STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

May 2002

STATE PROJECT: 6.739001T (R-2237B)
COUNTY: Caldwell
DESCRIPTION: US-321 From SR-1370 to SR-1500

SUBJECT: Geotechnical Report – Inventory (Revised)

Introduction

This project is located in northern Caldwell County. It extends from the end of new construction to the intersection with Blackberry Road (SR-1500). The project consists of widening the existing two-lane road to a four-lane divided highway. Each half will have two 12-foot travel lanes. The median will vary in width from 4 to 12 feet.

The following survey lines were investigated:

-L- Stations 10+00 to 353+31.16
-Y1- Stations 10+00 to 15+78.31

Relocation is proposed for the following segments:

-L- Stations 141+78.99 to 162+45.04
-L- Stations 304+17.44 to 339+42.99
-Y1- stations 10+00 to 15+78.31

Retaining walls are proposed for the following segments:

-L- Stations 236+50, 60' LT to 240+00, 50' LT (Approx.)
-L- Stations 294+50, 40' RT to 296+50, 40' RT (Approx.)

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT
1589 MAIL SERVICE CENTER
RALEIGH NC 27699-1589

TELEPHONE: 919-250-4088
FAX: 919-250-4237

WEBSITE: WWW.DOH.DOT.STATE.NC.US

LOCATION:
CENTURY CENTER COMPLEX
BUILDING B
1020 BIRCH RIDGE DRIVE
RALEIGH NC 27610

Methods

Field studies of rock and saprolite outcrops and surficial soil deposits were begun in September 2000. Over 800 exposures of rock and soil were investigated and over 2000 strike and dip orientations were noted. A subsurface investigation was carried out from December 2000 to the completion of field studies in October 2001.

The subsurface investigation was accomplished by two contracting firms operating four power drilling machines. Florence and Hutchinson, Inc., of Paducah, Kentucky operated skid-mounted CME-45C and trailer-mounted CME-45B drilling machines. Their work was carried out on -L- from Station 26+00 to 111+00 and from Station 296+00 to 350+00. CTL Engineering, Inc. of Durham, North Carolina operated a track-mounted Simco 4000 and a CME-550 on -L- from Station 92+00 to 296+00 and on -Y1-.

Most borings in soil and weathered rock were made with 8-inch hollow-stem augers. A few borings in bouldery colluvial and embankment soils were made with NW casing with advancers or NXWL diamond core bits. Standard Penetration Tests (SPT) were routinely conducted in auger borings. Numerous soil samples were tested for California Bearing Ratio (CBR) and for triaxial shear (Cu), recompacted density, and permeability. Two undisturbed Shelby Tube samples were submitted for triaxial Cu and compaction testing.

A number of borings in hard rock were made with NXWL diamond coring equipment. A total of 3013.2 feet of rock core was taken. Two deep angle borings were made from the top of a high ridge in an area with very limited access. Those borings were designed to intersect grade near the proposed ditchline. Geophex, Ltd., of Raleigh, North Carolina conducted downhole geophysical logging in those borings and in two other vertical core borings. A Borehole Image Processing System (BIPS) provided orientation data on rock fractures and layering.

Areas of Special Geotechnical Interest

I. Springs are located within the proposed limits of construction at the following sites:

Stations

-L- 89+60, 60' RT
-L- 115+00, 90' LT
-L- 151+65, 40' LT
-L- 234+00, 210' RT
-L- 313+40, 120' RT
-L- 325+40, 10' LT
-Y1- 13+65, 40' RT