STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

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SECRETARY

5 April, 2004

STATE PROJECT: 36664.1.1, R-4733
COUNTY: Haywood
DESCRIPTION: Site 2, US 74/23 bypass in Waynesville, east of SR 1177

MEMORANDUM TO: John Farger, PE, Western Region Design Engineer

FROM: Jody C. Kuhne, PG, PE, Project Geologist

SUBJECT: Geotechnical Report – Design Recommendations

The Geotechnical Engineering Unit has completed its investigation of this project and presents the following recommendations. A short inventory of the project is included in this report.

Inventory

The project is located along the prepared alignment L2, established for the purpose of mitigating this landslide area which has been unstable and moving continuously for 20 years. The area from 30+00 to 34+00 has been previously mitigated on a 1 ½:1 slope and has a moderate sized scarp appearing since that work was completed.

Borings were conducted with CME 45 and 550 drill machines using hollow augers.

Geology

Three SPT borings were taken at 32+50, 220' lt, 35+40, 250'lt and 36+90, 169'lt. These revealed deeply weathered, generally highly micaceous metasediments with granitic pegmatite intrusions. The metasediments are mostly silts with varying amounts of clay in the residual shallow layers and fine sand in thin layers up to 3'. These are all generally loose to medium dense. The pegmatites weather to mostly sands and tend to form weathered rock layers within the looser metasediments. The pegmatites form layers 3-10' thick and are the origin of large blocks of weathered to fresh rock in the landslide mass.

Soils are loose to medium dense and appear in depths up to 40'. Below this is usually 10-20' of soil with increasing weathered rock and rock fragments up to and including 10' of weathered rock. Soil and saprolite is mostly silt, very micaceous and contains manganese stained jointing, all of which contribute to weakness not implied by SPT blowcounts alone.
All stratigraphy labelled 'Saprolite with weathered rock' or 'Weathered rock' may require select ripping or blasting to excavate.

Groundwater

All three borings were dry and there is no evidence of springs or seeps which may contribute to the landslide. Material probably fails in this area once a new scarp face is exposed to weathering and the lack of groundwater has kept the area from failing in mass.

I. Slope/Embankment/Structure Stability

Slope Design

Cut Slopes: Recommend the cut slope be 2:1