

ECS Southeast, LLP

Preliminary Geotechnical Engineering Report

Rea Road High School

Charlotte, Mecklenburg County, North Carolina

ECS Project Number 08:13768

September 12, 2019





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September 12, 2019

Mr. Tim Ames Charlotte-Mecklenburg Schools (CMS) 3301 Stafford Drive Charlotte, North Carolina 28208

ECS Project No. 08:13768

Preliminary Geotechnical Engineering Report Reference: **Rea Road High School** Rea Road Charlotte, Mecklenburg County, North Carolina

Dear Mr. Ames:

ECS Southeast, LLP (ECS) has completed the preliminary subsurface exploration, laboratory testing, and geotechnical engineering analyses for the above-referenced project. Our services were performed in general accordance with our Proposal No. 08:23409P dated May 28, 2019. This report presents our understanding of the geotechnical aspects of the project, the results of the field exploration and laboratory testing conducted, and our preliminary design and construction recommendations.

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

Respectfully submitted,

ECS Southeast, LLP

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EXECUTIVE SUMMARY

This report contains the results of our preliminary subsurface exploration at the proposed site located along Rea Road north of the existing Old Providence Elementary School in Charlotte, Mecklenburg County, North Carolina. We understand the site will include the construction of a new high school, three-story parking garage, associated parking and drive areas, and a football stadium. The results of our preliminary exploration and geotechnical recommendations are summarized as follows:

- The subsurface conditions disclosed by the borings generally consisted of existing fill, residual soils, Partially Weathered Rock, and auger refusal to the explored depths of the borings.
 - Existing fills were encountered below surficial materials at Borings B-20 and B-26 to depths of approximately 3 to 8 feet below existing grades. Existing fills generally consisted of Sandy CLAY (CL).
 - Residual soils were encountered below the surficial materials and/or existing fill and consisted of Elastic SILT (MH), Sandy SILT (ML), Silty SAND (SM), Sandy CLAY (CL), Plastic CLAY (CH), and Clayey SAND (SC).
 - Partially Weathered Rock (PWR) was encountered below the surficial materials and/or residual soils at depths ranging from the surface to approximately 17 feet below existing ground surface with auger refusal at depths ranging from approximately 5 to 19 feet below ground surface.
- Moisture sensitive soils (MH/CH) were encountered at the surface in 18 out the 36 borings performed. MH soils with a Plasticity Index (PI) greater than 30 and CH soils should not be used for direct support of project foundations, slabs-on-grade, or pavements without remediation.
- Partially weathered rock (PWR) was encountered in the upper 10 feet in 29 of the 36 borings performed. Depending on the depth of the foundations and planned utilities, difficult excavation into PWR should be anticipated.
- For the parking garage, ground improvement or a deep foundation system may be required to support the structure. For the high school and football stadium, spread footings may be appropriate with maximum column foundation loads of 100 to 200 kips. At this time, a preliminary design bearing capacity of 2,000 to 4,000 psf for foundations bearing on firm residual soils appears feasible. Foundations bearing on new structural fill should consider a maximum design bearing capacity of 3,000 psf.
- Depending upon the project grading requirements, a seismic Site Class 'C' or 'D' may be appropriate.

Specific information regarding the subsurface exploration procedures, the site and subsurface conditions at the time of our exploration, and our conclusions and recommendations concerning the geotechnical design and construction aspects of the project are discussed in detail in the subsequent sections of this report. Please note this Executive Summary is an important part of this report but should be considered a "summary" only. The subsequent sections of this report constitute our findings, conclusions, and recommendations in their entirety. The recommendations provided in this report are preliminary. Final design and construction recommendations for the geotechnical aspects of the project should be developed by ECS once the actual site grading and structural loading information is available.

1.0 INTRODUCTION

1.1 GENERAL

The purpose of this study was to provide general subsurface conditions at the site and to evaluate those conditions with regard to foundation and floor slab support, along with general site development. The preliminary recommendations developed for this report are based on limited project information supplied by CMS. This report contains the results of our subsurface exploration and laboratory testing programs, site characterization, engineering analyses, and recommendations to assist in planning the project.

1.2 SCOPE OF SERVICES

Our scope of services for this phase of work included a preliminary subsurface exploration with soil test borings, engineering analysis, and preparation of this report with our recommendations. Overall, thirty-six (36) widely spaced soil test borings were performed at locations selected by ECS.

This preliminary report discusses our exploratory and testing procedures, presents our findings and evaluations and includes the following.

- Information on site conditions including geologic information and special site features.
- Description of the field exploration and tests performed.
- Final logs of the soil borings and records of the field exploration and laboratory tests in accordance with the standard practice of geotechnical engineers.
- Seismic site classification per the average-N method of the North Carolina Building Code (NCBC).
- Preliminary recommendations regarding foundations and slab-on-grade construction.
- Evaluation of the on-site soil, rock, and groundwater characteristics encountered in the soil borings.

2.0 PROJECT INFORMATION

2.1 PROJECT LOCATION

The site is located along Rea Road north of the existing Old Providence Elementary School in Charlotte, Mecklenburg County, North Carolina as shown in the Site Vicinity Map (Figure 2.1.1) below, and included in the Appendix.



Figure 2.1.1 Site Vicinity Map

2.2 SITE HISTORY/CURRENT SITE CONDITIONS

Based on the Google Earth historical imagery and our site visit, the site is developed with an elementary school in the southern portion, various athletic fields in the middle, and undeveloped and wooded in the northern portion. The previous use discussion is not considered a comprehensive or in-depth review of the site history, rather a cursory overview of available aerial imagery.

2.3 PROPOSED CONSTRUCTION

We understand that the project will include the construction of a new high school, three-story parking garage, associated parking and drive areas, and a football stadium.

2.3.1 Structural Information/Loads

The following information explains our assumptions regarding the structures and their loads:

SUBJECT	DESIGN INFORMATION / EXPECTATIONS
Framing	Steel/Masonry with Brick Veneer
Maximum Assumed Column Loads	100 to 200 kips – High School/Stadium 450 to 650 kips – Parking Garage
Maximum Assumed Wall Loads	6 kips per linear foot (klf)

Table 2.3.1.1 Design Assumptions

3.0 FIELD EXPLORATION

3.1 FIELD EXPLORATION PROGRAM

The field exploration was planned with the objective of characterizing the project site in general geotechnical and geological terms and to evaluate subsequent field and laboratory data to assist in the determination of preliminary geotechnical recommendations.

3.1.1 Test Borings

The subsurface conditions were explored by drilling thirty-six (36) widely-spaced soil test borings across the site. An ATV-mounted SIMCO 2400 drill rig with a manual hammer was utilized to drill the soil test borings using hollow stem auger techniques. Borings were generally advanced to depths ranging from approximately 12.1 to 30 feet below the current ground surface.

Boring locations were identified in the field by ECS personnel using handheld GPS techniques and existing landmarks as reference prior to mobilization of our drilling equipment. The approximate as-drilled boring locations are shown on the Boring Location Diagram in the Appendix. Ground surface elevations noted on our boring logs were estimated from Google Earth and should be considered accurate only to the degree implied by the method used to obtain them.

Standard penetration tests (SPTs) were conducted in the borings at regular intervals in general accordance with ASTM D 1586. Small representative samples were obtained during these tests and were used to classify the soils encountered. The standard penetration resistances obtained provide a general indication of soil shear strength and compressibility.

3.2 REGIONAL/SITE GEOLOGY

The site is located in the Piedmont Physiographic Province of North Carolina. The native soils in the Piedmont Province consist mainly of residuum with underlying saprolites weathered from the parent bedrock, which can be found in both weathered and unweathered states. Although the surficial materials normally retain the structure of the original parent bedrock, they typically have a much lower density and exhibit strengths and other engineering properties typical of soil. In a mature weathering profile of the Piedmont Province, the soils are generally found to be finer grained at the surface where more extensive weathering has occurred. The particle size of the soils generally becomes more granular with increasing depth and gradually changes first to weathered and finally to unweathered parent bedrock. The mineral composition of the parent rock and the environment in which weathering occurs largely control the resulting soil's engineering characteristics. The residual soils are the product of the weathering of the parent bedrock.

It is apparent that the natural geology has been modified in the past by grading that included the placement of fill materials. The quality of man-made fills can vary significantly, and it is often difficult to assess the engineering properties of existing fills. Furthermore, there is no specific correlation between N-values from standard penetration tests performed in soil test borings and the degree of compaction of existing fill soils; however, a qualitative assessment of existing fills can sometimes be made based on the N-values obtained and observations of the materials sampled in the test borings.

3.3 SUBSURFACE CHARACTERIZATION

The following sections provide generalized characterizations of the soil and rock strata encountered during our subsurface exploration. For subsurface information at a specific location, refer to the Boring Logs in Appendix B.

Approximate Depth Range (ft)	Stratum	Description	Ranges of SPT ⁽¹⁾ N- values (bpf)
0 to 0.5 (Surface cover)	n/a	Drillers reported topsoil thicknesses of about 1 to 5 inches across the site. Deeper topsoil or organic laden soils may be present in wooded areas. ⁽²⁾	N/A
0.5 to 8	I	FILL – Sandy CLAY (CL). ⁽³⁾	8 to 12
0.5 to 30	П	RESIDUAL – Sandy SILT (ML), Elastic SILT (MH), Sandy CLAY (CL), Plastic CLAY (CH), and Silty SAND (SM).	6 to 66
0.5 to 19.5	Ш	Partially Weathered Rock (PWR) – Sampled as Silty SAND (SM). ⁽⁴⁾	50+

Notes: (1) Standard Penetration Test

(2) Since mechanical clearing was used to gain access to a portion of the boring locations, some of the surficial organic laden soil may have been removed at the boring locations. Our experience indicates that organic laden soil depths in wooded areas may be greater than reported.

(3) Fill was encountered in Borings B-20 and B-26.

(4) Partially weathered rock is defined as a material with 100+ blows per foot.

3.4 GROUNDWATER OBSERVATIONS

Groundwater measurements were attempted at the termination of drilling and prior to demobilization from the site. Groundwater was encountered in Borings B-16. B-17, B-27, and B-28 approximately 8 to 23.5 feet below the existing grounds surface (bgs). Cave-in depths were attempted to be measured at each of the boring locations with cave-in depths ranging from approximately 3 to 26.2 feet. Cave-in of a soil test boring can be caused by groundwater hydrostatic pressure, weak soil layers, and/or drilling activities (i.e. drilling fluid circulation or advancement of bit).

Fluctuations in the groundwater elevation should be expected depending on precipitation, run-off, utility leaks, and other factors not evident at the time of our evaluation. Normally, highest groundwater levels occur in late winter and spring and the lowest levels occur in late summer and fall. Depending on time of construction, groundwater may be encountered at shallower depths and locations not explored during this study. If encountered during construction, engineering personnel from our office should be notified immediately.

4.0 LABORATORY SERVICES

The laboratory testing performed by ECS for this project consisted of selected tests performed on samples obtained during our field exploration operations. The following paragraphs briefly discuss the results of the completed laboratory testing program. Classification and index property tests were performed on representative soil samples obtained from the test borings in order to aid in classifying soils according to the Unified Soil Classification System and to quantify and correlate engineering properties.

A geotechnical staff professional visually classified each soil sample from the test borings on the basis of texture and plasticity in accordance with the Unified Soil Classification System (USCS) and ASTM D-2488 (Description and Identification of Soils-Visual/Manual Procedures). After classification, the staff professional then grouped the various soil types into the major zones noted on the Boring Logs in the Appendix. The group symbols for each soil type are indicated in parentheses following the soil descriptions on the boring logs. The stratification lines designating the interfaces between earth materials on the boring logs are approximate; in situ, the transitions may be gradual.

4.1 Laboratory Testing

In addition to visual classification, ECS performed six (6) natural moisture content tests and three (3) Atterberg limits test on selected soil samples obtained from within the borings. The laboratory testing was performed in general accordance with the applicable ASTM standards. The results of the laboratory testing are presented on the respective Boring Logs included in the Appendix.

5.0 PRELIMINARY SITE CONSTRUCTION RECOMMENDATIONS

The results of the exploration indicates the site is adaptable for the proposed construction. The considerations provided in this report are based upon widely spaced test locations; therefore, specific recommendations for design and construction are not provided. Once the final project requirements are known, additional testing should be performed at specific structure locations and final design and construction recommendations provided.

5.1 FOUNDATIONS & FLOOR SLABS

Parking Garage

We assume the parking garage will be concrete framed with maximum column loads in the range of 450 to 650 kips. Depending on the finished floor elevation, ground improvement such as stone columns or a deep foundation system may be required to support the parking garage.

High School/Football Stadium

We assume the high school and football stadium will have maximum column loads of 100 to 200 kips. Spread footings may be appropriate to support these structures. At this time, a preliminary design bearing capacity in the range of 2,000 to 4,000 psf for foundations bearing on firm residual soils appears feasible. Foundations bearing on new structural fill should consider a maximum design bearing capacity of 3,000 psf. The actual design bearing pressure should be determined by ECS once the actual site grading and structural loading information is available.

Slabs-on-grade can be adequately supported on undisturbed residual soils or on new properly placed structural fill provided the site preparation and fill recommendations outlined herein are implemented. Additionally, it appears that the existing fill soils were placed with compactive effort and are likely suitable for slab-on-grade bearing provided they are found to be stable at the time of construction.

Further discussions with the design team are necessary to develop more specific bearing pressure, settlement, floor slab, and any potential groundwater recommendations. Final design and construction recommendations should be based on actual structural loading information, finished grades, etc.

5.2 SEISMIC DESIGN CONSIDERATIONS

Seismic Site Classification: The North Carolina Building Code (NCBC) requires site classification for seismic design based on the upper 100 feet of a soil profile. Three methods are utilized in classifying sites, namely the shear wave velocity (v_s) method; the unconfined compressive strength (s_u) method; and the Standard Penetration Resistance (SPT N-value) method. Based on the SPT N-values obtained within the drilled depth of borings and depending on the site plan, a seismic Site Class "**C**" or "**D**" may considered appropriate for this project. The final site grades will heavily influence the Site Class used in design.

The seismic site class definitions for the weighted average of SPT N-value in the upper 100 feet of the soil profile are shown in the following table:

Table 5.2.1: Seismic Site Classification										
Site Class	Soil Profile Name	SPT Resistance, N-bar	N value (bpf)							
А	Hard Rock	Not Applicable	N/A							
В	Rock	Not Applicable	N/A							
С	Very dense soil and soft rock	N-bar > 50	>50							
D	Stiff Soil Profile	15 ≤ N-bar ≤ 50	15 to 60							
E	Soft Soil Profile	N-bar < 15	<15							

5.3 EARTHWORK CONSIDERATIONS

5.3.1 Existing Man-Placed Fill

Existing fill was encountered below surficial material at Borings B-20 and B-26 and extended to depths of approximately 3 to 8 feet below existing grades. Standard penetration resistances in the existing fill ranged from 8 to 12 blows per foot (bpf). ECS was not provided with the test records (such as previous surface exploration, proofrolling, compaction testing etc.) at the time of this report; therefore, the existing fill should be considered undocumented.

Undocumented fill poses risks associated with undetected deleterious inclusions within the fill and/or deleterious materials at the virgin ground fill interface that are covered by the fill. Deleterious materials can consist of significant amount of organics derived from organic rich stripping, rubbish, construction or demolition debris, stumps and roots, and logs. These deleterious inclusions can result in the premature distress of new grade supported construction if not removed. Where these types of conditions exist under or within undocumented fill, they are sometimes in discreet pockets that can go undetected by soil test borings.

Based on our evaluation of the existing fill, we anticipate the risk of supporting slabs and pavements on the existing fill is relatively low provided the fill is thoroughly evaluated at the time of construction and found to be stable. Otherwise, the risk can be mitigated by removing the existing fill and replacing it with new structural fill.

5.3.2 High Plasticity Soils

Elastic SILTS (MH) and Plastic CLAYS (CH) were encountered across the site at various depths. Soils classified as MH/CH are fine-grained and have a Liquid Limit greater than 50 percent. Additionally, MH/CH soils are moisture sensitive soils and tend to shrink and swell with moisture variations.

MH soils with a plasticity index greater than 30 and CH soils should not be used for direct support of project foundations, slabs-on-grade, or pavements. MH soils (PI's greater than 30) and CH soils encountered within proposed structural areas should be undercut and replaced with low plasticity engineered fill to a minimum depth of 2 feet below foundations, slabs, and pavement areas. Upon completion of the removal, the resulting subgrade soils should be evaluated for stability prior to placement of engineered fill. Once building locations, loading conditions, elevations, etc. have been established, ECS can further refine our recommendations regarding the moisture sensitive soils.

High plasticity soils are not suitable as retaining wall or below grade wall backfill.

5.3.2 Below Grade Excavation

Based on the results of the soil test borings, PWR and Auger Refusal materials (i.e. rock) were encountered within the majority of the borings. Depending on the depth of the foundations and utilities, difficult excavation into PWR should be anticipated. Partially weathered rock/rock should be taken into consideration by the site civil designer when developing foundation, storm drainage, and utility plans.

We would like to point out that our experience indicates rock in a weathered, boulder, and/or massive form varies erratically in location and depth within the Piedmont Geologic Province, of which Mecklenburg County is part. Due to the variability of the Piedmont soils, there is always a potential that these materials could be encountered at shallower depths between the boring locations. The depth to, and thickness of weathered rock, rock lenses or seams, and bedrock, can vary dramatically in short distances and between boring locations; therefore, weathered rock and/or bedrock should be anticipated during construction at locations or depths, between boring locations, not encountered during this exploration. The following table summarizes the locations and depths where PWR may be encountered.

Location	Depth of PWR* (ft)	Location	Depth of PWR* (ft)	Location	Depth of PWR* (ft)
B-1	5.5	B-13	3	B-25	3
B-2	8	B-14	3	B-26	8
B-3	8	B-15	5.5	B-27	12
B-4	3	B-16	17	B-28	
B-5	3	B-17	12	B-29	3
B-6	8	B-18	0	B-30	3
B-7	5.5	B-19	5.5	B-31	5.5
B-8	3	B-20	12	B-32	5.5
B-9	3	B-21	5.5	B-33	22
B-10	12	B-22	8	B-34	5.5
B-11	12	B-23	8	B-35	8
B-12	5.5	B-24	3	B-36	5.5

Table 5.3.3.1: Partially Weathered Rock (PWR) Encountered

*Depth to top of Partially Weathered Rock.

Typically, in mass excavation for general site work, materials with an N-value of 50 blows per 3 to 6 inches of penetration can be excavated with moderate to heavy effort using appropriately sized equipment, such as a large track-hoe (e.g., Caterpillar 330 with rock teeth or a D-8 bulldozer with a single ripping tooth). In confined excavations such as foundations, utility trenches, etc., removal of PWR may require use of heavy duty backhoes, pneumatic spades, or blasting. Material that exhibits less than 3 inches of penetration per 50 blows and material causing auger refusal will likely require jack hammering, blasting or drilling to facilitate removal. Due to the apparent quality of the refusal materials and local geology, we anticipate that blasting will be required in excavations that extend below the depths/elevations indicated as "Auger Refusal" in our boring logs.

Rock materials will normally require blasting for removal in all types of excavations. Any blasting in foundation excavations must be done carefully to prevent damage to the bearing materials and nearby buildings or roadways/utilities. The gradation of the material removed by ripping or blasting will likely be erratic.

As a general guide, we recommend the following definitions be used to define rock:

General Excavation

- Rip Rock: Material that cannot be removed by scrapers, loaders, pans, dozers, or graders; and requires the use of a single-tooth ripper mounted on a crawler tractor having a minimum draw bar pull rated at not less than 56,000 pounds.
- Blast Rock: Material which cannot be excavated with a single-tooth ripper mounted on a crawler tractor having a minimum draw bar pull rated at not less than 56,000 pounds (Caterpillar D-8 or equivalent) or by a Caterpillar 977 frontend loader or equivalent; and occupying an original volume of at least one (1) cubic yard.

Trench Excavation

Blast Rock: Material which cannot be excavated with a backhoe having a bucket curling force rated at not less than 25,700 pounds (Caterpillar Model 225 or equivalent), and occupying an original volume of at least one-half (1/2) cubic yard.

6.0 CLOSING

ECS has prepared this report of findings, evaluations, and preliminary recommendations to guide geotechnical-related design and construction aspects of the project.

The description of the proposed project is based on limited information provided to ECS. If any of this information is inaccurate, either due to our interpretation of the documents provided or site or design changes that may occur later, ECS should be contacted immediately in order that we can review the report in light of the changes.

We also recommend that ECS be allowed to review the project's plans and specifications pertaining to our work so that we may ascertain consistency of those plans/specifications with the intent of the geotechnical report.

Field observations, monitoring, and quality assurance testing during earthwork and foundation installation are an extension of and integral to the geotechnical design recommendation. We recommend that the owner retain these quality assurance services and that ECS be allowed to continue our involvement throughout these critical phases of construction to provide general consultation as issues arise. ECS is not responsible for the conclusions, opinions, or recommendations of others based on the data in this report.

APPENDIX

Site Vicinity Map Boring Location Diagram Reference Notes for Boring Logs

Boring Logs

Laboratory Testing Summary















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Charlo	otte,	Cha	rlot	te, N	lecklenburg C	County, NC						BRATED P	ENETROME	TER TONS/FT ²
NORTHIN	G	_		EASTIN	NG	STATION					ROCK QL RQD	JALITY DES %	REC%	& RECOVERY
38857	53.9	97	ŝ	518	276.73	IATERIAL	E	NGLISH UNI	TS		PLASTIC	۷	VATER	LIQUID
Ê.	NO	ТҮРЕ	DIST. (RY (IN)	BOTTOM OF CASING	G 🗩	LOSS OF CIRC		.EVELS	50	\times	CO		Δ
DEPTH (F	SAMPLE	SAMPLE	SAMPLE	RECOVE	SURFACE ELEVATIO	DN 596			WATER L	BLOWS/6	\otimes	STANDAF BL	RD PENETR/ OWS/FT	ATION
0					∑Topsoil Thickn (MH RESIDUA)	ess [2.50"] \L) ELASTIC SI	LT, contains s		595	5				
	S-1	SS	18	16	mica, brown, n	noist, very stiff				10 15		25-⊗		
					(SM) SILTY FI	NE TO MEDIUN dense	M SAND, gray	vish		6				
5	S-2	SS	18	16						16 18			34-⊗	
	S-3	SS	18	18					590	22 13			35-🛇	
										22				
	S-4	SS	0	0	SAMPLED AS	SILTY FINE TO	D MEDIUM SA	and,		50/0				100+
10					AUGER REFU	ISAL @ 8.5'			- 585					
									-					
15-									-					
									580 					
20														
									575					
25									-					
									- 570					
									- -					
									E					
30														
THE STRATIFICATION LINES REPRESENT THE APPROXIMA						THE APPROXIMAT	E BOUNDARY LI	NES BETWE	EN SOIL TYP	ES. IN-	SITU THE TRA	ANSITION N	IAY BE GRAD	DUAL.
₩ WL G	ANE			WS	WD	BORING STARTE	RTED 08/21/19 CAVE IN DEPTH 6.3							
₩ WL(SH	HW)		Ţ	WL(AC	R) GNE	BORING COMPLE	TED 08/21	/19		HAMI	MER TYPE M	lanual		
₩ WL	₩ WL RIG ATV						FORE	MAN Cody	Presley	DRILI	LING METHOD	2.25 HS	SA	

CLIENT						Job #:		BORI	NG #			SHEET				
Charlotte PROJECT NA	<u>e-Mec</u>	kle	nburg	g Schools (Cl	MS)	0 ARCHI	8:13768	1	B-4		1	OF 1		Ε	20	
	a Roa	ad H	ligh	School												14
Charlotte	h Ch	arlo	to N	lecklenburg (County NC						-O- c	ALIBRATE	ED PEN	ETROME	TER TON	S/FT ²
NORTHING	5, 011		EASTIN	IG	STATION						ROCK R	QUALITY QD%	DESIG	NATION REC%	& RECOV	ERY
3885760).31		<u>518:</u>	329.70 DESCRIPTION OF N	IATERIAL		ENGLISH	UNITS			PLAST	IC	WAT	TER	LIC	QUID
Ê Â	ТҮРЕ	DIST. (II	RY (IN)	BOTTOM OF CASIN	IG 📕	LOSS		N 2002	EVELS DN (FT)	=		%	CONT	ENT%		ит% ∕∆
DEPTH (F	SAMPLE	SAMPLE	RECOVE	SURFACE ELEVATI	on 598				WATER L	BLOWS/6		⊗ stan	IDARD I BLOW	PENETR/ VS/FT	ATION	
					ness [2.50"]	AV b			_							
S-	1 SS	18	14	firm	AL) PLASTIC CL	_A I, D	rown, moist,			2 3 5	\otimes					
	2 SS	11	7	(PWR) PARTI SAMPI ED AS					595 	25	0				10)+)
5 - ^{S-}	3 SS	0	0							50/5 50/0					- 50/0 -Č	·
				Nodennere												
10																
									<u> </u>							
_									 585							
15																
									 580							
20																
25																
									<u> </u>							
30																
		•								. •						
THE STRATIFICATION LINES REPRESENT THE APPROXIMA						E BOUN	IDARY LINES BE	TWEEN	SOIL TYPI	ES. IN-S	SITU THE	TRANSITIC	ON MAY	BE GRAD	UAL.	
						D	08/21/19			CAVE	IN DEPTI	+ 3.0				
₩ WL(SHW) ₩ WL(ACR) GNE BORING COMPL							PLETED 08/21/19 HAMMER TYPE Manual									
≑ w∟ RiG ATV							FOREMAN C	ody Pı	resley	DRILL	ING MET	HOD 2.25	5 HSA			

CLIENT		Job #:	BORING #	SHEET	
Charlotte-Mecklenburg	g Schools (CMS)	08:13768 ARCHITECT-ENGINEER	B-5	1 OF 1	ECe
CMS Rea Road High	School			1	
Charlotta Charlotta	Jooklophurg County, NC			CALIBRATED P	ENETROMETER TONS/FT ²
	NG STATION			ROCK QUALITY DES RQD%	GNATION & RECOVERY
3885695.54 518	172.40 DESCRIPTION OF MATERIAL	ENGLISH	UNITS		VATER LIQUID
(FT) E NO. E DIST. (IN ERY (IN)		LOSS OF CIRCULATIO		LIMIT% CO	NTENT% LIMIT%
DEPTH (SAMPLE SAMPLE SAMPLE SAMPLE	SURFACE ELEVATION 594		WATER	STANDAR BL	ND PENETRATION OWS/FT
0	Topsoil Thickness [3.00"] (CH BESIDUAL) PLASTIC (CLAY, brown, moist,			
	stiff	,		3 5 9 14	
	(PWR) PARTIALLY WEATH SAMPLED AS SILTY FINE T	ERED ROCK TO MEDIUM SAND,	590	0/5	100+
5 <u>S-3</u> SS 0 0	gray AUGER REFUSAL @ 5.0'		50	0/0	100+ 🔆
			585		
			580		
			575		
20					
			570		
25—					
30			565 		
	I				
₩L GNE WS	WD BORING START	red 08/21/19	C.	AVE IN DEPTH 3.1	
₩ WL(SHW) ₩ WL(AC	CR) GNE BORING COMP	LETED 08/21/19	н	AMMER TYPE Manual	
₩ Į	RIG ATV	FOREMAN C	ody Presley D	RILLING METHOD 2.25 HS	SA

CLIENT	Job #:	BORING #	SHEET			
Charlotte-Mecklenburg Schools (CM	MS) 08:1376 ARCHITECT-ENG	8 B-6	1 OF 1	ECe		
CMS Rea Road High School						
				PENETROMETER TONS/FT ²		
NORTHING EASTING	STATION		ROCK QUALITY DE RQD%	SIGNATION & RECOVERY REC%		
3885710.54 518226.64						
H H H H H H H H H H H H H H H H H H H	on 602	WATER	S STANDAR BL	RD PENETRATION LOWS/FT		
0	ess [2.00"] AL) ELASTIC SILT, gravish	-/ =	7			
	hard	600	7 16 22	38-⊗		
S-2 SS 18 16 (ML) SANDY S	SILT, gray, moist, hard		13 13 18	31-🛛		
5 (SM) SILTY FI	NE TO MEDIUM SAND, gray,					
	i dense	595 	12 15 14	29		
S-4 SS 9 9 SAMPLED AS	ALLY WEATHERED ROCK		36			
			50/3	100+		
S-5_SS_0_0_AUGER REFU	ISAL @ 12.5'		50/0	⊗ 100+		
		_				
20						
		580 				
	THE APPROXIMATE BOUNDARY LIN	ES BETWEEN SOIL TYPE	S. IN-SITU THE TRANSITION N	N-SITU THE TRANSITION MAY BE GRADUAL.		
₩ WL(SHW) ¥ WL(ACR) GNE	BORING COMPLETED 08/21/1	MILED U8/21/19 CAVE IN DEPTH 10.1 MPLETED 08/21/19 HAMMER TYPE Manual				
₩ ₩L	RIG ATV FOREM	AN Cody Presley	DRILLING METHOD 2.25 H	SA		

CLIENT							Job #:		BORI	NG #			SHEET				
		Mec	klei	nburg	g Schools (CN	MS)	0 ARCHI	8:13768 TECT-ENGINEE	R	B-7			<u>1 OF 1</u>		E	20	
CMS SITE LOC	Rea ATION	Roa	ad F	ligh	School												
Charle	otto	Cha	arloi	to N	lecklenburg (County NC						-O- 0	CALIBRAT		NETROME	TER TONS	/FT ²
NORTHIN	G			EASTIN	IG	STATION						ROCł F	k qualit Rqd% —	Y DESIC	GNATION REC%	& RECOVE	RY
38857	23.2	21	Î	<u>5182</u>	280.97 DESCRIPTION OF M	IATERIAL		ENGLISH	I UNITS			PLAS	TIC	WA	TER	LIQU	JID
Ē	<u>o</u>	ΥPE	IST. (IN	X (IN)	BOTTOM OF CASIN	G 🗩	LOSS		ON ∑100≵	evels N (FT)		LIMIT	7%	CONT	ENT%		Т% \
ОЕРТН (F [.]	SAMPLE N	SAMPLE T	SAMPLE D	RECOVER	SURFACE ELEVATIO	DN 601				NATER LE	BLOWS/6"		⊗ sta	NDARD BLO	PENETR/ WS/FT	ATION	
0	0,	05	0,		Topsoil Thickn	ess [2.50"]			ŇŇ		ш						
	S-1	SS	18	16	(SM RESIDUA SAND, trace c	lay, gray, moist,	dense	EDIUM 9		600	4 14 30				4	4-%	
					(SM) Residuur	n, SILTY FINE	ТО МЕ	EDIUM		_	16						
5	S-2	SS	18	14	SAND, gray, m	ioist, dense				_	20 20				40-0		
	S-3	SS	10	7	(PWR) PARTI	ALLY WEATHE		ROCK		595 	17					100+-⊗	
	∖S-4	SS	1	0	<u>n∖gray</u> AUGEB BEFU	ISAL @ 7.1'		ſ		 	50/4						
10																	
										590 							
15										- 585							
20										_							
										580							
										_							
25 —																	
										575							
										_							
30 —																	
	TH	E STR	ATIFI		I LINES REPRESENT	THE APPROXIMAT	E BOUN	IDARY LINES BE	TWEEN	SOIL TYP	ES. IN-	SITU THE	TRANSIT	'ION MA'	Y BE GRAD	UAL.	
₩ WL C	GNE			WS	WD	BORING STARTE	D	08/21/19			CAVE	IN DEPT	н 5.8				
₩ WL(SI	HW)		Ţ	WL(AC	R) GNE	BORING COMPLE	TED	08/21/19			HAM	MER TYP	E Manu	al			
₩ WL						RIG ATV		FOREMAN (Cody P	resley	DRILI	LING MET	THOD 2.2	25 HSA	l.		

CLIENT							Job #:		BORI	NG #		SHEET	Г			
Charlo PROJECT N	tte-I	Nec	kler	burg	g Schools (Cl	MS)	0 ARCHI	8:13768 TECT-ENGINEEF	3	B-8		1 OF	1	E	20	
CMS F	Rea	Roa	<u>ıd H</u>	igh :	School											The
Charlo	tto	Cha	rlat		lecklenhura (County NC							ATED P	ENETROME	TER TONS	/FT ²
NORTHING	<u>iie,</u>			EASTIN	IG	STATION						ROCK QUAL RQD%	ITY DE	SIGNATION REC%	& RECOVE	RY
388573	<u>34.3</u>	7	;	<u>5183</u>	336.09 DESCRIPTION OF M	MATERIAL		ENGLISH	UNITS			PLASTIC	v	VATER	LIQI	UID
(FT)	ON	: ТҮРЕ	E DIST. (IN	ERY (IN)	BOTTOM OF CASIN	IG 📕	LOSS	OF CIRCULATIO	DN 21002	LEVELS ION (FT)	.9	LIMIT%	CO	NTENT%		Τ% Δ
DEPTH	SAMPLE	SAMPLE	SAMPLE	RECOVI	SURFACE ELEVATI	on 599				WATER	BLOWS	⊗ sī	FANDAF BL	RD PENETR OWS/FT	ATION	
0					\Topsoil Thickr (MH BESIDU)	ness [2.50"] ALL ELASTIC SI	IT bro	own moist	ŇŇ	_						
	S-1	SS	18	18	very stiff		L1, 01	own, molot,			5 9 9	17.3- (1	8			
	S-2	SS	3	3	(PWR) PARTI SAMPLED AS	ALLY WEATHE S SILTY FINE TO	RED F D MED	ROCK DIUM SAND,		595	50/3					-
5					gray					_						
	S-3	SS	9	7						_	50 50/3				100+-🔗	
	<u> </u>	~~~		0							50/2					
	S-4 SS 3 2 AUGER REFUS/								<u>-/- %</u> 4	590 	50/3				100+	÷
										_						
										_						
										585 						
										_						
20										580 						
										_						
										_						
										 575						
25—																
										_						
30 —																
	1	I		I	I				1	F	· I	:	:	:		
	THE	STRA	ATIFIC	ATION	I LINES REPRESENT	T THE APPROXIMAT	E BOUN	IDARY LINES BE	TWEEN	SOIL TYP	ES. IN-	SITU THE TRANS	SITION N	IAY BE GRAI	DUAL.	
⊈ w∟ G	NE			ws	WD	BORING STARTE	D	08/21/19			CAVE	IN DEPTH 6.3				
₩ WL(SH	W)		▼ -	WL(AC	R) GNE	BORING COMPLE	TED	08/21/19			HAMM	MER TYPE Man	iual			
₩ WL						RIG ATV		FOREMAN C	ody P	resley	DRILL	ING METHOD 2	2.25 HS	SA		

CLIENT							Job #:		BORI	NG #		SHEET				
Charle		Mec	kle	hburg	g Schools (C	MS)	08 ARCHIT	13768 ECT-ENGINEEF	}	B-9		1 OF 1		E	20	
	Rea	Roa	ad H	ligh	School											
													TED PE	ENETROME	ETER TONS/F	T ²
NORTHIN	otte, ^{IG}	Cha	arlo	EASTIN	/lecklenburg ^{IG}	STATION						ROCK QUALIT RQD% -	Y DES	IGNATION REC%	& RECOVER	Y
38856	62.5	54		<u>518</u>	177.62	MATERIAI		ENGLISH					10			חו
(FT)	E NO.	е түре	e dist. (In	ERY (IN)	BOTTOM OF CASIN	NG	LOSS	DF CIRCULATIC		R LEVELS	.9/		CON	NTENT%		%
DEPTH	SAMPL	SAMPL	SAMPL	RECOV	SURFACE ELEVAT	ION 600				WATEF	BLOWS	⊗ sta	NDAR BL(D PENETR OWS/FT	ATION	
°					Topsoil Thick	ness [2.00"] AL) ELASTIC SI	LT. con	tains slight		600						
-	S-1	SS	18	18	mica, brown,	moist, hard	,				5 9 31			40-0	*	
	S-2	SS	17	16	(PWR) PART SAMPLED AS contains sligh	IALLY WEATHE S SILTY FINE TO t mica, gray	RED RO D MEDI	OCK UM SAND,		 	22 35 50/5				100+-🛇	
5										595 	25					
-	S-3	SS	15	12							36 50/3				100+-🛇	
_	S-4	SS	9	9						_	34 50/3				\otimes	
10					AUGER REFI	JSAL @ 9.5'					50/5				100+	
_																
15 —										 585						
										_						
20-										580						
	-															
										<u> </u>						
25 —										<u> </u>						
_										_						
										_						
30										570						
	•	. 1									•					
	TH	E STR	ATIFI		LINES REPRESEN	T THE APPROXIMAT	E BOUND	ARY LINES BE	TWEEN	SOIL TYP	ES. IN-	SITU THE TRANSIT	ION M	AY BE GRAI	DUAL.	
<u></u> ¥ w∟ (GNE			WS	WD	BORING STARTE	D	08/21/19			CAVE	IN DEPTH 7.9				
₩ WL(S	HW)		Ţ	WL(AC	R) GNE	BORING COMPLE	ETED	08/21/19			HAMM	MER TYPE Manua	al			
₩ UL						RIG ATV		FOREMAN C	ody Pı	resley	DRILL	ING METHOD 2.2	25 HS	A		

CLIENT						Job #:		BORI	NG #		SHEET		
Charlotte PROJECT NAM	-Mec	kle	nbur	g Schools (Cl	MS)	08 ARCHIT	8:13768 TECT-ENGINEER		B-10		1 OF 1	E	CS
CMS Rea	a Roa	ad H	ligh	School									
Charlotte	Cha	arlo	tto N	<i>l</i> ecklenburg (County NC						-()- CALIBRATED F	PENETROME	TER TONS/FT ²
NORTHING	, 0110		EASTIN	NG	STATION						ROCK QUALITY DE RQD%	SIGNATION REC%	& RECOVERY
3885677.	63		518	236.47			ENGLISH						
, o	ΥΡΕ	IST. (IN	۲ (IN)			1099			VELS V (FT)				
EPTH (FT	AMPLE T	AMPLE D	ECOVER	SURFACE ELEVATI	on 607		OF ONOOLANO	<u> / / / / / / / / / / / / / / / / / / /</u>	ATER LE	LOWS/6"	⊗ STANDAF BL	RD PENETR	ATION
∾ ⊡ _ 0	S	S		Topsoil Thickr	ness [1.00"]			////	<u>> u</u>	8			
	SS	18	18	(CL RESIDUA mica and rock	L) SANDY CLA	Y, cont wn, mo	tains slight pist, firm		605	3 3 4	7-⊗		
				(CL) SANDY (CLAY, contains	slight n	nica and			-			
5-2 5	SS	18	16	rock fragment	s, grayish brown	ı, moist	t, stiff			6 6	12-8		
				(ML) SANDY	SILT, contains s	light m	ica, grayish			7			
	SS	18	14	brown, moist,	very suit				600	8 13	21		
	SS	18	16	(SM) SILTY F slight mica, gr	INE TO MEDIUN ayish brown, mc	M SAN	D, contains ry dense			26 28			66 ⊗
10										38			
									- 595				
		_		SAMPLED AS	SILTY FINE TO	D MED	IUM SAND,			50/5			400
5-5	55	5	5	grayish brown					— —	50/5			100+-8
	SS	4	4						<u> </u>	50/4			100+-⊗
				AUGER REFL	JSAL @ 16.5'				590				
									_				
20									_				
									585 				
25—									_				
_									- 580				
_													
30									F				
	HE STR	ATIFI				E BOUN	DARY LINES BET	WEEN	SOIL TYP	ES. IN-	SITU THE TRANSITION N	IAY BE GRAI	DUAL.
¥ wL GNE ₩ wi (SHW)		Ţ	WS []				08/21/19			CAVE	MERTYPE Manual		
<u>-</u> ₩L		Ŧ			RIG ATV		FOREMAN C	ody P	reslev	DRILI	LING METHOD 2.25 H	SA	
					1			-	,				

CLIENT							Job #:		BORI	NG #		SHEET		
Charlott PROJECT NA		1eck	lei	hbur	g Schools (CN	MS)	08 ARCHITE	:13768 ECT-ENGINEER	4	B-11		1 OF 1	- E	20
CMS RE	ea F	Road	<u> </u>	ligh	School									
Charlott		² hou	101	to N	looklophurg (County NC							PENETROME	TER TONS/FT ²
NORTHING	<u>.e, (</u>			EASTIN		STATION						ROCK QUALITY D RQD%	ESIGNATION - REC%	& RECOVERY
3885694	<u>4.2(</u>	<u> </u>		<u>518:</u>	299.26 DESCRIPTION OF M	IATERIAL		ENGLISH	UNITS			PLASTIC	WATER	LIQUID
(FT)	L NO.	ЕТҮРЕ	E DIST. (IN	ERY (IN)	BOTTOM OF CASIN	G 📕	LOSS C	OF CIRCULATIO	on 2002	(LEVELS		LIMIT% C	ONTENT%	LIMIT%
DEPTH	SAMPL	SAMPL	SAMPL	RECOV	SURFACE ELEVATIO	on 604	_			WATEF ELEVA ⁻	BLOWS	STAND/ E	ARD PENETR BLOWS/FT	ATION
	-1 :	SS	18	18	(ML RESIDUA grayish brown	L) SANDY SILI , moist, very stif	f f	clay,			3 8	17-⊗		
	-						moint o	+:ff		-	9			
S	-2	ss	18	12		, CLAT, DIOWII,	110151, 5			600	5 6 7	13-&	30 -€	
	_				(ML) SILT WIT	H SAND, grayis	sh brow	n, moist,			8			
S	-3	SS	18	12	very sum					_	11 15		8 26	
					(SM) SILTY FI	NE TO MEDIUN	M SAND), contains / dense		- 595	15			63
	-4 :	SS	18	16	Sign mea, gr	ayısır brown, me	Jist, very				26 37			×
										_				
					SAMPLED AS	SILTY FINE TO		JCK JM SAND,						
S	-5	SS	15	15	contains slight	mica, grayish b	orown			590 	20 36 50/3			100+-⊗
	-6	SS	1	1	AUGEB BEEL	ISAL @ 16.1'			<u>,</u>		50/1			100+-🔗
										585				
20														
										_				
										 580				
25														
										_				
										_				
										575				
30														
	I	I		1	I				I	I	1 I	. : :	i	. !
	THE	STRA	TIFIC		I LINES REPRESENT	THE APPROXIMAT	E BOUND	ARY LINES BE	TWEEN	SOIL TYP	ES. IN-	SITU THE TRANSITION	MAY BE GRAD	DUAL.
⊈ w∟ GN	IE			WS	WD	BORING STARTE	D	08/21/19			CAVE	E IN DEPTH 14.3		
≝ WL(SHW	/)		Ţ	WL(AC	R) GNE	BORING COMPLE	ETED (08/21/19			HAM	MER TYPE Manual		
₩ E WL						RIG ATV		FOREMAN C	ody P	resley	DRILI	LING METHOD 2.25	ISA	

CLIENT							Job #:		BORI	NG #		SHEE	r			
Charlo PROJECT	Dtte-	Mec	kler	hburg	g Schools (Cl	MS)	08 ARCHIT	3:13768 ECT-ENGINEER	3	B-12		1 OF	1	E	Co	
CMS F	Rea ATION	Roa	ad H	ligh	School) ¹
Charlo	otte	Cha	arlot	te N	lecklenhura (County NC							ATED P	ENETROME	TER TON	IS/FT ²
NORTHING	G			EASTIN	NG	STATION						ROCK QUAL RQD%	.ITY DES 	GNATION REC%	& RECOV	'ERY
38857	05.3	35	<u> </u>	<u>518:</u>	353.48			ENGLISH					10		L L	
	Ċ.	ΡE	ST. (IN	(N)						/ELS I (FT)		LIMIT%	CO		LI	
TH (FT	PLE NO	LE T	PLE DI	OVERY			LUSS	OF CIRCULATIC	<u>)N /1004</u> /	ER LEV	"9/S/	Ø 6'				_
DEP.	SAM	SAM	SAM	REC		596			N374337	WAT ELEV	BLOV		BL	OWS/FT		
					(CH RESIDUA	AL) PLASTIC CL	AY, bro	own, moist,		595	3	_				
	S-1	SS	18	18	stiff					<u> </u>	4 8	⊗ 12				
					(SM) SILTY F	INE TO MEDIUN	M SANI	D, grayish		_	16				6	2
5	S-2	SS	18	18						_	24 38)
	5.3	99	17	16	(PWR) PARTI SAMPLED AS	ALLY WEATHE	RED R	OCK UM SAND,		590 	21				1000	λ
	grayish browr									-	43 50/5				100+ 0	ý
	S-4	SS	9	8						-	37 50/3				× ×	3
10					AUGER REFL	JSAL @ 9.3'									10)+
										585 						
										_						
										_						
15-																
										580 						
										_						
20 —																
										575 						
										_						
25										 						
_																
										_						
30										F						
									<u>.</u>							
	TH	E STR	ATIFIC		LINES REPRESENT	THE APPROXIMAT	E BOUNE	DARY LINES BE	TWEEN	SOIL TYP	ES. IN-	SITU THE TRANS	BITION M	AY BE GRAI	DUAL.	
¥ w⊾ G	iNE			WS 🗌	WD	BORING STARTE	D	08/21/19			CAVE	IN DEPTH 6.6				
≝ WL(SH	HW)		Ţ	WL(AC	R) GNE	BORING COMPLE	ETED	08/21/19			HAMM	MER TYPE Mar	iual			
¥ ₩L						RIG ATV		FOREMAN C	ody P	resley	DRILL	LING METHOD 2	2.25 HS	SA		

CLIENT							Job #:		BORI	NG #			SHEET				
Charlo PROJECT	otte-	Mec	kler	hburg	g Schools (Cl	MS)	08 ARCHIT	8:13768	3	B-13		-	1 OF 1		E	Co	
	Rea	Roa	ıd ⊢	ligh	School												
Charle		<u>_</u>	المعاس	4- N	A a a la la vala suvar d							0	CALIBRA	TED PE	NETROM	ETER TOP	IS/FT ²
NORTHING	<u>a</u>	<u>Cna</u>		EASTIN	IG IG	STATION						ROCł F	k qualit Rqd% —	Y DESI	GNATION REC%	& RECO\	/ERY
38856	22.7	<u>'1</u>		<u>518</u>	162.91 DESCRIPTION OF N			ENGLISH					TIC	10/	ATER		חוווס
Ê	ġ.	-YPE	DIST. (IN	(NI) ۲۶	BOTTOM OF CASIN	IG 🗩	LOSS	OF CIRCULATIO		EVELS N (FT)			r%	CON	TENT%	LI	міт% -∕∆
ОЕРТН (F	SAMPLE N	AMPLE 1	SAMPLE [RECOVER	SURFACE ELEVATI	on 602				VATER LI	9/SMO1		\otimes sta) PENETR WS/FT	ATION	
0	0	0)	0)		<u>∖Topsoil Thickr</u>	ness [3.00"]				<u>>ш</u> _	ш						
	S-1	SS	18	18	(CH RESIDUA slight mica, br	AL) PLASTIC CL own, moist, very	AY, co stiff	ontains			3 10 20				30		
	S-2	SS	5	4	(PWR) PARTI SAMPLED AS					_	50/5						3
5—					brown					_						100+	
	S-3	SS	4	3							50/4					100+-0	3
	AUGER REFUSAL (595 							
_										_							
10 —										_							
										-							
										590 							
										-							
15-										_							
										_							
										585 							
										_							
20										_							
										_							
										580							
25										_							
										_							
										575							
30										<u> </u>							
	I	ļ		I	I					F	1 I			<u>i</u>	<u>.</u> ;		
	TH	E STRA	ATIFIC		I LINES REPRESENT	THE APPROXIMAT	E BOUNI	DARY LINES BE	TWEEN	SOIL TYPE	ES. IN-	SITU THE	TRANSIT		Y BE GRA	DUAL.	
₽ ₩LG	àΝΕ			ws	WD	BORING STARTE	D	08/23/19			CAVE	IN DEPT	н 4.1				
₩ WL(SH	HW)		Ţ	WL(AC	R) GNE	BORING COMPLE	ETED	08/23/19			HAMM	IER TYP	E Manu	al			
₩ UL						RIG ATV		FOREMAN C	ody P	resley	DRILI	ING MET	THOD 2.2	25 HS/	٩		

CLIENT	Job #:	BORING #		SHEET	
Charlotte-Mecklenburg Schools (CMS)	08:13768 ARCHITECT-ENGIN	B-14	ļ	1 OF 1	ECe
CMS Rea Road High School					
Charletta, Charletta, Maaldarburg, Caust				-O- CALIBRATED P	ENETROMETER TONS/FT ²
NORTHING EASTING STATION	, NC			Rock quality des RQD%	SIGNATION & RECOVERY REC% ———
3885636.90 518226.44	ENGI		_		
	LOSS OF CIRCULA		5.	LIMIT% CO	NTENT% LIMIT%
U U U U U U U U U U U U U U U U U U U	09	WATER L	BLOWS/6	⊗ STANDAF BL	RD PENETRATION OWS/FT
)0"]				
S-1 SS 18 18 mica, grayish brown,	DY CLAY, contains slight noist, stiff		3 6 7	⊗ 13	_
(PWR) PARTIALLY V	EATHERED ROCK		28		100+
5-2 SS 11 10 SAMPLED AS SILTY grayish brown	FINE TO MEDIUM SAND	D, 605	50/5		\sim
<u> </u>			50/5		100+-🚫
AUGER REFUSAL @	6.5'				
		000			
		- 595			
20					
		-			
		585			
25					
30		580			
		 -	I L		
THE STRATIFICATION LINES REPRESENT THE APP	PROXIMATE BOUNDARY LINES	BETWEEN SOIL TYP	ES. IN-S	ITU THE TRANSITION M	IAY BE GRADUAL.
	G STARTED 08/22/19		CAVE	IN DEPTH 5.3	
₩ WL(SHW) ₩ WL(ACR) GNE BORIN	G COMPLETED 08/22/19		HAMN	IER TYPE Manual	
₩ WL RIG A	TV FOREMAN	Cody Presley	DRILL	ING METHOD 2.25 HS	SA

CLIENT							Job #:		BORI	NG #		SH	IEET		
Charlo PROJECT I	tte-	Mec	kler	hburg	g Schools (Cl	MS)	0 ARCHI	8:13768 TECT-ENGINEEF	1	B-15		10	DF 1	E	20
CMS F	Rea	Roa	ad H	ligh :	School										
Charlo	tte	Cha	arlot	te N	lecklenburg (County NC						-()- CAL	IBRATED F	PENETROME	ETER TONS/FT ²
NORTHING	,			EASTIN	IG	STATION						ROCK QI RQD	JALITY DE % – — –	SIGNATION REC%	& RECOVERY
38856	<u>50.3</u>	86		<u>5182</u>	295.52 DESCRIPTION OF N	IATERIAL		ENGLISH	UNITS			PI ASTIC	Ň	WATER	
	ö	ΥPE	IST. (IN	(IN)			1000		NI 21002)	VELS VELS			cc		
РТН (FT	MPLE N	APLE T	APLE D	COVER	SURFACE ELEVATION	on 607	2000	OF CINCOLATIC	<u> </u>	TER LE	"9/SWC	8) STANDAI	RD PENETR	ATION
	SAI	SAI	SAI	RE	\Topsoil Thickr	ness [1.00"]			V///	ELE	BLC		BL	_OWS/FT	
	S-1	SS	18	18	(CL RESIDUA mica, grayish	L) SANDY CLA brown, moist, st	Y, con [.] iff	tains slight		 	6 7	14-0	2		
							light m	ion brown		- 005	7				
	S-2	SS	18	18	moist, very stil	ff	iigint in	lica, diowii,			5 8 20			8	
	<u>S-3</u>	SS	5	5	(PWR) PARTI SAMPLED AS	ALLY WEATHE	RED F D MED	ROCK NUM SAND,		 	50/5				100+
	S-4	SS	0	0	gray AUGER REFL	JSAL @ 7.5'				600 	50/0				100+
10															
										595					
15															
										<u> </u>					
										590					
										<u> </u>					
20										_					
										585 					
										<u> </u>					
25										<u> </u>					
										- 580					
30										F					<u> </u>
	THE	E STR/	ATIFIC	ATION	I LINES REPRESENT	THE APPROXIMAT	E BOUN	DARY LINES BE	TWEEN	SOIL TYP	ES. IN-	SITU THE TR	ANSITION N	IAY BE GRA	DUAL.
₩ WLG	NE			WS	WD 🖂	BORING STARTE	D	08/22/19			CAVE	IN DEPTH	5.1		
₩ WL(SH	IW)		Ţ	WL(AC	R) GNE		ETED	08/22/19	, -		HAMM		Anual		
¥ WL	· WL F							FOREMAN C	ody P	resley	DRILL	ING METHO	D 2.25 H	SA	

CLIENT							Job #:	BO	RING #		SHEET			
Charlo	otte-	Mec	klei	hbur	g Schools (Cl	MS)	08:1376	68	B-16	3	1 OF -	1		
PROJECT	NAME					-,	ARCHITECT-ENO	GINEER						US
	Rea	Roa	ld H	ligh	School									14
			ہ ہے	+~ •								TED PE	NETROME	TER TONS/FT ²
NORTHING	<u>a</u>	Cna	rioi	EASTIN	VIECKIENDURG (STATION					ROCK QUALI	TY DESI	GNATION	& RECOVERY
38856	55.2	24		518	337.88						RQD% -		REC%	
			(IN) .	Î	DESCRIPTION OF N	MATERIAL	EN	IGLISH UNIT	s s (F		PLASTIC LIMIT%		ATER TENT%	LIQUID LIMIT%
(L L	Ő.	ТҮРЕ	DIST	ERY (II	BOTTOM OF CASIN	NG	LOSS OF CIRC			.9	X		•	Δ
PTH (MPLE	MPLE	MPLE	COVE	SURFACE ELEVATI	ION 601			ATER EVAT	OWS/	⊗ st/			ATION
	SA	SA	SA	8	 _∖Topsoil Thickr	ness [2.00"]		/ _]¥fi	j≩ ⊒ ML	BL		BLU	W03/F1	
	0.1	00	10	10	(MH RESIDU	AL) ELASTIC SI	_T, grayish		600	5	10 🛇			
	5-1	55	18	18	brown, moist,	very sun			-	11	18-04			
					(ML) SANDY	SILT, grayish bro	own, moist, ha	ırd		11				
5	S-2	SS	18	8						14 19			33	
					(SM) SILTY F		/I SAND, grayi	sh	595	14				
	S-3	SS	18	4	brown, moist,	dense				19 24			43	3-⊗
					(ML) SANDY	SILT. gravish bro	own. moist. ve	rv				04		
	S-4	SS	18	18	stiff	, , , , , , , , ,	- , , -			7 9		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		
10 _										15				
									590					
_					(SM) SILTY F		/I SAND, grayi	sh						
	<u>с</u> Е	<u> </u>	10			very dense			_	17				CO
15	5-5	55	10	9					_	50				00-8
									- 585					
					(PWR) PARTI	IALLY WEATHEI	RED ROCK							
					SAMPLED AS	S SILTY FINE TO	D MEDIUM SA	ND,	¥ ₹	50				
	S-6	SS	11	5		احما @ 19.5'				50/5				100+-⊗
20					AGGENTIER	56/12 @ 10.0			- 580					
									–					
									-					
25														
									575					
									–					
_									-					
30									E					
					l				F					
	TH	E STR	ATIFI		LINES REPRESENT	T THE APPROXIMATI	E BOUNDARY LIN	IES BETWEE	EN SOIL TYP	PES. IN-	SITU THE TRANSI	TION MA	Y BE GRAD	DUAL.
<u></u> ₩L 18	8.5			ws	WD	BORING STARTE	D 08/22/	19		CAVE	E IN DEPTH 15.1			
₩ WL(SH	łW)		Ţ	WL(AC	R) 15.0	BORING COMPLE	TED 08/22/	19		HAM	MER TYPE Manu	ial		
₩ WL						RIG ATV	FOREM	IAN Cody	Presley	DRIL	LING METHOD 2.	25 HSA	4	

CLIENT						Job #:	BORING	i #		SHEET			
Charlotte PROJECT NA	<u>e-Me</u>	ckle	nbur	g Schools (C	MS)	08:13768 ARCHITECT-ENGIN	ER	<u>B-17</u>	,	1 OF 1	I	E	20
CMS Re	a Ro	ad I	ligh	School									
Charlotte	e. Ch	arlo	tte. N	lecklenburg	County, NC					-()- CALIBRA	TED PE	ENETROME	TER TONS/FT ²
NORTHING	_,		EASTIN	NG	STATION					ROCK QUALII RQD% -	TY DES	IGNATION REC%	& RECOVERY
3885669	<u>).63</u>	<u> </u>	5183	389.14 DESCRIPTION OF I	MATERIAL	ENGL	ISH UNITS			PLASTIC	W	ATER	LIQUID
Ê Q	TYPE	DIST. (IN	RY (IN)	BOTTOM OF CASIN		LOSS OF CIRCULA		EVELS DN (FT)		LIMIT%	CON	ITENT%	LIMIT%
DEPTH (F	SAMPLE	SAMPLE	RECOVE	SURFACE ELEVAT	ION 594			WALER L	BLOWS/6	⊗ st4	ANDARI BLC	D PENETR/ DWS/FT	TION
0				Topsoil Thick	ness [2.00"] AL) ELASTIC SIL	T gravish		_					
S-	1 SS	18	18	brown, moist,	very stiff			_	5 9 12	21-	Ø		
	2 SS	18	18	(ML) SANDY stiff to hard	SILT, grayish bro	own, moist, very		- - 590	9 19			39	
5								_	20				
	3 SS	18	14					-	9 14 16		30	r K	
									10				
	4 SS	18	14					- 585 -	14 24			38-&	
								_					
				(PWR) PART SAMPLED AS	IALLY WEATHE	RED ROCK MEDIUM SANI).	_					
	5 SS	11	8	grayish brown	1			- 580	35 50/5				100+-🔗
15								7					
								_					
								_	34				
20 - S-	6 SS	11	5	END OF BOR	IING @ 19.5'			- 575 -	50/5				100+-⊗
								_					
								_					
								- - 570					
25								_					
								_					
								_					
20								- 565					
				l			-						
	THE ST	RATIFI	CATION	LINES REPRESEN	Τ ΤΗΕ ΑΡΡRΟΧΙΜΑΤΙ	E BOUNDARY LINES	BETWEEN SC		ES. IN-	SITU THE TRANS			UAL.
⊈ w⊾ 15.0)		ws	WD	BORING STARTEI	08/20/19			CAVE	EIN DEPTH 13.7			
₩ WL(SHW)		Ţ	WL(AC	R) 8.3	BORING COMPLE	TED 08/20/19			HAMI	MER TYPE Manu	al		
₩ ÷ WL					RIG ATV	FOREMAN	Cody Pres	sley	DRILI	LING METHOD 2.2	25 HS/	A	

CLIENT							Job #:		BORII	NG #			SHEET				
Charle	<u>otte</u> -	<u>Me</u> c	<u>kl</u> er	<u>bur</u>	<u>g School</u> s (CN	/IS)	0	<u>)8:1376</u> 8		<u>B-</u> 18			<u>I OF</u> 1				
PROJECT	NAME						ARCH	ITECT-ENGINEE	R			-				6	
CMS SITE LOC	Rea ATION	Roa	ad H	ligh :	School												⁷⁶
Charle	otto	Cha	arlot	to N	lecklenburg (County NC						-O- c	ALIBRAT	FED PE	NETROME	TER TON	IS/FT ²
NORTHIN	G			EASTIN	NG	STATION						ROCK	QUALIT	Y DESI	GNATION REC%	& RECO\	'ERY
38855	87.3	31		<u>518 -</u>	170.27							51.1.0					
		ЭE	T. (IN)	(IN)	DESCRIPTION OF M			ENGLISI		ELS (FT)			™ ™	CON	TENT%	LI	QUID MIT% _∧
H (FT)	E NO	-е ту	E DIS	VERY	BOTTOM OF CASING	G 📕	LOSS	S OF CIRCULATIO	<u>∕‱∑</u> NC	R LEV	"9/S	~					Z
DEPTH	SAMPI	SAMPI	SAMPI	RECO	SURFACE ELEVATION	on 594				WATE ELEVA	BLOW		⊗ sta	NDARI BLC) PENETR WS/FT	ATION	
0					Topsoil Thickn	ess [3.00"]											
	S-1	SS	17	16	SAMPLED AS	SILTY FINE TO	O MEE	DIUM SAND,			8 38 50/5					100+-0	3
					grayish brown						50/5						
	S-2	SS	11	10						590	40 50/5					100+-0	3
5					AUGER REFU	ISAL @ 4.5'											
10-																	
_										580							
15 —																	
										<u> </u>							
20-										575 							
										_							
										570 							
25—																	
										565							
30 —										<u> </u>							
	TH	E STR	ATIFIC	ATION	I LINES REPRESENT	THE APPROXIMAT		NDARY LINES BE	TWEEN	SOIL TYP	ES. IN-	SITU THE	TRANSIT		Y BE GRAI	DUAL.	
<u></u> ⊒ w∟ (ANE		,	ws	WD	BORING STARTE	ED	08/23/19			CAVE	IN DEPT	н 3.9				
₩ WL(S	HW)		Ţ	WL(AC	R) GNE	BORING COMPLI	ETED	08/23/19			HAM	MER TYPE	E Manua	al			
₩L						RIG ATV		FOREMAN (Cody Pi	resley	DRILI	LING MET	HOD 2.2	25 HS/	٩		

CLIENT							Job #:		BORI	NG #			SHEET				
	tte-	Mec	kle	nbur	g Schools (CN	MS)	08 ARCHIT	3:13768 ECT-ENGINEEF	3	B-19			<u>1 OF 1</u>		E	<u>C 9</u>	
CMS R	Rea	Roa	ad H	ligh	School)
Charlot	tte,	Cha	arlo	tte, N	<u>/lecklenburg (</u>	County, NC						-()- (S/FT ²
NORTHING	а О Л С	5		EASTIN	NG 222 52	STATION						RUCI	RQD% -	T DES	REC%		ERT
300300	<u>04.0</u>		(N)	210	DESCRIPTION OF M	IATERIAL		ENGLISH	I UNITS	s É		PLAS LIMIT	TIC F%	W. CON	ATER ITENT%	LIC	QUID MIT%
(FT)	NO.	Е ТҮРЕ	E DIST	/ERY (II	BOTTOM OF CASIN	G 📕	LOSS	OF CIRCULATIO	<u>) N 2002</u>	R LEVEL		×			•		\triangle
DEPTH	SAMPL	SAMPL	SAMPL	RECOV	SURFACE ELEVATIO	on 608				WATEF ELEVA	BLOWS		⊗ sta	NDARI BLC	D PENETR DWS/FT	ATION	
0					Topsoil Thickn (SM RESIDUA	ness [1.00"] AL) SILTY FINE	TO ME	DIUM		_	15						
	S-1	SS	18	18	SAND, contair white, moist, v	ns rock fragment ery dense	ts, light	brown and			24 38					6) 2
	S-2	SS	18	16	(SM) SILTY FI clay, contains white, moist, m	NE TO MEDIUN rock fragments, nedium dense	VI SANE light br), trace own and		605 	13 10 15			×			
5					(PWR) PARTI	ALLY WEATHE	RED R	OCK		_	34			25		100)+
	S-3	SS	11	9	I SAMPLED AS	SILTY FINE IC) MEDI	UM SAND,			50/5					×)
	<u>S-4</u>	SS	4	2	AUGER REFU	JSAL @ 8.5'				600 	50/4					() 100))+
10																	
										595							
15										_							
										590 							
20										_							
										585							
25																	
										_							
										580							
20										_							
				l					F								
	ты	= STP								SOIL TYP	ES IN-	SITLI THE	TRANGIT				
⊈ w∟ GI	NE	_ 0110		ws 🗌	WD	BORING STARTE	D	08/22/19			CAVE		н 6.1				
₩ WL(SH	IW)		Ţ	WL(AC	R) GNE	BORING COMPLE	ETED	08/22/19			HAM	IER TYP	E Manua	al			
₩ Ţ WL						RIG ATV		FOREMAN C	ody P	resley	DRILI	ING MET	THOD 2.2	25 HS	A		

CLIENT							Job #:	B	ORING #		SHEET			
Charlo PROJECT	otte-l	Mec	kle	nbur	g Schools (C	MS)	08:137 ARCHITECT-EN	768 NGINEER	B-2	0	1 OF -	1	E	20
CMS F	Rea	Roa	<u>ıd F</u>	ligh	School									
Charlo	tto	Cha	rlo	110 N	lecklenhurg	County NC						TED PI	ENETROME	TER TONS/FT ²
NORTHING	3			EASTIN	G	STATION					ROCK QUALI ⁻ RQD% –	TY DES	GNATION REC%	& RECOVERY
38856	22.1	9		<u>518:</u>	300.27 DESCRIPTION OF I	MATERIAL	E	ENGLISH UN	ITS		PLASTIC	W	/ATER	LIQUID
(FT)	ON	Е ТҮРЕ	E DIST. (IN	ERY (IN)	BOTTOM OF CASIN	NG	LOSS OF CIR			.9	LIMIT%	CO	NTENT%	LIMIT%
DEPTH	SAMPLE	SAMPLE	SAMPLE	RECOV	SURFACE ELEVAT	ION 607			WATER FI FVAT	BLOWS	⊗ st/	ANDAR BL	D PENETR OWS/FT	ATION
0					C Topsoil Thicki (CL FILL) SAI	ness [1.00"] NDY CLAY, trac	e organics,			2				
	S-1	SS	18	18	grayish browr	n, moist, firm	0		605	3 5	8-⊗			
	S-2	SS	18	16						2 3 5	8-×			
5					(CL FILL) SAI	NDY CLAY, trac	e organics.							
	S-3	SS	18	14	contains wood	d, grayish brown	, moist, stiff			2 2 10	8			
	S-4	SS	18	14	(SM RESIDU SAND, grayis	AL) SILTY FINE h brown, moist,	TO MEDIUM very dense	1		21 30				59 ×
10	-									29				Ť
									595					
	<u>S-5</u>	SS	4	2	SAMPLED AS	SILTY FINE TO	O MEDIUM S		<u>_</u>	50/4				 100+
					AUGER REFL	USAL @ 13.0'			-					
15									-					
									_					
20 —									_					
_									- 585					
									_					
25 —									-					
									-					
									-					
30														
	I	I						,	·					
	THE	E STR/	ATIFI		I LINES REPRESEN	T THE APPROXIMAT	E BOUNDARY L	INES BETWE	EN SOIL TY	PES. IN-	SITU THE TRANSI	TION M	AY BE GRAD	JUAL.
₩ wL G	iNE		•	ws 🗌		BORING STARTE	D 08/22	2/19		CAV	EIN DEPTH 10.9			
₩ WL(SH	IW)		Ŧ	WL(AC	R) GNE	BORING COMPLE	ETED 08/22	2/19		НАМ	MER TYPE Manu	ial		
¥ WL						RIG ATV	FORE	EMAN Cody	/ Presley	DRIL	LING METHOD 2.	25 HS	SA	

CLIENT						Job #:		BORING #			SHE	ET			
Charlotte PROJECT NA	<u>e-Me</u>	ckle	nbur	g Schools (Cl	MS)	08:13 ARCHITECT-E	768 INGINEER	В	-21		10	F 1	E	Co	
CMS Re	ea Ro	ad H	ligh	School											
Charlotte	e Ch	arlo	tte N	/lecklenburg (County NC							BRATED P	ENETROME	ETER TON	IS/FT ²
NORTHING	0, 01		EASTI	NG	STATION						ROCK QU RQD%	ALITY DE: %	SIGNATION REC%	& RECO\	'ERY
3885630	<u>).13</u>		518	341.89	IATERIAL		ENGLISHI	INITS				V			סוווס
Ê Q	TYPE	DIST. (IN	RY (IN)	BOTTOM OF CASIN	G 📕	LOSS OF CIF	RCULATION		ON (FT)	=		со	NTENT%	LI	міт% -Д
DEPTH (F	SAMPLE	SAMPLE	RECOVE	SURFACE ELEVATION	on 603			WATER L	ELEVATIO	3LOWS/6	\otimes	STANDAF BL	RD PENETR OWS/FT	ATION	
	<u>, , ,</u>				iess [3.00"]										
S-	-1 SS	18	18	moist, very stil	L) SANDY CLA if	Y, grayish b	rown,			5 8 14		⊗			
				(ML) SANDY S	SILT, grayish bro	own, moist,	very		600	15				5	6
S	-2 SS	18	18	naiù						27 29					\$ 1
	-3 SS	11	10	(PWR) PARTI SAMPLED AS	ALLY WEATHE	RED ROCK D MEDIUM S	SAND,			25 50/5				100+-0	3
				grayish brown					595						I
	-4 SS	18	16	rock fragments	s, grayish brown	n, moist, very	ntains Y			38 41 43				Q	3
10				END OF BOR	ING @ 10.0'		1								±
								<u> </u>							
									590						
15								E							
_								-							
									585						
20								_							
								_							
								E	580						
25								E							
_								-							
									575						
30 -								E							
	I	I		I				F							
· · ·	THE ST	RATIFI	CATION	LINES REPRESENT	THE APPROXIMAT	E BOUNDARY	LINES BETV	WEEN SOIL	TYPE	ES. IN-S	SITU THE TRA	NSITION M	IAY BE GRAI	DUAL.	
⊈ w∟ GN	E		ws□	WD	BORING STARTE	D 08/2	2/19			CAVE	IN DEPTH 6	.1			
WL(SHW))	Ţ	WL(AC	CR)	BORING COMPLE	TED 08/2	2/19			HAMN	IER TYPE M	anual			
₩L					RIG ATV	FOR	REMAN CO	dy Presle	әу	DRILL	ING METHOD	2.25 HS	SA		

CLIENT							Job #:		BORI	NG #		SHEET		
Charlo PROJECT	tte-l	Mec	klei	nburg	g Schools (C	MS)	0	8:13768 TECT-ENGINEE	۹	B-22		1 OF 1	E	2.1
	<u>Rea</u>	Roa	<u>d F</u>	ligh	School							Γ		
		<u></u>			4 1 - 1 1							CALIBRATED	PENETROME	ETER TONS/FT ²
NORTHING	<u>ite,</u>	Cna	<u>rio</u> 1	EASTIN	IG IG	STATION						ROCK QUALITY DE RQD%	ESIGNATION – REC%	& RECOVERY
388564	42.9	0		<u>5183</u>	395.53			ENCLIC				DIASTIC		
ГН (FT)	PLE NO.	PLE TYPE	PLE DIST. (IN	OVERY (IN)			LOSS			ER LEVELS ATION (FT)	NS/6"			
DEP	SAM	SAM	SAM	REC	SURFACE ELEVAT	ION 299				WAT ELEV	BLOV	B	LOWS/FT	ATION
	0.1	<u> </u>	10	10	CL RESIDUA	ness [2.00"] AL) SANDY CLA	Y, brov	wn, moist,			4	17 (0)		
	5-1	55	18	16	very still					-	8 9	17-8		
 5	S-2	SS	18	16	(ML) SANDY	SILT, grayish bro	own, m	ioist, stiff		595 	9 11 15	26-	8	
	6.0	~~	10	16	(SM) SILTY F brown, moist,	INE TO MEDIUN dense	/I SAN	D, grayish		 	10		26-00	
	5-3	55	10	10						_	20		30 ×	
	S-4	SS	11	8	(PWR) PART SAMPLED AS	SILTY FINE TO	RED F D MED	IUM SAND,			45 50/5			100+
10					grayish brown	I.				_				
	S-5	SS	11	8							35			
					AUGER REF	JSAL @ 13.0'			* * * * * *	 - 	50/5			100+
15										585 				
										580				
20-														
										_				
										_				
										575 				
25														
										_				
30										570 				
	ļ	ļ		I	I				I	F	1		<u>.</u>	: i
	THE	E STRA	TIFI		I LINES REPRESEN	T THE APPROXIMAT	E BOUN	DARY LINES BE	TWEEN	SOIL TYP	ES. IN-	SITU THE TRANSITION	MAY BE GRAI	DUAL.
<u>⊒</u> w∟ G	NE			WS	WD	BORING STARTE	D	08/20/19			CAVE	E IN DEPTH 10.9		
₩ WL(SH	W)		Ţ	WL(AC	R) GNE	BORING COMPLE	TED	08/20/19			HAMI	MER TYPE Manual		
₩ wL						RIG ATV		FOREMAN C	ody P	resley	DRILI	LING METHOD 2.25 H	ISA	

CLIENT							Job #:		BORI	NG #			SHEET				
Charlott PROJECT NA		lec	klei	nbur	g Schools (Cl	MS)	0 ARCHI	8:13768 TECT-ENGINEE	R	B-23	1	1	OF 1		E	23	1
CMS Re	<u>ea F</u>	Roa	<u>d F</u>	ligh	School) II ~
Charlott	e (` ha	rloi	to N	<i>l</i> ecklenhura (County NC						-()- C	ALIBRAT	TED PE	NETROME	TER TON	S/FT ²
NORTHING				EASTIN	VG	STATION						ROCK R	QUALIT QD% -	Y DESI — –	GNATION REC%	& RECOVE	ERY
3885558	<u>8.36</u>	6		<u>518</u>	181.11 DESCRIPTION OF N	MATERIAL		ENGLIS					10	W.		ЦС	סוו וכ
(FT)	NO.	ТҮРЕ	: DIST. (IN	ERY (IN)	BOTTOM OF CASIN	ig 📕	LOSS	OF CIRCULATI		LEVELS	6"		%	CON	TENT%		ит% ∆
DEPTH	SAMPLE	SAMPLE	SAMPLE	RECOVI	SURFACE ELEVATI	on 593				WATER	BLOWS		⊗ sta	NDARI BLC	D PENETR WS/FT	ATION	
0	_				CL RESIDUA	ness [3.00"] L) SANDY CLA	Y, con	tains slight		_	1						
	-1 :	SS	18	18	roots and mica	a, grayish brown	n, mois	it, soft		 590	2 2	⊗-4	24	.3-●			
s	-2	ss	18	18	(CH) PLASTIC grayish brown	C CLAY, contain , moist, stiff to v	is rock ery stil	fragments, ff			5 6 6	12	\otimes				
										_	6						
S-	-3	SS	18	18							8 17			⊗_ 25		100	1.
<u>s</u>	S-4 SS 3 3 SAMPLED AS S grayish brown						RED F	ROCK DIUM SAND,			50/3						
10					grayish brown					_							
										_							
											12						
15 - S-	-5 :	SS	11	9	END OF BOR	ING @ 14.5'				_	50/5					100+-⊗	
20																	
										_							
25										-							
										_							
-																	
										565 							
30																	
											- •						
								IDARY LINES BE	TWEEN	SOIL TYPI	ES. IN-	SITU THE	TRANSIT	ION MA	Y BE GRAI)UAL.	
₩ wL GN	IE		•	ws 🗆		BORING STARTE		08/23/19			CAVE		H 11.1				
는 WL(SHW 꼬 տ	()		-	WL(AC	(R) GNE		ETED	08/23/19		roslov					^		
÷ VVL	÷ WL							FUREMAN (Jouy P	resiey	UKILI		HUU 2.2	:o HS/	٦		

CLIENT						Job #:		BORI	NG #			SHEET				
Charlotte PROJECT NAM	e-Meo	klei	nburg	g Schools (C	MS)	0 ARCHI	8:13768 TECT-ENGINEEF		B-24			<u>1 OF 1</u>		E	20	
CMS Re	a Roa	ad H	ligh	School) ¹⁴
Charlotte		arlat	to N	locklophurg	County NC						0	ALIBRAT	TED PE	NETROME	TER TON	S/FT ²
NORTHING	<u>, on</u>		EASTIN	G	STATION						ROCł F	k qualit QD% -	Y DESI	GNATION REC%	& RECOV	ERY
3885571	.95	<u></u>	<u>518</u> 2	242.08 DESCRIPTION OF I	MATERIAL		ENGLISH	UNITS			PLAS	TIC	W	ATER		סוטכ
F 9	LYPE	DIST. (IN	(NI) کې	BOTTOM OF CASIN		LOSS		N 2007	EVELS DN (FT)			%	CON	TENT%	LIN	літ% ∆
DEPTH (F	SAMPLE -	SAMPLE [RECOVER	SURFACE ELEVAT	ION 606				VATER LI	BLOWS/6		⊗ sta	NDARI) PENETR WS/FT	ATION	
	0,	0,		Topsoil Thick	ness [3.00"]	TOM		ŇŇ								
	1 SS	18	16	SAND, contai moist, very de	ns slight mica, g	rayish	brown,		- 605	13 25 38					63-(8)
	2 55	14	14	(PWR) PART SAMPLED AS	IALLY WEATHE	RED F	ROCK NUM SAND.			12					100+-8)
5- <u>1</u> 5-2	2 33 3 SS	14	1	contains sligh	t mica, grayish b	prown			_	50/2 50/1					100+ &	, ,
				AUGER REF	JSAL @ 5.1				600							
									_							
									_							
10									_							
									595							
-																
									_							
15 —									_							
									590							
									_							
									_							
									_							
									_							
25									_							
									580							
									_							
30									_							
			I	I				I	F	I I				<u> </u>	<u> </u>	
т	THE STR	ATIFIC		LINES REPRESEN	T THE APPROXIMAT	E BOUN	IDARY LINES BET	WEEN	SOIL TYP	ES. IN-	SITU THF	TRANSIT		Y BE GRAI	DUAL.	
¥ w∟ GNE			ws	WD	BORING STARTE	.D	08/22/19			CAVE		н 3.0				
₩ WL(SHW)		Ţ	WL(AC	R) GNE	BORING COMPLE	ETED	08/22/19			HAMM	IER TYP	E Manu	al			
₩L	<u>₽</u> ¯ WL				RIG ATV		FOREMAN C	ody P	resley	DRILL	ING MET	HOD 2.2	25 HS/	4		

CLIENT							Job #:		BORI	NG #			SHEET				
Charlot PROJECT N	tte-l	Mec	kler	hburg	g Schools (Cl	MS)	0 ARCHI	8:13768 TECT-ENGINEER		B-25	1		<u>1 OF 1</u>		E	Co	
CMS R	Rea	Roa	ad H	ligh	School												
Charlot	tte	Cha	arlot	to N	lecklenhura (County NC						0	CALIBRAT	fed pe	ENETROME	ETER TON	IS/FT ²
NORTHING	<u>iio,</u>			EASTIN	NG	STATION						ROCł F	(QUALIT QD% -	Y DES	IGNATION REC%	& RECO\	/ERY
388559	92.4	5		<u>518:</u>	305.26 DESCRIPTION OF N	IATERIAL		ENGLISH	UNITS			PLAS	TIC	w			סוום
F	Ŋ	гүре	DIST. (IN	(IN) ک۶	BOTTOM OF CASIN	IG 📕	LOSS	OF CIRCULATIO	N 2007	EVELS DN (FT)	=		%	CON	NTENT%	LI	MIT%
DEPTH (F	AMPLE	AMPLE -	AMPLE [ECOVER	SURFACE ELEVATI	on 608				VATER LI	9/SMO1		\otimes sta	NDAR BLC	D PENETR OWS/FT	ATION	
	0	<i>w</i>	0	ш.	- Topsoil Thickr	ness [5.00"]			XXX	<u>> u</u>	<u>ш</u>						
	S-1	SS	18	18	(SM) SILTY FI slight mica, gra	INE TO MEDIUN ayish brown, mc	M SAN bist, de	ID, contains ense			7 17 27				2	14-8	
					(PWR) PARTI	ALLY WEATHE	RED F	ROCK		605	17						
5	S-2	SS	17	16	SAMPLED AS grayish white t	SILTY FINE TO to grayish browr	ວ MED າ	DIUM SAND,		_	38 50/5					100+–Č	3
	6.2	22	17	16						 	18						ĸ
	3-3	33	17	10	AUGER REFL	JSAL @ 7.5'			ý ýž		50/5					10	0+
10										_							
										_							
										595							
										_							
										590 							
20										_							
										- 585							
25										<u> </u>							
										580							
30	30																
							E BOUN	IDARY LINES BET	WEEN	SOIL TYP	ES. IN-	SITU THE	TRANSIT	ION M	AY BE GRAI	DUAL.	
¥ WL GI ۳ wu (cu יי			T	ws []				08/22/19			CAVE		H 5.2	<u></u>			
E WL(SH	vv)		Ŧ	VVL(AC				FOREMAN C	odv P	reslev				aı 25 H.S	A		
	Ž WL								-~, '								

CLIENT							Job #:		BORI	NG #		S	HEET				
Charlo PROJECT	otte-	Vec	kle	nbur	g Schools (Cl	MS)	0 ARCHI	8:13768 TECT-ENGINEE	R	B-26		1	OF 1		Ε	60	
CMS F	Rea	Roa	ld F	ligh	School												
Charlo	tte	Cha	rlo	tte N	<i>l</i> ecklenhura (County NC						-()- CA	LIBRATE	D PENE	TROME	TER TON	IS/FT ²
NORTHING	3	0110		EASTI	NG	STATION						ROCK C	QUALITY [D%	DESIGN 	ATION &	& RECOV	'ERY
388560	<u>05.0</u>	6		<u>518</u>	349.26 Description of M	MATERIAL		ENGLIS					`	\\/ATF	-R	L I	סוווס
Ê.	Ŏ	ТҮРЕ	DIST. (IN	RY (IN)	BOTTOM OF CASIN	IG 🕭	LOSS	OF CIRCULATIO		EVELS DN (FT)	5.0		. (NT%	LI	ит% ⊿
DEPTH (I	SAMPLE	SAMPLE	SAMPLE	RECOVE	SURFACE ELEVATI	on 608				WATER L	BLOWS/6	Q	STANE	DARD PI BLOWS	ENETRA 6/FT	TION	
0					Topsoil Thickr	ness [2.00"] ASTIC CLAX or	avish ł										
	S-1	SS	18	18	moist, stiff	to no obrit, gi	ayıorı	,			4 5 7	12 🛇	♥ ₩ 17.4 22	2		· — —2	58∠
	S-2	SS	18	18	(CH RESIDUA brown, moist,	AL) PLASTIC CL stiff	_AY, gi	rayish		605 	2	11-8					
5											7						
	S-3	SS	18	18	(SC) CLAYEY grayish brown	SAND, contain , moist, medium	s sligh 1 dense	t mica, e		-	6 12			X			
											17			29			
	S-4	SS	17	15	SAMPLED AS	SILTY FINE TO	O MED	NUM SAND,			21 38 50/5					100+	\$
										_						100+	
										595 	21						
15	S-5	SS	16	16						_	40 50/4					100+-©	\$
					END OF BOR	ING @ 15.0'				_							
										590 							
20										_							
										_							
										585 							
25 —										_							
										_							
										580 							
30 —										_							
	I	ļ		1	I				1	F	· I		:	:	:	:	
	THE	E STR/	TIFI		LINES REPRESENT		E BOUN	IDARY LINES BE	TWEEN	SOIL TYP	ES. IN-	SITU THE T	RANSITIO	N MAY E	BE GRAD	UAL.	
⊈ w∟ G	iNE			WS	WD	BORING STARTE	D	08/22/19			CAVE	IN DEPTH	11.3				
₩_ WL(SH	IW)		¥ ₹	WL(AC	CR) GNE	BORING COMPLI	ETED	08/22/19			HAMM	MER TYPE	Manual				
₩ Ţ						RIG ATV		FOREMAN (Cody P	resley	DRILI	ING METHO	OD 2.25	HSA			

CLIENT							Job #:		BORIN	IG #		SH	EET			
Charlo PROJECT I	NAME	Mec	klei	nburg	g Schools (C	MS)	08:1	3768 T-ENGINEER		B-27		1 C)F 1	E	20	
	Rea	Roa	ud H	ligh	School											
Charle		04-	ن م اس	4. N	An alda ahuwa d							CALI	BRATED P	ENETROME	TER TONS/	FT ²
NORTHING	ile,	Cna		EASTIN	NG NG	STATION						ROCK QU RQD	JALITY DES % – — –	SIGNATION REC%	& RECOVER	٦Y
38856 ⁻	<u>17.7</u>	'8		<u>518</u> 4				FNOLICIU								
(F	ŎŊ	ТҮРЕ	DIST. (IN	RY (IN)	BOTTOM OF CASIN		LOSS OF			(TT) NC	-		co			пD Г%
DEPTH (F	SAMPLE	SAMPLE	SAMPLE	RECOVE	SURFACE ELEVAT	ION 601				WATER L ELEVATI	BLOWS/6	\otimes	STANDAF BL	RD PENETR OWS/FT	ATION	
0					Topsoil Thick	ness [2.00"] AL) SANDY CLA	Y. gravish	brown.			_					
	S-1	SS	18	18	moist, very sti	ff	, 3 - , -	,			7 8 11		⊗ 19			
	S-2	SS	18	14	(SM) SILTY F moist, dense	INE TO MEDIUN to very dense	/I SAND, g	gray,		_	15 22				47	
5											25					
	S-3	SS	18	14						595 	14 19 21			40-0		
										_	16					
10	S-4	SS	18	16							28 38				66-⊗	
										590 						
					(PWR) PART SAMPLED AS	IALLY WEATHE S SILTY FINE TO	RED ROC D MEDIUN	K I SAND,								
15	S-5	SS	17	16	Contains sign	t filica, gray		8			20 31 50/5				100+-🛇	
										585						
										- -						
	<u>S-6</u>	SS	5	5	END OF BOR	NG @ 19 0'					50/5				100+-😓	
20									-							
										580 						
									-							
25																
										575 						
30										_						
								Y LINES BET	WEEN	SOIL TYPI	ES. IN-	SITU THE TR	ANSITION M	IAY BE GRAD	DUAL.	
₩ ₩ 46	6.5		•	ws		BORING STARTE		/20/19			CAVE		8.0			
≝ wL(SH								/20/19			HAM					
÷ WL	WL RIG A						F	DREMAN CO	ody Pr	esley	DRILL	LING METHO	2.25 HS	öΑ		

CLIENT			Job #:	BORING	G #		SHEET	
Charlotte-Meckler PROJECT NAME	nbur	g Schools (CMS)	08:13768 ARCHITECT-ENGINE	ER	B-28		1 OF 1	ECS
CMS Rea Road H	ligh	School						
Charlotte Charlot	tte N	Aecklenburg County	/ NC				-()- CALIBRATED F	PENETROMETER TONS/FT ²
NORTHING	EASTIN	IG STATION					ROCK QUALITY DE RQD% – — –	SIGNATION & RECOVERY REC%
3885530.89	<u>518</u>	186.93	- ENGL	SH UNITS			PLASTIC	WATER LIQUID
О. IST. (IN	(IN)				VELS N (FT)		LIMIT% CC	NTENT% LIMIT%
TH (FT	OVER		96		VATIO	"9/SM	\otimes standal	RD PENETRATION
SAM SAM	REC				ELE	BLO	BL	_OWS/FT
	16	(CL RESIDUAL) SAN	DY CLAY, grayish brown,		- 595	4	12 0 12 1	
	10				_	о 7	13-0 - 10.1	
	16					3	6-8	
5						3		
	14	(CL) SANDY CLAY, g	rayish brown, moist, soft		- 590	2 2	⊗−4	
						2		
	18	(SC) CLAYEY SAND,	gray, wet, very loose			1 2	⊗-3	
10						1		
			and the barrier sector		- 565			
		very stiff	, grayish brown, moist,					
S-5 SS 18	16					4 9 8	17-⊗	
					580			
		(SM) SILTY FINE TO	MEDIUM SAND, contains	3				
		slight mica, gray, mois	st, medium dense	_		5		
	14			_		8 10	18-⊗	
					- 575			
S-7 SS 18	14					5 6	13-⊗	
						7		
					— 570 —			
		(SM) SILTY FINE TO slight mica, gray, mois	MEDIUM SAND, contains st, very dense	;				
	16					13 23		
30		END OF BORING @	30.0'			+2		65
	CATION		PROXIMATE BOUNDARY LINES	BETWEEN SC	OIL TYPE	ES. IN-	SITU THE TRANSITION N	IAY BE GRADUAL.
₩	WS		G STARTED 08/23/19			CAVE	EIN DEPTH 22.2	
ײַ WL(SHW) ײַ	WL(AC	BORIN	G COMPLETED 08/23/19			HAM	MER TYPE Manual	24
₩L		RIG A	IV FOREMAN	Cody Pres	sley	DRIL	LING METHOD 2.25 H	SA

CLIENT							Job #:		BORI	NG #			SHEET				
Charle PROJECT	otte-	Mec	klei	nburg	g Schools (C	MS)	0 ARCHI	8:13768	3	B-29		1	OF 1		Ε	Cs	
CMS SITE LOC		Roa	ad H	ligh	School												
Charl	otte.	Cha	arloi	tte. N	/lecklenbura (County, NC						-()- c	ALIBRATE	ED PENET	ROME	TER TOP	IS/FT ²
NORTHIN	IG			EASTIN	NG	STATION						ROCK R	QUALITY QD%	′ DESIGNA — – F	ATION A	& RECO\	/ERY
38855	542.2	23	Î	<u>518</u> 2	251.82 DESCRIPTION OF N	MATERIAL		ENGLISH	UNITS			PLAST	-IC	WATE	R	LI	QUID
Ē	ġ	ΥPE	oIST. (II	X (IN)	BOTTOM OF CASIN	IG 📕	LOSS		0N >100%>	evels N (FT)		LIMIT	%		IT%	LI	міт% -∕∆
ОЕРТН (F'	SAMPLE N	SAMPLE T	SAMPLE D	RECOVER	SURFACE ELEVATI	ION 607				NATER LE	BLOWS/6"		⊗ STAN	NDARD PE BLOWS	NETR/	ATION	
0		0,				ness [2.50"]	TOM		ŇŇ								
-	S-1	SS	18	18	SAND, grayisl	h brown, moist, o	dense	EDIOM		605	5 11 22			33–0	8		
_	6.2	00	16	14	(PWR) PARTI SAMPLED AS	ALLY WEATHE		ROCK DIUM SAND.			21						Å
5	5-2	33	10	14	contains slight	t mica, grayish b	prown				50/4					100+	y
	S-3	SS	15	15							25 41					Q	\$
_					AUGER REFL	JSAL @ 7.3'			¥,. (4)	600	50/3						0+
10										_							
_										- 595							
										_							
15										_							
										590							
20-										_							
										585							
_										_							
25 —																	
										_							
_										580 							
30																	
	THE STRATIFICATION LINES REPRESENT THE AP							NDARY LINES BE	TWEEN	SOIL TYP	ES. IN-S	SITU THE	TRANSITIO	ON MAY BE	E GRAD	UAL.	
<u>⊒</u> w∟ (GNE			WS 🗌		BORING STARTE	D	08/23/19			CAVE	IN DEPT	H 5.3				
≝ WL(S 교	HW)		-	WL(AC	(R) GNE		TED	08/23/19		rooleu	HAMN		Manua				
÷ WL	¥ WL							FOREMAN C	ody P	resley	URILL	ING MET	HOD 2.25	5 HSA			

CLIENT	Job	b #:	BORING #	ŧ		SHEET				
Charlotte-Mecklenburg Schools (CM PROJECT NAME	/IS)	08:13768 CHITECT-ENGINEER	E	3-30		1 OF ⁻	1	E	20	
CMS Rea Road High School									14	
Charlotte, Charlotte, Mecklenburg C	County, NC					-()- CALIBRA	TED PE		TER TONS/FT	Γ ²
388555/ 15 518316 /0	STATION					RQD% -		REC%		
3003334.13 310310.49 Image: Example of the second se	ATERIAL	ENGLISH	UNITS 0	Ē		PLASTIC	W CON	ATER	LIQUID)
		OSS OF CIRCULATION		ION (F	.9	×		•		•
H H H H H H H H H H H H H H H H H H H	DN 610		WATER	ELEVAT	BLOWS	⊗ st/	ANDAR BL(D PENETR DWS/FT	ATION	
0	ess [2.00"] .L) SILTY FINE TO	MEDIUM		610	8					
SAND, contain moist, medium	s slight mica, gray dense	ish brown,			13 17			⊗ 30		
S-2 SS 9 6 SAMPLED AS	ALLY WEATHERE	D ROCK			38				\searrow	
5 Contains slight	mica, grayish brow	vn		· 605	50/3				100+	
					38 47				×	
	NG @ 7.5'			. 5	50/5				100+	
			-	600						
			E	·						
			-							
			F							
			E	595						
			-							
			_							
			E	590						
			-							
			F							
			E							
25—			-	585						
			-							
			E							
30 -			F	580	L					
	THE APPROXIMATE BO	OUNDARY LINES BET	WEEN SOI	L TYPES	6. IN-S	ITU THE TRANSI	TION M	AY BE GRAD	DUAL.	
₩L GNE WSU WD⊠ WL(SHW) ¥ WI (ACB) GNE		08/23/19		(ER TYPE Man	ıal			
<u>₩</u> ₩L	RIG ATV	FOREMAN CC	ody Presl	ley [ORILLI	NG METHOD 2.	25 HS	A		

CLIENT						Job #:		BORII	NG #		S	HEET			1	
Charlotte	<u>ə-Me</u>	ckle	nbur	g Schools (Cl	MS)	08	:13768		B-31		1 (OF 1		6	l I	
PROJECT NA	ме ea Ro	ad F	ligh	School		ARCHIT	ECT-ENGINEE	R						63	P*	
SITE LOCATIO	NC					,						LIBRATED F	PENETROME	TER TONS	3/FT ²	
Charlotte NORTHING	<u>ə, Ch</u>	arlo ⁻	<u>tte, N</u> Eastir	<u>/lecklenburg (</u> ^{vG}	STATION						ROCK C RQI	ROCK QUALITY DESIGNATION & RECOVERY				
3885573	8.78		518	358.84			ENGLISH			-					חוו וו	
(L N	TYPE	DIST. (IN	RY (IN)	BOTTOM OF CASIN	g 🗩	LOSS			(FT) NC	5.0		, СС			IT% \	
DEPTH (F	SAMPLE	SAMPLE	RECOVE	SURFACE ELEVATION	on 610				WATER L	BLOWS/6	Q	STANDARD PENETRATION BLOWS/FT				
0				Topsoil Thickn	iess [2.00"] L) SANDY CLA	Y brow	n moist		610							
S-	1 SS	18	18	firm			n, molot,			2 3 4	⊗7					
	_			(CH) PLASTIC	CLAY, trace sa	and, gra	iyish			2						
	2 SS	18	18	brown, moist,	naru					9 22			31			
— — — — — — — — — — — — — — — — — — —	3 SS	11	8	(PWR) PARTI SAMPLED AS	ALLY WEATHE	RED RO D MEDI	OCK UM SAND,			24 50/5				8		
				grayish brown										100+		
	4 SS	8	6							35 50/2				100-	+	
10					JSAL @ 9.2				600 							
									_							
									_							
20									590							
									_							
25									585 							
30									 580							
	I	I	I	I					F	1				<u>i i</u>		
	THE ST	RATIFI	CATION	I LINES REPRESENT	THE APPROXIMAT	E BOUND	ARY LINES BE	TWEEN	SOIL TYP	ES. IN-	SITU THE TI	RANSITION	MAY BE GRAI	DUAL.		
⊈ w∟ GNE	Ξ		WS	WD	BORING STARTE	D	08/22/19			CAVE	VE IN DEPTH 6.9					
₩_ WL(SHW)		Ţ	WL(AC	R) GNE	BORING COMPLE	ETED	08/22/19			HAMI	MER TYPE	Manual				
₩L					RIG ATV	TV FOREMAN Cody Presley DRILLING METHOD 2.25 HSA										

CLIENT							Job #:		BORING #			SHEET			
	Otte-	Mec	kle	nburg	g Schools (CN	MS)	08:13	768 ENGINEER	B-3	2	1	OF 1	E	20	
CMS SITE LOC	Rea ATION	Roa	ad F	ligh	School						0				
Charle	otte.	Cha	arlo	tte. N	lecklenbura (County, NC					-()- CA	ALIBRATED F	PENETROME	ETER TONS/FT ²	
NORTHIN	IG			EASTIN	IG	STATION					ROCK QUALITY DESIGNATION & RECOVERY RQD% – — – REC% ———				
38855	587.9	97	î	<u>518</u> 4	411.33 DESCRIPTION OF M	IATERIAL		ENGLISH U	NITS		PLASTI	с \	WATER	LIQUID	
Æ	NO	түре	DIST. (I	(NI) YE	BOTTOM OF CASIN	G 🗩	LOSS OF CI	RCULATION				6 CC	NTENT%	LIMIT%	
DEPTH (F	SAMPLE	SAMPLE	SAMPLE	RECOVEI	SURFACE ELEVATIO	ON 605			WATER L	BLOWS/6	(STANDAI	RD PENETR .OWS/FT	ATION	
0	-				\ <u>Topsoil Thickn</u> (ML_BESIDUA	ess [2.00"] I) SANDY SII T	. trace orga	unics.	60! 60!						
	S-1	SS	18	8	brown, moist,	very stiff	,	,		11 12 16		28 [.]	\sim		
_					(SM) SILTY FI		M SAND, tra	ace		13					
5	S-2	SS	18	7	organics, brow	n, moist, dense			- 600	21 17			38-⊗		
	S-3	SS	13	4	(PWR) PARTI SAMPLED AS	ALLY WEATHE	RED ROCK	SAND,		23 43				100+-8	
_		~~~	0		brown					50/1					
	\ <u>5-4</u>	55	2	2	AUGER REFL	JSAL @ 8.2'				50/2				100+	
10									595 	;					
_															
									-						
15									- 50(
										, 					
									-						
20-										;					
									_						
									_						
25—									- 580						
									-						
30									- 575	;					
	1		I	I	I			1	F	I	L :	:	:	: :	
THE STRATIFICATION LINES REPRESENT THE APPROXIMA							E BOUNDARY	LINES BETW	VEEN SOIL TY	PES. IN-	SITU THE 1	RANSITION N	IAY BE GRAI	DUAL.	
<u>⊒</u> w∟ (GNE			WS	WD	BORING STARTE	D 08/2	20/19		CAVE	VE IN DEPTH 6.2				
₩ WL(S	HW)		Ţ	WL(AC	R) GNE	BORING COMPLE	TED 08/2	20/19		НАМ	AMMER TYPE Manual				
₩ L						RIG ATV	IG ATV FOREMAN Cody Presley DRILLING METHOD 2.25 HSA								

CLIENT	Job #:	BORING #		SHEET						
Charlotte-Mecklenburg Schools (CMS) PROJECT NAME	08:13768 ARCHITECT-ENGIN	B-33	3	1 OF 1	ECS					
CMS Rea Road High School										
Charlotte, Charlotte, Mecklenburg County, NC	C				'ENETROMETER TONS/FT ²					
NORTHING EASTING STATION				ROCK QUALITY DE RQD%	SIGNATION & RECOVERY REC%					
3885497.48 518202.74 ⇒ DESCRIPTION OF MATERIAL	ENGI	ISH UNITS		PLASTIC \	WATER LIQUID					
	LOSS OF CIRCUL/			LIMIT% CC	NTENT% LIMIT%					
HI H		VATER LE	3LOWS/6'	⊗ STANDAF BL	RD PENETRATION .OWS/FT					
	CLAV brown to	605		05						
S-1 SS 18 18 grayish brown, moist, stiff	CLAT, DIOWITO		5 6 8	25 14-⊗ 米 € 21	.5 					
			4							
5-2 SS 18 18		600	5 6	11-⊗						
			4	11-🛇						
			6							
S-4 SS 18 16 (CL) SANDY CLAY, grayist	h brown, wet, soft		1 2	⊗_3						
		595	1							
	brown moist very									
stiff	brown, moist, very		6							
		590	12 16	28-	~					
(SM) SILTY FINE TO MED	IUM SAND, gray,									
			12 21		46-8					
		585	25							
	HERED ROCK TO MEDIUM SANI	D,								
			38 50/5		100+-🔆					
		580								
(SM) SILTY FINE TO MED	IUM SAND, gray,									
moist, very dense			38							
30 <u>5-8 SS 18 16</u> 30 <u>5-8 SS 18 16</u> 30 <u>5-8 SS 18 16</u> 50 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			42 50		92-⊗					
			1 1							
THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.										
	RTED 08/23/19		CAVE	AVE IN DEPTH 26.2						
WL(SHW) WL(ACR) 22.6 BORING COM	IPLETED 08/23/19		НАМІ	HAMMER TYPE Manual						
₩ wL RIG ATV	FOREMAN	Cody Presley	DRILI	RILLING METHOD 2.25 HSA						

CLIENT						Job #:		BORI	NG #		SHEET				
Charlotte PROJECT NAM	-Mec	kle	nbur	g Schools (C	MS)	08: ARCHITE	13768 CT-ENGINEEF	}	B-34		1 OF 1	E	0.1		
CMS Rea	a Roa	ad H	ligh	School				-							
SITE LOCATIO				A = = - = -= =											
NORTHING	<u>, Cna</u>		EASTIN	Vieckiendurg NG	STATION						ROCK QUALITY DESIGNATION & RECOVERY RQD% REC%				
3885512	.63		<u>518</u>	269.19			ENGLISH			1					
c Ö	YPE	IST. (IN	X (IN)			1.055.01			VELS N (FT)		LIMIT% CO				
DEPTH (F1	AMPLE T	AMPLE D	ECOVER	SURFACE ELEVAT	ION 609				VATER LE	"NWS/6	STANDARD PENETRATION				
	0	0		Topsoil Thick	ness [2.00"]				<u>> ш</u> _	<u> </u>					
S-1	SS	18	18	(ML RESIDU/ mica, brown,	AL) SANDY SILT moist, firm	, contair	is slight			4 3 3	6-&				
	00	10	10	(SM) SILTY F slight mica, br	INE TO MEDIUN	M SAND	contains se		 605	3					
5-2 5-2	SS	18	18							8	11-8		100.		
_ S-3	SS	10	7	SAMPLED AS	SILTY FINE TO	D MEDIU	IM SAND,			38 50/4					
	SS	2	0	g						50/2			&		
		_		AUGER REF	USAL @ 8.7'				600 				100+		
									_						
									_						
15									595 						
									_						
									_						
									590 						
20									_						
									_						
									585 						
25 —									_						
									_						
									_						
									580 						
30									F						
	HE STR	ATIFI					RY LINES BE	TWEEN	SOIL TYP	ES. IN-					
		Ţ	WL(AC		BORING COMPLE		8/22/19			HAM	AMMERTYPE Manual				
₩					RIG ATV	V FOREMAN Cody Presley DRILLING METHOD 2.25 HSA									

CLIENT							Job #:		BORI	NG #		SHEET				
	te-M	eckl	enl	burg	g Schools (Cl	MS)		8:13768	_	B-35		1 OF 1	ΙE	20		
	ea R	oad	Hi	gh S	School											
													PENETROME	TER TONS/FT ²		
NORTHING	<u>te, C</u>	nari		e, IV Astin	^G G	STATION						ROCK QUALITY DI RQD% – —	ESIGNATION - REC%	& RECOVERY		
388553	<u>9.10</u>	-	5	<u>5183</u>	370.49 DESCRIPTION OF M	IATERIAL		ENGLISH				PLASTIC	WATER			
Ê.	NO.		NI) . I SIN	RY (IN)	BOTTOM OF CASIN	G 🗩	LOSS	OF CIRCULATIO	DN 2002	-EVELS ON (FT)		LIMIT% CONTENT% LIMI				
DEPTH (I	SAMPLE		SAIMPLE	RECOVE	SURFACE ELEVATI	on 611				WATER I	BLOWS/6	⊗ STANDA E	RD PENETRA LOWS/FT	ATION		
0							V brou	wn moist	<i>\///</i>	- 610						
s	6-1 S	S 1	8	18	stiff	L) SANDT CLA	1, 0101	wii, moist,			3 4 6	10-⊗				
	6-2 S	S 1	8	18	(SC) CLAYEY grayish brown	FINE TO MEDI , moist, medium	UM SA dense	AND, 9			3 9		>			
5							4.041	<u> </u>			16	25				
s	6-3 S	S 1	8	18	brown, moist,	medium dense	VI SAN	D, grayish		605 	7 12 17		29			
	S-4 S	s :	,	0	(PWR) PARTI	ALLY WEATHE	RED F	ROCK			50/2			<u> </u>		
			-		SAMPLED AS	SILTY FINE TO) MED	IUM SAND,		_				100+		
					AUGER REFL	JSAL @ 8.7'										
15																
										595						
										<u> </u>						
20																
										_ 590						
25										585						
30																
	I		I	l						F				i		
	THE S	TRATI	FICA		LINES REPRESENT	THE APPROXIMAT	E BOUN	DARY LINES BE	TWEEN	SOIL TYP	ES. IN-	SITU THE TRANSITION	MAY BE GRAD	UAL.		
및 wL GNE ws□ wd⊠ boring							D	08/22/19			CAVE	CAVE IN DEPTH 6.3				
₩ WL(SHW	V)	1	L v	/L(AC	R) GNE	BORING COMPLE	ETED	08/22/19			HAM	MER TYPE Manual				
₩ UL						RIG ATV	RIG ATV FOREMAN Cody Presley DRILLING METHOD 2.25 HSA									

CLIENT							Job #:		BORI	NG #		SH	IEET			
Charle	Otte-	Mec	kle	hburg	g Schools (C	MS)	08 ARCHIT	3:13768 ECT-ENGINEEF	3	B-36		10	DF 1	E	20	
	Rea	Roa	ad H	ligh	School											
					4 1 - 1 1								IBRATED P	ENETROME	TER TONS/FT ²	
NORTHIN	otte, ^{IG}	Cha		EASTIN	IG IG	STATION						ROCK QI RQD	JALITY DE: %	SIGNATION REC%	& RECOVERY	
38855	546.5	56	<u></u>	<u>518</u> 4	405.30 DESCRIPTION OF I	MATERIAL		ENGLISH				PI ASTIC	v	VATER		
(F	Image: Constraint of the sector of the se										-	LIMIT%	co	NTENT%		
ОЕРТН (Р	SAMPLE	T = J = J = J = J = J = J = J = J = J =										\otimes) STANDAF BL	RD PENETR .OWS/FT	ATION	
0		0,	0,			ness [4.00"]				-						
	S-1	SS	18	18	firm	AL) PLASTIC CL	-AY, Dro	own, moist,			1 2 5	⊗7				
_					(ML) SANDY	SILT, brown, mo	oist, har	d		605	7					
5	S-2	SS	18	12							13 22			≫ 35		
-	S-3	SS	16	14	(PWR) PART SAMPLED AS	IALLY WEATHE S SILTY FINE TO	RED R D MEDI	OCK UM SAND,			20 30 50/4					
					grayish brown	ı				 	11				100+	
10-	S-4	SS	17	16						600 	31 50/5				⊗ 100+	
					END OF BOF	RING @ 10.0'										
_										- -						
15-																
										_						
_										- 590						
20 —																
										_						
-										_						
_										- 585						
25 —																
	-															
_																
_										580						
30	-															
		. 1														
THE STRATIFICATION LINES REPRESENT THE APPRO							E BOUNE	DARY LINES BE	TWEEN	SOIL TYP	ES. IN-	SITU THE TR	ANSITION N	IAY BE GRAI	DUAL.	
<u>⊒</u> w∟ (GNE			WS	WD	BORING STARTE	D	08/22/19			CAVE	VE IN DEPTH 6.9				
₩ WL(S	iHW)		Ţ	WL(AC	R) GNE	BORING COMPLE	ETED	08/22/19			HAM	HAMMER TYPE Manual				
¥ WL						RIG ATV FOREMAN Cody Presley DRILL					LLING METHOD 2.25 HSA					

				La	bora	tory Te	sting	Sun	nmar	у				Page 1 of 1
		Ctort	Final	Comula			Atter	berg Li	mits3	Percent	Moisture - De	nsity (Corr.)5		i ago i oi i
Sample Source	Sample Number	Start Depth (feet)	End Depth (feet)	Distance (feet)	MC1 (%)	Soil Type ²	LL	PL	PI	Passing No. 200 Sieve ⁴	Maximum Density (pcf)	Optimum Moisture (%)	CBR Value ⁶	Other
B-8	S-1	1.0	2.5	1.5	17.3									
B-11	S-2	3.5	5.0	1.5	29.4	СН	70	30	40					
B-23	S-1	1.0	2.5	1.5	24.3									
B-26	S-1	1.0	2.5	1.5	17.4	СН	58	22	36					
B-28	S-1	1.0	2.5	1.5	16.1									
B-33	S-1	1.0	2.5	1.5	25.5	СН	54	21	33					
Notes: Definitions:	1. ASTM D 2216, 2 MC: Moisture Cont	2. ASTM D 2487 tent, Soil Type:	7, 3. ASTM D 43 USCS (Unified S	318, 4. ASTM D 1 Soil Classificatior	140, 5. Se n System),	ee test reports LL: Liquid Lin	for test me hit, PL: Pla	ethod, 6. S stic Limit,	ee test re PI: Plastic	ports for test m ity Index, CBR	ethod : California Bearin	g Ratio, OC: Orga	anic Content (A	ASTM D 2974)
Project No.	08:13768											FCS	SUITUE	
Project Name:	CMS Rea	Road High So	chool									1812 Ce	enter Park Dri	ve, Suite D
PM:	Laura E. H	lill										Charlot	te, NC 28217	2
PE:	Stephen J	. Geiger										Fax: (70	(104) 325-515	6
Printed On:	Septembe	r 12, 2019												