



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

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October 30, 2003

STATE PROJECT: 8.T540402 (R-2417BB)  
F.A. PROJECT: STP-NHF-421 (2)  
COUNTY: Lee  
DESCRIPTION: US 421/NC 87 (Sanford Bypass) from east of SR 1521 (Kelly Dr.) to east of NC 42  
SUBJECT: Geotechnical Report - Structure Inventory for Structure No. 1 on  
-Y1- (SR 1524, O'Quinn Rd.) over -L- (US 421/NC 87, Sanford Bypass) at -Y1-  
Station 20+02.46

**Project Description**

The proposed structure is a two-span bridge, 252.8 feet in length and the skew of the bents ranges from 114°45'38" at End Bent 2 to 119°10'57" at End Bent 1. It will carry the existing -Y1- (SR 1524, O'Quinn Rd.) over the proposed -L- (US 421/NC 87, Sanford Bypass). The project is located in Lee County about 3 miles east of Sanford.

The subsurface investigation was conducted during September of 2003 using an ATV-mounted CME-45C drill machine. Standard Penetration Test borings were performed at each of the three proposed bent locations. All borings except the boring at EB1-A were advanced using rotary with bentonite drilling fluid. Boring EB1-A was advanced with hollow stem augers. Representative soil samples were obtained for visual classification in the field and selected samples were sent to the Materials and Test Unit for laboratory analysis.

**Physiography and Geology**

The project is located near the boundary of the Piedmont Physiographic Province and the Coastal Plain Physiographic Province. Geologically, the site is located east of the Jonesboro fault and the Piedmont soil and rock are part of the Raleigh Geologic Belt. The terrain consists of a relatively flat to gently rolling hills and a mixture of wooded land and homes.

**Soil Properties**

Soils encountered at the project site include coastal plain and residual soils.

Coastal Plain soils are present at all proposed bent locations and range in thickness from 15.2 to 22.5 feet. These soils consist predominantly of red-brown, orange-brown and yellow-brown, moist, soft to hard, silty clay (A-7-5, A-7-6), and orange-brown, moist, medium dense, clayey sand (A-2-6, A-2-7). Coastal Plain soils are underlain by residual soils.

Residual soils are present at each proposed bent location. These soils consist of tan, black and pink, moist, dense to very dense, saprolitic, silty sand (A-2-4) and light gray, black, tan and pink-white, moist, medium stiff to hard, saprolitic, sandy and clayey silt (A-4, A-5). Light gray and red-brown, moist, medium stiff to stiff, silty clay (A-7-5) is also present. Weathered rock and/or crystalline rock underlie residual soils.

**Rock Properties**

Weathered rock was derived from the underlying gneiss and ranges in thickness from 4.5 to 11.3 feet. The top of weathered rock was encountered at elevations ranging from 384.7 at B1-B to 379.7 feet at EB2-B.

Crystalline rock was encountered at the boring locations of EB1-A, EB1-B and B1-A. The top of crystalline rock ranges in elevation from 376.4 at B1-A to 370.4 feet at EB1-A.

**Groundwater**

Groundwater was encountered at each bent location. Groundwater elevations ranged from 420.1 at EB1-B to 399.5 feet at EB1-A.

**Notice**

This Geotechnical foundation report is based on the Preliminary General Drawing for structure no. 1 on -Y1- (SR 1524, O'Quinn Rd.) over -L- (US 421/NC 87, Sanford Bypass) dated August 18, 2003. If significant changes are made in the design or location of the proposed structure, the subsurface information should be reviewed and modified as necessary.

Respectfully submitted,

Joseph I. Milkovits, Jr.  
Project Geologist