Clayey residual soils overlie saprolite from the ground surface to about 2 to 4 feet, or rarely to depths of about 8 feet in some areas. These are typically red-brown to orange-brown, moist, medium stiff, silty clay or plastic clayey silt (A-7-5, A-6, A-4).

Alluvial soils form shallow, silty deposits on narrow floodplains. They are brown, red-brown, or gray, moist to saturated, very soft to soft, sandy to clayey silt (A-4, A-5), sandy, silty clay (A-6), or loose, silty sand with gravel (A-2-4). Floodplain deposits typically overlie weathered rock or hard saprolite. An alluvial terrace deposit at Station 136+00 consists of 12 feet of yellow-brown and red-brown, moist to wet, soft to medium stiff silty clay (A-7-5, A-7-6) overlying 8 to 10 feet of gray, wet, medium stiff sandy, clayey silt (A-4).

Colluvial soils are not abundant on this project. Where found they are of two kinds. Stony colluvium is found on some toe slopes and in basin heads in areas of high relief and abundant rock outcrops. Those soils are brown to orange-brown, moist, loose, silty sand and medium stiff, sandy silt (A-1-b, A-2-4, A-4) with variable concentrations of pebbles, cobbles, and boulders. Some very large boulders may be encountered. The maximum thickness of stony colluvium is about 35 feet.

Fine colluvial soils are found as small accumulations in basin heads and at the mouths of ravines in areas of abundant saprolite and little rock. Those soils consist of yellow-brown, red-brown, or brown to gray, moist, medium dense, pebbly, silty sand (A-2-4), or moist to wet, soft to medium stiff, plastic, sandy silt and sandy, silty clay (A-4, A-6). The maximum thickness of fine colluvium is about 10 feet.

Only a few of the many existing embankments on this project were investigated. A total of 23 borings were made in 9 embankments. Results indicate that embankments are either coarse sandy, stony material in areas of abundant rock, or they are fine silty material in areas where saprolite predominates. Stony embankment soils occur between Stations 26+00 and 90+00 and between Stations 295+00 and 355+00. They consist of brown, moist, loose, coarse sand and gravel with abundant cobbles and boulders (A-1-b). Fine embankment soils are brown, red-brown, yellow-brown, gray, or white, moist, soft to stiff sandy, micaceous silt (A-4, A-5) and loose to medium dense, silty sand (A-2-4) with or without fragments of rock and weathered rock.

Artificial fill has been placed over a floodplain beside Waterfalls Store just north of Silvervail Falls. Borings there encountered gray-brown, moist to wet, loose, coarse silty sand and boulders.

Groundwater

Groundwater was not found within 6 feet of proposed grade at any point on this project. Wet areas that will have an impact on construction are described under "Areas of Special Geotechnical Interest".

Geotechnical Descriptive Analysis

This project will be described in segments as follows for reasons of topography and subsurface conditions.

-L- Stations 10+00 to 21+00

Grading has been completed on this part of the roadway.

-L- Stations 21+00 to 26+00

Construction in this segment consists of widening an existing embankment and constructing a retaining wall on the left side. The soil profile in this area consists of a few feet of hard silty saprolite overlying weathered rock. The depth to hard rock is estimated to be about 8 to 12 feet.

-L- Stations 26+00 to 40+00

Proposed construction in this segment consists of a large cut on the right side. The top of the proposed 1:1 cut face will lie almost 250 feet above grade. Only a minimal amount of embankment material is to be added to the left side. Most of the material from this cut will be carried forward, beyond Station 40+00.

Extensive areas of hard rock outcrop are exposed on the right side in natural spalls, cliffs and ledges and in existing roadcuts. The estimated depth to the rock line for this cut averages less than 5 feet and is a maximum of 10 feet or less. The material above hard rock is composed chiefly of weathered rock. The slope is covered with a dense growth of shallow-rooted, mature trees and brush.

The rock consists of granite gneiss on the lower half of the slope and mylonite gneiss on the upper half. Those lithologies, particularly the granite gneiss, have numerous large joints that are unfavorably oriented and the rock shows various degrees of partial weathering. A local resident, Mr. June Ford, who participated in construction of the existing highway, has reported frequent rock slides on this segment of the road over a period of about 20 years after the highway was constructed. Examination of the cut reveals a number of wedge failure sites. Those wedges involve a set of large, undulating joints intersecting other joints. Foliation joints dipping into the slope provided release on some failures. Borings in this segment indicated unsound rock at depth due to some high angle faulting.

-L- Station 40+00 to 47+50

A large cut is proposed on the right side on this segment. The cut will achieve a maximum height of just over 100 feet. The existing cut on the right side exposes abundant hard rock with very little weathered rock or soil overburden. A boring at Station 43+50, 120' RT found 4 feet of stiff saprolite and about 10 feet of weathered rock overlying sound hard rock. Those figures are the maximum estimated for this segment. The lithology in this cut is fresh, sound granite gneiss. Joint orientations here are similar to orientations in the previous cut area, but joints are fewer and there is little evidence of past failures.