UNITED
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REPORT

For Mr. Allen Mitchell, DeKalb County

Geotechnical Exploration
Tobie Grant Recreation Center
Hugh Howell Road &
DeKalb County
Scottdale, Georgia

Project No. DKC-18-GA-02631-01

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UNITED CONSULTING

DKC-18-GA-02631-01

September 14, 2018

Mr. Allen Mitchell
Director of Community Development
3486 Covington Highway
Decatur, GA 30032

Via E-mail: AMitchell@dekalbcountyga.gov; rreese@dekalbcountyga.gov

RE: Final Report of Geotechnical Exploration
Tobie Grant Recreation Center
Scottdale, DeKalb County, Georgia
Project No.: DKC-18-GA-02631-01

Dear Mr. Mitchell:

United Consulting is pleased to submit this report of Geotechnical Exploration for the proposed **Tobie Grant Recreation Center** at the above referenced location. This report includes a summary of site and subsurface conditions; recommendations for site preparation and foundation design; and discussions of other geotechnical engineering issues.

We appreciate the opportunity to provide you with these services and look forward to working with you in the future. If you have any questions, or if we can be of further assistance, please contact us at your convenience.

Sincerely,

UNITED CONSULTING

GEORGIA REGISTERED No. 20383 PROFESSIONAL ENGINEER MICHAEL A. KEMP

Michael A. Kemp, P.E.
Geotechnical Engineer

Chris L. Roberds, P.G.
Senior Executive Vice President

MC/MK/CLR/nj

SP: Geotechnical Documents/DKC-18-GA-02631-01.geo.docx

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1.0 EXECUTIVE SUMMARY

United Consulting has completed a final Geotechnical Exploration for the proposed **Tobie Grant Recreation Center** located in Scottdale, DeKalb County, Georgia. The results of the current and previous exploration are briefly summarized below. Please review the text of the report for a discussion of these items.

1. Borings B-1 through B-5, B-16 and B-18 encountered approximately 3 to 13 feet of existing fill soils. In general, the fill encountered appeared to be clean, and moderately to well compacted. We recommend that the quality of the fill throughout the site be thoroughly evaluated at the time of construction by proofrolling and possibly excavation of test pits. The construction budget should include funds for management of any localized zones of poor quality fill soils that may be encountered.

2. Continuous partially weathered rock (PWR) was encountered in borings B-1 to B-5, B-11 to B-14A, B-16, B-17A, B-18 and B-19 at depths ranging from of the ground surface to about 13 feet. Auger refusal (rock) was encountered in borings B-4, B-4A, B-12 to B-14A, B-17 to B-19, I-1 and I-1A at depths ranging from about 1 to 11 feet below the ground surface.

   Significant difficult excavation (ripping, blasting, jackhammer, ram hoes, etc.) should be expected during grading and installation of foundations, utilities, and underground detention. Furthermore, since PWR and auger refusal were encountered very near finished floor elevations for the structures, we recommend that PWR and rock, where present in the building areas, be over excavated to at least 12 inches below foundation bearing depths, or to a depth below utility trench invert elevations, and replaced with engineered fill. This will allow for foundations and utilities to be installed with conventional light construction equipment, and help reduce the potential for differential foundation settlement.

3. Groundwater was not encountered in the borings at the time of drilling. Shallow groundwater is not expected to impact construction, however, the contractor should be prepared to control groundwater or perched water, as needed.

4. Provided that the site is prepared in accordance with the recommendations of this report, the proposed distribution building can be supported on a shallow foundation system. Shallow foundations bearing within the underlying existing residual or fill soils or engineered fill can be designed for a net maximum allowable soils bearing pressure of up to 3000 psf.

2.0 PROJECT DESCRIPTION

The project site located at 593 Parkdale Drive in Scottdale, Georgia in the northwest quadrant of the intersection of Parkdale Drive and Tobie Grant Lane in Scottdale. A provided site plan was utilized to determine the boundaries of the project site. The Project Site was accessible from Parkdale Drive. The locations of the site and the borings are shown on the attached Boring Location Plan (Figure 1).

The Project Site was developed with an existing abandoned baseball field, dugout, and perimeter fencing. Topography at the site is very gently sloping from east to west, from a high elevation near of 1026 near Parkdale Drive and a low near 1020 at the west site boundary. There is an existing, 35- to 50-foot-high slope west and north of the site boundaries, with the slope crest generally at or within 15 feet west of the site boundary. The western portion of the slope is inclined at approximately 2H:1V, and the northern portion at approximately 5H:1V. Based on a review of a provided topographic site grading plan, we expect that cuts and fills for mass grading will be minimal, on the order of three feet or less.

A proposed underground detention structure is planned below the western parking and drive areas. The underground detention structure is located about 30 to 50 feet east of the crest of the existing 2H:1V slope on the west side of the site. Based on our conversations with the site civil engineer and review of the 95% Submittal Drawing *Stormwater Management Plan* (Sheet C-8), we understand the detention structure will be comprised of a series of parallel, sealed, 60-inch diameter corrugated metal pipes underlain by at least 6 inches of stone bedding. Excavation to the achieve the bottom elevation of the stone bedding layer is expected to extend about 8 to 10 feet below existing grades.

We understand that the proposed construction includes a gymnasium, surrounding library, multipurpose room, offices and amenities in the northeast portion of the site. New parking and drive areas are planned south and west of the proposed buildings. The gymnasium and associated buildings will have a finished floor elevation of 1024.5. Grades in the parking and drive areas will slope gently down to the west from a high elevation near 1026 to a low near 1020.

Based on our email conversations with the Structural Engineer, we understand maximum column loads for this project will not exceed about 120 kips, with maximum wall loads no greater than about 5 kips per linear foot.

3.0 BACKGROUND

United Consulting had previously conducted a Preliminary Geotechnical Exploration on the parent tract under Project Number 2016.5599.01, dated August 9, 2016. Six of the previous SPT borings (designated B-1, B-2, B-3, B-4, B-4A, and B-5) were within and in the vicinity of the proposed development. Data from these borings were used in conjunction with the current borings to form our recommendations.

4.0 PURPOSE

The purpose of this geotechnical exploration was to assess potential rock, unsuitable and possible soft areas, to determine if the existing soils are suitable for reuse as engineered fill, and to provide foundation and pavement recommendations.

5.0 SCOPE

The scope of our geotechnical exploration has included the following items:

1. A visual reconnaissance of the site from a geotechnical standpoint;

2. Drilling nine Standard Penetration Test (SPT) borings, nine offset borings and two straight auger borings (infiltration) in order to assess the general nature and condition of the soils;

3. An evaluation of soil samples obtained during our field exploration program by a Geotechnical Engineer for further identification and classification;

4. Evaluating the existing soil conditions with respect to the proposed construction; and

5. Preparing this report to document the results of our field-testing program, engineering analysis, and preliminary recommendations.

6.0 SUBSURFACE CONDITIONS

All borings initially encountered a surficial layer of grass and topsoil. Below the surficial materials, borings B-1 through B-5, B-16 and B-18 encountered approximately 3 to 13 feet of existing fill soils. In general, the fill encountered appeared to be clean, and moderately to well compacted. The fill soils generally consisted of firm to medium dense sand with varying amounts of silt and root hair as well as trace amounts of clay. The fill soils also consisted of very stiff to clay sand with varying amounts of silt. The Standard Penetration Test resistances (N-values) in the fill soils ranged from 8 to 31 blows per foot (bpf).

Underlying the fill soils, the borings encountered residual soils typical of the Piedmont Physiographic Province of Georgia. The residual soils typically consisted of loose to very dense sand with varying amounts of silt and mica as well as trace amounts of clay. The residual soils also consisted of firm to very stiff silt with varying amounts of sand and mica, as well as trace amounts of clay. The Standard Penetration Test resistances (N-values) in the residual soils ranged from 8 to greater than 50 blows per foot (bpf).

Continuous partially weathered rock (PWR) was encountered in borings B-1 to B-5, B-11 to B-14A, B-16, B-17A, B-18 and B-19 at depths ranging from of the ground surface to about 13 feet. PWR is a term for the residuum that can be penetrated by soil drilling techniques and has N-values in excess of 100 bpf. The PWR encountered consisted of very dense sand with trace amounts of clay, silt, and mica.

Auger refusal occurred in borings B-4, B-4A, B-12 to B-14A, B-17 to B-19, I-1 and I-1A at depths ranging from about 1 to 11 feet below the ground surface. Auger refusal indicates the depth at which the boring cannot be drilled further using soil drillings tools and techniques. Auger refusal levels may represent a seam of hard rock, a boulder, or the top of massive bedrock.

Groundwater was not encountered at the time of drilling. Groundwater levels should be anticipated to fluctuate with the change of seasons, during periods of very low or high precipitation, or due to changes in the floodplain or watershed upstream from the area. Further, the soils at this site are susceptible to formation of perched water conditions during periods of wet weather.

Please refer to the Boring Logs attached in the Appendix for more detailed descriptions of the subsurface materials encountered. The approximate primary boring locations are shown on the Boring Location Plan (Figure 1), also included in the Appendix. The offset boring locations are not shown on the Boring Location Plan due to lack of room; however, distances and directions from the initial boring location are noted on the offset Boring Logs.

7.0 DISCUSSION AND RECOMMENDATIONS

The following recommendations are based on our understanding of the proposed construction, the data obtained in the SPT borings, a site reconnaissance, and our experience with subsurface conditions similar to those encountered at the project site.

United Consulting requests the opportunity for a general review of final design documents and specifications in order to verify that earthwork and foundation recommendations have been properly interpreted and implemented in the design and specifications. We recommend that United Consulting, as the Geotechnical Engineer of Record, be consulted during construction to conduct Geotechnical Controls as the Owner's Representative.

7.1 Existing Fill

Borings B-1 through B-5, B-16 and B-18 encountered approximately 3 to 13 feet of existing fill soils. In general, the fill encountered appeared to be clean, and moderately to well compacted. However, as with any undocumented fill materials, soft soils, or buried trash, topsoil, boulders, or other unsuitable materials could be present intermediate of the boring locations. We recommend that the quality of the fill at the site be thoroughly evaluated at the time of construction by proofrolling and possibly excavation of test pits. The construction budget should include funds for management of any localized zones of poor quality fill soils that may be encountered.

7.2 Existing Slope Considerations

The proposed underground detention structure will be located approximately 30 to 50 feet east of the existing western slope. While slope stability analyses were beyond the scope of our services, we offer the following discussion to address the site Civil Engineer's concern regarding the impact of potential leaks from the detention structure on stability of the existing western slope.

In general, saturation of soils comprising a slope lowers the factor of safety against slope failure. While the underground detention structure is located at least 30 feet from the crest of the existing slope, it is possible that water leaking from the structure could preferentially migrate to the face of the existing slope, possibly leading to some degree of slope failure. In order to prevent the migration of leaking stormwater from the structure, one could consider installing a series of French drains below the detention structure bedding stone to collect any stormwater that may leak and route it safely away from the slope. Another, more leak proof style of detention structure could also be considered in lieu of the current design.

7.3 Site Preparation

Prior to any development, the existing vegetation, any topsoil, and other deleterious materials, trees, fencing should be removed from the area of the proposed construction. After lowering the site grade where needed and prior to placement of new fill, areas to receive engineered fill, foundations and pavements, should be proofrolled. Proofrolling should be performed under the observation of the Geotechnical Engineer or his representative. Areas which exhibit "pumping" during proofrolling should be treated by a method recommended by the Geotechnical Engineer.

We recommend that the Geotechnical Engineer observe the proofrolling operation. If rutting of the roller into the ground occurs in any area, this may indicate locations where localized near-surface zones of soft soils exist which should then be removed and replaced with engineered fill. The depth of undercutting, if required, should be determined by the Geotechnical Engineer at the time of densification.

7.4 Difficult Excavation

Continuous partially weathered rock (PWR) was encountered in borings B-1 to B-5, B-11 to B-14A, B-16, B-17A, B-18 and B-19 at depths ranging from of the ground surface to about 13 feet. Auger refusal (rock) was encountered in borings B-4, B-4A, B-12 to B-14A, B-17 to B-19, I-1 and I-1A at depths ranging from about 1 to 11 feet below the ground surface.

Significant difficult excavation (ripping, blasting, jackhammer, ram hoes, etc.) should be expected during grading and installation of foundations, utilities and underground detention. Furthermore, since PWR and auger refusal were encountered very near finished floor elevations for the structures, we recommend that PWR and rock, where present in the building areas, be over excavated to at least 12 inches below foundation bearing depths, or to a depth below utility trench invert elevations, and replaced with engineered fill. This will allow for foundations and utilities to be installed with conventional light construction equipment, and help reduce the potential for differential foundation settlement.

PWR typically requires loosening by ripping with large dozers pulling single-tooth rippers in mass excavation. The use of specialized excavation equipment (such as ram-hoes, jackhammers, or possibly blasting) is typically required for PWR excavation in confined (trench) excavations. Relatively sound, massive rock typically requires blasting for removal in mass or trench excavation.

Excavation techniques will vary based on the weathering of the materials, fracturing and jointing in the rock, and the overall stratigraphy of the feature. Actual field conditions usually display a gradual weathering progression with poorly defined and uneven boundaries between layers of different materials. We recommend that the following definitions for rock in earthwork excavation be included in bid documents:

1. General Excavation: Any material occupying an original volume of more than 1 cubic yard which cannot be excavated with a single-tooth ripper drawn by a crawler tractor having a minimum draw bar pull rating of not less than 80,000 lbs. usable pull (Caterpillar D-8 or larger).

2. Trench Excavation: Any material occupying an original volume of more than 1/2 cubic yard which cannot be excavated with a backhoe having a bucket curling force rated at not less than 40,000 lbs., using a rock bucket and rock teeth (John Deere 790 or larger).

Removal of rock by blasting can be very expensive. The costs of excavation vary with the type of material encountered and the quantities to be excavated. Hence, control of quantities is important. You may consider exposing the rock surface prior to blasting, so the rock quantities can be more accurately estimated using surveying methods. Leaving soil overburden in place during blasting may result in difficulties in determination of blast-rock quantities resulting in greater rock excavation costs. Test pits can also be considered to further evaluate excavation conditions within the areas where shallow PWR and auger refusal were encountered.

7.5 Groundwater Considerations

Groundwater was not encountered in the borings at the time of drilling. Shallow groundwater is not expected to impact construction, however, the contractor should be prepared to control groundwater or perched water, as needed.

7.6 Earthwork

The existing on-site soil, if free of large boulders and organics (roots, stumps, wood, etc.), could be reused as engineered fill with proper moisture control. Due to presence of significant silt and mica content, the onsite soil may be sensitive to moisture variation. During rainy seasons, these soils may become unstable and their reuse as engineered fill may not be feasible. These soils should be placed within a narrow range of their optimum moisture content to achieve proper compaction. Typical restrictions on suitable fill are no organics, plasticity index less than 25, and maximum particle size of four inches, with not more than 30 percent greater than 3/4-inch. These restrictions should also be applied to the imported borrow soils if needed.

7.7 Foundation Design and Construction

The soils within the area of the site are generally considered capable of supporting the proposed structures structure on conventional shallow foundations. The shallow foundations may consist of shallow strip and/or isolated column footings supported within and underlain by suitable bearing soils. Based on the subsurface exploration data obtained, a maximum net allowable soil bearing pressure of 3,000 pounds per square foot (psf) is recommended for foundation design.

We recommend footing dimensions should be a minimum of 20 inches wide for strip footings and 24 inches for square footings. The foundations should bear at least 12 inches below adjacent grade for frost protection or as recommended by local building code, whichever greater.

As mentioned previously, we recommend that PWR and rock, where present in the building areas, be over excavated to at least 12 inches below foundation bearing depths, or to a depth below utility trench invert elevations, and replaced with engineered fill. This will allow for foundations and utilities to be installed with conventional light construction equipment, and help reduce the potential for differential foundation settlement.

The Geotechnical Engineer must evaluate each footing excavation prior to steel reinforcement or concrete placement. Due to presence of fill, the foundations should be evaluated prior to concrete placement. Some localized excavation and replacement of soft or otherwise unsuitable soils may be required in order to achieve the required allowable bearing capacity. Conditions that are observed should be compared to the test boring data and design requirements. If unsuitable bearing material is encountered, it should be excavated and replaced or otherwise treated as recommended by the Geotechnical Engineer.

Surface water control should be maintained to prevent accumulation of water in footing excavations. Standing water in footing excavations should be removed promptly. Soil softened by the water should be removed, and the Geotechnical Engineer or his representative should re-examine the area.

7.8 Slab on Grade

Slabs-on-grade may be utilized for the proposed structures. We recommend a subgrade modulus of 125 pounds per cubic inch (pci) be used for slab design. It has been our experience that the floor slab subgrade is often disturbed by weather, foundation and utility line installation, and other construction activities between completion of grading and slab construction. For this reason, the Geotechnical Engineer should evaluate the subgrade immediately prior to placing the concrete. Areas judged by the Geotechnical Engineer to be unstable should be re-compacted or undercut and replaced with engineered fill compacted to at least 98 percent of its Standard Proctor maximum dry density.

7.9 Pavement Design Recommendations

An estimated CBR value of 4 has been used in preliminary flexible pavement thickness design for the proposed parking and driveway areas. This value corresponds to a vertical subgrade modulus (k) value of approximately 125 pci for rigid pavement design. This assumed CBR value is based on our experience with similar soil types; no CBR tests were performed.

For light duty areas restricted to passenger cars traffic only; with an average maximum daily traffic of approximately 400 cars and an occasional delivery truck per day, we recommend a minimum pavement section consisting of 2.0 inches of asphalt (type "E" or "F") underlain by 6.0 inches of graded aggregate base (GAB).

We recommend that the subgrade beneath all pavement areas be compacted to at least 98% of the Standard Proctor density in the upper two feet below subgrade, and to at least 95% of the Standard Proctor maximum dry density elsewhere. We recommend that the graded aggregate base course for each of the preceding pavement sections be compacted to 100% of the materials modified proctor value (ASTM D-1557). Also, all subgrades, base and asphalt materials, concrete, and construction procedures conform to Georgia DOT “Standard Specifications for Construction of Roads and Bridges”.

We recommend that a rigid (concrete) slab at least 6-inches thick using 4,000 psi concrete over 12 inches of prepared subgrade be used for dumpster pad area, if any. This pad should be large enough to accommodate the front wheels of the dumpster truck when the dumpster is being emptied. Concrete pavement is also recommended in any loading areas where heavy trucks will maneuver or trailer jacks will be supported.

The pavement sections selected will require adequate drainage to provide long-term serviceability. Pavement areas should be sloped to drain and ditches or underdrains should be incorporated to promote drainage away from the pavement areas. The most critical factor in providing long-term serviceability for a pavement is a well-prepared, uniform, subgrade. Small areas, which are not adequately prepared by thorough proofrolling and treating of soft or wet areas, can result in potholes or cracking. Even though the potholes will affect only a small percentage of the pavement area, the overall pavement serviceability will be significantly reduced.

7.10 Caving Considerations

Due to the presence of low-cohesive soil, some caving of excavations should be expected. Flattening of the excavation sidewalls and/or the use of bracing may be needed to maintain stability. All excavations should be conducted in accordance with the Occupational Safety and Health Administration (OSHA) guidelines.

7.11 Fill Placement

The fill should be placed in thin lifts (not to exceed 8-inch loose thickness) and compacted. We recommend the fill be compacted to at least 98 percent of Standard Proctor (ASTM D 698) maximum dry density within top two feet and at least 95 percent of Standard Proctor maximum dry density elsewhere on the site.

Moisture-density determinations should be performed for each soil type used to provide data necessary for quality assurance testing. The natural moisture content at the time of compaction should be within moisture content limits, which will allow the required compaction to be obtained. This is generally within about three percentage points of the optimum moisture. The contractor should be prepared to increase or decrease soil water content as needed to achieve the required compaction.

A Geotechnical Engineer on a full-time basis should observe grading operations. In-place density tests taken by that individual will assess the degree of compaction being obtained. The frequency of the testing should be determined by the Geotechnical Engineer.

7.12 Infiltration Testing

Auger borings I-1 and I-1A were drilled in the proposed underground detention structure footprint. However, because auger refusal was encountered above the planned bottom elevation of the structure, no meaningful infiltration data could be obtained. Therefore, no infiltration tests were performed.

8.0 LIMITATIONS

This report is for the exclusive use of **DeKalb County** and the designers of the project, and should be read in accordance to our standard contract including the attached appendix. Our conclusions and recommendations have been prepared using generally accepted standards of Geotechnical Engineering practice in the State of Georgia. No other warranty is expressed or implied. Our firm is not responsible for conclusions, opinions or recommendations of others.

The right to rely upon this report and the data within may not be assigned without UNITED CONSULTING'S written permission.

Our conclusions and recommendations are based upon design information furnished us, data obtained from the previously described exploration and testing program and our experience. They do not reflect variations in subsurface conditions that may exist intermediate of our borings and in unexplored areas of the site. Should such variations become apparent during construction, it will be necessary to re-evaluate our conclusions and recommendations based upon "on-site" observations of the conditions.

If the design or location of the project is changed, the recommendations contained herein must be considered invalid, unless our firm reviews the changes and our recommendations are either verified or modified in writing. When design is complete, we should be given the opportunity to review the grading plan, and applicable portions of the specifications to see if they are consistent with the intent of our recommendations.

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APPENDIX

General Notes/Narrative of Drilling Operations
Figure 1 – Boring Location Plan
Exploration Procedures
Boring Logs (20) Current Study
Boring Logs (6) Previous Study

GENERAL NOTES

The soil classifications noted on the Boring Logs are visual classifications unless otherwise noted. Minor constituents of a soil sample are termed as follows:

Trace	0 - 10%
Some	11 - 35%
Suffix "y" or "ey"	36 - 49%

LEGEND

Split Spoon Sample obtained during Standard Penetration Testing

Relatively Undisturbed Shelby Tube Sample

Groundwater Level at Time of Boring Completion

Groundwater Level at 24 hours (or as noted) after Termination of Boring

w	Natural Moisture Content	
LL	Liquid Limit	
PL	Plastic Limit	Atterberg Limits
PI	Plasticity Index	
PF	Percent Fines (Percent Passing #200 Sieve)	
γ_d	Dry Unit Weight (Pounds per Cubic Foot or PCF	
γ_m	Moist or In-Situ Unit Weight (PCF)	
γ_{sat}	Saturated Unit Weight (PCF)	

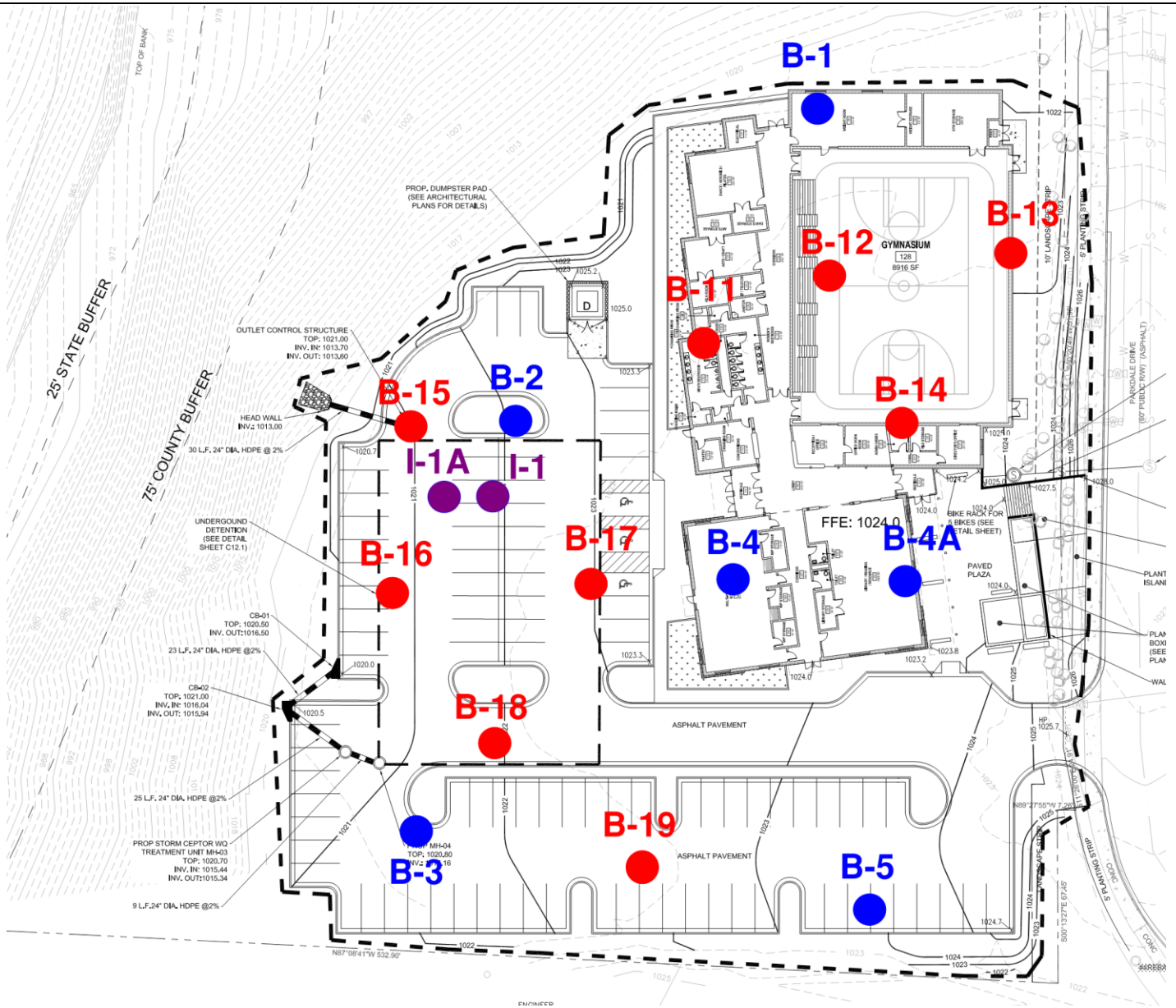
BORING LOG DATA AND NARRATIVE OF DRILLING OPERATIONS

The test borings were made by mechanically advancing helical hollow stem augers into the ground. Samples were covered at regular intervals in each of the borings following established procedures for performing the Standard Penetration Test in accordance with ASTM Specification D-1586. Soil samples were obtained with a standard 1.4" I.D. x 2.0" O.D. split barrel sampler. The sampler is first seated 6" to penetrate any loose cuttings and then driven an additional foot with the blows of a 140 pound hammer freely falling a distance of 30". The number of blows required to drive the sampler each six inches is recorded on the Boring Logs. The total number of blows required to drive the sampler the final foot is designated the "standard penetration resistance." This driving resistance, known as the "N" value, is a measure of the relative density of granular soils and is an indication of the consistency of cohesive deposits.

The Following table describes soil consistencies and relative densities based on standard-penetration resistance values (N) determined by the Standard Penetration Test.

	"N"	Consistency
	0-2	Very Soft
	3-4	Soft
	5-8	Firm
Clay and Silt	9-15	Stiff
	16-30	Very Stiff
	Over 31	Hard

	"N"	Relative Density
	0-4	Very Loose
	5-10	Loose
	11-19	Firm
Sand	20-29	Medium Dense
	30-49	Dense
	50+	Very Dense



SCALE: NTS	PROJECT NO.: DKC-18-GA-02631-01		TITLE: BORING LOCATION PLAN TOBIE GRANT RECREATION CENTER– DEKALB COUNTY SCOTTDALE, GEORGIA	**FIG. 1**
PREPARED: MC	CHECKED: MAK	DATE: 09/12/2018		
CLIENT: DEKALB COUNTY	N		UNITED CONSULTING 625 Holcomb Bridge Road, Norcross, GA 30071 Tel. 770/209-0029 FAX 770/582-2900 www.unitedconsulting.com We're here for you UNITED CONSULTING	

EXPLORATION PROCEDURES

Twenty (20) Standard Penetration Test (SPT) borings, including nine initial borings (designated B-11 through B-19) and additional offset borings (designated B-12A, B-12B, B-12C, B-12D, B-13A, B-14A, B-17A, B-17B, B-17C, I-1 and I-1A) were performed at the approximate locations shown on the attached Boring Location Plan (Figure 1). Soil samples obtained using the split spoon sampler were examined by the Geotechnical Engineer and classified according to the visual- manual procedure described in ASTM D 2488-00. Soil test borings were performed in general accordance with ASTM D 1586. A narrative of field operations is included in The Appendix.

Test locations in the field were determined by the Geotechnical Engineer who measured distances using a measuring tape and estimated angles with the aid of a hand held compass and existing site features. The test locations should, therefore, be considered approximate.

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BORING LOG

CONTRACTED WITH: DeKalb County | BORING NO.: B-11
PROJECT NAME: Toby Grant Recreation Center | DATE: 09/04/2018
JOB NO.: DKC-18-GA-02631-01 | DRILLER: SUNRISE | RIG: CME-45 | LOGGED BY: MC

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	N VALUE	RECOV.	PPR (tsf)	NOTES
1020	Grass	0							
	Sand-trace silt and rock fragments; medium dense; light red brown (Residual)		1		7-11-11	22	10		
	-dense; dark brown	5	2		22-25-16	41	10		
1015									
	-medium dense; gray	10	3		7-11-11	22	16		
1010									
	-dark brown/ black	15	4		10-11-12	23	12		
1005									
	Partially Weathered Rock sampled as sand-trace silt; very dense; dark brown/ black	20	5		50/6	50/6	16		
1000	BORING TERMINATED AT 20 FEET								No groundwater encountered at the time of drilling
		25							
995									
		30							
990									
		35							
985									
		40							
980									

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BORING LOG

CONTRACTED WITH: DeKalb County | BORING NO.: B-12
PROJECT NAME: Toby Grant Recreation Center | DATE: 09/04/18
JOB NO.: DKC-18-GA-02631-01 | DRILLER: SUNRISE | RIG: CME-45 | LOGGED BY: MC

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	N VALUE	RECOV.	PPR (tsf)	NOTES
	Grass	0							No groundwater encountered at the time of drilling
	Partially Weathered Rock - No sample recovered		1		12-50/0	50	0		
1020	AUGER REFUSAL AT 1 FEET								
		5							
1015									
		10							
1010									
		15							
1005									
		20							
1000									
		25							
995									
		30							
990									
		35							
985									
		40							

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BORING LOG

CONTRACTED WITH: DeKalb County BORING NO.: B-12A
PROJECT NAME: Toby Grant Recreation Center DATE: 09/04/18
JOB NO.: DKC-18-GA-02631-01 DRILLER: SUNRISE RIG: CME-45 LOGGED BY: MC

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	N VALUE	RECOV.	PPR (tsf)	NOTES
	Grass	0							
	Partially Weathered Rock sampled as Sand-trace silt, rock fragments and roots; very dense; brown (Residual)		1		6-50/6	50/6	4		Offset located 10 feet southwest from B- 12
1020									
	-light gray/red brown	5	2		15-16-50/1	50/1	10		
	AUGER REFUSAL AT 6 FEET								No groundwater encountered at the time of drilling
1015									
		10							
1010									
		15							
1005									
		20							
1000									
		25							
995									
		30							
990									
		35							
985									
		40							

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625 HOLCOMB BRIDGE ROAD
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BORING LOG

CONTRACTED WITH: DeKalb County BORING NO.: B-12B
PROJECT NAME: Toby Grant Recreation Center DATE: 09/04/18
JOB NO.: DKC-18-GA-02631-01 DRILLER: SUNRISE RIG: CME-45 LOGGED BY: MC

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	N VALUE	RECOV.	PPR (tsf)	NOTES
	Grass	0							
	Partially Weathered Rock sampled as sand-trace silt, mica and rock fragments; very dense; brown (Residual)		1		14-50/3	50/3	10		Offset located 15 feet south from B-12
1020									
	-some rock fragments; tan gray	5	2		25-50/2	50/2	12		
	AUGER REFUSAL AT 6 FEET								No groundwater encountered at the time of drilling
1015									
		10							
1010									
		15							
1005									
		20							
1000									
		25							
995									
		30							
990									
		35							
985									
		40							

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BORING LOG

CONTRACTED WITH: DeKalb County | BORING NO.: B-12C
PROJECT NAME: Toby Grant Recreation Center | DATE: 09/04/18
JOB NO.: DKC-18-GA-02631-01 | DRILLER: SUNRISE | RIG: CME-45 | LOGGED BY: MC

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	N VALUE	RECOV.	PPR (tsf)	NOTES
	Grass	0							Offset located 15 feet north from B-12
	Sand-trace silt and rock fragments; firm; brown (Residual)		1		7-6-9	15	12		
1020									
	-very dense; orange brown	5	2		13-15-50/2	50/2	14		
	Partially Weathered Rock sampled as sand-trace silt, mica and rock fragments; very dense; brown								No groundwater encountered at the time of drilling
1015	AUGER REFUSAL AT 6 FEET								
		10							
1010									
		15							
1005									
		20							
1000									
		25							
995									
		30							
990									
		35							
985									
		40							

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BORING LOG

CONTRACTED WITH: DeKalb County | BORING NO.: B-12D
PROJECT NAME: Toby Grant Recreation Center | DATE: 09/04/18
JOB NO.: DKC-18-GA-02631-01 | DRILLER: SUNRISE | RIG: CME-45 | LOGGED BY: MC

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	N VALUE	RECOV.	PPR (tsf)	NOTES
	Grass	0							
	Partially Weathered Rock sampled as sand-trace silt; very dense; black gray		1		7-8-50/3	50/3	16		Offset located at 20 feet east from B-12
1020									
	-trace quartz	5	2		50/2	50/2	16		
1015									
		10	3		50/1	50/1	12		
	AUGER REFUSAL AT 11 FEET								No groundwater encountered at the time of drilling
1010									
		15							
1005									
		20							
1000									
		25							
995									
		30							
990									
		35							
985									
		40							

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BORING LOG

CONTRACTED WITH: DeKalb County BORING NO.: B-13
PROJECT NAME: Toby Grant Recreation Center DATE: 09/04/18
JOB NO.: DKC-18-GA-02631-01 DRILLER: SUNRISE RIG: CME-45 LOGGED BY: MC

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	N VALUE	RECOV.	PPR (tsf)	NOTES
	Grass	0							
	Sand-trace silt and rock fragments; medium dense; light red-brown (Residual)		1		16-10-10	20	10		
1020									
	-firm; brown gray	5	2		5-5-7	12	10		
1015									
	Partially Weathered Rock sampled as sand-trace silt; very dense; gray	10	3		16-50/3	50/3	10		No groundwater encountered at the time of drilling
	AUGER REFUSAL AT 10 FEET								
1010									
		15							
1005									
		20							
1000									
		25							
995									
		30							
990									
		35							
985									
		40							

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BORING LOG

CONTRACTED WITH: DeKalb County | BORING NO.: B-13A
PROJECT NAME: Toby Grant Recreation Center | DATE: 09/04/18
JOB NO.: DKC-18-GA-02631-01 | DRILLER: SUNRISE | RIG: CME-45 | LOGGED BY: MC

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	N VALUE	RECOV.	PPR (tsf)	NOTES
	Grass	0							
	Sand-trace silt; medium dense; light brown (Residual)		1		9-11-12	23	14		Offset located at 10 feet North from B-13
1020									
	Partially Weathered Rock sampled as sand-trace silt and rock fragments; very dense; gray tan	5	2		50/2	50/2	14		
	AUGER REFUSAL AT 6 FEET								No groundwater encountered at the time of drilling
1015									
		10							
1010									
		15							
1005									
		20							
1000									
		25							
995									
		30							
990									
		35							
985									
		40							

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BORING LOG

CONTRACTED WITH: DeKalb County | BORING NO.: B-14
PROJECT NAME: Toby Grant Recreation Center | DATE: 09/04/18
JOB NO.: DKC-18-GA-02631-01 | DRILLER: SUNRISE | RIG: CME-45 | LOGGED BY: MC

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	N VALUE	RECOV.	PPR (tsf)	NOTES
	Grass	0							No groundwater encountered at the time of drilling
	Sand-some silt, trace mica; red-brown (Residual)		1		4-6-5	11	10		
1020									
	-silty, some mica; orange/red- brown	5	2		4-4-4	8	14		
1015	Partially Weathered Rock sampled as sand- silty, some mica; very dense; dark/ light brown		3		50/1	50/1	16		
	AUGER REFUSAL AT 9 FEET	10							
1010		15							
1005		20							
1000		25							
995		30							
990		35							
985		40							

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BORING LOG

CONTRACTED WITH: DeKalb County | BORING NO.: B-14A
PROJECT NAME: Toby Grant Recreation Center | DATE: 09/04/2018
JOB NO.: DKC-18-GA-02631-01 | DRILLER: SUNRISE | RIG: CME-45 | LOGGED BY: MC

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	N VALUE	RECOV.	PPR (tsf)	NOTES
	Grass	0							
	Sand-silty, some mica; firm; red-brown (Residual)		1		11-8-6	14	4		Offset located at 10 feet southwest from B- 14
1020									
	Partially Weathered Rock sampled as sand-silty, some mica; very dense; dark/ light brown	5	2		13-50/6	50/6	10		
1015	AUGER REFUSAL AT 8 FEET								No groundwater encountered at the time of drilling
		10							
1010									
		15							
1005									
		20							
1000									
		25							
995									
		30							
990									
		35							
985									
		40							

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BORING LOG

CONTRACTED WITH: DeKalb County | BORING NO.: B-15
PROJECT NAME: Toby Grant Recreation Center | DATE: 09/04/18
JOB NO.: DKC-18-GA-02631-01 | DRILLER: SUNRISE | RIG: CME-45 | LOGGED BY: MC

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	N VALUE	RECOV.	PPR (tsf)	NOTES
	Grass	0							
1020	Sand-trace silt and root fragments; medium dense; brown (Fill)		1		9-10-12	22	16		
	-micaceous, trace clay; firm; orange brown	5	2		4-5-7	12	12		
1015									
		10	3		5-6-6	12	18		
1010									
	Sand-trace silt and rock fragments; dense; black gray (Residual)	15	4		16-9-23	32	10		
1005	BORING TERMINATED AT 15 FEET								No groundwater encountered at the time of drilling
		20							
1000									
		25							
995									
		30							
990									
		35							
985									
		40							
980									

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BORING LOG

CONTRACTED WITH: DeKalb County | BORING NO.: B-16
PROJECT NAME: Toby Grant Recreation Center | DATE: 09/04/18
JOB NO.: DKC-18-GA-02631-01 | DRILLER: SUNRISE | RIG: CME-45 | LOGGED BY: MC

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	N VALUE	RECOV.	PPR (tsf)	NOTES
	Grass	0							
1020	Sand-trace silt and mica; firm; red-brown (Fill)		1		5-4-7	11	18		
	Clay-silty, trace sand; very stiff; orange/ red brown	5	2		5-11-10	21	12		
1015									
	Sand-some quartz fragments; trace silt and clay; medium dense; white-red brown (Residual)	10	3		11-16-11	27	16		
1010									
	Partially Weathered Rock - No sample recovered	15	4		50/1	50/1	0		
1005	BORING TERMINATED AT 15 FEET								No groundwater encountered at the time of drilling
		20							
1000									
		25							
995									
		30							
990									
		35							
985									
		40							
980									

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BORING LOG

CONTRACTED WITH: DeKalb County BORING NO.: B-17
PROJECT NAME: Toby Grant Recreation Center DATE: 09/04/2018
JOB NO.: DKC-18-GA-02631-01 DRILLER: SUNRISE RIG: CME-45 LOGGED BY: MC

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	N VALUE	RECOV.	PPR (tsf)	NOTES
	Grass	0							
	Sand-trace silt and rock fragments; medium dense; red-brown (Residual)		1		5-9-16	25	10		
1020	AUGER REFUSAL AT 2 FEET								No groundwater encountered at the time of drilling
		5							
1015									
		10							
1010									
		15							
1005									
		20							
1000									
		25							
995									
		30							
990									
		35							
985									
		40							

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BORING LOG

CONTRACTED WITH: DeKalb County BORING NO.: B-17A
PROJECT NAME: Toby Grant Recreation Center DATE: 09/04/18
JOB NO.: DKC-18-GA-02631-01 DRILLER: SUNRISE RIG: CME-45 LOGGED BY: MC

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	N VALUE	RECOV.	PPR (tsf)	NOTES
	Grass	0							
	Partially Weathered Rock sampled as sand-trace silt, rock, root; very dense; gray (Residual)		1		9-11-50/1	50/1	14		Offset located 10 feet northeast from B- 17
1020									
		5	2		12-50/5	50/5	14		
1015	AUGER REFUSAL AT 7 FEET								No groundwater encountered at the time of drilling
		10							
1010									
		15							
1005									
		20							
1000									
		25							
995									
		30							
990									
		35							
985									
		40							

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BORING LOG

CONTRACTED WITH: DeKalb County BORING NO.: B-17B
PROJECT NAME: Toby Grant Recreation Center DATE: 09/04/18
JOB NO.: DKC-18-GA-02631-01 DRILLER: SUNRISE RIG: CME-45 LOGGED BY: MC

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	N VALUE	RECOV.	PPR (tsf)	NOTES
	Grass	0							
	Sand-trace silt and rock; firm; brown (Residual)		1		9-7-9	16	10		Offset located 15 feet northwest from B-17
1020									
	AUGER REFUSAL AT 3 FEET								No groundwater encountered at the time of drilling
		5							
1015									
		10							
1010									
		15							
1005									
		20							
1000									
		25							
995									
		30							
990									
		35							
985									
		40							

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BORING LOG

CONTRACTED WITH: DeKalb County | BORING NO.: B-17C
PROJECT NAME: Toby Grant Recreation Center | DATE: 09/04/18
JOB NO.: DKC-18-GA-02631-01 | DRILLER: SUNRISE | RIG: CME-45 | LOGGED BY: MC

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	N VALUE	RECOV.	PPR (tsf)	NOTES
	Grass	0							
	Sand-some silt, trace clay and rock fragments; dense; brown (Residual)		1		9-21-10	31	10		Offset located 20 feet west from B-17
1020									
	-medium dense	5	2		14-9-12	21	10		
1015	AUGER REFUSAL AT 7 FEET								No groundwater encountered at the time of drilling
		10							
1010									
		15							
1005									
		20							
1000									
		25							
995									
		30							
990									
		35							
985									
		40							

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BORING LOG

CONTRACTED WITH: DeKalb County BORING NO.: B-18
PROJECT NAME: Toby Grant Recreation Center DATE: 09/04/18
JOB NO.: DKC-18-GA-02631-01 DRILLER: SUNRISE RIG: CME-45 LOGGED BY: MC

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	N VALUE	RECOV.	PPR (tsf)	NOTES
	Grass	0							
	Sand-trace silt and rock fragments; medium dense; brown (Fill)		1		9-12-10	22	14		
1020									
	Partially Weathered Rock sampled as sand-trace silt, some rock fragments; very dense; red-brown/ gray	5	2		25-50/2	50/2	16		
1015									
	-dark gray	10	3		50/1	50/1	10		
	AUGER REFUSAL AT 10 FEET								No groundwater encountered at the time of drilling
1010									
		15							
1005									
		20							
1000									
		25							
995									
		30							
990									
		35							
985									
		40							

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BORING LOG

CONTRACTED WITH: DeKalb County BORING NO.: B-19
PROJECT NAME: Toby Grant Recreation Center DATE: 09/04/18
JOB NO.: DKC-18-GA-02631-01 DRILLER: SUNRISE RIG: CME-45 LOGGED BY: MC

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	N VALUE	RECOV.	PPR (tsf)	NOTES
	Grass	0							No groundwater encountered at the time of drilling
	Sand-some silt and rock fragments; medium dense; red-brown (Residual)		1		9-12-15	27	14		
1020									
	Partially Weathered Rock sampled as sand-trace silt and rock; very dense; light brown	5	2		50/1	50/1	14		
1015	AUGER REFUSAL AT 7 FEET								
		10							
1010									
		15							
1005									
		20							
1000									
		25							
995									
		30							
990									
		35							
985									
		40							

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BORING LOG

CONTRACTED WITH: DeKalb County BORING NO.: I-1
PROJECT NAME: Toby Grant Recreation Center DATE: 09/04/18
JOB NO.: DKC-18-GA-02631-01 DRILLER: SUNRISE RIG: CME-45 LOGGED BY: MC

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	N VALUE	RECOV.	PPR (tsf)	NOTES
	Grass	0							
	Straight Auger: Sand-trace silt; brown/ orange-brown								
1020		5							
	AUGER REFUSAL AT 6 FEET								No groundwater encountered at the time of drilling
1015		10							
1010		15							
1005		20							
1000		25							
995		30							
990		35							
985		40							

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BORING LOG

CONTRACTED WITH: DeKalb County BORING NO.: I-1A
PROJECT NAME: Toby Grant Recreation Center DATE: 09/04/18
JOB NO.: DKC-18-GA-02631-01 DRILLER: SUNRISE RIG: CME-45 LOGGED BY: MC

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	N VALUE	RECOV.	PPR (tsf)	NOTES
	Grass	0							
	Straight Auger: Sand-trace silt; brown/ orange-brown								
1020		5							
	AUGER REFUSAL AT 6 FEET								No groundwater encountered at the time of drilling
1015		10							
1010		15							
1005		20							
1000		25							
995		30							
990		35							
985		40							

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BORING LOG

CONTRACTED WITH: DEKALB COUNTY RECREATION, PARKS AND CULTURAL | BORING NO.: B-1
PROJECT NAME: TOBIE GRANT RECREATION CENTER | DATE: 7/29/2016
JOB NO.: 2016.5599.01 | DRILLER: ZAC | RIG: CME 45 | LOGGED BY: AB

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
	Grass and topsoil (2")	0						
	Clay - some silt, trace sand and mica; stiff; red-brown (Fill)	5	1		11-14-14	0		
			2		6-8-7	18		
	Sand - some mica, trace clay and silt; medium dense; brown (Residual)	10	3		9-10-11	18		
	PWR sampled as gray-to-black sand with trace clay, silt and mica	15	4		50/4	6		
	- trace silt; brown	20	5		39-50/5	18		
	BORING TERMINATED AT 20 FEET							No groundwater encountered at time of drilling

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BORING LOG

CONTRACTED WITH: DEKALB COUNTY RECREATION, PARKS AND CULTURAL | BORING NO.: B-2
PROJECT NAME: TOBIE GRANT RECREATION CENTER | DATE: 7/28/2016
JOB NO.: 2016.5599.01 | DRILLER: ZAC | RIG: CME 45 | LOGGED BY: AB

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
	Grass and topsoil (3")	0						
	Clay - some sand, trace silt and mica; hard; red-brown (Fill)		1		10-13-18	18		
	- trace rock fragments; firm	5	2		4-4-4	18		
	- no silt; stiff	10	3		3-4-10	18		
	Sand - some clay, trace silt and mica; firm; brown (Residual)	15	4		7-8-7	18		
	PWR sampled as a light brown sand with some silt, trace clay and mica	20	5		13-50/6	18		
	BORING TERMINATED AT 20 FEET	25						No groundwater encountered at time of drilling
		30						
		35						
		40						

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BORING LOG

CONTRACTED WITH: DEKALB COUNTY RECREATION, PARKS AND CULTURAL | BORING NO.: B-3
PROJECT NAME: TOBIE GRANT RECREATION CENTER | DATE: 7/28/2016
JOB NO.: 2016.5599.01 | DRILLER: ZAC | RIG: CME 45 | LOGGED BY: AB

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
	Grass and topsoil (2")	0						
	Sand - some clay, trace silt and mica; medium dense; brown (Fill)		1		9-10-11	18		
	- firm	5	2		8-9-9	18		
	Clay - some silt, trace sand, mica and root hairs; stiff; dark brown	10	3		3-4-5	18		
	Sand - some rock fragments, trace clay, silt and mica; firm; brown (Residual)	15	4		6-7-6	18		
	PWR sampled as a brown sand with trace clay, silt and mica	20	5		50/4	6		
	BORING TERMINATED AT 20 FEET	25						No groundwater encountered at time of drilling
		30						
		35						
		40						

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BORING LOG

CONTRACTED WITH: DEKALB COUNTY RECREATION, PARKS AND CULTURAL | BORING NO.: B-4
PROJECT NAME: TOBIE GRANT RECREATION CENTER | DATE: 7/28/2016
JOB NO.: 2016.5599.01 | DRILLER: ZAC | RIG: CME 45 | LOGGED BY: AB

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
	Grass and topsoil (3")	0						
	Clay - some sand, trace silt, mica and rock fragments; very stiff; brown (Fill)		1		9-12-10	18		
	PWR sampled as a gray sand with some rock fragments, trace clay, silt and mica (Residual)	5	2		30-50/4	18		
	- no rock fragments	10	3		50/0	6		
	AUGER REFUSAL AT 11 FEET	15						No groundwater encountered at time of drilling
		20						
		25						
		30						
		35						
		40						

UNITED CONSULTING
625 HOLCOMB BRIDGE ROAD
NORCROSS, GEORGIA 30071
(770)209-0029, FAX (770)582-2800

BORING LOG

CONTRACTED WITH: DEKALB COUNTY RECREATION, PARKS AND CULTURAL | BORING NO.: B-4A
PROJECT NAME: TOBIE GRANT RECREATION CENTER | DATE: 7/28/2016
JOB NO.: 2016.5599.01 | DRILLER: ZAC | RIG: CME 45 | LOGGED BY: AB

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
	Grass and topsoil (3")	0						B-4A is 8 feet east of B-4
	Clay - some sand, trace silt and mica; very stiff; brown (Fill)		1		6-10-11	18		
	AUGER REFUSAL AT 2 FEET	5						No groundwater encountered at time of drilling
		10						
		15						
		20						
		25						
		30						
		35						
		40						

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BORING LOG

CONTRACTED WITH: DEKALB COUNTY RECREATION, PARKS AND CULTURAL | BORING NO.: B-5
PROJECT NAME: TOBIE GRANT RECREATION CENTER | DATE: 7/28/2016
JOB NO.: 2016.5599.01 | DRILLER: ZAC | RIG: CME 45 | LOGGED BY: AB

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES NO.	TYPE	BLOWS/6"	RECOV.	W	NOTES
	Grass and topsoil (3")	0						
	Sand - some clay, trace silt and mica; firm; brown (Fill)		1		11-8-9	18		
	Sand - some mica, trace silt and clay; loose; pink (Residual)	5	2		4-4-5	18		
	- firm; light orange	10	3		7-8-9	18		
	- light tan	15	4		9-10-8	18		
	PWR sampled as a tan sand with some mica and trace clay and silt	20	5		50/0	6		
	BORING TERMINATED AT 20 FEET							No groundwater encountered at time of drilling

Important Information about This

Geotechnical-Engineering Report

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

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

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

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

Read the Full Report

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

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

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

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

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

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

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

Subsurface Conditions Can Change

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

Most Geotechnical Findings Are Professional Opinions

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

A Report's Recommendations Are Not Final

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

A Geotechnical-Engineering Report Is Subject to Misinterpretation

Other design-team members' misinterpretation of geotechnical-engineering reports has resulted in costly

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

Do Not Redraw the Engineer's Logs

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

Give Constructors a Complete Report and Guidance

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

Read Responsibility Provisions Closely

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

Environmental Concerns Are Not Covered

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

Obtain Professional Assistance To Deal with Mold

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

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

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

GEOTECHNICAL BUSINESS COUNCIL
of the Geoprofessional Business Association

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