



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

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STATE PROJECT: 8.2852001 (B-3419)  
COUNTY: Burke  
FEDERAL PROJECT: BRZ-1223(2)  
DESCRIPTION: Bridge No. 46 on SR-1223 over Catawba River  
SUBJECT: Geotechnical Report – Bridge Approaches Inventory

This proposed bridge replacement project is located just downstream of the Lake James powerhouse in the valley of the former Linville River now designated as the Catawba River. The Catawba River merges with the Old Catawba River just downstream of the project.

The focus of this investigation is on shallow cuts associated with the slightly relocated bridge approaches and the foundation materials for a fill retaining wall. The subsurface investigation was conducted using a CME-550 ORV drill machine equipped with an automatic hammer for Standard Penetration Testing (SPT) through hollow stem augers. Other borings utilized solid augers.

The following survey line was investigated and subsurface profiles of limited areas are included in this report.

-L- Line from Station 13+45 to 25+32.40

AREAS OF GEOTECHNICAL INTEREST

- 1) Rock in cut area right of -L- Station 15+30 to 15+90. Area of rock is delineated on the plan view and cross-sections.
- 2) Retaining wall foundation soils right of -L- Stations 21+75 to 23+30.

Geology and Physiography

The river valley is migrating laterally to the northeast at the project site where a steep river bluff or cliff with large rocky outcrops is found. The southwest side has a thin, intermittent blanket of river terrace soil lying on small hills dipping gently towards the river. Terrace materials have weathered to a deep red colored sandy clay with rounded and polished quartzose cobbles and boulders overlying residual soils, saprolite or rock. The heredity of the alluvial boulders, derived from the Grandfather Mountain Window, includes rocks of sedimentary, metamorphic and igneous origins. Alluvium in the riverbed is almost entirely cobbles and boulders.

Bedrock at the site includes metamorphosed granite known as the Henderson Gneiss, which is the local cliff maker, along with gneiss and schist of the Ashe Formation.

Soil and Rock Properties

Very loose to loose alluvial sand and silty sand with gravel is present below embankment at the proposed retaining wall. Alluvial terrace soils encountered in the cut section right of -L- Stations 14+00 to 17+00 consist of medium stiff to stiff, bright red sandy clay with cobbles and occasional boulders. The terrace clay is from one to six feet deep. Saprolitic soils underlie embankment, alluvium, and terrace clays consists of very soft to hard sandy silt and very loose to very dense silty sand. Weathered rock is present throughout the project at shallow depths is often interlayered with silty sand saprolite. Crystalline rock is exposed at the surface and at shallow depths in the cut section right of -L- Stations 15+30 to 15+90. The crystalline rock has an undulating surface and phases in and out of weathered rock.

Retaining Wall

The proposed retaining wall is located at the lower (right) side of the road by the river from -L- Station 21+75 to 22+90. It is situated on existing embankment over side creek alluvium and a short section of hillside. Existing embankment consists mostly of 5 to 17 feet of very soft to soft sandy silt and a small segment of medium stiff sandy clay. Embankment is partially underlain by 3 to 8 feet of very loose to loose silty sand to fine to coarse sand alluvium. From -L- Station 22+75 to 23+30 embankment is underlain by up to 15 feet of medium to very dense sandy saprolite grading to a thin rind of weathered rock over crystalline rock. Underlying alluvium from -L- Station 21+75 to 22+75 is a deeper and more weathered saprolite consisting of medium stiff to stiff sandy silt. Groundwater was encountered near elevation 1061 feet in the area of the wall.

Respectfully Submitted,

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