

Elevations generally range from 44± to 60± meters along upland terrain and 26± to 28± meters along the lower lying areas at the end of the project (Cape Fear River Terrace). Two significant flood plain areas were encountered in the vicinity of -LREV- station 18+00± and 34+00± lie at elevations of 41± and 26± meters, respectively.

The project lies within the Cape Fear River drainage system. Drainage along the corridor is provided by man made ditches and small branches which flow into the Cape Fear River. Surface drainage is generally good in areas of moderate relief. However, drainage is fair to poor along flood plains and the relatively flat, low lying portion of the project.

Ground Water

Ground water data was collected during the spring of 2002 during below average rainfall conditions. Along upland areas with gentle to moderate relief, the water table was generally not encountered within 2 to 9 meters or more of the natural ground surface. Water is typically at or near the surface in flood plain areas and 1.5 meters or more along the remainder of the Cape Fear River terrace. Two small springs were noted approximately 5 meters right of station 18+30±.

Soils

Soils encountered during this investigation are separated into four major categories based on origin and occurrence. These categories are surficial soils, alluvial soils, embankment soils and Cretaceous age marine deposits.

The majority of the upland surficial (Quaternary age) soils along the project consist of 2 to 9 meters or more of very loose to medium dense fine to coarse sand (A-2-4, A-3) which exhibit good to excellent engineering properties. However, approximately 0.5 to 2 meters of soft to medium stiff sandy silty clay (A-6, A-7-6) was encountered from -LREV- station 19+40 to 19+85, 26+60 to 27+50, 29+80 to 30+45, and 33+80 to 37+00. The clay soils generally exhibit poor engineering properties which include plasticity indices of 25 to 35, relatively high percentage passing the 75µm sieve and moisture contents ranging from 28 to 32 percent. These soils have the potential to cause subgrade construction problems.

Alluvial soils consist of organic flood plain sediments and the Cape Fear River terrace deposits. Organic flood plain sediments occur along -LREV- station 17+20± to 18+65± and 33+80± to 34+20±. Generally, the flood plain deposits consist of 0.5 to 0.9 meters of very soft organic silt and muck underlain by loose to medium dense sand (A-2-4, A-3) and/or medium stiff sandy silty clay (A-7-6). Organic contents of tested samples range from 15 to 40 percent. Natural moisture contents of tested samples range from 167 to 308 percent. Vane Shear Tests performed in the muck deposits indicate shear strengths of 4.4 to 28.3 kPa. Based on a deeper boring made at station 17+85, approximately 4.5 meters of soft muck with wood was encountered at a depth of 5 meters. The organic deposits, due to their low shear strengths and high compressibility, have the potential to cause embankment stability and/or long term

settlement problems. The Cape Fear River terrace deposits consist of a thin veneer of loose silty sand (A-2-4) underlain by medium stiff sandy clay (A-7-6) and generally occur from -LREV- station 33+00± to the end of the project. The cohesive deposits in these areas have the potential to cause subgrade problems.

The Black Creek Formation of Cretaceous age was encountered at an elevation of 30± meters in deeper borings in the vicinity of -LREV- station 18+00. Soils within this formation at the site consist of stiff to very stiff sandy silty clay (A-6) and medium dense clayey sand (A-2-6). The moisture content of a tested clay sample was near 20 percent. Due to the depth of these deposits and formational strength, no geotechnical problems within this strata are anticipated.

Embankments are man made fills built during construction of existing roadways. The fill material generally consists of loose to medium dense silty sand (A-1-b, A-2-4). Thickness of the fill material ranges from 0.3 to 2.0 meters or more and has good to excellent engineering properties.

Undisturbed Samples

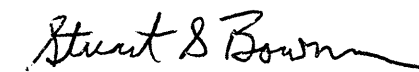
Undisturbed (Shelby Tube) samples were taken in the organic soils at the following locations and submitted for testing.

<u>Sample No.</u>	<u>Station (-LREV-)</u>	<u>Depth (m)</u>	<u>Test</u>
ST-1	17+49, 7 m Rt.	0.2-0.81	Triaxial CU
ST-2	17+49, 7.5 m Rt.	0.2-0.81	Consolidation
ST-3	17+85	5.54-6.15	Consolidation

California Bearing Ratio (CBR) Sample

A bulk sample was taken at -LREV- station 20+80 at a depth of 0.5 to 5.0 meters and submitted for CBR testing.

Respectfully submitted,



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