# REPORT OF SUBSURFACE EXPLORATION
# AND PRELIMINARY GEOTECHNICAL EVALUATION

**HORRY COUNTY SCHOOLS RECORDS CENTER SITE**
**2205 CHURCH STREET**
**CONWAY, SOUTH CAROLINA 29526**
BUILDING & EARTH PROJECT NO.: **RD200105**

***PREPARED FOR:***
**ECLS Global, Inc.**

***MARCH 20, 2020***

BUILDING & EARTH
Geotechnical, Environmental, and Materials Engineers

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March 20, 2020

Horry County Schools
c/o ECLS Global, Inc.
1160 E. Hwy 501
Conway, SC 29526

Attention: Mr. Dennis McCray

Subject: Report of Subsurface Exploration and Preliminary Geotechnical Evaluation
Horry County Schools Records Center Site
Conway, South Carolina
Building & Earth Project No: RD200105

Dear Mr. McCray:

Building & Earth Sciences, LLP. has completed the authorized subsurface exploration and preliminary pavement design recommendations for the Horry County Schools records center bus fueling station and training pad located on 2205 Church street in Conway, South Carolina.

The purpose of this exploration and evaluation has been to evaluate general subsurface conditions at the site and to prepare pavement section recommendations for the project. Recommendations in this report are based on a physical reconnaissance of the site and observation and classification of samples obtained from ten (10) soil test borings drilled at the site.

***The analysis and recommendations presented in this report shall be considered preliminary and should not be used for final design or construction***. Site plans, traffic loads, and grading information was not available at the time of this reporting. Further evaluation, once these details are available, and confirmation of the anticipated subsurface conditions during construction, are an essential part of geotechnical services.

We appreciate the opportunity to provide our services for this project. If there are any questions regarding the information in this report or if additional information is required, please call.

Respectfully Submitted,
**BUILDING & EARTH SCIENCES, LLP.**

Monique Lumpkin
Monique Lumpkin
Field Professional

Kurt A. Miller, PE
Regional Manager

KURT A. MILLER
No. 29820

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## 1.0 PROJECT & SITE DESCRIPTION

Proposed for construction is a new fueling station and bus training pad on the Horry County Schools (HCS) Records Center site. The site is located at 2205 Church Street in the southwest quadrant of the Church Street - Richardson Street intersection, in Conway, South Carolina. The site is currently occupied by the HCS Records Center, a maintenance shop and a building slab.

We understand this preliminary investigation is being performed as part of preliminary design services in support of sitework and paving improvements. Geotechnical recommendations presented in this report will therefore be considered preliminary until traffic information has been provided and Building & Earth has had the opportunity to review civil plans signed and sealed by a professional engineer registered in the State of South Carolina.

Depending on final grading plans, supplemental subsurface exploration and geotechnical analyses may be warranted to prepare final geotechnical recommendations. Photographs depicting the current site conditions appear below.

**Figure 1: Approximate Geotechnical Scope Boundary**

**Figure 2: Looking Northeast from Southwest Corner**

**Figure 3: Looking Southwest from Northeast Corner**

**Figure 4: Looking Northwest from Southeast Corner**

## 2.0 SCOPE OF SERVICES

The authorized subsurface exploration was performed on February 21 and 27, 2020 in conformance with Survey & Geotechnical proposal for Horry County Schools Records Center sitework improvements, dated December 13, 2019. Occasionally some modification to work scopes appearing in our proposals is required to provide for proper evaluation of encountered subsurface conditions. No modification to the scope was necessary for this study.

The purpose of the geotechnical exploration has been to characterize general subsurface conditions at specific boring locations and to gather data on which to base a geotechnical evaluation with respect to the proposed construction. The subsurface exploration for this project consisted of ten (10) hand auger test borings. At each location, Kessler DCP testing was performed in general accordance with ASTM D6951 by vertically dropping a 17.6-pound weight a distance of 22.6 inches, and recording the number of millimeters of penetration per hammer blow. A 4-inch diameter bucket-style auger with an extendable handle was used to bore and collect soil samples. Upon completion, standard penetration test values were estimated using the Kessler DCP data. Estimated N-values are reported on the boring logs.

Soil boring sites were field located by a representative of our staff using Garmin 63ST GPS and site plans provided by the client. As such, boring positions appearing on the Boring Location Plan attached to this report should be considered approximate.

Soil samples recovered during our site investigation were visually classified and specific samples were selected by the project engineer for laboratory analysis. The laboratory analyses consisted of:

| Test | ASTM | No. of Tests |
|---|---|---|
| Natural Moisture Content | D2216 | **12** |
| Atterberg Limits | D4318 | **3** |
| Material Finer Than No. 200 Sieve by Washing | D1140 | **3** |
| Kessler Dynamic Cone Penetrometer (in Situ CBR) | D6951 | **10** |

**Table 1: Scope of Laboratory Tests**

Results of the laboratory analyses are presented on the attached Boring Logs and in tabular form in the report Appendix. Descriptions of laboratory tests that were performed are also included in the Appendix.

Information gathered from the exploration was evaluated to develop heavy-duty pavement sections for the bus fueling station and training pad. The information was also evaluated to identify any special subgrade preparation procedures that may be required during the project earthworks phase.

Results of the work presented in this report address:

- Summary of existing surface conditions.
- A description of the subsurface conditions encountered at the boring locations.
- Site preparation considerations including material types to be expected during grading as well as recommendations regarding handling and treatment of unsuitable soils, if encountered.
- Compaction requirements and recommended criteria to establish suitable surfaces for structural backfill.
- Boring logs describing materials encountered with soil classifications, penetration values, and groundwater levels (if measured).
- Presentation of laboratory test results.
- Preliminary recommendations for pavement design

- Plans and maps showing the location of the project and our onsite work.

## 3.0 GEOTECHNICAL SITE CHARACTERIZATION

The following paragraphs are intended to provide a general characterization of the site from a geotechnical engineering perspective. It is not the intention of this report to address every potential geotechnical matter that may arise, nor to provide every possible interpretation of conditions identified. The following condition descriptions and subsequent recommendations are based, in part, on the assumption significant changes in subsurface conditions do not occur between boreholes. However, anomalous conditions can occur due to variations in existing fill that may be present at the site, or due to natural geologic variations. It will be necessary to compare assumed to actual conditions during site grading and pavement construction.

### 3.1 EXISTING SURFACE CONDITIONS

At the time of our field work, the site was described as well drained with about 8 feet of surface relief estimated from ground surface elevations at the boring sites. Per Google Earth aerial imagery, on-site elevations range from approximately 26 feet to 34 feet. A records center, maintenance shop and building slab currently occupy the site, several buildings have been removed from the site, and up to about 2 feet of fill has been placed at various locations on the site. Records suggest fill materials has not been placed with engineering controls. Neither locations, depths nor suitability with respect to pavement support of any in-situ fill material has been addressed as part of this study.

Vegetation on the site consist of grass and mature trees along the south and west boundary. Historical aerial imagery indicates the site has had the same configuration since at least 1994, with relatively recent demolition of several buildings.

### 3.2 SUBSURFACE CONDITIONS

A generalized stratification summary has been prepared using data from the soil test borings and is tabulated below. The stratification depicts general soil conditions and strata types encountered during our field investigation.

| Stratum No. | Typical Thickness | Description | Consistency |
|---|---|---|---|
| 1 | 3 – 5 in. | Topsoil | N/A |
| 2 | 3 – 5 in | Crushed Stone | N/A |
| 3 | 1.5 – 3 ft. | Fill – Clayey Sand (SC), Silty Sand (SM) | Very Loose to Medium Dense |
| 4 | 2.0 – 4.0+ ft. | Fat Clay (CH) | Stiff to Very Stiff |
| 5 | 1.0 ft. | Silty Sand (SM) | Medium Dense |

**Table 2: Stratification Summary**

Subsurface soil profiles have also been prepared based on the data obtained at specific boring locations. The subsurface soil profiles are presented in the Appendix. For specific details on the information obtained from individual soil borings, please refer to the Boring Logs included in the Appendix. Ground surface elevations at the boring sites were estimated using the Google Earth imagery. As such, these elevations should be considered approximate.

### 3.2.1 TOPSOIL

Topsoil was encountered in borings B-01, B-03 and B-04 with a thickness of approximately 3 to 5 inches. No testing has been performed to verify this material meets the requirements of "topsoil". Topsoil depths reported should only be considered an estimate as topsoil thickness may vary in unexplored portions of the site.

### 3.2.2 CRUSHED STONE

Crushed stone, generally described as NCDOT No. 57, was encountered in boring B-09 and B-10 with a thickness of approximately 3 to 5 inches. No testing has been performed to verify this material meets the requirements of NCDOT No. 57 stone. The stone depths reported should only be considered an estimate as thicknesses may vary in unexplored portions of the site.

### 3.2.3 FILL - CLAYEY SAND (SC) AND SILTY SAND (SM)

Soils described as clayey sand (SC) or silty sand (SM) were observed in all borings, except B-01, B-03, and B-04, extending to depths up to 3 feet below the surface. SPT N-values in this soil layer range from 0 to 22 blows per foot. Soils in this layer are further described as very loose to medium dense, brown to reddish-brown, fine to medium grained, and moist. No laboratory testing was performed to verify this material meets the requirements of "Clayey Sand or Silty Sand". Auger refusal was encountered in boring B-10 at 2 feet below the surface within this stratum, due to possible buried debris from previous site buildings.

### 3.2.4 Fat Clay (CH)

Soils described as fat clay (CH) were observed in all borings below the clayey sand (SC) layer described above. SPT N-values in this layer range from 8 to 20 blows per foot. Soils in this layer are further described as stiff to very stiff, brown to reddish brown, fine grained, and moist to wet.

Laboratory test performed on this material indicate a fines (passing standard #200 sieve) content of 54 to 65.8 percent, liquid limit values of 50 to 61, and plasticity indices of 30 to 38. These values correspond to USCS CH classification.

### 3.2.5 Silty Sand

Naturally occurring soils described as silty sand (SM) were encountered in boring B-04, below the fat clay (CH) layer described above, extending to depths 5.0 feet below the surface. These soils are generally described as medium dense, light brown, fine to medium grained, and wet. SPT N-values in the stratum were at approximately 10 blows per foot.

### 3.2.6 Auger Refusal

Auger refusal is the drilling depth at which a borehole can no longer be advanced using soil drilling procedures. Auger refusal can occur on hard soil, boulders, buried debris or bedrock. Coring is required to sample the material below auger refusal. Auger refusal was encountered in boring B-10, about 2 feet below the surface.

### 3.2.7 Groundwater

At the time of drilling, groundwater, perched or otherwise, was encountered in several borings. Water levels reported are accurate only for the time and date that the borings were drilled. Long term monitoring of the boreholes was not included as part of our subsurface exploration. The borings were backfilled the same day that they were drilled. Groundwater data is included in the following table.

| Boring No. | Depth (ft) | Elevation (ft) | Boring No. | Depth (ft) | Elevation (ft) |
|---|---|---|---|---|---|
| **B-01** | -- | **--** | **B-06** | 3.1 | 27.9 |
| **B-02** | 1.0 | 32.0 | **B-07** | -- | -- |
| **B-03** | 2.5 | 22.5 | **B-08** | -- | -- |
| **B-04** | 5.0 | 21.0 | **B-09** | -- | -- |
| **B-05** | -- | -- | **B-10** | 1.0 | 25.0 |

**Table 3: Groundwater Depths and Estimated Elevations**

## 4.0 SITE DEVELOPMENT CONSIDERATIONS

The area explored is suited to construction of the proposed Horry County School Records Center site bus fueling station and training pad. Geotechnical considerations affecting the project include:

- Stripping of topsoil and clearing of organic materials from construction areas,
- Subgrade preparation including compaction of surface materials in order to prepare a firm and competent subgrade condition.
- Previously placed fill soils encountered in borings.
- Presence of potential buried debris in building areas and augur refusal at boring B-10.
- Grading to provide efficient drainage of pavement surfaces and unpaved ground adjacent to paved surfaces.

Recommendations addressing the site conditions are presented in the following sections.

### 4.1 INITIAL SITE PREPARATION

Initial site preparation should include the clearing of all topsoil gravel surface and otherwise deleterious materials from proposed bus fueling station and training pad locations. Approximately 3 to 5 inches of topsoil were observed in borings B-01, B-03, and B-04, and 3 to 5 inches of crushed stone were observed at the surface at borings B-09 and B-10. The geotechnical engineer should observe stripping and grubbing operations to confirm all unsuitable materials are removed from locations for proposed construction.

Because of past use, buried structures such as foundations, utility lines, septic tanks, etc. may be present in the subsurface. If encountered, these should be removed and the resulting excavations backfilled in accordance with requirements appearing in the Structural Fill section of this report. Up to about 3 feet of fill was observed in borings B-02, B-05, B-06, B-07, B-08 and B-09, and auger refusal occurred at about 2 feet in boring B-10. We recommend in-situ fill soils be evaluated via test pits to confirm it is free of excess organic matter other deleterious materials. Provided it is acceptable for use as pavement or training pad support material, it is recommended this material be densified or compacted prior to roadway or slab construction. Evaluation of the material should be performed, and recommendations for densification/compaction, should be provided by the geotechnical engineer following the evaluation.

Materials disturbed during clearing operations should be stabilized in place or, if necessary, undercut to undisturbed materials and backfilled with properly compacted, approved structural fill.

During site preparation, the contractor should identify borrow source materials that will be used as structural fill and provide samples to the testing laboratory so that conformance to Structural Fill recommendations presented below can be confirmed, in in order that laboratory moisture-density (Proctor) testing can be completed prior to commencement of fill operations.

## 4.2 SUBGRADE EVALUATION

We recommend that the project geotechnical engineer or a qualified representative evaluate the subgrade after the site is prepared. Some unsuitable or unstable areas may be present in unexplored areas of the site. All areas that will require fill or that will support structures should be carefully proofrolled with a heavy (40,000 # minimum), rubber-tired vehicle at the following times.

- After an area has been stripped, and undercut if required, prior to the placement of any fill.
- After grading an area to the finished subgrade elevation in a building or pavement area.
- After areas have been exposed to any precipitation, and/or have been exposed for more than 48 hours.

Some instability may exist during construction, depending on climatic and other factors immediately preceding and during construction. If any soft or otherwise unsuitable soils are identified during the proofrolling process, they must be undercut or stabilized prior to fill placement, pavement construction, or floor slab construction. All unsuitable material identified during the construction shall be removed and replaced in accordance with the Structural Fill section of this report.

## 4.3 MOISTURE SENSITIVE SOILS

Moisture sensitive silty sands (SM) and clayey sands (SC) were encountered across most of the site during the subsurface exploration. These soils will degrade if allowed to become saturated. Therefore, not allowing water to pond by maintaining positive drainage and temporary dewatering methods (if required) is important to help avoid degradation and softening of the soils.

The contractor should anticipate some difficulty during the earthwork phase of this project if moisture levels are moderate to high during construction. Increased moisture levels will soften the subgrade and the soils may become unstable under the influence of construction traffic. Accordingly, construction during wet weather conditions should be avoided, as this could result in soft and unstable soil conditions that would require ground modification, such as in place stabilization or undercutting.

### 4.4 LOW RELATIVE DENSITY SOILS

Where low relative-density soils (N-values less than 10 using a manual hammer) are encountered, densification is recommended prior to proofrolling. Densification can be achieved using a heavy (10 ton minimum) smooth drum vibratory roller. If densification is performed, a rolling pattern that demonstrates densification through the low relative density strata should be developed, and densification observations should be observed by the geotechnical engineer.

If the soils cannot be stabilized in place, it may be necessary to remove the soils to a stable, suitable subgrade and replaced with compacted structural fill. The undercutting or in-situ stabilization should extend laterally 5 feet outside the pavement or structural footprint. All stabilization work should be observed by the geotechnical engineer or a qualified representative or the geotechnical engineer.

Some unsuitable or unstable areas may be present in unexplored areas of the site. Once the known undercut is complete, the areas planned for construction should be proofrolled in order to identify any additional soft soils requiring removal.

Undercut soils should be replaced with structural fill. Clean, non-organic, non-saturated soils taken from the undercut area can be re-used as structural fill. The placement procedure, compaction and composition of the structural fill must meet the requirements of the Structural Fill section of this report.

### 4.5 EVALUATION OF HIGH PLASTICITY CLAY

Soils described as CH (highly plastic clay) were observed in all but boring B-10 beginning at depths 1 to 3 feet below the surface. The fines content of this material is generally in the range 55 to 60 percent suggesting a relatively low shrink-swell potential. However, it should be recognized that this material may pose some risk with respect to volume change with fluctuating moisture content, and will have the potential for deterioration under dynamic (pavement subgrade) loading.

We recommend preliminary planning address the use and presence of this material. Further evaluation (classification testing with hydrometer grain size analysis) is recommended as part of a final geotechnical study. Preliminary recommendations with respect to this material are:

- Where it occurs beneath pavements and training pads, the material should be buried at least 18-inches below the subgrade surface.
- This material is not (on a preliminary basis) recommended for use in construction of fill embankments that will support buildings, training slabs or pavements unless it is placed a minimum 18-inches below embankment surfaces.
- It is generally recommended that the geotechnical engineer of record, or a qualified representative, observe placement and any undercutting operations of these materials.

## 4.6 STRUCTURAL FILL

Requirements for structural fill on this project follow:

| Soil Type | USCS Classification | Property Requirements | Placement Location |
|---|---|---|---|
| Sand and Gravel | GW, GP, GM, SW, SP, SM or combinations | Maximum 2" particle size | Areas where the material can be confined, and adequate drainage provided |
| Clay | CL, SC, GC | LL<50, PI<25, $\gamma_d$>100 pcf | Fill and Backfill |
| Clay/Silt | CH/MH | LL>50, PI>25, $\gamma_d$>100 pcf | Not Recommended for Use |
| On-site soils | Onsite Soils | Maximum 2" particle size | SC, SM: Areas where the material can be confined, and adequate drainage provided.<br>CH: Not recommended for use. |

**Table 4: Structural Fill Requirements**

Notes:

1. LL indicates the soil Liquid Limit; PI indicates the soil Plasticity Index; $\gamma_d$ indicates the maximum dry density as defined by the density standard outlined in the table below.
2. Laboratory testing of the soils proposed for fill must be performed in order to verify their conformance with the above recommendations.
3. Any fill to be placed at the site should be reviewed by the geotechnical engineer.

Placement requirements for structural fill are as follows:

| Specification | Requirement |
|---|---|
| Lift Thickness | 8" loose, 6" compacted |
| Density | 98 Percent minimum per ASTM D-698 |
| Moisture | ±3% of the optimum moisture content as determined by ASTM D698 |
| Density Testing Frequency | 1 test per 2,500 S.F., minimum 2 tests per lift |

**Table 5: Structural Fill Placement Requirements**

## 4.7 EXCAVATION CONSIDERATIONS

All excavations performed at the site should follow OSHA guidelines for temporary excavations. Excavated soils should be stockpiled according to OSHA regulations to limit the potential cave-in of soils.

### 4.7.1 GROUNDWATER

Groundwater perched otherwise was encountered at depths of approximately 1 to 5 feet in five of the ten borings. Groundwater could be encountered during construction, particularly during undercutting operations. It should be noted that fluctuations in the water level could occur due to seasonal variations in rainfall. The contractor must be prepared to remove groundwater seepage from excavations if encountered during construction. Excavations extending below groundwater levels will require dewatering systems (such as well points, sump pumps or trench drains). The contractor should evaluate the most economical and practical dewatering method.

## 4.8 UTILITY TRENCH BACKFILL

All utility trenches must be backfilled and compacted in the manner specified above for structural fill. It may be necessary to reduce the lift thickness to 4 to 6 inches to achieve compaction using hand-operated equipment.

## 4.9 LANDSCAPING AND DRAINAGE CONSIDERATION

The potential for soil moisture fluctuations within building areas and pavement subgrades should be reduced to lessen the potential of subgrade movement. Site grading should include positive drainage away from buildings and pavements. Excessive irrigation of landscaping poses a risk of saturating and softening soils below shallow footings and pavements, which could result in settlement of footings and premature failure of pavements.

### 4.10 WET WEATHER CONSTRUCTION

Excessive movement of construction equipment across the site during wet weather may result in ruts, which will collect rainwater, prolonging the time required to dry the subgrade soils.

During rainy periods, additional effort will be required to properly prepare the site and establish/maintain an acceptable subgrade. The difficulty will increase in areas where clay or silty soils are exposed at the subgrade elevation. Grading contractors typically postpone grading operations during wet weather to wait for conditions that are more favorable. Contractors can typically disk or aerate the upper soils to promote drying during intermittent periods of favorable weather. When deadlines restrict postponement of grading operations, additional measures such as undercutting and replacing saturated soils or stabilization can be utilized to facilitate placement of additional fill material.

## 5.0 PAVEMENT CONSIDERATIONS

For preliminary planning purposes, the following pavement section estimates have been prepared. Based on the materials encountered at the boring locations and after our recommendations for site preparation are implemented, pavements at the subject site may be designed based on a California Bearing Ratio (CBR) of eight (8). This CBR estimate is based upon average CBR values in the upper 18-inches of the soil profile, adjusted for some deterioration due to potentially wet subgrade conditions.

Subgrade and traffic analyses are required to provide comprehensive pavement section recommendations. Specific traffic information was not provided. Once the site grading has been designed, and traffic loading can be provided, we would be pleased to provide a design for the proposed bus fueling station and training pad. Results of our preliminary analysis follow:

| Type | Automobiles (per day) | Delivery Trucks (2-Axle/4-Tire) (per day) | Buses (per day) | Garbage Trucks (per week) | Delivery Trucks (2-Axle/6-Tire) (per day) | ESAL |
|---|---|---|---|---|---|---|
| Standard Duty | 500 | 1 | 50 | 1 | 1 | 2.7E+05 |
| Heavy Duty | 500 | 2 | 100 | 1 | 2 | 5.2E+05 |

**Table 9: Assumed Traffic Volume**

The volumes shown above are just one example of possible vehicle types and daily traffic that would result in the total equivalent 18-kip single-axle load (ESAL) shown. It has been our experience that parking lots experience a certain level of wear and stress greater than roadways designed for similar traffic volumes. Therefore, parking lots are typically designed using the AASHTO method and adjusted based on experience. If the owner would like Building & Earth to assess other likely traffic volumes, we will gladly review other options. In addition, we have assumed the following design parameters:

| Design Criteria | Value |
|---|---|
| Design life (Years) | 20 |
| Terminal Serviceability | 2.0 |
| Reliability | 85% |
| Initial Serviceability | 4.2 |
| Standard Deviation | 0.45 (Flexible) |
| Standard Deviation | 0.35 (Rigid) |

**Table 10: Assumed Design Parameters**

## 5.1 FLEXIBLE PAVEMENT

The asphalt pavement sections described herein were designed using the "AASHTO Guide for Design of Pavement Structures, 1993". Alternative pavement sections were designed by establishing the structural numbers used for the AASHTO design system and substituting materials based upon structural equivalency as follows:

| Material | Structural No. |
|---|---|
| Asphalt Concrete | 0.44 |
| Crushed Stone Base | 0.14 |

**Table 12: Structural Equivalent Coefficient**

The following flexible pavement sections are based on the design parameters presented above:

<table>
<tr><th colspan="3">Preliminary Flexible Pavement Section[1] (in.)</th></tr>
<tr><th colspan="2">Minimum Recommended Thickness (in.)</th><th rowspan="2">Material</th></tr>
<tr><th>Standard Duty</th><th>Heavy Duty</th></tr>
<tr><td>2.0</td><td>2.0</td><td>Surface Course</td></tr>
<tr><td>4.0</td><td>3.0</td><td>Binder Course</td></tr>
<tr><td>8.0</td><td>8.0</td><td>Crushed Stone Base</td></tr>
</table>

**Table 13: Asphalt Pavement Recommendations**

*Notes: 1. All Paving operations should comply with minimum standards required by SCDOT*

## 5.2 RIGID PAVEMENT

The following rigid pavement sections are based on the design parameters presented above. We assume an effective modulus of subgrade reaction (k) of 130 pci, a concrete elastic modulus ($E_c$) of 3.6 X $10^6$ psi, and a concrete modulus of rupture ($S'_c$) of 650 psi.

| Preliminary Rigid Pavement Section[1] (in.) | | |
|---|---|---|
| Minimum Recommended Thickness (in.) | | Material |
| Standard Duty | Heavy Duty | |
| 6.0 | 6.0 | Portland Cement Concrete, $f'_c$=4000 psi |
| 4.0 | 6.0 | Crushed Stone Base |

**Table 14: Rigid Pavement Recommendations**

*Notes: 1. All Paving operations should comply with minimum standards required by SCDOT*

Please note that site specific traffic volume information would be required for specific pavement recommendations. All subgrade, base, and pavement construction operations should meet minimum requirements of the SCDOT Standard Specifications for Roads and Structures.

## 6.0 SUBGRADE REHABILITATION

The subgrade soils often become disturbed during the period between initial site grading and construction of surface improvements. The amount and depth of disturbance will vary with soil type, weather conditions, construction traffic, and drainage.

The engineer should evaluate the subgrade soil during final grading to verify that the subgrade is suitable to receive pavement and/or concrete slab base materials. The final evaluation may include proofrolling or density tests.

Subgrade rehabilitation can become a point of controversy when different contractors are responsible for site grading and building construction. The construction documents should specifically state which contractor will be responsible for maintaining and rehabilitating the subgrade. Rehabilitation may include moisture conditioning and re-compacting soils. When deadlines or weather restrict grading operations, additional measures such as undercutting and replacing saturated soils or chemical stabilization can often be utilized.

## 7.0 CONSTRUCTION MONITORING

Field verification of site conditions is an essential part of the services provided by the geotechnical consultant. In order to confirm our recommendations, it will be necessary for Building & Earth personnel to make periodic visits to the site during site grading. Typical construction monitoring services are listed below.

- Site stripping and subgrade evaluation
- Compaction Testing and Proofrolling for Structural Fill and Backfill Soils
- Compaction and Thickness Testing for Asphalt and Concrete Paving Materials
- Compaction and Thickness Testing for Aggregate Base Course Material

## 8.0 CLOSING AND LIMITATIONS

This preliminary report was prepared for Horry County Schools c/o ECLS Global, Inc., for specific application to the Horry County Schools Records Center site located on Church Street in Conway, South Carolina. The information in this report is not transferable. This report should not be used for a different development on the same property without first being evaluated by the engineer.

The recommendations in this report were based on the information obtained from our field exploration and laboratory analysis. The data collected is representative of the locations tested. Variations are likely to occur at other locations throughout the site. Engineering judgment was applied in regards to conditions between borings. It will be necessary to confirm the anticipated subsurface conditions during construction.

This report has been prepared in accordance with generally accepted standards of geotechnical engineering practice. No other warranty is expressed or implied. In the event that changes are made, or anticipated to be made, to the nature, design, or location of the project as outlined in this report, Building & Earth must be informed of the changes and given the opportunity to either verify or modify the conclusions of this report in writing, or the recommendations of this report will no longer be valid.

The scope of services for this project did not include any environmental assessment of the site or identification of pollutants or hazardous materials or conditions. If the owner is concerned about environmental issues Building & Earth would be happy to provide an additional scope of services to address those concerns.

This report is intended for use during design and preparation of specifications and may not address all conditions at the site during construction. Contractors reviewing this information should acknowledge that this document is for design information only.

An article published by the Geoprofessional Business Association (GBA), titled *Important Information About Your Geotechnical Report*, has been included in the Appendix. We encourage all individuals to become familiar with the article to help manage risk.

# Appendix Table of Contents

## GEOTECHNICAL INVESTIGATION METHODOLOGIES

The subsurface exploration, which is the basis of the recommendations of this report, has been performed in accordance with industry standards. Detailed methodologies employed in the investigation are presented in the following sections.

### *DUAL MASS DYNAMIC CONE PENETRATION TESTING (KESSLER DCP)*

Dynamic Cone Penetration (DCP) tests were performed to estimate the in-place soil consistency and in-place California Bearing Ratio (CBR) of the subsurface soils by in-situ methods.

The DCP tests were performed starting at the top of existing subgrade to the desired depth of investigation. The DCP test was performed using the Kessler DCP with Dual Mass Hammer. A cone tip with base diameter of 0.79 inches and tip angle of 60 degrees was driven into the subsurface soils by a 17.6 pound (dual mass) sliding hammer from a height of 22.6 inches. The depth of cone penetration was measured at selected hammer drop intervals and the soil shear strength was reported in terms of DCP index. The DCP index is based on the average penetration depth resulting from one blow of the 17.6-pound hammer. The Kessler DCP can be used to estimate the strength characteristics of clay soils. The in-place CBR values of the subsurface soils at the test locations were estimated using empirical correlations between DCP index and California Bearing Ratio (CBR). The DCP test results are included in a subsequent section of the Appendix.

### *HAND AUGER BORINGS*

Hand auger borings were drilled with a 4-inch diameter auger to advance the hole below the existing grade. A Building & Earth representative collected samples of the subsurface soils at regular depth intervals and at depths where a change in lithology occurred.

# BORING LOG DESCRIPTION

Building & Earth Sciences, Inc. used the gINT software program to prepare the attached boring logs. The gINT program provides the flexibility to custom design the boring logs to include the pertinent information from the subsurface exploration and results of our laboratory analysis. The soil and laboratory information included on our logs is summarized below:

## *DEPTH AND ELEVATION*

The depth below the ground surface and the corresponding elevation are shown in the first two columns.

## *SAMPLE TYPE*

The method used to collect the sample is shown. The typical sampling methods include Split Spoon Sampling, Shelby Tube Sampling, Grab Samples, and Rock Core. A key is provided at the bottom of the log showing the graphic symbol for each sample type.

## *SAMPLE NUMBER*

Each sample collected is numbered sequentially.

## *BLOWS PER INCREMENT, REC%, RQD%*

When Standard Split Spoon sampling is used, the blows required to drive the sampler each 6-inch increment are recorded and shown in column 5. When rock core is obtained the recovery ration (REC%) and Rock Quality Designation (RQD%) is recorded.

## *SOIL DATA*

Column 6 is a graphic representation of four different soil parameters. Each of the parameters use the same graph, however, the values of the graph subdivisions vary with each parameter. Each parameter presented on column 6 is summarized below:

- N-value- The Standard Penetration Test N-value, obtained by adding the number of blows required to drive the sampler the final 12 inches, is recorded . The graph labels range from 0 to 50.
- Qu – Unconfined Compressive Strength estimate from the Pocket Penetrometer test in tons per square foot (tsf). The graph labels range from 0 to 5 tsf.
- Atterberg Limits – The Atterberg Limits are plotted with the plastic limit to the left, and liquid limit to the right, connected by a horizontal line. The difference in the plastic and liquid limits is referred to as the Plasticity Index. The Atterberg Limits test results are also included in the Remarks column on the far right of the boring log. The Atterberg Limits graph labels range from 0 to 100%.
- Moisture – The Natural Moisture Content of the soil sample as determined in our laboratory.

### *SOIL DESCRIPTION*

The soil description prepared in accordance with ASTM D2488, Visual Description of Soil Samples. The Munsel Color chart is used to determine the soil color. Strata changes are indicated by a solid line, with the depth of the change indicated on the left side of the line and the elevation of the change indicated on the right side of the line. If subtle changes within a soil type occur, a broken line is used. The Boring Termination or Auger Refusal depth is shown as a solid line at the bottom of the boring.

### *GRAPHIC*

The graphic representation of the soil type is shown. The graphic used for each soil type is related to the Unified Soil Classification chart. A chart showing the graphic associated with each soil classification is included.

### *REMARKS*

Remarks regarding borehole observations, and additional information regarding the laboratory results and groundwater observations.

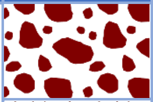
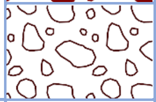
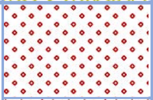
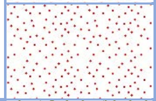
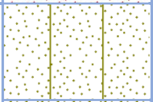
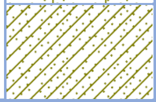
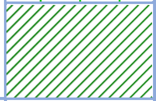
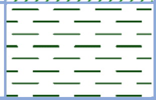
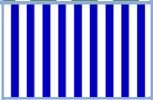
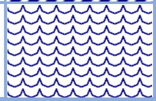
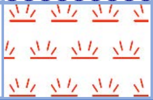
| ***Major Divisions*** | | | ***Symbols*** | | ***Group Name & Typical Description*** |
|---|---|---|---|---|---|
| | | | ***Lithology*** | ***Group*** | |
| ***Coarse Grained Soils***<br>*More than 50% of material is larger than No. 200 sieve size* | ***Gravel and Gravelly Soils***<br>*More than 50% of coarse fraction is larger than No. 4 sieve* | ***Clean Gravels***<br>*(Less than 5% fines)* |  | ***GW*** | *Well-graded gravels, gravel – sand mixtures, little or no fines* |
| | | |  | ***GP*** | *Poorly-graded gravels, gravel – sand mixtures, little or no fines* |
| | | ***Gravels with Fines***<br>*(More than 12% fines)* |  | ***GM*** | *Silty gravels, gravel – sand – silt mixtures* |
| | | |  | ***GC*** | *Clayey gravels, gravel – sand – clay mixtures* |
| | ***Sand and Sandy Soils***<br>*More than 50% of coarse fraction is smaller than No. 4 sieve* | ***Clean Sands***<br>*(Less than 5% fines)* |  | ***SW*** | *Well-graded sands, gravelly sands, little or no fines* |
| | | |  | ***SP*** | *Poorly-graded sands, gravelly sands, little or no fines* |
| | | ***Sands with Fines***<br>*(More than 12% fines)* |  | ***SM*** | *Silty sands, sand – silt mixtures* |
| | | |  | ***SC*** | *Clayey sands, sand – clay mixtures* |
| ***Fine Grained Soils***<br>*More than 50% of material is smaller than No. 200 sieve size* | ***Silts and Clays***<br>*Liquid Limit less than 50* | ***Inorganic*** |  | ***ML*** | *Inorganic silts and very find sands, rock flour, silty or clayey fine sands or clayey silt with slight plasticity* |
| | | |  | ***CL*** | *Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays* |
| | | ***Organic*** |  | ***OL*** | *Organic silts and organic silty clays of low plasticity* |
| | ***Silts and Clays***<br>*Liquid Limit greater than 50 sieve* | ***Inorganic*** |  | ***MH*** | *Inorganic silts, micaceous or diatomaceous fine sand, or silty soils* |
| | | |  | ***CH*** | *Inorganic clays of high plasticity* |
| | | ***Organic*** |  | ***OH*** | *Organic clays of medium to high plasticity, organic silts* |
| ***Highly Organic Soils*** | | |  | ***PT*** | *Peat, humus, swamp soils with high organic contents* |

**Table 1: Soil Classification Chart (based on ASTM D2487)**

# SOIL CLASSIFICATION METHODOLOGY

Building & Earth Sciences classifies soil in general accordance with the Unified Soil Classification System (USCS) presented in ASTM D2487. Table 1 and Figure 1 exemplify the general guidance of the USCS. Soil consistencies and relative densities are presented in general accordance with Terzaghi, Peck, & Mesri's (1996) method, as shown on Table 2, when quantitative field and/or laboratory data is available. Table 2 includes Consistency and Relative Density correlations with N-values obtained using either a manual hammer (60 percent efficiency) or automatic hammer (90 percent efficiency). The *Blows Per Increment* and *SPT N-values* displayed on the boring logs are the unaltered values measured in the field. When field and/or laboratory data is not available, we may classify soil in general accordance with the Visual Manual Procedure presented in ASTM D2488.

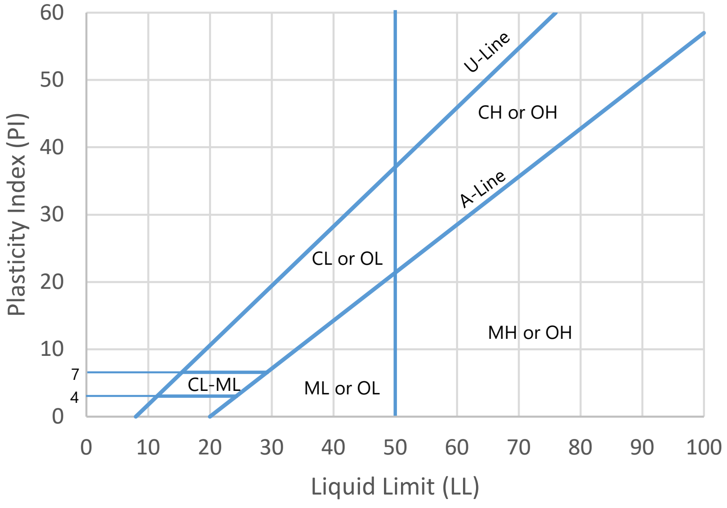


**Figure 1: Plasticity Chart (based on ASTM D2487)**

| **Non-cohesive: Coarse-Grained Soil** | | | **Cohesive: Fine-Grained Soil** | | | |
|---|---|---|---|---|---|---|
| **SPT Penetration (blows/foot)** | | **Relative Density** | **SPT Penetration (blows/foot)** | | **Consistency** | **Estimated Range of Unconfined Compressive Strength (tsf)** |
| | | | Automatic Hammer* | Manual Hammer | | |
| Automatic Hammer* | Manual Hammer | | < 2 | < 2 | Very Soft | < 0.25 |
| 0 - 3 | 0 - 4 | Very Loose | 2 - 3 | 2 - 4 | Soft | 0.25 – 0.50 |
| 3 - 8 | 4 - 10 | Loose | 3 - 6 | 4 - 8 | Medium Stiff | 0.50 – 1.00 |
| 8 - 23 | 10 - 30 | Medium Dense | 6 - 12 | 8 - 15 | Stiff | 1.00 – 2.00 |
| 23 - 38 | 30 - 50 | Dense | 12 - 23 | 15 - 30 | Very Stiff | 2.00 – 4.00 |
| > 38 | > 50 | Very Dense | > 23 | > 30 | Hard | > 4.00 |

**Table 2: Soil Consistency and Relative Density (based on Terzaghi, Peck & Mesri, 1996)**

* - Modified based on 80% hammer efficiency

# KEY TO LOGS

| | | | |
|---|---|---|---|
| ☒ | Standard Penetration Test ASTM D1586 or AASHTO T-206 | ▼ | Dynamic Cone Penetrometer (Sower DCP) ASTM STP-399 |
| ■ | Shelby Tube Sampler ASTM D1587 | ○ | No Sample Recovery |
| ▨ | Rock Core Sample ASTM D2113 | ▽ | Groundwater at Time of Drilling |
| ▮ | Auger Cuttings | ▼ | Groundwater as Indicated |

**Table 1: Symbol Legend**

| Soil | Particle Size | U.S. Standard |
|---|---|---|
| **Boulders** | Larger than 300 mm | N.A. |
| **Cobbles** | 300 mm to 75 mm | N.A. |
| **Gravel** | 75 mm to 4.75 mm | 3-inch to #4 sieve |
| Coarse | 75 mm to 19 mm | 3-inch to ¾-inch sieve |
| Fine | 19 mm to 4.75 mm | ¾-inch to #4 sieve |
| **Sand** | 4.75 mm to 0.075 mm | #4 to #200 Sieve |
| Coarse | 4.75 mm to 2 mm | #4 to #10 Sieve |
| Medium | 2 mm to 0.425 mm | #10 to #40 Sieve |
| Fine | 0.425 mm to 0.075 mm | #40 to #200 Sieve |
| **Fines** | Less than 0.075 mm | Passing #200 Sieve |
| Silt | Less than 5 µm | N.A. |
| Clay | Less than 2 µm | N.A. |

**Table 2: Standard Sieve Sizes**

| | | | |
|---|---|---|---|
| N-Value<br>☐ | Standard Penetration Test Resistance calculated using ASTM D1586 or AASHTO T-206. Calculated as sum of original, field recorded values. | Atterberg Limits<br>├──┤<br>PL LL | A measure of a soil's plasticity characteristics in general accordance with ASTM D4318. The soil Plasticity Index (PI) is representative of this characteristic and is bracketed by the Liquid Limit (LL) and the Plastic Limit (PL). |
| Qu<br>▲ | Unconfined compressive strength, typically estimated from a pocket penetrometer. Results are presented in tons per square foot (tsf). | % Moisture<br>● | Percent natural moisture content in general accordance with ASTM D2216. |

**Table 3: Soil Data**

| | |
|---|---|
| Hollow Stem Auger | Flights on the outside of the shaft advance soil cuttings to the surface. The hollow stem allows sampling through the middle of the auger flights. |
| Mud Rotary / Wash Bore | A cutting head advances the boring and discharges a drilling fluid to support the borehole and circulate cuttings to the surface. |
| Solid Flight Auger | Flights on the outside bring soil cuttings to the surface. Solid stem requires removal from borehole during sampling. |
| Hand Auger | Cylindrical bucket (typically 3-inch diameter and 8 inches long) attached to a metal rod and turned by human force. |

**Table 4: Soil Drilling Methods**

| Descriptor | Meaning |
|---|---|
| Trace | Likely less than 5% |
| Few | 5 to 10% |
| Little | 15 to 25% |
| Some | 30 to 45% |
| Mostly | 50 to 100% |

**Table 5: Descriptors**

| | |
|---|---|
| **Manual Hammer** | The operator tightens and loosens the rope around a rotating drum assembly to lift and drop a sliding, 140-pound hammer falling 30 inches. |
| **Automatic Trip Hammer** | An automatic mechanism is used to lift and drop a sliding, 140-pound hammer falling 30 inches. |
| **Dynamic Cone Penetrometer (Sower DCP) ASTM STP-399** | Uses a 15-pound steel mass falling 20 inches to strike an anvil and cause penetration of a 1.5-inch diameter cone seated in the bottom of a hand augered borehole. The blows required to drive the embedded cone a depth of 1-3/4 inches have been correlated by others to N-values derived from the Standard Penetration Test (SPT). |

**Table 6: Sampling Methods**

| | |
|---|---|
| **Non-plastic** | A 1/8-inch thread cannot be rolled at any water content. |
| **Low** | The thread can barely be rolled and the lump cannot be formed when drier than the plastic limit. |
| **Medium** | The thread is easy to roll and not much time is required to reach the plastic limit. The thread cannot be re-rolled after reaching the plastic limit. The lump crumbles when drier than the plastic limit. |
| **High** | It takes considerable time rolling and kneading to reach the plastic limit. The thread can be re-rolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit. |

**Table 7: Plasticity**

| | |
|---|---|
| **Dry** | Absence of moisture, dusty, dry to the touch. |
| **Moist** | Damp but no visible water. |
| **Wet** | Visible free water, usually soil is below water table. |

**Table 8: Moisture Condition**

| | |
|---|---|
| **Stratified** | Alternating layers of varying material or color with layers at least ½ inch thick. |
| **Laminated** | Alternating layers of varying material or color with layers less than ¼ inch thick. |
| **Fissured** | Breaks along definite planes of fracture with little resistance to fracturing. |
| **Slickensides** | Fracture planes appear polished or glossy, sometimes striated. |
| **Blocky** | Cohesive soil that can be broken down into small angular lumps which resist further breakdown. |
| **Lensed** | Inclusion of small pockets of different soils, such as small lenses of sand scattered through a mass of clay. |
| **Homogeneous** | Same color and appearance throughout. |

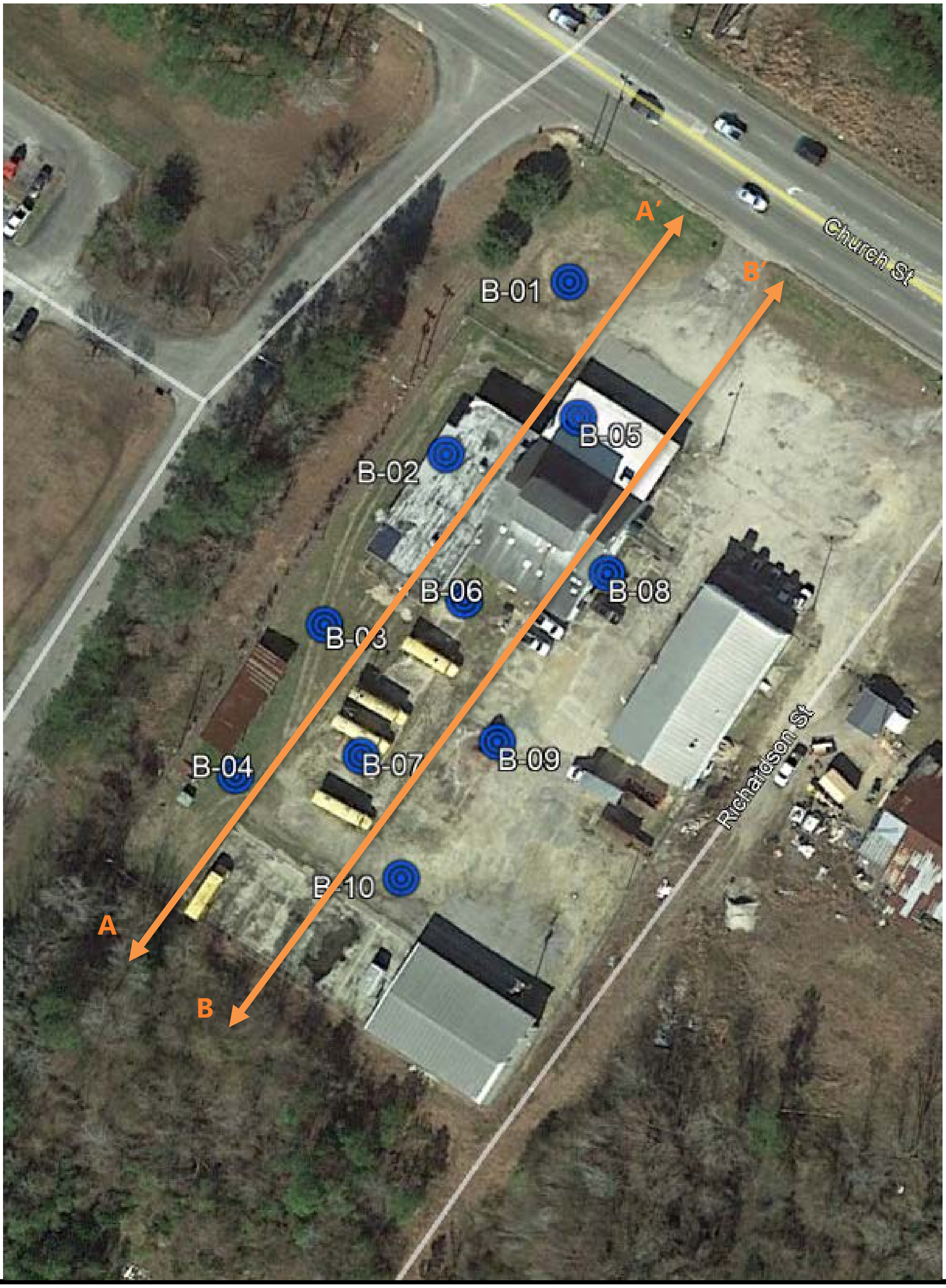
**Table 9: Structure**

# KEY TO HATCHES

| Hatch | Description | Hatch | Description | Hatch | Description |
|---|---|---|---|---|---|
| ▨ | **GW** - Well-graded gravels, gravel – sand mixtures, little or no fines | ■ | Asphalt | ▨ | Clay with Gravel |
| ▨ | **GP** - Poorly-graded gravels, gravel – sand mixtures, little or no fines | ▨ | Aggregate Base | ▨ | Sand with Gravel |
| ▨ | **GM** - Silty gravels, gravel – sand – silt mixtures | ▨ | Topsoil | ▨ | Silt with Gravel |
| ▨ | **GC** - Clayey gravels, gravel – sand – clay mixtures | ▨ | Concrete | ▨ | Gravel with Sand |
| ▨ | **SW** - Well-graded sands, gravelly sands, little or no fines | ▨ | Coal | ▨ | Gravel with Clay |
| ▨ | **SP** - Poorly-graded sands, gravelly sands, little or no fines | ▨ | **CL-ML** - Silty Clay | ▨ | Gravel with Silt |
| ▨ | **SM** - Silty sands, sand – silt mixtures | ▨ | Sandy Clay | ▨ | Limestone |
| ▨ | **SC** - Clayey sands, sand – clay mixtures | ▨ | Clayey Chert | ▨ | Chalk |
| ▨ | **ML** - Inorganic silts and very find sands, rock flour, silty or clayey fine sands or clayey silt with slight plasticity | ▨ | Low and High Plasticity Clay | ▨ | Siltstone |
| ▨ | **CL** - Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays | ▨ | Low Plasticity Silt and Clay | ▨ | Till |
| ▨ | **OL** - Organic silts and organic silty clays of low plasticity | ▨ | High Plasticity Silt and Clay | ▨ | Sandy Clay with Cobbles and Boulders |
| ▨ | **MH** - Inorganic silts, micaceous or diatomaceous fine sand, or silty soils | ▨ | Fill | ▨ | Sandstone with Shale |
| ▨ | **CH** - Inorganic clays of high plasticity | ▨ | Weathered Rock | ▨ | Coral |
| ▨ | **OH** - Organic clays of medium to high plasticity, organic silts | ▨ | Sandstone | ▨ | Boulders and Cobbles |
| ▨ | **PT** - Peat, humus, swamp soils with high organic contents | ▨ | Shale | ▨ | Soil and Weathered Rock |

Table 1: Key to Hatches Used for Boring Logs and Soil Profiles

# BORING LOCATION PLAN



⌖ **Approximate Boring Location**

N

## Test Location Map

| | | | |
|---|---|---|---|
| **BES Project #:** | RD200105 | **Client:** | ECLS Global, Inc |
| **Drawing Source:** | **Google Earth Imagery** | **Project:** | Horry County Schools – Records Center |
| | | **Address:** | Church Street |
| | | **City:** | Conway, South Carolina |

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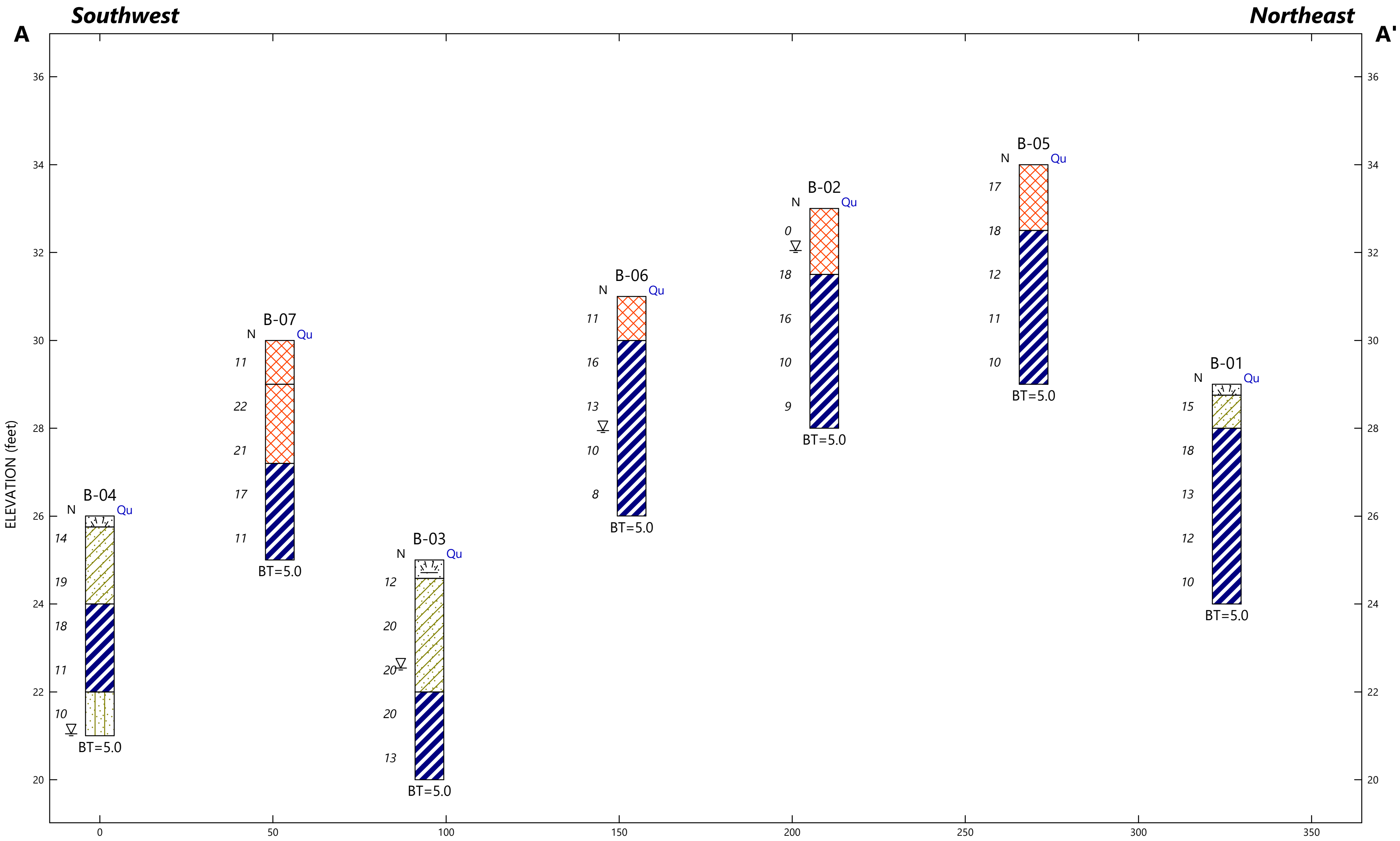
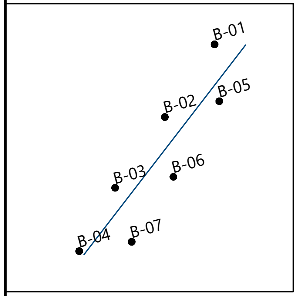
**Figure 1**

# SUBSURFACE PROFILES





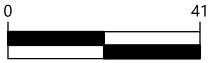
Site Map Scale 1 inch equals 255 feet

## Key to Hatches

| | |
|---|---|
| ▨ | Topsoil |
| ▨ | Fill |
| ▨ | USCS Clayey Sand |
| ▨ | USCS Silty Sand |
| ▨ | USCS High Plasticity Clay |

## Legend

BT=Boring Termination, TPT=Test Pit Terminated
AR=Auger Refusal, ER=Excavation Refusal
N=Standard Penetration Test N-Value
Qu=Unconfined compressive strength estimate from pocket penetrometer test (tsf)
▽ Water Level Reading at time of drilling.
▼ Water Level Reading after drilling.



Horizontal Scale (feet)
Vertical Exaggeration: 12.5x

**Building & Earth Sciences, Inc.**
610 Spring Branch Road, Dunn, NC, 28334

Horry County School - Records Center
Conway, SC

**Section A-A': Subsurface Profile**
**Figure 1**

| PROJECT NO: RD200105 | PLATE NO: A-1 | DATE: 3/16/20 |
|---|---|---|

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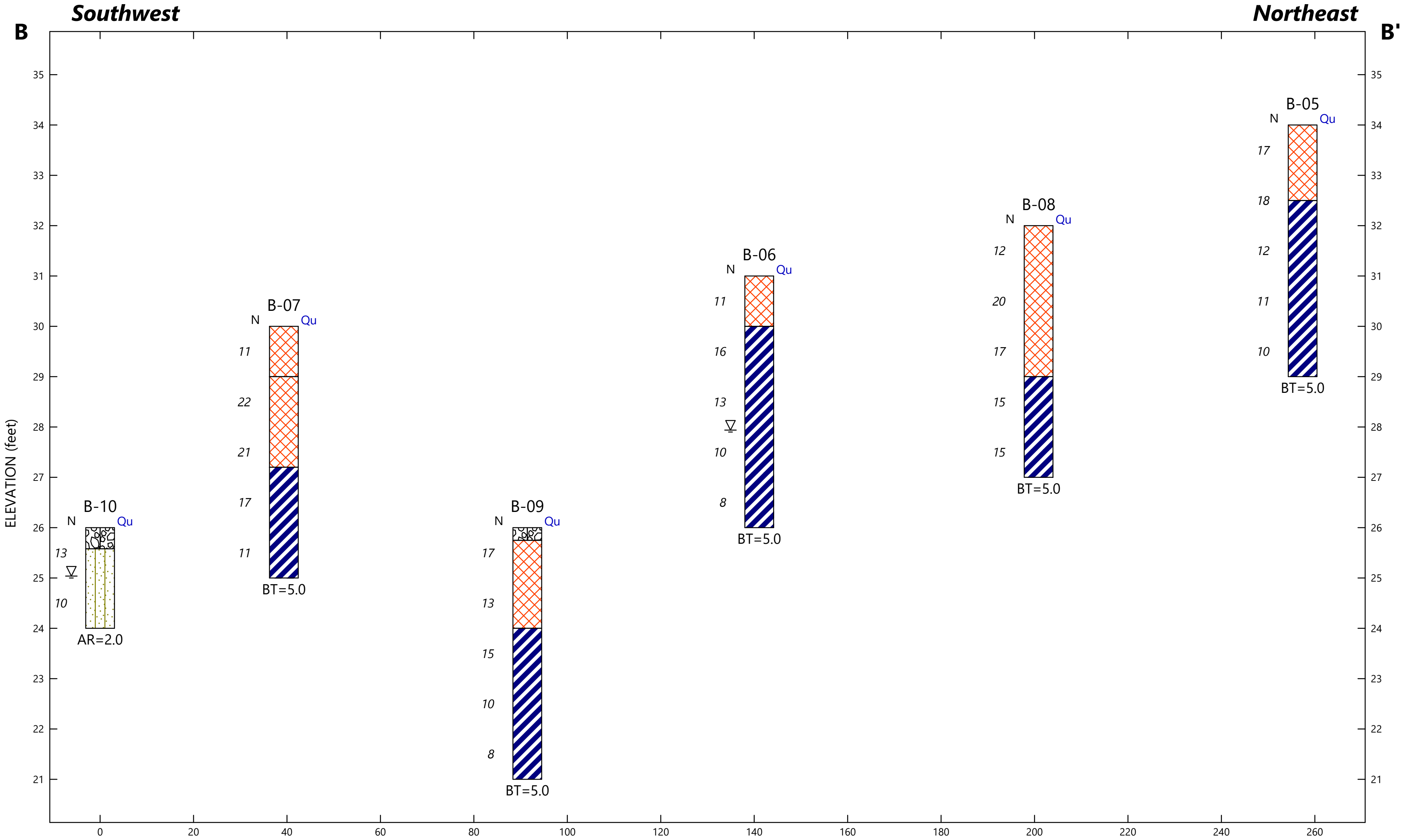

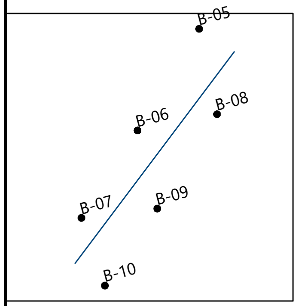

Site Map Scale 1 inch equals 190 feet

## Key to Hatches

▨ Fill

▨ USCS High Plasticity Clay

▨ Aggregate Base Material

▨ USCS Silty Sand

## Legend

BT=Boring Termination, TPT=Test Pit Terminated
AR=Auger Refusal, ER=Excavation Refusal
N=Standard Penetration Test N-Value
Qu=Unconfined compressive strength estimate from pocket penetrometer test (tsf)
▽ Water Level Reading at time of drilling.
▼ Water Level Reading after drilling.

0 31

Horizontal Scale (feet)
Vertical Exaggeration: 11x

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610 Spring Branch Road, Dunn, NC, 28334

Horry County School - Records Center
Conway, SC

**Section B-B': Subsurface Profile**
**Figure 2**

| | | |
|---|---|---|
| PROJECT NO: RD200105 | PLATE NO: A-1 | DATE: 3/16/20 |

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# BORING LOGS

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# LOG OF BORING

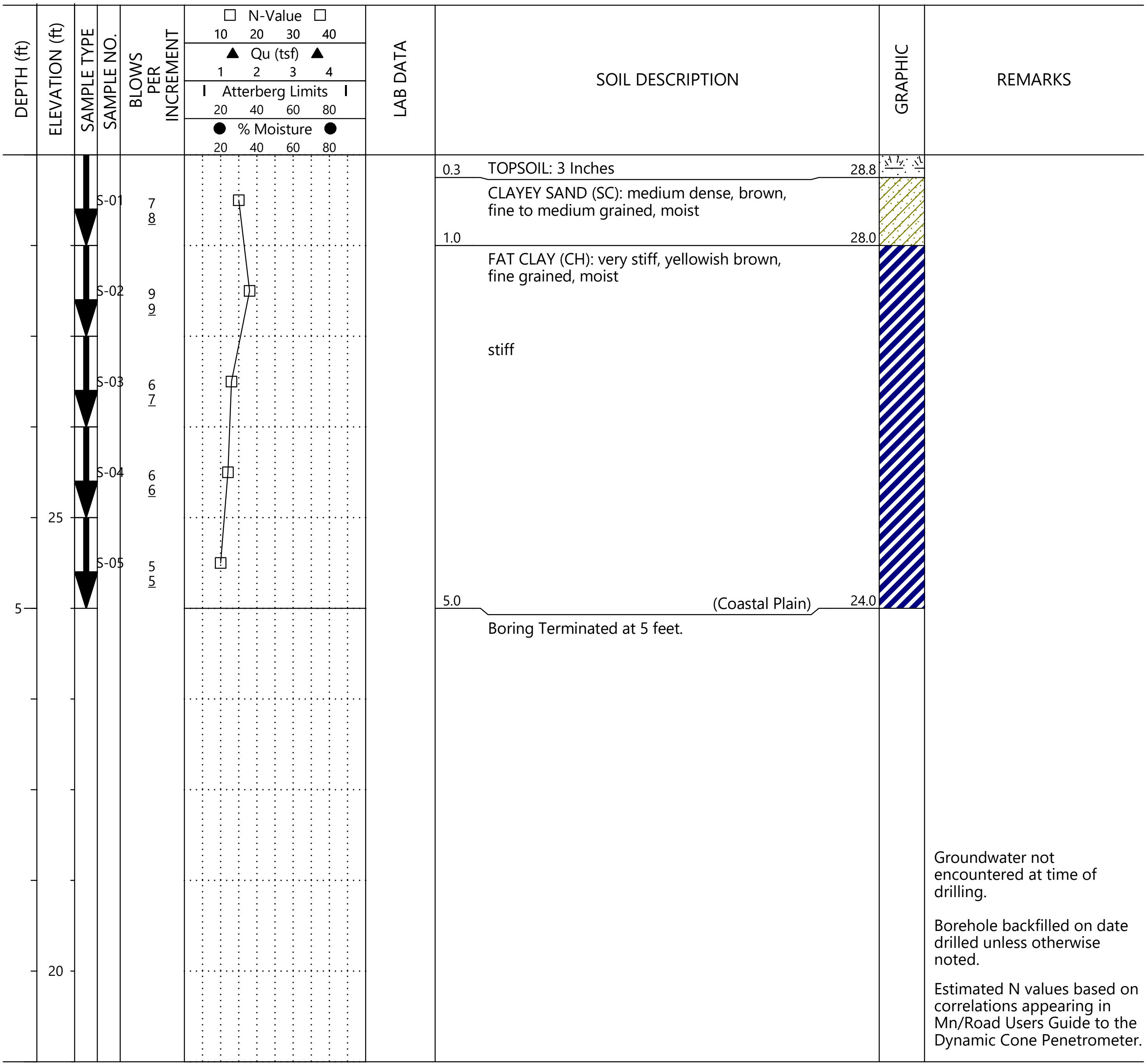
## Designation: B-01

Sheet 1 of 1

610 Spring Branch Road
Dunn, NC, 28334
Office: (910) 292-2085

PROJECT NAME: Horry County School - Records Center
PROJECT NUMBER: RD200105
DRILLING METHOD: Hand Auger
EQUIPMENT USED: Kessler DCP
HAMMER TYPE: Manual
BORING LOCATION: See Boring Location Map

LOCATION: Conway, SC
DATE DRILLED: 2/27/20
WEATHER: 44 Degrees, Sunny
ELEVATION: 29
DRILL CREW: Building & Earth Sciences
LOGGED BY: M.Lumpkin



| SAMPLE NO. | BLOWS PER INCREMENT |
|---|---|
| S-01 | 7<br>8 |
| S-02 | 9<br>9 |
| S-03 | 6<br>7 |
| S-04 | 6<br>6 |
| S-05 | 5<br>5 |

0.3 TOPSOIL: 3 Inches 28.8

CLAYEY SAND (SC): medium dense, brown, fine to medium grained, moist

1.0 28.0

FAT CLAY (CH): very stiff, yellowish brown, fine grained, moist

stiff

5.0 (Coastal Plain) 24.0

Boring Terminated at 5 feet.

Groundwater not encountered at time of drilling.

Borehole backfilled on date drilled unless otherwise noted.

Estimated N values based on correlations appearing in Mn/Road Users Guide to the Dynamic Cone Penetrometer.

SAMPLE TYPE THD Cone Penetration

**N-VALUE** STANDARD PENETRATION RESISTANCE (AASHTO T-206)
**% MOISTURE** PERCENT NATURAL MOISTURE CONTENT
▽ GROUNDWATER LEVEL IN THE BOREHOLE AT TIME OF DRILLING
▼ STABILIZED GROUNDWATER LEVEL

**REC** RECOVERY
**RQD** ROCK QUALITY DESIGNATION
**UD** UNDISTURBED
**Qu** POCKET PENETROMETER UNCONFINED COMPRESSIVE STRENGTH

**LL:** LIQUID LIMIT
**PL:** PLASTIC LIMIT
**PI:** PLASTICITY INDEX
**M:** NATURAL MOISTURE CONTENT
**F:** PERCENT PASSING NO. 200 SIEVE

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# LOG OF BORING

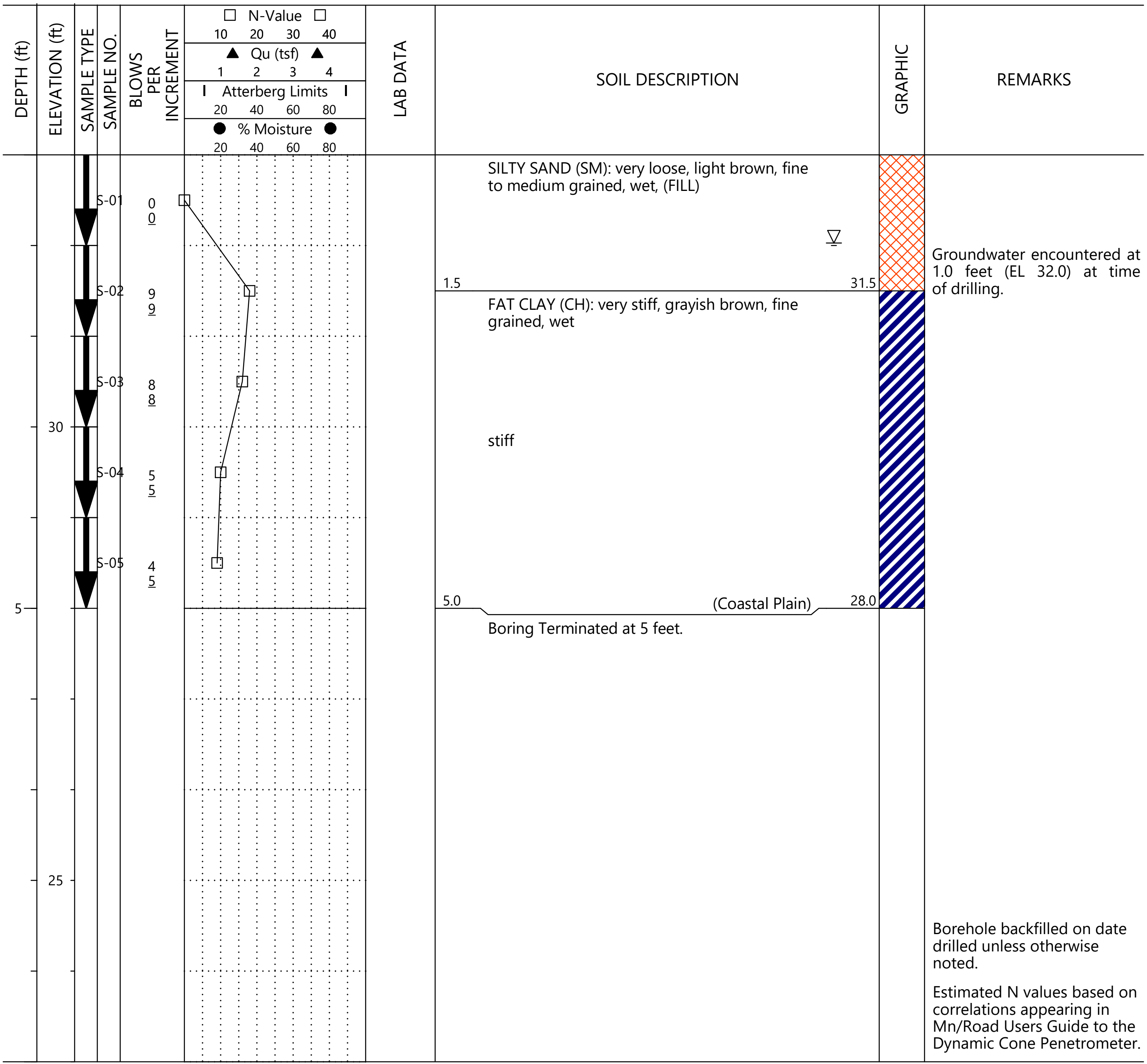
## Designation: B-02

Sheet 1 of 1

610 Spring Branch Road
Dunn, NC, 28334
Office: (910) 292-2085

PROJECT NAME: Horry County School - Records Center
PROJECT NUMBER: RD200105
DRILLING METHOD: Hand Auger
EQUIPMENT USED: Kessler DCP
HAMMER TYPE: Manual
BORING LOCATION: See Boring Location Map

LOCATION: Conway, SC
DATE DRILLED: 2/27/20
WEATHER: 44 Degrees, Sunny
ELEVATION: 33
DRILL CREW: Building & Earth Sciences
LOGGED BY: M.Lumpkin



SILTY SAND (SM): very loose, light brown, fine to medium grained, wet, (FILL)

FAT CLAY (CH): very stiff, grayish brown, fine grained, wet

stiff

(Coastal Plain)

Boring Terminated at 5 feet.

Groundwater encountered at 1.0 feet (EL 32.0) at time of drilling.

Borehole backfilled on date drilled unless otherwise noted.

Estimated N values based on correlations appearing in Mn/Road Users Guide to the Dynamic Cone Penetrometer.

SAMPLE TYPE ⬇ THD Cone Penetration

| | | | | | |
|---|---|---|---|---|---|
| **N-VALUE** | STANDARD PENETRATION RESISTANCE (AASHTO T-206) | **REC** | RECOVERY | **LL:** LIQUID LIMIT | **M:** NATURAL MOISTURE CONTENT |
| **% MOISTURE** | PERCENT NATURAL MOISTURE CONTENT | **RQD** | ROCK QUALITY DESIGNATION | **PL:** PLASTIC LIMIT | **F:** PERCENT PASSING NO. 200 SIEVE |
| ∇ | GROUNDWATER LEVEL IN THE BOREHOLE AT TIME OF DRILLING | **UD** | UNDISTURBED | **PI:** PLASTICITY INDEX | |
| ▼ | STABILIZED GROUNDWATER LEVEL | **Qu** | POCKET PENETROMETER UNCONFINED COMPRESSIVE STRENGTH | | |

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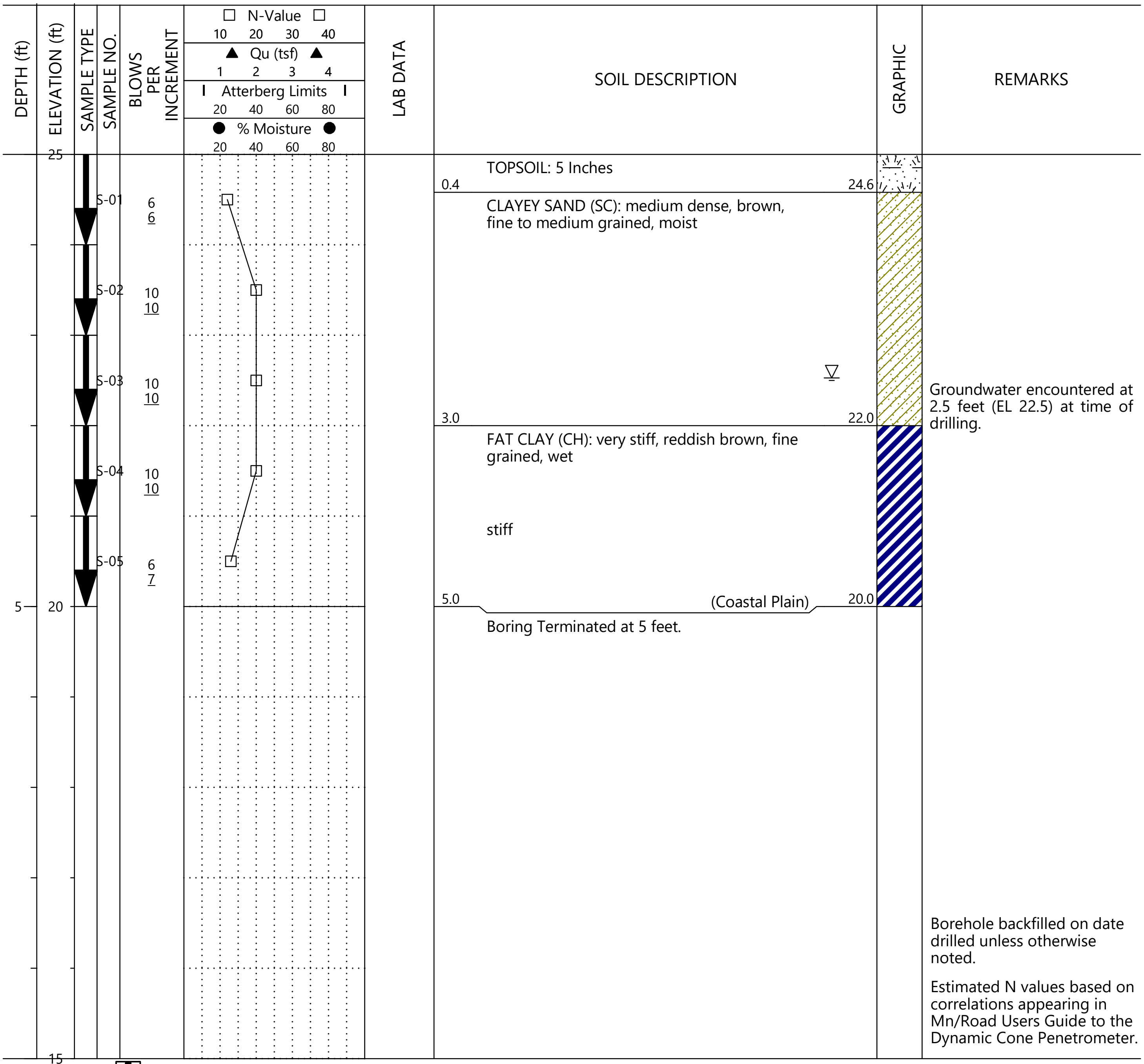
Office: (910) 292-2085

# LOG OF BORING

## Designation: B-03

Sheet 1 of 1

PROJECT NAME: Horry County School - Records Center
PROJECT NUMBER: RD200105
DRILLING METHOD: Hand Auger
EQUIPMENT USED: Kessler DCP
HAMMER TYPE: Manual
BORING LOCATION: See Boring Location Map
LOCATION: Conway, SC
DATE DRILLED: 2/27/20
WEATHER: 44 Degrees, Sunny
ELEVATION: 25
DRILL CREW: Building & Earth Sciences
LOGGED BY: M.Lumpkin



| Sample No. | Blows per Increment |
|---|---|
| S-01 | 6<br>6 |
| S-02 | 10<br>10 |
| S-03 | 10<br>10 |
| S-04 | 10<br>10 |
| S-05 | 6<br>7 |

| Depth | Soil Description | Elevation |
|---|---|---|
|  | TOPSOIL: 5 Inches |  |
| 0.4 |  | 24.6 |
|  | CLAYEY SAND (SC): medium dense, brown, fine to medium grained, moist |  |
| 3.0 |  | 22.0 |
|  | FAT CLAY (CH): very stiff, reddish brown, fine grained, wet |  |
|  | stiff |  |
| 5.0 | (Coastal Plain) | 20.0 |
|  | Boring Terminated at 5 feet. |  |

REMARKS:

Groundwater encountered at 2.5 feet (EL 22.5) at time of drilling.

Borehole backfilled on date drilled unless otherwise noted.

Estimated N values based on correlations appearing in Mn/Road Users Guide to the Dynamic Cone Penetrometer.

SAMPLE TYPE ⬇ THD Cone Penetration

**N-VALUE** STANDARD PENETRATION RESISTANCE (AASHTO T-206)
**% MOISTURE** PERCENT NATURAL MOISTURE CONTENT
∇ GROUNDWATER LEVEL IN THE BOREHOLE AT TIME OF DRILLING
▼ STABILIZED GROUNDWATER LEVEL
**REC** RECOVERY
**RQD** ROCK QUALITY DESIGNATION
**UD** UNDISTURBED
**Qu** POCKET PENETROMETER UNCONFINED COMPRESSIVE STRENGTH
**LL:** LIQUID LIMIT
**PL:** PLASTIC LIMIT
**PI:** PLASTICITY INDEX
**M:** NATURAL MOISTURE CONTENT
**F:** PERCENT PASSING NO. 200 SIEVE

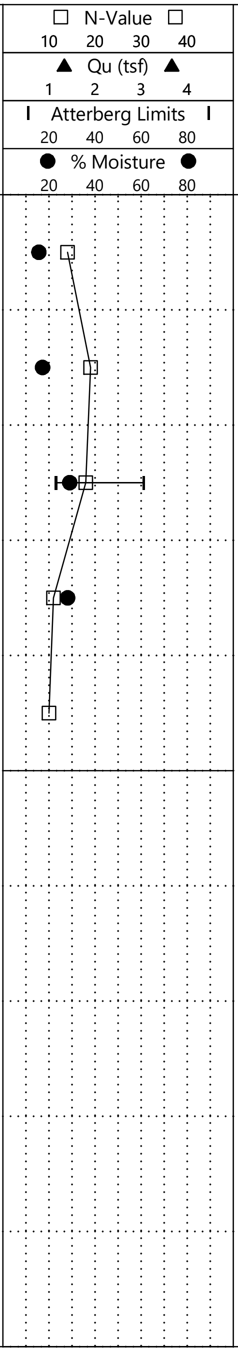
BUILDING & EARTH
Geotechnical, Environmental, and Materials Engineers

# LOG OF BORING
## Designation: B-04
Sheet 1 of 1

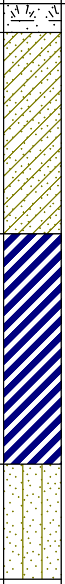
610 Spring Branch Road
Dunn, NC, 28334
Office: (910) 292-2085

| | | | |
|---|---|---|---|
| PROJECT NAME: | Horry County School - Records Center | LOCATION: | Conway, SC |
| PROJECT NUMBER: | RD200105 | DATE DRILLED: | 2/21/20 |
| DRILLING METHOD: | Hand Auger | WEATHER: | 37 Degrees , Partly Cloudy |
| EQUIPMENT USED: | Kessler DCP | ELEVATION: | 26 |
| HAMMER TYPE: | Manual | DRILL CREW: | Building & Earth Sciences |
| BORING LOCATION: | See Boring Location Map | LOGGED BY: | M.Lumpkin |

| DEPTH (ft) | ELEVATION (ft) | SAMPLE TYPE | SAMPLE NO. | BLOWS PER INCREMENT | LAB DATA |
|---|---|---|---|---|---|
| | | ⬇ | S-01 | 7<br>7 | Sample S-01<br>M: 15.6% |
| | 25 | ⬇ | S-02 | 9<br>10 | Sample S-02<br>M: 17.2% |
| | | ⬇ | S-03 | 9<br>9 | Sample S-03<br>LL: 61<br>PL: 23<br>PI: 38<br>M: 29.0%<br>F: 54% |
| | | ⬇ | S-04 | 5<br>6 | Sample S-04<br>M: 28.1% |
| 5 | | ⬇ | S-05 | 5<br>5 | |
| | 20 | | | | |



| Depth | SOIL DESCRIPTION | Elevation | REMARKS |
|---|---|---|---|
| 0.3 | TOPSOIL: 3 inches | 25.8 | |
| | CLAYEY SAND (SC): medium dense, brown, fine to medium grained, moist<br>reddish brown | | |
| 2.0 | | 24.0 | |
| | FAT CLAY (CH): very stiff, gray, fine grained, moist<br>stiff | | |
| 4.0 | | 22.0 | |
| | SILTY SAND (SM): medium dense, light brown, fine to medium grained, wet | | |
| 5.0 | (Coastal Plain) ∇ | 21.0 | |
| | Boring Terminated at 5 feet. | | Groundwater encountered at 5.0 feet (EL 21.0) at time of drilling. |



Borehole backfilled on date drilled unless otherwise noted.

Estimated N values based on correlations appearing in Mn/Road Users Guide to the Dynamic Cone Penetrometer.

SAMPLE TYPE ⬇ THD Cone Penetration

**N-VALUE** STANDARD PENETRATION RESISTANCE (AASHTO T-206)
**% MOISTURE** PERCENT NATURAL MOISTURE CONTENT
∇ GROUNDWATER LEVEL IN THE BOREHOLE AT TIME OF DRILLING
▼ STABILIZED GROUNDWATER LEVEL
**REC** RECOVERY
**RQD** ROCK QUALITY DESIGNATION
**UD** UNDISTURBED
**Qu** POCKET PENETROMETER UNCONFINED COMPRESSIVE STRENGTH
**LL:** LIQUID LIMIT
**PL:** PLASTIC LIMIT
**PI:** PLASTICITY INDEX
**M:** NATURAL MOISTURE CONTENT
**F:** PERCENT PASSING NO. 200 SIEVE

BUILDING & EARTH
Geotechnical, Environmental, and Materials Engineers

# LOG OF BORING

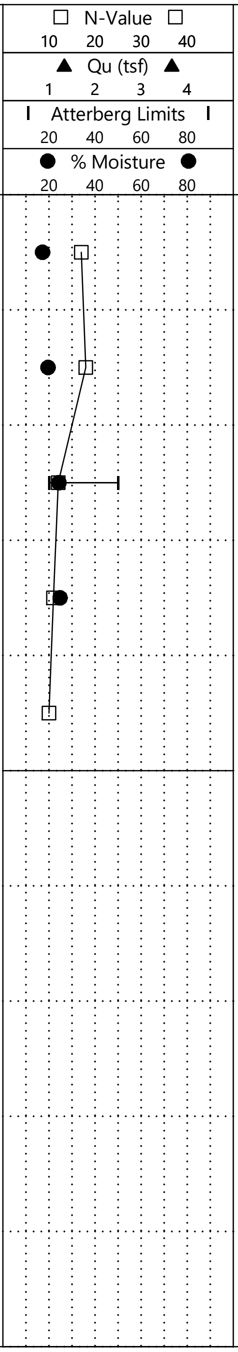
## Designation: B-05

Sheet 1 of 1

610 Spring Branch Road
Dunn, NC, 28334
Office: (910) 292-2085

PROJECT NAME: Horry County School - Records Center
PROJECT NUMBER: RD200105
DRILLING METHOD: Hand Auger
EQUIPMENT USED: Kessler DCP
HAMMER TYPE: Manual
BORING LOCATION: See Boring Location Map

LOCATION: Conway, SC
DATE DRILLED: 2/21/20
WEATHER: 37 Degrees , Partly Cloudy
ELEVATION: 34
DRILL CREW: Building & Earth Sciences
LOGGED BY: M.Lumpkin



| DEPTH (ft) | ELEVATION (ft) | SAMPLE TYPE | SAMPLE NO. | BLOWS PER INCREMENT | LAB DATA | SOIL DESCRIPTION | GRAPHIC | REMARKS |
|---|---|---|---|---|---|---|---|---|
| | | ⬇ | S-01 | 8<br>9 | Sample<br>S-01<br>M: 17.2% | SILTY SAND (SM): medium dense, brown, fine to medium grained, moist, (FILL) | ▨ | |
| 1.5 | 32.5 | ⬇ | S-02 | 9<br>9 | Sample<br>S-02<br>M: 19.6% | FAT CLAY (CH): very stiff, gray, brown, fine grained, moist | ▨ | |
| | | ⬇ | S-03 | 6<br>6 | Sample<br>S-03<br>LL: 50<br>PL: 20<br>PI: 30<br>M: 24.3%<br>F: 54% | stiff | ▨ | |
| | | ⬇ | S-04 | 5<br>6 | Sample<br>S-04<br>M: 24.8% | gray, reddish brown | ▨ | |
| | 30 | ⬇ | S-05 | 5<br>5 | | | ▨ | |
| 5.0 | 29.0 | | | | | (Coastal Plain) | | |
| 5 | | | | | | Boring Terminated at 5 feet. | | |
| | 25 | | | | | | | Groundwater not encountered at time of drilling.<br>Borehole backfilled on date drilled unless otherwise noted.<br>Estimated N values based on correlations appearing in Mn/Road Users Guide to the Dynamic Cone Penetrometer. |

SAMPLE TYPE ⬇ THD Cone Penetration

| | | | | | |
|---|---|---|---|---|---|
| **N-VALUE** | STANDARD PENETRATION RESISTANCE (AASHTO T-206) | **REC** | RECOVERY | **LL:** LIQUID LIMIT | **M:** NATURAL MOISTURE CONTENT |
| **% MOISTURE** | PERCENT NATURAL MOISTURE CONTENT | **RQD** | ROCK QUALITY DESIGNATION | **PL:** PLASTIC LIMIT | **F:** PERCENT PASSING NO. 200 SIEVE |
| ▽ | GROUNDWATER LEVEL IN THE BOREHOLE AT TIME OF DRILLING | **UD** | UNDISTURBED | **PI:** PLASTICITY INDEX | |
| ▼ | STABILIZED GROUNDWATER LEVEL | **Qu** | POCKET PENETROMETER UNCONFINED COMPRESSIVE STRENGTH | | |

BUILDING & EARTH
Geotechnical, Environmental, and Materials Engineers

# LOG OF BORING

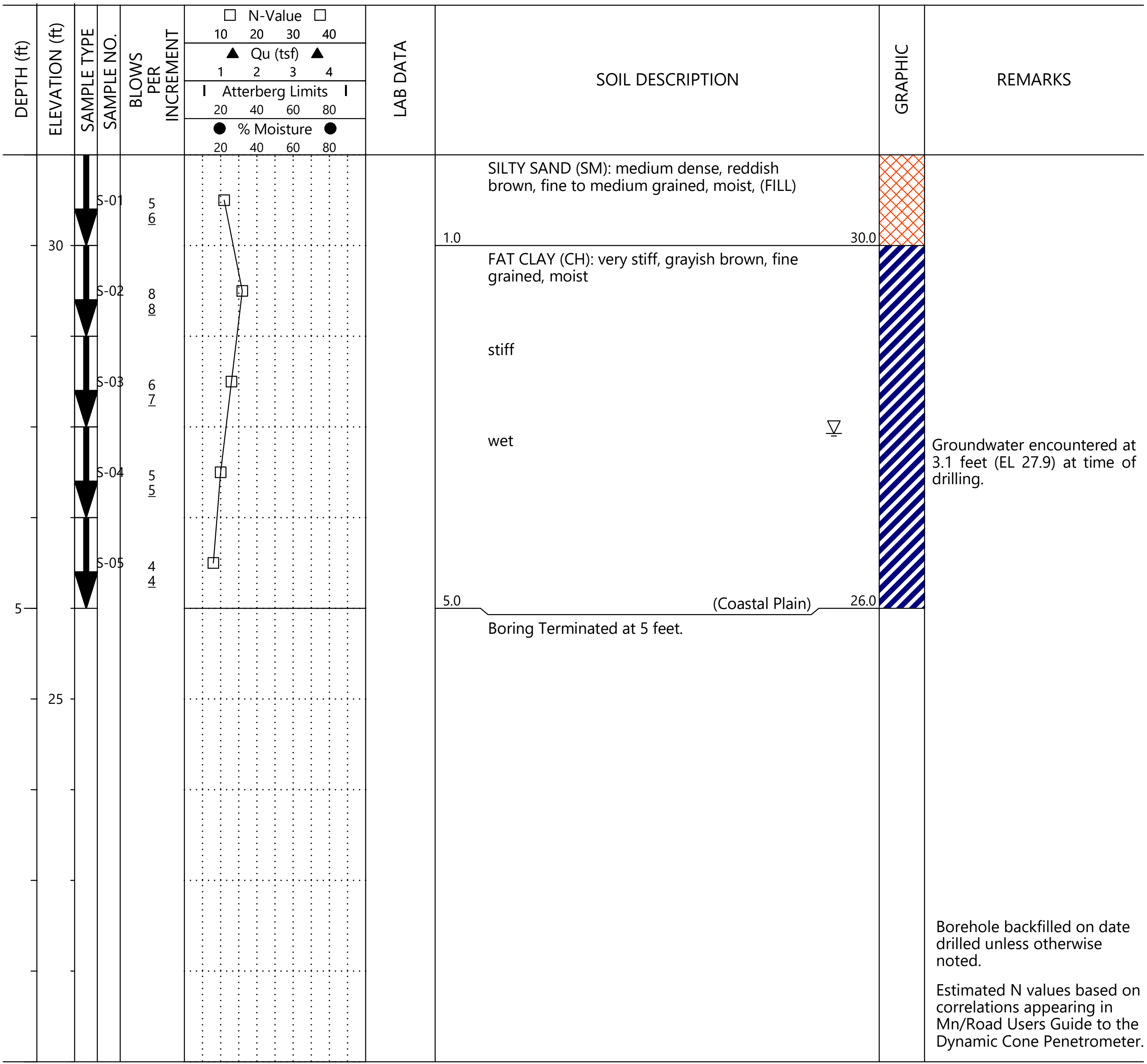
## Designation: B-06

Sheet 1 of 1

610 Spring Branch Road
Dunn, NC, 28334
Office: (910) 292-2085

PROJECT NAME: Horry County School - Records Center
PROJECT NUMBER: RD200105
DRILLING METHOD: Hand Auger
EQUIPMENT USED: Kessler DCP
HAMMER TYPE: Manual
BORING LOCATION: See Boring Location Map

LOCATION: Conway, SC
DATE DRILLED: 2/27/20
WEATHER: 44 Degrees, Sunny
ELEVATION: 31
DRILL CREW: Building & Earth Sciences
LOGGED BY: M.Lumpkin



| SAMPLE NO. | BLOWS PER INCREMENT |
|---|---|
| S-01 | 5<br>6 |
| S-02 | 8<br>8 |
| S-03 | 6<br>7 |
| S-04 | 5<br>5 |
| S-05 | 4<br>4 |

SILTY SAND (SM): medium dense, reddish brown, fine to medium grained, moist, (FILL)

FAT CLAY (CH): very stiff, grayish brown, fine grained, moist

stiff

wet

(Coastal Plain)

Boring Terminated at 5 feet.

Groundwater encountered at 3.1 feet (EL 27.9) at time of drilling.

Borehole backfilled on date drilled unless otherwise noted.

Estimated N values based on correlations appearing in Mn/Road Users Guide to the Dynamic Cone Penetrometer.

SAMPLE TYPE THD Cone Penetration

**N-VALUE** STANDARD PENETRATION RESISTANCE (AASHTO T-206)
**% MOISTURE** PERCENT NATURAL MOISTURE CONTENT
∇ GROUNDWATER LEVEL IN THE BOREHOLE AT TIME OF DRILLING
▼ STABILIZED GROUNDWATER LEVEL

**REC** RECOVERY
**RQD** ROCK QUALITY DESIGNATION
**UD** UNDISTURBED
**Qu** POCKET PENETROMETER UNCONFINED COMPRESSIVE STRENGTH

**LL:** LIQUID LIMIT
**PL:** PLASTIC LIMIT
**PI:** PLASTICITY INDEX
**M:** NATURAL MOISTURE CONTENT
**F:** PERCENT PASSING NO. 200 SIEVE

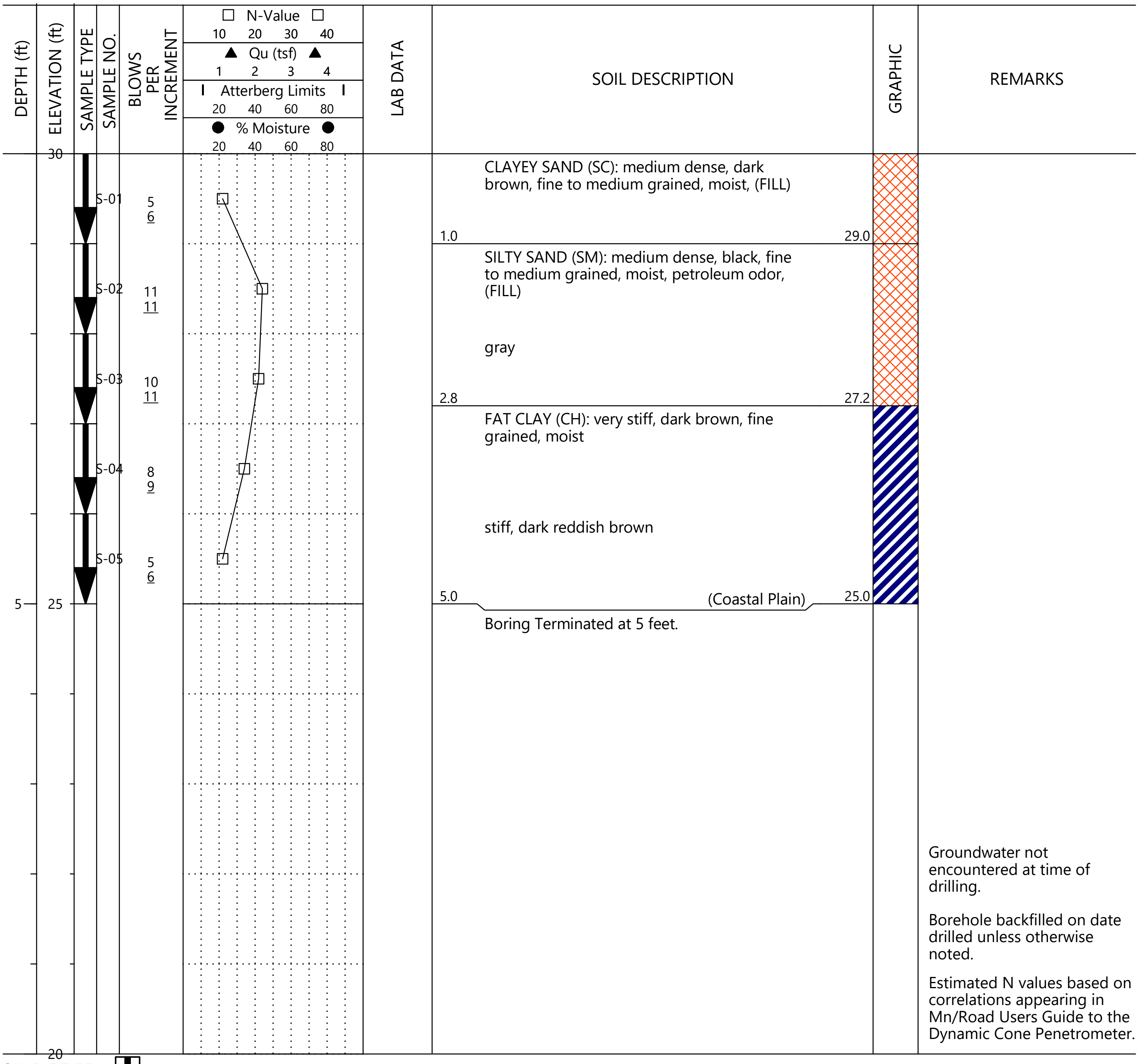
BUILDING & EARTH
Geotechnical, Environmental, and Materials Engineers

# LOG OF BORING
## Designation: B-07
Sheet 1 of 1

610 Spring Branch Road
Dunn, NC, 28334
Office: (910) 292-2085

PROJECT NAME: Horry County School - Records Center
PROJECT NUMBER: RD200105
DRILLING METHOD: Hand Auger
EQUIPMENT USED: Kessler DCP
HAMMER TYPE: Manual
BORING LOCATION: See Boring Location Map

LOCATION: Conway, SC
DATE DRILLED: 2/21/20
WEATHER: 37 Degrees , Partly Cloudy
ELEVATION: 30
DRILL CREW: Building & Earth Sciences
LOGGED BY: M.Lumpkin



| SAMPLE NO. | BLOWS PER INCREMENT | SOIL DESCRIPTION |
|---|---|---|
| S-01 | 5<br>6 | CLAYEY SAND (SC): medium dense, dark brown, fine to medium grained, moist, (FILL) |
| | | 1.0 — 29.0 |
| S-02 | 11<br>11 | SILTY SAND (SM): medium dense, black, fine to medium grained, moist, petroleum odor, (FILL) |
| S-03 | 10<br>11 | gray |
| | | 2.8 — 27.2 |
| S-04 | 8<br>9 | FAT CLAY (CH): very stiff, dark brown, fine grained, moist |
| S-05 | 5<br>6 | stiff, dark reddish brown |
| | | 5.0 — (Coastal Plain) — 25.0 |
| | | Boring Terminated at 5 feet. |

REMARKS

Groundwater not encountered at time of drilling.

Borehole backfilled on date drilled unless otherwise noted.

Estimated N values based on correlations appearing in Mn/Road Users Guide to the Dynamic Cone Penetrometer.

SAMPLE TYPE ⬇ THD Cone Penetration

**N-VALUE** STANDARD PENETRATION RESISTANCE (AASHTO T-206)
**% MOISTURE** PERCENT NATURAL MOISTURE CONTENT
▽ GROUNDWATER LEVEL IN THE BOREHOLE AT TIME OF DRILLING
▼ STABILIZED GROUNDWATER LEVEL

**REC** RECOVERY
**RQD** ROCK QUALITY DESIGNATION
**UD** UNDISTURBED
**Qu** POCKET PENETROMETER UNCONFINED COMPRESSIVE STRENGTH

**LL:** LIQUID LIMIT
**PL:** PLASTIC LIMIT
**PI:** PLASTICITY INDEX
**M:** NATURAL MOISTURE CONTENT
**F:** PERCENT PASSING NO. 200 SIEVE

# LOG OF BORING

## Designation: B-08

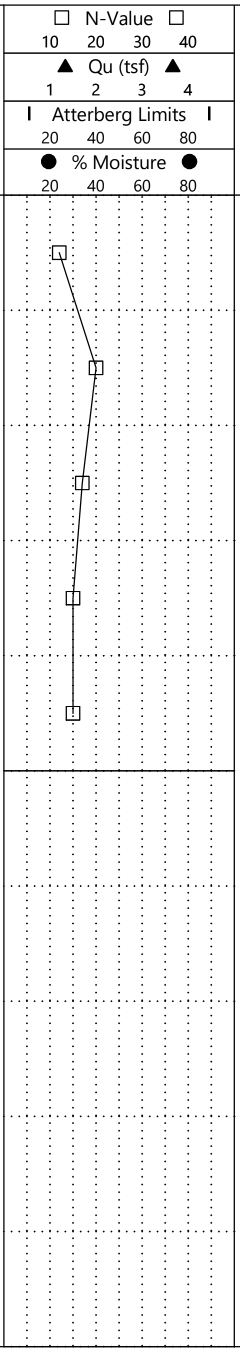
Sheet 1 of 1

BUILDING & EARTH
Geotechnical, Environmental, and Materials Engineers

610 Spring Branch Road
Dunn, NC, 28334
Office: (910) 292-2085

| | | | |
|---|---|---|---|
| PROJECT NAME: | Horry County School - Records Center | LOCATION: | Conway, SC |
| PROJECT NUMBER: | RD200105 | DATE DRILLED: | 2/21/20 |
| DRILLING METHOD: | Hand Auger | WEATHER: | 37 Degrees , Partly Cloudy |
| EQUIPMENT USED: | Kessler DCP | ELEVATION: | 32 |
| HAMMER TYPE: | Manual | DRILL CREW: | Building & Earth Sciences |
| BORING LOCATION: | See Boring Location Map | LOGGED BY: | M.Lumpkin |

| DEPTH (ft) | ELEVATION (ft) | SAMPLE TYPE | SAMPLE NO. | BLOWS PER INCREMENT | LAB DATA | SOIL DESCRIPTION | GRAPHIC | REMARKS |
|---|---|---|---|---|---|---|---|---|
| | | THD Cone Penetration | S-01 | 6<br>6 | | CLAYEY SAND (SC): medium dense, brown, fine to medium grained, moist, (FILL) | | |
| | | THD Cone Penetration | S-02 | 10<br>10 | | | | |
| | 30 | THD Cone Penetration | S-03 | 8<br>9 | | | | |
| 3.0 | 29.0 | | | | | FAT CLAY (CH): stiff, reddish brown, fine grained, moist | | |
| | | THD Cone Penetration | S-04 | 7<br>8 | | | | |
| | | THD Cone Penetration | S-05 | 7<br>8 | | (Coastal Plain) | | |
| 5.0 | 27.0 | | | | | Boring Terminated at 5 feet. | | |
| | 25 | | | | | | | Groundwater not encountered at time of drilling.<br>Borehole backfilled on date drilled unless otherwise noted.<br>Estimated N values based on correlations appearing in Mn/Road Users Guide to the Dynamic Cone Penetrometer. |



SAMPLE TYPE ⬇ THD Cone Penetration

| | | | | | |
|---|---|---|---|---|---|
| **N-VALUE** | STANDARD PENETRATION RESISTANCE (AASHTO T-206) | **REC** | RECOVERY | **LL:** | LIQUID LIMIT **M:** NATURAL MOISTURE CONTENT |
| **% MOISTURE** | PERCENT NATURAL MOISTURE CONTENT | **RQD** | ROCK QUALITY DESIGNATION | **PL:** | PLASTIC LIMIT **F:** PERCENT PASSING NO. 200 SIEVE |
| ▽ | GROUNDWATER LEVEL IN THE BOREHOLE AT TIME OF DRILLING | **UD** | UNDISTURBED | **PI:** | PLASTICITY INDEX |
| ▼ | STABILIZED GROUNDWATER LEVEL | **Qu** | POCKET PENETROMETER UNCONFINED COMPRESSIVE STRENGTH | | |

BUILDING & EARTH
Geotechnical, Environmental, and Materials Engineers

# LOG OF BORING

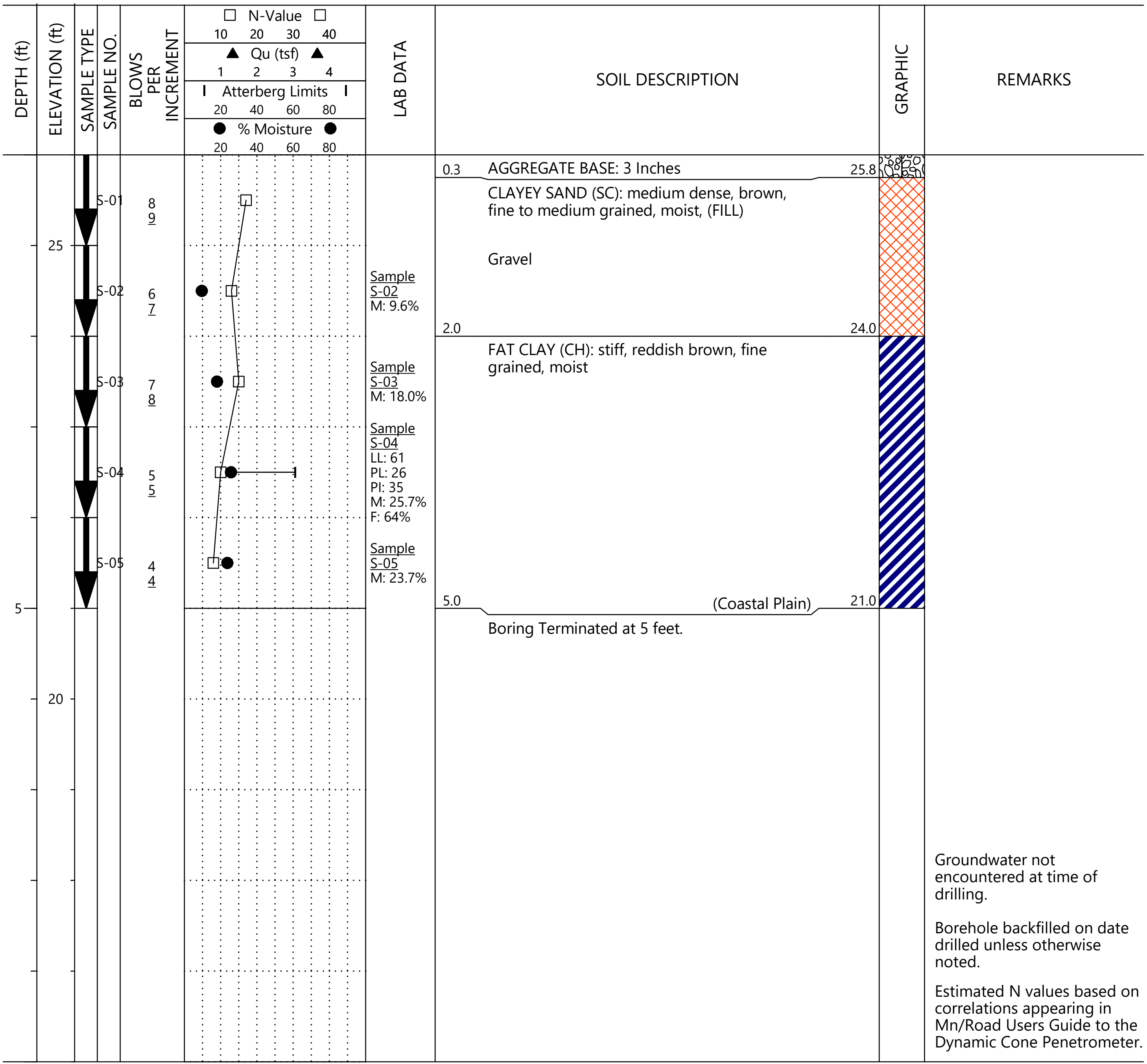
## Designation: B-09

Sheet 1 of 1

610 Spring Branch Road
Dunn, NC, 28334
Office: (910) 292-2085

PROJECT NAME: Horry County School - Records Center
PROJECT NUMBER: RD200105
DRILLING METHOD: Hand Auger
EQUIPMENT USED: Kessler DCP
HAMMER TYPE: Manual
BORING LOCATION: See Boring Location Map

LOCATION: Conway, SC
DATE DRILLED: 2/21/20
WEATHER: 37 Degrees , Partly Cloudy
ELEVATION: 26
DRILL CREW: Building & Earth Sciences
LOGGED BY: M.Lumpkin



| SAMPLE NO. | BLOWS PER INCREMENT | LAB DATA |
|---|---|---|
| S-01 | 8<br>9 | |
| S-02 | 6<br>7 | Sample<br>S-02<br>M: 9.6% |
| S-03 | 7<br>8 | Sample<br>S-03<br>M: 18.0% |
| S-04 | 5<br>5 | Sample<br>S-04<br>LL: 61<br>PL: 26<br>PI: 35<br>M: 25.7%<br>F: 64% |
| S-05 | 4<br>4 | Sample<br>S-05<br>M: 23.7% |

SOIL DESCRIPTION

0.3 AGGREGATE BASE: 3 Inches 25.8

CLAYEY SAND (SC): medium dense, brown, fine to medium grained, moist, (FILL)

Gravel

2.0 24.0

FAT CLAY (CH): stiff, reddish brown, fine grained, moist

5.0 (Coastal Plain) 21.0

Boring Terminated at 5 feet.

REMARKS

Groundwater not encountered at time of drilling.

Borehole backfilled on date drilled unless otherwise noted.

Estimated N values based on correlations appearing in Mn/Road Users Guide to the Dynamic Cone Penetrometer.

SAMPLE TYPE THD Cone Penetration

**N-VALUE** STANDARD PENETRATION RESISTANCE (AASHTO T-206)
**% MOISTURE** PERCENT NATURAL MOISTURE CONTENT
∇ GROUNDWATER LEVEL IN THE BOREHOLE AT TIME OF DRILLING
▼ STABILIZED GROUNDWATER LEVEL
**REC** RECOVERY
**RQD** ROCK QUALITY DESIGNATION
**UD** UNDISTURBED
**Qu** POCKET PENETROMETER UNCONFINED COMPRESSIVE STRENGTH
**LL:** LIQUID LIMIT
**PL:** PLASTIC LIMIT
**PI:** PLASTICITY INDEX
**M:** NATURAL MOISTURE CONTENT
**F:** PERCENT PASSING NO. 200 SIEVE

BUILDING & EARTH
Geotechnical, Environmental, and Materials Engineers

# LOG OF BORING

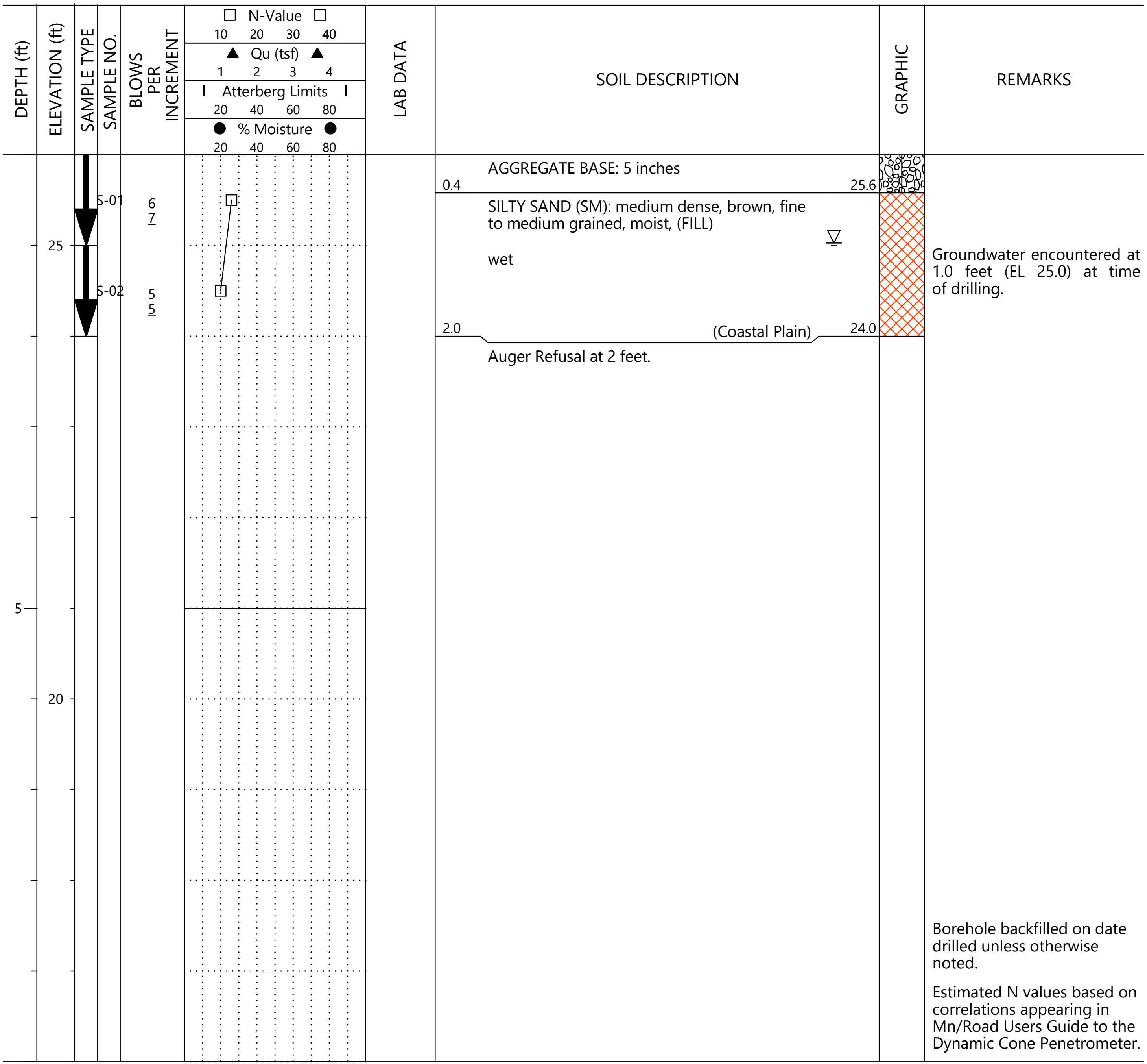
## Designation: B-10

Sheet 1 of 1

610 Spring Branch Road
Dunn, NC, 28334
Office: (910) 292-2085

PROJECT NAME: Horry County School - Records Center
PROJECT NUMBER: RD200105
DRILLING METHOD: Hand Auger
EQUIPMENT USED: Kessler DCP
HAMMER TYPE: Manual
BORING LOCATION: See Boring Location Map

LOCATION: Conway, SC
DATE DRILLED: 2/21/20
WEATHER: 37 Degrees , Partly Cloudy
ELEVATION: 26
DRILL CREW: Building & Earth Sciences
LOGGED BY: M.Lumpkin



| Sample No. | Blows per Increment |
|---|---|
| S-01 | 6<br>7 |
| S-02 | 5<br>5 |

0.4 AGGREGATE BASE: 5 inches 25.6

SILTY SAND (SM): medium dense, brown, fine to medium grained, moist, (FILL)

wet

2.0 (Coastal Plain) 24.0

Auger Refusal at 2 feet.

Groundwater encountered at 1.0 feet (EL 25.0) at time of drilling.

Borehole backfilled on date drilled unless otherwise noted.

Estimated N values based on correlations appearing in Mn/Road Users Guide to the Dynamic Cone Penetrometer.

SAMPLE TYPE ⬇ THD Cone Penetration

**N-VALUE** STANDARD PENETRATION RESISTANCE (AASHTO T-206)
**% MOISTURE** PERCENT NATURAL MOISTURE CONTENT
▽ GROUNDWATER LEVEL IN THE BOREHOLE AT TIME OF DRILLING
▼ STABILIZED GROUNDWATER LEVEL
**REC** RECOVERY
**RQD** ROCK QUALITY DESIGNATION
**UD** UNDISTURBED
**Qu** POCKET PENETROMETER UNCONFINED COMPRESSIVE STRENGTH
**LL:** LIQUID LIMIT
**PL:** PLASTIC LIMIT
**PI:** PLASTICITY INDEX
**M:** NATURAL MOISTURE CONTENT
**F:** PERCENT PASSING NO. 200 SIEVE

# KESSLER DYNAMIC CONE PENETROMETER (In Situ CBR) RESULTS

Geotechnical, Environmental, and Materials Engineers

## Dynamic Cone Penetrometer (In situ CBR) - ASTM D 6951

**Project:** Horry County Schools - Records Center
**Date:** 02/21/20
**Client:** ECLS Global, Inc
**Soil Type(s):** SC, CH
**Technician:** M. Lumpkin
**Location:** B-01

Hammer
○ 10.1 lbs. - (2)
● 17.6 lbs. - (1)
○ Both hammers used

Soil Type
○ CH
○ CL
● All other soils

| No. of Blows | Accumulative Penetration (mm) | M, CH+C41:C5 Blow Factor |
|---|---|---|
| 0 | 0 | 1 |
| 2 | 51 | 1 |
| 3 | 119 | 1 |
| 3 | 170 | 1 |
| 4 | 229 | 1 |
| 2 | 290 | 1 |
| 2 | 381 | 1 |
| 2 | 457 | 1 |
| 2 | 516 | 1 |
| 2 | 572 | 1 |
| 3 | 638 | 1 |
| 3 | 696 | 1 |
| 3 | 747 | 1 |
| 4 | 803 | 1 |
| 4 | 859 | 1 |
| 4 | 917 | 1 |
| 2 | 942 | 1 |
| 4 | 1001 | 1 |
| 4 | 1054 | 1 |
| 4 | 1107 | 1 |
| 5 | 1166 | 1 |
| 5 | 1219.2 | 1 |
| 5 | 1273 | 1 |
| 5 | 1326 | 1 |
| 6 | 1384 | 1 |
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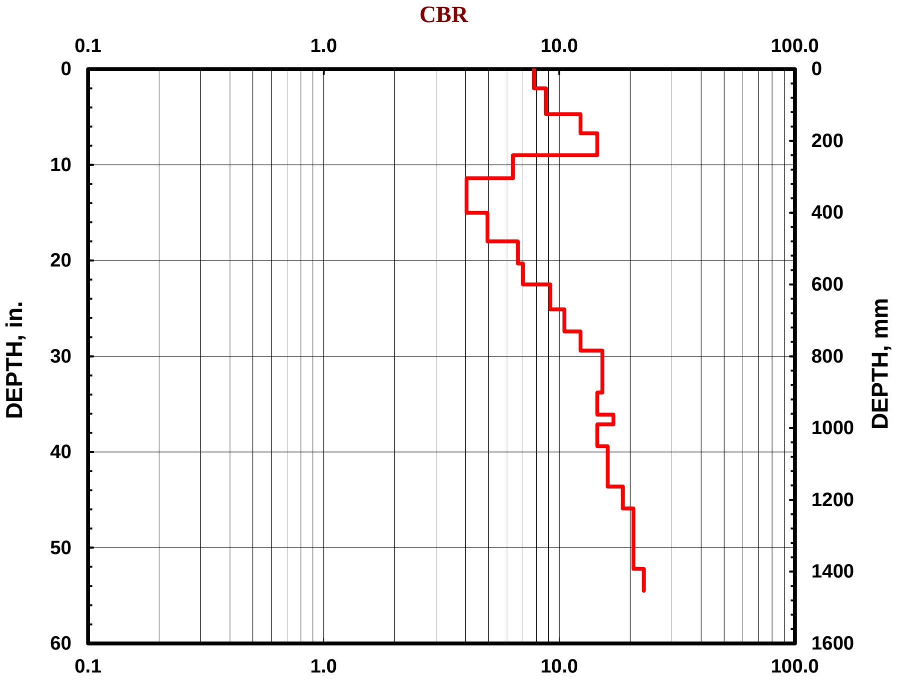
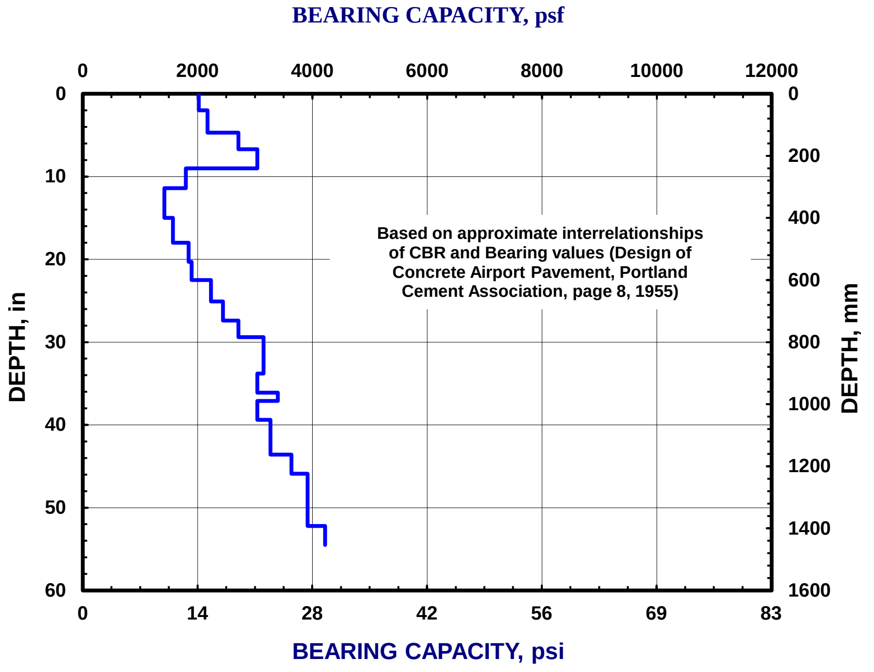




Based on approximate interrelationships of CBR and Bearing values (Design of Concrete Airport Pavement, Portland Cement Association, page 8, 1955)

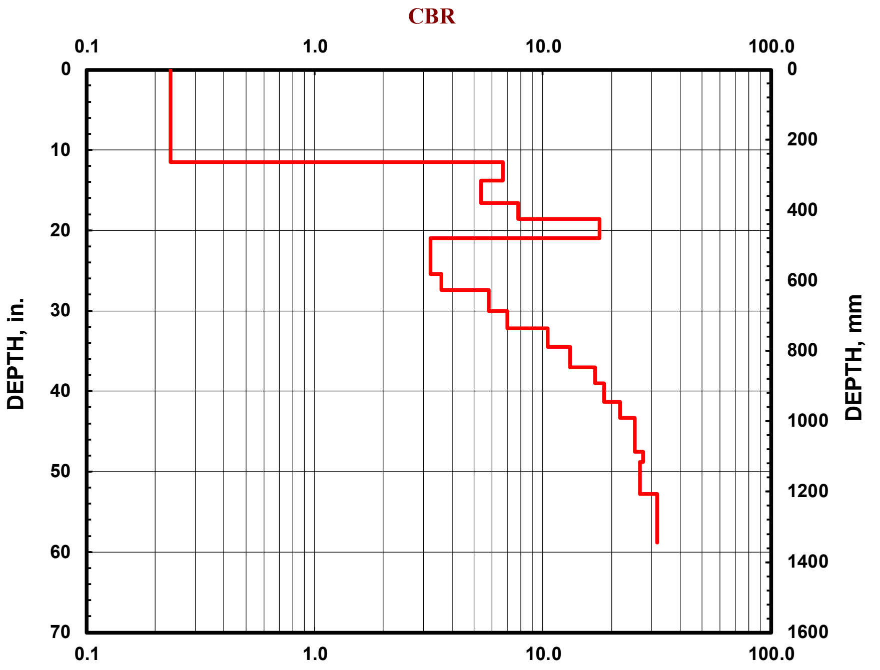
# Dynamic Cone Penetrometer (In situ CBR) - ASTM D 6951

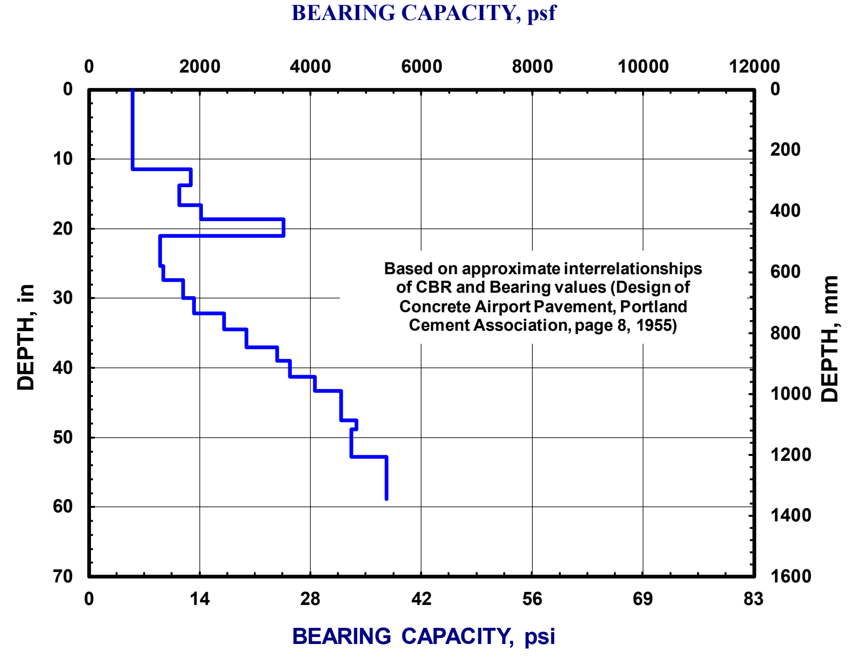
**Project:** Horry County Schools - Records Center
**Client:** ECLS Global, Inc
**Technician:** M. Lumpkin
**Date:** 02/21/20
**Soil Type(s):** SM, CH
**Location:** B-02

Hammer
○ 10.1 lbs. - (2)
● 17.6 lbs. - (1)
○ Both hammers used

Soil Type
○ CH
○ CL
● All other soils

| No. of Blows | Accumulative Penetration (mm) | Hammer Blow Factor |
|---|---|---|
| 0 | 0 | 1 |
| 0.5 | 292 | 1 |
| 2 | 351 | 1 |
| 2 | 422 | 1 |
| 2 | 472 | 1 |
| 5 | 533 | 1 |
| 2 | 645 | 1 |
| 1 | 696 | 1 |
| 2 | 762 | 1 |
| 2 | 818 | 1 |
| 3 | 876 | 1 |
| 4 | 940 | 1 |
| 4 | 991 | 1 |
| 5 | 1049 | 1 |
| 5 | 1100 | 1 |
| 6 | 1153 | 1 |
| 6 | 1207 | 1 |
| 4 | 1240 | 1 |
| 6 | 1290 | 1 |
| 6 | 1341 | 1 |
| 7 | 1392 | 1 |
| 7 | 1443 | 1 |
| 7 | 1494 | 1 |


CBR


BEARING CAPACITY, psf

Based on approximate interrelationships of CBR and Bearing values (Design of Concrete Airport Pavement, Portland Cement Association, page 8, 1955)

BUILDING & EARTH

Geotechnical, Environmental, and Materials Engineers

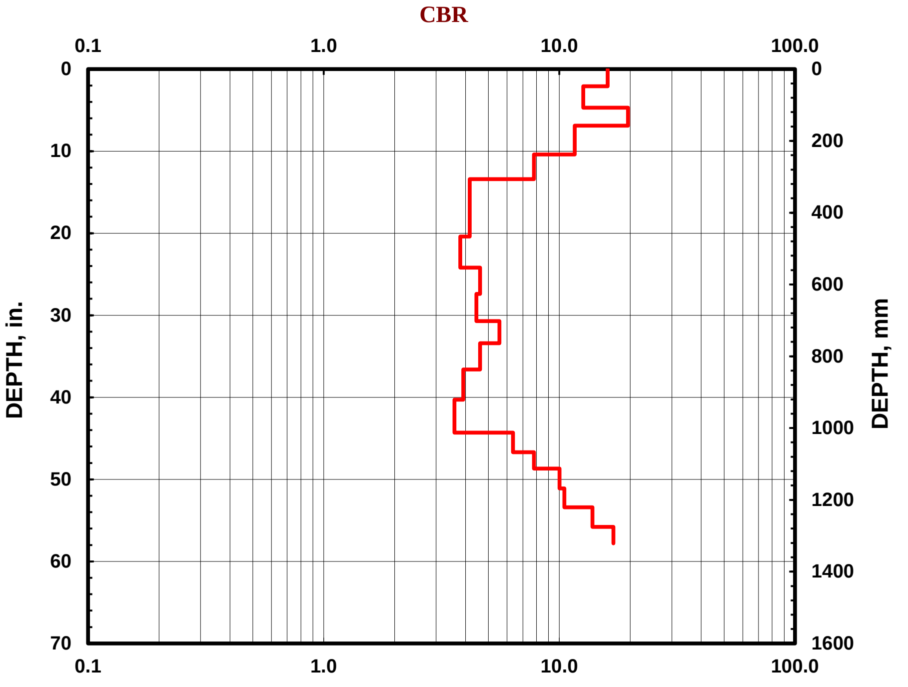
## Dynamic Cone Penetrometer (In situ CBR) - ASTM D 6951

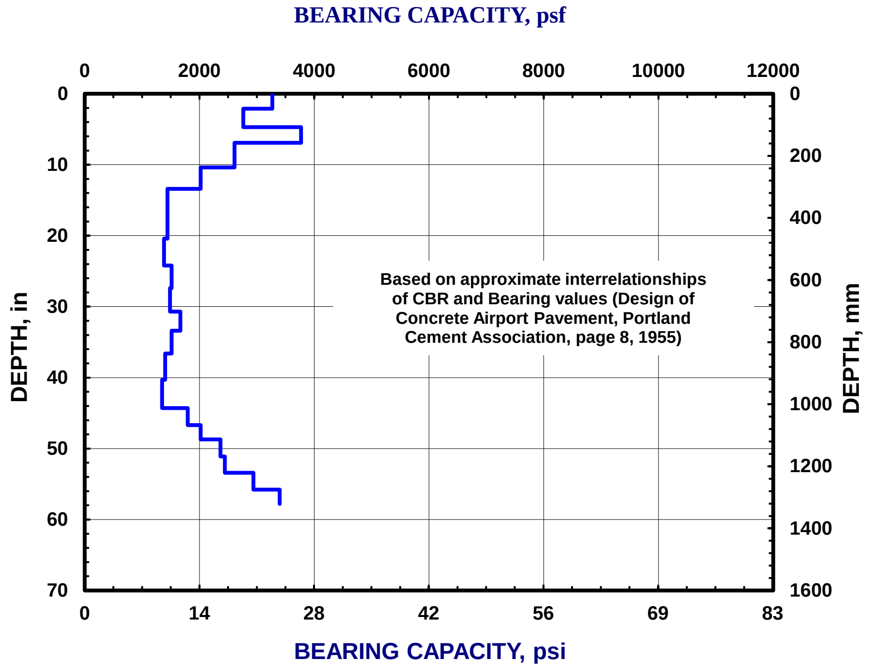
**Project:** Horry County Schools - Records Center
**Date:** 02/21/20
**Client:** ECLS Global, Inc
**Soil Type(s):** SC,CH
**Technician:** M. Lumpkin
**Location:** B-03

Hammer
○ 10.1 lbs. - (2)
● 17.6 lbs. - (1)
○ Both hammers used

Soil Type
○ CH
○ CL
● All other soils

| No. of Blows | Accumulative Penetration (mm) | Hammer Blow Factor |
|---|---|---|
| 0 | 0 | 1 |
| 4 | 53 | 1 |
| 4 | 119 | 1 |
| 5 | 175 | 1 |
| 5 | 264 | 1 |
| 3 | 340 | 1 |
| 2 | 429 | 1 |
| 2 | 518 | 1 |
| 2 | 615 | 1 |
| 2 | 696 | 1 |
| 2 | 780 | 1 |
| 2 | 848 | 1 |
| 2 | 930 | 1 |
| 2 | 1024 | 1 |
| 2 | 1125 | 1 |
| 2 | 1186 | 1 |
| 2 | 1237 | 1 |
| 3 | 1298 | 1 |
| 3 | 1356 | 1 |
| 4 | 1417 | 1 |
| 4 | 1468 | 1 |





Based on approximate interrelationships of CBR and Bearing values (Design of Concrete Airport Pavement, Portland Cement Association, page 8, 1955)

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Geotechnical, Environmental, and Materials Engineers

# Dynamic Cone Penetrometer (In situ CBR) - ASTM D 6951

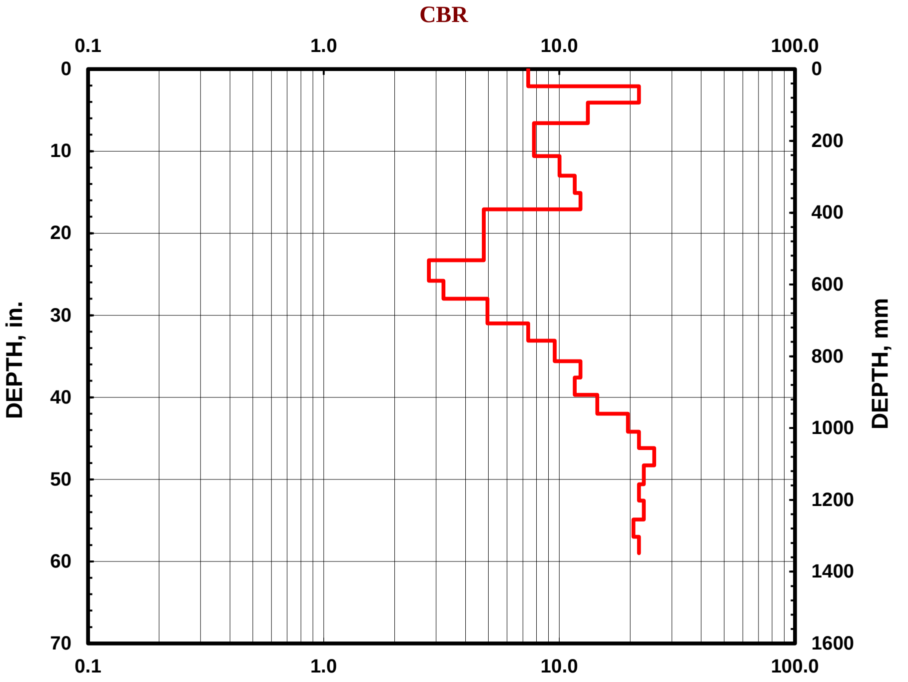
**Project:** Horry County Schools - Records Center
**Client:** ECLS Global, Inc
**Technician:** M. Lumpkin

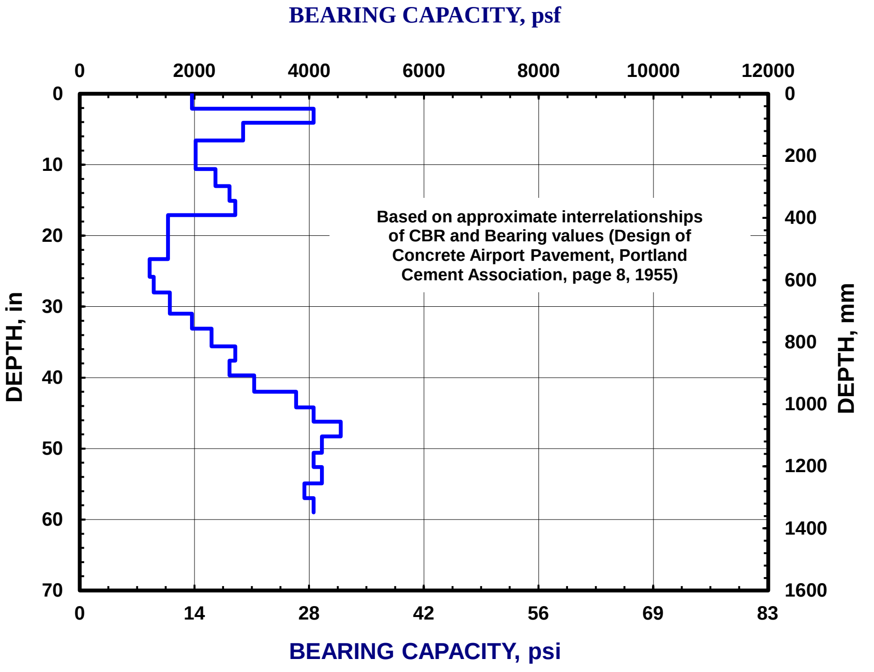
**Date:** 02/21/20
**Soil Type(s):** SC, CH, SM
**Location:** B-04

Hammer
○ 10.1 lbs. - (2)
○ 17.6 lbs. - (1)
● Both hammers used

Soil Type
○ CH
○ CL
● All other soils

| No. of Blows | Accumulative Penetration (mm) | Hammer Blow Factor |
|---|---|---|
| 0 | 0 | 1 |
| 2 | 53 | 1 |
| 5 | 104 | 1 |
| 4 | 168 | 1 |
| 2 | 218 | 1 |
| 2 | 269 | 1 |
| 3 | 330 | 1 |
| 3 | 384 | 1 |
| 3 | 434 | 1 |
| 2 | 513 | 1 |
| 2 | 592 | 1 |
| 1 | 655 | 1 |
| 1 | 711 | 1 |
| 2 | 787 | 1 |
| 2 | 841 | 1 |
| 3 | 904 | 1 |
| 3 | 955 | 1 |
| 3 | 1008 | 1 |
| 4 | 1067 | 1 |
| 5 | 1123 | 1 |
| 5 | 1173 | 1 |
| 6 | 1227 | 1 |
| 6 | 1285 | 1 |
| 5 | 1336 | 1 |
| 6 | 1394 | 1 |
| 5 | 1448 | 1 |
| 5 | 1499 | 1 |





Based on approximate interrelationships of CBR and Bearing values (Design of Concrete Airport Pavement, Portland Cement Association, page 8, 1955)

BUILDING & EARTH
Geotechnical, Environmental, and Materials Engineers

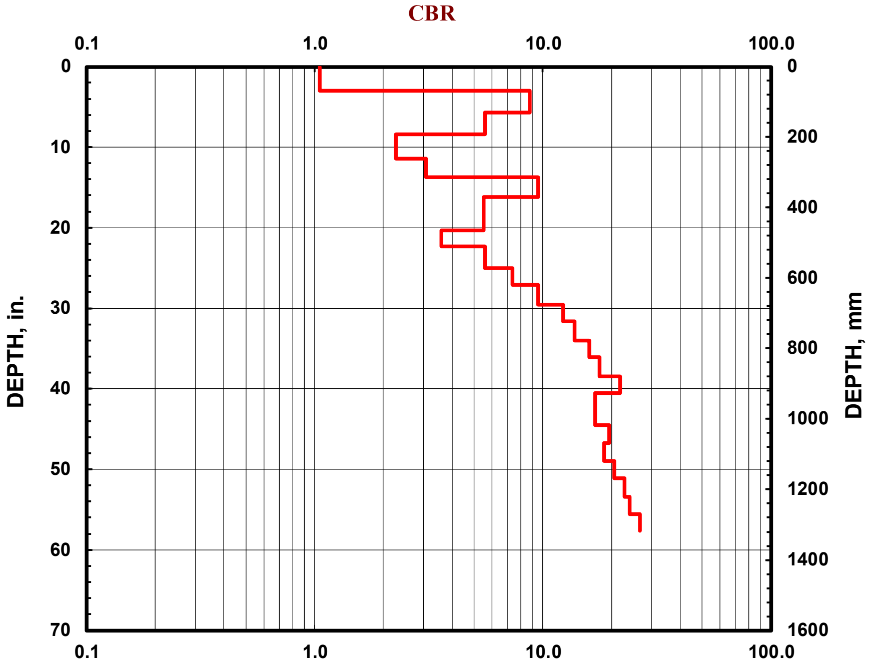
# Dynamic Cone Penetrometer (In situ CBR) - ASTM D 6951

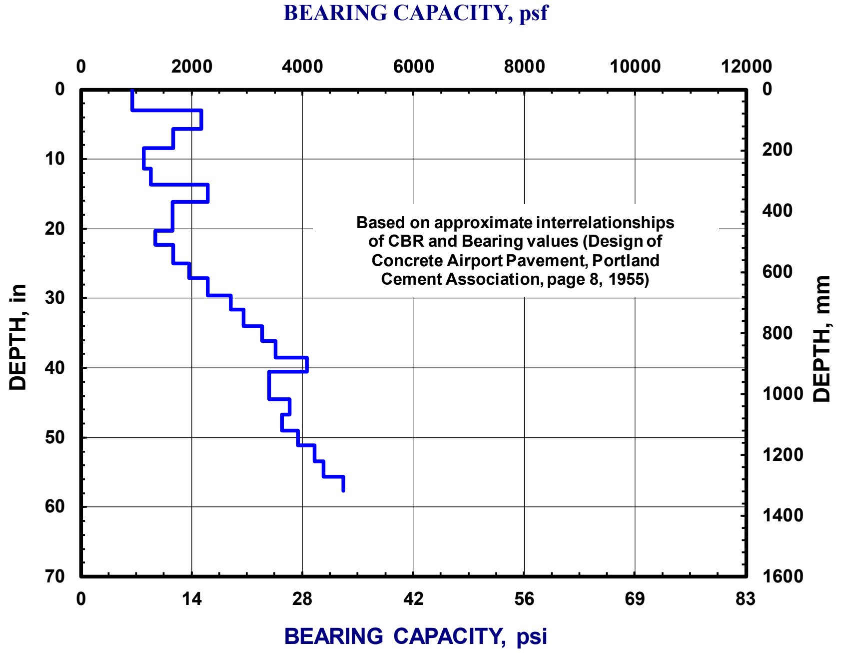
**Project:** Horry County Schools - Records Center
**Client:** ECLS Global, Inc
**Technician:** M. Lumpkin
**Date:** 02/21/20
**Soil Type(s):** SM, CH
**Location:** B-05

Hammer
○ 10.1 lbs. - (2)
● 17.6 lbs. - (1)
○ Both hammers used

Soil Type
○ CH
○ CL
● All other soils

| No. of Blows | Accumulative Penetration (mm) | Hammer Blow Factor |
|---|---|---|
| 0 | 0 | 1 |
| 0.5 | 76 | 1 |
| 3 | 145 | 1 |
| 2 | 213 | 1 |
| 1 | 290 | 1 |
| 1 | 348 | 1 |
| 3 | 411 | 1 |
| 3 | 516 | 1 |
| 1 | 566 | 1 |
| 2 | 635 | 1 |
| 2 | 688 | 1 |
| 3 | 752 | 1 |
| 3 | 803 | 1 |
| 4 | 864 | 1 |
| 4 | 917 | 1 |
| 5 | 978 | 1 |
| 5 | 1029 | 1 |
| 4 | 1080 | 1 |
| 4 | 1130 | 1 |
| 5 | 1186 | 1 |
| 5 | 1245 | 1 |
| 5 | 1298 | 1 |
| 6 | 1356 | 1 |
| 6 | 1412 | 1 |
| 6 | 1463 | 1 |





Based on approximate interrelationships of CBR and Bearing values (Design of Concrete Airport Pavement, Portland Cement Association, page 8, 1955)

BUILDING & EARTH

Geotechnical, Environmental, and Materials Engineers

# Dynamic Cone Penetrometer (In situ CBR) - ASTM D 6951

**Project:** Horry County Schools - Records Center

**Client:** ECLS Global, Inc

**Technician:** M. Lumpkin

**Date:** 02/21/20

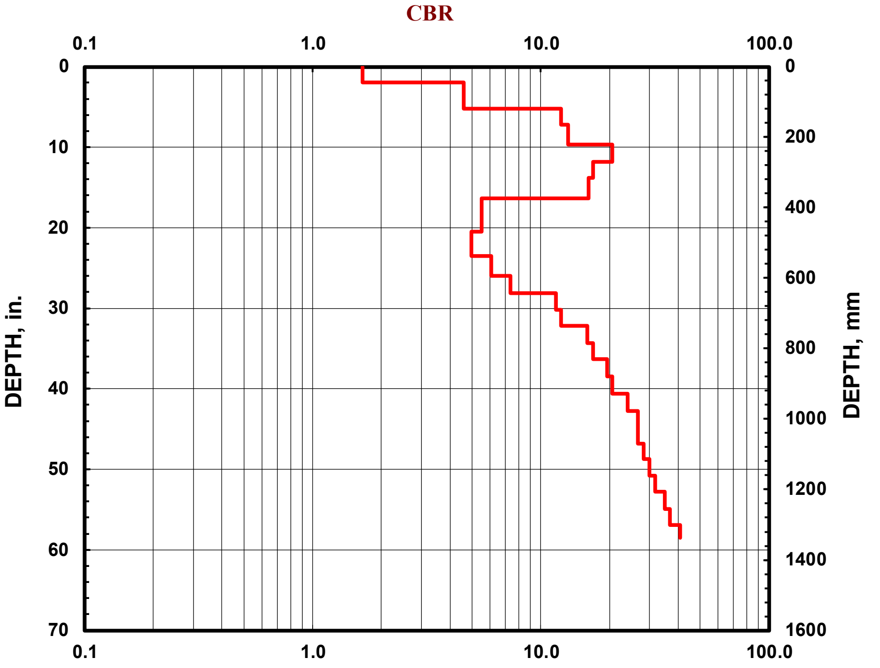
**Soil Type(s):** SM, CH

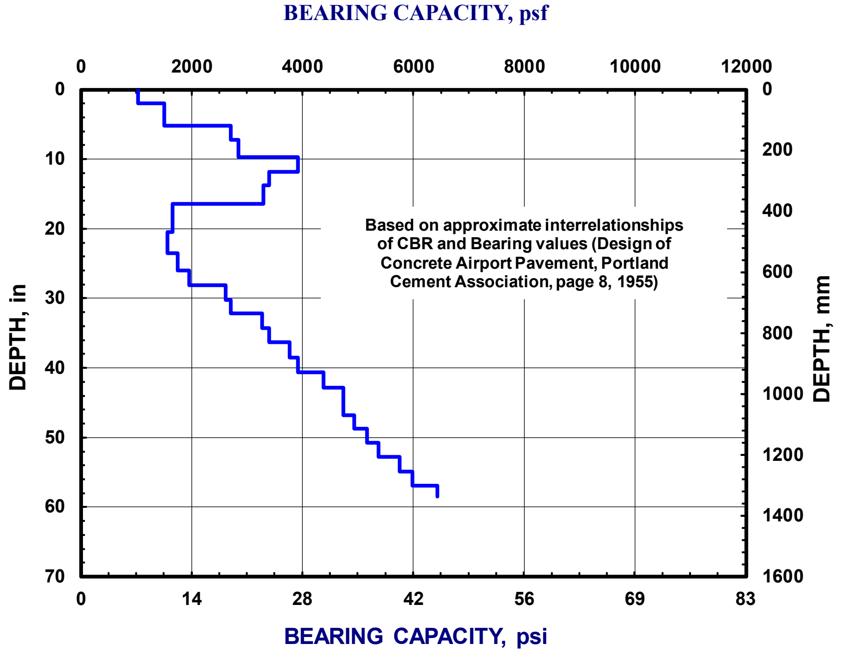
**Location:** B-06

Hammer
- ○ 10.1 lbs. - (2)
- ● 17.6 lbs. - (1)
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ● All other soils

| No. of Blows | Accumulative Penetration (mm) | Hammer Blow Factor |
|---|---|---|
| 0 | 0 | 1 |
| 0.5 | 51 | 1 |
| 2 | 132 | 1 |
| 3 | 183 | 1 |
| 4 | 246 | 1 |
| 5 | 300 | 1 |
| 4 | 351 | 1 |
| 5 | 417 | 1 |
| 3 | 521 | 1 |
| 2 | 597 | 1 |
| 2 | 660 | 1 |
| 2 | 714 | 1 |
| 3 | 767 | 1 |
| 3 | 818 | 1 |
| 4 | 871 | 1 |
| 4 | 922 | 1 |
| 5 | 978 | 1 |
| 5 | 1031 | 1 |
| 6 | 1087 | 1 |
| 6 | 1138 | 1 |
| 6 | 1189 | 1 |
| 6 | 1237 | 1 |
| 7 | 1290 | 1 |
| 7 | 1341 | 1 |
| 8 | 1394 | 1 |
| 8 | 1445 | 1 |
| 7 | 1486 | 1 |





Based on approximate interrelationships of CBR and Bearing values (Design of Concrete Airport Pavement, Portland Cement Association, page 8, 1955)

**BUILDING & EARTH**

Geotechnical, Environmental, and Materials Engineers

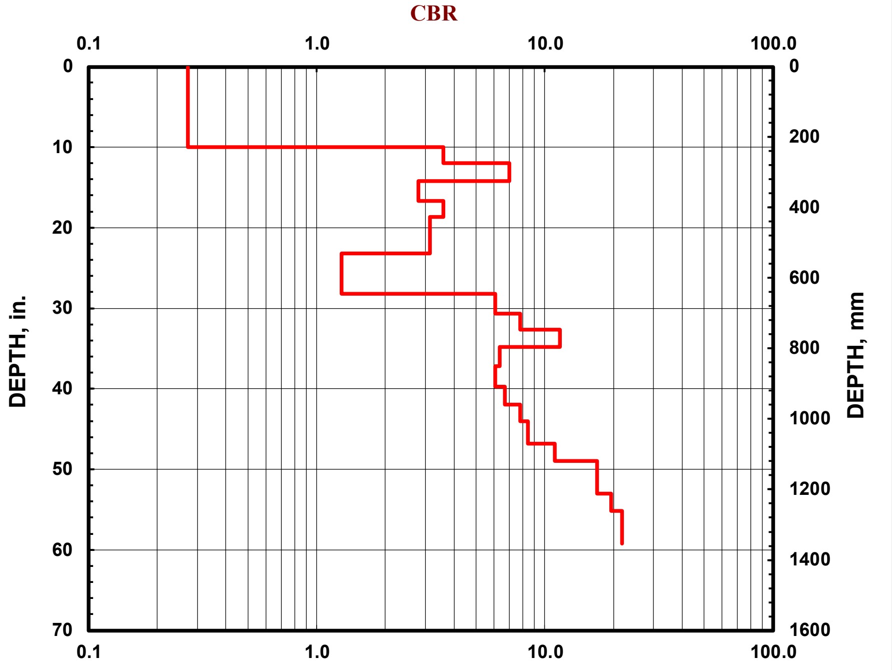
# Dynamic Cone Penetrometer (In situ CBR) - ASTM D 6951

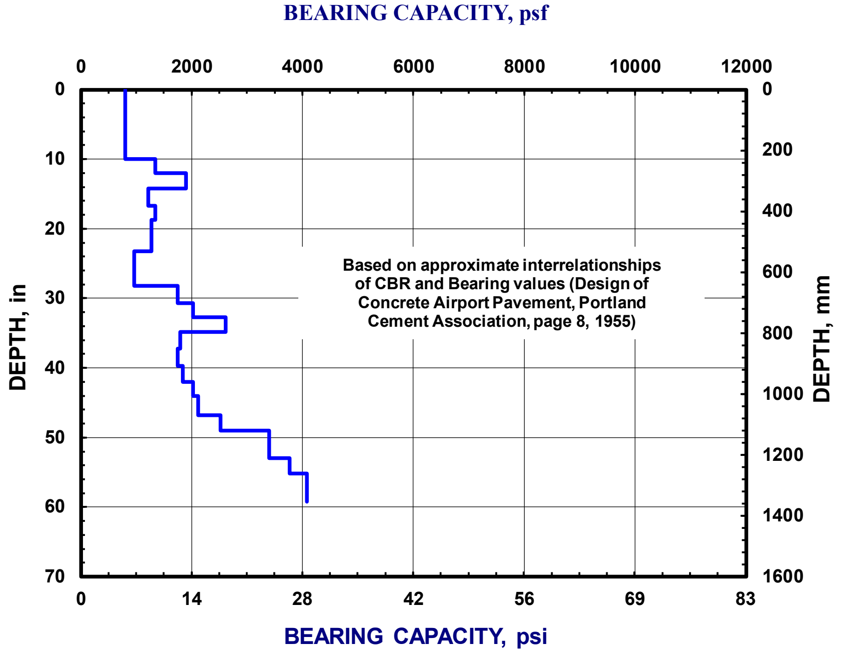
**Project:** Horry County Schools - Records Center
**Client:** ECLS Global, Inc
**Technician:** M. Lumpkin
**Date:** 02/21/20
**Soil Type(s):** SC, SM, CH
**Location:** B-07

Hammer
○ 10.1 lbs. - (2)
● 17.6 lbs. - (1)
○ Both hammers used

Soil Type
○ CH
○ CL
● All other soils

| No. of Blows | Accumulative Penetration (mm) | Hammer Blow Factor |
|---|---|---|
| 0 | 0 | 1 |
| 0.5 | 254 | 1 |
| 1 | 305 | 1 |
| 2 | 361 | 1 |
| 1 | 424 | 1 |
| 1 | 475 | 1 |
| 2 | 589 | 1 |
| 1 | 716 | 1 |
| 2 | 780 | 1 |
| 2 | 831 | 1 |
| 3 | 884 | 1 |
| 2 | 945 | 1 |
| 2 | 1008 | 1 |
| 2 | 1067 | 1 |
| 2 | 1118 | 1 |
| 3 | 1189 | 1 |
| 3 | 1245 | 1 |
| 4 | 1295 | 1 |
| 4 | 1346 | 1 |
| 5 | 1402 | 1 |
| 5 | 1453 | 1 |
| 5 | 1504 | 1 |





Based on approximate interrelationships of CBR and Bearing values (Design of Concrete Airport Pavement, Portland Cement Association, page 8, 1955)

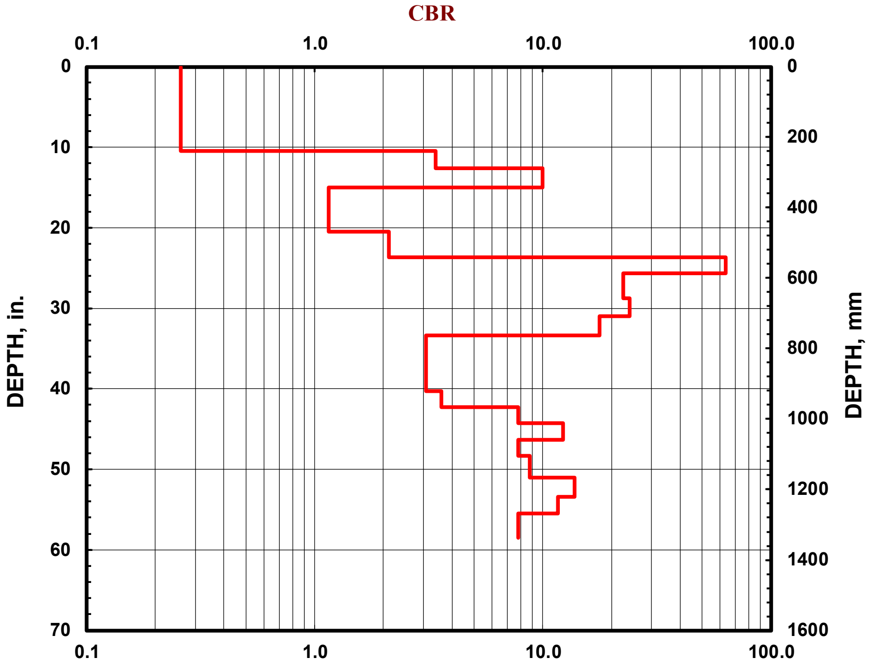
# Dynamic Cone Penetrometer (In situ CBR) - ASTM D 6951

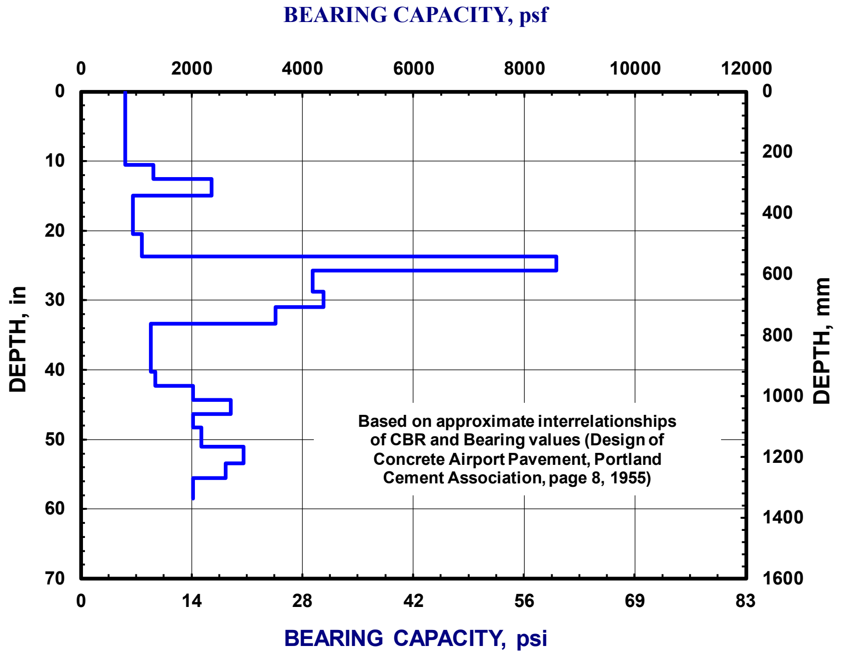
**Project:** Horry County Schools - Records Center
**Client:** ECLS Global, Inc
**Technician:** M. Lumpkin
**Date:** 02/21/20
**Soil Type(s):** SC, CH
**Location:** B-08

Hammer
○ 10.1 lbs. - (2)
● 17.6 lbs. - (1)
○ Both hammers used

Soil Type
○ CH
○ CL
● All other soils

| No. of Blows | Accumulative Penetration (mm) | Hammer Blow Factor |
|---|---|---|
| 0 | 0 | 1 |
| 0.5 | 267 | 1 |
| 1 | 320 | 1 |
| 3 | 381 | 1 |
| 1 | 521 | 1 |
| 1 | 602 | 1 |
| 13 | 653 | 1 |
| 8 | 732 | 1 |
| 6 | 787 | 1 |
| 5 | 848 | 1 |
| 3 | 1024 | 1 |
| 1 | 1074 | 1 |
| 2 | 1125 | 1 |
| 3 | 1176 | 1 |
| 2 | 1227 | 1 |
| 3 | 1295 | 1 |
| 4 | 1356 | 1 |
| 3 | 1410 | 1 |
| 3 | 1486 | 1 |





Based on approximate interrelationships of CBR and Bearing values (Design of Concrete Airport Pavement, Portland Cement Association, page 8, 1955)

**BUILDING & EARTH**

Geotechnical, Environmental, and Materials Engineers

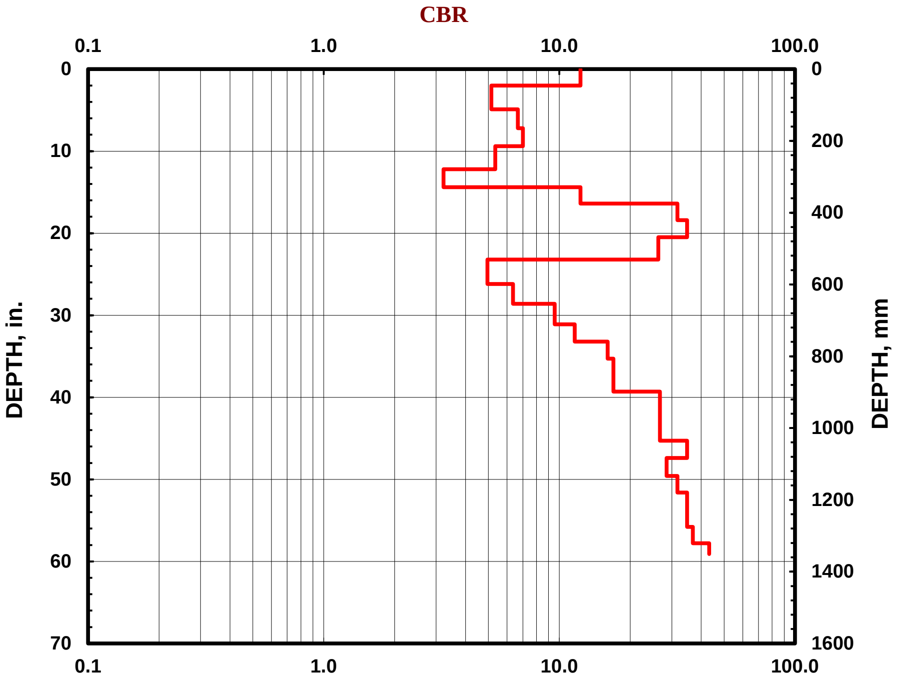
# Dynamic Cone Penetrometer (In situ CBR) - ASTM D 6951

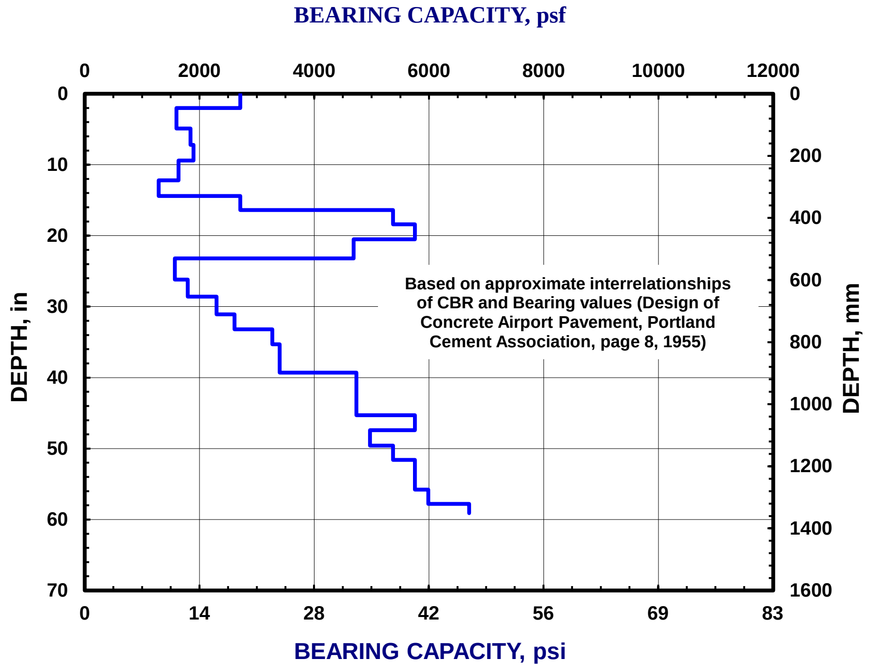
**Project:** Horry County Schools - Records Center
**Date:** 02/21/20
**Client:** ECLS Global, Inc
**Soil Type(s):** SC, CH
**Technician:** M. Lumpkin
**Location:** B-09

Hammer
○ 10.1 lbs. - (2)
● 17.6 lbs. - (1)
○ Both hammers used

Soil Type
○ CH
○ CL
● All other soils

| No. of Blows | Accumulative Penetration (mm) | Hammer Blow Factor |
|---|---|---|
| 0 | 0 | 1 |
| 3 | 51 | 1 |
| 2 | 124 | 1 |
| 2 | 183 | 1 |
| 2 | 239 | 1 |
| 2 | 310 | 1 |
| 1 | 366 | 1 |
| 3 | 417 | 1 |
| 7 | 467 | 1 |
| 8 | 521 | 1 |
| 8 | 589 | 1 |
| 2 | 665 | 1 |
| 2 | 726 | 1 |
| 3 | 790 | 1 |
| 3 | 843 | 1 |
| 4 | 897 | 1 |
| 4 | 947 | 1 |
| 4 | 998 | 1 |
| 6 | 1049 | 1 |
| 6 | 1100 | 1 |
| 6 | 1151 | 1 |
| 8 | 1204 | 1 |
| 7 | 1260 | 1 |
| 7 | 1311 | 1 |
| 8 | 1364 | 1 |
| 8 | 1417 | 1 |
| 8 | 1468 | 1 |
| 6 | 1501 | 1 |





Based on approximate interrelationships of CBR and Bearing values (Design of Concrete Airport Pavement, Portland Cement Association, page 8, 1955)

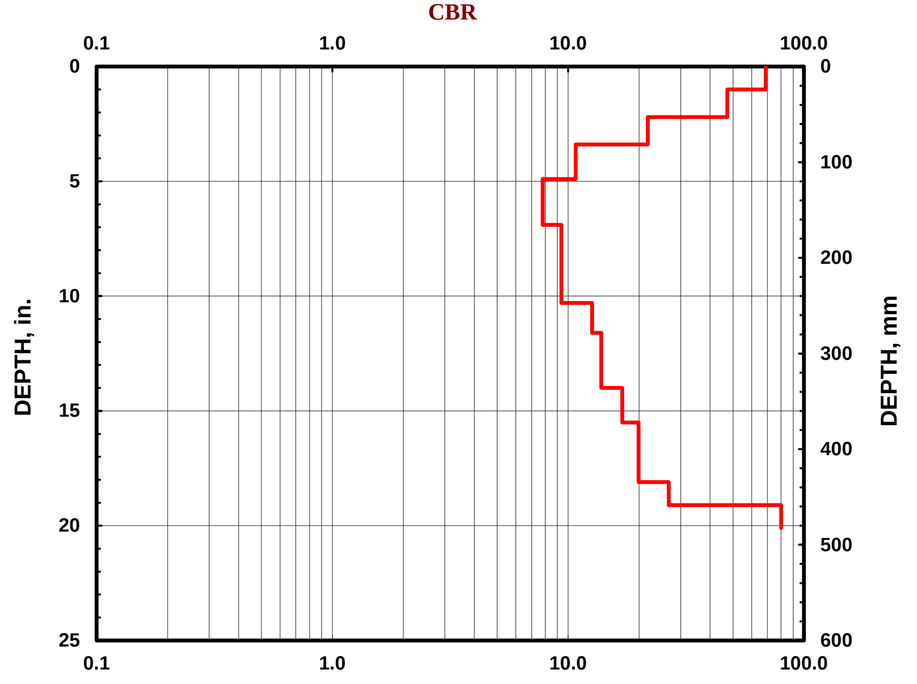
## Dynamic Cone Penetrometer (In situ CBR) - ASTM D 6951

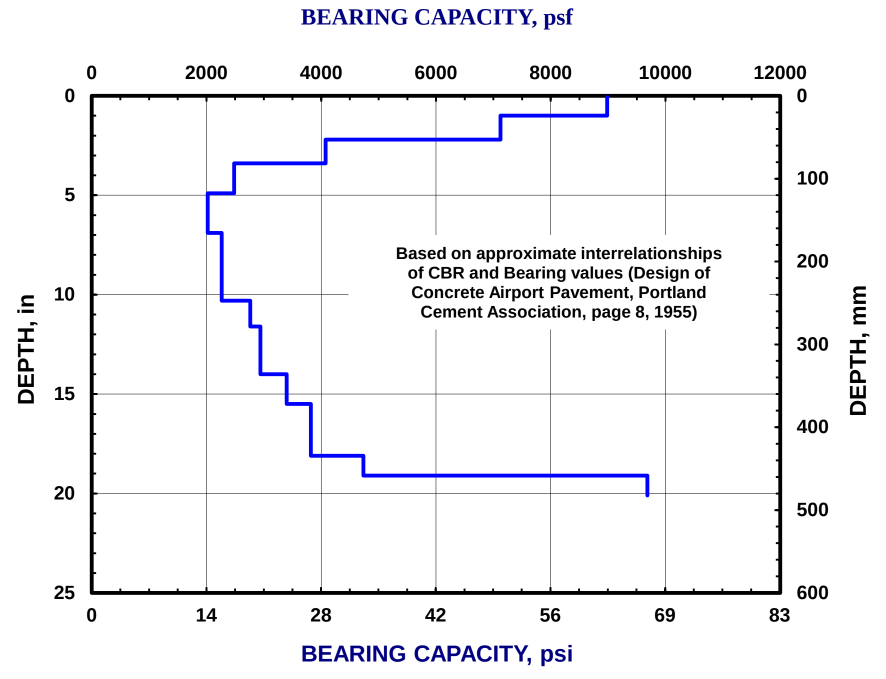
**Project:** Horry County Schools - Records Center
**Date:** 02/21/20
**Client:** ECLS Global, Inc
**Soil Type(s):** SM
**Technician:** M. Lumpkin
**Location:** B-10

Hammer
○ 10.1 lbs. - (2)
● 17.6 lbs. - (1)
○ Both hammers used

Soil Type
○ CH
○ CL
● All other soils

| No. of Blows | Accumulative Penetration (mm) | Hammer Blow Factor |
|---|---|---|
| 0 | 0 | 1 |
| 7 | 25 | 1 |
| 6 | 56 | 1 |
| 3 | 86 | 1 |
| 2 | 124 | 1 |
| 1 | 150 | 1 |
| 1 | 175 | 1 |
| 2 | 218 | 1 |
| 2 | 262 | 1 |
| 2 | 295 | 1 |
| 2 | 325 | 1 |
| 2 | 356 | 1 |
| 3 | 394 | 1 |
| 3 | 427 | 1 |
| 3 | 460 | 1 |
| 3 | 485 | 1 |
| 8 | 511 | 1 |





Based on approximate interrelationships of CBR and Bearing values (Design of Concrete Airport Pavement, Portland Cement Association, page 8, 1955)

## LABORATORY TEST PROCEDURES

A brief description of the laboratory tests performed is provided in the following sections.

### *DESCRIPTION OF SOILS (VISUAL-MANUAL PROCEDURE) (ASTM D2488)*

The soil samples were visually examined by our engineer and soil descriptions were provided. Representative samples were then selected and tested in accordance with the aforementioned laboratory-testing program to determine soil classifications and engineering properties. This data was used to correlate our visual descriptions with the Unified Soil Classification System (USCS).

### *NATURAL MOISTURE CONTENT (ASTM D2216)*

Natural moisture contents (M%) were determined on selected samples. The natural moisture content is the ratio, expressed as a percentage, of the weight of water in a given amount of soil to the weight of solid particles.

### *ATTERBERG LIMITS (ASTM D4318)*

The Atterberg Limits test was performed to evaluate the soil's plasticity characteristics. The soil Plasticity Index (PI) is representative of this characteristic and is bracketed by the Liquid Limit (LL) and the Plastic Limit (PL). The Liquid Limit is the moisture content at which the soil will flow as a heavy viscous fluid. The Plastic Limit is the moisture content at which the soil is between "plastic" and the semi-solid stage. The Plasticity Index (PI = LL - PL) is a frequently used indicator for a soil's potential for volume change. Typically, a soil's potential for volume change increases with higher plasticity indices.

### *MATERIAL FINER THAN NO. 200 SIEVE BY WASHING (ASTM D1140)*

Grain-size tests were performed to determine the partial soil particle size distribution. The amount of material finer than the openings on the No. 200 sieve (0.075 mm) was determined by washing soil over the No. 200 sieve. The results of wash #200 tests are presented on the boring logs included in this report and in the table of laboratory test results.

## LABORATORY TEST RESULTS

*The results of the laboratory testing are presented in the following tables.*

| BORING NO. | DEPTH | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PLASTICITY INDEX | % PASSING #200 SIEVE | CLASSIFICATION |
|---|---|---|---|---|---|---|---|
| B-04 | 0.0 - 1.0 | 15.6 | | | | | |
| B-04 | 1.0 - 2.0 | 17.2 | | | | | |
| B-04 | 2.0 - 3.0 | 29.0 | 61 | 23 | 38 | 54 | CH |
| B-04 | 3.0 - 4.0 | 28.1 | | | | | |
| B-05 | 0.0 - 1.0 | 17.2 | | | | | |
| B-05 | 1.0 - 2.0 | 19.6 | | | | | |
| B-05 | 2.0 - 3.0 | 24.3 | 50 | 20 | 30 | 54 | CH |
| B-05 | 3.0 - 4.0 | 24.8 | | | | | |
| B-09 | 1.0 - 2.0 | 9.6 | | | | | |
| B-09 | 2.0 - 3.0 | 18.0 | | | | | |
| B-09 | 3.0 - 4.0 | 25.7 | 61 | 26 | 35 | 64 | CH |
| B-09 | 4.0 - 5.0 | 23.7 | | | | | |
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***TABLE L-1: General Soil Classification Test Results***

Soils with a Liquid Limit (LL) greater than 50 and Plasticity Index (PI) greater than 25 usually exhibit significant volume change with varying moisture content and are considered to be highly plastic

# Important Information about This

# Geotechnical-Engineering Report

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

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

## 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 constructor — 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 this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply this report for any purpose or project except the one originally contemplated.

## Read 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.

## Geotechnical Engineers Base Each Report on a Unique Set of Project-Specific Factors

Geotechnical engineers consider many 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 a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *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 geotechnical engineer performed the study. *Do not rely on a geotechnical-engineering report whose adequacy may have been affected by*: the passage of time; man-made events, such as construction on or adjacent to the site; or natural events, such as floods, droughts, earthquakes, or groundwater fluctuations. *Contact the geotechnical engineer before applying this 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 geotechnical-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 confirmation-dependent recommendations included in your report. *Confirmation-dependent 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 confirmation-dependent recommendations if that engineer does not perform the geotechnical-construction observation required to confirm the recommendations' applicability.*

## A Geotechnical-Engineering Report Is Subject to Misinterpretation

Other design-team members' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront 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. Constructors can also misinterpret a geotechnical-engineering report. Confront that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing geotechnical 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 Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make constructors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give constructors the complete geotechnical-engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise constructors 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 constructors have sufficient time* to perform additional study. Only then might you be in a position to give constructors 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 constructors fail to 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.

### Environmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform an *environmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own environmental 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, many 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 GBC-Member Geotechnical Engineer for Additional Assistance

Membership in the Geotechnical Business Council of the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project. Confer with you GBC-Member geotechnical engineer for more information.

GEOTECHNICAL
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