metamorphosed ultramafic rocks around the southeastern portions of Falls Lake are located within the same geographic area as the project site.

Medium to high grade metamorphic rocks (Amphibolite Facies) consisting primarily of biotite schist outcrop at the project location in the channel of Lower Barton's Creek. Based on the results of the subsurface exploration and the rock outcrop, the metamorphic rock in this project area appears to be predominantly biotite mica schist. This rock type has weathered to form a relatively thin layer of micaceous, saprolitic silty sand or sandy silt in the vicinity of the project site. The biotite schist is gray to brown, and strongly foliated, with flakes of biotite mica, and contains localized areas of amphibolite. No discernible joint surfaces or foliation orientations could be detected on the outcrop surfaces for measuring strike and dip.

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 and/or core photographs should be reviewed. The Boring Identification Diagram, Boring Logs, Coring Logs, and Core Photographs are included herein. Representative subsurface cross-sections at each drilled bent location and a subsurface profile along the structure are also included herein. The subsurface properties for the project site are described below.

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

Roadway embankment fill was encountered beginning at the existing ground surface at elevation ±280 feet at the end bent borings. Roadway embankment fill was not encountered at the interior bent borings. The roadway embankment fill extends to depths of ±9 feet to ±13 feet (Elevation ±271 feet to ±267 feet) at End Bent-1, and to depths of ±13 feet to ±14 feet (Elevations ±267 feet to ±266 feet) at End Bent-2. The roadway embankment fill encountered generally consists of silty sand and silty clayey sand (A-2-4/A-2-5), and sandy silt or sandy clayey silt(A-4/A-5). Gravel and traces of roots are present within most of the embankment fill. Standard Penetration Resistance values of 5 to 12 blows per foot (bpf) were measured within the roadway embankment fill.

Mr. Njoroge W. Wainaina, P.E., NCDOT
Bridge No. 108 over Lower Barton's Creek on SR 1834, Wake County, North Carolina
October 20, 2003
Trigon Project No. 071-03-015

Artificial fill consisting of rip rap was encountered at the ground surface to depths of ±3 to ±5 feet at B2-A and B2-B. The rip rap has been infilled with recently deposited alluvial sand (A-3) and silty sand (A-2-4). Standard Penetration Resistance values of 21 to 100+ blows per foot (bpf) were measured within the artificial fill/rip rap infilled with alluvial sand. The higher blow count values were due to the presence of gravel and rip rap.

Alluvial soils were absent at the End Bent 1 borings but were encountered in the End Bent 2 borings and at all of the interior bent borings. The alluvium at the interior bents extends to depths ranging from ±3 feet to ±10 feet (Elevations ±265 feet to ±255 feet) and at End Bent 2 alluvium extends to depths ranging from ±13 to ±17 feet (Elevations ±267 feet to ±263 feet). The alluvium generally consists of very loose silty sand (A-2-4), fine to coarse sand (A-1-b) and sandy or clayey silt (A-4 / A-5). Gravel and traces of organic matter are present within most of the alluvial soils. Standard Penetration Resistance values of 3 to 57 blows per foot (bpf) were measured within the alluvial material with the higher N-values in the fine to coarse sands (A-1-b).

Residual soils were encountered underlying the roadway embankment fill at the End Bent-1 borings, and underlying the alluvium at borings B2-B, EB2-A, and EB2-B. Residual soils were not encountered at Borings B1-A, B1-B, and B2-A. The residual soils, where encountered, extend to the following depths and elevations: ±12 to ±15 feet (Elevations ±269 to ±265 feet) at End Bent-1; ±6 feet (Elevation ±264 feet) at B1-A (Revised) and B1-B (Revised); ±10 feet (Elevation ±254 feet) at B2-B; and ±22 feet to ±28 feet (Elevations ±258 feet to ±253 feet) at End Bent-2. The residual soils generally consist of silty sand (A-2-4) and sandy silt (A-4). Rock fragments were encountered within the residual silty sand and sandy silt at EB1-A and EB1-B. In boring EB2-A, a zone of residual silty sand (A-2-4) occurred within the weathered rock at a depth of ±33 feet to ±36 feet (Elevation ±247 feet to ±245 feet). Standard Penetration Resistance values within the residuum ranged from 6 to 85 bpf.

Weathered rock was encountered underlying the residuum at borings EB1-A, EB1-B, B1-A (Revised), B1-B (Revised), B2-B, EB2-A, and EB2-B and underlying the alluvium at the remaining borings with the exception of B1-A. In B1-A crystalline rock was encountered underlying the alluvium with no weathered rock transition zone in-between. The weathered rock consists predominantly of brown and gray biotite schist. The weathered rock was encountered at the following depths and elevations: ±12 feet to ±16 feet (Elevations ±269 feet to ±265 feet) at End Bent-1, ±6 feet (Elevations ±264 feet) at the Revised Bent-1, ±4 feet (Elevation ±261 feet) at the original Bent-1 (B1-B), ±10 feet (Elevation ±255 feet to ±254 feet) at Bent-2, and ±22 feet to ±28 feet