



March 14, 2018

Bruce B. Payne, PE
ATKINS
1616 E. Millbrook Road, Suite 160
Raleigh, NC 27609

Project: 17BP.6.R.76 (SF-770239)
County: Robeson
Description: Bridge No. 239 on SR 1515 (Union Chapel Road) Over Burnt Swamp
Subject: Structure Foundation Recommendations

Dear Mr. Payne:

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 ATKINS 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 black 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 # SF-770239

T.I.P. NO. 17BP.6.R.76

COUNTY Robeson

STATION 13+21

DESCRIPTION Bridge No. 239 on SR 1515 over Burnt Swamp

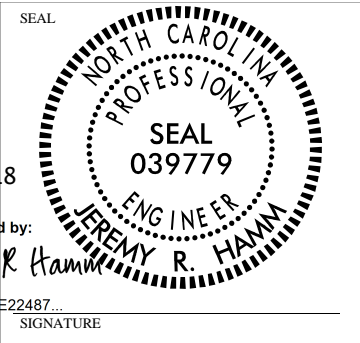
	INITIALS	DATE
DESIGN	JRH	3/7/2018
CHECK	WSH	3/7/2018
APPROVAL		

3/14/2018

DocuSigned by:

Jeremy R Hamm

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	STATION	FOUNDATION TYPE	FACTORED RESISTANCE	MISCELLANEOUS DETAILS
END BENT NO. 1	12+84.5 -L-	Cap on HP 12x53 Steel Piles	80 tons/pile	Average Bottom of Cap Elev. = 148.9 ± ft Length of Pile = 60 ft Number of Vertical Piles = 7 Pile Spacing = 6 feet 0 inches
END BENT NO. 2	13+57.5 -L-	Cap on HP 12x53 Steel Piles	80 tons/pile	Average Bottom of Cap Elev. = 149.0 ± ft Length of Pile = 55 ft Number of Vertical Piles = 7 Pile Spacing = 6 feet 0 inches

TIP # 17BP.6.R.76

County Robeson

FOUNDATION RECOMMENDATION NOTES ON PLANS

1. FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
2. PILES AT END BENTS NO. 1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 80 TONS PER PILE.
3. DRIVE PILES AND END BENTS NO. 1 AND 2 TO A REQUIRED DRIVING RESISTANCE OF 135 TONS PER PILE.
4. 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 2 is 78 tons per pile.
3. A waiting period is not required prior to the construction of End Bent No. 1 or End Bent No. 2.
4. Recommend Type II - Modified Bridge Approach Fills. See 2018 Roadway Standard Drawing 422.02.

PILE PAY ITEMS

(Revised 8/15/12)

WBS ELEMENT	SF-770239		DATE	3/7/2018
TIP NO.	17BP.6.R.76		DESIGNED BY	JRH
COUNTY	Robeson		CHECKED BY	WSH
STATION	13+21			
DESCRIPTION	Bridge No. 239 on SR 1515 over Burnt Swamp			

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			4			X
End Bent #2	no			4			
TOTALS				8	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.

If quantity of "PDA Testing" is 3 or less, reference "Pile Driving Criteria" provision in PDA notes on plans and include "Pile Driving Criteria" provision in the contract.