Report of Subsurface Investigation

and Geotechnical Engineering Evaluation

Moody Property

Rolesville, North Carolina

prepared for

Caruso Homes

Prepared by

NV5 Engineers and Consultants, Inc.
NC Engineering Corporation F-1333
NC Geologist Corporation C-585
4905 Professional Court
Raleigh, NC 27609
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November 3, 2021

Mr. Bruce Whitten
Caruso Homes
bwhitten@cursohomes.com

Report of Subsurface Investigation
And Engineering Evaluation
Moody Property
Rolesville, North Carolina
Our Project Number 121-21-107010

Gentlemen:

NV5 Engineers & Consultants, Inc. has completed the authorized subsurface investigation and engineering evaluation for the above referenced site. The enclosed report describes our site investigation procedures, presents the results of our testing and evaluation, and presents our design and construction recommendations regarding the geotechnical aspects of this project.

We appreciate the opportunity to work with you on this subsurface investigation and geotechnical engineering evaluation and are prepared to follow up with the recommended construction materials testing services. If you have any questions concerning the report, please contact us.

Sincerely,

NV5 Engineers & Consultants, Inc. (F-1333)

Addison N. Roe
Project Manager

Glen A. Malpass, P.E.
Principal Geotechnical Engineer

SCOPE OF SERVICES

The scope of this study is based on our email correspondence with Mr. Bruce Whitten, the review of the provided map, and our experience with similar constructions. We understand that subsurface investigation and geotechnical engineering evaluation for the site has been performed by others. The primary objectives of this investigation, which are described in our proposal number 9040-N, were to evaluate the subsurface conditions in the locations of the planned sewer lines and evaluate the excavation characteristics of the encountered subgrade materials. More specifically, this investigation included the following objectives:

1. To evaluate the existing subsurface soil and groundwater conditions within the area of proposed sanitary sewer line.
2. To make recommendations concerning the excavation characteristics of the encountered subgrade materials.
3. To make recommendations concerning construction dewatering if it appears necessary.
4. To make recommendations for achieving high density utility backfill capable of satisfactorily supporting the proposed construction.
5. To make pertinent recommendations concerning quality control measures during construction.

INVESTIGATIVE PROCEDURES

Field Investigation

The subsurface investigation consisted of the requested 10 machine-drilled borings. The approximate boring locations, which were determined by others, are shown on the Test Boring Location Map (Figure 1) in the Appendix. The test borings were advanced to a planned depth of 20 feet.

The test borings were located in the field by our representative by using handheld GPS unit and by measuring distances and angles from existing reference points. Exact ground surface elevations were not known at the time of this report. Our scope of services did not include surveying of the test boring locations. In general, the locations of the test borings should be considered approximate.

Standard penetration testing, as provided in ASTM D-1586, was performed at selected intervals in the machine drilled soil test borings utilizing an auto hammer with 90% efficiency. The penetration resistances, in conjunction with soil classifications, provide some indication of a soil's engineering characteristics.

Detailed description of the soils encountered in the test borings are provided in the Test Boring Records included in the Appendix. Ground water conditions, penetration resistances, and other pertinent information are also included. Because our samples are taken at discrete locations and depths, variations in the materials could be present that are not detected by the industry standard procedures used for this project and cannot be delineated in the Test Boring Records.

Laboratory Investigation

The laboratory investigation consisted of a physical examination and classification of all samples. Classification of the soil samples was performed in general accordance with ASTM D-2488 (Visual-Manuel Procedure for Description of Soils). The Visual-Manuel procedure used for soil classification is a qualitative analysis performed in conjunction with the education, experience, and professional judgement of our geotechnical engineer. Quantitative analysis of soil properties, such as those referenced in ASTM D-2487, could result in different soil classifications. In these instances, adjustments to the design and construction may be necessary, depending on the actual conditions. The soil classification also included our evaluation of the geological origin of the soils. Evaluations of geological origin are based on our experience and interpretation and may be subject to some degree of error.

GENERAL SITE AND SUBSURFACE CONDITIONS

Site Locations and Description

The subject site consists of two parcels located near physical address 1716 Roseville Road in Wake Forest, North Carolina (Wake County GIS PIN#1767-28-4925 and PIN#1767-28-4304). The parcels have an approximate total area of 51.8 acres. The site is currently a mixture of cleared farmland and wooded area. The existing relief at the site is approximately 50 feet.

Document Review

We have reviewed USGS for information regarding the expected soil conditions at the subject site. Based on our review, the soils at the site consists of primarily Rawlings-Rion complex soils, Wedowee-Saw complex soils, and Helena sandy loam. Alvavista fine sandy loam and Chewacla and Wehadkee soils are also present in isolated areas of the site. The seasonal water table could range from 6 inches to over 80 inches below ground surface. However, generally the water table will be deeper than 80 inches in the soil encountered.

Regional Geology

Based on review of state geological maps, the subject site is located in the Piedmont geological region of North Carolina, more specifically the Late Paleozoic intrusions. Late Paleozoic intrusions are mainly composed of the igneous rick granite and granodiorite. These rocks intruded as giant blobs of molten rock during the formation of the Appalachian Mountain chain. Soils typically consist of clays and silts in the upper 10 to 30 feet. The soils become coarser grained with depth and begin to take on characteristics of the underlying parent rock. When the residual materials have standard penetration resistance of 100 blows per foot or greater, they are referred to as partially weathered rock. The transition from soil to partially weathered rock is usually a gradual one and may occur at a wide range of depths. Lenses or layers of partially weathered rock are not unusual in the soil profile. Partially weathered rock represents zones of transition between the soils and underlaying rocks from which the soils are derived. The thickness of the zone of partially weathered rock and the depth of rock surface have both been found to vary considerably over relatively short distances.

General Subsurface Condition

Topsoil was encountered in each of our test borings ranging from depths of 5.5 inches to 12 inches. Our experience indicates that the thickness of topsoil can show significant variance and could possibly be different in other locations on the site. Therefore, the provided thicknesses should not be used for detailed quantity estimates.

Beneath topsoil, residual materials were encountered in each of our soil test borings. The residual soils generally consist of sandy silts, silty sands, and sands. Standard penetration resistances of the residual soils ranged from weight of hammer to 43 blows per foot.

Partially weathered rock was encountered in test borings B-1, B-3, B-9, and B-10. Partially weathered rock ranged from depth of 3 feet to 8 feet below the ground surface except in B-3 where it was encountered directly beneath topsoil.

Rock was encountered in test borings B-1, B-3, B-9, and B-10 at a depth of approximately 5.5 to 8 feet below ground surface. Rock, as used in this report, is denoted as material causing refusal of our motorized drilling equipment.

Groundwater was encountered in B-2, B-4, B-5, B-6, B-7, and B-8. Groundwater in the borings was observed at a depth ranging from approximately 7.3 feet to 9 feet below ground surface. Borings were backfilled upon completion. Groundwater levels will fluctuate depending on seasonal variations of precipitation and other factors and may occur at higher elevations in the future. The highest water levels generally occur in early spring, with lower levels in late and early fall. Therefore, water may be encountered during construction at depths not indicated during this study.

Detailed descriptions of the materials encountered in our borings are provided on the Test Boring Records included in the Appendix.

PROPOSED CONSTRUCTION

Project information has been provided to us by Mr. Bruce Whitten. We understand that the properties are to be developed as single-family residential subdivision with associated streets and storm water control ponds. The sewer outfall location is to be located on the western portion of the site as well as the sewer lines to be located along the planned streets near the center of the site.

Site grading at the time of this report is not currently known. However, we anticipate that the site grading will involve mass excavation and fill placement.

EVALUATIONS AND RECOMMENDATIONS

The following recommendations are based on the information available on the proposed construction, the data obtained from our soil test borings, and our experience with soils and subsurface conditions like those encountered at this site. Because the test borings represent a very small statistical sampling of subsurface conditions, it is possible that the conditions may be encountered during construction that are substantially different from those identified by the test borings. In these instances, adjustments to the design and construction may be necessary depending on actual conditions.

Excavation Characteristics

For the purpose of discussing excavation characteristics, the materials encountered in the test borings may be placed into three broad categories: (1) residual soils, (2) partially weathered rock, and (3) rock.

The residual soils at the project site should be generally excavatable with conventional soil excavation equipment, such as scrappers, loaders, etc.

Partially weathered rock (PWR) was encountered in soil test borings B-1, B-3, B-9, and B-10. The depth to the encountered PWR ranged from 5.5 to 8 feet below the existing ground surface, except in test boring B-3 where it was encountered directly under topsoil. Although materials identified as PWR may in some cases be excavatable with conventional soil excavation equipment, it would be prudent to assume that PWR will require ripping and in some cases blasting to efficiently achieve excavation. The thickness and continuity of PWR should be expected to vary widely even over a relatively short distance. Additionally, it would not be unusual to find isolated lenses of partially weathered rock within more weathered residual soils in other areas of the site.

In our experience, partially weathered rock with standard penetration resistances ranging from 50/6 inches to 50/4 inches of penetration can typically be excavated with a Caterpillar D-8 or similar tractor with a single-tooth ripper. In confined excavations, such material may be removed with a Caterpillar 330 or similar excavator with rock teeth. Partially weathered rock with standard penetration resistances ranging from 50/3 inches or less typically will require rock excavation methods.

Rock was encountered in test borings B-1, B-3, B-9, and B-10 at depths of approximately 5.5 feet to 8 feet below the existing ground surface. Rock, as used in this report, is defined as auger refusal of our conventional soil drilling equipment. Rock will typically require blasting or utilization of pneumatic equipment for efficient removal.

We recommend that the project specifications include a clear definition of excavation types to prevent field discussions regarding excavation of hard materials. We have enclosed our standard Rock Excavation Specifications for your use. We recommend that these be incorporated into the project earthwork specifications.

It is important to note that the depth to rock or partially weathered rock may vary quite rapidly over relatively short distances. It would not be unusual for rock or partially weathered rock to occur at higher elevations between or around the soil test borings.

Earth Slopes

Temporary construction slopes should be designed in strict compliance with the most recent OSHA regulations. The test borings indicated that the soils at the site are generally Type B with the presence of some Type C. Type B soils require a 1 horizontal (H) to 1 vertical (V) and Type C soils require a 1.5 (H) to 1 (V), for excavation up to 20 feet. Loose surficial soils or other conditions could require the use of even flatter slopes. A competent person as defined by OSHA guidelines should be present to determine the type of material exposed during trench excavations. Temporary construction slopes should be closely observed for signs of mass movement: tension cracks near the crest, bulging at the toe of the slope, etc. If potential stability problems are observed, the geotechnical engineer should be immediately contacted. The responsibility for excavation safety and stability of construction slopes should lie solely with the contractor.

We recommend that permanent cut or fill slopes be no steeper than 3.0 (H) to 1.0 (V) to maintain long term stability and to provide ease of maintenance. Slopes constructed steeper than 3.0 (H) to 1.0 (V) could be highly susceptible to erosion, will be difficult to maintain, and could experience large scale slope failure in some instances. The crest or toe of cut or fill slopes should be no closer than 15 feet to any building foundation. The crest or toe should be no closer than 5 feet to the edge of any pavement.

Groundwater Control

Groundwater was encountered within our soil test borings B-2, B-4, B-5, B-6, B-7, and B-8 at a depth ranging from 7.3 feet to 9 feet below the existing ground surface during or drilling operations. However, water levels will fluctuate depending upon seasonal variations in precipitation and other factors and may occur at other elevations in the future. Ground water control may be required to facilitate utility installation. We anticipate that dewatering will include pumping ground water from excavations on site and the excavation of dewatering trenches to the existing storm water management features on the site. If pumping from deeper excavations proves ineffective, then the use of well points or other methods may be required. Pumping from dewatering trenches should be done with care to prevent loss of soil fines, soils, or instability of slopes. In certain cases, gravity flow in a trench may be sufficient for effective dewatering.

We must emphasize that dewatering requirements will be dictated by ground water conditions at the time of construction. The contractor should use a technique or combination of techniques which achieves the desired result under actual field conditions.

In areas where offsite or onsite surface water flow adversely impacts site grading operations, surface water control will be required. Surface water should be directed around the construction areas using diversion ditches around the perimeter of the construction area or underground drainage pipes to facilitate drainage to sediment control basins.

If sandy soils are utilized as structural fill in areas where clay and silt soils are present, there is the potential for creating a perched ground water condition. This is caused when a highly permeable material (sand) is placed over a low permeability material (silt or clay). Therefore, if sandy soils are utilized as structural fill in areas where surficial silts or clays are present, we recommend that a series of underdrains be constructed. Additional recommendations and details for the underdrains can be provided once site grading plans are developed.

Suitability of Excavated Material for Reuse as Structural Fill

Placement and compaction of structural fill and utility backfill soils should be performed under the observations of our representative. Materials selected for use as structural fill should be free of vegetation, waste construction debris, and other deleterious materials. The fill materials should be compacted to a minimum of 95% of their standard Proctor (ASTM D-698) maximum dry density at a moisture content within 3% of the optimum moisture content. Blasted rock which has been crushed to a maximum size of 3 inches can generally be sued as utility backfill if it has a suitable gradation. Sufficient density tests should be performed by our representative to verify that the required degree of compaction has been achieved. All structural fill soils should be placed in accordance with the recommendations provided in the "Structural Fill" section of this report.

The residual soils encountered in our test borings generally consisted of sandy silts, silty clays, and sands. These soils are generally adequate for use as structural fill.

Structural Fill

In order to achieve high density structural fill, the following recommendations are offered:

(1) Materials selected for use as structural fill should be free of vegetable matter, waste construction debris, and other deleterious materials. The material should not contain rocks having a diameter over 3 inches. It is our opinion that the following soils represented by their USCS group symbols will typically be suitable for use as structural fill: (SM), (SC), (ML), (CL). Due to potential for creating a perched ground water condition, these soils should only be used under the discretion of a licensed geotechnical engineer: (SW), (SP), (SP-SM), and (SP-SC). At depths greater than 3 feet, the following soil types may be suitable for use as structural fill: (CH) and (MH). The following soil types are considered unsuitable: (OL), (OH), and (Pt).

(2) Laboratory Proctor compaction tests and classification tests should be performed on representative samples obtained from the proposed borrow material to provide data necessary to determine acceptability and for quality control. The moisture content of suitable borrow soils should generally not be more than 3 percentage points above or more than 3 percentage points below optimum at the time of compaction. Tighter moisture limits may be necessary with certain soils.

(3) Suitable fill material should be placed in thin lifts (lift thickness depends on type of compaction equipment, but in general, lifts of 8-inches, by loose measurement, are recommended). The soil should be compacted by mechanical means such as steel drum or sheepsfoot rollers. Proofrolling with rubber tired, heavily loaded vehicles may be desirable at approximately every third lift to bind the lifts together and to seal the surface of the compacted area thus reducing potential for infiltration of surface water following a rain. This sealing operation is particularly important at the end of the workday and at the end of the week. Within small excavations, we recommend the use of "wacker packers" or diesel sled tamps and loose lift thicknesses of 4 to 6 inches to achieve the specified compaction.

(4) We recommend that structural fill be compacted to a minimum of 95% of the standard Proctor maximum dry density (ASTM Specification D-698). Additionally, the in-place maximum dry density of structural fill should be no less than 90 pounds per cubic foot (pcf). The upper 12 inches of floor slab subgrades should be compacted to at least 98% of the standard Proctor maximum dry density (ASTM D-698). Fill soils placed in driveways and parking areas shall be placed and tested in accordance with NCDOT specifications.

(5) An experienced soil engineering technician should take adequate density tests throughout the fill placement operation to verify that the specified compaction is achieved. It is particularly important that this be accomplished during the initial stages of the compaction operation to enable adjustments to the compaction operation, if necessary.

ADDITIONAL SERVICES RECOMMENDED

Additional foundation engineering, testing, and consulting services recommended for this project are summarized below:

(1) Site Preparation Observations: Site preparation, including implementation of the recommended remedial measures should be observed by our representative on a full-time basis. Removal of any encountered unsuitable soils should be monitored by our representative to verify that adequate removal is accomplished.

(2) Quality Control of Fill Placement and Compaction: We recommend that an experienced engineering technician witness all required filling operations and take sufficient in-place density tests to verify that the specified degree of compaction has been achieved. Soil engineering judgements will be involved and should be made by our project geotechnical engineer with information provided by our engineering technician.

(3) Footing and Slab Evaluations: Footing and slab areas for this project should be evaluated by our representative. The purpose of these evaluations will be to verify that the design soil bearing pressure is available and that subgrade areas are properly prepared.

(4) Pavement Components Testing and Inspection: Pavement components should be tested and inspected during and after construction to verify compliance with project plans and specifications.

The attached Appendix completes this report.

Sincerely,

NV5 Engineers & Consultants, Inc. (F-1333)

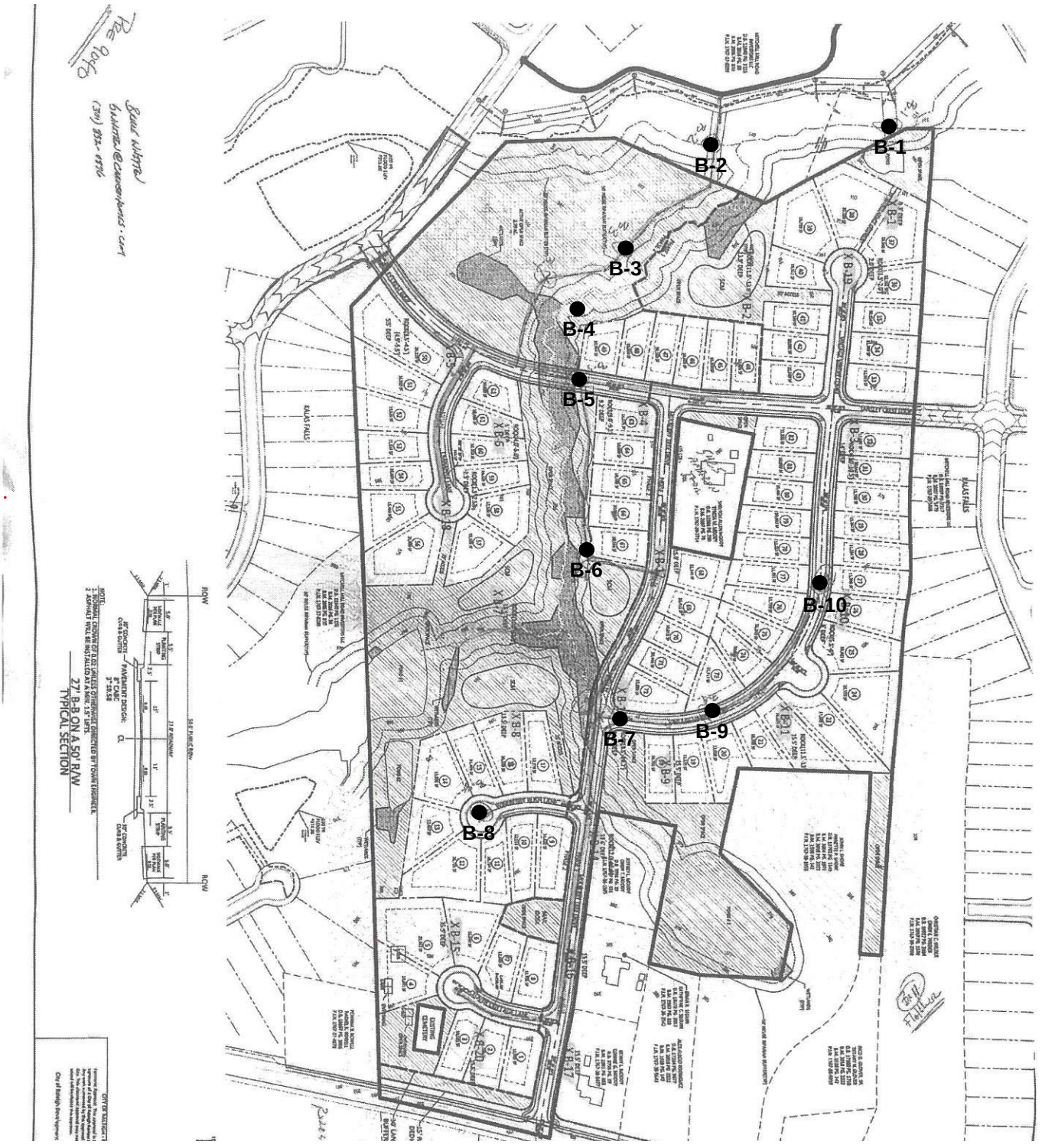
Addison N. Roe, E.I.
Project Manager

Date: 2021.11.15 16:04:42-05'00'

NORTH CAROLINA PROFESSIONAL SEAL 030988 ENGINEER GLEN A. MALPASS

Glen A. Malpass, Ph.D., P.E.
Senior Principal Geotechnical Engineer

Enclosures



Base map from client

Figure 1. Boring Locations

NV5 Engineers and Consultants, Inc. (F-1333)
4905 Professional Court
Raleigh, NC 27609
919-876-9799

Project: Moody Property
Rolesville, North Carolina
Our Project Number 121-21-107010

Rock Excavation Specifications

Excavation Classifications: The classifications of excavation below will be made when rock excavation is encountered in work. Do not perform such work until material to be excavated has been cross-sectioned and classified by the Geotechnical Engineer. Such excavation will be paid on basis of contract conditions relative to changes in work.

1. Earth excavation includes removal and disposal of pavements and other obstructions visible on surface; underground structures and utilities indicated to be demolished and removed; along with earth and other materials encountered that are not classified as rock excavation or unauthorized excavation.

2. Mass rock excavation consists of the removal and disposal of a formation that cannot be excavated with a Caterpillar D-8 bulldozer or equivalent, mounted with a single tooth ripper. Trenches in excess of 10 feet in width and pits in excess of 30 feet high in either length or width are classified as mass rock excavation.

3. In trench excavations for footings and utilities, trench rock excavation shall be the removal and disposal of a formation that cannot be excavated with a Caterpillar 322 track mounted excavator or equivalent, equipped with ¾ cubic yard bucket equipped with rock teeth.

4. The owner's testing agency or architect shall be the final judge as to what is to be classified as rock excavation. The contractor shall provide the specified equipment at the site to confirm rock excavation.

5. Intermittent ripping or drilling and blasting to increase production and not necessary to permit excavation will be classified as earth excavation.

6. Rock payment lines are as follows:
    A. Two feet outside of concrete work for which forms are required, except footings.
    B. One foot outside perimeter of footings.
    C. In pipe trenches, 6 inches below invert elevation of pipe and two feet wider than inside diameter of pipe, but not less than 3 feet minimum trench width.
    D. For drainage structures, 18 inches outside ofstructure dimension, and 6 inches below bottom of structure.
    E. Neat outside dimensions of concrete work where no forms are required.
    F. Under slabs-on-grade, 6 inches below bottom of concrete slab.
    G. Under pavements, 6 inches below planned subgrade elevation.

7. Field verification of rock quantities shall be performed by the owner's testing agency or a registered land surveyor.

8. Remove all excavated material classified as rock from the site.

9. Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of the architect. Unauthorized excavation, as well as remedial work associated with unauthorized excavation, shall be at Contractor's expense.

Symbols and Nomenclature

▮	Undisturbed Sample (UD)
●	Standard penetration resistance (ASTM D-1586)
100/2"	Number of blows (100) to drive the spoon a number of inches (2)
W-O-H, R	Weight of Hammer, Weight of Rods
AX, BX, NX	Core barrel sizes for rock cores
65%	Percentage of rock core recovered
RQD	Rock quality designation - % of core 4 or more inches long
▼	Water table at least 24 hours after drilling
▼	Water table one hour or less after drilling
△	Loss of drilling water
A	Atterberg Limits test performed
C	Consolidation test performed
GS	Grain size test performed
T	Triaxial shear test performed
P	Proctor compaction test performed
18	Natural moisture content (percent)

Penetration Resistance Results

	SPT Penetration (blows per foot)		
	Traditional Hammer	Automatic Hammer (90%)	
Sands	0-4	0-3	very loose
	5-10	4-7	loose
	11-20	8-14	firm
	21-30	15-20	very firm
	31-50	21-34	dense
	over 50	over 34	very dense
Silts and Clays	0-1	0-1	very soft
	2-4	2-3	soft
	5-8	4-5	firm
	9-15	6-10	stiff
	16-30	11-20	very stiff
	31-50	21-34	hard
	over 50	over 34	very hard

Drilling Procedures

Soil sampling and standard penetration testing performed in accordance with ASTM D-1586. The standard penetration resistance is the number of blows of a 140 pound hammer falling 30 inches to drive a 2 inch O.D., 1.4 inch I.D. split spoon sampler one foot. Core drilling performed in accordance with ASTM D-2113. Undisturbed sampling performed in accordance with ASTM D-1587.

Date	Project Number	Project	Boring No.
Started: 10/20/21 Completed: 10/21/21	121-21-107010	Moody Property	B-1
Hammer Type: Auto	Drilling Method: SPT	Logged By: ANR	Reviewed By: GAM
Latitude:	Longitude:	Surface Elevation:	

Location:

Sample Type
G - Bulk / Grab Sample
SPT - 2" O.D. 1.4" I.D. Tube Sample
MC - 3 " O.D. 2.4" I.D. Ring Sample
NR - No Recovery
* - Uncorrected Blow Counts

Groundwater

Depth (ft)	Hour	Date

Groundwater Depth (ft.)	Depth (ft.)	Graphical Log	Sample Taken	Sample ID	SPT N-Value	Moisture Content (%)	% Passing No. 200	Other Tests and Remarks	USCS Class.	Visual Classification
	0			SPT-						0.5' Topsoil (Approximately 8 inches)
				SPT-	3-6-10 N=16				ML	Very stiff brown tan fine to medium sandy silt (ML) (RESIDUAL)
										3.0'
				SPT-	4-3-4 N=7				ML	Stiff brown tan fine to medium sandy silt (ML)
	5									5.5'
				SPT-	5-50/1" N=100				ML	Partially weathered rock sampled as brown tan gray fine to medium sandy silt (ML)
										8.0'
	10									
	15									
	20									

Notes:
Boring terminated at depth of (20.0').
Cave in at 6.5 feet below ground surface. Auger refusual encountered at 8 feet below ground surface.

Date	Project Number	Project	Boring No.
Started: 10/20/21 Completed: 10/21/21	121-21-107010	Moody Property	B-2

Hammer Type: Auto	Drilling Method: SPT	Logged By: ANR	Reviewed By: GAM

Latitude:	Longitude:	Surface Elevation:

Location:

Sample Type
G - Bulk / Grab Sample
SPT - 2" O.D. 1.4" I.D. Tube Sample
MC - 3 " O.D. 2.4" I.D. Ring Sample
NR - No Recovery
* - Uncorrected Blow Counts

Groundwater

Depth (ft)	Hour	Date
8		

Groundwater Depth (ft.)	Depth (ft.)	Graphical Log	Sample Taken	Sample ID	SPT N-Value	Moisture Content (%)	% Passing No. 200	Other Tests and Remarks	USCS Class.	Visual Classification
▽	0			SPT-						0.5' Topsoil (Approximately 6.5")
				SPT-	3-4-8 N=12				ML	Very stiff brown fine to medium sandy silt (ML) (RESIDUAL)
										3.0'
				SPT-	3-4-6 N=10				ML	Stiff brown orange fine to medium sandy silt with clay (ML)
	5									5.5'
				SPT-	4-3-4 N=7				SP	Loose white black fine to medium sand (SP)
										8.0'
				SPT-	2-3-4 N=7					Stiff brown orange fine to medium sandy silt (ML)
	10								ML	
				SPT-	3-3-4 N=7					
	15									16.0'
				SPT-	7-9-13 N=22				SM	Dense white tan black fine to medium silty sand (SM)
	20									20.0'

Notes:
Boring terminated at depth of (20.0').
Cave in at 17 feet below ground surface. Water table encountered at 8 feet below ground surface.

Date	Project Number	Project	Boring No.
Started: 10/20/21 Completed: 10/21/21	121-21-107010	Moody Property	B-3
Hammer Type: Auto	Drilling Method: SPT	Logged By: ANR	Reviewed By: GAM
Latitude:	Longitude:	Surface Elevation:	

Location:

Sample Type
G - Bulk / Grab Sample
SPT - 2" O.D. 1.4" I.D. Tube Sample
MC - 3 " O.D. 2.4" I.D. Ring Sample
NR - No Recovery
* - Uncorrected Blow Counts

Groundwater

Depth (ft)	Hour	Date

Groundwater Depth (ft.)	Depth (ft.)	Graphical Log	Sample Taken	Sample ID	SPT N-Value	Moisture Content (%)	% Passing No. 200	Other Tests and Remarks	USCS Class.	Visual Classification
	0			SPT-						0.5' Topsoil (Approximately 9 inches)
				SPT-	7-50/5" N=100				ML	Partially weathered rock sampled as tan brown fine to medium sandy silt (ML) (RESIDUAL)
										3.0'
				SPT-	50/0.5" N=100				SP	Partially weathered rock sampled as gray fine to medium sand (SP)
	5									5.5'
	10									
	15									
	20									

Notes:
Boring terminated at depth of (20.0').
Cave in at 1.7 feet below ground surface. Auger refusal encountered at 5.5 feet below ground surface.

Date	Project Number	Project	Boring No.
Started: 10/20/21 Completed: 10/21/21	121-21-107010	Moody Property	B-4

Hammer Type: Auto	Drilling Method: SPT	Logged By: ANR	Reviewed By: GAM

Latitude:	Longitude:	Surface Elevation:

Location:

Sample Type
G - Bulk / Grab Sample
SPT - 2" O.D. 1.4" I.D. Tube Sample
MC - 3 " O.D. 2.4" I.D. Ring Sample
NR - No Recovery
* - Uncorrected Blow Counts

Groundwater

Depth (ft)	Hour	Date
8.3		

Groundwater Depth (ft.)	Depth (ft.)	Graphical Log	Sample Taken	Sample ID	SPT N-Value	Moisture Content (%)	% Passing No. 200	Other Tests and Remarks	USCS Class.	Visual Classification
	0			SPT-						Topsoil (Appriximately 12 inches) 1.0'
				SPT-	4-3-2 N=5				ML	Firm brown tan fine to medium sandy silt (ML) (RESIDUAL) 3.0'
				SPT-	3-3-4 N=7					Stiff tan gray orange fine to medium sandy micaceous silt (ML)
	5								ML	
				SPT-	3-3-3 N=6					8.0'
▽				SPT-	2-2-2 N=4				ML	Firm tan gray orange fine to medium sandy micaceous silt (ML) 12.0'
	10									
				SPT-	WOHx3 WOH				ML	Very soft tan fine to medium sandy micaceous silt (ML) 16.0'
	15									
				SPT-	1-2-2 N=4				ML	Firm orange tan fine to medium sandy micaceous silt (ML) 20.0'
	20									

Notes:
Boring terminated at depth of (20.0').
Cave in at 11.3 feet below ground surface. Water table encountered at 8.3 feet below ground surface.

Date	Project Number	Project	Boring No.
Started: 10/20/21 Completed: 10/21/21	121-21-107010	Moody Property	B-5

Hammer Type: Auto	Drilling Method: SPT	Logged By: ANR	Reviewed By: GAM

Latitude:	Longitude:	Surface Elevation:

Location:

Sample Type
G - Bulk / Grab Sample
SPT - 2" O.D. 1.4" I.D. Tube Sample
MC - 3 " O.D. 2.4" I.D. Ring Sample
NR - No Recovery
* - Uncorrected Blow Counts

Groundwater

Depth (ft)	Hour	Date
9		

Groundwater Depth (ft.)	Depth (ft.)	Graphical Log	Sample Taken	Sample ID	SPT N-Value	Moisture Content (%)	% Passing No. 200	Other Tests and Remarks	USCS Class.	Visual Classification
	0			SPT-						Topsoil (Approximately 12 inches) 1.0'
				SPT-	4-4-4 N=8				ML	Stiff tan orange fine to medium sandy micaceous silt (ML) (RESIDUAL) 3.0'
	5			SPT-	2-2-2 N=4				ML	Firm tan orange fine sandy micaceous silt (ML) 5.5'
				SPT-	1-1-1 N=2				ML	Soft tan orange fine sandy micaceous silt (ML) 8.0'
▽	10			SPT-	4-4-7 N=11				ML	Very stiff tan orange gine sandy silt (ML)
	15			SPT-	4-6-7 N=13					16.0'
	20			SPT-	6-8-9 N=17				ML	Very stiff white tan fine to medium sandy silt (ML) 20.0'

Notes:
Boring terminated at depth of (20.0').
Cave in at 17.1 feet below ground surface. Water table encountered at 9 feet below ground surface.

Date	Project Number	Project	Boring No.
Started: 10/20/21 Completed: 10/21/21	121-21-107010	Moody Property	B-6

Hammer Type: Auto	Drilling Method: SPT	Logged By: ANR	Reviewed By: GAM

Latitude:	Longitude:	Surface Elevation:

Location:

Sample Type
G - Bulk / Grab Sample
SPT - 2" O.D. 1.4" I.D. Tube Sample
MC - 3 " O.D. 2.4" I.D. Ring Sample
NR - No Recovery
* - Uncorrected Blow Counts

Groundwater

Depth (ft)	Hour	Date
8		

Groundwater Depth (ft.)	Depth (ft.)	Graphical Log	Sample Taken	Sample ID	SPT N-Value	Moisture Content (%)	% Passing No. 200	Other Tests and Remarks	USCS Class.	Visual Classification
▽	0			SPT-						Topsoil (Approximately 12 inches) 1.0'
				SPT-	3-4-6 N=10				ML	Stiff tan orange fine to medium sandy micaceous silt (ML) (RESIDUAL) 3.0'
	5			SPT-	1-2-2 N=4				ML	Firm tan micaceous silt (ML) 5.5'
				SPT-	1-1-2 N=3				ML	Soft tan orange fine to medium sandy micaceous silt (ML) 8.0'
	10			SPT-	2-2-2 N=4				ML	Firm brown white black fine sandy silt with trace organics (ML) 12.0'
				SPT-	3-4-5 N=9				ML	Stiff tan orange fine to medium sandy micaceous silt (ML) 16.0'
	15			SPT-	10-26-17 N=43				SM	Very dense orange brown fine to medium silty sand (SM) 20.0'
	20									

Notes:
Boring terminated at depth of (20.0').
Cave in at 16.4 feet below ground surface. Water table encountered at 8 feet below ground surface.

Date	Project Number	Project	Boring No.
Started: 10/20/21 Completed: 10/21/21	121-21-107010	Moody Property	B-7

Hammer Type: Auto	Drilling Method: SPT	Logged By: ANR	Reviewed By: GAM

Latitude:	Longitude:	Surface Elevation:

Location:

Sample Type
G - Bulk / Grab Sample
SPT - 2" O.D. 1.4" I.D. Tube Sample
MC - 3 " O.D. 2.4" I.D. Ring Sample
NR - No Recovery
* - Uncorrected Blow Counts

Groundwater

Depth (ft)	Hour	Date
8		

Groundwater Depth (ft.)	Depth (ft.)	Graphical Log	Sample Taken	Sample ID	SPT N-Value	Moisture Content (%)	% Passing No. 200	Other Tests and Remarks	USCS Class.	Visual Classification
	0			SPT-						0.5' Topsoil (Approximately 8 inches)
				SPT-	4-4-4 N=8				ML	Stiff tan brown fine to medium sandy silt (ML) (RESIDUAL)
										3.0'
				SPT-	2-3-3 N=6					Stiff gray tan fine to medium sandy micaceous silt (ML)
	5								ML	
				SPT-	2-3-3 N=6					
▽										8.0'
										Soft tan orange fine sandy micaceous silt (ML)
	10			SPT-	1-1-2 N=3				ML	
										12.0'
										Soft brown tan orange fine sandy micaceous silt (ML)
				SPT-	WOH-1-1 N=2				ML	
	15									
										16.0'
										Very stiff brown tan white fine sandy micaceous silt (ML)
				SPT-	5-6-8 N=14				ML	
	20									20.0'

Notes:
Boring terminated at depth of (20.0').
Cave in at 12 feet below ground surface. Water table encountered at 8 feet below ground surface.

Date	Project Number	Project	Boring No.
Started: 10/20/21 Completed: 10/21/21	121-21-107010	Moody Property	B-8
Hammer Type: Auto	Drilling Method: SPT	Logged By: ANR	Reviewed By: GAM
Latitude:	Longitude:	Surface Elevation:	

Location:

Sample Type
G - Bulk / Grab Sample
SPT - 2" O.D. 1.4" I.D. Tube Sample
MC - 3 " O.D. 2.4" I.D. Ring Sample
NR - No Recovery
* - Uncorrected Blow Counts

Groundwater

Depth (ft)	Hour	Date
7.3		

Groundwater Depth (ft.)	Depth (ft.)	Graphical Log	Sample Taken	Sample ID	SPT N-Value	Moisture Content (%)	% Passing No. 200	Other Tests and Remarks	USCS Class.	Visual Classification
	0			SPT-						Topsoil (Approximately 12 inches) 1.0'
				SPT-	3-3-5 N=8				ML	Stiff tan fine to medium sandy silt (ML) 3.0'
				SPT-	4-6-7 N=13				ML	Very stiff tan gray fine sandy silt (ML) 5.5'
▽	5			SPT-	3-4-4 N=8				ML	Stiff tan gray fine to medium sandy silt (ML) 8.0'
	10			SPT-	WOHx3 WOH				ML	Very soft tan gray fine to medium sandy micaceous silt (ML) 12.0'
	15			SPT-	2-2-2 N=4				ML	Firm tan orange fine sandy micaceous silt (ML) 16.0'
	20			SPT-	5-7-7 N=14				ML	Very stiff brown gray fine to medium sandy silt (ML) 20.0'

Notes:
Boring terminated at depth of (20.0').
Cave in at 9.4 feet below ground surface. Water table encountered at 7.3 feet below ground surface.

Date	Project Number	Project	Boring No.
Started: 10/20/21 Completed: 10/21/21	121-21-107010	Moody Property	B-9
Hammer Type: Auto	Drilling Method: SPT	Logged By: ANR	Reviewed By: GAM
Latitude:	Longitude:	Surface Elevation:	

Location:

Sample Type
G - Bulk / Grab Sample
SPT - 2" O.D. 1.4" I.D. Tube Sample
MC - 3 " O.D. 2.4" I.D. Ring Sample
NR - No Recovery
* - Uncorrected Blow Counts

Groundwater

Depth (ft)	Hour	Date

Groundwater Depth (ft.)	Depth (ft.)	Graphical Log	Sample Taken	Sample ID	SPT N-Value	Moisture Content (%)	% Passing No. 200	Other Tests and Remarks	USCS Class.	Visual Classification
	0			SPT-						0.5' Topsoil (Approximately 5.5 inches)
				SPT-	6-9-12 N=21				ML	Hard tan orange fine sandy silt (ML) (RESIDUAL)
										3.0'
				SPT-	6-23-50/2" N=100				ML	Partially weathered rock sampled as tan orange fine to medium sandy silt (ML)
	5									5.5'
	10									
	15									
	20									

Notes:
Boring terminated at depth of (20.0').
Cave in at 4 feet below ground surface. Auger refusal encountered at 5.5 feet below ground surface.

Date	Project Number	Project	Boring No.
Started: 10/20/21 Completed: 10/21/21	121-21-107010	Moody Property	B-10
Hammer Type: Auto	Drilling Method: SPT	Logged By: ANR	Reviewed By: GAM
Latitude:	Longitude:	Surface Elevation:	

Location:

Sample Type
G - Bulk / Grab Sample
SPT - 2" O.D. 1.4" I.D. Tube Sample
MC - 3 " O.D. 2.4" I.D. Ring Sample
NR - No Recovery
* - Uncorrected Blow Counts

Groundwater

Depth (ft)	Hour	Date

Groundwater Depth (ft.)	Depth (ft.)	Graphical Log	Sample Taken	Sample ID	SPT N-Value	Moisture Content (%)	% Passing No. 200	Other Tests and Remarks	USCS Class.	Visual Classification
	0			SPT-						0.5' Topsoil (Approximately 5 inches)
				SPT-	10-11-13 N=24				ML	Hard tan orange fine to medium sandy silt (ML) (RESIDUAL)
										3.0'
				SPT-	13-50/0.5" N=100				ML	Partially weatered rock sampled as orange red white fine to medium sandy silt (ML)
	5									5.5'
	10									
	15									
	20									

Notes:
Boring terminated at depth of (20.0').
Cave in at 4 feet below ground surface. Auger refusal encountered at 5.5 feet below ground surface.