



STEWART

September 4, 2018

MEMORANDUM TO: Christy Huff, PE
Division Bridge Program Manager

FROM: Don Brown, PE
Sr. Geotechnical Engineer

PROJECT NO: 17BP.6.R.103
ID NO: SF-420151
COUNTY: Harnett
DESCRIPTION: Bridge No. 151 Replacement on SR 1415 (Rawls Church Rd)
over Hector's Creek

SUBJECT: Geotechnical Report - Design and Construction Recommendations

I. Slope/Embankment Stability

A. Slope Design

Recommend that all slopes be constructed at a ratio of 2:1 (H:V) or flatter.

B. Undercut

A quantity of 200 cubic yards of undercut for embankment stability should be included in the project contract as a contingency item to be used at the discretion of the Engineer.

C. Geotextile for Soil Stabilization

A quantity of 200 square yards of geotextile for soil stabilization should be included in the project contract as a contingency item to be used at the discretion of the Engineer.

II. Subgrade Stability

A. Undercut for Subgrade Stability

Recommend a quantity of 200 cubic yards of undercut for subgrade stability be included in the project 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

Recommend a quantity of 200 square yards of geotextile for soil stabilization be included in the project 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 shall meet the Piedmont and Western Area criteria outlined in Standard Specification, Article 1018-2(A).

B. Select Granular Material

Select Granular Material for embankment construction on geotextile for soil stabilization shall meet the criteria outlined in Standard Specification, Article 1016-3 Class II or Class III. Include 400 cubic yards of this material in



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the project contract as a contingency item. The backfill material should be placed on geotextile for soil stabilization to a height not less than three (3) feet above geotextile for soil stabilization.

C. Shrinkage Factor

A shrinkage factor of 20 percent 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.

IV. Miscellaneous

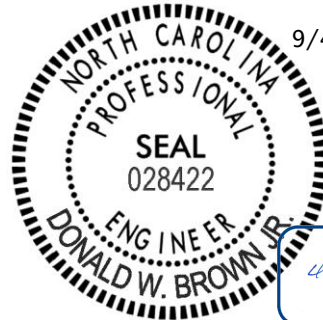
A. Reduction of Unclassified Excavation – Clearing and Grubbing

Loss due to clearing and grubbing is estimated to be negligible.

B. Reduction of Unclassified Excavation – Unsuitable Unclassified

Based on the current roadway plans, unclassified excavation will be primarily derived from shallow roadway cuts and ditch excavation. These areas contain soils that are generally suitable for embankment construction.

Prepared by,



9/4/2018

DocuSigned by:

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Donald W. Brown, Jr., P.E.
Senior Geotechnical Engineer



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

Summary of Quantities

WBS Number: 17BP.6.R.103

County: Harnett

Project Engineer: D. Brown, PE

TIP Number: SF-420151

Field Office: STEWART

Project Geologist: C. Tang, EI

Description: Bridge No. 151 on SR 1415 (Rawls Church Road) over Hector's Creek

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. A	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	400	CY
Total Quantity of Select Granular Material =							400	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. B	Contingency	N/A	N/A	200	SY
Total Quantity of Geotextile for Soil Stabilization =							400	SY

These Items Only Impact Earthwork Totals								
N/A	Shrinkage Factor	235 - Embankments	III. C	N/A	N/A	N/A	20	%