GEOTECHNICAL DATA REPORT
RZESZUTKO AND DACOSSE PROPERTY
1335 VERSAILLES ROAD
FRANKFORT, KENTUCKY

Prepared for:

ANCHOR PROPERTIES, INC.
COVINGTON, KENTUCKY

Prepared by:

GEOTECHNOLOGY, INC.
ERLANGER, KENTUCKY

Date:

JULY 18, 2017

Geotechnology Project No.:

J029879.01

SAFETY
QUALITY
INTEGRITY
PARTNERSHIP
OPPORTUNITY
RESPONSIVENESS

GEOTECHNOLOGY INC
FROM THE GROUND UP

July 18, 2017

Mr. Nate Stark
Anchor Properties, Inc.
128 East Second Street
Covington, Kentucky 41011

Re: Geotechnical Data Report
Rzeszutko and DaCosse Property
1335 Versailles Road
Frankfort, Kentucky
Geotechnology Project No. J029879.01

Dear Mr. Stark:

Presented in this report are the results of our geotechnical data report completed for the Rzeszutko and DaCosse Property project in Frankfort, Kentucky. Our services were performed in general accordance with our Proposal P029879.01, which was dated May 5, 2017, and signed for authorization on May 12, 2017.

We appreciate the opportunity to provide geotechnical services for this project. If you have any questions regarding this report, or if we may be of any additional service to you, please do not hesitate to contact us.

Respectfully submitted,
GEOTECHNOLOGY, INC.

Mark A. Hushebeck, PG
Principal Geologist

Andrew C. Casto, PE
Senior Project Manager

MAH/ACC:tmk

Copies submitted: Anchor Properties (email / 2 mail)

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GEOTECHNICAL DATA REPORT
RZESZUTKO AND DACOSSE PROPERTY
1335 VERSAILLES ROAD
FRANKFORT, KENTUCKY

July 18, 2017 | Geotechnology Project No. J029879.01

1.0 INTRODUCTION

Geotechnology, Inc. (Geotechnology) prepared this geotechnical data report for Anchor Properties, Inc. (Anchor) for the Rzeszutko and DaCosse Property project that will be located at 1335 Versailles Road in Frankfort, Kentucky. Our services documented in this report were provided in general accordance with the terms and scope of services described in our Proposal P029879.01, which was dated May 5, 2017.

The purposes of this geotechnical data report (GDR) was to explore the subsurface conditions at the site. Our scope of services included a site reconnaissance, geotechnical borings, laboratory testing, and preparation of this data report as defined in our proposal.

2.0 PROJECT INFORMATION

The following project information was derived from:

- The Site Plan, titled "Site Concept Plan", which was prepared by CMW Architecture (CMW), dated May 2017.
- Correspondence with Mr. Nate Stark of Anchor Properties, Inc.

The project will involve a 5.1-acre site that is located at 1335 Versailles Road in Frankfort, Kentucky and will include the construction of four (4) commercial building lots with subgrades ranging from El. 824 to El 821. The type of construction on each building lot was not known at the time of this GDR.

Site grading will involve cuts and fills to approximately 4 feet and 5 feet, respectively.

3.0 SITE CONDITIONS

The site location and topography of the area are shown on the Boring Plan included in Appendix B.

The site terrain is generally flat lying with some minor relief on the south side of site. Approximately 14 feet of relief currently exists across the site with the ground surface varying from El. 829 to El. 815. The site currently drains to southeast.

4.0 PROJECT RESEARCH

4.1 Historic Information

The following list of readily available historic information was reviewed for this project:

- USGS Geologic Map of the Frankfort East Quadrangle, Franklin and Woodford Counties, Kentucky, (Pomeroy, J.A., 1968);
- Kentucky Geologic Survey, Karst Risk Potential Map, undated.

The Karst Risk Potential Map shows that the bedrock units mapped on the site have a high potential for karst. Karst is the solutioning of the bedrock that can form into sinkholes and caves. Several mapped sinkholes are shown just southwest of the site on the Karst Risk Potential Map.

5.0 SUBSURFACE EXPLORATION

The subsurface exploration consisted of four test borings (numbered B-1 through B-4); eight rockline soundings (numbered S-1 through S-8) and four pavement cores (numbered C-1 through C-4). The boring, pavement core, and sounding locations were selected by us and were staked in the field by the Project Surveyor. The location of rockline sounding S-3 was moved 20 feet east of the staked location due to a request from the neighboring property owner not to encroach onto their crop plantings. The locations of the borings, pavement cores, and soundings are shown on the Boring Plan, which is included in Appendix B.

The borings were drilled on June 18, 2017 with a track-mounted drill rig advancing hollow-stem augers, as indicated on the boring logs presented in Appendix C. Tabulations of the rockline soundings and pavement cores are also presented in Appendix C. Sampling of the overburden soils and bedrock was accomplished ahead of the augers at the depths indicated on the boring logs, with 2-inch-outside-diameter (O.D.) split-spoons in general accordance with the procedures outlined by ASTM D1586. Standard Penetration Tests (SPTs) were performed on the split-spoon samples to obtain the N-values[1] of the sampled material. All of the borings and soundings were extended into the bedrock.

Observations for groundwater were made in the borings during drilling, at the completion of drilling, and before backfilling the boring holes.

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1 The Standard Penetration Resistance, or N-value, is defined as the number of blows required to drive the split-spoon sampler 12 inches with a 140-pound hammer falling 30 inches. Since the split spoon sampler is driven 18 inches or until refusal, the blows for the first 6 inches are for seating the sampler, and the number of blows for the final 12 inches is the N-value. Additionally, “refusal” of the split-spoon sampler occurs when the sampler is driven less than 6 inches with 50 blows of the hammer.

As each boring was advanced, the Drilling Foreman kept a field log of the subsurface profile noting the soil and bedrock types and stratifications, groundwater, SPT results, and other pertinent data.

Representative portions of the split-spoon samples were placed in glass jars with lids to preserve the in-situ moisture contents of the samples. The glass jars were marked and labeled in the field for identification when returned to our laboratory.

The soundings were made with a track-mounted drill rig advancing continuous flight solid augers until auger refusal. This auger refusal has been called the top of "bedrock" in the soundings listed in the Bedrock Sounding Tabulation in Appendix C. It should be noted that "Auger Refusal" as determined in the rockline soundings is defined as rock-like resistance to the advancement of the augers using carbide steel cutting teeth. This may indicate the presence of weathered bedrock, boulders, or rock remnants. A more accurate determination regarding the location of the top of rock cannot be made without performing rock coring.

The pavement cores were made with an electric coring machine. A summary of the pavement cores is provided in the Pavement Core Tabulation in Appendix C.

6.0 LABORATORY REVIEW AND TESTING

Upon completion of the fieldwork, the samples recovered from the borings were transported to our Soil Mechanics Laboratory, where they were visually reviewed and classified by the Project Engineering Geologist.

Laboratory testing was performed on selected soil and rock samples to estimate engineering and index properties. Laboratory testing of the selected soil samples included various combinations of the following tests: moisture content and Atterberg limits. The results of these tests are summarized below and in the Tabulation of Laboratory Tests in Appendix D. Additionally, the results of laboratory index tests are presented on the boring logs.

The boring logs were prepared by the Project Engineering Geologist on the basis of the field logs, the visual classification of the soil and bedrock samples in the laboratory, and the laboratory test results (cf. Section 6.0 for information on the laboratory testing). Soil and Rock Classification Sheets are also included in Appendix C, which describe the terms and symbols used on the boring logs. The dashed lines on the boring logs indicate an approximate change in strata as estimated between samples, whereas a solid line indicates that the change in strata occurred within a sample where a more precise measurement could be made. Furthermore, the transition between strata can be abrupt or gradual.

7.0 SUBSURFACE CONDITIONS

7.1 Stratification

Generally, the existing pavement or ground surface is underlain by topsoil over residual silty clay and clay over the lower to middle-aged Ordovician Lexington Limestone bedrock. More specific descriptions of the subsurface strata are provided below, and the boring logs containing detailed material descriptions are located in Appendix C.

7.1.1 Pavement

The four pavement cores taken along the west edge of Versailles Road revealed Asphalt thickness varying from 5.5 to 6.5 inches over 3 to 8.5 inches of crushed limestone base.

7.1.2 Topsoil

Topsoil was encountered at the ground surface in the test borings. The thickness of the topsoil in the borings varied from 0.3 to 0.5 feet.

7.1.3 Residuum

Residual soils (or residuum) are soils that have formed by the in-situ weathering of the underlying bedrock into a soil. Occasionally, layers of the bedrock (i.e., shale or limestone layers) may be encountered within the residual soils. Residual soils were encountered beneath the ground surface / pavement at depths of 2 to 10.5 feet below the existing ground surface in the test borings and soundings. The residuum in the test borings was described as generally stiff to very stiff silty clay and clay. Four samples were selected for Atterberg limits testing. The results are presented in Table 1 below and in Appendix D.

Table 1. Summary of Atterberg limits test results of the residuum.

	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)
B-1, 5.0 to 6.5 feet	71	32	39
B-2, 2.5 to 4.0 feet	56	29	27
B-4, 2.5 to 4.0 feet	57	27	30
B-4, 7.5 to 9.0 feet	69	33	36

All of the tested samples classify as CH according to the Unified Soil Classification System (USCS). These clay samples would be characterized as moderately plastic to highly plastic.

7.1.4 Bedrock

The overburden soils at the site are underlain by bedrock consisting of interbedded limestone with trace shale layers. Bedrock was encountered at depths of 2.0 to 10.5 feet below the ground surface in the test borings and soundings.

According to the 1968 USGS Geologic Map of the Franklin East Quadrangle, Franklin and Woodford Counties, Kentucky, the bedrock immediately underlying the overburden soils belongs to the Lexington Limestone Formation. This formation has many members, two of which are mapped on the subject site. The upper member is called the Tanglewood Member #3 that contains limestone (calcarenite), medium- to medium-dark-gray to grayish-orange, medium- to coarse-grained, bioclastic, very thin bedded to thick-bedded, mostly thin-bedded, partly crossbedded, phosphatic and locally contains minor shale interbeds. The lower member is called

Millersburg Member which contains, interbedded limestone and shale: Limestone (65 to 75 percent), medium-light-gray, very fine to coarse-grained, nodular to irregularly bedded; profusely fossiliferous. The shale is medium- to dark-gray and fissile. The contact between the Tanglewood Member #3 and the Millersburg Member is near El. 820.00.

Interbedded shale and limestone bedrock in the Kentucky Area is typically categorized as highly weathered, weathered, or unweathered, based on the degree of weathering of the shale component. The highly weathered zone is typically the uppermost zone, wherein the shale is brown to olive brown in color and has almost weathered to a clay. In the intermediate weathered zone, the shale is typically olive brown with occasional gray and is stronger than the shale in the highly weathered zone. In the unweathered parent zone, the shale is gray and is stronger than the shale in the weathered zones. All three zones are interbedded with limestone. It is common for one or both of the weathered shale bedrock zones to be absent due to differential weathering, erosion, or prior excavation. The Rock Classification Sheet, which is included in Appendix C, describes the varying degrees of weathering along with the rock strength descriptions that are used on the appended boring logs.

Regarding the limestone, these layers are predominantly unweathered, and their strengths are estimated to range from medium strong to very strong. Occasionally, layers can be encountered within the bedrock profile where groundwater seepage is concentrated and weathering of the limestone layers is more advanced.

7.2 Groundwater Conditions

As mentioned in Section 5.0, groundwater observations were made in the borings during drilling, at the completion of drilling, and before backfilling the boring holes.

Groundwater was not encountered in the borings or soundings.

Based on our local experience, groundwater seepage should be anticipated, along the overburden soil/bedrock interface or along fractures in the bedrock. Additionally, groundwater levels and seepage amounts are expected to vary with time, location, season of the year, and amounts of precipitation.

8.0 LIMITATIONS

This report has been prepared on behalf of, and for the exclusive use of, the client for specific application to the named project as described herein. If this report is provided to other parties, it should be provided in its entirety with all supplementary information. In addition, the client should make it clear that the information is provided for factual data only, and not as a warranty of subsurface conditions presented in this report.

Geotechnology has attempted to conduct the services reported herein in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality and under similar conditions. The conclusions contained in this report are professional opinions. The report is not a bidding document and should not be used for that purpose.

Our scope for this phase of the project did not include any environmental assessment or investigation for the presence or absence of wetlands or hazardous or toxic materials in the soil, surface water, groundwater, or air, on or below or around this site. Any statements in this report or on the boring logs regarding odors noted or unusual or suspicious items or conditions observed are strictly for the information of our client. Our scope did not include an assessment of the effects of flooding and erosion of creeks or rivers adjacent to or on the project site.

Our scope did not include: any services to investigate or detect the presence of mold or any other biological contaminants (such as spores, fungus, bacteria, viruses, and the by-products of such organisms) on and around the site; or any services, designed or intended, to prevent or lower the risk of the occurrence of an infestation of mold or other biological contaminants.

The information contained in this report is based on the data obtained from the subsurface exploration. The field exploration methods used indicate subsurface conditions only at the specific locations where samples were obtained, only at the time they were obtained, and only to the depths penetrated. Consequently, subsurface conditions may vary gradually, abruptly, and/or nonlinearly between sample locations and/or intervals. At the request of the client, Geotechnology has provided this data report without any conclusions or recommendations regarding the proposed construction. Geotechnology is therefore not responsible for any conclusions or recommendations made by others on the basis of the data presented in this report.

A copy of "Important Information about This Geotechnical-Engineering Report" that is published by the Geotechnical Business Council (GBC) of the Geoprofessional Business Association (GBA) is included in Appendix A for your review. The publication discusses some other limitations, as well as ways to manage risk associated with subsurface conditions.

APPENDIX A – IMPORTANT INFORMATION ABOUT THIS GEOTECHNICAL-ENGINEERING REPORT

Important Information about This

Geotechnical-Engineering Report

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

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

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

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a civil engineer may not fulfill the needs of a constructor — a construction contractor — or even another civil engineer. Because each geotechnical- engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. No one except you should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply this report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical-engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

Geotechnical Engineers Base Each Report on a Unique Set of Project-Specific Factors

Geotechnical engineers consider many unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk-management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical-engineering report that was:

- not prepared for you;
- not prepared for your project;
- not prepared for the specific site explored; or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical-engineering report include those that affect:

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

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical-engineering report is based on conditions that existed at the time the geotechnical engineer performed the study. *Do not rely on a geotechnical-engineering report whose adequacy may have been affected by*: the passage of time; man-made events, such as construction on or adjacent to the site; or natural events, such as floods, droughts, earthquakes, or groundwater fluctuations. *Contact the geotechnical engineer before applying this report to determine if it is still reliable.* A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ — sometimes significantly — from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide geotechnical-construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are Not Final

Do not overrely on the confirmation-dependent recommendations included in your report. *Confirmation-dependent recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations *only* by observing actual subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's confirmation-dependent recommendations if that engineer does not perform the geotechnical-construction observation required to confirm the recommendations' applicability.*

A Geotechnical-Engineering Report Is Subject to Misinterpretation

Other design-team members' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Constructors can also misinterpret a geotechnical-engineering report. Confront that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing geotechnical construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical-engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make constructors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give constructors the complete geotechnical-engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise constructors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure constructors have sufficient time* to perform additional study. Only then might you be in a position to give constructors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and constructors fail to recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Environmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform an *environmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold-prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, many mold- prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical- engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; *none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.*

Rely, on Your GBC-Member Geotechnical Engineer for Additional Assistance

Membership in the Geotechnical Business Council of the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project. Confer with you GBC-Member geotechnical engineer for more information.

GEOTECHNICAL BUSINESS COUNCIL
of the Geoprofessional Business Association

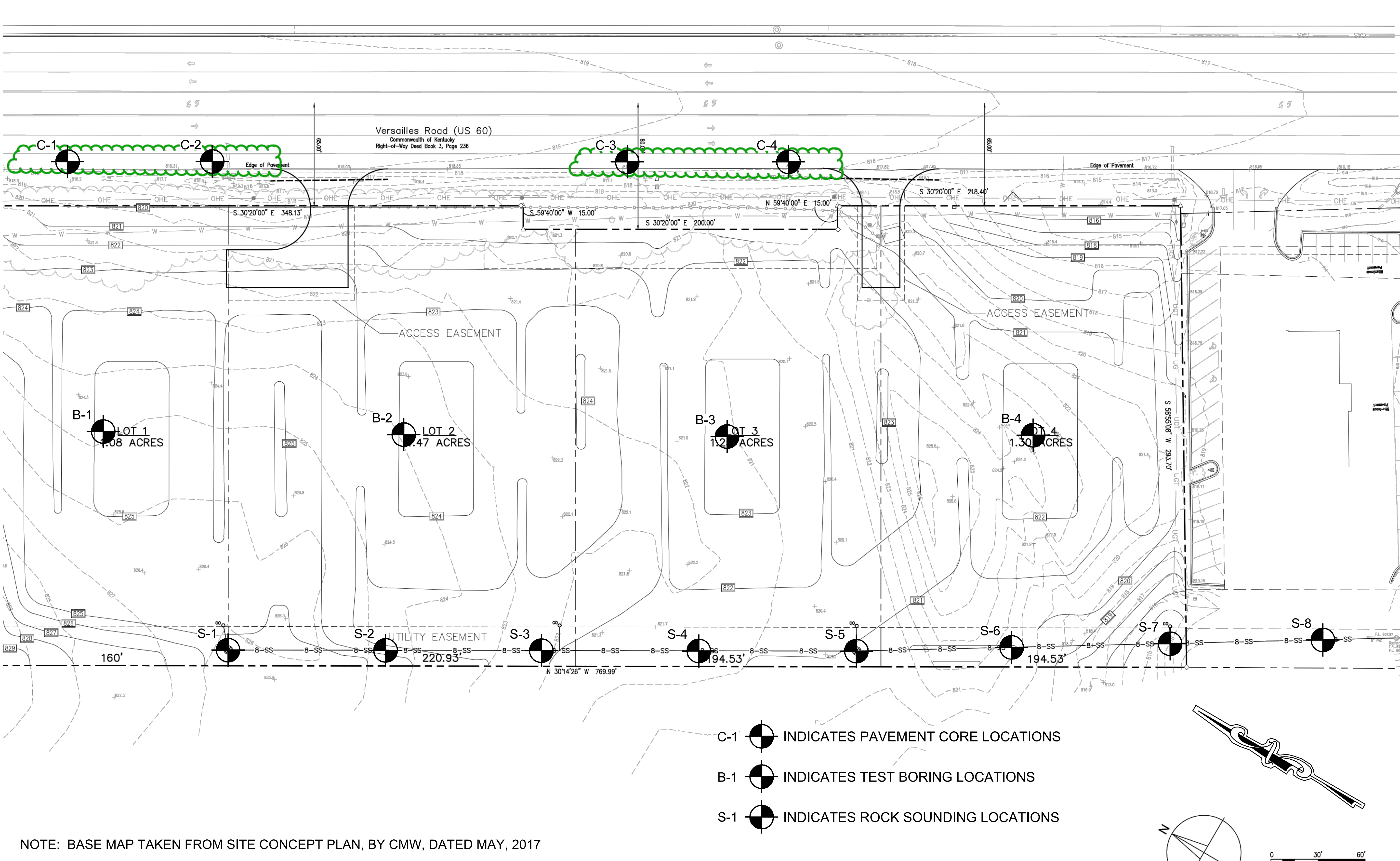
8811 Colesville Road/Suite G106, Silver Spring, MD 20910
Telephone: 301/565-2733 Facsimile: 301/589-2017
e-mail: info@geoprofessional.org www.geoprofessional.org

APPENDIX B – PLAN

Boring Plan, Drawing No. 1

Date Printed: 7/18/2017 9:15 AM Path: \\10.0.10.12\network storage\data\projects\J029879.01\Draw\J029879.01-1.dwg

0 30 60 120
SCALE: 1" = 60'



NOTE: BASE MAP TAKEN FROM SITE CONCEPT PLAN, BY CMW, DATED MAY, 2017

GEOTECHNOLOGY INC
FROM THE GROUND UP

Project: Rzeszutko and DaCosse Property

Location: 1335 Versailles Road
Frankfort, Kentucky

Title: BORING PLAN

Client: Anchor Properties, Inc.

Date: 7/18/2017
Project No.: J029879.01
Drawing No.: 1

APPENDIX C – BORING INFORMATION

Boring Logs

Soil Classification Sheet

Rock Classification Sheet

Bedrock Sounding Tabulation

Pavement Core Tabulation

GEOTECHNOLOGY INC
FROM THE GROUND UP

LOG OF TEST BORING

CLIENT: Anchor Properties, Inc.
BORING #: BH-1
PROJECT: Geotechnical Data Report, Rzeszutko and DaCosse Proprerty
1335 Versailles Road, Frankfort, Kentucky
PROJECT #: J029879.01
PAGE #: 1 of 1
LOCATION OF BORING: As shown on Boring Plan, Drawing No. 1

ELEV.	COLOR, MOISTURE, DENSITY, PLASTICITY, SIZE, PROPORTIONS DESCRIPTION	Strata Depth (feet)	Sample Condition	Sample Number	Sample Type	SPT* Blows/6" / Rock Core RQD (%)	Recovery (in.)	Recovery (%)
825.0	Ground Surface	0.0						
824.5	TOPSOIL	0.5						
823.0	Brown moist stiff SILTY CLAY with trace organic root matter, oxide stains.	2.0	I	1A 1B	DS	2-3-4	18	100
817.5	Brown moist very stiff CLAY with heavy oxide stains (CH).	7.5	I	2	DS	4-5-8	18	100
			I	3	DS	5-6-8	18	100
815.5	Interbedded gray very strong weathered LIMESTONE, extremely weak SHALE (bedrock).	9.5	I	4	DS	75/5"	3	60
	Auger refusal and bottom of test boring at 9.5 feet.							

Depth Scale (feet): 0, 5, 10, 15

Datum: NAVD 88
Surface Elevation: 825.0 ft.
Date Started: 6/12/2017
Date Completed: 6/12/2017
Hammer Weight: 140 lb.
Hammer Drop: 30 in.
Pipe Size: 2 in. O.D.
Hole Diameter: 8 in.
Rock Core Diameter: --
Boring Method: HSA-3.25
Drill Rig: CME-55 TD-3
Foreman: L. Wanstrath
Engineer: Mark A. Hushebeck

BORING METHOD
HSA = Hollow Stem Augers
CFA = Continuous Flight Augers
DC = Driving Casing
MD = Mud Drilling

SAMPLE TYPE
PC = Pavement Core
CA = Continuous Flight Auger
DS = Driven Split Spoon
PT = Pressed Shelby Tube
RC = Rock Core

SAMPLE CONDITIONS
D = Disintegrated
I = Intact
U = Undisturbed
L = Lost

GROUNDWATER DEPTH
First Noted: Dry
At Completion: Dry
After: --
Backfilled: Dry

* SPT = Standard Penetration Test - Driving 2" O.D. Sampler 18" with 140-Pound Hammer Falling 30"; Count Made at 6" Intervals

LOG OF TEST BORING

CLIENT: Anchor Properties, Inc.
BORING #: BH-2
PROJECT: Geotechnical Data Report, Rzeszutko and DaCosse Proprerty
1335 Versailles Road, Frankfort, Kentucky
PROJECT #: J029879.01
PAGE #: 1 of 1
LOCATION OF BORING: As shown on Boring Plan, Drawing No. 1

ELEV.	COLOR, MOISTURE, DENSITY, PLASTICITY, SIZE, PROPORTIONS DESCRIPTION	Strata Depth (feet)	Depth Scale (feet)	Sample Condition	Sample Number	Sample Type	SPT* Blows/6" / Rock Core RQD (%)	Recovery (in.)	Recovery (%)
823.9	Ground Surface	0.0	0						
823.4	TOPSOIL	0.5							
	Brown moist stiff to very stiff SILTY CLAY with oxide stains.			I	1A 1B	DS	2-3-5	18	100
821.9		2.0							
	Brown moist very stiff CLAY, clay with oxide stains and trace bedding (CH).			I	2	DS	5-7-7	18	100
818.9		5.0	5	I	3	DS	50/0"	0	
	Interbedded gray very strong LIMESTONE, trace extremely weak SHALE (bedrock).								
817.9		6.0							
	Auger refusal and bottom of test boring at 6.0 feet.		10						
			15						

Datum: NAVD 88
Hammer Weight: 140 lb.
Hole Diameter: 8 in.
Drill Rig: CME-55 TD-3
Surface Elevation: 823.9 ft.
Hammer Drop: 30 in.
Rock Core Diameter: --
Foreman: L. Wanstrath
Date Started: 6/12/2017
Pipe Size: 2 in. O.D.
Boring Method: HSA-3.25
Engineer: Mark A. Hushebeck
Date Completed: 6/12/2017

BORING METHOD
HSA = Hollow Stem Augers
CFA = Continuous Flight Augers
DC = Driving Casing
MD = Mud Drilling

SAMPLE TYPE
PC = Pavement Core
CA = Continuous Flight Auger
DS = Driven Split Spoon
PT = Pressed Shelby Tube
RC = Rock Core

SAMPLE CONDITIONS
D = Disintegrated
I = Intact
U = Undisturbed
L = Lost

GROUNDWATER DEPTH
First Noted: Dry
At Completion: Dry
After: --
Backfilled: Dry

* SPT = Standard Penetration Test - Driving 2" O.D. Sampler 18" with 140-Pound Hammer Falling 30"; Count Made at 6" Intervals

LOG OF TEST BORING

CLIENT: Anchor Properties, Inc.
PROJECT: Geotechnical Data Report, Rzeszutko and DaCosse Proprerty
1335 Versailles Road, Frankfort, Kentucky
LOCATION OF BORING: As shown on Boring Plan, Drawing No. 1

BORING #: BH-3
PROJECT #: J029879.01
PAGE #: 1 of 1

ELEV.	COLOR, MOISTURE, DENSITY, PLASTICITY, SIZE, PROPORTIONS DESCRIPTION	Strata Depth (feet)	Depth Scale (feet)	Sample Condition	Sample Number	Sample Type	SPT* Blows/6" / Rock Core RQD (%)	Recovery (in.)	Recovery (%)
821.0	Ground Surface	0.0	0						
820.7	TOPSOIL	0.3							
	Brown moist to very moist medium stiff CLAY, trace sand with roots.			I	1A 1B	DS	2-3-5	18	100
819.0		2.0							
	Interbedded gray very strong LIMESTONE, trace extremely weak SHALE layers (bedrock).			I	2	DS	50/2"	2	100
818.0		3.0							
	Auger refusal and bottom of test boring at 3.0 feet.								
			5						
			10						
			15						

Datum: NAVD 88
Surface Elevation: 821.0 ft.
Date Started: 6/12/2017
Date Completed: 6/12/2017
Hammer Weight: 140 lb.
Hammer Drop: 30 in.
Pipe Size: 2 in. O.D.
Hole Diameter: 8 in.
Rock Core Diameter: --
Boring Method: HSA-3.25
Drill Rig: CME-55 TD-3
Foreman: L. Wanstrath
Engineer: Mark A. Hushebeck

BORING METHOD
HSA = Hollow Stem Augers
CFA = Continuous Flight Augers
DC = Driving Casing
MD = Mud Drilling

SAMPLE TYPE
PC = Pavement Core
CA = Continuous Flight Auger
DS = Driven Split Spoon
PT = Pressed Shelby Tube
RC = Rock Core

SAMPLE CONDITIONS
D = Disintegrated
I = Intact
U = Undisturbed
L = Lost

GROUNDWATER DEPTH
First Noted: Dry
At Completion: Dry
After: --
Backfilled: Dry

* SPT = Standard Penetration Test - Driving 2" O.D. Sampler 18" with 140-Pound Hammer Falling 30"; Count Made at 6" Intervals

GEOTECHNOLOGY INC
FROM THE GROUND UP

LOG OF TEST BORING

CLIENT: Anchor Properties, Inc.
BORING #: BH-4
PROJECT: Geotechnical Data Report, Rzeszutko and DaCosse Proprerty
1335 Versailles Road, Frankfort, Kentucky
PROJECT #: J029879.01
PAGE #: 1 of 1
LOCATION OF BORING: As shown on Boring Plan, Drawing No. 1

ELEV.	COLOR, MOISTURE, DENSITY, PLASTICITY, SIZE, PROPORTIONS DESCRIPTION	Strata Depth (feet)	Depth Scale (feet)	Sample Condition	Sample Number	Sample Type	SPT* Blows/6" / Rock Core RQD (%)	Recovery (in.)	Recovery (%)
823.8	Ground Surface	0.0	0						
823.5	TOPSOIL	0.3							
	Brown to dark brown moist medium stiff to stiff SILTY CLAY iron oxide stains, organics.			I	1A 1B	DS	1-3-4	18	100
821.8		2.0							
	Brown moist very stiff CLAY, with oxide stains (CH).			I	2	DS	2-3-5	18	100
819.3		4.5							
	Brown moist very stiff to stiff CLAY, with oxide stains, trace bedding (CH).		5	I	3	DS	6-7-9	18	100
				I	4	DS	5-5-5	18	100
813.3		10.5	10	I	5	DS	5-75/3"	8	89
	Gray very strong LIMESTONE (bedrock).								
811.8		12.0							
	Auger refusal and bottom of test boring at 12.0 feet.		15						

Datum: NAVD 88
Hammer Weight: 140 lb.
Hole Diameter: 8 in.
Drill Rig: CME-55 TD-3
Surface Elevation: 823.8 ft.
Hammer Drop: 30 in.
Rock Core Diameter: --
Foreman: L. Wanstrath
Date Started: 6/12/2017
Pipe Size: 2 in. O.D.
Boring Method: HSA-3.25
Engineer: Mark A. Hushebeck
Date Completed: 6/12/2017

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SOIL CLASSIFICATION SHEET

NON COHESIVE SOILS
(Silt, Sand, Gravel and Combinations)

Density

Very Loose	- 5 blows/ft. or less
Loose	- 6 to 10 blows/ft.
Medium Dense	- 11 to 30 blows/ft.
Dense	- 31 to 50 blows/ft.
Very Dense	- 51 blows/ft. or more

Relative Properties

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

Particle Size Identification

Boulders	- 8 inch diameter or more	
Cobbles	- 3 to 8 inch diameter	
Gravel	- Coarse	- 3/4 to 3 inches
	- Fine	- 3/16 to 3/4 inches
Sand	- Coarse	- 2mm to 5mm (dia. of pencil lead)
	- Medium	- 0.45mm to 2mm (dia. of broom straw)
	- Fine	- 0.075mm to 0.45mm (dia. of human hair)
Silt		- 0.005mm to 0.075mm (Cannot see particles)

COHESIVE SOILS
(Clay, Silt and Combinations)

Consistency	Field Identification	Unconfined Compressive Strength (tons/sq. ft.)
Very Soft	Easily penetrated several inches by fist	Less than 0.25
Soft	Easily penetrated several inches by thumb	0.25 – 0.5
Medium Stiff	Can be penetrated several inches by thumb with moderate effort	0.5 – 1.0
Stiff	Readily indented by thumb but penetrated only with great effort	1.0 – 2.0
Very Stiff	Readily indented by thumbnail	2.0 – 4.0
Hard	Indented with difficulty by thumbnail	Over 4.0

Classification on logs are made by visual inspection.

Standard Penetration Test – Driving a 2.0" O.D., 1 3/8" I.D., sampler a distance of 1.0 foot into undisturbed soil with a 140 pound hammer free falling a distance of 30 inches. It is customary to drive the spoon 6 inches to seat into undisturbed soil, then perform the test. The number of hammer blows for seating the spoon and making the tests are recorded for each 6 inches of penetration on the drill log (Example – 6/8/9). The standard penetration test results can be obtained by adding the last two figures (i.e. 8+9=17 blows/ft.). Refusal is defined as greater than 50 blows for 6 inches or less penetration.

Strata Changes – In the column "Soil Descriptions" on the drill log, the horizontal lines represent strata changes. A solid line (————) represents an actually observed change; a dashed line (— — — —) represents an estimated change.

Groundwater observations were made at the times indicated. Porosity of soil strata, weather conditions, site topography, etc., may cause changes in the water levels indicated on the logs.

ROCK CLASSIFICATION SHEET

ROCK WEATHERING

Descriptions	Field Identification
Unweathered	No visible sign of rock material weathering, perhaps slight discoloration on major discontinuity surfaces.
Weathered	Discoloration indicates weathering of rock material and discontinuity surfaces. All the rock material may be discolored by weathering and may be somewhat weaker externally than it its fresh condition.
Highly Weathered	Less than half of the rock material is decomposed and/or disintegrated to a soil. Fresh or discolored rock is present either as a discontinuous framework or as corestones.
Residual Soil	All rock material is decomposed and/or disintegrated to soil. The original mass structure is still largely intact with bedding planes visible, and the soil has not been significantly transported.

ROCK STRENGTH

Descriptions	Field Identification	Uniaxial Compressive Strength (psi)
Extremely Weak	Indented by thumbnail	40-150
Very Weak	Crumbles under firm blows with point of geological hammer, can be peeled by a pocket knife.	150-700
Weak	Can be peeled by a pocket knife with difficulty, shallow indentations made by firm blow with point of geological hammer.	700-4,000
Medium Strong	Cannot be scraped or peeled with a pocket knife, specimen can be fractured with a single blow of a geological hammer.	4,000-7,000
Strong	Specimen requires more than one blow of a geological hammer to fracture.	7,000-15,000
Very Strong	Specimen requires many blows with a geological hammer to fracture.	15,000-36,000
Extremely Strong	Specimen can only be chipped with geological hammer.	>36,000

BEDDING

Descriptive Term	Bed Thickness
Massive	> 4 ft.
Thick	2 to 4 ft.
Medium	2 in. to 2 ft.
Thin	< 2 in.

Anchor Properties, Inc.
Rzeszutko and DaCosse Property
Frankfort Kentucky
J029879.01

BEDROCK SOUNDING TABULATION (EXISTING GROUND SURFACE ELEVATION)

S – 1(814.4’) = Bedrock at 5.0’

S – 2 (828.8’) = Bedrock at 9.0’

S – 3 (830.0’) moved 20’ east = Bedrock at 4.0’

S – 4 (821.4’) = Bedrock at 4.0’

S – 5 (822.1’) = Bedrock at 2.0’

S – 6 (824.6’) = Bedrock at 4.0’

S – 7 (826.0’) = Bedrock at 4.5’

S – 8 (N/A) = Bedrock at 6.5’

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PAVEMENT CORE TABULATION (EXISTING GROUND SURFACE ELEVATION)

C-1 @ Elev. 819.6'

0.0" to 6.5"	Asphalt
6.6" to 11.5"	Base (Crushed Limestone)

C-2 @ Elev. 819.3'

0.0" to 6.0"	Asphalt
6.0" to 14.5"	Base (Crushed Limestone)

C-3 @ Elev. 818.7'

0.0" to 5.5"	Asphalt
5.5" to 8.5"	Base (Crushed Limestone)

C-4 @ Elev. 818.2'

0.0" to 5.5"	Asphalt
5.5" to 1.0'	Base (Crushed Limestone)

APPENDIX D – LAB TESTING

Laboratory Test Results

TABULATION OF LABORATORY TESTS

Boring No.	Sample No.	Depth (ft.)		Moisture Content (%)	Atterberg Limits (%)			USCS Classification
		From	To		LL	PL	PI	
BH-1	1B	0.5	1.5	21.2				
BH-1	2	2.5	4.0	35.7				
BH-1	3	5.0	6.5	38.3	71	32	39	CH
BH-2	1B	0.5	1.5	41.6				
BH-2	2	2.5	4.0	23.5	56	29	27	CH
BH-3	1B	0.3	1.5	31.5				
BH-4	1B	0.3	1.5	20.8				
BH-4	2	2.5	4.0	25.3	57	27	30	CH
BH-4	3	5.0	6.5	37.8				
BH-4	4	7.5	9.0	38.9	69	33	36	CH