

REFERENCE: U-2579AB

PROJECT: 34839

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**STATE OF NORTH CAROLINA**  
**DEPARTMENT OF TRANSPORTATION**  
**DIVISION OF HIGHWAYS**  
**GEOTECHNICAL ENGINEERING UNIT**

**STRUCTURE**  
**SUBSURFACE INVESTIGATION**

COUNTY FORSYTH  
PROJECT DESCRIPTION WINSTON-SALEM BELTWAY  
FROM US 421/I-40 BUS TO I-40

SITE DESCRIPTION BRIDGE NO. 724 ON -Y15REV-  
(I-40 BYPASS) OVER -L- (WINSTON SALEM  
BELTWAY)

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2579AB	1	22

**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 T07-6850. 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.

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- 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

RED DOG DRILLING

INVESTIGATED BY ESP Associates, Inc.

DRAWN BY C.R. PASTRANA

CHECKED BY P.M. WEAVER

SUBMITTED BY ESP Associates, Inc.

DATE MAY 2019

 **ESP ASSOCIATES, INC.**  
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Designed by:  
Paul M. Weaver

01847D3739650407  
6/27/2019

SIGNATURE DATE

**DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED**

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

Main content table with columns: SOIL DESCRIPTION, GRADATION, ROCK DESCRIPTION, TERMS AND DEFINITIONS. Includes sub-sections like 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, and NOTES.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
GEOTECHNICAL ENGINEERING UNIT

**SUBSURFACE INVESTIGATION**

SUPPLEMENTAL LEGEND, GEOLOGICAL STRENGTH INDEX (GSI) TABLES  
FROM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

AASHTO LRFD Figure 10.4.6.4-1 — Determination of GSI for Jointed Rock Mass (Marinos and Hoek, 2000)

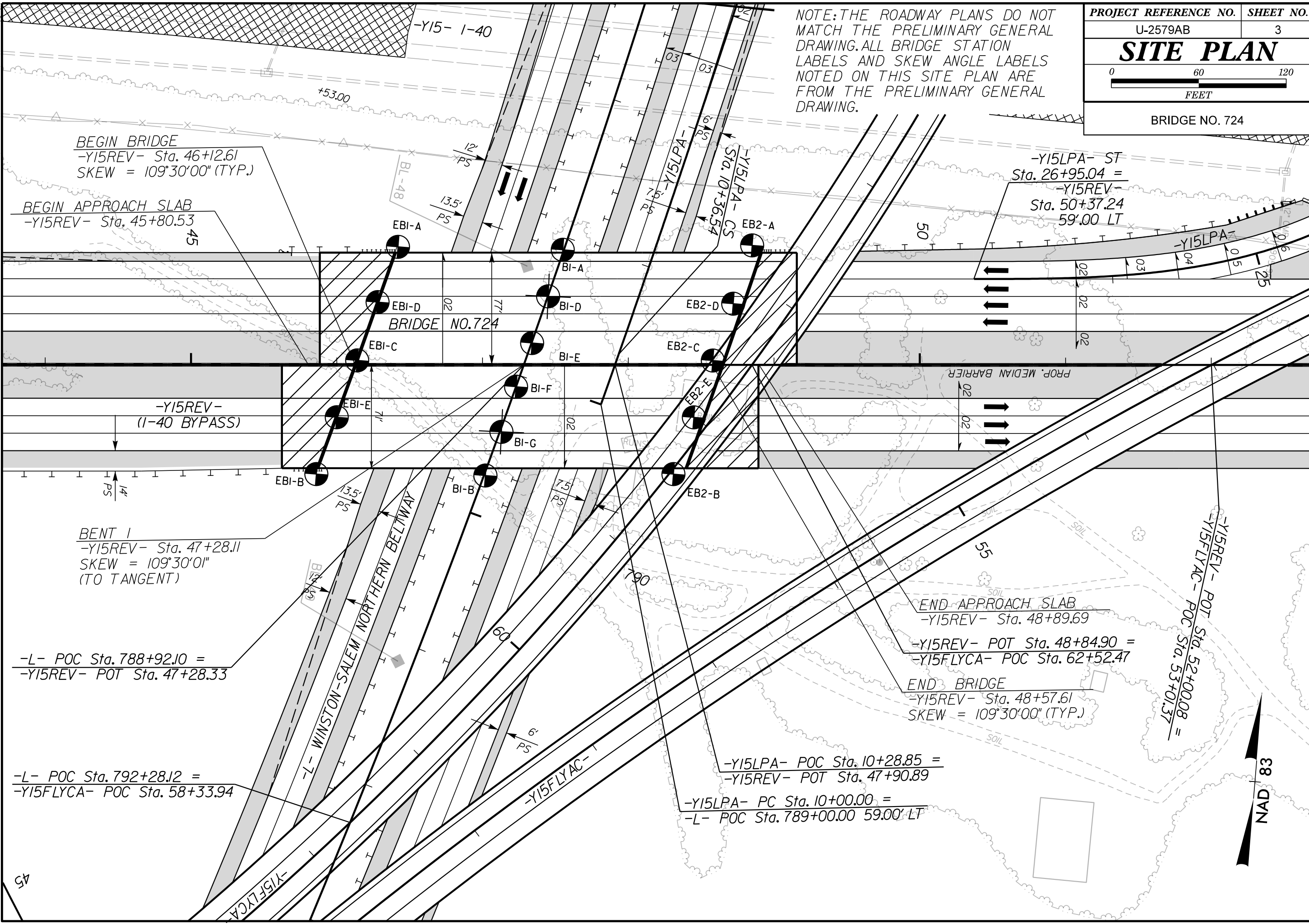
AASHTO LRFD Figure 10.4.6.4-2 — Determination of GSI for Tectonically Deformed Heterogeneous Rock Masses (Marinos and Hoek, 2000)

GEOLOGICAL STRENGTH INDEX (GSI) FOR JOINTED ROCKS (Hoek and Marinos, 2000)		SURFACE CONDITIONS					GSI FOR HETEROGENEOUS ROCK MASSES SUCH AS FLYSCH (Marinos, P and Hoek E., 2000)		SURFACE CONDITIONS OF DISCONTINUITIES (Predominantly bedding planes)					
<p>From the lithology, structure and surface conditions of the discontinuities, estimate the average value of GSI. Do not try to be too precise. Quoting a range from 33 to 37 is more realistic than stating that GSI = 35. Note that the table does not apply to structurally controlled failures. Where weak planar structural planes are present in an unfavorable orientation with respect to the excavation face, these will dominate the rock mass behaviour. The shear strength of surfaces in rocks that are prone to deterioration as a result of changes in moisture content will be reduced if water is present. When working with rocks in the fair to very poor categories, a shift to the right may be made for wet conditions. Water pressure is dealt with by effective stress analysis.</p>		VERY GOOD	GOOD	FAIR	POOR	VERY POOR	<p>From a description of the lithology, structure and surface conditions (particularly of the bedding planes), choose a box in the chart. Locate the position in the box that corresponds to the condition of the discontinuities and estimate the average value of GSI from the contours. Do not attempt to be too precise. Quoting a range from 33 to 37 is more realistic than giving GSI = 35. Note that the Hoek-Brown criterion does not apply to structurally controlled failures. Where unfavourably oriented continuous weak planar discontinuities are present, these will dominate the behaviour of the rock mass. The strength of some rock masses is reduced by the presence of groundwater and this can be allowed for by a slight shift to the right in the columns for fair, poor and very poor conditions. Water pressure does not change the value of GSI and it is dealt with by using effective stress analysis.</p>	VERY GOOD - Very Rough, fresh unweathered surfaces	GOOD - Rough, slightly weathered surfaces	FAIR - Smooth, moderately weathered and altered surfaces	POOR - Very smooth, occasionally slickensided surfaces with compact coatings or fillings with angular fragments	VERY POOR - Very smooth, slickensided or highly weathered surfaces with soft clay coatings or fillings		
		Very rough, fresh unweathered surfaces	Rough, slightly weathered, iron stained surfaces	Smooth, moderately weathered and altered surfaces	Slickensided, highly weathered surfaces with compact coatings or fillings or angular fragments	Slickensided, highly weathered surfaces with soft clay coatings or fillings		Very Rough, fresh unweathered surfaces	Rough, slightly weathered surfaces	Smooth, moderately weathered and altered surfaces	Very smooth, occasionally slickensided surfaces with compact coatings or fillings with angular fragments	Very smooth, slickensided or highly weathered surfaces with soft clay coatings or fillings		
STRUCTURE	DECREASING INTERLOCKING OF ROCK PIECES	DECREASING SURFACE QUALITY →					COMPOSITION AND STRUCTURE							
	INTACT OR MASSIVE - intact rock specimens or massive in situ rock with few widely spaced discontinuities	90			N/A	N/A		A. Thick bedded, very blocky sandstone The effect of pelitic coatings on the bedding planes is minimized by the confinement of the rock mass. In shallow tunnels or slopes these bedding planes may cause structurally controlled instability.	70					
	BLOCKY - well interlocked undisturbed rock mass consisting of cubical blocks formed by three intersecting discontinuity sets	80	70					B. Sandstone with thin inter-layers of siltstone	60					
	VERY BLOCKY - interlocked, partially disturbed mass with multi-faceted angular blocks formed by 4 or more joint sets		60	50				C. Sandstone and siltstone in similar amounts		50				
	BLOCKY/DISTURBED/SEAMY - folded with angular blocks formed by many intersecting discontinuity sets. Persistence of bedding planes or schistosity			40				D. Siltstone or silty shale with sandstone layers			40			
	DISINTEGRATED - poorly interlocked, heavily broken rock mass with mixture of angular and rounded rock pieces				30			E. Weak siltstone or clayey shale with sandstone layers				30		
	LAMINATED/SHEARED - Lack of blockiness due to close spacing of weak schistosity or shear planes					20		F. Tectonically deformed, intensively folded/faulted, sheared clayey shale or siltstone with broken and deformed sandstone layers forming an almost chaotic structure					20	
						10		G. Undisturbed silty or clayey shale with or without a few very thin sandstone layers						10
		N/A	N/A					H. Tectonically deformed silty or clayey shale forming a chaotic structure with pockets of clay. Thin layers of sandstone are transformed into small rock pieces.						

→ Means deformation after tectonic disturbance

PROJECT REFERENCE NO.	SHEET NO.
U-2579AB	3
<b>SITE PLAN</b>	
BRIDGE NO. 724	

NOTE: THE ROADWAY PLANS DO NOT MATCH THE PRELIMINARY GENERAL DRAWING. ALL BRIDGE STATION LABELS AND SKEW ANGLE LABELS NOTED ON THIS SITE PLAN ARE FROM THE PRELIMINARY GENERAL DRAWING.



BEGIN BRIDGE  
-Y15REV- Sta. 46+12.61  
SKEW = 109°30'00" (TYP.)

BEGIN APPROACH SLAB  
-Y15REV- Sta. 45+80.53

-Y15LPA- ST  
Sta. 26+95.04 =  
-Y15REV-  
Sta. 50+37.24  
59.00 LT

-Y15REV-  
(I-40 BYPASS)

BENT 1  
-Y15REV- Sta. 47+28.11  
SKEW = 109°30'01"  
(TO TANGENT)

-L- POC Sta. 788+92.10 =  
-Y15REV- POT Sta. 47+28.33

-L- POC Sta. 792+28.12 =  
-Y15FLYCA- POC Sta. 58+33.94

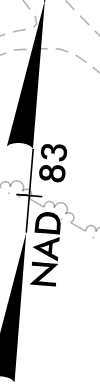
END APPROACH SLAB  
-Y15REV- Sta. 48+89.69

-Y15REV- POT Sta. 48+84.90 =  
-Y15FLYCA- POC Sta. 62+52.47

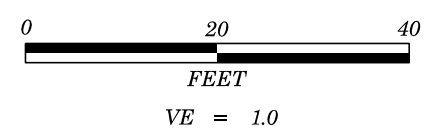
END BRIDGE  
-Y15REV- Sta. 48+57.61  
SKEW = 109°30'00" (TYP.)

-Y15LPA- POC Sta. 10+28.85 =  
-Y15REV- POT Sta. 47+90.89  
-Y15LPA- PC Sta. 10+00.00 =  
-L- POC Sta. 789+00.00 59.00' LT

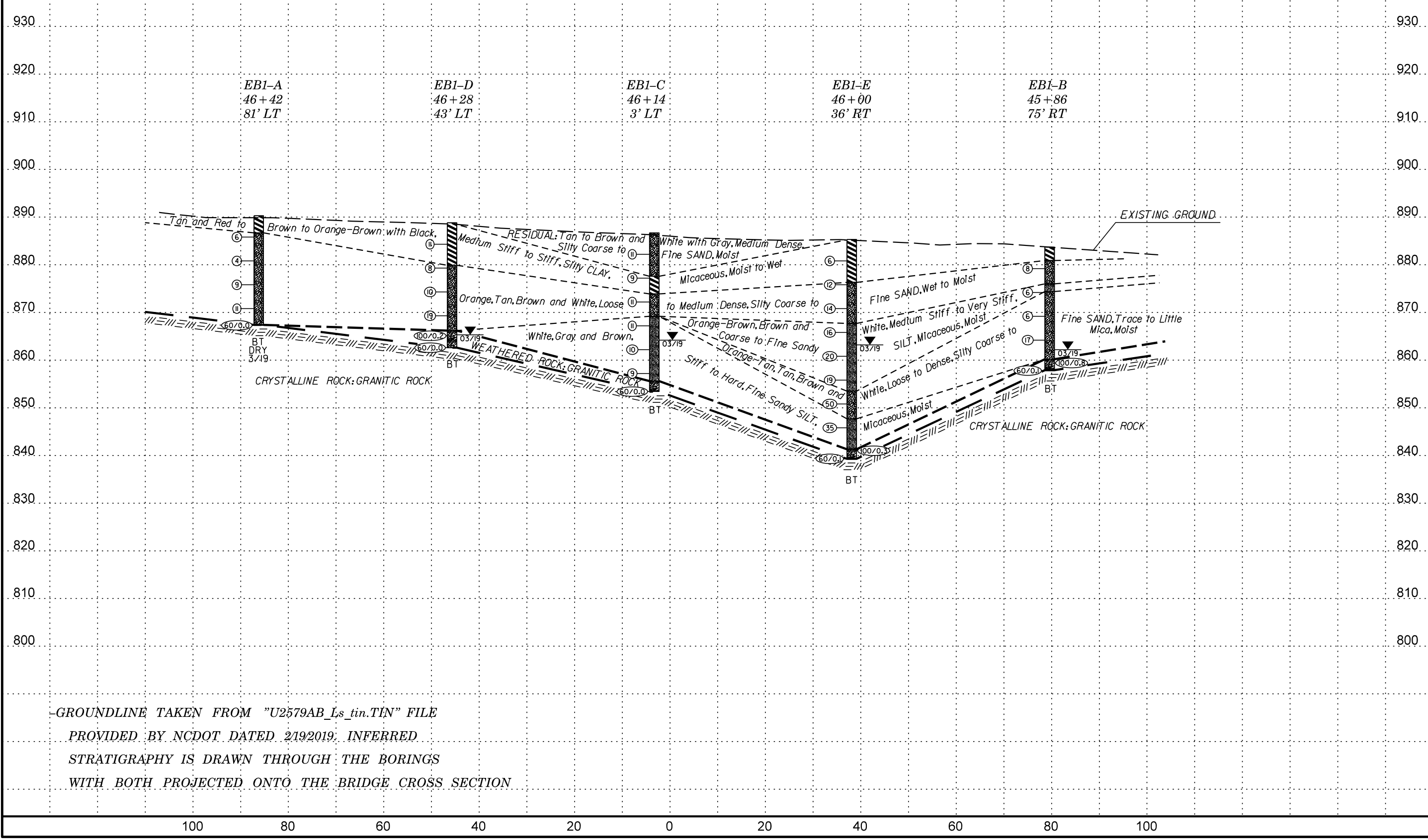
-Y15REV- POT Sta. 52+00.08 =  
-Y15FLYAC- POC Sta. 53+01.37



-Y15REV- STA. 46+12.61

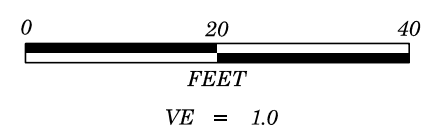


PROJECT REFERENCE NO.	SHEET NO.
U-5979AB	4
SECTION THROUGH END BENT 1 SKEW ANGLE = 109°30'00" (TYP.)	

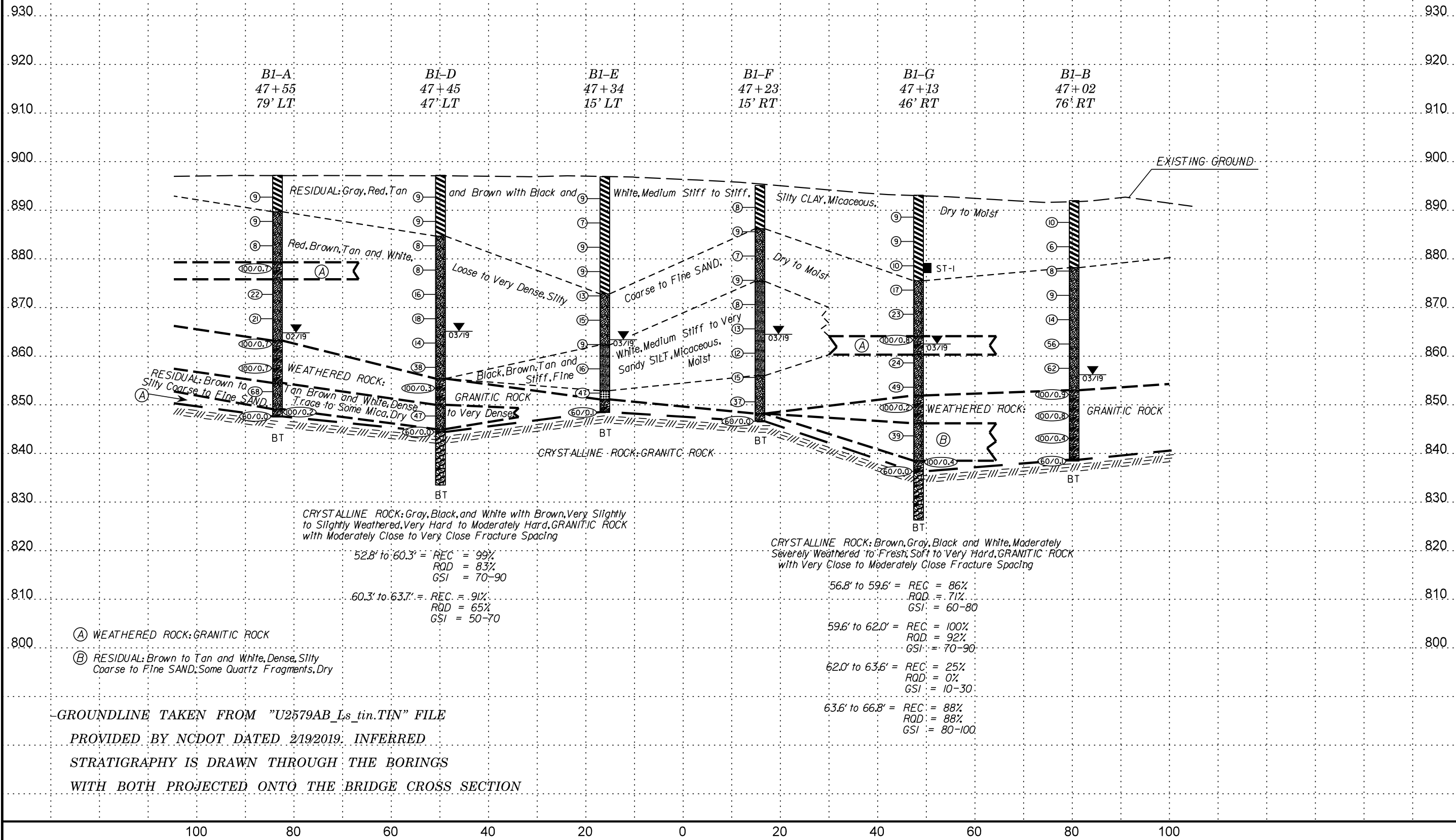


-GROUNDLINE TAKEN FROM "U2579AB\_Ls\_tin.TIN" FILE  
 PROVIDED BY NCDOT DATED 2/19/2019. INFERRED  
 STRATIGRAPHY IS DRAWN THROUGH THE BORINGS  
 WITH BOTH PROJECTED ONTO THE BRIDGE CROSS SECTION

-Y15REV- STA. 47+28.11

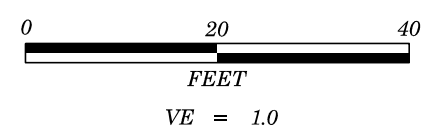


PROJECT REFERENCE NO.	SHEET NO.
U-5979AB	5
SECTION THROUGH BENT 1 SKEW ANGLE = 109°30'01" (TO TANGENT)	

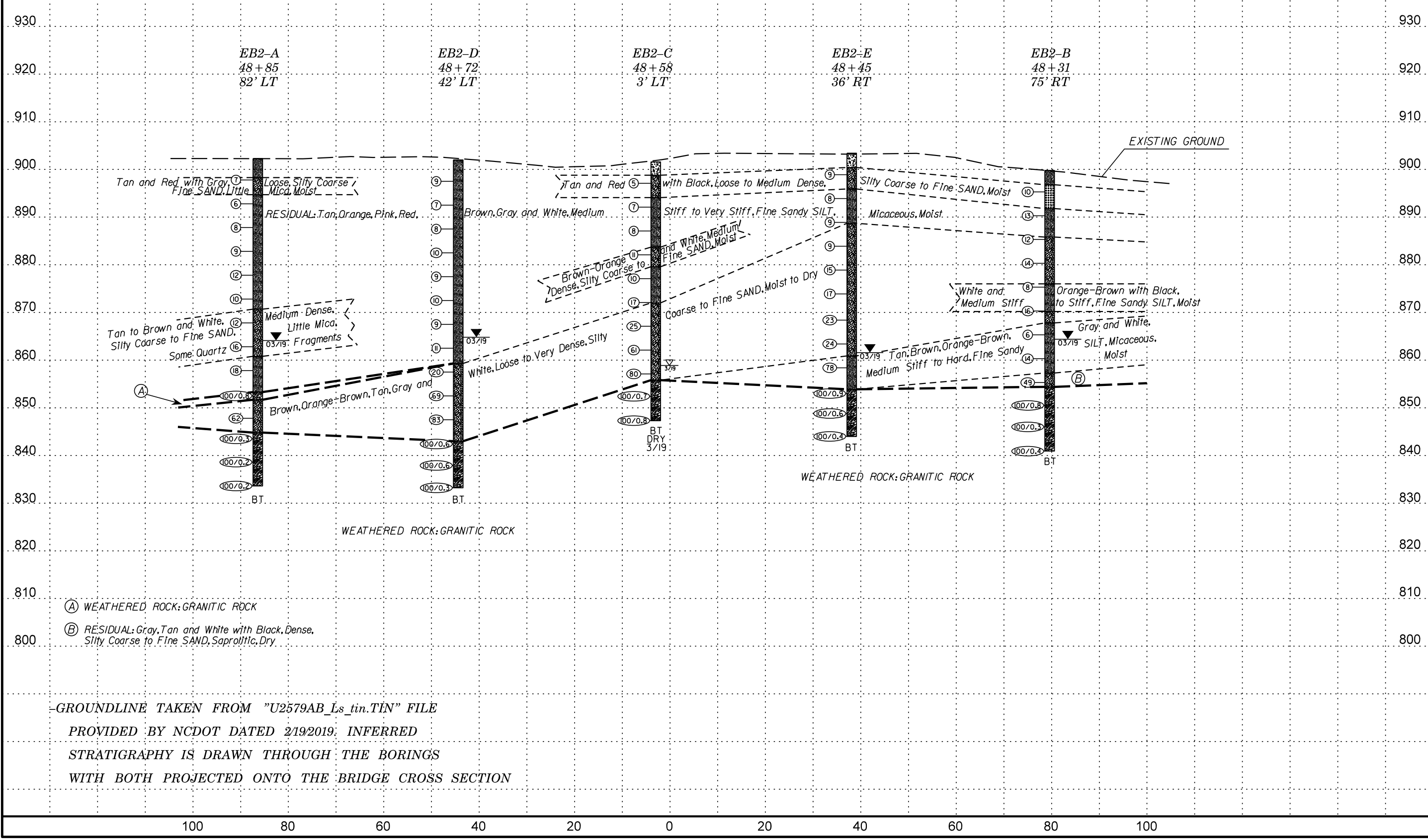


-GROUNDLINE TAKEN FROM "U2579AB\_Ls\_tin.TIN" FILE  
 PROVIDED BY NCDOT DATED 2/19/2019. INFERRED  
 STRATIGRAPHY IS DRAWN THROUGH THE BORINGS  
 WITH BOTH PROJECTED ONTO THE BRIDGE CROSS SECTION

-Y15REV- STA. 48+57.61



<b>PROJECT REFERENCE NO.</b>	<b>SHEET NO.</b>
U-5979AB	6
SECTION THROUGH END BENT 2 SKEW ANGLE = 109°30'00" (TYP.)	



- (A) WEATHERED ROCK: GRANITIC ROCK
- (B) RESIDUAL: Gray, Tan and White with Black, Dense, Silty Coarse to Fine SAND, Saprottic, Dry

-GROUNDLINE TAKEN FROM "U2579AB\_Ls\_tin.TIN" FILE  
 PROVIDED BY NCDOT DATED 2/19/2019; INFERRED  
 STRATIGRAPHY IS DRAWN THROUGH THE BORINGS  
 WITH BOTH PROJECTED ONTO THE BRIDGE CROSS SECTION

100 80 60 40 20 0 20 40 60 80 100



# GEOTECHNICAL BORING REPORT

## BORE LOG

<b>WBS</b> 34839.1.8		<b>TIP</b> U-2579AB		<b>COUNTY</b> FORSYTH		<b>GEOLOGIST</b> Weaver, P.M.									
<b>SITE DESCRIPTION</b> Bridge No. 724 on -Y15REV- (I-40 Bypass) over -L- (Winston-Salem Beltway)							<b>GROUND WTR (ft)</b>								
<b>BORING NO.</b> EB1-A		<b>STATION</b> 46+42		<b>OFFSET</b> 81 ft LT		<b>ALIGNMENT</b> -Y15REV-									
<b>COLLAR ELEV.</b> 890.3 ft		<b>TOTAL DEPTH</b> 23.0 ft		<b>NORTHING</b> 848,023		<b>EASTING</b> 1,663,821									
<b>DRILL RIG/HAMMER EFF./DATE</b> RD285584 CME-45C 84% 03/18/2019			<b>DRILL METHOD</b> H.S. Augers			<b>HAMMER TYPE</b> Automatic									
<b>DRILLER</b> Seiler, M.		<b>START DATE</b> 03/18/19		<b>COMP. DATE</b> 03/18/19		<b>SURFACE WATER DEPTH</b> N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
895															
890														890.3	GROUND SURFACE 0.0
															RESIDUAL Red, Silty CLAY, Micaceous, Wet
885	886.8	3.5	2	3	3								W	886.7	3.6
															Tan, Brown, and White, Silty Coarse to Fine SAND, Little to Trace Mica
880	881.8	8.5	3	2	2								M		
875	876.8	13.5	5	5	4								M		
870	871.8	18.5	5	5	6								M		
	867.3	23.0	60/0.0			60/0.0									
														867.4	22.9
														867.3	23.0
															CRYSTALLINE ROCK GRANITIC ROCK Boring Terminated with Standard Penetration Test Refusal at Elevation 867.3 ft in Crystalline Rock: GRANITIC ROCK

<b>WBS</b> 34839.1.8		<b>TIP</b> U-2579AB		<b>COUNTY</b> FORSYTH		<b>GEOLOGIST</b> Weaver, P.M.										
<b>SITE DESCRIPTION</b> Bridge No. 724 on -Y15REV- (I-40 Bypass) over -L- (Winston-Salem Beltway)							<b>GROUND WTR (ft)</b>									
<b>BORING NO.</b> EB1-D		<b>STATION</b> 46+28		<b>OFFSET</b> 43 ft LT		<b>ALIGNMENT</b> -Y15REV-										
<b>COLLAR ELEV.</b> 888.8 ft		<b>TOTAL DEPTH</b> 26.2 ft		<b>NORTHING</b> 847,984		<b>EASTING</b> 1,663,810										
<b>DRILL RIG/HAMMER EFF./DATE</b> RD285584 CME-45C 84% 03/18/2019			<b>DRILL METHOD</b> H.S. Augers			<b>HAMMER TYPE</b> Automatic										
<b>DRILLER</b> Seiler, M.		<b>START DATE</b> 03/18/19		<b>COMP. DATE</b> 03/18/19		<b>SURFACE WATER DEPTH</b> N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
890																
														888.8	GROUND SURFACE 0.0	
															RESIDUAL Tan and Red, Silty CLAY, Little Mica	
885	885.3	3.5	3	5	6								M			
880	880.3	8.5	3	4	4								M	879.9	8.9	
															Brown to Tan and White, Silty Coarse to Fine SAND, Trace Mica, Saprolitic with Some Quartz Fragments in Sample at 18.5'	
875	875.3	13.5	5	5	5								M			
870	870.3	18.5	7	9	10								D			
865	865.3	23.5	100/0.2			100/0.2									866.2	22.6
	862.6	26.2	60/0.0			60/0.0									862.6	26.2
															WEATHERED ROCK GRANITIC ROCK	
															Boring Terminated with Standard Penetration Test Refusal at Elevation 862.6 ft on Crystalline Rock: GRANITIC ROCK	

NCDOT BORE DOUBLE U2579AB\_BRIDGE330724\_GINT LOGS.GPJ NC\_DOT\_GDT 5/13/19



# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 34839.1.8		TIP U-2579AB		COUNTY FORSYTH		GEOLOGIST Weaver, P.M.									
SITE DESCRIPTION Bridge No. 724 on -Y15REV- (I-40 Bypass) over -L- (Winston-Salem Beltway)							GROUND WTR (ft)								
BORING NO. EB1-C		STATION 46+14		OFFSET 3 ft LT		ALIGNMENT -Y15REV-									
COLLAR ELEV. 886.7 ft		TOTAL DEPTH 33.3 ft		NORTHING 847,943		EASTING 1,663,799									
DRILL RIG/HAMMER EFF./DATE RD285584 CME-45C 84% 03/18/2019				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER Seiler, M.		START DATE 03/18/19		COMP. DATE 03/18/19		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					
890															
885	883.2	3.5	3	6	5									886.7	GROUND SURFACE 0.0
880	878.2	8.5	4	5	4									877.6	RESIDUAL Tan to Brown and White with Gray, Silty Coarse to Fine SAND
875	873.2	13.5	4	5	6									873.9	Tan and Brown, Silty CLAY, Micaceous
870	868.2	18.5	3	6	5									869.2	Tan, Brown and White with Gray, Silty Coarse to Fine SAND, Trace Quartz Fragments
865	863.2	23.5	4	4	6									869.2	White, Gray and Brown, Fine Sandy SILT, Micaceous
860	858.2	28.5	3	3	6									855.6	
855	853.4	33.3												853.4	WEATHERED ROCK GRANITIC ROCK
															Boring Terminated with Standard Penetration Test Refusal at Elevation 853.4 ft on Crystalline Rock: GRANITIC ROCK

WBS 34839.1.8		TIP U-2579AB		COUNTY FORSYTH		GEOLOGIST Weaver, P.M.									
SITE DESCRIPTION Bridge No. 724 on -Y15REV- (I-40 Bypass) over -L- (Winston-Salem Beltway)							GROUND WTR (ft)								
BORING NO. EB1-E		STATION 46+00		OFFSET 36 ft RT		ALIGNMENT -Y15REV-									
COLLAR ELEV. 885.3 ft		TOTAL DEPTH 46.0 ft		NORTHING 847,903		EASTING 1,663,789									
DRILL RIG/HAMMER EFF./DATE RD285584 CME-45C 84% 03/18/2019				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER Seiler, M.		START DATE 03/18/19		COMP. DATE 03/18/19		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					
890															
885														885.3	GROUND SURFACE 0.0
880	881.8	3.5	2	3	3										RESIDUAL Orange-Brown to Tan with Black, Silty CLAY, Micaceous
875	876.8	8.5	4	6	6									876.3	Brown, Tan and White, Silty Coarse to Fine SAND, Little Quartz Fragments
870	871.8	13.5	7	7	7									867.7	Brown and White, Coarse to Fine Sandy SILT, Micaceous, Saprolitic in Sample at 28.5'
865	866.8	18.5	6	8	8									867.7	
860	861.8	23.5	6	7	13									853.5	Tan and White, Silty Coarse to Fine SAND, Trace Mica, Saprolitic
855	856.8	28.5	6	8	11									847.7	Brown and White, Fine Sandy SILT, Micaceous, Saprolitic
850	851.8	33.5	18	22	28									841.3	
845	846.8	38.5	16	18	17									839.4	WEATHERED ROCK GRANITIC ROCK
840	841.8	43.5	17	100/0.3										839.3	CRYSTALLINE ROCK GRANITIC ROCK
	839.4	45.9												839.3	Boring Terminated with Standard Penetration Test Refusal at Elevation 839.3 ft in Crystalline Rock: GRANITIC ROCK

NCDOT BORE DOUBLE U2579AB\_BRDGE330724\_GINT LOGS.GPJ NC\_DOT\_GDT 5/13/19

# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 34839.1.8		TIP U-2579AB		COUNTY FORSYTH		GEOLOGIST Weaver, P.M.										
SITE DESCRIPTION Bridge No. 724 on -Y15REV- (I-40 Bypass) over -L- (Winston-Salem Beltway)							GROUND WTR (ft)									
BORING NO. EB1-B		STATION 45+86		OFFSET 75 ft RT		ALIGNMENT -Y15REV-										
COLLAR ELEV. 883.7 ft		TOTAL DEPTH 25.9 ft		NORTHING 847,863		EASTING 1,663,778										
DRILL RIG/HAMMER EFF./DATE RD285584 CME-45C 84% 03/18/2019				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Seiler, M.		START DATE 03/18/19		COMP. DATE 03/18/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			ELEV. (ft)	DEPTH (ft)		
885														883.7	0.0	GROUND SURFACE
														880.9	2.8	<b>RESIDUAL</b> Tan and Red, Silty CLAY, Moist
880	880.2	3.5	3	4	4							M				Orange, Tan and White, Silty Coarse to Fine SAND, Little Mica
														876.0	7.7	Orange-Brown and Brown, Fine Sandy SILT, Micaceous
875	875.2	8.5	3	3	3							M		874.4	9.3	Orange-Tan, Brown and White, Silty Coarse to Fine SAND, Trace to Little Mica
870	870.2	13.5	3	3	3							M				
865	865.2	18.5	5	10	7							M				
860	860.2	23.5	30	70/0.3								M		860.2	23.5	<b>WEATHERED ROCK</b> GRANITIC ROCK
														857.9	25.8	<b>CRYSTALLINE ROCK</b> GRANITIC ROCK
	857.9	25.8	60/0.1											857.8	25.9	Boring Terminated with Standard Penetration Test Refusal at Elevation 857.8 ft in Crystalline Rock: GRANITIC ROCK

NCDOT BORE DOUBLE U2579AB\_BRDGE330724\_GINT LOGS.GPJ NC\_DOT\_GDT 5/13/19

# GEOTECHNICAL BORING REPORT

## BORE LOG

<b>WBS</b> 34839.1.8	<b>TIP</b> U-2579AB	<b>COUNTY</b> FORSYTH	<b>GEOLOGIST</b> Pastrana, C.R.
<b>SITE DESCRIPTION</b> Bridge No. 724 on -Y15REV- (I-40 Bypass) over -L- (Winston-Salem Beltway)			<b>GROUND WTR (ft)</b>
<b>BORING NO.</b> B1-A	<b>STATION</b> 47+55	<b>OFFSET</b> 79 ft LT	<b>ALIGNMENT</b> -Y15REV-
<b>COLLAR ELEV.</b> 897.2 ft	<b>TOTAL DEPTH</b> 49.6 ft	<b>NORTHING</b> 848,030	<b>EASTING</b> 1,663,934
<b>DRILL RIG/HAMMER EFF./DATE</b> RD285584 CME-45C 84% 03/18/2019		<b>DRILL METHOD</b> H.S. Augers	<b>HAMMER TYPE</b> Automatic
<b>DRILLER</b> Seiler, M.	<b>START DATE</b> 03/20/19	<b>COMP. DATE</b> 03/20/19	<b>SURFACE WATER DEPTH</b> N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			ELEV. (ft)	DEPTH (ft)		
900														897.2	0.0	GROUND SURFACE
895	893.7	3.5	3	4	5	1	1	1	1	1		M	RESIDUAL Red-Brown to Tan-Brown to Brown, Silty CLAY, Micaceous			
890	888.7	8.5	4	4	5	1	1	1	1	1		D	Tan-Brown, Silty Coarse to Fine SAND	889.7	7.5	
885	883.7	13.5	5	4	4	1	1	1	1	1		D				
880	878.7	18.5	44	56/0.2		1	1	1	1	100/0.7		D	WEATHERED ROCK GRANITIC ROCK	879.3	17.9	
875	873.7	23.5	17	12	10	1	1	1	1			D	TRIASSIC RESIDUAL Tan, Brown and White, Silty Coarse to Fine SAND, Trace Mica	875.8	21.4	
870	868.7	28.5	5	10	11	1	1	1	1			D				
865	863.7	33.5	39	55	45/0.2	1	1	1	1	100/0.7		D	WEATHERED ROCK GRANITIC ROCK	863.2	34.0	
860	858.7	38.5	36	62	38/0.2	1	1	1	1	100/0.7		D				
855	853.7	43.5	25	31	37	1	1	1	1			D	TRIASSIC RESIDUAL White and Brown, Silty Coarse to Fine SAND, Trace Mica	854.5	42.7	
850	848.7	48.5				1	1	1	1			D		849.1	48.1	
	847.6	49.6	100/0.2			1	1	1	1	100/0.2		D	WEATHERED ROCK GRANITIC ROCK	847.6	49.6	
			60/0.0							60/0.0			Boring Terminated with Standard Penetration Test Refusal at Elevation 847.6 ft on Crystalline Rock: GRANITIC ROCK			

NCDOT BORE DOUBLE U2579AB\_BRDGE330724\_GINT LOGS.GPJ NC\_DOT\_GDT 5/13/19

# GEOTECHNICAL BORING REPORT BORE LOG

SHEET 11

WBS 34839.1.8		TIP U-2579AB		COUNTY FORSYTH		GEOLOGIST Pastrana, C.R.								
SITE DESCRIPTION Bridge No. 724 on -Y15REV- (I-40 Bypass) over -L- (Winston-Salem Beltway)						GROUND WTR (ft)								
BORING NO. B1-D		STATION 47+45		OFFSET 47 ft LT		ALIGNMENT -Y15REV-								
COLLAR ELEV. 897.2 ft		TOTAL DEPTH 63.7 ft		NORTHING 847,997		EASTING 1,663,927								
DRILL RIG/HAMMER EFF./DATE RD285584 CME-45C 84% 03/18/2019		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Seiler, M.		START DATE 03/20/19		COMP. DATE 03/21/19		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	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75					
900													897.2	0.0
													GROUND SURFACE	
895	893.7	3.5	4	4	5							M	RESIDUAL Red-Brown to Tan-Brown and Red, Silty CLAY, Micaceous, Some Rock Fragments	
890	888.7	8.5	5	4	5							D		
885	883.7	13.5	5	4	4							D	884.7	12.5
880	878.7	18.5	4	4	4							D	Tan-Brown and White, Silty Coarse to Fine SAND, Trace Mica	
875	873.7	23.5	6	7	9							D		
870	868.7	28.5	6	9	9							M		
865	863.7	33.5	4	6	8							M		
860	858.7	38.5	8	15	23							M		
855	853.7	43.5	100/0.3										855.4	41.8
													WEATHERED ROCK GRANITIC ROCK	
850	848.7	48.5	40	28	19							D	850.0	47.2
													RESIDUAL Brown to Tan-Brown with White, Silty Coarse to Fine SAND, Some Mica	
845	844.4	52.8	60/0.0										845.0	52.2
													844.4	52.8
													WEATHERED ROCK GRANITIC ROCK	
840													836.9	60.3
													CRYSTALLINE ROCK Gray, Black and White, Very Slightly Weathered, Hard to Very Hard, GRANITIC ROCK with Close to Moderately Close Fracture Spacing REC=99% RQD=83% GSI=70-90	
835													833.5	63.7
													White with Gray and Brown, Slightly Weathered, Moderately Hard to Hard, GRANITIC ROCK with Very Close to Close Fracture Spacing REC=91% RQD=65% GSI=50-70 Boring Terminated at Elevation 833.5 ft in Crystalline Rock: GRANITIC ROCK	

NCDOT BORE SINGLE U2579AB\_BRIDGE330724\_GINT LOGS.GPJ NC\_DOT.GDT 5/13/19

# GEOTECHNICAL BORING REPORT CORE LOG

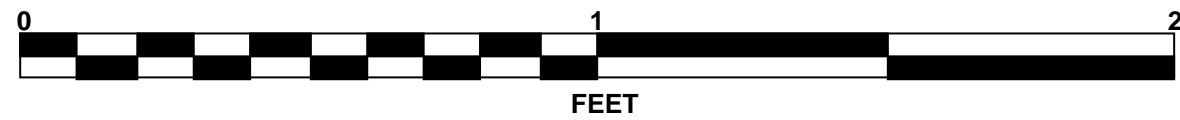
SHEET 11

WBS 34839.1.8		TIP U-2579AB		COUNTY FORSYTH		GEOLOGIST Pastrana, C.R.						
SITE DESCRIPTION Bridge No. 724 on -Y15REV- (I-40 Bypass) over -L- (Winston-Salem Beltway)						GROUND WTR (ft)						
BORING NO. B1-D		STATION 47+45		OFFSET 47 ft LT		ALIGNMENT -Y15REV-						
COLLAR ELEV. 897.2 ft		TOTAL DEPTH 63.7 ft		NORTHING 847,997		EASTING 1,663,927						
DRILL RIG/HAMMER EFF./DATE RD285584 CME-45C 84% 03/18/2019		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic								
DRILLER Seiler, M.		START DATE 03/20/19		COMP. DATE 03/21/19		SURFACE WATER DEPTH N/A						
CORE SIZE NQ		TOTAL RUN 10.9 ft										
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC (ft) %	RQD (ft) %	SAMP. NO.	STRATA REC (ft) %	RQD (ft) %	L O G	DESCRIPTION AND REMARKS	DEPTH (ft)
844.4	844.4	52.8	3.9	1:48/1.0 1:33/1.0 2:01/1.0 1:20/0.9	(3.8) 97%	(3.0) 77%		(7.4) 99%	(6.2) 83%		Begin Coring @ 52.8 ft	52.8
840	840.5	56.7	5.0	1:43/1.0 1:16/1.0 1:25/1.0 1:34/1.0 1:39/1.0	(5.0) 100%	(4.4) 88%					Gray, Black and White, Very Slightly Weathered, Hard to Very Hard, GRANITIC ROCK with Close to Moderately Close Fracture Spacing Some foliation at 30 degrees to 80 degrees Three areas <0.16' thick with very close fracture spacing Isolated iron staining of fracture faces GSI=70-90	60.3
835	835.5	61.7	2.0	2:08/1.0 1:27/1.0	(1.7) 85%	(1.0) 50%		(3.1) 91%	(2.2) 65%		White with Gray and Brown, Slightly Weathered, Moderately Hard to Hard, GRANITIC ROCK with Very Close to Close Fracture Spacing Iron staining and micaceous silt on fracture faces Core loss occurred at end of run GSI=50-70	63.7
											Boring Terminated at Elevation 833.5 ft in Crystalline Rock: GRANITIC ROCK	

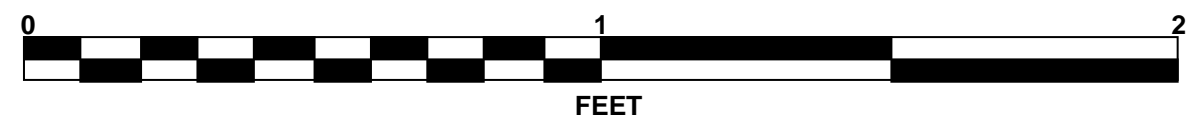
NCDOT BORE SINGLE U2579AB\_BRIDGE330724\_GINT LOGS.GPJ NC\_DOT.GDT 5/13/19

# CORE PHOTOGRAPHS

**B1-D**  
BOX 1: 52.8 - 61.7 FEET



**B1-D**  
BOX 2: 61.7 - 63.7 FEET



# GEOTECHNICAL BORING REPORT

## BORE LOG

<b>WBS</b> 34839.1.8	<b>TIP</b> U-2579AB	<b>COUNTY</b> FORSYTH	<b>GEOLOGIST</b> Weaver, P.M.
<b>SITE DESCRIPTION</b> Bridge No. 724 on -Y15REV- (I-40 Bypass) over -L- (Winston-Salem Beltway)			<b>GROUND WTR (ft)</b>
<b>BORING NO.</b> B1-E	<b>STATION</b> 47+34	<b>OFFSET</b> 15 ft LT	<b>ALIGNMENT</b> -Y15REV-
<b>COLLAR ELEV.</b> 896.9 ft	<b>TOTAL DEPTH</b> 48.5 ft	<b>NORTHING</b> 847,964	<b>EASTING</b> 1,663,918
<b>DRILL RIG/HAMMER EFF./DATE</b> RD285584 CME-45C 84% 03/18/2019		<b>DRILL METHOD</b> H.S. Augers	<b>HAMMER TYPE</b> Automatic
<b>DRILLER</b> Seiler, M.	<b>START DATE</b> 03/19/19	<b>COMP. DATE</b> 03/19/19	<b>SURFACE WATER DEPTH</b> 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				
900														
896.9													GROUND SURFACE	0.0
895	893.4	3.5	4	4	5							M	RESIDUAL Tan, Red to Red-Brown with Black and White, Silty CLAY, Micaceous	
890	888.4	8.5	3	3	4							M		
885	883.4	13.5	4	5	4							M		
880	878.4	18.5	3	4	5							M		
875	873.4	23.5	4	6	7							M		
870	868.4	28.5	4	7	8							M		
865	863.4	33.5	3	4	5							W		
860	858.4	38.5	5	8	8							M	Black, Brown, Tan, Orange-Brown and White, Fine Sandy SILT, Micaceous	34.6
855	853.4	43.5	9	18	29							M		
850	848.5	48.4										M	Black, Brown and White, Silty Fine SAND, Micaceous	44.0
													WEATHERED ROCK GRANITIC ROCK	45.8
													WEATHERED ROCK GRANITIC ROCK	48.4
													CRYSTALLINE ROCK GRANITIC ROCK	48.5
													Boring Terminated with Standard Penetration Test Refusal at Elevation 848.4 ft in Crystalline Rock: GRANITIC ROCK	

<b>WBS</b> 34839.1.8	<b>TIP</b> U-2579AB	<b>COUNTY</b> FORSYTH	<b>GEOLOGIST</b> Weaver, P.M.
<b>SITE DESCRIPTION</b> Bridge No. 724 on -Y15REV- (I-40 Bypass) over -L- (Winston-Salem Beltway)			<b>GROUND WTR (ft)</b>
<b>BORING NO.</b> B1-F	<b>STATION</b> 47+23	<b>OFFSET</b> 15 ft RT	<b>ALIGNMENT</b> -Y15REV-
<b>COLLAR ELEV.</b> 895.1 ft	<b>TOTAL DEPTH</b> 48.5 ft	<b>NORTHING</b> 847,933	<b>EASTING</b> 1,663,910
<b>DRILL RIG/HAMMER EFF./DATE</b> RD285584 CME-45C 84% 03/18/2019		<b>DRILL METHOD</b> H.S. Augers	<b>HAMMER TYPE</b> Automatic
<b>DRILLER</b> Seiler, M.	<b>START DATE</b> 03/19/19	<b>COMP. DATE</b> 03/19/19	<b>SURFACE WATER DEPTH</b> 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				
900														
895.1													GROUND SURFACE	0.0
895	891.6	3.5	4	4	4							M	RESIDUAL Tan and Red with Black and White, Silty CLAY, Little Mica	
890	886.6	8.5	5	5	4							M		
885	881.6	13.5	4	3	4							M	Tan and White, Silty Coarse to Fine SAND, Trace Mica, Little Quartz Fragments in Sample at 13.5 Feet	8.9
880	876.6	18.5	4	5	4							M		
875	871.6	23.5	3	4	4							M	Black, Red-Brown to Orange-Brown, Tan and White, Fine Sandy SILT, Micaceous	19.7
870	866.6	28.5	3	6	7							M		
865	861.6	33.5	3	5	7							M		
860	856.6	38.5	6	7	8							M		
855	851.6	43.5	7	13	24							M	Brown to Tan and White, Silty Coarse to Fine SAND, Some Quartz Fragments, Trace Mica	39.1
850	846.6	48.5										M		
													WEATHERED ROCK GRANITIC ROCK	46.9
													WEATHERED ROCK GRANITIC ROCK	48.5
													Boring Terminated with Standard Penetration Test Refusal at Elevation 846.6 ft on Crystalline Rock: GRANITIC ROCK	

NCDOT BORE DOUBLE U2579AB\_BRDGE330724\_GINT LOGS.GPJ NC\_DOT\_GDT 5/13/19

# GEOTECHNICAL BORING REPORT

## BORE LOG

<b>WBS</b> 34839.1.8	<b>TIP</b> U-2579AB	<b>COUNTY</b> FORSYTH	<b>GEOLOGIST</b> Weaver, P.M.
<b>SITE DESCRIPTION</b> Bridge No. 724 on -Y15REV- (I-40 Bypass) over -L- (Winston-Salem Beltway)			<b>GROUND WTR (ft)</b>
<b>BORING NO.</b> B1-G	<b>STATION</b> 47+13	<b>OFFSET</b> 46 ft RT	<b>ALIGNMENT</b> -Y15REV-
<b>COLLAR ELEV.</b> 893.1 ft	<b>TOTAL DEPTH</b> 66.8 ft	<b>NORTHING</b> 847,902	<b>EASTING</b> 1,663,902
<b>DRILL RIG/HAMMER EFF./DATE</b> RD285584 CME-45C 84% 03/18/2019		<b>DRILL METHOD</b> H.S. Augers	<b>HAMMER TYPE</b> Automatic
<b>DRILLER</b> Seiler, M.	<b>START DATE</b> 03/19/19	<b>COMP. DATE</b> 03/21/19	<b>SURFACE WATER DEPTH</b> N/A

<b>WBS</b> 34839.1.8	<b>TIP</b> U-2579AB	<b>COUNTY</b> FORSYTH	<b>GEOLOGIST</b> Weaver, P.M.
<b>SITE DESCRIPTION</b> Bridge No. 724 on -Y15REV- (I-40 Bypass) over -L- (Winston-Salem Beltway)			<b>GROUND WTR (ft)</b>
<b>BORING NO.</b> B1-G	<b>STATION</b> 47+13	<b>OFFSET</b> 46 ft RT	<b>ALIGNMENT</b> -Y15REV-
<b>COLLAR ELEV.</b> 893.1 ft	<b>TOTAL DEPTH</b> 66.8 ft	<b>NORTHING</b> 847,902	<b>EASTING</b> 1,663,902
<b>DRILL RIG/HAMMER EFF./DATE</b> RD285584 CME-45C 84% 03/18/2019		<b>DRILL METHOD</b> H.S. Augers	<b>HAMMER TYPE</b> Automatic
<b>DRILLER</b> Seiler, M.	<b>START DATE</b> 03/19/19	<b>COMP. DATE</b> 03/21/19	<b>SURFACE WATER DEPTH</b> N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
895															893.1
															GROUND SURFACE
															<b>RESIDUAL</b> Gray, Tan, Red to Brown and White, Silty CLAY, Micaceous
890	889.6	3.5		4	4	5									
885	884.6	8.5		4	4	5									
880	879.6	13.5		4	4	6									
875	874.6	18.5		7	8	9									
870	869.6	23.5		6	10	13									
865	864.6	28.5		26	54	46/0.3									
860	859.6	33.5		15	14	10									
855	854.6	38.5		15	14	35									
850	849.6	43.5		100/0.2											
845	844.6	48.5		17	22	17									
840	839.6	53.5		11	15	100/0.4									
835	836.3	56.8		60/0.0											
830															

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
815															Match Line
															Fracture Spacing REC=88% RQD=88% GSI=80-100 Boring Terminated at Elevation 826.3 ft in Crystalline Rock: GRANITIC ROCK
															Other Samples: ST-1 (14.0 - 16.0)

NCDOT BORE DOUBLE U2579AB\_BRDGE330724\_GINT LOGS.GPJ NC\_DOT\_GDT 5/13/19



# GEOTECHNICAL BORING REPORT

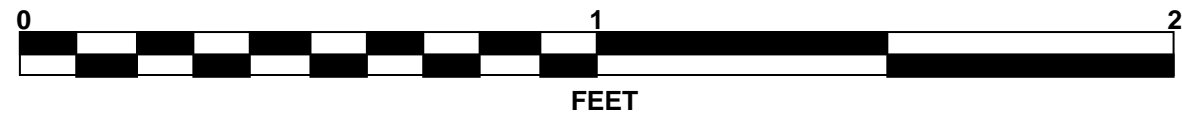
## CORE LOG

WBS 34839.1.8		TIP U-2579AB		COUNTY FORSYTH		GEOLOGIST Weaver, P.M.					
SITE DESCRIPTION Bridge No. 724 on -Y15REV- (I-40 Bypass) over -L- (Winston-Salem Beltway)							GROUND WTR (ft)				
BORING NO. B1-G		STATION 47+13		OFFSET 46 ft RT		ALIGNMENT -Y15REV-					
COLLAR ELEV. 893.1 ft		TOTAL DEPTH 66.8 ft		NORTHING 847,902		EASTING 1,663,902					
DRILL RIG/HAMMER EFF./DATE RD285584 CME-45C 84% 03/18/2019				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic					
DRILLER Seiler, M.		START DATE 03/19/19		COMP. DATE 03/21/19		SURFACE WATER DEPTH N/A					
CORE SIZE NQ		TOTAL RUN 10.0 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	RQD (ft) %	REC. (ft) %	RQD (ft) %			
836.3										Begin Coring @ 56.8 ft	
835	836.3	56.8	5.0	1:34/1.0 1:00/1.0 1:45/1.0 1:21/1.0 1:17/1.0	(4.6) 92%	(4.2) 84%	(2.4) 86%	(2.0) 71%	CRYSTALLINE ROCK	Gray, Black and White, Moderately Severely to Moderately Weathered, Soft to Medium Hard, GRANITIC ROCK with Very Close to Close Fracture Spacing	56.8 59.6
830	831.3	61.8	5.0	0:55/1.0 0:38/1.0 1:36/1.0 1:45/1.0 2:37/1.0	(3.4) 68%	(2.8) 56%	(2.4) 100%	(2.2) 92%	Isolated foliation at 10 degrees to 30 degrees Some mica silt on fracture faces GSI=60-80		62.0 63.6
	826.3	66.8					(0.4) 25%	(0.0) 0%	White with Gray and Brown, Slightly to Very Slightly Weathered, Hard to Very Hard, GRANITIC ROCK with Close to Moderately Close Fracture Spacing No foliation GSI=70-90		66.8
							(2.8) 88%	(2.8) 88%	White, Brown, Black and Gray, Moderately Severely to Moderately Weathered, Soft to Medium Hard, GRANITIC ROCK with Very Close Fracture Spacing GSI=10-30		
									Gray, Black and White, Very Slightly Weathered to Fresh, Hard to Very Hard, GRANITIC ROCK with Moderately Close Fracture Spacing One fracture at 10 degrees Isolated foliateion at 10 degrees to 30 degrees Note: Bottom 0.4' of core not retrieved GSI=80-100		
Boring Terminated at Elevation 826.3 ft in Crystalline Rock: GRANITIC ROCK											
Other Samples: ST-1 (14.0 - 16.0)											

NCDOT CORE DOUBLE U2579AB\_BRDGE330724\_GINT LOGS.GPJ NC\_DOT\_GDT 5/13/19

# CORE PHOTOGRAPHS

**B1-G**  
BOX 1: 56.8 - 66.8 FEET



# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 34839.1.8		TIP U-2579AB		COUNTY FORSYTH		GEOLOGIST Weaver, P.M.										
SITE DESCRIPTION Bridge No. 724 on -Y15REV- (I-40 Bypass) over -L- (Winston-Salem Beltway)							GROUND WTR (ft)									
BORING NO. B1-B		STATION 47+02		OFFSET 76 ft RT		ALIGNMENT -Y15REV-										
COLLAR ELEV. 892.0 ft		TOTAL DEPTH 53.6 ft		NORTHING 847,871		EASTING 1,663,894										
DRILL RIG/HAMMER EFF./DATE RD285584 CME-45C 84% 03/18/2019				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Seiler, M.		START DATE 03/13/19		COMP. DATE 03/13/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			ELEV. (ft)	DEPTH (ft)		
895														892.0	0.0	GROUND SURFACE
890	888.5	3.5	3	4	6	10						M				<b>RESIDUAL</b> Tan and Red-Brown, Silty CLAY, Micaceous
885	883.5	8.5	3	3	3	6						M				
880	878.5	13.5	3	4	4	9						M		878.2	13.8	Brown to Tan and White, Silty Coarse to Fine SAND, Some to Little Quartz Fragments, Little to Trace Mica
875	873.5	18.5	5	5	4	9						M				
870	868.5	23.5	11	8	6	14						D				
865	863.5	28.5	20	28	28	56						D				
860	858.5	33.5	16	29	33	62										
855	853.5	38.5	32	41	59/0.4									853.0	39.0	<b>WEATHERED ROCK</b> GRANITIC ROCK
850	848.5	43.5	25	75/0.3												
845	843.5	48.5	100/0.4													
840	838.5	53.5	60/0.1											838.7 838.4	53.3 53.6	<b>CRYSTALLINE ROCK</b> GRANITIC ROCK Boring Terminated with Standard Penetration Test Refusal at Elevation 838.4 ft in Crystalline Rock: GRANITIC ROCK

NCDOT BORE DOUBLE U2579AB\_BRDGE330724\_GINT LOGS.GPJ NC\_DOT\_GDT 5/13/19

# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 34839.1.8		TIP U-2579AB		COUNTY FORSYTH		GEOLOGIST Weaver, P.M.												
SITE DESCRIPTION Bridge No. 724 on -Y15REV- (I-40 Bypass) over -L- (Winston-Salem Beltway)							GROUND WTR (ft)											
BORING NO. EB2-A		STATION 48+85		OFFSET 82 ft LT		ALIGNMENT -Y15REV-												
COLLAR ELEV. 902.3 ft		TOTAL DEPTH 68.7 ft		NORTHING 848,043		EASTING 1,664,063												
DRILL RIG/HAMMER EFF./DATE RD285584 CME-45C 84% 03/18/2019				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic												
DRILLER Seiler, M.		START DATE 03/14/19		COMP. DATE 03/15/19		SURFACE WATER DEPTH N/A												
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG G	SOIL AND ROCK DESCRIPTION				
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)			
905																902.3	GROUND SURFACE	0.0
900	898.8	3.5	3	3	4								M		898.3	RESIDUAL Red with Tan, Fine Sandy SILT, Wet	4.0	
895	893.8	8.5	2	3	3								M		894.7	Tan and Red with Gray, Silty Coarse to Fine SAND, Little Mica	7.6	
890	888.8	13.5	3	3	5								M			Tan, Red-Brown to Orange-Brown to Red-Orange to Brown and White with Black, Fine Sandy SILT, Micaceous		
885	883.8	18.5	3	4	5								M					
880	878.8	23.5	3	5	7								M					
875	873.8	28.5	3	4	6								M					
870	868.8	33.5	7	5	7								M		870.7	Tan to Brown and White, Silty Coarse to Fine SAND, Little Mica, Some Quartz Fragments in Sample at 38.5 Feet	31.6	
865	863.8	38.5	4	7	9								M					
860	858.8	43.5	5	7	11								M		860.8	Orange-Brown, Brown and White, Fine Sandy SILT, Micaceous	41.5	
855	853.8	48.5	25	45	55/0.3								M		853.3		49.0	
850	848.8	53.5	16	28	34								M		851.7	WEATHERED ROCK GRANITIC ROCK	50.6	
845	843.8	58.5	100/0.3										D		844.8	RESIDUAL Brown, Tan and White, Silty Coarse to Fine SAND	57.5	
840	838.8	63.5	100/0.2													WEATHERED ROCK GRANITIC ROCK Note: Thin crystalline rock layers throughout		
835	833.8	68.5	100/0.2												833.6		68.7	
																Boring Terminated at Elevation 833.6 ft in Weathered Rock: GRANITIC ROCK		

WBS 34839.1.8		TIP U-2579AB		COUNTY FORSYTH		GEOLOGIST Weaver, P.M.												
SITE DESCRIPTION Bridge No. 724 on -Y15REV- (I-40 Bypass) over -L- (Winston-Salem Beltway)							GROUND WTR (ft)											
BORING NO. EB2-D		STATION 48+72		OFFSET 42 ft LT		ALIGNMENT -Y15REV-												
COLLAR ELEV. 902.0 ft		TOTAL DEPTH 68.8 ft		NORTHING 848,002		EASTING 1,664,054												
DRILL RIG/HAMMER EFF./DATE RD285584 CME-45C 84% 03/18/2019				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic												
DRILLER Seiler, M.		START DATE 03/14/19		COMP. DATE 03/14/19		SURFACE WATER DEPTH N/A												
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG G	SOIL AND ROCK DESCRIPTION				
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)			
905																902.0	GROUND SURFACE	0.0
900	898.5	3.5	3	4	5								M			RESIDUAL Red to Pink, Black, Orange-Red, Red-Brown and White, Fine Sandy SILT, Micaceous to Little Mica		
895	893.5	8.5	2	3	4								M					
890	888.5	13.5	2	4	4								M					
885	883.5	18.5	4	5	5								M					
880	878.5	23.5	3	4	5								M					
875	873.5	28.5	3	4	6								M					
870	868.5	33.5	3	4	5								M					
865	863.5	38.5	3	4	7								M					
860	858.5	43.5	6	10	10								M		859.3	Brown to Tan and White, Silty Coarse to Fine SAND, Little to No Mica, Trace Quartz Fragments	42.7	
855	853.5	48.5	19	29	40								M					
850	848.5	53.5	17	31	52								M					
845	843.5	58.5	27	64	36/0.1								M					
840	838.5	63.5	70	30/0.1									M					
835	833.5	68.5	100/0.3										M					
																Boring Terminated at Elevation 833.2 ft in Weathered Rock: GRANITIC ROCK		

NCDOT BORE DOUBLE U2579AB\_BRDGE330724\_GINT LOGS.GPJ\_NC\_DOT\_GDT 5/13/19

# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 34839.1.8		TIP U-2579AB		COUNTY FORSYTH		GEOLOGIST Weaver, P.M.	
SITE DESCRIPTION Bridge No. 724 on -Y15REV- (I-40 Bypass) over -L- (Winston-Salem Beltway)							GROUND WTR (ft)
BORING NO. EB2-C		STATION 48+58		OFFSET 3 ft LT		ALIGNMENT -Y15REV-	
COLLAR ELEV. 901.6 ft		TOTAL DEPTH 54.3 ft		NORTHING 847,962		EASTING 1,664,043	
DRILL RIG/HAMMER EFF./DATE RD285584 CME-45C 84% 03/18/2019			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic	
DRILLER Seiler, M.		START DATE 03/14/19		COMP. DATE 03/14/19		SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						ELEV. (ft)
905																
															901.6	GROUND SURFACE
900															898.8	RESIDUAL Tan and Red, Clayey SILT, Moist
	898.1	3.5	3	2	3								M		898.8	Tan and Red, Silty Coarse to Fine SAND
895															894.1	Tan and Brown, Fine Sandy SILT, Micaceous
	893.1	8.5	3	3	4								M		894.1	Tan and Brown, Fine Sandy SILT, Micaceous
890															888.7	Tan, Brown and White with Gray, Silty Coarse to Fine SAND, Some to Trace Mica, Trace to Some Quartz Fragments
	888.1	13.5	3	4	4								M		888.7	Tan, Brown and White with Gray, Silty Coarse to Fine SAND, Some to Trace Mica, Trace to Some Quartz Fragments
885															883.7	Brown-Orange and White with Gray, Silty Coarse to Fine SAND
	883.1	18.5	6	6	5								M		883.7	Brown-Orange and White with Gray, Silty Coarse to Fine SAND
880															879.6	Gray-Brown and White, Fine Sandy SILT, Micaceous
	878.1	23.5	6	5	5								M		879.6	Gray-Brown and White, Fine Sandy SILT, Micaceous
875															872.0	Tan to Brown, Gray and White, Silty Coarse to Fine SAND, Micaceous, Trace Quartz Fragments in Sample at 38.5', Saprolitic
	873.1	28.5	5	8	9								M		872.0	Tan to Brown, Gray and White, Silty Coarse to Fine SAND, Micaceous, Trace Quartz Fragments in Sample at 38.5', Saprolitic
870															855.8	WEATHERED ROCK GRANITIC ROCK
	868.1	33.5	7	12	13								M		855.8	WEATHERED ROCK GRANITIC ROCK
865															847.3	Boring Terminated at Elevation 847.3 ft in Weathered Rock: GRANITIC ROCK
	863.1	38.5	16	26	35								D		847.3	Boring Terminated at Elevation 847.3 ft in Weathered Rock: GRANITIC ROCK
860																
	858.1	43.5	19	32	48								M			
855																
	853.1	48.5	43	57/0.2												
850																
	848.1	53.5	53	47/0.3												

WBS 34839.1.8		TIP U-2579AB		COUNTY FORSYTH		GEOLOGIST Weaver, P.M.	
SITE DESCRIPTION Bridge No. 724 on -Y15REV- (I-40 Bypass) over -L- (Winston-Salem Beltway)							GROUND WTR (ft)
BORING NO. EB2-E		STATION 48+45		OFFSET 36 ft RT		ALIGNMENT -Y15REV-	
COLLAR ELEV. 903.4 ft		TOTAL DEPTH 59.4 ft		NORTHING 847,922		EASTING 1,664,033	
DRILL RIG/HAMMER EFF./DATE RD285584 CME-45C 84% 03/18/2019			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic	
DRILLER Seiler, M.		START DATE 03/13/19		COMP. DATE 03/13/19		SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						ELEV. (ft)
905																
															903.4	GROUND SURFACE
900															900.4	RESIDUAL Red, Clayey SILT, Moist
	899.9	3.5	4	4	5								M		900.4	Tan and Red, Silty Coarse to Fine SAND, Micaceous
895															895.9	Tan and Red, Fine Sandy SILT, Micaceous
	894.9	8.5	3	3	5								M		895.9	Tan and Red, Fine Sandy SILT, Micaceous
890															888.7	Tan, Brown and White with Gray, Silty Coarse to Fine SAND, Some to Trace Mica, Trace to Some Quartz Fragments
	889.9	13.5	2	3	6								M		888.7	Tan, Brown and White with Gray, Silty Coarse to Fine SAND, Some to Trace Mica, Trace to Some Quartz Fragments
885															883.7	Brown-Orange and White with Gray, Silty Coarse to Fine SAND
	884.9	18.5	4	4	5								M		883.7	Brown-Orange and White with Gray, Silty Coarse to Fine SAND
880															879.6	Gray-Brown and White, Fine Sandy SILT, Micaceous
	879.9	23.5	6	7	8								M		879.6	Gray-Brown and White, Fine Sandy SILT, Micaceous
875															872.0	Tan to Brown, Gray and White, Silty Coarse to Fine SAND, Micaceous, Trace Quartz Fragments in Sample at 38.5', Saprolitic
	874.9	28.5	9	8	9								M		872.0	Tan to Brown, Gray and White, Silty Coarse to Fine SAND, Micaceous, Trace Quartz Fragments in Sample at 38.5', Saprolitic
870															855.8	WEATHERED ROCK GRANITIC ROCK
	869.4	34.0	10	12	11								M		855.8	WEATHERED ROCK GRANITIC ROCK
865															847.3	Boring Terminated at Elevation 847.3 ft in Weathered Rock: GRANITIC ROCK
	864.4	39.0	10	12	12								D		847.3	Boring Terminated at Elevation 847.3 ft in Weathered Rock: GRANITIC ROCK
860																
	859.4	44.0	21	29	49								M			
855																
	854.4	49.0	19	39	61/0.4											
850																
	849.4	54.0	90	10/0.1												
845																
	844.4	59.0	100/0.4													

NCDOT BORE DOUBLE U2579AB\_BRIDGE330724\_GINT LOGS.GPJ\_NC\_DOT.GDT 5/13/19

# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 34839.1.8		TIP U-2579AB		COUNTY FORSYTH		GEOLOGIST Weaver, P.M.										
SITE DESCRIPTION Bridge No. 724 on -Y15REV- (I-40 Bypass) over -L- (Winston-Salem Beltway)							GROUND WTR (ft)									
BORING NO. EB2-B		STATION 48+31		OFFSET 75 ft RT		ALIGNMENT -Y15REV-										
COLLAR ELEV. 899.8 ft		TOTAL DEPTH 58.9 ft		NORTHING 847,882		EASTING 1,664,022										
DRILL RIG/HAMMER EFF./DATE RD285584 CME-45C 84% 03/18/2019				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Seiler, M.		START DATE 03/15/19		COMP. DATE 03/15/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			ELEV. (ft)	DEPTH (ft)		
900														899.8	GROUND SURFACE	0.0
															<b>RESIDUAL</b> Red, Fine Sandy SILT, Moist	
895	896.3	3.5	3	5	5							M		896.8	Tan and Red with Black, Silty Fine SAND, Little Mica	3.0
890	891.3	8.5	4	6	7							M		891.8	White, Brown and Tan, Fine Sandy SILT, Micaceous	8.0
885	886.3	13.5	4	6	6							D		885.8	Tan, Brown and White, Silty Coarse to Fine SAND, Little to Trace Mica	14.0
880	881.3	18.5	4	6	8							D				
875	876.3	23.5	3	4	4							M		876.0	White and Orange-Brown with Black, Fine Sandy SILT	23.8
870	871.3	28.5	3	4	12							D		870.2	White and Orange-Brown, Silty Coarse to Fine SAND	29.6
865	866.3	33.5	2	3	3									867.8	White, Dark Gray, Tan, and Orange-Brown to Brown, Fine Sandy SILT, Micaceous, Saprolitic	32.0
860	861.3	38.5	8	5	9							M				
855	856.3	43.5	15	19	30							D		857.3	Gray, Tan and White with Black, Silty Coarse to Fine SAND, Saprolitic	42.5
850	851.3	48.5	50	50/0.3										854.4	<b>WEATHERED ROCK</b> GRANITIC ROCK	45.4
845	846.3	53.5	100/0.3													
	841.3	58.5	100/0.4											840.9	Boring Terminated at Elevation 840.9 ft in Weathered Rock: GRANITIC ROCK	58.9

NCDOT BORE DOUBLE U2579AB\_BRIDGE330724\_GINT LOGS.GPJ NC\_DOT\_GDT 5/13/19

SOILS LABORATORY TESTS RESULTS

WBS NO.: 34839.1.8

TIP NO.: U-2579AB

COUNTY: Forsyth

SITE DESCRIPTION: Bridge No. 724 on -Y1REV- (I-40 Bypass) over -L- (Winston-Salem Beltway)

BORING NO.	SAMPLE NO.	BORING LOCATION	DEPTH INTERVAL (FT)	AASHTO CLASS	N	L.L	P.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	UNIT WT (pcf)
								CSE. SAND	F. SAND	SILT	CLAY	10	40	200		
B1-G	ST-1	-Y15REV- STA. 47+13, 46' RT	14.0-16.0	A-7-5 (4)	N/A	51	13	31	27	22	20	100	78	47	23	68.3

Signed: 

NCDOT Certification No. 129-04-0411



**SITE PHOTOGRAPHS**  
Bridge No. 724 on -Y15REV- (I-40 Bypass) over -L- (Winston-Salem Beltway)

View of Along End Bent 1 Looking Left to Right



View Along Bent 1 Looking Left to Right



View of Along End Bent 2 Looking Left to Right

