STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

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STATE PROJECT: 8.2843601 (B-3310)
F. A. PROJECT: BRZ-2173(1)
COUNTY: Buncombe
DESCRIPTION: Bridge No.145 on SR-2173 over Dillingham Creek

SUBJECT: Geotechnical Report- Foundation Investigation

Introduction

This project is located in northeastern Buncombe County, approximately 20.0 miles from Asheville. The existing structure will be replaced with a double spanned bridge, approximately 60.0 feet downstream. The spans will be 75.0 feet long and the skew will be 130°.

The subsurface investigation was conducted using a CME-550 drill machine with an automatic drive-hammer. The borings were advanced with –NX- casing with advancer. Standard Penetration Tests (SPT's) were performed, where appropriate, at intervals of 5.0 feet. Soil samples were collected and submitted for testing for quality. Rock core was recovered from each of the six borings using –NXWL- equipment. Four rock core samples were submitted to be tested for Unit Weight, Compressive Strength (Qu), Young's Modulus (E) and Split Tensile Strenght.

Geology and Rock Characteristics

The rock recovered by coring is predominately a biotite gneiss with varying amounts of garnets and muscovite. T races of pyrite and manganese are also present. Occasional seams of granite gneiss interlayer with the biotite gneiss.

The rock is generally hard and slightly weathered with moderately to well developed foliation. A severely to moderately severely weathered zone was encountered in B1-B, between 24.1fett and 38.5 feet. This interval is soft to medium hard, with occasional seams that are completely weathered into soil.

Foundation Material

End Bent One

Alluvium is present from the ground surface across this bent site. It is comprised of 7.0 to 8.0 feet of very dense gravel, cobbles and boulders.

The alluvium lies directly upon saprolite. The saprolite is from 4.5 to 15.0 feet thick, and made of loose to very dense silty sand. Mica and trace amounts of garnets are present.

Weathered rock was not encountered in the EB1-A boring. In the boring for EB1-B, weathered rock was encountered at 12.5 feet (el 2251.3).

Coring was begun in EB1-A at 22.1 feet (el 2244.5) and terminated at 32.9 feet (el 2233.7). Recoveries ranged from 57% to 100%; RQD's were also from 57% to 100%. In EB1-B, coring was begun at 16.4 feet (el 2247.4) and terminated at 28.3 feet (el 2235.5). The Recoveries in this boring were from 98% to 100%, and the RQD's from 88% to 100%.

Static groundwater level was measured in EB1-A at 5.3 feet (el 2261.3). In the boring for EB1-B, static water level was not measurable due to hole wall collapse.

Interior Bent One

The interior bent location is on a gravel and cobble bar in the creek channel. In B1-A, this alluvial horizon extends to a depth of 2.5 feet. In B1-B it extends to 2.7feet.

The alluvium was deposited directly upon weathered rock at the B1-A site. The weathered rock horizon here is only 1.0 foot thick.

Coring in B1-A was begun at 3.5 feet (el 2259.6) and terminated at 31.8 feet (el 2231.3). The Recoveries and RQD's were from 92% to 100%.

In the boring for B1-B, the alluvium rests upon saprolite. This material is 16.0 feet of medium dense silty sand with mica.

Weathered rock was encountered at 18.8 feet (el 2243.7).

Coring in B1-B was begun at 20.2 feet (el 2242.3) and terminated at 47.6 feet (el 2214.9). The Recoveries from this boring were from 80% to 100%; RQD's were from