



GEOTECHNICAL EXPLORATION REPORT

FOR THE

**CUYAHOGA FALLS STATION NO.4 & TRAINING CENTER
3089 NORTHAMPTON ROAD
CUYAHOGA FALLS, OHIO 44223
WGE #20231041**

PREPARED FOR

**CITY OF CUYAHOGA FALLS - DIVISION OF ENGINEERING
2310 2ND STREET
CUYAHOGA FALLS, OHIO 44223**

BY

**WERTZ GEOTECHNICAL ENGINEERING, INC.
400 COLLIER DRIVE
DOYLESTOWN, OHIO 44230**



DRILLING | MATERIAL TESTING | ENGINEERING

March 9, 2023

City of Cuyahoga Falls - Division of Engineering
2310 2nd Street
Cuyahoga Falls, Ohio 44223

ATTN: Tony Demasi, P.E.

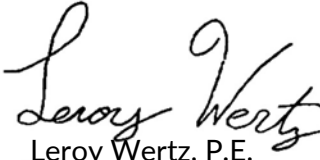
RE: Cuyahoga Falls Station No.4 & Training Center, 3089 Northampton Road,
Cuyahoga Falls, Ohio; WGE #20231041


Mr. Demasi:

Wertz Geotechnical Engineering (WGE) has completed the requested subsurface investigation for the proposed Cuyahoga Falls Station No.4 & Training Center project in Cuyahoga Falls, Ohio. The purpose of this investigation is to define the subsurface conditions at the project site and to make general recommendations relative to site preparation, earthwork, pavement, construction, and other pertinent geotechnical aspects of the project. These professional services have been performed, the findings obtained, and the recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices.

If you have any questions or concerns regarding the information presented in this submittal, or have need of additional services, please contact our office at (330) 991-0041.

Sincerely,


Leroy Wertz, P.E.
Senior Project Engineer


Rebecca Thieret
Project Engineer

Wertz Geotechnical Engineering, Inc.
400 Collier Drive, Doylestown, OH 44230 | (330) 991-0041

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PROJECT DESCRIPTION

SITE DESCRIPTION

The project site is located at 3089 Northampton Road in the City of Cuyahoga Falls, Ohio. The site is on the northeast corner of Northampton Road and West Bath Road. The site currently contains Cuyahoga Falls Fire Station No. 4, the Northampton Town Hall building, two other structures, and surrounding asphalt/concrete pavement. The site also has some grass and trees.

An undated site plan was provided and shows the planned construction of three new structures with surrounding drives and parking. The structures are assumed to be built with slab-on-grade construction. For the geotechnical analysis, the maximum foundation loadings are assumed to not exceed 100 kips for columns and 6 kips per foot for walls. The planned foundation systems are assumed to be shallow spread footings set below the frost penetration depth and built according to the Ohio Building Code.

The site is mildly sloped and generally sheds toward the north. Grades within the development area range from approximate elevation 998 feet near West Bath Road, down to 988 feet on the north side of the project area. A final grading plan or finished floor elevations were not provided at the time of this report. Cut/fill depths for the building pads are not expected to exceed 4 feet.

If our project understanding or any of our project assumptions are incorrect, we should be contacted in order to determine if our recommendations remain valid.

DESCRIPTION OF REGIONAL GEOLOGICAL SETTING

The project site, located in Cuyahoga Falls, Summit County, Ohio is situated in the Killbuck-Glaciated Pittsburgh Plateau Physiographic Region of Ohio, which is defined by ridges and flat uplands generally covered with thin drift and dissected by steep valleys where valley segments alternate between broad drift filled and narrow rock-walled reaches (Ohio Department of Natural Resources Division of Geological Survey, 1998).

According to the USDA Web Soil Survey, the site area is mapped by the local soil and water conservation district as Ellsworth silt loam, a material consisting of till, deposited on till plains on uplands. (USDA, 2022). A USDA Web Soil Survey site map is presented in Figure 2.

According to publicly available mine data from ODNR, no active or inactive surface or underground sand and gravel, limestone, or coal mining activities are present within the site footprint or surrounding areas.

According to 24k Ohio Division of Geological Survey (ODNR-DGS) Bedrock Geology Maps, bedrock in the area consists of the Cuyahoga Formation, of which the major lithologies are shale, siltstone, and sandstone (Ohio Department of Natural Resources Division of Geological Survey, 1991). Bedrock is reported by ODNR-DGS at approximately 900 feet MSL in elevation. Bedrock

is likely to be encountered 90 to 100 feet below existing site grades. A Geologic Map is presented in Figure 3.

FIELD INVESTIGATION & LABORATORY TESTING

Fourteen (14) soil borings were advanced at the project site on February 22nd, 24th, and 27th, 2023, utilizing a CME-550 all-terrain, rotary drilling rig, with 3.25" and 4.25" hollow stem augers, operated by WGE drilling staff. The borings were advanced to depths of 10 to 20 feet below the existing grades. The boring locations were field marked by WGE personnel at the approximate locations shown on the attached Figure 1 Geotechnical Boring Location Map.

Standard penetration testing and sampling was performed at the depth intervals shown on the attached Soil Boring Logs utilizing a 140-lb automatic hammer falling 30 inches to drive a 2-inch outer-diameter split spoon sampler over three, six-inch intervals. Collected samples were examined and visually identified by our personnel in the field based on the visual-manual procedure (ASTM D-2488). Representative samples were retained and transported to our office, for further examination and the assignment of laboratory testing.

Moisture content testing was performed on selected representative samples per ASTM D-2216. Fifty-nine (59) moisture content tests and two (2) Atterberg Limits tests were conducted on the retained samples. Test results are included as the Attachment A Boring Logs.

Static groundwater level observations and hole depth soundings were made upon completion of each boring. This was followed by backfilling the holes. Groundwater level observations, made during the drilling of each boring, are indicated on the attached Soil Boring Logs. It should be noted that groundwater levels and zones of saturation should be expected to fluctuate seasonally based on variation in amounts of rainfall, evapotranspiration, runoff from impervious areas, and several other factors.

SUBSURFACE CONDITIONS

Soil boring data collected at the site indicated the presence of clay fill over clay and silt soils. These findings can be described for engineering purposes as the following:

- Topsoil was observed at the surface in Borings B-1, B-2, B-3, B-8, B-9, and B-14 to depths of 9 inches or less. Gravel and/or 304 base was encountered at the surface of Borings B-1, B-4, and B-5 and was 4 inches thick.
- Fill material was encountered in 8 of the 14 test borings to depths as follows: 3 feet in B-1, B-7, B-10, B-12, and B-14; 5.5 feet in B-2 and B-3; 8 feet in B-8. The fill consisted of damp to wet, soft to very stiff sandy clay, clayey silt, silty clay, clay, and organic clay.
- Natural (non-fill) soils consisted of clay and silty clay in a damp to moist condition and a medium stiff to very stiff consistency.

- Groundwater was encountered during drilling in Boring B-2 at a depth of 10.5 feet. Upon completion of drilling, water was observed in the bore hole at a depth of 2.5 feet in B-2 and 5.6 feet in B-3.

GEOTECHNICAL RECOMMENDATIONS

We offer the following for your consideration based on our analysis of the soil conditions encountered at the locations indicated; and the assumption that conditions between and away from the soil borings are similar to those that are known:

GENERAL CONSIDERATIONS

It is WGE's engineering opinion that the natural (non-fill) stiff and better clayey soils, as well as compacted engineered fill are suitable for bearing the anticipated foundation, floor slab, and pavement loadings.

It is also WGE's opinion that the fill material encountered in many borings is not suitable for bearing the loads of the proposed structure. The fill should be undercut to the underlying natural, stable soils and backfilled with compacted engineered fill. The undercut excavation should extend laterally a distance equal to or greater than the difference in elevation between the bottom of the undercut and the planned subgrade elevation. The soft fill soils were present in the northwest building to a depth of 6 to 8 feet in Borings B-2, B-3, and B-8. Soft fill was encountered to a depth of approximately 3 feet in the southeast region of the site in Borings B-7 and B-14. The soft soils are unsuitable to be reused as engineered fill.

Soils with elevated moisture contents will likely be too wet of their optimum moisture content to achieve stability during proof rolling or to achieve required density during earthwork operations and these soils will need to be dried prior to compaction.

Asphalt and/or concrete pavement would be suitable for the parking areas and drives surrounding the buildings. The proposed pavement can be supported on existing, stable, dried and compacted clay site soils and stable, properly compacted, non-frost susceptible engineered fill. Additional costs associated with stabilizing the subgrade should be anticipated.

Recommendations are provided in the *Earthwork Guidelines* section below for the quality, compaction, testing and inspection of engineered fill. Care should be taken to evaluate foundation, slab and pavement subgrades prior to stone or concrete placement. All subgrades should be observed by a qualified soils technician under the supervision of a geotechnical engineer, and field density tests should be made to ensure compaction to specification.

EXCAVATIONS

Groundwater was encountered in one test boring at a depth of 10.5 feet. It is our opinion that any water influx into the excavations less than 20 feet below existing grades can be controlled by pumping from local sumps within the excavation.

Excavations should either be sloped back or shored in accordance with Occupational Safety & Health Administration (OSHA) regulations and any other applicable local codes. Parameters for design of temporary shoring are included in those regulations. Due to the presence of fill material on the site, with respect to temporary excavation side slopes, the site soils should be classified as Type "C" per OSHA. Therefore, temporary excavations should be cut back to a temporary slope no steeper than a 1.5:1 (horizontal: vertical).

The existing soils encountered onsite can likely be excavated with a medium-sized hydraulic excavator equipped with a standard earth bucket.

EARTHWORK GUIDELINES

- Prior to construction, all topsoil, vegetation, soft soils or other deleterious material should be completely stripped and grubbed from within the footprint of the proposed building and pavement areas and areas to be cut or to receive engineered fill, prior to construction.
- All surfaces cut to subgrade elevation, or subgrades to receive fill, should be proof rolled under the direction of an on-site geotechnical engineer or their direct assigns. Any areas of soft or yielding (pumping/rutting) soils, or obviously contaminated zones, should be undercut to underlying, stable soils and replaced with stable, compacted engineered fill, or stabilized in place as directed by the engineer.
- The engineered fill should be clean, inert soil which should be approved by the geotechnical engineer. The engineered fill should have a dry density greater than 100 pcf, liquid limit less than 50%, and an organic content less than 1%.
- Engineered fill material should be placed on the approved subgrade in controlled lifts. Each lift should be compacted to a stable condition at a minimum of 98% maximum dry density per ASTM D-698, with a moisture content between 2.0% below to 2.0% over optimum moisture. All filling operations should be observed by a qualified soils technician under the supervision of a geotechnical engineer. Field density tests should be made to ensure compaction to specification.
- All surfaces should be sealed and sloped after each day or prior to inclement weather to promote positive drainage of water offsite.
- Construction traffic should be kept off any wet subgrades. If site work is performed during times of drier weather, the need for additional repairs and stabilization to the

subgrade may be substantially reduced. Therefore, it is recommended that sitework be performed during these times.

BUILDING BEARING CAPACITY AND FOUNDATIONS

Conventional shallow spread and strip footings are recommended for transmitting structural loads to the subsoil. Estimated maximum total and differential settlements for footings designed in accordance with the recommendations provided in this report are approximately 1 and ½ inch, respectively.

In general, the native (non-fill) stiff and better clays and approved compacted engineered fill materials can support a maximum net allowable bearing pressure of 2,500 psf. The following provisions for foundation design and construction should apply:

- The foundation subgrades, for an allowable design bearing pressure of 2,500 psf, should consist of natural stiff or better clay soil, loose or better sand and silt soils, or approved engineered fill. The foundation subgrade should be evaluated and approved by a geotechnical engineer, or their representative, prior to concrete placement. Any deleterious foundation subgrade soils should be undercut and backfilled with lean concrete or compacted stone as directed by our field engineer.
- Foundation subgrades should be concreted in a dry and frost-free condition as soon after exposure as possible.
- The ground surface surrounding the building should be graded to direct surface drainage of water away from all exterior foundation walls and members.
- All exterior footings should be located below the depth of potential frost penetration (39 inches).

FLOOR SLAB AND PAVEMENT SUPPORT

Concrete floor slabs would be adequately supported on stable, approved site soils prepared according to *Earthwork Guidelines* and on stable engineered fill placed and compacted to the above-provided specifications. Any areas of soft or yielding (pumping/rutting) soils, or obviously contaminated zones, should be undercut to underlying, stable soils and replaced with stable, compacted engineered fill, or stabilized in place as directed by the engineer. The floor slab subgrades should be evaluated prior to stone placement.

The slab and pavement subgrades should be densified via multiple passes of heavy compaction equipment and proof rolled. Any soft or yielding (pumping/rutting) areas should be undercut to underlying, stable soils and replaced with stable, compacted engineered fill as described below, or stabilized in place as directed by the engineer.

Floor slab-on-grade subgrades should be evaluated prior to stone placement by our personnel. Interior floor slabs should be provided with a minimum of 4 inches of free-draining granular subbase (ODOT #57 limestone or an approved equivalent) with a suitable vapor barrier. Interior floor slabs subject to heavy loadings should have a minimum of 4 inches (ODOT #304 limestone). All exterior concrete slabs should have a minimum of 4 inches of #304 crushed limestone base.

The pavements should be designed for the anticipated traffic loading using a California Bearing Ratio (CBR) of 5 and a corresponding Resilient Modulus (Mr) of 6,000 psi. As a general guide, parking lots and drive lanes subjected only to light-duty traffic should consist of a minimum of 6 inches of #304 crushed limestone overlain by 2.5 inches of #441 Type II intermediate course asphaltic concrete and topped with 1.5 inches of #441 Type I finished course asphaltic concrete. Truck traffic and/or areas of heavy turning should consist of rigid concrete pavement. The heavy-duty concrete pavement section should consist of a minimum of 8 inches of ODOT Item 451 air-entrained, reinforced concrete pavement underlain by a minimum of 6 inches of #304 crushed limestone. Finger drains and curb drains positively drained to the catch basins should be provided in parking and driving areas and in the area of the dumpster pad to allow for positive drainage of the stone base.

SEISMIC SITE CLASSIFICATION

The seismic design requirements for buildings and other structures are based on Seismic Design Category. Seismic Site Classification is required to determine the Seismic Design Category for a structure. The Seismic Site Classification is based on the upper 100 feet of the site profile defined by a weighted average value of either shear wave velocity, Standard Penetration Test (SPT) resistance, or undrained shear strength in accordance with Section 20.4 of ASCE 7. Borings at this site were extended to a maximum depth of 20 feet. The site properties below the boring depths to 100 feet were estimated based on our experience and knowledge of geologic conditions of the general area.

Based upon the stratigraphy encountered in the borings and the SPT blow counts, it is the opinion of WGE that the site is best characterized as Seismic Site Class "D". This Seismic Site Classification should be used for design of the structure, according to the Ohio Building Code and Related Codes, section 1613.5.2 "Site Class Definitions."

STANDARD OF CARE AND LIMITATIONS

Our recommendations for this project were developed utilizing the project information provided to WGE and the soil information obtained from the test borings that were made at the project site. The test borings only depict the soil and rock conditions at the specified locations and time at which they were made. The soil conditions at other locations on the site may differ from those occurring at the boring locations. Additionally, the conclusions and recommendations have been based upon the available soil information and the design details furnished to us. We should be immediately notified, if during construction, any conditions different from those found in this investigation are evident or our project assumptions or understanding are incorrect. We will advise you of any modifications to our conclusions and recommendations deemed necessary, after observing the exposed conditions and/or changes to the project scope. The scope of our services does not include any environmental assessment or investigation for the presence or absence of hazardous or toxic materials in the soil, groundwater, or surface water within or beyond the site studied.

Our professional services have been performed, our findings obtained, and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices. Wertz Geotechnical Engineering, Inc. is not responsible for the conclusions, opinions, or recommendation made by others based upon the data included herein.

We hope you will find this report satisfactory. Please contact our office if we can be of further service or you have questions regarding this submittal.

Respectfully submitted,

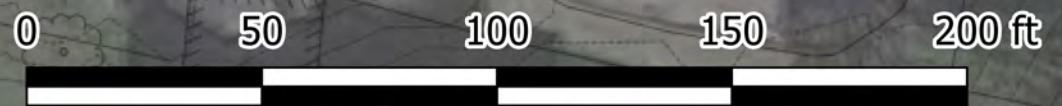

Rebecca Thieret
Project Engineer


Leroy Wertz, P.E.
Senior Project Engineer



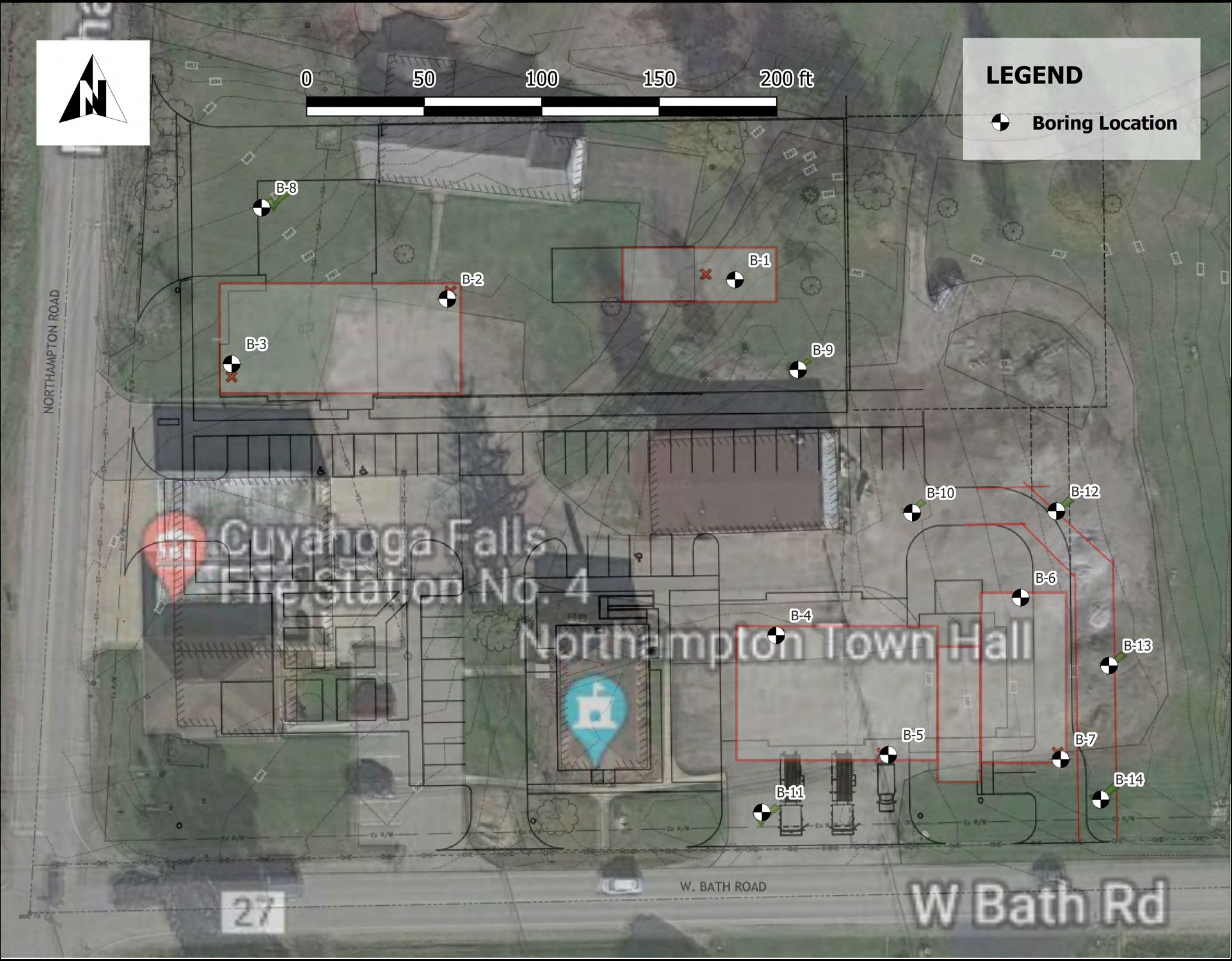
FIGURE 1

Geotechnical Boring Location Map



LEGEND

Boring Location



GEOTECHNICAL ENGINEERING

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 330-991-0041
 OFFICE@WERTZGEO.COM

GEOTECHNICAL BORING LOCATION MAP

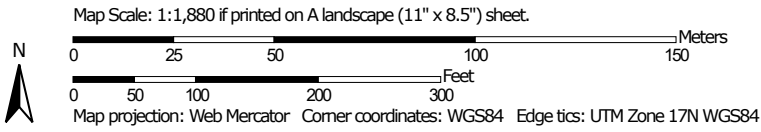
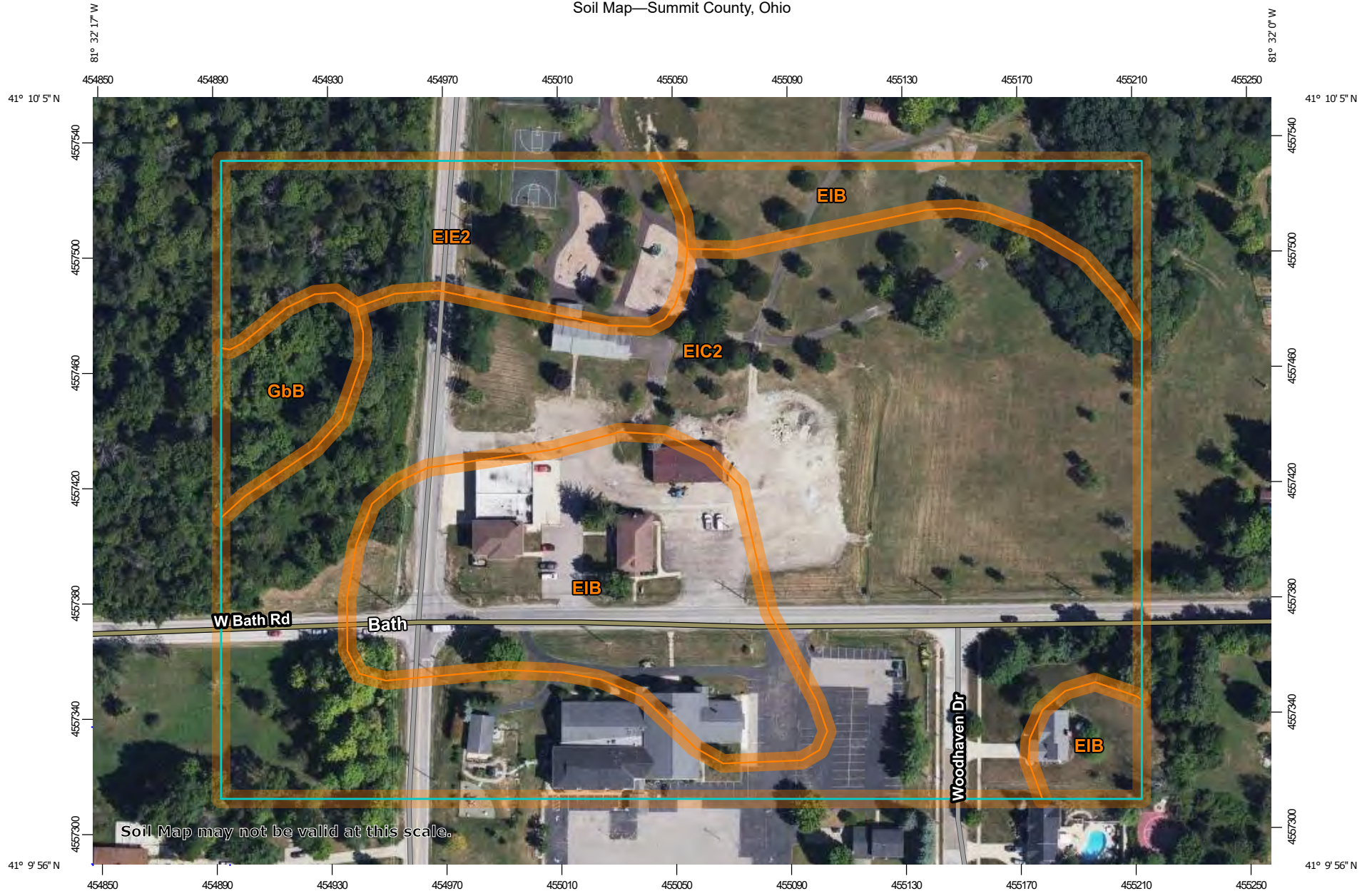
CLIENT CITY OF CUYAHOGA FALLS DIVISION OF ENGINEERING 2310 2ND STREET CUYAHOGA FALLS, OH 44221	
SITE 3089 NORTHAMPTON RD, CUYAHOGA FALLS, OH 44223	
PROJECT NAME CUYAHOGA FALLS FIRE STATION NO.4 & TRAINING CENTER	
LAYOUT BY CD	DATE: 2/23/23
DRAWN BY CD	FIGURE NO. 1
CHECKED BY LW	

Wertz Geotechnical Engineering (WGE) shall not be held liable for improper or incorrect use of the data presented and/or contained herein. These data and related graphics are not legal documents and are not intended to be used as such. WGE does not guarantee the positional or thematic accuracy of the GIS data presented in this figure. WGE gives no warranty, expressed or implied, as to the accuracy, reliability, or completeness of these data.

FIGURE 2

USDA Web Soil Survey Map

Soil Map—Summit County, Ohio




MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Summit County, Ohio

Survey Area Data: Version 19, Sep 12, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 22, 2020—Oct 7, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
EIB	Ellsworth silt loam, 2 to 6 percent slopes	4.5	25.4%
EIC2	Ellsworth silt loam, 6 to 12 percent slopes, eroded	10.5	59.5%
EIE2	Ellsworth silt loam, 12 to 25 percent slopes, eroded	2.1	11.6%
GbB	Geeburg silt loam, 2 to 6 percent slopes	0.6	3.5%
Totals for Area of Interest		17.6	100.0%

FIGURE 3

ODNR Bedrock Geology Map

CF FIRE STATION #4 NEW BUILDINGS PROJECT GEOLOGIC MAP



Bedrock may be present approximately 90 to 100 feet below existing site grades.

ATTACHMENT A

Geotechnical Boring Logs



WERTZ GEOTECHNICAL ENGINEERING, INC.
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 DOYLESTOWN, OHIO, 44230
 (330) 991-0041

PROJECT: CF Fire Station #4	PROJECT NO.: 20231041	DRILL RIG: CME 550	BORING ID: B-1	Page 1 of 1
LOCATION: Cuyahoga Falls, Ohio		METHOD: Hollow Stem	DATE STARTED: 2/22/2023	
LOGGED BY: JA		AUGER SIZE: 3.25 inches	DATE COMPLETED: 2/22/2023	
DRILL CREW: TT & DM		HAMMER: Auto SPT	ELEVATION: 994 feet MSL	
GROUNDWATER ENCOUNTER DEPTH: None	GROUNDWATER AT COMPLETION: None	TOTAL DEPTH: 20'	CAVE DEPTH: 12.5'	

DEPTH (FEET)	SAMPLE NUMBER	SAMPLE DEPTH	BLOW COUNTS (BLOWS/FOOT)	RECOVERY (INCHES)	POCKET PEN (TSF)	GRAPHIC LOG	LITHOLOGY
1		AS	-	-	-		4" TOPSOIL.
2	1	1.0-2.5	4-8-6	5			FILL: Moist, stiff, brown and black, fine to coarse sandy CLAY, minor silt, trace asphalt grindings. Wn%: 18.8
3							
4	2	3.5-5.0	5-10-12	16	5+		Damp, very stiff, brown and gray, CLAY, some silt, trace sand. Wn%: 18.6
5							
6							
7	3	6.0-7.5	5-10-13	17	5+		Damp, very stiff, brown, CLAY, some silt, trace sand. Wn%: 20.5
8							
9	4	8.5-10.0	5-8-12	18	5+		Damp, very stiff, brown, CLAY, some silt, trace sand. Wn%: 18.0
10							
11							
12							
13							
14	5	13.5-15.0	5-9-11	18	5		Damp, very stiff, brown, CLAY, some silt, trace sand. Wn%: 19.9
15							
16							
17							
18							
19	6	18.5-20.0	4-9-10	16	5		Damp to moist, very stiff, brown and gray, CLAY, some silt, trace sand. Wn%: 16.6
20							<i>Note: Ground surface elevations at boring locations estimated using data provided by Google Earth Pro.</i>
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							



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PROJECT: CF Fire Station #4	PROJECT NO.: 20231041	DRILL RIG: CME 550	BORING ID: B-2	Page 1 of 1
LOCATION: Cuyahoga Falls, Ohio		METHOD: Hollow Stem	DATE STARTED: 2/24/2023	
LOGGED BY: JA		AUGER SIZE: 3.25 inches	DATE COMPLETED: 2/24/2023	
DRILL CREW: TT & DM		HAMMER: Auto SPT	ELEVATION: 992 feet MSL	
GROUNDWATER ENCOUNTER DEPTH: 10.5'	GROUNDWATER AT COMPLETION: 2.5'	TOTAL DEPTH: 15'	CAVE DEPTH: 10.5'	

DEPTH (FEET)	SAMPLE NUMBER	SAMPLE DEPTH	BLOW COUNTS (BLOWS/FOOT)	RECOVERY (INCHES)	POCKET PEN (TSF)	GRAPHIC LOG	LITHOLOGY
1		AS	-	-	-	[Cross-hatch pattern]	1.5" TOPSOIL.
2	1	1.0-2.5	3-3-2	9		[Cross-hatch pattern]	PROBABLE FILL: Moist, medium stiff, brown, CLAY, minor silt and fine to coarse sand, trace gravel. Wn%: 12.6
3							
4	2	3.5-5.0	1-1-1	13	1	[Cross-hatch pattern]	PROBABLE FILL: Moist, soft, gray, ORGANIC CLAY, minor silt. ORGANIC CONTENT: 5.6% Wn%: 90.4
5							
6						[Diagonal lines pattern]	
7	3	6.0-7.5	2-3-4	16	1.5	[Diagonal lines pattern]	Moist, medium stiff, brown, CLAY, some silt, minor fine to coarse sand, trace gravel. Wn%: 17.8
8							
9	4	8.5-10.0	2-4-7	18	5+	[Diagonal lines pattern]	Damp, stiff, brown, CLAY, some silt, trace sand. Wn%: 17.7
10							
11							
12							
13							
14	5	13.5-15.0	5-10-13	18	5+	[Diagonal lines pattern]	Damp, very stiff, brown, CLAY, some silt, trace sand. Wn%: 18.6
15							<i>Note: Ground surface elevations at boring locations estimated using data provided by Google Earth Pro.</i>
16							
17							
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PROJECT: CF Fire Station #4	PROJECT NO.: 20231041	DRILL RIG: CME 550	BORING ID: B-3	Page 1 of 1
LOCATION: Cuyahoga Falls, Ohio		METHOD: Hollow Stem	DATE STARTED: 2/24/2023	
LOGGED BY: JA		AUGER SIZE: 3.25 inches	DATE COMPLETED: 2/24/2023	
DRILL CREW: TT & DM		HAMMER: Auto SPT	ELEVATION: 991 feet MSL	
GROUNDWATER ENCOUNTER DEPTH: None	GROUNDWATER AT COMPLETION: 5.6'	TOTAL DEPTH: 15'	CAVE DEPTH: 11.6'	

DEPTH (FEET)	SAMPLE NUMBER	SAMPLE DEPTH	BLOW COUNTS (BLOWS/FOOT)	RECOVERY (INCHES)	POCKET PEN (TSF)	GRAPHIC LOG	LITHOLOGY
1		AS	-	-	-	[Cross-hatch pattern]	6" TOPSOIL.
2	1	1.0-2.5	3-3-2	10	1	[Cross-hatch pattern]	FILL: Moist, medium stiff, brown, fine to coarse sandy CLAY, minor asphalt grindings. Wn%: 13.6
3							
4	2	3.5-5.0	0-1-1	8	1	[Cross-hatch pattern]	FILL: Moist, soft, brown and gray and black, CLAY, some silt, minor fine to coarse sand, trace organics. Wn%: 30.7
5							
6						[Diagonal lines pattern]	
7	3	6.0-7.5	3-5-6	16	5	[Diagonal lines pattern]	Damp, stiff, brown, CLAY, minor silt, trace sand. Wn%: 22.5
8							
9	4	8.5-10.0	4-8-10	18	5+	[Diagonal lines pattern]	Damp, very stiff, brown, CLAY, minor silt, trace sand. Wn%: 18.7
10							
11							
12							
13							
14	5	13.5-15.0	8-13-16	10	5+	[Diagonal lines pattern]	Damp, very stiff, brown, CLAY, minor silt, trace sand. Wn%: 15.1
15							<i>Note: Ground surface elevations at boring locations estimated using data provided by Google Earth Pro.</i>
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PROJECT: CF Fire Station #4	PROJECT NO.: 20231041	DRILL RIG: CME 550	BORING ID: B-4	Page 1 of 1
LOCATION: Cuyahoga Falls, Ohio		METHOD: Hollow Stem	DATE STARTED: 2/22/2023	
LOGGED BY: JA		AUGER SIZE: 3.25 inches	DATE COMPLETED: 2/22/2023	
DRILL CREW: TT & DM		HAMMER: Auto SPT	ELEVATION: 1000 feet MSL	
GROUNDWATER ENCOUNTER DEPTH: None	GROUNDWATER AT COMPLETION: None	TOTAL DEPTH: 20'	CAVE DEPTH: 14.5'	

DEPTH (FEET)	SAMPLE NUMBER	SAMPLE DEPTH	BLOW COUNTS (BLOWS/FOOT)	RECOVERY (INCHES)	POCKET PEN (TSF)	GRAPHIC LOG	LITHOLOGY
1		AS	-	-	-		10" ASPHALT GRINDINGS.
2	1	1.0-2.5	13-7-7	18	5+		Damp, stiff, brown and gray, silty CLAY, trace sand. Wn%: 20.7
3							
4	2	3.5-5.0	4-6-10	17	5+		Damp, stiff, brown and gray, silty CLAY, trace sand. Wn%: 18.3
5							
6							
7	3	6.0-7.5	5-8-11	10	5+		Damp, very stiff, brown, silty CLAY, trace sand. Wn%: 19.1
8							
9	4	8.5-10.0	6-9-13	18	5+		Damp, very stiff, brown, silty CLAY, trace sand. Wn%: 16.8
10							
11							
12							
13							
14	5	13.5-15.0	4-5-10	18	5+		Damp, stiff, brown, CLAY, some silt, trace sand. Wn%: 19.5
15							
16							
17							
18							
19	6	18.5-20.0	3-7-7	15	2.5		Moist, stiff, brown and gray, CLAY, some silt, trace sand. Wn%: 17.7
20							<i>Note: Ground surface elevations at boring locations estimated using data provided by Google Earth Pro.</i>
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PROJECT: CF Fire Station #4	PROJECT NO.: 20231041	DRILL RIG: CME 550W	BORING ID: B-5	Page 1 of 1
LOCATION: Cuyahoga Falls, Ohio		METHOD: Hollow Stem	DATE STARTED: 2/27/2023	
LOGGED BY: RJ		AUGER SIZE: 4.25 inches	DATE COMPLETED: 2/27/2023	
DRILL CREW: TT & DM		HAMMER: Auto SPT	ELEVATION: 998 feet MSL	
GROUNDWATER ENCOUNTER DEPTH: None	GROUNDWATER AT COMPLETION: None	TOTAL DEPTH: 15'	CAVE DEPTH: 15'	

DEPTH (FEET)	SAMPLE NUMBER	SAMPLE DEPTH	BLOW COUNTS (BLOWS/FOOT)	RECOVERY (INCHES)	POCKET PEN (TSF)	GRAPHIC LOG	LITHOLOGY
1		AS	-	-	-		10" Asphalt Grindings.
2	1	1.0-2.5	7-2-3	12	2.5		Moist medium stiff, gray, CLAY, minor silt, trace sand and gravel and organics. Wn%: 25.5
3							
4	2	3.5-5.0	2-5-6	17	5+		Moist, stiff, brown, CLAY, minor silt, trace sand and gravel. Wn%: 22.3
5							
6							
7	3	6.0-7.5	2-4-6	18			Damp, medium dense, brown fine sandy SILT. Wn%: 20.7
8							
9	4	8.5-10.0	4-8-13	18	5+		Damp, very stiff, brown CLAY, minor silt, trace sand and gravel. Wn%: 19.6
10							
11							
12							
13							
14	5	13.5-15.0	2-4-6	18	4		Damp, stiff, gray CLAY, trace silt and sand and gravel. Wn%: 18.1
15							<i>Note : Ground surface elevations at boring locations estimated using data provided by Google Earth Pro.</i>
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PROJECT: CF Fire Station #4	PROJECT NO.: 20231041	DRILL RIG: CME 550W	BORING ID: B-6	Page 1 of 1
LOCATION: Cuyahoga Falls, Ohio		METHOD: Hollow Stem	DATE STARTED: 2/27/2023	
LOGGED BY: RJ		AUGER SIZE: 4.25 inches	DATE COMPLETED: 2/27/2023	
DRILL CREW: TT & DM		HAMMER: Auto SPT	ELEVATION: 996 feet MSL	
GROUNDWATER ENCOUNTER DEPTH: None	GROUNDWATER AT COMPLETION: None	TOTAL DEPTH: 15'	CAVE DEPTH: 11'	

DEPTH (FEET)	SAMPLE NUMBER	SAMPLE DEPTH	BLOW COUNTS (BLOWS/FOOT)	RECOVERY (INCHES)	POCKET PEN (TSF)	GRAPHIC LOG	LITHOLOGY
1		AS	-	-	-		10" Asphalt Grindings.
2	1	1.0-2.5	6-5-5	17	3.5		Damp, stiff, brown CLAY, minor silt and gravel, trace sand. Wn%: 21.0
3							
4	2	3.5-5.0	3-6-10	15	5+		Damp, stiff, brown CLAY, minor silt, trace sand . Wn%: 15.5
5							
6							
7							
8							
9	3	8.5-10.0	4-8-13	18	5		Damp to moist, very stiff, brown CLAY, minor silt, trace sand. Wn%: 18.4
10							
11							
12							
13							
14	4	13.5-15.0	5-8-11	18	5+		Damp to moist, very stiff, brown CLAY, minor silt, trace sand. Wn%: 18.5
15							<i>Note : Ground surface elevations at boring locations estimated using data provided by Google Earth Pro.</i>
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PROJECT: CF Fire Station #4	PROJECT NO.: 20231041	DRILL RIG: CME 550W	BORING ID: B-7	Page 1 of 1
LOCATION: Cuyahoga Falls, Ohio		METHOD: Hollow Stem	DATE STARTED: 2/27/2023	
LOGGED BY: RJ		AUGER SIZE: 4.25 inches	DATE COMPLETED: 2/27/2023	
DRILL CREW: TT & DM		HAMMER: Auto SPT	ELEVATION: 995 feet MSL	
GROUNDWATER ENCOUNTER DEPTH: None	GROUNDWATER AT COMPLETION: None	TOTAL DEPTH: 15'	CAVE DEPTH: 11'	

DEPTH (FEET)	SAMPLE NUMBER	SAMPLE DEPTH	BLOW COUNTS (BLOWS/FOOT)	RECOVERY (INCHES)	POCKET PEN (TSF)	GRAPHIC LOG	LITHOLOGY
1		AS	-	-	-		3" Asphate Grindings.
2	1	1.0-2.5	5-2-3	18	1		PROBABLE FILL: Damp, medium stiff, brown CLAY, minor silt, trace gravel. LL: 39 PI: 21 Wn%: 25.1
3							
4	2	3.5-5.0	1-3-6	18	5+		Damp, stiff, brown CLAY, trace silt and sand and gravel. Wn%: 18.9
5							
6							
7							
8							
9	3	8.5-10.0	4-8-11	18	5+		Damp, very stiff, brown CLAY, trace silt and sand and gravel. Wn%: 20.4
10							
11							
12							
13							
14	4	13.5-15.0	4-7-10	16	5		Damp to moist, very stiff, gray, CLAY, trace silt and sand and gravel. Wn%: 18.6
15							<i>Note : Ground surface elevations at boring locations estimated using data provided by Google Earth Pro.</i>
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PROJECT: CF Fire Station #4	PROJECT NO.: 20231041	DRILL RIG: CME 550	BORING ID: B-8	Page 1 of 1
LOCATION: Cuyahoga Falls, Ohio		METHOD: Hollow Stem	DATE STARTED: 2/22/2023	
LOGGED BY: JA		AUGER SIZE: 3.25 inches	DATE COMPLETED: 2/22/2023	
DRILL CREW: TT & DM		HAMMER: Auto SPT	ELEVATION: 988 feet MSL	
GROUNDWATER ENCOUNTER DEPTH: None	GROUNDWATER AT COMPLETION: None	TOTAL DEPTH: 10'	CAVE DEPTH: 4'	

DEPTH (FEET)	SAMPLE NUMBER	SAMPLE DEPTH	BLOW COUNTS (BLOWS/FOOT)	RECOVERY (INCHES)	POCKET PEN (TSF)	GRAPHIC LOG	LITHOLOGY
1		AS	-	-	-		9" TOPSOIL.
2	1	1.0-2.5	3-4-4	10	1		PROBABLE FILL: Moist, medium stiff, brown, clayey SILT, trace sand and organics. Wn%: 22.8
3							
4	2	3.5-5.0	2-1-1	13			PROBABLE FILL: Wet, soft, brown and gray, clayey SILT, trace sand and gravel and organics. Wn%: 22.2
5							
6							
7	3	6.0-7.5	1-1-3	16	1		POSSIBLE FILL: Moist, soft, gray, CLAY, minor silt, trace organics. Wn%: 27.0
8							
9	4	8.5-10.0	2-6-10	18	5+		Damp, stiff, brown and gray, CLAY, minor silt, trace sand and gravel. Wn%: 19.2
10							<i>Note: Ground surface elevations at boring locations estimated using data provided by Google Earth Pro.</i>
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PROJECT: CF Fire Station #4	PROJECT NO.: 20231041	DRILL RIG: CME 550	BORING ID: B-9	Page 1 of 1
LOCATION: Cuyahoga Falls, Ohio		METHOD: Hollow Stem	DATE STARTED: 2/22/2023	
LOGGED BY: JA		AUGER SIZE: 3.25 inches	DATE COMPLETED: 2/22/2023	
DRILL CREW: TT & DM		HAMMER: Auto SPT	ELEVATION: 998 feet MSL	
GROUNDWATER ENCOUNTER DEPTH: None	GROUNDWATER AT COMPLETION: None	TOTAL DEPTH: 10'	CAVE DEPTH: 7'	

DEPTH (FEET)	SAMPLE NUMBER	SAMPLE DEPTH	BLOW COUNTS (BLOWS/FOOT)	RECOVERY (INCHES)	POCKET PEN (TSF)	GRAPHIC LOG	LITHOLOGY
1		AS	-	-	-		6" ASPHALT GRINDINGS
2	1	1.0-2.5	22-5-6	10	4		Moist, stiff, brown and gray, CLAY, some silt, trace sand. Wn%: 22.4
3							
4	2	3.5-5.0	4-9-12	14	5+		Damp, very stiff, brown and gray, CLAY, some silt, trace sand. Wn%: 19.0
5							
6							
7	3	6.0-7.5	4-7-10	16	5+		Damp, very stiff, brown and gray, CLAY, some silt, trace sand. Wn%: 19.7
8							
9	4	8.5-10.0	4-8-13	18	5+		Damp, very stiff, brown and gray, CLAY, some silt, trace sand. Wn%: 17.9
10							<i>Note: Ground surface elevations at boring locations estimated using data provided by Google Earth Pro.</i>
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PROJECT: CF Fire Station #4	PROJECT NO.: 20231041	DRILL RIG: CME 550	BORING ID: B-10	Page 1 of 1
LOCATION: Cuyahoga Falls, Ohio		METHOD: Hollow Stem	DATE STARTED: 2/22/2023	
LOGGED BY: JA		AUGER SIZE: 3.25 inches	DATE COMPLETED: 2/22/2023	
DRILL CREW: TT & DM		HAMMER: Auto SPT	ELEVATION: 998 feet MSL	
GROUNDWATER ENCOUNTER DEPTH: None	GROUNDWATER AT COMPLETION: None	TOTAL DEPTH: 10'	CAVE DEPTH: 5'	

DEPTH (FEET)	SAMPLE NUMBER	SAMPLE DEPTH	BLOW COUNTS (BLOWS/FOOT)	RECOVERY (INCHES)	POCKET PEN (TSF)	GRAPHIC LOG	LITHOLOGY
1		AS	-	-	-		10" ASPHALT GRINDINGS
2	1	1.0-2.5	14-9-9	16			FILL: Moist, very stiff, gray and black, fine to coarse sandy CLAY, minor silt, trace gravel. Wn%: 10.1
3							
4	2	3.5-5.0	3-12-9	10	5+		Damp, very stiff, brown, CLAY, minor silt, trace sand. Wn%: 15.7
5							
6							
7	3	6.0-7.5	4-8-12	18	5+		Damp, very stiff, brown, CLAY, minor silt, trace sand. Wn%: 18.6
8							
9	4	8.5-10.0	3-8-11	18	5+		Damp, very stiff, brown, CLAY, minor silt, trace sand. Wn%: 19.9
10							<i>Note: Ground surface elevations at boring locations estimated using data provided by Google Earth Pro.</i>
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PROJECT: CF Fire Station #4	PROJECT NO.: 20231041	DRILL RIG: CME 550 W	BORING ID: B-11	Page 1 of 1
LOCATION: Cuyahoga Falls, Ohio		METHOD: Hollow Stem	DATE STARTED: 2/27/2023	
LOGGED BY: RJ		AUGER SIZE: 3.25 inches	DATE COMPLETED: 2/27/2023	
DRILL CREW: TT & DM		HAMMER: Auto SPT	ELEVATION: 1000 feet MSL	
GROUNDWATER ENCOUNTER DEPTH: None	GROUNDWATER AT COMPLETION: None	TOTAL DEPTH: 10'	CAVE DEPTH: 7'	

DEPTH (FEET)	SAMPLE NUMBER	SAMPLE DEPTH	BLOW COUNTS (BLOWS/FOOT)	RECOVERY (INCHES)	POCKET PEN (TSF)	GRAPHIC LOG	LITHOLOGY
1		AS	-	-	-		4" Asphalt
2	1	1.0-2.5	4-6-12	17	5+		Damp, very stiff, brown and gray CLAY, minor silt, trace sand and gravel. Wn%: 16.1
4	2	3.5-5.0	6-9-12	16	5+		Damp, very stiff, brown CLAY, trace silt and sand and gravel. Wn%: 17.9
9	3	8.5-10.0	4-6-12	18	5+		Damp, very stiff, gray CLAY, minor silt, trace sand and gravel. Wn%: 17.3
10	<i>Note: Ground surface elevations at boring locations estimated using data provided by Google Earth Pro.</i>						
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PROJECT: CF Fire Station #4	PROJECT NO.: 20231041	DRILL RIG: CME 550 W	BORING ID: B-12	Page 1 of 1
LOCATION: Cuyahoga Falls, Ohio		METHOD: Hollow Stem	DATE STARTED: 2/27/2023	
LOGGED BY: RJ		AUGER SIZE: 4.25 inches	DATE COMPLETED: 2/27/2023	
DRILL CREW: TT & DM		HAMMER: Auto SPT	ELEVATION: 995 feet MSL	
GROUNDWATER ENCOUNTER DEPTH: None	GROUNDWATER AT COMPLETION: None	TOTAL DEPTH: 10'	CAVE DEPTH: 6'	

DEPTH (FEET)	SAMPLE NUMBER	SAMPLE DEPTH	BLOW COUNTS (BLOWS/FOOT)	RECOVERY (INCHES)	POCKET PEN (TSF)	GRAPHIC LOG	LITHOLOGY
1		AS	-	-	-		10" FILL.
2	1	1.0-2.5	6-9-11	15			FILL: Damp, very stiff, gray, silty CLAY, minor fine to coarse sand and gravel, trace organics. Wn%: 14.0
3							
4	2	3.5-5.0	3-7-12	15	4		Damp, very stiff, gray and brown CLAY, minor silt, trace sand and gravel. Wn%: 22.4
5							
6							
7							
8							
9	3	8.5-10.0	4-8-18	10	5+		Damp, very stiff, brown CLAY, minor silt, trace sand and gravel. Wn%: 19.4
10							<i>Note: Ground surface elevations at boring locations estimated using data provided by Google Earth Pro.</i>
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PROJECT: CF Fire Station #4	PROJECT NO.: 20231041	DRILL RIG: CME 550 W	BORING ID: B-13	Page 1 of 1
LOCATION: Cuyahoga Falls, Ohio		METHOD: Hollow Stem	DATE STARTED: 2/27/2023	
LOGGED BY: RJ		AUGER SIZE: 4.25 inches	DATE COMPLETED: 2/27/2023	
DRILL CREW: TT & DM		HAMMER: Auto SPT	ELEVATION: 994 feet MSL	
GROUNDWATER ENCOUNTER DEPTH: None	GROUNDWATER AT COMPLETION: None	TOTAL DEPTH: 10'	CAVE DEPTH: 7'	

DEPTH (FEET)	SAMPLE NUMBER	SAMPLE DEPTH	BLOW COUNTS (BLOWS/FOOT)	RECOVERY (INCHES)	POCKET PEN (TSF)	GRAPHIC LOG	LITHOLOGY
1		AS	-	-	-		6" Asphalt grindings.
2	1	1.0-2.5	5-5-5	16	4.5		Damp, stiff, brown and gray CLAY, minor silt, trace sand and gravel. Wn% 18.3
4	2	3.5-5.0	2-4-7	15	5+		Damp to moist, stiff, brown and gray CLAY, minor silt, trace sand and gravel. Wn%: 19.2
9	3	8.5-10.0	5-9-12	16	5+		Damp to moist, very stiff, brown and gray CLAY, minor silt, trace sand and gravel. Wn%: 19.1
10	<i>Note: Ground surface elevations at boring locations estimated using data provided by Google Earth Pro.</i>						
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PROJECT: CF Fire Station #4	PROJECT NO.: 20231041	DRILL RIG: CME 550 W	BORING ID: B-14	Page 1 of 1
LOCATION: Cuyahoga Falls, Ohio		METHOD: Hollow Stem	DATE STARTED: 2/27/2023	
LOGGED BY: RJ		AUGER SIZE: 4.25 inches	DATE COMPLETED: 2/27/2023	
DRILL CREW: TT & DM		HAMMER: Auto SPT	ELEVATION: 995 feet MSL	
GROUNDWATER ENCOUNTER DEPTH: None	GROUNDWATER AT COMPLETION: None	TOTAL DEPTH: 10'	CAVE DEPTH: 7'	

DEPTH (FEET)	SAMPLE NUMBER	SAMPLE DEPTH	BLOW COUNTS (BLOWS/FOOT)	RECOVERY (INCHES)	POCKET PEN (TSF)	GRAPHIC LOG	LITHOLOGY
1		AS	-	-	-		6" TOPSOIL.
2	1	1.0-2.5	2-2-2	18	1.5	[Cross-hatch pattern]	FILL: Damp, soft, gray CLAY, minor silt, trace sand and gravel and organics. LL: 40 PI: 19 Wn% 29.9
3							
4	2	3.5-5.0	2-5-7	14	5	[Diagonal lines pattern]	Moist, stiff, gray and brown CLAY, minor silt, trace sand and gravel. Wn%: 19.9
5							
6							
7							
8							
9	3	8.5-10.0	3-5-8	18	5	[Diagonal lines pattern]	Damp, stiff, brown CLAY, some silt, trace sand and gravel. Wn%: 20.5
10							<i>Note: Ground surface elevations at boring locations estimated using data provided by Google Earth Pro.</i>
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