



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

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STATE PROJECT: 8.2951901 (B-3664)
COUNTY: Henderson
DESCRIPTION: Approaches to Bridge No. 21 on SR-1528 (Brookside Camp Rd.)
over Mud Creek
SUBJECT: Geotechnical Report – Inventory

Site Description

This project is located in Henderson County approximately 4 miles north of the City of Hendersonville. It is set in a rural area near scattered residential developments and commercial sites. Mud Creek is a bold stream with a channel 40 to 50 feet wide. Its floodplain is more than 1000 feet wide, bordered by low hills with gentle slopes. The proposed construction lies on the floodplain in areas of open grassland and forest.

Plans call for a new bridge on alignment -L- approximately 45 feet right of the existing bridge. Construction of the new approach will begin at Station 12+75 and end at Station 29+75.

The Geotechnical Unit conducted a subsurface investigation in January and February 2003. Borings were made with a CME-550 power drilling machine equipped with 8-inch, hollow-stem augers. Standard Penetration Tests (SPT's) were done at 5-foot intervals in soil and weathered rock, and soil samples were submitted to a DOT laboratory for quality tests. Two undisturbed samples (Shelby Tube) were taken from clay soils for triaxial tests.

Soil and Rock Characteristics

Soils encountered on this project include artificial fill, roadway embankment, alluvium, colluvium, saprolite, and weathered rock. Hard rock was found at the base of one boring.

Artificial fill has been placed on the Right Side of the alignment from approximately Station 22+25 to Station 23+50, extending from about 10 feet Right to well beyond the limit of construction on that side. That material is about 3 to 4 feet thick composed of moist to wet, very loose, silty sand and very soft, sandy silt (A-2-4, A-4) containing tree stumps, piles of wood chips, and pieces of masonry and stone.

Embankment soils underlie the existing roadway through most of the length of the project. They increase in thickness from a few feet on the south approach to the bridge to more than 20 feet at the end of the project, north of the bridge. Those soils could not be investigated due to a narrow road shoulder and overhead power lines.

Colluvial soils form a surficial, thin layer of orange-brown, soft, sandy silt and clay (A-4, A-6) overlying part of the floodplain beyond Station 23+00.

Alluvial soils comprise a variety of clays, silts, sands, and gravels of the floodplain. Soils on the south side of the floodplain are chiefly brown, moist, soft to medium stiff, sandy silt (A-4) overlying brown to gray, wet to saturated, loose, silty sand (A-2-4). Soils on the north side of the floodplain are more clay rich. They include yellow, red, gray, or mottled red and yellow, wet, very soft to medium stiff, sandy, silty clay and clayey silt (A-6, A-7-6, A-4) overlying yellow to gray, wet to saturated, loose, silty sand (A-2-4). Basal alluvial gravel (A-1-a) underlies the sand in some places.

Saprolite underlies alluvium in most places. It is comprised of brownish gray to gray and white, moist, very stiff to hard, sandy silt (A-4) and medium dense to very dense, silty sand (A-2-4).

Weathered rock may directly underlie alluvium in some places. It is composed of gray and white, severely weathered, granite gneiss or quartz monzonite gneiss.

Hard rock was encountered in a boring near the north bank of the creek, at a depth of 22.0 feet, but it was not cored. The rock in this area is a massive, augen gneiss of granite to quartz monzonite composition, belonging to the Henderson Gneiss Formation.

Areas of Special Geotechnical Interest

-L- 22+00 to 23+50, Right Side

This area, beginning about 5 to 10 feet Right of -L- and extending rightward beyond the limits of construction, is covered with a surficial layer of artificial fill. The fill soil consists of very soft, sandy silt and very loose silty sand with a variety of other materials, including masonry, blocks of stone, tree stumps, and piles of wood chips. It has a maximum depth of approximately 4 feet on the Right Side of Station 22+50, tapering to zero on the Right Side of Station 23+30.