STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

August 29, 2012

MEMORANDUM TO: Gregory J. Thorpe, Ph.D., Director
Project Development and Environmental Analysis Unit

ATTN: Mark Pierce, P.E.
Project Development and Environmental Analysis Unit

FROM: Njoroge W. Wainaina, P.E.
State Geotechnical Engineer
Geotechnical Engineering Unit

STATE PROJECT: 34460.1.1 R-2553
F.A. PROJECT: NHF-70 (94)
COUNTY: Lenoir
DESCRIPTION: US 70 – Kinston Bypass

SUBJECT: Geotechnical Planning Report

The Geotechnical Engineering Unit performed an analysis of previous projects in the area of the above reference project to provide an early identification of any regional Geotechnical issues that might impact the project's planning, design or construction. The following information summarizes our findings.

Geotechnical Issues

Methodology

An analysis of previous investigations was completed for this project along the proposed study corridors north and south of Kinston. All proposed corridors begin near LaGrange and end near Dover. Subsurface conditions have been evaluated in order to assess the suitability of subgrade material and ground water depth.

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LOCATION:
CENTURY CENTER COMPLEX
ENTRANCE B-2
1020 BIRCH RIDGE DRIVE
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Findings

The proposed project lies within the Coastal Plain Physiographic Province. Topography along the project area is flat to gently sloping. The project area is drained by the Neuse River and its tributaries. Subsurface drainage is typically moderate to well drained in upland areas and poor to moderately drained near stream/swamp crossings.

The geology within the study is generally divided into two groups: alluvial deposits and undivided coastal plain soils. These soils are underlain by the Pliocene age Yorktown Formation and the Peedee Formation of Cretaceous age.

The alluvial deposits in the smaller tributaries consist of silty clay (A-7-6) and sandy clay (A-6) with trace to little organic matter and highly organic soils (muck). The organic soils exhibit poor engineering properties. The migration of the Neuse River over geologic time has produced terrace deposits consisting of sand as far as two miles away from the existing path of the Neuse. The granular soils exhibit good to excellent engineering properties.

The upland undivided coastal plain soils consist of silty sand (A-2-4), sandy silt (A-4), silty clay (A-7-6) and sandy clay (A-6). The undivided coastal plain soils are generally located adjacent to the Neuse River terraces and in the inter-stream areas. The cohesive soils exhibit fair to good engineering properties.

Ground water is typically encountered within 6 feet of the natural ground surface in the upland areas. Ground water near the flood plains was at or near the ground surface.

Anticipated Impacts / Recommendations

Based on previous experience with the adjoining projects in this area, 3:1 (H:V) or flatter side slopes are needed to establish vegetation and assist in erosion control. We recommend that the roadway grade be a minimum six feet above natural ground in the flood plains to minimize undercut for subgrade stability. Due to the cohesive and organic nature of the soils, undercut and/or other soil stabilization methods may be required at locations along each corridor. There is no geotechnical preference for a corridor based on the limited information at this time.

For Geotechnical Engineering questions please contact Dean Argenbright at (252) 355-9054 or Kyung Kim, P.E. at (919) 662-3576.