STATE OF NORTH CAROLINA
# DEPARTMENT OF TRANSPORTATION
P.O. BOX 25201, RALEIGH, N.C. 27611-5201

Michael F. Easley
GOVERNOR

Lyndo Tippett
SECRETARY

March 31, 2004

STATE PROJECT:  33131.1.1 (B-3522)
F.A. PROJECT:   BRSTP-1007 (5)
COUNTY:         Wake

DESCRIPTION:    Bridge No. 215 on -L- (SR 1007, Poole Rd.) over Buffalo Creek at -L- Station 26+10.50.

SUBJECT:        Geotechnical Report - Structure Inventory

## Project Description

A three-span bridge, 105 feet in length with a 90° skew, is proposed on -L- (SR 1007, Poole Rd.) over Buffalo Creek to replace the existing structure. The new bridge will be 60 feet longer than the existing bridge. Also a temporary bridge will be constructed approximately 45 feet right of the permanent bridge. The project is located in Wake County about 2 miles southwest of Wendell.

The subsurface investigation was conducted during January of 2004 using a B-57 drill machine with a manual hammer. Standard Penetration Test borings were performed at each of the four bent locations. All borings were advanced until crystalline rock was encountered. Interior bent borings B1-B and B2-A were cored using NX core equipment to recover rock samples from crystalline rock. 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. Four rock core samples were also sent to the Materials and Test Unit to determine Unit Weight, Compressive Strength and Young's Modulus.

## Physiography and Geology

The project is located in gently rolling terrain of the Piedmont Physiographic Province. The site is located within the Raleigh Geologic Belt and is underlain by foliated to massive granitic rock. Buffalo Creek is a tributary of the Little River.

## Soil Properties

Soils encountered at the project site include roadway embankment and alluvial soils.

Roadway embankment soils are present at the two end bent locations and range in thickness from 6.7 to 10.2 feet. These soils consist predominantly of tan and red-brown, moist to wet, medium stiff to stiff, sandy and silty clay (A-6, A-7-6). Embankment soils are underlain by alluvial soils.

Alluvial soils were encountered in all borings and range in thickness from 2.2 to 8.5 feet. Alluvial soils consist of light gray to white-black and tan, dry to wet, very loose to medium dense, coarse sand (A-1-b) and silty sand (A-2-4). Light gray to gray-green and red-brown, moist to wet, very soft to stiff, sandy silt (A-4) and silty clay (A-7-6) are also present. The alluvial soils were deposited on crystalline rock.

## Rock Properties

Crystalline rock was encountered at each boring location. The top of crystalline rock ranges in elevation from 253.7 at EB2-B to 249.5 feet at EB1-A. Rock core was obtained from two of the interior bent borings. Crystalline rocks in borings B1-B and B2-A consists of pink-white-black, fresh, hard to very hard, no fractures, granite. Core recovery (REC) was 100% in all borings. Rock Quality Designation (RQD) values was 100% in all borings. More detailed rock descriptions can be found in the Core Boring Reports.

## Goundwater

Groundwater was encountered in EB1-B, B2-A, B2-B, EB2-A and in the detour boring EB2-B. Groundwater elevations ranged from 255.8 to 252.2 feet.

## Temporary Detour Structure

A temporary detour structure will be constructed approximately 45 feet right of the existing bridge located at -DET- Station 26+30.

The top of crystalline rock was encountered in EB2-B at an elevation of 244.6 feet. Geologic conditions including soil and rock types generally correlate with the borings performed for the structure on -L-.

## Notice

This Geotechnical foundation report is based on the bridge survey and hydraulic design report for bridge no. 215 on -L- (SR 1007, Poole Rd.) over Buffalo Creek dated June 9, 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