

REFERENCE: SF-330095

PROJECT: 17BP.9.R.99

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<u>SHEET NO.</u>	<u>DESCRIPTION</u>
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 GEOTECHNICAL ENGINEERING UNIT

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY FORSYTH
 PROJECT DESCRIPTION REPLACE BRIDGE NO. 95 ON
SR 1100 (LASATER RD) OVER BLANKET CREEK

SITE DESCRIPTION STRUCTURE ABUTMENTS
INVESTIGATION: BRIDGE NO. 95 ON SR 1100
(LASATER RD) OVER BLANKET CREEK

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	SF-330095	1	7

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT 1919 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

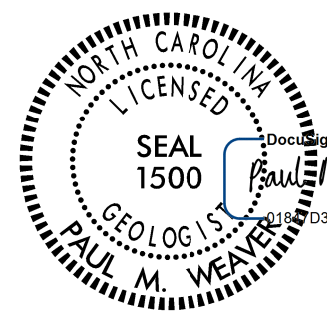
- NOTES:
1. THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N.C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT.
 2. BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

PERSONNEL

P.M. WEAVER
C.R. PASTRANA
Trigon Exploration

INVESTIGATED BY ESP Associates, P.A.
 DRAWN BY C.R. PASTRANA
 CHECKED BY P.M. WEAVER
 SUBMITTED BY ESP Associates, P.A.
 DATE April 2018

 **ESP ASSOCIATES, PA**
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 SUITE E
 GREENSBORO, NC 27409
 FIRM # C-0587
 WWW.ESPASSOCIATES.COM



DocuSigned by:
Paul M. Weaver
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5/3/2018

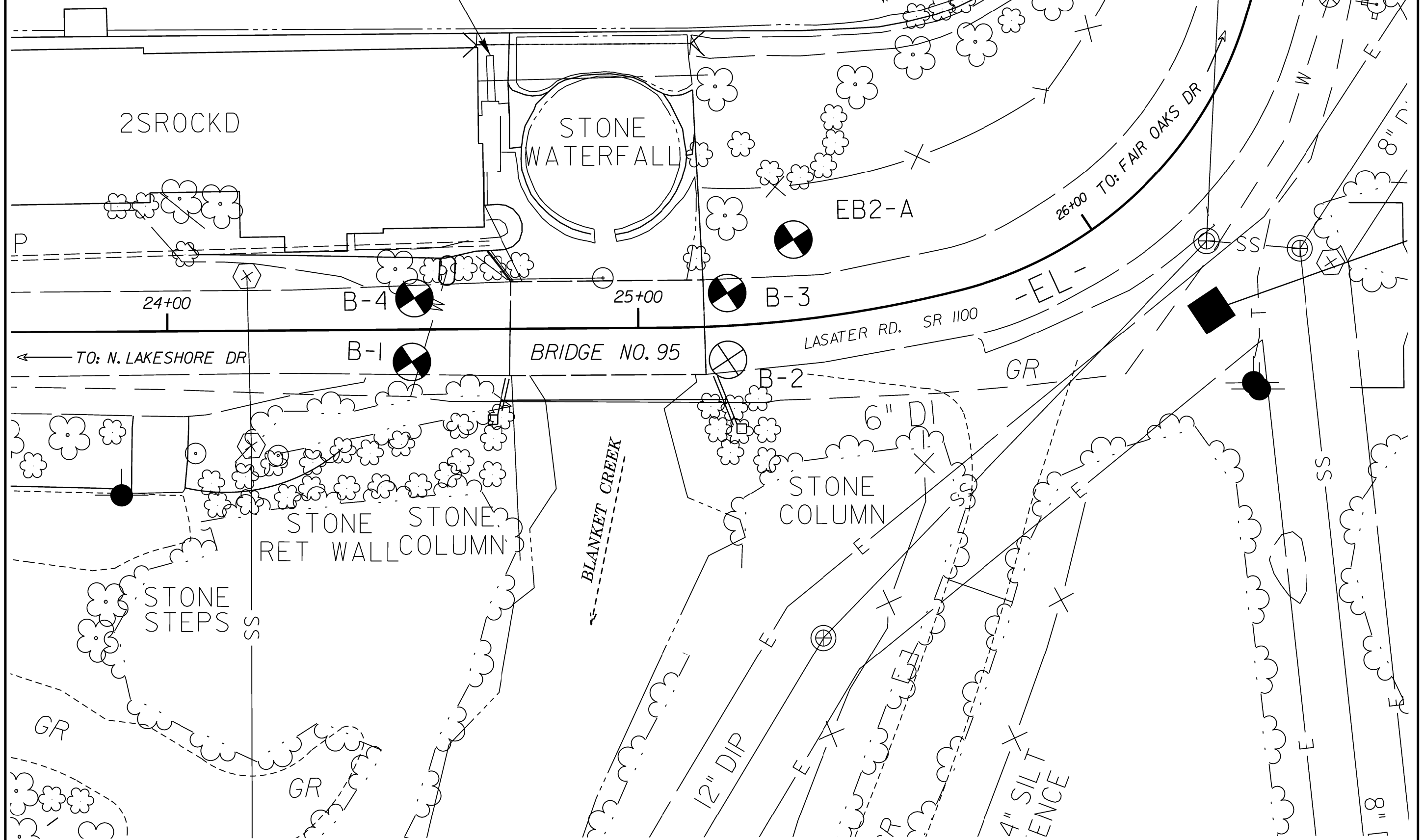
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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT SUBSURFACE INVESTIGATION SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION GRADATION ROCK DESCRIPTION TERMS AND DEFINITIONS SOIL LEGEND AND AASHTO CLASSIFICATION CONSISTENCY OR DENSENESS TEXTURE OR GRAIN SIZE SOIL MOISTURE - CORRELATION OF TERMS PLASTICITY COLOR MISCELLANEOUS SYMBOLS RECOMMENDATION SYMBOLS ABBREVIATIONS EQUIPMENT USED ON SUBJECT PROJECT FRACTURE SPACING BEDDING INDURATION

ROUND WATERFALL
AND MTL GATES



GEOTECHNICAL BORING REPORT

BORE LOG

WBS 17BP.9.R.99	TIP SF-330095	COUNTY FORSYTH	GEOLOGIST Pastrana, C. R.
SITE DESCRIPTION Bridge No. 95 on SR 1100 (Lasater Rd) over Blanket Creek: Structure Abutments Investigation			GROUND WTR (ft)
BORING NO. B-1	STATION 24+52	OFFSET 7 ft RT	ALIGNMENT -EL-
COLLAR ELEV. 694.6 ft	TOTAL DEPTH 44.1 ft	NORTHING 831,216	EASTING 1,580,167
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 95% 03/19/2018		DRILL METHOD H.S. Augers / Mud Rotary	HAMMER TYPE Automatic
DRILLER Estep, J. E.	START DATE 04/02/18	COMP. DATE 04/03/18	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
695														GROUND SURFACE	0.0
	693.6	1.0	3	2	2									PAVEMENT	0.4
	691.1	3.5	1	1	1									ROADWAY EMBANKMENT Brown to Tan-Brown, Soft to Medium Stiff, Fine Sandy Clayey SILT, Trace Debris (Glass) and Gravel	
690	688.6	6.0	1	2	1										
	686.1	8.5	1	1	2									Brown to Tan-Brown to Gray, Soft to Very Soft, Clayey Fine Sandy SILT	
685	683.6	11.0	WOH	WOH	1										
	681.1	13.5	WOH	WOH	2										
680	678.6	16.0													
	676.1	18.5	36	40	24									RESIDUAL	15.7
	673.6	21.0	58	42/0.4										Black to Greenish-Gray, Very Dense, Silty Fine SAND, Little Rock Fragments	18.5
675	671.1	23.5	16	25	20									WEATHERED ROCK	20.3
	668.6	26.0	19	30	14									Black to Greenish-Brown METADIORITE	
	666.1	28.5	3	10	7									RESIDUAL	
	661.1	33.5												Black to Greenish-Brown, Dense to Medium Dense, Silty Fine SAND, Little Rock Fragments	28.0
670	656.1	38.5												Black to Greenish-Brown METADIORITE	31.0
	651.1	43.5	85	15/0.1										WEATHERED ROCK	
														Black to Greenish-Brown METADIORITE	
														Black to Greenish-Gray METADIORITE	34.0
														Orange to Pink to White GRANITIC ROCK	37.0
															41.3
														Boring Terminated with Standard Penetration Test Refusal at Elevation 653.4 ft On Crystalline Rock: GRANITIC ROCK	
														Boring Terminated at Elevation 650.5 ft In Weathered Rock: METADIORITE	
														Note: Begin Mud Rotary at 19.4'	

WBS 17BP.9.R.99	TIP SF-330095	COUNTY FORSYTH	GEOLOGIST Pastrana, C. R.
SITE DESCRIPTION Bridge No. 95 on SR 1100 (Lasater Rd) over Blanket Creek: Structure Abutments Investigation			GROUND WTR (ft)
BORING NO. B-4	STATION 24+53	OFFSET 7 ft LT	ALIGNMENT -EL-
COLLAR ELEV. 694.7 ft	TOTAL DEPTH 41.3 ft	NORTHING 831,227	EASTING 1,580,175
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 95% 03/19/2018		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER Estep, J. E.	START DATE 04/03/18	COMP. DATE 04/03/18	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
695														GROUND SURFACE	0.0
	694.7													PAVEMENT	0.4
	691.2	3.5	1	0	1									ROADWAY EMBANKMENT Reddish-Brown to Brown, Very Soft to Soft, Fine Sandy SILT, Trace Clay	
690	686.2	8.5	1	1	2										
685	681.2	13.5	2	3	9									RESIDUAL	11.5
	676.2	18.5	13	12	8									Black to Greenish-Gray, Stiff, Fine Sandy SILT	17.0
680	671.2	23.5	5	6	9									Black to Greenish-Gray to White, Medium Dense to Very Dense, Clayey Silty Coarse to Fine SAND, Little Rock Fragments	
675	666.2	28.5	25	29	42										
	661.2	33.5	23	70	30/0.1									WEATHERED ROCK	34.0
670	656.2	38.5	15	57	43/0.3									Black to Greenish-Gray METADIORITE	37.0
	653.4	41.3													41.3
														Boring Terminated with Standard Penetration Test Refusal at Elevation 653.4 ft On Crystalline Rock: GRANITIC ROCK	

NCDOT BORE DOUBLE_SF330095_GEO_SPECIAL_GINTLOGS.GPJ_NC_DOT.GDT 4/17/18

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 17BP.9.R.99		TIP SF-330095		COUNTY FORSYTH		GEOLOGIST Pastrana, C. R.									
SITE DESCRIPTION Bridge No. 95 on SR 1100 (Lasater Rd) over Blanket Creek: Structure Abutments Investigation							GROUND WTR (ft)								
BORING NO. B-2		STATION 25+19		OFFSET 7 ft RT		ALIGNMENT -EL-									
COLLAR ELEV. 694.9 ft		TOTAL DEPTH 19.4 ft		NORTHING 831,179		EASTING 1,580,223									
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 95% 03/19/2018		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER Estep, J. E.		START DATE 04/03/18		COMP. DATE 04/03/18		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
695														694.9 GROUND SURFACE 0.0	
														694.3 PAVEMENT 0.6	
														691.4 ROADWAY EMBANKMENT 3.5	
690														Moist, Reddish Brown, Loose, Clayey Silty Fine SAND	
														Moist to Wet, Reddish Brown, Very Soft to Soft, Clayey SILT	
685															
680														682.3 ALLUVIAL 12.8	
														Saturated, Gray, Very Loose, Fine to Coarse SAND	
														675.5 Boring Terminated at Elevation 675.5 ft In Alluvial: SAND 19.4	

WBS 17BP.9.R.99		TIP SF-330095		COUNTY FORSYTH		GEOLOGIST Pastrana, C. R.									
SITE DESCRIPTION Bridge No. 95 on SR 1100 (Lasater Rd) over Blanket Creek: Structure Abutments Investigation							GROUND WTR (ft)								
BORING NO. B-3		STATION 25+19		OFFSET 7 ft LT		ALIGNMENT -EL-									
COLLAR ELEV. 694.8 ft		TOTAL DEPTH 19.9 ft		NORTHING 831,190		EASTING 1,580,232									
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 95% 03/19/2018		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER Estep, J. E.		START DATE 04/03/18		COMP. DATE 04/03/18		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
695														694.8 GROUND SURFACE 0.0	
														694.4 PAVEMENT 0.4	
														691.8 ROADWAY EMBANKMENT 3.0	
														Reddish-Brown to Brown, Loose, Clayey Silty Fine SAND	
														689.3 Reddish-Brown, Soft to Medium Stiff, Fine Sandy Clayey SILT 5.5	
														686.8 Reddish-Brown to Brown, Very Loose, Silty Fine SAND, Trace Gravel 8.0	
														Reddish-Brown to Brown, Very Soft, Fine Sandy Clayey SILT, Trace Organics (Roots)	
														681.8 ALLUVIAL 13.0	
														Saturated, Gray, Very Loose, Clayey Coarse to Fine SAND	
														679.3 Gray, Very Loose, Coarse SAND, Trace Organics (Wood Fragments) 15.5	
														676.8 Gray, Very Loose, Coarse SAND, Trace Organics (Wood Fragments) 18.0	
														675.3 RESIDUAL 19.5	
														674.9 Orange to White, Silty Fine to Coarse SAND, Some Rock Fragments 19.9	
														WEATHERED ROCK	
														Orange to White GRANITIC ROCK	
														Boring Terminated at Elevation 674.9 ft In Weathered Rock: GRANITIC ROCK	

NCDOT BORE DOUBLE_SF330095_GEO_SPECIAL_GINTLOGS.GPJ NC_DOT.GDT 4/17/18

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 17BP.9.R.99		TIP SF-330095		COUNTY FORSYTH		GEOLOGIST Murray, C. C.										
SITE DESCRIPTION Bridge No. 95 on SR 1100 (Lasater Rd) over Blanket Creek: Structure Abutments Investigation							GROUND WTR (ft)									
BORING NO. EB2-A		STATION 25+35		OFFSET 17 ft LT		ALIGNMENT -EL-										
COLLAR ELEV. 695.4 ft		TOTAL DEPTH 27.0 ft		NORTHING 831,193		EASTING 1,580,249										
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550X				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Estep, J. E.		START DATE 04/21/10		COMP. DATE 04/21/10		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	L O G	SOIL AND ROCK DESCRIPTION		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)	
700																
695															695.4	GROUND SURFACE
																ROADWAY EMBANKMENT Red-Brown, Soft to Medium Stiff, Silty CLAY
690	691.5	3.9	2	3	3								M			
685	686.5	8.9	2	1	2								M			
680	681.5	13.9	3	4	2								W		680.4	ALLUVIAL Gray, Medium Dense, Silty SAND with Gravel
675	676.5	18.9	4	6	7								W		674.4	WEATHERED ROCK GRANITIC ROCK
670	671.5	23.9	60/0.1												671.5	CRYSTALLINE ROCK GRANITIC ROCK
															668.4	Boring Terminated by Auger Refusal at Elevation 668.4 ft In Crystalline Rock: GRANITIC ROCK Note: Boring done by NCDOT

NCDOT BORE DOUBLE_SF330095_GEO_SPECIAL_GINTLOGS.GPJ NC_DOT.GDT 4/17/18

SITE PHOTOGRAPHS

State Project No. 17BP.9.R.99 – TIP No. SF-330095 – Structure Abutments Investigation: Bridge No. 95 on SR 1100 (Lasater Rd) over Blanket Creek – Forsyth County, NC

View of Existing Bridge No. 95 Looking Upstation



View of Existing Bridge No. 95 Looking Downstation



View Looking Upstream from Bridge No. 95



View Looking Downstream from Bridge No. 95

