



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

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STATE PROJECT: 33413.1.1 (B-4047)
COUNTY: Burke
DESCRIPTION: Bridge No. 94 on SR-1972 over East Prong Hunting Creek
SUBJECT: Geotechnical Report – Foundation Investigation

Introduction

This project is located in south-central Burke County, approximately 2.5 miles southeast of Morganton. The existing bridge is to be replaced with a double-span structure. Each of the spans will be 70.0 feet; the skew is 105 degrees.

The subsurface investigation was conducted using a CME-550, a CME-45 track-mounted drill and a CME-45 skid-mounted drill. The borings were advanced using 8-inch hollow stem augers and -NX- casing with advancer. Rock core was retrieved using -NXWL- equipment. Standard Penetration Tests were performed at intervals of 5.0 feet using an automatic drop-hammer. Soil samples were submitted to be tested for quality. Three rock core samples were submitted to be tested for Unit Weight, Compressive Strength (Qu), Young's Modulus (E) and Split Tensile Strength.

Geology and Rock Characteristics

The rocks recovered by coring on this project are primarily gray granite gneisses. Occasionally a gray amphibolite gneiss was encountered. Except for the upper 2.2 feet in the EB1-B boring, the rock material is hard and fresh with high RQD's. The first two feet or so of EB1-B is moderately severely to moderately weathered with abundant partings along the foliation.

Foundation Material

End Bent One

Roadway embankment is present at both drill sites along this bent. It consists of 3.0 to 5.0 feet of soft sandy silt and silty clay.

Underlying the embankment is alluvium. This material is made of 5.0 to 10.0 feet of silty sand and gravel. In the boring for EB1-B, a basal gravel and boulder layer is present.

Saprolite was encountered in the boring for EB1-A. It consists of silty sand, and grades gradually into weathered rock densities. In EB1-A, hollow auger refusal on rock occurred at 14.4 feet (elevation 1056.7). A minor amount of weathered rock was penetrated in EB1-B before coring was begun. Coring was initiated at 14.7 feet (elevation 1058.2) and terminated at 26.5 feet (elevation 1046.4). Recoveries were from 28 to 98% (73% average) and RQD's were from zero to 98% (61% average).

Static groundwater levels were not recorded from either boring.

Interior Bent One

Embankment material was encountered in the boring for B1-B, and consists of soft sandy silt.

Alluvium is present at the surface across most of this bent. It is composed of 8.0 to 16.0 feet of silty sand and sandy silt with varying amounts of gravel.

A small horizon of silty sand saprolite was found in B1-A. One to two feet of weathered rock is present in both borings.

Coring was begun in B1-A at 18.8 feet (elevation 1049.1) and terminated at 33.3 feet (elevation 1034.6). All of the Recoveries and RQD's were 100%. In B1-B, coring was begun at 23.5 feet (elevation 1073.0) and terminated at 29.1 feet (elevation 1067.4). Again, the Recoveries and RQD's were 100%.

Static groundwater was measured in B1-A at 5.9 feet (elevation 1062.0).

End Bent Two

A layer of sandy silt embankment, 3.0 feet thick, was encountered at the surface of EB2-B.

Alluvium is present at the surface of EB2-A, and beneath the embankment at EB2-B. This horizon consists of 7.0 to 13.0 feet of soft sandy silt and loose silty sand with gravel. No saprolite was encountered in EB2-B. In EB2-A, the saprolite is a layer of loose silty sand 10.5 feet thick.

A thin horizon of weathered rock was found in each boring. In EB2-A, coring was begun at 20.6 feet (elevation 1050.3) and ended at 32.2 feet (elevation 1038.7). Recoveries ranged from 93 to 100% (96% average). RQD's were from 89 to 100% (94% average). In EB2-B, coring was