ESP Associates, P.A.

REPORT OF
SUBSURFACE EXPLORATION
UNION COUNTY PIPELINE
WEST ALIGNMENT
MONROE, NORTH CAROLINA
ESP PROJECT NO. E4B-EP08.300

Prepared For:

Union County Public Works
500 North Main Street
Monroe, North Carolina 28112

Prepared By:

ESP Associates, P.A.
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Concord, North Carolina 28027

July 22, 2016

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July 22, 2016

Union County Public Works
500 North Main Street
Monroe, North Carolina 28112

Attention: Mr. Scott Huneycutt

Reference: **REPORT OF SUBSURFACE EXPLORATION**
Union County Pipeline West Alignment
Monroe, North Carolina
ESP Project No. E4B-EP08.300

Dear Mr. Huneycutt:

ESP Associates, P.A. (ESP) has completed the subsurface exploration for the proposed Union County Pipeline West Alignment project in Monroe, North Carolina. This exploration was performed in general accordance with our Task Order 2012-6. Authorization to proceed with this study was provided via email by you.

The purpose of our exploration was to evaluate the general subsurface conditions within select areas of the project with regard to the design and construction of the proposed western realignment of the pipeline system. This report presents our findings, conclusions, recommendations, and construction considerations for the proposed pipeline.

ESP appreciates the opportunity to assist you during this phase of the project. If you should have any questions concerning this report, or if we may be of further assistance, please contact us.

Sincerely,

ESP Associates, P.A.

Matthew J. Amick
Project Manager

Andrew M. Burton, PE
NC Registration No. 28134

SEAL
28134
ANDREW MARTIN BURTON
7-22-16

MJA/AMB/ea

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TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 SITE AND PROJECT DESCRIPTION

The project site is six miles located adjacent to portions of Rock River Road and Secrest Short Cut Road in Monroe, North Carolina. We understand that plans are to install a 36-inch diameter waterline at the site. We understand that the pipeline will cross Dry Fork along North Rocky River Road, and South Fork Crooked Creek along Secrest Shortcut Road The properties were undeveloped with some scattered mature trees. No other detailed information has been provided at this time

1.2 PURPOSE OF SERVICES

The purpose of the exploration was to evaluate the general subsurface conditions at the site with regard to the general pipeline installation. This report presents our findings, conclusions, recommendations, and construction considerations for the pipeline installation. This report also contains a brief description of the field testing procedures performed for this study and a discussion of the soil conditions encountered at the site.

2.0 EXPLORATION PROCEDURES

2.1 FIELD

Fifty four (54) soil test borings (B-1 through B-54) were performed at the approximate locations shown on the attached “Boring Location Plan,” Figures 1 through 33 . The boring locations were selected by representatives of Black and Veatch. The boring locations were located in the field by a project manager using a hand held global positioning system (GPS). The soil test borings were extended to depths ranging between approximately 4.2 to 20 feet below the existing ground surface using a CME-550X ATV drill rig. Hollow-stem, continuous flight augers were used to advance the borings into the ground.

Standard Penetration Tests were performed at designated intervals in the soil test borings in general accordance with ASTM D 1586 in order to obtain data for estimating soil strength and consistency. In conjunction with the penetration testing, split-spoon soil samples were recovered for soil classification. Water level measurements were attempted at the termination of drilling. All of the borings were backfilled after drilling for safety concerns with the exception of Boring B-25. Water levels were also obtained from Boring B-25 1-day after the completion of drilling. A brief description of the field testing procedures is included in the Appendix.

While in the field, a representative of the geotechnical engineer visually examined each sample to evaluate the type of soil encountered, soil plasticity, moisture condition, organic content, presence of lenses and seams, colors and apparent geological origin. The results of the visual soil classifications for the borings, as well as field test results, are presented on the individual "Test Boring Records," included in the Appendix. Similar soils were grouped into strata on the logs. The strata lines represent approximate boundaries between the soil types; however, the actual transition between soil types in the field may be gradual in both the horizontal and vertical directions.

3.0 SUBSURFACE CONDITIONS

3.1 PHYSIOGRAPHY AND AREA GEOLOGY

The referenced property is located in Monroe, North Carolina which is in the Piedmont Physiographic Province. The Piedmont Province generally consists of hills and ridges which are intertwined with an established system of draws and streams. The Piedmont Province is predominately underlain by igneous rock (formed from molten material) and metamorphic rock (formed by heat, pressure and/or chemical action), which were initially formed during the Precambrian and Paleozoic eras.

The virgin soils encountered in this area are the residual product of in-place chemical weathering of rock which was similar to the rock presently underlying the site. In areas not altered by erosion or disturbed by the activities of man, the typical residual soil profile consists of clayey soils near the surface, where soil weathering is more advanced, underlain by sandy silts and silty sands. The boundary between soil and rock is not sharply defined. This transitional zone termed "partially weathered rock" is normally found overlying the parent bedrock. Partially weathered rock is defined, for engineering purposes, as residual material with Standard Penetration Resistances in excess of 100 blows per foot. Weathering is facilitated by fractures, joints and by the presence of less resistant rock types. Consequently, the profile of the partially weathered rock and hard rock is quite irregular and erratic, even over short horizontal distances. Also, it is common to find lenses and boulders of hard rock and zones of partially weathered rock within the soil mantle, well above the general bedrock level.

3.2 SUBSURFACE

Subsurface conditions as indicated by the borings generally consist of topsoil underlain by fill and/or residual soils. The residual soils have formed from the weathering of the parent bedrock. The residual soils generally transition with depth into partially weathered rock. The generalized subsurface conditions at the site are described below. For more detailed soil descriptions and stratifications at a particular boring location, the respective "Test Boring Record" included in the Appendix should be reviewed.

Surface: A topsoil layer approximately 1 to 6 inches thick was encountered in all borings. The thickness of topsoil may be greater between the relatively widely spaced borings or in unexplored areas of the project site.

Fill: Below the topsoil in Borings B-25 through B-28, B-33, B-35, B-36, and B-54, fill soils were encountered. The fill soils observed consisted of firm to very stiff sandy silt, clayey silt, silty clay and sandy silt. Standard Penetration Resistances (N-values) in the fill ranged from 6 to 24 blows per foot (bpf). The fill observed extends to depths ranging between 1.5 and 10 feet below the existing ground surface.

Residuum: Beneath the topsoil in Borings B-1 through B-24, B-29 through B-32, B-34, and B-37 through B-53, and beneath the topsoil in Borings B-25 through B-28, B-33, B-35, B-36, and B-54 residual soils were encountered. The residuum generally consists of very soft to very stiff clayey silt, sandy silt, sandy clay and silty clay and loose to very dense silty sand and clayey sand. Standard Penetration Resistances (N-values) in the residuum varied between 4 and 95 blow per foot (bpf). The residuum extends to depths ranging between approximately 4 and 20 feet below the existing ground surface. Borings B-05, B-19, B-24, B-29, B-30, B-33, B-49, B-50, and B-52 were terminated in the residual soils at depths ranging between approximately 15 and 20 feet below the existing ground surface.

Partially Weathered Rock: Below the fill in Borings B-28 and B-35 and underlying the residuum in Borings in B-01 through B-04, B-06 through B-18, B-20 through B-23, B-25 through B-27, B-31, B-32, B-34, B-36 through B-48, B-51, B-53, and B-54 partially weathered rock (PWR) was encountered. PWR is defined as residual soils exhibiting N-values in excess of 100 bpf. When sampled, the PWR generally breaks down into sandy silts and silty sands with rock fragments. Borings B-02, B-06, B-07, B-09 through B-14, B-20 through B-23, B-25, B-31, B-32, B-37, B-38, B-40, B-43, B-44, and B-46 were terminated in the PWR at depths ranging between approximately 13.6 and 14.8 feet below the existing ground surface. Borings B-01, B-03, B-04, B-08, B-15 through B-18, B-26, B-27, B-28, B-34, B-35, B-36, B-39, B-41, B-42, B-45, B-47, B-48, B-51, B-53, and B-54 were terminated in the PWR upon **auger refusal** at depths ranging between approximately 4.2 and 13.2 feet below the existing ground surface. Auger refusal is defined as material that could not be penetrated with the drill rig equipment used on the project. Auger refusal material may consist of large boulders, rock ledges, lenses, seams or the top of parent bedrock. Core drilling techniques would be required to evaluate the character and continuity of the refusal material.

3.3 SUBSURFACE WATER

Water was observed in Boring B-25 at a depth of 5.8 feet below the existing ground surface one (1) day after drilling. Hole cave-in depths ranged between approximately 2.4 and 15.6 feet below the existing ground surface in the reminder of the borings. Hole cave-in depths may provide an indication of water present, particularly in granular soils. Subsurface water levels tend to fluctuate with seasonal and climatic variations, as well as with some types of construction operations. Therefore, water may be encountered during construction at depths not indicated during this study.

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 GENERAL

Our conclusions and recommendations are based on the project information previously discussed and on the data obtained from the field testing program. If the project information significantly differs or changes from previously discussed, or if conditions encountered during the construction differs from those encountered by the borings, ESP requests the opportunity to review our recommendations based on the new information and make any necessary changes.

4.2 SITE DEVELOPMENT

The results of the field testing program and analyses indicate the site is adaptable for the proposed construction, provided the information presented in the following sections of this report are considered.

A) Water was observed in Boring B-25 at a depth of approximately 5.8 feet below existing ground surface one (1) day after drilling. Depending on final excavation depths, temporary dewatering may be required insuring pipe installation.

B) Partially weathered rock was encountered in Borings B-01 through B-04, B-06 through B-18, B-20 through B-23, B-25 through B-28, B-31, B-32, B-34, B-35 through B-48, B-51, B-53, and B-54 at depths ranging between 2 and 14 feet below the existing ground surface. Depending on final site grades and utility excavation depths, partially weathered rock, bedrock, intermittent rock lenses, and/or boulders will be encountered during excavation for the pipeline.

5.0 CONSTRUCTION CONSIDERATIONS

5.1 DIFFICULT EXCAVATION

Based on the results of the soil test borings, it appears that portions of the general excavation will be in residual soils. We anticipate that the residual soil can be excavated using pans, scrapers, backhoes and front end loaders. **However, results from Borings B-01 through B-04, B-06 through B-18, B-20 through B-23, B-25 through B-28, B-31 and B-32, B-34 through B-48, B-51, B-53, and B-54 indicate that partially weathered rock is present ranging in depth from approximately 4.2 to 13.2 feet below the existing ground surface.** Borings B-01, B-02 through B-04, B-08, B-15 through B-18, B-26 through B-28, B-34 through B-36, B-39, B-41, B-42, B-45, B-47, B-48, B-51, B-53, and B-54 were terminated in the PWR upon **auger refusal** at depths ranging between approximately 4.2 and 13.2 feet below the existing ground surface; therefore, we anticipate that partially weathered rock, intermittent rock lenses and/or boulders may be encountered during general site grading and excavation for the installation of the pipeline.

The depth to, and thickness of, PWR and rock lenses or seams, can vary dramatically in short distances and between boring locations; therefore, PWR or bedrock may be encountered during construction at locations or depths between boring locations, not encountered during this exploration.

It has been our past experience in this geologic area that materials having Standard Penetration Resistances of less than 50 blows per 0.4 foot can generally be excavated using pans and scrapers by first loosening with a ripper attached to a suitable sized dozer such as a Caterpillar D-8 or D-9. On earthwork projects requiring ripping, questions sometimes develop as to whether the materials can be removed by ripping or whether blasting is required. It should be noted that ripping is dependent upon finding the right combination of equipment and techniques used, as well as the operator's skill and experience. The success of the ripping operation is dependent on finding the proper combinations for the conditions encountered. Excavation of the weathered rock is typically much more difficult in confined excavations. Jackhammering or blasting is anticipated to be required for materials having Standard Penetration Resistances in excess of 50 blows per 0.2 foot.

We recommend that materials requiring blasting or hammering to remove be well defined in the project specifications and/or construction contract documents. Below are recommended definitions for "rock."

Trench Rock: Material that cannot be dislodged by a Caterpillar 320 hydraulic backhoe, or equivalent, equipped with a rock bucket.

Boulders: Masses of rock exceeding 1 cubic yard in volume for mass excavations and ½ cubic yard in volume for trench excavations shall also be considered mass or trench rock, respectively, during excavation.

These classifications are for information purposes only and are not considered contractual definitions unless referenced as such by the project plans and/or contract documents. The classifications do not include materials such as loose rock, concrete, or other materials that can be removed by means other than impact hammering, but which for any reason, such as economic reasons, the contractor chooses to remove by impact hammering.

We also recommend that quantification guidelines for payment purposes be established prior to removal of materials defined above. These guidelines should include the following measurements to be used during quantity calculations:

- The depth below proposed utility design depth for trench rock
- The width on each side of the utility for trench rock.

These guidelines should establish a base line for payment and should be completely independent of the means and methods of the contractor.

We would like to point out that our experience indicates rock in a weathered, boulder and massive form varies erratically in location and depth in the Piedmont Geologic Province, which contains Monroe, North Carolina. Therefore, there is always a potential that these materials could be encountered at shallow depths between the boring locations.

Boring ID	**Depth to PWR (feet)***	**Depth to Refusal (feet)***		**Boring ID**	**Depth to PWR (feet)***	**Depth to Refusal (feet)***
B-01	5	5.2		B-26	3.5	4.3
B-02	13.5	NA		B-27	5.5	9
B-03	5	5.9		B-28	5	7.5
B-04	3	9.9		B-31	5.5	NA
B-06	12	NA		B-32	5.5	NA
B-07	13	NA		B-34	5.5	8.3
B-08	5	7.9		B-35	5	5.2
B-09	8.5	NA		B-36	8	9.1
B-10	3	NA		B-37	13	NA
B-11	5.5	NA		B-38	13.5	NA
B-12	6	NA		B-39	5	6
B-13	8	NA		B-40	5.5	NA
B-14	5.5	NA		B-41	5.5	9
B-15	6	9.6		B-42	5.5	10.3
B-16	3.5	4.2		B-43	3	NA
B-17	3	9.8		B-44	13.5	NA
B-18	5	5.3		B-45	5.5	13.2
B-20	13	NA		B-46	3	NA
B-21	8	NA		B-47	8.5	9.2

B-22	13.5	NA		B-48	5	5.9
B-23	13.5	NA		B-51	3	10.3
B-25	13.5	NA		B-53	5.5	6
				B-54	5	5.2

*Below Existing Subgrade

5.2 TEMPORARY EXCAVATION STABILITY

Since the excavation for the pipeline will extend beyond five (5) feet below final grades, shoring and bracing or flattening (laying back) of the slopes will be required to obtain a safe working environment. In this regard, we anticipate that the residual soils and compacted structural fill will remain stable on an approximately 1(H) to 1(V) slope for the short period that they should remain open, if the dewatering of the soils is performed as outlined previously. However, this should be verified in the field at the time of construction. A flatter slope may be required. All excavations should be conducted in a safe manner and comply with all local, state and federal guidelines and codes. We recommend that all excavated soils be placed away from the edges of the excavation, at a distance equaling or exceeding the depth of the excavation.

Excavations greater than four feet in depth should be sloped or shored in accordance with local, state, and federal regulations, including OSHA "Construction Standard for Excavations" (29 CFR Part 1926.650-652). The contractor is usually solely responsible for site safety. This information is provided only as a service and under no circumstances should ESP be assumed to be responsible for construction site safety.

5.3 TEMPORARY DEWATERING

Based on existing ground surface elevations, stabilized groundwater levels and proposed subgrade elevations, we anticipate that dewatering will be required at the site. We expect that dewatering could be adequately handled with pumping from sumps excavated at least 3 feet below the bottom of the excavations. Pumping from the sumps should be maintained until fill placement in the excavation is a minimum of 3 feet above the water level. At no time should pumping be performed directly beneath the exposed subgrade elevation since this could result in disturbance of the bearing materials and a loss of soil strength and increased settlement.

5.4 FILL MATERIAL AND PLACEMENT

All structural fill should consist of a clean (free of organics and debris), low plasticity soil (Plasticity Index less than 30). The proposed fill should have a maximum dry density of at least 90 pounds per cubic foot as determined by a Standard Proctor compaction test, ASTM D 698. All structural fill should be placed in loose lifts not exceeding 12 inches in thickness and compacted to a minimum of 95 percent of its Standard Proctor maximum dry density, with at least 100 percent achieved in the upper 12 inches. Depending upon the type of compaction equipment used, lift thicknesses may need to be reduced to achieve the recommended compaction criteria. We recommend that field density tests, including one-point Proctor verification tests, be performed on structural fill as it is being placed at a frequency determined by an experienced geotechnical engineer to verify the compaction criteria. Based on the results of the soil test borings and our past experience with similar type materials, the soils encountered appeared suitable for use as structural fill; however, moisture conditioning should be anticipated.

5.5 EFFECTS OF CONSTRUCTION METHODS

Several aspects of construction at this site could adversely affect the adjacent streets, utilities and nearby facilities. Therefore, proper design and special care during construction will be needed to protect the adjoining properties. These items are discussed below.

Jackhammering, blasting, pile driving and other construction activities can generate vibrations that travel off-site. These vibrations can cause damage to adjacent structures if not properly controlled. Care must be taken to prevent damage of newly placed structures, especially fresh concrete. Any blasting charges that are used must be properly sized and timed to prevent structural damage. We recommend that vibration monitoring be performed for structures located nearby during the construction activities that generate a large amount of vibration. This will reduce the potential for large magnitude vibrations and subsequent damage claims.

General site dewatering can sometimes cause settlement of adjacent structures due to an increase in effective stresses which can consolidate soils. Based on the available data, we anticipate that this will generally not be a problem at this site. However, pumping of fine soil particles due to improper dewatering techniques can result in unwanted subsidence. Therefore, proper dewatering systems, if required, should be implemented to reduce these effects.

6.0 LIMITATIONS OF REPORT

This report has been prepared in accordance with generally accepted geotechnical engineering practice with regard to the specific conditions and requirements of this site. The conclusions and recommendations contained in this report were based on the applicable standards of our practice in this geographic area at the time this report was prepared. No other warranty, expressed or implied, is made.

The analysis and recommendations submitted herein are based, in part, upon the data obtained from the subsurface exploration. The nature and extent of variations between the borings will not be known until construction is underway. If variations appear evident, then we request the opportunity to re-evaluate the recommendations of this report. In the event that any changes in the nature, design, or location of the structures are planned, the conclusions and recommendations contained in this report will not be considered valid unless the changes are reviewed and conclusions modified or verified in writing by ESP.

In order to verify that our recommendations are properly interpreted and implemented, we recommend that ESP be provided the opportunity to review the final plans and specifications. Any concerns observed will be brought to our client’s attention in writing.

FIELD EXPLORATION PROCEDURES

Soil Test Boring: Fifty Four (54) soil test borings were drilled at the approximate locations shown on the attached Boring Location Plan, Figures 1 through 33. Soil sampling and penetration testing were performed in accordance with ASTM D 1586.

The borings were advanced with hollow-stem augers and, at standard intervals, soil samples were obtained with a standard 1.4-inch I.D., 2-inch O.D., split-tube sampler. The sampler was first seated six (6) inches to penetrate any loose cuttings, then driven an additional foot with blows of a 140-pound hammer falling 30 inches. The number of hammer blows is designated the "Standard Penetration Resistance." When properly evaluated, the Standard Penetration Resistances provide an index to soil strength, relative density and ability to support foundations.

Select portions of each soil sample were placed in sealed containers and taken to our office. The samples were examined by a representative of the geotechnical engineer for classification. Test Boring Records are attached showing the soil descriptions and Standard Penetration Resistances.

LEGEND TO SOIL CLASSIFICATION AND SYMBOLS

SOIL TYPES

(Shown in Graphic Log)

- ▦ Asphalt / Concrete
- ■ Topsoil
- ⁘ Gravel
- ⁘ Sand
- ▥ Silt
- ▨ Clay
- ▨ Silty Gravel
- ▨ Clayey Gravel

- ▤ Organic
- ⁘ Sandy
- ▥ Silty
- ▨ Clayey
- ▥ Silty Sand
- ▨ Clayey Sand

- ▥ Sandy Silt
- ▨ Clayey Silt
- ▨ Sandy Clay
- ▨ Silty Clay
- ▦ Partially Weathered Rock
- ▩ Cored Rock

SAMPLER TYPES

(Shown in Samples Column)

- ▮ Shelby Tube
- ☒ Split Spoon
- ▯ Rock Core
- ▯ No Recovery

WATER LEVELS

(Shown in Water Level Column)

∇ = Water Level at Termination of Boring

▼ = Water Level at 1 Day

◀ = Loss of Drilling Water

HC = Hole Cave

CONSISTENCY OF COHESIVE SOILS

CONSISTENCY	STD. PENETRATION RESISTANCE BLOWS / FOOT
Very Soft	0 to 2
Soft	3 to 4
Firm	5 to 8
Stiff	9 to 15
Very Stiff	16 to 30
Hard	31 to 50
Very Hard	Over 50

CONSISTENCY OF COHESIONLESS SOILS

CONSISTENCY	STD. PENETRATION RESISTANCE BLOWS / FOOT
Very Loose	0 to 4
Loose	5 to 10
Medium Dense	11 to 30
Dense	31 to 50
Very Dense	Over 50

TERMS

Standard - Penetration Resistance	The Number of Blows of a 140 lb. Hammer Falling 30 in. Required to Drive a 1.4 in I.D. Split Spoon Sampler 1 Foot (N-Value) As Specified in ASTM D-1586.
REC -	Total Length of Rock Recovered in the Core Barrel Divided by the Total Length of the Core Run Times 100 (expressed as a percentage).
RQD -	Total Length of Sound Rock Segments Recovered that are Longer Than or Equal to 4" (mechanical breaks included) Divided by the Total Length of the Core Run Times 100 (expressed as a percentage).
Dynamic Cone - Penetrometer Test Data	The Number of Blows of a 15 lb. Hammer Falling 20 in. Required to Drive a Cone Point 1 3/4 in. When Properly Evaluated, it can be compared to the Standard Penetration Resistance.

ESP

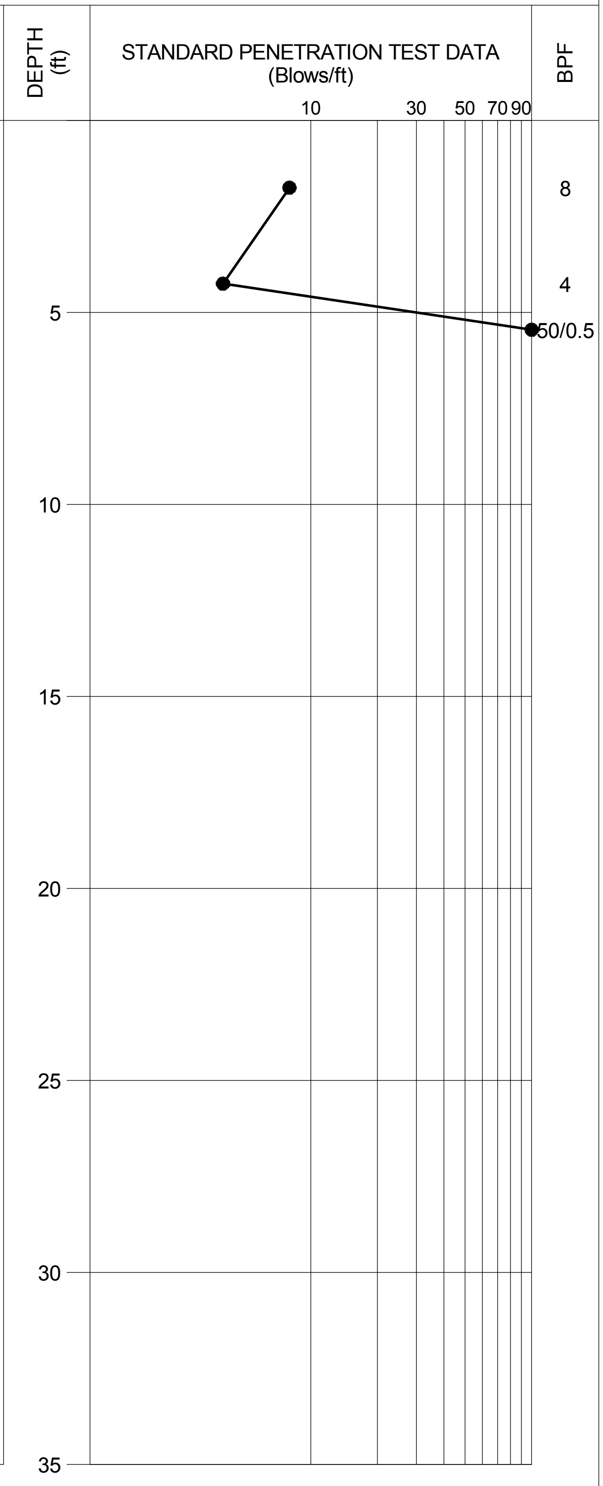
ESP Associates, P.A.

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-01

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 5.2 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/21/16	**WATER LEVEL:** Dry@ TOB		

DEPTH (ft)	SOIL DESCRIPTION	WATER LEVEL	SAMPLE
0	**TOPSOIL/GRASSMAT**		
	RESIDUUM: Firm to Soft Grayish Brown Fine Sandy Clayey **SILT**	HC	☒ ☒
5	**PARTIALLY WEATHERED ROCK**: When Sampled Becomes Olive Brown Fine Sandy **SILT**		☒
	Auger refusal encountered at 5.2 feet. Boring was terminated at 5.2 feet. Hole cave-in was observed at 3.6 feet.		



DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

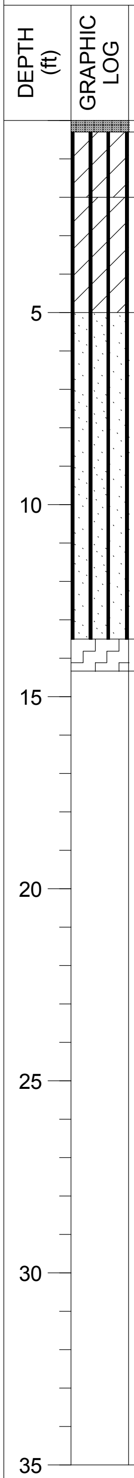
DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

ESP Associates, P.A.

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-02

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 14.3 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/21/16	**WATER LEVEL:** Dry@ TOB		



SOIL DESCRIPTION

TOPSOIL/GRASSMAT

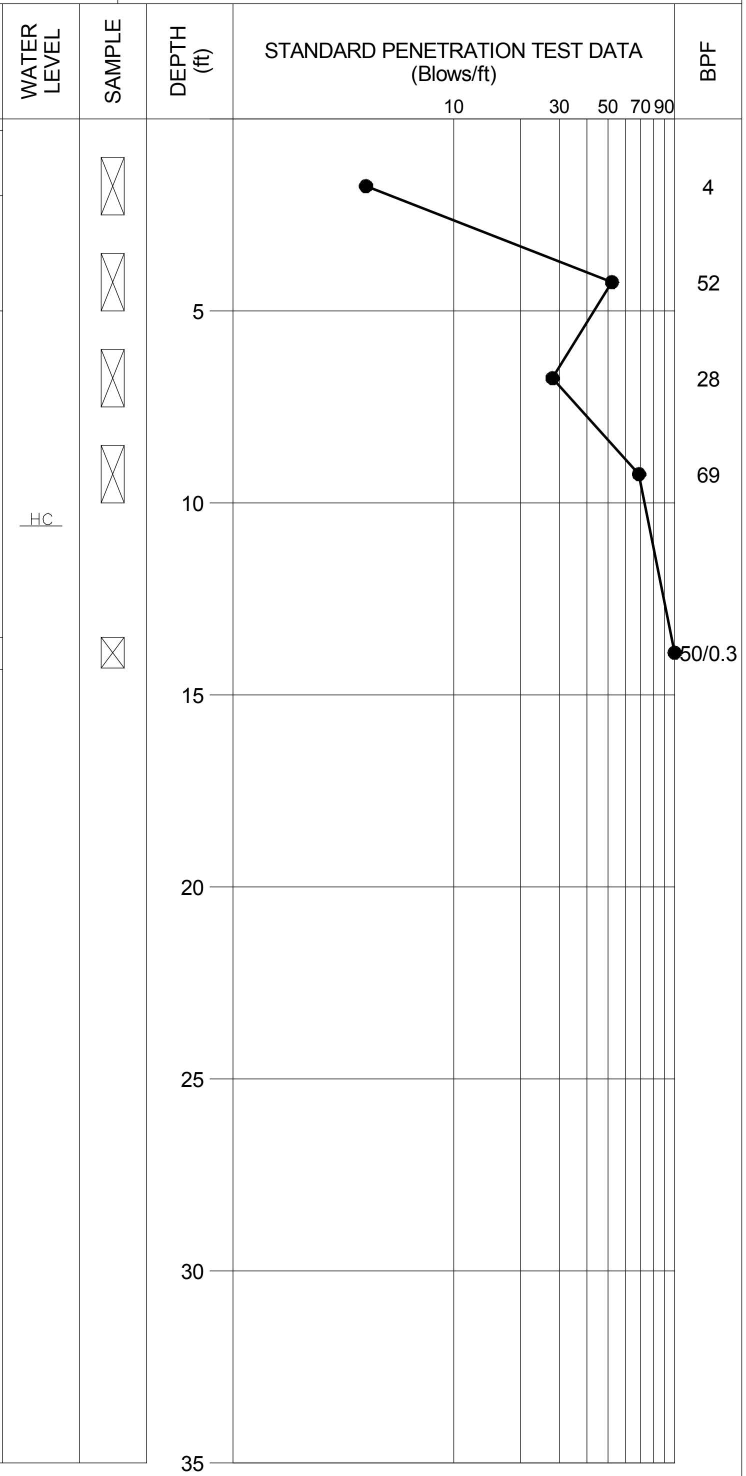
RESIDUUM: Soft Grayish Brown Fine Sandy Clayey **SILT**

RESIDUUM: Soft to Very Hard Oliveish Gray Fine Sandy Clayey **SILT**

RESIDUUM: Very Stiff to Very Hard Reddish Tan to Oliveish Tan Fine Sandy **SILT**, with rock fragments

PARTIALLY WEATHERED ROCK: When Sampled Becomes Olive Fine Sandy **SILT**

Boring was terminated at 14.3 feet. Hole cave-in was observed at 10.6 feet.



DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

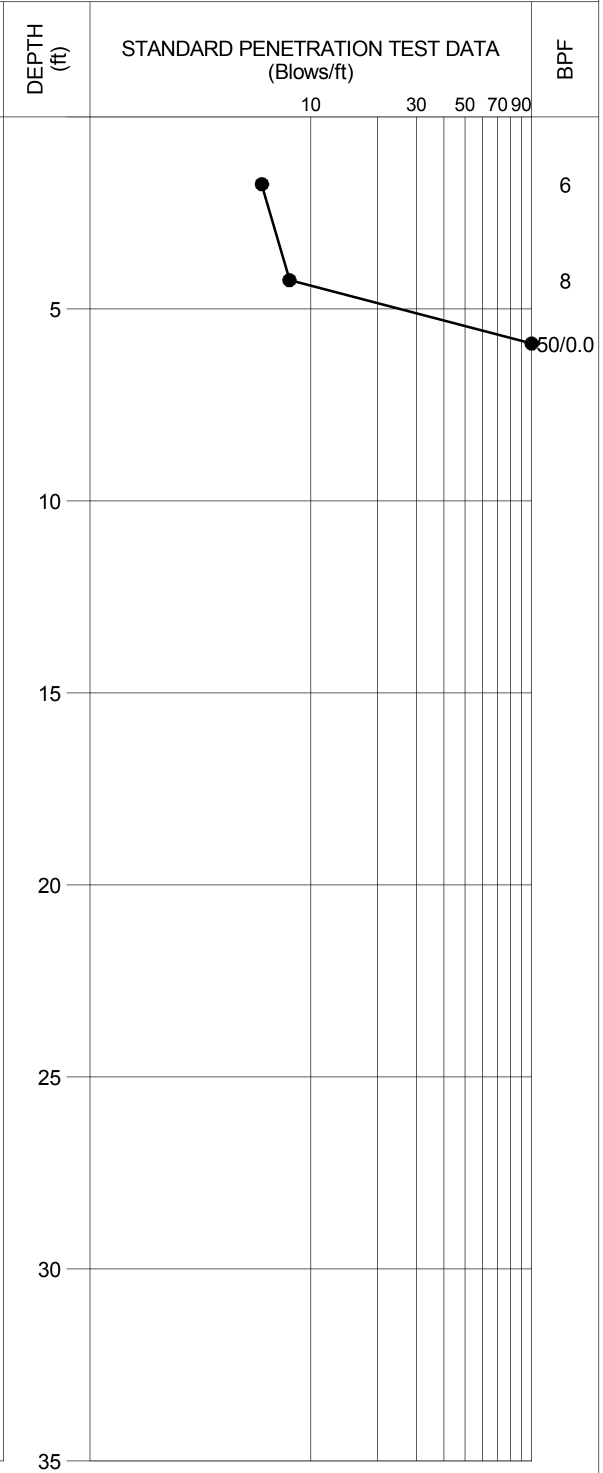
ESP_TBR EP08.300.GPJ LOG-LAB.GDT 7/22/16

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-03

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 5.9 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/21/16	**WATER LEVEL:** Dry@ TOB		

DEPTH (ft)	SOIL DESCRIPTION	WATER LEVEL	SAMPLE	BPF
0	**TOPSOIL/GRASSMAT**			
	RESIDUUM: Firm Brownish Tan to Brownish Gray Fine Sandy Silty **CLAY**		☒	6
			☒	8
5	**PARTIALLY WEATHERED ROCK**: When Sampled Becomes Grayish Tan Fine To Medium Sandy **SILT**	HC	—	50/0.0
	Auger refusal encountered at 5.9 feet. Boring was terminated at 5.9 feet. Hole cave-in was observed at 5 feet.			



DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

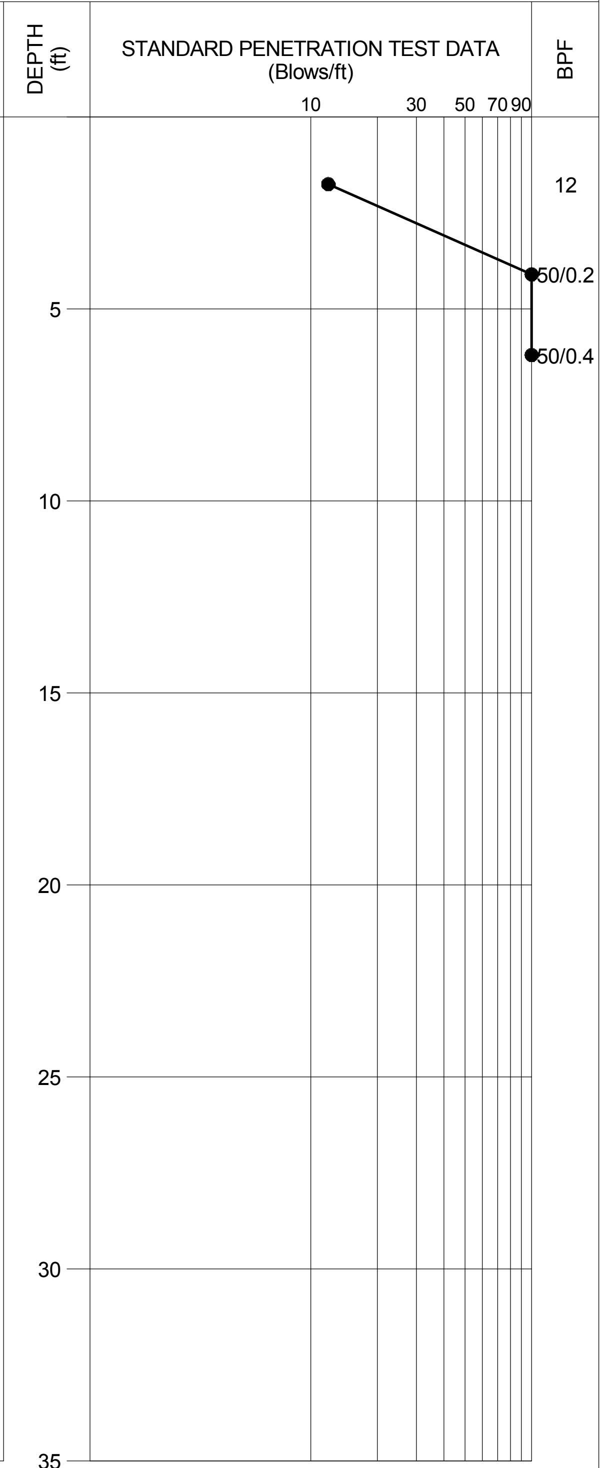
DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

PROJECT:	Union County Pipeline West Alignment Monroe, North Carolina

TEST BORING RECORD B-04

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 9.9 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/21/16	**WATER LEVEL:** Dry@ TOB		

DEPTH (ft)	GRAPHIC LOG	SOIL DESCRIPTION	WATER LEVEL	SAMPLE
0	▨	**TOPSOIL/ROOTMAT**		
	▨	**RESIDUUM**: Stiff Tannish Brown Clayey Fine Sandy **SILT**		☒
3	▨	**PARTIALLY WEATHERED ROCK**: When Sampled Becomes and Gray Silty Fine **SAND**, with rock fragments	HC	☒ ☒
9.9		Auger refusal encountered at 9.9 feet. Boring was terminated at 9.9 feet. Hole cave-in was observed at 8.1 feet.		



DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

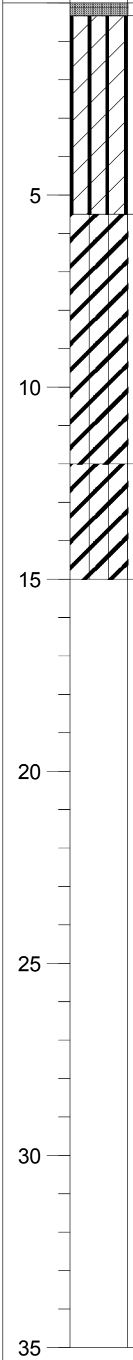
ESP Associates, P.A.

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-05

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 15 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/21/16	**WATER LEVEL:** Dry@ TOB		

DEPTH (ft) | GRAPHIC LOG | SOIL DESCRIPTION | WATER LEVEL | SAMPLE



TOPSOIL/GRASSMAT

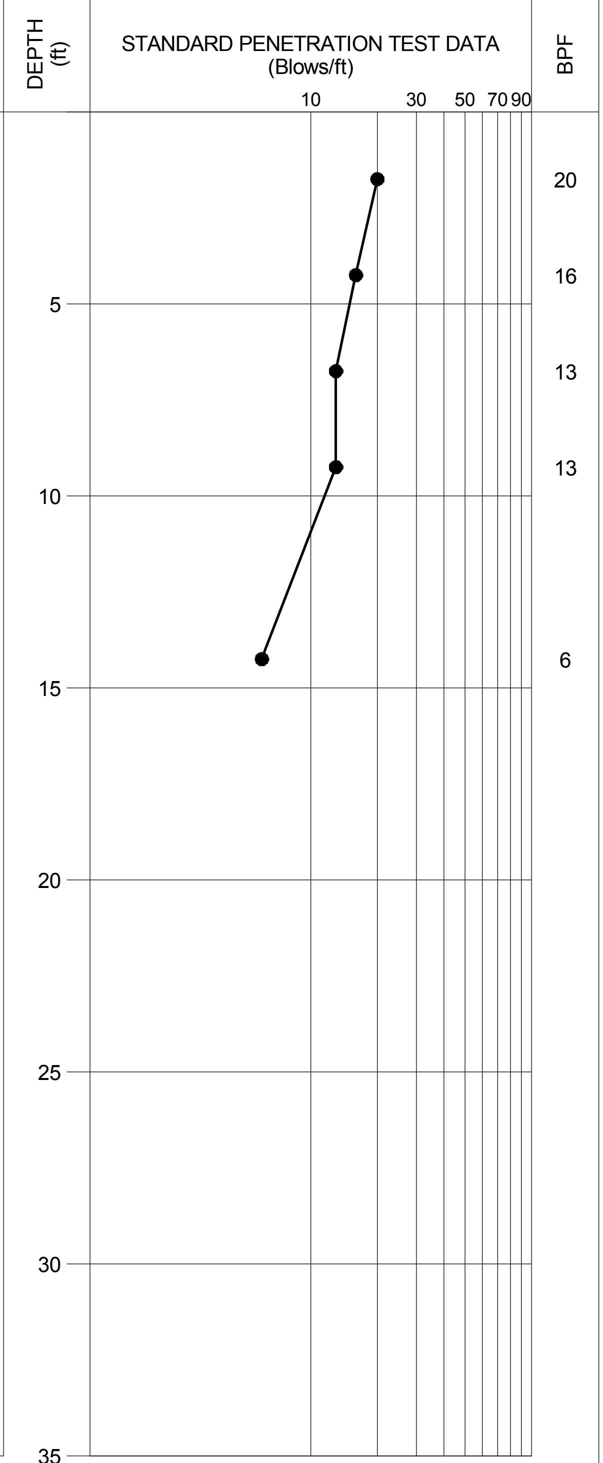
RESIDUUM: Very Stiff Tannish Orange Fine Sandy Clayey **SILT**

RESIDUUM: Stiff Brown Grayish Orange Fine Sandy Silty **CLAY**

RESIDUUM: Firm Black Grayish Tan Silty **CLAY**

HC

Boring was terminated at 15 feet. Hole cave-in was observed at 12.2 feet.



DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

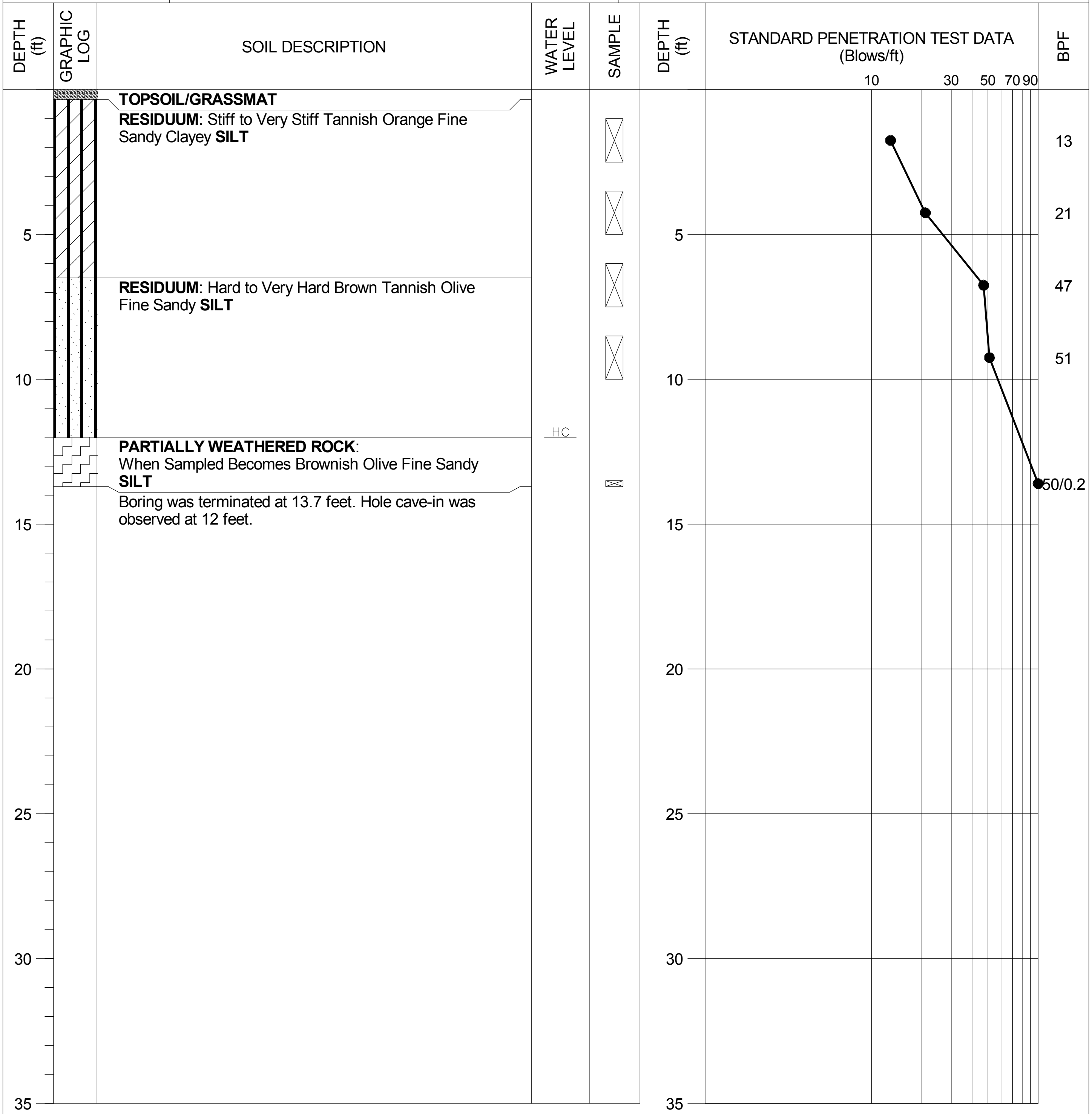
DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

ESP_TBR EP08.300.GPJ LOG-LAB.GDT 7/22/16

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-06

PROJECT No.: EP08.300
ELEVATION: Existing Ground Surface
DRILLING METHOD: Hollow Stem Auger
DRILLING COMPANY: Ameridrill
LOGGED BY: Jeff Black
BORING DEPTH: 13.7 Feet
DRILL RIG: CME550X (ATV)
NOTES:
DATE DRILLED: 06/21/16
WATER LEVEL: Dry@ TOB



TOPSOIL/GRASSMAT

RESIDUUM: Stiff to Very Stiff Tannish Orange Fine Sandy Clayey **SILT**

RESIDUUM: Hard to Very Hard Brown Tannish Olive Fine Sandy **SILT**

PARTIALLY WEATHERED ROCK: When Sampled Becomes Brownish Olive Fine Sandy **SILT**

Boring was terminated at 13.7 feet. Hole cave-in was observed at 12 feet.

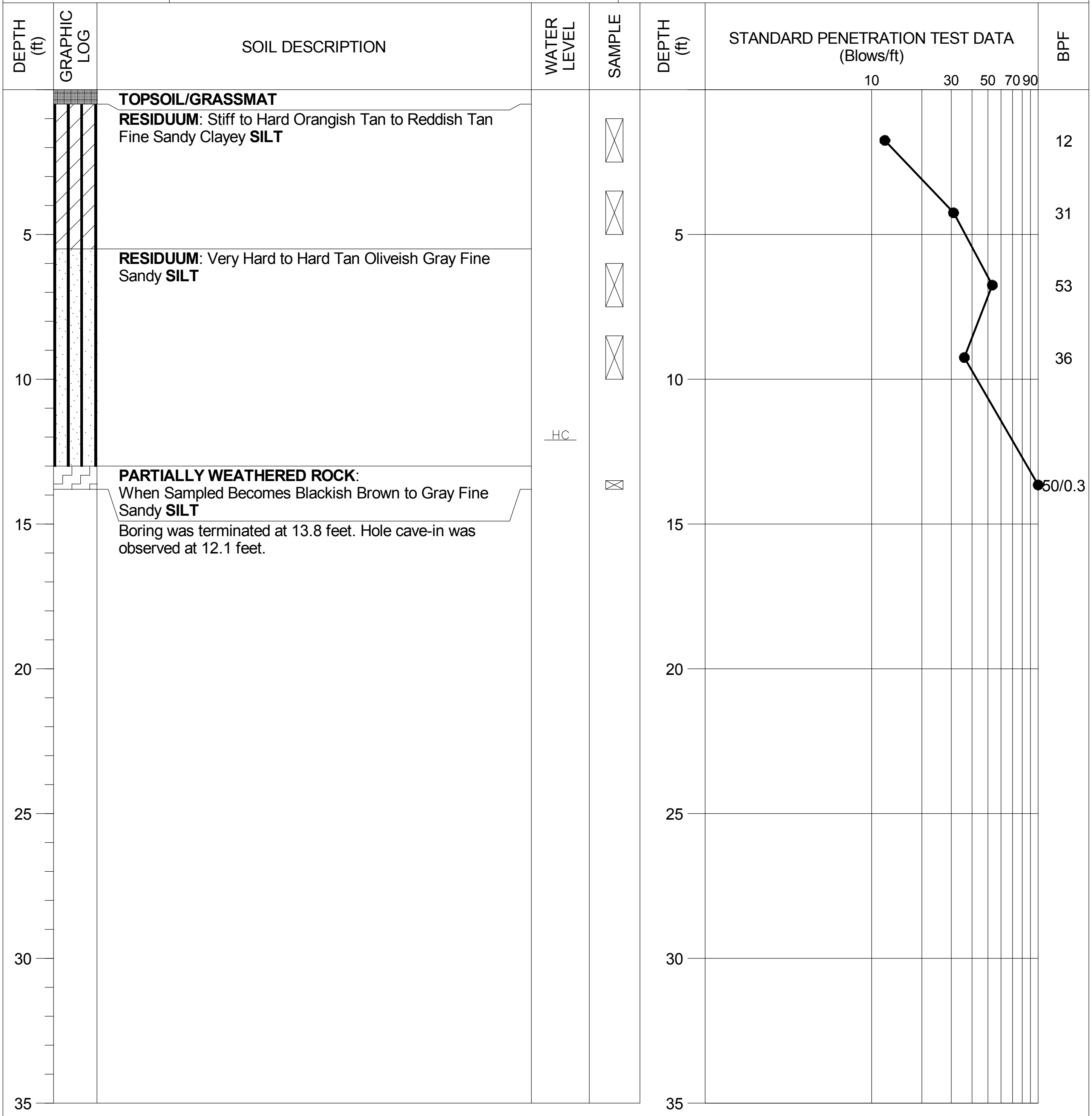
DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-07

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 13.8 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/21/16	**WATER LEVEL:** Dry@ TOB		



TOPSOIL/GRASSMAT

RESIDUUM: Stiff to Hard Orangish Tan to Reddish Tan Fine Sandy Clayey **SILT**

RESIDUUM: Very Hard to Hard Tan Oliveish Gray Fine Sandy **SILT**

PARTIALLY WEATHERED ROCK: When Sampled Becomes Blackish Brown to Gray Fine Sandy **SILT**

Boring was terminated at 13.8 feet. Hole cave-in was observed at 12.1 feet.

BPF
12
31
53
36
50/0.3

DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

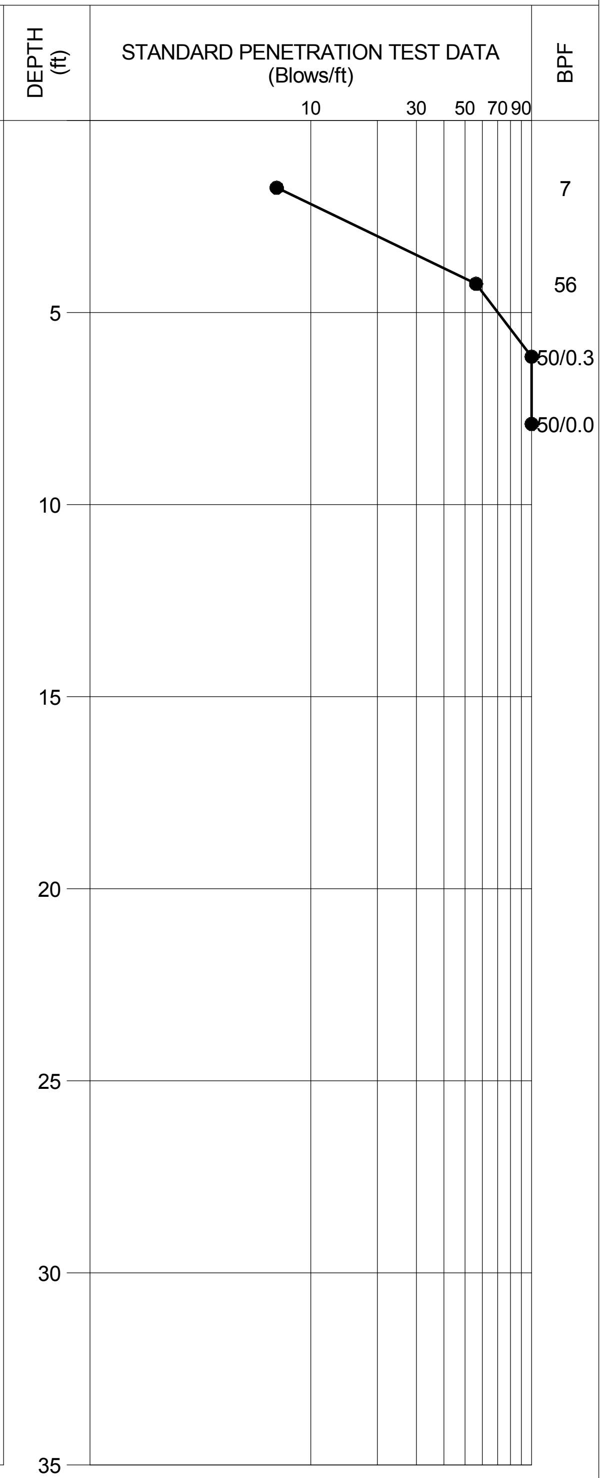
ESP Associates, P.A.

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-08

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 7.9 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/21/16	**WATER LEVEL:** Dry@ TOB		

DEPTH (ft)	GRAPHIC LOG	SOIL DESCRIPTION	WATER LEVEL	SAMPLE	BPF
		TOPSOIL/GRASSMAT			
		RESIDUUM: Firm to Very Hard Grayish Orange Fine Sandy Clayey **SILT**		☒	7
		RESIDUUM: Very Hard Grayish Tan Fine Sandy Clayey **SILT**, with rock fragments		☒	56
5		**PARTIALLY WEATHERED ROCK**: When Sampled Becomes Gray Silty Fine **SAND**	HC	☒	50/0.3
					50/0.0
		Auger refusal encountered at 7.9 feet. Boring was terminated at 7.9 feet. Hole cave-in was observed at 5.6 feet.			



ESP Associates, P.A.

DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

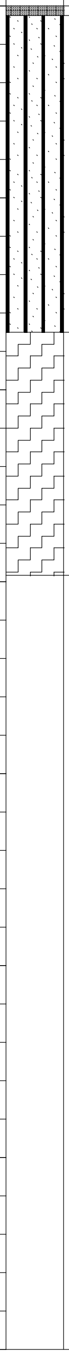
DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

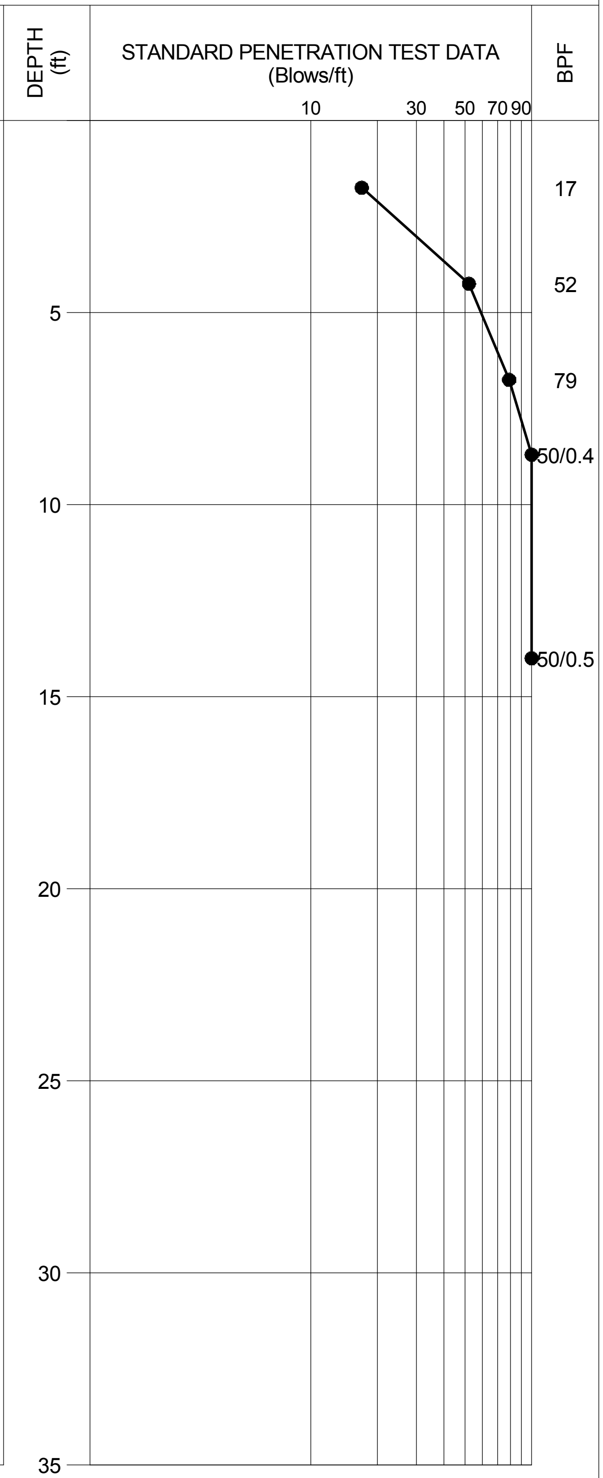
PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-09

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 14.8 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/22/16	**WATER LEVEL:** Dry@ TOB		

DEPTH (ft)	SOIL DESCRIPTION	WATER LEVEL	SAMPLE	BPF
0	**TOPSOIL/GRASSMAT**			
	RESIDUUM: Very Stiff to Very Hard Grayish Tan Fine Sandy **SILT**		☒	17
			☒	52
5			☒	79
	PARTIALLY WEATHERED ROCK: When Sampled Becomes Grayish Tan Fine Sandy **SILT**		☒	50/0.4
10		HC		
			☒	50/0.5
15	Boring was terminated at 14.8 feet. Hole cave-in was observed at 12.4 feet.			





DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

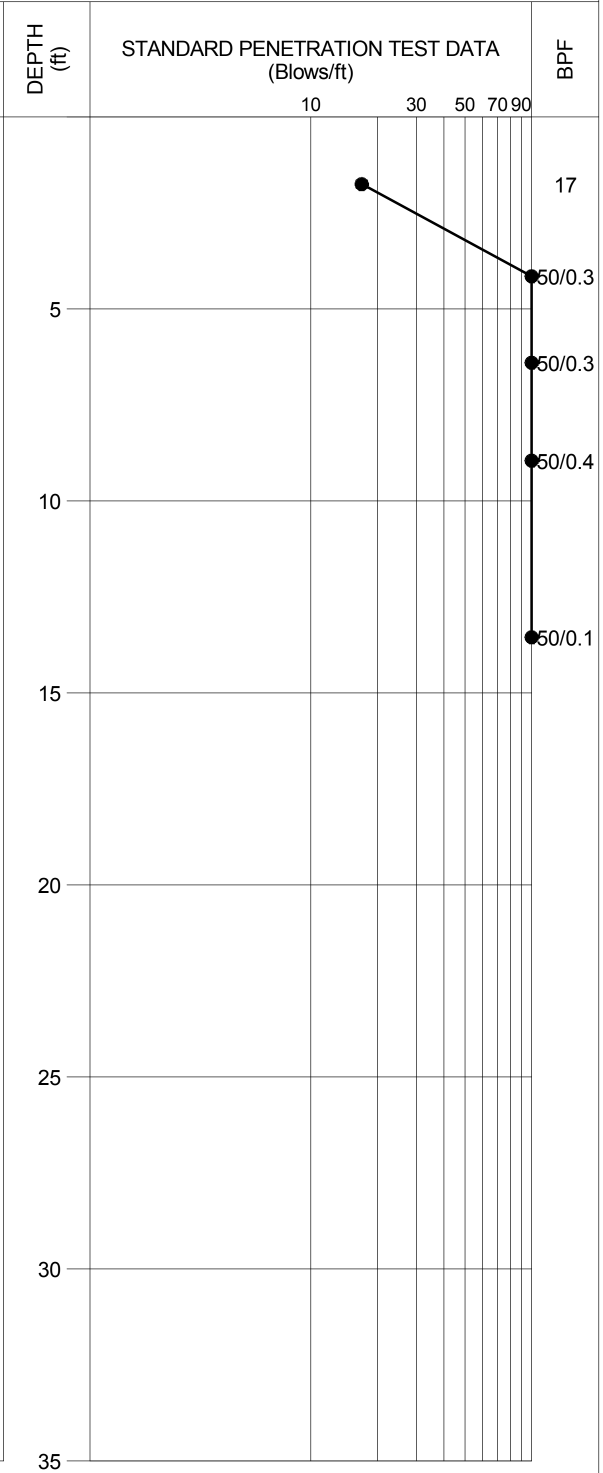
ESP
ESP Associates, P.A.

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-10

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 13.6 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/22/16	**WATER LEVEL:** Dry@ TOB		

DEPTH (ft)	SOIL DESCRIPTION	WATER LEVEL	SAMPLE	BPF
0	**TOPSOIL/GRASSMAT**			
	RESIDUUM: Very Stiff Grayish Tan Fine Sandy **SILT**		☒	17
3	**PARTIALLY WEATHERED ROCK**: When Sampled Becomes Grayish Tan Fine Sandy **SILT**		☒	50/0.3
			☒	50/0.3
			☒	50/0.4
11.4		HC		
13.6	Boring was terminated at 13.6 feet. Hole cave-in was observed at 11.4 feet.			50/0.1



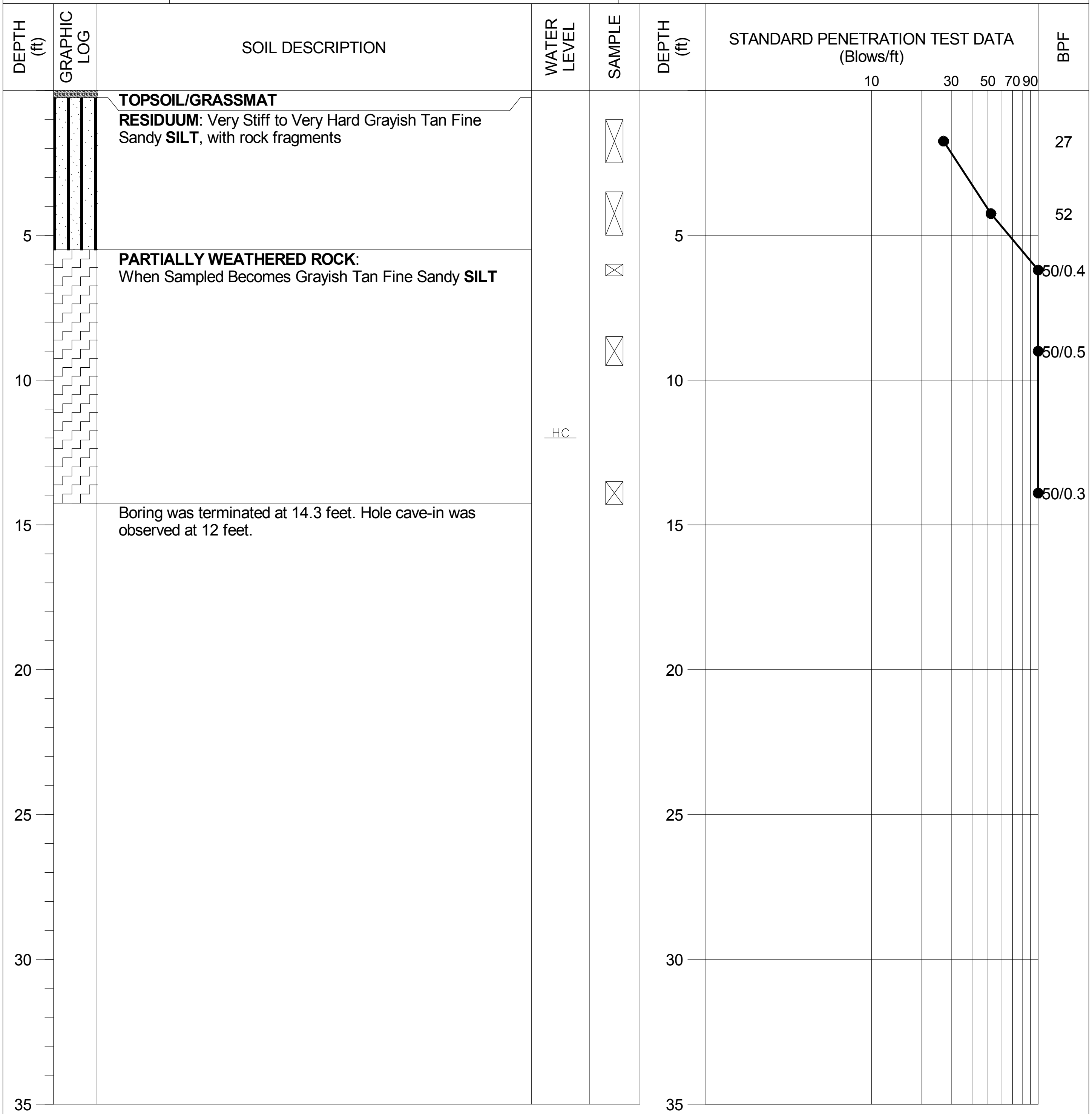
DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-11

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 14.3 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/22/16	**WATER LEVEL:** Dry@ TOB		



TOPSOIL/GRASSMAT

RESIDUUM: Very Stiff to Very Hard Grayish Tan Fine Sandy **SILT**, with rock fragments

PARTIALLY WEATHERED ROCK: When Sampled Becomes Grayish Tan Fine Sandy **SILT**

Boring was terminated at 14.3 feet. Hole cave-in was observed at 12 feet.

DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

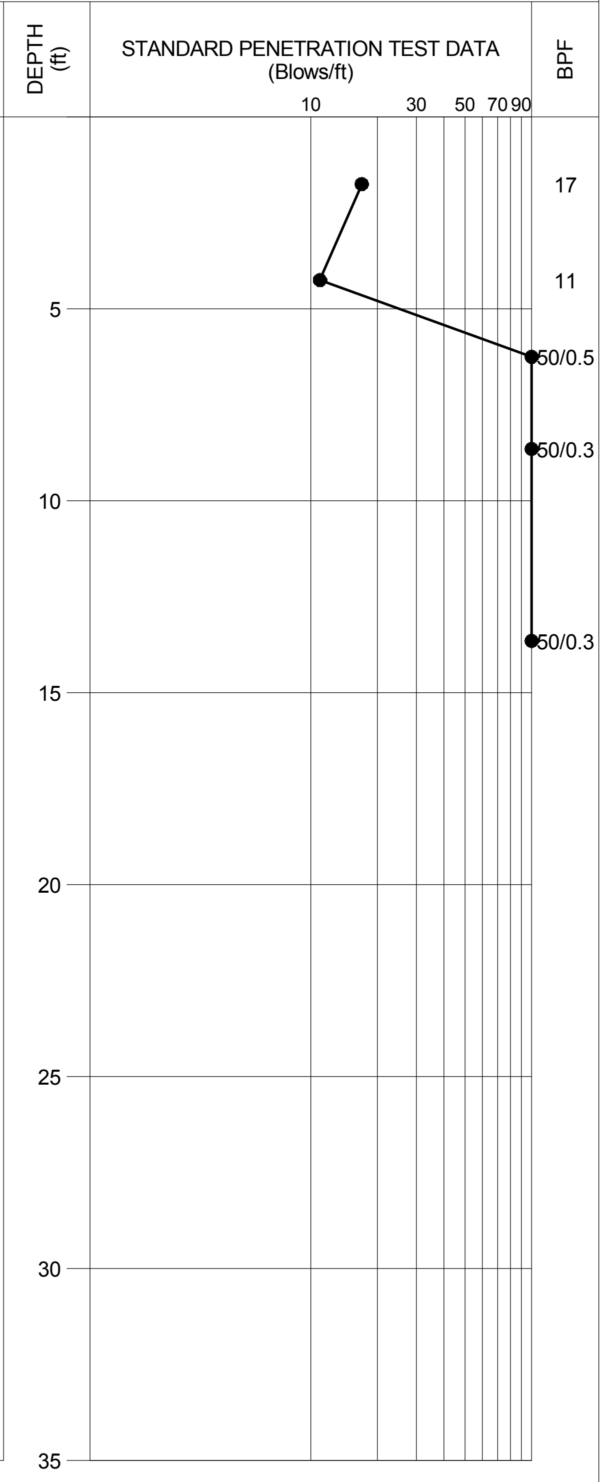
DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-12

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 13.8 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/22/16	**WATER LEVEL:** Dry@ TOB		

DEPTH (ft)	SOIL DESCRIPTION	WATER LEVEL	BPF
0	**TOPSOIL/GRASSMAT**		
	RESIDUUM: Very Stiff Grayish Tan Fine Sandy **SILT**		17
3	**RESIDUUM**: Stiff White Grayish Tan Fine Sandy Clayey **SILT**		11
6	**PARTIALLY WEATHERED ROCK**: When Sampled Becomes Grayish Tan Fine Sandy **SILT**		50/0.5
		HC	50/0.3
			50/0.3
13.8	Boring was terminated at 13.8 feet. Hole cave-in was observed at 9.1 feet.		



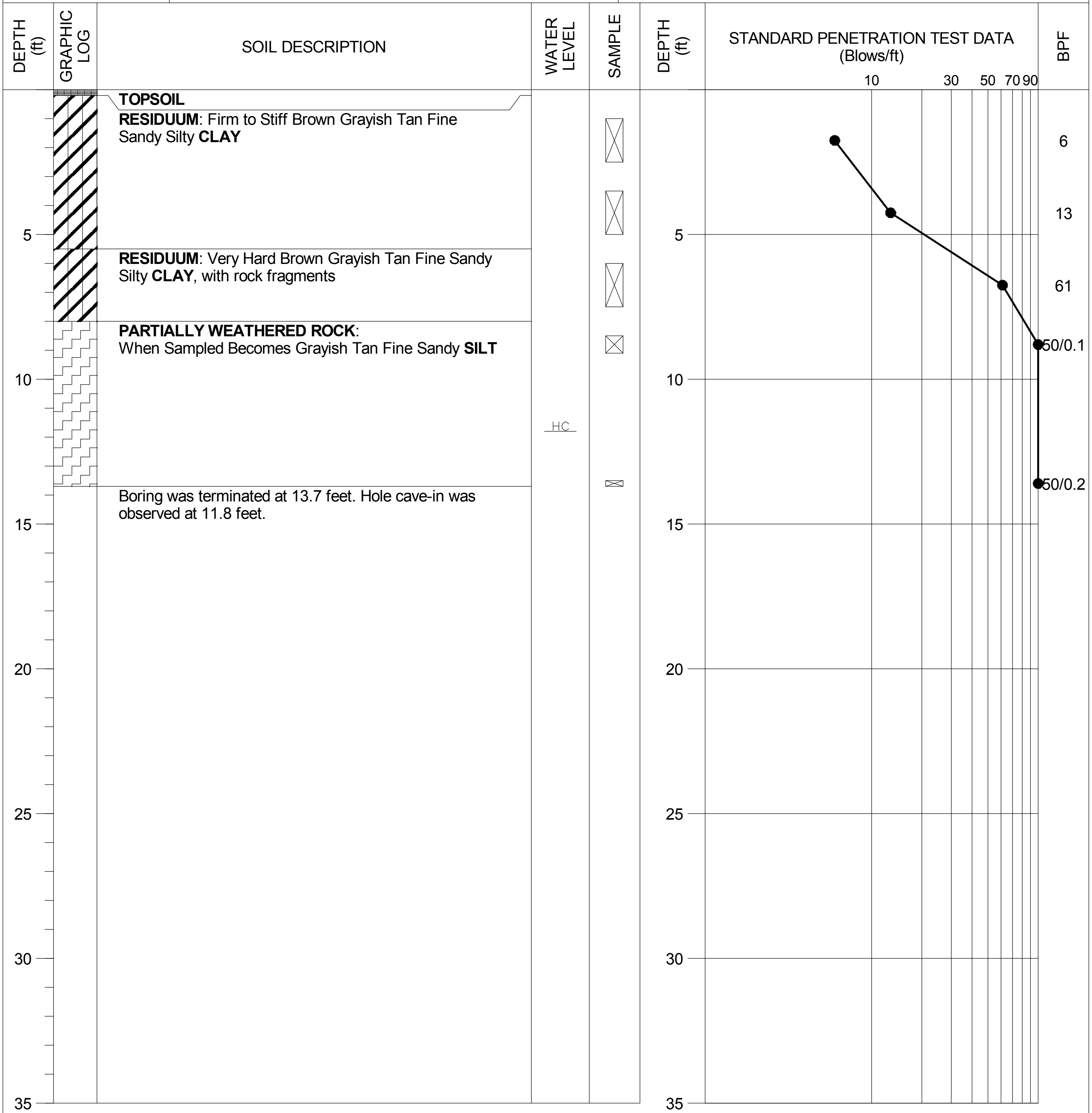
DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-13

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 13.7 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/22/16	**WATER LEVEL:** Dry@ TOB		



TOPSOIL

RESIDUUM: Firm to Stiff Brown Grayish Tan Fine Sandy Silty **CLAY**

RESIDUUM: Very Hard Brown Grayish Tan Fine Sandy Silty **CLAY**, with rock fragments

PARTIALLY WEATHERED ROCK: When Sampled Becomes Grayish Tan Fine Sandy **SILT**

Boring was terminated at 13.7 feet. Hole cave-in was observed at 11.8 feet.

DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

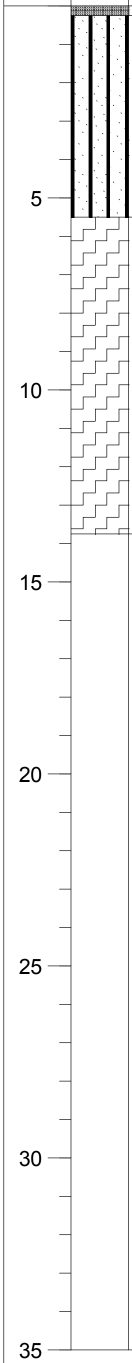
ESP Associates, P.A.

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-14

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 13.8 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/22/16	**WATER LEVEL:** Dry@ TOB		

DEPTH (ft)	GRAPHIC LOG	SOIL DESCRIPTION	WATER LEVEL	SAMPLE	DEPTH (ft)	STANDARD PENETRATION TEST DATA (Blows/ft)	BPF



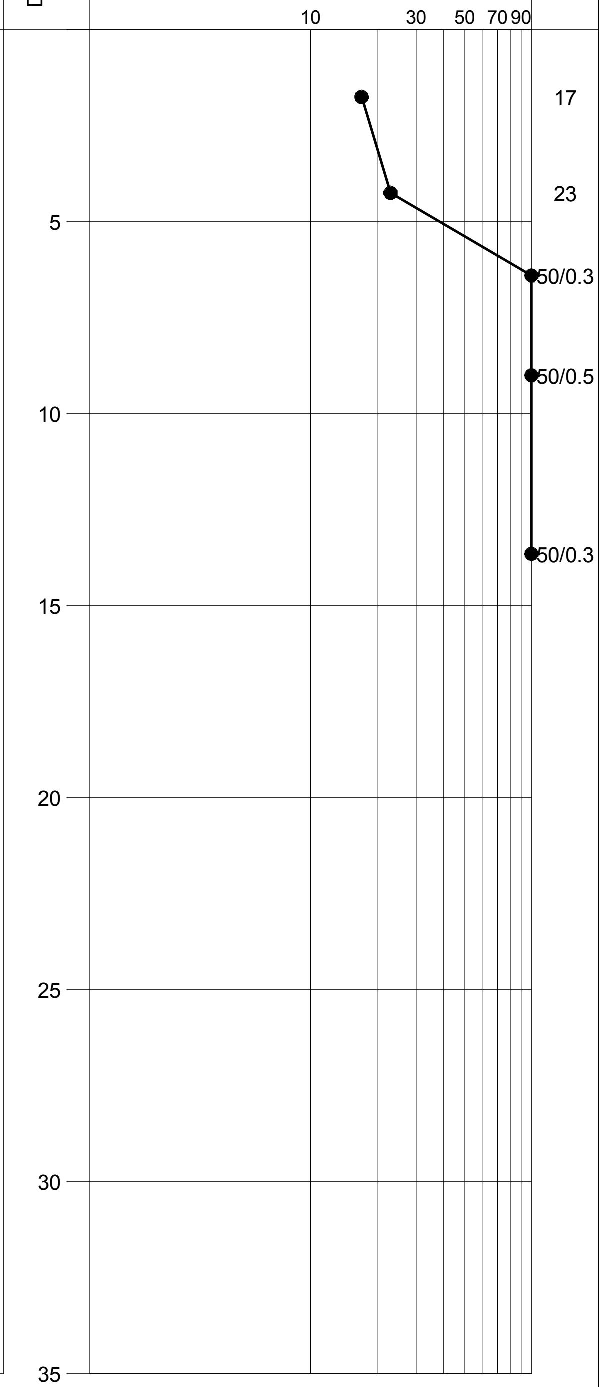
TOPSOIL/GRASSMAT

RESIDUUM: Very Stiff Grayish Brown Fine Sandy **SILT**

PARTIALLY WEATHERED ROCK:
When Sampled Becomes Grayish Tan Fine Sandy **SILT**

HC

Boring was terminated at 13.8 feet. Hole cave-in was observed at 12.1 feet.



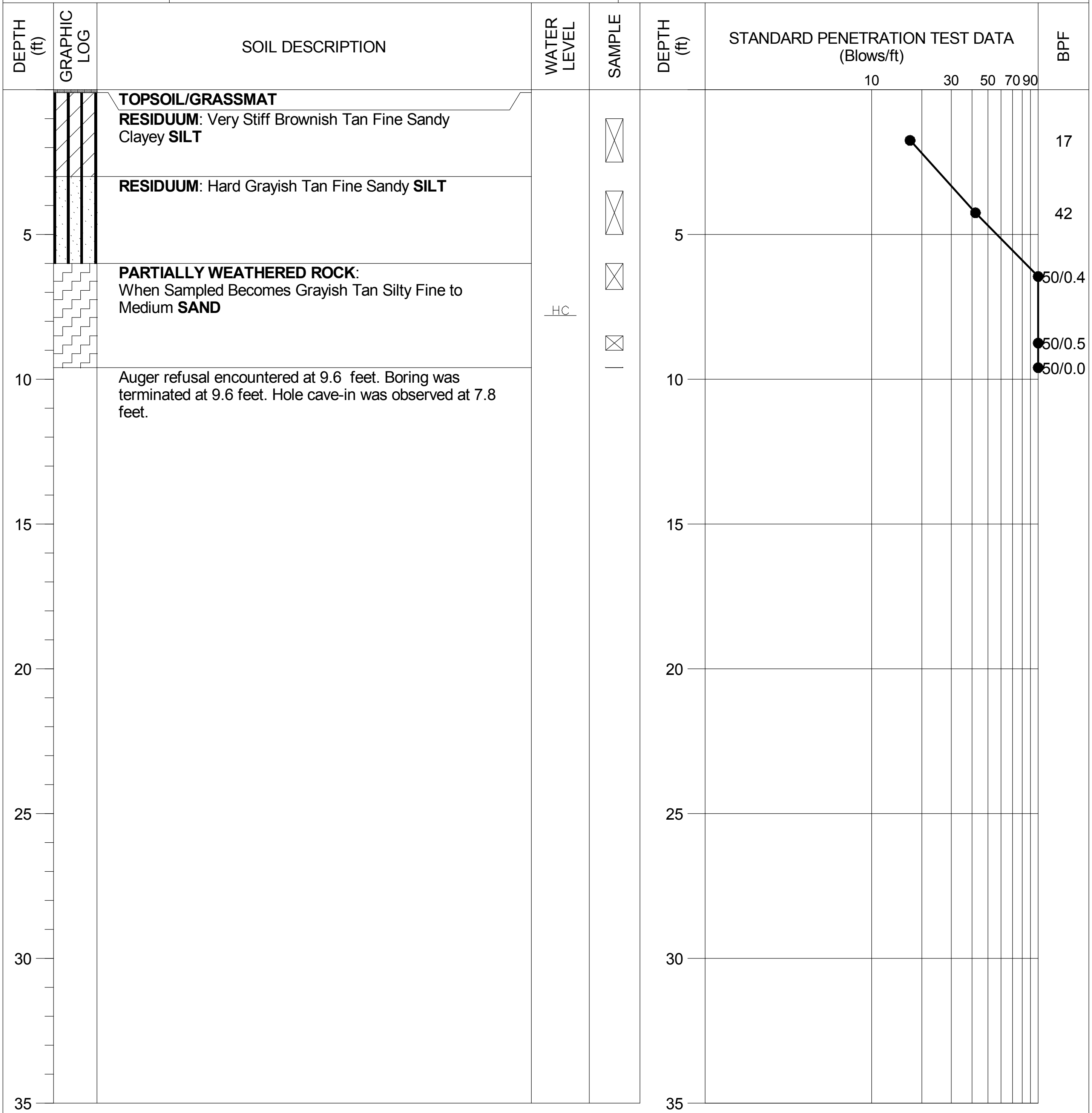
DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

TEST BORING RECORD B-15

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 9.6 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/22/16	**WATER LEVEL:** Dry@ TOB		



TOPSOIL/GRASSMAT

RESIDUUM: Very Stiff Brownish Tan Fine Sandy Clayey **SILT**

RESIDUUM: Hard Grayish Tan Fine Sandy **SILT**

PARTIALLY WEATHERED ROCK:
When Sampled Becomes Grayish Tan Silty Fine to Medium **SAND**

Auger refusal encountered at 9.6 feet. Boring was terminated at 9.6 feet. Hole cave-in was observed at 7.8 feet.

DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-16

PROJECT No.: EP08.300

ELEVATION: Existing Ground Surface

DRILLING METHOD: Hollow Stem Auger

DRILLING COMPANY: Ameridrill

LOGGED BY: Jeff Black

BORING DEPTH: 4.2 Feet

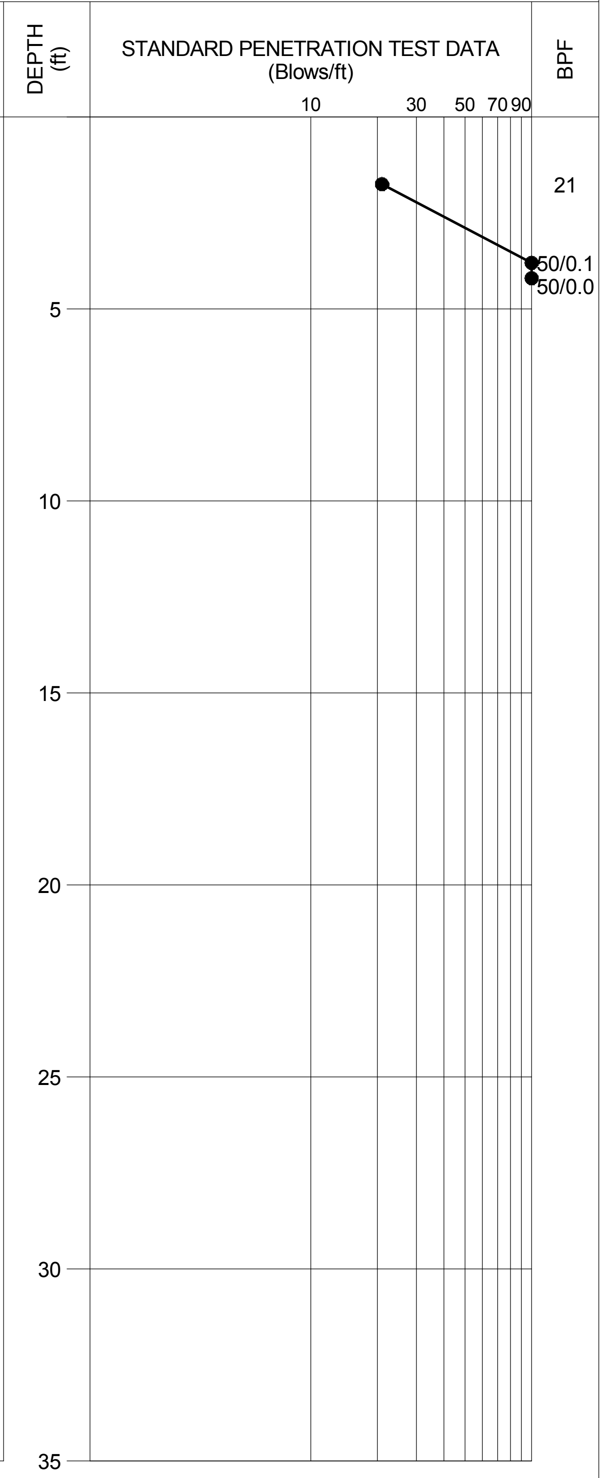
DRILL RIG: CME550X (ATV)

NOTES:

DATE DRILLED: 06/22/16

WATER LEVEL: Dry@ TOB

DEPTH (ft)	GRAPHIC LOG	SOIL DESCRIPTION	WATER LEVEL	SAMPLE
		TOPSOIL		
		RESIDUUM: Very Stiff Grayish Brown Fine Sandy **SILT**		☒
		RESIDUUM: Medium Dense Brownish Gray Silty Fine **SAND**, with rock fragments	HC	
		PARTIALLY WEATHERED ROCK: When Sampled Becomes Brownish Gray Silty Fine to Medium **SAND**		☒
5		Auger refusal encountered at 4.2 feet. Boring was terminated at 4.2 feet. Hole cave-in was observed at 2.4 feet.		
10				
15				
20				
25				
30				
35				



DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

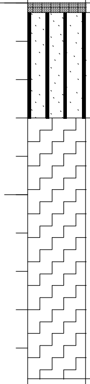
ESP Associates, P.A.

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-17

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 9.8 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:** Performed at Creek Crossing
DATE DRILLED: 06/22/16	**WATER LEVEL:** Dry@ TOB		

DEPTH (ft) | GRAPHIC LOG | SOIL DESCRIPTION | WATER LEVEL | SAMPLE | DEPTH (ft) | STANDARD PENETRATION TEST DATA (Blows/ft) | BPF



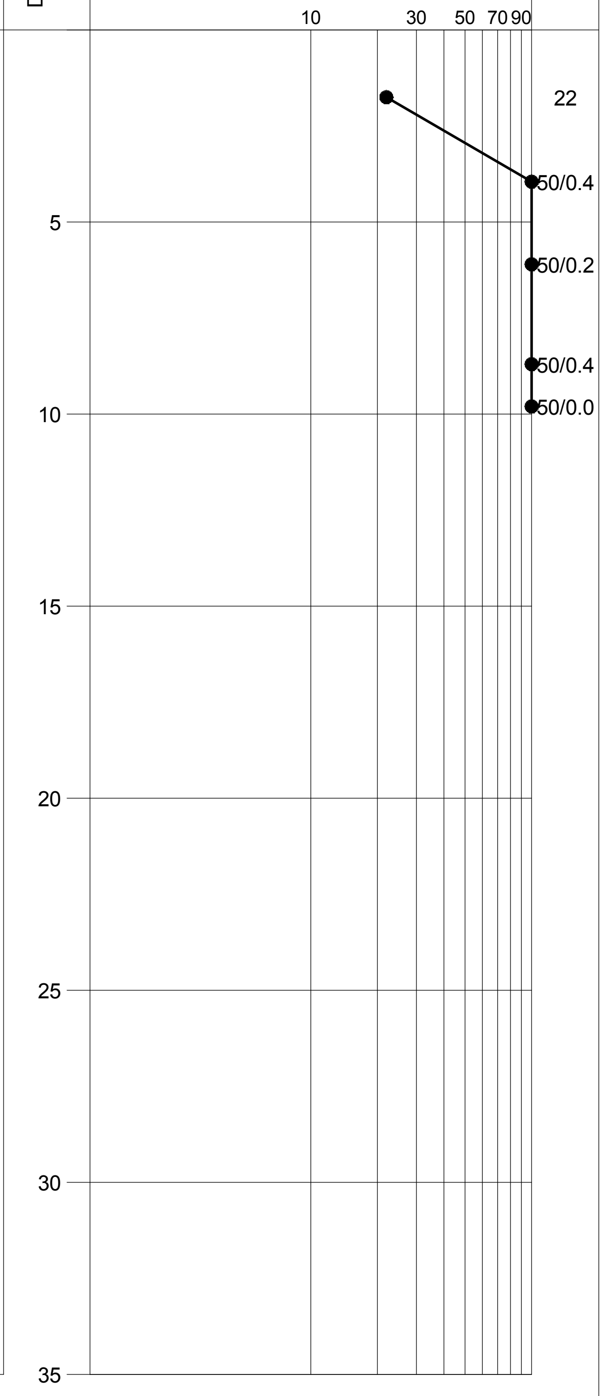
TOPSOIL/GRASSMAT

RESIDUUM: Very Stiff Orangish Tan Clayey Fine Sandy **SILT**

PARTIALLY WEATHERED ROCK: Very Dense When Sampled Becomes Brownish Gray Silty Fine to Medium **SAND**

Auger refusal encountered at 9.8 feet. Boring was terminated at 9.8 feet. Hole cave-in was observed at 8.7 feet.

HC



	22
	50/0.4
	50/0.2
	50/0.4
	50/0.0

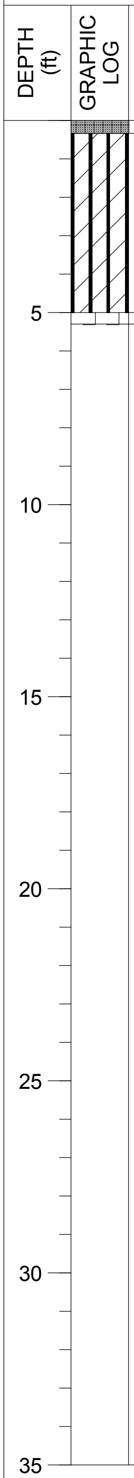
DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-18

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 5.3 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:** Performed at Creek Crossing
DATE DRILLED: 06/23/16	**WATER LEVEL:** Dry@ TOB		



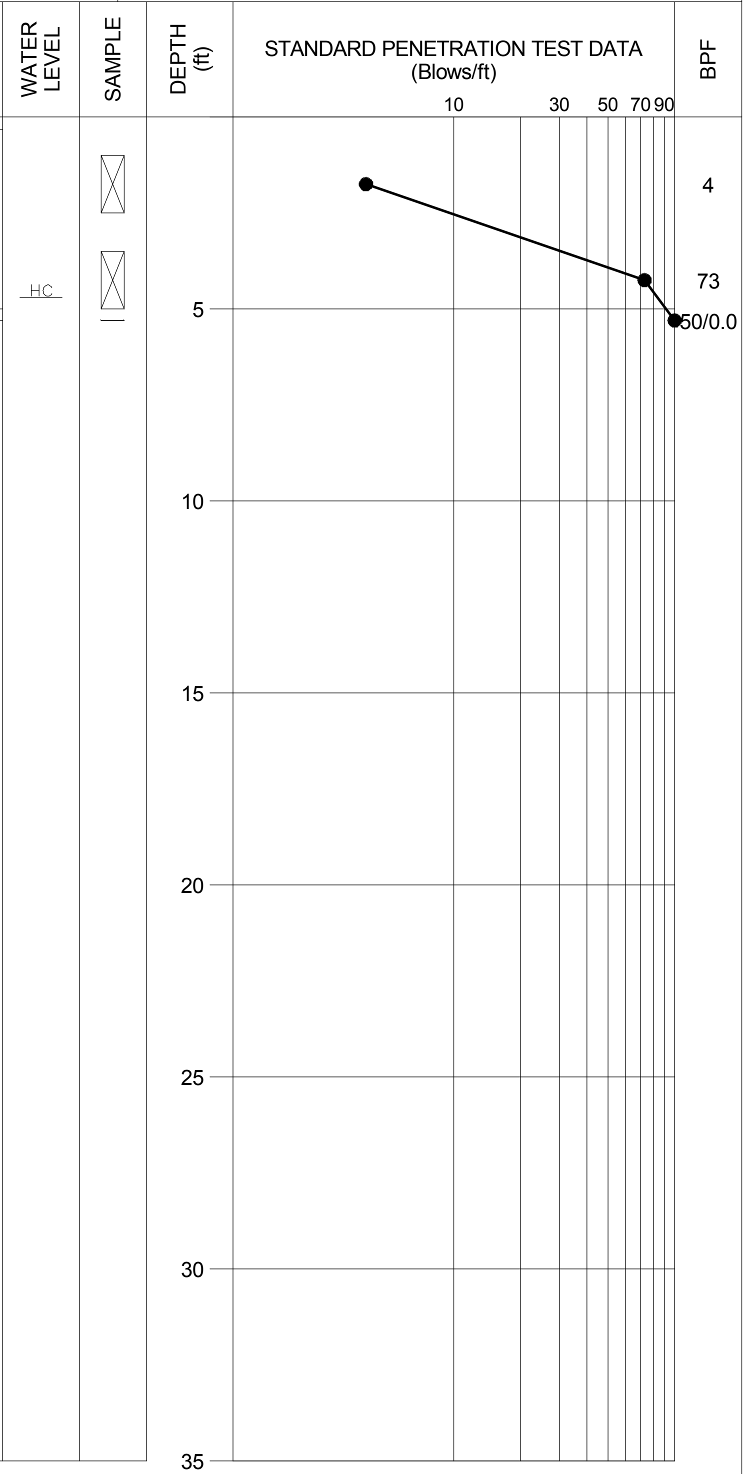
SOIL DESCRIPTION

TOPSOIL/GRASSMAT

RESIDUUM: Soft to Very Hard Grayish Tan Fine Sandy Clayey **SILT**

PARTIALLY WEATHERED ROCK: When Sampled Becomes Brownish Gray Silty Fine to Medium **SAND**

Auger refusal encountered at 5.3 feet. Boring was terminated at 5.3 feet. Hole cave-in was observed at 4.7 feet.



DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

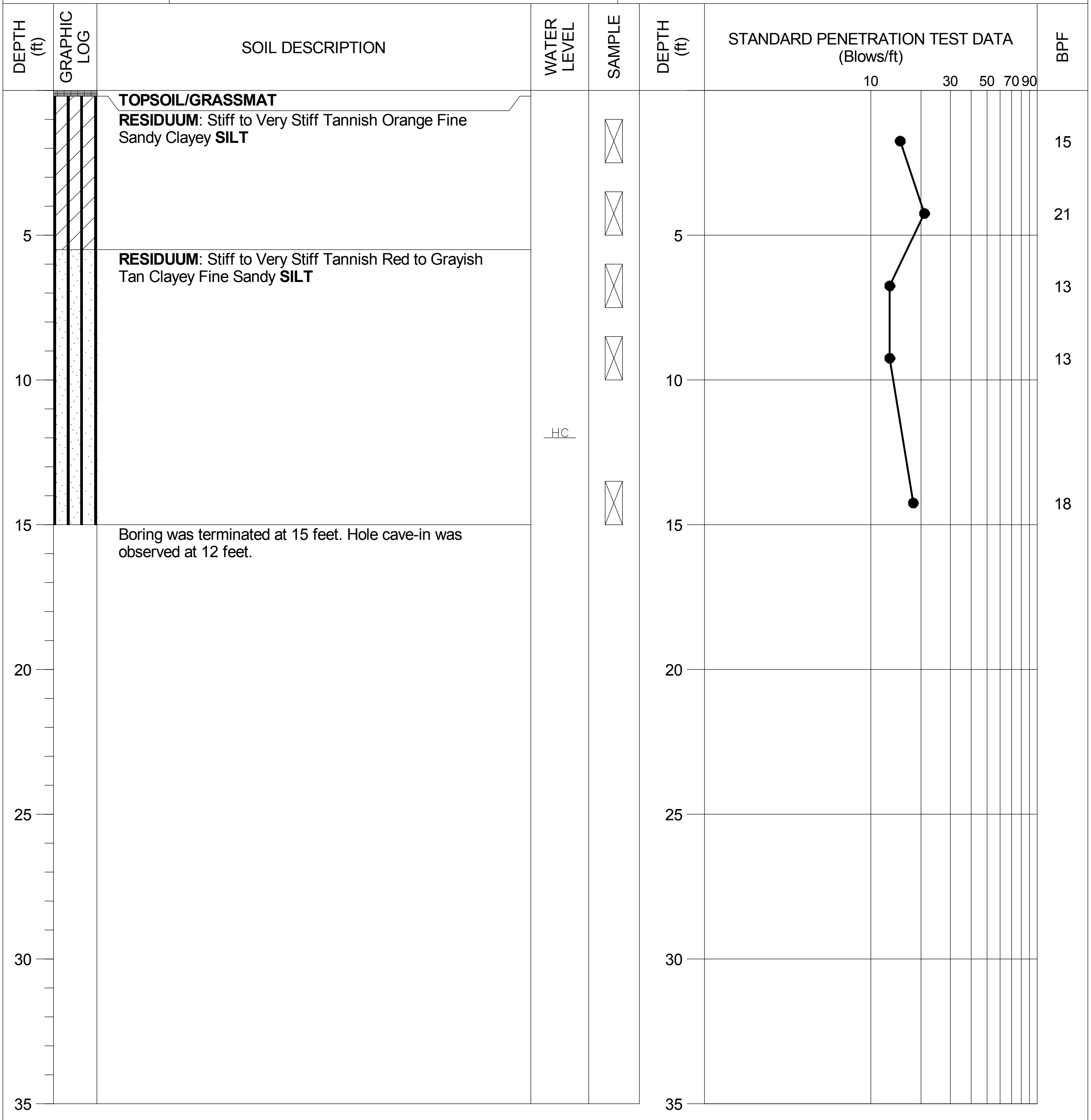
DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

ESP Associates, P.A.

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-19

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 15 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/23/16	**WATER LEVEL:** Dry@ TOB		



TOPSOIL/GRASSMAT

RESIDUUM: Stiff to Very Stiff Tannish Orange Fine Sandy Clayey **SILT**

RESIDUUM: Stiff to Very Stiff Tannish Red to Grayish Tan Clayey Fine Sandy **SILT**

Boring was terminated at 15 feet. Hole cave-in was observed at 12 feet.

ESP
ESP Associates, P.A.

DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

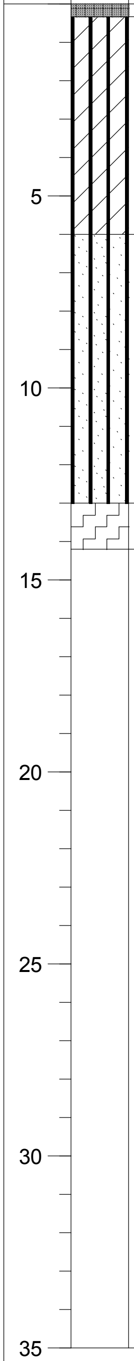
DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-20

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 14.2 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/23/16	**WATER LEVEL:** Dry@ TOB		

DEPTH (ft) | GRAPHIC LOG | SOIL DESCRIPTION | WATER LEVEL | SAMPLE | DEPTH (ft) | STANDARD PENETRATION TEST DATA (Blows/ft) | BPF



TOPSOIL/GRASSMAT

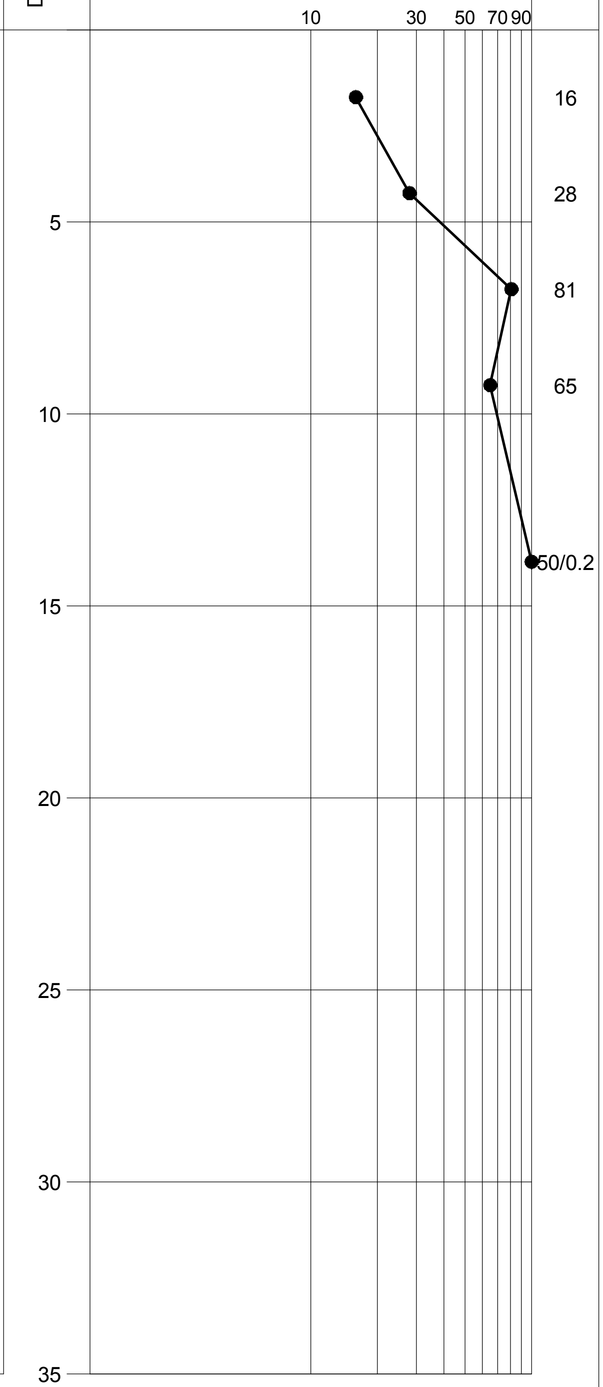
RESIDUUM: Very Stiff Brown Grayish Tan Fine Sandy Clayey **SILT**, with rock fragments

RESIDUUM: Very Hard Grayish Tan Fine Sandy **SILT**

HC

PARTIALLY WEATHERED ROCK: When Sampled Becomes Grayish Tan Fine Sandy **SILT**

Boring was terminated at 14.2 feet. Hole cave-in was observed at 12.4 feet.



ESP Associates, P.A.

DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

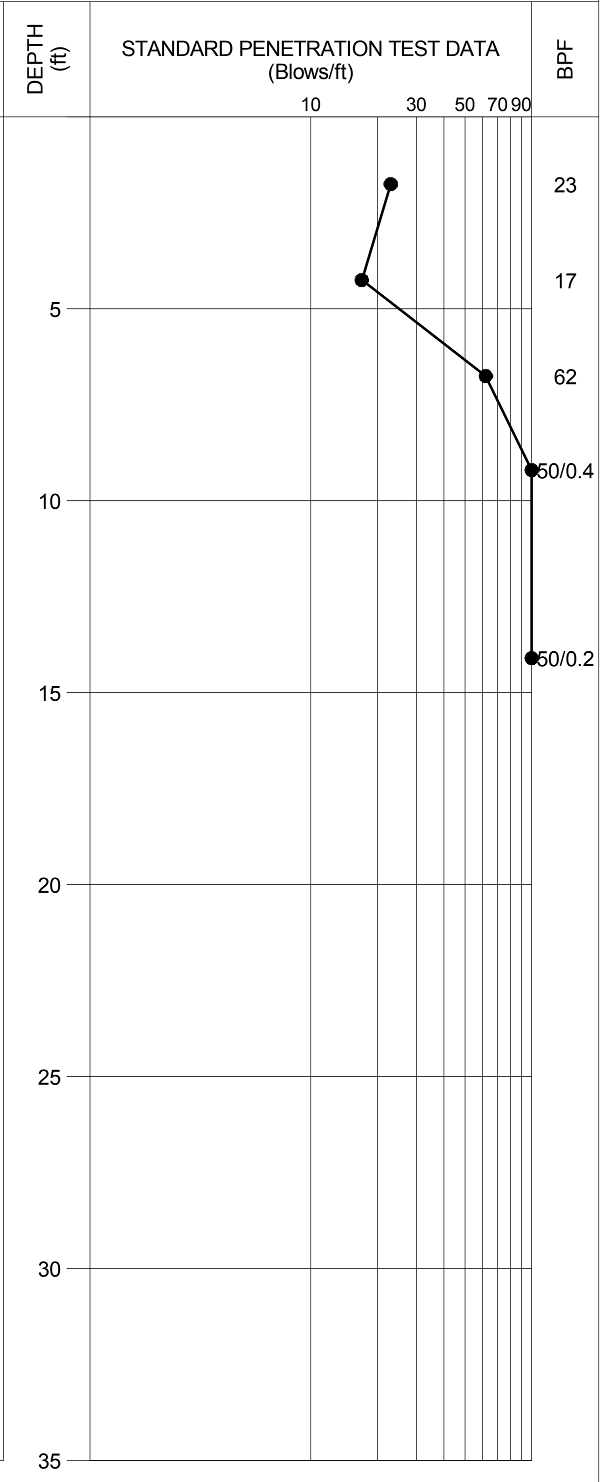
DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-21

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 14.7 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/23/16	**WATER LEVEL:** Dry@ TOB		

DEPTH (ft)	SOIL DESCRIPTION	WATER LEVEL	BPF
0	**TOPSOIL/GRASSMAT**		
	RESIDUUM: Very Stiff to Very Hard Grayish Tan Clayey Fine Sandy **SILT**, with rock fragments		23 17 62
8	**PARTIALLY WEATHERED ROCK**: When Sampled Becomes Brown Grayish Tan Fine Sandy **SILT**	HC	50/0.4 50/0.2
14.7	Boring was terminated at 14.7 feet. Hole cave-in was observed at 12 feet.		



DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

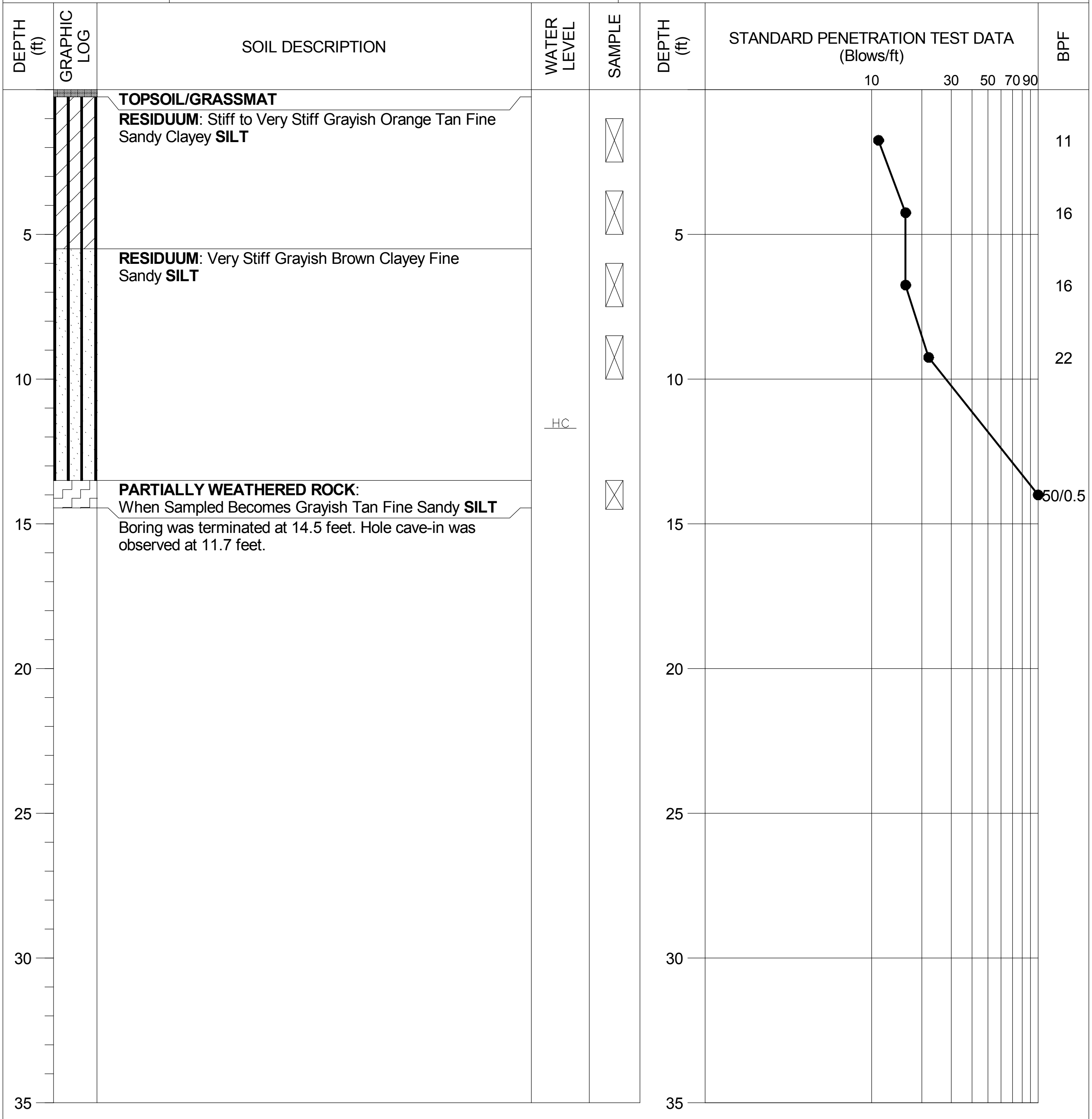
DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

ESP Associates, P.A.

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-22

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 14.5 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/23/16	**WATER LEVEL:** Dry@ TOB		



TOPSOIL/GRASSMAT

RESIDUUM: Stiff to Very Stiff Grayish Orange Tan Fine Sandy Clayey **SILT**

RESIDUUM: Very Stiff Grayish Brown Clayey Fine Sandy **SILT**

PARTIALLY WEATHERED ROCK: When Sampled Becomes Grayish Tan Fine Sandy **SILT**

Boring was terminated at 14.5 feet. Hole cave-in was observed at 11.7 feet.

DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

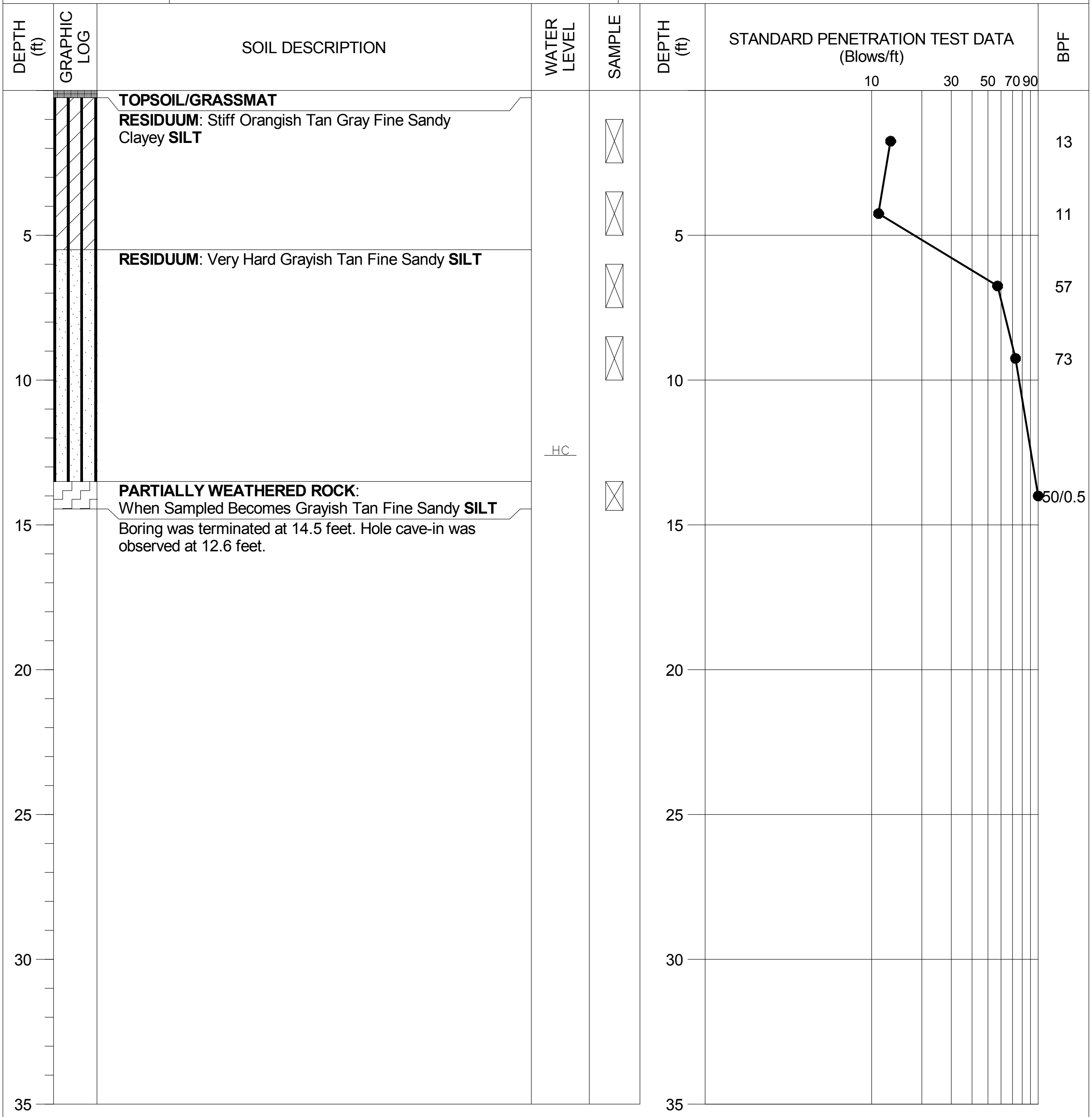
DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

ESP Associates, P.A.

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-23

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 14.5 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/23/16	**WATER LEVEL:** Dry@ TOB		



TOPSOIL/GRASSMAT

RESIDUUM: Stiff Orangish Tan Gray Fine Sandy Clayey **SILT**

RESIDUUM: Very Hard Grayish Tan Fine Sandy **SILT**

PARTIALLY WEATHERED ROCK:
When Sampled Becomes Grayish Tan Fine Sandy **SILT**

Boring was terminated at 14.5 feet. Hole cave-in was observed at 12.6 feet.

DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

ESP Associates, P.A.

ESP_TBR EP08.300.GPJ LOG-LAB.GDT 7/22/16

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-24

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 15 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/23/16	**WATER LEVEL:** Dry@ TOB		

DEPTH (ft)	GRAPHIC LOG	SOIL DESCRIPTION	WATER LEVEL	SAMPLE
		TOPSOIL		
		RESIDUUM: Firm to Stiff Grayish Orange Fine Sandy Clayey **SILT**		☒ ☒
5		**RESIDUUM**: Hard to Very Stiff Grayish Tan and Tannish Orange Fine Sandy **SILT**		☒ ☒
10			HC	☒
15		Boring was terminated at 15 feet. Hole cave-in was observed at 12.6 feet.		
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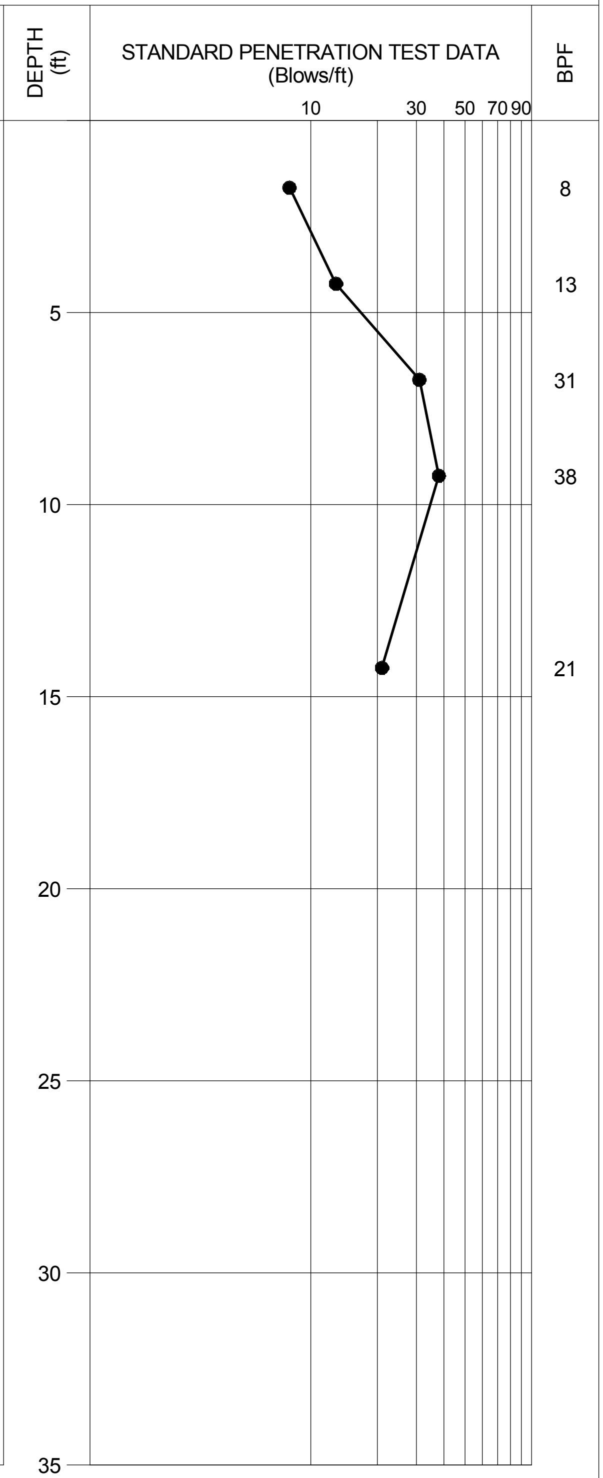


DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

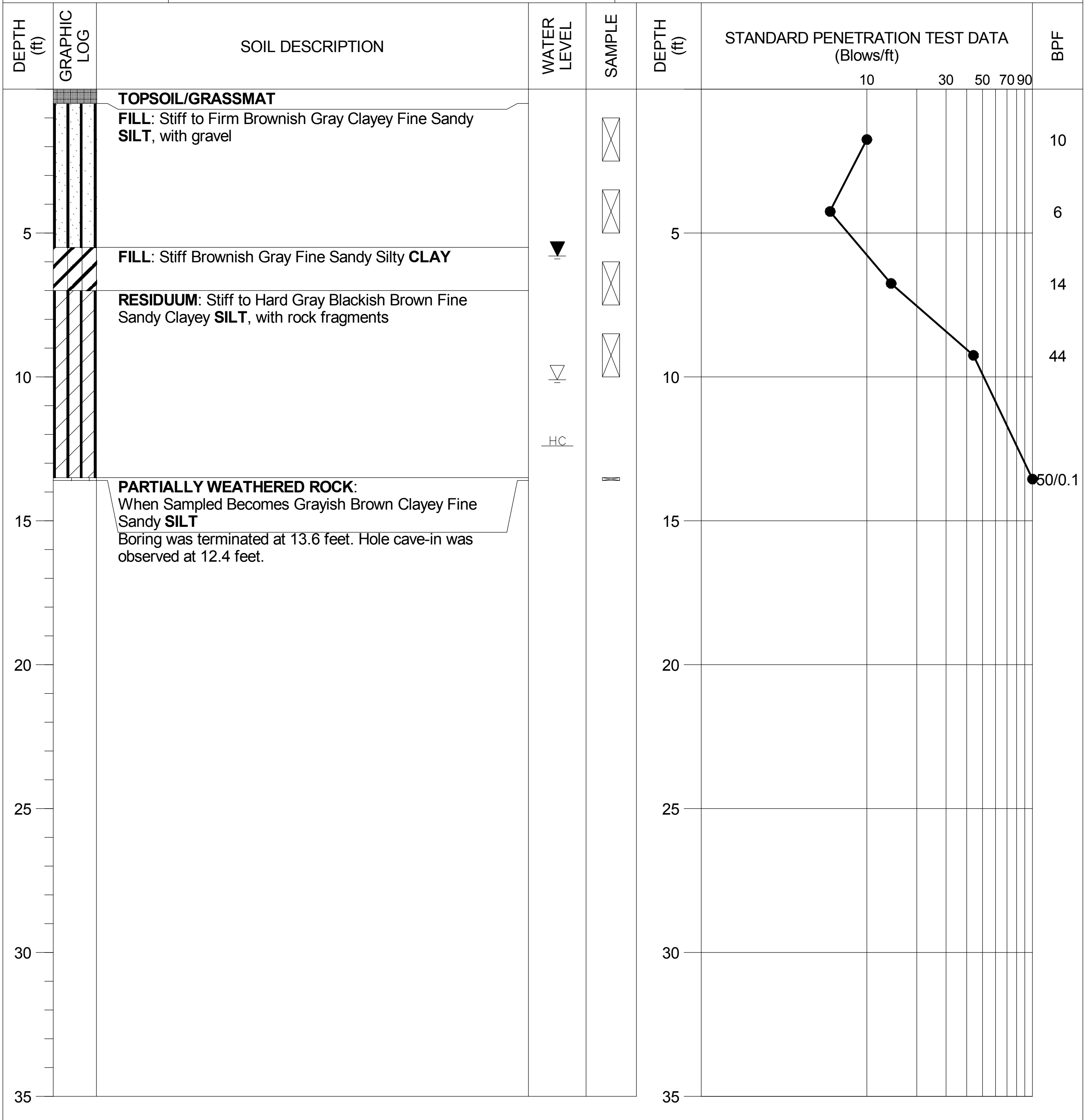
ESP Associates, P.A.

ESP_TBR EP08.300.GPJ LOG-LAB.GDT 7/22/16

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-25

PROJECT No.: EP08.300
ELEVATION: Existing Ground Surface
DRILLING METHOD: Hollow Stem Auger
DRILLING COMPANY: Ameridrill
LOGGED BY: Jeff Black
BORING DEPTH: 13.6 Feet
DRILL RIG: CME550X (ATV)
NOTES:
DATE DRILLED: 06/23/16
WATER LEVEL: ▽ 10.1 feet@ TOB ▼ 5.8 @ 1 day



TOPSOIL/GRASSMAT

FILL: Stiff to Firm Brownish Gray Clayey Fine Sandy **SILT**, with gravel

FILL: Stiff Brownish Gray Fine Sandy Silty **CLAY**

RESIDUUM: Stiff to Hard Gray Blackish Brown Fine Sandy Clayey **SILT**, with rock fragments

PARTIALLY WEATHERED ROCK: When Sampled Becomes Grayish Brown Clayey Fine Sandy **SILT**

Boring was terminated at 13.6 feet. Hole cave-in was observed at 12.4 feet.

DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

ESP Associates, P.A.

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-26

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 4.3 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/23/16	**WATER LEVEL:** Dry@ TOB		

DEPTH (ft) | GRAPHIC LOG | SOIL DESCRIPTION | WATER LEVEL | SAMPLE

TOPSOIL/GRASSMAT

FILL: Very Stiff to Stiff Orangish Brown Gray Fine Sandy Clayey **SILT**

RESIDUUM: Very Stiff Orangish Brown Gray Fine Sandy Clayey **SILT**

HC

PARTIALLY WEATHERED ROCK: When Sampled Becomes Brownish Gray Fine Sandy **SILT**

Auger refusal encountered at 4.3 feet. Boring was terminated at 4.3 feet. Hole cave-in was observed at 2.5 feet.

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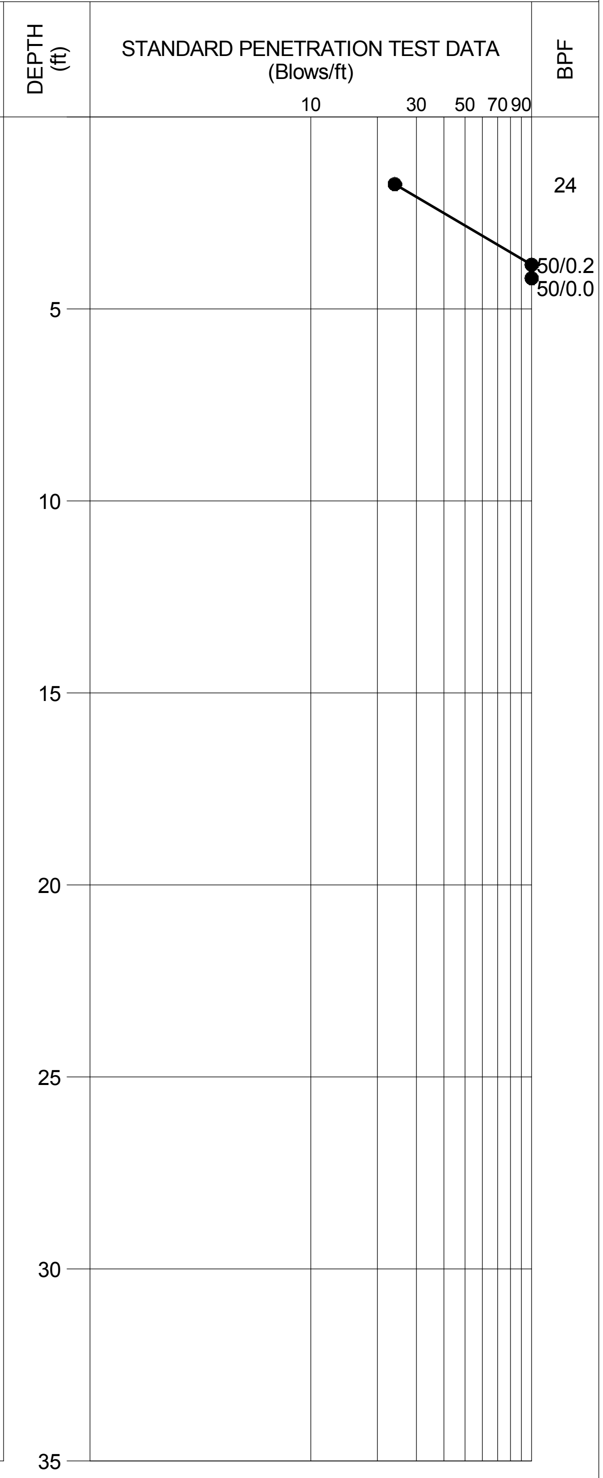


DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

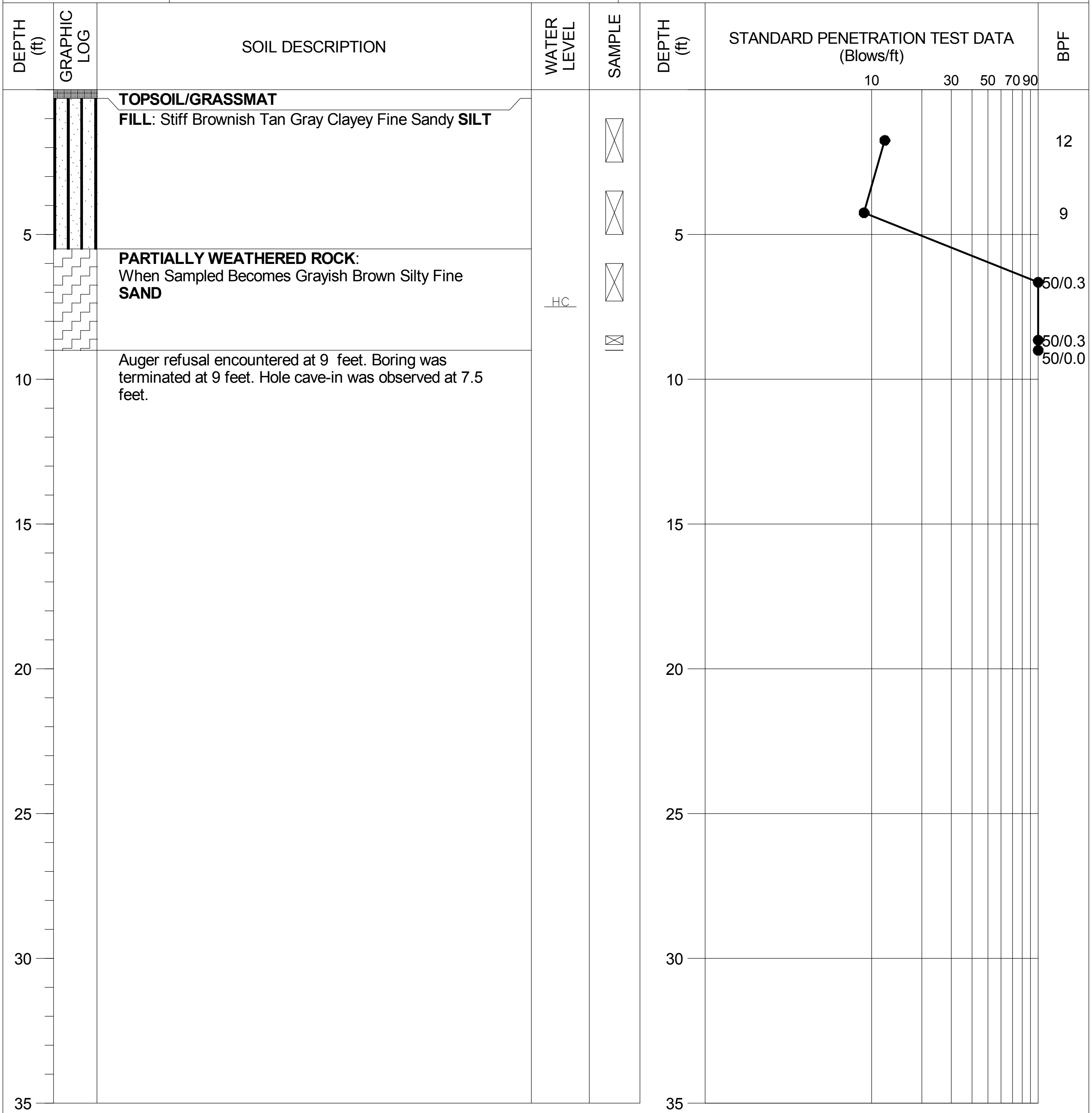
DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

ESP Associates, P.A.

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-27

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 9 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/23/16	**WATER LEVEL:** Dry@ TOB		



TOPSOIL/GRASSMAT

FILL: Stiff Brownish Tan Gray Clayey Fine Sandy **SILT**

PARTIALLY WEATHERED ROCK: When Sampled Becomes Grayish Brown Silty Fine **SAND**

Auger refusal encountered at 9 feet. Boring was terminated at 9 feet. Hole cave-in was observed at 7.5 feet.

DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

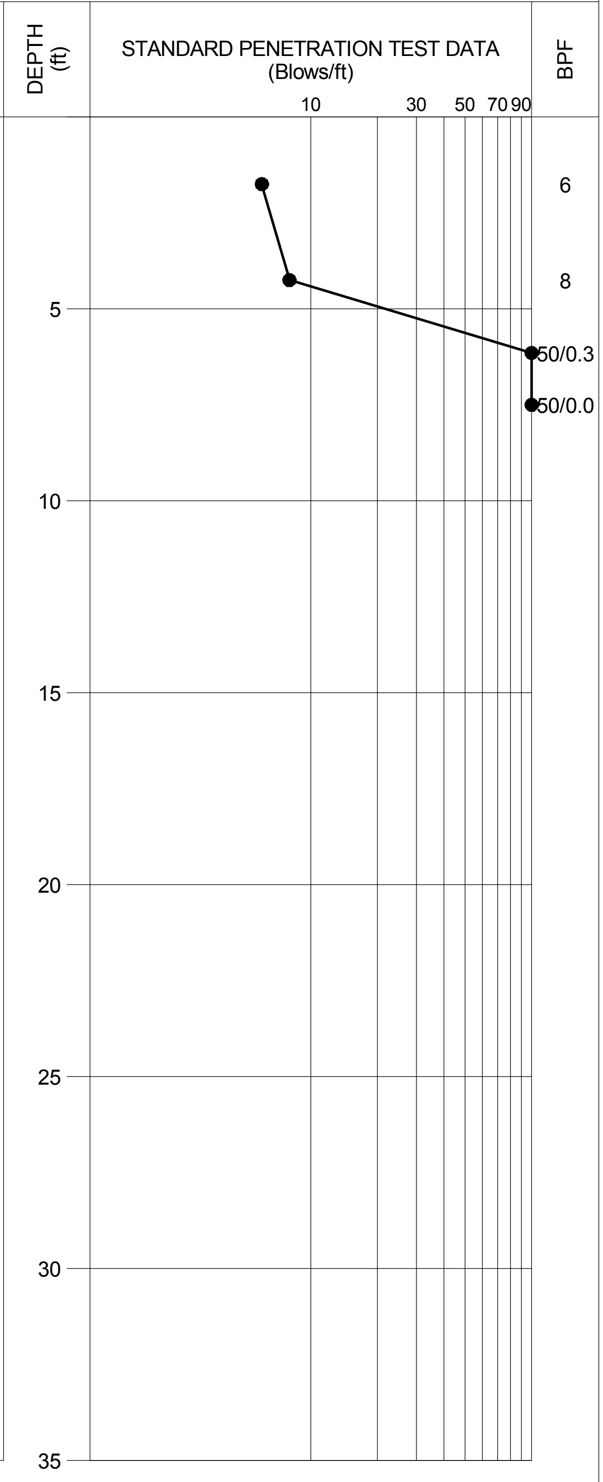
ESP Associates, P.A.

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-28

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 7.5 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/23/16	**WATER LEVEL:** Dry@ TOB		

DEPTH (ft)	GRAPHIC LOG	SOIL DESCRIPTION	WATER LEVEL	SAMPLE
		TOPSOIL/GRASSMAT		
		FILL: Firm Grayish Tan Orange Clayey Fine Sandy **SILT**		☒ ☒
5		**PARTIALLY WEATHERED ROCK**: When Sampled Becomes Brownish Gray Silty Fine **SAND**	HC	☒
		Auger refusal encountered at 7.5 feet. Boring was terminated at 7.5 feet. Hole cave-in was observed at 5.6 feet.		



DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

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ESP Associates, P.A.

PROJECT: Union County Pipeline West Alignment Monroe, North Carolina	**TEST BORING RECORD B-29**

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 15 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/24/16	**WATER LEVEL:** Dry@ TOB		

DEPTH (ft)	GRAPHIC LOG	SOIL DESCRIPTION	WATER LEVEL	SAMPLE
		TOPSOIL/GRASSMAT		
		RESIDUUM: Stiff Brownish Red Fine Sandy Clayey **SILT**		☒ ☒
5		**RESIDUUM**: Very Stiff to Very Hard Grayish Tan Fine Sandy **SILT**		☒ ☒
10			HC	☒
15		Boring was terminated at 15 feet. Hole cave-in was observed at 11.8 feet.		
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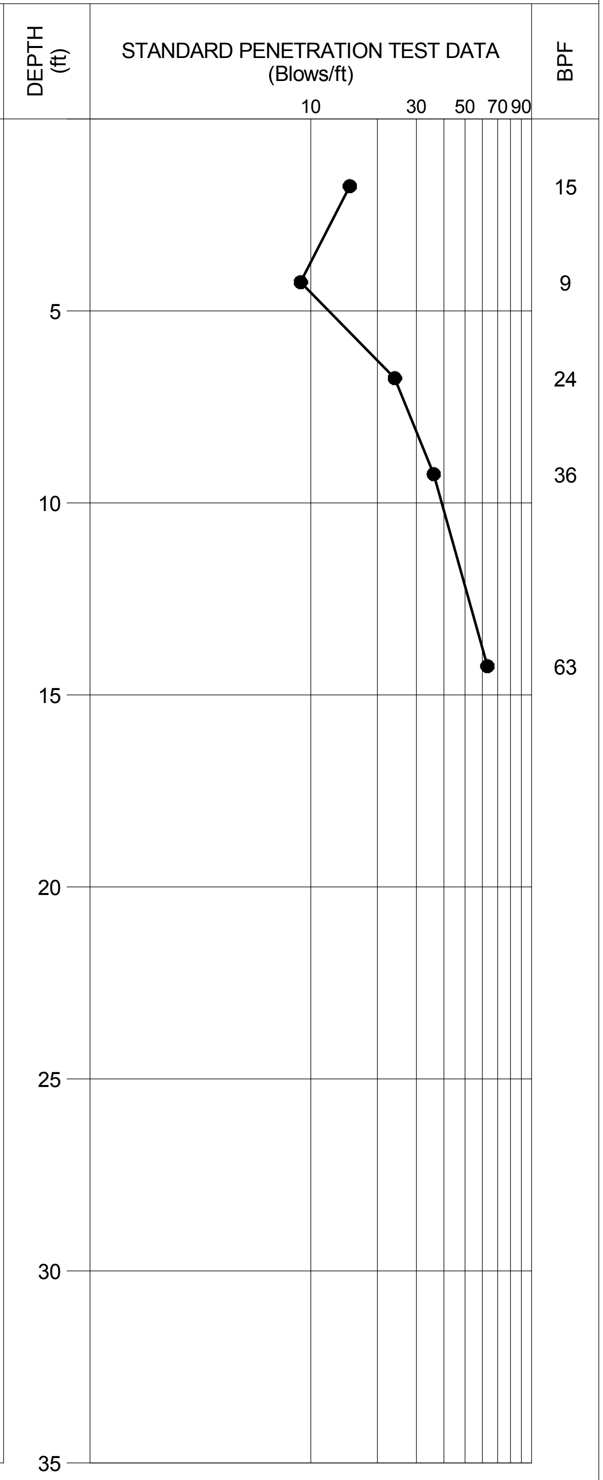
25				
30				
35				



DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

ESP Associates, P.A.

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-30

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 15 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/24/16	**WATER LEVEL:** Dry@ TOB		

DEPTH (ft)	GRAPHIC LOG	SOIL DESCRIPTION	WATER LEVEL	SAMPLE
		TOPSOIL/GRASSMAT		
		RESIDUUM: Stiff Orange and Red Fine Sandy Clayey **SILT**		☒ ☒
5		**RESIDUUM**: Very Stiff to Hard Grayish Tan Fine Sandy **SILT**		☒ ☒
10			HC	☒
15		Boring was terminated at 15 feet. Hole cave-in was observed at 11.6 feet.		
20				
25				
30				
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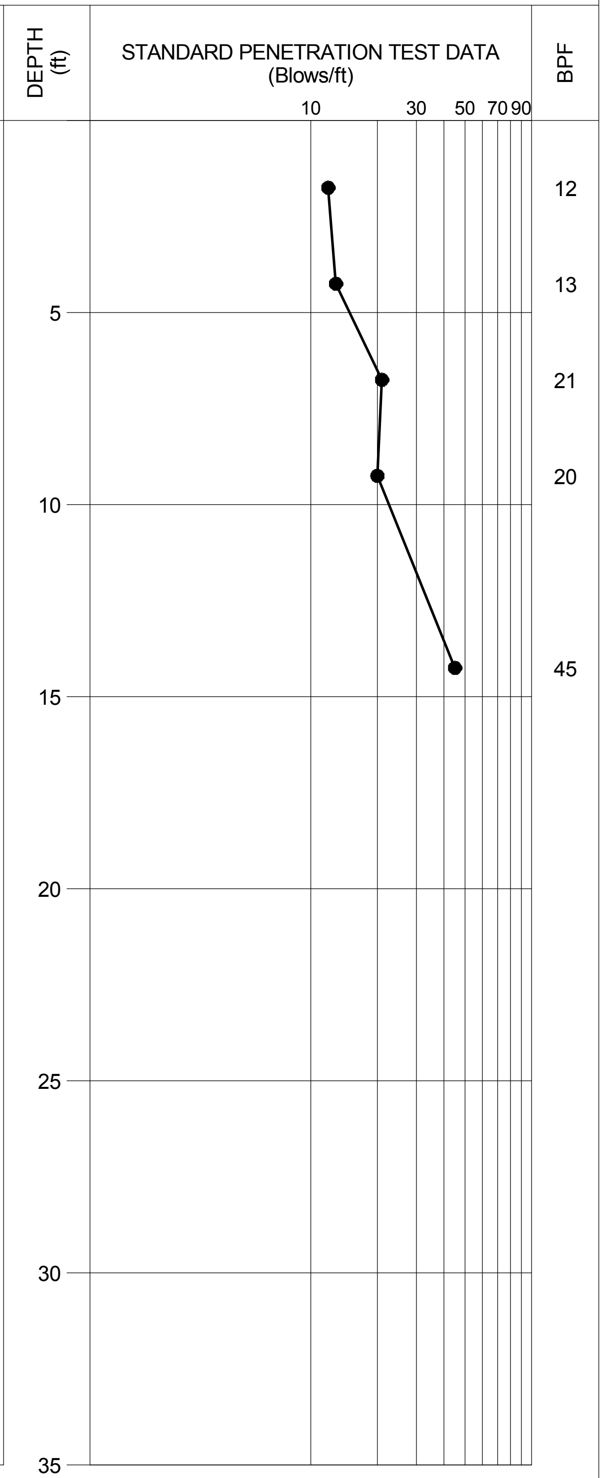

DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

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ESP Associates, P.A.

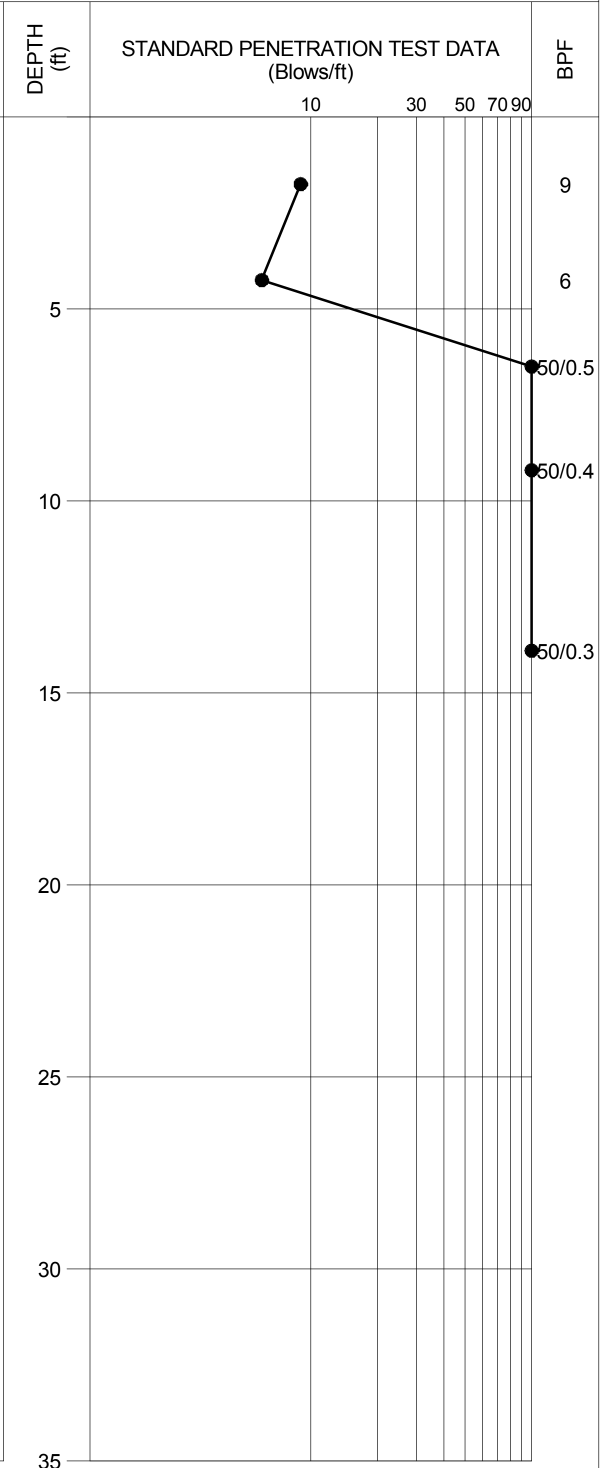
ESP_TBR EP08.300.GPJ LOG-LAB.GDT 7/22/16

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-31

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 14.3 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/24/16	**WATER LEVEL:** Dry@ TOB		

DEPTH (ft)	GRAPHIC LOG	SOIL DESCRIPTION	WATER LEVEL	SAMPLE
0	▨	**TOPSOIL/GRASSMAT**		
0.5–5.5	▨	**RESIDUUM**: Stiff to Firm Brownish Gray Fine Sandy Silty **CLAY**		☒ ☒
5.5–14.3	▨	**PARTIALLY WEATHERED ROCK**: When Sampled Becomes Brown Grayish Tan Fine Sandy **SILT**	HC	☒ ☒ ☒
14.3		Boring was terminated at 14.3 feet. Hole cave-in was observed at 12 feet.		



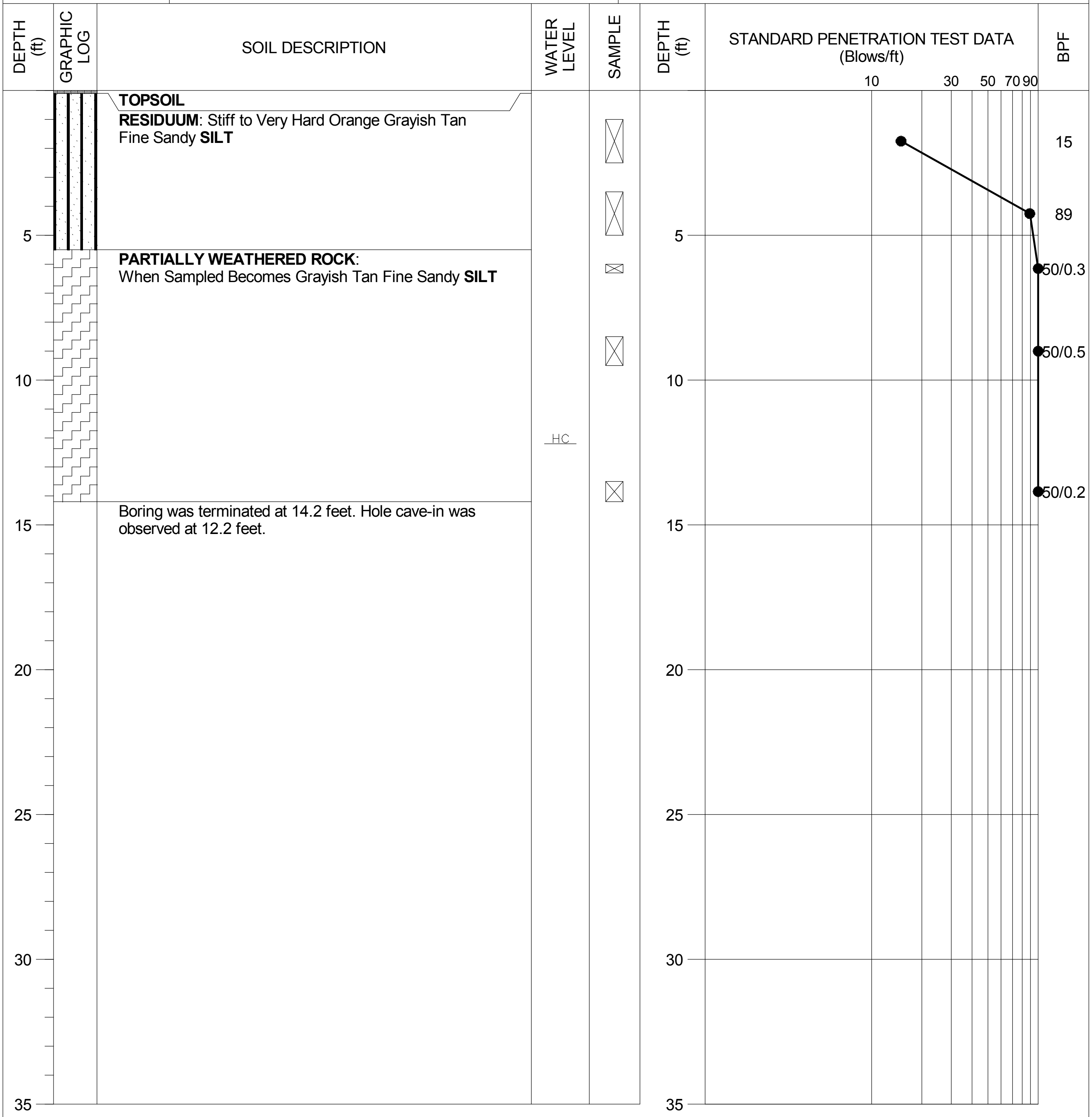
DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-32

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 14.2 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/24/16	**WATER LEVEL:** Dry@ TOB		



TOPSOIL

RESIDUUM: Stiff to Very Hard Orange Grayish Tan Fine Sandy **SILT**

PARTIALLY WEATHERED ROCK:
When Sampled Becomes Grayish Tan Fine Sandy **SILT**

Boring was terminated at 14.2 feet. Hole cave-in was observed at 12.2 feet.

ESP Associates, P.A.

DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-33

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 20 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/24/16	**WATER LEVEL:** Dry@ TOB		

DEPTH (ft)	GRAPHIC LOG	SOIL DESCRIPTION	WATER LEVEL	SAMPLE
		TOPSOIL/GRASSMAT		
		FILL: Stiff to Firm Grayish Tan Fine Sandy **SILT**, with rootlets		☒ ☒
5		**FILL**: Stiff Grayish Tan Fine Sandy **SILT**		☒
		FILL: Very Stiff Gray Tannish Brown Fine Sandy Clayey **SILT**		☒
10		**RESIDUUM**: Very Stiff Oliveish Brown Fine To Medium Sandy **SILT**	HC	☒
15				
		RESIDUUM: Very Stiff Grayish Tan Fine Sandy **SILT**		☒
20		Boring was terminated at 20 feet. Hole cave-in was observed at 15.6 feet.		
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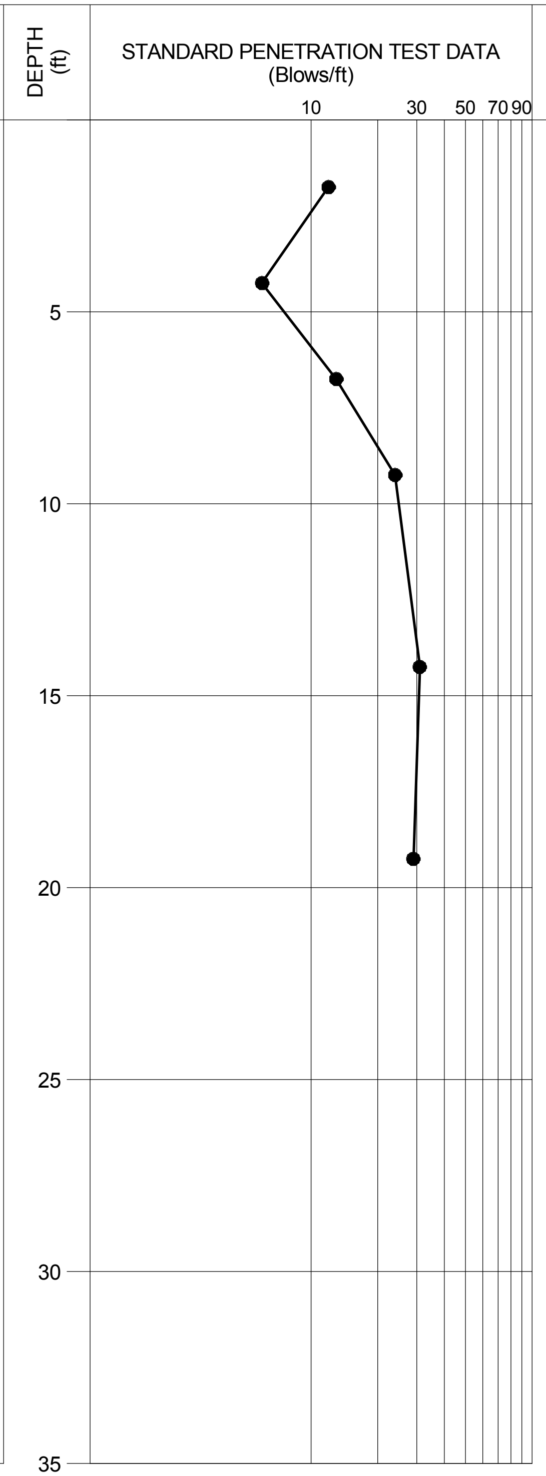

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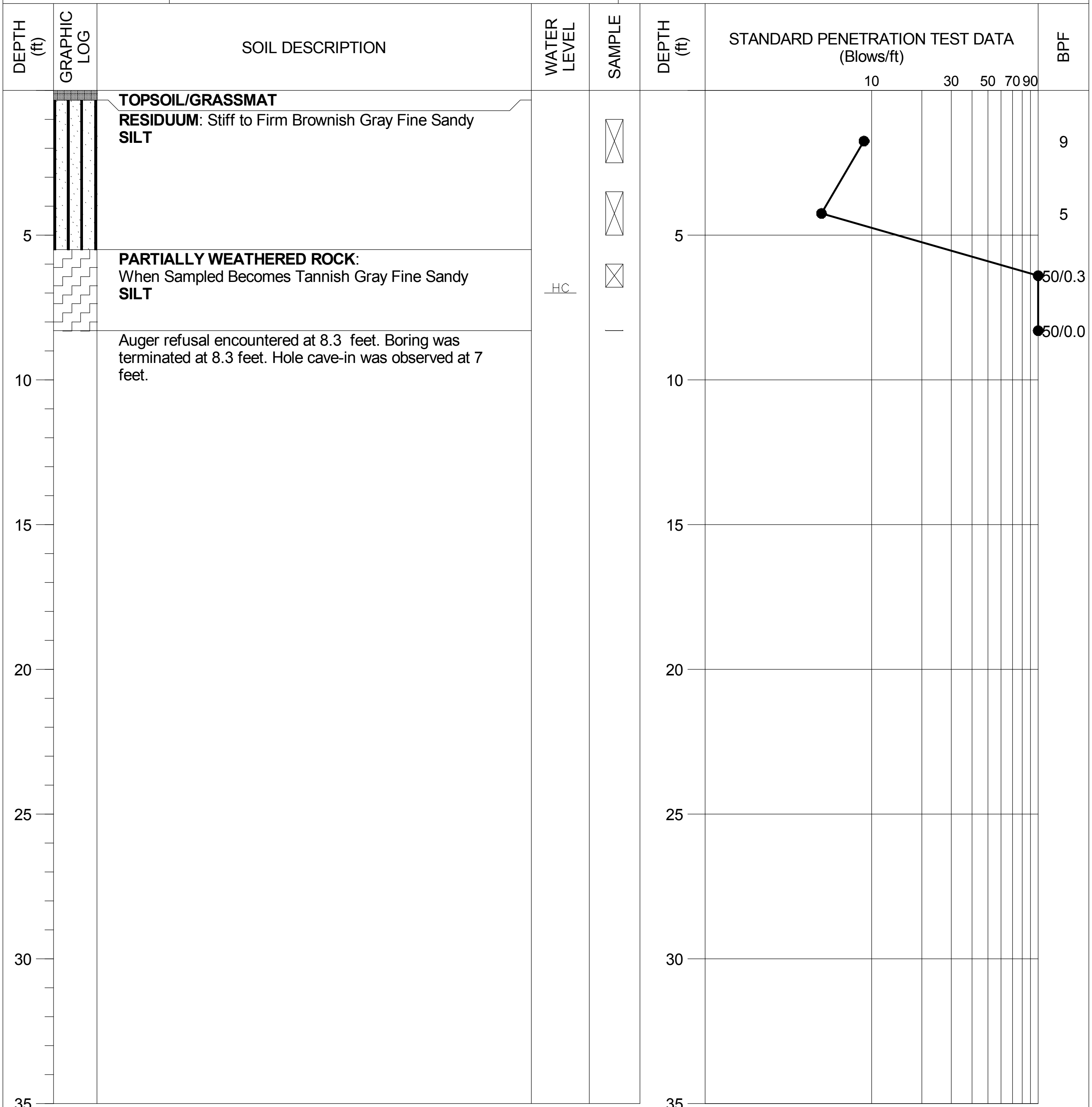
ESP Associates, P.A.

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-34

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 8.3 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/24/16	**WATER LEVEL:** Dry@ TOB		



TOPSOIL/GRASSMAT

RESIDUUM: Stiff to Firm Brownish Gray Fine Sandy **SILT**

PARTIALLY WEATHERED ROCK: When Sampled Becomes Tannish Gray Fine Sandy **SILT**

Auger refusal encountered at 8.3 feet. Boring was terminated at 8.3 feet. Hole cave-in was observed at 7 feet.

DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

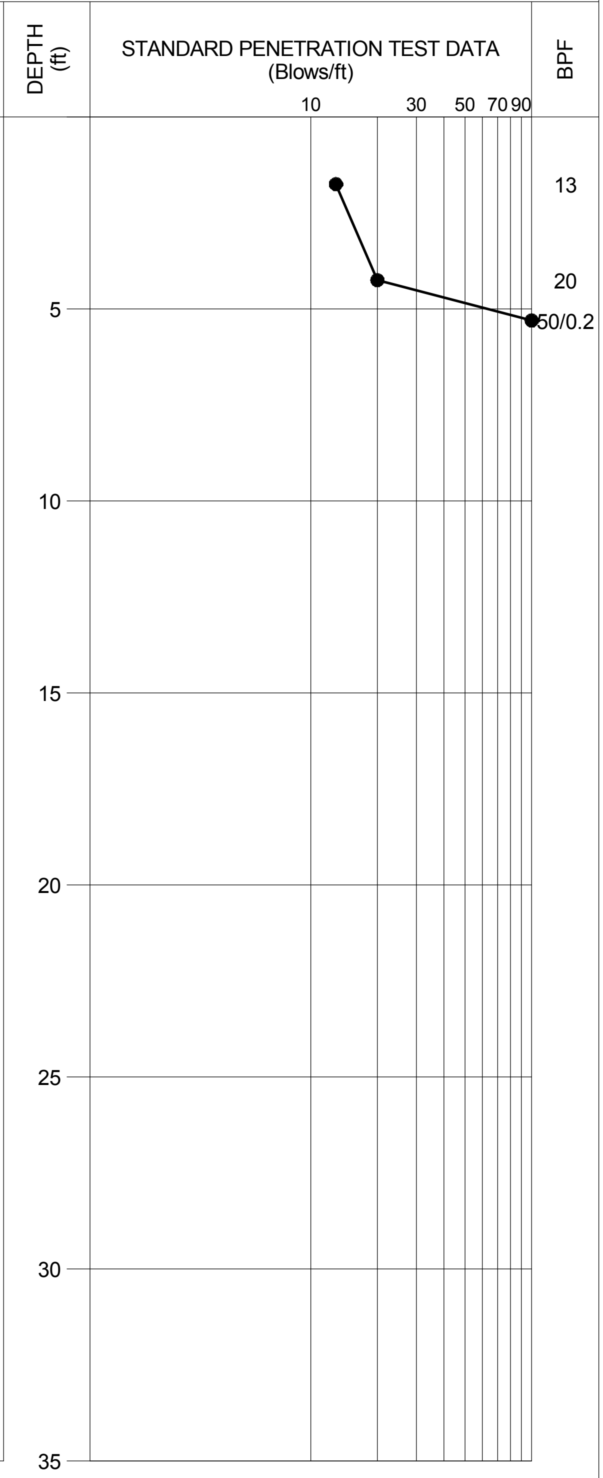
ESP Associates, P.A.

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-35

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 5.2 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/24/16	**WATER LEVEL:** Dry@ TOB		

DEPTH (ft)	GRAPHIC LOG	SOIL DESCRIPTION	WATER LEVEL	SAMPLE
0		**TOPSOIL/GRASSMAT**		
		FILL: Stiff Reddish Brown Fine To Medium Sandy **SILT**	HC	☒
		FILL: Very Stiff Tan Grayish Brown Fine Sandy Clayey **SILT**		☒
5		**PARTIALLY WEATHERED ROCK**: When Sampled Becomes Brown Tannish Gray Fine Sandy **SILT**		☒
		Auger refusal encountered at 5.2 feet. Boring was terminated at 5.2 feet. Hole cave-in was observed at 2.6 feet.		



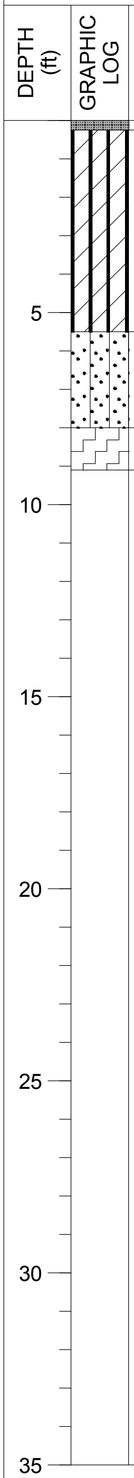
DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-36

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 9.1 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/24/16	**WATER LEVEL:** Dry@ TOB		



SOIL DESCRIPTION

TOPSOIL/GRASSMAT

FILL: Firm Orangish Gray and Brown Fine Sandy Clayey **SILT**

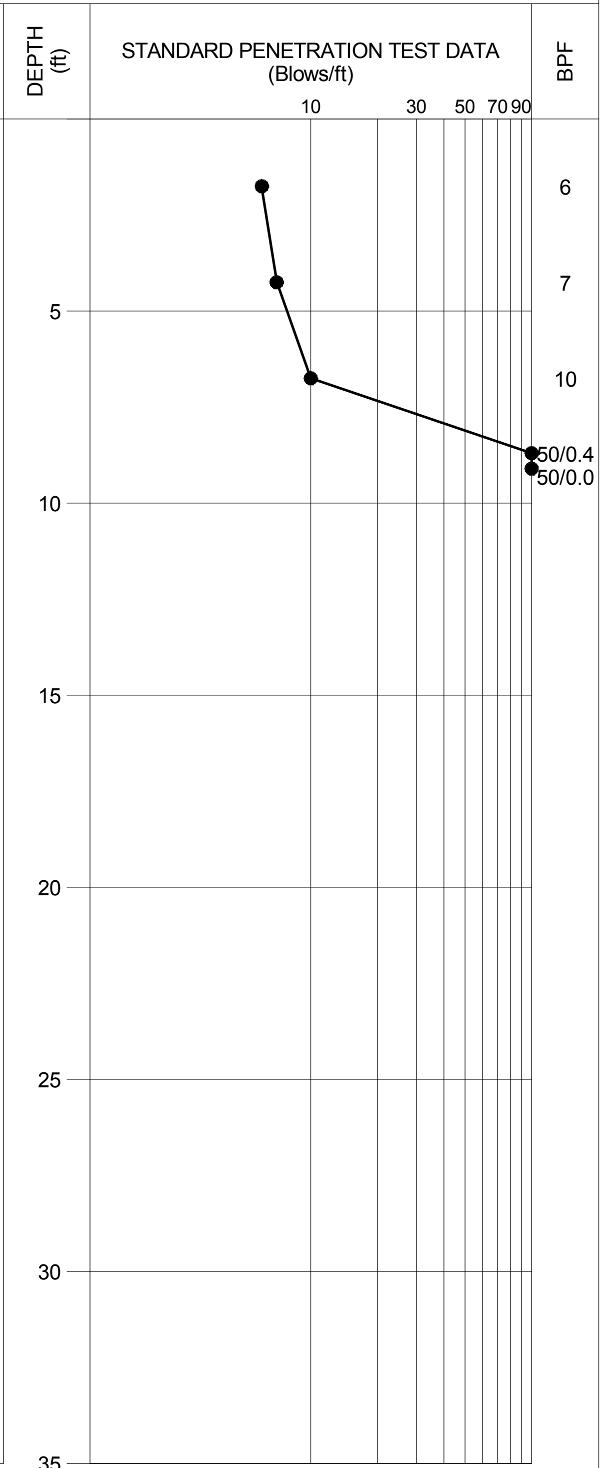
RESIDUUM: Loose Grayish Brown Silty Fine **SAND**

PARTIALLY WEATHERED ROCK: When Sampled Becomes Grayish Brown Silty Fine **SAND**

Auger refusal encountered at 9.1 feet. Boring was terminated at 9.1 feet. Hole cave-in was observed at 8 feet.

WATER LEVEL: HC

SAMPLE: ☒ ☒ ☒ ☒



DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

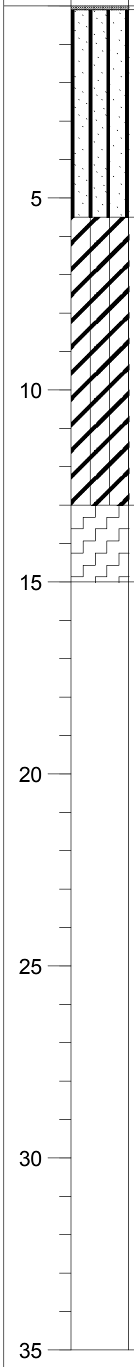
ESP Associates, P.A.

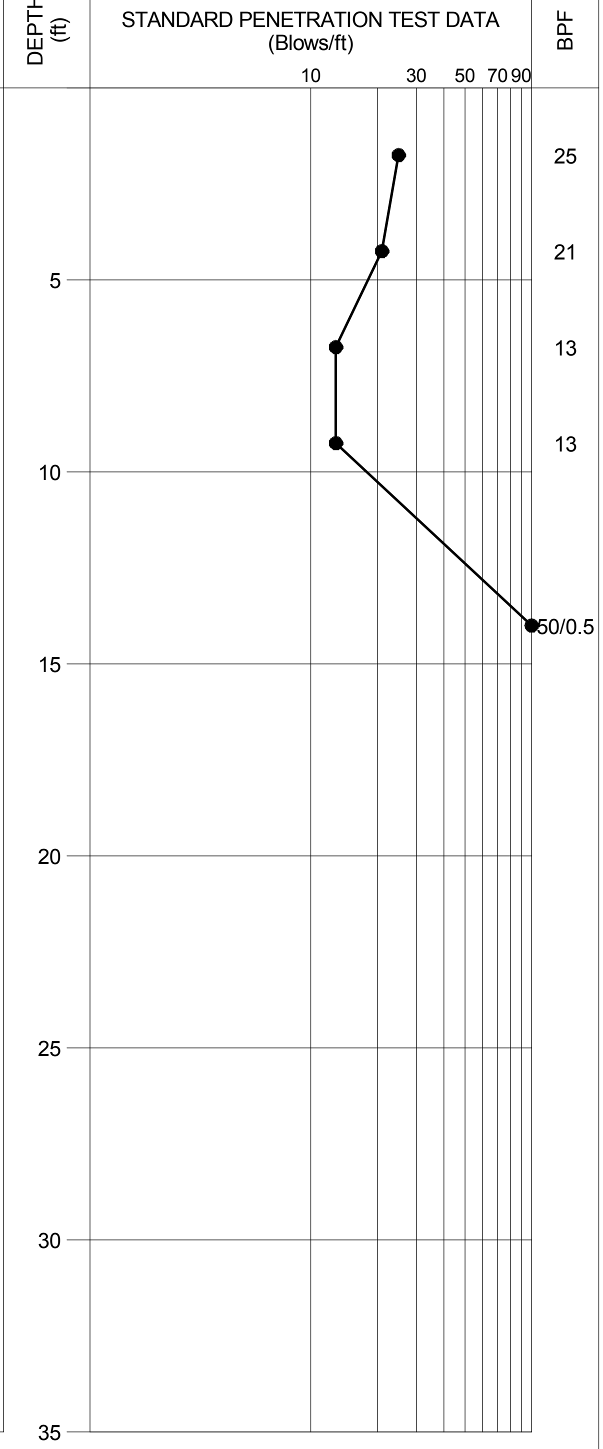
PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-37

PROJECT No.: EP08.300
ELEVATION: Existing Ground Surface
DRILLING METHOD: Hollow Stem Auger
DRILLING COMPANY: Ameridrill
LOGGED BY: Jeff Black
BORING DEPTH: 14.5 Feet
DRILL RIG: CME550X (ATV)
NOTES:
DATE DRILLED: 06/27/16
WATER LEVEL: Dry@ TOB

DEPTH (ft)	GRAPHIC LOG	SOIL DESCRIPTION	WATER LEVEL	SAMPLE	DEPTH (ft)	STANDARD PENETRATION TEST DATA (Blows/ft)	BPF
0–5.5		**TOPSOIL/GRASSMAT** **RESIDUUM**: Very Stiff Orange Brownish Tan Fine Sandy **SILT**		☒ ☒			25 21
5.5–13		**RESIDUUM**: Stiff Grayish Tan Fine Sandy Silty **CLAY**	HC	☒ ☒			13 13
13–15		**PARTIALLY WEATHERED ROCK**: When Sampled Becomes Brown Grayish Tan Fine Sandy **SILT**		☒			50/0.5
		Boring was terminated at 14.5 feet. Hole cave-in was observed at 11.1 feet.					





DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

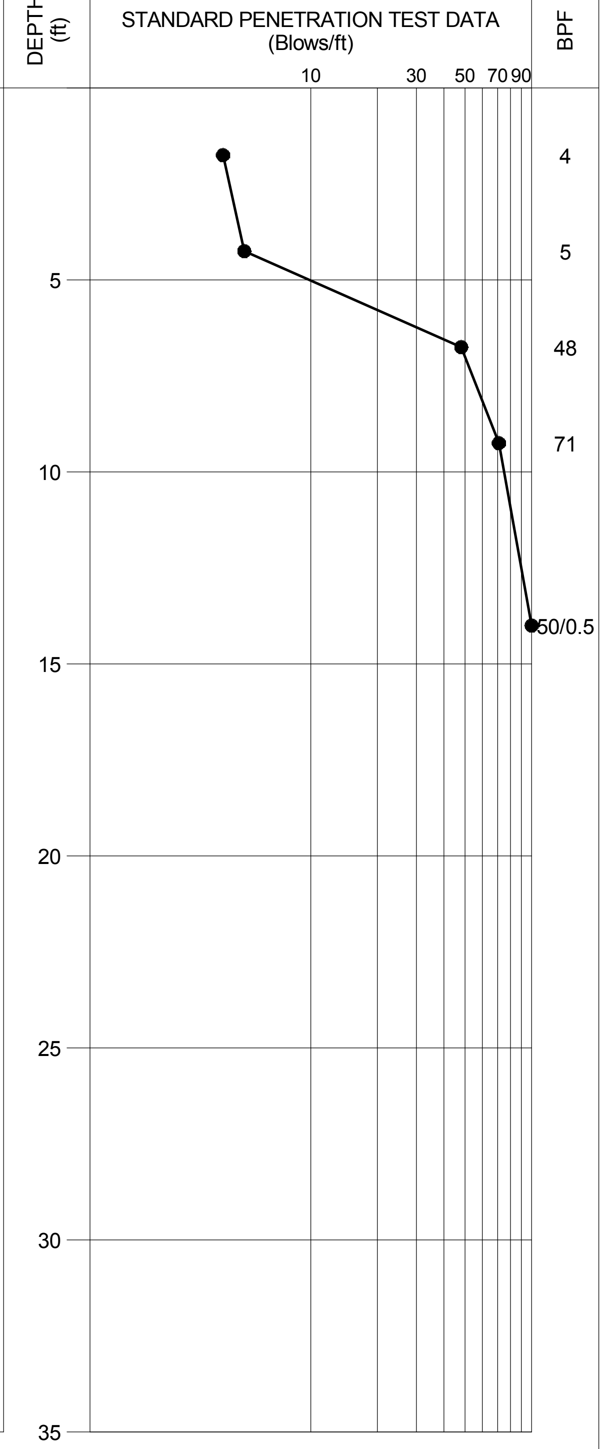
ESP Associates, P.A.

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-38

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 14.5 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/27/16	**WATER LEVEL:** Dry@ TOB		

DEPTH (ft)	GRAPHIC LOG	SOIL DESCRIPTION	WATER LEVEL	SAMPLE
0		**TOPSOIL/GRASSMAT**		
		RESIDUUM: Soft to Firm Grayish Tan Clayey Fine Sandy **SILT**, (wet)		☒ ☒
5.5		**RESIDUUM**: Hard to Very Hard Brown Grayish Tan Fine Sandy **SILT**	HC (12.2)	☒ ☒
13.5		**PARTIALLY WEATHERED ROCK**: When Sampled Becomes Brown Grayish Tan Fine Sandy **SILT**		☒
14.5		Boring was terminated at 14.5 feet. Hole cave-in was observed at 12.2 feet.		



DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

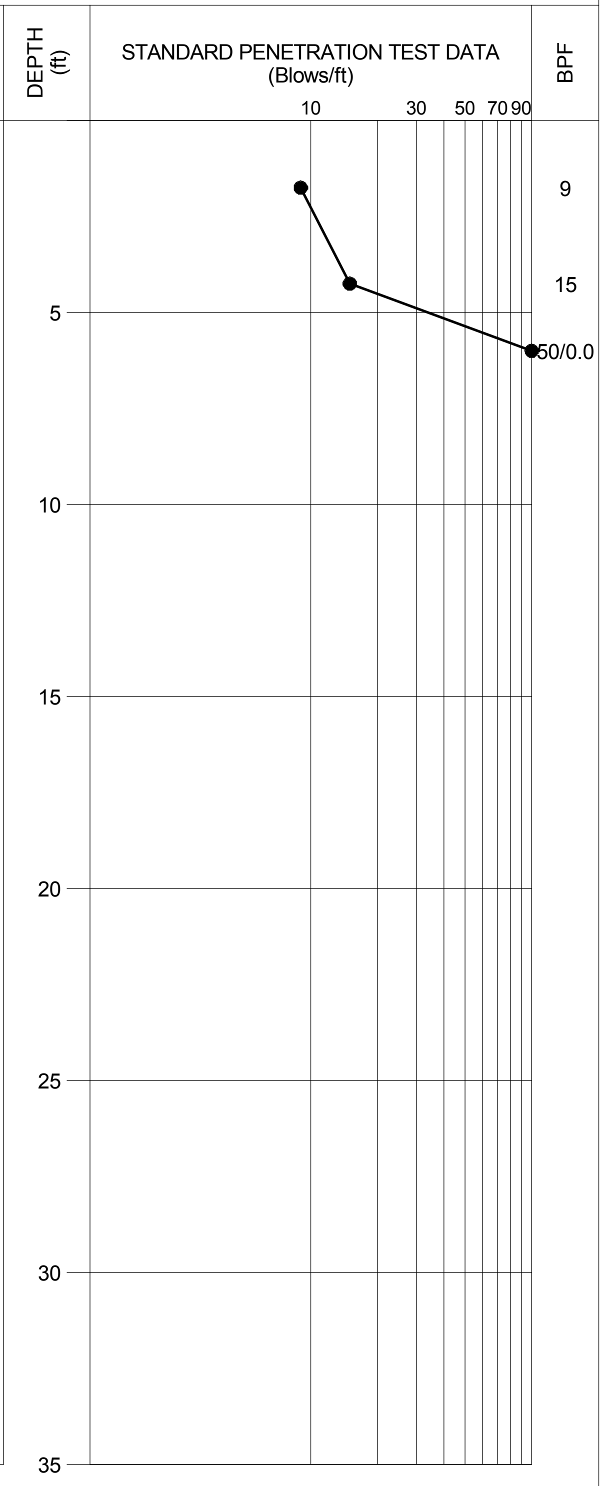
PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-39

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 6 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/27/16	**WATER LEVEL:** Dry@ TOB		

DEPTH (ft)	SOIL DESCRIPTION	WATER LEVEL	SAMPLE	BPF
0	**TOPSOIL/GRASSMAT**			
	RESIDUUM: Stiff Grayish Brown and Red Fine Sandy Clayey **SILT**		☒	9
			☒	15
5	**PARTIALLY WEATHERED ROCK**: When Sampled Becomes Brownish Gray Silty Fine to Medium **SAND**	HC		50/0.0

Auger refusal encountered at 6 feet. Boring was terminated at 6 feet. Hole cave-in was observed at 5.3 feet.



DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

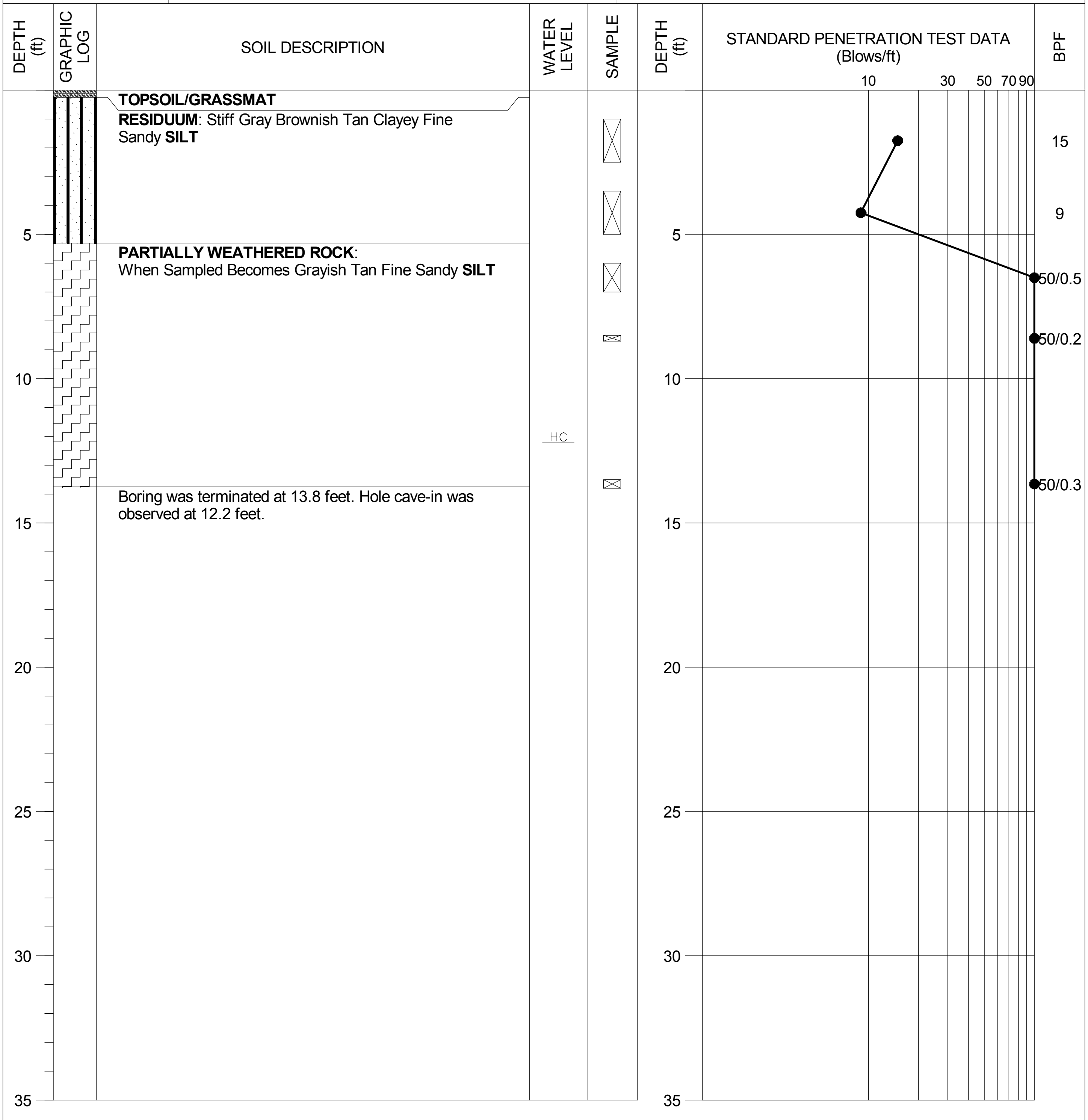
DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

ESP Associates, P.A.

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-40

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 13.8 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/27/16	**WATER LEVEL:** Dry@ TOB		



TOPSOIL/GRASSMAT

RESIDUUM: Stiff Gray Brownish Tan Clayey Fine Sandy **SILT**

PARTIALLY WEATHERED ROCK:
When Sampled Becomes Grayish Tan Fine Sandy **SILT**

Boring was terminated at 13.8 feet. Hole cave-in was observed at 12.2 feet.

DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

ESP Associates, P.A.

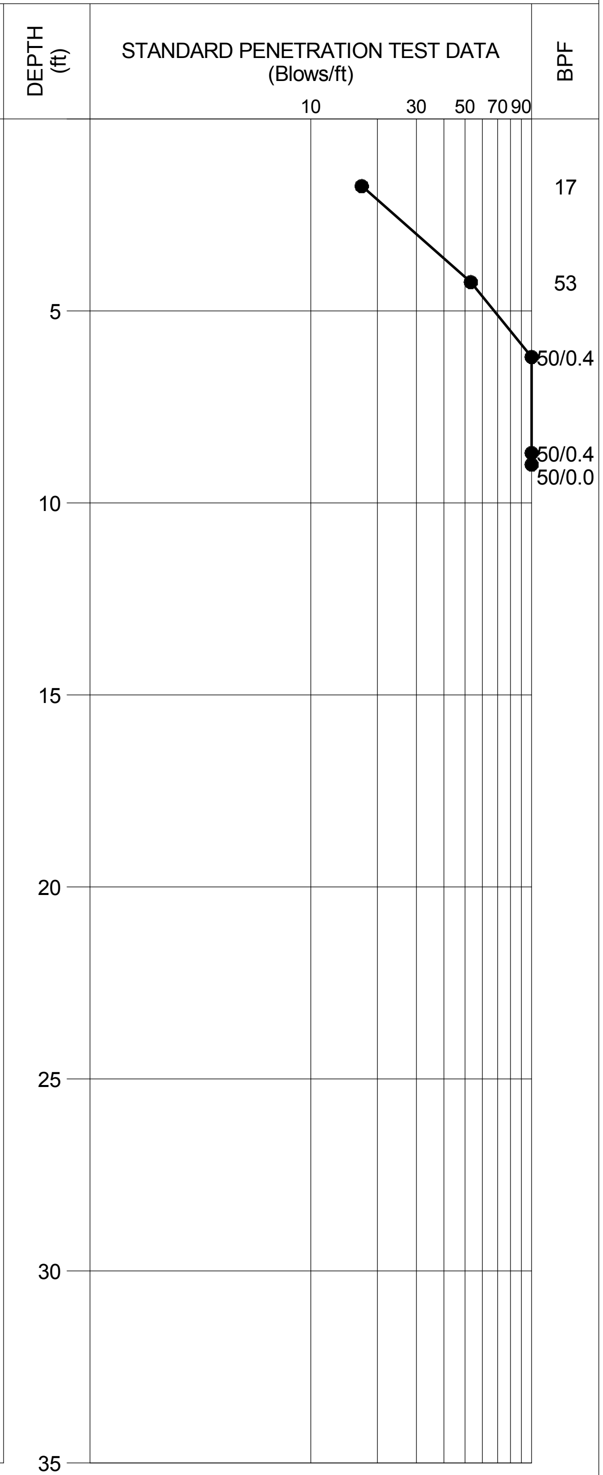
ESP_TBR EP08.300.GPJ LOG-LAB.GDT 7/22/16

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-41

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 9 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/27/16	**WATER LEVEL:** Dry@ TOB		

DEPTH (ft)	GRAPHIC LOG	SOIL DESCRIPTION	WATER LEVEL	SAMPLE	BPF
		TOPSOIL/ROOTMAT			
		RESIDUUM: Very Stiff Grayish Tan Fine Sandy Clayey **SILT**		☒	17
5		**RESIDUUM**: Very Hard Tannish Gray Fine Sandy **SILT**		☒	53
		PARTIALLY WEATHERED ROCK: When Sampled Becomes Grayish Tan Fine Sandy **SILT**	HC	☒ ☒	50/0.4 50/0.4 50/0.0
10		Auger refusal encountered at 9 feet. Boring was terminated at 9 feet. Hole cave-in was observed at 7.8 feet.			
15					
20					
25					
30					
35					



DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

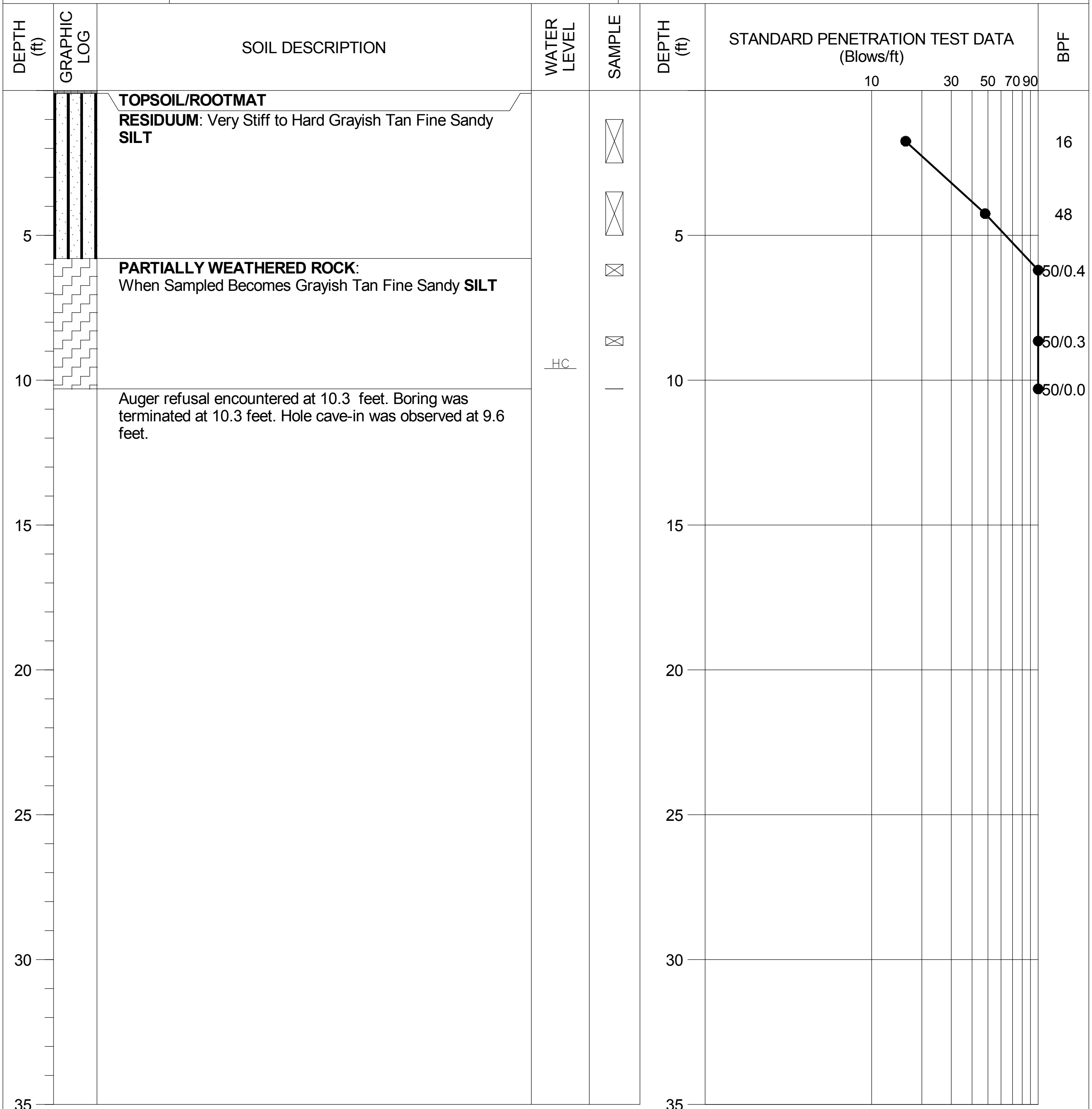
ESP Associates, P.A.

ESP_TBR EP08.300.GPJ LOG-LAB.GDT 7/22/16

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-42

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 10.3 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/27/16	**WATER LEVEL:** Dry@ TOB		



TOPSOIL/ROOTMAT

RESIDUUM: Very Stiff to Hard Grayish Tan Fine Sandy **SILT**

PARTIALLY WEATHERED ROCK: When Sampled Becomes Grayish Tan Fine Sandy **SILT**

Auger refusal encountered at 10.3 feet. Boring was terminated at 10.3 feet. Hole cave-in was observed at 9.6 feet.

ESP Associates, P.A.

DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

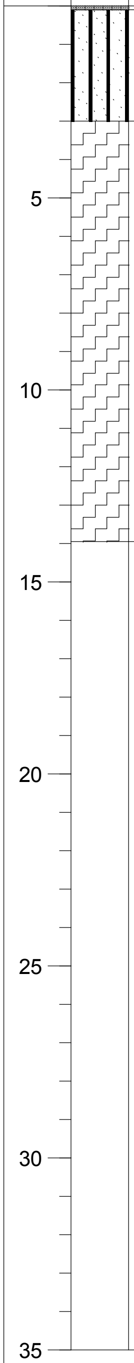
DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-43

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 14 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/27/16	**WATER LEVEL:** Dry@ TOB		

DEPTH (ft) | GRAPHIC LOG | SOIL DESCRIPTION | WATER LEVEL | SAMPLE | DEPTH (ft) | STANDARD PENETRATION TEST DATA (Blows/ft) | BPF

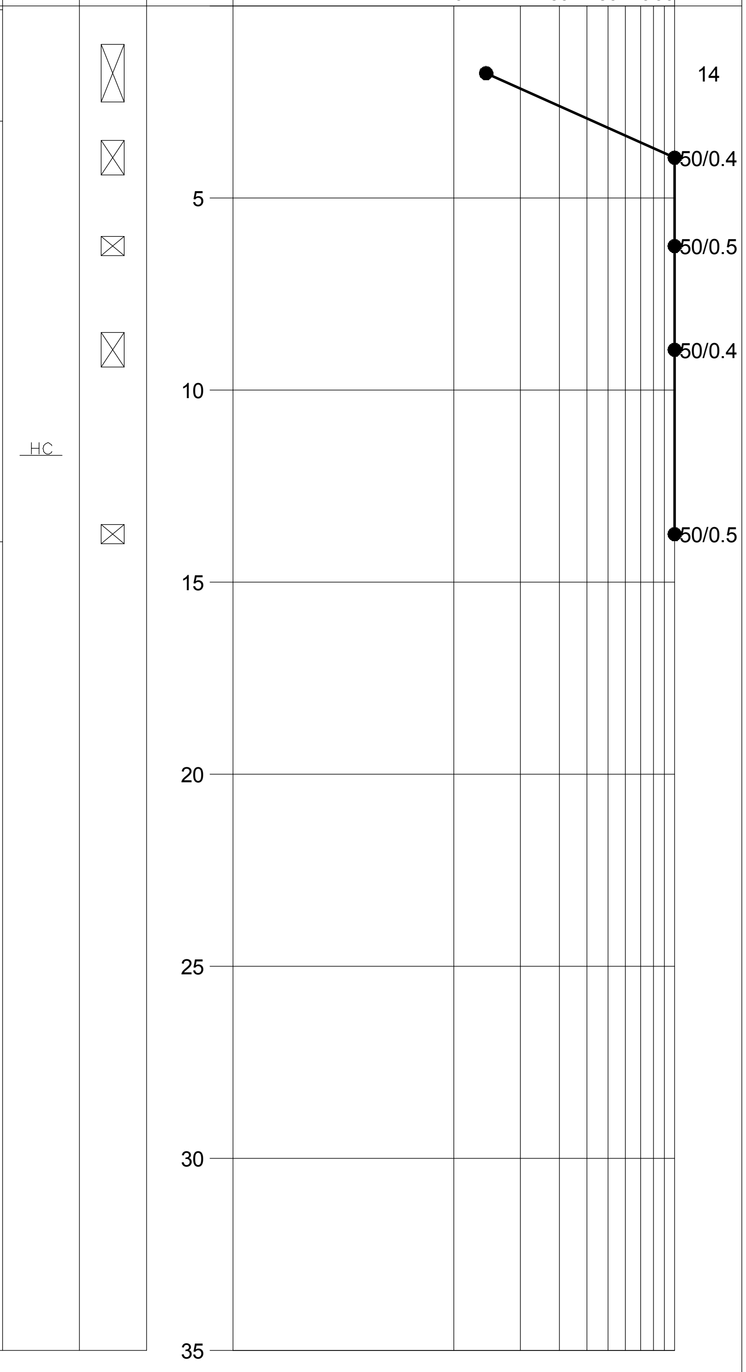


TOPSOIL/ROOTMAT

RESIDUUM: Stiff Orangish Tan Clayey Fine Sandy **SILT**

PARTIALLY WEATHERED ROCK: When Sampled Becomes Grayish Tan and Dark Brown Fine Sandy **SILT**

Boring was terminated at 14 feet. Hole cave-in was observed at 11.7 feet.



DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

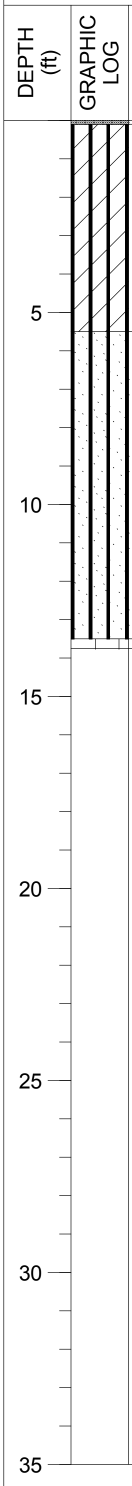
ESP Associates, P.A.

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-44

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 13.8 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/27/16	**WATER LEVEL:** Dry@ TOB		

DEPTH (ft) | GRAPHIC LOG | SOIL DESCRIPTION | WATER LEVEL | SAMPLE | DEPTH (ft) | STANDARD PENETRATION TEST DATA (Blows/ft) | BPF



TOPSOIL/ROOTMAT

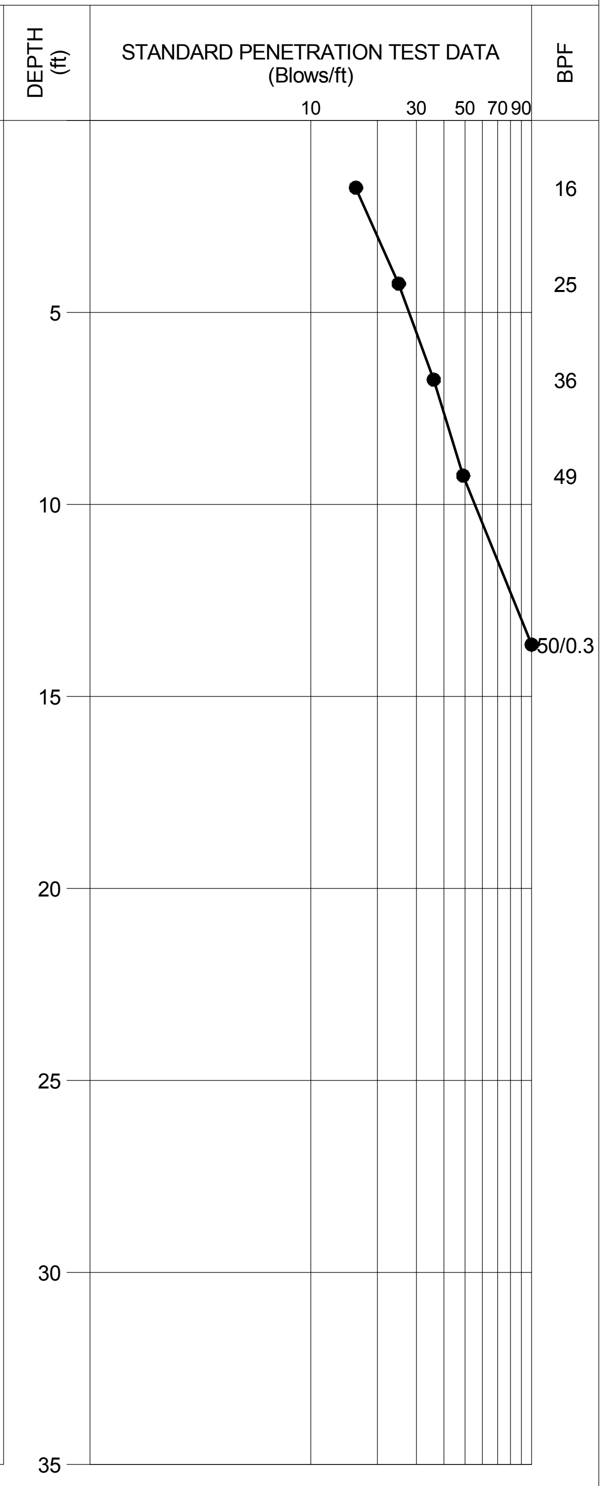
RESIDUUM: Very Stiff Orangish Tan Fine Sandy Clayey **SILT**

RESIDUUM: Hard Gray Tannish Brown Fine Sandy **SILT**

PARTIALLY WEATHERED ROCK: When Sampled Becomes Brownish Gray Fine Sandy **SILT**

Boring was terminated at 13.8 feet. Hole cave-in was observed at 12.1 feet.

HC



DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

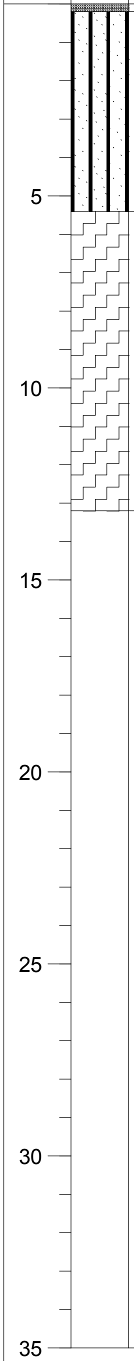
ESP Associates, P.A.

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-45

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 13.2 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/27/16	**WATER LEVEL:** Dry@ TOB		

DEPTH (ft)	GRAPHIC LOG	SOIL DESCRIPTION	WATER LEVEL	SAMPLE



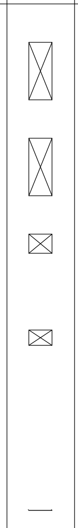
TOPSOIL/GRASSMAT

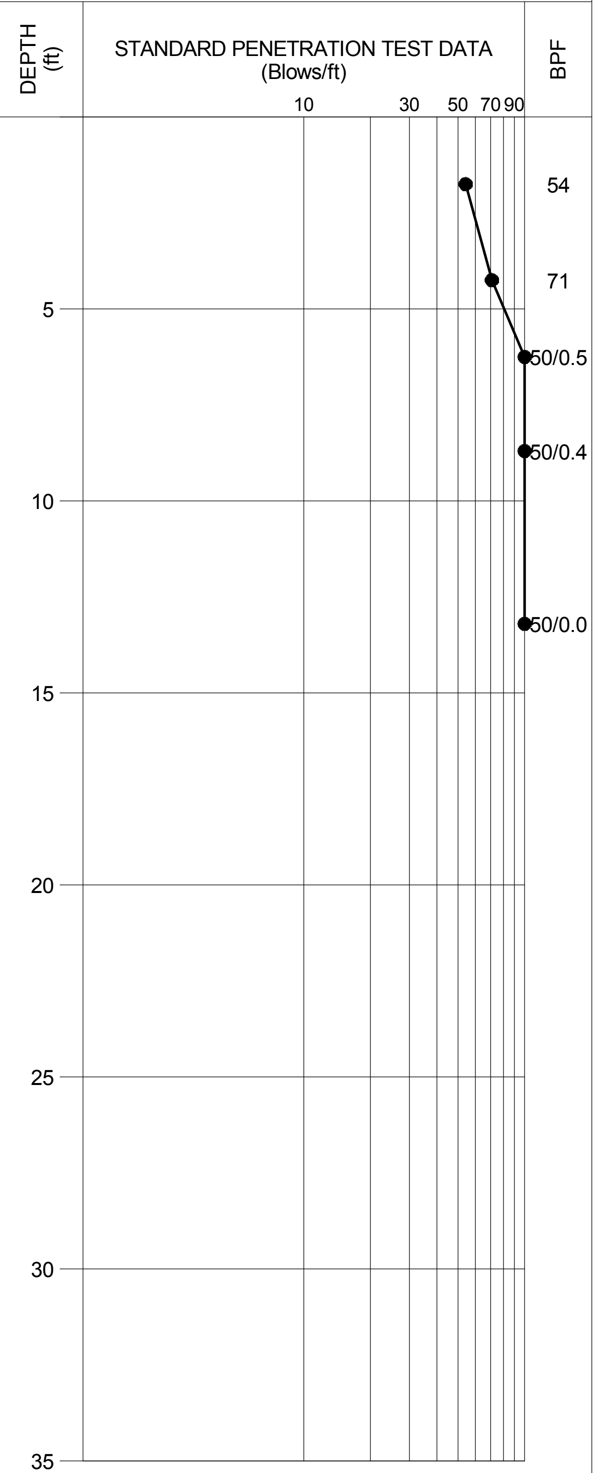
RESIDUUM: Very Hard Gray Brownish Tan Fine Sandy **SILT**

PARTIALLY WEATHERED ROCK:
When Sampled Becomes Gray Brownish Tan Clayey Fine Sandy **SILT**

HC

Auger refusal encountered at 13.2 feet. Boring was terminated at 13.2 feet. Hole cave-in was observed at 11.2 feet.





DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

ESP Associates, P.A.

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-46

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 13.8 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/27/16	**WATER LEVEL:** Dry@ TOB		

DEPTH (ft) | GRAPHIC LOG | SOIL DESCRIPTION | WATER LEVEL | SAMPLE

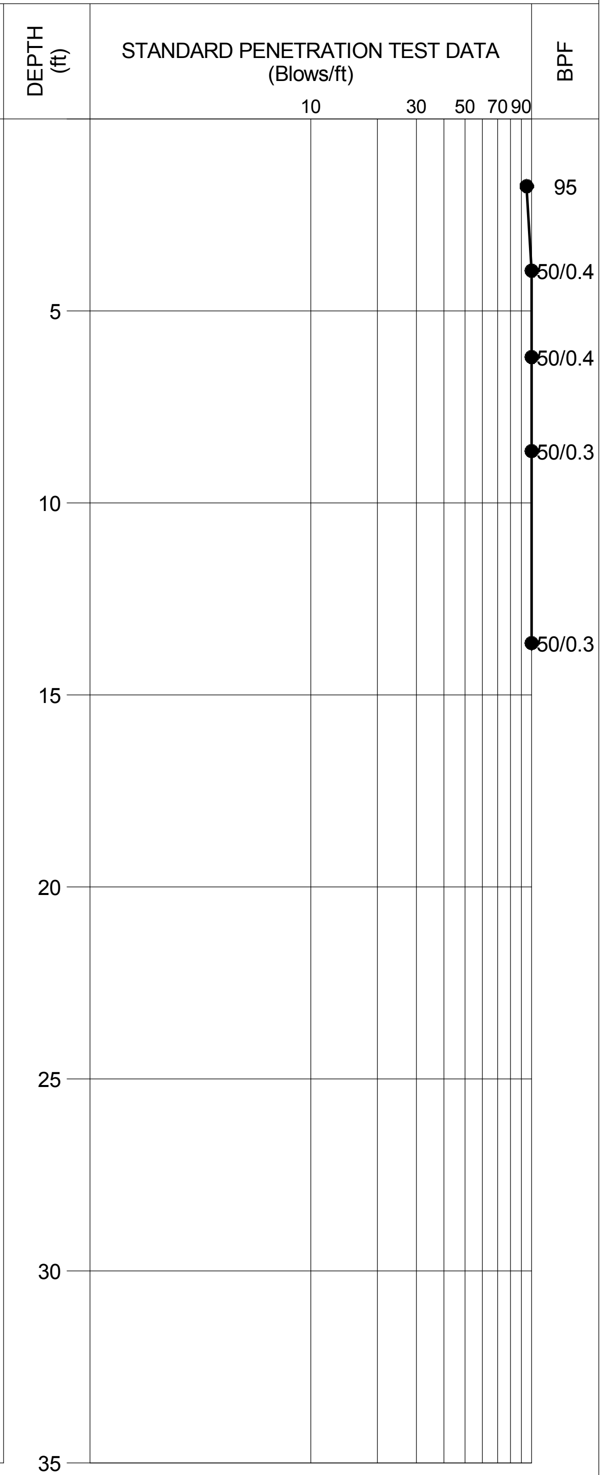
TOPSOIL/ROOTMAT

RESIDUUM: Very Hard Gray Brownish Tan Clayey Fine Sandy **SILT**

PARTIALLY WEATHERED ROCK: When Sampled Becomes Gray Brownish Tan Fine Sandy **SILT**

HC

Boring was terminated at 13.8 feet. Hole cave-in was observed at 11.7 feet.



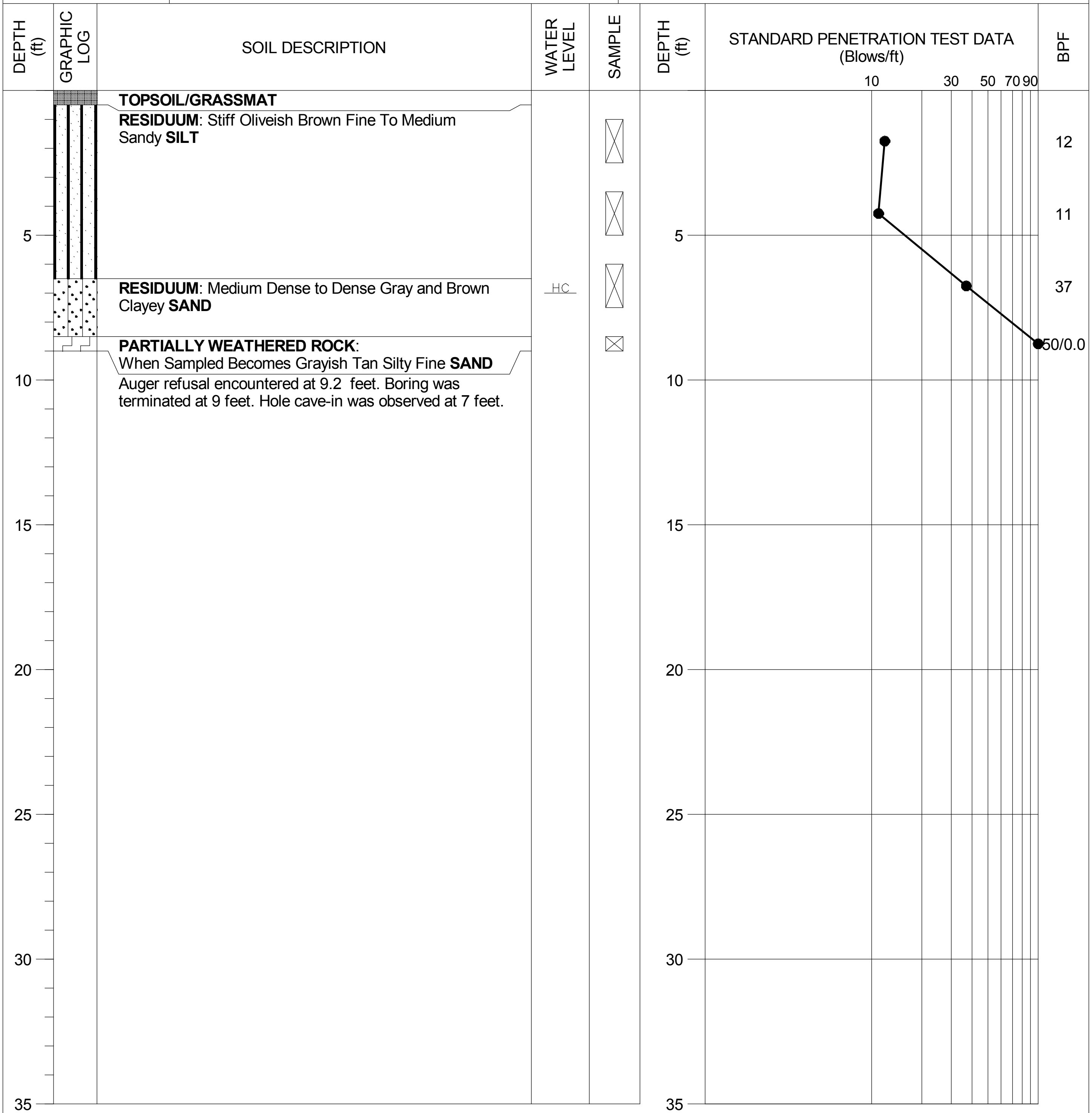
DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-47

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 9 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:** Performed at Creek Crossing
DATE DRILLED: 06/27/16	**WATER LEVEL:** Dry@ TOB		



TOPSOIL/GRASSMAT

RESIDUUM: Stiff Oliveish Brown Fine To Medium Sandy **SILT**

RESIDUUM: Medium Dense to Dense Gray and Brown Clayey **SAND**

PARTIALLY WEATHERED ROCK: When Sampled Becomes Grayish Tan Silty Fine **SAND**

Auger refusal encountered at 9.2 feet. Boring was terminated at 9 feet. Hole cave-in was observed at 7 feet.

DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

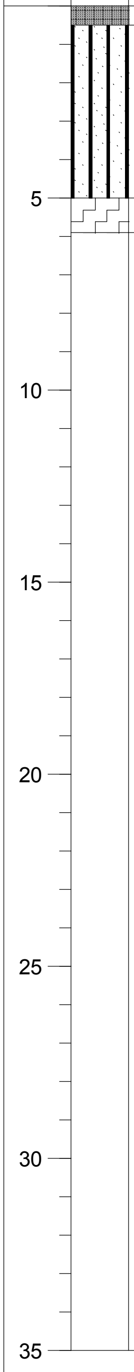
ESP Associates, P.A.

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-48

PROJECT No.: EP08.300
ELEVATION: Existing Ground Surface
DRILLING METHOD: Hollow Stem Auger
DRILLING COMPANY: Ameridrill
LOGGED BY: Jeff Black
BORING DEPTH: 5.9 Feet
DRILL RIG: CME550X (ATV)
NOTES: Performed at Creek Crossing
DATE DRILLED: 06/27/16
WATER LEVEL: Dry@ TOB

DEPTH (ft)	GRAPHIC LOG	SOIL DESCRIPTION	WATER LEVEL	SAMPLE	DEPTH (ft)	STANDARD PENETRATION TEST DATA (Blows/ft)	BPF



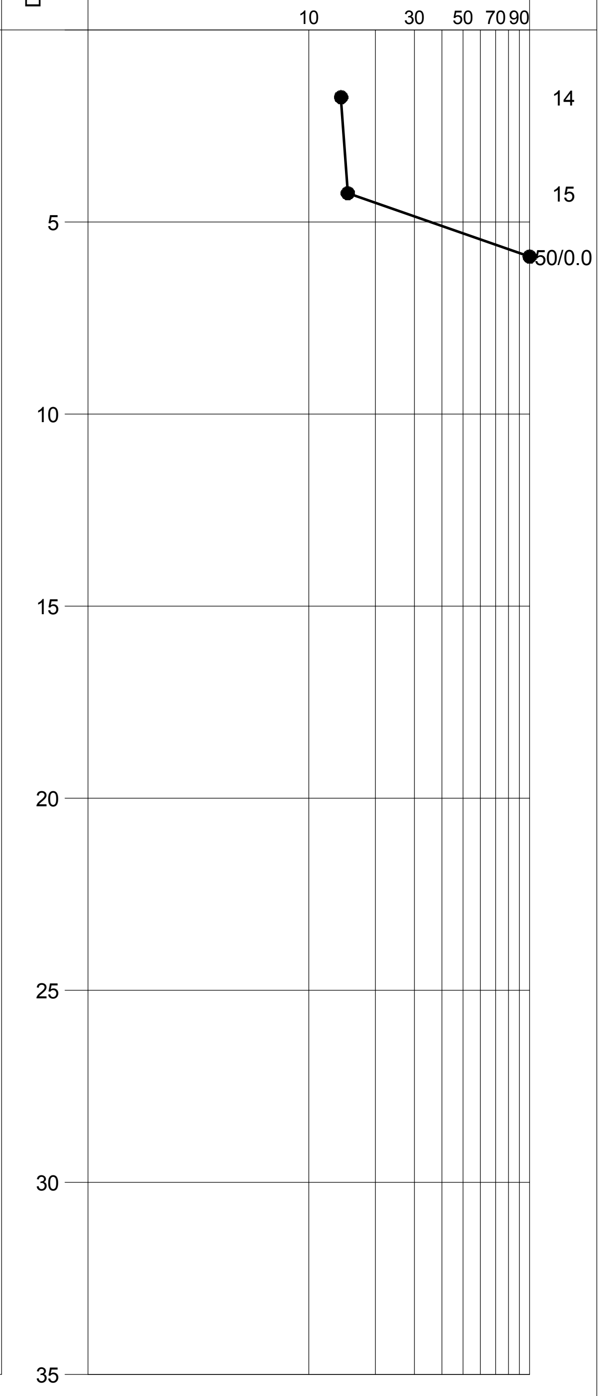
TOPSOIL/GRASSMAT

RESIDUUM: Stiff Olive to Brown Fine To Medium Sandy **SILT**

HC

PARTIALLY WEATHERED ROCK: When Sampled Becomes Olive and Tan Silty Fine **SAND**

Auger refusal encountered at 5.9 feet. Boring was terminated at 5.9 feet. Hole cave-in was observed at 3.8 feet.



DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

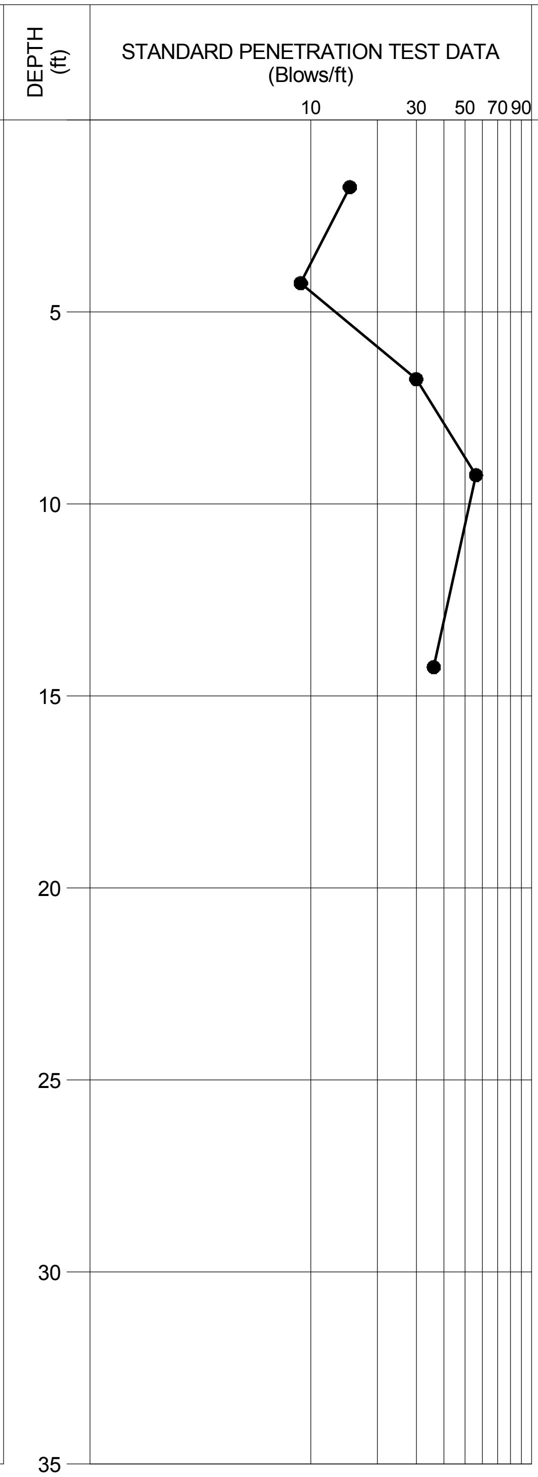
ESP_TBR EP08.300.GPJ LOG-LAB.GDT 7/22/16

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-49

PROJECT No.: EP08.300
ELEVATION: Existing Ground Surface
DRILLING METHOD: Hollow Stem Auger
DRILLING COMPANY: Ameridrill
LOGGED BY: Jeff Black
BORING DEPTH: 15 Feet
DRILL RIG: CME550X (ATV)
NOTES:
DATE DRILLED: 06/27/16
WATER LEVEL: Dry@ TOB

DEPTH (ft)	GRAPHIC LOG	SOIL DESCRIPTION	WATER LEVEL	SAMPLE
0		**TOPSOIL/GRASSMAT**		
		RESIDUUM: Stiff Orangish Brown Fine To Medium Sandy **SILT**		☒ ☒
6		**RESIDUUM**: Medium Dense to Dense Tannish Olive Silty **SAND**	HC	☒ ☒ ☒
15		Boring was terminated at 15 feet. Hole cave-in was observed at 11.7 feet.		



BPF
15
9
30
56
36

DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

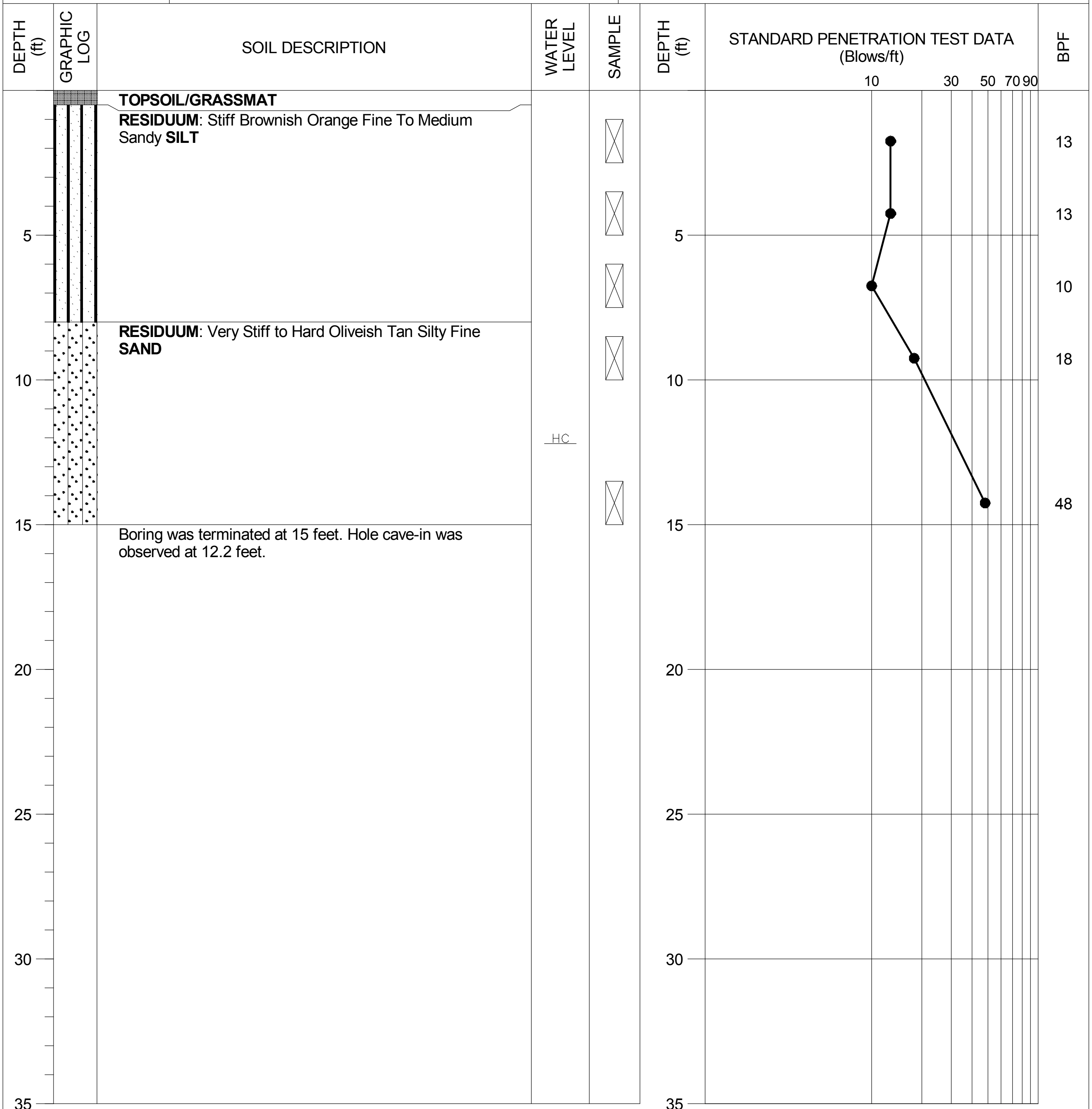
DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

ESP Associates, P.A.

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-50

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 15 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/21/16	**WATER LEVEL:** Dry@ TOB		



TOPSOIL/GRASSMAT

RESIDUUM: Stiff Brownish Orange Fine To Medium Sandy **SILT**

RESIDUUM: Very Stiff to Hard Oliveish Tan Silty Fine **SAND**

Boring was terminated at 15 feet. Hole cave-in was observed at 12.2 feet.

DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

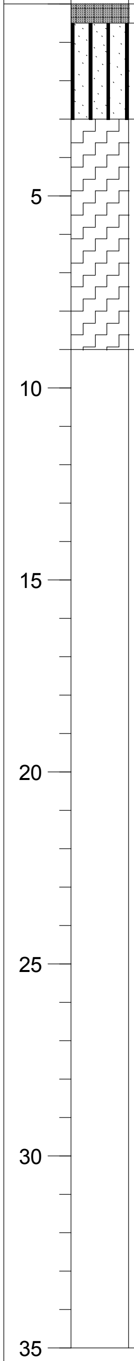
ESP Associates, P.A.

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-51

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 9 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/21/16	**WATER LEVEL:** Dry@ TOB		

DEPTH (ft) | GRAPHIC LOG | SOIL DESCRIPTION | WATER LEVEL | SAMPLE

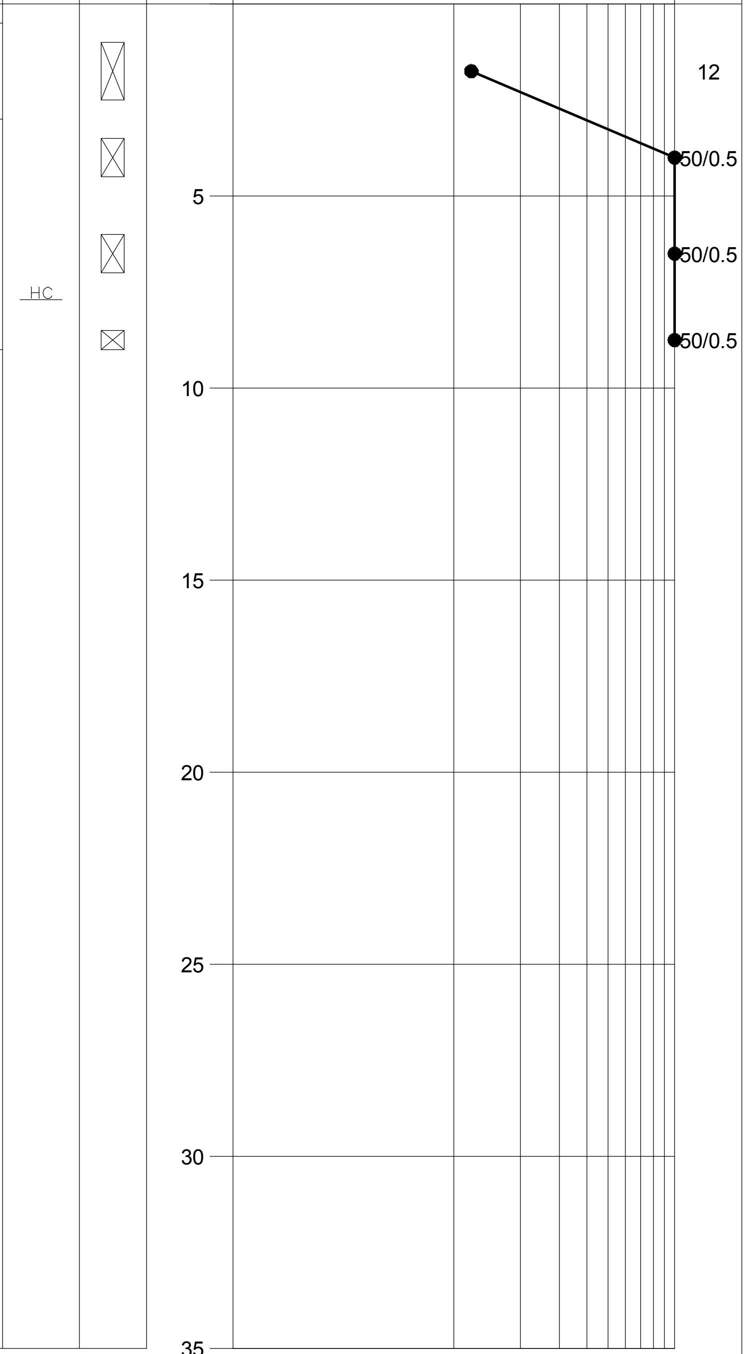


TOPSOIL/GRASSMAT

RESIDUUM: Stiff Reddish Orange Fine To Medium Sandy **SILT**

PARTIALLY WEATHERED ROCK: When Sampled Becomes Oliveish Brown Silty Fine **SAND**

Auger refusal encountered at 10.3 feet. Boring was terminated at 9 feet. Hole cave-in was observed at 7.7 feet.



DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

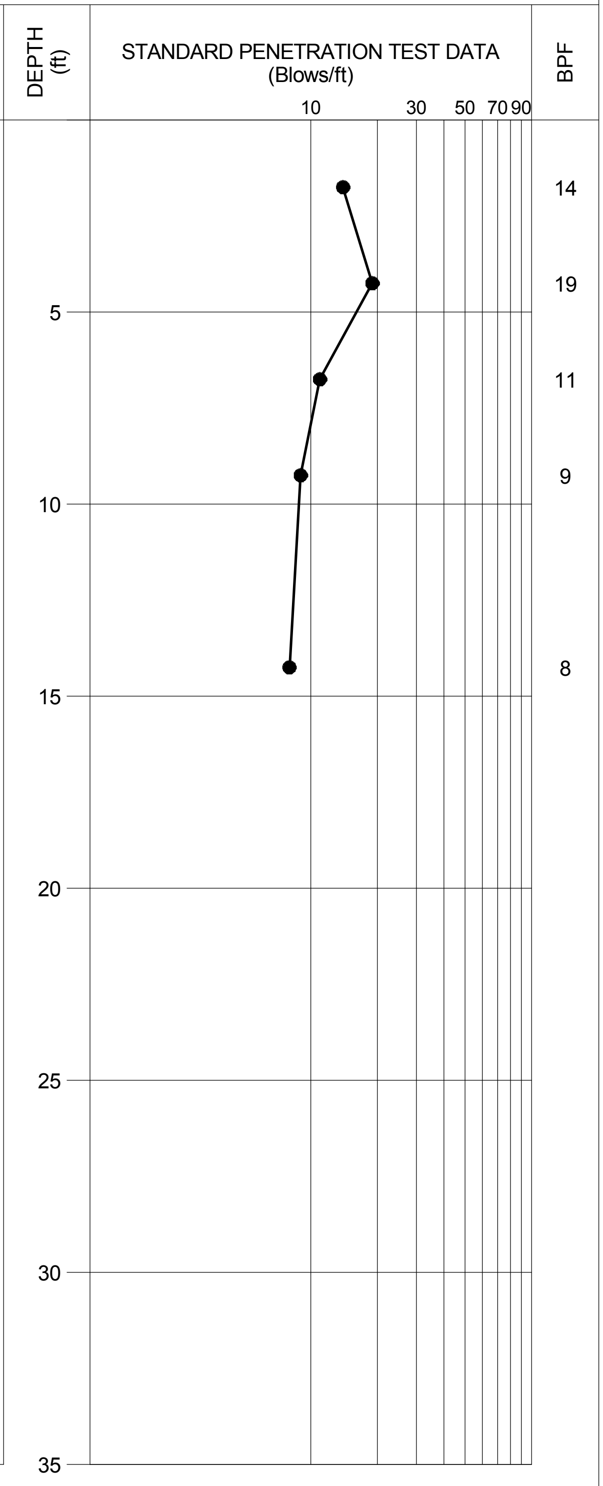
ESP Associates, P.A.

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-52

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 15 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/21/16	**WATER LEVEL:** Dry@ TOB		

DEPTH (ft)	GRAPHIC LOG	SOIL DESCRIPTION	WATER LEVEL	SAMPLE
0		**TOPSOIL/GRASSMAT**		
		RESIDUUM: Very Stiff to Firm Orangish Brown Fine To Medium Sandy **SILT**		☒ ☒ ☒ ☒
			HC	☒
15		Boring was terminated at 15 feet. Hole cave-in was observed at 12.6 feet.		



DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

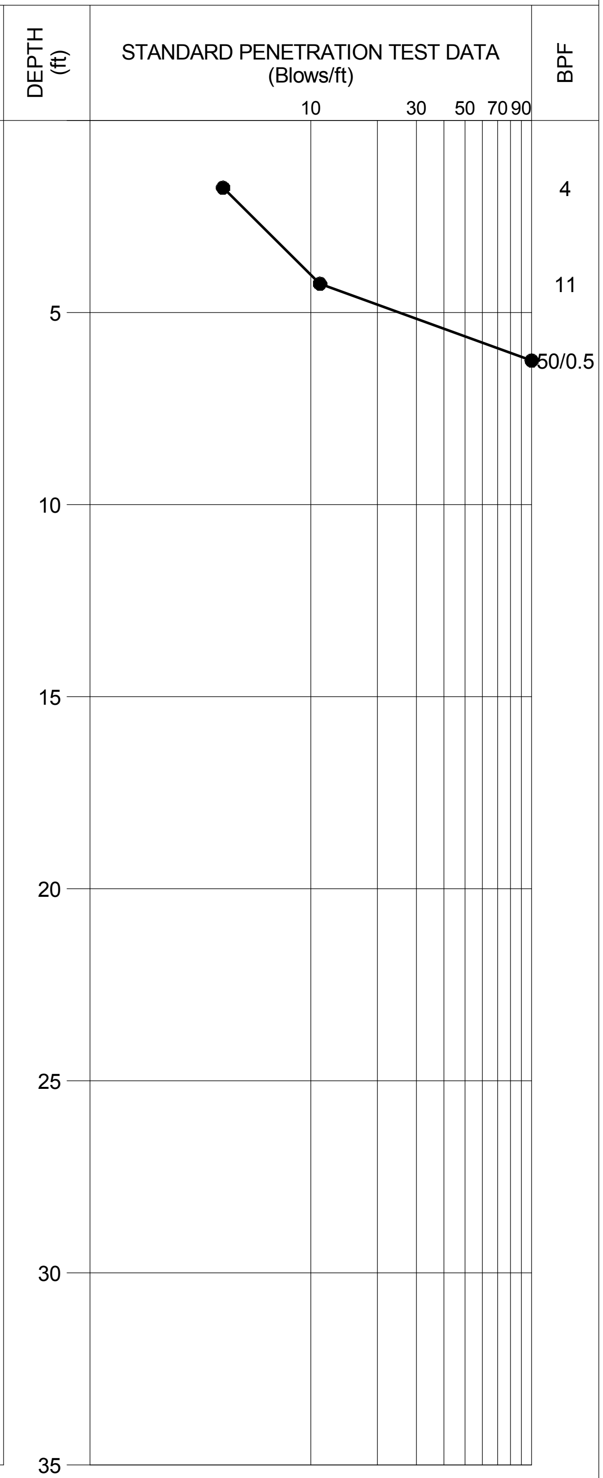
ESP Associates, P.A.

PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-53

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 6 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/23/16	**WATER LEVEL:** Dry@ TOB		

DEPTH (ft)	SOIL DESCRIPTION	WATER LEVEL	SAMPLE
	TOPSOIL/GRASSMAT		
	RESIDUUM: Soft to Stiff Tannish Brown Fine Sandy Clayey **SILT**, with rock fragments		☒
5		HC	☒
	PARTIALLY WEATHERED ROCK: When Sampled Becomes Tannish Brown Fine Sandy **SILT**		☒
	Auger refusal encountered at 6 feet. Boring was terminated at 6 feet. Hole cave-in was observed at 5.3 feet.		
10			
15			
20			
25			
30			
35			



DEPTH MEASUREMENTS ARE SHOWN TO ILLUSTRATE THE GENERAL ARRANGEMENTS OF THE SOIL TYPES ENCOUNTERED AT THE BORING LOCATIONS.

DO NOT USE DEPTH MEASUREMENTS FOR DETERMINATION OF DISTANCES OR QUANTITIES.

ESP Associates, P.A.

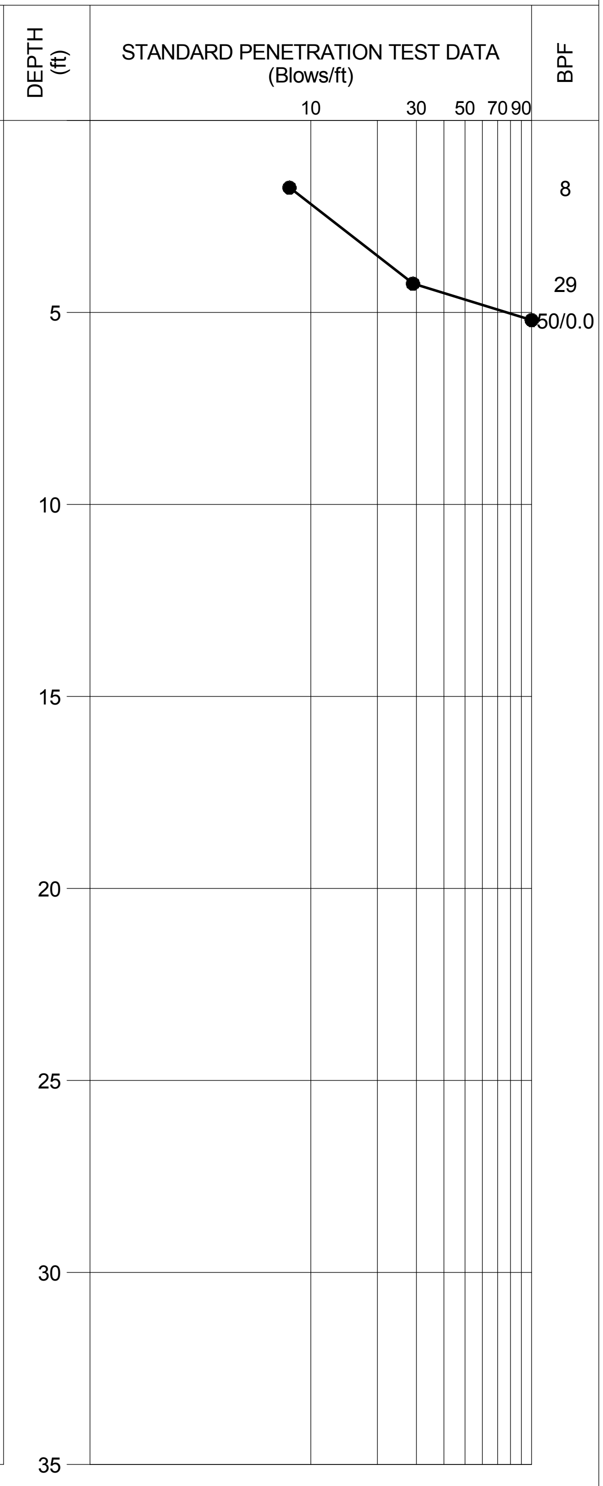
PROJECT: Union County Pipeline West Alignment
Monroe, North Carolina

TEST BORING RECORD B-54

PROJECT No.: EP08.300	**ELEVATION:** Existing Ground Surface	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING COMPANY:** Ameridrill
LOGGED BY: Jeff Black	**BORING DEPTH:** 5.2 Feet	**DRILL RIG:** CME550X (ATV)	**NOTES:**
DATE DRILLED: 06/23/16	**WATER LEVEL:** Dry@ TOB		

DEPTH (ft)	SOIL DESCRIPTION	WATER LEVEL	SAMPLE	BPF
0	**TOPSOIL/GRASSMAT**			
	FILL: Firm Grayish Brown Fine Sandy Clayey **SILT**		☒	8
	RESIDUUM: Very Stiff Brownish Gray Clayey Fine Sandy **SILT**	HC	☒	29
5	**PARTIALLY WEATHERED ROCK**: When Sampled Becomes Brownish Gray Fine Sandy **SILT**			50/0.0

Auger refusal encountered at 5.2 feet. Boring was terminated at 5.2 feet. Hole cave-in was observed at 3 feet.



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