Schnabel ENGINEERING

July 30, 2010

Mr. Ethan Caldwell, LG, EI
NCDOT, Geotechnical Engineering Unit
1020 Birch Ridge Drive
Raleigh, NC 27610

RE:	State Project:	U-0209B
	WBS Element:	34749.1.1
	County:	Mecklenburg
	Description:	Charlotte – US 74 (Independence Boulevard) from NC 24-27 (Albemarle Road) to Idlewild Road

Subject: **Project 09210013.25, Report on Geophysical Surveys**
Parcel 97, Mecklenburg County, North Carolina

Dear Mr. Caldwell:

SCHNABEL ENGINEERING SOUTH, PC (Schnabel) is pleased to present this report on the geophysical surveys we conducted on the subject site. The report includes one 11x17 color figure.

INTRODUCTION

The work described in this report was conducted on June 16 and 22, 2010, by Schnabel under our 2009 contract with the NCDOT. The work was conducted within the accessible areas of the proposed right-of-way and/or easement as indicated on the NCDOT's preliminary plan sheets to support their environmental assessment of Parcel 97 (Dorthy H. Marshall Et. Al. Property). The purpose of the geophysical surveys was to locate possible metal underground storage tanks (UST's) and associated metal product lines in the accessible areas of the right-of-way and/or easement.

The geophysical investigation consisted of electromagnetic (EM) induction surveys using a Geonics EM61-MK2 instrument. The EM61 metal detector is used to locate metal objects buried up to about eight feet below ground surface. Ground-penetrating radar (GPR) investigations of selected EM61 anomalies, including areas of reinforced concrete, were conducted using a Geophysical Survey Systems SIR-3000 system equipped with a 400 MHz antenna.

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FIELD METHODOLOGY

Locations of geophysical data points were obtained using a sub-meter Trimble Pro-XRS DGPS system. 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. The locations of existing site features (manholes, signs, etc.) were recorded for later correlation with the geophysical data and for location references to the NCDOT drawings.

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 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 UST's. The GPR data also were recorded digitally and later transferred to a desktop computer for further review.

DISCUSSION OF RESULTS

We used a rental EM61 for the data collection on this project. We discovered that this rental unit had an intermittent short in the top coil, which made the differential data unreliable. The data collected from just the bottom coil were not affected by this problem. The early time gate data collected from the bottom coil were used to determine anomalous locations to survey with GPR. The early time gate data provide the more sensitive detection of metal objects.

The contoured early time gate EM61 data for Parcel 97 are shown on Figure 1. The early time gate results show anomalies apparently caused by reinforced concrete, buried utilities, or known site features (Figure 1). The GPR data collected at the site do not indicate the presence of metallic UST's within the right-of-way and/or easement.

CONCLUSIONS

Our evaluation of the geophysical data collected on Parcel 97 on Project U-0209B in Charlotte, NC indicates the following:

The geophysical data do not indicate the presence of metallic UST's in the areas surveyed on Parcel 97.

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.

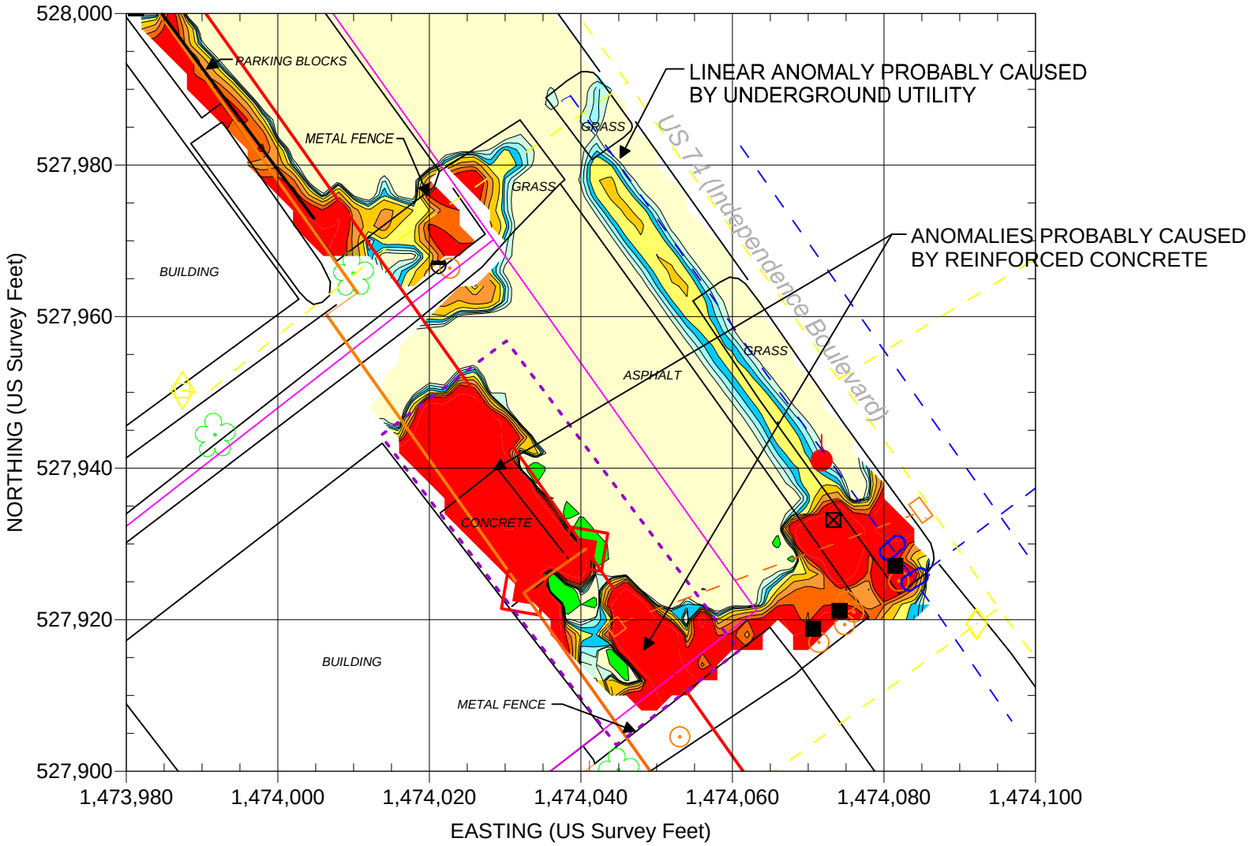
Sincerely,

SCHNABEL ENGINEERING SOUTH, PC

Jeremy S Strohmeyer, LG
Project Manager

Edward D Billington, LG
Senior Vice President

JS:JW:NB
Attachments: Figure 1
FILE: G:\2009 PROJECTS\09210013 (NCDOT 2009 GEOTECH UNIT SERVICES)\09210013.25 (U-0209B, MECKLENBURG CO.)\REPORT\PARCEL 97\SCHNABEL GEOPHYSICAL REPORT ON PARCEL 97.DOCX



EM61 Early Time Gate Response (mV)

-15000 -200 0 50 100 150 200 300 500 750 1000 2000

Scale in US Survey Feet

0 20 40 60

EXPLANATION

- SIGN
- UTILITY POLE
- GUY WIRE
- MISCELLANEOUS METALLIC OBJECT
- UTILITY MANHOLE, METER, BOX, ETC.
- LIGHT POLE
- STORM SEWER INLET
- UST LID
- MONITORING WELL
- DOT PROPOSED R/W
- DOT PROPOSED UTILITY EASEMENT
- PROPERTY LINE
- UTILITY (AS MARKED BY OTHERS OR AS PROVIDED BY NCDOT [VARIOUS COLORS])
- GPR SURVEY AREA

REF.: NCDOT FILE: u-209b_rdy_psh_10.dgn
(FOR SOME SITE FEATURES)

Note: The contour plot shows the earliest and most sensitive time gate of the EM61 bottom coil/channel in millivolts (mV). The EM data were collected on June 14 through June 16, 2010, 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 Zone 3200, using the NAD 1983 datum. GPR data were acquired on June 22 through June 24, 2010, using a Geophysical Survey Systems SIR 3000 equipped with a 400 MHz antenna.

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STATE PROJECT U-0209B
NC DEPARTMENT OF TRANSPORTATION
MECKLENBURG COUNTY, NC
PROJECT NO. 09210013.25

PARCEL 97
EM61 EARLY TIME GATE RESPONSE
FIGURE 1