

The hard rock line is observable in the existing cut faces, and it is encountered in the borings. On the right side, it rises from near grade level at Station 109+00 to about 30 feet above grade near the center of the cut, and it stays high from there to the north end of the cut. There is a much greater thickness of weathered rock on the left side. Rock line is below grade at the south end and rises to not more than 10 feet above grade at the north end.

The lithology is dark gray mylonite gneiss that is cut by numerous, smooth joint faces into small to large blocks. Cleavage dips steeply to the east, and wedge intersections tend to be steeper than 1:1. The larger block faces are about 6 feet across. The rock near the north end of the cut is somewhat schistose and highly fractured.

Stations 113+50 to 141+78.99

This segment traverses the drainage basin of Puncheon Camp Creek. The topography here is similar to the drainage basin of Greenfield Branch, consisting of small stream valleys and relatively low interfluves. Land use here is primarily residential lots with intervening woodlands. The alignment intersects -Y1- at -L- Station 140+00.

Construction will consist of widening several existing embankments over small stream valleys and widening low to moderately high side cuts. The maximum existing embankment is about 75 feet high, and the maximum existing cut is 70 feet.

Cutslopes in this segment will be entirely in saprolite with a thin residual clay cap. The saprolite is predominantly red-brown to yellow brown, gray, or white, moist, stiff to hard, micaceous, sandy silt (A-4, A-5). White, fine to coarse, feldspathic sand (A-1-b, A-2-4) occurs as pockets or layers about 10 feet thick around Stations 130+00 to 134+00. Mr. Joseph R. "Junior" Goins operates a borrow pit in saprolite about 300 feet right of -L- in that area.

Fine colluvial soils are found left of an embankment at Stations 114+50 to 116+00. Those soils, which are about 10 feet or less in thickness, consist of brown, moist to wet, soft to medium stiff, sandy silt (A-4) and loose, silty sand (A-2-4) with pebbles.

Alluvial floodplain soils are typically 5 to 10 feet thick, consisting of brown, very soft to soft, sandy clayey silt, and silty clay (A-4, A-5, A-6).

Special attention should be given to alluvial soils on the left side between Stations 135+30 and 136+15, at the base of an existing embankment. The floor of a small valley there is occupied by a marsh and an adjacent alluvial terrace. Soil in the marsh is brown to gray, very soft, saturated, sandy silt (A-5) that is 5 to 7 feet thick overlying hard saprolite. The alluvial terrace stands about 10 feet higher than the marsh. It is composed of about 12 feet of yellow-brown, moist, soft to medium stiff, sandy silty clay (A-7-5), overlying about 10 feet of gray, moist to wet, medium stiff, clay-silt (A-4). Those alluvial deposits overlie 2-3 feet of medium stiff colluvial silt (A-4). Two Shelby Tube samples have been recovered from the alluvial clay and silt. Plans call for 20 to 30 feet of new embankment over those deposits.

No borings were made into existing embankments of this segment. The embankments appear to be stable.

Stations 141+78.99 to 162+45.04

Plans call for relocation of this segment west of the existing highway. Construction will consist of two through-cuts and a high embankment across the head of a valley. The maximum depth of proposed cuts is about 50 feet, and the maximum embankment height is 100 feet. The alignment crosses Waterfalls Road with no provision for -Y- Line construction. The alignment crosses a residential lot with a brick house, outbuildings, and water well at Station 154+00. Property on the left side between Stations 155+00 and 164+00 is part of Pisgah National Forest, Grandfather Ranger District.

Cuts will encounter saprolite composed of red-brown to gray or white, moist, medium stiff to hard, micaceous, sandy silt (A-4) with a few weathered rock layers. A ledge of hard rock crops out near proposed ditchline at Station 148+00.

The area of proposed embankment is underlain by a pocket of fine colluvium composed of yellow-brown, moist, soft to medium stiff, clay-silt (A-6, A-4). Those soils are accumulated at the base of the valley head and on surrounding toe-slopes to a maximum depth of about 10 feet. A small spring emerges in colluvium near the center of the embankment area. Soils beneath the colluvium, and on the slopes above it, are composed of medium stiff to hard, silty saprolite (A-4).

Stations 162+45.04 to 240+00

This long segment runs on the broad crest of a ridge. The alignment shifts alternately from the right to left sides of the ridge. Long side cuts with opposing fills are interspersed with embankments across saddles and valley heads. The maximum relief on slopes above the highway is about 100 feet, while slopes below the highway fall 200 to 500 feet. The area is covered by a large expanse of forest broken by only a few residential or small commercial sites.

Construction will involve widening existing cuts and embankments. The maximum existing embankment is about 45 feet high, and widening will place a maximum of 30 feet of new embankment over natural ground. The maximum existing cut is about 60 feet high. A few segments of existing four-lane highway will require minimal new construction. Plans call for a retaining wall to hold an embankment on the left side from Stations 236+40 to 240+00. Embankment widening without a wall there would override a soil road downslope.

Soils in cut areas are generally 20 to 60 feet or more in thickness, composed of saprolite interlayered with weathered rock, and usually capped with 2 to 5 feet of medium stiff, residual clay or sandy clay-silt (A-6, A-7-5, A-7-6, A-4). The saprolite is typically red-brown, brown, or gray, moist, medium stiff to hard, micaceous sandy silt (A-4, A-5) and medium dense to very dense silty sand (A-2-4). The silty and sandy soils and weathered rock are all interlayered in some places. Weathered rock may be the dominant material in cuts beyond Station 200+00.

Fine, wet colluvial and alluvial soils lie beneath the toe area of a proposed embankment widening on the right side between Stations 232+00 and 234+50. The soils are in transition from toe slope colluvium to headwater alluvium. Investigation with a hand soil auger found about 7 feet of dark