STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

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August, 2003

STATE PROJECT: 8.2752101 (B-3926)
COUNTY: Watauga
DESCRIPTION: Bridges No. 35 and 36 on SR-1340 over Meat Camp Creek

SUBJECT: Geotechnical Report – Foundation Investigation

Site Description

This project is located in northern Watauga County, on Meat Camp Road (SR-1340) approximately 4 miles west of the junction with NC 194. Meat Camp Road is intersected by SR-1399 about halfway between Bridges 35 and 36.

Meat Camp Creek is a bold, trunk stream tributary to the South Fork of the New River. Bridges No. 35 and 36 are about 1000 feet apart and lie on a section of the creek where it flows from a broad alluvial plain into a narrow valley segment with a steep gradient. Bridge 36 lies at the end of the alluvial plain and Bridge 35 lies downstream within the constricted valley.

The stream is 10 to 20 feet wide in a very bouldery channel with bouldery, floodplain deposits on either bank. The floodplain narrows from about 100 feet wide at Bridge 36 to less than 50 feet at Bridge 35, where most of the floodplain is taken up by the road. A few houses and a church occupy the remainder of the floodplain between the two bridges and around Bridge 36.

Both existing bridges are 2-lane structures, each in a single span about 25 feet long. Both are to be replaced with 2-lane, single span bridges 45 feet long, at a skew of 135 degrees. Plans call for two retaining walls on approaches to Bridge 35 and a retaining wall on the west approach to Bridge 36. Traffic is to be diverted on temporary detours with multiple corrugated steel culverts at both sites.

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The Geotechnical Engineering Unit conducted a subsurface investigation at both bridge sites in July, 2003. Seven borings were made at Bridge 35 at proposed end bents and retaining walls, and 5 borings were made at Bridge 36 at proposed end bents and on the detour alignment. Borings were made with a CME-550 power drilling machine using a NX rotary casing advancer and NXWL rock coring equipment. One of the borings at Bridge 36 was made with 8-inch hollow stem augers.

Standard Penetration Tests (SPT's) were conducted at 5-foot intervals, and 11 soil samples were submitted to a DOT laboratory for quality analyses.

Foundation Materials – Bridge 35

Bouldery embankment and very bouldery alluvial gravel overlie hard rock or weathered rock at this bridge site. The surficial materials vary in thickness from about 7 feet to 12.5 feet.

So many large boulders were encountered in the surficial materials at this bridge site that it was sometimes difficult to distinguish between cored boulders and the underlying hard rock. Distinctions were made on the basis of variations in the orientation of layering and foliation and slight variations in lithology among suspected boulders, as well as on the rare recovery of a few rounded pebbles among rock cores from boulders. Depths to the base of surficial deposits should be taken as maximums, bearing in mind the possibility that some rock cored material interpreted as boulders may in fact have been hard rock in place.

<u>End Bent One</u>

A boring on the Left Side (EB1-A) found poor quality hard rock at a depth of 10.1 feet beneath embankment and alluvial gravels. The boring passed into good rock at 17.4 feet before termination at a depth of 22.9 feet.

Borings on the Right Side (EB1-B) and near the Centerline (EB1-C) found fair to good quality hard rock at depths of 7.1 and 7.0 feet, respectively, beneath very bouldery embankment soils. The borings were carried into hard rock to depths of 16.8 feet at EB1-B and 11.7 feet at EB1-C.

<u>End Bent Two</u>

A boring on the Left Side (EB2-A) found weathered rock beneath 12.4 feet of bouldery embankment and alluvial soils. Weathered rock was penetrated to the hard rock line at a depth of 16.4 feet.

A boring on the Right Side (EB2-B) encountered hard rock beneath 9.2 feet of very bouldery gravel. Rock coring from 9.2 feet to 20.7 feet penetrated poor quality hard rock with seams of weathered rock.