



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

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STATE PROJECT: 8.2353001 (B-3450)  
WBS ELEMENT: 33070.1.1  
FEDERAL PROJECT: BRSTP-1116(4)  
COUNTY: Durham

DESCRIPTION: Bridge 217 over New Hope Creek and Bridge over Sandy Creek on SR 1116 Detours

SUBJECT: Geotechnical Report – Inventory

Project Description

This project is located in southwestern Durham County within the City of Durham. This project consists of widening a two-lane facility along 0.32 miles of existing alignment as well as 0.19 miles along two temporary detours. There are a total of four structures proposed with two permanent structures over New Hope Creek and Sandy Creek on -L- and two temporary structures that will be utilized along the detour alignment.

A geotechnical investigation was conducted between September and October 2002 utilizing ATV-mounted Mobile B-57 and Track mounted CME-850 drill machines. Borings were advanced with hollow stem augers. Standard Penetration Tests were conducted at all locations. Representative soil samples were obtained for visual classification in the field, and for laboratory analysis by the Material and Tests Unit and Trigon Engineering Consultants, Inc.

The following survey lines were investigated.

<u>Line</u>	<u>Station</u>
-L-	10+70 – 24+00
-Detour1-	1+12 – 6+84
-Detour2-	1+48 – 5+86

Areas of Special Geotechnical Interest

1) Groundwater: Groundwater was at the ground surface to 2 feet below the ground surface in various areas and was found to be above or within 6 feet of the proposed grade at the following locations.

<u>Line</u>	<u>Station</u>
-L-	11+11 – 12+43
-L-	20+01 – 20+63
-Detour 1-	1+12 – 2+49
-Detour 2-	1+53 – 2+18

2) Soft Foundation Soils: The following areas call for proposed embankments that will impact on soft alluvial soils with trace to little organics in some areas.

<u>Line</u>	<u>Station</u>
-L-	11+11 – 15+43
-L-	19+96 – 23+57
-Detour 1-	1+12 – 5+62
-Detour 2-	1+48 – 5+11

Physiography and Geology

The project is located within the City of Durham boundary in the Piedmont Physiographic Province. The project has topography typical of the Piedmont with gently rolling terrain and a wide well-defined stream valley. The project is drained by New Hope Creek and Sandy Creek. Geologically, Triassic mudstone and sandstone of the Durham Triassic basin underlie Triassic residual soils and/or alluvial soils throughout the project.

Soils Properties

Soils present on this project are separated into three major categories based on origin. These categories are roadway embankment, alluvial soils and residual soils.

Roadway embankment soils are present on the project near the existing road and were encountered in two borings. These soils were predominately brown, soft to hard, moist to wet, sandy clay (A-6) underlying brown and gray, medium dense, moist silty fine sand (A-2-4) with gravel.

Alluvial soils were found within the floodplain boundaries of New Hope Creek and Sandy Creek. These soils are predominantly brown to gray, very soft to stiff, fine sandy silty clay (A-6, A-7-5, A-7-6), brown and gray, very soft to soft, wet fine sandy silt (A-4) with little to trace organic matter and gray and brown, very loose to medium dense, silty, fine to coarse sand (A-2-4, A-1-b).

The alluvial clays are moderately to highly compressible while the alluvial silts and sands are slightly compressible.