



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

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GOVERNOR

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January 31, 2005

STATE PROJECT: 33209.1.1 (B-3664)
F. A. PROJECT: BRZ-1528(2)
COUNTY: Henderson
DESCRIPTION: Bridge No. 21 on SR-1528 over Mud Creek
SUBJECT: Geotechnical Report – Foundation Investigation

Project Description

This project is located in central Henderson County, approximately 0.75 miles east of the Mountain Home township and 0.5 miles north of the Hillgirt community. Interstate 26 is located 1000± feet north of the site. A new structure, 220 feet long and 33 feet wide, is proposed to replace the existing bridge which is located 45± feet downstream. The replacement bridge is to consist of the following three spans constructed on a 120 degree skew: one at 80 feet; one at 85 feet; and one at 55 feet.

The subsurface investigation was conducted with the use of a CME-45 drill track unit. Borings were advanced with eight-inch hollow stem augers through which Standard Penetration Tests were performed with an automatic drive hammer. Soil samples were collected and submitted to the Materials and Tests Unit for analysis.

Physiography and Geology

The project is located in the Chauga Belt of the Piedmont Physiographic Province. The site area is flat as it is situated in the 2000± foot floodplain of Mud Creek. The area is underlain by the intrusive Henderson Gneiss which is described as a massive, homogeneous, well-foliated augen gneiss. Rock core specimens were not obtained.

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LOCATION:
CENTURY CENTER COMPLEX
BUILDING B
1020 BIRCH RIDGE DRIVE
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Foundation Materials

End Bent One

End Bent One is located in the floodplain 90± feet away from the creek bank. Minor fill (1.5-3.0 feet) has been placed on alluvial soils at this locale. The alluvium extends to depths of 18 feet along the bent and is composed of very loose to medium dense silty fine sand and coarser sand and gravel. The alluvium rests on saprolite at contact elevation 2046 feet. The saprolite horizon is comprised of a medium to very dense mottled fine to coarse sand. This residual horizon grades to weathered rock between elevations 2038± and 2027± feet.

Interior Bents One and Two

Both of these bents are to be situated approximately 5 feet from either creek bank. Alluvium has been deposited over saprolite at these sites and extends to depths of 12± to 17± feet. Very loose silty sand constitutes the alluvium at Bent One. Bent Two deposits are predominantly very soft sandy silt. A denser basal gravel layer from 1 to 3± feet thick underlies the finer alluvium at both bents. The saprolite horizon at both bents was encountered at elevation 2047± feet. Weathered rock was penetrated at variable elevations between 2028 and 2046 feet. Moderately severely weathered hard rock (SPT refusal) was found at Bent Two at approximate elevation 2037 feet.

End Bent Two

End Bent Two is to be located 60± feet away from the north bank of the creek. An interlayered mixture of alluvial very soft to soft silt, clay, and medium dense sand and gravel overlies saprolite at this locale. Depths of alluvium approach 17 feet. Medium dense sand and very stiff silt comprise the saprolite, which averages 5 feet in thickness. Weathered rock was encountered between elevations 2040 and 2045 feet.

Groundwater

Groundwater was measured in three borings at depths of 5 to 7 feet beneath the ground surface, or at approximate elevation 2056 feet.

Respectfully Submitted,

John W. Mann, LG
Project Engineering Geologist