STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLEY EAVES PERDUE
GOVERNOR

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SECRETARY

July 12, 2012

STATE PROJECT: 39017.1.1 (U-3465)
FEDERAL PROJECT: STP-1121 (9)
COUNTY: Harnett
DESCRIPTION: SR 1121 (Ray Road) from NC 210 to SR 1120 (Overhills Road)

SUBJECT: Geotechnical Report – Inventory

Project Description

This project consists of the widening of Ray Rd. (-L-), reworking intersections of (-Y1-, -Y2-, -Y3-, -YC-, -Y4A-, -Y5-, -Y6-, -Y6B-, -Y7-, and -Y8-), the realignment of McKay Rd. (-Y4-), Gordon Ln. (-Y6A-), the realignment of the intersection of Overhills Rd. (-Y-, -YA2-) with Ray Rd., and new alignments at (-DRV1-, -DRV2-, -DRV3-). Three roundabouts are planned along the project. Ray Rd. will be widened from two to four lanes with turn lanes and medians. The project begins 0.3 miles north of the intersection of Ray Rd. and Overhills Rd., and extends 3.8 miles south to NC 210.

The geotechnical field investigation was conducted from February and March of 2012. The subsurface investigation was conducted by the NCDOT's Geotechnical Engineering Unit. Hand augers were performed in areas of proposed cuts and fills. Representative soil samples were collected for visual classification in the field and submitted for laboratory analysis by NCDOT's Materials and Tests Unit.

The following alignments, totaling 4.9 miles, were investigated:

Line	Station		
-L-	21+00	to	221+49
-Y-	10+00	to	19+00
-YA1-	12+00	to	14+28
-YA2-	10+00	to	19+52
-Y1-	10+00	to	12+25
-Y2-	10+80	to	13+25
-Y4-	10+00	to	17+38
-Y5-	11+50	to	13+16
-Y6-	11+75	to	14+81
-Y6A-	10+00	to	13+14
-Y7-	10+00	to	13+00
-Y8-	11+50	to	14+83
-DRV1-	10+43	to	19+50
-DRV2-	14+32	to	17+66

Areas of Special Geotechnical Interest

1) Highly Plastic Clay Soils: Occurrences of highly plastic clay soil (Plasticity Index greater than 25) are noted below:

Alignment	Station	Offset
-L-	112+00	45' RT
-L-	128+50	50' LT
-L-	167+50	45' LT
-L-	181+50	60' LT
-DRV2	16+00	CL
-Y4-	13+50	CL (Artificial Fill)
-Y4-	16+50	CL

2) Water Wells: Several water wells are located within or in close proximity to the proposed right of way at the following locations:

Alignment	Station	Offset
-Y-	15+81	133' LT
-L-	38+32	110' RT
-L-	40+48	44' RT
-L-	106+72	88' LT
-L-	108+51	15' RT
-L-	189+49	85' RT
-L-	209+54	115' RT
-L-	214+59	62' RT

Physiography and Geology

The project is located in the gently rolling terrain of the Inner Coastal Plain area of North Carolina. A mixture of businesses, single-family homes, and woods are located along the project corridor. Small creeks and ephemeral streams run across the project corridor, generally from right to left across the alignment.

Geologically the project lies within the western Coastal Plain Physiographic Province. Soils within the project are Cretaceous-age Coastal Plain sediments derived from the Middendorf Formation. The Middendorf Formation was deposited in a deltaic system between 63 and 128 million years ago, and is characterized by sand, sandstone, and mudstone with clay balls and iron-cemented concretions.