REPORT OF
GEOTECHNICAL EXPLORATION
East Seventh Street Development
Rome, Floyd County, Georgia
Contour Project No: G21LED02

March 22, 2021

Prepared For:

R. H. Ledbetter Properties, LLC
106 East 8th Avenue
Rome, Georgia 30161

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March 22, 2021

R. H. Ledbetter Properties, LLC
106 East 8th Avenue
Rome, Georgia 30161

Attention: Joe Holmes
Executive Vice President for Development

Reference: Report of Geotechnical Exploration
East Seventh Street Development
Rome, Floyd County, Georgia
Contour Project No: G21LED02

Dear Joe:

Contour Engineering, LLC (Contour) has completed the geotechnical exploration for the project referenced above in general accordance with the scope of services outlined in Contour's Geotechnical Proposal No: G21LED-192 dated February 15, 2021. The following report includes a summary of the project and the findings from our subsurface investigations.

We appreciate the opportunity to work with you on this project and look forward to assisting you with future projects. Should you have any questions regarding this report or if we may be of further service, please contact our office.

Sincerely,
Contour Engineering, LLC

William M. Hesterlee, E.I.T.
Project Engineer

James E. Gough, P.E.
Senior Engineer

Copies Submitted: Addressee (1)

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1.0 EXECUTIVE SUMMARY

Site Description: The subject site is located directly northeast of the intersection of East Seventh Street and Turner McCall Boulevard in Rome, Floyd County, Georgia. The site is bordered to the east by Holmes Road. The site is currently occupied by an abandoned restaurant building and associated pavement areas. The southeastern portion of the site is grassed and pre-graded.

Project Description: It is our understand that the proposed development will include demolition of the existing commercial building and construction of a 2,026 square foot restaurant building along with associated infrastructure. For the preparation of this proposal, we have assumed that the building will have maximum column loads of 75 kips and wall loads of 3 kips per linear foot. We also have assumed cuts and fills of less than 5 feet during site development.

Subsurface Conditions: Beneath the surficial layer, the soil test borings encountered fill materials and residual soils to their termination depths ranging from 10 to 15 feet below the existing ground surface. The surficial layer consisted of asphalt (1 to 6 inches) at locations B-1, B-2, B-3, B-4, and B-6 and topsoil (3 inches) at location B-5. Soils encountered on-site were classified as silty/clayey sands (SM/SC), sandy silts (ML), or silty/sandy clays (CL) with SPT values ranging from 3 to 31 bpf.

Site Preparation: Loose fill materials and/or fill materials mixed with varying amounts of topsoil/organic material were encountered in borings B-1 through B-4. During construction of the new building addition, these soils may require remediation. Within building slab areas, these soils can be stabilized in place by partially undercutting the unstable soils 2 to 3 feet and placing a geogrid such as Tensar TX-140 or equivalent followed by structural fill or crushed stone. Within foundations, the unstable soils will require removal up to 3 feet below foundation subgrade and replaced with consolidated crushed stone. Due to the presence of these unstable soils, we recommend that a representative from our office observe and evaluate all slab and foundation subgrades.

Foundation Support: Based on boring data, assumed loading conditions, and after the completion of the recommended subgrade preparation, we anticipate that the proposed structure may be supported on a conventional shallow foundation system. A maximum allowable net bearing pressure of 2,500 pounds per square foot should be available for the design of the shallow foundation system bearing on approved subgrade soils, residual soils, or structural fill. Final structural loads should be forwarded Contour for our review. At that time, we will finalize our foundation recommendations.

Seismic Site Classification: Based on the 2018 International Building Code (IBC), boring data, and the geological features of the Piedmont Physiographic Province of Georgia, it is our opinion that the Seismic Site Classification for the project is “D”. The soil profile named “Stiff Soil Profile” was determined from Chapter 20 of ASCE-7.

2.0 INTRODUCTION

2.1 Site and Project Description

The subject site is located directly northeast of the intersection of East Seventh Street and Turner McCall Boulevard in Rome, Floyd County, Georgia. The site is bordered to the east by Holmes Road. The site is currently occupied by an abandoned restaurant building and associated pavement areas. The southeastern portion of the site is grassed and pre-graded. Based on review of historical topographic and aerial information, the site has been in its current state since 2010 excluding any building and/or pavement renovations. Prior to this date, there appears to have been a structure located on the grassed southeastern portion of the site. A Site Vicinity Map (Figure 1) and Aerial View of the Site (Figure 2) are included in the Appendix.

It is our understand that the proposed development will include demolition of the existing commercial building and construction of a 2,026 square foot restaurant building along with associated infrastructure. For the preparation of this proposal, we have assumed that the building will have maximum column loads of 75 kips and wall loads of 3 kips per linear foot. We also have assumed cuts and fills of less than 5 feet during site development.

2.2 Scope of Work

This report presents the results of our geotechnical exploration performed for the proposed East Seventh Street Development in Rome, Georgia. The purpose of this study was to perform a geotechnical exploration at the site and provide recommendations for site design and construction.

Our services were provided in general accordance with the scope of services outlined in Contour's Proposal No: G21LED-192 dated February 15, 2021. Moreover, the services rendered by this firm included a site reconnaissance, drilling and sampling of six (6) soil test borings, engineering analyses of obtained information, and preparation of this report. Specifically, our report addresses the following:

- Description of existing conditions including detailed boring records, soil profiles, and a boring location plan;
- A description of the area and site geologic conditions;
- Recommendations for site preparation, excavation and grading, backfilling and compaction;
- Recommendations for subgrade preparation and slab-on-grade construction;
- Excavation conditions and the presence of very dense materials, partially weathered rock, or rock and the degree of difficulty of excavation;
- Recommendations for foundation design and construction including allowable bearing pressure and settlements;
- Lateral earth pressures for retaining walls;
- Recommendations for temporary and permanent slopes;
- Pavement design and construction recommendations; and
- Seismic information based on the International Building Code 2018.

The scope of our geotechnical services did not include any environmental assessment or exploration for the presence or absence of hazardous or toxic materials in the soil, groundwater, or surface water within or beyond the site.

3.0 FIELD EXPLORATION AND LABORATORY PROGRAM

3.1 Field Exploration

The field exploration consisted of a site visit and performing six (6) soil test borings at the site. More specifically, the borings were performed in the following locations:

- Proposed Building Footprint: Three (3) soil test borings, designated as B-1, B-2, and B-3 were performed within the proposed building footprint and extended to their termination depths of 15 feet below existing grades.

- Proposed Pavement Areas: Three (3) soil test borings, designated as B-4, B-5, and B-6 were performed within future pavement areas and extended to their termination depths of 10 feet below existing grades.

Each soil test boring location was plotted on the provided site plans. Once plotted, the location of each boring was determined in the field by a Contour professional measuring distances and approximating right angles from existing site features. Therefore, the boring locations should be considered approximate. If more exact locations are desired, we recommend that a professional survey be engaged to locate the borings. The location of each soil test boring is depicted on the Boring Location Plan included in the Appendix of this report as Figure 3.

The sampling and penetration procedures of the soil test borings were drilled in accordance with ASTM D-1586, using a power rotary drill. Standard Penetration Tests (SPT) are performed by driving a standard 1-$^3/_8$" I.D. and 2" O.D. split spoon sampler with a 140-pound hammer falling 30 inches. Samples were taken at intervals of 2½ feet for the first 10 feet and then 5 feet thereafter until boring termination or refusal. The number of hammer blows required to drive the sampler a total of 18 inches, in 6-inch increments, are recorded. The SPT resistance or "N" value is the summation of the last two 6-inch increments and is illustrated on the Boring Log Records adjacent to their corresponding depths, included in the Appendix. In very dense soils or weathered rock, the sample is driven a few inches rather than the 6-inch increment and the number of blows required versus the penetration depth is recorded. The penetration resistance or SPT value is used as an index to derive soil parameters from various empirical correlations. Automatic hammers have higher efficiency than manual hammers, thus yielding lower standard penetration resistance values. We recognize this and account for it in our evaluation. However, the field-recorded penetration resistances and consistency terms based on the field values are presented on our test boring logs.

Upon completion of the fieldwork, boreholes were backfilled with soil cuttings and patched prior to demobilization from the site. All recovered soil samples from our subsurface exploration will be held in storage for a minimum of 3 months within Contour Engineering, LLC's facility in Kennesaw, Georgia.

3.2 Laboratory Program

Representative portions of each recovered split-spoon sample were transported to our laboratory for further visual classification and testing. Using the Unified Soil Classification System (ASTM D-2487), the subsoil conditions are stratified and described in an illustrated form of soil profiles on the Boring Log Records included in the Appendix.

4.0 SITE AND SUBSURFACE CONDITIONS

4.1 Area Geology

The subject site is located within the Valley and Ridge Physiographic Province of Georgia. The Valley and Ridge Province is the westernmost physiographic region of the Appalachian Mountains, bounded to the east by the Blue Ridge, the south by the Piedmont, and the northwest by the Appalachian Plateau. It is characterized by long north-northeasterly trending ridges separated by fertile valleys and extends continuously from New York to the edge of the Coastal Plain (fall line) in Alabama. The province owes its topography to the erosion of alternating layers of hard and soft sedimentary rock that were folded and faulted during the building of the Appalachians. Based on published information, the site is underlain by the Rome Formation. The predominant rock types in this formation are shale and sandstone.

4.2 Soil Survey

According to the Natural Resource Conservation Service (NRCS) On-line Soil Survey of Floyd County, Georgia, soils located at the subject site consists of Etowah-Urban land complex (EuC) with 2 to 10 percent slopes and Townley-Urban land complex (ToE) with 15 to 25 percent slopes. These soils are further described as follows:

- *Urban land* includes areas that have been modified by cutting, filling, shaping, and smoothing;

- The *Etowah Series* consists of very deep, well drained, moderately permeable soils on high stream terraces, alluvial fans and foot slopes. These soils formed in alluvium or colluvium that is commonly underlain by limestone residuum below 40 inches. The slopes range from 0 to 35 percent; and

- The *Townley series* consists of moderately deep, well drained, slowly permeable soils on upland ridgetops and side slopes. They formed in clayey residuum weathered from shale or interbedded sandstone and shale. Slope ranges from 2 to 45 percent.

4.3 Subsurface Soil Conditions

Beneath the surficial layer, the soil test borings encountered fill materials and residual soils to their termination depths ranging from 10 to 15 feet below the existing ground surface. The surficial layer consisted of asphalt (1 to 6 inches) at locations B-1, B-2, B-3, B-4, and B-6 and topsoil (3 inches) at location B-5.

Fill materials, soils that have been placed by man, were encountered beneath the surficial layer in borings B-1 through B-5 extended to approximate depths ranging from 3 to 8 feet below the existing ground surface. The sampled fill materials were classified as clayey/silty sands (SC/SM) with Standard Penetration Test (SPT) values ranging from 3 to 25 blows per foot (bpf). It should be noted that varying amounts of topsoil/organic material were encountered in borings B-1 through B-4.

Residual soils, formed by in-place weathering of the parent rock, were encountered in all of the borings beneath the surficial layer or fill materials and extended to their termination depths ranging from 10 to 15 feet below the ground surface. The residual soils were classified as silty/clayey sands (SM/SC), sandy silts (ML), or silty/sandy clays (CL) with SPT values ranging from 7 to 31 bpf.

4.4 Groundwater Conditions

The measurement to the depth below the existing ground surface to the groundwater table was attempted immediately following the completion of each boring. No groundwater was encountered during our field exploration in any of the soil test borings to the depths drilled. Groundwater levels in this area will fluctuate in response to local variations of precipitation and temperature and may be different at other times and areas.

Individual soil boring profiles are depicted on the Boring Log Records included in the Appendix. Subsurface Profile Plates illustrating the subsurface soil is also included in the Appendix. Stratification lines represent the approximate boundaries between soil types. The actual transitions may be more gradual than depicted.

5.0 EARTHWORK RECOMMENDATIONS

5.1 Site Preparation

Prior to the commencement of construction, all vegetation, topsoil, asphalt pavement, utilities, and any other non-soil deleterious materials that may fall within the limits of the proposed construction should be removed. Upon completion of the clearing and stripping, all subgrade areas should be proofrolled with a 20-ton loaded tandem-axle dump truck or other pneumatic-tired vehicle of similar size and weight. The purpose of the proofroll is to locate soft, weak, or excessively wet soils present at the time of construction. Any unstable subgrades or unsuitable materials observed during proofrolling operations (materials that exhibit excessive pumping or rutting) should be undercut and replaced with structural fill or stabilized in place.

<u>Existing Structures</u>
During the removal of the existing building on-site, demolition activities may loosen the upper 2 to 3 feet; therefore, subgrade soils may require moisture conditioning and recompacting prior to construction. The subsurface conditions within the existing building footprint are unknown. It should be anticipated that conditions different than those encountered in the borings may exist beneath or in the vicinity of the existing structures. These conditions may require additional evaluation and/or remedial measures prior to construction.

<u>Existing Fill Material</u>
Loose fill materials and/or fill materials mixed with varying amounts of topsoil/organic material were encountered in borings B-1 through B-4. During construction of the new building addition, these soils may require remediation. Within building slab areas, these soils can be stabilized in place by partially undercutting the unstable soils 2 to 3 feet and placing a geogrid such as Tensar TX-140 or equivalent followed by structural fill or crushed stone. Within foundations, the unstable soils will require removal up to 3 feet below foundation subgrade and replaced with consolidated crushed stone. Due to the presence of these unstable soils, we recommend that a representative from our office observe and evaluate all slab and foundation subgrades.

5.2 Excavation Conditions

During our field activities, no partially weathered rock (PWR) or auger refusal material was encountered. Therefore, we do not anticipate that difficult excavation techniques will be required within the limits of our exploration.

5.3 Structural Fill

Structural fill to be used on the site should be evaluated and approved by the geotechnical engineer. All structural fill should be free of organics, with a maximum particle size of 3 inches and moisture conditioned to maintain a moisture content within two percentage points above or below the soil's optimum moisture content as determined by the Standard Proctor tests (ASTM D-698). Thus, the grading contractor should be prepared to moisture condition the soils as required during fill placement.

Off-Site Borrow Materials

Off-site borrow material or imported fill may also be used if it has a liquid limit (LL) and a plastic index (PI) not exceeding 40 and 20 percent, respectively. Therefore, laboratory tests including standard Proctors (ASTM D-698), soil particle size analysis (ASTM D-422) and Atterberg Limits Test (ASTM D 4318), etc. will be required during construction on the proposed borrow/fill soils to verify that their characteristics match the specified criteria.

Suitability of On-Site Soils

The on-site residual soils and existing fill materials (free of organics) appear suitable for re-use as structural fill, provided that the soils are placed in accordance to the requirements specified in this report.

Placement and Compaction Requirements

Structural fill should be placed in thin loose lifts not exceeding 8 inches in thickness and tested by a soils technician to determine the compaction percentage. Based on the soil data, Contour recommends that the following minimum level of compaction and density be achieved during construction:

> *Building Areas* – In fill areas, compact to 98 percent of the soil's maximum standard Proctor density value (ASTM D-698). In cut areas, the subgrade should be proofrolled and if found unstable, it should be scarified and re-compacted to 98 percent of the soil's maximum standard Proctor density value.
>
> *Pavement Areas* – Compact the upper 18 inches of subgrade in fill areas and the upper 12 inches in cut areas to 98 percent of the soil’s maximum standard Proctor density value (ASTM D-698) prior to placement of the base course material and 95 percent of the soil's maximum standard Proctor density value below this level. In cut areas, the subgrade shall be proofrolled and if found unstable, should be scarified and re-compacted to 98 percent of the soil's maximum standard Proctor density value.
>
> *Utility Trenches* – Compact to 98 percent of the soil's maximum standard Proctor density value (ASTM D-698). Field density testing should be performed as one test per lift for 150 linear foot of trench. Note: Existing utilities that require abandonment should be completely removed, backfilled with structural fill and compacted in accordance to the requirements for new utility trenches.

5.4 Groundwater and Drainage Considerations

No groundwater was encountered during our field exploration in any of the soil test borings to the depths drilled. Should site/utility excavations extend into the groundwater table, the contractor should implement dewatering techniques to maintain groundwater levels a minimum of 2 feet below working subgrades.

Site drainage should be planned and maintained to promote drainage away from all improvements during and after construction. Moreover, permanent site drainage should be

established to prevent subgrade soils beneath pavements and slabs from becoming saturated and to minimize potential distress. Surface drainage should be directed away from proposed building structures. All roof drains should be tied directly to a storm sewer by closed pipes.

Landscape irrigation should also be minimized to reduce future maintenance problems. Additionally, maximum practical grades should be utilized to reduce the likelihood of ponding water on or adjacent to flatworks. Care should be taken to properly seal and maintain all flatwork that abuts building structures to minimize the intrusion of water.

6.0 DESIGN RECOMMENDATIONS

6.1 Foundation Support

Based on boring data, assumed loading conditions, and after the completion of the recommended subgrade preparation, we anticipate that the proposed structure may be supported on a conventional shallow foundation system. A maximum allowable net bearing pressure of 2,500 pounds per square foot should be available for the design of the shallow foundation system bearing on approved subgrade soils, residual soils, or structural fill. Final structural loads should be forwarded Contour for our review. At that time, we will finalize our foundation recommendations.

To reduce the possibility of shear failure, wall bearing and column foundations should be designed with a minimum width of 18 and 24 inches, respectively. For frost protection, exterior wall bearing and column foundations should be designed with a minimum embedment depth of 18 inches, while interior foundations should be designed with a minimum embedment depth of 12 inches. The embedment depth should be measured from the base of the foundation to lowest adjacent outside grade.

Bottoms of foundation excavations should be evaluated by a geotechnical engineer prior to placement of reinforcing steel and concrete to verify that adequate bearing materials are present and that all debris, mud, and loose, frozen or water-softened soils are removed. In the event that soft soils are encountered in foundation excavations at individual locations, it will be necessary to undercut them and replace with structural fill. A geotechnical engineer will make actual recommendations, as conditions warrant.

Foundation excavations should be concreted as soon as practical after they are excavated. Water should not be allowed to pond in any excavation. If an excavation is left open for an extended period, a thin mat of lean concrete should be placed over the bottom to minimize damage to the bearing surface from weather or construction activities. Foundation concrete should not be placed on frozen or saturated subgrades.

Upon completion of the recommendations and using the assumed structural loading, we anticipate total settlement of 1-inch or less and differential settlement of approximately half of the total settlement. Careful field control will contribute substantially to minimizing potential settlements.

Once site plans and structural loading information have been finalized, we recommend that a copy be forwarded to our office so that we may review them in relation to the encountered subsurface conditions during our field exploration. At that time, we will finalize our recommendations regarding foundation support.

6.2 Floor Support

Upon completion of the recommended site preparation, the building floor slabs may be directly supported on approved subgrade, residual soils and/or structural fill. Provided the slab

subgrade is prepared in accordance with our recommendations and slab loads do not exceed 100 pounds per square foot, a subgrade modulus reaction (K) of 100 pounds per cubic inch (pci, pounds per square inch per inch of deflection) may be used for slab design.

If a higher modulus of subgrade reaction is required, then we recommend that a 6-inch layer of compacted crushed stone be placed underneath the concrete building slab. The 6 inches of crushed stone will provide a protective cover as well as a uniform working surface. The crushed stone should consist of crushed aggregate base meeting the requirements of GDOT Section 815. Slabs underlain by 6 inches of stone will have moduli of subgrade reactions (K) of 150 pci, respectively.

6.3 Below grade or Concrete Retaining Wall Design

Any below grade or on-site concrete retaining walls will be subjected to lateral earth pressures. Walls that are relatively rigid or fixed at the top and bottom may be subjected to "at-rest" earth pressures. Walls that are allowed to have sufficient movement and not fixed at the top will be subjected to "active" pressures.

The following lateral earth pressure parameters are recommended for design in residual soils or structural fill meeting the requirements outlined in Section 5.2 – Excavation Conditions.

Recommended Lateral Earth Pressure Parameters

Earth Pressure Coefficient	Earth Pressure Value	Equivalent Fluid Density (pcf)
At-Rest (K_O)	0.53	63.6
Active (K_A)	0.36	43.2
Passive (K_P)	2.77	332

These values assume that the wall has horizontal backfill and no surcharge loads such as from adjacent structures. A moist unit weight of 120 pounds cubic foot and an allowable coefficient of friction of 0.35 may be used in the design value of retaining walls.

The recommended equivalent fluid pressures assume that constantly functioning drainage systems are installed between walls and soil backfill to prevent the accidental buildup of hydrostatic pressures and lateral stresses in excess of those stated. If a functioning drainage system is not installed, then lateral earth pressures should be determined using the buoyant weight of the soil (approximately 58 pcf). Hydrostatic pressures calculated with the unit weight of water (62.4 pcf) should be added to these earth pressures to obtain the total stresses for design.

The surcharge and lateral loads from tractors and other heavy equipment operating within 10 feet of below grade walls should be added to the lateral loads cited in this section of the report. If foundations or other surcharge loadings are located a short distance outside below grade walls, they may also exert appreciable additional lateral pressures that must be considered.

The retaining wall/below grade wall recommendations listed above *should not be* correlated with soil parameters for use in Segmental Retaining Wall/MSE Wall design. In the event that Retaining

Walls are constructed as MSE Walls, we recommend that design soil parameters be established through appropriate laboratory testing by the wall designer.

6.4 Slope Recommendations

Temporary Slope Recommendations

Temporary slopes not exceeding 10 feet in height for confined areas and constructed in the residual soils (virgin soils) or structural fill, should be configured no steeper than 1.5(H):1.0(V) provided no water is observed seeping from the sides of the excavation. These temporary slopes should be regularly monitored for signs of movement or unsafe conditions. Temporary slopes below the groundwater table will require shoring / bracing. Additionally, construction excavation should comply with OSHA Guidelines outlined in the Code of Federal Regulations Federal Register Volume 54, Number 209 (October 1989) "Construction Standards for Excavation, 29CFR Part 1926, Subpart P." Also, the contractor should have a designated "qualified engineer" as defined by OSHA on-site during the excavation to observe the slopes for signs of possible failure.

Proper management of groundwater seepage and surface water runoff around the excavations will also contribute to the stability of temporary slopes. Material removed from excavations should *not* be stockpiled within a distance of twenty (20) feet from the crest of temporary excavations. Furthermore, positive drainage should also be maintained with ditches or channels at the top and bottom of the slope. It is also very important to always keep these drainage channels free of dirt, debris and vegetation.

Permanent Slope Recommendation

Permanent slopes less than 20 feet in height and constructed in residual soils or structural fill that are placed in accordance with the recommendations outlined in this report should be constructed no steeper than 2(H):1(V). For slopes greater than 20 feet, the slopes may require to be constructed at a 2.5(H):1(V) configuration and/or include a 10-foot bench at mid-height of the slope. Therefore, slopes greater than 20 feet in height will require a slope stability analysis.

To prevent erosion and saturation of the slopes, we recommend that a trench drain/diversion ditch be constructed adjacent to and along the top of the embankment (sloping toward the trench drain) to ensure that water drains away from the slope. Depending on site conditions, a toe drain or french drain may also be constructed at the toe of cut slopes to collect water seepage. A protective cover of grass or other vegetation should be established on the slopes as soon as possible for erosion protection.

Buildings should have a minimum setback of 10 feet from the slope shoulders. A minimum setback of 5 feet is recommended for the pavement curbs.

6.5 Pavement Design

Traffic loading conditions were not provided at the time of this report; however, a pavement thickness design was performed by Contour based on assumed traffic loads for standard and heavy-duty pavement areas. For the design, we have assumed that subgrade soils will be

prepared in accordance with this report, will have a minimum CBR value of 3 (assumed), a pavement design life of 10 years, and placement quality control per the State of Georgia Department of Transportation (GDOT) Standard Specifications and the American Association of State Highway and Transportation Officials (AASHTO) criteria. The following traffic conditions were used for the pavement design:

Standard duty pavement areas – Standard duty pavement areas are intended for car traffic only and no delivery trucks. The following table summarizes the results of our standard duty pavement thickness design:

STANDARD DUTY		
COMPONENT	**OPTION 1 (inches)**	**OPTION 2 (inches)**
Asphalt Surface Course (9.5 mm Superpave)	1.25	1.5
Asphalt Binder Course (19 mm Superpave)	1.75	--
Asphalt Binder Course (12.5 mm Superpave)	--	1.5
Graded Aggregate Base (GAB)	6.0	6.0

Heavy-duty pavement areas

Heavy-duty pavement areas are intended to receive delivery truck traffic. We estimate that the restaurant will receive no more than 10 truck trips per day. The following table summarizes the results of our heavy-duty pavement thickness design:

HEAVY DUTY		
COMPONENT	**ASPHALT (inches)**	**CONCRETE (inches)**
Asphalt Surface Course (9.5 mm Superpave)	1.5	--
Asphalt Binder Course (19 mm Superpave)	2.0	--
Concrete	--	6.0
Graded Aggregate Base (GAB)	8.0	6.0

If pavement areas are subjected to heavier loading conditions than those assumed, a pavement re-evaluation will be required. The flexible pavement sections recommended above may not be suitable for the support of heavy concentrated static or wheel loads and/or dynamic (impact) loading conditions. Thus, heavy-duty concrete pavement is recommended in dumpster areas and any other areas where repetitive truck turning and stopping is anticipated.

The following materials may be used for all of the above pavement sections:

- Asphaltic Concrete Wearing Surface, 9.5 mm Superpave (Type II), Section 828
- Asphaltic Concrete Binder, 19 mm Superpave, Section 828
- Asphaltic Concrete Binder, 12.5 mm Superpave, Section 828
- Crushed Stone Graded Aggregate Base Course, Section 815
- Portland Cement Concrete Pavement, Section 430

The referenced specifications are from the State of Georgia Standard Specifications Construction of Transportation Systems, 2013 Edition.

The compaction, quality and gradation of the GAB crushed stone base will directly affect the quality and life of the pavement section. Consequently, we recommend a minimum compaction of 98 percent of the maximum dry density for the GAB crushed stone material as determined by either the modified Proctor compaction test (ASTM D 1557, Method D) or the Modified AASHTO (T-180).

A geotechnical testing firm should observe placement and compaction of the base course material and perform density tests to confirm that the material has been placed in accordance with our recommendations. GAB materials should extend at least 2 feet horizontally beyond the planned pavement edges.

Concrete pavement should have the minimum thickness listed above. The concrete pavement should have a minimum 28-day compressive strength of 4,000 pounds per square inch (psi) with a modulus rupture of 600 psi. Placing a crushed stone base course beneath the concrete pavement will prevent the pumping of the soil fines through the construction joints.

In addition, the quality and life of the pavement is also contingent upon periodic inspection and maintenance. Over time, cracks may form within the pavement. The cracks should be filled or patched in order to prevent water infiltration into the underlying base material and soil subgrade.

Contour recommends that positive drainage should be maintained to prevent the ponding of water. We also recommend that measures be taken to contain water from irrigation system to within landscape islands. Water infiltration into the underlying soil subgrade will reduce the soil's bearing capacity and result in pavement failure

6.6 Seismic Recommendations

Based on the 2018 International Building Code (IBC), published information, boring data, and the geological features of the Piedmont Physiographic Province of Georgia, it is our opinion that the Seismic Site Classification for the project is "D". The soil profile named "Stiff Soil Profile" was determined from Chapter 20 of ASCE-7.

7.0 QUALIFICATION OF RECOMMENDATIONS

This report has been prepared based on currently accepted geotechnical engineering principles and practices in the local area for the specific application of this project.

The analyses and recommendations presented in this report are based upon preliminary information and our understanding of the Site and the data obtained from our field exploration. If there are any revisions to the plans for this project, we should be permitted to determine if the recommendations must be modified. The nature and extent of variations between borings will not be evident until the course of construction. If such variations become evident, it may be necessary to submit supplementary recommendations.

Regardless of the thoroughness of a geotechnical study, there is always a possibility that subsurface conditions will be different from those at the boring locations; that conditions will not be as anticipated by the designers or contractors; or that the construction process will alter soil conditions. Therefore, the geotechnical engineer’s representative should observe and confirm that the conditions indicated by the geotechnical exploration actually exist.

Once final design plans and specifications are complete, and loading criterion for the proposed building has been determined, we recommend that Contour Engineering, LLC be provided the opportunity to review the final design and specifications in order that earthwork and foundation recommendations are properly interpreted and implemented.

This report and all of the contents herein are issued exclusively for use by R. H. Ledbetter Properties, LLC. No other person or entity may rely on this report without written authorization from Contour Engineering, LLC. Any use, reliance on, or decisions to be made based on this report by a third party are the responsibilities of such third parties.

APPENDIX

Figure 1 – Site Vicinity Plan
Figure 2 – Aerial View of Site
Figure 3 – Boring Location Plan
Subsurface Profile Plate
Boring Log Records (6)
Soil Classification Chart
Important Information about This Geotechnical-Engineering Report

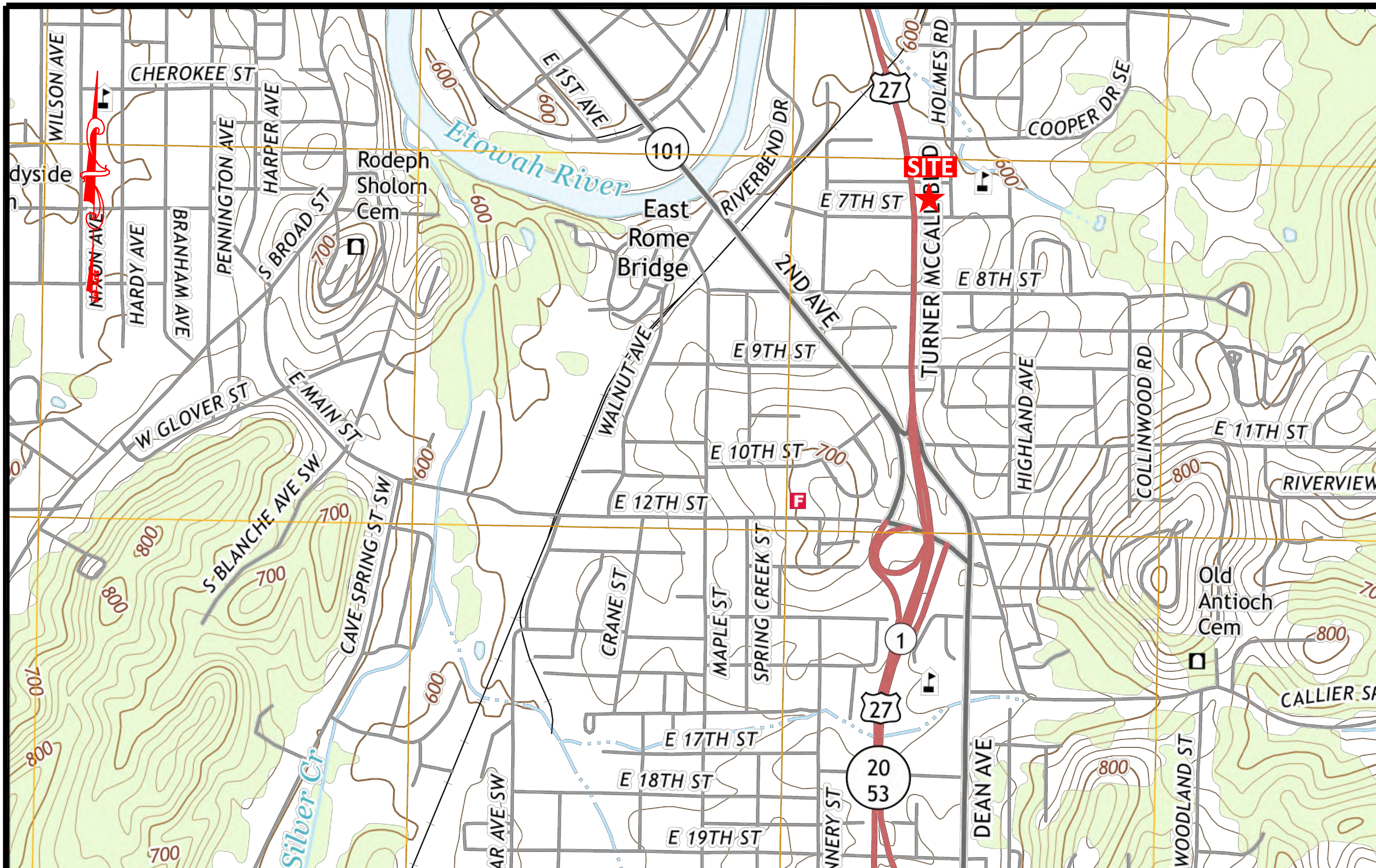

FIGURE 1: SITE VICINITY MAP

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LEGEND

Source: USGS Topographic Map - Rome South, GA Quadrangle

Scale: Not to Scale

PROJECT

Geotechnical Exploration

East Seventh Street Development

Rome, Floyd County, Georgia

Project No.: G21LED02

FIGURE 2: AERIAL VIEW OF SITE

CONTOUR ENGINEERING A Universal Engineering Sciences Company	**LEGEND** Scale: Not to Scale	**PROJECT** **Geotechnical Exploration** East Seventh Street Development Rome, Floyd County, Georgia Project No.: G21LED02

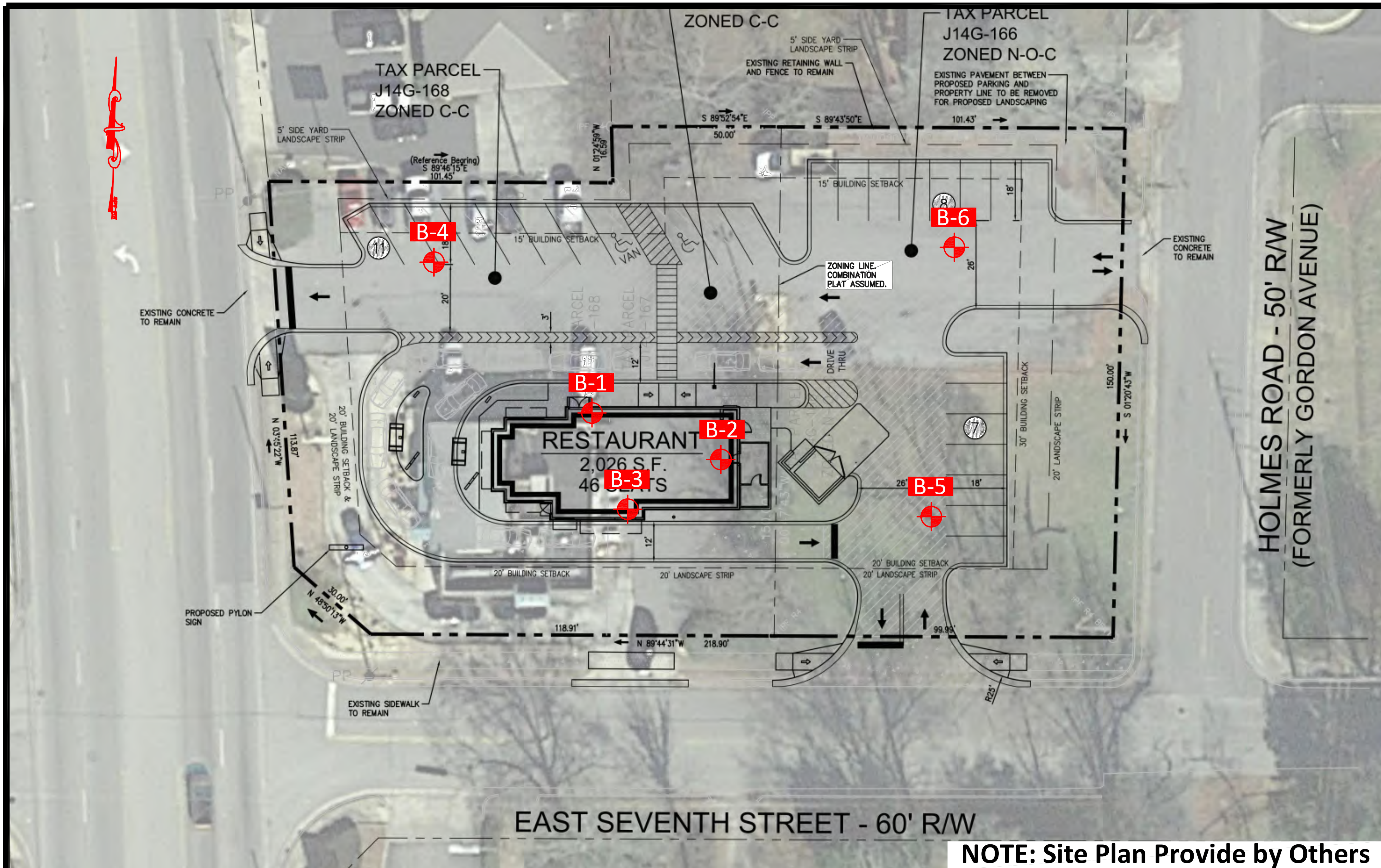

FIGURE 3: BORING LOCATION PLAN

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LEGEND

B-1 - Approximate Boring Locations

Scale: Not to Scale

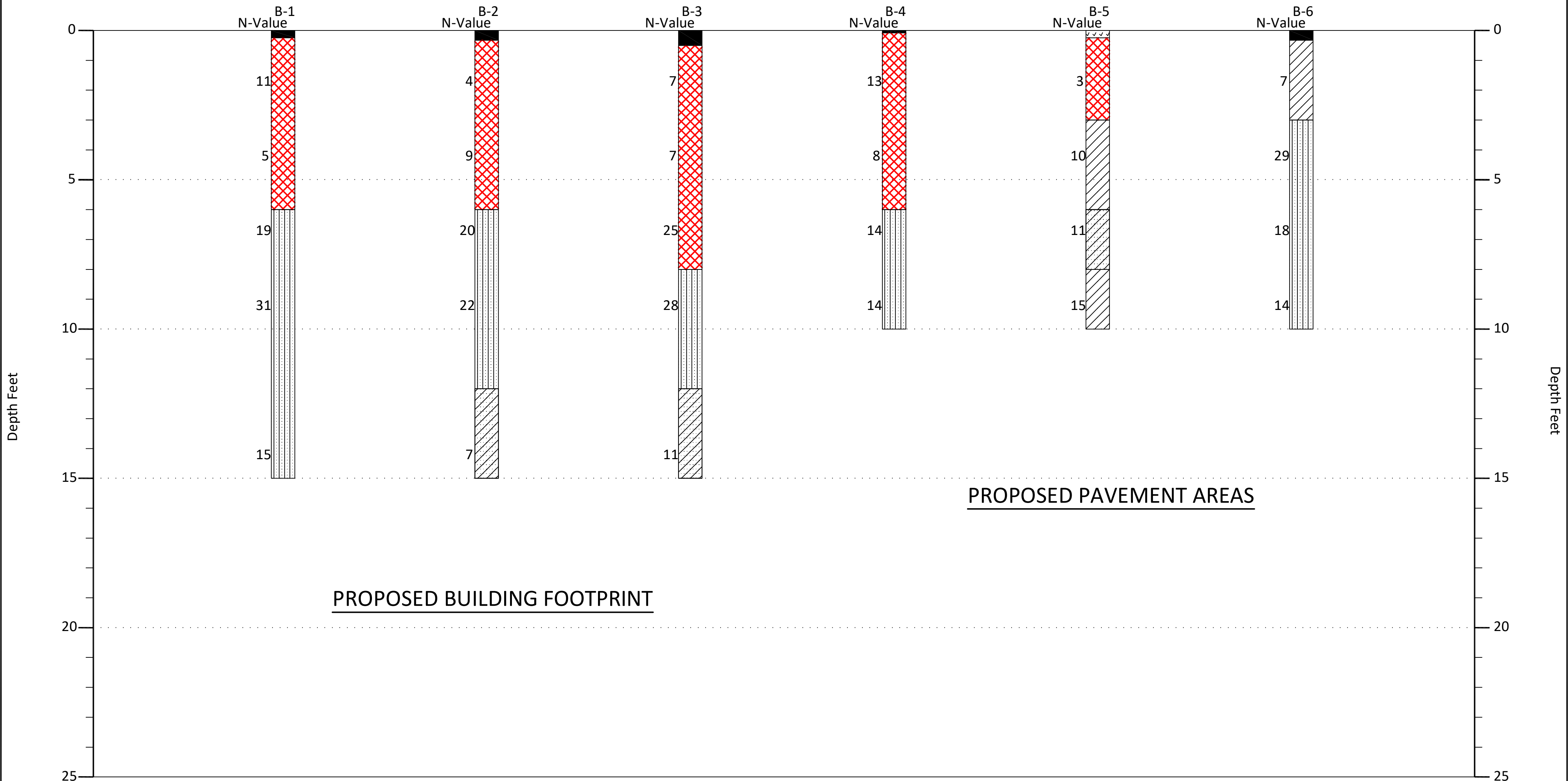
PROJECT

Geotechnical Exploration

East Seventh Street Development

Rome, Floyd County, Georgia

Project No.: G21LED02



LEGEND

- Topsoil
- Paving
- Fill Materials
- Silty Sand (SM)
- Sandy Clay (CL)
- Clayey Sand (SC)

NOTE: This profile is a visual representation of the soil test borings and does not represent actual horizontal alignment of the borings

Borehole	Boring Depth	Termination or Refusal
B-1	15	TERMINATED
B-2	15	TERMINATED
B-3	15	TERMINATED
B-4	10	TERMINATED
B-5	10	TERMINATED
B-6	10	TERMINATED

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SUBSURFACE PROFILE

East Seventh Street Development
Rome, Floyd County, GA

PROJECT #	DATE	PLATE
G21LED02	March 2021	1 of 1

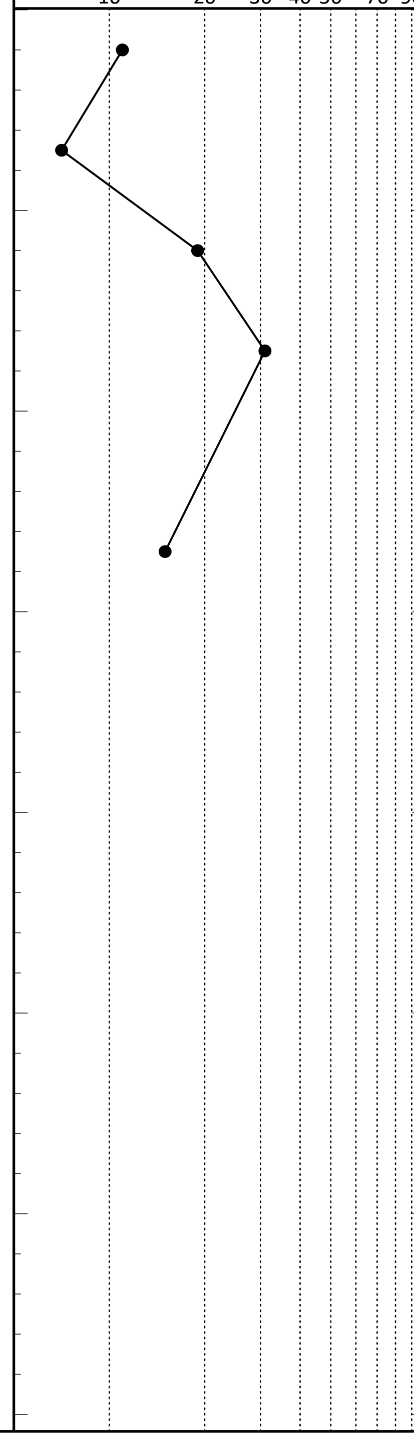
LOG OF BORING No. B-1

Page 1 of 1

PROJECT: East Seventh Street Development **PROJECT NO.:** G21LED02
CLIENT: R.H. Ledbetter Properties, LLC
PROJECT LOCATION: Rome, Floyd County, GA
ELEVATION: **LOGGED BY:** Will Hesterlee
DRILLING METHOD: Hollow Stem Auger **DATE:** 03/04/2021
GROUNDWATER DEPTH: INITIAL ▽ NE **24 HOURS:** ▼ **CAVE IN:** C

Depth (feet)	Elev. (feet)	Graphic	Description	Sample No.	Blow Counts
0	0.0'		ASPHALT: 3 Inches		
	-0.3'		0.3'		
			FILL: Medium dense, dark brown, silty SAND (SM), some clay, some rock fragments, some topsoil	1	3-5-6
5			Loose, clayey SAND (SC), trace rock fragments	2	2-2-3
	-6.0'		6.0'		
			RESIDUUM: Medium dense to dense, tan-orange-gray, silty SAND (SM), trace clay, some quartz fragments	3	5-7-12
10				4	9-12-19
			Medium dense, tan-orange-gray, silty SAND (SM), trace clay	5	5-6-9
15	-15.0'		Boring Terminated at 15 feet		
20					
25					
30					
35					

Plastic Limit |——| Liquid Limit
Percent Passing #200 Sieve - ▲
Moisture Content, % - ∗
SPT N-Value - ●



This information pertains only to this boring and should not be interpreted as being indicative of the site.

PROJECT: East Seventh Street Development **PROJECT NO.:** G21LED02

CLIENT: R.H. Ledbetter Properties, LLC

PROJECT LOCATION: Rome, Floyd County, GA

ELEVATION: **LOGGED BY:** Will Hesterlee

DRILLING METHOD: Hollow Stem Auger **DATE:** 03/04/2021

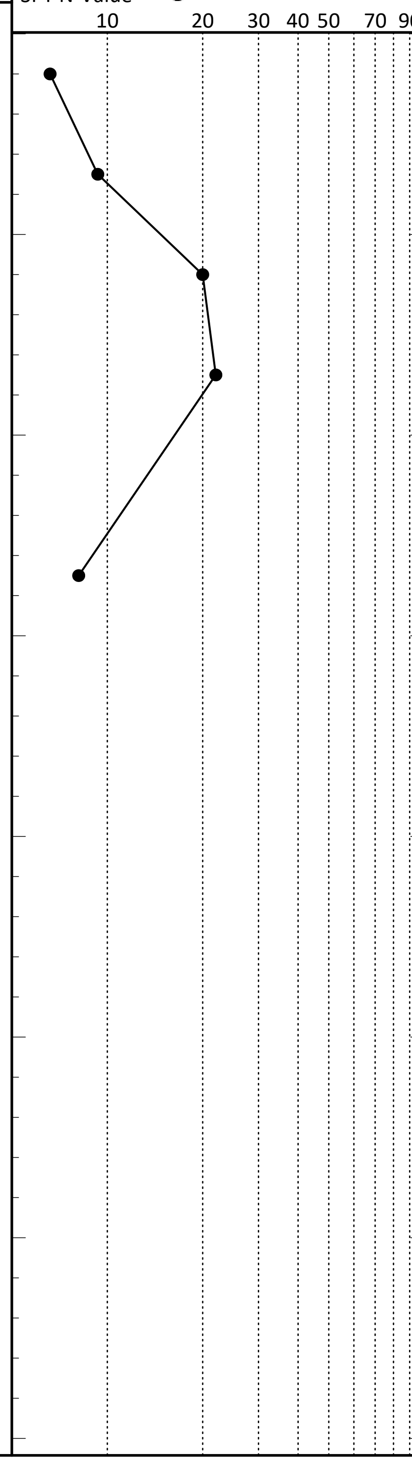
GROUNDWATER DEPTH: INITIAL NE **24 HOURS:** **CAVE IN:** C

LOG OF BORING No.

B-2

Depth (feet)	Elev. (feet)	Description	Sample No.	Blow Counts
0	0.0'	ASPHALT: 4 Inches		
0.3'	-0.3'	FILL: Very loose, dark brown, silty SAND (SM), with topsoil and organics	1	3-1-3
		Loose, brown-red, clayey SAND (SC), with rock fragments	2	3-4-5
6.0'	-6.0'	RESIDUUM: Medium dense, tan-brown, silty SAND (SM), trace clay	3	5-8-12
			4	2-10-12
12.0'	-12.0'	Loose, tan-brown, clayey SAND (SC)	5	3-3-4
15	-15.0'	Boring Terminated at 15 feet		

Plastic Limit ├──┤ Liquid Limit
Percent Passing #200 Sieve - ▲
Moisture Content, % - ∗
SPT N-Value - ●



This information pertains only to this boring and should not be interpreted as being indicative of the site.

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PROJECT: East Seventh Street Development **PROJECT NO.:** G21LED02

CLIENT: R.H. Ledbetter Properties, LLC

PROJECT LOCATION: Rome, Floyd County, GA

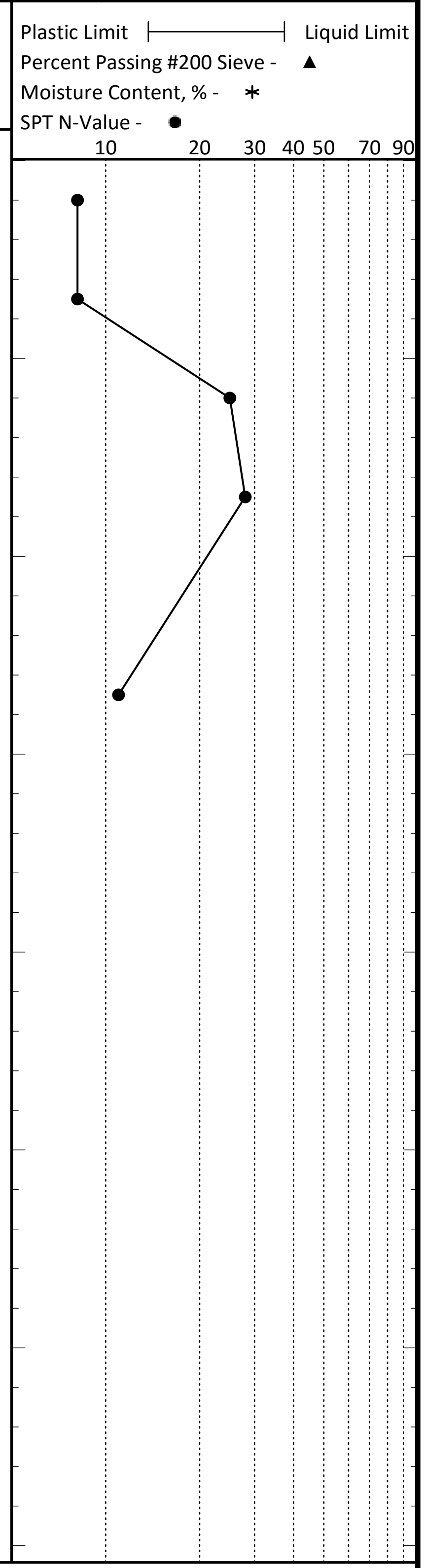
ELEVATION: **LOGGED BY:** Will Hesterlee

DRILLING METHOD: Hollow Stem Auger **DATE:** 03/04/2021

GROUNDWATER DEPTH: INITIAL NE **24 HOURS:** **CAVE IN:** C

LOG OF BORING No. B-3

Depth (feet)	Elev. (feet)	Description	Sample No.	Blow Counts
0	0.0'	ASPHALT: 6 Inches		
0.5'	-0.5'	FILL: Loose, dark brown, silty SAND (SM), trace clay, trace rock fragments, trace topsoil, with organics	1	4-3-4
		Loose to medium dense, brown-red, silty SAND (SM), with rock fragments	2	3-3-4
			3	7-12-13
8.0'	-8.0'	RESIDUUM: Medium dense, orange-brown-black, silty SAND (SM), trace clay, with rock fragments	4	9-14-14
12.0'	-12.0'	Medium dense, tan-brown, clayey SAND (SC)	5	5-5-6
15	-15.0'	Boring Terminated at 15 feet		



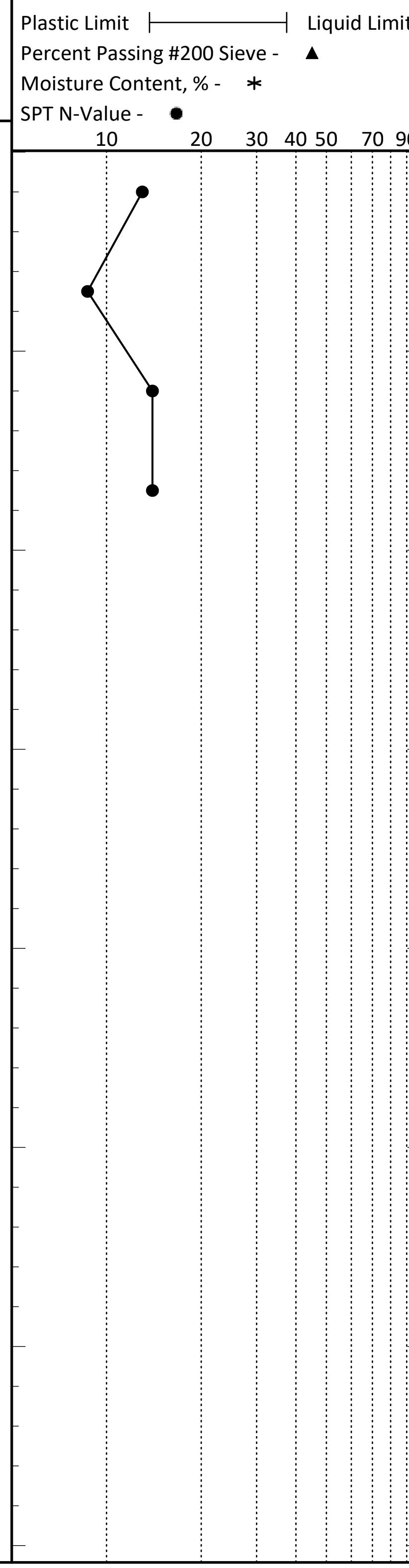
This information pertains only to this boring and should not be interpreted as being indicative of the site.

LOG OF BORING No. B-4

Page 1 of 1

PROJECT: East Seventh Street Development **PROJECT NO.:** G21LED02
CLIENT: R.H. Ledbetter Properties, LLC
PROJECT LOCATION: Rome, Floyd County, GA
ELEVATION: **LOGGED BY:** Will Hesterlee
DRILLING METHOD: Hollow Stem Auger **DATE:** 03/04/2021
GROUNDWATER DEPTH: INITIAL NE **24 HOURS:** **CAVE IN:** C

Depth (feet)	Elev. (feet)	Graphic	Description	Sample No.	Blow Counts
0	0.0' / -0.1'		ASPHALT: 1 Inch (0.1')		
			FILL: Medium dense, brown, silty SAND (SM), trace rock fragments, trace clay	1	6-5-8
			Loose, brown, silty SAND (SM), trace rock fragments, trace topsoil, low recovery	2	2-2-6
5	-6.0'		RESIDUUM: Medium dense, gray-tan, silty SAND (SM), trace to with rock fragments (6.0')	3	4-5-9
				4	4-5-9
10	-10.0'		Boring Terminated at 10 feet		
15					
20					
25					
30					
35					



This information pertains only to this boring and should not be interpreted as being indicative of the site.

PROJECT: East Seventh Street Development **PROJECT NO.:** G21LED02

CLIENT: R.H. Ledbetter Properties, LLC

PROJECT LOCATION: Rome, Floyd County, GA

ELEVATION: **LOGGED BY:** Will Hesterlee

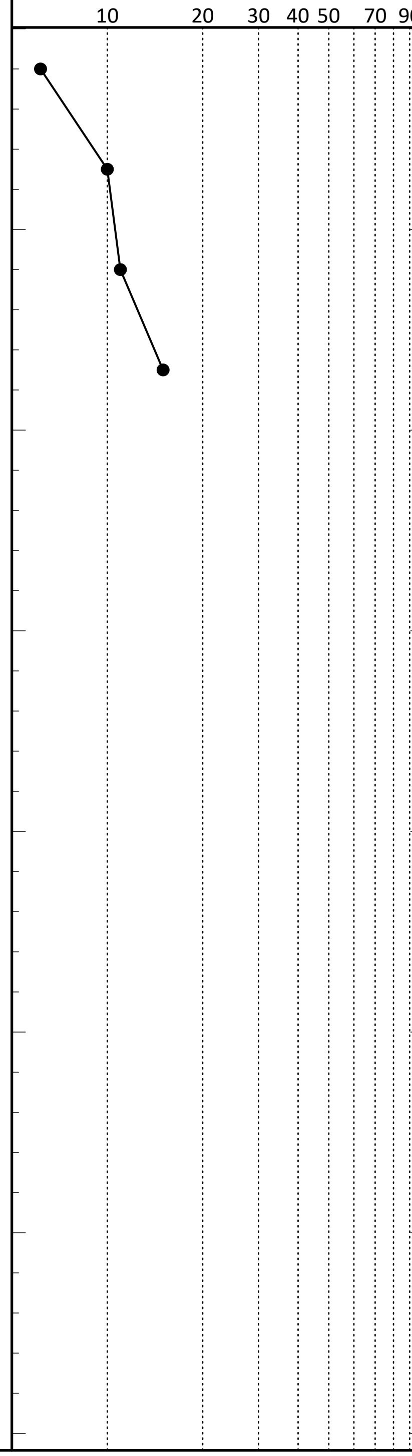
DRILLING METHOD: Hollow Stem Auger **DATE:** 03/04/2021

GROUNDWATER DEPTH: INITIAL NE **24 HOURS:** **CAVE IN:** C

LOG OF BORING No. B-5

Depth (feet)	Elev. (feet)	Description	Sample No.	Blow Counts
0	0.0' / -0.3'	TOPSOIL: 3 Inches		
0.3'		FILL: Very loose, brown, clayey SAND (SC)	1	2-2-1
3.0'	-3.0'	RESDIUUM: Stiff, tan-orange-gray, sandy CLAY (CL), trace rock fragments	2	4-4-6
6.0'	-6.0'	Medium dense, tan-orange-gray, clayey SAND (SC), trace rock fragments	3	4-5-6
8.0'	-8.0'	Stiff, tan-orange-gray, sandy CLAY (CL), trace rock fragments	4	7-6-9
10	-10.0'	Boring Terminated at 10 feet		

Plastic Limit ├──┤ Liquid Limit
Percent Passing #200 Sieve - ▲
Moisture Content, % - ∗
SPT N-Value - ●



This information pertains only to this boring and should not be interpreted as being indicative of the site.

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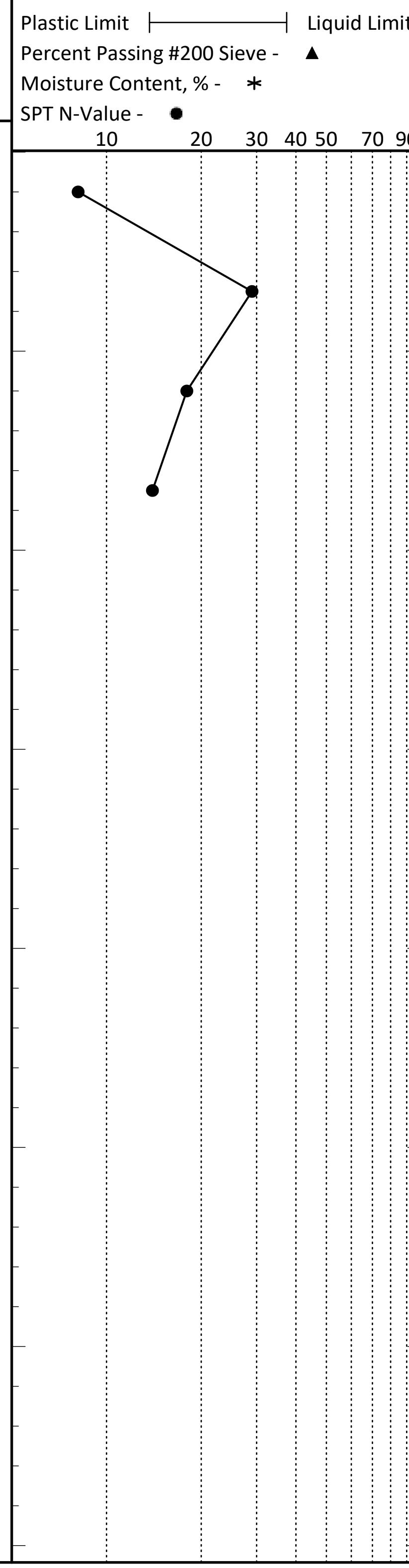
LOG OF BORING No. B-6

Page 1 of 1

PROJECT: East Seventh Street Development **PROJECT NO.:** G21LED02
CLIENT: R.H. Ledbetter Properties, LLC
PROJECT LOCATION: Rome, Floyd County, GA
ELEVATION: **LOGGED BY:** Will Hesterlee
DRILLING METHOD: Hollow Stem Auger **DATE:** 03/04/2021
GROUNDWATER DEPTH: INITIAL ∇ NE **24 HOURS:** ▼ **CAVE IN:** C 9 feet

Depth (feet)	Elev. (feet)	Description	Sample No.	Blow Counts
0	0.0' / -0.3'	ASPHALT: 4 Inches (0.3')		
		RESIDUUM: Firm, tan-orange-gray, silty CLAY (CL), trace rock fragments	1	2-3-4
	-3.0'	Medium dense, black-tan-brown, silty SAND (SM), with some rock fragments (3.0')	2	4-12-17
5			3	7-10-8
		Medium dense, tan-brown, silty SAND (SM), trace rock fragments	4	5-6-8
10	-10.0'	Boring Terminated at 10 feet		
15				
20				
25				
30				
35				



This information pertains only to this boring and should not be interpreted as being indicative of the site.

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SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		(LITTLE OR NO FINES)		GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
		(APPRECIABLE AMOUNT OF FINES)		GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	SAND AND SANDY SOILS	CLEAN SANDS		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		(LITTLE OR NO FINES)		SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	SANDS WITH FINES		SM	SILTY SANDS, SAND - SILT MIXTURES
		(APPRECIABLE AMOUNT OF FINES)		SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

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Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, clients can benefit from a lowered exposure to the subsurface problems that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed below, contact your GBA-member geotechnical engineer. Active involvement in the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Geotechnical-Engineering Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. *Those who rely on a geotechnical-engineering report prepared for a different client can be seriously misled.* No one except authorized client representatives should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one – not even you – should apply this report for any purpose or project except the one originally contemplated.*

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read it *in its entirety*. Do not rely on an executive summary. Do not read selected elements only. *Read this report in full.*

You Need to Inform Your Geotechnical Engineer about Change

Your geotechnical engineer considered unique, project-specific factors when designing the study behind this report and developing the confirmation-dependent recommendations the report conveys. A few typical factors include:

- the client's goals, objectives, budget, schedule, and risk-management preferences;
- the general nature of the structure involved, its size, configuration, and performance criteria;
- the structure's location and orientation on the site; and
- other planned or existing site improvements, such as retaining walls, access roads, parking lots, and underground utilities.

Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.*

This Report May Not Be Reliable

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, that it could be unwise to rely on a geotechnical-engineering report whose reliability may have been affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If your geotechnical engineer has not indicated an "apply-by" date on the report, ask what it should be*, and, in general, *if you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying it. A minor amount of additional testing or analysis – if any is required at all – could prevent major problems.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface through various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing were performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgment to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team from project start to project finish, so the individual can provide informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, *they are not final*, because the geotechnical engineer who developed them relied heavily on judgment and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* revealed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a full-time member of the design team, to:

- confer with other design-team members,
- help develop specifications,
- review pertinent elements of other design professionals' plans and specifications, and
- be on hand quickly whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction observation.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for informational purposes only*. To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report, but they may rely on the factual data relative to the specific times, locations, and depths/elevations referenced. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely*. Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures*. If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. As a general rule, *do not rely on an environmental report prepared for a different client, site, or project, or that is more than six months old.*

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, none of the engineer's services were designed, conducted, or intended to prevent uncontrolled migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration.*** Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

Telephone: 301/565-2733
e-mail: info@geoprofessional.org www.geoprofessional.org