STATE OF ALABAMA
No. 7007
RYAN D. VERNON
REGISTERED ARCHITECT

LATHAN ▪ McKEE
ARCHITECTS

300 CHASE PARK SOUTH • SUITE 200 • HOOVER, ALABAMA 35244
205-988-9112

ADDENDUM NO. 5
CLASSROOM ADDITION TO ELVIN HILL ELEMENTARY SCHOOL
Architect Job No. 25-34
January 7, 2026
DCM #2025854

<u>BIDS DUE:</u>
Tuesday, January 13, 2025, until
3:00 p.m., local time, held at
Shelby County Board of Education,
Facilities and Maintenance Building
125 Industrial Parkway
Columbiana, AL 35051

The Plans and Specifications are here by amended. The following supersedes all contrary and/or conflicting information and is made part of the contract documents.

GENERAL

1. **MANDATORY PRE-BID MEETING:** A mandatory pre-bid meeting was held on 1/6/2026, please see the attached sign-in sheet for a list of all attendees.

SPECIFICATIONS

1. **SECTION 01020 – ALLOWANCES:** Revise Schedule of Allowances as follows:

   3.3 Schedule of Allowances

   Allowance No. 1: Include a contingency allowance of $125,000.00 for the Owner’s use throughout the project for unforeseen conditions as directed by the Architect.

   Allowance No. 2: Include a contingency allowance of $600.00 per thousand for the purchase of brick. Brick masonry installation and all associated materials shall be included under Base Bid.

   Allowance No. 3: Include a contingency allowance of $30,000.00 for providing materials and labor for an additional irrigation system and associated Landscaping not otherwise indicated to be installed at the direction of the Architect throughout the project at single or multiple locations of any divisible quantity.

Allowance No. 4: Include a contingency allowance of $50,000.00 to furnish and install a Fire Department Radio Transponder.

REVISE: Allowance No. 5: Include an **Aid-to-Construction** contingency allowance of ***$25,000.00*** for Utility fees as directed by the Architect

Allowance No. 6: Include a quantity allowance of 1200 cubic yards of replacement of unsuitable soils with compacted structural fill. This Base Bid grading shall include the required cutting and filling of the existing grade to the proposed subgrade elevation. Onsite Geotechnical engineer shall determine if unsuitable soils are present. Unit price is provided for the addition to or deletion from this assumed amount. Refer to Section 02300.

REVISE: Allowance No. 7: Include a Contingency Allowance of **$50,000.00** under Base Bid for Security Cameras and Security Devices not otherwise indicated as directed by the Architect. The balance of all associated work, including installation, shall be provided as indicated under base bid

2. **SECTION 01030 – SPECIAL PROJECT REQUIREMENTS:** Add the attached Geotechnical Report.

Proposed Classrooms Additions
Elvin Hill Elementary School
Geotechnical Engineering Report
Terracon Project No. E1255093

3. **SECTION 08810 – GLASS AND GLAZING:** Revise **2.2 Materials** as follows:

DELETE: ~~R. *Exterior Glazing shall be **Hurricane Impact Resistant Glazing** and shall be 1" insulated Low-E. Comply with all Local and State Building Codes to meet performance requirements. Glazing shall be equal to Insulgard or Oldcastle Hurricane Impact Resistant Glazing.*~~

4. **SECTION 08320 – TORNADO RESISTANT WINDOW SYSTEMS:** Delete section in its entirety.

CLARIFICATIONS

1. **Sheet E2.1 – Master Plan and Single Line Diagram:**
   a. Transformer Schedule incorrectly calls for a 225 KVA transformer for T-1. The Single Line Diagram shows a 300 KVA. The Single Line Diagram is correct, the transformer T-1 needs to be 300 KVA.

Proposed Classroom Additions

Elvin Hill Elementary School

Geotechnical Engineering Report

Columbiana, Alabama

July 07, 2025 | Terracon Project No. E1255093

Prepared for:

Shelby County Board of Education
410 East College Street
PO Box 1910
Columbiana, Alabama 35051

2147 Riverchase Office Road
Birmingham, Alabama 35244
P (205) 942-1289
Terracon.com

July 7, 2025

Shelby County Board of Education
410 East College Street
PO Box 1910
Columbiana, Alabama 35051

Attn: Mr. David Calhoun
Assistant Superintendent of Operations/Chief of Staff

Re: Geotechnical Engineering Report
Proposed Classroom Additions
Elvin Hill Elementary School
Columbiana, Alabama
Terracon Project No. E1255093

Dear Mr. Calhoun:

We have completed the scope of Geotechnical Engineering services for the above referenced project in general accordance with Terracon Proposal No. PE1255093 dated May 13, 2025. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning earthwork and the design and construction of foundations and floor slabs for the proposed classroom additions at Elvin Hill Elementary School.

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

ALABAMA LICENSED No. 17908 PROFESSIONAL ENGINEER BRYAN C. RITENOUR

Bryan Ritenour, P.E.
Senior Engineer

Matt McCullough, P.E.
Geotechnical Department Manager

CC: Mr. Howard Rasco

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Figures

Attachments

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 classroom additions at Elvin Hill Elementary School in Columbiana, Alabama. The purpose of these services was to provide information and geotechnical engineering recommendations relative to:

- Subsurface soil conditions
- Groundwater conditions
- Seismic site classification per IBC
- Site preparation and earthwork
- Foundation design and construction
- Floor slab design and construction
- Lateral earth pressures for foundation walls

The geotechnical engineering Scope of Services for this project included four test borings, laboratory testing, engineering analysis, and preparation of this report. Exhibits 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 on the boring logs in the **Exploration Results** section.

Project Description

Our initial understanding of the project was provided in our proposal and was discussed during project planning. A period of collaboration has transpired since the project was initiated, and our final understanding of the project conditions is as follows:

Item	Description
Information Provided	Site layout plan was provided by Mr. Howard Rasco via email.
Project Description	The project will consist of a new classroom additions (See Exploration Plan).
Proposed Structures	New one-story classrooms
Building Construction	Masonry with slab on grade

Item	Description
Finished Floor Elevation	Assumed to match existing building
Maximum Loads	■ Columns: 100 - 200 kips (assumed) ■ Walls: 3-5 kips per linear foot (klf) (assumed) ■ Floor Slabs: 100 pounds per square foot (psf) (assumed)
Grading/Slopes	No grading plans for this project have been provided. We anticipate cuts and fills of less than 2 feet will be required.
Below-Grade Structures	None anticipated
Retaining Walls	We anticipate that foundation walls will be required to accommodate grade changes between the existing ground surface and the finished floor elevation.
Pavements	None anticipated

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 the field exploration and our review of publicly available geologic and topographic maps.

Item	Description
Parcel Information	The project is located at the existing Elvin Hill Elementary School in Columbiana, AL. (See Site Location) Latitude/Longitude (approximate): 33.1759° N, 86.5990° W
Existing Improvements	None
Current Ground Cover	Grass or concrete sidewalks
Existing Topography	The site is relatively level to sloping. An elevation difference of up to about 8 feet exists between the existing ground surface and the finished floor elevation of the existing building.

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 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	Surface Layer	Topsoil 2 to 4 inches thick
2	Low Consistency Existing Fill	Sandy Lean clay, tan, N-values 2 to 5 blows per foot
3	Higher Consistency Existing Fill	Sandy Lean clay, tan, N-values 8 to 15 blows per foot
4	Native Sandy Lean Clay	Typically, reddish brown with tan, stiff to hard consistency
5	Remnant Topsoil	Remnant original topsoil beneath the existing fill, gray

The borings were advanced using a solid stem auger drilling technique that allows short term groundwater observations to be made while drilling. Groundwater was not observed 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

Published maps from the United States Geological Survey (USGS) and the Geological Survey of Alabama (GSA) indicate that the project site is underlain by the Weisner And Wilson Ridge Undifferentiated geologic formation. The Weisner And Wilson Ridge Undifferentiated geologic formation consists of interbedded quartzose to slightly feldspathic sandstone and laterally continuous conglomerate.

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. The Site Classification is based on the upper 100 feet of the site profile defined by a weighted average value of either shear wave velocity, standard penetration resistance, or undrained shear strength in accordance with Section 20.4 of ASCE 7 and the International Building Code (IBC). Based on the soil/bedrock properties observed at the site and as described on the exploration logs and results, our professional opinion is for that a **Seismic Site Classification of D** be considered for the project. Subsurface explorations at this site were extended to a maximum depth of 15 feet. The site properties below the boring depth to 100 feet were estimated based on our experience and knowledge of geologic conditions of the general area. Additional deeper borings or geophysical testing may be performed to confirm the conditions below the current boring depth.

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.

The borings initially penetrated a surface topsoil layer having a thickness of about 2 to 4 inches. Beneath the topsoil, the borings encountered a layer of existing fill material. The existing fill generally consists of sandy lean clay. At borings B-1 and B-4, the N-values recorded in the upper 3 feet and 6 feet, respectively, ranged from 2 to 5 blows per foot indicating a low consistency (Geomodel Layer 2). The low consistency fill was likely not placed in a controlled manner (i.e., not placed in thin lifts and evenly compacted. Higher consistency fill (Geomodel Layer 3) was encountered in borings B-2 and B-3, and beneath the low consistency fill in boring B-4. The existing fill extended to depths ranging from about 3 to 11 feet below the ground surface.

Beneath the existing fill, boring B-4 encountered a thin layer of remnant topsoil (Geomodel Layer 5) at the native soil interface.

Beneath the fill at borings B-1 through B-3 and beneath the remnant topsoil in boring B-4, native soils were encountered to the boring termination depth of 15 feet. The native soils consist of Lean Clay (CL) with varying sand content. The native soils were of stiff to hard consistency.

After the stripping of the site and performing the planned cuts and in areas to receive fill, the exposed subgrade should be compacted and then proof-rolled under the observation of the Geotechnical Engineer as further discussed in the **Earthwork** section of this report. Any soft, loose, or otherwise unstable soils excessively deflecting during the proof-roll should be undercut and replaced with structural fill or stabilized as discussed in the **Earthwork** section of this report. The project budget should include contingencies for undercutting and replacing low consistency soils such as encountered in borings B-1 and B-4.

Based on the conditions encountered, the proposed structure can be supported on conventional continuous or spread footing foundations bearing on medium stiff to hard native soils, approved higher consistency existing fill, or new engineered fill. The proposed floor slab can bear on the medium stiff to hard native soils, approved higher consistency existing fill, or new engineered fill.

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 and floor slabs.

Subgrade Preparation

Prior to placing fill, any planted vegetation, topsoil, root mats, and hardscapes should be removed from the proposed building area. After stripping the site and making the necessary cuts to finish subgrade, but prior to fill placement, the exposed subgrade should be compacted using a heavy vibratory roller having a maximum static weight of 12,000 lbs. and capable of exerting a minimum impact energy of 20,000 lbs.

After densification/compaction as described above, the subgrade should be proofrolled with an adequately loaded vehicle such as a fully-loaded tandem-axle dump truck. The proofrolling should be performed under the observation of the Geotechnical Engineer or representative. Areas excessively deflecting under the proofroll should be delineated and subsequently addressed by the Geotechnical Engineer. Such areas should either be removed, further densified in place, or stabilized by other methods discussed in the following sections, depending on site and weather conditions. Excessively wet or dry material should either be removed or moisture conditioned and recompacted. Test pits may also be requested by the Geotechnical Engineer to further evaluate the low consistency existing fill. The project budget should include contingencies for undercutting and replacing low consistency soils such as encountered in borings B-1 and B-4. Compacted structural fill soils should then be placed to the proposed design grade and the moisture content and compaction of subgrade soils should be maintained until foundation or pavement construction.

The workability of the subgrade may be affected by precipitation, repetitive construction traffic or other factors. If unworkable conditions develop, workability may be improved by scarifying and drying. Some moisture conditioning (i.e., drying) of the existing soils should be anticipated for onsite soils to be reused as fill. Furthermore, soils failing the proofroll test may require additional reworking and drying to be stabilized in place, especially if earthwork is performed during the winter months.

Existing Fill

As noted in **Geotechnical Characterization**, the borings encountered previously placed fill. The existing fill generally consists of sandy lean clay. At borings B-1 and B-4, the N-values recorded in the upper 3 feet and 6 feet, respectively, ranged from 2 to 5 blows per foot indicating a low consistency (Geomodel Layer 2). The low consistency fill was likely not placed in a controlled manner (i.e., not placed in thin lifts and evenly compacted. Higher consistency fill (Geomodel Layer 3) was encountered in borings B-2 and B-3, and beneath the low consistency fill in boring B-4. The existing fill extended to depths ranging from about 3 to 11 feet below the ground surface.

Even after removal of the low consistency fill, an inherent risk remains for the owner that other zones of compressible fill or unsuitable material, within or buried by the fill, will not be discovered. This risk of unforeseen conditions cannot be eliminated but can be reduced by following the recommendations contained in this report.

After the planned grading has been completed, the entire building subgrade areas should be proofrolled with heavy, rubber tire construction equipment, to aid in delineating areas of soft or otherwise unsuitable soil. Areas of soft or otherwise unsuitable material should be undercut and replaced with new structural fill.

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.

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

Property	Structural Fill
Composition	Free of deleterious material
Maximum particle size	4 inches
Fines content	Not limited
Plasticity	Liquid Limit less than 50 Plasticity index less than 30
GeoModel Layer Expected to be Suitable[1,2]	2[3], 3[3], 4

1. Based on subsurface exploration.
2. Some moisture conditioning (i.e., drying) may be necessary.
3. If free of organics or deleterious materials

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, SM, SC	Liquid Limit less than 50 Plasticity index less than 25
Granular	GW, GP, GM, GC, SW, SP, SM, SC	Less than 50% passing No. 200 sieve

1. Structural 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 fill should meet the following compaction requirements.

Item	Structural Fill
Soil Fill 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 Open graded stone should be placed in 12-inch maximum lifts
Minimum Compaction Requirements [1]	98% of max. Each lift of open graded stone should be densified by at least 3 repeated passes of a vibratory smooth drum roller or portable vibrating plate compactor.
Water Content Range [1]	Low to Moderate Plasticity Cohesive: -2% to +2% of optimum Granular: -3% to +4% of optimum

1. Maximum density and optimum water content as determined by the standard Proctor test (ASTM D 698).

Excavation

We anticipate that excavations for the proposed foundations can be accomplished with conventional earthmoving equipment. The bottom of excavations should be thoroughly cleaned of loose soils and disturbed materials prior to backfill placement and/or construction.

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, provided the material is free of organic matter and deleterious substances. However, material used as trench backfill should comply with the pipe manufacturer or governing municipality’s requirements.

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, footings, or pavements, the backfill should satisfy the gradation 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 structure during and after construction and should be maintained throughout the life of the structure. Water retained next to the structure can result in soil movements greater than those discussed in this report. Greater movements can result in unacceptable differential movements.

Exposed ground should be sloped and maintained at a minimum 5% away from the structure for at least 10 feet beyond the perimeter of the structure. Locally, flatter grades may be necessary to transition ADA access requirements for flatwork. After 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.

Earthwork Construction Considerations

Shallow excavations for the proposed structure are anticipated to be accomplished with conventional construction equipment. 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.

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.

Construction Observation and Testing

The foundation installation efforts should be observed by the Geotechnical Engineer (or others under their direction). Observation should include documentation of adequate bearing material exposed at the design bearing elevation. 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 foundations.

Design Parameters – Compressive Loads

Item	Description
Maximum Net Allowable Bearing Pressure [1, 2]	2,000 psf
Required Bearing Stratum [3]	Stiff to hard native soils, approved higher consistency existing fill, or new engineered fill
Minimum Foundation Dimensions	Per IBC 1809.7
Ultimate Passive Resistance[4] **(equivalent fluid pressures)**	330 pcf (cohesive backfill)
Sliding Resistance [5]	0.30 ultimate coefficient of friction
Minimum Embedment below Finished Grade [6]	18 inches
Estimated Total Settlement from Structural Loads [2]	Less than about 1 inch
Estimated Differential Settlement [2, 7]	About 1/2 of total settlement

1. The maximum net allowable bearing pressure is the pressure in excess of 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.

Item	Description

3. Unsuitable or soft soils should be overexcavated and replaced per the recommendations presented earlier in this report.
4. Use of passive earth pressures require the sides of the excavation for the spread footing foundation to be nearly vertical and the concrete placed neat against these vertical faces or that the footing forms be removed and compacted structural fill be placed against the vertical footing face. Assumes no hydrostatic pressure. Apply a factor of safety of at least 1.5 when designing for lateral force resistance.
5. Can be used to compute sliding resistance where foundations are placed on suitable soil/materials. Frictional resistance for granular materials is dependent on the bearing pressure which may vary due to load combinations.
6. Embedment necessary to minimize the effects of frost and/or seasonal water content variations.
7. 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.

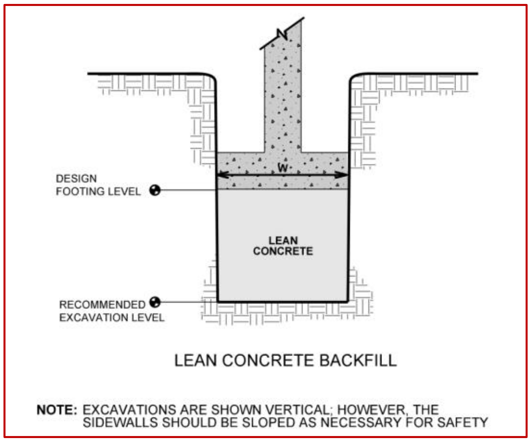
Uplift resistance of spread footings can be developed from the effective weight of the footing and the overlying soils with consideration to the IBC basic load combinations.

Item	Description
Soil Moist Unit Weight	120 pcf
Soil Effective Unit Weight[1]	60 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

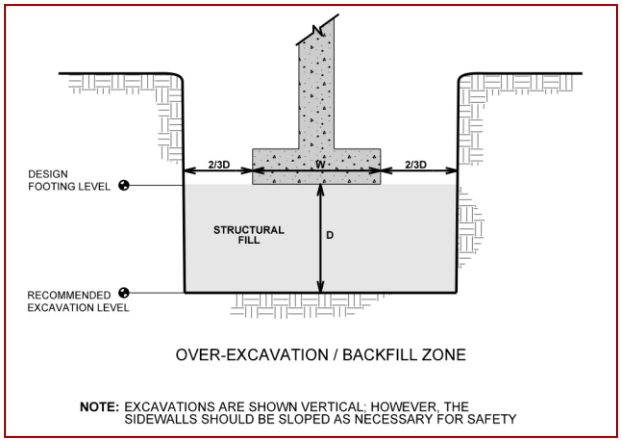
1. Effective (or buoyant) unit weight should be used for soil above the foundation level and below a water level. The high groundwater level should be used in uplift design as applicable.

Foundation Construction Considerations

If the unstable native soils are exposed at the bearing elevations determined by the Geotechnical Engineer, the footings should be excavated completely through the unstable native soils. The overexcavation can be backfilled to the design bearing elevation with lean concrete, flowable fill, or engineered fill. The lean concrete or flowable fill replacement zone is illustrated on the sketch below.



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



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 a lean concrete mud mat may be required prior to the placement of reinforcing steel and construction of foundations.

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.

Depending upon the site and weather conditions at the time of construction, unsuitable, weak, and/or loose soils may be observed at the floor slab subgrade level. These soils should be densified in place or undercut and replaced with structural fill meeting the requirements in the **Earthwork** section.

Floor Slab Design Parameters

Item	Description
Floor Slab Support[1]	Minimum 4 inches base course meeting material 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

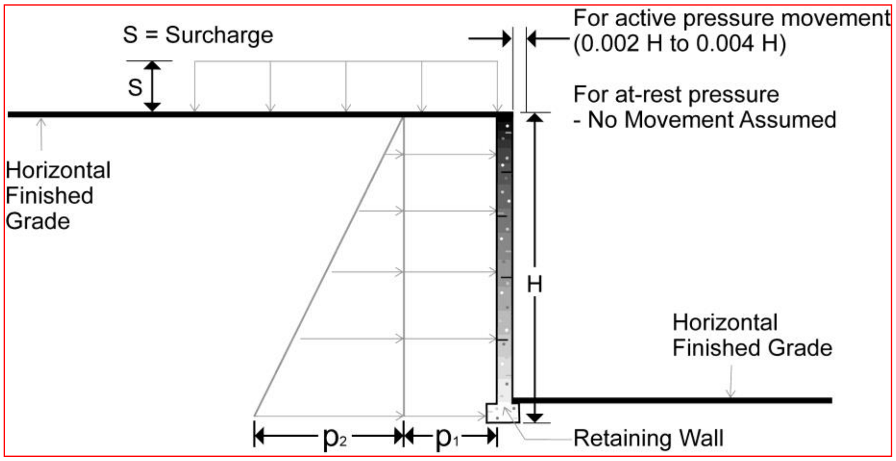
Finished subgrade, within and for at least 10 feet beyond the floor slab, should be protected from traffic, rutting, or other disturbance and maintained in a relatively moist condition until floor slabs are constructed. If the subgrade should become damaged or desiccated prior to construction of floor 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.

Lateral Earth Pressures

Design Parameters

Structures with unbalanced backfill levels on opposite sides should be designed for earth pressures at least equal to values indicated in the following table. Earth pressures will be influenced by structural design of the walls, conditions of wall restraint, methods of construction, and/or compaction and the strength of the materials being restrained. Two wall restraint conditions are shown in the diagram below. Active earth pressure is commonly used for design of free-standing cantilever retaining walls and assumes wall movement. The “at-rest” condition assumes no wall movement and is commonly used for basement walls, loading dock walls, or other walls restrained at the top. The recommended design lateral earth pressures do not include a factor of safety and do not provide for possible hydrostatic pressure on the walls (unless stated).



Lateral Earth Pressure Design Parameters

Earth Pressure Condition [1]	Coefficient for Backfill Type [2]	Surcharge Pressure [3] p_1 (psf)	Equivalent Fluid Pressures (psf) [2,4]	
			Unsaturated [5]	Submerged [5]
Active (Ka)	Crushed Stone - 0.24 Fine Grained - 0.42	(0.24)S (0.42)S	(25)H (50)H	(75)H (85)H
At-Rest (Ko)	Crushed Stone - 0.38 Fine Grained - 0.59	(0.38)S (0.59)S	(40)H (70)H	(80)H (95)H
Passive	Crushed Stone – 3.85 Fine Grained – 2.77	--- ---	(420)H (330)H	--- ---

1. For active earth pressure, wall must rotate about base, with top lateral movements 0.002 H to 0.004 H, where H is wall height. For passive earth pressure, wall must move horizontally to mobilize resistance. Fat clay or other expansive soils should not be used as backfill behind the wall.
2. Uniform, horizontal backfill, with a maximum unit weight of 120 pcf for cohesive soils and 110 pcf for open graded crushed stone (ALDOT #57).
3. Uniform surcharge, where S is surcharge pressure.
4. Loading from heavy compaction equipment is not included.
5. To achieve "Unsaturated" conditions, follow guidelines in **Subsurface Drainage for Below-Grade Walls** below. "Submerged" conditions are recommended when water cannot be evacuated from behind the walls using positive drainage or a permanent sump pump.

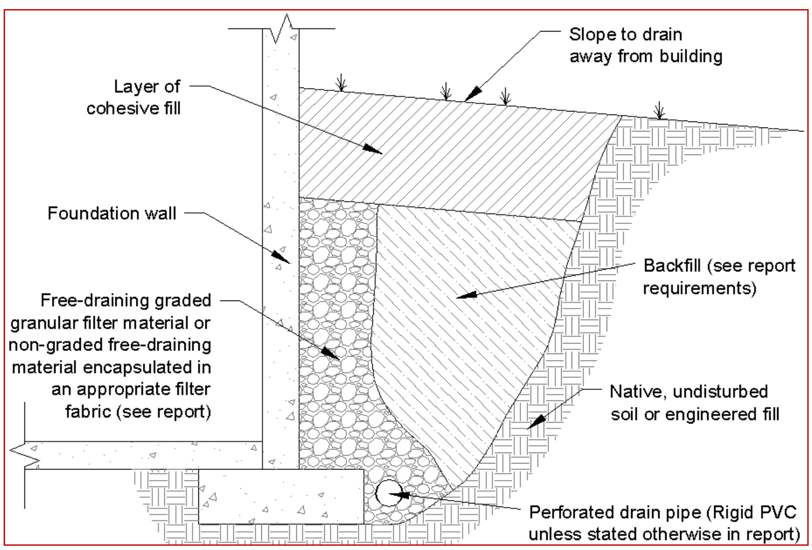
Backfill placed against structures should consist of open-graded crushed stone or low plasticity cohesive soils. For the crushed stone values to be valid, the stone backfill must extend out and up from the base of the wall at an angle of at least 45 degrees from vertical for the active case.

Footings, floor slabs or other loads bearing on backfill behind walls may have a significant influence on the lateral earth pressure. Placing footings within wall backfill and in the zone of active soil influence on the wall should be avoided unless structural analyses indicate the wall can safely withstand the increased pressure.

The lateral earth pressure recommendations given in this section are applicable to the design of rigid retaining walls subject to slight rotation, such as cantilever, or gravity type concrete walls. These recommendations are not applicable to the design of modular block - geogrid reinforced backfill walls (also termed MSE walls) or temporary shoring systems. Recommendations covering these types of wall systems are beyond the scope of services for this assignment.

Subsurface Drainage for Below-Grade Walls

A perforated rigid plastic drain line installed behind the base of walls and extends below adjacent grade is recommended to prevent hydrostatic loading on the walls. The invert of a drain line around a below-grade building area or exterior retaining wall should be placed near foundation bearing level. The drain line should be sloped to provide positive gravity drainage to daylight or to a sump pit and pump. The drain line should be surrounded by clean, free-draining granular material having less than 5% passing the No. 200 sieve, such as ALDOT No. 57 stone. The free-draining aggregate should be encapsulated in a filter fabric. The granular fill should extend to within 2 feet of final grade, where it should be capped with compacted cohesive fill to reduce infiltration of surface water into the drain system.



As an alternative to free-draining granular fill, a prefabricated drainage structure may be used. A prefabricated drainage structure is a plastic drainage core or mesh which is covered with filter fabric to prevent soil intrusion and is fastened to the wall prior to placing backfill.

The use of a permanent dewatering system is recommended to control long term hydrostatic uplift and lateral pressures beneath and around the below-grade walls. Typically, this system would consist of a retaining wall drainage layer and piping network which drains discharges by positive drainage.

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 until 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 provided information 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 damages 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.

Figures

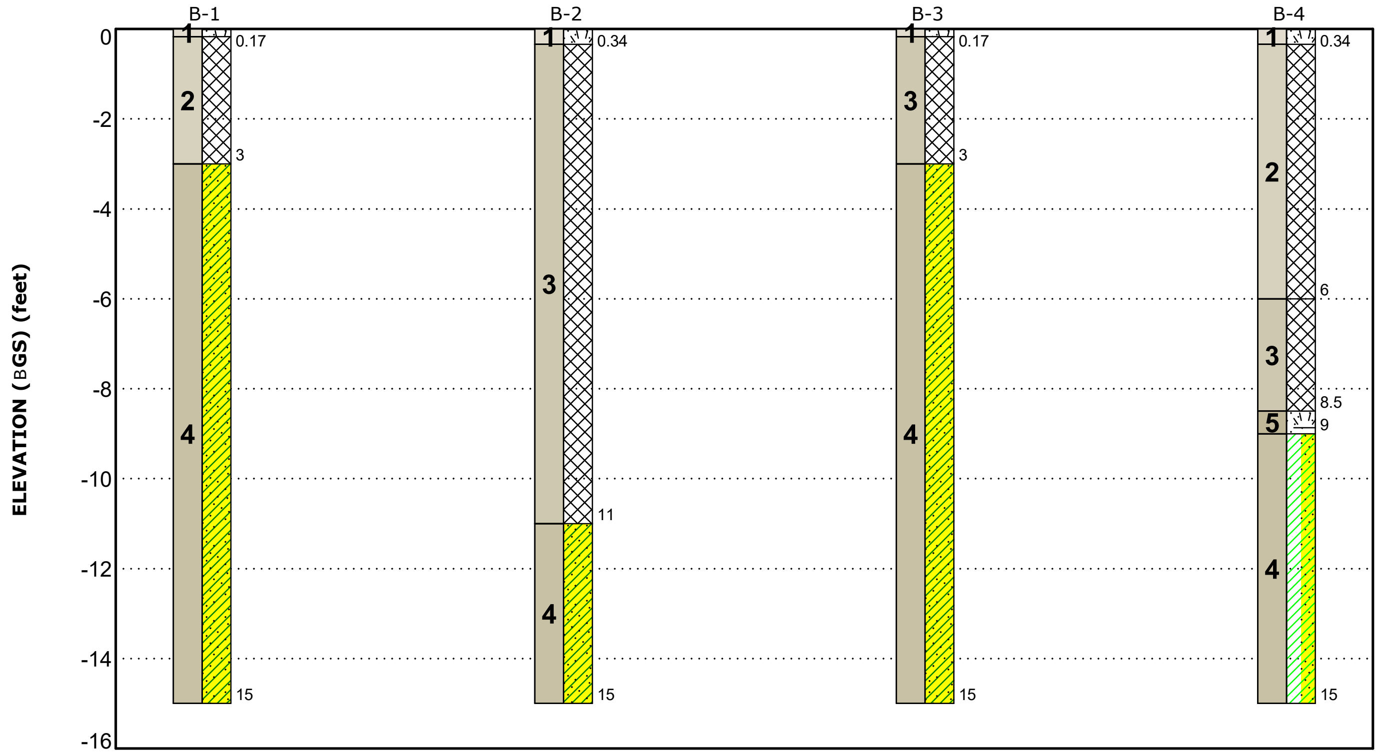
Contents:

GeoModel

Proposed Classroom Additions
Elvin Hill Elementary | Columbiana, AL
Terracon Project No. E1255093

2147 Riverchase Office Rd
Hoover, AL

GeoModel



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

Model Layer	Layer Name	General Description
1	Surface Layer	Topsoil 2 to 4 inches thick
2	Low Consistency Existing Fill	Sandy Lean Clay, tan, N-values 2 to 5 blows per foot
3	Higher Consistency Existing Fill	Sandy Lean Clay, tan, N-values 8 to 15 blows per foot
4	Native Sandy Lean Clay	Typically, reddish brown with tan, stiff to hard consistency
5	Remnant Topsoil	Remnant original topsoil beneath the existing fill, gray

Legend

Topsoil
Fill
Sandy Lean Clay
Lean Clay with Sand

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.

Attachments

Exploration and Testing Procedures

Field Exploration

Number of Borings	Approximate Boring Depth (feet)	Location
4	15	Classroom Additions

Boring Layout and Elevations: Terracon personnel provided the boring layout using the existing site features. If a more precise boring layout is desired, we recommend borings be surveyed.

Subsurface Exploration Procedures: We advanced the borings with a truck-mounted, rotary drill rig using continuous flight augers (solid stem and/or hollow stem, as necessary, depending on soil conditions). 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 safety hammer hoisted by a rope and cathead 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 the test depths. For safety purposes, all borings were backfilled with auger cuttings after their completion and the upper portion of the borehole was plugged with a cement mixture.

We also observed the boreholes while drilling and at the completion of drilling for the presence of groundwater. Groundwater was not encountered during drilling.

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:

- Moisture Content
- Atterberg Limits

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

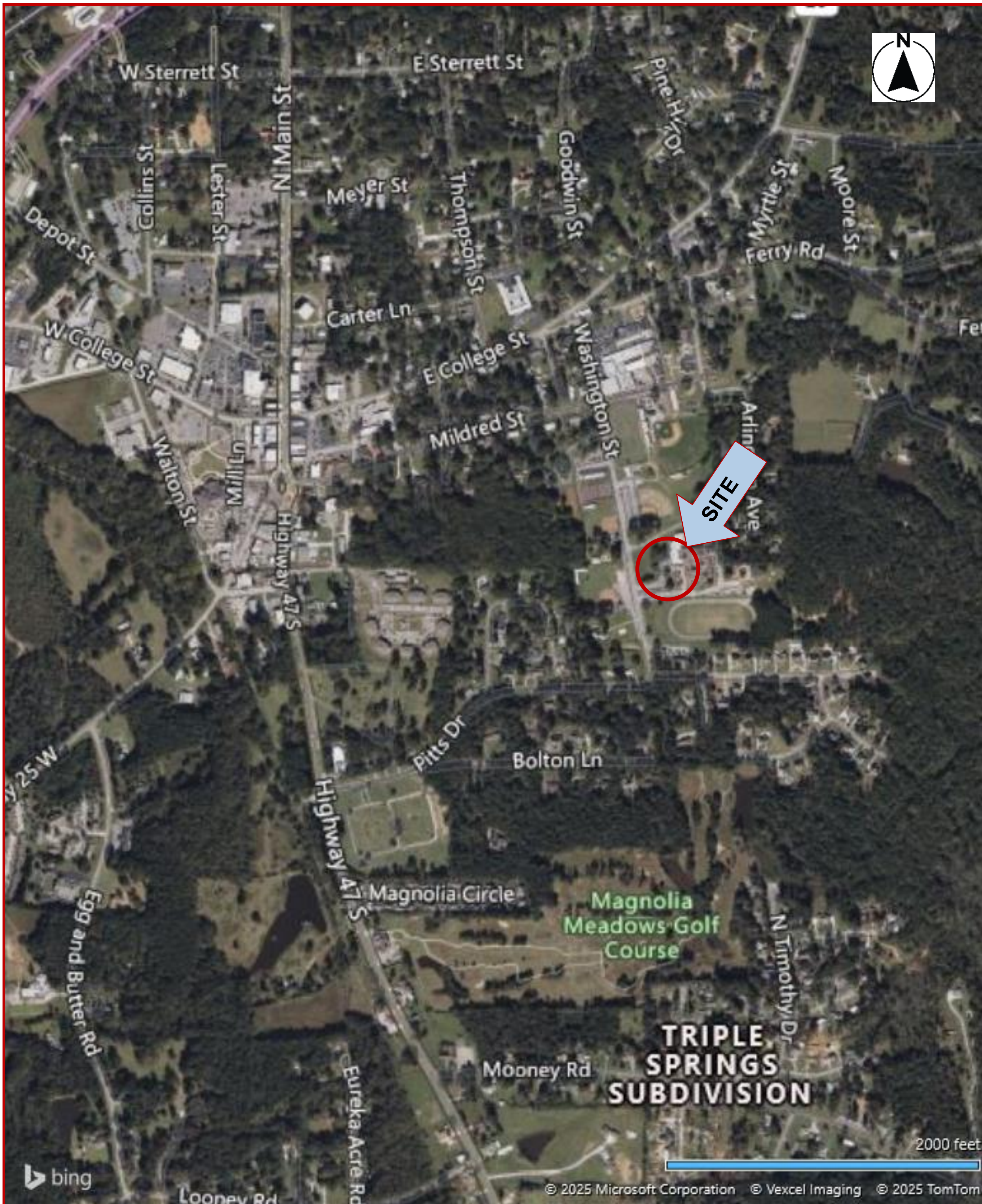


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES   MAP PROVIDED BY MICROSOFT BING MAPS

Exploration Plan

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

FLOOR PLAN PROVIDED BY LATHAN ARCHITECTS

Exploration and Laboratory Results

Contents:

Note: All attachments are one page unless noted above.

Terracon
2147 Riverchase Office Rd
Hoover, AL

Boring Log No. B-1

Location: See Exploration Plan

Latitude: 33.1762° Longitude: -86.5990°

Model Layer	Graphic Log	Depth (Ft.)	Description	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Atterberg Limits LL-PL-PI
1		0.2	**TOPSOIL (2")**						
2		3.0	**FILL - SANDY LEAN CLAY**, tan, low consistency				2-1-1 N=2	23.3	
4			**SANDY LEAN CLAY (CL)**, tan with black staining, stiff				1-6-7 N=13	18.7	
				5					
			becomes reddish brown with tan and very stiff, no black staining				7-11-9 N=20	24.7	
							8-12-14 N=26		
				10					
		15.0		15			10-13-15 N=28		
			Boring Terminated at 15 Feet						

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

Water Level Observations
No water observed during drilling

Advancement Method
Continuous flight auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Drill Rig
CME 45

Driller
Smith Drilling

Logged by
BCR

Boring Started
06-10-2025

Boring Completed
06-10-2025

Terracon
2147 Riverchase Office Rd
Hoover, AL

Boring Log No. B-2

Location: See Exploration Plan

Latitude: 33.1760° Longitude: -86.5991°

Model Layer	Depth (Ft.)	Description	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Atterberg Limits LL-PL-PI
1	0.3	**TOPSOIL (4")**						
3		**FILL - SANDY LEAN CLAY**, reddish brown with tan						
					X	5-7-8 N=15	24.8	
					X	3-5-5 N=10	26.7	
			5					
					X	5-7-8 N=15	23.9	
					X	3-4-4 N=8		
	11.0		10					
4		**SANDY LEAN CLAY (CL)**, reddish brown, very stiff						
					X	5-8-9 N=17		
	15.0		15					
		Boring Terminated at 15 Feet						

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.

Water Level Observations
No water observed during drilling

Drill Rig
CME 45

Driller
Smith Drilling

Notes

Advancement Method
Continuous flight auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Logged by
BCR

Boring Started
06-10-2025

Boring Completed
06-10-2025

Terracon
2147 Riverchase Office Rd
Hoover, AL

Boring Log No. B-3

Location: See Exploration Plan

Latitude: 33.1761° Longitude: -86.5993°

Model Layer	Graphic Log	Depth (Ft.)	Description	Depth (Ft.)	Water Level Observations	Sample Type	Field Test Results	Water Content (%)	Atterberg Limits LL-PL-PI
1		0.2	**TOPSOIL (2")**						
3		3.0	**FILL - SANDY LEAN CLAY**, reddish brown with tan			X	3-4-4 N=8	20.2	44-24-20
4			**SANDY LEAN CLAY (CL)**, reddish brown with tan, very stiff	5		X	10-13-16 N=29	23.2	
			becomes hard			X	8-15-17 N=32	23.1	
				10		X	8-15-20 N=35		
		15.0		15		X	10-16-23 N=39		
			Boring Terminated at 15 Feet						

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.

Water Level Observations
No water observed during drilling

Drill Rig
CME 45

Driller
Smith Drilling

Notes

Advancement Method
Continuous flight auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Logged by
BCR

Boring Started
06-10-2025

Boring Completed
06-10-2025

Terracon
2147 Riverchase Office Rd
Hoover, AL

Boring Log No. B-4

Location: See Exploration Plan

Latitude: 33.1759° Longitude: -86.5993°

Model Layer	Depth (Ft.)	Description	Field Test Results	Water Content (%)	Atterberg Limits LL-PL-PI
1	0.3	**TOPSOIL (4")**			
2	6.0	**FILL - SANDY LEAN CLAY**, tan, low consistency	2-3-2 N=5	27.3	
			2-1-1 N=2	28.5	
3	8.5	**FILL - SANDY LEAN CLAY**, tan	4-5-6 N=11	24.5	
5	9.0	**REMNANT TOPSOIL**, gray	3-4-6 N=10		
4	15.0	**LEAN CLAY WITH SAND (CL)**, reddish brown with tan, stiff			
		becomes very stiff	10-12-15 N=27		
		Boring Terminated at 15 Feet			

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

Water Level Observations
No water observed during drilling

Advancement Method
Continuous flight auger

Abandonment Method
Boring backfilled with auger cuttings upon completion.

Drill Rig
CME 45

Driller
Smith Drilling

Logged by
BCR

Boring Started
06-10-2025

Boring Completed
06-10-2025

Supporting Information

Contents:

Note: All attachments are one page unless noted above.

Terracon
2147 Riverchase Office Rd
Hoover, AL

General Notes

Sampling	Water Level	Field Tests
Standard Penetration Test	Water Initially Encountered Water Level After a Specified Period of Time Water Level After a Specified Period of Time Cave In Encountered 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.	N Standard Penetration Test Resistance (Blows/Ft.) (HP) Hand Penetrometer (T) Torvane (DCP) Dynamic Cone Penetrometer 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 Unified Soil Classification System. Where sufficient laboratory data exist 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 exist 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		
Relative Density	**Standard Penetration or N-Value (Blows/Ft.)**	**Consistency**	**Unconfined Compressive Strength Qu (tsf)**	**Standard Penetration or N-Value (Blows/Ft.)**
Very Loose	0 - 3	Very Soft	less than 0.25	0 - 1
Loose	4 - 9	Soft	0.25 to 0.50	2 - 4
Medium Dense	10 - 29	Medium Stiff	0.50 to 1.00	5 - 8
Dense	30 - 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 Exploration and Laboratory Test Results

Exploration/field results and/or laboratory test data contained within this document are intended for application to the project as described in this document. Use of such exploration/field results and/or laboratory test data should not be used independently of this document.

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.