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REFERENCE: U-2579C

PROJECT: 34839

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2579C	1	12

STRUCTURE
SUBSURFACE INVESTIGATION

CONTENTS

SHEET NO.	DESCRIPTION
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COUNTY FORSYTH
PROJECT DESCRIPTION WINSTON SALEM NORTHERN BELTWAY

SITE DESCRIPTION BRIDGE NO. 700 ON -Y1- (US 311 - NEW WALKERTOWN ROAD) OVER -L- (FUTURE I-74)

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 (919) 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 CONTRACTOR 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

C. BUKOVITZ, E.I.

J. BRADSHAW, E.I.

GEOLOGIC EX.

M. BREWER, P.E.

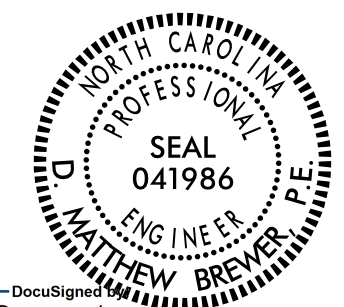
INVESTIGATED BY ECS CAROLINAS, LLP

DRAWN BY M. BREWER, P.E.

CHECKED BY M. WALKO, P.E.

SUBMITTED BY ECS CAROLINAS, LLP

DATE MARCH 2016



DocuSigned by
D. Matthew Brewer

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3/11/2016

SIGNATURE

DATE

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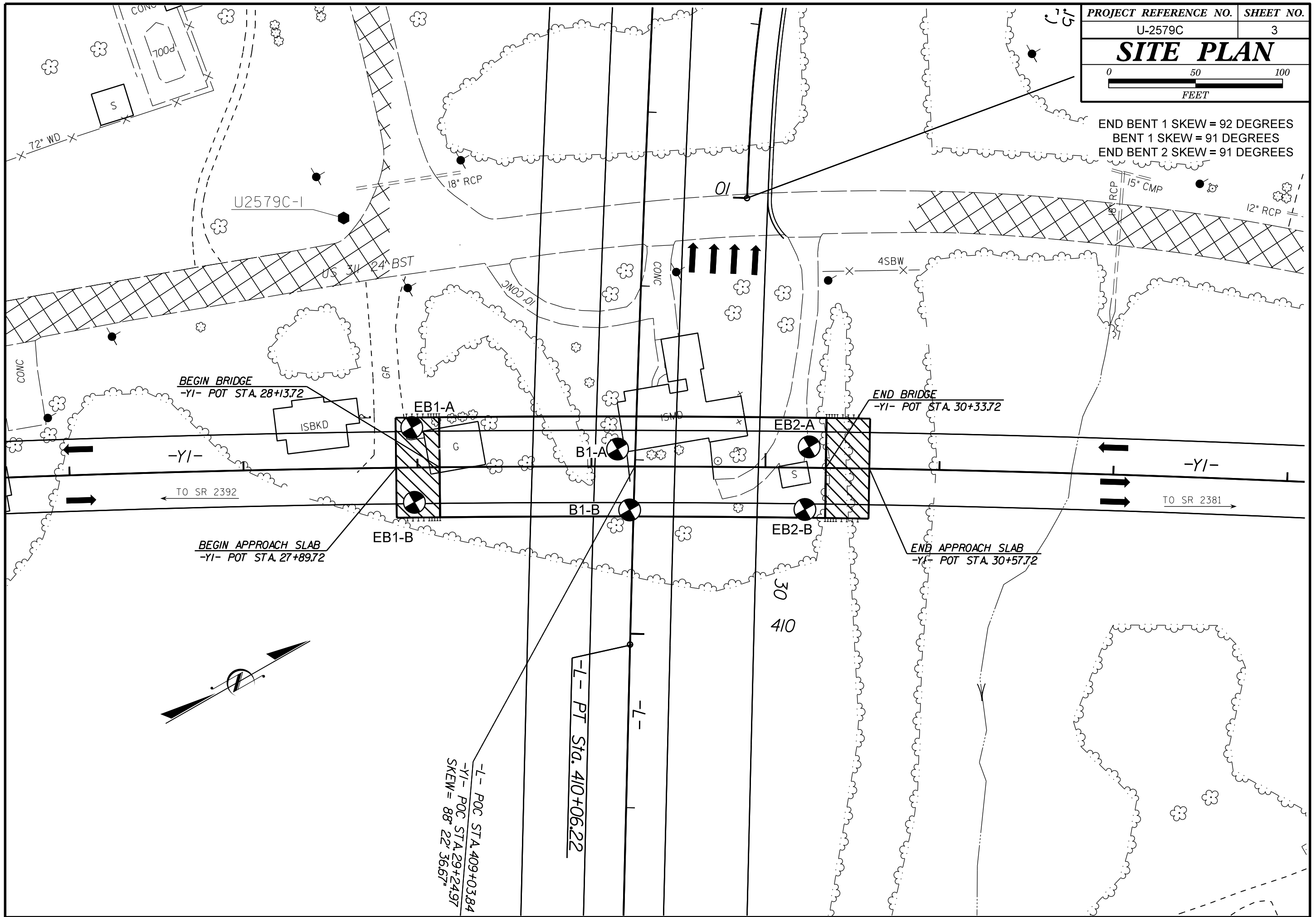
**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS**

SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS
SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, <i>VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i>	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.	HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS: WEATHERED ROCK (WR) NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED. CRYSTALLINE ROCK (CR) FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC. NON-CRYSTALLINE ROCK (NCR) FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC. COASTAL PLAIN SEDIMENTARY ROCK (CP) COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
SOIL LEGEND AND AASHTO CLASSIFICATION	ANGULARITY OF GRAINS THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.	WEATHERING FRESH VERY SLIGHT (V SL.) SLIGHT (SL.) MODERATE (MOD.) MODERATELY SEVERE (MOD. SEV.) SEVERE (SEV.) VERY SEVERE (V SEV.) COMPLETE	
MINERALOGICAL COMPOSITION MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.	COMPRESSION SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50	ROCK HARDNESS VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT	
PERCENTAGE OF MATERIAL	GROUND WATER WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING STATIC WATER LEVEL AFTER 24 HOURS PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA SPRING OR SEEP	RECOMMENDATION SYMBOLS	
CONSISTENCY OR DENSENESS	MISCELLANEOUS SYMBOLS	ABBREVIATIONS	
TEXTURE OR GRAIN SIZE	EQUIPMENT USED ON SUBJECT PROJECT	FRACTURE SPACING	BEDDING
SOIL MOISTURE - CORRELATION OF TERMS		INDURATION	
PLASTICITY			
COLOR			

SITE PLAN



END BENT 1 SKEW = 92 DEGREES
 BENT 1 SKEW = 91 DEGREES
 END BENT 2 SKEW = 91 DEGREES



BEGIN BRIDGE
 -YI- POT STA. 28+13.72

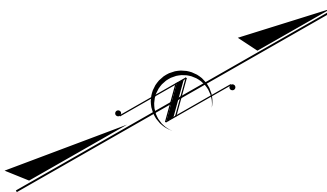
END BRIDGE
 -YI- POT STA. 30+33.72

BEGIN APPROACH SLAB
 -YI- POT STA. 27+89.72

END APPROACH SLAB
 -YI- POT STA. 30+57.72

-L- POC STA. 409+03.84
 -YI- POC STA. 29+24.97
 SKEW = 88° 22' 36.67"

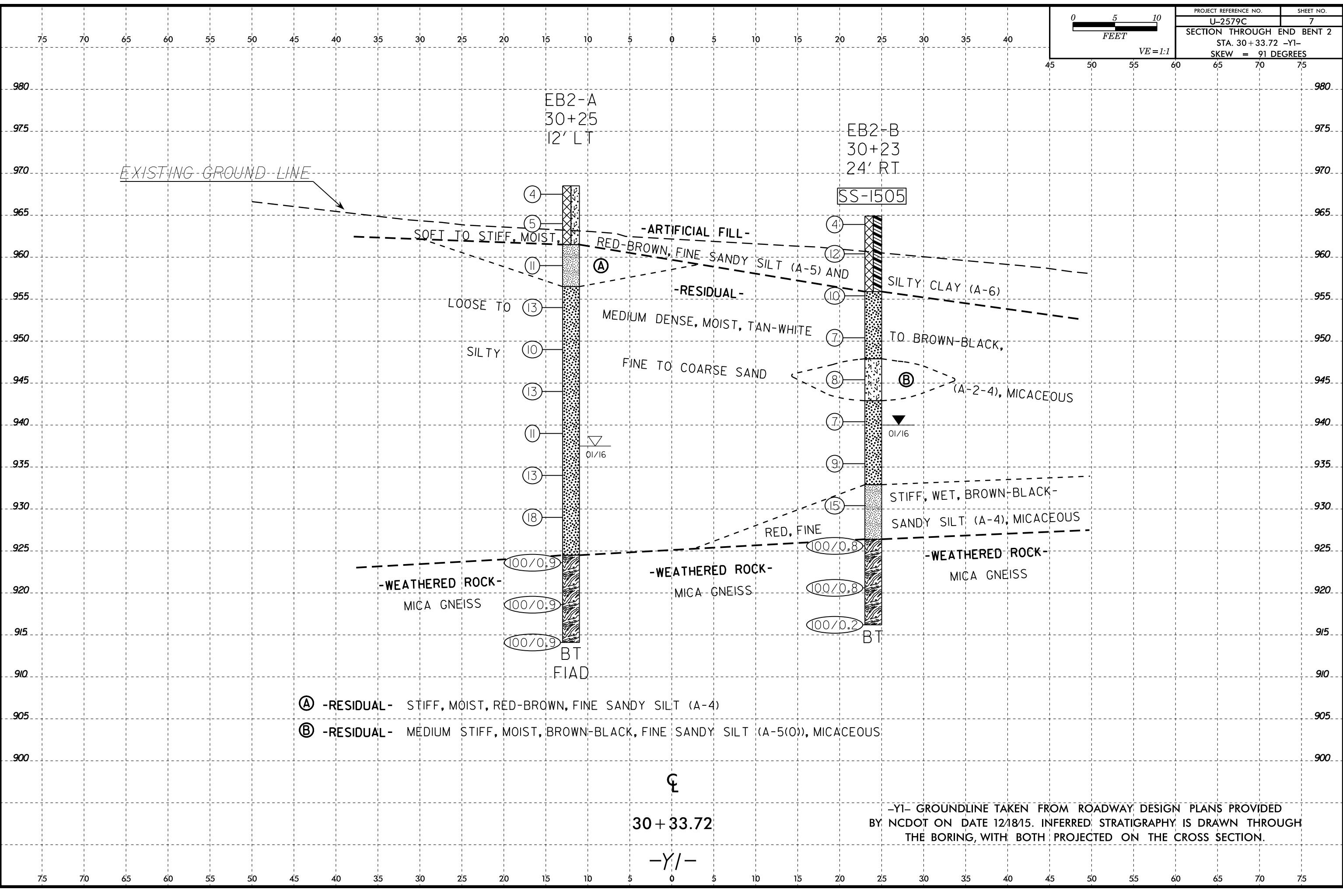
-L- PT Sta. 410+06.22



8/23/99

08-MAR-2016 17:16 I:\2\GEO\TECH\02-PRG\JFC\1511000\11999\11500\11500 - U-2579C BRDG (26410) - Bridge No. 700 - DTR\CADD_GEO\TECH\Site&Sub\U-2579C_Geo_xsi-gj.dgn

PROJECT REFERENCE NO.		SHEET NO.	
U-2579C		7	
SECTION THROUGH END BENT 2			
STA. 30+33.72 -Y1-			
SKEW = 91 DEGREES			



GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34839.1.1		TIP U-2579C		COUNTY FORSYTH		GEOLOGIST J. Bradshaw								
SITE DESCRIPTION Bridge No. 700 on -Y1- (US-311 - New Walkerton Road) over -L- (Future I-74)							GROUND WTR (ft)							
BORING NO. EB1-A		STATION 27+97		OFFSET 23 ft LT		ALIGNMENT -Y1-								
COLLAR ELEV. 969.6 ft		TOTAL DEPTH 58.6 ft		NORTHING 876,393		EASTING 1,651,716								
DRILL RIG/HAMMER EFF./DATE GEO366 Diedrich D50 87% 11/07/2015			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER J. Messick		START DATE 01/14/16		COMP. DATE 01/14/16		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				
970	969.6	0.0	3	3	4							M	GROUND SURFACE	0.0
												M	RESIDUAL Brown, Silty CLAY (A-7-5), Medium Stiff Red-Brown, Fine Sandy SILT (A-5), Very Stiff, Micaceous	2.0
965	966.1	3.5	6	8	11							M		
												M	Tan, Silty Fine SAND (A-2-5(0)), Medium Dense, Micaceous	7.0
960	961.1	8.5	5	6	6						SS-1015	M		
												M	Tan-White, Silty Fine to Coarse SAND (A-2-4), Loose to Very Dense, Micaceous	12.0
955	956.1	13.5	5	5	4							M		
												M		
950	951.1	18.5	5	6	7							M		
												M		
945	946.1	23.5	6	8	16							M		
												M		
940	941.1	28.5	6	9	13							M		
												M		
935	936.1	33.5	5	7	10							M		
												M		
930	931.1	38.5	6	7	11							M		
												M		
925	926.1	43.5	8	19	40							M		
												M		
920	921.1	48.5	84	16/0.1								M	WEATHERED ROCK Tan-White, (MICA GNEISS).	48.5
												M		
915	916.1	53.5	14	58	42/0.2							M		
												M		
	911.1	58.5	60/0.1									M	CRYSTALLINE ROCK (MICA GNEISS). Boring Terminated with Standard Penetration Test Refusal at Elevation 911.0 ft IN CRYSTALLINE ROCK (MICA GNEISS)	58.5

WBS 34839.1.1		TIP U-2579C		COUNTY FORSYTH		GEOLOGIST J. Bradshaw								
SITE DESCRIPTION Bridge No. 700 on -Y1- (US-311 - New Walkerton Road) over -L- (Future I-74)							GROUND WTR (ft)							
BORING NO. EB1-B		STATION 27+98		OFFSET 20 ft RT		ALIGNMENT -Y1-								
COLLAR ELEV. 967.5 ft		TOTAL DEPTH 54.3 ft		NORTHING 876,373		EASTING 1,651,753								
DRILL RIG/HAMMER EFF./DATE GEO366 Diedrich D50 87% 11/07/2015			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER J. Messick		START DATE 01/14/16		COMP. DATE 01/14/16		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				
970												M	GROUND SURFACE	0.0
												M	RESIDUAL Red-Brown, Fine Sandy SILT (A-5), Medium Stiff to Stiff, Micaceous	
965	967.5	0.0	3	2	4							M		
												M		
960	963.5	4.0	4	6	8							M		
												M		
955	958.5	9.0	3	4	5							M		
												M		
950	953.5	14.0	4	4	5						SS-1004	M		
												M	Tan-Gray, Silty Fine to Coarse SAND (A-2-4(0)), Loose to Very Dense, Micaceous	12.0
945	948.5	19.0	3	5	7							M		
												M		
940	943.5	24.0	6	7	8							M		
												M		
935	938.5	29.0	15	18	14							M		
												M		
930	933.5	34.0	23	24	28							M		
												M		
925	928.5	39.0	13	28	32							M		
												M		
920	923.5	44.0	100/0.3									M	WEATHERED ROCK Gray-White, (MICA GNEISS).	44.0
												M		
915	918.5	49.0	25	55	45/0.2							M		
												M		
	913.5	54.0	100/0.3									M	Boring Terminated at Elevation 913.2 ft IN WEATHERED ROCK (MICA GNEISS)	54.3

NCDOT BORE DOUBLE U2579C_GEO_BRDG700.GPJ NC_DOT_GDT 3/8/16

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34839.1.1		TIP U-2579C		COUNTY FORSYTH		GEOLOGIST J. Bradshaw										
SITE DESCRIPTION Bridge No. 700 on -Y1- (US-311 - New Walkerton Road) over -L- (Future I-74)							GROUND WTR (ft)									
BORING NO. B1-A		STATION 29+15		OFFSET 10 ft LT		ALIGNMENT -Y1-										
COLLAR ELEV. 967.9 ft		TOTAL DEPTH 58.6 ft		NORTHING 876,489		EASTING 1,651,785										
DRILL RIG/HAMMER EFF./DATE GEO366 Diedrich D50 87% 11/07/2015			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER J. Messick		START DATE 01/15/16		COMP. DATE 01/15/16		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						
970																
	967.9	0.0	2	4	6									967.9	GROUND SURFACE	0.0
965	964.4	3.5	5	7	9										RESIDUAL Red-Brown, Fine Sandy SILT (A-5), Medium Stiff, Micaceous	
960	959.4	8.5	5	6	6									960.9	Tan-White, Silty Fine to Coarse SAND (A-2-4), Medium Dense to Very Dense, Micaceous	7.0
955	954.4	13.5	5	4	6											
950	949.4	18.5	4	4	7											
945	944.4	23.5	7	8	9											
940	939.4	28.5	6	7	9											
935	934.4	33.5	6	5	7											
930	929.4	38.5	7	9	10											
925	924.4	43.5	31	29	32											
920	919.4	48.5	46	54/0.3												
915	914.4	53.5	81	19/0.1												
910	909.4	58.5	60/0.1													

WBS 34839.1.1		TIP U-2579C		COUNTY FORSYTH		GEOLOGIST J. Bradshaw										
SITE DESCRIPTION Bridge No. 700 on -Y1- (US-311 - New Walkerton Road) over -L- (Future I-74)							GROUND WTR (ft)									
BORING NO. B1-B		STATION 29+22		OFFSET 25 ft RT		ALIGNMENT -Y1-										
COLLAR ELEV. 964.9 ft		TOTAL DEPTH 59.5 ft		NORTHING 876,478		EASTING 1,651,819										
DRILL RIG/HAMMER EFF./DATE GEO366 Diedrich D50 87% 11/07/2015			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER J. Messick		START DATE 01/14/16		COMP. DATE 01/15/16		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						
965	964.9	0.0	2	2	4									964.9	GROUND SURFACE	0.0
960	960.5	4.4	4	5	6										RESIDUAL Red-Brown, Fine Sandy SILT (A-5), Medium Stiff, Micaceous	
955	955.5	9.4	4	4	7									957.9	Tan-Red-Brown, Fine Sandy SILT (A-4), Stiff, Micaceous	7.0
950	950.5	14.4	3	4	4									952.9	Tan, Silty Fine to Coarse SAND (A-2-4), Loose to Very Dense, Micaceous	12.0
945	945.5	19.4	3	5	5											
940	940.5	24.4	9	8	9											
935	935.5	29.4	6	8	9											
930	930.5	34.4	18	30	65											
925	925.5	39.4	18	25	36											
920	920.5	44.4	15	85/0.4												
915	915.5	49.4	62	38/0.2												
910	910.5	54.4	87	13/0.1												
	905.5	59.4	60/0.1													

NCDOT BORE DOUBLE U2579C_GEO_BRDG700.GPJ NC_DOT.GDT 3/8/16

Boring Terminated with Standard Penetration Test Refusal at Elevation 909.3 ft IN CRYSTALLINE ROCK (MICA GNEISS)

Boring Terminated with Standard Penetration Test Refusal at Elevation 905.4 ft IN CRYSTALLINE ROCK (MICA GNEISS)

SOIL TEST RESULTS

SAMPLE NO.	BORING	OFFSET	STATION -Y1-	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
								C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-1015	EB1-A	23' LT	27+97	8.5-10.0'	A-2-5(0)	52	NP	14.9	66.3	9.1	9.6	96.0	89.0	29.0	-	-
SS-1004	EB1-B	20' RT	27+98	14.0-15.5'	A-2-4(0)	NP	NP	20.8	66.3	9.5	3.4	100.0	93.0	20.0	-	-
SS-1505	EB2-B	24' RT	30+23	18.5-20.0'	A-5(0)	44	NP	12.2	58.4	20.2	9.1	100.0	96.0	40.0	21.5	-

SS = Split-Barrel Sample (ASTM D-1586)

NP=Non-Plastic

Lab Technician: Amanda R. Roth

NCDOT Certification No.: 112-09-1003

Signature:  _____

SITE PHOTOS



Site Photo No. 1: End Bent 1 -YI- (US 311) Looking Upstation (North)



Site Photo No. 3: Bent 1 -YI- (US 311) Looking Upstation (North)



Site Photo No. 2: -L- (Future I-74) Looking Upstation (East)

REFERENCE: U-2579C

PROJECT: 34839

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2579C	1	12

STRUCTURE
SUBSURFACE INVESTIGATION

CONTENTS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4	PROFILE
5-7	CROSS SECTION(S)
8-10	BORE LOG(S)
11	SOIL TEST RESULTS
12	SITE PHOTOGRAPH(S)

COUNTY FORSYTH
PROJECT DESCRIPTION WINSTON SALEM NORTHERN BELTWAY

SITE DESCRIPTION BRIDGE NO. 701 ON -Y2- (SR 2381 WILLISTON ROAD) OVER -L- (FUTURE I-74)

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 (919) 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.

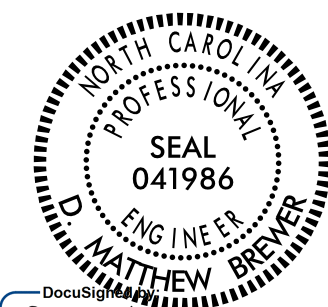
THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE CONTRACTOR 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

J. BRADSHAW, E.I.
GEOLOGIC EX.
M. BREWER, P.E.

INVESTIGATED BY ECS CAROLINAS, LLP
DRAWN BY M. BREWER, P.E.
CHECKED BY M. WALKO, P.E.
SUBMITTED BY ECS CAROLINAS, LLP
DATE MARCH 2016



DocuSign
D. Matthew Brewer

EC2ABBE99DB48C...





4/19/2016

SIGNATURE

DATE

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

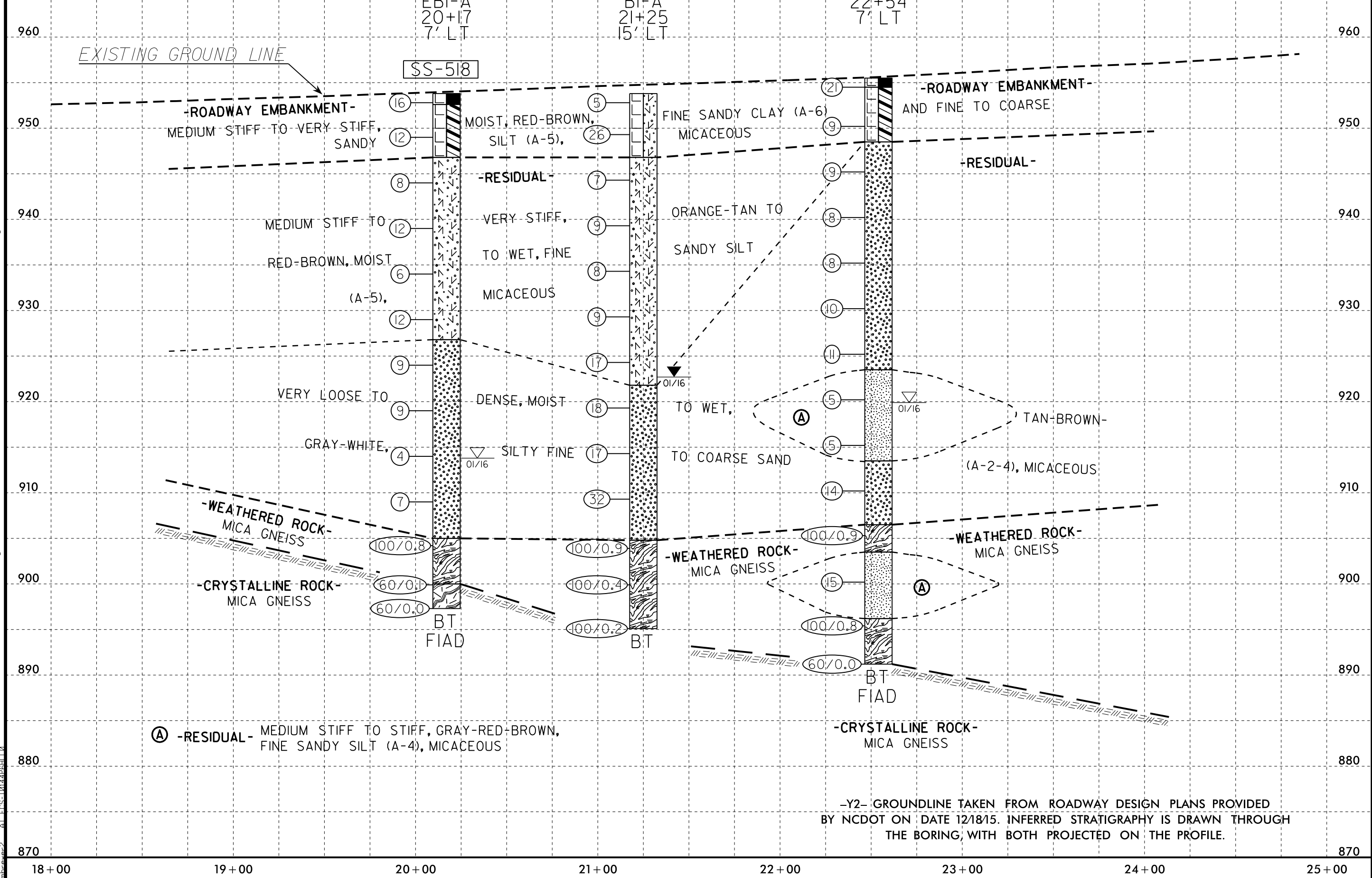
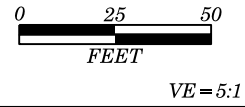
**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS**

SOIL DESCRIPTION										GRADATION										ROCK DESCRIPTION										TERMS AND DEFINITIONS																			
SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, <i>VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i>										WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.										HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:  WEATHERED ROCK (WR)  CRYSTALLINE ROCK (CR)  NON-CRYSTALLINE ROCK (NCR)  COASTAL PLAIN SEDIMENTARY ROCK (CPS)										ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.																			
SOIL LEGEND AND AASHTO CLASSIFICATION										ANGULARITY OF GRAINS										WEATHERING																													
GENERAL CLASS. GRANULAR MATERIALS (<= 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS										THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.										FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.																													
MINERALOGICAL COMPOSITION										COMPRESSION										PERCENTAGE OF MATERIAL																													
MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.										SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50										ORGANIC MATERIAL GRANULAR SOILS SILT - CLAY SOILS OTHER MATERIAL TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10% LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20% MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35% HIGHLY ORGANIC > 10% > 20% HIGHLY 35% AND ABOVE																													
GROUND WATER										MISCELLANEOUS SYMBOLS										ROCK HARDNESS																													
FAIR TO POOR POOR UNSUITABLE										ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT INFERRED SOIL BOUNDARY INFERRED ROCK LINE ALLUVIAL SOIL BOUNDARY										VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT																													
CONSISTENCY OR DENSENESS										RECOMMENDATION SYMBOLS										ABBREVIATIONS																													
PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)										UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK										AR - AUGER REFUSAL BT - BORING TERMINATED CL - CLAY CPT - COARSE PENETRATION TEST CSE - COARSE DMT - DILATOMETER TEST DPT - DYNAMIC PENETRATION TEST e - VOID RATIO F - FINE FOSS. - FOSSILIFEROUS FRAC. - FRACTURED, FRACTURES FRAGS. - FRAGMENTS HI. - HIGHLY										VST - VANE SHEAR TEST WEA. - WEATHERED UNIT WEIGHT DRY UNIT WEIGHT SAMPLE ABBREVIATIONS S - BULK SS - SPLIT SPOON ST - SHELBY TUBE RS - ROCK RT - RECOMPACTED TRIAXIAL CBR - CALIFORNIA BEARING RATIO																			
TEXTURE OR GRAIN SIZE										ABBREVIATIONS										FRACTURE SPACING										BEDDING																			
U.S. STD. SIEVE SIZE OPENING (MM) BOULDER (BLDR.) COBBLE (COB.) GRAVEL (GR.) COARSE SAND (CSE. SD.) FINE SAND (F SD.) SILT (SL.) CLAY (CL.)										MED. - MEDIUM MICA - MICACEOUS MOD. - MODERATELY NP - NON PLASTIC ORG. - ORGANIC PMT - PRESSUREMETER TEST SAP. - SAPROLITIC SD. - SAND, SANDY SL. - SILTY, SILTY SLI. - SLIGHTLY TCR - TRICONE REFUSAL w - MOISTURE CONTENT V - VERY										VERY WIDE WIDE MODERATELY CLOSE CLOSE VERY CLOSE										VERY THICKLY BEDDED THICKLY BEDDED THINLY BEDDED VERY THINLY BEDDED THICKLY LAMINATED THINLY LAMINATED																			
SOIL MOISTURE - CORRELATION OF TERMS										SOIL MOISTURE SCALE (ATTERBERG LIMITS)										EQUIPMENT USED ON SUBJECT PROJECT																													
SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION										DRILL UNITS: CME-45C CME-55 CME-550 VANE SHEAR TEST PORTABLE HOIST DIEDRICH D-50 DIEDRICH D-120										ADVANCING TOOLS: CLAY BITS 6" CONTINUOUS FLIGHT AUGER 8" HOLLOW AUGERS HARD FACED FINGER BITS TUNG-CARBIDE INSERTS CASING w/ ADVANCER TRICONE * STEEL TEETH TRICONE * TUNG-CARB. CORE BIT 2.25" I.D. H.S. AUGERS																													
LL - LIQUID LIMIT PL - PLASTIC LIMIT OM - OPTIMUM MOISTURE SL - SHRINKAGE LIMIT										HAMMER TYPE: AUTOMATIC MANUAL CORE SIZE: B H N HAND TOOLS: POST HOLE DIGGER HAND AUGER SOUNDING ROD VANE SHEAR TEST																																							
PLASTICITY										INDURATION																																							
NON PLASTIC SLIGHTLY PLASTIC MODERATELY PLASTIC HIGHLY PLASTIC										FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. FRIABLE MODERATELY INDURATED INDURATED EXTREMELY INDURATED																																							
COLOR																																																	
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.																																																	

5/14/99
 I:\MIS\2016\09\15\PROJECTS\11000-11999\11500\11501 - U-2579C BRDG (26411) - Bridge No. 701 - DTR\CADD\GEO\TECH\Site&Sub\U2579C_GEO_BRDG701_PFI_Y2.LT_sht4.dgn
 DATE: 07/25/15
 TIME: 10:42 AM

-Y2- (WILLISTON ROAD)

PROJECT REFERENCE NO. U-2579C	SHEET NO. 4
PROFILE BORINGS PROJECTED ALONG -Y2-	

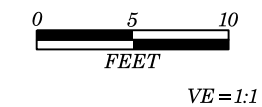


(A) -RESIDUAL- MEDIUM STIFF TO STIFF, GRAY-RED-BROWN,
 FINE SANDY SILT (A-4), MICACEOUS

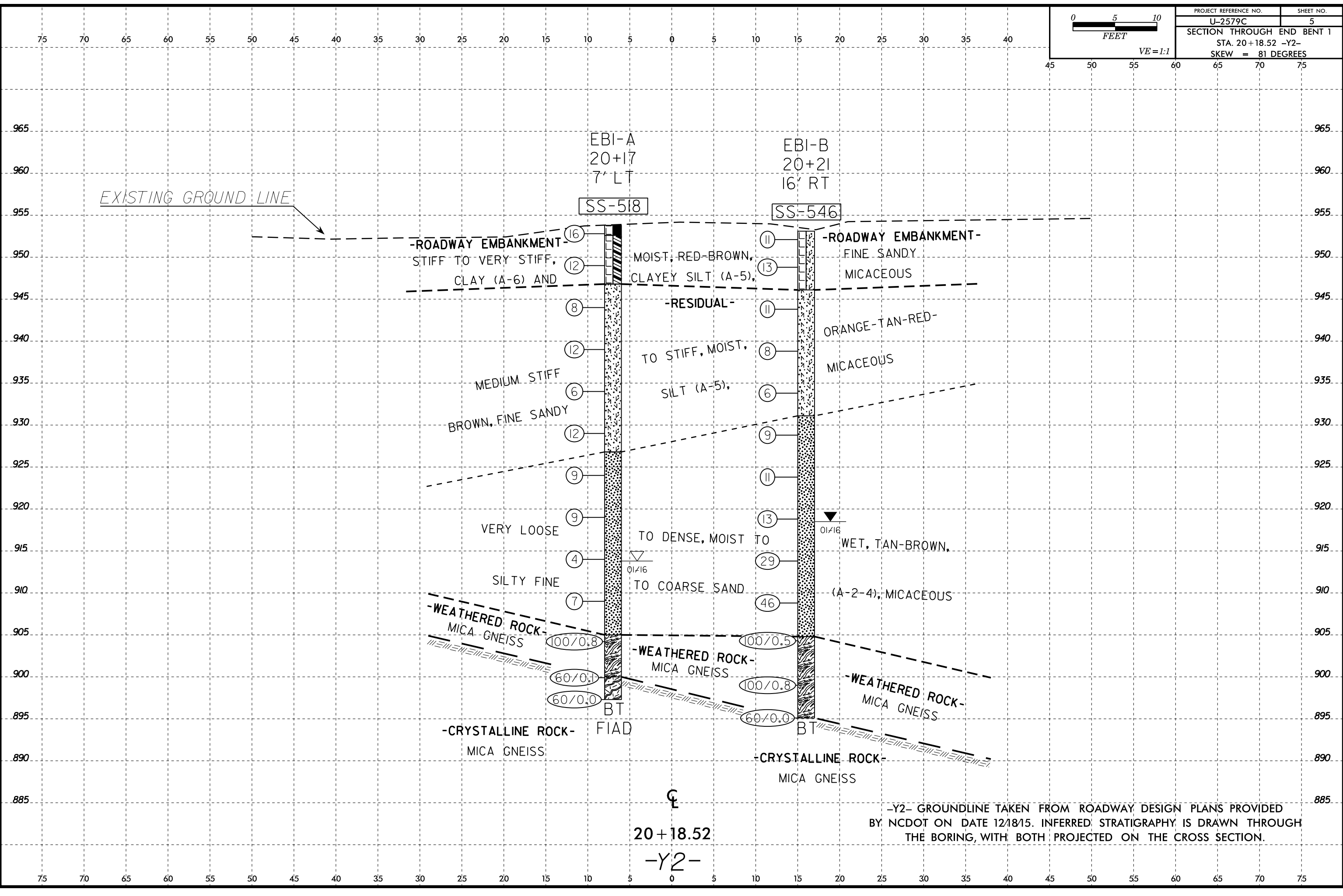
-Y2- GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED
 BY NCDOT ON DATE 12/18/15. INFERRED STRATIGRAPHY IS DRAWN THROUGH
 THE BORING, WITH BOTH PROJECTED ON THE PROFILE.

8/23/99

08-MAR-2016 16:23 I:\Z\GEO\TECH\02-PRG\JCS\11000\11501 - U-2579C BRDG (26411) - Bridge No. 701 - D:\TRACADD_GEO\TECH\Site\Sub\U2579C_Geo_BRDG701_xst-y2.dgn



PROJECT REFERENCE NO.	SHEET NO.
U-2579C	5
SECTION THROUGH END BENT 1	
STA. 20+18.52 -Y2-	
SKEW = 81 DEGREES	



EXISTING GROUND LINE

EBI-A
20+17
7' LT

EBI-B
20+21
16' RT

SS-518

SS-546

-ROADWAY EMBANKMENT-
STIFF TO VERY STIFF,
CLAY (A-6) AND

MOIST, RED-BROWN,
CLAYEY SILT (A-5),

-ROADWAY EMBANKMENT-
FINE SANDY
MICACEOUS

-RESIDUAL-

ORANGE-TAN-RED-
MICACEOUS

MEDIUM STIFF
BROWN, FINE SANDY

TO STIFF, MOIST,
SILT (A-5),

VERY LOOSE

TO DENSE, MOIST TO
TO COARSE SAND

WET, TAN-BROWN,
(A-2-4), MICACEOUS

SILTY FINE

-WEATHERED ROCK-
MICA GNEISS

-WEATHERED ROCK-
MICA GNEISS

-WEATHERED ROCK-
MICA GNEISS

-CRYSTALLINE ROCK-
MICA GNEISS

-CRYSTALLINE ROCK-
MICA GNEISS

20+18.52

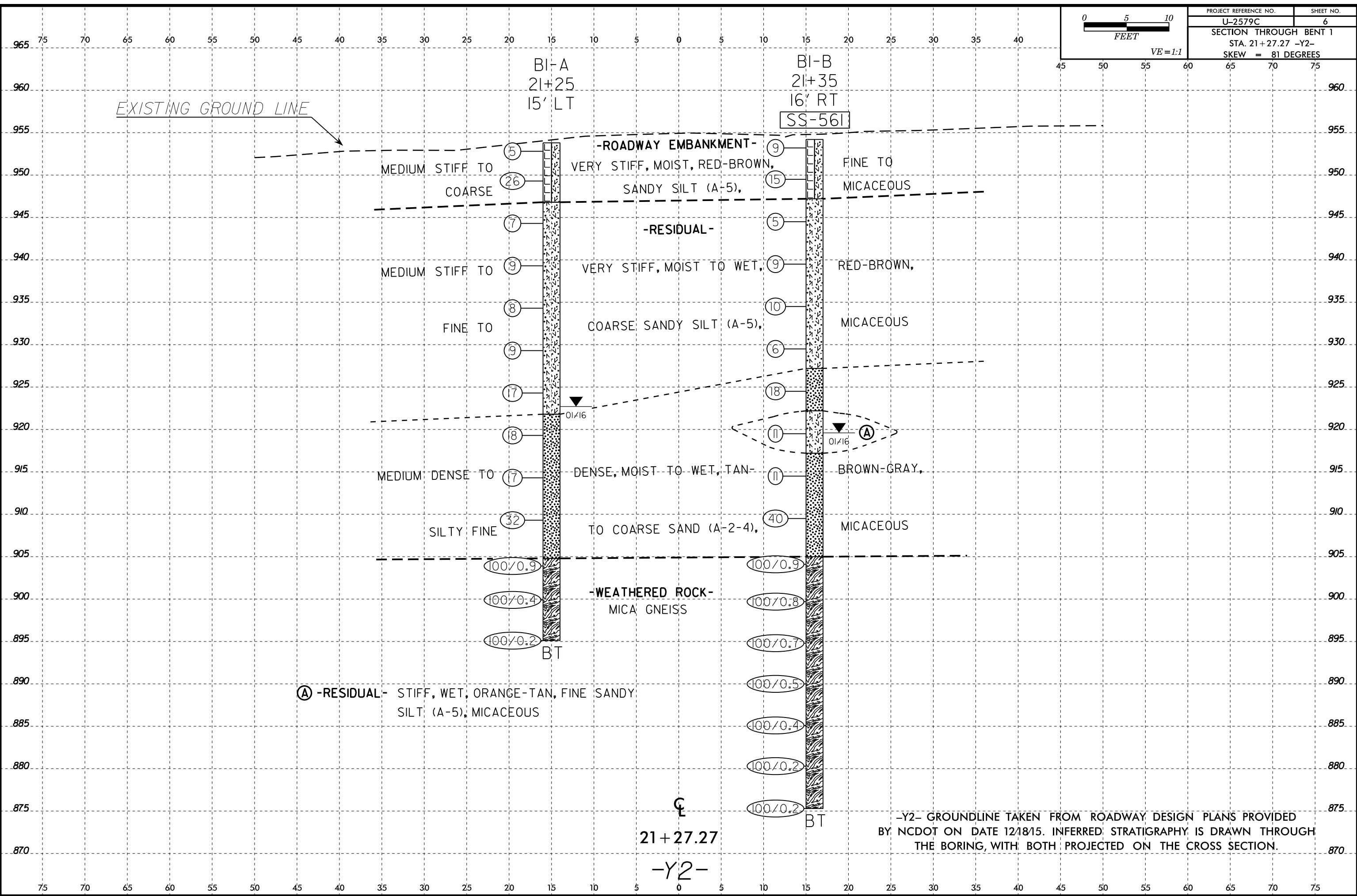
-Y2-

-Y2- GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED
BY NCDOT ON DATE 12/18/15. INFERRED STRATIGRAPHY IS DRAWN THROUGH
THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.

8/23/99
I:\MAR-2016_09449
I:\ZGEO\TECH\W2-PRG\JFC\11000\11999\11500\11501 - U-2579C BRDG (26411) - BrIDGE No. 701 - DTR\CADD_GEO\TECH\Site&Sub\U2579C_Geo_BRDG701_xst-y2.dgn
mbrayer2 AT EGS-1014R6L1L0

PROJECT REFERENCE NO.		SHEET NO.	
U-2579C		6	
SECTION THROUGH BENT 1			
STA. 21+27.27 -Y2-			
SKEW = 81 DEGREES			

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FEET
VE=1:1



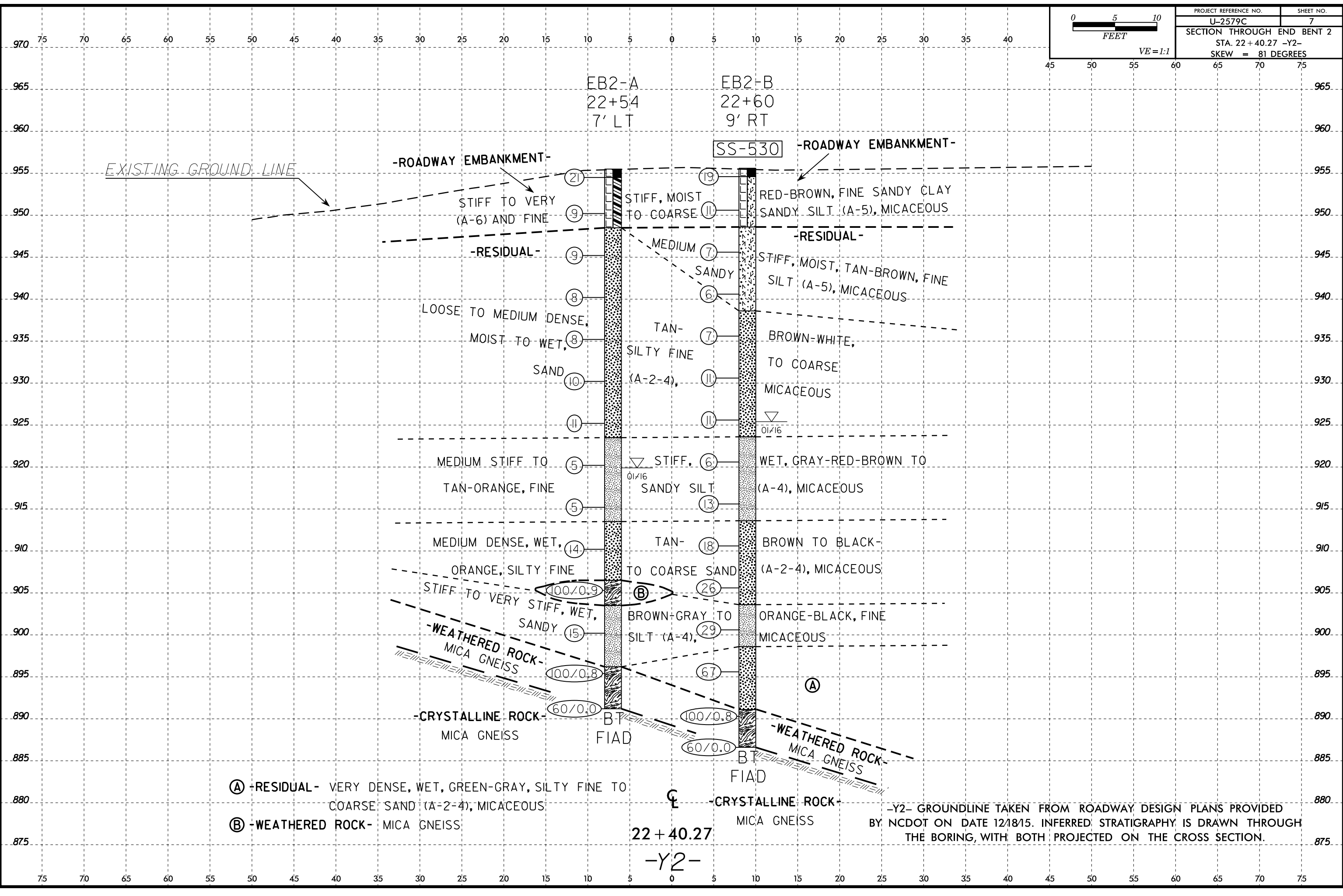
(A) -RESIDUAL- STIFF, WET, ORANGE-TAN, FINE SANDY SILT (A-5), MICACEOUS

21+27.27
-Y2-

-Y2- GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY NCDOT ON DATE 12/18/15. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.

8/23/99
I:\MAR-2016_09337
I:\Z\GEO\TECH\AVZ\FRG\JFC\10000\1999\11500\11501 - U-2579C BRDG (26411) - BrIDGE No. 701 - DTR\CADD_GEO\TECH\Site&Sub\U2579C_Geo_BRDG701_xst-y2.dgn
mbrayer2 AT EGS-1014RBL0

PROJECT REFERENCE NO.		SHEET NO.	
U-2579C		7	
SECTION THROUGH END BENT 2			
STA. 22+40.27 -Y2-			
SKEW = 81 DEGREES			



- (A) -RESIDUAL- VERY DENSE, WET, GREEN-GRAY, SILTY FINE TO COARSE SAND (A-2-4), MICACEOUS
- (B) -WEATHERED ROCK- MICA GNEISS

-Y2- GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY NCDOT ON DATE 12/18/15. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.

22 + 40.27
-Y2-

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34839.1.1		TIP U-2579C		COUNTY FORSYTH		GEOLOGIST J. Bradshaw									
SITE DESCRIPTION Bridge No. 701 on -Y2- (Williston Road) over -L- (Future I-74)							GROUND WTR (ft)								
BORING NO. EB1-A		STATION 20+17		OFFSET 7 ft LT		ALIGNMENT -Y2-									
COLLAR ELEV. 953.8 ft		TOTAL DEPTH 56.5 ft		NORTHING 875,177		EASTING 1,655,304									
DRILL RIG/HAMMER EFF./DATE GEO105 Diedrich D120 92% 11/07/2015			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER M. Ireland		START DATE 01/12/16		COMP. DATE 01/12/16		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					
955	953.8	0.0	14	11	5									953.8 GROUND SURFACE 0.0	
														952.6 Asphalt (0.5') and ABC Stone (0.7') 1.2	
950	950.0	3.8	7	5	7									ROADWAY EMBANKMENT Red-Brown, Fine Sandy CLAY (A-6), Very Stiff to Stiff, Micaceous	
														946.8 RESIDUAL 7.0	
945	945.0	8.8	3	3	5									Orange-Tan, Fine Sandy SILT (A-5(1)), Stiff to Medium Stiff, Micaceous	
940	940.0	13.8	3	5	7										
935	935.0	18.8	3	3	3										
930	930.0	23.8	3	5	7										
925	925.0	28.8	3	4	5										
920	920.0	33.8	4	4	5										
915	915.0	38.8	3	1	3										
910	910.0	43.8	1	2	5										
905	905.0	48.8	55	45/0.3											
900	900.0	53.8	60/0.1												
	897.3	56.5	60/0.0												

WBS 34839.1.1		TIP U-2579C		COUNTY FORSYTH		GEOLOGIST J. Bradshaw									
SITE DESCRIPTION Bridge No. 701 on -Y2- (Williston Road) over -L- (Future I-74)							GROUND WTR (ft)								
BORING NO. EB1-B		STATION 20+21		OFFSET 16 ft RT		ALIGNMENT -Y2-									
COLLAR ELEV. 953.1 ft		TOTAL DEPTH 58.0 ft		NORTHING 875,177		EASTING 1,655,328									
DRILL RIG/HAMMER EFF./DATE GEO366 Diedrich D50 87% 11/07/2015			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER J. Messick		START DATE 01/13/16		COMP. DATE 01/13/16		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					
955	953.1	0.0	3	4	7									953.1 GROUND SURFACE 0.0	
950	949.8	3.3	3	5	8									ROADWAY EMBANKMENT Red-Brown, Clayey Silt (A-5), Stiff, Micaceous	
945	944.8	8.3	3	4	7									RESIDUAL 7.0	
940	939.8	13.3	3	3	5									Tan-Red-Brown, Fine Sandy SILT (A-5(8)), Stiff to Medium Stiff, Micaceous	
935	934.8	18.3	2	3	3										
930	929.8	23.3	3	3	6										
925	924.8	28.3	2	4	7										
920	919.8	33.3	6	7	6										
915	914.8	38.3	8	6	23										
910	909.8	43.3	14	17	29										
905	904.8	48.3	100												
900	899.8	53.3	49	51/0.3											
	895.1	58.0	60/0.0												

NCDOT BORE DOUBLE U2579C_GEO_BRDG701.GPJ NC_DOT.GDT 3/8/16

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34839.1.1		TIP U-2579C		COUNTY FORSYTH		GEOLOGIST J. Bradshaw									
SITE DESCRIPTION Bridge No. 701 on -Y2- (Williston Road) over -L- (Future I-74)							GROUND WTR (ft)								
BORING NO. B1-A		STATION 21+25		OFFSET 15 ft LT		ALIGNMENT -Y2-									
COLLAR ELEV. 953.8 ft		TOTAL DEPTH 58.9 ft		NORTHING 875,285		EASTING 1,655,316									
DRILL RIG/HAMMER EFF./DATE GEO366 Diedrich D50 87% 11/07/2015			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER J. Messick		START DATE 01/13/16		COMP. DATE 01/14/16		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					
955	953.8	0.0	2	3	2							M	953.8	GROUND SURFACE	0.0
950	950.3	3.5	3	7	19							M		ROADWAY EMBANKMENT Red-Brown, Fine to Coarse Sandy SILT (A-5), Medium Stiff to Very Stiff, Micaceous	
945	945.3	8.5	3	3	4							M	946.8	RESIDUAL Red-Brown, Fine Sandy SILT (A-5), Medium Stiff to Very Stiff, Micaceous	7.0
940	940.3	13.5	4	4	5							M			
935	935.3	18.5	3	3	5							M			
930	930.3	23.5	3	4	5							M			
925	925.3	28.5	8	6	11							M			
920	920.3	33.5	6	8	10							W	921.8	Tan-Gray, Silty Fine to Coarse SAND (A-2-4), Medium Dense to Dense, Micaceous	32.0
915	915.3	38.5	6	9	8							W			
910	910.3	43.5	10	15	17							W			
905	905.3	48.5	28	21	79/0.4							W	904.8	WEATHERED ROCK Tan-Gray, (MICA GNEISS).	49.0
900	900.3	53.5	100/0.4												
895	895.3	58.5	100/0.2												
Boring Terminated at Elevation 894.9 ft IN WEATHERED ROCK (MICA GNEISS)															

WBS 34839.1.1		TIP U-2579C		COUNTY FORSYTH		GEOLOGIST J. Bradshaw									
SITE DESCRIPTION Bridge No. 701 on -Y2- (Williston Road) over -L- (Future I-74)							GROUND WTR (ft)								
BORING NO. B1-B		STATION 21+35		OFFSET 16 ft RT		ALIGNMENT -Y2-									
COLLAR ELEV. 954.2 ft		TOTAL DEPTH 78.9 ft		NORTHING 875,289		EASTING 1,655,348									
DRILL RIG/HAMMER EFF./DATE GEO366 Diedrich D50 87% 11/07/2015			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER J. Messick		START DATE 01/13/16		COMP. DATE 01/13/16		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					
955	954.2	0.0	3	4	5							M	954.2	GROUND SURFACE	0.0
950	950.5	3.7	5	7	8							M		ROADWAY EMBANKMENT Red-Brown, Fine to Coarse Sandy SILT (A-5), Stiff, Micaceous	
945	945.5	8.7	2	2	3							M	947.2	RESIDUAL Red-Brown, Fine Sandy SILT (A-5), Medium Stiff to Stiff, Micaceous	7.0
940	940.5	13.7	2	4	5							M			
935	935.5	18.7	2	3	7							M			
930	930.5	23.7	2	2	4							M			
925	925.5	28.7	5	7	11							M			
920	920.5	33.7	4	4	7							W	927.2	Tan, Silty Fine to Coarse SAND (A-2-4), Medium Dense, Micaceous	27.0
915	915.5	38.7	4	5	6							W	922.2	Orange-Tan, Fine Sandy SILT (A-5), Stiff, Micaceous	32.0
910	910.5	43.7	8	13	27							W	917.2	Tan-Brown, Silty Fine to Coarse SAND (A-2-4), Medium Dense to Dense, Micaceous	37.0
905	905.5	48.7	25	39	61/0.4							W	905.0	WEATHERED ROCK Tan-Brown-Gray, (MICA GNEISS).	49.2
900	900.5	53.7	30	70/0.3											
895	895.5	58.7	48	62/0.2											
890	890.5	63.7	100/0.5												
885	885.5	68.7	100/0.4												
880	880.5	73.7	100/0.2												
	875.5	78.7	100/0.2										875.3	Boring Terminated at Elevation 875.3 ft IN WEATHERED ROCK (MICA GNEISS)	78.9

NCDOT BORE DOUBLE U2579C_GEO_BRDG701.GPJ NC_DOT_GDT 3/8/16

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34839.1.1		TIP U-2579C		COUNTY FORSYTH		GEOLOGIST J. Bradshaw										
SITE DESCRIPTION Bridge No. 701 on -Y2- (Williston Road) over -L- (Future I-74)							GROUND WTR (ft)									
BORING NO. EB2-A		STATION 22+54		OFFSET 7 ft LT		ALIGNMENT -Y2-										
COLLAR ELEV. 955.5 ft		TOTAL DEPTH 64.3 ft		NORTHING 875,411		EASTING 1,655,346										
DRILL RIG/HAMMER EFF./DATE GEO105 Diedrich D120 92% 11/07/2015			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER M. Ireland		START DATE 01/12/16		COMP. DATE 01/12/16		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	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
960																
955	955.5	0.0	13	9	12										955.5	GROUND SURFACE
															954.5	Asphalt (0.3') and ABC Stone (0.7')
																ROADWAY EMBANKMENT Red-Brown, Fine Sandy CLAY (A-6), Very Stiff to Stiff, Micaceous
950	951.2	4.3	7	4	5										948.5	RESIDUAL Tan-Brown-White, Silty Fine to Coarse SAND (A-2-4), Loose to Medium Dense, Micaceous
945	946.2	9.3	7	4	5											
940	941.2	14.3	6	4	4											
935	936.2	19.3	4	3	5											
930	931.2	24.3	4	3	7											
925	926.2	29.3	4	4	7											
920	921.2	34.3	3	2	3										923.5	Gray-Red-Brown, Fine Sandy SILT (A-4), Medium Stiff, Micaceous
915	916.2	39.3	1	3	2											
910	911.2	44.3	4	6	8										913.5	Tan-Brown, Silty Fine to Coarse SAND (A-2-4), Medium Dense, Micaceous
905	906.2	49.3	12	88/0.4											906.5	WEATHERED ROCK Tan-Brown, (MICA GNEISS).
900	901.2	54.3	2	5	10										903.5	Brown-Gray, Fine Sandy SILT (A-4), Stiff, Micaceous
895	896.2	59.3	33	67/0.3											896.2	WEATHERED ROCK Tan-Brown, (MICA GNEISS).
	891.2	64.3													891.2	Boring Terminated with Standard Penetration Test Refusal at Elevation 891.2 ft ON CRYSTALLINE ROCK (MICA GNEISS)

WBS 34839.1.1		TIP U-2579C		COUNTY FORSYTH		GEOLOGIST J. Bradshaw										
SITE DESCRIPTION Bridge No. 701 on -Y2- (Williston Road) over -L- (Future I-74)							GROUND WTR (ft)									
BORING NO. EB2-B		STATION 22+60		OFFSET 9 ft RT		ALIGNMENT -Y2-										
COLLAR ELEV. 955.6 ft		TOTAL DEPTH 69.0 ft		NORTHING 875,414		EASTING 1,655,363										
DRILL RIG/HAMMER EFF./DATE GEO105 Diedrich D120 92% 11/07/2015			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER M. Ireland		START DATE 01/12/16		COMP. DATE 01/12/16		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	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
960																
955	955.6	0.0	7	9	10										955.6	GROUND SURFACE
															954.6	Asphalt (0.3') and ABC Stone (0.7')
																ROADWAY EMBANKMENT Red-Brown, Fine to Coarse Sandy SILT (A-5), Very Stiff to Stiff
950	951.6	4.0	7	5	6										948.6	RESIDUAL Tan-Brown, Fine Sandy SILT (A-5(13)), Medium Stiff, Micaceous
945	946.6	9.0	3	3	4											
940	941.6	14.0	3	3	3											
935	936.6	19.0	2	3	4											
930	931.6	24.0	5	5	6											
925	926.6	29.0	4	4	7											
920	921.6	34.0	3	3	3										923.6	Tan-Orange, Fine Sandy SILT (A-4), Medium Stiff to Stiff, Micaceous
915	916.6	39.0	3	5	8											
910	911.6	44.0	5	8	10										913.6	Orange-Black, Silty Fine to Coarse SAND (A-2-4), Medium Dense, Micaceous
905	906.6	49.0	5	12	14										903.6	Orange-Black, Fine Sandy SILT (A-4), Very Stiff, Micaceous
900	901.6	54.0	7	12	17										898.6	Green-Gray, Silty Fine to Coarse SAND (A-2-4), Very Dense, Micaceous
895	896.6	59.0	14	24	43										891.1	WEATHERED ROCK Gray, (MICA GNEISS).
890	891.6	64.0	11	42	58/0.3										886.6	Boring Terminated with Standard Penetration Test Refusal at Elevation 886.6 ft ON CRYSTALLINE ROCK (MICA GNEISS)

NCDOT BORE DOUBLE U2579C_GEO_BRDG701.GPJ NC_DOT.GDT 3/8/16


SOIL TEST RESULTS

SAMPLE NO.	BORING	OFFSET	STATION -Y2-	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
								C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-518	EB1-A	7' LT	20+17	13.8-15.3'	A-5(1)	44	3	17.6	43.4	25.4	13.6	99.0	89.0	50.0	30.1	-
SS-546	EB1-B	16' RT	20+21	18.3-19.8	A-5(8)	50	10	11.3	23.6	33.0	32.0	99.0	94.0	69.0	40.8	-
SS-561	B1-B	16' RT	21+35	33.7-35.2'	A-5(0)	42	2	15.1	42.6	33.6	8.7	95.0	88.0	50.0	53.0	-
SS-530	EB2-B	9' RT	22+60	14.0-15.5'	A-5(13)	55	10	4.6	19.9	49.7	25.8	99.0	97.0	81.0	41.9	-

SS = Split-Barrel Sample (ASTM D-1586)

Lab Technician: Amanda R. Roth

NCDOT Certification No.: 112-09-1003

Signature: 

SITE PHOTOS



Site Photo No. 1: End Bent 1 -Y2- (Willison Road) Looking Upstation (North)



Site Photo No. 2: Bent 1 -Y2- (Willison Road) Looking Upstation (North)



Site Photo No. 3: Bent 1 -L- (Future I-74) Looking Downstation (West)