



July 25, 2019

Robert J. Porter, Jr. PE
MA Engineering Consultants, Inc.
598 East Chatham St, Suite 137
Cary, NC 27511

TIP No.: A-0011C
County: Clay
Project Description: NC 69 from Georgia State Line to US 64
Site Description: Culvert on -L- at Station 186+81 over Unnamed Tributary to South Blair Creek
Subject: Culvert Foundation Recommendations

Dear Mr. Porter:

As authorized, Falcon Engineering Inc. (Falcon) has completed the Culvert Foundation Recommendations for the above referenced project based on current NCDOT LRFD bridge design policy and procedures.

Foundation recommendations and notes on plans are presented in the attachments. These recommendations are based on subsurface data obtained by Falcon as presented in the Subsurface Investigation Report submitted under separate cover. Culvert geometry and scour data used in our analysis were obtained from the Culvert Scour Report (CSR) provided to us by MA Engineering.

Falcon appreciates the opportunity to have provided Stantec with geotechnical engineering services. If you have any questions concerning the contents of this report or need additional information, please do not hesitate to contact our office.

Respectfully submitted:

FALCON ENGINEERING, INC.

A handwritten signature in blue ink that reads "Stephen C. Crockett".

Stephen C. Crockett, PE
Geotechnical Engineer

A handwritten signature in blue ink that reads "Jeremy R. Hamm".

Jeremy R. Hamm, PE
Geotechnical Engineering Manager

Attachments: Foundation Recommendations and Notes on Plans

FOUNDATION RECOMMENDATIONS

WBS # 32574.1.FD7

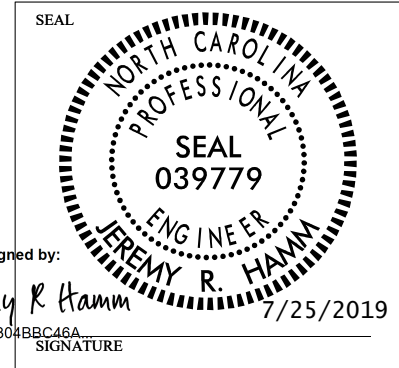
T.I.P. NO. A-0011C

COUNTY Clay

STATION 186+81 -L-

DESCRIPTION Culvert on -L- at Station 186+81 over
Unnamed Tributary to South Blair Creek

	INITIALS	DATE
DESIGN	JRH	05/07/19
CHECK	SCC	05/08/19
APPROVAL		



CULVERT SIZE	STATION	FOUNDATION TYPE	EXCAVATION DEPTH	MISCELLANEOUS DETAILS
8' x 5' Reinforced Concrete Box Culvert	-L- 186+81	36" Class VI Foundation Conditioning Material	3.0 foot below bottom of culvert	Approximate Culvert Extension = 20 ft upstream, 34 ft downstream Culvert Skew = 105 degrees Exist. Culvert Invert Elevation = 1817.67 ft Slope = 0.3% upstream and downstream

FOUNDATION RECOMMENDATION SPECIAL NOTES ON PLANS

- EXCAVATE FOUNDATION A MINIMUM OF 3.0 FEET BELOW CULVERT BEARING ELEVATION.
- INSTALL GEOTEXTILE FOR SOIL STABILIZATION, TYPE 4, TO A MINIMUM DISTANCE OF 1.5 FEET BEYOND THE EXTENTS OF THE CULVERT FOUNDATION IN ACCORDANCE WITH SECTION 270 OF THE STANDARD SPECIFICATIONS.
- PLACE 3.0 FEET OF CLASS VI FOUNDATION CONDITIONING MATERIAL IN ACCORDANCE WITH SECTION 414 OF THE STANDARD SPECIFICATIONS.
- OVEREXCAVATE LOOSE/SOFT MATERIAL IF PRESENT TO SUITABLE BEARING MATERIALS AND REPLACE WITH ADDITIONAL CLASS VI FOUNDATION CONDITIONING MATERIAL. IF MORE THAN 1.0 FEET OF ADDITIONAL EXCAVATION IS NEEDED, CONTACT THE OPERATIONS ENGINEER FOR APPROVAL.

FOUNDATION RECOMMENDATION COMMENTS

- Culvert settlement is anticipated to approach 1.0 inches.
- Culvert foundation will require the following estimated pay item quantities:

Item	Spec. Section	Quantity	Units
Undercut Excavation	225	80	CY
Geotextile for Soil Stabilization, Type 4	270	80	CY
Foundation Conditioning Material, Box Culvert (Class VI)	414	120	tons