

# STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY

P.O. BOX 25201, RALEIGH, N.C. 27611-5201 LYNDO TIPPETT

GOVERNOR

SECRETARY

September 29, 2003

STATE PROJECT: 33337.1.1 (B-3901)

COUNTY:

Rockingham

**DESCRIPTION:** 

Bridge #181 on SR 1501 (Garrett Rd.) over Matrimony Creek

SUBJECT:

Geotechnical Report – Bridge Foundation Investigation

This is a single structure bridge replacement for bridge number 181 on SR 1501 over Matrimony Creek. The proposed new structure calls for 3 spans at lengths of 45', 55', and 45' on a 60 degree skew angle. The structure design type is cored slab with a recommended width of roadway at 30 feet from shoulder to shoulder. Slopes are proposed at 1 ½:1 with class II Rip Rap protection.

Foundation test borings were performed with a CME-550 drill machine utilizing hollow stem augers, NX Casing / NXWL, and tri-cone roller bit. This drill rig is equipped with an automatic drop hammer. The field investigation for this project was conducted in August of 2003.

## Physiography/Geology

Geologically this site is within the Sauratown Mountains Anticlinorium. Underlying rock types are comprised of metagraywacke, biotite gneiss and schist. Site specific soils encountered consist of approximately 10 feet of roadway fill material at end bent locations consisting of soft micaceous sandy clay (A-7-5, A-7-6, A-6) with gravel size rock fragments. Other soils include up to 7.2 feet of alluvial very loose to dense silty clayey micaceous sand (A-2-4, A-3) with quartz gravel, and up to 3 feet of residual medium dense to very dense micaceous silty sand (A-2-4). Weathered rock was encountered at all boring locations followed by hard gneissic schist rock.

#### **Foundation Materials**

#### End Bent 1:

This proposed bent is located west of Matrimony Creek. The fill soil associated with the roadway at this location is very soft and caused the side slope to fail under the weight of the drill rig. Only one boring was performed at this bent location due to power lines.

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EB1-B was performed along the edge of existing Garrett Rd. and encountered 8.9 feet of roadway fill soil consisting of brown-orange soft micaceous sandy clay (A-7-5) overlying 7.2 feet of alluvial gray loose to medium dense silty clayey sand (A-2-4) with quartz gravel. The soil boundary between roadway fill and alluvium occurs about elevation 616.32 feet. Beneath alluvium at elevation 609.12 feet a 0.9 foot layer of weathered rock is encountered prior to auger refusal on hard rock at elevation 608.22 feet.

#### Bent 1:

A single boring was performed for this bent along the western bank of Matrimony Creek. The boring encountered 3.8 feet of alluvial tan-brown dense micaceous sand (A-2-4) with quartz gravel overlying 2.9 feet of residual brown dense micaceous silty fine sand (A-2-4). The soil boundary between alluvium and residual soil occurred at elevation 606.59 feet. Gravel in the alluvial layer was likely responsible for the 48bpf N value from a split spoon drive taken at a depth of 1.7 feet. Below residual soil the boring encountered 3.1 feet of weathered rock on top of hard rock. Elevation for weathered rock is 603.69 feet with hard rock following at elevation 600.59. Hard rock was cored at this location to evaluate its engineering characteristics.

### Bent 2:

Two boring were performed east of Matrimony Creek for this bent location. Each boring encountered between 5 and 6 feet of alluvial tan-brown very loose to dense micaceous sand (A-3) overlying a very thin layer of very dense residual sand and /or weathered rock. The top of weathered rock occurs at approximate elevation 607.5 feet and extends 1 foot in depth where hard rock is encountered at elevation 606.5 feet. Hard rock was cored at both boring locations for evaluation purposes.

#### End Bent 2:

This proposed bent is located east of Matrimony Creek. A single boring performed along the edge of existing Garrett Rd. at this bent location encountered 10.4 feet of roadway fill soil consisting of red-brown-tan soft to stiff micaceous sandy clay (A-7-5, A-6) with gravel size rock fragments. Beneath roadway fill at elevation 613.86 feet is where 3 feet of residual brown-tan medium dense silty sand (A-2-4) is encountered. The bottom of residual sand lies in contact with weathered rock at elevation 610.86 feet. The occurrence of weathered rock extends for 3.5 feet and terminates at the hard rock horizon. This boring achieved auger refusal on hard rock at elevation 597.01 feet.

#### Groundwater

Static groundwater measurements made more than 24 hours after each boring indicate the groundwater table at approximate elevation 610 feet.

Respectfully submitted,

JE Beverly

J.E. Beverly, Project Geologist