STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAT MCCRORY
GOVERNOR

ANTHONY J. TATA
SECRETARY

March 5, 2015

MEMORANDUM TO: Jennifer Harris, P.E.
Bridge Project Development Section Head
PDEA – Bridge Project Development Section

ATTENTION: April Annis
Project Development Engineer

FROM: John Pilipchuk, L.G., P.E.
State Geotechnical Engineer

Docusigned by: John Pilipchuk DS ENW

TIP: B-4683
WBS: 38466.1.FD2
COUNTY: Yadkin
DESCRIPTION: Bridge No. 20 on SR 1152 (Nellie Rd.) over South Deep Creek

SUBJECT: Geotechnical Report for Planning

The Geotechnical Engineering Unit has completed the Geotechnical Impact Report, and presents the following information.

Techniques and Methodologies

This geotechnical investigation consists of 2 SPT borings and field reconnaissance. Boring B-1 was drilled in the SE bridge quadrant 13' back from the end bent and 16' from road centerline. Boring B-2 is located in the NW bridge quadrant 12' back from the end bent and 15' from road centerline.

Findings

This rural site is surrounded by open fields and wooded areas. South Deep Creek has a sandy bottom and there are no obvious signs of scour. Bridge abutments are stabilized with rip rap. Geologically this site lies within the Inner Piedmont Belt and is likely underlain by metamorphosed granite rock. Boring B-1 was advanced 13.1 feet before refusing on rock. Boring

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LOCATION:
CENTURY CENTER COMPLEX
ENTRANCE B-2
1020 BIRCH RIDGE DRIVE
RALEIGH NC

B-2 went 28.4 feet before stopping on top of rock. Collar elevations for each boring are 0.3' in difference, thus the soil profile to rock in deeper at the B-2 location (west of the creek).

The stratigraphy in our borings is as follows:

B-1 *Roadway Embankment Fill* (0 to 9.2') red-brown soft to medium stiff, moist, sandy silty clay (A-7)
Alluvial (9.2 – 12.6') red medium stiff, moist, sandy silty clay (A-7)
Weathered Rock (12.6 – 13.1') severely weathered crystalline rock
Rock (13.1') drill casing refusal

B-2 *Roadway Embankment Fill* (0 to 7') red-brown soft to medium stiff, moist, sandy silty clay (A-7)
Alluvial (7 – 14') tan-gray very loose, wet, clayey silty sand (A-2)
Alluvial (14 - 18') gray medium stiff, wet, sandy silty clay (A-7)
Alluvial (18 – 22.8') gray-black very loose, wet, clayey silty coarse sand (A-2)
Weathered Rock (22.8 – 28.4') severely weathered crystalline rock
Rock (28.4') drill casing refusal

Anticipated Impacts

- Roadway slopes will be recommended at 2:1 (H:V). End Bent slopes can be constructed at 1.5:1(H:V) using slope protection.
- Based on boring data weathered rock / rock lies 0.5 feet below creek bed elevation east of the creek and 10.6 feet below creek bed west of the creek. Driven piles are generally utilized for end bent foundations. Interior bent foundations will likely encounter weathered rock or rock within 10 feet of creek bed.
- From a geologic stand point there is no preference as to location of the replacement structure.

Please direct any geotechnical questions or comments to Eddie Beverly at (704) 455-8902.

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EB

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CBL