



PAT McCRORY
Governor

NICHOLAS J. TENNYSON
Secretary

June 13, 2016

MEMORANDUM TO: David Leonard, P.E.
DDC Engineer – Division 3

FROM: Kyung Kim, P.E. *K.J. Kim*
Eastern Regional Geotechnical Manager

STATE PROJECT: 40238.1.4 (U-4902D)
FEDERAL PROJECT: NHS-0017(76)
COUNTY: New Hanover

DESCRIPTION: US 17 Business (Market Street) from Lendire Road SR 2734
(Marsh Oaks Drive)

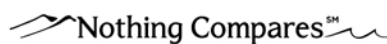
SUBJECT: Roadway Subsurface Inventory Report and Roadway Design
Recommendations Report

The Geotechnical Engineering Unit has reviewed and presents the following report prepared by Catlin Engineers & Scientists for the above referenced project.

Roadway Subsurface Inventory Report: 20 pages
Roadway Design Recommendations Report: 5 pages

Please call Dean N Argenbright, L.G. at (252) 355-9054 or Majid Khazaei, P.E. at (919) 662-4710 if there are any questions concerning this memorandum.

Attachment KJK/DNA/MK





Post Office Box 10279
Wilmington, North Carolina 28404-0279

Telephone: (910) 452-5861
Fax: (910) 452-7563

www.catlinusa.com

June 13, 2016

MEMORANDUM TO: John L. Pilipchuk, LG, PE
State Geotechnical Engineer

FROM: Steven V. Hudson, LG
CATLIN Geotechnical Geologist

STATE PROJECT: 40238.1.4 (U-4902D)
F.A. NUMBER: NHS-0017(76)
COUNTY: NEW HANOVER

DESCRIPTION: US 17 Business (Market Street) from Lendire Road to Marsh
Oaks Drive

SUBJECT: Geotechnical Report – Design and Construction
Recommendations

CATLIN Engineers and Scientists (CATLIN) has completed a subsurface investigation for this project and presents the following recommendations:

I. SLOPE/EMBANKMENT STABILITY

A. Slope Design

Recommend roadway side slopes be constructed no steeper than 3:1 (H:V) in order to assist in erosion control and establish vegetation.

B. Undercut (Soft Foundation Soils)

Include 200 cubic yards in the contract as a contingency item to be used at the discretion of the Engineer.

C. Geotextile for Soil Stabilization

Include 200 square yards of fabric for soil stabilization in the contract as a contingency item to be used at the discretion of the Engineer.

II. SUBGRADE STABILITY

A. Subsurface Drainage – Subsurface Drains

Recommend including 200 linear feet of subdrain pipe (Roadway Standard Drawing 815.02) in the contract as a contingency item to be used at the discretion of the Engineer.

B. Undercut for Subgrade Stability

Include 200 cubic yards in the contract as a contingency item to be used at the discretion of the Engineer.

C. Aggregate Subgrade

Include 100 cubic yards of shallow undercut for aggregate subgrade in the contract as a contingency item to be used at the discretion of the Engineer.

D. Geotextile for Soil Stabilization

Recommend contingency of 200 square yards of soil stabilization fabric to be used for subgrade stability as outlined in Section II.B.

Recommend 300 square yards be included in the contract for soil stabilization as a contingency item for use with aggregate subgrade as outlined in Section II.C.

Recommend an additional 200 square yards for soil stabilization be included in the contract as a contingency item to be used at the discretion of the Engineer.

III. BORROW SPECIFICATIONS

A. Borrow Criteria

Common borrow for embankment construction to subgrade shall meet Coastal Plain specifications outlined in the Standard Specifications, Article 1018-2, Section II.

B. Select Granular Material

Recommend 400 cubic yards of Select Granular Material be included as a contingency in the contract for backfill as detailed in Sections I.B and II.B.

Recommend 200 cubic yards of Select Granular Material, Class II and/or III to be included in the contract as a contingency item. Select granular material for embankment/backfill for geotextile for soil stabilization if required, or backfill in

water shall meet the criteria outlined in the Standard Specifications, Article 1016-3, Class II and/or III.

C. Shrinkage Factor

A shrinkage factor of 25 percent is recommended for calculation of earthwork in the contract.

D. Borrow Reconnaissance and Availability

Sandy soils with good to excellent engineering properties are available in nearby areas.

E. Class IV Subgrade Stabilization Material

A quantity of 190 tons of Class IV subgrade stabilization material should be included in the project contract as backfill for the Aggregate Subgrade referenced in Section II.C. The material should meet the requirement of Standard Specifications, Article 10-16-3 Class IV.

IV. MISCELLANEOUS

A. Reduction of Unclassified Excavation – Loss Due to Clearing and Grubbing

No significant loss of unclassified excavation is anticipated due to clearing and grubbing.

B. Reduction of Unclassified Excavation – Unsuitable Waste

Unclassified excavation will be predominantly derived from ditch and subgrade excavation and is comprised primarily of granular material which is estimated to be 100 percent suitable for embankment construction.

C. Water Wells

No water wells were identified with the proposed right of way limits on this project. However, if any water wells are identified during construction activities, the well/s should be sealed by a North Carolina Certified Well Contractor in accordance with the North Carolina Department of Transportation Standard Specification, Section 205, "Sealing Abandoned Wells".

Prepared By:



DocuSigned by:
Steve Hudson 6/22/2016
62EFD88181F446F
Steven V. Hudson, L.G.
CATLIN Project Geologist

Prepared By:



DocuSigned by:
Jacob Wessell 6/26/2016
7D9CE6DE1D8462
Jacob C. Wessell, P.E.
CATLIN Geotechnical Engineer



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING UNIT

Summary of Quantities

WBS Number: 40238.1.4
 TIP Number: U-4902D
 Description: US 17 Business (Market Street) from Lendire Road to Marsh Oaks Drive

County: New Hanover
 Field Office: GFO

DS
gcn

DS
SH

Project Engineer: JCW (CATLIN)
 Project Geologist: SVH (CATLIN)

Pay Item No.	Pay Item/ Quantity Adjustment	Spec Book Section No. or Special Provision (SP) Reference	Report Section	Alignment	Begin Station	End Station	Quantity	Units / %
0036000000-E	Undercut Excavation	225 - Roadway Excavation	I. B	Contingency	N/A	N/A	200	CY
0036000000-E	Undercut Excavation	225 - Roadway Excavation	II. B	Contingency	N/A	N/A	200	CY
Total Quantity of Undercut Excavation =							400	CY
0195000000-E	Select Granular Material	265 - Select Granular Material	III. B	Contingency	N/A	N/A	600	CY
Total Quantity of Select Granular Material =							600	CY
0196000000-E	Geotextile for Soil Stabilization	270 - Geotextile for Soil Stabilization	I. C	Contingency	N/A	N/A	200	SY
0196000000-E	Geotextile for Soil Stabilization	270 - Geotextile for Soil Stabilization	II. D	Contingency	N/A	N/A	700	SY
Total Quantity of Geotextile for Soil Stabilization =							900	SY
1099500000-E	Shallow Undercut	505 - Aggregate Subgrade	II. C	Contingency	N/A	N/A	100	CY
Total Quantity of Shallow Undercut =							100	CY
1099700000-E	Class IV Subgrade Stabilization	505 - Aggregate Subgrade	III. E	Contingency	N/A	N/A	190	TON
Total Quantity of Class IV Subgrade Stabilization =							190	TON
2044000000-E	6" Perforated Subdrain Pipe	815 - Subsurface Drainage	II. A	Contingency	N/A	N/A	200	LF
Total Quantity of 6" Perforated Subdrain Pipe =							200	LF

These Items Only Impact Earthwork Totals								
N/A	Shrinkage Factor	235 - Embankments	III. C	N/A	N/A	N/A	25	%