grain size analysis with hydrometer. In addition, two Unconfined Compressive Strength (Qu only) tests were performed by Trigon on selected samples of the recovered rock core from the Bent-1 borings. Laboratory tests were performed in general accordance with AASHTO and NCDOT specifications. The results of the soil laboratory tests are included on Sheets 34 through 36. A Summary of Rock Test Data table is included on Sheet 37. Laboratory results of the rock testing are also included under separate cover in Appendix A.

3.3 SITE GEOLOGY

The site of the proposed project is located at the juncture of the Blue Ridge and Inner Piedmont Belts and the Sauratown Mountains Anticlinorium of the Piedmont Physiographic Province of North Carolina. Based on the 1985 Geologic Map of North Carolina published by the Division of Land Resources of the North Carolina Department of Natural Resources and Community Development, the site appears to be located within the Sauratown Mountains Anticlinorium. According to The Geology of the Carolinas published by the Carolina Geological Society in l991, the Sauratown Mountain Anticlinorium is a "northeast-trending folilation arch characterized by nearly symmetrical distribution of basement-cover rock sequences and an inverted sequence of metamorphic isograds". It is believed that the major thrusting and imbrication of the thrust sheets occurred coincident with and following middle Paleozoic metamorphism. Parts of four stacked thrust sheets are exposed in the Sauratown Mountains Anticlinorium. These thrust sheets were domed during the formation of the anticlinorium, and subsequent erosion has exposed "a complex, multitiered window." (Horton, J.W., and Zullo, V.A., *The Geology of the Carolinas*, 1991).

According to the 1985 Geologic Map of North Carolina, the site is located at the confluence of areas generally consisting of gneiss and schist with locally occurring calc-silicate rock, granitic rock, quartzite, amphibolite, and phyllite. The crystalline rock encountered in our test borings generally consisted of slightly to very slightly weathered calc-silicate rock ranging in quality from fair to good. The residual soils at the site are the product from the physical and chemical weathering of the adjacent crystalline rock.

3.4 FOUNDATION MATERIALS

The generalized subsurface conditions indicated by the borings are described below. For soil descriptions and general stratification at a particular boring location, the respective Boring Log should be reviewed. For rock descriptions and stratification at a particular boring location, the respective Coring Log should be reviewed. The Boring Identification Diagram, Boring Logs, Coring Logs, and Core Photographs are located behind this report. Representative subsurface cross-sections at each bent location and a subsurface profile

along the structure are also included behind this report. The subsurface properties for the project site are described below.

Foundation materials encountered at the site included roadway embankment fill, alluvial soils, residual soils, weathered rock, and crystalline rock.

Roadway embankment fill was encountered beginning at the existing ground surface at Borings DOT EB1-B, DOT EB2-A, and DOT EB2-B. The fill extends to depths of between ±6 and ±7 feet (Elevations ±990 feet to ±992 feet). The roadway embankment fill encountered generally consists of loose, slightly micaceous, silty sand (A-2-4); and medium stiff, silty clay (A-6) and sandy silt (A-4). A Standard Penetration Resistance value of 5 blows per foot (bpf) was encountered within the roadway embankment fill.

Alluvial soil was encountered underlying the roadway embankment fill at Borings DOT EB1-B, DOT EB2-A, and DOT EB2-B, and beginning at the existing ground surface at the remaining borings. The alluvium soil extends to depths of ±15 feet to ±17 feet (Elevations ±973 feet to ±980 feet) at End Bent-1 ((note that DOT EB1-A(DET) has alluvium extending to ±10 feet but this boring is 13 feet off of the bent line)), to depths of ±14 feet to ±12 feet (Elevations ±971 feet to ±973 feet) at Bent-1, to depths of ±4 feet to ±9 feet (Elevations ±979 feet to ±974 feet) at Bent-2, and to depths of ±11 feet to ±18 feet (Elevations ±979 feet to ±980 feet) at End Bent-2. The alluvial soil generally consists of very loose to dense, variably micaceous, silty, coarse to fine sand (A-1-b and A-2-4) with varying amounts of gravel; and very soft to very stiff, variably micaceous, variably clayey, fine sandy silt (A-4), and silty clay (A-7-5). A layer of old streambed material consisting of cobbles and gravel was encountered as the basal portion of the alluvium at Borings TEB1-A and TB1-B between Elevations ±974 feet to ±973 feet. Quartzite boulders were encountered at the base of the alluvium at Boring TB1-A between depths of ±14 feet and ±16 feet (Elevations ±971 feet and ±970 feet), and at Boring TEB2-A between depths of ±11 feet and ±13 feet (Elevations ±979 feet and ±977 feet). We estimate that these boulders are between 2 feet and 3 feet in width. Standard Penetration Resistance values within the alluvial soil ranged from 1 to 53 blows per foot (bpf). However, the blow counts higher than 10 blows per foot were influenced by gravel.

Residual soils were encountered underlying the alluvium at all of the borings drilled for this project. The residual soils extend to depths of ±24 feet to ±19 feet (Elevations ±965 feet to ±968 feet) at the End Bent-1 borings drilled by Trigon, to a depth of ±26 feet (Elevation ±960 feet) at DOT EB1-A(DET), to a depth of ±18 feet (Elevation ±980 feet) at DOT EB1-B, to depths of ±27 feet to ±29 feet (Elevations ±958 feet to