STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

P.O. BOX 25201, RALEIGH, N.C. 27611-5201

LYNDO TIPPETT
SECRETARY

October 21, 2003

STATE PROJECT: 8.1621301 (I-2102)
FEDERAL PROJECT: IR-40-3(62)182
COUNTY: Forsyth
DESCRIPTION: Bridge #50 on SR 1101 over I-40 between Peace Haven Rd and NC 158.

SUBJECT: Geotechnical Report - Bridge Foundation Investigation

SITE DESCRIPTION

This project is located in Forsyth County between the Yadkin River and Clemmons. The proposed two-span structure has a skew of 56 degrees, 40 minutes to line –LREV- with one span at 144.50' and one span at 140.00'. The proposed structure will be located in the same place as the existing structure.

Between May and August of 2003, the Geotechnical Engineering Unit performed 9 Standard Penetration Test (SPT) borings at the site. The USGS monument "Tanglewood" (elevation 811.02) was the benchmark used to run all collar elevations across the site. This benchmark is located at 22+05 –LREV-, 5.00' right.

Roadway fill soils/materials encountered are two to 12.00' feet thick and consist of asphalt (at Bent One), stiff silty clay (A-7) with rock fragments, and dense clayey sand (A-2-5) with gravel and boulders. Alluvial soils were not encountered within the project corridor. Residual soils are 58.00' to 68.00' thick and consist of medium stiff to very stiff sandy clay (A-7), medium dense to dense silty sand (A-2-4), and soft to very stiff sandy silt (A-4, A-5).

Weathered rock was encountered across the site between elevations 717.00' and 737.00'. Hard rock (auger refusal), where encountered, is near elevation 739.00'. Groundwater across the site is between elevations 771.00' and 774.00'.

FOUNDATION SUMMARY

End Bent One (EB1)

Roadway fill soils encountered at the boring performed at EB1-C are eight feet thick and consist of dense clayey sand (A-2-7) with gravel and boulders. The gravel and boulder layer was encountered starting at elevation 801.50' and extended downward to elevation 798.20'. The boulders could impede pile driving at this location. No other

roadway fill soils were encountered at this bent. Residual soils at this location consist of very soft to very stiff silty and sandy clay (A-7), medium stiff to hard sandy silt (A-4, A-5) and medium dense to dense silty sand (A-2-4). The boring performed at EB1-C was the only boring on this bent to reach the bottom of the saprolitic soils (elev. 736.60').

Consistency (SPT) values increased markedly across the bent between elevations 755.00' and 765.00'. Weathered rock was encountered in the boring performed at EB1-C starting at elevation 736.60'. This boring (EB1-C) was terminated at elevation 735.90'. 24 hour groundwater levels at this location were between elevations 771.20' and 773.60'.

Bent One (B1)

The borings for this bent were performed in the paved shoulder of the eastbound lane of I-40. A two-foot layer of asphalt was encountered in each of the borings at this location. No other fill materials were encountered. Residual soils at this bent are 54.00' to 66.00' thick and consist of very soft to very stiff sandy and silty clay (A-7), medium stiff to hard sandy silt (A-4, A-5), and medium dense to very dense silty and clayey sand (A-2-4, A-2-6). Consistency (SPT) values increased markedly across the bent between elevations 755.00' and 760.00'.

Weathered rock was first encountered near elevation 733.00' and was interlayered with soil seams below that elevation. SPT refusal on crystalline rock was encountered in the boring performed at B1-C starting at elevation 727.80' with boring termination occurring at elevation 722.69'. Due to the time constraints of working in the interstate, the 24 hour groundwater level (elevation 774.20') was obtained from only one boring (B1-A) on this bent.

End Bent Two (EB2)

Roadway fill soils encountered across this bent are eight to 12.00' thick and consist of medium stiff to very stiff silty and sandy clay (A-7). Residual soils at this location are approximately 58.00' to 65.00' thick and consist of soft to stiff sandy and silty clay (A-7), soft to hard sandy silt (A-4, A-5), and medium dense to very dense silty sand (A-2-4). Consistency (SPT) values increased markedly across the bent between elevations 760.00' and 763.00'. Weathered rock was encountered in the boring performed at EB2-B starting near elevation 736.00'. SPT refusal occurred on hard, crystalline rock in the boring performed at EB2-C at elevation 740.00'. 24 hour groundwater levels at this location were between elevations 772.00' and 774.00'.

Respectfully submitted,

J. P. Rogers
Project Geologist
Geotechnical Unit, Matthews Field Office

cc: Pat Ivey, PE
Division 09 Engineer