REPORT OF PRELIMINARY GEOTECHNICAL ENGINEERING EXPLORATION

MONROE COUNTY JUSTICE CENTER
BLOOMINGTON, INDIANA

PREPARED FOR:

MONROE COUNTY COMMISSIONERS
100 WEST KIRKWOOD
BLOOMINGTON, INDIANA 47404

Patriot Engineering and Environmental, Inc.
2006 South Yost Avenue
Bloomington, Indiana 47403

October 27, 2023

PATRIOT
ENGINEERING AND ENVIRONMENTAL, INC.

October 27, 2023

Mr. Jeff Cockerill
Monroe County Commissioners
100 West Kirkwood
Bloomington, Indiana 47404

Re: Report of Preliminary Geotechnical Engineering Exploration
Monroe County Justice Center
1510 South Strong Drive
Bloomington, Indiana
Patriot Project No.: 23-1415-11G

Dear Jeff:

Attached is the report of our preliminary geotechnical engineering exploration for the above referenced project. This exploration was completed in general accordance with our Proposal No. P23-1446-11G dated August 8, 2023.

This report includes detailed and graphic logs of twelve (12) soil borings drilled at the proposed project site. Also included in the report are the results of laboratory tests performed on samples obtained from the site, and preliminary geotechnical recommendations pertinent to the site development.

We appreciate the opportunity to perform this preliminary geotechnical engineering exploration and are looking forward to working with you during the final design phase of the project. If you have questions regarding this report or if we may be of additional assistance regarding the preliminary geotechnical aspect of the project, please do not hesitate to contact our office.

Respectfully submitted,
Patriot Engineering and Environmental, Inc.

Mark Jonard, E.I.
Geotechnical Engineer

William D. Dubois, P.E.
Senior Principal Engineer

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INDIANA
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REPORT OF PRELIMINARY GEOTECHNICAL ENGINEERING EXPLORATION

Monroe County Justice Center
1510 South Strong Drive
Bloomington, Indiana
Patriot Project No.: 23-1415-11G

1.0 INTRODUCTION

1.1 General

The Monroe County Commissioners, in conjunction with DLZ Indiana, LLC, is considering the construction of a multi-story justice center at 1510 South Strong Drive in Bloomington, Indiana. Refer to Appendix "A" *"Site Vicinity Map"* for general project location. The results of our preliminary geotechnical engineering exploration for the project are presented in this report.

1.2 Purpose and Scope

The purpose of this preliminary exploration is to determine the general near surface and subsurface conditions within the project area and to develop preliminary geotechnical engineering recommendations for the development of a proposed multi-story justice center. This was achieved by drilling soil borings, and by conducting laboratory tests on samples taken from the borings. This report contains the results of our findings, an engineering interpretation of these results with respect to the available project information, and preliminary recommendations to aid in the planning of the proposed facility, including the selection of building locations.

2.0 PROJECT INFORMATION

The proposed project is located at 1510 South Strong Drive in Bloomington, Indiana. The proposed number of structures, locations, loading conditions, whether the structures will be slab-on-grade construction or have basements, along with framing systems have not been provided at this time. However, we understand structures will be required for inmate housing, shared indoor/outdoor program classroom space, intake/booking, Sheriff's Office, video visitation, kitchen, laundry, vehicular sallyport, access drives, parking areas, and storm-water management basins.

3.0 SITE AND SUBSURFACE CONDITIONS

3.1 Site Conditions

The project area is presently an approximately 80-acre parcel, which is predominately wooded. However, easements, which are cleared and maintained, for the existing power lines span throughout the parcel. Throughout the site and in the surrounding area, karst features are known to be present.

A topographical survey and/or spot elevations were not provided to us at the time of this report. However, based on Indiana GIS map data and Google Earth Pro (2022), ground surface elevations across the site are estimated to vary between about 765 feet at the western edge of the parcel to about 834 feet at the northern edge.

3.2 General Subsurface Conditions

Our interpretation of the subsurface conditions is based upon twelve (12) soil borings drilled at the approximate locations shown on the *"Boring Location Map"* (Figure No. 2) in Appendix "A". The soil, rock, and groundwater conditions described below are general. Dashed stratification lines shown on the soil boring logs indicate approximate transitions between soil types. For more specific information, refer to the boring logs in Appendix "A". All depths discussed below refer to depths below the existing ground surface. Based on the results of the soil borings completed at the site, the following subsurface profile is presented. A description of each general soil unit has been identified and is described below:

3.2.1 Soil Conditions

Topsoil – Topsoil, a surficial layer of material that is a blend of silts, sands, and clays, with varying amounts of organic matter, is encountered at the ground surface of all boring locations. The topsoil layer is about 4 to 8 inches thick in the borings.

Silty Clay (CL) – Below the surficial layer in five (5) (i.e., B-6, B-7, B-8, B-10, & B-12) of the borings is brown, slightly moist to very moist, stiff to hard, silty clay. The silty clay layer extends to depths of about 3.5 to 8.5 feet below the existing ground surface. The natural moisture content of this material ranges from about 14 to 28 percent (%). Atterberg's Limits were taken of select samples of this material. Liquid Limits (LL) varied from about 48 to 49, Plastic Limits (PL) varied from about 21 to 23, and Plasticity Index (PI) varied from about 25 to 28. (Refer to Table No. 1 below for general qualitative indicators for plasticity). The silty clay layers have unconfined compressive strengths, as determined by a hand penetrometer, of about 1.6 to greater than 6 tons per square foot (tsf). Standard Penetration Test N-values in this material varies from about 9 to 18 blows per foot (bpf). **However, organic material was observed in Boring B-12 in the upper 6 feet.**

Clay (CH) – Below the surficial layer in five (5)(i.e., B-1, B-3, B-4, B-5, & B-11) of the borings, and below the silty clay layers in five (5) additional borings, is moist to very moist, stiff to hard, *highly plastic* clay. The clay layer extended to depths of 2 to 20 feet below the existing ground surface. The natural moisture content of this material ranges from 20 to 59 percent (%). Atterberg's Limits were taken of select samples of this material. LL varied from about 55 to 118, PL varied from about 21 to 37, and PI varied from about 38 to 81. (Refer to Table No. 1 below for general qualitative indicators for plasticity). The clay layers have unconfined compressive strengths about of 1.7 to greater than 6 tsf. Standard Penetration Test N-values in this material varies from about 10 to greater than 50 bpf.

Table No. 1: General Qualitative Indicators for Plasticity

Plasticity Index (PI)	Description
0	Non-Plastic
1-5	Slightly Plastic
5-10	Low Plasticity
10-20	Medium Plasticity
20-40	High Plasticity
>40	Very High Plasticity

3.2.2 Rock Conditions

Weathered limestone (rock) is present at seven (7) of the twelve (12) borings (i.e., B-1, B-2, B-5, B-6, B-9, B-11, & B-12) at depths ranging from about 1 to 6.5 feet below the existing ground surface, including below the topsoil in two (2) borings (i.e., (B-2 & B-9). Additionally, auger refusal was encountered at eleven (11) of the twelve (12) borings at depth between roughly 1 and 10.5 feet below the existing ground surface on shallow limestone rock (Boring B-7 did not encounter auger refusal). Refusal is defined as the depth at which the boring could no longer be advanced using conventional soil drilling and sampling methods.

Open voids in bedrock was encountered in one boring (Boring B-5), about 2 feet below the surface of rock and observed to be about 1 foot in length. In addition, a clay seams was encountered in one boring (Boring B-6) about 1 foot below the surface of rock and observed to be about ½ foot in length.

To evaluate the quality of more sound rock encountered at isolated locations at the parcel, rock coring and recovery of continuous rock core samples occurred at six (6) boring locations (i.e., B-1, B-15, B-6, B-9, B-11, and B-12). The sounder rock is gray, **slightly weathered limestone**. Refer to Appendix "B" for "*Rock Core Photographs*". Based on the recoveries and Rock Quality Designation (RQD) of twelve (12) core samples, the overall quality of the rock at the six (6) boring locations is "very poor" to "good" within the upper 10 feet of sound rock. Refer to Table No. 2 below for "*General Qualitative Indicators for Rock Quality*".

Table No. 2: General Qualitative Indicators for Rock Quality

Rock Quality Designation (RQD %)	Rock Quality
0 to 25	Very Poor
25 to 50	Poor
50 to 75	Fair
75 to 90	Good
90 to 100	Excellent

Unconfined compression strength tests were performed on twelve (12) rock core samples obtained from the site. The compressive strength of the bedrock ranges from 3,360 to 20,530 pounds per square inch (psi). Refer to Table No. 3 below a "*Summary of Rock Core RQD & Compressive Strengths*" and Appendix "B" for "*Rock Core Photographs*".

Table No. 3: Summary of Rock Core RQD & Compressive Strengths

Boring Number	Depth (feet)[1]	RQD (%)	Compressive Strength (psi)
B-1	4.6 TO 4.9	53	4,830
	11 TO 11.3	62	4,290
B-5	3.5 TO 3.8	25	11,400
	4.6 TO 4.9	37	20,530
B-6	7.1 TO 7.4	54	6,170
	13 TO 13.3	55	5,570
B-9	2 TO 2.3	7	6,110
	8 TO 8.3	44	8,240
B-11	6 TO 6.3	48	15,510
	12.3 TO 12.6	75	11,290
B-12	9.1 TO 9.4	35	3,360
	15.9 TO 16.3	87	3,820

(1) Refers to approximate depths below existing ground surface.

3.3 Groundwater Conditions

The term groundwater pertains to water that percolates through the soil found on site. This includes overland flow that permeates through a given depth of soil, perched water, and water that occurs below the "water table", a zone that remains saturated and water-bearing year-round.

Groundwater was not observed during drilling, nor upon completion of drilling activities. It should be recognized that fluctuations in the groundwater level should be expected over time due to variations in rainfall and other environmental or physical factors. ***The true static groundwater level can only be determined through observations made in cased holes over a long period of time, the installation of which was beyond the scope of this exploration.***

4.0 PRELIMINARY DESIGN RECOMMENDATIONS

4.1 Basis

Our preliminary recommendations are based on data presented in this report, which include soil borings, laboratory testing, and our experience with similar projects. Subsurface variations that may not be indicated by a dispersive exploratory boring program can exist on any site. If such variations or unexpected conditions are encountered during construction, or if the project information is incorrect or changed, we should be informed immediately since the validity of our recommendations may be affected.

4.2 General

Due to the preliminary nature of this geotechnical engineering exploration, further site-specific soil borings should be performed to provide earthwork and foundation design recommendations tailored to the actual building locations and loading conditions prior to construction. These additional borings are necessary to establish final design foundation depth and bearing pressures. It is important to obtain adequate coverage of borings for the final report. *Patriot* would be pleased to assist you in the planning and performance of this follow-up exploration phase and the development of a more project specific geotechnical engineering report.

4.3 Overall Site Evaluation

The preliminary borings indicate that the site is primarily underlain by clayey soils. In general, the areas near soil borings performed appear to be somewhat suitable for the anticipated development based on subsurface conditions observed in the preliminary borings. The soils will be suitable for shallow foundations, and for support of floor slabs and pavements with minor undercutting and replacement with compacted structural fill of the near surface soils. Concerns for construction are listed below.

4.3.1 Expansive (Highly Plastic) Clays

Ten (10) of the twelve (12) borings encountered highly plastic (expansive) clays (CH) at depths typically between about 1 and 20 feet below the existing ground surface. Expansive soils undergo volume changes upon wetting and drying. Expansive soils tend to shrink on drying and expand when the degree of saturation increases. However, the primary factors that govern the amount of expansion of the soils are the availability of moisture and the amount and type of clay particles in the soil.

In Indiana, typically expansive soils within the upper 5 to 10 feet of the surface grade are influenced most by climatic environmental factors, which affect the water content of the soils and hence cause the soils to shrink and swell. This range of influence is generally referred to as the active zone. Foundations, floor slabs, pavements and subsurface utilities placed on or in this active zone of highly plastic (expansive) clays can be subjected to detrimental effects of shrink and swell; which can cause unsuitable total and/or differential settlements, along with cracking. Therefore, we recommend that foundations, floor slabs, pavements, other infrastructure not bear or be placed directly on highly plastic clays (CH).

Positive drainage of surface water both during construction and after construction is complete will be especially important to reduce the amount of surface water that is allowed to permeate into the subgrade soils and subsequently reduce the potential for unsuitable shrinking or swelling of the underlying highly plastic clays. Water and drainage lines should be located such that if any leakage occurs, water will not be readily accessible to foundations, floor slabs and/or pavement sections. Additionally, the installation and use of an irrigation system at the parcel is highly discouraged.

4.3.2 Karst

The project site is located within a region known for karstic features. Karstic areas are typically associated with the development of solution features within the soluble carbonate bedrock leading to formation of sinkholes. A sinkhole is described as “Closed depression in soil or bedrock formed by the erosion and transport of earth material from below the land surface.” Sinkholes may develop within karstic areas as a result of soil fines migrating from the overburden soil by infiltrating water flowing downward into the bedrock through solution features/channels, such as voids and clay seams within the rock. Sinkholes may consist of a relatively localized weathered feature or larger features resulting from a collapse within a void formed in the overburden soils as a result of loss of the fine soils into the bedrock features.

Patriot has observed features in neighboring parcels consistent with signs of karst, including drop out features. The irregularity of the rock surface of the Bloomington Area could be associated with possible karst conditions. Refer to Appendix “A” Figure No. 3 *“Mapped Sinkhole”* for proximity to karst features in the area. We recommend that geophysical testing be performed to verify that karst features are not present in the structure areas and delineate the karst area. *Patriot* can provide a proposal for a geophysical study upon request.

4.3.3 Limestone Topography

The limestone topography observed at the borings locations varies in depth and elevation. Bedrock at the parcel should **not** be presumed to slope downward or upward in one direction or another. Limestone bedrock in this region typically exhibits an irregular surface pattern with pinnacles, ridges, channels and broken slabs or rock in the soil matrix that can form over relatively short lateral distances. Therefore, some excavation or removal of limestone bedrock should be anticipated during construction regardless of the finished floor elevation. Refer to Appendix "D" "Variances in Bloomington Bedrock Geology" (Figure No. 4).

The shallow limestone (rock) conditions encountered at the parcel were determined to be "very poor" to "poor" in quality, the limestone in the region is known to be susceptible to solution weathering, as we know from existing voids in our collected rock cores samples. Therefore, proper design and construction methods for minimizing the quantity of surface water that is allowed to infiltrate the subgrade at or near the planned structure will be important in reducing the risk of solution weathering or creation of voids in the underlying limestone.

4.4 Foundations

Our preliminary findings indicate, the project area could consider spread footings bearing on the stiff to very stiff silty clay encountered at shallow depths or on new well-compacted structural fill overlying the same. It is estimated that typical shallow footings can be designed using a maximum net allowable bearing pressure in the range of 2,000 to 3,500 pounds per square foot. This is the pressure that can be transmitted to the foundation soil in excess of the final maximum surrounding overburden pressure. **However, organic material, similar to B-12, must be undercut prior to foundation placement and replaced with well-compacted structural fill. Additionally, highly plastic clay within 5 feet below the ground surface should be removed and replaced with well-compacted structural fill.**

Alternatively, as a more cost-effective recommendation and based on the presence of highly plastic clays and shallow bedrock, the buildings can be supported on spread footings bearing on weathered limestone. It is estimated that typical shallow footings can be designed using a maximum net allowable bearing pressure in the range of 10,000 to 20,000 pounds per square foot.

Prior to construction of the foundation or placement of any structural fill, the exposed subgrades will require inspection of the bearing surface. **Any structure should bear on either silty clay soils or weathered bedrock, *not a combination of both materials due to the possibility of differential settlement.***

Footings exposed to freezing weather will need to extend to at least 24 inches below the adjacent exterior ground surface for frost protection. We also recommend that wall footings should be at least 18 inches wide and column footings should be at least 24 inches wide.

4.5 Floor Slabs

Floor slabs, which are anticipated to be placed on grade, could be supported on a granular base overlying the firm native soils. Floor slabs area may require some undercutting to remove organics or highly plastic clays prior to placement of the granular base course. We recommend that floor slab should be structurally independent of the building columns, walls, and foundations.

4.6 Seismic Considerations

For preliminary structural design purposes, a ***Site Classification of "C"*** as defined by the 2014 Indiana Building Code (modified 2012 International Building Code (IBC)) could be considered.

5.0 CONSTRUCTION CONSIDERATIONS

5.1 Site Preparation

All areas that will support foundations, floors, pavements or newly placed structural fill must be properly prepared. All loose surficial soil or "topsoil" and other unsuitable materials must be removed. Unsuitable materials include: frozen soil, relatively soft material, relatively wet soils, deleterious material, or soils that exhibit a high organic content.

Care must be exercised during grading and fill placement operations. ***The combination of heavy construction equipment traffic and excess surface moisture can cause pumping and deterioration of the near surface soils. The severity of this potential problem depends to a great extent on the weather conditions prevailing during construction.***

5.2 Groundwater Considerations

Groundwater was not encountered in the borings during drilling activities. Groundwater inflow into shallow excavations **above** the groundwater table is expected to be adequately controlled by conventional methods such as gravity drainage and/or pumping from sumps. More significant inflow can be expected in deeper excavations **below** the groundwater table requiring more aggressive dewatering techniques, such as well or wellpoint systems. For groundwater to have minimal effects on the construction, foundation excavations should be constructed and poured in the same day, if possible.

6.0 EXPLORATION PROCEDURES

6.1 Field Work

A total of twelve (12) soil borings were drilled, sampled, and tested at the project site between September 28 and 30, 2023 at the approximate locations shown on the Boring Location Map (Figure No. 2) in Appendix “A”. The depths that the soil borings were advanced to are shown on the Boring Logs in Appendix “A”. All depths are given as feet below the existing ground surface.

The borings were advanced using 3¼ inch inside diameter hollow-stem augers. Samples were recovered in the undisturbed material below the bottom of the augers using the standard drive sample technique in accordance with ASTM D 1586-74. A 2 inch outside diameter by $1^{3}/_{8}$ inch inside diameter split-spoon sampler was driven a total of 18 inches with the number of blows of a 140 pound hammer falling 30 inches recorded for each 6 inches of penetration. The sum of blows for the final 12 inches of penetration is the Standard Penetration Test result commonly referred to as the N-value (or blow-count). Split-spoon samples were recovered at 2.5 feet intervals, beginning at a depth of 1 foot below the existing surface grade, extending to a depth of 10 feet, and at 5 feet intervals thereafter to the termination of the boring.

In addition, where auger refusal was encountered at rock surface, 1.875-inch diameter rock core (NQ size) was obtained from the bedrock at six (6) select locations (i.e., B-1, B-5, B-6, B-9, B-11, and B-12). To measure the quality of the rock, the rock quality designation (RQD) was determined for each of the runs of rock core obtained. The percent (%) recovery and RQD for each core sample was recorded during the field activities and was confirmed in the laboratory. The RQD was computed by summing the lengths of all pieces of the core equal to or longer than 4 inches and then dividing by the total length of the core run. The RQD was then multiplied by 100 and expressed as a percentage (%).

Water levels were monitored at each borehole location during drilling and upon completion of the boring. The boreholes were backfilled with auger cuttings and boring performed in pavement areas were patched prior to demobilization for safety considerations.

Upon completion of the boring program, all of the samples retrieved during drilling were returned to *Patriot*'s soil testing laboratory where they were visually examined and classified. A laboratory-generated log of each boring was prepared based upon the driller's field log, laboratory test results, and our visual examination. Test boring logs and a description of the classification system are included in Appendix "A" in this report. Indicated on each log are: the primary strata encountered, the depth of each stratum change, the depth of each sample, the Standard Penetration Test results, groundwater conditions, and selected laboratory test data. The laboratory logs were prepared for each boring giving the appropriate sample data and the textural description and classification.

6.2 Laboratory Testing

Representative samples recovered in the borings were selected for testing in the laboratory to evaluate their physical properties and engineering characteristics. Laboratory analysis included:

- Natural Moisture Content Analysis (ASTM D 2216)
- Atterberg Limits Analysis (ASTM D 4318)
- Unconfined Compressive Strength of Intact Rock Core (ASTM D 7012-14)

Additionally, an estimate of the unconfined compressive strength (q_u) of the cohesive soil samples utilizing a calibrated hand penetrometer (q_p) were obtained. The results of laboratory tests are summarized in Section 3.2 *"General Subsurface Conditions"*, as well as in Appendix "C". Soil descriptions on the boring logs are in accordance with the Unified Soil Classification System (USCS).

7.0 LIMITATIONS OF EXPLORATION

The preliminary recommendations provided herein were developed from the information obtained in the soil borings, which depict subsurface conditions only at specific locations. Subsurface conditions at other locations may differ from those occurring at the specific drill sites.

The nature and extent of variations between borings may not become evident until the course of construction. If variations become evident, it will be necessary to re-evaluate the recommendations of this report after performing on-site observations during the excavation and noting the characteristics of any variation.

Our professional services have been performed, findings obtained, and recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices. This warranty is in lieu of all other warranties either expressed or implied. This company is not responsible for the independent conclusions, opinions or recommendations made by others based on the field and laboratory data presented in this report.

The scope of our services did not include any environmental assessment or exploration for the presence or absence of wetlands, hazardous or toxic materials in the soil, groundwater, or surface water within or beyond the site studied. Any statements in this report or on the test borings logs regarding vegetation types, odors or staining of soils, or other unusual conditions observed are strictly for the information of our client and the owner.

APPENDIX A

SITE VICINITY MAP
(FIGURE NO. 1)

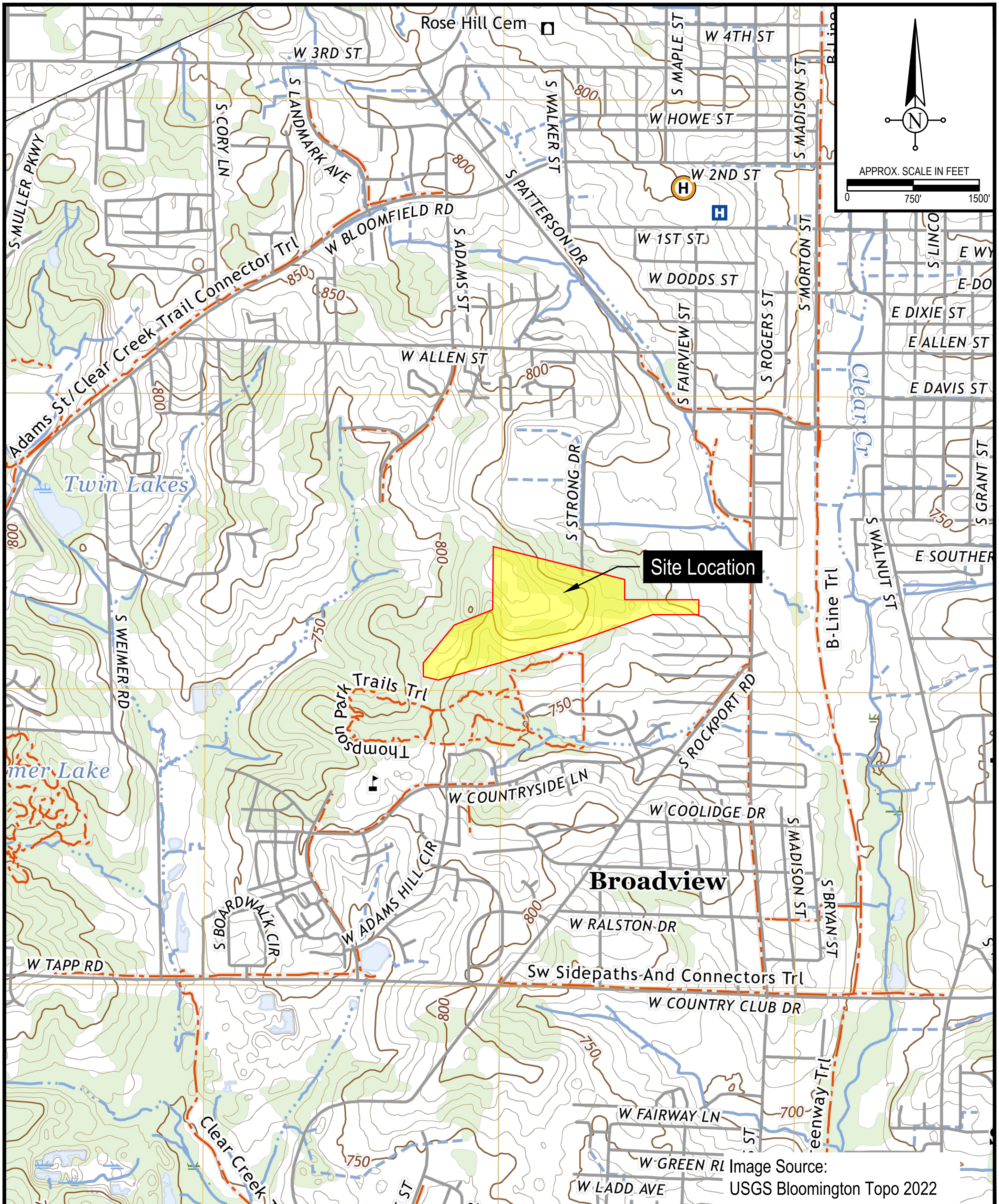
BORING LOCATION MAP
(FIGURE NO. 2)

MAPPED SINKHOLES
(FIGURE NO. 3)

BORING LOGS

BORING LOG KEY

UNIFIED SOIL CLASSIFICATION SYSTEM
(USCS)



Patriot Engineering & Environmental, Inc.

Project: Monroe County Justice Center
1510 South Strong Drive
Bloomington, Indiana

	Drawn By: J. DuMond
Project Number: 23-1415-11	Approved: M. Jonard
Date: October 10, 2023	DWG: 23-1415-11_geo

Figure 1

Site Vicinity Map

Patriot Engineering & Environmental, Inc.

NOTES:
1. Boring locations were staked by PATRIOT. All locations are shown as approximate.
2. All locations were determined in the field with references to existing landmarks.
3. Image Source: Bing Maps
4. Scale as shown.

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	Drawn By: J. DuMond
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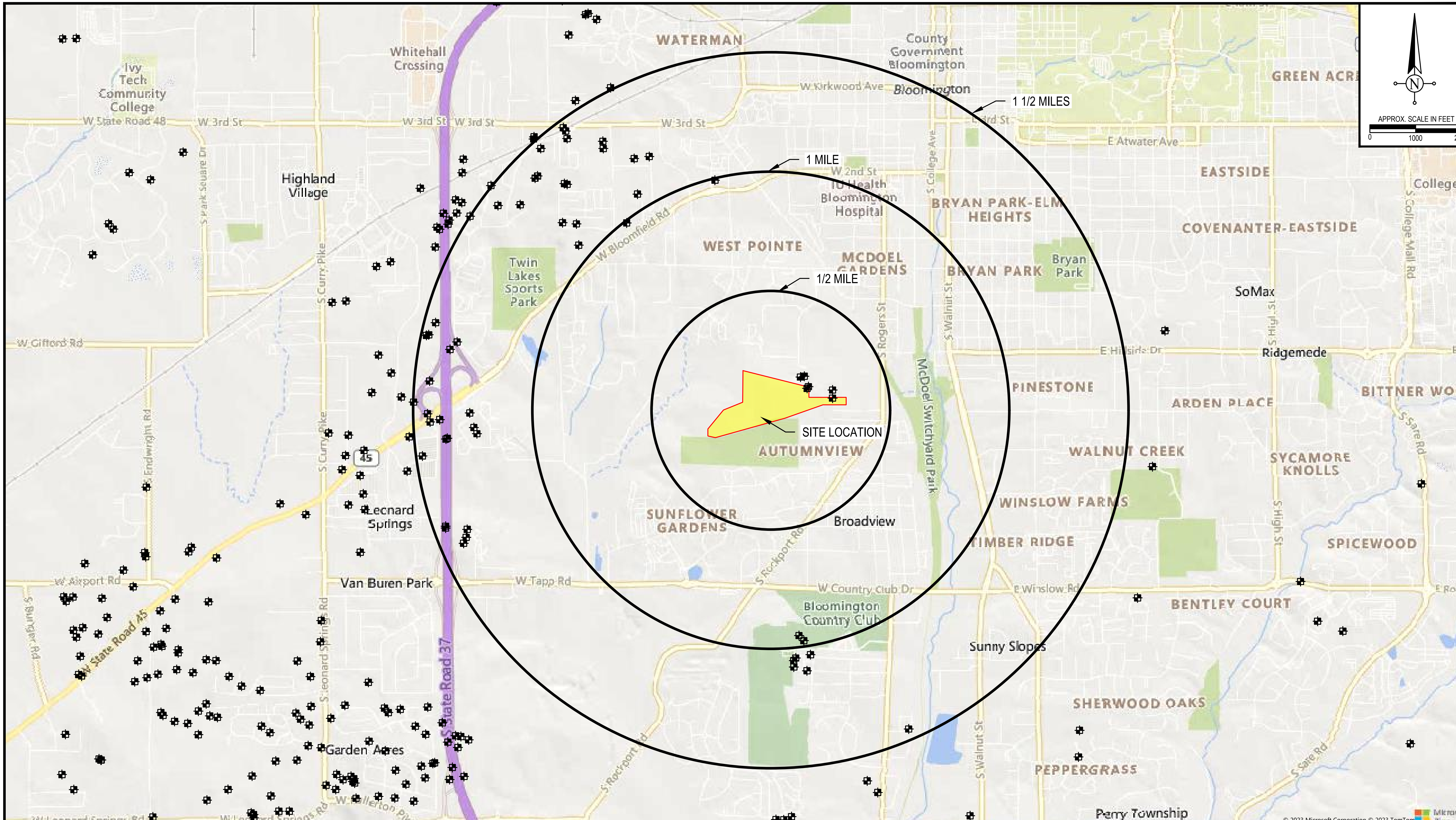
Figure 2

Soil Boring Location Map



Patriot Engineering & Environmental, Inc.

LEGEND

Mapped Indiana Sinkhole Locaiton

NOTES:
1. Sink Hole Locations from Indiana Map Karst Sinkhole Inventory IN KY 2011
2. Image Source: Bing Maps
3. Scale as shown.

Project: Monroe County Justice Center
1510 South Strong Drive
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Figure 3

Mapped Sinkholes

PATRIOT ENGINEERING and Environmental Inc.
Indianapolis, Terre Haute, Evansville, Fort Wayne, Lafayette, Bloomington Louisville, KY Dayton, Cincinnati, OH

LOG OF BORING B-1

Monroe County Justice Center
1510 South Strong Drive
Bloomington, Indiana

Client Name	: Monroe Co. Commissioners	Driller	: J. Boeche
Project Number	: 23-1415-11G	Sampling	: Splitspoon
Logged By	: J. Rogers/E. Bergel	Approx. Elevation	: +/- feet
Start Date	: 09/29/2023	Latitude	: 39° 8'44.51"N
Drilling Method	: HSA	Longitude	: 86°33'14.74"W

Water Levels
- During Drilling - Dry
- After Completion - Dry
- After 24 Hours - N/A

Depth (Feet)	Elevation (Feet) 768	Water Level	USCS	GRAPHIC	DESCRIPTION	Samples	Rec %	SPT Results	qp tsf	w %	REMARKS
0					TOPSOIL (7")						Sample No. 1: Atterberg Limits Test LL = 93, PL = 33, PI = 60
			CH		Brown, very moist, hard, CLAY with trace sand	1	44	8/50-3"		31	Boring caved to 2 feet upon auger removal.
	765				Gray, slightly weathered, LIMESTONE						Auger refusal encountered at 3 feet, and rock coring began.
5						2	94	RC			Sample No. 2: Rock cored from 3 to 8 feet. Rock Quality Designation RQD = 53% Unconfined Compressive Strength Test From 4.6 to 4.9 feet. Qu = 4,830 psi
	760										
10						3	100	RC			Sample No. 3: Rock cored from 8 to 13 feet. Rock Quality Designation RQD = 62% Unconfined Compressive Strength Test From 11 to 11.3 feet. Qu = 4,290 psi
	755				Boring terminated at 13 feet.						Groundwater was not encountered during drilling, nor upon completion.
15											
	750										
20											
	745										
25											

10-27-2023 C:\Users\mjonard\Patriot Engineering\GEO - Documents\Mtech\2023 Mtech\1415-11G\b1.bor

PATRIOT ENGINEERING and Environmental Inc.
Indianapolis, Terre Haute, Evansville, Fort Wayne, Lafayette, Bloomington Louisville, KY Dayton, Cincinnati, OH

LOG OF BORING B-2

Monroe County Justice Center
1510 South Strong Drive
Bloomington, Indiana

Client Name	: Monroe Co. Commissioners	Driller	: J. Boeche
Project Number	: 23-1415-11G	Sampling	: Splitspoon
Logged By	: J. Rogers	Approx. Elevation	: +/- feet
Start Date	: 09/29/2023	Latitude	: 39° 8'44.39"N
Drilling Method	: HSA	Longitude	: 86°33'6.50"W

Water Levels
- During Drilling - Dry
- After Completion - Dry
- After 24 Hours - N/A

Depth (Feet)	Elevation (Feet) 811	Water Level	USCS	GRAPHIC	DESCRIPTION	Samples	Rec %	SPT Results	qp tsf	w %	REMARKS
0					TOPSOIL (8")						
	810				Brown, highly weathered, LIMESTONE	1	67	5/18/20			
					Brown, highly weathered, LIMESTONE with interbedded clay seams	2	17	50-3"			Boring caved to 3 feet upon auger removal.
5	805				Auger refusal encountered at 4 feet.						Groundwater was not encountered during drilling, nor upon completion.
10	800										
15	795										
20	790										
25											

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PATRIOT ENGINEERING and Environmental Inc.

Indianapolis, Terre Haute, Evansville, Fort Wayne, Lafayette, Bloomington Louisville, KY Dayton, Cincinnati, OH

LOG OF BORING B-3

Monroe County Justice Center
1510 South Strong Drive
Bloomington, Indiana

Client Name	: Monroe Co.Commissioners	Driller	: J. Boeche
Project Number	: 23-1415-11G	Sampling	: Splitspoon
Logged By	: J. Rogers	Approx. Elevation	: +/- feet
Start Date	: 09/29/2023	Latitude	: 39° 8'45.48"N
Drilling Method	: HSA	Longitude	: 86°33'0.92"W

Water Levels
- During Drilling - Dry
- After Completion - Dry
- After 24 Hours - N/A

Depth (Feet)	Elevation (Feet) 798	Water Level	USCS	GRAPHIC	DESCRIPTION	Samples	Rec %	SPT Results	qp tsf	w %	REMARKS
0					TOPSOIL (8")						
			CH		Brown and dark brown, moist, stiff to very stiff, CLAY with trace sand	1	78	3/5/6	3.4	21	Sample No. 1: Atterberg Limits Test LL = 65, PL = 26, PI = 39
	795		CH		Brown, very moist, very stiff, CLAY with trace sand	2	44	2/50-3"	2.6	39	Sample No. 2: Atterberg Limits Test LL = 83, PL = 28, PI = 55 Boring caved to 4 feet upon auger removal.
5					Auger refusal encountered at 5 feet.						Groundwater was not encountered during drilling, nor upon completion.
	790										
10											
	785										
15											
	780										
20											
	775										
25											

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LOG OF BORING B-4

Monroe County Justice Center
1510 South Strong Drive
Bloomington, Indiana

Client Name	: Monroe Co. Commissioners	Driller	: J. Boeche
Project Number	: 23-1415-11G	Sampling	: Splitspoon
Logged By	: J. Rogers	Approx. Elevation	: +/- feet
Start Date	: 09/30/2023	Latitude	: 39° 8'47.47"N
Drilling Method	: HSA	Longitude	: 86°32'53.30"W

Water Levels
- During Drilling - Dry
- After Completion - Dry
- After 24 Hours - N/A

Depth (Feet)	Elevation (Feet) 791	Water Level	USCS	GRAPHIC	DESCRIPTION	Samples	Rec %	SPT Results	qp tsf	w %	REMARKS
0					TOPSOIL (8")						
	790		CH		Brown, moist, stiff to hard, CLAY with trace sand	1	78	4/6/8	4.8	20	Sample No. 1: Atterberg Limits Test LL = 59, PL = 21, PI = 38
			CH		Brown, very moist, very stiff, CLAY with trace sand	2	44	3/50-3"	3.9	42	Boring caved to 4 feet upon auger removal.
5	785				Auger refusal encountered at 5 feet.						Groundwater was not encountered during drilling, nor upon completion.
10	780										
15	775										
20	770										
25											

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LOG OF BORING B-5

Monroe County Justice Center
1510 South Strong Drive
Bloomington, Indiana

Client Name	: Monroe Co. Commissioners	Driller	: J. Boeche
Project Number	: 23-1415-11G	Sampling	: Splitspoon
Logged By	: J. Rogers/E. Bergel	Approx. Elevation	: +/- feet
Start Date	: 09/28/2023	Latitude	: 39° 8'57.75"N
Drilling Method	: HSA	Longitude	: 86°32'56.49"W

Water Levels
- During Drilling - Dry
- After Completion - Dry
- After 24 Hours - N/A

Depth (Feet)	Elevation (Feet) 830	Water Level	USCS	DESCRIPTION	Samples	Rec %	SPT Results	qp tsf	w %	REMARKS
0				TOPSOIL (8")						
			CH	Brown, very moist, hard, CLAY with trace sand and interbedded silt seams	1	56	3/3/50-2"		31	Boring caved to 2.5 feet upon auger removal.
				Gray, slightly weathered, LIMESTONE						Auger refusal encountered at 3 feet, and rock coring began
5	825			VOID	2	60	RC			Sample No. 2: Rock cored from 3 to 8 feet. Rock Quality Designation RQD = 25% Unconfined Compressive Strength Test From 3.5 to 3.8 feet. Qu = 11,410 psi
				Gray, slightly weathered, LIMESTONE						
10	820				3	88	RC			Sample No. 3: Rock cored from 8 to 13 feet. Rock Quality Designation RQD = 37% Unconfined Compressive Strength Test From 9.6 to 9.9 feet. Qu = 20,530 psi
				Dark gray, highly weathered, SHALE						
				Gray, slightly weathered, LIMESTONE						
				Boring terminated at 13 feet.						Groundwater was not encountered during drilling, nor upon completion.
15	815									
20	810									
25	805									

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LOG OF BORING B-6

Monroe County Justice Center
1510 South Strong Drive
Bloomington, Indiana

Client Name	: Monroe Co. Commissioners	Driller	: J. Boeche
Project Number	: 23-1415-11G	Sampling	: Splitspoon
Logged By	: J. Rogers/E. Bergel	Approx. Elevation	: +/- feet
Start Date	: 09/30/2023	Latitude	: 39° 8'49.03"N
Drilling Method	: HSA	Longitude	: 86°32'45.74"W

Water Levels
- During Drilling - Dry
- After Completion - Dry
- After 24 Hours - N/A

Depth (Feet)	Elevation (Feet) 796	Water Level	USCS	GRAPHIC	DESCRIPTION	Samples	Rec %	SPT Results	qp tsf	w %	REMARKS
0					TOPSOIL (8")						
	795		CL		Brown, moist, stiff to hard, SILTY CLAY with trace sand	1	100	4/5/7	4.5	19	Sample No. 1: Atterberg Limits Test LL = 48, PL = 23, PI = 25
			CH		Brown, moist, very stiff, CLAY with trace sand	2	44	5/6/50-1"	3.3	24	Boring caved to 5 feet upon auger removal.
5					Gray, slightly weathered, LIMESTONE						Auger refusal encountered at 5 feet and rock coring began.
	790		CH		Brown, CLAY with trace sand						
					Gray, slightly to moderately weathered, LIMESTONE	3	84	RC			Sample No. 3: Rock cored from 5 to 10 feet. Rock Quality Designation RQD = 54% Unconfined Compressive Strength Test From 7.1 to 7.4 feet. Qu = 6,170 psi
10	785					4	95	RC			Sample No. 4: Rock cored from 10 to 15 feet. Rock Quality Designation RQD = 55% Unconfined Compressive Strength Test From 13 to 13.3 feet. Qu = 5,570 psi
15	780				Boring terminated at 15 feet.						Groundwater was not encountered during drilling, nor upon completion.
20	775										
25											

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LOG OF BORING B-7

Monroe County Justice Center
1510 South Strong Drive
Bloomington, Indiana

Client Name	: Monroe Co. Commissioners	Driller	: J. Boeche
Project Number	: 23-1415-11G	Sampling	: Splitspoon
Logged By	: J. Rogers	Approx. Elevation	: +/- feet
Start Date	: 09/30/2023	Latitude	: 39° 8'51.00"N
Drilling Method	: HSA	Longitude	: 86°32'37.71"W

Water Levels
- During Drilling - Dry
- After Completion - Dry
- After 24 Hours - N/A

Depth (Feet)	Elevation (Feet) 776	Water Level	USCS	GRAPHIC	DESCRIPTION	Samples	Rec %	SPT Results	qp tsf	w %	REMARKS
0					TOPSOIL (8")						
	775		CL		Brown, moist, stiff to hard, SILTY CLAY with trace to little sand	1	78	6/7/9	4.5	21	
5						2	78	7/8/7	4.5	19	Sample No. 2: Atterberg Limits Test LL = 49, PL = 21, PI = 28
	770					3	44	6/6/6	4.2	17	
10			CH		Reddish brown, moist to very moist, hard to stiff, CLAY with trace sand	4	78	6/7/7	>6.0	21	
	765										
15						5	67	4/5/6	3.5	26	
	760										Boring caved to 17 feet upon auger removal.
						6	78	4/5/5	3.3	32	
20					Boring terminated at 20 feet.						
	755										Groundwater was not encountered during drilling, nor upon completion.
25											

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LOG OF BORING B-8

Monroe County Justice Center
1510 South Strong Drive
Bloomington, Indiana

Client Name	: Monroe Co. Commissioners	Driller	: J. Boeche
Project Number	: 23-1415-11G	Sampling	: Splitspoon
Logged By	: J. Rogers	Approx. Elevation	: +/- feet
Start Date	: 09/30/2023	Latitude	: 39° 8'51.48"N
Drilling Method	: HSA	Longitude	: 86°32'30.60"W

Water Levels
- During Drilling - Dry
- After Completion - Dry
- After 24 Hours - N/A

Depth (Feet)	Elevation (Feet) 760	Water Level	USCS	GRAPHIC	DESCRIPTION	Samples	Rec %	SPT Results	qp tsf	w %	REMARKS
0					TOPSOIL (7")						
			CL		Brown, moist, stiff to very stiff, SILTY CLAY with little sand	1	78	4/6/6	2.5	22	Sample No. 1: Atterberg Limits Test LL = 48, PL = 21, PI = 27
5	755		CH		Reddish brown, moist, stiff to hard, CLAY with trace sand	2	89	4/5/6	4.8	24	
			CH		Brown and reddish brown, very moist, stiff, CLAY with trace sand	3	78	5/5/6	1.7	51	Sample No. 3: Atterberg Limits Test LL = 82, PL = 32, PI = 50
			CH		Brown, very moist, very stiff, CLAY with trace sand and trace gravel	4	67	5/9/50-2"	2.5	59	Boring caved to 9 feet upon auger removal.
10	750				Auger refusal encountered at 10 feet.						Groundwater was not encountered during drilling, nor upon completion.
15	745										
20	740										
25	735										

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LOG OF BORING B-9

Monroe County Justice Center
1510 South Strong Drive
Bloomington, Indiana

Client Name	: Monroe Co. Commissioners	Driller	: J. Boeche
Project Number	: 23-1415-11G	Sampling	: Splitspoon
Logged By	: E. Bergel	Approx. Elevation	: +/- feet
Start Date	: 09/30/2023	Latitude	: 39° 8'48.33"N
Drilling Method	: HSA	Longitude	: 86°33'2.32"W

Water Levels
▼ During Drilling - Dry
▽ After Completion - Dry
◆ After 24 Hours - N/A

Depth (Feet)	Elevation (Feet) 823	Water Level	USCS	GRAPHIC	DESCRIPTION	Samples	Rec %	SPT Results	qp tsf	w %	REMARKS
0					TOPSOIL (8")						Boring caved to 1.5 feet upon auger removal.
					Gray, moderately to slightly weathered, LIMESTONE						Auger refusal encountered at 1 feet and rock coring began.
	820					1	29	RC			Sample No. 1: Rock cored from 1 to 6 feet. Rock Quality Designation RQD = 7%
5											Unconfined Compressive Strength Test From 2 to 2.3 feet. Qu = 6,110 psi
	815					2	66	RC			Sample No. 2: Rock cored from 6 to 11 feet. Rock Quality Designation RQD = 44%
10											Unconfined Compressive Strength Test From 8 to 8.3 feet. Qu = 8,230 psi
					Boring terminated at 11 feet.						Groundwater was not encountered during drilling, nor upon completion.
	810										
15											
	805										
20											
	800										
25											

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LOG OF BORING B-10

Monroe County Justice Center
1510 South Strong Drive
Bloomington, Indiana

Client Name	: Monroe Co. Commissioners	Driller	: J. Boeche
Project Number	: 23-1415-11G	Sampling	: Splitspoon
Logged By	: J. Rogers	Approx. Elevation	: +/- feet
Start Date	: 09/28/2023	Latitude	: 39° 8'52.14"N
Drilling Method	: HSA	Longitude	: 86°32'55.69"W

Water Levels
- During Drilling - Dry
- After Completion - Dry
- After 24 Hours - N/A

Depth (Feet)	Elevation (Feet) 808	Water Level	USCS	GRAPHIC	DESCRIPTION	Samples	Rec %	SPT Results	qp tsf	w %	REMARKS
0					TOPSOIL (8")						
			CL		Brown and gray, slightly moist, very stiff to hard, SANDY CLAY with trace gravel	1	78	7/8/9	>6.0	14	
	805		CH		Brown and dark brown, moist, very stiff to hard, CLAY with trace sand	2	100	8/10/12	>6.0	20	Sample No. 2: Atterberg Limits Test LL = 65, PL = 21, PI = 44
5			CH		Brown, very moist, stiff to very stiff, CLAY with trace sand	3	67	8/7/8		36	
	800					4	100	4/5/7	3.0	45	Sample No. 4: Atterberg Limits Test LL = 118, PL = 37, PI = 81 Boring caved to 10 feet upon auger removal.
10					Auger refusal encountered at 10.5 feet.						Groundwater was not encountered during drilling, nor upon completion.
	795										
15											
	790										
20											
	785										
25											

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LOG OF BORING B-11

Monroe County Justice Center
1510 South Strong Drive
Bloomington, Indiana

Client Name	: Monroe Co. Commissioners	Driller	: J. Boeche
Project Number	: 23-1415-11G	Sampling	: Splitspoon
Logged By	: J. Rogers/E. Bergel	Approx. Elevation	: +/- feet
Start Date	: 09/27/2023	Latitude	: 39° 8'51.83"N
Drilling Method	: HSA	Longitude	: 86°32'46.78"W

Water Levels
- During Drilling - Dry
- After Completion - Dry
- After 24 Hours - N/A

Depth (Feet)	Elevation (Feet) 815	Water Level	USCS	GRAPHIC	DESCRIPTION	Samples	Rec %	SPT Results	qp tsf	w %	REMARKS
0					TOPSOIL (7")						
			CH		Brown, moist, stiff to hard, CLAY with trace sand	1	78	6/7/8	>6.0	20	Sample No. 1: Atterberg Limits Test LL = 74, PL = 21, PI = 53
						2	78	8/9/10	>6.0	22	Boring caved to 4 feet upon auger removal.
5	810		CH		Brown, CLAY with trace sand						Auger refusal encountered at 5 feet, and rock coring began.
					Gray, slightly weathered, LIMESTONE	3	72	RC			Sample No. 3: Rock cored from 5 to 10 feet. Rock Quality Designation RQD = 48% Unconfined Compressive Strength Test From 6 to 6.3 feet. Qu = 15,510 psi
10	805					4	90	RC			Sample No. 4: Rock cored from 10 to 15 feet. Rock Quality Designation RQD = 75% Unconfined Compressive Strength Test From 12.3 to 12.6 feet. Qu = 11,290 psi
15	800				Boring terminated at 15 feet.						Groundwater was not encountered during drilling, nor upon completion.
20	795										
25	790										

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LOG OF BORING B-12

Monroe County Justice Center
15410 South Strong Drive
Bloomington, Indiana

Client Name	: Monroe Co. Commissioners	Driller	: G. Taylor
Project Number	: 23-1415-11G	Sampling	: Splitspoon
Logged By	: J. Rogers/E. Bergel	Approx. Elevation	: +/- feet
Start Date	: 09/29/2023	Latitude	: 39° 8'54.99"N
Drilling Method	: HSA	Longitude	: 86°32'40.92"W

Water Levels
- During Drilling - Dry
- After Completion - Dry
- After 24 Hours - N/A

Depth (Feet)	Elevation (Feet) 777	Water Level	USCS	DESCRIPTION	Samples	Rec %	SPT Results	qp tsf	w %	REMARKS
0				TOPSOIL (4")						
	775		CL	Brown, moist, stiff to hard, SILTY CLAY with trace sand and trace plant material	1	100	6/5/4	5.0	19	Sample No. 3: Two attempts were made to obtain a splitspoon sample. Classification is based on field observations.
5			CL	Brown, very moist, stiff to very stiff, SILTY CLAY with trace sand, trace plant material, and little gravel	2	100	8/9/9	1.6	28	Boring caved to 5 feet upon auger removal.
					3	0	50-1"			Auger refusal encountered at 6.5 feet, and rock coring began.
	770			Gray, moderately to slightly weathered, LIMESTONE						
10					4	100	RC			Sample No. 4: Rock cored from 6.5 to 11.5 feet. Rock Quality Designation RQD = 35% Unconfined Compressive Strength Test From 9.1 to 9.4 feet. Qu = 3,820 psi
15	765				5	100	RC			Sample No. 5: Rock cored from 11.5 to 16.5 feet. Rock Quality Designation RQD = 87% Unconfined Compressive Strength Test From 15.9 to 16.3 feet. Qu = 3,360 psi
20	760			Boring terminated at 16.5 feet.						Groundwater was not encountered during drilling, nor upon completion.
25	755									

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BORING LOG KEY

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

FIELD CLASSIFICATION SYSTEM
FOR SOIL EXPLORATION

NON-COHESIVE SOILS

(Silt, Sand, Gravel, and Combinations)

Density	Field Identification (SPT Blows/ft)
Very Loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 51

Grain Size Terminology

Soil Fraction		Particle Size	US Standard Sieve Size
Boulders		> 12 inches	> 12 inches
Cobbles		3 - 12 inches	3 - 12 inches
Gravel:	Coarse	¾ - 3 inches	¾ - 3 inches
	Small	4.76 mm - ¾ inch	No. 4 - ¾ inches
Sand:	Coarse	2.00 - 4.76 mm	No. 10 - No. 4
	Medium	0.42 - 2.00 mm	No. 40 - No. 10
	Fine	0.074 - 0.42 mm	No. 200 – No. 40
Silt		0.005 - 0.074 mm	< No. 200
Clay		< 0.005 mm	< No. 200

RELATIVE PROPORTIONS FOR SOILS

Descriptive Term	Percent
Trace	1 - 10
Little	11 - 20
Some	21 - 35
And	36 - 50

COHESIVE SOILS

(Clay, Silt and Combinations)

Consistency	Unconfined Compressive Strength (tons/ft^2)	Field Identification (SPT Blows/ft)
Very Soft	Less than 0.25	0 - 2
Soft	0.25 – < 0.5	3 - 4
Medium Stiff	0.5 - < 1.0	5 - 8
Stiff	1.0 - < 2.0	9 -15
Very Stiff	2.0 - < 4.0	16 - 30
Hard	Over 4.0	> 30

Classification: Provided on Boring Logs are made by visual inspection.

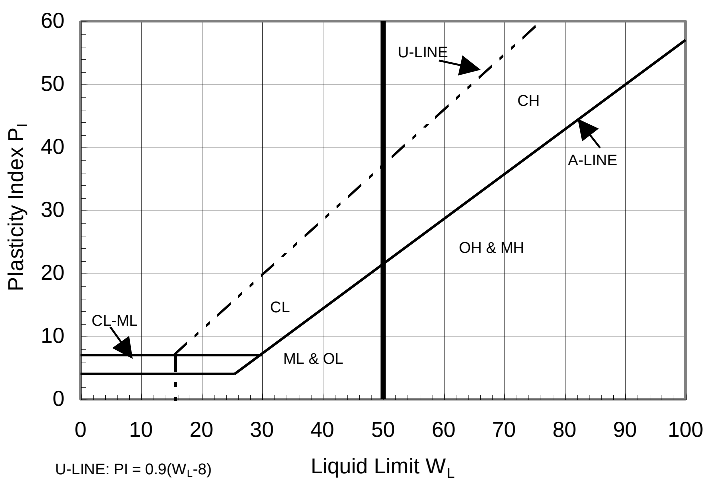
Standard Penetration Test: Driving a 2 inch outer-diameter (O.D.) by 1⅜ inch inner-diameter (I.D.) split-spoon sampler a total of 18 inches into undisturbed soil with the number of blows of a 140 pound hammer free-falling a distance of 30 inches recorded for each 6 inches of penetration. The sum of blows for the final 12 inches of penetration is the Standard Penetration Test result commonly referred to as the “N”-value (or blow-count).

Strata Changes: In the column “Descriptions” on the Boring Logs the horizontal lines represent strata changes. A solid line (———) represents an observed change, a dashed line (- - - - - -) represents an estimated change.

Groundwater: Observations were made at the times indicated on the Boring Logs. Fluctuations in the groundwater level should be expected over time due to variations in rainfall and other environmental or physical factors. *Groundwater symbols*: (▼)-observed groundwater level and/or elevation during drilling; (∇)-observed groundwater level and/or elevation upon completion of boring.

Unified Soil Classification System (USCS)

Major Divisions			Group Symbol	Typical Names	Classification Criteria for Coarse-Grained Soils
Coarse-grained soils (more than half of material is larger than No. 200)	Gravels (more than half of coarse fraction is larger than No. 4 sieve size)	Clean gravels (little or no fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines	$C_U \geq 4$; $1 \leq C_C \leq 3$; $C_U = \frac{D_{60}}{D_{10}}$; $C_C = \frac{D^2_{30}}{D_{10} D_{60}}$
			GP	Poorly graded gravels, gravel-sand mixtures, little or no fines	Not meeting all gradation requirements for GW ($C_U < 4$ or $1 > C_C > 3$)
		Gravels with fines (appreciable amount of fines)	GM *d* *u*	Silty gravels, gravel-sand-silt mixtures	Atterberg limits below A line or $P_I < 4$ / Above A line with $4 < P_I < 7$ are borderline cases requiring use of dual symbols
			GC	Clayey gravels, gravel-sand-clay mixtures	Atterberg limits above A line or $P_I > 7$
	Sands (more than half of coarse fraction is smaller than No. 4 sieve size)	Clean sands (little or no fines)	SW	Well-graded sands, gravelly sands, little or no fines	$C_U \geq 6$; $1 \leq C_C \leq 3$; $C_U = \frac{D_{60}}{D_{10}}$; $C_C = \frac{(D_{30})^2}{D_{10} D_{60}}$
			SP	Poorly graded sands, gravelly sands, little or no fines	Not meeting all gradation requirements for SW ($C_U < 6$ or $1 > C_c > 3$)
		Sands with fines (appreciable amount of fines)	SM *d* *u*	Silty sands, sand-silt mixtures	Atterberg limits below A line or $P_I < 4$ / Limits plotting in hatched zone with $4 \leq P_I \leq 7$ are borderline cases requiring use of dual symbols
			SC	Clayey sands, sand-clay mixtures	Atterberg limits above A line with $P_I > 7$
Fine-grained soils (more than half of material is smaller than No. 200)	Silt and clays (liquid limit <50)		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity	1. Determine percentages of sand and gravel from grain size curve. 2. Depending on percentages of fines (fraction smaller than 200 sieve size), coarse-grained soils are classified as follows: Less than 5% - GW, GP, SW, SP More than 12% - GM, GC, SM, SC 5-12% - Borderline cases requiring dual symbols
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays	
			OL	Organic silts and organic silty clays of low plasticity	
	Silts and clays (liquid limit >50)		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts	
			CH	Inorganic clays or high plasticity, fat clays	
			OH	Organic clays of medium to high plasticity, organic silts	
	Highly organic soils		PT	Peat and other highly organic soils	



U-LINE: PI = $0.9(W_L-8)$
A-LINE: PI = $0.73(W_L-20)$

Plasticity Chart

APPENDIX B

ROCK CORE PHOTOGRAPHS

ROCK CORE PHOTOGRAPHS

Monroe County Just Center
1510 South Strong Drive
Bloomington, Indiana
Patriot Project No.: 23-1415-11G

BORING B-1 (3 TO 13 FEET)

ROCK CORING SUMMARY

BORING NUMBER	ROCK CORE DEPTH (feet)(1)	RQD (%)	UNCONFINED COMPRESSIVE STRENTH (psi)
B-1	3 TO 8	53	4,830
	8 TO 13	62	4,290

(1) Represents depth below existing ground surface.

ROCK CORE PHOTOGRAPHS

Monroe County Just Center
1510 South Strong Drive
Bloomington, Indiana
Patriot Project No.: 23-1415-11G

BORING B-5 (3 TO 13 FEET)

ROCK CORING SUMMARY

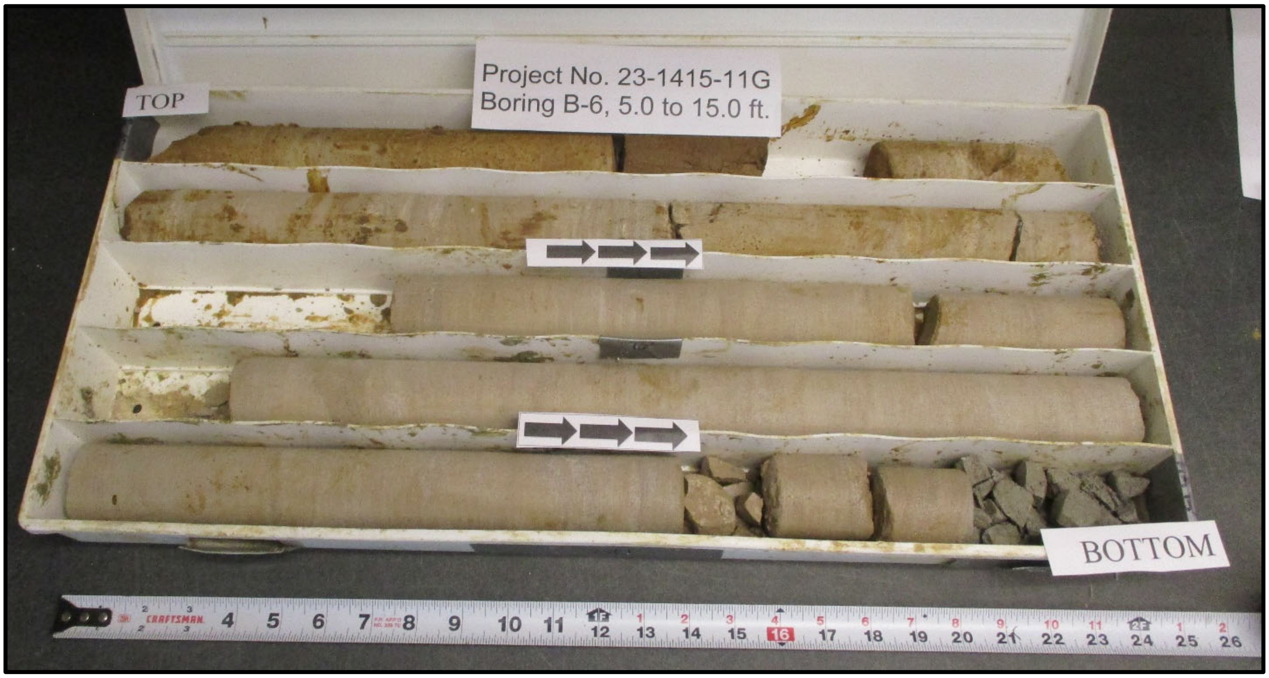
BORING NUMBER	ROCK CORE DEPTH (feet)[(1)]	RQD (%)	UNCONFINED COMPRESSIVE STRENTH (psi)
B-5	3 TO 8	25	11,410
	8 TO 13	37	20,530

[(1)] *Represents depth below existing ground surface.*

ROCK CORE PHOTOGRAPHS

Monroe County Just Center
1510 South Strong Drive
Bloomington, Indiana
Patriot Project No.: 23-1415-11G

BORING B-6 (5 TO 15 FEET)



ROCK CORING SUMMARY

BORING NUMBER	ROCK CORE DEPTH (feet)[1]	RQD (%)	UNCONFINED COMPRESSIVE STRENTH (psi)
B-6	5 TO 10	54	6,170
	10 TO 15	55	5,570

[1] Represents depth below existing ground surface.

ROCK CORE PHOTOGRAPHS

Monroe County Just Center
1510 South Strong Drive
Bloomington, Indiana
Patriot Project No.: 23-1415-11G

BORING B-9 (1 TO 11 FEET)

ROCK CORING SUMMARY

BORING NUMBER	ROCK CORE DEPTH (feet)[(1)]	RQD (%)	UNCONFINED COMPRESSIVE STRENTH (psi)
B-9	1 TO 6	7	6,110
	6 TO 11	44	8,230

[(1)] *Represents depth below existing ground surface.*

ROCK CORE PHOTOGRAPHS

Monroe County Just Center
1510 South Strong Drive
Bloomington, Indiana
Patriot Project No.: 23-1415-11G

BORING B-11 (5 TO 15 FEET)

ROCK CORING SUMMARY

BORING NUMBER	ROCK CORE DEPTH (feet)[1]	RQD (%)	UNCONFINED COMPRESSIVE STRENTH (psi)
B-11	5 TO 10	48	15,510
	10 TO 15	75	11,290

[1] *Represents depth below existing ground surface.*

ROCK CORE PHOTOGRAPHS

Monroe County Just Center
1510 South Strong Drive
Bloomington, Indiana
Patriot Project No.: 23-1415-11G

BORING B-12 (6.5 TO 16.5 FEET)

ROCK CORING SUMMARY

BORING NUMBER	ROCK CORE DEPTH (feet)[1]	RQD (%)	UNCONFINED COMPRESSIVE STRENTH (psi)
B-12	6.5 TO 11.5	35	3,820
	11.5 TO 16.5	87	3,360

[1] Represents depth below existing ground surface.

APPENDIX C

LABORATORY TESTING RESULTS

Compressive Strength of Intact Rock Core Specimens without Strain Measurement ASTM D 7012-14 Method C

PATRIOT ENGINEERING and Environmental, Inc.
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Consulting Environmental, Geotechnical and Materials Engineers

Project Name	Monroe County Justice Center
Project No.	23-1415-11G
Client	Monroe County Commissioners
Boring No.	B-1
Sample No.	S-2
Sample Depth, (ft)	4.6-4.9
Lithologic Sample Description	Gray, slightly weathered, LIMESTONE
Load Direction (with respect to lithology)	Vertical
Moisture Condition at Time of Test	As-Received
Average Diameter (in)	1.838
Average Length (in)	3.927
Mass (g)	371.1
Conforms to ASTM D4543 Dimensional Requirements? If no, explain.	Specimen capped with Gypsum Capping Compound due to irregularities on the end surfaces
Temperature at Time of Test (℃)	20.1
Loading Rate (lb/sec)	100
Time to Failure (min)	4
Failure Load, (lb)	12,820
Uniaxial Compressive Strength, (psi)	4,830
Uniaxial Compressive Strength, (tsf)	348
Description of Specimen After Test	See Photograph Below
Tested by/ Date	V. Bump 10/17/2023
Reviewed by / Date	J. Rogers 10/24/2023

Remarks: Specimen was not prepared per ASTM D4543 Section 7.6. Results reported may differ from results obtained from a test specimen that meets the requirments of Practice D4543.

Equipment Used	**ID No.**	**Calibration Date**
Loading Device	CM-500P-D, 16103	6/19/23

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Compressive Strength of Intact Rock Core Specimens without Strain Measurement
ASTM D 7012-14 Method C

Project Name	Monroe County Justice Center
Project No.	23-1415-11G
Client	Monroe County Commissioners
Boring No.	B-1
Sample No.	S-3
Sample Depth, (ft)	11-11.3
Lithologic Sample Description	Gray, slightly weathered, LIMESTONE
Load Direction (with respect to lithology)	Vertical
Moisture Condition at Time of Test	As-Received
Average Diameter (in)	1.849
Average Length (in)	3.897
Mass (g)	382.3
Conforms to ASTM D4543 Dimensional Requirements? If no, explain.	Specimen capped with Gypsum Capping Compound due to irregularities on the end surfaces
Temperature at Time of Test (℃)	20.1
Loading Rate (lb/sec)	100
Time to Failure (min)	3
Failure Load, (lb)	11,530
Uniaxial Compressive Strength, (psi)	4,290
Uniaxial Compressive Strength, (tsf)	309
Description of Specimen After Test	See Photograph Below
Tested by/ Date	V. Bump 10/17/2023
Reviewed by / Date	J. Rogers 10/24/2023

Remarks: Specimen was not prepared per ASTM D4543 Section 7.6. Results reported may differ from results obtained from a test specimen that meets the requirments of Practice D4543.

Equipment Used	ID No.	Calibration Date
Loading Device	CM-500P-D, 16103	6/19/23

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Compressive Strength of Intact Rock Core Specimens without Strain Measurement ASTM D 7012-14 Method C

Project Name	Monroe County Justice Center
Project No.	23-1415-11G
Client	Monroe County Commissioners
Boring No.	B-5
Sample No.	S-2
Sample Depth, (ft)	3.5-3.8
Lithologic Sample Description	Gray, slightly weathered, LIMESTONE
Load Direction (with respect to lithology)	Vertical
Moisture Condition at Time of Test	As-Received
Average Diameter (in)	1.848
Average Length (in)	3.882
Mass (g)	421.7
Conforms to ASTM D4543 Dimensional Requirements? If no, explain.	Specimen capped with Gypsum Capping Compound due to irregularities on the end surfaces
Temperature at Time of Test (℃)	20.1
Loading Rate (lb/sec)	100
Time to Failure (min)	6
Failure Load, (lb)	30,600
Uniaxial Compressive Strength, (psi)	11,410
Uniaxial Compressive Strength, (tsf)	821
Description of Specimen After Test	See Photograph Below
Tested by/ Date	V. Bump 10/17/2023
Reviewed by / Date	J. Rogers 10/24/2023

Remarks: Specimen was not prepared per ASTM D4543 Section 7.6. Results reported may differ from results obtained from a test specimen that meets the requirments of Practice D4543.

Equipment Used	ID No.	Calibration Date
Loading Device	CM-500P-D, 16103	6/19/23

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Compressive Strength of Intact Rock Core Specimens without Strain Measurement ASTM D 7012-14 Method C

Project Name	Monroe County Justice Center
Project No.	23-1415-11G
Client	Monroe County Commissioners
Boring No.	B-5
Sample No.	S-3
Sample Depth, (ft)	9.6-9.9
Lithologic Sample Description	Gray, slightly weathered, LIMESTONE
Load Direction (with respect to lithology)	Vertical
Moisture Condition at Time of Test	As-Received
Average Diameter (in)	1.847
Average Length (in)	3.906
Mass (g)	443.0
Conforms to ASTM D4543 Dimensional Requirements? If no, explain.	Specimen capped with Gypsum Capping Compound due to irregularities on the end surfaces
Temperature at Time of Test (℃)	20.2
Loading Rate (lb/sec)	100
Time to Failure (min)	8
Failure Load, (lb)	54,970
Uniaxial Compressive Strength, (psi)	20,530
Uniaxial Compressive Strength, (tsf)	1,478
Description of Specimen After Test	See Photograph Below
Tested by/ Date	V. Bump 10/17/2023
Reviewed by / Date	J. Rogers 10/24/2023

Remarks: Specimen was not prepared per ASTM D4543 Section 7.6. Results reported may differ from results obtained from a test specimen that meets the requirments of Practice D4543.

Equipment Used	ID No.	Calibration Date
Loading Device	CM-500P-D, 16103	6/19/23

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Compressive Strength of Intact Rock Core Specimens without Strain Measurement ASTM D 7012-14 Method C

Project Name	Monroe County Justice Center
Project No.	23-1415-11G
Client	Monroe County Commissioners
Boring No.	B-6
Sample No.	S-3
Sample Depth, (ft)	7.1-7.4
Lithologic Sample Description	Gray, slightly weathered, LIMESTONE
Load Direction (with respect to lithology)	Vertical
Moisture Condition at Time of Test	As-Received
Average Diameter (in)	1.842
Average Length (in)	4.000
Mass (g)	376.9
Conforms to ASTM D4543 Dimensional Requirements? If no, explain.	Specimen capped with Gypsum Capping Compound due to irregularities on the end surfaces
Temperature at Time of Test (℃)	20.2
Loading Rate (lb/sec)	100
Time to Failure (min)	3
Failure Load, (lb)	16,420
Uniaxial Compressive Strength, (psi)	6,170
Uniaxial Compressive Strength, (tsf)	444
Description of Specimen After Test	See Photograph Below
Tested by/ Date	V. Bump 10/17/2023
Reviewed by / Date	J. Rogers 10/24/2023

Remarks: Specimen was not prepared per ASTM D4543 Section 7.6. Results reported may differ from results obtained from a test specimen that meets the requirments of Practice D4543.

Equipment Used	ID No.	Calibration Date
Loading Device	CM-500P-D, 16103	6/19/23

AASHTO ACCREDITATION PROGRAM

Compressive Strength of Intact Rock Core Specimens without Strain Measurement ASTM D 7012-14 Method C

PATRIOT ENGINEERING and Environmental, Inc.
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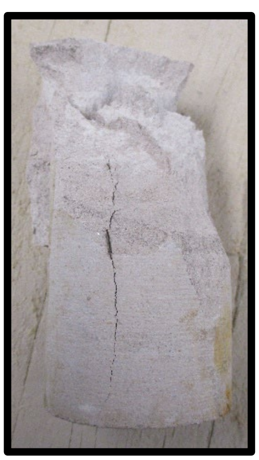
Consulting Environmental, Geotechnical and Materials Engineers

Project Name	Monroe County Justice Center
Project No.	23-1415-11G
Client	Monroe County Commissioners
Boring No.	B-6
Sample No.	S-4
Sample Depth, (ft)	13-13.3
Lithologic Sample Description	Gray, slightly to moderately weathered, LIMESTONE
Load Direction (with respect to lithology)	Vertical
Moisture Condition at Time of Test	As-Received
Average Diameter (in)	1.852
Average Length (in)	4.028
Mass (g)	378.0
Conforms to ASTM D4543 Dimensional Requirements? If no, explain.	Specimen capped with Gypsum Capping Compound due to irregularities on the end surfaces
Temperature at Time of Test (℃)	20.3
Loading Rate (lb/sec)	100
Time to Failure (min)	3
Failure Load, (lb)	15,000
Uniaxial Compressive Strength, (psi)	5,570
Uniaxial Compressive Strength, (tsf)	401
Description of Specimen After Test	See Photograph Below
Tested by/ Date	V. Bump 10/17/2023
Reviewed by / Date	J. Rogers 10/24/2023

Remarks: Specimen was not prepared per ASTM D4543 Section 7.6. Results reported may differ from results obtained from a test specimen that meets the requirments of Practice D4543.

Equipment Used	ID No.	Calibration Date
Loading Device	CM-500P-D, 16103	6/19/23



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Compressive Strength of Intact Rock Core Specimens without Strain Measurement
ASTM D 7012-14 Method C

Project Name	Monroe County Justice Center
Project No.	23-1415-11G
Client	Monroe County Commissioners
Boring No.	B-9
Sample No.	S-1
Sample Depth, (ft)	2-2.3
Lithologic Sample Description	Gray, moderately to slightly weathered, LIMESTONE
Load Direction (with respect to lithology)	Vertical
Moisture Condition at Time of Test	As-Received
Average Diameter (in)	1.847
Average Length (in)	3.840
Mass (g)	388.1
Conforms to ASTM D4543 Dimensional Requirements? If no, explain.	Specimen capped with Gypsum Capping Compound due to irregularities on the end surfaces
Temperature at Time of Test (℃)	20.3
Loading Rate (lb/sec)	100
Time to Failure (min)	4
Failure Load, (lb)	16,370
Uniaxial Compressive Strength, (psi)	6,110
Uniaxial Compressive Strength, (tsf)	440
Description of Specimen After Test	See Photograph Below
Tested by/ Date	V. Bump 10/17/2023
Reviewed by / Date	J. Rogers 10/24/2023

Remarks: Specimen was not prepared per ASTM D4543 Section 7.6. Results reported may differ from results obtained from a test specimen that meets the requirments of Practice D4543.

Equipment Used	ID No.	Calibration Date
Loading Device	CM-500P-D, 16103	6/19/23

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Compressive Strength of Intact Rock Core Specimens without Strain Measurement ASTM D 7012-14 Method C

Project Name	Monroe County Justice Center
Project No.	23-1415-11G
Client	Monroe County Commissioners
Boring No.	B-9
Sample No.	S-2
Sample Depth, (ft)	8-8.3
Lithologic Sample Description	Gray, moderately to slightly weathered, LIMESTONE
Load Direction (with respect to lithology)	Vertical
Moisture Condition at Time of Test	As-Received
Average Diameter (in)	1.850
Average Length (in)	3.965
Mass (g)	404.2
Conforms to ASTM D4543 Dimensional Requirements? If no, explain.	Specimen capped with Gypsum Capping Compound due to irregularities on the end surfaces
Temperature at Time of Test (℃)	20.3
Loading Rate (lb/sec)	100
Time to Failure (min)	4
Failure Load, (lb)	22,130
Uniaxial Compressive Strength, (psi)	8,230
Uniaxial Compressive Strength, (tsf)	593
Description of Specimen After Test	See Photograph Below
Tested by/ Date	V. Bump 10/17/2023
Reviewed by / Date	J. Rogers 10/24/2023

Remarks: Specimen was not prepared per ASTM D4543 Section 7.6. Results reported may differ from results obtained from a test specimen that meets the requirments of Practice D4543.

Equipment Used	ID No.	Calibration Date
Loading Device	CM-500P-D, 16103	6/19/23

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Compressive Strength of Intact Rock Core Specimens without Strain Measurement ASTM D 7012-14 Method C

Project Name	Monroe County Justice Center
Project No.	23-1415-11G
Client	Monroe County Commissioners
Boring No.	B-11
Sample No.	S-3
Sample Depth, (ft)	6-6.3
Lithologic Sample Description	Gray, slightly weathered, LIMESTONE
Load Direction (with respect to lithology)	Vertical
Moisture Condition at Time of Test	As-Received
Average Diameter (in)	1.847
Average Length (in)	3.944
Mass (g)	429.7
Conforms to ASTM D4543 Dimensional Requirements? If no, explain.	Specimen capped with Gypsum Capping Compound due to irregularities on the end surfaces
Temperature at Time of Test (℃)	20.4
Loading Rate (lb/sec)	100
Time to Failure (min)	5
Failure Load, (lb)	41,530
Uniaxial Compressive Strength, (psi)	15,510
Uniaxial Compressive Strength, (tsf)	1,117
Description of Specimen After Test	See Photograph Below
Tested by/ Date	V. Bump 10/17/2023
Reviewed by / Date	J. Rogers 10/24/2023

Remarks: Specimen was not prepared per ASTM D4543 Section 7.6. Results reported may differ from results obtained from a test specimen that meets the requirments of Practice D4543.

Equipment Used	ID No.	Calibration Date
Loading Device	CM-500P-D, 16103	6/19/23

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Compressive Strength of Intact Rock Core Specimens without Strain Measurement ASTM D 7012-14 Method C

Project Name	Monroe County Justice Center
Project No.	23-1415-11G
Client	Monroe County Commissioners
Boring No.	B-11
Sample No.	S-4
Sample Depth, (ft)	12.3-12.6
Lithologic Sample Description	Gray, slightly weathered, LIMESTONE
Load Direction (with respect to lithology)	Vertical
Moisture Condition at Time of Test	As-Received
Average Diameter (in)	1.846
Average Length (in)	3.953
Mass (g)	423.0
Conforms to ASTM D4543 Dimensional Requirements? If no, explain.	Specimen capped with Gypsum Capping Compound due to irregularities on the end surfaces
Temperature at Time of Test (℃)	20.5
Loading Rate (lb/sec)	100
Time to Failure (min)	7
Failure Load, (lb)	30,210
Uniaxial Compressive Strength, (psi)	11,290
Uniaxial Compressive Strength, (tsf)	813
Description of Specimen After Test	See Photograph Below
Tested by/ Date	V. Bump 10/17/2023
Reviewed by / Date	J. Rogers 10/24/2023

Remarks: Specimen was not prepared per ASTM D4543 Section 7.6. Results reported may differ from results obtained from a test specimen that meets the requirments of Practice D4543.

Equipment Used	ID No.	Calibration Date
Loading Device	CM-500P-D, 16103	6/19/23

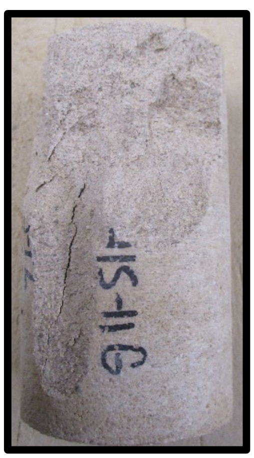
AASHTO ACCREDITATION PROGRAM

Compressive Strength of Intact Rock Core Specimens without Strain Measurement ASTM D 7012-14 Method C

Project Name	Monroe County Justice Center
Project No.	23-1415-11G
Client	Monroe County Commissioners
Boring No.	B-12
Sample No.	S-4
Sample Depth, (ft)	9.1-9.4
Lithologic Sample Description	Gray, moderately to slightly weathered, LIMESTONE
Load Direction (with respect to lithology)	Vertical
Moisture Condition at Time of Test	As-Received
Average Diameter (in)	1.861
Average Length (in)	3.999
Mass (g)	381.7
Conforms to ASTM D4543 Dimensional Requirements? If no, explain.	Specimen capped with Gypsum Capping Compound due to irregularities on the end surfaces
Temperature at Time of Test (℃)	20.5
Loading Rate (lb/sec)	100
Time to Failure (min)	3
Failure Load, (lb)	10,400
Uniaxial Compressive Strength, (psi)	3,820
Uniaxial Compressive Strength, (tsf)	275
Description of Specimen After Test	See Photograph Below
Tested by/ Date	V. Bump 10/17/2023
Reviewed by / Date	J. Rogers 10/24/2023

Remarks: Specimen was not prepared per ASTM D4543 Section 7.6. Results reported may differ from results obtained from a test specimen that meets the requirments of Practice D4543.

Equipment Used	ID No.	Calibration Date
Loading Device	CM-500P-D, 16103	6/19/23



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Compressive Strength of Intact Rock Core Specimens without Strain Measurement ASTM D 7012-14 Method C

Project Name	Monroe County Justice Center
Project No.	23-1415-11G
Client	Monroe County Commissioners
Boring No.	B-12
Sample No.	S-5
Sample Depth, (ft)	15.9-16.3
Lithologic Sample Description	Gray, moderately to slightly weathered, LIMESTONE
Load Direction (with respect to lithology)	Vertical
Moisture Condition at Time of Test	As-Received
Average Diameter (in)	1.857
Average Length (in)	3.946
Mass (g)	378.1
Conforms to ASTM D4543 Dimensional Requirements? If no, explain.	Specimen capped with Gypsum Capping Compound due to irregularities on the end surfaces
Temperature at Time of Test (℃)	20.4
Loading Rate (lb/sec)	100
Time to Failure (min)	3
Failure Load, (lb)	9,100
Uniaxial Compressive Strength, (psi)	3,360
Uniaxial Compressive Strength, (tsf)	242
Description of Specimen After Test	See Photograph Below
Tested by/ Date	V. Bump 10/17/2023
Reviewed by / Date	J. Rogers 10/24/2023

Remarks: Specimen was not prepared per ASTM D4543 Section 7.6. Results reported may differ from results obtained from a test specimen that meets the requirments of Practice D4543.

Equipment Used	ID No.	Calibration Date
Loading Device	CM-500P-D, 16103	6/19/23

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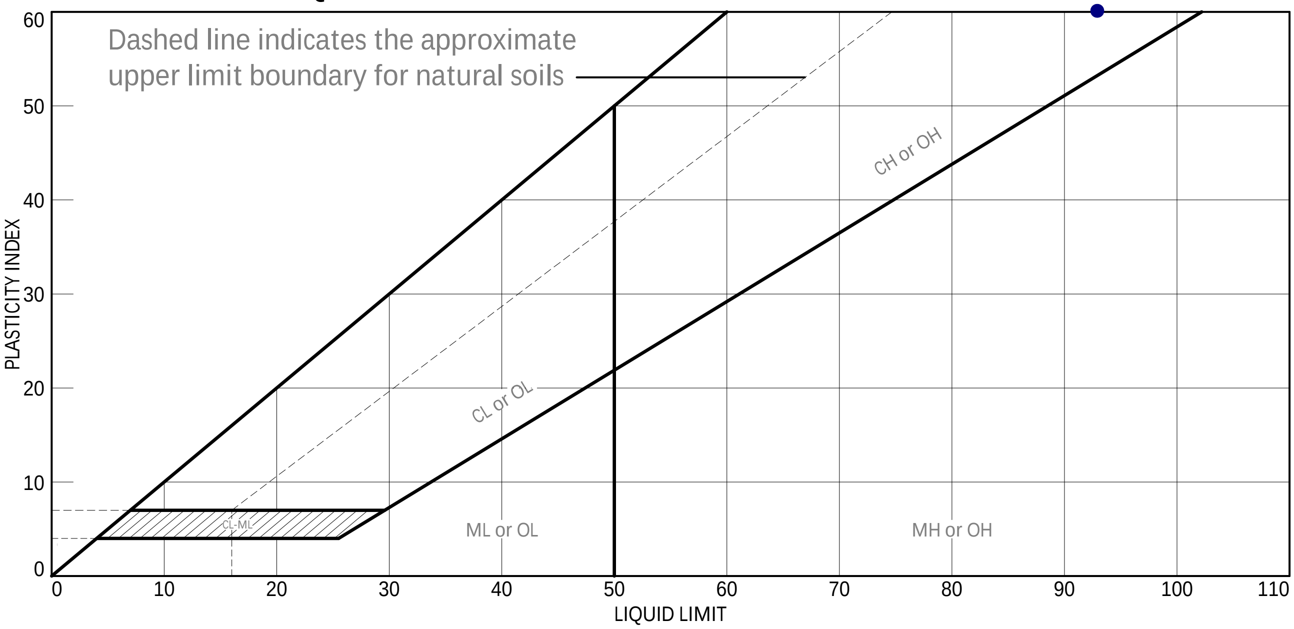
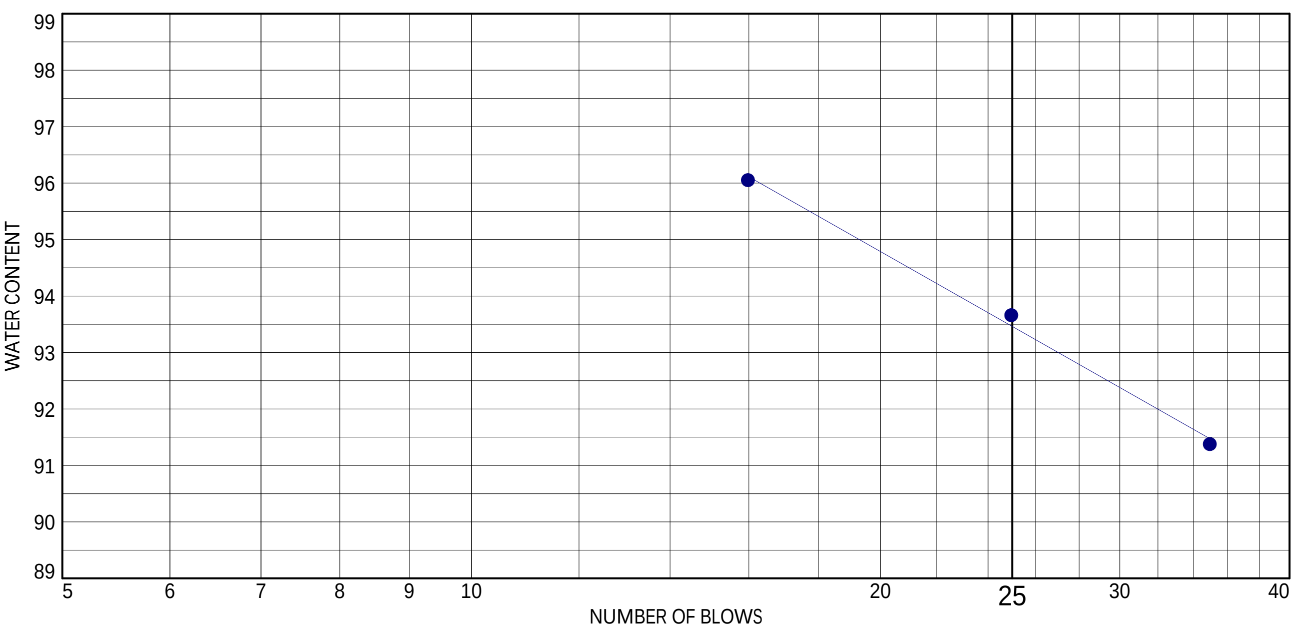
LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Brown CLAY with trace sand	93	33	60			CH

Project No. 23-1415-11G Client: Monroe County Redevelopment Commission

Project: Monroe County Justice Center

Source of Sample: B-1 Depth: 1.0-2.5 feet

Sample Number: S-1

PATRIOT ENGINEERING AND ENVIRONMENTAL, INC.

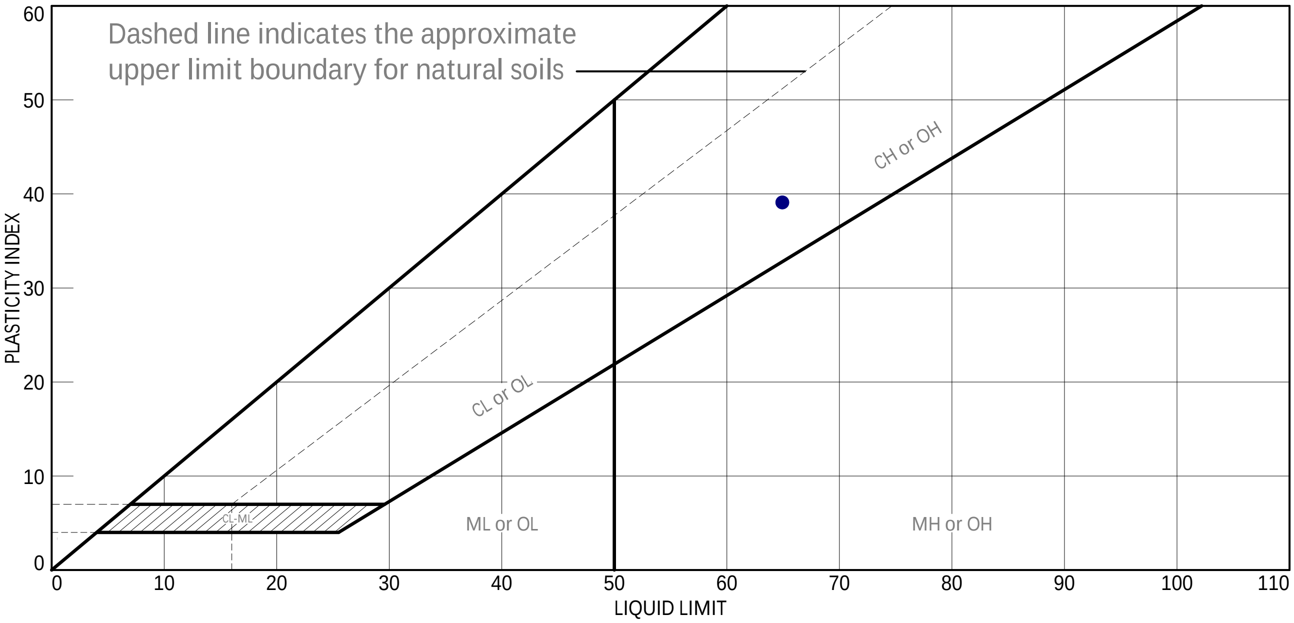
Indianapolis, Indiana

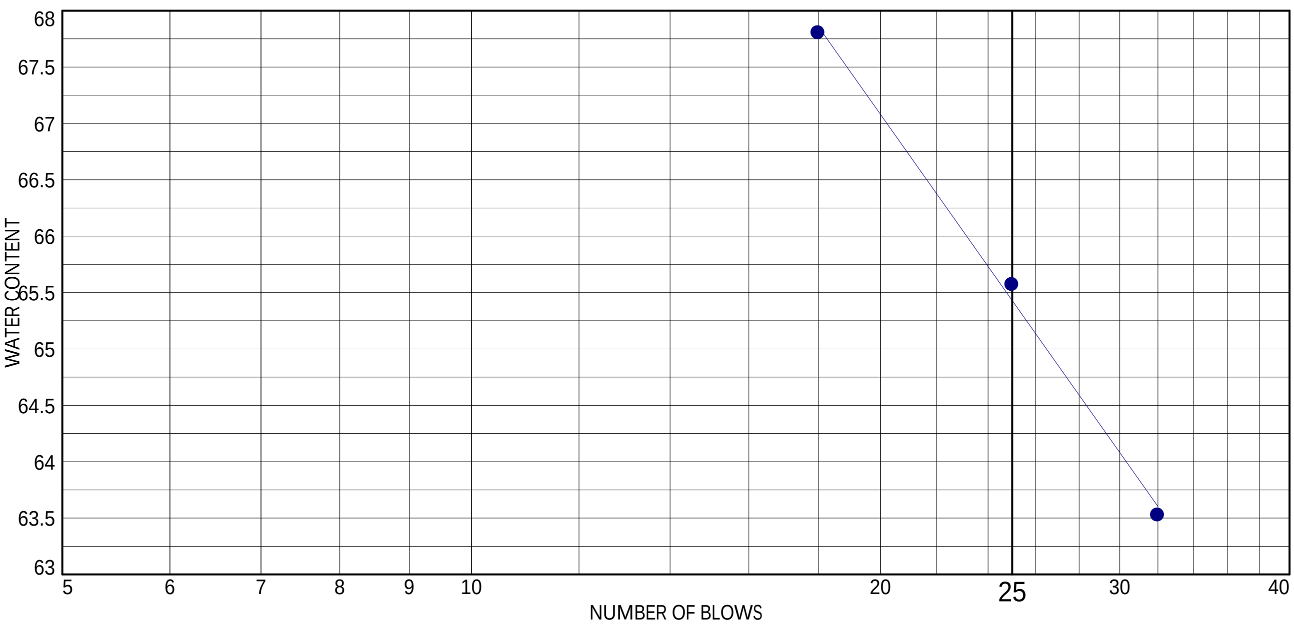
Remarks:

Figure

Tested By: E. Bergel Checked By: J. Rogers

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Brown and dark brown CLAY with trace sand	65	26	39			CH

Project No. 23-1415-11G Client: Monroe County Redevelopment Commission

Project: Monroe County Justice Center

Source of Sample: B-3 Depth: 1.0-2.5 feet
Sample Number: S-1

PATRIOT ENGINEERING AND ENVIRONMENTAL, INC.

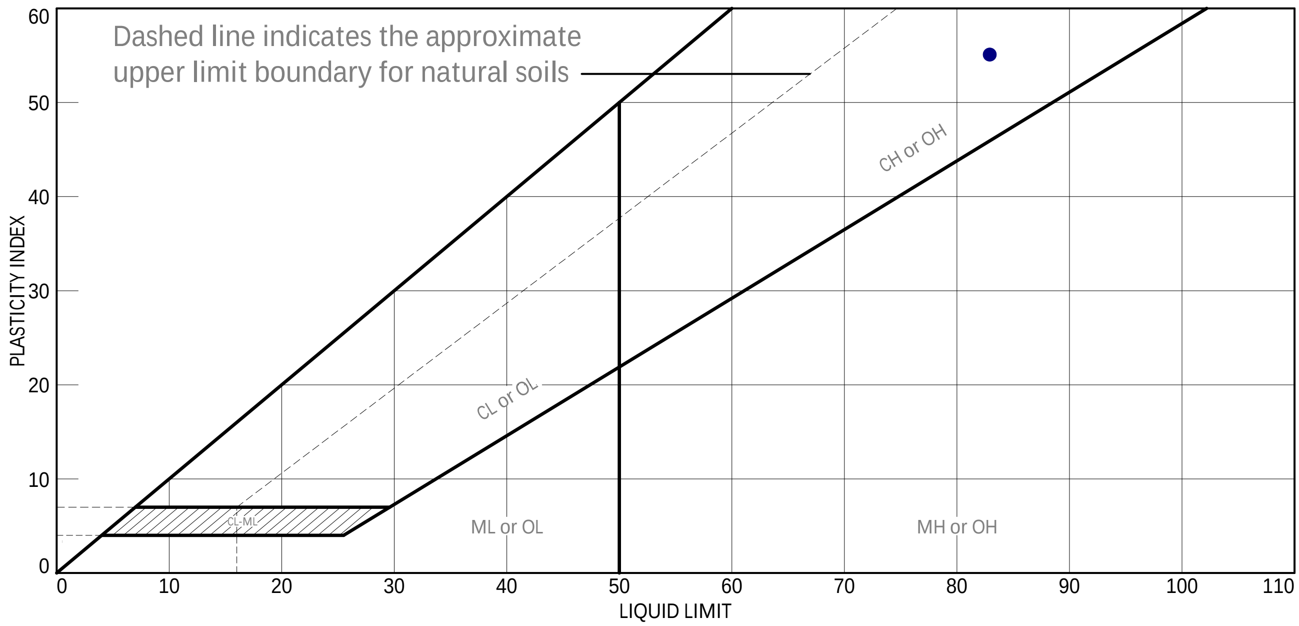
Indianapolis, Indiana

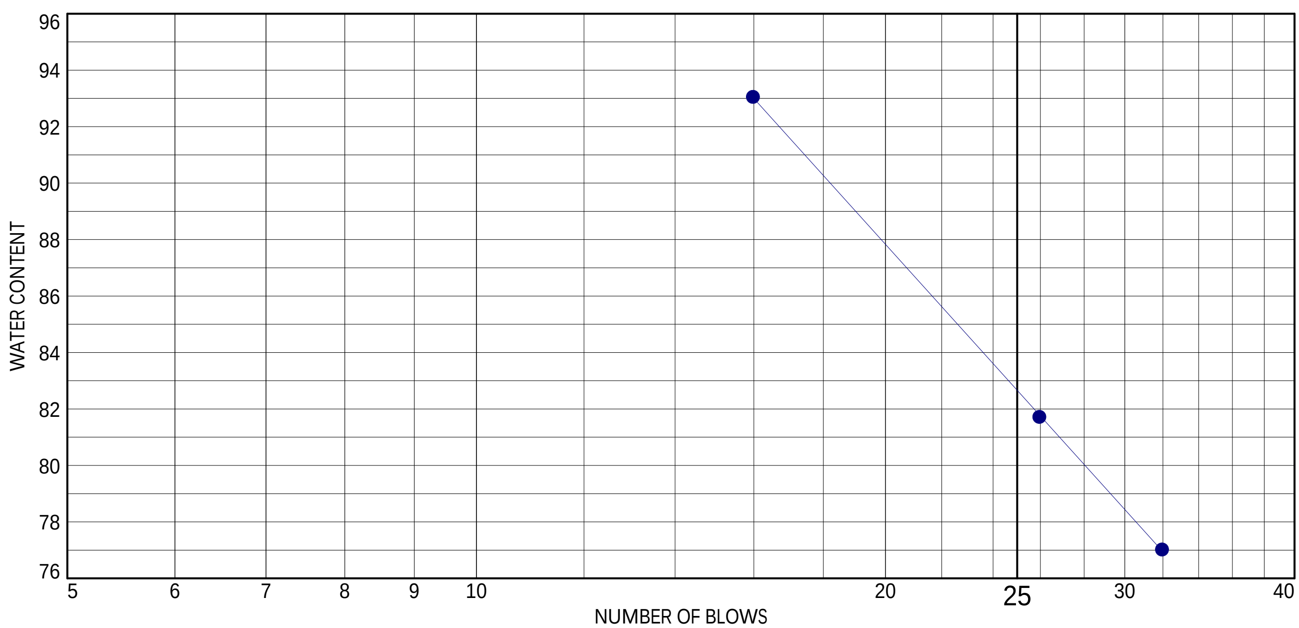
Remarks:

Figure

Tested By: E. Bergel Checked By: J. Rogers

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Brown CLAY with trace sand	83	28	55			CH

Project No. 23-1415-11G Client: Monroe County Redevelopment Commission

Project: Monroe County Justice Center

Source of Sample: B-3 Depth: 3.5-5.0 feet
Sample Number: S-2

PATRIOT ENGINEERING AND ENVIRONMENTAL, INC.

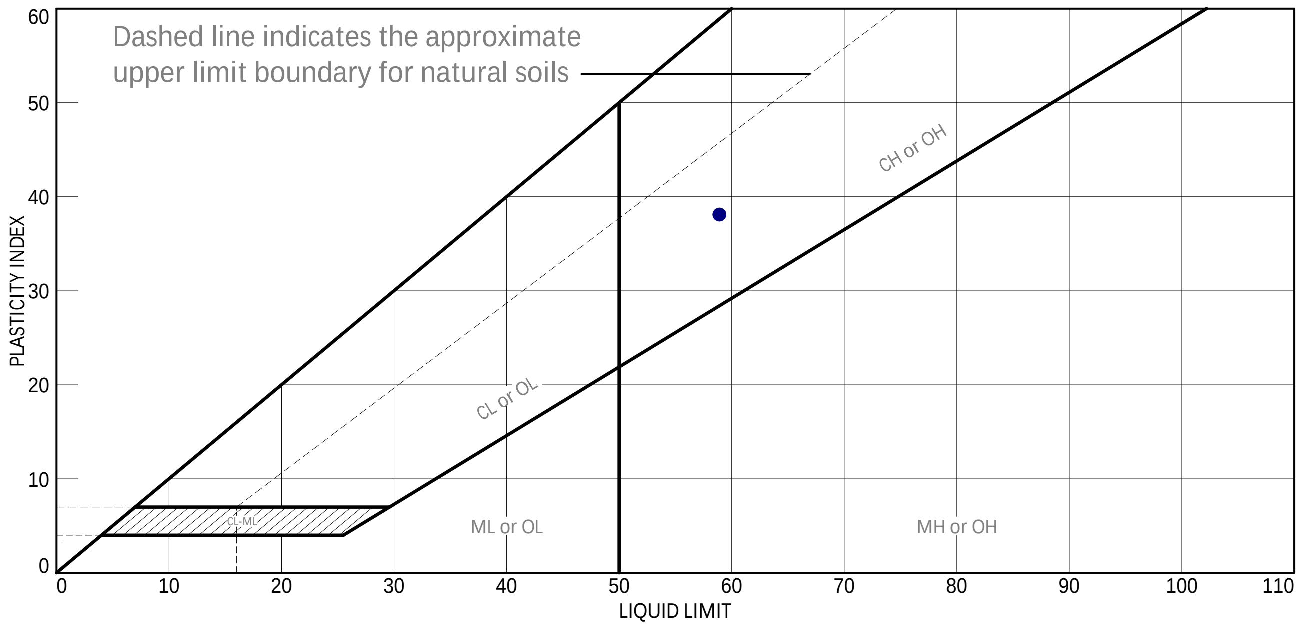
Indianapolis, Indiana

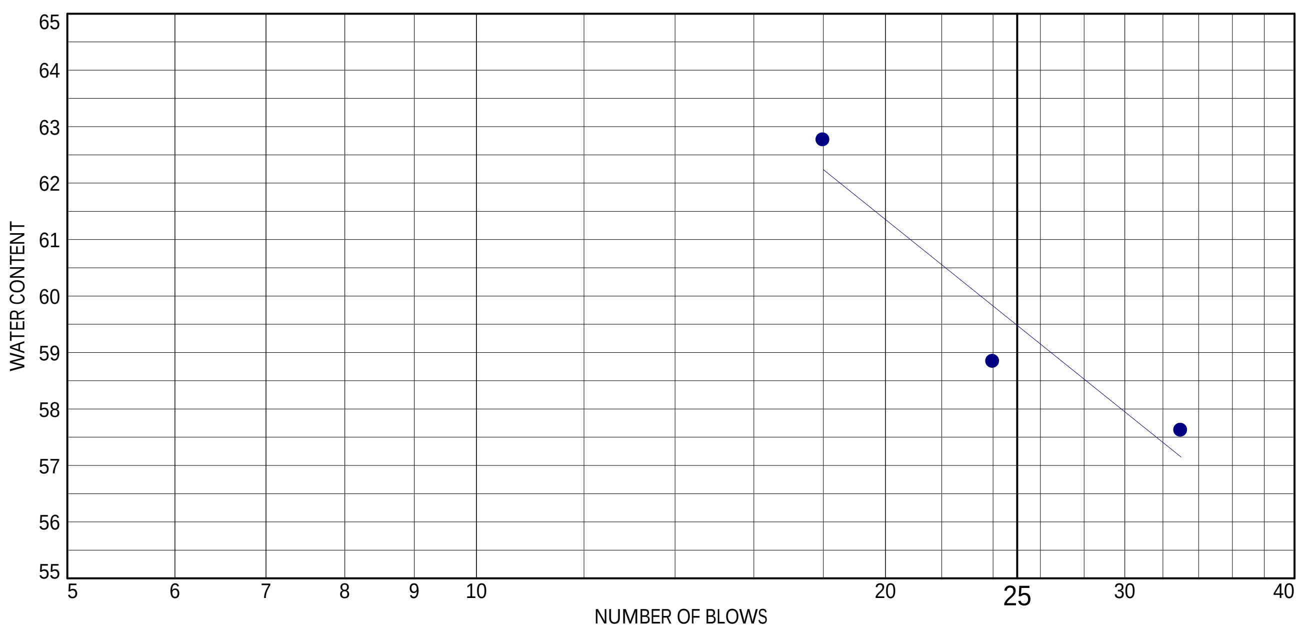
Remarks:

Figure

Tested By: E. Bergel Checked By: J. Rogers

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Brown CLAY with trace sand	59	21	38			CH

Project No. 23-1415-11G Client: Monroe County Redevelopment Commission

Project: Monroe County Justice Center

Source of Sample: B-4 Depth: 1.0-2.5 feet
Sample Number: S-1

PATRIOT ENGINEERING AND ENVIRONMENTAL, INC.

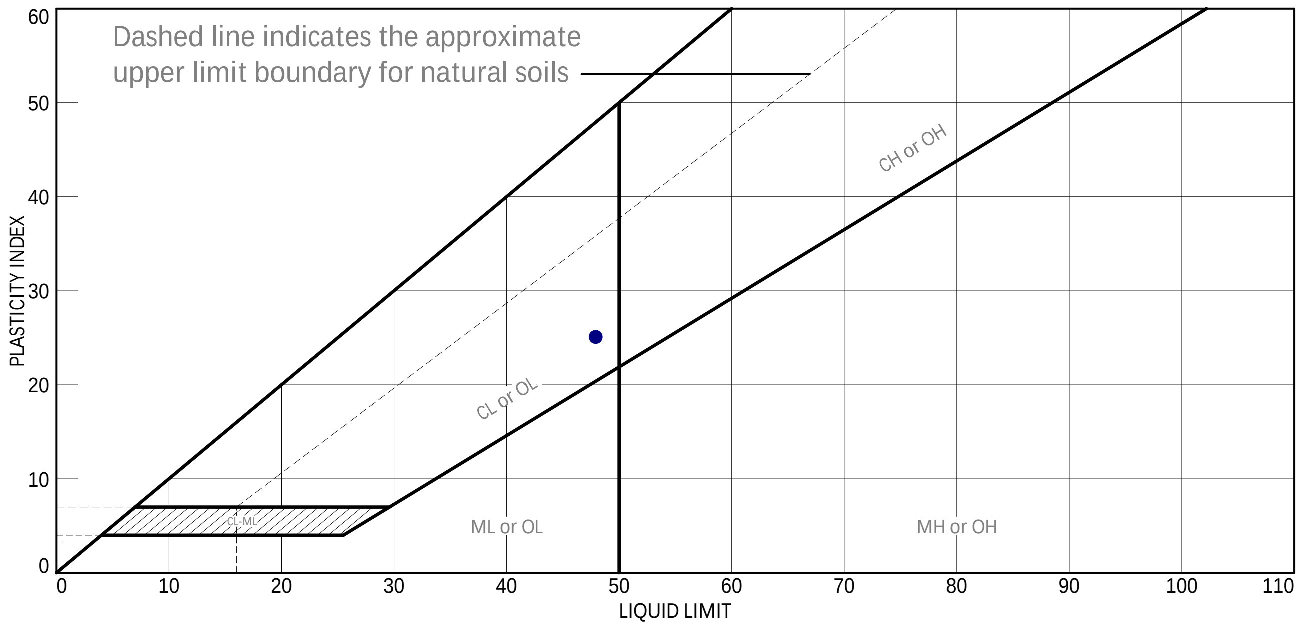
Indianapolis, Indiana

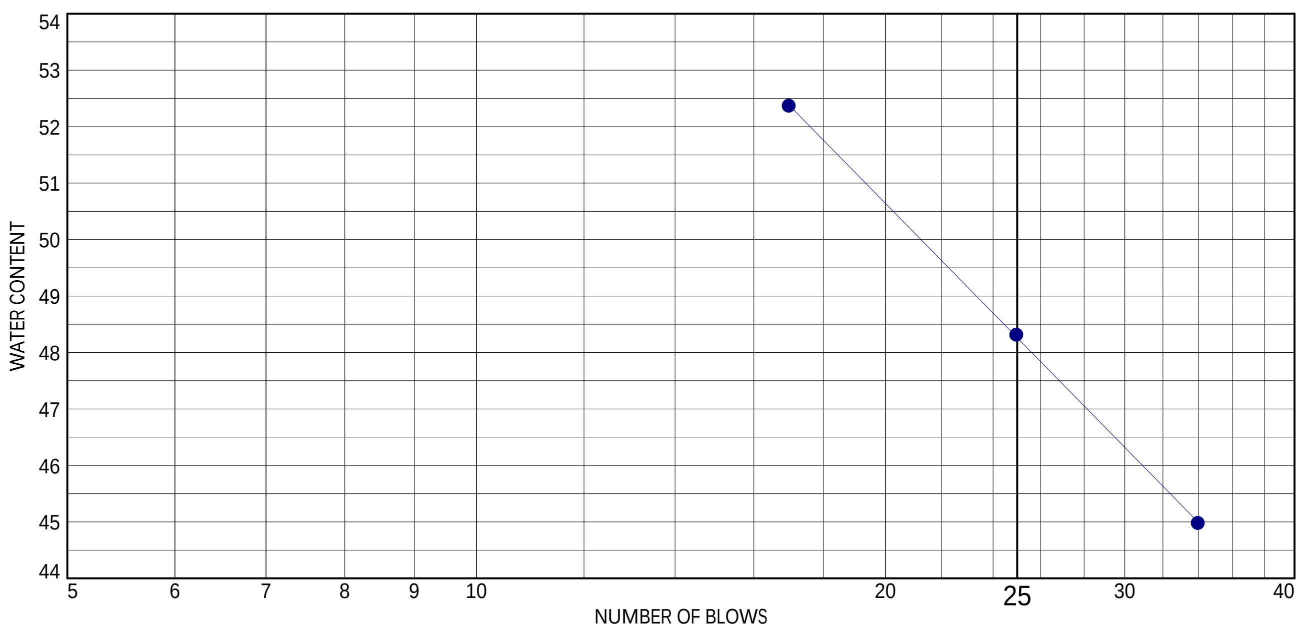
Remarks:

Figure

Tested By: E. Bergel Checked By: J. Rogers

LIQUID AND PLASTIC LIMITS TEST REPORT





MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
● Brown SILTY CLAY with trace sand	48	23	25			CL

Project No. 23-1415-11G Client: Monroe County Redevelopment Commission

Project: Monroe County Justice Center

Source of Sample: B-6 Depth: 1.0-2.5 feet

Sample Number: S-1

PATRIOT ENGINEERING AND ENVIRONMENTAL, INC.

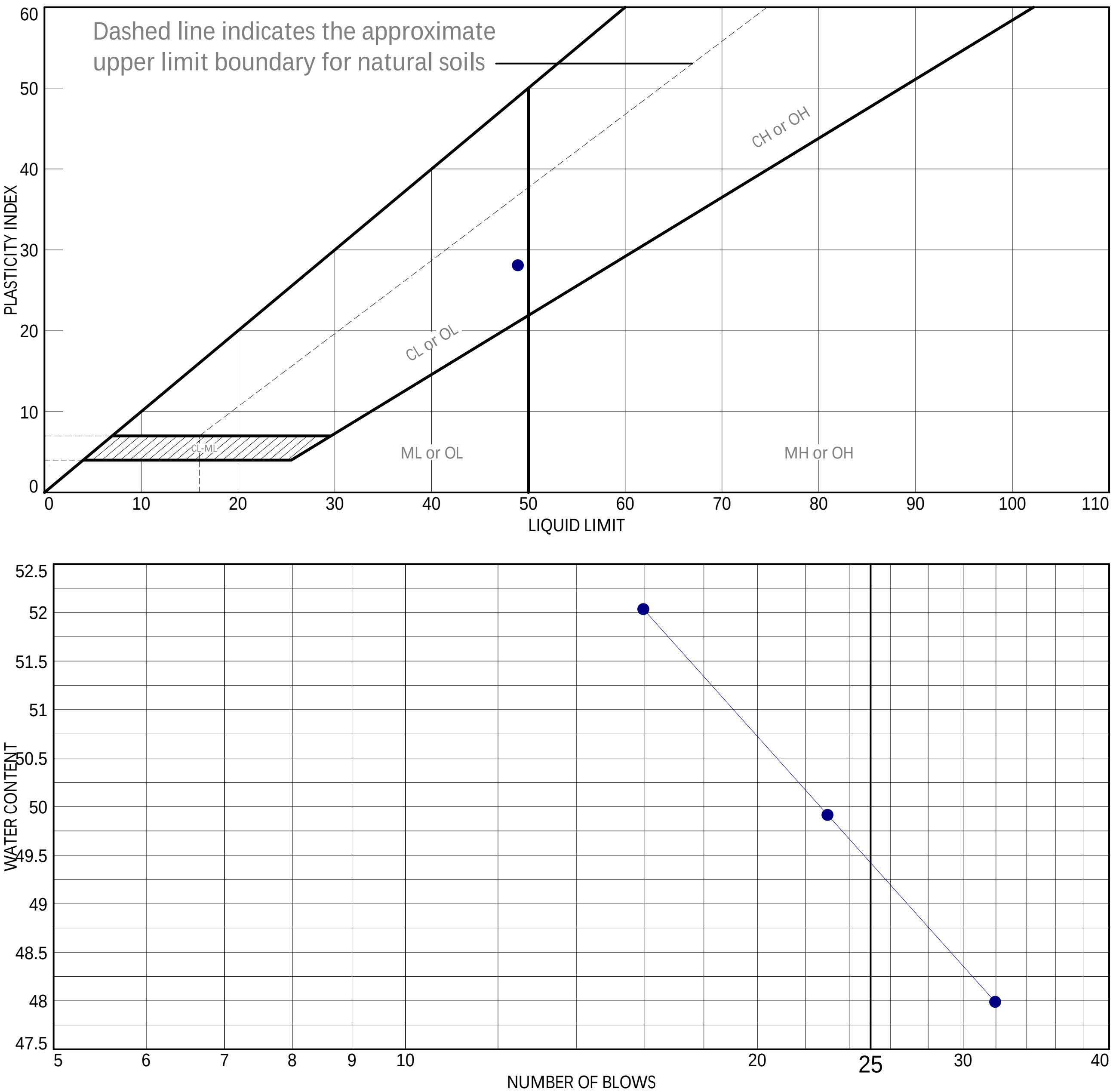
Indianapolis, Indiana

Remarks:

Figure

Tested By: E. Bergel Checked By: J. Rogers

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Brown SILTY CLAY with trace sand	49	21	28			CL

Project No. 23-1415-11G Client: Monroe County Redevelopment Commission

Project: Monroe County Justice Center

Source of Sample: B-7 Depth: 3.5-5.0 feet
Sample Number: S-2

PATRIOT ENGINEERING AND ENVIRONMENTAL, INC.

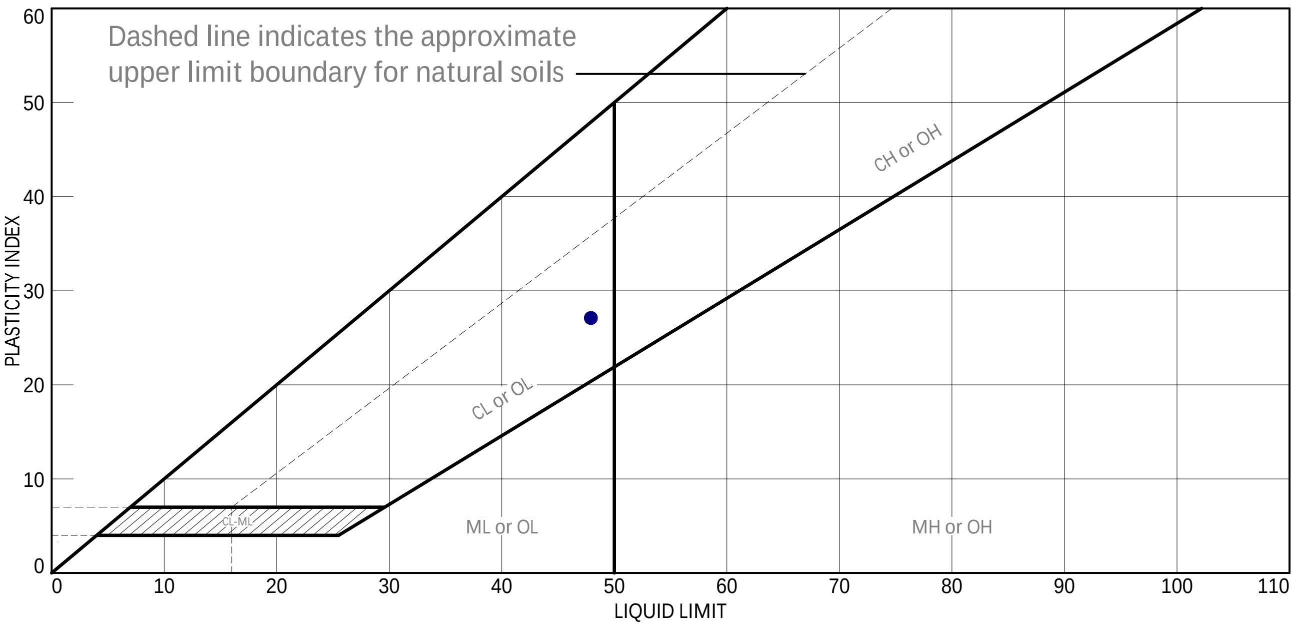
Indianapolis, Indiana

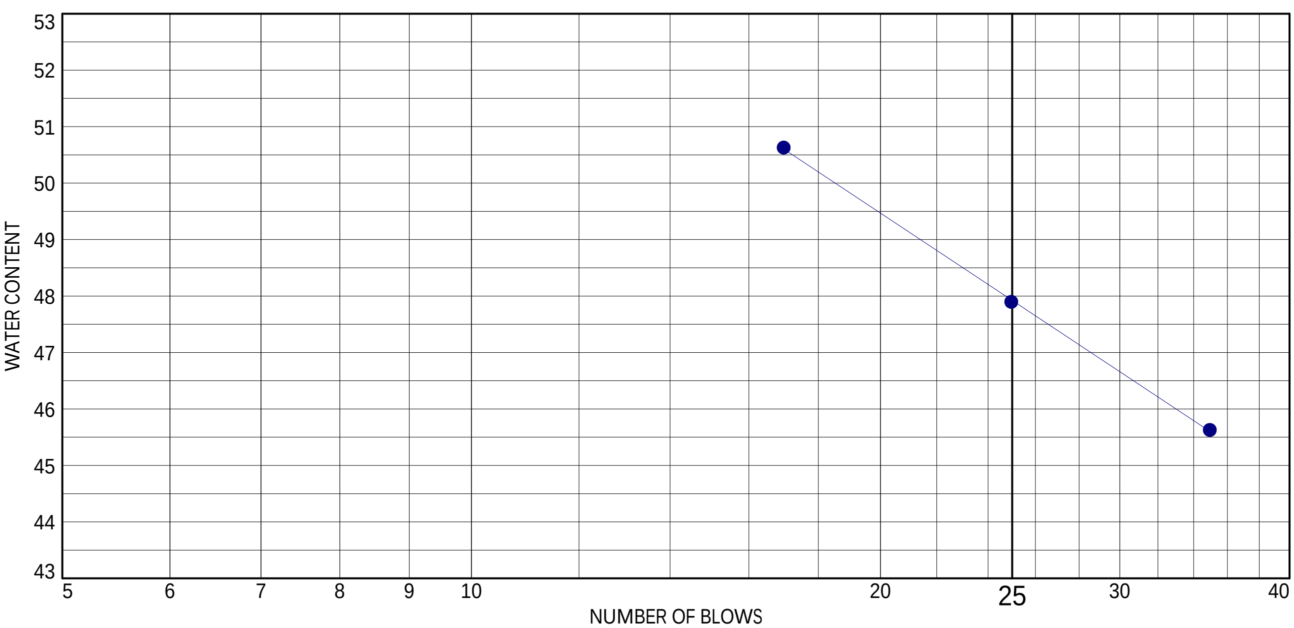
Remarks:

Figure

Tested By: E. Bergel Checked By: J. Rogers

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Brown SILTY CLAY with trace sand	48	21	27			CL

Project No. 23-1415-11G Client: Monroe County Redevelopment Commission

Project: Monroe County Justice Center

Source of Sample: B-8 Depth: 1.0-2.5 feet
Sample Number: S-1

PATRIOT ENGINEERING AND ENVIRONMENTAL, INC.

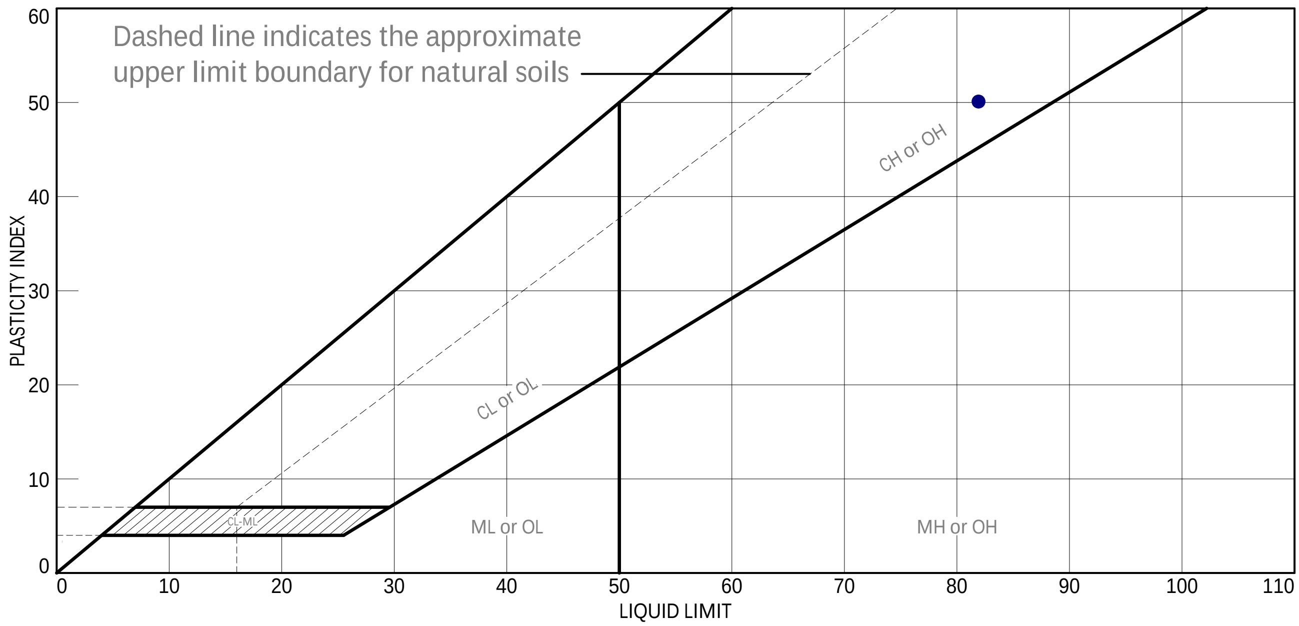
Indianapolis, Indiana

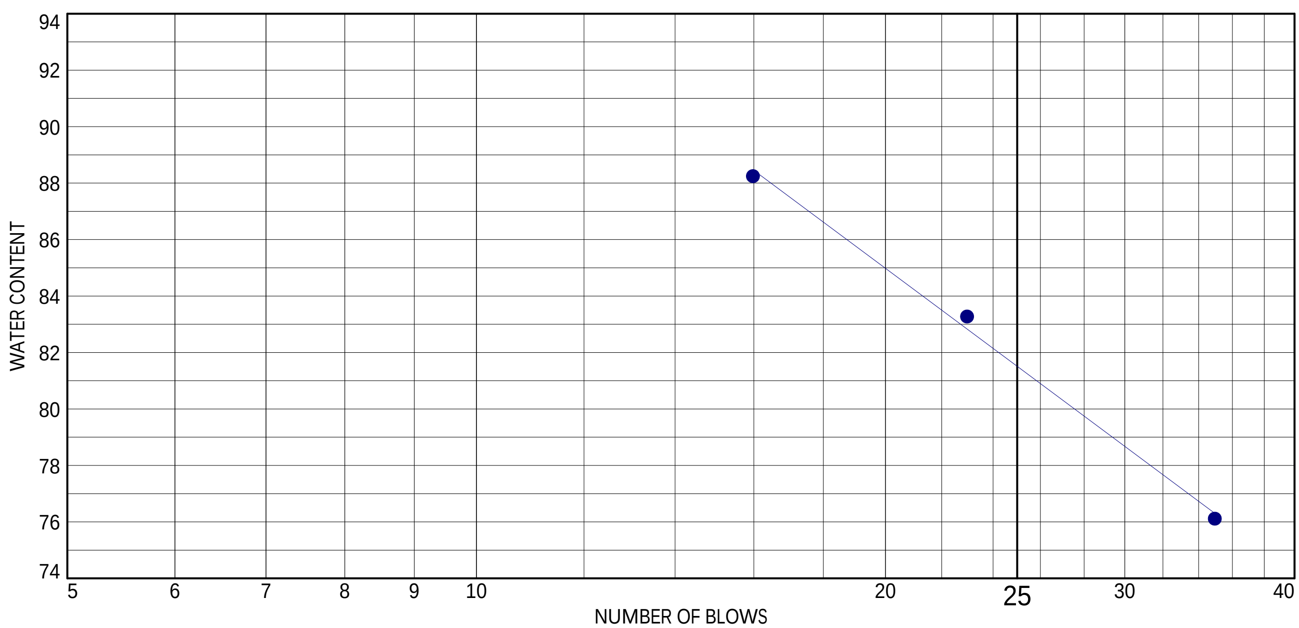
Remarks:

Figure

Tested By: E. Bergel Checked By: J. Rogers

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Brown and reddish brown CLAY with trace sand	82	32	50			CH

Project No. 23-1415-11G Client: Monroe County Redevelopment Commission

Project: Monroe County Justice Center

Source of Sample: B-8 Depth: 6.0-7.5 feet
Sample Number: S-3

PATRIOT ENGINEERING AND ENVIRONMENTAL, INC.

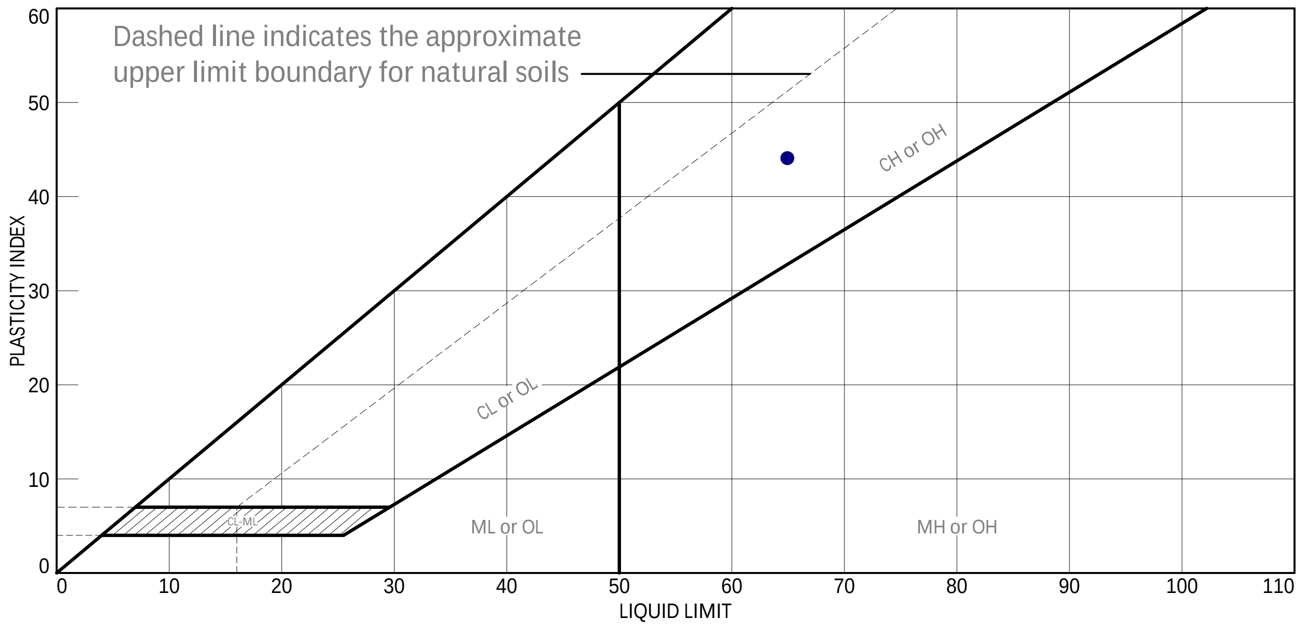
Indianapolis, Indiana

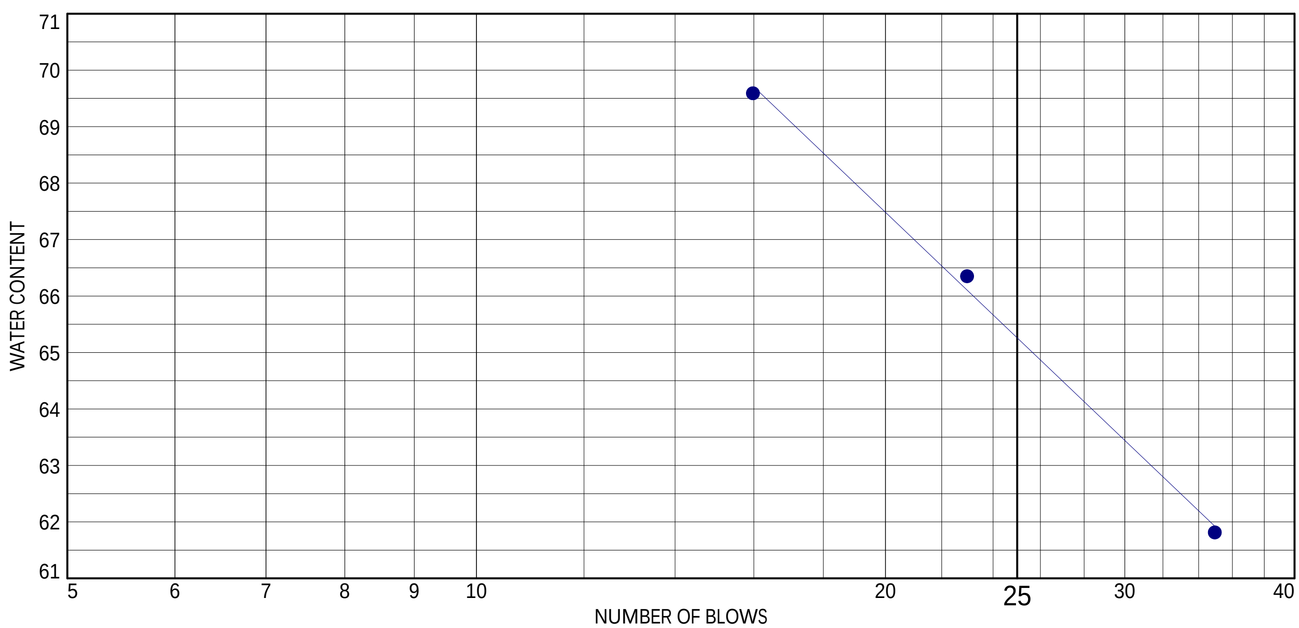
Remarks:

Figure

Tested By: E. Bergel Checked By: J. Rogers

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Brown and dark brown CLAY with trace sand	65	21	44			CH

Project No. 23-1415-11G Client: Monroe County Redevelopment Commission

Project: Monroe County Justice Center

Source of Sample: B-10 Depth: 3.5-5.0 feet

Sample Number: S-2

PATRIOT ENGINEERING AND ENVIRONMENTAL, INC.

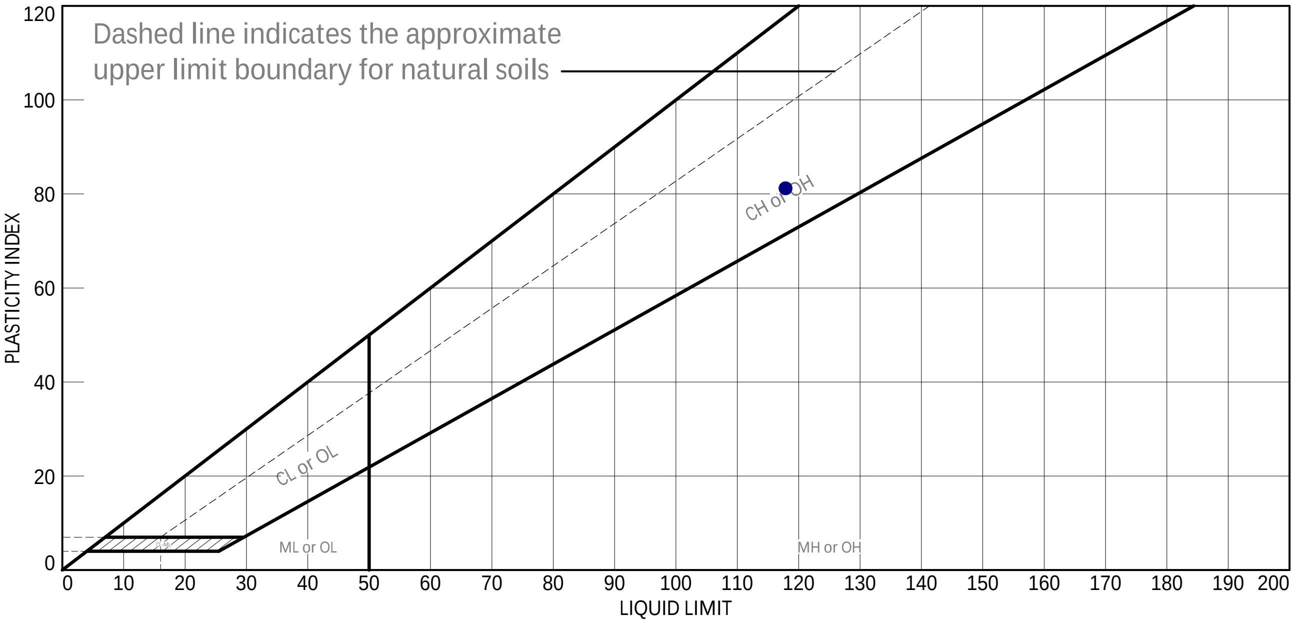
Indianapolis, Indiana

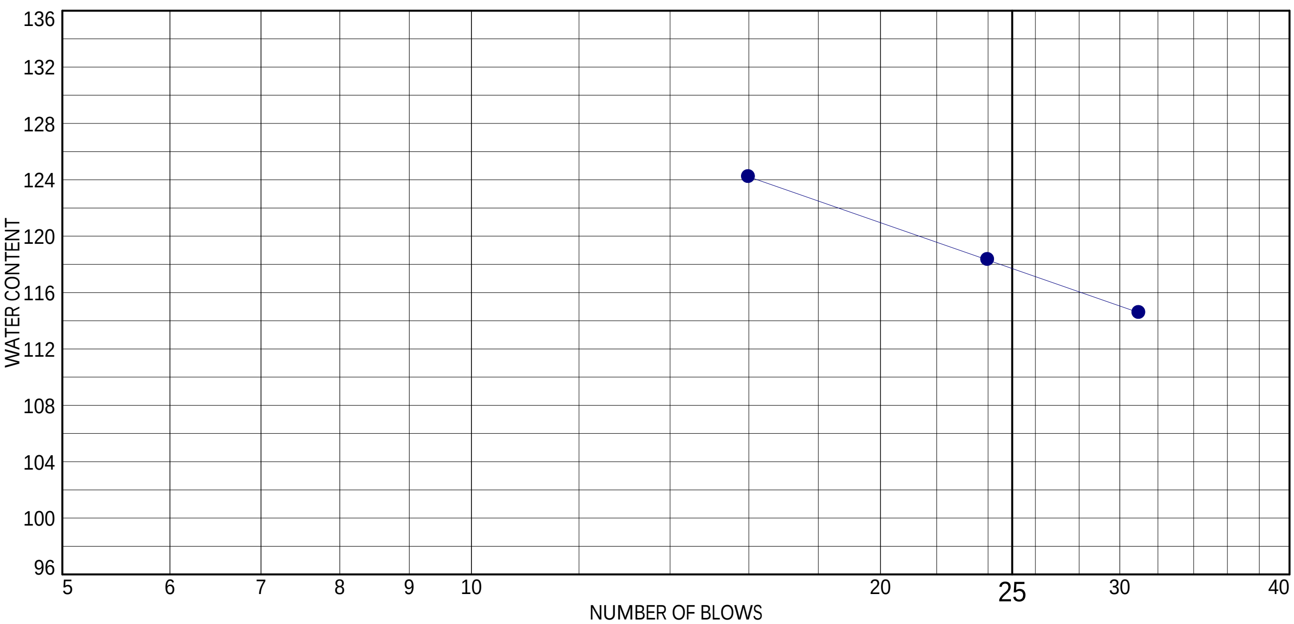
Remarks:

Figure

Tested By: E. Bergel Checked By: J. Rogers

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Brown CLAY with trace sand	118	37	81			CH

Project No. 23-1415-11G Client: Monroe County Redevelopment Commission

Project: Monroe County Justice Center

Source of Sample: B-10 Depth: 8.5-10.0 feet
Sample Number: S-4

PATRIOT ENGINEERING AND ENVIRONMENTAL, INC.

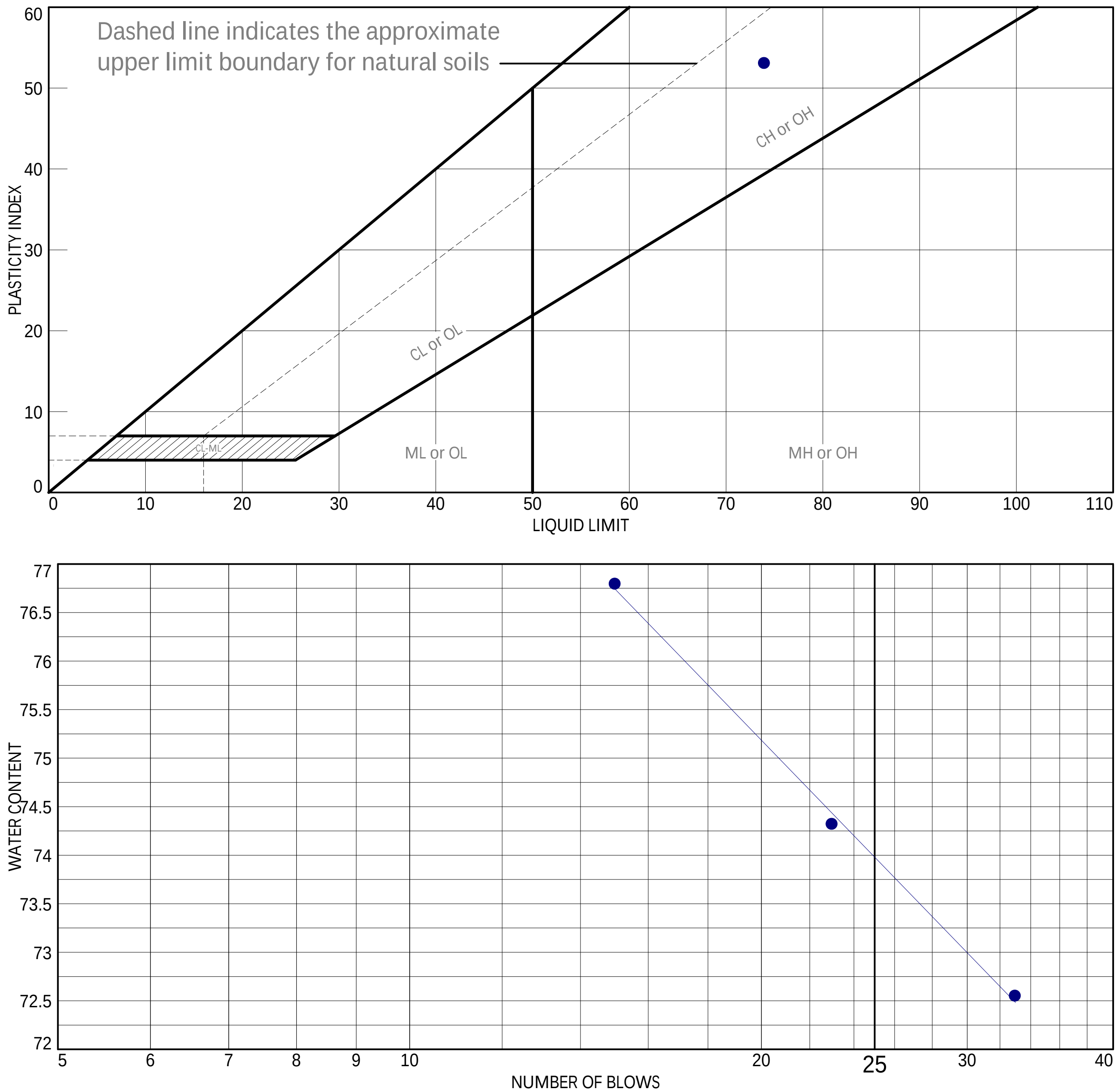
Indianapolis, Indiana

Remarks:

Figure

Tested By: E. Bergel Checked By: J. Rogers

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Brown CLAY with trace sand	74	21	53			CH

Project No. 23-1415-11G Client: Monroe County Redevelopment Commission

Project: Monroe County Justice Center

Source of Sample: B-11 Depth: 1.0-2.5 feet
Sample Number: S-1

PATRIOT ENGINEERING AND ENVIRONMENTAL, INC.

Indianapolis, Indiana

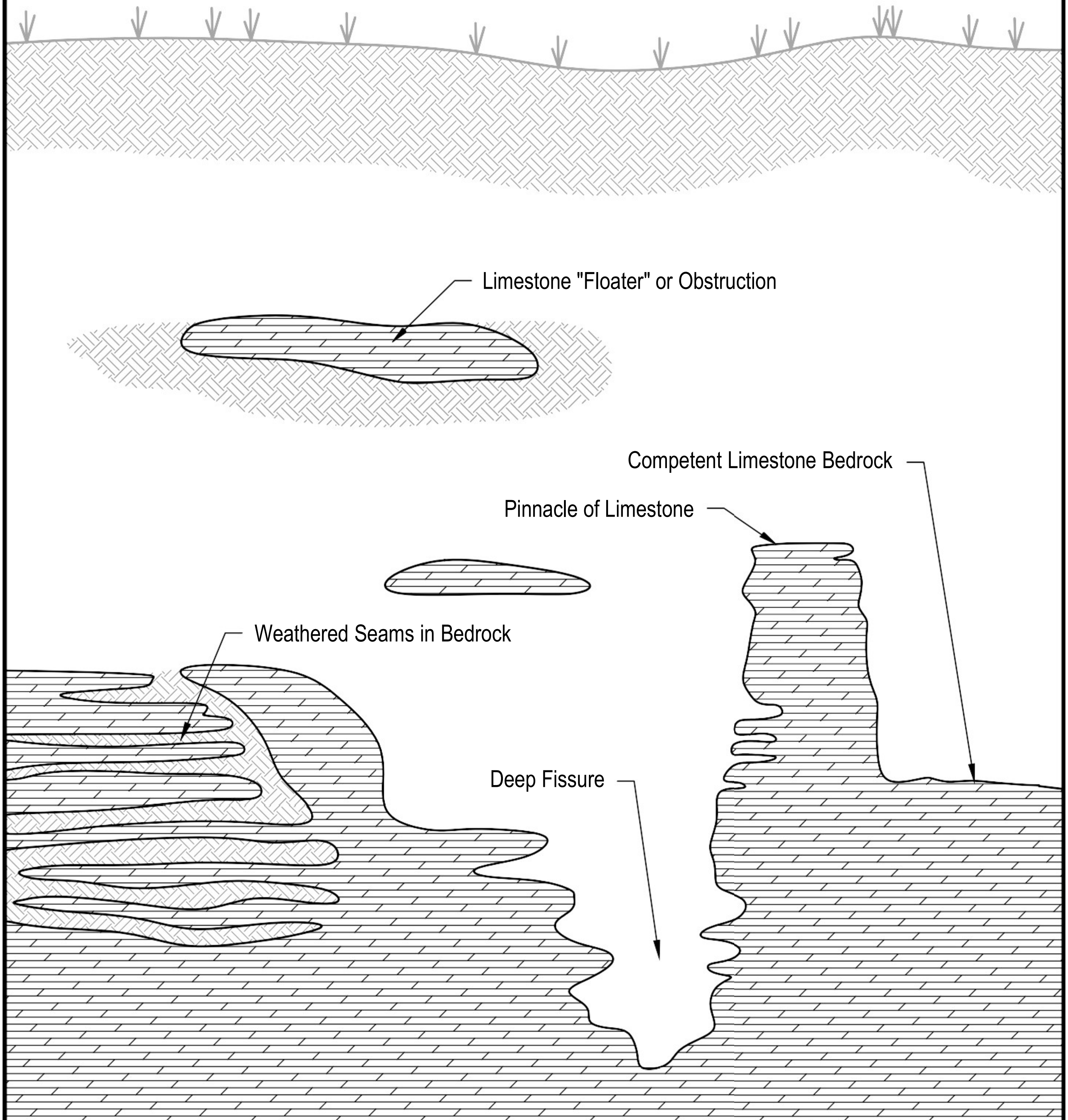
Remarks:

Figure

Tested By: E. Bergel Checked By: J. Rogers

APPENDIX D

VARIANCES IN BLOOMINGTON BEDROCK GEOLOGY
(FIGURE NO. 3)



Patriot Engineering & Environmental, Inc.

Figure No. 4

Variances in Bloomington Bedrock Geology

APPENDIX E

GENERAL QUALIFICATIONS

STANDARD CLAUSE FOR UNANTICIPATED SUBSURFACE CONDITIONS

GENERAL QUALIFICATIONS

of Patriot Engineering's Geotechnical Engineering Investigation

This report has been prepared at the request of our client for his use on this project. Our professional services have been performed, findings obtained, and recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices. This warranty is in lieu of all other warranties either expressed or implied.

The scope of our services did not include any environmental assessment or investigation for the presence or absence of wetlands, hazardous or toxic materials in the soil, groundwater, or surface water within or beyond the site studied. Any statements in this report or on the test borings logs regarding vegetation types, odors or staining of soils, or other unusual conditions observed are strictly for the information of our client and the owner.

This report may not contain sufficient information for purposes of other parties or other uses. This company is not responsible for the independent conclusions, opinions or recommendations made by others based on the field and laboratory data presented in this report. Should there be any significant differences in structural arrangement, loading or location of the structure, our analysis should be reviewed.

The recommendations provided herein were developed from the information obtained in the test borings, which depict subsurface conditions only at specific locations. The analysis, conclusions, and recommendations contained in our report are based on site conditions as they existed at the time of our exploration. Subsurface conditions at other locations may differ from those occurring at the specific drill sites. The nature and extent of variations between borings may not become evident until the time of construction. If, after performing on-site observations during construction and noting the characteristics of any variation, substantially different subsurface conditions from those encountered during our explorations are observed or appear to be present beneath excavations, we must be advised promptly so that we can review these conditions and reconsider our recommendations where necessary.

If there is a substantial lapse of time between the submission of our report and the start of work at the site, or if conditions have changed due to natural causes or construction operations at or adjacent to the site, we urge that our report be reviewed to determine the applicability of the conclusions and recommendations considering the changed conditions and time lapse.

We urge that Patriot be retained to review those portions of the plans and specifications that pertain to earthwork and foundations to determine whether they are consistent with our recommendations. In addition, we are available to observe construction, particularly the compaction of structural backfill and preparation of the foundations, and such other field observations as may be necessary.

In order to fairly consider changed or unexpected conditions that might arise during construction, we recommend the following verbiage (Standard Clause for Unanticipated Subsurface Conditions) be included in the project contract.

STANDARD CLAUSE FOR UNANTICIPATED SUBSURFACE CONDITIONS

"The owner has had a subsurface exploration performed by a soils consultant, the results of which are contained in the consultant's report. The consultant's report presents his conclusions on the subsurface conditions based on his interpretation of the data obtained in the exploration. The contractor acknowledges that he has reviewed the consultant's report and any addenda thereto, and that his bid for earthwork operations is based on the subsurface conditions as described in that report. It is recognized that a subsurface exploration may not disclose all conditions as they actually exist and further, conditions may change, particularly groundwater conditions, between the time of a subsurface exploration and the time of earthwork operations. In recognition of these facts, this clause is entered in the contract to provide a means of equitable additional compensation for the contractor if adverse unanticipated conditions are encountered and to provide a means of rebate to the owner if the conditions are more favorable than anticipated.

At any time during construction operations that the contractor encounters conditions that are different than those anticipated by the soils consultant's report, he shall immediately (within 24 hours) bring this fact to the owner's attention. If the owner's representative on the construction site observes subsurface conditions which are different than those anticipated by the consultant's report, he shall immediately (within 24 hours) bring this fact to the contractor's attention. Once a fact of unanticipated conditions has been brought to the attention of either the owner or the contractor, and the consultant has concurred, immediate negotiations will be undertaken between the owner and the contractor to arrive at a change in contract price for additional work or reduction in work because of the unanticipated conditions. The contract agrees that the following unit prices would apply for additional or reduced work under the contract. For changed conditions for which unit prices are not provided, the additional work shall be paid for on a time and materials basis."

Another example of a changed conditions clause can be found in paper No. 4035 by Robert F. Borg, published in ASCE Construction Division Journal, No. CO2, September 1964, page 37.