

# STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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GOVERNOR

SECRETARY

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STATE PROJECT: 8.1830501 (R-2206C)

COUNTY:

Lincoln

**DESCRIPTION:** 

Bridge on Forney Hill Rd. (SR 1373) over NC 16

SUBJECT:

Geotechnical Report – Bridge Foundation Investigation

This 2 lane structure is a new bridge on Forney Hill Rd. (SR 1373) over proposed NC 16. The proposed structure is comprised of 2 spans at lengths of 30.455 and 35.736 meters, and is approximately 12.39 meters in width. The bridge is on a curve making the skew angle vary between 78<sup>35</sup> 34" and 85<sup>07</sup> 53". According to the provided structure sketch the bridge will be a composite deck on composite steel girders. Slopes are proposed at 2:1 with 150mm concrete slope protection.

Foundation test borings were performed with a CME-550 drill machine utilizing NW Casing and automatic drop hammer. The field investigation for this project was conducted in June of 2003.

# Physiography/Geology

Geologically this site is part of the Charlotte Belt and is underlain by metamorphosed quartz diorite and granitic rock. The topography of the bridge site is relatively flat with woods forming a boundary on the east and west side of Forney Hill Road. Some roadway fill soil is associated with existing Forney Hill Road. Residual soils were encountered at all boring locations, and consist of 1.5 to 6 meters of medium stiff to very stiff micaceous silty sandy clay (A-7-5, A-6), 5 to 7.5 meters of stiff to hard micaceous sandy silt (A-4, A-5), and 3.5 to 9.25 meters of loose to dense micaceous silty sand (A-2-4). All borings encountered weathered rock at depth.

## **Foundation Materials**

#### End Bent 1:

This proposed bent is located south of proposed -L- (NC 16). Two borings were performed at this bent location and encountered a small amount of existing roadway fill material associated with Forney Hill Rd. overlying residual soils. Residual soils

(R-2206C) Forney Hill Rd.

beginning at the ground surface, and directly under roadway fill material, consist of 2.4 to 2.9 meters of very stiff to stiff red-tan micaceous silty sandy clay (A-7-5) overlying 1.6 meters of medium stiff to stiff red-tan micaceous sandy silt (A-5). Beneath sandy silt and beginning at elevation 255.32 - 256.86 meters lies 7.5 to 8.5 meters of loose to dense tangray micaceous silty sand (A-2-4). A 1 meter thick weathered rock seam lies between elevation 252.2 and 251.2 meters in boring EB1-A. Weathered rock was encountered with depth for each boring location beginning at elevations 249.26 meters for boring EB1-A and 246.82 meters for boring EB1-B. Boring EB1-B achieved SPT refusal at elevation 259.82 meters on hard rock.

## Bent 2:

This proposed bent is located in the center median of proposed NC 16. Two borings performed at this boring location encountered 2.5 meters of residual medium stiff red-tan micaceous silty sandy clay (A-7-5) to elevation 258.5 meters. Beneath this location 5 meters of medium stiff to stiff red-tan micaceous sandy silt (A-4) is encountered. Below silt at elevation 253.5 meters, medium dense to very dense silty sand (A-2-4) is encountered for 3.3 to 9.3 meters. Weathered rock is encountered at depth ranging from elevation 250.3 meters at B1-A to 244.2 meters at B1-B. Each boring terminated in weathered rock.

## End Bent 2:

This proposed bent is located north of proposed -L- (NC 16). Two borings performed at this bent location encountered 3.9 to 6 meters of residual stiff to very stiff red-tan micaceous silty sandy clay (A-6) overlying stiff to hard tan-gray micaceous sandy silt (A-4) beginning at elevations 257.75 – 255.02 meters. Beneath silt lies weathered rock at elevation 250.45 meters in boring EB2-A and 244.73 meters in boring EB2-B. Boring EB2-A achieved SPT refusal at elevation 246.63 meters on hard rock.

## Groundwater

Static groundwater measurements made more than 24 hours after each boring indicate a groundwater table between elevation 249 and 250 meters across the entire site.

Respectfully submitted,

J.E. Beverly, Project Geologist