Roadway Geotechnical Report

IDOT PTB 163-017
IL 171 and 95th Street
Willow Springs, Illinois

Prepared for

Illinois Department of Transportation
Contract Number: 60R94

Project Design Engineer Team:
Ames Engineering, Inc.

Geotechnical Consultant:

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November 4, 2024

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Roadway Geotechnical Report
IL 171 and 95th Street, Willow Springs, IL
IDOT PTB 163-017

Dear Mr. Regis:

Attached is a copy of the Roadway Geotechnical Report for the above referenced project. The report provides a description of the site investigation, site conditions and construction recommendations for the proposed improvements. The site investigation included advancing thirty nine (39) soil borings to depths ranging from 10 to 40 feet.

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

Sincerely,

Min Zhang, P.E.
Sr. Project Engineer

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

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1.0 INTRODUCTION

GSG Consultants, Inc. (GSG) completed a subsurface investigation and geotechnical analysis for the construction of the proposed improvements along IL 171 at the intersection with 95th Street in Willow Springs, Illinois. The purpose of this site investigation was to explore the subsurface conditions along the proposed improvements limits, to determine engineering properties of the subsurface soil, and to develop design and construction recommendations for the project. **Exhibit 1** shows the general project location.

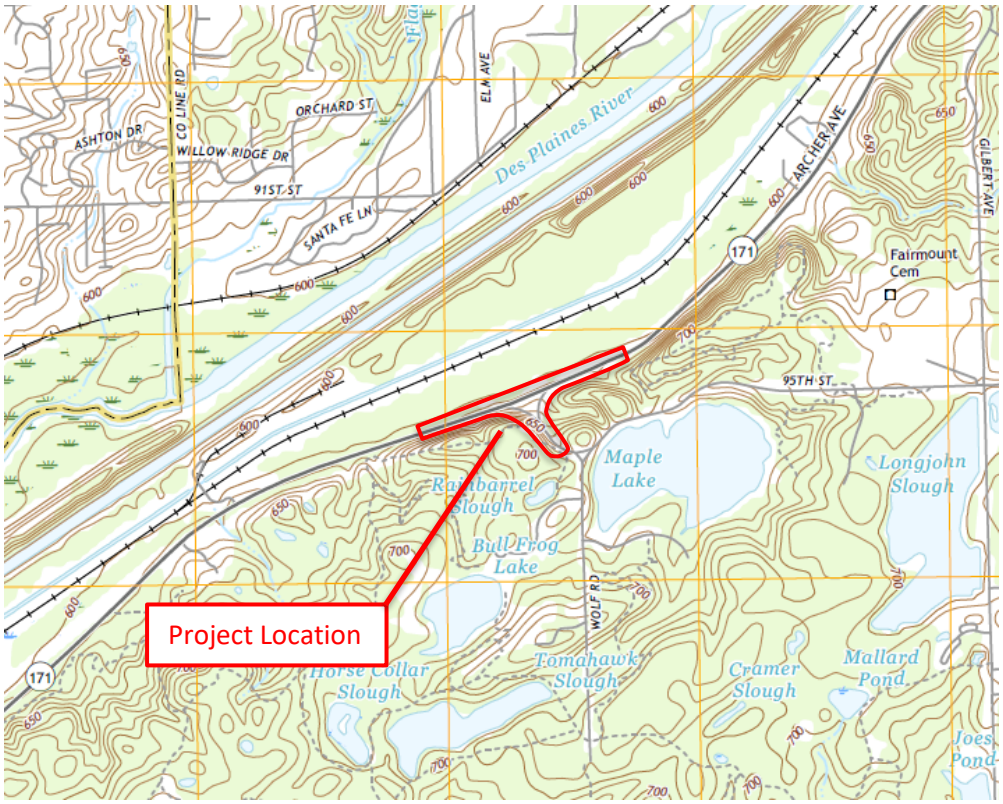


Exhibit 1 – Project Location Map
(Source: USGS Topographic Maps, usgs.gov)

The general scope of the overall project is to raise the grade of IL 171 for a new intersection with 95th Street. The profile of IL 171 will be raised approximately 18 feet at the new realigned intersection. A retaining wall will be required along the northern right-of-way of IL 171 due to limited right-of-way available for slope reconfiguration. The remainder of the embankment will

be sloped away from the newly aligned 95th Street. The overall project will also include constructing one (1) new culvert, roadway improvements including new embankment construction, realigning the IL 171 and 95th Street intersection and new traffic signals at the intersection. The proposed retaining wall and culvert will be discussed in separate reports.

1.1 Proposed Roadway Information

Based on drawings (dated March 22, 2024) and design information (dated March 27, 2024) (**Appendix A**) provided by Collins Engineers, Inc. (Collins), the proposed project will include reconstructing and raising the profile grade of IL 171 near the intersection with 95th Street; realigning 95th Street to create a T-intersection with IL 171; and reconstructing and realigning the existing 95th Street ramps to IL 171. Subsequent to the road realignment, new traffic signals at the intersection of IL 171 and 95th Street will also be constructed. The improvements addressed in this report will include the following:

- Construction of IL 171 embankment from Station 316+00 to 335+00;
- Construction of 95th Street from Station 191+00 to 200+00;
- Traffic sign structures at the new intersection of IL 171 and 95th Street

The proposed IL 171 profile will have a new maximum embankment height of 18 feet, with the greatest fill height at the intersection with 95th Street. The new embankment will be constructed with a 3% grade. It is anticipated that along 95th Street between Station 191+00 and 197+00, the proposed profile will be relatively consistent with the existing roadway profile, and that minimal cut and fill (less than 3 feet) would be required. Between Station 197+00 and 200+00, it is anticipated that up to 18 feet of new fill will be required.

1.2 Site Geology

GSG reviewed several published documents to determine the regional geological setting in the area of the site. The site is in southwest Cook County, in Willow Springs, Illinois. The surficial deposits in this area are typically glacial drift deposited during the Wisconsin Glacial Age and sediments deposited by various high-level states of the Des Plaines River. The subsurface profile in the site consists of deposits of clay, gravel, sand, and silt extending to approximately 50 to 100 feet below ground surface, at which point bedrock is generally encountered. This is consistent with the soil borings completed. Underlying the surficial deposits, the bedrock consists of the Silurian System, Niagaran Series, which consists of almost entirely dolomite that varies from extremely argillaceous, silty and cherty to exceptionally pure.

1.3 Climatic Conditions

The geotechnical field exploration was performed between June 9 and 21, 2021. The climate conditions for the months of March to June are summarized in **Table 1**. The data in this table was obtained from the National Weather Service Forecast Office website for Chicago, Illinois and the surrounding area. The data was evaluated to determine any effects of temperature and precipitation on the water table level and soil moisture content that was encountered at the site at the time the borings were performed.

For the months included in the study, the precipitation average rate was higher in June, but below average in March through May. The average monthly temperatures were higher than the average in the months of March, April, and June, and was lower in May. It is our opinion that the climatic conditions for the site at the time the exploration was performed did not have a direct impact on the soil moisture contents or water table levels that were recorded during the field exploration.

Table 1 – Climate Conditions

Date (M-Y)	Precipitation (in.)		Temperature (Fº)	
	Total	Departure	Average	Departure
March – 2021	1.25	-1.20	44.2	+5.2
April – 2021	0.71	-3.04	51.9	+2.2
May – 2021	1.79	-2.73	60.2	-0.4
June – 2021	6.78	2.68	74.3	+3.7

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 Ames Engineering, Inc. (Ames) 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 June 9 and June 21, 2021. The exploration program included advancing twenty-seven (27) retaining wall borings (RWB) to depths between 14 and 40 feet. These borings were spaced approximately 75 feet apart along the length of the proposed IL 171 retaining wall. An additional seven (7) subgrade stability borings (SSB) were completed for the proposed embankment along IL 171 to depths between 10 and 15 feet. Three (3) subgrade borings (SGB) were completed along 95th Street to depths of 10 feet. At the proposed T-intersection of IL 171 and 95th Street, two (2) traffic sign borings (TSB) were completed to depths of 25 feet.

The coordinates and existing ground surface elevations shown on the soil boring logs were obtained by GSG using handheld surveying equipment. The coordinates and surface elevations of borings SSB-02, SGB-02, and SGB-03 were estimated using internet resources. The as-drilled locations of the soil borings are shown on the Soil Boring Location Map and Subsurface Profiles (**Appendix B**). **Table 2** presents a list of the borings used for the analysis for the proposed improvements.

Table 2 - Summary of Borings

Boring ID	Station*	Offset*	Northing	Easting	Depth (ft)	Surface Elevation (ft)
RWB-01	316+01.26	43.32 RT	1839443.234	1102341.754	20.0	611.6
RWB-02	316+84.34	43.02 RT	1839469.640	1102420.528	20.0	611.5
RWB-03	317+44.00	43.11 RT	1839488.306	1102477.187	20.0	612.0
RWB-04	318+08.19	42.74 RT	1839508.831	1102538.006	14.0**	612.0
RWB-05	318+80.90	38.55 RT	1839535.671	1102605.716	19.0**	612.4
RWB-06	319+63.02	29.88 RT	1839569.708	1102680.946	17.5**	612.0
RWB-07	320+28.98	29.59 RT	1839590.722	1102743.476	29.0	612.5

Boring ID	Station*	Offset*	Northing	Easting	Depth (ft)	Surface Elevation (ft)
RWB-08	321+11.99	36.09 RT	1839611.032	1102824.576	25.0	613.0
RWB-09	321+80.29	39.38 RT	1839630.595	1102890.575	20.5**	613.3
RWB-10	322+42.24	42.24 RT	1839653.739	1102962.597	30.0	613.4
RWB-11	323+30.65	41.78 RT	1839681.051	1103033.379	32.0**	613.6
RWB-12	324+04.38	39.86 RT	1839710.073	1103101.778	40.0	613.4
RWB-13	324+53.54	38.61 RT	1839729.882	1103147.158	35.0**	613.4
RWB-14	325+28.22	36.74 RT	1839760.709	1103215.753	40.0	612.4
RWB-15	326+03.57	34.52 RT	1839793.032	1103284.381	35.0	611.9
RWB-16	326+75.53	36.03 RT	1839820.826	1103350.769	35.0	612.1
RWB-17	327+37.52	33.68 RT	1839848.100	1103406.487	26.5**	611.5
RWB-18	328+14.34	34.07 RT	1839878.888	1103476.869	22.5**	611.0
RWB-19	328+84.22	35.55 RT	1839905.862	1103541.354	25.0	610.6
RWB-20	329+60.01	35.99 RT	1839936.188	1103610.814	20.0	610.3
RWB-21	330+34.08	36.40 RT	1839965.836	1103678.685	20.0	610.0
RWB-22	331+11.20	36.05 RT	1839997.416	1103749.049	20.0	609.9
RWB-23	331+80.73	36.47 RT	1840025.219	1103812.782	20.0	609.6
RWB-24	332+52.64	36.43 RT	1840054.406	1103878.494	19.0	609.2
RWB-25	333+26.85	36.39 RT	1840084.529	1103946.322	20.0	608.9
RWB-26	333+92.54	38.85 RT	1840108.906	1104007.369	20.0	608.8
RWB-27	334+79.35	37.63 RT	1840145.215	1104086.231	20.0	608.9
SGB-01	196+00***	5.00 RT***	1839465.135	1103326.205	15.0	637.6
SGB-02	194+00***	5.00 LT***	1839193.635	1103469.063	10.0	662.0
SGB-03	191+00***	5.00 RT***	1839041.080	1103725.423	10.0	672.0
SSB-01	318+77.07	77.35 RT	1839497.630	1102614.277	15.0	612.1
SSB-02	320+79.71	72.03 RT	1839566.820	1102805.087	15.0	613.0
SSB-03	322+74.75	68.36 RT	1839627.867	1102986.274	15.0	613.8
SSB-04	324+66.67	70.07 RT	1839705.874	1103171.425	15.0	613.1
SSB-05	326+71.10	75.35 RT	1839783.084	1103362.659	15.0	612.1

Boring ID	Station*	Offset*	Northing	Easting	Depth (ft)	Surface Elevation (ft)
SSB-06	328+74.56	67.03 RT	1839873.163	1103545.280	13.0**	610.7
SSB-07	330+73.63	68.02 RT	1839952.958	1103727.658	10.0	610.1
TSB-01	324+27.35	107.05 RT	1839656.500	1103148.529	25.0	620.1
TSB-02	325+40.62	96.64 RT	1839710.613	1103250.896	25.0	618.2

* Based on drawings provided by Collins (dated March 22, 2024)

** Borings terminated upon encountering practical auger refusal

*** 95th Street stationing based on preliminary drawings provided by Ames (dated March 2022)

The soil borings were drilled using truck-mounted Diedrich D-50 (hammer efficiency 92%) and CME-75 (hammer efficiency 91%) 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 depths of 30 feet below grade in borings RWB-13 through RWB-16, and then at 5-foot intervals thereafter to the respective termination depths. In the remaining borings, soil samples were obtained at 2.5-foot intervals to the boring termination depths or upon encountering auger refusal. 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.

Bedrock coring was attempted upon encountering auger refusal in borings RWB-12 and RWB-19 at depths of 11.5 and 32 feet, respectively. However, bedrock was not encountered during this process, and the borings were subsequently drilled to the planned termination depths, and no bedrock cores were taken.

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.

2.1 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 project area. 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
- Particle Size Analysis ASTM D422 / AASHTO T-88

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 included in the **Appendix D Laboratory Test Results** and are also shown along with the field test results in **Appendix C Soil Boring Logs**.

2.2 Subsurface Soil Conditions

The subsurface soil conditions were evaluated based on the results of both the site investigation and laboratory results. Detailed descriptions of the subsurface soils, as well as the surface elevations, are provided in the Soil Boring Logs. 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.

IL 171 Borings (RWB-01 thru RWB-27, and SSB-01 thru SSB-07)

Borings RWB-01 thru RWB-27 and SBSB-01 thru SSB-07 were drilled off the shoulder of the existing pavement along IL 171. The surface elevations of the borings ranged between 608.9 and 613.8 feet. Borings RWB-01 thru RWB-04, RWB-10 thru RWB-15, RWB-20 thru RWB-25, and RWB-27 initially noted between 3 to 18 inches of topsoil. Boring RWB-26 was completed within the

existing roadway shoulder and noted 6 inches of asphalt over 6 inches of concrete. The remaining borings did not encounter any topsoil or pavement materials.

Beneath the surficial materials, borings RWB-01 thru RWB-06, RWB-10, RWB-16, RWB-17, RWB-19 thru RWB-22, RWB-24, RWB-25, SSB-02, and SSB-04 thru SSB-07 noted native loose to extremely dense brown and gray cohesionless soils (sand, sandy clay loam, silty sand, gravel, silt, and loam) to depths extending to 3.5 feet below existing grade in borings RWB-01 thru RWB-06, RWB-10, SSB-02, and SSB-04; to a depth of 6 feet below existing grade in borings SSB-05; to a depth of 18.5 feet below existing grade in borings RWB-16 and RWB-17; and to the boring termination depths in RWB-19 thru RWB-22, RWB-24, RWB-25, SSB-06, and SSB-07. In the remaining borings, native soft to hard brown cohesive soils (silty clay, silty clay loam, and clay loam) were encountered to depths between 6 and 26 feet below existing grade. Beneath the initial layers in the borings, interbedded layers of cohesive and cohesionless soils were encountered to the boring termination depths. Gravel and cobbles were noted throughout the borings at various depths.

The cohesionless soils (sand, sandy clay loam, silty sand, gravel, silt, and loam) along IL 171 had SPT blow count 'N' values between of 4 blows per foot (bpf) and 50 blows for 1 inch. The cohesive soils along IL 171 had unconfined compressive strength vales ranging between 0.25 and 10.0 tsf, with most values ranging between 1.0 and 4.5 tsf.

95th Street Borings (SGB-01, SGB-02, and SGB-03)

Borings SGB-01, SGB-02, and SGB-03 were drilled along the existing 95th Street alignment south of IL 171. The surface elevations of the borings ranged between 637.6 and 672.0 feet as the roadway slopes upwards away from IL 171. Boring SGB-01 initially encountered 3 inches of topsoil. Borings SGB-02 and SGB-03 initially encountered 12 to 13 inches of asphalt underlain by 8 to 9 inches of concrete. Beneath the surficial materials in boring SGB-01, brown and gray to gray medium dense to dense cohesionless soils (sandy clay loam and silt) were encountered to a depth of 13.5 feet below existing grade. Beneath these soils and below the pavement in borings SGB-02 and SGB-03, stiff to hard brown and gray to gray silty clay and silty clay loam soils were encountered to the boring termination depths.

The brown and gray to gray silty clay had unconfined compressive strengths ranging between 1.5 and 4.2 tsf. The cohesionless soils in borings SGB-01 had SPT 'N' values between of 13 and 23 blows per foot (bpf).

Traffic Signal Borings (TSB-01 and TSB-02)

Borings TSB-01 and TSB-02 were drilled through in the grass area between IL 171 and the 95th Street ramps. The surface elevations of the borings ranged between 618.2 and 620.2 feet. The borings each noted 3 inches of topsoil at the surface. Beneath the surficial layers, boring TSB-01 encountered loose to medium dense brown silt to a depth of 8.5 feet below existing grade. Beneath these soils and from the ground surface in boring TSB-02, medium stiff to hard brown and gray to gray silty clay and silty clay loam soils were encountered to a depth of 23.5 feet in boring TSB-01 and to the termination depth in TSB-02. Boring TSB-01 then noted dense gray silt to the boring termination depth. Wood and roots fragments were noted in boring TSB-02 at depths of 6.5 and 9 feet below existing grade.

The brown and gray to gray silty clay soils had unconfined compressive strengths ranging between 0.8 and 4.5 tsf. The cohesionless soils in borings TSB-01 had SPT 'N' values between 8 and 15 blows per foot (bpf).

2.3 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 noted in boring RWB-01 at a depth of 8.5 feet (603.1 feet), RWB-03 at a depth of 11 feet (601.0 feet), RWB-10 at a depth of 28.5 feet (584.9 feet), and RWB-14 at a depth of 33.5 feet (578.9 feet). Groundwater was not encountered in the remaining borings either while drilling or after drilling. No delayed groundwater readings were obtained, and the borings were backfilled immediately upon completion.

Based on the color change from brown and gray to gray and moisture contents of the samples, it is anticipated that the long-term groundwater level is below the bottom of the shallow depth borings completed along the project corridor. In borings RWB-01 thru RWB-10 and SSB-01 thru SSB-03, the long-term groundwater level could range between elevations 586.0 to 605.0 feet. Perched water may also be present within any confined granular layers throughout the borings. 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 AND RECOMMENDATIONS

This section provides GSG's geotechnical analysis and recommendations for the design of the proposed roadway improvements based on the results of the field exploration and laboratory testing. Subsurface conditions in unexplored locations may vary from those encountered at the boring locations. If the alignment or proposed grades change, we request that you contact GSG to re-evaluate our recommendations.

3.1 Drainage Characteristics

The drainage characteristics of the site were evaluated per the IDOT Geotechnical Manual, Section 6.3.4.1, based on the subgrade soil type and moisture condition, depth of water table, project topography, the proposed profile grade line, and depth and grade of drainage ditches along the roadway. The proposed roadway improvements along IL 171 and along 95th Street near the intersection with IL 171 (Station 197+00 to 200+00) will be supported on new engineered fill having a fill height greater than 3 feet. Fill soils that are cohesive (A-6) or granular in nature with a fill height greater than 3 feet are classified as Good drainage material; therefore, a Good classification should be used for the subgrade soils for the areas of elevated embankment.

The following road sections may be supported on new engineered fill thicknesses of less than 3 feet. **Table 3** summarizes the drainage classification for these sections based on the subgrade soil characteristics.

Table 3 - Summary of Drainage Classification

Road Section	Station	Subgrade soil description	Drainage Characteristics
95th Street (SGB-01)	Sta. 191+00 to Sta. 197+00	Sandy Clay Loam	Fair
95th Street (SGB-02 and SGB-03)		Silty Clay	Poor to Fair

3.2 Frost Susceptibility

The frost susceptibility of the subgrade soils was evaluated per Section 6.3.2.2.3 of the IDOT Geotechnical Manual. The maximum anticipated frost penetration depth below pavement in northern Illinois for extreme weather conditions is 45 to 60 inches. The frost susceptibility was evaluated for the soils encountered that would be within the proposed roadway subgrade. The frost class for the subgrade soils in these areas was assigned using Table 6.3.2.2.3-1, Frost Susceptibility Classification of Soils, in the IDOT Geotechnical Manual.

Along IL 171 and 95th Street, the new sloped embankment and inner core of the embankment fill will likely be cohesive in nature and will have a Frost Class of F3 (high frost susceptibility). However, the majority of the proposed roadway will be built on embankment which will be elevated more than 5 feet and will have a proper drainage system. Based on the proposed drainage conditions for the site and the anticipated deeper long-term groundwater level below existing subgrade, frost heave is not a concern.

For the areas identified in **Table 3**, the subgrade soils generally consisted of cohesive and granular soils containing fine grained material and were found to have a Frost Class of F3 (high frost susceptibility). In our opinion, there is no concern potential frost action due to groundwater capillary rise, due to the anticipated depth of the groundwater within the project limits. Therefore, GSG dos does not recommend any corrective measures regarding frost susceptibility.

3.3 Subgrade Support Rating

The subgrade support rating (SSR) was determined based on the physical properties of in-situ soils present beneath the proposed pavement section. The SSR includes three categories (poor, fair, and granular), and are used to determine the depth of soil treatment to provide a stable working platform that is required to prevent excessive rutting, and moisture related problems during construction activities. Granular soils have the highest rating and provide a stable working platform that may require less than a 12-inch-thick improved subgrade layer, while poor subgrade may require more than 12 inches to provide stable subgrade during construction activities. The new inner core of the embankment along IL 171 and 95th Street will likely be cohesive in nature and will have a Subgrade Support Rating (SSR) rating of Poor. It is recommended that a Subgrade Support Rating of Poor be used for the elevated section of roadway for this project. The near surface soils described in **Table 3** consisted of cohesive and granular soils containing fine grained material. These soils have a Subgrade Support Rating (SSR) of Poor to Fair.

3.4 Illinois Bearing Ratio

The Illinois Bearing Ratio (IBR) is a measure of the support provided by the roadbed soils for the new pavement. Along the elevated sections of IL 171 and 95th Street, portions of the inner core embankment fill and sloped embankment fill will likely consist of cohesive soils, therefore it is recommended to use an IBR value of 2, based on typical IBR values for Illinois soils-Table 5.5.16-1 of the IDOT Geotechnical Manual, for the roadway pavement design and correlate to the

subgrade resilient modulus based on the AASHTO recommended pavement design formula for fine grained soils (M_r = 1,500 x IBR).

For the soils described in **Table 3**, it is recommended that an IBR value of five (5) be used for the roadway pavement design where granular soils are present. It is recommended that an IBR value of two (2) be used for the roadway pavement design where clay soils are present.

3.5 Organic Content

Typically, soils with an organic content in excess of 10 percent are considered unsuitable to remain below proposed pavement areas. Based on the soil borings, it is not anticipated that highly organic soils will be encountered in subgrade soils for the proposed roadway.

3.6 Shrinkage Factor

Based on IDOT and FHWA references, a shrinkage factor of 15% may be used for newly placed cohesive soils. For dry sand, a shrinkage factor of 10% may be used.

4.0 EMBANKMENT RECOMMENDATIONS

This section provides GSG's geotechnical recommendations for the design of the proposed improvements based on the results of the field exploration, laboratory testing, and geotechnical analysis. As part of the project plans, new embankments will be constructed that will require new fill heights of up to 18 feet. The largest fill heights will be located near the proposed intersection of IL 171 and 95th Street. For the design and construction of the new embankments, the existing subgrade soils were evaluated for potential settlement due to the anticipated loading. The proposed embankment was also analyzed for global stability. Design and construction recommendations for the proposed embankment are in the following sections.

4.1 Proposed Embankments

GSG understands that new engineered fill will be used to construct the new embankment for the reconstructed IL 171 and 95th Street intersection. It is anticipated that the majority of the roadway embankment along IL 171 will be retained by a retaining wall along the north side of existing IL 171, while 95th street will be supported on sloped embankments. Recommendations for the proposed retaining wall are included in a separate report.

4.2 Embankment Settlement

Based on the variable heights, shapes, and soil conditions across the length of the mainline embankment, the analysis was broken into several sections to evaluate the anticipated amount of primary settlement. Each analysis section was selected based on the overall height of the embankment, the anticipated loading and influence zone of the embankment due to the variable shapes, or the soil conditions encountered in the soil borings along each section of IL 171 and 95th Street. Due to the predominantly granular nature of the site soils, significant long term consolidation settlement is not anticipated; however, the low strength, high plasticity and moisture content clays encountered in borings RWB-14 through RWB-16 may be subject to high settlements. The maximum estimated primary settlements were calculated as shown in **Table 4**.

Table 4 – Estimated Settlement Summary

Roadway Area	Boring IDs / Roadway Station*	Maximum Embankment Height*	Anticipated Total Primary Settlement	Anticipated Subgrade Materials
IL 171	RWB-03 thru RWB-13, SSB-01 thru SSB-04 / Sta. 317+80.13 to Sta. 324+75	16.5	1.3	Stiff to Very Stiff Silty Clay and Loose to Medium Dense Sand
IL 171	RWB-14 thru RWB-16, SSB-05 Sta. 324+75 to Sta. 327+25	18	3.5	Soft to Stiff Silty Clay and Loose Silt
IL 171	RWB-17 thru RWB-25, SSB-06 & SSB-07 / Sta. 327+25 to Sta. 333+27.91	15	< 1.0	Loose to Medium Dense Sand and Stiff Silty Clay
95th Street	SGB-01 thru SGB-03 / Sta. 191+00 to 197+00	<5	< 1.0	Stiff to Very Stiff Silty Clay
95th Street	RWB-11 thru RWB-15, SSB-04 / Sta. 197+00 to 200+00	18	3.5	Soft to Stiff Silty Clay and Loose Silt

*Based on drawings (dated 03/22/2024) and design information (dated 03/27/2024) provided by Collins

Based on experience with similar soil conditions, 90% of the primary consolidation will occur within approximately 9 to 12 months from the date of loading. It is recommended that settlement plates be installed near the intersection of IL 171 and 95th Street where the greatest fill height is anticipated and midpoints of the embankments to monitor settlement and help the design section engineer determine when acceptable settlement rates and settlement amounts have been achieved.

4.3 Embankment Settlement Treatment and Recommendations

Due to the anticipated magnitude of total settlement for several sections of the alignment, special design recommendations should be considered. This should mitigate the impact of differential settlement along the proposed roadway alignment and any impacts to the construction schedule.

4.3.1 Staged Construction

Due to the magnitude of fill heights that are proposed for the roadway construction, segments of the project could utilize controlled rate of loading or staged construction. With staged construction, a portion of the embankment is constructed to allow for soil consolidation and pore water pressure dissipation which would increase soil strength prior to completion of the full embankment/fill construction. For the initial construction, allowing the partially constructed

embankment to remain in place for varying amounts of time, prior to the final stage construction will result in different amounts of settlement after construction. The longer the initial stage construction remains in place as a surcharge over the underlying soils, the less settlement is anticipated to occur post construction.

Proper instrumentation, as outlined in IDOT Geotechnical Manual (2020) in *Section 6.4.4.6-Instrumentation and Control of Embankment Construction,* will be required to monitor the state of stress in the soil during the loading period, to ensure that loading does not proceed so rapidly as to cause a shear failure.

4.3.2 Maintenance

A maintenance program will likely be necessary throughout the construction stage to account for movement of the new embankments. This will require additional quantities of fill materials to be placed during construction, which should be accounted for when estimating earthwork quantities. The site improvement alternative selected will determine how long and how much maintenance may be necessary.

4.3.3 Ground Improvement Recommendations

Based on the anticipated embankment settlements noted in **Table 4 in** the vicinity of borings RWB-13 to RWB-17, additional ground modification should also be considered. The installation of rammed aggregate piers, stone columns or rigid inclusions below the embankment could be considered to stabilize the site and minimize long term settlement. Additional ground improvement would be necessary for only a portion of the embankment where excessive settlement is anticipated. Based on the engineering analysis, the ground improvements are recommended between IL 171 Stations 324+75 and 327+25.

Aggregate columns can also act as wick drains in accelerating drainage at the site, and decrease the time frame for consolidation settlement. Typical column diameters range from 18 to 36 inches and, in general, are most economical for sites requiring column lengths less than 35 feet deep and preferably about 20 feet deep below the surface, such as this site.

Rigid inclusions (RIs) are columns of grout used to reinforce the ground to increase bearing resistance and reduce settlement of a structure or embankment. Rigid Inclusions are constructed with an auger displacement tool or vibrated pipe tool that displaces soil laterally, producing very little spoils. Grout mixes for rigid inclusions shall consist of Portland cement, sand, and water,

and may also contain coarse aggregate, a mineral admixture and/or approved fluidifier. Geogrid or geotextile and reinforcing steel can also be used to increase the strength of the inclusions. Typical inclusion diameters range from 12 to 18 inches. The rigid inclusions reinforce the soil rather than function as distinct structural elements or piles. The improved ground has increased stiffness and therefore improved settlement and bearing characteristics.

In addition to the stone columns or rigid inclusions, a load transfer layer consisting of compacted material with geogrid reinforcement would be necessary to transfer the embankment load to the columns. The embankment construction and fill placement could then be completed after the installation of the columns and the load transfer layer.

This site improvement technique would provide a stable platform for construction of the embankment by transferring the embankment and MSE wall loads to the lower medium dense to extremely dense granular materials and limit the influence on the compressible materials. Based on the subsurface conditions the stone columns should be designed to bear within the medium dense to extremely dense granular soils approximately 26 feet below the existing native grade, in accordance with *GBSP 71-Aggregate Column Ground Improvement* provided within the IDOT guidelines.

The installation of this ground improvement method could have significant initial costs for the project; however, there would be limited impacted on the construction schedule, and little to no long-term maintenance costs.

4.4 Slope Stability Analyses and Recommendations

Slope stability analyses were performed in areas where sloped embankments are proposed along reconstructed 95th Street. For the proposed improvements, the maximum fill height will be 18 feet near the intersection with IL 171 (95th Street stations 199+00 to 200+00). Based on the estimated widths and elevations of the proposed 95th Street embankment, it is anticipated that the side slopes will be approximately 14:1 (H:V). For the areas of the project that will include retaining walls, analyses of these areas were completed within the retaining wall SGR.

Slide2 is a comprehensive slope stability analysis software used to evaluate the proposed sloped embankments for the project based on the limit equilibrium method. The proposed sloped embankments were analyzed based on the plans provided by Ames and Collins (**Appendix A**) and the soils encountered while drilling. Circular failure analyses were evaluated using the simplified

Bishops analyses methods for the proposed slope geometry. Based on the proposed geometry and the soil borings, global stability analyses were performed. The analyses are summarized in **Table 5**.

Table 5 – Global Slope Stability Analyses Results

Analysis Exhibit	Location	Embankment Height (ft)	Side Slope (H:V)	Analysis Type	Factor of Safety	Minimum Factor of Safety
Exhibit 1	95th Street, Station 199+50, Left side of embankment	18.0	14:1	Circular – Short Term	14.2	1.5
Exhibit 2				Circular – Long Term	8.2	1.5
Exhibit 3	95th Street, Station 199+50, Right side of embankment	18.0	14:1	Circular – Short Term	6.3	1.5
Exhibit 4				Circular – Long Term	7.3	1.5

Based on the analyses performed, the proposed slopes meet the minimum factor of safety of 1.5. Copies of the Slope Stability Analysis exhibits are included in **Appendix E**.

5.0 GEOTECHNICAL ROADWAY DESIGN RECOMMENDATIONS

This section provides GSG's geotechnical recommendations for the design of the proposed roadway improvements based on the results of the field exploration, laboratory testing, and geotechnical analysis.

5.1 Subgrade Treatment and Recommendations

Based on the existing site conditions, undercuts may be necessary along sections of the proposed improvements to provide a stable platform for the embankment construction. The preliminary recommended undercuts and locations are summarized in **Table 6**. These locations are shown on the soil profiles included in **Appendix B**. The depth, location, and extent of the proposed undercuts should be field verified during construction. All potentially unstable soils should be tested with a cone penetrometer and treated in accordance with Article 301.04 of the SSRBC and the undercut guidelines in the IDOT Subgrade Stability Manual.

Table 6 – Preliminary Recommended Undercuts

Roadway	Approximate Roadway Stations	Lateral Limits	Boring IDs	Soil Description	Remedial Undercut/Scarify and Recompact		Comments
					Elevation (feet)	Depth* (feet)	
IL 171	316+25 to 317+25	Embankment Footprint	RWB-02	Loose Brown Sand	609.5	0.0 -2.0	'N' value < 7 bpf
IL 171	321+45 to 322+10	Embankment Footprint	RWB-09 &SSB-03	Medium Stiff Brown Silty Clay	610.0	3.0-3.5	q_u < 2.0 tsf
IL 171	324+75 to 327+25**	Embankment Footprint	SSB-04, RWB-14&15	Medium Stiff Brown Silty Clay & Loose Brown Sandy Clay Loam	611.0 - 612.0	0.0 – 2.0	'N' value < 7 bpf & q_u < 2.0 tsf
IL 171	329+75 to 331+50	Embankment Footprint	RWB-20 & RWB-21	Loose Brown Sand, Silty Sand, & Silt	608.0	0.0 – 2.0	'N' value <7 bpf

*Depth measured from existing ground surface

** Undercut may not be required if ground improvement measures used as discussed in Section 4.3.3

Approved structural fill includes IDOT Porous Granular Embankment (PGE), or suitable borrow materials, as specified in the Borrow Material and Compaction Requirements section of this report. It is also recommended that a woven geotechnical fabric be placed at the base of the undercut. The geotextile fabric should consist of a woven material meeting the requirements of

Section 1080.02 of the IDOT SSRBC (2022) and should be placed in accordance with Section 210 of the IDOT SSRBC (2022).

5.2 Drainage Recommendations

The embankment fill with proper drainage systems should be designed using a Good drainage classification. The groundwater depth is significantly deeper than the anticipated frost depth of 45 to 60 inches for the northern Illinois region, and as such no subgrade saturation is anticipated due to capillary action. GSG anticipates that storm drainage system constructed along the sides of the proposed roads should be sufficient to provide good drainage and therefore we do not anticipate the need of any additional underdrains for this project. For the roadway sections described in **Table 3**, a drainage classification of Poor to Fair should be used.

5.3 Traffic Signal Foundations

GSG understands that new traffic signal structures will be installed at the intersection of IL 171 and 95th Street. Based on estimated mast arm lengths, **Table 7** summarizes design requirements for the depth and diameter of foundations per the IDOT Highway Standard 878001-11 (**Appendix F**).

Table 7 – Proposed Traffic Signal Structure Summary

Mast Arm Length[1] (feet)	Anticipated Foundation Depth[2]	Anticipated Foundation Diameter[2]
30.0	13’ 6”	30”
	11- 0”	36”
40.0	13’ 0”	36”

[1] Estimated length
[2] Based on IDOT Highway Standard 878001-11.

Based on the proposed roadway grading, it is anticipated that the traffic signal foundations will bear within new clay fill, constructed as part of the elevated embankment sections of IL 171 and 95th Street; these soils will be compacted in accordance with IDOT specifications (SSRBC) and will meet the required unconfined compressive strengths (Qu) above 1.0 tsf. Therefore, the IDOT standard is valid for borings TSB-01 and TSB-02 and can be used for the design of the traffic signal foundations. If granular materials are used in the embankment construction, it is recommended that the drilled shafts at borings TSB-01 and TSB-02 be installed using a temporary casing.

Soils must be visually inspected at each location to confirm the presence of new clay fill; if

different soils are encountered during construction the engineer must be notified to provide a revised design. The lateral resistance of the upper 3.5 feet of soils in the frost penetration zone should be neglected in design.

5.4 Lateral Earth Pressure and Loading

Drilled shafts for the proposed 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, 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.

6.0 CONSTRUCTION CONSIDERATIONS

All work performed for the proposed project should conform to the requirements in the IDOT Standard Specifications for Road and Bridge Construction (SSRBC, 2022) along with the Illinois Tollway Supplemental Specifications, and the IDOT Subgrade Stability Manual (2005). Any deviation from the requirements in the manuals above should be approved by the design engineer.

6.1 Topsoil Removal

GSG recommends completely stripping the topsoil to a minimum depth of 12 inches or any greater full depth encountered within the limits of the proposed embankment and roadway areas and stockpiling it per Section 211.03 of the IDOT SSRBC. Topsoil thicknesses of up to 18 inches could be anticipated in the project limits. The topsoil should be separated from other materials being stockpiled onsite for reuse or haul off. If the topsoil is to be reused, mechanical and chemical analyses for nutrients should be performed in order to determine the suitability and nature of treatment required for the topsoil prior to reuse for this project.

6.2 Embankment and Pavement Subgrade Preparation

The stability of the embankment subgrade should be evaluated immediately prior to placement of any new engineered fill in accordance with the Section 205 - Embankment of IDOT SSRBC to determine if additional treatment is required.

After the subgrade areas are exposed, the inspection should include visual inspection and performing a proof roll using heavy equipment or heavily loaded tandem axle dump truck with a minimum gross weight of 25 tons to check for deflection or rutting. Areas with excessive rutting and deflection shall be evaluated using a dynamic cone penetrometer (DCP) and static cone penetrometer (SCP) to determine the depth of required treatment in accordance with the IDOT Subgrade Stability Manual (2005) and IDOT SSRBC (2022), Section 301. The subgrade should be prepared in accordance with Sections 205-Embankment and Section 301-Subgrade preparation, of the IDOT SSRBC (2022).

Treatment for unstable and unsuitable soils encountered during proof rolling and subgrade evaluation may include the use of a geotextile fabric, removal and replacement with approved structural fill for small areas, or the use of additive materials, such as lime, cement or fly ash. Subgrade improvements should be based on the recommendations in the Subgrade Treatment and Recommendations Section 5.1 of this report or based on field evaluation of the materials

during construction. Field evaluation of the subgrade soils should be conducted in accordance with the procedures outlined in the IDOT Geotechnical Manual and Subgrade Stability Manual, and under the supervision of a licensed geotechnical engineer.

6.3 Site Excavation and Construction Safety

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 for all excavation activities.

6.4 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 Standard Specifications for Road and Bridge Construction (2022). Imported or on-site fill materials should be evaluated using Table 8.4-1 of the IDOT Geotechnical Manual, Requirements of Borrow Soils for the top 24 inch, and Section 204, "Borrow and Furnish Excavations" of the IDOT SSRBC.

The fill material should be free of organic matter and debris and should be placed and compacted in accordance with Section 205, Embankment, of the IDOT SSRBC (2022). Earth-moving operations should be avoided during excessively cold or wet weather to avoid freezing of softening subgrade soils. Fill should be placed in lifts and compacted according to Section 205, Embankment (IDOT, 2022).

6.5 Groundwater Management

It is anticipated that the long-term groundwater level is below the bottom of the borings for the majority of the project corridor. In borings RWB-01 thru RWB-10 and SSB-01 thru SSB-03, the

long-term groundwater level could range between elevations 586.0 to 605.0 feet. GSG does not anticipate significant groundwater related issues during construction activity, however perched water may be encountered in any confined granular layers. 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 construction 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. The remaining portion of the excavation should be backfilled using approved structural fill.

7.0 LIMITATIONS

This report has been prepared for the exclusive use of the Illinois Department of Transportation and its Design Section Engineer. The recommendations provided in the report are specific to the project described herein and are based on the information obtained from the soil boring locations within the proposed project limits. 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 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

Bench Mark: A 2" metal disk in concrete located in grass median at 95th Street and IL Route 171 lying 36' south of south pavement edge along IL Route 171 and 29' northwest of west pavement edge along east leg for 95th Street. Elev. 608.57.

Existing Structure: None

Traffic to be detoured during construction.

DESIGN SPECIFICATIONS

2020 AASHTO LRFD Bridge Design Specifications, 9th Edition

DESIGN STRESSES

FIELD UNITS

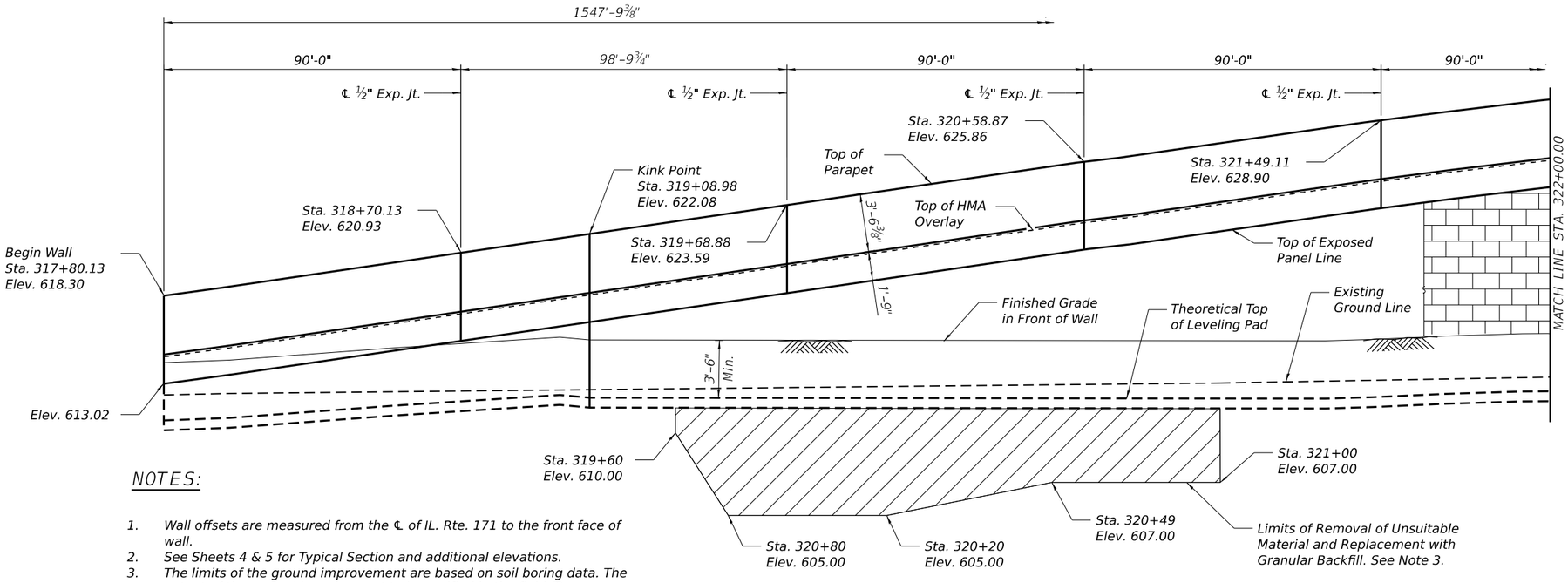
f'c = 3,500 psi
fy = 60,000 psi (Reinforcement)

PRECAST UNITS

f'c = 4,500 psi (precast panels)

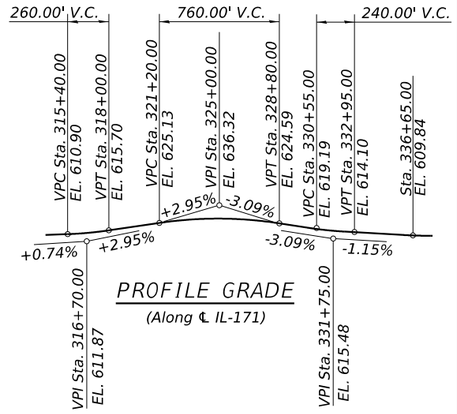
HIGHWAY CLASSIFICATION

F.A.U. 3565 - IL Rte. 171
Functional Class: Minor Arterial
ADT: 13,000 (2021); 17,200 (2038)
ADTT: 780 (2021); 1,030 (2038)
DHV: 1,720 (2038)
Design Speed: 55 m.p.h.
Posted Speed: 55 m.p.h.
2-Way Traffic
Directional Distribution: 50/50



ELEVATION

(Looking Northwest at Front Face of Wall)



PROFILE GRADE

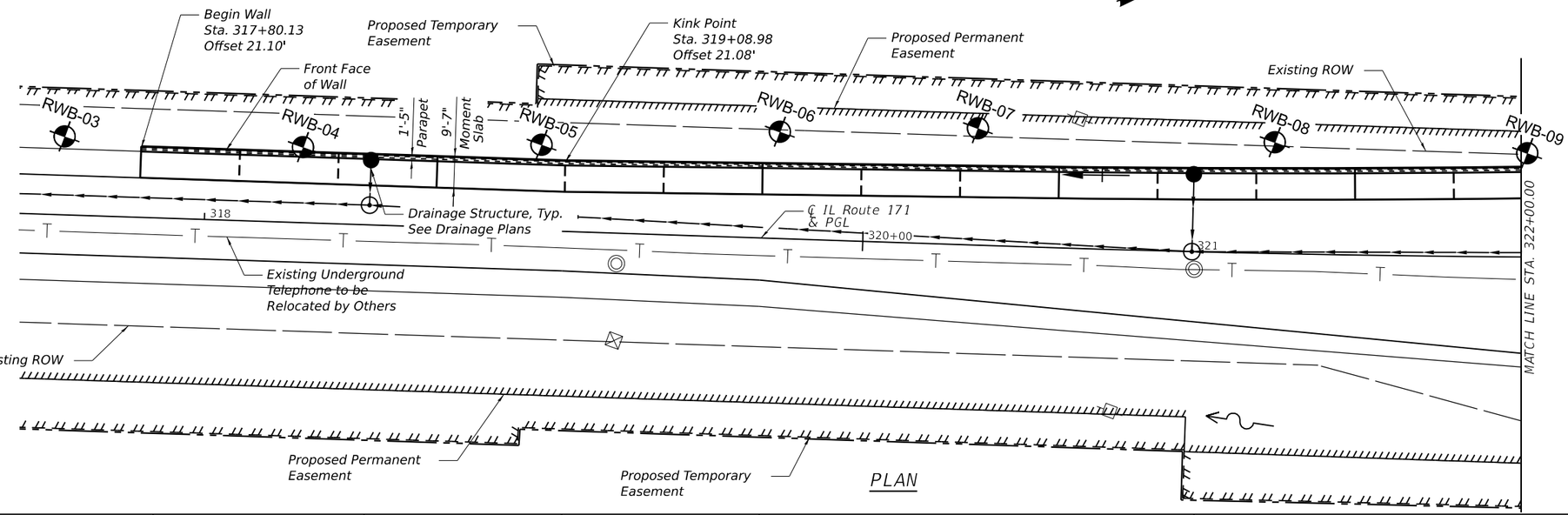
(Along ℄ IL-171)

NOTES:

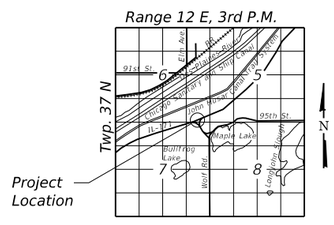
1. *Wall offsets are measured from the ℄ of IL. Rte. 171 to the front face of wall.*
2. *See Sheets 4 & 5 for Typical Section and additional elevations.*
3. *The limits of the ground improvement are based on soil boring data. The extent of the ground improvement to be verified in the field (See Roadway Plans and SGR).*

CURVE DATA

P.I. Sta. = 323+29.13
Δ = 5° 35' 37" (LT)
D = 1° 01' 23"
R = 5,600.00
T = 273.57'
L = 546.70'
E = 6.68'
P.C. Sta. = 320+55.56
P.T. Sta. = 326+02.26



PLAN



LOCATION SKETCH

GENERAL PLAN AND ELEVATION I RETAINING WALL NO. 1 ALONG ILLINOIS ROUTE 171 (ARCHER AVE.) F.A.U. RTE. 3565 - SEC U-1-N COOK COUNTY STA. 317+80.13 STA. 333+27.91 STRUCTURE NO. 016-2310

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COLLINS ENGINEERS INC.

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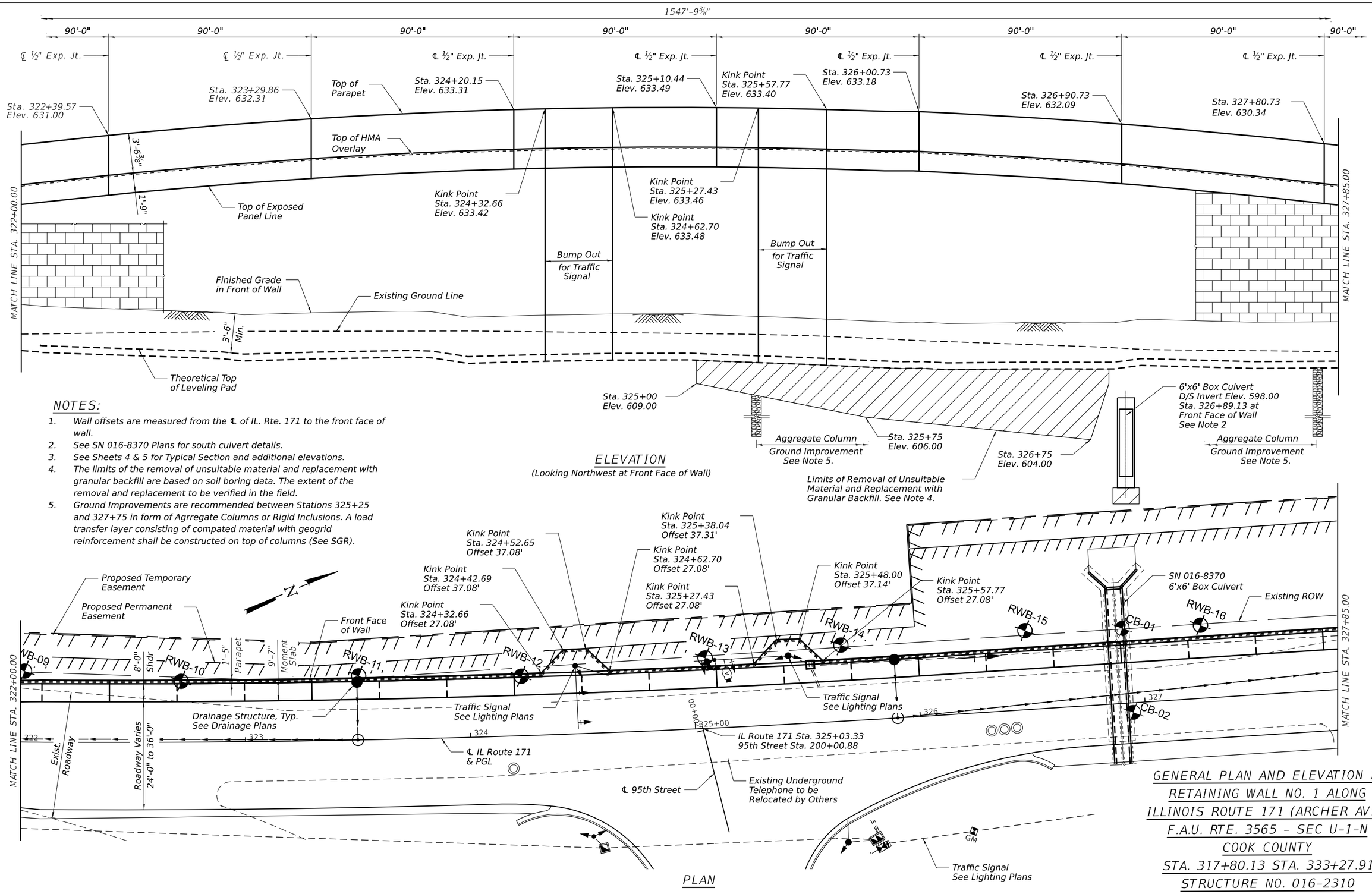
	CHECKED - EKM	REVISED -	
PLOT SCALE =	DRAWN - DR	REVISED -	
PLOT DATE =	CHECKED - EKM	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GENERAL PLAN AND ELEVATION
STRUCTURE NO. 016-2310
SHEET 1 OF 5 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
3565	U-1-N	COOK	5	1
		CONTRACT NO. 60R94		
		ILLINOIS	FED. AID PROJECT	



NOTES:

1. Wall offsets are measured from the ℄ of IL. Rte. 171 to the front face of wall.
2. See SN 016-8370 Plans for south culvert details.
3. See Sheets 4 & 5 for Typical Section and additional elevations.
4. The limits of the removal of unsuitable material and replacement with granular backfill are based on soil boring data. The extent of the removal and replacement to be verified in the field.
5. Ground Improvements are recommended between Stations 325+25 and 327+75 in form of Agrregate Columns or Rigid Inclusions. A load transfer layer consisting of compated material with geogrid reinforcement shall be constructed on top of columns (See SGR).

GENERAL PLAN AND ELEVATION II
RETAINING WALL NO. 1 ALONG
ILLINOIS ROUTE 171 (ARCHER AVE.)
F.A.U. RTE. 3565 - SEC U-1-N
COOK COUNTY
STA. 317+80.13 STA. 333+27.91
STRUCTURE NO. 016-2310

COLLINS ENGINEERS INC.

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PLOT DATE = ____	CHECKED - EKM	REVISED - ____	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GENERAL PLAN AND ELEVATION
STRUCTURE NO. 016-2310
SHEET 2 OF 5 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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		CONTRACT NO. 60R94		
		ILLINOIS	FED. AID PROJECT	

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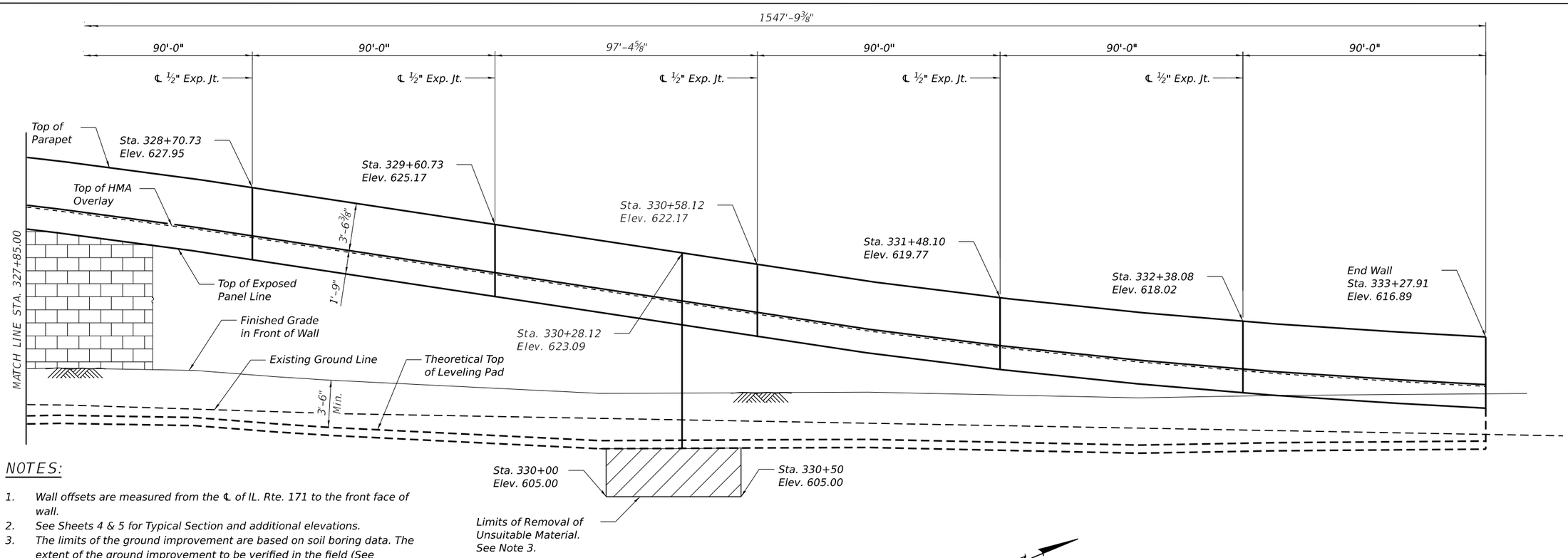
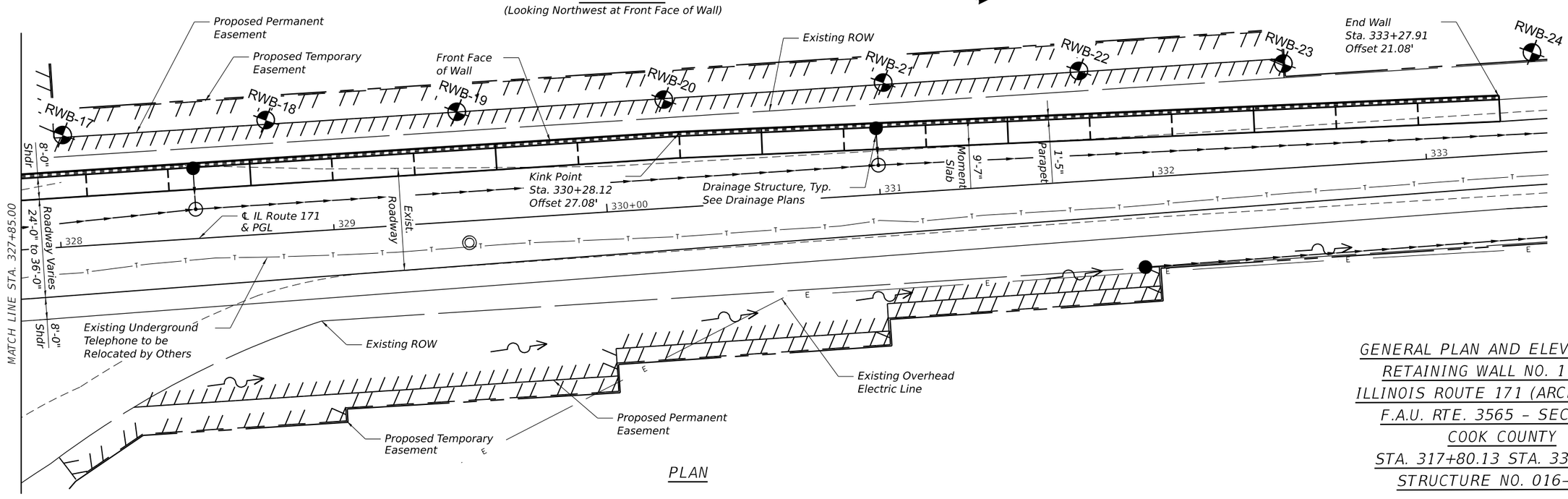


NOTES:

1. Wall offsets are measured from the ℄ of IL. Rte. 171 to the front face of wall.
2. See Sheets 4 & 5 for Typical Section and additional elevations.
3. The limits of the ground improvement are based on soil boring data. The extent of the ground improvement to be verified in the field (See Roadway Plans and SGR).

ELEVATION

(Looking Northwest at Front Face of Wall)



PLAN

GENERAL PLAN AND ELEVATION III
RETAINING WALL NO. 1 ALONG
ILLINOIS ROUTE 171 (ARCHER AVE.)
F.A.U. RTE. 3565 - SEC U-1-N
COOK COUNTY
STA. 317+80.13 STA. 333+27.91
STRUCTURE NO. 016-2310

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PLOT DATE =	CHECKED - EKM	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GENERAL PLAN AND ELEVATION
STRUCTURE NO. 016-2310
SHEET 3 OF 5 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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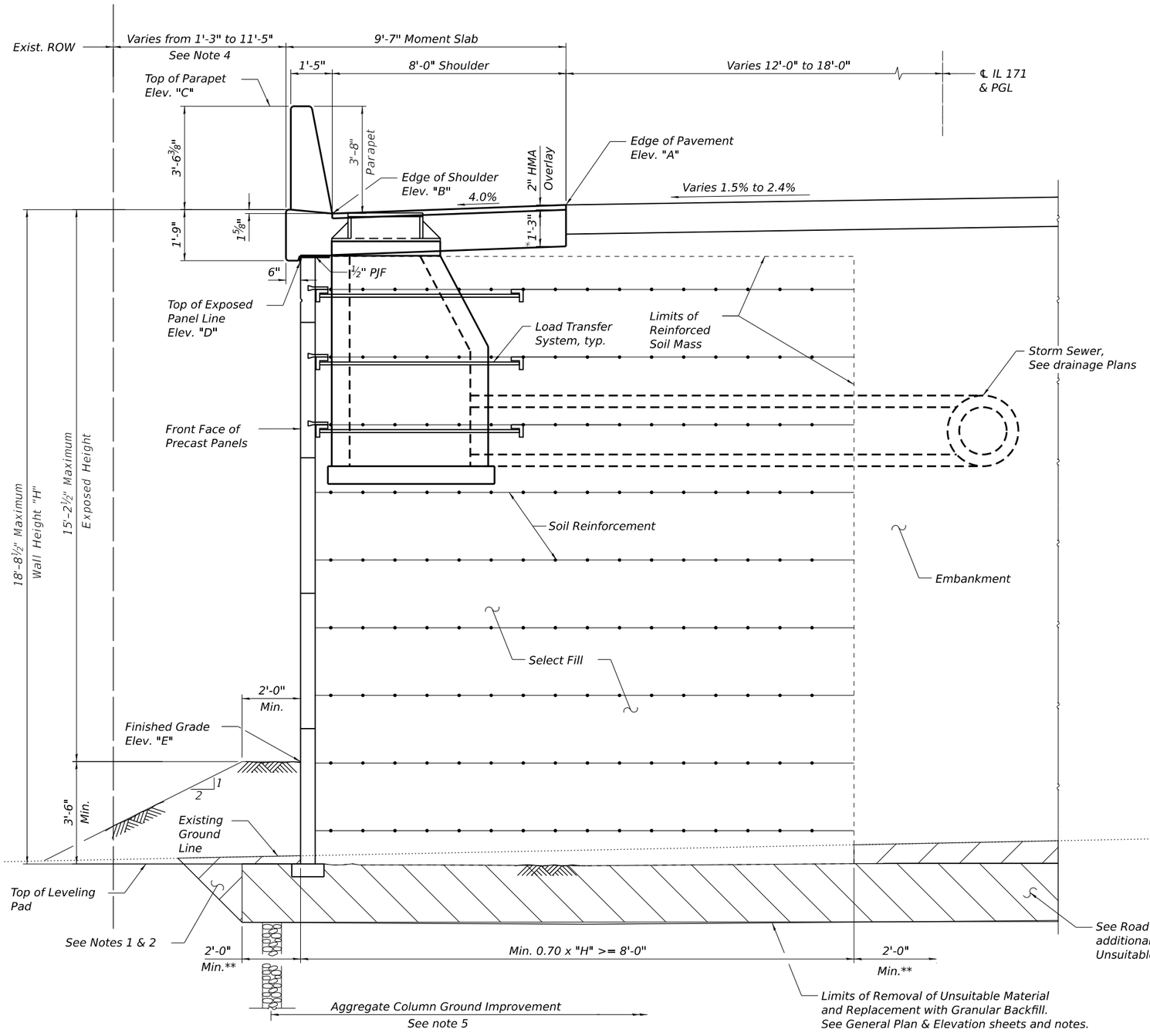
	ILLINOIS	FED. AID PROJECT		



TYPICAL SECTION

* Slab thickness to be refined in final design.
**Removal of Unsuitable Material Limits vary depending on the removal depth and will be refined in Final Design.

Station	LOCATION "A"		LOCATION "B"		Location "C"	Location "D"		Location "E"
	OFFSET	ELEV.	OFFSET	ELEV.	ELEV.	OFFSET	ELEV.	ELEV.
317+80.13	12.00	614.95	20.00	614.63	618.30	21.08	613.02	614.26
318+70.13	12.00	617.59	20.00	617.27	620.93	21.08	615.65	615.39
319+08.98	12.00	618.73	20.00	618.41	622.08	21.08	616.80	615.81
319+68.88	13.20	620.24	21.20	619.92	623.59	22.28	618.31	615.81
320+58.87	15.00	622.52	23.00	622.20	625.86	24.08	620.58	615.67
321+49.11	16.83	625.55	24.83	625.23	628.90	25.91	623.62	615.79
322+39.57	18.00	627.65	26.00	627.33	631.00	27.08	625.72	615.66
323+29.86	18.00	629.13	26.00	628.81	632.48	27.08	627.20	615.05
324+20.15	18.00	629.96	26.00	629.64	633.31	27.08	628.03	614.95
324+32.66	18.00	630.03	26.00	629.71	633.37	27.08	628.09	614.98
324+42.69	18.00	630.07	26.00	629.75	633.42	37.08	628.13	615.01
324+52.65	18.00	630.10	26.00	629.78	633.45	37.08	628.17	615.04
324+62.70	18.00	630.13	26.00	629.81	633.48	27.08	628.19	615.07
325+10.44	18.00	630.15	26.00	629.83	633.49	27.08	628.21	615.09
325+27.43	18.00	630.11	26.00	629.79	633.46	27.08	628.17	614.97
325+38.04	18.00	630.07	26.00	629.75	633.42	37.31	628.14	614.89
325+48.00	18.00	630.03	26.00	629.71	633.38	37.14	628.10	614.82
325+57.77	18.00	629.98	26.00	629.66	633.33	27.08	628.05	614.75
326+00.73	18.00	629.83	26.00	629.51	633.18	27.08	627.90	614.44
326+89.13	18.00	628.77	26.00	628.45	632.11	27.08	626.83	614.67
326+90.73	18.00	628.74	26.00	628.42	632.09	27.08	626.81	614.68
327+80.73	18.00	626.99	26.00	626.67	630.34	27.08	625.06	614.56
328+70.73	18.00	624.60	26.00	624.28	627.95	27.08	622.67	613.88
329+60.73	18.00	621.83	26.00	621.51	625.17	27.08	619.89	613.03
330+28.12	18.00	619.75	26.00	619.43	623.09	27.08	617.81	612.68
330+58.12	17.40	618.83	25.40	618.51	622.18	26.81	616.90	612.71
331+48.10	15.60	616.43	23.60	616.11	619.77	24.68	614.49	612.54
332+38.08	13.80	614.68	21.80	614.36	618.03	22.88	612.74	612.41
333+27.91	12.00	613.54	20.00	613.22	616.89	21.08	611.61	612.55

NOTES:

1. Overexcavation beyond Structure Excavation and Removal of Unsuitable Material is not measured for payment.
2. Backfill overexcavation with same material as used for select fill in MSE wall.
3. The MSE wall supplier's internal stability design shall account for the anchorage slab's bearing pressure surcharge of 1.0 ksf and horizontal bearing pressure of 0.5kips/ft of wall.
4. The limits of the removal and replacement of unsuitable material are based on soil boring data and to be verified in the field.
5. Ground Improvements are recommended between Stations 325+25 and 327+75 in form of Aggregate Columns or Rigid Inclusions. A load transfer layer consisting of compacted material with geogrid reinforcement shall be constructed on top of columns. Size, depth, and spacing of Agrregate Column Ground Improvement to be determined in design phase.
6. For Proposed Temporary and Permanent Easement, see General Plan and Elevation Sheets.

TYPICAL SECTION
RETAINING WALL NO. 1 ALONG
ILLINOIS ROUTE 171 (ARCHER AVE.)
F.A.U. RTE. 3565 – SEC U-1-N
COOK COUNTY
STA. 317+80.13 STA. 333+27.91
STRUCTURE NO. 016-2310

MODEL: Default
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3/22/2024 2:37:35 PM

COLLINS ENGINEERS INC.

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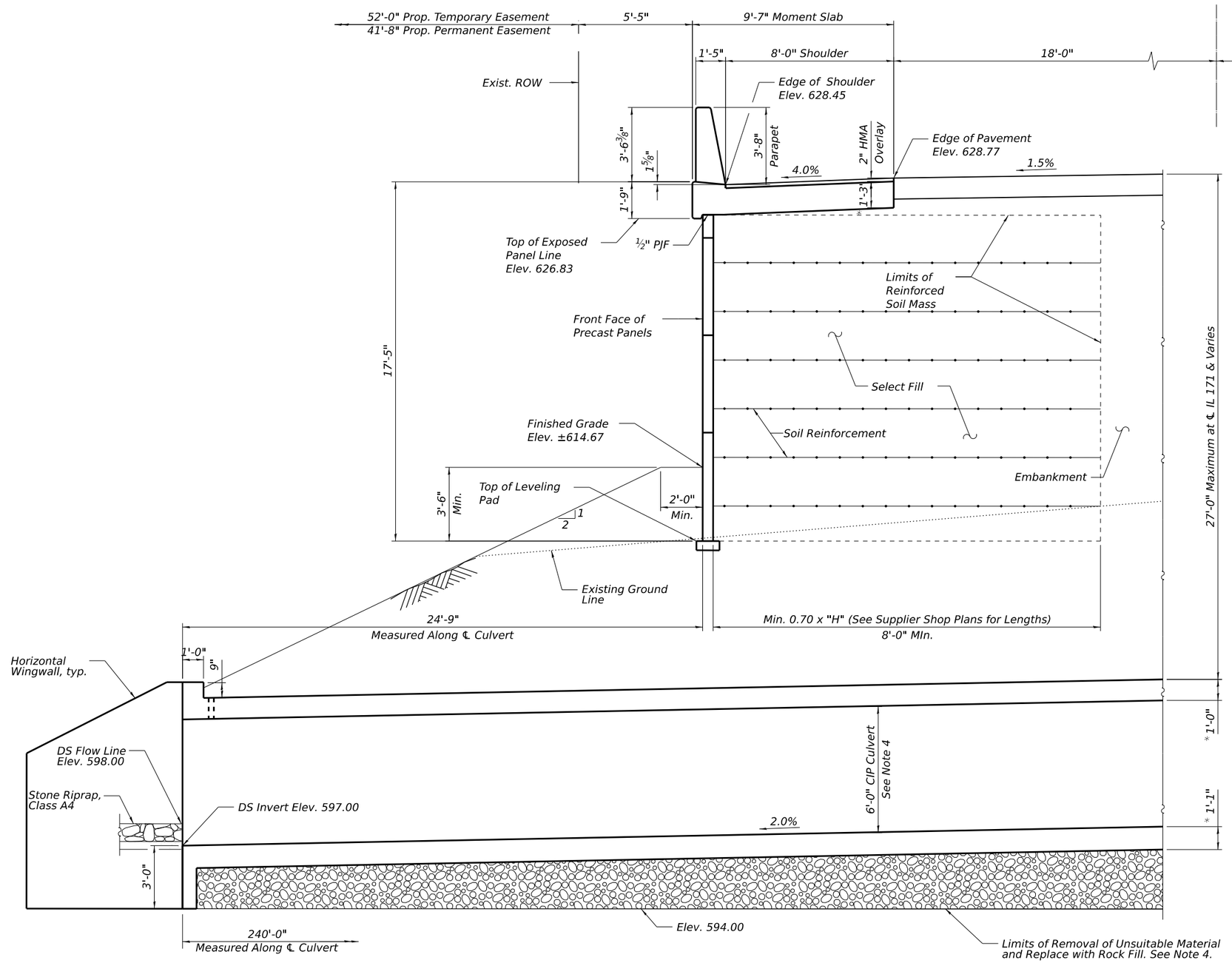
	CHECKED - EKM	REVISED -	
PLOT SCALE =	DRAWN - DR	REVISED -	
PLOT DATE =	CHECKED - EKM	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

RETAINING WALL SECTIONS I
STRUCTURE NO. 016-2310
SHEET 4 OF 5 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
3565	U-1-N	COOK	5	4
		CONTRACT NO. 60R94		
	ILLINOIS	FED. AID PROJECT		



SECTION AT SOUTH CULVERT

*Slab thickness may be refined in final design

NOTES:

1. Overexcavation beyond Structure Excavation and Removal of Unsuitable Material is not measured for payment.
2. Backfill overexcavation with same material as used for select fill in MSE wall.
3. The MSE wall supplier's internal stability design shall account for the anchorage slab's bearing pressure surcharge of 1.0 ksf and horizontal bearing pressure of 0.5kips/ft of wall.
4. The limits of the ground improvement are based on soil boring data. The extent of the ground improvement to be verified in the field (See SGR).

SECTION AT CULVERT
RETAINING WALL NO. 1 ALONG
ILLINOIS ROUTE 171 (ARCHER AVE.)
F.A.U. RTE. 3565 – SEC U-1-N
COOK COUNTY
STA. 317+80.13 TO STA. 333+27.91
STRUCTURE NO. 016-2310

COLLINS ENGINEERS INC.

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PLOT DATE =	CHECKED - EKM	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

RETAINING WALL SECTIONS II
STRUCTURE NO. 016-2310
SHEET 5 OF 5 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
3565	U-1-N	COOK	5	5
		CONTRACT NO. 60R94		
	ILLINOIS	FED. AID PROJECT		

APPENDIX B

SOIL BORING LOCATION PLAN AND SUBSURFACE PROFILES

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

USER NAME = Jscott	DESIGNED - TK	REVISED -	
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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

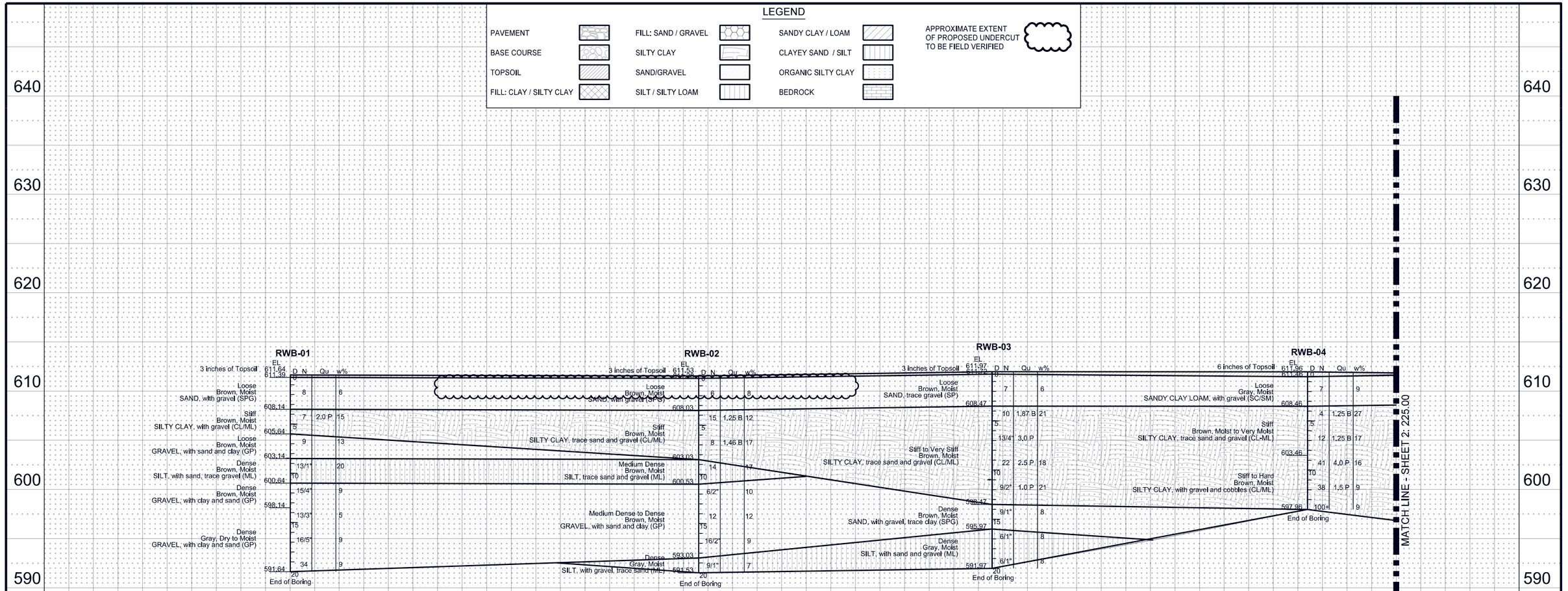
IDOT AMES PTB 163–017
IL 171 & 95TH STREET
BORING LOCATION PLAN

SCALE: 1:60 | SHEET 1 OF 1 SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK	1	9
		CONTRACT NO. 60R94		
		ILLINOIS	FED. AID PROJECT	

LEGEND

PAVEMENT	FILL: SAND / GRAVEL	SANDY CLAY / LOAM	APPROXIMATE EXTENT OF PROPOSED UNDERCUT TO BE FIELD VERIFIED
BASE COURSE	SILTY CLAY	CLAYEY SAND / SILT	
TOPSOIL	SAND/GRAVEL	ORGANIC SILTY CLAY	
FILL: CLAY / SILTY CLAY	SILT / SILTY LOAM	BEDROCK	



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PLOT DATE = 11/22/2021	DATE - 11/15/2021	REVISED -	

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

IDOT AMES PTB 163–017
IL 171 & 95TH STREET
BORING LOCATION PROFILE

SCALE: AS NOTED | SHEET 1 OF 8 SHEETS | STA. 0.00 | TO STA. 225.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK	9	2
		CONTRACT NO. 60R94		
		ILLINOIS	FED. AID PROJECT	

LEGEND

PAVEMENT	FILL: SAND / GRAVEL	SANDY CLAY / LOAM	APPROXIMATE EXTENT OF PROPOSED UNDERCUT TO BE FIELD VERIFIED
BASE COURSE	SILTY CLAY	CLAYEY SAND / SILT	
TOPSOIL	SAND/GRAVEL	ORGANIC SILTY CLAY	
FILL: CLAY / SILTY CLAY	SILT / SILTY LOAM	BEDROCK	

640 630 620 610 600 590 580 570 560

MATCH LINE - SHEET 1: 225.00

MATCH LINE - SHEET 3: 475.00

RWB-05

EL. 612.42

	D	N	Qu	w%
Medium Dense, Gray, Moist, SANDY CLAY LOAM, with gravel (SC/SM)	0	14		7
608.92				
Stiff, Gray and Brown, Moist, SILTY CLAY, with sand and gravel (CL/ML)	5	7	1.0 P	20
606.42		19	2.5 P	15
Stiff to Hard, Brown, Moist, SILTY CLAY LOAM, trace sand and gravel (ML/CL)	10	18	1.5 P	18
		27	4.5 P	15
598.92		85	3.0 P	11
Stiff to Very Stiff, Brown, Dry to Moist, CLAY LOAM, with gravel and cobbles (CL-S)	15	100+	1.0 P	12
593.42		100+		5
End of Boring				

RWB-06

EL. 611.98

	D	N	Qu	w%
Medium Dense, Gray, Moist, SILTY SAND, with gravel (SM)	0	19		5
608.48				
Stiff, Brown, Moist, SILTY CLAY, trace sand and gravel (CL/ML)	5	8	1.0 P	14
		18	1.5 P	15
	10	18	1.0 P	20
		14	1.5 P	16
598.48		71	4.5 P	7
Very Stiff to Hard, Brown, Moist, CLAY LOAM, with gravel (CL-S)	15	59	3.0 P	13
594.48				
End of Boring				

RWB-07

EL. 612.49

	D	N	Qu	w%
	0	13	1.5 P	10
Stiff, Brown, Moist, CLAY LOAM, with gravel (CL-S)	5	5	1.0 P	17
		14	2.0 P	16
603.99		16	2.5 B	17
Very Stiff to Hard, Brown, Moist, SILTY CLAY LOAM, trace sand and gravel (ML/CL)	10	22	4.5+ P	18
598.99		17	6.25 B	17
Hard, Gray, Moist, SILTY CLAY, trace sand and gravel (CL/ML)	15			
596.49		37	1.0 P	16
Stiff, Gray, Moist, SILTY CLAY LOAM, trace sand and gravel (ML/CL)				
593.99		30		14
Dense, Brown, Moist, SAND, trace gravel (SP)	20			
591.49		26		13
Medium Dense to Very Dense, Brown, Moist, SANDY CLAY LOAM, with gravel and cobbles (SC/SM)	25	61		9
586.49				
Hard, Gray, Moist, SILTY CLAY LOAM, with gravel (ML/CL)		41	4.5+ P	11
583.99				
Extremely Dense, Brown and Gray, Moist, SAND, with gravel (SPG)		100+		10
583.49 End of Boring				

225.00' 250.00' 275.00' 300.00' 325.00' 350.00' 375.00' 400.00' 425.00' 450.00' 475.00'

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PLOT DATE = 11/15/2021	DATE - 11/15/2021	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

IDOT AMES PTB 163-017
IL 171 & 95TH STREET
BORING LOCATION PROFILE

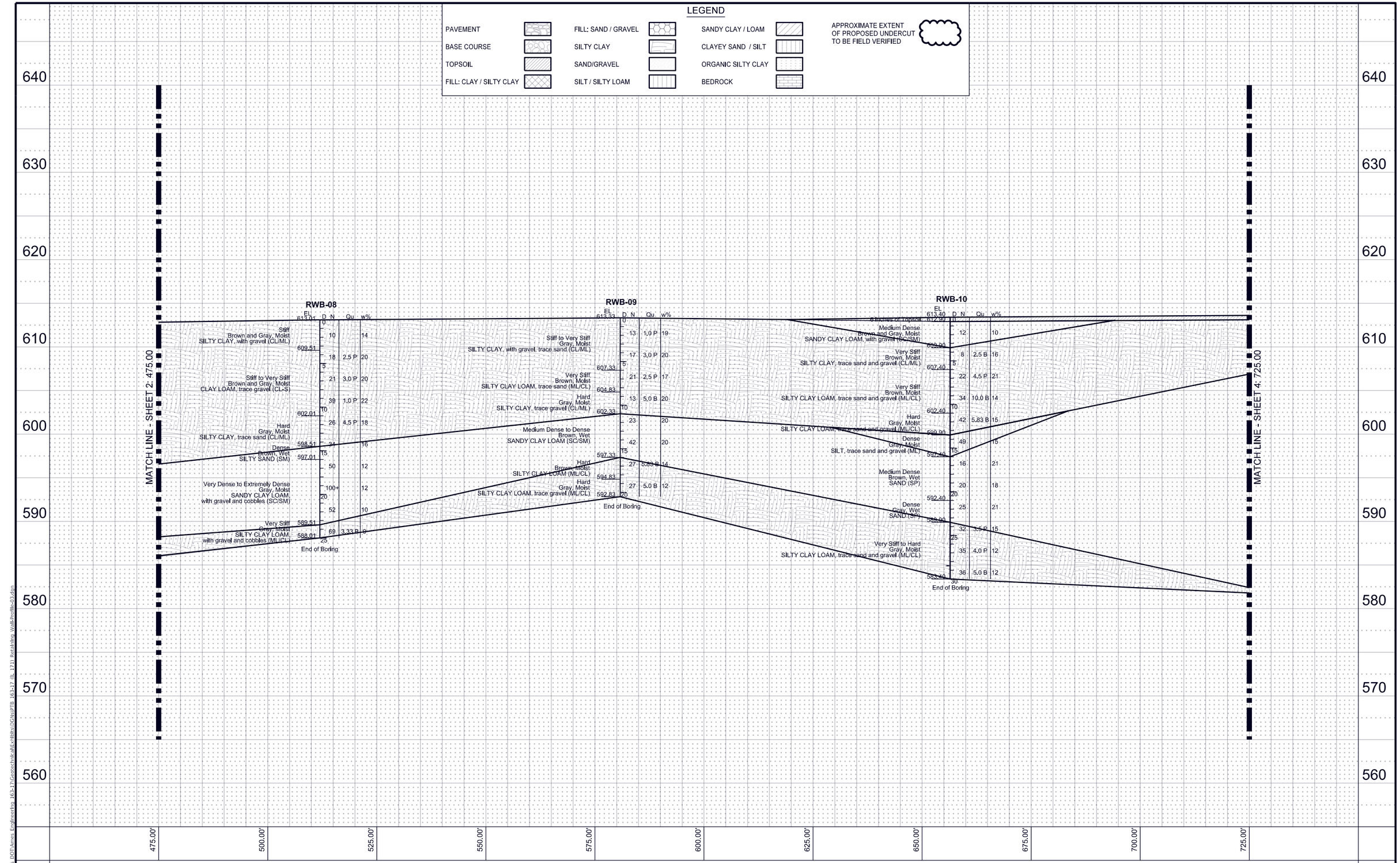
SCALE: AS NOTED | SHEET 2 OF 8 SHEETS | STA. 225.00 | TO STA. 475.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK	9	3
		CONTRACT NO. 60R94		
		ILLINOIS	FED. AID PROJECT	

LEGEND

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

APPROXIMATE EXTENT OF PROPOSED UNDERCUT TO BE FIELD VERIFIED



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PLOT DATE = 11/15/2021	DATE - 11/15/2021	REVISED -	

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

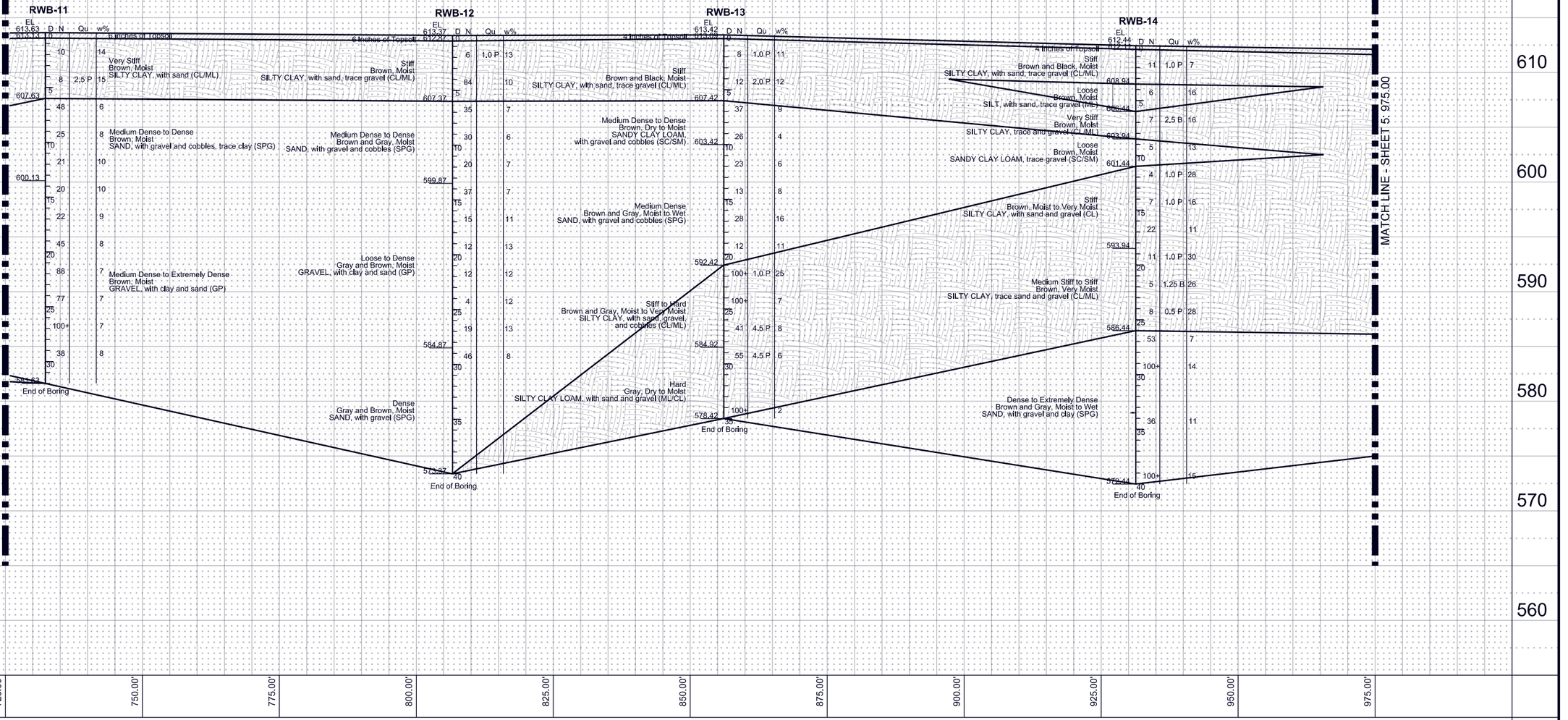
IDOT AMES PTB 163–017
IL 171 & 95TH STREET
BORING LOCATION PROFILE

SCALE: AS NOTED | SHEET 3 OF 8 SHEETS | STA. 475.00 | TO STA. 725.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK	9	4
		CONTRACT NO. 60R94		
		ILLINOIS	FED. AID PROJECT	

LEGEND

PAVEMENT	FILL: SAND / GRAVEL	SANDY CLAY / LOAM	APPROXIMATE EXTENT OF PROPOSED UNDERCUT TO BE FIELD VERIFIED
BASE COURSE	SILTY CLAY	CLAYEY SAND / SILT	
TOPSOIL	SAND/GRAVEL	ORGANIC SILTY CLAY	
FILL: CLAY / SILTY CLAY	SILT / SILTY LOAM	BEDROCK	



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	DRAWN - JS	REVISED -	
PLOT SCALE = 240.0000 ' / ft.	CHECKED - DE	REVISED -	
PLOT DATE = 11/15/2021	DATE - 11/15/2021	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

IDOT AMES PTB 163–017
IL 171 & 95TH STREET
BORING LOCATION PROFILE

SCALE: AS NOTED | SHEET 4 OF 8 SHEETS | STA. 725.00 | TO STA. 975.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK	9	5
		CONTRACT NO. 60R94		
		ILLINOIS	FED. AID PROJECT	

LEGEND

PAVEMENT	FILL: SAND / GRAVEL	SANDY CLAY / LOAM	APPROXIMATE EXTENT OF PROPOSED UNDERCUT TO BE FIELD VERIFIED
BASE COURSE	SILTY CLAY	CLAYEY SAND / SILT	
TOPSOIL	SAND/GRAVEL	ORGANIC SILTY CLAY	
FILL: CLAY / SILTY CLAY	SILT / SILTY LOAM	BEDROCK	

640 630 620 610 600 590 580 570 560

MATCH LINE - SHEET 4: 975.00

MATCH LINE - SHEET 6: 1237.50

RWB-15

EL 611.28

6 inches of Topsoil

611.28

Stiff to Hard
Brown and Gray, Moist
SILTY CLAY, with sand (CL/ML)

595.88

Soft to Stiff
Brown, Moist to Very Moist
CLAY, trace sand and gravel (CH)

585.88

Medium Dense
Brown, Moist
SAND, with gravel (SPG)

576.88

End of Boring

D	N	Qu	w%
0			
9	4.5 P		12
8	1.25 B		22
5			
4	1.0 P		17
22			13
10			
5			19
9			13
15			
10	1.25 B		38
11	0.83 B		33
20			
10	0.42 B		25
22	0.5 P		15
25			
18			11
26			8
30			
24			9
35			

RWB-16

EL 612.05

Loose
Gray, Moist
GRAVEL, with sand and clay (GP)

608.55

Medium Dense
Brown, Wet
SAND, with gravel (SPG)

606.05

Loose to Medium Dense
Brown, Moist
SILTY SAND, with gravel (SM)

593.55

Medium Stiff to Stiff
Brown, Moist
SILTY CLAY, with sand and gravel (CL/ML)

586.05

Medium Dense
Brown, Moist
SILTY SAND, with gravel (SM)

577.05

End of Boring

D	N	Qu	w%
0			
10			10
15			22
5			
13			9
8			8
10			
100+			7
26			11
15			
10			11
5	1.0 P		20
20			
7	1.0 P		21
36	0.5 P		13
25			
25			6
13			12
30			
22			12
35			

RWB-17

EL 611.54

Loose
Gray, Moist
SAND, with gravel (SPG)

608.04

Stiff
Brown, Moist
SILTY CLAY, trace sand and gravel (CL/ML)

606.54

Medium Dense to Very Dense
Brown, Dry to Moist
SILTY SAND, with gravel and cobbles (SM)

593.04

Stiff
Brown, Moist
CLAY LOAM, with gravel (CL-S)

590.54

Medium Dense to Dense
Brown, Moist
SANDY CLAY LOAM, with gravel and cobbles (SC/SM)

585.04

End of Boring

D	N	Qu	w%
0			
7			9
11	2.0 P		17
5			
56			7
26			6
10			
27			14
46			3
15			
37			7
18	2.0 P		20
20			
29			15
42			8
25			
100+			110

RWB-18

EL 611.02

Stiff
Brown, Moist
SILTY CLAY, with gravel, trace sand (CL/ML)

607.52

Medium Dense to Exremely Dense
Brown, Moist
GRAVEL, with sand and silt (GP)

588.52

End of Boring

D	N	Qu	w%
0			
9			12
33			7
5			
33			5
100+			8
10			
35			7
27			6
15			
39			6
14			8
20			
56			14

975.00' 1000.00' 1025.00' 1050.00' 1075.00' 1100.00' 1125.00' 1150.00' 1175.00' 1200.00' 1225.00'

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USER NAME = jscott	DESIGNED - TK	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	IDOT AMES PTB 163-017 IL 171 & 95TH STREET BORING LOCATION PROFILE	
	DRAWN - JS	REVISED -			
PLOT SCALE = 240.0000 ' / ft.	CHECKED - DE	REVISED -			
PLOT DATE = 11/15/2021	DATE - 11/15/2021	REVISED -		SCALE: AS NOTED SHEET 5 OF 8 SHEETS STA. 975.00 TO STA. 1237.50	

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK	9	6
		CONTRACT NO. 60R94		
	ILLINOIS FED. AID PROJECT			

LEGEND

PAVEMENT	FILL: SAND / GRAVEL	SANDY CLAY / LOAM	APPROXIMATE EXTENT OF PROPOSED UNDERCUT TO BE FIELD VERIFIED
BASE COURSE	SILTY CLAY	CLAYEY SAND / SILT	
TOPSOIL	SAND/GRAVEL	ORGANIC SILTY CLAY	
FILL: CLAY / SILTY CLAY	SILT / SILTY LOAM	BEDROCK	

MATCH LINE - SHEET 5: 1237.50

MATCH LINE - SHEET 7: 1500.00

RWB-19

EL 610.64

Loose
Gray, Moist
SILTY SAND, with gravel (SM)
607.14

Medium Dense
Brown, Wet
SAND, with gravel (SPG)
604.64

Very Dense to Exremely Dense
Brown, Dry to Moist
SILTY SAND, with gravel and cobbles (SM)
599.64

Medium Dense to Extremely Dense
Brown, Moist to Wet
SAND, with gravel and cobbles (SPG)
585.64
End of Boring

	D	N	Qu	w%
	0			
	9		14	
	26		17	
	5			
	100+		7	
	56		5	
	10			
	43		12	
	24		28	
	15			
	100+		22	
	100+		13	
	20			
	32		12	
	60			
	25			

RWB-20

EL 606.83

Concrete or Topsoil
0.67

Loose
Brown, Moist
SAND, trace gravel (SP)
606.83

Loose
Dark Brown, Moist
SILT, trace sand and gravel (ML)
605.33

Medium Dense
Light Brown, Moist
SAND, trace gravel (SP)
601.83

Dense to Very Dense
Light Brown, Dry to Moist
SAND, with gravel (SPG)
597.83

Dense to Very Dense
Light Brown, Moist
GRAVEL, with sand (GP)
590.33
End of Boring

	D	N	Qu	w%
	6		10	
	4		11	
	5			
	20		5	
	71		3	
	10			
	42		5	
	58		5	
	15			
	31		6	
	63		5	
	20			

RWB-21

EL 606.04

6 inches of Topsoil
605.54

Loose
Light Brown, Moist
SILTY SAND, trace gravel (SM)

Loose
Light Brown, Wet
SAND, trace gravel (SP)
605.04

Medium Dense to Dense
Light Brown, Moist
SILT, with sand, trace gravel (ML)
598.04

Medium Dense
Light Brown, Moist
SAND, trace gravel (SP)
594.04

Medium Dense
Brown and Gray, Very Moist
SILT, with sand, trace gravel (ML)
590.04
End of Boring

	D	N	Qu	w%
	6		10	
	7		17	
	5			
	24		17	
	38		16	
	10			
	29		9	
	29		9	
	15			
	25		25	
	27		21	
	20			

590 580 570 560

1250.00' 1275.00' 1300.00' 1325.00' 1350.00' 1375.00' 1400.00' 1425.00' 1450.00' 1475.00' 1500.00'

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PLOT SCALE = 240.0000 ' / ft.	CHECKED - DE	REVISED -
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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

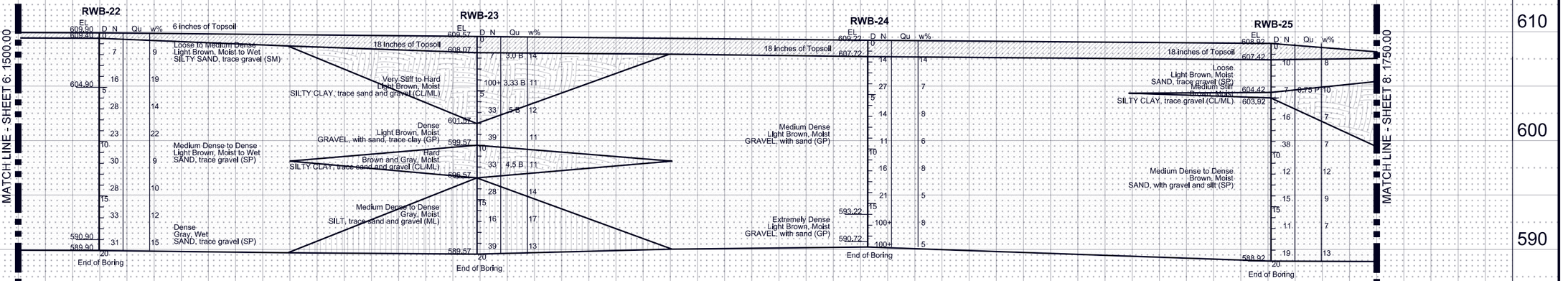
IDOT AMES PTB 163–017
IL 171 & 95TH STREET
BORING LOCATION PROFILE

SCALE: AS NOTED | SHEET 6 OF 8 SHEETS | STA. 1237.50 | TO STA. 1500.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK	9	7
		CONTRACT NO. 60R94		
		ILLINOIS	FED. AID PROJECT	

LEGEND

PAVEMENT	FILL: SAND / GRAVEL	SANDY CLAY / LOAM	APPROXIMATE EXTENT OF PROPOSED UNDERCUT TO BE FIELD VERIFIED
BASE COURSE	SILTY CLAY	CLAYEY SAND / SILT	
TOPSOIL	SAND/GRAVEL	ORGANIC SILTY CLAY	
FILL: CLAY / SILTY CLAY	SILT / SILTY LOAM	BEDROCK	



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

USER NAME = jscott	DESIGNED - TK	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	IDOT AMES PTB 163-017 IL 171 & 95TH STREET BORING LOCATION PROFILE	
	DRAWN - JS	REVISED -			
PLOT SCALE = 240.0000 ' / ft.	CHECKED - DE	REVISED -			
PLOT DATE = 11/15/2021	DATE - 11/15/2021	REVISED -		SCALE: AS NOTED | SHEET 7 OF 8 SHEETS | STA. 1500.00 TO STA. 1750.00	

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK	9	8
		CONTRACT NO. 60R94		
	ILLINOIS FED. AID PROJECT			

LEGEND

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

APPROXIMATE EXTENT OF PROPOSED UNDERCUT TO BE FIELD VERIFIED

640 630 620 610 600 590 580 570 560

MATCH LINE - SHEET 7: 1750.00

RWB-26

	EL	D	N	Qu	w%
6 inches of Asphalt	608.78				
6 Inches of Concrete	608.28				
	607.78				
			9		NR
			8	2.0 P	19
Stiff Brown, Moist SILTY CLAY, trace sand and gravel (CL/ML)		5			
			17		19
			8		20
	597.78	T0			
			9	0.83 B	43
Soft to Stiff Brown, Very Moist CLAY, trace sand and gravel (CH)			13	1.67 B	32
		15			
			7	0.25 P	39
	590.28				
Stiff Brown, Moist SILTY CLAY, trace sand and gravel (CL/ML)			29	1.5 P	15
	588.78	20			

End of Boring

RWB-27

	EL	D	N	Qu	w%
4 Inches of Topsoil	608.86				
	608.53	T0			
Stiff Brown, Moist SILTY CLAY, with sand (CL/ML)			11	2.0 P	11
	605.36				
			6	2.08 B	26
		5			
			22	2.5 P	16
Very Stiff Brown, Moist to Very Moist SILTY CLAY, trace sand and gravel (CL/ML)			41	2.0 P	16
		T0			
			18	2.5 B	19
	595.36				
			21	2.5 P	21
		15			
Very Stiff Brown, Moist SILTY CLAY LOAM, trace sand and gravel (ML/CL)			30	2.0 P	17
			32	2.5 P	8
	588.86	20			

End of Boring

1750.00' 1775.00' 1800.00' 1825.00' 1850.00' 1875.00' 1900.00' 1925.00' 1950.00' 1975.00' 2000.00'

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USER NAME = jscott		DESIGNED - TK		REVISED -	
		DRAWN - JS		REVISED -	
PLOT SCALE = 240.0000 ' / ft.		CHECKED - DE		REVISED -	
PLOT DATE = 11/15/2021		DATE - 11/15/2021		REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

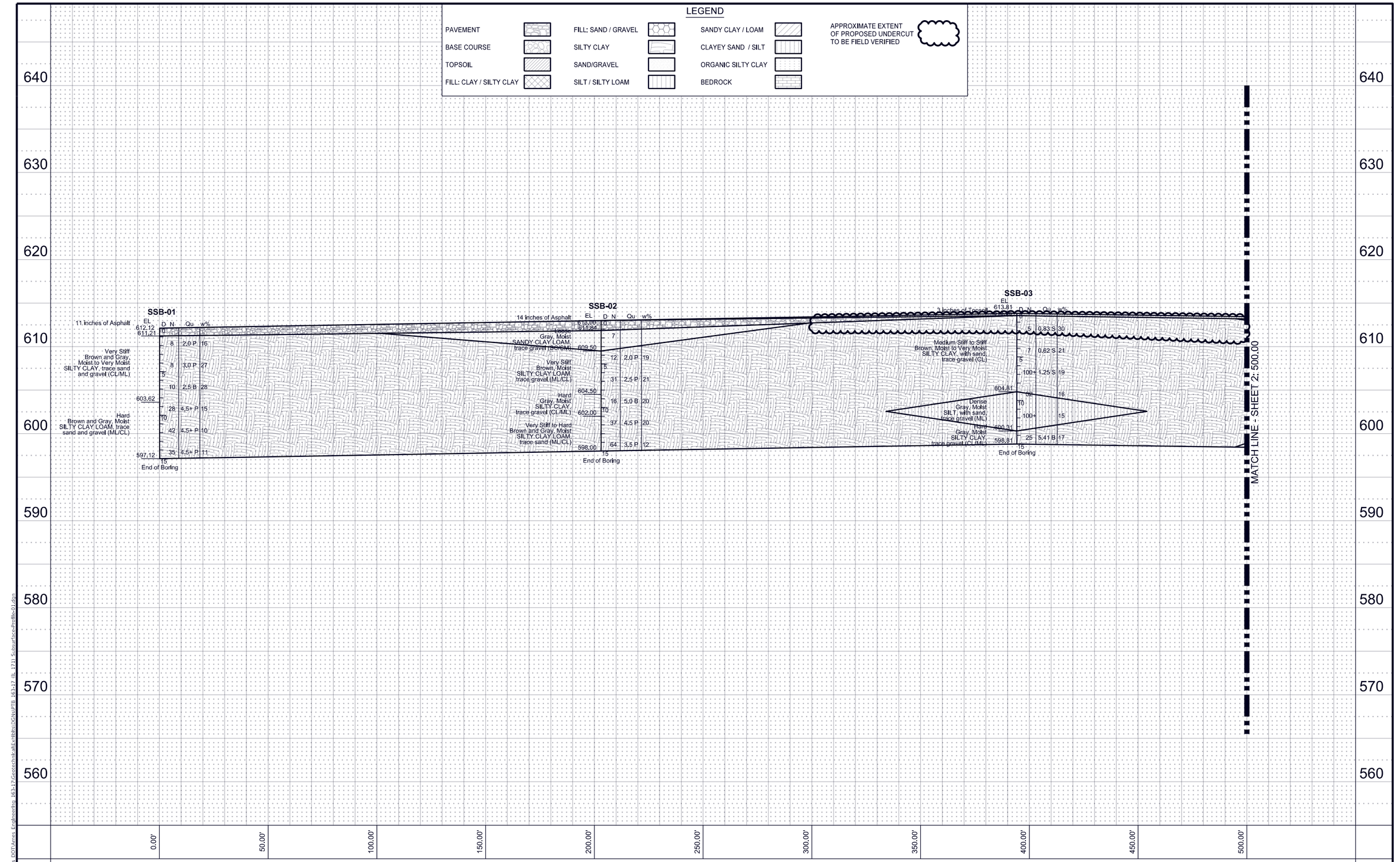
IDOT AMES PTB 163-017
IL 171 & 95TH STREET
BORING LOCATION PROFILE

SCALE: AS NOTED | SHEET 8 OF 8 SHEETS | STA. 1750.00 | TO STA. 2000

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK	9	9
		CONTRACT NO. 60R94		
	ILLINOIS FED. AID PROJECT			

LEGEND

PAVEMENT	FILL: SAND / GRAVEL	SANDY CLAY / LOAM	APPROXIMATE EXTENT OF PROPOSED UNDERCUT TO BE FIELD VERIFIED
BASE COURSE	SILTY CLAY	CLAYEY SAND / SILT	
TOPSOIL	SAND/GRAVEL	ORGANIC SILTY CLAY	
FILL: CLAY / SILTY CLAY	SILT / SILTY LOAM	BEDROCK	



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TEL: +1630.994.2600 | WWW.GSG-CONSULTANTS.COM

USER NAME = jscott	DESIGNED - TK	REVISED -	
	DRAWN - JS	REVISED -	
PLOT SCALE = 240.0000 ' / ft.	CHECKED - DE	REVISED -	
PLOT DATE = 11/22/2021	DATE - 11/15/2021	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

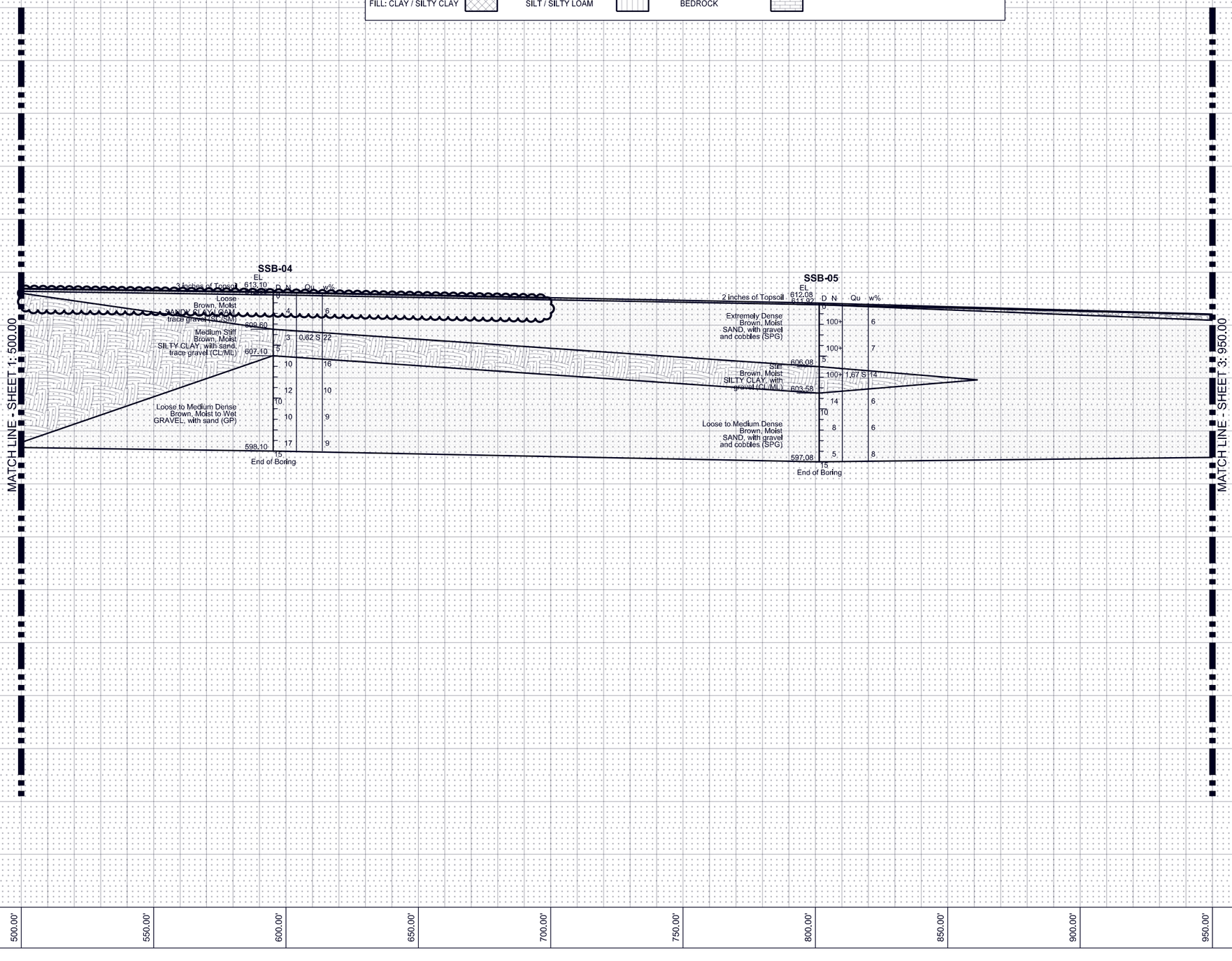
IDOT AMES PTB 163-017
IL 171 & 95TH STREET
BORING LOCATION PROFILE

SCALE: AS NOTED | SHEET 1 OF 3 SHEETS | STA. 0.00 | TO STA. 500.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK	3	1
		CONTRACT NO. 60R94		
	ILLINOIS	FED. AID PROJECT		

LEGEND

PAVEMENT	FILL: SAND / GRAVEL	SANDY CLAY / LOAM	APPROXIMATE EXTENT OF PROPOSED UNDERCUT TO BE FIELD VERIFIED
BASE COURSE	SILTY CLAY	CLAYEY SAND / SILT	
TOPSOIL	SAND/GRAVEL	ORGANIC SILTY CLAY	
FILL: CLAY / SILTY CLAY	SILT / SILTY LOAM	BEDROCK	



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USER NAME = jscott	DESIGNED - TK	REVISED -	
	DRAWN - JS	REVISED -	
PLOT SCALE = 240.0000 ' / ft.	CHECKED - DE	REVISED -	
PLOT DATE = 11/22/2021	DATE - 11/15/2021	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

IDOT AMES PTB 163-017
IL 171 & 95TH STREET
BORING LOCATION PROFILE

SCALE: AS NOTED | SHEET 2 OF 3 SHEETS | STA. 500.00 | TO STA. 950.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK	3	2
		CONTRACT NO. 60R94		
		ILLINOIS	FED. AID PROJECT	

LEGEND

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

APPROXIMATE EXTENT OF PROPOSED UNDERCUT TO BE FIELD VERIFIED

MATCH LINE - SHEET 2: 950.00

SSB-06

EL 640.66 | D | N | w%

9 inches of Asphalt 609.91 0

Medium Dense Brown and Gray, Moist GRAVEL, with sand and clay (GP) — 18 11; 29 10; 5

604.66

Dense to Extremely Dense Brown and Gray, Dry SAND, with gravel and cobbles (SPG) — 39 3; 100+ 4; 10; 100+ 5; 100+

597.66 End of Boring

SSB-07

EL 610.13 | D | N | w%

9 inches of Asphalt 609.38 0

Loose to Medium Dense Brown, Moist LOAM, trace gravel (ML-S) — 10 17; 16 12; 5; 19 11; 24 11

600.13 10 End of Boring

590 580 570 560

950.00' 1000.00' 1050.00' 1100.00' 1150.00' 1200.00' 1250.00' 1300.00'

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TEL: +630.994.2600 | WWW.GSG-CONSULTANTS.COM

USER NAME = jscott	DESIGNED - TK	REVISED -	
	DRAWN - JS	REVISED -	
PLOT SCALE = 240.0000 ' / ft.	CHECKED - DE	REVISED -	
PLOT DATE = 11/15/2021	DATE - 11/15/2021	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

IDOT AMES PTB 163-017
IL 171 & 95TH STREET
BORING LOCATION PROFILE

SCALE: AS NOTED | SHEET 3 OF 3 SHEETS | STA. 950.00 | TO STA. 1300.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK	3	3
		CONTRACT NO. 60R94		
	ILLINOIS	FED. AID PROJECT		

LEGEND

PAVEMENT	FILL: SAND / GRAVEL	SANDY CLAY / LOAM	APPROXIMATE EXTENT OF PROPOSED UNDERCUT TO BE FIELD VERIFIED
BASE COURSE	SILTY CLAY	CLAYEY SAND / SILT	
TOPSOIL	SAND/GRAVEL	ORGANIC SILTY CLAY	
FILL: CLAY / SILTY CLAY	SILT / SILTY LOAM	BEDROCK	

690 680 670 660 650 640 630 620 610

EXISTING GROUND SURFACE ALONG 95th STREET

SGB-02

	EL.	D	N	Qu	w%
12 inches of Asphalt	662.00	0			
9 inches of Concrete	661.00		16	1.5 P	13
Stiff to Very Stiff Gray, Moist SILTY CLAY (CL/ML)	660.25	5	12	2.5 P	12
	656.00		37	3.0 P	10
Very Stiff Gray, Moist SILTY CLAY LOAM, trace sand and gravel (ML/CL)	652.00	10	39	3.5 P	6
End of Boring					

SGB-01

	EL.	D	N	Qu	w%
3 inches of Topsoil	637.56	0			
	637.31		8/1"		10
Medium Dense to Dense Brown, Moist SANDY CLAY LOAM, with gravel (SC/SM)		5	19		12
	631.56		23		13
Medium Dense Gray, Moist SILT, with gravel (ML)			21		12
	626.56	10	13		15
Medium Dense Brown and Gray, Moist SILT, with gravel (ML)					
Hard Brown, Moist SILTY CLAY, with gravel, trace sand (CL/ML)	624.06		24	4.17 B	16
	622.56	15			
End of Boring					

MATCH LINE - SHEET 2: 400.00

0.00' 50.00' 100.00' 150.00' 200.00' 250.00' 300.00' 350.00' 400.00'

MODEL: Default
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USER NAME = jscott	DESIGNED - TK	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	IDOT AMES PTB 163-017 IL 171 & 95TH STREET BORING LOCATION PROFILE
	DRAWN - JS	REVISED -		
PLOT SCALE = 240.0000 ' / ft.	CHECKED - DE	REVISED -		
PLOT DATE = 11/15/2021	DATE - 11/15/2021	REVISED -		SCALE: AS NOTED SHEET 1 OF 2 SHEETS STA. 0.00 TO STA. 400.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK	2	1
		CONTRACT NO. 60R94		
		ILLINOIS FED. AID PROJECT		

LEGEND

PAVEMENT	FILL: SAND / GRAVEL	SANDY CLAY / LOAM	APPROXIMATE EXTENT OF PROPOSED UNDERCUT TO BE FIELD VERIFIED
BASE COURSE	SILTY CLAY	CLAYEY SAND / SILT	
TOPSOIL	SAND/GRAVEL	ORGANIC SILTY CLAY	
FILL: CLAY / SILTY CLAY	SILT / SILTY LOAM	BEDROCK	

690 680 670 660 650 640 630 620 610

MATCH LINE - SHEET 1: 400.00

EXISTING GROUND SURFACE ALONG 95th STREET

SGB-03

	EL	D	N	Qu	w%
13 inches of Asphalt	672.00	0			
8 inches of Concrete	671.92				
	670.25		9	2.5 P	10
Very Stiff Brown and Gray, Moist SILTY CLAY, trace sand and gravel (CL/ML)		5	24	2.0 P	13
			20	3.0 P	12
	662.00	10	23	3.0 P	12
End of Boring					

400.00' 450.00' 500.00' 550.00' 600.00' 650.00'

MODEL: Default
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GSG CONSULTANTS, INC.
735 E. REMINGTON RD, SCHAUMBURG, IL 60173
TEL: +630.994.2600 | WWW.GSG-CONSULTANTS.COM

USER NAME = jscott	DESIGNED - TK	REVISED -
	DRAWN - JS	REVISED -
PLOT SCALE = 240.0000 ' / ft.	CHECKED - DE	REVISED -
PLOT DATE = 11/15/2021	DATE - 11/15/2021	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

IDOT AMES PTB 163-017
IL 171 & 95TH STREET
BORING LOCATION PROFILE

SCALE: AS NOTED | SHEET 2 OF 2 SHEETS | STA. 400.00 | TO STA. 650.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		COOK	2	2
		CONTRACT NO. 60R94		
		ILLINOIS	FED. AID PROJECT	

APPENDIX C

SOIL BORING LOGS

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

SOIL BORING LOG

Date 6/17/21

ROUTE 95th Street **DESCRIPTION** Retaining Wall Boring **LOGGED BY** JB

SECTION IL 171 & 95th Street **LOCATION** IL 171, **SEC.** 22, **TWP.** 37N, **RNG.** 12E,
Latitude 41.7161228, **Longitude** -87.900791

COUNTY COOK **DRILLING RIG** Diedrich D-50 **HAMMER TYPE** AUTO
DRILLING METHOD HSA **HAMMER EFF (%)** 92

STRUCT. NO. SN 016-2310
Station Sta. 317+80.13 to 333+27.91

BORING NO. RWB-01
Station 316+1.26
Offset 43.32ft RT
Ground Surface Elev. 611.64 ft

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

Groundwater Elev.:
First Encounter 603.1 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 611.39				
Loose Brown, Moist SAND, with gravel (SPG)		8		
		5 3		6
608.14				
Stiff Brown, Moist SILTY CLAY, with gravel (CL/ML)		3		
	-5	3 4	2.0 P	15
605.64				
Loose Brown, Moist GRAVEL, with sand and clay (GP)		6		
		5 4		13
603.14 ▼				
Dense Brown, Moist SILT, with sand, trace gravel (ML)		11		
		13/1"		20
	-10			
600.64				
Dense Brown, Moist GRAVEL, with clay and sand (GP)		11		
		15/4"		9
598.14				
Dense Gray, Dry to Moist GRAVEL, with clay and sand (GP)		13		
		13/3"		5
	-15			
		16/5"		
				9
		15		
		16 18		9
591.64	-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 6/17/21

ROUTE 95th Street **DESCRIPTION** Retaining Wall Boring **LOGGED BY** JB

SECTION IL 171 & 95th Street **LOCATION** IL 171, **SEC.** 22, **TWP.** 37N, **RNG.** 12E,
Latitude 41.7161942, **Longitude** -87.900502

COUNTY COOK **DRILLING RIG** Diedrich D-50 **HAMMER TYPE** AUTO
DRILLING METHOD HSA **HAMMER EFF (%)** 92

STRUCT. NO. SN 016-2310
Station Sta. 317+80.13 to 333+27.91

BORING NO. RWB-02
Station 316+84.34
Offset 43.02ft RT
Ground Surface Elev. 611.53 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
611.28				3 inches of Topsoil
	6			Loose Brown, Moist SAND, with gravel (SPG)
	3 3		8	
608.03	5			Stiff Brown, Moist SILTY CLAY, trace sand and gravel (CL/ML)
-5	8 7	1.3 B	12	
	2			
	3 5	1.5 B	17	
603.03	7			Medium Dense Brown, Moist SILT, trace sand and gravel (ML)
-10	8 6		17	
600.53	13			Medium Dense to Dense Brown, Moist GRAVEL, with sand and clay (GP)
	13 6/2"		10	
	11			
-15	6 6		12	
	16/2"			
			9	
593.03	18			Dense Gray, Moist SILT, with gravel, trace sand (ML)
591.53 -20	9/1"		7	

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 6/17/21

ROUTE 95th Street **DESCRIPTION** Retaining Wall Boring **LOGGED BY** JB

SECTION IL 171 & 95th Street **LOCATION** IL 171, **SEC.** 22, **TWP.** 37N, **RNG.** 12E,
Latitude 41.7162446, **Longitude** -87.9002941

COUNTY COOK **DRILLING RIG** Diedrich D-50 **HAMMER TYPE** AUTO
DRILLING METHOD HSA **HAMMER EFF (%)** 92

STRUCT. NO. SN 016-2310
Station Sta. 317+80.13 to 333+27.91

BORING NO. RWB-03
Station 317+44.00
Offset 43.11ft RT
Ground Surface Elev. 611.97 ft

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

Groundwater Elev.:
First Encounter 601.0 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 611.72
	4			Loose Brown, Moist SAND, trace gravel (SP)
	4 3		6	
				608.47
	4			Stiff to Very Stiff Brown, Moist
	5 5	1.9 B	21	SILTY CLAY, trace sand and gravel (CL/ML)
-5				
	13/4"			Little recovery at 6-7.5 feet
		3.0 P		
	12			
	12 10	2.5 P	18	
-10				
▼	8			
	11 9/2"	1.0 P	21	
				598.47
	18			Dense Brown, Moist
	28 9/1"		8	SAND, with gravel, trace clay (SPG)
-15				
				595.97
	6			Dense Gray, Moist
	20 6/1"		8	SILT, with sand and gravel (ML)
	23			
	25 6/1"		8	
591.97 -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 6/17/21

ROUTE 95th Street **DESCRIPTION** Retaining Wall Boring **LOGGED BY** EH

SECTION IL 171 & 95th Street **LOCATION** IL 171, **SEC.** 22, **TWP.** 37N, **RNG.** 12E,
Latitude 41.7163001, **Longitude** -87.900071

COUNTY COOK **DRILLING RIG** Diedrich D-50 **HAMMER TYPE** AUTO
DRILLING METHOD HSA **HAMMER EFF (%)** 92

STRUCT. NO. SN 016-2310
Station Sta. 317+80.13 to 333+27.91

BORING NO. RWB-04
Station 318+8.19
Offset 42.74ft RT
Ground Surface Elev. 611.96 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 (%)
6 inches of Topsoil 611.46				
Loose Gray, Moist SANDY CLAY LOAM, with gravel (SC/SM)		3 2 5		9
608.46		1		
Stiff Brown, Moist to Very Moist SILTY CLAY, trace sand and gravel (CL-ML)	-5	2 2	1.3 B	27
		3		
		5 7	1.3 B	17
603.46		9		
Stiff to Hard Brown, Moist SILTY CLAY, with gravel and cobbles (CL/ML)	-10	16 25	4.0 P	16
		8		
		15 23	1.5 P	9
Auger refusal at 14 feet 597.96		50/3"		9
End of Boring	-15			
	-20			

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

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

SOIL BORING LOG

Date 6/17/21

ROUTE 95th Street **DESCRIPTION** Retaining Wall Boring **LOGGED BY** EH

SECTION IL 171 & 95th Street **LOCATION** IL 171, **SEC.** 22, **TWP.** 37N, **RNG.** 12E,
Latitude 41.7163728, **Longitude** -87.8998225

COUNTY COOK **DRILLING RIG** Diedrich D-50 **HAMMER TYPE** AUTO
DRILLING METHOD HSA **HAMMER EFF (%)** 92

STRUCT. NO. SN 016-2310
Station Sta. 317+80.13 to 333+27.91

BORING NO. RWB-05
Station 318+80.90
Offset 38.55ft RT
Ground Surface Elev. 612.42 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 (%)
Medium Dense Gray, Moist SANDY CLAY LOAM, with gravel (SC/SM)		7		
		5 9		7
608.92		3		
Stiff Gray and Brown, Moist SILTY CLAY, with sand and gravel (CL/ML)		3 4	1.0 P	20
	-5			
606.42		5		
Stiff to Hard Brown, Moist SILTY CLAY LOAM, trace sand and gravel (ML/CL)		8 11	2.5 P	15
		5		
		8 10	1.5 P	18
	-10			
		7		
		13 14	4.5 P	15
598.92		12		
Stiff to Very Stiff Brown, Dry to Moist CLAY LOAM, with gravel and cobbles (CL-S)		48 37	3.0 P	11
	-15			
		11		
		50/5"	1.0 P	12
593.42		50/4"		5
Split-spoon refusal at 19 feet				
End of Boring	-20			

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

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

SOIL BORING LOG

Date 6/16/21

ROUTE 95th Street **DESCRIPTION** Retaining Wall Boring **LOGGED BY** EH

SECTION IL 171 & 95th Street **LOCATION** IL 171, **SEC.** 22, **TWP.** 37N, **RNG.** 12E,
Latitude 41.7164652, **Longitude** -87.8995463

COUNTY COOK **DRILLING RIG** Diedrich D-50 **HAMMER TYPE** AUTO
DRILLING METHOD HSA **HAMMER EFF (%)** 92

STRUCT. NO. SN 016-2310
Station Sta. 317+80.13 to 333+27.91

BORING NO. RWB-06
Station 319+63.02
Offset 29.88ft RT
Ground Surface Elev. 611.98 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
	7			Medium Dense Gray, Moist SILTY SAND, with gravel (SM)
	9 10		5	
	3			608.48 Stiff Brown, Moist SILTY CLAY, trace sand and gravel (CL/ML)
-5	4 4	1.0 P	14	
	7			
	10 8	1.5 P	15	
	4			
-10	5 13	1.0 P	20	
	7			
	7 7	1.5 P	16	
	8			598.48 Very Stiff to Hard Brown, Moist CLAY LOAM, with gravel (CL-S)
-15	42 29	4.5 P	7	
	6			
	17 42	3.0 P	13	
				594.48 Auger refusal at 17.5 feet End of Boring
-20				

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

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

SOIL BORING LOG

Date 6/16/21

ROUTE 95th Street **DESCRIPTION** Retaining Wall Boring **LOGGED BY** EH

SECTION IL 171 & 95th Street **LOCATION** IL 171, **SEC.** 22, **TWP.** 37N, **RNG.** 12E,
Latitude 41.716522, **Longitude** -87.8993169

COUNTY COOK **DRILLING RIG** Diedrich D-50 **HAMMER TYPE** AUTO
DRILLING METHOD HSA **HAMMER EFF (%)** 92

STRUCT. NO. SN 016-2310
Station Sta. 317+80.13 to 333+27.91

BORING NO. RWB-07
Station 320+28.98
Offset 29.59ft RT
Ground Surface Elev. 612.49 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
				Stiff Brown, Moist CLAY LOAM, with gravel (CL-S)
	6			
	7 6	1.5 P	10	
	2			
-5	2 3	1.0 P	17	
	5			
	7 7	2.0 P	16	
603.99				
	4			Very Stiff to Hard Brown, Moist SILTY CLAY LOAM, trace sand and gravel (ML/CL)
-10	7 9	2.5 B	17	
	6			
	10 12	4.5 P	18	
598.99				
	4			Hard Gray, Moist SILTY CLAY, trace sand and gravel (CL/ML)
-15	7 10	6.3 B	17	
596.49				
	12			Stiff Gray, Moist SILTY CLAY LOAM, trace sand and gravel (ML/CL)
	19 18	1.0 P	16	
593.99				
	14			Dense Brown, Moist SAND, trace gravel (SP)
-20	15 15		14	
591.49				
	12			Medium Dense to Very Dense Brown, Moist SANDY CLAY LOAM, with gravel and cobbles (SC/SM)
	13 13		13	
	12			
-25	33 28		9	
586.49				
	10			Hard Gray, Moist SILTY CLAY LOAM, with gravel (ML/CL)
	15 26	4.5 P	11	
583.99				
583.49	50/6"		10	Extremely Dense Brown and Gray, Moist SAND, with gravel (SPG) Split-spoon refusal at 29 feet
-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 6/9/21

ROUTE 95th Street **DESCRIPTION** Retaining Wall Boring **LOGGED BY** EH

SECTION IL 171 & 95th Street **LOCATION** IL 171, **SEC.** 22, **TWP.** 37N, **RNG.** 12E,
Latitude 41.7165766, **Longitude** -87.8990195

COUNTY COOK **DRILLING RIG** Diedrich D-50 **HAMMER TYPE** AUTO
DRILLING METHOD HSA **HAMMER EFF (%)** 92

STRUCT. NO. SN 016-2310
Station Sta. 317+80.13 to 333+27.91

BORING NO. RWB-08
Station 321+11.99
Offset 36.09ft RT
Ground Surface Elev. 613.01 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 (%)	Material Description
	9			Stiff Brown and Gray, Moist SILTY CLAY, with gravel (CL/ML)
	6 4		14	
609.51				
	4			Stiff to Very Stiff Brown and Gray, Moist CLAY LOAM, trace gravel (CL-S)
	8 10	2.5 P	20	
-5				
	5			
	10 11	3.0 P	20	
	28			
	18 21	1.0 P	22	
-10				
602.01				
	15			Hard Gray, Moist SILTY CLAY, trace sand (CL/ML)
	14 12	4.5 P	18	
	10			
	16 18		16	
598.51				
-15				Dense Brown, Wet SILTY SAND (SM)
597.01				
	12			Very Dense to Extremely Dense Gray, Moist SANDY CLAY LOAM, with gravel and cobbles (SC/SM)
	20 30		12	
	30			
	50/2"		12	
-20				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material Description
	27			Very Dense to Extremely Dense Gray, Moist SANDY CLAY LOAM, with gravel and cobbles (SC/SM) *(continued)*
	24 28		10	
589.51				
	14			Very Stiff Gray, Moist SILTY CLAY LOAM, with gravel and cobbles (ML/CL)
	34 35	3.3 B	9	
588.01 -25				
				End of Boring
-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 6/9/21

ROUTE 95th Street **DESCRIPTION** Retaining Wall Boring **LOGGED BY** EH

SECTION IL 171 & 95th Street **LOCATION** IL 171, **SEC.** 22, **TWP.** 37N, **RNG.** 12E,
Latitude 41.7166294, **Longitude** -87.8987774

COUNTY COOK **DRILLING RIG** Diedrich D-50 **HAMMER TYPE** AUTO
DRILLING METHOD HSA **HAMMER EFF (%)** 92

STRUCT. NO. SN 016-2310
Station Sta. 317+80.13 to 333+27.91

BORING NO. RWB-09
Station 321+80.29
Offset 39.38ft RT
Ground Surface Elev. 613.33 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
				Stiff to Very Stiff Gray, Moist SILTY CLAY, with gravel, trace sand (CL/ML)
	8			
	7 6	1.0 P	19	
	6			
	7 10	3.0 P	20	
-5				
607.33				
	6			Very Stiff Brown, Moist SILTY CLAY LOAM, trace sand (ML/CL)
	9 12	2.5 P	17	
604.83				
	3			Hard Gray, Moist SILTY CLAY, trace gravel (CL/ML)
	5 8	5.0 B	20	
-10				
602.33				
	6			Medium Dense to Dense Brown, Wet SANDY CLAY LOAM (SC/SM)
	10 13		20	
	4			
	10 32		20	Cobbles at 13.5-15 feet
-15				
597.33				
	13			Hard Brown, Moist SILTY CLAY LOAM (ML/CL)
	11 16	5.8 B	14	
594.83				
	10			
	13 14	5.0 B	12	
-20				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
592.83				Hard Gray, Moist SILTY CLAY LOAM, trace gravel (ML/CL) *(continued)* Auger refusal at 20.5 feet 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 6/16/21

ROUTE 95th Street **DESCRIPTION** Retaining Wall Boring **LOGGED BY** EH

SECTION IL 171 & 95th Street **LOCATION** IL 171, **SEC.** 22, **TWP.** 37N, **RNG.** 12E,
Latitude 41.7166919, **Longitude** -87.8985132

COUNTY COOK **DRILLING RIG** Diedrich D-50 **HAMMER TYPE** AUTO
DRILLING METHOD HSA **HAMMER EFF (%)** 92

STRUCT. NO. SN 016-2310
Station Sta. 317+80.13 to 333+27.91

BORING NO. RWB-10
Station 322+42.24
Offset 42.24ft RT
Ground Surface Elev. 613.40 ft

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

Groundwater Elev.:
First Encounter 584.9 ft ▼
Upon Completion N/A ft
After N/A **Hrs.** N/A ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
612.90				6 inches of Topsoil
	5			Medium Dense Brown and Gray, Moist SANDY CLAY LOAM, with gravel (SC/SM)
	6 6		10	
609.90				
	2			Very Stiff Brown, Moist SILTY CLAY, trace sand and gravel (CL/ML)
	4 4	2.5 B	16	
-5				
607.40				
	5			Hard to Very Hard Brown, Moist SILTY CLAY LOAM, trace sand and gravel (ML/CL)
	9 13	4.5 P	21	
	6			
	12 22	10.0 B	14	
-10				
602.40				
	9			Hard Gray, Moist SILTY CLAY LOAM, trace sand and gravel (ML/CL)
	17 25	5.8 B	15	
599.90				
	12			Dense Gray, Moist SILT, trace sand and gravel (ML)
	21 28		15	
-15				
597.40				
	6			Medium Dense Brown, Wet SAND (SP)
	8 8		21	
	8			
	8 12		18	
-20				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
592.40				
	8			Dense Gray, Wet SAND (SP)
	10 15		21	
589.90				
	7			Very Stiff to Hard Gray, Moist SILTY CLAY LOAM, trace sand and gravel (ML/CL)
	8 24	3.5 P	15	
-25				
	12			
	16 19	4.0 P	12	
▼				
	8			
	13 23	5.0 B	12	
583.40 -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 6/15/21

ROUTE 95th Street **DESCRIPTION** Retaining Wall Boring **LOGGED BY** EH

SECTION IL 171 & 95th Street **LOCATION** IL 171, **SEC.** 22, **TWP.** 37N, **RNG.** 12E,
Latitude 41.7167659, **Longitude** -87.8982534

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

STRUCT. NO. SN 016-2310
Station Sta. 317+80.13 to 333+27.91

BORING NO. RWB-11
Station 323+30.65
Offset 41.78ft RT
Ground Surface Elev. 613.63 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 Topsoil 613.13
	9			Very Stiff Brown, Moist SILTY CLAY, with sand (CL/ML)
	5 5		14	
	3			
	3 5	2.5 P	15	
-5				607.63
	11			Medium Dense to Dense Brown, Moist SAND, with gravel and cobbles, trace clay (SPG)
	24 24		6	
	10			
	14 11		8	
-10				
	8			
	10 11		10	
	9			600.13 Medium Dense to Extremely Dense Brown, Moist GRAVEL, with clay and sand (GP)
	11 9		10	
-15				
	13			
	12 10		9	
	16			
	23 22		8	
-20				
	16			Medium Dense to Extremely Dense Brown, Moist GRAVEL, with clay and sand (GP) *(continued)*
	42 46		7	
	15			
	43 34		7	
-25				
	21			
	50/5"		7	
	19			
	25 13		8	
-30				
				Auger refusal at 32 feet 581.63
				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 6/21/21

ROUTE 95th Street **DESCRIPTION** Retaining Wall Boring **LOGGED BY** EH

SECTION IL 171 & 95th Street **LOCATION** IL 171, **SEC.** 22, **TWP.** 37N, **RNG.** 12E,
Latitude 41.7168446, **Longitude** -87.8980023

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

STRUCT. NO. SN 016-2310
Station Sta. 317+80.13 to 333+27.91

BORING NO. RWB-12
Station 324+4.38
Offset 39.86ft RT
Ground Surface Elev. 613.37 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 Topsoil 612.87
	4			Stiff Brown, Moist SILTY CLAY, with sand, trace gravel (CL/ML)
	3 3	1.0 P	13	
	42			Cobbles at 3.5-5 feet
	46 38		10	
-5				
				607.37
	17			Medium Dense to Dense Brown and Gray, Moist SAND, with gravel and cobbles (SPG)
	17 18		7	
	17			
	18 12		6	
-10				
	10			
	11 9		7	
				599.87
	10			Loose to Dense Gray and Brown, Moist GRAVEL, with clay and sand (GP)
	28 9		7	
-15				
	6			
	7 8		11	
	2			
	6 6		13	
-20				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
	6			Loose to Dense Gray and Brown, Moist GRAVEL, with clay and sand (GP) *(continued)*
	6 6		12	
	2			
	3 1		12	
-25				
	4			
	6 13		13	
				584.87
	15			Dense Gray and Brown, Moist SAND, with gravel (SPG)
	22 24		8	
-30				
-35				Blind drill from 32 to 40 feet. Auger refusal at 32 feet on 06/12/2021. Attempted rock core on 06/21/2021, was able to blind drill to full depth of 40 feet.
				573.37
-40				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 6/14/21

ROUTE 95th Street **DESCRIPTION** Retaining Wall Boring **LOGGED BY** EH

SECTION IL 171 & 95th Street **LOCATION** IL 171, **SEC.** 22, **TWP.** 37N, **RNG.** 12E,
Latitude 41.7168983, **Longitude** -87.8978358

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

STRUCT. NO. SN 016-2310
Station Sta. 317+80.13 to 333+27.91

BORING NO. RWB-13
Station 324+53.54
Offset 38.61ft RT
Ground Surface Elev. 613.42 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
0				4 inches of Topsoil 613.09
	5			Stiff Brown and Black, Moist SILTY CLAY, with sand, trace gravel (CL/ML)
	2 6	1.0 P	11	
	4			
-5	6 6	2.0 P	12	
	12			607.42 Medium Dense to Dense Brown, Dry to Moist SANDY CLAY LOAM, with gravel and cobbles (SC/SM)
	17 20		9	
	18			
-10	16 10		4	603.42 Medium Dense Brown and Gray, Moist to Wet SAND, with gravel and cobbles (SPG)
	6			
	9 14		6	
	6			
-15	6 7		8	
	14			
	10 18		16	
	8			
-20	7 5		11	
				592.42
	2			Stiff to Hard Brown and Gray, Moist to Very Moist SILTY CLAY, with sand, gravel, and cobbles (CL/ML)
	3 50/5"	1.0 P	25	
	50/4"			
-25			7	
	20			
	15 26	4.5 P	8	
	12			584.92 Hard Gray, Dry to Moist SILTY CLAY LOAM, with sand and gravel (ML/CL)
-30	23 32	4.5 P	6	
	50/3"			
-35			2	Auger refusal at 35 feet 578.42
				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 6/14/21

ROUTE 95th Street **DESCRIPTION** Retaining Wall Boring **LOGGED BY** EH

SECTION IL 171 & 95th Street **LOCATION** IL 171, **SEC.** 22, **TWP.** 37N, **RNG.** 12E,
Latitude 41.7169819, **Longitude** -87.8975839

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

STRUCT. NO. SN 016-2310
Station Sta. 317+80.13 to 333+27.91

BORING NO. RWB-14
Station 325+28.22
Offset 36.74ft RT
Ground Surface Elev. 612.44 ft

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

Groundwater Elev.:
First Encounter 578.9 ft ▼
Upon Completion N/A ft
After N/A **Hrs.** N/A ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				4 inches of Topsoil 612.11
	5			Stiff Brown and Black, Moist SILTY CLAY, with sand, trace gravel (CL/ML)
	4 7	1.0 P	7	
				608.94
	2			Loose Brown, Moist SILT, with sand, trace gravel (ML)
-5	2 4		16	
				606.44
	2			Very Stiff Brown, Moist SILTY CLAY, trace and gravel (CL/ML)
	2 5	2.5 B	16	
				603.94
	4			Loose Brown, Moist SANDY CLAY LOAM, trace gravel (SC/SM)
	3		13	
-10	2			
				601.44
	1			Stiff Brown, Moist to Very Moist SILTY CLAY, with sand and gravel (CL)
	1 3	1.0 P	28	
	5			
	5	1.0	16	
-15	2	P		
	4			Cobbles at 16-17.5 feet
	3 19		11	
				593.94
	1			
	5	1.0	30	
-20	6	P		

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
	2			Medium Stiff to Stiff Brown, Very Moist SILTY CLAY, trace sand and gravel (CL/ML) *(continued)*
	3 2	1.3 B	26	
	3			
-25	3 5	0.5 P	28	
				586.44
	35			Dense to Extremely Dense Brown and Gray, Moist to Wet SAND, with gravel and clay (SPG)
	23 30		7	
	19			
	50/5"		14	
-30				
▼	11			
	24		11	
-35	12			
	50/3"			
			15	
-40				

572.44

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 6/10/21

ROUTE 95th Street **DESCRIPTION** Retaining Wall Boring **LOGGED BY** EH

SECTION IL 171 & 95th Street **LOCATION** IL 171, **SEC.** 22, **TWP.** 37N, **RNG.** 12E,
Latitude 41.7170697, **Longitude** -87.897332

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

STRUCT. NO. SN 016-2310
Station Sta. 317+80.13 to 333+27.91

BORING NO. RWB-15
Station 326+3.57
Offset 34.52ft RT
Ground Surface Elev. 611.88 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 Topsoil 611.28
	5			Stiff to Hard Brown and Gray, Moist SILTY CLAY, with sand (CL/ML)
	4 5	4.5 P	12	
	2			
-5	2 6	1.3 B	22	
	3			
	2 2	1.0 P	17	
	9			Cobbles at 8.5-10 feet
-10	17 5		13	
	2			Cobbles at 11-12.5 feet
	3 2		19	
	10			Cobbles at 13.5-15 feet
-15	4 5		13	
				595.88
	2			Soft to Stiff Brown, Moist to Very Moist CLAY, trace sand and gravel (CH)
	5 5	1.3 B	38	
	6			
-20	4 7	0.8 B	33	
	WOH			Soft to Stiff Brown, Moist to Very Moist CLAY, trace sand and gravel (CH) *(continued)*
	1 9	0.4 B	25	
	3			Cobbles at 23.5-25 feet
-25	12 10	0.5 P	15	
				585.88
	5			Medium Dense Brown, Moist SAND, with gravel (SPG)
	6 12		11	
	28			
-30	16 10		8	
	13			
-35	10 14		9	
				576.88
				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 6/9/21

ROUTE 95th Street **DESCRIPTION** Retaining Wall Boring **LOGGED BY** EH

SECTION IL 171 & 95th Street **LOCATION** IL 171, **SEC.** 22, **TWP.** 37N, **RNG.** 12E,
Latitude 41.717145, **Longitude** -87.8970883

COUNTY COOK **DRILLING RIG** Diedrich D-50 **HAMMER TYPE** AUTO
DRILLING METHOD HSA **HAMMER EFF (%)** 92

STRUCT. NO. SN 016-2310
Station Sta. 317+80.13 to 333+27.91

BORING NO. RWB-16
Station 326+75.53
Offset 36.03ft RT
Ground Surface Elev. 612.05 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
				Loose Gray, Moist GRAVEL, with sand and clay (GP)
	4			
	5		10	
	5			
608.55				
	7			Medium Dense Brown, Wet SAND, with gravel (SPG)
	9		22	
-5	6			
606.05				
	6			Loose to Medium Dense Brown, Moist SILTY SAND, with gravel (SM)
	5		9	
	8			
	5			
	4		8	
-10	4			
	50/4"			Cobbles at 11-12.5
			7	
	6			
	13		11	
-15	13			
	5			Cobbles at 16-17.5
	5		11	
	5			
593.55				
	1			
	2	1.0	20	
-20	3	P		

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				Medium Stiff to Stiff Brown, Moist SILTY CLAY, with sand and gravel (CL/ML) *(continued)*
	2			
	3	1.0	21	
	4	P		
	15			Cobbles at 23.5-25 feet
	21	0.5	13	
-25	15	P		
586.05				
	10			Medium Dense Brown, Moist SILTY SAND, with gravel (SM)
	12		6	
	13			
	6			
	5		12	
-30	8			
	6			
	10		12	
577.05 -35	12			
				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 6/9/21

ROUTE 95th Street **DESCRIPTION** Retaining Wall Boring **LOGGED BY** EH

SECTION IL 171 & 95th Street **LOCATION** IL 171, **SEC.** 22, **TWP.** 37N, **RNG.** 12E,
Latitude 41.7172191, **Longitude** -87.8968837

COUNTY COOK **DRILLING RIG** Diedrich D-50 **HAMMER TYPE** AUTO
DRILLING METHOD HSA **HAMMER EFF (%)** 92

STRUCT. NO. SN 016-2310
Station Sta. 317+80.13 to 333+27.91

BORING NO. RWB-17
Station 327+37.52
Offset 33.68ft RT
Ground Surface Elev. 611.54 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 (%)	Description
				Loose Gray, Moist SAND, with gravel (SPG)
	4			
	4		9	
	3			
				608.04
	3			Stiff Brown, Moist SILTY CLAY, trace sand and gravel (CL/ML)
	3	2.0	17	
-5	8	P		
				605.54
	10			Medium Dense to Very Dense Brown, Dry to Moist SILTY SAND, with gravel and cobbles (SM) Boulder at 6-7.5 feet
	26		7	
	30			
	9			
	13		6	
-10	13			
	8			
	9		14	
	18			
	24			
	23		3	
-15	23			
	16			
	15		7	
	22			
				593.04
	1			Stiff Brown, Moist CLAY LOAM, with gravel (CL-S)
	3	2.0	20	
-20	15	P		
				590.54
	8			Medium Dense to Dense Brown, Moist SANDY CLAY LOAM, with gravel and cobbles (SC/SM)
	13		15	
	16			
	13			
	28		8	
-25	14			
				585.04
	50/4"		10	Auger refusal at 26.5 feet End of Boring
-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 6/10/21

ROUTE 95th Street **DESCRIPTION** Retaining Wall Boring **LOGGED BY** EH

SECTION IL 171 & 95th Street **LOCATION** IL 171, **SEC.** 22, **TWP.** 37N, **RNG.** 12E,
Latitude 41.7173026, **Longitude** -87.8966253

COUNTY COOK **DRILLING RIG** Diedrich D-50 **HAMMER TYPE** AUTO
DRILLING METHOD HSA **HAMMER EFF (%)** 92

STRUCT. NO. SN 016-2310
Station Sta. 317+80.13 to 333+27.91

BORING NO. RWB-18
Station 328+14.34
Offset 34.07ft RT
Ground Surface Elev. 611.02 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
				Stiff Brown, Moist SILTY CLAY, with gravel, trace sand (CL/ML)
	2			
	5 4		12	
607.52				
	12			Medium Dense to Exremely Dense Brown, Moist GRAVEL, with sand and silt (GP)
	13 20		7	
-5				
	16			
	20 13		5	
	17			
	50/3"		8	
-10				
	37			
	21 14		7	
	15			
	15 12		6	
-15				
	37			
	24 15		6	
	9			
	8 6		8	
-20				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
	10			Medium Dense to Exremely Dense Brown, Moist GRAVEL, with sand and silt (GP) *(continued)*
	33 23		14	
588.52				Auger Refusal at 22.5 feet
				End of Boring
-25				
-30				
-35				
-40				

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

BBS, form 137 (Rev. 8-99)

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

SOIL BORING LOG

Date 6/21/21

ROUTE 95th Street **DESCRIPTION** Retaining Wall Boring **LOGGED BY** EH

SECTION IL 171 & 95th Street **LOCATION** IL 171, **SEC.** 22, **TWP.** 37N, **RNG.** 12E,
Latitude 41.7173758, **Longitude** -87.8963887

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

STRUCT. NO. SN 016-2310
Station Sta. 317+80.13 to 333+27.91

BORING NO. RWB-19
Station 328+84.22
Offset 35.55ft RT
Ground Surface Elev. 610.64 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
				Loose Gray, Moist SILTY SAND, with gravel (SM)
	6			
	4 5		14	
607.14				
	5			Medium Dense Brown, Wet SAND, with gravel (SPG)
	10 16		17	
-5				
604.64				
	20			Very Dense to Exremely Dense Brown, Dry to Moist SILTY SAND, with gravel and cobbles (SM)
	50/2"		7	
	15			
	18 38		5	
-10				
599.64				
	14			Medium Dense to Extremely Dense Brown, Moist to Wet SAND, with gravel and cobbles (SPG)
	15 28		12	
	5			
	12 12		28	
-15				
	50/5"			Auger refusal at 11.5 feet on 06/09/2021 and 06/10/2021. Attempted rock core on 06/21/2021 and boring was completed to full depth of 25 feet. Little recovery at 16-17.5 feet
	50/6"			
			22	
-20				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				Medium Dense to Extremely Dense Brown, Moist to Wet SAND, with gravel and cobbles (SPG) *(continued)*
	7			
	12 20		13	
	15			
	32 28		12	
585.64 -25				
				End of Boring
-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 6/9/21

ROUTE 95th Street **DESCRIPTION** Retaining Wall Boring **LOGGED BY** DM

SECTION IL 171 & 95th Street **LOCATION** IL 171, **SEC.** 22, **TWP.** 37N, **RNG.** 12E,
Latitude 41.717458, **Longitude** -87.8961337

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

STRUCT. NO. SN 016-2310
Station Sta. 317+80.13 to 333+27.91

BORING NO. RWB-20
Station 329+60.01
Offset 35.99ft RT
Ground Surface Elev. 610.33 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 (%)
6 inches of Topsoil 609.83				
Loose Brown, Moist SAND, trace gravel (SP)		4		
		2 4		10
606.83				
Loose Dark Brown, Moist SILT, trace sand and gravel (ML)		3		
605.33	-5	2 2		11
Medium Dense Light Brown, Moist SAND, trace gravel (SP)		7		
		8 12		5
601.83				
Dense to Very Dense Light Brown, Dry to Moist SAND, with gravel (SPG)		14		
		35 36		3
	-10			
		18		
		17 25		5
597.83				
Dense to Very Dense Light Brown, Moist GRAVEL, with sand (GP)		13		
		18 40		5
	-15			
		19		
		18 13		6
		18		
		28 35		5
590.33	-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 6/9/21

ROUTE 95th Street **DESCRIPTION** Retaining Wall Boring **LOGGED BY** DM

SECTION IL 171 & 95th Street **LOCATION** IL 171, **SEC.** 22, **TWP.** 37N, **RNG.** 12E,
Latitude 41.7175384, **Longitude** -87.8958845

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

STRUCT. NO. SN 016-2310
Station Sta. 317+80.13 to 333+27.91

BORING NO. RWB-21
Station 330+34.08
Offset 36.40ft RT
Ground Surface Elev. 610.04 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 (%)
6 inches of Topsoil 609.54				
Loose Light Brown, Moist SILTY SAND, trace gravel (SM)		4 3 2		12
606.04		5		
Loose Light Brown, Wet SAND, trace gravel (SP) 605.04	-5	3 4		17
Medium Dense to Dense Light Brown, Moist SILT, with sand, trace gravel (ML)		6 10 14		17
		6		
	-10	17 21		16
599.04		11		
Medium Dense Light Brown, Moist SAND, trace gravel (SP)		14 15		9
		9		
	-15	14 15		9
594.04		10		
Medium Dense Brown and Gray, Very Moist SILT, with sand, trace gravel (ML)		12 13		25
		10		
590.04	-20	14 13		21

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 6/9/21

ROUTE 95th Street **DESCRIPTION** Retaining Wall Boring **LOGGED BY** DM

SECTION IL 171 & 95th Street **LOCATION** IL 171, **SEC.** 22, **TWP.** 37N, **RNG.** 12E,
Latitude 41.7176241, **Longitude** -87.8956262

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

STRUCT. NO. SN 016-2310
Station Sta. 317+80.13 to 333+27.91

BORING NO. RWB-22
Station 331+11.20
Offset 36.05ft RT
Ground Surface Elev. 609.90 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
609.40				6 inches of Topsoil
	6			Loose to Medium Dense Light Brown, Moist to Wet SILTY SAND, trace gravel (SM)
	4 3		9	
	5			
	8 8		19	
604.90 -5				
	10			Medium Dense to Dense Light Brown, Moist to Wet SAND, trace gravel (SP)
	14 14		14	
	7			
	9 14		22	
-10				
	12			
	15 15		9	
	10			
	14 14		10	
-15				
	13			
	17 16		12	
	14			
590.90				
	15 16		15	Dense Gray, Wet
589.90 -20				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				SAND, trace gravel (SP) End of Boring
-25				
-30				
-35				
-40				

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

BBS, form 137 (Rev. 8-99)

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

SOIL BORING LOG

Date 6/9/21

ROUTE 95th Street **DESCRIPTION** Retaining Wall Boring **LOGGED BY** DM

SECTION IL 171 & 95th Street **LOCATION** IL 171, **SEC.** 22, **TWP.** 37N, **RNG.** 12E,
Latitude 41.7176995, **Longitude** -87.8953923

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

STRUCT. NO. SN 016-2310
Station Sta. 317+80.13 to 333+27.91

BORING NO. RWB-23
Station 331+80.73
Offset 36.47ft RT
Ground Surface Elev. 609.57 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

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
18 inches of Topsoil				
608.07		3		
Very Stiff to Hard Light Brown, Moist SILTY CLAY, trace sand and gravel (CL/ML)		2 5	3.0 B	14
Cobbles at 3.5-5 feet		50/4"		
	-5		3.3 B	11
		11		
		13 20	5.0 B	12
601.57				
Dense Light Brown, Moist GRAVEL, with sand, trace clay (GP)		14		
599.57	-10	22 17		11
Hard Brown and Gray, Moist SILTY CLAY, trace sand and gravel (CL/ML)		9		
		16 17	4.5 B	11
596.57				
Medium Dense to Dense Gray, Moist SILT, trace sand and gravel (ML)		10		
		14 14		14
	-15	6		
		6 10		17
		12		
		19 20		13
589.57	-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 6/9/21

ROUTE 95th Street **DESCRIPTION** Retaining Wall Boring **LOGGED BY** DM

SECTION IL 171 & 95th Street **LOCATION** IL 171, **SEC.** 22, **TWP.** 37N, **RNG.** 12E,
Latitude 41.7177787, **Longitude** -87.895151

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

STRUCT. NO. SN 016-2310
Station Sta. 317+80.13 to 333+27.91

BORING NO. RWB-24
Station 332+52.64
Offset 36.43ft RT
Ground Surface Elev. 609.22 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 (%)
18 inches of Topsoil				
607.72		3		
Medium Dense Light Brown, Moist GRAVEL, with sand (GP)		4 10		14
		5		
	-5	12 15		7
		12		
		8 6		8
		6		
	-10	4 7		6
		9		
		9 7		8
		20		
	-15	12 9		5
593.22		10		
Extremely Dense Light Brown, Moist GRAVEL, with sand (GP) Cobbles at 16-17 feet		50/3"		8
590.72		50/6"		5
Auger refusal at 19 feet End of Boring	-20			

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

Illinois Department of Transportation

Division of Highways
GSG Consultants, Inc.

SOIL BORING LOG

Date 6/9/21

ROUTE 95th Street **DESCRIPTION** Retaining Wall Boring **LOGGED BY** DM

SECTION IL 171 & 95th Street **LOCATION** IL 171, **SEC.** 22, **TWP.** 37N, **RNG.** 12E,
Latitude 41.7178604, **Longitude** -87.894902

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

STRUCT. NO. SN 016-2310
Station Sta. 317+80.13 to 333+27.91

BORING NO. RWB-25
Station 333+26.85
Offset 36.39ft RT
Ground Surface Elev. 608.92 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
				18 inches of Topsoil
	5			607.42
	7		8	Loose
	3			Light Brown, Moist
				SAND, trace gravel (SP)
	5			
	5	0.8	10	604.42
-5	2	P		Medium Stiff
				603.92
				Brown, Moist
				SILTY CLAY, trace gravel
	8			(CL/ML)
	8		7	Medium Dense to Dense
	8			Brown, Moist
				SAND, with gravel and silt (SP)
	5			
	18		7	
-10	20			
	9			
	7		12	
	5			
	8			
	7		9	
-15	8			
	6			
	6		7	
	5			
	3			
	7		13	
-20	12			588.92

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 6/10/21

ROUTE 95th Street **DESCRIPTION** Retaining Wall Boring **LOGGED BY** EH

SECTION IL 171 & 95th Street **LOCATION** IL 171, **SEC.** 22, **TWP.** 37N, **RNG.** 12E,
Latitude 41.7179265, **Longitude** -87.894678

COUNTY COOK **DRILLING RIG** Diedrich D-50 **HAMMER TYPE** AUTO
DRILLING METHOD HSA **HAMMER EFF (%)** 92

STRUCT. NO. SN 016-2310
Station Sta. 317+80.13 to 333+27.91

BORING NO. RWB-26
Station 333+92.54
Offset 38.85ft RT
Ground Surface Elev. 608.78 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 (%)	Description
608.28				6 inches of Asphalt
607.78				6 inches of Concrete
	10			Stiff
	5		NR	Brown, Moist
	4			SILTY CLAY, trace sand and gravel (CL/ML)
	4			
	4	2.0	19	
-5	4	P		
	8			Cobbles at 6-7.5 feet
	10		19	
	7			
	3			Cobbles at 8.5-10 feet
	3		20	
-10	5			
597.78				
	3			Soft to Stiff
	5	0.8	43	Brown, Very Moist
	4	B		CLAY, trace sand and gravel (CH)
	8			
	7	1.7	32	
-15	6	B		
	3			Cobbles at 16-17.5 feet
	3	0.3	39	
	4	P		
590.28				
	4			Stiff
	12	1.5	15	Brown, Moist
	17	P		SILTY CLAY, trace sand and
588.78 -20				gravel (CL/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)

BBS, form 137 (Rev. 8-99)

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

SOIL BORING LOG

Date 6/10/21

ROUTE 95th Street **DESCRIPTION** Retaining Wall Boring **LOGGED BY** EH

SECTION IL 171 & 95th Street **LOCATION** IL 171, **SEC.** 22, **TWP.** 37N, **RNG.** 12E,
Latitude 41.718025, **Longitude** -87.8943884

COUNTY COOK **DRILLING RIG** Diedrich D-50 **HAMMER TYPE** AUTO
DRILLING METHOD HSA **HAMMER EFF (%)** 92

STRUCT. NO. SN 016-2310
Station Sta. 317+80.13 to 333+27.91

BORING NO. RWB-27
Station 334+79.35
Offset 37.63ft RT
Ground Surface Elev. 608.86 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 (%)
4 inches of Topsoil 608.53				
Stiff Brown, Moist SILTY CLAY, with sand (CL/ML)		2		
		3 8	2.0 P	11
605.36				
Very Stiff Brown, Moist to Very Moist SILTY CLAY, trace sand and gravel (CL/ML)		5		
		2 4	2.1 B	26
	-5			
		19		
		14 8	2.5 P	16
		8		
Cobbles at 8.5-10 feet		20 21	2.0 P	16
	-10			
		17		
		12 6	2.5 B	19
595.36				
Very Stiff Brown, Moist SILTY CLAY LOAM, trace sand and gravel (ML/CL)		14		
		10 11	2.5 P	21
	-15			
		10		
		20 10	2.0 P	17
		14		
		12 20	2.5 P	8
588.86	-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 6/17/21

ROUTE 95th Street **DESCRIPTION** Subgrade Boring **LOGGED BY** JB

SECTION IL 171 & 95th Street **LOCATION** 95th Street, **SEC.** 22, **TWP.** 37N, **RNG.** 12E,
Latitude 41.7161693, **Longitude** -87.8971849

COUNTY COOK **DRILLING RIG** Diedrich D-50 **HAMMER TYPE** AUTO
DRILLING METHOD HSA **HAMMER EFF (%)** 92

STRUCT. NO. N/A
Station N/A

BORING NO. SGB-01
Station 196+00
Offset 5.00ft RT
Ground Surface Elev. 637.56 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 637.31				
Medium Dense to Dense Brown, Moist SANDY CLAY LOAM, with gravel (SC/SM)		6		
		7 8/1"		10
		7		
		8		12
	-5	11		
631.56				
Medium Dense Gray, Moist SILT, with gravel (ML)		10		
		11 12		13
		8		
		8		12
	-10	13		
626.56				
Medium Dense Brown and Gray, Moist SILT, with gravel (ML)		7		
		13		15
624.06				
Hard Brown, Moist		8		
		11	4.2	16
SILTY CLAY, with gravel, trace sand (CL/ML) 622.56	-15	13	B	
End of Boring				
	-20			

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

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

SOIL BORING LOG

Date 6/17/21

ROUTE 95th Street **DESCRIPTION** Subgrade Boring **LOGGED BY** EH

SECTION IL 171 & 95th Street **LOCATION** 95th Street, **SEC.** 22, **TWP.** 37N, **RNG.** 12E,
Latitude 41.7154222, **Longitude** -87.8966667

COUNTY COOK **DRILLING RIG** Diedrich D-50 **HAMMER TYPE** AUTO
DRILLING METHOD HSA **HAMMER EFF (%)** 92

STRUCT. NO. N/A
Station N/A

BORING NO. SGB-02
Station 194+00
Offset 5.00ft LT
Ground Surface Elev. 662.00 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
				12 inches of Asphalt 9 inches of Concrete
661.00	11			
660.13	9 9	1.5 P	13	Stiff to Very Stiff Gray, Moist SILTY CLAY (CL/ML)
	6			
-5	4 8	2.5 P	12	
656.00	16			Very Stiff Gray, Moist SILTY CLAY LOAM, trace sand and gravel (ML/CL)
	18 19	3.0 P	10	
	15			
652.00 -10	19 20	3.5 P	9	
-15				End of Boring
-20				

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

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

SOIL BORING LOG

Date 6/17/21

ROUTE 95th Street **DESCRIPTION** Subgrade Boring **LOGGED BY** EH

SECTION IL 171 & 95th Street **LOCATION** 95th Street, **SEC.** 22, **TWP.** 37N, **RNG.** 12E,
Latitude 41.715, **Longitude** -87.8957306

COUNTY COOK **DRILLING RIG** Diedrich D-50 **HAMMER TYPE** AUTO
DRILLING METHOD HSA **HAMMER EFF (%)** 92

STRUCT. NO. N/A
Station N/A

BORING NO. SGB-03
Station 191+00
Offset 5.00ft RT
Ground Surface Elev. 672.00 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
				13 inches of Asphalt 8 inches of Concrete
670.92				
	3			
670.25	6	2.5	10	
	3	P		Very Stiff Brown and Gray, Moist SILTY CLAY, trace sand and gravel (CL/ML)
	5			
	5	2.0	13	
-5	19	P		
	7			
	10	3.0	12	
	10	P		
	5			
	10	3.0	12	
662.00 -10	13	P		
				End of Boring
-15				
-20				

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

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

SOIL BORING LOG

Date 6/18/21

ROUTE 95th Street **DESCRIPTION** Embankment Stability Boring **LOGGED BY** EH

SECTION IL 171 & 95th Street **LOCATION** IL 171, **SEC.** 22, **TWP.** 37N, **RNG.** 12E,
Latitude 41.7162683, **Longitude** -87.8997918

COUNTY COOK **DRILLING RIG** Diedrich D-50 **HAMMER TYPE** AUTO
DRILLING METHOD HSA **HAMMER EFF (%)** 92

STRUCT. NO. N/A
Station N/A

BORING NO. SSB-01
Station 318+77.07
Offset 77.35ft RT
Ground Surface Elev. 612.12 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 (%)	
11 inches of Asphalt				
611.21				
Very Stiff Brown and Gray, Moist to Very Moist SILTY CLAY, trace sand and gravel (CL/ML)	6			
	5 3	2.0 P	16	
	3			
	3 5	3.0 P	27	
-5	4			
	4 6	2.5 B	28	
603.62				
Hard Brown and Gray, Moist SILTY CLAY LOAM, trace sand and gravel (ML/CL)	7			
	11 17	4.5 P	15	
-10	9			
	23 19	4.5 P	10	
	10			
	17 18	4.5 P	11	
597.12 -15				
End of Boring				
-20				

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

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

SOIL BORING LOG

Date 6/18/21

ROUTE 95th Street **DESCRIPTION** Embankment Stability Boring **LOGGED BY** EH

SECTION IL 171 & 95th Street **LOCATION** IL 171, **SEC.** 22, **TWP.** 37N, **RNG.** 12E,
Latitude 41.7164556, **Longitude** -87.8990917

COUNTY COOK **DRILLING RIG** Diedrich D-50 **HAMMER TYPE** AUTO
DRILLING METHOD HSA **HAMMER EFF (%)** 92

STRUCT. NO. N/A
Station N/A

BORING NO. SSB-02
Station 320+79.71
Offset 72.03ft RT
Ground Surface Elev. 613.00 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 (%)
14 inches of Asphalt				
611.84		7		
Loose Gray, Moist SANDY CLAY LOAM, trace gravel (SC/SM)		4 3		
Little recovery at 1-2.5 feet				
609.50		3		
Very Stiff Brown, Moist SILTY CLAY LOAM, trace gravel (ML/CL)	-5	4 8	2.0 P	19
		12		
		14 17	2.5 P	21
604.50		7		
Hard Gray, Moist SILTY CLAY, trace gravel (CL/ML)	-10	8 8	5.0 B	20
602.00		11		
Very Stiff to Hard Brown and Gray, Moist SILTY CLAY LOAM, trace sand (ML/CL)		16 21	4.5 P	20
		13		
		31 33	3.5 P	12
598.00	-15			
End of Boring				
	-20			

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

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

SOIL BORING LOG

Date 6/21/21

ROUTE 95th Street **DESCRIPTION** Embankment Stability Boring **LOGGED BY** JB

SECTION IL 171 & 95th Street **LOCATION** IL 171, **SEC.** 22, **TWP.** 37N, **RNG.** 12E,
Latitude 41.7166206, **Longitude** -87.8984269

COUNTY COOK **DRILLING RIG** Diedrich D-50 **HAMMER TYPE** AUTO
DRILLING METHOD HSA **HAMMER EFF (%)** 92

STRUCT. NO. N/A
Station N/A

BORING NO. SSB-03
Station 322+74.75
Offset 68.36ft RT
Ground Surface Elev. 613.81 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 (%)
3 inches of Topsoil 613.56				
Medium Stiff to Stiff Brown, Moist to Very Moist SILTY CLAY, with sand, trace gravel (CL)		2		
		3 2	0.8 S	30
		3		
	-5	3 4	0.6 S	21
Cobbles at 6-7.5 feet		8		
		16 50/2"	1.3 S	19
604.81		9		
Dense Gray, Moist SILT, with sand, trace gravel (ML)	-10	15 17		16
Cobbles at 11-12.5 feet		12		
		50/1"		15
600.31				
Hard Gray, Moist SILTY CLAY, trace gravel (CL/ML) 598.81		6		
	-15	10 15	5.4 B	17
End of Boring				
	-20			

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

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

SOIL BORING LOG

Date 6/21/21

ROUTE 95th Street **DESCRIPTION** Embankment Stability Boring **LOGGED BY** JB

SECTION IL 171 & 95th Street **LOCATION** IL 171, **SEC.** 22, **TWP.** 37N, **RNG.** 12E,
Latitude 41.7168321, **Longitude** -87.8977473

COUNTY COOK **DRILLING RIG** Diedrich D-50 **HAMMER TYPE** AUTO
DRILLING METHOD HSA **HAMMER EFF (%)** 92

STRUCT. NO. N/A
Station N/A

BORING NO. SSB-04
Station 324+66.67
Offset 70.07ft RT
Ground Surface Elev. 613.10 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
				3 inches of Topsoil 612.85
	2			Loose Brown, Moist SANDY CLAY LOAM, trace gravel (SC/SM)
	2 2		6	
				609.60
	1			Medium Stiff Brown, Moist SILTY CLAY, with sand, trace gravel (CL/ML)
	1 2	0.6 S	22	
-5				
				607.10
	5			Loose to Medium Dense Brown, Moist to Wet GRAVEL, with sand (GP)
	5 5		16	
	5			
	6 6		10	
-10				
	9			
	5 5		9	
	7			
	10 7		9	
-15				
				598.10
				End of Boring
-20				

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

BBS, form 137 (Rev. 8-99)

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

SOIL BORING LOG

Date 6/21/21

ROUTE 95th Street **DESCRIPTION** Embankment Stability Boring **LOGGED BY** JB

SECTION IL 171 & 95th Street **LOCATION** IL 171, **SEC.** 22, **TWP.** 37N, **RNG.** 12E,
Latitude 41.7170413, **Longitude** -87.8970454

COUNTY COOK **DRILLING RIG** Diedrich D-50 **HAMMER TYPE** AUTO
DRILLING METHOD HSA **HAMMER EFF (%)** 92

STRUCT. NO. N/A
Station N/A

BORING NO. SSB-05
Station 326+71.10
Offset 75.35ft RT
Ground Surface Elev. 612.08 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 611.92
	50/1"			Extremely Dense Brown, Moist SAND, with gravel and cobbles (SPG)
			6	
	50/1"			
-5			7	
				606.08
	10			Stiff Brown, Moist
	9 50/3"	1.7 S	14	SILTY CLAY, with gravel (CL/ML) Cobbles at 6-7.5 feet
				603.58
	6			Loose to Medium Dense Brown, Moist
-10	7 7		6	SAND, with gravel and cobbles (SPG)
	3			
	4 4		6	
	2			
	2 3		8	
-15				597.08
				End of Boring
-20				

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

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

SOIL BORING LOG

Date 6/18/21

ROUTE 95th Street **DESCRIPTION** Embankment Stability Boring **LOGGED BY** EH

SECTION IL 171 & 95th Street **LOCATION** IL 171, **SEC.** 22, **TWP.** 37N, **RNG.** 12E,
Latitude 41.717286, **Longitude** -87.8963749

COUNTY COOK **DRILLING RIG** Diedrich D-50 **HAMMER TYPE** AUTO
DRILLING METHOD HSA **HAMMER EFF (%)** 92

STRUCT. NO. N/A
Station N/A

BORING NO. SSB-06
Station 328+74.56
Offset 67.03ft RT
Ground Surface Elev. 610.66 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 (%)
9 inches of Asphalt 609.91			
Medium Dense Brown and Gray, Moist GRAVEL, with sand and clay (GP)	7		
	10 8		11
	8		
	14 15		10
-5			
604.66			
Dense to Extremely Dense Brown and Gray, Dry SAND, with gravel and cobbles (SPG)	25		
	19 20		3
	41		
	50/2"		4
-10			
	25		
	22 50/4"		5
Split-spoon refusal at 13 feet 597.66			
	50/1"		
End of Boring			
-15			
-20			

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

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

SOIL BORING LOG

Date 6/18/21

ROUTE 95th Street **DESCRIPTION** Embankment Stability Boring **LOGGED BY** EH

SECTION IL 171 & 95th Street **LOCATION** IL 171, **SEC.** 22, **TWP.** 37N, **RNG.** 12E,
Latitude 41.7175024, **Longitude** -87.8957054

COUNTY COOK **DRILLING RIG** Diedrich D-50 **HAMMER TYPE** AUTO
DRILLING METHOD HSA **HAMMER EFF (%)** 92

STRUCT. NO. N/A
Station N/A

BORING NO. SSB-07
Station 330+73.63
Offset 68.02ft RT
Ground Surface Elev. 610.13 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 (%)	
9 inches of Asphalt 609.38				
Loose to Medium Dense Brown, Moist LOAM, trace gravel (ML-S)	4			
	4 6		17	
	6			
-5	7 9		12	
	10			
	9 10		11	
	6			
600.13 -10	10 14		11	
End of Boring				
-15				
-20				

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

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

SOIL BORING LOG

Date 6/17/21

ROUTE 95th Street **DESCRIPTION** Traffic Sign Boring **LOGGED BY** JB

SECTION IL 171 & 95th Street **LOCATION** IL 171, **SEC.** 22, **TWP.** 37N, **RNG.** 12E,
Latitude 41.7166969, **Longitude** -87.8978321

COUNTY COOK **DRILLING RIG** Diedrich D-50 **HAMMER TYPE** AUTO
DRILLING METHOD HSA **HAMMER EFF (%)** 92

STRUCT. NO. N/A
Station N/A

BORING NO. TSB-01
Station 324+27.35
Offset 107.05ft RT
Ground Surface Elev. 620.15 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
619.90				3 inches of Topsoil
	6			Loose to Medium Dense Brown, Moist to Very Moist SILT, with gravel (ML)
	4 4		11	
	7/1"			
-5			24	
	5			
	6 9		13	
611.65	6			
	9 12	4.5 P	13	Hard Brown, Moist SILTY CLAY LOAM, with gravel (ML/CL)
-10				
609.15	8			
	12 16	3.0 P	13	Very Stiff Brown and Gray, Moist SILTY CLAY, with gravel (CL/ML)
606.65	6			
	7 12	4.0 P	11	Very Stiff Gray, Moist SILTY CLAY, with gravel, trace sand (CL)
-15				
	5			
	9 11	3.3 B	12	
	4			
	7 9	2.9 B	11	
-20				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
599.15	4			Stiff Gray, Moist SILTY CLAY, trace gravel (CL/ML)
	4 6	1.9 B	23	
596.65	13			Dense Gray, Moist SILT (ML)
595.15 -25	18 13/1"		15	
				End of Boring
-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 6/17/21

ROUTE 95th Street **DESCRIPTION** Traffic Sign Boring **LOGGED BY** JB

SECTION IL 171 & 95th Street **LOCATION** IL 171, **SEC.** 22, **TWP.** 37N, **RNG.** 12E,
Latitude 41.716844, **Longitude** -87.8974561

COUNTY COOK **DRILLING RIG** Diedrich D-50 **HAMMER TYPE** AUTO
DRILLING METHOD HSA **HAMMER EFF (%)** 92

STRUCT. NO. N/A
Station N/A

BORING NO. TSB-02
Station 325+40.62
Offset 96.64ft RT
Ground Surface Elev. 618.16 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
				3 inches of Topsoil 617.91
	6			Medium Stiff to Stiff Brown, Moist SILTY CLAY, trace gravel (CL/ML)
	6 8	2.0 P	15	
	6			
	8 9	2.0 P	18	
-5	6			
	10 8	2.0 P	22	Wood and root fragments at 6.5 feet
	4			
	4 6	0.8 B	21	Wood and root fragments at 9 feet
-10				607.16
	2			Medium Stiff Brown and Gray, Moist SILTY CLAY, with sand, trace gravel (CL/ML)
	3 4	0.8 B	17	
	2			604.66
	3 4	1.5 B	18	Stiff Gray, Moist SILTY CLAY, trace gravel (CL)
-15				602.16
	5			Stiff to Very Stiff Brown and Gray, Moist SILTY CLAY, with sand and gravel (CL/ML)
	5 7	1.5 B	14	
	5			
	9 9	3.5 B	13	
-20				

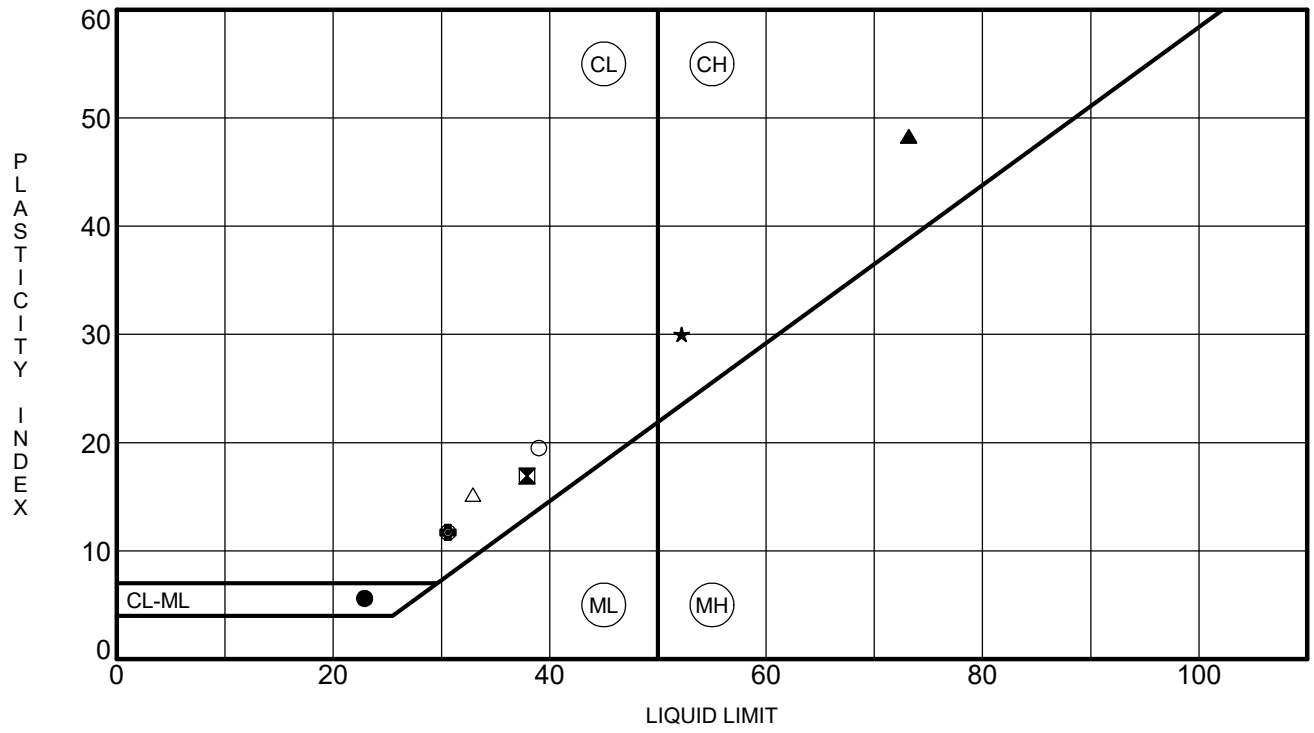
DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
	8			Stiff to Very Stiff Brown and Gray, Moist SILTY CLAY, with sand and gravel (CL/ML) *(continued)*
	9 9	2.5 B	12	
				594.66
	6			Very Stiff Gray, Moist SILTY CLAY, with sand and gravel (CL/ML) 593.16
	9 11	2.5 B	11	
-25				End of Boring
-30				
-35				
-40				

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

BBS, form 137 (Rev. 8-99)

APPENDIX D

LABORATORY TEST RESULTS



	Specimen Identification		LL	PL	PI	Fines	Classification
●	**RWB-04**	**6.00**	**22.9**	**17.3**	**5.6**		
⊠	**RWB-14**	**11.00**	**37.9**	**21.0**	**16.9**		
▲	**RWB-15**	**16.00**	**73.2**	**24.9**	**48.3**		
★	**RWB-26**	**16.00**	**52.2**	**22.2**	**30.0**		
⊙	**SGB-03**	**3.50**	**30.6**	**18.9**	**11.7**		
✿	**SSB-03**	**3.50**	**30.6**	**18.9**	**11.7**		
○	**TSB-01**	**16.00**	**39.0**	**19.5**	**19.5**		
△	**TSB-02**	**13.50**	**32.9**	**17.7**	**15.2**		

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

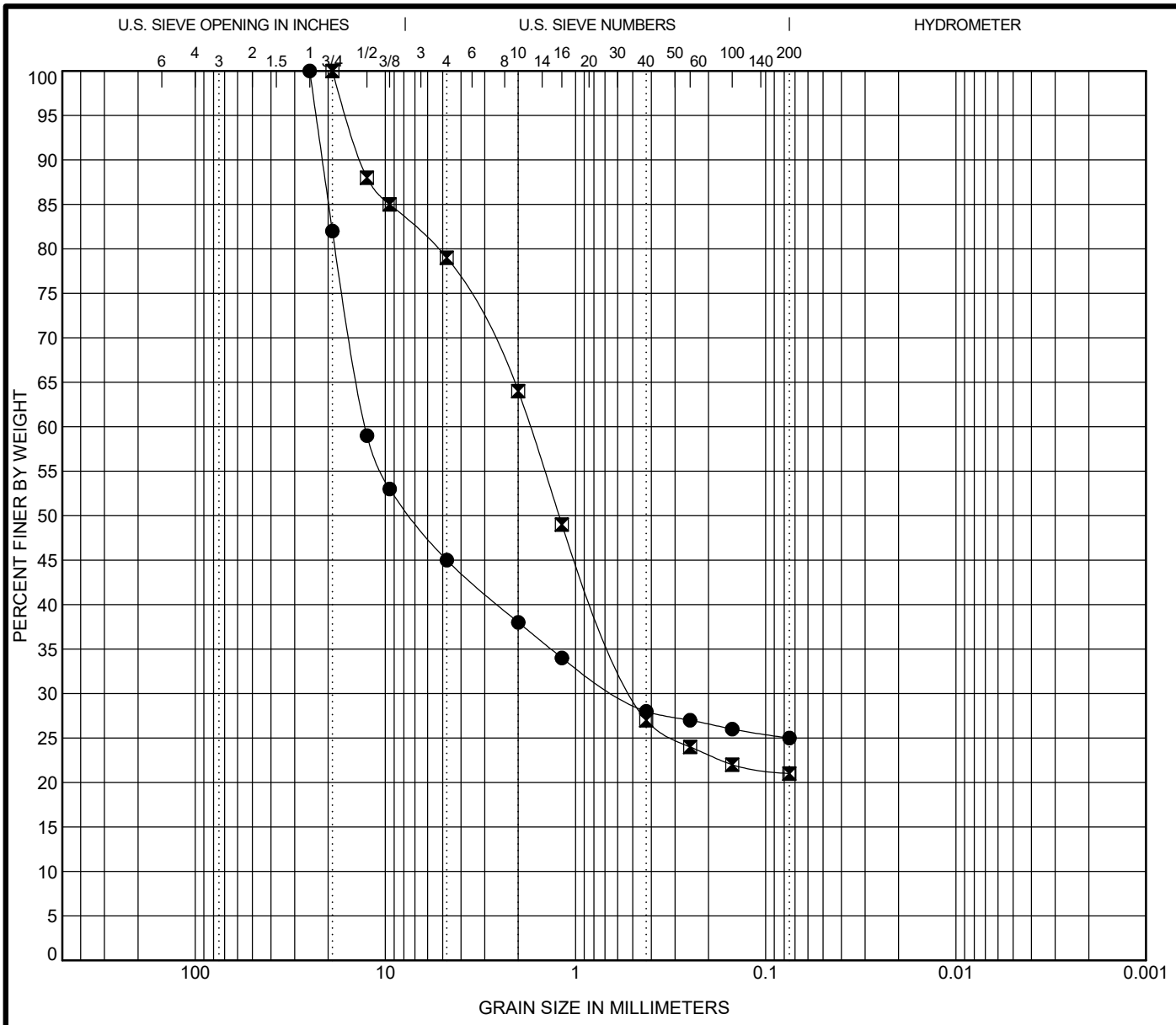
ATTERBERG LIMITS' RESULTS

Route: IL 171

Section: IL 171 & 95th Street

County: COOK

ATTERBERG_LIMITS PTB 163-17.GPJ IL_DOT.GDT 10/21/21



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	**RWB-18**	**18.50**						
⊠	**RWB-25**	**11.00**						

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**RWB-18**	**18.50**	**25**	**12.73**	**0.597**		**55.0**	**20.0**	**25.0**	
⊠	**RWB-25**	**11.00**	**19**	**1.737**	**0.489**		**21.0**	**58.0**	**21.0**	

GSG Consultants, Inc
735 Remington Road
Schaumburg, IL 60173
(630) 994-2600
Fax: (312) 733-5612

GRAIN SIZE DISTRIBUTION

Route: IL 171

Section: IL 171 & 95th Street

County: COOK

GRAIN SIZE PTB 163-17.GPJ IL DOT.GDT 7/20/21

GSG CONSULTANTS, INC.

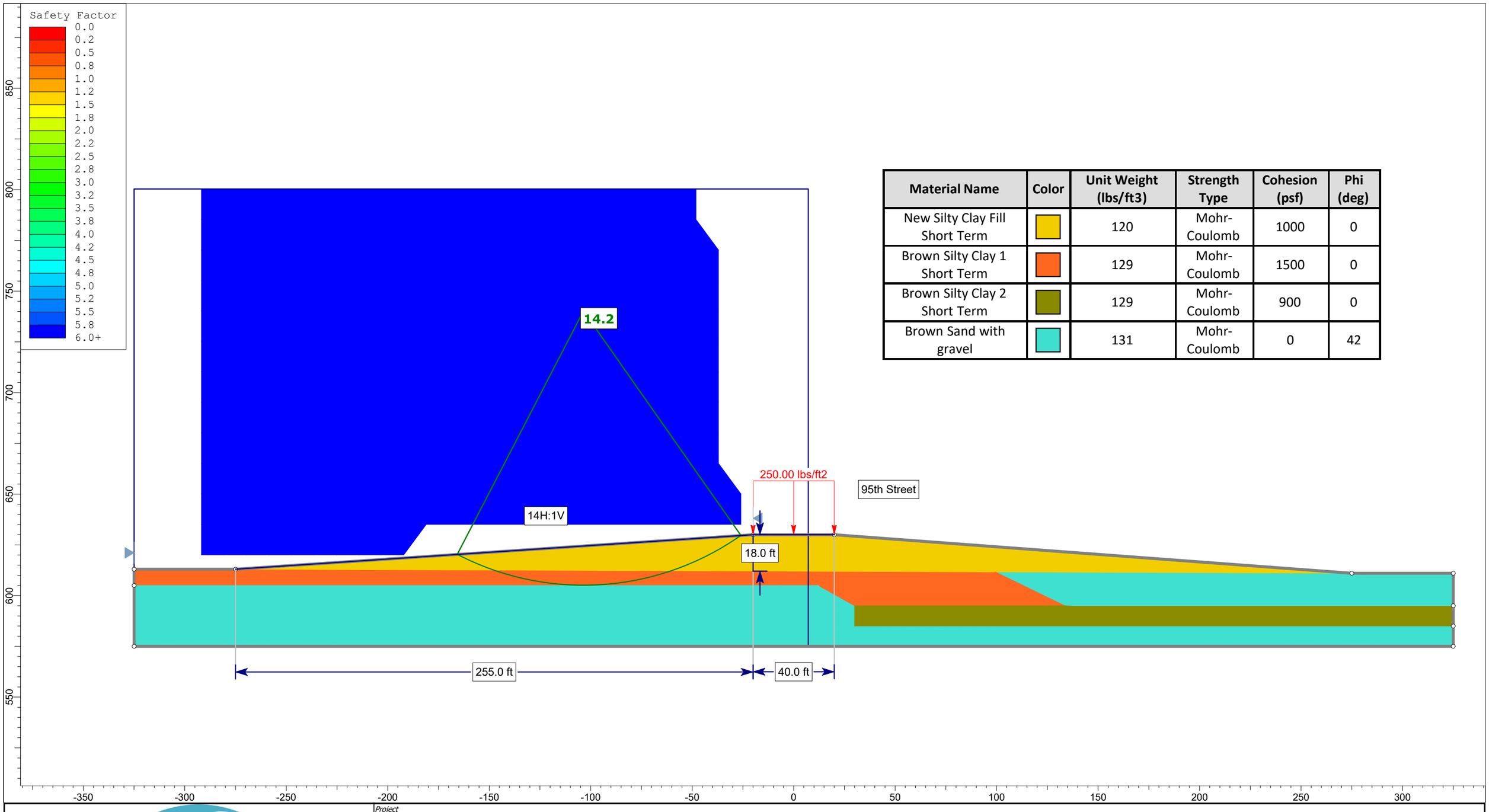
735 Remington Road
Schaumburg, IL 60173
Tel: 630.994.2600
www.gsg-consultants.com

Table D1 – PTB 163-17 Test Results – Dry Unit Weight

Boring ID	Sample Depth (ft)	Dry Unit Weight (pcf)	Wet Unit Weight (pcf)	Soil Classification
SGB-02	3.5-5	132.6	148.1	CL/ML
SGB-03	6-7.5	130.5	145.9	CL/ML
RWB-04	6-7.5	120.3	140.7	CL/ML
RWB-09	3.5-5	112.3	136.9	CL/ML
RWB-14	11-12.5	93.3	124.1	CL
RWB-15	16-17.5	81.2	110.0	CH

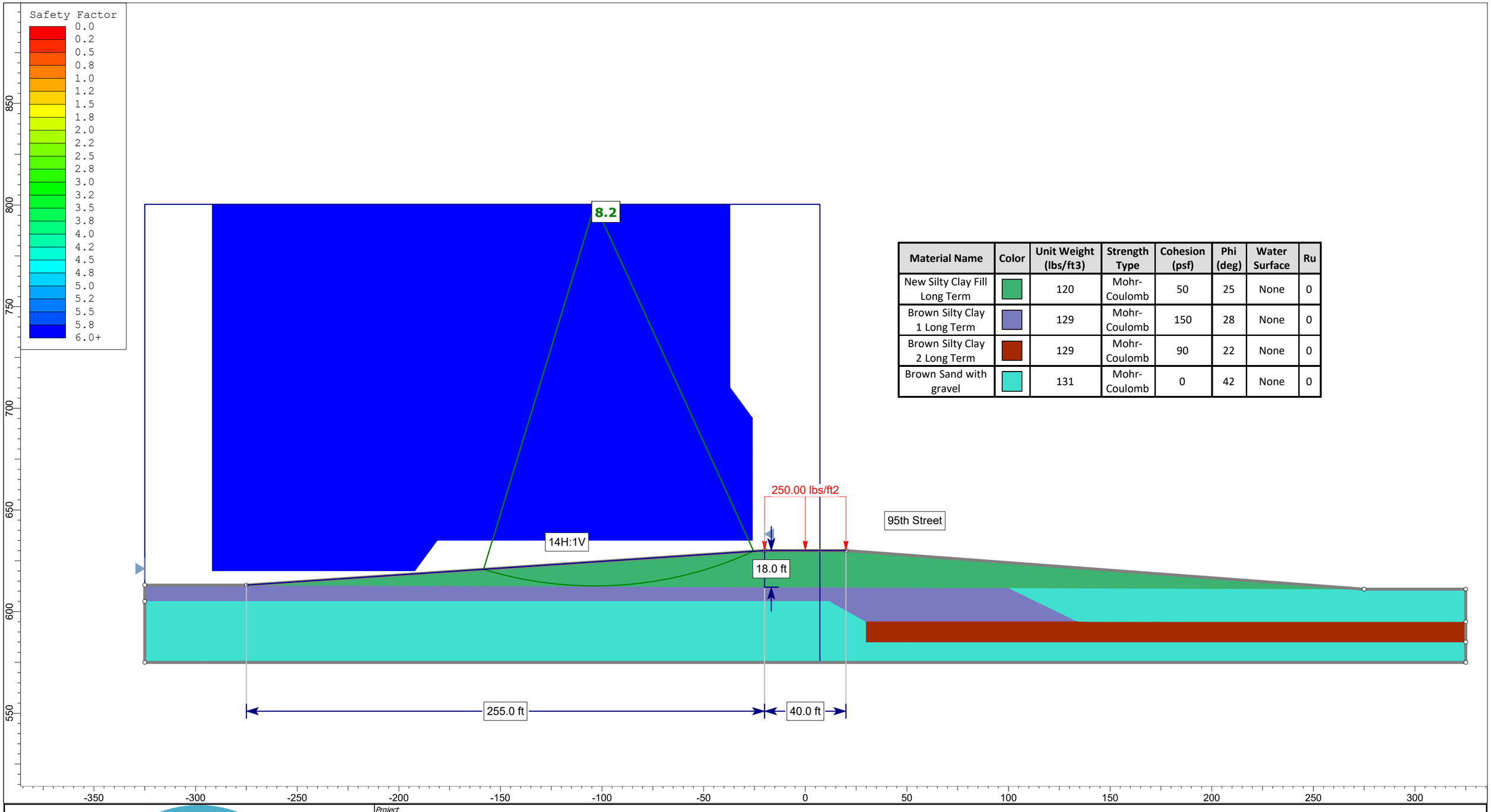
APPENDIX E

SLOPE STABILITY ANALYSES EXHIBITS



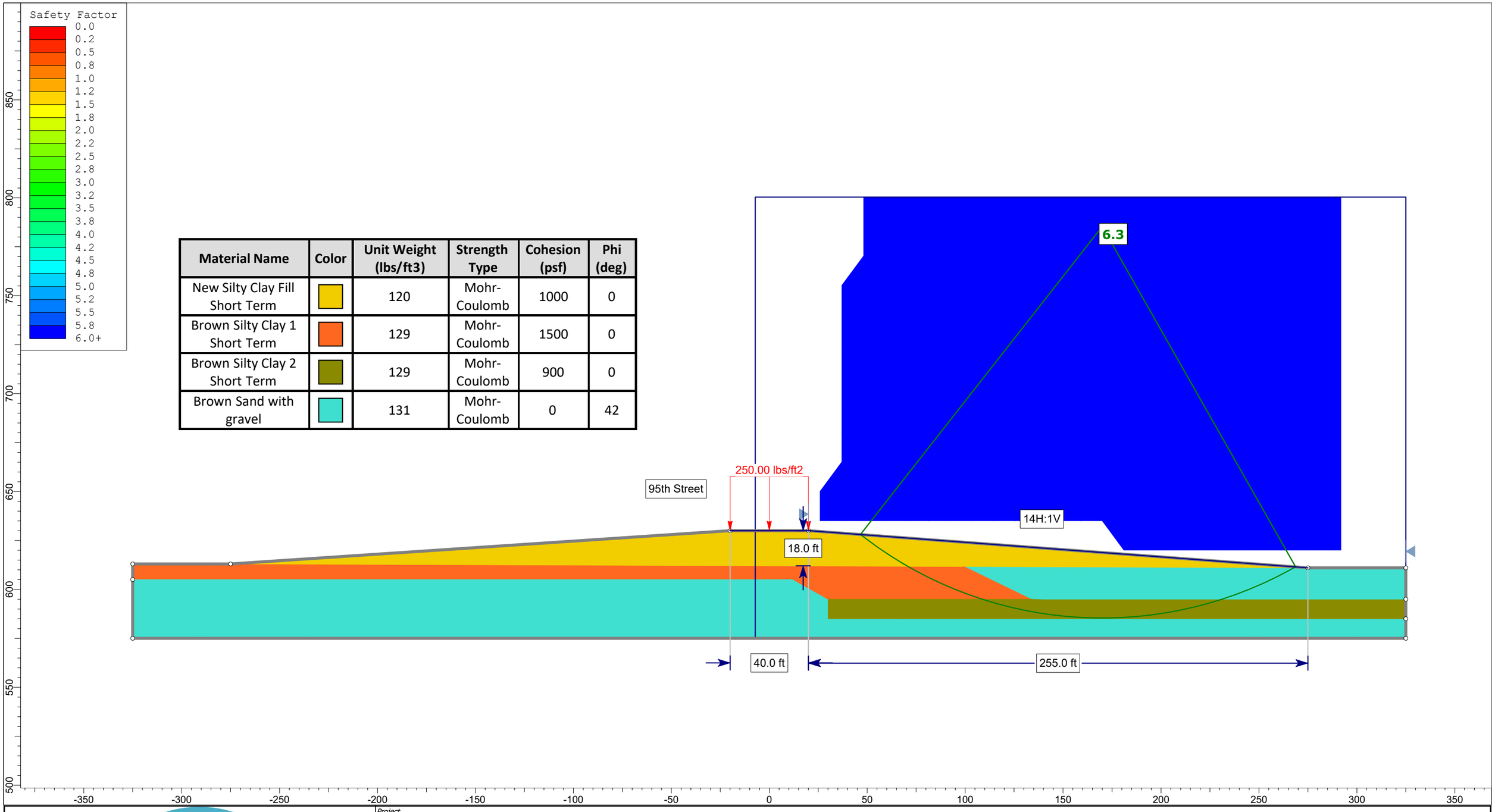
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
New Silty Clay Fill Short Term		120	Mohr-Coulomb	1000	0
Brown Silty Clay 1 Short Term		129	Mohr-Coulomb	1500	0
Brown Silty Clay 2 Short Term		129	Mohr-Coulomb	900	0
Brown Sand with gravel		131	Mohr-Coulomb	0	42

	Project	IDOT PTB 163-017: 95th Street Embankment at IL 171	
	Analysis Description	Exhibit 1 - Left Side of Embankment at Station 199+50 - Slope Circular Failure Short Term	
	Drawn By	TEK	*Company* GSG Consultants, Inc.
	Date	10/27/2021 4:04:05 PM	*File Name* 95th street at 199+50.slmd



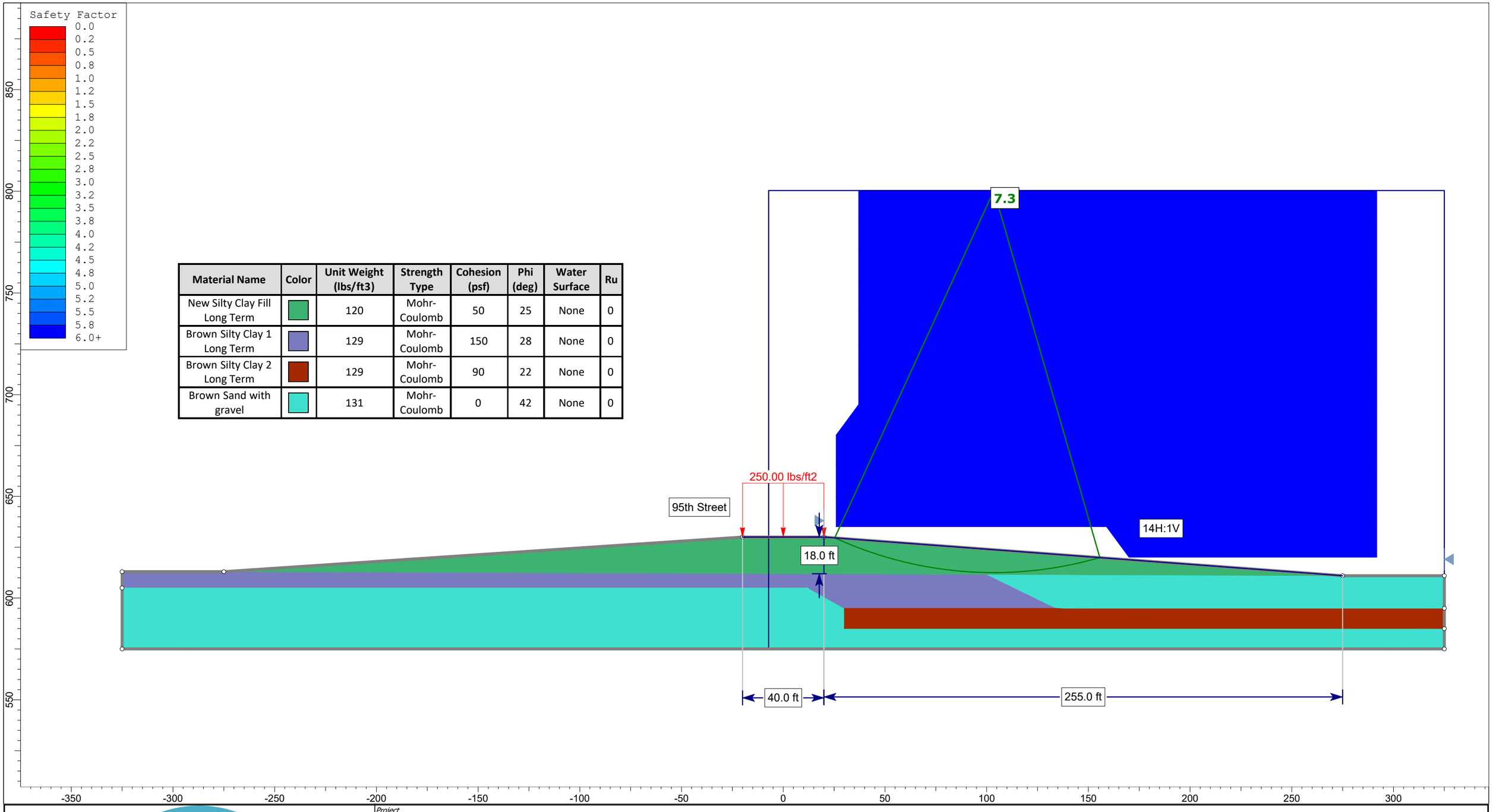
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru
New Silty Clay Fill Long Term		120	Mohr-Coulomb	50	25	None	0
Brown Silty Clay 1 Long Term		129	Mohr-Coulomb	150	28	None	0
Brown Silty Clay 2 Long Term		129	Mohr-Coulomb	90	22	None	0
Brown Sand with gravel		131	Mohr-Coulomb	0	42	None	0

GSG	*Project*	IDOT PTB 163-017: 95th Street Embankment at IL 171	
	Analysis Description	Exhibit 2 - Left Side of Embankment at Station 199+50 - Slope Circular Failure Long Term	
	Drawn By	TEK	*Company* GSG Consultants, Inc.
	Date	10/27/2021 4:10:21 PM	*File Name* 95th street at 199+50.slmd



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
New Silty Clay Fill Short Term		120	Mohr-Coulomb	1000	0
Brown Silty Clay 1 Short Term		129	Mohr-Coulomb	1500	0
Brown Silty Clay 2 Short Term		129	Mohr-Coulomb	900	0
Brown Sand with gravel		131	Mohr-Coulomb	0	42

Project	IDOT PTB 163-017: 95th Street Embankment at IL 171		
Analysis Description	Exhibit 3 - Right Side of Embankment at Station 199+50 - Slope Circular Failure Short Term		
Drawn By	TEK	*Company*	GSG Consultants, Inc.
Date	10/27/2021 4:19:17 PM	*File Name*	95th street at 199+50 - Copy.slmd

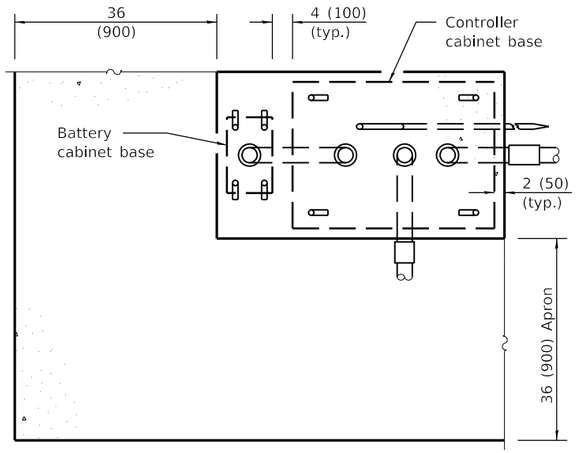


Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru
New Silty Clay Fill Long Term		120	Mohr-Coulomb	50	25	None	0
Brown Silty Clay 1 Long Term		129	Mohr-Coulomb	150	28	None	0
Brown Silty Clay 2 Long Term		129	Mohr-Coulomb	90	22	None	0
Brown Sand with gravel		131	Mohr-Coulomb	0	42	None	0

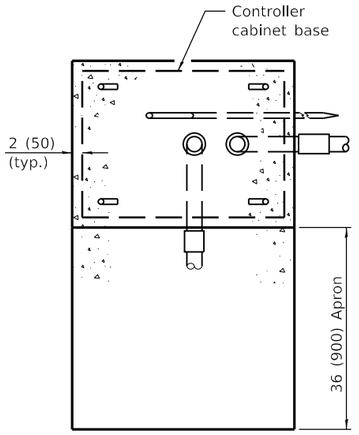
Project	IDOT PTB 163-017: 95th Street Embankment at IL 171	
Analysis Description	Exhibit 4 - Right Side of Embankment at Station 199+50 - Slope Circular Failure Long Term	
Drawn By	TEK	*Company* GSG Consultants, Inc.
Date	10/27/2021 4:20:20 PM	*File Name* 95th street at 199+50 - Copy.slmd

APPENDIX F

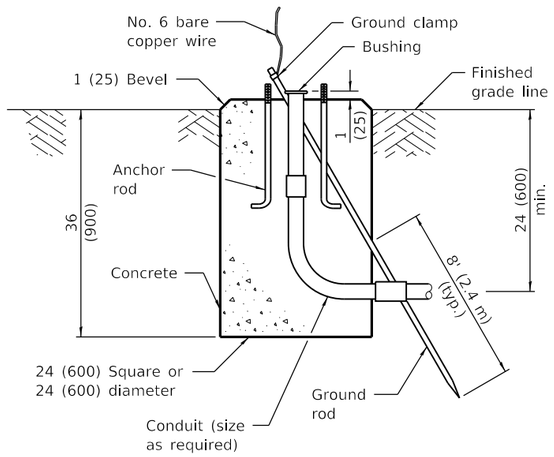
IDOT HIGHWAY STANDARD 878001-11



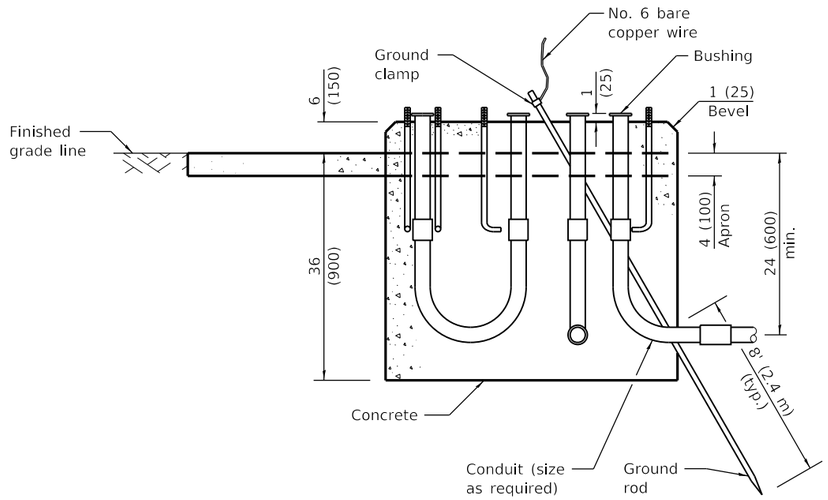
TOP VIEW



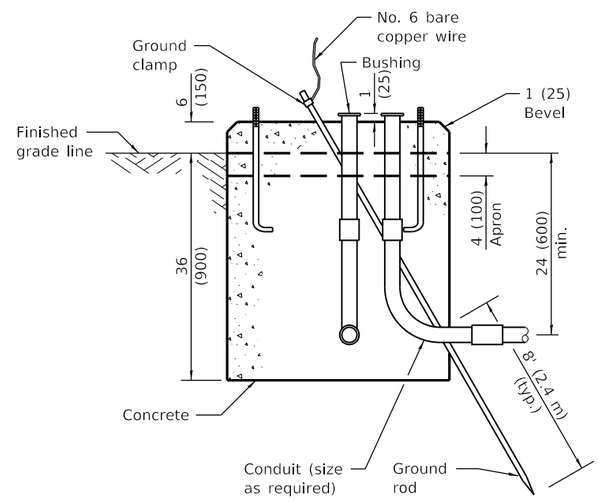
TOP VIEW



TYPE A



TYPE C
FOR GROUND MOUNTED
CONTROLLER CABINET
AND UPS BATTERY CABINET



TYPE D
FOR GROUND MOUNTED
CONTROLLER CABINET

All dimensions are in inches (millimeters)
unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2021
ENGINEER OF OPERATIONS

APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

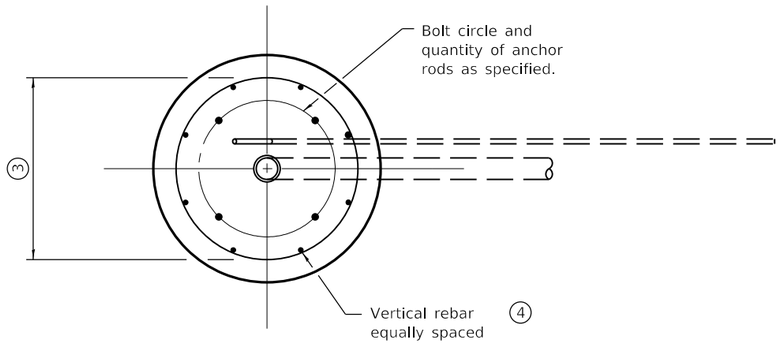
ISSUED 1-1-02

DATE	REVISIONS
1-1-21	Revised anchor rod end in
	Type E detail.
1-1-15	Revised TYPE E detail.

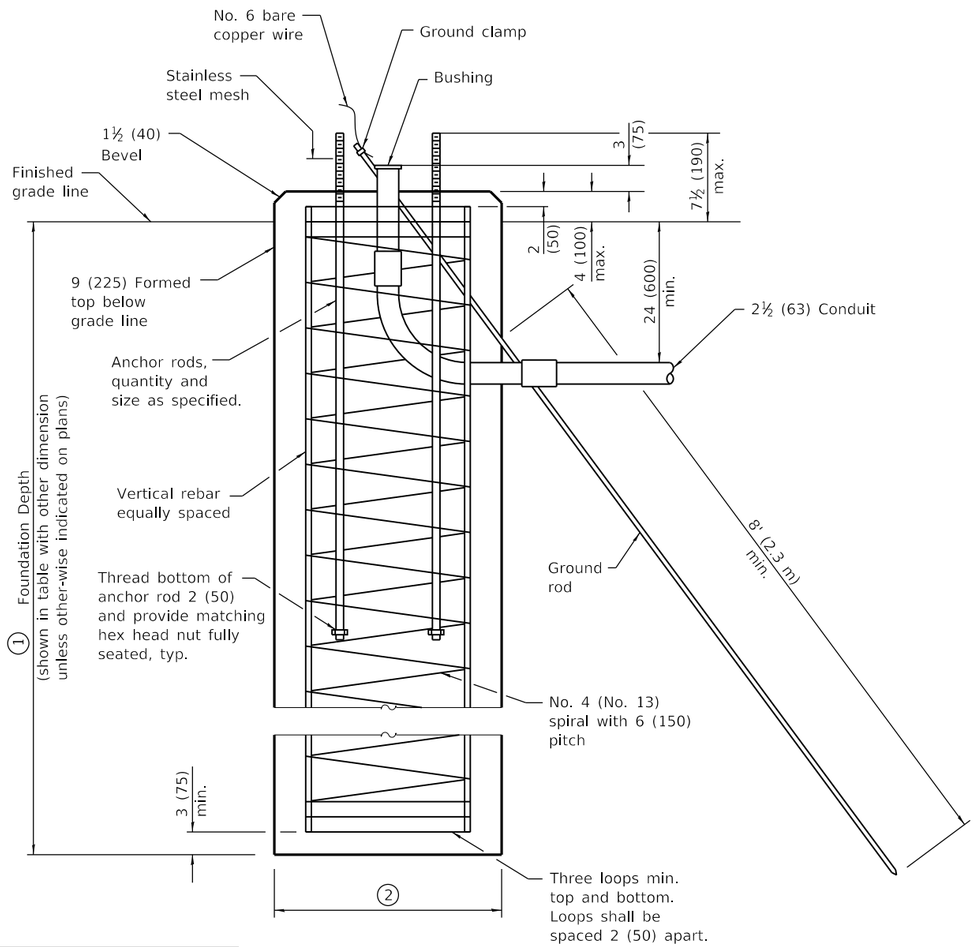
CONCRETE FOUNDATION DETAILS

(Sheet 1 of 2)

STANDARD 878001-11



TOP VIEW



TYPE E

Mast Arm Length	1 Foundation Depth *	2 Foundation Diameter	3 Spiral Diameter	4 Quantity of Rebars	Size of Rebars
Less than 30' (9.1 m)	10'-0" (3.0 m)	30 (750)	24 (600)	8	6 (19)
Greater than or equal to 30' (9.1 m) and less than 40' (12.2 m)	13'-6" (4.1 m)	30 (750)	24 (600)	8	6 (19)
	11'-0" (3.4 m)	36 (900)	30 (750)	12	7 (22)
Greater than or equal to 40' (12.2 m) and less than 50' (15.2 m)	13'-0" (4.0 m)	36 (900)	30 (750)	12	7 (22)
Greater than or equal to 50' (15.2 m) and up to 55' (16.8 m)	15'-0" (4.6 m)	36 (900)	30 (750)	12	7 (22)
Greater than or equal to 56' (16.8 m) and less than 65' (19.8 m)	21'-0" (6.4 m)	42 (1060)	36 (900)	16	8 (25)
Greater than or equal to 65' (19.8 m) and up to 75' (22.9 m)	25'-0" (7.6 m)	42 (1060)	36 (900)	16	8 (25)

* For standard and combination mast arm assemblies. Foundation depths for standard dual mast arms with the longest arm length upto and including 55' (16.8 m) shall be increased by 1' (0.3 m) of that shown in the table, based on the longer of the two arms.

These foundation depths are for sites which have cohesive soils (clayey silt, sandy clay, etc.) along the length of the shaft, with an average Unconfined Compressive Strength (Qu) > 1.0 tsf (100 kpa). This strength shall be verified by boring data prior to construction or with testing by the Engineer during foundation drilling. The Bureau of Bridges & Structures should be contacted for a revised design if other conditions are encountered.

Illinois Department of Transportation

PASSED January 1, 2021
ENGINEER OF OPERATIONS

APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-02

CONCRETE FOUNDATION DETAILS

(Sheet 2 of 2)

STANDARD 878001-11