GeoTechnologies, Inc.
Geotechnical and Construction Materials Testing Services

April 1, 2025

Smith + Gardner
14 N. Boylan Ave
Raleigh, NC 27603

Attn: Mr. Stacey Smith, PE

Re: Report of Subsurface Investigation
Parkton Convenience Center
Hope Mills, North Carolina
GeoTechnologies Project No. 125-0257-EA

Dear Mr. Smith,

GeoTechnologies, Inc. has completed the authorized subsurface investigation for the above referenced project in Hope Mills, North Carolina. The site is located in an open field near 6606 Parkton Road. It is our understanding that a new sold waste and recycling convenience center will be constructed, including construction of a new small single-story building, new concrete pads and new paved entrance and exit aprons.

Subsurface conditions at the site were investigated by completing 6 soil test borings at the approximate locations shown on the attached Figure 1. These borings were advanced to a depth of about 6 feet below existing grade. The boring locations were established in the field using a handheld Trimble GPS and should be considered approximate. The borings were complete utilizing hand auger and dynamic cone penetrometer (DCP) testing methods in accordance with ASTM STP#399. This report presents the findings of our investigation and our recommendations concerning site grading/earthwork, foundation support and pavements.

AREA GEOLOGY

The site is located in the Coastal Plain Physiographic and Geologic Province of North Carolina. The near surface soils in the area of the site generally consist of sands, clays, and silts which have eroded from the Piedmont Uplands and been deposited by streams. More specifically, the site is located within the Black Creek Formation which is comprised of gray clays and sands which were deposited during the Cretaceous Period approximately 63 to 138 million years ago. Frequent migration of the shoreline over the last two million years have redistributed the sedimentary soils originally deposited by streams and has resulted in the fairly Coastal Plain topography.

SUBSURFACE CONDITIONS

A generalized subsurface profile prepared from the test boring data is attached to this report as Figure 2 to graphically illustrate subsurface conditions encountered at this site. More detailed descriptions of the conditions encountered at the individual test boring locations are then presented on the attached test boring records.

The borings encountered about 2 inches of topsoil at the ground surface overlying possible fill or disturbed surface soils consisting of silty sand to a depth of about 8 to 14 inches below grade. Underlying the silty sand,

deposits of sandy clay and clayey sand was encountered to the boring completion depth of 6 feet. The soils exhibited DPC resistances of 3 to 15 blows per 1.75 inch increment (bpi).

Groundwater was encountered in the borings at depths between 4 and 5 feet below existing grade. It should be noted that the near surface soils at the site are conducive to the temporary development of perched groundwater conditions during periods of wet weather, and that groundwater levels will fluctuate during different periods of the year.

RECOMMENDATIONS

The following recommendations are made based upon a review of the attached test boring data, our understanding of the proposed construction, and past experience with similar projects and subsurface conditions. Once final grading and structural plans are available, GeoTechnologies would appreciate being provided with these so recommendations can be confirmed, extended, or modified as necessary. Additionally, should subsurface conditions adverse to those indicated by this report be encountered during construction, those differences should be reported to us for review and comment.

Site Grading Considerations: Site grading should begin with clearing and stripping of all topsoil and vegetation within the limits of the proposed construction. Following stripping and clearing all areas at grade or which are designated to receive fill should be proofrolled for stability with a partially loaded tandem axel dump truck in the presence of a geotechnical engineer to identify areas necessitating repairs. Repairs should be performed as directed by the engineer.

Our borings indicate that the soils at this site are typically loose /soft in the upper 2 feet of the subsurface profile. For this reason, we expect some near surface repairs may be required, especially in areas where the borings exhibited DCP values of 5 bpi or less. If the work is performed during a cold and wet time of the year, repair depths may be significantly increased. If the site is graded during a period of warm and dry weather, the depth of near surface repairs should be reduced. Conditions in this geology deteriorate during wetter periods of the year, resulting in significant seasonal differences in the quantity of near surface repairs necessary for site development. Additionally, many of the subsurface soils are micaceous and may exhibit instability under a proofroll, even in ideal grading conditions.

It is expected that near surface instability can be mitigated with limited undercut provided that the contractor is prepared to disc and dry wet soils prior to recompaction. In our experience, the most effective way to dry any wet on-site soils is with a farm disc turning the soils every 60 to 90 minutes under favorable (warm/dry) conditions. In this area, these conditions are most prevalent from about April through October. If the contractor is not prepared to dry soils, or if the site is graded during a wet or cool period of the year, drying will be ineffective and undercut quantities may increase. It may be beneficial to include some additional undercut allowance if the site is to be graded during cooler months.

Borrow Materials/Placement: The on-site soils, excluding topsoil and soils containing organics and/or debris, should be suitable for reuse as structural fill. If off-site borrow is required, low plasticity clays, sands, or silts with Unified Soil Classification of CL, SM, SC, and ML may be used for structural fill. Processed fill may also be used.

A standard backfill compaction recommendation for soils placed in structural areas is to compact the material to at least 95% of the standard Proctor maximum dry density, except at subgrade elevations where the

compaction should be at least 98% of the standard Proctor maximum dry density. In order to achieve proper density and stability, soil moisture contents should be maintained within 2% of the optimum moisture content, which may require some drying or the addition of moisture. Non-structural areas should have some compaction effort when filling. We recommend that fill in non-structural areas be compacted to at least 90% of the standard Proctor maximum dry density, if some post-construction settlement is acceptable.

Foundation Support Considerations: Assuming that the site is prepared as directed, foundations may be designed for an allowable bearing pressure of 2,000 psf subject to the restriction that column and wall footings have least dimensions of not less than 24 and 16 inches, respectively. These foundations may bear at nominal depth below finished exterior grade in residual soils or in properly compacted fill except that a minimum embedment depth of not less than 12 inches for exterior footings is recommended for frost protection. The bottom of all foundation excavations should be free from water, loose soil, and debris prior to placement of concrete. Concrete should also not be placed on frozen subgrades. Concrete should be placed as soon as possible, and preferably within the same day it is excavated to minimize the potential for disturbing of the foundation subgrade due to inclement weather.

GeoTechnologies recommends that all foundation excavations be carefully evaluated by a geotechnical engineer to verify that suitable bearing materials have been reached. The evaluation should include hand auger borings utilizing a steel probe rod and DCP testing. If any areas are encountered which are found to be soft/unsuitable, those areas should be repaired as recommended by the geotechnical engineer. Typical repairs of unsuitable soils include over-excavation as determined by the geotechnical engineer and backfilling to design subgrade elevation using washed #57 or #67 stone.

For lightly loaded structures such as a small guard shack for employees, we would expect total estimated settlements to be less than 1 inch for foundation bearing on properly prepared subgrade soils. Typically, differential settlement will be approximately one-half of the maximum settlement.

Slab-on-Grades: We recommend that slabs-on-grade for the structure are designed for an assumed subgrade modulus of 100 pci (for a 1 foot by 1 foot area). This assumes that subgrades will be compacted to a minimum of 98% of the standard Proctor maximum dry density. We recommend that slabs be supported on a minimum of a 4 inch thick layer of compacted CABC. All slabs should be constructed per current ACI guidelines, including proper jointing to help control shrinkage cracking.

Seismic Design: This site is a seismic site class "D" under the building code based on the test boring data and past experience in the area of the site.

Pavement Design: Following proper completion of grading, the site should be suitable for support of conventional pavement structures. We recommend using a design CBR of 5% can be used for the design of flexible pavements and a subgrade modulus of 100 pci can be used for rigid pavements. Any new pavement subgrades should be moisture conditioned and recompacted to not less than 98% of the standard Proctor maximum dry density immediately prior to placement of base course stone. We recommend a pavement section of 4 inches asphalt over 8 inches CABC stone base for the entrance and existing aprons and 12 inches of CABC stone for the gravel surface area. Additionally, a heavy-duty woven fabric should be considered in the gravel area to help prevent the stone from migrating into the soil subgrade over time.

All pavement subgrades should be proofrolled in the presence of an engineer prior to the placement of CABC. Areas which are unstable in the opinion of the engineer should be repaired as directed. Stone grade should

be proofrolled as well prior to paving. We recommend that proof rolls be conducted with the same size dump trucks which will be used for paving.

The most important factors affecting pavement life in the area of the site are the condition of the subgrade immediately prior to base course stone placement and post-construction drainage. It is recommended that site grades be detailed to promote positive drainage away from pavement areas and that a drainage swale be installed on the uphill side of all pavement areas to intercept and divert perched water which may otherwise occur during the wetter winter months of the year.

CLOSING

GeoTechnologies, Inc. appreciates the opportunity to provide you with our services during this phase of the project. Please contact us if you should have questions regarding this information or if we may be of further assistance.

Sincerely,
GeoTechnologies, Inc.

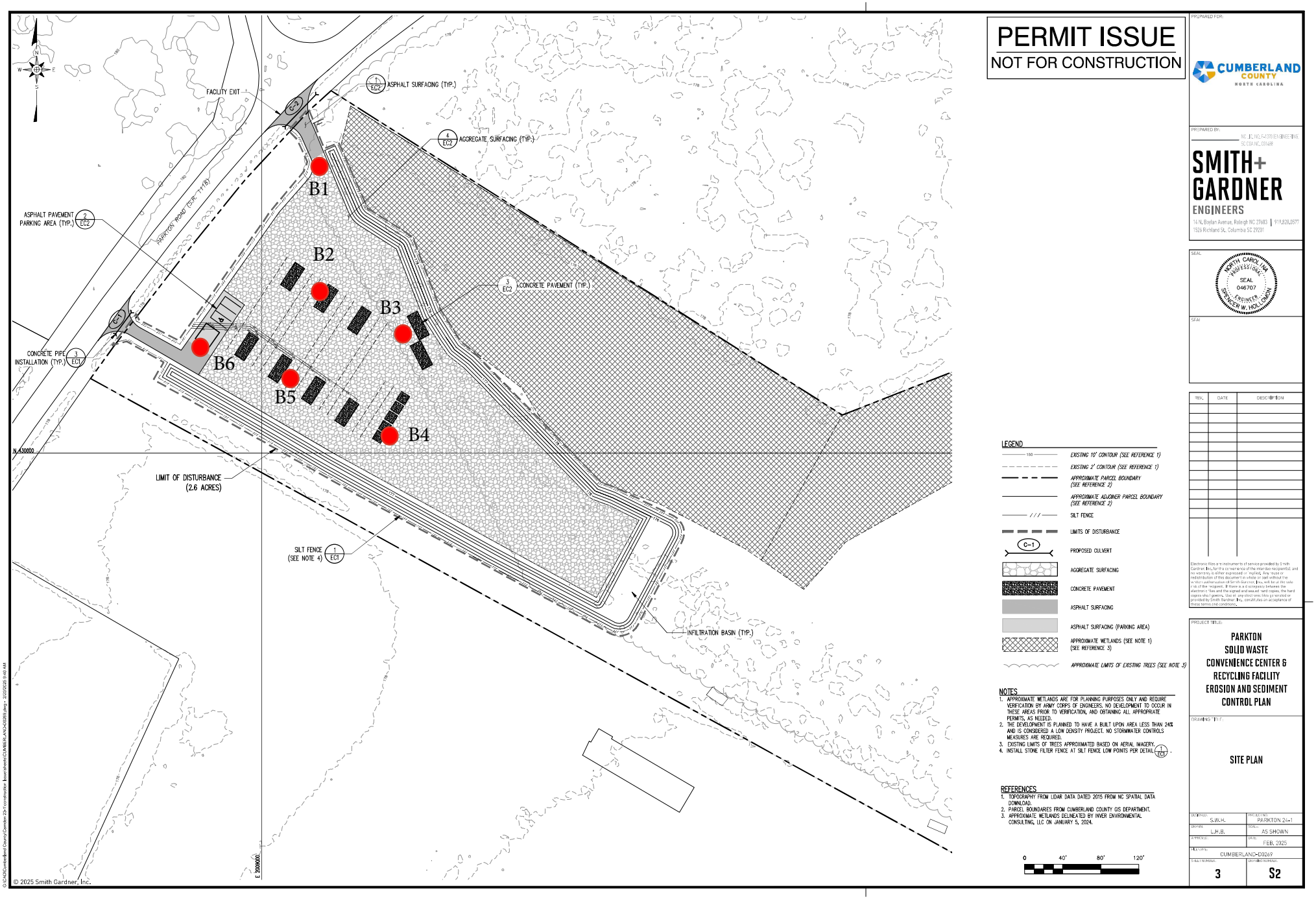
Mark R. Potratz, PE
NC License No. 25955

NORTH CAROLINA PROFESSIONAL SEAL 25955 ENGINEER MARK R. POTRATZ

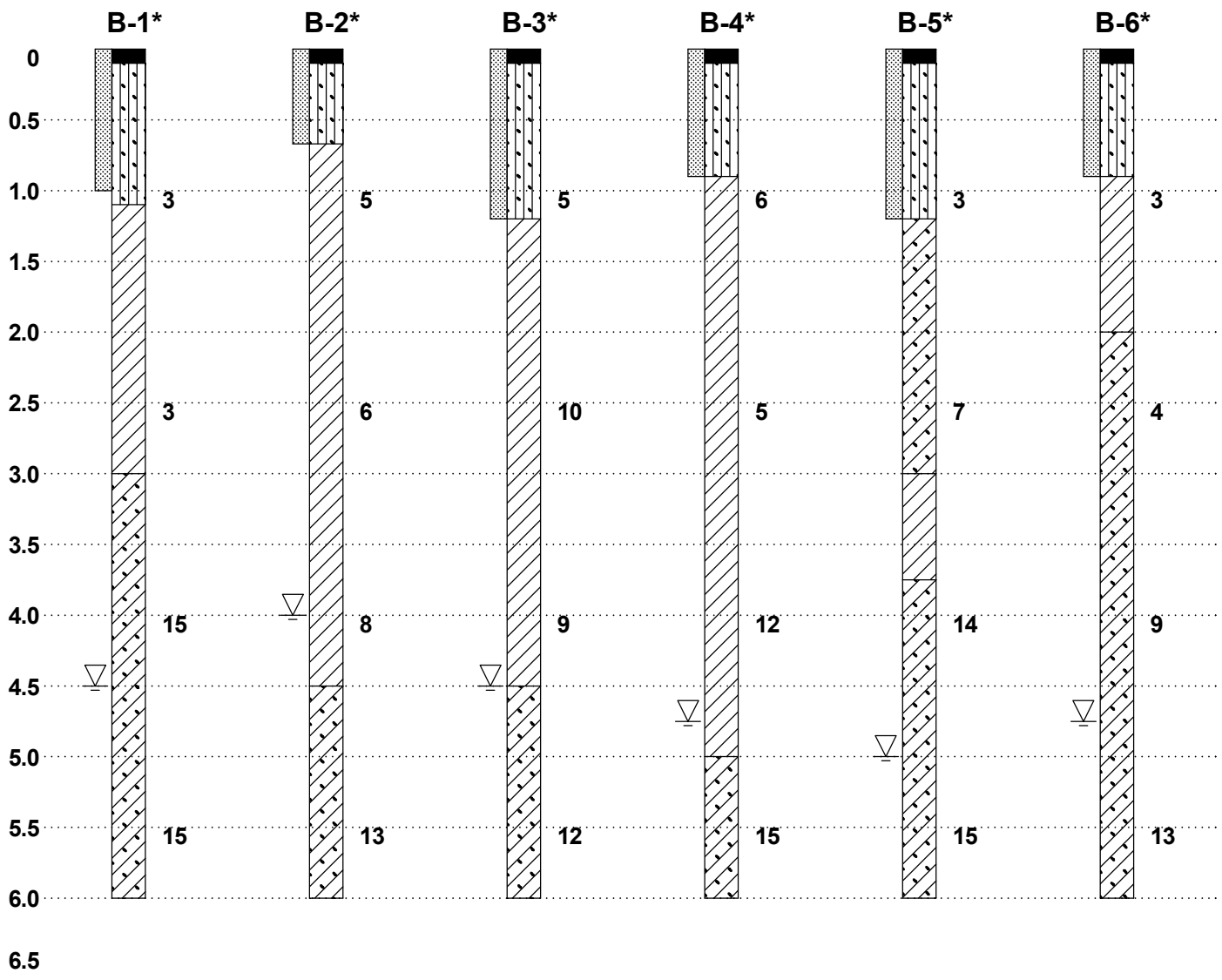
MRP/pr-dli

Attachments

Figure 1 - Boring Locations



GENERALIZED SUBSURFACE PROFILE



LEGEND

- Topsoil
- Silty Sand
- Low Plasticity Clay
- Clayey Sand
- Possible Fill
- * Dynamic Cone Penetration
- Groundwater at Time of Boring

PROJECT:

Parkton Road Convenience Center
Hope Mills, North Carolina

GeoTechnologies, Inc.

SCALE: As Shown

JOB No:125-0257-EA

FIGURE No: 2

Test Boring Record

Boring Name: **B-1**
Dates Drilled: 3/27/2025

Job Name: Parkton Road Convenience Center
Job Number: 125-0257-EA
Location: Hope Mills, North Carolina

NC State Plane Coordinates:
N:
E:
Elevation:

Depth (ft)	Approx. Elev. (ft)	Material Description	USCS	Dynamic Cone Penetration (Blows/1.75") 0 10 30 50 70 90	Blows Per 1.75" Increments	GW/Cave
		(0-0.1 ft) TOPSOIL				
		(0.1-1.1 ft) Possible Fill- Very Loose, Dark Brown, Silty, Fine to Medium SAND	SM		3-3-3 (3)	
		(1.1-3 ft) Soft, Orange, Gray, Brown, Fine to Medium Sandy CLAY	CL		3-3-4 (3)	
		(3-6 ft) Moist to Wet-Medium Dense, Orange, Gray, Clayey, Fine to Medium SAND	SC		15-15+ (15)	▽
5					15-15+ (15)	
		Boring terminated at 6 ft. Water at 4.5 ft at time of boring.				

Notes:

GeoTechnologies, Inc.

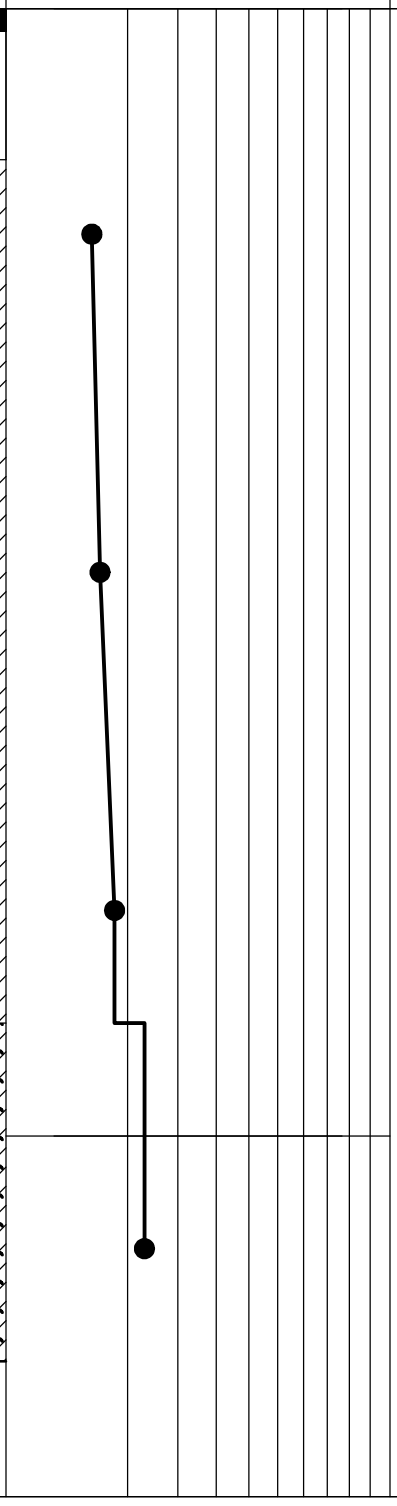
Test Boring Record

Boring Name: **B-2**
Dates Drilled: 3/27/2025

Job Name: Parkton Road Convenience Center
Job Number: 125-0257-EA
Location: Hope Mills, North Carolina

NC State Plane Coordinates:
N:
E:
Elevation:

Depth (ft)	Approx. Elev. (ft)	Material Description	USCS
		(0-0.1 ft) TOPSOIL	
		(0.1-0.67 ft) Possible Fill-, Dark Brown, Silty, Fine to Medium SAND	SM
		(0.67-4.5 ft) Firm to Stiff, Orange, Brown, Fine to Medium Sandy CLAY	CL
5		(4.5-6 ft) Wet to Moist- Medium Dense, Orange, Brown, Gray, Clayey, Fine to Medium SAND w/ clay lenses	SC
		Boring terminated at 6 ft. Water at 4 ft at time of boring.	



Blows Per 1.75" Increments	GW/Cave
5-6-6 (5)	
5-6-6 (6)	
6-8-8 (8)	▽
10-13-15 (13)	

Notes:

GeoTechnologies, Inc.

Test Boring Record

Boring Name: **B-3**
Dates Drilled: 3/27/2025

Job Name: Parkton Road Convenience Center
Job Number: 125-0257-EA
Location: Hope Mills, North Carolina

NC State Plane Coordinates:
N:
E:
Elevation:

Depth (ft)	Approx. Elev. (ft)	Material Description	USCS	Dynamic Cone Penetration (Blows/1.75") 0 10 30 50 70 90	Blows Per 1.75" Increments	GW/Cave
		(0-0.1 ft) TOPSOIL				
		(0.1-1.2 ft) Possible Fill-Loose, Dark Brown, Silty, Fine to Medium SAND	SM		5-4-6 (5)	
		(1.2-4.5 ft) Stiff, Orange, Brown, Fine to Medium Sandy CLAY	CL		9-10-10 (10)	
					9-9-9 (9)	▽
5		(4.5-6 ft) Damp- Medium Dense, White, Light Gray, Clayey, Fine to Medium SAND	SC		11-12-14 (12)	
		Boring terminated at 6 ft. Water at 4.5 ft at time of boring.				

Notes:

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Test Boring Record

Boring Name: **B-4**
Dates Drilled: 3/27/2025

Job Name: Parkton Road Convenience Center
Job Number: 125-0257-EA
Location: Hope Mills, North Carolina

NC State Plane Coordinates:
N:
E:
Elevation:

Depth (ft)	Approx. Elev. (ft)	Material Description	USCS	Dynamic Cone Penetration (Blows/1.75") 0 10 30 50 70 90	Blows Per 1.75" Increments	GW/Cave
		(0-0.1 ft) TOPSOIL				
		(0.1-0.9 ft) Possible Fill- Dark Brown, Silty, Fine to Medium SAND	SM			
		(0.9-5 ft) Firm to Stiff, Gray, Orange, Fine to Medium Sandy CLAY	CL		5-6-6 (6)	
					5-5-6 (5)	
					12-12-13 (12)	
5		(5-6 ft) Wet- Medium Dense, White, Light Gray, Clayey, Fine to Medium SAND	SC		15-15+ (15)	
		Boring terminated at 6 ft. Water at 4.75 ft at time of boring.				

Notes:

Test Boring Record

Boring Name: **B-5**
Dates Drilled: 3/27/2025

Job Name: Parkton Road Convenience Center
Job Number: 125-0257-EA
Location: Hope Mills, North Carolina

NC State Plane Coordinates:
N:
E:
Elevation:

Depth (ft)	Approx. Elev. (ft)	Material Description	USCS	Dynamic Cone Penetration (Blows/1.75") 0 10 30 50 70 90	Blows Per 1.75" Increments	GW/Cave
		(0-0.1 ft) TOPSOIL				
		(0.1-1.2 ft) Possible Fill- Very Loose, Dark Brown, Silty, Fine to Medium SAND	SM		3-3-2 (3)	
		(1.2-3 ft) Loose, Brown, Clayey, Fine to Medium SAND	SC		4-7-10 (7)	
		(3-3.75 ft) Orange, Brown, Fine to Medium Sandy CLAY	CL			
		(3.75-6 ft) Moist to Wet- Medium Dense, Orange, Brown, White, Light Gray, Clayey, Fine to Medium SAND	SC		13-15-15 (14)	
5					15-15+ (15)	▽
		Boring terminated at 6 ft. Water at 5 ft at time of boring.				

Notes:

GeoTechnologies, Inc.

Test Boring Record

Boring Name: **B-6**
Dates Drilled: 3/27/2025

Job Name: Parkton Road Convenience Center
Job Number: 125-0257-EA
Location: Hope Mills, North Carolina

NC State Plane Coordinates:
N:
E:
Elevation:

Depth (ft)	Approx. Elev. (ft)	Material Description	USCS	Dynamic Cone Penetration (Blows/1.75") 0 10 30 50 70 90	Blows Per 1.75" Increments	GW/Cave
		(0-0.1 ft) TOPSOIL				
		(0.1-0.9 ft) Possible Fill-Dark Brown, Silty, Fine to Medium SAND	SM			
		(0.9-2 ft) Soft, Gray, Orange, Brown, Fine to Medium Sandy CLAY	CL		3-3-3 (3)	
		(2-6 ft) Moist to Wet- Loose to Medium Dense, Orange, Light Gray, Clayey, Fine to Medium SAND	SC		3-4-5 (4)	
					8-9-10 (9)	
5					11-14-15 (13)	▽
		Boring terminated at 6 ft. Water at 4.75 ft at time of boring.				

Notes:

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