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STATE PROJECT: 8.2502001 (B-3885)

WBS ELEMENT : 33325.1.1

FEDERAL PROJECT: BRZ-1958(1)

COUNTY: Orange

DESCRIPTION: Bridge No. 174 Over Cane Creek on SR 1958

SUBJECT: Geotechnical Report of Subsurface Exploration

Trigon Engineering Consultants, Inc. has completed the authorized geotechnical investigation for the above referenced project in Orange County, North Carolina. The purpose of this exploration was to investigate the subsurface conditions at the proposed bridge bent locations.

1.0 SITE DESCRIPTION

The project site is located in the southwest corner of Orange County, at the approximate location shown on the Project Vicinity Map (Drawing No. 1) located in Appendix A. The site and project description of the proposed project is "Bridge No. 174 over Cane Creek on SR 1958". Topographically, the site slopes down towards the southwest and down towards Cane Creek from each end of the existing bridge with an approximately 50-foot wide floodplain in the vicinity of the existing bridge. The topography of the general site vicinity consists of gently rolling hills.

Mr. Njoroge W. Wainaina, P.E., NCDOT
Bridge No. 174 over Cane Creek on SR 1958, Orange County, North Carolina

August 22, 2003
Trigon Project No. 071-03-020

At the time of this exploration, a five-span bridge (existing Bridge No. 174) was present at the location of the proposed bridge. The existing bridge consists of an asphalt-covered wood deck on timber and steel girders with three timber interior piers and two concrete interior piers. The end bents consisted of timber piles with timber beam abutments and both timber beam and partially concrete wingwalls. At the End Bent 1 side of the existing bridge, a large boulder was incorporated into the wingwall construction. The existing bridge is approximately 120 feet in length and approximately 18 feet in width. The two concrete piers of the existing bridge are within the channel of Cane Creek. All of the remaining bents of the existing bridge are located within the floodplain.

A small drainage ditch feeds into the main channel approximately 200 feet upstream near a sharp meander in Cane Creek. The creek channel in this area is rocky with large rock outcrops exposed along the channel banks. Downstream from the existing bridge the channel consists of cobbles and sand.

The river water surface elevation surveyed by Trigon on July 21, 2003 was ± 413 feet. According to the Bridge Survey and Hydraulic Report, the normal river water surface elevation is approximately 413 feet, the 25-year flood water surface elevation is approximately 428.5 feet, the 50-year flood water surface elevation is approximately 429.8 feet, the 100-year flood elevation is approximately 430.9 feet, and the 500-year flood elevation is approximately 433.8 feet. Debris, including large portions of trees and limbs, was present during this exploration underneath the existing bridge.

2.0 PROJECT DESCRIPTION

Proposed for construction is a new, three-span structure to replace the existing Bridge No. 174 on SR 1958 (Morrow Mill Road). Information for the proposed bridge structure was obtained from the Bridge Survey & Hydraulic Design Report dated April 7, 2003. The proposed bridge will be 160 feet in length and approximately 30 feet in width. The proposed bridge is to have 1 span length at 57.5 feet, 1 span at 65.0 feet, and 1 span at 37.5 feet. A skew angle of $120^{\circ}00'00''$ is proposed for each bent. All of the proposed bents are to be located on land. The proposed grade along the -L- centerline at End Bent-1 and up to just before interior bent 1 will remain essentially unchanged from the existing grade. Beginning just before the proposed interior bent 1 along the -L- centerline, the existing grade will be gradually raised so that the proposed grade will be approximately 1.0 foot higher near interior bent 2, and approximately 1.5 to 2.0 feet higher near End Bent-2 and beyond. New embankment fill will be required above the existing ground surface near the proposed End Bent-2 abutment and extending beyond the End Bent 2 side of the proposed bridge. New embankment fill will