



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

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SECRETARY

September, 2003

STATE PROJECT: 8.1711401 (B-4010)
COUNTY: ASHE
DESCRIPTION: Bridge No. 7 on NC-163 over South Fork New River
SUBJECT: Geotechnical Report – Foundation Investigation

Site Description

This project is located in the southern part of Ashe County, approximately 8 miles south of the city of West Jefferson. NC Highway 163 crosses the South Fork of the New River on a tight, horseshoe bend in the river. The river at this point is broad, shallow, and swiftly flowing. The channel is approximately 130 feet wide and not more than about 4 feet deep at any point. A thin veneer of gravel, cobbles, and boulders only partially covers hard rock on the channel bed.

The south bank lies at the foot of a steep hill about 150 feet high, with rock outcrops on the lower slope near the river. The slope is densely forested except where cleared for a power line right-of-way. The north bank is bordered by a low floodplain about 100 feet wide and a very gently sloping floodplain terrace more than 500 feet wide and from 10 to 40 feet above the river. The ground on the north side is covered in dense weeds and light brush near the river and grassy fields and yards farther back.

The proposed construction consists of a bridge 314 feet long and 34 feet wide, on a skew of 20 degrees. It is to be constructed on alignment -L-, located approximately 38 feet right of the centerline of the existing bridge. Plans call for three spans of 76 feet, 140 feet, and 98 feet, respectively, supported by hammerhead bents standing approximately 36-38 feet high from channel bed to bridge deck.

The Geotechnical Engineering Unit conducted a foundation investigation in August, 2003. Borings were made with a CME-550 power drilling machine equipped with NXWL rock coring equipment and with 8 inch hollow-stem augers. A rock core boring was made on the Centerline at each interior bent, and an auger boring with Standard Penetration Tests (SPT's) was made on the Right Side of End Bent Two. The Left Side of End Bent Two and all of End Bent One were inaccessible to the drilling equipment.

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

Hard rock is the principal material found on this project. Other materials include a few feet or less of alluvial sand and bouldery gravel, thin weathered rock, and the existing roadway embankment, which was not investigated.

End Bent One (EB1)

This end bent was inaccessible to the drilling equipment because of the steepness of the slope. An outcrop of hard rock is present at ground surface on this bent between the Centerline and the Left Side, and abundant hard rock is exposed in the road cut a few feet left and back station of the EB1-A position. It can be estimated that hard rock or weathered rock will be encountered within 5 feet of the ground surface at all points across this bent.

Bent One (B1)

This bent is located on the south bank of the river. A boring was made on Centerline (B1-C), offset 3 feet forward of the bent position, in 0.8 feet of water. Hard rock was cored from the ground surface to a depth of 36.0 feet. Fresh, moderately hard, very good quality mica schist and mica gneiss were encountered throughout, with the exception of a moderately weathered seam 0.3 feet thick at a depth of approximately 22.5 feet.

Bent Two (B-2)

This bent is located on the north bank of the river. A boring was made on Centerline (B2-C), offset 4 feet back from the bent position, in 1.4 feet of water. Hard rock was encountered beneath 1.7 feet of alluvial gravel, and was cored to a depth of 36.7 feet. The lithology was fresh, moderately hard, mica gneiss with very good quality down to a depth of 29.1 feet. Rock quality deteriorated slightly (RQD=72) in the lower 7.6 feet of the core.

End Bent Two (EB2)

This bent is located on the floodplain approximately 100 feet from the river bank. The Left Side and Center of the bent fall on the existing roadway embankment slope.

An auger boring on the Right Side (EB2-B) found approximately 4 feet of alluvial silty sand (A-2-4) and 3 feet of alluvial basal gravel (A-1-b) overlying weathered rock. The boring penetrated weathered rock from 7.0 feet to the hard rock line at 12.0 feet. The auger was able to penetrate about 0.7 feet of hard rock before termination of the boring. The static ground water table was found at a depth of 10.2 feet.

Respectfully submitted,

Louis L. Acker, LG
Project Geologist