

March 18, 2016

MEMORANDUM TO: Glenn W. Mumford, P.E.
State Roadway Design Engineer

ATTENTION: Rekha Patel, P.E.
Roadway Design Project Engineer

FROM:  John L. Pilipchuk, L.G., P.E.
State Geotechnical Engineer 
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STATE PROJECT: 40108.1.1 (B-4950)
FEDERAL PROJECT: BRZ-1851 (3)
COUNTY: Cumberland
DESCRIPTION: Bridge Nos. 171 and 172 on SR 1851 (Faircloth Bridge Rd.)
over South River

SUBJECT: Geotechnical Report - Design and Construction
Recommendations

I. Slope/Embankment Stability

- A. Slope Design
Recommend that all slopes be constructed at a ratio of 3:1 (H:V) or flatter.
- B. Undercut
A quantity of 300 cubic yards of undercut for embankment stability should be included in the project contract as a contingency item.
- C. Geotextile for Soil Stabilization
A quantity of 300 square yards of geotextile for soil stabilization should be included in the project contract to be used at the discretion of the Engineer.

II. Subgrade Stability

- A. Subgrade Undercut
Recommend a quantity of 200 cubic yards of subgrade undercut be included in the contract as a contingency item for areas of unsuitable subgrade soil to be used at the discretion of the Engineer.
- B. Geotextile for Soil Stabilization
An additional quantity of 200 square yards of geotextile for soil stabilization should be included in the project contract as a contingency item for areas of subgrade undercut.

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).

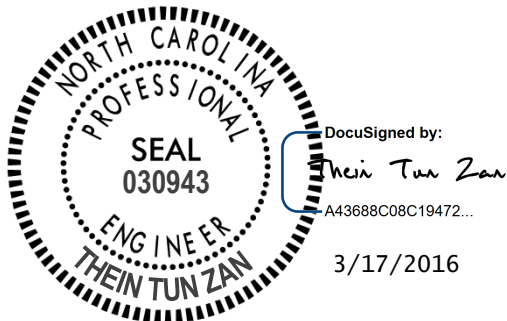
B. Select Granular Material

Recommend that a quantity of 500 cubic yards of Select Granular Material be included in the contract as a contingency item, to be used at the discretion of the Engineer. Select Granular Material for embankment/backfill for geotextile for soil stabilization or backfill in water shall meet the criteria outlined in Standard Specifications, Article 1016-3 Class III. The backfill material should be placed to a height of three (3) feet above geotextile for soil stabilization, or water level.

C. Shrinkage Factor

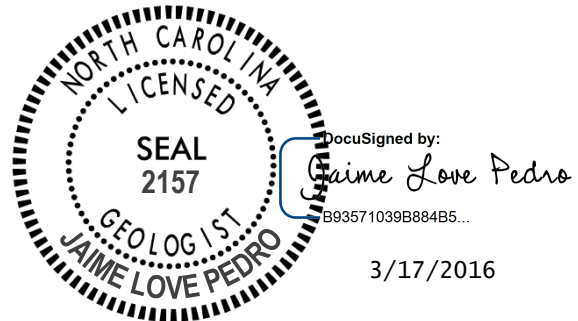
A shrinkage factor of 25% is recommended in the calculation of all earthwork quantities. This is to compensate for loss of soils due to erosion, clearing and grubbing of fill areas, and an increase in embankment quantities required due to consolidation of underlying soils and other factors.

Prepared by,



Thein T. Zan, PE
Geotechnical Design Engineer

Prepared by,



Jaime Love Pedro, LG
Project Geological Engineer



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING UNIT

Summary of Quantities

WBS Number: 40108.1.1

TIP Number: B-4950

Description: BRIDGE NOS. 171 and 172 ON SR 1851 OVER SOUTH RIVER

County: Cumberland

Field Office: RALEIGH

Project Engineer: T.T. ZAN

Project Geologist: J. L. PEDRO

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	300	CY
0036000000-E	Undercut Excavation	225 - Roadway Excavation	II. A	Contingency	N/A	N/A	200	CY
Total Quantity of Undercut Excavation =							500	CY
0195000000-E	Select Granular Material	265 - Select Granular Material	III. B	Contingency	N/A	N/A	500	CY
Total Quantity of Select Granular Material =							500	CY
0196000000-E	Geotextile for Soil Stabilization	270 - Geotextile for Soil Stabilization	I. C	Contingency	N/A	N/A	300	SY
0196000000-E	Geotextile for Soil Stabilization	270 - Geotextile for Soil Stabilization	II. B	Contingency	N/A	N/A	200	SY
Total Quantity of Geotextile for Soil Stabilization =							500	SY

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