



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

Michael F. Easley
GOVERNOR

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

Lyndo Tippet
SECRETARY

November 20, 2003

STATE PROJECT: 8.2360601 (B-4515)
FEDERAL PROJECT: BRZ-1235(1)
COUNTY: Franklin

DESCRIPTION: Bridge No. 40 on -L- (SR 1235) over Bear Swamp Creek
at Station 15+37.00

SUBJECT: Geotechnical Report – Structure Inventory

Project Description

This project consists of a 130-foot long three span bridge to be constructed over Bear Swamp Creek along the existing -L- alignment on SR 1235 (Dyking Road). The project is located in rural Franklin County approximately two miles northwest of the town of Louisburg. The proposed bridge has a 90° skew and will replace the existing 41-foot long structure. Approximately 10 feet of the existing embankment is being removed between each end bent and the adjacent interior bent. An offsite detour will be utilized during construction. The area is wooded west and south of the bridge. A brick home is located to the northeast of the bridge. The remnants of a former bridge are located 75 feet north of the existing structure and consist of the abandoned concrete abutments and approach embankments.

The geotechnical field investigation was conducted in October, 2003. Borings were advanced using a CME-750 drill machine with manual hammer. All borings were advanced until crystalline rock was encountered. Borings B1-B and B2-A were cored using NWD core equipment to recover rock samples from the crystalline rock. Standard Penetration Tests were performed at each location. Representative soil samples were collected for visual classification in the field and for laboratory analysis by the Materials and Tests Unit. Four rock core samples were 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 in the northeastern portion of the Piedmont Physiographic Province. The project occurs within the Raleigh Belt geologic province. The underlying bedrock consists of granite.

Soil Properties

Soils encountered at the project site include roadway embankment, alluvial, and residual soil.

Roadway embankment fill soil occurs in each boring, ranging in thickness from four to fourteen feet. Fill soil at each proposed end bent consists of soft to stiff, moist to wet, silty sandy clay (AASHTO classification of A-6 and A-7-6) and sandy silt (A-4). The fill soil at each interior bent location is generally sandy, and consists of loose to medium dense, silty sand and coarse sand (A-2-4) with gravel and weathered granite boulders. The fill soil overlies alluvial soil in each boring except at B1-A where fill soil lies directly on residual soil.

Alluvial soils occur at all bent locations on this project. At End Bent 1, six to seven feet of alluvial soil occurs beneath embankment fill soil and consists of soft to stiff, sandy silt (A-4). Six to eleven feet of generally sandy alluvial soil occurs at the interior bent locations. These soils consist of very loose to loose, coarse sand and silty coarse sand (A-2-4) at the right side of Interior Bent 1 and the left side of Interior Bent 2. Eight feet of stiff, sandy alluvial silt (A-4) occurs at the right side of Interior Bent 2. Minor amounts of gravel-size granite rock fragments occur in the alluvial soils. Trace amounts of woody organic debris are present in the alluvial soils as well. The alluvial soils overlie either granitic weathered rock, or crystalline rock.

Six feet of residual soil occurs on the left side of End Bent 1. The soil thins to the right and was not encountered in the B1-B boring. The residual soil underlies roadway embankment soil and alluvial soil, and consists of medium dense, wet clayey coarse sand (A-2-6). The residual soil overlies weathered granite bedrock.

Rock Properties

Weathered rock, which is derived from the underlying granitic bedrock, varies in thickness from one foot to as much as five feet in the EB2-A boring. Weathered rock is missing in the B2-A boring where alluvial soils lie directly on crystalline rock.

Crystalline rock was encountered at each boring. Rock core was recovered from the B1-B and B2-A borings. This rock consists of gray to pink-gray granite. The rock is very fresh, with only slight weathering at the start of the B1-B core. Fractures are generally widely spaced and have dip orientations ranging from 25° to 50°, with 45° to 50° being the most common. Core recovery ranges from 88% to 100%, with an average of 96%. Rock Quality Designation (RQD) values ranges from 70% to 100%, with an average of 89%. More detailed rock descriptions can be found in the Core Boring Reports.

Groundwater

Groundwater was encountered at each bent location. Groundwater elevations ranged from 203 feet at boring B1-A to 198 feet at boring EB1-B. The water elevation of Bear Swamp Creek was measured at 199 feet on October 30, 2003.