LETTER REPORT

Preliminary Geotechnical Recommendations for Phase II Outdoor Scenario Training Conceptual at Joint Public Safety Training Campus 4443 W. Chicago Avenue Chicago, Illinois

Prepared for:

DLR Group
333 West Wacker Drive, Suite 850
Chicago, IL 60606

Prepared by:

Geo Services, Inc.
805 Amherst Court
Suite 204
Naperville, Illinois 60565
(630) 305-9186

JOB NO. 20130

12/17/2020

Geo Services, Inc.
Geotechnical, Environmental and Civil Engineering
An MBE - DBE Firm

December 17, 2020

DLR Group
333 West Wacker Drive, Suite 850
Chicago, IL 60606

ATTN: Mr. Scott A. Birney, PE, SE

Project No. 20130

Re: Preliminary Geotechnical Recommendations for Proposed Site Development for Phase II Outdoor Scenario Training Conceptual at
Joint Public Safety Training Campus Project
4443 W. Chicago Avenue
Chicago, Illinois

Dear Mr. Birney:

Geo Services, Inc. has been retained by DLR Group to provide Preliminary Geotechnical recommendations for the proposed Site Development for Phase II – Outdoor Scenario Training Conceptual located at 4443 W. Chicago Avenue in Cook County, Illinois. The analysis and recommendations presented in this letter report are based upon the information provided by your firm which include: Phase II Outdoor Scenario Training Conceptual Design Report dated June 12, 2020 prepared by AECOM for City of Chicago, Assets Information and Services (AIS), JPSTC overall site plan showing proposed phase II development and nearest soil borings and test pit exploration performed by Geo Services for JPSTC phase I project. This brief letter report provides our summary of the information reviewed and our opinions and recommendations based on the data relative for the preliminary engineering analysis for proposed phase II development with the requirement of additional soil borings to meet Chicago Building Department frequency requirements for borings, OUC permitting, and coordinating all aspects of the proposed design. The content of this report has been prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices.

If there are any questions regarding the information submitted herein, please do not hesitate to contact us.

Very truly yours,

GEO SERVICES, Inc.

Arun Tailor
Project Engineer

Drew Ptak, P.E.
Principal

enc.

TABLE OF CONTENTS

SECTION 01: INTRODUCTION

The scope of services was conducted in general accordance with GSI proposal No.20701 dated November 12, 2020.

This brief letter report has been prepared based upon review of the close proximity soil boring/test pit logs and provide our engineering opinion regarding suitable foundation support for the proposed site development for phase II Outdoor Scenario Training Conceptual at Joint Public Safety Training Campus (JPSTC). This report included logs of 3 soil borings SB- 13, SB-39, SB-41 and 5 test pits TP-12, TP-16, TP-17, TP-18 and TP-20 performed by Geo Services Inc. in June-July 2019 and August 2020 for the Joint Public Safety Training Campus (JPSTC) Phase I Project. Copies of the Soil boring logs along with a location diagram are included in this report.

Table 1 below summarizes the Soil boring and Test Pit location information with the approximate ground surface elevation at the time of the field exploration.

TABLE 1 SOIL BORING LOCATION INFORMATION

Boring & Test Pit #	Northing	Easting	Depth of Boring /Test Pit (ft.)	Approximate Ground Surface Elevation* (CCD)	Approximate Termination of Boring Elevation(ft.) (CCD)
SB-13	1904289.5	1146826.9	50.0	+33.1	-16.9
SB-39	1904666.3	1146679.6	50.0	+34.7	-15.3
SB-41	1904391.8	1146688.0	50.0	+34.8	-15.2
TP-12	1904573.9	1146762.3	10.0	n/a	n/a
TP-16	1904391.3	1146719.8	10.0	n/a	n/a
TP-17	1904395.2	1146823.7	10.0	n/a	n/a
TP-18	1904399.8	1146967.8	10.0	n/a	n/a
TP-20	1904267.2	1146828.0	10.0	n/a	n/a

- Project Soil Boring Location obtained from handheld GPS device and elevations estimated from topographic survey drawing by American Surveying and Engineering, P.C dated 12/18/2017.
- *Soil borings SB-13 and Test Pit exploration performed in June 2019
- *SB-39 and SB-41 drilled in August 2020.
- n/a Not Available

A description of soil and groundwater conditions, general construction considerations for the site, along with general notes in Appendix A, site location map found in Appendix B, boring location and Environmental Test Pit location diagram in Appendix C, Soil boring logs and Test Pits logs/records found in Appendix D, Lab test results found in Appendix E and Proposed Phase II concept drawing found in Appendix F are included with this report.

Project Site location

The project site currently consists of a vacant parcel of land located southeast of the intersection of W. Chicago Ave. and N. Kilbourn Ave located in City of Chicago, Cook County, Illinois with the following range/township information: T39N R13E, Section 10. Figure 1 shows the project location map.

Figure 1: Project Location, from Google Earth

SECTION 02: PROJECT DESCRIPTION

The scope of the phase II project is to design multiple smaller design build tactical village structures, which allows the first responders to conduct scenario-based training in a realistic, context- based environment. The structures can also be utilized by CFD to conduct EMS scenario training as well as for low visibility search and rescue instruction. As shown in latest phase II concept drawings, the proposed development includes the 2 & 3 story mixed used tactical building; two/three flat residential tactical building, six-story burn tower or live fire tower building, two to four story burn building or live fire building and two-story technical rescue prop building. In addition, site improvements include surrounding roadway pavement.

Table 2 below summarizes the proposed structures – type, approximate sq. ft size, proposed finished floor elevation with estimated foundation load.

TABLE 2 SUMMARIES OF PROPOSED PHASE II STRUCTURES

Type of Structure		Aprox. Sq.ft.	Estimated Proposed F.F Elevation (CCD)	Column Load (KIPS)	Foundation Load (KIPS/SF)
Multi story mixed used tactical building (Stick Framed no basement) supported on Shallow Foundation	2- Story Tactical	2,875	+40.80	-	5.0
	2- Story Tactical	2,875			
	3- Story Tactical	5,610			
Two/Three Flat Residential tactical building (Stick Framed no basement) supported on Shallow Foundation	2- Story Residential + Garden Unit	3,050	+32.50	-	5.0
	2- Story Residential	2,285	+41.50		
	3- Story Residential	3,240	+41.50		
Multi story mixed use Live fire building (R.C.C framed) Supported on drilled shaft foundation	4-story Live Fire	4,640	+38.0	TBD	TBD
	2-story Live Fire	2,700			
	3-story Live Fire	4,125			
Six Story Burn Tower Live fire building (R.C.C framed) Supported on drilled shaft foundation		15,265	+40.60	TBD	TBD
Two- Story Technical Rescue Prop building (R.C.C framed) Supported on drilled shaft foundation		11,000	+36.50	TBD	TBD

- TBD= To be determined later

SECTION 03: SUBSURFACE AND WATER TABLE CONDITIONS

The subsurface soil conditions described in this section were developed based on the review of the soil borings and review of the results of laboratory results. Detailed descriptions of the subsurface soils, as well as, the approximate ground surface elevations and laboratory test results are provided on the soil boring logs.

In general, the test pits encountered topsoil/sandy topsoil from the ground surface to approximately one (1) to two (2) feet depth. Underlying the sandy topsoil was poorly graded sand fill/silty sand fill to the total excavation depth of ten (10) feet. The site soils appear to consist of primarily fill material from ground surface to ten (10) feet.

The surficial soil conditions at soil borings SB-13, SB-39 and SB-41 consist of approximately 12 inches of topsoil/sandy topsoil. Underlying the topsoil, a 7 to 10 feet layer of non-cohesive fill material was encountered and consisted of medium dense to loose, poorly graded sand/silty sand with varying gravel contents. Below the fill materials, the soil stratigraphy continues with strata of stiff to very stiff lean clay with sand / silty clay with sand to depth of 11 feet to 35 feet below grade surface with the exception of soil boring SB-39 and SB-41 where approximately 5 feet thick layer of silty sand and gravel layer encountered at shallower depth from 17 to 22 below grade surface. The soil stratigraphy then continues with strata of dense to very dense silt/sandy silt/ clayey silt to termination of boring at approximate 50 feet below the grade surface with the exception of SB-41 where very dense silty gravel and fractured rock encountered at 37 feet below grade surface to termination of boring at approximate 50 feet below the grade surface.

In the above listed borings, the soil samples above 11 feet, predominately granular fill materials, had moisture contents ranging from 1% to 15% with an average of 8 %. Similarly, moisture content of the soil samples below 11 feet to 35 feet, predominately cohesive soils, had moisture contents ranging from 11% to 34% with an average of 17 %.The unconfined compressive strengths (Qu) for cohesive soil samples below 11 feet to 35 feet ranging from 1.25 tsf to 4.5+ tons per square foot (tsf) with an average of 3.4 tons per square foot (tsf).

Based on review of the boring logs groundwater depths encountered at 6.0 feet to 8.5 feet below the ground surface and this reading is shown on boring logs, also summarized in table 3.

TABLE 3 GROUND WATER OBSERVATIONS

Boring No.	Approximate Ground Surface Elevation (CCD)	Ground Water Observations While Drilling / Upon Completion	
		Depth below Ground Surface (ft.)	Elevation (CCD)
SB-13	33.1	6.0 / n/a	+27.1/ n/a
SB-39	34.7	7.5 / n/a	+27.2 / n/a
SB-41	34.8	8.5 / n/a	+26.3 / n/a

- Rotary-wash drilling technique was used below 10 feet of depth.
- n/a= Not Available

Based on the coloration change in the soils from dark brown, gray and black to gray, we estimate a depth of 13.0 feet (+22.0 CCD) below existing ground surface for the long-term groundwater table.

SECTION 04: FOUNDATIONS RECOMMENDATIONS

General

This section provides recommendations regarding foundation design and construction for the proposed Phase II Outdoor Scenario Training Conceptual at JPSTC based on the project information provided by DLR Group and review of the subsurface data of available close

proximity soil boring performed by GSI at the project site and constructability with respect to existing site conditions.

We recommend that an economic analysis for each foundation option presented below be considered before choosing a foundation system for the below listed structures.

- 2 & 3 story mixed used tactical building (Stick framed no basement)
- 2 & 3 story flat residential tactical building (Stick framed no basement)
- 6 story burn tower or live fire tower building (RCC framed)
- 2 to 4 story burn building or live fire building (RCC framed)
- 2 story technical rescue prop building (RCC framed)

The approximate proposed finish floor elevations and estimated substructure loads for the proposed structures provided by DLR Group are shown in Table 1 of this report.

4.1 Additional Soil Boring Recommendations

Additional soil borings will be required at each structure footprint to meet City of Chicago, Department of Building requirements. Minimum number of borings varies depending on the footprint size of the structure (i.e. 2 borings for 1,000 sq.ft; 21 borings for 250,000 sq.ft). We would recommend that additional borings be extended to a minimum depth of 10 feet below any existing fill soils into natural virgin soils (approximate 20-ft.depth).

4.2 Shallow Foundation Recommendations

The proposed slab-on-grade 2 to 3 story mixed used tactical building-stick framed no basement with minor load structure may be supported on shallow foundation system (I.e., wall and spread footing) bearing in competent dense sand & gravel fill layer. In addition, footings should be placed at a depth to provide adequate frost cover protection. A shallow foundation system bearing in the dense sand & gravel fill layer can be designed for a maximum net allowable soil bearing pressure of 1,500 psf. The net allowable soil bearing pressure refers to that pressure which may be transmitted to the foundation bearing soils in excess of the final minimum surrounding overburden pressure.

Where higher bearing pressure are needed for design; a shallow foundation can be supported on natural silty clay soil or new engineered fill / lean concrete overlying competent natural silty clay soils at the depth of 8 to 11 feet below the existing grade. A shallow foundation system bearing in the natural silty clay soil can be designed for a maximum net allowable soil bearing pressure of 3,000 psf. Competent natural silty clay soils can be identified on the attached boring logs as silty clay-stiff with unconfined compressive strength value in excess of 1.25 tsf. (See the table 4- Remedial Treatment Recommendations).

TABLE 4 ESTIMATED ELEVATION OF SUITABLE FOUNDATION BEARING

BORING	EXISTING GRADE*	EXISTING FILL DEPTH (FEET)	3000 PSF NATIVE BEARING		DEPTH OF UNDERCUT FOR ASSUMED FOOTING
			DEPTH (FEET)	ELEVATION (FEET)* (CCD)	UNDERCUT (FEET)
SB-13	33.1	8.0	8.0	25.1	8.0
SB-39	34.7	10.5	11.0	23.7	11.0
SB-41	34.8	9.5	10.0	24.8	10.0

- Note: 1. verify in field
- Chicago City datum (CCD)

If soils with less than adequate bearing strength are noted at the foundation level during footing construction, the weaker soils encountered at the base of the footings should be undercut to reach suitable bearing soils, and the undercut area filled with lean concrete or a suitable compacted crushed stone structural fill material. Suitable crushed stone fill materials include materials meeting the gradation requirements of IDOT CA-1, CA-7 and CA-6.

Structural fill utilized to support footings should be extended at least 6 inches beyond the proposed footing limits and then one foot horizontally for each one foot of fill placed below the base of the footing. This new fill should consist of inorganic material free of debris and should be placed in maximum 8-inch loose lifts and compacted to a minimum of 95% of the maximum dry density obtained in accordance with ASTM Standard D-1557, modified Proctor method. If CA-1 or CA-7 crushed stone materials are used, they can be compacted by appropriate equipment that provide proper consolidation. If open-graded stone is used, a non-woven geotechnical fabric should be used between the structural fill and the bottom of undercut to prevent fine migration from the subgrade to the structural fill. The moisture content of the fill should be controlled within +2% of the optimum moisture content.

To provide adequate frost protection, we recommend that footing foundations in non-heated areas be situated at a minimum depth of 4 feet below final grade while the perimeter footings in heated areas should be situated at a minimum depth of 4.0 feet below final outside grade. Also, in order to prevent disproportionately small footings, we recommend that continuous wall footings have a minimum width of 3 feet and that isolated column footings have a minimum lateral dimension of 4 feet.

Settlement of the shallow foundation structures designed in accordance with our recommendations presented in this section is expected to be within tolerable limits for the proposed building. The maximum foundation settlement is expected to be in the range of 1 inch or less. These settlement values are based on our engineering experience with the soil and the anticipated structural loading, and are to guide the structural engineer with his design.

4.3 Deep Foundation Drilled Shaft Foundation Recommendations

Based on the existing soil conditions and the provided site development information the use of shallow spread footings may be not economical for support of the RCC framed building foundations due to the existing fill material which lies in the range of 8 to 11 feet below the existing grade. A deep foundation system consisting of drilled shafts is recommended for the support of the proposed Multi story mixed use Live fire building; 6-story Burn Tower structure and two - Story Technical Rescue Prop building.

The foundation may be constructed using a foundation system of straight shaft or belled caissons bearing at or below depths of about 27 to 35 feet below existing grade (within +5 CCD to -5 CCD), in the very stiff to hard clay stratum encountered at this depth. A maximum allowable bearing of 12.0 kips per square foot (ksf) could be used for design using Service Load Design Method, SLD, (also known as Allowable Stress Design, ASD).

TABLE 5

ESTIMATED ELEVATION OF SUITABLE DRILLED SHAFT BEARING

BORING	EXISTING GRADE*	Drilled Shafts Bearing 12 ksf	
		DEPTH (FEET)	ELEVATION* (CCD)
SB-13	+33.1	25	+8.1
SB-39	+34.7	30	+4.7
SB-41	+34.8	30	+4.8

- Note: 1 verify in field
- Elevations in feet, Chicago City Datum (CCD)

If necessary, the bases of the foundations should be enlarged by belling to achieve the required bearing area. Belling should be feasible in the very stiff clay soils that overlie the recommended soil bearing layer. Where silt strata cause caving problems, it may be necessary to extend temporary casing deeper and form the bell at a lower elevation. Based on the estimated bearing pressures, the consistency of the soils encountered and the magnitude of the loads expected, we estimate a maximum settlement of 1/2 inch. It should be noted that these settlement values are for soil compression only and that elastic compression of the caisson concrete should be added to these values.

Based on soil strength data collected from in-situ Qp test, laboratory Rimac test, water content of the cohesive soil, calculated overburden stress, ground water level, depth of excavation and recommended shaft diameter, we have calculated squeeze analysis for the worst-case scenario and attached in Appendix of this report. There were no soft soils encountered at any of the borings and squeeze potential is calculated as low.

To prevent groundwater, as well as, upper fill materials and silt, sand and gravel soil granular fill present in the borings from sloughing/caving into the caisson boreholes during construction, we

recommend that a temporary steel casing be employed at the surface during construction. Potential use for temporary casing will be required to a depth of approximately 25 feet below the ground surface; the temporary casing should be extended through the granular fill and at least 2 feet into the underlying cohesive soils to provide a seal.

If casing is used for drilled shaft construction, it should be withdrawn in a slow continuous manner maintaining a sufficient head of concrete above the bottom of the casing at all times to prevent infiltration of water or the creation of voids in shaft concrete. The caisson bell should have a base angle of at least 60 degrees (from horizontal) and the bell diameter should not exceed 3 times the shaft diameter.

Care should be taken to assure that soils do not slough into the caisson shaft and that voids do not occur during concrete placement. After the bearing materials have been reached, belling (if used on hard clay soils), cleaning, testing and concrete placement should occur as quickly as possible. Because the caisson technician will likely not be lowered into the excavation to observe the base of the caisson excavation directly due to safety concerns, it will be necessary to oversize the bell area by 15%- or 1-foot diameter, whichever is smaller, and any loose spoils be back bladed to the outside edge prior to placing concrete. As an alternative, a camera can be used to inspect the bottom of the bell

A minimum caisson shaft diameter of 4.0 feet is recommended. The concrete slump should be in the range of 5 to 7 inches. The recommended minimum 28-day compression strength of the concrete should be a minimum of 4,000 psi. Caisson concrete may be placed by the free fall method into the clean and dry shaft excavations as long as concrete does not hit the sides of the shaft or the rebar cage during placement. The caissons should be excavated and backfilled with concrete in one work-day shifts.

4.4 Slabs-On-Grade Construction

Based on review of the project site topographic survey drawing by American Surveying and Engineering, P.C dated 12/18/2017. The proposed site existing surface elevation ranges from 33.0 to 35.0 feet CCD. Table 6 blow summarize the amount of fill required to reach the design grade to match the proposed finished floor elevations (FF) for the proposed structures.

TABLE 6
SUMMARIES OF PROPOSED PHASE II STRUCTURES

Type of Structure		Estimated Proposed F.F Elevation (CCD)	Cut / Fill
Multi story mixed used tactical building (Stick Framed no basement) supported on Shallow Foundation	2- Story Tactical	+40.80	6.0' Fill
	2- Story Tactical		
	3- Story Tactical		
Two/Three Flat Residential tactical building (Stick Framed no basement) supported on Shallow Foundation	2- Story Residential + Garden Unit	+32.50	2.0' cut
	2- Story Residential	+41.50	
	3- Story Residential	+41.50	7.0' Fill
Multi story mixed use Live fire building (R.C.C framed) Supported on drilled shaft foundation	4-story Live Fire	+38.0	4.0' Fill
	2-story Live Fire		
	3-story Live Fire		
Six Story Burn Tower Live fire building (R.C.C framed) Supported on drilled shaft foundation		+40.60	6.0' Fill
Two- Story Technical Rescue Prop building (R.C.C framed) Supported on drilled shaft foundation		+36.50	2.5' Fill

The borings and test pit records indicate that the existing surface materials below the 1 to 2 feet black topsoil consists of dense to medium dense non-cohesive fill materials were present at all of the borings drilled in and around the proposed phase II structures "footprints". The non-cohesive fill was variable in consistency with poorly graded sand with gravel/silty, sand/clayey sand and gravel materials.

Assuming that the 2 to 3 story mixed used tactical building-stick framed no basement structure foundation will be done as slab-on-grade and multi-story mixed use Live fire building; 6-story Burn Tower structure and two-Story Technical Rescue Prop building foundation supported on drilled shaft as described in previous sections. Stripped topsoil and any organic, unsuitable or deleterious material should be removed from the surface. The subgrade should also be thoroughly proofrolled as described below prior to placing any new engineered fill or base course for support of the floor slab and adjacent pavement.

Proofrolling of the resultant subgrade should be performed to locate unstable/unsuitable soils that should be stabilized /removed. During the proofrolling procedure, the soil stripped to design subgrade elevation is rolled with the heaviest piece of construction equipment available at the site, such as a heavily loaded tandem axle dump truck having a gross weight of not less than 25 tons. Areas exhibiting deflection or rutting should be removed (or disked, dried and recompacted) and the proofrolling continued until all unsuitable soils have been located and removed, or improved in-place.

Where new fill is required to reach the design slab or pavement subgrade elevation, we recommend that an approved inorganic material be utilized for structural fill. This material should consist of material that is free of organic matter, topsoil, and debris. Fill material used in pavement or slab-on-grade subgrade that may be exposed to freezing temperatures should also be non-frost susceptible. Provided they can be moisture conditioned to facilitate proper compaction, the on-site non-cohesive sand and gravel fill materials appear to be suitable for reuse as engineered fill below floor slabs and pavements. New fill should be placed in maximum 8-inch thick loose lifts and be compacted to a minimum of 95% of the maximum dry density obtained in accordance with ASTM Standard D-1557, modified Proctor method.

Beneath slab-on-grade areas, a minimum of 6 to12 inches of granular base course material is recommended to facilitate fine grading and provide a capillary cut-off. Typical base course materials include IDOT gradations CA-6 (well-graded sand and gravel with fines) or CA-7 (¼" to ¾" chips). The CA-6 material should be compacted using vibratory equipment to 95 percent Modified Proctor density, the CA-7 until a dense and stable state is achieved. The CA-7 material is considered free-draining, providing a superior capillary break.

Concrete floors should be isolated from foundation elements, i.e., jointed around columns and foundation walls, to permit minor differential settlement to occur without causing undue cracking or other distress. They should also be provided with adequate reinforcement and jointing to minimize the effects of any slab movement and control minor cracking. In this regard, slab-on-grade construction and jointing should be in accordance with ACI 360-10 (Guide to Design of Slabs-on-Ground). A subgrade modulus of up to 150 pci is recommended for concrete floor slab design, with a higher value possible if the upper subgrade is lime stabilized.

4.5 Deep Foundation Lateral Soil Properties

The following Table contains a tabulation of soil parameters to be used design for deep foundation lateral resistance.

TABLE 7
LATERAL SOIL PARAMETERS

Material (Elevation, ft.) (CCD)	Unit Weight (pcf)	Drained Friction Angle (°)	Undrained Cohesion (psf)	Lateral Modulus of Subgrade Reaction k (pci)[1]	Strain ε_{50}
Loose to Medium Dense Poorly Graded Sand/Sand and Gravel / Clayey Sand and Gravel (Fill) (+35.0 to +22.0)	120	28	-	60	-
Stiff Lean Clay / Silty Clay (CL) (+22.0 to +5.0)	125	28	1,500	650	0.005
Very Stiff to Hard Lean Clay (CL) (+5.0 to -5.0)	125	28	4,000	2,000	0.004
Very Dense Clayey Silt / Silt (ML) (-1.0 to -17.0)	125	30	-	90	-

Note: 1. Values recommended for use in design from L-Pile software manual.

4.6 Pavement Design and Construction

Pavement subgrade preparation should include stripping of any surficial topsoil or root zone materials. Existing fill may be left in-place subject to proof-rolling. The exposed subgrade and any new fill should then be compacted to 95 percent Modified Proctor density.

Based on the predominately cohesive fill anticipated at subgrade level, an Illinois Bearing Ratio (IBR) value of 3.0 could be used in the design of pavements. This value considers that any soft or unstable areas will be remediated during subgrade preparation.

Base course and subbase materials should otherwise conform to IDOT gradation CA-6 and be compacted to 95 percent Modified Proctor density or 100 percent of the Standard Proctor (ASTM D 698) maximum density value. Bituminous materials should be an approved IDOT Superpave minimum design, with N30 or N50 typical for light-duty parking lots and N50 or N70 for heavy-duty pavements. Standard Specifications for Road and Bridge Construction, Sections 406 and 1032 should also be referenced. They should be compacted to between 93 and 97 percent of their theoretical maximum density, as determined by the supplier.

Portland Cement Concrete (PCC) or heavy-duty bituminous concrete is recommended for pavements with heavy truck traffic and high traffic load areas such as fire truck/ semi-trucks /

school bus /garbage truck dumpster loading areas. Standard Specifications for Road and Bridge Construction should be followed.

SECTION 05: GENERAL CONSTRUCTION CONSIDERATIONS

All excavations that extend greater than 4 feet in depth should be designed in accordance with OSHA regulations with properly sloped or braced sides to prevent excavation instability. Excavation safety is the responsibility of the contractor; however, we recommend that excavation sides be sloped at 1-1/2H:1V or flatter above the water table for this purpose. Stockpiles of material or equipment should not be placed near the top of excavation slopes.

All soils which become softened or loosened at the base of foundation excavation areas or subgrade areas should be carefully re-compacted or removed prior to placement of foundation concrete or fill material. No foundation concrete or structural fill should be placed in areas of ponded water or frozen soil.

It is recommended that all foundation subgrade soils be observed by an experienced geotechnical engineer or his field representative prior to placement of concrete or fill, in order to confirm that the subgrade conditions are consistent with the design assumptions and recommendations contained in this report. Periodic density testing should be performed on any fill in order to document that density requirements have been met.

During excavation for the proposed improvements, movement of adjacent soils into the excavation should be prevented. All excavations should be performed in accordance with the latest Occupational Safety and Health Administration (OSHA) requirements

SECTION 06: GENERAL QUALIFICATIONS

The analysis and recommendations presented in this report are based upon the review of the close proximity soil boring and information provided by DLR group for the indicated locations. This report does not reflect any variations that may occur between test pit and borings across the site. In addition, it is recommended that Geo Services, Inc. be retained to perform additional soil boring to meet Chicago Building Department frequency requirements and for construction observation and thereby provide a complete professional geotechnical engineering service through the observational method.

This report has been prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. In the event that any changes in the nature, design or location of the project as outlined in this report are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions of this report modified or verified in writing by the geotechnical engineer. Also note that Geo Services, Inc. is not responsible for any claims, damages, or liability associated with any other party's interpretation of this report's subsurface data or reuse of the report's' subsurface data or engineering analyses without the express written authorization of Geo Services, Inc.

If there are any questions regarding the information submitted herein, please do not hesitate to contact us.

APPENDIX A

GENERAL NOTES

GENERAL NOTES

CLASSIFICATION

American Association of State Highway & Transportation Officials (AASHTO) System used for soil classification.

Cohesionless Soils

Relative Density	No. of Blows per foot N
Very Loose	0 to 4
Loose	4 to 10
Medium Dense	10 to 30
Dense	30 to 50
Very Dense	Over 50

Cohesive Soils

Consistency	Unconfined Compressive Strength - qu (tsf)
Very Soft	Less than 0.25
Soft	0.25 - 0.5
Medium Stiff	0.5 - 1.0
Stiff	1.0 - 2.0
Very Stiff	2.0 - 4.0
Hard	Over 4.0

TERMINOLOGY

Streaks are considered to be paper thick. **Lenses** are considered to be less than 2 inches thick. **Layers** are considered to be less than 6 inches thick. **Stratum** are considered to be greater than 6 inches thick.

DRILLING AND SAMPLING SYMBOLS

SS:	Split Spoon 1-3/8" I.D., 2" O.D.	HS:	Housel Sampler
ST:	Shelby Tube 2" O.D., except where noted	WS:	Wash Sample
AS:	Auger Sample	FT:	Fish Tail
DB:	Diamond Bit - NX: BX: AX	RB:	Rock Bit
CB:	Carboloy Bit - NX: BX: AX	WO:	Wash Out
OS:	Osterberg Sampler		

Standard "N" Penetration: Blows per foot of a 140 lb. hammer falling 30" on a 2" O.D. Split Spoon

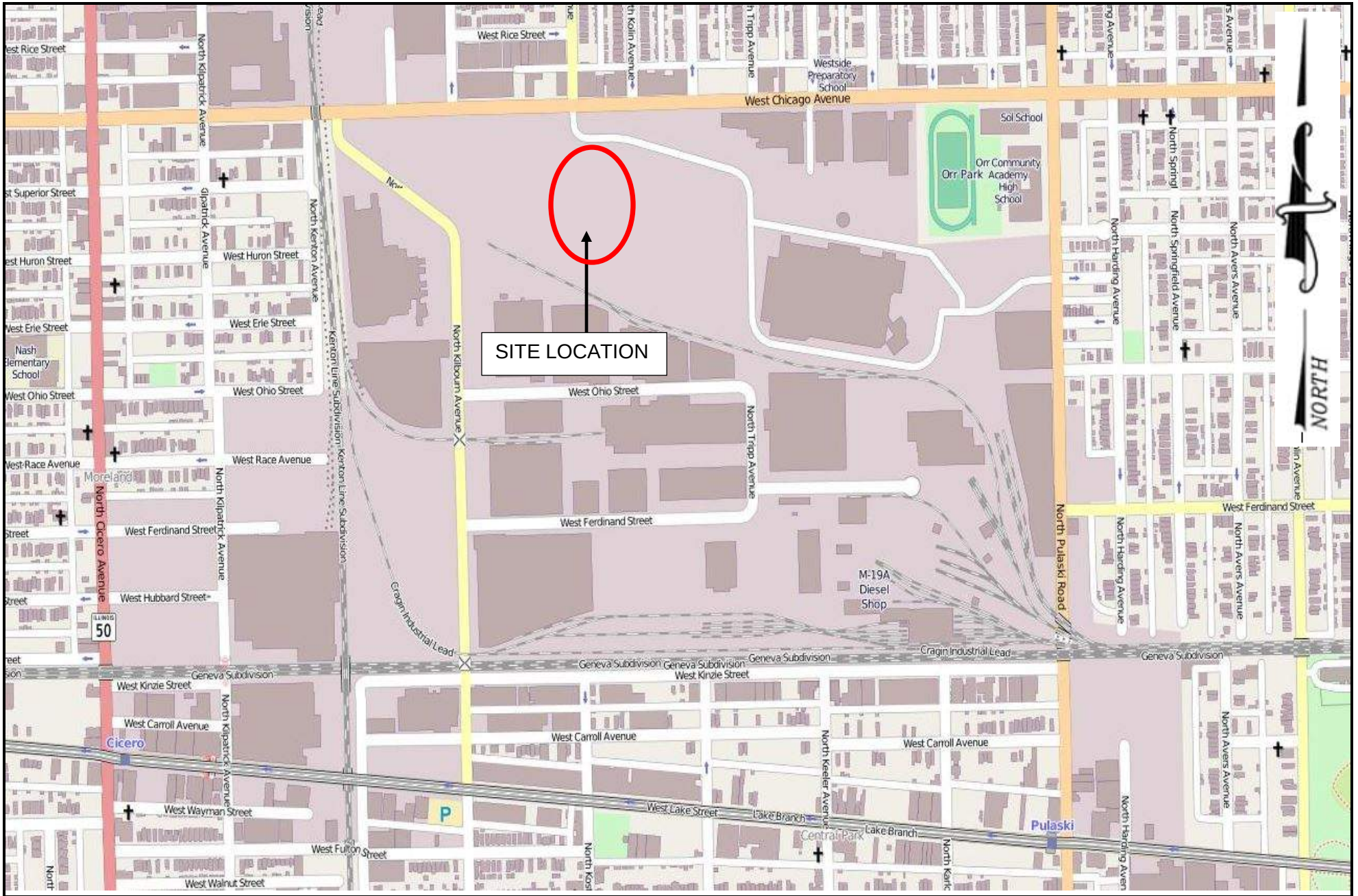
WATER LEVEL MEASUREMENT SYMBOLS

WL:	Water	WD:	While Drilling
WCI:	Wet Cave In	BCR:	Before Casing Removal
DCI:	Dry Cave In	ACR:	After Casing Removal
WS:	While sampling	AB:	After Boring

Water levels indicated on the boring logs are the levels measured in the boring at the times indicated. In pervious soils, the indicated elevations are considered reliable ground water levels. In impervious soils, the accurate determination of ground water elevations is not possible in even several days observation, and additional evidence on ground water elevations must be sought.

APPENDIX B

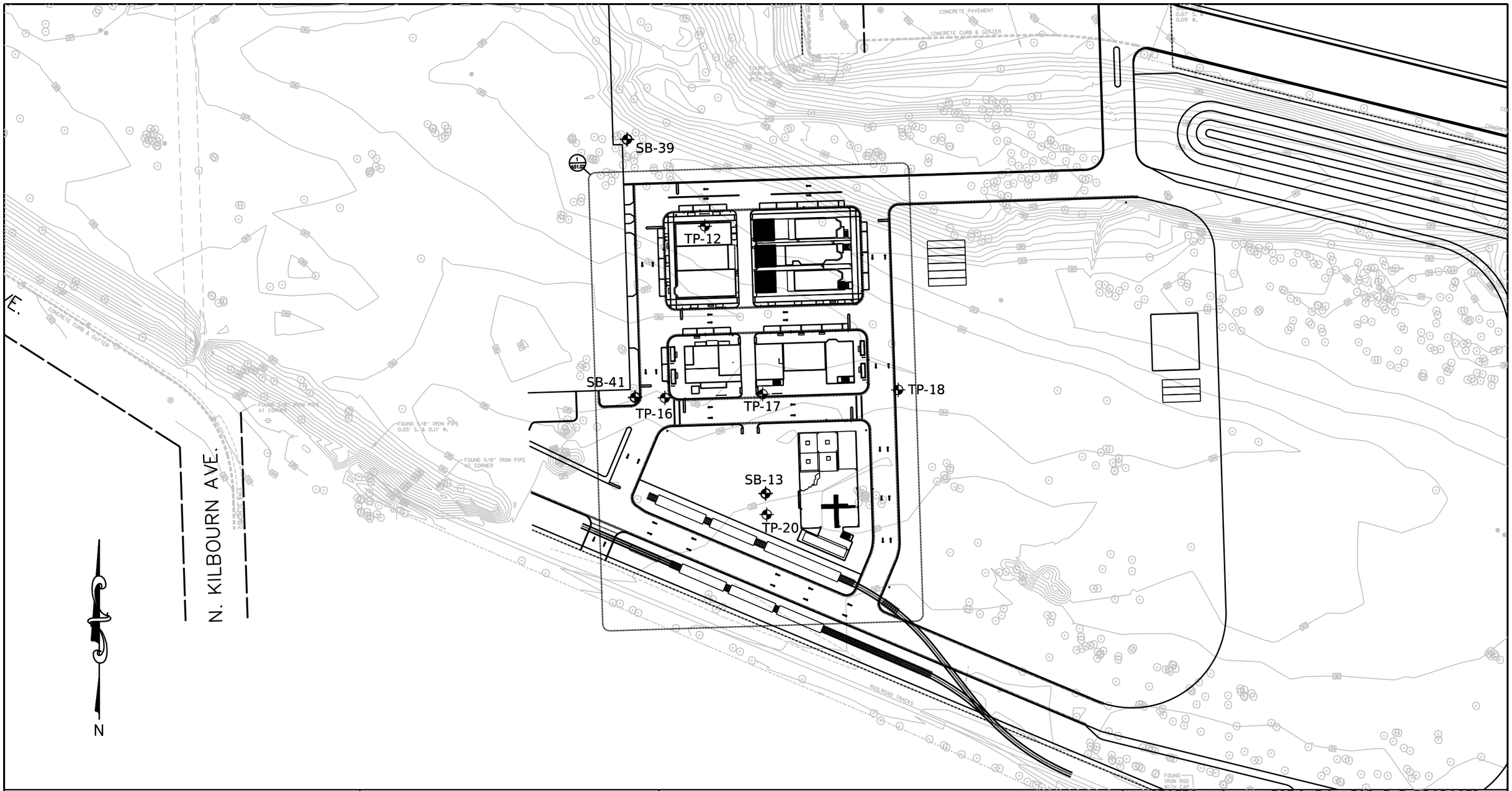
SITE MAP



SITE LOCATION MAP **GEOTECHNICAL RECOMMENDATION** **Phase II -Outdoor Scenario Training Conceptual** **Joint Public Safety Training Campus** **4443 W. Chicago Avenue,** **Cook County, Chicago, IL**	***Geo Services, Inc.*** Geotechnical, Environmental & Civil Engineering 805 Amherst Court, Suite 204 Naperville, Illinois 60565 (630) 355-2838	DRAWN BY	AT
		APPROVED BY	AJP
		DATE	December 15, 2020
		GSI JOB No.	20130
		SCALE	NTS

APPENDIX C

SOIL BORING & TEST PIT LOCATION MAP



LEGEND
SOIL BORING ⊕ SB-XX
TEST PIT ⊕ TP-XX

Geo Services, Inc.
Geotechnical, Environmental & Civil Engineering
805 Amherst Court, Suite 204
Naperville, Illinois 60565
(630) 355-2838

REVISIONS

ZONE	REV	DESCRIPTION	DATE	APPROVED

GEOTECHNICAL INVESTIGATION FOR THE PROPOSED
PHASE 2 SITE DEVELOPMENT
OUTDOOR SCENARIO TRAINING CONCEPTUAL
JOINT PUBLIC SAFETY TRAINING CAMPUS
4301 W. CHICAGO AVENUE, CHICAGO, ILLINOIS

SOIL BORING LOCATION DIAGRAM

SIZE	REV.	GSI Job No.	DRAWN BY	APPROVED BY
B	1	20130	RWC	AJP

SCALE: 1"=150' | DATE: 12/9/2020 | SHEET: 1 OF 1

...\20130_loc (100 SCALE).dgn 12/9/2020 9:52:12 AM

APPENDIX D

BORING LOGS & TEST PITS LOGS

Geo Services, Inc.
Geotechnical, Environmental & Civil Engineering
805 Amherst Court, Suite 204
Naperville, Illinois 60565
(630) 355-2838

STRUCTURE FOUNDATION BORING LOG

DATE 6/27/2019

LOGGED BY RT

GSI JOB No. 19059

Project: Geotechnical Investigation For Joint Public Safety Training Campus (JPSTC)

Location: 4301 W. Chicago Avenue, Chicago, Illinois

County: Cook Drilling Method: Hollow Stem Auger/Rotary Hammer Type: CME Automatic

Client: AECOM

BORING No.: **SB-13**

Northing: 1904289.5

Easting: 1146826.9

Ground Surface Elev. +33.1 CCD

Surface Water Elev. n/a

Stream Bed Elev. n/a

Groundwater Elevation:

First Encounter -6.0'

Upon Completion n/a

After _____ Hrs.

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
	AS		7	TOPSOIL-black
	3			
	11			POORLY GRADED SAND & GRAVEL-brown-medium dense (GP) Apparent Fill
	8		6	
	5			POORLY GRADED SAND-brown-medium dense (SP) Apparent Fill
-5	6			
	7		11	
	2			SILTY SANDY CLAY-dark brown-medium dense (CL/ML) Fill
	3			
	12		13	
	4			SILTY CLAY-dark gray-stiff (CL)
	3			
-10	3	2.0P	25	
	3			LEAN CLAY with Sand-gray-very stiff to hard (CL)
	3			
-15	4	2.5P	21	
	5		*124*	SANDY SILT-gray-very dense (ML)
	8			
-20	13	4.8B	13	

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				LEAN CLAY with Sand-gray-very stiff to hard (CL)
	16			
	20			
-25	24	4.5+P	18	
	18			
-30	19	4.5+P	13	
	17			
	50/3"			
-35		4.5+P	13	
	26			
	50/5"			
-40			15	

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer) ST-Shelby Tube Sample VS=Vane Shear Test
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206) The Unit Dry Weight (pcf) is noted in italics above moist (%)
NR-No Recovery NP-Nonplastic

Geo Services, Inc.
Geotechnical, Environmental & Civil Engineering
805 Amherst Court, Suite 204
Naperville, Illinois 60565
(630) 355-2838

STRUCTURE FOUNDATION BORING LOG

DATE 6/27/2019

LOGGED BY RT

GSI JOB No. 19059

Project: Geotechnical Investigation For Joint Public Safety Training Campus (JPSTC)

Location: 4301 W. Chicago Avenue, Chicago, Illinois

County: Cook Drilling Method: Hollow Stem Auger/Rotary Hammer Type: CME Automatic

Client: AECOM

BORING No.: **SB-13**

Northing: 1904289.5

Easting: 1146826.9

Ground Surface Elev. +33.1 CCD

Surface Water Elev. n/a

Stream Bed Elev. n/a

Groundwater Elevation:

First Encounter −6.0'

Upon Completion n/a

After _____ Hrs. _____

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
SANDY SILT–gray–very dense (ML)							
	24						
	32						
−45	50/3"		16	−65			
SILT–gray–very dense (ML)							
	35						
	50/5"						
−50			17	−70			
End Of Boring @ −50.0'							
Hollow Stem Augers To −10.0'							
Rotary Drilling To Completion							
10.0' Of 4.0"ø Casing Used							
CME Automatic Hammer							
−55				−75			
−60				−80			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B–Bulge, S–Shear, P–Penetrometer) ST–Shelby Tube Sample VS=Vane Shear Test
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206) The Unit Dry Weight (pcf) is noted in italics above moist (%)
NR–No Recovery NP–Nonplastic

Geo Services, Inc.
Geotechnical, Environmental & Civil Engineering
805 Amherst Court, Suite 204
Naperville, Illinois 60565
(630) 355-2838

STRUCTURE FOUNDATION BORING LOG

DATE 8/13/2020

LOGGED BY RT

GSI JOB No. 19059

Project: Geotechnical Investigation For Joint Public Safety Training Campus (JPSTC)

Location: 4301 W. Chicago Avenue, Chicago, Illinois

County: Cook Drilling Method: Hollow Stem Auger/Rotary Hammer Type: CME Automatic

Client: AECOM

BORING No.: **SB-39**

Northing: 1904666.3

Easting: 1146679.6

Ground Surface Elev. +34.7 CCD

Surface Water Elev. n/a

Stream Bed Elev. n/a

Groundwater Elevation:

First Encounter -7.5'

Upon Completion n/a

After _____ Hrs. _____

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	
	AS		15	SANDY TOPSOIL with Cinders–black
	3			
	7			
	9		4	POORLY GRADE SAND–brown–medium dense (SP) Fill
	3			
	4			
-5	6		6	
	3			POORLY GRADE SAND w/ Gravel–brown–medium dense (GP) Fill
	4			
	7		12	
	9			SILTY SAND, CINDERS & GRAVEL–black–medium dense (Fill)
	11			
-10	16		15	
	3		*104*	SILTY CLAY–brown & gray–stiff (CL)
	4			
	8	1.7B	23	
	3		*101*	
	4			
-15	7	1.8B	25	
				SILTY SAND with Gravel–gray–medium dense (SM)
	9			
	12			
-20	14		10	

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	
				SILTY SAND & GRAVEL–gray–medium dense (GM)
	19		*125*	SILTY CLAY with Sand–gray–very stiff (CL)
	39			
-25	50/5"	3.8B	11	
	17		*126*	
	21			
-30	43	4.4B	12	
	17			
	20			
-35	50/5"	4.5P	15	
				CLAYEY SILT–gray–very dense (ML)
	29			
	50/5"			
-40			11	

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B–Bulge, S–Shear, P–Penetrometer) ST–Shelby Tube Sample VS=Vane Shear Test
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206) The Unit Dry Weight (pcf) is noted in italics above moist (%)
NR–No Recovery NP–Nonplastic

Geo Services, Inc.
Geotechnical, Environmental & Civil Engineering
805 Amherst Court, Suite 204
Naperville, Illinois 60565
(630) 355-2838

STRUCTURE FOUNDATION BORING LOG

DATE 8/13/2020

LOGGED BY RT

GSI JOB No. 19059

Project: Geotechnical Investigation For Joint Public Safety Training Campus (JPSTC)

Location: 4301 W. Chicago Avenue, Chicago, Illinois

County: Cook Drilling Method: Hollow Stem Auger/Rotary Hammer Type: CME Automatic

Client: AECOM

BORING No.: **SB-39**

Northing: 1904666.3

Easting: 1146679.6

Ground Surface Elev. +34.7 CCD

Surface Water Elev. n/a

Stream Bed Elev. n/a

Groundwater Elevation:

First Encounter -7.5'

Upon Completion n/a

After _____ Hrs. _____

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	
				CLAYEY SILT-gray-very dense (ML)
	32			CLAYEY SILT with Sand-gray-very dense (ML)
	50/4"			
-45			12	
				SILT-gray-very dense (ML)
	15			
	27			
-50	50/5"		20	
				End Of Boring @ -50.0'
				Hollow Stem Augers To -10.0'
				Rotary Drilling To Completion
				10.0' Of 4.0"ø Casing Used
				CME Automatic Hammer
-55				
-60				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
-65			
-70			
-75			
-80			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer) ST-Shelby Tube Sample VS=Vane Shear Test
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206) The Unit Dry Weight (pcf) is noted in italics above moist (%)
NR-No Recovery NP-Nonplastic

Geo Services, Inc.
Geotechnical, Environmental & Civil Engineering
805 Amherst Court, Suite 204
Naperville, Illinois 60565
(630) 355-2838

STRUCTURE FOUNDATION BORING LOG

DATE 8/10/2020

LOGGED BY RT

GSI JOB No. 19059

Project: Geotechnical Investigation For Joint Public Safety Training Campus (JPSTC)

Location: 4301 W. Chicago Avenue, Chicago, Illinois

County: Cook Drilling Method: Hollow Stem Auger/Rotary Hammer Type: CME Automatic

Client: AECOM

BORING No.: **SB-41**

Northing: 1904391.796

Easting: 1146687.975

Ground Surface Elev. +34.8 CCD

Surface Water Elev. n/a

Stream Bed Elev. n/a

Groundwater Elevation:

First Encounter -8.5'

Upon Completion n/a

After _____ Hrs.

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
	AS		13	12.0" TOPSOIL—black
	4			POORLY GRADED SAND—brown—medium dense (SP) Fill
	5			
	6		1	
	4			POORLY GRADED SAND & GRAVEL—gray—loose to medium dense (GP) Fill
	7			
-5	8		3	becoming brown @ -5.5'
	4			
	6			
	6		3	
	3			▼
	3		10	
-10	4	2.5P		SILTY CLAY—brown & gray—stiff to very stiff (CL)
	3			
	4			
	5	2.5P	23	
	2			becoming gray @ -13.0'
	2			
-15	2	1.25P	34	
				SILTY SAND & GRAVEL—gray—medium dense (GM)
	5			
	6			
-20	7		15	

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				SILTY SAND & GRAVEL—gray—medium dense (GM)
	14		*117*	SILTY CLAY with Sand—gray—very stiff (CL)
	12			
-25	17	3.2B	15	
	12		*121*	
	16			
-30	50/4"	4.4B	13	
	20			SILTY CLAY—gray—very stiff (CL—ML)
	50/5"			
-35		4.5P	17	
				SILTY GRAVEL & FRACTURED ROCK—gray—very dense (GM)
	50/4"			
-40			12	

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B—Bulge, S—Shear, P—Penetrometer) ST—Shelby Tube Sample VS=Vane Shear Test
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206) The Unit Dry Weight (pcf) is noted in italics above moist (%)
NR—No Recovery NP—Nonplastic

Geo Services, Inc.
Geotechnical, Environmental & Civil Engineering
805 Amherst Court, Suite 204
Naperville, Illinois 60565
(630) 355-2838

STRUCTURE FOUNDATION BORING LOG

DATE 8/10/2020

LOGGED BY RT

GSI JOB No. 19059

Project: Geotechnical Investigation For Joint Public Safety Training Campus (JPSTC)

Location: 4301 W. Chicago Avenue, Chicago, Illinois

County: Cook Drilling Method: Hollow Stem Auger/Rotary Hammer Type: CME Automatic

Client: AECOM

BORING No.: **SB-41**

Northing: 1904391.796

Easting: 1146687.975

Ground Surface Elev. +34.8 CCD

Surface Water Elev. n/a

Stream Bed Elev. n/a

Groundwater Elevation:

First Encounter -8.5'

Upon Completion n/a

After _____ Hrs.

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	
				SILTY GRAVEL & FRACTURED ROCK- gray-very dense (GM)
	50/3"			
-45			11	
				FRACTURED ROCK-gray- very dense (GM)
	50/1"			
-50			2	
				End Of Boring @ -50.0' Hollow Stem Augers To -10.0' Rotary Drilling To Completion 10.0' Of 4.0"ø Casing Used CME Automatic Hammer
-55				
-60				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
-65			
-70			
-75			
-80			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer) ST-Shelby Tube Sample VS=Vane Shear Test
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206) The Unit Dry Weight (pcf) is noted in italics above moist (%)
NR-No Recovery NP-Nonplastic

Geo Services, Inc.
Geotechnical, Environmental & Civil Engineering
805 Amherst Court, Suite 204
Naperville, Illinois 60565
(630) 355-2838

TEST PIT FIELD RECORD

DATE 6/26/2019

LOGGED BY VH

GSI JOB No. 19059

Project: Geotechnical Investigation For Joint Public Safety Training Campus (JPSTC)

Location: 4301 W. Chicago Avenue, Chicago, Illinois

County: Cook | Weather: Sunny, 80's | Operator: Kevin

Client: AECOM | Time Started: 1:56 PM | Capacity: 2 c.y.

Test Pit No.: **TP-12** | Time Completed: 2:10 PM | Make: Caterpillar

Northing: 1904573.9 | Ground Elev: *XX* | Model: 308 E

Easting: 1146762.3 | Contractor: Taylor Excavating | Reach: 10'-12'

DEPTH (ft)	SOIL DESCRIPTION	WATER CONTENT (%)	UCS Q_u (tsf)	REMARKS
	23.0" SANDY TOPSOIL-black		-	
5	POORLY GRADED SAND with Gravel-brown (SP) Fill		NP	Moist
				P.I.D. Reading 23.0"-10.0' (0.7 ppm)
10			NP	Wet
15	END OF TEST PIT AT -10.0' TEST PIT BACKFILLED WITH EXCAVATED SOILS			
20				

Remarks: No Odors Encountered

Ground Water Level

First Encounter: -9.0'

At Completion: Cave In

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer
NP-Nonplastic

Geo Services, Inc.
Geotechnical, Environmental & Civil Engineering
805 Amherst Court, Suite 204
Naperville, Illinois 60565
(630) 355-2838

TEST PIT FIELD RECORD

DATE 6/26/2019

LOGGED BY VH

GSI JOB No. 19059

Project: Geotechnical Investigation For Joint Public Safety Training Campus (JPSTC)

Location: 4301 W. Chicago Avenue, Chicago, Illinois

County: Cook	Weather: Sunny, 80's	Operator: Kevin
Client: AECOM	Time Started: 1:36 PM	Capacity: 2 c.y.
Test Pit No.: **TP-16**	Time Completed: 1:50 PM	Make: Caterpillar
Northing: 1904391.3	Ground Elev: *XX*	Model: 308 E
Easting: 1146719.8	Contractor: Taylor Excavating	Reach: 10'-12'

DEPTH (ft)	SOIL DESCRIPTION	WATER CONTENT (%)	UCS Q_u (tsf)	REMARKS
	20.0" SANDY TOPSOIL-black		-	
5	POORLY GRADED SAND with Gravel-brown (SP) Fill		NP	P.I.D. Reading 16.0"-10.0' (1.9 ppm) Moist
10				
15	END OF TEST PIT AT -10.0' TEST PIT BACKFILLED WITH EXCAVATED SOILS			
20				

Remarks: No Odors Encountered

Ground Water Level

First Encounter: Dry

At Completion: Dry

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer
NP-Nonplastic

Geo Services, Inc.
Geotechnical, Environmental & Civil Engineering
805 Amherst Court, Suite 204
Naperville, Illinois 60565
(630) 355-2838

TEST PIT FIELD RECORD

DATE 6/26/2019

LOGGED BY VH

GSI JOB No. 19059

Project: Geotechnical Investigation For Joint Public Safety Training Campus (JPSTC)

Location: 4301 W. Chicago Avenue, Chicago, Illinois

County: Cook | Weather: Sunny, 80's | Operator: Kevin

Client: AECOM | Time Started: 1:19 PM | Capacity: 2 c.y.

Test Pit No.: **TP-17** | Time Completed: 1:32 PM | Make: Caterpillar

Northing: 1904395.2 | Ground Elev: *XX* | Model: 308 E

Easting: 1146823.7 | Contractor: Taylor Excavating | Reach: 10'-12'

DEPTH (ft)	SOIL DESCRIPTION	WATER CONTENT (%)	UCS Q_u (tsf)	REMARKS
	16.0" SANDY TOPSOIL-black		NP	
5	POORLY GRADED SAND with Gravel-brown (SP) Fill			P.I.D. Reading 16.0"-10.0' (0.6 ppm)
10			NP	Moist
15	END OF TEST PIT AT -10.0' TEST PIT BACKFILLED WITH EXCAVATED SOILS			
20				

Remarks: No Odors Encountered

Ground Water Level

First Encounter: Dry

At Completion: Cave In

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer
NP-Nonplastic

Geo Services, Inc.
Geotechnical, Environmental & Civil Engineering
805 Amherst Court, Suite 204
Naperville, Illinois 60565
(630) 355-2838

TEST PIT FIELD RECORD

DATE 6/26/2019

LOGGED BY VH

GSI JOB No. 19059

Project: Geotechnical Investigation For Joint Public Safety Training Campus (JPSTC)

Location: 4301 W. Chicago Avenue, Chicago, Illinois

County: Cook	Weather: Sunny, 80's	Operator: Kevin
Client: AECOM	Time Started: 11:44 AM	Capacity: 2 c.y.
Test Pit No.: **TP-18**	Time Completed: 12:01 PM	Make: Caterpillar
Northing: 1904399.8	Ground Elev: *XX*	Model: 308 E
Easting: 1146967.8	Contractor: Taylor Excavating	Reach: 10'-12'

DEPTH (ft)	SOIL DESCRIPTION	WATER CONTENT (%)	UCS Q_u (tsf)	REMARKS
	16.0" SANDY TOPSOIL-black		–	
5	POORLY GRADED SAND with Gravel-brown (SP) Fill			P.I.D. Reading 15.0"-10.0' (0.8 ppm)
			NP	Moist
10				
	END OF TEST PIT AT -10.0' TEST PIT BACKFILLED WITH EXCAVATED SOILS			
15				
20				

Remarks: No Odors Encountered

Ground Water Level

First Encounter: -7.0'

At Completion: -10.0'

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer
NP-Nonplastic

Geo Services, Inc.
Geotechnical, Environmental & Civil Engineering
805 Amherst Court, Suite 204
Naperville, Illinois 60565
(630) 355-2838

TEST PIT FIELD RECORD

DATE 6/26/2019

LOGGED BY VH

GSI JOB No. 19059

Project: Geotechnical Investigation For Joint Public Safety Training Campus (JPSTC)

Location: 4301 W. Chicago Avenue, Chicago, Illinois

County: Cook	Weather: Sunny, 80's	Operator: Kevin
Client: AECOM	Time Started: 1:04 PM	Capacity: 2 c.y.
Test Pit No.: **TP-20**	Time Completed: 1:17 PM	Make: Caterpillar
Northing: 1904267.2	Ground Elev: *XX*	Model: 308 E
Easting: 1146828.0	Contractor: Taylor Excavating	Reach: 10'-12'

DEPTH (ft)	SOIL DESCRIPTION	WATER CONTENT (%)	UCS Q_u (tsf)	REMARKS
	16.0" SANDY TOPSOIL-black		-	
5	POORLY GRADED SAND-brown (SP) Fill		NP	P.I.D. Reading 16.0"-10.0' (0.5 ppm) Moist
10				
15	END OF TEST PIT AT -10.0' TEST PIT BACKFILLED WITH EXCAVATED SOILS			
20				

Remarks: No Odors Encountered

Ground Water Level

First Encounter: -6.0' ▼

At Completion: -10.0' ▽

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer
NP-Nonplastic

APPENDIX E

LAB TEST RESULTS

Geo Services, Inc.
Geotechnical, Environmental and Civil Engineering
An MBE - DBE Firm

1235 East Davis Street, Suite 101
Arlington Heights, IL 60005
(847) 253-3845

Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D 4318

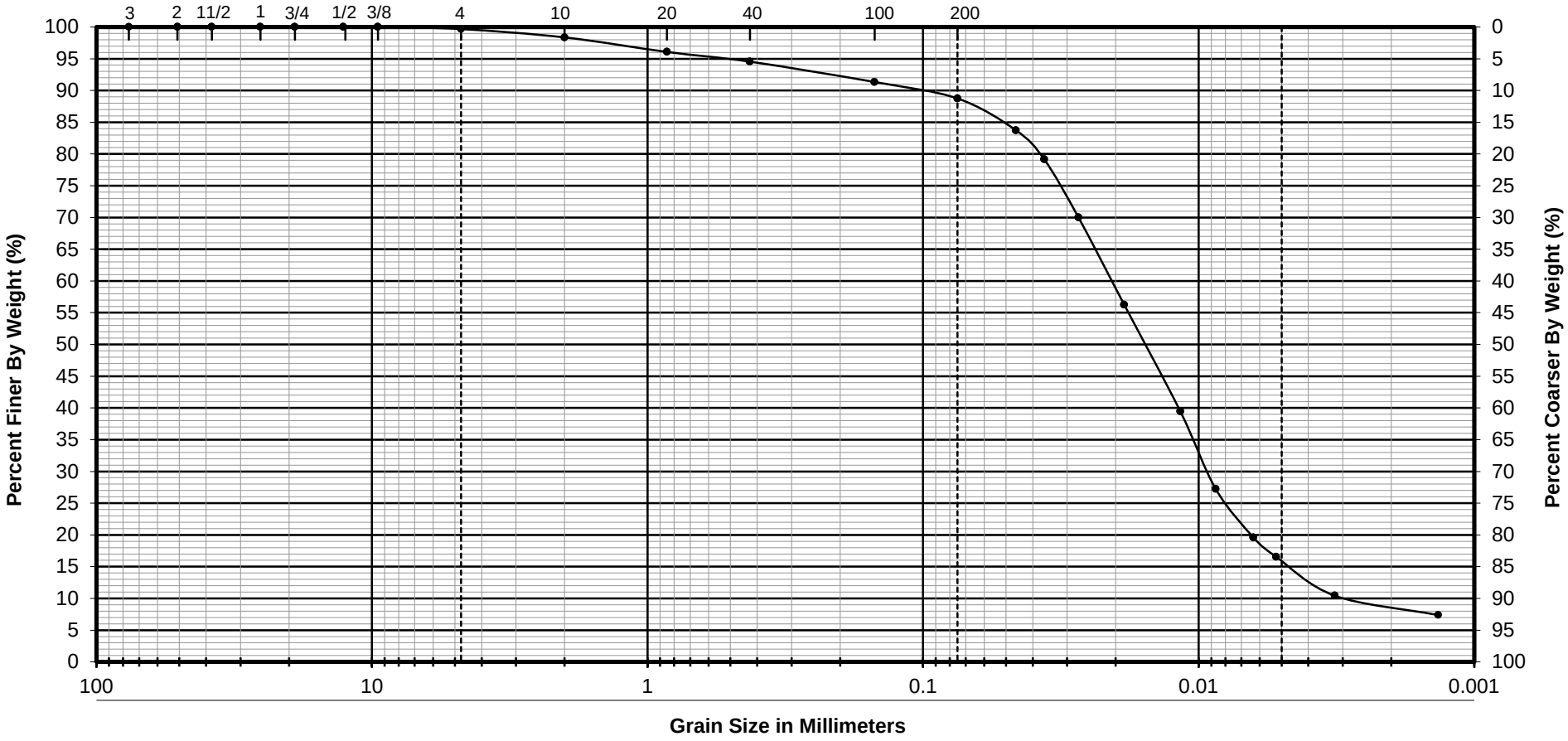
Project Name Joint Public Safety Training Campus (JPSTC) Job No 19059

Location 4301 W. Chicago Avenue, Chicago, IL Date 8/21/20

Client AECOM

Boring No.	**SB-41**							
Sample No.	**11**							
Depth	**23.5'-25.0'**							
LIQUID LIMIT (LL)	**22**							
PLASTIC LIMIT (PL)	**17**							
PLASTICITY INDEX (PI)	**5**							

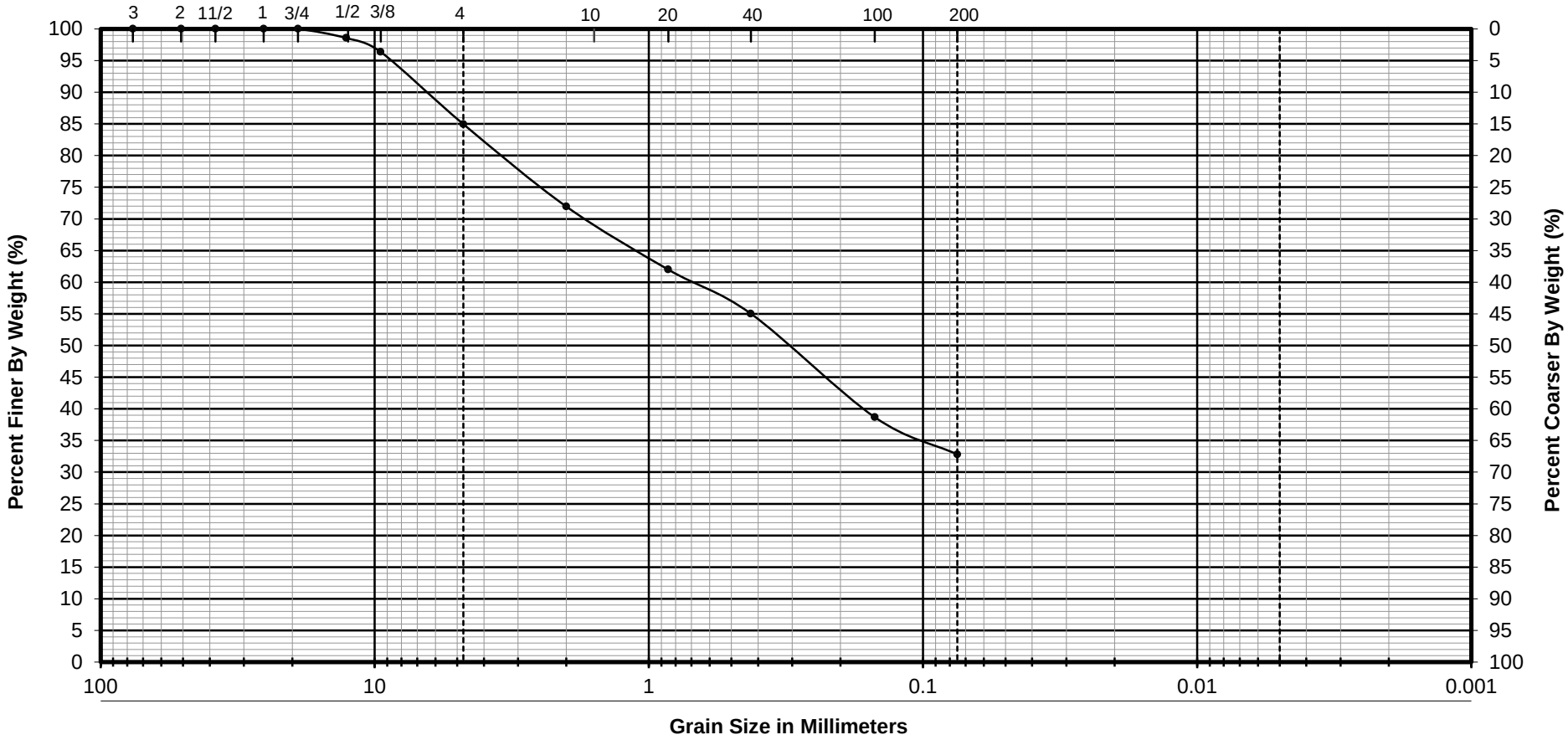
Tested by VH/MT



GRAVEL	SAND			SILT	CLAY
	COARSE	MEDIUM	FINE		

Boring No.	SB-41	CLASSIFICATION-ASTM D 2487		PARTICLE SIZE ANALYSIS-ASTM D 422
Sample No.	11	SILTY CLAY (CL-ML)		Joint Public Safety Training Campus (JPSTC)
Depth	33.5'-35.0'			Maintenance Facility
Liquid Limit	22	gray		Chicago, Illinois
Plastic Limit	17	Cu	7.0	
Plasticity Index	5	Cc	143.3	
Test By	MT	% Gravel	0.3	
Date	8/21/20	% Sand	10.9	
Reviewed By	AT	% Silt	69.2	
Job No	19059	% Clay	19.6	

Geo Services, Inc.
Geotechnical, Environmental and Civil Engineering
An MBE - DBE Firm
1235 E. Davis St., Arlington Heights, IL 60005
Phone 847-253-3845 ● Fax 847-253-0482



GRAVEL	SAND			SILT	CLAY
	COARSE	MEDIUM	FINE		

Boring No.	**SB-39**	**CLASSIFICATION-ASTM D 2487**	**GRAIN SIZE ANALYSIS-ASTM C117/C136**
Sample No.	**8**	**SILTY SAND with GRAVEL (SM)** **gray** **Cu** **700** **Cc** **0** **% Gravel** **15.0** **% Sand** **52.2** **% Silt/Clay** **32.8**	**Joint Public Safety Training Campus (JPSTC)** **4301 W. Chicago Avenue** **Chicago, Illinois**
Depth	**18.5'-20.0'**		
Test By	**MT**		
Date	**8/21/20**		
Reviewed By	**AT**		
Job No	**19059**		

Geo Services, Inc.
Geotechnical, Environmental and Civil Engineering
An MBE - DBE Firm
1235 E. Davis St., Arlington Heights, IL 60005
Phone 847-253-3845 ● Fax 847-253-0482