



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

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STATE PROJECT: 8.1080601 B-3348  
FEDERAL PROJECT: BRSTP-264(9)  
COUNTY: Hyde  
DESCRIPTION: Bridge No. 52 over Wallace Canal and Bridge No. 54 over Kitty Creek on US 264

SUBJECT: Geotechnical Report - Inventory

**Project Description**

The proposed project is located on US 264 at the existing bridges over Wallace Canal and Kitty Creek just east of Engelhard. Based on the current plans, the roadway portion of the project will primarily consist of constructing the approaches for the replacement structures and some major widening of the existing US 264 embankment along the same alignment. The existing grade along US 264 will be raised up to 1± feet along the project. The majority of the widening is proposed to be along the east side of the existing roadway. In addition, some revisions are proposed along the -Y-lines and a driveway adjacent to the project. Traffic will be maintained on site during the construction phase of the project. The investigation of subsurface conditions was confined to the corridor of proposed new construction.

The following base lines were investigated for this project:

<u>Line</u>	<u>Station</u>
-L-	10+00 to 31+29
-Y-	10+13 to 12+10
-Y1-	10+13 to 12+60
-DR-	10+13 to 11+40

**Areas of Special Geotechnical Interest**

- 1) The entire project contains relatively soft cohesive and organic soils which have the potential to cause subgrade problems.
- 2) The entire project was found to exhibit high water levels, seasonal high ground water or the potential for ground water related construction problems.

**Physiography, Geology and Ground Water**

The project corridor is located in Hyde County along existing US 264 near Engelhard. Topography is typical of the Lower Coastal Plain and ranges from flat to very gently sloping. Ground elevations along the project typically range from -3 to -6 feet in the existing canals to an elevation of 4± feet along the existing embankments. A marsh borders the entire project where elevations of natural ground are at or near 1± foot.

The geology of this region primarily consists of Recent to Pleistocene sediments. Surficial soils encountered along this project typically consist of several feet of cohesive/organic soils underlain by granular deposits. The project area is drained by Wallace Canal and Kitty Creek, which flow into the Pamlico Sound. Surface drainage is poor throughout the proposed corridor due to the relatively flat terrain.

Water levels within the marsh areas are variable due to tidal fluctuations. During our investigation, the water levels generally ranged from -1± to 1± foot above sea level.

**Soils**

Tidal marsh (alluvial) deposits, which exhibit very poor to poor engineering properties, were noted along the entire project. These sediments typically consist of up to 8 feet of very soft slightly to highly organic (muck) soils and soft silt/clay (A-4, A-6) deposits. Organic content of tested samples range from 14 to 23 percent. Moisture content of tested organic and/or silt-clay samples range from 21 to 160 percent. Vane Shear Tests performed in the organic soils within the tidal marsh typically range between 400 to 940 psf. However, Vane Shear Tests made near -L- station 17+98 beneath the embankment range between 850 to 1360 psf. Roots, shells, and/or the fibrous nature of the marsh deposits may have given higher shear values than they actually are. SPT borings in the same material show blow counts typically ranging from 0 to 3 blows. These sediments have the potential for subgrade failure due to their poor engineering properties. Fabric for soil stabilization and/or undercutting the organic alluvial soils may be required to assist in stabilizing portions of the new alignment and adjacent areas. Soils encountered beneath the organic deposits consist of loose alluvial fine sand (A-2-4). Engineering properties of the granular soils are generally good to excellent. Pleistocene sediments were not encountered during the scope of the roadway investigation.