January 16, 2018

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

Project:	17BP.6.R.73 (SF-080175)
County:	Bladen
Description:	Bridge No. 175 on SR 1124 (Singletary Mill Pond Rd) over Crawley Creek
Subject:	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.

Scott Hunsberger, PE
Geotechnical Engineer

Jeremy R. Hamm, PE
Geotechnical Engineering Manager

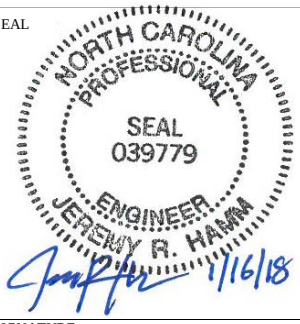
Attachments: Foundation Recommendations
Notes on Plans
Pay Item Quantities

FOUNDATION RECOMMENDATIONS

WBS #	17BP.6.R.73	DESCRIPTION	Bridge No. 175 on SR 1124
T.I.P. NO.	SF-080175		(Singletary Mill Pond Rd) over Crawley Creek
COUNTY	Bladen		
STATION	13+58.72 -L-		

	INITIALS	DATE
DESIGN	JRH	1/16/2018
CHECK	WSH	1/16/2018
APPROVAL		

SEAL



SIGNATURE

	STATION	FOUNDATION TYPE	FACTORED RESISTANCE	MISCELLANEOUS DETAILS
END BENT NO. 1	13+13.7 -L-	Cap on HP 12x53 Steel Piles	65 tons/pile	Average Bottom of Cap Elev. = ± 106.5 ft Estimated Length of Pile = 50 ft Number of Piles = 6 Pile Spacing = 6 feet 6 inches
BENT NO. 1	13+58.7 -L-	Cap on HP 14x73 Steel Piles	120 tons/pile	Average Bottom of Cap Elev. = ± 107.3 ft Estimated Length of Pile = 90 ft Point of Fixity Elev. = 75 ft Tip Elev. No Higher Than = 70 ft Number of Vertical Piles = 8 Pile Spacing = 5 feet 0 inches
END BENT NO. 2	14+03.7 -L-	Cap on HP 12x53 Steel Piles	65 tons/pile	Average Bottom of Cap Elev. = ± 106.1 ft Estimated Length of Pile = 55 ft Number of Piles = 7 Pile Spacing = 6 feet 6 inches

TIP # SF-080175 **County** Bladen

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 65 TONS PER PILE.
3. DRIVE PILES AT END BENTS NO. 1 AND 2 TO A REQUIRED DRIVING RESISTANCE OF 95 TONS PER PILE.
4. PILES AT BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 120 TONS PER PILE.
5. DRIVE PILES AT BENT NO. 1 TO A REQUIRED DRIVING RESISTANCE OF 185 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR SCOUR.
6. INSTALL PILES AT BENT NO. 1 TO A TIP ELEVATION NO HIGHER 75 FT.
7. THE SCOUR CRITICAL ELEVATION FOR BENT NO. 1 IS ELEVATION 86.5 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

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 Bent No. 1 is 65 tons per pile.
3. The factored axial load at Bent No. 1 is 235 kips per pile.
4. The factored axial load at End Bent No. 2 is 65 tons per pile.
5. The Geotechnically Adjusted Scour Elevation (GASE) at Bent No. 1 is 89.5 feet.
6. A waiting period is not required for End Bents No. 1 and 2.
7. Recommend Type II - Modified Bridge Approach Fills. See 2018 Roadway Standard Drawing 422.02.

PILE PAY ITEMS

(Revised 8/15/12)

WBS ELEMENT: 17BP.6.R.73 | DATE: 1/16/2018

TIP NO.: SF-080175 | DESIGNED BY: JRH

COUNTY: Bladen | CHECKED BY: WSH

STATION: 13+58.72 -L-

DESCRIPTION: Bridge No. 175 on SR 1124 (Singletary Mill Pond Rd) over Crawley Creek

NUMBER OF BENTS WITH PILES

NUMBER OF PILES PER BENT

NUMBER OF END BENTS WITH PILES

NUMBER OF PILES PER END BENT

Only required for "Predrilling for Piles" & "Pile Excavation" pay items

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

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.