Structural Geotechnical Report

Noise Abatement Wall #2
I-55 Station 301+90 to Station 329+50
SE Frontage Road
Will County, Illinois

Prepared for

Illinois Department of Transportation
Contract Number: IDOT PTB 189-011

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 #2
I-55 Sta. 301+90 to Sta. 329+50
SE Frontage Road
Contract Number: 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 and foundation recommendations. The site investigation included advancing fourteen (14) soil borings to depths between 20 to 41 feet.

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

Sincerely,

Ehab Shaheen

Ehab Shaheen, Ph.D., P.E.
Project Engineer

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

GSG

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WILL County, Illinois
IDOT PTB 189-011

1.0 INTRODUCTION

GSG Consultants, Inc. (GSG) completed a geotechnical investigation for the design of a noise abatement wall (#2) to mitigate noise for the City of Joliet, located on the west edge of the East Frontage Road southbound lane, south of IL52 in Will County, Illinois. The purpose of this site investigation was to explore the subsurface conditions along the proposed structure location, to determine engineering properties of the subsurface soil, and to develop final design and construction recommendations for the SE Frontage Road Noise Abatement Wall.

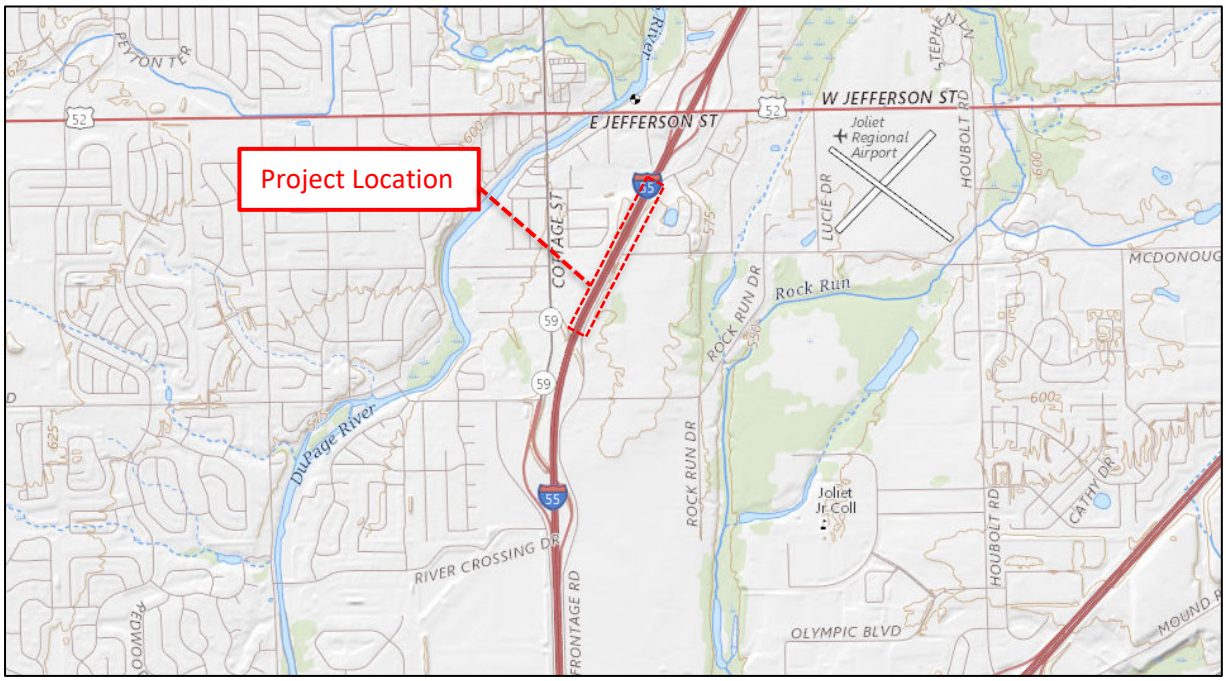


Exhibit 1 – Project Location Map
(Source: USGS Topographic Maps, usgs.gov)

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 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. In proximity to the DDI, the existing I-55 East Frontage Road will be realigned further east. This report pertains to Noise Wall #2.

1.1 Existing Site Conditions

The proposed Noise Wall # 2 will be located on the east side of the I-55 northbound lanes, and the west side of SE Frontage Road. The area where the proposed improvements are to be built will be on existing IDOT property right-of-way (ROW) and consists of the unoccupied ditch and utility corridor between I-55 and Frontage Road. **Exhibit 2a and 2b** generally shows the existing conditions where the proposed noise wall will be constructed. There are 2 existing 36-inch diameter Kinder Morgan pipelines that will be crossed by the noise wall at the southern wall limits near Station 302+00. There is an existing 48-inch diameter sewer that will remain in place at the northern limit of the noise wall. Several electrical conduits are shown on the GPE plan that cross the noise wall, but the exact size, depth and location are not known at this time.

Exhibit 2a – Existing Site Condition, Looking North along SE Frontage Road

Exhibit 2b – Existing Site Condition, Looking South along SE Frontage Road

1.2 Proposed Noise Wall Information

Based on the design information and drawings provided by Benesch (dated December 04, 2020, Appendix A), it is anticipated that the proposed noise wall will be crash worthy ground mounted wall between Stations 301+90 and 329+50. The wall will be located approximately 6 feet east of the proposed Retaining Wall W099-1002 between Stations 319+50 to 327+60. **Table 1** presents a summary of the proposed noise wall.

Table 1 – Noise Wall Summary

Wall Name	Wall Stations*	Proposed Wall Type	Approximate Length (ft)	Maximum Anticipated Retained Wall Height (ft)
Noise Wall #2	Sta. 301+90 to Sta. 329+50	Crash Worthy Ground Mounted	2,760	17.0

* Based on existing I-55 Stationing

A proposed new 12-inch sewer will be constructed perpendicular to the noise wall and retaining wall near Station 327+75.

1.3 Regional Geology

GSG reviewed several published documents to determine the regional geological setting in the area of the site. 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 the 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 between November 2 and November 6, 2020. The exploration program included advancing fourteen (14) 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. Two borings RWB-22 and RWB-24 drilled for Retaining Wall W099-1002 were also included in the analysis.

Table 2 – Summary of Subsurface Exploration Borings

Boring ID	Station*	Offset (ft)/ Direction	Depth (ft)	Surface Elevation (ft)
NAW2-001	302+00	92 RT	30	598.21
NAW2-002	304+00	92 RT	30	599.03
NAW2-003	306+00	92 RT	30	599.16
NAW2-004	308+00	93 RT	30	599.81
NAW2-005	310+00	93 RT	30	599.96
NAW2-006	312+00	93 RT	30	599.91
NAW2-007	314+00	93 RT	30	601.15
NAW2-008	316+00	95 RT	30	601.54
NAW2-009	318+00	95 RT	30	601.34
NAW2-010	320+00	95 RT	41**	601.15
NAW2-011	322+00	95 RT	30	601.11
RWB-22	323+30.2	87.3 RT	30	598.80
RWB-24	324+72.5	87.3 RT	35	597.00

Boring ID	Station*	Offset (ft)/ Direction	Depth (ft)	Surface Elevation (ft)
NAW2-012	326+50	95 RT	38**	592.49
NAW2-013	328+50	96 RT	23**	585.22
NAW2-014	329+50	96 RT	20**	582.78

* Based on existing I-55 Stationing.

** Boring terminated upon encountering auger refusal on apparent bedrock.

The soil borings were drilled using CME-75 and Diedrich D-50 TM 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 30 feet and at 5.0-foot afterwards to the planned termination depth or auger refusal on bedrock. 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.

The following laboratory tests were performed on representative soil samples:

- Moisture content ASTM D2216 / AASHTO T-265
- Atterberg Limits ASTM D 4318 / AASHTO T-89 / AASHTO T-90
- Dry Unit Weight ASTM D7263
- Organic Content ASTM D2974 / AASHTO T-267

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 Illinois Division of Highways (IDH) classification systems. The results of the laboratory testing program are shown on the 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.

NAW2-001 to NAW2-011 and RWB-22

The borings were drilled through the existing pavement on the shoulder of East Frontage Road, or within the topsoil along the side of the East Frontage Road. The ground elevations of these borings ranged between 598.2 and 601.1 feet.

The borings noted 6 inches of asphalt or 2 to 4 inches of topsoil underlain by sand and gravel fill to elevations between 600.0 to 594.2 feet. The borings then encountered dark gray, brown and gray silty clay fill to elevations between 598.0 to 590 feet. Beneath these fill materials, the borings encountered very stiff to hard brown and gray silty clay to elevations between 590.0 to 583.0 feet followed by very stiff to hard gray silty clay to elevations between 583.0 to 577.0 feet. The borings then noted loose to extremely dense gray silty loam to elevations between 575.0 to 560.0 feet, where borings NAW2-005, 006, and NAW2-008 through NAW2-011 terminated. Borings NAW2-001 through NAW2-004, NAW2-007 and RWB-22 noted very stiff silty clay loam to the boring termination depth. Boring NAW2-002 noted medium dense light brown sand at an

elevation between 693.0 and 588.0 feet and medium dense gray silty loam at an elevation between 588.0 and 584.5 feet. Cobbles and limestone fragments were encountered throughout the borings at varying depths. Boring NAW2-010 was terminated upon encountering auger refusal on limestone at a depth of 40 feet.

The silty clay fill had unconfined compressive strength ranging from 1.7 to 5.4 tsf. The native brown and gray silty clay had unconfined compressive strength ranging from 2.1 to 7.1 tsf, with most values between 3.0 and 5.0 tsf. The native gray silty clay had an unconfined compressive strength ranging from 2.0 to 6.0 tsf.

The standard penetration test (SPT) N values of the silty loam were between 7 and 80 blows per foot (bpf). The standard penetration test (SPT) N values of the sand were between 18 and 20 blows per foot (bpf).

RWB-24 and NAW2-012

The borings were drilled on the topsoil on the side of East Frontage Road. The ground elevations of these borings ranged between 592.5 and 597.0 feet.

The borings noted 3 to 6 inches of topsoil underlain by silty clay fill to elevations between 583.5 to 581.5 feet. Beneath these fill materials, the borings encountered gray medium dense to dense silt to elevations between 561.5 to 568.5 feet followed by stiff to very stiff gray silty clay to the boring termination depth upon encountering auger refusal on apparent bedrock at elevations between 563.5 and 554.5 feet. Boring RWB-24 noted weathered limestone fragments at elevation of 563.5 feet. Cobbles and limestone fragments were encountered below elevation 566.0 feet.

The silty clay fill had unconfined compressive strength ranging from 3.5 to 6.25 tsf. The native gray silty clay had an unconfined compressive strength ranging from 1.9 to 4.0 tsf. The standard penetration test (SPT) N values of the silty loam were between 11 and 38 blows per foot (bpf).

NAW2-013 to NAW2-014

The borings were drilled on the topsoil on the side of the East Frontage Road. The ground elevations of these borings ranged between 582.8 and 585.2 feet.

The borings noted 3 inches of topsoil underlain by silty clay/sand and gravel fill to elevations between 577 to 574.5 feet. Beneath these fill materials, the boring encountered stiff to hard gray silty clay to the boring termination depth upon encountering auger refusal on apparent bedrock at elevations between 562.0 to 563.0. Cobbles were encountered throughout the depth of boring NAW2-013.

The silty clay fill had unconfined compressive strength ranging from 2.5 to 3.5 tsf. The native gray silty clay had unconfined compressive strength ranging from 1.25 to 5.2 tsf. The standard penetration test (SPT) N values of the sand and gravel fill soils were between 6 and 10 blows per foot (bpf).

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 only encountered in borings NAW2-001, 002, 012, 013 and RWB-24 during drilling at elevations between 588.0 and 563.5 feet; groundwater was not encountered upon completion or after drilling was completed in the remaining borings. Due to the location of the borings along the active roadway, the borings were not left open after completion, and no 24-hour readings were collected. All of the borings were immediately backfilled with soil cuttings and bentonite, and surface patched with asphalt where necessary.

Based on the color change from brown to gray, it is anticipated that the long-term groundwater level could range between elevations 590.2 to 567.8 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. Long term observations in cased borings or piezometers would be necessary to more accurately evaluate the long-term groundwater conditions at the site. 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 in unexplored locations 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 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 efficiency of the automatic hammer used for this exploration was estimated to be approximately 91% and 92% for the CME 75 and Diedrich D-50 TM rigs based on GSG's calibration records. The following equations should be used in calculating the corrected blow counts for the purposes of design and analysis:

$$N_{60} = N_{Field}*(91/60) : \text{CME-75}$$
$$N_{60} = N_{Field}*(92/60) : \text{Diedrich D-50 TM}$$

*Where the N_{Field} value is the field recorded blow counts during drilling activities.

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

Table 3a – Soil Parameters Table (NAW2-001 to NAW2-011, RWB-22)

Elevation (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
600-598	Brown and Gray Sand and Gravel FILL	123	0	30	0	30
598-595	Dark Gray, Brown and Gray Silty Clay FILL	138	3,300	0	330	25
595-588	Brown and Gray Very Stiff to Hard Silty Clay	138	4,100	0	410	27
588-580	Gray Very Stiff to Hard Silty Clay	138	3,500	0	350	27
580-570	Gray Loose to Extremely Dense Silty Loam	131	0	42	0	42
574-569 [1]	Gray Very Stiff Silty Clay Loam	138	2,300	0	230	27
593-588 [2]	Light Brown Medium Dense Sand	129	0	42	0	42
588-584.5 [2]	Gray Medium Dense Silty Loam	119	0	40	0	40

[1] Soil Parameters only for NAW-001, 002, 003, 007 and RWB-22
[2] Soil Parameters only for NAW-002

Table 3b – Soil Parameters Table (RWB-24 and NAW2-012)

Elevation (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
596-582	Brown and Gray Silty Clay FILL	138	4,500	0	450	25
582-567	Gray Medium Dense to Dense Silt	128	0	42	0	42
567-563.5 RWB-24	Gray Stiff to Very Stiff Silty Clay	138	2,200	0	220	27
567-561.5 NAW2-012	Gray Medium Dense Silt	122	0	36	0	36
561.5-544.5 NAW2-012	Gray Very Stiff Silty Clay	138	3,200	0	320	27

Table 3c – Soil Parameters Table (NAW2-013 to NAW2-014)

Elevation (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
585-576.5 NAW2-013	Brown and Gray Silty Clay FILL	138	3,000	0	300	25
583-574.5 NAW2-014	Brown and Gray Sand and Gravel FILL	115	0	30	0	30
576.5-563	Gray Stiff to Hard Silty Clay	138	2,400	0	240	23

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

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 preliminary 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 load factors specified in AASHTO Table 3.4.1-1.

4.2.1 Shallow Foundations

The proposed ground-mounted wall may be supported on a conventional shallow continuous footing foundation system, bearing on new or existing clay/sand and gravel fill. 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 factored bearing resistance was determined using a bearing resistance factor, ϕ_b, of 0.50 per AASHTO 10.6.3.1 2a-1. The Service I Limit State is based on 1-inch maximum settlement.

Table 5 – Recommended Shallow Foundation Bearing Resistance

Stations**	Bearing Elevation* (ft.)	Nominal Resistance (ksf)	Factored Bearing Resistance (ksf)	Bearing Resistance for 1-inch Service Limit (ksf)	Anticipated Bearing Soil
301+90 to 324+00	597 to 603	5.6	2.8	2.6	New Engineered or Existing Fill
324+00 to 327+50	585 to 602	5.6	2.8	2.2	New Engineered or Existing Fill
327+50 to 329+50	580 to 585	5.6	2.8	1.9	New Engineered or Existing Fill

*Elevations assuming bearing elevation of 4 feet below existing site grade

**Stationing Based on existing I-55 Stationing

The subgrade soils encountered at the bearing elevation should be cleared of any unsuitable material. Based on the results of the subsurface exploration, and the anticipated grading in this area, we anticipate the wall would be supported upon the soil types noted in **Table 5**. Based on the consistency of the fill material, the moisture contents, in-situ unit weights, and unconfined compressive strengths, the majority of the existing fill materials appear suitable for the support of shallow foundations as recommended herein. Although undercuts are not anticipated for this wall, the existing fill soils should be field verified during construction of the wall, and any cohesive materials exhibiting unconfined compressive strengths less than 2.0 tsf, moisture content higher than 30% or significant organic materials 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 clay soils. A resistance factor of 0.80 for CIP or 0.90 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 Settlement of Noise Wall Supported on Shallow Foundation

Settlement of the ground-mounted noise wall depends on the foundation size and bearing resistance, 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 resistance as noted in **Table 5** are used, settlement of the noise wall will be on the order of 1 inch.

4.2.3 Drilled Shaft Foundations

As an alternative, the noise wall may be supported on a system of shallow drilled shafts. It is estimated that the drilled shafts should be extended to bearing elevations as shown in **Table 6**. Based on the nature of the subsurface soil, resistance factors of 0.40 and 0.45 were used for the tip resistance and side shaft resistance, respectively, for cohesive material. Drilled piers extending to these depths can be designed using the nominal bearing resistance and side resistances shown in **Table 6**.

Table 6a – Drilled Shaft Design Parameters (NAW2-001 to NAW2-011 and RWB-22)

Station[2]	Shaft Intervals Elev. (feet)[1]	Assumed Shaft Diameter (feet)	End Bearing			Side Friction	
			Bearing Elevation (feet)	Nominal Tip Resistance (ksf)	Factored Tip Resistance (ksf)	Nominal Side Friction (ksf)	Factored Side Resistance (ksf)
301+90 to 324+00	595-588	3.0	591.5	36.9	14.7	2.08	0.93
	588-580	3.0	584.0	31.5	12.6	1.87	0.84
	580-570	3.0	575.0	56.4	28.2	2.16	1.19

[1] Elevations estimated from surveyed boring locations

[2] Stationing based on existing I-55 Stationing

Table 6b – Drilled Shaft Design Parameters (RWB-24 and NAW2-012)

Station[2]	Shaft Intervals Elev. (feet)[1]	Assumed Shaft Diameter (feet)	End Bearing			Side Friction	
			Bearing Elevation (feet)	Nominal Tip Resistance (ksf)	Factored Tip Resistance (ksf)	Nominal Side Friction (ksf)	Factored Side Resistance (ksf)
324+00 to 327+50	591-582	3.0	586.5	40.5	16.2	2.19	0.99
	582-567	3.0	574.5	43.7	21.8	2.10	1.16
	567-563.5 RWB-24	3.0	565.3	19.8	7.9	1.21	0.54
	567-563.5 NAW2-012	3.0	565.3	25.5	12.7	2.15	1.18
	563.5-544.5	3.0	554	28.8	11.5	1.76	0.79

[1] Elevations estimated from surveyed boring locations

[2] Stationing based on existing I-55 Stationing

Table 6c – Drilled Shaft Design Parameters (NAW2-013 to NAW2-014)

Station[2]	Shaft Intervals Elev. (feet)[1]	Assumed Shaft Diameter (feet)	End Bearing			Side Friction	
			Bearing Elevation (feet)	Nominal Tip Resistance (ksf)	Factored Tip Resistance (ksf)	Nominal Side Friction (ksf)	Factored Side Resistance (ksf)
327+50 to 329+50	580-576.5 RWB-13	3.0	578.3	26.1	10.4	1.65	0.74
	580-576.5 RWB-14	3.0	578.3	14.9	7.4	0.77	0.43
	576.5	3.0	569.8	21.6	8.6	1.32	0.59

[1] Elevations estimated from surveyed boring locations

[2] Stationing based on existing I-55 Stationing

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: $3 \leq (L/D) \leq 30$. 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 for Drilled Shafts Foundation

Drilled shafts for the proposed noise wall structure 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, and 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. **Table 7** presents recommended soil parameters for use in the drilled shafts lateral load analysis.

Table 7a– Lateral Soil Parameters (NAW2-001 to NAW2-011, RWB-22)

Depth (feet)	Soil Description	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})
	New Engineered Clay Fill	0.41	2.46	0.58	500	0.01
	New Engineered Granular Fill	0.31	3.25	0.47	90	N/A
600-598	Brown and Gray Sand and Gravel FILL	0.33	3.00	0.50	90	N/A
598-595	Dark Gray, Brown and Gray Silty Clay FILL	0.41	2.46	0.58	1,000	0.005
595-588	Brown and Gray Very Stiff to Hard Silty Clay	0.38	2.66	0.55	2,000	0.004
588-580	Gray Very Stiff to Hard Silty Clay	0.38	2.66	0.55	1,000	0.005
580-570	Gray Loose to Extremely Dense Silty Loam	0.20	5.04	0.33	125	N/A
574-569 [1]	Gray Very Stiff Silty Clay Loam	0.55	0.38	2.66	1,000	0.005
593-588 [2]	Light Brown Medium Dense Sand	0.33	0.20	5.04	60	N/A
588-584.5 [2]	Gray Medium Dense Silty Loam	0.36	0.22	4.60	60	N/A

[1] Soil Parameters only for NAW-001, 002, 003 and 007
[2] Soil Parameters only for NAW-002
*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 (RWB-24 and NAW2-012)

Depth (feet)	Soil Description	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})
	New Engineered Clay Fill	0.41	2.46	0.58	500	0.01
	New Engineered Granular Fill	0.31	3.25	0.47	90	N/A
596-582	Brown and Gray Silty Clay FILL	0.41	2.46	0.58	2,000	0.004
582-567	Gray Medium Dense to Dense Silt	0.20	5.04	0.33	60	N/A
567-563.5 RWB-24	Gray Stiff to Very Stiff Silty Clay	0.38	2.66	0.55	1,000	0.005
567-561.5 NAW2-012	Gray Medium Dense Silt	0.26	3.85	0.41	60	N/A
561.5-544.5 NAW2-012	Gray Very Stiff Silty Clay	0.38	2.66	0.55	1,000	0.005

*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 7c– Lateral Soil Parameters (NAW2-013 to NAW2-014)

Depth (feet)	Soil Description	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})
	New Engineered Clay Fill	0.41	2.46	0.58	500	0.01
	New Engineered Granular Fill	0.31	3.25	0.47	90	N/A
585-576.5 NAW2-013	Brown and Gray Silty Clay FILL	0.41	2.46	0.58	1,000	0.005
583-574.5 NAW2-014	Brown and Gray Sand and Gravel FILL	0.33	3.00	0.50	20	N/A
576.5-563	Gray Stiff to Hard Silty Clay	0.44	2.28	0.61	1,000	0.005

*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 Existing Utilities

Based on the GPE plans provided, several utilities will remain in place below the proposed new wall. Where these existing will remain in place, the final locations of the utilities should be determined relative to the new foundations to determine any impact of influence the new structure may have on the utilities. There are also existing utilities that may be relocated or abandoned prior to 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.

5.2 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.

5.3 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 the 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.

5.4 Groundwater Management

Based on the color change from brown to gray, it is anticipated that the long-term groundwater level could range between elevations 590.2 to 567.8 feet. GSG does not anticipate groundwater related issues during construction activity; however, water may become perched in the near-surface fill material. 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 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.

5.5 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. A temporary casing may 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. 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.

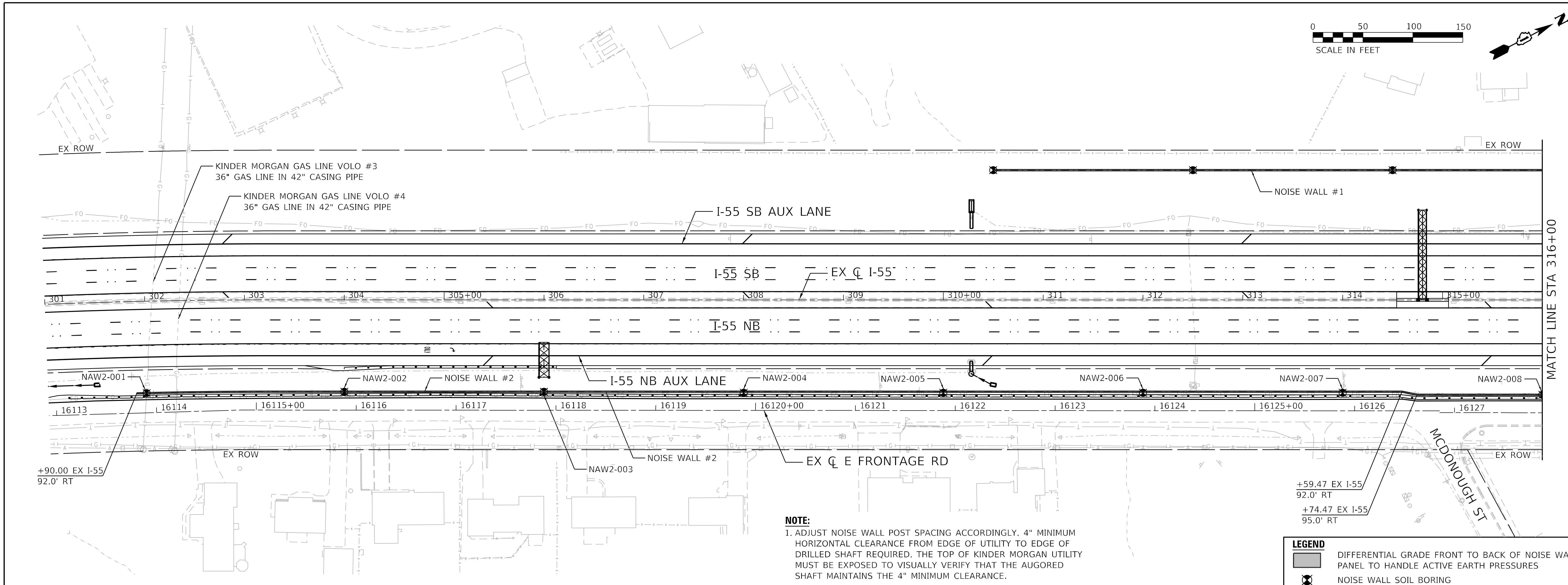
6.0 LIMITATIONS

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 have been 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 the submission of this report, it will be necessary to evaluate their nature and review the recommendations presented herein.

APPENDIX A

GENERAL PLANS, ELEVATIONS,

AND DETAILS

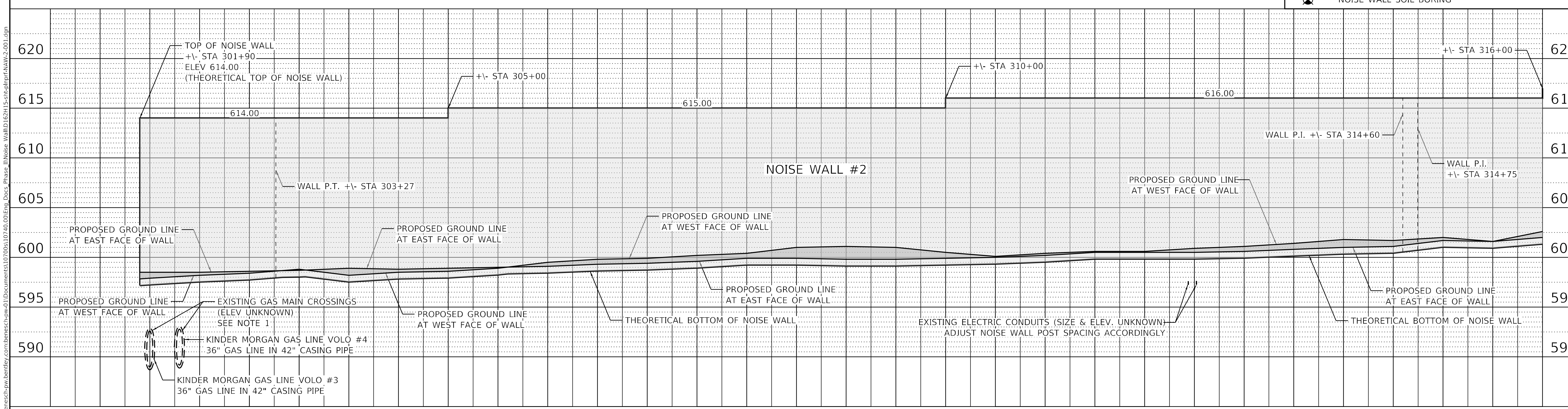


NOTE:

1. ADJUST NOISE WALL POST SPACING ACCORDINGLY. 4" MINIMUM HORIZONTAL CLEARANCE FROM EDGE OF UTILITY TO EDGE OF DRILLED SHAFT REQUIRED. THE TOP OF KINDER MORGAN UTILITY MUST BE EXPOSED TO VISUALLY VERIFY THAT THE AUGORED SHAFT MAINTAINS THE 4" MINIMUM CLEARANCE.

LEGEND

- DIFFERENTIAL GRADE FRONT TO BACK OF NOISE WALL PANEL TO HANDLE ACTIVE EARTH PRESSURES
- NOISE WALL SOIL BORING



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PLOT DATE = 12/4/2020	DATE - 12/04/2020	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

NOISE WALL #2 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.
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CONTRACT NO. 62H15

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

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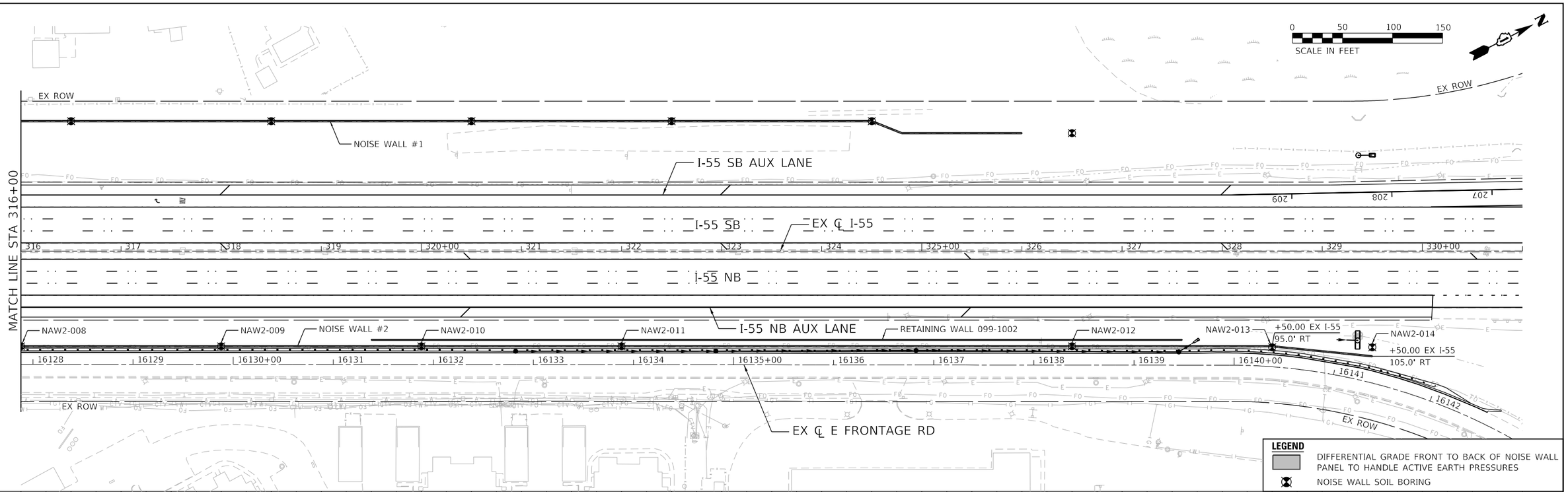
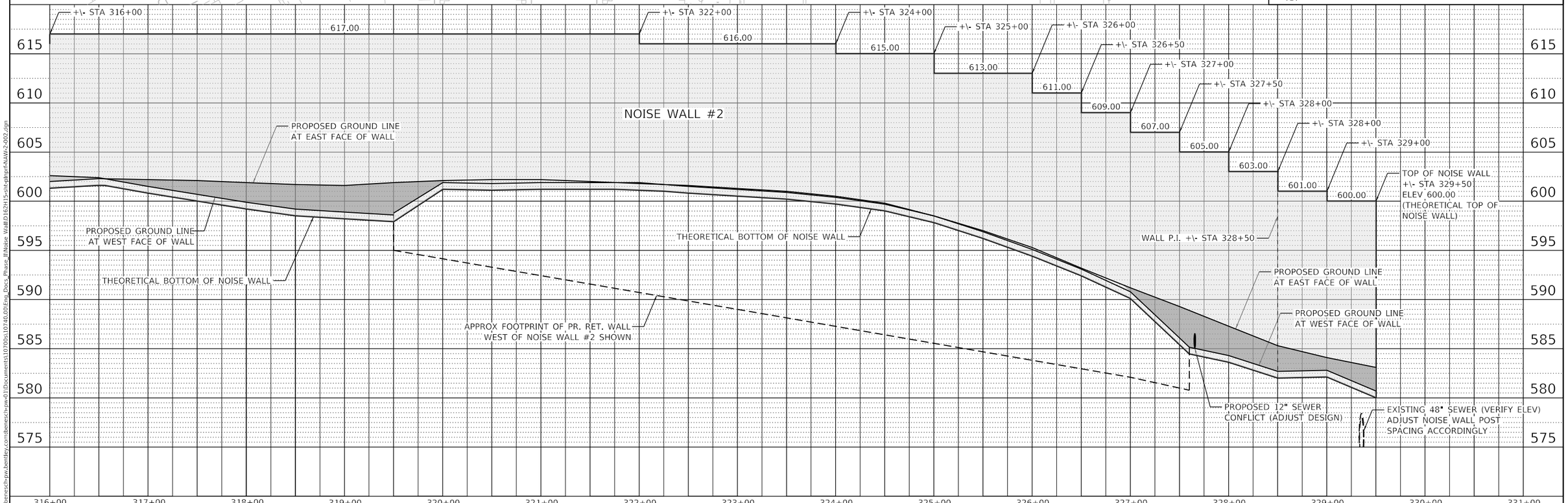
2012/11/30





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NOISE WALL #2 PLAN AND PROFILE

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

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		CONTRACT NO. 62H15		
* FAI 55, FAP 338	ILLINOIS	FED. AID PROJECT		

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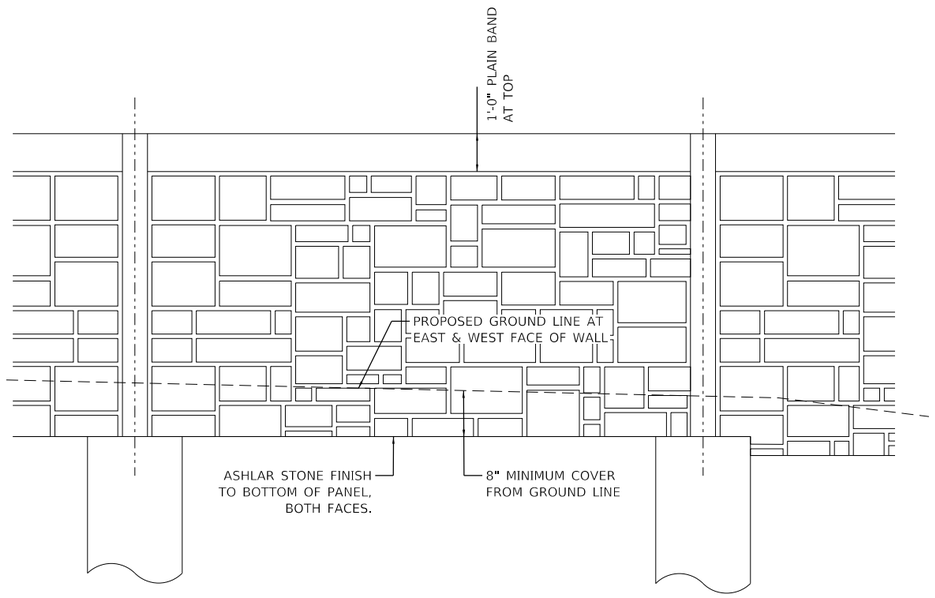

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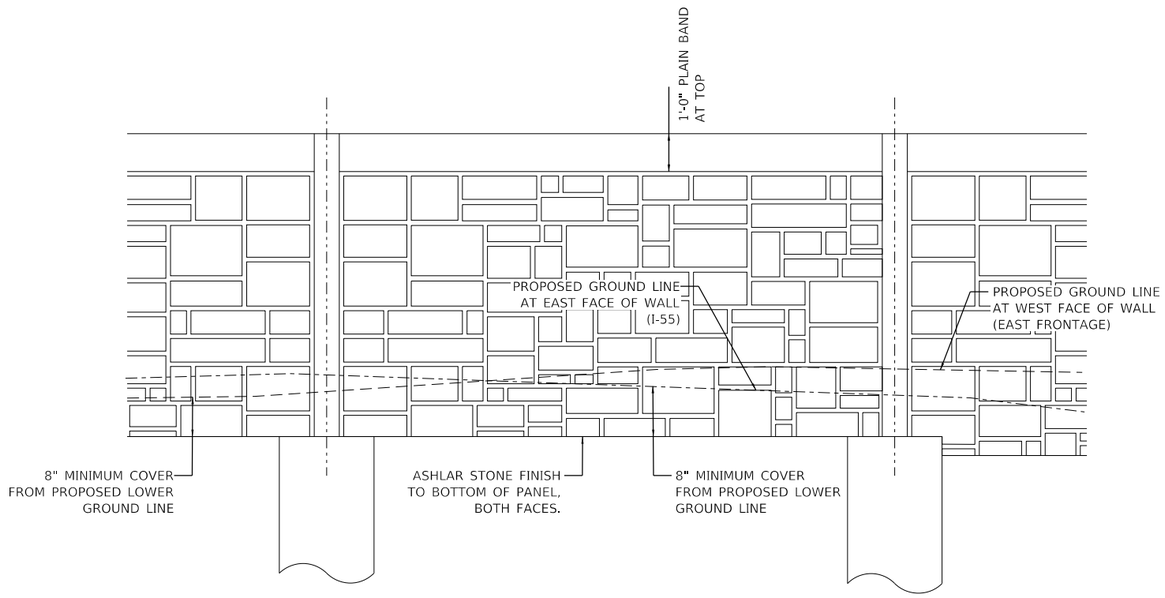

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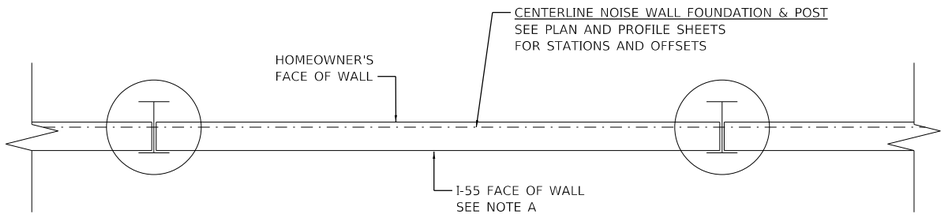

NOISE WALL #1 PLAN
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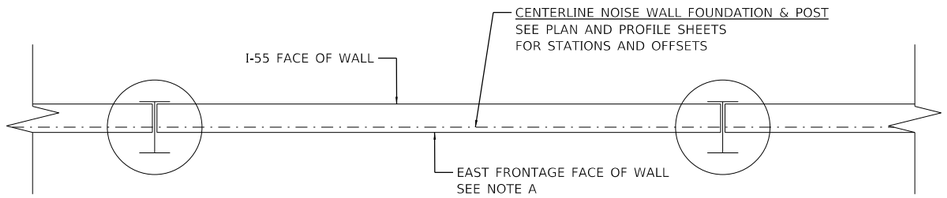

NOISE WALL #2 PLAN
N.T.S

NOTE A
THE FACE OF THE NOISE WALL PANELS SHALL BE PLACED FLUSH WITH THE FLANGE OF THE SUPPORT POST AS SHOWN IN THE PLAN VIEW.

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312-565-0450 Job No. 10740

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

NOISE WALL DETAILS

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* FAI 55, FAP 338	ILLINOIS	FED. AID PROJECT		

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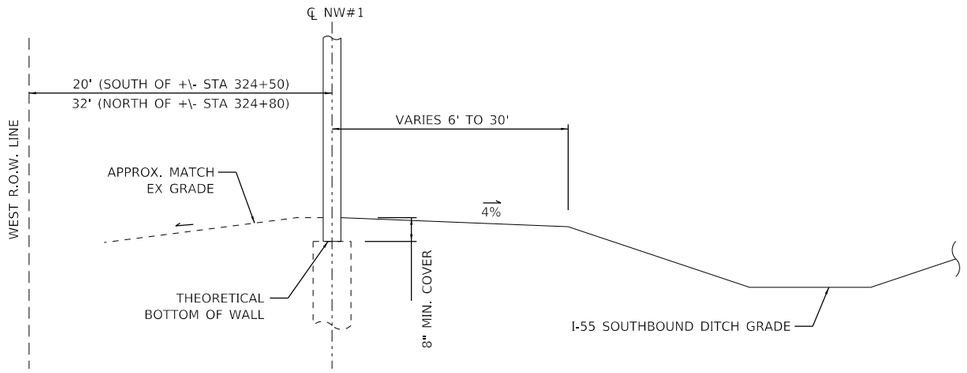
2012/11/30



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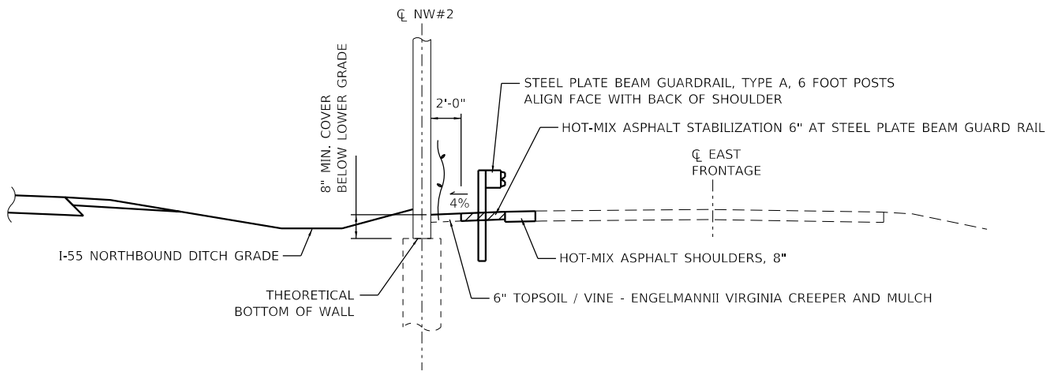

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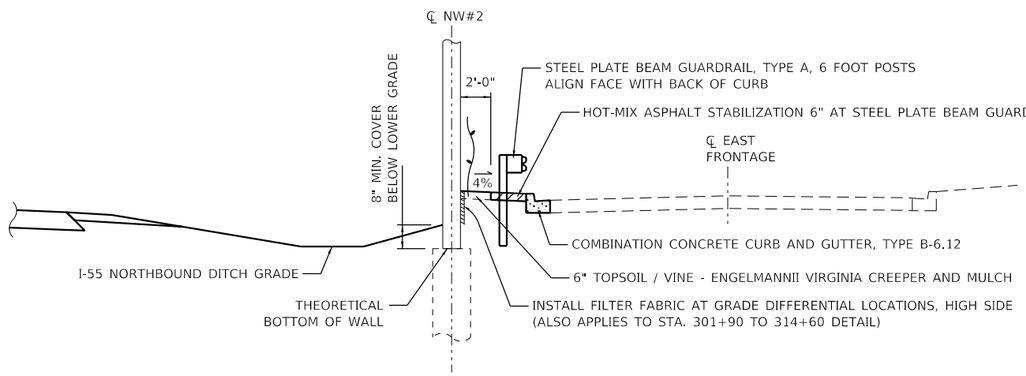

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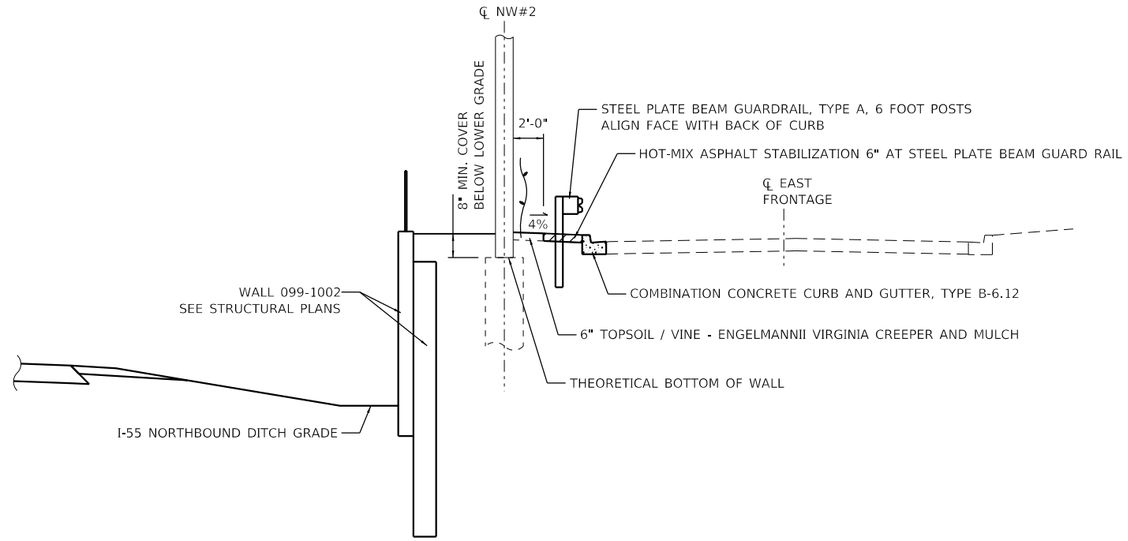

NOISE WALL #2 SECTION DETAIL, STA. 319+50 TO 327+60

N.T.S

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

NOISE WALL DETAILS

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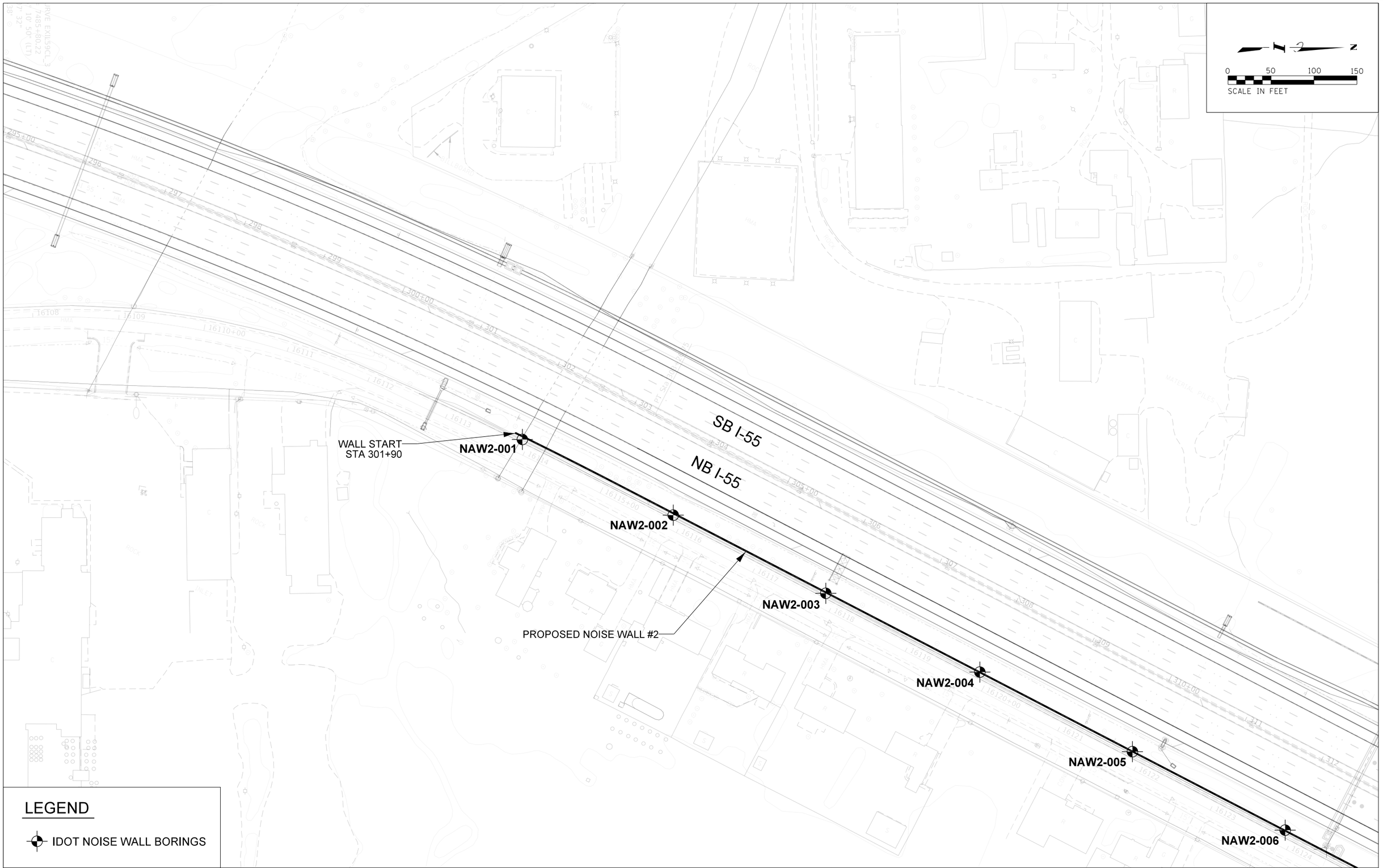
2012/11/30

APPENDIX B

SOIL BORING LOCATION MAP

AND SUBSURFACE PROFILE



LEGEND

IDOT NOISE WALL BORINGS

GSG CONSULTANTS, INC.
735 Remington Road, Schaumburg, IL 60173
Tel: 630.994.2600, www.gsg-consultants.com

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

CONTRACT NO. 189-011

I-55/ROUTE 59 WILL COUNTY
NOISE ABATEMENT WALL 2 BORING LOCATION PLAN

SCALE: AS NOTED | SHEET 1 OF 2 SHEETS | STA. | TO STA.

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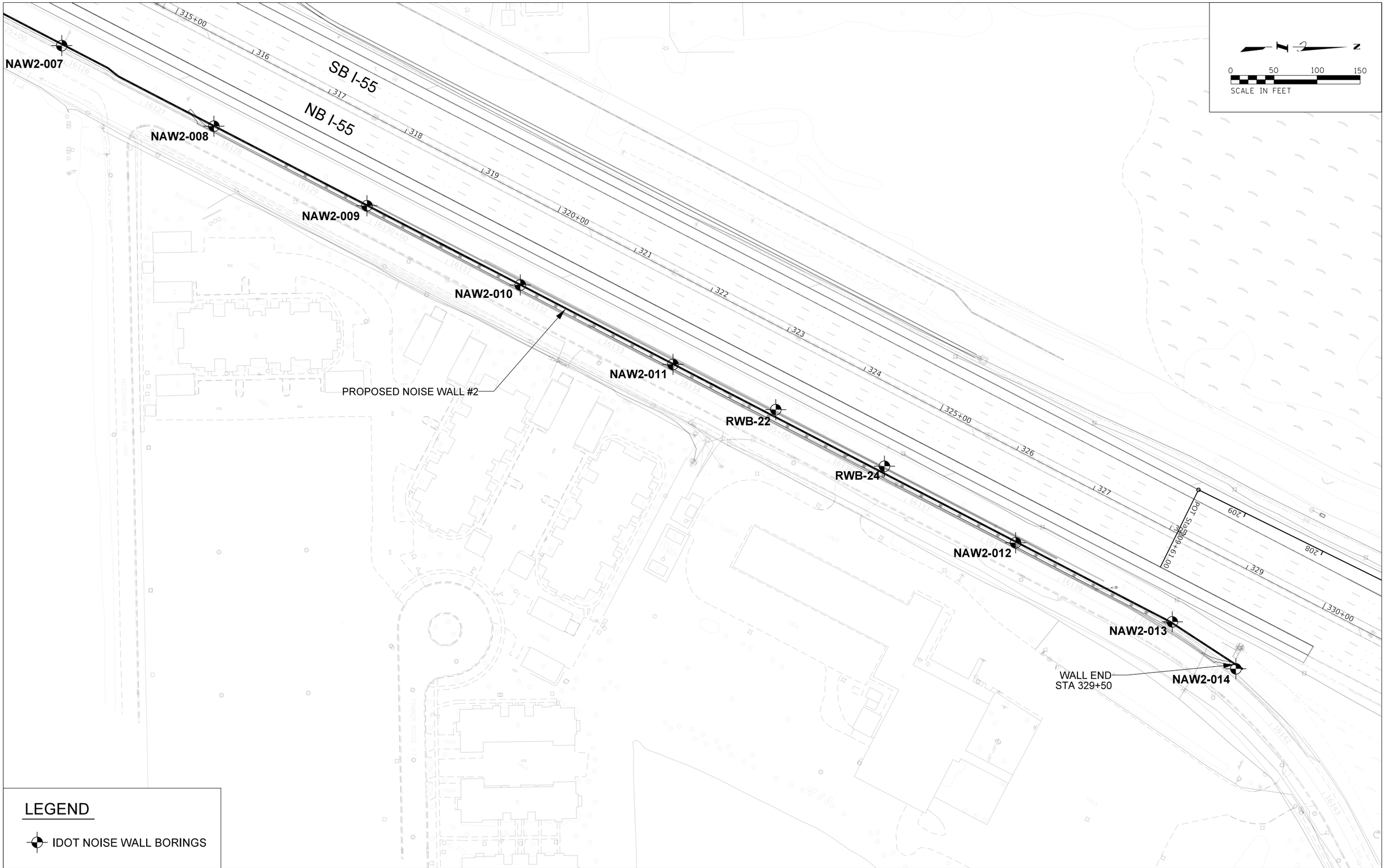

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IDOT NOISE WALL BORINGS

GSG CONSULTANTS, INC.
735 Remington Road, Schaumburg, IL 60173
Tel: 630.994.2600, www.gsg-consultants.com

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

CONTRACT NO. 189-011
I-55/ROUTE 59 WILL COUNTY
NOISE ABATEMENT WALL 2 BORING LOCATION PLAN
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PAVEMENT	FILL: SAND / GRAVEL	SANDY CLAY / LOAM
BASE COURSE	SILTY CLAY	CLAYEY SAND / SILT
TOPSOIL	SAND	ORGANIC SILTY CLAY
FILL: CLAY / SILTY CLAY	SILT / SILTY LOAM	BEDROCK

BEGINN NOISE WALL STA 301+90

EXISTING GAS MAIN CROSSING

TOP OF NOISE WALL

PROPOSED GROUND INE AT EAST FACE OF WALL

PROPOSED GROUND INE AT WEST FACE OF WALL

BOTTOM OF NOISE WALL

MATCH LINE STA.: 306+50

NAW2-001
302+00
92.00ft RT

EL		D	N	Qu	w%
598.21	6 inches of Asphalt				
597.71	Light Brown and Gray, Dry FILL: SAND and GRAVEL	0	14		4
594.21	Dark Gray and Brown, Moist FILL: SILTY CLAY, with sand	5	7	1.67 B	17
589.71	Hard Brown and Gray, Moist SILTY CLAY LOAM, with sand (ML/CL)	10	7	3.0 P	19
587.21	Stiff to Hard Gray, Moist SILTY CLAY LOAM, trace sand (ML/CL)	15	16	4.79 B	21
577.21	Medium Dense to Very Dense Gray, Moist to Very Moist SILTY LOAM, with sand (ML)	20	10	1.87 B	17
569.71	Very Stiff Gray, Very Moist SILTY CLAY LOAM (ML/CL)	25	8	2.50 B	16
568.21	End of Boring	30	10	4.58 B	15
			20	6.04 B	17
			57		20
			17	6.0 B	21
			20		23
			9	2.08 B	32

NAW2-002
304+00
92.00ft RT

EL		D	N	Qu	w%
599.03	6 inches of Asphalt				
598.53	Brown and Gray, Moist FILL: SAND and GRAVEL	0	7	3.5 P	22
598.03	Brown and Gray, Moist FILL: SILTY CLAY, trace sand	5	14	5.21 B	20
593.03	Medium Dense Light Brown, Wet SAND (SP)	10	18		24
588.03	Loose to Medium Dense Gray, Moist to Very Moist SILT LOAM, with sand (ML)	15	20		22
584.53	Stiff to VeryStiff Gray, Moist SILTY CLAY LOAM, trace sand (ML/CL)	20	11		23
578.03	Medium Dense to Very Dense Gray, Moist to Very Moist SILT LOAM, with sand (ML)	25	6	2.08 B	17
573.03	Very Stiff Gray, Very Moist SILTY CLAY LOAM (ML/CL)	30	19	2.0 P	18
569.03	End of Boring		32		19
			57		19
			26		21
			9	2.71 B	27
			10	2.50 B	20

NAW2-003
306+00
92.00ft RT

EL		D	N	Qu	w%
599.16	6 inches of Asphalt				
598.66	Brown and Gray, Moist FILL: SAND and GRAVEL	0	10	3.12 B	27
598.16	Dark Gray, Very Moist FILL: SILTY CLAY, trace sand and gravel	5	15	5.00 B	19
595.66	Very Stiff to Hard Brown and Gray, Moist SILTY CLAY LOAM, trace sand (ML/CL)	10	18		15
583.16	Very Stiff to Hard Gray, Moist to Very Moist SILTY CLAY LOAM (ML/CL)	15	11	3.0 P	16
578.16	Medium Dense to Dense Gray, Moist SILTY LOAM, with sand (ML)	20	16	4.0 P	16
570.66	Very Stiff Gray, Very Moist SILTY CLAY LOAM (ML/CL)	25	14		14
569.16	End of Boring	30	14	4.0 P	21
			15	4.58 B	27
			48		18
			29		19
			12		20
			8	2.29 B	27

301+50 302+00 302+50 303+00 303+50 304+00 304+50 305+00 305+50 306+00 306+50

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Tel: 630.994.2600, www.gsg-consultants.com

USER NAME = $USER$		DESIGNED -	MZ
SHEET SIZE = 1.41667x0.916667 (ft.)		DRAWN -	NN
PLOT SCALE = 120.0000 ' / ft.		CHECKED -	DE
PLOT DATE = 1/22/2021		DATE -	01/22/2021

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

CONTRACT NO. 189-011
I-55/ROUTE 59 WILL COUNTY
NOISE ABATEMENT WALL 2 BORING PROFILE

SCALE: ___AS NOTED | SHEET 1 OF 6 SHEETS | STA. 301+00 | TO STA. 306+50

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
I-55		WILL	8	3
		CONTRACT NO.	2189-011	
	ILLINOIS	FED. AID PROJECT		

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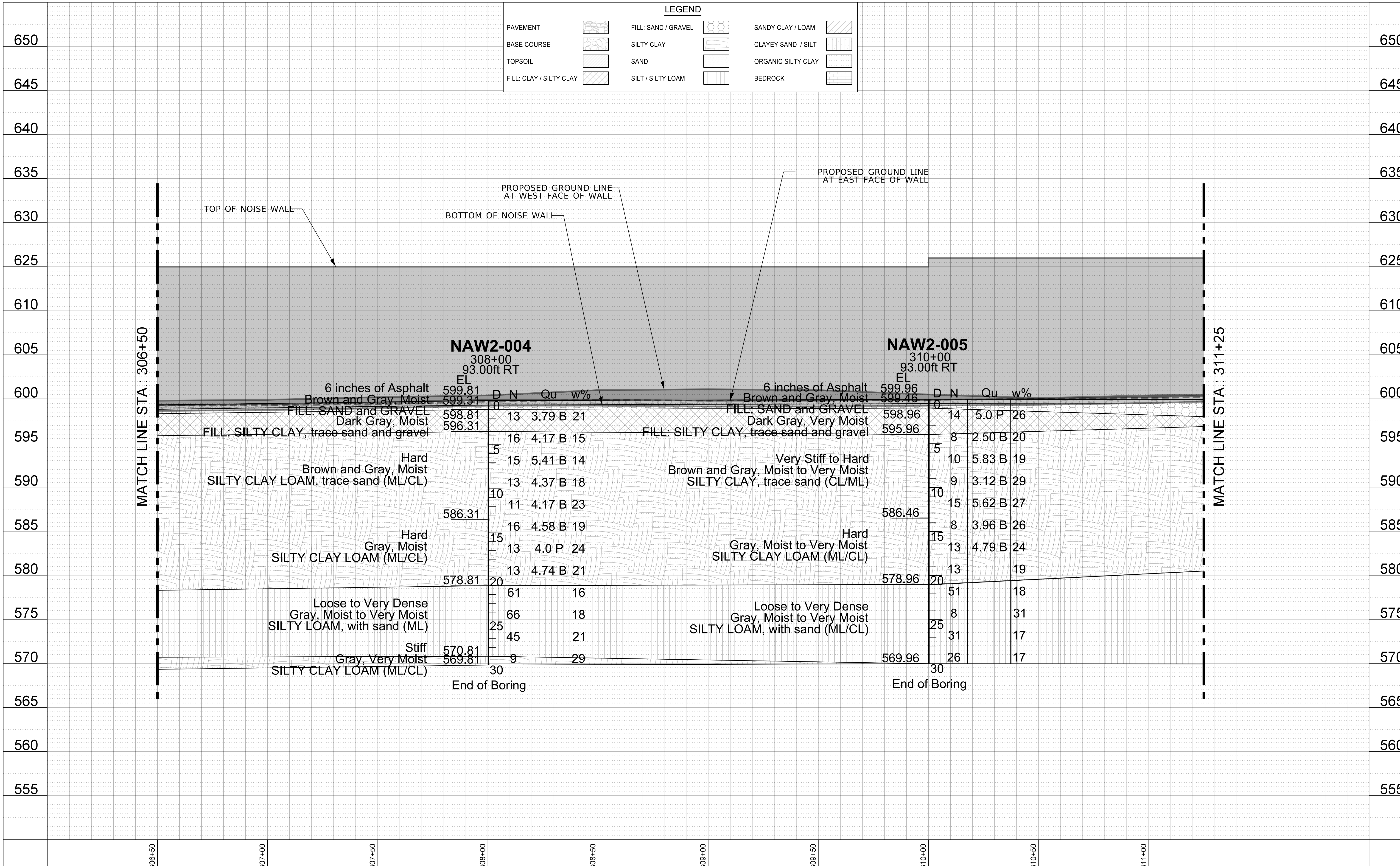

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USER NAME = $USER$		DESIGNED -	MZ
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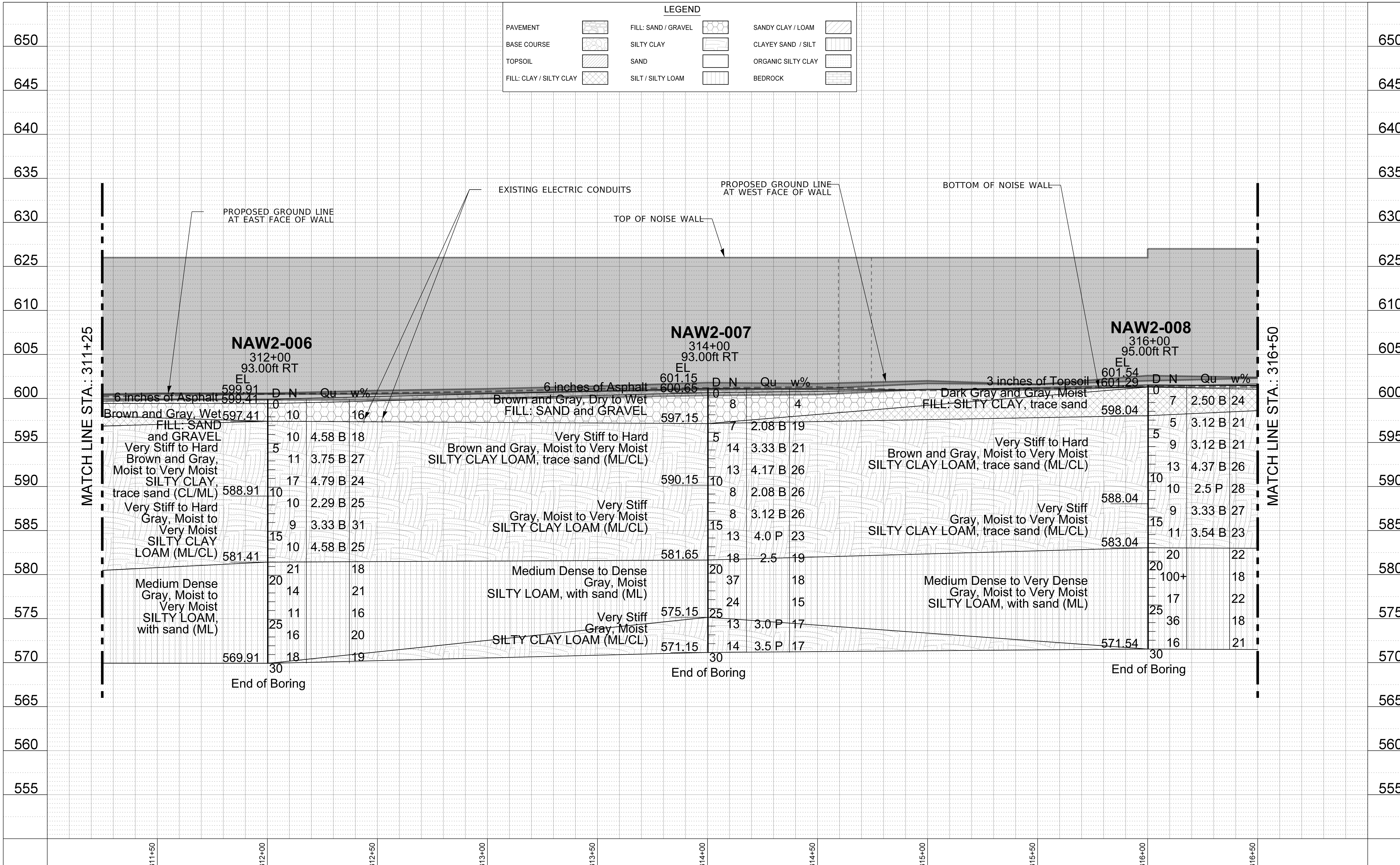
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

CONTRACT NO. 189-011
I-55/ROUTE 59 WILL COUNTY
NOISE ABATEMENT WALL 2 BORING PROFILE

SCALE: AS NOTED | SHEET 2 OF 6 SHEETS | STA. 306+50 TO STA. 311+25

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
I-55		WILL	8	4
		CONTRACT NO.	2189-011	
	ILLINOIS	FED. AID PROJECT		



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USER NAME = $USER$		DESIGNED -	MZ
SHEET SIZE = 1.41667x0.916667 (ft.)		DRAWN -	NN
PLOT SCALE = 120.0000 ' / ft.		CHECKED -	DE
PLOT DATE = 1/22/2021		DATE -	01/22/2021

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

CONTRACT NO. 189-011
I-55/ROUTE 59 WILL COUNTY
NOISE ABATEMENT WALL 2 BORING PROFILE

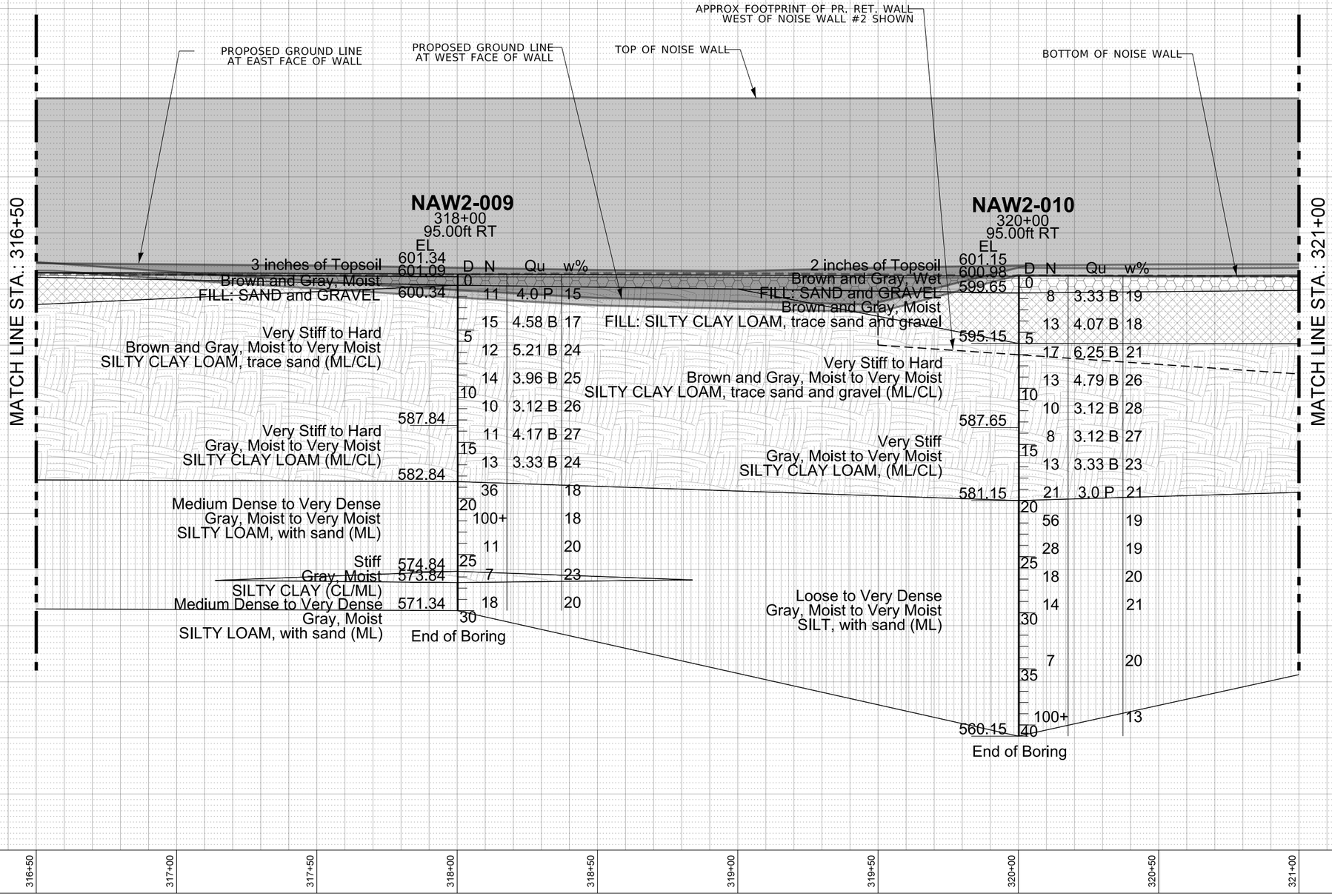
SCALE: AS NOTED | SHEET 2 OF 6 SHEETS | STA. 311+25 TO STA. 316+50

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
I-55		WILL	8	4
		CONTRACT NO.	2189-011	

ILLINOIS | FED. AID PROJECT

LEGEND

PAVEMENT	FILL: SAND / GRAVEL	SANDY CLAY / LOAM
BASE COURSE	SILTY CLAY	CLAYEY SAND / SILT
TOPSOIL	SAND	ORGANIC SILTY CLAY
FILL: CLAY / SILTY CLAY	SILT / SILTY LOAM	BEDROCK



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USER NAME	= $USER$	DESIGNED -	MZ
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PLOT SCALE	= 120.0000 ' / ft.	CHECKED -	DE
PLOT DATE	= 2/9/2021	DATE -	01/22/2021

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

CONTRACT NO. 189-011
I-55/ROUTE 59 WILL COUNTY
NOISE ABATEMENT WALL 2 BORING PROFILE

SCALE: ___ AS NOTED | SHEET 4 OF 6 SHEETS | STA. 316+50 | TO STA. 321+00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
I-55		WILL	8	6
		CONTRACT NO. 2189-011		
	ILLINOIS	FED. AID PROJECT		

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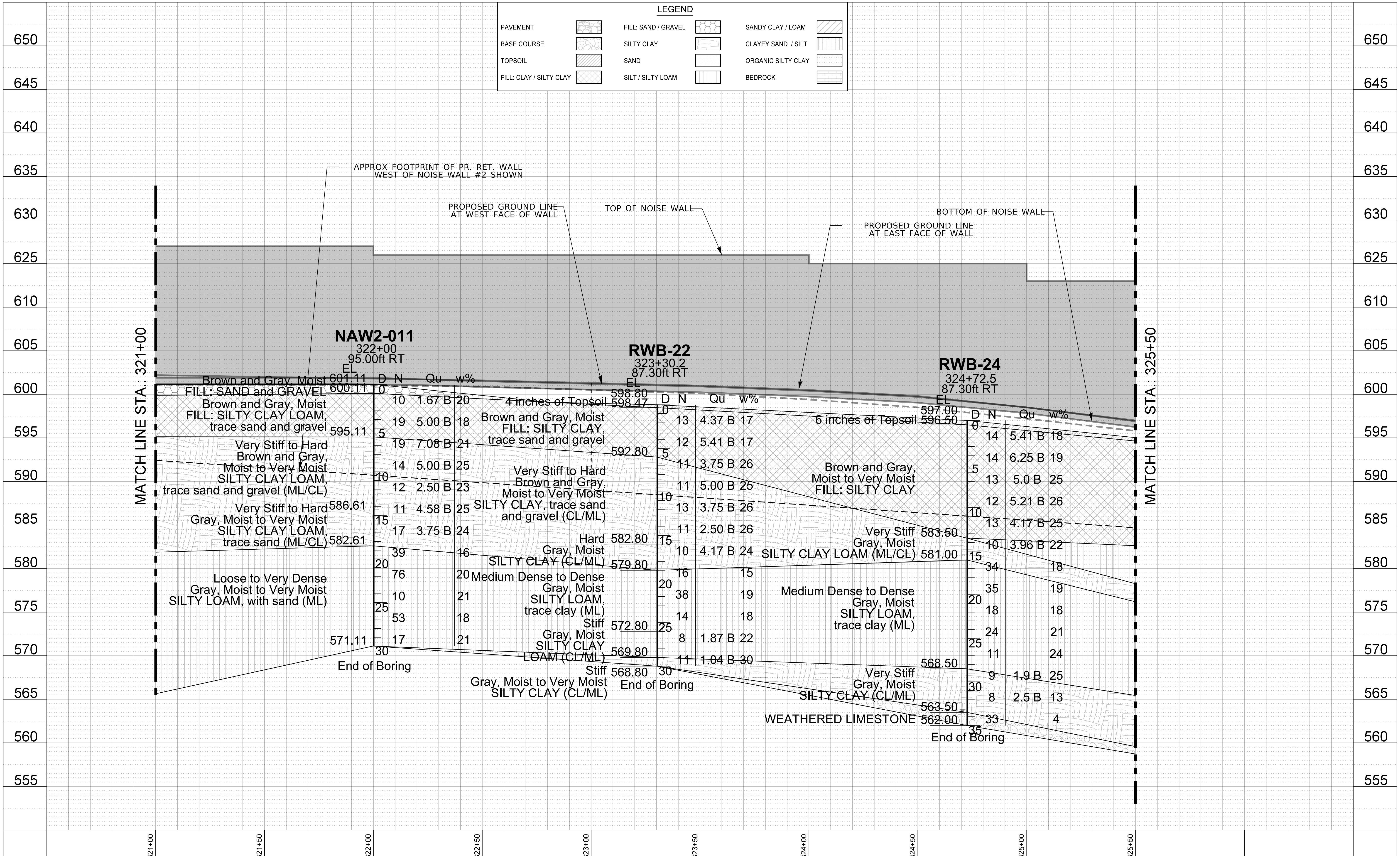

LEGEND
PAVEMENT
BASE COURSE
TOPSOIL
FILL: CLAY / SILTY CLAY
FILL: SAND / GRAVEL
SILTY CLAY
SAND
SILT / SILTY LOAM
SANDY CLAY / LOAM
CLAYEY SAND / SILT
ORGANIC SILTY CLAY
BEDROCK
650
645
640
635
630
625
610
605
600
595
590
585
580
575
570
565
560
555
APPROX FOOTPRINT OF PR. RET. WALL WEST OF NOISE WALL #2 SHOWN
PROPOSED GROUND LINE AT WEST FACE OF WALL
TOP OF NOISE WALL
PROPOSED GROUND LINE AT EAST FACE OF WALL
BOTTOM OF NOISE WALL
MATCH LINE STA.: 321+00
MATCH LINE STA.: 325+50
NAW2-011
322+00
95.00ft RT
EL
601.11
D N Qu w%
Brown and Gray, Moist
FILL: SAND and GRAVEL 600.11
Brown and Gray, Moist
FILL: SILTY CLAY LOAM, trace sand and gravel 595.11
Very Stiff to Hard Brown and Gray, Moist to Very Moist SILTY CLAY LOAM, trace sand and gravel (ML/CL)
Very Stiff to Hard 586.61
Gray, Moist to Very Moist SILTY CLAY LOAM, trace sand (ML/CL) 582.61
Loose to Very Dense Gray, Moist to Very Moist SILTY LOAM, with sand (ML)
571.11
End of Boring
0 | 10 1.67 B 20 | 19 5.00 B 18 | 5 | 19 7.08 B 21 | 14 5.00 B 25 | 10 | 12 2.50 B 23 | 11 4.58 B 25 | 15 | 17 3.75 B 24 | 39 16 | 20 | 76 20 | 10 21 | 25 | 53 18 | 17 21 | 30
RWB-22
323+30.2
87.30ft RT
EL
598.80
D N Qu w%
4 inches of Topsoil 598.47
Brown and Gray, Moist FILL: SILTY CLAY, trace sand and gravel 592.80
Very Stiff to Hard Brown and Gray, Moist to Very Moist SILTY CLAY, trace sand and gravel (CL/ML)
Hard 582.80
Gray, Moist SILTY CLAY (CL/ML) 579.80
Medium Dense to Dense Gray, Moist SILTY LOAM, trace clay (ML)
Stiff 572.80
Gray, Moist SILTY CLAY LOAM (CL/ML) 569.80
Stiff 568.80
Gray, Moist to Very Moist SILTY CLAY (CL/ML)
End of Boring
0 | 13 4.37 B 17 | 12 5.41 B 17 | 5 | 11 3.75 B 26 | 11 5.00 B 25 | 10 | 13 3.75 B 26 | 11 2.50 B 26 | 15 | 10 4.17 B 24 | 16 15 | 20 | 38 19 | 14 18 | 25 | 8 1.87 B 22 | 11 1.04 B 30 | 30
RWB-24
324+72.5
87.30ft RT
EL
597.00
D N Qu w%
6 inches of Topsoil 596.50
Brown and Gray, Moist to Very Moist FILL: SILTY CLAY
Very Stiff 583.50
Gray, Moist SILTY CLAY LOAM (ML/CL) 581.00
Medium Dense to Dense Gray, Moist SILTY LOAM, trace clay (ML)
568.50
Very Stiff Gray, Moist SILTY CLAY (CL/ML)
563.50
WEATHERED LIMESTONE 562.00
End of Boring
0 | 14 5.41 B 18 | 14 6.25 B 19 | 5 | 13 5.0 B 25 | 12 5.21 B 26 | 10 | 13 4.17 B 25 | 10 3.96 B 22 | 15 | 34 18 | 35 19 | 20 | 18 18 | 24 21 | 25 | 11 24 | 9 1.9 B 25 | 30 | 8 2.5 B 13 | 33 4 | 35
321+00
321+50
322+00
322+50
323+00
323+50
324+00
324+50
325+00
325+50

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USER NAME = $USER$		DESIGNED -	MZ
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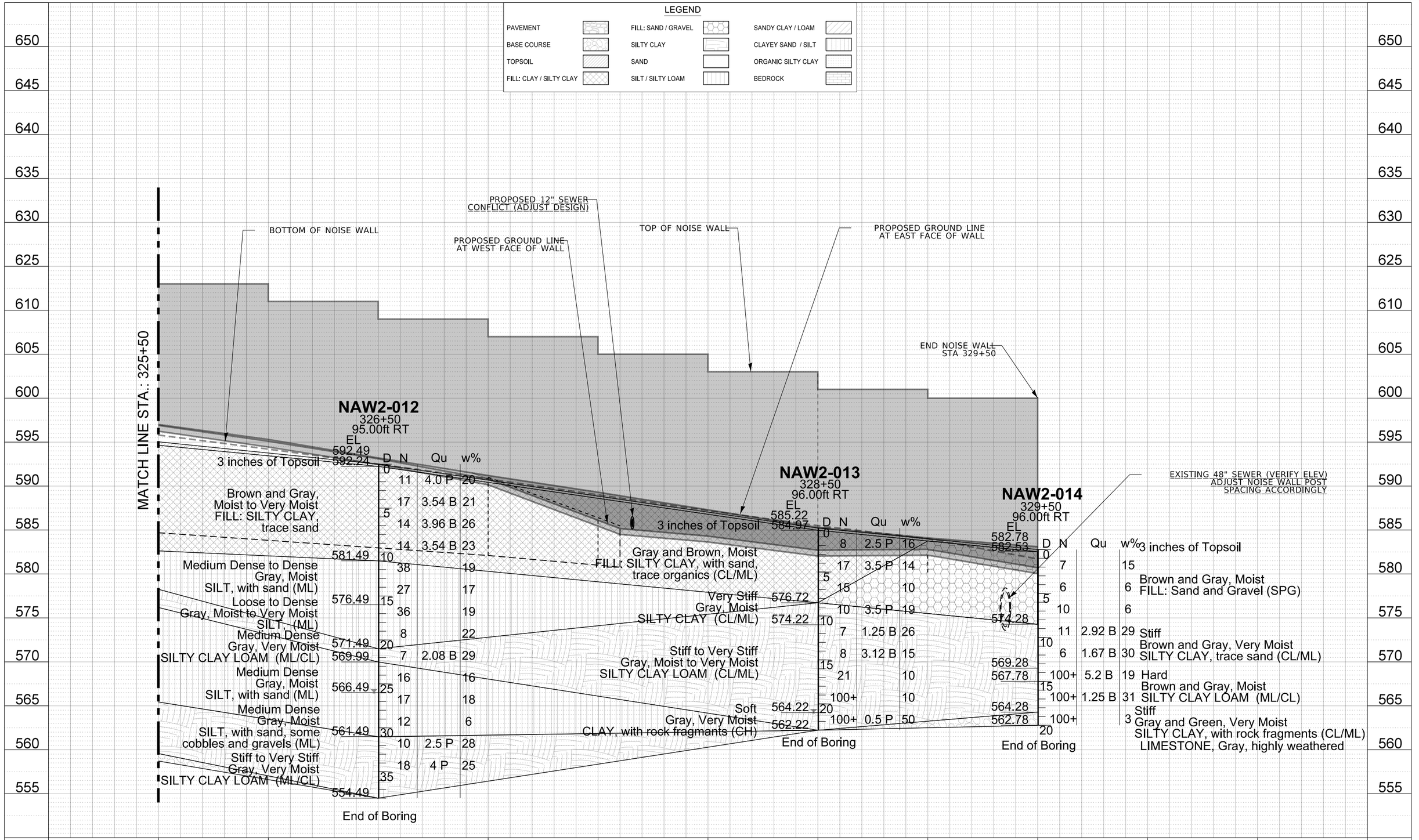
PLOT SCALE = 120.0000 ' / ft.		CHECKED -	DE
PLOT DATE = 1/26/2021		DATE -	01/22/2021

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

CONTRACT NO. 189-011
I-55/ROUTE 59 WILL COUNTY
NOISE ABATEMENT WALL 2 BORING PROFILE
SCALE: AS NOTED | SHEET 5 OF 6 SHEETS | STA. 321+00 TO STA. 325+50

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
I-55		WILL	8	7
		CONTRACT NO. 2189-011		
		ILLINOIS FED. AID PROJECT		



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Tel: 630.994.2600, www.gsg-consultants.com

USER NAME = $USER$	DESIGNED - MZ		
SHEET SIZE = 1.41667x0.916667 (ft.)	DRAWN - NN		
PLOT SCALE = 120.0000 ' / ft.	CHECKED - DE		
PLOT DATE = 2/9/2021	DATE - 01/22/2021		

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

CONTRACT NO. 189-011
I-55/ROUTE 59 WILL COUNTY
NOISE ABATEMENT WALL 2 BORING PROFILE

SCALE: ___ AS NOTED | SHEET 6 OF 6 SHEETS | STA. 325+50 | TO STA. 331+00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
I-55		WILL	8	8
		CONTRACT NO.	2189-011	
	ILLINOIS	FED. AID PROJECT		

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USER NAME = $USER$

APPENDIX C

SOIL BORING LOGS

Illinois Department of Transportation
Division of Highways
GSG Consultants, Inc.

SOIL BORING LOG

Date 11/6/20

ROUTE I-55 and IL 59 **DESCRIPTION** Noise Abatement Wall #2 **LOGGED BY** MH

SECTION 2018-075-R **LOCATION** Frontage RD W, **SEC.** , **TWP.** , **RNG.** ,
Latitude , **Longitude**

COUNTY WILL **DRILLING METHOD** HSA **HAMMER TYPE** AUTO

STRUCT. NO. NAW#2
Station

BORING NO. NAW2-001
Station 302+00
Offset 92.00ft RT
Ground Surface Elev. 598.21 ft

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

Groundwater Elev.:
First Encounter 572.2 ft ▼
Upon Completion N/A ft
After N/A **Hrs.** N/A ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				6 inches of Asphalt 597.71
	13			Light Brown and Gray, Dry FILL: SAND and GRAVEL
	7 7		4	
	6			594.21
	3 4	1.7 B	17	Dark Gray and Brown, Moist FILL: SILTY CLAY, with sand
-5				
	4			
	4 3	3.0 P	19	
	6			589.71
	6 10	4.8 B	21	Hard Brown and Gray, Moist SILTY CLAY LOAM, with sand (ML/CL)
-10				
	3			587.21
	4 6	1.9 B	17	Stiff to Hard Gray, Moist SILTY CLAY LOAM, trace sand (ML/CL)
	2			
-15	3 5	2.5 B	16	
	2			
	3 7	4.6 B	15	
	7			
-20	8 12	6.0 B	17	
				577.21
	16			Medium Dense to Very Dense Gray, Moist to Very Moist SILTY LOAM, with sand (ML)
	26 31		20	
	6			Silty Clay Seam at 23.5 feet
-25	5 12	6.0 B	21	
▼	11			
	12 8		23	
	5			569.71
	4 5	2.1 B	32	Very Stiff Gray, Very Moist SILTY CLAY LOAM (ML/CL)
-30				568.21
-35				End of Boring
-40				

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

BBS, form 137 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
GSG Consultants, Inc.

SOIL BORING LOG

Date 11/6/20

ROUTE I-55 and IL 59 **DESCRIPTION** Noise Abatement Wall #2 **LOGGED BY** MH

SECTION 2018-075-R **LOCATION** Frontage RD W, **SEC.** , **TWP.** , **RNG.** ,
Latitude , **Longitude**

COUNTY WILL **DRILLING METHOD** HSA **HAMMER TYPE** AUTO

STRUCT. NO. NAW#2
Station

BORING NO. NAW2-002
Station 304+00
Offset 92.00ft RT
Ground Surface Elev. 599.03 ft

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

Groundwater Elev.:
First Encounter 588.0 ft ▼
Upon Completion N/A ft
After N/A **Hrs.** N/A ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
6 inches of Asphalt 598.53				
Brown and Gray, Moist FILL: SAND and GRAVEL 598.03		6		
Brown and Gray, Moist FILL: SILTY CLAY, trace sand Trace gravel at 1.5 feet		3 4	3.5 P	22
		6		
	-5	6 8	5.2 B	20
593.03		7		
Medium Dense Light Brown, Wet SAND (SP)		8 10		24
		7		
	-10	10 10		22
588.03 ▼		3		
Loose to Medium Dense Gray, Moist to Very Moist SILT LOAM, with sand (ML)		4 7		23
		2		
584.53		3	2.1	17
Stiff to Very Stiff Gray, Moist SILTY CLAY LOAM, trace sand (ML/CL)	-15	3	B	
		6		
		7 12	2.0 P	18
		9		
	-20	14 18		19
578.03				
Medium Dense to Very Dense Gray, Moist to Very Moist SILT LOAM, with sand (ML)		17		
		25 32		19
Trace limestone fragments at 23.5		15		
	-25	10 16		21
573.03		5		
Very Stiff Gray, Very Moist SILTY CLAY LOAM (ML/CL)		4 5	2.7 B	27
		3		
569.03	-30	3 7	2.5 B	20
End of Boring				
	-35			
	-40			

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

Illinois Department of Transportation
Division of Highways
GSG Consultants, Inc.

SOIL BORING LOG

Date 11/5/20

ROUTE I-55 and IL 59 **DESCRIPTION** Noise Abatement Wall #2 **LOGGED BY** MH

SECTION 2018-075-R **LOCATION** Frontage RD W, **SEC.** , **TWP.** , **RNG.** ,
Latitude , **Longitude**

COUNTY WILL **DRILLING METHOD** HSA **HAMMER TYPE** AUTO

STRUCT. NO. NAW#2
Station

BORING NO. NAW2-003
Station 306+00
Offset 92.00ft RT
Ground Surface Elev. 599.16 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

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
598.66				6 inches of Asphalt
598.16	8			Brown and Gray, Moist FILL: SAND and GRAVEL
	4 6	3.1 B	27	Dark Gray, Very Moist FILL: SILTY CLAY, trace sand and gravel
595.66	6			Very Stiff to Hard Brown and Gray, Moist SILTY CLAY LOAM, trace sand (ML/CL)
-5	6 9	5.0 B	19	
	9			
	10 8		15	Sand at 6.5 feet
	3			
-10	6 5	3.0 P	16	
	4			
	7 9	4.0 P	16	
	7			Cobbles at 12.5 feet
-15	7 7		14	
583.16	3			Very Stiff to Hard Gray, Moist to Very Moist SILTY CLAY LOAM (ML/CL)
	3			
	5 9	4.0 P	21	
	3			
-20	6 9	4.6 B	27	
578.16	9			Medium Dense to Dense Gray, Moist SILTY LOAM, with sand (ML)
	19 29		18	
	12			
-25	13 16		19	
	11			
	8 4		20	
570.66	3			Very Stiff Gray, Very Moist SILTY CLAY LOAM (ML/CL)
569.16 -30	4 4	2.3 B	27	
				End of Boring
-35				
-40				

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

BBS, form 137 (Rev. 8-99)

Illinois Department of Transportation

Division of Highways
GSG Consultants, Inc.

SOIL BORING LOG

Date 11/5/20

ROUTE I-55 and IL 59 **DESCRIPTION** Noise Abatement Wall #2 **LOGGED BY** MH

SECTION 2018-075-R **LOCATION** Frontage RD W, **SEC.** , **TWP.** , **RNG.** ,
Latitude , **Longitude**

COUNTY WILL **DRILLING METHOD** HSA **HAMMER TYPE** AUTO

STRUCT. NO. NAW#2
Station

BORING NO. NAW2-004
Station 308+00
Offset 93.00ft RT
Ground Surface Elev. 599.81 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

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				6 inches of Asphalt 599.31
				Brown and Gray, Moist 598.81
	9			FILL: SAND and GRAVEL
	5	3.8	21	Dark Gray, Moist
	8	B		FILL: SILTY CLAY, trace sand and gravel
				596.31
	8			Hard
	8	4.2	15	Brown and Gray, Moist
-5	8	B		SILTY CLAY LOAM, trace sand (ML/CL)
	7			
	8	5.4	14	
	7	B		
	5			
	5	4.4	18	
-10	8	B		
	3			
	5	4.2	23	
	6	B		
				586.31
	4			Hard
	7	4.6	19	Gray, Moist
-15	9	B		SILTY CLAY LOAM (ML/CL)
	3			
	5	4.0	24	
	8	P		
	3			
	5	4.7	21	
-20	8	B		

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				578.81
	13			Loose to Very Dense
	26		16	Gray, Moist to Very Moist
	35			SILTY LOAM, with sand (ML)
	15			
	32		18	
-25	34			
	17			
	25		21	
	20			
	3			
				570.81
	4		29	Stiff
-30	5			Gray, Very Moist
				569.81 SILTY CLAY LOAM (ML/CL)
				End of Boring
-35				
-40				

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

Illinois Department of Transportation
Division of Highways
GSG Consultants, Inc.

SOIL BORING LOG

Date 11/5/20

ROUTE I-55 and IL 59 **DESCRIPTION** Noise Abatement Wall #2 **LOGGED BY** MH

SECTION 2018-075-R **LOCATION** Frontage RD W, **SEC.** , **TWP.** , **RNG.** ,
Latitude , **Longitude**

COUNTY WILL **DRILLING METHOD** HSA **HAMMER TYPE** AUTO

STRUCT. NO. NAW#2
Station

BORING NO. NAW2-005
Station 310+00
Offset 93.00ft RT
Ground Surface Elev. 599.96 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

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				6 inches of Asphalt 599.46
				Brown and Gray, Moist 598.96
	7			FILL: SAND and GRAVEL
	6	5.0	26	Dark Gray, Very Moist
	8	P		FILL: SILTY CLAY, trace sand and gravel
	3			595.96
	4	2.5	20	Very Stiff to Hard
-5	4	B		Brown and Gray, Moist to Very Moist
	4			SILTY CLAY, trace sand (CL/ML)
	4	5.8	19	
	6	B		
	4			
	4	3.1	29	
-10	5	B		
	3			
	6	5.6	27	
	9	B		
	3			586.46
	3	4.0	26	Hard
-15	5	B		Gray, Moist to Very Moist
	3			SILTY CLAY LOAM (ML/CL)
	6	4.8	24	
	7	B		
	4			
	6		19	
-20	7			

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				578.96
	15			Loose to Very Dense
	27		18	Gray, Moist to Very Moist
	24			SILTY LOAM, with sand (ML/CL)
	4			
	4		31	
-25	4			
	8			
	13		17	
	18			
	11			
	11		17	
	15			569.96
-30				End of Boring
-35				
-40				

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

BBS, form 137 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
GSG Consultants, Inc.

SOIL BORING LOG

Date 11/5/20

ROUTE I-55 and IL 59 **DESCRIPTION** Noise Abatement Wall #2 **LOGGED BY** MH

SECTION 2018-075-R **LOCATION** Frontage RD W, **SEC.** , **TWP.** , **RNG.** ,
Latitude , **Longitude**

COUNTY WILL **DRILLING METHOD** HSA **HAMMER TYPE** AUTO

STRUCT. NO. NAW#2
Station

BORING NO. NAW2-006
Station 312+00
Offset 93.00ft RT
Ground Surface Elev. 599.91 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

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				6 inches of Asphalt 599.41
	5			Brown and Gray, Wet FILL: SAND and GRAVEL
	4 6		16	
				597.41
	4			Very Stiff to Hard Brown and Gray, Moist to Very Moist SILTY CLAY, trace sand (CL/ML)
-5	4 6	4.6 B	18	
	5			
	5 6	3.8 B	27	
	4			
-10	7 10	4.8 B	24	
				588.91
	3			Very Stiff to Hard Gray, Moist to Very Moist SILTY CLAY LOAM (ML/CL)
	4 6	2.3 B	25	
	3			
-15	3 6	3.3 B	31	
	3			
	3 7	4.6 B	25	
				581.41
	3			Medium Dense Gray, Moist to Very Moist SILTY LOAM, with sand (ML)
-20	4 17		18	

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
	8			Medium Dense Gray, Moist to Very Moist SILTY LOAM, with sand (ML) *(continued)*
	8 6		21	
	7			
-25	6 5		16	
	4			
	7 9		20	
	7			
-30	8 10		19	
				569.91
-35				End of Boring
-40				

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

Illinois Department of Transportation
Division of Highways
GSG Consultants, Inc.

SOIL BORING LOG

Date 11/4/20

ROUTE I-55 and IL 59 **DESCRIPTION** Noise Abatement Wall #2 **LOGGED BY** MH

SECTION 2018-075-R **LOCATION** Frontage RD W, **SEC.** , **TWP.** , **RNG.** ,
Latitude , **Longitude**

COUNTY WILL **DRILLING METHOD** HSA **HAMMER TYPE** AUTO

STRUCT. NO. NAW#2
Station

BORING NO. NAW2-007
Station 314+00
Offset 93.00ft RT
Ground Surface Elev. 601.15 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

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				6 inches of Asphalt 600.65
	5			Brown and Gray, Dry to Wet FILL: SAND and GRAVEL
	3 5		4	
	3			597.15
	3 4	2.1 B	19	Very Stiff to Hard Brown and Gray, Moist to Very Moist SILTY CLAY LOAM, trace sand (ML/CL)
-5				
	4			Trace Gravel at 4.5 feet
	6 8	3.3 B	21	
	5			
	5 8	4.2 B	26	
-10				
				590.15
	3			Very Stiff Gray, Moist to Very Moist SILTY CLAY LOAM (ML/CL)
	3 5	2.1 B	26	
	3			Atterberg Limits at 13.5-15 ft sample: LL: 39%, PL: 21%, PI: 18%
	3 5	3.1 B	26	
-15				
	3			Organic Content at 16-17.5 ft sample: 1.3%
	5 8	4.0 P	23	
	2			Unit Weight at 18.5-20 ft sample: Wet Density = 142.4 pcf; Dry Density = 120 pcf
	5 13	2.5	19	581.65
-20				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
	13			Medium Dense to Dense Gray, Moist SILTY LOAM, with sand (ML) *(continued)*
	21 16		18	
	5			
-25	11 13		15	
				575.15
	4			Very Stiff Gray, Moist SILTY CLAY LOAM (ML/CL)
	6 7	3.0 P	17	
	5			
-30	8 6	3.5 P	17	
				571.15 End of Boring
-35				
-40				

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

Illinois Department of Transportation
Division of Highways
GSG Consultants, Inc.

SOIL BORING LOG

Date 11/3/20

ROUTE I-55 and IL 59 **DESCRIPTION** Noise Abatement Wall #2 **LOGGED BY** MH

SECTION 2018-075-R **LOCATION** Frontage RD W, **SEC.** , **TWP.** , **RNG.** ,
Latitude , **Longitude**

COUNTY WILL **DRILLING METHOD** HSA **HAMMER TYPE** AUTO

STRUCT. NO. NAW#2
Station

BORING NO. NAW2-008
Station 316+00
Offset 95.00ft RT
Ground Surface Elev. 601.54 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

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
3 inches of Topsoil 601.29			
Dark Gray and Gray, Moist FILL: SILTY CLAY, trace sand	4		
	3 4	2.5 B	24
598.04			
Very Stiff to Hard Brown and Gray, Moist to Very Moist SILTY CLAY LOAM, trace sand (ML/CL)	3		
	2 3	3.1 B	21
-5			
	3		
	4 5	3.1 B	21
	4		
	5 8	4.4 B	26
-10			
	4		
	4 6	2.5 P	28
588.04			
Very Stiff Gray, Moist to Very Moist SILTY CLAY LOAM, trace sand (ML/CL)	3		
	3 6	3.3 B	27
-15			
	3		
	4 7	3.5 B	23
583.04			
Medium Dense to Very Dense Gray, Moist to Very Moist SILTY LOAM, with sand (ML)	4		
	5 15		22
-20			

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Medium Dense to Very Dense Gray, Moist to Very Moist SILTY LOAM, with sand (ML) *(continued)*	13		
	30 50/6"		18
Silty Clay Seam at 23.5 feet	15		
	10 7		22
-25			
	5		
	15 21		18
	11		
	9 7		21
571.54 -30			
End of Boring			
-35			
-40			

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

Illinois Department of Transportation
Division of Highways
GSG Consultants, Inc.

SOIL BORING LOG

Date 11/3/20

ROUTE I-55 and IL 59 **DESCRIPTION** Noise Abatement Wall #2 **LOGGED BY** MH

SECTION 2018-075-R **LOCATION** Frontage RD W, **SEC.** , **TWP.** , **RNG.** ,
Latitude , **Longitude**

COUNTY WILL **DRILLING METHOD** HSA **HAMMER TYPE** AUTO

STRUCT. NO. NAW#2
Station

BORING NO. NAW2-009
Station 318+00
Offset 95.00ft RT
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

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
601.09				3 inches of Topsoil
600.34	8			Brown and Gray, Moist FILL: SAND and GRAVEL
	5 6	4.0 P	15	Very Stiff to Hard Brown and Gray, Moist to Very Moist SILTY CLAY LOAM, trace sand (ML/CL)
	5			Trace Gravel at 2.0 feet
-5	6 9	4.6 B	17	
	4			
	5 7	5.2 B	24	
	4			
-10	6 8	4.0 B	25	
	3			
	4 6	3.1 B	26	Silt Seam at 12.0 feet
587.84	2			Very Stiff to Hard Gray, Moist to Very Moist SILTY CLAY LOAM (ML/CL)
-15	4 7	4.2 B	27	
	4			
	5 8	3.3 B	24	
582.84	3			Medium Dense to Very Dense Gray, Moist to Very Moist SILTY LOAM, with sand (ML)
-20	15 21		18	
-25	15			Medium Dense to Very Dense Gray, Moist to Very Moist SILTY LOAM, with sand (ML) *(continued)*
	35 50/6"		18	
	7			
	5 6		20	
574.84	8			
	3 4		23	Stiff Gray, Moist SILTY CLAY (CL/ML)
573.84	2			Medium Dense to Very Dense Gray, Moist SILTY LOAM, with sand (ML)
-30	7 11		20	
571.34				End of Boring
-35				
-40				

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

BBS, form 137 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
GSG Consultants, Inc.

SOIL BORING LOG

Date 11/3/20

ROUTE I-55 and IL 59 **DESCRIPTION** Noise Abatement Wall #2 **LOGGED BY** MH

SECTION 2018-075-R **LOCATION** Frontage RD W, **SEC.** , **TWP.** , **RNG.** ,
Latitude , **Longitude**

COUNTY WILL **DRILLING METHOD** HSA **HAMMER TYPE** AUTO

STRUCT. NO. NAW#2
Station

BORING NO. NAW2-010
Station 320+00
Offset 95.00ft RT
Ground Surface Elev. 601.15 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

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				2 inches of Topsoil 600.98
	5			Brown and Gray, Wet FILL: SAND and GRAVEL 599.65
	4 4	3.3 B	19	Brown and Gray, Moist FILL: SILTY CLAY LOAM, trace sand and gravel
	4			
-5	5 8	4.1 B	18	
				595.15
	4			Very Stiff to Hard Brown and Gray, Moist to Very Moist SILTY CLAY LOAM, trace sand and gravel (ML/CL)
	8 9	6.3 B	21	
	5			
-10	5 8	4.8 B	26	
	3			
	4 6	3.1 B	28	
				587.65
	2			Very Stiff Gray, Moist to Very Moist SILTY CLAY LOAM, (ML/CL)
-15	4 4	3.1 B	27	
	3			
	5 8	3.3 B	23	
	3			
-20	6 15	3.0 P	21	581.15

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
	21			Loose to Very Dense Gray, Moist to Very Moist SILT, with sand (ML)
	29 27		19	
	13			
-25	20 8		19	
	8			
	14 4		20	
	2			
-30	8 6		21	Silty Clay Seam at 29.5 feet
	3			
-35	3 4		20	
	18			
-40	50/2"		13	Limestone Fragments at 39.0 feet

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 Consultants, Inc.

SOIL BORING LOG

Date 11/3/20

ROUTE I-55 and IL 59 **DESCRIPTION** Noise Abatement Wall #2 **LOGGED BY** MH

SECTION 2018-075-R **LOCATION** Frontage RD W, **SEC.** , **TWP.** , **RNG.** ,
Latitude , **Longitude**

COUNTY WILL **DRILLING METHOD** HSA **HAMMER TYPE** AUTO

STRUCT. NO. NAW#2
Station

BORING NO. NAW2-010
Station 320+00
Offset 95.00ft RT
Ground Surface Elev. 601.15 **ft**

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Auger refusal at 40.0 feet			
560.15			
End of Boring			
-45			
-50			
-55			
-60			

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**

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 Consultants, Inc.

SOIL BORING LOG

Date 11/3/20

ROUTE I-55 and IL 59 **DESCRIPTION** Noise Abatement Wall #2 **LOGGED BY** MH

SECTION 2018-075-R **LOCATION** Frontage RD W, **SEC.** , **TWP.** , **RNG.** ,
Latitude , **Longitude**

COUNTY WILL **DRILLING METHOD** HSA **HAMMER TYPE** AUTO

STRUCT. NO. NAW#2
Station

BORING NO. NAW2-011
Station 322+00
Offset 95.00ft RT
Ground Surface Elev. 601.11 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

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				Brown and Gray, Moist FILL: SAND and GRAVEL
	4			600.11
	4 6	1.7 B	20	Brown and Gray, Moist FILL: SILTY CLAY LOAM, trace sand and gravel
	7			
-5	9 10	5.0 B	18	
	6			595.11
	8 11	7.1 B	21	Very Stiff to Hard Brown and Gray, Moist to Very Moist SILTY CLAY LOAM, trace sand and gravel (ML/CL)
	4			
-10	6 8	5.0 B	25	
	3			
	5 7	2.5 B	23	
	3			
	5 6	4.6 B	25	586.61
-15				Very Stiff to Hard Gray, Moist to Very Moist SILTY CLAY LOAM, trace sand (ML/CL)
	4			
	7 10	3.8 B	24	
	4			582.61
	18 21		16	Loose to Very Dense Gray, Moist to Very Moist SILTY LOAM, with sand (ML)
-20				
-25	17			Loose to Very Dense Gray, Moist to Very Moist SILTY LOAM, with sand (ML) *(continued)*
	33 43		20	
	9			
	4 6		21	
	15			
	28 25		18	
	4			
-30	8 9		21	571.11
-35				End of Boring
-40				

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

BBS, form 137 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
GSG Consultants, Inc.

SOIL BORING LOG

Date 11/2/20

ROUTE I-55 and IL 59 **DESCRIPTION** Noise Abatement Wall #2 **LOGGED BY** MH

SECTION 2018-075-R **LOCATION** Frontage RD W, **SEC.** , **TWP.** , **RNG.** ,
Latitude , **Longitude**

COUNTY WILL **DRILLING METHOD** HSA **HAMMER TYPE** AUTO

STRUCT. NO. NAW#2
Station

BORING NO. NAW2-012
Station 326+50
Offset 95.00ft RT
Ground Surface Elev. 592.49 ft

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

Groundwater Elev.:
First Encounter 566.5 ft ▼
Upon Completion N/A ft
After N/A **Hrs.** N/A ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				3 inches of Topsoil 592.24
	4			Brown and Gray, Moist to Very Moist FILL: SILTY CLAY, trace sand
	5 6	4.0 P	20	
	6			
-5	7 10	3.5 B	21	
	4			
	6 8	4.0 B	26	
	3			
-10	6 8	3.5 B	23	
	9			581.49 Medium Dense to Dense Gray, Moist SILT, with sand (ML)
	16 22		19	
	8			
-15	13 14		17	
	8			576.49 Loose to Dense Gray, Moist to Very Moist SILT, (ML)
	16 20		19	
	3			
-20	4 4		22	
				571.49
	3			Medium Dense Gray, Very Moist SILTY CLAY LOAM (ML/CL)
	3 4	2.1 B	29	569.99
	8			Medium Dense Gray, Moist SILT, with sand (ML)
-25	8 8		16	
	7			566.49 ▼
	9 8		18	Medium Dense Gray, Moist SILT, with sand, some cobbles and gravels (ML)
	4			
-30	5 7		6	
	6			561.49 Stiff to Very Stiff Gray, Very Moist SILTY CLAY LOAM (ML/CL)
	4 6	2.5 P	28	
	4			
-35	7 11	4.0 P	25	
				Auger refusal at 37 feet
				554.49 End of Boring
-40				

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

BBS, form 137 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
GSG Consultants, Inc.

SOIL BORING LOG

Date 11/2/20

ROUTE I-55 and IL 59 **DESCRIPTION** Noise Abatement Wall #2 **LOGGED BY** MH

SECTION 2018-075-R **LOCATION** Frontage RD W, **SEC.** , **TWP.** , **RNG.** ,
Latitude , **Longitude**

COUNTY WILL **DRILLING METHOD** HSA **HAMMER TYPE** AUTO

STRUCT. NO. NAW#2
Station

BORING NO. NAW2-013
Station 328+50
Offset 96.00ft RT
Ground Surface Elev. 585.22 ft

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

Groundwater Elev.:
First Encounter 564.2 ft ▼
Upon Completion N/A ft
After N/A **Hrs.** N/A ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				3 inches of Topsoil 584.97
	3			Gray and Brown, Moist FILL: SILTY CLAY, with sand, trace organics
	3 5	2.5 P	16	
	5			
-5	7 10	3.5 P	14	
	6			
	9 6		10	Cobbles at 6.5 feet
	2			576.72 Very Stiff Gray, Moist SILTY CLAY (CL/ML)
-10	4 6	3.5 P	19	
	3			574.22 Stiff to Very Stiff Gray, Moist to Very Moist SILTY CLAY LOAM (CL/ML)
	3 4	1.3 B	26	
	3			
-15	4 4	3.1 B	15	Sand Seam at 14.5 feet
	13			Cobbles at 16.0 feet
	10 11		10	
	50/2"			
-20			10	

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				564.22 ▼
	11			Soft Gray, Very Moist CLAY, with rock fragments (CH)
	14 50/2"	0.5 P	50	
				Auger refusal at 23.0 feet 562.22 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 Consultants, Inc.

SOIL BORING LOG

Date 11/2/20

ROUTE I-55 and IL 59 **DESCRIPTION** Noise Abatement Wall #2 **LOGGED BY** MH

SECTION 2018-075-R **LOCATION** Frontage RD W, **SEC.** , **TWP.** , **RNG.** ,
Latitude , **Longitude**

COUNTY WILL **DRILLING METHOD** HSA **HAMMER TYPE** AUTO

STRUCT. NO. NAW#2
Station

BORING NO. NAW2-014
Station 329+50
Offset 96.00ft RT
Ground Surface Elev. 582.78 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

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
3 inches of Topsoil 582.53				
Brown and Gray, Moist FILL: Sand and Gravel		2		
		2 5		15
		5		
		3 3		6
	-5			
		3		
		4 6		6
574.28				
Stiff Brown and Gray, Very Moist SILTY CLAY, trace sand (CL/ML)		4		
		5 6	2.9 B	29
	-10			
Sand Seam at 11 feet		5		
Atterberg Limits at 11-12.5 ft sample: LL: 60%, PL: 26%, PI: 34%		3 3	1.7 B	30
569.28				
Hard Brown and Gray, Moist SILTY CLAY LOAM (ML/CL)		5		
		7 50/4"	5.2 B	19
567.78	-15			
Stiff Gray, Very Moist SILTY CLAY, with rock fragments (CL/ML)		8		
		10 50/3"	1.3 B	31
564.28				
LIMESTONE, Gray, highly weathered		41		
		50/4"		3
Auger refusal at 19.5 feet 562.78	-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 Consultants, Inc.

SOIL BORING LOG

Date 4/3/20

ROUTE I-55 and IL 59 **DESCRIPTION** Retaining Wall 4 **LOGGED BY** ES

SECTION 2018-075-R **LOCATION** Frontage RD W, **SEC.** , **TWP.** , **RNG.** ,
Latitude , **Longitude**

COUNTY WILL **DRILLING METHOD** HSA **HAMMER TYPE** AUTO

STRUCT. NO. W099-1002
Station

BORING NO. RWB-22
Station 323+30.2
Offset 87.30ft RT
Ground Surface Elev. 598.80 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

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
598.47				4 inches of Topsoil
	4			Brown and Gray, Moist FILL: SILTY CLAY, trace sand and gravel
	5 8	4.4 B	17	
	3			
-5	5 7	5.4 B	17	
592.80				
	3			Very Stiff to Hard Brown and Gray, Moist to Very Moist SILTY CLAY, trace sand and gravel (CL/ML)
	4 7	3.8 B	26	
	3			
-10	4 7	5.0 B	25	
	3			
	6 7	3.8 B	26	
	2			
-15	5 6	2.5 B	26	
582.80				
	3			Hard Gray, Moist SILTY CLAY (CL/ML)
	4 6	4.2 B	24	
579.80	3			
-20	6 10		15	

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				Medium Dense to Dense Gray, Moist SILTY LOAM, trace clay (ML) *(continued)*
	26			
	17 21		19	
	5			
-25	5 9		18	
572.80				
	2			Stiff Gray, Moist SILTY CLAY LOAM (CL/ML)
	3 5	1.9 B	22	
569.80	4			
	6 5	1.0 B	30	Stiff Gray, Moist to Very Moist SILTY CLAY (CL/ML)
568.80 -30				End of Boring
-35				
-40				

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

BBS, form 137 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
GSG Consultants, Inc.

SOIL BORING LOG

Date 4/1/20

ROUTE I-55 and IL 59 **DESCRIPTION** Retaining Wall 4 **LOGGED BY** ES

SECTION 2018-075-R **LOCATION** Frontage RD W, **SEC.** , **TWP.** , **RNG.** ,
Latitude , **Longitude**

COUNTY WILL **DRILLING METHOD** HSA **HAMMER TYPE** AUTO

STRUCT. NO. W099-1002
Station

BORING NO. RWB-24
Station 324+72.5
Offset 87.30ft RT
Ground Surface Elev. 597.00 ft

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

Groundwater Elev.:
First Encounter 563.5 ft ▼
Upon Completion N/A ft
After N/A **Hrs.** N/A ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
6 inches of Topsoil 596.50				
Brown and Gray, Moist to Very Moist FILL: SILTY CLAY		3		
		6 8	5.4 B	18
		3		
	-5	6 8	6.3 B	19
		3		
		5 8	5.0 B	25
		4		
	-10	5 7	5.2 B	26
		2		
		6 7	4.2 B	25
583.50		3		
Very Stiff Gray, Moist SILTY CLAY LOAM (ML/CL)	-15	4 6	4.0 B	22
581.00		7		
Medium Dense to Dense Gray, Moist SILTY LOAM, trace clay (ML)		15 19		18
		8		
	-20	15 20		19
Medium Dense to Dense Gray, Moist SILTY LOAM, trace clay (ML) *(continued)*		7		
		5 13		18
		9		
	-25	14 10		21
		2		
		3 8		24
568.50		2		
Very Stiff Gray, Moist SILTY CLAY (CL/ML)	-30	4 5	1.9 B	25
		2		
		3 5	2.5 B	13
563.50 ▼				
WEATHERED LIMESTONE		19		
562.00	-35	15 18		4
End of Boring				
	-40			

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