

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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SECRETARY

GOVERNOR

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STATE PROJECT: 8.1631801 (R-2911A) WBS Element # 34517.1.1

COUNTY:

DESCRIPTION:

Dual Structures on US 70 over SR 2527 (Morehead Rd.)

SUBJECT:

Geotechnical Report – Bridge Foundation Investigation

This is a proposed 4 lane dual structure on new location. The proposed bridge is on US 70 (-L-) over Morehead Rd. (-Y6-). Each proposed structure is identical with span lengths at 40.48 meters, skew angles at 80²³ 06" and structure widths of 11.74 meters. Slopes are proposed at 1 1/2:1 with concrete slope protection.

Foundation test borings were performed with a CME-550 drill machine utilizing tri-cone roller bit, NW casing, and automatic drop hammer. The field investigation for this project was conducted in September of 2003.

Physiography/Geology

Geologically this site lies in the northern region of the Charlotte Belt. Rock types underlying the area are most likely amphibolite or fine grained biotite gneiss. Site specific soils encountered during test borings consist of artificial fill, and residual soil with both weathered rock and hard rock encountered in several boring locations.

Artificial fill soil encountered in the vicinity appears to have been in place for some time. The fill was built up and leveled over a large area for the purpose of adding buildings in some capacity. No structures currently exist on the fill. Fill soils consist of up to 3.0 meters of medium stiff to stiff micaceous silty sandy clay (A-7-5) and medium stiff micaceous clayey fine sandy silt (A-4). Residual soils encountered by borings range in thickness up to 20 meters and were encountered at all boring locations. These soils consist of soft to hard micaceous clayey sandy silt, sandy silt, or sandy clayey silt (A-4, A-5) and loose to very dense micaceous silty sand or clayey silty sand (A-2-4, A-2-5). Four of the eight borings performed encountered weathered rock at depth. Two borings obtained SPT refusal in crystalline rock.

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Foundation Materials

End Bent 1:

This proposed bent is located west of -Y6- (Morehead Rd.). A total of 3 borings were performed along this bent location for left and right lane structures. Boring EB1-A LT LN could not be obtained due to access problems caused by a drainage ditch. Soils encountered along the left lane begin with residual soil at the ground surface. It should however be noted that some alluvial soil might be associated with the drainage ditch located 15 meters left along the bent. Residual soils left of -L- begin with 10 meters of soft to hard micaceous moist to wet clayey sandy silt (A-4, A-5) to elevation 244.88 meters. Beneath the silt layer lies at least 10 meters of medium dense to very dense moist micaceous clayey silty sand (A-2-4, A-2-5). Right lane soils encountered up to 3 meters of Artificial Fill to approximate elevation 253.9 meters. Fill soil consists of medium stiff to stiff moist micaceous silty fine sandy clay (A-7-5). Beneath the fill lies 12.8 to 20 meters of residual soft to hard micaceous moist to wet clayey sandy silt (A-4, A-5). Boring EB1-B RT LN encountered weathered rock at elevation 240.68 meters.

End Bent 2:

This proposed bent is located east of -Y6- (Morehead Rd.). Four borings were performed at this bent location for both left and right lane structures. Artificial Fill was encountered across the entire bent and extends to approximate elevation 251.1 meters. Fill is comprised of stiff to very stiff moist silty sandy clay (A-7-6), and medium stiff micaceous clayey sandy silt (A-4). Beneath fill soil lies between 11.8 and 20.9 meters of residual very soft to very stiff micaceous moist to wet clayey sandy silt or sandy silt, and loose to very dense dry to wet micaceous silty sand or clayey silty sand (A-2-4). Across the bent weathered rock is encountered at various depths ranging between elevation 239.3 and 232.6 meters. In borings EB2-B LT LN and EB2-B RT LN SPT refusal was achieved in crystalline rock.

Groundwater

Static groundwater measurements made more than 24 hours after the completion of each boring indicates a groundwater table between elevation 247.9 and 249.7 meters.

Respectfully submitted,

JE Bevery

J.E. Beverly, Project Geologist