FOUNDATION RECOMMENDATIONS

PROJECT BP8.R010.1

TIP NO. BP8.R010

COUNTY MOORE

STATION 15+50.00 -L-

DESCRIPTION BRIDGE 620127 on SR 1428 (DAN ROAD) OVER BEAR CREEK

	INITIALS	DATE
DESIGN	ZA	8/17/21
CHECK	AAN	8/18/21

P.E. SEAL 9/8/2021

NORTH CAROLINA PROFESSIONAL SEAL 046591 ENGINEER ZAHRA AGHAZADEH ARDEBILI

DocuSigned by: Zahra Aghazadeh

SIGNATURE

Terracon Consultants, Inc.

NC Registered Engineering Firm: F-0869

	BENT STATION	FOUNDATION TYPE	FACTORED RESISTANCE	ADDITIONAL INFORMATION
END BENT 1	14+88.75 -L-	Cap on HP 12 x 53 Steel H-Piles	61 Tons/Pile	Bottom of Cap Elev. = 383.8 ft Average Estimated Pile Length = 20 ft Number of Piles/Cap = 5 Pile Spacing = 8' - 3"
BENT 1	15+19.94 -L-	Column on 36" Diameter Drilled Pier	340 Tons/Pier	Bottom of Cap Elev. = 384.5 ft Point of Fixity Elev. = 358.3 ft Tip No Higher Than Elev. = 354.9 ft Number of Piers/Cap = 3
BENT 2	15+80.06 -L-	Column on 36" Diameter Drilled Pier	340 Tons/Pier	Bottom of Cap Elev. = 384.3 ft Point of Fixity Elev. = 365.0 ft Tip No Higher Than Elev. = 361.7 ft Number of Piers/Cap = 3
END BENT 2	16+11.25 -L-	Cap on HP 12 x 53 Steel H-Piles	61 Tons/Pile	Bottom of Cap Elev. = 383.2 ft Average Estimated Pile Length = 20 ft Number of Piles/Cap = 5 Pile Spacing = 8' - 3"

(SEE NOTES ON PLANS AND COMMENTS ON FOLLOWING PAGES.)

BRIDGE 620127 on SR 1428 (DAN ROAD) OVER BEAR CREEK MOORE COUNTY

FOUNDATION RECOMMENDATIONS NOTES ON PLANS

1. FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

2. FOR PILES, SEE PILES PROVISION AND SECTION 450 OF THE STANDARD SPECIFICATIONS.

3. INSTALL PERMANENT STEEL CASINGS AT BENTS NO. 1 AND 2 BY VIBRATING, SCREWING OR DRIVING PERMANENT CASINGS BEFORE EXCAVATING OR DISTURBING ANY MATERIAL BELOW ELEVATIONS 366.0 AND 368.0 FT, RESPECTIVELY.

(Use comments as needed. Common/typical comments are listed below.)

BRIDGE 620127 on SR 1428 (DAN ROAD) OVER BEAR CREEK MOORE COUNTY

FOUNDATION RECOMMENDATIONS COMMENTS

1. USE 1.5 : 1 (H:V) END BENT SLOPES WITH CLASS II RIP-RAP SLOPE PROTECTION WITH GEOTEXTILE.
2. USE TYPE II MODIFIED APPROACH FILLS (STANDARD DRAWING 422.02) AT END BENTS.
3. A WAITING PERIOD IS NOT REQUIRED PRIOR TO THE CONSTRUCTION OF END BENTS NO. 1 AND 2.
4. THE FACTORED AXIAL LOAD FOR END BENTS NO. 1 AND 2 IS 61 TONS PER PILE.
5. USE VERTICAL PILES AT END BENTS.
6. THE FACTORED AXIAL LOAD FOR BENTS NO. 1 AND 2 IS 340 TONS PER PIER.
7. THE POINT OF FIXITY ELEVATION FOR BENT NO. 1 IS 358.3 FT.
8. THE POINT OF FIXITY ELEVATION FOR BENT NO. 2 IS 365.0 FT.
9. THE TOTAL ESTIMATED QUANTITY OF 36-INCH DRILLED PIER “NOT IN SOIL” IS 50.7 LINEAR FEET.
10. LATERAL DEFLECTION CONTROLS ESTIMATED TIP ELEVATIONS FOR BENT NO. 1 AND 2.
11. DESIGN SCOUR ELEVATIONS AT BENTS NO. 1 AND 2 ARE 366.0 AND 368.0, RESPECTIVELY

SUMMARY OF PILE INFORMATION/INSTALLATION

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pile(s) #-# (e.g., "Bent 1, Piles 1-5")	Factored Resistance per Pile TONS	Pile Cut-Off (Top of Pile) Elevation FT	Estimated Pile Lenth per Pile FT	Scour Critical Elevation FT	Driven Piles			Predrilling for Piles*			Drilled-In Piles		
					Min Pile Tip (Tip No Higher Than) Elev FT	Required Driving Resistance (RDR)** per Pile TONS	Total Pile Redrives Quantity EACH	Predrilling Length per Pile Lin FT	Predrilling Elevation (Elev Not To Predrill Below) FT	Maximum Predrilling Dia INCHES	Pile Excavation (Bottom of Hole) Elev FT	Pile Exc Not In Soil per Pile Lin FT	Pile Exc In Soil per Pile Lin FT
END BENT 1, Piles 1-5	61	385.80	20	NA		105	0						
END BENT 2, Piles 1-5	61	385.18	20	NA		105							

*Predrilling for Piles is required for end bents/bents with a predrilling length and at the Contractor's option for end bents/bents with predrilling information but no predrilling length.

$$^{**}RDR = \frac{Factored\ Resistance + \ Factored\ Downdrag\ Load + Factored\ Dead\ Load}{Dynamic\ Resistance\ Factor} + Nominal\ Downdrag\ Resistance + \frac{Nominal\ Scour\ Resistance}{Scour\ Resistance\ Factor}$$

SUMMARY OF PDA/PILE ORDER LENGTHS

(Blank entries indicate item is not applicable to structure)

Pile Driving Analyzer (PDA)				Pile Order Lengths	
End Bent/ Bent No	PDA Testing Required? YES or MAYBE	PDA Test Pile Length FT	Total PDA Testing Quantity EACH	End Bent/ Bent No(s)	Pile Order Length Basis* EST or PDA
END BENT 1, Piles 1-5	MAYBE		1		
END BENT 2, Piles 1-5	MAYBE				

*EST = Pile order lengths from estimated pile lengths; PDA = Pile order lengths based on PDA testing. For groups of end bents/bents with pile order lengths based on PDA testing, the first end bent/bent no. listed for each group is the representative end bent/bent with the PDA.

PILE DESIGN INFORMATION

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pile(s) #-# (e.g., "Bent 1, Piles 1-5")	Factored Axial Load per Pile TONS	Factored Downdrag Load per Pile TONS	Factored Dead Load* per Pile TONS	Dynamic Resistance Factor	Nominal Downdrag Resistance per Pile TONS	Nominal Scour Resistance per Pile TONS	Scour Resistance Factor (Default = 1.00)
END BENT 1, Piles 1-5	61			0.60			1.00
END BENT 2, Piles 1-5	61			0.60			1.00

*Factored Dead Load is factored weight of pile above the ground line.

SUMMARY OF PILE ACCESSORIES

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pile(s) #-# (e.g., "Bent 1, Piles 1-5")	Pipe Pile Plates Required? YES or MAYBE	Steel Pile Points			Steel Pile Tips Required? YES
		Pipe Pile Cutting Shoes Required? YES	Pipe Pile Conical Points Required? YES	H-Pile Points Required? YES	
END BENT 1, Piles 1-5				YES	
END BENT 2, Piles 1-5				YES	
TOTAL QTY:				10	

SUMMARY OF DRILLED PIER INFORMATION/INSTALLATION

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pier(s) #-# (e.g., "Bent 1, Piers 1-3")	Factored Resistance per Pier TONS	Minimum Pier Tip (Tip No Higher Than) Elevation FT	Required Tip Resistance per Pier TSF	Scour Critical Elevation FT	Minimum Drilled Pier Penetration Into Rock per Pier Lin FT	Drilled Pier Length per Pier Lin FT	Drilled Pier Length Not In Soil per Pier Lin FT	Drilled Pier Length In Soil per Pier Lin FT	Permanent Steel Casing Required? YES or MAYBE	Permanent Steel Casing Tip Elevation (Elev Not To Extend Casing Below) FT	Permanent Steel Casing Length* per Pier Lin FT
Bent 1, Piers 1-3	340	354.9	105	365	5.8	19.1	10.0	9.1	MAYBE	366.0	8.0
Bent 2, Piers 1-3	340	361.7	110	367	5.6	11.8	6.9	4.9	MAYBE	368.0	5.5

*Permanent Steel Casing Length equals the difference between the ground line or top of drilled pier elevation, whichever is higher, and the permanent casing tip elevation.

SUMMARY OF DRILLED PIER TESTING

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pier(s) #-# (e.g., "Bent 1, Piers 1-3")	Standard Penetration Test (SPT) Required? YES or MAYBE	Crosshole Sonic Logging (CSL) Required?* YES or MAYBE	Total CSL Tube Length (For All Tubes) per Pier Lin FT	Shaft Inspection Device (SID) Required? YES or MAYBE	Pile Integrity Test (PIT) Required? MAYBE
Bent 1, Piers 1-3	MAYBE	MAYBE	82	NO	MAYBE
Bent 2, Piers 1-3	MAYBE	MAYBE	53	NO	MAYBE
TOTAL QTY:	6	2	407		2

*CSL Tubes are required if CSL Testing is or may be required. The number of CSL Tubes per drilled pier is equal to one tube per foot of design pier diameter with at least 4 tubes per pier. The length of each CSL Tube is equal to the drilled pier length plus 1.5 ft.

NOTES:

1. The Pile and Drilled Pier Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer (Zahra Aghazadeh Ardebili, 046591) on 09-08-2021.
2. Total Pile Driving Equipment Setup quantity (not shown in Pile Foundation Tables) equals the number of driven piles, i.e., the number of piles with a Required Driving Resistance.
3. The Engineer will determine the need for PDA Testing, Pipe Pile Plates, Permanent Steel Casing, SPTs, CSL Testing, SID Inspections and PITs when these items may be required.

PROJECT NO. BP8.R010

Moore COUNTY

STATION: 15+50.00 -L-

9/8/2021

NORTH CAROLINA PROFESSIONAL SEAL 046591 ENGINEER ZAHRA AGHAZADEH ARDEBILI

DocuSigned by:

Zahra Aghazadeh

SIGNATURE DATE

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PILE AND DRILLED PIER FOUNDATION TABLES

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO.

TOTAL SHEETS