

PRELIMINARY GEOTECHNICAL ENGINEERING REPORT

**WAKE TECH CC – FIRE STATION
PARAMOUNT PKWY
MORRISVILLE, NC**

JOB NUMBER: 69593.003

**PREPARED FOR:
TOWN OF MORRISVILLE, NC
260 TOWN HALL DR, SUITE B
MORRISVILLE, NC 27560**

April 14, 2026



TIMMONS GROUP

YOUR VISION ACHIEVED THROUGH OURS.

TABLE OF CONTENTS

REPORT OVERVIEW	A
1. PROJECT INFORMATION	1
2. FIELD EXPLORATION	1
3. SITE GEOLOGY.....	2
4. LABORATORY TESTING.....	3
5. SUBSURFACE CONDITIONS.....	4
5.1 Ground Surface Materials	4
5.2 Soils.....	4
5.3 Partially Weathered Rock and Rock	4
5.4 Groundwater	4
6. PRELIMINARY CONCLUSIONS AND RECOMMENDATIONS	5
6.1 Site Preparation.....	5
6.1.1 General.....	5
6.1.2 Subgrade Evaluation	5
6.1.3 High Plasticity Soils.....	6
6.2 Excavatability	6
6.3 Construction Dewatering	6
6.4 Structural Fill	7
6.5 Shallow Foundations.....	7
6.6 Slab-On-Grade	8
6.7 Pavements	8
7. ADDITIONAL EXPLORATION FOR DESIGN PHASE	8
8. LIMITATIONS OF REPORT.....	8
9. CLOSURE	9

APPENDICES

Appendix A – Figures

Appendix B – Boring Logs

Appendix C – Laboratory Test Results

REPORT OVERVIEW

Some critical components of the report are outlined below. This outline should not be used for planning purposes without reviewing the full report.

1. **This report is preliminary and is not intended for design.** We recommend additional exploration be performed once a grading plan is available during the design phase.
2. The site appears suitable for the proposed construction based upon geotechnical conditions encountered in the SPT borings and laboratory testing performed, provided that the recommendations given in this report are implemented in the design and construction phases of this project.
3. A 2 feet separation distance should be maintained between high plasticity soils and design building and infrastructure subgrades. This can be further evaluated during a design-level geotechnical exploration based upon the final grades.
4. Low plasticity soils encountered in the borings should be suitable for reuse as structural fill in building and infrastructure areas. High plasticity soils can be reused as structural fill in pavement and slope areas and should be placed 2 feet below design pavement subgrades.



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April 14, 2026

Town of Morrisville, NC
260 Town Hall Drive, Suite B
Morrisville, NC 27560

Attention: Eric Pearson

Re: **Preliminary Geotechnical Engineering Report**
Wake Tech CC – Fire Station
Paramount Pkwy
Morrisville, NC
Timmons Group Project No. 69593.003

Eric Pearson,

Timmons Group is pleased to submit this preliminary geotechnical engineering report for the referenced project. The objectives of our services were to explore subsurface conditions and provide our preliminary geotechnical recommendations for site grading, foundation support, and pavement support.

This report is preliminary in nature and is not intended to be used for design purposes. Our current exploration performed widely spaced borings across the site, as a design-phase site and grading plan were not available. Construction estimates using widely spaced borings are expected to have a higher risk of unforeseen conditions and variations between boring locations.

1. PROJECT INFORMATION

The site is located at Paramount Pkwy, Morrisville, NC. A Site Vicinity Map is shown in Figure 1. We visited the site in March 2026. At that time, the site was undeveloped. The current ground cover consisted of trees.

We understand the proposed development is in a conceptual phase and may consist of a new fire station facility, which we assume may consist of a 1-story building, driveway, parking lot, and new stormwater control measure. The approximate existing grades range between 350 feet and 370 feet, msl.

2. FIELD EXPLORATION

The field exploration included a visual site reconnaissance by a representative of Timmons Group and performance of six soil test borings (B-1 through B-6). Boring locations were selected by

Timmons Group with input from the client. A representative from Timmons Group established boring locations in the field using GPS equipment. Approximate boring locations are shown on Figure 2 in the Appendix.

Borings were performed to a depth of approximately 10 to 17 feet below the existing ground surface with hollow stem augers. Split-spoon samples of subsurface soils were taken within soil test borings at approximate 2-foot depth intervals above a depth of 10 feet and at 5-foot intervals below 10 feet. A bulk sample of auger cuttings was also collected. Standard Penetration Tests were conducted in conjunction with split-spoon sampling in general accordance with ASTM D 1586.

The boreholes were observed for water immediately after drilling. Upon completion, boreholes were then backfilled to the original ground surface with drill cuttings. Representative portions of split-spoon soil samples were returned to our laboratory for quantitative testing and visual classification in general accordance with Unified Soil Classification System guidelines.

Boring logs and a generalized soil profile (Figure 3), which present specific information from the borings, are included in the Appendix. Stratification lines shown on the boring logs and profile are intended to represent approximate depths of changes in soil types. Naturally, transitional changes in soil types are often gradual and cannot be defined at particular depths. Ground surface elevations shown on the boring logs and profile were obtained from Google Earth Pro and should be considered approximate.

3. SITE GEOLOGY

This site is in one of the Triassic Basins of the Piedmont Physiographic Province, which were created through the accumulation of eroded sediments in deep basins that were formed through rift faulting. Over time, these sediments were compressed and partially cemented to form soft to moderately hard sedimentary rock. The soils and partially weathered rock that form the subsurface profiles are residual materials derived from the in-place weathering of these sedimentary rocks. The boundary between soil and bedrock in the Triassic Basins is not sharply defined. A transitional zone termed “partially weathered rock” is normally found overlying the parent bedrock. Partially weathered rock (PWR) is an intermediate geomaterial defined for engineering purposes as residual material with Standard Penetration Resistances (N-values) exceeding 100 blows per foot.

Groundwater within the Triassic Basins tends to flow along inclined bedding fractures in the deep multi-unit PWR and bedrock. The overburden soils and PWR provide storage and pathways for groundwater to recharge the deep aquifers. Localized perched water tables are common in the overburden soils in upland areas. The depth of the seasonal groundwater table reflects the composite recharge and discharge elevations from the leaky semiconfined bed-parallel flow zones. USGS well data indicates water depths for wells drilled in the Triassic sedimentary rock in Durham

County, North Carolina, vary from about 10 to 40 feet, with an average depth of approximately 25 feet. Water well yields are typically low, and many dry wells have been drilled into the weathered rock and deep bedrock.

4. LABORATORY TESTING

Laboratory testing was performed on representative split-spoon and bulk soil samples obtained from the borings. This testing consisted of natural moisture content, Atterberg limits, grain size analyses, Standard Proctor, and California Bearing Ratio (CBR). Laboratory tests were performed in general accordance with applicable ASTM procedures. Individual laboratory test data sheets are provided in the Appendix. A summary of laboratory test data is provided in the tables below.

Natural Moisture and Classification Tests

Boring	Depth (Feet)	Natural Moisture Content (%)	Atterberg Limits			Grain Size Analysis		USCS Classification
			LL	PL	PI	% Sand And Gravel	% Fines*	
B-4	3.5-5	18.7	50	26	24	33	67	CH
B-4	6-7.5	13.8	41	20	21	12.8	87.2	CL
B-5	1-5	9.9	25	14	11	41.2	58.8	CL
B-6	1-2.5	17.5	38	23	14	36.1	63.9	CL-ML
B-6	6-7.5	13.7	40	25	14	49.3	50.7	CL-ML

*Material passing No. 200 sieve (clay and silt)

Standard Proctor and CBR Testing

Boring	Depth (Feet)	Natural Moisture Content (%)	Standard Proctor		CBR (0.1")	%Swell	USCS Classification
			Optimum Moisture Content (%)	Maximum Dry Density (pcf)			
B-5	1-5	9.9	17.5	113.8	6.1	0.1	CL

Based on the Atterberg limits testing, encountered soils are generally of low to high plasticity. The natural moisture contents of lab-tested soils are below of optimum compaction moisture. The amount of moisture manipulation will likely depend on prevailing weather conditions.

5. SUBSURFACE CONDITIONS

5.1 Ground Surface Materials

The borings encountered approximately 1 to 3 inches of surficial topsoil. It is important to note that topsoil thicknesses can vary considerably on a particular site and could extend outside the range we encountered (either higher or lower). We recommend anticipating 12 inches of topsoil in wooded areas.

5.2 Soils

Below the topsoil, materials encountered consisted of undisturbed residuum below ground surface materials to approximate depths of 5.5-17 feet. The soils consisted of the following:

- Stiff to hard sandy fat clay (CH) and sandy silt (ML)
- Medium dense to very dense clayey sand (SC) and silty sand (SM)
- High-plasticity fat clay (CH) was encountered in two borings to approximate depths of 3 and 8 feet below existing grades.

5.3 Partially Weathered Rock and Rock

Below the soils, Partially Weathered Rock (PWR) and auger refusal were encountered in all borings locations.

- PWR is defined as an intermediate geomaterial with rock-like structure that could be penetrated with the exploration method and drill rig used and which exhibited a Standard Penetration Test value of at least 100 (or more) blows per foot. PWR was encountered at approximate depths of 5.5-17 feet.
- Auger bit refusal is typically considered to be the upper surface of relatively hard rock. Approximate refusal depths range between 9.9 and 17.1 feet.

5.4 Groundwater

Groundwater was not encountered immediately after drilling within the borings performed. It is important to realize that groundwater levels will fluctuate with changes in rainfall and evaporation rates. In addition, perched groundwater could be encountered within near-surface soils, particularly after rainfall.

6. PRELIMINARY CONCLUSIONS AND RECOMMENDATIONS

The following preliminary conclusions and recommendations are based upon our borings, engineering analysis, and past experience with similar projects and subsurface conditions.

6.1 Site Preparation

6.1.1 General

Site grading will be difficult during periods of extended rainfall and low temperatures that generally occur during the late autumn to early spring months. If grading is conducted during a wet time period, soils at this site will be particularly susceptible to rutting and pumping under rubber-tired traffic and will provide poor subgrade support for foundations, floor slabs, and pavements. Heavy rubber-tired construction equipment should not be allowed to operate on wet or unstable subgrades at this site due to the potential for rutting and other damage to the soils. To reduce potential earthwork problems, site preparation and grading should be scheduled during the typically warmer summer months, if possible. We recommend that exposed subgrades be sloped and sealed at the end of each day to promote runoff and reduce infiltration from rainfall.

Site preparation should begin with the demolition of existing structures and their foundations, demolition of existing pavements, clearing and grubbing of trees, stripping of topsoil, and removal of any other fill and unsuitable materials. Any existing water supply wells should be abandoned in accordance with the North Carolina Department of Environment and Natural Resources (NCDENR) requirements. Stripping activities often mix topsoil with underlying “clean” soils and cause stripping depths to be greater than actual topsoil depths, particularly during wet periods of the year. Topsoil should be wasted from the site or permanently stockpiled outside the proposed construction limits. Demolished construction materials and vegetation should be wasted from the site.

6.1.2 Subgrade Evaluation

After stripping, soil subgrades in areas to receive fill and those at finished subgrade should be evaluated by the Geotechnical Engineer or his representative. To aid the engineer during this evaluation, exposed soil subgrades should be proofrolled with a loaded tandem axle dump truck or equivalent. Proofrolling will help to reveal the presence of unstable or otherwise unsuitable surface materials.

The following methods are typically used to repair soil subgrades that are observed to rut, pump, or deflect excessively during proofrolling:

- Undercut the unstable soils to firm soils and replace them with suitable, well compacted structural fill.

- In-place repair of near-surface soils by scarifying, drying and recompacting, when weather conditions are favorable.

It will be important to properly manage surface runoff so that water doesn't pond excessively on subgrade soils. Poor management of surface runoff could lead to softening of subgrade soils and the need for extensive soil repairs. Smoothing out the soils at the end of each day and construction of temporary ditches may be required to control surface runoff.

6.1.3 High Plasticity Soils

The on-site high-plasticity fat clay (CH) are considered potentially expansive soils, which may swell with increases in moisture content and shrink upon drying. Project construction activities, including modifications to site drainage, along with future weather variations, may result in gradual changes in soil moisture conditions. Increases in moisture content can cause expansive soils to swell, while drying can lead to shrinkage. These volume changes have the potential to adversely affect foundations, floor slabs, hardscaping, and pavements.

The following preliminary recommendations can be further evaluated during a design-level geotechnical exploration based upon the final grades:

- A 2 feet separation distance should be maintained between high plasticity soils and design building and infrastructure subgrades.
- Footing should be placed 3 feet below final grades where high plasticity soils are encountered at subgrades.
- High plasticity soils can be reused as structural fill in pavement and slope areas and should be placed 2 feet below design pavement subgrades.

6.2 Excavatability

We anticipate that excavation of soil can generally be accomplished with conventional earthmoving equipment. Depending on the design grades, we anticipate that some trench and some mass excavations will require ripping and/or blasting to excavate the partially weathered rock and bedrock at the site.

6.3 Construction Dewatering

Borings did not encounter water, however temporary construction excavations for this project may encounter groundwater during seasonal high water table conditions. The contractor should design, furnish, install, test, operate, monitor, and maintain a dewatering system of sufficient scope, size, and capacity to control hydrostatic pressures and to lower, control, remove, and dispose of groundwater and permit excavation and construction to proceed on dry, stable subgrades. The

contractor should accomplish dewatering without damaging any existing buildings, structures, and site improvements adjacent to and near the excavations.

Typical temporary dewatering measures used on similar projects in the project area consist of temporary ditches, sump excavations, sump pumps, well points, wells, and/or sheet pile cutoff walls.

6.4 Structural Fill

We assume the cut and fill will be relatively balanced for site grading.

On-site used as structural fill should consist of low-plasticity soils that have a maximum particle size of 3 inches, are free of debris, have a maximum Liquid Limit (LL) of 50, a maximum Plasticity Index (PI) of 30, and a Standard Proctor Maximum Dry Unit Weight of at least 90 pcf.

We anticipate that low plasticity on-site soils will be suitable for use as structural fill in building and infrastructure areas, **except for MSE site walls, which will require imported soils/materials.**

Structural fill should be placed in maximum 8 to 10-inch loose lifts and compacted to at least 95 percent of the Standard Proctor maximum dry density (ASTM D 698). Within 12 inches relative to finished soil subgrade, structural fill should be compacted to at least 98 percent of the Standard Proctor maximum dry density. Structural fill should be maintained within 3 percentage points of optimum moisture during placement and compaction.

Site preparation, including fill placement and compaction, should be observed by a qualified soils technician working under the direction of the Geotechnical Engineer. During fill placement, a sufficient amount of in-place density tests should be conducted to confirm that compaction and fill moisture is in accordance with our recommendations.

6.5 Shallow Foundations

Based on the preliminary exploration, the proposed fire station may be supported on shallow foundations bearing on approved undisturbed soils or new structural fill. A preliminary allowable bearing pressure in the range of 3,000 psf can likely be achieved for foundations. This preliminary recommendation should be reevaluated through additional geotechnical exploration during the design phase of these buildings. Existing undocumented fill and soft/very loose soils, if encountered, are not acceptable for shallow foundation support.

6.6 Slab-On-Grade

The ground floors can be slabs-on-grade bearing on suitable undisturbed low-plasticity soils, assuming the preliminary recommendations given in Site Preparation have been followed. Specific attention should be given to positive drainage away from the proposed buildings.

6.7 Pavements

The pavements can be supported on suitable undisturbed low-plasticity soils, assuming the preliminary recommendations given in Site Preparation have been followed. A preliminary design CBR of 3 can be considered for pavement design. Timmons can provide pavement section thickness recommendations during the design-phase of the project once design grades, different pavement type locations (e.g. light duty and heavy duty areas), and design traffic have been determined and provided to us.

7. ADDITIONAL EXPLORATION FOR DESIGN PHASE

Once proposed site and grading plans are available, we recommend that additional borings be performed so design-level recommendations can be provided.

8. LIMITATIONS OF REPORT

The preliminary recommendations contained in this report are made on the basis of the site information made available to us and the surface and subsurface conditions that existed at the time of the exploration. While this exploration has been conducted in accordance with generally accepted geotechnical engineering practices, there remains some potential for variation of the subsurface conditions in unexplored areas of the site. No other warranty, expressed or implied, is made as to the professional advice included in this report.

9. CLOSURE

We appreciate this opportunity to be of service to you on this project. If you have any questions regarding this report, or if we can be of further assistance, please contact us at (919) 866-4951.

Respectfully submitted,
TIMMONS GROUP

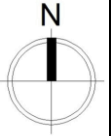


Jesse L. Israel, E.I.
Geotechnical Project Manager



Taylor Y. Dowell, P.E.
Geotechnical Engineer

APPENDIX A
FIGURES

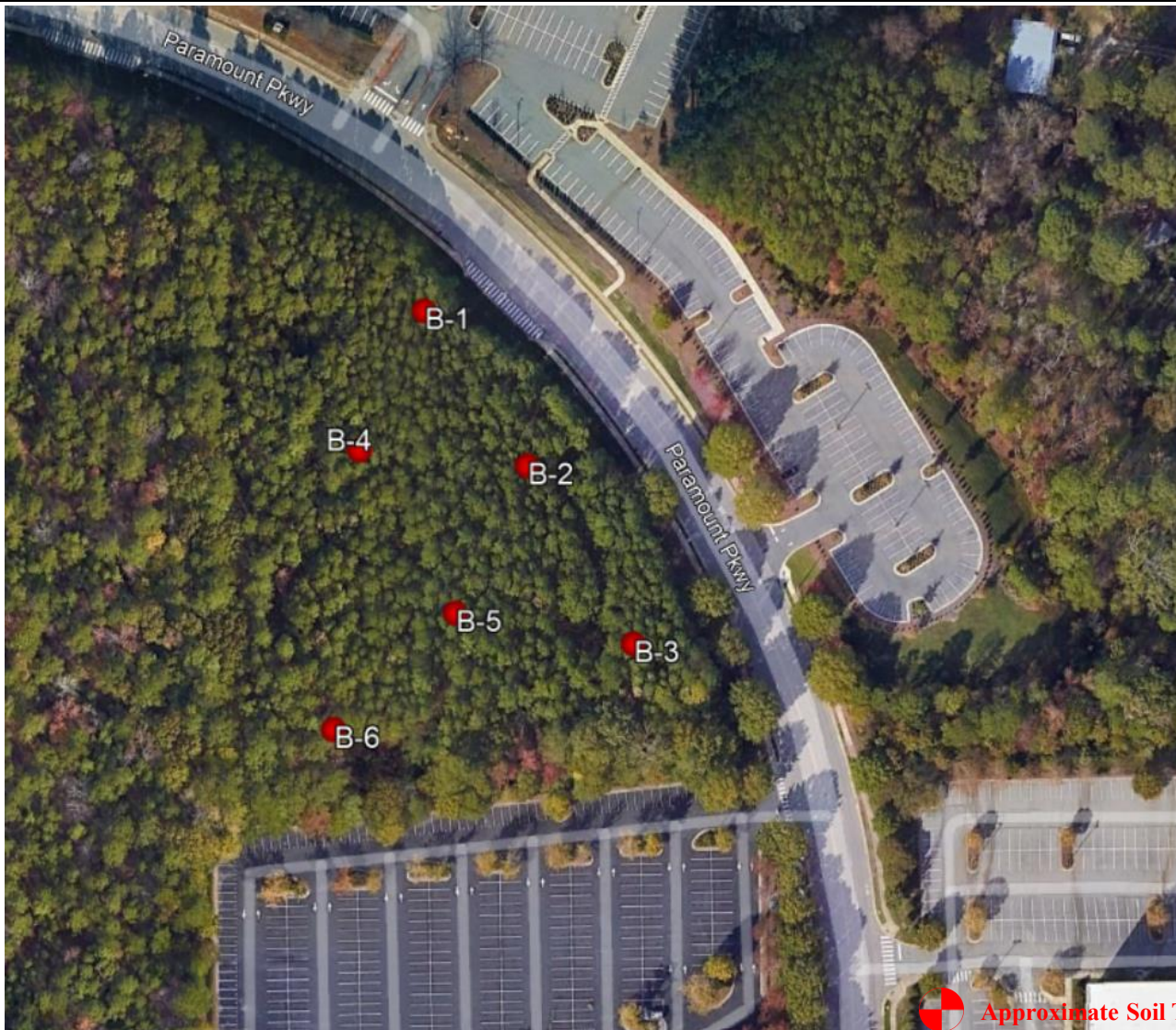


Scale:	NTS
Date:	April 14, 2026
Drawn By:	TYD
Project No.:	69593.003



Site Location Plan
Wake Tech CC – Fire Station
Morrisville, NC

Figure
1



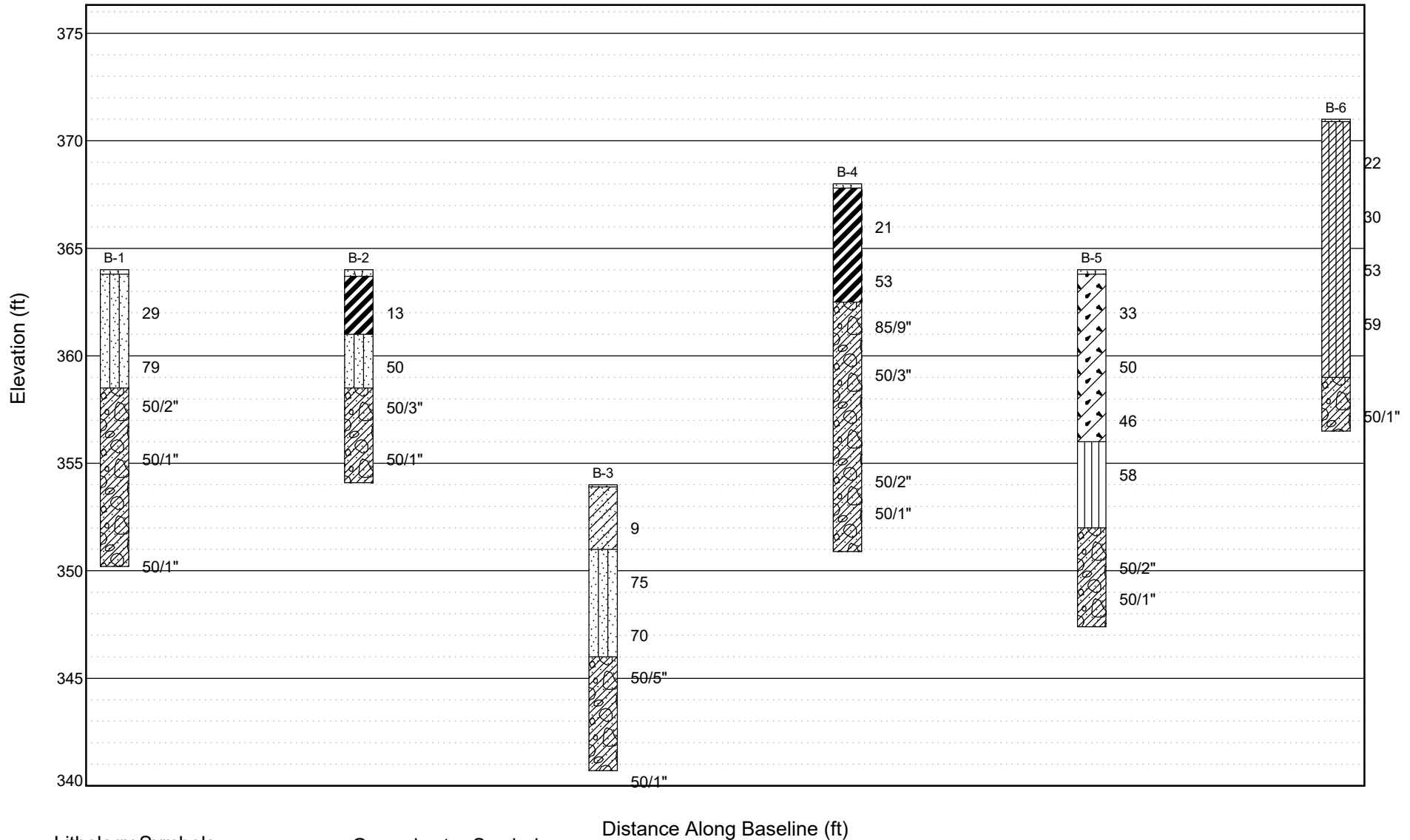
Approximate Soil Test Boring Locations

Scale:	NTS
Date:	April 14, 2026
Drawn By:	TYD
Project No.:	69593.003











Boring Location Plan
Wake Tech CC – Fire Station
Morrisville, NC



Figure
2





Lithology Symbols

-  Topsoil
-  Silty Sand
-  Weathered Rock
-  High Plasticity Clay
-  Clayey Sand
-  Low Plasticity Clay
-  Silt
-  Low Plasticity Silty Clay

Groundwater Symbols

-  At End of Drilling
-  At 24 Hours

Exploration Symbols

- B-01 (Exploration ID)
-  13 (N-Value)
-  53% 98%(RQD REC)

Distance Along Baseline (ft)



Timmons Group
521 Uwharrie Ct
Raleigh, NC

Subsurface Profile

Wake Tech CC - Fire Station
Morrisville, NC

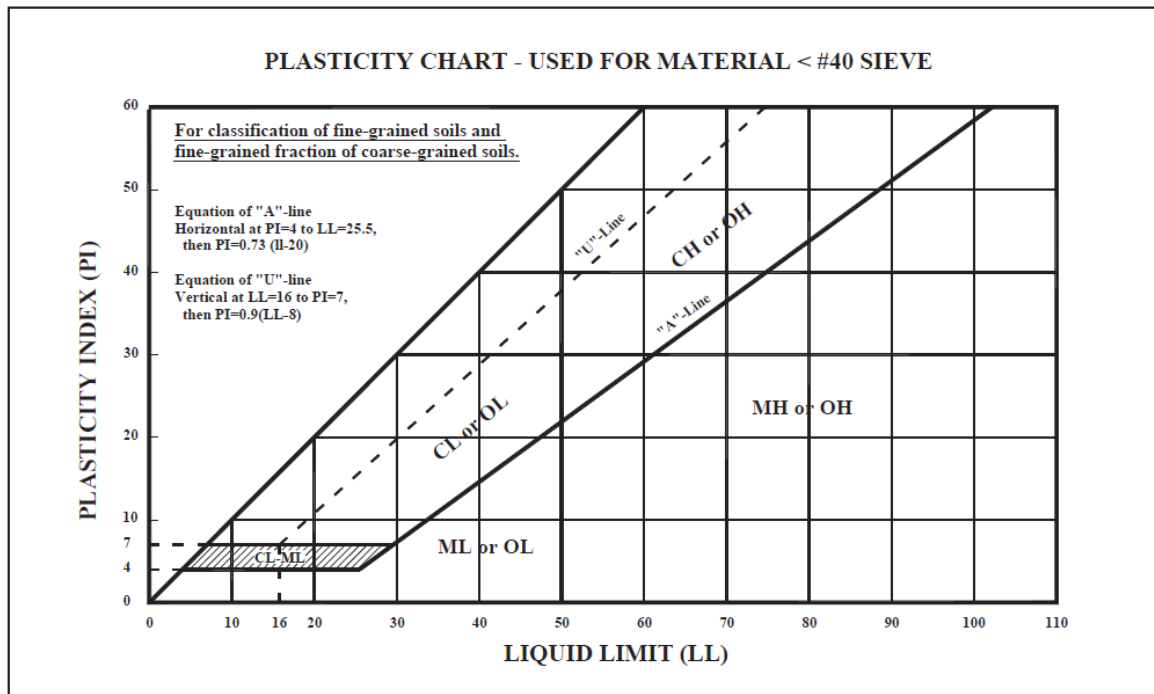
PROJECT NUMBER 69593.003		DRAWN BY TYD	DATE DRAWN 4/13/26
HORIZONTAL SCALE	NTS	APPROVED BY	FIGURE 3
VERTICAL SCALE	NTS		

APPENDIX B
BORING LOGS

KEY TO BORING LOG TERMINOLOGY

Relative Density – Used for soils with less than 50% passing No. 200 sieve		Consistency – Used for soils with 50 percent or more passing No. 200 sieve	
Relative Density	SPT N-Value (blows/ft)	Consistency	SPT N-Value (blows/foot)
Very Loose	0 to 3	Very Soft	0 to 2
Loose	4 to 10	Soft	3 to 4
Medium Dense	11 to 30	Firm	4 to 8
Dense	31 to 49	Stiff	9 to 15
Very Dense	Greater than 50	Very Stiff	15 to 30
		Hard	31 to 49
		Very Hard	Greater than 50

Grain Size Terminology (U.S. Standard Sieves)		Natural Moisture Content	
Term	Particle Size		
Boulder	12 inches +	Dry	Very little apparent moisture, dusty
Cobble	3 to 12 inches		
Coarse Gravel	¾ to 3 inches	Moist	Damp, but no free water visible
Fine Gravel	#4 to ¾ inches		
Coarse Sand	#10 to #4		
Medium Sand	#40 to #10	Wet	Visible free water, or in cohesive soil, clearly saturated
Fine Sand	#200 to #40		
Silt and Clay	<#200		



SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS		
			GRAPH	LETTER			
<p>COARSE GRAINED SOILS</p> <p>MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE</p>	<p>GRAVEL AND GRAVELLY SOILS</p>	<p>CLEAN GRAVELS</p> <p>(LITTLE OR NO FINES)</p>		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES		
		<p>GRAVELS WITH FINES</p> <p>(APPRECIABLE AMOUNT OF FINES)</p>		GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES		
		<p>GRAVELS WITH FINES</p> <p>(APPRECIABLE AMOUNT OF FINES)</p>		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES		
	<p>SAND AND SANDY SOILS</p>	<p>CLEAN SANDS</p> <p>(LITTLE OR NO FINES)</p>	<p>CLEAN SANDS</p> <p>(LITTLE OR NO FINES)</p>		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES	
			<p>SANDS WITH FINES</p> <p>(LITTLE OR NO FINES)</p>		SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES	
			<p>SANDS WITH FINES</p> <p>(APPRECIABLE AMOUNT OF FINES)</p>		SM	SILTY SANDS, SAND - SILT MIXTURES	
	<p>FINE GRAINED SOILS</p> <p>MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE</p>	<p>SILTS AND CLAYS</p> <p>LIQUID LIMIT LESS THAN 50</p>	<p>SANDS WITH FINES</p> <p>(APPRECIABLE AMOUNT OF FINES)</p>		SC	CLAYEY SANDS, SAND - CLAY MIXTURES	
			<p>SILTS AND CLAYS</p> <p>LIQUID LIMIT GREATER THAN 50</p>	<p>SANDS WITH FINES</p> <p>(APPRECIABLE AMOUNT OF FINES)</p>		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				<p>SANDS WITH FINES</p> <p>(APPRECIABLE AMOUNT OF FINES)</p>		CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
<p>SANDS WITH FINES</p> <p>(APPRECIABLE AMOUNT OF FINES)</p>				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY		
<p>SILTS AND CLAYS</p> <p>LIQUID LIMIT GREATER THAN 50</p>		<p>SANDS WITH FINES</p> <p>(APPRECIABLE AMOUNT OF FINES)</p>		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS		
		<p>SANDS WITH FINES</p> <p>(APPRECIABLE AMOUNT OF FINES)</p>		CH	INORGANIC CLAYS OF HIGH PLASTICITY		
	<p>SANDS WITH FINES</p> <p>(APPRECIABLE AMOUNT OF FINES)</p>		OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS			
<p>HIGHLY ORGANIC SOILS</p>				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS		

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS



Timmons Group
521 Uwharrie Ct
Raleigh, NC

PROJECT NUMBER 69593.003 **PROJECT NAME** Wake Tech CC - Fire Station
CLIENT Town of Morrisville, NC **PROJECT LOCATION** Morrisville, NC
DATE STARTED 3/31/2026 **COMPLETED** _____ **GROUND ELEVATION** 364 ft **HOLE DEPTH** 13.8 feet
DRILLING CONTRACTOR Bridger **BOREHOLE WATER LEVELS:**
DRILLING METHOD 2 1/4" I.D. Hollow Stem Auger **AT END OF DRILLING** --- DRY
LOGGED BY TD **CHECKED BY** _____ **AT 24 HOURS DRILLING** ---
NOTES _____ **CAVE DEPTH** 11.4 feet

TG GEOTECH BH LOG V2.0 - GINT STD US LAB GDT - 4/13/26 14:35 - C:\USERS\PUBLIC\DOCUMENTS\BENTLEY\GINTCL\PROJECTS\WAKE TECH CC - FIRE STATION.GPJ

DEPTH (ft)	ELEVATION (ft)	MATERIAL DESCRIPTION	SYMBOL	SAMPLING BLOW COUNTS (N-VALUE)	POCKET PEN. (tsf)	LAB TESTS	REMARKS
0		TOPSOIL - 2 INCHES					
		SILTY SAND, (SM): brown, medium dense to very dense					
	360			1, SS 8-14-15 (29)			
5				2, SS 14-48-31 (79)			
		PARTIALLY WEATHERED ROCK, sampled as silty sand, brown					
	355			3, SS 50/2"			
10				4, SS 50/1"			
				5, SS 50/1"			

AUGER REFUSAL AT 13.8 FT
Bottom of borehole at 13.8 feet.



Timmons Group
521 Uwharrie Ct
Raleigh, NC

PROJECT NUMBER 69593.003 **PROJECT NAME** Wake Tech CC - Fire Station
CLIENT Town of Morrisville, NC **PROJECT LOCATION** Morrisville, NC
DATE STARTED 3/31/2026 **COMPLETED** _____ **GROUND ELEVATION** 364 ft **HOLE DEPTH** 9.9 feet
DRILLING CONTRACTOR Bridger **BOREHOLE WATER LEVELS:**
DRILLING METHOD 2 1/4" I.D. Hollow Stem Auger **AT END OF DRILLING** --- DRY
LOGGED BY TD **CHECKED BY** _____ **AT 24 HOURS DRILLING** ---
NOTES _____ **CAVE DEPTH** 6.3 feet

TG GEOTECH BH LOG V2.0 - GINT STD US LAB.GDT - 4/13/26 14:35 - C:\USERS\PUBLIC\DOCUMENTS\BENTLEY\GINTCL\PROJECTS\WAKE TECH CC - FIRE STATION.GPJ

DEPTH (ft)	ELEVATION (ft)	MATERIAL DESCRIPTION	SYMBOL	SAMPLING BLOW COUNTS (N-VALUE)	POCKET PEN. (tsf)	LAB TESTS	REMARKS
0		TOPSOIL - 3 INCHES SANDY FAT CLAY, (CH): yellow gray, stiff		1, SS 2-6-7 (13)			
	360	SILTY SAND, (SM): brown, dense		2, SS 9-22-28 (50)			
5		PARTIALLY WEATHERED ROCK, sampled as silty sand, brown		3, SS 50/3"			
	355			4, SS 50/1"			

AUGER REFUSAL AT 9.9 FT
Bottom of borehole at 9.9 feet.



Timmons Group
521 Uwharrie Ct
Raleigh, NC

PROJECT NUMBER 69593.003 **PROJECT NAME** Wake Tech CC - Fire Station
CLIENT Town of Morrisville, NC **PROJECT LOCATION** Morrisville, NC
DATE STARTED 3/31/2026 **COMPLETED** _____ **GROUND ELEVATION** 354 ft **HOLE DEPTH** 13.3 feet
DRILLING CONTRACTOR Bridger **BOREHOLE WATER LEVELS:**
DRILLING METHOD 2 1/4" I.D. Hollow Stem Auger **AT END OF DRILLING** --- DRY
LOGGED BY TD **CHECKED BY** _____ **AT 24 HOURS DRILLING** ---
NOTES _____ **CAVE DEPTH** 12.6 feet

TG GEOTECH BH LOG V2.0 - GINT STD US LAB.GDT - 4/13/26 14:35 - C:\USERS\PUBLIC\DOCUMENTS\BENTLEY\GINTCL\PROJECTS\WAKE TECH CC - FIRE STATION.GPJ

DEPTH (ft)	ELEVATION (ft)	MATERIAL DESCRIPTION	SYMBOL	SAMPLING BLOW COUNTS (N-VALUE)	POCKET PEN. (tsf)	LAB TESTS	REMARKS
0		TOPSOIL - 1 INCH CLAYEY SAND, (SC): yellow, stiff		1, SS 2-4-5 (9)			
	350	SILTY SAND, (SM): brown, very dense		2, SS 44-47-28 (75)			
				3, SS 13-28-42 (70)			
	345	PARTIALLY WEATHERED ROCK, sampled as silty sand, brown		4, SS 50/5"			
	10						
		AUGER REFUSAL AT 13.3 FT Bottom of borehole at 13.3 feet.		5, SS 50/1"			
				6, SS 50/2"			



Timmons Group
521 Uwharrie Ct
Raleigh, NC

PROJECT NUMBER 69593.003 **PROJECT NAME** Wake Tech CC - Fire Station
CLIENT Town of Morrisville, NC **PROJECT LOCATION** Morrisville, NC
DATE STARTED 3/31/2026 **COMPLETED** _____ **GROUND ELEVATION** 368 ft **HOLE DEPTH** 17.1 feet
DRILLING CONTRACTOR Bridger **BOREHOLE WATER LEVELS:**
DRILLING METHOD 2 1/4" I.D. Hollow Stem Auger **AT END OF DRILLING** --- DRY
LOGGED BY TD **CHECKED BY** _____ **AT 24 HOURS DRILLING** ---
NOTES _____ **CAVE DEPTH** 9.9 feet

DEPTH (ft)	ELEVATION (ft)	MATERIAL DESCRIPTION	SYMBOL	SAMPLING BLOW COUNTS (N-VALUE)	POCKET PEN. (tsf)	LAB TESTS	REMARKS
0		TOPSOIL - 2 INCHES SANDY FAT CLAY, (CH): red, very stiff to hard	[Diagonal Hatching]	1, SS 6-8-13 (21)			
5	365	PARTIALLY WEATHERED ROCK, sampled as sandy lean clay, red	[Cross-hatching]	2, SS 20-28-25 (53)			
				3, SS 85/9"			
10	360			4, SS 50/3"			
	355			5, SS 50/2"			
15				6, SS 50/1"			

AUGER REFUSAL AT 17.1 FT
Bottom of borehole at 17.1 feet.

TG GEOTECH BH LOG V2.0 - GINT STD US LAB.GDT - 4/13/26 14:35 - C:\USERS\PUBLIC\DOCUMENTS\BENTLEY\GINTCL\PROJECTS\WAKE TECH CC - FIRE STATION.GPJ



Timmons Group
521 Uwharrie Ct
Raleigh, NC

PROJECT NUMBER 69593.003 **PROJECT NAME** Wake Tech CC - Fire Station
CLIENT Town of Morrisville, NC **PROJECT LOCATION** Morrisville, NC
DATE STARTED 3/31/2026 **COMPLETED** _____ **GROUND ELEVATION** 364 ft **HOLE DEPTH** 16.6 feet
DRILLING CONTRACTOR Bridger **BOREHOLE WATER LEVELS:**
DRILLING METHOD 2 1/4" I.D. Hollow Stem Auger **AT END OF DRILLING** --- DRY
LOGGED BY TD **CHECKED BY** _____ **AT 24 HOURS DRILLING** ---
NOTES _____ **CAVE DEPTH** 11.3 feet

TG GEOTECH BH LOG V2.0 - GINT STD US LAB.GDT - 4/13/26 14:35 - C:\USERS\PUBLIC\DOCUMENTS\BENTLEY\GINTCL\PROJECTS\WAKE TECH CC - FIRE STATION.GPJ

DEPTH (ft)	ELEVATION (ft)	MATERIAL DESCRIPTION	SYMBOL	SAMPLING BLOW COUNTS (N-VALUE)	POCKET PEN. (tsf)	LAB TESTS	REMARKS
0		TOPSOIL - 2 INCHES					
		SANDY LEAN CLAY, (CL): yellow, hard					
	360			1, SS 7-11-22 (33)			
5				2, SS 40-28-22 (50)			
				3, SS 17-23-23 (46)			
	355	SANDY SILT, (ML): brown, hard		4, SS 13-23-35 (58)			
10							
	350	PARTIALLY WEATHERED ROCK, sampled as sandy silt, brown		5, SS 50/2"			
15				6, SS 50/1"			

AUGER REFUSAL AT 16.6 FT
Bottom of borehole at 16.6 feet.



Timmons Group
521 Uwharrie Ct
Raleigh, NC

PROJECT NUMBER 69593.003 **PROJECT NAME** Wake Tech CC - Fire Station
CLIENT Town of Morrisville, NC **PROJECT LOCATION** Morrisville, NC
DATE STARTED 3/31/2026 **COMPLETED** _____ **GROUND ELEVATION** 371 ft **HOLE DEPTH** 14.5 feet
DRILLING CONTRACTOR Bridger **BOREHOLE WATER LEVELS:**
DRILLING METHOD 2 1/4" I.D. Hollow Stem Auger **AT END OF DRILLING** --- DRY
LOGGED BY TD **CHECKED BY** _____ **AT 24 HOURS DRILLING** ---
NOTES _____ **CAVE DEPTH** 9.9 feet

TG GEOTECH BH LOG V2.0 - GINT STD US LAB.GDT - 4/13/26 14:35 - C:\USERS\PUBLIC\DOCUMENTS\BENTLEY\GINTCL\PROJECTS\WAKE TECH CC - FIRE STATION.GPJ

DEPTH (ft)	ELEVATION (ft)	MATERIAL DESCRIPTION	SYMBOL	SAMPLING BLOW COUNTS (N-VALUE)	POCKET PEN. (tsf)	LAB TESTS	REMARKS
0							
	370	TOPSOIL - 1 INCH LOW PLASTICITY SILTY CLAY, (CL-ML): yellow, very stiff to hard		1, SS 5-9-13 (22)			
5				2, SS 2-13-17 (30)			
	365			3, SS 10-21-32 (53)			
10				4, SS 15-27-32 (59)			
	360						
		PARTIALLY WEATHERED ROCK, sampled as silty sand		5, SS 50/1"			

AUGER REFUSAL AT 14.5 FT
Bottom of borehole at 14.5 feet.

APPENDIX C
LABORATORY TEST RESULTS

Material Classification
 ASTM D2487

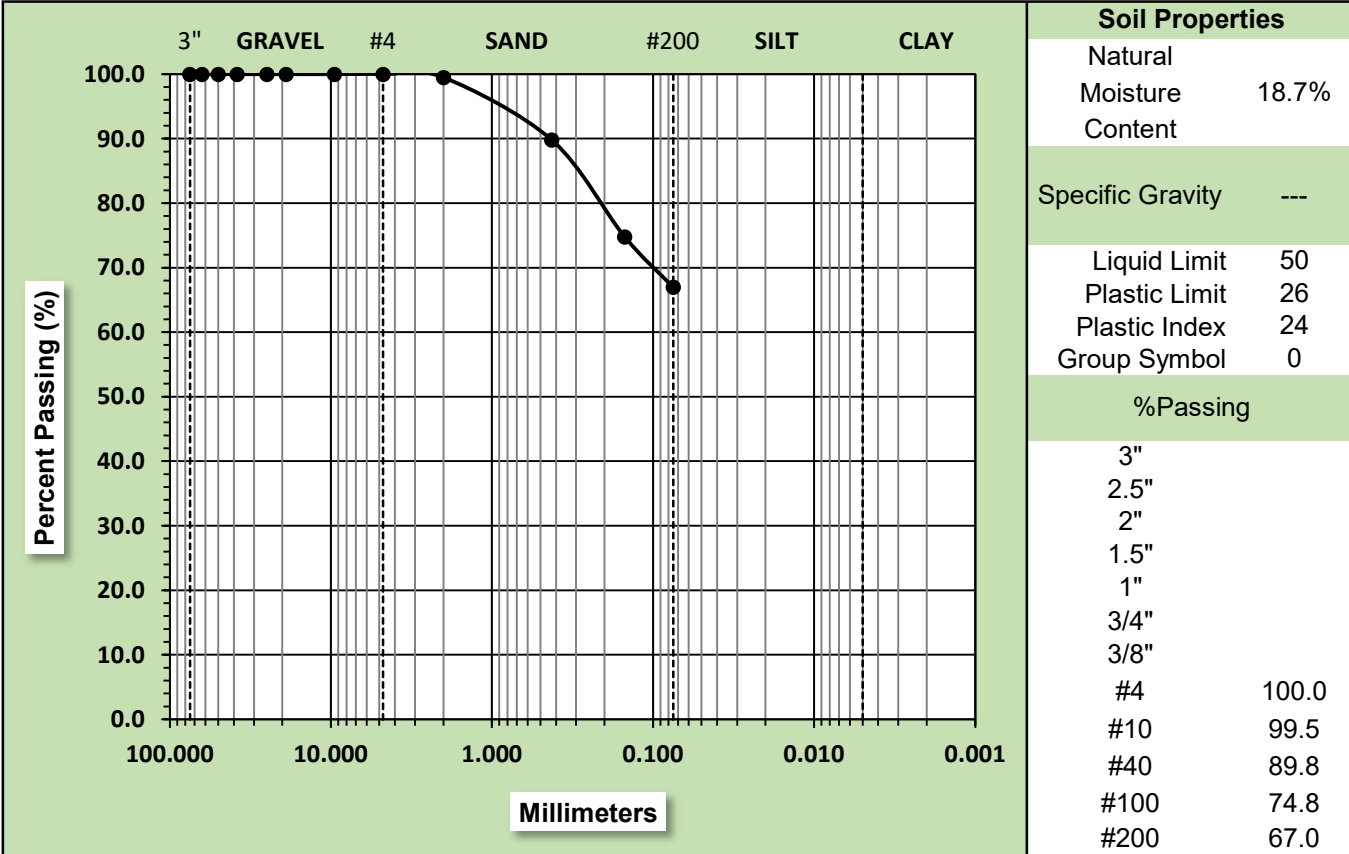


PROJECT INFORMATION

Project #: 69593.003 Report Date: 4/13/2026
 Project Name: Wake Tech C.C. - Town of Morrisville Fire Station Tested By: CAS
 Project Location: Morrisville, NC
 Client Name: Town of Morrisville

SAMPLE INFORMATION

Location: B-4 Sample #: S-2 Sample Date: 4/2/2026
 Depth: 3.5 to 5 feet Offset: N/A Lab Control #: 2
 Material Description: Tan, medium to fine SANDY FAT CLAY (CH)



Maximum Particle Size #4 Gravel 0.0% Sand 33.0% Silt and Clay 67.0%

C_u --- C_c ---

Description of Sand & Gravel Particles: Rounded, Angular, Hard

Notes: 2

References: ASTM D2216 Method A tested on 4/03/26 by CAS
 ASTM D422 tested on 4/03/26 by CAS
 ASTM D4318 Method A tested on 4/10/26 by CAS

Chris Smith Laboratory Manager 4/13/26
 Technical Responsibility Signature Position Date

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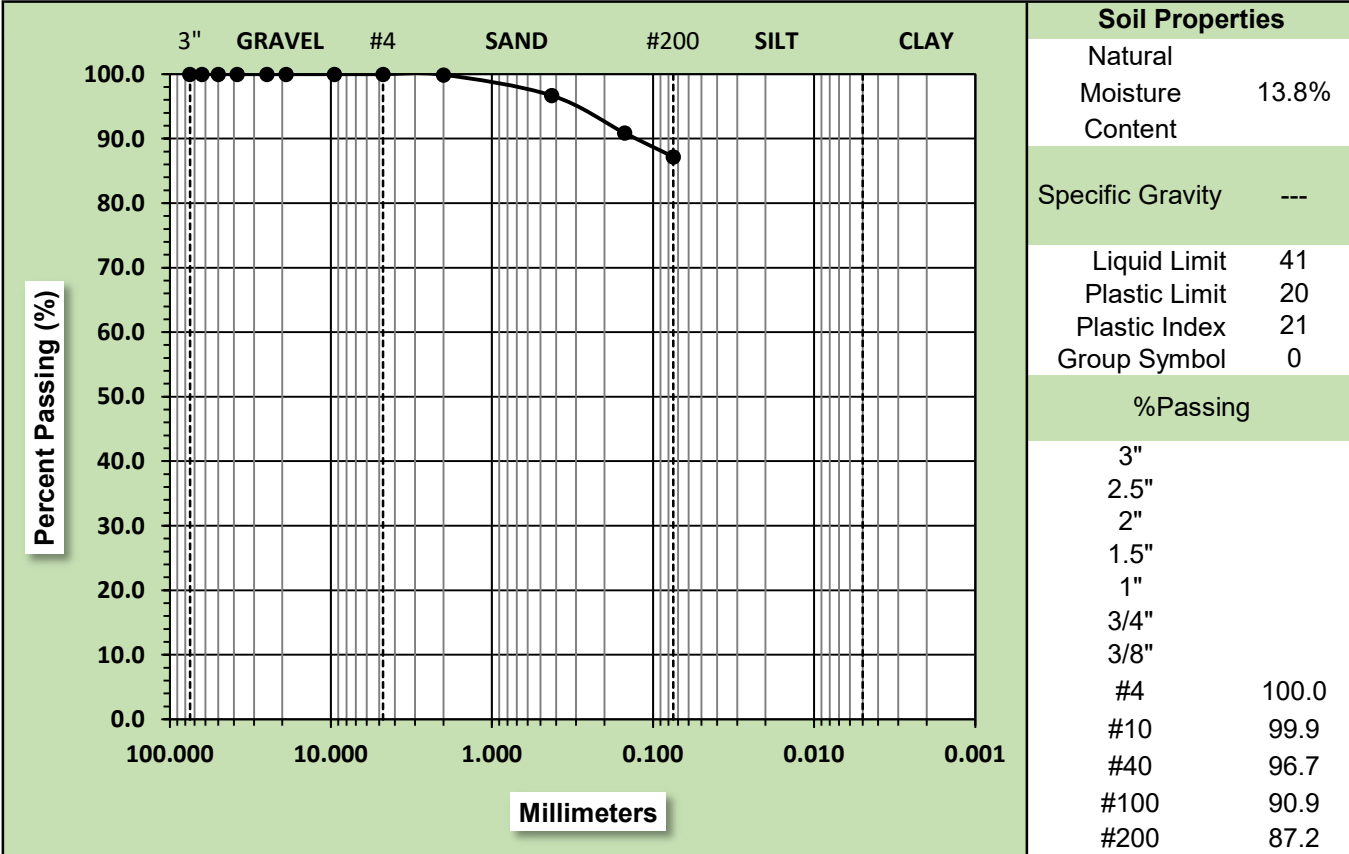
Material Classification
 ASTM D2487

PROJECT INFORMATION

Project #: 69593.003 Report Date: 4/13/2026
 Project Name: Wake Tech C.C. - Town of Morrisville Fire Station Tested By: CAS
 Project Location: Morrisville, NC
 Client Name: Town of Morrisville

SAMPLE INFORMATION

Location: B-4 Sample #: S-3 Sample Date: 4/2/2026
 Depth: 6 to 7.5 feet Offset: N/A Lab Control #: 3
 Material Description: Red Brown, fine SANDY LEAN CLAY (CL)



Maximum Particle Size #4 Gravel 0.0% Sand 12.8% Silt and Clay 87.2%

C_u --- C_c ---

Description of Sand & Gravel Particles: Rounded, Angular, Hard

Notes: 3

References: ASTM D2216 Method A tested on 4/03/26 by CAS
 ASTM D422 tested on 4/03/26 by CAS
 ASTM D4318 Method A tested on 4/10/26 by CAS

Chris Smith Laboratory Manager 4/13/26
 Technical Responsibility Signature Position Date

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Material Classification
 ASTM D2487

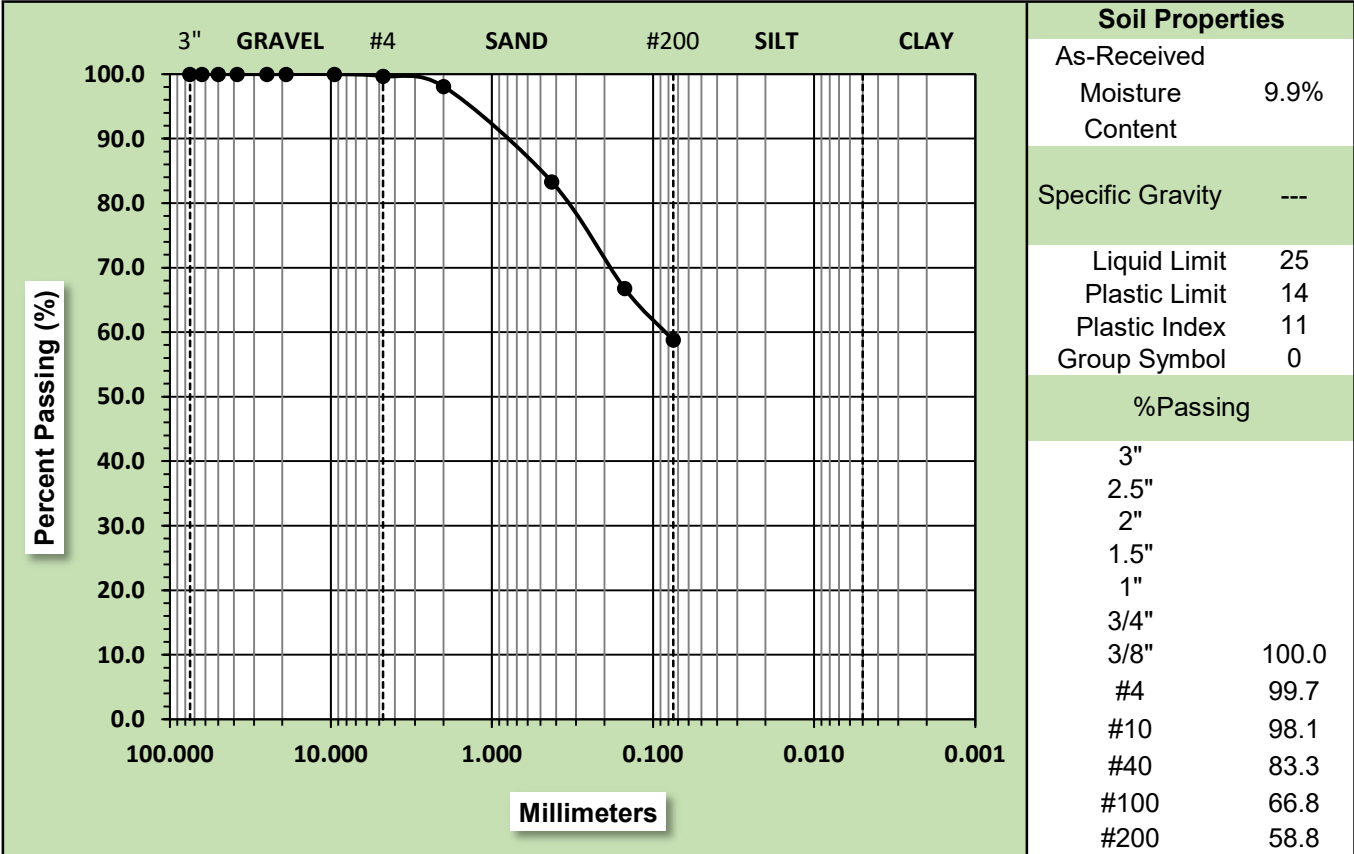


PROJECT INFORMATION

Project #: 69593.003 Report Date: 4/13/2026
 Project Name: Wake Tech C.C. - Town of Morrisville Fire Station Tested By: CAS
 Project Location: Morrisville, NC
 Client Name: Town of Morrisville

SAMPLE INFORMATION

Location: B-5 Sample #: Bulk Sample Date: 4/2/2026
 Depth: 1 to 5 feet Offset: N/A Lab Control #: 1
 Material Description: Brown, medium to fine SANDY LEAN CLAY (CL)



Maximum Particle Size 3/8" Gravel 0.3% Sand 40.9% Silt and Clay 58.8%

C_u --- C_c ---

Description of Sand & Gravel Particles: Rounded, Angular, Hard

Notes: 1

References: ASTM D2216 Method A tested on 4/03/26 by CAS
 ASTM D422 tested on 4/03/26 by CAS
 ASTM D4318 Method A tested on 4/10/26 by CAS

Chris Smith Laboratory Manager 4/13/26
 Technical Responsibility Signature Position Date

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MOISTURE-DENSITY RELATIONSHIP REPORT



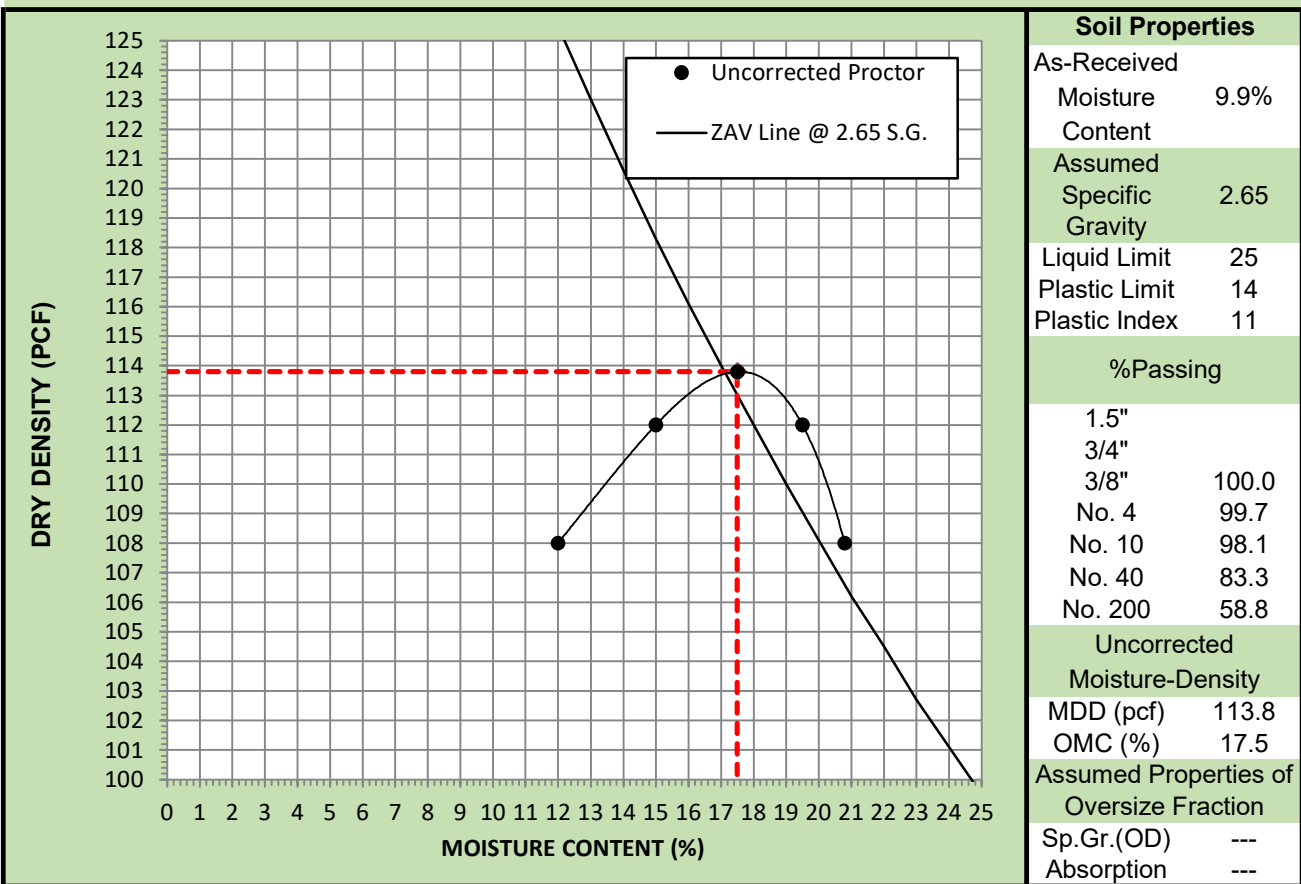
PROJECT INFORMATION

Project #:	69593.003	Report Date:	4/13/2026
Project Name:	Wake Tech C.C. - Town of Morrisville Fire Station	Test Date(s):	4/6/2026
Project Location:	Morrisville, NC	Tested By:	CAS
Client Name:	Town of Morrisville		

SAMPLE INFORMATION

Location:	B-5	Sample #:	Bulk	Sample Date:	4/2/2026
Depth:	1 to 5 feet	Offset:	N/A	Lab Control #:	1
Material Description:	Brown, medium to fine SANDY LEAN CLAY (CL)				

Corrected Maximum Dry Density	113.8 PCF	Corrected Optimum Moisture Content	17.5 %
ASTM D698 - Method A			



The Moisture-Density Curve Displayed relates only to material passing a No. 4 sieve. Air-dried material passing a No. 4 sieve was prepared then compacted with a circular, manual rammer.

References / Comments / Deviations:

Chris Smith		Laboratory Manager	4/13/26
Technical Responsibility	Signature	Position	Date

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Timmons Group / 430 Southlake Boulevard Suite B-15 Richmond, VA 23236 / p 804.200.6500

**CBR (California Bearing Ratio) of
 Laboratory Compacted Soil**
 ASTM D1883

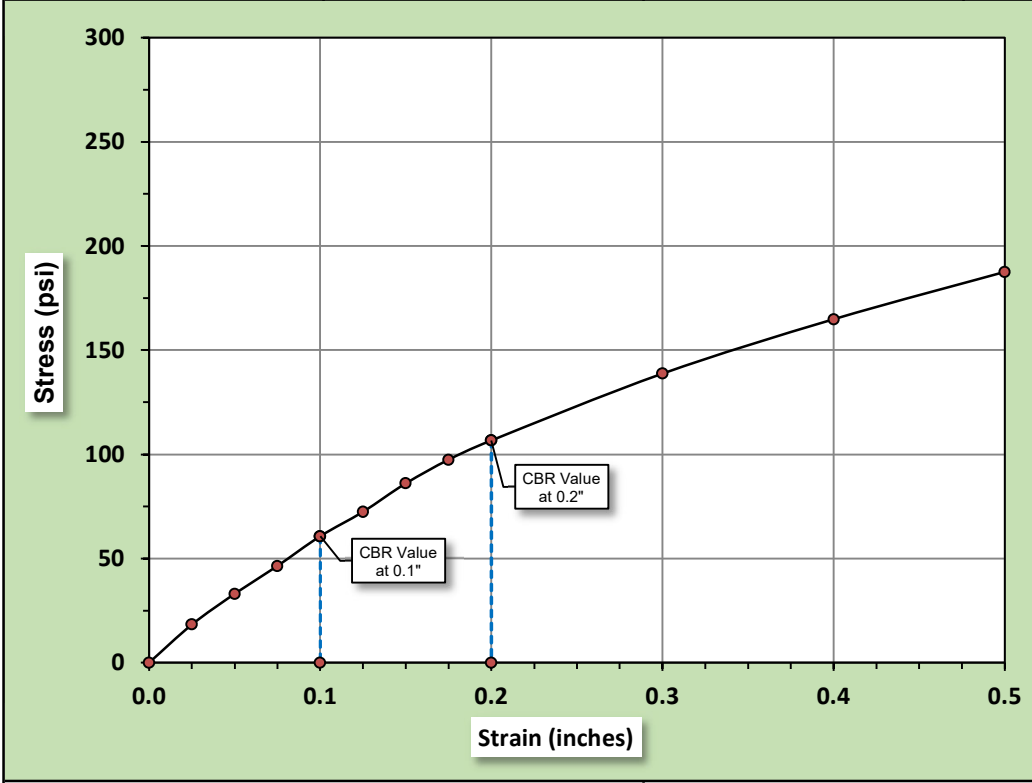
PROJECT INFORMATION

Project #:	69593.003	Report Date:	4/13/2026
Project Name:	Wake Tech C.C. - Town of Morrisville Fire Station	Test Date(s):	4/6/2026
Project Location:	Morrisville, NC	Tested By:	CAS
Client Name:	Town of Morrisville		

SAMPLE INFORMATION

Location:	B-5	Sample #:	Bulk	Sample Date:	4/2/2026
Depth:	1 to 5 feet	Offset:	N/A	Lab Control #:	1
Material Description:	Brown, medium to fine SANDY LEAN CLAY (CL)				

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in.	6.1	CBR at 0.2 in.	7.1
CBR at 0.1 in	---	CBR at 0.2 in	---



Soil Properties	
As-Received	
Moisture Content	9.9%
Liquid Limit	25
Plastic Limit	14
Plastic Index	11
%Passing	
1.5"	
3/4"	
3/8"	100.0
No. 4	99.7
No. 10	98.1
No. 40	83.3
No. 100	66.8
No. 200	58.8
ASTM D698 - Method A	
MDD (pcf)	113.8
OMC (%)	17.5

Before Soaking		After Soaking	
Compactive Effort (Blows Per Layer)	56	Final Dry Density (pcf)	112.3
Initial Dry Density (pcf)	113.2	Average Final Moisture Content	18.6%
Moisture Content of Compacted Specimen	17.4%	Moisture Content (top 1" after soaking)	19.8%
Percent Compaction	99.5%	Percent Swell	0.1%

Soak Time (hours): 96 Surcharge Weight (lb): 10 Surcharge Stress (psf): 50.9
 ASTM D698 - Method A was performed on grading complying with CBR specification. % Retained on
 ASTM D1883 was performed on the entire gradation compacted in a 6" CBR mold. 3/4" sieve: 0.0

References / Comments / Deviations:

Chris Smith	_____	Laboratory Manager	4/13/26
Technical Responsibility	Signature	Position	Date

Information included in this report relates only to material sampled at the time of testing.

Timmons Group, 490 South Main Boulevard, Suite B-5, Raleigh, NC 27606, Phone: 919.200.6500

Material Classification
 ASTM D2487

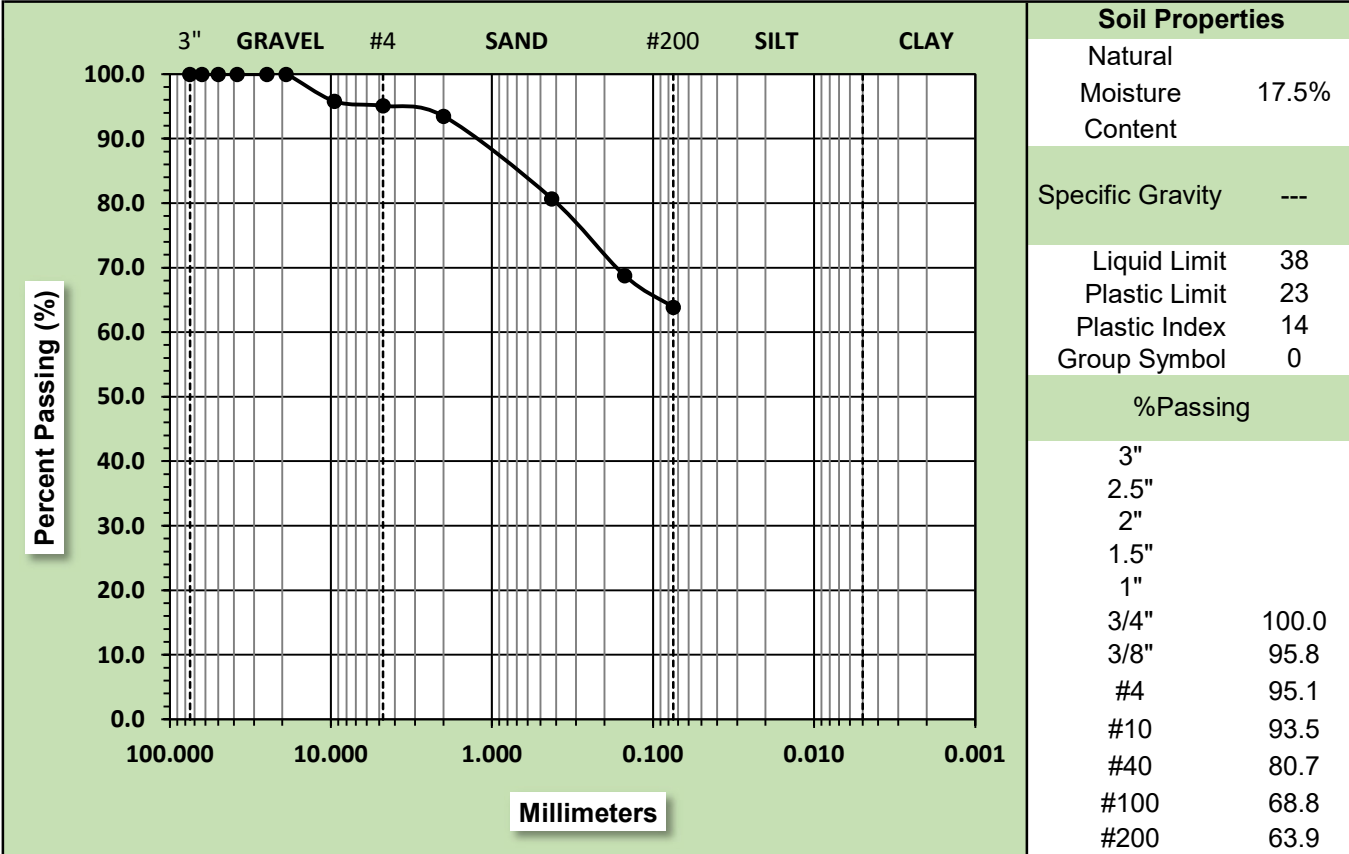


PROJECT INFORMATION

Project #: 69593.003 Report Date: 4/13/2026
 Project Name: Wake Tech C.C. - Town of Morrisville Fire Station Tested By: CAS
 Project Location: Morrisville, NC
 Client Name: Town of Morrisville

SAMPLE INFORMATION

Location: B-6 Sample #: S-1 Sample Date: 4/2/2026
 Depth: 1 to 2.5 feet Offset: N/A Lab Control #: 4
 Material Description: Brown, medium to fine SANDY SILTY CLAY (CL-ML)



Maximum Particle Size 3/4" Gravel 4.9% Sand 31.2% Silt and Clay 63.9%

C_u --- C_c ---

Description of Sand & Gravel Particles: Rounded, Angular, Hard

Notes: 4

References: ASTM D2216 Method A tested on 4/03/26 by CAS
 ASTM D422 tested on 4/03/26 by CAS
 ASTM D4318 Method A tested on 4/10/26 by CAS

Chris Smith Laboratory Manager 4/13/26
 Technical Responsibility Signature Position Date

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Material Classification
 ASTM D2487

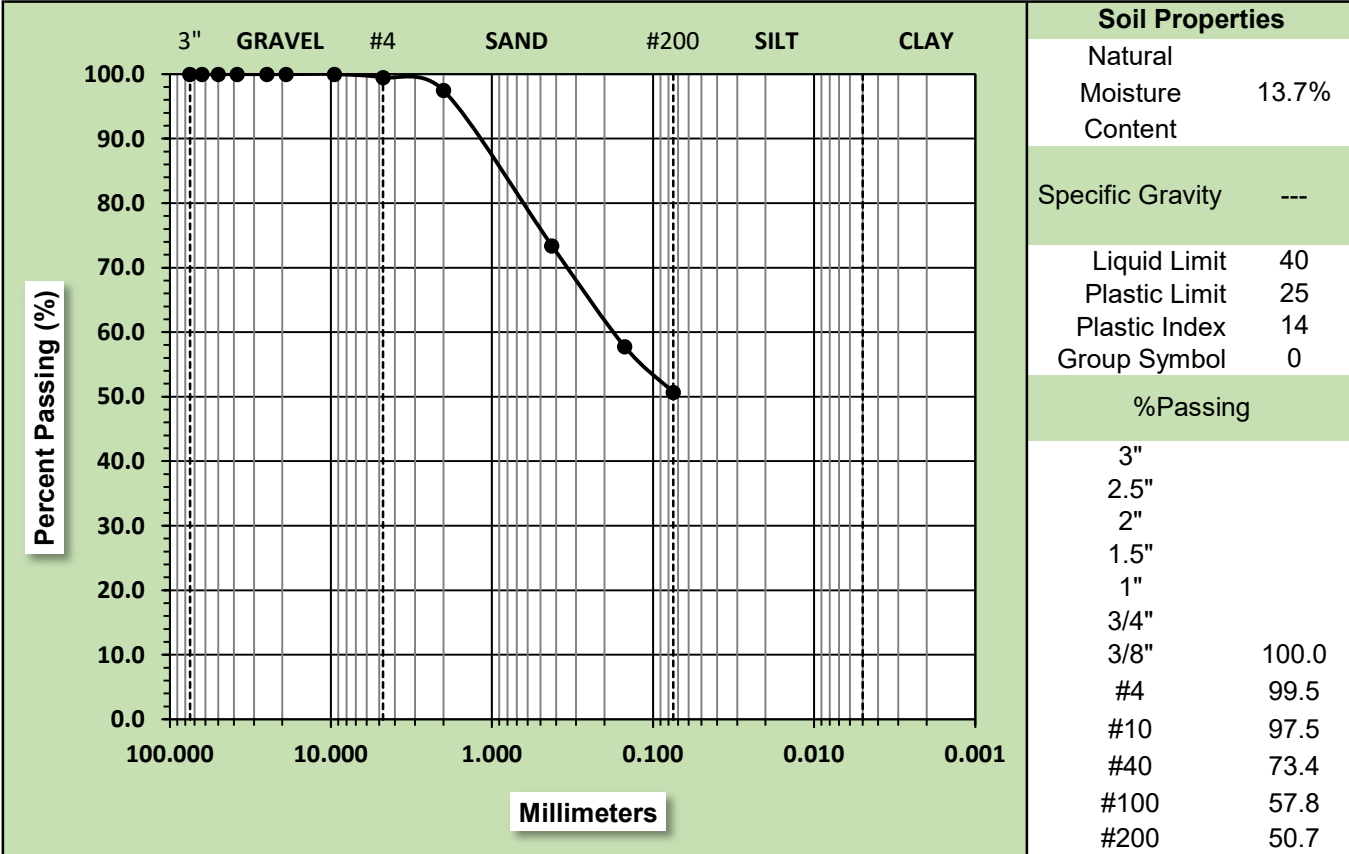


PROJECT INFORMATION

Project #: 69593.003 Report Date: 4/13/2026
 Project Name: Wake Tech C.C. - Town of Morrisville Fire Station Tested By: CAS
 Project Location: Morrisville, NC
 Client Name: Town of Morrisville

SAMPLE INFORMATION

Location: B-6 Sample #: S-3 Sample Date: 4/2/2026
 Depth: 6 to 7.5 feet Offset: N/A Lab Control #: 5
 Material Description: , fine SANDY SILTY CLAY (CL-ML)



Maximum Particle Size 3/8" Gravel 0.5% Sand 48.8% Silt and Clay 50.7%

C_u --- C_c ---

Description of Sand & Gravel Particles: Rounded, Angular, Hard

Notes: 5

References: ASTM D2216 Method A tested on 4/03/26 by CAS
 ASTM D422 tested on 4/03/26 by CAS
 ASTM D4318 Method A tested on 4/10/26 by CAS

Chris Smith Laboratory Manager 4/13/26
 Technical Responsibility Signature Position Date

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