James L. Loring, P.G.
Geo-Consulting Services

August 27, 2019

Ms. Andrea Ragano
Aetna Development Corporation
200 West Madison Street, Suite 4200
Chicago, Illinois 60606-3465

Subsurface Exploration and Geotechnical Engineering Analysis and Limited Site Assessment (LSI) Report **Project No LG2113A**
Proposed Retail Development
Sibley Lincoln Plaza
1319 East Sibley Blvd.
Dolton, Illinois

Dear Ms. Ragona:

James L. Loring, P.G. appreciates the opportunity to provide professional services for Aetna Development Corporation. This letter transmits the Preliminary Geotechnical Site Exploration Assessment for the above-referenced property located at the approximate address of 1319 East Sibley Boulevard, Dolton, Illinois. The parcel is currently a vacant lot partially covered by a former asphalt parking lot. James L. Loring, P.G., personnel provided supervision of the drilling operations and conducted sampling and field logging of the soil borings. Soil samples were collected by our Field Personnel and submitted to ECS Midwest for physical soil classification, laboratory testing and preparation of a Geotechnical Engineering Report of findings. Additionally the site was reviewed for Recognized Environmental Conditions (RECs) associated with prior use of the property as part of a LPC663 CCDD Review. The review included submitting soil samples to Stat Analysis to complete analysis for Illinois Environmental Protection Agency (IEPA) Maximum Allowable Concentrations (MAC) for Chemical Constituents in Uncontaminated Soil or Clean construction or demolition debris (CCDD) chemical analysis.

The subject site is located west of the intersection of East Sibley Blvd. and Lincoln Road immediately west of an existing Taco Bell Restaurant recently developed on the larger original parent property in 2018. The subject property consisted of one parcels totaling approximately 37,361 square feet or 0.86 acres.

A total of seven (7) soil borings were completed at the subject property to the maximum exploration depth of 25 feet below the ground surface. Soil borings were located in the field in the approximate corners and center of the proposed building and in the parking lot areas. Surficial materials at the boring locations consisted of 1-2 inches of asphalt pavement over 5-8 inches of gravel fill or sand fill. The surficial fill was underlain by a natural loose to medium

dense sand to a depth of approximately 14 feet. Below the sand to the maximum depth explored a firm to very stiff silty clay or medium dense silt was encounter

Ground water was encountered in the soil borings at depths of 5 to 8 feet below the ground surface.

Soil boring locations were located in the field based on a site plan provided by the client. The site plan illustrated the general location of the proposed retail structures and associated parking areas and is included as an attachment. Soil boring locations were determined in the field using standard field tape measurements. Corner monuments recently installed by surveyors were utilized to determine the property corners.

Site specific engineering recommendations are included in the ECS Midwest reports attached Project 16:13014 dated August 22, 2019. **Please review the complete report carefully for site specific recommendations**.

Limited Site Investigation: During site soil exploration Field Personnel utilized a PID to evaluate the soils for the presence of volatile organic compounds and collected soils for laboratory analysis following EPA Method SW-846 sampling procedures and utilizing laboratory supplied containers for VOC8260/5030 methods. Laboratory samples were maintained on ice and delivered to our subcontract laboratory under chain of custody. During the field operations soils did not exhibited petroleum odors or PID meter deflections and consisted of a stiff to hard lean clay and or clayey silt to fine sand. Table 1 presents field PID values for each sample interval.

Table 1 Field PID Values

Boring	B1	B2	B3	B4	B5	P1	P2
Depth ft.							
1-2.5	2	0	0	0	0	0	0
3.5-5	0	0	0	0	0	0	0
6-7.5	0	0	0	0	0	0	0
8.5-10	0	0	0	0	0	0	0
13.5-15	0	0	0	0	0	NT	NT
18.5-20	NT	NT	0	NT	0	NT	NT
23.5-25	NT	NT	0	NT	NT	NT	NT

NT=no test

During the Field investigation to further evaluate site conditions soil samples were collected from Borings P1 and B4. The collected soil samples were placed in appropriate containers and transported to our subcontract laboratory under standard chain of custody (COC) for pH analysis and for full Target Compound List (TCL) VOCs-SVOC-PCBs-Pesticides-Total Cyanide and Metals. The results of the pH testing are shown in the Table 2 below:

Table 2 pH Values

Boring	*Sample Depth*	*Soil Type*	*Ph value*
B4	1-2.5 ft.	Br sand	8.49
P1	5-6 ft.	Br sand	8.3
P1/JL072219100	6-7.5 ft.	Br sand	8.06

Additionally analysis of the soil sample collected for P1 identified as JL072219100 was submitted for full TCL laboratory analysis. That analysis is presented below in Table 3:

Table 3 TCL Analysis Summary

			Laboratory ID :	19071270-001
			Client Sample ID :	JL072319100
			Date Collected :	07/23/2019 11:10
CAS No.	Analyte		Maximum Allowable Concentration	
83-32-9	Acenaphthene		570	< 0.035
67-64-1	Acetone		25	< 0.084
309-00-2	Aldrin		0.94	< 0.0017
120-12-7	Anthracene		12,000	< 0.035
7440-36-0	Antimony		5	< 1.9
7440-38-2	Arsenic	within a MSA county	13.0	2.5
		within a non-MSA county	11.3	2.5
7440-39-3	Barium		1,500	11
71-43-2	Benzene		0.03	< 0.0056

56-55-3	Benz(a)anthracene	within Chicago corporate limits	1.1	< 0.035
		within a populated area in MSA excluding Chicago	1.8	< 0.035
		within a populated area in non-MSA county or outside populated area	0.9	< 0.035
205-99-2	Benzo(b)fluoranthene	within Chicago corporate limits	1.5	< 0.035
		within a populated area in MSA excluding Chicago	2.1	< 0.035
		within a populated area in non-MSA county or outside populated area	0.9	< 0.035
207-08-9	Benzo(k)fluoranthene		9	< 0.035
65-85-0	Benzoic acid		400	< 0.87
50-32-8	Benzo(a)pyrene	within Chicago corporate limits	1.3	< 0.035
		within a populated area in MSA excluding Chicago	2.1	< 0.035
		within a populated area in non-MSA county	0.98	< 0.035
		outside populated area	0.09	< 0.035
7440-41-7	Beryllium		22	< 0.47

111-44-4	Bis(2-chloroethyl)ether		0.66	< 0.18
117-81-7	Bis(2-ethylhexyl)phthalate		46	< 0.87
75-27-4	Bromodichloromethane		0.6	< 0.0056
75-25-2	Bromoform		0.8	< 0.0056
85-68-7	Butyl benzyl phthalate		930	< 0.18
7440-43-9	Cadmium		5.2	< 0.47
7440-70-2	Calcium		---	1500
86-74-8	Carbazole		0.6	< 0.18
75-15-0	Carbon disulfide		9	< 0.056
56-23-5	Carbon tetrachloride		0.07	< 0.0056
57-74-9	Chlordane		1.8	< 0.017
106-47-8	4-Chloroaniline		0.7	< 0.18
108-90-7	Chlorobenzene		1	< 0.0056
124-48-1	Dibromochloromethane		0.4	< 0.0056
67-66-3	Chloroform		0.3	< 0.0056
95-57-8	2-Chlorophenol		1.5	< 0.18
7440-47-3	Chromium		21	3.0
218-01-9	Chrysene		88	< 0.035
7440-48-4	Cobalt		20	1.5
7440-50-8	Copper		2,900	< 2.4
57-12-5	Cyanide		40	< 0.26
72-54-8	4,4´-DDD		3	< 0.0017
72-55-9	4,4´-DDE		2	< 0.0017
50-29-3	4,4´-DDT		2	< 0.0017
53-70-3	Dibenz(a,h)anthracene	within Chicago corporate limits	0.20	< 0.035
		within a populated area in MSA excluding Chicago	0.42	< 0.035
		within a populated area in non-MSA county	0.15	< 0.035
		outside populated area	0.09	< 0.035
84-74-2	Di-n-butyl phthalate		2,300	< 0.18

95-50-1	1,2-Dichlorobenzene		17	< 0.18
106-46-7	1,4-Dichlorobenzene		2	< 0.18
91-94-1	3,3´-Dichlorobenzidine		1.3	< 0.18
75-34-3	1,1-Dichloroethane		23	< 0.0056
107-06-2	1,2-Dichloroethane		0.02	< 0.0056
75-35-4	1,1-Dichloroethene		0.06	< 0.0056
156-59-2	cis-1,2-Dichloroethene		0.4	< 0.0056
156-60-5	trans-1,2-Dichloroethene		0.7	< 0.0056
120-83-2	2,4-Dichlorophenol		0.48	< 0.18
78-87-5	1,2-Dichloropropane		0.03	< 0.0056
10061-01-5	cis-1,3-Dichloropropene		0.005	< 0.0022
10061-02-6	trans-1,3-Dichloropropene		0.005	< 0.0022
60-57-1	Dieldrin		0.603	< 0.0017
84-66-2	Diethyl phthalate		470	< 0.18
105-67-9	2,4-Dimethylphenol		9	< 0.18
51-28-5	2,4-Dinitrophenol		3.3	< 0.87
121-14-2	2,4-Dinitrotoluene		0.25	< 0.035
606-20-2	2,6-Dinitrotoluene		0.26	< 0.035
117-84-0	Di-n-octyl phthalate		1,600	< 0.18
959-98-8	Endosulfan I		18	< 0.0017
33213-65-9	Endosulfan II		18	< 0.0017
72-20-8	Endrin		1	< 0.0017
100-41-4	Ethylbenzene		13	< 0.0056
206-44-0	Fluoranthene		3,100	< 0.035
86-73-7	Fluorene		560	< 0.035
76-44-8	Heptachlor		0.871	< 0.0017
1024-57-3	Heptachlor epoxide		1.005	< 0.0017
118-74-1	Hexachlorobenzene		0.4	< 0.18
319-84-6	alpha-BHC		0.0074	< 0.0017
58-89-9	gamma-BHC		0.009	< 0.0017
77-47-4	Hexachlorocyclopentadiene		1.1	< 0.18
67-72-1	Hexachloroethane		0.5	< 0.18
193-39-5	Indeno(1,2,3-cd)pyrene	within a populated area in MSA excluding	1.6	< 0.035

		Chicago		
		within Chicago corporate limits or a populated area in non-MSA county or outside a populated area	0.9	< 0.035
7439-89-6	Iron	within a MSA county	15,900	3700
		within a non-MSA county	15,000	3700
78-59-1	Isophorone		8	< 0.18
7439-92-1	Lead		107	3.1
7439-95-4	Magnesium		325,000	860
7439-96-5	Manganese	within a MSA county	636	33
		within a non-MSA county	630	33
7439-97-6	Mercury	elemental (analyzed as total mercury)	0.1	< 0.020
		ionic (analyzed as total mercury)	0.89	< 0.020
72-43-5	Methoxychlor		160	< 0.0017
74-83-9	Bromomethane		0.2	< 0.012
1634-04-4	Methyl tert-butyl ether		0.32	< 0.0056
75-09-2	Methylene chloride		0.02	< 0.012
95-48-7	2-Methylphenol		15	< 0.18
91-20-3	Naphthalene		1.8	< 0.035
7440-02-0	Nickel		100	2.5
98-95-3	Nitrobenzene		0.26	< 0.035
86-30-6	N-Nitrosodiphenylamine		1	< 0.035
621-64-7	N-Nitrosodi-n-propylamine		0.0018	< 0.035
87-86-5	Pentachlorophenol		0.02	< 0.035
108-95-2	Phenol		100	< 0.18

12674-11-2	Aroclor 1016		1	< 0.083
11104-28-2	Aroclor 1221		1	< 0.083
11141-16-5	Aroclor 1232		1	< 0.083
53469-21-9	Aroclor 1242		1	< 0.083
12672-29-6	Aroclor 1248		1	< 0.083
11097-69-1	Aroclor 1254		1	< 0.083
11096-82-5	Aroclor 1260		1	< 0.083
7440-09-7	Potassium		---	150
129-00-0	Pyrene		2,300	< 0.035
7782-49-2	Selenium		1.3	< 0.95
7440-22-4	Silver		4.4	< 0.95
7440-23-5	Sodium		---	< 57
100-42-5	Styrene		4	< 0.0056
127-18-4	Tetrachloroethene		0.06	< 0.0056
7440-28-0	Thallium		2.6	< 0.95
108-88-3	Toluene		12	< 0.0056
8001-35-2	Toxaphene		0.6	< 0.034
120-82-1	1,2,4-Trichlorobenzene		5	< 0.18
71-55-6	1,1,1-Trichloroethane		2	< 0.0056
79-00-5	1,1,2-Trichloroethane		0.02	< 0.0056
79-01-6	Trichloroethene		0.06	< 0.0056
95-95-4	2,4,5-Trichlorophenol		26	< 0.18
88-06-2	2,4,6-Trichlorophenol		0.66	< 0.18
7440-62-2	Vanadium		550	4.5
75-01-4	Vinyl chloride		0.01	< 0.0056
1330-20-7	Xylenes, Total		5.6	< 0.017
7440-66-6	Zinc		5,100	12
	pH		6.25 - 9.0	8.06

Based on 35 IAC Part 1100.Subpart F.

Based on the site data obtained during the LSI the following summary can be presented:

- VOCs-SVOC-PCBs-Pesticides-Total Cyanide and Metals were **not** identified during field sampling based on field PID screening

- pH for the three laboratory analysis completed on soil samples was within the normal range for CCDD

Based on a review of the geotechnical report it is likely that similar fill and natural soils are present in remaining areas of the site. The soil pH was found to be acceptable for CCDD soils.

Copies of the laboratory soil analysis for samples collected for this LSI area included as attachments. Site specific engineering recommendations are included in the ECS Midwest reports attached Project 16:13014 dated August 22, 2019. If you have any questions regarding the site exploration program please feel free to contact me at your convenience.

Sincerely,

James L. Loring, P.G.

James L. Loring, P.G.
Principal Geologist

Enclosures: Report of Subsurface Exploration and Engineering Services, Project 16:13014, ECS Midwest dated August 22, 2019
Stat Analysis Laboratory Report dated August 5, 2109

ECS Midwest, LLC

Geotechnical Engineering Report

Sibley Lincoln Plaza

SWC of Sibley Boulevard and Lincoln Avenue
Dolton, Illinois

ECS Project Number 16:13014

August 22, 2019

August 22, 2019

Jim Loring
Geo Consulting
Email: jlloring@comcast.net

ECS Project No. 16:13014

Reference: Geotechnical Engineering Report
Sibley Lincoln Plaza
SWC of Sibley Boulevard and Lincoln Avenue
Dolton, Illinois

Mr. Loring:

ECS Midwest, LLC (ECS) has completed the subsurface exploration, laboratory testing, and geotechnical engineering analyses for the above-referenced project. This report presents our understanding of the geotechnical aspects of the project along, the results of the field exploration and laboratory testing conducted, and our design and construction.

It has been our pleasure to be of service to you on this project. We would like to continue our services during design and provide our services during construction to verify the assumptions of subsurface conditions made for this report. Please contact us should you have any questions about the information contained in this report, or if we can be of further assistance to you.

Respectfully submitted,

ECS Midwest, LLC

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APPENDICES

EXECUTIVE SUMMARY

This executive summary is solely provided to give a brief overview of the project findings. The summary is abbreviated. Information gleaned from the Executive Summary should not be utilized in lieu of reading the entire geotechnical report.

- The proposed project will consist of constructing a single-story, slab-on-grade building and associated pavements on the site of an existing lot.

- The geotechnical exploration performed under the direction of Geo Consulting for the planned development included seven (7) soil boring that were drilled to the planned depths ranging from 10 to 25 feet below existing grade.

- The subsurface conditions were observed to consist of about 1½ to 2 inches of asphalt underlain by 5¼ to 8 inches of gravel. The surficial materials were observed to be underlain primarily by loose to medium dense, sand that continued to a depth of 14 feet below the ground surface. The sand was underlain by firm to very stiff, silty clay that continued to the boring termination depth at Borings B-1, B-2 and B-5. The sand was underlain by loose to medium dense silt at Boring B-3 which continued to the termination depth.

- The planned structure may be supported by conventional shallow foundations consisting of column or strip footings bearing on competent native soils or engineered fill overlying competent native soils. The foundations may be proportioned for a maximum net allowable bearing pressure of 3,000 psf provided subgrade soils are properly prepared. Foundation subgrade soils should be prepared in accordance with the Foundation and Slab Observations section of this report.

- We recommend the slabs be designed with a minimum thickness of 5 inches. The structural engineer should determine the actual slab thickness and steel reinforcing requirements.

- The minimum recommended pavement sections are 3 inches of hot mix asphalt (HMA) over 4 inches of base course or 5 inches of Portland cement concrete (PCC) over 4 inches of base course in light duty areas, and 3½ inches of HMA over 10 inches of base course or 6 inches of PCC over 4 inches of base course in heavy duty areas. In high stress areas, such as entrance/exit aprons, drive-thru lanes, at trash enclosures, loading docks and in areas where trucks will turn or will be parked, the heavy duty rigid pavement section is recommended.

1.0 INTRODUCTION

1.1 GENERAL

The purpose of this report is to provide the results of our subsurface exploration and laboratory testing, engineering analyses, and geotechnical recommendations for the design of building foundations and floor slabs, and pavements for the proposed development. Also included are geotechnical subgrade preparation, fill placement and general dewatering recommendations.

1.2 SCOPE OF SERVICES

Seven (7) test borings were performed at locations selected by Jim Loring. ECS implemented a laboratory-testing program to characterize the subsurface soils.

This report contains a description of the reported exploratory procedures, laboratory testing procedures, presents our findings and evaluations, and includes the following.

- A brief description of the field and laboratory test procedures and the results of testing conducted.
- A description of surface topographical features and site conditions.
- Copies of the subsurface exploration (test boring logs).
- Recommendations for site preparation and construction of compacted fills, including an evaluation of on-site soils for use as compacted fills and delineation of potentially unsuitable soils at the time of sampling.
- Recommended foundation type(s).
- Recommendations for the design and construction of soil-supported slabs.
- Recommendations for pavement construction including recommended pavement sections (flexible pavement), subgrade preparation recommendations and drainage recommendations (as applicable).
- Considerations relative to groundwater control.

2.0 PROJECT INFORMATION

2.1 PROJECT LOCATION AND CURRENT SITE CONDITIONS

The project site is situated on vacant lot on the south side of Sibley Boulevard near the intersection with Lincoln Avenue in Dolton, Illinois. The lot is partially covered by asphalt pavement and partially by surficial gravel. The site is bordered to the north by East Sibley Boulevard, to the east by a Taco Bell restaurant, to the west by a medical facility, and to the south by residential property. The site location is shown below, and in wider scope on the Site Location Diagram in Appendix A. Ground surface elevation across the property range from EL. 606 to EL. 611 feet above mean sea level.

Figure 2.1.1 Site Location

2.2 PROPOSED CONSTRUCTION

We understand that the proposed construction at the project site will consist of a retail development, which will include a building and new pavement.

Building Structure: Based on email correspondence with Jim Loring, we understand the existing parking lot will be developed into a single story, retail building. We understand it will be a slab-on-grade structure with a finished floor elevation (FFE) of 607.5 feet above mean sea level. The proposed is planned to have a footprint of about 7,200 square feet. At the time this report was written, the structure loads were not available. We assume the maximum column and wall load will not exceed 50 kips and 3 kips per lineal foot, respectively. It is assumed the maximum floor live load will be 125 psf. Based on the provided floor elevation, and considering the site topography when the borings were performed, it is assumed that up to approximately ½ foot of fill and ½ foot of cut will be needed to develop the floor elevation independent of subgrade preparation recommendations.

Pavement Structure: The development will also include paved parking and drive lanes. Proposed

pavement surface grades for the drive lane and parking lot will vary from approximately EL. 606 to EL. 610 feet according to the Grading Plan, dated August 5, 2019 by Manhard Consulting Ltd. We understand a new pavement structure will be constructed adjacent to the new building, will contain 30 parking stalls and 2 handicap stalls. For our pavement analysis, we have assumed a maximum daily volume of 75 passenger vehicles and 2 delivery trucks for the light duty pavements, and 200 passenger vehicles and 5 delivery trucks for heavy duty pavements. Based on the provided pavement elevations, and considering the site topography, it is assumed that approximately less than one foot of fill and one foot of cut will be needed to develop the floor elevation independent of subgrade preparation recommendations.

If our understanding of the proposed construction is inaccurate, if the design changes, or if the loads and/or the final civil drawings become available, please notify ECS immediately so that we can review (and revised, if appropriate) the recommendations in this report.

3.0 FIELD EXPLORATION

3.1 FIELD EXPLORATION PROGRAM

The field exploration was not planned or coordinated by ECS. The client delivered the retained soil samples to ECS' office after the completion of the subsurface exploration. ECS understands the objective of characterizing the project site in general geotechnical and geological terms and to evaluate subsequent field and laboratory data is to assist in the development of geotechnical design and construction recommendations.

The boring locations were selected by the Client. The reported approximate as-drilled boring locations are shown on the Boring Location Diagram in Appendix A. The ground surface elevations were estimated using the topographic map on Sheet 5 of the "Proposed Retail Development" site plan drawings prepared by Manhard Consulting Ltd and provided to ECS by Geo-Consulting.

Standard penetration tests (SPTs) were conducted in the test borings at regular intervals in general accordance with ASTM D 1586. SPT samples were taken at 2½-foot intervals to a depth of 10 feet and at 5-foot intervals, thereafter. Small representative samples obtained during these tests were collected and brought to ECS, which we used to classify the soils. The obtained SPT resistances (N-values) provide a general indication of soil relative density and consistency.

3.2 SUBSURFACE CHARACTERIZATION

Listed in Table 3.2.1 is a generalized characterization of the soil strata encountered at the test boring locations. Refer to the Boring Logs in Appendix B for subsurface information at a specific test boring location. A Subsurface Soil Profile (cross-section) of the borings is also included in Appendix B.

Table 3.2.1 Generalized Subsurface Stratigraphy

Approximate Depth Range (ft)	Stratum	Description	Calibrated Penetrometer Resistance (tsf)	Water Content (%)	SPT[(1)] N-values (bpf)
(Surface)	NA	1 ½ to 2 inches of Asphalt 2½ to 8½ inches of Gravel	NA	NA	NA
0 – 14½	I	(SP) Sand; trace gravel, loose to dense	NA	NA	4 – 30
		(SM) Silty Sand; trace clay, trace organics, loose encountered at Borings B-4 and P-1	NA	NA	6 – 15
6 –10	IA	(SP) Sand with Grave; medium dense to dense encountered at Borings B-3 and P-1	NA	NA	15 – 35
12 – 20	II	(CL/ML) Silty Clay; trace sand, trace gravel, firm to very stiff encountered at Borings B-1, B-2 and B-5	¾ – 2 ½	25 – 27	3 – 16
10 – 25	III	(ML) Silt; very loose to medium dense encountered at Borings B-3 and B-5	NA	NA	2 – 14

Notes: [1] Standard Penetration Test

The soil stratification shown on the boring logs represents the interpreted soil conditions at the actual boring locations. Variations in the stratification can occur between sample intervals and between boring locations. The subsurface conditions at other times and locations on the site may differ from those found at the boring locations. If different site conditions are encountered during

construction, ECS should be contacted to review our recommendations relative to the new information.

3.3 GROUNDWATER OBSERVATIONS

The drillers observed the boreholes for the presence of free water during drilling and at the completion of drilling. A summary of the water levels observed are listed in Table 3.3.1 and on the boring logs in Appendix B.

Table 3.3.1 Groundwater Readings

Observation	Boring(s)	Depth (feet)	Elevation (feet)
During Drilling	B-1 to B-5, P-1 and P-2	5 to 8	601 to 599
At Completion of Drilling	B-1, B-3 to B-5, P-1	7 to 9	598 to 599

Based on groundwater observations, we anticipate the seasonal high groundwater levels to range from approximately 5 to 8 feet below the existing ground surface or from EL. 599 to EL. 601 feet above mean sea level. Soils in the Midwest frequently oxidize from gray to brown above the level where the soil remains saturated. This zone of change, which may be an indication of the long-term water level, is frequently interpreted to be the ground water table. Gray soil was encountered at approximate depths of 6 to 13 feet at the boring locations, or approximately EL. 595 feet to EL. 600 feet. Variations in the long term water table elevation may occur as a result of changes in precipitation, evaporation, surface water runoff, construction activities, and other factors. Perched water conditions may also develop or exist at shallower depths seasonally, particularly within the existing fill and granular soils underlain by clay.

4.0 LABORATORY SERVICES

The laboratory services performed by ECS for this project consisted of selected tests performed on samples obtained during the field exploration operations. Classification and index property tests were performed on representative soil samples obtained from the test borings to aid classification of the soils and to help estimate engineering properties. The following paragraphs briefly describe the completed laboratory testing program.

A geotechnical engineer visually classified each soil sample from the test borings on the basis of texture and plasticity using the Unified Soil Classification System (USCS) and ASTM D-2488 (Description and Identification of Soils-Visual/Manual Procedures) as a guide. After classification, the geotechnical engineer grouped the various soil types into the major zones noted on the boring logs in Appendix B. The group symbols for each soil type are indicated in parentheses preceding the soil descriptions on the boring logs. The stratification lines designating the interfaces between earth materials on the boring logs are approximate; in situ, the transitions may be gradual.

Moisture content determination was performed on select fine-grained soil samples in accordance with ASTM D 2166. Calibrated hand penetrometer (Qp) tests were performed on select cohesive soil samples. In the hand penetrometer test, the unconfined compressive strength of a soil sample is estimated, to a maximum of 4½ tons per square foot (tsf), by measuring the resistance of a soil sample to penetration of a small, calibrated spring-loaded cylinder.

The soil samples will be retained in our laboratory for a period of 60 days, after which, they will be discarded unless other instructions are received as to their disposal.

5.0 DESIGN RECOMMENDATIONS

5.1 BUILDING DESIGN

The following sections provide recommendations for building foundations and soil supported slabs.

5.1.1 Foundations

The foundation analysis was conducted using the provided floor elevation noted in the **Proposed Construction** section and the building test boring information. Provided subgrades and engineered fills are prepared as discussed herein, the proposed structure may be supported by a conventional individual column (spread) footing and continuous wall (strip) footing foundation system bearing on suitable native soil and/or engineered fill placed continuous from a suitable bearing native soil subgrade.

The following parameters are recommended for foundation design.

Table 5.1.1 Foundation Design [1]

Design Parameter		Value
Net Allowable Bearing Pressure [2]		3,000 psf
Minimum Foundation Width	Wall (Strip)	18 inches
	Column (Spread)	30 inches
Minimum Footing Frost Embedment Depth [3]		3½ feet
Post-Construction Estimated Settlement	Total	1 inch
	Differential	½ inch

1. We recommend a structural engineer provide specific foundation details including footing dimensions, reinforcing, and other details.
2. The applied pressure in excess of the surrounding overburden soils above the base of the foundation, based on a factor of safety of 3.
3. Interior footings could be directly below the floor slab if the building will be continuously heated and support soil will not freeze. Bear footings beyond the building which will not have the benefit of building heat at least 4 feet below the finished ground grade.

Footing pads are recommended to be directly and entirely supported by suitable-bearing native soil and/or on engineered fill placed continuous from a suitable bearing native soil subgrade. Soils suitable for direct foundation support or as the subgrade for engineered fill and indirect foundation support should have parameters as noted in the following table or greater, unless otherwise recommended by the geotechnical engineer.

Table 5.1.2 Suitable Bearing Material

Bearing Capacity (psf)	Cohesionless Soil	
	Relative Density	Corrected N-value (blows per foot)
3,000	Medium Dense	7

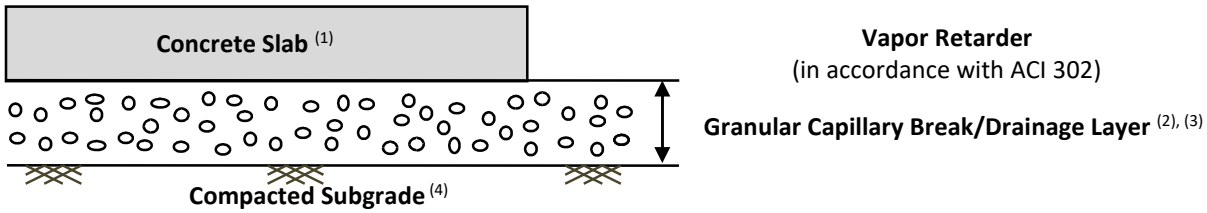
Suitable bearing soil is anticipated to be available at the assumed foundation bearing grade at the boring locations, but unsuitable bearing soil may be present at the assumed bearing elevation of the footings elsewhere. Observe and test the foundation bearing grade, and backfill foundation undercuts as recommended in the **Foundation and Slab Observations** section of this report.

5.1.2 Slabs-on-Grade

Building Floor Slabs

Based on the finished floor elevation of the building, it is anticipated the base course subgrade will consist of sand and/or engineered fill. Areas of undercut or recompaction might be necessary to develop a suitable floor slab sub-grade, especially if the subgrade is subjected to wet weather and/or construction traffic disturbance.

Based on the anticipated subgrade soils and floor loading, the following graphic depicts our general soil-supported slab recommendations.



1. **Concrete Slab:** Minimum 5 inches thick
2. **Drainage Layer:** Minimum 4 inches thick
3. **Drainage Layer Material:** GRAVEL (GP, GW) having a maximum aggregate size of 1½ inches and no more than 10 percent passing the No. 200 sieve, and follow the recommendations of ACI 302.
4. **Compacted Subgrade:** Compacted to at least 95 percent of the maximum dry density per ASTM D1557.

Figure 5.1.1

A thicker slab may be needed depending on the actual floor loads. The structural engineer should determine the actual slab thickness and steel reinforcing requirements. Provide adequate construction joints, contraction joints and isolation joints in the slab to reduce the impacts of cracking and shrinkage. Refer to ACI 302.1R04 *Guide for Concrete Floor and Slab Construction* for additional information regarding concrete slab joint design. Reinforce the slab with welded wire fabric or include an appropriate fiber mesh admixture to help control shrinkage cracking.

We recommend floor slabs be underlain by a granular drainage layer placed on a properly prepared subgrade as recommended in the **Site Construction Recommendations** section. The granular material will serve as a capillary break, which if properly designed and installed can assist in more uniform curing of concrete.

Inclusion of a vapor retarder should be considered if the building will contain moisture-sensitive floor coverings, equipment or materials. The vapor retarder will help reduce the potential of upward migration of water vapor from the soil into and through the concrete slab, which can contribute to excess humidity and microbial growth in the building. Where a vapor retarder is considered to help provide additional moisture protection, give special attention to the surface curing of the slabs to reduce uneven drying of the slabs and associated cracking and/or slab curling. The design engineer should consider the moisture sensitivity of floor coverings and finishes, and the potential effects of slab curling and cracking when determining if the vapor retarder will be in direct contact with the slab or beneath a layer of granular fill. The use of a blotter or cushion layer above the vapor retarder may be considered for project specific reasons. Refer to ACI 302.1R04

Guide for Concrete Floor and Slab Construction and ASTM E 1643 *Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs* for additional guidance on these issues.

Implement positive drainage around the perimeter of the proposed structures to reduce the potential for water accumulation under the floor slab and foundation elements. Slope exterior grades adjacent to the building such that runoff is directed away from the building walls. Direct building downspouts away from the building walls/foundations. Direct slab and pavement surface runoff to appropriate stormwater infrastructure.

Subgrade Modulus: Provided the Subgrade is prepared, and any engineered fill and the Granular Drainage Layer are placed as recommended in this report, design the slabs assuming a modulus of subgrade reaction, k_{v1} of 150 psi/in (pounds per square inch per inch). This modulus of subgrade reaction value assumed is based on the recommended minimum drainage base thickness and a 1 foot by 1 foot plate.

Slab Isolation: Isolate ground-supported slabs from the foundations and foundation-supported elements of the structure to help reduce shear and bending stresses in the floor caused by differential movement between the foundations and slab. Where the structural configuration prevents the use of a free-floating slab, design the slab with suitable reinforcement and load transfer devices to preclude overstressing of the slab.

5.2 PAVEMENT DESIGN CONSIDERATIONS

The following sections provide recommendations for pavements.

Subgrade Characteristics: A California Bearing Ratio (CBR) test is commonly used to determine soil support parameters for pavement design. A CBR test or other appropriate test was not part of the scope for this project, so it was necessary to assume the CBR design value. Based on the test borings, it appears the pavement subgrade soils will mainly consist of native sand that has loose to dense properties. The sand was generally fine-grained, which generally exhibits a medium degree of permeability. We assumed a design CBR value of 5 for the flexible pavement and assuming a modulus of subgrade reaction, k_{v1} of 150 psi/in for the rigid pavement. The pavement design recommendations assume the subgrade consists of suitable materials evaluated by ECS, and the subgrade is prepared as recommended in the **Subgrade Preparation** and **Earthwork Operations** sections of this report.

Pavement Sections: The recommended minimum pavement sections listed in Table 5.2.1 are based on the anticipated usage at the project site and a 20-year design service life, but were not developed based on specific traffic patterns, loading and resiliency factors, as those parameters were not provided by the design team.

In frequent traffic areas such as where trucks frequently turn, drive through lanes, delivery areas, trash enclosure pads, and points of ingress or egress the heavy duty rigid pavement is recommended to be used. ***If the anticipated traffic will exceed that assumed in the Proposed Construction section, ECS should be contacted for revised pavement design recommendations; otherwise, increased pavement maintenance and a shortened pavement life should be expected.***

Table 5.2.1 Pavement Section Recommendations

Pavement Material	Compacted Material Thicknesses (Inches)			
	Flexible Pavement		Rigid Pavement	
	Light Duty	Heavy Duty	Light Duty	Heavy Duty
Hot Mix Asphalt [1] Surface Course	1½	1½	--	--
Hot Mix Asphalt [1] Binder Course	1½	2	--	--
Portland Cement Concrete [2]	--	--	5	6
Crushed Aggregate Base Course [3]	4	6	4	4
Total Pavement Section Thickness	7	9½	9	10

1. Section 406 of IDOT Standard Specification for Road and Bridge Construction.
2. Section 420 of IDOT Standard Specification for Road and Bridge Construction.
3. Section 351 of IDOT Standard Specification for Road and Bridge Construction. If crushed gravel or some other material is used in lieu of crushed stone, the material may have a lower structural coefficient and a thicker base may be required.

All pavement materials and construction should be in accordance with the Guidelines for AASHTO Pavement Design and the IDOT Standard Specifications for Road and Bridge Construction.

We recommend the crushed granular base course be compacted to at least 95 percent of the maximum dry density obtained in accordance with ASTM D1557, Modified Proctor Method, within ±3 percent of the optimum moisture content value. The hot mix asphalt should be compacted to a minimum of 93 percent of the maximum theoretical density value.

Rigid Pavements: The concrete mix should be air-entrained and has a minimum compressive strength of 4,000 psi at 28 days. Adequate construction joints, contraction joints and isolation joints should be provided in the areas of rigid pavement to reduce the impacts of cracking and shrinkage. Please refer to ACI 330R-92 *Guide for Design of Concrete Parking Lots*. The Guide recommends an appropriate spacing strategy for the anticipated loads and pavement thickness. It has been our experience that joint spacing closer to the minimum values results in a pavement with less cracking and better long term performance.

Pavement Drainage: An important consideration with the design and construction of pavements is surface and subsurface drainage. Where standing water develops, either on the pavement surface or within the base course layer, softening of the subgrade and other problems related to the deterioration of the pavement can be expected. Based on our estimated groundwater level, we consider surface water infiltration to be the main source of water to be considered for pavement design on this project.

Shape or crown the final pavement surface to properly direct surface water to suitable on or off-site stormwater drainage infrastructure. Properly slope the pavement subgrade to avoid dips or pockets where water may become trapped.

Pavement Maintenance: A sound maintenance program should be implemented to help maintain and enhance the performance of pavements, and help attain the design service life. A preventative maintenance program should be implemented early in the pavement life to be effective. The "standard in the industry" supported by research indicates that preventative maintenance should typically begin within 2 to 5 years of the placement of pavement. Failure to perform preventative maintenance will reduce the service life of the pavement, and increase the costs for corrective maintenance and full pavement rehabilitation. To help reduce water infiltration thru the pavement section into the base course layer, which may result in softening of the subgrade and deterioration of the pavement, we recommend timely sealing of pavement joints and cracks with elastomeric caulk. We recommend exterior pavements be observed for distresses, such as cracks, depressions and poor drainage, at least twice a year, typically once in the spring and once in the fall.

Weather Restrictions: Daily temperatures from mid-November to April can often stay below 40°F, limiting the days that asphalt placement can occur. In this region, asphalt plants may close during the months of December, January, and/or February if particularly cold weather conditions prevail. However, this can change based on year to year temperature fluctuations.

6.0 SITE CONSTRUCTION RECOMMENDATIONS

6.1 SUBGRADE PREPARATION

6.1.1 Stripping and Initial Site Preparation

The subgrade preparation should include stripping pavement, vegetation, rootmat, topsoil, and any other soft or otherwise unsuitable materials from the 10-foot expanded building limits, 5-foot expanded pavement limits, and 5 feet beyond the toe of engineered fills, where feasible. Call on ECS to observe and document that unsuitable surficial materials have been removed prior to the placement of engineered fill or construction of structures.

6.1.2 Proofrolling

Thoroughly proofroll the exposed subgrade after removal of all unsuitable surface materials, the site has been cut to the proposed grade, and prior to the placement of any engineered fill or other construction materials. Proofroll with approved construction equipment having a minimum axle load of 10 tons (e.g. fully loaded tandem-axle dump truck) under the observation of ECS. Traverse the subgrade with the proofroll equipment in two perpendicular (orthogonal) directions with overlapping passes of the vehicle. This procedure is intended to assist identification of yielding subgrade materials. Marked unstable or pumping subgrade areas identified during the proofroll for repair prior to the placement of any subsequent engineered fill or other construction materials. Unstable subgrade repair methods, such as undercutting, or moisture conditioning and recompaction, or chemical stabilization, should be discussed with ECS to determine the appropriate procedures with regard to the existing conditions causing the instability. Test pits may be excavated to explore the shallow subsurface materials in the area of the instability to help determine the appropriate remedial action to stabilize the subgrade.

The proofrolling procedure will only identify near surface soils that are unsuitable for slab and pavement support and any potential deeper pockets of unsuitable soils may not be fully identified and could lead to premature deterioration/cracking of the building slab and pavements. Test pits may be excavated to explore the shallow subsurface materials in the area of the instability to help in determined the cause of the observed unstable materials and to assist in the evaluation of the appropriate remedial action to stabilize the subgrade.

6.1.3 Site Temporary Dewatering

It appears the long term static groundwater level at this site may be at a depth of approximately 5 to 13 feet. Where excavations will extend below the groundwater level encountered at the boring locations, excavation dewatering will be necessary. Where excavations extend below the groundwater level, dewatering likely will require installation of a well-point system or some other dewatering system to aid in maintaining the groundwater level below the excavation bottom. A qualified dewatering contractor should be consulted if groundwater cannot be satisfactorily controlled through the use of sump pumps.

6.2 EARTHWORK OPERATIONS

6.2.1 Engineered Fill Materials

Product Submittals: Prior to placement of engineered fill, representative bulk samples (typically at least 50 to 100 pounds) of on-site and off-site borrow should be submitted to ECS for laboratory testing, which may include natural moisture content, organic content, grain-size distribution,

Atterberg limits, and moisture-density relationships for compaction. Import material should be tested prior to being hauled to the site to determine if it complies with project specifications.

Satisfactory Engineered Fill Materials: Engineered fills should consist of approved materials, contain no more than 3 percent organic matter as determined by ASTM D2974, be free of debris, contain no particle sizes greater than 3 inches in the largest dimension, and have a Liquid Limit and Plasticity Index less than 40 and 15, respectively. Open-graded materials, such as coarser sands, and gravels (SP and GP), which contain void space in their mass should not be used in engineered fills unless properly encapsulated within a filter geotextile. If the fill is to provide non-frost susceptible characteristics, it must be classified as a clean GW, GP, SW or SP per Unified Soil Classification System (ASTM D-2487) and must be properly drained.

Unsatisfactory Materials: Unsatisfactory engineered fill materials, which do not satisfy the requirements for suitable materials, include topsoil and organic materials (PT, OH, OL), frost susceptible silt (ML), and high plasticity soils elastic silt (MH) and fat clay (CH).

Pea gravel is not recommended to be used as engineered fill. Pea gravel has round/smooth characteristics, no fines and does not interlock when compacted, which makes it more susceptible to future movement and instability resulting in excessive and variable settlement.

On-Site Borrow Suitability: The on-site soil may be feasible to use as engineered fill, but should be further evaluated by ECS prior to its use. On-site soil used as engineered fill must not contain more than 3 percent organic matter as determined by ASTM D2974, and must be free of frozen matter, deleterious materials, over-sized material (maximum 3-inch particle diameter), or chemicals that may result in the material being classified as “contaminated.”

It may be feasible to reuse the existing base course material as base course or subbase for the new pavement, but should be evaluated by ECS after the material is exposed and prior to its use. The existing granular base material that is planned to be reused as fill should be stripped clean (e.g., not mixed with bituminous material, subgrade soils and other foreign materials) and stockpiled separately. Prior to its reuse, the material is recommended to be tested, such as with grain-size distribution tests, to further evaluate its suitability. Depending on the base course properties a reduced structural coefficient may be needed for design, which would require additional base course or a thicker hot mix asphalt section.

6.2.2 Compaction

Engineered fill Compaction: Place engineered fill in maximum 8-inch thick loose lifts within the expanded building and pavement limits. Moisture condition fine grained soils as necessary to between ±2 percent of the soil’s optimum moisture content, and moisture condition coarse grained soils as necessary to within ±3 percent of the soil’s optimum moisture content. Compact all materials with suitable equipment to a dry density of at least 95 percent of the Modified Proctor maximum dry density (ASTM D1557). Beyond these areas, achieve compaction of at least 90 percent. Give as much importance to the moisture content requirements of the material as the density requirements during placement and compaction considering the moisture sensitivity of the soil. Call on ECS to check and document that proper fill compaction has been achieved.

Fill Compaction Control: The expanded limits of the proposed construction areas should be well defined, including the limits of the fill zones for buildings, pavements, and slopes, etc., at the time of fill placement. Maintain grade control throughout the filling operations. All filling operations are recommended to be observed on a full-time basis by ECS to check and document that the minimum compaction requirements are being achieved. The recommended minimum frequency for field density testing of fills is listed in Table 6.2.1, but should not be less than 1 test per lift.

Table 6.2.1 Frequency of Compaction Tests in Fill Areas

Location	Frequency of Tests
Expanded Building Limits	1 test per 2,500 sq. ft. per lift
Pavement Areas	1 test per 10,000 sq. ft. per lift
Utility Trenches	1 test per 200 linear ft. per lift
Outparcels/SWM Facilities	1 test per 5,000 sq. ft. per lift
All Other Non-Critical Areas	1 test per 10,000 sq. ft. per lift

Compaction Equipment: Compaction equipment suitable to the soil type being compacted should be used to compact the subgrades and fill materials. Sheepsfoot compaction equipment should be suitable for the fine-grained soils (clays and silts). A vibratory steel drum roller should be used for compaction of coarse-grained soils (sands and gravels) as well as to help seal compacted surfaces.

Vibratory compaction methods should be done with caution near the water table because an unstable subgrade condition could develop. Static compaction and thinner lifts may be needed near the water table.

Fill Placement Considerations: Do not place fill materials on frozen soils, on frost-heaved soils, on excessively wet soils, or soils that are otherwise unstable. Borrow fill materials should not contain frozen materials at the time of placement, and all frozen or frost-heaved soils should be removed prior to placement of engineered fill or other fill soils and aggregates. Excessively wet soils or aggregates should be scarified, aerated, and moisture conditioned.

Grade fill areas at the end of each work day to facilitate drainage of any precipitation and seal the surface by use of a smooth-drum roller to reduce infiltration of surface water. During placement and compaction of new fill at the beginning of each workday, the Contractor may need to scarify existing subgrades to an approximate depth of 4 inches to reduce the potential for a weak plane to form between the new fill and the existing subgrade soils.

Drying and compaction of wet soils is difficult, especially during the wetter and/or colder months of late fall to early spring. Perform earthwork during the warmer drier times of the year, if practical, to reduce the potential for compaction difficulties. Maintain proper drainage during earthwork to reduce ponding of water which can degrade subgrade soils. Alternatively, if these soils cannot be stabilized by conventional methods as previously discussed, chemical modification of the subgrade soils, such as with lime, lime kiln dust, cement or other materials, may be utilized to adjust the moisture content. The soil modification procedure, such as determination of the type and quantity of additive, and mixing and curing procedures, should be evaluated before implementation. This evaluation may include testing the soil for pH, resistivity, sulphates, and chloride to check if an

adverse chemical reaction could occur. The contractor should be required to minimize dusting or implement dust control measures, as required.

The zone of the engineered fill placed below the foundations is recommended to extend 1 foot beyond the outside edges of the footings and from that point, outward laterally 1 foot for every 2 feet of fill thickness below the footing.

Place and compact fill on a 5 (H):1 (V) or flatter slope, or step or bench as required to flatten. In confined areas such as utility trenches, portable compaction equipment and thin lifts of 3 to 4 inches may be required to achieve specified degrees of compaction.

Have equipment readily available during earthwork for both drying and wetting of fill soils. We do not anticipate significant problems in controlling moisture within the fill during dry weather, but moisture control may be difficult during winter months or extended periods of rain. The control of moisture content of silty clay soil is difficult when these soils become wet. Further, these soils are easily degraded by construction traffic when the moisture content is elevated.

6.3 FOUNDATION AND SLAB OBSERVATIONS

Protection of Foundation Excavations: Exposure to the environment may weaken the soils at the footing bearing level if the foundation excavations remain open for too long a time. Foundation concrete should be placed the same day that excavations are made. If the bearing soils are softened by surface water intrusion or exposure, the softened soils must be removed from the foundation excavation bottom immediately prior to placement of concrete. If the excavation must remain open overnight, or if rainfall becomes imminent while the bearing soils are exposed, a 2 to 3-inch thick "mud mat" of "lean" concrete should be placed on the bearing soils before the placement of reinforcing steel.

Footing Subgrade Observations: The recommendations of this report are predicated upon ECS checking the suitability of the actual foundation support soils during construction. We recommend hand auger probes and appropriate bearing capacity tests be conducted during construction. Cone penetrometer tests (static or dynamic, depending on soil type) or other appropriate bearing capacity tests should be conducted within the probe holes to evaluate the support characteristics of the soil. The suitability of the actual bearing grade is recommended to be observed and tested to a depth below the foundation bearing grade or undercut subgrade equivalent to ½ the footing width (i.e., ½B), or a minimum of 3 feet below each isolated column footing and continuous footings, whichever is deeper. This observation and testing should be performed at each isolated column footing and at approximately 20-foot intervals along continuous wall footings to check that the soils are as indicated by the borings and are suitable to support the recommended maximum net allowable bearing pressure.

Unsuitable bearing soils encountered at the proposed foundation bearing grade or within the foundation influence zone are recommended to be recompacted, if feasible, or removed to a suitable bearing subgrade and to a lateral extent, as noted in the **Fill Placement Considerations** section. Any undercut should be backfilled with engineered fill or lean concrete ($f'_c \geq 1{,}000$ psi at 28 days) up to the original design bottom of footing elevation. The original footing is recommended to be constructed on top of the engineered fill or hardened lean concrete. The engineered fill and lean concrete should be placed and compacted as recommended in the **Earthwork Operations**

section of this report. If lean concrete is utilized to replace weaker/low bearing soils or unsuitable soils, lateral over-excavation is typically not necessary, but the excavation is recommended to be 1 foot wider than the footing (6 inches on each side), and the lean concrete should be allowed to sufficiently harden prior to placement of the foundation concrete. Use of lean mix concrete to limit lateral over-excavation is not expected to be effective due to caving of excavation sidewalls in the granular soil.

Slab Subgrade Verification: ECS should be called on to observe and test exposed subgrade within the expanded building limits prior to engineered fill placement and slab construction to check that adequate subgrade preparation has been achieved. A proofroll using a loaded dump truck should be performed in their presence at that time. Once subgrades have been prepared to the satisfaction of ECS, subgrades should be properly compacted and new engineered fill can be placed. Existing subgrades to a depth of at least 10 inches and all engineered fill should be properly moisture conditioned and compacted to the required in-place density. ECS should check the condition of the prepared subgrade prior to placement of the subbase stone and concrete. If there will be significant time lag between the subgrade check and placement of the subbase stone and concrete, ECS may need to recheck the condition of the subgrade before placement of stone and concrete. Prior to final slab construction, the subgrade may require scarification, moisture conditioning, and re-compaction to restore stable conditions.

6.4 UTILITY INSTALLATIONS

Utility Subgrades: The soils encountered at the boring locations below the topsoil are anticipated to generally be suitable for support of utility pipes. We recommend utility lines be underlain by at least 6 inches of stone fill such as CA-6 or CA-7 to create a stable bedding surface for the below-grade utilities. The pipe subgrade should be observed and probed for stability by ECS to evaluate the suitability of the materials encountered. Any loose or unsuitable materials encountered at the utility pipe subgrade elevation should be removed and replaced with suitable compacted engineered fill or pipe bedding material.

Utility Backfilling: The granular bedding material should be at least 4 inches thick, but not less than that specified by the project drawings and specifications. Fill placed for support of the utilities, as well as backfill over the utilities, should satisfy the requirements for engineered fill given in this report. Compacted backfill should be free of topsoil, roots, ice, or any other material designated by ECS as unsuitable. The backfill should be moisture conditioned, placed, and compacted in accordance with the recommendations of this report.

6.5 GENERAL CONSTRUCTION CONSIDERATIONS

Subgrade Protection: Measures should also be taken to limit site disturbance, especially from rubber-tired heavy construction equipment, and to control and remove surface water from development areas, including structural and pavement areas. It would be advisable to designate a haul road and construction staging area to limit the areas of disturbance and to prevent construction traffic from excessively degrading sensitive subgrade soils and existing pavement areas. Haul roads and construction staging areas could be covered with excess depths of aggregate to protect those subgrades. The aggregate can later be removed and used in pavement areas.

Surface Drainage: Surface drainage conditions should be properly maintained. Surface water should be directed away from the construction area, and the work area should be sloped away from the construction area at a gradient of 1 percent or greater to reduce the potential of ponding water and the subsequent saturation of the surface soils. At the end of each work day, the subgrade soils should be sealed by rolling the surface with a smooth drum roller to minimize infiltration of surface water.

Excavation Safety: Excavations should comply with the requirements of OSHA 29CFR, Part 1926, Subpart P, "Excavations" and its appendices, as well as other applicable codes. This document states that the contractor is solely responsible for the design and construction of stable, temporary excavations. The excavations should not only be in accordance with current OSHA excavation and trench safety standards but also with applicable local, state, and federal regulations. The contractor should shore, slope or bench the excavation sides when appropriate.

Care must be taken during excavation for the detention system to prevent undermining of existing structures, sidewalk, pavements and underground utilities. Any excavation should include appropriate preventative measures, such as underpinning, to avoid undermining or loss of support of nearby construction.

Excavation Instability: Excavation stability and caving problems are expected to occur due to the granular soil, especially below the water level. The instability problems will generally depend upon the excavation depth, length of time the excavations remain open, inclination of excavation side-walls, magnitude and location of surcharges near the excavations, groundwater levels, and the suitability of any needed dewatering systems.

Bidding/Estimating Considerations: Contractors bidding or undertaking any work at the site should examine the results of the subsurface exploration, satisfy themselves as to the adequacy of the information for bidding and construction, make their own interpretation of the data, and consider the effect it may have on their cost proposal, construction techniques, schedule, and equipment capabilities. Furthermore, contractors should complete any additional fieldwork and investigation they deem necessary to properly prepare a cost proposal for the site work. Soil borings do not provide the same wide-scale view of the subsurface conditions that is obtained during site grading, excavation or other aspects of earthwork construction. Additional scope may be required to obtain more detailed subsurface information needed for earthwork bid preparation, which could include test pits to better understand the lateral and vertical extents of the subsurface materials of concern such as existing undocumented fill. Even with this additional information, budget contingencies should be carried in construction to help cover potential variations in subsurface conditions.

7.0 CLOSING

ECS has prepared this report of findings, evaluations, and recommendations to guide geotechnical-related design and construction aspects of the project. In fulfilling our obligations and responsibilities, as listed in the proposal, we performed these services in accordance with the standard of care expected of professionals in the industry performing similar services on projects of like size and complexity at this time in the region. No other representation, expressed or implied, and no warranty or guarantee is included or intended in this report.

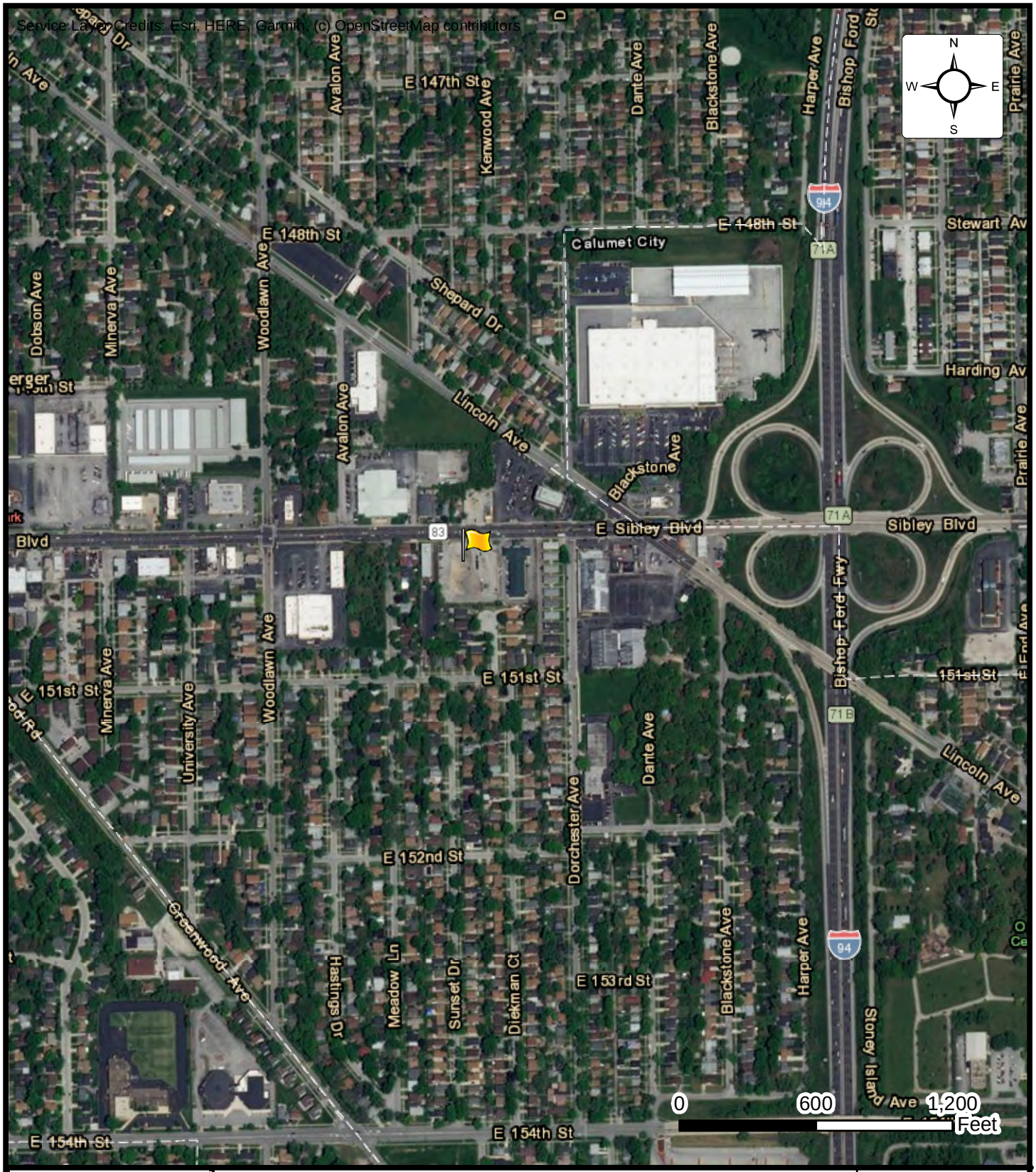
The description of the proposed project is based on information provided to ECS by Geo-Science Consulting. If any of this information is inaccurate, either because of our interpretation of the documents provided or site or design changes that may occur later, ECS should be contacted immediately, so we can review the report in light of the changes and provide additional or alternate recommendations as may be required to reflect the proposed construction.

We recommend ECS be retained to review the project's plans and specifications pertaining to our services, so we may evaluate consistency of those plans/specifications with the intent of this geotechnical report.

Field observations, and quality assurance testing during earthwork and foundation installation are an extension of and integral to the geotechnical design recommendation. We recommend the owner retain these quality assurance services and that ECS be allowed to continue our involvement throughout these critical phases of construction to provide general consultation as issues arise. ECS is not responsible for the conclusions, opinions, or recommendations of others based on the data in this report.

APPENDIX A - Drawings & Reports

Site Location Diagram
Boring Location Diagram

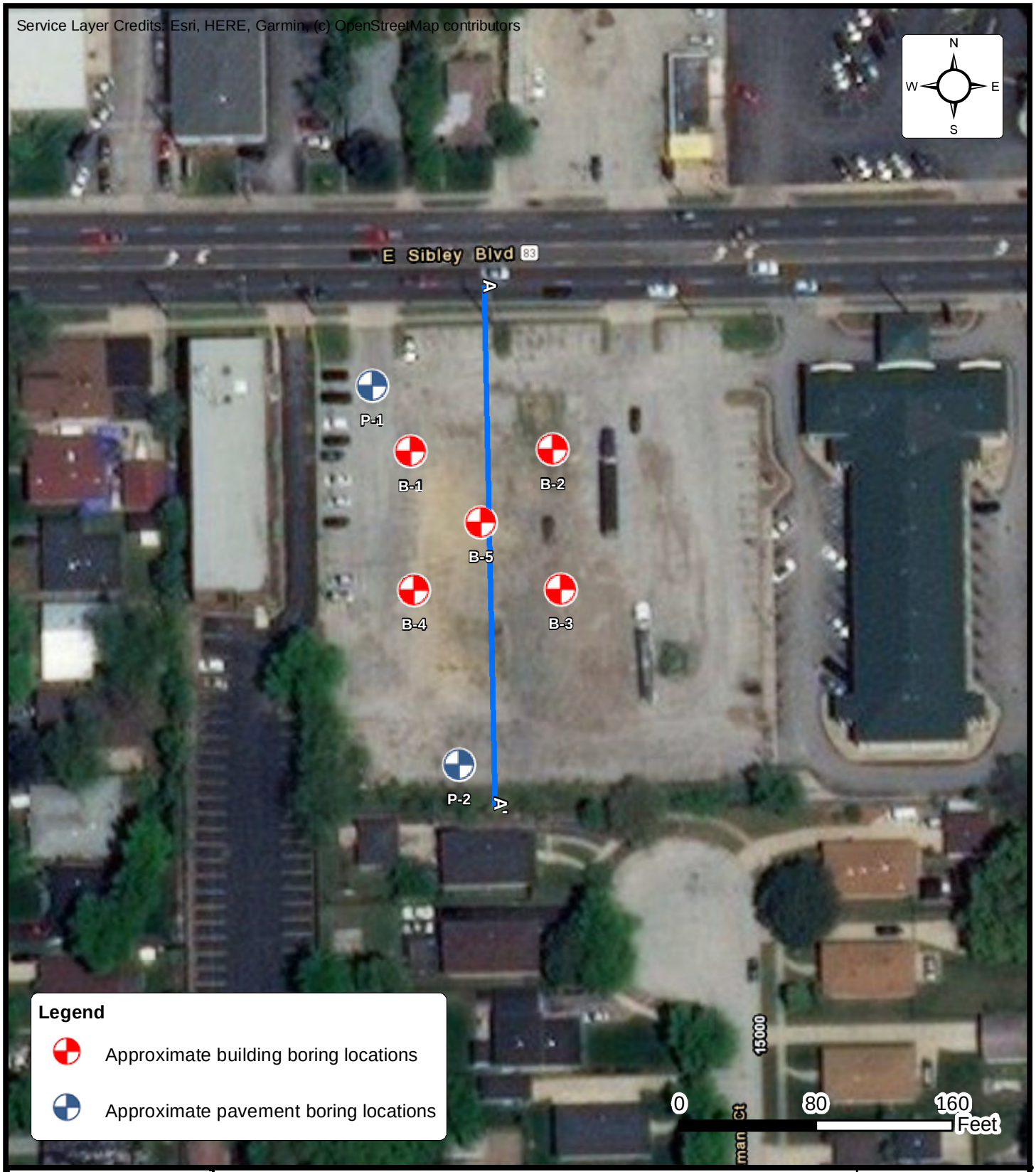


Site Location Diagram
SIBLEY LINCOLN PLAZA

SWC SIBLEY BOULEVARD AND LINCOLN AVENUE,

GEO-SCIENCE CONSULTING

ENGINEER	WAS
SCALE	1 " = 600 '
PROJECT NO.	16:13014
SHEET	1 OF 1
DATE	8/15/2019



Boring Location Diagram
SIBLEY LINCOLN PLAZA

SWC SIBLEY BOULEVARD AND LINCOLN AVENUE,

GEO-SCIENCE CONSULTING

ENGINEER	WAS
SCALE	1 " = 80 '
PROJECT NO.	16:13014
SHEET	1 OF 1
DATE	8/21/2019

APPENDIX B - Field Operations

Reference Notes for Boring Logs
Boring Logs B-1 through B-5, P-1 and P-2
Subsurface Soil Profile A-A’

REFERENCE NOTES FOR BORING LOGS

MATERIAL[1,2]	
	ASPHALT
	CONCRETE
	GRAVEL
	TOPSOIL
	VOID
	BRICK
	AGGREGATE BASE COURSE
	FILL[3] MAN-PLACED SOILS
GW	**WELL-GRADED GRAVEL** gravel-sand mixtures, little or no fines
GP	**POORLY-GRADED GRAVEL** gravel-sand mixtures, little or no fines
GM	**SILTY GRAVEL** gravel-sand-silt mixtures
GC	**CLAYEY GRAVEL** gravel-sand-clay mixtures
SW	**WELL-GRADED SAND** gravelly sand, little or no fines
SP	**POORLY-GRADED SAND** gravelly sand, little or no fines
SM	**SILTY SAND** sand-silt mixtures
SC	**CLAYEY SAND** sand-clay mixtures
ML	**SILT** non-plastic to medium plasticity
MH	**ELASTIC SILT** high plasticity
CL	**LEAN CLAY** low to medium plasticity
CH	**FAT CLAY** high plasticity
OL	**ORGANIC SILT or CLAY** non-plastic to low plasticity
OH	**ORGANIC SILT or CLAY** high plasticity
PT	**PEAT** highly organic soils

DRILLING SAMPLING SYMBOLS & ABBREVIATIONS			
SS	Split Spoon Sampler	PM	Pressuremeter Test
ST	Shelby Tube Sampler	RD	Rock Bit Drilling
WS	Wash Sample	RC	Rock Core, NX, BX, AX
BS	Bulk Sample of Cuttings	REC	Rock Sample Recovery %
PA	Power Auger (no sample)	RQD	Rock Quality Designation %
HSA	Hollow Stem Auger		

PARTICLE SIZE IDENTIFICATION		
DESIGNATION		**PARTICLE SIZES**
Boulders		12 inches (300 mm) or larger
Cobbles		3 inches to 12 inches (75 mm to 300 mm)
Gravel:	Coarse	¾ inch to 3 inches (19 mm to 75 mm)
	Fine	4.75 mm to 19 mm (No. 4 sieve to ¾ inch)
Sand:	Coarse	2.00 mm to 4.75 mm (No. 10 to No. 4 sieve)
	Medium	0.425 mm to 2.00 mm (No. 40 to No. 10 sieve)
	Fine	0.074 mm to 0.425 mm (No. 200 to No. 40 sieve)
Silt & Clay ("Fines")		<0.074 mm (smaller than a No. 200 sieve)

COHESIVE SILTS & CLAYS		
UNCONFINED COMPRESSIVE STRENGTH, Q_P[4]	**SPT[5] (BPF)**	**CONSISTENCY[7] (COHESIVE)**
<0.25	<3	Very Soft
0.25 - <0.50	3 - 4	Soft
0.50 - <1.00	5 - 8	Medium Stiff
1.00 - <2.00	9 - 15	Stiff
2.00 - <4.00	16 - 30	Very Stiff
4.00 - 8.00	31 - 50	Hard
>8.00	>50	Very Hard

GRAVELS, SANDS & NON-COHESIVE SILTS	
SPT[5]	**DENSITY**
<5	Very Loose
5 - 10	Loose
11 - 30	Medium Dense
31 - 50	Dense
>50	Very Dense

RELATIVE AMOUNT[7]	COARSE GRAINED (%)	FINE GRAINED (%)
Trace	<5	<5
Dual Symbol *(ex: SW-SM)*	10	10
With	15 - 20	15-25
Adjective *(ex: "Silty")*	25 - <50	30 - <50

WATER LEVELS[6]		
	WL	Water Level (WS)(WD)
		(WS) While Sampling
		(WD) While Drilling
	SHW	Seasonal High WT
	ACR	After Casing Removal
	SWT	Stabilized Water Table
	DCI	Dry Cave-In
	WCI	Wet Cave-In

[1] *Classifications and symbols per ASTM D 2488-09 (Visual-Manual Procedure) unless noted otherwise.*

[2] *To be consistent with general practice, "POORLY GRADED" has been removed from GP, GP-GM, GP-GC, SP, SP-SM, SP-SC soil types on the boring logs.*

[3] *Non-ASTM designations are included in soil descriptions and symbols along with ASTM symbol [Ex: (SM-**FILL**)].*

[4] *Typically estimated via pocket penetrometer or Torvane shear test and expressed in tons per square foot (tsf).*

[5] *Standard Penetration Test (SPT) refers to the number of hammer blows (blow count) of a 140 lb. hammer falling 30 inches on a 2 inch OD split spoon sampler required to drive the sampler 12 inches (ASTM D 1586). "N-value" is another term for "blow count" and is expressed in blows per foot (bpf).*

[6] *The water levels are those levels actually measured in the borehole at the times indicated by the symbol. The measurements are relatively reliable when augering, without adding fluids, in granular soils. In clay and cohesive silts, the determination of water levels may require several days for the water level to stabilize. In such cases, additional methods of measurement are generally employed.*

[7] *Minor deviation from ASTM D 2488-09.*

CLIENT	Job #:	BORING #	SHEET
Geo-Science Consulting	16:13014	B-1	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
Sibley Lincoln Plaza	

SITE LOCATION

SWC Sibley Boulevard and Lincoln Avenue, Dolton, Cook County, IL

NORTHING	EASTING	STATION

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% – — – REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING | LOSS OF CIRCULATION

SURFACE ELEVATION 606 feet (+/-)

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0						606	
	S-1	SS	18	18			4 7 10
3						603	
	S-2	SS	18	18			2 4 4
6						600	
	S-3	SS	18	18			3 6 11
9	S-4	SS	18	18		597	10 11 12
12	S-5	SS	18	18		594	1 2 6
15						591	
18						588	

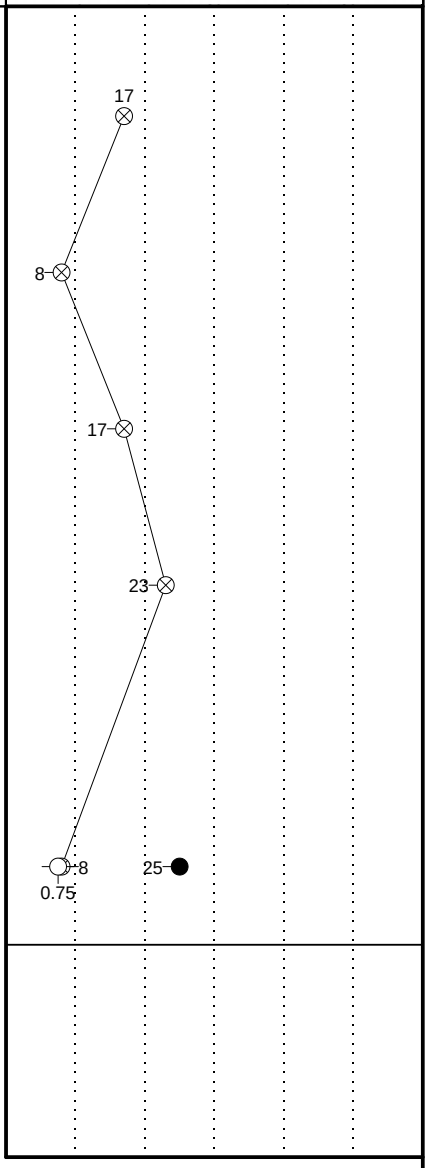
Asphalt [1.75"](+/-)

Gravel [5.25"](+/-)

(SP) SAND, brown to dark brown, moist, loose to medium dense

(CL/ML) SILTY CLAY, gray, moist, firm

END OF BORING @ 15'



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL 5 feet WS ☐ WD ☒	BORING STARTED 07/23/19	CAVE IN DEPTH 9 feet
WL(SHW) WL(ACR) 8 feet	BORING COMPLETED 07/23/19	HAMMER TYPE Auto
WL	RIG Truck FOREMAN	DRILLING METHOD

CLIENT	Job #:	BORING #	SHEET
Geo-Science Consulting	16:13014	B-2	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
Sibley Lincoln Plaza	

SITE LOCATION

SWC Sibley Boulevard and Lincoln Avenue, Dolton, Cook County, IL

NORTHING	EASTING	STATION

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% – — – REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING ▰ — LOSS OF CIRCULATION 100%

SURFACE ELEVATION 607 feet (+/-)

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0							
						606	
	S-1	SS	18	18			3 4 5
3							
	S-2	SS	18	18		603	4 6 7
6							
	S-3	SS	18	18		600	3 6 7
9							
	S-4	SS	18	18		597	6 13 17
12						594	
	S-5	SS	18	18			WOH 1 2
15						591	
18							

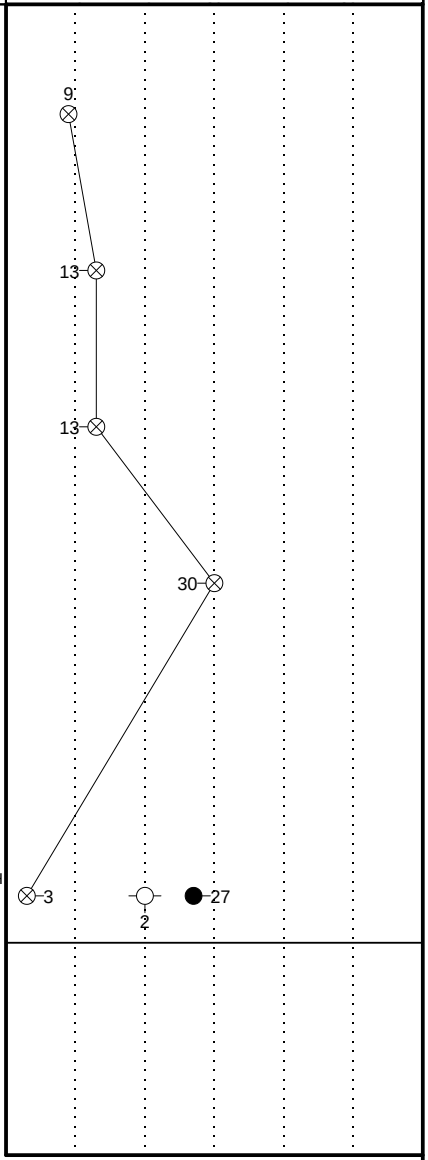
Gravel Thickness [2"](+/-)

(SP) SAND, brown, moist, loose to dense

(CL/ML) SILTY CLAY, trace sand, gray, moist, firm

(CL/ML) SILTY CLAY, trace gravel, gray, moist, very stiff

END OF BORING @ 15'



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL 6 feet WS ☐ WD ☒	BORING STARTED 07/23/19	CAVE IN DEPTH
WL(SHW) WL(ACR) DRY	BORING COMPLETED 07/23/19	HAMMER TYPE Auto
WL	RIG Truck FOREMAN	DRILLING METHOD HAS/SPT

CLIENT	Job #:	BORING #	SHEET
Geo-Science Consulting	16:13014	B-3	1 OF 2

PROJECT NAME	ARCHITECT-ENGINEER
Sibley Lincoln Plaza	

SITE LOCATION

SWC Sibley Boulevard and Lincoln Avenue, Dolton, Cook County, IL

NORTHING	EASTING	STATION

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% - — - REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

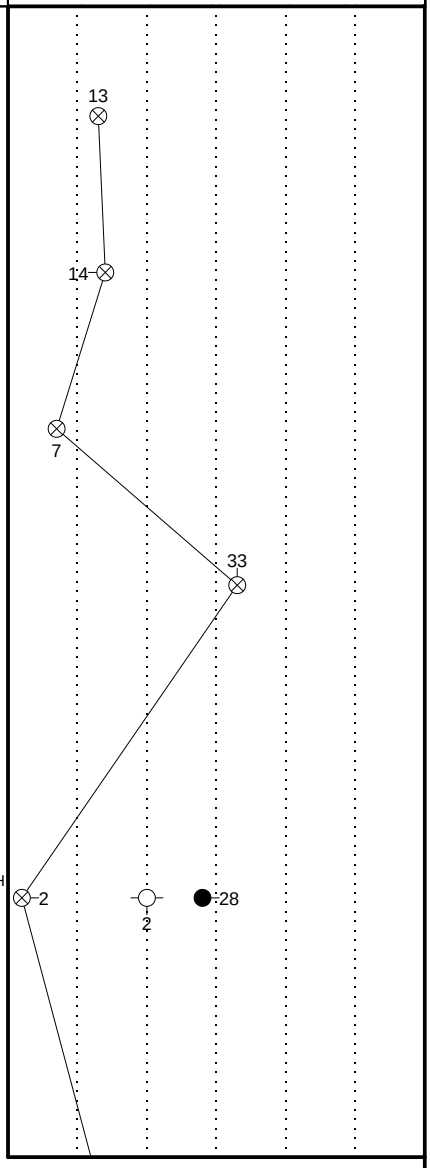
STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING ▰ — LOSS OF CIRCULATION

SURFACE ELEVATION 608 feet (+/-)

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Asphalt [1.5"](+/-) Gravel [8.5"](+/-)			
	S-1	SS	18	18	(SP) SAND, orange, moist, medium dense		606	4 6 7
3					(SP) SAND, brown to dark brown, moist, medium dense			
	S-2	SS	18	18			603	4 6 8
6	S-3	SS	18	18		▽		2 3 4
					(SP) SAND WITH GRAVEL, brown, moist, dense	▽	600	
9	S-4	SS	18	18				8 15 18
					(ML) SILT, gray, moist, very loose to medium dense		597	
12								
	S-5	SS	18	18			594	WOH 1 1
15							591	
18								



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THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL 7 feet WS ☐ WD ☒	BORING STARTED 07/23/19	CAVE IN DEPTH 8.5 feet
WL(SHW) WL(ACR) 8 feet	BORING COMPLETED 07/23/19	HAMMER TYPE Auto
WL	RIG D-50 ATV FOREMAN	DRILLING METHOD HAS/SPT

CLIENT	Job #:	BORING #	SHEET
Geo-Science Consulting	16:13014	B-3	2 OF 2

PROJECT NAME	ARCHITECT-ENGINEER
Sibley Lincoln Plaza	

SITE LOCATION: SWC Sibley Boulevard and Lincoln Avenue, Dolton, Cook County, IL

NORTHING | EASTING | STATION

CALIBRATED PENETROMETER TONS/FT²

ROCK QUALITY DESIGNATION & RECOVERY
RQD% – — – REC%

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING | LOSS OF CIRCULATION

SURFACE ELEVATION 608 feet (+/-)

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
	S-6	SS	18	18			3 7 7
21						588	
						585	
24	S-7	SS	18	18			3 5 9
						582	
27							
						579	
30							
						576	
33							
						573	
36							

(ML) SILT, gray, moist, very loose to medium dense

1.25 — 19 — 14

14

END OF BORING @ 25'

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL 7 feet WS ☐ WD ☒	BORING STARTED 07/23/19	CAVE IN DEPTH 8.5 feet
WL(SHW) WL(ACR) 8 feet	BORING COMPLETED 07/23/19	HAMMER TYPE Auto
WL	RIG D-50 ATV FOREMAN	DRILLING METHOD HAS/SPT

CLIENT	Job #:	BORING #	SHEET
Geo-Science Consulting	16:13014	B-4	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
Sibley Lincoln Plaza	

SITE LOCATION

SWC Sibley Boulevard and Lincoln Avenue, Dolton, Cook County, IL

NORTHING	EASTING	STATION

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% – — – REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING ▰ — LOSS OF CIRCULATION 100%

SURFACE ELEVATION 607 feet (+/-)

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Asphalt [2"](+/-)			
					(SP) SAND, brown, moist, medium dense		606	
	S-1	SS	18	18				4 5 6
3								
	S-2	SS	18	18			603	4 5 5
6								
	S-3	SS	18	18			600	3 2 2
					(SP) SAND, gray, moist, loose	▽		
9	S-4	SS	18	18		▼		5 6 12
							597	
12							594	
	S-5	SS	18	18	(SM) SILTY SAND, dark gray, moist, loose			4 4 2
15					END OF BORING @ 15'		591	
18								

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

▽ WL 8 feet WS ☐ WD ☒	BORING STARTED 07/23/19	CAVE IN DEPTH 10 feet
▽ WL(SHW) ▼ WL(ACR) 9 feet	BORING COMPLETED 07/23/19	HAMMER TYPE Auto
▽ WL	RIG Truck FOREMAN	DRILLING METHOD

CLIENT	Job #:	BORING #	SHEET
Geo-Science Consulting	16:13014	B-5	1 OF 2

PROJECT NAME	ARCHITECT-ENGINEER
Sibley Lincoln Plaza	

SITE LOCATION

SWC Sibley Boulevard and Lincoln Avenue, Dolton, Cook County, IL

NORTHING	EASTING	STATION

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% – — – REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

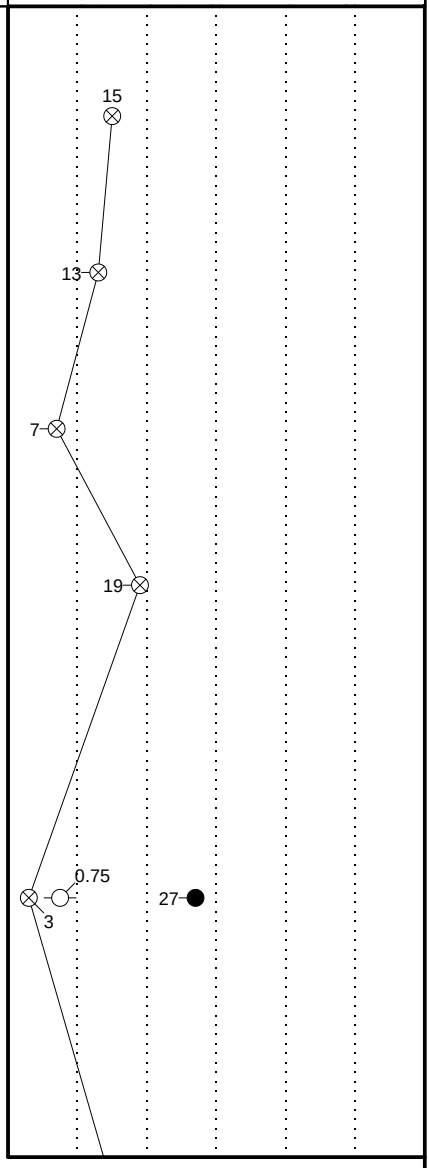
STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING ▰ — LOSS OF CIRCULATION (100%)

SURFACE ELEVATION 608 feet (+/-)

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					(SP) SAND, light brown, moist, medium dense to loose to medium dense			
	S-1	SS	18	18			606	4 6 9
3								
	S-2	SS	18	18			603	5 6 7
6								
	S-3	SS	18	18			600	3 3 4
9								
	S-4	SS	18	18			597	4 6 13
12					(SP) SAND, trace gravel, gray, moist, loose		594	1 1 2
	S-5	SS	18	18				
15					(ML) SILT, gray, moist, very loose (CL/ML) SILTY CLAY WITH SAND, gray, moist, very stiff		591	
18								



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THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL 8 feet WS ☐ WD ☒	BORING STARTED 07/23/19	CAVE IN DEPTH 10 feet
WL(SHW) WL(ACR) 9 feet	BORING COMPLETED 07/23/19	HAMMER TYPE Auto
WL	RIG Truck FOREMAN	DRILLING METHOD

CLIENT	Job #:	BORING #	SHEET
Geo-Science Consulting	16:13014	B-5	2 OF 2

PROJECT NAME	ARCHITECT-ENGINEER
Sibley Lincoln Plaza	

SITE LOCATION

SWC Sibley Boulevard and Lincoln Avenue, Dolton, Cook County, IL

NORTHING	EASTING	STATION

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% - — - REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING | LOSS OF CIRCULATION

SURFACE ELEVATION 608 feet (+/-)

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
	S-6	SS	18	18	(CL/ML) SILTY CLAY WITH SAND, gray, moist, very stiff			3 6 10
					END OF BORING @ 20'		588	
21							585	
24							582	
27							579	
30							576	
33							573	
36								

16 (⊗) 26 (◑) 2.5

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL 8 feet WS ☐ WD ☒	BORING STARTED 07/23/19	CAVE IN DEPTH 10 feet
WL(SHW) WL(ACR) 9 feet	BORING COMPLETED 07/23/19	HAMMER TYPE Auto
WL	RIG Truck FOREMAN	DRILLING METHOD

CLIENT	Job #:	BORING #	SHEET
Geo-Science Consulting	16:13014	P-1	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
Sibley Lincoln Plaza	

SITE LOCATION

SWC Sibley Boulevard and Lincoln Avenue, Dolton, Cook County, IL

NORTHING	EASTING	STATION

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% – — – REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

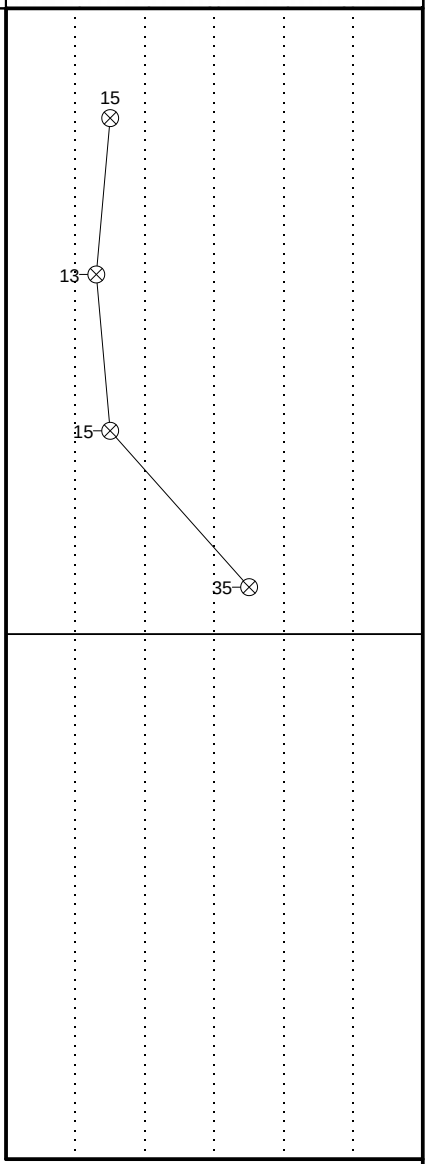
STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING | LOSS OF CIRCULATION

SURFACE ELEVATION 606 feet (+/-)

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Asphalt [2"](+/-) Gravel [8"](+/-)		606	
	S-1	SS	18	18	(SP) SAND, brown, moist, medium dense			7 7 8
3					(SM) SILTY SAND, trace clay, trace organics, brown, moist, medium dense		603	
	S-2	SS	18	18	(SP) SAND, brown, moist, medium dense			4 5 8
6							600	
	S-3	SS	18	18	(SP) SAND WITH GRAVEL, gray, moist, medium dense to dense			5 7 8
9	S-4	SS	18	18			597	8 12 23
					END OF BORING @ 10'			
12							594	
15							591	
18							588	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL 6 feet WS ☐ WD ☒	BORING STARTED 07/23/19	CAVE IN DEPTH 7 feet
WL(SHW) WL(ACR) 7 feet	BORING COMPLETED 07/23/19	HAMMER TYPE Auto
WL	RIG Truck FOREMAN	DRILLING METHOD

CLIENT	Job #:	BORING #	SHEET
Geo-Science Consulting	16:13014	P-2	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
Sibley Lincoln Plaza	

SITE LOCATION

SWC Sibley Boulevard and Lincoln Avenue, Dolton, Cook County, IL

NORTHING	EASTING	STATION

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% - - - REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING | LOSS OF CIRCULATION

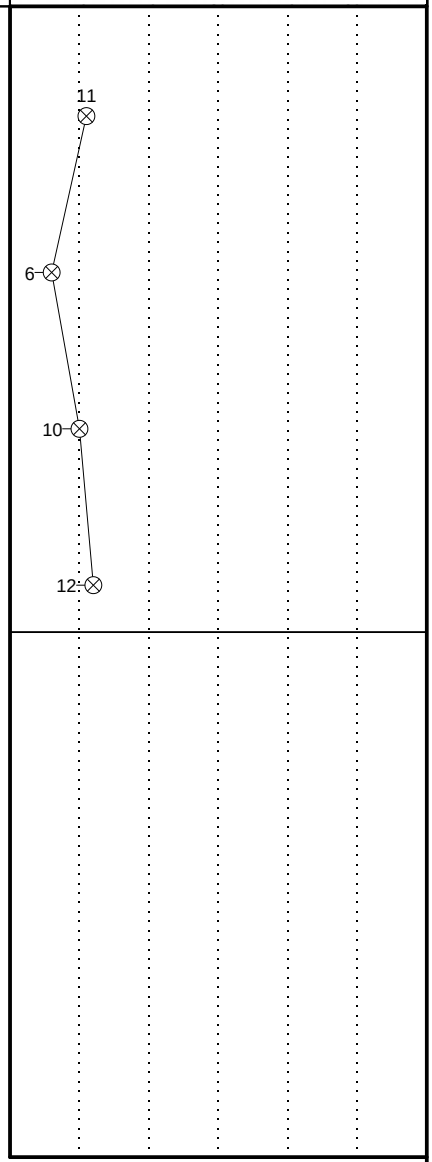
SURFACE ELEVATION 609 feet (+/-)

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0						609	
	S-1	SS	18	18			4 5 6
3						606	
	S-2	SS	18	18			2 2 4
6						603	
	S-3	SS	18	18			3 4 6
9	S-4	SS	18	18		600	3 5 7
12						597	
15						594	
18						591	

Asphalt [1.75"](+/-)
Gravel [4.5"](+/-)
(SP) SAND, orange, moist, medium dense

(SP) SAND, brown, moist, loose to medium dense

END OF BORING @ 10'



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL 8 feet WS ☐ WD ☒	BORING STARTED 07/23/19	CAVE IN DEPTH 8 feet
WL(SHW) WL(ACR) DRY	BORING COMPLETED 07/23/19	HAMMER TYPE Auto
WL	RIG Truck FOREMAN	DRILLING METHOD

SOIL CLASSIFICATION LEGEND

GW - WELL GRADED GRAVEL
GM - SILTY GRAVEL
GP - POORLY GRADED GRAVEL
GC - CLAYEY GRAVEL
SW - WELL GRADED SAND
ML - LOW PLASTICITY SILT

ST - SHELBY TUBE
CL - LOW PLASTICITY CLAY
MH - HIGH PLASTICITY SILT
SM - SILTY SAND

RC - ROCK CORE
SP - POORLY GRADED SAND
SC - CLAYEY SAND
CH - HIGH PLASTICITY CLAY

PM - PRESSURE METER
OH - HIGH PLASTICITY ORGANIC SILTS AND CLAYS
OL - LOW PLASTICITY ORGANIC SILTS AND CLAY
PT - PEAT

NOTE: NUMBERS IMMEDIATELY TO THE LEFT OF THE BORING PROFILE ARE SPT-N VALUES.

WR - WEATHERED ROCK
PWR - PARTIALLY WEATHERED ROCK

- FILL
- POSSIBLE FILL
- PROBABLE FILL

SURFACE MATERIALS

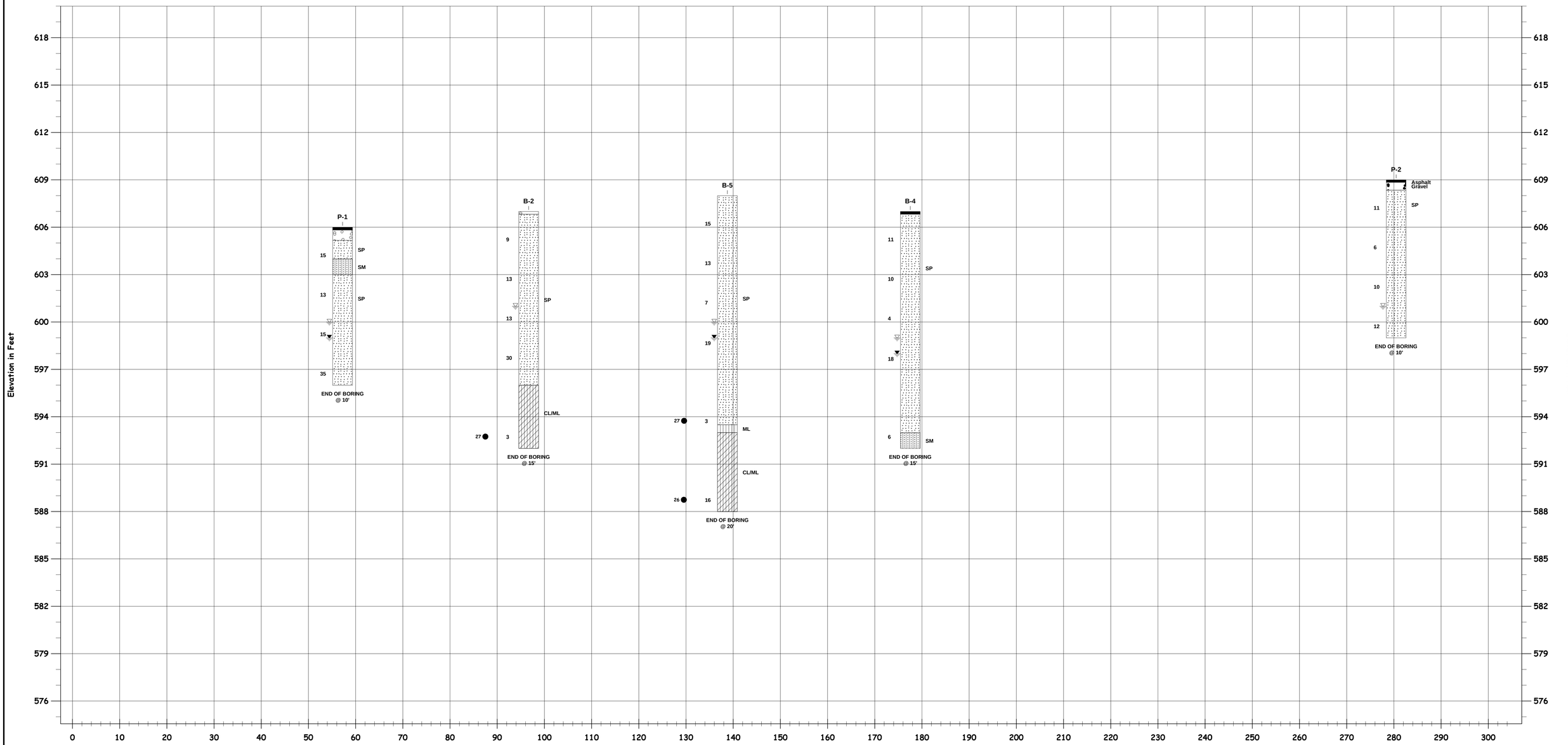
TOPSOIL
ASPHALT
GRAVEL
CONCRETE
VOID

ROCK TYPES

IGNEOUS
METAMORPHIC
SEDIMENTARY

SYMBOL LEGEND

WATER LEVEL - DURING DRILLING/SAMPLING
WATER LEVEL - SEASONAL HIGH WATER
WATER LEVEL - AFTER CASING REMOVAL
WATER LEVEL - AFTER 24 HOURS
PLASTIC LIMIT% WATER CONTENT% % PASSING #200 SIEVE (85%) LIQUID LIMIT%



NOTES:
1 SEE INDIVIDUAL BORING LOG AND GEOTECHNICAL REPORT FOR ADDITIONAL INFORMATION.
2 PENETRATION TEST RESISTANCE IN BLOWS PER FOOT (ASTM D1586).
3 HORIZONTAL DISTANCES ARE NOT TO SCALE.

Sibley Lincoln Plaza

SWC Sibley Boulevard and Lincoln Avenue, Dolton, Cook County, IL

Subsurface Soil Profile A-A'

Geo-Science Consulting

PROJECT NO.: 13014 | DATE: 8/19/2019 | VERTICAL SCALE: 1"=3'

APPENDIX C - Supplemental Report Documents

Important Information about This Geotechnical-Engineering Report

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, clients can benefit from a lowered exposure to the subsurface problems that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed below, contact your GBA-member geotechnical engineer. Active involvement in the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Geotechnical-Engineering Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. *Those who rely on a geotechnical-engineering report prepared for a different client can be seriously misled*. No one except authorized client representatives should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one – not even you – should apply this report for any purpose or project except the one originally contemplated.*

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read it *in its entirety*. Do not rely on an executive summary. Do not read selected elements only. *Read this report in full.*

You Need to Inform Your Geotechnical Engineer about Change

Your geotechnical engineer considered unique, project-specific factors when designing the study behind this report and developing the confirmation-dependent recommendations the report conveys. A few typical factors include:

- the client's goals, objectives, budget, schedule, and risk-management preferences;
- the general nature of the structure involved, its size, configuration, and performance criteria;
- the structure's location and orientation on the site; and
- other planned or existing site improvements, such as retaining walls, access roads, parking lots, and underground utilities.

Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.*

This Report May Not Be Reliable

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, that it could be unwise to rely on a geotechnical-engineering report whose reliability may have been affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If your geotechnical engineer has not indicated an "apply-by" date on the report, ask what it should be*, and, in general, *if you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying it. A minor amount of additional testing or analysis – if any is required at all – could prevent major problems.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface through various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing were performed*. The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgment to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team from project start to project finish, so the individual can provide informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, *they are not final*, because the geotechnical engineer who developed them relied heavily on judgment and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* revealed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a full-time member of the design team, to:

- confer with other design-team members,
- help develop specifications,
- review pertinent elements of other design professionals' plans and specifications, and
- be on hand quickly whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction observation.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for informational purposes only*. To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report, but they may rely on the factual data relative to the specific times, locations, and depths/elevations referenced. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely*. Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures*. If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. As a general rule, *do not rely on an environmental report prepared for a different client, site, or project, or that is more than six months old.*

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, none of the engineer's services were designed, conducted, or intended to prevent uncontrolled migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration.*** Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

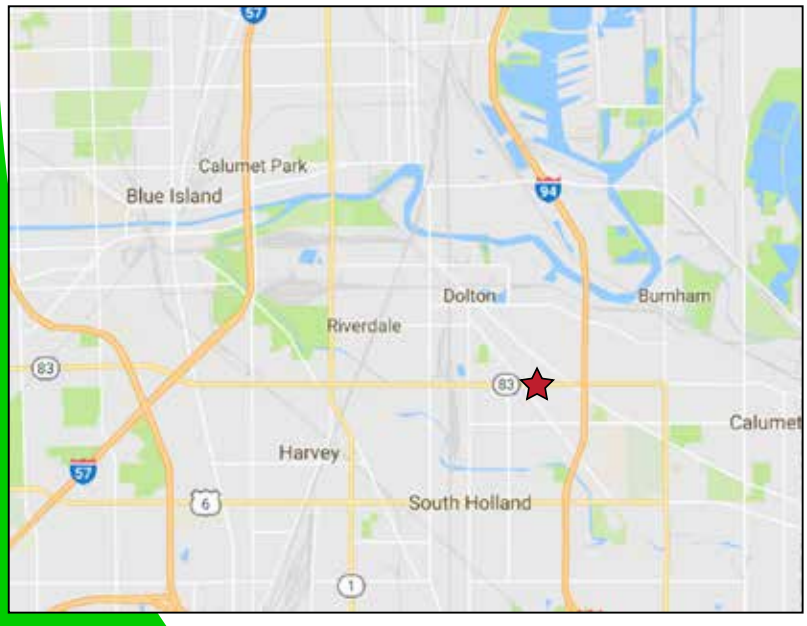
Telephone: 301/565-2733
e-mail: info@geoprofessional.org www.geoprofessional.org

Specialty Package for O'Reilly

EXCELLENT LOCATION

SIBLEY LINCOLN PLAZA

Near SWC of Sibley Blvd & Lincoln Ave, Dolton, IL



PROPERTY HIGHLIGHTS

- Great visibility
- Key Intersection
- High volume traffic
- Excellent signage

For Information Please Contact:

312 - 332 - 4172

National Shopping Plazas, Inc. 200 W. Madison St. Suite 4200 Chicago, IL

SIBLEY LINCOLN PLAZA

Near SWC of Sibley Blvd & Lincoln Ave,
Dolton, IL

For Information Please Contact:

312 - 332 - 4172

National Shopping Plazas, Inc. 200 W. Madison St. Suite 4200 Chicago, IL

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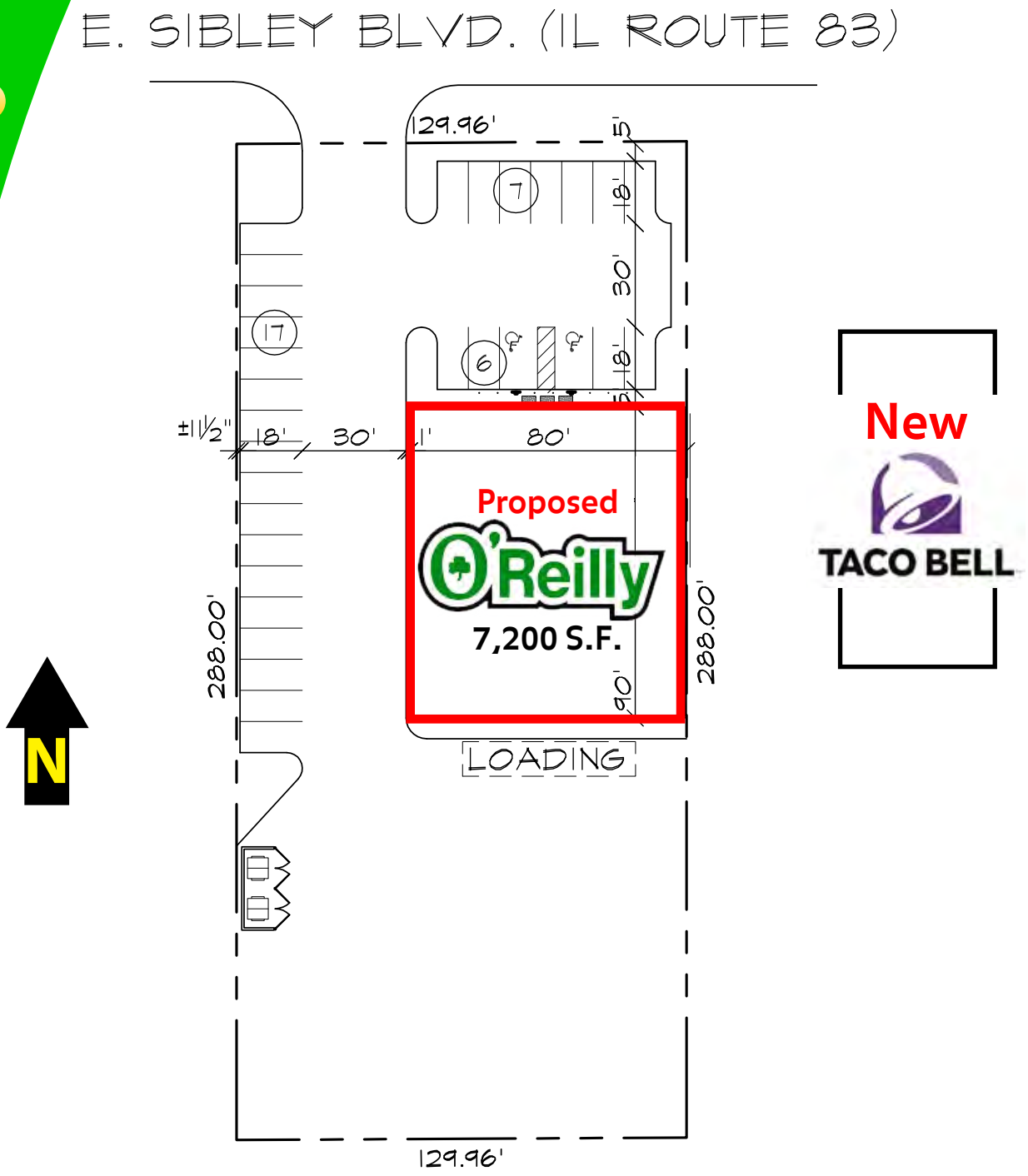

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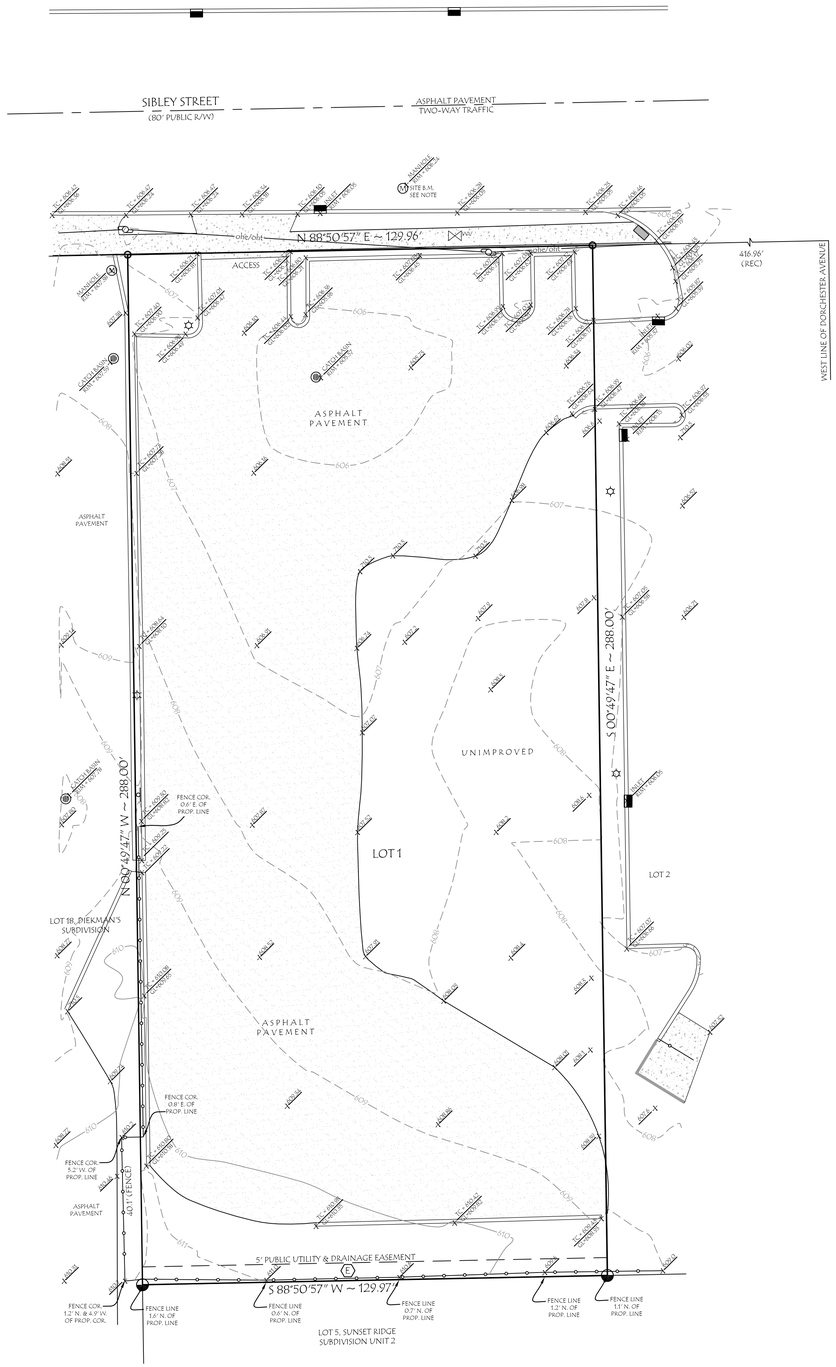
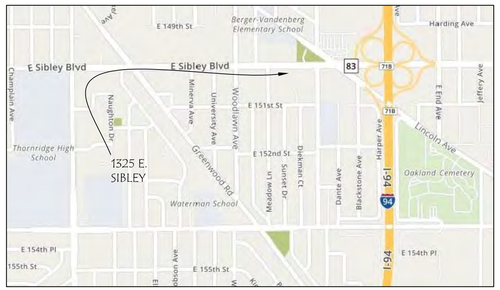


SEKEREZ
NORTH
LAND SURVEYING & PLANNING

SCALE : 1 inch = 20 feet

20 0 20 40

Graphic Scale



VICINITY MAP
no scale

LEGEND

- = Set Iron Rod
- = Found Iron Rod
- = Set Survey Nail
- = Water Valve
- = Catch Basin
- = Manhole
- = Curb Inlet
- = Curb
- = ADA Textured Pad
- = Schedule "B" Item
- = Area Light
- = Bollard
- = Utility Pole
- = Sign
- = Spot Grade
- = Top of Curb Elevation / Gutter Line Elevation
- = Concrete Walks & Pads
- = Chain Link Fence
- = Overhead Utility Wires

PROPERTY DESCRIPTION:

LOT 1 IN FINAL PLAT OF RESUBDIVISION OF LOT 2 IN DIEKMAN'S SUBDIVISION BEING A RESUBVISION OF PART OF LOT 2 IN DIEKMAN'S SUBDIVISION, LOCATED IN THE SOUTHEAST 1/4 OF SECTION 11, TOWNSHIP 36 NORTH, RANGE 14, EAST OF THE THIRD PRINCIPAL MERIDIAN, ACCORDING TO THE PLAT OF RESUBDIVISION RECORDED JUNE 2, 2016 AS DOCUMENT 1615429064, IN THE VILLAGE OF DOLTON, COOK COUNTY, ILLINOIS.

ITEMS CORRESPONDING TO SCHEDULE "B:"

CHICAGO TITLE INSURANCE COMPANY
COMMITMENT No. 19GSC0062421P
EFFECTIVE DATE: MARCH 18, 2019

(N) N 16. Subject to matters of record as shown on plat of resubdivision recorded June 2, 2016 as document 1615429064. (For further particulars, see record.)
PLATTED BOUNDARY AND OTHER PARTICULARS SHOWN BUT NOT OTHERWISE LABELED - SEE DRAWING

(C) C 17. Rights of the public, the State of Illinois and the municipality in and to that part of the Land, if any, taken or used for road purposes.
ROADWAY SHOWN BUT NOT OTHERWISE LABELED - SEE DRAWING

(O) O 18. Rights of Way for drainage tiles, ditches, feeders, laterals and underground pipes, if any.
SURFACE DRAINAGE STRUCTURES SHOWN BUT NOT OTHERWISE LABELED - SEE DRAWING

(E) E 19. Easement for public utilities and drainage over the South 5 feet of the Land as depicted on the Survey by L.R. Pass & Associates order no. 97081205 dated August 26, 1997.
AFFECTS PARCEL AND IS SHOWN - SEE DRAWING
NOTE: SURVEYOR IS NOT IN POSSESSION OF THIS DOCUMENT.

ZONING NOTE:

PROPERTY CURRENTLY ZONED "BUSINESS DISTRICT LIMITED RETAIL."

FOR BULK RESTRICTIONS REFER TO:
BUILDING DEPARTMENT
VILLAGE OF DOLTON
14122 CHICAGO ROAD, DOLTON, IL 60419
PHONE: 708-849-4000
https://vodolton.org/departments/building-department/

FLOOD NOTE:

ACCORDING TO THE FEDERAL EMERGENCY MANAGEMENT AGENCY FLOOD INSURANCE RATE MAP NUMBER 17031C, COMMUNITY PANEL 0752J EFFECTIVE DATE AUGUST 19, 2008, THE PARCEL SHOWN HEREON APPEARS TO BE LOCATED IN ZONE "X.". ZONE "X" IS DEFINED AS "AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN." THIS DETERMINATION WAS MADE BY GRAPHICAL PLOTTING AND SCALED MAP MEASURE ONLY. NO FIELD MEASUREMENTS WERE TAKEN CONCERNING THIS DETERMINATION, AND BASE FLOOD ELEVATIONS WERE NOT ESTABLISHED IN PERFORMANCE OF THIS SURVEY.

BENCHMARK AND DATUM NOTES:

1) ELEVATIONS ARE ADJUSTED TO STATE PLANE COORDINATE DATUM.
2) SITE BENCHMARK IS RIM OF MANHOLE IN SIBLEY STREET AT APPROXIMATE MIDPOINT OF LOT 2. ELEVATION = 606.24

ENCROACHMENT NOTE:

SUBJECT PROPERTY FENCE APPEARS TO ENCROACH OVER AND UPON WEST ADJOINER'S PROPERTY BY THE AMOUNT SHOWN ON THE DRAWING.

MISCELLANEOUS NOTES:

1) PARCEL P.I.N.: 29-11-400-049-0000
2) PARCEL AREAS: 37,429.33 sq. ft./0.859 ac±
3) NO STRIPED PARKING STALLS WERE OBSERVED ON THE DAY THE FIELD WORK WAS PERFORMED
4) BEARINGS SHOWN HEREON ARE BASED UPON THOSE RECITED IN THE RECORDED PLAT
5) UTILITIES AND OTHER IMPROVEMENTS SHOWN HEREON ARE BASED ON DIRECT OBSERVATION OF ABOVE-GROUND APPURTENANCES ONLY. THE SURVEYOR HAS NOT BEEN PROVIDED WITH UTILITY PLANS OR ATLASES RELATED TO THE SUBJECT PROPERTY OR ADJOINING PROPERTIES OR RIGHTS-OF-WAY.
6) SUBJECT PARCEL IS 416.96 FEET WEST OF THE SOUTHWESTERLY INTERSECTION OF SIBLEY BOULEVARD AND DORCHESTER AVENUE, BOTH PUBLIC RIGHTS-OF-WAY. PARCEL HAS DIRECT VEHICULAR ACCESS TO SIBLEY BOULEVARD AS SHOWN AND LABELED ON THE DRAWING.
7) THE PROPERTY DESCRIPTION SHOWN HEREON IS THE SAME AS, AND DESCRIBES THE SAME PARCEL, AS THAT REFERRED TO IN CHICAGO TITLE INSURANCE COMPANY COMMITMENT No. 19GSC0062421P BEARING AN EFFECTIVE DATE OF MARCH 18, 2019.

SURVEYOR'S CERTIFICATION

To:
AETNA DEVELOPMENT CORPORATION, AN ILLINOIS CORPORATION
CHICAGO TITLE INSURANCE COMPANY

This is to certify that this map or plat and the survey on which it is based were made in accordance with the 2016 Minimum Standard Detail Requirements for ALTA/NSPS Land Title Surveys, jointly established and adopted by ALTA and NSPS, and includes Items 1, 2, 3, 4, 5, 7(a), 7(b)(1), 8, 9 and 14 of Table A thereof. The field work was completed on April 9, 2019.

RUSSELL WAID DILLON
Professional Land Surveyor No. 3153
LICENSE EXPIRATION DATE: November 30, 2020
Date of Survey: April 25, 2019

3153 PROFESSIONAL LAND SURVEYOR STATE OF ILLINOIS
RUSSELL WAID DILLON
GRIFFITH, IN

No dimensions should be assumed by scale measurements upon plat. Contractor should verify and compare all points before beginning any construction and at once report any discrepancies to the surveyor. Surveyor should be contacted for construction layout of any improvements.

For building restrictions and/or easements refer to your deed, contract, title policy, and/or zoning regulations. This plat is valid only if it contains the original signature and seal of the surveyor. If you have any questions regarding this plat do not hesitate to contact us.

DRAWN BY: PS | CHECKED BY: RWD
DATE: April 25, 2019
ORDER NO.: 11060

ZARKO SEKEREZ & ASSOCIATES, INC.
Land Surveyors & Land Planners
116 WEST CLARK STREET
CROWN POINT, INDIANA 46307
ILL. PHONE: (312)726-1313 IND. PHONE: (219)663-5544
ILL. FAX: (312) 726-1320 IND. FAX: (219) 663-7282
WWW.SEKEREZ.COM

ALTA/NSPS LAND TITLE SURVEY

1325 East Sibley Boulevard
Dolton, Illinois

Denzin Soltanzadeh, LLC
190 S. LaSalle Street Suite 2160
Chicago, Illinois

SHEET 1 OF 1

STAT Analysis Corporation
2242 West Harrison St., Suite 200, Chicago, IL 60612-3766
Tel: (312) 733-0551 Fax: (312) 733-2386 STATinfo@STATAnalysis.com
Accreditations: IEPA ELAP 100445; ORELAP IL300001; AIHA-LAP, LLC 101160; NVLAP LabCode 101202-0

August 05, 2019

James L. Loring, P.G.
26288 N. Maple Avenue
Mundelein, IL 60060
Telephone: (847) 331-0621
Fax:

Analytical Report for STAT Work Order: 19071270 Revision 0

RE: LG21113A, Sibley Lincoln Plaza, Dolton, IL

Dear James L. Loring:

STAT Analysis received 3 samples for the referenced project on 7/23/2019 1:45:00 PM. The analytical results are presented in the following report.

All analyses were performed in accordance with the requirements of 35 IAC Part 186 / NELAP standards. Analyses were performed in accordance with methods as referenced on the analytical report. Those analytical results expressed on a dry weight basis are also noted on the analytical report.

All analyses were performed within established holding time criteria, and all Quality Control criteria met EPA or laboratory specifications except when noted in the Case Narrative or Analytical Report. If required, an estimate of uncertainty for the analyses can be provided. A listing of accredited methods/parameters can also be provided.

Thank you for the opportunity to serve you and I look forward to working with you in the future. If you have any questions regarding the enclosed materials, please contact me at (312) 733-0551.

Sincerely,

Justice Kwateng
Project Manager

STAT Analysis Corporation

Date: August 05, 2019

Client: James L. Loring, P.G.
Project: LG21113A, Sibley Lincoln Plaza, Dolton, IL
Work Order: 19071270 Revision 0

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Tag Number	Collection Date	Date Received
19071270-001A	JL072319100		7/23/2019 11:10:00 AM	7/23/2019
19071270-001B	JL072319100		7/23/2019 11:10:00 AM	7/23/2019
19071270-002A	P1-5.6'		7/23/2019 8:10:00 AM	7/23/2019
19071270-003A	B4-51		7/23/2019 12:15:00 PM	7/23/2019

STAT Analysis Corporation
2242 West Harrison St., Suite 200, Chicago, IL 60612-3766
Tel: (312) 733-0551 Fax: (312) 733-2386 STATinfo@STATAnalysis.com
Accreditations:IEPA ELAP 100445;ORELAP IL300001;AIHA-LAP, LLC 101160;NVLAP LabCode 101202-0

Date Reported: August 05, 2019
Date Printed: August 05, 2019

ANALYTICAL RESULTS

Client: James L. Loring, P.G.
Work Order: 19071270 Revision 0
Project: LG21113A, Sibley Lincoln Plaza, Dolton, IL
Lab ID: 19071270-001

Client Sample ID: JL072319100
Collection Date: 7/23/2019 11:10:00 AM
Matrix: Soil

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
Volatile Organic Compounds by GC/MS	**SW5035/8260B**			Prep Date: **7/23/2019**		Analyst: **ERP**
Acetone	ND	0.084		mg/Kg-dry	1	7/26/2019
Benzene	ND	0.0056		mg/Kg-dry	1	7/26/2019
Bromodichloromethane	ND	0.0056		mg/Kg-dry	1	7/26/2019
Bromoform	ND	0.0056		mg/Kg-dry	1	7/26/2019
Bromomethane	ND	0.012		mg/Kg-dry	1	7/26/2019
2-Butanone	ND	0.084		mg/Kg-dry	1	7/26/2019
Carbon disulfide	ND	0.056		mg/Kg-dry	1	7/26/2019
Carbon tetrachloride	ND	0.0056		mg/Kg-dry	1	7/26/2019
Chlorobenzene	ND	0.0056		mg/Kg-dry	1	7/26/2019
Chloroethane	ND	0.012		mg/Kg-dry	1	7/26/2019
Chloroform	ND	0.0056		mg/Kg-dry	1	7/26/2019
Chloromethane	ND	0.012		mg/Kg-dry	1	7/26/2019
Dibromochloromethane	ND	0.0056		mg/Kg-dry	1	7/26/2019
1,1-Dichloroethane	ND	0.0056		mg/Kg-dry	1	7/26/2019
1,2-Dichloroethane	ND	0.0056		mg/Kg-dry	1	7/26/2019
1,1-Dichloroethene	ND	0.0056		mg/Kg-dry	1	7/26/2019
cis-1,2-Dichloroethene	ND	0.0056		mg/Kg-dry	1	7/26/2019
trans-1,2-Dichloroethene	ND	0.0056		mg/Kg-dry	1	7/26/2019
1,2-Dichloropropane	ND	0.0056		mg/Kg-dry	1	7/26/2019
cis-1,3-Dichloropropene	ND	0.0022		mg/Kg-dry	1	7/26/2019
trans-1,3-Dichloropropene	ND	0.0022		mg/Kg-dry	1	7/26/2019
Ethylbenzene	ND	0.0056		mg/Kg-dry	1	7/26/2019
2-Hexanone	ND	0.022		mg/Kg-dry	1	7/26/2019
4-Methyl-2-pentanone	ND	0.022		mg/Kg-dry	1	7/26/2019
Methylene chloride	ND	0.012		mg/Kg-dry	1	7/26/2019
Methyl tert-butyl ether	ND	0.0056		mg/Kg-dry	1	7/26/2019
Styrene	ND	0.0056		mg/Kg-dry	1	7/26/2019
1,1,2,2-Tetrachloroethane	ND	0.0056		mg/Kg-dry	1	7/26/2019
Tetrachloroethene	ND	0.0056		mg/Kg-dry	1	7/26/2019
Toluene	ND	0.0056		mg/Kg-dry	1	7/26/2019
1,1,1-Trichloroethane	ND	0.0056		mg/Kg-dry	1	7/26/2019
1,1,2-Trichloroethane	ND	0.0056		mg/Kg-dry	1	7/26/2019
Trichloroethene	ND	0.0056		mg/Kg-dry	1	7/26/2019
Vinyl chloride	ND	0.0056		mg/Kg-dry	1	7/26/2019
Xylenes, Total	ND	0.017		mg/Kg-dry	1	7/26/2019
Semivolatile Organic Compounds by GC/MS	**SW8270C (SW3550B)**			Prep Date: **7/29/2019**		Analyst: **DM**
Acenaphthene	ND	0.035		mg/Kg-dry	1	7/30/2019
Acenaphthylene	ND	0.035		mg/Kg-dry	1	7/30/2019

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
HT - Sample received past holding time
* - Non-accredited parameter
RL - Reporting / Quantitation Limit for the analysis
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H - Holding time exceeded

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Accreditations:IEPA ELAP 100445;ORELAP IL300001;AIHA-LAP, LLC 101160;NVLAP LabCode 101202-0

Date Reported: August 05, 2019
Date Printed: August 05, 2019

ANALYTICAL RESULTS

Client: James L. Loring, P.G.
Work Order: 19071270 Revision 0
Project: LG21113A, Sibley Lincoln Plaza, Dolton, IL
Lab ID: 19071270-001

Client Sample ID: JL072319100
Collection Date: 7/23/2019 11:10:00 AM
Matrix: Soil

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
Semivolatile Organic Compounds by GC/MS	**SW8270C (SW3550B)**			Prep Date: **7/29/2019**		Analyst: **DM**
Aniline	ND	0.35		mg/Kg-dry	1	7/30/2019
Anthracene	ND	0.035		mg/Kg-dry	1	7/30/2019
Benz(a)anthracene	ND	0.035		mg/Kg-dry	1	7/30/2019
Benzidine	ND	0.35		mg/Kg-dry	1	7/30/2019
Benzo(a)pyrene	ND	0.035		mg/Kg-dry	1	7/30/2019
Benzo(b)fluoranthene	ND	0.035		mg/Kg-dry	1	7/30/2019
Benzo(g,h,i)perylene	ND	0.035		mg/Kg-dry	1	7/30/2019
Benzo(k)fluoranthene	ND	0.035		mg/Kg-dry	1	7/30/2019
Benzoic acid	ND	0.87		mg/Kg-dry	1	7/30/2019
Benzyl alcohol	ND	0.18		mg/Kg-dry	1	7/30/2019
Bis(2-chloroethoxy)methane	ND	0.18		mg/Kg-dry	1	7/30/2019
Bis(2-chloroethyl)ether	ND	0.18		mg/Kg-dry	1	7/30/2019
Bis(2-ethylhexyl)phthalate	ND	0.87		mg/Kg-dry	1	7/30/2019
4-Bromophenyl phenyl ether	ND	0.18		mg/Kg-dry	1	7/30/2019
Butyl benzyl phthalate	ND	0.18		mg/Kg-dry	1	7/30/2019
Carbazole	ND	0.18		mg/Kg-dry	1	7/30/2019
4-Chloroaniline	ND	0.18		mg/Kg-dry	1	7/30/2019
4-Chloro-3-methylphenol	ND	0.35		mg/Kg-dry	1	7/30/2019
2-Chloronaphthalene	ND	0.18		mg/Kg-dry	1	7/30/2019
2-Chlorophenol	ND	0.18		mg/Kg-dry	1	7/30/2019
4-Chlorophenyl phenyl ether	ND	0.18		mg/Kg-dry	1	7/30/2019
Chrysene	ND	0.035		mg/Kg-dry	1	7/30/2019
Dibenz(a,h)anthracene	ND	0.035		mg/Kg-dry	1	7/30/2019
Dibenzofuran	ND	0.18		mg/Kg-dry	1	7/30/2019
1,2-Dichlorobenzene	ND	0.18		mg/Kg-dry	1	7/30/2019
1,3-Dichlorobenzene	ND	0.18		mg/Kg-dry	1	7/30/2019
1,4-Dichlorobenzene	ND	0.18		mg/Kg-dry	1	7/30/2019
3,3´-Dichlorobenzidine	ND	0.18		mg/Kg-dry	1	7/30/2019
2,4-Dichlorophenol	ND	0.18		mg/Kg-dry	1	7/30/2019
Diethyl phthalate	ND	0.18		mg/Kg-dry	1	7/30/2019
2,4-Dimethylphenol	ND	0.18		mg/Kg-dry	1	7/30/2019
Dimethyl phthalate	ND	0.18		mg/Kg-dry	1	7/30/2019
4,6-Dinitro-2-methylphenol	ND	0.35		mg/Kg-dry	1	7/30/2019
2,4-Dinitrophenol	ND	0.87		mg/Kg-dry	1	7/30/2019
2,4-Dinitrotoluene	ND	0.035		mg/Kg-dry	1	7/30/2019
2,6-Dinitrotoluene	ND	0.035		mg/Kg-dry	1	7/30/2019
Di-n-butyl phthalate	ND	0.18		mg/Kg-dry	1	7/30/2019
Di-n-octyl phthalate	ND	0.18		mg/Kg-dry	1	7/30/2019

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Date Reported: August 05, 2019
Date Printed: August 05, 2019

ANALYTICAL RESULTS

Client: James L. Loring, P.G.
Work Order: 19071270 Revision 0
Project: LG21113A, Sibley Lincoln Plaza, Dolton, IL
Lab ID: 19071270-001

Client Sample ID: JL072319100
Collection Date: 7/23/2019 11:10:00 AM
Matrix: Soil

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
Semivolatile Organic Compounds by GC/MS	**SW8270C (SW3550B)**			Prep Date: **7/29/2019**		Analyst: **DM**
Fluoranthene	ND	0.035		mg/Kg-dry	1	7/30/2019
Fluorene	ND	0.035		mg/Kg-dry	1	7/30/2019
Hexachlorobenzene	ND	0.18		mg/Kg-dry	1	7/30/2019
Hexachlorobutadiene	ND	0.18		mg/Kg-dry	1	7/30/2019
Hexachlorocyclopentadiene	ND	0.18		mg/Kg-dry	1	7/30/2019
Hexachloroethane	ND	0.18		mg/Kg-dry	1	7/30/2019
Indeno(1,2,3-cd)pyrene	ND	0.035		mg/Kg-dry	1	7/30/2019
Isophorone	ND	0.18		mg/Kg-dry	1	7/30/2019
2-Methylnaphthalene	ND	0.18		mg/Kg-dry	1	7/30/2019
2-Methylphenol	ND	0.18		mg/Kg-dry	1	7/30/2019
4-Methylphenol	ND	0.18		mg/Kg-dry	1	7/30/2019
Naphthalene	ND	0.035		mg/Kg-dry	1	7/30/2019
2-Nitroaniline	ND	0.18		mg/Kg-dry	1	7/30/2019
3-Nitroaniline	ND	0.18		mg/Kg-dry	1	7/30/2019
4-Nitroaniline	ND	0.18		mg/Kg-dry	1	7/30/2019
2-Nitrophenol	ND	0.18		mg/Kg-dry	1	7/30/2019
4-Nitrophenol	ND	0.35		mg/Kg-dry	1	7/30/2019
Nitrobenzene	ND	0.035		mg/Kg-dry	1	7/30/2019
N-Nitrosodi-n-propylamine	ND	0.035		mg/Kg-dry	1	7/30/2019
N-Nitrosodimethylamine	ND	0.18		mg/Kg-dry	1	7/30/2019
N-Nitrosodiphenylamine	ND	0.035		mg/Kg-dry	1	7/30/2019
2, 2'-oxybis(1-Chloropropane)	ND	0.18		mg/Kg-dry	1	7/30/2019
Pentachlorophenol	ND	0.035		mg/Kg-dry	1	7/30/2019
Phenanthrene	ND	0.035		mg/Kg-dry	1	7/30/2019
Phenol	ND	0.18		mg/Kg-dry	1	7/30/2019
Pyrene	ND	0.035		mg/Kg-dry	1	7/30/2019
Pyridine	ND	0.70		mg/Kg-dry	1	7/30/2019
1,2,4-Trichlorobenzene	ND	0.18		mg/Kg-dry	1	7/30/2019
2,4,5-Trichlorophenol	ND	0.18		mg/Kg-dry	1	7/30/2019
2,4,6-Trichlorophenol	ND	0.18		mg/Kg-dry	1	7/30/2019
PCBs	**SW8082A (SW3550B)**			Prep Date: **7/29/2019**		Analyst: **GVC**
Aroclor 1016	ND	0.083		mg/Kg-dry	1	7/30/2019
Aroclor 1221	ND	0.083		mg/Kg-dry	1	7/30/2019
Aroclor 1232	ND	0.083		mg/Kg-dry	1	7/30/2019
Aroclor 1242	ND	0.083		mg/Kg-dry	1	7/30/2019
Aroclor 1248	ND	0.083		mg/Kg-dry	1	7/30/2019
Aroclor 1254	ND	0.083		mg/Kg-dry	1	7/30/2019
Aroclor 1260	ND	0.083		mg/Kg-dry	1	7/30/2019

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Date Reported: August 05, 2019
Date Printed: August 05, 2019

ANALYTICAL RESULTS

Client: James L. Loring, P.G.
Work Order: 19071270 Revision 0
Project: LG21113A, Sibley Lincoln Plaza, Dolton, IL
Lab ID: 19071270-001

Client Sample ID: JL072319100
Collection Date: 7/23/2019 11:10:00 AM
Matrix: Soil

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
Pesticides		**SW8081B (SW3550B)**		Prep Date: **7/29/2019**		Analyst: **GVC**
4,4´-DDD	ND	0.0017		mg/Kg-dry	1	7/30/2019
4,4´-DDE	ND	0.0017		mg/Kg-dry	1	7/30/2019
4,4´-DDT	ND	0.0017		mg/Kg-dry	1	7/30/2019
Aldrin	ND	0.0017		mg/Kg-dry	1	7/30/2019
alpha-BHC	ND	0.0017		mg/Kg-dry	1	7/30/2019
alpha-Chlordane	ND	0.0017		mg/Kg-dry	1	7/30/2019
beta-BHC	ND	0.0017		mg/Kg-dry	1	7/30/2019
Chlordane	ND	0.017		mg/Kg-dry	1	7/30/2019
delta-BHC	ND	0.0017		mg/Kg-dry	1	7/30/2019
Dieldrin	ND	0.0017		mg/Kg-dry	1	7/30/2019
Endosulfan I	ND	0.0017		mg/Kg-dry	1	7/30/2019
Endosulfan II	ND	0.0017		mg/Kg-dry	1	7/30/2019
Endosulfan sulfate	ND	0.0017		mg/Kg-dry	1	7/30/2019
Endrin	ND	0.0017		mg/Kg-dry	1	7/30/2019
Endrin aldehyde	ND	0.0017		mg/Kg-dry	1	7/30/2019
Endrin ketone	ND	0.0017		mg/Kg-dry	1	7/30/2019
gamma-BHC	ND	0.0017		mg/Kg-dry	1	7/30/2019
gamma-Chlordane	ND	0.0017		mg/Kg-dry	1	7/30/2019
Heptachlor	ND	0.0017		mg/Kg-dry	1	7/30/2019
Heptachlor epoxide	ND	0.0017		mg/Kg-dry	1	7/30/2019
Methoxychlor	ND	0.0017		mg/Kg-dry	1	7/30/2019
Toxaphene	ND	0.034		mg/Kg-dry	1	7/30/2019
Metals by ICP/MS		**SW6020A (SW3050B)**		Prep Date: **7/29/2019**		Analyst: **JG**
Aluminum	2400	19		mg/Kg-dry	10	7/31/2019
Antimony	ND	1.9		mg/Kg-dry	10	7/31/2019
Arsenic	2.5	0.95		mg/Kg-dry	10	7/31/2019
Barium	11	0.95		mg/Kg-dry	10	7/31/2019
Beryllium	ND	0.47		mg/Kg-dry	10	7/31/2019
Cadmium	ND	0.47		mg/Kg-dry	10	7/31/2019
Calcium	1500	57		mg/Kg-dry	10	7/31/2019
Chromium	3.0	0.95		mg/Kg-dry	10	7/31/2019
Cobalt	1.5	0.95		mg/Kg-dry	10	7/31/2019
Copper	ND	2.4		mg/Kg-dry	10	7/31/2019
Iron	3700	28		mg/Kg-dry	10	7/31/2019
Lead	3.1	0.47		mg/Kg-dry	10	7/31/2019
Magnesium	860	28		mg/Kg-dry	10	7/31/2019
Manganese	33	0.95		mg/Kg-dry	10	7/31/2019
Nickel	2.5	0.95		mg/Kg-dry	10	7/31/2019

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Date Reported: August 05, 2019
Date Printed: August 05, 2019

ANALYTICAL RESULTS

Client: James L. Loring, P.G.
Work Order: 19071270 Revision 0
Project: LG21113A, Sibley Lincoln Plaza, Dolton, IL
Lab ID: 19071270-001

Client Sample ID: JL072319100
Collection Date: 7/23/2019 11:10:00 AM
Matrix: Soil

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
Metals by ICP/MS	**SW6020A (SW3050B)**			Prep Date: **7/29/2019**		Analyst: **JG**
Potassium	150	28		mg/Kg-dry	10	7/31/2019
Selenium	ND	0.95		mg/Kg-dry	10	7/31/2019
Silver	ND	0.95		mg/Kg-dry	10	7/31/2019
Sodium	ND	57		mg/Kg-dry	10	7/31/2019
Thallium	ND	0.95		mg/Kg-dry	10	7/31/2019
Vanadium	4.5	0.95		mg/Kg-dry	10	7/31/2019
Zinc	12	4.7		mg/Kg-dry	10	7/31/2019
Mercury	**SW7471B**			Prep Date: **7/29/2019**		Analyst: **LB**
Mercury	ND	0.020		mg/Kg-dry	1	7/30/2019
Cyanide, Total	**SW9012A**			Prep Date: **8/2/2019**		Analyst: **MD**
Cyanide	ND	0.26		mg/Kg-dry	1	8/3/2019
pH (25 °C)	**SW9045C**			Prep Date: **7/29/2019**		Analyst: **EDB**
pH	8.06			pH Units	1	7/29/2019
Percent Moisture	**D2974**			Prep Date: **7/26/2019**		Analyst: **RW**
Percent Moisture	5.3	0.2	*	wt%	1	7/29/2019

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Date Reported: August 05, 2019
Date Printed: August 05, 2019

ANALYTICAL RESULTS

Client: James L. Loring, P.G.
Work Order: 19071270 Revision 0
Project: LG21113A, Sibley Lincoln Plaza, Dolton, IL
Lab ID: 19071270-002

Client Sample ID: P1-5.6'
Collection Date: 7/23/2019 8:10:00 AM
Matrix: Soil

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
pH (25 °C)	**SW9045C**			Prep Date: **7/29/2019**		Analyst: **EDB**
pH	8.30			pH Units	1	7/29/2019

Qualifiers:
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HT - Sample received past holding time
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Date Reported: August 05, 2019
Date Printed: August 05, 2019

ANALYTICAL RESULTS

Client: James L. Loring, P.G.
Work Order: 19071270 Revision 0
Project: LG21113A, Sibley Lincoln Plaza, Dolton, IL
Lab ID: 19071270-003

Client Sample ID: B4-51
Collection Date: 7/23/2019 12:15:00 PM
Matrix: Soil

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
pH (25 °C)	**SW9045C**			Prep Date: **7/29/2019**		Analyst: **EDB**
pH	8.49			pH Units	1	7/29/2019

Qualifiers:
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e-mail address: STATinfo@STATAnalysis.com

CHAIN OF CUSTODY RECORD

Nº: 921535 **Page : 1 of 1**

Company: James & Doering P.C.
Project Number: 20-21113A
Client Tracking No.:
Project Name: Dalton #1
Project Location: Sibley Lincoln Plaza
Sampler(s): T. Doering
Report To: Phone:
Fax:
QC Level: 1 ___ 2 ___ 3 ___ 4 ___
e-mail:

Quote No.:
P.O. No.:
Turn Around Time (Days):
1 2 3 4 5-7 10
Results Needed:
/ / am/pm

Client Sample Number/Description:	Date Taken	Time Taken	Matrix	Comp.	Grab	Preserv.	No. of Containers	TCL - List PAH	PAH		Additional Information:	Lab No.:
TB0723A9100	7-23-19	11:10AM	Soil		X	HNO3	3	X				001
P1-5-6'	"	8:10	Soil		X		1		X			002
B4-S1	"	12:15PM	Soil		X		1		X			003

Relinquished by: (Signature) Date/Time: 7-23-19 13:45
Received by: (Signature) Date/Time: 7/23/19 13:45
Relinquished by: (Signature) Date/Time:
Received by: (Signature) Date/Time:
Relinquished by: (Signature) Date/Time:
Received by: (Signature) Date/Time:

Comments:

Laboratory Work Order No.: 1907270

Preservation Code: A = None B = HNO_3 C = NaOH
D = H_2SO_4 E = HCl F = 5035/EnCore G = Other

Received on Ice: Yes ✓ No
Temperature: 4.5 °C

STAT Analysis Corporation

Sample Receipt Checklist

Client Name JAMES LORING

Date and Time Received: 7/23/2019 1:45:00 PM

Work Order Number 19071270

Received by: EAA

Checklist completed by: E L (Signature) 7/23/19 (Date)

Reviewed by: (Initials) 8/5/19 (Date)

Matrix: Carrier name Client Delivered

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shippping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels/containers?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container or Temp Blank temperature in compliance?	Yes ☑	No ☐	Temperature 4.5 °C
Water - VOA vials have zero headspace?	No VOA vials submitted ☐	Yes ☐	No ☐
Water - Samples pH checked?	Yes ☐	No ☒	Checked by:
Water - Samples properly preserved?	Yes ☐	No ☒	pH Adjusted?

Any No response must be detailed in the comments section below.

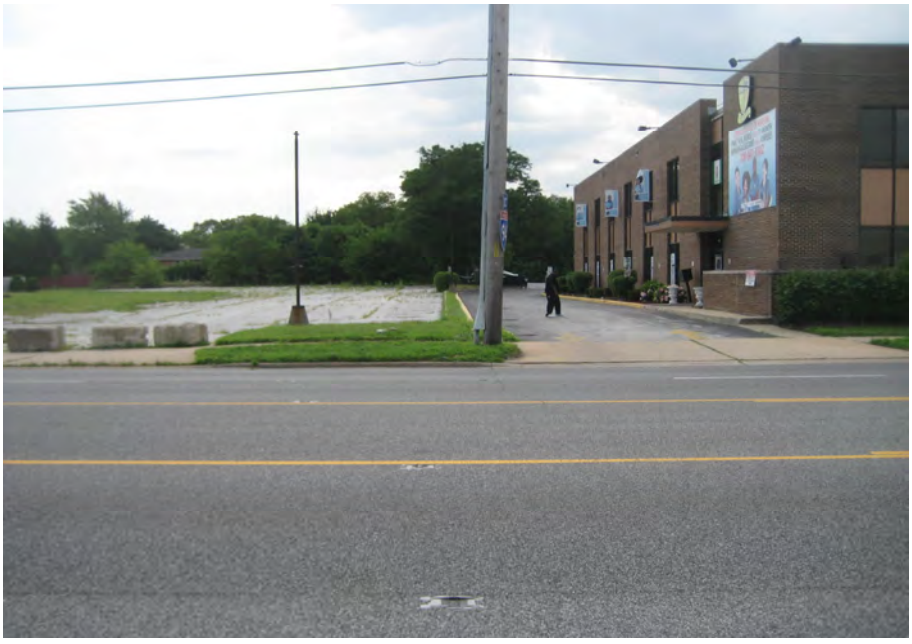
Comments:

Client / Person contacted: Date contacted: Contacted by:

Response:

PHOTOGRAPHS

Photograph No. 1
View of subject property facing southeast form north side of East Sibley Blvd.



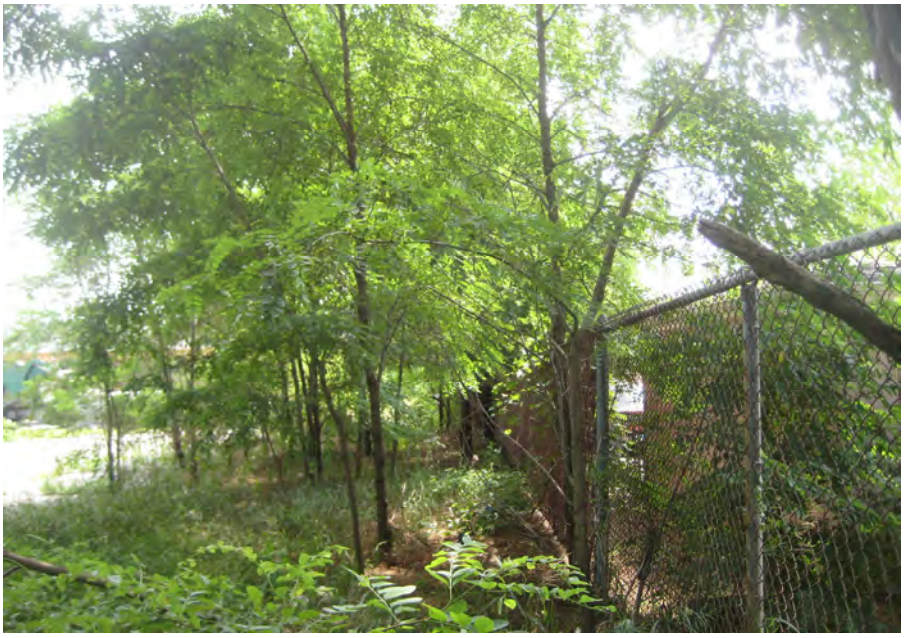
Photograph No. 2
West and north property elevations

PHOTOGRAPHS

Photograph No. 3
View facing north along east property boundary from SE property corner

Photograph No. 4
Veiw fcing east alogn north property oudnary at NW property corner and E Sible Blvd.

PHOTOGRAPHS



Photograph No. 5
South property boundary overgrown

Photograph No. 6
Central poriton of property

PHOTOGRAPHS

Photograph No. 7
East adjacent Taco Bell restaurant

Photograph No. 8
West adjacnet schoo;

PHOTOGRAPHS

Photograph No. 9
Restaurant to NE on north side of E. Sibley Blvd

Photograph No. 10
Residential structres on north side of E Sibley Blvd

PHOTOGRAPHS

Photograph No. 11
Nursing school parking lot and residential areas to south

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Photograph No. 12
View facing west across southern portion of property