ECS Southeast, LLC

Geotechnical Engineering Report

Oak Pointe Apartments

1600 Kurz Way
Louisville, Jefferson County, Kentucky 40216

ECS Project Number 61:3494

March 22, 2026

ECS SOUTHEAST, LLC
Geotechnical • Construction Materials • Environmental • Facilities

March 22, 2026

Mr. Jason Lange
Prodigy Construction
11106 Decimal Drive
Louisville, KY 40299

ECS Project No. 61:3494

Reference: Geotechnical Engineering Report
Oak Pointe Apartments
1600 Kurz Way
Louisville, Jefferson County, Kentucky 40216

Dear Mr. Lange,

ECS Southeast, LLC (ECS) has completed the subsurface exploration and geotechnical engineering analyses for the above-referenced project. Our services were performed in general accordance with our agreed to scope of work detailed in ECS Proposal No. 61:P4054R1, dated January 26, 2026. This report presents our understanding of the geotechnical aspects of the project along with the results of the field exploration, laboratory testing conducted, and our geotechnical related design and construction recommendations.

It has been our pleasure to be of service to Prodigy Construction during the design phase of this project. We would appreciate the opportunity to remain involved during the continuation of the design phase and would like to provide our services during construction operations as well to verify subsurface conditions determined for this report. Should you have any questions concerning the information contained in this report, or if we can be of further assistance to you, please contact us.

Respectfully submitted,

ECS Southeast, LLC

Denis Diemer
Project Engineer
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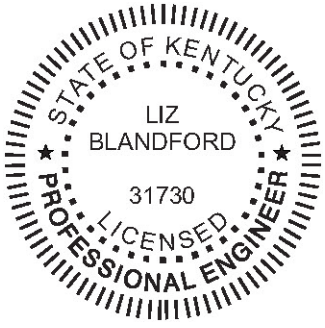

Liz Blandford, P.E.
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EXECUTIVE SUMMARY

The following summarizes the main findings of the exploration, particularly those that may have a cost impact on the planned development. Further, our principal foundation recommendations are summarized. Information gleaned from the Executive Summary should not be utilized in lieu of reading the entire geotechnical report.

- Based on the provided information, the proposed project will include the construction of ten (10) two-story approximately 11,000 square-foot apartments buildings, thirty (30) residential lots, a detention area, and associated drive lanes and parking areas located at 1600 Kurz Way in Louisville, Jefferson County, Kentucky.
- The site was mostly undeveloped and wooded but contained many old concrete drainage pipes, approximately eleven (11) ponds along the western side of the property, a large pond near the eastern-central portion of the property, and active storm sewer lines on the eastern portion of the site that drained into the large pond on-site. The site was bounded on its western side by a railroad track and an LG&E natural gas transmission easement and on its northern, southern, and eastern sides by residential lots. According to Google Earth historical aerial imagery, there was a house with a garage located near the center of the property (near proposed lots 6, 7, 14, and 15) present from before 1992 and reportedly demolished between November of 2003 and November of 2004. Mass grading and clearing operations on-site also reportedly occurred between November of 2003 and June of 2010. The eleven (11) small ponds were reportedly constructed between October of 2008 and June of 2010. Mass grading of the site and the construction of a detention pond in the northwestern corner of the site following the construction of new homes along the northern side of the site reportedly occurred between October of 2018 and September of 2019. The site generally sloped downward from east to west with approximately 75 feet of elevation change across the site. The site leveled out near the middle, and the large pond near the middle of the site had a lower elevation, approximately 10 to 15 feet lower, than the areas that surrounded it.
- Surface drainage was poor as multiple areas with standing water were observed on site.
- Surface materials consisted of approximately 1 to 4 inches of topsoil in all five (5) of the borings.
- Surface materials were underlain by existing fill consisting of mottled gray and orangish brown, moist, low plasticity LEAN CLAY (CL) with rock fragments in one (1) of the five (5) borings extending approximately 0.5 feet below existing grades.
- Surface materials and existing fill were underlain by native soils consisting of brown, moist, stiff, low plasticity, clayey SILT (ML), with trace sand in two (2) of the five (5) borings extending approximately 1.5 to 6.5 feet below existing grades. SILTY SAND generally transitioned to dark gray, yellowish brown, light grayish brown, mottled gray and orangish brown, moist, firm to hard, low to moderate plasticity, silty to very silty LEAN CLAY (CL) with chert, trace organics, weathered shale fragments, weathered sandstone fragments, and some gravel in all five (5) of the borings extending approximately 9.5 to 20.5 feet below existing grades. LEAN CLAY (CL) generally transitioned to brown, moist, loose to medium dense, poorly graded, fine grained, silty CLAYEY SAND (SC) encountered in all one (1) of the borings extending approximately 15.5 feet below existing grades or dark gray, light gray and brown, slightly moist, highly to completely WEATHERED SHALE (WR) encountered in two (2) of the five (5) borings extending approximately 20.0 feet below existing grades.
- No rock cores were obtained, as continuous, unweathered rock was not encountered in any of the geotechnical borings. The rock observed on site was weathered and did not result in auger refusal. Based on these conditions, the encountered material will likely be excavatable using conventional equipment, such as an excavator with a standard bucket.
- Auger refusal was not encountered in any of the borings during this geotechnical investigation and all borings reached planned depths of 15.5 to 20.0 feet below existing grades.
- Groundwater was not encountered in any of the borings at the time of the exploration at the maximum depth drilled.

GEOTECHNICAL CONCERNS:

- Shallow Rock
- Variable Bearing Conditions
- High Plasticity Clays
- Karst Topography
- Low Strength Soils
- Drainage Swales
- Agricultural Use
- Trees
- Degradable Soils
- Reuse of On-Site Soils
- Subgrade Improvement
- Weather Consideration

DESIGN & CONSTRUCTION RECOMMENDATIONS:

- Recommendations in this report relied on the estimated finish floor elevations since none were provided by the client. ECS should be contacted to provide appropriate values and recommendations for changes to the finish elevations provided to ECS.
- Shallow Rock was not encountered during this exploration, but was encountered in a prior geotechnical exploration and during excavations on the northern portion of the site. Individual foundations must not bear on soil and rock simultaneously unless they are specifically designed to accommodate the stress concentrations associated with variable bearing conditions. Therefore, creation of an adequate soil cushion should be anticipated. The soil cushion should consist of a minimum of 24 inches of clay or sand (not gravel) placed and compacted between the rock surface and the bottom of the foundation.
- Low-strength soils (uncorrected N-value of 3 to 4 in clays and 5 to 6 in sands, firm and loose) were encountered in three (3) of the five (5) borings extending approximately 5.5 to 10.5 feet below existing grades. The vicinity of these borings will likely require additional undercutting and/or remediation to be adequate for support of overlying building foundations, floor slabs, and pavements.
- The proposed structures may be supported on conventional shallow foundations bearing on stiff native inorganic clay or structural fill as defined in this report. The following net allowable design bearing pressures may be used in foundation design:
  - 2,000 psf for continuous wall foundations bearing on soil.
  - 2,000 psf for isolated column foundations bearing on soil.
  - 3,000 psf for isolated column foundations bearing on rock.
  - 3,000 psf for isolated continuous wall foundations bearing on rock.
- A site class of “C” may be used in seismic design per the 2018 Kentucky Building Code.
- The allowable subgrade modulus for slab design is estimated to be 100 pci.
- Foundation excavations and floor and pavement subgrades should be evaluated by an ECS representative during construction to confirm that encountered conditions are consistent with the findings of this exploration.
- Flexible and/or rigid pavements may be used in proposed pavement areas. Rigid pavements should be considered for entranceways, dumpster pads, or other areas where heavy vehicles will turn on a tight radius or be parked for extended periods of time.

The following summarizes the main findings of the exploration, particularly those that may have a cost impact on the planned development. Further, our principal foundation recommendations are summarized. Information gleaned from the Executive Summary should not be utilized in lieu of reading the entire geotechnical report.

1.0 INTRODUCTION

1.1 GENERAL

The purpose of this study was to provide geotechnical information for the design of foundations, floor slabs, and pavements for the proposed development. The recommendations developed for this report are based on project information supplied by Prodigy Construction. Included in our recommendations are geotechnical subgrade preparation and fill placement guidelines. The recommendations developed for this report are based on project information supplied by Mr. Jason Lange with Prodigy Construction.

1.2 SCOPE OF SERVICES

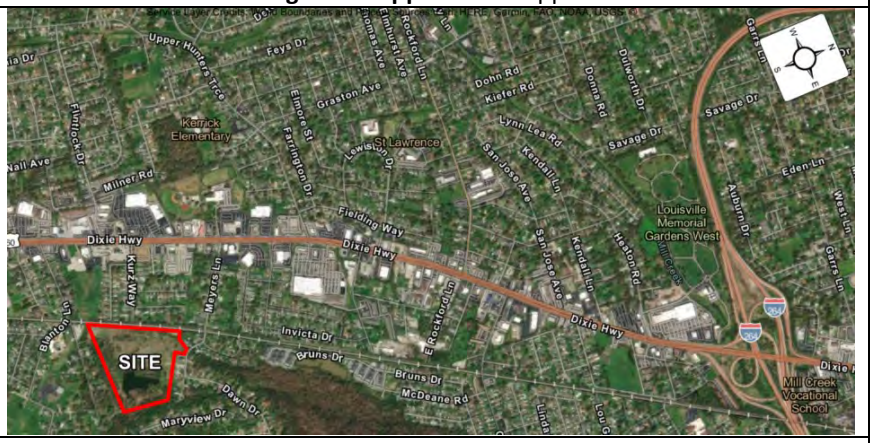
Five (5) soil test borings were performed at the selected locations in the proposed construction area. A laboratory testing program was also implemented to characterize the physical and engineering properties of the subsurface soils. This report describes our exploratory and testing procedures, presents our findings and evaluations and includes the following:

- Summary of the project information provided.
- Description of existing site conditions, reported geology, and encountered subsurface conditions.
- Assessment of general adequacy of the site for the intended use from a geotechnical standpoint.
- Site preparation and structural fill placement recommendations.
- Recommended foundation type(s), design parameters, and construction guidelines.
- Recommended ground floor bearing parameters and construction guidelines.
- Recommended flexible and rigid pavement design parameters and construction guidelines.
- Site class for seismic design based on the boring data and on available data from the vicinity.
- Other identified geotechnical concerns and recommended additional sampling/testing/analysis.

Our services were provided in accordance with our Terms and Conditions of Service included in our Proposal No. 61:P4054R1, dated January 26, 2026.

2.0 PROJECT INFORMATION

2.1 SITE INFORMATION

SUBJECT	SUMMARY OF EXISTING SITE CONDITIONS
Site Address	The site is located at 1600 Kurz Way in Louisville, Jefferson County, Kentucky. Refer to **Site Location Diagram** in **Appendix** for approximate location of site.
Site Location Diagram	
General Description & Topography	The site was mostly undeveloped and wooded but contained many old concrete drainage pipes, approximately eleven (11) ponds along the western side of the property, a large pond near the eastern-central portion of the property, and active sewer lines on the eastern portion of the site that drained into the large pond on-site. The site was bounded on its western side by a railroad track and an LG&E natural gas transmission easement and on its northern, southern, and eastern sides by residential lots. The site generally sloped downward from east to west with approximately 75 feet of elevation change across the site. The site leveled out near the middle, and the large pond near the middle of the site had a lower elevation, approximately 10 to 15 feet lower, than the areas that surrounded it.
Site History	According to Google Earth historical aerial imagery, there was a house with a garage located near the center of the property (near proposed lots 6, 7, 14, and 15) present from before 1992 and reportedly demolished between November of 2003 and November of 2004. Mass grading and clearing operations on-site also reportedly occurred between November of 2003 and June of 2010. The eleven (11) small ponds were reportedly constructed between October of 2008 and June of 2010. Mass grading of the site and the construction of a detention pond in the northwestern corner of the site following the construction of new homes along the northern side of the site reportedly occurred between October of 2018 and September of 2019.
Surface Water Drainage	Surface drainage was poor as multiple areas with standing water were observed on site.
Ground Cover	Topsoil.
Existing Utilities	Active storm sewers were observed to the east of the existing large pond on site which drained into the large pond. An LG&E natural gas transmission line also bounded the site on its western side.

2.2 PROPOSED CONSTRUCTION

SUBJECT	DESIGN INFORMATION / UNDERSTANDINGS
Project Description	The proposed project will include the construction of ten (10) two-story approximately 11,000 square-foot apartments buildings, thirty (30) residential lots, a detention area, and associated drive lanes and parking areas located at 1600 Kurz Way in Louisville, Jefferson County, Kentucky.
# of Stories	1 to 2-stories above grade
Usage	Residential – Apartment Buildings (Multi-family) and Single-Family Homes
Maximum Column Loads	100 kips (Estimated)
Maximum Wall Loads	3 kips per linear foot (Estimated)
Finish Floor Elevation	EL 475 to EL 535 (Estimated)
Maximum Cut/Fill	Building Areas: ±10 feet (Estimated)
Conversations/E-mail	Mr. Jason Lange and Mr. Steve Bosco of Prodigy Construction
Project Information Sources	"Oak Pointe Residential", provided by Prodigy Construction, received via email, and dated July 14, 2025.

3.0 SITE GEOLOGY

According to the Geologic map of the Louisville West and Lanesville Quadrangles, Jefferson County, Kentucky, published by the United States Geological Survey (USGS), and information obtained from the Kentucky Geological Survey (KGS) Geologic Information Service website, the site was underlain by the Borden Formation throughout the central areas of the site, Loess in the eastern and western portions of the site, and Glacial Outwash (Wisconsonian) in the far western portion of the site.

Site Geology - Underlying Formations[1]		
FORMATION	**DESCRIPTION**	**KARST POTENTIAL[2,3]**
Borden Formation (Central Portion of Site)	**Holtscalw Siltstone Member** **Primary Lithology:** Siltstone and Silty Shale **Description:** Siltstone and silty shale, medium to medium light gray, weather light gray to yellowish gray; clayey, calcareous, and pyritic in part; in uneven, indistinct laminae; contain iron stained medium dark gray calcareous concretions. Siltstone forms smooth weathering massive faces that grade laterally to slopes littered with elongate prisms 1/4 to 1 inch thick. Trace fossils on bedding planes include Scalarituba missouriensis Weller and smaller features sometimes called "curly worm marks", resembling Cosmorhaphe sp. In quadrangle to south, basal part of member intergrades with underlying unit within an interval of as much as 40 feet. Member covered by loess, rarely exposed. Position of basal contact in most areas placed at change from steeper slopes on Holtsclaw Siltstone Member to gentler slopes caused by decrease in silt content of underlying Nancy Member. **New Providence Shale Member** **Primary Lithology:** Clay Shale and Minor Limestone **Description:** Clay shale, silty, olive gray to grayish green, weathers yellowish gray to light greenish gray; locally iron stained; contains scattered light brown to dark yellowish brown ellipsoidal ironstone concretions, commonly 4 inches across and as much as one foot long, particularly abundant along bedding planes within 70 feet below Kenwood Siltstone Member. Unit micaceous, illitic, plastic when wet. Clay filled worm trails common, resemble Scalarituba missouriensis Weller. Crinoids, brachiopods, corals, pelecypods, gastropods, bryozoans, trilobites, and cephalopods rare to abundant in scattered thin limestone lenses 80 to 100 feet below the Kenwood. Limestone commonly underlain by persistent bed of concretionary siderite with double cone in cone structure; concretions are pale to grayish brown in middle with a dark-yellowish orange rind. An upper tongue 0 to 55 feet thick is separated from main unit by the Kenwood in southwestern part of area. Base of unit distinct; where exposed, base is marked by persistent zone of brownish gray phosphatic nodules and scattered glauconite, except at two localities where underlain by Rockford Limestone.	Non-Karst[4]

Site Geology - Underlying Formations[1]		
FORMATION	**DESCRIPTION**	**KARST POTENTIAL[2,3]**
Loess and Eolian Sand (Eastern and Western Portions of Site)	**Primary Lithology:** Silt and Minor Sand **Description:** Silt and minor sand, light olive gray, calcareous where fresh; weathers yellowish brown to grayish brown, light brown to medium yellowish orange, non-calcareous; small irregular calcareous concretions locally abundant near base. Exposures below elevation of 500 feet locally include interbeds of quartzose, silty, crossbedded fluvial and eolian sand; grains are very fine to fine, subangular to subrounded.	Non-Karst[4]
Glacial Outwash (Wisconsonian) (Far Western Portion of Site)	**Primary Lithology:** Limestone and Shale. **Description:** Sand, very fine to coarse, and gravel are light brownish gray to light reddish brown, well to poorly sorted, sub-angular to well rounded, commonly cross-bedded. Gravel includes pebbles and cobbles mostly less than 0.3 foot in diameter of limestone, siltstone, dolomite, quartz, chert, quartzite, granite, gneiss. schist, and finely crystalline igneous and metamorphic rocks. Clay and silt are yellowish brown above water table, gray to olive gray below water table, weather yellowish gray. Unit deposited as alluvium by river of low gradient following release of glacial meltwater. Logs of water wells indicate that clay and silt mantle sand and gravel deposits commonly 50 to 100 feet thick and are locally inter-bedded and intermixed with these deposits.	Non-Karst[4]

Notes:

(1) Source: Geologic map of the Louisville West and Lanesville Quadrangle, Jefferson County, Kentucky, published by the United States Geological Survey, and information obtained from the KGS Geologic Map Information Service website.

(2) Karst is topography commonly formed over limestone or dolomite and characterized by sinkholes, irregular rock conditions, underground drainage, springs, and caves.

(3) The karst potential level is based on the tendency for the site to develop or have karst features and is not necessarily indicative of the actual presence or absence of existing karst activity at the site.

(4) According to the KGS Karst Potential Classification definitions, formations designated with an "Non-Karst" karst potential are underlain by bedrock with limited or no potential for karst development. Karst features rare or absent.

4.0 FIELD EXPLORATION AND LABORATORY TESTING

4.1 SUBSURFACE CHARACTERIZATION

SUBJECT	SUMMARY OF SUBSURFACE EXPLORATION(1)
Boring Method	Direct Push
Sampling Method	Standard Penetration Testing (ASTM D-1586)
Number of Borings	Five (5) total borings - Five (5) total borings were placed across the site in areas near where shallow refusal was encountered. - No rock cores were obtained, as continuous, unweathered rock was not encountered in any of the geotechnical borings. The rock observed on site was weathered and did not result in auger refusal. Based on these conditions, the encountered material will likely be excavatable using conventional equipment, such as an excavator with a standard bucket.
Boring Locations	Refer to **Boring Location Plan** in the **Appendix** for specific locations.
Boring Depths	Refer to **Geotechnical Borehole Logs** in the **Appendix**.
Logging Method	Full-time presence of an ECS engineer to observe, manage, and document the drilling, sampling and testing results, and encountered conditions. Water level measurement obtained in boreholes during drilling.
Groundwater	Groundwater was not observed in any of the borings at the time of the subsurface exploration at the maximum depths drilled.
Refusal (2)	Equipment refusal was not encountered in any of the borings during this geotechnical investigation and all borings reached planned depths of 15.5 to 20.5 feet below existing grades

Notes:

(1) Detailed descriptions of the exploration methods are listed in the **Field Procedures** section of the **Appendix**.

(2) Refusal is the term applied to material that cannot be penetrated with drilling tools or has a standard penetration resistance exceeding 50 blows per 6-inch increment or 10 blows with little to no penetration of the split spoon. Refusal may be encountered on continuous bedrock, discontinuous floaters, cemented soil, weathered rock, debris, buried structures, or other hard subsurface materials.

The subsurface conditions encountered were generally consistent with published geological mapping. The following sections provide generalized characterizations of the soil strata. Please refer to the **Geotechnical Borehole Records** and **Fence Diagrams** in the **Appendix** for detail at specific boring locations.

APPROXIMATE DEPTH (FT)	STRATUM	DESCRIPTION(1)	N-VALUES BLOWS PER FOOT (BPF)(2)
0 – 1.0	N/A	**TOPSOIL –** Approximately 1 to 4 inches. Encountered in all five (5) of the borings.	N/A
0.1 – 0.5	I	**FILL – LEAN CLAY (CL) –** Generally consisted of mottled gray and orangish brown, moist, low plasticity LEAN CLAY (CL) with rock fragments. Encountered in one (1) of the five (5) borings extending approximately 0.5 feet below existing grades.	N/A

APPROXIMATE DEPTH (FT)	STRATUM	DESCRIPTION[1]	N-VALUES BLOWS PER FOOT (BPF)[2]
0.1 – 6.5	II	**SILT (ML) –** Generally consisted of brown, moist, stiff, low plasticity, clayey SILT (ML) with trace sand. Encountered in two (2) of the five (5) borings extending approximately 1.5 to 6.5 feet below existing grades.	6 to 8
0.1 – 20.5	III	**LEAN CLAY (CL) –** Generally consisted of dark gray, yellowish brown, light grayish brown, mottled gray and orangish brown, moist, firm to hard, low to moderate plasticity, silty to very silty LEAN CLAY (CL) with chert, trace organics, weathered shale fragments, weathered sandstone fragments, and some gravel. Encountered in all five (5) of the borings extending approximately 9.5 to 20.5 feet below existing grades.	3 to 35
9.5 – 15.5	IV	**CLAYEY SAND (SC) –** Generally consisted of brown, moist, loose to medium dense, poorly graded, fine grained, silty CLAYEY SAND (SC). Encountered in one (1) of the five (5) borings extending approximately 15.5 feet below existing grades.	5 to 8
10.0 – 20.0	V	**WEATHERED SHALE (WR) –** Generally consisted of dark gray, light gray and brown, slightly moist, highly to completely WEATHERED SHALE (WR). Encountered in two (2) of the five (5) borings extending approximately 20.0 feet below existing grades.	24 to 50+

Notes:
(1) This summary is generalized and does not describe the actual conditions in each boring. These zones also may not occur at each location. Depths are approximate. Detailed descriptions of the encountered materials are listed on the **Geotechnical Borehole Logs** in the **Appendix**.
(2) BPF – Blows per Foot

4.2 LABORATORY TEST SUMMARY

Laboratory testing was performed on selected samples obtained during our field exploration operations. Classification and index property tests were performed on representative samples. The laboratory testing program included:

- Natural Moisture Content
- Atterberg Limits
- Percent Finer than #200 Sieve
- Sieve Analysis

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

SUMMARY OF LABORATORY TEST RESULTS[1]						
STRATUM	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	FINES CONTENT % (SILT and CLAY)	UNIFIED SOIL CLASSIFICATION
I	21.9 %	–	–	–	–	–

SUMMARY OF LABORATORY TEST RESULTS[1]						
STRATUM	**MOISTURE CONTENT (%)**	**LIQUID LIMIT**	**PLASTIC LIMIT**	**PLASTICITY INDEX**	**FINES CONTENT % (SILT and CLAY)**	**UNIFIED SOIL CLASSIFICATION**
II	21.4 – 24.6 %	–	–	–	97.5 – 99.1 %	
III	14.9 – 33.4 %	28 – 46	17 – 23	11 – 24	–	**CL**
IV	21.1 – 23.8 %	–	–	–	–	–
V	13.0 – 17.4 %	50	22	28	–	–

Notes:

(1) A more detailed summary of the laboratory test results is included on the **Geotechnical Borehole Logs** in the **Appendix**. Detailed descriptions of the laboratory test methods are listed in the **Laboratory Procedures** section of the **Appendix**

5.0 GEOTECHNICAL CONCERNS

Analysis of the provided project information, observed site conditions, encountered subsurface conditions, and our past experience with similar projects, revealed the following important geotechnical considerations. These considerations must be properly addressed in planning, budgeting, design, and construction phases to reduce impacts on construction cost, completion schedule, performance of the building and site improvements, and long-term maintenance of the proposed construction. Our recommendations for addressing these concerns are provided in subsequent sections of this report.

5.1 SHALLOW ROCK

- The potential presence of shallow rock has been identified as a concern based on shallow refusal encountered during a previous ECS geotechnical boring and sounding program (issued August 6, 2018; ECS No. 61:1167), as well as reports of shallow rock encountered by others during residential construction to the north of the site along Dawn Drive.
- Borings were strategically advanced in areas where shallow refusal had been encountered during the previous geotechnical exploration in an effort to intercept and core the anticipated shallow rock. However, auger refusal was not encountered at the explored locations, with borings advancing to depths ranging from approximately 15.5 to 20.5 feet.
- Based on information provided by Prodigy Construction and findings from the previous geotechnical investigation, competent, continuous rock may be encountered during foundation excavations at the site, although it is expected to occur only in isolated areas. Rock encountered elsewhere is anticipated to be weathered and generally removable using conventional excavation methods (e.g., an excavator with a standard bucket).
- The shallowest rock encountered on site was at approximately 4.5 feet below existing grades. As such, rock removal is not anticipated within floor slab areas and would likely be limited to foundation excavations. Alternatively, finished floor elevations may be raised to avoid rock removal within the building footprint.
- If continuous, unweathered rock is encountered during foundation excavations, removal with conventional excavation equipment is not expected to be effective. Competent sandstone or siltstone reported to underlie the site will likely require specialized equipment (e.g., a hoe ram) for efficient removal. Shale, however, is expected to be removable using conventional methods.
- Because rock is anticipated primarily along foundation lines rather than for mass excavation, and due to the proximity of existing homes and structures, blasting is not recommended. Rock removal using a hoe ram or similar equipment is advised.
- If blasting is ultimately considered, the potential impacts to adjacent structures, as well as the risks associated with fractured and overbreak rock, must be carefully evaluated.
- The difficulty of rock excavation will vary depending on the selected methods, operator experience, and the equipment utilized.
- The presence of shallow rock may result in variable bearing conditions, which are addressed under a separate section.
- Adjustments to building location, configuration, and finished floor elevations should be evaluated to help mitigate costs associated with shallow rock conditions. In consideration of such variations, the limited number and wide spacing of the soil test borings and

soundings conducted in this exploration for foundation design cannot reliably depict the irregularities of the actual rock present.

- The irregular nature of the rock surface may result in variable bearing conditions, which are discussed in a subsequent section.

5.2 VARIABLE BEARING CONDITIONS

- Soil bearing conditions are expected to predominate across most of the site; however, isolated areas where rock is at or near planned foundation bearing elevations may be encountered.
- Based on available information, continuous, unweathered rock is not anticipated at the planned foundation bearing elevations within the building areas.
- The depth to rock in untested areas may vary significantly from the depths indicated in the borings.
- Supplemental rock soundings are recommended in areas where rock is anticipated. These soundings should be performed after final finished floor and utility trench elevations are established, prior to making final determinations regarding rock at foundation bearing levels. All supplemental soundings should be surveyed to confirm actual ground surface elevations.
- Foundation design should account for the potential presence of varying subsurface materials at bearing elevations and the associated impacts on bearing capacity and settlement.
- Foundations bearing partially on rock and partially on soil are likely to experience differential settlement exceeding typical tolerances.
- Potential mitigation options include:
  - Adjusting building location and/or finished floor elevations to avoid mixed bearing conditions.
  - Extending foundations to bear entirely on rock.
  - Removing rock and replacing it with properly compacted structural fill so that foundations bear on a minimum of 24 inches of suitable soil or controlled fill.
  - Utilizing isolated column footings (bearing on soil or rock) interconnected with grade beams to help reduce differential settlement effects.

5.3 CLAY SHALE & NEW PROVIDENCE SHALE

- Subsurface exploration indicates the site is underlain by clay shale and New Providence Shale, generally described in the Geotechnical Boring Logs (Appendix) as dark gray, light gray, and brown, slightly moist, highly to completely WEATHERED SHALE (WR).
- Clay shale is highly susceptible to degradation and rapidly loses strength when exposed to moisture, often breaking down into a weak, soil-like material.
- Improper placement or inadequate protection of clay shale has been associated with bearing capacity failures, slope instability, excessive settlement, fill compaction difficulties, and poor slab support performance.
- Due to these concerns, reuse of the weathered shale (WR) within building areas is not recommended. Reuse, if any, should be limited to deep fill applications in pavement or undeveloped green areas.

- Based on the encountered subsurface conditions and the anticipated grading plan, clay shale and New Providence Shale will likely be excavated and may be considered for reuse as fill.
- To be suitable for reuse, the shale would require significant processing, including multiple disking and watering cycles to break down the material, along with curing periods to allow adequate moisture absorption.
- Based on our experience, excavation of weathered clay shale in large, open areas can generally be accomplished using heavy equipment (e.g., a D-8 dozer equipped with a ripper). However, excavation in confined areas or trenches may require more intensive rock removal methods.
- Although New Providence Shale is not classified as hard rock, it typically requires specialized excavation techniques, such as repeated passes with heavy equipment fitted with ripping attachments.
- When used as fill, New Providence Shale must be thoroughly processed and broken down through repeated disking and moisture conditioning so it can be placed and compacted as a cohesive, soil-like material rather than as shot rock.
- Certain strata of New Providence Shale exhibit swell potential, which has been known to cause damage to lightly loaded structures, including pavements and floor slabs. Due to this potential for adverse performance, reuse of this material as fill is generally not recommended.
- Where clay shale or New Providence Shale remains in place beneath proposed improvements, a protective clay barrier layer is recommended between the shale and any overlying floor slabs, pavements, or foundations.

5.4 EXISTING FILL

- Existing fill was encountered beneath surface materials in one (1) of the five (5) borings extending approximately 0.5 feet below existing grades. The fill generally consisted of mottled gray and orangish-brown, moist, low plasticity LEAN CLAY (CL) with rock fragments.
- Abandoned concrete pipes were observed scattered across the site, predominantly within the western portion of the site.
- The encountered fill is considered uncontrolled or undocumented, as no records are available regarding documenting its origin, placement, or material quality.
- The presence of uncontrolled fill introduces subsurface uncertainties that may increase construction costs, including the need for foundation systems designed to mitigate associated risks. It should be noted, however, that no fill was encountered in the borings advanced within the existing building areas.
- Potential issues associated with uncontrolled fill include excessive total and differential settlement, collapse of buried debris, and inadequate bearing support, all of which may adversely impact foundation and slab performance.
- If uncontrolled fill is encountered in areas not explored during this investigation, its composition and consistency may differ from that described herein. ECS should be notified if significantly different subsurface conditions are encountered so that appropriate recommendations for removal and/or remediation can be evaluated and revised, as necessary.

5.5 EXISTING UTILITIES

- Existing storm sewer infrastructure was observed along the eastern portion of the site, discharging into the large pond near the site center. Existing sanitary sewer lines were also noted traversing the central portion of the site. Refer to the Appendix for locations and photographs of these features.
- An LG&E natural gas transmission line easement borders the western side of the site. Extreme caution should be exercised when performing construction activities in proximity to this easement. All applicable safety requirements, clearance distances, and construction guidelines established by LG&E for work near high-pressure gas lines should be strictly followed.
- Existing utilities may be susceptible to damage from construction activities or loading imposed by new structures. If abandoned underground utilities are not removed or properly grouted, soil migration into resulting voids (e.g., open pipes) may occur, potentially leading to subsidence of overlying improvements.
- Where existing utility lines are located within proposed construction areas, they may result in variable support conditions due to inconsistent or poorly compacted backfill, which can adversely affect structural performance.
- Backfill associated with existing utilities is often inadequately compacted and may not provide suitable support for new construction. These conditions may contribute to settlement or distress of overlying foundations or slabs. Based on experience, existing utility backfill is generally not considered suitable for direct foundation support.
- In slab-on-grade and pavement areas, the support characteristics of utility backfill can typically be evaluated through proofrolling and subgrade inspection during construction. Localized undercutting and/or bridging of these areas should be anticipated.

5.6 LOW STRENGTH SOILS

- Firm and loose soils (N-values of 3–4 for clays and 5–6 for sands, as indicated on boring logs) were encountered in three (3) of the five (5) borings, generally extending from approximately 5.5 to 10.5 feet below existing grades. Undercutting and/or stabilization of these marginal-strength soils should be expected in areas planned for foundations, floor slabs, and pavements.
- The low strength silty soils encountered in the upper layer readily lose strength, become soft, and exhibit “pumping” under construction equipment in wet conditions. Seasonal weather exposure may require adjustments to moisture content to achieve proper compaction and fill characteristics.
- Low-strength soils at the pavement and foundation subgrades must be undercut or stabilized prior to construction. Additional guidance regarding subgrade improvement is provided in the following subsection.
- The lateral and vertical extent of low-strength soils is generally reduced if earthwork is performed during warmer, drier periods, such as in summer or fall.

5.7 GLACIAL OUTWASH & LOESS

- The site is underlain by deposits composed of interbedded and intermixed clay, silt, sand, and gravel.

- These deposits often contain soft, saturated, poorly consolidated zones that can degrade easily under construction traffic, potentially impacting both design and construction if not properly anticipated.
- The character and consistency of these deposits can vary significantly over short distances, affecting foundation and subgrade performance.
- Design recommendations have been adjusted to account for this natural variability; however, careful and continuous observation of subgrades and foundations during construction will be necessary.
- Construction quality control testing can help identify variations in the materials, assess their impact on foundation performance, and determine if remediation is required.
- The site is specifically underlain by loess deposits, which are wind-deposited soils.
- The apparent strength of these soils is partly derived from natural cementation, which can be easily destroyed by disturbance.
- Disturbance, vibration, or repeated traffic can reduce the strength of once-firm deposits, creating soft, unstable conditions.
- Construction disturbance should be minimized, and traffic should be limited to stabilized haul roads wherever possible.
- ECS strongly recommends active construction monitoring to detect variations affecting subgrade performance and to ensure the recommendations in this report are appropriately applied.

5.8 TREES

- Trees were present across the majority of the site.
- Organic matter, roots, topsoil, and unsuitable soils are associated with trees and vegetative growth.
- Building damage can result if trees and root balls are not properly removed and backfilled or if topsoil depths are not removed during the earthwork operations.
- Fill material that contains significant roots (i.e., more than 3 percent organics as determined by loss-on-ignition testing) is not suitable for use as structural fill.
- It is important to note that the topsoil depths reported for this exploration were based on measurements in specific small-diameter samples, which were representative of that particular location but may not have been representative of all conditions or predominant conditions.
- Stripping in excess of the reported topsoil depths should be expected in some areas, especially areas with past heavy vegetation growth or trees.

5.9 DEGRADABLE SOILS

- Most of the soils on-site are susceptible to degradation. These soils can readily lose strength, become soft, and exhibit “pumping” when subjected to construction equipment, particularly under wet conditions.
- Undercutting and/or stabilization of firm clay and loose sand soils may increase project costs, especially if project documents do not clearly define inadequate soil conditions or assign responsibility for maintaining stabilized soils, or if construction practices allow repeated traffic over unprotected areas.

5.10 REUSE OF ON-SITE SOILS

- In general, most of the on-site soils appeared adequate for reuse as structural fill provided the soils are moisture conditioned to appropriate moisture contents for compaction.
- Some wetting, drying, mixing or chemical treatment of the soils may be necessary to obtain workable moisture contents for the on-site soils, especially during wetter times of the year.
- Reuse of the on-site soils will be subject to the weather considerations described subsequently.

5.11 SUBGRADE IMPROVEMENT

- Subgrade improvement should be anticipated due to the presence of firm and loose soils on site. The depth and extent of improvement required will be heavily dependent on the time of year of construction, the weather preceding site work, and the site work techniques employed.
- The required extent of improvement will depend to a large degree on when earthwork operations take place as well as on how the earthwork contractor prepares the site. The level of improvement likely will increase if:
  - Construction traffic is concentrated along localized unstabilized routes.
  - Earthwork occurs during cool, wet periods (typically November through May).
- Subgrade improvement alternatives, if required, include but are not limited to:
  - Scarification, drying, and recompaction of surface materials.
  - Removal of inadequate materials, including the debris piles and undocumented fill (if encountered), and replacement with Structural Fill.
  - Bridging with a thick lift of limestone aggregate.
- Subgrade improvement for stabilization of areas subject to construction traffic or other problematic areas, may require:
  - Placement of a geosynthetic or geo-grid in combination with granular fill.
  - Chemical stabilization (e.g., kiln dust, lime, or Portland cement).
- Provided construction occurs during the drier time of the year, it would be our expectation that much of the improvement could be achieved by scarifying, drying and recompacting the soils.
- If construction occurs during the wetter periods of the year, alternate remediation may be required (i.e., removal and replacement or chemical treatment).
- Some of the subgrade improvement alternatives provided above are affected by the weather considerations described previously. For example, scarification, drying, and recompaction of surface materials would be difficult during the cool, wet months of the year.

5.12 WEATHER CONSIDERATIONS

- Conducting site work during periods of cool and/or wet weather (typically November to May) can be problematic for sites in the project region.
- Proper compaction of clay fill generally is very difficult to achieve during periods of cool and/or wet weather. Some drying, mixing, or chemical treatment of the soils would be necessary to obtain workable moisture contents for the on-site soils or proposed borrow materials if placed during the cool, wet seasons.

- If compaction of clay fill takes place under wet weather conditions, increased earthwork costs, an extended construction schedule, and soil improvement (likely chemical stabilization) likely would be required. In addition, reuse of the site soils may be severely limited.
- Surface soils tend to be softer during wet weather conditions due to the excess moisture in the near surface soils.
- Weather-softened surface soils tend to result in more undercutting and/or stabilization than would be required during dry weather conditions, which increases site development costs.
- Project specifications should include definitions and require contractors to provide unit rates for subgrade stabilization, removal of inadequate soils, and replacement of inadequate soils with Structural Fill appropriate for use during the anticipated construction season.

6.0 SITE CONSTRUCTION RECOMMENDATIONS

6.1 PLANNING

- Adjust project plans, specifications, schedules and budgets to incorporate the issues discussed in **Section 5.0** and the recommendations provided herein.
- It will be critical that the planning of earthwork operations is carefully considered and executed given the presence of shallow rock, clay shale, New Providence Shale, existing fill, existing utilities, low strength soils, glacial outwash, loess, trees, and degradable soils.
- Findings and recommendations in this report were based on estimated finish floor elevations. As such, ECS should be contacted to provide appropriate values and recommendations for changes to the assumed elevations.

6.2 SUBGRADE PREPARATION

- The following subsections describe our general recommendations for preparing the site subgrade prior to fill placement operations.

Stripping and Grubbing:

- Materials required to be stripped:
  - Topsoil, vegetation, large root zones, organic material, and excessively wet, desiccated, frozen, contaminated, existing fill, debris piles or otherwise inadequate materials.
- Minimum extent of stripping:
  - 10 feet beyond the building limits.
  - 5 feet beyond the pavement limits.
- ECS should observe and document that topsoil and poor surficial materials have been removed prior to the placement of Structural Fill or construction of structures.
- Stripped material not meeting Structural Fill requirements should be considered for reuse in landscaped areas only.

Subgrade Improvement:

- Accommodations for the near surface soils should be expected either via stabilization measures (e.g., undercutting and replacement or lime stabilization), modification to normal construction procedures (e.g., by limiting construction traffic or pumping concrete), or the agreement of risk.
- The construction budget should be adjusted to reflect the adverse subgrade conditions expected in some areas.

Subgrade Evaluation:

- Proofroll the site in the presence of an ECS representative with a pneumatic-tired vehicle (e.g., triaxial dump truck) loaded as recommended by the ECS representative.
- Proofroll subgrades prior to filling or after excavation to grade.
- Proofroll slab and pavement subgrades prior to granular base placement.
- Areas judged by the ECS representative to deflect excessively during proofrolling should be remediated in accordance with ECS recommendations provided at that time.

- Prepare subgrades with a slight slope to maintain surface drainage.

Other Measures:

- Roll subgrade surfaces smooth if rain is expected.
- Slope final subgrades away from the proposed structure.
- Rough grade subgrades high to allow for removal of degraded soil.
- Remove soil frozen or softened by rain.

6.3 STRUCTURAL FILL

Subgrade Requirements:

- Subgrade proofrolled and required improvements completed.

Fill Material Requirements:

- No deleterious debris.
- No rock pieces larger than 3 inches.
- Less than 3% organic material (loss on ignition).
- Maximum dry density of at least 100 pcf according to the Standard Proctor compaction method (ASTM D-698), unless specifically reviewed otherwise by ECS.
- Unified Soil Classifications (USCS): CL, ML, GW, GM, GC, GP, SW, SP, SM, and SC..
- Inadequate USCS classifications: CH, OL, OH, Pt, MH.
- Evaluated and approved by ECS prior to construction.

Fill Placement Guidelines:

- Minimum compaction:
  - 98 % Standard Proctor maximum dry density (ASTM D-698).
- Moisture Content:
  - Within 2 % of optimum (ASTM D-698) if plasticity index less than 30.
- Maximum loose lift thickness: 8 inches.
- Compaction test frequency:
  - One test per lift for each 5,000 square feet of fill placed.
  - Minimum of 3 tests per lift.
- Bench new fill into existing slopes or sidewalls of deep excavations in 1-foot steps or as recommended by ECS at the time of construction.
- Compact and test each lift prior to placing additional lifts.
- Scarify smoothed fill surfaces prior to placing the next lift.
- Maintain positive surface drainage on fill surfaces during placement to avoid ponding of water.
- Roll fill surfaces smooth if rain is expected.
- Rough grade high to allow for removal of degraded surface soils if fill will be exposed to adverse weather conditions.

- Do not place fill on a frozen subgrade. At a minimum, remove frozen material, or allow to thaw and then recompact.

6.4 SHALLOW ROCK

- Drilling equipment refusal was not encountered in this exploration at depths up to 15.5 to 20.5 feet below existing grades. However, based on the previous geotechnical exploration and reports from Prodigy Construction, shallow rock was encountered near the northern portion of the site.
- Based on the rock encountered during this geotechnical exploration, the majority of rock encountered during site excavations will likely be able to be excavated using regular traditional excavation methods (excavator bucket, D8 dozer fitted with ripping tool, etc.). Some isolated areas of continuous, unweathered rock may be encountered, however in the northern portion of the site.
- Differential settlement in excess of typical allowable parameters is likely where foundations are supported concurrently on both rock and soil. Alternatives to address this concern include:
  - Adjust the floor elevation and/or building location to avoid this condition.
  - Assume that soil-bearing conditions will predominate, and create a soil cushion above rock, where necessary to address the shallow rock. To create the soil cushion, remove rock and backfill with compacted clay or manufactured sand fill (gravel is not appropriate for creation of a soil cushion) where necessary, so that foundations bear on at least 24 inches of approved native soil or compacted clay or sand fill.
  - Support the building on isolated column foundations tied together with grade beams designed to reduce the effects of differential settlement. Isolated columns may bear entirely on rock or on soil but not both simultaneously. Adjacent columns may bear entirely on rock or soil.
- Shallow rock should be anticipated in foundation excavations in the northern portion of the site based on past excavation information and past geotechnical explorations.
- The method used to remove the on-site rock, if necessary, should be selected by the contractor. Removal of the on-site rock with conventional excavation equipment is not expected to be effective where continuous, unweathered rock is encountered. The competent rock that may be discovered in the northern portions of the site requires special rock removal equipment (e.g., hoe-ram, etc.) for efficient excavation.
- Blasting is not recommended for use because of the close proximity of the site to existing residential areas, train tracks, and a natural gas high pressure transmission line.

6.5 CLAY SHALE & NEW PROVIDENCE SHALE

- Clay shale and New Providence Shale encountered on site are prone to degradation and swelling when exposed to air and moisture. Due to these characteristics, these materials are not suitable for use as structural fill. Their use should be limited to undeveloped green areas or deep fills beneath pavement sections.
- When used as shallow fill in undeveloped green areas, clay shale should be placed a minimum of 5 feet from pavement limits and 10 feet from building limits.
- If clay shale or New Providence Shale is encountered within foundation or floor slab excavations, it should be overexcavated by at least 12 inches and replaced with a well-compacted clay liner. This liner will act as an impermeable barrier, reducing moisture infiltration into the underlying shale beneath building foundations.

- ECS should be notified to evaluate the presence of shale within foundation and floor slab excavations and to assess the suitability of any material suspected to be shale for reuse.

6.6 SOIL/ROCK FILL MATERIALS

Limitations:

- Mixed soil and rock material generated from rock removal practices should only be used at least two feet below final subgrade in non-critical areas that will not support structures or sensitive road or slope construction.
- The reuse of clay shale or New Providence shale is not recommended as structural fill. This shale should only be used as fill in undeveloped green areas or deep fills in pavement areas. This shale should be placed at least 5 feet from pavement limits and 10 feet form building limits.
- The generation of competent rock is expected to occur in isolated areas in the northern portion of the site. ECS should be requested to evaluate the competence of rock desired to be used as fill at the time of excavation.

Subgrade Requirements:

- Subgrade proofrolled and the required improvements completed.

Soil/Rock Material Requirements:

- The materials should be free of deleterious debris and should contain no particle sizes greater than 16 inches in the largest dimension.
- Moisture content of material passing the No. 4 sieve should be within 3 percent of optimum moisture content for that fraction as determined by Standard Proctor (ASTM D-698).
- No more than 60% should be retained on the No. 4 sieve to improve filling of voids.

Placement Guidelines:

- Soil/rock fill should be pushed into place, not dumped, with the maximum loose lift thickness of 16 inches. Each lift should be compacted using tracked equipment, a large sheepsfoot roller (CAT 815 or equivalent), and hauling equipment.
- Since compaction testing is not feasible, soil/rock fill must be continuously monitored to document the character of the materials placed and compaction procedures.
- Trimming or re-excavation of soil/rock fills damages the fill structure and should be avoided.

6.6 EXISTING FILL

General Comments:

- The recommendations contained in this report assume that the existing fill is uncontrolled fill.
- Structural fill should be placed and compacted in accordance with the recommendations provided in this report.
- Existing uncontrolled fill was encountered in one (1) of the five (5) borings and extended approximately 0.5 feet below existing grades.

Foundations:

- If existing fill is encountered in foundation excavations, the uncontrolled fill is not considered adequate for support of new foundations. Therefore, new foundations should penetrate existing fill to bear on the underlying native stiff soils.
- Based on the assumed bearing elevations, and the conditions encountered in the borings, minimal (i.e., less than 6 inches) undercutting for foundations is anticipated. However, depths of existing fill in unexplored areas may vary.
- The existing fill should be removed and replaced with structural fill as described in this report (**Section 6.3**) or the foundation should be undercut and filled with lean concrete or flowable fill.
- We recommend visual observation, probing, hand augering, and dynamic cone penetrometer tests to be performed by an ECS representative at the time of construction to evaluate the bearing conditions.
- Improvement of the bearing conditions as recommended by ECS based on the results of the evaluations mentioned above will be required. This can include undercut and replacement of the existing fill, where inadequate bearing conditions and poor-quality soils are encountered during construction.

Floor Slabs/Pavements:

- Existing fill may be left in-place below floor slabs and pavements provided the owner is willing to accept the associated risks described in **Section 5.6**.
- If existing fill is left in-place in floor slab and pavement areas and the owner is willing to accept the associated risks, the risks associated with the existing fill in floor slab and pavement areas can be reduced by implementing the following recommendations:
  - Visual observation and proofrolling evaluation of the subgrade by an ECS representative at the time of construction.
  - Improvement of the subgrade as recommended by ECS based on the results of proofrolling and observations.
- The risk in floor slab and pavement areas can be somewhat reduced if the upper 2 feet of existing fill is removed and replaced with structural fill. In pavement areas, a geofabric such as Mirafi HP570, or equivalent, should be placed on the existing fill subgrade before placing the structural fill.
- If the risks associated with the existing fill, as described in a previous section, are not acceptable, the existing fill should be entirely removed and replaced with structural fill.

6.7 EXISTING CONSTRUCTION

General Comments:

- Existing storm sewers were observed on the eastern side of the site and drained into the existing large pond near the center of the site. See the **Appendix** for specific locations and pictures of the structures.
- An LG&E natural gas transmission line easement also bounds the site on the western side. Caution must be used when construction occurs near one of these natural gas transmission lines and it should be ensured that safe distances, safe construction practices, etc. outlined by LG&E when operating near a high pressure natural gas line easement should be followed.

- Recommendations to address existing construction can be affected by many factors, including factors that are not obvious until construction (e.g., removal of some features creates more potential problems and risks than leaving them in-place).
- As such, the recommendations provided below should be considered general guidelines. If modification to the recommendations provided below is needed, ECS should be contacted for guidance.

Utilities:

- Utilities should be relocated as necessary.
- Needed improvements to poor backfill conditions should be identified during construction via proofrolling and surface probing by an ECS representative and remediated in accordance with the recommendations provided by ECS at the time of construction.

6.8 LOW STRENGTH SOILS

- Low strength soils (firm and loose) were encountered below the surface materials in three (3) of the five (5) borings and extended to approximately 5.5 to 10.5 feet below existing grades.
- The design recommendations in this report have been adjusted where possible, to account for the lower strength soils, but the presence of these materials will necessitate more detailed and careful observation of subgrades and foundations during construction.
- We strongly recommend that ECS be involved in construction monitoring to better detect low strength soils that can affect subgrade performance and the recommendations provided in this report.
- Subgrade improvement in floor slab and pavement areas should be anticipated to remediate the upper low strength soils encountered during this subsurface exploration.
- Estimated foundation bearing elevations will likely penetrate low strength soils.

7.0 DESIGN RECOMMENDATIONS

7.1 PLANNING

- Adjust project plans, specifications, schedules, and budgets to incorporate the issues discussed in **Section 5.0 and 6.0** and the recommendations provided herein.
    - Findings and recommendations in this report are based on an assumed finish floor elevation for the proposed building. As such, ECS should be contacted to provide appropriate values and recommendations for changes to the assumed elevations.

7.2 SHALLOW FOUNDATIONS

General Comments:

- Conventional spread continuous wall and isolated column foundations should be adequate for support of the proposed buildings provided the shallow rock, clay shale, New Providence shale, existing fill, existing utilities, low strength soils, glacial outwash, loess, trees, and degradable soils are addressed as recommended in **Section 6.0**.
- Bearing materials should consist of adequate stiff, undisturbed inorganic soils or Structural Fill, flowable fill, or lean concrete.
- Foundation bearing conditions should be carefully evaluated by ECS during construction for the presence of inadequate soil conditions.
- Individual foundations must not bear on soil and rock simultaneously unless they are specifically designed to accommodate the stress concentrations associated with variable bearing conditions.
- Differential settlement should not be a concern if the new foundations are placed entirely on soil or entirely on rock.
- Where a combination of soil and rock are anticipated, use of soil bearing foundations likely will be the most economical option.
- To address the concerns associated with variable bearing concerns, a minimum 24-inch-thick cushion above the rock that can dissipate the stress concentrations and placement of strategically located control joints.
- This may require the removal of some rock to construct the soil cushion. The soil cushion may consist of clay or sand, but not gravel. The cushion should be placed and compacted in accordance with the “Structural Fill” recommendations provided in this report. Alternatively, foundations may be designed as a grade beam to better accommodate the stress concentrations and distribute differential settlements.
- The design of the foundation should utilize the following parameters:

FOUNDATION DESIGN RECOMMENDATIONS		
DESIGN PARAMETER	**CONTINUOUS WALL FOUNDATIONS**	**ISOLATED COLUMN FOUNDATIONS**
Net Allowable Bearing Pressure (Soil-Bearing)(1)	2,000 psf	2,000 psf
Net Allowable Bearing Pressure (Rock-Bearing)	3,000 psf	3,000 psf
Bearing Soil Material	Stiff Low Plasticity Native Soils, Structural Fill, Flowable Fill, or Lean Concrete	Stiff Low Plasticity Native Soils, Structural Fill, Flowable Fill, or Lean Concrete
Minimum Width	18 inches	24 inches
Depth of Foundations Subject to Freezing (below slab or finished grade) (2)	30 inches	30 inches
Depth Foundations Protected from Freezing	12 inches	12 inches
Estimated Total Settlement (Soil-Bearing) (4)	≤ 1 inch	≤ 1 inch
Estimated Total Settlement (Rock-Bearing) (4)	≤ 1/8 inch	≤ 1/8 inch
Estimated Differential Settlement (Soil-Bearing) (4)	≤ ¾ inch along 50 linear feet	≤ ¾ inch between columns
Estimated Differential Settlement (Rock-Bearing) (4)	≤ 1/8 inch along 50 linear feet	≤ 1/8 inch between columns

Notes:

(1) Net allowable bearing pressure is the applied pressure in excess of the surrounding overburden soils above the base of the foundation.

(2) The 2018 Kentucky Building Code requires a minimum foundation embedment depth of 24 inches for foundations subject to freezing in Jefferson County. However, a minimum embedment of 30 inches is common for commercial development in the project region.

(3) The recommended net allowable bearing pressures may be increased 33 percent for transient loading.

(4) The estimated settlement potential is based on the following: empirical guidelines for the project soil types and consistencies; the assumption that ECS will observe and test each foundation excavation during construction; and the provided project information. Actual settlements will depend, in part, on site preparation and conditions at each foundation location.

(5) Existing fills that are tested and observed by ECS may be acceptable if the owner is willing to accept the associated risks in exchange for the associated cost savings.

- Desiccation or disturbance may result in soil voids or cracks adjacent to foundations, reducing passive and uplift resistance. As a result, for these calculations, the upper 2.5 feet of soils should be neglected for passive resistance.
- Ignore passive earth pressure within existing fill materials and if the soil against the sides of the foundations may not be present during the life of the structure (e.g., the soil could be excavated or be subject to erosion).

SOIL PARAMETERS	ESTIMATED VALUE(1)
Coefficient of At-Rest Earth Pressure (K_o) (2)	0.58
Coefficient of Active Earth Pressure (Ka) (2)	0.41
Coefficient of Passive Earth Pressure (K_p) (2)	2.46
Moist Unit Weight of Soil (γ)	125 pcf
Base Shear Adhesion [Concrete on Undisturbed Clay]	325 psf
Coefficient of Friction [Concrete on Clay] (μ)	0.30
Coefficient of Friction [Concrete on Sand] (μ)	0.35
Ceofficient of Friction [Concrete on Rock]	0.35

Notes:
(1) These design parameters do not include factors of safety. Appropriate factors of safety should be included in the designs.
(2) Provided earth pressure coefficients are based on an assumed internal angle of friction (ϕ) of 25 degrees for clay.

Construction Guidelines:

- The bearing conditions of each foundation should be evaluated by ECS at the time of construction to confirm the presence of adequate bearing soils and to provide recommendations for the remediation of poor soils, if present. This evaluation should be performed before the reinforcing steel is placed in the excavations.
- Concrete should be placed the same day the foundations are excavated to reduce degradation of the bearing surface due to exposure. Alternatively, a "mud mat" of lean concrete should be placed to protect the bearing surface.
- Disturbed, degraded or loose material should be removed from the excavation bottoms prior to concrete placement.

7.3 FLOOR SLABS

Recommended Slab Type:

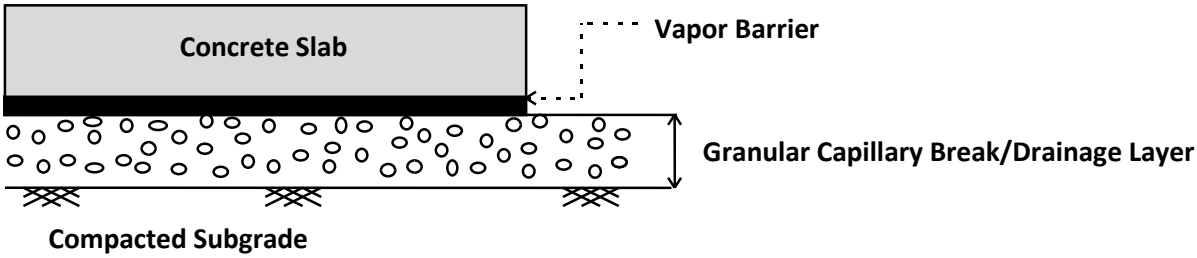
- Grade supported floor slabs

Floor Subgrade Recommendations:

- Prepare subgrade in accordance with recommendations contained within this report.
- The limitations and recommendations associated with shallow rock, clay shale, New Providence shale, existing fill, existing utilities, low strength soils, glacial outwash, loess, trees, and degradable soils are described in more detail in **Section 6.0** and should be carefully understood and incorporated into construction planning.
- Subgrade proofrolled by an ECS representative and required improvements completed.
- Subgrade modulus for slab design in soils not treated with lime: 100 pci.
- Place a minimum of 4 inches of well-graded crushed stone or angular sand base.
- Compact base material in accordance with the structural fill recommendations provided previously.
- Unless specifically approved otherwise, do not support floor slabs directly over open-graded coarse aggregate to avoid loss of concrete, increased concrete cracking during

drying shrinkage, and puncture of the vapor barrier. If coarse aggregate is used as a drainage base, cap the coarse aggregate with a 2-inch (minimum) layer of well-graded aggregate (e.g., KYTC DGA).

- The following graphic depicts our soil-supported slab recommendations:



Notes:

(1) Drainage layer should consist of a minimum of 4 inches of open-graded coarse gravel capped with a minimum 2-inch layer of coarse aggregate with fines (e.g., KYTC DGA).

(2) Subgrade compacted to 98% maximum dry density per ASTM D698.

Construction Guidelines:

- If a vapor barrier will be used, an adequate concrete design mix, placement, finishing, and curing techniques should be employed to reduce the potential for differential slab shrinkage, cracking, and curling.
- Special care must be taken to avoid puncturing the vapor barrier during construction. We recommend utilizing the ACI 302 guidelines for placement of the vapor barrier, manufactured sand layer, and concrete as a function of the construction sequence.
- Drying shrinkage and concrete curing methods frequently causes floor slab cracks. Control joints and saw cuts should be installed in accordance with ACI guidelines to control cracking.
- Slab joints should be doweled or keyed to allow rotation of the slab sections without localized vertical displacement.
- Penetrations of the floor slab by fixed objects, such as drains or piping, restrict shrinkage movement and must be isolated to reduce cracking potential.
- Slab-on-grade floor should be structurally isolated from foundation supported walls.
- Backfill along foundation excavations should be carefully controlled to reduce differential slab settlement.

7.4 SEISMIC DESIGN CONSIDERATIONS

- The 2018 Kentucky Building Code (KBC) requires site classification for seismic design based on the upper 100 feet of a soil profile. According to ASCE/SEI 7-16 Table 20.3-1, referenced in IBC 2015, which is relied on by the KBC, three methods are utilized in classifying sites, namely the shear wave velocity (vs) method, the Standard Penetration Resistance (N-value) method, and the undrained shear strength (s_u). The second method (Standard Penetration Resistance method) was used in classifying this site.

SEISMIC SITE CLASSIFICATION			
Site Class	**Soil Profile Name**	**Shear Wave Velocity, Vs, (ft./s)**	**N value (bpf)**
A	Hard Rock	Vs > 5,000 fps	N/A
B	Rock	2,500 < Vs ≤ 5,000 fps	N/A
C	Very dense soil and soft rock	1,200 < Vs ≤ 2,500 fps	>50
D	Stiff Soil Profile	600 ≤ Vs ≤ 1,200 fps	15 to 50
E	Soft Soil Profile	Vs < 600 fps	<15

- Based upon our interpretation of the subsurface conditions, the appropriate Seismic Site Classification is **"C"** as shown in the preceding table.
- A higher Site Seismic Class may be achievable if a site-specific site seismic study is conducted based on the shallow rock encountered on site.

Ground Motion Parameters:

- In addition to the seismic site classification noted above, ECS has determined the design spectral response acceleration parameters following the International Building Code (IBC) 2015 methodology. The Mapped Reponses were estimated from the OSHPD Seismic Design Map website (http://seismicmaps.org/). The design responses for the short (0.2-sec, S_{DS}) and 1-second period (S_{D1}) are noted at the right end of the following Table:

GROUND MOTION PARAMETERS [IBC 2015 Method]								
Period (sec)	**Mapped Spectral Response Accelerations (g)**		**Values of Site Coefficient for Site Class**		**Maximum Spectral Response Acceleration Adjusted for Site Class (g)**		**Design Spectral Response Acceleration (g)**	
0.2	S_S	0.214	F_a	1.200	$S_{MS}=F_aS_s$	0.257	$S_{DS}=2/3\ S_{MS}$	**0.171**
1.0	S_1	0.109	F_v	1.691	$S_{M1}=F_vS_1$	0.184	$S_{D1}=2/3\ S_{M1}$	**0.123**

- The Site Class definition should not be confused with the Seismic Design Category designation which the Structural Engineer typically assesses.
- The Site Risk Category is estimated to be II.

7.5 FLEXIBLE PAVEMENT DESIGN

- Main driving lanes, parking areas or other locations where heavy vehicle or other equipment will not turn on a tight radius or be parked for extended periods of time.

General Comments:

- The limitations and recommendations associated with shallow rock, clay shale, New Providence shale, existing fill, existing utilities, low strength soils, glacial outwash, loess, trees, and degradable soils are described in more detail in **Sections 5.0 and 6.0** and should be carefully understood and incorporated into construction planning.

- The pavement sections below are guidelines that may or may not comply with local jurisdictional minimums.
- If the traffic loads, Equivalent Single-Axle Loads (ESALs), used in this report differ from the expected traffic loads onsite, ECS should be contacted to modify the pavement design.

FLEXIBLE DESIGN PARAMETERS	
Design Method	AASHTO Guide for Design of Pavement Structures (1993)
Daily Equivalent 18-KIP Axle Loads	7 (Light Duty) 30 (Heavy Duty)
Design Life	20 Years
California Bearing Ratio (CBR)	3 (Estimated) – Soils not treated with lime 10 (Estimated) – Soils treated with lime
Reliability	85%
Terminal Serviceability Index	2.5

RECOMMENDED FLEXIBLE PAVEMENT SECTIONS [1]			
Pavement Section	**Hot Mix Asphalt Wearing Surface**	**Hot Mix Asphalt Binder or Base**	**Granular Base Kentucky DGA**
Light Duty	1½ inches	2 inches	8 inches
Heavy Duty	2 inches	2 inches	10 inches

Notes:

(1) It should be noted that although flexible pavement for the 20-year design period is structurally sound, an asphalt overlay is usually necessary after 7 to 12 years due to normal wear and exposure of the surfacing layer. In general, asphalt pavement should be sealed approximately 3 to 5 years to extend the life of the asphalt.

Subgrade Requirements:

- Prepare subgrade in accordance with recommendations contained within this report.
- Proofroll in the presence of an ECS representative and complete required improvements.
- Pavement subgrades sloped to facilitate drainage.

Drainage Requirements:

- Permit water movement beneath curbs at the subgrade level.
- Design catch basins to include finger drains at the granular base level.

Construction Guidelines

- Pavements should be constructed in accordance with the construction and material guidelines in the most recent edition of the Kentucky Transportation Cabinet's "Standard Specifications for Road and Bridge Construction."
- Granular base should be compacted in accordance with the structural fill recommendations provided in a previous section.

- In-place density, thickness, and gradation tests should be conducted by an ECS representative on the pavement components during construction to confirm compliance with project specifications.

7.7 RIGID PAVEMENT DESIGN

Application:

- Rigid pavements are adequate wherever flexible pavements can be used. Rigid pavements often provide better service for dumpster aprons, entranceways, or other areas where heavy trucks will turn on a tight radius or be parked for extended periods of time.

General Comments:

- The limitations and recommendations associated with shallow rock, clay shale, New Providence shale, existing fill, existing utilities, low strength soils, glacial outwash, loess, trees, and degradable soils are described in more detail in **Sections 5.0 and 6.0** and should be carefully understood and incorporated into construction planning.
- The pavement sections below are guidelines that may or may not comply with local jurisdictional minimums.

RIGID PAVEMENT DESIGN PARAMETERS	
Design Method	ACI Guide for the Design and Construction of Concrete Parking Lots (ACI 330R-08)
Traffic Category	A (Light Duty): Car Parking Areas and Access Lanes (ADTT=10) C (Heavy Duty): Entrance and Exterior Lanes (ADTT=100)
Design Life	20 Years
California Bearing Ratio (CBR)	3 (Estimated) – Soils not treated with lime 10 (Estimated) – Soils treated with lime
Effective Subgrade Modulus	100 pci
Concrete Modulus of Rupture	550 psi

RECOMMENDED RIGID PAVEMENT SECTIONS – UNTREATED SOILS		
Pavement Section	**Portland Cement Concrete**	**Granular Base Kentucky DGA**
Light Duty	5 inches	6 inches
Heavy Duty	6½ inches	7 inches

Subgrade Requirements:

- Prepare subgrade in accordance with recommendations contained within this report.
- Proofroll in the presence of an ECS representative and complete required improvements.
- Pavement subgrades sloped to facilitate drainage.

Drainage Requirements:

- Permit water movement beneath curbs at the subgrade level.
- Design catch basins to include finger drains at the granular base level.

Concrete Recommendations:

- 4,000 pounds per square inch (psi) minimum 28-day compressive strength.
- 4 to 6 percent entrained air.
- Proper joint spacing to control shrinkage cracking.
- Dowels at construction joints to properly transfer loads between pavement sections.
- Control joints where concrete pavement abuts fixed structures or protrusions.

8.0 CLOSING

There are certain limitations inherent to geotechnical explorations and reports. These limitations are discussed below and in the **GBA "Important Information About Your Geotechnical Engineering Report"** in the Appendix. They should be fully considered prior to using the recommendations in this report.

Our geotechnical exploration identified the subsurface conditions that existed only at the locations and times that the borings were advanced. Given the natural variable characteristics of soil and rock, conditions may vary over short distances, change with time, or be affected by natural events, such as floods or earthquakes, or by human activity, such as past land use or new construction. As such, the information generated during our geotechnical exploration may not be representative of the entire conditions that may exist on the project site now or in the future. We use our professional judgment to render an opinion about the subsurface conditions that may exist in the areas of the site not specifically tested during our exploration based on our review of available field and laboratory data and our past experience with similar subsurface conditions. However, the subsurface conditions encountered during construction may vary from the assumed conditions. Variations in the subsurface conditions between our borings and in unexplored areas of the site could affect our interpretations. Thus, it is important to retain ECS to provide construction monitoring services based on our involvement in the project, our knowledge about the site, and our knowledge relating to the assumptions and recommendations contained within this report.

The recommendations contained within this report are dependent on many factors, including, but not limited to, the project information provided by others and the specific conditions encountered during our exploration. If the project information contained within this report is incorrect or changed at a later date or if the location or nature of the structures or facility components changes, ECS should be notified and given the chance to assess the impact of the changes. We cannot and do not consent to responsibility or liability for problems that occur because we were not given the opportunity to properly assess changes to the project. The recommendations contained in this report must not be considered valid unless our firm reviews such changes and required modifications to our recommendations are verified in writing.

Our recommendations are dependent on several factors including, but not limited to, our review of project drawings and specifications prior to construction and observation of actual conditions during construction, including providing the required Special Inspections. We strongly recommend that ECS be retained to review pertinent portions of the project plans and specifications.

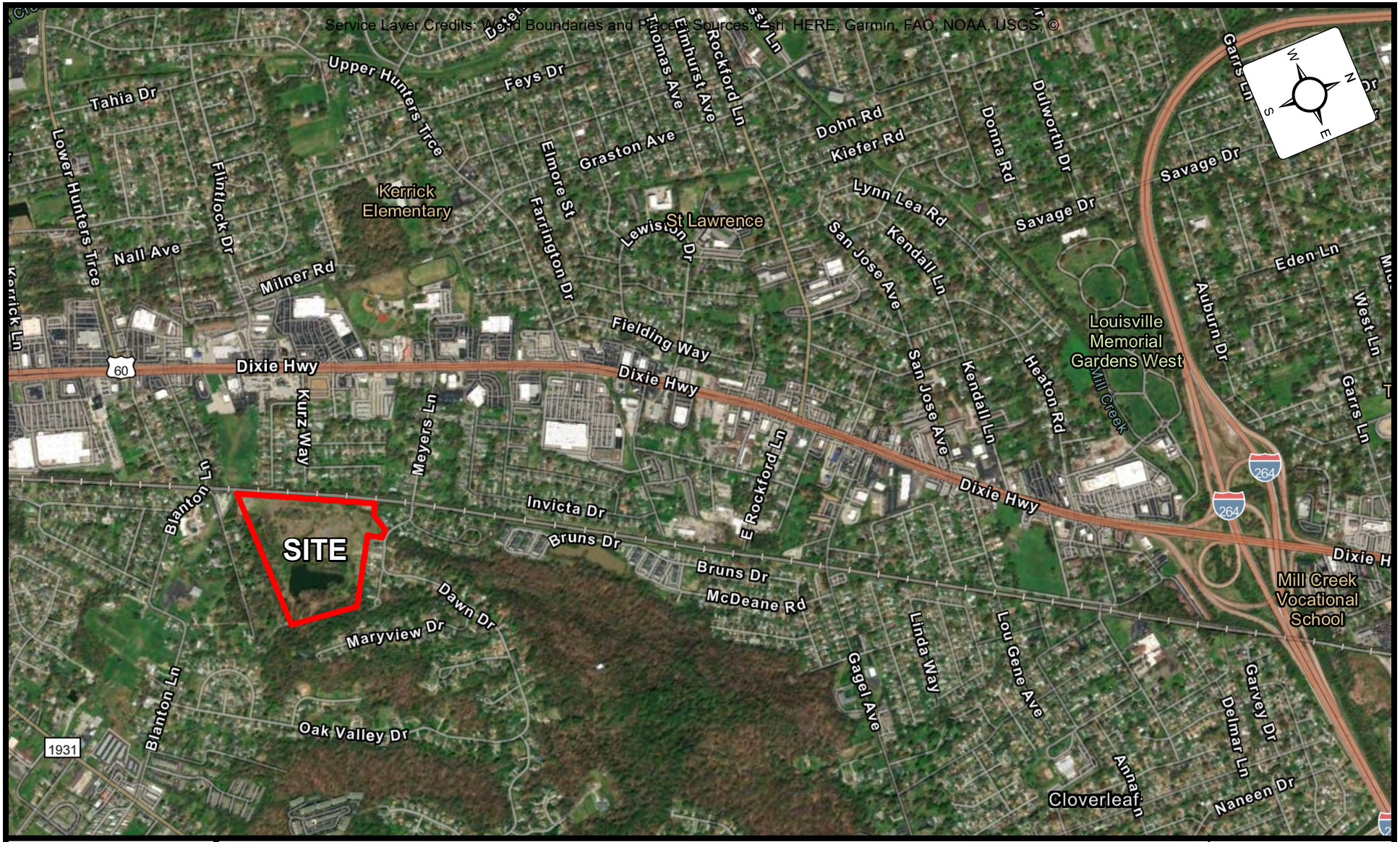
This report should be reproduced in its entirety only. Portions of this report should not be separated and used by others. It should be noted that this report was not prepared for the purpose of bid development and should not be used as such.

This geotechnical report is unique and was based on client needs and project requirements for the specific project described in this report. As such, no one other than who the report was intended and prepared for should rely on this report or the information contained within the report without first consulting with ECS. This report is not valid for any purpose or project except as described in this report.

This report and our recommendations were prepared using the generally accepted standards of geotechnical engineers practicing in this region. No warranty is express or implied.

APPENDIX A – Drawings

Site Location Diagram
Boring Location Diagram

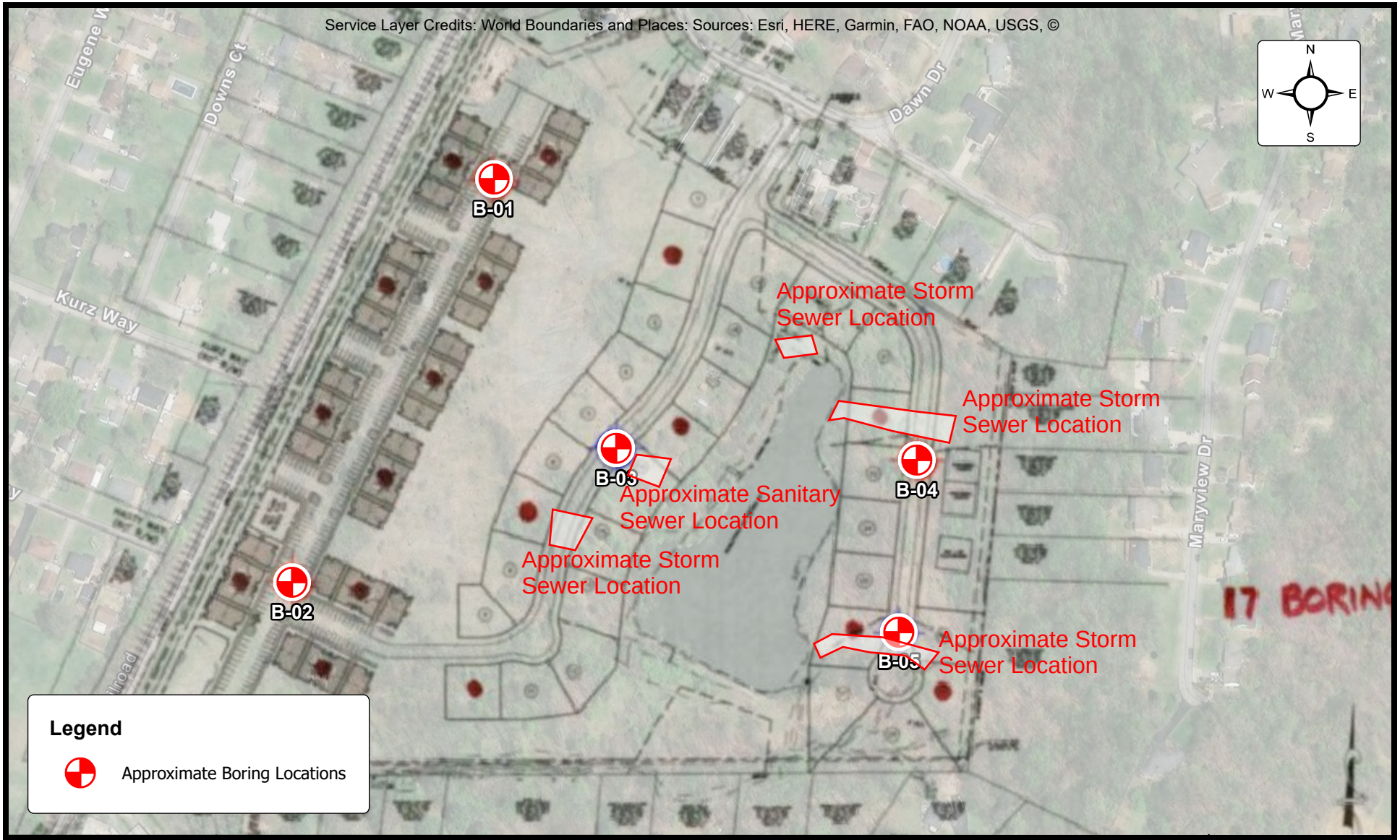


SITE LOCATION DIAGRAM

Oak Pointe Apartments

160 Kurz Way, Louisville, Kentucky
Prodigy Construction Corporation

ENGINEER	D. Diemer
SCALE	1" = 1500'
PROJECT NO.	61:3494
SHEET	
DATE	3/2/2026



BORING LOCATION DIAGRAM

Oak Pointe Apartments

160 Kurz Way, Louisville, Kentucky
Prodigy Construction Corporation

ENGINEER	D. Diemer
SCALE	1" = 250'
PROJECT NO.	61:3494
SHEET	
DATE	3/2/2026

APPENDIX B – Field Operations

Refence Notes for Boring Logs
Geotechnical Boring Logs
Generalized Subsurface Cross Sections
Storm Sewer Photos
Field Procedures

REFERENCE NOTES FOR BORING LOGS

MATERIAL[1,2]

	ASPHALT	
	CONCRETE	
	GRAVEL	
	TOPSOIL	
	VOID	
	BRICK	
	AGGREGATE BASE COURSE	
GW	WELL-GRADED GRAVEL	gravel-sand mixtures, little or no fines
GP	POORLY-GRADED GRAVEL	gravel-sand mixtures, little or no fines
GM	SILTY GRAVEL	gravel-sand-silt mixtures
GC	CLAYEY GRAVEL	gravel-sand-clay mixtures
SW	WELL-GRADED SAND	gravelly sand, little or no fines
SP	POORLY-GRADED SAND	gravelly sand, little or no fines
SM	SM SILTY SAND	sand-silt mixtures
SC	CLAYEY SAND	sand-clay mixtures
ML	SILT	non-plastic to medium plasticity
MH	ELASTIC SILT	high plasticity
CL	LEAN CLAY	low to medium plasticity
CH	FAT CLAY	high plasticity
OL	ORGANIC SILT or CLAY	non-plastic to low plasticity
OH	ORGANIC SILT or CLAY	high plasticity
PT	PEAT	highly organic soils

DRILLING SAMPLING SYMBOLS & ABBREVIATIONS

SS	Split Spoon Sampler	PM	Pressuremeter Test
ST	Shelby Tube Sampler	RD	Rock Bit Drilling
WS	Wash Sample	RC	Rock Core, NX, BX, AX
BS	Bulk Sample of Cuttings	REC	Rock Sample Recovery %
PA	Power Auger (no sample)	RQD	Rock Quality Designation %
HSA	Hollow Stem Auger		

PARTICLE SIZE IDENTIFICATION

DESIGNATION		PARTICLE SIZES
Boulders		12 inches (300 mm) or larger
Cobbles		3 inches to 12 inches (75 mm to 300 mm)
Gravel:	Coarse	¾ inch to 3 inches (19 mm to 75 mm)
	Fine	4.75 mm to 19 mm (No. 4 sieve to ¾ inch)
Sand:	Coarse	2.00 mm to 4.75 mm (No. 10 to No. 4 sieve)
	Medium	0.425 mm to 2.00 mm (No. 40 to No. 10 sieve)
	Fine	0.074 mm to 0.425 mm (No. 200 to No. 40 sieve)
Silt & Clay ("Fines")		<0.074 mm (smaller than a No. 200 sieve)

COHESIVE SILTS & CLAYS

UNCONFINED COMPRESSIVE STRENGTH, Q_P[4]	SPT[5] (BPF)	CONSISTENCY[7] (COHESIVE)
<0.25	<3	Very Soft
0.25 - <0.50	3 - 4	Soft
0.50 - <1.00	5 - 8	Firm
1.00 - <2.00	9 - 15	Stiff
2.00 - <4.00	16 - 30	Very Stiff
4.00 - 8.00	31 - 50	Hard
>8.00	>50	Very Hard

GRAVELS, SANDS & NON-COHESIVE SILTS

SPT[5]	DENSITY
<5	Very Loose
5 - 10	Loose
11 - 30	Medium Dense
31 - 50	Dense
>50	Very Dense

RELATIVE AMOUNT[7]	COARSE GRAINED (%)[8]	FINE GRAINED (%)[8]
Trace	≤5	≤5
With	10 - 20	10 - 25
Adjective *(ex: "Silty")*	25 - 45	30 - 45

WATER LEVELS[6]

- WL (First Encountered)
- WL (Completion)
- WL (Seasonal High Water)
- WL (Stabilized)

FILL AND ROCK

FILL | POSSIBLE FILL | PROBABLE FILL | ROCK

[1]Classifications and symbols per ASTM D 2488-17 (Visual-Manual Procedure) unless noted otherwise.

[2]To be consistent with general practice, "POORLY GRADED" has been removed from GP, GP-GM, GP-GC, SP, SP-SM, SP-SC soil types on the boring logs.

[3]Non-ASTM designations are included in soil descriptions and symbols along with ASTM symbol [Ex: (SM-FILL)].

[4]Typically estimated via pocket penetrometer or Torvane shear test and expressed in tons per square foot (tsf).

[5]Standard Penetration Test (SPT) refers to the number of hammer blows (blow count) of a 140 lb. hammer falling 30 inches on a 2 inch OD split spoon sampler required to drive the sampler 12 inches (ASTM D 1586). "N-value" is another term for "blow count" and is expressed in blows per foot (bpf). SPT correlations per 7.4.2 Method B and need to be corrected if using an auto hammer.

[6]The water levels are those levels actually measured in the borehole at the times indicated by the symbol. The measurements are relatively reliable when augering, without adding fluids, in granular soils. In clay and cohesive silts, the determination of water levels may require several days for the water level to stabilize. In such cases, additional methods of measurement are generally employed.

[7]Minor deviation from ASTM D 2488-17 Note 14.

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

CLIENT:	PROJECT NO.:	BORING NO.:	SHEET:
Prodigy Construction Corporation	**61:3494**	**B-01**	**1 OF 1**
PROJECT NAME: **Oak Pointe Apartments**	DRILLER/CONTRACTOR: **Mathes Drilling Services LLC**		
SITE LOCATION: **160 Kurz Way, Louisville, Kentucky, 40216**			LOSS OF CIRCULATION
LATITUDE: **38.160924**	LONGITUDE: **-85.82637**	STRUCTURE:	SURFACE ELEVATION: **487**	BOTTOM OF CASING

DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DISTANCE	SAMPLE RECOVERY (IN)	DESCRIPTION OF MATERIAL	STRATIGRAPHY	ELEVATION (FT)	WATER LEVELS	BLOWS/6" (TCP/MC/SPT N-VALUE)	LIQUID LIMIT	PLASTICITY INDEX	MOISTUE CONTENT (%)	QP (TSF)	FINES CONTENT	DRY UNIT WEIGHT (PCF)	COMPRESSIVE STR. (TSF)
	S-1	SS	18	8	Topsoil [Thickness=1"]. (CL) LEAN CLAY - dark gray and mottled gray and orangish brown, moist, stiff to very stiff, low plasticity, silty to very silty, with weathered shale and sandstone fragments.		485		1-2-4 (6)			19.4				
	S-2	SS	18	6					5-5-5 (10)			17.2				
5	S-3	SS	18	8					4-6-8 (14)	46	23	14.9				
	S-4	SS	18	18			480		3-5-9 (14)			17.0				
10	S-5	SS	18	18			475		6-7-9 (16)			19.6				
15	S-6	SS	18	12	(WR) WEATHERED ROCK SAMPLED AS dark gray, [WEATHERED SHALE] slightly moist, highly to completely weathered.		470		6-10-14 (24)			17.4				
					END OF BORING at 20.0 FT											

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

WL (First Encountered):	BORING STARTED: 02/26/2026	CAVE IN DEPTH: Not Observed
WL (Completion): DRY	BORING COMPLETED: 02/26/2026	HAMMER TYPE: Automatic
WL (Seasonal High Water):	EQUIPMENT: Moble B53 / LOGGED BY: Denis Diem	DRILLING METHOD: Solid Stem Auger (0'-20')
WL (Stabilized):		

GEOTECHNICAL BOREHOLE LOG

CLIENT: **Prodigy Construction Corporation**	PROJECT NO.: **61:3494**	BORING NO.: **B-02**	SHEET: **1 OF 1**
PROJECT NAME: **Oak Pointe Apartments**	DRILLER/CONTRACTOR: **Mathes Drilling Services LLC**		
SITE LOCATION: **160 Kurz Way, Louisville, Kentucky, 40216**			LOSS OF CIRCULATION
LATITUDE: **38.158914**	LONGITUDE: **-85.82759**	STRUCTURE:	SURFACE ELEVATION: **478**	BOTTOM OF CASING

DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DISTANCE	SAMPLE RECOVERY (IN)	DESCRIPTION OF MATERIAL	STRATIGRAPHY	ELEVATION (FT)	WATER LEVELS	BLOWS/6" (TCP/MC/SPT N-VALUE)	Rec % / RQD % / SPT / TCP / ModCal	LIQUID LIMIT	PLASTICITY INDEX	MOISTUE CONTENT (%)	QP (TSF)	FINES CONTENT	DRY UNIT WEIGHT (PCF)	COMPRESSIVE STR. (TSF)
	S-7	SS	18	6	Topsoil [Thickness=1"]. (CL) LEAN CLAY - dark gray and mottled gray and orangish brown, moist, stiff, low to moderate plasticity, very silty, sandy, with shale and some gravel.				3-3-3 (6)				18.2				
	S-8	SS	18	5			475		2-3-5 (8)				16.9				
5	S-9	SS	18	12					2-3-3 (6)		31	14	19.5				
	S-10	SS	18	3			470		2-3-2 (5)				18.1				
10	S-11	SS	18	10	(SC) CLAYEY SAND - brown, moist, loose to medium dense, poorly graded, fine grained, silty.		465		3-2-3 (5)				23.8				
15	S-12	SS	18	18			463		3-4-4 (8)				21.1				
					END OF BORING at 15.5 FT												

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

WL (First Encountered):	BORING STARTED: 02/26/2026	CAVE IN DEPTH: Not Observed
WL (Completion): DRY	BORING COMPLETED: 02/26/2026	HAMMER TYPE: Automatic
WL (Seasonal High Water):	EQUIPMENT: Moble B53 / LOGGED BY: Denis Diem	DRILLING METHOD: Solid Stem Auger (0'-15.5')
WL (Stabilized):		

GEOTECHNICAL BOREHOLE LOG

CLIENT: **Prodigy Construction Corporation**	PROJECT NO.: **61:3494**	BORING NO.: **B-03**	SHEET: **1 OF 1**
PROJECT NAME: **Oak Pointe Apartments**	DRILLER/CONTRACTOR: **Mathes Drilling Services LLC**		
SITE LOCATION: **160 Kurz Way, Louisville, Kentucky, 40216**			LOSS OF CIRCULATION
LATITUDE: **38.159604**	LONGITUDE: **-85.825573**	STRUCTURE:	SURFACE ELEVATION: **523**	BOTTOM OF CASING

DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DISTANCE	SAMPLE RECOVERY (IN)	DESCRIPTION OF MATERIAL	STRATIGRAPHY	ELEVATION (FT)	WATER LEVELS	BLOWS/6" (TCP/MC/SPT N-VALUE)	LIQUID LIMIT	PLASTICITY INDEX	MOISTUE CONTENT (%)	QP (TSF)	FINES CONTENT	DRY UNIT WEIGHT (PCF)	COMPRESSIVE STR. (TSF)
	S-13	SS	18	18	Topsoil [Thickness=4"]. (ML) SILT - brown, moist, stiff, low plasticity, clayey with trace sand.				1-4-4 (8)			22.4		98.3		
	S-14	SS	18	18					1-3-4 (7)			19.4				
					(CL) LEAN CLAY - light grayish brown and mottled gray and orangish brown, moist, stiff to hard, low plasticity, very silty, with trace organics and weathered shale and sandstone fragments.		520									
5	S-15	SS	18	18					2-4-6 (10)	28	11	17.7				
	S-16	SS	18	18					3-7-12 (19)			18.1				
							515									
10	S-17	SS	17	17					10-13-50/5" (50)			15.9				
					(WR) WEATHERED ROCK SAMPLED AS light gray and brown, [WEATHERED SHALE] slightly moist, highly to completely weathered.		510									
	S-18	SS	11	11					11-50/5" (50)	50	28	13.0				
15																
							505									
					END OF BORING at 20.0 FT											

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

WL (First Encountered):	BORING STARTED: 02/26/2026	CAVE IN DEPTH: Not Observed
WL (Completion): DRY	BORING COMPLETED: 02/26/2026	HAMMER TYPE: Automatic
WL (Seasonal High Water):	EQUIPMENT: Moble B53 / LOGGED BY: Denis Diem	DRILLING METHOD: Solid Stem Auger (0'-20')
WL (Stabilized):		

GEOTECHNICAL BOREHOLE LOG

CLIENT: **Prodigy Construction Corporation**	PROJECT NO.: **61:3494**	BORING NO.: **B-04**	SHEET: **1 OF 1**
PROJECT NAME: **Oak Pointe Apartments**	DRILLER/CONTRACTOR: **Mathes Drilling Services LLC**		
SITE LOCATION: **160 Kurz Way, Louisville, Kentucky, 40216**			LOSS OF CIRCULATION
LATITUDE: **38.15957**	LONGITUDE: **-85.82369**	STRUCTURE:	SURFACE ELEVATION: **532**	BOTTOM OF CASING

DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DISTANCE	SAMPLE RECOVERY (IN)	DESCRIPTION OF MATERIAL	STRATIGRAPHY	ELEVATION (FT)	WATER LEVELS	BLOWS/6" (TCP/MC/SPT N-VALUE)	LIQUID LIMIT	PLASTICITY INDEX	MOISTUE CONTENT (%)	QP (TSF)	FINES CONTENT	DRY UNIT WEIGHT (PCF)	COMPRESSIVE STR. (TSF)
	S-19	SS	18	6	Topsoil [Thickness=1"]. FILL - (CL) LEAN CLAY - mottled gray and orangish brown, moist, low plasticity, with rock fragments.				1-2-6 (8)			21.9				
	S-20	SS	18	6			530		5-4-4 (8)			33.4				
5	S-21	SS	18	12	(CL) LEAN CLAY - mottled gray and orangish brown, moist, firm to very stiff, low to moderate plasticity, very silty, sandy, with trace organics, chert, and weathered sandstone.				1-1-2 (3)	41	24	26.3				
	S-22	SS	18	14			525		2-2-4 (6)			19.0				
10	S-23	SS	18	6					7-7-9 (16)	34	11	23.7				
							520									
15	S-24	SS	18	10			517		6-9-9 (18)			18.2				
					END OF BORING at 15.5 FT											

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

WL (First Encountered):	BORING STARTED: 02/26/2026		CAVE IN DEPTH: Not Observed
WL (Completion): DRY	BORING COMPLETED: 02/26/2026		HAMMER TYPE: Automatic
WL (Seasonal High Water):	EQUIPMENT:	LOGGED BY:	DRILLING METHOD: Solid Stem Auger (0'-15.5')
WL (Stabilized):	Moble B53	Denis Diem	

GEOTECHNICAL BOREHOLE LOG

CLIENT: **Prodigy Construction Corporation**	PROJECT NO.: **61:3494**	BORING NO.: **B-05**	SHEET: **1 OF 1**
PROJECT NAME: **Oak Pointe Apartments**	DRILLER/CONTRACTOR: **Mathes Drilling Services LLC**		
SITE LOCATION: **160 Kurz Way, Louisville, Kentucky, 40216**			LOSS OF CIRCULATION
LATITUDE: **38.15872**	LONGITUDE: **-85.823784**	STRUCTURE:	SURFACE ELEVATION: **539**	BOTTOM OF CASING

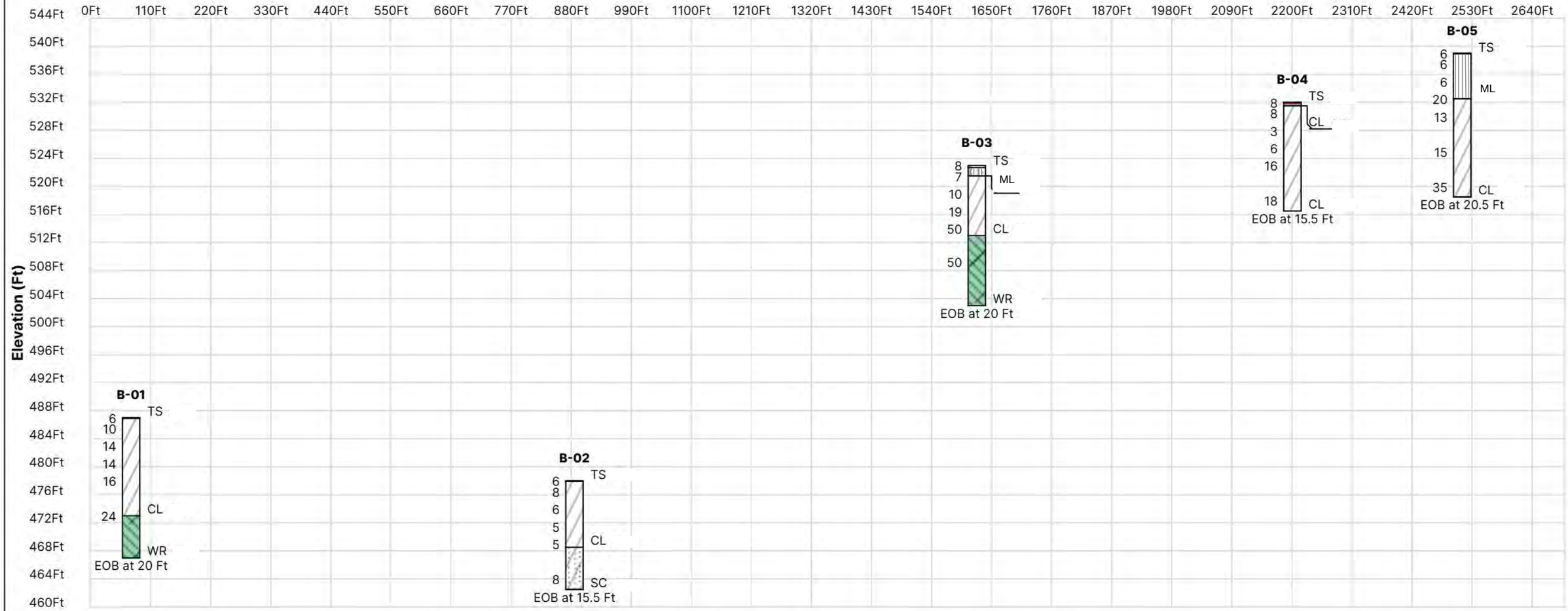
DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DISTANCE	SAMPLE RECOVERY (IN)	DESCRIPTION OF MATERIAL	STRATIGRAPHY	ELEVATION (FT)	WATER LEVELS	BLOWS/6" (TCP/MC/SPT N-VALUE)	LIQUID LIMIT	PLASTICITY INDEX	MOISTUE CONTENT (%)	QP (TSF)	FINES CONTENT	DRY UNIT WEIGHT (PCF)	COMPRESSIVE STR. (TSF)
	S-25	SS	18	4	Topsoil [Thickness=1"]. (ML) SILT - brown and orangish brown, moist, stiff, low plasticity, clayey, with trace sand.				1-2-4 (6)			24.6				
	S-26	SS	18	8					2-2-4 (6)			21.4		99.1		
							535									
5	S-27	SS	18	18					2-3-3 (6)			22.8		97.5		
	S-28	SS	18	10	(CL) LEAN CLAY - light grayish brown and yellowish brown, moist, very stiff to hard, low to moderate plasticity, very silty, sandy, with weathered sandstone and shale.				4-8-12 (20)	37	19	21.3				
							530									
10	S-29	SS	18	18					3-5-8 (13)			20.9				
							525									
15	S-30	SS	18	18					3-6-9 (15)			22.1				
							520									
20				18			519		13-19-16 (35)							
					END OF BORING at 20.5 FT											

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

WL (First Encountered):	BORING STARTED: 02/26/2026	CAVE IN DEPTH: Not Observed
WL (Completion): DRY	BORING COMPLETED: 02/26/2026	HAMMER TYPE: Automatic
WL (Seasonal High Water):	EQUIPMENT: Moble B53 / LOGGED BY: Denis Diem	DRILLING METHOD: Solid Stem Auger (0'-20.5')
WL (Stabilized):		

GEOTECHNICAL BOREHOLE LOG

Generalized Subsurface Cross Section 3494



CLIENT:	Prodigy Construction Corporation	PROJECT:	Oak Pointe Apartments
DRAWN DATE:	Mar 02, 2026	PROJECT NO.:	61:3494
CHECKED DATE:	Mar 02, 2026	SCALE:	AS SHOWN

Notes:
1-EOB: END OF BORING AR: AUGER REFUSALSR: SAMPLER REFUSAL
2-SEE INDIVIDUAL BORING LOG AND GEOTECHNICAL INFORMATION.
3-STANDARD PENETRATION TEST RESISTANCE (LEFT OF BORING) IN BLOWS PER FOOT (ASTM D1586).
4- TOPOGRAPHIC INFORMATION IS BASED ON PUBLICLY AVAILABLE DATA (GOOGLE OR CESIUM).THE TOPOGRAPHIC LINE SHOWN BETWEEN BORINGS IS FOR VISUAL REFERENCE ONLY.PLEASE REFER TO THE REFERENCE NOTES FOR BORING LOGS FOR SYMBOLOGY MEANING AND ADDITIONAL

Plastic Limit Water Content Liquid Limit X——●——△		▽	WL (First Encountered)
[FINES CONTENT %]		▼	WL (Completion)
▰	BOTTOM OF CASING	▼	WL (Estimated Seasonal High Water)
100%	LOSS OF CIRCULATION	▽	WL (Stabilized)
○	CALIBRATED PENETROMETER		

	Fill
	Possible Fill
	Probable Fill
	WR/Rock

Oak Pointe Apartments – Site Photos

South Central Sanitary Sewer

North Central Sanitary Sewer

North Central Storm Sewer

Northeastern Storm Sewer

Northeastern Storm Sewer

Northeastern Storm Sewer

Northeastern Storm Sewer Outlet

Southern Storm Sewer

Southern Storm Sewer

Southern Storm Sewer

Field Procedures

General

ECS conducts field sampling and testing procedures in general accordance with methods of the American Society for Testing Materials (ASTM) and widely accepted geotechnical engineering standards. A brief description of the procedures we utilize is provided in the following paragraphs.

Soil Borings (ASTM D-1452)

Soil borings are made with hollow stem augers or continuous augers which are mechanically advanced by a powered drill rig. At selected depths, soil samples are obtained with either a split-barrel sampler or a thin wall tube sampler. Soil borings are advanced to refusal, or to maximum depths as defined in our scope of work. The boring data, including sampling intervals, penetration resistances, soil classifications, and groundwater observations, are presented on the attached Boring Records.

Boring Locations and Elevations

Boring locations typically are selected by our project manager. The project manager establishes the boring locations in the field by pacing or measuring distances and estimating angles relative to existing site landmarks. When topographic plans of the site are provided, the project manager estimates the surface elevation of the boring locations using available information. Surveying to determine the locations and elevations of the borings is beyond the scope of typical geotechnical studies; therefore, the boring locations and elevations should be considered approximate.

Standard Penetration Test (SPT) Split-Barrel Samples (ASTM D-1586)

A split-barrel or "split spoon" is inserted into the borehole to obtain soil samples. The sampler is driven three, 6-inch increments with a 140-pound hammer falling from a height of 30 inches. The "standard penetration resistance" or "N-value" is the number of hammer blows required to drive the sampler the final 12 inches. The N-value, when properly evaluated, is an index of soil strength and/or density. Upon completion of each standard penetration test, the sampler is brought to the surface and the tube is opened to expose the recovered soil. Our project manager examines the sample, records the soil description and other pertinent information, and places a representative portion of the soil into a sealed container for transportation to our laboratory.

Water Level Readings

Water level readings are taken in each borehole upon the completion of drilling or excavation. In low permeability soils, such as silts and clays, the water level in the boreholes may take many hours to stabilize. Groundwater levels may be dependent upon recent rainfall activity and other site-specific factors. Since these conditions may change with time, the water level information presented on the Boring Records represents the conditions only at the time each measurement was taken.

Boring Records

Our interpretation of the conditions encountered at each location is indicated on the Boring Records, which are prepared from the observations of the ECS field engineer or geologist during drilling or excavation, our engineering review of the soil samples obtained, the results of laboratory testing on selected samples, and our experience with similar subsurface conditions. Soil descriptions are made using the Unified Soil Classification System and/or ASTM D-2488 as guides. The depths designating strata changes are estimations and only representative of depths at that specific boring location. In many geologic settings, the transition between strata is gradual. A Boring Legend, which defines the symbols and other pertinent information presented on the Boring Records, is provided with this report. The subsurface conditions indicated on our Boring Records represent only the conditions encountered at the specific boring location at the time of our exploration. The groundwater

observations were made at the time of drilling and may vary with changes in the season and weather.

Refusal

Refusal is the term applied to material that cannot be penetrated with augers or has a standard penetration resistance exceeding 50 blows per 6-inch increment. Refusal may be encountered on continuous bedrock, discontinuous floaters, cemented soil, weathered rock, debris, buried structures, or other hard subsurface materials. Refusal materials can be evaluated only by obtaining a core of the material. This limitation must be considered when evaluating refusal depths where coring is not conducted.

APPENDIX C – Procedures

Laboratory Results
Laboratory Procedures

Laboratory Testing Summary

Sample Location	Sample Number	Depth (ft)	^MC (%)	Soil Type	Atterberg Limits			**Percent Passing No. 200 Sieve	Moisture - Density		CBR (%)		#Organic Content (%)
					LL	PL	PI		<Maximum Density (pcf)	<Optimum Moisture (%)	0.1 in.	0.2 in.	
B-01	S-1	0.0-1.5	19.4										
B-01	S-2	1.5-3.0	17.2										
B-01	S-3	4.0-5.5	14.9		46	23	23						
B-01	S-4	6.5-8.0	17.0										
B-01	S-5	9.0-10.5	19.6										
B-01	S-6	14.0-15.5	17.4										
B-02	S-7	0.0-1.5	18.2										
B-02	S-8	1.5-3.0	16.9										
B-02	S-9	4.0-5.5	19.5		31	17	14						
B-02	S-10	6.5-8.0	18.1										

Notes: See test reports for test method, ^ASTM D2216-19, *ASTM D2488, **ASTM D1140-17, #ASTM D2974-20e1 < See test report for D4718 corrected values

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

Project: Oak Pointe Apartments
Client: Prodigy Construction Corporation

Project No.: 61:3494
Date Reported: 3/19/2026

Office / Lab	Address	Office Number / Fax
ECS Southeast LLC - Louisville	1762 Watterson Trail Louisville, KY 40299	(502)493-7100 (502)493-8190

Tested by	Checked by	Approved by	Date Received
AshleyB		DFBurke	

Laboratory Testing Summary

Sample Location	Sample Number	Depth (ft)	^MC (%)	Soil Type	Atterberg Limits			**Percent Passing No. 200 Sieve	Moisture - Density		CBR (%)		#Organic Content (%)
					LL	PL	PI		<Maximum Density (pcf)	<Optimum Moisture (%)	0.1 in.	0.2 in.	
B-02	S-11	9.0-10.5	23.8										
B-02	S-12	14.0-15.5	21.1										
B-03	S-13	0.0-1.5	22.4					98.3					
B-03	S-14	1.5-3.0	19.4										
B-03	S-15	4.0-5.5	17.7		28	17	11						
B-03	S-16	6.5-8.0	18.1										
B-03	S-17	9.0-10.4	15.9										
B-03	S-18	14.0-14.9	13.0		50	22	28						
B-04	S-19	0.0-1.5	21.9										
B-04	S-20	1.5-3.0	33.4										

Notes: See test reports for test method, ^ASTM D2216-19, *ASTM D2488, **ASTM D1140-17, #ASTM D2974-20e1 < See test report for D4718 corrected values

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

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Laboratory Testing Summary

Sample Location	Sample Number	Depth (ft)	^MC (%)	Soil Type	Atterberg Limits			**Percent Passing No. 200 Sieve	Moisture - Density		CBR (%)		#Organic Content (%)
					LL	PL	PI		<Maximum Density (pcf)	<Optimum Moisture (%)	0.1 in.	0.2 in.	
B-04	S-21	4.0-5.5	26.3		41	17	24						
B-04	S-22	6.5-8.0	19.0										
B-04	S-23	9.0-10.5	23.7		34	23	11						
B-04	S-24	14.0-15.5	18.2										
B-05	S-25	0.0-1.5	24.6										
B-05	S-26	1.5-3.0	21.4					99.1					
B-05	S-27	4.0-5.5	22.8					97.5					
B-05	S-28	6.5-8.0	21.3		37	18	19						
B-05	S-29	9.0-10.5	20.9										
B-05	S-30	14.0-15.5	22.1										

Notes: See test reports for test method, ^ASTM D2216-19, *ASTM D2488, **ASTM D1140-17, #ASTM D2974-20e1 < See test report for D4718 corrected values

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

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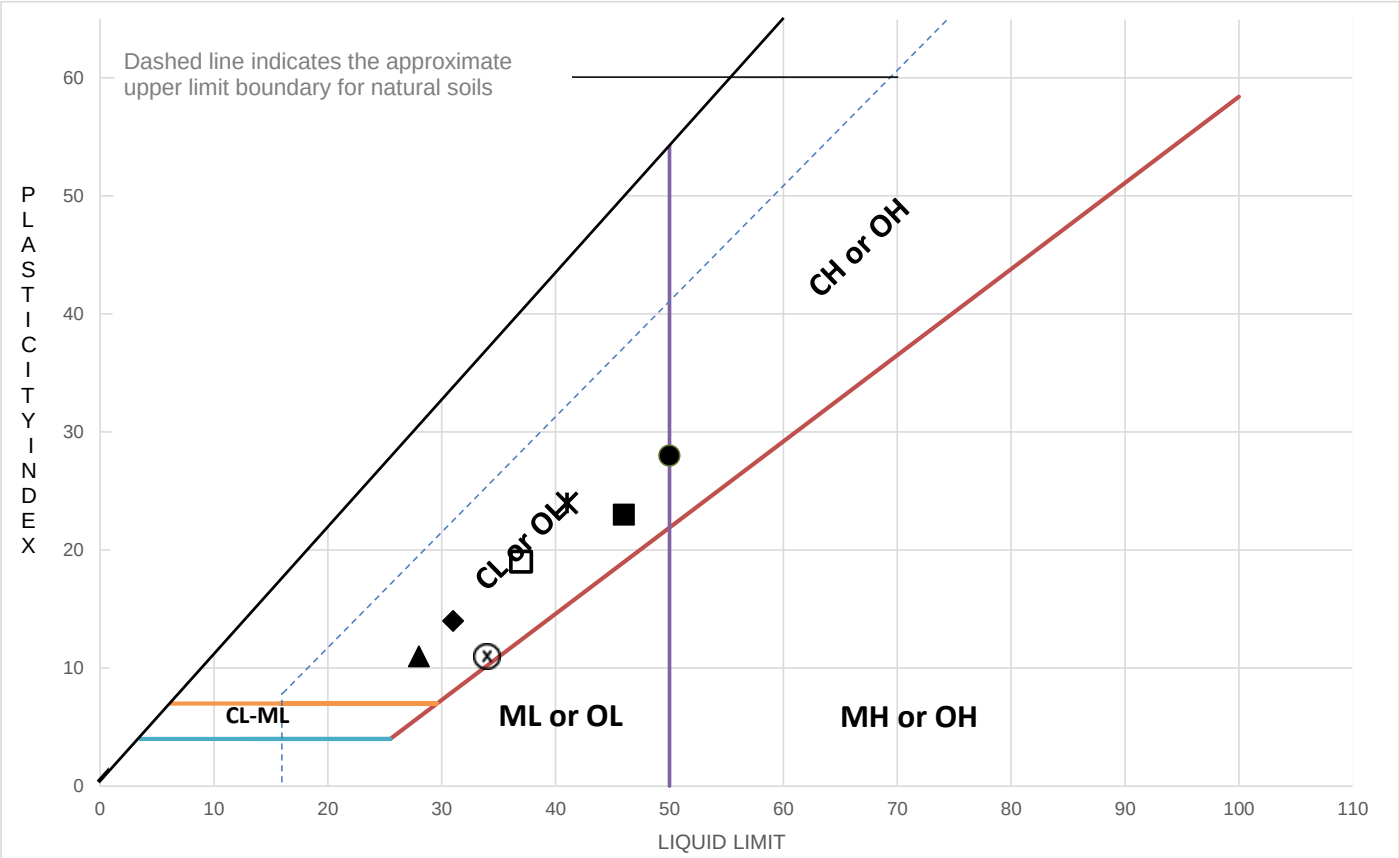
Tested by	Checked by	Approved by	Date Received
AshleyB		DFBurke	

LIQUID AND PLASTIC LIMITS TEST REPORT



TEST RESULTS (ASTM D4318-10 (MULTIPOINT TEST))

	Sample Location	Sample Number	Sample Depth (ft)	LL	PL	PI	%<#40	%<#200	AASHTO	USCS	Material Description
■	B-01	S-3	4.00-5.50	46	23	23					(CL) Medium to Dark Gray Lean Clay w Trc Shale
◆	B-02	S-9	4.00-5.50	31	17	14					(CL) Medium Brown & Gray Lean Sandy, Silty Clay
▲	B-03	S-15	4.00-5.50	28	17	11					(CL) Medium Brown Lean Silty Clay
●	B-03	S-18	14.00-14.92	50	22	28					WEATHERED SHALE (WR)
✳	B-04	S-21	4.00-5.50	41	17	24					(CL) Greenish Gray-Brown Lean Silty Clay
⊗	B-04	S-23	9.00-10.50	34	23	11					(CL) Grayish Brown Lean Silty Clay
□	B-05	S-28	6.50-8.00	37	18	19					(CL) Dark Yellow-Brown Lean Silty Clay

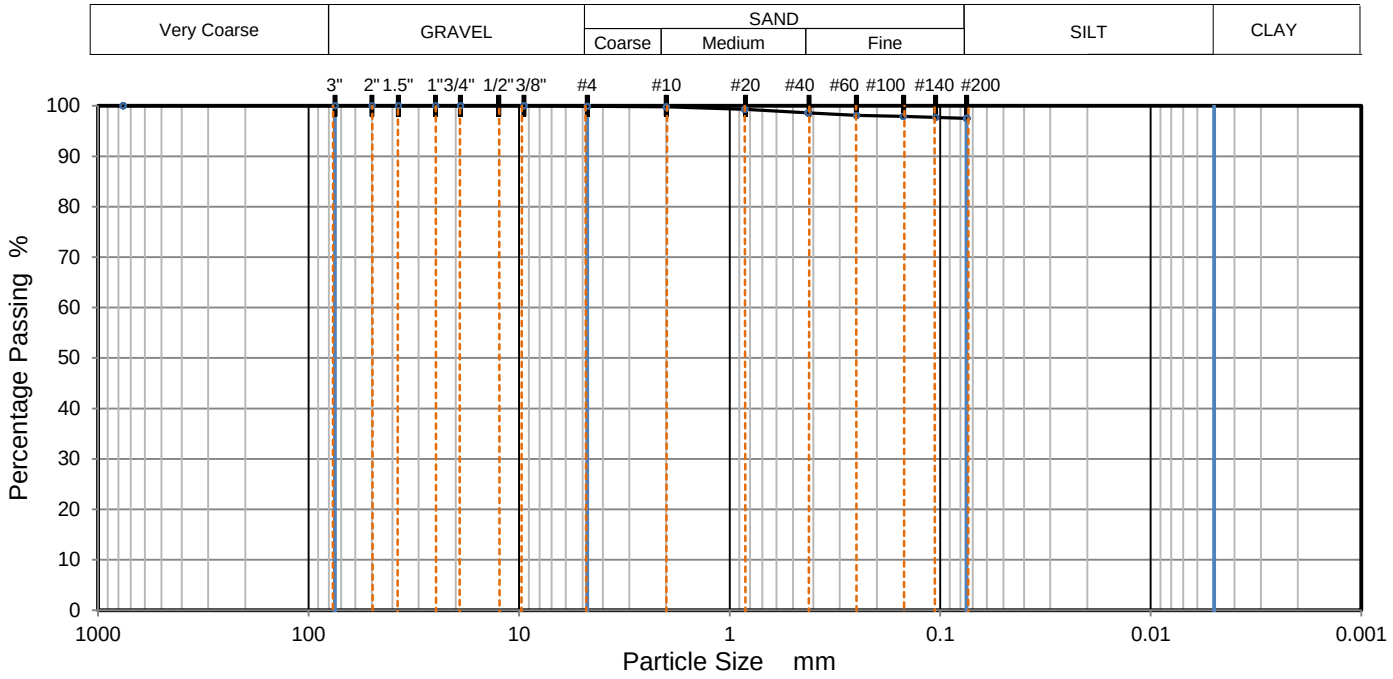
Project: Oak Pointe Apartments
Client: Prodigy Construction Corporation

Project No.: 61:3494
Date Reported: 3/19/2026

Office / Lab	Address	Office Number / Fax
ECS Southeast LLC - Louisville	1762 Watterson Trail Louisville, KY 40299	(502)493-7100 (502)493-8190

Tested by	Checked by	Approved by	Date Received
AshleyB	DFBurke	DFBurke	

PARTICLE SIZE DISTRIBUTION



TEST RESULTS (ASTM D6913M-17-METHOD A)

Sieving		Hydrometer Sedimentation	
Particle Size	% Passing	Particle Size mm	% Passing
3"	100		
2"	100		
1 1/2"	100		
1"	100		
3/4"	100		
3/8"	100		
#4	100		
#10	100		
#20	99		
#40	99		
#60	98		
#100	98		
#140	98		
#200	98		

Dry Mass of sample, g	467.4

Sample Proportions	% dry mass
Very coarse, >3" sieve	0
Gravel, 3" to # 4 sieve	0
Coarse Sand, #4 to #10 sieve	0
Medium Sand, #10 to #40	1
Fine Sand, #40 to #200	1
Fines <#200	98

USCS		Liquid Limit		D90		D50		D10	
AASHTO		Plastic Limit		D85		D30		Cu	
USCS Group Name		Plasticity Index		D60		D15		Cc	

Project: Oak Pointe Apartments
Client: Prodigy Construction Corporation
Sample Description: Medium Brown Clay w/ Trc Fine Sand
Sample Source: B-05

Project No.: 61:3494
Depth (ft): 4.0 - 5.5
Sample No.: S-27
Date Reported: 3/19/2026

Office / Lab	Address	Office Number / Fax
ECS Southeast LLC - Louisville	1762 Watterson Trail Louisville, KY 40299	(502)493-7100 (502)493-8190

Tested by	Checked by	Approved by	Date Received	Remarks
AshleyB		DFBurke		

Laboratory Procedures

General

Laboratory tests are generally conducted to satisfy one or more of the following objectives: (1) confirmation of visual-manual soil identification; (2) determination of index values used to estimate soil engineering properties (i.e., strength, compressibility, and permeability); or (3) direct measurement of specific soil properties. The tests selected for a given project are dependent on the subsurface conditions encountered, as well as specific project requirements, such as structural loads and planned grade changes. The results of laboratory tests conducted for this project are listed on the Boring Records, Laboratory Test Data Summary, or laboratory data curves in the Appendix. Brief descriptions of the test procedures are provided below.

Description and Identification of Soils (Visual-Manual Procedure) (ASTM D 2488)

The Visual-Manual Procedure provides a general guide to the engineering properties of soils and enables the engineer to apply experience to current situations. Samples obtained during the field exploration are examined and visually described and identified by a geotechnical engineer or geologist. The soils are typically identified according to predominant particle size (clay, silt, sand, etc.), consistency (based on apparent stiffness and the number of blows from standard penetration tests), color, moisture, and group symbol (CL, CH, SP, SC, etc.). Unless otherwise indicated, the soil descriptions in this report are based on the Visual-Manual Procedure.

Classification of Soils for Engineering Purposes (Unified Soil Classification System) (ASTM D 2487)

The Visual-Manual Procedure described above is primarily qualitative. The Unified Soil Classification System (USCS) is used when precise soil classification is required. The USCS is based on laboratory determination of particle-size characteristics, liquid limit, and plasticity index. Using these test results, the soil can be classified according to the Unified Classification System, which provides an index for estimating soil behavior.

Water (Moisture) Content of Soil (ASTM D 2216)

Moisture content is one of the most important index properties used in establishing a correlation between soil behavior and soil properties such as strength and compressibility. The moisture content, along with the liquid and plastic limits, are used to express the relative consistency or liquidity index of a soil. Increasing moisture contents typically reflect lower strengths for a given soil. The soil moisture content is the ratio, expressed as a percentage, of the mass of “pore” or “free” water in each mass of soil to the mass of the solid soil. Moisture content samples are taken from the sealed container obtained during the field exploration phase of a project. Each sample is weighed, and then placed in an oven set to 110°C + 5°. Each sample remains in the oven until the free moisture evaporates. Each dried sample is removed from the oven, allowed to cool, and then weighed. The moisture content is computed by dividing the weight of evaporated water by the weight of the dry sample.

Liquid Limit, Plastic Limit, and Plasticity Index of Soils (ASTM D 4318)

Depending upon the relative moisture content, a fine-grained soil may occur in a liquid, plastic, or solid state. In current usage, the liquid limit (LL) and plastic limit (PL) of a soil are referred to as the “Atterberg Limits”, which establish the approximate moisture contents at which the soil changes state. This test method is an integral part of several engineering classification systems to characterize the fine-grained fractions of soils. It is also used with other soil properties to correlate with engineering behavior such as compressibility, permeability, compactability, shrink-swell, and shear strength. The liquid limit is the moisture content at which a soil becomes sufficiently "wet" to behave as a heavy viscous fluid (i.e., transition from plastic to liquid state). It is defined as the moisture content at which the soil, when placed in a standard brass bowl, makes a 1/2-inch closure in a groove cut through the soil after the bowl is dropped 25 times at a specified height and rate.

The plastic limit is the moisture content at which the soil begins to lose its plasticity (i.e., transition from plastic to semi-solid state). It is defined as the lowest moisture content at which the soil can be rolled into 1/8-inch diameter threads without crumbling. The plasticity index (PI) is the difference between the liquid limit and the plastic limit and is the range of moisture content over which a soil deforms as a plastic material.

APPENDIX D – Supplemental Report Document

GBA "Important Information About This Geotechnical Engineering Report"
Previous Geotechnical Exploration on Site

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.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, clients can benefit from a lowered exposure to the subsurface problems that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed below, contact your GBA-member geotechnical engineer. Active involvement in 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.

Geotechnical-Engineering 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 given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. *Those who rely on a geotechnical-engineering report prepared for a different client can be seriously misled.* No one except authorized client representatives 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 this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read it *in its entirety*. Do not rely on an executive summary. Do not read selected elements only. *Read this report in full.*

You Need to Inform Your Geotechnical Engineer about Change

Your geotechnical engineer considered unique, project-specific factors when designing the study behind this report and developing the confirmation-dependent recommendations the report conveys. A few typical factors include:

- the client's goals, objectives, budget, schedule, and risk-management preferences;
- the general nature of the structure involved, its size, configuration, and performance criteria;
- the structure's location and orientation on the site; and
- other planned or existing site improvements, such as retaining walls, access roads, parking lots, and underground utilities.

Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- 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. *The geotechnical engineer who prepared this report cannot accept responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.*

This Report May Not Be Reliable

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, that it could be unwise to rely on a geotechnical-engineering report whose reliability may have been affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If your geotechnical engineer has not indicated an "apply-by" date on the report, ask what it should be*, and, in general, *if you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying it. A minor amount of additional testing or analysis – if any is required at all – could prevent major problems.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface through various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing were performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgment to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team from project start to project finish, so the individual can provide informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, *they are not final*, because the geotechnical engineer who developed them relied heavily on judgment and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* revealed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a full-time member of the design team, to:

- confer with other design-team members,
- help develop specifications,
- review pertinent elements of other design professionals' plans and specifications, and
- be on hand quickly whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction observation.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for informational purposes only*. To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report, but they may rely on the factual data relative to the specific times, locations, and depths/elevations referenced. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include 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.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering 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 subsurface environmental problems have led to project failures*. If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. As a general rule, *do not rely on an environmental report prepared for a different client, site, or project, or that is more than six months old.*

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, none of the engineer's services were designed, conducted, or intended to prevent uncontrolled migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration.*** Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

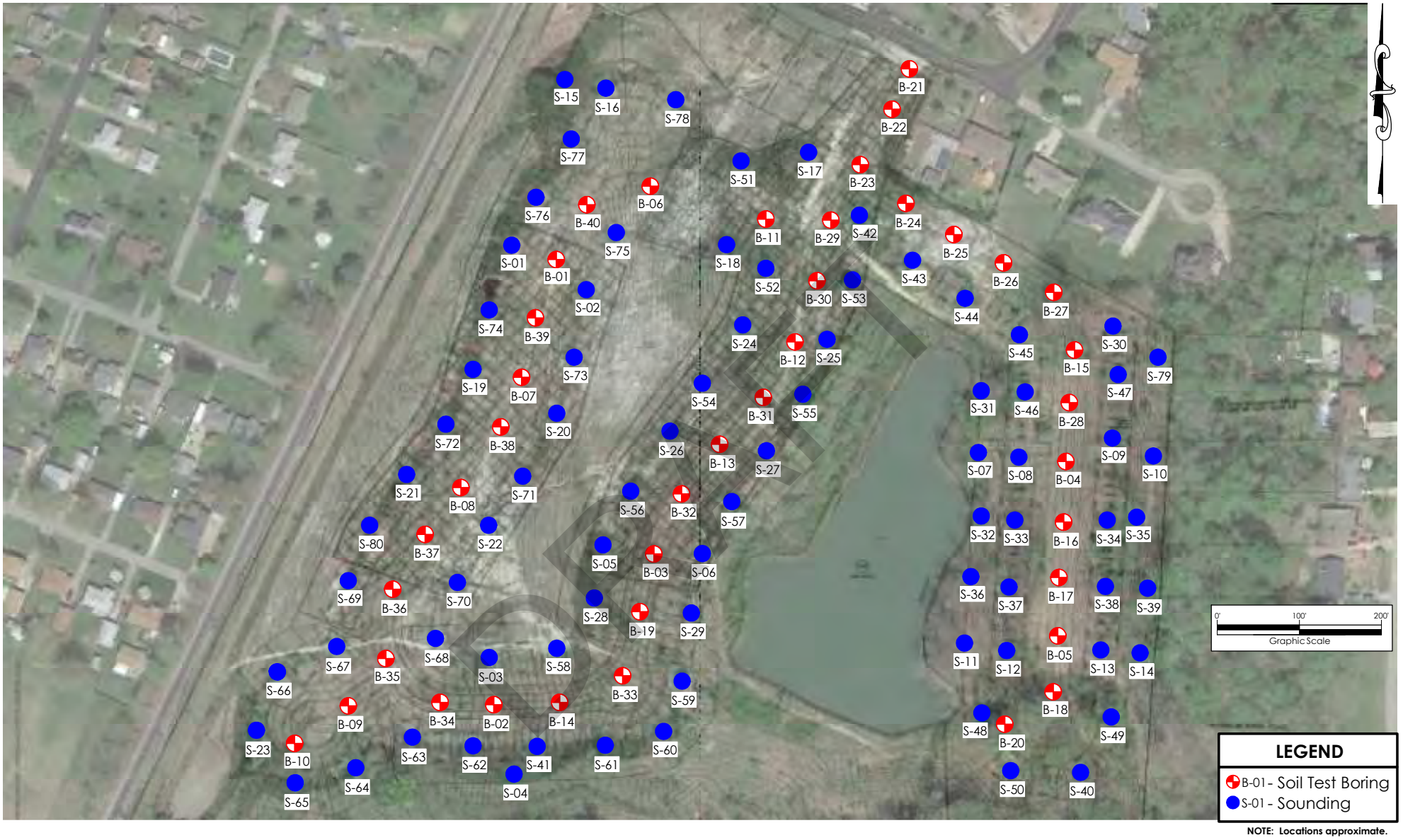
Telephone: 301/565-2733
e-mail: info@geoprofessional.org www.geoprofessional.org

Soundings					
Location	Apparent Top of Weathered Rock (ft)	Drill Tool Refusal Depth (ft)	Location	Apparent Top of Weathered Rock (ft)	Drill Tool Refusal Depth (ft)
S-01	13.0	17.5	S-41	28.5	30.0+
S-02	4.5	14.2	S-42	9.0	10.0+
S-03	4.5	29.3	S-43	10.0+	10.0+
S-04	15.0	33.2	S-44	10.0+	10.0+
S-05	4.2	9.3	S-45	10.0+	10.0+
S-06	24.1	29.4	S-46	10.0+	10.0+
S-07	6.6	10.0	S-47	10.0+	10.0+
S-08	4.5	11.2	S-48	10.0+	10.0+
S-09	10.0+	10.0+	S-49	10.0+	10.0+
S-10	8.2	11.4	S-50	10.0+	10.0+
S-11	10.0+	10.0+	S-51	6.0	7.1
S-12	12.2	14.3	S-52	6.7	10.0+
S-13	8.1	9.0	S-53	9.0	10.0+
S-14	7.9	10.5	S-54	5.0	6.7
S-15	Location Inaccessible At Time of Drilling[1]		S-55	10.0+	10.0+
S-16	28.5	30+	S-56	10.0+	10.0+
S-17	4.0	7.6	S-57	Location Inaccessible At Time of Drilling[4]	
S-18	Location Inaccessible At Time of Drilling[2]		S-58	10.0+	10.0+
S-19	--	30.0+	S-59	Location Inaccessible At Time of Drilling[4]	
S-20	10.0+	10.0+	S-60	10.0+	10.0+
S-21	Location Inaccessible At Time of Drilling[3]		S-61	10.0+	10.0+
S-22	10.0+	10.0+	S-62	10.0+	10.0+
S-23	--	30.0+	S-63	10.0+	10.0+
S-24	4.0	5.4	S-64	10.0+	10.0+
S-25	8.0	16.0	S-65	10.0+	10.0+
S-26	1.0	4.5	S-66	10.0+	10.0+
S-27	16.0	18.0+	S-67	10.0+	10.0+
S-28	--	29.0+	S-68	10.0+	10.0+
S-29	7.0	18.5+	S-69	Location Inaccessible At Time of Drilling[3]	
S-30	26.5	30.0+	S-70	10.0+	10.0+
S-31	23.5	25.5	S-71	10.0+	10.0+
S-32	21.0	24.0+	S-72	10.0+	10.0+
S-33	15.0	18.0+	S-73	10.0+	10.0+
S-34	18.0	20.0+	S-74	10.0+	10.0+
S-35	14.0	18.0+	S-75	10.0+	10.0+
S-36	8.4	10.0+	S-76	10.0+	10.0+
S-37	9.2	10.0+	S-77	10.0+	10.0+
S-38	10.0+	10.0+	S-78	10.0+	10.0+
S-39	10.0+	10.0+	S-79	10.0+	10.0+
S-40	10.0+	10.0+	S-80	Location Inaccessible At Time of Drilling[3]	

Borings		
Location	Apparent Top of Weathered Rock (ft)	Drill Tool Refusal Depth (ft)
B-01	10.0	20.5+
B-02	--	25+
B-03	9.5	10.3
B-04	--	10.3
B-05	--	13.5
B-06	4.7	8.1
B-07	--	28.5
B-08	--	30.5+
B-09	--	35.5+
B-10	--	25.5+
B-11	--	8.1
B-12	6.5	7.9
B-13	11.0	12.5
B-14	24.7	27.0
B-15	23.5	25+
B-16	17.0	20.5+
B-17	9.0	14.0
B-18	19.3	24.0
B-19	19.0	24.5
B-20	15.0	25.5
B-21	0.7	11.0
B-22	0.1	9.0
B-23	0.7	8.6
B-24	9.0	13.0
B-25	29.0	30.5
B-26	24.9	25.5
B-27	9.0	24.0
B-28	24.0	26.0
B-29	4.5	9.0
B-30	2.9	10.0
B-31	10.3	15.0
B-32	7.0	9.0
B-33	--	28.0
B-34	--	30.5+
B-35	--	30.5+
B-36	--	30.5+
B-37	--	30.5+
B-38	24.0	30.5+
B-39	24.0	25.5
B-40	14.0	19.0

Notes:

1: Sounding located on steep hillside.
2: Sounding located in existing fill stock pile.
3: Sounding located in soft/wet area.
4: Sounding located in densely wooded area.



Boring Location Plan Proposed Oak Pointe Conservation Subdivision 1600 Kurz Way Louisville, Kentucky 40216	Project No.: 61:1167	Drawn By: BTG	ECS Southeast, LLP 1762 Watterson Trail Louisville, Kentucky 40299 Tel. (502) 493-7100
	Drawing No.: BLP	Checked By: JRH/GTV	
	Date: 8/6/2018	Scale: As Shown	

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BORING RECORD

Project Name	**Oak Pointe Conservation Subdivision**			Boring No.	B-01
Location	**Louisville, KY**			Project No.	61:1167
Client	**Prodigy Construction**			Elevation	
Driller	M. Reynolds	Rig Type	Geoprobe 7822DT	Started	5/31/2018
Drill Method	Direct Push	Hammer Type	Automatic	Completed	5/31/2018
Groundwater				Logged By	G. Hess
				Weather	70's - 80's Scattered Thunderstorms

Scale, ft.	Elevation, ft.	Soil Symbol	Material Description and Classification	Depth, ft.	Sample Type	Sample Depth, ft.	Recovery, %	Standard Penetration Test Blows	N Value	Water Content, %	Uc, tsf	Comments
			CLAY, silty, mottled, gray and orange, moderate plasticity to high plasticity, stiff, moist, (CH), with trace root fibers			0.0 - 1.5	100	2-2-3	5			
						1.5 - 3.0	100	4-5-6	11			
			- very stiff with trace black oxide nodules below 1.5 feet									
5			- with trace siltstone fragments below 4.0 feet			4.0 - 5.5	100	4-7-7	14			
						6.5 - 8.0	100	8-7-6	13			
10			- very moist below 9.0 feet									
				10.1		9.0 - 10.5	100	8-9-13	22			
			SHALE, medium to highly weathered, gray mottled orange, blocky									
15			- highly weathered with trace siltstone fragments below 14.0 feet			14.0 - 15.5	100	5-8-12	20			
20			- gray and slightly to medium weathered below 19.0 feet			19.0 - 20.5	100	7-8-12	20			
				20.5								
			Boring Terminated									
25												
30												
35												
40												

Remarks:

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BORING RECORD

Project Name	**Oak Pointe Conservation Subdivision**			Boring No.	B-02
Location	**Louisville, KY**			Project No.	61:1167
Client	**Prodigy Construction**			Elevation	
Driller	M. Reynolds	Rig Type	Geoprobe 7822DT	Started	5/31/2018
Drill Method	Direct Push	Hammer Type	Automatic	Completed	5/31/2018
Groundwater				Logged By	G. Hess
				Weather	70's - 80's Scattered Thunderstorms

Scale, ft.	Elevation, ft.	Soil Symbol	Material Description and Classification	Depth, ft.	Sample Type	Sample Depth, ft.	Recovery, %	Standard Penetration Test Blows	N Value	Water Content, %	Uc, tsf	Comments
			TOPSOIL	0.3		0.0 - 1.5	94	2-2-3	5			
			SHALE, completely weathered, gray, blocky, with trace root fibers - highly weathered below 1.5 feet			1.5 - 3.0	100	3-4-5	9			
				4.0								
5			CLAY, silty, dark gray, low plasticity to moderate plasticity, firm to stiff, very moist, (CL), with trace organics			4.0 - 5.5	83	5-5-4	9			
						6.5 - 8.0	100	2-2-1	3			
10			- gray mottled orange brown below 9.0 feet			9.0 - 10.5	100	3-2-2	4			
15			- soft below 14.0 feet			14.0 - 15.5	33	0-1-1	2			
20				20.0		19.0 - 20.5	100	6-6-10	16			
			SAND, silty, clay gray, fine grained, dense, with trace root fibers, (SC-SM)									
25				25.0								
			Boring Terminated									
30												
35												
40												

Remarks:

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BORING RECORD

Project Name	**Oak Pointe Conservation Subdivision**			Boring No.	B-03
Location	**Louisville, KY**			Project No.	61:1167
Client	**Prodigy Construction**			Elevation	
Driller	M. Reynolds	Rig Type	Geoprobe 7822DT	Started	5/31/2018
Drill Method	Direct Push	Hammer Type	Automatic	Completed	5/31/2018
Groundwater				Logged By	G. Hess
				Weather	70's - 80's Scattered Thunderstorms

Scale, ft.	Elevation, ft.	Soil Symbol	Material Description and Classification	Depth, ft.	Sample Type	Sample Depth, ft.	Recovery, %	Standard Penetration Test Blows	N Value	Water Content, %	Uc, tsf	Comments
			TOPSOIL, with asphalt fragments, (FILL)	0.8		0.0 - 1.5	100	1-2-3	5			
			CLAY, silty, sand, orange brown, moderate plasticity, firm to stiff, moist, (CL), with trace limestone	4.0		1.5 - 3.0	100	2-2-2	4			
5			SILT, sandy, clayey, orange brown, soft, low plasticity, very moist, (ML)			4.0 - 5.5	100	2-1-1	2			
			- stiff below 6.5 feet			6.5 - 8.0	100	3-3-6	9			
10			SHALE, highly weathered to fresh, mottled fine and gray, blocky	9.5		9.0 - 9.8	100	7-10-50/3	50/3			
			Boring Terminated at Splitspoon Refusal	10.3								
15												
20												
25												
30												
35												
40												

Remarks:

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BORING RECORD

Project Name	**Oak Pointe Conservation Subdivision**			Boring No.	B-04
Location	**Louisville, KY**			Project No.	61:1167
Client	**Prodigy Construction**			Elevation	
Driller	M. Reynolds	Rig Type	Geoprobe 7822DT	Started	5/31/2018
Drill Method	Direct Push	Hammer Type	Automatic	Completed	5/31/2018
Groundwater				Logged By	G. Hess
				Weather	70's - 80's Scattered Thunderstorms

Scale, ft.	Elevation, ft.	Soil Symbol	Material Description and Classification	Depth, ft.	Sample Type	Sample Depth, ft.	Recovery, %	Standard Penetration Test Blows	N Value	Water Content, %	Uc, tsf	Comments
			Cinders and silty clay, (FILL)	0.3								
			CLAY, silty, light brown, moderate plasticity, stiff, moist, (CL), with trace root fibers and siltstone fragments			0.0 - 1.5	67	5-3-3	6			
						1.5 - 3.0	72	5-6-6	12			
				4.0								
5			- very stiff below 1.5 feet			4.0 - 5.5	89	6-8-8	16			
			CLAY, mottled orange brown and gray, high plasticity, very stiff, slightly moist, (CH), with trace black oxide nodules and siltstone fragments			6.5 - 8.0	83	13-13-13	26			
10			- hard below 6.5 feet - gray below 9.0 feet			9.0 - 9.8	100	24-50/3	50/3			
				10.3								
			Boring Terminated at Direct Push Refusal									
15												
20												
25												
30												
35												
40												

Remarks:

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BORING RECORD

Project Name	**Oak Pointe Conservation Subdivision**			Boring No.	B-05
Location	**Louisville, KY**			Project No.	61:1167
Client	**Prodigy Construction**			Elevation	
Driller	M. Reynolds	Rig Type	Geoprobe 7822DT	Started	5/31/2018
Drill Method	Direct Push	Hammer Type	Automatic	Completed	5/31/2018
Groundwater				Logged By	G. Hess
				Weather	70's - 80's Scattered Thunderstorms

Scale, ft.	Elevation, ft.	Soil Symbol	Material Description and Classification	Depth, ft.	Sample Type	Sample Depth, ft.	Recovery, %	Standard Penetration Test Blows	N Value	Water Content, %	Uc, tsf	Comments
			TOPSOIL	0.3		0.0 - 1.5	67	5-4-2	6			
			CLAY, silty, orange brown, low plasticity, stiff, moist, (CL) - soft to firm, very moist to wet below 1.5 feet			1.5 - 3.0	83	2-1-2	3			
5						4.0 - 5.5	67	1-1-1	2			
			SILT, sandy, clayey, orange, low plasticity, stiff, very moist, (ML)	6.3		6.5 - 8.0	100	2-3-4	7			
10			- very stiff and few siltstone fragments below 9.0 feet			9.0 - 10.5	50	14-7-7	14			
			CLAY, reddish orange, high plasticity, very stiff, moist, (CH)	10.3								
			Boring Terminated at Direct Push Refusal	13.5								
15												
20												
25												
30												
35												
40												

Remarks:

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BORING RECORD

Project Name	**Oak Pointe Conservation Subdivision**			Boring No.	B-06
Location	**Louisville, KY**			Project No.	61:1167
Client	**Prodigy Construction**			Elevation	
Driller	R. Mathes	Rig Type	Mobile B-53	Started	6/29/2018
Drill Method	Direct Push	Hammer Type	Automatic	Completed	6/29/2018
Groundwater				Logged By	J. Hudson
				Weather	80's Sunny

Scale, ft.	Elevation, ft.	Soil Symbol	Material Description and Classification	Depth, ft.	Sample Type	Sample Depth, ft.	Recovery, %	Standard Penetration Test Blows	N Value	Water Content, %	Uc, tsf	Comments
			TOPSOIL (1-inch)	0.1		0.0 - 1.5	100	2-2-3	5			
			CLAY, silty, gray brown, low plasticity, stiff, moist, (CL) - trace weathered gray shale below 2.0 feet			1.5 - 3.0	100	3-4-5	9			
5			SHALE, completely to highly weathered, gray	4.7		4.0 - 5.5	100	3-12-16	28			
			Boring Terminated at Auger Refusal	8.1								
10												
15												
20												
25												
30												
35												
40												

Remarks:

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BORING RECORD

Project Name	**Oak Pointe Conservation Subdivision**			Boring No.	B-07
Location	**Louisville, KY**			Project No.	61:1167
Client	**Prodigy Construction**			Elevation	
Driller	R. Mathes	Rig Type	Mobile B-53	Started	8/03/2018
Drill Method	Direct Push	Hammer Type	Automatic	Completed	8/03/2018
Groundwater				Logged By	B. Gatson
				Weather	80's Clear

Scale, ft.	Elevation, ft.	Soil Symbol	Material Description and Classification	Depth, ft.	Sample Type	Sample Depth, ft.	Recovery, %	Standard Penetration Test Blows	N Value	Water Content, %	Uc, tsf	Comments
			CLAY, silty, gray, low plasticity, stiff to very stiff, moist, (FILL), with trace shale fragments			0.0 - 1.5	100	3-4-8	12			
				2.5		1.5 - 3.0	100	5-5-3	8			
			CLAY, silty, mottled gray and orange brown, high plasticity, stiff, moist, (CL)									
5						4.0 - 5.5	100	2-3-3	6			
						6.5 - 8.0	100	3-3-4	7			
10			- gray brown below 9.0 feet			9.0 - 10.5	100	4-4-5	9			
				14.5								
15			CLAY, silty, gray mottled brown, low plasticity, very stiff, moist, (CL)			14.0 - 15.5	100	4-7-10	17			
20						19.0 - 20.5	100	4-7-9	16			
				24.0								
25			CLAY, silty, mottled gray to orange brown, low plasticity, very stiff, moist, (CL), with few reddish brown rock/shale fragments			24.0 - 25.5	100	4-6-10	16			
				28.5								
30			Boring Terminated at Auger Refusal									
35												
40												

Remarks:

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BORING RECORD

Project Name	**Oak Pointe Conservation Subdivision**			Boring No.	B-08
Location	**Louisville, KY**			Project No.	61:1167
Client	**Prodigy Construction**			Elevation	
Driller	R. Mathes	Rig Type	Mobile B-53	Started	8/03/2018
Drill Method	Direct Push	Hammer Type	Automatic	Completed	8/03/2018
Groundwater				Logged By	B. Gatson
				Weather	80's Clear

Scale, ft.	Elevation, ft.	Soil Symbol	Material Description and Classification	Depth, ft.	Sample Type	Sample Depth, ft.	Recovery, %	Standard Penetration Test Blows	N Value	Water Content, %	Uc, tsf	Comments
			TOPSOIL (2 inches)	0.2								
			CLAY, silty, gray mottled brown, moderate plasticity, firm, moist, (CL), trace shale fragments	1.1		0.0 - 1.5	100	1-1-2	3			
						1.5 - 3.0	100	4-5-9	14			
5			CLAY, gray, silty, mixed with clay, silty, gray, moderate plasticity, stiff to very stiff, moist, (CL)			4.0 - 5.5	100	4-4-6	10			
			- interbedded weathered shale from 2.0 to 6.0 feet			6.5 - 8.0	83	3-3-4	7			
10						9.0 - 10.5	100	12-6-7	13			
				14.0								
15			CLAY, sandy, brown and gray, low plasticity, stiff to very stiff, moist, (CL)			14.0 - 15.5	100	4-6-8	14			
20			- very moist below 19.0 feet			19.0 - 20.5	100	2-3-6	9			
25						24.0 - 25.5	100	4-6-7	13			
30				30.5		29.0 - 30.5	100	4-4-7	11			
			Boring Terminated									
35												
40												

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BORING RECORD

Project Name	**Oak Pointe Conservation Subdivision**			Boring No.	B-09
Location	**Louisville, KY**			Project No.	61:1167
Client	**Prodigy Construction**			Elevation	
Driller	R. Mathes	Rig Type	Mobile B-53	Started	6/29/2018
Drill Method	Direct Push	Hammer Type	Automatic	Completed	6/29/2018
Groundwater				Logged By	J. Hudson
				Weather	80's Sunny

Scale, ft.	Elevation, ft.	Soil Symbol	Material Description and Classification	Depth, ft.	Sample Type	Sample Depth, ft.	Recovery, %	Standard Penetration Test Blows	N Value	Water Content, %	Uc, tsf	Comments
			TOPSOIL (5 inches)	0.4								
			CLAY, silty, gray brown, low plasticity, firm to stiff, moist, (CL)			0.0 - 1.5	80	1-2-2	4			
						1.5 - 3.0	100	3-3-6	9			
5			- trace sand below 4.0 feet			4.0 - 5.5	100	2-3-3	6			
						6.5 - 8.0	0	2-3-4	7			
				8.5								
10			SAND, with silt, light brown, very fine to fine grained, poorly graded, moist, loose to medium dense, (SP-SM)			9.0 - 10.5	100	2-2-3	5			
15						14.0 - 15.5	100	3-4-5	9			
20			- wet below 19.0 feet			19.0 - 20.5	80	2-2-3	5			
25						24.0 - 25.5	75	2-2-2	4			
30						29.0 - 30.5	100	2-5-7	12			
35			- trace fine to medium gravel, dense below 34.0 feet	35.5		34.0 - 35.5	100	4-10-12	22			
			Boring Terminated									
40												

Remarks:

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BORING RECORD

Project Name	**Oak Pointe Conservation Subdivision**			Boring No.	B-10
Location	**Louisville, KY**			Project No.	61:1167
Client	**Prodigy Construction**			Elevation	
Driller	R. Mathes	Rig Type	Mobile B-53	Started	6/29/2018
Drill Method	Direct Push	Hammer Type	Automatic	Completed	6/29/2018
Groundwater				Logged By	J. Hudson
				Weather	80's Sunny

Scale, ft.	Elevation, ft.	Soil Symbol	Material Description and Classification	Depth, ft.	Sample Type	Sample Depth, ft.	Recovery, %	Standard Penetration Test Blows	N Value	Water Content, %	Uc, tsf	Comments
			TOPSOIL (5 inches)	0.4								
			CLAY, silty, gray brown, low plasticity, firm to stiff, moist, (CL)			0.0 - 1.5	100	2-2-2	4			
						1.5 - 3.0	100	3-4-4	8			
5			- trace sand below 4.0 feet			4.0 - 5.5	100	3-4-5	9			
						6.5 - 8.0	100	3-4-5	9			
10						9.0 - 10.5	100	3-3-4	7			
				14.0								
15			SAND, with silt, light brown, very fine to fine grained, poorly graded, moist, loose to medium dense, (SP-SM)			14.0 - 15.5	100	4-5-6	11			
20			- wet below 19.0 feet			19.0 - 20.5	100	2-2-3	5			
25				25.5		24.0 - 25.5	100	2-3-4	7			
			Boring Terminated									
30												
35												
40												

Remarks:

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BORING RECORD

Project Name	**Oak Pointe Conservation Subdivision**			Boring No.	B-11
Location	**Louisville, KY**			Project No.	61:1167
Client	**Prodigy Construction**			Elevation	
Driller	R. Mathes	Rig Type	Mobile B-53	Started	7/02/2018
Drill Method	Direct Push	Hammer Type	Automatic	Completed	7/02/2018
Groundwater				Logged By	J. Hudson
				Weather	80's Sunny

Scale, ft.	Elevation, ft.	Soil Symbol	Material Description and Classification	Depth, ft.	Sample Type	Sample Depth, ft.	Recovery, %	Standard Penetration Test Blows	N Value	Water Content, %	Uc, tsf	Comments
			TOPSOIL (2 inches)	0.2								
			CLAY, silty, gray brown, low plasticity, very stiff, moist, (CL)	1.0		0.0 - 1.5	100	3-7-12	19			
						1.5 - 2.6	100	17-27-50/1"	50/1"			
5			SHALE, completely to highly weathered, gray									
				8.1								
10			Boring Terminated at Auger Refusal									
15												
20												
25												
30												
35												
40												

Remarks:

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BORING RECORD

Project Name	**Oak Pointe Conservation Subdivision**			Boring No.	B-12
Location	**Louisville, KY**			Project No.	61:1167
Client	**Prodigy Construction**			Elevation	
Driller	R. Mathes	Rig Type	Mobile B-53	Started	7/02/2018
Drill Method	Direct Push	Hammer Type	Automatic	Completed	7/02/2018
Groundwater				Logged By	J. Hudson
				Weather	80's Sunny

Scale, ft.	Elevation, ft.	Soil Symbol	Material Description and Classification	Depth, ft.	Sample Type	Sample Depth, ft.	Recovery, %	Standard Penetration Test Blows	N Value	Water Content, %	Uc, tsf	Comments
			TOPSOIL (2 inches)	0.2								
			CLAY, silty, gray brown, low plasticity, very stiff, moist, (CL) - trace weathered gray shale below 2.0 feet			0.0 - 1.5	100	3-5-8	13			
						1.5 - 3.0	100	7-9-10	19			
5						4.0 - 5.5	100	4-7-8	15			
				6.5								
			SHALE, completely to highly weathered, gray			6.5 - 7.3	100	27-50/4"	50/4"			
				7.9								
10			Boring Terminated at Auger Refusal									
15												
20												
25												
30												
35												
40												

Remarks:

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BORING RECORD

Project Name	**Oak Pointe Conservation Subdivision**			Boring No.	B-13
Location	**Louisville, KY**			Project No.	61:1167
Client	**Prodigy Construction**			Elevation	
Driller	R. Mathes	Rig Type	Mobile B-53	Started	7/02/2018
Drill Method	Direct Push	Hammer Type	Automatic	Completed	7/02/2018
Groundwater				Logged By	J. Hudson
				Weather	80's Sunny

Scale, ft.	Elevation, ft.	Soil Symbol	Material Description and Classification	Depth, ft.	Sample Type	Sample Depth, ft.	Recovery, %	Standard Penetration Test Blows	N Value	Water Content, %	Uc, tsf	Comments
			TOPSOIL (4 inches)	0.3								
			CLAY, silty, gray brown, low plasticity, moist, (FILL), trace weathered shale	1.5		0.0 - 1.5	0	3-10-11	21			
						1.5 - 3.0	100	4-4-6	10			
5			CLAY, silty, orange brown and gray mottled, low plasticity, very stiff, moist, (CL) - trace weathered gray shale below 2.0 feet - very moist, trace black oxide nodules below 6.5 feet			4.0 - 5.5	100	3-5-5	10			
						6.5 - 8.0	100	5-5-6	11			
10						9.0 - 10.5	100	3-5-7	12			
				11.0								
			SHALE, completely to highly weathered, gray	12.5								
			Boring Terminated at Auger Refusal									
15												
20												
25												
30												
35												
40												

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Louisville, Kentucky 40299

BORING RECORD

Project Name	**Oak Pointe Conservation Subdivision**			Boring No.	B-14
Location	**Louisville, KY**			Project No.	61:1167
Client	**Prodigy Construction**			Elevation	
Driller	R. Mathes	Rig Type	Mobile B-53	Started	7/02/2018
Drill Method	Direct Push	Hammer Type	Automatic	Completed	7/02/2018
Groundwater				Logged By	J. Hudson
				Weather	80's Sunny

Scale, ft.	Elevation, ft.	Soil Symbol	Material Description and Classification	Depth, ft.	Sample Type	Sample Depth, ft.	Recovery, %	Standard Penetration Test Blows	N Value	Water Content, %	Uc, tsf	Comments
			CLAY, silty, orange brown and gray brown, low plasticity, stiff to very stiff, moist, (CL), trace weathered shale			0.0 - 1.5	100	2-3-3	6			
						1.5 - 3.0	100	5-6-7	13			
5						4.0 - 5.5	100	4-5-7	12			
						6.5 - 8.0	100	3-3-3	6			
				8.5								
10			CLAY, silty, orange brown, low plasticity, very soft to firm, very moist to wet, (CL), trace sand			9.0 - 10.5	25	1-1-1	2			
15						14.0 - 15.5	100	1-2-1	3			
20						19.0 - 20.5	10	0-1-0	1			
				24.7								
25			CLAY, silty, gray and orange brown mottled, low plasticity, stiff, very moist, (CL)			24.0 - 25.5	100	0-2-4	6			
				27.0								
30			Boring Terminated at Auger Refusal									
35												
40												

Remarks:

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BORING RECORD

Project Name	**Oak Pointe Conservation Subdivision**			Boring No.	B-15
Location	**Louisville, KY**			Project No.	61:1167
Client	**Prodigy Construction**			Elevation	
Driller	R. Mathes	Rig Type	Mobile B-53	Started	7/03/2018
Drill Method	Direct Push	Hammer Type	Automatic	Completed	7/03/2018
Groundwater				Logged By	J. Hudson
				Weather	80's Overcast

Scale, ft.	Elevation, ft.	Soil Symbol	Material Description and Classification	Depth, ft.	Sample Type	Sample Depth, ft.	Recovery, %	Standard Penetration Test Blows	N Value	Water Content, %	Uc, tsf	Comments
			TOPSOIL (4 inches)	0.3								
			CLAY, silty, light brown, low plasticity, firm to stiff, moist, (CL)			0.0 - 1.5	100	1-2-2	4			
						1.5 - 3.0	100	3-3-4	7			
				3.5								
5			CLAY, silty, orange brown and gray mottled, low plasticity, stiff, moist, (CL), trace weathered shale gravel			4.0 - 5.5	30	2-2-3	5			
						6.5 - 8.0	100	3-3-4	7			
10						9.0 - 10.5	100	3-4-5	9			
15			- very stiff to hard below 14.0 feet			14.0 - 15.5	100	8-9-11	20			
20			- gray brown and tan below 19.0 feet			19.0 - 20.5	100	6-7-10	17			
				23.5								
25			SHALE, completely to highly weathered, gray	25.0		24.0 - 24.8	100	25-50/3"	50/3"			
			Boring Terminated									
30												
35												
40												

Remarks:

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BORING RECORD

Project Name	**Oak Pointe Conservation Subdivision**			Boring No.	B-16
Location	**Louisville, KY**			Project No.	61:1167
Client	**Prodigy Construction**			Elevation	
Driller	R. Mathes	Rig Type	Mobile B-53	Started	7/03/2018
Drill Method	Direct Push	Hammer Type	Automatic	Completed	7/03/2018
Groundwater				Logged By	J. Hudson
				Weather	80's Overcast

Scale, ft.	Elevation, ft.	Soil Symbol	Material Description and Classification	Depth, ft.	Sample Type	Sample Depth, ft.	Recovery, %	Standard Penetration Test Blows	N Value	Water Content, %	Uc, tsf	Comments
			TOPSOIL (1-inch)	0.1								
			CLAY, silty, orange brown and gray mottled, low plasticity, typically firm, moist, (FILL)			0.0 - 1.5	100	1-2-2	4			
						1.5 - 3.0	100	1-1-2	3			
				3.5								
5			CLAY, silty, blue gray, low plasticity, very soft to soft, very moist to wet, (CL), trace organics			4.0 - 5.5	100	0-1-1	2			
						6.5 - 8.0	100	0-0-1	1			
				8.5								
10			CLAY, silty, orange brown and gray mottled, low plasticity, stiff, moist, (CL), trace weathered shale			9.0 - 10.5	100	2-4-5	9			
15			- hard below 14.0 feet			14.0 - 15.5	100	6-8-12	20			
				17.0								
			SHALE, completely to highly weathered, gray									
20						19.0 - 20.5	100	10-15-22	37			
				20.5								
			Boring Terminated									
25												
30												
35												
40												

Remarks:

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BORING RECORD

Project Name	**Oak Pointe Conservation Subdivision**			Boring No.	B-17
Location	**Louisville, KY**			Project No.	61:1167
Client	**Prodigy Construction**			Elevation	
Driller	R. Mathes	Rig Type	Mobile B-53	Started	8/01/2018
Drill Method	Direct Push	Hammer Type	Automatic	Completed	8/01/2018
Groundwater				Logged By	B. Gatson
				Weather	70's - 80's Partly Cloudy to Clear

Scale, ft.	Elevation, ft.	Soil Symbol	Material Description and Classification	Depth, ft.	Sample Type	Sample Depth, ft.	Recovery, %	Standard Penetration Test Blows	N Value	Water Content, %	Uc, tsf	Comments
			TOPSOIL (3 inches)	0.3								
			CLAY, silty, gray brown, low plasticity, stiff, moist, (CL), with trace rootlets			0.0 - 1.5	44	2-4-5	9			
						1.5 - 3.0	100	2-3-4	7			
5				4.5								
			SHALE, completely to highly weathered, gray			4.0 - 5.5	100	3-6-6	12			
						6.5 - 8.0	100	7-8-10	18			
10						9.0 - 10.5	100	9-10-12	22			
				14.0								
15			Boring Terminated at Auger Refusal									
20												
25												
30												
35												
40												

Remarks:

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BORING RECORD

Project Name	**Oak Pointe Conservation Subdivision**			Boring No.	B-18
Location	**Louisville, KY**			Project No.	61:1167
Client	**Prodigy Construction**			Elevation	
Driller	R. Mathes	Rig Type	Mobile B-53	Started	8/01/2018
Drill Method	Direct Push	Hammer Type	Automatic	Completed	8/01/2018
Groundwater				Logged By	B. Gatson
				Weather	70's - 80's Partly Cloudy to Clear

Scale, ft.	Elevation, ft.	Soil Symbol	Material Description and Classification	Depth, ft.	Sample Type	Sample Depth, ft.	Recovery, %	Standard Penetration Test Blows	N Value	Water Content, %	Uc, tsf	Comments
			TOPSOIL (3 inches)	0.3								
			CLAY, silty, orange brown, low plasticity, soft to stiff, moist, (CL)			0.0 - 1.5	44	1-2-3	5			
						1.5 - 3.0	100	1-1-1	2			
5						4.0 - 5.5	100	2-2-2	4			
						6.5 - 8.0	100	1-1-2	3			
				9.5								
10			CLAY, silty, gray with brown orange mottling, low plasticity, very stiff, moist, (CL), trace weathered shale			9.0 - 10.5	100	5-6-7	13			
15			- red orange and gray mottled below 14.5 feet			14.0 - 15.5	100	5-6-10	16			
				19.3								
20			SHALE, completely to highly weathered, gray			19.0 - 20.5	100	5-7-10	17			
				24.0								
25			Boring Terminated at Auger Refusal									
30												
35												
40												

Remarks:

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BORING RECORD

Project Name	**Oak Pointe Conservation Subdivision**			Boring No.	B-19
Location	**Louisville, KY**			Project No.	61:1167
Client	**Prodigy Construction**			Elevation	
Driller	R. Mathes	Rig Type	Mobile B-53	Started	7/03/2018
Drill Method	Direct Push	Hammer Type	Automatic	Completed	7/03/2018
Groundwater				Logged By	J. Hudson
				Weather	80's Overcast

Scale, ft.	Elevation, ft.	Soil Symbol	Material Description and Classification	Depth, ft.	Sample Type	Sample Depth, ft.	Recovery, %	Standard Penetration Test Blows	N Value	Water Content, %	Uc, tsf	Comments
			TOPSOIL (2 inches)	0.2								
			CLAY, silty, orange brown, low plasticity, stiff, very moist, (CL)			0.0 - 1.5	100	1-2-3	5			
						1.5 - 3.0	100	3-3-4	7			
				3.5								
5			SAND, with silt, light brown, very fine to fine grained, poorly graded, moist, loose, (SP-SM)			4.0 - 5.5	100	2-2-2	4			
						6.5 - 8.0	100	3-1-2	3			
10			- very moist below 9.0 feet			9.0 - 10.5	60	2-2-2	4			
				14.5								
15			CLAY, silty, orange brown and gray mottled, low plasticity, stiff, very moist, (CL)			14.0 - 15.5	80	2-3-3	6			
				19.0								
20			SHALE, completely to highly weathered, gray			19.0 - 20.5	10	9-10-15	25			
				24.5		24.0 - 24.3	100	50/3"	50/3"			
25			Boring Terminated at Auger Refusal									
30												
35												
40												

Remarks:

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BORING RECORD

Project Name	**Oak Pointe Conservation Subdivision**			Boring No.	B-20
Location	**Louisville, KY**			Project No.	61:1167
Client	**Prodigy Construction**			Elevation	
Driller	R. Mathes	Rig Type	Mobile B-53	Started	8/01/2018
Drill Method	Direct Push	Hammer Type	Automatic	Completed	8/01/2018
Groundwater				Logged By	B. Gatson
				Weather	70's - 80's Partly Cloudy to Clear

Scale, ft.	Elevation, ft.	Soil Symbol	Material Description and Classification	Depth, ft.	Sample Type	Sample Depth, ft.	Recovery, %	Standard Penetration Test Blows	N Value	Water Content, %	Uc, tsf	Comments
			TOPSOIL (5 inches)	0.5								
			CLAY, silty, brownish gray, low plasticity, very stiff, moist, (CL), trace weathered shale			0.0 - 1.5	78	2-3-7	10			
						1.5 - 3.0	100	5-5-6	11			
				4.0								
5			CLAY, silty, gray mottled orange, low plasticity, very stiff to hard, moist, (CL), trace weathered shale			4.0 - 5.5	94	5-7-8	15			
						6.5 - 8.0	100	6-9-11	20			
10						9.0 - 10.5	100	7-8-10	18			
15				15.4		14.0 - 15.5	100	7-10-12	22			
			SHALE, completely to highly weathered, gray									
20						19.0 - 20.5	100	6-7-8	15			
25				25.5		24.0 - 25.5	100	10-12-18	30			
			Boring Terminated									
30												
35												
40												

Remarks:

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BORING RECORD

Project Name	**Oak Pointe Conservation Subdivision**			Boring No.	B-21
Location	**Louisville, KY**			Project No.	61:1167
Client	**Prodigy Construction**			Elevation	
Driller	R. Mathes	Rig Type	Mobile B-53	Started	7/31/2018
Drill Method	Direct Push	Hammer Type	Automatic	Completed	7/31/2018
Groundwater				Logged By	B. Gatson
				Weather	70's - 80's Cloudy to Light Rain

Scale, ft.	Elevation, ft.	Soil Symbol	Material Description and Classification	Depth, ft.	Sample Type	Sample Depth, ft.	Recovery, %	Standard Penetration Test Blows	N Value	Water Content, %	Uc, tsf	Comments
			CRUSHED STONE, (FILL)	1.5								
			SHALE, completely highly weathered, gray, black, and brown			1.5 - 3.0	89	16-19-25	44			
5						4.0 - 5.5	89	10-15-20	35			
						6.5 - 7.4	100	22-50/5"	50/5"			
10						9.0 - 9.9	100	31-50/5"	50/5"			
			Boring Terminated at Auger Refusal	11.0								
15												
20												
25												
30												
35												
40												

Remarks:

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BORING RECORD

Project Name	**Oak Pointe Conservation Subdivision**			Boring No.	B-22
Location	**Louisville, KY**			Project No.	61:1167
Client	**Prodigy Construction**			Elevation	
Driller	R. Mathes	Rig Type	Mobile B-53	Started	7/31/2018
Drill Method	Direct Push	Hammer Type	Automatic	Completed	7/31/2018
Groundwater				Logged By	B. Gatson
				Weather	70's - 80's Cloudy to Light Rain

Scale, ft.	Elevation, ft.	Soil Symbol	Material Description and Classification	Depth, ft.	Sample Type	Sample Depth, ft.	Recovery, %	Standard Penetration Test Blows	N Value	Water Content, %	Uc, tsf	Comments
			TOPSOIL (1 inch)	0.1								
			SHALE, completely to highly weathered, gray and orange brown			0.0 - 1.5	56	4-6-7	13			
						1.5 - 3.0	61	6-12-19	31			
5						4.0 - 4.9	100	25-50/5"	50/5"			
						6.5 - 7.3	100	26-50/4"	50/4"			
				9.0								
10			Boring Terminated at Auger Refusal									
15												
20												
25												
30												
35												
40												

Remarks:

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BORING RECORD

Project Name	**Oak Pointe Conservation Subdivision**			Boring No.	B-23
Location	**Louisville, KY**			Project No.	61:1167
Client	**Prodigy Construction**			Elevation	
Driller	R. Mathes	Rig Type	Mobile B-53	Started	7/31/2018
Drill Method	Direct Push	Hammer Type	Automatic	Completed	7/31/2018
Groundwater				Logged By	B. Gatson
				Weather	70's - 80's Cloudy to Light Rain

Scale, ft.	Elevation, ft.	Soil Symbol	Material Description and Classification	Depth, ft.	Sample Type	Sample Depth, ft.	Recovery, %	Standard Penetration Test Blows	N Value	Water Content, %	Uc, tsf	Comments
			CRUSHED STONE, (FILL)	1.5								
			SHALE, completely to highly weathered, gray and orange brown			1.5 - 2.8	100	8-25-50/3"	50/3"			
5						4.0 - 4.8	100	25-50/3"	50/3"			
						6.5 - 7.1	100	25-50/1"	50/1"			
				8.6								
10			Boring Terminated at Auger Refusal									
15												
20												
25												
30												
35												
40												

Remarks:

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BORING RECORD

Project Name	**Oak Pointe Conservation Subdivision**			Boring No.	B-24
Location	**Louisville, KY**			Project No.	61:1167
Client	**Prodigy Construction**			Elevation	
Driller	R. Mathes	Rig Type	Mobile B-53	Started	7/31/2018
Drill Method	Direct Push	Hammer Type	Automatic	Completed	7/31/2018
Groundwater				Logged By	B. Gatson
				Weather	70's - 80's Cloudy to Light Rain

Scale, ft.	Elevation, ft.	Soil Symbol	Material Description and Classification	Depth, ft.	Sample Type	Sample Depth, ft.	Recovery, %	Standard Penetration Test Blows	N Value	Water Content, %	Uc, tsf	Comments
			TOPSOIL (2 inches)	0.2								
			CLAY, silty, gray brown, low to moderate plasticity, moist, (FILL), trace organics			0.0 - 1.5	100	2-2-2	4			
						1.5 - 3.0	100	3-4-5	9			
5						4.0 - 5.5	100	5-6-7	13			
			CLAY, orange mottled gray, low plasticity, very stiff, moist, (CL)	6.5		6.5 - 8.0	100	5-5-7	12			
			SHALE, completely to highly weathered, gray	9.0		9.0 - 10.5	100	10-11-14	25			
10												
			Boring Terminated at Auger Refusal	13.0								
15												
20												
25												
30												
35												
40												

Remarks:

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BORING RECORD

Project Name	**Oak Pointe Conservation Subdivision**			Boring No.	B-25
Location	**Louisville, KY**			Project No.	61:1167
Client	**Prodigy Construction**			Elevation	
Driller	R. Mathes	Rig Type	Mobile B-53	Started	7/31/2018
Drill Method	Direct Push	Hammer Type	Automatic	Completed	7/31/2018
Groundwater				Logged By	B. Gatson
				Weather	70's - 80's Cloudy to Light Rain

Scale, ft.	Elevation, ft.	Soil Symbol	Material Description and Classification	Depth, ft.	Sample Type	Sample Depth, ft.	Recovery, %	Standard Penetration Test Blows	N Value	Water Content, %	Uc, tsf	Comments
			CLAY, silty, gray, low plasticity, moist, (FILL), trace organic matter and filter fabric			0.0 - 1.5	100	4-6-7	13			
						1.5 - 3.0	83	3-7-9	16			
5						4.0 - 5.5	100	6-7-9	16			
						6.5 - 8.0	89	4-5-8	13			
10				9.5		9.0 - 10.5	100	2-2-3	5			
			CLAY, silty, brown to brownish gray, moderate plasticity, stiff, very moist, (CL)									
15			- very stiff to hard below 14.0 feet			14.0 - 15.5	94	4-6-7	13			
20						19.0 - 20.5	100	4-8-15	23			
25			- trace weathered shale below 24.0 feet			24.0 - 25.5	100	4-6-9	15			
				29.0								
30			SHALE, completely to highly weathered, gray	30.5		29.0 - 29.9	100	25-50/5"	50/5"			
			Boring Terminated									
35												
40												

Remarks:

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BORING RECORD

Project Name	**Oak Pointe Conservation Subdivision**			Boring No.	B-26
Location	**Louisville, KY**			Project No.	61:1167
Client	**Prodigy Construction**			Elevation	
Driller	R. Mathes	Rig Type	Mobile B-53	Started	7/31/2018
Drill Method	Direct Push	Hammer Type	Automatic	Completed	7/31/2018
Groundwater				Logged By	B. Gatson
				Weather	70's - 80's Cloudy to Light Rain

Scale, ft.	Elevation, ft.	Soil Symbol	Material Description and Classification	Depth, ft.	Sample Type	Sample Depth, ft.	Recovery, %	Standard Penetration Test Blows	N Value	Water Content, %	Uc, tsf	Comments
			TOPSOIL (2 inches)	0.2								
			CLAY, silty, gray mottled brown, low plasticity, stiff, moist, (CL), trace rootlets, (possible fill)	3.0		0.0 - 1.5	100	2-2-3	5			
						1.5 - 3.0	83	2-3-4	7			
5			CLAY, silty, gray, low plasticity, soft to firm, moist, (CL), with trace rootlets			4.0 - 5.5	94	1-1-1	2			
						6.5 - 8.0	100	1-1-2	3			
10			- very soft below 9.0 feet			9.0 - 10.5	100	0-1-0	1			
15			CLAY, silty, gray mottled orange and red brown, low plasticity, hard, moist, (CL), trace weathered shale	14.5		14.0 - 15.5	100	12-16-18	34			
20						19.0 - 20.5	100	9-12-14	26			
25				24.9		24.0 - 24.9	100	18-50/5"	50/5"			
			SHALE, completely to highly weathered, gray and black	25.5								
30			Boring Terminated at Auger Refusal									
35												
40												

Remarks:

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BORING RECORD

Project Name	**Oak Pointe Conservation Subdivision**			Boring No.	B-27
Location	**Louisville, KY**			Project No.	61:1167
Client	**Prodigy Construction**			Elevation	
Driller	R. Mathes	Rig Type	Mobile B-53	Started	7/31/2018
Drill Method	Direct Push	Hammer Type	Automatic	Completed	7/31/2018
Groundwater				Logged By	B. Gatson
				Weather	70's - 80's Cloudy to Light Rain

Scale, ft.	Elevation, ft.	Soil Symbol	Material Description and Classification	Depth, ft.	Sample Type	Sample Depth, ft.	Recovery, %	Standard Penetration Test Blows	N Value	Water Content, %	Uc, tsf	Comments
			TOPSOIL (3 inches)	0.3								
			CLAY, silty, brown to gray brown, low plasticity, firm, moist, (CL) - very stiff to hard below 1.5 feet			0.0 - 1.5	100	2-1-3	4			
						1.5 - 3.0	100	5-7-9	16			
5			- trace weathered shale below 5.0 feet			4.0 - 5.5	89	7-9-12	21			
						6.5 - 8.0	100	7-8-9	17			
				9.0								
10			SHALE, completely to highly weathered, gray and orange brown			9.0 - 10.5	100	9-10-11	21			
15						14.0 - 15.5	100	9-10-13	23			
20						19.0 - 20.5	100	7-8-11	19			
				24.0								
25			Boring Terminated at Auger Refusal									
30												
35												
40												

Remarks:

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BORING RECORD

Project Name	**Oak Pointe Conservation Subdivision**			Boring No.	B-28
Location	**Louisville, KY**			Project No.	61:1167
Client	**Prodigy Construction**			Elevation	
Driller	R. Mathes	Rig Type	Mobile B-53	Started	8/01/2018
Drill Method	Direct Push	Hammer Type	Automatic	Completed	8/01/2018
Groundwater				Logged By	B. Gatson
				Weather	70's - 80's Partly Cloudy to Clear

Scale, ft.	Elevation, ft.	Soil Symbol	Material Description and Classification	Depth, ft.	Sample Type	Sample Depth, ft.	Recovery, %	Standard Penetration Test Blows	N Value	Water Content, %	Uc, tsf	Comments
			TOPSOIL (5 inches)	0.5								
			CLAY, silty, gray brown, low plasticity, very stiff, dry, (CL)			0.0 - 1.5	72	2-8-7	15			
						1.5 - 3.0	100	7-8-10	18			
5			- moist, stiff below 4.0 feet			4.0 - 5.5	100	3-4-4	8			
			- very stiff, trace weathered shale below 6.5 feet			6.5 - 8.0	100	3-5-6	11			
				9.0								
10			CLAY, silty, gray mottled orange brown, low to moderate plasticity, very stiff, moist, (CL), trace weathered shale			9.0 - 10.5	100	4-5-5	10			
15						14.0 - 15.5	100	4-9-6	15			
20						19.0 - 20.5	100	6-9-10	19			
				24.0								
25			SHALE, completely to highly weathered, gray			24.0 - 25.5	83	12-15-25	40			
				26.0								
			Boring Terminated at Auger Refusal									
30												
35												
40												

Remarks:

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BORING RECORD

Project Name	**Oak Pointe Conservation Subdivision**			Boring No.	B-29
Location	**Louisville, KY**			Project No.	61:1167
Client	**Prodigy Construction**			Elevation	
Driller	R. Mathes	Rig Type	Mobile B-53	Started	7/31/2018
Drill Method	Direct Push	Hammer Type	Automatic	Completed	7/31/2018
Groundwater				Logged By	B. Gatson
				Weather	70's - 80's Cloudy to Light Rain

Scale, ft.	Elevation, ft.	Soil Symbol	Material Description and Classification	Depth, ft.	Sample Type	Sample Depth, ft.	Recovery, %	Standard Penetration Test Blows	N Value	Water Content, %	Uc, tsf	Comments
			TOPSOIL (3 inches)	0.3								
			CLAY, silty, gray to orange brown, low plasticity, moist, (FILL), trace gravel and organics			0.0 - 1.5	78	3-4-5	9			
						1.5 - 3.0	78	4-6-7	13			
				4.0								
5			CLAY, orange brown, low plasticity, very stiff, moist, (CL)	4.5		4.0 - 5.5	100	5-6-10	16			
			SHALE, completely to highly weathered, gray			6.5 - 6.9	100	50/5"	50/5"			
				9.0								
10			Boring Terminated at Auger Refusal									
15												
20												
25												
30												
35												
40												

Remarks:

ECS Southeast, LLP
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Louisville, Kentucky 40299

BORING RECORD

Project Name	**Oak Pointe Conservation Subdivision**			Boring No.	B-30
Location	**Louisville, KY**			Project No.	61:1167
Client	**Prodigy Construction**			Elevation	
Driller	R. Mathes	Rig Type	Mobile B-53	Started	8/02/2018
Drill Method	Direct Push	Hammer Type	Automatic	Completed	8/02/2018
Groundwater				Logged By	B. Gatson
				Weather	80's Clear

Scale, ft.	Elevation, ft.	Soil Symbol	Material Description and Classification	Depth, ft.	Sample Type	Sample Depth, ft.	Recovery, %	Standard Penetration Test Blows	N Value	Water Content, %	Uc, tsf	Comments
			TOPSOIL (2 inches)	0.2								
			CLAY, silty, gray mottled orange brown, low plasticity, stiff, moist, (CL), trace weathered shale - hard below 1.5 feet	2.9		0.0 - 1.5	78	2-2-3	5			
						1.5 - 3.0	100	6-9-12	21			
5			SHALE, completely to highly weathered, gray			4.0 - 5.5	100	6-10-11	21			
						6.5 - 8.0	100	7-11-13	24			
10						9.0 - 9.4	100	50/5"	50/5"			
			Boring Terminated at Auger Refusal	10.0								
15												
20												
25												
30												
35												
40												

Remarks:

ECS Southeast, LLP
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Louisville, Kentucky 40299

BORING RECORD

Project Name	**Oak Pointe Conservation Subdivision**			Boring No.	B-31
Location	**Louisville, KY**			Project No.	61:1167
Client	**Prodigy Construction**			Elevation	
Driller	R. Mathes	Rig Type	Mobile B-53	Started	8/02/2018
Drill Method	Direct Push	Hammer Type	Automatic	Completed	8/02/2018
Groundwater				Logged By	B. Gatson
				Weather	80's Clear

Scale, ft.	Elevation, ft.	Soil Symbol	Material Description and Classification	Depth, ft.	Sample Type	Sample Depth, ft.	Recovery, %	Standard Penetration Test Blows	N Value	Water Content, %	Uc, tsf	Comments
			TOPSOIL (3 inches)	0.3								
			CLAY, silty, gray to dark brown, low plasticity, stiff to very stiff, moist, (FILL), trace weathered shale	2.6		0.0 - 1.5	89	3-5-5	10			
						1.5 - 3.0	100	2-3-5	8			
5			CLAY, silty, gray and brown, low plasticity, firm to stiff, moist, (CL), trace weathered shale			4.0 - 5.5	100	2-3-3	6			
						6.5 - 8.0	94	2-2-2	4			
10				10.3		9.0 - 10.5	100	1-2-3	5			
			SHALE, completely to highly weathered, gray									
15				14.9		14.0 - 14.9	100	20-50/5"	50/5"			
			Boring Terminated at Splitspoon									
20												
25												
30												
35												
40												

Remarks:

ECS Southeast, LLP
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Louisville, Kentucky 40299

BORING RECORD

Project Name	**Oak Pointe Conservation Subdivision**			Boring No.	B-32
Location	**Louisville, KY**			Project No.	61:1167
Client	**Prodigy Construction**			Elevation	
Driller	R. Mathes Direct Push	Rig Type	Mobile B-53	Started	8/02/2018
Drill Method	Direct Push	Hammer Type	Automatic	Completed	8/02/2013
Groundwater				Logged By	B. Gatson
				Weather	80's Clear

Scale, ft.	Elevation, ft.	Soil Symbol	Material Description and Classification	Depth, ft.	Sample Type	Sample Depth, ft.	Recovery, %	Standard Penetration Test Blows	N Value	Water Content, %	Uc, tsf	Comments
			TOPSOIL (2 inches)	0.2								
			CLAY, silty, gray to orange brown, low plasticity, stiff to very stiff, moist, (CL), with trace weathered shale and organics			0.0 - 1.5	72	1-2-3	5			
						1.5 - 3.0	100	3-5-7	12			
5						4.0 - 5.5	100	5-6-8	14			
				7.0								
			SHALE, completely to highly weathered, gray			6.5 - 8.0	100	6-12-25	37			
				9.0								
10			Boring Terminated at Auger Refusal									
15												
20												
25												
30												
35												
40												

Remarks:

ECS Southeast, LLP
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Louisville, Kentucky 40299

BORING RECORD

Project Name	**Oak Pointe Conservation Subdivision**			Boring No.	B-33
Location	**Louisville, KY**			Project No.	61:1167
Client	**Prodigy Construction**			Elevation	
Driller	R. Mathes	Rig Type	Mobile B-53	Started	8/02/2018
Drill Method	Direct Push	Hammer Type	Automatic	Completed	8/02/2018
Groundwater				Logged By	B. Gatson
				Weather	80's Clear

Scale, ft.	Elevation, ft.	Soil Symbol	Material Description and Classification	Depth, ft.	Sample Type	Sample Depth, ft.	Recovery, %	Standard Penetration Test Blows	N Value	Water Content, %	Uc, tsf	Comments
			TOPSOIL (2 inches)	0.2								
			CLAY, silty, brown and gray brown, low plasticity, very stiff, (CL), trace organics and weathered shale			0.0 - 1.5	100	2-4-6	10			
						1.5 - 3.0	100	3-5-7	12			
5						4.0 - 5.5	94	5-6-8	14			
						6.5 - 8.0	100	7-5-5	10			
10			- stiff below 9.0 feet			9.0 - 10.5	100	3-3-5	8			
				14.0								
15			CLAY, silty, orange brown, low plasticity, firm, very moist, (CL)			14.0 - 15.5	100	1-2-2	4			
20			- gray below 19.0 feet			19.0 - 20.5	100	1-1-2	3			
25			- soft below 24.0 feet			24.0 - 25.5	100	2-1-1	2			
				28.0								
30			Boring Terminated at Auger Refusal									
35												
40												

Remarks:

ECS Southeast, LLP
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BORING RECORD

Project Name	**Oak Pointe Conservation Subdivision**			Boring No.	B-34
Location	**Louisville, KY**			Project No.	61:1167
Client	**Prodigy Construction**			Elevation	
Driller	R. Mathes	Rig Type	Mobile B-53	Started	8/02/2018
Drill Method	Direct Push	Hammer Type	Automatic	Completed	8/02/2018
Groundwater				Logged By	B. Gatson
				Weather	80's Clear

Scale, ft.	Elevation, ft.	Soil Symbol	Material Description and Classification	Depth, ft.	Sample Type	Sample Depth, ft.	Recovery, %	Standard Penetration Test Blows	N Value	Water Content, %	Uc, tsf	Comments
			TOPSOIL (2 inches)	0.2								
			CLAY, silty, gray and black, low plasticity, firm, moist, (CL), trace weathered shale			0.0 - 1.5	83	0-1-2	3			
						1.5 - 3.0	100	1-1-2	3			
5						4.0 - 5.5	100	1-1-2	3			
			- stiff below 6.5 feet			6.5 - 8.0	100	1-2-3	5			
10				10.0		9.0 - 10.5	100	2-4-5	9			
			CLAY, silty, orange brown to gray, moderate plasticity, stiff, moist, (CL)									
15						14.0 - 15.5	100	3-3-3	6			
20			- soft, very moist below 19.0 feet			19.0 - 20.5	100	2-1-1	2			
25				25.0		24.0 - 25.5	100	0-1-1	2			
			CLAY, silty, gray, low plasticity, soft, very moist, (CL), trace sand									
30			- dark gray to black, very stiff, little sand below 29.0 feet	30.5		29.0 - 30.5	100	4-6-6	12			
			Boring Terminated									
35												
40												

Remarks:

ECS Southeast, LLP
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BORING RECORD

Project Name	**Oak Pointe Conservation Subdivision**			Boring No.	B-35
Location	**Louisville, KY**			Project No.	61:1167
Client	**Prodigy Construction**			Elevation	
Driller	R. Mathes	Rig Type	Mobile B-53	Started	8/02/2018
Drill Method	Direct Push	Hammer Type	Automatic	Completed	8/02/2018
Groundwater				Logged By	B. Gatson
				Weather	80's Clear

Scale, ft.	Elevation, ft.	Soil Symbol	Material Description and Classification	Depth, ft.	Sample Type	Sample Depth, ft.	Recovery, %	Standard Penetration Test Blows	N Value	Water Content, %	Uc, tsf	Comments
			TOPSOIL (2 inches)	0.2								
			CLAY, silty, gray, low plasticity, stiff to very stiff, moist, (CL), trace weathered shale			0.0 - 1.5	100	3-4-5	9			
						1.5 - 3.0	100	5-7-6	13			
5						4.0 - 5.5	100	6-7-7	14			
						6.5 - 8.0	100	6-7-8	15			
10			CLAY, silty, gray and brown, low plasticity, stiff to very stiff, moist, (CL)	9.5		9.0 - 10.5	100	4-5-4	9			
15			- little sand below 14.5 feet			14.0 - 15.5	100	5-6-7	13			
20						19.0 - 20.5	100	3-4-5	9			
25						24.0 - 25.5	100	8-6-5	11			
30				30.5		29.0 - 30.5	100	4-4-4	8			
35			Boring Terminated									
40												

Remarks:

ECS Southeast, LLP
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BORING RECORD

Project Name	**Oak Pointe Conservation Subdivision**			Boring No.	B-36
Location	**Louisville, KY**			Project No.	61:1167
Client	**Prodigy Construction**			Elevation	
Driller	R. Mathes	Rig Type	Mobile B-53	Started	8/03/2018
Drill Method	Direct Push	Hammer Type	Automatic	Completed	8/03/2018
Groundwater				Logged By	B. Gatson
				Weather	80's Clear

Scale, ft.	Elevation, ft.	Soil Symbol	Material Description and Classification	Depth, ft.	Sample Type	Sample Depth, ft.	Recovery, %	Standard Penetration Test Blows	N Value	Water Content, %	Uc, tsf	Comments
			TOPSOIL (2 inches)	0.2								
			CLAY, silty, gray mottled brown orange, low plasticity, stiff, moist, (CL), with trace rootlets and weathered shale			0.0 - 1.5	100	2-3-6	9			
						1.5 - 3.0	100	9-13-18	31			
5			- very stiff to hard below 1.5 feet			4.0 - 5.5	100	6-7-8	15			
						6.5 - 8.0	100	6-6-7	13			
				9.3								
10			CLAY, silty, gray to orange brown, low plasticity, stiff, moist, (CL)			9.0 - 10.5	100	3-4-5	9			
				14.0								
15			SAND, with silt, brown, fine grained, poorly graded, medium dense, moist, (SP-SM)			14.0 - 15.5	100	6-6-8	14			
20						19.0 - 20.5	100	6-5-4	9			
25						24.0 - 25.5	100	5-5-4	9			
30						29.0 - 30.5	100	5-3-4	7			
				30.5								
35			Boring Terminated									
40												

Remarks:

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BORING RECORD

Project Name	**Oak Pointe Conservation Subdivision**			Boring No.	B-37
Location	**Louisville, KY**			Project No.	61:1167
Client	**Prodigy Construction**			Elevation	
Driller	R. Mathes	Rig Type	Mobile B-53	Started	8/03/2018
Drill Method	Direct Push	Hammer Type	Automatic	Completed	8/03/2018
Groundwater				Logged By	B. Gatson
				Weather	80's Clear

Scale, ft.	Elevation, ft.	Soil Symbol	Material Description and Classification	Depth, ft.	Sample Type	Sample Depth, ft.	Recovery, %	Standard Penetration Test Blows	N Value	Water Content, %	Uc, tsf	Comments
			TOPSOIL (2 inches)	0.2								
			CLAY, silty, gray brown and orange brown, low plasticity, stiff, moist, (CL), trace weathered shale			0.0 - 1.5	100	1-2-3	5			
						1.5 - 3.0	100	3-4-5	9			
5						4.0 - 5.5	100	2-3-4	7			
						6.5 - 8.0	100	3-4-4	8			
10						9.0 - 10.5	100	3-4-4	8			
15			- very stiff below 14.0 feet			14.0 - 15.5	100	3-5-9	14			
20						19.0 - 20.5	100	4-5-7	12			
				24.0								
25			SAND, with silt, brown, fine grained, poorly graded, medium dense, moist, (SP-SM)			24.0 - 25.5	100	6-7-9	16			
30				30.5		29.0 - 30.5	94	3-5-6	11			
			Boring Terminated									
35												
40												

Remarks:

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BORING RECORD

Project Name	**Oak Pointe Conservation Subdivision**			Boring No.	B-38
Location	**Louisville, KY**			Project No.	61:1167
Client	**Prodigy Construction**			Elevation	
Driller	R. Mathes	Rig Type	Mobile B-53	Started	8/03/2018
Drill Method	Direct Push	Hammer Type	Automatic	Completed	8/03/2018
Groundwater				Logged By	B. Gatson
				Weather	80's Clear

Scale, ft.	Elevation, ft.	Soil Symbol	Material Description and Classification	Depth, ft.	Sample Type	Sample Depth, ft.	Recovery, %	Standard Penetration Test Blows	N Value	Water Content, %	Uc, tsf	Comments
			TOPSOIL (2 inches)	0.2								
			CLAY, silty, gray brown, low plasticity, very stiff, dry, (CL)			0.0 - 1.5	100	2-3-7	10			
						1.5 - 3.0	100	6-8-9	17			
				4.0								
5			CLAY, silty, orange brown and gray mottled, low plasticity, stiff, moist, (CL)			4.0 - 5.5	100	2-2-4	6			
			- very stiff to hard, trace weathered shale below 6.5 feet			6.5 - 8.0	100	4-5-7	12			
10						9.0 - 10.5	100	5-8-12	20			
15						14.0 - 15.5	89	3-5-9	14			
20						19.0 - 20.5	100	3-9-11	20			
				24.0								
25			SHALE, completely to highly weathered, orange brown and gray			24.0 - 25.5	100	6-8-10	18			
30				30.5		29.0 - 30.5	100	9-16-25	41			
			Boring Terminated at Auger Refusal									
35												
40												

Remarks:

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BORING RECORD

Project Name	**Oak Pointe Conservation Subdivision**			Boring No.	B-39
Location	**Louisville, KY**			Project No.	61:1167
Client	**Prodigy Construction**			Elevation	
Driller	R. Mathes	Rig Type	Mobile B-53	Started	8/03/2018
Drill Method	Direct Push	Hammer Type	Automatic	Completed	8/03/2018
Groundwater				Logged By	B. Gatson
				Weather	80's Clear

Scale, ft.	Elevation, ft.	Soil Symbol	Material Description and Classification	Depth, ft.	Sample Type	Sample Depth, ft.	Recovery, %	Standard Penetration Test Blows	N Value	Water Content, %	Uc, tsf	Comments
			TOPSOIL (1 inch)	0.1								
			CLAY, silty, gray brown, low to moderate plasticity, very stiff, slightly moist to moist, (CL), trace weathered shale			0.0 - 1.5	100	3-5-6	11			
						1.5 - 3.0	100	11-8-9	17			
5						4.0 - 5.5	100	4-6-8	14			
						6.5 - 8.0	100	5-6-7	13			
				9.0								
10			CLAY, silty, gray mottled orange brown, moderate plasticity, very stiff, moist, (CL)			9.0 - 10.5	100	7-8-11	19			
15						14.0 - 15.5	100	5-6-7	13			
20						19.0 - 20.5	100	6-8-11	19			
				24.0								
25			SHALE, completely to highly weathered,, gray			24.0 - 25.2	100	11-25-50/2"	50/2"			
				25.5								
			Boring Terminated at Splitspoon Refusal									
30												
35												
40												

Remarks:

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Louisville, Kentucky 40299

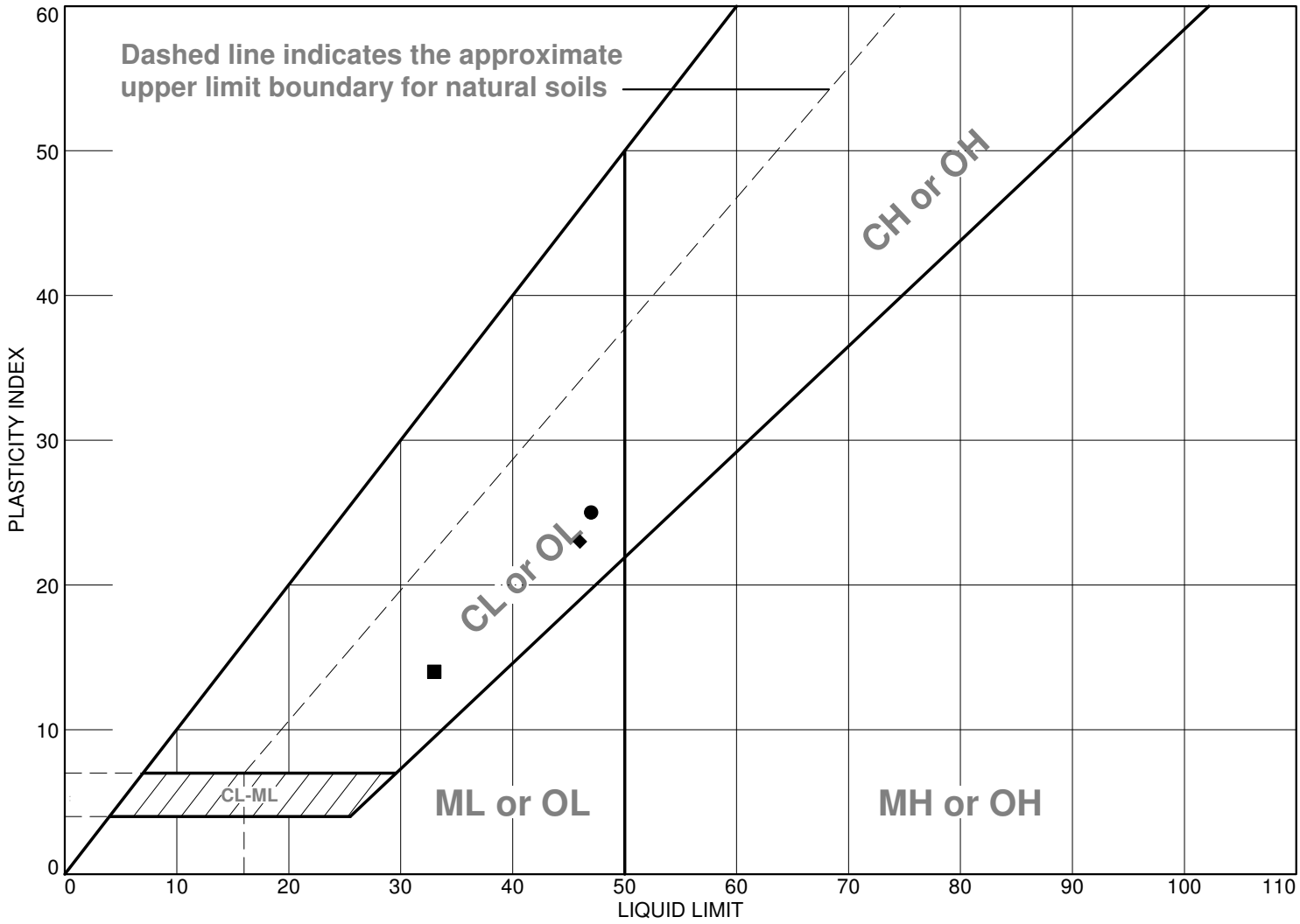
BORING RECORD

Project Name	**Oak Pointe Conservation Subdivision**			Boring No.	B-40
Location	**Louisville, KY**			Project No.	61:1167
Client	**Prodigy Construction**			Elevation	
Driller	R. Mathes	Rig Type	Mobile B-53	Started	8/06/2018
Drill Method	Direct Push	Hammer Type	Automatic	Completed	8/06/2018
Groundwater				Logged By	B. Gatson
				Weather	70's Clear

Scale, ft.	Elevation, ft.	Soil Symbol	Material Description and Classification	Depth, ft.	Sample Type	Sample Depth, ft.	Recovery, %	Standard Penetration Test Blows	N Value	Water Content, %	Uc, tsf	Comments
			TOPSOIL (2 inches)	0.2								
			CLAY, silty, orange brown and gray, low to moderate plasticity, stiff, moist, (CL)			0.0 - 1.5	100	2-3-3	6			
						1.5 - 3.0	67	2-3-5	8			
5			- very stiff, trace weathered shale below 4.0 feet			4.0 - 5.5	100	3-5-6	11			
						6.5 - 8.0	100	6-7-8	15			
10						9.0 - 10.5	100	4-7-8	15			
				14.0								
15			SHALE, completely to highly weathered, gray			14.0 - 15.3	100	11-20-50/3"	50/3"			
				19.0								
20			Boring Terminated at Auger Refusal									
25												
30												
35												
40												

Remarks:

LIQUID AND PLASTIC LIMITS TEST REPORT



	Material Description	Sampled	Tested	Technician	LL	PL	PI	%<#40	USCS
●	Brown Moderate Plasticity Clay		9/16/18	DB	47	22	25		CL
■	Tan Silty Clay		9/16/18	DB	33	19	14		CL
▲	Tan Clayey Silt		9/16/18	DB, LN	NP	NP	NP		NP
◆	Tan Silty Clay		9/16/18	DB	46	23	23		CL

Project No. 1167 **Client:** Prodigy Construction

Project: Oak Pointe Conservation Subdivision

○ **Source of Sample:** B-24 **Depth:** 6.50-8.00 **Sample Number:** D4S-6

□ **Source of Sample:** B-08 **Depth:** 6.50-8.00 **Sample Number:** D4S-5

△ **Source of Sample:** B-27 **Depth:** 0.00-1.50 **Sample Number:** D4S-7

◇ **Source of Sample:** B-31 **Depth:** 9.50-10.00 **Sample Number:** D4S-8

ECS SOUTHEAST, LLP
1762 Watterson Trail
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Phone: (502) 493-7100
Fax: (502) 493-8190

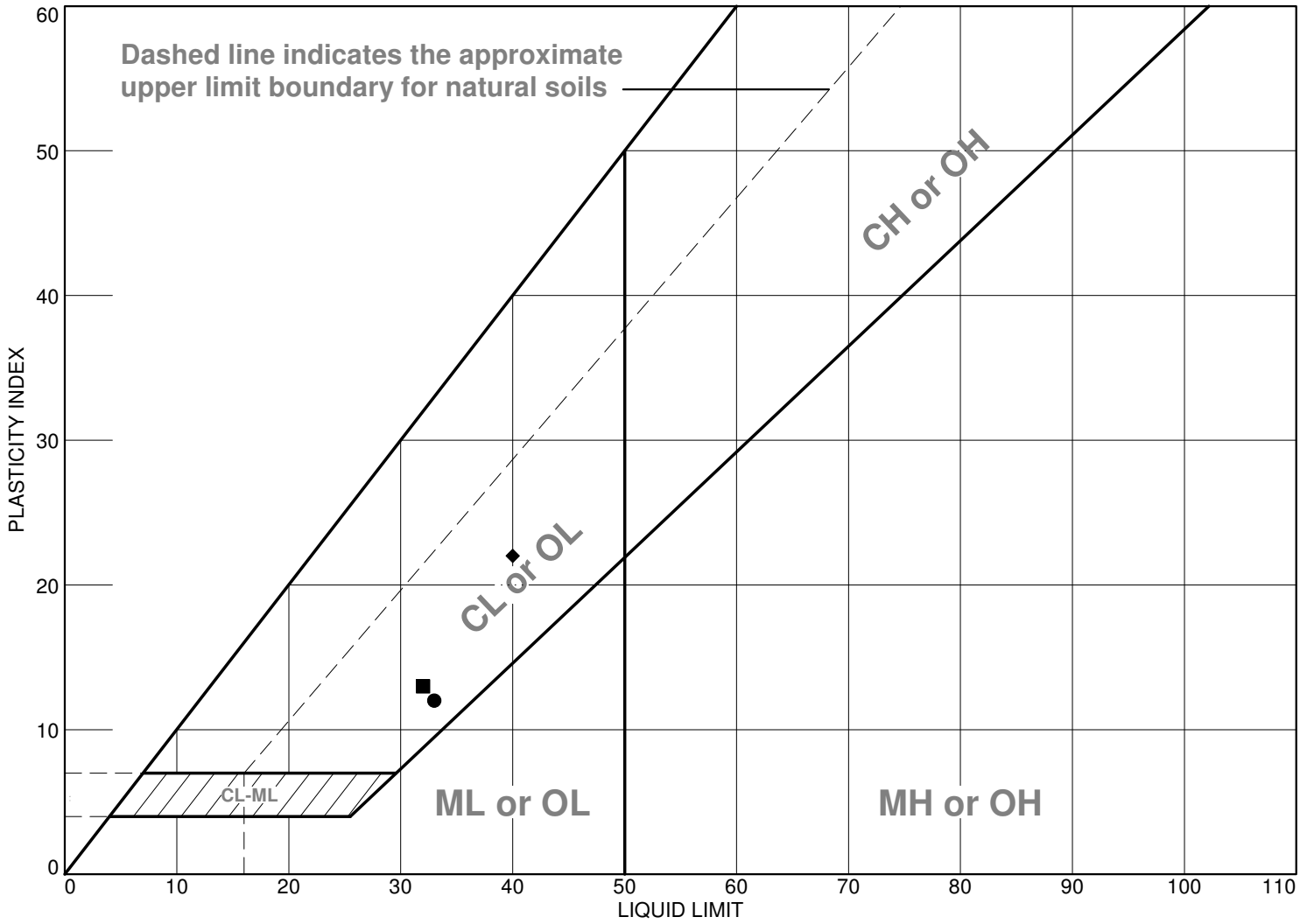
Checked by: DB

Title: Lab Manager

Figure

Tested By: ● DB ■ DB ▲ DB, LN ◆ DB **Checked By:** DB

LIQUID AND PLASTIC LIMITS TEST REPORT



	Material Description	Sampled	Tested	Technician	LL	PL	PI	%<#40	USCS
●	Lean CLAY		6/25	DB	33	21	12		CL
■	Lean Plastic CLAY		6/25-6/26/18	DB/MM	32	19	13		CL
▲	Silty Clayey SAND		6/25/18	DB	NP	NP	NP		NP
◆	Low Plastic CLAY		6/25-6/26/18	TR/MM	40	18	22		CL

Project No. 1167 **Client:** Prodigy Construction

Project: Oak Pointe Conservation Subdivision

○ **Source of Sample:** B-01 **Depth:** 1.50-3.00 **Sample Number:** D4S-1

□ **Source of Sample:** B-02 **Depth:** 6.50-8.00 **Sample Number:** D4S-2

△ **Source of Sample:** B-03 **Depth:** 4.00-5.50 **Sample Number:** D4S-3

◇ **Source of Sample:** B-04 **Depth:** 4.00-5.50 **Sample Number:** D4S-4

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Checked by: DB

Title: 6/26/18

Figure

Tested By: ● DB ■ DB/MM ▲ DB ◆ TR/MM **Checked By:** DB