Addendum 4

REQUEST FOR PROPOSAL (RFP)
DESIGN-BUILD BRIDGING SERVICES

FORSYTH COUNTY KERNERSVILLE BRANCH LIBRARY

PROPOSALS
WILL BE RECEIVED UNTIL

****** December 7, 2016 @ 2:00 PM EST ******

November 10, 2016

Please acknowledge receipt of this Addendum and include with your Proposal.

_____
Company

_____
Authorized Signature Date

Questions / Responses

The following are questions related to this RFP with County responses.

Question: What items are included in the FFE items, page 3 and 4 conflict one another?
Response: It isn't necessary to identify each FF&E item. Pages 3 & 4 do not conflict. FF&E built-in (page 3) refers to built-in book shelving (if any), etc.

Question: Is there an allowance we should place in our proposal? **Response:** Both Allowances and Unit Price Items will be submitted to the selected Design-Builder.

Question: Any consultants required on the project, i.e., Test & Balance? Page 1 listed a few requirements. **Response:** The Design-Builder is responsible for providing all the professional services necessary to meet all required codes, State Statutes etc. that one would normally expect on a construction project of this type. T&B is normally required. Please remember, the purpose of the RFP was not to provide a comprehensive document. During the selection process, the Owner is also required to take into consideration the Design-Build teams demonstrated competence and qualifications.

Question: Is there a HUB goal / requirement for the design firm? **Response:** No

Question: What is the HUB requirement for the project? **Response:** Yes, minimum of 10%.

Question: Is there a separation of MBE/WBE? **Response:** No

Question: Is there a page limit to our proposal? **Response:** No

Question: Can we have access to the Phase I report conducted by ECS, Inc.? This is dated 9-12-16.
Response: The Report you are referencing dated 9.12.16 isn't the Phase I rather the Subsurface Exploration and yes this will be shared.

Question: Is there a testing agent requirement for concrete, steel etcetera? **Response:** Yes, but the Owner will contract directly with the materials testing agency which will cover all the normal materials, soil, concrete, grout, steel, asphalt, etc.

Question: Is there a clear title to the property for the project? **Response:** Yes

Question: Do we include tap fees in our proposal? **Response:** Yes

Question: Are fees associated with special inspections to be included under the design/build team's scope or reimbursable? **Response:** All fees are the responsibility of the Design-Builder including those required by code and/or State Statute.

Question: Are there liquidated damages? **Response:** Yes, $500/Calendar Day

Question: Will expedited delivery be a factor in the selection? **Response:** No, but duration will.

Question: Are engineering consultants from the SD/DD phase excluded from the CD/CA phase of the project? **Response:** No

Question: Confirm the wind speed and seismic information (Wind speed appears to be incorrect at 120mph, should it be 90mph?) **Response:** 90 mph complies with ASCE 7-05 which is the older document superceded by ASCE 7-10. ASCE 7-10 has been out for some time now and this is generally understood by structural engineers and vendors of building components impacted by wind.

Question: Are there preferred brand alternates that will be identified for such items as windows, doors, door hardware, HVAC equipment? **Response:** Yes

Question: Is it the intent to certify this building or site as a LEED project? **Response:** No, however; it should be designed as energy efficient as possible and meet all of the State energy codes/requirements.

Question: Addendum #03 included a requirement for Construction teams to complete and submit a General Conditions vs. Fee Matrix for the new Kernersville Library project. Please provide further direction on how this form should be completed. For example, is the contractor to simply identify which column each line item would fall into or should a dollar amount be assigned to each line item? It may make for a more equal bidding environment if the County were to establish what items should be included for each category (Cost of work, GC, Designer Fee, Contractor Fee). Also, some items seem to have a combination of General Conditions and Cost of Work, while other items would appear to be considered Owner Costs or Costs of work and would not be included in any of the 3 categories listed on the Matrix. Please advise. **Response:** No dollar amount and the Contractor shall determine the category each item shall be under.

It is our understanding the proposal that we are to include only the fees billed to the City/County for General Conditions, Profit (fee for general construction), and fee for design services.

Therefore please confirm the following:

1. That we are not to include any cost of construction estimates with our proposals. **Response:** No construction costs
2. If the fees should be expressed as a dollar amount or a percentage of the cost of construction. **Response:** Dollar amount
3. Since the fee matrix will be filled out as part of the proposal, any explanation of fees can just be referenced to the matrix without extensive written description. **Response:** Each item within the General Conditions Matrix should be clearly defined.

REPORT
OF
SUBSURFACE EXPLORATION

KERNERSVILLE LIBRARY
KERNERSVILLE, NORTH CAROLINA

ECS PROJECT NO. 09-27081
SEPTEMBER 12, 2016

REPORT OF SUBSURFACE EXPLORATION

Kernersville Library
Kernersville, North Carolina

Prepared For:

Forsyth County General Services Department
201 North Chestnut Street
Winston Salem, NC 27101

Prepared By:

ECS CAROLINAS, LLP
4811 Koger Boulevard
Greensboro, NC 27406

ECS Project No:

09-27081

Report Date:

September 12, 2016

September 12, 2016

Mr. Gary Key
Forsyth County General Services
201 North Chestnut Street
Winston Salem, NC 27101

Reference: Report of Subsurface Exploration
Kernersville Library
Kernersville, North Carolina
ECS Project No. 09-27081

Dear Mr. Key:

ECS Carolinas, LLP (ECS) has completed the subsurface exploration for the above referenced project. This project was authorized and performed in general accordance with ECS Proposal No. 09-24527-P dated June 28, 2016. The purpose of this exploration was to determine the general subsurface conditions at the site and to evaluate those conditions with regard to foundation and floor slab support, along with general site development. This report presents our findings, conclusions, and recommendations for design and construction of the project.

ECS Carolinas, 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 CAROLINAS, LLP

NORTH CAROLINA PROFESSIONAL SEAL 022089 ENGINEER DAVID M. CUTTER
9-12-16

David M. Cutter, P.E.
Principal Engineer
NC Registration No. 022089

Jonathan M. Rich
Project Manager

1. INTRODUCTION

1.1. Project Information

The approximately 3.0 acre site, located at 248 Harmon Lane in Kernersville, North Carolina, is currently undeveloped and is partially wooded. The project involves development of the site for use as a public library. We understand that main building will be constructed with interior steel columns with wood trusses for the roof and the exterior will be 12-inch CMU with brick veneer.

1.2. Scope of Services

1.2.1 Soil Borings

Our scope of services included a subsurface exploration with soil test borings, laboratory testing, engineering analysis of the foundation support options, and preparation of this report with our recommendations. The subsurface exploration included six (6) soil test borings (B-7 through B-12). Borings B-1 through B-6 were drilled by ECS in June, 2013 (ECS project 09.22815-A) in an exploration of a larger overall site that included the property within the current investigation. Approximate boring locations are shown on the Boring Location Plan (Figure 2) included in the Appendix. The soil borings were performed using a Mobile B-50 truck-mounted drill rig using continuous-flight, hollow-stem augers.

2. FIELD SERVICES

2.1. Test Locations

The soil boring locations were selected by you and depths were selected and located in the field by ECS using handheld GPS technology and existing landmarks as reference. The approximate test locations are shown on the Boring Location Plan (Figure 2) presented in the Appendix of this report and should be considered accurate only to the degree implied by the method used.

2.2. Soil Test Borings

A total of six (6) soil test borings were drilled to evaluate the stratification and engineering properties of the subsurface soils at the project site. 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 and potential laboratory tests 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 Greensboro, North Carolina for further visual examination. 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, our visual/manual examinations, and laboratory testing are included on the respective boring logs in the Appendix.

3.1. Soil Classification

A geotechnical 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 soil engineer 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. 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 five (5) natural moisture content test and one (1) Atterberg Limits test. 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 Log and presented within the Laboratory Summary Sheet included within the Appendix.

4. SITE AND SUBSURFACE FINDINGS

4.1. Area Geology

The site is located in the Piedmont Physiographic Province of North 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 soil 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.

Organic laden soil, approximately 2 inches thick, was encountered at the ground surface at each boring location.

Residual soil was encountered below the organic laden soil at each boring location. Residual soils are formed by the in-place chemical and mechanical weathering of the parent bedrock. The residual soils extended to the depths explored. The residual soils encountered in the borings generally consisted of Silty SAND (SM) and Sandy Elastic SILT (MH), exhibiting SPT N-values ranging between 5 and 24 bpf, with a majority of the N-values between 7 and 14 bpf.

Each of the borings were terminated in residual soils. Materials hard enough to cause auger refusal were not encountered by borings.

4.3. Groundwater Observations

Groundwater measurements were attempted at the termination of drilling and prior to demobilization. Groundwater was encountered at boring location B-7 at a depth of 14.3 feet below the ground surface. Groundwater was not encountered within the drilled depths of the remaining borehole locations. 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.

4.4. Laboratory Test Results

Atterberg Limits testing was performed on a select soil sample from Boring B-8 which indicated a liquid limit of 59 and plasticity index of 18. The portion of the sample tested classified as a MH.

Selected split-spoon samples from Borings B-7, B-8, B-9 and B-10 were tested for natural moisture content in accordance with ASTM D2216. The moisture contents of the tested samples ranged from 17.1 to 25.7 percent.

5. CONCLUSIONS AND RECOMMENDATIONS

The 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 foundation support 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

Organic laden soil, approximately 2 inches thick, was encountered at the ground surface at each boring location. 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 observed surficial organic laden soils. Therefore, the phrase “surficial organic laden soil” is not intended to indicate suitability for landscaping and/or other purposes. The surficial organic laden soil depths provided in this report and on the individual Boring Logs are based on driller observations and should be considered approximate. Please note that the transition from surficial organic laden soils to underlying materials may be gradual, and therefore the observation and measurement of the surficial organic laden soil depth is approximate. Actual

surficial 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)

Elastic silts (MH) were encountered at boring location B-8. Soils classified as MH are fine-grained and have a Liquid Limit greater than 50 percent. MH soils are moisture sensitive soils and tend to shrink and swell with moisture variations.

These soils may be difficult to compact, and exhibit instability under construction traffic at moisture contents above optimum. Because of their susceptibility to drying shrinkage they are not ideal for direct foundation support. If these materials are encountered at planned bearing elevation, we recommend extending the footing excavations to 3 feet below finished exterior grade to help reduce the potential for building distress due to seasonal shrink/swell.

5.3. Seismic Site Class

We recommend a Seismic Site Classification D in accordance with the North Carolina Building Code based on the encountered conditions.

5.4. Structure Foundations

Provided the recommendations outlined herein are implemented, the proposed building can be adequately supported on a shallow foundation system consisting of spread footings bearing on firm undisturbed low plasticity residual soil or newly-placed engineered fill. A bearing capacity of up to 2,500 psf is recommended for foundations bearing on firm undisturbed low plasticity residual soil or newly-placed engineered fill. Near surface plastic soils (MH classification) were encountered near the ground surface in Boring B-8. Therefore, some isolated undercutting or extending of the footing excavation should be anticipated within the vicinity of Boring B-5.

For this 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 be placed 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. ECS recommends that control joints be placed within masonry to allow movement.

5.5. Slab-On-Grade Support

Slabs-on-grade can be adequately supported on undisturbed low plasticity residual soils or on newly-placed engineered 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 the size and shape of the loaded area depending on the method of structural analysis.

We recommend the slabs-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 302.1R96 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.

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. 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 slabs on ground 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 302.1R96 Guide for Concrete Floor and Slab Construction for additional information regarding concrete slab joint design.

5.6. 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.

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. This is particularly important at the site due to the moisture sensitive near-surface soils. Furthermore, good drainage should help reduce the possibility of the subgrade materials becoming saturated during the normal service period of the pavement.

Pavements for the project are expected to consist of light duty parking areas and heavy duty pavements in driveway areas. Based on our experience with soils similar to those encountered at the site, we recommend the following minimum pavement sections for the project provided the subgrade can be successfully proofrolled during construction. **Please note that these sections are considered minimum required thicknesses and do not represent a pavement design.**

PAVEMENT SECTION RECOMMENDATIONS

Material Designation	Light Duty Asphalt Pavement	Heavy Duty Asphalt Pavement	Portland Cement Concrete (PCC) Pavement
Asphalt Surface Course (S9.5B)	2 inch	1.5 inches	-
Intermediate Coarse (I19.0B)	-	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 100 percent of their standard Proctor maximum dry density (ASTM D 698).

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. Therefore, we suggest that the pavements in trash pickup 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 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 North 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.

5.7. Below Grade Excavation

Based on the results of the soil test borings, and previous seismic refraction study, it does not appear that difficult excavation will be encountered during site development.

5.8. Cut and Fill Slopes

We recommend that permanent cut slopes with less than 15 feet crest height through undisturbed residual soils be constructed at 2:1 (horizontal: vertical) or flatter. Permanent fill slopes less than 15 feet tall may be constructed using engineered fill at a slope of 2.5:1 or flatter. A slope of 3:1 or flatter may be desirable to permit establishment of vegetation, safe mowing, and maintenance. The surface of all cut and fill slopes should be adequately compacted. All permanent slopes should be protected using vegetation or other means to prevent erosion.

A slope stability analysis should be performed on cut and fill slopes exceeding 15 feet in height to determine a slope inclination resulting in a factor of safety greater than 1.4. Upon finalization of site civil drawings, ECS should be contacted to perform slope stability analysis and determine if further exploration is necessary.

The outside face of building foundations and the edges of pavements placed near slopes should be located an appropriate distance from the slope. Buildings or pavements placed at the top of

fill slopes should be placed a distance equal to at least 1/3 of the height of the slope behind the crest of the slope. Buildings or pavements near the bottom of a slope should be located at least ½ of the height of the slope from the toe of the slope. Slopes with structures located closer than these limits or slopes taller than the height limits indicated should be specifically evaluated by the geotechnical engineer and may require approval from the building code official.

Temporary slopes in confined or open excavations should perform satisfactorily at inclinations of 2:1. All excavations should conform to applicable OSHA regulations. Appropriately sized ditches should run above and parallel to the crest of all permanent slopes to divert surface runoff away from the slope face. To aid in obtaining proper compaction on the slope face, the fill slopes should be overbuilt with properly compacted structural fill and then excavated back to the proposed grades.

6. CONSTRUCTION CONSIDERATIONS

6.1. Site Preparation

Prior to construction, the proposed construction area should be stripped of all topsoil and organic material within the building footprint, 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 (high elasticity soil) may be used in deeper fill areas greater than 5 feet below proposed foundation bearing elevations or finished grades, with the added requirement that they remain stable beneath heavy construction traffic. CH soils are not recommended 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. Aggregate base course (ABC stone) should be compacted to 100 percent of standard Proctor maximum dry density. 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.

The maximum loose lift thickness depends upon the type of compaction equipment use. The table below provides maximum loose lifts that may be placed based on compaction equipment.

LIFT THICKNESS RECOMMENDATIONS

Equipment	Maximum Loose Lift Thickness, in.
Large, Self-Propelled Equipment (CAT 815, etc.)	8
Small, Self-Propelled or Remote Controlled (Rammax, etc.)	6
Hand Operated (Plate Tamps, Jumping Jacks, Wacker-Packers)	4

ECS recommends that fill operations be observed and tested by an engineering technician to determine if compaction requirements are being met. The testing agency should perform a sufficient number of tests to confirm that compaction is being achieved. For mass grading operations we recommend a minimum of one density test per 2,500 SF per lift of fill placed or per 1 foot of fill thickness, whichever results in more tests. When dry, the majority of the site soil should provide adequate subgrade support for fill placement and construction operations. When wet, the soil may degrade quickly with disturbance from construction traffic. Good site drainage should be maintained during earthwork operations to prevent ponding water on exposed subgrades.

We recommend at least one test per 1 foot thickness of fill for every 100 linear ft of utility trench backfill. Where fill will be placed on existing slopes, we recommend that benches be cut in the existing slope to accept the new fill. All fill slopes should be overbuilt and then cut back to expose compacted material on the slope face. While compacting adjacent to below-grade walls, heavy construction equipment should maintain a horizontal distance of 1(H):1(V). If this minimum distance cannot be maintained, the compaction equipment should run perpendicular, not parallel to, the long axis of the wall.

6.3. Foundation Construction & Testing

Foundation excavations should be tested to confirm adequate bearing prior to installation of reinforcing steel or placement of concrete. Unsuitable soils should be undercut to firm soils and the undercut excavations should be backfilled with compacted controlled fill. Exposure to the environment may weaken the soils at the footing bearing level if the foundation excavations remain open for too long a time; therefore, foundation concrete should be placed the same day that foundations are excavated. If the bearing soils are softened by surface water intrusion or exposure, the softened soils must be removed from the foundation excavation bottom immediately prior to placement of concrete. If the excavation must remain open overnight, or if rainfall becomes imminent while the bearing soils are exposed, a 1- to 3-inch thick "mud mat" of "lean" concrete may be placed on the bearing surface to protect the bearing soils. The mud mat

should not be placed until the bearing soils have been tested for adequate bearing capacity. If lean concrete is placed within the undercut zone, the foundation footprint does not require oversizing. However, if soil or ABC stone is used in lieu of lean concrete, the foundation footprint should be oversized on a 1V:1H scale.

We recommend testing all shallow foundations to confirm the presence of foundation materials similar to those assumed in the design. We recommend the testing consist of hand auger borings with Dynamic Cone Penetrometer (DCP) testing performed by an engineer or engineering technician.

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 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 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.

APPENDICES

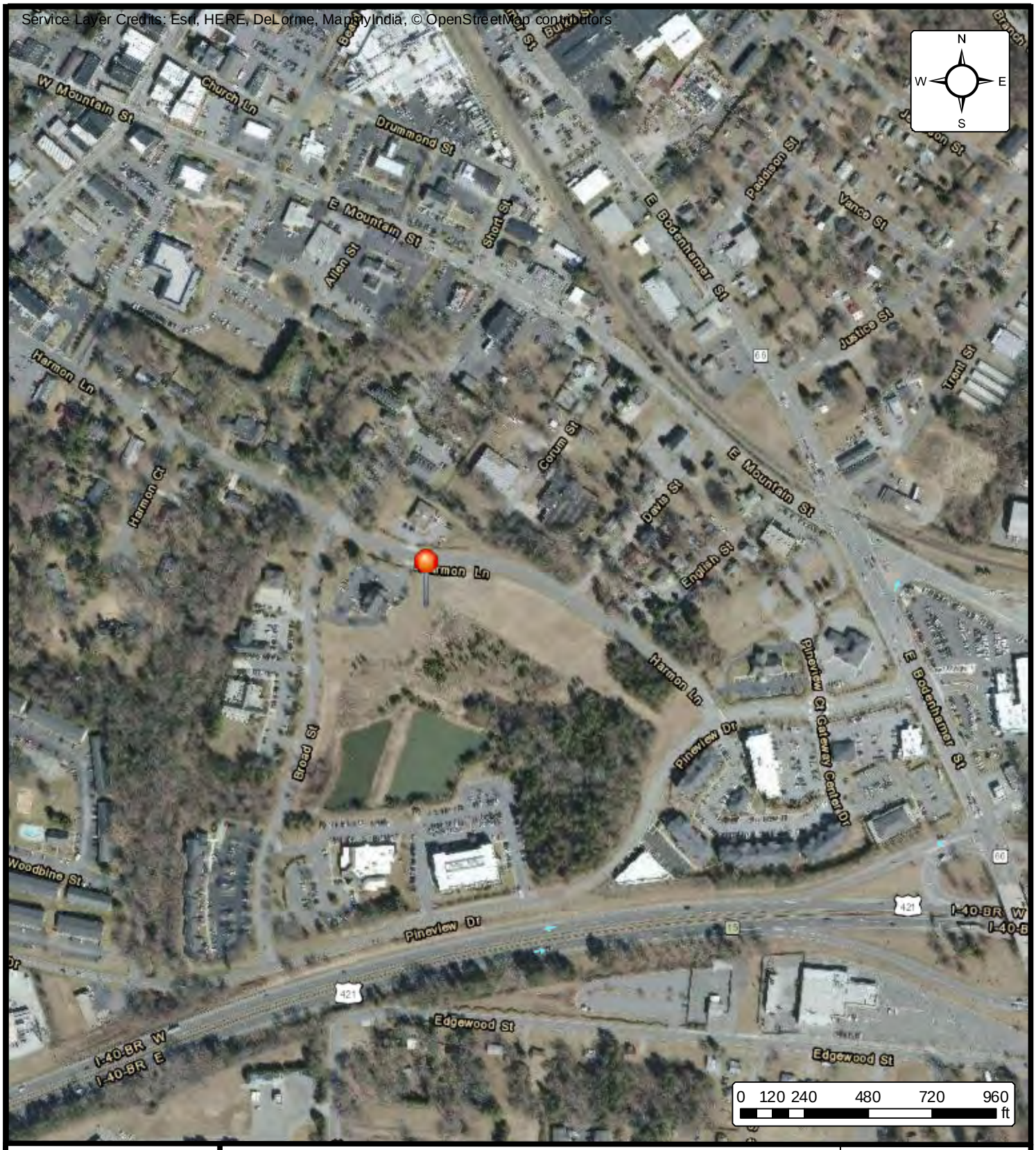
Appendix A – Illustrations

Site Location Map
Boring Location Plan
Generalized Subsurface Profile
Reference Notes for Boring Logs
Soil Test Boring Logs

Appendix B – Laboratory Test Results

Laboratory Testing Summary
Atterberg Limits

APPENDIX A – ILLUSTRATIONS

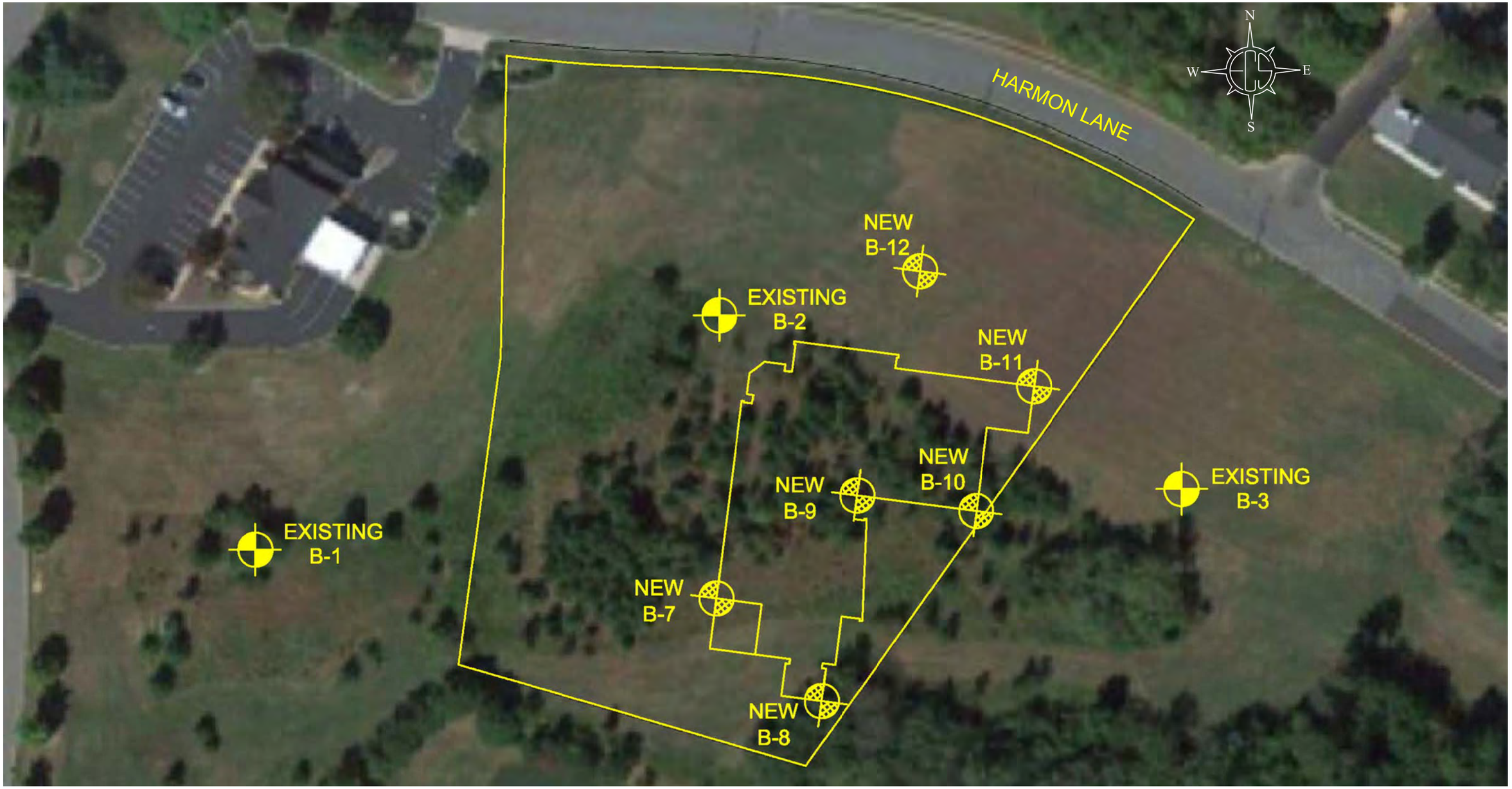


SITE LOCATION MAP

KERNERSVILLE LIBRARY

KERNERSVILLE, NORTH CAROLINA

ENGINEER	
SCALE	1 " = 500 '
PROJECT NO.	
SHEET	1 OF 1
DATE	8/18/2016



REVISIONS	DATE

SCALE 1"=60'

30 60

60 0

REFERENCE:
BORING LOCATION
DIAGRAM PROVIDED BY
THE CLIENT

FIGURE 2
BORING LOCATION PLAN

KERNERSVILLE LIBRARY
KERTNERSVILLE, NORTH CAROLINA

DRAWN BY/DATE: JMR/08-18-16

PROJECT NO. 09.27081

SOIL CLASSIFICATION LEGEND

GW - WELL GRADED GRAVEL
GM - SILTY GRAVEL
GP - POORLY GRADED GRAVEL
GC - CLAYEY GRAVEL
SW - WELL GRADED SAND
ML - LOW PLASTICITY SILT
ST - SHELBY TUBE
CL - LOW PLASTICITY CLAY
MH - HIGH PLASTICITY SILT
SM - SILTY SAND
RC - ROCK CORE
SP - POORLY GRADED SAND
SC - CLAYEY SAND
CH - HIGH PLASTICITY CLAY
PM - PRESSURE METER
OH - HIGH PLASTICITY ORGANIC SILTS AND CLAYS
OL - LOW PLASTICITY ORGANIC SILTS AND CLAY
PT - PEAT
- FILL
WR - WEATHERED ROCK
PWR - PARTIALLY WEATHERED ROCK
HWR - HIGHLY WEATHERED ROCK
- POSSIBLE FILL
DR - DECOMPOSED ROCK
- PROBABLE FILL

SURFACE MATERIALS

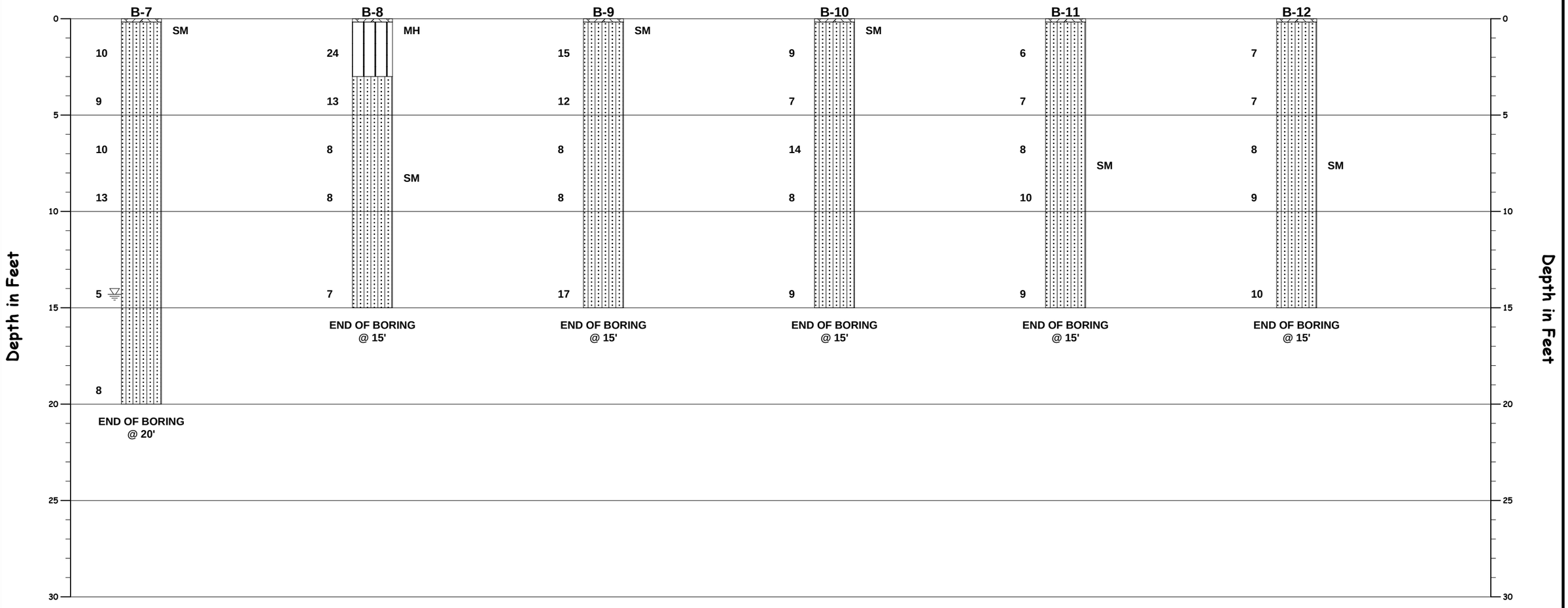
TOPSOIL
ASPHALT
GRAVEL
CONCRETE
VOID

ROCK TYPES

IGNEOUS
METAMORPHIC
SEDIMENTARY

SYMBOL LEGEND

WATER LEVEL - DURING DRILLING/SAMPLING
WATER LEVEL - SEASONAL, HIGH WATER
WATER LEVEL - AFTER CASING REMOVAL
WATER LEVEL - AFTER 24 HOURS



NOTES:
1 SEE INDIVIDUAL BORING LOG AND GEOTECHNICAL REPORT FOR ADDITIONAL INFORMATION.
2 PENETRATION TEST RESISTANCE IN BLOWS PER FOOT (ASTM D1586).
3 HORIZONTAL DISTANCES ARE NOT TO SCALE.

GENERALIZED SUBSURFACE SOIL PROFILE

Kernersville Library
Forsyth County General Services Dept
Harmon Lane, Kernersville, Forsyth County, NC

PROJECT NO.: 27081 | DATE: 9/12/2016 | VERTICAL SCALE: 1"=5'

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

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

GRAVELS, SANDS & NON-COHESIVE SILTS

SPT[5]	DENSITY
<5	Very Loose
5 - 10	Loose
11 - 30	Medium Dense
31 - 50	Dense
>50	Very Dense

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.*

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CLIENT	JOB #	BORING #	SHEET
Forsyth County General Services Dept	27081	B-7	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
Kernersville Library	

SITE LOCATION: Harmon Lane, Kernersville, Forsyth County, NC

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 100%

SURFACE ELEVATION

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	BLOWS/6"	STANDARD PENETRATION BLOWS/FT	CALIBRATED PENETROMETER TONS/FT^2
0							
	S-1	SS	18	18	3 4 6	10	25.7
	S-2	SS	18	18	3 4 5	9	
5							
	S-3	SS	18	18	5 4 6	10	
	S-4	SS	18	18	6 7 6	13	
10							
	S-5	SS	18	18	2 2 3	5	
15							
	S-6	SS	18	18	2 3 5	8	
20							
25							
30							

Topsoil Depth [2.00"]

(SM) SILTY SAND, Trace Clay, Tannish Brown, Moist, Loose

(SM) SILTY SAND, Contains Significant Mica, Brown, Moist, Loose to Medium Dense, Contains Some Manganese Staining

END OF BORING @ 20'

WATER LEVELS — ELEVATION (FT)

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

WL 14.3	WS ☐ WD ☒	BORING STARTED 08/22/16	CAVE IN DEPTH @ 11.5'
WL(SHW)	WL(ACR) DRY	BORING COMPLETED 08/22/16	HAMMER TYPE Auto
WL		RIG Truck FOREMAN M. Hartely	DRILLING METHOD HSA

CLIENT	JOB #	BORING #	SHEET
Forsyth County General Services Dept	27081	B-8	1 OF 1

PROJECT NAME: Kernersville Library

ARCHITECT-ENGINEER:

SITE LOCATION: Harmon Lane, Kernersville, Forsyth County, NC

NORTHING | EASTING | STATION

CALIBRATED PENETROMETER TONS/FT^2

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

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

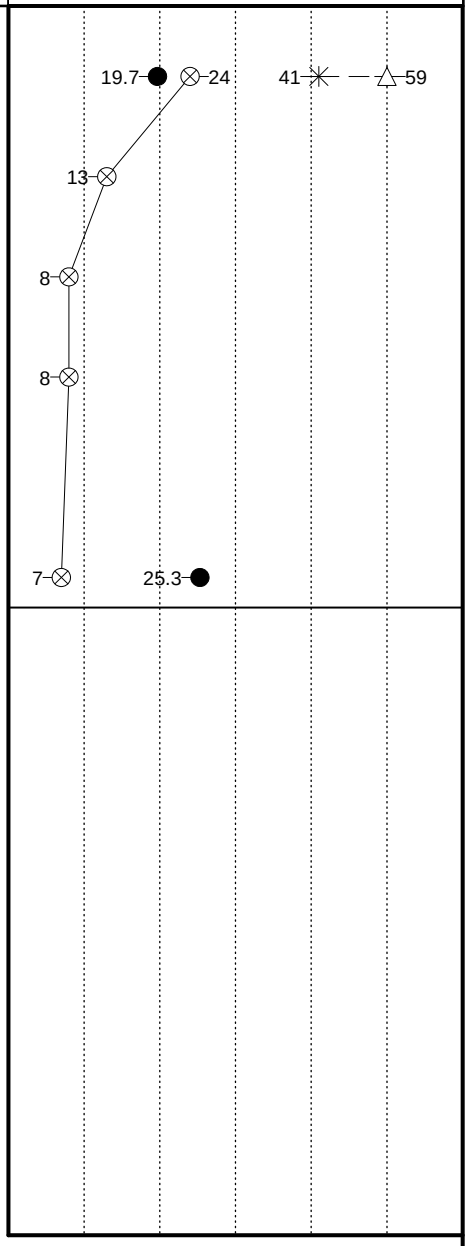
STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING | LOSS OF CIRCULATION 100%

SURFACE ELEVATION

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Topsoil Depth [2.00"]			
	S-1	SS	18	18	(MH) SANDY ELASTIC SILT, Reddish Brown, Dry, Medium Dense			6 11 13
	S-2	SS	18	18	(SM) SILTY SAND, Contains Mica, Tan to Brown, Moist, Loose to Medium Dense			5 6 7
5								
	S-3	SS	18	18				4 4 4
	S-4	SS	18	18				3 4 4
10								
	S-5	SS	18	18				3 3 4
15					END OF BORING @ 15'			
20								
25								
30								



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

WL DRY WS☐ WD☒	BORING STARTED 08/22/16	CAVE IN DEPTH @ 7.9'
WL(SHW) WL(ACR) DRY	BORING COMPLETED 08/22/16	HAMMER TYPE Auto
WL	RIG Truck FOREMAN M. Hartely	DRILLING METHOD HSA

CLIENT	JOB #	BORING #	SHEET
Forsyth County General Services Dept	27081	B-9	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
Kernersville Library	

SITE LOCATION: Harmon Lane, Kernersville, Forsyth County, NC

NORTHING	EASTING	STATION

CALIBRATED PENETROMETER TONS/FT^2

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

PLASTIC LIMIT% — WATER CONTENT% — LIQUID LIMIT%

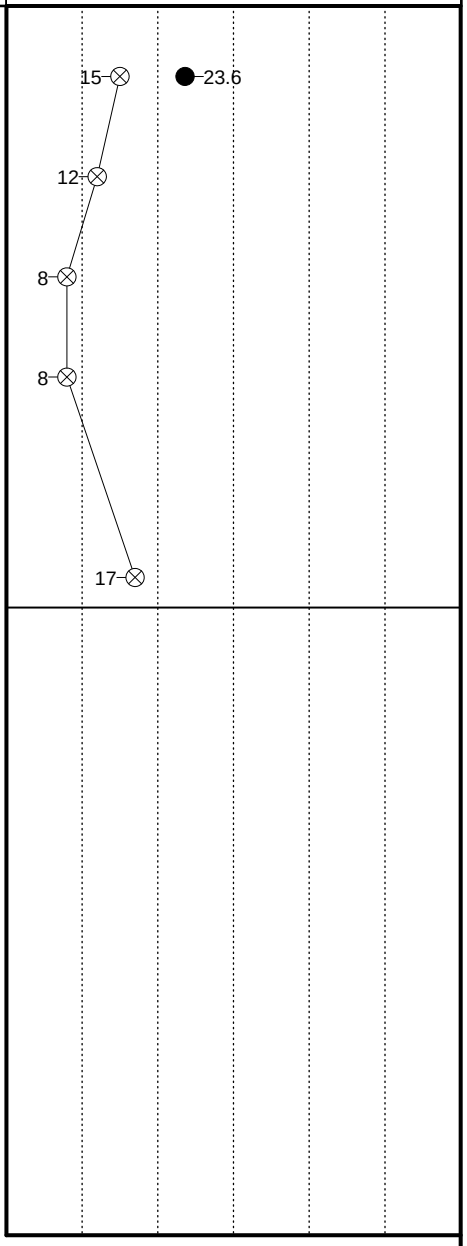
STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING — LOSS OF CIRCULATION 100%

SURFACE ELEVATION

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Topsoil Depth [2.00"]			
	S-1	SS	18	18	(SM) SILTY SAND, Contains Significant Mica, Grayish Brown, Dry, Loose to Medium Dense, Contains Some Manganese Staining			4 7 8
	S-2	SS	18	18				4 6 6
5								
	S-3	SS	18	18				4 4 4
	S-4	SS	18	18				3 4 4
10					(SM) SILTY SAND, Contains Mica, Gray, Moist, Medium Dense			
	S-5	SS	18	18				5 8 9
15					END OF BORING @ 15'			
20								
25								
30								



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

WL DRY WS☐ WD☒	BORING STARTED 08/22/16	CAVE IN DEPTH @ 7.8'
WL(SHW) WL(ACR) DRY	BORING COMPLETED 08/22/16	HAMMER TYPE Auto
WL	RIG Truck FOREMAN M. Hartely	DRILLING METHOD HSA

CLIENT	JOB #	BORING #	SHEET
Forsyth County General Services Dept	27081	B-10	1 OF 1

PROJECT NAME: Kernersville Library

ARCHITECT-ENGINEER:

SITE LOCATION: Harmon Lane, Kernersville, Forsyth County, NC

NORTHING | EASTING | STATION

CALIBRATED PENETROMETER TONS/FT^2

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

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

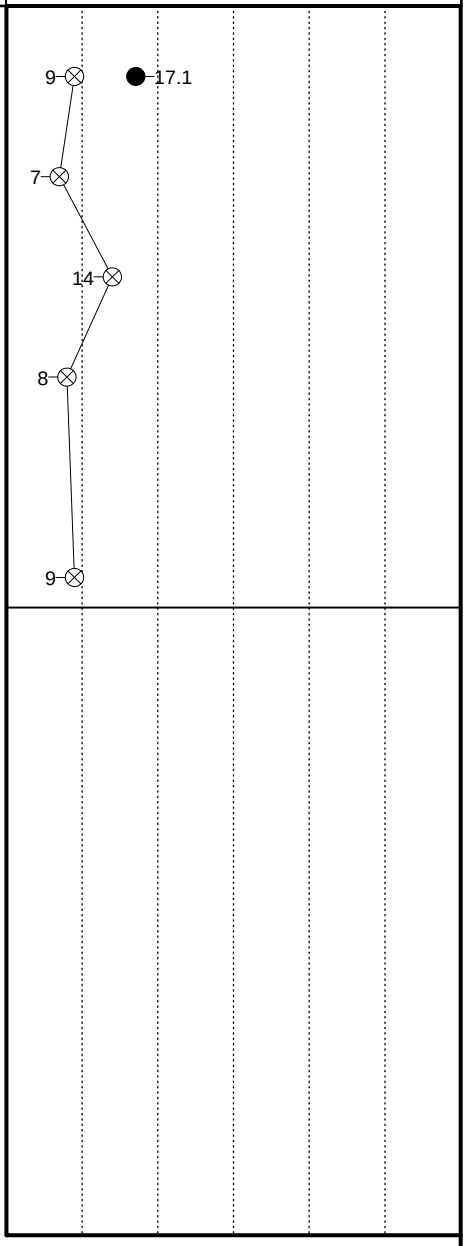
STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING | LOSS OF CIRCULATION

SURFACE ELEVATION

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Topsoil Depth [2.00"]			
	S-1	SS	18	18	(SM) SILTY SAND, Contains Mica and Contains Slight Roots, Grayish Brown, Moist, Loose, Contains Some Manganese Staining			3 4 5
	S-2	SS	18	18				3 3 4
5					(SM) SILTY SAND, Contains Mica and Contains Slight Rock Fragments, Brown, Moist, Loose to Medium Dense, Contains Some Manganese Staining			
	S-3	SS	18	18				6 7 7
	S-4	SS	18	18				4 4 4
10								
	S-5	SS	18	18				5 5 4
15					END OF BORING @ 15'			
20								
25								
30								



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

WL DRY WS ☐ WD ☒	BORING STARTED 08/22/16	CAVE IN DEPTH @ 7.7'
WL(SHW) WL(ACR) DRY	BORING COMPLETED 08/22/16	HAMMER TYPE Auto
WL	RIG Truck FOREMAN M. Hartely	DRILLING METHOD HSA

CLIENT	JOB #	BORING #	SHEET
Forsyth County General Services Dept	27081	B-11	1 OF 1

PROJECT NAME: Kernersville Library

ARCHITECT-ENGINEER:

SITE LOCATION: Harmon Lane, Kernersville, Forsyth County, NC

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

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"	STANDARD PENETRATION BLOWS/FT
0					Topsoil Depth [2.00"]				
	S-1	SS	18	18	(SM) SILTY SAND, Contains Significant Mica, Brown, Moist, Loose, Contains Some Manganese Staining			2 3 3	6
	S-2	SS	18	18				2 3 4	7
5	S-3	SS	18	18				3 3 5	8
	S-4	SS	18	18				3 5 5	10
10	S-5	SS	18	18				4 4 5	9
15					END OF BORING @ 15'				
20									
25									
30									

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

WL DRY WS ☐ WD ☒	BORING STARTED 08/22/16	CAVE IN DEPTH @ 7.9'
WL(SHW) WL(ACR) DRY	BORING COMPLETED 08/22/16	HAMMER TYPE Auto
WL	RIG Truck FOREMAN M. Hartely	DRILLING METHOD HSA

CLIENT	JOB #	BORING #	SHEET
Forsyth County General Services Dept	27081	B-12	1 OF 1

PROJECT NAME: Kernersville Library

ARCHITECT-ENGINEER:

SITE LOCATION: Harmon Lane, Kernersville, Forsyth County, NC

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

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"	STANDARD PENETRATION BLOWS/FT
0					Topsoil Depth [2.00"]				
	S-1	SS	18	18	(SM) SILTY SAND, Contains Mica, Tan to Gray, Dry to Moist, Loose			3 3 4	7
	S-2	SS	18	18				3 3 4	7
5	S-3	SS	18	18				3 4 4	8
	S-4	SS	18	18				4 4 5	9
10	S-5	SS	18	18				4 5 5	10
15					END OF BORING @ 15'				
20									
25									
30									

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

WL DRY WS ☐ WD ☒	BORING STARTED 08/22/16	CAVE IN DEPTH @ 7.7'
WL(SHW) WL(ACR) DRY	BORING COMPLETED 08/22/16	HAMMER TYPE Auto
WL	RIG Truck FOREMAN M. Hartely	DRILLING METHOD HSA

APPENDIX B – LABORATORY RESULTS

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]	Other
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
B-7												
	S-1	1.00 - 2.50	25.7									
B-8												
	S-1	1.00 - 2.50	19.7	MH	59	41	18					
	S-5	13.50 - 15.00	25.3									
B-9												
	S-1	1.00 - 2.50	23.6									
B-10												
	S-1	1.00 - 2.50	17.1									

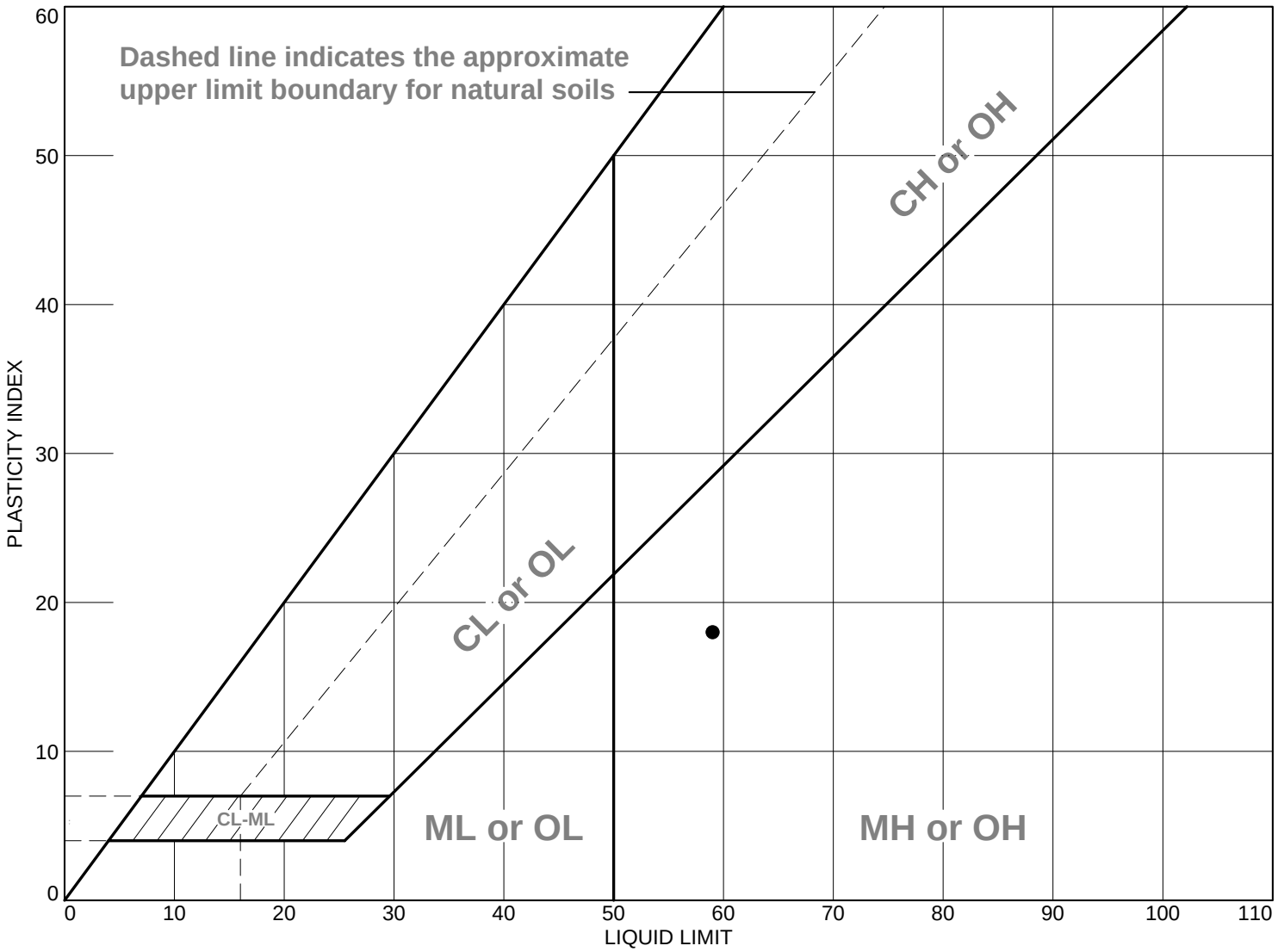
Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

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. 27081
Project Name: Kernersville Library
PM: Jonathan M. Rich
PE: David M. Cutter
Printed On: Monday, September 12, 2016

ECS CAROLINAS, LLP
4811 Koger Boulevard
Greensboro, NC 27407
Phone: (336) 856-7150
Fax: (336) 856-7160

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	(MH) SANDY ELASTIC SILT, Reddish Brown, Dry, Medium Dense	59	41	18			MH

Project No. 27081 **Client:** Forsyth County General Services Dept

Project: Kernersville Library

● **Source of Sample:** B-8 **Depth:** 1.00-2.50 **Sample Number:** S-1

Remarks:

ECS CAROLINAS, LLP
4811 Koger Boulevard
Greensboro, NC 27407
Phone: (336) 856-7150
Fax: (336) 856-7160

Figure