



April 18, 2018

Tim Jordan, PE
Mott MacDonald
7621 Purfoy Road, Suite 115
Fuquay-Varina, NC 27526

Project: 17BP.7.R.110 (SF-160019)
County: Caswell
Description: Bridge No. 19 over Lynch Creek on SR 1771 (Dave Smith Rd.)
Subject: Foundation Recommendations

Dear Mr. Jordan:

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

Foundation recommendations, notes on plans, and pay item quantities 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. Bridge geometry and scour data used in our analysis were obtained from the approved Bridge Survey and Hydraulic Design Report (BSR).

Falcon appreciates the opportunity to have provided Mott MacDonald 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 Crockett".

Stephen Crockett, EI
Geotechnical Professional

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

Jeremy R. Hamm, PE
Geotechnical Engineering Manager

Attachments: Foundation Recommendations
Notes on Plans
Pay Item Quantities

FOUNDATION RECOMMENDATIONS

Prepared for NCDOT by: Falcon Engineering

WBS # 17BP.7.R.110

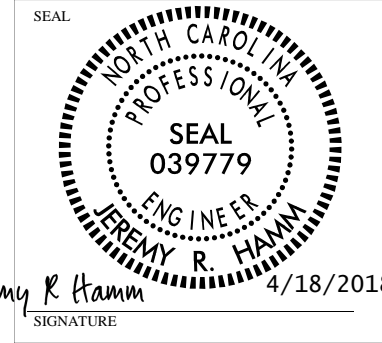
T.I.P. NO. SF-160019

COUNTY Caswell

STATION 15+64 -L-

DESCRIPTION Bridge No. 19 over Lynch Creek on SR 1771
(Dave Smith Rd.)

	INITIALS	DATE
DESIGN	SCC	4/11/2018
CHECK	JRH	4/17/2018
APPROVAL		



	STATION	FOUNDATION TYPE	FACTORED RESISTANCE	MISCELLANEOUS DETAILS
END BENT NO. 1	15+14.00 -L-	Cap on HP 12x53 Steel Piles	140 tons/pile	Bottom of Cap Elev. = 532.8 ft Estimated Length of Pile = 30 ft Number of Vertical Piles = 3 Number of Battered Piles = 2 Pile Spacing = 9 feet 6 inches
END BENT NO. 2	16+14.00 -L-	Cap on HP 12x53 Steel Piles	140 tons/pile	Bottom of Cap Elev. = 533.1 ft Estimated Length of Pile = 35 ft Number of Vertical Piles = 3 Number of Battered Piles = 2 Pile Spacing = 9 feet 6 inches

TIP # SF-160019

County Caswell

FOUNDATION RECOMMENDATION NOTES ON PLANS

1. FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
2. OBSERVE A 1 MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT TO THE BOTTOM OF CAP ELEVATION BEFORE BEGINNING END BENT CONSTRUCTION AT END BENTS NO. 1 AND NO. 2. FOR BRIDGE WAITING PERIODS, SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS.
3. PILES AT END BENTS NO. 1 AND NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 140 TONS PER PILE.
4. DRIVE PILES AT END BENTS NO. 1 AND NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 235 TONS PER PILE.
5. TESTING PILES WITH THE PDA DURING DRIVING, RESTRIKING, OR REDRIVING MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

FOUNDATION RECOMMENDATION COMMENTS

1. 1.5:1 (H:V) slopes at both end bents are ok with slope protection.
2. The factored axial load at End Bents No. 1 and No. 2 is 139 tons per pile.
3. Recommend Type II - Modified Bridge Approach Fills. See 2018 Roadway Standard Drawing 422.02.

PILE PAY ITEMS

(Revised 8/15/12)

WBS ELEMENT 17BP.7.R.110

TIP NO. SF-160019

COUNTY Caswell

STATION 15+64 -L-

DATE 4/11/2018

DESIGNED BY SCC

CHECKED BY JRH

DESCRIPTION Bridge No. 19 over Lynch Creek on SR 1771
(Dave Smith Rd.)

NUMBER OF BENTS WITH PILES _____	}	Only required for "Predrilling for Piles" & "Pile Excavation" pay items
NUMBER OF PILES PER BENT _____		
NUMBER OF END BENTS WITH PILES _____		
NUMBER OF PILES PER END BENT _____		

Bent # or End Bent #	PILE PAY ITEM QUANTITIES						PDA Testing (per each)
	Steel Pile Points (yes/no)	Pipe Pile Plates (yes/no/maybe)	Predrilling For Piles (per linear ft)	Pile Redrives (per each)	Pile Excavation (per linear ft)		
					In Soil	Not In Soil	
End Bent # 1	no						X
End Bent # 2	no						
TOTALS			0	0	0	0	1

Notes:

Blanks or "no" represent quantity of zero.

If steel pile points are required, calculate quantity of "Steel Pile Points" as equal to the number of steel piles.

If pipe pile plates are or may be required, calculate the quantity of "Pipe Pile Plates" as equal to the number of pipe piles.

Show quantity of "PDA Testing" on the plans as total only.