PROJECT DESCRIPTION

Project information has been provided by the Geotechnical Unit of the North Carolina Department of Transportation. This information included the following documents:

1. Bridge Survey and Hydraulic Design Report Dated 10/28/2003
2. Printout of Baseline Survey Information
3. Electronic files on ftp site.

The purpose of this geotechnical investigation was to explore the general subsurface conditions at the bridge site and to evaluate these conditions with respect to the general foundation recommendations. Our scope of services included drilling 5 borings, performing laboratory tests and preparing this report of our findings for the proposed construction of a new bridge over Hawtree Creek, Halifax County, North Carolina.

According to the Bridge Design & Hydraulic Survey Report, the proposed structure will be 40.0 feet wide and 75.0 feet long with a skew angle of 90°. The bridge will have two spans supported by two end bents and one interior bent. The interior bent will be 25.0 feet from end bent 1.

Titan/Terracon performed a Utility Investigation at the site performed during September of 2002 and dated October 4, 2002. Titan/Terracon performed two borings B-1 and B-2, that were offset right of the -L- line. These boring logs are included in this investigation as well as on the profiles.

SITE DESCRIPTION AND GEOLOGY

Site Description

The proposed site is located on SR 1333 in Halifax County. Bridge No. 145 crosses Hawtree creek at this location. The project site is shown at the approximate location on Drawing No. 1 in the Appendix. SR 1333 is a paved, two-lane road. The road shoulders and approach embankment slopes are grass covered and slope gently towards heavily wooded areas. The road shoulders and embankment form a grassed covered strip approximately 20 feet wide.

Site Geology

The project site is located in the Eastern Slate Belt, which is along the western fringe of the Coastal Plain Physiographic Province. In this setting, a surface zone of marine and alluvial sediments deposited during successive periods of fluctuating sea level and moving shoreline overlies parent rock materials. The soils in this area are typical of those laid down in a shallow sloping sea bottom; sands, silts, and clays with irregular deposits of shells. More recently deposited alluvial sands, silts, and clays are typically present near rivers and creeks.

Fluctuations in the groundwater table on the order of 2 to 3 feet are typical in the Eastern Slate Belt, depending on variations in precipitation, evaporation, and surface water runoff. Seasonal high groundwater levels are expected to occur during or just after the typically wetter months of the year (November through April).

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Bridge Investigation
Halifax County, NC
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According to the 1985 *Geologic Map of North Carolina*, the bedrock under the site belongs to the Eastern Slate Belt and primarily consists of metamudstone and meta-argillite.

FIELD TESTING

Five borings were drilled at the project site for this investigation; two along End Bent 1, two along Bent 1, and one along End Bent 2. Rock coring was performed at the two End Bent 1 borings. The boring locations were located in the field by a Titan/Terracon survey crew relative to NCDOT baseline survey information. After the completion of drilling operations, the boring locations and their corresponding ground surface elevations were measured by a Titan survey crew relative to the located survey stakes using the NCDOT benchmark near the southeast corner of the bridge. The actual boring locations are shown on Drawing No. 2 in the Appendix.

A CME 550 drilling rig mounted on an all-terrain-vehicle was used to perform the borings. Drilling techniques included hollow stem auger drilling and wash rotary HQ rock coring procedures. Standard Penetration Tests (SPT's) were performed at approximate 2.5 foot intervals in general accordance with ASTM D 1586, as well as requirements stated in the NCDOT Division of Highways, Geotechnical Unit's "Guidelines & Procedures Manual For Subsurface Investigations". Split-spoon soil samples were visually classified in the field and sealed in plastic bags or glass jars for transportation to our laboratory.

At the completion of the borings, the boreholes were left open to allow for stabilized groundwater measurements. Groundwater levels were generally measured in the open boreholes soon after drilling and after at least 24 hours. These water levels were measured in the field using a "Slope Indicator" model electronic water level indicator. After stabilized groundwater levels were measured, the open boreholes were backfilled with on-site soil and capped with bentonite.

LABORATORY TESTING

Laboratory analysis was conducted on representative soil samples to aid in classification of the on-site soils. AASHTO Test Procedures T-87-86, T-88-94, T-89-90, T-90-94, T-265-86 were conducted on the soil samples that were considered representative of the embankment fill and alluvial soils encountered in the borings.

Split tensile strength tests (ASTM D 3967-95) were performed on rock core samples from the interior bent boring B1-A. Due to the poor RQD values of the core samples, only four specimens could be tested.

All testing was performed in general accordance with applicable AASHTO and ASTM specifications as modified by the NCDOT Materials and Testing Unit. A summary table of the test results is included with this report.

SUBSURFACE CONDITIONS

The general subsurface conditions at the site consist of roadway embankment fill soils overlying alluvial soils, residual soils, weathered rock, and non-crystalline metamudstone. The embankment fill soils consist primarily of clayey and sandy silt (A-4) and generally extend to