

brown, wet, loose, silty sand (A-2-4) and soft, sandy silt to sandy clay (A-4, A-6). Plans call for about 20 feet of embankment to be placed over those soils.

Hard rock may be encountered approximately at grade between Stations 176+00 and 178+50, and it may occur sporadically as much as 10 feet above grade at ditchline between Stations 208+00 and 222+00.

Several of the existing embankments have been investigated. They are composed of red-brown, orange-brown, brown and gray, moist, medium stiff to stiff, sandy silt (A-4) and loose to medium dense, silty sand (A-2-4). Embankments beyond Station 200+00 contain rock fragments.

The existing embankment between Stations 165+00 and 173+00 has undergone slow or incremental circular failure in at least two places. Soil movement around Station 167+00 to 168+00 has displaced the guardrail and shoulder on the right side. A more serious failure has occurred on the right side between Stations 171+00 and 172+50. The embankment slope has given way there and a semicircular fracture in the pavement takes in the entire width of the right outside travel lane in this four-lane part of the highway.

Borings were made at the two failure sites. A boring on the shoulder at Station 167+50 penetrated 42 feet of silty embankment and provided inconclusive data. A boring at Station 171+50 encountered 45 feet of silty embankment. The lower half of the embankment, beginning at a depth of 25 feet, was wet with soft, crumbly intervals.

The embankment in question overlies a saddle on the crest of the ridge. The source of the wetness is undetermined. A possible source is the drainage ditch upstation, across the highway. Surface runoff might be entering the soil at the contact between embankment and natural ground on the left side and soaking through the embankment to the right side.

Slope indicators have been installed in both borings, and they are currently being monitored.

Stations 240+00 to 297+00

This segment of the alignment lies on the left side of the ridge less than 100 feet below the crest. The slope falls away to the left as much as 500 feet. Most of the terrain is heavily forested except for a few house lots and rather extensive areas cleared for power line right-of-ways. Falcon Ridge is a suburban style housing development on the right side between Stations 267+00 and 290+00.

Existing long cuts on the right side achieve a maximum height of about 50 feet. Existing embankments lie along a saddle in the ridge, and they form left side fill slopes opposite the cuts. Those embankments are not more than 20 feet in height. An embankment across a valley between Stations 294+00 and 296+00 is 60 feet high.

Construction will involve widening the existing embankments and cuts. The maximum new cut at ditchline will be about 42 feet. The maximum depth of new embankment will be about 40 feet placed over natural ground and over shallow existing fill slopes. A retaining wall is indicated for embankment on the right side between Stations 294+50 and 296+50.

The soil profile becomes more and more shallow over the length of this segment, from a maximum depth of about 35 feet overlying weathered rock near the beginning to a few feet or less near the end. Residual clay cap soils were not found in borings beyond Station 260+00. Saprolite consists predominantly of brown to gray or white, moist, medium stiff to hard, micaceous sandy silt (A-4), and lesser amounts of dense to very dense, silty sand (A-2-4, A-1-b). Saprolite is interlayered with weathered rock in many places.

Weathered rock is the predominant material to be expected in new cuts. It has a maximum thickness of about 30 feet overlying hard rock. It consists chiefly of fine grained, friable, brown to gray weathered mylonite.

Hard rock can be expected in the lower part of most new cuts. The rock line will achieve a maximum height of about 30 feet above proposed grade at ditchline at Station 268+50. Hard rock at that location is a gray, fine-grained, even-textured quartz monzonite. Hard rock in most other proposed cuts is mylonite.

Alluvial soil about 5 feet thick underlies a wet area on the right side between Stations 294+00 and 296+00. That soil consists of dark brown to gray, very loose, saturated silty sand (A-2-4). A retaining wall has been proposed to defend the wet area from embankment widening.

A few borings were made in embankments in this segment. Fill slope embankment left of Station 275+00 is orange-brown and gray, moist, loose silty sand and medium stiff sandy silt (A-2-4, A-4) with abundant rock fragments. Two borings into the high embankment at Stations 294+75 and 295+75 encountered boulders in a brown coarse sandy matrix.

-L- Station 297+00 to 305+00

A long cut on the right side is proposed for this segment. The maximum height of the cut will be about 90 feet assuming a 1:1 slope. About 10 feet of new embankment is to be added to existing embankment on the left between Stations 302+50 and 305+00.

Soil in this segment consists of loose to medium dense clayey to silty coarse sand saprolite (A-1-b), which reaches a maximum depth of about 10 feet around Station 301+00. Saprolite is extremely thin or absent from much of this segment, where weathered rock is at or near ground surface. The depth to hard rock varies from zero to about 20 feet.

The hard rock is composed of coarse augen gneiss up to Station 303+00 and quartz monzonite gneiss beyond there. Foliation dips eastward, favorable for the proposed right side cut.

-L- Station 305+00 to 315+00

Relocation of the highway is proposed for this segment. Construction consists of a large through cut to depths of 85 feet at the left ditchline and 130 feet at the right ditchline.