PRELIMINARY SITE ASSESSMENT

PARCELS 021 AND 022, STATE PROJECT B-4490, WBS ELEMENT 33727.1.1, CUMBERLAND COUNTY

REPLACE BRIDGE NO. 116 OVER CXS RAILROAD, NORTH SOUTH RAILROAD, AND HILLSBORO STREET ON NC 24-210, FAYETTEVILLE, NORTH CAROLINA

Schnabel Project 11821014.33
April 8, 2014

Schnabel ENGINEERING

Schnabel ENGINEERING

April 8, 2014

Mr. Mohammed A. Mulla, P.E., CPM, MCE
NCDOT, Geotechnical Engineering Unit
1020 Birch Ridge Drive
Raleigh, NC 27610

RE: State Project: B-4490
WBS Element: 33727.1.1
County: Cumberland
Description: Replace Bridge No. 116 over CSX Railroad, North South Railroad, and Hillsboro Street on NC 24-210 in Fayetteville

Subject: **Preliminary Site Assessment for Parcels 021 and 022, Fayetteville, NC**
Schnabel Engineering Project 11821014.33

Dear Mr. Mulla:

SCHNABEL ENGINEERING SOUTH, P.C. (Schnabel) is pleased to submit our report for this project. This study was performed in accordance with our proposal dated January 23, 2014 as authorized by the Notice to Proceed on January 24, 2014 and was conducted under our June 2, 2011 Agreement with the NCDOT.

We appreciate the opportunity to be of service for this project. Please call us if you have any questions regarding this report.

Sincerely,

SCHNABEL ENGINEERING SOUTH, PC

Benjamin L. Bradley, GIT
Project Scientist

Gregory B. Kuntz, LG
Senior Associate Scientist

BB/GK

schnabel-eng.com

T/ 336-274-9456 F/ 336-274-9486
11A Oak Branch Drive / Greensboro, NC / 27407

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PRELIMINARY SITE ASSESSMENT FOR PARCELS 021 AND 022

STATE PROJECT B-4490, WBS ELEMENT 33727.1.1

REPLACE BRIDGE NO. 116 OVER CSX RAILROAD, NORTH SOUTH RAILROAD, AND HILLSBORO STREET ON NC 24-210
FAYETTEVILLE, CUMBERLAND COUNTY, NORTH CAROLINA

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES

1.0 INTRODUCTION

The North Carolina Department of Transportation (NCDOT) is replacing a bridge over CSX Railroad, North South Railroad, and Hillsboro Street on Highway 24/210 (W. Rowan Street) in the town of Fayetteville, located in Cumberland County, North Carolina. Acquisition of properties within the right-of-way (ROW) is necessary prior to road and bridge construction. Schnabel Engineering conducted Preliminary Site Assessments (PSAs) on 10 sites (thirteen parcels) located within the proposed ROW that are of concern to the NCDOT.

This report summarizes the results of field activities conducted during the PSA for the proposed property acquisition area (Study Area) identified by NCDOT on Parcels 021 and 022. The property is located at 407 Greensboro Street and is occupied by Vick's Drive-In, currently owned by George Skenteris (Figure 1). The property line and topography are shown on Figure 2. The approximate NCDOT project limits that delineate the property acquisition area are shown on Figure 3.

The scope of work executed at the site was performed in general accordance with our cost proposal dated January 23, 2014 and was initiated based on a Notice to Proceed issued by the NCDOT Geotechnical Engineering Unit on January 24, 2014 under contract 7000012208, dated June 2, 2011.

2.0 BACKGROUND AND SITE DESCRIPTION

A one-story cinder block structure is located on Parcels 021 and 022. The surface of the proposed ROW is covered with a paved parking lot and some grassy areas. Several utilities cross the site including buried water and storm sewer lines, and overhead electric lines are located along the ROW. The information regarding prior site use provided to Schnabel Engineering by NCDOT was that the site operates as a drive in restaurant, but Sanborn Fire Insurance maps show that a gasoline underground storage tank (UST) was on site in the 1930s. Because there is no property line established between these two parcels they have been combined into one parcel. This PSA is for the investigation of the entire parcel. Photographs of the Study Area are presented in Appendix A.

3.0 FIELD METHODOLOGY

Prior to mobilizing to the site to conduct the field investigation, Schnabel Engineering contacted North Carolina One Call to locate underground utilities in the Study Area of the site. Schnabel Engineering mobilized a geophysical crew to the site on January 29, 2014 and performed an electromagnetic survey of the subsurface in the proposed ROW area within the parcel. The electromagnetic survey equipment (EM61-MK2) identified various magnetic anomalies within the Study Area. The Schnabel geophysical crew returned to the Study Area on February 10, 2014 to perform ground penetrating radar (GPR) survey with a Geophysical Survey Systems SIR 3000 equipped with a 400 MHz antenna. Results of the survey suggested the presence of buried utility lines or conduits within the Study Area.

After reviewing the background information and geophysical data, Schnabel returned to Parcels 021 and 022 to conduct field screening of soils from within the Study Area. Four soil borings designated B-21/22-01 through B-21/22-04 were advanced by SAEDACCO of Fort Mill, SC along Rowan Street on February 20, 2014. The locations of the soil borings are shown on Figure 3. The borings were advanced to a total depth of ten feet below ground surface (bgs). The borings drilled within the Study Area were advanced utilizing a track-mounted Geoprobe® (Model 7822-DT) with direct push probe technology. At the completion of the sampling activities, the borings were backfilled with soil removed from the boring during sampling and/or bentonite chips.

Soils for field screening were obtained from the borings using a MacroCore® sampler fitted with a new, single-use, five foot long disposable polyvinyl chloride (PVC) liner. A portion of each 2-foot interval was placed in a separate re-sealable plastic bag. These bags were sealed and placed at ambient temperature for field screening with a MiniRAE Plus photo ionization detector (PID). Volatiles were allowed to accumulate in the headspace of each bag for approximately 15 minutes, and then the headspace of each sealed bag was scanned with the PID. Headspace screening of the soil samples indicated a concentration of 0 ppm at each boring location at intervals of two, four, six, eight, and ten feet bgs (Table 1, Field Volatile Measurements). The PID was calibrated on February 20, 2014 in general accordance with the manufacturer's recommended calibration procedures. The PID readings were recorded with the soil descriptions and indications of staining or odors, if present. Logs for each boring are presented in Appendix C.

Soil and groundwater samples were not submitted for laboratory analysis and Ultra Violet Fluorescence (UVF) field analysis was not performed at this parcel because PID readings did not meet or exceed 10 ppm at the screened intervals noted above.

Soils collected from borings within the Study Area generally consisted of orangish brown Silty Sand with Clay (SM) or dark gray Fat Clay (CH). GPS coordinates for each boring were obtained using a Trimble Pro-XRS DGPS system (Appendix D) with coordinates reported in US State Plane 1983 system, North Carolina 3200 zone, using the NAD 83 datum, with units in US survey feet.

4.0 GROUNDWATER MONITORING WELLS OR REMEDIATION WELLS

Groundwater monitoring wells and remediation wells were not observed within the proposed ROW or easement on this parcel.

5.0 DISCUSSION OF RESULTS

The geophysical survey conducted at the site did not indicate the presence of probable USTs on Parcels 021 and 022. The geophysical survey did indicate the presence of buried utility lines and conduits.

PID readings were not at or above 10 ppm at the four borings advanced on this parcel. Staining, odor, and/or visual impact of the soil was not observed in the soil borings.

6.0 CONCLUSIONS

Anomalies were not observed in the EM or the GPR geophysical data at the subject properties that we interpret to be the results of metallic USTs within about 6 feet of the ground surface.

Four soil borings B-21/22-01 through B-21/22-04 were advanced to evaluate potential petroleum impact within the Study Area, and to document soil conditions.

Soil impact at Parcels 021 and 022 was not observed during the field investigation.

7.0 RECOMMENDATIONS

Based on the currently available information presented in this report, additional assessment is not recommended.

8.0 LIMITATIONS

This PSA was prepared for the use of the NCDOT. The scope of work performed at the site is limited to the tasks described in our cost proposal dated January 23, 2014. This report is not intended to represent an exhaustive research of all potential hazards that may exist. Schnabel makes no other declarations, or any express or implied warranty, as to the professional services provided under the terms of the agreement.

TABLES

Table 1, Sampling Intervals and Field Volatile Measurements

TABLE 1
FIELD VOLATILE MEASUREMENTS
PARCELS 021 & 022
NCDOT B-4490, CUMBERLAND COUNTY

Depth Below Ground Surface	Soil Borings			
	B-21/22-01	B-21/22-02	B-21/22-03	B-21/22-04
0 - 2 feet	0.0	0.0	0.0	0.0
2 - 4 feet	0.0	0.0	0.0	0.0
4 - 6 feet	0.0	0.0	0.0	0.0
6 - 8 feet	0.0	0.0	0.0	0.0
8 - 10 feet	0.0	0.0	0.0	0.0

Notes:
Field volatile measurements were obtained with a MiniRae Photo Ionization Detector
Measurements in parts per million (ppm)

FIGURES

Figure 1, Vicinity Map
Figure 2, Site Map
Figure 3 and 3A, Boring Locations and Legend

Source: 1. Cumberland County, NC, GIS Department
http://www.co.cumberland.nc.us/is_technology/gis.aspx
Projection: NAD 1983 StatePlane North Carolina FIPS 3200 Feet

240 120 0 240 Feet

Scale: 1:3,000

Schnabel ENGINEERING

SITE PROJECT B-4490, PSA PARCELS
CUMBERLAND COUNTY, NORTH CAROLINA
NC DEPARTMENT OF TRANSPORTATION
PROJECT NO. 11821014.33

VICINITY MAP

FIGURE 1

bbradley

3/27/2014 G:\2011-SDE-Jobs\11821014_00_NCDOT_2011_Geotechnical_Unit_Services\11821014_33_B-4490_Cumberland_County\GIS\Vicinity_map.mxd

Source: 1. Cumberland County, NC, GIS Department
http://www.co.cumberland.nc.us/is_technology/gis.aspx
Projection: NAD 1983 StatePlane North Carolina FIPS 3200 Feet

25 12.5 0 25 Feet

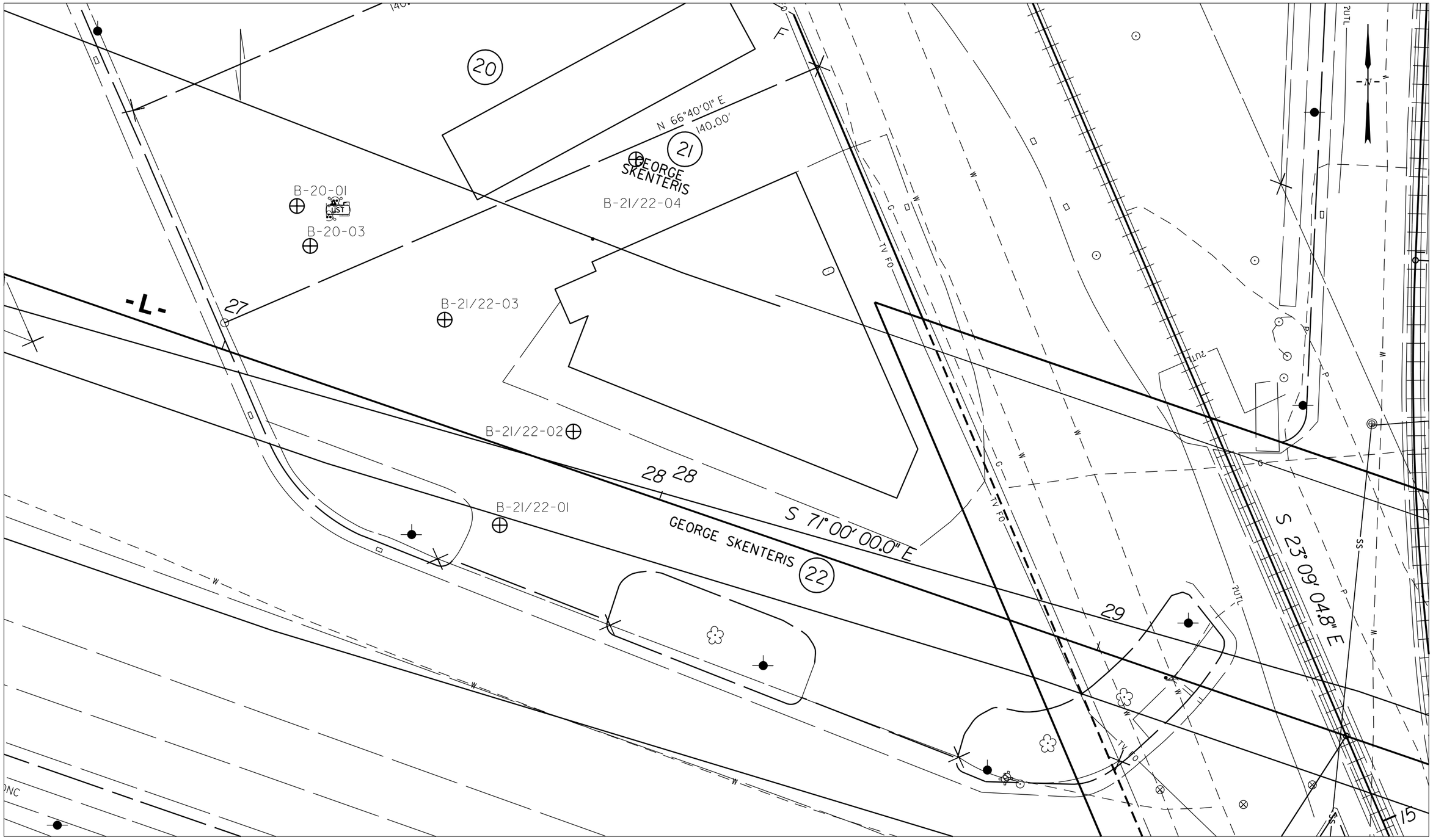
Scale: 1:350

Schnabel ENGINEERING

SITE PROJECT B-4490, PARCELS 021 & 022
CUMBERLAND COUNTY, NORTH CAROLINA
NC DEPARTMENT OF TRANSPORTATION
PROJECT NO. 11821014.33

SITE MAP
PARCELS 021 & 022
FIGURE 2

bbradley
3/25/2014 G:\2011-SDE-Jobs\11821014_00_NCDOT_2011_Geotechnical_Unit_Services\11821014_33_B-4490_Cumberland_County\GIS\Parcel_021and022_Site_Map.mxd



0 20 40

FEET

Schnabel ENGINEERING

NC Department of Transportation
Geotechnical Engineering Unit
State Project No. B-4490
Cumberland County, North Carolina

BORING LOCATIONS
Parcels 021, 022
Figure 3

04/16/11

PROJECT REFERENCE NO.	SHEET NO.
B-4490	S-A

Note: Not to Scale

****S.U.E. = Subsurface Utility Engineering***

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB
- Known Soil Contamination: Boundary or Site
- Potential Soil Contamination: Boundary or Site

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign — S
- Well — W
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

- Stream or Body of Water
- Hydro, Pool or Reservoir
- Jurisdictional Stream — JS
- Buffer Zone 1 — BZ 1
- Buffer Zone 2 — BZ 2
- Flow Arrow
- Disappearing Stream
- Spring
- Wetland
- Proposed Lateral, Tail, Head Ditch — FLOW
- False Sump

RAILROADS:

- Standard Gauge — CSX TRANSPORTATION
- RR Signal Milepost — MILEPOST 35
- Switch — SWITCH
- RR Abandoned
- RR Dismantled

RIGHT OF WAY:

- Baseline Control Point
- Existing Right of Way Marker
- Existing Right of Way Line
- Proposed Right of Way Line — RW
- Proposed Right of Way Line with Iron Pin and Cap Marker — RW
- Proposed Right of Way Line with Concrete or Granite Marker — RW
- Existing Control of Access — CA
- Proposed Control of Access — CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Drainage / Utility Easement — DUE
- Proposed Permanent Utility Easement — PUE
- Proposed Temporary Utility Easement — TUE
- Proposed Aerial Utility Easement — AUE
- Proposed Permanent Easement with Iron Pin and Cap Marker

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Curb Ramp — CR
- Curb Cut Future Ramp — CCFR
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

- Single Tree
- Single Shrub
- Hedge
- Woods Line
- Orchard
- Vineyard — Vineyard

EXISTING STRUCTURES:

MAJOR:

- Bridge, Tunnel or Box Culvert — CONC
- Bridge Wing Wall, Head Wall and End Wall — CONC WW

MINOR:

- Head and End Wall — CONC HW
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB — CB
- Paved Ditch Gutter
- Storm Sewer Manhole — S
- Storm Sewer — S

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole — P
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole
- H-Frame Pole
- Recorded U/G Power Line — P
- Designated U/G Power Line (S.U.E.*) — P

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole — T
- Telephone Booth — T
- Telephone Pedestal — T
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole — HH
- Recorded U/G Telephone Cable — T
- Designated U/G Telephone Cable (S.U.E.*) — T
- Recorded U/G Telephone Conduit — TC
- Designated U/G Telephone Conduit (S.U.E.*) — TC
- Recorded U/G Fiber Optics Cable — T FO
- Designated U/G Fiber Optics Cable (S.U.E.*) — T FO

WATER:

- Water Manhole — W
- Water Meter
- Water Valve
- Water Hydrant
- Recorded U/G Water Line — W
- Designated U/G Water Line (S.U.E.*) — W
- Above Ground Water Line — A/G Water

TV:

- TV Satellite Dish
- TV Pedestal — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- Recorded U/G TV Cable — TV
- Designated U/G TV Cable (S.U.E.*) — TV
- Recorded U/G Fiber Optic Cable — TV FO
- Designated U/G Fiber Optic Cable (S.U.E.*) — TV FO

GAS:

- Gas Valve
- Gas Meter
- Recorded U/G Gas Line — G
- Designated U/G Gas Line (S.U.E.*) — G
- Above Ground Gas Line — A/G Gas

SANITARY SEWER:

- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- Recorded SS Forced Main Line — FSS
- Designated SS Forced Main Line (S.U.E.*) — FSS

MISCELLANEOUS:

- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line — ?UTL
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. — UST
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- U/G Test Hole (S.U.E.*)
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

APPENDIX A

PHOTOGRAPHS

Parcels 021 & 022, facing east toward B-21/22-01, 02, and 03.

Parcels 021 & 022, facing east toward B-21/22-04.

APPENDIX B

GEOPHYSICS REPORT

Schnabel ENGINEERING

March 27, 2014

Mr. Mohammed A. Mulla, P.E., CPM, MCE
NCDOT, Geotechnical Engineering Unit
1020 Birch Ridge Drive
Raleigh, NC 27610

RE:	State Project:	B-4490
	WBS Element:	33727.1.1
	County:	Cumberland
	Description:	Replace Bridge No. 116 over CSX Railroad, North South Railroad, and Hillsboro Street on NC 24-210

Subject: **Project 11821014.33, Report on Geophysical Surveys**
Parcels 021 & 022, George Skenteris Property, Fayetteville, North Carolina

Dear Mr. Mulla:

SCHNABEL ENGINEERING SOUTH, PC (Schnabel) is pleased to present this report on the geophysical surveys we performed on the subject properties. The report includes two 11x17 inch color figures and two 8.5x11 inch color figures. This study was performed in accordance with our proposal for Geophysical Surveys to Locate Possible USTs dated December 26, 2013, as approved by Terry Farr on January 24, 2014, and our existing agreement dated June 2, 2011. Gordon Box provided a verbal notice to proceed on January 23, 2014.

INTRODUCTION

The field work described in this report was performed on January 28 and January 29, 2014 and February 6, 2014. The purpose of the geophysical surveys is to evaluate the potential presence of metal underground storage tanks (USTs) in the accessible areas of Parcels 021 and 022. Photographs of the properties are included on Figure 1. The properties are located in the northwest quadrant of the Rowan Street and Hillsboro Street intersection in Fayetteville, NC.

The geophysical surveys consisted of an electromagnetic (EM) induction survey and a ground penetrating radar (GPR) survey. The EM survey was performed using a Geonics EM61-MK2 (EM61) instrument. The EM61 is a time domain metal detector that stores data digitally for later processing and review. Sensitivity to metallic objects is dependent on the size, depth, and orientation of the buried object and the amount of noise (i.e. response from spurious metallic objects) in the area. The EM61 can generally observe a single

T/ 336-274-9456 F/ 336-274-9486
11A Oak Branch Drive / Greensboro, NC / 27407

buried 55 gallon drum at a depth of 10 feet or less. The EM61 makes measurements by creating an electromagnetic pulse and then measuring the response from metallic objects over time after the pulse is generated. We measured and recorded the response at several time increments after the pulse to help evaluate relative size and depth of metallic objects in the subsurface.

The GPR survey was performed over selected EM61 anomalies using a Geophysical Survey Systems SIR-3000 system equipped with a 400 MHz antenna to further investigate and evaluate EM responses that could indicate a potential UST.

Photographs of the equipment used are shown on Figure 2.

FIELD METHODOLOGY

We obtained locations of geophysical data points using a sub-meter Trimble Pro-XRS differential global positioning system (DGPS). References to direction and location in this report are based on the US State Plane 1983 System, North Carolina 3200 Zone, using the NAD 83 datum, with units in US survey feet. We also recorded the locations of existing site features (signs, guy wires, etc.) with the DGPS for later correlation with the geophysical data and a site plan provided by the NCDOT. The Microstation data provided by the NCDOT appears to be offset from the DGPS data we collected. The amount (approximately 5 feet) and direction (WNW) of offset of the Microstation data appear to be consistent for all parcels where we collected data for this project.

The EM61 data were collected along parallel survey lines spaced approximately 2.5 feet apart. The EM61 and DGPS data were recorded digitally using a field computer and later transferred to a desktop computer for data processing. The GPR data were collected along survey lines spaced approximately one to two feet apart in orthogonal directions over anomalous EM readings not attributed to cultural features. The GPR data were reviewed in the field to evaluate the possible presence of USTs. The GPR data also were recorded digitally and later transferred to a desktop computer for further review.

DISCUSSION OF RESULTS

The contoured EM61 data collected over Parcels 021 & 022 and the GPR survey area locations are shown on Figure 3, EM61 Early Time Gate Response, and Figure 4, EM61 Differential Response. Areas outside the colored, contoured EM61 data were not surveyed. Early time data refer to the response measured at a short time after the initial EM pulse is generated. Early time data typically contain responses from all metal objects, small or large and shallow or deep, within the sensitivity range of the instrument. Differential data represent the difference in response between the top and bottom coils of the EM61 instrument at a later time after the initial pulse than early time data. Differential data naturally tend to filter out the effect of surface and very shallowly buried metallic objects. Typically, the differential response emphasizes anomalies from deeper and larger objects such as USTs.

We were able to access nearly all of the planned survey area with the exception of avoiding small obstacles in various locations throughout the parcel. The EM data contain multiple anomalies that we investigated with GPR (as shown on Figures 3 and 4), all of which appear to be the result of buried utilities, reinforced concrete, or other metal objects at the ground surface or at shallow depths. The

geophysical data collected at the site do not indicate the presence of metallic USTs within the areas surveyed.

CONCLUSIONS

As shown in Figures 3 and 4, the EM data we collected over Parcels 021 and 022 covered nearly all of the planned survey area. The EM data include responses from several visible metallic objects at grade (e.g. utilities, guy wires, etc.). We did not observe anomalies in the EM or the GPR geophysical data at the subject properties that we interpret to be the results of metallic USTs within about 6 feet of the ground surface.

LIMITATIONS

These services have been performed and this report prepared for the North Carolina Department of Transportation in accordance with generally accepted guidelines for conducting geophysical surveys. It is generally recognized that the results of geophysical surveys are non-unique and may not represent actual subsurface conditions.

We appreciate the opportunity to have provided these services. Please call if you need additional information or have any questions.

Sincerely,

SCHNABEL ENGINEERING SOUTH, PC

James W. Whitt, LG
Senior Staff Geophysicist

Gregory B. Kuntz, LG
Senior Associate

JWW:JCD:GBK
Attachments: Figures (4)
CC: NCDOT, Gordon Box
FILE: G:\2011-SDE-JOBS\11821014_00_NCDOT_2011_GEOTECHNICAL_UNIT_SERVICES\11821014_33_B-4490_CUMBERLAND_COUNTY\REPORT\GEOPHYSICS\PARCEL 21 & 22\SCHNABEL GEOPHYSICAL REPORT ON PARCELS 21 & 22 (B-4490) FINAL.DOCX

Attachments:

- Figure 1 - Parcels 021 & 022 Site Photos
- Figure 2 - Photos of Geophysical Equipment Used
- Figure 3 - EM61 Early Time Gate Response
- Figure 4 - EM61 Differential Response

Parcels 021 & 022 (George Skenteris Property), looking southwest

Parcels 021 & 022 (George Skenteris Property), looking west

Schnabel ENGINEERING	STATE PROJECT B-4490 NC DEPT. OF TRANSPORTATION CUMBERLAND CO., NORTH CAROLINA PROJECT NO. 11821014.33	PARCELS 021 & 022 SITE PHOTOS FIGURE 1

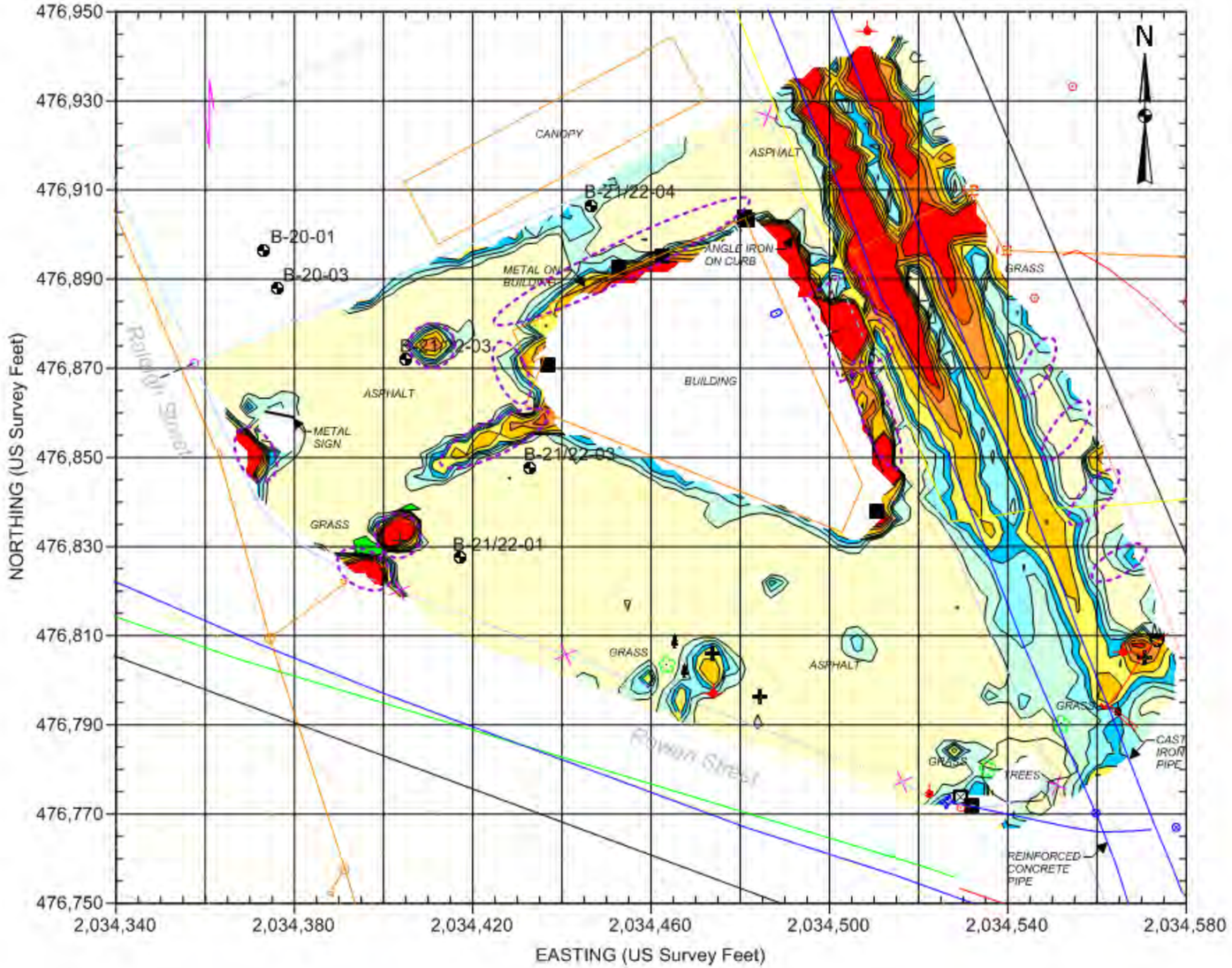
Geonics EM61-MK2 Metal Detector with Trimble DGPS Unit

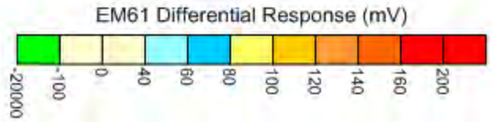
GSSI SIR-3000 Ground-Penetrating Radar with 400 MHz Antenna

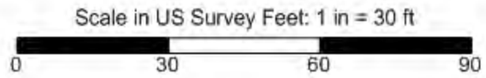
Note: Stock photographs – not taken on site.

Schnabel ENGINEERING	STATE PROJECT B-4490 NC DEPT. OF TRANSPORTATION CUMBERLAND CO., NORTH CAROLINA PROJECT NO. 11821014.33	PHOTOS OF GEOPHYSICAL EQUIPMENT USED FIGURE 2

PARCELS 021 & 022







EXPLANATION

- SIGN
- MISCELLANEOUS METALLIC OBJECT
- UTILITY MANHOLE, METER, BOX, ETC.
- GUY WIRE
- UTILITY POLE
- EDGE OF NCDOT PROPOSED R/W
- PROPERTY LINE
- GPR SURVEY AREA
- BORING LOCATION

BASE PLAN FROM NCDOT FILE:
B-4490_rdy_psh_07.dgn &
B-4490_rdy_psh_08.dgn
(FOR SOME SITE FEATURES)

Note: The contour plot shows the difference, in millivolts (mV), between the readings from the top and bottom coils of the EM61. The difference is taken to reduce the effect of shallow metal objects and emphasize anomalies caused by deeper metallic objects, such as drums and tanks. The EM data were collected on January 28 and January 29, 2014, using a Geonics EM61-MK2 instrument. Positioning for the EM61 survey was provided using a submeter Trimble ProXRS DGPS system. Coordinates are in the US State Plane 1983 System, North Carolina 3200 Zone, using the NAD 1983 datum. GPR data were acquired on February 6, 2014, using a Geophysical Survey Systems SIR 3000 equipped with a 400 MHz antenna.

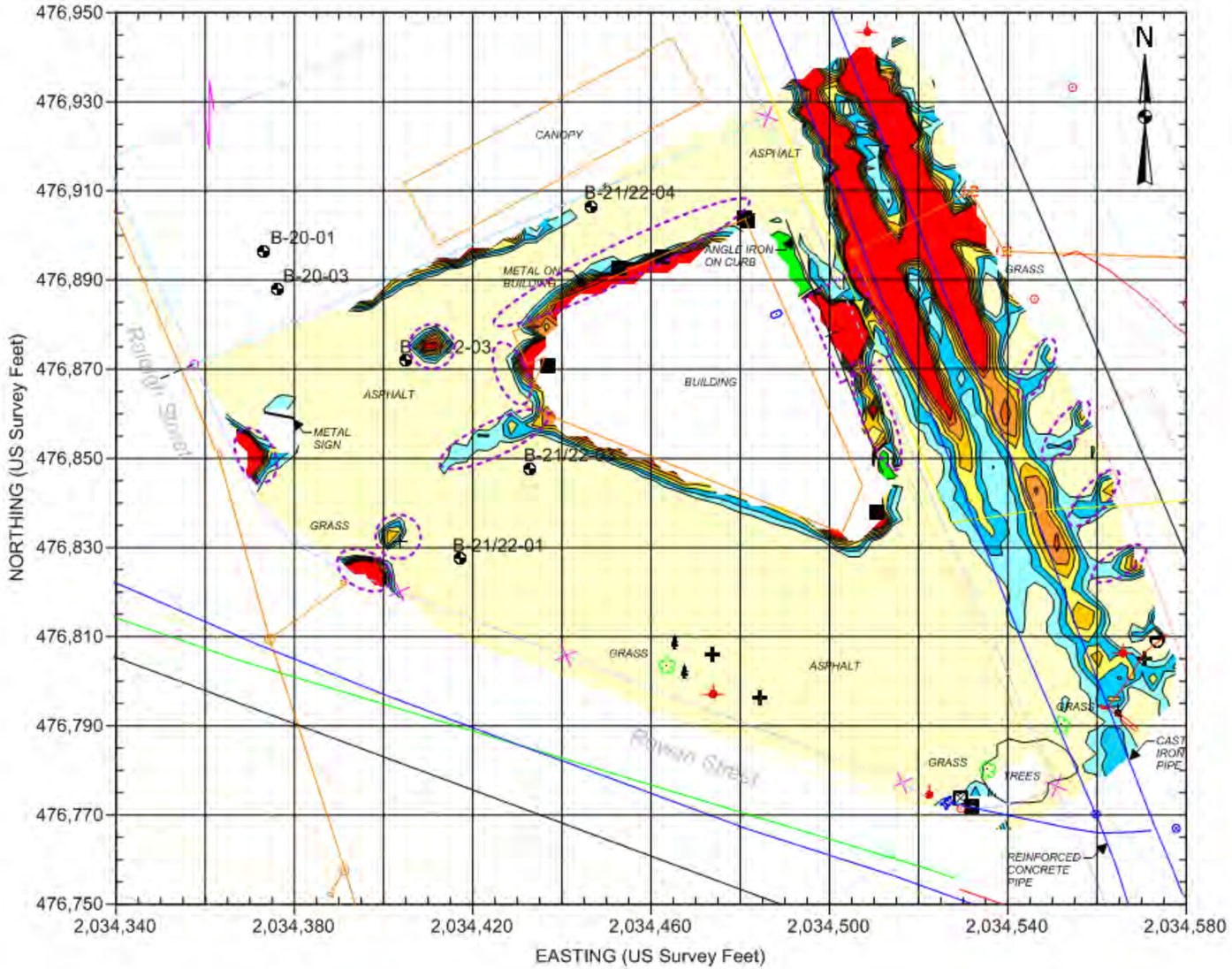
Schnabel ENGINEERING

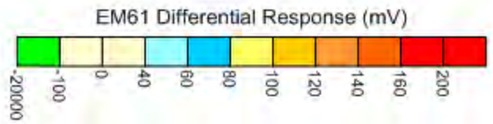
STATE PROJECT B-4490
NC DEPARTMENT OF TRANSPORTATION
CUMBERLAND COUNTY, NC
PROJECT NO. 11821014.33

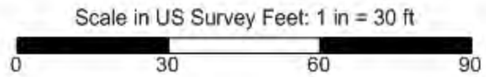
EM61
EARLY TIME GATE
RESPONSE

FIGURE 3

PARCELS 021 & 022







EXPLANATION

- SIGN
- MISCELLANEOUS METALLIC OBJECT
- UTILITY MANHOLE, METER, BOX, ETC.
- GUY WIRE
- UTILITY POLE
- EDGE OF NCDOT PROPOSED R/W
- PROPERTY LINE
- GPR SURVEY AREA
- BORING LOCATION

BASE PLAN FROM NCDOT FILE:
B-4490_rdy_psh_07.dgn &
B-4490_rdy_psh_08.dgn
(FOR SOME SITE FEATURES)

Note: The contour plot shows the difference, in millivolts (mV), between the readings from the top and bottom coils of the EM61. The difference is taken to reduce the effect of shallow metal objects and emphasize anomalies caused by deeper metallic objects, such as drums and tanks. The EM data were collected on January 28 and January 29, 2014, using a Geonics EM61-MK2 instrument. Positioning for the EM61 survey was provided using a submeter Trimble ProXRS DGPS system. Coordinates are in the US State Plane 1983 System, North Carolina 3200 Zone, using the NAD 1983 datum. GPR data were acquired on February 6, 2014, using a Geophysical Survey Systems SIR 3000 equipped with a 400 MHz antenna.

Schnabel ENGINEERING

STATE PROJECT B-4490
NC DEPARTMENT OF TRANSPORTATION
CUMBERLAND COUNTY, NC
PROJECT NO. 11821014.33

EM61
DIFFERENTIAL
RESPONSE

FIGURE 4

APPENDIX C

SOIL BORING LOGS

Schnabel ENGINEERING

GEO PROBE LOG

Project: Preliminary Site Assessments
Cumberland County
Fayetteville, North Carolina

Geo Probe Number: B-21/22-01
Contract Number: B-4490
Sheet: 1 of 1

Contractor: Saedacco, Inc.
Fort Mill, South Carolina

Contractor Foreman: W. Hall

Schnabel Representative: B. Bradley

Equipment: Geoprobe 7822DT

Method: 3-1/4" Probe Rod,
Macrocore

Hammer Type:

Dates Started: 2/19/14 **Finished:** 2/19/14

X: 476827.431 m **Y:** 2034417.03 m

Ground Surface Elevation: **Total Depth:** 10.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered ▽	2/19	3:09 PM	7.0'	---	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
0.2	Asphalt							
	PROBABLE FILL, sampled as silty sand; moist, orangeish brown	FILL					PID = 0.0 ppm	
					5		PID = 0.0 ppm	
							PID = 0.0 ppm	
7.0 ▽	SILTY SAND WITH CLAY; wet, light gray, probable RESIDUAL material	SM					PID = 0.0 ppm	
							PID = 0.0 ppm	
10.0					10		PID = 0.0 ppm	

Bottom of Geo Probe at 10.0 ft.
Boring terminated at selected depth.
Boring backfilled with bentonite and cuttings upon completion.

Schnabel ENGINEERING

GEO PROBE LOG

Project: Preliminary Site Assessments
Cumberland County
Fayetteville, North Carolina

Geo Probe Number: B-21/22-02
Contract Number: B-4490
Sheet: 1 of 1

Contractor: Saedacco, Inc.
Fort Mill, South Carolina

Contractor Foreman: W. Hall

Schnabel Representative: B. Bradley

Equipment: Geoprobe 7822DT

Method: 3-1/4" Probe Rod,
Macrocore

Hammer Type:

Dates Started: 2/19/14 **Finished:** 2/19/14

X: 476847.673 m **Y:** 2034432.943 m

Ground Surface Elevation: **Total Depth:** 10.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered ▽	2/19	2:59 PM	7.0'	---	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
0.2	Asphalt							
	PROBABLE FILL, sampled as silty sand; moist, orangeish brown	FILL					PID = 0.0 ppm	
4.0	SILTY SAND; wet, orangeish gray, probable RESIDUAL material ▽	SM			5		PID = 0.0 ppm PID = 0.0 ppm	
8.0	FAT CLAY; moist, dark gray, probable RESIDUAL material	CH					PID = 0.0 ppm	
10.0					10		PID = 0.0 ppm	

Bottom of Geo Probe at 10.0 ft.
Boring terminated at selected depth.
Boring backfilled with bentonite and cuttings upon completion.

Schnabel ENGINEERING

GEO PROBE LOG

Project: Preliminary Site Assessments
Cumberland County
Fayetteville, North Carolina

Geo Probe Number: B-21/22-03
Contract Number: B-4490
Sheet: 1 of 1

Contractor: Saedacco, Inc.
Fort Mill, South Carolina

Contractor Foreman: W. Hall

Schnabel Representative: B. Bradley

Equipment: Geoprobe 7822DT

Method: 3-1/4" Probe Rod,
Macrocore

Hammer Type:

Dates Started: 2/19/14 **Finished:** 2/19/14

X: 476871.859 m **Y:** 2034405.126 m

Ground Surface Elevation: **Total Depth:** 10.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered ▽	2/19	3:14 PM	7.0'	---	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
0.3	Asphalt							
	PROBABLE FILL, sampled as silty sand; moist, orangeish brown	FILL					PID = 0.0 ppm	
4.5	SILTY SAND WITH CLAY; wet, light gray, probable RESIDUAL material	SM			5		PID = 0.0 ppm	
							PID = 0.0 ppm	
							PID = 0.0 ppm	
10.0					10		PID = 0.0 ppm	

Bottom of Geo Probe at 10.0 ft.
Boring terminated at selected depth.
Boring backfilled with bentonite and cuttings upon completion.

TEST BORING LOG PSA.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 3/27/14

Schnabel ENGINEERING **GEO PROBE LOG**

Project: Preliminary Site Assessments
Cumberland County
Fayetteville, North Carolina

Geo Probe Number: **B-21/22-04**
Contract Number: B-4490
Sheet: 1 of 1

Contractor: Saedacco, Inc.
Fort Mill, South Carolina

Contractor Foreman: W. Hall

Schnabel Representative: B. Bradley

Equipment: Geoprobe 7822DT

Method: 3-1/4" Probe Rod,
Macrocore

Hammer Type:

Dates Started: 2/19/14 **Finished:** 2/19/14

X: 476906.526 m **Y:** 2034446.485 m

Ground Surface Elevation: **Total Depth:** 10.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered ▽	2/19	3:21 PM	7.0'	---	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
0.2	Asphalt							
	PROBABLE FILL, sampled as silty sand; moist, orangeish brown	FILL					PID = 0.0 ppm	
4.2	SILTY SAND WITH CLAY; wet, light gray, probable RESIDUAL material	SM			5		PID = 0.0 ppm PID = 0.0 ppm PID = 0.0 ppm	
10.0					10		PID = 0.0 ppm	

Bottom of Geo Probe at 10.0 ft.
Boring terminated at selected depth.
Boring backfilled with bentonite and cuttings upon completion.

APPENDIX D

SOIL BORING GPS COORDINATES

SOIL BORING GPS COORDINATES
NCDOT B-4490, CUMBERLAND COUNTY

Soil Boring GPS Coordinates		
Boring Identification	Easting	Northing
	X	Y
B-21/22-01	2034417.030	476827.431
B-21/22-02	2034432.943	476847.673
B-21/22-03	2034405.126	476871.859
B-21/22-04	2034446.485	476906.526

* NC State Plane 1983 System, NC 3200 Zone,
NAD 83 Datum, US Survey Feet