Carolina Geological Society in 1991, 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 in an area generally consisting of biotite gneiss and schist with locally abundant potassic feldspar and garnet. The biotite gneiss and schist is interlayered and gradational with calc-silicate rock, sillimanite-mica schist, mica schist, and amphibolite, and contains small masses of granitic rock. The crystalline rock encountered in our test borings generally consisted of moderately severely to very slightly weathered biotite-mica schist and biotite schist with small masses of metamorphosed granitic rock and biotite gneiss. The crystalline rock cored ranged in quality from very poor to very good, with the majority of the crystalline rock recovered being very poor in quality. The low quality is most likely due to the numerous healed and partially healed fractures common through out the rock. These fractures make the rock easily breakable and present difficulty in distinguishing between open fractures present prior to coring and fractures opened during the coring and core extraction process. The overlying residual soils at the site are the product from the physical and chemical weathering of the underlying 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 included behind this report. Representative subsurface cross-sections at each drilled 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 the End Bent-1 borings and at Boring EB2-B. The fill extends to depths of ±31 to ±32 feet (Elevation ±880 feet) at End Bent-1, and to a depth of ±11 feet (Elevation ±917 feet) at EB2-B. The roadway embankment fill encountered generally consists of medium stiff to stiff, coarse to fine sandy, silty clay (A-7-6), and coarse to fine sandy silt (A-4). Trace amounts of organics in the form of rootlets and wood fragments were present within some of the fill. Standard Penetration Resistance values of 6 to 14 blows per foot (bpf) were encountered within the roadway embankment fill.

Alluvial soil was encountered underlying the roadway embankment fill at the End Bent-1 borings. Alluvium was encountered beginning at the existing ground surface at Bent-1, Bent-2, Bent-3, Bent-4, and Bent-5 for the concrete span structure, and at Bent-1, Bent-2, and Bent-3 for the steel span structure. Alluvium was not encountered at Bent-6 for the concrete span structure, or at End Bent-2. The alluvium extends to depths of ±46 feet to ±47 feet (Elevation ±865 feet) at End Bent-1, to a depth of ±20 feet (Elevation ±861 feet) at Bent-1 for the concrete span structure, to depths ranging from ±1 foot to ±4 feet (Elevations ±856 feet to ±860 feet) at the borings for the bents located within the river (Bent-1 for the steel span structure and Bents 2 and 3 for the concrete span structure), to a depth of ±17 feet (Elevations ±863 feet to ±861 feet) at Bent-2 for the steel span structure, to a depth of ±13 feet (Elevations ±865 feet to ±864 feet) at Bent-4 for the concrete span structure, and to depths of ±12 feet to ±14 feet (Elevations ±871 feet to ±868 feet) at Bent-3 for the steel span structure/Bent-5 for the concrete span structure. The alluvium generally consists of very loose to medium dense, variably silty, coarse to fine sand (A-1-b, A-2-4, and A-3); and soft to very stiff, fine sandy, silty clay (A-6 and A-7-6), and variably clayey, fine sandy silt (A-4). Varying amounts of gravel and mica were encountered within the alluvium, and trace amounts of organics in the form root fragments, twig fragments, and decayed leaves were present within some of the alluvial material. Standard Penetration Resistance values of Weight-of-Hammer (W.O.H.) to 21 blows per foot (bpf) were encountered within the alluvial material.

Residual soils were encountered underlying the alluvium at all of the borings where alluvium was present, with the exception of Borings B2-A CS and B3-B CS at which residual soil was not encountered, at Borings EB1-B, B1-A SS, and B3-B SS/B5-B CS at which weathered rock separates alluvial and residual soils. Residual soils were encountered beginning at the existing ground surface at Bent-6 for the concrete span structure, and at End Bent-2. The residual soils extend to a depth of ±57 feet (Elevation ±855 feet) at End Bent-1, to depths of ±32 feet ±34 feet (Elevations ±848 feet to ±847 feet) at Bent-1 for the concrete span structure, to a depth of ±3 feet (Elevation ±855 feet) at Boring B1-B SS, to a depth of ±3 feet (Elevation ±853 feet) at Boring B3-B