

The hard rock at this site is part of the Ashe Formation as shown on the Geologic Map of North Carolina, 1985. The predominant lithology is amphibolite, a dark gray, massive rock composed of black amphibole with subordinate amounts of feldspar. A layer of mica schist about 10 feet thick is exposed in outcrops near the Buffalo Rd. intersection, and a boring on -DR1- encountered phyllite, mica schist, and mica gneiss.

All of the lithologies have well developed foliation joints that dip southeast at moderate angles, and they are highly jointed in other directions as well. The foliation joints are usually spaced about 0.1 to 5.0 feet apart; and a steep, west-dipping, orthogonal joint set is spaced 0.5 to 2.0 feet apart. Other joint sets have less consistent spacing that is hard to characterize. Much of the rock encountered in borings in the cut slope areas is moderately weathered or worse, and of poor quality.

Areas of Special Geotechnical Interest

Hard Rock Above Grade

Hard rock will be encountered above grade on the Left Side of -L- at the following location:

-L- Stations 11+50 to 16+00

Hard rock will be encountered intermittently on the Left Side of -L- and intermittently on -DR2- at the following locations:

-L- Stations 19+50 to 23+00

-DR2- Stations 10+00 to 14+00

Wet Cut in Rock

The water table will be found above grade in rock in the proposed Left Side cut at the following location:

-L- Stations 19+50 to 20+50

Retaining Wall

Plans call for a retaining wall to be constructed 9 feet Left of alignment -DR1- at the following Stations:

-DR1- Stations 10+00 to 11+00

The wall is located on an existing embankment slope for SR 1131. Two rock core borings were made offset to the left, on the Buffalo Creek flood plain at the foot of the embankment. Both borings penetrated 9 feet of very soft, alluvial silt and loose, alluvial gravel. The alluvial gravel overlay hard, fresh rock at one boring and a thin layer of weathered rock at the other, before encountering fresh rock. The rock in both borings was fresh and fair to very good quality throughout, from the first encounter to depths of 50 and 30 feet, respectively.

Ground Water Within 2 Feet of Natural Ground

Groundwater was found within 2 feet of natural ground, possibly interfering with the movement of construction equipment, at the following location:

-DR1- Station 10+15 to 11+29.80

This area is on the flood plain of Buffalo Creek.

Artesian Water

Artesian water flowed from a rock core boring at the following location:

-DR1- Station 10+75, 15' Left

The artesian flow was observed for several hours during the day. When the boring was revisited after 24 hours, the artesian flow had stopped.

Water Wells

A water well in close proximity to a proposed cut is sited at the following location:

-L- Station 13+30, 195' Left (approximate)

This well is located within 20 feet of the top of a proposed cut. It is no longer in use but remains open.

Geotechnical Descriptive Analysis

-L- Stations 11+30 to 16+00

A large, Left Side cut is proposed for this segment. The maximum depth of cut at the ditch line is to be about 25 feet, and the proposed cut face will be about 120 feet high. The upper part of the natural slope is in use as a Christmas tree farm, with a mobile home on the site and two soil roads giving access to the plantings. The lower part of the slope is in mature forest and is very steep, about 40 degrees. Abundant hard rock is exposed on the slope near Station 14+50 and in the road cut on SR-1131 at the end of this segment.

Three rock core borings and 2 auger borings were made to investigate this proposed cut. The depth to hard rock varied from 3 to 13.5 feet across the middle of the slope to more than 20 feet near the top of the slope. The shallower rock depths were beyond Station 14+00, where there are some large rock outcrops.

The hard rock was poor quality and badly weathered to a depth of about 30 feet in borings Left of Stations 12+00 and 13+00. A boring Left of Station 14+50 found poor to fair quality, slightly to moderately weathered rock from near ground surface to 50 feet.