STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

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June 7, 2005

STATE PROJECT: 33377.1.1
I.D. : B-4009
COUNTY: Anson
DESCRIPTION: Bridge No. 033 over Brown Creek on US 74 WBL

SUBJECT: Geotechnical Report - Bridge Foundation Investigation

SITE DESCRIPTION AND GEOLOGY

The site is located in southwestern Anson County, near the town of Polkton. The proposed replacement structure will be a concrete deck on reinforced concrete deck girders with two spans of 43.0', one span of 59.00', nine spans of 45.0', and one span of 59.0'. The skew is approximately 90 degrees to line -L- (US 74 WBL). The new structure will be in the same location as the existing structure. The benchmark (TBM #3, elev. 255.53') used to survey our collar elevations is located on the northwest headwall of US 74 EBL at 31+48.56 –BL-, 42.05' left.

The Geotechnical Unit performed a total of 13 Standard Penetration Test (SPT) borings and 16 core borings at this site. All borings were advanced with water using either a tri-cone bit or NX wireline (core). The predominant rock types encountered in our core borings were Triassic, red/brown to gray, sandstone and mudstone. Thirteen rock core samples were submitted to the rock lab where they were tested for Unit Weight, Compressive Strength, and Young's Modulus. The results from these tests can be obtained from either John Rogers in the Harrisburg Field Office or from Chris Chen in the Central (Headquarters) Office.

At least one boring on each of the interior bents was cored. Due to the predicted depths of scour on Bents One - Three, all six borings performed in this area were cored. The primary difference between the weathered rock and the hard non-crystalline rock as depicted on the cross-sections was the drilling method. This is based on the following three factors:

(a) The Compressive Strengths of the submitted rock core samples,
(b) Standard Penetration Tests in the borings that were not cored, and
(c) Visual inspection of recovered core.

FOUNDATION SUMMARY

End Bent One (EB1)

Roadway fill soils encountered at this location are approximately nine feet thick and consist of loose asphalt, gravel, and rock. Approximately 19.0' of alluvial soils were

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encountered on this bent. These soils consist of a very soft to soft, sandy and silty clay (A-6) layer overlying a coarse sandy layer (A-1-b). Residual soils were not encountered at this location.

Metal shavings were observed coming out of the top of the casing while the boring was being advanced through this sandy alluvial layer. These shavings could possible have come from drilling through an existing abutment wall tieback system. In addition, a tri-cone-drilling bit was destroyed in this zone. Please refer to sheet 5 of the attached Bridge Foundation investigation. Weathered rock was encountered near elevation 224.50' in the boring performed at EB1-A. Hard, non-crystalline rock (tri-cone bit refusal) was encountered across the bent between elevation 725.90' and 736.30'. At the time of our investigation, the zero hour groundwater level was near elevation 243.40' across the bent.

Interior Bent One (B1)

Alluvial soils encountered are 14.0' to 15.0' thick and consist of very soft to soft, silty clay (A-6) and loose to dense, coarse sand (A-1-b). Wood debris was encountered in the clay layer at B1-A and in the sand layer at B1-B. Residual soils encountered at this bent are approximately 2.50'- 4.00' thick and consist of medium stiff to very stiff, clayey silt (A-4). Roadway fill soils were not encountered at this location.

Weathered, Triassic rock was encountered between elevation 223.50' - 223.60' across this bent. Hard, Triassic rock (auger refusal) is present on this bent between elevation 221.60' – 222.00'. Rock core retrieved at this location consisted of moderately severe to slightly weathered and soft to moderately hard, mudstone and sandstone. RQD's are between 0% and 89%. The zero hour groundwater level was above the collar elevations for both borings along this bent (elevation 242.00' – 246.00'). Please refer to the appropriate corelog and cross-section for a detailed, run-by run analysis of the core retrieved at this location.

Interior Bent Two (B2)

Alluvial soils encountered are 11.80' to 14.50' thick and consist of very soft to medium stiff, silty clay (A-6) and very loose to medium dense, clayey sand (A-1-b) with gravel. Burnt wood debris, trash, and leaves were encountered throughout the alluvial layers across this bent. Residual soils encountered at this bent are approximately 1.80'-4.00' thick and consist of stiff to hard, clayey silt (A-4). Roadway fill soils were not encountered at this location.

Weathered, Triassic rock was encountered between elevation 217.80' – 223.90' across this bent. Hard, Triassic rock (auger refusal) is present on this bent between elevation 217.10' – 222.20'. Rock core retrieved at this location consisted of moderately to slightly weathered and medium hard to moderately hard, mudstone and sandstone. RQD's are between 57% and 93%. The zero hour groundwater level was above the collar elevations for both borings along this bent (elevation 242.30' – 243.00'). Please refer to the appropriate corelog and cross-section for a detailed, run-by run analysis of the core retrieved at this location.

Interior Bent Three (B3)

Alluvial soils encountered on this bent are 16.50' to 17.40' thick and consist of very soft to soft, sandy silt (A-4) and medium dense, coarse sand (A-1-b) with gravel and rock fragments. Residual soils encountered at this bent are approximately 2.30'- 7.00'