also be required on the sides of the existing embankment fills at both end bents to accommodate the proposed wider roadway.

The Bridge Survey & Hydraulic Design Report are in English units with feet as the primary unit of length.

3.0 SCOPE OF INVESTIGATION

3.1 FIELD TESTING

The proposed boring locations were determined in the field by Trigon using the existing structure and the Bridge Survey & Hydraulic Design Report drawing as a reference and taping distances at right angles. The proposed boring locations were used as a reference to establish the as-drilled locations for the soil test borings where the drill rig was unable to be positioned at the desired location due to topography or obstructions. Elevations for each of the proposed boring locations and the as-drilled locations, as well as along the existing ground surface at the end bent and interior bent locations, and along the structure profile were surveyed by personnel from Trigon. As-drilled boring locations are shown on the Boring Identification Diagram (Drawing No. 2) included in Appendix A.

The subsurface exploration was conducted between July 17 and 31, 2003. This exploration consisted of nine soil test borings, two at each of the proposed bent locations and one additional offset boring (EB1-B Offset) to verify the presence of shallow bedrock at the original EB1-B boring. All End Bent borings and the "A" (left-side) interior borings were drilled using an ATV-mounted CME 55 drilling machine equipped with a 140-pound manual hammer. Borings B1-B and B2-B were drilled using a skid rig-mounted CME 45 drilling machine equipped with a 140-pound manual hammer. The borings along the left side of the interior bents (B1-A and B2-A) were drilled through the existing bridge deck. The end bent borings were drilled utilizing 0.50-foot hollow-stem augering techniques, while 0.33-foot tricone/wash-drilling techniques were used to advance interior bent borings B1-A and B2-A, and 0.24-foot tricone/wash-drilling techniques were used to advance interior bent borings B1-B and B2-B. River water alone was used as the drilling fluid for the interior bent borings. Borings EB1-A and EB2-A were drilled at the proposed locations. All other borings were offset slightly from the proposed locations due to steep embankment and channel bank slopes, as well as the location of the piers for the existing structure.

Standard Penetration Tests were performed in the soil and weathered rock materials in general accordance with NCDOT guidelines. In conjunction with this testing, split-barrel soil and weathered rock samples were

Mr. Njoroge W. Wainaina, P.E., NCDOT
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recovered for visual classification and potential laboratory testing. Shelby tube samples were obtained at the ground surface to a depth of 2.0 feet at B1-A and B2-A for Erosion Function Apparatus testing at the NCDOT laboratory.

Rock coring was performed at the interior bent borings in order to evaluate the nature of the weathered rock/crystalline rock. The cored weathered rock/crystalline rock was returned to our laboratory for further classification and unconfined compression testing on selected samples. Rock coring at Borings B1-B and B2-B was performed with an NQ-2 size hollow double-tube core barrel, while rock coring at Borings B1-A and B2-A was performed with an HQ size hollow double-tube core barrel. River water alone was used as the coring fluid.

3.2 LABORATORY TESTING

Laboratory soil testing was performed on twenty representative split-barrel samples and one grab sample from the stream channel to aid in the assessment of AASHTO soil classification and to provide data for evaluation of engineering properties. The laboratory testing on the samples consisted of natural moisture content determinations, Atterberg Limit testing, and grain size analysis with hydrometer. In addition, eight Unconfined Compressive Strength (Qu only) tests were performed on selected samples of the recovered rock core. Laboratory tests were performed in general accordance with AASHTO and NCDOT specifications. The results of the soil laboratory tests and a Summary of Rock Test Data table are both included in Appendix A. Laboratory results of the rock testing are also included under separate cover in Appendix C.

3.3 SITE GEOLOGY

The site of the proposed project is located in the Carolina Slate Belt of the Piedmont Physiographic Province of North Carolina. According to The Geology of the Carolinas published by the Carolina Geological Society in 1991, the Carolina Slate Belt is "a large metamorphic terrane that is almost entirely of chlorite and biotite grade". It includes sedimentary and volcanic rocks that are metamorphosed to lower greenschist facies and intruded by a variety of plutons.

According to the 1985 Geologic Map of North Carolina, the site is located in an area consisting of generally felsic metavolcanic rock (CZfv). There are small isolated areas to the south of the site that are characterized by metamorphosed granitic rock (Czg) and, similarly, to the west there are isolated areas consisting of primarily metamorphosed intermediate rock (CZiv). The rock encountered in our test borings generally consisted of moderately to slightly weathered, green-gray metamorphosed rhyolitic and dacitic flows and tuffs