REPORT OF PRELIMINARY GEOTECHNICAL EXPLORATION

DAN ROGERS INDUSTRIAL PARK

Dillon County, South Carolina
S&ME Project No. 1611-05-284

Prepared For:

Alliance Consulting Engineers, Inc.
Post Office Box 8147
Columbia SC 29202-8147

Prepared By:

S&ME, Inc.
231 Labonte Street
Conway, South Carolina 29526

August 12, 2005

August 12, 2005

Alliance Consulting Engineers, Inc.
Post Office Box 8147
Columbia SC 29202-8147

Attention: Mr. Jamie Frost, P.E.

Reference: **Report of Preliminary Geotechnical Exploration**
Dan Rogers Industrial Park
Dillon County, South Carolina
S&ME Project No. 1611-05-284

Dear Mr. Frost:

As requested S&ME, Inc. has conducted a preliminary geotechnical exploration at the above referenced site in general accordance with S&ME Proposal No. 1614-4107-05, dated June 27, 2005. The purpose of the exploration was to characterize and provide preliminary information about the on site subsurface soils based upon the widely spaced borings conducted. Information obtained was then used to provide site specific recommendations for the potential construction of light to medium industrial facilities. Recommendations include likely site preparation requirements, potential foundation types, and identification of potential borrow soils.

S&ME appreciates this opportunity to work with Alliance Consulting Engineers, Inc. as your geotechnical engineering consultant on this project. If you have any questions or need any further information in regard to this geotechnical report, please do not hesitate to contact us.

Very truly yours,
S&ME, Inc.

For, Joseph D. Laps
Geotechnical Professional

SOUTH CAROLINA
S & ME, INC.
No. C00473
CERTIFICATE OF AUTHORIZATION

James T. Palmer, P.E.
Engineering Dept. Manager

SOUTH CAROLINA
REGISTERED PROFESSIONAL ENGINEER
No. 19098
JAMES T. PALMER

S&ME, Inc.
134 Suber Road
Columbia, South Carolina 29210

(803) 561-9024
(803) 561-9177 fax
www.smeinc.com

PROJECT INFORMATION

Project information was provided to us by email on June 24, 2005 from Alliance Consulting Engineers, Inc. The site is approximately 144 acres and is located west of U.S. 301 and north of Secondary Road 292 approximately 4 miles northeast of Latta, South Carolina. Seaboard Coast Line Railroad borders the western portion of the site. Currently, the southern three-quarters of the site consist mostly of an agricultural field of cotton and soybean. The northern one-quarter of the site consists of woodland. The approximate location of the site is denoted on the Site Location Map (Figure 1) included in the Appendix.

Based on the information provided, the proposed construction will likely consist of light to medium industrial facilities with associated parking and drive areas. Specific structural loading information was not provided. However, based on our experience with similar construction, we assume that maximum column and wall loads will be on the order of 150 to 200 kips and 3 to 4 kips/ft, respectively. Also, we assume new fill heights of 2 feet or less will be required to grade the proposed building areas.

EXPLORATION PROCEDURES

Reconnaissance of the Project Area

We reviewed USGS topographic maps of the area prior to visiting the site. We then walked over the site to note land use, topography, surface drainage, ground cover and existing structures, as well as access to proposed sampling points. Right-of-entry to perform borings and other fieldwork on the property was granted with acceptance of our proposal by Mr. Gene Butler, Economic Developer of Dillon County, South Carolina.

Layout and Access to Boring Locations

Standard Penetration Test (SPT) boring locations are approximately indicated on the Geotechnical Exploration Location Plan (Figure 2) included in the Appendix. Borings locations were established in the field based on visual reference to existing site features. The borings were located in areas where our track-mounted SPT rig could obtain relatively easy access with little or no clearing. After boring locations were determined, corresponding GPS coordinates were recorded for all borings performed. A list of the borings and GPS coordinates recorded from the South Carolina 3900 Zone of the US State Plane 1983 coordinate system are included in the Appendix.

Drilling and Sampling

The site subsurface conditions were explored by performing five standard penetration test (SPT) borings at widely spaced locations across the site. Boring B-1 was performed to a depth of approximately 100 ft below existing grade. Four additional borings (designated B-2 through B-5) were each performed to a depth of approximately 30 ft below existing grade.

Soil sampling and penetration testing were performed in general accordance with ASTM D1586, *"Standard Test Method for Penetration Test and Split Barrel Sampling of Soils.* A rotary drilling process was used to advance the hole and a heavy drilling fluid was circulated in the bore holes to stabilize the sides and flush the cuttings. At regular intervals, drilling tools were removed and soil samples were obtained with a standard 1.4 inch I. D., two-inch O. D., split barrel sampler. The sampler was first seated six inches to penetrate any loose cuttings, and then driven an additional 12 inches with blows of a 140-pound hammer falling 30 inches. The number of hammer blows required to drive the sampler through the two final six inch increments was recorded as the penetration resistance (SPT N) value. The N-value, when properly interpreted by qualified professional staff, is an index of the soil strength and foundation support capability.

SITE CONDITIONS

Local Physiographic and Geologic Setting

The site lies within the Atlantic Flatwoods Region of South Carolina. The Atlantic Flatwoods comprises most of the Lower Coastal Plain and ranging from 15 to 100 miles inland from the sea. The topography of this region is predominately near level to gently sloping, with stronger slopes along ditches or drainage paths.

The lower coastal plain terraces are relatively young features, exhibiting only minor surface erosion, and can be traced large distances on the basis of surface elevation. Each terrace forms a thin veneer over older, underlying Coastal Plain soils. The surface soils of this region are termed as the Bear Bluff Formation, lying between the Surry Scarp and the Mechanicsville Scarp. These materials are comprised of terraces typically consisting of a beach strand or ridge deposit of clean sands at the seaward margin. Between the strand and the toe of the next inland terrace are mainly finely interlayered clays and sands termed backbarrier deposits. Old swamp deposits, stumps and buried trees have in some areas been covered by the backbarrier deposits and are usually not evident at the surface. Lying below the Bear Bluff Formation are intercalated clays and sands overlain by fossiliferous sand deposits commonly termed as the Black Creek Formation. The Black Creek Formation was laid down during the late Campanian to early Maestrichtian age. Though in most areas they are suitable for development, some soils are highly compressible under light to moderate structural loads, are susceptible to liquefaction, or exhibit moderate to high plasticity.

Topography

The USGS 7.5 Minute Latta quadrangle topographic map dated 1980 indicates elevations with very little topographic relief across the site. Grades across the site vary from about 115

ft-MSL[1] in the center of the site to approximately 113 ft-MSL along the eastern boundary of U.S. 301.

Ground Cover

The subject property is comprised mainly of an agricultural field currently growing cotton and soy bean. Ditching was observed to travel around the perimeter of the entire agricultural field along the roadways, railroad, and forest line. A forested area is present on approximately one-quarter of northern portion of the site. The forested areas consist mainly of mature pines and hardwoods with unimproved footpaths running throughout. One dirt road was observed entering the site from the northeastern boundary of U.S. 301 and traversing along the forest line before turning south along the railroad tracks and continuing on until exiting the site onto Secondary Road 292. Structures shown on Geotechnical Exploration Location Plan (Figure 2) in the vicinity of boring B-3 were not observed on the site. No rock outcroppings or existing structures were observed on the site.

Soil Survey Data

From a qualitative standpoint, the USDA Soil Conservation Service's (SCS) Soil Surveys can often provide helpful information. The SCS survey maps the near surface soils (i.e., depths ≤ 6 ft) and provides general descriptions. The data is not intended to replace geotechnical evaluations and testing but it can help identify trends. The SCS *Soil Survey of Dillon County, South Carolina*, dated November, 1978 indicates that the soils present at this site are of the Coxville (Cx), Smithboro (Sm), Lynchburg (Ln), Varina (VaA), Dunbar (Dn), and Persanti (PeA) series. These series are generally classified as clayey sands or sandy clay soils. A list of pertinent data from the soil survey is shown in Table 1. A copy of the Soil Survey Map (Figure 3) is included in the Appendix.

[1] Mean Sea Level

Table 1. Soil Conservation Service (SCS) Survey Data (Issued November 1978)
Dillon County, South Carolina
Soils Present in Upper Six Feet of Dan Rogers Industrial Park

SCS Designation	Classification		Depth to Seasonal High Water Table (ft)	Permeability (in/hr)	Suitability as source of road fill	Estimated Limitations for Foundations of Small Commercial Buildings
	USCS	AASHTO				
Coxville (Cx)	SM, ML, CL-ML, CL, CH	A-4, A-6, A-7	0-2.5	0.2-2.0	Poor - Wetness, Low Strength	Severe: Wetness
Dunbar (Dn)	SM, SM-SC, CL, CH	A-2, A-4, A-6, A-7	1.0-2.5	0.2-6.0	Poor - Low Strength, Wetness	Severe: Wetness
Lynchburg (Ln)	SM, SM-SC, SC, CL, CL-ML	A-2, A-4, A-6	0.5-1.5	0.6-6.0	Fair - Wetness	Severe: Wetness
Persanti (PeA)	SM, SM-SC, ML, CL, CL-ML, CH, MH	A-4, A-6, A-7	2.0-3.5	0.06-2.0	Poor - Low Strength	Moderate: Wetness, Shrink-Swell, Low Strength
Smithboro (Sm)	ML, CL, CL-ML, CH, MH	A-4, A-6, A-7	0.5-1.5	0.06-2.0	Poor - Low Strength	Severe: Wetness, Low Strength
Varina (VaA)	SM, SM-SC, SC, CL, ML	A-2, A-4, A-6, A-7	2.5-5.0	0.06-6.0	Good	Slight

Based on the soil survey information for the soil series found on site, the seasonal high water table ranges from the ground surface to 5.0 feet below the ground surface. The permeability of the soils present at the site ranges from 0.06 to 6.0 in/hr. The SCS Soil Survey characterized the Coxville, Dunbar, Persanti, and Smithboro series soils as poor road fill while the Lynchburg series soils are characterized as fair road fill and the Varina series soils as good road fill. Also based on the soil survey, the soils present at the site pose slight to severe limitations for foundations for small commercial buildings due to low strength, shrink-swell, and the potential for a high water table. In addition, all of the listed series soils pose a moderate to high risk of corrosion to unprotected steel and concrete. Again, we emphasize that our use of the SCS Soil Survey data is qualitative in nature. Furthermore, the SCS evaluations are based solely on the characteristics of the shallow (i.e., $\leq$ 6 ft deep) soil stratigraphy, and do not consider deeper soil conditions which typically are the driving function in foundation bearing capacity and settlement recommendations.

These soils are typical of the soil conditions in the site vicinity. In general, the reason the site soils are described as "poor" to "good" for road fill and present limitations for development with respect to the shallow water level is the fines (silt and clay) content of the soils. The greater the fines content, the more moisture sensitive the soil and the more difficult to work with during construction. Additionally, cohesive soils and sands with high fines contents, such as those present at the site, have a low permeability or penetration rate and will impede the infiltration of rainwater. Therefore, water may pond at the ground surface for extended periods of time.

INTERPRETED SUBSURFACE PROFILE

Details of the subsurface conditions encountered by the borings are shown on the logs in the Appendix. These logs represent our interpretation of the subsurface conditions based upon field data and collected soil samples. Stratification lines on the boring logs represent approximate boundaries between soil types; however, the actual transition may be more gradual. The general subsurface conditions and their pertinent characteristics are discussed in the following paragraphs. Due to the wide spacing of borings conducted at the site, the discussion of the subsurface conditions given below should be considered very general. Subsurface conditions at specific locations may be substantially different from the conditions encountered during this preliminary exploration.

The topsoil was measured to be approximately 12 to 24 inches thick across the site. These deep topsoil thicknesses are possibly due to the agricultural plowing and fertilizing of the crop lands in which the borings were performed. Below the topsoil, borings B-1, B-3, B-4, and B-5 initially encountered a layer of firm to very stiff sandy lean clay ranging in thickness from approximately 8 to 14 ft. Boring B-2 encountered a 1-½ foot thick layer of poorly graded sand to a depth of 3 feet, at which point the boring entered sandy lean clays similar to those observed near the surface in all of the other borings. Underlying the sandy clay, the borings generally encountered loose to medium dense sands with varying amounts of silt/clay and gravel to the termination depth of borings B-

2 through B-5 (i.e., a depth of approximately 30 ft below the ground surface) and to a depth of about 34 ft in boring B-1. Underlying the sands, boring B-1 encountered interbedded layers of stiff to hard clay and medium dense to very dense sand or silty sand of the Black Creek Formation to the boring termination depth of 100 ft.

Groundwater

Groundwater measurements were taken 24 hours after the completion of the SPT borings and ranged from 6 to 8-½ feet below the existing ground surface. Generally, groundwater was encountered at a depth of 7 ft below the ground surface at the time of our exploration. Water levels at the site will fluctuate during the year due to such things as seasonal and climatic variations and with construction activity in the area. Additionally, the on-site sandy lean clays have a low permeability, or percolation rate, which will impede the infiltration of rainwater, so there is a potential for water to pond at the surface or in the near surface soils after a period of precipitation.

2003 INTERNATIONAL BUILDING CODE SEISMIC FACTORS

Seismic induced ground shaking at the foundation is the effect taken into account by seismic-resistant design provisions of the 2003 International Building Code (IBC). Other effects, including landslides or soil liquefaction, are not addressed in building codes but must also be considered. Because our borings are widely spaced, it is likely conditions will vary between the boring locations. Each building site should be evaluated on a case by case basis when lots and building locations are established.

IBC Site Class. We classified the site as one of the Site Classes defined in IBC Section 1615.1 (Table 1615.1.1) using the procedures described in Section 1615.1.5.1. The Site Class is used in conjunction with mapped spectral accelerations S_S and S_1 to determine Site Coefficients F_A and F_V in IBC Section 1615.1.2, tables 1615.1.2(1) and 1615.1.2(2).

Table 2. Site Class Definitions as defined in IBC Section 1615.1

SITE CLASS	SOIL PROFILE NAME	AVERAGE PROPERTIES IN TOP 100 FEET, AS PER SECTION 1615.1.5		
		Soil Shear Wave Velocity Vs (ft/s)	Standard Penetration Resistance, N	Soil Undrained Shear Strength, Su psf
A	**HARD ROCK**	**Vs > 5000**	**Not applicable**	**Not applicable**
B	**ROCK**	**2500 < Vs < 5000**	**Not applicable**	**Not applicable**
C	**VERY DENSE SOIL AND SOFT ROCK**	**1200 < Vs < 2500**	**N > 50 bpf**	**Su > 2000**
D	**STIFF SOIL PROFILE**	**600 < Vs < 1200**	**15 < N < 50 bpf**	**1000 < Su < 2000**
E	**SOFT SOIL PROFILE**	**Vs < 600**	**N < 15 bpf**	**Su < 1000**
E		**Any profile with more than 10 feet of soil having the following characteristics:** 1. Plasticity index, PI > 20 2. Moisture Content, w > 40 percent, and 3. Undrained shear strength, Su < 500 psf		
F		**Any profile containing soils having one or more of the following characteristics** 1. Soils vulnerable to potential failure or collapse under seismic loading such as liquefiable soils, quick and highly sensitive clays, collapsible weakly cemented soils. 2. Peat and highly organic clays (H>10 ft of peat and/or highly organic clay where H=thickness of soil) 3. Very high plasticity clays (H>25 ft with plasticity index PI > 75) 4. Very thick soft/medium stiff clays (H>120 ft)		

The initial step in site class definition is to check for the four conditions described for Site Class F which would require a site specific evaluation to determine site coefficients F_A and F_V. Soils vulnerable to potential failure under item 1) including quick and highly sensitive clays or collapsible weakly cemented soils were not observed in the borings. Three other conditions, 2) peat and highly organic clays; 3) very high plasticity clays; and 4) very thick soft/medium stiff clays, were also not evident in the borings performed. Soils most susceptible to liquefaction generally consist of saturated, loose, "clean" (i.e., plasticity indices less than 5), fine (particle diameters of 0.07 to 0.25 mm) sands. To evaluate liquefaction potential, we performed analyses at representative SPT test locations considering the characteristics of the soil and subsurface water level observed in each boring. When considering the design earthquake as specified by the IBC 2003, liquefaction

was estimated to be unlikely based on the fines (clay and silt fraction) content, relatively high density, and age of the materials encountered below the water table.

We also compared site soil conditions within the borings to the three conditions described as default for Site Class E. These are soft soils vulnerable to large strains under seismic motion. Borings did not appear to include at least 10 feet having *all three* of the following: 1) plasticity index greater than 20, 2) moisture content greater than 40 percent, and 3) undrained shear strength estimated to be less than 500 psf. Our evaluation of the recovered samples indicates that these criteria are not met and therefore, Site Class E would not apply.

The average weighted SPT N-value over the total boring length of 100 feet was computed using the N method formula in Section 1615.1.5. The weighted N-value is estimated to be about 17 bpf. Also, based on the N-values recorded in the sandy fat clays, the undrained shear strength of the clays encountered is likely greater than 1000 psf. Therefore, Seismic Site Class D appears appropriate for the site. Corresponding values of F_A and F_V may be determined from the tables contained in the code provisions.

CONCLUSIONS AND RECOMMENDATIONS

The conclusions and recommendations included in this section are based on the data obtained during our exploration. The following recommendations are given only to present a general idea of the soil conditions that can be anticipated at the site. More in-depth subsurface investigations should be performed in future building pad and parking areas. We recommend that S&ME, Inc. be retained to perform these additional subsurface explorations.

Foundation Types

The soil profiles encountered appear generally suitable for development of light to medium industrial buildings considering static loading. The use of shallow foundations for support of column loads up to 200 kips appears feasible with little risk of excessive settlement for typical light to medium industrial structural column configurations, provided footings are properly constructed. Area loads imposed by stacked materials or large vessels or tanks can likely be supported by mat or strip footings, however settlement would need to be calculated on an individual basis for each structure and evaluated for proper foundation design.

Due to the wide spacing of the borings across the site, buildings will need to be evaluated individually and possible alternate means of foundation support, such as deep foundations, may be required for heavy loads. Based on our preliminary borings, we anticipate that shallow foundations will provide adequate bearing capacity across the majority of the site for light to moderately loaded structures.

Control of Groundwater and Surface Runoff

Groundwater was encountered in our borings at depths ranging from 6 to 8-1/2 feet. However, the USDA Soil Survey indicates groundwater depths ranging from the ground surface to a depth of 5 feet below the ground surface during winter months. Therefore, the impact of groundwater on grading will depend on the area within the site being graded, rain fall amounts during that time and the time of the year that grading takes place.

Ditching to help drain groundwater will likely be required on some portions of the site. The success of ditching is depended on soil type, rain fall, and the availability of an outfall at sufficiently lower elevations. It will be very important to maintain adequate site drainage throughout construction. Positive drainage may be established by excavating

gravity draining ditches and/or by pumping from sumps so that water will flow away from the construction area. If site work takes place during extended periods of dry weather, the need for extensive drainage improvements will be less critical. However, if site work takes place during wet weather conditions, much more extensive drainage improvements may be required. Even during dry weather conditions, ditches and drainage improvements should be in place to handle any heavy rainfall that might occur during construction.

Site Preparation and Earthwork

Because of the thick agricultural plow zone, stripping depth will be about 12 to 24 inches over the majority of the site to adequately remove all topsoil. This topsoil thickness is to be expected within an agricultural field but may be vary within the wooded areas of the site which were not explored. In drainage features, stripping depths could be considerably greater. Stripping depths may also be greater in unexplored areas of the fields if organic plow zone material extends to greater depths.

Fill Materials

We typically recommend that new controlled fill have no more than 15 percent fines (silt and clay content) by weight. Based on the results of the borings, the surficial sandy clays may present difficult workability and exhibit a low remolded strength and therefore are not ideal for use as fill material. However, sandy lean clays similar to those encountered in our borings have been successfully used at other sites. Because the plasticity of the upper clays appears to be relatively low to moderate, these soils could be used as fill if the contractor is prepared to rigorously work the material and sufficient time is allotted during the construction schedule to alter the moisture content of these soils as needed to achieve compaction. Somewhat lower slab and pavement subgrade support values would need to be accepted during design, and shallow foundation allowable bearing pressures may be lower in this material than in superior imported sandy fill.

The sands encountered below the upper sandy clays appear to be suitable to a depth of about 30 feet, but since these soils were encountered near or below the water table, some period of drying may be required before use. It should be noted that the moisture content of the natural soils will be significantly affected by prevailing weather conditions combined with the groundwater level at the time grading begins. Because the borrow soils below the clay are relatively cohesionless, they should drain fairly freely once excavated from below the groundwater table.

Grade Slab Support and Construction

1. It is likely that grade slabs will be supported by on-site soils or by borrow fill soils. Natural on site sandy clays can likely support grade slabs, but will have a reduced modulus of subgrade reaction (k). The modulus of the sandy clays can likely be improved by the application of lime or cement or by placement of a layer of graded aggregate or a geogrid material. The subgrade performance can also be improved by placement of about 2 feet of sandy borrow fill material imported or excavated from on site retention or detention ponds. Sand borrow fill will generally provide adequate support to soil-supported slabs-on-grade, assuming proper preparation, moisture control, and compaction of the subgrade for static load conditions.

2. A capillary break of at least 4 inches of clean sand or crushed stone placed below floor slabs is recommended.

3. We recommend you place a vapor barrier such as "Visqueen," or the equivalent, to limit moisture infiltration into finished space, or other areas where moisture infiltration will potentially cause problems. The vapor barrier should be placed below the capillary break material.

4. Performance of the grade slabs under seismic conditions will need to be evaluated site-by-site during development of the park. Potential for settlement or cracking of the slab

under the design earthquake should be considered in terms of relative risk vs. cost of supplemental support.

Pavements

The surficial sandy clays encountered in our borings may not be ideal for support of pavements and could require relatively conservative (i.e. thick) pavement sections because of their low California Bearing Ratio (CBR) value that is anticipated based on soil type. Depending on the conditions at the time of construction, subgrade improvements such as undercutting and backfilling with controlled fill, placement of geotextile or geogrid or the use of lime or cement may be needed to stabilize the pavement subgrade in areas where surficial soils have high fines content (i.e., silt and clay).

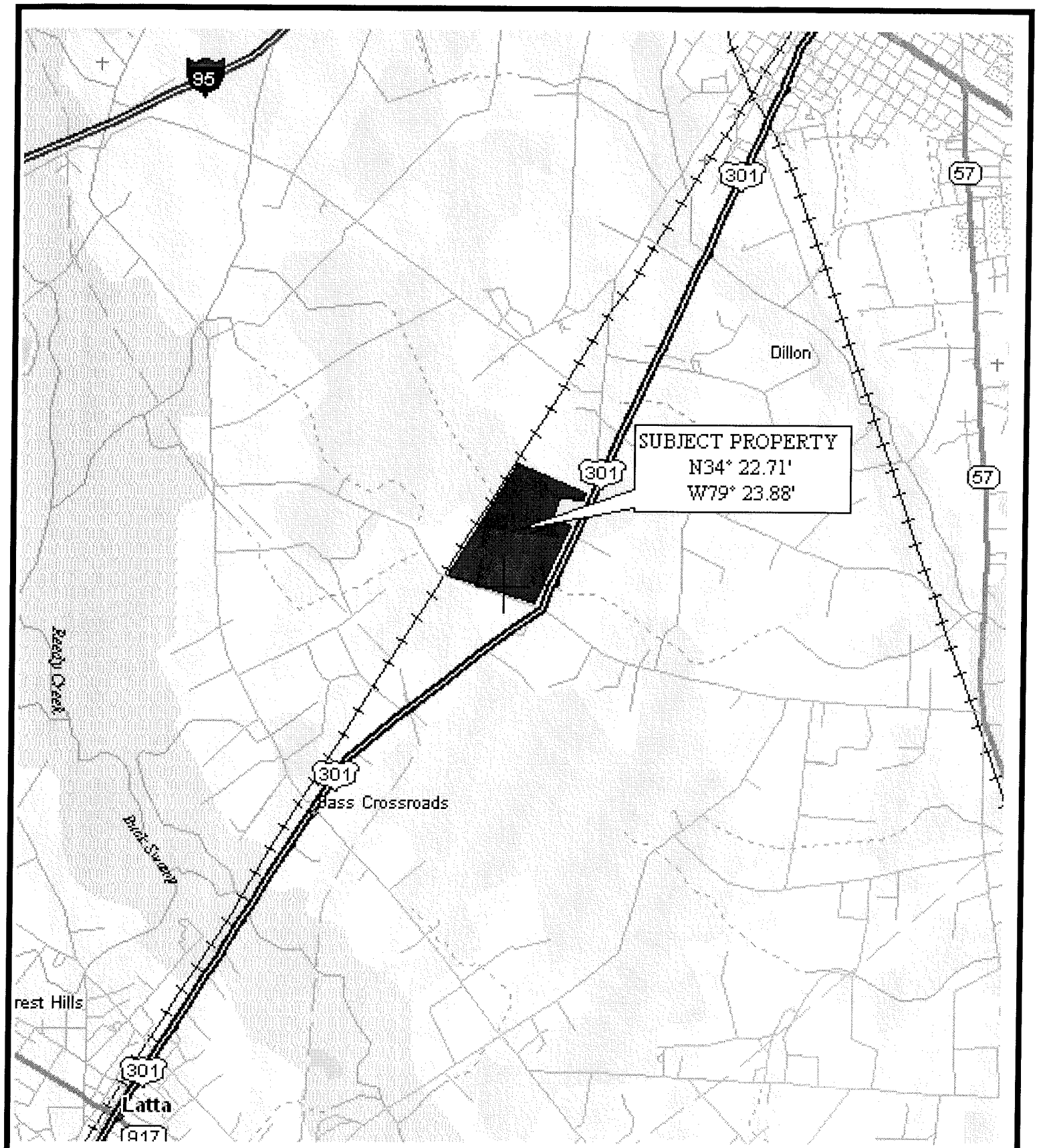
Control of groundwater will also play an important role in the performance of pavement sections. Crowning and ditching or underdrains may be required to help control groundwater depending on the conditions encountered at each building site. Construction traffic, which may be greater than post-development traffic, should also be considered in the design.

LIMITATIONS OF REPORT

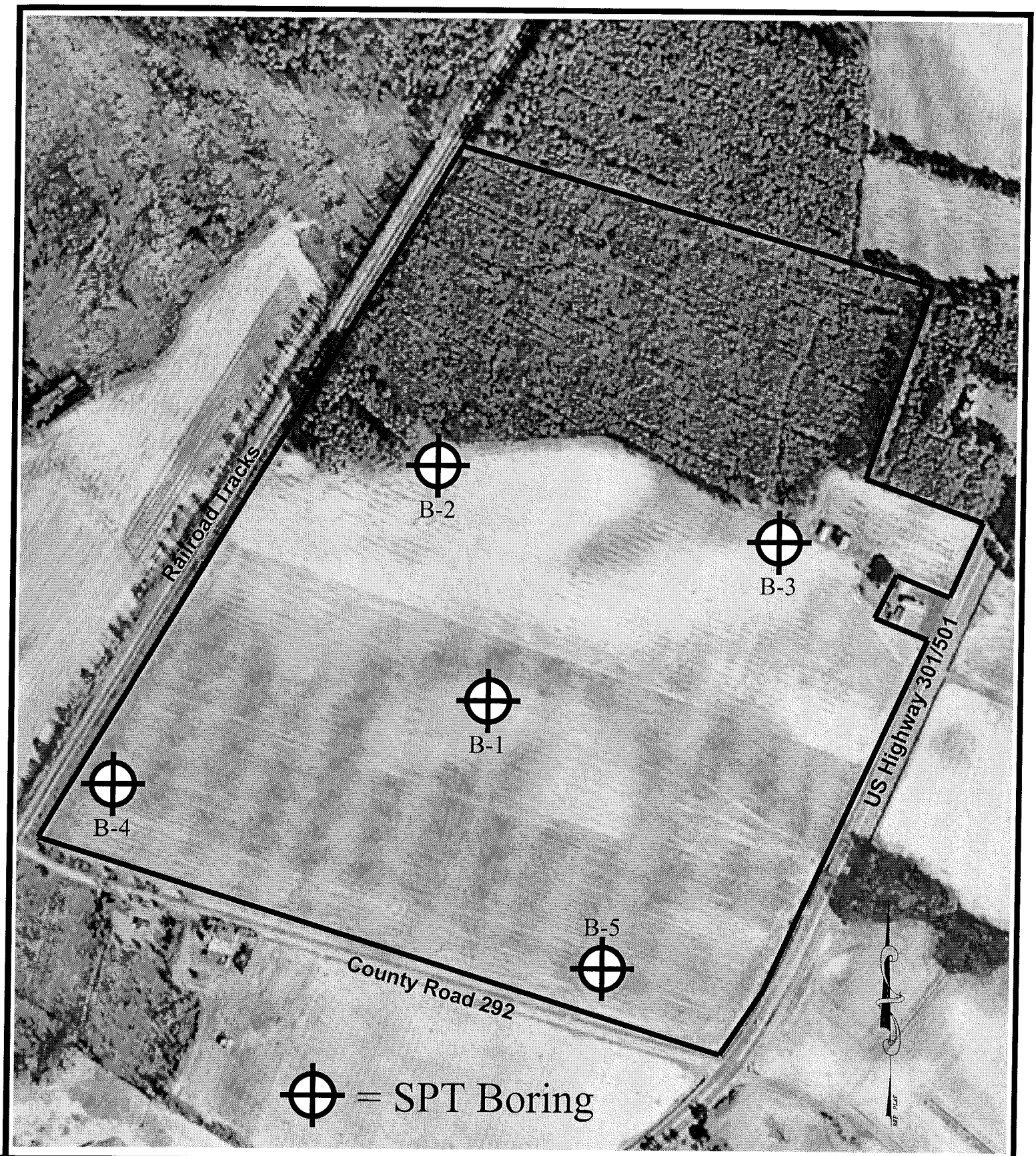
This preliminary report has been prepared in accordance with generally accepted geotechnical engineering practice for specific application to this project. The preliminary information contained in this report is based upon applicable standards of our practice in this geographic area at the time this report was prepared. No other warranty, express or implied, is made. This report is not intended to be used as a final geotechnical report for the site. Once design information is available, additional geotechnical exploration should be performed to develop detailed foundation recommendations for any proposed structures.

APPENDIX

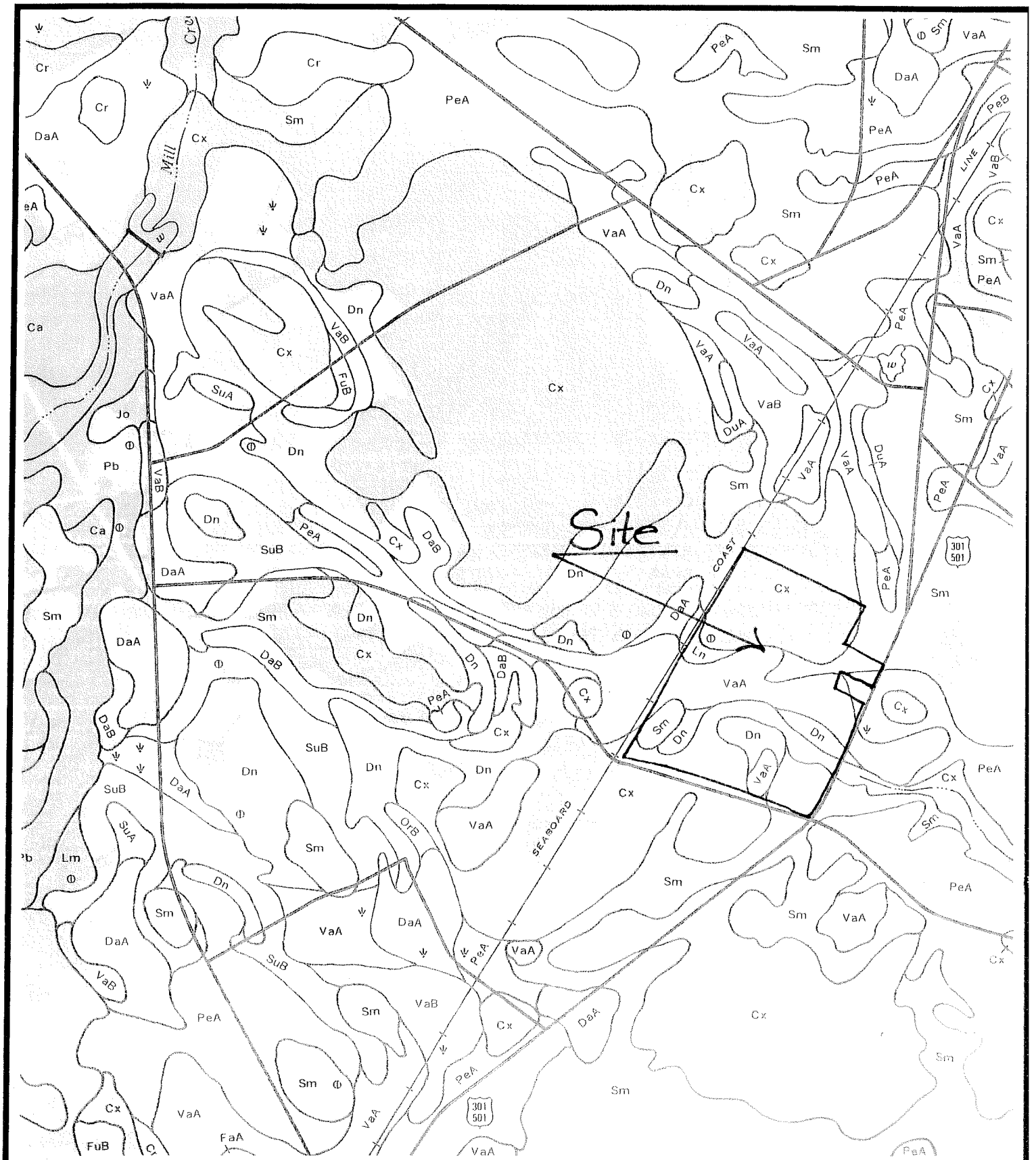
Figures
Boring Logs
Boring GPS Coordinates



SCALE: NTS	S&ME ENVIRONMENTAL SERVICES ENGINEERING•TESTING	SITE VICINITY MAP Dan A Rogers Site Dillon County, South Carolina	FIGURE NO 1
SOURCE: 1999 DeLORME Street Atlas			
DRAWN BY: JDL			
DATE: July, 2005		JOB NO. 1611-05-284	



SCALE: NTS	S&ME ENVIRONMENTAL SERVICES ENGINEERING•TESTING	Geotechnical Exploration Location Plan Dan A. Rogers Tract Dillon County, South Carolina	FIGURE NO 2
SOURCE: NAPP AERIAL PHOTOGRAPH			
SOURCE DATE: 1999			
DATE: July, 2005		JOB NO. 1611-05-284	



SCALE: NTS	S&ME ENVIRONMENTAL SERVICES ENGINEERING•TESTING	SITE SOIL SURVEY Dan A. Rogers Tract Dillon County, South Carolina	FIGURE NO 3
SOURCE: USDA/SCS Dillon Co. Soil Survey			
SOURCE DATE: Issued November 1978			
DATE: August, 2005		JOB NO. 1611-05-284	

Boring Locations - GPS Coordinates

Project Name: Dan Rogers Site
Project # 1611-05-284
Date: 7/29/2005
Coordinate System: US State Plane 1983
Zone: South Carolina 3900

	GPS Coordinates (feet)	
Boring	**North**	**East**
B-1	929111.850	2482734.224
B-2	930049.032	2483006.079
B-3	929775.697	2484242.320
B-4	928775.503	2481831.011
B-5	928158.630	2483556.629

SOIL CLASSIFICATION CHART

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

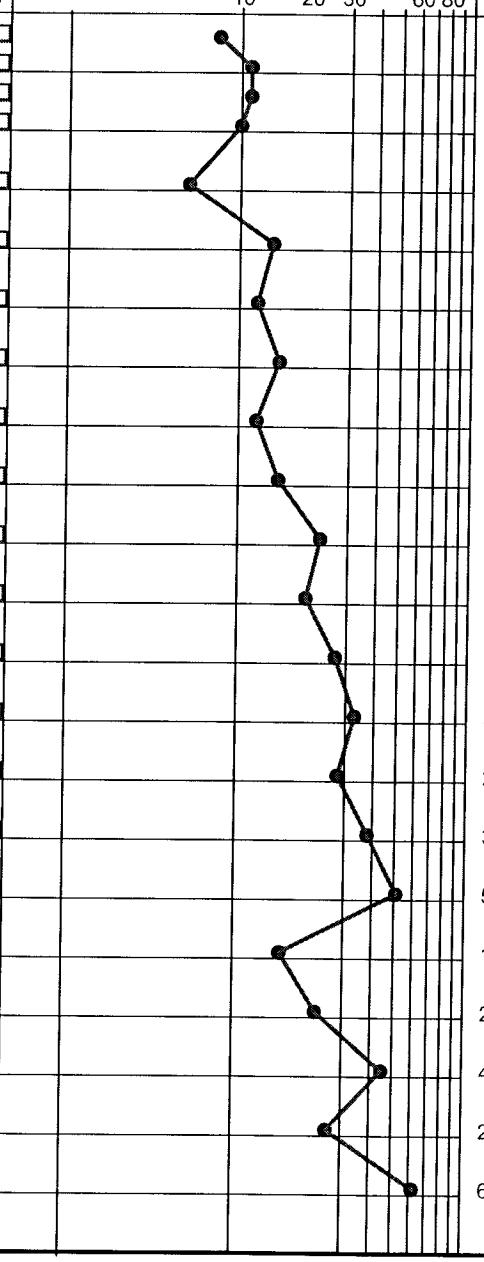
S&ME

ENGINEERING • TESTING
ENVIRONMENTAL SERVICES

PROJECT:	Dan Rogers Site Dillon County, South Carolina 1611-05-284	**BORING LOG B-1**
DATE DRILLED: 7/28/2005	ELEVATION: 115	NOTES:
DRILLING METHOD: Mud Rotary	BORING DEPTH: 100	
LOGGED BY: J. Laps	WATER LEVEL: 24 hr level at 6 feet	
DRILLER: Parker	DRILL RIG: CME 45-B	

DEPTH (feet)	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	N VALUE
	TOPSOIL			1	8
5	SANDY LEAN CLAY (CL) - Mostly medium to low plasticity fines, some fine sands, dry to wet, orange to gray, firm to stiff.	▼	110.0	2	11
				3	11
10			105.0	4	10
15	POORLY GRADED SAND WITH CLAY (SP-SC) - Mostly fine to coarse sands with gravel, few low plasticity fines, saturated, white and orange, loose to medium dense.		100.0	5	6
20			95.0	6	14
25			90.0	7	12
30			85.0	8	15
35	SANDY FAT CLAY (CH) (Black Creek Formation) - Mostly medium to high plasticity fines, some interbedded sand seams, wet, gray, very stiff to hard.		80.0	9	12
40			75.0	10	15
45			70.0	11	23
50			65.0	12	20
55			60.0	13	27
60			55.0	14	33
65			50.0	15	28
70	SILTY SAND (SM) (Black Creek Formation) - Mostly fine to medium sand, some low plasticity fines, saturated, gray, dense to very dense.		45.0	16	38
75	SANDY FAT CLAY (CH) (Black Creek Formation) - Mostly medium to high plasticity fines, some interbedded sand seams, wet, gray, very stiff.		40.0	17	51
80			35.0	18	16
85	- hard drilling encountered at 86 feet, approximately 6 inches thick.		30.0	19	23
90	CLAYEY SAND (SC) (Black Creek Formation) - Mostly fine to coarse sands, some medium to high plasticity fines, saturated, gray, medium dense to very dense.		25.0	20	45
95			20.0	21	26
100	Boring B-1 terminated at 100 feet.		15.0	22	62

STANDARD PENETRATION TEST DATA (blows/ft)



BORING LOG 1611-05-284.GPJ WITH CPT.GDT 8/11/05

NOTES:

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3. *STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.*
4. *WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.*

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PROJECT:	Dan Rogers Site Dillon County, South Carolina 1611-05-284	**BORING LOG**	**B-2**

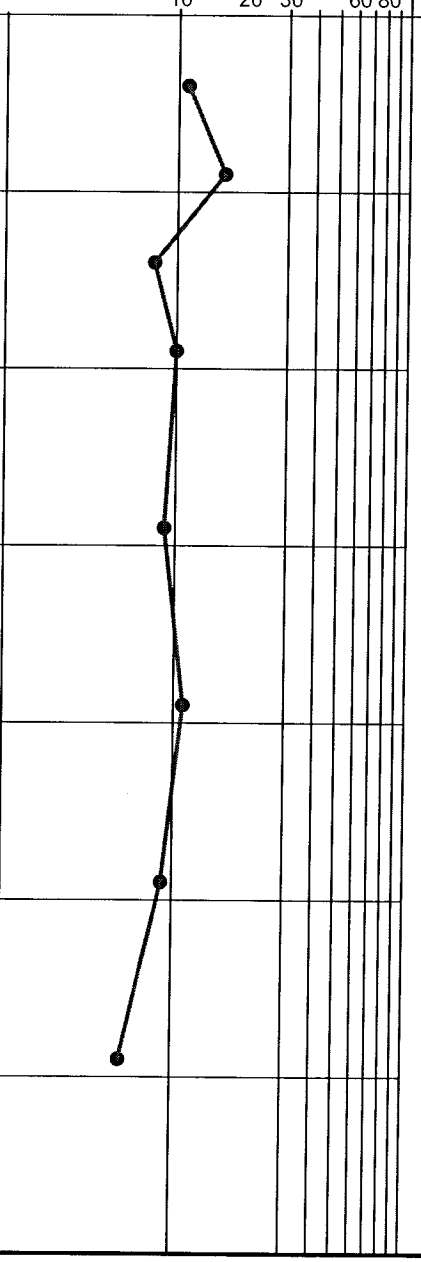
DATE DRILLED:	7/29/2005	ELEVATION:	115
DRILLING METHOD:	Mud Rotary	BORING DEPTH:	30
LOGGED BY:	J. Laps	WATER LEVEL:	24 hr level at 7 feet
DRILLER:	Parker	DRILL RIG:	CME 45-B

NOTES:

DEPTH (feet)	MATERIAL DESCRIPTION	ELEVATION (feet)	SAMPLE NO.	N VALUE
	TOPSOIL			
	POORLY GRADED SAND (SP) - Mostly fine to medium sand, trace fines, dry to moist, tan, medium dense.		1	11
	SANDY LEAN CLAY (CL) - Mostly medium to low plasticity fines, some fine sands, moist to wet, orange to gray, firm to very stiff.	110.0	2	16
5			3	8
10		105.0	4	10
15	POORLY GRADED SAND WITH CLAY (SP-SC) - Mostly fine to coarse sands, few low to medium plasticity fines as interbedded clay lenses, saturated, white and orange, loose to medium dense.	100.0	5	9
20		95.0	6	11
25		90.0	7	9
30	Boring B-2 terminated at 30 feet.	85.0	8	6

WATER LEVEL

STANDARD PENETRATION TEST DATA (blows/ft)



BORING LOG 1611-05-284.GPJ WITH CPT.GDT 8/11/05

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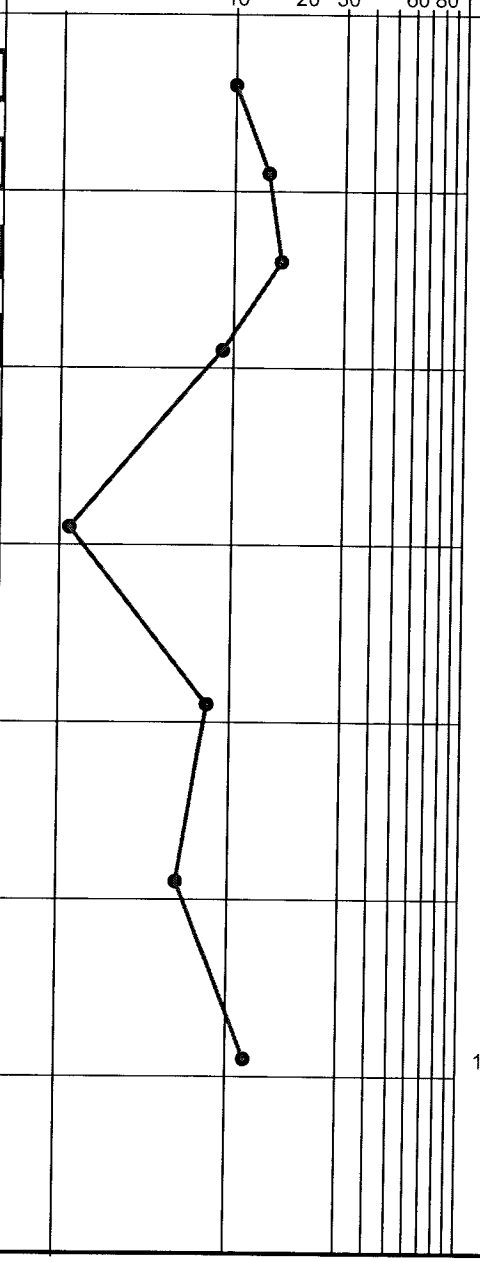
PROJECT:	Dan Rogers Site Dillon County, South Carolina 1611-05-284	**BORING LOG**	**B-3**
DATE DRILLED:	7/29/2005	ELEVATION:	115
DRILLING METHOD:	Mud Rotary	BORING DEPTH:	30
LOGGED BY:	J. Laps	WATER LEVEL:	24 hr level at 8.5 feet
DRILLER:	Parker	DRILL RIG:	CME 45-B

NOTES:

DEPTH (feet)	MATERIAL DESCRIPTION	ELEVATION (feet)	SAMPLE NO.	N VALUE
	TOPSOIL			
	SANDY LEAN CLAY (CL) - Mostly medium to low plasticity fines, some fine sands, moist to wet, orange to gray, stiff to very stiff.		1	10
5		110.0	2	14
			3	16
10		105.0	4	9
	SILTY SAND (SM) - Mostly fine sand, some low plasticity fines, saturated, gray, very loose.		5	2
15		100.0		
	POORLY GRADED SAND WITH CLAY (SP-SC) - Mostly fine to coarse sands, few low to medium plasticity fines as thin interbedded clay lenses, saturated, white and orange, loose to medium dense.		6	8
20		95.0		
25		90.0	7	6
30	Boring B-3 terminated at 30 feet.	85.0	8	12

STANDARD PENETRATION TEST DATA (blows/ft)



BORING LOG 1611-05-284.GPJ WITH CPT.GDT 8/11/05

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PROJECT:	Dan Rogers Site Dillon County, South Carolina 1611-05-284	**BORING LOG**	**B-4**

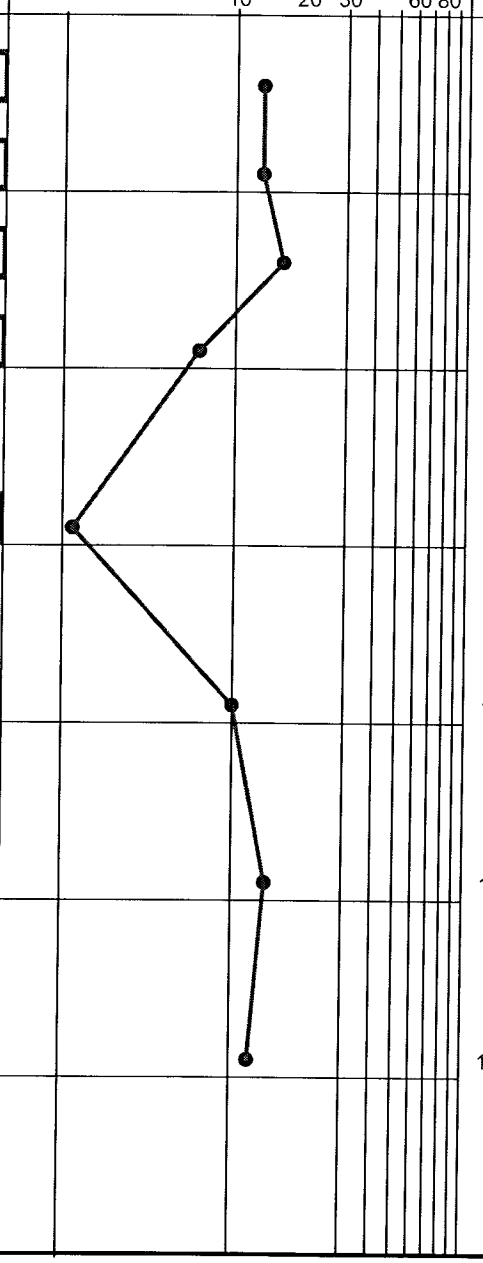
DATE DRILLED:	7/29/2005	ELEVATION:	115
DRILLING METHOD:	Mud Rotary	BORING DEPTH:	30
LOGGED BY:	J. Laps	WATER LEVEL:	24 hr level at 6.5 feet
DRILLER:	Parker	DRILL RIG:	CME 45-B

NOTES:

DEPTH (feet)	MATERIAL DESCRIPTION	ELEVATION (feet)	SAMPLE NO.	N VALUE
	TOPSOIL			
	SANDY LEAN CLAY (CL) - Mostly medium to low plasticity fines, some fine sands, moist, orange to gray, stiff to very stiff.		1	13
5		110.0	2	13
			3	16
10	POORLY GRADED SAND WITH CLAY (SP-SC) - Mostly fine to coarse sands,few low to medium plasticity fines as interbedded clay lenses, saturated, white and orange, loose.	105.0	4	7
15	CLAYEY SAND (SC) - Mostly fine to medium sand with some medium to high plasticity fines, saturated, orange, very loose.	100.0	5	2
20	POORLY GRADED SAND WITH CLAY (SP-SC) - Mostly fine to coarse sands, some gravel, few low to medium plasticity fines as interbedded clay lenses, saturated, orange, loose to medium dense.	95.0	6	10
25		90.0	7	14
30	Boring B-4 terminated at 30 feet.	85.0	8	12

WATER LEVEL

STANDARD PENETRATION TEST DATA (blows/ft)



BORING LOG 1611-05-284.GPJ WITH CPT.GDT 8/11/05

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PROJECT:	Dan Rogers Site Dillon County, South Carolina 1611-05-284	**BORING LOG**	**B-5**

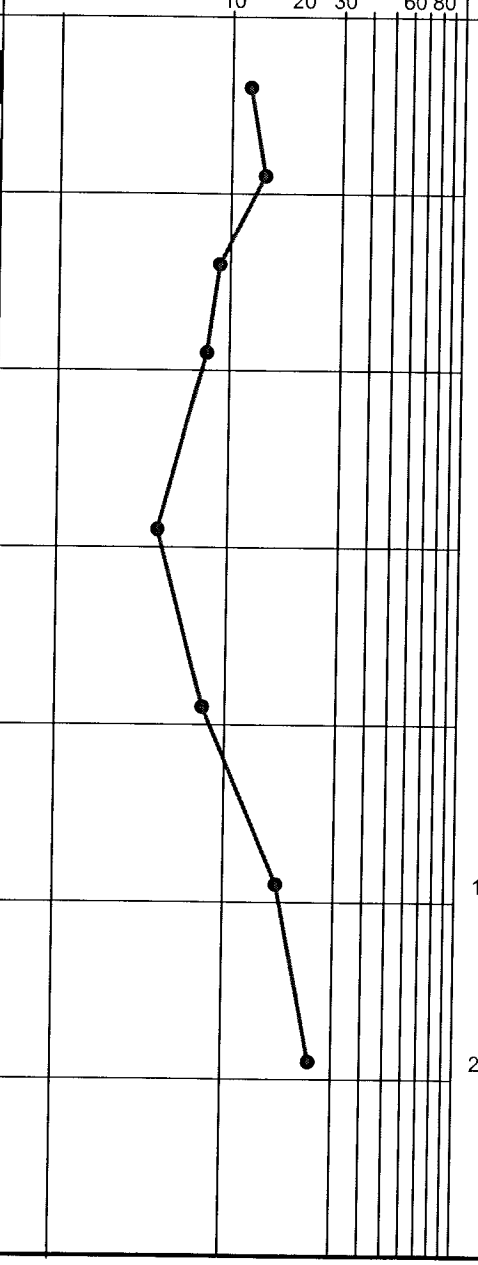
DATE DRILLED:	7/29/2005	ELEVATION:	115
DRILLING METHOD:	Mud Rotary	BORING DEPTH:	30
LOGGED BY:	J. Laps	WATER LEVEL:	24 hr level at 7 feet
DRILLER:	Parker	DRILL RIG:	CME 45-B

NOTES:

DEPTH (feet)	MATERIAL DESCRIPTION	ELEVATION (feet)	SAMPLE NO.	N VALUE
	TOPSOIL			
	SANDY LEAN CLAY (CL) - Mostly medium to low plasticity fines, some fine sands, moist, orange to gray, firm to stiff.		1	12
5		110.0	2	14
			3	9
10	POORLY GRADED SAND WITH CLAY (SP-SC) - Mostly fine to coarse sands, few low to medium plasticity fines as interbedded clay lenses, saturated, white and orange, loose.	105.0	4	8
15	CLAYEY SAND (SC) - Mostly fine to medium sand with some medium to high plasticity fines, saturated, orange, loose.	100.0	5	5
20	POORLY GRADED SAND WITH CLAY (SP-SC) - Mostly fine to coarse sands, some gravel, few low to medium plasticity fines as interbedded clay lenses, saturated, orange, loose to medium dense.	95.0	6	8
25		90.0	7	17
30	Boring B-4 terminated at 30 feet.	85.0	8	24

WATER LEVEL

STANDARD PENETRATION TEST DATA (blows/ft)



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