



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

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GOVERNOR SECRETARY

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STATE PROJECT: 8.1830501 (R-2206C)
COUNTY: Catawba
DESCRIPTION: Dual Bridges on NC 16 over East Maiden Rd. (SR 1855)
SUBJECT: Geotechnical Report – Bridge Foundation Investigation

The dual structures for this bridge site are on new location with proposed NC 16 over East Maiden Rd (SR 1855) between NC 150 and SR 1895. Both left and right lane structures are comprised of a single span ranging from 28.5 to 30.8 meters in length, 11.74 to 14.74 meters in width, and at a skew angle of $87^{\circ} 45' 08''$. According to the provided structure sketch, each bridge will be a single span composite deck on composite steel girders. Slopes are proposed at 1.5:1 with 100mm concrete slope protection.

Foundation test borings were performed with a CME-550 drill machine utilizing hollow stem augers and automatic drop hammer. The field investigation for this project was conducted in May 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 and open except for several house trailers adjacent to the proposed End Bent 1 RT LN structure. Residual soils were encountered at all boring locations with a 1 to 4 meter surficial clay layer (A-7-6) overlying sand (A-2-4) and or silt (A-4) soils of varying thicknesses. The plasticity index of the surficial clays across the site is on the high side but ranges between 20 and 30 PI. All borings encountered weathered rock and achieved auger refusal on hard rock.

Foundation Materials

End Bent 1:

This proposed bent is located south of East Maiden Rd. Two borings were performed per left and right structures for a total of 4 borings across the bent location. Across both structures 2.5 to 4 meters of residual red-black-tan medium stiff to stiff highly plastic silty

sandy clay (A-7-6) was encountered beginning at the ground surface. Beneath clay soils tan-orange-white loose to dense silty sand (A-2-4) and tan-brown-black medium stiff micaceous clayey sandy silt (A-4) are encountered for 2.8 to 6.2 meters before a definitive layer of weathered rock was reached at depth. Additionally, an isolated 2.5 meter layer of weathered rock was encountered in boring EB1-A RT LN between elevation 289.04 – 287.49 meters. The definitive weathered rock line lies at approximate elevation 286.2 meters for left lane borings and 284.7 meters for right lane borings. Auger refusal on hard rock was achieved between elevation 284.04 and 284.84 meters across both structures.

End Bent 2:

This proposed bent is located north of East Maiden Rd. Like End Bent 1, a total of 4 boring were performed across the entire bent location. Beginning at the ground surface 1 to 4 meters of residual red-black-tan medium stiff to very stiff highly plastic silty sandy clay (A-7-6) was encountered. Underneath clay soil lies 2 – 6.2 meters of tan-orange-white loose to very dense silty sand (A-2-4). A very thin isolated weathered rock seam was encountered in boring EB2-A LT LN between elevation 287.94 – 287.70 meters. In all boring locations beneath the sand lies weathered rock between elevation 285.9 – 284.2 meters. Auger refusal on hard rock was achieved between elevation 286.85 – 282.75 meters across both structures.

Groundwater

Static groundwater measurements made more than 24 hours after each boring indicate a groundwater table at approximate elevation 288.0 meters across the entire site.

Respectfully submitted,

J.E. Beverly, Project Geologist