



Date: September 9, 2021

Memorandum to: Brian Wiles, PE
Project Manager
CH Engineering

From: Zahra Aghazadeh, PhD, PE
Senior Geotechnical Engineer
Terracon Consultants

State Project: BP8.R010
County: Moore
Description: Replace Bridge 620127 on SR 1428 (Dan Road) over Bear Creek

Subject: Geotechnical Roadway Recommendations

Terracon Consultants has completed a subsurface investigation for this project and presents the following recommendations:

I. Slope and Embankment Stability

A. Slope Design

All new permanent slopes should be constructed at a ratio of 2:1 (H:V) or flatter. The slope recommendation does not apply to transitions to end slopes and sliver fills.

B. Undercut for Embankment Stability

We recommend a quantity of 100 cubic yards of Undercut Excavation for embankment stability be included in the contract as a contingency to be used at the discretion of the Engineer.

C. Geotextile for Soil Stabilization

We recommend that 100 square yards of Geotextile for Soil Stabilization be included in the contract to be used in conjunction with the Undercut described in Section I.B as a contingency item to be used at the discretion of the Engineer..

II. Subgrade Stability

A. Aggregate Subgrade

We recommend a quantity of 100 cubic yards of Undercut for Subgrade Stability be included in the contract as a contingency item, to be used in areas for undercut at the discretion of the Engineer. Shallow Undercut should be to a depth of 1.0 foot below subgrade. Backfill should extend to a depth of 1.0 foot below subgrade from the edge of existing pavement to 1.0 foot beyond edge of pavement structure.



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B. 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 in conjunction with the Shallow Undercut for Aggregate Subgrade described in Section II.A 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 Piedmont criteria as described in Section 1018-1(A) of the Standard Specifications.

B. Select Granular Material

We recommend a quantity of 100 cubic yards of Select Granular Material (Class II/III Material) be included in the project, for backfilling the Undercut described in Section I.B, as a contingency item, to be used at the discretion of the Engineer.

C. Class IV Material

We recommend a quantity of 200 tons of Class IV Subgrade Stabilization be included in the contract for backfilling the Shallow Undercut described in Section II.A, as a contingency item, to be used at the discretion of the Engineer.

D. D. Shrinkage Factor

A shrinkage factor of 20 percent is recommended for calculation of earthwork on this project.

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

No significant Reduction of Unclassified Excavation is anticipated on the project due to clearing and grubbing.

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Sincerely,
Terracon Consultants, Inc.

9/20/2021



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Attachments: Summary of Quantities

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED.



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

Summary of Quantities

WBS Number: BP8.R010.1County: MOOREProject Engineer: AGHAZADEH, Z.TIP Number: BP8.R010Field Office / PEF: TERRACONProject Geologist: RUSSEK, S.C.Description: REPLACE BRIDGE 620127 ON SR 1428 (DAN ROAD) OVER BEAR 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	100	CY
Total Quantity of Undercut Excavation =							100	CY
0194000000-E	Select Granular Material, Class III	265 - Select Granular Material	III. B	Contingency	N/A	N/A	100	CY
Total Quantity of Select Granular Material, Class III =							100	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. B	Contingency	N/A	N/A	300	SY
Total Quantity of Geotextile for Soil Stabilization =							400	SY
1099500000-E	Shallow Undercut	505 - Aggregate Subgrade	II. A	Contingency	N/A	N/A	100	CY
Total Quantity of Shallow Undercut =							100	CY
1099700000-E	Class IV Subgrade Stabilization	505 - Aggregate Subgrade	III. C	Contingency	N/A	N/A	200	TON
Total Quantity of Class IV Subgrade Stabilization =							200	TON

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