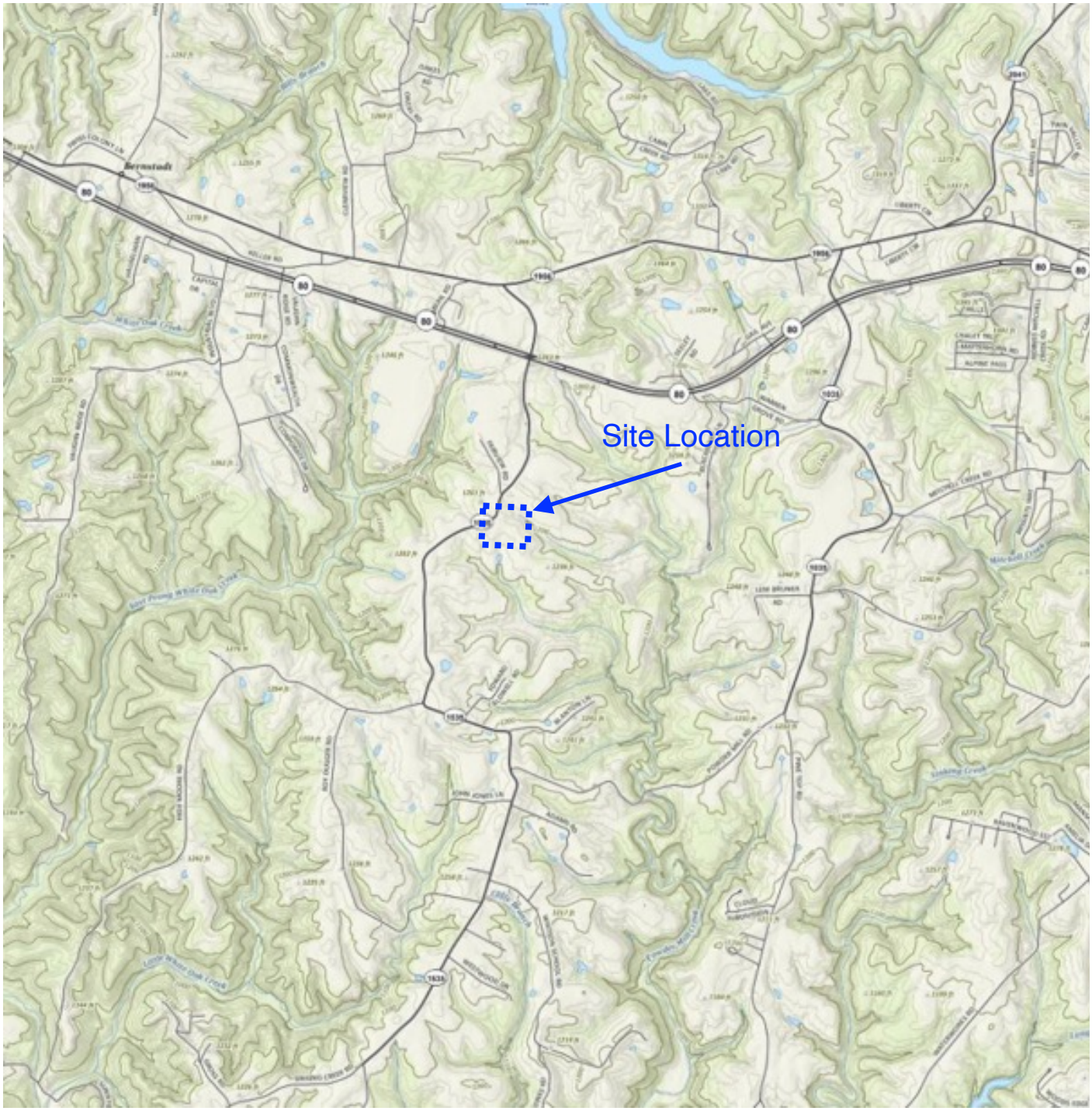


Site location plan adapted from Kentucky Geological Survey, with further adaptations from CETCO professionals.

N

CETCO, PLLC
624 Wellington Way
Lexington, KY 40515
859.475.3933
www.cetcopllc.com

SITE LOCATION PLAN
for McDaniel Property
Access Road

London, Kentucky

CETCO Project: 1776-25-0139
Date: July 14, 2025
Drawn by: Mason Ross
Checked by: Joe Cooke, PE
Drawing: 1 of 1

Legend

- Boring B-X
- 10' Contour
- 2' Contour

Boring location plan adapted from Google Earth and GeoSync, with further adaptations from CETCO professionals. Drilling locations were collected on-site using GPS equipment

This work product represents only generalized locations of features, objects or boundaries, and should not be relied upon as being legally authoritative for the precise location of any feature, object or boundary.

N

CETCO,PLLC
624 Welllington Way
Lexington, KY 40503
859.475.3933
www.cetcopllc.com

BORING LOCATION PLAN

For McDaniel Property Access Road
London, KY

CETCO Project #: 1776-25-0139
Date: August 4, 2025
Drawn by: Hunter Hawkins
Checked by: Joe Cooke, PE
Drawing: 1 of 1
Scale: NTS

CETCO
624 Wellington Way
Lexington, KY 40503
Telephone: 859-475-3933

BORING NUMBER B-1

CLIENT London-Laurel EDA
PROJECT NAME McDaniel Property Access Road
PROJECT NUMBER 1776-25-0139
PROJECT LOCATION London, Kentucky
DATE STARTED 8/1/25 **COMPLETED** 8/1/25
GROUND ELEVATION 1234 ft **HOLE SIZE** 4
DRILLING CONTRACTOR Strata Group
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING ---
LOGGED BY Hunter Hawkins **CHECKED BY** Joe Cooke, PE
AT END OF DRILLING --- Dry upon completion of drilling
NOTES Cloudy, 70s
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)
0.0		Previously Placed FILL: Sampled as brown LEAN CLAY (CL), with few gravel, slighlt moist, STIFF	SPT S-1	33	5-7-7 (14)		
			SPT S-2	50	6-7-10 (17)		
2.5		Brownish orange LEAN CLAY (CL), silty, moist, VERY STIFF					
			SPT S-3	100	10-15-25 (40)		
5.0		Brownish orange LEAN CLAY (CL), with some interbedded siltstone lenses, slightly moist, HARD into VERY STIFF					
			SPT S-4	100	9-12-16 (28)		
7.5							
			SPT S-5	100	11-21-50/3"		
10.0		Brownish orange SILTSTONE, with some sand, slightly moist, VERY STIFF					
		Pink weathered SANDSTONE					

▲ SPT N VALUE ▲
20 40 60 80
PL MC LL
20 40 60 80
☐ FINES CONTENT (%) ☐
20 40 60 80

>>

Refusal at 10.1 feet.
Bottom of borehole at 10.4 feet.

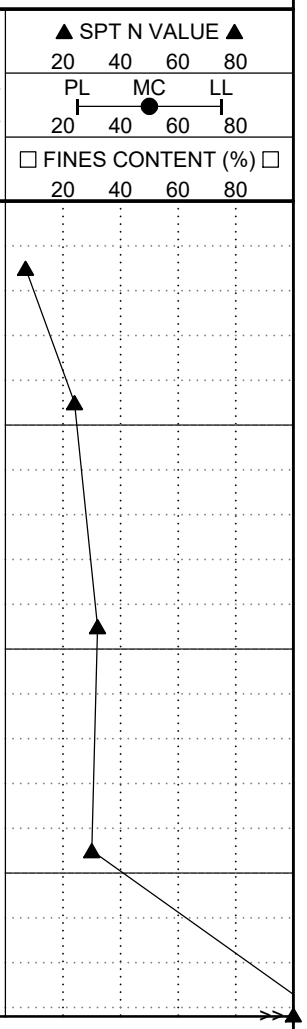
CETCO
624 Wellington Way
Lexington, KY 40503
Telephone: 859-475-3933

BORING NUMBER B-2

CLIENT London-Laurel EDA
PROJECT NAME McDaniel Property Access Road
PROJECT NUMBER 1776-25-0139
PROJECT LOCATION London, Kentucky
DATE STARTED 8/1/25 **COMPLETED** 8/1/25
GROUND ELEVATION 1233 ft **HOLE SIZE** 4
DRILLING CONTRACTOR Strata Group
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING ---
LOGGED BY Hunter Hawkins **CHECKED BY** Joe Cooke, PE
AT END OF DRILLING --- Dry upon completion of drilling
NOTES Cloudy, 70s
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)
0.0		TOPSOIL (8")					
		Brown LEAN CLAY (CL), silty, moist, FIRM	SPT S-1	100	1-3-4 (7)		
2.5		Brownish orange LEAN CLAY, silty, slightly moist, VERY STIFF	SPT S-2	94	3-5-19 (24)		
		Pink and tan SANDSTONE lens, with little clay, slighty moist, HARD					
		Brownish tan slightly layered SILTSTONE, with some interbedded SANDSONE lenses, HARD					
5.0			SPT S-3	100	16-13-19 (32)		
7.5			SPT S-4	100	8-12-18 (30)		
		Tan SANDSTONE	SPT S-5	100	5/2"		

Refusal at 9.1 feet.
Bottom of borehole at 9.1 feet.



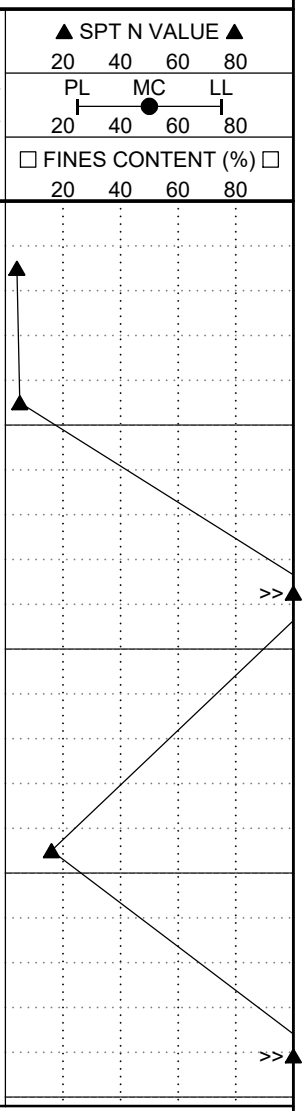
CETCO
624 Wellington Way
Lexington, KY 40503
Telephone: 859-475-3933

BORING NUMBER B-3

CLIENT London-Laurel EDA
PROJECT NAME McDaniel Property Access Road
PROJECT NUMBER 1776-25-0139
PROJECT LOCATION London, Kentucky
DATE STARTED 8/1/25 **COMPLETED** 8/1/25
GROUND ELEVATION 1237 ft **HOLE SIZE** 4
DRILLING CONTRACTOR Strata Group
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING ---
LOGGED BY Hunter Hawkins **CHECKED BY** Joe Cooke, PE
AT END OF DRILLING --- Dry upon completion of drilling
NOTES Cloudy, 70s
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)
0.0		TOPSOIL (10")	SPT S-1	100	2-3-1 (4)		
		Brown to dark brown LEAN CLAY (CL), silty, with trace organics, slightly moist to moist, SOFT					
		Brown LEAN CLAY (CL), silty, with trace fine sand, moist, FIRM	SPT S-2	61	1-2-3 (5)		
2.5							
		Tan and orange SILTY SAND (SM), with few sandstone lenses, VERY DENSE	SPT S-3	100	23-50/3"		
5.0		Tan and orange SANDSTONE lens, HARD					
		Brownish orange and gray slightly layered SILTSTONE, with trace sand, VERY STIFF	SPT S-4	100	5-5-11 (16)		
7.5							
			SPT S-5	100	12-20-50/1"		
10.0		Tan SANDSTONE					

Refusal at 10.1 feet.
Bottom of borehole at 10.1 feet.



CETCO
624 Wellington Way
Lexington, KY 40503
Telephone: 859-475-3933

BORING NUMBER B-4

CLIENT London-Laurel EDA
PROJECT NAME McDaniel Property Access Road
PROJECT NUMBER 1776-25-0139
PROJECT LOCATION London, Kentucky
DATE STARTED 8/1/25 **COMPLETED** 8/1/25
GROUND ELEVATION 1244 ft **HOLE SIZE** 4
DRILLING CONTRACTOR Strata Group
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING ---
LOGGED BY Hunter Hawkins **CHECKED BY** Joe Cooke, PE
AT END OF DRILLING --- Dry upon completion of drilling
NOTES Cloudy, 70s
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)
0.0		TOPSOIL (5")					
		Brown LEAN CLAY (CL), with trace fine organics, slightly moist, STIFF	SPT S-1	100	3-5-5 (10)		
		Brownish orange LEAN CLAY (CL), silty, with few red sandstone inclusions, slightly moist, FIRM	SPT S-2	100	4-3-4 (7)		
2.5							
		Brownish orange and gray SANDY LEAN CLAY (CLS), with some pink sandstone lenses, moist, VERY STIFF	SPT S-3	100	6-45-50/3"		
5.0		Pink and orange weathered SANDSTONE					

Refusal at 5.3 feet.
Bottom of borehole at 5.3 feet.

▲ SPT N VALUE ▲
20 40 60 80
PL MC LL
20 40 60 80
☐ FINES CONTENT (%) ☐
20 40 60 80
>>▲

CETCO
624 Wellington Way
Lexington, KY 40503
Telephone: 859-475-3933

BORING NUMBER B-5

CLIENT London-Laurel EDA
PROJECT NAME McDaniel Property Access Road
PROJECT NUMBER 1776-25-0139
PROJECT LOCATION London, Kentucky
DATE STARTED 8/1/25 **COMPLETED** 8/1/25
GROUND ELEVATION 1240 ft **HOLE SIZE** 4
DRILLING CONTRACTOR Strata Group
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING ---
LOGGED BY Hunter Hawkins **CHECKED BY** Joe Cooke, PE
AT END OF DRILLING --- Dry upon completion of drilling
NOTES Cloudy, 70s
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	SPT N VALUE / PL MC LL / FINES CONTENT (%)
0.0		TOPSOIL (7")						
		Brown LEAN CLAY (CL), silty, with trace fine organics, slightly moist, STIFF	SPT S-1	94	2-4-5 (9)			
2.5		Brownish orange LEAN CLAY, silty, with trace fine sand, slightly moist, STIFF	SPT S-2	100	2-4-10 (14)			
		Brownish orange SANDY LEAN CLAY (CLS), with gray silty lenses, moist, STIFF						
		Pink and tan SANDSTONE lens, with little clay, slighty moist, HARD	SPT S-3	100	50/5"			>>
5.0		Tan and orange SILTY SAND (CS), with interbedded sandstone lenses, slightly moist, HARD						
		Brownish red SANDSTONE	SPT S-4	100	25-50/5"			>>

Refusal at 4.4 feet.
Bottom of borehole at 7.4 feet.

CETCO
624 Wellington Way
Lexington, KY 40503
Telephone: 859-475-3933

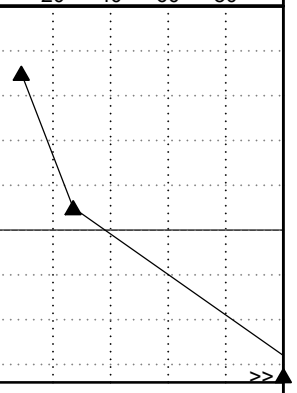
BORING NUMBER B-6

CLIENT London-Laurel EDA
PROJECT NAME McDaniel Property Access Road
PROJECT NUMBER 1776-25-0139
PROJECT LOCATION London, Kentucky
DATE STARTED 8/1/25 **COMPLETED** 8/1/25
GROUND ELEVATION 1242 ft **HOLE SIZE** 4
DRILLING CONTRACTOR Strata Group
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING ---
LOGGED BY Hunter Hawkins **CHECKED BY** Joe Cooke, PE
AT END OF DRILLING --- Dry upon completion of drilling
NOTES Cloudy, 70s
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)
0.0		TOPSOIL (5")					
		Brown LEAN CLAY (CL), silty, with trace fine organics and gravel, slightly moist, STIFF	SPT S-1	83	3-6-3 (9)		
2.5		Brownish orange LEAN CLAY (CL), silty, with trace sandstone lenses, slightly moist, VERY STIFF	SPT S-2	89	5-9-18 (27)		
		Pink and tan SANDSTONE lens, slighty moist, HARD					
		Brownish red SANDSTONE	SPT S-3	100	50/3"		

Refusal at 4.2 feet.
Bottom of borehole at 4.2 feet.

▲ SPT N VALUE ▲
20 40 60 80
PL MC LL
20 40 60 80
☐ FINES CONTENT (%) ☐
20 40 60 80



CETCO
624 Wellington Way
Lexington, KY 40503
Telephone: 859-475-3933

BORING NUMBER B-7

CLIENT London-Laurel EDA
PROJECT NAME McDaniel Property Access Road
PROJECT NUMBER 1776-25-0139
PROJECT LOCATION London, Kentucky
DATE STARTED 8/1/25 **COMPLETED** 8/1/25
GROUND ELEVATION 1246 ft **HOLE SIZE** 4
DRILLING CONTRACTOR Strata Group
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING ---
LOGGED BY Hunter Hawkins **CHECKED BY** Joe Cooke, PE
AT END OF DRILLING --- Dry upon completion of drilling
NOTES Cloudy, 70s
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)
0.0		TOPSOIL (1")					
		Brown LEAN CLAY (CL), silty, with trace fine organics and gravel, slightly moist, FIRM	SPT S-1	94	2-3-2 (5)		
		Brown LEAN CLAY (CL), silty, with few red streaks, slightly moist to moist, STIFF					
2.5		Brownish orange SANDY LEAN CLAY (CLS), slightly moist, VERY STIFF	SPT S-2	89	8-12-50 (62)		
		Pink and tan SILTY SAND (SC) with some interbedded sandstone lenses, slighty moist, HARD					
		Tan and pink SANDSTONE	SPT S-3	1800	50/1"		

Refusal at 4.1 feet.
Bottom of borehole at 4.1 feet.

▲ SPT N VALUE ▲
20 40 60 80
PL MC LL
20 40 60 80
☐ FINES CONTENT (%) ☐
20 40 60 80

CETCO
624 Wellington Way
Lexington, KY 40503
Telephone: 859-475-3933

BORING NUMBER B-8

CLIENT London-Laurel EDA
PROJECT NAME McDaniel Property Access Road
PROJECT NUMBER 1776-25-0139
PROJECT LOCATION London, Kentucky
DATE STARTED 8/1/25 **COMPLETED** 8/1/25
GROUND ELEVATION 1251 ft **HOLE SIZE** 4
DRILLING CONTRACTOR Strata Group
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING ---
LOGGED BY Hunter Hawkins **CHECKED BY** Joe Cooke, PE
AT END OF DRILLING --- Dry upon completion of drilling
NOTES Cloudy, 70s
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)
0.0		TOPSOIL (10")	SPT S-1	100	5-7-7 (14)		
		Previously Placed FILL: Sampled as dark brown LEAN CLAY (CL), with few organics, moist to very moist, STIFF					
		Brownish orange and gray LEAN CLAY (CL), with few red inclusions, moist, VERY STIFF into HARD	SPT S-2	94	6-7-10 (17)		
2.5							
			SPT S-3	100	10-15-25 (40)		
5.0							
		Brownish gray layered SILTSTONE	SPT S-4	100	9-12-16 (28)		
7.5							
			SPT S-5	100	11-21-50/0"		
10.0							
		Gray weathered SHALE					
12.5							

▲ SPT N VALUE ▲
20 40 60 80
PL MC LL
20 40 60 80
☐ FINES CONTENT (%) ☐
20 40 60 80

>>

Refusal at 13.9 feet.
Bottom of borehole at 13.9 feet.

GEOTECH BH PLOTS - GINT STD US.GDT - 8/4/25 11:22 - C:\USERS\PUBLIC\DOCUMENTS\BENTLEY\GINTCL\PROJECTS\MCDANIEL PROPERTY ACCESS ROAD.GPJ

LABORATORY STANDARDS AND PROCEDURES

Soil Classification: Soil classifications provide a general guide to the engineering properties of various soil types and enable the engineer to apply past experience to current problems. In our investigations, samples obtained during drilling operations are examined in our laboratory and visually classified by an engineer. The soils are classified according to consistency (based on number of blows from standard penetration tests or “by hand” stiffness), color and texture. These classification descriptions are included on our "Boring Logs” or “Test Pit Logs”

The classification system discussed above is primarily qualitative and for detailed soil classification two laboratory tests are necessary: grain size tests and plasticity tests. Using these test results the soil can be classified according to the AASHTO or Unified Classification Systems (ASTM D2487). Each of these classification systems and the in-place physical soil properties provides an index for estimating the soil's behavior. The soil classification and physical properties obtained are presented in this report.

Atterberg Limits: Portions of the samples are taken for Atterberg Limits testing to determine the plasticity characteristics of the soil. The plasticity index (PI) is the range of moisture content over which the soil deforms as a plastic material. It is bracketed by the liquid limit (LL) and the plastic limit (PL). The liquid limit is the moisture content at which the soil becomes sufficiently "wet" to flow as a heavy viscous fluid. The plastic limit is the lowest moisture content at which the soil is sufficiently plastic to be manually rolled into tiny threads. The liquid limit and plastic limit are determined in accordance with ASTM D4318.

Moisture Content: The Moisture Content is determined according to ASTM D2216.

Percent Finer Than 200 Sieve: Selected samples of soils are washed through a number 200 sieve to determine the percentage of material less than 0.074 mm in diameter.

“Proctor” (Moisture-Density Test): Often called by it’s original author’s name, the “Proctor” test is a moisture-density relationship test to determine “maximum dry density” and “optimum moisture content” curves using a set amount of force of “compaction” at variable moisture contents in a pre-determined mold size. The test is typically ASTM D698, method A, for standard effort. For a “modified” effort (higher amount of force), ASTM D 1557, again method A, is usually used. Due to high amounts of clay as well as typical compaction construction equipment used, the standard Proctor (ASTM D698) is the most common method used. For materials with larger grain sizes, methods B, C and D of each ASTM method can be used.

CBR: California Bearing Ratio (CBR) testing is often performed on soils to assist in pavement design. The test involves compacting soil into an approximate “0.075 cubic foot” volume at specified density and moisture content and then soaking the compacted sample with a surcharge weight (for a time period of usually at least 96 hours). Then, the sample is “loaded” using a fixed strain penetration piston and the penetration resistance and stress is recorded (as stress in pounds per square inch-psi) at 0.1 inches and 0.2 inches penetration. The resistant stress is then compared (as a “ratio”) to the standard resistant stress, hence the value is reported as unit-less. The test is typically conducted in general accordance with ASTM D1883.

Rock Strength Tests: To obtain strength data for rock materials encountered, unconfined compression tests are performed on selected samples. In the unconfined compression test, a cylindrical portion of the rock core is subjected to increasing axial load until it fails. The pressure required to produce failure is recorded, corrected for the length to diameter ratio of the core and reported.

FIELD SERVICES STANDARDS AND PROCEDURES

Field Operations: The general field procedures employed by CETCO are summarized in ASTM D420 which is entitled "Investigating and Sampling Soils and Rocks for Engineering Purposes." This recommended practice lists recognized methods for determining soil and rock distribution and ground water conditions. These methods include geophysical, in situ methods and test pits as well as borings.

Borings are drilled to obtain subsurface samples using one of several alternate techniques depending upon the subsurface conditions. These techniques typically include:

a. Continuous 2-1/2 or 3-1/4 inch I.D. hollow stem augers;
b. Wash borings using roller cone or drag bits (mud or water);
c. Continuous flight augers (ASTM D 1425).

These drilling methods are not capable of penetrating through material designated as "refusal materials." Refusal, thus indicated, may result from hard cemented soil, soft weathered rock, coarse gravel or boulders, thin rock seams, or the upper surface of sound continuous rock. Core drilling procedures are required to determine the character and continuity of refusal materials.

The subsurface conditions encountered during drilling are reported on a field test boring record by our field personnel (typically engineers). The record contains information concerning the boring method, samples attempted and recovered, indications of the presence of various materials such as coarse gravel, cobbles, etc., and observations between samples. Therefore, these boring records contain both factual and interpretive information. The field boring records are on file in our office.

The soil and rock samples plus the field boring records are reviewed by a geotechnical engineer. The engineer classifies the soils in general accordance with the procedures outlined in ASTM D2488 and prepares the final boring records which are the basis for all evaluations and recommendations.

The final boring records represent our interpretation of the contents of the field records based on the results of the engineering examinations and tests of the field samples. These records depict subsurface conditions at the specific locations and at the particular time when drilled. Soil conditions at other locations may differ from conditions occurring at these boring locations. Also, the passage of time may result in a change in the subsurface soil and ground water conditions at these boring locations. The lines designating the interface between soil or refusal materials on the records and on profiles represent approximate boundaries. The transition between materials may be gradual. The final boring records are included with this report.

The detailed data collection methods using during this study are discussed on the following pages.

Soil Test Borings: Soil test borings were made at the site at locations shown on the attached Boring Plan. Soil sampling and penetration testing were performed in accordance with ASTM D1586.

The borings were made by mechanically twisting a hollow stem steel auger into the soil. At regular intervals, the drilling tools were removed and soil samples obtained with a standard 1.4 inch I.D., 2 inch O.D., split tube sampler. The sampler was first seated 6 inches to penetrate any loose cuttings, then driven an additional foot with blows of a 140-pound hammer falling 30 inches. The number of hammer blows required to drive the sampler the final foot was recorded and is designated the "penetration resistance". The penetration resistance, when properly evaluated, is an index to the soil strength and foundation supporting capability.

Representative portions of the soil samples, thus obtained, were placed in glass jars and transported to the laboratory. In the laboratory, the samples were examined to verify the driller's field classifications. Test Boring Records are attached which graphically show the soil descriptions and penetration resistances.

Core Drilling: Refusal materials are materials that cannot be penetrated with the soil drilling methods employed. Refusal, thus indicated, may result from hard cemented soil, soft weathered rock, coarse gravel or boulders, thin rock seams or the upper surface of sound continuous rock. Core drilling procedures are required to determine the character and continuity of refusal materials.

Prior to coring, casing is set in the drilled hole through the overburden soils, if necessary, to keep the hole from caving. Refusal materials are then cored according to ASTM D2113 using a diamond-studded bit fastened to the end of a hollow

double tube core barrel. This device is rotated at high speeds, and the cuttings are brought to the surface by circulating water. Core samples of the material penetrated are protected and retained in the swivel-mounted inner tube. Upon completion of each drill run, the core barrel is brought to the surface, the core recovered is measured, the samples are removed and the core is placed in boxes for storage.

The core samples are returned to our laboratory where the refusal material is identified and the percent core recovery and rock quality designation is determined by a soils engineer or geologist. the percent core recovery is the ratio of the sample length obtained to the depth drilled, expressed as a percent. The rock quality designation (RQD) is obtained by summing up the length of core recovered, including only the pieces of core which are four inches or longer, and dividing by the total length drilled. The percent core recovery and RQD are related to soundness and continuity of the refusal material. Refusal material descriptions, recoveries, and RQDs are shown on the "Test Boring Records".

Water Level Readings: Water table readings are normally taken in conjunction with borings and are recorded on the "Boring Logs". These readings indicate the approximate location of the hydrostatic water table at the time of our field investigation. Where impervious soils are encountered (clayey soils) the amount of water seepage into the boring is small, and it is generally not possible to establish the location of the hydrostatic water table through water level readings. The ground water table may also be dependent upon the amount of precipitation at the site during a particular period of time. Fluctuations in the water table should be expected with variations in precipitation, surface run-off, evaporation and other factors.

The time of boring water level reported on the boring records is determined by field crews as the drilling tools are advanced. The time of boring water level is detected by changes in the drilling rate, soil samples obtained, etc. Additional water table readings are generally obtained at least 24 hours after the borings are completed. The time lag of at least 24 hours is used to permit stabilization of the ground water table which has been disrupted by the drilling operations. The readings are taken by dropping a weighted line down the boring or using an electrical probe to detect the water level surface.

Occasionally the borings will cave-in, preventing water level readings from being obtained or trapping drilling water above the caved-in zone. The cave-in depth is also measured and recorded on the boring records.

Rock Classification: Rock classifications (if any) provide a general guide to the engineering properties of various rock types and enable the engineer to apply past experience to current situations. In our explorations, rock core samples obtained during drilling operations are examined in our laboratory and visually classified by an engineer. The rock cores are classified according to relative hardness and RQD (see Guide to Rock Classification Terminology), color, and texture. These classification descriptions are included on our Boring Records.

Test Pits: Occasionally, our field sampling includes the use of “test pits”. Similarly to soil test borings, our classifications on the materials observed and sampled are performed in general accordance with ASTM standards. These excavations are performed by excavators of various sizes and the width/length/depth of the excavations vary as well. Typically, only the soil or “loose” rock areas can be sampled or excavated. The samples taken are usually taken at highly variable depths and the engineer or field personnel have extreme discretion on the sample sizes and locations. These are typically sealed in “zip lock” type baggies and transported back to our office for lab testing and further classification. Visual descriptions of rock materials (sand, gravel, cobbles, boulders, etc.) are provided on both samples taken and observations of spoils removed and sides of excavations. Typically, photos of both the mass excavation and spoil pile are provide on the test pit logs in our reports. Groundwater levels are noted and can include water flow at the excavation bottom or at points of depth in the excavation sides. “Refusal” usually means that the excavator cannot remove additional materials at the excavation bottom. Some excavations may also have very large boulders than cannot be removed by the excavator used. Depths indicated on the logs are usually measured with steel tape or cloth tape. Final complete details of the test pit findings and opinions are provided in the “Test Pit Logs” in our reports. Lastly, test pit excavations have no set standards and are performed at our engineers discretion.

Field and Lab Procedures