



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

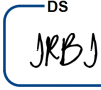
ROY COOPER
GOVERNOR

ERIC BOYETTE
SECRETARY

December 12, 2022

MEMORANDUM TO: Chad Kimes, P.E.
Division Engineer

ATTENTION: Katie Hite, P.E.
Division Project Development Engineer

FROM:  John Pilipchuk, P.E.
State Geotechnical Engineer

STATE PROJECT: 50259
F.A. PROJECT: N/A
COUNTY: New Hanover and Pender Counties

DESCRIPTION: US 421 Signals and Improvements in Coordination with Pender
Commerce Park

SUBJECT: Geotechnical Report - Design and Construction Recommendations

The Geotechnical Engineering Unit (GEU) has completed a subsurface investigation for this project and presents the following recommendations. Fieldwork was conducted and reported under State Projects 6.804121 and R-2633CA. The recommendations below reference the data obtained during those investigations.

I. Slope/Embankment Stability

A. Slope/Embankment Stability

Recommend all roadway slopes be constructed no steeper than 3:1 (H:V).

B. Undercut for Embankment Stability

Recommend 100 cubic yards of Undercut Excavation for embankment stability be included in the contract as a contingency item to be used at the direction of the Engineer.

C. Geotextile for Soil Stabilization

Include 100 square yards of Geotextile for Soil Stabilization in the contract as a contingency item to be used at the discretion of the Engineer.

II. Subgrade Stability

A. Undercut for Subgrade Stability

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

B. Special Ditches

Special ditches are not recommended for this project.

C. Subsurface Drainage - Subsurface Drain

Recommend 200 linear feet of 6" Perforated Subdrain Pipe for subsurface drain (Roadway Standard Drawing 815.02) be included in the contract as a contingency item to be used at the discretion of the Engineer.

D. Geotextile for Soil Stabilization

Recommend 200 square yards of Geotextile for Soil Stabilization be included in the contract as a contingency item to be used in Section II A.

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(B).

B. Select Granular Material

Recommend 300 cubic yards of Select Granular Material be included in the contract for backfill as a contingency item for Section I. B. and II. A.

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 on this project.

D. Borrow Reconnaissance and Availability

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

IV. Miscellaneous

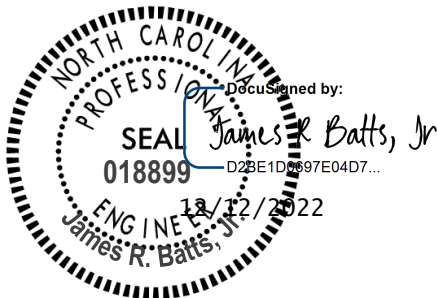
A. Reduction of Unclassified Excavation - Loss Due to Clearing and Grubbing

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

B. Reduction of Unsuitable Unclassified Excavation - Unsuitable Waste

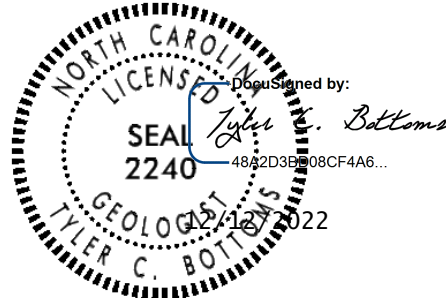
Based on the current roadway plans, unclassified excavation along this project will be primarily derived from shallow subgrade cuts and ditch excavation. These areas contain granular soils which are suitable for subgrade construction.

Prepared By:



James R. Batts, Jr., P.E.
Eastern Region Design Engineer

Prepared By:



Tyler C. Bottoms, L.G.
Project Geological Engineer

JLP/JRB/TCB



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

Summary of Quantities

WBS Number: _____

County: New Hanover/ Pender

Project Engineer: JAMES BATTS

TIP Number: 50259

Field Office: GREENVILLE

Project Geologist: TYLER BOTTOMS

Description: US 421 Signals and Improvements in Coordination with Pender Commerce Park

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	100	CY
0036000000-E	Undercut Excavation	225 - Roadway Excavation	II. A	Contingency	N/A	N/A	200	CY
Total Quantity of Undercut Excavation =							300	CY
0195000000-E	Select Granular Material	265 - Select Granular Material	III. B	Contingency	N/A	N/A	300	CY
Total Quantity of Select Granular Material =							300	CY
0196000000-E	Geotextile for Soil Stabilization	270 - Geotextile for Soil Stabilization	I. C	Contingency	N/A	N/A	100	SY
0196000000-E	Geotextile for Soil Stabilization	270 - Geotextile for Soil Stabilization	II. D	Contingency	N/A	N/A	200	SY
Total Quantity of Geotextile for Soil Stabilization =							300	SY
2044000000-E	6" Perforated Subdrain Pipe	815 - Subsurface Drainage	II. C	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	%