



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

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STATE PROJECT: 8.1331701 B-3711
FEDERAL PROJECT: BRSTP-111(5)
COUNTY: Wayne
DESCRIPTION: Bridge No. 42 on NC 111 Over Neuse River Overflow
SUBJECT: Geotechnical Report – Bridge Foundation Investigation for
NC 111 over Neuse River Overflow at -L- Station 18+53.5

Site Description

The proposed bridge site is located on NC 111 at existing bridge over Neuse River Overflow approximately 4 miles southeast of Goldsboro. The replacement structure will be constructed along the alignment of the existing bridge. Based on the proposed design, the new bridge will consist of 3 spans having an overall length of 110 feet. In addition, a temporary detour bridge with a single 110 foot span will be constructed approximately 50 feet east of the NC 111 replacement structure. The bents along -L- and the detour will have a skew of 90 degrees.

One Standard Penetration Test (SPT) boring was made at or near each proposed bent location along -L- and close to each end of the detour structure to provide subsurface information relative to foundation design. The borings were made with an ATV mounted CME-45B drill machine and advanced by rotary drilling methods utilizing bentonite drilling fluid.

The bridge site is located in the Coastal Plain Physiographic Province on the Neuse River terrace. The geology of the area generally consist of Pleistocene to Recent age alluvium underlain by Upper Cretaceous age deltaic sediments belonging to the Black Creek Formation. The Neuse River Overflow at this site is generally a slow moving stream ranging from approximately 10 to 50 feet wide and 3± feet deep during wet seasons. During extended dry periods there may be no stream flow at all. Topography along the project is flat to gently sloping. Elevations at the site range from 49.0± feet along the stream bottom to 64.0± feet along the existing NC 111 embankment. The stream is bordered by a 600± foot wide flood plain lying at an elevation of 52.0± to 57.0± feet. During this investigation, water levels within the bore holes and the surface of the Neuse River Overflow were measured at elevations ranging from 49.5± to 53± feet.

Foundation Description

Subsurface conditions along the proposed structure are relatively uniform. Surficial alluvial soils typically consist of 9.0 to 17.0 feet of very loose to medium dense silty fine to coarse alluvial sand (A-2-4, A-3, A-1-b). However, interbeds of very soft to soft sandy silty clay (A-6, A-7-6) generally 3.0 to 7.0 feet thick were noted at B2-B and EB2-A. Moisture content of a tested cohesive soil sample was 31%. The alluvium is underlain by the Upper Cretaceous age Black Creek Formation at an elevation of 34 to 41 feet. The initial 11 to 18 feet of sediments within this formation consist of very loose to medium dense fine to coarse sand (A-1-b, A-2-4, A-3) and stiff sandy silt (A-4). Soils below elevations of 23 to 26 feet consist primarily of dense to very dense granular deposits (A-2-4, A-3) with thin clay lenses and some lignite. Borings B1-A and B2-B were extended to near an elevation of -10.5± with no significant change in stratigraphy noted.

Based on the proposed design, the existing grade will be maintained at the bridge site. The existing roadway embankment is approximately 10.0± feet thick and constructed of very loose to loose silty fine to coarse sand (A-2-4, A-3) and silty clayey sand (A-2-6). 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 is available in nearby areas.

Detour Structure

Borings made near the proposed Detour End Bent locations indicate that the surficial alluvial soils consist of 3 to 6 feet of very loose to loose sand (A-2-4) overlying 4.5 to 6.0 feet of soft clayey sandy silt (A-4) and sandy silty clay (A-7-6). The moisture content of a tested clay sample was 36%. Approximately 5.0 feet of loose sand was noted beneath the silt/clay layer. The Black Creek Formation was encountered at an elevation of 41.0±. Subsurface conditions below this elevation are essentially the same as those encountered along the main structure.

The Geotechnical Unit foundation report is based on the bridge survey report for Neuse River Overflow dated June, 2003. If significant changes are made in the design or location of the proposed structure, the subsurface investigation should be reviewed and modified as necessary.

Respectfully submitted,

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