



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

Michael F. Easley
GOVERNOR

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

Lyndo Tippett
SECRETARY

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STATE PROJECT: 33322.1.1 (B-3879)
F.A. PROJECT: BRZ-1603(2)
COUNTY: Nash

DESCRIPTION: Bridge No. 73 on (SR 1603) over Stoney Creek at -L- Station 22+61.00

SUBJECT: Geotechnical Report – Structure Inventory Report

Project Description

A four-span bridge, 192-feet in length with a 80° skew, is proposed on -L- (SR 1603) over Stoney Creek to replace the existing structure. The new bridge will be 10 feet longer than the existing bridge. The project is located in Nash County about five miles south of Red Oak.

The subsurface investigation was conducted during May of 2004 using an ATV-mounted CME 750 drill machine. Two Standard Penetration Test borings were performed at each of the five proposed bent locations. Two additional solid auger borings were performed at EB1 and EB2 to assist in defining crystalline rock. All borings were advanced until weathered rock or crystalline rock was encountered or bearing was achieved. 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. Geologically, the site is located within the Eastern Slate Belt, and is underlain by granite. The area consists of a mixture of wooded land and sparse homes. Stoney Creek is a tributary of the Tar River.

Soil Properties

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

Roadway embankment soils were encountered at both end bents. These soils consist primarily of red-brown to orange-brown, moist, very soft to soft silty clay (A-7). These soils are 11.5 to 15.0 feet thick and are underlain by alluvial soils.

Alluvial soils were encountered in all borings and range in thickness from 3.9 to 13.9 feet. Alluvial soils consist of tan, brown and gray, very loose to medium dense, coarse sand and gravel (A-1-b), and gray, fine

to coarse, sand and silty sand (A-3, A-2-4). Cohesive alluvial soils consist of brown and gray, very soft to very stiff, sandy silt, (A-4) and blue-gray to tan, soft to stiff, sandy and silty clays (A-6, A-7). The alluvial soils were deposited on residual soil.

Residual soils were encountered in most borings and range in thickness from 3.3 to 44.0 feet. These soils consist of brown and tan, medium dense to very dense, coarse sand and silty sand (A-1-b, A-2-4). Cohesive soils were orange-brown, tan, and gray, medium stiff to hard, sandy and clayey silt (A-4, A-5) and orange-brown, green, and white, soft to hard silty clay (A-7-5, A-7-6). Residual soils are derived from the underlying weathered rock

Rock Properties

Weathered rock occurs in discontinuous lenses and was derived from the underlying granitic rock. The weathered rock ranges in thickness from 3.5 to 10.0 feet where present. The tops of the weathered rock lenses were encountered at various elevations ranging 94.9 to 61.1 feet.

Crystalline rock was encountered in EB1-B, B1-A and EB2-A. Solid Auger borings were done approximately six feet away from and adjacent to EB1-B and EB2-A and did not encounter crystalline rock. It is likely that the borings in EB1-B and EB2-A were terminated on lenses of crystalline rock. The top of crystalline rock was encountered from elevation 100.6 to 66.5 feet.

Temporary Detour Structure

A temporary detour structure will be constructed approximately 37 feet east of the existing bridge along -L- Detour at Sta. 17+52. The structure has a total length of 180 feet. Borings EB1-B and EB2-B (see sheets No. 10 and 15 for boring logs) were drilled near the proposed end bents and provide data for the detour structure. Geologic conditions along the -L- Detour alignment should correlate directly to those encountered along the main structure.

Groundwater

Groundwater was encountered at each bent location. Groundwater elevations ranged from 119.0 to 112.0 feet. Artesian conditions were present at end bent 1 and end bent 2. Surface water in Stoney Creek was at an elevation of 109.2 feet (5-5-04).

Notice

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

J. B. Barfield, LG
Project Geologist