



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
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LYNDO TIPPETT SECRETARY

April 10, 2001

STATE PROJECT: 6.469002T R-0513A
FEDERAL PROJECT: NHF-18-4(19)
COUNTY: Robeson
DESCRIPTION: US 74 from Maxton Bypass to 1.87 km East of SR 1166 (Cabinet Shop Road)

SUBJECT: Geotechnical Report - Inventory

The project consists of upgrading dual lane US 74 to a relocated four lane divided facility with a typical median width of 21 meters. The majority of the project generally lies parallel to and south of existing US 74. Length of the project is 7.7 km. The eastern terminus will tie into a future US 74 roadway project. The geotechnical investigation of subsurface conditions was confined to the corridor of proposed new construction.

The following survey lines were investigated for this project:

Table with 2 columns: Line, Station. Lists various survey lines like -L-, -Y1-, -RPAY1-, etc. and their corresponding station ranges.

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Soils

Soils occurring along the project are derived from marine, eolian and fluvial sediments deposited in the geologic past.

The predominant soil type along the project consists of fine to coarse sand (A-2-4, A-3, A-1-b, A-2-6). Sand occurs as surficial deposits, low ridges or rims associated with probable Carolina Bays and as thick beds underlying the surficial soils.

Cohesive soils typically consisting of clayey sandy silt (A-4) and silty to fine sandy clay (A-6, A-7-6) occur as 1 to 2 meter thick surficial beds and discontinuous beds of variable thickness underlying the surficial soil veneer.

Organic soils occurring along the project typically consist of muck, slightly to highly organic sands (A-2-4, A-2-5), silts (A-4, A-5) and clays (A-6, A-7-6). Tested organic contents range from 6.5 to 42.8 percent.

The organic soils are generally highly compressible and exhibit low shear strengths. A potential for subgrade failure or embankment stability/long term settlement problems exists in areas containing organic soils.

Culverts

Based on the Culvert Survey and Hydraulic Design Report of 1/8/01, a dual 2.4m x 2.1m RBCB is proposed for -Y2- over Double Branch at station 12+42.5. A Standard Penetration Test (SPT) boring made adjacent to the proposed culvert site shows that very loose to loose fine to coarse sand (A-1-b, A-2-4) underlies the culvert site.

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Table with 2 columns: Line, Station. Lists lines -SR1- through -X3- and their station ranges.

Areas of Special Geotechnical Interest

1) A high water table, seasonal high ground water or the potential for ground water related construction problems occurs along the majority of the project.

2) The following sections contain surficial cohesive soils which have the potential to cause subgrade problems during construction. Typically the cohesive soils exhibit medium to high plasticity indices, relatively high moisture contents and 50 percent or more passing the 75µm sieve.

Table with 2 columns: Line, Station. Lists lines -L- through -L- and their station ranges.

Table with 2 columns: Line, Station. Lists lines -Y1-, -RPAY1-, -RPCY1-, etc. and their station ranges.

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Undisturbed Samples

Undisturbed (Shelby Tube) samples were taken at the following locations and submitted for testing:

Table with 4 columns: Sample No., Station, Depth (m), Test. Lists samples ST-1 through ST-10 with their respective details.

California Bearing Ratio (CBR) Samples

Bulk samples were taken at the following locations and submitted for CBR testing:

Table with 3 columns: Sample No., Station, Depth (m). Lists CBR-1, CBR-2, and CBR-3.

Respectfully submitted,

EA Witort

E. A. Witort, Project Geologist

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Table with 2 columns: Line, Station. Lists lines -SR2- through -SR2- and their station ranges.

Table with 2 columns: Line, Station. Lists lines -SR3- through -SR3- and their station ranges.

Table with 2 columns: Line, Station. Lists lines -X1- through -X3- and their station ranges.

3) The following sections contain organic soils:

Table with 2 columns: Line, Station. Lists lines -L- through -L- and their station ranges.

Table with 2 columns: Line, Station. Lists lines -RPAY1-, -RPBY1-, etc. and their station ranges.

Table with 2 columns: Line, Station. Lists lines -Y2-, -RPBY2-, etc. and their station ranges.

Table with 2 columns: Line, Station. Lists lines -SR1-, -SR2-, etc. and their station ranges.

Approximate limits of surficial organic soils are shown on the accompanying plan view sheets.

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4) The following sections contain beds of very soft to soft clay and/or organic soils which have the potential to cause embankment stability and/or long term settlement problems:

Table with 2 columns: Line, Station. Lists various lines like -L-, -Y1-, -RPAY1-, etc. and their station ranges.

Physiography and Geology

The project is located within the Inner Coastal Plain Physiographic Province. Geology basically consists of mixed fluvial, marine and eolian sediments of Pliocene to Recent age overlying deltaic sediments of the Upper Cretaceous age Black Creek Formation.

The project is primarily located on upland topography which generally forms the interstream divide between Big Shoe Heel Creek to the south and the Lumber River to the north. Carolina Bay or bay like features which have been drained occur along portions of the project.

Ground Water Properties

Ground water data was collected primarily from summer of 2000 through the winter of 2000/2001 during average rainfall conditions. Typically ground water levels were measured at depths of 1.0 to 1.5 meters or less along the majority of the project.