



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

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SECRETARY

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STATE PROJECT: 8.2495501 (B-3649)
F.A. PROJECT: N/A
COUNTY: Guilford
DESCRIPTION: Bridge No. 227 on -L- (SR 3000) over Beaver Creek
SUBJECT: Geotechnical Report - Structure Inventory

Project Description

A three-span bridge, 160-feet in length with a 55° skew, is proposed on -L- (SR 3000) over Beaver Creek to replace the existing structure. The new bridge will be 110 feet longer than the existing bridge. The project is located in Guilford County about six miles east of Greensboro.

The subsurface investigation was conducted during April and May of 2003 using an ATV-mounted BK-51 drill machine. Standard Penetration Test borings were performed at each of the four proposed bent locations and bridge rod soundings were performed at the proposed end bent locations for the detour structure. All borings were advanced until crystalline rock was encountered. Interior bent borings B1-B and B2-B were cored using NXWL 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. Geologically, the site is located within the Carolina Slate Belt, and is underlain by metamorphosed granite and amphibolite. The area consists of a mixture of wooded land and sparse homes. Beaver Creek is a tributary of the Haw 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 3.4 to 8.4 feet. These soils consist predominantly of red-orange, moist, soft to medium stiff, silty clay (A-7-6) and orange-brown to tan-brown, moist, loose, silty sand (A-2-4). Embankment soils are underlain by alluvial soils.

Alluvial soils were encountered in all borings and range in thickness from 3.0 to 7.8 feet. Alluvial soils consist of brown, dry to moist, medium stiff to hard, sandy silt (A-4) and tan-brown, wet to saturated, loose, silty and clayey sand (A-2-4, A-2-6). The alluvial soils were deposited on residual soil and weathered rock.

Residual soils are present at each proposed bent location except Bent 1. These soils consist of brown and white, dry to moist, medium dense, coarse sand (A-1-b) and brown, dry, very stiff to hard, sandy clay (A-6). Residual soils are underlain by weathered rock.

Rock Properties

Weathered rock was derived from the underlying metamorphosed granite and amphibolite and ranges in thickness from 0.2 to 5.3 feet. The top of weathered rock was encountered at elevations ranging from 609.2 at EB2-A to 588.9 feet at EB2-B.

Crystalline rock was encountered at each boring location. The top of crystalline rock ranges in elevation from 604.6 at EB2-A to 588.6 feet at EB2-B. Rock core was obtained from two of the interior bent borings. Crystalline rock in boring B1-B consists of dark gray to black, moderately severely weathered to fresh, moderately hard to hard, closely to moderately closely fractured amphibolite with layers 0.7 to 1.7 feet thick of light gray and white, moderately weathered to fresh, hard to very hard, closely fractured to very widely fractured, metamorphosed granite. Crystalline rock in boring B2-B consists of 2.0 feet of amphibolite similar to that cored at Bent 1 underlain by light gray, pink and white, slightly weathered to fresh, hard to very hard, closely fractured to very widely fractured, metamorphosed granite. Core recovery ranged from 86% in boring B1-B to 94% in boring B2-B. Rock Quality Designation (RQD) values range from 51% in boring B1-B to 82% in boring B2-B. More detailed rock descriptions can be found in the Core Boring Reports.

Groundwater

Groundwater was encountered at each bent location. Groundwater elevations ranged from 608.0 at EB2-A to 602.9 feet at B1-A.

Temporary Detour Structure

A temporary detour structure will be constructed approximately 125 feet northeast of the existing bridge located near -DET- Station 18+00. The detour structure has a total length of 120 feet.

Due to inaccessibility by heavy drill equipment, bridge rod soundings were performed at the center of each of the proposed detour end bent locations. These soundings indicate that soils generally consist of 2.5 to 6.0 feet of alluvial soil on top of 4.5 to 5.5 feet of residual soil. Weathered rock was encountered at an elevation of 599.2 feet at end bent 1 and was not encountered at end bent 2. The top of crystalline rock was encountered at 597.1 and 596.4 feet at end bent 1 and end bent 2, respectively. Geologic conditions including soil and rock types should generally correlate with the borings performed for the structure on -L-.

Notice

This Geotechnical foundation report is based on the bridge survey report for Beaver Creek dated February 13, 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,

Handwritten signature of Neil T. Roberson in black ink.

Neil T. Roberson
Project Geologist