Burkes Chapel Road Fire Station

Geotechnical Engineering Report

LaGrange, GA

July 20, 2026 | Terracon Project No. 1000019222

Prepared for:

Troup County Board of Commissioners
100 Ridley Avenue
LaGrange, GA 30240

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July 20, 2026

Troup County Board of Commissioners
100 Ridley Avenue
LaGrange, GA 30240

Attn: James Anderson
P: (706) 298 - 1883
E: janderson@troupcountyga.gov

Re: Geotechnical Engineering Report
Burkes Chapel Road Fire Station
31 Burkes Chapel Road
LaGrange, GA
Terracon Project No. 1000019222

Dear Mr. Anderson:

We have completed the scope of Geotechnical Engineering services for the above referenced project in general accordance with Terracon Proposal No. 1000016581 dated June 12, 2026. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning earthwork and the design and construction of foundations, floor slabs, and pavement for the proposed project.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report or if we may be of further service, please contact us.

Sincerely,

Terracon

Candace G. Milligan, E.I.T.
Staff Engineer

Richard L. Curtis, P.E, BC.GE, F.ASCE
Senior Engineering Consultant

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Note: This report was originally delivered in a web-based format. **Blue Bold** text in the report indicates a referenced section heading. The PDF version also includes hyperlinks which direct the reader to that section and clicking on the Terracon logo will bring you back to this page. For more interactive features, please view your project online at **client.terracon.com**.

Refer to each individual Attachment for a listing of contents.

Introduction

This report presents the results of our subsurface exploration and Geotechnical Engineering services performed for the proposed fire station to be located at 31 Burkes Chapel Road in LaGrange, GA. The purpose of these services was to provide information and geotechnical engineering recommendations related to:

- Subsurface soil conditions
- Groundwater conditions
- Seismic site classification per IBC
- Site preparation and earthwork
- Foundation design and construction
- Floor slab design and construction
- Pavement design and construction

The geotechnical engineering Scope of Services for this project included the advancement of test borings, laboratory testing, engineering analysis, and preparation of this report.

Drawings showing the site and boring locations are shown on the **Site Location** and **Exploration Plan**, respectively. The results of the laboratory testing performed on soil samples obtained from the site during our field exploration are included in the boring logs in the **Exploration and Laboratory Results** section.

Project Description

Our initial understanding of the project was provided in our proposal.

Item	Description
Information Provided	An email request for proposal was provided by James Anderson of Troup County on June 12, 2026. The request included: ▪ Earthwork Exhibit v2_05-28-26.pdf ▪ Earthwork Exhibit v2.1_05-28-26.pdf
Project Description	The project includes a high-bay, single-story fire station with onsite asphalt parking for personnel and concrete driveways and parking for fire station vehicles.
Proposed Structure	Structures associated with the project include a 7,680 square foot fire station with vehicle parking, firefighter quarters, and offices.

Item	Description
Building Construction	Not provided.
Finished Floor Elevation	Finished floor elevation for the building is anticipated to be 722 feet for V2 and 727 for V2.1 based on the plans provided.
Maximum Loads	Anticipated structural loads were not provided. In the absence of information provided by the design team, we will use the following loads in estimating settlement based on our experience with similar projects. ▪ Columns: 50 kips ▪ Walls: 5 kips per linear foot (klf) ▪ Slabs: 100 pounds per square foot (psf)
Grading/Slopes	For V2: Proposed finished grade elevation for the building pad is expected to be at 722. Approximately up to 4 feet of cut will be required to develop final grades within the building footprint, excluding remedial grading requirements. Final slopes are planned with a maximum height of 9 feet and an inclination of 2H:1V (Horizontal: Vertical) or flatter. For V2.1: Proposed finished grade elevation for the building pad is expected to be at 727. Approximately up to 4 feet of fill will be required to develop final grade within the building footprint, excluding remedial grading requirements. Final slopes are planned with a maximum height of 6 feet and an inclination of 2H:1V (Horizontal: Vertical) or flatter.
Below-Grade Structures	None anticipated.
Free-Standing Retaining Walls	None anticipated.

Item	Description
Pavements	Paved driveway and parking will be constructed on the parcel. A preferred pavement surfacing has been identified to us as part of the preliminary information. Unless information is provided prior to the report, the anticipated ACI traffic categories and daily truck traffic will be assumed to consist of: ▪ Light Duty Asphalt for personal vehicles ▪ Heavy Duty Concrete for fire truck lanes and parking The pavement design period is 20 years.
Building Code	2024 IBC

Terracon should be notified if any of the above information is inconsistent with the planned construction, especially the grading limits, as modifications to our recommendations may be necessary.

Site Conditions

The following description of site conditions is derived from our site visit in association with field exploration and our review of provided grading plan.

Item	Description
Parcel Information	The project is located at 31 Burkes Chapel Road in LaGrange, GA. 2.2 acres Latitude/Longitude (approximate) 32.91678° N 85.01930° W (See Exhibit D) See **Site Location**
Existing Improvements	Historical aerial photos show this parcel is undeveloped.
Current Ground Cover	Moderate woodland
Existing Topography	Based on plans provided, the site slopes downhill from south (maximum elevation of 732) to the northwest (minimum elevation of 719).

Geotechnical Characterization

We have developed a general characterization of the subsurface conditions based upon our review of the subsurface exploration, laboratory data, geologic setting and our understanding of the project. This characterization, termed GeoModel, forms the basis of our geotechnical calculations and evaluation of the site. Conditions observed at each exploration point are indicated on the individual logs. The individual logs and GeoModel can be found in the **Exploration Results** and the GeoModel can be found in the Figures attachment of this report.

As part of our analyses, we identified the following model layers within the subsurface profile. For a more detailed view of the model layer depths at each boring location, refer to the GeoModel.

Model Layer	Layer Name	General Description
1	SANDY ELASTIC SILT	Red, brown, medium stiff to very stiff, trace mica, residuum
2	SILTY SAND	Red, brown, and gray, fine to medium grained, loose to medium dense, with mica, residuum

The borings were advanced using continuous flight, hollow steam auger drilling technique that allows short term groundwater observations to be made while drilling. Groundwater was not encountered within the maximum drilling depth at the time of our field exploration. Groundwater conditions may be different at the time of construction. Groundwater conditions may change because of seasonal variations in rainfall, runoff, and other conditions not apparent at the time of drilling. Long-term groundwater monitoring was outside the scope of services for this project.

Site Geology

The project site is in the Piedmont Physiographic Province of Georgia which is characterized by medium to high grade metamorphic rocks with standard igneous intrusions. The term metamorphic rocks that have been subjected to high temperatures and/or pressures, are usually deep within the earth's crust. These high temperatures and pressure cause the textural and mineralogical characteristics of the original rock to be altered and can also cause certain rock types to fully melt, becoming what is known as magma. Magma is less dense than the surrounding solidified rock and tends to move upward through fractures and joints, displacing the surrounding rock. This type of rock is known as an igneous intrusion. Metamorphic rocks are predominant in this region but, due to erosion and uplift, both rocks will eventually become exposed to the land surface.

The subsurface bedrock in this region has undergone differing rates of weathering, which often produce a considerable variation in depth to competent rock over short horizontal distances. It is also not unusual for lenses and boulders of hard rock and zone of partially weathered rock to be present within the soil mantle above the general bedrock level. The typical residual soil profile consists of clayey soils near the surface, where soil weathering is more advanced, underlain by sandy silts and silty sands, which often consist of saprolites (native soils which maintain the original fabric of the parent rock). Generally, the soil becomes harder with depth to the top of parent crystalline rock or "massive bedrock" which occurs at depth.

The boundary between soil and rock is typically not sharply defined. A transitional zone termed" partially weathered rock" is normally found overlaying bedrock. Partially weathered rock (PWR) is defined for engineering purposes as residual material with a standard penetration resistance exceeding 100 blows per foot (bpf).

Seismic Site Class

The seismic design requirements for buildings and other structures are based on Seismic Design Category. Site Classification is required to determine the Seismic Design Category for a structure. Per the 2024 International Building Code (2024 IBC), the seismic site classification is based on a site subsurface profile extending to a depth of 100 feet. Based on the soil conditions observed at the site and as described on the exploration logs and results, it is our professional opinion that a default **Seismic Site Classification of D** be considered for the project. Subsurface explorations at this site were only extended to a maximum depth of 30 feet. Therefore, the recommended seismic site class was selected to represent the most critical site conditions per ASCE 7-22 Section 20.1 as referenced by the 2024 IBC. Additional geophysical testing may be performed to confirm or potentially improve the site class.

Geotechnical Overview

The site appears suitable for the proposed construction based upon geotechnical conditions encountered in the test borings, provided that the recommendations provided in this report are implemented in the design and construction phases of this project.

In most of the borings, the near surface materials consisted of residual sandy elastic silt (MH) extending to a depth ranging from 5 to 10 feet. This report provides recommendations to help mitigate the effects of soil shrinkage and expansion. However, even if these procedures are followed, some movement and (at least minor) cracking in the structure should be anticipated. The severity of cracking and other damage such as uneven floor slabs will probably increase if modification of the site results in excessive wetting or drying of the expansive soils. Eliminating the risk of movement and distress may not be feasible, but it may be possible to further reduce the risk of movement if significantly more expensive measures are used during construction, such as a structural slab.

Due to the presence of high-plasticity silts (MH), we recommend that the building pad and pavement subgrade be prepared to reduce the risk of movements caused by volume change of the elastic silts and to remove the soils that are not suitable for foundation, floor slabs, and pavement support. Typical means of mitigating the risk associated with elastic silts include providing a suitable buffer of low volume change structural fil between the bottom of the footings, slabs, and pavement subgrades.

At a minimum, the upper 3 feet of soil within the building footprint (and extending to 10 feet beyond the edge of the building on all sides) should consist of low volume change structural fill. This can be achieved by raising the finished floor elevation of the building using low volume change fill, by undercutting the existing elastic silts and replacing with low volume change structural fill, or a combination of the two. Deeper undercut may be necessary depending on the conditions observed by the Geotechnical Engineer after the initial undercut.

Below the sandy elastic silt, silty sands extending to the maximum depth of the boring. Groundwater was not encountered within the maximum depths of exploration during or at the completion of drilling.

Based on the conditions encountered and estimated load-settlement relationships, the proposed structures can be supported on conventional continuous or spread footings bearing on new low volume change structural fill. The **Shallow Foundations** section addresses support of the new building bearing on approved stable residual soils or structural fill. The **Floor Slabs** section addresses slab-on-grade support of the building.

For pavements, we recommend that at least 18 inches of low volume change structural fill be placed between the final subgrade and the top of the elastic silts. Excavations made to install the low volume change fill buffer should extend at least 3 feet beyond the back of curb. Based on the grading plan provided, some undercutting may be required to achieve the minimum buffer thickness. Additional undercutting or stabilization of the elastic silts should be anticipated prior to fill placement.

The recommendations contained in this report are based upon the results of field and laboratory testing (presented in the **Exploration Results**), engineering analyses, and our current understanding of the proposed project. The **General Comments** section provides an understanding of the report limitations.

Earthwork

Earthwork is anticipated to include clearing and grubbing, excavations, and engineered fill placement. The following sections provide recommendations for use in the preparation of specifications for the work. Recommendations include critical quality criteria, as necessary, to render the site in the state considered in our geotechnical engineering evaluation for foundations, floor slabs, and pavements.

Site Preparation

Prior to placing fill, existing vegetation, topsoil, and root mats should be removed. Complete striping of the topsoil should be performed in the proposed building and parking/driveway areas.

Mature trees are located within or near the footprint of some of the proposed buildings, which will require removal at the onset of construction. Tree root systems can remove substantial moisture from surrounding soils. Where trees are removed, the full root ball and all associated dry and desiccated soils should be removed. The soil materials which contain less than 5 percent organics can be reused as engineered fill provided the material is moisture conditioned and properly compacted.

Where fill is placed on existing slopes steeper than 5H:1V, benches should be cut into the existing slopes prior to fill placement. The benches should have a minimum vertical face height of 1 foot and a maximum vertical face height of 3 feet and should be cut wide enough to accommodate the compaction equipment. This benching will help provide a positive bond between the fill and natural soils and reduce the possibility of failure along the fill/natural soil interface.

Although no evidence of fill or underground facilities (such as septic tanks, cesspools, basements, and utilities) was observed during the exploration and site reconnaissance, such features could be encountered during construction. If unexpected fills or underground facilities are encountered, such features should be removed, and the excavation thoroughly cleaned prior to backfill placement and/or construction.

Subgrade Preparation

At a minimum, the upper 3 feet of soils within the building footprint (and extending to 10 feet beyond the edge of the building on all sides) should consist of low volume change structural fill. This can be achieved by raising the finished floor elevation of the building using low volume change fill, by undercutting the existing elastic silts and replacing with low volume change structural fill, or a combination of the two. New low volume change structural fill should be placed beneath the entire footprint of the building and extending horizontally a minimum distance of 10 feet beyond the outside edge of the footings. On-site soils excavated during undercutting are not considered suitable to be used as structural fill material.

We recommend that at least 18 inches of low volume change structural fill be placed between the final subgrade and the top of the elastic silts.

The subgrade should be proof rolled with an adequately loaded vehicle such as a fully loaded tandem-axle dump truck. The proof rolling should be performed under the observation of the Geotechnical Engineer or representative. Areas excessively deflected under the proof roll should be delineated and subsequently addressed by the Geotechnical Engineer. Such areas should either be removed or modified by means described in the Soil Stabilization section. Excessively wet or dry material should either be removed or moisture conditioned and recompacted.

Excavation

We anticipate that excavations for the proposed construction can be accomplished with conventional earthmoving equipment.

Soil Stabilization

The near surface soils at the site are anticipated to be elastic silt and some areas of failing proofroll should be anticipated after the initial stripping or undercutting, where necessary. Methods of subgrade improvement, as described below, could include scarification, moisture conditioning and decompaction or removal of unstable materials and replacement with granular fill. The appropriate method of improvement, if required, would be dependent on factors such as schedule, weather, the size of areas to be stabilized, and the nature of instability. More detailed recommendations can be provided during construction as the need for subgrade stabilization occurs. Performing site grading operation during warm seasons and dry periods would help reduce the amount of subgrade stabilization required

If the exposed subgrade is unstable during proof rolling operations, it could be stabilized using one of the methods outlined below.

- **Scarification and Recompaction** - It may be feasible to scarify, dry, and recompact the exposed soils. The success of this procedure would depend primarily upon favorable weather and sufficient time to dry the soil. Stable subgrades likely would not be achievable if the thickness of the unstable soil is greater than about 1 foot, if the unstable soil is at or near groundwater levels, or if construction is performed during a period of wet or cool weather when drying is difficult.
- **Crushed Stone** - The use of crushed stone or crushed gravel is a common procedure to improve subgrade stability. Typical undercut depths would be

expected to range from about 12 to 18 inches below finished subgrade elevation. The use of high modulus geotextiles (i.e., engineering fabric or geogrid) could also be considered after underground work such as utility construction is completed. Prior to placing the fabric or geogrid, we recommend that all below grade construction, such as utility line installation, be completed to avoid damaging the fabric or geogrid. Equipment should not be operated above the fabric or geogrid until one full lift of crushed stone fill is placed above it. The maximum particle size of granular material placed over geotextile fabric or geogrid should not exceed 1-1/2 inches.

Further evaluation of the need and recommendations for subgrade stabilization can be provided during construction as the geotechnical conditions are exposed.

Fill Material Types

Fill required to achieve design grade should be classified as structural fill. Structural fill is material used below, or within 10 feet of structures, pavements or constructed slopes. General fill is material used to achieve grade outside of these areas.

Reuse of On-Site Soil: Excavated on-site soil may be selectively reused as general fill. Material property requirements for on-site soil for use as general fill and structural fill are noted in the table below:

Property	General Fill	Structural Fill
Composition	Free of deleterious material	Free of deleterious material
Maximum particle size	6 inches (or 2/3 of the lift thickness)	3 inches
Fines content	Not limited	Not Limited
Plasticity	Not limited	Liquid Limit less than 45 Plasticity Index of 25
GeoModel Layer Expected to be Suitable[1]	1, 2	2

1. Based on subsurface exploration. Actual material suitability should be determined in the field at time of construction.

Imported Fill Materials: Imported fill materials should meet the following material property requirements. Regardless of its source, compacted fill should consist of approved materials that are free of organic matter and debris. Frozen material should not be used, and fill should not be placed on a frozen subgrade.

Soil Type [1]	USCS Classification	Acceptable Parameters (for Structural Fill)
Low Plasticity Cohesive	CL, CL-ML ML	Liquid Limit less than 45 Plasticity index less than 25
Granular	GW, GP, GM, GC, SW, SP, SM, SC	Less than 50% passing No. 200 sieve

1. Structural and general fill should consist of approved materials free of organic matter and debris. Frozen material should not be used, and fill should not be placed on a frozen subgrade. A sample of each material type should be submitted to the Geotechnical Engineer for evaluation prior to use on this site. Additional geotechnical consultation should be provided prior to use of uniformly graded gravel on the site.

Fill Placement and Compaction Requirements

Structural and general fill should meet the following compaction requirements.

Item	Structural Fill	General Fill
Maximum Lift Thickness	8 inches or less in loose thickness when heavy, self-propelled compaction equipment is used 4 to 6 inches in loose thickness when hand-guided equipment (i.e. jumping jack or plate compactor) is used	Same as structural fill
Minimum Compaction Requirements [1,2,3]	98% of max. below foundations and within 1 foot of finished pavement subgrade 95% of max. above foundations, below floor slabs, and more than 1 foot below finished pavement subgrade	92% of max.
Water Content Range [1]	-3% to +3%	As required to achieve min. compaction requirements

1. Maximum density and optimum water content as determined by the standard Proctor test (ASTM D 698).
2. Fill should be tested for compaction and moisture content during placement. Should the results of the in-place density tests indicate that the specified moisture or compaction requirements have not been met, the area represented by the test should be reworked and retested as required until the specified moisture and compaction requirements are achieved.

Utility Trench Backfill

Any soft or unsuitable materials encountered at the bottom of utility trench excavations should be removed and replaced with structural fill or bedding material in accordance with public works specifications for the utility be supported. This recommendation is particularly applicable to utility work requiring grade control and/or in areas where subsequent grade raising could cause settlement in the subgrade supporting the utility. Trench excavation should not be conducted below a downward 1:1 projection from existing foundations without engineering review of shoring requirements and geotechnical observation during construction.

On-site materials are considered suitable for backfill of utility and pipe trenches from 1 foot above the top of the pipe to the final ground surface, provided the material is free of organic matter and deleterious substances.

Trench backfill should be mechanically placed and compacted as discussed earlier in this report. Compaction of initial lifts should be accomplished with hand-operated tampers or other lightweight compactors. Where trenches are placed beneath slabs or footings, the backfill should satisfy the gradation and expansion index requirements of engineered fill discussed in this report. Flooding or jetting for placement and compaction of backfill is not recommended.

Grading and Drainage

All grades must provide effective drainage away from the building during and after construction and should be maintained throughout the life of the structure. Water retained next to the building can result in soil movements greater than those discussed in this report. Greater movements can result in unacceptable differential floor slab and/or foundation movements, cracked slabs and walls, and roof leaks. The roof should have gutters/drains with downspouts that discharge onto splash blocks at a distance of at least 10 feet from the building.

Exposed ground should be sloped and maintained at a minimum 5% away from the building for at least 10 feet beyond the perimeter of the building. Locally, flatter grades may be necessary to transition into ADA access requirements for flatwork. After building construction and landscaping have been completed, final grades should be verified to document effective drainage has been achieved. Grades around the structure should also be periodically inspected and adjusted, as necessary, as part of the structure's maintenance program. Where paving or flatwork abuts the structure, a maintenance program should be established to effectively seal and maintain joints and prevent surface water infiltration.

Earthwork Construction Considerations

Shallow excavations for the proposed structure are anticipated to be accomplished with conventional construction equipment. Upon completion of filling and grading, care should be taken to maintain the subgrade water content prior to construction of grade-supported improvements such as floor slabs and pavements. Construction traffic over the completed subgrades should be avoided. The site should also be graded to prevent ponding of surface water on the prepared subgrades or in excavations. Water collecting over or adjacent to construction areas should be removed. If the subgrade freezes, desiccates, saturates, or is disturbed, the affected material should be removed, or the materials should be scarified, moisture conditioned, and recompacted prior to floor slab construction.

Although groundwater was not encountered during the field exploration, the groundwater table could affect over excavation efforts, especially for over excavation and replacement of lower strength soils. If groundwater is encountered during construction, temporary or permanent dewatering may be required. Convectional dewatering methods, such as sumps, should likely be adequate for temporary removal of groundwater encountered during excavation at the site.

As a minimum, excavations should be performed in accordance with OSHA 29 CFR, Part 1926, Subpart P, “Excavations” and its appendices, and in accordance with any applicable local and/or state regulations.

Construction site safety is the sole responsibility of the contractor who controls the means, methods, and sequencing of construction operations. Under no circumstances shall the information provided herein be interpreted to mean Terracon is assuming responsibility for construction site safety or the contractor's activities; such responsibility shall neither be implied nor inferred.

Excavations or other activities resulting in ground disturbance have the potential to affect adjoining properties and structures. Our scope of services does not include reviewing available final grading information or considering potential temporary grading performed by the contractor for potential effects such as ground movement beyond the project limits. A preconstruction/precondition survey should be conducted to document nearby property/infrastructure prior to any site development activity. Excavation or ground disturbance activities adjacent or near property lines should be monitored or instrumented for potential ground movements that could negatively affect adjoining property and/or structures.

Construction Observation and Testing

The earthwork efforts should be observed by the Geotechnical Engineer (or others under their direction). Observation should include documentation of adequate removal of surficial materials (vegetation, topsoil, and pavements), evaluation and remediation of existing fill materials, as well as proof rolling and mitigation of unsuitable areas delineated by the proof roll.

Each lift of compacted fill should be tested, evaluated, and reworked, as necessary, as recommended by the Geotechnical Engineer prior to placement of additional lifts. Each lift of fill should be tested for density and water content at a frequency of at least one test for every 2,500 square feet of compacted fill in the building areas and 5,000 square feet in pavement areas. Where not specified by local ordinance, one density and water content test should be performed for every 100 linear feet of compacted utility trench backfill and a minimum of one test performed for every 12 vertical inches of compacted backfill.

In areas of foundation excavations, the bearing subgrade should be evaluated by the Geotechnical Engineer. If unanticipated conditions are observed, the Geotechnical Engineer should prescribe mitigation options.

In addition to the documentation of the essential parameters necessary for construction, the continuation of the Geotechnical Engineer into the construction phase of the project provides the continuity to maintain the Geotechnical Engineer's evaluation of subsurface conditions, including assessing variations and associated design changes.

Shallow Foundations

If the site has been prepared in accordance with the requirements noted in **Earthwork**, the following design parameters are applicable for shallow foundation.

Design Parameters – Compressive Loads

Item	Description
Maximum Net Allowable Bearing Pressure [1, 2]	3,000 psf
Required Bearing Stratum [3]	New low volume change structural fill
Minimum Foundation Dimensions	Columns: 24 inches Continuous Footings: 18 inches
Sliding Resistance [4]	0.35
Minimum Embedment below Finished Grade [5]	Exterior footings: 18 inches Interior footings: 12 inches
Estimated Total Settlement from Structural Loads [2]	Less than about 1 inch
Estimated Differential Settlement [2, 6]	About 1/2 of total settlement

Item	Description

1. The maximum net allowable bearing pressure is the pressure more than the minimum surrounding overburden pressure at the footing base elevation. Values assume that exterior grades are no steeper than 20% within 10 feet of structure.
2. Values provided are for maximum loads noted in **Project Description**. Additional geotechnical consultation will be necessary if higher loads are anticipated.
3. Unsuitable or soft soil should be over excavated and replaced per the recommendations presented in **Earthwork**.
4. Can be used to compute sliding resistance where foundations are placed on suitable soil/materials. Frictional resistance to granular materials is dependent on the bearing pressure which may vary due to load combinations. For fine-grained materials, lateral resistance using cohesion should not exceed ½ the dead load.
5. Embedment necessary to minimize the effects of frost and/or seasonal water content variations. For sloping ground, maintain depth below the lowest adjacent exterior grade within 5 horizontal feet of the structure.
6. Differential settlements are noted for equivalent-loaded foundations and bearing elevation as measured over a span of 50 feet.

Design Parameters – Overturning and Uplift Loads

Shallow foundations subjected to overturning loads should be proportioned such that the resultant eccentricity is maintained in the center-third of the foundation (e.g., $e < b/6$, where b is the foundation width). This requirement is intended to keep the entire foundation area in compression during the extreme lateral/overturning load event. Foundation oversizing may be required to satisfy this condition.

Uplift resistance of spread footings can be developed from the effective weight of the footing and the overlying soils with consideration to the IBC basic load combinations.

Item	Description
Soil Moist Unit Weight	100 pcf
Soil Effective Unit Weight[1]	40 pcf
Soil weight included in uplift resistance	Soil included within the prism extending up from the top perimeter of the footing at an angle of 20 degrees from vertical to ground surface

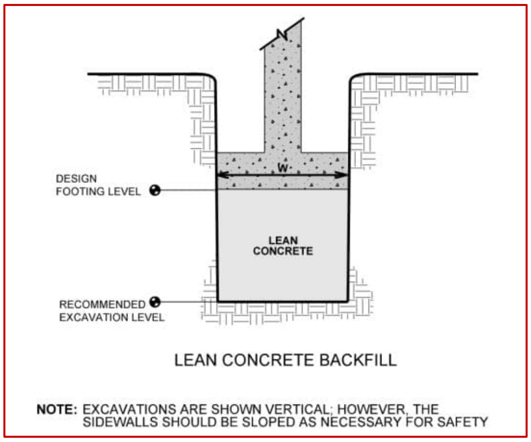
1. Effective (or buoyant) unit weight should be used for soil above the foundation level and below a water level. The high groundwater level should be used in uplift design as applicable.

Foundation Construction Considerations

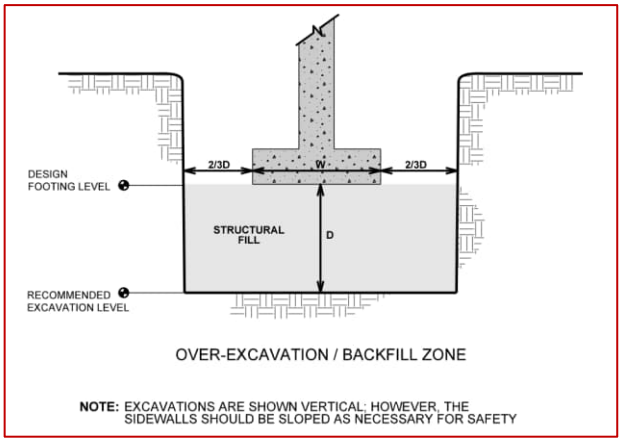
As noted in **Earthwork**, the footing excavations should be evaluated under the observation of the Geotechnical Engineer. The base of all foundation excavations should be free of water and loose soil, prior to placing concrete. Concrete should be placed soon after excavating to reduce bearing soil disturbance. Care should be taken to prevent wetting or drying of the bearing materials during construction. Excessively wet or dry material or any loose/disturbed material in the bottom of the footing excavations should be removed/reconditioned before foundation concrete is placed.

Sensitive soils exposed at the surface of footing excavations may require surficial compaction with hand-held dynamic compaction equipment prior to placing structural fill, steel, and/or concrete. Should surficial compaction not be adequate, construction of a working surface consisting of either crushed stone or a lean concrete mud mat may be required prior to the placement of reinforcing steel and construction of foundations.

If unsuitable bearing soils are observed at the base of the planned footing excavation, the excavation should be extended deeper to suitable soils, and the footings could bear directly on these soils at the lower level or on lean concrete backfill placed in the excavations. The lean concrete replacement zone is illustrated on the sketch below.



Over excavation for structural fill placement below footings should be conducted as shown below. The over excavation should be backfilled up to the footing base elevation, with suitable structural fill placed, as recommended in the **Earthwork** section.



Floor Slabs

Design parameters for floor slabs assume the requirements for **Earthwork** have been followed. Specific attention should be given to positive drainage away from the structure and positive drainage of the aggregate base beneath the floor slab.

The existing onsite soils are comprised of elastic silt exhibiting the potential to swell with increased water content. It is therefore anticipated that the floor slab will be supported by 3 feet or more of low volume change structural fill.

Floor Slab Design Parameters

Item	Description
Floor Slab Support[1]	Minimum 4 inches base course meeting specifications of ACI 302 Subgrade compacted to recommendations in **Earthwork**
Estimated Modulus of Subgrade Reaction [2]	100 pounds per square inch per inch (psi/in) for point loads

1. Floor slabs should be structurally independent of building footings or walls to reduce the possibility of floor slab cracking caused by differential movements between the slab and foundation.
2. Modulus of subgrade reaction is an estimated value based upon our experience with the subgrade condition, the requirements noted in **Earthwork**, and the floor slab support as noted in this table. It is provided for point loads. For large area loads the modulus of subgrade reaction would be lower.

The use of a vapor retarder should be considered beneath concrete slabs on grade covered with wood, tile, carpet, or other moisture sensitive or impervious coverings, when the project includes humidity-controlled areas, or when the slab will support equipment sensitive to moisture. When conditions warrant the use of a vapor retarder, the slab designer should refer to ACI 302 and/or ACI 360 for procedures and cautions regarding the use and placement of a vapor retarder.

Saw-cut contraction joints should be placed in the slab to help control the location and extent of cracking. For additional recommendations, refer to the ACI Design Manual. Joints or cracks should be sealed with a waterproof, non-extruding compressible compound specifically recommended for heavy duty concrete pavement and wet environments.

Where floor slabs are tied to perimeter walls or turn-down slabs to meet structural or other construction objectives, our experience indicates differential movement between the walls and slabs will likely be observed in adjacent slab expansion joints or floor slab cracks beyond the length of the structural dowels. The Structural Engineer should account for potential differential settlement through use of sufficient control joints, appropriate reinforcing or other means.

Floor Slab Construction Considerations

Finished subgrade, within and for at least 10 feet beyond the floor slab, should be protected from traffic, rutting, or other disturbance and maintained in a relatively moist condition until floor slabs are constructed. If the subgrade should become damaged or desiccated prior to construction of floor slabs, the affected material should be removed, and structural fill should be added to replace the resulting excavation. Final conditioning of the finished subgrade should be performed immediately prior to placement of the floor slab support course.

The Geotechnical Engineer should observe the condition of the floor slab subgrades immediately prior to placement of the floor slab support course, reinforcing steel, and concrete. Attention should be paid to high traffic areas that were rutted and disturbed earlier, and to areas where backfilled trenches are located.

Pavements

General Pavement Comments

Pavement designs are provided for the traffic conditions and pavement life conditions as noted in **Project Description** and in the following sections of this report. A critical aspect of pavement performance is site preparation. Pavement designs noted in this section must be applied to the site which has been prepared as recommended in the **Earthwork** section.

Support characteristics of subgrade for pavement design do not account for shrink/swell movements of an elastic silt subgrade, such as soils observed on this project. Thus, the pavement may be adequate from a structural standpoint, yet still experience cracking and deformation due to shrink/swell related movement of the subgrade.

Please note that the recommended pavement sections are not applicable to construction traffic conditions. Any use of the pavement sections recommended (either partial or full pavement) for construction expediency (for working/storage platform) is solely at the discretion of the contractor and could require extensive remedial measures prior to final pavement construction.

Pavement Subgrade Preparation

We recommend that at least 18 inches of low volume change structural fill be placed between the final subgrade and the top of the elastic silts, where they are present.

On most project sites, the site grading is accomplished relatively early in the construction phase. Fills are placed and compacted in a uniform manner. However, as construction proceeds, excavations are made into these areas, rainfall and surface water saturates some areas, heavy traffic from concrete trucks and other delivery vehicles disturbs the subgrade and many surface irregularities are filled in with loose soils to improve trafficability temporarily. As a result, the pavement subgrades, initially prepared early in the project, should be carefully evaluated as the time for pavement construction approaches.

We recommend the moisture content and density of the top 12 inches of the subgrade be evaluated and the pavement subgrades be proofrolled within two days prior to commencement of actual paving operations. Areas not in compliance with the required ranges of moisture or density should be moisture conditioned and recompacted. Particular attention should be paid to high traffic areas that were rutted and disturbed earlier and to areas where backfilled trenches are located. Areas where unsuitable conditions are located should be repaired by removing and replacing the materials with properly compacted fills. If a significant precipitation event occurs after the evaluation or if the surface becomes disturbed, the subgrade should be reviewed by qualified personnel immediately prior to paving. The subgrade should be in its finished form at the time of the final review.

After proofrolling and repairing subgrade deficiencies, the entire subgrade should be scarified and developed as recommended in **Earthwork** to provide a uniform subgrade for pavement construction. Areas that appear severely desiccated following site stripping may require further undercutting and moisture conditioning.

Pavement Design Parameters

Traffic loading conditions were not provided by the client. We therefore assumed the driving lanes may experience 6 fire engines per day. We have assumed light duty pavements may experience 25 cars and 2 delivery trucks per day. We have provided pavement thickness design for the drive lanes based upon our experience of the quality of subgrade as prescribed by the **Site Preparation** condition as outlined in **Earthwork**, a subgrade maintained in a dry condition for the life of the project, and out experience with similar facilities. The subgrade in fill areas should be compacted to at least 98% of the standard Proctor maximum dry density.

Sufficient information is not available for us to provide an opinion of minimum pavement thickness for the project. For pavement design by others, we recommend that a subgrade California Bearing Ratio, CBR, of 5 be used for the asphaltic concrete pavement designs. We recommend that a modulus of subgrade reaction of 100 pci be used for the portland cement concrete pavement designs. These values were empirically derived based upon our experience with the Piedmont Physiographic Province subgrade soils and our expectation of the quality of the subgrade as prescribed by the **Site Preparation** conditions as outlined in **Earthwork**.

Pavement Section Thicknesses

Asphaltic Concrete (AC) Design

The following table provides our opinion of minimum thickness for AC sections:

Layer	Thickness (inches)		Reference
	Light Duty[1]	Heavy Duty[2]	
AC Surface	2	1 1/4	SP9.5 – GDOT Sections 400, 424, 824, and 828
AC Binder	--	1 3/4	SP19 – GDOT Sections 400, 424, 824, and 828
Aggregate Base	6	8	GAB, GDOT Sections 815 and 310
Subgrade	Upper 12 inches of existing soil or engineered fill	Upper 12 inches of existing soil or engineered fill	98% of Standard Proctor MDD, -2 to +3% OMC

1. Automobiles only.
2. Combined automobiles and trucks.

The graded aggregate base should be compacted to a minimum of 98 percent of the material's modified Proctor (ASTM D-1557, Method C) maximum dry density. Where base course thickness exceeds 6 inches, the material should be placed and compacted in two or more lifts of equal thickness.

Asphalt concrete aggregates and base course materials should conform to the Georgia Department of Transportation (GDOT) "Standard Specifications for Construction of Transportation System".

Portland Cement Concrete (PCC) Design

The following table provides our estimated minimum thickness of PCC pavements.

Layer	Thickness (inches)		Reference
	Light Duty[1]	Heavy Duty[2]	
PCC	5	6 1/2	ACI
Aggregate Base	4	4	GAB, GDOT Sections 815 and 310
Subgrade	Upper 12 inches of existing soil or engineering fill	Upper 12 inches of existing soils or engineering fill	98% of Standard Proctor MDD, -2 to +3% OMC

1. Automobiles only
2. Combined automobiles and trucks.

We recommend a Portland cement concrete (PCC) pavement be utilized in entrance and exit sections, dumpster pads, loading dock areas, or other areas where extensive wheel maneuvering are expected. The dumpster pad should be large enough to support the wheels of the truck which will bear the load of the dumpster.

Areas for parking heavy vehicles, concentrated turn areas, and start/stop maneuvers could require thicker pavement sections. Edge restraints (i.e. concrete curbs or aggregate shoulders) should be planned along curves and areas of maneuvering vehicles.

Although not required for structural support, a minimum 4-inch-thick base course layer is recommended to help reduce potential for slab curl, shrinkage cracking, and subgrade pumping through joints. Proper joint spacing will also be required to prevent excessive slab curling and shrinkage cracking. Joints should be sealed to prevent entry of foreign material and dowels where necessary for load transfer. PCC pavement details for joint spacing, joint reinforcement, and joint sealing should be prepared in accordance with ACI 330 and ACI 325.

Where practical, we recommend early-entry cutting of crack-control joints in PCC pavements. Cutting of the concrete in its "green" state typically reduces the potential for micro-cracking of the pavements prior to the crack control joints being formed, compared to cutting the joints after the concrete has fully set. Micro-cracking of pavements may lead to crack formation in locations other than the sawed joints, and/or reduction of fatigue life of the pavement.

Openings in pavements, such as decorative landscaped areas, are sources for water infiltration into surrounding pavement systems. Water can collect in the islands and migrate into the surrounding subgrade soils thereby degrading support of the pavement. Islands with raised concrete curbs, irrigated foliage, and low permeability near-surface soils are areas of concern. The civil design for the pavements with these conditions should include features to restrict or collect and discharge excess water from the islands. Examples of features are edge drains connected to the stormwater collection system, longitudinal subdrains, or other suitable outlets and impermeable barriers preventing lateral migration of water such as a cutoff wall installed to a depth below the pavement structure.

Pavement Drainage

Pavements should be sloped to provide rapid drainage of surface water. Water allowed to pond on or adjacent to the pavements could saturate the subgrade and contribute to premature pavement deterioration. In addition, the pavement subgrade should be graded to provide positive drainage within the granular base section. Appropriate sub-drainage or connection to a suitable daylight outlet should be provided to remove water from the granular subbase.

Pavement Maintenance

The pavement sections represent minimum recommended thicknesses and, as such, periodic upkeep should be anticipated. Preventive maintenance should be planned and provided for through an on-going pavement management program. Maintenance activities are intended to slow the rate of pavement deterioration and to preserve the pavement investment. Pavement care consists of both localized (e.g., crack and joint sealing and patching) and global maintenance (e.g., surface sealing). Additional engineering consultation is recommended to determine the type and extent of a cost-effective program. Even with periodic maintenance, some movements and related cracking may still occur, and repairs may be required.

Pavement performance is affected by its surroundings. In addition to providing preventive maintenance, the civil engineer should consider the following recommendations in the design and layout of pavements:

- Final grade adjacent to paved areas should slope down from the edges at a minimum 2%.

- Subgrade and pavement surfaces should have a minimum 2% slope to promote proper surface drainage.
- Install pavement drainage systems surrounding areas anticipated for frequent wetting.
- Install joint sealant and seal cracks immediately.
- Seal all landscaped areas in or adjacent to pavements to reduce moisture migration to subgrade soils.
- Place compacted, low permeability backfill against the exterior side of curb and gutter.
- Place curb, gutter and/or sidewalk directly on clay subgrade soils rather than on unbound granular base course materials.

General Comments

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Variations will occur between exploration point locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident during or after construction. Terracon should be retained as the Geotechnical Engineer, where noted in this report, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Our Scope of Services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third-party beneficiaries intended. Any third-party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client and is not intended for third parties. Any use or reliance of the information provided by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly affect excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety and cost estimating including excavation support and dewatering requirements/design are the responsibility of others. Construction and site development have the potential to affect adjacent properties. Such impacts can include damage due to vibration, modification of groundwater/surface water flow during construction, foundation movement due to undermining or subsidence from excavation, as well as noise or air quality concerns. Evaluation of these items on nearby properties are commonly associated with contractor means and methods and are not addressed in this report. The owner and contractor should consider a preconstruction/precondition survey of surrounding development. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

Attachments

Exploration and Testing Procedures

Field Exploration

Number of Borings	Approximate Boring Depth (feet)	Location
5	20 - 30	Building area
4	10	Parking/driveway

Boring Layout and Elevations: Terracon personnel provided the boring layout using handheld GPS equipment (estimated horizontal accuracy of about ±10 feet) and referencing existing site features. Approximate ground surface elevations were obtained from Earthwork Exhibit V2. If elevations and a more precise boring layout are desired, we recommend borings be surveyed.

Subsurface Exploration Procedures: We advanced the borings with an ATV-mounted drill rig using continuous flight, hollow stem augers. Four samples were obtained in the upper 10 feet of each boring and at intervals of 5 feet thereafter. In the split-barrel sampling procedure, a standard 2-inch outer diameter split-barrel sampling spoon was driven into the ground by a 140-pound automatic hammer falling a distance of 30 inches. The number of blows required to advance the sampling spoon the last 12 inches of a normal 18-inch penetration is recorded as the Standard Penetration Test (SPT) resistance value. The SPT-resistance values, also referred to as N-values, are indicated on the boring logs at test depths.

We observed the boreholes while drilling and at the completion of drilling for the presence of groundwater. Groundwater was not observed at these times in the boreholes. For safety purposes, all borings were backfilled with auger cuttings after their completion.

The sampling depths, penetration distances, and other sampling information was recorded on the field boring logs. The samples were placed in appropriate containers and taken to our soil laboratory for testing and classification by a Geotechnical Engineer. Our exploration team prepared field boring logs as part of the drilling operations. These field logs included visual classifications of the materials observed during drilling and our interpretation of the subsurface conditions between samples. Final boring logs were prepared from the field logs. The final boring logs represent the Geotechnical Engineer's interpretation of the field logs and include modifications based on observations and tests of the samples in our laboratory.

Laboratory Testing

The project engineer reviewed the field data and assigned laboratory tests. The laboratory testing program included the following types of tests:

- Water Content
- Atterberg Limits
- Grain size analysis

The laboratory testing program often included examination of soil samples by an engineer. Based on the results of our field and laboratory programs, we described and classified the soil samples in accordance with the Unified Soil Classification System.

Site Location and Exploration Plans

Contents:

Note: All attachments are one page unless noted above.

Site Location Plan

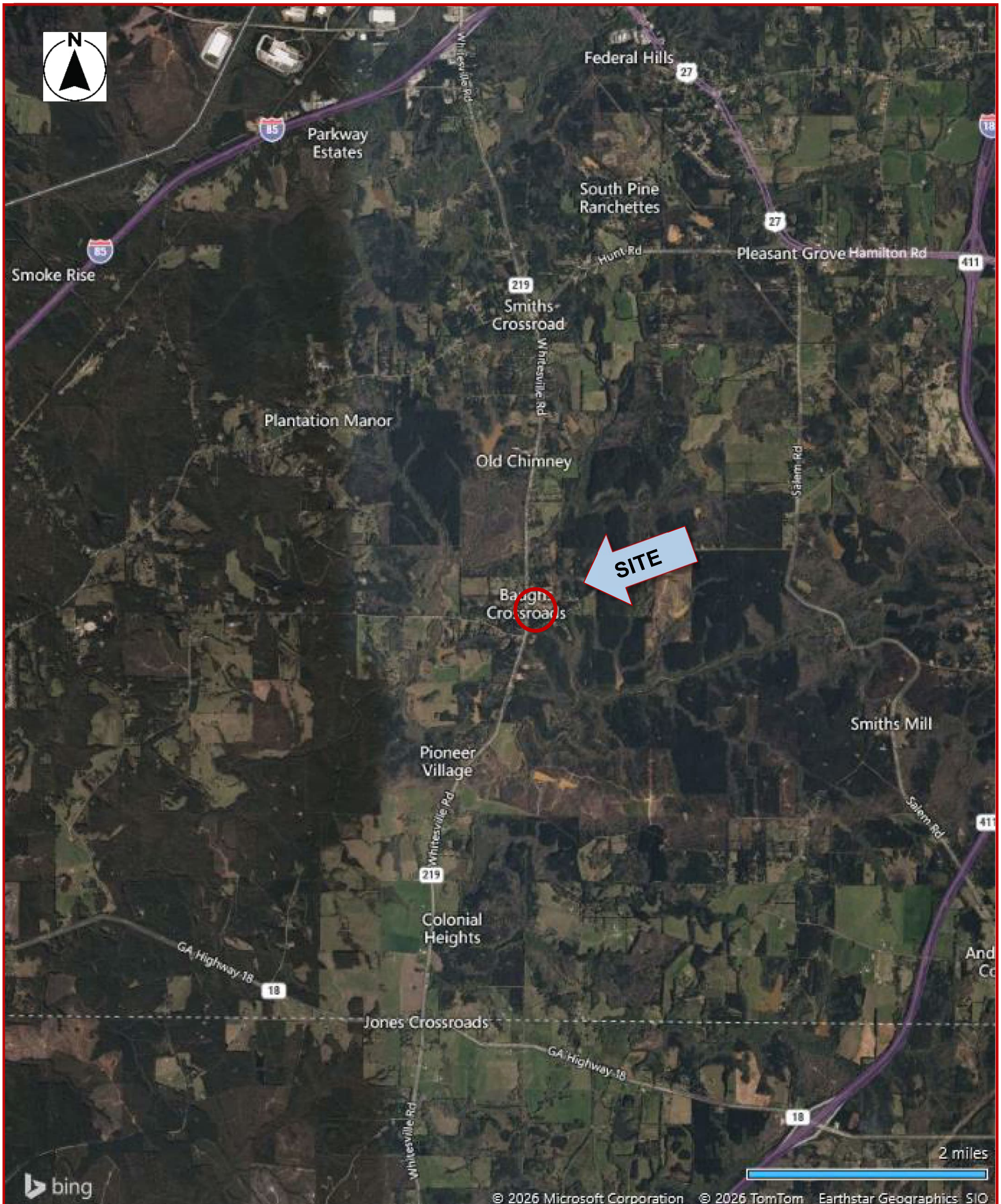


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Exploration Plan with Earthwork Exhibit V2

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

EARTHWORK EXHIBIT V2 PROVIDED BY HARRIS GRAY LLC

Exploration Results, Laboratory Results, and Geomodels

Contents:

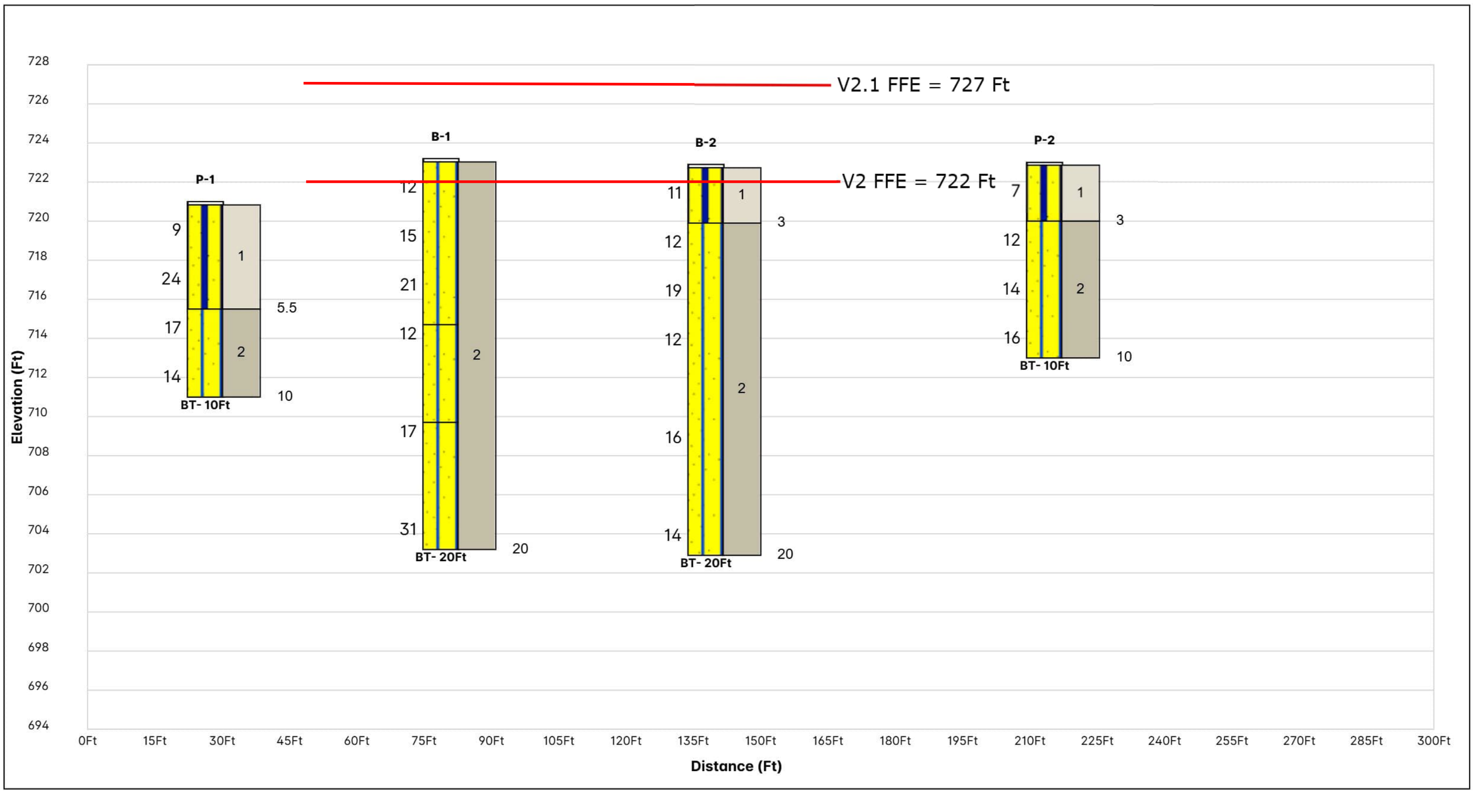
GeoModels (2)
Boring Logs (B-1 through B-4, P-1 through P-4)
Atterberg Limits

Note: All attachments are one page unless noted above.

Burkes Chapel Road Fire Station - CGE - 26 Project
31 Burkes Chapel Rd, LaGrange, GA, 30240,USA
Terracon Project No: 1000019222

Terracon
5031 Milgen Ct
Columbus, GA 31907-1315

GeoModel Section A-A'



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions

#	Layer Name	General Description
1	**Sandy Elastic Silt**	red, brown, medium stiff to very stiff, trace mica
2	**Silty Sand**	fine to coarse grained, red, brown, orange, and gray, medium dense to dense, trace mica

Legend

- Topsoil
- Sandy Elastic Silt
- Silty Sand

Groundwater levels are temporal. The levels shown are representative of the date and time of our exploration. Significant changes are possible over time.
Water levels shown are as measured during and/or after drilling. In some cases, boring advancement methods mask the presence/absence of groundwater. See individual logs for details.

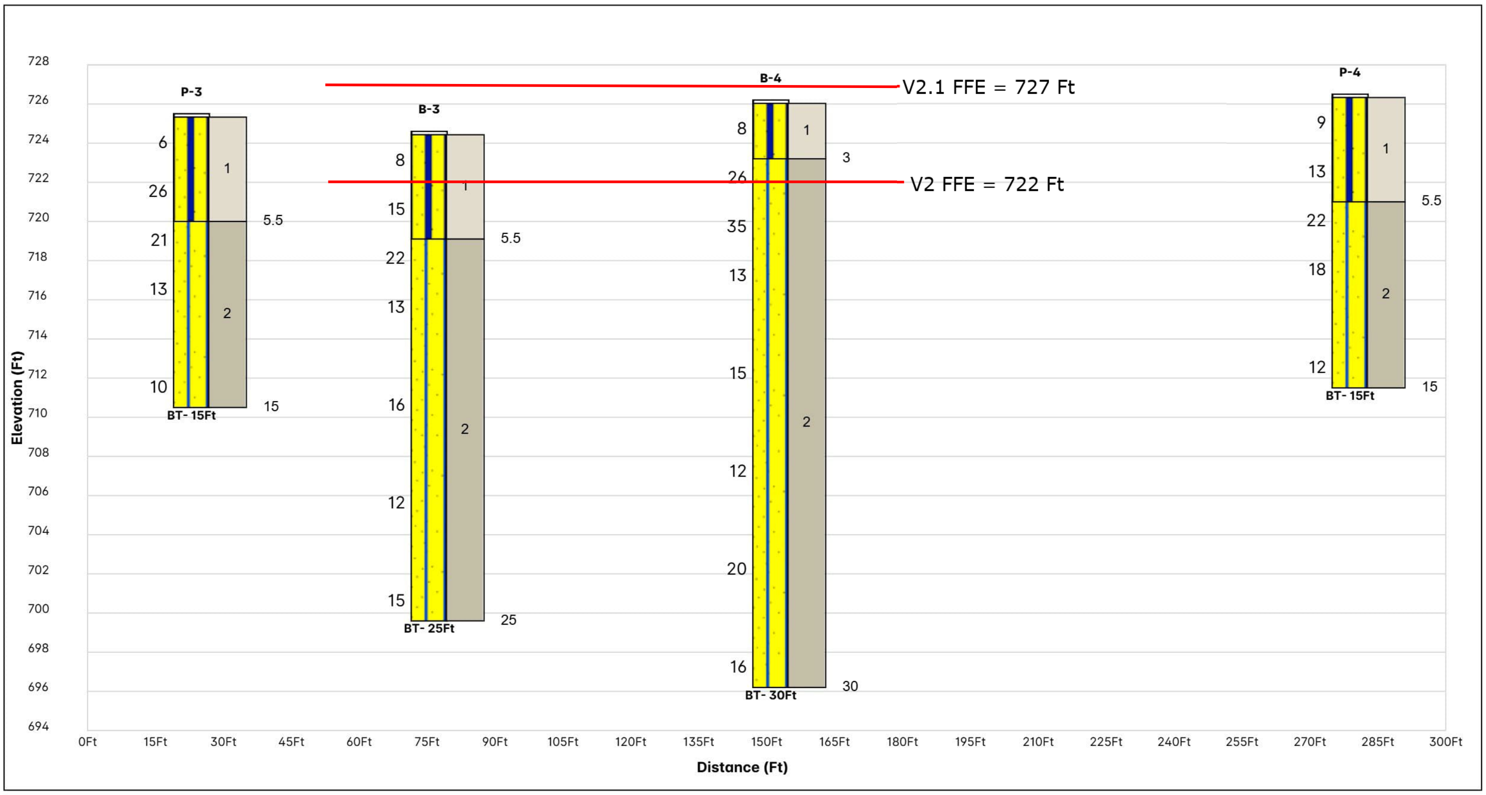
Notes:
Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project.
Numbers adjacent to soil column indicate depth below ground surface.

- First Water Observation
- Second Water Observation
- Third Water Observation

Burkes Chapel Road Fire Station - CGE - 26 Project
31 Burkes Chapel Rd, LaGrange, GA, 30240,USA
Terracon Project No: 1000019222

Terracon
5031 Milgen Ct
Columbus, GA 31907-1315

GeoModel Section B-B'



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions

#	Layer Name	General Description
1	**Sandy Elastic Silt**	red, brown, medium stiff to very stiff, trace mica
2	**Silty Sand**	fine to coarse grained, red, brown, orange, and gray, medium dense to dense, trace mica

Legend

- Topsoil
- Sandy Elastic Silt
- Silty Sand

Groundwater levels are temporal. The levels shown are representative of the date and time of our exploration. Significant changes are possible over time.
Water levels shown are as measured during and/or after drilling. In some cases, boring advancement methods mask the presence/absence of groundwater. See individual logs for details.

Notes:
Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project.
Numbers adjacent to soil column indicate depth below ground surface.

First Water Observation
Second Water Observation
Third Water Observation

Burkes Chapel Road Fire Station - CGE - 26 Project
31 Burkes Chapel Rd, LaGrange, GA, 30240,USA
Terracon Project No. 1000019222

Latitude: 32.91711° Longitude: -85.01953°

BORING LOG NO. B-1

Terracon
5031 Milgen Ct
Columbus, GA 31907-1315

Surface Elevation: 723.2(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Field Test Results	Water Content (%)	Percent Fines	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI
2		0.2	**TOPSOIL,** 2 inches		723.2								
			SILTY SAND (SM), fine to medium grained sand, red and brown, medium dense to dense, trace mica, residuum		723.0		18	4-5-7 N = 12	20.8	48.9	NP	NP	NP
							18	5-7-8 N = 15					
				5			18	8-11-10 N = 21	21.9	49.7	NP	NP	NP
		8.5	orange and tan		714.7		18	5-5-7 N = 12					
				10									
		13.5	brown and gray		709.7		18	6-8-9 N = 17					
				15									
							18	8-12-19 N = 31					

Boring Terminated at 20 Ft

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).
See Supporting Information for explanation of symbols and abbreviations.

Notes
Elevation Reference: Obtained from Earthwork Exhibit V2

Water Level Observations
Groundwater not encountered

Advancement Method
0-20 Ft. Hollow Stem Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Equipment
Subcontractor - CME-550X

Hammer Type
Automatic

Driller
Midway Drilling

Logged By
Daniel Hehir

Start Date
07/01/2026

Facilities | Environmental | Geotechnical | Materials

Burkes Chapel Road Fire Station - CGE - 26 Project
31 Burkes Chapel Rd, LaGrange, GA, 30240,USA
Terracon Project No. 1000019222

Latitude: 32.91711° Longitude: -85.01933°

BORING LOG NO. B-2

Terracon
5031 Milgen Ct
Columbus, GA 31907-1315

Surface Elevation: 722.9(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Field Test Results	Water Content (%)	Percent Fines	Atterberg Limits LL	PL	PI
		0.2	**TOPSOIL,** 2 inches		722.9								
1		3.0	**SANDY ELASTIC SILT (MH),** red and brown, stiff, residuum		722.7 / 719.9	X	18	3-5-6 N = 11					
2			**SILTY SAND (SM),** fine to medium grained sand, red, brown, and gray, medium dense, trace mica			X	18	4-6-6 N = 12					
				5		X	18	7-9-10 N = 19					
						X	18	4-5-7 N = 12					
				10									
						X	18	5-7-9 N = 16					
				15									
						X	18	5-7-7 N = 14	17.9	29.2	NP	NP	NP

Boring Terminated at 20 Ft

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).
See Supporting Information for explanation of symbols and abbreviations.

Notes
Elevation Reference: Obtained from Earthwork Exhibit V2

Water Level Observations
Groundwater not encountered

Advancement Method
0-20 Ft. Hollow Stem Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Equipment
Subcontractor - CME-550X

Hammer Type
Automatic

Driller
Midway Drilling

Logged By
Daniel Hehir

Start Date
07/01/2026

Burkes Chapel Road Fire Station - CGE - 26 Project
31 Burkes Chapel Rd, LaGrange, GA, 30240,USA
Terracon Project No. 1000019222

Latitude: 32.91683° Longitude: -85.01952°

BORING LOG NO. B-3

Terracon
5031 Milgen Ct
Columbus, GA 31907-1315

Surface Elevation: 724.6(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Field Test Results	Water Content (%)	Percent Fines	Atterberg Limits LL	PL	PI
1		0.2	**TOPSOIL,** 2 inches		724.6								
		5.5	**SANDY ELASTIC SILT (MH),** red and brown, medium stiff to stiff, residuum		724.4		18	4-3-5 N = 8	24.8	62.3	50	37	13
							18	5-6-9 N = 15					
2			**SILTY SAND (SM),** fine to coarse grained sand, red, brown and, gray, medium dense, trace mica	5	719.1		18	4-10-12 N = 22					
							18	5-6-7 N = 13					
				10									
				15			18	5-7-9 N = 16	14.0	29.5	NP	NP	NP
				20			18	5-6-6 N = 12					
							18	5-7-8 N = 15					

Boring Terminated at 25 Ft

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes
Elevation Reference: Obtained from Earthwork Exhibit V2

Water Level Observations
Groundwater not encountered

Advancement Method
0-25 Ft. Hollow Stem Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Equipment
Subcontractor - CME-550X

Hammer Type
Automatic

Driller
Midway Drilling

Logged By
Daniel Hehir

Start Date
07/01/2026

Facilities | Environmental | Geotechnical | Materials

Burkes Chapel Road Fire Station - CGE - 26 Project
31 Burkes Chapel Rd, LaGrange, GA, 30240,USA
Terracon Project No. 1000019222

Latitude: 32.91684° Longitude: -85.01928°

BORING LOG NO. B-4

Terracon
5031 Milgen Ct
Columbus, GA 31907-1315

Surface Elevation: 726.2(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Field Test Results
1		0.2	**TOPSOIL,** 2 inches		726.2			
		3.0	**SANDY ELASTIC SILT (MH),** red and brown, medium stiff, residuum		726.0	X	18	3-4-4 N = 8
2			**SILTY SAND (SM),** fine to medium grained sand, red, brown, and gray, medium dense to dense, with mica		723.2	X	18	10-14-12 N = 26
				5		X	18	10-14-21 N = 35
						X	18	6-6-7 N = 13
				10				
						X	18	5-6-9 N = 15
				15				
						X	18	5-6-6 N = 12
				20				
						X	18	8-11-9 N = 20
				25				
						X	18	6-7-9 N = 16
			Boring Terminated at 30 Ft					

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes
Elevation Reference: Obtained from Earthwork Exhibit V2

Water Level Observations
Groundwater not encountered

Advancement Method
0-30 Ft. Hollow Stem Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Equipment
Subcontractor - CME-550X

Hammer Type
Automatic

Driller
Midway Drilling

Logged By
Daniel Hehir

Start Date
07/01/2026

Facilities | Environmental | Geotechnical | Materials

Burkes Chapel Road Fire Station - CGE - 26 Project
31 Burkes Chapel Rd, LaGrange, GA, 30240,USA
Terracon Project No. 1000019222

Latitude: 32.91704° Longitude: -85.01969°

BORING LOG NO. P-1

Terracon
5031 Milgen Ct
Columbus, GA 31907-1315

Surface Elevation:
721(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Field Test Results
		0.2	**TOPSOIL,** 2 inches		721.0			
1			**SANDY ELASTIC SILT (MH),** red and brown, stiff to very stiff, trace mica, residuum		720.8		18	4-4-5 N = 9
							18	10-11-13 N = 24
		5.5		5	715.5			
2			**SILTY SAND (SM),** fine to medium grained sand, red and brown, medium dense, trace mica				18	8-8-9 N = 17
							18	5-6-8 N = 14

Boring Terminated at 10 Ft

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes
Elevation Reference: Obtained from Earthwork Exhibit V2

Water Level Observations
Groundwater not encountered

Advancement Method
0-10 Ft. Hollow Stem Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Equipment
Subcontractor - CME-550X

Hammer Type
Automatic

Driller
Midway Drilling

Logged By
Daniel Hehir

Start Date
07/01/2026

Facilities | Environmental | Geotechnical | Materials

Burkes Chapel Road Fire Station - CGE - 26 Project
31 Burkes Chapel Rd, LaGrange, GA, 30240,USA
Terracon Project No. 1000019222

Latitude: 32.91705° Longitude: -85.01909°

BORING LOG NO. P-2

Terracon
5031 Milgen Ct
Columbus, GA 31907-1315

Surface Elevation:
723(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Field Test Results
		0.2	**TOPSOIL,** 2 inches		723.0			
1			**SANDY ELASTIC SILT (MH),** red and brown, medium stiff, residuum		722.8	X	18	3-3-4 N = 7
		3.0			720.0			
2			**SILTY SAND (SM),** fine to medium grained sand, red and brown, medium dense, trace mica			X	18	4-5-7 N = 12
				5		X	18	6-8-6 N = 14
						X	18	6-7-9 N = 16

Boring Terminated at 10 Ft

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).
See Supporting Information for explanation of symbols and abbreviations.

Notes
Elevation Reference: Obtained from Earthwork Exhibit V2

Water Level Observations
Groundwater not encountered

Advancement Method
0-10 Ft. Hollow Stem Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Equipment
Subcontractor - CME-550X

Hammer Type
Automatic

Driller
Midway Drilling

Logged By
Daniel Hehir

Start Date
07/01/2026

Burkes Chapel Road Fire Station - CGE - 26 Project
31 Burkes Chapel Rd, LaGrange, GA, 30240,USA
Terracon Project No. 1000019222

Latitude: 32.91669° Longitude: -85.01953°

BORING LOG NO. P-3

Terracon
5031 Milgen Ct
Columbus, GA 31907-1315

Surface Elevation:
725.5(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Field Test Results	Water Content (%)	Percent Fines	Atterberg Limits LL	PL	PI
1		0.2	**TOPSOIL,** 2 inches		725.5								
		5.5	**SANDY ELASTIC SILT (MH),** red and brown, medium stiff to very stiff, residuum		725.3	X	18	2-3-3 N = 6	26.20	63.9	66	40	26
						X	18	8-12-14 N = 26					
2			**SILTY SAND (SM),** fine to medium grained sand, red and brown, medium dense, trace mica	5	720.0	X	18	10-12-9 N = 21					
						X	18	6-6-7 N = 13					
				10									
						X	18	4-5-5 N = 10					

Boring Terminated at 15 Ft

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).
See Supporting Information for explanation of symbols and abbreviations.

Notes
Elevation Reference: Obtained from Earthwork Exhibit V2

Water Level Observations
Groundwater not encountered

Advancement Method
0-15 Ft. Hollow Stem Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Equipment
Subcontractor - CME-550X

Hammer Type
Automatic

Driller
Midway Drilling

Logged By
Daniel Hehir

Start Date
07/01/2026

Facilities | Environmental | Geotechnical | Materials

Burkes Chapel Road Fire Station - CGE - 26 Project
31 Burkes Chapel Rd, LaGrange, GA, 30240,USA
Terracon Project No. 1000019222

Latitude: 32.91689° Longitude: -85.01887°

BORING LOG NO. P-4

Terracon
5031 Milgen Ct
Columbus, GA 31907-1315

Surface Elevation:
726.5(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Field Test Results
1		0.2	**TOPSOIL,** 2 inches		726.5			
			SANDY ELASTIC SILT (MH), red and brown, stiff, residuum		726.3		18	2-4-5 N = 9
							18	6-9-4 N = 13
2		5.5	**SILTY SAND (SM),** fine to medium grained sand, red and brown, medium dense	5	721.0		18	12-13-9 N = 22
							18	6-8-10 N = 18
				10			18	5-6-6 N = 12

Boring Terminated at 15 Ft

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).
See Supporting Information for explanation of symbols and abbreviations.

Notes
Elevation Reference: Obtained from Earthwork Exhibit V2

Water Level Observations
Groundwater not encountered

Advancement Method
0-15 Ft. Hollow Stem Auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Equipment
Subcontractor - CME-550X

Hammer Type
Automatic

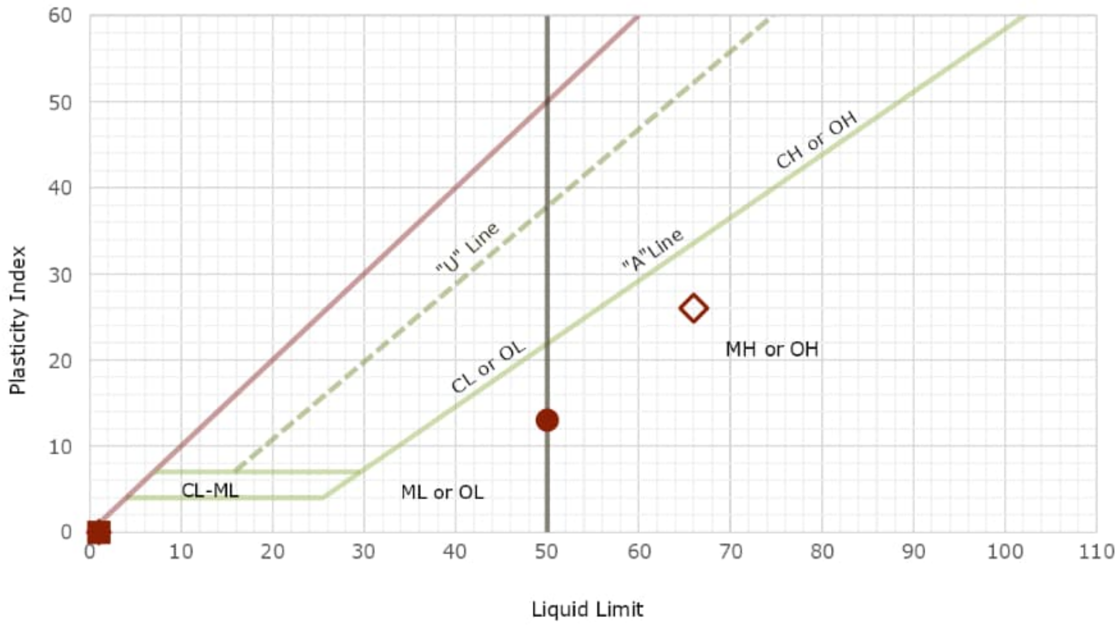
Driller
Midway Drilling

Logged By
Daniel Hehir

Start Date
07/01/2026

5031 Milgen Ct
Columbus, GA

Atterberg Limit Results
ASTM D4318



	Boring ID	Depth (Ft)	LL	PL	PI	Fines (%)	Description	USCS
■	B-1	1-2.5	NP	NP	NP	48.9	Red Silty Sand	SM
◆	B-1	6-7.5	NP	NP	NP	49.7	Brownish Red Silty Sand	SM
▲	B-2	18.5-20	NP	NP	NP	29.2	Brownish Red Silty Sand	SM
●	B-3	1-2.5	50	37	13	62.3	Red Sandy Elastic Silt	MH
□	B-3	13.5-15	NP	NP	NP	29.5	Brownish Red Silty Sand	SM
◇	P-3	1-2.5	66	40	26	63.9	Red Sandy Elastic Silt	MH

Supporting Information

Contents:

Note: All attachments are one page unless noted above.

General Notes

SAMPLING	WATER LEVEL		FIELD TESTS	
Standard Penetration Test		Water Initially Encountered	N	Standard Penetration Test Resistance (Blows/Ft.)
		Water Level After a Specified Period of Time	(HP)	Hand Penetrometer
		Water Level After a Specified Period of Time	(T)	Torvane
		Cave In Encountered	(DCP)	Dynamic Cone Penetrometer
	Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.		UC	Unconfined Compressive Strength
			(PID)	Photo-Ionization Detector
			(OVA)	Organic Vapor Analyzer

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification as noted on the soil boring logs is based on the Unified Soil Classification System. Where sufficient laboratory data exists to classify the soils consistent with ASTM D2487 "Classification of Soils for Engineering Purposes" this procedure is used. ASTM D2488 "Description and Identification of Soils (Visual-Manual Procedure)" is also used to classify the soils, particularly where insufficient laboratory data exists to classify the soils in accordance with ASTM D2487. In addition to USCS classification, coarse grained soils are classified on the basis of their in-place relative density, and fine-grained soils are classified on the basis of their consistency. See "Strength Terms" table below for details. The ASTM standards noted above are for reference to methodology in general. In some cases, variations to methods are applied as a result of local practice or professional judgment.

LOCATION AND ELEVATION NOTES

Exploration point, locations as shown on the Exploration Plan and as noted on the soil boring logs in the form of Latitude and Longitude are approximate. See Exploration and Testing Procedures in the report for the methods used to locate the exploration points for this project. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

STRENGTH TERMS

RELATIVE DENSITY OF COARSE-GRAINED SOILS (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance		CONSISTENCY OF FINE-GRAINED SOILS (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance		
Descriptive Term (Density)	**Standard Penetration or N-Value Blows/Ft.**	**Descriptive Term (Consistency)**	**Unconfined Compressive Strength Qu, (tsf)**	**Standard Penetration or N-Value Blows/Ft.**
Very Loose	0 - 4	**Very Soft**	less than 0.25	0 – 1
Loose	5 – 10	**Soft**	0.25 to 0.5	2 – 4
Medium Dense	11 – 30	**Medium Stiff**	0.5 to 1.00	5 - 8
Dense	31 - 50	**Stiff**	1.00 to 2.00	9 - 15
Very Dense	> 50	**Very Stiff**	2.00 to 4.00	16 - 30
		Hard	> 4.00	> 30

RELEVANCE OF SOIL BORING LOG

The soil boring logs contained within this document are intended for application to the project as described in this document. Use of these soil boring logs for any other purpose may not be appropriate.

Unified Soil Classification System

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]				Soil Classification	
				Group Symbol	**Group Name** [B]
Coarse-Grained Soils: More than 50% retained on No. 200 sieve	**Gravels:** More than 50% of coarse fraction retained on No. 4 sieve	**Clean Gravels:** Less than 5% fines [C]	Cu≥4 and 1≤Cc≤3 [E]	GW	Well-graded gravel [F]
			Cu<4 and/or [Cc<1 or Cc>3.0] [E]	GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH	GM	Silty gravel [F, G, H]
			Fines classify as CL or CH	GC	Clayey gravel [F, G, H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	**Clean Sands:** Less than 5% fines [D]	Cu≥6 and 1≤Cc≤3 [E]	SW	Well-graded sand [I]
			Cu<6 and/or [Cc<1 or Cc>3.0] [E]	SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH	SM	Silty sand [G, H, I]
			Fines classify as CL or CH	SC	Clayey sand [G, H, I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	**Silts and Clays:** Liquid limit less than 50	**Inorganic:**	PI > 7 and plots above "A" line [J]	CL	Lean clay [K, L, M]
			PI < 4 or plots below "A" line [J]	ML	Silt [K, L, M]
		Organic:	$\frac{LL\ oven\ dried}{LL\ not\ dried} < 0.75$	OL	Organic clay [K, L, M, N]
					Organic silt [K, L, M, O]
	Silts and Clays: Liquid limit 50 or more	**Inorganic:**	PI plots on or above "A" line	CH	Fat clay [K, L, M]
			PI plots below "A" line	MH	Elastic silt [K, L, M]
		Organic:	$\frac{LL\ oven\ dried}{LL\ not\ dried} < 0.75$	OH	Organic clay [K, L, M, P]
					Organic silt [K, L, M, Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor			PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve.
[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.
[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.
[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay.
[E] $Cu = D_{60}/D_{10}$ $Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$
[F] If soil contains ≥ 15% sand, add "with sand" to group name.
[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.
[H] If fines are organic, add "with organic fines" to group name.
[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.
[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.
[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.
[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.
[N] PI ≥ 4 and plots on or above "A" line.
[O] PI < 4 or plots below "A" line.
[P] PI plots on or above "A" line.
[Q] PI plots below "A" line.