

ROADWAY INVENTORY
for
US 74 From West of SR 1157 (Henry Berry Road) to
West of SR 1164 (Back Swamp Road)
State Project No: 6.469002T
Tip No: R-0513BB
FA No: N/A
County: Robeson

May 13, 2002

1.0 INTRODUCTION AND PROJECT DESCRIPTION

CATLIN Engineers and Scientists (CATLIN) was retained by the North Carolina Department of Transportation (NCDOT) Geotechnical Unit to conduct a Roadway Subsurface Investigation under an Engineering Agreement (Agreement) dated October 16, 2000. The investigation was designed to inventory and document the surficial and subsurficial conditions of the project corridor. Existing geological and geotechnical information was collected to assist with the design and construction of an upgrade of US Highway 74 from West of SR 1157 (Henry Berry Rd.) to West of SR 1164 (Back Swamp Rd.).

The project is located in the southern portion of Robeson County, west-southwest of Lumberton, North Carolina. The proposed highway improvements will begin west of Henry Berry Road (SR 1157) and extend approximately eight kilometers (km) easterly to west of Back Swamp Road (SR 1164) where it will conclude at the beginning of Project R-0513C. The total length of the proposed project is 8.361 km. A Project Vicinity Figure is included in the Appendix.

The following alignments were investigated for this project:

<u>ALIGNMENT</u>	<u>Station (Begin to End)</u>		
-L-	153+80	to	237+51
-SR5-	10+00	to	38+80
-RA-	10+00	to	14+10
-RB-	10+00	to	16+70
-RC-	10+00	to	14+60
-RD-	10+00	to	16+60
-Y-	10+05	to	19+70
-Y5-	9+55	to	18+30

2.0 FIELD METHODS

Drilling was conducted utilizing a Central Mine Equipment (CME) 45B drilling rig mounted on a Gemco articulating all terrain vehicle (ATV). Borings were advanced with one, or a combination, of the following: continuous flight hollow stem augers [0.21 meter (m) and 0.15m outer diameter (OD)], mud rotary utilizing 0.1m OD step-tooth drag or 0.1m

OD tri-cone roller bits. Typically, mud rotary techniques were utilized to advance borings with depths greater than 4.5m below existing land surface (BLS).

Selected borings were advanced in conjunction with performing Standard Penetration Testing (SPT) in accordance with American Association of State Highway and Transportation (AASHTO) Standard Method T206. Where deemed necessary, thin-walled sampling tubes, (Shelby tubes) were advanced in accordance with AASHTO Standard Method T207. Table 1 is attached summarizing Shelby tubes collected with analysis completed on each tube during this project. The field geologist using AASHTO Designation M145 visually described soil samples, with the exception of those collected via Shelby tubes, in the field. The field geologist recorded all SPT results, sample numbers, sample descriptions, and pertinent drilling information on modified NCDOT field boring logs. Borings were typically advanced to 1.5 to 2 times the depth of fill. Certain borings located near proposed structures were advanced to a depth sufficient to achieve a bearing capacity of 1060 kN (for steel H-piles) or two times the fill depth, which ever was greater.

Water level measurements were taken from boreholes immediately after drilling (IAD) and recorded on each field-boring log. If possible, a 24 hour measurement was also recorded for each boring. The locations of several borings were such that the borings needed to be backfilled IAD as a safety precaution. Unless otherwise noted, fieldwork was conducted in accordance with NCDOT Geotechnical Unit Guidelines and Procedures Manual for Subsurface Investigations (Revised March 1994).

3.0 AREAS OF SPECIAL GEOTECHNICAL INTEREST

A. No ground water within two meters of proposed grade was identified within the construction limits of this project.

Ground water characteristics are discussed in Section 6.0.

B. High plasticity clays [Plasticity Index (PI) ≥25] were encountered in the shallow (≤ 2m proposed grade) subsurface at the following approximate locations:

<u>ALIGNMENT</u>	<u>START</u>	<u>END</u>
-L-	179+10	180+40
-Y-	10+00	11+40
-Y-	18+40	19+70
-Y5-	9+55	10+90
-Y5-	17+30	18+30
-SR5-	37+70	38+80

C. Numerous streams, ditches, and wetland areas were observed crossing the project corridor. These areas may present construction related problems when attempting to traverse with heavy equipment. Additionally, the streams and ditches appear to be actively draining the area. Problems with standing water may arise if these features are filled in and alternate means of drainage are not provided.

One pond was identified along the project corridor. The pond is located at -L-