



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

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STATE PROJECT: 8.2941701 (B-3659)  
COUNTY: Haywood  
DESCRIPTION: Bridge No. 112 on SR-1147 over Allens Creek  
SUBJECT: Geotechnical Report – Foundation Investigation

This proposed bridge replacement project is located on SR-1147 between the quarry and the Waynesville reservoir. Several abandoned and active water mains are located near the bridge. The proposed structure will have one span at 56 feet with a 130-degree skew built on existing location. A local detour is expected to be used during construction.

The subsurface investigation was conducted using a CME-550 ORV drill machine equipped with an automatic hammer for Standard Penetration Testing (SPT) advanced by casing with an advancer. Four borings were made. All borings were made as close as possible to the bent locations. Six disturbed soil samples were submitted to the lab for testing.

Allens Creek has a bent linear valley with steep and very high slopes exceeding 6000 feet in elevation. Abundant rounded creek rock is found at shallow depth throughout the valley. Creek banks are usually less than 6 feet high and have exposed cobbles and boulders. The creek bed is paved with rounded stones and void of bedrock exposures.

**Foundation Materials**

Soils encountered include 12 to 17 feet of alluvial sand and gravel with cobbles and boulders. Backfill at existing abutments is of the same material as the alluvium and impossible to differentiate from the alluvium. Any embankment encountered is identified as alluvium in this report.

Below the armored alluvium a rather uniform horizon of saprolite has developed. Saprolite consists of 12 to 40 feet of loose to very dense silty sand with mica derived from gneiss of the Ashe Formation. Underlying the saprolite is a rind of weathered rock (from 2 to 5 feet thick) which grades to crystalline rock. Approximately 1/2 mile downstream is the Hayesville Fault, an inactive low angle thrust seperating the Ashe Formation from the basement. Based on observations of saprolite recovered in SPT samples, faulting appears to have had no effect on the fabric of bedrock at this site. Soil sample results will be made available when received.

End Bent One

The rock line ascends to the left where a short section of floodplain exists between the bridge and the valley side. Twelve to seventeen feet of alluvium consisting of brown silty sand and gravel with cobbles and boulders is present across proposed End Bent One. The alluvium deepens to the left and indicates creek migration in that direction. Underlying the alluvium is 12 to 40 feet of saprolite consisting of loose to dense silty sand with mica. A rind of weathered rock from 2 to 5 feet thick underlies the saprolite. The weathered rock makes a quick transition to crystalline rock and becomes much more resistant to penetration by N casing tipped with an advancer.

End Bent Two

From 13 to 17 feet of coarse alluvium consisting of silty sand and gravel with cobbles and boulders is present across End Bent Two. The alluvial material deepens to the left. Some SPT values in the alluvium are inflated due to the presence of large stones. From 26 to 34 feet of loose to very dense saprolitic silty sand with mica underlies the alluvium. Weathered rock is present below elevations 2977 to 2973 feet. The boring at EB2-A was terminated in weathered rock at elevation 2975 feet while the boring at EB2-B went slightly deeper and penetrated crystalline rock.

**Groundwater**

Groundwater is present at the site near an elevation of 3013.8 feet.

Respectfully Submitted,  
*P. Q. Lockamy*  
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