



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

Michael F. Easley
GOVERNOR

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

Lyndo Tippett
SECRETARY

March 19, 2004

STATE PROJECT: 33024.1.1 (B-3376)
F.A. PROJECT: BRSTP-2564 (1)
COUNTY: Wake

DESCRIPTION: Bridge No. 246 on -L- (SR 2564, Creech Rd.) over Big Branch Creek Trib. No. 1 at -L- Station 12+90.000.

SUBJECT: Geotechnical Report - Structure Inventory

Project Description

A single span bridge, 32.0 meters in length with a 90° skew, is proposed on -L- (SR 2564, Creech Rd.) over Big Branch Creek to replace the existing structure. The new bridge will be 13.0 meters longer than the existing bridge. Also a temporary bridge will be constructed approximately 9.0 meters left of the permanent structure. The project is located in Wake County about 2 kilometers northeast of Garner.

The subsurface investigation was conducted during November of 2003 using a CME-45 drill machine. Standard Penetration Test borings were performed at each of the two proposed bent locations. A bridge rod sounding and Standard Penetration Test Boring were performed at the proposed end bent locations for the detour structure. All borings were advanced until crystalline rock was encountered. 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 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 granite rock. The area consists of a mixture of wooded land and sparse homes. Big Branch Creek is a tributary of the Neuse River.

Soil Properties

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

Roadway embankment soils are present at all bent locations and range in thickness from 1.38 to 4.00 meters. These soils consist predominantly of tan-brown, moist, very loose to loose, silty sand (A-2-4), and orange-brown and tan-brown, moist to wet, soft, sandy and silty clay (A-6, A-7-6). Embankment soils are underlain by alluvial and residual soils.

Alluvial soils were encountered at end bent 2 and range in thickness from 0.68 to 1.19 meters. Alluvial soils consist of orange-brown, dry, loose, silty sand (A-2-4) and dark gray, moist to wet, very loose, clayey sand (A-2-6). Also a gray, moist, soft, sandy clay (A-6) is present. The alluvial soils were deposited on residual soil and weathered rock.

Residual soils are present at each proposed end bent location and range in thickness from 0.99 to 2.53 meters. These soils consist of tan-brown to dark brown, gray to orange-gray and blueish green, dry to moist, loose to dense, saprolitic, silty sand (A-2-4). Residual soils are underlain by weathered rock.

Rock Properties

Weathered rock was derived from the underlying granite and ranges in thickness from 0.28 to 1.02 meters. The top of weathered rock was encountered at elevations ranging from 67.34 at EB1-B to 64.23 meters at EB2-A.

Crystalline rock was encountered at each boring location. The top of crystalline rock ranges in elevation from 67.04 at EB1-B to 63.39 meters at EB2-A.

Groundwater

Groundwater was encountered only at end bent 2. Groundwater elevations ranged from 67.14 at EB2-A to 65.15 meters at EB2-B.

Temporary Detour Structure

A temporary detour structure will be constructed approximately 9.0 meters left of the existing bridge located at -DET- Station 12+38.25. The detour structure has a total length of 25.5 meters.

Due to inaccessibility by heavy drill equipment, bridge rod soundings were performed at the proposed detour end bent 2 location. The top of crystalline rock was encountered at 65.56 meters at end bent 1. Bridge rods encountered residual soil at an elevation of 65.71 meters at end bent 2. 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. 246 on -L- (SR 2564, Creech Rd.) over Big Branch Creek trib. no. 1 dated February 2, 2004. 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