REPORT OF
SUPPLEMENTAL SUBSURFACE EXPLORATION

YORK COUNTY FAMILY COURT
ROCK HILL, SOUTH CAROLINA

ECS PROJECT NO. 08-11615-D
JANUARY 13, 2017
REVISED FEBRUARY 8, 2017

REPORT OF SUPPLEMENTAL SUBSURFACE EXPLORATION

York County Family Court
Rock Hill, South Carolina

Prepared For:

York County
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ECS Project No:

08-11615-D

Report Date:

January 13, 2017
Revised February 8, 2017

ECS SOUTHEAST, LLP

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January 13, 2017
Revised February 8, 2017

Ms. Lisa Hagood
York County Engineering
6 South Congress Street
York, South Carolina 29745

Reference: Report of Supplemental Subsurface Exploration
York County Family Court
Rock Hill, South Carolina
ECS Project No: 08-11615-D

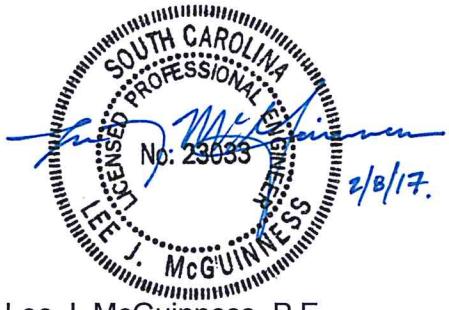
Dear Ms. Hagood:

ECS Southeast, LLP (ECS) has completed the supplemental subsurface exploration for the above referenced project. This project was authorized and performed in general accordance with ECS Proposal No. 08-20420P dated December 12, 2016. This supplemental report presents our findings, conclusions, and recommendations for design and construction of the project.

ECS Southeast, LLP appreciates the opportunity to assist you during this phase of the project. If you have questions concerning this report, please contact our office.

Respectfully,

ECS SOUTHEAST, LLP



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1. INTRODUCTION

1.1. Project Information

The site is located southwest of the intersection of West Main Street and Colby Avenue in Rock Hill, South Carolina as shown on the Site Vicinity Map (Figure 1) included in the Appendix. The site is currently undeveloped and heavily wooded. We understand the site will include the construction of a new 4 story family court building with associated parking/drive areas. We understand that a partial basement is planned for the southern portion of the structure.

Based on the topographical map provided, the site appears to generally slope downwards from the north to the south. Ground surface elevations in the vicinity of the structure generally range from approximately 615 feet to 622 feet for a relief of approximately 7 feet. The first floor Finish Floor elevation (FFE) is currently planned at 626 feet. The basement FFE is currently planned for 614 feet. Therefore, we anticipate maximum cut and fill depths will be on the order of 3 feet and 12 feet below existing grades.

Construction methodology has not been provided to us at this time; however, the structure will be 4 stories. Structural loading was provided by Moseley Architects. We anticipate that maximum column and wall footing loads will not exceed 300 kips and 4 kips per linear foot, respectively. No other information was provided to us at the time of this proposal.

ECS has previously performed a Preliminary Subsurface Exploration at the site. Please refer to our report titled “Report of Preliminary Exploration, York County Potential Sites – Family Court (Parcel 2)” dated April 15, 2016 for more information regarding the site.

Should any of this information be incorrect or if additional information becomes available, ECS should be provided the opportunity to review our recommendations with regards to the new information and recommend additional exploration as deemed necessary for the proposed construction.

1.2. Scope of Services

Our scope of services for this phase of the project included a supplemental subsurface exploration with soil test borings and preparation of this report with our recommendations. Twenty-five (25) soil test borings (B-1 through B-25) were drilled during the preliminary exploration as well as six (6) additional borings (B-101 through B-106) were drilled during this supplemental exploration. The borings were drilled to depths ranging from approximately 10 to 25 feet below existing grades. Approximate boring locations are shown on the Test Location Diagram (Figure 2) included in the Appendix. The soil borings were performed using an ATV-mounted drill rig using continuous-flight, hollow-stem augers.

2. FIELD SERVICES

2.1. Test Locations

The soil boring locations and depths were provided to us by York County. The borings were then located in the field by ECS using GPS and existing landmarks as reference. The approximate test locations are shown on the Boring Location Diagram (Figure 2) presented in the Appendix of this report. At the completion of preliminary soil boring testing (Borings B-1 through B-25), the owner contracted a surveyor to provide the northing, easting, and collar elevations of each boring location. These coordinates and elevations are presented on the

borelogs. ECS has provided the approximate elevations of the supplemental borings based on the provided topographic survey. Surveying the boring locations was beyond our scope of services.

2.2. Soil Test Borings

A total of thirty-one (31) preliminary and supplemental soil test borings were drilled to evaluate the stratification and engineering properties of the subsurface soils. Standard Penetration Tests (SPT's) were performed at designated intervals in general accordance with ASTM D 1586. The Standard Penetration Test is used to provide an index for estimating soil strength and density. In conjunction with the penetration testing, split-barrel soil samples were recovered for soil classification at each test interval. Boring Logs are included in the Appendix.

The drill crew also maintained a field log of the soils encountered at each of the boring locations. After recovery, each sample was removed from the auger and visually classified. Representative portions of each sample were then sealed and brought to our laboratory in Charlotte, North Carolina for further visual examination and potential lab testing. Groundwater measurements were attempted at the termination of drilling at each boring location.

3. LABORATORY SERVICES

Soil samples were collected from the borings and examined in our laboratory to check field classifications and to determine pertinent engineering properties. Data obtained from the borings, laboratory testing, and our visual/manual examinations are included on the respective boring logs in the Appendix.

3.1. Soil Classification

A geotechnical staff professional classified each soil sample on the basis of color, texture, and plasticity characteristics in general accordance with the Unified Soil Classification System (USCS). The geotechnical professional then grouped the various soil types into the major zones noted on the boring logs. The stratification lines designating the interfaces between earth materials on the boring logs and profiles are approximate; in situ, the transition between strata may be gradual in both the vertical and horizontal directions. No laboratory testing services were proposed for this phase of the investigation. The results of the visual classifications are presented on the Boring Logs included in the Appendix.

3.2. Laboratory Testing

In addition to visual classification, ECS performed twelve (12) natural moisture content tests, two (2) Atterberg Limits tests, and two (2) percent fines tests on selected soil samples obtained from within the preliminary borings. The laboratory testing was performed in general accordance with the applicable ASTM standards. The results of the laboratory testing are presented on the respective Boring Logs included in the Appendix.

4. SITE AND SUBSURFACE FINDINGS

4.1. Area Geology

The site is located in the Piedmont Physiographic Province of South Carolina. The native soils in the Piedmont Province consist mainly of residuum with underlying saprolites weathered from the parent bedrock, which can be found in both weathered and unweathered states. Although the surficial materials normally retain the structure of the original parent bedrock, they typically

have a much lower density and exhibit strengths and other engineering properties typical of soil. In a mature weathering profile of the Piedmont Province, the soils are generally found to be finer grained at the surface where more extensive weathering has occurred. The particle size of the soils generally becomes more granular with increasing depth and gradually changes first to weathered and finally to unweathered parent bedrock. The mineral composition of the parent rock and the environment in which weathering occurs largely control the resulting soil's engineering characteristics. The residual soils are the product of the weathering of the parent bedrock.

4.2. Subsurface Conditions

The subsurface conditions at the site, as indicated by the borings, generally consisted of residual soils, partially weathered rock (PWR), and auger refusal materials to the depths explored. The generalized subsurface conditions are described below. For soil stratification at a particular test location, the respective Boring Log found in the Appendix should be reviewed.

A layer of topsoil (organic laden soils), approximately 2 to 6 inches thick, was encountered at the ground surface at each boring location with the exception of Boring B-106. Approximately 1.5 inches of asphalt underlain by approximately 2 inches of gravel was encountered at the ground surface at Boring B-106. However, these values are driller reported and should not be used in determining topsoil removal quantities.

Residual soils were encountered below the surficial materials at each boring location. Residual soils are formed by the in-place chemical and mechanical weathering of the parent bedrock. The residual soils encountered in the borings generally consisted of Sandy Fat CLAY (CH), Sandy CLAY (CL), Elastic SILT (MH), Sandy SILT (ML) and Silty SAND (SM) exhibiting SPT N-values ranging from 3 to 82 blows per foot (bpf), with a majority of the N-values ranging between 9 and 24 bpf.

Partially weathered rock (PWR) was encountered beneath the residual soils at Borings B-11 and B-20 through B-24. The top of PWR was encountered at depths ranging from approximately 12 to 22 feet below existing grades. PWR is defined as residual material exhibiting SPT N-values greater than 100 bpf. The PWR encountered consisted of Silty SAND (SM) exhibiting SPT N-values ranging from 50 blows per 5 inches of penetration to 50 blows per 0 inches of penetration.

Auger refusal was encountered at Borings B-11 and B-20 through B-24 at depths ranging from approximately 15 to 24.3 feet below the existing ground surface. Auger refusal indicates the presence of material that permitted no further advancement of the hollow stem auger or split spoon sampler. Rock coring would have been required to evaluate the character and continuity of the refusal materials; however, rock coring was beyond the scope of this exploration.

4.3. Groundwater Observations

Groundwater measurements were attempted at the termination of drilling at the time of our exploration. Groundwater was encountered at Borings B-8 through B-10, B-12 through B-21, B-23 through B-25, B-101, and B-106 at depths ranging from approximately 6 to 24 feet below the existing ground surface. The remaining boreholes were dry at the time of our exploration. Borehole cave-in depths were observed at each boring location at depths ranging from 8.5 to 22.6 feet below the existing ground surface. Cave-in of a soil test boring can be caused by groundwater hydrostatic pressure, weak soil layers, and/or drilling activities (i.e. drilling fluid circulation or advancement of bit).

Fluctuations in the groundwater elevation should be expected depending on precipitation, run-off, utility leaks, and other factors not evident at the time of our evaluation. Normally, highest groundwater levels occur in late winter and spring and the lowest levels occur in late summer and fall. Depending on time of construction, groundwater may be encountered at shallower depths and locations not explored during this study. If encountered during construction, engineering personnel from our office should be notified immediately.

4.4. Laboratory Test Results

Moisture content test results of the sampled soils range from 18.5 to 31.5 percent. Atterberg Limits were performed on selected soil samples from Borings B-6 and B-20 resulting in a Liquid Limit (LL) ranging from 51 to 70 and a Plasticity Index (PI) ranging from 24 to 32. The portion of the samples tested was USCS classified as Elastic SILT (MH) and Fat CLAY (CH). For laboratory test results at a particular test location, the Laboratory Test Summary sheet found in the Appendix should be reviewed.

5. CONCLUSIONS AND RECOMMENDATIONS

The preliminary and supplemental borings performed at this site represent the subsurface conditions at the location of the borings. Due to inconsistencies associated with the prevailing geology, there can be changes in the subsurface conditions over relatively short distances that have not been disclosed by the results of the test location performed. Consequently, there may be undisclosed subsurface conditions that require special treatment or additional preparation once these conditions are revealed during construction.

Our evaluation of subgrade conditions has been based on our understanding of the site, project information and the data obtained in our exploration. The general subsurface conditions utilized in our foundation evaluation have been based on interpolation of subsurface data between and away from the borings. In evaluating the boring data, we have examined previous correlations between penetration resistance values and foundation bearing pressures observed in soil conditions similar to those at your site.

5.1. Organic Laden Soils

A layer of organic laden soil, approximately 2 to 6 inches thick, was encountered at the ground surface at each boring location. Please note that the recorded topsoil depths noted on the boring logs are driller reported and should not be used in cost estimating topsoil removal.

The surficial organic laden soil is typically a dark-colored soil material containing roots, fibrous matter, and/or other organic components, and is generally unsuitable for support of engineering fill, foundations, or slabs-on-grade. ECS has not performed laboratory testing to determine the organic content or other horticultural properties of the organic laden soils at the site. Therefore, the phrase “organic laden soil” is not intended to indicate suitability for landscaping and/or other purposes. Please note that the transition from organic laden soils to underlying materials may be gradual. Actual organic laden soil depths should be expected to vary and generally increases with the amount of vegetation present over the site.

5.2. Moisture Sensitive Soils (MH and CH)

Elastic SILTS (MH) were encountered at Borings B-1 through B-20, B-22 through B-24, and B-101 through B-106 and Fat CLAYS (CH) were encountered at Boring B-20 and extended to depths ranging from approximately 3 to 17 feet below existing ground surface. Soils classified as

MH/CH are fine-grained and have a Liquid Limit greater than 50 percent. Additionally, MH/CH soils are moisture sensitive soils and tend to shrink and swell with moisture variations.

Please note that the soils encountered were classified using the visual/manual method of classification with limited laboratory testing. However, the laboratory testing performed indicated Plasticity Indices of (PI's) of 32 and 24. Therefore, we anticipate the potential for shrink and swell of the on-site MH/CH soils is moderate to high.

MH soils with a plasticity index greater than 30 or CH soils should not be used for direct support of foundations, slabs-on-grade, or pavements. MH soils with PI's greater than 30 or CH soils encountered within proposed structural areas should be undercut and replaced with low plasticity engineered fill to a minimum depth of 2 feet below foundations and 2 feet below subgrade elevations in slab and pavement areas. Upon completion of the removal of the moisture sensitive soils, the resulting subgrade soils should be evaluated for stability prior to placement of engineered fill.

If encountered in proposed fill areas, MH/CH soils within the building footprint or parking/drive areas that will receive 2 feet or more of engineered fill may be left in place provided these soils are stable and can pass a proofroll. The quality of the subgrade soils should be evaluated by the geotechnical engineer on a case-by-case basis in order to evaluate the need for remediation. Remediation methods may include shallow isolated undercutting and/or the use of geotextiles.

5.3. Seismic Site Classification

The International Building Code (IBC) requires that the stiffness of the top 100-ft of soil profile be evaluated in determining a site seismic classification. The method for determining the Site Class is presented in Section 1615 of the code. The seismic Site Class is typically determined by calculating a weighted average of the N-values or shear wave velocities recorded to a depth of 100 feet within the proposed building footprint. Based on the SPT N-values obtained within the drilled depth of borings, a seismic site class of "D" is considered appropriate for this project.

5.4. Structure Foundations

A shallow foundation system consisting of spread footings may be appropriate to support the proposed buildings. Provided the recommendations outlined herein are implemented, a net allowable soil bearing pressure up to 2,500 psf for foundations bearing on firm undisturbed low plasticity residual soil or newly-placed engineered fill is feasible.

As previously mentioned, MH soils with a plasticity index greater than 30 and CH soils should not be used for direct support of foundations or slabs-on-grade. These soils, if encountered, should be undercut and replaced with approved engineered fill to a minimum depth of 2 feet below foundations provided that the resulting subgrade is stable.

For this type of project, minimum wall and column footing dimensions of 18 and 24 inches, respectively, should be maintained to reduce the possibility of a localized, "punching" type, shear failure. Exterior foundations and foundations in unheated areas should be embedded deep enough below exterior grades to reduce potential movements from frost action or excessive drying shrinkage. For this region, we recommend footings bear at least 18 inches below finished grade.

Total settlement is anticipated to be less than 1 inch, while differential settlement between columns is anticipated to be less than ½ inch for shallow foundations bearing on low plasticity residual soil or newly-placed structural fill. Foundation geometry, loading conditions, and/or bearing strata different than those described in this report may result in magnitudes of settlement inconsistent with the previous estimates.

5.5. Slab on Grade Support

Slabs-on-grade can be adequately supported on undisturbed residual soils or on new properly placed structural fill provided the site preparation and fill recommendations outlined herein are implemented. For a properly prepared site, a modulus of subgrade reaction (k_s) for the soil of 90 pounds per cubic inch for the soil can be used. This value is representative of a 1-ft square loaded area and may need to be adjusted depending on the size and shape of the loaded area and depending on the method of structural analysis.

MH soils (PI's greater than 30) and CH soils should not be used for direct support of slabs-on-grade. MH soils (PI's greater than 30) and CH soils encountered should be undercut and replaced with approved engineered fill to a minimum depth of 2 feet below slabs-on-grade provided that the resulting subgrade is stable.

ECS recommends that the slab be isolated from the footings so differential settlement of the structure will not induce shear stresses on the floor slab. We also recommend the slab-on-grade be underlain by a minimum of 4 inches of granular material having a maximum aggregate size of 1½ inches and no more than 2 percent fines. Prior to placing the granular material, the floor subgrade soil should be properly compacted, proofrolled, and free of standing water, mud, and frozen soil. A properly designed and constructed capillary break layer can often eliminate the need for a moisture retarder and can assist in more uniform curing of concrete. If a vapor retarder is considered to provide additional moisture protection, special attention should be given to the surface curing of the slabs to minimize uneven drying of the slabs and associated cracking and/or slab curling. The use of a blotter or cushion layer above the vapor retarder can also be considered for project specific reasons.

Please refer to ACI 302.1R04 Guide for Concrete Floor and Slab Construction and ASTM E 1643 Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs for additional guidance on this issue.

Also, in order to minimize the crack width of shrinkage cracks that may develop near the surface of the slab, we recommend mesh reinforcement as a minimum be included in the design of the floor slab. For maximum effectiveness, temperature and shrinkage reinforcements in slab-on-grade should be positioned in the upper third of the slab thickness. The Wire Reinforcement Institute recommends the mesh reinforcement be placed 2 inches below the slab surface or upper one-third of slab thickness, whichever is closer to the surface.

Adequate construction joints, contraction joints and isolation joints should also be provided in the slab to reduce the impacts of cracking and shrinkage. Please refer to ACI 302.1R04 Guide for Concrete Floor and Slab Construction for additional information regarding concrete slab joint design.

5.6. Lateral Earth Pressures

ECS understands that basement walls will likely be used for the building. Specifics regarding the below grade walls (i.e. location, height, length, loading, etc.) were unknown at the time of this report. Retaining walls should be designed to withstand the lateral earth pressures exerted upon them, and to resist additional lateral pressures generated by surcharge loads such as traffic loads, adjacent slab loads or from foundations bearing behind the walls.

For wall conditions where wall movement cannot be tolerated or where the wall is restrained at the top, such as the loading dock walls, the "At Rest" earth pressure should be used. For wall conditions where outward wall movement on the order of 0.5 percent of the wall height can be tolerated, the "Active" earth pressure should be used. In the design of loading dock walls to restrain compacted backfill, engineered fill or in-situ residual soils, the coefficient of lateral earth pressure can be used to determine lateral earth pressure loads. Please note that the values presented below are for on-site ML and SM materials. If the wall backfill is imported to the site, ECS should be contacted to review the lateral earth pressure coefficients provided. *Moderately to highly elastic/plastic soils (CL, MH, and CH) should not be utilized behind earth retaining structures.*

Soil Parameter	Coefficient of Lateral Earth Pressure
"At Rest" Earth Pressure (K_o)	0.56
"Active" Earth Pressure (K_a)	0.39
"Passive" Earth Pressure (K_p)	2.56

The lateral earth pressure values presented above assume level backfill fill behind the wall, and do not account for hydrostatic pressures against the walls or surcharge loads from overlying or nearby construction.

Resistance to sliding can be provided by friction between the bottom of the wall foundation and the underlying soils and by passive resistance of soil adjacent to the wall foundation. The passive resistance should only be used in situations where the soil adjacent to the toe of the wall will not be eroded or otherwise removed in the future. A coefficient of friction of 0.35 for concrete bearing on approved soils is recommended.

Drainage behind freestanding retaining walls is considered essential towards relieving hydrostatic pressures. Drainage can be established by providing a perimeter drainage system located just above the below grade/retaining wall footings which discharges by gravity flow to a suitable outlet. This system should consist of "perforated pipe" or "porous wall", closed-joint drain lines. These drain lines should be surrounded by a minimum 6 inches of free-draining, granular filter material having a gradation compatible with the size of the openings utilized in the drain lines and the surrounding soils to be retained, or by gravel wrapped in filter fabric. The space between the interior face of the wall and the earth fill should be backfilled with a granular fill of porous quality or better extending from the perimeter drainage system to just below the top of the wall. To prevent frost heave effects from acting against these walls, the granular backfill should extend a minimum of 12 horizontal inches behind the wall. The granular backfill should be capped with pavement, concrete, or a 12-inch layer of low permeable silt or clay to minimize the seepage of water into that backfill from the surface. The ground surface adjacent to the below-grade walls should be kept properly graded to prevent ponding of water adjacent to the walls.

5.7. Pavement Considerations

For the design and construction of exterior pavements, the subgrades should be prepared in accordance with the recommendations in the "Site and Subgrade Preparation" and "Engineered Fill" sections of this report.

As previously discussed, MH soils (PI's greater than 30) and CH soils should not be used for direct support of pavements. MH soils (PI's greater than 30) and CH soils encountered should be undercut and replaced with approved engineered fill to a minimum depth of 2 feet below pavements provided that the resulting subgrade is stable.

An important consideration with the design and construction of pavements is surface and subsurface drainage. Where standing water develops, either on the pavement surface or within the aggregate base course layer, softening of the subgrades and other problems related to the deterioration of the pavement can be expected. Furthermore, good drainage should help reduce the possibility of the subgrade materials becoming saturated during the normal service period of the pavement.

Based on our past experience with similar facilities and subsurface conditions, we present the following design pavement sections, provided the recommendations contained in this report are implemented. We have developed the pavement sections recommended below using AASHTO guidelines with an assumed CBR value of 4, which is typical of the on-site soils encountered. The provided pavement sections assume the existing subgrades are satisfactorily evaluated during proofroll and repaired in accordance with the geotechnical engineer's recommendations. Based upon our previous experience with similar projects, ECS has estimated the provided pavement sections based upon a 20 year life, with equivalent single axle loadings of approximately 20,000 and 100,000 ESALs for light-duty and heavy-duty pavements, respectively.

PAVEMENT SECTION RECOMMENDATIONS

Material Designation	Light Duty Asphalt Pavement	Heavy Duty Asphalt Pavement	Portland Cement Concrete (PCC) Pavement
Asphalt Surface Course (Type C)	3 inches	1.5 inches	-
Binder/Intermediate Course (Type C)	-	2.5 inches	-
Portland Cement Concrete	-	-	6 inches
Aggregate Base Course	6 inches	8 inches	6 inches

ECS should be allowed to review these recommendations and make appropriate revisions based upon the formulation of the final traffic design criteria for the project. It is important to note that the design sections do not account for construction traffic loading.

The aggregate base course materials beneath pavements and sidewalks should be compacted to at least 95 percent of their modified Proctor maximum dry density (ASTM D 1557).

Front-loading trash dumpsters frequently impose concentrated front-wheel loads on pavements during loading. This type of loading typically results in rutting of bituminous pavements and ultimately pavement failures and costly repairs. Similarly, drive-thru lanes also create severe

risk of rutting and scuffing. Therefore, we suggest that the pavements in trash pickup and drive-thru areas utilize the aforementioned Portland Cement Concrete (PCC) pavement section. It may be prudent to use rigid pavement sections in all areas planned for heavy bus/truck traffic. Such a PCC section would typically consist of 6 inches of 4,000 psi, air-entrained concrete over not less than 6 inches of compacted aggregate base course. Appropriate steel reinforcing and jointing should also be incorporated into the design of all PCC pavements.

It should be noted that these design recommendations may not satisfy the South Carolina Department of Transportation traffic guidelines. Any roadways constructed for public use and to be dedicated to the State for repair and maintenance must be designed in accordance with the State requirements.

5.8. Excavation Characteristics

We anticipate a majority of the near-surface subgrade soils at the site can be excavated with backhoes, front-end loaders or other similar equipment using conventional means and methods. However, please note that PWR was encountered at Borings B-11 and B-22 through B-24 at depths ranging from approximately 17 to 22 feet below existing grades. The depth of PWR on this site should not be an issue for site development. However, partially weathered rock depths should be taken into consideration by the site civil designer when developing foundation, storm drainage, and utility plans.

We would like to point out that our experience indicates rock in a weathered, boulder, and/or massive form varies erratically in location and depth within the Piedmont Geologic Province, of which Rock Hill is part. Due to the variability of the Piedmont soils, there is always a potential that these materials could be encountered at shallower depths between the boring locations. The depth to, and thickness of weathered rock, rock lenses or seams, and bedrock, can vary dramatically in short distances and between boring locations; therefore, weathered rock and/or bedrock should be anticipated during construction at locations or depths, between boring locations, not encountered during this exploration.

Typically, in mass excavation for general site work, materials with an N-value of 50 blows per 3 to 6 inches of penetration can be excavated with moderate to heavy effort using appropriately sized equipment, such as a large track-hoe (e.g., Caterpillar 330 with rock teeth or a D-8 bulldozer with a single ripping tooth). In confined excavations such as foundations, utility trenches, etc., removal of PWR may require use of heavy duty backhoes, pneumatic spades, or blasting. Material that exhibits less than 3 inches of penetration per 50 blows and material causing auger refusal will likely require jack hammering, blasting or drilling to facilitate removal. Due to the apparent quality of the refusal materials and local geology, we anticipate that blasting will be required in excavations that extend below the elevations indicated as “Auger Refusal” in our boring logs.

Rock materials will normally require blasting for removal in all types of excavations. Blasting in foundation excavations must be done carefully to prevent damage to the bearing materials and nearby buildings or roadways/utilities. The gradation of the material removed by ripping or blasting will likely be erratic.

As a general guide, we recommend the following definitions be used to define rock:

General Excavation

Rip Rock: Material that cannot be removed by scrapers, loaders, pans, dozers, or graders; and requires the use of a single-tooth ripper mounted on a crawler tractor having a minimum draw bar pull rated at not less than 56,000 pounds.

Blast Rock: Material which cannot be excavated with a single-tooth ripper mounted on a crawler tractor having a minimum draw bar pull rated at not less than 56,000 pounds (Caterpillar D-8 or equivalent) or by a Caterpillar 977 front-end loader or equivalent; and occupying an original volume of at least one (1) cubic yard.

Trench Excavation

Blast Rock: Material which cannot be excavated with a backhoe having a bucket curling force rated at not less than 25,700 pounds (Caterpillar Model 225 or equivalent), and occupying an original volume of at least one-half (1/2) cubic yard.

As noted in the Geology section of this report, the weathering process in the Piedmont can be erratic and significant variations of the depths of the more dense materials can occur in relatively short distances. In some cases, isolated boulders or thin rock seams may be present in the soil matrix. We have generally found that material that our soil drilling augers can penetrate can also be excavated with a large backhoe or ripped with a dozer mounted ripper. Weathered rock or rock that cannot be penetrated by the mechanical auger will normally require blasting to loosen it for removal.

5.9. Settlement Monitoring

ECS anticipates that fill depths may be on the order of 12 feet within the proposed building footprint. ECS recommends that settlement plates be placed within these areas to monitor consolidation of the fill materials. The frequency of monitoring should be on a weekly basis, but this should be adjusted as necessary by the geotechnical engineer of record based upon fill placement rates and settlement rates. Typically, the settlement rates will accelerate during the fill placement, and start tapering off shortly after stopping any fill placement. ECS recommends a minimum timeline between 45 and 60 days to monitor the consolidation. Upon reaching a tolerable settlement rate, foundation construction may begin.

Settlement plates shall be installed within the proposed building area and adjacent parking/drive areas that will receive new fill of more than 8 ft. We recommend that a minimum of three (3) settlement plates be installed in the deepest fill zones within the building footprint. Settlement plates shall be placed on subgrades after stripping and proofrolling is complete and before placement of engineered fill.

The plate should be placed on a level area of the prepared subgrade and the elevation of the plate and the top of the riser shall be recorded before fill placement. After completion of fill placement the elevations of the top riser shall be recorded at least once per week until

settlement has adequately ceased, based upon review of the settlement versus time curve of data reviewed by the geotechnical engineer of record.

Settlement plate readings should be made to 0.01 ft accuracy and shall be referenced to a benchmark well beyond the influence of the fill placement and protected from disturbance by construction equipment. Readings of the plates shall be taken by a qualified surveyor licensed in the State of South Carolina, and the data shall be evaluated by a licensed Geotechnical Engineer. The General Contractor shall furnish all labor and material and perform all operations needed for the installation and maintenance of the plates. The contractors working at the site must be aware of the locations of each monitoring point to avoid damage during the reading period.

6. CONSTRUCTION CONSIDERATIONS

6.1. Site Preparation

Prior to construction, the proposed construction area should be stripped of all topsoil, organic material, MH/CH soils as previously discussed, and other soft or unsuitable material. Upon completion of these razing and stripping operations, the exposed subgrade in areas to receive fill should be proofrolled with a loaded dump truck or similar pneumatic-tired vehicle having a loaded weight of approximately 25 tons. After excavation, the exposed subgrades in cut areas should be similarly proofrolled.

Proofrolling operations should be performed under the observation of a geotechnical engineer or his authorized representative. The proofrolling should consist of two (2) complete passes of the exposed areas, with each pass being in a direction perpendicular to the preceding one. Any areas which deflect, rut or pump during the proofrolling, and fail to be remedied with successive passes, should be undercut to suitable soils and backfilled with compacted fill.

The ability to dry wet soils, and therefore the ability to use them for fill, will likely be enhanced if earthwork is performed during summer or early fall. If earthwork is performed during winter or after appreciable rainfall then subgrades may be unstable due to wet soil conditions, which could increase the amount of undercutting required. Drying of wet soils, if encountered, may be accomplished by spreading and disking or by other mechanical or chemical means.

6.2. Fill Material and Placement

The project fill should be soil that has less than five percent organic content and a liquid limit and plasticity index less than 50 and 30, respectively. Soils with Unified Soil Classification System group symbols of SP, SW, SM, SC, and ML are generally suitable for use as project fill. Soils with USCS group symbol of CL that meet the restrictions for liquid limit and plasticity index are also suitable for use as project fill. Soils with USCS group symbol of MH may be used in deeper fills (greater than 2 ft.) with the additional requirement that they remain stable beneath heavy construction traffic. Soils with USCS group symbol of CH (high plasticity soil) or corrosive soils are generally not suitable for use as project fill.

The fill should exhibit a maximum dry density of at least 90 pounds per cubic foot, as determined by a standard Proctor compaction test (ASTM D-698). We recommend that moisture control limits of -3 to +2 percent of the optimum moisture content be used for placement of project fill with the added requirement that fill soils placed wet of optimum remain stable under heavy pneumatic-tired construction traffic. During site grading, some moisture modification (drying and/or wetting) of the onsite soils will likely be required.

Project fill should be compacted to at least 95 percent of its standard Proctor maximum dry density except within 24 inches of finished soil subgrade elevation beneath slab-on-grade and pavements. Within the top 24 inches of finished soil subgrade elevation beneath slab on grade and pavements, the approved project fill should be compacted to at least 100 percent of its standard Proctor maximum dry density. Aggregate base course (ABC stone) should be compacted to 95 percent of its modified Proctor maximum dry density (ASTM D-1557). However, for isolated excavations around footing locations or within utility excavations, a hand tamper will likely be required. ECS recommends that field density tests be performed on the fill as it is being placed, at a frequency determined by an experienced geotechnical engineer, to verify that proper compaction is achieved.

7. GENERAL COMMENTS

The borings performed at this site represent the subsurface conditions at the location of the borings only. Due to the prevailing geology, changes in the subsurface conditions can occur over relatively short distances that have not been disclosed by the results of the borings performed. Consequently, there may be undisclosed subsurface conditions that require special treatment or additional preparation once these conditions are revealed during construction.

Our preliminary evaluation of foundation support conditions has been based on our understanding of the site and project information and the data obtained in our exploration. The general subsurface conditions utilized in our preliminary foundation evaluation have been based on interpolation of subsurface data between and away from the test holes. If the project information is incorrect, or if the structure locations (horizontal or vertical) and/or dimensions are changed, please contact us so that our recommendations can be reviewed. The discovery of any site or subsurface conditions during construction which deviate from the data outlined in this exploration should be reported to us for our evaluation. The assessment of site environmental conditions for the presence of pollutants in the soil, rock, and groundwater of the site was beyond the scope of this exploration.

The recommendations outlined herein should not be construed to address moisture or water intrusion effects after construction is completed. Proper design of landscaping, surface and subsurface water control measures are required to properly address these issues. In addition, proper operation and maintenance of building systems is required to minimize the effects of moisture or water intrusion. The design, construction, operation, and maintenance of waterproofing and dampproofing systems are beyond the scope of services for this project.

APPENDIX

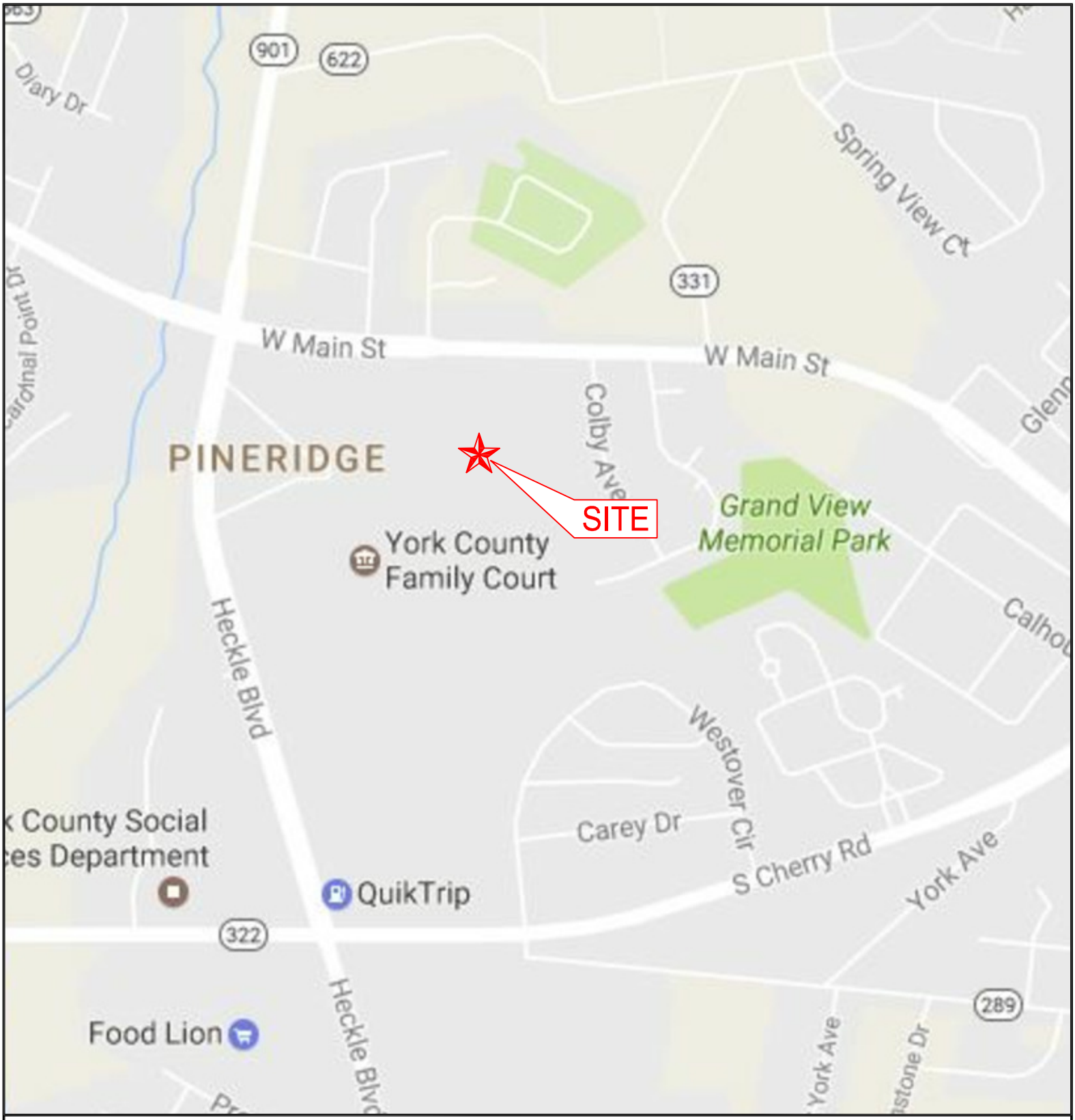
Site Vicinity Map

Boring Location Diagram

Laboratory Testing Summary

Borelogs

ASFE Documents



LEGEND:

N
W
E
S

Source:

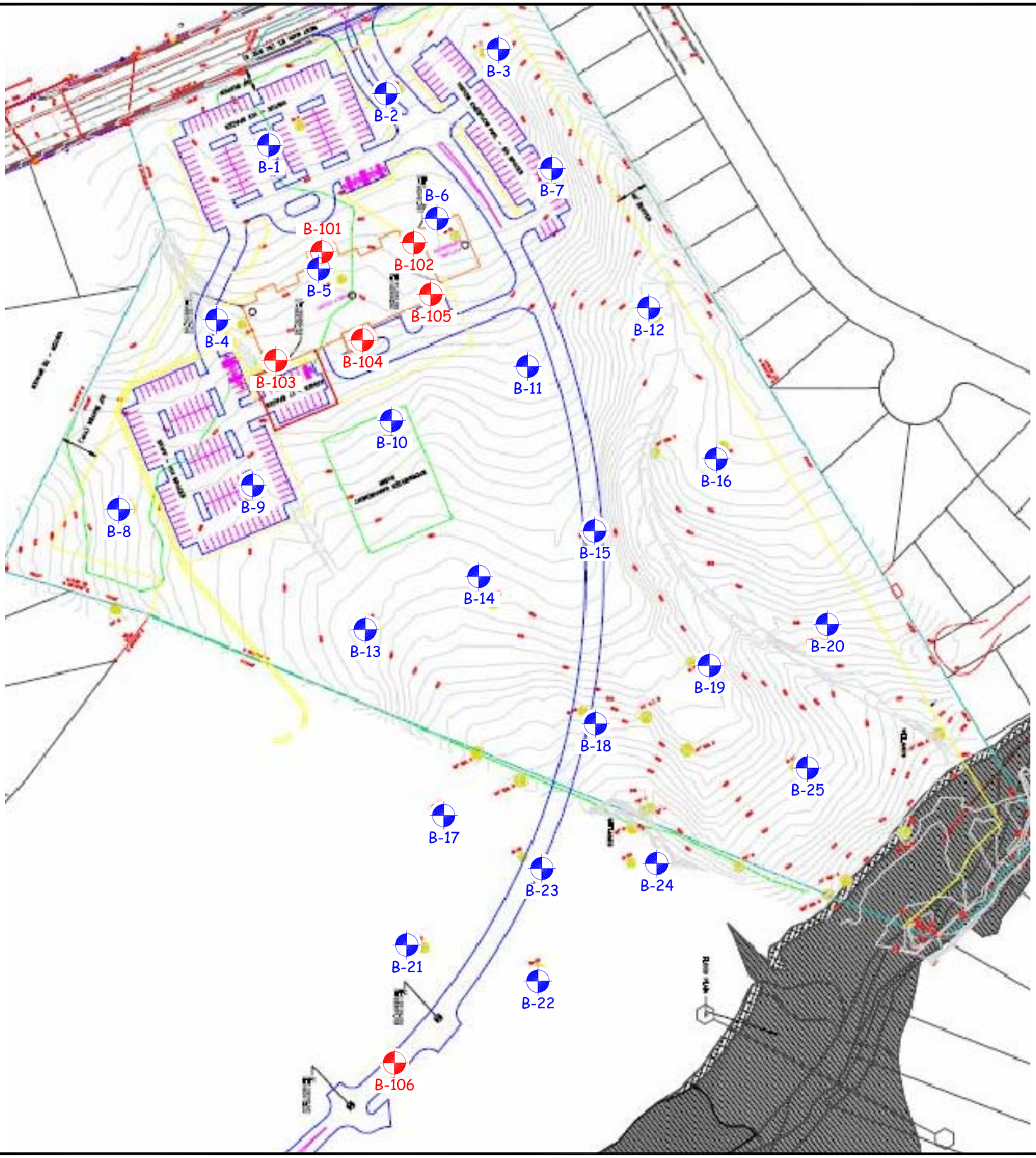
Google Maps

ECS
SETTING THE STANDARD FOR SERVICE

FIGURE 1

Site Vicinity Map
York County Family Court
Additional Exploration
Rock Hill, South Carolina

PROJ. MGR. RLH	SCALE N.T.S.
DRAFTSMAN JRF	PROJECT NO. 08-11615-D
REVISIONS	FIGURE 1
	DATE 01-06-17



LEGEND:

= Approximate Location of Boring (March 2016)

= Approximate Location of Boring (January 2017)

N
E
W
S

Background Image Provided By:
Client

SETTING THE STANDARD FOR SERVICE

FIGURE 2

Boring Location Diagram
York County Family Court
Additional Exploration
Rock Hill, South Carolina

PROJ. MGR. RLH	SCALE N.T.S.
DRAFTSMAN JRF	PROJECT NO. 08-11615-D
REVISIONS	FIGURE 2
	DATE 01-06-17

Laboratory Testing Summary

Sample Source	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Specific Gravity
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
B-1												
B-2												
	S-2	3.50 - 5.00	28.5									
B-3												
B-4												
B-5												
	S-3	6.00 - 7.50	27.5									
B-6												
	S-2	3.50 - 5.00	25.1	MH	70	38	32	76				
B-7												
	S-2	3.50 - 5.00	26.7									
B-8												
	S-2	3.50 - 5.00	26.8									
B-9												
	S-1	1.00 - 2.50	18.5									
B-10												
B-11												
	S-3	6.00 - 7.50	37.3									
B-12												
B-13												
B-14												
	S-3	6.00 - 7.50	24.7									
B-15												
B-16												
B-17												
B-18												
B-19												
B-20												

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

Project No. 11615-A

Project Name: York County Potential Sites - Parcel 2 - GEO

PM: Matthew Brewer

PE: Lee J. McGuinness

Printed On: Friday, April 15, 2016

ECS CAROLINAS, LLP
1812 Center Park Drive, Suite D
Charlotte, NC 28217
Phone: (704) 525-5152
Fax: (704) 357-0023

Laboratory Testing Summary

Sample Source	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Specific Gravity
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
	S-2	3.50 - 5.00	24.1	CH	51	27	24	84				
B-21												
	S-2	3.50 - 5.00	29.2									
B-22												
B-23												
	S-2	3.50 - 5.00	23.2									
B-24												
B-25												
	S-1	1.00 - 2.50	31.5									

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

Project No. 11615-A
Project Name: York County Potential Sites - Parcel 2 - GEO
PM: Matthew Brewer
PE: Lee J. McGuinness
Printed On: Friday, April 15, 2016

ECS CAROLINAS, LLP
1812 Center Park Drive, Suite D
Charlotte, NC 28217
Phone: (704) 525-5152
Fax: (704) 357-0023

CLIENT	JOB #	BORING #	SHEET
York County	11615-A	B-1	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
York County Potential Sites - Parcel 2 - GEO	Cumming Corporation

SITE LOCATION: 1555 West Main Street, Rock Hill, York County, SC

NORTHING	EASTING	STATION
1130347	1983415	

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% – — – REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

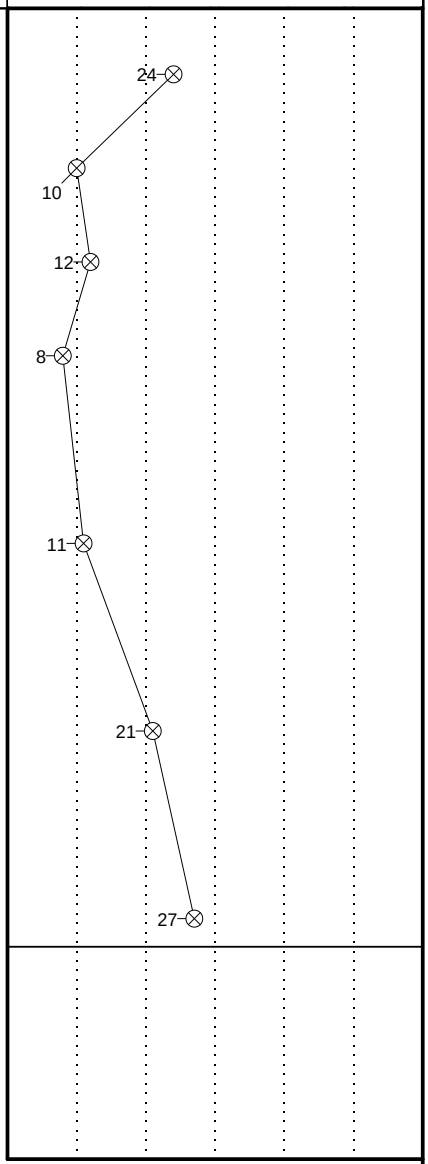
STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING ▰ — LOSS OF CIRCULATION (100%)

SURFACE ELEVATION 629.5

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Topsoil Depth [2"]			
	S-1	SS	18	14	(MH) RESIDUAL- ELASTIC SILT, Contains Mica, Red, Moist, Very Stiff			8 11 13
	S-2	SS	18	18	(ML) SANDY SILT, Contains Mica, Red to Tan, Moist, Stiff		625	4 4 6
5	S-3	SS	18	10				4 5 7
	S-4	SS	18	16	(SM) SILTY FINE SAND, Contains Mica, Tan, Moist, Loose to Medium Dense		620	3 3 5
10	S-5	SS	18	14			615	4 5 6
15	S-6	SS	18	16	(SM) SILTY FINE TO MEDIUM SAND, Contains Mica, Tan, Moist, Medium Dense		610	7 10 11
20	S-7	SS	18	16			605	9 11 16
25					END OF BORING @ 25'			
30							600	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL GNE WS ☐ WD ☒	BORING STARTED 03/24/16	CAVE IN DEPTH @ 21'
WL(BCR) WL(ACR) GNE	BORING COMPLETED 03/24/16	HAMMER TYPE Manual
WL	RIG SIMCO 2400 FOREMAN Cody	DRILLING METHOD HSA 2.25

CLIENT	JOB #	BORING #	SHEET
York County	11615-A	B-2	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
York County Potential Sites - Parcel 2 - GEO	Cumming Corporation

SITE LOCATION: 1555 West Main Street, Rock Hill, York County, SC

NORTHING	EASTING	STATION
1130334	1983557	

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% – — – REC%

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

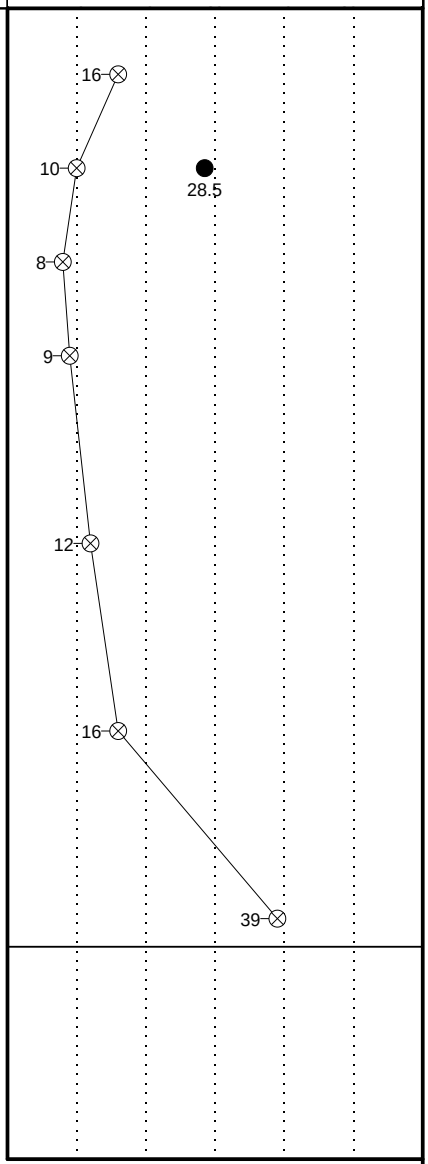
STANDARD PENETRATION BLOWS/FT

ENGLISH UNITS

BOTTOM OF CASING | LOSS OF CIRCULATION

SURFACE ELEVATION 626.9

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Topsoil Depth [2"]			
	S-1	SS	18	16	(MH) RESIDUAL- ELASTIC SILT, Contains Mica, Red, Moist, Very Stiff to Stiff		625	6 8 8
	S-2	SS	18	18				3 4 6
5					(ML) SANDY SILT, Contains Mica, Tannish Red, Moist, Medium Stiff			
	S-3	SS	18	18			620	2 4 4
	S-4	SS	18	9	(SM) SILTY FINE TO MEDIUM SAND, Contains Mica, Tan, Moist, Loose to Medium Dense			4 4 5
10							615	
	S-5	SS	18	10				4 5 7
15							610	
	S-6	SS	18	16				6 7 9
20							605	
	S-7	SS	18	18	(SM) SILTY FINE TO MEDIUM SAND, Contains Mica, Tan, Moist, Dense			8 15 24
25					END OF BORING @ 25'		600	
30								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL GNE WS ☐ WD ☒	BORING STARTED 03/24/16	CAVE IN DEPTH @ 21'
WL(BCR) WL(ACR) GNE	BORING COMPLETED 03/24/16	HAMMER TYPE Manual
WL	RIG SIMCO 2400 FOREMAN Cody	DRILLING METHOD HSA 2.25

CLIENT	JOB #	BORING #	SHEET
York County	11615-A	B-3	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
York County Potential Sites - Parcel 2 - GEO	Cumming Corporation

SITE LOCATION: 1555 West Main Street, Rock Hill, York County, SC

NORTHING	EASTING	STATION
1130332	1983683	

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% – — – REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

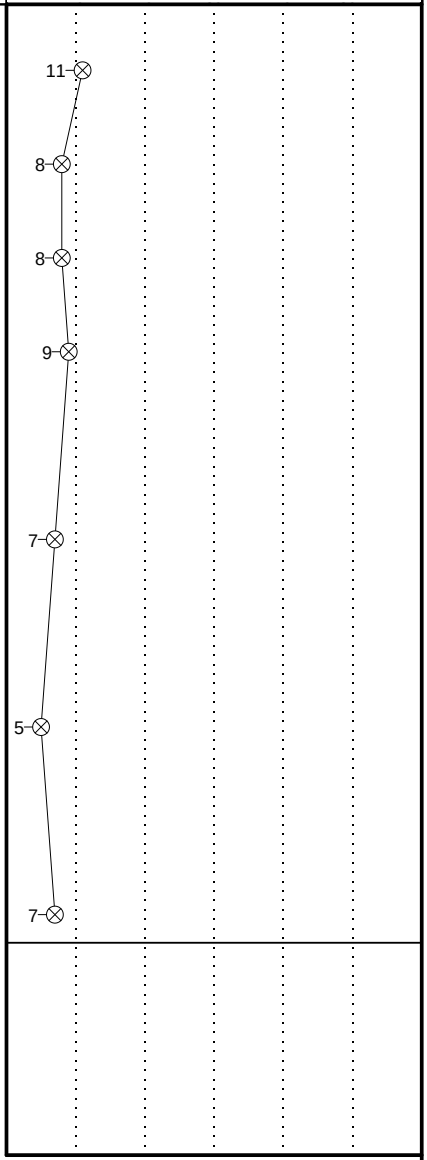
STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING ▰ LOSS OF CIRCULATION ⟩⟨

SURFACE ELEVATION 624.6

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Topsoil Depth [2"]			
	S-1	SS	18	18	(MH) RESIDUAL- ELASTIC SILT, Contains Mica, Red, Moist, Stiff			4 5 6
	S-2	SS	18	18	(ML) SILT, Contains Mica, Tannish Red, Moist, Medium Stiff to Stiff		620	3 3 5
5	S-3	SS	18	18				2 3 5
	S-4	SS	18	18			615	3 3 6
10					(ML) SILT, Contains Mica, Tan to Grayish Tan, Moist, Medium Stiff			
	S-5	SS	18	18			610	2 3 4
15								
	S-6	SS	18	18			605	2 2 3
20								
	S-7	SS	18	18			600	2 3 4
25					END OF BORING @ 25'			
30							595	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL GNE WS ☐ WD ☒	BORING STARTED 03/24/16	CAVE IN DEPTH @ 22.6'
WL(BCR) WL(ACR) GNE	BORING COMPLETED 03/24/16	HAMMER TYPE Manual
WL	RIG SIMCO 2400 FOREMAN Cody	DRILLING METHOD HSA 2.25

CLIENT	JOB #	BORING #	SHEET
York County	11615-A	B-4	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
York County Potential Sites - Parcel 2 - GEO	Cumming Corporation

SITE LOCATION: 1555 West Main Street, Rock Hill, York County, SC

NORTHING	EASTING	STATION
1130135	1983229	

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% – — – REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

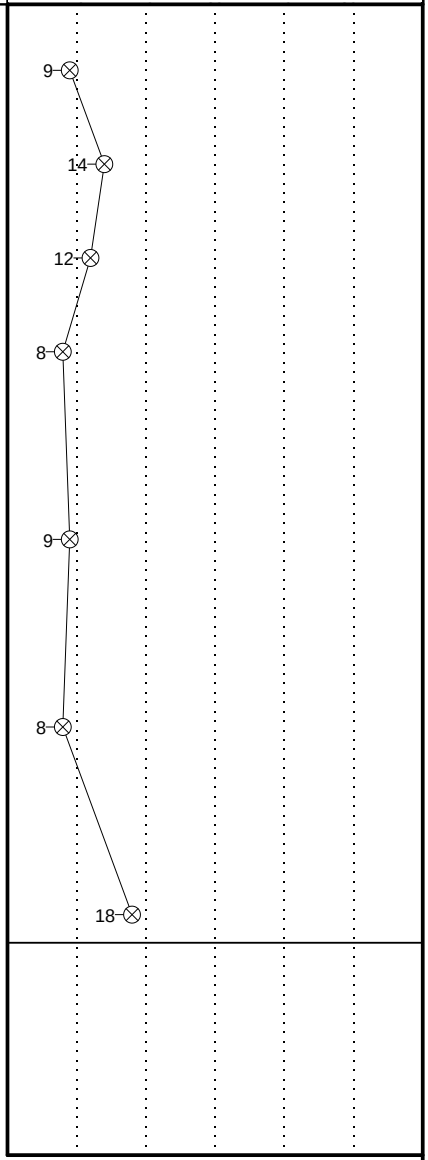
⊗ STANDARD PENETRATION BLOWS/FT

ENGLISH UNITS

BOTTOM OF CASING ▰ LOSS OF CIRCULATION

SURFACE ELEVATION 617.5

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Topsoil Depth [2"]			
	S-1	SS	18	18	(MH) RESIDUAL- ELASTIC SILT, Red, Moist, Stiff		615	4 4 5
	S-2	SS	18	18	(ML) SILT, Contains Mica, Orangish Red to Tan, Moist, Stiff to Medium Stiff			4 6 8
5	S-3	SS	18	18			610	4 5 7
	S-4	SS	18	18				3 4 4
10					(ML) SILT, Contains Mica, Tan, Moist, Stiff to Medium Stiff		605	
	S-5	SS	18	18				3 4 5
15							600	
	S-6	SS	18	18				3 3 5
20							595	
	S-7	SS	18	18	(ML) SILT, Contains Mica, Tan, Moist, Very Stiff			4 7 11
25					END OF BORING @ 25'		590	
30								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL GNE WS ☐ WD ☒	BORING STARTED 03/24/16	CAVE IN DEPTH @ 22.6'
WL(BCR) WL(ACR) GNE	BORING COMPLETED 03/24/16	HAMMER TYPE Manual
WL	RIG SIMCO 2400 FOREMAN Cody	DRILLING METHOD HSA 2.25

CLIENT	JOB #	BORING #	SHEET
York County	11615-A	B-5	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
York County Potential Sites - Parcel 2 - GEO	Cumming Corporation

SITE LOCATION: 1555 West Main Street, Rock Hill, York County, SC

NORTHING	EASTING	STATION
1130133	1983378	

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% – — – REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

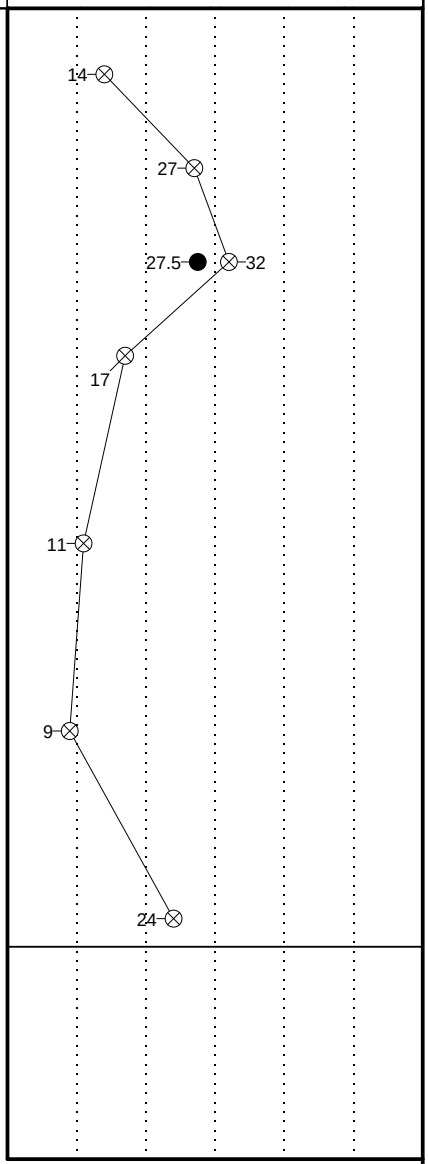
STANDARD PENETRATION BLOWS/FT

ENGLISH UNITS

BOTTOM OF CASING ▰ LOSS OF CIRCULATION

SURFACE ELEVATION 618.6

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Topsoil Depth [2"]			
	S-1	SS	18	12	(MH) RESIDUAL- ELASTIC SILT, Contains Mica, Brownish Red to Tannish Red, Moist, Stiff to Very Stiff			5 5 9
	S-2	SS	18	18			615	7 12 15
5					(MH) ELASTIC SILT, Contains Mica, Reddish Tan, Moist, Hard to Very Stiff			
	S-3	SS	18	18				9 12 20
	S-4	SS	18	18			610	5 7 10
10					(ML) SANDY SILT, Contains Mica, Brownish Tan, Moist, Stiff			
	S-5	SS	18	18			605	5 5 6
15								
	S-6	SS	18	18			600	3 4 5
20					(SM) SILTY FINE TO MEDIUM SAND, Contains Mica, Grayish Tan, Moist, Medium Dense			
	S-7	SS	18	18			595	10 9 15
25					END OF BORING @ 25'			
							590	
30								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL GNE WS ☐ WD ☒	BORING STARTED 3	CAVE IN DEPTH @ 21.3'
WL(BCR) WL(ACR) GNE	BORING COMPLETED 03/23/16	HAMMER TYPE Manual
WL GNE	RIG SIMCO 2400 FOREMAN Cody	DRILLING METHOD HSA 2.25

CLIENT	JOB #	BORING #	SHEET
York County	11615-A	B-6	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
York County Potential Sites - Parcel 2 - GEO	Cumming Corporation

SITE LOCATION: 1555 West Main Street, Rock Hill, York County, SC

NORTHING	EASTING	STATION
1130121	1983543	

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% – — – REC%

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

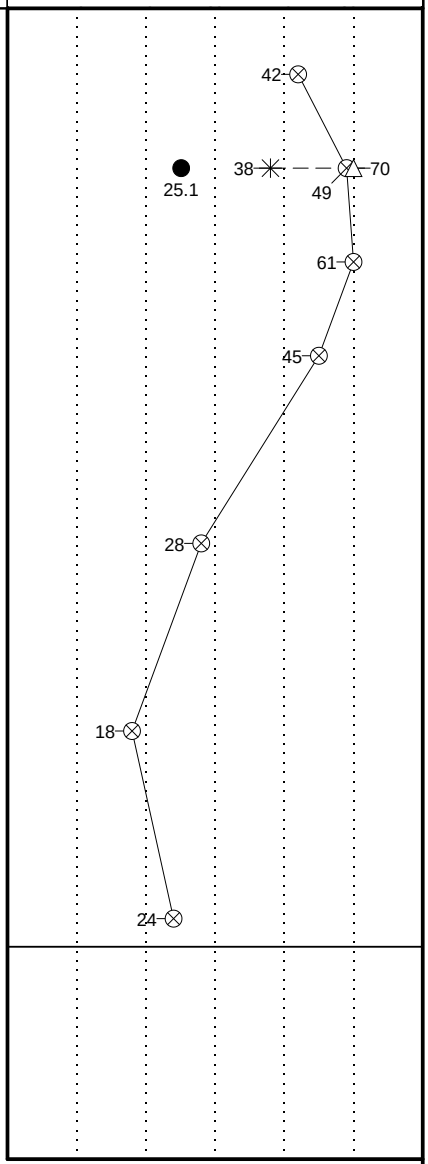
STANDARD PENETRATION BLOWS/FT

ENGLISH UNITS

BOTTOM OF CASING | LOSS OF CIRCULATION

SURFACE ELEVATION 621.8

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Topsoil Depth [2"]			
	S-1	SS	18	18	(MH) RESIDUAL- ELASTIC SILT, Contains Mica, Dark Red, Moist, Hard to Very Hard		620	16 20 22
	S-2	SS	18	18				14 18 31
5								
	S-3	SS	18	18			615	13 24 37
	S-4	SS	18	18	(MH) ELASTIC SILT, Contains Mica, Red to Orangish Red, Moist, Hard to Very Stiff			13 17 28
10							610	
	S-5	SS	18	18				8 11 17
15							605	
					(ML) SANDY SILT, Contains Mica, Tan, Moist, Very Stiff			
	S-6	SS	18	18				5 8 10
20							600	
	S-7	SS	18	18				7 10 14
25					END OF BORING @ 25'		595	
30								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL GNE WS ☐ WD ☒	BORING STARTED 03/23/16	CAVE IN DEPTH @ 19.8'
WL(BCR) WL(ACR) GNE	BORING COMPLETED 03/23/16	HAMMER TYPE Manual
WL GNE	RIG SIMCO 2400 FOREMAN Cody	DRILLING METHOD HSA 2.25

CLIENT	JOB #	BORING #	SHEET
York County	11615-A	B-7	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
York County Potential Sites - Parcel 2 - GEO	Cumming Corporation

SITE LOCATION: 1555 West Main Street, Rock Hill, York County, SC

NORTHING	EASTING	STATION
1130154	1983709	

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% – — – REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

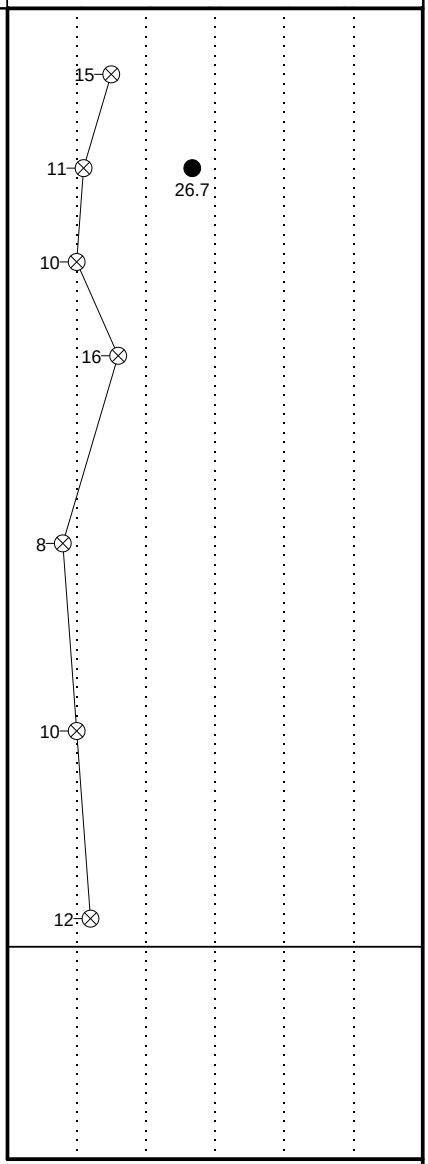
STANDARD PENETRATION BLOWS/FT

ENGLISH UNITS

BOTTOM OF CASING ▰ LOSS OF CIRCULATION ⟩⟨

SURFACE ELEVATION 620.4

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Topsoil Depth [2"]		620	
	S-1	SS	18	16	(MH) RESIDUAL- SANDY ELASTIC SILT, Red, Moist, Stiff			5 6 9
	S-2	SS	18	16	(ML) SANDY SILT, Contains Mica, Orangish Red, Moist, Stiff			4 4 7
5							615	
	S-3	SS	18	14				3 4 6
	S-4	SS	18	14	(SM) SILTY FINE TO MEDIUM SAND, Contains Mica, Tan, Moist, Medium Dense			6 7 9
10							610	
	S-5	SS	18	16	(ML) SANDY SILT, Contains Mica, Tan to Brown, Moist, Medium Stiff to Stiff			3 4 4
15							605	
	S-6	SS	18	18				4 4 6
20							600	
	S-7	SS	18	18				3 5 7
25					END OF BORING @ 25'		595	
30							590	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL GNE WS ☐ WD ☒	BORING STARTED 03/24/16	CAVE IN DEPTH @ 22.6'
WL(BCR) WL(ACR) GNE	BORING COMPLETED 03/24/16	HAMMER TYPE Manual
WL	RIG SIMCO 2400 FOREMAN Cody	DRILLING METHOD HSA 2.25

CLIENT	JOB #	BORING #	SHEET
York County	11615-A	B-8	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
York County Potential Sites - Parcel 2 - GEO	Cumming Corporation

SITE LOCATION: 1555 West Main Street, Rock Hill, York County, SC

NORTHING: 1129972 | EASTING: 1982986 | STATION:

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% – — – REC%

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING | LOSS OF CIRCULATION

SURFACE ELEVATION 612.2

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0						612.2	
	S-1	SS	18	18			3 4 6
						610	
	S-2	SS	18	16			3 4 6
5							
	S-3	SS	18	18		605	3 4 5
	S-4	SS	18	14			3 4 4
10						600	
	S-5	SS	18	16			4 4 5
15						595	
	S-6	SS	18	18			4 4 5
20						590	
	S-7	SS	18	18	▽		9 12 13
25							
						585	
30							

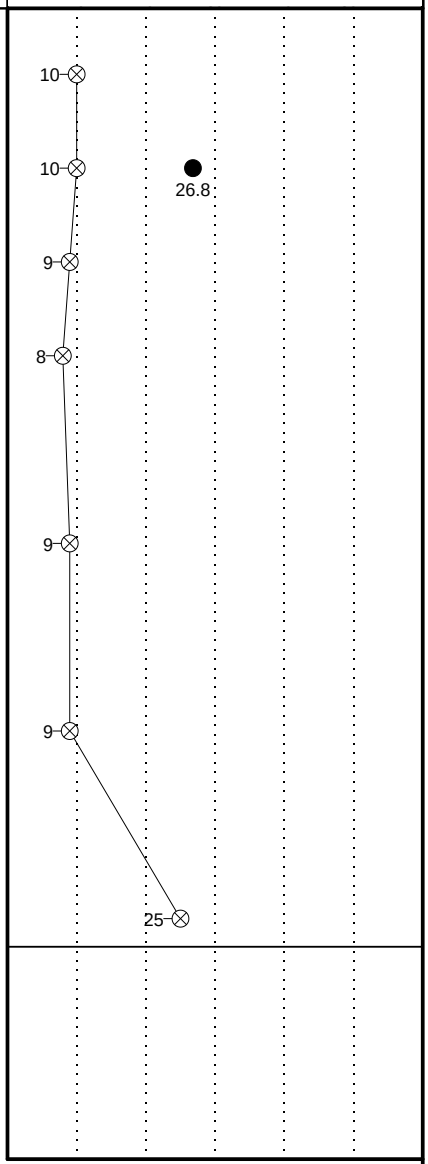
Topsoil Depth [6"]

(MH) RESIDUAL- ELASTIC SILT, Contains Mica, Red, Moist, Stiff

(ML) SANDY SILT, Contains Mica, Orangish Red, Moist, Stiff

(SM) SILTY FINE TO MEDIUM SAND, Contains Mica, Tan, Moist, Loose to Medium Dense

END OF BORING @ 25'



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

▽ WL 24 WS ☐ WD ☒	BORING STARTED 03/24/16	CAVE IN DEPTH @ 22'
▽ WL(BCR) ▼ WL(ACR) GNE	BORING COMPLETED 03/24/16	HAMMER TYPE Manual
▽ WL	RIG SIMCO 2400 FOREMAN Cody	DRILLING METHOD HSA 2.25

CLIENT	JOB #	BORING #	SHEET
York County	11615-A	B-9	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
York County Potential Sites - Parcel 2 - GEO	Cumming Corporation

SITE LOCATION: 1555 West Main Street, Rock Hill, York County, SC

NORTHING	EASTING	STATION
1129918	1983141	

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% – — – REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

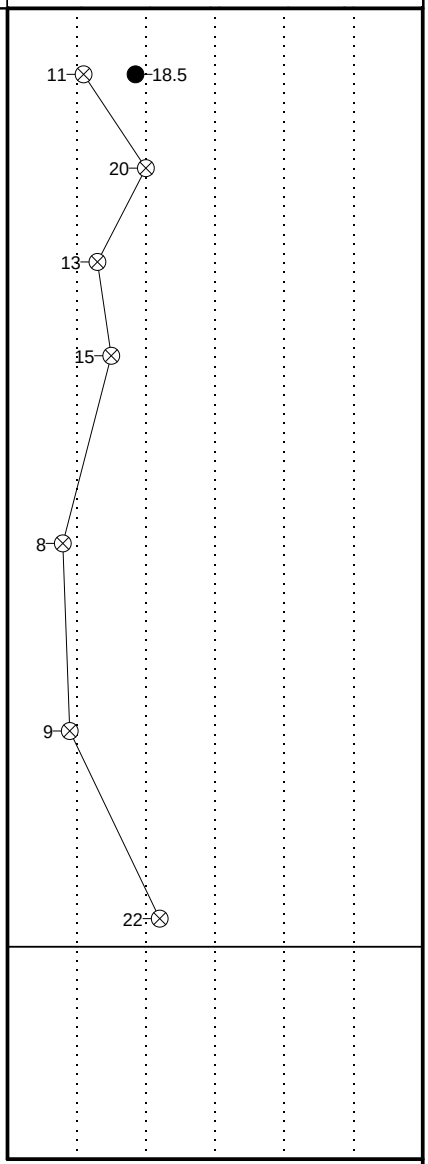
STANDARD PENETRATION BLOWS/FT

ENGLISH UNITS

BOTTOM OF CASING ▰ LOSS OF CIRCULATION

SURFACE ELEVATION 607.8

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Topsoil Depth [2"]			
	S-1	SS	18	16	(MH) RESIDUAL- ELASTIC SILT, Dark Brown, Moist, Stiff to Very Stiff		605	4 5 6
	S-2	SS	18	18				6 9 11
5					(ML) SANDY SILT, Light Red to Light Brown, Moist, Stiff to Medium Stiff			
	S-3	SS	18	18			600	5 6 7
	S-4	SS	18	18				5 6 9
10							595	
	S-5	SS	18	18				2 4 4
15					(ML) SANDY SILT, Light Tan to Dark Gray, Moist, Stiff to Very Stiff	▽	590	
	S-6	SS	18	18				2 4 5
20							585	
	S-7	SS	18	18				6 9 13
25					END OF BORING @ 25'		580	
30								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

▽ WL GNE WS ☐ WD ☒	BORING STARTED 03/23/16	CAVE IN DEPTH @ 17.9'
▽ WL(BCR) ▼ WL(ACR) 22.2	BORING COMPLETED 03/23/16	HAMMER TYPE Manual
▽ WL 17.3	RIG SIMCO 2400 FOREMAN Cody	DRILLING METHOD HSA 2.25

CLIENT	JOB #	BORING #	SHEET
York County	11615-A	B-10	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
York County Potential Sites - Parcel 2 - GEO	Cumming Corporation

SITE LOCATION: 1555 West Main Street, Rock Hill, York County, SC

NORTHING	EASTING	STATION
1129903	1983346	

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% – — – REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

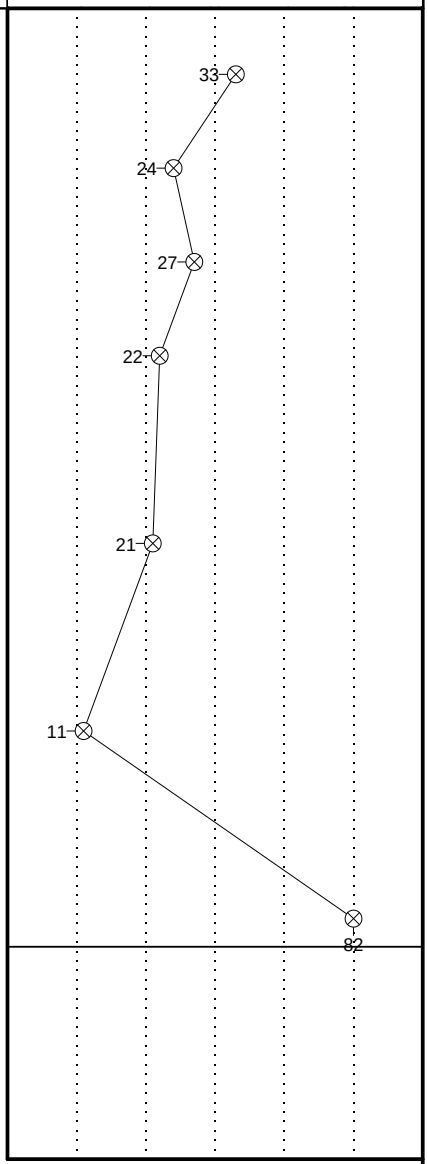
STANDARD PENETRATION BLOWS/FT

ENGLISH UNITS

BOTTOM OF CASING ▰ LOSS OF CIRCULATION ⧖

SURFACE ELEVATION 608.0

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Topsoil Depth [2"]			
	S-1	SS	18	18	(MH) RESIDUAL- ELASTIC SILT, Dark Red to Light Gray and Brown, Moist, Hard to Very Stiff		605	12 15 18
	S-2	SS	18	18				7 10 14
5								
	S-3	SS	18	18				7 12 15
	S-4	SS	18	18			600	6 9 13
10								
	S-5	SS	18	18			595	6 9 12
15					(ML) SANDY SILT, Light Gray and Brown, Moist, Stiff			
	S-6	SS	18	18			590	4 5 6
20					(SM) SILTY FINE TO MEDIUM SAND, Gray, Moist, Very Dense			
	S-7	SS	18	16			585	23 41 41
25					END OF BORING @ 25'			
							580	
30								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL 23.4 WS ☐ WD ☒	BORING STARTED 03/23/16	CAVE IN DEPTH @ 18.8'
WL(BCR) WL(ACR) 21.4	BORING COMPLETED 03/23/16	HAMMER TYPE Manual
WL 17.1	RIG SIMCO 2400 FOREMAN Cody	DRILLING METHOD HSA 2.25

CLIENT	JOB #	BORING #	SHEET
York County	11615-A	B-11	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
York County Potential Sites - Parcel 2 - GEO	Cumming Corporation

SITE LOCATION: 1555 West Main Street, Rock Hill, York County, SC

NORTHING	EASTING	STATION
1129923	1983563	

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% – — – REC%

PLASTIC LIMIT% WATER CONTENT% LIQUID LIMIT%

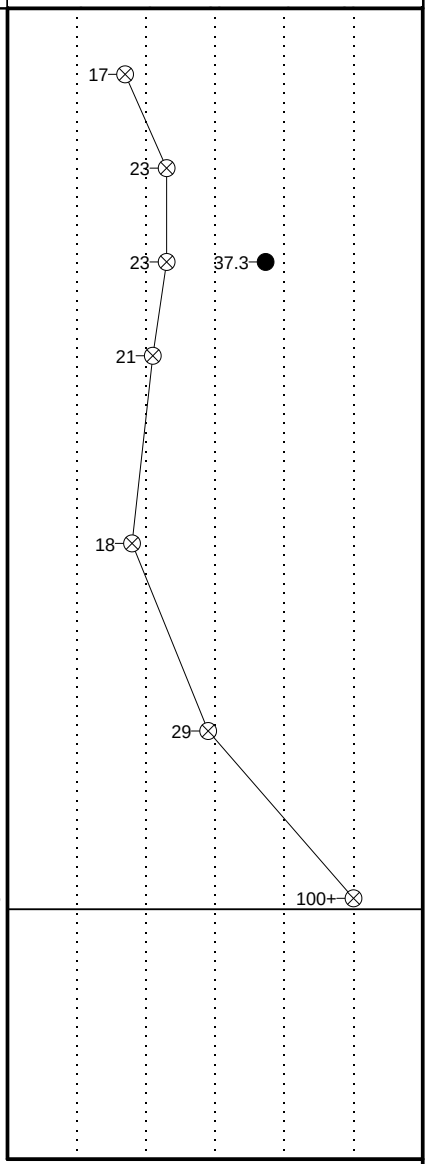
STANDARD PENETRATION BLOWS/FT

ENGLISH UNITS

BOTTOM OF CASING ▰ LOSS OF CIRCULATION

SURFACE ELEVATION 613.2

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Topsoil Depth [2"]			
	S-1	SS	18	18	(MH) RESIDUAL- ELASTIC SILT, Dark Red to Brown, Moist, Very Stiff		610	7 8 9
	S-2	SS	18	18				6 9 14
5	S-3	SS	18	18				6 9 14
	S-4	SS	18	18			605	6 8 13
10					(ML) SANDY SILT, Light Tan, Moist, Very Stiff			
	S-5	SS	18	18			600	6 8 10
15					(SM) SILTY FINE TO MEDIUM SAND, Light Gray, Moist, Dense			
	S-6	SS	18	18			595	14 15 14
20					(PWR) PARTIALLY WEATHERED ROCK SAMPLED AS SILTY FINE TO MEDIUM SAND, Light Gray			
	S-7	SS	5	5			590	50/5
					AUGER REFUSAL @ 24'			
25							585	
30								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL GNE WS ☐ WD ☒	BORING STARTED 03/23/16	CAVE IN DEPTH @ 21.2'
WL(BCR) WL(ACR) GNE	BORING COMPLETED 03/23/16	HAMMER TYPE Manual
WL GNE	RIG SIMCO 2400 FOREMAN Cody	DRILLING METHOD HSA 2.25

CLIENT	JOB #	BORING #	SHEET
York County	11615-A	B-12	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
York County Potential Sites - Parcel 2 - GEO	Cumming Corporation

SITE LOCATION: 1555 West Main Street, Rock Hill, York County, SC

NORTHING	EASTING	STATION
1129906	1983744	

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% – — – REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

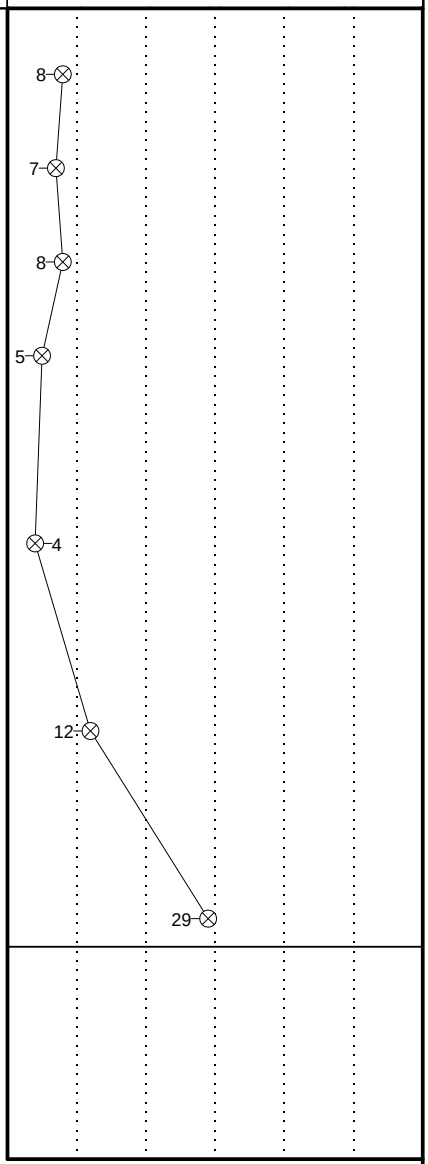
STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING ▰ LOSS OF CIRCULATION (100%)

SURFACE ELEVATION 601.8

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Topsoil Depth [3"]			
	S-1	SS	18	8	(MH) RESIDUAL- ELASTIC SILT, Dark Brown, Moist, Medium Stiff		600	3 3 5
	S-2	SS	18	18	(ML) SANDY SILT, Brown to Gray, Moist, Medium Stiff to Soft			2 3 4
5	S-3	SS	18	18			595	2 4 4
	S-4	SS	18	16				3 2 3
10							590	
	S-5	SS	18	14				2 2 2
15						▼	585	
	S-6	SS	18	18	(ML) SANDY SILT, Brown to Gray, Moist, Stiff to Very Stiff			3 5 7
20							580	
	S-7	SS	18	16		▽		6 12 17
25					END OF BORING @ 25'		575	
30								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

▽ WL 23.4 WS ☐ WD ☒	BORING STARTED 03/24/16	CAVE IN DEPTH @ 20.4'
▽ WL(BCR) ▼ WL(ACR) 17.2	BORING COMPLETED 03/24/16	HAMMER TYPE Manual
▽ WL	RIG SIMCO 2400 FOREMAN Cody	DRILLING METHOD HSA 2.25

CLIENT	JOB #	BORING #	SHEET
York County	11615-A	B-13	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
York County Potential Sites - Parcel 2 - GEO	Cumming Corporation

SITE LOCATION: 1555 West Main Street, Rock Hill, York County, SC

NORTHING	EASTING	STATION
1129686	1983219	

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% – — – REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING ▰ LOSS OF CIRCULATION

SURFACE ELEVATION 600.4

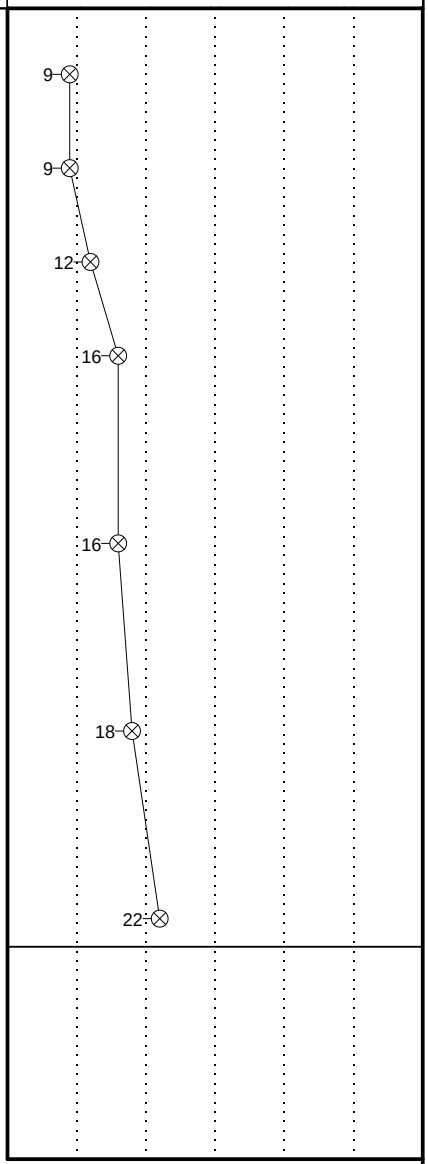
DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	ELEVATION (FT)	BLOWS/6"
0					600	
	S-1	SS	18	14		4 4 5
	S-2	SS	18	18		3 4 5
5					595	
	S-3	SS	18	14		2 5 7
	S-4	SS	18	18		4 7 9
10					590	
	S-5	SS	18	18		4 6 10
15					585	
	S-6	SS	18	10		7 8 10
20					580	
	S-7	SS	18	18		6 8 14
25					575	
30					570	

Topsoil Depth [2"]

(MH) RESIDUAL- SANDY ELASTIC SILT, Brownish Red to Orangish Red, Moist, Stiff to Very Stiff

(SM) SILTY FINE TO MEDIUM SAND, Tan, Moist, Medium Dense

END OF BORING @ 25'



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL 18.4 WS ☐ WD ☒	BORING STARTED 03/23/16	CAVE IN DEPTH @ 19.9'
WL(BCR) WL(ACR) 15.7	BORING COMPLETED 03/23/16	HAMMER TYPE Manual
WL 11.8	RIG SIMCO 2400 FOREMAN Cody	DRILLING METHOD HSA 2.25

CLIENT	JOB #	BORING #	SHEET
York County	11615-A	B-14	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
York County Potential Sites - Parcel 2 - GEO	Cumming Corporation

SITE LOCATION: 1555 West Main Street, Rock Hill, York County, SC

NORTHING	EASTING	STATION
1129646	1983378	

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% – — – REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

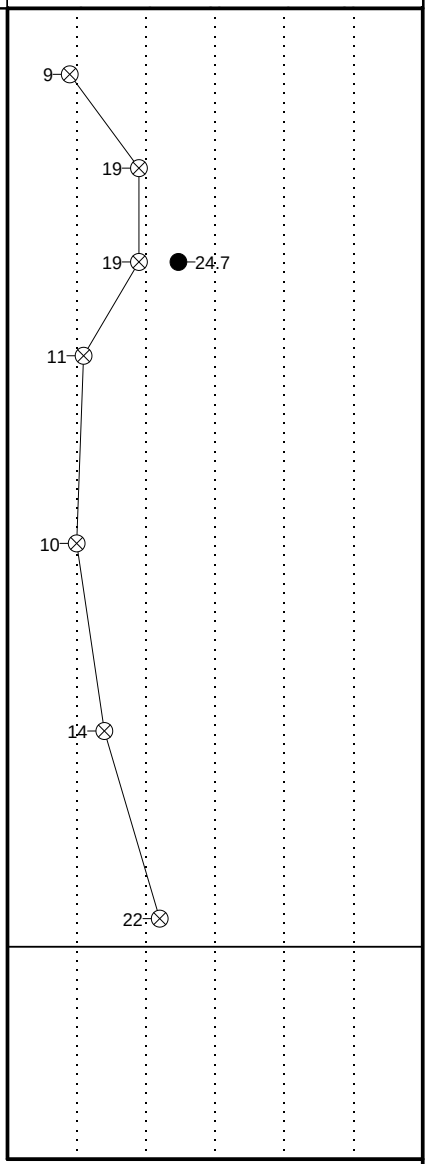
STANDARD PENETRATION BLOWS/FT

ENGLISH UNITS

BOTTOM OF CASING ▰ LOSS OF CIRCULATION ⟩⟨

SURFACE ELEVATION 599.9

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Topsoil Depth [2"]			
	S-1	SS	18	18	(MH) RESIDUAL- SANDY ELASTIC SILT, Brownish Red to Orangish Red, Moist, Stiff to Very Stiff			3 4 5
	S-2	SS	18	18				5 8 11
5							595	
	S-3	SS	18	18	(ML) SANDY SILT, Orangish Tan, Moist, Very Stiff			6 7 12
	S-4	SS	18	18	(SM) SILTY FINE TO MEDIUM SAND, Orangish Tan, Moist, Medium Dense to Loose			4 4 7
10							590	
	S-5	SS	18	18				3 4 6
15							585	
					(SM) SILTY FINE TO MEDIUM SAND, Tan, Moist, Medium Dense			
	S-6	SS	18	18				5 6 8
20							580	
	S-7	SS	18	10				7 9 13
25					END OF BORING @ 25'		575	
30							570	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL 18.4 WS ☐ WD ☒	BORING STARTED 03/23/16	CAVE IN DEPTH @ 14.0'
WL(BCR) WL(ACR) 15.1	BORING COMPLETED 03/23/16	HAMMER TYPE Manual
WL 13.0	RIG SIMCO 2400 FOREMAN Cody	DRILLING METHOD HSA 2.25

CLIENT	JOB #	BORING #	SHEET
York County	11615-A	B-15	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
York County Potential Sites - Parcel 2 - GEO	Cumming Corporation

SITE LOCATION: 1555 West Main Street, Rock Hill, York County, SC

NORTHING	EASTING	STATION
1129671	1983533	

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% – — – REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

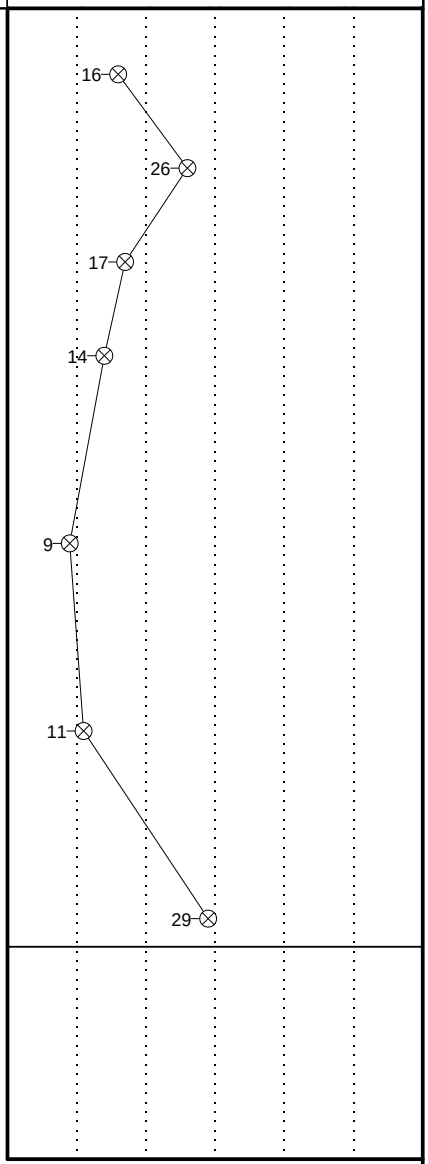
STANDARD PENETRATION BLOWS/FT

ENGLISH UNITS

BOTTOM OF CASING ▰ LOSS OF CIRCULATION

SURFACE ELEVATION 603.3

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Topsoil Depth [2"]			
	S-1	SS	18	18	(MH) RESIDUAL- SANDY ELASTIC SILT, Brownish Red to Orangish Red, Moist, Very Stiff		600	5 7 9
	S-2	SS	18	16				8 11 15
5					(ML) SANDY SILT, Orangish Tan, Moist, Very Stiff to Stiff		595	5 7 10
	S-3	SS	18	18				
	S-4	SS	18	18				5 6 8
10					(SM) SILTY FINE TO MEDIUM SAND, Light Orangish Tan, Moist, Loose to Medium Dense		590	4 3 6
	S-5	SS	18	18				
15							585	4 5 6
	S-6	SS	18	18				
20							580	10 12 17
	S-7	SS	18	18				
25					END OF BORING @ 25'		575	
30								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL 18.4 WS ☐ WD ☒	BORING STARTED 03/23/16	CAVE IN DEPTH @ 20.1'
WL(BCR) WL(ACR) 19.3	BORING COMPLETED 03/23/16	HAMMER TYPE Manual
WL 17.5	RIG SIMCO 2400 FOREMAN Cody	DRILLING METHOD HSA 2.25

CLIENT	JOB #	BORING #	SHEET
York County	11615-A	B-16	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
York County Potential Sites - Parcel 2 - GEO	Cumming Corporation

SITE LOCATION: 1555 West Main Street, Rock Hill, York County, SC

NORTHING	EASTING	STATION
1129708	1983752	

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% – — – REC%

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

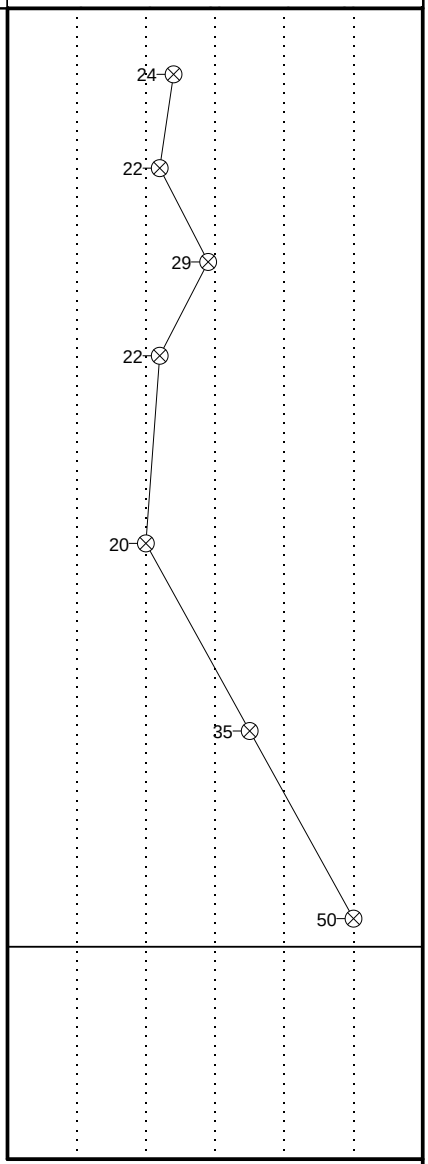
STANDARD PENETRATION BLOWS/FT

ENGLISH UNITS

BOTTOM OF CASING | LOSS OF CIRCULATION

SURFACE ELEVATION 601.3

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Topsoil Depth [2"]			
	S-1	SS	18	18	(MH) RESIDUAL- ELASTIC SILT, Reddish Brown, Moist, Very Stiff		600	9 12 12
	S-2	SS	18	18	(ML) SANDY SILT, Orangish Red to Orangish Tan, Moist, Very Stiff			7 11 11
5	S-3	SS	18	18			595	9 11 18
	S-4	SS	18	18				8 10 12
10							590	
	S-5	SS	18	18	(SM) SILTY FINE TO MEDIUM SAND, Tan, Moist, Medium Dense to Dense	▼		7 7 13
15							585	
	S-6	SS	18	18				14 17 18
20							580	
	S-7	SS	18	18				20 24 26
25					END OF BORING @ 25'		575	
30								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL 18.4 WS ☐ WD ☒	BORING STARTED 03/22/16	CAVE IN DEPTH @ 21.0'
WL(BCR) WL(ACR) 15.8	BORING COMPLETED 03/22/16	HAMMER TYPE Manual
WL	RIG SIMCO 2400 FOREMAN Cody	DRILLING METHOD HSA 2.25

CLIENT	JOB #	BORING #	SHEET
York County	11615-A	B-17	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
York County Potential Sites - Parcel 2 - GEO	Cumming Corporation

SITE LOCATION: 1555 West Main Street, Rock Hill, York County, SC

NORTHING	EASTING	STATION
1129418	1983195	

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% – — – REC%

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

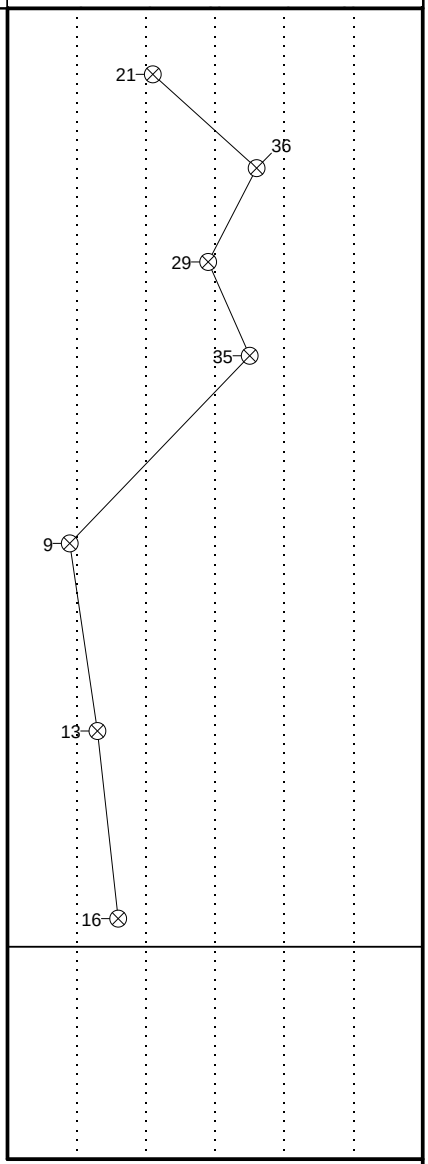
STANDARD PENETRATION BLOWS/FT

ENGLISH UNITS

BOTTOM OF CASING | LOSS OF CIRCULATION

SURFACE ELEVATION 596.1

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Topsoil Depth [2"]		595	
	S-1	SS	18	18	(MH) RESIDUAL- ELASTIC SILT, Brownish Red, Moist, Very Stiff to Hard			4 9 12
	S-2	SS	18	18				11 14 22
5					(MH) ELASTIC SILT, Brownish Red to Tan, Moist, Very Stiff to Hard		590	7 12 17
	S-3	SS	18	18				
	S-4	SS	18	18				10 19 16
10							585	
					(ML) SANDY SILT, Contains Mica, Tan, Moist, Stiff			
	S-5	SS	18	18				3 4 5
15							580	
					(SM) SILTY FINE TO MEDIUM SAND, Contains Rock Fragments, Tan, Moist, Medium Dense			
	S-6	SS	18	18				4 5 8
20							575	
	S-7	SS	18	16				5 7 9
25					END OF BORING @ 25'		570	
30								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL 18.4 WS ☐ WD ☒	BORING STARTED 03/23/16	CAVE IN DEPTH @ 13.3'
WL(BCR) WL(ACR) 16.6	BORING COMPLETED 03/23/16	HAMMER TYPE Manual
WL 10.5	RIG SIMCO 2400 FOREMAN Cody	DRILLING METHOD HSA 2.25

CLIENT	JOB #	BORING #	SHEET
York County	11615-A	B-18	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
York County Potential Sites - Parcel 2 - GEO	Cumming Corporation

SITE LOCATION: 1555 West Main Street, Rock Hill, York County, SC

NORTHING	EASTING	STATION
1129463	1983427	

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% – — – REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

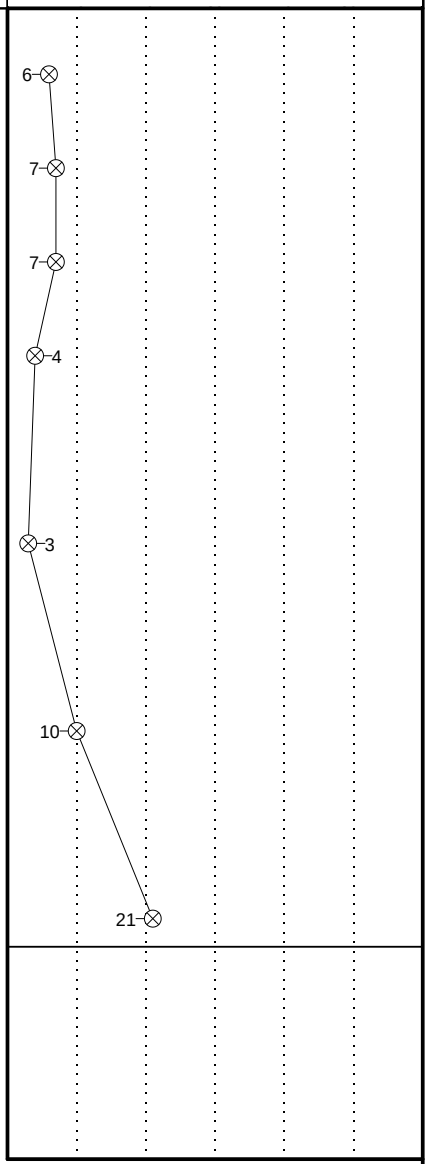
STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING ▰ LOSS OF CIRCULATION (100%)

SURFACE ELEVATION 591.3

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Topsoil Depth [2.5"]			
	S-1	SS	18	10	(CL) RESIDUAL- SANDY LEAN CLAY, Brown, Moist, Medium Stiff		590	4 2 4
	S-2	SS	18	18	(MH) ELASTIC SILT, Contains Mica, Orangish Tan, Moist, Medium Stiff			3 2 5
5	S-3	SS	18	16	(ML) SANDY SILT, Contains Mica, Orangish Tan, Moist, Medium Stiff		585	2 3 4
	S-4	SS	18	18	(ML) SANDY SILT, Contains Mica, Orangish Tan, Wet, Soft	▽		2 2 2
10						▼	580	
	S-5	SS	18	16	(ML) SANDY SILT, Contains Mica, Orangish Tan, Moist, Soft			2 1 2
15							575	
	S-6	SS	18	12	(SM) SILTY FINE TO MEDIUM SAND, Contains Mica, Gray, Moist, Loose to Medium Dense			2 4 6
20							570	
	S-7	SS	18	14				6 9 12
25					END OF BORING @ 25'		565	
30								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

▽ WL 9.0 WS ☐ WD ☒	BORING STARTED 03/22/16	CAVE IN DEPTH @ 15.8'
▽ WL(BCR) ▼ WL(ACR) 10.1	BORING COMPLETED 03/22/16	HAMMER TYPE Manual
▽ WL	RIG SIMCO 2400 FOREMAN Cody	DRILLING METHOD HSA 2.25

CLIENT	JOB #	BORING #	SHEET
York County	11615-A	B-19	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
York County Potential Sites - Parcel 2 - GEO	Cumming Corporation

SITE LOCATION: 1555 West Main Street, Rock Hill, York County, SC

NORTHING	EASTING	STATION
1129461	1983588	

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% – — – REC%

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

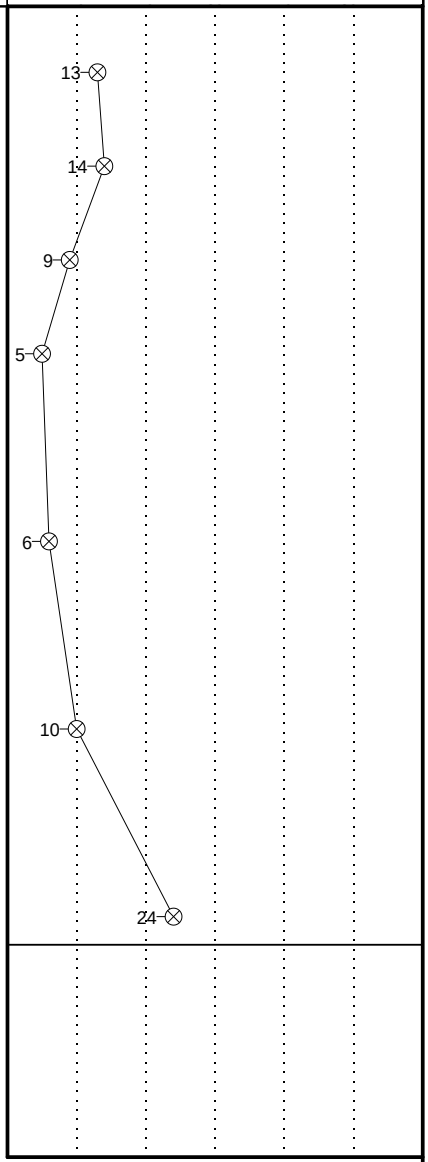
STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING | LOSS OF CIRCULATION

SURFACE ELEVATION 594.9

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Topsoil Depth [2"]			
	S-1	SS	18	18	(MH) RESIDUAL- SANDY ELASTIC SILT, Orangish Tan, Moist, Stiff			4 5 8
	S-2	SS	18	18				5 6 8
5							590	
	S-3	SS	18	18	(ML) SANDY SILT, Tan, Moist, Stiff to Medium Stiff			3 4 5
	S-4	SS	18	18				3 2 3
10							585	
					(SM) SILTY FINE TO MEDIUM SAND, Gray, Moist, Loose to Medium Dense			
	S-5	SS	18	18				2 3 3
15							580	
	S-6	SS	18	16				4 5 5
20							575	
	S-7	SS	18	14				7 9 15
25					END OF BORING @ 25'		570	
30							565	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL 13.4 WS ☐ WD ☒	BORING STARTED 03/22/16	CAVE IN DEPTH @ 16.3'
WL(BCR) WL(ACR) 13.3	BORING COMPLETED 03/22/16	HAMMER TYPE Manual
WL	RIG SIMCO 2400 FOREMAN Cody	DRILLING METHOD HSA 2.25

CLIENT	JOB #	BORING #	SHEET
York County	11615-A	B-20	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
York County Potential Sites - Parcel 2 - GEO	Cumming Corporation

SITE LOCATION: 1555 West Main Street, Rock Hill, York County, SC

NORTHING	EASTING	STATION
1129416	1983770	

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% – — – REC%

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

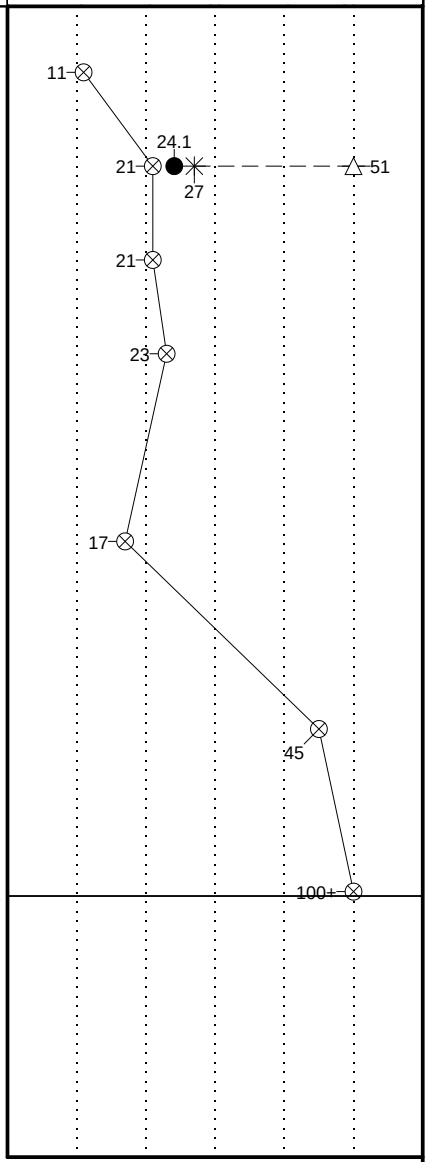
STANDARD PENETRATION BLOWS/FT

ENGLISH UNITS

BOTTOM OF CASING | LOSS OF CIRCULATION

SURFACE ELEVATION 586.0

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Topsoil Depth [2"]			
	S-1	SS	18	14	(MH) RESIDUAL- ELASTIC SILT, Orangish Tan, Moist, Stiff		585	4 5 6
	S-2	SS	18	12	(CH) SANDY FAT CLAY, Grayish Tan, Moist, Very Stiff			9 10 11
5	S-3	SS	18	18			580	6 9 12
	S-4	SS	18	18	(ML) SANDY SILT, Contains Mica, Brown, Moist, Very Stiff			8 9 14
10							575	
	S-5	SS	18	18		▽		5 7 10
15							570	
	S-6	SS	18	18	(SM) SILTY FINE TO MEDIUM SAND, Contains Mica Rock Fragments, Brownish Gray, Moist, Dense			17 19 26
20							565	
	S-7	SS	2	2	(PWR) PARTIALLY WEATHERED ROCK SAMPLED AS SILTY FINE TO MEDIUM SAND, Contains Mica, Brownish Gray			20/2
					AUGER REFUSAL @ 23.7'			
25							560	
30								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

▽ WL 13.4 WS ☐ WD ☒	BORING STARTED 03/22/16	CAVE IN DEPTH @ 16.7'
▽ WL(BCR) ▼ WL(ACR) 13.8	BORING COMPLETED 03/22/16	HAMMER TYPE Manual
▽ WL	RIG SIMCO 2400 FOREMAN Cody	DRILLING METHOD HSA 2.25

CLIENT	JOB #	BORING #	SHEET
York County	11615-A	B-21	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
York County Potential Sites - Parcel 2 - GEO	Cumming Corporation

SITE LOCATION: 1555 West Main Street, Rock Hill, York County, SC

NORTHING	EASTING	STATION
1129262	1983095	

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% – — – REC%

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

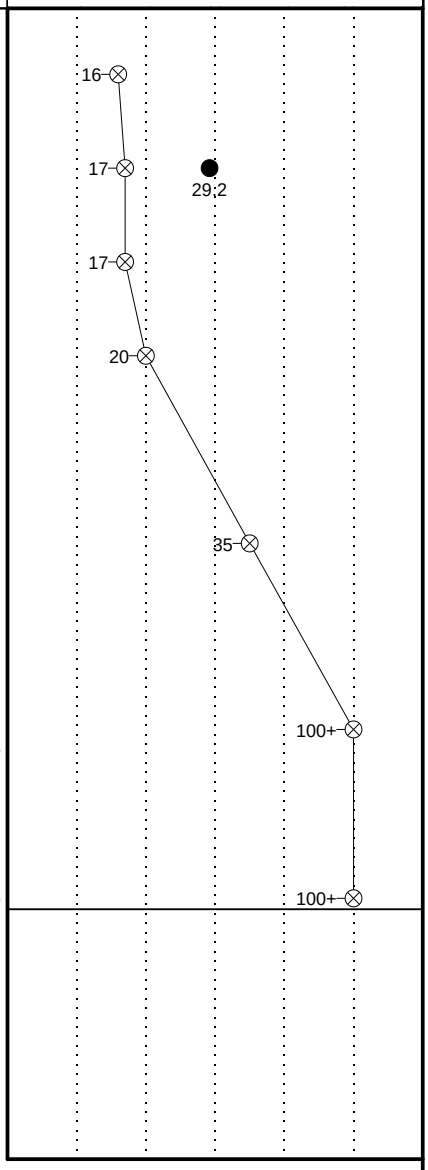
STANDARD PENETRATION BLOWS/FT

ENGLISH UNITS

BOTTOM OF CASING | LOSS OF CIRCULATION

SURFACE ELEVATION 594.3

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Topsoil Depth [2"]			
	S-1	SS	18	18	(ML) RESIDUAL- SILT, Red to Orangish Red, Moist, Very Stiff			7 7 9
	S-2	SS	18	18			590	5 7 10
5	S-3	SS	18	18				4 8 9
	S-4	SS	18	18	(CL) SANDY LEAN CLAY, Grayish Orange, Moist, Very Stiff		585	6 8 12
10					(SM) SILTY FINE TO MEDIUM SAND, Tan, Moist, Dense			
	S-5	SS	18	16			580	15 18 17
15					(PWR) PARTIALLY WEATHERED ROCK SAMPLED AS SILTY FINE TO MEDIUM SAND, Tan			
	S-6	SS	17	12			575	20 41 50/5
20	S-7	SS	5	4				50/5
					AUGER REFUSAL @ 24'		570	
25								
							565	
30								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL 23.4 WS ☐ WD ☒	BORING STARTED 03/23/16	CAVE IN DEPTH @ 17.6'
WL(BCR) WL(ACR) 21.3	BORING COMPLETED 03/23/16	HAMMER TYPE Manual
WL 11.8	RIG SIMCO 2400 FOREMAN Cody	DRILLING METHOD HSA 2.25

CLIENT	JOB #	BORING #	SHEET
York County	11615-A	B-22	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
York County Potential Sites - Parcel 2 - GEO	Cumming Corporation

SITE LOCATION: 1555 West Main Street, Rock Hill, York County, SC

NORTHING	EASTING	STATION
1129170	1983224	

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% – — – REC%

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

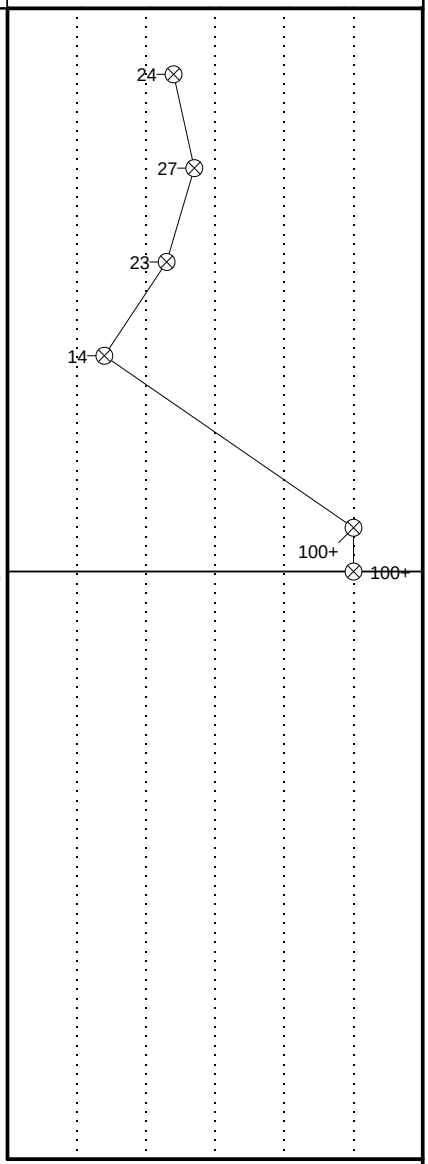
STANDARD PENETRATION BLOWS/FT

ENGLISH UNITS

BOTTOM OF CASING | LOSS OF CIRCULATION

SURFACE ELEVATION 586.6

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Topsoil Depth [2"]			
	S-1	SS	18	18	(MH) RESIDUAL- SANDY ELASTIC SILT, Red to Orangish Red, Moist, Very Stiff		585	7 11 13
	S-2	SS	18	18				7 10 17
5					(ML) SANDY SILT, Orangish Red, Moist, Very Stiff		580	6 9 14
	S-3	SS	18	18				
	S-4	SS	18	18	(CL) SANDY LEAN CLAY, Tan, Moist, Stiff			4 6 8
10							575	
	S-5	SS	8	8	(PWR) PARTIALLY WEATHERED ROCK SAMPLED AS SILTY FINE TO MEDIUM SAND, Tan			23 50/2
15	S-6	SS	0	0	AUGER REFUSAL @ 15'		570	50/0
20							565	
25							560	
30								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL GNE WS ☐ WD ☒	BORING STARTED 03/22/16	CAVE IN DEPTH @ 13'
WL(BCR) WL(ACR) GNE	BORING COMPLETED 03/22/16	HAMMER TYPE Manual
WL	RIG SIMCO 2400 FOREMAN Cody	DRILLING METHOD HSA 2.25

CLIENT	JOB #	BORING #	SHEET
York County	11615-A	B-23	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
York County Potential Sites - Parcel 2 - GEO	Cumming Corporation

SITE LOCATION: 1555 West Main Street, Rock Hill, York County, SC

NORTHING	EASTING	STATION
1129317	1983269	

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% – — – REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

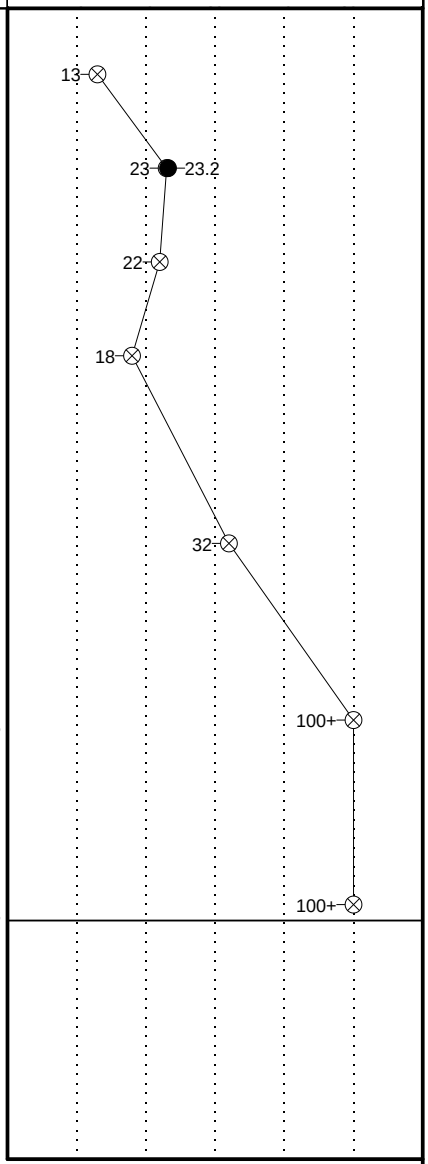
STANDARD PENETRATION BLOWS/FT

ENGLISH UNITS

BOTTOM OF CASING ▰ LOSS OF CIRCULATION

SURFACE ELEVATION 590.8

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Topsoil Depth [2"]		590	
	S-1	SS	18	18	(MH) RESIDUAL- ELASTIC SILT, Red to Orangish Red, Moist, Stiff to Very Stiff			4 6 7
	S-2	SS	18	18				6 9 14
5							585	
	S-3	SS	18	18				7 9 13
	S-4	SS	18	18	(CL) SANDY LEAN CLAY, Grayish Tan, Moist, Very Stiff			5 7 11
10							580	
	S-5	SS	18	18	(SM) SILTY FINE TO MEDIUM SAND, Contains Mica, Grayish Brown, Moist, Dense	▽		7 12 20
15							575	
	S-6	SS	11	10	(PWR) PARTIALLY WEATHERED ROCK SAMPLED AS SILTY FINE TO MEDIUM SAND, Contains Mica, Grayish Brown	▽		30 50/5
20							570	
	S-7	SS	9	9				45 50/3
25					AUGER REFUSAL @ 24.3'		565	
30								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

▽ WL 18.4 WS ☐ WD ☒	BORING STARTED 03/22/16	CAVE IN DEPTH @ 17.2'
▽ WL(BCR) ▼ WL(ACR) 14.3	BORING COMPLETED 03/22/16	HAMMER TYPE Manual
▽ WL	RIG SIMCO 2400 FOREMAN Cody	DRILLING METHOD HSA 2.25

CLIENT	JOB #	BORING #	SHEET
York County	11615-A	B-24	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
York County Potential Sites - Parcel 2 - GEO	Cumming Corporation

SITE LOCATION: 1555 West Main Street, Rock Hill, York County, SC

NORTHING	EASTING	STATION
1129248	1983399	

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% – — – REC%

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

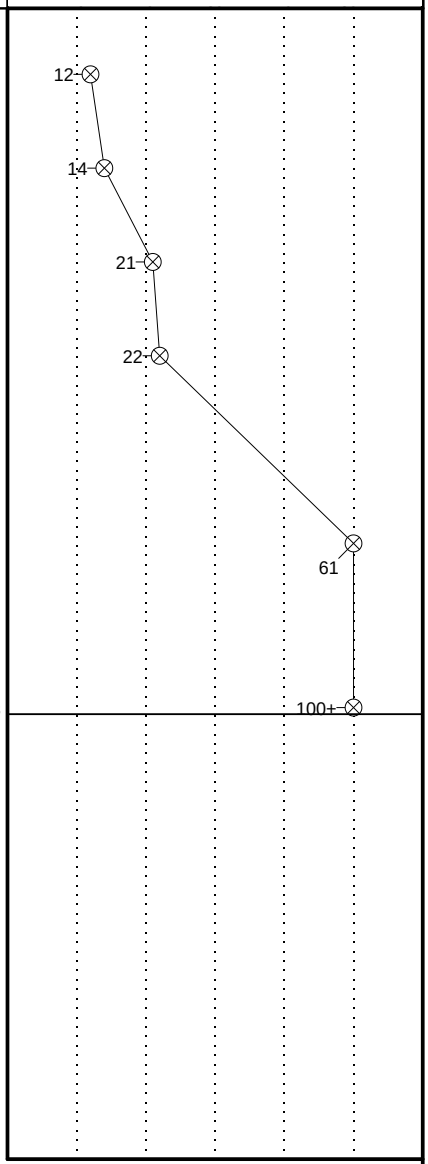
STANDARD PENETRATION BLOWS/FT

ENGLISH UNITS

BOTTOM OF CASING | LOSS OF CIRCULATION

SURFACE ELEVATION 582.2

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Topsoil Depth [2"]			
	S-1	SS	18	18	(MH) RESIDUAL- ELASTIC SILT, Red to Orangish Red, Moist, Stiff		580	5 5 7
	S-2	SS	18	16				4 6 8
5					(CL) SANDY LEAN CLAY, Grayish Tan, Moist, Very Stiff			
	S-3	SS	18	16			575	5 8 13
	S-4	SS	18	16	(ML) SANDY SILT, Contains Mica, Brown, Moist, Very Stiff			5 10 12
10								
					(SM) SILTY FINE TO MEDIUM SAND, Contains Mica, Brown, Moist, Very Dense		570	
	S-5	SS	18	18				22 24 37
15								
					(PWR) PARTIALLY WEATHERED ROCK SAMPLED AS SILTY FINE TO MEDIUM SAND, Contains Mica, Brown		565	
	S-6	SS	3	3	AUGER REFUSAL @ 18.8'			50/3
20							560	
25							555	
30								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL 13.4 WS ☐ WD ☒	BORING STARTED 03/22/16	CAVE IN DEPTH @ 14.8'
WL(BCR) WL(ACR) 12.9	BORING COMPLETED 03/22/16	HAMMER TYPE Manual
WL	RIG SIMCO 2400 FOREMAN Cody	DRILLING METHOD HSA 2.25

CLIENT	JOB #	BORING #	SHEET
York County	11615-A	B-25	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
York County Potential Sites - Parcel 2 - GEO	Cumming Corporation

SITE LOCATION: 1555 West Main Street, Rock Hill, York County, SC

NORTHING	EASTING	STATION
1129272	1983656	

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% – — – REC%

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

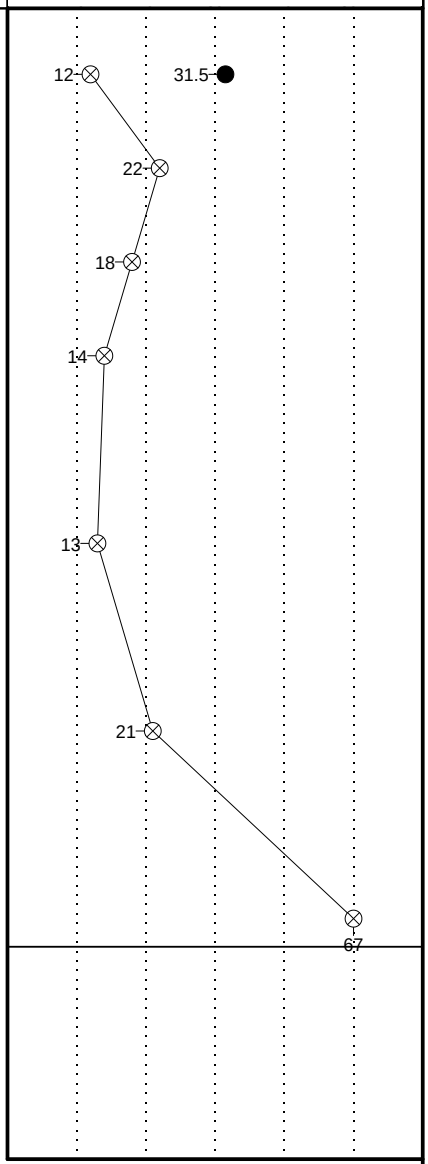
STANDARD PENETRATION BLOWS/FT

ENGLISH UNITS

BOTTOM OF CASING | LOSS OF CIRCULATION

SURFACE ELEVATION 585.6

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Topsoil Depth [2"]		585	
	S-1	SS	18	18	(MH) RESIDUAL- ELASTIC SILT, Red, Moist, Stiff to Very Stiff			4 5 7
	S-2	SS	18	0				7 9 13
5					(ML) SILT, Tan, Moist, Very Stiff		580	
	S-3	SS	18	18				5 8 10
	S-4	SS	18	14	(CL) SANDY LEAN CLAY, Grayish Tan, Moist, Stiff			6 6 8
10							575	
	S-5	SS	18	16	(ML) SANDY SILT, Brown, Moist, Stiff to Very Stiff	▽		5 5 8
15							570	
	S-6	SS	18	18				6 8 13
20							565	
	S-7	SS	18	18	(SM) SILTY FINE TO MEDIUM SAND, Brown, Moist, Very Dense			15 24 43
25					END OF BORING @ 25'		560	
30							555	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL 14.0 WS ☐ WD ☒	BORING STARTED 03/22/16	CAVE IN DEPTH @ 19.0'
WL(BCR) WL(ACR) 14.6	BORING COMPLETED 03/22/16	HAMMER TYPE Manual
WL	RIG SIMCO 2400 FOREMAN Cody	DRILLING METHOD HSA 2.25

CLIENT	JOB #	BORING #	SHEET
York County Building Maintenance	08:11615-D	B-101	1 OF 1

PROJECT NAME: York County Family Court- Additional Geo Exploration

ARCHITECT-ENGINEER:

SITE LOCATION: Heckle Blvd, Rock Hill, York County, SC

NORTHING | EASTING | STATION

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% – — – REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

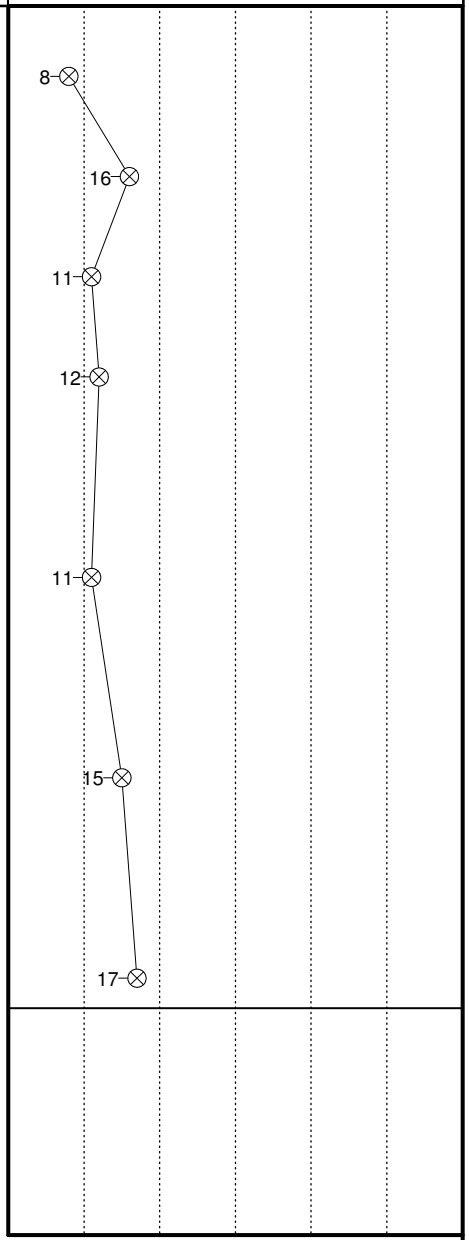
STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING | LOSS OF CIRCULATION

SURFACE ELEVATION 621

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0								
	S-1	SS	18	18	(MH) SANDY ELASTIC SILT, Reddish Brown, Moist, Medium Stiff		620	2 4 4
	S-2	SS	18	18	(MH) SANDY ELASTIC SILT, Reddish Brown, Moist, Very Stiff			2 6 10
5								
	S-3	SS	18	18	(ML) SANDY SILT, Brown to Grayish Brown, Moist, Stiff to Very Stiff		615	3 5 6
	S-4	SS	18	18				3 5 7
10							610	
	S-5	SS	18	18		▽		4 5 6
15							605	
	S-6	SS	18	18				4 7 8
20							600	
	S-7	SS	18	18				3 7 10
25					END OF BORING @ 25.0'		595	
30								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

▽ WL GNE WS ☐ WD ☒	BORING STARTED 01/03/17	CAVE IN DEPTH @ 16.0'
▽ WL(SHW) ▼ WL(ACR) GNE	BORING COMPLETED 01/03/17	HAMMER TYPE Manual
▽ WL 15.5	RIG CME 55 FOREMAN	DRILLING METHOD 2.25 H.S.A.

CLIENT	JOB #	BORING #	SHEET
York County Building Maintenance	08:11615-D	B-102	1 OF 1

PROJECT NAME: York County Family Court- Additional Geo Exploration

ARCHITECT-ENGINEER:

SITE LOCATION: Heckle Blvd, Rock Hill, York County, SC

NORTHING | EASTING | STATION

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% – — – REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

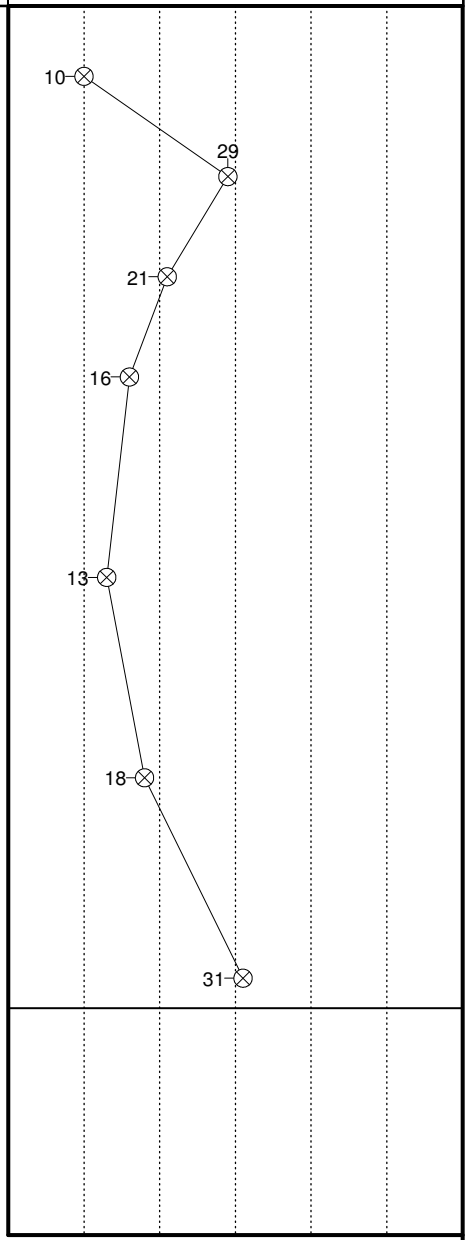
STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING | LOSS OF CIRCULATION

SURFACE ELEVATION 621

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					(MH) SANDY ELASTIC SILT, Reddish Brown, Moist, Stiff to Very Stiff		620	
	S-1	SS	18	18				2 5 5
	S-2	SS	18	18				3 11 18
5					(MH) SANDY ELASTIC SILT, Reddish Brown, Moist, Very Stiff to Stiff		615	
	S-3	SS	18	18				6 8 13
	S-4	SS	18	18				5 7 9
10							610	
	S-5	SS	18	18				3 5 8
15							605	
					(MH) SANDY ELASTIC SILT, Reddish Brown, Moist, Very Stiff			
	S-6	SS	18	18				3 7 11
20							600	
					(ML) SANDY SILT, Dark Brown, Moist, Hard			
	S-7	SS	18	18				7 13 18
25					END OF BORING @ 25.0'		595	
30								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL GNE WS ☐ WD ☒	BORING STARTED 01/04/17	CAVE IN DEPTH @ 14.5'
WL(SHW) WL(ACR) GNE	BORING COMPLETED 01/04/17	HAMMER TYPE Manual
WL	RIG CME 55 FOREMAN	DRILLING METHOD 2.25 H.S.A.

CLIENT	JOB #	BORING #	SHEET
York County Building Maintenance	08:11615-D	B-103	1 OF 1

PROJECT NAME: York County Family Court- Additional Geo Exploration

ARCHITECT-ENGINEER:

SITE LOCATION: Heckle Blvd, Rock Hill, York County, SC

NORTHING | EASTING | STATION

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% – — – REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

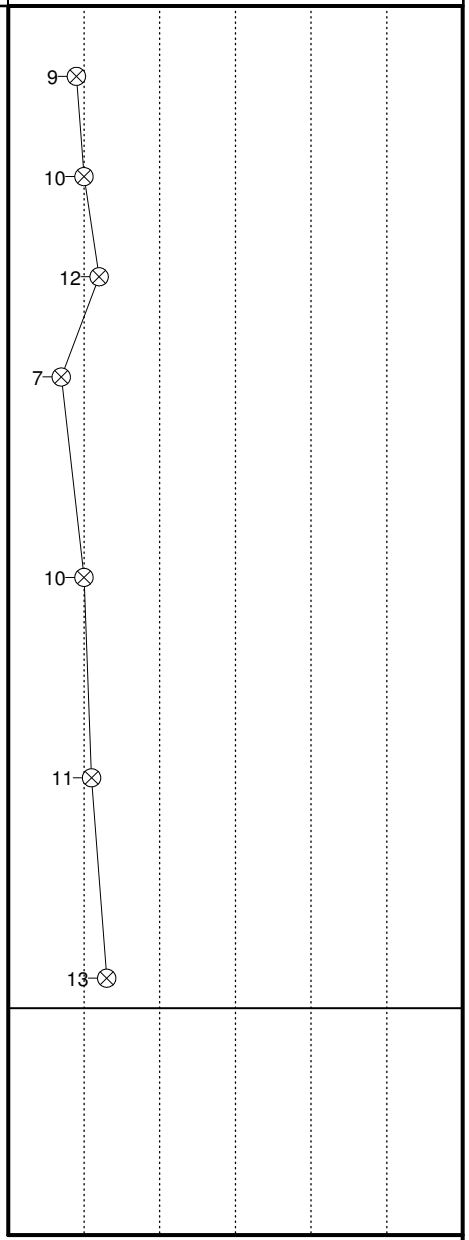
STANDARD PENETRATION BLOWS/FT

ENGLISH UNITS

BOTTOM OF CASING | LOSS OF CIRCULATION

SURFACE ELEVATION 616

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					(MH) SANDY ELASTIC SILT, Reddish Brown, Moist, Stiff		615	
	S-1	SS	18	18				3 4 5
					(ML) SANDY SILT, Reddish Brown, Moist, Stiff			
	S-2	SS	18	18				3 4 6
5							610	
	S-3	SS	18	18				2 5 7
					(SM) SILTY FINE TO MEDIUM SAND, Brown to Grayish Brown, Moist, Loose to Medium Dense			
	S-4	SS	18	18				2 3 4
10							605	
	S-5	SS	18	18				3 5 5
15							600	
	S-6	SS	18	18				3 5 6
20							595	
	S-7	SS	18	18				2 6 7
25					END OF BORING @ 25.0'		590	
30								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL GNE WS ☐ WD ☒	BORING STARTED 01/04/17	CAVE IN DEPTH @ 13.0'
WL(SHW) WL(ACR) GNE	BORING COMPLETED 01/04/17	HAMMER TYPE Manual
WL	RIG ATV FOREMAN	DRILLING METHOD 2.25 H.S.A.

CLIENT	JOB #	BORING #	SHEET
York County Building Maintenance	08:11615-D	B-104	1 OF 1

PROJECT NAME: York County Family Court- Additional Geo Exploration

ARCHITECT-ENGINEER:

SITE LOCATION: Heckle Blvd, Rock Hill, York County, SC

NORTHING | EASTING | STATION

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% – — – REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

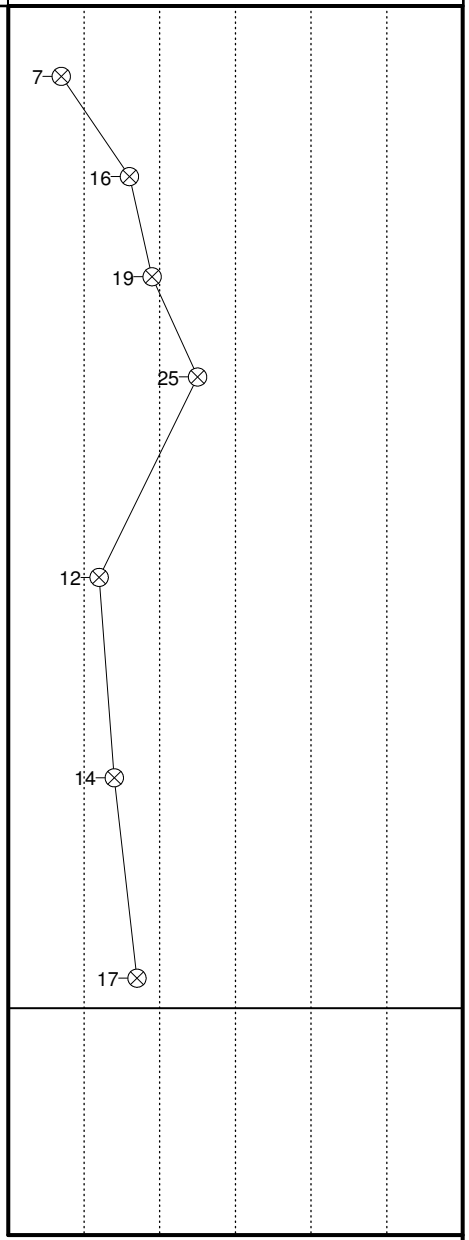
STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING | LOSS OF CIRCULATION

SURFACE ELEVATION 617

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0								
	S-1	SS	18	18	(MH) SANDY ELASTIC SILT, Reddish Brown, Moist, Medium Stiff		615	2 3 4
	S-2	SS	18	12	(MH) SANDY ELASTIC SILT, Reddish Brown, Moist, Very Stiff			2 6 10
5	S-3	SS	18	10	(MH) SANDY ELASTIC SILT, Reddish Brown, Moist, Very Stiff		610	5 8 11
	S-4	SS	18	18				6 10 15
10							605	
	S-5	SS	18	18	(CL) SANDY LEAN CLAY, Grayish Brown, Moist, Stiff			3 5 7
15							600	
	S-6	SS	18	18				3 6 8
20							595	
	S-7	SS	18	18	(ML) SANDY SILT, Grayish Brown, Moist, Very Stiff			5 7 10
25					END OF BORING @ 25.0'		590	
30								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL GNE WS ☐ WD ☒	BORING STARTED 01/04/17	CAVE IN DEPTH @ 11.0'
WL(SHW) WL(ACR) GNE	BORING COMPLETED 01/04/17	HAMMER TYPE Manual
WL	RIG CME 55 FOREMAN	DRILLING METHOD 2.25 H.S.A.

CLIENT	JOB #	BORING #	SHEET
York County Building Maintenance	08:11615-D	B-105	1 OF 1

PROJECT NAME: York County Family Court- Additional Geo Exploration

ARCHITECT-ENGINEER:

SITE LOCATION: Heckle Blvd, Rock Hill, York County, SC

NORTHING | EASTING | STATION

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% – — – REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

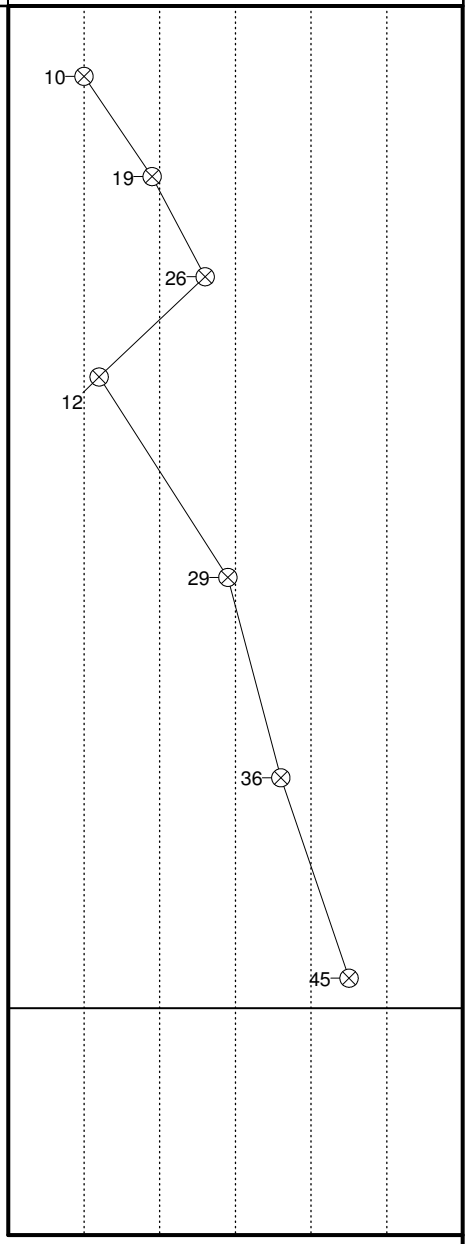
STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING | LOSS OF CIRCULATION

SURFACE ELEVATION 619

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					(MH) SANDY ELASTIC SILT WITH GRAVEL, Reddish Brown, Moist, Stiff			
	S-1	SS	18	18				3 4 6
	S-2	SS	18	18	(MH) SANDY ELASTIC SILT, Reddish Brown, Moist, Very Stiff to Stiff		615	5 8 11
5	S-3	SS	18	12				3 9 17
	S-4	SS	18	18			610	3 6 6
10					(ML) SANDY SILT, Brown to Grayish Brown, Moist, Very Stiff to Hard			
	S-5	SS	18	18			605	5 12 17
15								
	S-6	SS	18	12			600	8 15 21
20								
	S-7	SS	18	8			595	4 17 28
25					END OF BORING @ 25.0'			
							590	
30								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL GNE WS ☐ WD ☒	BORING STARTED 01/04/17	CAVE IN DEPTH @ 17.0'
WL(SHW) WL(ACR) GNE	BORING COMPLETED 01/04/17	HAMMER TYPE Manual
WL	RIG CME 55 FOREMAN	DRILLING METHOD 2.25 H.S.A.

CLIENT	JOB #	BORING #	SHEET
York County Building Maintenance	08:11615-D	B-106	1 OF 1

PROJECT NAME: York County Family Court- Additional Geo Exploration

ARCHITECT-ENGINEER:

SITE LOCATION: Heckle Blvd, Rock Hill, York County, SC

NORTHING | EASTING | STATION

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% – — – REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

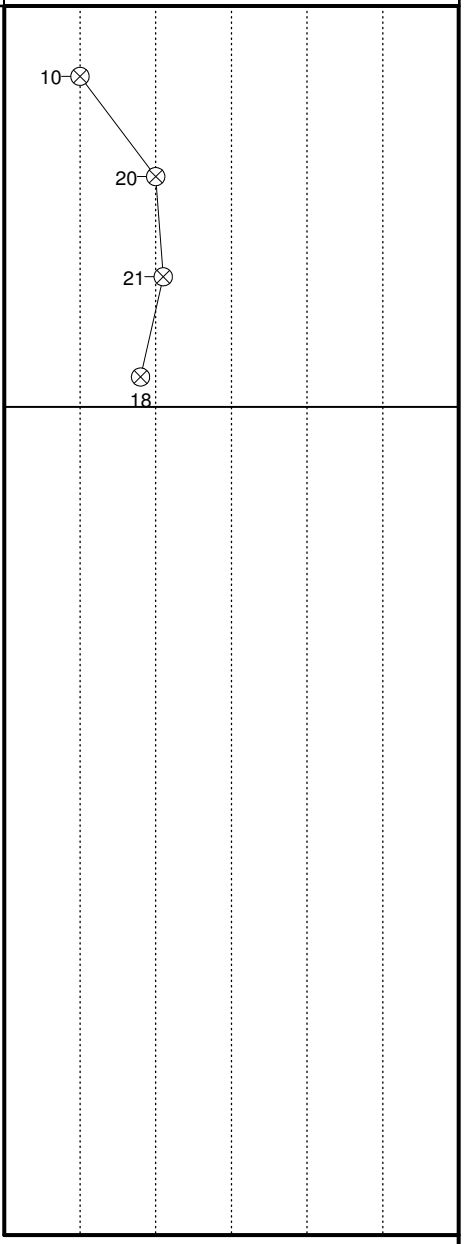
STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING | LOSS OF CIRCULATION

SURFACE ELEVATION 598

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Asphalt Depth [1.5"]			
					Gravel Depth [2.0"]			
	S-1	SS	18	18	(MH) SANDY ELASTIC SILT, Reddish Brown, Moist, Stiff			2 4 6
							595	
	S-2	SS	18	12	(MH) SANDY ELASTIC SILT, Grayish Brown, Moist, Very Stiff			3 8 12
5								
	S-3	SS	18	18				6 11 10
							590	
	S-4	SS	18	18				4 8 10
10					END OF BORING @ 10.0'			
							585	
15								
							580	
20								
							575	
25								
							570	
30								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL GNE WS ☐ WD ☒	BORING STARTED 01/04/17	CAVE IN DEPTH @ 8.5'
WL(SHW) WL(ACR) GNE	BORING COMPLETED 01/04/17	HAMMER TYPE Manual
WL 6.0	RIG CME 55 FOREMAN	DRILLING METHOD 2.25 H.S.A.

REFERENCE NOTES FOR BORING LOGS

MATERIAL[1,2]	
	ASPHALT
	CONCRETE
	GRAVEL
	TOPSOIL
	VOID
	BRICK
	AGGREGATE BASE COURSE
	FILL[3] MAN-PLACED SOILS
GW	**WELL-GRADED GRAVEL** gravel-sand mixtures, little or no fines
GP	**POORLY-GRADED GRAVEL** gravel-sand mixtures, little or no fines
GM	**SILTY GRAVEL** gravel-sand-silt mixtures
GC	**CLAYEY GRAVEL** gravel-sand-clay mixtures
SW	**WELL-GRADED SAND** gravelly sand, little or no fines
SP	**POORLY-GRADED SAND** gravelly sand, little or no fines
SM	**SILTY SAND** sand-silt mixtures
SC	**CLAYEY SAND** sand-clay mixtures
ML	**SILT** non-plastic to medium plasticity
MH	**ELASTIC SILT** high plasticity
CL	**LEAN CLAY** low to medium plasticity
CH	**FAT CLAY** high plasticity
OL	**ORGANIC SILT or CLAY** non-plastic to low plasticity
OH	**ORGANIC SILT or CLAY** high plasticity
PT	**PEAT** highly organic soils

DRILLING SAMPLING SYMBOLS & ABBREVIATIONS			
SS	Split Spoon Sampler	PM	Pressuremeter Test
ST	Shelby Tube Sampler	RD	Rock Bit Drilling
WS	Wash Sample	RC	Rock Core, NX, BX, AX
BS	Bulk Sample of Cuttings	REC	Rock Sample Recovery %
PA	Power Auger (no sample)	RQD	Rock Quality Designation %
HSA	Hollow Stem Auger		

PARTICLE SIZE IDENTIFICATION		
DESIGNATION		**PARTICLE SIZES**
Boulders		12 inches (300 mm) or larger
Cobbles		3 inches to 12 inches (75 mm to 300 mm)
Gravel:	Coarse	¾ inch to 3 inches (19 mm to 75 mm)
	Fine	4.75 mm to 19 mm (No. 4 sieve to ¾ inch)
Sand:	Coarse	2.00 mm to 4.75 mm (No. 10 to No. 4 sieve)
	Medium	0.425 mm to 2.00 mm (No. 40 to No. 10 sieve)
	Fine	0.074 mm to 0.425 mm (No. 200 to No. 40 sieve)
Silt & Clay ("Fines")		<0.074 mm (smaller than a No. 200 sieve)

COHESIVE SILTS & CLAYS		
UNCONFINED COMPRESSIVE STRENGTH, Q_P[4]	**SPT[5] (BPF)**	**CONSISTENCY[7] (COHESIVE)**
<0.25	<3	Very Soft
0.25 - <0.50	3 - 4	Soft
0.50 - <1.00	5 - 8	Medium Stiff
1.00 - <2.00	9 - 15	Stiff
2.00 - <4.00	16 - 30	Very Stiff
4.00 - 8.00	31 - 50	Hard
>8.00	>50	Very Hard

GRAVELS, SANDS & NON-COHESIVE SILTS	
SPT[5]	**DENSITY**
<5	Very Loose
5 - 10	Loose
11 - 30	Medium Dense
31 - 50	Dense
>50	Very Dense

RELATIVE AMOUNT[7]	COARSE GRAINED (%)	FINE GRAINED (%)
Trace	<5	<5
Dual Symbol *(ex: SW-SM)*	10	10
With	15 - 20	15-25
Adjective *(ex: "Silty")*	25 - <50	30 - <50

WATER LEVELS[6]		
	WL	Water Level (WS)(WD)
		(WS) While Sampling
		(WD) While Drilling
	SHW	Seasonal High WT
	ACR	After Casing Removal
	SWT	Stabilized Water Table
	DCI	Dry Cave-In
	WCI	Wet Cave-In

[1] *Classifications and symbols per ASTM D 2488-09 (Visual-Manual Procedure) unless noted otherwise.*

[2] *To be consistent with general practice, "POORLY GRADED" has been removed from GP, GP-GM, GP-GC, SP, SP-SM, SP-SC soil types on the boring logs.*

[3] *Non-ASTM designations are included in soil descriptions and symbols along with ASTM symbol [Ex: (SM-**FILL**)].*

[4] *Typically estimated via pocket penetrometer or Torvane shear test and expressed in tons per square foot (tsf).*

[5] *Standard Penetration Test (SPT) refers to the number of hammer blows (blow count) of a 140 lb. hammer falling 30 inches on a 2 inch OD split spoon sampler required to drive the sampler 12 inches (ASTM D 1586). "N-value" is another term for "blow count" and is expressed in blows per foot (bpf).*

[6] *The water levels are those levels actually measured in the borehole at the times indicated by the symbol. The measurements are relatively reliable when augering, without adding fluids, in granular soils. In clay and cohesive silts, the determination of water levels may require several days for the water level to stabilize. In such cases, additional methods of measurement are generally employed.*

[7] *Minor deviation from ASTM D 2488-09.*

Important Information About Your

Geotechnical Engineering Report

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

The following information is provided to help you manage your risks.

Geotechnical 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 civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one - not even you* - should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from alight industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- 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. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ-sometimes significantly from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final*, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of 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 equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the express purpose of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in-this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely on Your ASFE-Member Geotechnical Engineer For Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

ASFE
The Best People on Earth

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