FAYETTEVILLE PUBLIC WORKS COMMISSION

PROCUREMENT DEPARTMENT

https://www.faypwc.com/bids/

Bid Addendum

PWC Number:	PWC2324041
Bid Title :	Cumberland Rd. Substation Installation Labor Contract
Bid Opening Date and Time:	Thursday, January 25, 2024 at 2:00 P.M. E.T
Addendum Number:	III
Addendum Date:	January 22, 2024
Procurement Advisor:	*Victoria McAllister, Procurement Manager* *procurement@faypwc.com*

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1. Acknowledgement of this Addendum must be done within Bid Summary section listed within the Bid Documents.
2. The solicitation is hereby modified as follows:

   M1. APPENDICES, GEOTECHNICAL SOIL BORING REPORT
   Attached is the latest soil boring report available.

Utility Electrical Consultants PC

200 W. Morgan Street • Suite 100 • Raleigh, North Carolina 27601-1338
Telephone: (919) 821-1410 • FAX: (919) 821-2417

March 14, 2001

Mr. Marcus R. Tunstall
Electric Operations Manager
Public Works Commission of the
City of Fayetteville
P.O. Box 1089 (28302-1089)
970 Public Works Drive
Fayetteville, North Carolina 28302

Subject: Cumberland Road Substation
Soil Borings

Dear Marc:

As we discussed Monday, we would like for you to coordinate two soil borings in the Cumberland Road Substations. A drawing is enclosed showing the ideal location of the borings. However, if there is any conflict with an overhead or an underground circuit, a boring may be relocated within the areas shown by the dashed lines. It is my understanding that PWC will provide cable locations within the station and will provide an observer while the S&ME crew is working inside the station.

The purpose of the boring is to provide information on soil conditions for design of the 69 kV full-tension structure foundations. The foundations will experience the following maximum conditions:

Shear - 14 kips
Uplift - 78 kips
Compression - 87 kips

Our present plans call for these to be drilled pier foundations. These will probably be more economical and cause less disruption during installations.

We request that boring be to a depth of 25' with split spoon samples taken at standard intervals. If unusual conditions are encountered the boring should be extended appropriately. The report by SM&E should give their recommendations for design values.

Please let me know if we can provide additional information. We will proceed with foundation design when the report is received.

Sincerely,

Edward S. Thomas, PE

cc: James R. Cates

est/kcw

00-1320-0016

SUBSURFACE EXPLORATION REPORT
PWC CUMBERLAND ROAD SUBSTATION
CUMBERLAND ROAD AND CARBINE STREET
FAYETTEVILLE, NORTH CAROLINA
S&ME JOB NO. 1033-01-920

Prepared For:

PWC – Electric Construction & Maintenance
P.O. Box 1089
Fayetteville, North Carolina 28302

Prepared By:

S&ME, Inc.
409 Chicago Drive, Suite 116
Fayetteville, North Carolina 28306

May 2001

S&ME

S&ME

May 18, 2001

Mr. Marc Tunstall
Public Works Commission
Electric Construction & Maintenance
P.O. Box 1089
Fayetteville, North Carolina 28302-1089

Reference: Report of Subsurface Exploration
Cumberland Road Substation
Cumberland Road and Carbine Street
Fayetteville, North Carolina
S&ME, Inc. Project Number 1033-01-920

Dear Mr. Tunstall;

S&ME, Inc. (S&ME) has completed the authorized Subsurface Exploration at the above referenced project located at the northwest corner of the intersection of Cumberland Road and Carbine Street in Fayetteville, North Carolina. The following report presents a description of our exploration and testing procedures, findings and recommendations.

SITE AND PROJECT INFORMATION

The subject property is presently developed. We understand that two deadend structures are to be constructed to support a 69 kV power line. Based upon the information provided by Mr. Ed Thomas of Utility Electrical Consultants, PC, the foundations will be designed to resist a maximum shear load of 14 kips, a maximum uplift load of 78 kips, and a maximum compression load of 87 kips. Both shallow foundations and 48-inch diameter drilled shafts are being considered.

S&ME, Inc.
409 Chicago Drive, Suite 116
Fayetteville, North Carolina 28306

(910) 323-1091
(910) 323-3499 fax

EXPLORATION PROCEDURES

Field

Two soil borings were drilled at the approximate locations shown in Figure 1 of this report. The boring locations were determined by measuring from known reference points and should be considered approximate.

The borings were drilled using an All Terrain Vehicle mounted with a CME-55 drill rig. Hollow stem, continuous flight augers were used to advance the borings to the termination depths. Standard Penetration Tests (SPT) were performed in the borings at 2.5-foot intervals in the top 10 feet, and then at 5-foot intervals thereafter in general accordance with the procedures presented in ASTM D 1586 to provide an index for estimating strength parameters and the relative consistency of the subsurface soils. In conjunction with the SPT testing, split-spoon samples were recovered for classification.

Water level measurements were noted during, and upon completion of, the drilling activities at each boring location. The boreholes were left open until completion of the daily drilling activities and backfilled with the auger cuttings before leaving the site. Water levels were measured prior to backfilling the boreholes.

Laboratory

After the soil samples were delivered to our laboratory, a geotechnical engineer examined each sample to visually classify the soils. The results of the engineer's classifications as well as field test results are presented on the individual Boring Logs included in the appendix. Similar soils were grouped into strata on the Boring Logs. The strata contact lines represent approximate boundaries between soil types. The actual transitions between soil types in the field is likely more gradual in both vertical and horizontal directions than those indicated on the Boring Logs.

SUBSURFACE CONDITIONS

The generalized conditions at the site are described below. More detailed descriptions and stratifications at a particular boring location are presented in the respective Boring Log included in the appendix of this report.

Surface Conditions

The proposed site is currently developed. The near surface conditions encountered at the boring locations generally consisted of approximately 2 to 3 inches of sand and gravel.

Coastal Plain Sediments

Underlying the thin surficial layer of sand and gravel, Coastal Plain sediments were encountered. The soils encountered in the borings consisted of silty and slightly clayey fine to medium sands. Standard Penetration Test (SPT) blow counts ranged from 2 to 25 blows per foot.

Water Levels

Water levels were not encountered during the drilling activities. However, upon completion of the drilling work, the borings had caved at a depth of approximately 17 feet. Often these caved depths represent the presence of water seepage near, or just below, the caved depths. The site water levels will also fluctuate with seasonal and climatic changes and may be higher at other times of the year.

SITE EARTHWORK RECOMMENDATIONS

Clearing, Grubbing and Stripping

Prior to initiating the earthwork, the proposed structural areas of the site should be cleared of any other deleterious materials.

Site Preparation – Shallow Foundations

After the structural areas of the site have been cleared and stripped of deleterious or unsuitable materials, the exposed subgrade should be densified with a vibratory roller (minimum loaded weight of 10 tons) to identify areas requiring surface repair. The densification should consist of four complete passes of the equipment over the subgrade, with the second pass perpendicular to the first. Areas of subgrade that rut or deflect excessively in the opinion of the geotechnical engineer should be repaired.

If the near surface soils are wet, the subgrade could be repaired by discing or scarifying the near surface soils and allowing time for the soils to air dry. Once the natural soil moisture contents have been lowered, the surface soils can be compacted. Weather conditions, project schedule constraints, or space limitations may make drying of the surface soils impractical.

The exposed subgrade soils for both cut and fill areas, as well as repaired areas, can deteriorate when exposed to construction activities and environmental changes. Subgrade soil deterioration can occur due to freezing, erosion, softening from ponded water, perched water, and rutting from construction traffic.

Potential Subgrade Repair and Improvement Methods

Due to the very loose soil conditions, densification of the foundation soils for shallow foundations will be necessary. Densification may be accomplished with a vibratory roller (minimum loaded weight of 10 tons) making 10 to 12 passes over the subgrade. The effectiveness of the densification can be monitored by performing DCP tests prior to starting the compaction work and then retesting the area after 4 to 5 passes of roller have been performed. If the soils cannot be densified, undercutting within the foundation area will be required.

The exposed subgrade soils for both cut and fill areas as well as repaired areas can deteriorate when exposed to construction activities and environmental changes. Subgrade soil deterioration can occur due to freezing, erosion, softening from ponded water, perched water, and rutting from construction traffic. Exposed subgrades and structural fill that has deteriorated in the building and pavement areas should be repaired by scarifying and recompacting as soon as practical.

Structural Fill Material

We do not anticipate that significant fill depths will be required. However, any fill used to reach finished grade should be clean (free of organics, roots, and other debris and deleterious materials), free of elongated or flat particles which may be susceptible to degradation, and have a low plasticity (plasticity index less than 20). In addition, the structural fill material should have a maximum dry weight of at least 100 pounds per cubic foot as determined by the Standard Proctor compaction test (ASTM D 698).

Generally, soils meeting the Unified Soils Classification System (USCS) designations of SP, SM, and SC are suitable for structural fill. However, clayey sands (SC) with a plasticity index higher than 20 would be unsuitable for use as structural fill.

In addition, we recommend that relatively clean sand be used as structural fill for backfilling undercuts. The granular fill should consist of a low to non-plastic sand (SP, SP-SM, or SP-SC) with a maximum of 12 percent by weight passing a No. 200 sieve.

Structural Fill Placement and Compaction

Structural fill should be placed in uniform lifts of 10 inches or less (loose measure) and compacted to at least 98 percent of the maximum dry density at a moisture content within 3 percent of the optimum moisture as defined by the Standard Proctor. To confirm that the specified degree of compaction is being obtained, field density testing should be performed in each lift by a soils technician.

DESIGN RECOMMENDATIONS

Foundation Support

Provided our site preparation recommendations are implemented and verified in the field by the geotechnical engineer or his representative, the site subsurface conditions will be suitable for supporting the proposed deadend structures on a shallow foundation system.

Based on the subsurface data obtained at the test boring locations, the subsurface conditions appear satisfactory for supporting the proposed deadend structures on shallow foundations. Provided the deadend structures are embedded at least 4 feet below the existing ground surface, it is our opinion that an allowable soil bearing pressure of 2000 pounds per square foot (psf) would be applicable for designing shallow foundations at this site. The results of our engineering analysis show that a compression load of 87 kips supported on a spread footing designed for a 2000 psf bearing pressure could experience total foundation settlements of approximately one inch.

Shallow foundations may also be used to resist the horizontal and vertical loads at the proposed deadend locations. The following soil parameters can be used to analyze uplift of shallow square footings:

Unit weight = 115 pounds per cubic foot (pcf)
Friction Angle = 30 degrees
At rest earth pressure coefficient = 0.5

The following equivalent fluid weight pressures may be used to design the deadend foundations assuming the soils have an effective stress friction angle of 30 degrees and a moist unit weight of 115 pcf.

Equivalent fluid weight for at-rest lateral earth pressure (pcf):	57
Equivalent fluid weight for passive lateral earth pressure (pcf):	345

The above earth pressure values are for soil conditions above the water table (total stress).

For sliding resistance of the square footing, the normal force acting downward on the footing times a frictional factor of .3 may be used to compute the shear resistance along the bottom of the footing.

Drilled Shafts

If a 48-inch diameter drilled shaft will be used as the deadend structure, a unit skin friction value of 500 psf can be used for determining the depth of a drilled shaft. Based upon this unit skin friction value, the shaft would need to be embedded at least 12 feet.

LIMITATIONS OF THE SUBSURFACE EXPLORATION REPORT

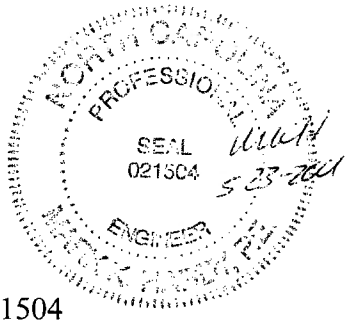
This report has been prepared in accordance with generally accepted engineering practice for the specific application to this project. The conclusions and recommendations contained in this report are based on the applicable standards of our profession at the time this report was prepared. No other warranty, expressed or implied, is made.

The analysis and recommendations submitted in this report are based upon the information provided regarding the proposed structure and use and the data obtained from the subsurface exploration. The nature and extent of variations between soil borings may not be evident until construction. If variations appear evident, then it will be necessary to reevaluate the recommendations of this report. In the event that any changes in the nature, design, or location of the proposed structures are planned or if the project information including anticipated structural loads are incorrect, the conclusions and recommendations contained in this report will not be considered valid unless the changes are reviewed and the conclusions of the report modified and verified in writing.

S&ME should be provided the opportunity for a general review of the final design and the specifications in order that the earthwork and foundation recommendations outlined in this report might be properly interpreted and implemented.

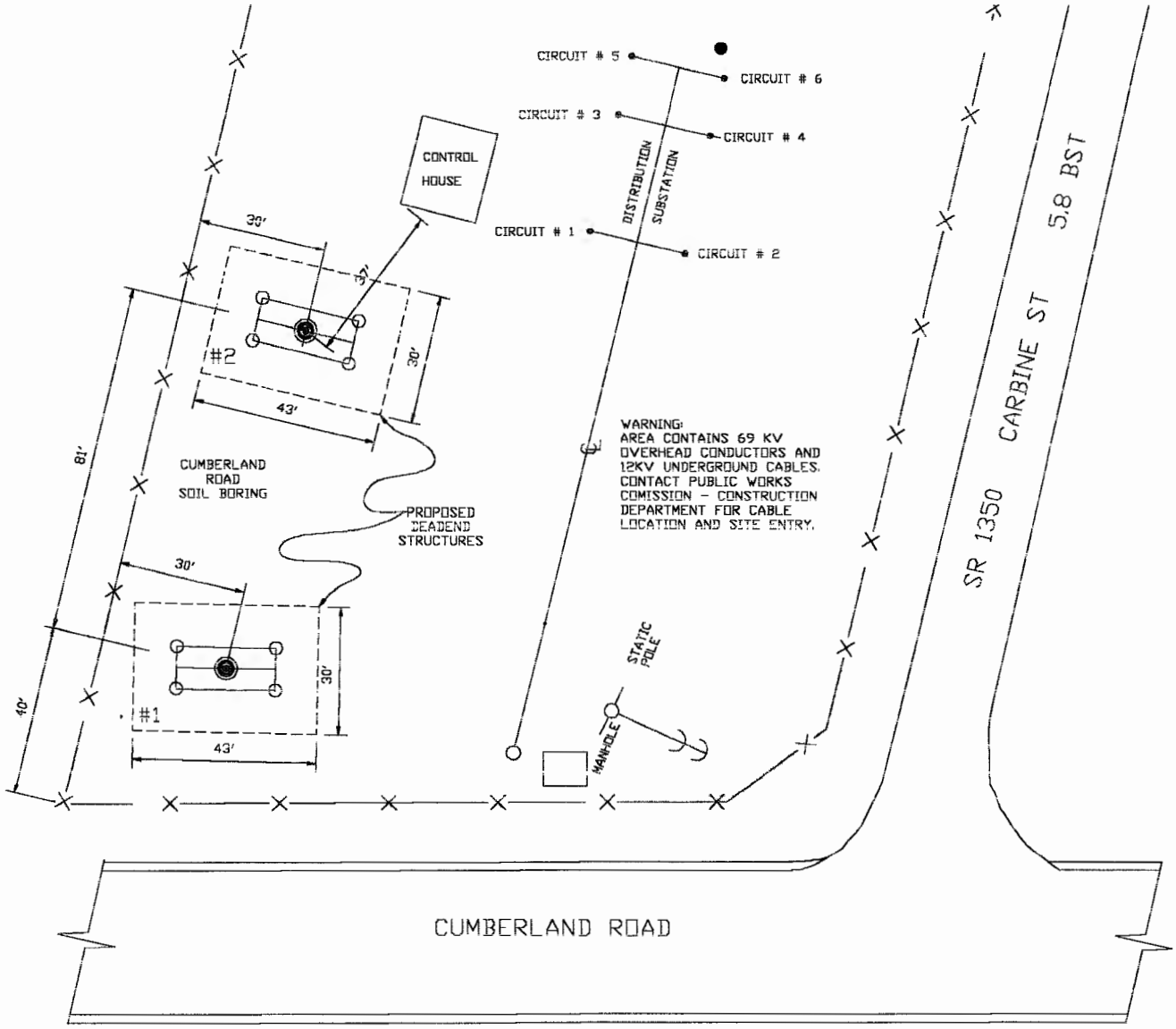
S&ME appreciates the opportunity to provide geotechnical engineering services for this project. If we can be of additional service to you, please do not hesitate to contact us.

Sincerely,
S&ME, Inc.



Mark K. Hardy, P.E.
NC Registration No. 021504
Fayetteville Branch Engineer

Michael W. Behen, P.E.
NC Registration No. 8384
Senior Geotechnical Engineer



RALEIGH

Utility Electrical Consultants PC

NORTH CAROLINA

PUBLIC WORKS COMISSION

FAYETVILLE, NORTH CAROLINA

CUMBERLAND ROAD SOIL BORING

DRAWN BY:	SDL	JOB NO.:	1230	SCALE:	NTS
CHECKED BY:	JRC	CAD FILE:	1320CRSB		
APPROVED BY:	EST	DATE:	3/13/01	SHEET NO.	1 OF 1

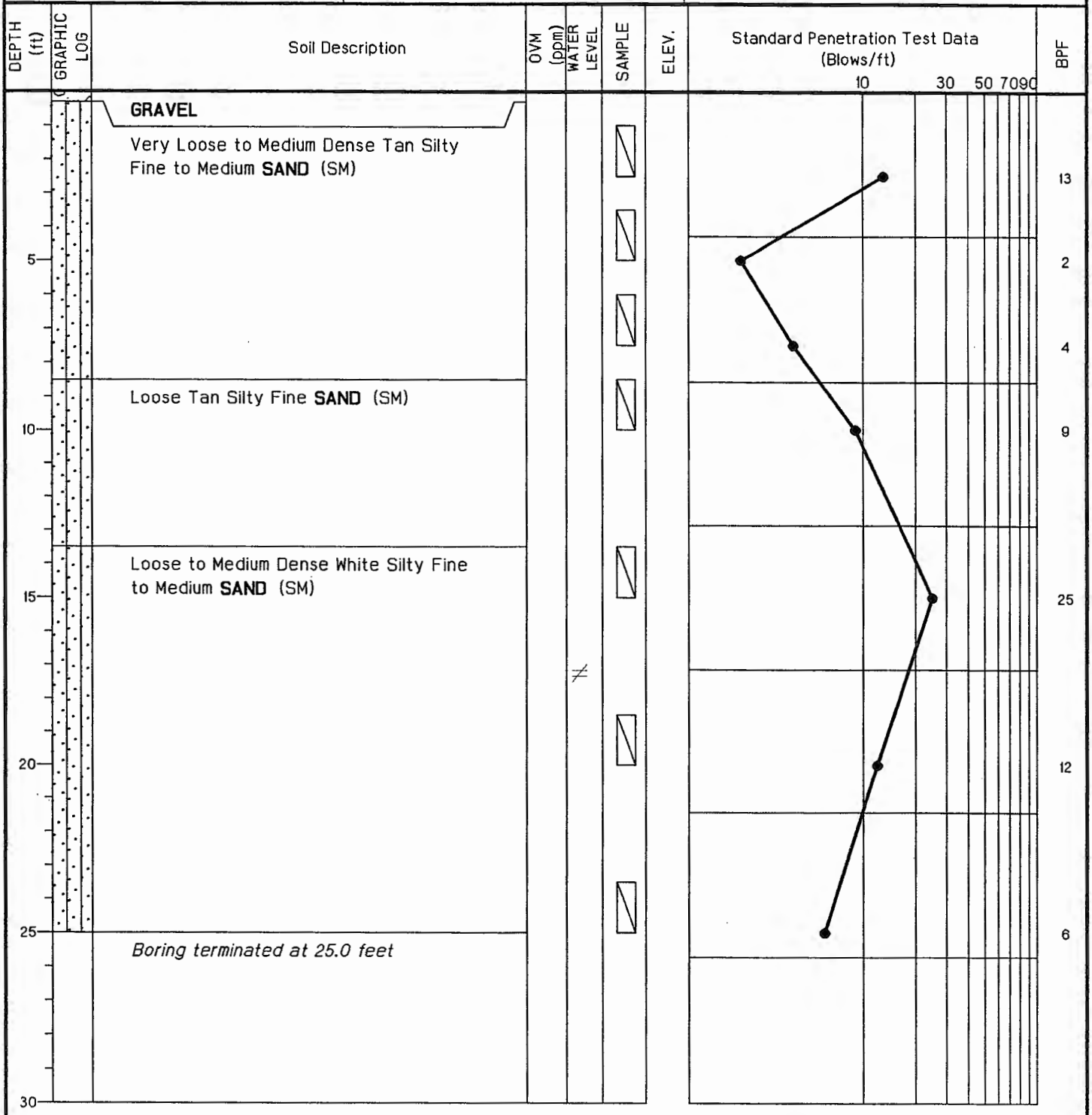
PROJECT:	PWC Cumberland Road Substation Fayetteville, North Carolina	TEST BORING RECORD	B-1
PROJECT NO.:	1033-01-920	ELEVATION:	
LOGGED BY:	S&ME, Inc.	BORING DEPTH:	25.0 FEET
DATE DRILLED:	05-09-2001	WATER LEVEL:	17 Feet
DRILLING METHOD:	HSA	DRILL RIG:	CME-55

NOTES:
S&ME, Inc. Fayetteville, North Carolina

DEPTH (ft)	Soil Description	OVM (ppm)	WATER LEVEL	SAMPLE	ELEV.	Standard Penetration Test Data (Blows/ft) 10 30 50 70 90	BPF
0	**GRAVEL**						
	Very Loose to Loose Tan Silty Fine to Medium **SAND** (SM)						7
5							3
	Very Loose to Loose Tan Silty Fine **SAND** (SM)						4
10							7
	Very Loose to Medium Dense Yellow-Tan Silty Fine **SAND** (SM)		≠				20
15							
20							4
25	*Boring terminated at 25.0 feet*						10
30							

S&ME
Environmental Services
Engineering * Testing

PROJECT:	PWC Cumberland Road Substation Fayetteville, North Carolina	TEST BORING RECORD B-2
PROJECT NO.: 1033-01-920	ELEVATION:	NOTES: S&ME, Inc. Fayetteville, North Carolina
LOGGED BY: S&ME, Inc.	BORING DEPTH: 25.0 FEET	
DATE DRILLED: 05-09-2001	WATER LEVEL: 17 Feet	
DRILLING METHOD: HSA	DRILL RIG: CME-55	



S&ME
Environmental Services
Engineering * Testing

LEGEND TO SOIL CLASSIFICATION AND SYMBOLS

SOIL TYPES

(Shown in Graphic Log)


Asphalt/Concrete


Topsoil


Gravel


Sand


Silt


Clay


Organic


Sandy


Silty


Clayey


Silty Sand


Clayey Sand


Sandy Silt


Clayey Silt


Sandy Clay


Silty Clay


Partially Weathered Rock


Cored Rock

WATER LEVELS

(Shown in Water Level Column)

▽ = Water Level At Termination Of Boring
▼ = Water Level Taken After 24 Hours
◀ = 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

RELATIVE DENSITY OF COHESIONLESS SOILS

RELATIVE DENSITY	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

SAMPLER TYPES

(Shown in Samples Column)

■ Shelby Tube

⊠ Split Spoon

I Rock Core

□ No Recovery

TERMS

Standard Penetration Resistance – The Number of Blows of 140 lb. Hammer Falling 30 in. Required to Drive 1.4 in. I.D. Split Spoon Sampler 1 Foot. 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%.

RQD – Total Length of Sound Rock Segments Recovered that are Longer Than or Equal to 4" (mechanical breaks exluded) Divided by the Total Length of the Core Run Times 100%.

S&ME
Environmental Services
Engineering * Testing