



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

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STATE PROJECT: 33226.1.1 B-3685  
FEDERAL PROJECT: BRSTP-1703(1)  
COUNTY: Pitt  
DESCRIPTION: Bridge No. 30 on SR 1703 over Green Mill Run  
SUBJECT: Geotechnical Report – Bridge Foundation Investigation for  
SR 1703 over Green Mill Run at -L- Station 17+47.50

The Geotechnical Engineering Unit has reviewed the revised Bridge Survey and Hydraulic Design Report for Bridge No. 30 over Green Mill Run dated February 6, 2004 and has found that the design has changed from 3 spans to 2 spans at 50 feet each. The centerline station (-L-) of the bridge will remain the same and as well as the skew of 115 degrees. The geologic foundation description submitted in the Geotechnical Report dated October 14, 2003 should be disregarded.

Site Description

The proposed bridge site is located within the city limits of Greenville at the existing SR 1703 bridge over Green Mill Run. The replacement structure will be constructed along the alignment of the existing bridge. Based on the proposed design, the new bridge will consist of 2 spans having an overall length of 100 feet. The bents will have a skew of 115 degrees.

One Standard Penetration Test (SPT) boring was made near each proposed end bent location and two borings were made along the skew of Bent 1 on -L- to provide subsurface information relative to foundation design. The borings were made with an ATV mounted CME-45B drill machine and were advanced by rotary drilling methods utilizing bentonite drilling fluid. The end bent borings were performed on the right side of the proposed structure due to high traffic volume, overhead and underground utilities. In addition, two additional borings (Boring 1 and Boring 2) which were drilled during the initial investigation are included to assist in defining a very dense sand layer that will have probable impact on the foundation design for the proposed structure.

The bridge site is located in the Coastal Plain Physiographic Province and is underlain by Recent alluvial deposits, Pliocene age soils of the Yorktown Formation and Cretaceous age sediments of the Black Creek Formation. Green Mill Run at this site is a slow moving stream approximately 25 to 35 feet wide and 3± feet deep. Topography along the project is flat to gently sloping. Elevations at the site range from 22.0± feet along the stream bottom to 37.0± feet along the existing SR 1703 embankment. The stream is bordered by a 150± foot wide flood plain lying at an elevation of 25.0 to 29.0± feet. During this investigation, water levels within the bore holes and the surface of Green Mill Run were measured at elevations ranging from 23 to 27± feet.

Foundation Description

Subsurface conditions along the proposed structure are relatively uniform. Surficial alluvial soils typically consist of 3.0 to 7.0 feet of very loose to medium dense slightly organic fine to coarse sand (A-3), fine sandy silt (A-4) and fine sandy silty clay (A-6). Moisture content of tested organic cohesive samples ranged from 47 to 67 percent. The surficial deposits are underlain by Pliocene age sediments of the Yorktown formation at an elevation of 17.0 to 19.0 feet. The Yorktown soils generally consist of 6.0 to 10.0 feet of medium dense to dense clayey fine to coarse sand (A-2-6, A-2-7) and medium stiff to very stiff silty sandy clay (A-6, A-7-6). However, at B1-A, B1-B and EB2-B a 2.0 to 4.0 foot thick bed of very dense fine to coarse sand (A-2-4) with indurated layers was noted between elevations of 14.0 to 18.0 feet. Below an elevation of 7± feet the interlayered portion of the Pliocene deposits grade to a medium dense to dense fine to coarse sand (A-2-4) with indurated sand and shell layers.

Cretaceous age sediments of the Black Creek Formation were encountered at an elevation of -2.0 to -5.0± feet. The soils within this formation typically consist of medium dense to very dense micaceous fine to coarse sand (A-2-4, A-3, A-1-b). A deep boring performed at Boring 2 indicates that the granular deposits extend to an elevation of -46± feet with no significant change in stratigraphy.

Based on the proposed design, the existing grade will be maintained at the bridge site. The existing roadway embankment is approximately 11.0± feet thick and constructed of loose to medium dense fine to coarse sand (A-2-4, A-3). The proposed end bent slopes will be primarily constructed within the existing embankment. Some additional fill will be required for the construction of the end bent and side slopes. Borrow meeting Coastal Plain criteria should be available in nearby areas.