ECS Mid-Atlantic, LLC

Infiltration Testing Report

4430 Connecticut Avenue NW
Washington, DC 20008

ECS Project Number 01:30325

October 19, 2020

October 19, 2020

Mark James
Potomac Foods Group
7611 N. Brickenbacker Dr.
Gaithersburg, MD 20879

ECS Project No. 01:30325

Reference: Infiltration Testing Report
4430 Connecticut Ave NW
Washington, DC 20008

Dear Mr. James:

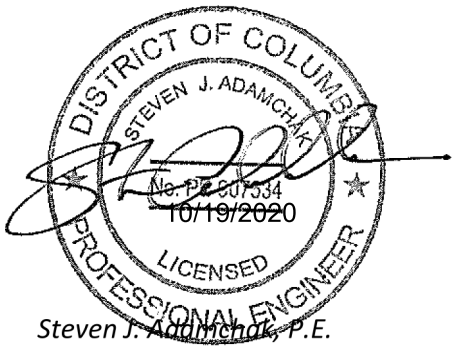
ECS Mid-Atlantic, LLC (ECS) has completed the subsurface exploration, laboratory testing, and in situ infiltration testing for the above-referenced project. Our services were performed in general accordance with our Proposal No. 01:62383-GPR, last revised September 9, 2020. This report presents our results of the field exploration, laboratory testing conducted and in situ infiltration testing performed for the project.

It has been our pleasure to be of service to Potomac Foods Group during the design phase of this project. We would appreciate the opportunity to remain involved during the continuation of the design phase. Should you have any questions concerning the information contained in this report, or if we can be of further assistance to you, please contact us.

Respectfully submitted,

ECS Mid-Atlantic, LLC,

Mariam Borga
Staff Project Manager
MBorga@ecslimited.com



Steven J. Adamchak, P.E.
Principal Engineer
Sadamchak@ecslimited.com

TABLE OF CONTENTS

APPENDICES

Appendix A – Drawings & Reports

- Site Location Diagram
- Boring Location Diagram

Appendix B – Field Operations

- Reference Notes for Boring Logs
- Subsurface Exploration Procedure: Standard Penetration Testing (SPT)
- Boring Logs B-1 through B-4
- Infiltration Test Data

Appendix C – Laboratory Testing

- Laboratory Test Results Summary
- Plasticity Chart
- Grain Size Analysis
- USDA Soil Classification Textural Triangle

EXECUTIVE SUMMARY

The following summarizes the main findings of the exploration. Information gleaned from the executive summary should not be utilized in lieu of reading the entire infiltration testing report.

- The purpose of our exploration included evaluating the subsurface conditions to assist in evaluating the infiltration potential at the subject site for the purpose of furnishing stormwater management system components/site improvements.
- The subsurface exploration performed for the proposed infiltration facilities included four soil borings and four adjacent auger probes to facilitate in situ infiltration testing. The soil borings were performed to the depth of approximately 10 feet below the existing site grades or until auger refusal. The infiltration tests were performed to the depth of approximately 4.5 feet below the existing site grades. Location and depth of the test borings/infiltration tests were provided by Ken Griffin with Smith Engineering.
- Man-placed fill materials were encountered in borings up to depths of 2 feet below the existing surface grades, which transitioned directly into the natural soils.

1.0 INTRODUCTION

1.1 GENERAL

The purpose of this study included evaluating the subsurface conditions to assist in evaluating the infiltration potential at the subject site for the purpose of furnishing stormwater management system components/site improvements.

Our services were provided in accordance with our proposal No. 01:62383-GPR, last revised September 9, 2020.

This report contains the procedures and results of our subsurface exploration and laboratory testing programs, and site characterization for use by the project team in evaluating the infiltration potential at the subject site.

The report includes the following items.

- A brief review and description of our field and laboratory test procedures and the results of testing conducted.
- A review of surface topographical features and site conditions.
- A review of area and site geologic conditions.
- A review of subsurface soil stratigraphy with pertinent physical properties.
- Final soil exploration/test boring logs.
- Tabulated results for the in situ infiltration testing.

2.0 PROJECT INFORMATION

2.1 PROJECT LOCATION

The project site is located at the physical address of 4430 Connecticut in NW Washington, DC. The overall subject site is bordered to the north by an existing two story brick structure, to the east by a public alley and an existing structure, to the south by a parking lot, and to the west by existing structures and 35th Street NW. The subject site is currently developed with an existing at-grade asphalt-paved lot.

Figure 2.1.1. Site Location

2.2 PROPOSED CONSTRUCTION

Based on the "Existing Conditions and Demolition Plan" drawing dated August 2020 and on our email correspondences with Ken Griffin with Smith Engineering, ECS has been requested to perform field and laboratory services to assist in evaluating the infiltration potential at the subject site. Based on our discussions, ECS was directed by Ken Griffin with Smith Engineering to perform infiltration tests at a depth of approximately 4.5' feet below existing site grades.

3.0 FIELD EXPLORATION AND LABORATORY TESTING

Our scope of work included drilling four soil test borings and four adjacent auger probes to facilitate the in situ infiltration testing. The approximate test locations are shown on the Location Diagram in Appendix A and were located in the field referencing existing site features.

3.1 SUBSURFACE CHARACTERIZATION

The subsurface conditions encountered were generally consistent with published geological mapping. The following sections provide generalized characterizations of the soil. Please refer to the boring logs in Appendix B.

The site is located within the Piedmont Physiographic Province of Washington DC.

The stratigraphy underlying the project site is generally consistent with the mapped geologic conditions. Surficial fills are typically seen to overlay residual materials (clay, silt and sand) generated from the in-place physical and chemical weathering of the underlying parent bedrock. Generally, these materials are observed to become denser with depth and overlie the parent bedrock. An overview of the general site geology is illustrated in Figure 3.1.1.

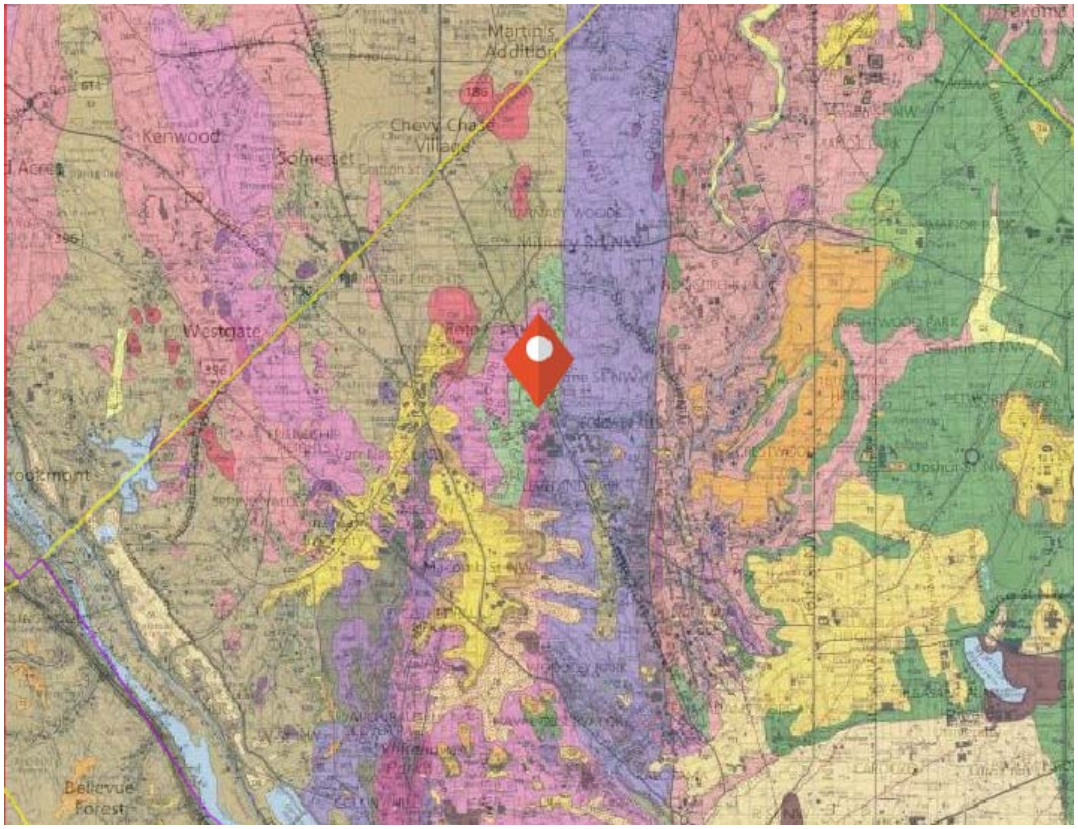


Figure 3.1.1

Geologic map for Figure 3.1.1 obtained from the U.S. Geologic Service website, https://ngmdb.usgs.gov/maps/mapview/

Table 3.1.1

Approximate Elevation to Bottom of Stratum [(1)] (ft)	Stratum	Description	Ranges of SPT[(2)] N-values (bpf)
EL. +251 to +248	N/A	Surface Cover – – Approximately 3 inches of asphalt and 3 inches of gravel below the asphalt.	N/A
EL. +246.5 to +249.5	I	Existing FILL – Silty Sand (SM) & Silt (ML)	9 to 14
EL. +244.5 to +245.5	II	Residual – Silty Sand (SM)	15 to 67/8
EL. +239 to +242	III	Weathered Rock – Silty Sand (SM)	50 to 50/6

Notes:
(1) Please note that the ground surface elevations were approximated from the drawing "Existing Conditions and Demolition Plan" drawing dated August 2020.
(2) Standard Penetration Testing

It should be noted that boring B-4 encountered auger and spoon refusal at 6.5 ft. below existing grades. We anticipate auger refusal is indicative of the top of the parent bedrock at this boring location, but samples were not able to be retrieved to confirm this.

3.2 GROUNDWATER OBSERVATIONS

Observations for groundwater were made during the current subsurface exploration within the site. In auger drilling operations, water is not introduced into the boreholes, and the groundwater position can often be determined by observing water flowing into or out of the boreholes. Furthermore, visual observation of the soil samples retrieved during auger drilling explorations can often be used in evaluating the groundwater conditions.

During our current exploration, groundwater was not observed within the depths explored. Stabilized water level readings (24+/-6 hours after drilling) were also observed to be dry. The highest groundwater observations are normally encountered in late winter and early spring. Variations in the long-term water table may occur as a result of changes in precipitation, evaporation, surface water runoff, construction activities, and other factors.

3.3 INFILTRATION TESTING

The infiltration testing program was implemented to help characterize the infiltration potential of soils at specific locations and depths (provided to ECS by Ken Griffin with Smith Engineering), and in general accordance with local requirements for infiltration testing. As noted above, auger probes (no samples taken) were advanced below the existing ground surface at the infiltration test

locations. ECS used the Johnson Permeameter™ to perform a constant head infiltration test in general accordance with Appendix P of the Stormwater Management Guidebook dated January 2020.

The holes were prepared in general accordance with the information contained in the Johnson Permeameter™ Instruction Manual dated June 14, 2014. The test was then performed in general accordance with the manual and the test results recorded during testing are included herein. The final design rate is typically the average of the last three to four readings taken during the test. Please refer to Appendix B of this report for additional data.

3.4 LABORATORY TESTING

The laboratory testing consisted of selected tests performed on samples obtained during our field exploration operations. Classification and index property tests were performed on representative soil samples. The laboratory testing program included visual classifications, moisture content tests, Atterberg Limits tests, grain size distribution analysis tests, and USDA soil classifications.

Each sample was visually classified on the basis of texture and plasticity in accordance with ASTM D2488 Standard Practice for Description and Identification of Soils (Visual-Manual Procedures) and including USCS classification symbols, and ASTM D2487 Standard Practice for Classification for Engineering Purposes (Unified Soil Classification System (USCS)). After classification, the samples were grouped in the major zones noted on the boring logs in Appendix B. The group symbols for each soil type are indicated in parentheses along with the soil descriptions. The stratification lines between strata on the logs are approximate; in situ, the transitions may be gradual.

4.0 INFILTRATION TEST DATA

The results of our infiltration tests are included below. Locations of the individual infiltration tests can be referenced on the Boring Location Diagram.

Table 4.1 Field Infiltration Data

Infiltration Test Location	Existing Ground EL. (Ft.)[1]	Groundwater Depth (ft.)	Depth of Infiltration Test (ft.)	USCS Soil Classification	USDA Classification	Avg. Fall (in/hr)	Recommended Rate (in/hr) – ½ Avg. Fall
I-1	251	Dry	4.5	SM	Sandy Loam	0.05	0.025
I-2	248.5	Dry	4.5	SM	Sandy Loam	0.02	0.01
I-3	249	Dry	4.5	SM	Sandy Loam	0.17	0.085
I-4	250.5	Dry	4.5	SM	Sandy Loam	0.11	0.055

Note 1: Please note that the ground surface elevations were approximated from the drawing "Existing Conditions and Demolition Plan" drawing dated August 2020.

5.0 CLOSING

ECS has prepared this report of findings to assist in the design aspects of the project.

The description of the proposed project is based on information provided to ECS by Ken Griffin with Smith Engineering. If any of this information is inaccurate, either due to our interpretation of the documents provided or site or design changes that may occur later, ECS should be contacted immediately in order that 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.

ECS is not responsible for the conclusions, opinions, or recommendations of others based on the data in this report.

In addition to geotechnical engineering services, ECS Mid-Atlantic, LLC has the in-house capability to perform multiple additional services as this project moves forward. These services include the following:

- Third Party Plan Review;
- Pre-Construction and Post-Construction Surveys;
- 3-D Monitoring;
- Construction Material Testing / Special Inspections;

We would be pleased to provide these services for you. If you have any questions with regard to this information or need any further assistance during the design and construction of the project please feel free to contact us.

APPENDIX A – Drawings & Reports

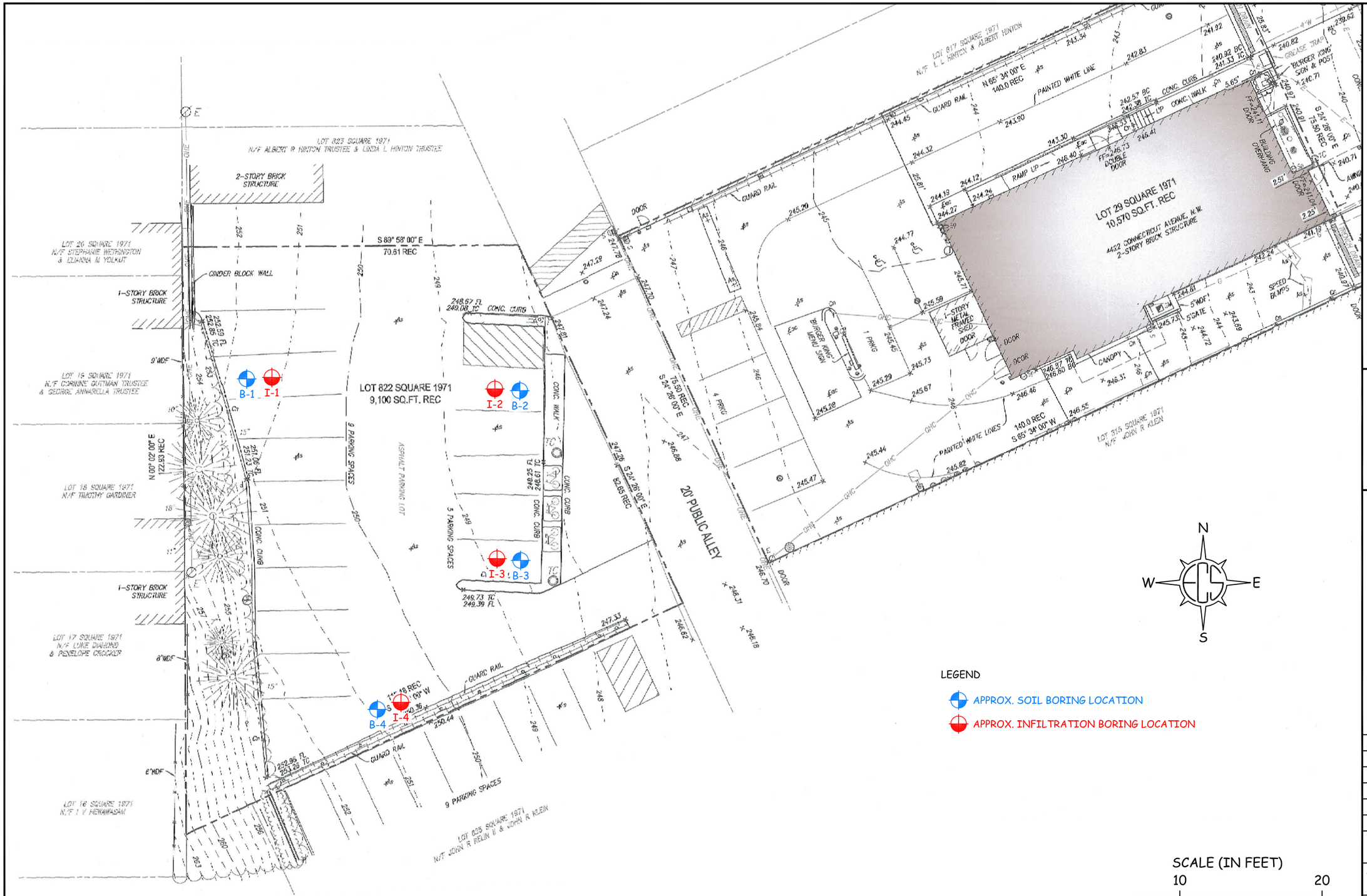
Site Location Diagram
Boring Location Diagram

Site Location Diagram
4430 CONNECTICUT AVENUE NW

4430 CONNECTICUT AVENUE, NW WASHINGTON,

POTOMAC FOODS GROUP

ENGINEER	MKB
SCALE	AS NOTED
PROJECT NO.	01:30325
SHEET	1 OF 1
DATE	10/12/2020



N

W E

S

LEGEND

APPROX. SOIL BORING LOCATION

APPROX. INFILTRATION BORING LOCATION

SCALE (IN FEET)

10 20

20 0

4430 CONNECTICUT AVENUE NW

NW WASHINGTON, DC

BORING LOCATION DIAGRAM

POTOMAC FOODS GROUP

ECS REVISIONS

ENGINEER	DRAFTING
MKB	RAC

SCALE	1"=20'
PROJECT NO.	30325
SHEET	1
DATE	10/12/2020

I:\Geotechnical\eProjects\30300-30399\30325 - 4430 Connecticut ave\b-Drafting\30325_BLD.dwg, bld_11x17_landscape_clr, 10/12/2020 4:41:05 PM

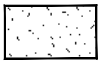
APPENDIX B – Field Operations

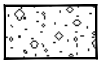
Reference Notes for Boring Logs
Subsurface Exploration Procedure: Standard Penetration Testing (SPT)
Boring Logs B-1 through B-4
Infiltration Test Data

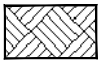
REFERENCE NOTES FOR BORING LOGS

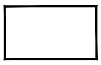
MATERIAL[1,2]

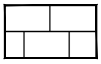

ASPHALT


CONCRETE


GRAVEL

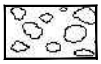

TOPSOIL

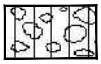

VOID


BRICK

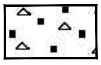

AGGREGATE BASE COURSE

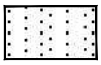

GW **WELL-GRADED GRAVEL**
gravel-sand mixtures, little or no fines

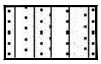

GP **POORLY-GRADED GRAVEL**
gravel-sand mixtures, little or no fines


GM **SILTY GRAVEL**
gravel-sand-silt mixtures

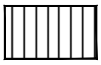

GC **CLAYEY GRAVEL**
gravel-sand-clay mixtures

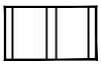

SW **WELL-GRADED SAND**
gravelly sand, little or no fines

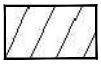

SP **POORLY-GRADED SAND**
gravelly sand, little or no fines


SM **SM SILTY SAND**
sand-silt mixtures

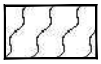

SC **CLAYEY SAND**
sand-clay mixtures

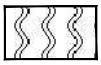

ML **SILT**
non-plastic to medium plasticity

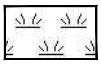

MH **ELASTIC SILT**
high plasticity


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	Firm
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 (%)[8]	FINE GRAINED (%)[8]
Trace	≤5	≤5
With	10 - 20	10 - 25
Adjective *(ex: "Silty")*	25 - 45	30 - 45

WATER LEVELS[6]

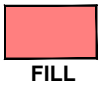

WL (First Encountered)


WL (Completion)


WL (Seasonal High Water)


WL (Stabilized)

FILL AND ROCK


FILL


POSSIBLE FILL


PROBABLE FILL


ROCK

[1]Classifications and symbols per ASTM D 2488-17 (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). SPT correlations per 7.4.2 Method B and need to be corrected if using an auto hammer.

[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 2488-17 Note 14.

[8]Percentages are estimated to the nearest 5% per ASTM D 2488-17.

SUBSURFACE EXPLORATION PROCEDURE: STANDARD PENETRATION TESTING (SPT) ASTM D 1586 Split-Barrel Sampling

Standard Penetration Testing, or **SPT**, is the most frequently used subsurface exploration test performed worldwide. This test provides samples for identification purposes, as well as a measure of penetration resistance, or N-value. The N-Value, or blow counts, when corrected and correlated, can approximate engineering properties of soils used for geotechnical design and engineering purposes.

SPT Procedure:

- Involves driving a hollow tube (split-spoon) into the ground by dropping a 140-lb hammer a height of 30-inches at desired depth
- Recording the number of hammer blows required to drive split-spoon a distance of 12 inches (in 3 or 4 Increments of 6 inches each)

- Auger is advanced* and an additional SPT is performed
- One SPT test is typically performed for every two to five feet

- Obtain two-inch diameter soil sample

**Drilling Methods May Vary—* The predominant drilling methods used for SPT are open hole fluid rotary drilling and hollow-stem auger drilling.

CLIENT:	PROJECT NO.:	BORING NO.:	SHEET:
Potomac Foods Group	**01:30325**	**B-1**	**1 of 1**
PROJECT NAME:	DRILLER/CONTRACTOR:		
4430 Connecticut Avenue NW	**Connelly and Associates, Inc.**		

SITE LOCATION: **4430 Connecticut Avenue, NW Washington, District of Columbia 20008**

LOSS OF CIRCULATION

NORTHING:	EASTING:	STATION:	SURFACE ELEVATION: **251.5**

BOTTOM OF CASING

DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	ELEVATION (FT)	BLOWS/6"
0	S-1	SS	24	24	Asphalt Thickness[3.00"] Gravel Thickness[3.00"]		6-5-6-15 (11)
	S-2	SS	24	22	(SM FILL) FILL, SILTY SAND, trace gravel, contains mica, brown and tan, moist, medium dense		16-19-21-25 (40)
5	S-3	SS	24	24	(SM) SILTY SAND, contains mica, gray and brown, moist, dense	247	12-15-20-20 (35)
	S-4	SS	12	12	(WR) WEATHERED ROCK SAMPLED AS SILTY SAND, contains mica, gray, moist, very dense [Weathered ROCK]	242	19-50/6" (50/6")
10					**END OF DRILLING AT 9.5 FT**		
15						237	
20						232	
25						227	
30						222	

Plastic Limit Water Content Liquid Limit

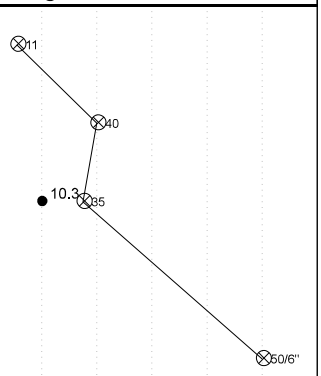
STANDARD PENETRATION BLOWS/FT

ROCK QUALITY DESIGNATION & RECOVERY

RQD

REC

CALIBRATED PENETROMETER TON/SF



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

WL (First Encountered)	**Dry**	BORING STARTED:	**Sep 30 2020**	CAVE IN DEPTH:	**8.00**
WL (Completion)	**Dry**	BORING COMPLETED:	**Sep 30 2020**	HAMMER TYPE:	**Auto**
WL (Seasonal High Water)	**Not Evaluated**	EQUIPMENT: **Track**	LOGGED BY: **MKB2**	DRILLING METHOD:	**3.25" HSA**
WL (Stabilized)	**Dry**				

GEOTECHNICAL BOREHOLE LOG

CLIENT:	PROJECT NO.:	BORING NO.:	SHEET:
Potomac Foods Group	**01:30325**	**B-2**	**1 of 1**

PROJECT NAME:	DRILLER/CONTRACTOR:
4430 Connecticut Avenue NW	**Connelly and Associates, Inc.**

SITE LOCATION: **4430 Connecticut Avenue, NW Washington, District of Columbia 20008**

LOSS OF CIRCULATION

NORTHING:	EASTING:	STATION:	SURFACE ELEVATION: **248.5**

BOTTOM OF CASING

DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0	S-1	SS	18	14	Asphalt Thickness[3.00"] Gravel Thickness[3.00"]			6-4-5 (9)
	S-2	SS	24	20	(SM FILL) FILL, SILTY SAND, contains mica and asphalt, brown and gray, moist, loose			5-7-8-21 (15)
	S-3	SS	10	8	(SM) SILTY SAND, trace gravel, contains mica, brown and tan, moist, medium dense		244	30-50/4" (50/4")
5					(WR) WEATHERED ROCK SAMPLED AS SILTY SAND, contains mica, dark greenish gray, moist, very dense [Weathered ROCK]			
	S-4	SS	5	5	**END OF DRILLING AT 8.9 FT**		239	50/5" (50/5")
10								
15							234	
20							229	
25							224	
30							219	

Plastic Limit Water Content Liquid Limit

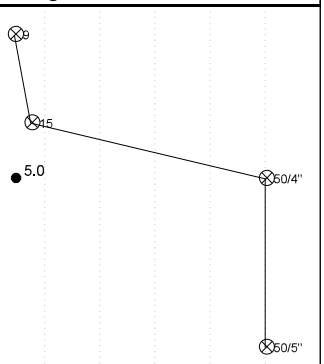
STANDARD PENETRATION BLOWS/FT

ROCK QUALITY DESIGNATION & RECOVERY

RQD

REC

CALIBRATED PENETROMETER TON/SF



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

WL (First Encountered)	**Dry**	BORING STARTED:	**Sep 30 2020**	CAVE IN DEPTH:	**7.50**
WL (Completion)	**Dry**	BORING COMPLETED:	**Sep 30 2020**	HAMMER TYPE:	**Auto**
WL (Seasonal High Water)	**Not Evaluated**	EQUIPMENT: **Track**	LOGGED BY: **MKB2**	DRILLING METHOD:	**3.25" HSA**
WL (Stabilized)	**Dry**				

GEOTECHNICAL BOREHOLE LOG

CLIENT:	PROJECT NO.:	BORING NO.:	SHEET:
Potomac Foods Group	**01:30325**	**B-3**	**1 of 1**

PROJECT NAME:	DRILLER/CONTRACTOR:
4430 Connecticut Avenue NW	**Connelly and Associates, Inc.**

SITE LOCATION: **4430 Connecticut Avenue, NW Washington, District of Columbia 20008**

LOSS OF CIRCULATION

NORTHING:	EASTING:	STATION:	SURFACE ELEVATION:
			248.5

BOTTOM OF CASING

DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0	S-1	SS	18	16	Asphalt Thickness[3.00"] Gravel Thickness[3.00"] (ML FILL) FILL, SILT WITH SAND, trace clay, trace gravel, brown, moist, medium dense		248	8-5-8 (13)
	S-2	SS	14	14				8-17-50/2" (67/8")
	S-3	SS	3	3	(SM) SILTY SAND, contains mica, greenish gray, moist, very dense		244	50/3.5" (50/3.5")
5					(WR) WEATHERED ROCK SAMPLED AS SILTY SAND, contains mica, greenish gray, moist, very dense [Weathered ROCK]			
	S-4	SS	9	9				30-50/3" (50/3")
10					**END OF DRILLING AT 9.3 FT**		239	
15							234	
20							229	
25							224	
30							219	

Plastic Limit Water Content Liquid Limit

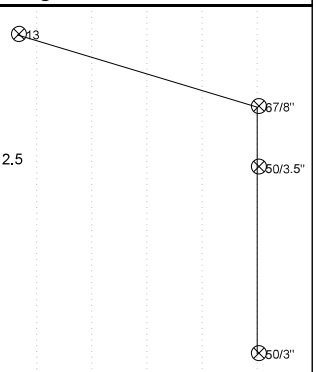
⊗ STANDARD PENETRATION BLOWS/FT

ROCK QUALITY DESIGNATION & RECOVERY

RQD

REC

○ CALIBRATED PENETROMETER TON/SF



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

▽ WL (First Encountered)	**Dry**
▼ WL (Completion)	**Dry**
⧩ WL (Seasonal High Water)	**Not Evaluated**
⧩ WL (Stabilized)	**Dry**

BORING STARTED:	**Sep 30 2020**	CAVE IN DEPTH:	**7.50**
BORING COMPLETED:	**Sep 30 2020**	HAMMER TYPE:	**Auto**
EQUIPMENT: **Track**	LOGGED BY: **MKB2**	DRILLING METHOD:	**3.25 HSA**

GEOTECHNICAL BOREHOLE LOG

CLIENT:	PROJECT NO.:	BORING NO.:	SHEET:
Potomac Foods Group	**01:30325**	**B-4**	**1 of 1**

PROJECT NAME:	DRILLER/CONTRACTOR:
4430 Connecticut Avenue NW	**Connelly and Associates, Inc.**

SITE LOCATION: **4430 Connecticut Avenue, NW Washington, District of Columbia 20008**

LOSS OF CIRCULATION

NORTHING:	EASTING:	STATION:	SURFACE ELEVATION: **251.0**

BOTTOM OF CASING

DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0	S-1	SS	18	13	Asphalt Thickness[3.00"] Gravel Thickness[3.00"]		251	6-6-8 (14)
	S-2	SS	3	2	(ML FILL) FILL, SILT, trace gravel, trace sand, contains mica, brown, moist, medium dense			50/3" (50/3")
	S-3	SS	6	6				50/6" (50/6")
	S-4	SS	5	5	(WR) WEATHERED ROCK SAMPLED AS SILTY SAND WITH GRAVEL, contains mica, brown and gray, moist, very			50/5" (50/5")
5	S-5	SS	0	0	dense [Weathered ROCK]		246	50/0" (50/0")
					Auger and spon refusal encountered at 6.5 feet.			
					AUGER AND SPOON REFUSAL AT 6.5 FT			
10							241	
15							236	
20							231	
25							226	
30							221	

Plastic Limit Water Content Liquid Limit

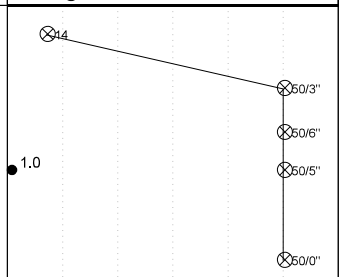
STANDARD PENETRATION BLOWS/FT

ROCK QUALITY DESIGNATION & RECOVERY

RQD

REC

CALIBRATED PENETROMETER TON/SF



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

WL (First Encountered)	**Dry**	BORING STARTED:	**Sep 30 2020**	CAVE IN DEPTH:	**3.00**
WL (Completion)	**Dry**	BORING COMPLETED:	**Sep 30 2020**	HAMMER TYPE:	**Auto**
WL (Seasonal High Water)	**Not Evaluated**	EQUIPMENT: **Track**	LOGGED BY: **MKB2**	DRILLING METHOD:	**3.25" HSA**
WL (Stabilized)	**Dry**				

GEOTECHNICAL BOREHOLE LOG

Constant-Head Borehole Permeameter Test

Solution: R. E. Glover (Deep WT or Impermeable Layer)

File Name…..:

Project Name……..:	4430 Connecticut Avenue NW	**Boring No……..:**	I-1	**Solution and Terminology (R. E. Glover solution)***	
Project No……..:	30325	**Investigators……:**	DHS	$K_{sat} = Q[\sinh^{-1}(H/r) - (r^2/H^2+1)^{-.5} + r/H]/(2\pi H^2)$ [Basic Glover solution]	
Project Location……..:	4430 Connecticut Avenue NW	**Date……..:**	10-1-2020	$K_{satB} = QV[\sinh^{-1}(H/r) - (r^2/H^2+1)^{-.5} + r/H]/(2\pi H^2)$ [Temp.-corrected]	
Boring Depth……..:	4.5 ft. **(Specify units)**	**WCU Base Ht. h:**	10.0 **cm*** **	K_{satB}: Saturated Hydraulic Conduct. @ base Tmp. T_B °C:	20
Boring Diameter……:	17.78 **cm**	**WCU Susp. Ht. S:**	45.0 **cm**	Q: Rate of flow of water from the borehole	
Boring Radius r……..:	8.89 **cm**	**Const. Wtr. Ht. H:**	55.0 **cm**	H: Constant height of water in the borehole	
Soil Temperature T…:	25 **°C**	**H/r**……..:**	6.2	r: Radius of the cylindrical borehole	
Dyn. Visc. @ T……..:	0.000891 **kg/m·s**	**Dyn. Visc. @ T_B.:**	0.001003 **kg/m·s**	V: Dynamic viscosity of water @ T °C/Dyn. Visc. of water @ T_B °C	

Reservoir Volume (ml)	Time (12 hr) (h:mm:ss A/P)	Volume Out (ml)	Elapsed Time		Flow Rate	K_{satB} Equivalent Values				
			Total (min)	Interval (min)	(ml/min)	(µm/sec)	(cm/sec)	(cm/day)	(in/hr)	(ft/day)
3,250	11:34:00 AM									
2,710	11:44:00 AM	540	10.00	10.00	54.0	0.7	7.03E-05	6.1	0.10	0.20
2,410	11:54:00 AM	300	20.00	10.00	30.0	0.4	3.90E-05	3.4	0.06	0.11
2,160	12:04:00 PM	250	30.00	10.00	25.0	0.3	3.25E-05	2.8	0.05	0.09
1,920	12:14:00 PM	240	40.00	10.00	24.0	0.3	3.12E-05	2.7	0.04	0.09
1,670	12:24:00 PM	250	50.00	10.00	25.0	0.3	3.25E-05	2.8	0.05	0.09
1,430	12:34:00 PM	240	60.00	10.00	24.0	0.3	3.12E-05	2.7	0.04	0.09

Natural Moisture……..:	10.3%	**Consistence……:**	Very Dense	**Enter K_{satB} Value……..:**		**0.3**	**3.19E-05**	**2.8**	**0.05**	**0.09**
USDA Txt./USCS Class:	Loamy Sand/SM	**WT Depth……..:**	Dry	**Data Logger No….:**		Note: K_B is determined by visually analyzing the Flow Rate vs Elapsed Time Graph and averaging the the results for the final three to five stabilized values.				
Struct./% Pass. #200..:	29.3	**Init. Sat. Time…:**								

*Glover, R. E. l953. Flow from a test-hole located above groundwater level. pp. 69-71. in: Theory and Problems of Water Percolation. (C. N. Zanger. ed.). USBR. The Cond. for this solution exists when the Dist. from the bottom of the BH to the WT or an imperm. layer is ≥2X the depth of the water in the BH. **H/r ≥5 to ≤10. ***JP-M1: h = 15cm, WCU-3 (3" Dia.): h = 10cm, WCU-2 (2" Dia.) h = 17cm.

Constant-Head Borehole Permeameter Test		Solution: R. E. Glover (Deep WT or Impermeable Layer)		File Name.....:
Project Name............:	4430 Connecticut Avenue NW	**Boring No...........:**	I-2	**Solution and Terminology (R. E. Glover solution)***
Project No.................:	30325	**Investigators......:**	DHS	$K_{sat} = Q[\sinh^{-1}(H/r) - (r^2/H^2+1)^{.5} + r/H]/(2\pi H^2)$ [Basic Glover solution]
Project Location.........:	4430 Connecticut Avenue NW	**Date..................:**	10-1-2020	$K_{satB} = QV[\sinh^{-1}(H/r) - (r^2/H^2+1)^{.5} + r/H]/(2\pi H^2)$ [Temp.-corrected]
Boring Depth.............:	4.5ft **(Specify units)**	**WCU Base Ht. h:**	10.0 **cm*** **	K_{satB}: Saturated Hydraulic Conduct. @ base Tmp. T_B °C: 20
Boring Diameter.......:	17.78 **cm**	**WCU Susp. Ht. S:**	45.0 **cm**	Q: Rate of flow of water from the borehole
Boring Radius r.........:	8.89 **cm**	**Const. Wtr. Ht. H:**	55.0 **cm**	H: Constant height of water in the borehole
Soil Temperature T...:	25 **°C**	**H/r**..................:**	6.2	r: Radius of the cylindrical borehole
Dyn. Visc. @ T..........:	0.000891 **kg/m·s**	**Dyn. Visc. @ T_B.:**	0.001003 **kg/m·s**	V: Dynamic viscosity of water @ T °C/Dyn. Visc. of water @ T_B °C

Reservoir Volume (ml)	Time (12 hr) (h:mm:ss A/P)	Volume Out (ml)	Elapsed Time		Flow Rate (ml/min)	K_{satB} Equivalent Values				
			Total (min)	Interval (min)		(µm/sec)	(cm/sec)	(cm/day)	(in/hr)	(ft/day)
3,250	9:40:00 AM									
2,440	9:50:00 AM	810	10.00	10.00	81.0	1.1	1.05E-04	9.1	0.15	0.30
2,000	10:00:00 AM	440	20.00	10.00	44.0	0.6	5.73E-05	4.9	0.08	0.16
1,770	10:10:00 AM	230	30.00	10.00	23.0	0.3	2.99E-05	2.6	0.04	0.08
1,640	10:20:00 AM	130	40.00	10.00	13.0	0.2	1.69E-05	1.5	0.02	0.05
1,560	10:30:00 AM	80	50.00	10.00	8.0	0.1	1.04E-05	0.9	0.01	0.03
1,470	10:40:00 AM	90	60.00	10.00	9.0	0.1	1.17E-05	1.0	0.02	0.03
1,360	10:50:00 AM	110	70.00	10.00	11.0	0.1	1.43E-05	1.2	0.02	0.04
1,260	11:00:00 AM	100	80.00	10.00	10.0	0.1	1.30E-05	1.1	0.02	0.04

Natural Moisture........:	5	**Consistence......:**	Very dense	**Enter K_{satB} Value........................:**	**0.1**	**1.24E-05**	**1.1**	**0.02**	**0.04**
USDA Txt./USCS Class:	Loamy Sand/SM	**WT Depth..........:**	Dry	**Data Logger No....:**		Note: K_B is determined by visually analyzing the Flow Rate vs Elapsed Time Graph and averaging the the results for the final three to five stabilized values.			
Struct./% Pass. #200..:	18.8	**Init. Sat. Time...:**							

*Glover, R. E. l953. Flow from a test-hole located above groundwater level. pp. 69-71. in: Theory and Problems of Water Percolation. (C. N. Zanger. ed.). USBR. The Cond. for this solution exists when the Dist. from the bottom of the BH to the WT or an imperm. layer is ≥2X the depth of the water in the BH. **H/r ≥5 to ≤10. ***JP-M1: h = 15cm, WCU-3 (3" Dia.): h = 10cm, WCU-2 (2" Dia.) h = 17cm.

Constant-Head Borehole Permeameter Test

Solution: R. E. Glover (Deep WT or Impermeable Layer)

File Name…..:

Project Name……:	4430 Connecticut Avenue NW	**Boring No……:**	I-3	**Solution and Terminology (R. E. Glover solution)***	
Project No……:	30325	**Investigators……:**	DHS	$K_{sat} = Q[\sinh^{-1}(H/r) - (r^2/H^2+1)^{-.5} + r/H]/(2\pi H^2)$ [Basic Glover solution]	
Project Location……:	4430 Connecticut Avenue NW	**Date……:**	10-1-2020	$K_{satB} = QV[\sinh^{-1}(H/r) - (r^2/H^2+1)^{-.5} + r/H]/(2\pi H^2)$ [Temp.-corrected]	
Boring Depth……:	4.5ft **(Specify units)**	**WCU Base Ht. h:**	10.0 **cm*** **	K_{satB}: Saturated Hydraulic Conduct. @ base Tmp. T_B °C:	20
Boring Diameter……:	17.78 **cm**	**WCU Susp. Ht. S:**	45.0 **cm**	Q: Rate of flow of water from the borehole	
Boring Radius r……:	8.89 **cm**	**Const. Wtr. Ht. H:**	55.0 **cm**	H: Constant height of water in the borehole	
Soil Temperature T…:	25 **°C**	**H/r**……:**	6.2	r: Radius of the cylindrical borehole	
Dyn. Visc. @ T……:	0.000891 **kg/m·s**	**Dyn. Visc. @ T_B.:**	0.001003 **kg/m·s**	V: Dynamic viscosity of water @ T °C/Dyn. Visc. of water @ T_B °C	

Reservoir Volume (ml)	Time (12 hr) (h:mm:ss A/P)	Volume Out (ml)	Elapsed Time		Flow Rate (ml/min)	---------- K_{satB} Equivalent Values ----------				
			Total (min)	Interval (min)		(µm/sec)	(cm/sec)	(cm/day)	(in/hr)	(ft/day)
3,250	10:01:00 AM									
1,300	10:11:00 AM	1,950	10.00	10.00	195.0	2.5	2.54E-04	21.9	0.36	0.72
3,250	10:11:00 AM									
2,160	10:21:00 AM	1,090	20.00	10.00	109.0	1.4	1.42E-04	12.3	0.20	0.40
1,220	10:31:00 AM	940	30.00	10.00	94.0	1.2	1.22E-04	10.6	0.17	0.35
350	10:41:00 AM	870	40.00	10.00	87.0	1.1	1.13E-04	9.8	0.16	0.32
3,250	10:41:00 AM									
2,340	10:51:00 AM	910	50.00	10.00	91.0	1.2	1.18E-04	10.2	0.17	0.34
1,450	11:01:00 AM	890	60.00	10.00	89.0	1.2	1.16E-04	10.0	0.16	0.33

Natural Moisture……:	2.5	**Consistence……:**	Very dense	**Enter K_{satB} Value……:**		**1.2**	**1.17E-04**	**10.1**	**0.17**	**0.33**
USDA Txt./USCS Class:	Loamy Sand/SM	**WT Depth……:**	Dry	**Data Logger No….:**		Note: K_B is determined by visually analyzing the Flow Rate vs Elapsed Time Graph and averaging the the results for the final three to five stabilized values.				
Struct./% Pass. #200..:	16.1	**Init. Sat. Time…:**								

*Glover, R. E. l953. Flow from a test-hole located above groundwater level. pp. 69-71. in: Theory and Problems of Water Percolation. (C. N. Zanger. ed.). USBR. The Cond. for this solution exists when the Dist. from the bottom of the BH to the WT or an imperm. layer is ≥2X the depth of the water in the BH. **H/r ≥5 to ≤10. ***JP-M1: h = 15cm, WCU-3 (3" Dia.): h = 10cm, WCU-2 (2" Dia.) h = 17cm.

Constant-Head Borehole Permeameter Test

Solution: R. E. Glover (Deep WT or Impermeable Layer)

File Name…..:

Project Name……:	4430 Connecticut Avenue NW	**Boring No……:**	I-4	**Solution and Terminology (R. E. Glover solution)***	
Project No……:	30325	**Investigators……:**	DHS	$K_{sat} = Q[\sinh^{-1}(H/r) - (r^2/H^2+1)^{-.5} + r/H]/(2\pi H^2)$ [Basic Glover solution]	
Project Location……:	4430 Connecticut Avenue NW	**Date……:**	10-1-2020	$K_{satB} = QV[\sinh^{-1}(H/r) - (r^2/H^2+1)^{-.5} + r/H]/(2\pi H^2)$ [Temp.-corrected]	
Boring Depth……:	4.5ft **(Specify units)**	**WCU Base Ht. h:**	10.0 **cm*** **	K_{satB}: Saturated Hydraulic Conduct. @ base Tmp. T_B °C:	20
Boring Diameter……:	17.78 **cm**	**WCU Susp. Ht. S:**	45.0 **cm**	Q: Rate of flow of water from the borehole	
Boring Radius r……:	8.89 **cm**	**Const. Wtr. Ht. H:**	55.0 **cm**	H: Constant height of water in the borehole	
Soil Temperature T…:	25 **°C**	**H/r**……:**	6.2	r: Radius of the cylindrical borehole	
Dyn. Visc. @ T……:	0.000891 **kg/m·s**	**Dyn. Visc. @ T_B.:**	0.001003 **kg/m·s**	V: Dynamic viscosity of water @ T °C/Dyn. Visc. of water @ T_B °C	

Reservoir Volume (ml)	Time (12 hr) (h:mm:ss A/P)	Volume Out (ml)	Elapsed Time		Flow Rate (ml/min)	---------- K_{satB} Equivalent Values ----------				
			Total (min)	Interval (min)		(µm/sec)	(cm/sec)	(cm/day)	(in/hr)	(ft/day)
3,250	11:26:00 AM									
2,470	11:36:00 AM	780	10.00	10.00	78.0	1.0	1.02E-04	8.8	0.14	0.29
1,790	11:46:00 AM	680	20.00	10.00	68.0	0.9	8.85E-05	7.6	0.13	0.25
1,150	11:56:00 AM	640	30.00	10.00	64.0	0.8	8.33E-05	7.2	0.12	0.24
550	12:06:00 PM	600	40.00	10.00	60.0	0.8	7.81E-05	6.7	0.11	0.22
3,250	12:06:00 PM									
2,560	12:16:00 PM	690	50.00	10.00	69.0	0.9	8.98E-05	7.8	0.13	0.25
1,960	12:26:00 PM	600	60.00	10.00	60.0	0.8	7.81E-05	6.7	0.11	0.22
1,370	12:36:00 PM	590	70.00	10.00	59.0	0.8	7.68E-05	6.6	0.11	0.22
770	12:46:00 PM	600	80.00	10.00	60.0	0.8	7.81E-05	6.7	0.11	0.22

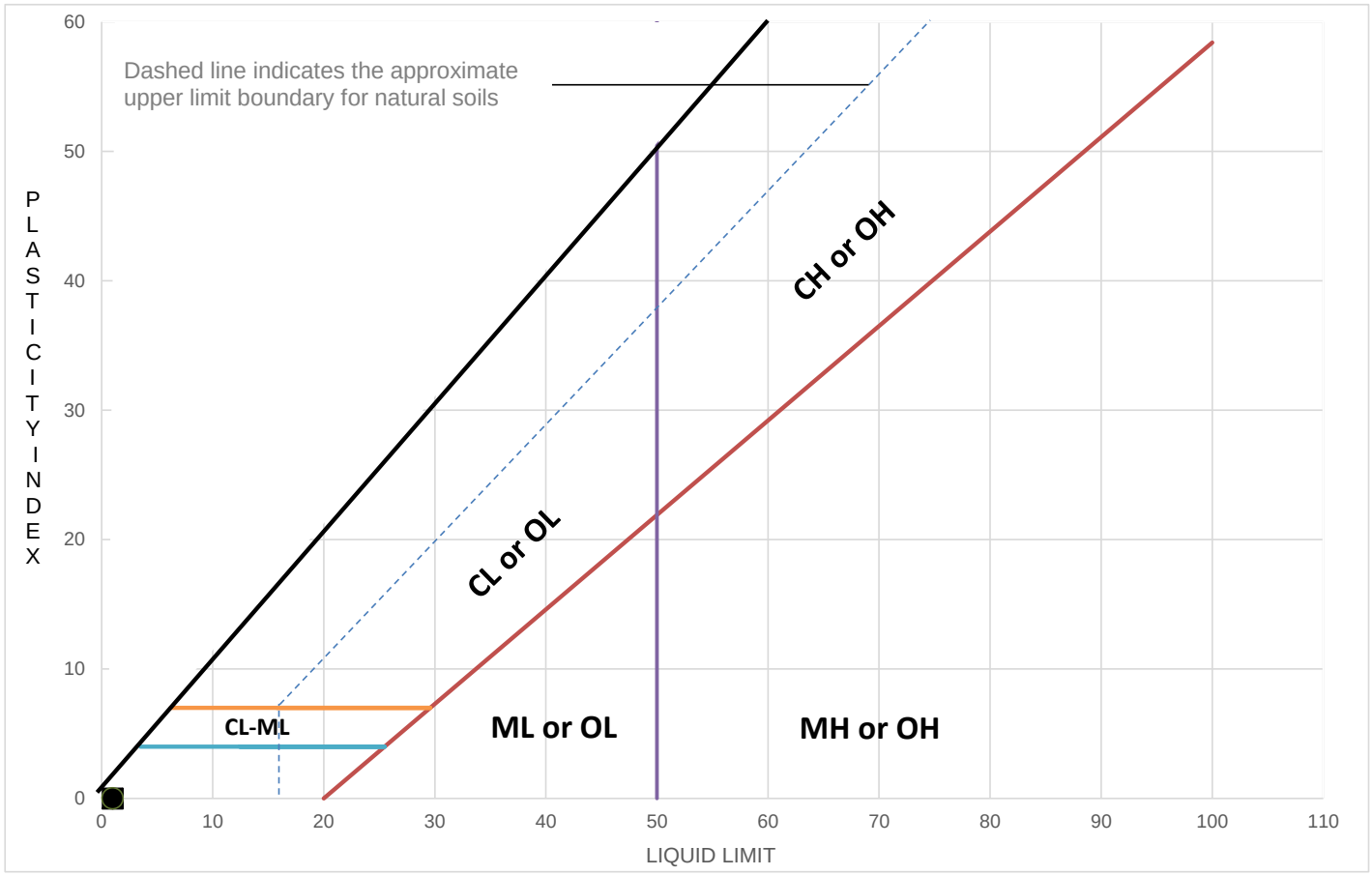
Natural Moisture……:	1	**Consistence……:**	Very dense	**Enter K_{satB} Value……:**		**0.8**	**8.02E-05**	**6.9**	**0.11**	**0.23**
USDA Txt./USCS Class:	Loamy Sand/SM	**WT Depth……:**	Dry	**Data Logger No….:**		Note: K_B is determined by visually analyzing the Flow Rate vs Elapsed Time Graph and averaging the the results for the final three to five stabilized values.				
Struct./% Pass. #200..:	15.7	**Init. Sat. Time…:**								

*Glover, R. E. l953. Flow from a test-hole located above groundwater level. pp. 69-71. in: Theory and Problems of Water Percolation. (C. N. Zanger. ed.). USBR. The Cond. for this solution exists when the Dist. from the bottom of the BH to the WT or an imperm. layer is ≥2X the depth of the water in the BH. **H/r ≥5 to ≤10. ***JP-M1: h = 15cm, WCU-3 (3" Dia.): h = 10cm, WCU-2 (2" Dia.) h = 17cm.

APPENDIX C – Laboratory Testing

Laboratory Test Results Summary
Plasticity Chart
Grain Size Analysis
USDA Soil Classification Textural Triangle

LIQUID AND PLASTIC LIMITS TEST REPORT



	Sample Location	Sample Number	Sample Depth (ft)	LL	PL	PI	%<#40	%<#200	AASHTO	USCS	Material Description
■	B-1	S-3	4-6	NP	NP	NP	64.3	29.3	A-2-4	SM	Silty Sand Trace Mica Olive Brown
◆	B-2	S-3	4-4.83	NP	NP	NP	49.1	18.8	A-1-b	SM	Silty Sand Trace Mica Olive
▲	B-3	S-3	4-4.25	NP	NP	NP	36.5	16.1	A-1-b	SM	Silty Sand Trace Mica Olive
●	B-4	S-4	4-4.42	NP	NP	NP	35.1	15.7	A-1-b	SM	Silty Sand Trace Mica Dark Gray

Project: 4430 Connecticut Avenue NW
Client: Potomac Foods Group

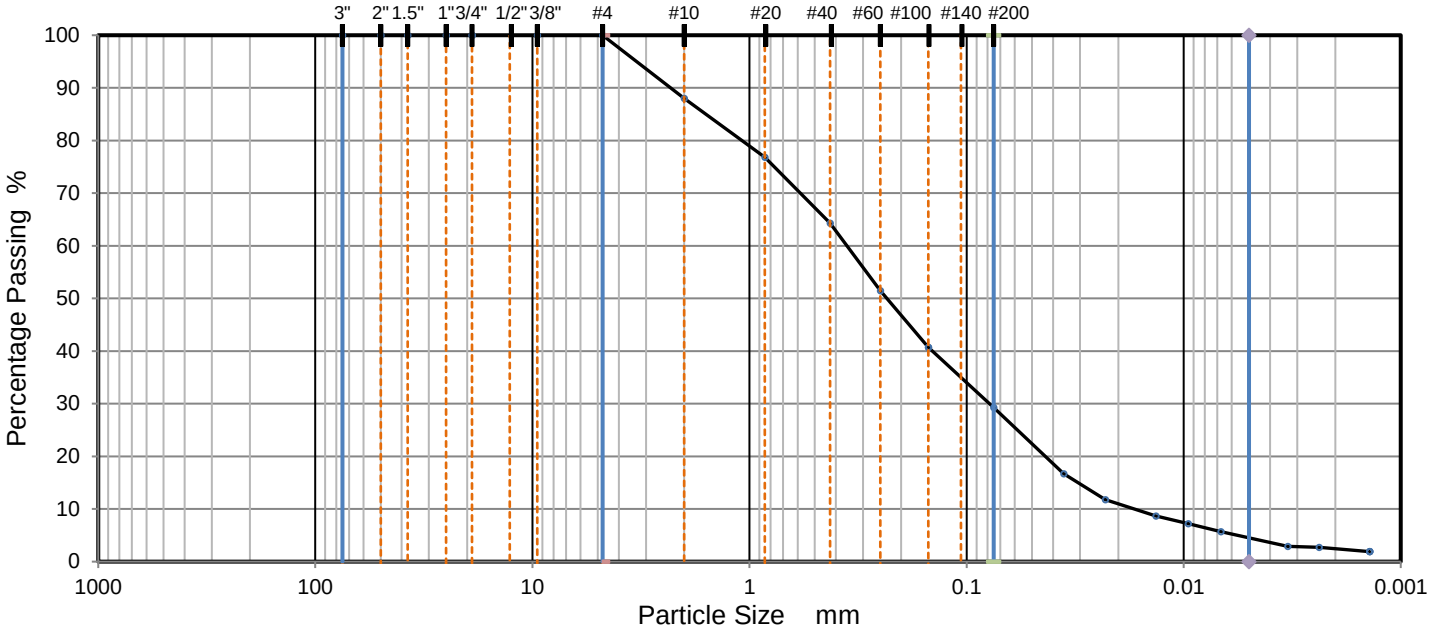
Project No.: 01:30325
Date Reported: 10/9/2020

Office / Lab	Address	Office Number / Fax
ECS Mid-Atlantic LLC - Chantilly	14026 Thunderbolt Place Suite 100 Chantilly, VA 20151-3232	(703)471-8400 (703)834-5527

Tested by	Checked by	Approved by	Date Received
jvong	Htran	Htran	10/2/2020

PARTICLE SIZE DISTRIBUTION

Very Coarse	GRAVEL	SAND			SILT	CLAY
		Coarse	Medium	Fine		



Sieving		Hydrometer Sedimentation	
Particle Size	% Passing	Particle Size mm	% Passing
3"	100.0	0.0357	16.7
2"	100.0	0.0230	11.8
1 1/2"	100.0	0.0134	8.7
1"	100.0	0.0095	7.2
3/4"	100.0	0.0068	5.7
3/8"	100.0	0.0033	2.9
#4	100.0	0.0024	2.7
#10	88.0	0.0014	1.9
#20	76.8		
#40	64.3		
#60	51.5	Specific Gravity (assumed)	
#100	40.7	2.60	
#200	29.3		

Dry Mass of sample, g	201.1

Sample Proportions	% dry mass
Very coarse, >3" sieve	0.0
Gravel, 3" to # 4 sieve	0.0
Coarse Sand, #4 to #10 sieve	12.0
Medium Sand, #10 to #40	23.7
Fine Sand, #40 to #200	35.0
Silt, 75µm to 5 µm	24.8
Clay < 5µm	4.5

USCS	SM	Liquid Limit	NP	D90	2.310	D50	0.233	D10	0.017
AASHTO	A-2-4	Plastic Limit	NP	D85	1.590	D30	0.078	Cu	21.141
USCS Group Name	Silty sand	Plasticity Index	NP	D60	0.356	D15	0.031	Cc	1.024

Project: 4430 Connecticut Avenue NW
Client: Potomac Foods Group
Sample Source: B-1

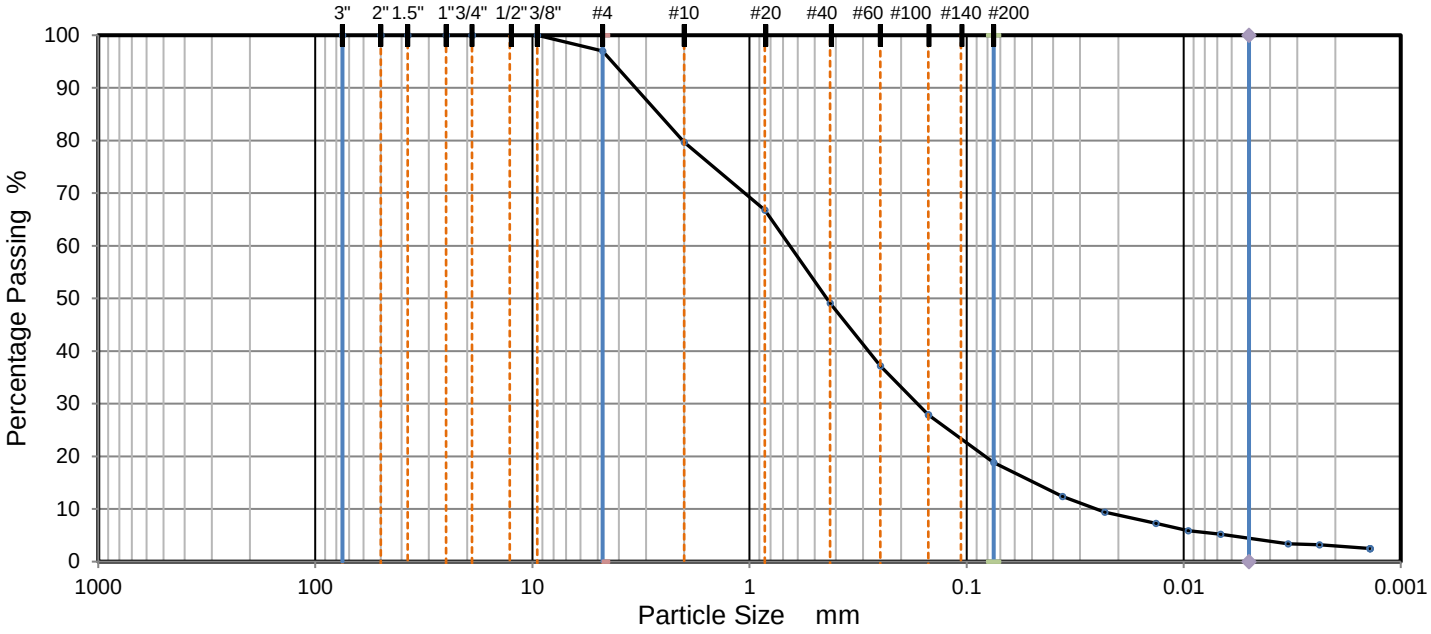
Project No.: 01:30325
Depth (ft): 4 - 6
Sample No.: S-3
Date Reported: 10/9/2020

Office / Lab	Address	Office Number / Fax
ECS Mid-Atlantic LLC - Chantilly	14026 Thunderbolt Place Suite 100 Chantilly, VA 20151-3232	(703)471-8400 (703)834-5527

Tested by	Checked by	Approved by	Date Received	Remarks
jvong	Htran	Htran	10/2/2020	

PARTICLE SIZE DISTRIBUTION

Very Coarse	GRAVEL	SAND			SILT	CLAY
		Coarse	Medium	Fine		



Sieving		Hydrometer Sedimentation	
Particle Size	% Passing	Particle Size mm	% Passing
3"	100.0	0.0362	12.4
2"	100.0	0.0231	9.4
1 1/2"	100.0	0.0134	7.3
1"	100.0	0.0095	5.9
3/4"	100.0	0.0068	5.2
3/8"	100.0	0.0033	3.4
#4	97.0	0.0024	3.2
#10	79.7	0.0014	2.5
#20	66.8		
#40	49.1		
#60	37.2	Specific Gravity (assumed)	
#100	27.9	2.60	
#200	18.8		

Dry Mass of sample, g	213.8

Sample Proportions	% dry mass
Very coarse, >3" sieve	0.0
Gravel, 3" to # 4 sieve	3.0
Coarse Sand, #4 to #10 sieve	17.3
Medium Sand, #10 to #40	30.6
Fine Sand, #40 to #200	30.3
Silt, 75µm to 5 µm	14.4
Clay < 5µm	4.4

USCS	SM	Liquid Limit	NP	D90	3.347	D50	0.440	D10	0.025
AASHTO	A-1-b	Plastic Limit	NP	D85	2.607	D30	0.168	Cu	25.747
USCS Group Name	Silty sand	Plasticity Index	NP	D60	0.651	D15	0.049	Cc	1.720

Project: 4430 Connecticut Avenue NW
Client: Potomac Foods Group
Sample Source: B-2

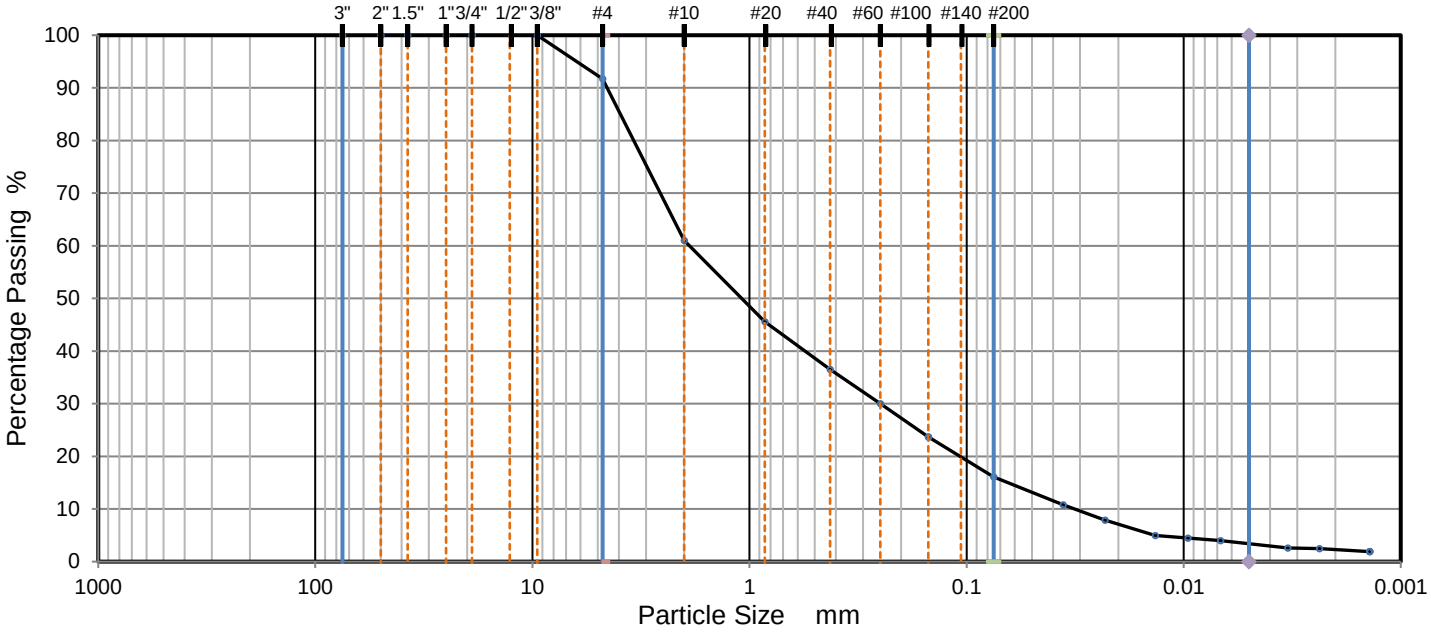
Project No.: 01:30325
Depth (ft): 4 - 4.83
Sample No.: S-3
Date Reported: 10/9/2020

Office / Lab	Address	Office Number / Fax
ECS Mid-Atlantic LLC - Chantilly	14026 Thunderbolt Place Suite 100 Chantilly, VA 20151-3232	(703)471-8400 (703)834-5527

Tested by	Checked by	Approved by	Date Received	Remarks
jvong	Htran	Htran	10/2/2020	

PARTICLE SIZE DISTRIBUTION

Very Coarse	GRAVEL	SAND			SILT	CLAY
		Coarse	Medium	Fine		



Sieving		Hydrometer Sedimentation	
Particle Size	% Passing	Particle Size mm	% Passing
3"	100.0	0.0359	10.8
2"	100.0	0.0231	7.9
1 1/2"	100.0	0.0135	5.0
1"	100.0	0.0096	4.5
3/4"	100.0	0.0068	4.0
3/8"	100.0	0.0033	2.6
#4	91.7	0.0024	2.5
#10	61.0	0.0014	1.9
#20	45.6		
#40	36.5		
#60	30.0	Specific Gravity (assumed)	
#100	23.7	2.60	
#200	16.1		

Dry Mass of sample, g	159.0

Sample Proportions	% dry mass
Very coarse, >3" sieve	0.0
Gravel, 3" to # 4 sieve	8.3
Coarse Sand, #4 to #10 sieve	30.7
Medium Sand, #10 to #40	24.5
Fine Sand, #40 to #200	20.4
Silt, 75µm to 5 µm	12.7
Clay < 5µm	3.4

USCS	SM	Liquid Limit	NP	D90	4.528	D50	1.085	D10	0.032
AASHTO	A-1-b	Plastic Limit	NP	D85	3.933	D30	0.250	Cu	59.483
USCS Group Name	Silty sand	Plasticity Index	NP	D60	1.892	D15	0.064	Cc	1.039

Project: 4430 Connecticut Avenue NW
Client: Potomac Foods Group
Sample Source: B-3

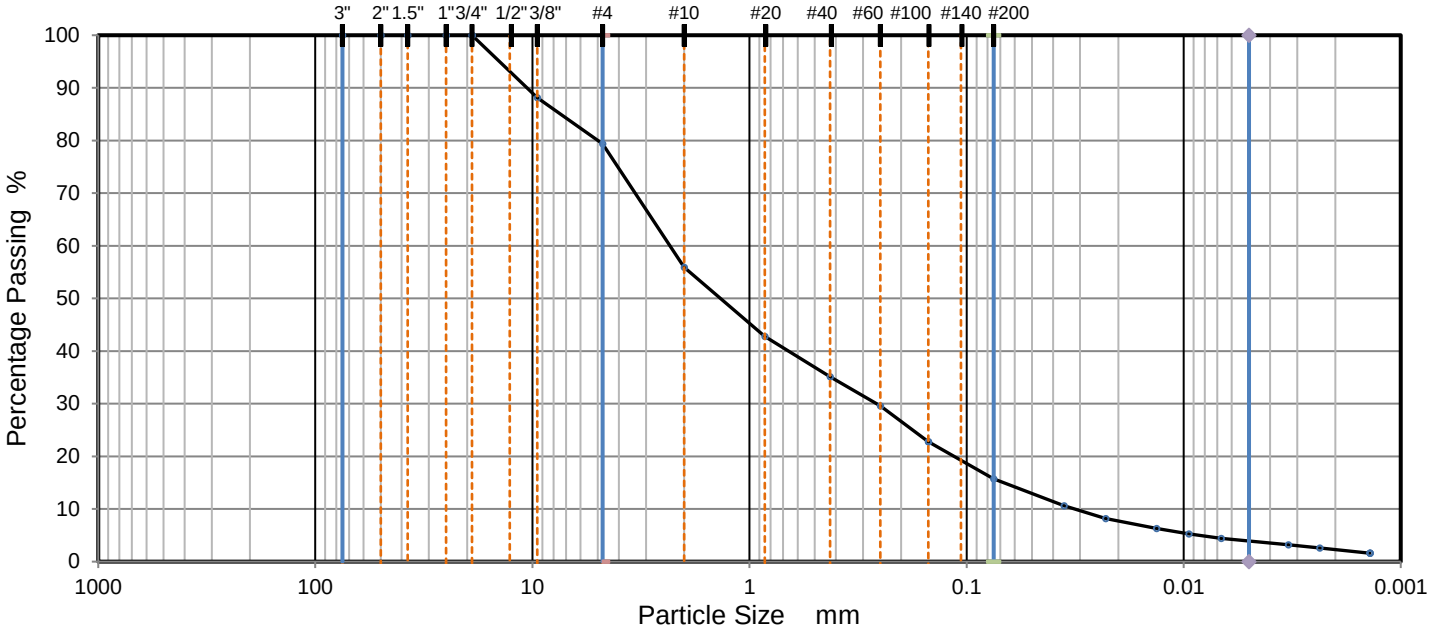
Project No.: 01:30325
Depth (ft): 4 - 4.25
Sample No.: S-3
Date Reported: 10/9/2020

Office / Lab	Address	Office Number / Fax
ECS Mid-Atlantic LLC - Chantilly	14026 Thunderbolt Place Suite 100 Chantilly, VA 20151-3232	(703)471-8400 (703)834-5527

Tested by	Checked by	Approved by	Date Received	Remarks
jvong	Htran	Htran	10/2/2020	

PARTICLE SIZE DISTRIBUTION

Very Coarse	GRAVEL	SAND			SILT	CLAY
		Coarse	Medium	Fine		



Sieving		Hydrometer Sedimentation	
Particle Size	% Passing	Particle Size mm	% Passing
3"	100.0	0.0356	10.6
2"	100.0	0.0229	8.2
1 1/2"	100.0	0.0133	6.3
1"	100.0	0.0095	5.3
3/4"	100.0	0.0067	4.4
3/8"	88.1	0.0033	3.2
#4	79.4	0.0024	2.6
#10	55.9	0.0014	1.6
#20	42.8		
#40	35.1		
#60	29.6	Specific Gravity (assumed)	
#100	22.8	2.60	
#200	15.7		

Dry Mass of sample, g	244.5

Sample Proportions	% dry mass
Very coarse, >3" sieve	0.0
Gravel, 3" to # 4 sieve	20.6
Coarse Sand, #4 to #10 sieve	23.5
Medium Sand, #10 to #40	20.8
Fine Sand, #40 to #200	19.4
Silt, 75µm to 5 µm	11.8
Clay < 5µm	3.9

USCS	SM	Liquid Limit	NP	D90	10.612	D50	1.360	D10	0.032
AASHTO	A-1-b	Plastic Limit	NP	D85	7.421	D30	0.260	Cu	72.937
USCS Group Name	Silty sand with gravel	Plasticity Index	NP	D60	2.326	D15	0.068	Cc	0.910

Project: 4430 Connecticut Avenue NW
Client: Potomac Foods Group
Sample Source: B-4

Project No.: 01:30325
Depth (ft): 4 - 4.42
Sample No.: S-4
Date Reported: 10/9/2020

Office / Lab	Address	Office Number / Fax
ECS Mid-Atlantic LLC - Chantilly	14026 Thunderbolt Place Suite 100 Chantilly, VA 20151-3232	(703)471-8400 (703)834-5527

Tested by	Checked by	Approved by	Date Received	Remarks
jvong	Htran	Htran	10/2/2020	

Laboratory Testing Summary

Sample Source	Sample Number	Depth (feet)	MC (%)	Soil Type	Atterberg Limits			Percent Passing No. 200 Sieve	Moisture - Density		CBR (%)		Organic Content (%)
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)	0.1 in.	0.2 in.	
B-1	S-3	4-6	10.3	SM	NP	NP	NP	29.3					
B-2	S-3	4-4.83	5	SM	NP	NP	NP	18.8					
B-3	S-3	4-4.25	2.5	SM	NP	NP	NP	16.1					
B-4	S-4	4-4.42	1	SM	NP	NP	NP	15.7					

Notes: See test reports for test method, *ASTM D2488

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content

Project:	4430 Connecticut Avenue NW	Project No.:	01:30325
Client:	Potomac Foods Group	Date Reported:	10/9/2020

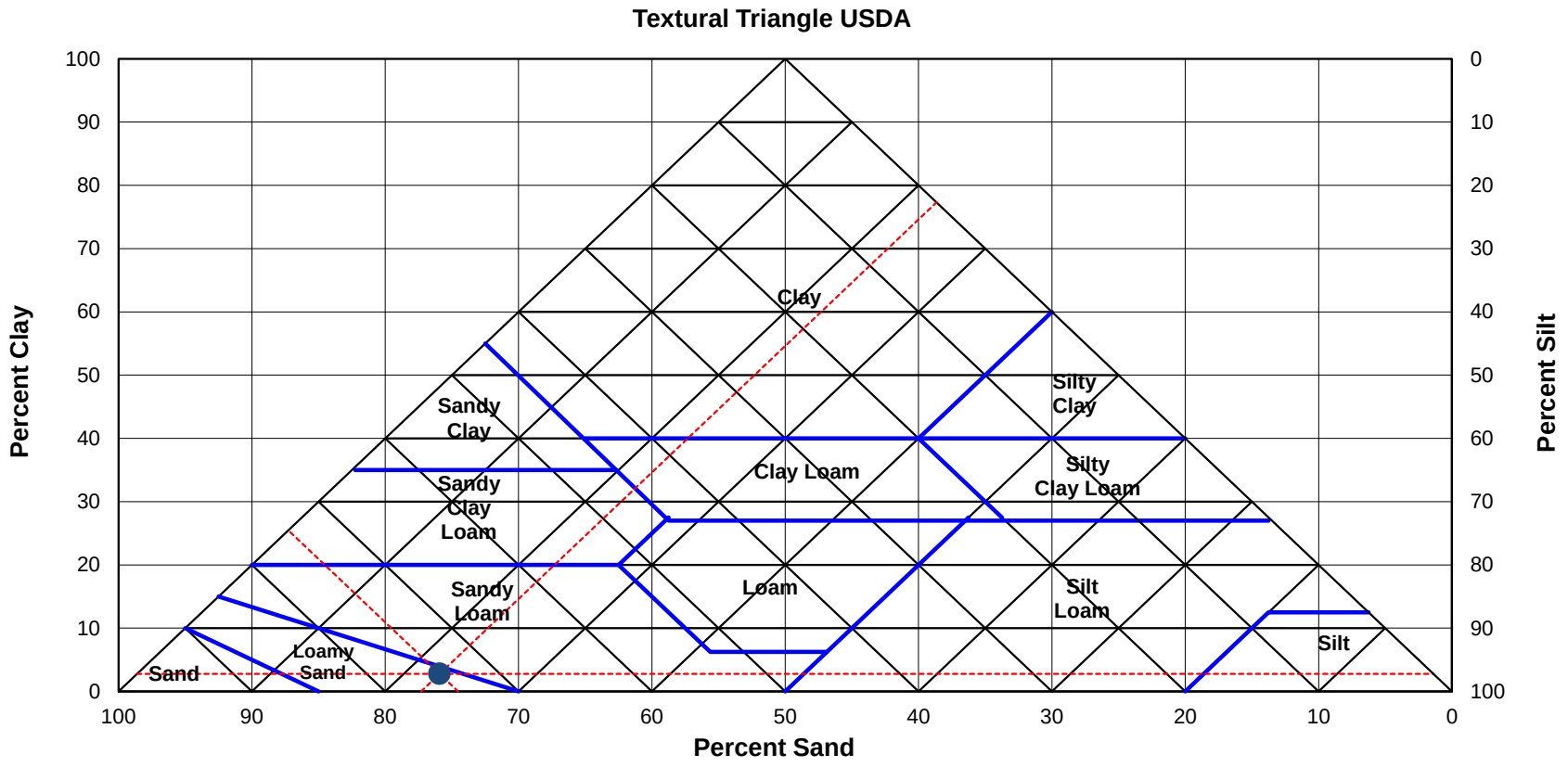
Office / Lab	Address	Office Number / Fax
ECS Mid-Atlantic LLC - Chantilly	14026 Thunderbolt Place Suite 100 Chantilly, VA 20151-3232	(703)471-8400 (703)834-5527

Tested by	Checked by	Approved by	Date Received
jvong	Htran	Htran	10/2/2020

USDA Classification

USDA Classification:	Loamy Sand

USDA Soil Percentages (Corrected for Gravel):	%Sand	%Silt	%Clay
	74.5	22.7	2.8



Project:	4430 Connecticut Avenue NW	Project No.:	01:30325
		Depth (ft):	4 - 6
Client:	Potomac Foods Group	Sample No.:	S-3
Sample Source:	B-1	Date Reported:	10/12/2020

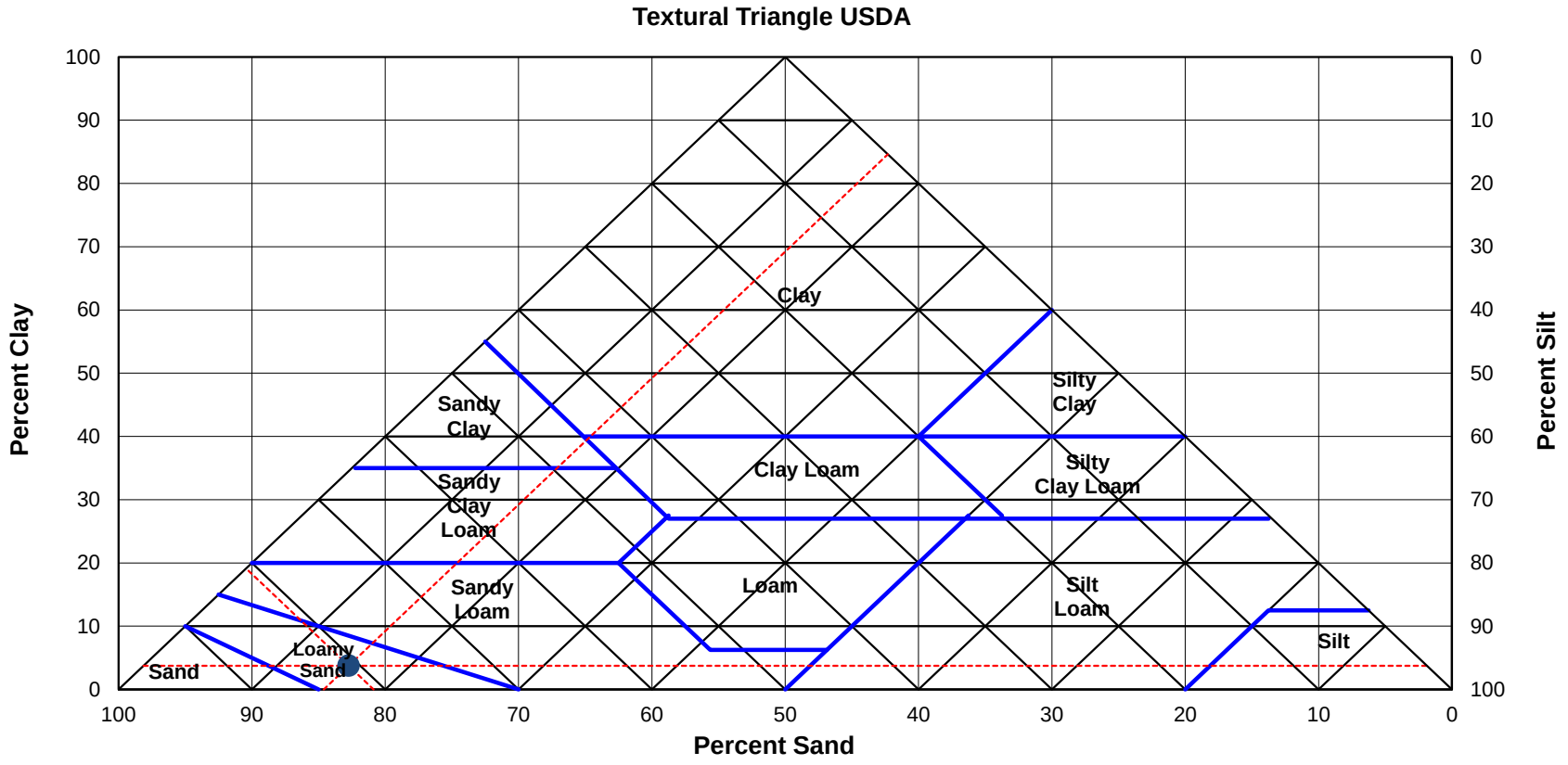
Office / Lab	Address	Office Number / Fax
ECS Mid-Atlantic LLC - Chantilly	14026 Thunderbolt Place Suite 100 Chantilly, VA 20151-3232	(703)471-8400 (703)834-5527

Tested by	Checked by	Approved by	Date Received
jvong	Htran	Htran	10/2/2020

USDA Classification

USDA Classification:	Loamy Sand

USDA Soil Percentages (Corrected for Gravel):	%Sand	%Silt	%Clay
	80.9	15.4	3.7



Project:	4430 Connecticut Avenue NW	Project No.:	01:30325
		Depth (ft):	4 - 4.83
Client:	Potomac Foods Group	Sample No.:	S-3
Sample Source:	B-2	Date Reported:	10/12/2020

Office / Lab	Address	Office Number / Fax
ECS Mid-Atlantic LLC - Chantilly	14026 Thunderbolt Place Suite 100 Chantilly, VA 20151-3232	(703)471-8400 (703)834-5527

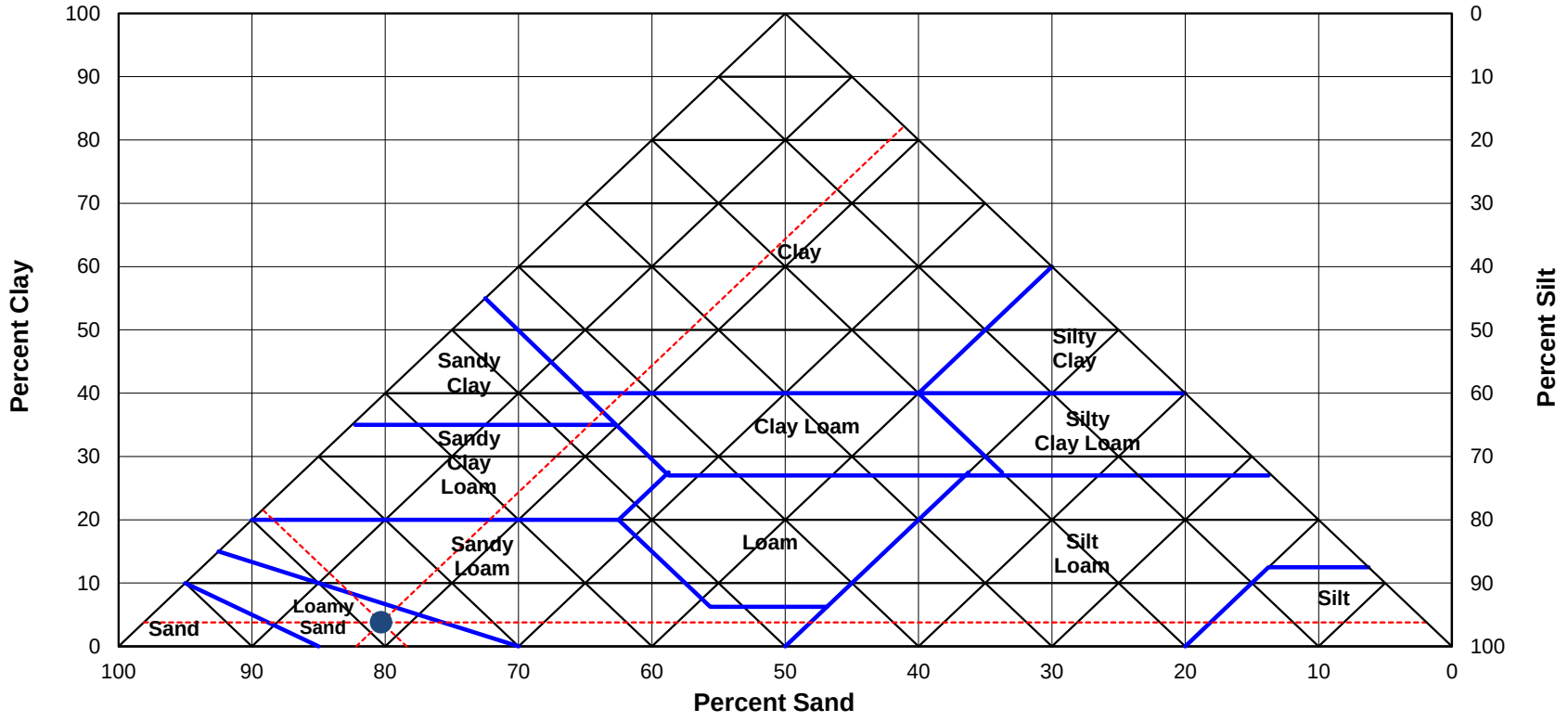
Tested by	Checked by	Approved by	Date Received
jvong	Htran	Htran	10/2/2020

USDA Classification

USDA Classification:	Loamy Sand

USDA Soil Percentages (Corrected for Gravel):	%Sand	%Silt	%Clay
	78.4	17.8	3.8

Textural Triangle USDA



Project:	4430 Connecticut Avenue NW	Project No.:	01:30325
		Depth (ft):	4 - 4.25
Client:	Potomac Foods Group	Sample No.:	S-3
Sample Source:	B-3	Date Reported:	10/12/2020

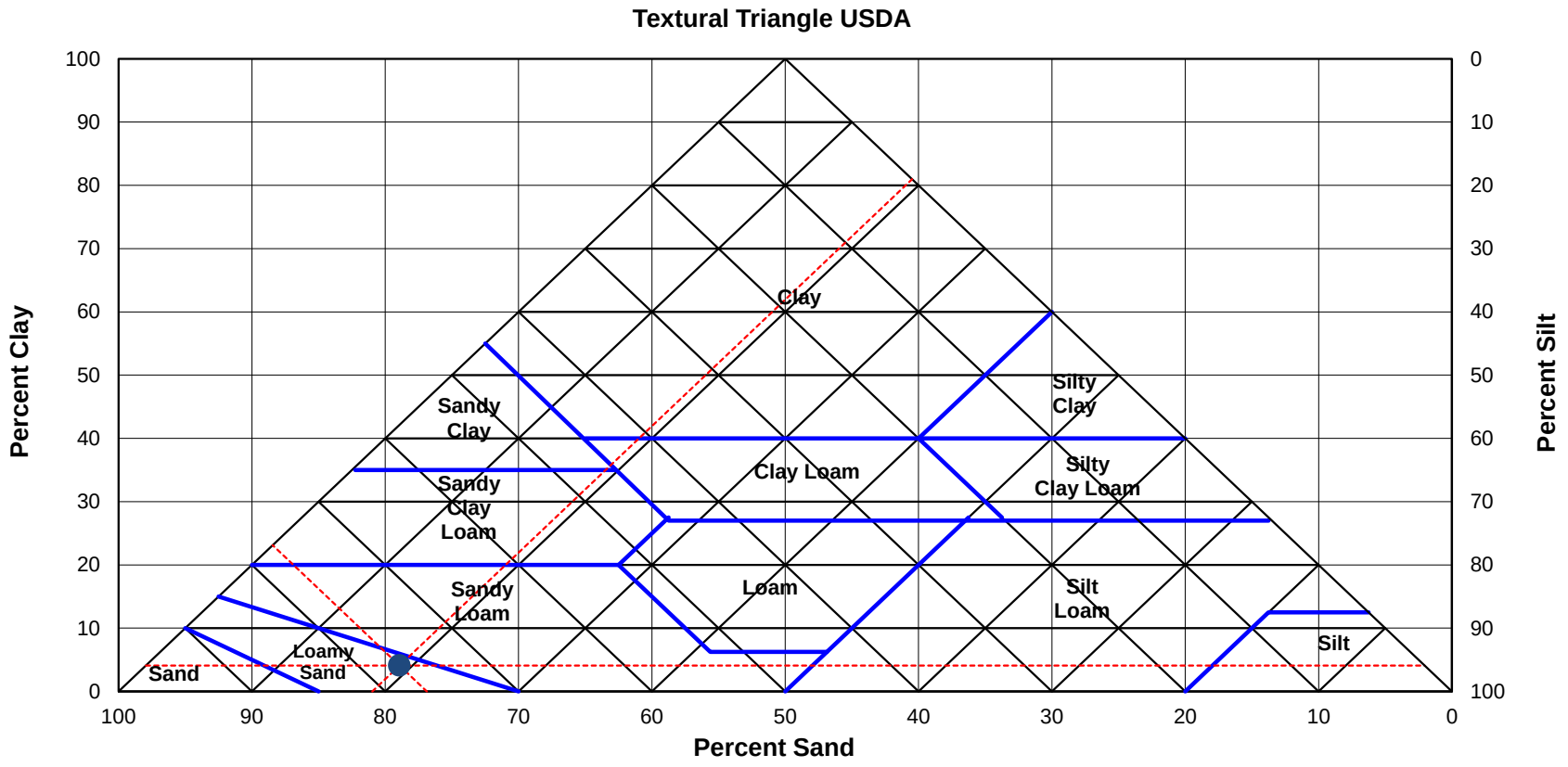
Office / Lab	Address	Office Number / Fax
ECS Mid-Atlantic LLC - Chantilly	14026 Thunderbolt Place Suite 100 Chantilly, VA 20151-3232	(703)471-8400 (703)834-5527

Tested by	Checked by	Approved by	Date Received
jvong	Htran	Htran	10/2/2020

USDA Classification

USDA Classification:	Loamy Sand

USDA Soil Percentages (Corrected for Gravel):	%Sand	%Silt	%Clay
	76.9	19.0	4.1



Project:	4430 Connecticut Avenue NW	Project No.:	01:30325
		Depth (ft):	4 - 4.42
Client:	Potomac Foods Group	Sample No.:	S-4
Sample Source:	B-4	Date Reported:	10/12/2020

Office / Lab	Address	Office Number / Fax
ECS Mid-Atlantic LLC - Chantilly	14026 Thunderbolt Place Suite 100 Chantilly, VA 20151-3232	(703)471-8400 (703)834-5527

Tested by	Checked by	Approved by	Date Received
jvong	Htran	Htran	10/2/2020