STATE PROJECT: 8.1442601 (U-0620)
FEDERAL PROJECT: STP-0622(2)
COUNTY: Cumberland

DESCRIPTION: Hope Mills Bypass From SR 1141 (Bingham Drive) to SR 1363 (Elk Road)

SUBJECT: Roadway Subsurface Investigation – Inventory Report

**Project Description**

This project is located in southeastern Cumberland County and extends from Bingham Drive, near the intersection of Fisher Road, continues along George Owen Road, crosses N.C. 59, Camden Road, Pinewood Drive and extends to Elk Road, just beyond the intersection of Legion Road. This project consists of a four-lane highway along 1.89 miles of new alignment and 3.29 miles along existing alignment (including fifteen –Y- lines). There are two bridge structures proposed for this project. One structure over Beaver Creek (Station 31+47 to 32+88 –L-) and one over CSX Railroad (Station 159+82 to 162+82 –L-). Four culverts are proposed with one under –Y2- (Station 15+74 –Y2) and three under –L- (Station 106+32, 118+40, and 184+27 –L-). Additionally, a noise wall is to be constructed between Station 183+00 –L-, 42.75 feet right and Station 192+00 –L-, 77 feet right near the intersection of Pinewood Drive.

A geotechnical investigation was conducted between December 4, 2001 and March 19, 2002 using several types of soil characterization methods and equipment. Forty-four (44) Cone Penetrometer soundings were advanced using a Gyro Track direct push rig between December 4 and December 10, 2001. During the CPT soundings, six pore water dissipation tests were performed at various depths. Drilling was conducted between January 30, 2002 and March 8, 2002. Drilling consisted of advancing 3-1/4 inch diameter hollow stem augers with standard penetration tests at thirty-four (34) locations and advancing 2-1/4 inch solid stem augers (auger probes) at eight (8) locations with a CME 750 drill rig mounted on an all terrain vehicle, a Diedrich D-50 drill rig mounted on a four-wheel drive truck or a Flex Track drill rig. Twenty-four (24) geo-probes were performed with a truck mounted direct push Geoprobe between February 26 and February 27, 2002. In addition, a Dual Mass Dynamic Cone Penetrometer was advanced at thirteen (13) locations on March 19, 2002 to determine in-place CBR values. Representative soil samples were collected for visual classification in the field and for laboratory analysis by the S&ME soil testing laboratory. Bulk samples are itemized in Appendix A.

The following survey lines were investigated.

| Line | Station | | |
|---|---|---|---|
| -L- | 13+80.00 | to | 211+93.67 |
| -Y1- | 10+60.00 | to | 12+50.00 |
| -Y2- | 10+00.00 | to | 17+83.88 |
| -Y3- | 11+63.26 | to | 17+69.55 |
| -Y4- | 10+00.00 | to | 14+24.00 |
| -Y5- | 10+00.00 | to | 11+73.65 |
| -Y6- | 10+00.00 | to | 12+20.87 |
| -Y7- | 11+00.00 | to | 12+70.00 |
| -Y8- | 15+03.36 | to | 20+24.67 |
| -Y9- | 11+58.66 | to | 13+50.00 |
| -Y10- | 11+64.57 | to | 13+50.00 |
| -Y11- | 12+47.00 | to | 15+00.00 |
| -Y12- | 12+50.00 | to | 30+00.00 |
| -Y13- | 15+00.00 | to | 19+00.00 (Rail Road) |
| -Y14- | 10+00.00 | to | 12+49.43 |
| -Y15- | 10+00.00 | to | 28+51.05 |
| -DET2- | 10+00.00 | to | 15+08.66 |
| NOISE WALL | 183+00.00 | to | 192+00.00 |

**Areas of Special Geotechnical Interest**

1) Groundwater: Groundwater was found to be above or within 6 feet of the proposed grade.

| Line | Station | | |
|---|---|---|---|
| -Y2- | 13+00 | to | 17+00 |

2) Hard Rock: Hard rock was not encountered in any of the soil test borings.

3) Highly Plastic Soils: The following areas contain soils that have plasticity indices of 20 or higher within the proposed construction limits:

| Line | Station | | |
|---|---|---|---|
| -L- | 19+00 | to | 21+50 |
| -L- | 51+80 | to | 57+80 |
| -L- | 64+00 | to | 65+80 |
| -L- | 76+60 | to | 78+00 |
| -L- | 105+50 | to | 109+00 |
| -L- | 118+00 | to | 118+80 |
| -L- | 136+00 | to | 141+20 |
| -L- | 148+00 | to | 154+00 |
| -L- | 162+00 | to | 166+00 |
| -L- | 183+20 | to | 184+80 |
| -Y2- | 12+60 | to | 16+00 |

4) Highly Organic or Soft Alluvial Soils: The following areas contain highly organic or soft alluvial soils:

| Line | Station | | |
|---|---|---|---|
| -L- | 31+50 | to | 32+80 |
| -L- | 32+80 | to | 34+80 (Rt lane only) |
| -L- | 34+80 | to | 40+50 |
| -L- | 117+30 | to | 124+50 |