55.0 feet. A skew angle of 90°00'00" is proposed for each bent. All of the proposed bents are to be located on land. The proposed grade along the -L- centerline will be approximately 9.0 feet higher in elevation at End Bent-1 and approximately 9.5 feet higher in elevation at End Bent 2. In order to gradually elevate the grade to the proposed level, fill will be placed over the existing ground surface beginning approximately 305 feet before End Bent 1, and ranging in thickness from 0 to 9.0 feet. Approximately 9.5 feet of fill will be placed over the existing grade in the vicinity of End Bent 2 and will gradually thin to a thickness of around 5.5 feet at 320 feet beyond End Bent 2. New embankment fill will also be required on the sides of the existing embankment fills at both end bents to accommodate the proposed wider roadway. Slope inclinations of 1.5H:1V are proposed at the end bent locations with Class II Rip Rap slope protection on both sides.

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 herein.

The subsurface exploration was conducted between June 18 and October 8, 2003. This exploration consisted of ten soil test borings, two at each of the originally proposed bent locations and two additional borings (B1-A Revised and B1-B Revised) at the revised Bent 1 location. All End Bent borings and the interior borings were drilled using a truck-mounted CME 55 drilling machine equipped with a 140-pound manual hammer. The six (6) interior bent borings were drilled through the existing bridge deck. The end bent borings were drilled utilizing 0.50-foot hollow-stem augering techniques, while wash-drilling techniques and rock coring techniques were used to advance all interior bent borings. River water alone was used as the drilling fluid for all of the interior bent borings. Boring EB2-B was drilled at the proposed location. All other borings were offset slightly

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from the proposed locations due to steep embankments and the location of the side railing 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 recovered for visual classification and potential laboratory testing.

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 all interior boring locations was performed with an HQ-size hollow double-tube core barrel. River water alone was used as the coring fluid in all interior borings with the exception of B1-B, which used a water and polymer mixture for coring.

3.2 LABORATORY TESTING

Laboratory soil testing was performed on 20 representative split-barrel samples and two grab samples from the stream channel bed 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 herein. Laboratory results of the rock testing are also included under separate cover in Appendix C.

3.3 SITE GEOLOGY

According to the 1985 Geologic Map of North Carolina, the project site is located within the Eastern Piedmont Physiographic Province. More precisely, the project area lies within a northeast-southwest trending band of metamorphic rocks which are part of the Raleigh Metamorphic Belt. These predominantly mafic metamorphic rocks are bounded to the west by sedimentary rocks of the Durham sub-basin of the central North Carolina Triassic basins, as well as a thin sliver of Carolina Slate Belt metavolcanic-epiclastic rocks. To the east, north-south trending felsic mica gneiss metamorphic bands or dike and sill injected gneissic rocks lie parallel to the biotite schist and gneiss metamorphic band. Small isolated bodies of