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### **CONTENTS**

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REFERENCE

SHEET NO.	<b>DESCRIPTION</b>
I.	TITLE SHEET
2	LEGEND (SOIL & ROCK)
2A	SUPPLEMENTAL LEGEND (GSI)
3-4	SITE PLAN
5-6	PROFILE
7-12	CROSS SECTIONS
13-28	BORE LOGS, CORE REPORTS & CORE PHOTOGRAPHS
29	ROCK LABORATORY RESULTS
30	SITE PHOTOGRAPHS

### STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION **DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT** 

### **STRUCTURE** SUBSURFACE INVESTIGATION

COUNTY FORSYTH

PROJECT DESCRIPTION WINSTON-SALEM NORTHERN BELTWAY EASTERN SECTION (FUTURE I-74) FROM US 311 I-40 SITE DESCRIPTION BRIDGE NO. 733 ON US 311 FLYOVER

(-Y2FLYAB-) OVER WINSTON-SALEM NORTHERN BELTWAY (-L-)

## 4839 3 PROJEC

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2579AA	1	30

### **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 REVEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT 1991 707-680. 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 SOLI MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOLI MOISTURE CONDITIONS MAY YARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OF CONTRACTOR IS CALIFORED 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 INTERRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY THINSELF 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 FOM THE ACUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

- TES: 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. BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAVES 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. 2.

PERSONNEL

S. PAPKE

C. DRISCOLL

TRIGON EXPLORATION

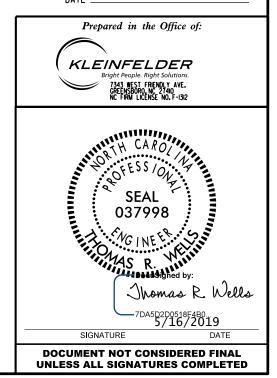
INVESTIGATED BY <u>S. PAPKE</u>

DRAWN BY S. PAPKE

CHECKED BY <u>T. WELLS</u>

SUBMITTED BY \_\_\_\_\_KLEINFELDER, INC

DATE MAY 2019



### NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

			SOIL	DESC	RIPTI	ON						GRAD	DATION							DESCRIPT	
BE PENETR ACCORDIN IS BA CONSISTEN	RATED WITH IG TO THE ISED ON TH ICY, COLOR,	A CONTINU STANDARD P E AASHTO S TEXTURE, MO	DUS FLIGHT F ENETRATION YSTEM, BASIC ISTURE, AASH	POWER AU TEST (AA C DESCRI ITO CLAS	UGER AND ASHTO T ; IPTIONS G SSIFICATIO	) YIELD LE 206, ASTM GENERALLY ON, AND OT	SS THAN D1586). INCLUDE HER PERT	MATERIALS TH 100 BLOWS PI 50IL CLASSIFI THE FOLLOWI FINENT FACTOR FOR EXAMPLE	ER FOOT CATION NG: RS SUCH	<u>WELL GRADED</u> - INDICAT UNIFORMLY GRADED - IN GAP-GRADED - INDICATES	NDICATE	IXTURE OF UNIFOR	RTICLES ARE ALI RM PARTICLE SIZ Y OF GRAIN	L APPROXIMA ZES OF TWO <b>NS</b>	TELY THE SAME SIZE. OR MORE SIZES.	ROCK LINE IND SPT REFUSAL I BLOWS IN NON REPRESENTED E	DICATES IS PENE I-COASTA BY A ZO	THE LEVEL ETRATION BY AL PLAIN I ONE OF WEA	_ AT WHICH NON Y A SPLIT SPOO MATERIAL, THE	-COASTAL PLA N SAMPLER E TRANSITION	ELD SPT REFUSAL IF TESTI IN MATERIAL WOULD YIELD JUAL TO OR LESS THAN Ø. BETWEEN SOIL AND ROCK
VE	ERY STIFF.GI	RAY.SILTY CLA	MOIST WITH I	NTERBED	DED FINE	SAND LAYE	RS, HIGHLY	PLASTIC.A-7-6				ROUNDNESS OF SO , <u>SUBROUNDED</u> , OR		SIGNATED B	Y THE TERMS:	WEATHERED	22	IIII.	NON-COASTAL	PLAIN MATER	AL THAT WOULD YIELD SP
GENERAL		DIL LEG GRANULAR MATI	END AND		HIU U SILT-CLAY M						M]	INERALOGICA	AL COMPOSI	TION		ROCK (WR)		2.2	100 BLOWS PE		STED. EOUS AND METAMORPHIC RO
CLASS.	(:	≤ 35% Passing	<b>*200</b> )	(	> 35% PASS	SING =200)		ORGANIC MATER	IALS			CH AS QUARTZ,FE RIPTIONS WHEN T				CRYSTALLINE ROCK (CR)			WOULD YIELD GNEISS, GABBRI	SPT REFUSAL	IF TESTED. ROCK TYPE IN
GROUP CLASS. A-	A-1 -1-a A-1-b	A-3 A-2-4	A-2 A-2-5 A-2-6 A		4 A-5	A-6 A-7 A-7-5 A-7-6	- A-2	2 A-4, A-5 A-6, A-7					SSIBILITY			NON-CRYSTALLI			FINE TO COAR	SE GRAIN ME	AMORPHIC AND NON-COAST
SYMBOL 000										SLIGH MODE		OMPRESSIBLE		LL < 31 LL = 31 -	50	ROCK (NCR)	÷	<u> </u>	ROCK TYPE IN	CLUDES PHYLI	ITE, SLATE, SANDSTONE, ET CEMENTED INTO ROCK, BUT
% PASSING	0000000							SILT-			LY COM	PRESSIBLE		LL > 50	50	SEDIMENTARY R				ROCK TYPE 1	NCLUDES LIMESTONE, SANDS
	IMX IMX 50 MX	51 MN					GRANUL		MUCK, PEAT		F	GRANULAR S	OF MATER	IAL						ATHERING	
	MX 25 MX	10 MX 35 MX	35 MX 35 MX 35	5 MX 36 M	4N 36 MN	36 MN 36 M	N	SUILS		ORGANIC MATERIAL TRACE OF ORGANIC MA		<u>SOILS</u> 2 - 3%	<u>SOILS</u> 3 - 5%	<u>OTHER</u> TRACE	<u>1 - 10%</u>			ESH, CRYSTA		JOINTS MAY S	OW SLIGHT STAINING. ROCK
MATERIAL PASSING #40 LL PI	_ 6 MX		41 MN 40 MX 4 10 MX 11 MN 11				N L	OILS WITH .ITTLE OR	HIGHLY	LITTLE ORGANIC MATT MODERATELY ORGANIC HIGHLY ORGANIC	TER	3 - 5%	5 - 12% 12 - 20% > 20%	LITTLE SOME HIGHLY	10 - 20% 20 - 35% 35% AND ABOVE	VERY SLIGHT R (V SLI.) C	ROCK GEN CRYSTALS	NERALLY FR S ON A BRO	ESH, JOINTS STAI KEN SPECIMEN FA		NTS MAY SHOW THIN CLAY C GHTLY. ROCK RINGS UNDER H
GROUP INDEX	0	0 0	4 MX		_	16 MX NO M	- '	MODERATE MOUNTS OF	ORGANIC			GROUN	D WATER	·				NERALLY FR		NED AND DISC	DLORATION EXTENDS INTO RO
	ONE FRAGS. RAVEL, AND		.TY OR CLAYEY WEL AND SAND		SILTY SOILS	CLAYEY SOILS		ORGANIC MATTER	SOILS			ER LEVEL IN BOR TIC WATER LEVEL			DRILLING	(SLI.) 1 C	INCH. O	OPEN JOINTS S ARE DULL	S MAY CONTAIN CL AND DISCOLORED	AY. IN GRANI . CRYSTALLIN	TOID ROCKS SOME OCCASIONA E ROCKS RING UNDER HAMMER ON AND WEATHERING EFFECT
GEN. RATING	SAND			+			FAIR 1	10				CHED WATER, SATU			RING STRATA	(MOD.) G	GRANITOI	ID ROCKS, MC	DST FELDSPARS A	RE DULL AND	DISCOLORED, SOME SHOW CLA
AS SUBGRADE		EXCELLENT TO			FAIR TO		POOR	PUUK	UNSUITABLE		SPRI	ING OR SEEP						ESH ROCK.	HAMMER BLUWS A	NU SHUWS SIG	NIFICANT LOSS OF STRENGTH
	F		BGROUP IS ≤ L					30				MISCELLANE	OUS SYMBO	115							. IN GRANITOID ROCKS, ALL I TION. ROCK SHOWS SEVERE L
			TNESS OR	R	ANGE OF	STANDARD	F	ANGE OF UNC				25 (825				(MOD. SEV.) A	AND CAN	BE EXCAVA		OGIST'S PICK.	ROCK GIVES "CLUNK" SOUND
PRIMARY SO		CONS	LOOSE		ETRATION (N-VA) < ·		CE CI	OMPRESSIVE S (TONS/F1		L ROADWAY EMBA			DT		SLOPE INDICATOR	SEVERE A (SEV.) R	ALL ROCK REDUCED	K EXCEPT O IN STRENG	WARTZ DISCOLORE TH TO STRONG SC	D OR STAINED DIL. IN GRANIT	. ROCK FABRIC CLEAR AND E OID ROCKS ALL FELDSPARS (
GRANULAF	2		DOSE M DENSE		4 TO 10 TC			N/A		ARTIFICIAL FI	11.1 (AF				INSTALLATION CONE PENETROMETER				UME FRAGMENTS U <u>TELD SPT N VALU</u>		CK USUALLY REMAIN.
MATERIAL (NON-COH		VERY	ENSE DENSE	+	30 TC > 5 < :	50		< 0.25			Y EMBA		AUGER BORING	•	TEST SOUNDING ROD	SEVERE B (V SEV.) R	BUT MASS REMAININ	S IS EFFEC	TIVELY REDUCED TE IS AN EXAMPL	TO SOIL STAT E OF ROCK WE	. ROCK FABRIC ELEMENTS AF US,WITH ONLY FRAGMENTS O ATHERED TO A DEGREE THAT
GENERALL SILT-CLA MATERIAL	Y	MEDIL	OFT M STIFF TIFF		2 TC 4 TC 8 TO	08		0.25 TO 0.5 TO 1 1 TO 2	.0	페르까를 INFERRED ROC	K LINE	E MWO	MONITORING WE	ш 🔶	TEST BORING WITH CORE	COMPLETE R	ROCK RED	DUCED TO S	OIL. ROCK FABRIC	NOT DISCERM	<u>ESTED, WOULD YIELD SPT N</u> NBLE, OR DISCERNIBLE ONLY ENT AS DIKES OR STRINGERS
(COHESIVE	Ξ)		STIFF ARD		15 TC > 3			2 TO 4 > 4	1	ALLUVIAL SOIL	L BOUN	NDARY 🛆	PIEZOMETER INSTALLATION	$\bigcirc$	- SPT N-VALUE	A	ILSO AN	EXAMPLE.	DOCK		20
		1	TEXTURE	OR	GRAIN	SIZE					F	RECOMMENDA	TION SYMB	OLS		VERY HARD C		RE SCRATCH			っっ BREAKING OF HAND SPECIMEN
U.S. STD. SIEV			4 10			60 20						ICLASSIFIED EXCA ISUITABLE WASTE			SIFIED EXCAVATION - ABLE, BUT NOT TO BE	s	SEVERAL	HARD BLOW	S OF THE GEOLO	GIST'S PICK.	
OPENING (MM) BOULDER (BLDR.)	COE		4.76 2.0 GRAVEL (GR.)	COA	ARSE AND	0.25 0.0 Fit SA		SILT (SL.)	CLAY (CL.)	SHALLOW UNDERCUT		ICLASSIFIED EXCA		USED IN	N THE TOP 3 FEET OF MENT OR BACKFILL	Т	TO DETAC	CH HAND SP	ECIMEN.		GROOVES TO 0.25 INCHES D
GRAIN MM	305	0B.) 75	2.		E. SD.)	(F 1 0.25	SD.) Ø.Ø			AR - AUGER REFUSAL		ABBRE	VIATIONS	VST -	VANE SHEAR TEST	HARD E	EXCAVATE		BLOW OF A GEO		HAND SPECIMENS CAN BE D
SIZE IN.	12	3	STURE -							BT - BORING TERMINATED CL CLAY		MICA MI MOD MO	ICACEOUS DERATELY	WEA Ύ-υ	• WEATHERED JNIT WEIGHT	MEDIUM C HARD C	CAN BE C CAN BE E	GROOVED OR EXCAVATED	GOUGED 0.05 IN IN SMALL CHIPS		FIRM PRESSURE OF KNIFE ( NCH MAXIMUM SIZE BY HARD
	IOISTURE S	SCALE	FIELD	MOISTUP	RE		_	MOISTURE DES	SCRIPTION	CPT - CONE PENETRATION CSE COARSE DMT - DILATOMETER TES		ORG ORG		-	DRY UNIT WEIGHT	SOFT C	CAN BE C		GOUGED READILY		PICK. CAN BE EXCAVATED IN
			- SATU	IRATED	- i			ERY WET, USU		DPT - DYNAMIC PENETRAT e - VOID RATIO			PROLITIC	S - B		Р	PIECES C	CAN BE BROM	KEN BY FINGER P	RESSURE.	RATE BLOWS OF A PICK POIN EADILY WITH POINT OF PICK.
LL PLASTIC		LIMIT	(SA	T.)				GROUND WATE		F - FINE FOSS FOSSILIFEROUS FRAC FRACTURED. FRAC	TUDEC	SL SILT SLI SLI		RS -		SOFT 0		IN THICKNE			PRESSURE. CAN BE SCRATCH
RANGE <			- WET	- (W)		SEMISOLIC ATTAIN OF		ES DRYING TO 10ISTURE	1	FRAGS FRAGMENTS	TURES	w - MOIS	TURE CONTENT		RECOMPACTED TRIAXIAL CALIFORNIA BEARING	FF	<b>≀ACTU</b>	JRE SPA	ACING		BEDDING
	PLASTIC	C LIMIT								HI HIGHLY		V - VERY			RATIO	TERM VERY WIDE		MORE	<u>SPACING</u> THAN 10 FEET	VEF	TERM THICKLY BEDDED
		M MOISTURE	- MOIS	T - (M)	ç	30LID; AT	OR NEAR	OPTIMUM MC	ISTURE	DRILL UNITS:		ANCING TOOLS:	JN JODULCI	HAMMER 1		WIDE MODERATELY		3	TO 10 FEET TO 3 FEET	тні	CKLY BEDDED 1 NLY BEDDED 0.
SL _	_ SHRINKA	AGE LIMII				REQUIRES		NAL WATER TO	 ו	CME-45C		CLAY BITS		X AUT	OMATIC MANUAL	CLOSE VERY CLOSE		0.1	6 TO 1 FOOT THAN 0.16 FEET	VEF	Y THINLY BEDDED 0.0 CKLY LAMINATED 0.00
			- DRY	- (D)		ATTAIN OF			-	X CME-55		6" CONTINUOUS FI		CORE SIZ				2233		тні	NLY LAMINATED <
			PL	_ASTI	CITY							8 HOLLOW AUGER		□-в _	🗌 -н					DURATION	
	PLASTIC		PLAS	STICITY Ø-9	INDEX (P	<u>,I)</u>		DRY STREND		CME-550		HARD FACED FING		X -N Q2	2			KS, INDURA			IATERIAL BY CEMENTING, HE REES NUMEROUS GRAINS;
SLIG⊢	HTLY PLAS			6-1	15			SLIGHT		VANE SHEAR TEST				HAND TOO		FRIABLE			GENTLE BL	OW BY HAMM	R DISINTEGRATES SAMPLE.
	RATELY PL Y PLASTIC			16-2 26 OR				MEDIUM HIGH		PORTABLE HOIST	屵		STEEL TEETH		T HOLE DIGGER	MODERAT	ELY IN	DURATED			TED FROM SAMPLE WITH ST IT WITH HAMMER.
				COLO	)R							TRICONE 1-15/16	_		D AUGER NDING ROD	INDURATI	ED		GRAINS AR		TO SEPARATE WITH STEEL
								W-BROWN, BLUI E APPEARANCI				CORE BIT			E SHEAR TEST	EXTREME	ELY IND	URATED	SHARP HAM		EQUIRED TO BREAK SAMPLE

PROJECT REPERENCE NO.

SHEET NO.

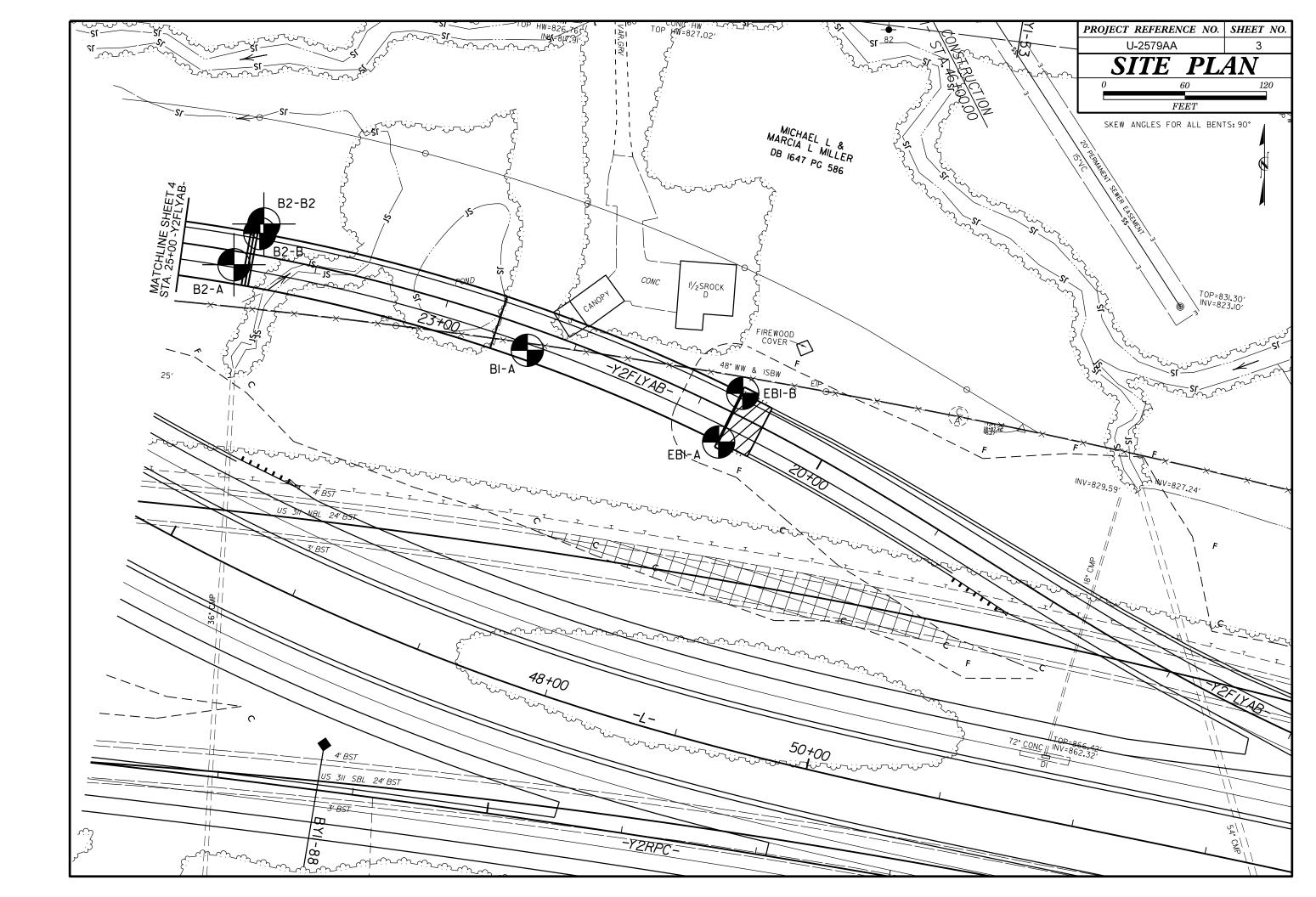
TED. AN INFERRED D SPT REFUSAL. 0.1 FOOT PER 60 < IS OFTEN	TERMS AND DEFINITIONS <u>ALLUVIUM (ALLUV.)</u> - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. <u>ADUIFER</u> - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
PT N VALUES >	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
ROCK THAT INCLUDES GRANITE, TAL PLAIN	WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. <u>CALCAREOUS (CALC.)</u> - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
. IF TESTED. TC. T MAY NOT YIELD	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
DSTONE, CEMENTED	BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. <u>DIKE</u> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.
< RINGS UNDER COATINGS IF OPEN.	DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
HAMMER BLOWS IF ROCK UP TO	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
NAL FELDSPAR ER BLOWS. TS. IN	SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. <u>FISSILE</u> - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM
AY. ROCK HAS TH AS COMPARED	PARENT MATERIAL. F <u>LOOD PLAIN (FP)</u> - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
FELDSPARS DULL LOSS OF STRENGTH WHEN STRUCK.	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
EVIDENT BUT ARE KAOLINIZED	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.
ARE DISCERNIBLE OF STRONG ROCK AT ONLY MINOR	MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. <u>PERCHED WATER</u> - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.
<u>VALUES &lt; 100 BPF</u> Y IN SMALL AND RS. SAPROLITE IS	RESIDUAL (RES.)SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK DUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SECMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
INS REQUIRES	$\underline{SAPROLITE}$ (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.
BLOWS REQUIRED	<u>SILL</u> - 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.
DEEP CAN BE DETACHED	<u>SLICKENSIDE</u> - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. <u>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT)</u> - NUMBER OF BLOWS (N OR BPF) OF
OR PICK POINT. D BLOWS OF THE	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.
N FRAGMENTS INT. SMALL, THIN	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
<. PIECES 1 INCH CHED READILY BY	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. <u>TOPSOIL (TS.)</u> - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
	BENCH MARK: SEE NOTES
THICKNESS 4 FEET	ELEVATION: N/A FEET
1.5 - 4 FEET 0.16 - 1.5 FEET .03 - 0.16 FEET 008 - 0.03 FEET	<u>NOTES:</u> FIAD - FILLED IMMEDIATELY AFTER DRILLING
< 0.008 FEET	GRATE AT STA. 33+65.53 -Y2FLYAB- 12' RT (840960FT.N., 1661148FT.E.) ELEVATION: 851.09
IEAT, PRESSURE, ETC. E.	MANHOLE AT STA. 27+16.06 -Y2FLYAB- 302'RT (841378FT.N., 1661779FT.E.) ELEVATION: 824.59
PROBE:	GRATE AT STA. 23+51.94 -Y2FLYAB- 239' RT (841267FT.N., 1662205FT.E.) ELEVATION: 851.09
_ PROBE; LE;	GRATE AT STA. 22+40.00 -Y2FLYAB- 294' RT (841280FT.N., 1662350FT.E.) ELEVATION: 827.20
	DATE: 8-15-14

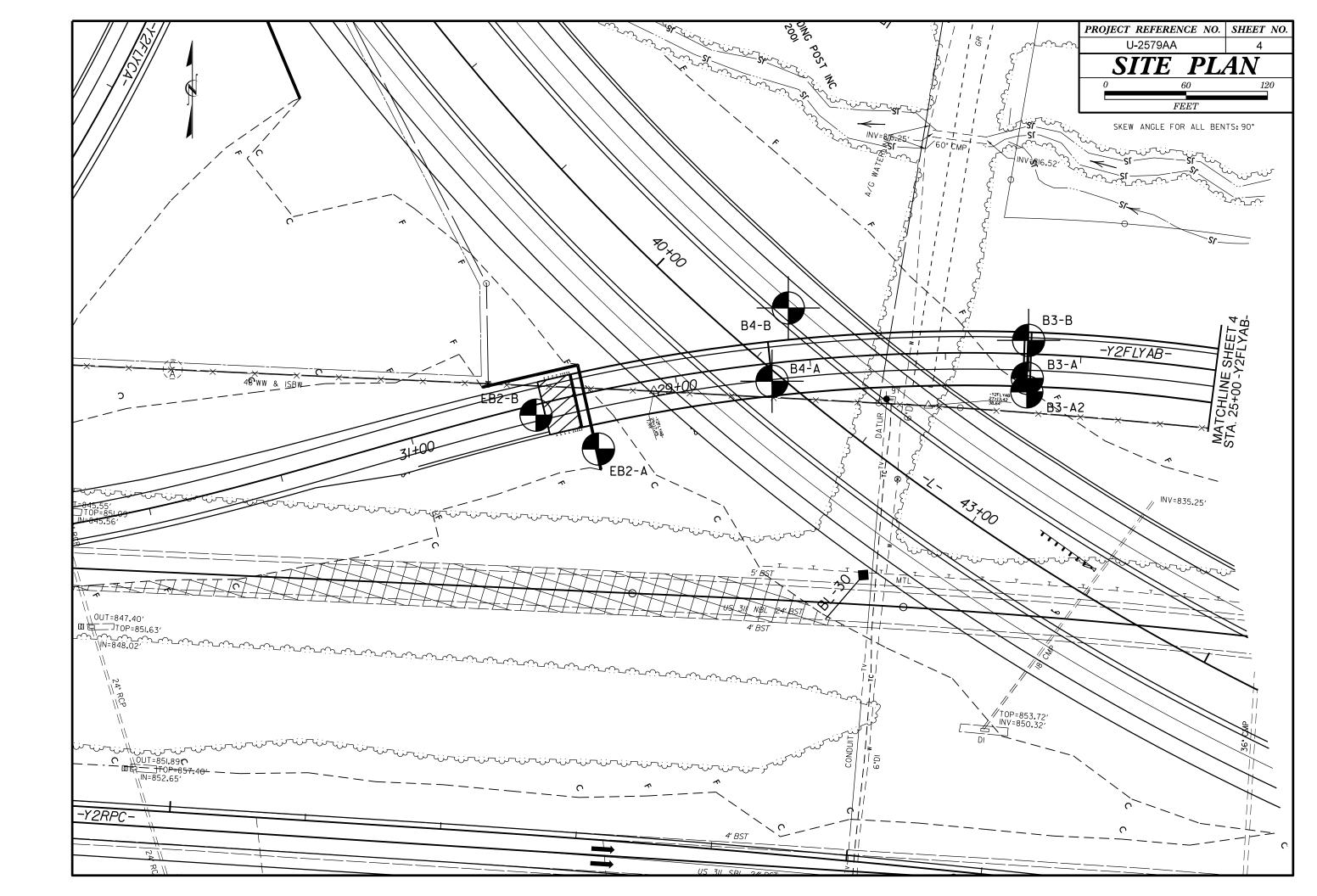
### NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT SUBSURFACE INVESTIGATION

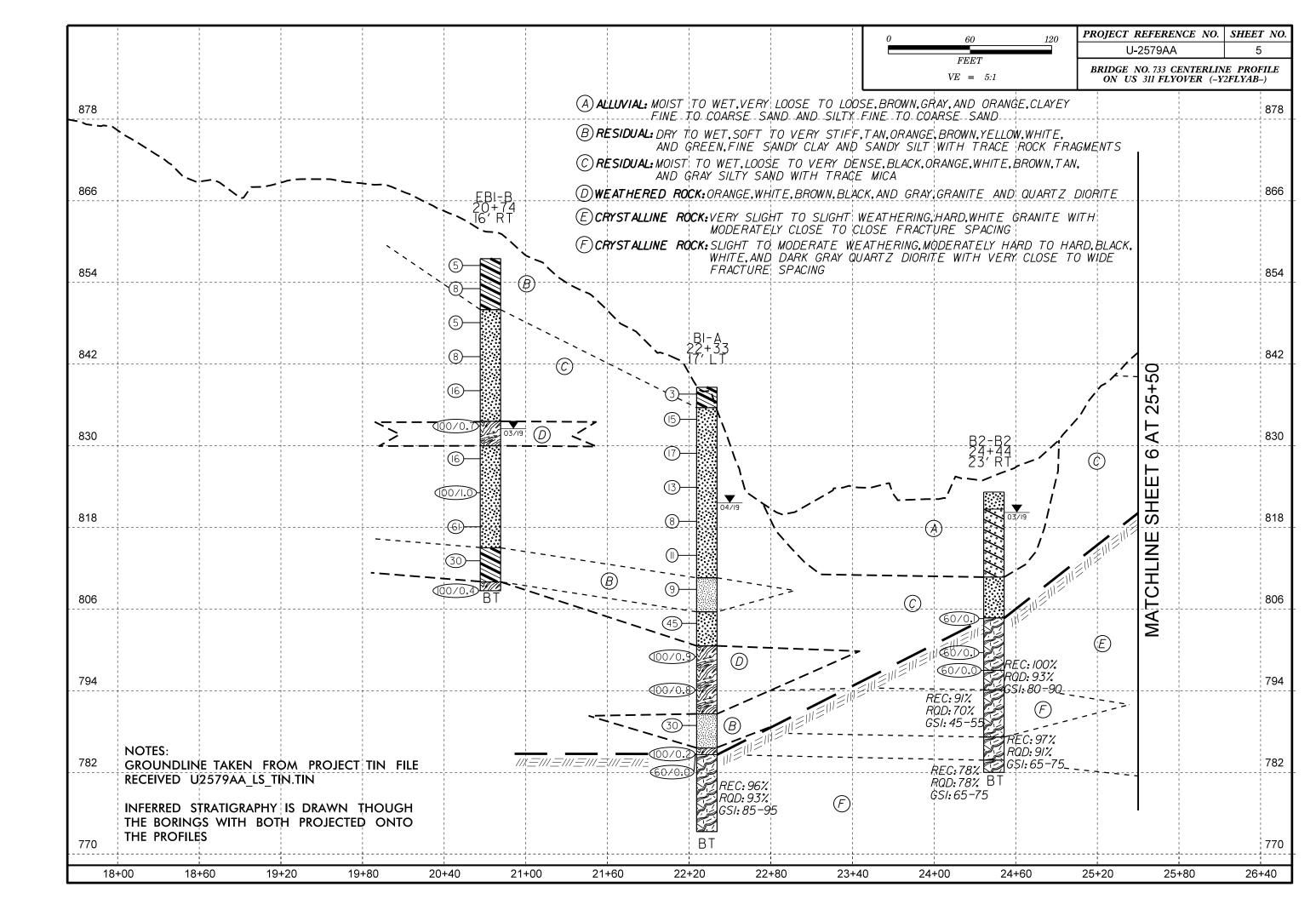
SUPPLEMENTAL LEGEND, GEOLOGICAL STRENGTH INDEX (GSI) TABLES FROM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

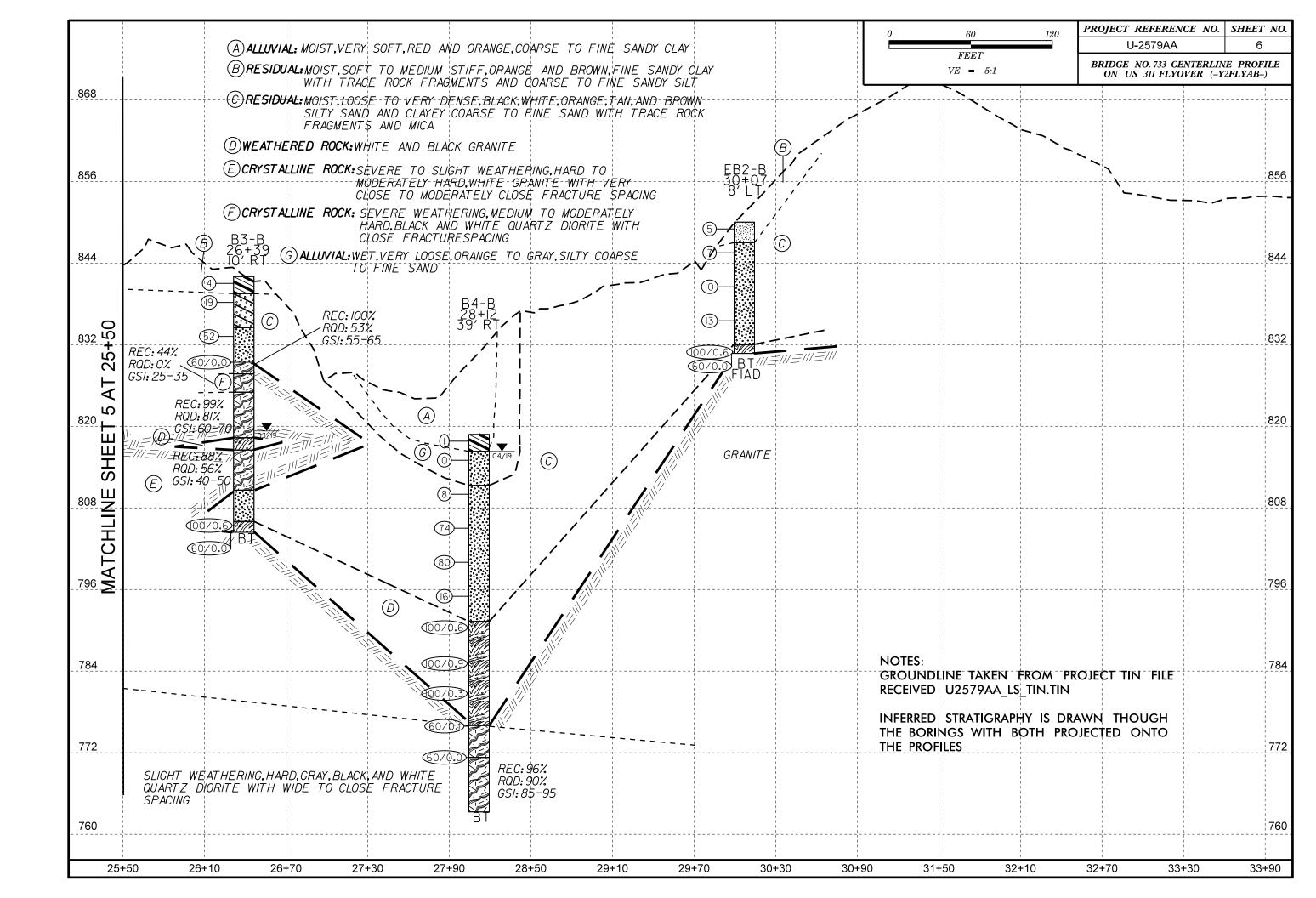
AASHTO LRFD Figure 10.4.6.4–1 — Determination of GSI for Jointed	Rock Mass (Marı	nos and Hoek,2	:000)			AASHTO LRFD Figure 10.4.6.4-2 — Determination of GSI for Tect
GEOLOGICAL STRENGTH INDEX (GSI) FOR JOINTED ROCKS (Hoek and Marinos, 2000) From the lithology, structure and surface conditions of the 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.		W COOD X Rough, slightly weathered, iron stained S surfaces	FAIR Smooth, moderately weathered and altered surfaces	POOR Slickensided, highly weathered surfaces with compact coatings or fillings or angular fragments	VERY POOR Slickensided, highly weathered surfaces with soft clay coatings or fillings	GSI FOR HETEROGENEOUS ROCK MASSES SUCH AS FLYSCH (Marinos. P and Hoek E., 2000) 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. COMPOSITION AND STRUCTURE
INTACT OR MASSIVE - intact rock specimens or massive in situ rock with few widely spaced discontinuities BLOCKY - well interlocked un-	80			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.
disturbed rock mass consisting of cubical blocks formed by three intersecting discontinuity sets		70 <sup>°</sup> 60				B. Sand- stone with thin inter-
VERY BLOCKY - interlocked, partially disturbed mass with multi-faceted angular blocks formed by 4 or more joint sets BLOCKY/DISTURBED/SEAMY - folded with angular blocks		5	0			layers of siltstone amounts stone layers
formed by many intersecting			40	30		<b>C. D. E.</b> and <b>G</b> - may be more or less folded than illustrated but this does not change the strength. Tectonic deformation, faulting and loss of continuity moves these categories to <b>F</b> and <b>H</b> .
discontinuity sets. Persistence of bedding planes or schistosity DISINTEGRATED - poorly inter- locked, heavily broken rock mass with mixture of angular and rounded rock pieces				20		G. Undisturbed silty or clayey shale with or without a few very thin sandstone layers
LAMINATED/SHEARED - Lack of blockiness due to close spacing of weak schistosity or shear planes	N/A	N/A			10	Means deformation after tectonic disturbance

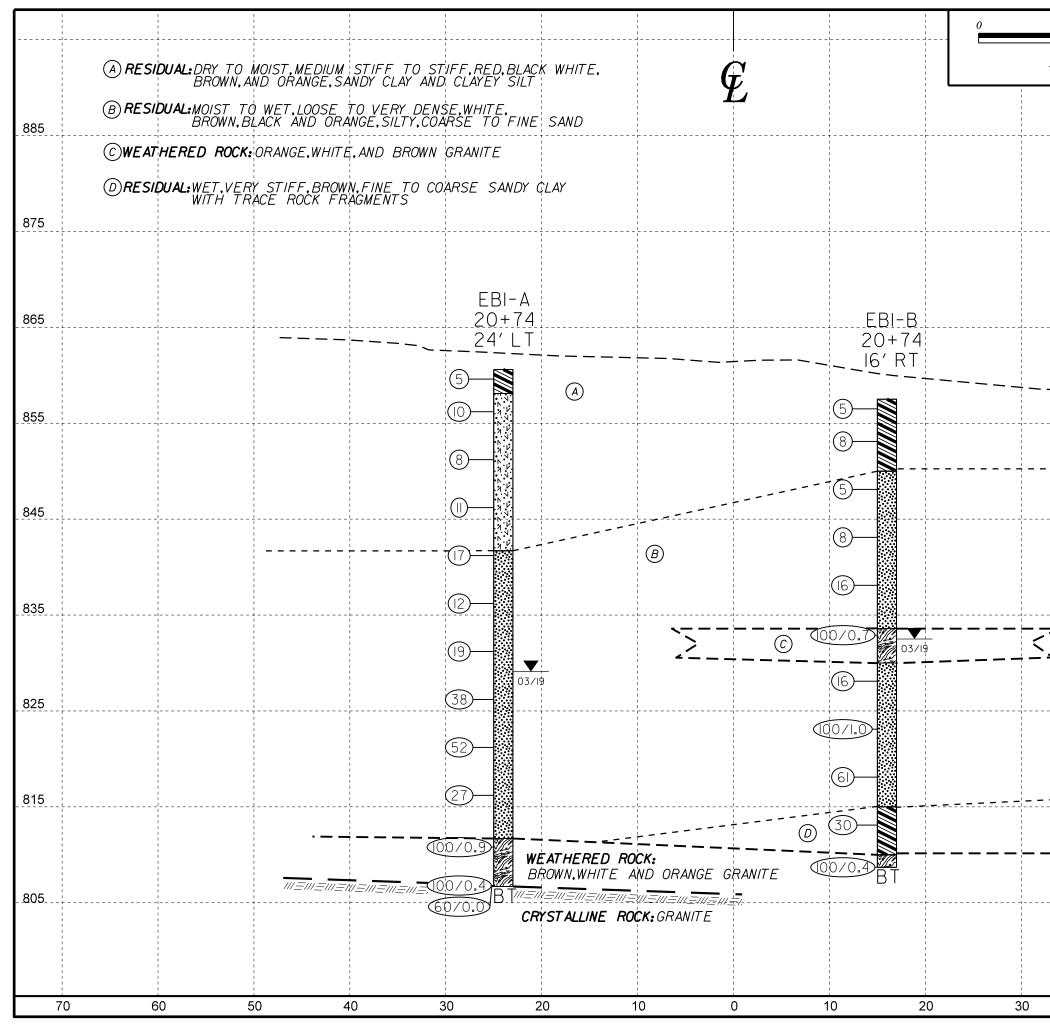
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Tecto	nically Defo	ormed Heterog	geneous Rock	Masses (Marır	nos and	Hoek,	, 2000)
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,	SURFACE CONDITIONS OF DISCONTINUITIES (Predominantly bedding	VERY GOOD - Very Rough, fresh unweathered surfaces	<b>GOOD -</b> Rough, slightly weathered surfaces	FAIR - Smooth, moderately weathered and altered surfaces	POOR - Very smooth, occasionally slickensided surfaces with compo	† 1 T	<b>VERY POOR -</b> Very smooth, slicken- sided or highly weathered surfaces with soft clay coatings or fillings
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	E. Weak siltstone		50				
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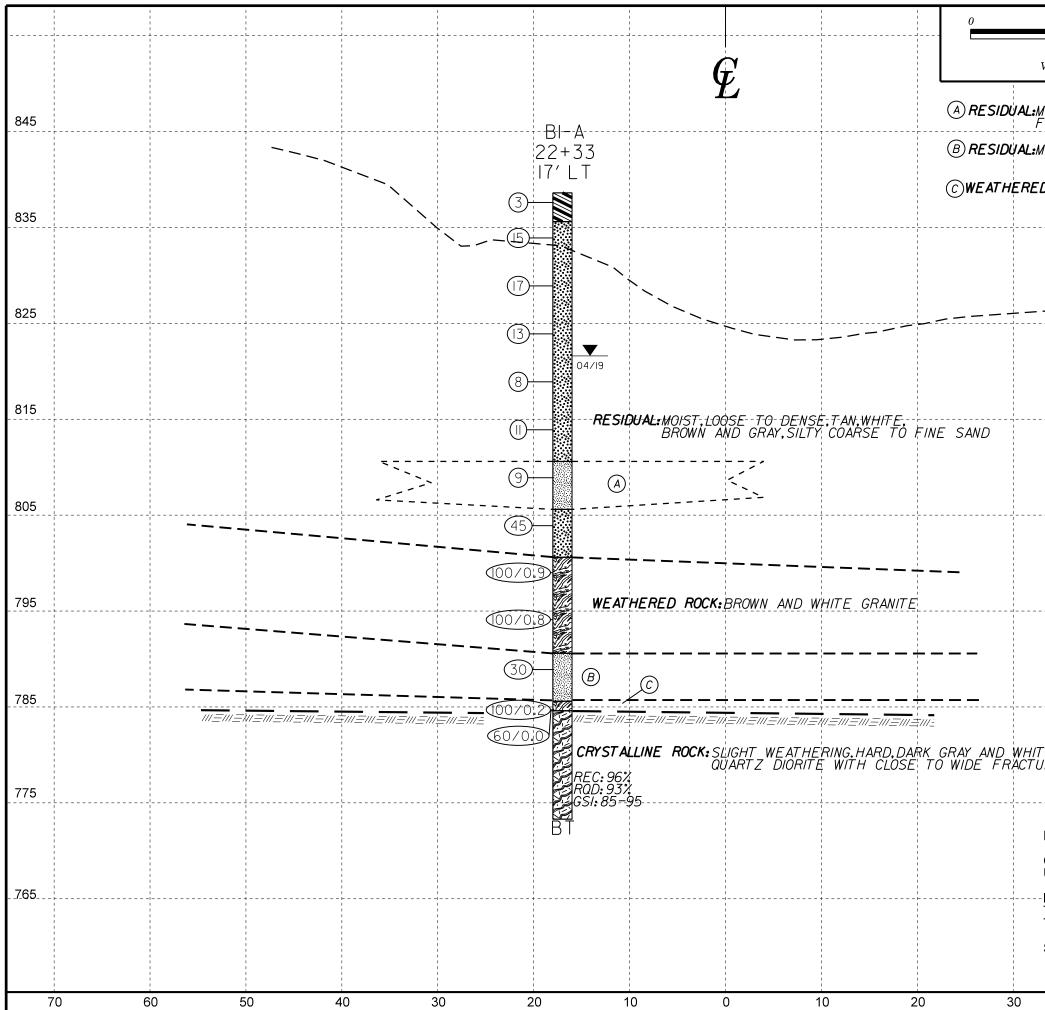




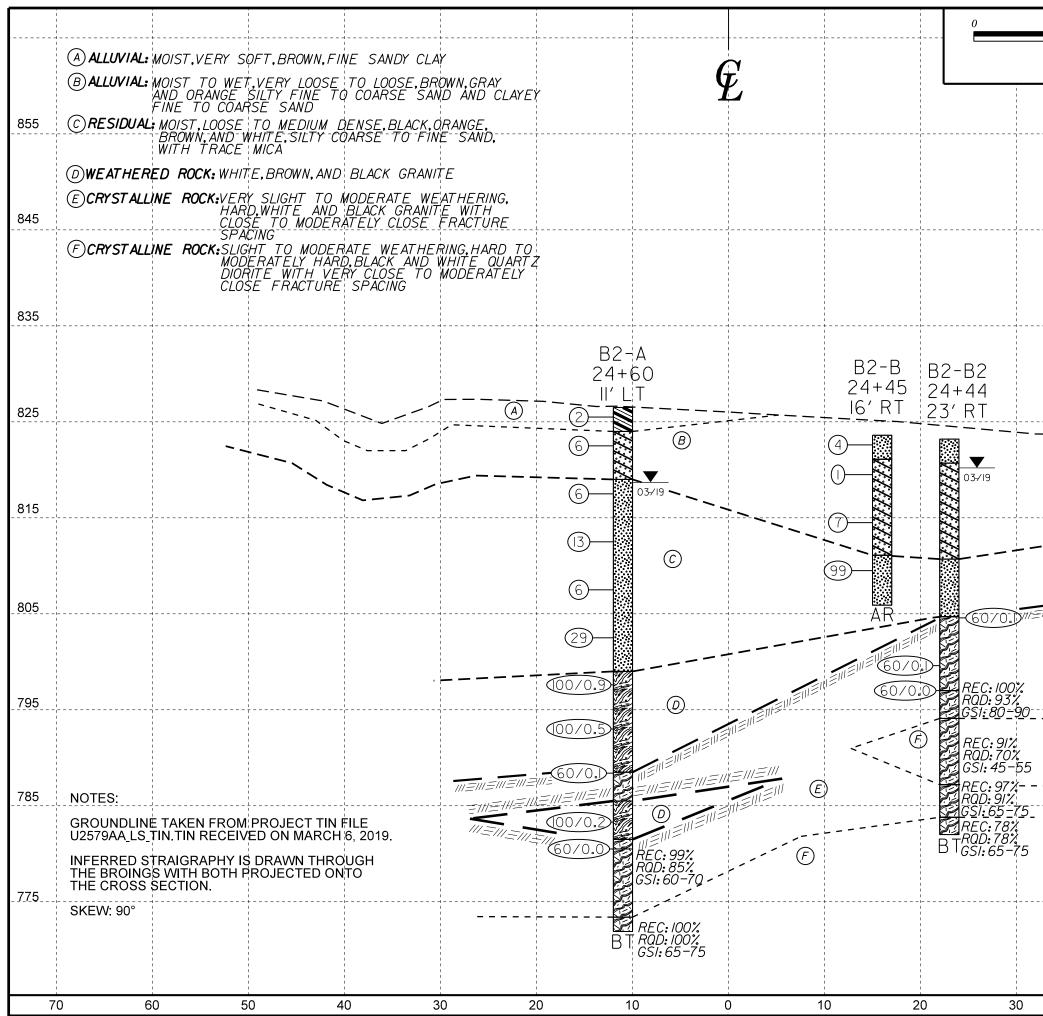




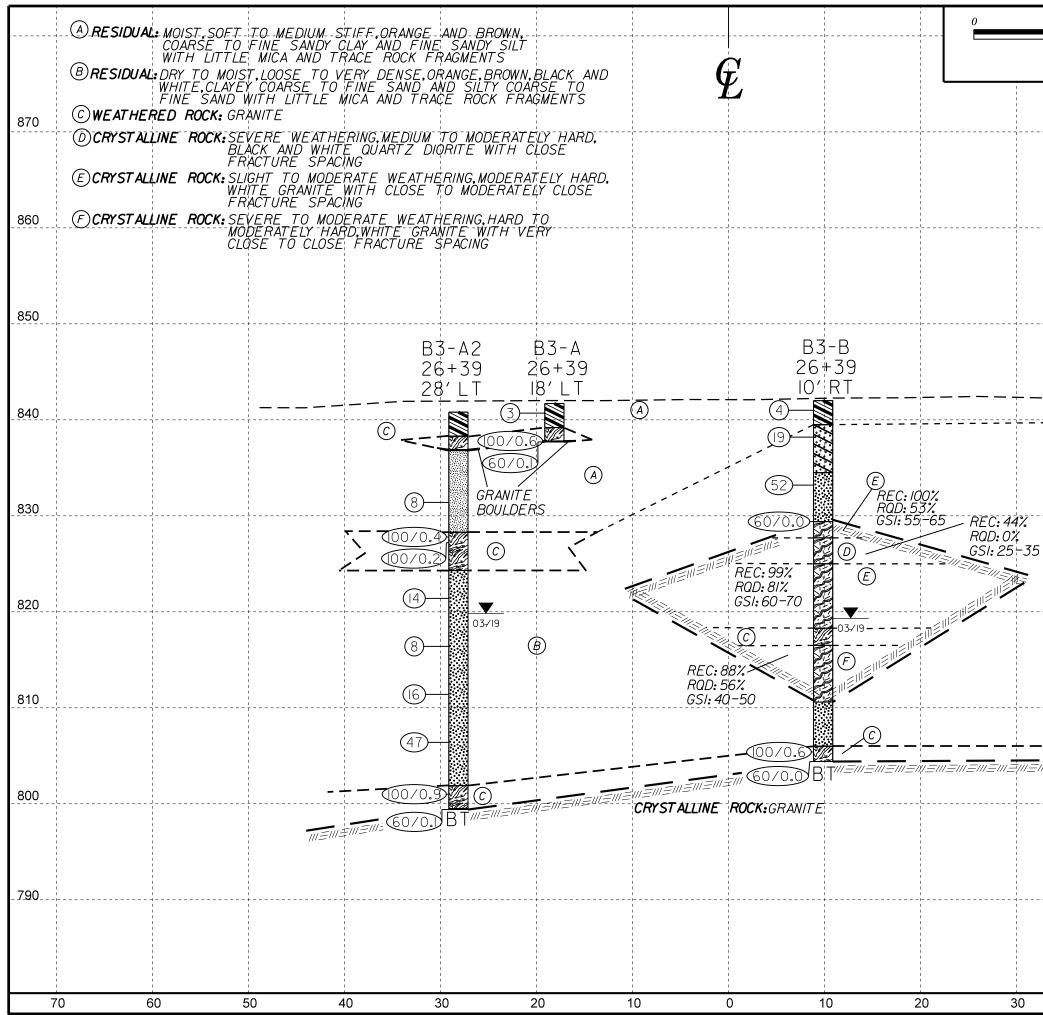
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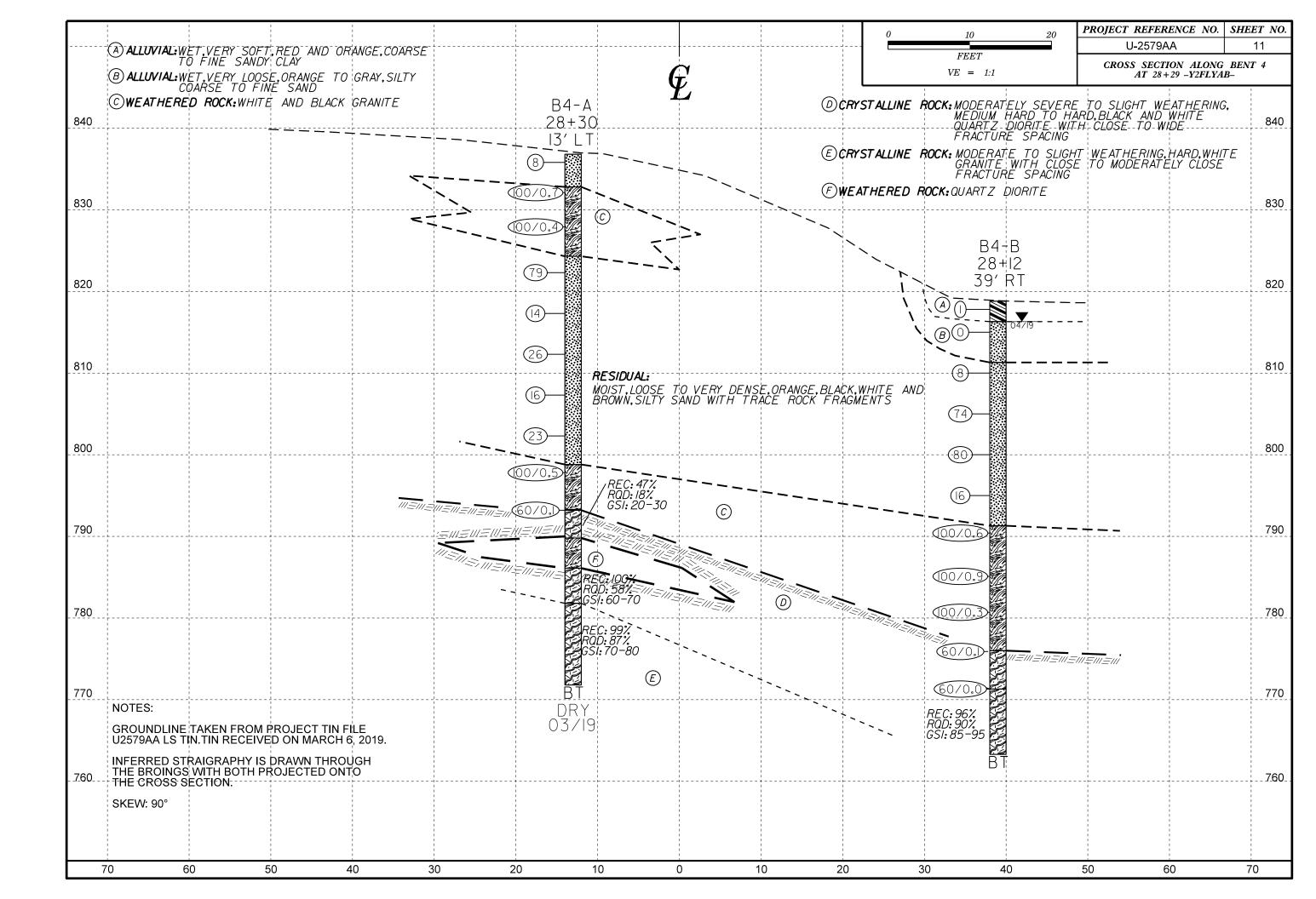
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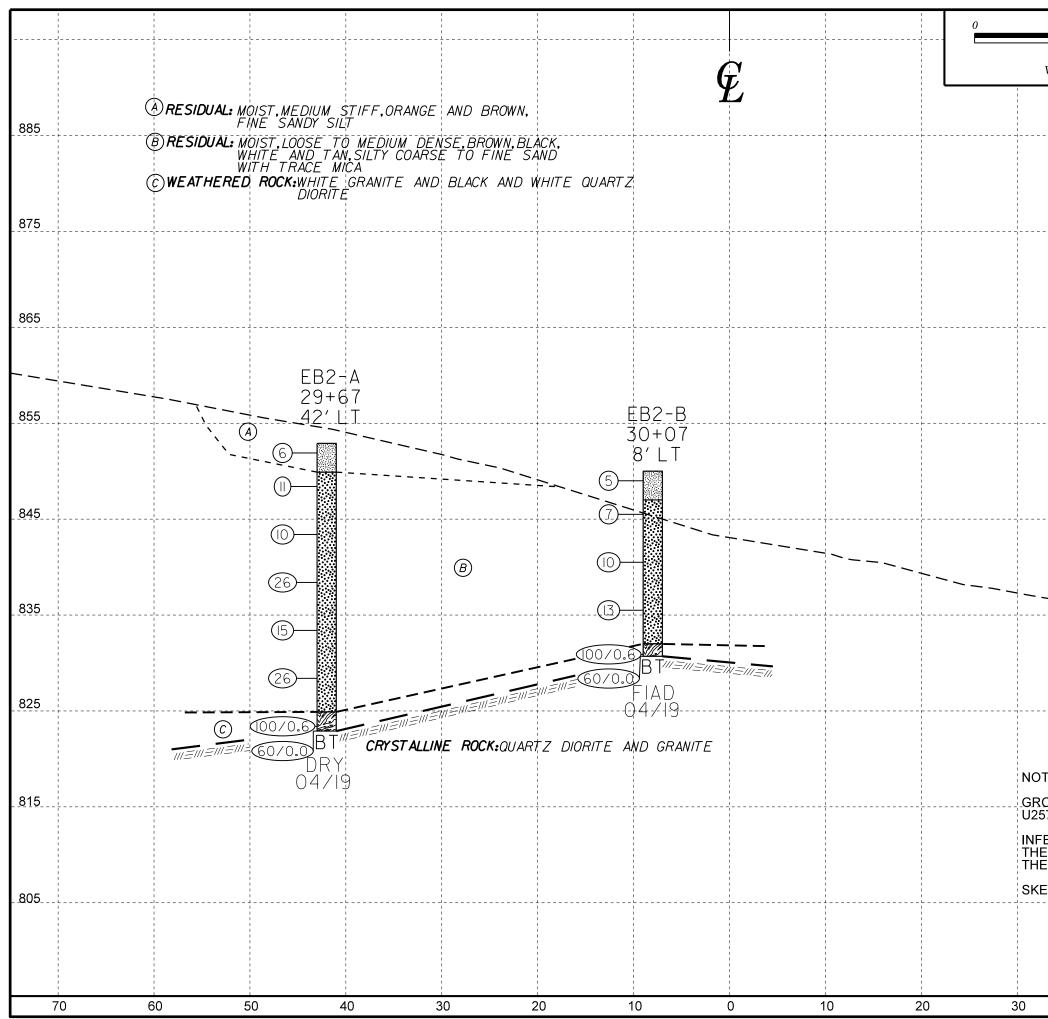


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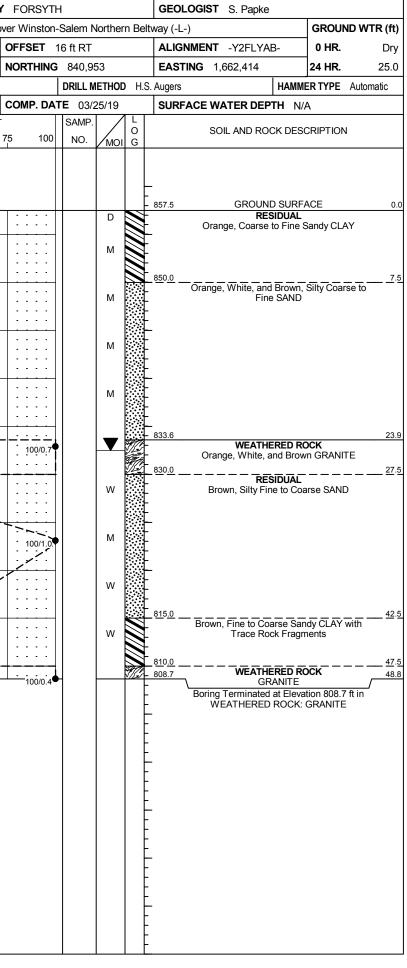
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ITTE DESCRIPTION         Bridge No. 733         UE-31 Flywer (-221-VA BORNO NO. E81-A         GROUND VIR.(ft) BORNO NO. E81-A           DOLLAR ELEV. 000.6 ft         TOTAL DEPTH 43.0 ft         NO.FFFET 241 FL/AB         ALGAMERT V-221-VAB         0.HR DV)         COLLAR ELEV. 007.5 ft         TOTAL DEPTH 43.0 ft           DRULE RIGHMANNEREFF.ONE TRODS: OLE-65 87K 0021007         DRULE RIGHMANNEREFF.ONE TRODS: OLE-65 87K 0021007         DRULE RIGHMANNEREFF.ONE TRODS: OLE-65 87K 0021000           DRULE RIGHMANNEREFF.ONE TRODS: OLE-65 87K 0021000         DRULE RIGHMANNEREFF.ONE TRODS: OLE-65 87K 0021000         DRULE RIGHMANNEREFF.ONE TRODS: OLE-65 87K 0021000         DRULE RIGHMANNEREFF.ONE TRODS: OLE-65 87K 0021000           000.1 E.0.0         0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0	<b>S</b> 34839.1.7					
DORMOND         ED1-A         STATION         OPFSET         2411.1         ALGAMEENT         Y2FLYAB         0 HR         DOT           COLLARELEV         680.6 ft         TOTAL DEPTH         53.0 ft         TOTAL DEPTH         53.0 ft         COLLARELEV         557.5 ft         TOTAL DEPTH         48.8 ft           DBLIL ROHMAGE         FEAST DATE         TOSS DATE         557.5 ft         TOTAL DEPTH         48.8 ft           DBLIL ROHMAGE         FEAST DATE         TOSS DATE         557.5 ft         TOTAL DEPTH         48.8 ft           DBLIL ROHMAGE         FEAST DATE         0.0 ft         57.6 ft         TOTAL DEPTH         48.8 ft           DBLIL ROHMAGE         FEAST DATE         0.0 ft         0.0 ft         57.6 ft         TOTAL DEPTH         48.8 ft           DBLI ROHMAGE         FEAST DATE         0.0 ft				GEOLOGIST S. Papke	WBS 34839.1.7	TIP U-2579AA COUNTY
COLLAR ELEV.         800 6 ft         TOTAL DEPTH         S3.0 ft         NORTHING         640.917         EASTING         1.682.306         24 H2         31.5           DRILL REVAMMENTER-DURE         TROOS CRESS OF 802/2019         DRILL REVAMENT PRE-DURE         TROOS CRESS OF 802/2019         DRILL REVAMENT PRE-DURE         TROOS CRESS OF 802/2019           DRILL REVAMENTER-DURE         TROOS CRESS OF 802/2019         DRILL REVAMENT PRE-DURE         TROOS CRESS OF 802/2019         DRILL REVAMENT PRE-DURE         TROOS CRESS OF 802/2019           DRILL REVAMENT PRE-DURE         TROOS CRESS OF 802/2019         DRILL REVAMENT PRE-DURE         TROOS CRESS OF 802/2019         DRILL REVAMENT PRE-DURE         TROOS CRESS OF 802/2019           DRILL REVAMENT PRE-DURE         TROOS CRESS OF 802/2019         DRILL REVAMENT PRE-DURE         TROOS CRESS OF 802/2019         DRILL REVAMENT PRE-DURE         TROOS CRESS OF 802/2019           B00         TROOS CRESS OF 802/2019         TROOS CRESS OF 802/2019         DRILL REVAMENT PRE-DURE         TROOS CRESS OF 802/2019         DRILL REVAMENT PRE-DURE         TROOS CRESS OF 802/2019           B00         TROOS CRESS OF 802/2019           B00         TROOS CRESS OF 802/2019         TROOS CRESS OF 802/2019         TROOS CRESS OF	E DESCRIPTION Bridge No		over Winston-Salem Northern Be		SITE DESCRIPTION Bridge No. 7	33 on US-311 Flyover (-Y2FLYAB-) over
DRILL INCLUSION         DISTRICT TROOP         DISTRI	RING NO. EB1-A		OFFSET 24 ft LT	ALIGNMENT -Y2FLYAB- 0 HR. Dry	BORING NO. EB1-B	STATION 20+74 O
DBLLER         R. ToxImman         START DATE         022010         SURFACE WATER DEPTH         N/A         DBLLER         R. ToxImman         START DATE         022210           LEW         DPULE         DEV	LLAR ELEV. 860.6 ft	TOTAL DEPTH 53.9 ft	NORTHING 840,917	<b>EASTING</b> 1,662,396 <b>24 HR.</b> 31.5	COLLAR ELEV. 857.5 ft	TOTAL DEPTH48.8 ftNo
LLOW       DEPTH       BLOW SOUNT       DEVMS FEE FOOT       SAMP       No       L       SOL AND ROCK DESCRIPTION       DEPTH       BLOW COUNT       BLOW SOUNT       DECUMS FEE FOOT         885       -       <	L RIG/HAMMER EFF./DATE	RI0055 CME-55 87% 03/21/2019	DRILL METHOD H.S	Augers HAMMER TYPE Automatic	DRILL RIG/HAMMER EFF./DATE TRI00	055 CME-55 87% 03/21/2019
(i)       (ii)       (iii)       (i		<b>START DATE</b> 03/26/19		SURFACE WATER DEPTH N/A		
(1)       (1)       (1)       (1)       (2)       (	V DRIVE DEPTH BLOW C			SOIL AND ROCK DESCRIPTION		
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0001     0002     100/0.4     -     Boring Terminated WITH STANDARD     -       60/0.0     60/0.0     -     PENETRATION TEST REFUSAL at     -       -     Elevation 806.7 ft on CRYSTALLINE     -     -       -     ROCK: GRANITE     -	60/0.0		60/0.0	<ul> <li>PENETRATION TEST REFUSAL at Elevation 806.7 ft on CRYSTALLINE</li> </ul>		



WIRE JUNC /         UNIX USANA         DOUBLY // USANA         UNIX USANAA         UNIX USANAA         UNIX USANAA         UNIX USANAA         UNIX USANAA         UNIX USANAA         UNIX USA										В	ORE	<u>L0</u>	G			_															00	<u>RE L</u>		j –						
BORNE 000         FAX         EXAMINE 2F4:05         OPFERT 77:17         ALLONANT 77/71/05         PLNE         No           DOULD ARE 02: 05:00         TOTAL DEPTH 05:01:10:00         SAMID 17:25:20         MAXEE FX         TOTAL DEPTH 05:00:00         MAXEE FX         MAXEE	WBS	34839.1.7	7			TIP	U-2579	9AA	C	COUNT	Y FOR	SYTH				GEC	DLOGIST C	. Driscoll				WBS	<b>S</b> 34839.1	7			TIP	U-257	9AA	CC	DUNTY	FORSY	Ή		0	GEOLOG	I <b>ST</b> C. Dr	scoll	_	
CILLAR EAX, 15 (4)         COTAL (EPTH: 63.14)         UNDTING: 26.04         Datamol 1 469.255         Numer 174         AMMER 174	SITE D	ESCRIPTI	ION	Bridge	No. 7	33 on	US-311	Flyover	r (-Y2		· · · · · · · · · · · · · · · · · · ·			m No	rtherr	_				GROUND	WTR (ft)	SITE		ION E	Bridge	No. 73	33 on L	JS-31	1 Flyove	er (-Y2F	LYAB-) o	ver Win	nston-S	alem Nor			-		GROUN	ID WTR (I
Display         Display <t< th=""><th>BORIN</th><th>G NO. B1</th><th>1-A</th><th></th><th></th><th>STA</th><th>TION 2</th><th>22+33</th><th></th><th></th><th>OFFSE</th><th><b>T</b> 17 f</th><th>ft LT</th><th></th><th></th><th>ALIC</th><th>GNMENT -</th><th>2FLYAB</th><th>-</th><th>0 HR.</th><th>N/A</th><th>BOF</th><th>ring no.</th><th>31-A</th><th></th><th></th><th>STAT</th><th>ION</th><th>22+33</th><th></th><th>OF</th><th>FSET</th><th>17 ft l</th><th>T</th><th>4</th><th>ALIGNME</th><th>NT -Y2Fl</th><th>YAB-</th><th>0 HR.</th><th>N/</th></t<>	BORIN	G NO. B1	1-A			STA	TION 2	22+33			OFFSE	<b>T</b> 17 f	ft LT			ALIC	GNMENT -	2FLYAB	-	0 HR.	N/A	BOF	ring no.	31-A			STAT	ION	22+33		OF	FSET	17 ft l	T	4	ALIGNME	NT -Y2Fl	YAB-	0 HR.	N/
DIRLEG         TAPET DAT         DATURE         DATURE        DATURE         DATURE         DATUR	COLLA	R ELEV.	838.	6 ft		тот	AL DEF	<b>PTH</b> 65.	.3 ft		NORTH	ING 8	340,98	35		EAS	<b>STING</b> 1,662	2,255	2	4 HR.	17.0	COL	LAR ELEV	838.6	6 ft		ΤΟΤΑ	L DEF	<b>PTH</b> 65	5.3 ft	NC	ORTHIN	<b>IG</b> 84	0,985	E	EASTING	1,662,25	5	24 HR.	17.
$ \frac{1}{10} + \frac{1}{10}$	DRILL R	IG/HAMMEI	R EFF.	/DATE	TRI00	55 CN	IE-55 87	% 03/21/2	2019			DF	RILL M	etho	D Mu	ud Rotar	ry/Core		HAMMER	R TYPE A	utomatic	DRIL	L RIG/HAMN	ER EFF./	/DATE	TRI00	55 CME	E-55 87	7% 03/21/	/2019			DRIL	L METHOD	Mud R	Rotary/Core		HAMM	IER TYPE	Automatic
Image:				an		STA	RT DAT	<b>E</b> 04/0	)1/19		COMP.	DATE	04/0	2/19		SUR	RFACE WAT	ER DEPT	H N/A			DRI	LLER R.T	oothma	n		STAR	RT DA	<b>FE</b> 04/0	01/19	CC	omp. D/	ATE (	04/02/19	s	SURFACE	WATER D	<b>EPTH</b> N	/A	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $			тн_											'/	0			AND ROCK	C DESCR	RIPTION		COF	RE SIZE N	A			ΤΟΤΑ	LRUN	<b>1</b> 1.3											
ABL       A	(11)	(ft) (II	<sup>1)</sup> 0	.5ft 0.	.5ft 0.	5ft C	)	25	50		75	100	NO.	/моі	G	ELEV.	(ft)				DEPTH (ft)					DRILL RATE	REC.	RQD	SAMP.	REC.	RQD O				DES	SCRIPTION	AND REMA	RKS		
Image       Job       Image       I																						(π)		π) (1	π) (	Min/ft)	(II) %	(II) %	NO.	(IL) %	(iii) % G	ELEV.	. (ft)							DEPTH
65       885       47.       6       7       7       6       7 <td></td> <td><u> </u></td> <td></td> <td>·<b>C</b></td> <td>0.0</td> <td>784.6</td> <td>3 784.6 <b>-</b> 3</td> <td>4.0 1</td> <td>3 N:</td> <td>=60/0 0</td> <td>(1.0)</td> <td>(0.7)</td> <td></td> <td>(10.9)</td> <td>(10.5)</td> <td>784.6</td> <td></td> <td></td> <td>В</td> <td>Begin Cor</td> <td>ing @ 54.0</td> <td>ft K</td> <td></td> <td>5</td>		<u> </u>																		· <b>C</b>	0.0	784.6	3 784.6 <b>-</b> 3	4.0 1	3 N:	=60/0 0	(1.0)	(0.7)		(10.9)	(10.5)	784.6			В	Begin Cor	ing @ 54.0	ft K		5
65       885       47.       6       7       7       6       7 <td></td> <td><u>338.6 + 0.0</u> +</td> <td>.0</td> <td>1</td> <td>1</td> <td>2</td> <td>3 · · ·</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>М</td> <td></td> <td>. 030.0</td> <td></td> <td>RESI</td> <td>DUAL</td> <td></td> <td></td> <td></td> <td>783.3</td> <td>5.3 5</td> <td>.0 1 6</td> <td>:30/0.3</td> <td>77%</td> <td>54%</td> <td></td> <td>96%</td> <td>93%</td> <td></td> <td>S</td> <td>ight Weathe</td> <td>ering, Ha</td> <td>rd, Dark G</td> <td>ay and White</td> <td>e, QUARTZ</td> <td>DIORITE w</td> <td>rith</td>		<u>338.6 + 0.0</u> +	.0	1	1	2	3 · · ·							М		. 030.0		RESI	DUAL				783.3	5.3 5	.0 1 6	:30/0.3	77%	54%		96%	93%		S	ight Weathe	ering, Ha	rd, Dark G	ay and White	e, QUARTZ	DIORITE w	rith
65       885       47.       6       7       7       6       7 <td>835</td> <td>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</td> <td>_</td> <td></td> <td></td> <td></td> <td>~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td><u>835.6</u></td> <td></td> <td></td> <td></td> <td></td> <td>3.0</td> <td>780</td> <td></td> <td></td> <td>14</td> <td>:30/1.0  </td> <td>(5.0)</td> <td>(0.0)</td> <td></td> <td></td> <td></td> <td>Ł</td> <td></td> <td></td> <td>Cit</td> <td>(GS</td> <td>SI: 85-95)</td> <td>acing</td> <td></td> <td></td>	835	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	_				~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~									<u>835.6</u>					3.0	780			14	:30/1.0	(5.0)	(0.0)				Ł			Cit	(GS	SI: 85-95)	acing		
65       885       47.       6       7       7       6       7 <td></td> <td><u> </u></td> <td></td> <td>5</td> <td>8</td> <td>7</td> <td>· · • •15</td> <td>;</td> <td>  </td> <td></td> <td>· · ·</td> <td></td> <td></td> <td>М</td> <td></td> <td>-</td> <td>Tan, Brown,</td> <td>White, and Fine S</td> <td>d Gray, S SAND</td> <td>Silty Coarse</td> <td>to</td> <td></td> <td>778.3 - 6</td> <td>0.3</td> <td></td> <td>:00/1.0 :00/1.0 :30/1.0</td> <td>(1.0)</td> <td>(1.0)</td> <td></td>		<u> </u>		5	8	7	· · • •15	;			· · ·			М		-	Tan, Brown,	White, and Fine S	d Gray, S SAND	Silty Coarse	to		778.3 - 6	0.3		:00/1.0 :00/1.0 :30/1.0	(1.0)	(1.0)												
65       885       47.       6       7       7       6       7 <td></td> <td>ŧ</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>•••</td> <td>· · · · ·</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>•</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>1 ±</td> <td>5</td> <td>0.0 6 7</td> <td>:00/1.0</td> <td>(4.9) 98%</td> <td>(4.8) 96%</td> <td></td>		ŧ							•••	· · · · ·						•							1 ±	5	0.0 6 7	:00/1.0	(4.9) 98%	(4.8) 96%												
65       885       47.       6       7       7       6       7 <td>830 8</td> <td>329.9 + 8.1</td> <td>.7</td> <td>7</td> <td>8</td> <td>- +</td> <td><u> </u></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>_</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>775</td> <td></td> <td></td> <td>5</td> <td>:00/1.0</td> <td></td>	830 8	329.9 + 8.1	.7	7	8	- +	<u> </u>									_						775			5	:00/1.0														
400       127       0       7       1       100       1<		ŧ		<i>'</i>	Ŭ			7				.		IVI									1/3.3	5.5	2	:30/1.0						- 113.3	Bor	ing Termina	ated at Ele			STALLINE R	ROCK: QUA	RTZ 6
1       6       6       7	825	, <b>†</b> ,	, _				:::::::::::::::::::::::::::::::::::::::		•••	· · · · ·																						F				D	IURITE			
40       110       11       1 <td></td> <td>×4.9 <u>+</u> 13. +</td> <td></td> <td>6</td> <td>6</td> <td>7    </td> <td>·••</td> <td></td> <td> </td> <td></td> <td></td> <td></td> <td></td> <td>М</td> <td></td> <td>-</td> <td></td> <td>F</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>		×4.9 <u>+</u> 13. +		6	6	7	·••							М		-																F								
180       1107       6       4 <td></td> <td>‡</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>  </td> <td>· · · · ·</td> <td> </td> <td></td> <td>ļ</td> <td>▼</td> <td></td> <td>F</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>		‡								· · · · ·			ļ	▼																		F								
815       815       812       227       5       4       7         810       803       227       5       4       7         810       803       227       5       4       7         810       803       33.7       8       9       9       9         900       7943       43.7       22       23       7       9       9         100       7943       43.7       10       14       18       10       100,000       9       90.000       9       90.000       9       9       9       10       100,000       9       9       9       9       10       100,000       9 <td>820 8</td> <td><u>319.9 <sup>+</sup> 18</u>.</td> <td>.7</td> <td>6</td> <td>4</td> <td></td> <td>-  </td> <td>· · · ·</td> <td>•••</td> <td></td> <td>· · · ·</td> <td>·</td> <td></td> <td></td> <td>-</td> <td>_</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>1 ±</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>F</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	820 8	<u>319.9 <sup>+</sup> 18</u> .	.7	6	4		-	· · · ·	•••		· · · ·	·			-	_							1 ±									F								
135       14.9       27       3       4       7       1 </td <td></td> <td>ŧ</td> <td></td> <td></td> <td>-</td> <td>·   </td> <td>.¶<sup>8</sup></td> <td></td> <td></td> <td></td> <td></td> <td>.   </td> <td></td> <td>IVI</td> <td></td> <td>•</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>1 ±</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>F</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>		ŧ			-	·	.¶ <sup>8</sup>					.		IVI		•							1 ±									F								
310       203.4       7       1 </td <td>815</td> <td></td> <td>  </td> <td></td> <td></td> <td></td> <td>· [· · ·</td> <td></td> <td>•••</td> <td>· · · · ·</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>•</td> <td></td> <td>F</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	815						· [· · ·		•••	· · · · ·						•																F								
810       900       901       907       9         805       9440       537       9       900<		14.9 <u>+</u> 23. +		5	4	7	· • 11 ·				<u> </u>			М	-	_							Ī									E								
00       004 9       03.7       18       22       23         00       706 9       38.7       00       40.0.4       100000         705       704 9       43.7       25       750.3       100000         705       704 9       43.7       25       750.3       100000       100000         705       704 9       43.7       25       750.3       100000       100000       100000         705       704 9       43.7       25       750.3       1000000       1000000       1000000       1000000       1000000       1000000       10000000       1000000       10000000       10000000       10000000       10000000       10000000       10000000       10000000       100000000       100000000       100000000       1000000000       1000000000000       100000000000000		ŧ					: į : :			· · · · ·		.											l I									E								
00       004 9       03.7       18       22       23         00       706 9       38.7       00       40.0.4       100000         705       704 9       43.7       25       750.3       100000         705       704 9       43.7       25       750.3       100000       100000         705       704 9       43.7       25       750.3       100000       100000       100000         705       704 9       43.7       25       750.3       1000000       1000000       1000000       1000000       1000000       1000000       10000000       1000000       10000000       10000000       10000000       10000000       10000000       10000000       10000000       100000000       100000000       100000000       1000000000       1000000000000       100000000000000	810 8	<u>309.9 ‡ 28</u> .		3	3		-			· · · · ·					-	<u>810.6</u>	White, Yelle	ow, and Gr	een, Fine	Sandy SIL	T <u>28.0</u>		<del> </del>									E								
200       804.9       33.7       18       22       23         800       7/9.9       38.7       60       400.4       43.7       60       400.4         7/95       7/94.9       43.7       100.45       100.04		‡		5	5					· · · · ·		·		М	-								Ŧ									E								
18       22       23       23       200 </td <td>805</td> <td></td> <td>_</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>•••</td> <td>· · · · ·</td> <td></td> <td>•</td> <td></td> <td></td> <td></td> <td>•8<u>05.6</u></td> <td></td> <td></td> <td></td> <td></td> <td><u>33.0</u></td> <td></td> <td>I I</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>E</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	805		_						•••	· · · · ·		•				•8 <u>05.6</u>					<u>33.0</u>		I I									E								
800       799.9       38.7       60       400.4       100.0		304.9 <u>+</u> 33. +		18 2	22 2	23			• • 45		<u> </u>			М		-	Tan and W	/hite, Silty I	Fine to Co	oarse SANE	0		Ŧ									-								
000       749.3       3.82       80       400.4       Image: constraint of the second s		‡										•											I I									F								
795       734.9       43.7       1000.0       1000.0         790       780.9       48.7       1000.0       1000.0         785       724.9       510       0000.0       1000.0         786       724.8       510       10000.0       1000.0         787       724.8       510       10000.0       1000.0         786       724.8       510       10000.0       1000.0         787       724.8       510       10000.0       10000.0         788       724.8       510       10000.0       10000.0         788       724.8       510       10000.0       10000.0         7780       724.8       510       10000.0       10000.0         7780       724.8       510       10000.0       10000.0         7780       7780       777.3       10000.0       10000.0         777.5       100000.0       100000.0       100000.0       100000.0         777.3       1000000.0       100000.0       100000.0       100000.0         777.3       10000000.0       1000000.0       1000000.0       1000000.0         777.3       100000000.0       1000000000000000000000000000000000000	800 -	<u>799.9 ‡ 38</u> .	.7	30 40	/0.4				· Ĺ	<u></u>		<u> </u>				<u>800.6</u>		WEATHER	RED ROC	к — — — — —	<u>38.0</u>		<del> </del>									E								
780       789.9       48.7       10       14       16		ŧ			/0.4		· · · · ·			· · · · ·	• • •	·					Bro	wn and Wi	hite GRA	NITE			l I									E								
780       789.9       48.7       10       14       16	795 -		_																				I I									E								
780       789.9       48.7       10       14       16		<u>94.9 - 4</u> 3. +		25 75	/0.3						• 100					-							1 ±									F								
780       789.9       48.7       10       14       16		‡										·				•							I									F								
785     784 9     53 7       785     784 9     53 7       785     784 9       785     784 0       785     784 0       785     784 0       785     784 0       785     784 0       785     784 0       785     784 0       785     784 0       785     784 0       786     784 0       786     784 0       787     1000 2       0     0       780     0       1   <	790	7 <u>89.9 <del>+</del> 48</u> .	.7	10 1	14	6		+ -	<u> </u>	<u> </u>	+					<u>/90.6</u>					<u>48.0</u>		+									F								
785       784.8       53.7		ŧ		~   '								:		IVI	St 1		Brown a	ind Orange	e, ⊢ine Sa	andy SILT			<u>†</u>									F								
1     60/0.0     1 <td< td=""><td>785 -</td><td>, <sup>†</sup> .</td><td>-</td><td></td><td></td><td></td><td></td><td></td><td>· · ·</td><td>· · · · ·</td><td></td><td>·   </td><td></td><td></td><td></td><td><u>785.6</u></td><td></td><td></td><td></td><td></td><td>53.0</td><td></td><td>  <u>f</u></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>F</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>	785 -	, <sup>†</sup> .	-						· · ·	· · · · ·		·				<u>785.6</u>					53.0		<u>f</u>									F								
780     775     775     773     653     653		<u>184.8 + 54</u>	10	0/0.2							60	0.2 0.0				- / 84.6 -	Black a	and Gray Q	UARTZ D	DIORITE	54.0											F								
780     1<	5	ŧ		,0.0											64	•	Dark Grav	and White	INE ROC	Z DIORITE			<u>+</u>									F								
775     773.3     65.3       60     773.3 ft in	780	+													64	_							+									F								
775     -		Ŧ										·			B\$								<u>+</u>									F								
Image: Constraint of the second sec	775	Ŧ													B\$								±									F								
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		Ŧ													F		Boring Ter CRYSTAL	minated at	t Elevation K: QUAR	n 773.3 ft in TZ DIORITE	י ב		‡									F								
	20	Ŧ														-							+									F								
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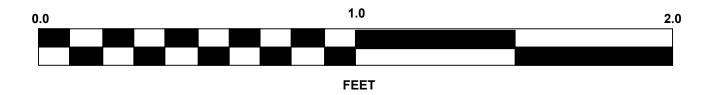
### SHEET 14

### GEOTECHNICAL BORING REPORT CORE LOG

### **CORE PHOTOGRAPHS**



**B1-A** BOX 1 & 2: 54.0 to 65.3 FEET



		BORE LOG			1	CORE LOG	
<b>WBS</b> 34839.1.7	TIP U-2579AA COUN	TY FORSYTH	GEOLOGIST S. Papke	<b>WBS</b> 34839.1.7	TIP U-2579AA COUN	TY FORSYTH	GEOLOGIST S. Papke
SITE DESCRIPTION Bridge No.	733 on US-311 Flyover (-Y2FLYA	İ	n Beltway (-L-) GROUND WTR (ft)	SITE DESCRIPTION Bridge No. 7	733 on US-311 Flyover (-Y2FLYA		ern Beltway (-L-) GROUND WTR
BORING NO. B2-A	<b>STATION</b> 24+60	OFFSET 11 ft LT	ALIGNMENT -Y2FLYAB- 0 HR. N/A	BORING NO. B2-A	STATION 24+60	OFFSET 11 ft LT	ALIGNMENT -Y2FLYAB- 0 HR. N
COLLAR ELEV. 826.5 ft	TOTAL DEPTH 54.6 ft	NORTHING 841,048	EASTING 1,662,039 24 HR. 7.8	COLLAR ELEV. 826.5 ft	TOTAL DEPTH 54.6 ft	NORTHING 841,048	EASTING 1,662,039 24 HR.
DRILL RIG/HAMMER EFF./DATE TRIC	0055 CME-55 87% 03/21/2019	DRILL METHOD N	lud Rotary/Core HAMMER TYPE Automatic	DRILL RIG/HAMMER EFF./DATE TRI0	055 CME-55 87% 03/21/2019	DRILL METHOD	Mud Rotary/Core HAMMER TYPE Automati
DRILLER R. Toothman	START DATE 03/22/19	COMP. DATE 03/22/19	SURFACE WATER DEPTH N/A	DRILLER R. Toothman	<b>START DATE</b> 03/22/19	COMP. DATE 03/22/19	SURFACE WATER DEPTH N/A
ELEV DRIVE DEPTH BLOW COUN		DT SAMP.	SOIL AND ROCK DESCRIPTION	CORE SIZE NQ2	TOTAL RUN 8.6 ft		·
(ft) (ft) (ft) 0.5ft 0.5ft (	0.5ft 0 25 50	75 100 NO. MOI G		ELEV RUN DEPTH RUN DRILL (ft) ELEV (ft) (ft) RATE	RUN (ft)SAMP.STRATA REC.(ft)(ft)NO.(ft)%%%		DESCRIPTION AND REMARKS
				(ft) ELEV (ft) (ft) (Min/ft)	(ft) (ft) NO. (ft) (ft) (ft)	G ELEV. (ft)	DESCRIPTION AND REMARKS
830			_	780,5			Begin Coring @ 46.0 ft
				780.5 780.5 780.5 780.5 46.0 4.6 8 2:00/0.6	2 (4.5) (3.9) (7.0) (6.0 98% 85% 99% 85%	) 780.5 Slight to Moderate	Weathering, Hard, White and Black GRANITE with Close to Moderately Close Facture Spacing
826.5 - 0.0 WOH 1	1		- 826.5 GROUND SURFACE 0.0 - ALLUVIAL				(GSI: 60-70)
	·   • • • • • • • • • • • • • • • • • •		Brown, Fine Sandy CLAY 2.5		(4.0) (3.6) 100% 90%		
823.5 + 3.0 3 3	3	· · · · ·   W	Brown, Clayey Fine to Coarse SAND	3:24/1.0 3:14/1.0 771.9 54.6 3:15/1.0 3:13/1.0	(1.5) (1.5)	773.4 ) 771.9 Slight Weathe	ering, Hard, Black and White QUARTZ DIORITE with
820			_	771.9 54.6 3.10/1.0	(1.5) (1.5) RS-1 100% 100%		Moderately Close Fracture Spacing (GSI: 65-75)
818.5 + 8.0	$2 \qquad 1 \qquad 2 \qquad 1 \qquad 2 \qquad 1 \qquad 1 \qquad 2 \qquad 1					Boring Terminated	at Elevation 771.9 ft in CRYSTALLINE ROCK: QUARTZ
	$\begin{array}{c c c c c c c c c c c c c c c c c c c $		Orange, Brown, and White, Silty Coarse to Fine SAND with Trace Mica, Saprolitic				DIORITE
<u>315</u>							
813.5 + 13.0 + 9	4	· · · · · ·   M	-				
			-				
808.5 + 18.0			-				
		·   · · · ·     M	-				
			-				
803.5 + 23.0 + 3 4	25	· · · · ·   M	-				
	$\left \begin{array}{c cccccccccccccccccccccccccccccccccc$		-				
798 5 - 28 0							
- 35 65/0.4		· · · · · · · · · · · · · · · · · · ·	White, Brown, and Black GRANITE			E	
795 +							
793.5 + 33.0		· · · · · · · · · · · · · · · · · · ·					
		· · · · · · · · · · · · · · · · · · ·					
		· · · · · · ]					
60/0.1			- CRYSTALLINE ROCK - GRANITE				
785 +		· · · · ·	<u>– 785.5</u> <u>41.0</u> <u>41.0</u> <u>41.0</u>				
783.5 + 43.0			White and Black GRANITE			I F	
			- 781.5 - 780.5 CRYSTALLINE ROCK 45.0 46.0				
780 780.5 + 46.0 60/0.0			GRANITE ////////////////////////////////////				
						F	
775			<u> </u>				
			- 773.4 53.1			F	
			Boring Terminated at Elevation 771.9 ft in				
			CRYSTALLINE ROCK: QUARTZ DIORITE				
			-				
			-				
			-				
			-				
			-				

### SHEET 16

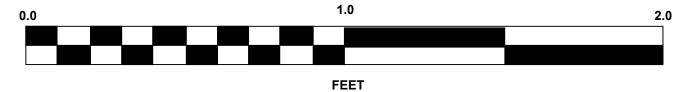
### GEOTECHNICAL BORING REPORT CORE LOG

WBS: 34839.1.7, TIP: U-2579AA BRIDGE NO. 733 ON US 311 FLYOVER (-Y2FLYAB-) OVER WINSTON-SALEM NORTHERN BELTWAY (-L-)

### **CORE PHOTOGRAPHS**

**B2-A** BOX 1: 46.0 to 54.6 FEET





825	ALIGNMENT     -Y2FLYAB-     0 HR.     N/A       EASTING     1,662,058     24 HR.     FIAD       Rotary     HAMMER TYPE     Automatic       SURFACE WATER DEPTH     N/A       SOIL AND ROCK DESCRIPTION       ELEV. (ft)     DEPTH (ft)       823.6     GROUND SURFACE     0       ALLUVIAL     DEPTH (ft)	
BORING NO. B2-B       STATION 24+45       OFFSET 16 ft RT         COLLAR ELEV. 823.6 ft       TOTAL DEPTH 17.7 ft       NORTHING 841,071         DRILL RIG/HAMMER EFF./DATE TRI055 CME-55 87% 03/21/2019       DRILL METHOD Mud         DRILL RC TRI055 CME-55 87% 03/21/2019       DRILL METHOD Mud         DRILL RE TRI055 CME-55 87% 03/21/2019       DRILL METHOD Mud         DRILL RE TRI055 CME-55 87% 03/21/2019       COMP. DATE 03/25/19         DRILL METHOD       Mud         DRILL PETH       BLOW COUNT       SAMP. NO.       L         BLOW COUNT       BLOWS PER FOOT       SAMP. NO.       L         B25       A <th colsp<="" th=""><th>ALIGNMENT     -Y2FLYAB-     0 HR.     N/A       EASTING     1,662,058     24 HR.     FIAD       Rotary     HAMMER TYPE     Automatic       SURFACE WATER DEPTH     N/A       SOIL AND ROCK DESCRIPTION       ELEV. (ft)     DEPTH (ft)       823.6     GROUND SURFACE     0       ALLUVIAL     DEPTH (ft)</th></th>	<th>ALIGNMENT     -Y2FLYAB-     0 HR.     N/A       EASTING     1,662,058     24 HR.     FIAD       Rotary     HAMMER TYPE     Automatic       SURFACE WATER DEPTH     N/A       SOIL AND ROCK DESCRIPTION       ELEV. (ft)     DEPTH (ft)       823.6     GROUND SURFACE     0       ALLUVIAL     DEPTH (ft)</th>	ALIGNMENT     -Y2FLYAB-     0 HR.     N/A       EASTING     1,662,058     24 HR.     FIAD       Rotary     HAMMER TYPE     Automatic       SURFACE WATER DEPTH     N/A       SOIL AND ROCK DESCRIPTION       ELEV. (ft)     DEPTH (ft)       823.6     GROUND SURFACE     0       ALLUVIAL     DEPTH (ft)
COLLAR ELEV.       823.6 ft       TOTAL DEPTH       17.7 ft       NORTHING       841,071         DRILL RIG/HAMMER EFF/DATE       TRI0055       CME-55       87%       03/21/2019       DRILL METHOD       Mud         DRILL R       R. Toothman       START DATE       03/25/19       COMP. DATE       03/25/19         ELEV (ft)       DRIVE ELEV (ft)       DEPTH (ft)       BLOW COUNT 0.5ft       BLOW COUNT       BLOWS PER FOOT 0       SAMP.       V       L 0       O NO.       MOI       G         825       823.6       0.0       0	EASTING     1,662,058     24 HR.     FIAD       Rotary     HAMMER TYPE     Automatic       SURFACE WATER DEPTH     N/A       SOIL AND ROCK DESCRIPTION       ELEV. (ft)     DEPTH (ft)       823.6     GROUND SURFACE     0       ALLUVIAL     Brown Sith Enders SAND	
DRILL RIG/HAMMER EFF./DATE         TRI0055         CME-55         87%         03/21/2019         DRILL METHOD         Mud           DRILLER         R. Toothman         START DATE         03/25/19         COMP. DATE         03/25/19           ELEV (ft)         DEPTH ELEV (ft)         BLOW COUNT         BLOW S PER FOOT         SAMP.         U         0           825         823.6         0.0         0	Rotary     HAMMER TYPE     Automatic       SURFACE WATER DEPTH     N/A       SOIL AND ROCK DESCRIPTION       ELEV. (ft)     DEPTH (ft)       823.6     GROUND SURFACE     0       ALLUVIAL     Energy State     0	
DRILLER         R. Toothman         START DATE         03/25/19         COMP. DATE         03/25/19           ELEV (ft)         DRIVE ELEV (ft)         DEPTH (ft)         BLOW COUNT         BLOWS PER FOOT         SAMP.         V         L O NO.         V         0 O MOI         O O           825         823.6         0.0         0	SURFACE WATER DEPTH N/A SOIL AND ROCK DESCRIPTION ELEV. (ft) DEPTH (1 823.6 GROUND SURFACE 0 ALLUVIAL Brown Sith Encore SAND	
BLEV (ft)         DEPTH (ft)         BLOW COUNT         BLOWS PER FOOT         SAMP.         L         O           825         823.6         0.0         0	SOIL AND ROCK DESCRIPTION ELEV. (ft) DEPTH (f 823.6 GROUND SURFACE 0 ALLUVIAL Brown Sith Encourse SAND	
(II)         (II)         0.5ft         0.5ft         0         25         50         75         100         NO.         MOI         G           825	ELEV. (ft) DEPTH (ft) 823.6 GROUND SURFACE 0 ALLUVIAL Brown Sith Encourse SAND	
823.6 - 0.0	ALLUVIAL Brown Silty Fine to Coargo SAND	
	Brown Silty Find to Coordo SAND	
	Brown, Gray, and Orange, Clayey Fine to Coarse SAND2.	
	Coarse SAND	
	Black and White, Silty Fine to Coarse SAND with Trace Mica 805.9 17.	
	Boring Terminated BY AUGER REFUSAL at Elevation 805.9 ft in RESIDUAL SOIL: Silty SAND NOTE:	
	Boring terminated due to inability to clean out borehole to test split spoon at sample depth. Boring was offset and redrilled as B2-B2.	

	1	BORELOG		1		CORE LOG
<b>WBS</b> 34839.1.7		ITY FORSYTH	GEOLOGIST S. Papke	<b>WBS</b> 34839.1.7		TY FORSYTH GEOLOGIST S. Papke
SITE DESCRIPTION Bridge No. 7	· · ·			SITE DESCRIPTION Bridge No. 7		B-) over Winston-Salem Northern Beltway (-L-) GROUND WTR (ft)
BORING NO. B2-B2	STATION 24+44	OFFSET 23 ft RT	ALIGNMENT -Y2FLYAB- 0 HR. N/A	BORING NO. B2-B2	STATION 24+44	OFFSET         23 ft RT         ALIGNMENT         -Y2FLYAB-         0 HR.         N/A
COLLAR ELEV. 823.2 ft	TOTAL DEPTH 41.2 ft	<b>NORTHING</b> 841,078	<b>EASTING</b> 1,662,061 <b>24 HR.</b> 3.0	COLLAR ELEV. 823.2 ft	TOTAL DEPTH 41.2 ft	NORTHING         841,078         EASTING         1,662,061         24 HR.         3.0
DRILL RIG/HAMMER EFF./DATE TRI0	055 CME-55 87% 03/21/2019	DRILL METHOD	ud Rotary/Core HAMMER TYPE Automatic	DRILL RIG/HAMMER EFF./DATE TRI0	0055 CME-55 87% 03/21/2019	DRILL METHOD Mud Rotary/Core HAMMER TYPE Automatic
DRILLER R. Toothman	START DATE 03/26/19	COMP. DATE 03/27/19	SURFACE WATER DEPTH N/A	DRILLER R. Toothman	START DATE 03/26/19	COMP. DATE 03/27/19 SURFACE WATER DEPTH N/A
ELEV DRIVE DEPTH BLOW COUN	T BLOWS PER FOO	DT SAMP.	SOIL AND ROCK DESCRIPTION	CORE SIZE NQ2	TOTAL RUN 15.0 ft	
(ft) (ft) (ft) 0.5ft 0.5ft 0	0.5ft 0 25 50	75 100 NO. MOI G		ELEV RUN DEPTH RUN RATE (ft) (ft) (ft) (ft) (Mio(ft)	REC.         RQD         SAMP.         STRATA           (ft)         (ft)         NO.         (ft)         (ft)         (ft)	L DESCRIPTION AND REMARKS
				(ft) ELEV (ft) (ft) (Min/ft)	(ft) (ft) NO. (ft) (ft) (ft)	0         0         DESCRIPTION AND REMARKS           G         ELEV. (ft)         DEPTH (ft)
825				797		Begin Coring @ 26.2 ft
			823.2 GROUND SURFACE 0.0	797.0 26.2 5.0 N=60/0.0	0 (4.5) (4.1) (2.9) (2.7 90% 82% 100% 93%	) 797.0 Very Slight Weathering, Hard, White GRANITE with Moderately Close 26.2 Fracture Spacing
			ALLUVIAL 820.7 Brown, Silty Fine to Coarse SAND 2.5		(6.3) (4.8	) 797.0 Very Slight Weathering, Hard, White GRANITE with Moderately Close 26.2 Fracture Spacing (GSI: 80-90) 29.1 Moderate Weathering, Moderately Hard, Black and White QUARTZ DIORITE with Very Close to Close Fracture Spacing
820 -			Brown, Gray, and Orange, Clayey Fine to	792.0 31.2 2:52/1.0 5.0 4:20/1.0		
		1 1 6.7	Coarse SAND	790 790 2:54/1.0	(4.9) (3.4) 98% 68%	(GSI: 45-55)
815				790 		787.2 36.0
		· · · · · ·	-	785 5.0 <u>3:47/1.0</u> 3:47/1.0	(4.5) (4.5) RS-2 (3.3) (3.1)	) Slight Weathering, Hard, White GRANITE with Close Fracture Spacing
						(GSI: 05-73) 783.8 39.4
810			I REGIDOAL	782.0 41.2 3:17/1.0 4:03/1.0		783.8     39.4       782.0     Moderate Weathering, Moderately Hard, Black and White QUARTZ       782.0     DIORITE with Close Fracture Spacing
			Black and White, Silty Fine to Coarse SAND with Trace Mica			GSI: 65-75)     Boring Terminated at Elevation 782.0 ft in CRYSTALLINE ROCK: QUARTZ
						Diorite
805 804.7 18.5 60/0.1			- 804.7 18.5 - CRYSTALLINE ROCK			NOTE:
			White and Black GRANITE			Auger Probe From 0.0 - 18.5' bgs (See Boring B2-B for SPT Sampling)
800 799.7 23.5		· 60/0.1 ·				
60/0.1		60/0.1				
797.0 26.2 60/0.0		· · · 60/0.0	797.0 26.2 White GRANITE			F
795			794.1 29.1			
			Black and White QUARTZ DIORITE			
		· · · · ·	-			
			787.2 36.0 White GRANITE			
785		RS-2	-			
			Black and White QUARTZ DIORITE			
			Boring Terminated at Elevation 782.0 ft in			
			CRYSTALLINE ROCK: QUARTZ DIORITE			
			NOTE: Auger Probe From 0.0 - 18.5' bgs (See			
			Boring B2-B for SPT Sampling)			
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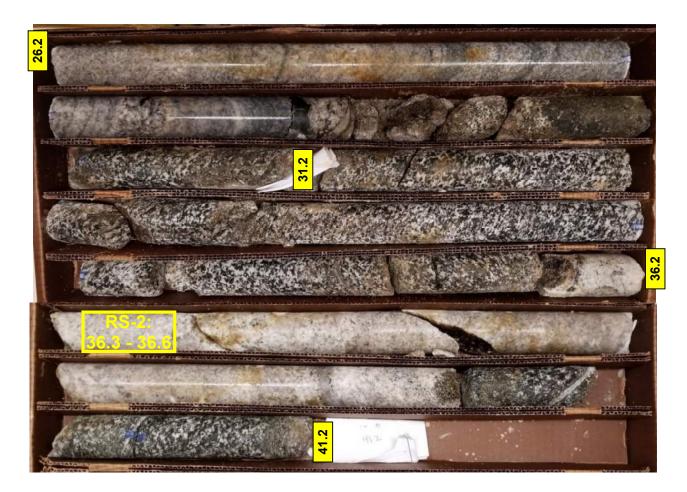
### SHEET 19

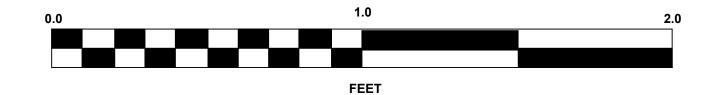
### GEOTECHNICAL BORING REPORT CORE LOG

### **CORE PHOTOGRAPHS**

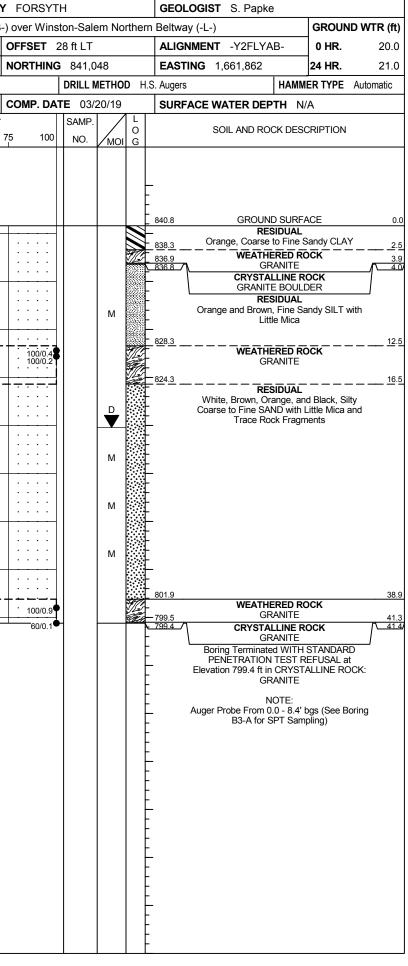
### B2-B2

BOX 1 & 2: 26.2 to 41.2 FEET





		1	ORE LUG		] [	
<b>WBS</b> 34839.1.7			ry forsyth	GEOLOGIST S. Papke	WBS 34839.1.7	TIP U-2579AA COUNTY
	Bridge No. 7	733 on US-311 Flyover (-Y2FLYA				733 on US-311 Flyover (-Y2FLYAB-)
BORING NO. B3-A		STATION 26+39	OFFSET 18 ft LT	ALIGNMENT -Y2FLYAB- 0 HR. Dry	BORING NO. B3-A2	STATION 26+39
COLLAR ELEV. 841	.7 ft	TOTAL DEPTH 4.0 ft	NORTHING 841,058	<b>EASTING</b> 1,661,862 <b>24 HR.</b> Dry	COLLAR ELEV. 840.8 ft	TOTAL DEPTH41.4 ft
DRILL RIG/HAMMER EFF	F./DATE TRI0	0055 CME-55 87% 03/21/2019	DRILL METHOD H.S	Augers HAMMER TYPE Automatic	DRILL RIG/HAMMER EFF./DATE TRI	0055 CME-55 87% 03/21/2019
DRILLER R. Toothm	nan	<b>START DATE</b> 03/19/19	COMP. DATE 03/19/19	SURFACE WATER DEPTH N/A	DRILLER R. Toothman	<b>START DATE</b> 03/20/19
ELEV DRIVE DEPTH	BLOW COUN		T SAMP.	SOIL AND ROCK DESCRIPTION	ELEV DRIVE DEPTH BLOW COUL	
(ft) ELEV (ft) (ft)	0.5ft 0.5ft 0	0.5ft 0 25 50	75 100 1 100 1 / 1	ELEV. (ft) DEPTH (ft)		0.5ft 0 25 50 7
845					845	
1 ‡				841.7 GROUND SURFACE 0.0		
841.7 + 0.0	2 1	2 3	М М	RESIDUAL		
				839.2       Orange, Coarse to Fine Sandy CLAY       2.5         837.8       WEATHERED ROCK       3.9		
	40 60/0.1 0/0.1	 	100/0.6	837.7_/ GRANITE / 4.0		
	0/0.0		60/0.1 60/0.0	CRYSTALLINE ROCK GRANITE BOULDER	835	
‡				Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at	832.4 + 8.4	
‡				Elevation 837.7 ft in CRYSTALLINE ROCK BOULDER: GRANITE		$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$
					828.2 <sup>+</sup> 12.6 827.4 <sup>+</sup> 13.4 100/0.4 <sup>+</sup> 100/0.2	
					825	
					822.4 - 18.4	
						7
					817.4 23.4 4 4	<u>4</u>   · <i>µ</i> · ·   · · · · ·   · · · · ·
					815	
					812.4 7 28.4	
					<b>†</b> 4 5	11   · · · · · ·   · · · · ·   · · · · ·
					807.4 + 33.4 6 17	30
					805	
					802.4 - 38.4	
					<u>T</u>   <sup>11</sup>   <sup>19</sup>   <sup>8</sup>	31/0.4
					800 799.5 41.3	
‡						



	1	URE LUG							I				RELUG			
WBS 34839.1.7		Y FORSYTH	GEOLOGIST S. Papke		-	34839.1.7			TIP U-				FORSYTH	GEOLOGIST S. Papke		
SITE DESCRIPTION Bridge No. 7	, ,	,	<b>,</b> ,	GROUND WTR (ft)				dge No. 7	1		• •		over Winston-Salem Norther			OWTR (ft)
BORING NO. B3-B	STATION 26+39	OFFSET 10 ft RT		0 HR. N/A		ING NO. B3			STATIO				FFSET 10 ft RT	ALIGNMENT -Y2FLYAE		N/A
COLLAR ELEV. 842.0 ft	TOTAL DEPTH 37.6 ft	NORTHING 841,086		<b>4 HR.</b> 22.7		LAR ELEV.					<b>TH</b> 37.6 ft	N	ORTHING 841,086	EASTING 1,661,862	24 HR.	22.7
DRILL RIG/HAMMER EFF./DATE TRIC	0055 CME-55 87% 03/21/2019	DRILL METHOD Mu	d Rotary/Core HAMMER	TYPE Automatic	DRILL	RIG/HAMMER	EFF./DA	TE TRIO	055 CME-5	5 87%	6 03/21/2019		DRILL METHOD M	lud Rotary/Core	HAMMER TYPE	Automatic
DRILLER R. Toothman	<b>START DATE</b> 03/19/19	COMP. DATE 03/20/19	SURFACE WATER DEPTH N/A			LER R. Too					E 03/19/19	С	<b>OMP. DATE</b> 03/20/19	SURFACE WATER DEPT	H N/A	
ELEV DRIVE DEPTH BLOW COUN (ft) (ft) (ft) 0.5ft 0.5ft (			SOIL AND ROCK DESCRI	IPTION	COR	E SIZE NQ2	2		TOTAL	RUN	22.9 ft	DATA				
(ft) (ft) (ft) 0.5ft 0.5ft 0	D.5ft 0 25 50	75 100 NO. MOI G	ELEV. (ft)	DEPTH (ft)	ELEV (ft)		TH RUN (ft)	DRILL RATE	REC. RI (ft) (	QD	SAMP. SAMP. REC	RATA L RQD C (ft) G		DESCRIPTION AND REMARKS		
					(11)	(ft) (ft)	(11)	(Min/ft)	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	%	NO. (11) %	(11) % G	ELEV. (ft)			DEPTH (ft)
845			-		829.4	829.4 - 12.0	3 29	N=60/0.0	(23) (0		(17	) (0.9)	829.4	Begin Coring @ 12.6 ft CRYSTALLINE ROCK		12.6
842.0 + 0.0			842.0 GROUND SURFACE	E 0.0		826.5 + 15.			79% 3	1%	100	6 53%	Slight Weathering,	Moderately Hard, White GRANITI Spacing	E with Close Fractu	ire14.3
	2 4	M	RESIDUAL Orange, Coarse to Fine Sandy		825		5.0	1:55/0.9 2:28/1.0 2:45/1.0	(4.0) (3 80% 68	3.4) 8%	(1.2		825.0	(GSI: 55-65)		17.0
839.2 2.8	12		Trace Rock Fragmen	its $1 - \frac{2}{3}$		+		1:43/1.0 3:54/1.0 2:23/1.0 4:00/1.0		<u> </u>	(6.6 99%	) (5.4)	Severe Weathering,	Medium to Moderately Hard, Blac DIORITE with Close Fracture Space		RTZ
	$\left  \begin{array}{c} \cdot \cdot \cdot \cdot \bullet^{19} \cdot \cdot \cdot \cdot \cdot \\ \cdot \cdot \cdot \cdot \bullet^{19} \cdot \cdot \cdot \cdot \cdot \\ \cdot \cdot \cdot \cdot \bullet^{19} \cdot \cdot \cdot \cdot \cdot \\ \cdot \cdot \cdot \cdot \bullet \end{array} \right  \cdot \cdot \cdot \cdot \cdot \left  \cdot \cdot \cdot \cdot \right $		Orange and Brown, Clayey Coa SAND	arse to Fine		821.5 - 20.	5 5.0	4:00/1.0 3:45/1.0	(32) (2	2.8)	DC 2	S.	- Moderate Weathe	(GSI: 25-35) ering, Moderately Hard, White GR	ANITE with Close tr	
835 7.8			-834.5	7.5	820	$\pm$	3.0	- <u>3:45/1.0</u> 3:16/1.0 3:35/1.0 3:07/1.0	(3.2) (2 64% 56	6%	RS-3 /		- 010 2	Moderately Close Fracture Spaci (GSI: 60-70)	ng	
	42	M	Orange, Black and White, Silty Fine SAND with Trace			816.5 + 25.	5	3:07/1.0 1:31/1.0 1:19/1.0	1 1		(0.0	) (0.9) 6 53% ) (0.0) 0% ) (5.4) 5 81% ) (0.0) 0% ) (0.0) 0% ) (0.0) 0% ) (0.0)	816.5	WEATHERED ROCK		23.7
				-	815		5.0	3:21/1.0	(4.3) (3 86% 66	3.3)			<u>ال</u>	GRANITE CRYSTALLINE ROCK		
830 829.4 12.6 60/0.0	· · · · · · · · · · · · · · · · · · ·		- 829.4 CRYSTALLINE ROC	12.6		Ŧ		3:10/1.0		0%	88%	56%	Severe to Moderate	Weathering, Hard to Moderately h Very Close to Close Fracture Sp	Hard, White GRANI	ITE
			White GRANITE	14.3		811.5 - 30.		3:09/1.0 2:41/1.0					810.6	(GSI: 40-50)	20g	24.4
825			Black and White QUARTZ D	DIORITE 17.0	810	+	5.0	1:56/1.0	(0.9) (0 18% 0	)%	(0.0	) (0.0)		RESIDUAL		31.4
			White GRANITE				_	2:19/1.0 1:22/1.0			0%	0%	VVhit	e and Brown, Silty Coarse to Fine	SAND	
		RS-3			805	806.5 + 35.4 +		1:16/1.0 N=100/0.0	6				806.0	WEATHERED ROCK		<u> </u>
			-		000	- +	_	N=60/0.0	,			/2	<ul> <li>Boring Terminated</li> </ul>	WITH STANDARD PENETRATIO	N TEST REFUSAL	37.6 . at
			818.3 WEATHERED ROCI 816.5	23.7 K 25.5		ļ ļ							Elevation	804.4 ft on CRYSTALLINE ROCK	(: GRANITE	
815			B16.5 GRANITE CRYSTALLINE ROC			‡							È.			
			White GRANITE			+							È.			
						‡							È.			
810 -			810.6 RESIDUAL	31.4		+							-			
			White and Brown, Silty Coarse to	o Fine SAND		1										
806.5 + 35.5 805 + 3 55 4	5/0.1			<u>36.0</u>		1							Ł			
804.4 + 37.6			GRANITE			t							Ł			
			Boring Terminated WITH ST. PENETRATION TEST REF	USAL at		±							Ł			
			Elevation 804.4 ft on CRYSTALI - GRANITE	LINE ROCK:		+							-			
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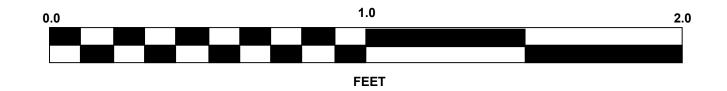
### GEOTECHNICAL BORING REPORT CORE LOG

WBS: 34839.1.7, TIP: U-2579AA BRIDGE NO. 733 ON US 311 FLYOVER (-Y2FLYAB-) OVER WINSTON-SALEM NORTHERN BELTWAY (-L-)

### **CORE PHOTOGRAPHS**

**B3-B** BOX 1 & 2: 12.6 to 35.5 FEET





	n

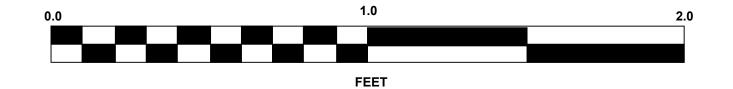
		BORE LOG											ORE LOG			
<b>WBS</b> 34839.1.7		JNTY FORSYTH	GEOLOGIST S. Papke	1	<b>WBS</b> 348				<b>TIP</b> U-257				/ FORSYTH	GEOLOGIST S. Papke		
SITE DESCRIPTION Bridge No		,	,	GROUND WTR (ft)				ge No. 7	1		· (-Y2F	LYAB	-) over Winston-Salem North	,,,		D WTR (ft)
BORING NO. B4-A	STATION 28+30	OFFSET 13 ft LT	ALIGNMENT -Y2FLYAB-	0 HR. N/A	BORING N	<b>0.</b> B4-A	4		STATION	28+30			OFFSET 13 ft LT	ALIGNMENT -Y2FLYAB-	0 HR.	N/A
COLLAR ELEV. 836.8 ft	TOTAL DEPTH 65.0 ft	NORTHING 841,056	EASTING 1,661,674	24 HR. Dry	COLLAR E	LEV. 8	36.8 ft		TOTAL DE	<b>PTH</b> 65.	0 ft		NORTHING 841,056	EASTING 1,661,674	24 HR.	Dry
DRILL RIG/HAMMER EFF./DATE TR	RI0055 CME-55 87% 03/21/2019	DRILL METHOD	Mud Rotary/Core HAM	MER TYPE Automatic	DRILL RIG/H	AMMER E	EFF./DA1	TE TRIOC	055 CME-55 8	7% 03/21/2	2019		DRILL METHOD	Mud Rotary/Core H	AMMER TYPE	Automatic
DRILLER R. Toothman	START DATE 03/27/19	COMP. DATE 03/29/19	SURFACE WATER DEPTH	N/A	DRILLER	R. Tooth	nman		START DA	<b>TE</b> 03/2	7/19		COMP. DATE 03/29/19	SURFACE WATER DEPTH	I N/A	
ELEV DRIVE DEPTH BLOW COU		OOT SAMP.	SOIL AND ROCK DES	SCRIPTION	CORE SIZE	NQ2			TOTAL RU							
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	0.5ft 0 25 50		G ELEV. (ft)	DEPTH (ft)	ELEV RUN			DRILL RATE	RUN REC. RQD	SAMP. NO.	STR REC. (ft) %	ATA RQD	L O	DESCRIPTION AND REMARKS		
					(ft) (ft)	(ft)	(ft)	(Min/ft)	(ft) (ft) % %	NO.	(ft) %	(ft) %	G ELEV. (ft)			DEPTH (ft)
840					793.2									Begin Coring @ 43.6 ft		
			Ł			$\frac{1}{45.0}$	1.4 5.0	0:38/0.4	(0.6)   (0.6) ∕\ 43% ∖\ 43% /		(1.6) 47%	(0.6) 18%	793.2 Moderately Seve DIORITE	ere Weathering, Medium Hard, Black a with Close to Moderately Close Fract	and White QUART	TZ 43.6
836.8 - 0.0 2 3	5	м	E 836.8 GROUND SURI	FACE 0.0	790	Ŧ	0.0	1:34/1.0 1:50/1.0	(0.6) (0.6) 43% 43% (1.0) (0.0) 20% 0%		(0,0)	(0,0)	789.8	(GSI: 20-30) WEATHERED ROCK		47.0
835			Orange, Silty Coarse to		786.8	$\frac{1}{50.0}$	1 1	0:48/1.0 1:28/1.0			(0.0) 0%	0%		QUARTZ DIORITE		
833.3 + 3.5   15 65	35/0.2		832.8 WEATHERED F	4.0 4.0	785	+ 00.0	5.0	5:23/1.0	(4.3) (2.5) 86% 50%		(4.3) 100%	(25)	786.1	CRYSTALLINE ROCK		50.7
830			WEATHERED W			Ŧ	1 1	3:19/1.0			100%	58%	Moderate to Slig	ht Weathering, Hard, Black and White Moderately Close to Close Fracture S		TE
828.3 8.5					781.8	3 55.0	1 1	3:28/1.0 2:40/1.0		RS-4		(0 =	- 781.8	(GSI: 60-70)		55.0
					780	‡	5.0	4:45/1.0 4:49/1.0	(4.9) (3.7) 98% 74%		(9.9) 99%	(8.7) 87%	Moderate to S	Slight Weathering, Hard, White GRAN Moderately Close Fracture Spacing	ITE with Close to	
825			824.3	<u>12.5</u>		‡		4:38/1.0 3:26/1.0						(GSI: 70-80)		
823.3 13.5 35 32			RESIDUAL White, Brown, and Black	_	776.8	<u> </u>		3:11/1.0	(5.0) (5.0) 100% 100%							
			Coarse SAN		775	$\pm$		4:12/1.0 4:37/1.0	100% 100%							
820					771.8	$\frac{1}{1}$ 65.0		4:40/1.0 4:34/1.0					771.8			65.0
818.3 18.5 11 8		М				+							Boring Terminated	d at Elevation 771.8 ft in CRYSTALLIN	NE ROCK: GRAN	IITE
815	$    \cdot \cdot \dot{\lambda} \cdot   \cdot \cdot \cdot   \cdot \cdot$					Ŧ							-			
813 3 7 23 5						ŧ							-			
	$\begin{bmatrix} 13 \\ \cdot \cdot \cdot \cdot \cdot \\ \cdot \cdot \cdot \cdot \\ \\ \cdot \\ \cdot \\ \\ \cdot \\ \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \\ \cdot \\ \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \\ \cdot \\ \\ \cdot \\ \cdot \\ \\ \cdot \\ \\$	М				‡							-			
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805						+							-			
803.3 33.5						ţ							-			
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798.3 - 38.5 100/0.5	╡╴║╴╴╴┡╼╼╼┽╼		<u></u>	<u>коск — — — — 38.0</u>		Ŧ							-			
		100/0.5	White and Black G	RANITE		Ŧ							-			
795						Ŧ							-			
793.3 + 43.5 60/0.1			793.3 CRYSTALLINE			Ŧ							-			
			QUARTZ DIOF			Ŧ							-			
			WEATHERED F	ROCK		‡							F F			
			QUARTZ DIOF	S0.7		‡							F F			
			CRYSTALLINE I Black and White QUAR	ROCK		‡							F F			
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			781.8 White GRANI	55.0 TE		‡							⊢ -			
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Y622			771.8 Boring Terminated at Elev	65.0 ation 771.8 ft in		Ŧ							F			
			CRYSTALLINE ROCK			Ŧ							F			
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### GEOTECHNICAL BORING REPORT ORE LOG

### **CORE PHOTOGRAPHS**



**B4-A** BOXES 1 & 2: 43.6 to 65.0 FEET



[		BORE LOG		1		ORE LOG	
<b>WBS</b> 34839.1.7		NTY FORSYTH	GEOLOGIST S. Papke/ C. Driscoll	WBS 34839.1.7		TY FORSYTH	GEOLOGIST S. Papke/ C. Driscoll
	lo. 733 on US-311 Flyover (-Y2FLY)	,			. 733 on US-311 Flyover (-Y2FLYA	,	
BORING NO. B4-B	STATION 28+12	OFFSET 39 ft RT	ALIGNMENT -Y2FLYAB- 0 HR. N/A	BORING NO. B4-B	STATION 28+12	OFFSET 39 ft RT	ALIGNMENT -Y2FLYAB- 0 HR. N/A
COLLAR ELEV. 818.8 ft	TOTAL DEPTH 55.5 ft	NORTHING 841,110	EASTING 1,661,686 24 HR. 2.5	COLLAR ELEV. 818.8 ft	TOTAL DEPTH 55.5 ft	NORTHING 841,110	EASTING 1,661,686 24 HR. 2.5
DRILL RIG/HAMMER EFF./DATE		DRILL METHOD	· · · · · · · · · · · · · · · · · · ·	DRILL RIG/HAMMER EFF./DATE TF			Mud Rotary/Core HAMMER TYPE Automatic
DRILLER R. Toothman	START DATE 03/29/19	<b>COMP. DATE</b> 04/01/19	SURFACE WATER DEPTH N/A	DRILLER R. Toothman	START DATE 03/29/19	COMP. DATE 04/01/19	SURFACE WATER DEPTH N/A
ELEV DRIVE (ft) DEPTH BLOW CO (ft) DEPTH 0.5ft 0.5ft		75 400 100 0	SOIL AND ROCK DESCRIPTION		TOTAL RUN 8.0 ft		
(ft) (ft) 0.5ft 0.5f		75 100 NO. /MOI G	ELEV. (ft) DEPTH (ft)	ELEV ELEV DEPTR RUN RAT	E REC. RQD SAWP. REC. RQD	G ELEV. (ft)	DESCRIPTION AND REMARKS
					π) % % % %	G ELEV. (ft)	DEPTH
820 818.8 - 0.0			818.8 GROUND SURFACE 0.0	771.3 770 771.3 47.5 3.0 N=60/	0.0 (2.7) (2.2) (7.7) (7.2) 1.0 90% 73% 96% 90%	771.3 Slight Weatheri	Begin Coring @ 47.5 ft ing, Hard, Gray, Black, and White QUARTZ DIORITE with 47
	$ \begin{vmatrix} 1 \\ \bullet 1$		ALLUVIAL 816.3 Red and Orange, Coarse to Fine Sandy 2.5	770 771.3 47.5 3.0 N=60/ 4:00/ 768.3 50.5 3:0 N=60/ 3:30/ 5:00/ 5:	1.0 90% 73% 96% 90%		Wide to Ćlose Fracture Spacing (GSI: 85-95)
815 816.0 2.8 1 0		· · · · · · · · · · · w	CLAY CLAY Orange to Gray, Silty Coarse to Fine SAND	5.0 <u>2:00/</u> 5:00/1 5:00/1	1.0 (5.0) (5.0) 1.0 100% 100%		
				T 4·45/1		763.3	_
811.0 7.8 1			- 811.3	763.3 55.5 5:00/1			ed at Elevation 763.3 ft in CRYSTALLINE ROCK: QUARTZ
		M	Black, White, and Brown, Silty Coarse to Fine SAND with Trace Rock Fragments				DIORITE
		· ·   · · · ·	The only with trace rook Flaghents				
805 12.8 14 42		M					
		· · \ · · · ·	-				
800 17.8 25 20			-				
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796.0 22.8			-				
795 10 9	7 16 16 16 16	М	-				
			-				
790 791.0 27.8 75 25/0.	$\begin{array}{c c c c c c c c c c c c c c c c c c c $		<u> </u>				
			Black and White GRANITE				
786.0 32.8			-				
785 25 75/0.		100/0.9	-				
			-				
780 781.0 37.8			-				
			-				
776.0 42.8			776.0 42.8				
775 60/0.1			776.0 42.8				
			F			F	
771.3 <b>4</b> 7.5 770 <b>60/0.0</b>			Gray, Black, and White QUARTZ DIORITE				
						I E	
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		RS-5	763.3 55.5			ΙE	
			Boring Terminated at Elevation 763.3 ft in CRYSTALLINE ROCK: QUARTZ DIORITE	<u>Ŧ</u>		ΙE	
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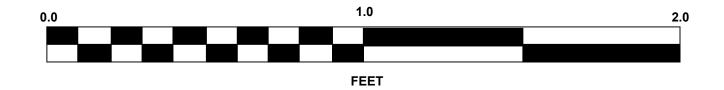
### GEOTECHNICAL BORING REPORT CORE LOG

WBS: 34839.1.7, TIP: U-2579AA BRIDGE NO. 733 ON US 311 FLYOVER (-Y2FLYAB-) OVER WINSTON-SALEM NORTHERN BELTWAY (-L-)

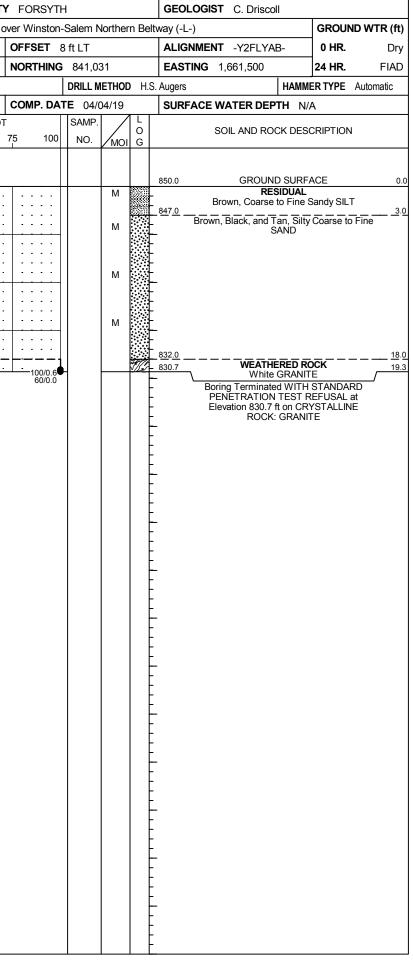
### **CORE PHOTOGRAPHS**

**B4-B** BOX 1 & 2: 47.5 to 55.5 FEET





											: <i>L</i> U																		
WBS	<b>3</b> 4839	9.1.7			Т	<b>IP</b> U-257	79AA		COUNT	Y FOR	SYTH				GEO	LOGIST	C. Drisco	oll .	I		-	<b>3</b> 483					P U-2579		COUNTY
SITE	DESCR	RIPTION	Bridg	je No.		n US-311	-	-	LYAB-) o				orther	m Be		-			GROUND W1	FR (ft)					ge No.			lyover (-Y2	FLYAB-) o
BOF	ING NO.	EB2-/	4		s	TATION	29+67			OFFSE	<b>T</b> 42 ft	LT			ALIG	NMENT	-Y2FLYA	NB-	0 HR.	Dry	BOR	ING NO	. EB2	-В		S	TATION 3	30+07	
COL	LAR EL	<b>EV.</b> 85	52.9 ft		Т	OTAL DE	epth 3	30.0 ft		NORTI	HING 84	11,006	6		EAST	<b>FING</b> 1,0	661,546		24 HR.	Dry	COL	LAR EL	<b>.EV.</b> 8	50.0 ft		Т	OTAL DEP	<b>PTH</b> 19.3 f	ť
DRIL	L RIG/HAN	MMER EF	F./DATE	E TRI	0055 C	ME-55 87%	% 03/21/2	2019			DR	ILL ME	THOD	) Н.	S. Augers			HAMME	ER TYPE Auton	natic	DRILI	_ RIG/HA	MMER E	FF./DAT	E TRI	0055 C	ME-55 87%	03/21/2019	
DRII	LER R	R. Toothr	man		S	TART DA	<b>TE</b> 04	1/03/19	)	COMP	DATE	04/03	3/19		SURF	ACE WA	ATER DEF	PTH N/A	4		DRIL	LER F	R. Tooth	nman		S	TART DAT	E 04/04/	19
ELEV	DRIVE	DEPTH	BLO	W CO			BLO	OWS P	ER FOOT	Г	SA	MP.	▼∕	L		SO	IL AND RO		RIPTION		ELEV	DRIVE ELEV	DEPT	H BLC	ow co	UNT		BLOWS	PER FOOT
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	5	0	75	100 N	10.	моі		ELEV. (1		27112110	011 0 2 0 0		EPTH (ft)	(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50
855		Ļ													_						850	8E0.0							
	852.9	± 0.0													852.9			ID SURFA	ACE	0.0		850.0	- 0.0	1	2	3	• • • • • • • • • • • • • • • • • • •		
		ŧ	3	3	3	• • • · · ·							М		-	Oran		SIDUAL wn, Fine S	Sandy SILT			846.5	+ 3.5	2	4	3	<u> </u>    <u> </u>	.	
850	849.4	3.5	3	5	6	<del>  . \ .</del>									<u>849.9</u>		n, White, an	d Tan, Co	parse to Fine	<u>3.0</u>	845	-	+	-		Ŭ			
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1	822.9	<u> </u>	60/0.0			+					0/0.6 <b>8</b> 0/0.0	F			822.9				Z DIORITE	30.0			‡						
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### LABORATORY SUMMARY SHEET FOR ROCK CORE SAMPLES

### PROJECT NO.: 34839.1.7 (U-2579AA) COUNTY: FORSYTH BRIDGE NO. 733 ON US 311 FLYOVER (-Y2FLYAB-) OVER WINSTON-SALEM NORTHERN BELTWAY (-L-)

Sample No.	Boring No.	Depth (ft)	Rock Type	Geologic Map Unit	Run RQD (%)	Length (in)	Diameter (in)	Wet Unit Weight (pcf)	Unconfined Compressive Strength (psi)	Young's Modulus (psi)	Splitting Tensile Strength (psi)	Remarks
RS-1	B2-A	54.1 - 54.4	Quartz Diorite	PPg	90	4.01	1.96	179.3	16,870	N/A	N/A	GSI - 65 to 75
RS-2	B2-B2	36.3 - 36.6	Granite	PPg	90	4.03	1.96	160.9	10,520	N/A	N/A	GSI - 65 to 75
RS-3	B3-B	20.6 - 20.9	Granite	PPg	56	4.00	1.96	159.8	8,410	N/A	N/A	GSI - 60 to 70
RS-4	B4-A	54.0 - 54.3	Quartz Diorite	PPg	50	4.03	1.96	177.2	17,770	N/A	N/A	GSI - 60 to 70
RS-5	B4-B	53.0 - 53.3	Quartz Diorite	PPg	100	4.05	1.96	179.2	16,570	N/A	N/A	GSI - 85 to 95

### WBS NO.: 34839.1.7 - TIP NO.: U-2579AA BRIDGE NO. 733 ON US 311 FLYOVER (-Y2FLYAB-) OVER WINSTON-SALEM NORTHERN BELTWAY (-L-) SITE PHOTOGRAPHS



View Looking South at -Y2FLYAB- from the North



View From EB2 looking downstation along -Y2FLYAB-



View from EB1 Looking Upstation Along -Y2FLYAB-



### **CONTENTS**

2

3-4

5-14

V 2579A Ú. REFERENCE

### SHEET NO. **DESCRIPTION** TITLE SHEET LEGEND (SOIL & ROCK) SITE PLAN AND WALL PROFILE

BORE LOGS

### STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION **DIVISION OF HIGHWAYS** GEOTECHNICAL ENGINEERING UNIT

### **STRUCTURE** SUBSURFACE INVESTIGATION

COUNTY FORSYTH

PROJECT DESCRIPTION WINSTON-SALEM NORTHERN **BELTWAY EASTERN SECTION (FUTURE I-74)** 

FROM US 311 TO I-40

SITE DESCRIPTION NOISE WALL NO. 7 FROM -NW7-STA. 10+00 TO 32+50

STA	.TE S	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.	C. l	J-2579AA	1	14

### 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 SOLI TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT 1991 707-680. THE SUBSIFICACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

CENERAL SOL 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 UN-PLACED TEST DATA CAN BE RELIED ON ONLY TO THE DECREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOLL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOLL 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 VIBSURFACE 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 WARANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPNION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONSTRUCTION STO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OF FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FOM THE ACTUAL CONDENSATIONS FOR ANY EXTENSION OF TIME FOR ANY REASON RESULTING FOR THE ACTUAL CONDITIONS TO BE COUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

- NOTES: I, THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR CUARANTEED 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 REDUCETED 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. K. STICKNEY				
C. L. SMITH				
B. E. FOSTER				
INVESTIGATED BY <u>C. R. LAVENDER, III</u>				
CAROLINAS DRAWN BY <u>GEOTECHNICAL GROUP</u>				
DS				
K. B. MILLER				
SUBMITTED BY <u>K. B. MILLER</u>				
DATE <u>MARCH 2021</u>				
CADD Work Prepared in the Office of:				
2400 CROWNPOINT EXECUTIVE DRIVE SUITE 800				
CHARLOTTE, NC 28227 (980) 339-8684				
TCENSED.				
SEAL 1506				
E. Cranton				
CLOG CLOG				
Man R. LAVEIN				
DocuSigned by:				
( 3/9/2021				
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

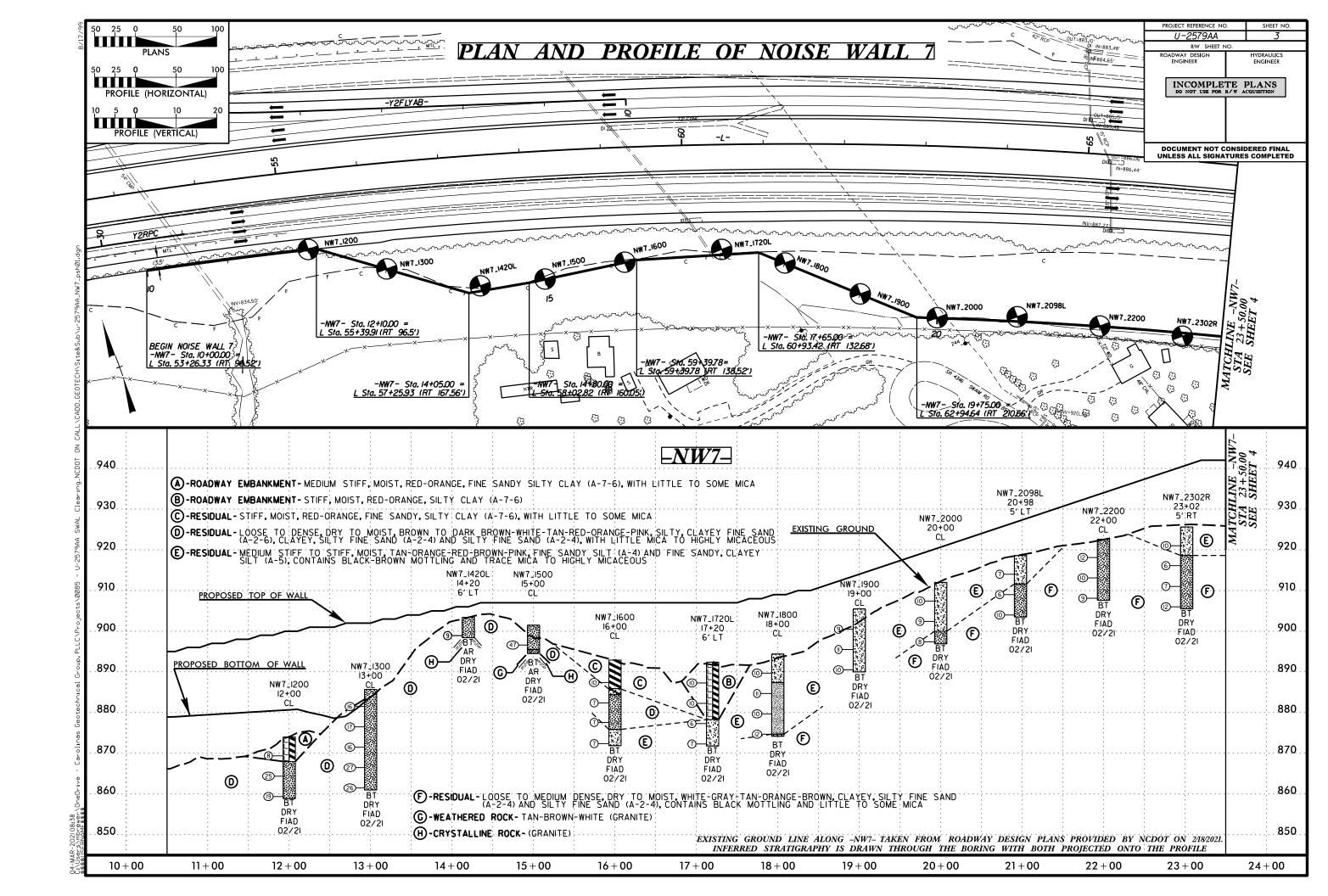
SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS
SOIL DESCRIPTION SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.	HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED. AN INFERRED	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
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	UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE.	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	AQUIFER - A WATER BEARING FORMATION OR STRATA.
IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING:	GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.	BLOWS IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK.	ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE,	ANGULARITY OF GRAINS	ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:	ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING
VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6	THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.	WEATHERED NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES >	A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.
SOIL LEGEND AND AASHTO CLASSIFICATION		ROCK (WR) 100 BLOWS PER FOOT IF TESTED.	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
GENERAL         GRANULAR MATERIALS         SILT-CLAY MATERIALS         ORGANIC MATERIALS           CLASS.         ( ≤ 35% PASSING *200)         ( > 35% PASSING *200)         ORGANIC MATERIALS	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC.	CRYSTALLINE	SURFACE.
GROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-4, A-5	ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.	ROCK (CR) GNEISS, GABBRO, SCHIST, ETC.	CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
CLASS. A-1-0 A-1-b A-2-4 A-2-5 A-2-6 A-2-7 A-7-5 A-3 A-6, A-7	COMPRESSIBILITY	DOCK THAT WOULD YEILD SPT REFUSAL IF TESTED.	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM
SYMBOL SOUCCESSION STATES STATES	SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50	ROLK (NCR)	OF SLOPE.
2 PASSING	HIGHLY COMPRESSIBLE LL > 50	SEDIMENTARY ROCK	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.
* 10 50 MX *10 50 MX *40 33 MX 50 MX 51 MN	PERCENTAGE OF MATERIAL		DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT
*40 30 MX 50 MX 51 MN *200 15 MX 25 MX 10 MX 35 MX 35 MX 35 MX 35 MX 36 MN 36 MN 36 MN 36 MN 50 ILS SOILS	GRANULAR SILT - CLAY ORGANIC MATERIAL <u>SOILS</u> <u>OTHER MATERIAL</u>	FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER	ROCKS OR CUTS MASSIVE ROCK.
MATERIAL	TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10%	HAMMER IF CRYSTALLINE.	DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
PASSING *40	LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20% MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35%	VERY SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN,	DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE
LL – – – 48 MX 41 MN LLITTLE OR PI 6 MX NP 18 MX 18 MX 11 MN 11 MN 18 MX 18 MX 11 MN 11 MN MODERATE HIGHLY	HIGHLY ORGANIC > 10% > 20% HIGHLY 35% AND ABOVE	(V SLI.) CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.	LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
GROUP INDEX 0 0 0 4 MX 8 MX 12 MX 16 MX NO MX AMOUNTS OF SOILS	GROUND WATER	SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE
USUAL TYPES STONE FRAGS. FINE SILTY OR CLAYEY SILTY CLAYEY MATTER	WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING	(SLI.) 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR	SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
OF MAJOR GRAVEL AND SAND GRAVEL AND SAND SOILS SOILS	▼ STATIC WATER LEVEL AFTER <u>24</u> HOURS	CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS. MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM
CEN RATING	✓ PW PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA	(MOD.) GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY, ROCK HAS	PARENT MATERIAL.
AS SUBGRADE EXCELLENT TO GOOD FAIR TO POOR POOR UNSUITABLE		DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.	FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ;PI OF A-7-6 SUBGROUP IS > LL - 30	- ()→     - SPRING OR SEEP	MODERATELY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE
CONSISTENCY OR DENSENESS	MISCELLANEOUS SYMBOLS	SEVERE AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH	FIELD.
PRIMARY SOIL TYPE COMPACTNESS OR PENETRATION RESISTENCE COMPRESSIVE STRENGTH	ROADWAY EMBANKMENT (RE) 25/025 DIP & DIP DIRECTION	(MOD. SEV.) AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. IF TESTED, WOULD YIELD SPT REFUSAL	<u>JOINT</u> - 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
CONSISTENCY (N-VALUE) (TONS/FT <sup>2</sup> )	WITH SOIL DESCRIPTION OF ROCK STRUCTURES	SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT	ITS LATERAL EXTENT.
GENERALLY VERY LOOSE < 4	SOIL SYMBOL	(SEV.) REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN.	LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.
GRANULAR LUUSE 4 IU 10 MEDIUM DENSE 10 TO 30		IT SUME EXTENT. SUME FRAGMENTS OF STRONG ROLK USUALLY REMAIN. IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF	MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS
MATERIAL DENSE 30 TO 50	ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT AUGER BORING CONE PENETROMETER TEST	VERY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE	USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
VERT DENSE 2 50		SEVERE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK (V SEV.) REMAINING, SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR	PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.
VERY SOFT         < 2         < 0.25           GENERALLY         SOFT         2 TO 4         0.25 TO 0.5	INFERRED SOIL BOUNDARY	VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. <u>IF TESTED, WOULD YIELD SPT N VALUES &lt; 100 BPF</u>	RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
SILT-CLAY MEDIUM STIFF 4 TO 8 0.5 TO 1.0	TIST BORING WITH CORE	COMPLETE ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND	ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF
MATERIAL         STIFF         8 T0 15         1 T0 2           (COHESIVE)         VERY STIFF         15 T0 30         2 T0 4	ALLUVIAL SOIL BOUNDARY A PIEZOMETER - SPT N-VALUE	SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.	ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE
HARD > 30 > 4		ROCK HARDNESS	RUN AND EXPRESSED AS A PERCENTAGE. <u>SAPROLITE (SAP.)</u> - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT
TEXTURE OR GRAIN SIZE	RECOMMENDATION SYMBOLS	VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK, BREAKING OF HAND SPECIMENS REQUIRES	ROCK.
U.S. STD. SIEVE SIZE 4 10 40 60 200 270	UNDERCUT UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE UNCLASSIFIED EXCAVATION TO BE	SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.	SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND
OPENING (MM) 4.76 2.00 0.42 0.25 0.075 0.053	SHALLOW USED IN THE TOP 3 FEET OF	HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.	RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.
BOULDER COBBLE GRAVEL COARSE FINE SILT CLAY	UNDERCUT ACCEPTABLE DEGRADABLE ROCK EMBANKMENT OR BACKFILL	NODERATELY CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE	SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT
(BLDR.) (COB.) (GR.) (CSE. SD.) (F SD.) (SL.) (CL.)	ABBREVIATIONS	HARD EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED	OR SLIP PLANE.
GRAIN MM 305 75 2.0 0.25 0.05 0.005	AR - AUGER REFUSAL MED MEDIUM VST - VANE SHEAR TEST	BY MODERATE BLOWS.	STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF
SIZE IN. 12 3	BT - BORING TERMINATED MICA MICACEOUS WEA WEATHERED CL CLAY MOD MODERATELY $\gamma$ - UNIT WEIGHT	MEDIUM CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. HARD CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE	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
SOIL MOISTURE - CORRELATION OF TERMS	_ CPT - CONE PENETRATION TEST NP - NON PLASTIC $\dot{\gamma}_{ m d}$ - DRY UNIT WEIGHT	POINT OF A GEOLOGIST'S PICK.	TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.
SOIL MOISTURE SCALE FIELD MOISTURE (ATTERBERG LIMITS) DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION	CSE COARSE ORG ORGANIC DMT - DILATOMETER TEST PMT - PRESSUREMETER TEST SAMPLE ABBREVIATIONS	SOFT CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK, CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN	STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.
	DPT - DYNAMIC PENETRATION TEST SAP SAPROLITIC S - BULK	PROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.	STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY
- SATURATED - USUALLY LIQUID; VERY WET, USUALLY (SAT.) FROM BELOW THE GROUND WATER TABLE	e - VOID RATIO         SD SAND, SANDY         SS - SPLIT SPOON           F - FINE         SL SILT, SILTY         ST - SHELBY TUBE	VERY CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH	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.
	FOSS FOSSILIFEROUS SLI SLIGHTLY RS - ROCK	SOFT OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.	TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
RANGE - WET - (W) SEMISULIDE REQUIRES DRYING TO	FRAC FRACTURED, FRACTURES         TCR - TRICONE REFUSAL         RT - RECOMPACTED TRIAXIAL           FRAGS FRAGMENTS         w - MOISTURE CONTENT         CBR - CALIFORNIA BEARING	FRACTURE SPACING BEDDING	BENCH MARK: N/A
(PI) PL PLASTIC LIMIT	HIHIGHLY V-VERY RATIO	TERM SPACING TERM THICKNESS	
ON ODTINUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE	EQUIPMENT USED ON SUBJECT PROJECT	VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED 4 FEET WIDE 3 TO 10 FEET THICKLY BEDDED 1.5 - 4 FEET	ELEVATION: FEET
	DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE:	MODERATELY CLOSE 1 TO 3 FEET THINLY BEDDED 0.16 - 1.5 FEET	NOTES:
REQUIRES ADDITIONAL WATER TO	CME-45C CLAY BITS X AUTOMATIC MANUAL	CLOSE         0.16         TO 1         VERY         THINLY         BEDDED         0.03         -         0.16         FEET           VERY         CLOSE         LESS         THAN         0.16         FEET         THICKLY         LAMINATED         0.008         -         0.03         FEET	THE DIVISION 9 LOCATION AND SURVEYS OFFICE PROVIDED BORING
- DRY - (D) ATTAIN OPTIMUM MOISTURE	CME-55 6' CONTINUOUS FLIGHT AUGER CORE SIZE:	THINLY LAMINATED < 0.008 FEET	LOCATIONS AND ELEVATIONS. FOR BORINGS THAT WERE OFFSET
PLASTICITY		INDURATION	DURING DRILLING, LOCATIONS AND ELEVATIONS WERE EXTRACTED FROM THE GPK AND TIN FILES DATED MARCH 17, 2020⊔
PLASTICITY INDEX (PI) DRY STRENGTH	X CME-550X HARD FACED FINGER BITS	FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.	
NON PLASTIC 0-5 VERY LOW	VANE SHEAR TEST	FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS: GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.	
SLIGHTLY PLASTIC 6-15 SLIGHT MODERATELY PLASTIC 16-25 MEDIUM	AND TOOLS:	CRAINS CAN BE SERARATED FROM CAMPLE WITH STEEL PRODE.	
HIGHLY PLASTIC 26 OR MORE HIGH		MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.	
COLOR		INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE:	
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY).		DIFFICULT TO BREAK WITH HAMMER.	
MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.		EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.	DATE: 8-15-14
		JHITLE DREMKS HUNUSS UNHINS.	UATE: 8-15-14

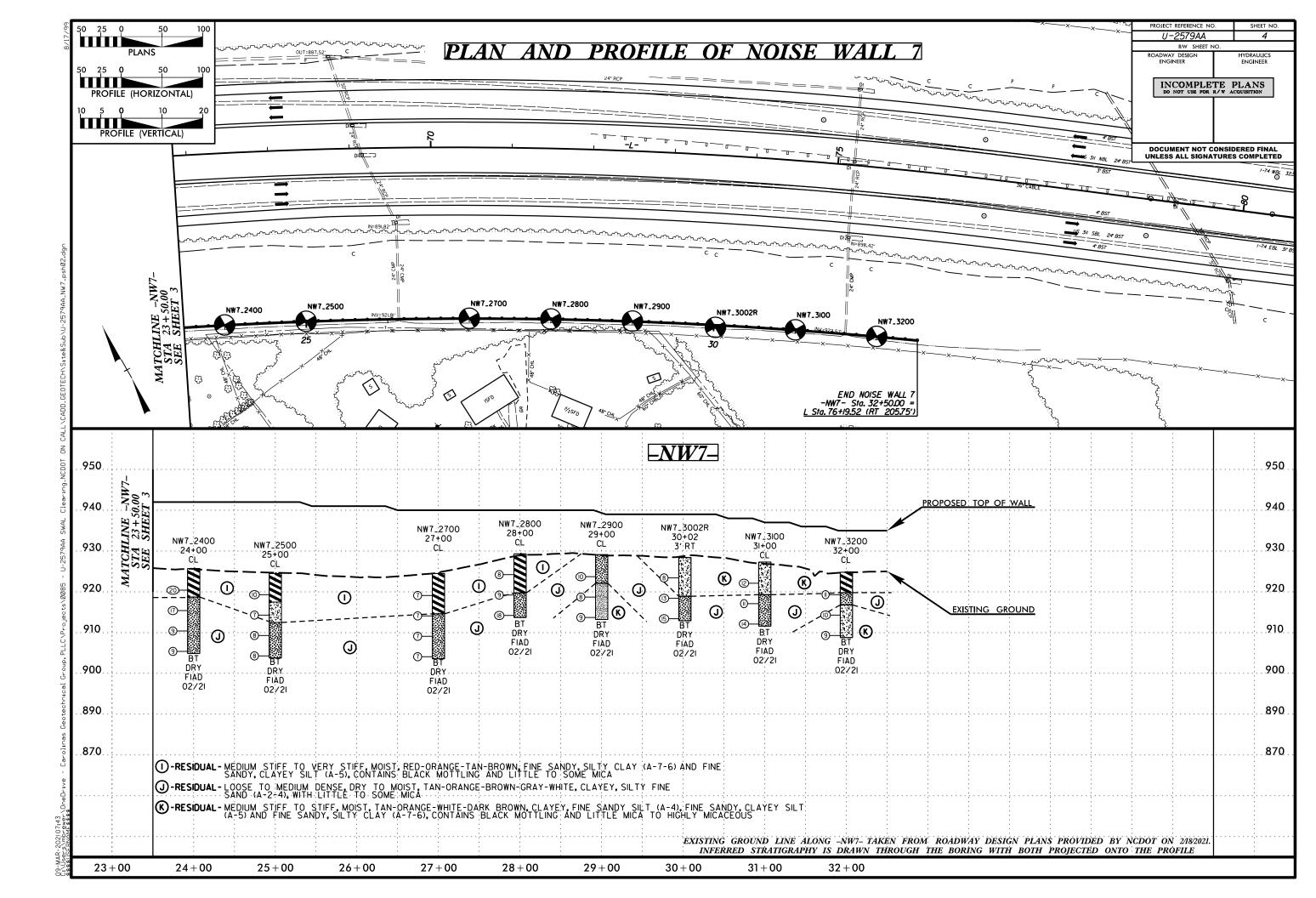
### PROJECT REFERENCE NO.

SHEET NO.

U-2579AA

2





<b>WBS</b> 34839.1.7	TIP U-2579AA COUNTY FORSYTH	GEOLOGIST Stickney, J. K.	WBS 34839.1.7 TIP U-2579AA COUNTY FORSYTH GEOLOGIST Stick	ney, J. K.
SITE DESCRIPTION Noise Wa	II No. 7 from -NW7- Sta. 10+00 to Sta. 32+50	GROUND WTR (ft)	SITE DESCRIPTION Noise Wall No. 7 from -NW7- Sta. 10+00 to Sta. 32+50	GROUND WTR (ft)
BORING NO. NW7_1420L	STATION         14+20         OFFSET         6 ft LT	ALIGNMENT -NW7- 0 HR. Dry	BORING NO. NW7_1500 STATION 15+00 OFFSET CL ALIGNMENT -NW7	7- 0 HR. Dry
COLLAR ELEV. 903.4 ft	TOTAL DEPTH 5.0 ft NORTHING 840,354	<b>EASTING</b> 1,663,137 <b>24 HR.</b> FIAD		4 <b>24 HR.</b> FIAD
DRILL RIG/HAMMER EFF/DATE HFC	C0072 CME-550X 89% 12/16/2019 DRILL METHOD	I.S. Augers HAMMER TYPE Automatic	DRILL RIG/HAMMER EFF,/DATE         HF00072 CME-550X 89% 12/16/2019         DRILL METHOD         HS. Augers	HAMINER TYPE Automatic
DRILLER Smith, C. L.	<b>START DATE</b> 02/03/21 <b>COMP. DATE</b> 02/03/21	SURFACE WATER DEPTH N/A	DRILLER         Smith, C. L.         START DATE         02/03/21         COMP. DATE         02/03/21         SURFACE WATER I	DEPTH N/A
ELEV CO (ft) DRIVE ELEV (ft) DEPTH (ft) 0.5ft 0.5ft	DUNT         BLOWS PER FOOT         SAMP.           0.5ft         0         25         50         75         100         NO.	SOIL AND ROCK DESCRIPTION	t) ELEV DRIVE DEPTH BLOW COUNT BLOWS PER FOOT SAMP. L (ft) (ft) 0.5ft 0.5ft 0.5ft 0 25 50 75 100 NO. MOI G	ROCK DESCRIPTION
ELEV (ft) DEPTH BLOW CO (ft) 0.5ft 0.5ft 905		SOIL AND ROCK DESCRIPTION ELEV. (ft)  903.4 GROUND SURFACE 0.0  RESIDUAL Loose, Tan-Brown-White, Clayey, Silty SAND (A-2-4), with some mica to highly micaceous 808.4  Boring Terminated by Auger Refusal at Elevation 898.4 ft On Crystalline Rock (GRANITE)  GRANITE)  GRANITE	Interpretation       Inter	PROCK DESCRIPTION

	34839					IP U-25				Y FORSY	ГН			GEC	LOGIST Stickney, J. K.				34839					IP U-2579		COUNT	
									+00 to Sta	1						GROUND WTR							-		/7- Sta. 10-	+00 to Sta	
	ING NO			)	_	TATION				OFFSET				ALIG	SNMENT -NW7-	4	Dry		ING NO.		_	L		TATION			OF
	AR ELI					OTAL D				NORTHIN							AD		LAR ELE						<b>PTH</b> 20.6 f		NO
DRILL	. RIG/HAN	/IMER EF	-F./DAT	E HFC		ME-550X								.S. Augers		ER TYPE Automatio	С	<u> </u>				E HFC			9% 12/16/20 <sup>°</sup>		
DRIL	LER S	mith, C	-							COMP. DA			-	SUR	FACE WATER DEPTH N/	A		DRIL	LER S	mith, C				TART DAT	E 02/03/2		CO
ELEV (ft)	DRIVE ELEV		·						PER FOO						SOIL AND ROCK DES	CRIPTION		ELEV (ft)	ELEV	DEPTH		W CO				PER FOO	
(11)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25		50 I	75 100	NO.	/мо	<u>) G</u>	ELEV.	(ft)	DEPT	<sup>-</sup> H (ft)	(11)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50	75
895		+												F				895		-							
	-	<u>†</u>												892.9	GROUND SURF.	ACE	0.0		-	-							
890	-	‡						· · · · ·	· · · ·					┢╴	<b>RESIDUAL</b> Stiff, Red-Orange, Fine San (A-7-6), with little to sc	dy, Silty CLAY		890	-	-					· · · · · ·		· ·
030	- 888.4	45													(A-7-6), with little to so	ome mica		030	888.3	-							
		1	3	4	6			· · · · ·	· · · ·	· · · · · ·		м		-							3	4	6	• • • • • • • • • • • • • • • • • • •		- · · ·	
885	-	ŧ					•••							<u>885.9</u> 884.4	Loose, Red-Orange-Pink, S	lty, Clayey Fine	<u>7.0</u> 8.5	885	-	_							• •
	883.4	9.5	3	3	4									-	Sand (A-2-6), with little to Loose, Brown-White, Clay		0.0		883.3	9.1	3	4	6		.		
		t			-	.●7 		· · · ·				M		-	SAND (A-2-4), with little to	o some mica			-	-	5	4	0		.		
880	_ 878.6 ·	1/1 3							<u> </u>									880							+	<u> </u>	
		14. <u>3</u>	2	3	4	<b>1</b>			· · ·			м							878.3	14.1	2	2	4		.	· · ·	.   .
875		+												875.9	Medium Stiff, Tan-Orange	Fine Sandy.	<u>17.0</u>	875	-	-							
	873.4	19.5											N 7 V 7		Clayey SILT (A-5), contains and little to some	brown mottling			873.3	19.1				.l			
		Ŧ	2	3	4	<b>•</b> 7					Ц	M	<u> </u>	871.9	Boring Terminated at Eleva		21.0				2	3	4				
	-	ŧ												-	Residual Fine Sandy, Cla	yey Siit (A-S)			-	-							
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NT	Y FORSYTI	Н			GEOLOGIS <sup>.</sup>	<b>F</b> Stickney,	J. K.			
Sta	32+50							GROUN	ID WTR (f	t)
	<b>OFFSET</b> 6	ft LT			ALIGNMEN	<b>-</b> NW7-		0 HR.	Dr	y
	NORTHING	840,29	93		EASTING	1,663,430		24 HR.	FIAD	5
		DRILL ME		HS.			HAMIME		Automatic	۲
	COMP. DAT	E 02/03	3/21		SURFACE V	VATER DEP	TH N//	4		┨
ю		SAMP.		L						┥
	75 100	NO.		O G	5	OIL AND ROO	JK DESU	RIPTION		
					878.3 Mec Claye 871.8 Borin	GROUNE ROADWAY I ff, Red-Orange lium Stiff, Tan- y SILT (A-5), and little to g Terminated sidual Fine Sat	EMBANK a, Silty Cl SIDUAL Orange, contains o some r at Elevat	MENT AY (A-7- Fine San black mol nica ion 871.8	6) 14 dy, tting 20 ft In	

WE	<b>S</b> 348	39.1.7			Т	IP U-25	79AA		COUN	ITY F	ORSYT	Ή			GEOL	OGIST S	Stickney,	J. K.			WB	<b>S</b> 34	839.1.	7			TIF	P U-2	579AA		COUN	NTY FO	ORSYT	Ή			GEC	JLOGIS	<b>T</b> Stick	ney, J. ł	۲.		
SIT	E DESC	RIPTIO	<b>N</b> Noi	se Wa	all No. 7	r from -N	W7- S	Sta. 10+	-00 to S	ta. 32+	+50								GROUNI	D WTR (ft)	SITI	E DES	SCRIPT	ΓΙΟΝ	Noise	e Wall	No. 7	from -I	NW7-	Sta. 10+	-00 to S	Sta. 32+	50								GRO		VTR (ft)
BO	RING N	<b>O</b> . NW	7_1800	)	S	TATION	18+0	00		OF	FSET	CL			ALIGN	MENT -	-NW7-		0 HR.	Dry	BO	ring	NO. N	NW7_	1900		ST	TATION	<b>I</b> 19+	00		OFF	SET (	CL			ALIC	GNMEN	T -NW	7-	ОН	IR.	Dry
СО	LLAR E	LEV. 8	94.4 ft		т	OTAL DI	EPTH	20.2 ft	t	NO	RTHING	<b>3</b> 840,2	250		EASTI	<b>ING</b> 1,66	33,498		24 HR.	FIAD	COI	LAR	ELEV.	905.	.5 ft		тс	OTAL D	DEPTH	15.5 f	t	NOF	RTHING	<b>3</b> 840,1	82		EAS	TING	1,663,57	71	24 H	IR.	FIAD
DR	L RIG/H	AMMER E	FF./Dat	EHF	00072.0	ME-550X	89% 1	12/16/201	9			DRILL	METHO	D H.S.	Augers			HAMIME	RTYPE A	Automatic	DRIL	L RIG	(Hamime	REFF.	/DATE	HFO	0072 01	ME-550X	K 89%	12/16/201	9			DRILL N	IETHO	DHS	S. Augers	s		HA	MIMERTY	PE Auto	matic
DR	LLER	Smith, (	C. L.		S	TART D	٩ΤΕ	02/03/2	1	co	MP. DA	TE 02/	/03/21		SURF	ACE WAT	TER DEPT	TH N/A	4		DRI	LLER	Smit	th, C. I	L.		ST	FART D	DATE	02/03/2	1	CON	/IP. DA	TE 02/0	)3/21		SUR	<b>FACE</b>	WATER	DEPTH	N/A		
ELE			H BL	ow co				BLOWS		от		SAMP	. 🔨			SOIL	AND ROC		RIPTION		ELE		IVE EV DE	PTH	BLOV	N COL	JNT		I	BLOWS				SAMP.			i	1	SOIL AND		) ESCRIPT		
(ft)	(ft)	v (ft)	0.5ft	0.5ft	0.5ft	0	25	!	50	75	100	NO.	Имо		ELEV. (ft)					DEPTH (f	) (ft)	(1	t)	(ft) (	0.5ft	0.5ft	0.5ft	0	25		50 I	75	100	NO.	/мо	I G	<b> </b>						
																																					1						
89		_													894.4		GROUND	SURFA	CE	0.	910	_															⊢						
		Ŧ														Stiff. Tan-	<b>RESI</b> Orange, Fir-	IDUAL ne Sand	v. Clavev S	ILT	]		‡														Ē						
890	890.	7 - 3.7				::	•	· · · · ·	· · · ·		· · · · · ·					́ (А-	-5), with little	le to som	ie mica		905		ŧ														- 905.5		GR	OUND SL			0.0
000		+	2	3	'	<b>•</b>							M									1	+					<del>  -  </del> -								2 2 2 2 2 2	- F	St	iff, Tan-Or	RESIDU ange-Bro	wn Fine S	Sandy,	
		‡						· · · · ·			· · · · · ·				887.4	Stiff, Tan-F	Red-Brown-	-Pink, Fi	ne Sandy S	<u>7.9</u> SILT	2	90	1.5 + 4	4.0						· · · ·		.	 			N . V	ŀ	Clay	/ey SILT (/	4-5), with	little to so	me mica	
885	885.	<u>7 + 8.7</u> -	4	4	7		1	· · · ·	· · ·	• •			м	Ľ		(A·	A-4), with tra	ace to littl	e mica 🥤		900	_	‡		3	4	5	<u>– •</u> 9		· · · ·					М	N N V	-						
		‡ ‡						· · · ·		:   :	· · · · · ·			-									‡							· · · ·						N N	Ē						
880	880.	7 <u>+</u> 13.7				] :::		 	· · ·   · · ·		· · · · · ·										895		6.5 + 9	9.0	3	5	6		•••	· · · · ·			 		м	N V N V	Ē						
001	_	‡	3	4	6				<u> </u>				M	-							095		+								· · ·	.				х х х и	F						
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875	875.	<u>7 + 18.7</u> +	3	4	8		2	· · · ·	· · ·	• •			D	<u> </u>	874.7					19.	,				4	4	6	• •	10.		• • •	.		4	М	V	890.0					00081-	15.5
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		‡													•	Boring Te	erminated a sidual Silty F	at Elevati	on 874.2 ft	t In			‡														Ē						
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	34839					_	<b>P</b> U-2						ORSYT	Ή				GEOL	OGIST	Stic	kney, .	J. K.				<b>3</b> 483						J-2579/			NTY F
	DESCF				Vall I	-				10+00	) to Sta	-						-					-	ND WTR (ft)									7- Sta. 10	)+00 to S	-
BOR	ING NO	. NW7	7_200	00		S	TATION	20	+00			OFF	SET	CL				ALIGN	MENT	-NW	/7-		0 HR.	Dry	BOR	ING NC	). NW	7_209	8L	S	STATI	<b>ON</b> 20	J+98		OF
	_AR EL						DTAL D					NO	RTHING	<b>3</b> 840, <sup>-</sup>				EAST	<b>NG</b> 1	,663,6			24 HR.			LAR EL							<b>FH</b> 15.1		NC
DRILL	. Rig/Hai	VIMER EF	ff./da	TE⊦	FOO	)72 a	ME-550X	( 89%	12/16/2	2019				DRILLI	METHO	OD	H.S.	Augers				Hamm	RTYPE	Automatic	DRIL	_ RIG/HA	MIMER E	FF./DA	TE HF	00072	CME-58	iOX 89%	% 12/16/20	019	
	LER S					S	FART D	ATE	02/04	4/21		CO	MP. DA	TE 02/				SURF	ACE W	ATER	DEPT	<b>H</b> N/.	4		DRIL	LER S				S	TART	DATE	E 02/04/	21	CC
ELEV	DRIVE ELEV	DEPTH		.ow o					BLOW					SAMP	•				SC	DIL ANI	D ROC	K DES	CRIPTIO	N	ELEV	DRIVE ELEV	DEPT	H BL	ow co	_				S PER FO	
(ft)	(ft)	(ft)	0.5f	t 0.5	5ft (	D.5ft	0	25	5	50		75	100	NO.	/м		G	ELEV. (ft)						DEPTH (ft)	(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	2	25	50	75
915		Ļ																_							920		Ļ								
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		<u>+</u>		-			1.1										<u>.</u> v.	912.0			RES	SURF/		0.0			ŧ								
910		±														1	<u>v</u>	-	Stiff, Ta Clave	an-Orai v SILT (	nge-Bro (A-5), w	own-Pin /ith little	k, Fine S to some	andy, mica	915	915.0	3.6	3	3	4	┨┝┧	7	+		
	908.4	<u>T 3.6</u> T	4	4	1	6				-	· · ·				м	N.	Ϋ́		,-	,	(),						Ŧ				]			.	.
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900	-	‡					· /·	•••			· · ·					N	<u>v</u>	900.0	1				Silty Fine S	<u>12.0</u>	905	905.0	13.6	3	4	6		1 <del>                                      </del>		- <del></del>	
	898.4	<u>† 13.6</u>	3	- 3	3	5	.  .		· · · · · ·		· · · · · ·				м		ļ		L005E,	(A-2-4),	with lit	tle to so	me mica				+	•		Ť	<u>  · ·</u>	•10		•   • •	•• •
		<del>†</del>		+			.98			•		.   .		-			-	896.9	Boring	g Termi	nated a	t Elevat	ion 896.9	15.1 9 ft In			‡								
	-	ŧ															F	-	Resid	dual Cla	ayey, Si	lty Fine	Sand (A-	2-4)		· ·	ŧ								
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NT)	FORSY1	Н				GEO	LOGIST	Stickney,	J. K.		
Sta.	32+50									GROUN	ND WTR (ft)
	OFFSET	5 ft	LT			ALIG	NMENT	-NW7-		0 HR.	Dry
+	NORTHING		340,08	39		EAST		,663,742		24 HR.	FIAD
					HS	. Augers			HAMIME		Automatic
	COMP. DA				-	-		ATER DEP			
ОТ			AMP.	4/21	L	JUK				٩	
	75 100		NO.		0		SC	DIL AND ROC	K DESC	RIPTION	1
	1		NO.	/моі	G						
					┢	918.6		GROUNE	) SURFA	CE	0.0
					<u>, N</u> F	010.0		RES	IDUAL		
• • • •							Sandy,	n Stiff, Tan-Br Clayey SILT (	(A-5), wit	k-Orange h little to :	, Fine some
				М	, v⊨ , v⊨	-		n	nica		
· ·					, v⊧	911.6					7.0
•••					Ŀ		Loose,	Gray-White, 0 A-2-4), with lit	Clayey, S	ilty Fine S	SAND
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• •		Ч	ŀ	5	<u>-</u>	903.5	Boring	Terminated	at Elevat	on 903.5	15.1 ft In
					F		Resid	lual Clayey, S	ilty Fine :	Sand (A-2	2-4)
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WBS         34839.1.7         TIP         U-2579AA         COUNT	Y FORSYTH	GEOLOGIST Stickney, J. K.		WBS	<b>S</b> 34	839.1.7			TI	P U-257	9AA COUN	ITY FORSY	ТН		GEOLOGIST Stickney,	J. K.
SITE DESCRIPTION Noise Wall No. 7 from -NW7- Sta. 10+00 to Sta	a. 32+50		GROUND WTR (ft)	SITE	E DES	CRIPTIO	N Nois	se Wal	ll No. 7	from -NV	/7- Sta. 10+00 to S	ta. 32+50				GROUND WTR (1
BORING NO.         NW7_2400         STATION         24+00	OFFSET CL	ALIGNMENT -NW7-	0 HR. Dry	BOF	RING I	<b>NO</b> . NW	7_2500	)	ST	TATION	25+00	OFFSET	CL		ALIGNMENT -NW7-	0 HR. Di
COLLAR ELEV. 925.7 ft TOTAL DEPTH 20.8 ft	NORTHING 839,958	EASTING 1,664,014	24 HR. FIAD	COL	LLAR	ELEV. 9	24.5 ft		тс	OTAL DEP	<b>PTH</b> 20.7 ft	NORTHIN	<b>G</b> 839,91	2	EASTING 1,664,103	24 HR. FIA
DRILL RIG/HAMMER EFF./DATE HF00072 OVE-550X 89% 12/16/2019	DRILL METHOD H.S	Augers HAMIN	ERTYPE Automatic	DRIL	L RIG/	HAMMER E	FF./DATI	E HFO	20072 CI	ME-550X 89	9% 12/16/2019		DRILL ME	ethod	H.S. Augers	HAMMER TYPE Automatic
DRILLER Smith, C. L. START DATE 02/04/21	COMP. DATE 02/04/21	SURFACE WATER DEPTH N	/A	DRII	LLER	Smith,	C. L.		ST	FART DAT	E 02/04/21	COMP. DA	TE 02/04	4/21	SURFACE WATER DEP	TH N/A
ELEV DRIVE DEPTH BLOW COUNT BLOWS PER FOO		SOIL AND ROCK DES	CRIPTION	ELEV			H BLC	ow co	UNT		BLOWS PER FO		SAMP.		- SOIL AND ROO	K DESCRIPTION
(ft) (ft) (ft) 0.5ft 0.5ft 0.5ft 0 25 50	75 100 NO. MOI G	ELEV. (ft)	DEPTH (ft)	(ft)	(ft	_v (ft)	0.5ft	0.5ft	0.5ft	0	25 50	75 100	NO.			
930		-		925	_											SURFACE
						ŧ									RES Stiff, Red-Orange, F	<b>IDUAL</b> Fine Sandy, Silty CLAY ttle to some mica
925		925.7 GROUND SURF	ACE 0.0	920	920	1.3 4.2									(A-7-6), with li	ttle to some mica
	· · · · · ·     <b>X</b>	- RESIDUAL Very Stiff, Red-Orange, Fir Clay (A-7-6), with little to	ne Sandy, Silty			+	3	4	6	. •10				м		
921.4 4.3		Clay (A-7-6), with little to	o some mica			ŧ				-  · -   -  · -				÷.	Medium Stiff, Tan	Orange-Brown, Fine (A-5), contains black
			7.0	915	915	<u>13 + 9.2</u>	3	3	4	•1••				М	v⊢ Sandy, Clayey SlL⊺ N⊢ mo	〔(A-5), contains black ottling
		Loose to Medium I				ŧ								N	v - 912.5	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	·   · · · · ·     D	Tan-Orange-Gray-White, C SAND (A-2-4	layey, Silty Fine 1)	910	910	.3 <b>†</b> 14.2									Loose, Gray-White-1 Fine SAND (A-2-4),	an-Brown, Clayey, Silty with little to some mica
						Ŧ	5	4	4					D		
911.4 + 14.3						ŧ										
910 5 4 5	· · · · · · · · · · · · · · · · · · ·	_		905	905	<u>.3 + 19.2</u> +	3	4	4					D	903.8	2
	-       -   -   -   -   -   -					+		1							Boring Terminated	at Elevation 903.8 ft In ilty Fine Sand (A-2-4)
905 $\begin{array}{ c c c c c c c c c c c c c c c c c c c$		904.9	20.8			Ŧ									- Residual Clayey, 3	illy Fille Saliu (A-2-4)
		Boring Terminated at Eleva Residual Clayey, Silty Fine	ation 904.9 ft In			Ŧ										
			5 Sanu (A-2-4)			Ŧ									-	
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<b>WBS</b> 34839.1.7	TIP U-2579AA COUN	TY FORSYTH	GEOLOGIST Stickney, J. K.		WB	<b>S</b> 3483	9.1.7			TIF	P U-2579	AA C	COUNTY FORSY	ΤH		GEOLOGIST Stickney	J. K.	
SITE DESCRIPTION Noise Wall	No. 7 from -NW7- Sta. 10+00 to S	ta. 32+50		GROUND WTR (ft)	SITE	E DESCF	RIPTION	Noise	e Wall	No. 7	from -NW	7- Sta. 10+00	) to Sta. 32+50				GROUNE	OWTR (ft)
BORING NO. NW7_2700	STATION 27+00	OFFSET CL	ALIGNMENT -NW7-	0 HR. Dry	BOF	RING NO	). NW7	_2800		ST	ATION 2	8+00	OFFSET	CL		ALIGNMENT -NW7-	0 HR.	Dry
COLLAR ELEV. 924.5 ft	TOTAL DEPTH 20.9 ft	NORTHING 839,817	EASTING 1,664,279	24 HR. FIAD		LAR EL						TH 15.6 ft	NORTHIN			<b>EASTING</b> 1,664,365	24 HR.	FIAD
DRILL RIG/HAMMER EFF./DATE HFCC		DRILL METHOD H		<b>ERTYPE</b> Automatic					ΗFO	-		% 12/16/2019				H.S. Augers	HAMMER TYPE A	Automatic
DRILLER Smith, C. L.	START DATE 02/09/21	COMP. DATE 02/09/21	SURFACE WATER DEPTH N	/A	DRI							E 02/09/21	COMP. DA		9/21	SURFACE WATER DEP	TH N/A	
ELEV DRIVE DEPTH BLOW COU (ft) (ft) (ft) 0.5ft 0.5ft			SOIL AND ROCK DES		ELE\ (ft)		DEPTH (ft)	0.5ft			0	BLOWS PE 25 50		SAMP.			CK DESCRIPTION	
(ft) (ft) 0.5ft 0.5ft		75 100 NO. MOI G	ELEV. (ft)	DEPTH (ft)		(ft)		0.011	0.011	0.011		<u> </u>		- NO.	/MOI G			
025					0.00													
925			- 924.5 GROUND SURF - RESIDUAL		930		<u>+</u>				+	<u></u>					D SURFACE	0.0
			- Medium Stiff, Tan-Orange, I - CLAY (A-7-6), with little t	Fine Sandy, Silty to some mica			ŧ						· · · ·   · · · · ·			Medium Stiff to S	iff, Red-Orange, Fine (A-7-6), little to som	e
920 920.1 4.4 3 3	4		-		925	925.2	+ 4.1	2	4	4		+ • • • • +	· · · · · · · · · · · ·	_			nica	
	$    \bullet ( \cdot \cdot \cdot   \cdot \cdot \cdot \cdot \cdot   \cdot \cdot \cdot \cdot   \cdot \cdot \cdot \cdot$		-				ŧ				. <b>●</b> 8 • <b> </b> • • •		· · · · · · · · · · · ·					
915 915.1 9.4			-		920	920.2	+ + <sub>9.1</sub>						· · · ·   · · · · ·			919.7		0.6
	4 • 7	🛛 м 🔊	- 914.6 - Loose, Gray-White, Clayey,	9.9 Silty Fine SAND	020		Ŧ	3	5	4	. •9				м	Loose to N	ledium Dense,	9.0
			- (A-2-4), with little to s	ome mica			Ŧ						· · · ·   · · · · · ·			Tan-Orange-Gray-\ SAND (A-2-4), w	ith little to some mica	ine a
910 910.1 14.4 3 3	4		-		915	915.2	<u>†</u> 14.1	6	10	8		8	· · · ·   · · · · ·		D	013 7		15.6
			-				+				· · · •	0				Boring Terminated	at Elevation 913.7 ft	In
905 905.1 19.4			-				Ŧ									- Residual Clayey, 3	Silty Fine Sand (A-2-4	4)
2 3	4	м	- 903.6 - Boring Terminated at Eleva	20.9		-	Ŧ									-		
			- Boring Terminated at Eleva - Residual Clayey, Silty Fine	e Sand (A-2-4)			Ŧ									-		
			-			-	Ŧ									-		
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<b>WBS</b> 34839.1.7	TIP U-2579AA COUN	TY FORSYTH	GEOLOGIST Stickney, J. K.		WB	<b>S</b> 348	839.1.7			TI	P U-2579	AA C	OUNTY FOR	SYTH			GEOLOGIST Stickney,	J. K.	
SITE DESCRIPTION Noise Wall N	lo. 7 from -NW7- Sta. 10+00 to St	a. 32+50		GROUND WTR (ft)	SITE	E DES	CRIPTIO	Noi:	se Wal	ll No. 7	from -NW	7- Sta. 10+00	) to Sta. 32+50					GROUND	WTR (ft)
BORING NO. NW7_2900	STATION 29+00	OFFSET CL	ALIGNMENT -NW7-	0 HR. Dry	BOF	RING N	NO. NW	/7_3002	2R	ST	TATION 3	0+02	OFFSE	3 ft R	Т		ALIGNMENT -NW7-	0 HR.	Dry
COLLAR ELEV. 929.1 ft	TOTAL DEPTH 15.9 ft	NORTHING 839,716	EASTING 1,664,451	24 HR. FIAD	COL	LLAR B	ELEV. 9	928.4 ft		тс	OTAL DEP	<b>TH</b> 15.5 ft	NORTH	<b>ING</b> 83	9,659		EASTING 1,664,536	24 HR.	FIAD
DRILL RIG/HAMMER EFF./DATE HF000	072 CME-550X 89% 12/16/2019	DRILL METHOD H.	S. Augers HAM	MER TYPE Automatic	DRIL	L RIG/H	HAMMER E	eff./dat	TE HFO	20072 Cl	ME-550X 899	% 12/16/2019		DRIL	LMETH	HOD H	S. Augers	HAMMER TYPE A	utomatic
DRILLER Smith, C. L.	START DATE 02/09/21	COMP. DATE 02/09/21	SURFACE WATER DEPTH N	I/A	DRI		Smith,			ST	FART DATI	E 02/09/21	COMP.	DATE	)2/09/2	21	SURFACE WATER DEP	TH N/A	
ELEV DRIVE DEPTH BLOW COUN			SOIL AND ROCK DES	SCRIPTION	ELE\			H BLO	ow co			BLOWS PE		SAN			SOIL AND RO	CK DESCRIPTION	
(ft) ELEV (ft) 0.5ft 0.5ft 0	0.5ft 0 25 50	75 100 NO. MOI G	ELEV. (ft)	DEPTH (ft)	(ft)	(ft)	_v (ft)	0.5ft	0.5ft	0.5ft	0	25 50	75	00 NC	D. /N	101 G			
930			929.1 GROUND SURF	ACE 0.0	930		-+										 - 928.4  GROUNI	) SURFACE	0.0
			RESIDUAL Loose, Tan-Orange, Cla	yey, Silty Fine			F							:	_	- ×	- RE	IDUAL	0.0
925 924.7 4.4			SAND (A-2-4), with little	to some mica	925	004	II.					1 1				N N N	<ul> <li>Clayey SILT (A-5),</li> </ul>	Orange, Fine Sandy contains black mottlin	r, ng
	5	М	-			924	1.4 <u>+</u> 4.0 I	3	3	5	. . .¶ <sup>8</sup>			·	Ν	1 N N	and little 1	o some mica	
			Medium Stiff to Stiff, Dark	Brown-White, 7.0			ł									N N N			
920 919.7 9.4 3 3	5		Clayey, Fine Sandy SILT (/ mica to highly mica	A-4), with some aceous	920	919	<u>9.4 + 9.0</u>	6	6	7						, , , , , , , ,	918.9		9.5
	$\left \begin{array}{c c} \Psi^{\delta} \\ \Psi^{\bullet} \\ \Psi^{$	· · · · · · · · · · · · · · · · · · ·	-				ŧ	0		,	●13. <b> </b>	1 1					_ Medium Dense, Gi _ Fine SAND (A-2-4)	ay-White, Clayey, Sil with little to some mi	ty ica
915 914.7 14.4			-		915	014	+ .4 <del>+</del> 14.0	,			· · ŀ ·	1 1					Medium Dense, G Fine SAND (A-2-4), 912.9		
3 4	$5$ . $\bullet_9$	· · · · · · M	913.2	15.9		914		7	7	8	15			·	[		912.9		15.5
			Boring Terminated at Eleva Residual Clayey, Fine Sa	ation 913.2 ft in andy Silt (A-4)			ŧ										Boring Terminated Residual Clayey, S	at Elevation 912.9 ft ilty Fine Sand (A-2-4	In ŀ)
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WBS         34839.1.7         TIP         U-2579AA         COUNTY         FORSYTH	GEOLOGIST Stickney, J. K.	WBS         34839.1.7         TIP         U-2579AA         County         Forsyth	H GEOLOGIST Stickney, J. K.
SITE DESCRIPTION Noise Wall No. 7 from -NW7- Sta. 10+00 to Sta. 32+50	GROUND WTR (ft)	SITE DESCRIPTION Noise Wall No. 7 from -NW7- Sta. 10+00 to Sta. 32+50	GROUND WTR (ft)
BORING NO. NW7_3100 STATION 31+00 OFFSET CL	ALIGNMENT -NW7- 0 HR. Dry	BORING NO. NW7_3200 STATION 32+00 OFFSET C	CL ALIGNMENT -NW7- 0 HR. Dry
COLLAR ELEV.         927.3 ft         TOTAL DEPTH         15.7 ft         NORTHING         839,608	<b>EASTING</b> 1,664,620 <b>24 HR.</b> FIAD	COLLAR ELEV.         924.8 ft         TOTAL DEPTH         16.0 ft         NORTHING	
DRILL RIG/HAMMER EFF./DATE HF00072 CVE-550X 89% 12/16/2019 DRILL METHOD H.S	Augers HAMMER TYPE Automatic		DRILL METHOD H.S. Augers HAMMER TYPE Automatic
DRILLER     Smith, C. L.     START DATE     02/09/21     COMP. DATE     02/09/21	SURFACE WATER DEPTH N/A	DRILLER Smith, C. L. START DATE 02/09/21 COMP. DAT	
ELEV         DRIVE ELEV         DEPTH         BLOW COUNT         BLOWS PER FOOT         SAMP.         L         O           (ft)         0.5ft         0.5ft         0.5ft         0         25         50         75         100         NO.         MOI         G	SOIL AND ROCK DESCRIPTION		SAMP. L O SOIL AND ROCK DESCRIPTION
(ft) (ft) 0.5ft 0.5ft 0.5ft 0 25 50 75 100 NO. MOI G	ELEV. (ft) DEPTH (ft)	(ft) (ft) 0.5ft 0.5ft 0.5ft 0 25 50 75 100	NO. MOI G
	-		924.8 GROUND SURFACE 0.0
	927.3 GROUND SURFACE 0.0 RESIDUAL		Stiff, Tan-Orange, Fine Sandy, Silty CLAY (A-7-6), with little to some mica
925	Stiff, Tan-Orange, Fine Sandy, Clayey SILT (A-5), with little to some mica	920 920.3 4.5 1 1	
			M Medium Dense, Gray-White, Clayey, Sity Fine SAND (A-2-4), with little to some mica
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		915 915.3 9.5	Stiff, Tan-Orange, Fine Sandy, Clayey SILT (A-5), contains black mottling and some
	<u>8.0</u> Medium Dense, Tan-Gray-White, Clayey,		M (A-5), contains black mottling and some mica
4 5 6	Silty Fine SAND (A-2-4), with some mica		
915	-	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$M = \frac{1}{2} $
	911.6 15.7		Boring Terminated at Elevation 908.8 ft In Residual Fine Sandy, Clayey Silt (A-5)
	Boring Terminated at Elevation 911.6 ft In - Residual Clayey, Silty Fine Sand (A-2-4)		
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### **CONTENTS**

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REFERENCE

TITLE SHEET LEGEND (SOIL & ROCK) SITE PLAN PROFILE CROSS SECTIONS BORE LOGS SITE PHOTOGRAPHS

**DESCRIPTION** 

### STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION **DIVISION OF HIGHWAYS** GEOTECHNICAL ENGINEERING UNIT

# **STRUCTURE** SUBSURFACE INVESTIGATION

COUNTY FORSYTH

PROJECT DESCRIPTION WINSTON-SALEM NORTHERN **BELTWAY EASTERN SECTION (FUTURE I-74)** 

FROM US 311 TO I-40

SITE DESCRIPTION BRIDGE NO. 729 ON -Y2FLYCA- OVER FUTURE I-74

# 483 3 PROJEC

0

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U–2579AA	1	31

### 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 SOLT TEST DATA AVAILABLE MAY BE REVEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT 1999 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

CENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A CEOTECHNICAL 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 DECREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOLL MOISTURE CONDITIONS NUCLATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOL MOISTIGE 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 CALIFORED THAT DETAILS SHOWNED IN THE UBBURFACE 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 INFOMATION ON THIS PROJECT. THE DEPARTMENT DOCS NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY IMMSELF 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 END OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE SUBSURFACE INFORMATION.

- NOTES: I. THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR CUARANTEED BY THE N.C.DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT. 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

A. SUTTLE P. DONNELLY M. MAGNO J. GARRICK M&W HPC

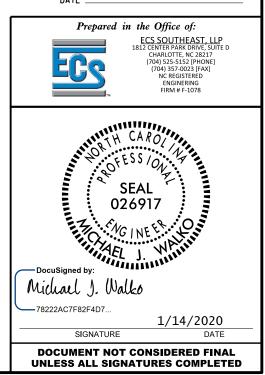
INVESTIGATED BY ECS SOUTHEAST, LLD

DRAWN BY K. DE MONTBRUN, P.E.

CHECKED BY <u>M. WALKO, P.E.</u>

SUBMITTED BY \_\_\_\_\_\_ ECS SOUTHEAST, LLP

DATE \_\_\_\_\_\_ 2019



# NORTH CAROLINA DEPARTMENT OF TRANSPORTATION **DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT** SUBSURFACE INVESTIGATION

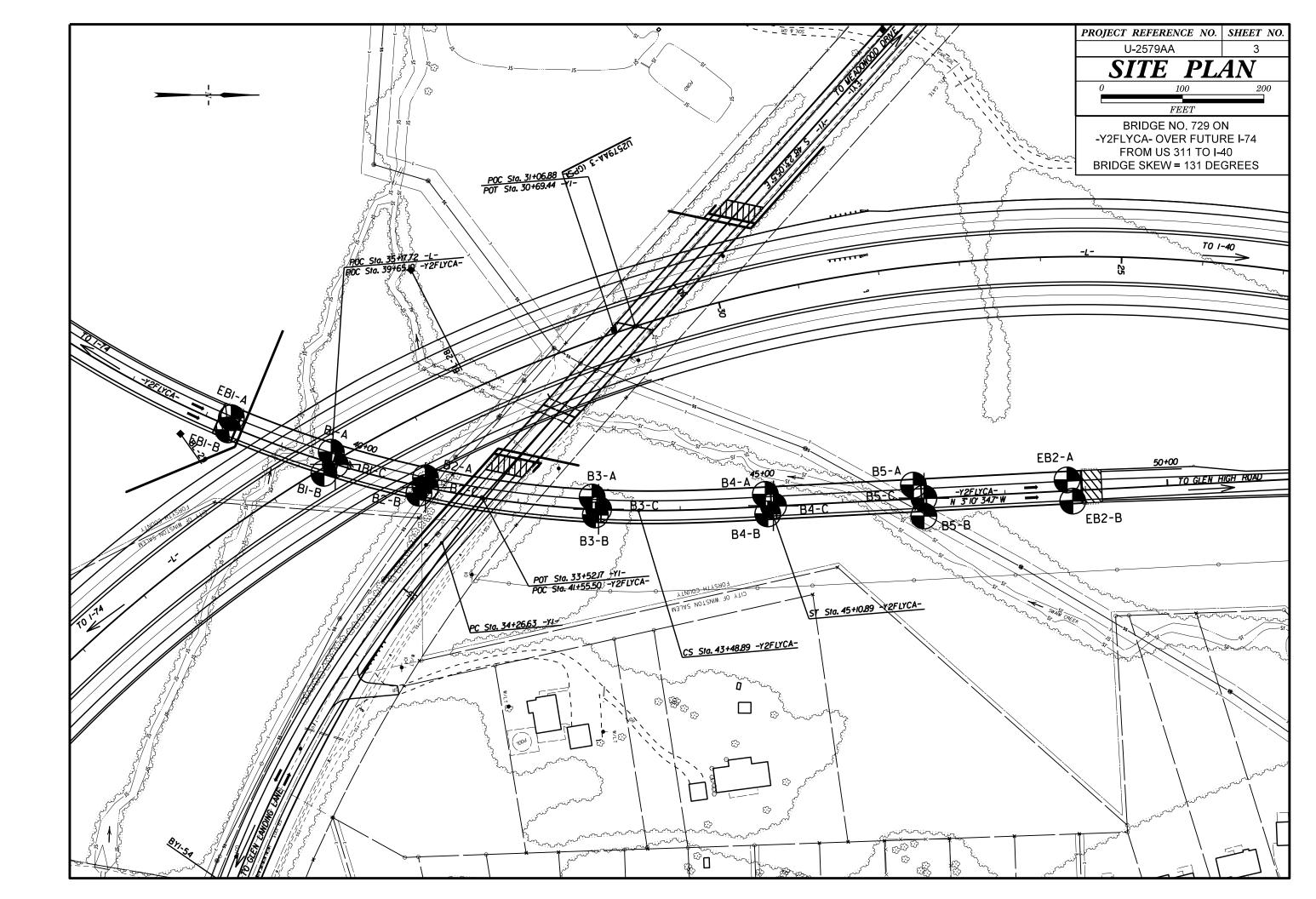
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

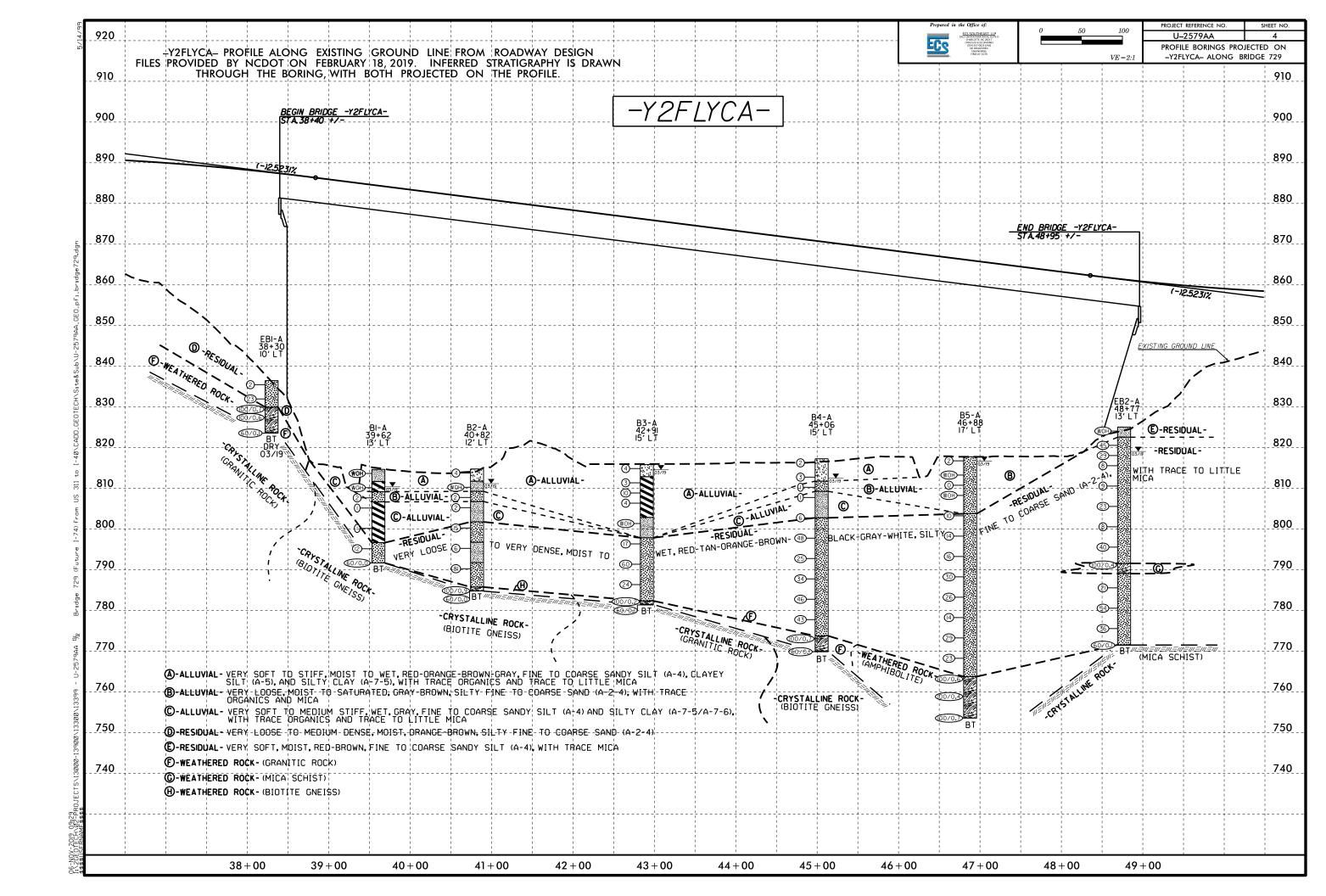
	SOIL DESCRIPTION			GRADATION		ROCK DESCRIPTION						
BE PENETRATED WITH A CONTINUOU ACCORDING TO THE STANDARD PEN	TED, SEMI-CONSOLIDATED, OR WEATHERED E S FLIGHT POWER AUGER AND YIELD LESS METRATION TEST (AASHTO T 206, ASTM DI TEM, BASIC DESCRIPTIONS GENERALLY IN	THAN 100 BLOWS PER FOOT 586). SOIL CLASSIFICATION	UNIFORMLY GRADED - IND	S A GOOD REPRESENTATION OF PARTICL ICATES THAT SOIL PARTICLES ARE ALL A MIXTURE OF UNIFORM PARTICLE SIZ	APPROXIMATELY THE SAME SIZE.	HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF T ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD Y SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAT BLOWS IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND RU						
CONSISTENCY, COLOR, TEXTURE, MOIS	TURE, AASHTO CLASSIFICATION, AND OTHE TION, ANGULARITY, STRUCTURE, PLASTICITY	R PERTINENT FACTORS SUCH		ANGULARITY OF GRAIN	S	REPRESENTED BY A	ZONE OF WEATHERED ROCK. RE TYPICALLY DIVIDED AS FOLLOW					
	NOIST WITH INTERBEDDED FINE SAND LAYERS,			OR ROUNDNESS OF SOIL GRAINS IS DE JLAR, SUBROUNDED, OR ROUNDED.	SIGNATED BY THE TERMS:	WEATHERED	SI MASI MA	IN MATERIAL THAT WOULD YIELD SP				
	ND AND AASHTO CLASSIFI	CATION		MINERALOGICAL COMPOSI	TION	ROCK (WR)	100 BLOWS PER FO	OOT IF TESTED.				
GENERAL GRANULAR MATER CLASS. (≤ 35% PASSING ■		ORGANIC MATERIALS	MINERAL NAME	S SUCH AS QUARTZ, FELDSPAR, MICA, TA		CRYSTALLINE ROCK (CR)		GRAIN IGNEOUS AND METAMORPHIC RO REFUSAL IF TESTED, ROCK TYPE IN				
GROUP A-1 A-3	A-2 A-4 A-5 A-6 A-7	A-1, A-2 A-4, A-5	ARE USED IN I	DESCRIPTIONS WHEN THEY ARE CONSIDE	RED OF SIGNIFICANCE.		GNEISS, GABBRO, SC	CHIST, ETC. GRAIN METAMORPHIC AND NON-COAST				
CLASS. A-1-a A-1-b A-2-4 A-	2-5 A-2-6 A-2-7 A-7-5, A-7-6	A-3 A-6, A-7	0. TOUT			NON-CRYSTALLINE ROCK (NCR)	SEDIMENTARY ROCK	K THAT WOULD YEILD SPT REFUSAL DES PHYLLITE, SLATE, SANDSTONE, ET				
SYMBOL 000000000000000000000000000000000000			MODER4	LY COMPRESSIBLE NTELY COMPRESSIBLE	LL < 31 LL = 31 - 50	COASTAL PLAIN	COASTAL PLAIN SE	EDIMENTS CEMENTED INTO ROCK, BUT				
2 PASSING		SILT- MICK	HIGHLY	COMPRESSIBLE PERCENTAGE OF MATER	LL > 50	SEDIMENTARY ROCK (CP)	SPT REFUSAL. ROC	CK TYPE INCLUDES LIMESTONE, SANDS				
*10 50 MX *40 30 MX 50 MX 51 MN		GRANULAR CLAY MUCK, SOILS SOILS PEAT			HL		WEAT	HERING				
	MX 35 MX 35 MX 36 MN 36 MN 36 MN 36 MN	30123	ORGANIC MATERIAL TRACE OF ORGANIC MAT	SOILS SOILS	OTHER MATERIAL TRACE 1 - 10%		FRESH, CRYSTALS BRIGHT, FEW JOIN ER IF CRYSTALLINE.	NTS MAY SHOW SLIGHT STAINING. ROCK				
MATERIAL PASSING #40		SOILS WITH	LITTLE ORGANIC MATTE	R 3 - 5% 5 - 12%	LITTLE 10 - 20%			SOME JOINTS MAY SHOW THIN CLAY C				
	MN 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN MX 11 MN 11 MN 10 MX 10 MX 11 MN 11 MN	LITTLE OR HIGHLY	MODERATELY ORGANIC HIGHLY ORGANIC	5 - 10% 12 - 20% > 10% > 20%	SOME 20 - 35% HIGHLY 35% AND ABOVE	(V SLI.) CRYST		SHINE BRIGHTLY. ROCK RINGS UNDER H				
GROUP INDEX 0 0 0	4 MX 8 MX 12 MX 16 MX NO MX	MUDERATE ORGANIC		GROUND WATER				AND DISCOLORATION EXTENDS INTO RO				
USUAL TYPES STONE FRAGS. FINE SILT	Y OR CLAYEY SILTY CLAYEY	ORGANIC SOILS MATTER	$\nabla$	WATER LEVEL IN BORE HOLE IMMEDIAT	ELY AFTER DRILLING	(SLI.) 1 INCH	H. OPEN JOINTS MAY CONTAIN CLAY.	IN GRANITOID ROCKS SOME OCCASIONA				
	EL AND SAND SOILS SOILS	MHITER		STATIC WATER LEVEL AFTER 24 H	DURS			RYSTALLINE ROCKS RING UNDER HAMMEN ISCOLORATION AND WEATHERING EFFECT				
GEN BATING		FAIR TO DOOD UNCULTADES	<u> </u>	PERCHED WATER, SATURATED ZONE, OR	WATER BEARING STRATA	(MOD.) GRANI	TOID ROCKS, MOST FELDSPARS ARE [	DULL AND DISCOLORED, SOME SHOW CLA				
AS SUBGRADE EXCELLENT TO GO	DOD FAIR TO POOR	POOR POOR UNSUITABLE		SPRING OR SEEP			FRESH ROCK.	SHOWS SIGNIFICANT LOSS OF STRENGTH				
	ROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS :	> LL - 30	0.00.					OR STAINED. IN GRANITOID ROCKS, ALL I				
	ISISTENCY OR DENSENESS RANGE OF STANDARD	RANGE OF UNCONFINED		MISCELLANEOUS SYMBO	LS		KAOLINIZATION. ROCK SHOWS SEVERE L ST'S PICK. ROCK GIVES "CLUNK" SOUND					
PRIMARY SOIL TYPE COMPACTI	TENCY PENETRATION RESISTENCE	COMPRESSIVE STRENGTH					STED, WOULD YIELD SPT REFUSAL					
VERY	(N-VALUE)	(TONS/FT <sup>2</sup> )	WITH SOIL DESC	en spi				OR STAINED. ROCK FABRIC CLEAR AND E IN GRANITOID ROCKS ALL FELDSPARS				
	SE 4 TO 10		SOIL SYMBOL	OPT DMT TEST BOR		TO SC	DME EXTENT. SOME FRAGMENTS OF S					
MATERIAL MEDIUM		N/A	ARTIFICIAL FILI		CONE PENETROMETER			<u>&gt; IDU DFF</u> DR STAINED. ROCK FABRIC ELEMENTS AF				
(NON-COHESIVE) VERY (	DENSE > 50			$\leftarrow$	-	SEVERE BUT M	MASS IS EFFECTIVELY REDUCED TO S	SOIL STATUS, WITH ONLY FRAGMENTS O				
GENERALLY SOF		< 0.25 0.25 TO 0.5	- INFERRED SOIL	BOUNDARY	<ul> <li>SOUNDING ROD</li> </ul>			F ROCK WEATHERED TO A DEGREE THAT MAIN. <u>IF TESTED, WOULD YIELD SPT N N</u>				
SILT-CLAY MEDIUM	STIFF 4 TO 8	Ø.5 TO 1.0	INFERRED ROCK	LINE MW MONITORING WE	L - TEST BORING			DT DISCERNIBLE, OR DISCERNIBLE ONLY				
MATERIAL STI (COHESIVE) VERY		1 TO 2 2 TO 4	ALLUVIAL SOIL	BOUNDARY A PIEZOMETER	SPT N-VALUE		TERED CONCENTRATIONS. QUARTZ MA) AN EXAMPLE.	Y BE PRESENT AS DIKES OR STRINGERS				
HAI		> 4		INSTREET ION			ROCK H	IARDNESS				
	EXTURE OR GRAIN SIZE			RECOMMENDATION SYMBO				ARP PICK. BREAKING OF HAND SPECIMEN				
U.S. STD. SIEVE SIZE OPENING (MM)	4 10 40 60 200 4.76 2.00 0.42 0.25 0.075	270 0.053		UNCLASSIFIED EXCAVATION -	ACCEPTABLE, BUT NOT TO BE		RAL HARD BLOWS OF THE GEOLOGIST	I'S PICK. NLY WITH DIFFICULTY. HARD HAMMER B				
	COARSE FINE	SILT CLAY	SHALLOW UNDERCUT	UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK	USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL		ETACH HAND SPECIMEN.	NET WITH DIFFICUETT. HAND HAMMEN B				
	GR.) (CSE. SD.) (F SD.			ABBREVIATIONS				COUGES OR GROOVES TO 0.25 INCHES D				
GRAIN MM 305 75	2.0 0.25	0.05 0.005	AR - AUGER REFUSAL	MED MEDIUM	VST - VANE SHEAR TEST		DERATE BLOWS.	IST'S PICK. HAND SPECIMENS CAN BE D				
SIZE IN. 12 3			BT - BORING TERMINATED CL CLAY	MICA MICACEOUS MOD MODERATELY	WEA WEATHERED $\gamma$ - UNIT WEIGHT			S DEEP BY FIRM PRESSURE OF KNIFE ( PEICES 1 INCH MAXIMUM SIZE BY HARD				
SOIL MOIS	TURE - CORRELATION OF	TERMS	CPT - CONE PENETRATION	TEST NP - NON PLASTIC	$\gamma_{\rm d}$ - DRY UNIT WEIGHT		OF A GEOLOGIST'S PICK.	FEICES I INCH MHAIMUM SIZE BT HHRU				
SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION GUIDE FOR F	IELD MOISTURE DESCRIPTION	CSE COARSE DMT - DILATOMETER TEST	ORG ORGANIC PMT - PRESSUREMETER TES	ST SAMPLE ABBREVIATIONS			KNIFE OR PICK. CAN BE EXCAVATED IN				
			DPT - DYNAMIC PENETRATI	ON TEST SAP SAPROLITIC	S - BULK		S CAN BE BROKEN BY FINGER PRESS	E BY MODERATE BLOWS OF A PICK POIN SURE.				
		UID; VERY WET, USUALLY THE GROUND WATER TABLE	e - VOID RATIO F - FINE	SD SAND, SANDY SL SILT, SILTY	SS - SPLIT SPOON ST - SHELBY TUBE			CAVATED READILY WITH POINT OF PICK.				
LL LIQUID LIMIT			<ul> <li>FOSS FOSSILIFEROUS</li> <li>FRAC FRACTURED, FRACTURED</li> </ul>	SLI SLIGHTLY JRES TCR - TRICONE REFUSAL	RS – ROCK RT – RECOMPACTED TRIAXIAL	SOFT OR MO FINGE		BY FINGER PRESSURE. CAN BE SCRATCH				
RANGE <		EQUIRES DRYING TO MUM MOISTURE	FRAGS FRAGMENTS	W - MOISTURE CONTENT	CBR - CALIFORNIA BEARING	FRAC	TURE SPACING	BEDDING				
(PI) PL PLASTIC LIMIT			HI HIGHLY	V - VERY	RATIO	TERM VERY WIDE	SPACING MORE THAN 10 FEET					
OM OPTIMUM MOISTURE	- MOIST - (M) SOLID; AT OR	NEAR OPTIMUM MOISTURE	DRILL UNITS:	IPMENT USED ON SUBJECT ADVANCING TOOLS:	HAMMER TYPE:	WIDE	3 TO 10 FEET	VERY THICKLY BEDDED THICKLY BEDDED 1				
SL SHRINKAGE LIMIT .			CME-45C	CLAY BITS		MODERATELY CLO CLOSE	0SE 1 TO 3 FEET 0.16 TO 1 FOOT	THINLY BEDDED 0. VERY THINLY BEDDED 0.0				
		DITIONAL WATER TO MUM MOISTURE		6" CONTINUOUS FLIGHT AUGER		VERY CLOSE	LESS THAN Ø.16 FEET	THICKLY LAMINATED 0.00 THINLY LAMINATED				
			CME-55	X 8" HOLLOW AUGERS	CORE SIZE:							
		DRY STRENGTH	Х СМЕ-550	HARD FACED FINGER BITS		FOR SEDIMENTARY		NING OF MATERIAL BY CEMENTING, HE				
NON PLASTIC	PLASTICITY INDEX (PI) 0-5	VERY LOW		TUNGCARBIDE INSERTS	X -N Q2	FRIABLE	RUBBING WITH	FINGER FREES NUMEROUS GRAINS;				
SLIGHTLY PLASTIC MODERATELY PLASTIC	6-15 16-25	SLIGHT MEDIUM	VANE SHEAR TEST	X CASING W/ ADVANCER	HAND TOOLS:			BY HAMMER DISINTEGRATES SAMPLE.				
HIGHLY PLASTIC	26 OR MORE	HIGH	PORTABLE HOIST	TRICONE *STEEL TEETH	POST HOLE DIGGER	MODERATELY		E SEPARATED FROM SAMPLE WITH ST Y WHEN HIT WITH HAMMER.				
	COLOR			TRICONE TUNGCARB.	HAND AUGER	INDURATED		IFFICULT TO SEPARATE WITH STEEL				
DESCRIPTIONS MAY INCLUDE COLO	R OR COLOR COMBINATIONS (TAN, RED,	(ELLOW-BROWN, BLUE-GRAY).	X DIEDRICH D-120	X CORE BIT	VANE SHEAR TEST	INDORHTED		BREAK WITH HAMMER.				
	DARK, STREAKED, ETC. ARE USED TO DE					EXTREMELY 1		R BLOWS REQUIRED TO BREAK SAMPL (S ACROSS GRAINS.				

PROJECT REFERENCE NO.	
U-2579AA	

SHEET NO. 2

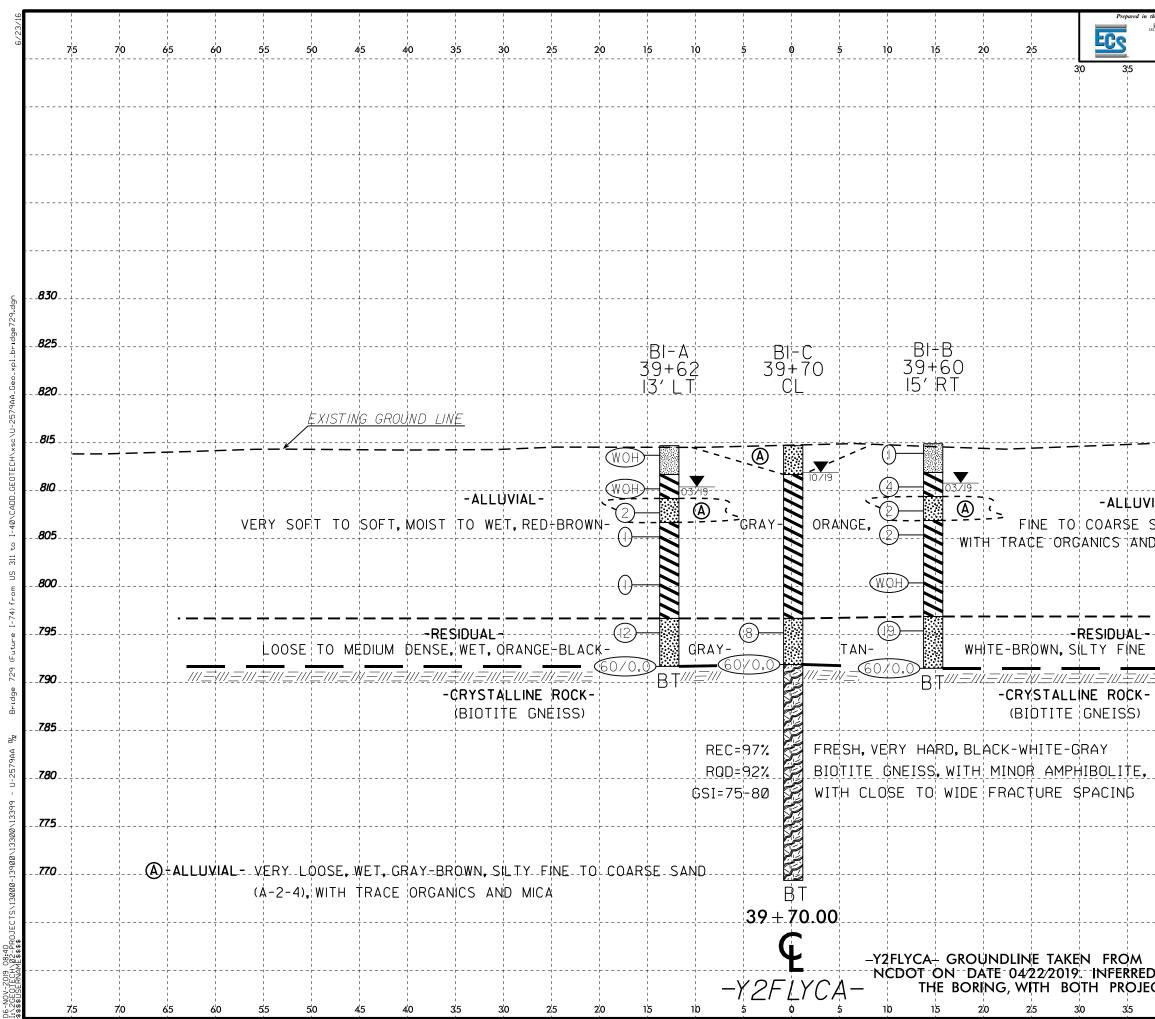
TERMS AND DEFINITIONS D. AN INFERRED ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. SPT REFUSAL. I FOOT PER 60 IS OFTEN AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.  $\frac{\text{ArGILLACEOUS}}{\text{A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.}$ N VALUES > ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT СК ТНАТ WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CLUDES GRANITE. 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. AL PLAIN IF TESTED. MAY NOT YIELD 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. TONE, CEMENTED DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. RINGS UNDER  $\underline{\text{DIP}}$  - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DATINGS IF OPEN. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. AMMER BLOWS IF FAULT - A FRACTURE OF FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. ICK UP ТО FELDSPAR BLOWS. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIG∖NAL POSITION AND DISLODGED FROM PARENT MATERIAL. S. IN AY. ROCK HAS AS COMPARED FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.  $\underline{\mbox{FORMATION (FM.)}}$  - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. ELDSPARS DULL DSS OF STRENGTH JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. WHEN STRUCK. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO VIDENT BUT ITS LATERAL EXTENT. ARE KAOLINIZED 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. RE DISCERNIBLE STRONG ROCK PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM ALUES < 100 BPF RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ' IN SMALL AND RS. SAPROLITE IS 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.  $\underline{\mathsf{SAPROLITE}}$  - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. S REQUIRES SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND THE INFORMATION OF THE INTEGER OF THE INTEGER OF THE AND A DESCRIPTION OF THE AND A DESCRIPTION OF THE INTRUDED ROCKS. LOWS REQUIRED EP CAN BE  $\underline{\text{SLICKENSIDE}}$  - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. ETACHED 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. R PICK POINT. BLOWS OF THE STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. FRAGMENTS NT. SMALL. THIN 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. PIECES 1 INCH HED READILY BY TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER. BENCH MARK: BL-29 (N:841331, E:1661254) THICKNESS 4 FEET ELEVATION: 843.31 FEET .5 - 4 FEET 6 - 1.5 FEET 3 - 0.16 FEET NOTES: 18 - Ø.Ø3 FEET 0.008 FEET EXISTING GROUND SURFACE INFORMATION PROVIDED BY NCDOT ON APRIL 22, 2019. AT, PRESSURE, ET SOME SURVEYED BORING LOCATIONS PROVIDED BY VAUGHN & MELTON ON APRIL 3,2019. TEEL PROBE: PROBE;





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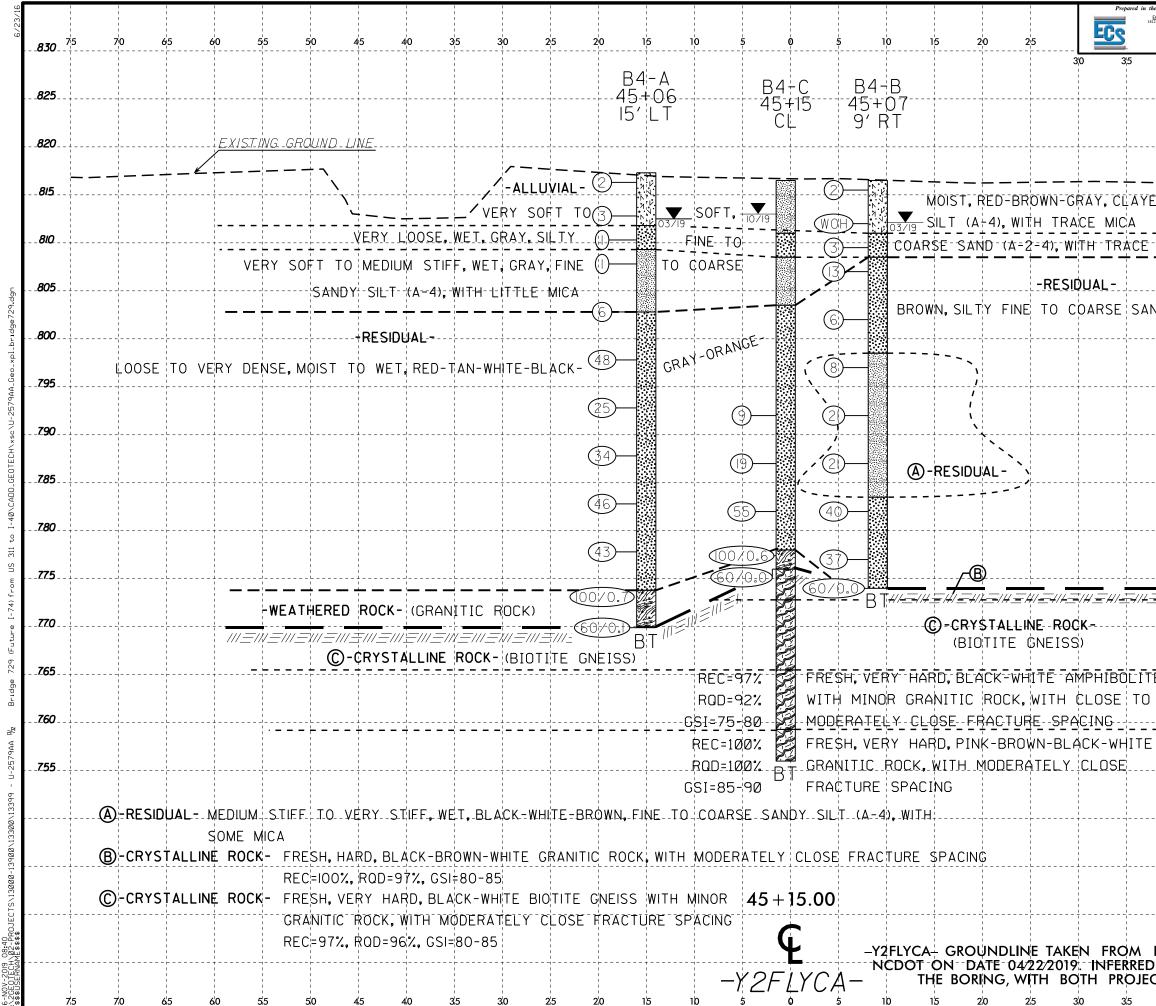
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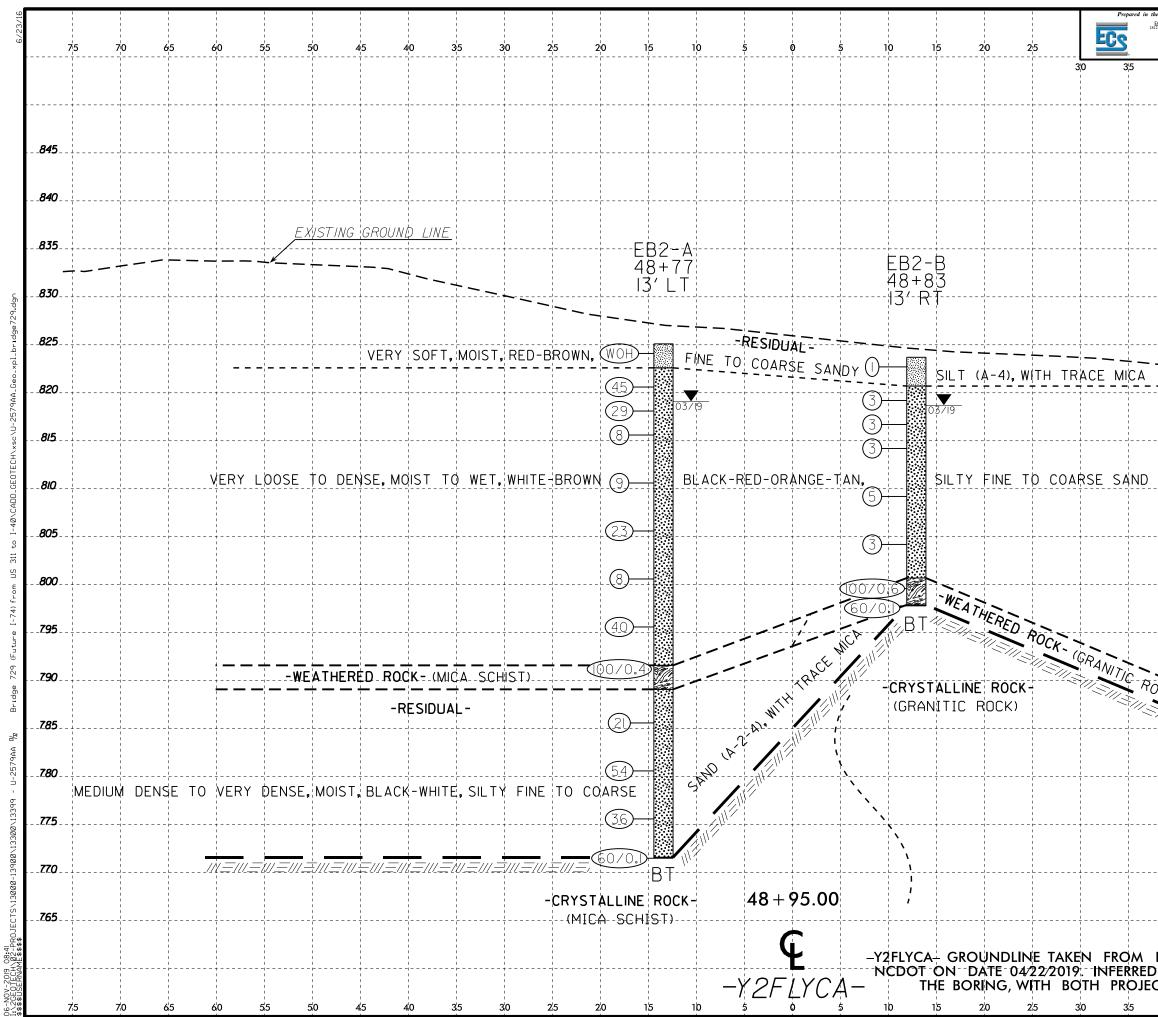
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775	(CRYSTALLINE ROCK- (AMPHIBOLITE)	
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	G-CRYSTALLINE ROCK- (BIOTITE GNEISS)	
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	WITH TRACE ORGANICS AND MICA	
.765	B-RESIDUAL + MEDIUM STIFF, WET, BLACK-BROWN, FINE TO COARSE SANDY SILT (A-4),	· - + - ·
	WITH TRACE MICA AND GRAVEL-SIZED ROCK FRAGMENTS	
760	C-RESIDUAL SOFT, WET, RED-GRAY, CLAYEY-SILT- (A-5), WITH-TRACE-MICA	<u>+</u>
	O-WEATHERED ROCK- (BIOTITE GNEISS)	
755	CRYSTALLINE ROCK- FRESH, VERY HARD, BROWN-BLACK-WHITE BIOTITE GNEISS, WITH MODERATELY CLOSE FRACTURE SPACING	<u>.</u>
	REC=100%, ROD=75%, GSI=55-60	
	(F)-CRYSTALLINE ROCK- FRESH, VERY HARD, BLACK-WHITE AMPHIBOLITE, WITH WIDE FRACTURE SPACING	
+	REC=100%, ROD=96%, GSI=80-85	-+-
	G-CRYSTALLINE ROCK- FRESH, VERY HARD, BLACK-WHITE, BIOTITE GNEISS, WITH VERY CLOSE TO MODERATELY CLOSE FRACTURE SPACING	i
		· - +
	REC=99%, ROD=98%, GSI=80+85	
	()-CRYSTALLINE ROCK- FRESH, VERY HARD, BLACK-WHITE BROWN GRANITIC ROCK, 40+95.00	<del> </del> 
	WITH MODERATELY CLOSE FRACTURE SPACING	
     	REC=100%, ROD=100%, GSI=85-90 NCDOT ON DATE 04/22/2019. INFERRED STRATIGRAPHY IS DRAWN THROUGH	     +
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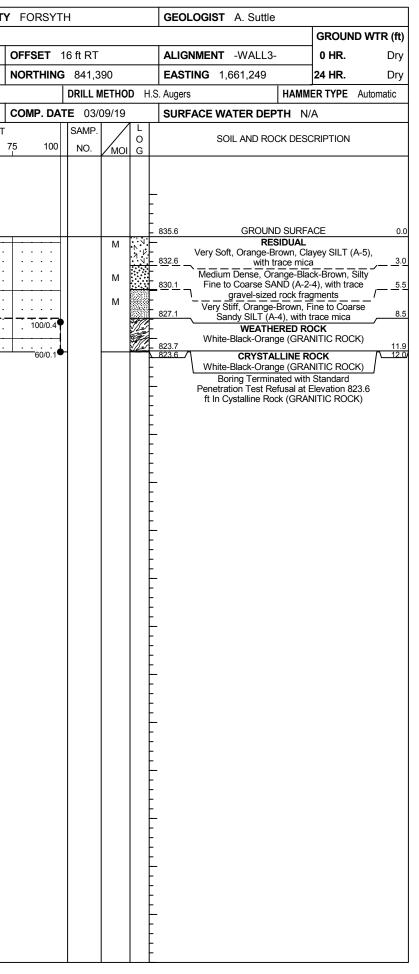
the Office	e of:	0	5	10		EFERENCE NC	). S⊦	ieet no.
CLS SOU 1812 CENTER PA CHARLOT (704) 525-1 (704) 357 NC RFI	THEAST, LLP ARK DRIVE, SUITE D TE, NC 28217 S152 [PHONE] 7-0023 [FAX] GISTERED INFRING # F-1078					2579AA BRIDGE NO.		
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47 + 00.00       000         47 + 00.00       000         47 + 00.00       000	Image: Second	TO COARSE SAND	TO COARSE SAND		- MEATHERED	ITE/GF ITE/GF E-BLA E-BLA E-BLA	
PLACK- PLACK-	Image: Second					MENENENENENEN 8% 90 SH TO MODERATEL 8D TO MEDIUM HAF NITIC ROCK, WITH 0SE FRACTURE SPA	
	46+88       177.1.1       177.1.1       177.1.1       10.0       10.0       10.0       10.0       10.0       11.1	47+00 CI-00 CI-00		-BLACK- W		RdD=362, 74, Rec RdD=362, 74, Rec SI=30-35 SI=30-35 RC=58, Rec RdD=36, Rec SI=30-35 SI=30-35 RdD=86, Rec RdD=86, RdD=86, R	JWN, FINE-TO WITH TRACE MICA UDY-SILTY FINE -TAN, SILTY FINE -E MICA 47 + 00.00



the Office of: ECS SOUTHEAST, LLP	0	5	10	PROJ. REFERENCE NO.	SHEET NO.
ECS SOUTHEAST, LLP 1812 CENTER PARK DRIVE, SUITE D CHARATOTE, NC 28217 (704) 525-5152 [PHONE] (704) 535-5152 [PHONE] (704) 535-5152 [PHONE] (704) 537-50023 [FAX] NC REGISTERED ENSIMERING FIRM # F-1078				U-2579AA BRIDGE NO. 729 E	
ENGINEEING FIRM # F-1078	4¦5	5¦0	VE = 1:1 5 5 6 0	ON _Y2FLYCA_ OVEI 6/5 7/0	R FUTURE I–74 7¦5
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WBS	34839	9.1.7			Т	<b>P</b> U-2579/	٩A	COUNT	Y FORSY	ТН			GEOL	OGIST A. Suttle		WB	<b>S</b> 34839	.1.7			TIF	<b>D</b> -2579	AA	COUNTY
SITE	DESCR	RIPTION	Brid	lge No	. 729 (	on -Y2FLYC	A- over F	uture I-74	4 from US 3	811 to I-4	0				GROUND WTR (	t) SIT	E DESCR	IPTION	Wal	l No. 3	at Bri	dge No. 72	29 on -Y2F	LYCA-
BOR	NG NO.	. EB1	-A		S	TATION 38	3+30		OFFSET	10 ft LT			ALIGN	MENT -Y2FLYCA-	OHR. D	y BOI	ring no.	EB1-	-B		ST	ATION 1	2+39	
COLI	AR ELI	EV. 83	36.5 ft		т	OTAL DEPT	<b>H</b> 12.9 ft	:	NORTHIN	<b>G</b> 841,3	394		EAST	NG 1,661,234	24 HR. D	y co	LLAR ELE	<b>V.</b> 83	35.6 ft		тс	TAL DEP	<b>TH</b> 12.0 f	ť
DRILL	. RIG/HA	MMER E	FF./DA	TE M	&W029	Diedrich D-12	0 89% 09/0	7/2018	1	DRILL	METHO	DD H	S. Augers	НАММ	J IER TYPE Automatic		LL RIG/HAM	MMER E	FF./DA	TE M8	W029 E	Diedrich D-12	20 89% 09/0	)7/2018
	LER G					TART DATE			COMP. D				<u> </u>	ACE WATER DEPTH N		_	<b>LLER</b> G							
ELEV			1	w col			BLOWS F			SAMP.	-	1 - 1				ELEV		DEPTH	1	W COL				PER FOOT
elev (ft)	DRIVE ELEV (ft)	(ft)	·	0.5ft		0 2			75 100		мо		ELEV. (ft)	SOIL AND ROCK DES	CRIPTION DEPTH	(ft)	DRIVE ELEV (ft)	(ft)		0.5ft		0		5 <u>0</u>
	(11)						I								DEFIN		(11)							
840		+											_			840		-						
	-	Ŧ											-	GROUND SURF			-	-						
835	836.5	<u>+ 0.0</u> +	WOH	WOH	2	2					м		- 836.5	RESIDUAL		0.0 835	- 835.6 -	- 0.0						
		<b>†</b>								11			-	Very Loose to Medium Orange-Brown, Silty Fine to	n Dense, Coarse SAND			-	WOH	WOH	WOH	•		
	833.0	3.5	8	11	12		23				м		-	(A-2-4)			832.1	3.5			- 10			
830	830.5	6.0	31	22	78/0.2		<u> </u>						830.0			.5 830	829.6		5	9	16	<u> </u>	25	<u> </u>
	828.0	- - - 8.5							100/0./	•			-	WEATHERED RO White-Black-Orange (GRA	OCK		629.6	- 6.0	2	4	19		23	
		- 0.0	78	22/0.1					• • 100/0.6	<b> </b>			-	THIC DAUK-CHAINE (ORA			827.1	8.5	100/0.4				└┥ <i>╼╴</i> ┍╴	+
825	-	‡	1							1			_			825		_	100,0.4			· · · ·		
	823.7	12.8	60/0.1						<u> </u>	┥	<u> </u>	in the	823.7 823.6	CRYSTALLINE R			823.7 -	- 11.9	60/0.1					
	-	+											-	White-Black-Orange (GRA	NITIC ROCK)		-	-						
	-	Ŧ											-	Boring Terminated with Penetration Test Refusal at	Elevation 823.6			-						
	-	ŧ											-	ft In Cystalline Rock (GRA	NITIC ROCK)		-	-						
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WBS	34839	9.1.7			Т	TIP U-28	579AA		COUNT	Y FORS	YTH			GE	OLOGIST A. Suttle		WBS	<b>S</b> 3483	9.1.7			TI	<b>P</b> U-2579/	١A	COUNT	ΥF
SITE	DESCR		<b>N</b> Brid	dge No	b. 729	on -Y2F	LYCA- o	over Fi	uture I-7	4 from US						GROUND WTR (ft)	SITE	E DESCF	RIPTIO	N Brid	lge No	). 729 (	on -Y2FLYC	A- over F	uture I-7	1 fron
BORI	NG NO.	. B1-A	4		s	STATION	39+62	2		OFFSET	' 13 ft L'	Т		AL	IGNMENT -Y2FLYCA-	<b>0 HR.</b> N/A	BOF	ring no	). B1-E	3		S	TATION 39	)+60		OFF
COLL	AR ELE	<b>EV.</b> 8	14.7 ft		Т	OTAL D	EPTH 2	23.0 ft		NORTH	<b>NG</b> 841	,517		EA	STING 1,661,276	<b>24 HR.</b> 4.3	COL	LAR EL	<b>EV.</b> 8	14.9 ft		т	OTAL DEPT	H 23.4 ft	t	NO
DRILL	RIG/HAI	MMER E	FF./DA	TE N	&W029	Diedrich [	0-120 899	% 09/07	7/2018	•	DRILL	METH	OD	H.S. Aug	ers HAMM	IER TYPE Automatic	DRIL	L RIG/HA	MMER E	EFF./DA	TE Ma	&W029	Diedrich D-120	) 89% 09/0	7/2018	·
DRIL	LER G	. Akins	3		s	START D	<b>ATE</b> 03	3/10/19	9	COMP.	DATE 0	3/11/1	9	SU	RFACE WATER DEPTH N	/A	DRII	LLER G	G. Akins	3		S	TART DATE	03/10/1	9	cor
ELEV	DRIVE	DEPTH	1	ow co					ER FOOT		SAM		ΛL				ELEV				w col				PER FOOT	
(ft)	ELEV (ft)	(ft)		0.5ft	-	0	25	5	0	75 1	00 NO.		O JIG	ELEV	SOIL AND ROCK DES	CRIPTION DEPTH (ft)	(ft)	ELEV (ft)	(ft)		0.5ft	0.5ft	0 2	25 5	50	75
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815																	815									
015	814.7	0.0	WOH	WOH	WOH	1						м		814.7	ALLUVIAL		015		0.0	WOH	WOH	1	1			
	-	ŧ						· · ·	· · ·					811.7	Very Soft, Red-Brown, Fine to SILT (A-4), with trac			011.4	+ + 3.5				$\begin{bmatrix} \mathbf{T}_1 & \cdots & \cdots \\ \mathbf{T}_n & \cdots & \mathbf{T}_n \end{bmatrix}$			
810	811.2	3.5	WOH	WOH	WOH		• •								Very Soft, Red-Brown-Gra	iy, Silty CLAY	810		†	WOH	WOH	4	4			
	808.7 -	6.0		WOH	2	_ <b>T</b> °								809.2	(A-7-5) Very Loose, Gray-Brown,	5.5		808.9	6.0	WOH	WOH	2	$\left[ \begin{array}{ccc} \overline{f} & \overline{f}$			
	806.2	+ 85			2	<b>•</b> 2		· · ·	· · · · · ·	· · · · ·	.	W		806.7	Coarse SAND (A-2-4), with	trace organics 8.0		806.4	+ 8.5							
805			WOH	WOH	1	┤ <b>↓</b> · · ·	·   ·	· · ·		· · · ·	·	w			Very Soft, Gray, Silty CLAY trace organics and	Y (A-7-6), with I mica	805		1	WOH	WOH	2	• <u>2</u>	· · · ·		<u> </u>
	-	ŧ					· · ·				·			ł					ŧ							
	801.2	13.5							· · ·		.			<u>801.7</u>	Very Soft, Gray, Silty CLAY	$\frac{13.0}{13.0}$			13.5							
800	-	Ŧ	WOH	WOH	1	•1						W			trace organics and		800		Ŧ	WOH	WOH	WOH	•0	<u> </u>		<u> </u>
	-	ŧ							· · · · · ·		.			5					‡							.   .
705	796.2	18.5	9	4	8	_    <u>-</u> ; -; ;	· · ·	· · · · · ·	· · ·	·   · · · ·				796.7	RESIDUAL	<u>18.0</u>			18.5	10	13	6				
795	-	t		<b>–</b>	ľ	∳`	2					W			Medium Dense, Orange-Bla Fine to Coarse SAND (A-2	ck-White, Silty	795		ŧ				<b>1</b>			+-
	- 791.7 -	23.0					• •							791.7	mica	23.0		704 5	1							
ł	- 191.7 -	<u>= 23.0</u>  -	60/0.0					<u></u>	<u> </u>	<u> </u>	.o•-			-	Boring Terminated with	Standard		/91.5	<u>+ 23.4</u> +	60/0.0						
	-	Ŧ												F	Penetration Test Refusal at ft On Crystalline Rock (BIO			-	Ŧ							
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INTY	FORSYT	Н			GEC	DLOGIS	T A. Suttl	e		
I-74 f	rom US 31	1 to I-40	0						GROUN	ID WTR (ft)
0	OFFSET '	15 ft RT			ALIC	GNMEN	T -Y2FLY	′CA-	0 HR.	5.8
	ORTHING		08				1,661,302		24 HR.	4.1
 }		DRILL		D H	S. Auge		,	НАММ		Automatic
6	COMP. DA						VATER DE			
<u>тос</u>		SAMP.		L	1001					
7 <u>;</u>	5 100	NO.	моі	O G		5	SOIL AND R	OCK DESC	RIPTION	
		1								
		1			814 0		CPOU	ND SURFA	CE	0.0
		1	М		_814.9		Α	LLUVIAL		0.0
· ·	· · · · ·		_		<u>811.9</u>	Very S	Soft, Red-Bro SILT (A-4	wn, Fine to 4), with little		andy
• •				$\mathbf{N}$	809.4	Soft,	Orange-Gray	/, Silty CLA ganics and		with <u>5.5</u>
			w				oose, Gray,	Silty Fine to	Coarse S	SAND
•••					806.9		-2-4), with tra Soft, Gray,			
			W		-			ganics and		
				N	801.9					13.0
			w	Š		Ver	Soft, Gray,	Silty CLAY		ith
				N	-		liace oig	yanics and	mica	
					796.9					<u> </u>
•••			w	-	-	Medi	um Dense, O	ESIDUAL Prange-Whi	te-Brown,	Silty
	· · · · ·			-		Fine	e to Coarse S	SAND (A-2- mica	4), with tra	ice
• •	<u> </u>	$\mathbf{H}$		-	791.5		Boring Termi	inated with	Standard	23.4
					-	Pene	tration Test F	Refusal at E	Elevation 7	
							r Gystainne r			50)
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WBS	34839.1	.7			ТІ	P U-	-2579/	٩A		COUN	TY	FORSY	ГН				GEOLOGIST A. Suttle				WBS	34839.1.7			TIP	U-25	79AA	С	
SITE	DESCRIP	TION	Bridg	je No	. 729 c	on -Y2	2FLYC	CA- ove	er Fu	iture I-7	74 fro	m US 3	11 to I-4	40					GROUND WTR (ft)	)	SITE	DESCRIPTIO	<b>N</b> Bri	dge No.	729 on	-Y2FL	YCA- ov	er Futi	ıre I-7
BORI	NG NO.	B1-C			ST	ΓΑΤΙΟ	<b>DN</b> 39	9+70			OF	FSET	CL				ALIGNMENT -Y2FLY0	CA-	0 HR. N/A		BOR	ING NO. B1-	0		STA	TION	39+70		
COLL	AR ELEV	. 814	.7 ft		тс	DTAL	DEPT	<b>H</b> 45	.3 ft		NC	ORTHIN	<b>G</b> 841,	522			EASTING 1,661,291		<b>24 HR.</b> 2.8	3	COL	LAR ELEV. 8	14.7 f	t	тот	AL DE	<b>PTH</b> 45	5.3 ft	
DRILL	RIG/HAMM	IER EFF	/DAT	E HF	PC2473	CME-	-550 85'	% 02/06	/2019	)			DRILL	METH	HOD	SP	T Core Boring	HAMI	MER TYPE Automatic		DRILI	L RIG/HAMMER	EFF./D	ATE HPO	2473 C	ME-550	85% 02/06	6/2019	
		Cain			ST	TART	DATE	10/2	29/19	)	cc	omp. Da	<b>TE</b> 10	)/29/1	19		SURFACE WATER DEF	TH N	N/A		DRIL	LER J. Cain			STA	RT DA	<b>TE</b> 10/2	29/19	
	FLEV P	DEPTH (ft)         BLOW COUNT         0         25           0         0.5ft         0.5ft         0         25           0         0         0         0         25           0         0         0         0         0         25           0         0         0         0         0         0         25           0         <							ER FOC			SAMF	P. <b>▼</b>			SOIL AND RO	CK DES	SCRIPTION		COR	E SIZE NQ-2					N 22.5			
(ft)	(ft)	(π) (	0.5ft	0.5ft	0.5ft	0	2	25	50	0	75	100	NO.	_/м	IOI G	;	ELEV. (ft)		DEPTH (f	t)	ELEV	RUN ELEV DEPTI		I DRILL RATE	REC.	RQD (ft) %	SAMP.	REC.	RQD (ft) %
																					(ft)	(ft) (ft)	(ft)	(Min/ft)	(11)	(IL) %	NO.	(IL) %	(II) %
815																	_814.7 GROUN	D SURF		.0	791.9	791.9 22.8	2.5	N=60/0	0 (2 0)	(12)		(21.9)	(20.8)
	Ŧ					·				· · · · · ·	·   ·	· · · · ·			7		Brown, Silty Fine to 811.7			_	790	789.4 - 25.3		3:52/1.0	80%	48%	_	97%	92%
810	Ŧ									· · · · · ·		· · · · ·				Ŧ	Gray, Silty	CLAY	(A-7-5)	<u> </u>		Ŧ	5.0	1:27/1.0	2/ (5.0) 2 100%	(5.0) 100%			
	Ŧ															❣	-				785	Ŧ		1:27/1.0 1:27/1.0 1:26/1.0 1:38/1.0 1:26/1.0					
	Ŧ						· · ·			· · · · · ·	.   .	· · · · ·										784.4 - 30.3	5.0	1 1:33/1.0	) (4.9)	(4.7)			
305	+						· · ·					••••				\$	-					‡		1:38/1.0	) 98% )	94%			
	‡					.i	· · · · · ·			· · · · · ·	.   .					\$					780	779.4 - 35.3	_	1:35/1.0	)				
800	‡						· · · · · ·			· · · · · ·		· · · · ·				\$						‡	5.0	2:50/1.0	100%	(4.9) 98%			
	+															⇇	-				775			4:48/1.0 3:56/1.0	)				
	706 2 +	18.5				:	· · · · · ·			· · · · · ·	.   .	· · · ·							<u>18</u> .	0		774.4 + 40.3	5.0		) (5.0)	(5.0)			
795		10.0	9	5	3	●	88		•••	· · ·		· · · ·		M	1		- Loose, Orange-G	SIDUAL Gray-Tai	n, Silty Fine to			‡		1:15/1.0	) 100% )	100%			
							· · · · · ·			· · · · · ·		· · · · · · · ·					Coarse SAND (A 791.9	-2-4), w	vith trace mica 22.		770	769.4 + 45.3		1:24/1.0 1:28/1.0	)				
790	<u></u>	22.8 6	0/0.0				<u></u>	 	 · ·		÷+:	60/0.0					CRYSTA		ROCK	<u> </u>		‡							
100	+					-											- Fresh, Very Har BIOTITE GN	EISS, v	with minor										
	‡	ESCRIPTION         Bridge No. 729 on -Y2FLYCA- c           G NO.         B1-C         STATION 39+70           R ELEV.         814.7 ft         TOTAL DEPTH         4           IOG/HAMMER EFF./DATE         HPC2473 CME-550 85% 02/         5         6           ELEV         DEPTH         BLOW COUNT         BLOW COUNT         BLOW COUNT           Image: Character of the state of the stat						I	· · · · · ·	.   .	· · · · ·					AMPHIBOLITE, with Sj	a Close	to Wide Fracture											
785	DESCRIPTION       Bridge No. 729 on -Y2FLYCA- c         NG NO.       B1-C       STATION 39+70         AR ELEV.       814.7 ft       TOTAL DEPTH       4         RIG/HAMMER EFF./DATE       HPC2473       CME-550 85% 02/         LER       J. Cain       START DATE       100         DRIVE ELEV       DEPTH (ft)       BLOW COUNT 0.5ft       0.5ft       0.5ft       0       25         ORIGH       BLOW COUNT (ft)       BLOW COUNT       BLOW       COUNT       COUNT       BLOW         ORIGH       BLOW COUNT (ft)       BLOW COUNT       0       25       0       25         ORIGH       BLOW COUNT       0       0       1       1       1       1         ORIGH       BLOW COUNT       0       25       0       25       0       25         ORIGH       BLOW COUNT       0       0       1						•••		· ·	· · · ·					- REC = 97%, RQD	= 92%	, GSI = 75 - 80			‡									
								· · · · · ·		 																			
780	‡									· · · · · ·		· · · ·										‡							
/60	+					-											-					‡							
	‡								I	· · · · · ·		· · · ·																	
775	+					· · ·	· · ·				·   ·						_												
	1						· · ·			· · · · · ·		 										‡							
770	±									· · ·		 										‡							
770							• • •				-		Ц		البخ مبر	1	- 769.4 Boring Terminated	at Flow	45.	3		1							
	±															F	Crystalline Rock	(BIOTI	ITE GNEISS)			+							
	+															E		lotes:				1							
	ŧ															F	1) Auger Pr	obe to '	18.5 Feet	11/4/19									
	ŧ															F						1							
	+															F	-			T.GDT		1							
	Ŧ															F				DOT									
	Ŧ															F	_			NC NC		<u>†</u>							
	Ŧ															F	-			29.GPJ									
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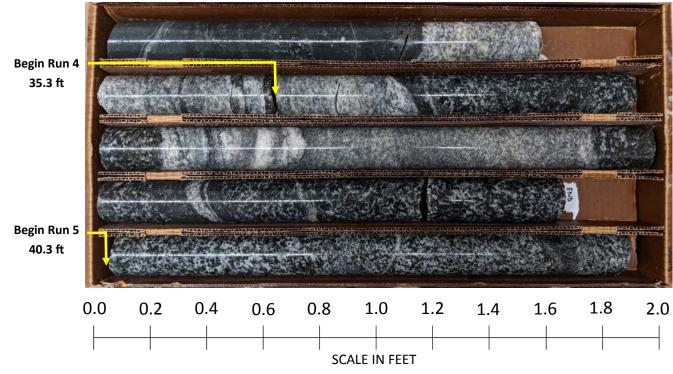
# **GEOTECHNICAL BORING REPORT** CORE LOG

er Future I-74 from US 311 to I-40 OFFSET CL ALIGN 5.3 ft NORTHING 841,522 EASTI 5/2019 DRILL METHOD SPT Core Bo 29/19 COMP. DATE 10/29/19 SURFA ft STRATA L COMP. DATE 10/29/19 SURFA ft DESCRIPT (ft) % G ELEV. (ft) DESCRIPT (21.9) (20.8) Fresh, Very Hard, Black-W AMPHIBOLITE, with	OGIST A. Suttle       GROUND WTR (ft         MENT -Y2FLYCA-       0 HR.       N/A         NG 1,661,291       24 HR.       2.8         ring       HAMMER TYPE       Automatic         ACE WATER DEPTH       N/A         TION AND REMARKS       DEPTH (ft)         STALLINE ROCK       22.         ricose to Wide Fracture Spacing       24.         RQD = 92%, GSI = 75 - 80       RQD = 92%, GSI = 75 - 80
OFFSET         CL         ALIGN           5.3 ft         NORTHING         841,522         EASTI           5/2019         DRILL METHOD         SPT Core Bo           29/19         COMP. DATE         10/29/19         SURFA           ft         Image: Complement of the second of the	MENT       -Y2FLYCA-       0 HR.       N/A         NG       1,661,291       24 HR.       2.8         ring       HAMMER TYPE       Automatic         ACE WATER DEPTH       N/A         TION AND REMARKS       DEPTH (I         Coring @ 22.8 ft       22.8         STALLINE ROCK       22.         hite-Gray BIOTITE GNEISS, with minor       22.         Close to Wide Fracture Spacing       24.
S.3 ft         NORTHING         841,522         EASTI           5/2019         DRILL METHOD         SPT Core Bo           29/19         COMP. DATE         10/29/19         SURFA           ft         Image: Complex constraints         SURFA           K         Image: Complex constraints         DESCRIPT           (ft)         (ft)         G         ELEV. (ft)           97%         92%         791.9         Fresh, Very Hard, Black-W           AMPHIBOLITE, with         Image: Complex constraints         CRY	NG     1,661,291     24 HR.     2.8       ring     HAMMER TYPE     Automatic       ACE WATER DEPTH     N/A         TION AND REMARKS         DEPTH (0)         Coring @ 22.8 ft         STALLINE ROCK       Pilose to Wide Fracture Spacing
S/2019         DRILL METHOD         SPT Core Bo           29/19         COMP. DATE         10/29/19         SURFA           ft	TION AND REMARKS  Coring @ 22.8 ft  STALLINE ROCK  Close to Wide Fracture Spacing  Description
29/19 COMP. DATE 10/29/19 SURFA ft STRATA L O G ELEV. (ft) G ELEV. (ft) Begin ( CRY 97% 92% Fresh, Very Hard, Black-W AMPHIBOLITE, with	TION AND REMARKS DEPTH ( Coring @ 22.8 ft STALLINE ROCK Nite-Gray BIOTITE GNEISS, with minor I Close to Wide Fracture Spacing
ft <u>STRATA</u> <u>REC.</u> RQD (ft) (ft) % % G <u>ELEV. (ft)</u> <u>Begin (</u> (21.9) (20.8) 97% 92% Fresh, Very Hard, Black-W AMPHIBOLITE, with	TION AND REMARKS DEPTH ( Coring @ 22.8 ft STALLINE ROCK 22. hite-Gray BIOTITE GNEISS, with minor I Close to Wide Fracture Spacing
STRATA REC.         RQD 0 (ft)         L 0 G         DESCRIPT           %         G         ELEV. (ft)         DESCRIPT           %         %         G         ELEV. (ft)           (21.9)         (20.8)         -         791.9           97%         92%         -         Fresh, Very Hard, Black-W AMPHIBOLITE, with	DEPTH ( Coring @ 22.8 ft STALINE ROCK 22. hite-Gray BIOTITE GNEISS, with minor I Close to Wide Fracture Spacing
(ft)         (ft)         G         ELEV. (ft)           %         %         G         ELEV. (ft)           (21.9)         (20.8)         791.9         CRY           97%         92%         Fresh, Very Hard, Black-W           AMPHIBOLITE, with         AMPHIBOLITE, with	DEPTH ( Coring @ 22.8 ft STALINE ROCK 22. hite-Gray BIOTITE GNEISS, with minor I Close to Wide Fracture Spacing
(21.9) (20.8) 791.9 CRY 97% 92% Fresh, Very Hard, Black-W AMPHIBOLITE, with	STALLINE ROCK 22. hite-Gray BIOTITE GNEISS, with minor Close to Wide Fracture Spacing
97% 92% Fresh, Very Hard, Black-W AMPHIBOLITE, with	hite-Gray BIOTITE GNEISS, with minor Close to Wide Fracture Spacing
REC = 97%,	RQD = 92%, GSI = 75 - 80
769.4	45.
Boring Terminated at Elevat	ion 769.4 ft In Crystalline Rock (BIOTITE GNEISS)
	Notes:
1) Auge	er Probe to 18.5 Feet
<u>E</u>	



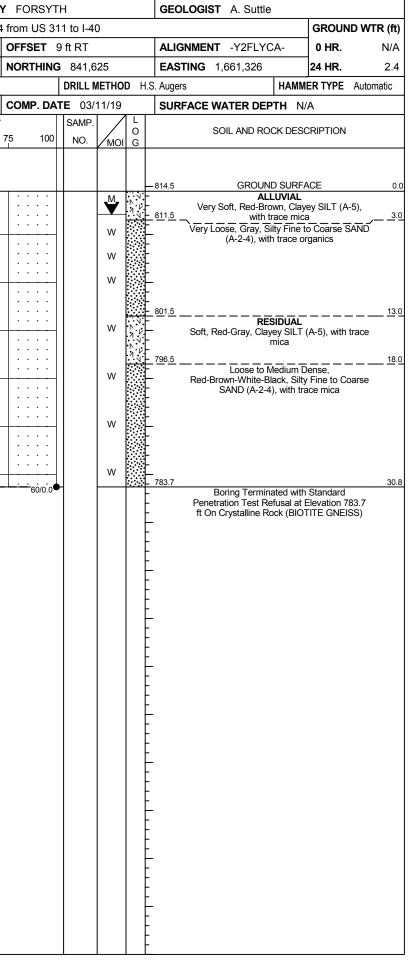
# Bridge No. 729 on –Y2FLYCA– over Future I-74 from US 311 to I-40 WBS: 34839.1.7 Tip No.: U-2579AA Rock Core Photographs: Boring: B1-C Station: 39+70 Offset: CL







WBS	21000	4 -			•																			
						<b>P</b> U-2579			FORSYT				GEC	LOGIST A. Suttle	T		<b>3</b> 4839					P U-2579/		COUNTY
				ge No				uture I-74	from US 3		0				GROUND WTR (ft)					ge No		on -Y2FLYC		uture I-74
BORI	NG NO.	B2-A			S	TATION 4	40+82		OFFSET	12 ft LT			ALIC	NMENT -Y2FLYCA-	0 HR. N/A	BOF	Ring No.	B2-E	3			ATION 40		
COLL	AR ELE	<b>V.</b> 81	4.8 ft		т	OTAL DEP	<b>PTH</b> 30.0 f	t	NORTHING	<b>3</b> 841,6	633		EAS	<b>TING</b> 1,661,307	<b>24 HR.</b> 3.6	COL	LAR ELI	<b>EV.</b> 8	14.5 ft		ТС	DTAL DEPT	H 30.8 ft	
DRILL	RIG/HAN	IMER E	FF./DA	TE M	&W029	Diedrich D-1	120 89% 09/0	)7/2018		DRILL N	METHO	DD H	I.S. Auge	s HAMM	IER TYPE Automatic	DRIL	L RIG/HA	MMER E	FF./DA	TE M&	W029 [	Diedrich D-12	0 89% 09/0	7/2018
DRILL	ER G	Akins			S	TART DAT	<b>FE</b> 03/11/1	9	COMP. DA	<b>TE</b> 03/	11/19	)	SUR	FACE WATER DEPTH N	/A	DRI	L <b>LER</b> G	i. Akins	6		ST	ART DATE	03/11/19	9
	DRIVE ELEV	DEPTH	BLC	W COL	JNT		BLOWS	PER FOOT		SAMP.	▼⁄	L		SOIL AND ROCK DES	CRIPTION	ELEV	, DRIVE ELEV	DEPTH	· — —	w col			BLOWS F	PER FOOT
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50	75 100	NO.	Имо	) G	ELEV.		DEPTH (ft)	(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0 2	5 5	50 7
815	0110												814.8	GROUND SURF	ACE 0.0	815	014 5							
	814.8	- 0.0	WOH	1	3	<b>•</b> 4 : : :					м	× ×	F	ALLUVIAL Soft, Red-Brown, Clayey S	ILT (A-5), with		814.5		WOH	WOH	2	•2 : : :		
	811.3	3.5		MOLL	MOL	/						- - -	<u>811.8</u>	trace mica			811.0	3.5						
810	808.8	- 6.0	WOH	WOH	WOH	•0					W		809.3	Very Soft, Red-Gray, Fine to SILT (A-4), with trace orga	nics and mica5.5	810		╞	WOH	1	1	<b>4</b> 2		
	+	-	WOH	2	0	$\mathbf{b}_2$					w		806.8	Very Loose, Gray, Silty Fine t (A-2-4), with trace organi	to Coarse SAND ics and mica 8.0		808.5	<u>    6.0    </u>	WOH	1	3			
805	806.3	8.5	WOH	1	1		·   · · · · ·				w l			Very Soft, Gray, Fine to Coa	arse Sandy SILT	805	806.0	8.5	WOH	WOH	WOH			
000	+	-											F	(A-4), with trace organic	s and mica	000	1 -	ŧ		won		••••••		
	801.3	-				     <b> </b> . <u>.</u> .	·   · · · · ·						<u>801.8</u>					÷					· · · ·	
800		- 13.5	7	9	6	<b> </b> . <b>1</b> 5	 5				w		L	RESIDUAL Medium Dense, Red-Gray	/. Silty Fine to	800	801.0	13.5	1	3	0	1		
	+	-				/							Ł	Coarse SAND (A-2-4), with	th trace mica		-	Ł				T		
	796.3	- 18.5				· /· · ·							<u>796.8</u>	Medium Stiff, Black-Brown,	<u>18.0</u>		796.0	[ 18.5						
795	-	-	4	3	3		· · · · · ·				W		F	Sandy SILT (A-4), with tra	ace mica and	795		- 10.0	3	1	3	<b>4</b>		
	+	-												gravel-sized rock fra	0		-	ŧ					· · · · ·	
700	791.3	23.5	31	42	39		.   .				w		7 <u>91.8</u>	Very Dense, Black-White-Bro		700	791.0	23.5			_	<u>j</u> ::::	· · · · ·	
790	+	-		-12	00			<u> </u>	81 				F	Coarse SAND (A	-2-4)	790	1 -	ŧ		3	4	•7		
	+								4 · · ·				Ł				-	Ł						
785	786.3	28.5	10	12	88/0.4	1 1						411	785.8 784.8	WEATHERED RO	29.0 OCK 30.0	785	786.0	28.5	7	11	16			
		- 50.0	60/0.0						100/0.9 60/0.0	4		- 1/1-2	-	Black-White-Brown (BIOT	ITE GNEISS)		783.7 -	30.8	60/0.0				····	<u> </u>
	+	-											F	Boring Terminated with Penetration Test Refusal at	Elevation 784.8			Ŧ	00/0.0					
	-	-											F	ft On Crystalline Rock (BIO	TITE GNEISS)			ŧ						
	‡	-											F				-	ŧ						
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# GEOTECHNICAL BORING REPORT

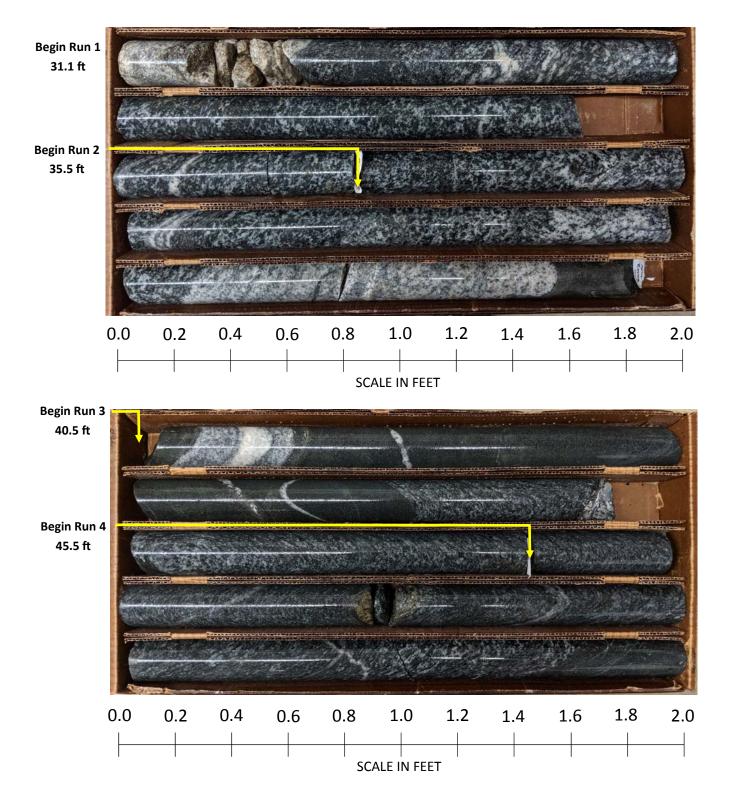
								,	B	ORE L	OG			1													С	(
WBS	348	339.1.7				TIP	• U-2579A	A	COUNT	Y FORSYT	Ή			GEOLOGIST A. Su	le			WBS	3483	9.1.7			TIP	U-257	79AA	С	OUNT	Y
				ridge N	lo. 72				uture I-74	1		0		1			VTR (ft)					dge No. 7	-			er Futu	ire I-74	4
BOR	ING N	<b>IO.</b> B2-	2				ATION 40			OFFSET				ALIGNMENT -Y2FL	YCA-	0 HR.	N/A	BOF	ING NO	. B2-C	;				40+85			ļ
COLI	LAR	ELEV. 8	13.8	ft		ТО	TAL DEPT	H 53.7 ft		NORTHING				EASTING 1,661,31	·	24 HR.	2.0	COL	LAR EL	<b>EV.</b> 81	13.8 ft		ТОТ	AL DE	<b>PTH</b> 53	.7 ft		
DRILL	RIG/	HAMMER	EFF./C	DATE	HPC2	473 (	CME-550 85%	% 02/06/201	9					PT Core Boring	HAM	MER TYPE Au	omatic	DRIL	L RIG/HA	MMER E	FF./DA	TE HPC	2473 CM	ME-550	85% 02/06	/2019		т
DRIL							ART DATE			COMP. DA	1			SURFACE WATER D	EPTH N	N/A		DRII	<b>.LER</b> J	. Cain			STA	rt da	<b>TE</b> 10/2	29/19		ļ
ELEV (ft)	ELE		' <b> </b>		_	_	0 2	BLOWS F			SAMP.	17	0	SOIL AND	OCK DE	SCRIPTION		COF		NQ-2					N 22.61			ļ
(11)	(ft)	) (11)	0.5	π 0.51	t 0.:	л	0 2	5 5	50	75 100	NO.		I G	ELEV. (ft)			DEPTH (ft)	ELEV (ft)		DEPTH (ft)	RUN (ft)	DRILL RATE	REC.	UN RQD (ft)	SAMP. NO.	REC. (ft)	RATA RQD (ft)	
																			(ft)	(11)	(11)	(Min/ft)	%	%		%	<u>%</u>	ł
815		<u> </u>													JND SURF	FACE	0.0	782.7	782.7	31.1	4.4	N=60/0.0	(4.4)	(3.8)		(2.0)	(1.5) 75%	Ī
		ţ											х л Л Л		ALLUVIAL Clayey SIL			780		‡		N=60/0.0 1:38/1.0 1:22/1.0 1:10/1.0	100%	86%		100%	75%	
810		1											7	810.8Gray, Fine to			<u>3.0</u>		778.3	+ 35.5 +	5.0	1:06/1.0	(50)	(4.9)		100%	(5.6) 97%	
		ŧ						· · · ·						-		,		775		‡		1:16/1.0 1:21/1.0 1:33/1.0 1:17/1.0		98%				
005		ţ						· · · ·						-				115	773.3	+ 40.5		1:17/1.0				(12.8)	(12.7) 98%	1
805	-	$\pm$												-						+	5.0	2:18/1.0 2:04/1.0	(5.0)	(5.0) 100%		99%	98%	
		‡						· · · ·						-				770	-	‡		2:03/1.0 2:00/1.0						No.
800	-	+													RESIDUAL		<u> 13.0</u>		768.3	+ 45.5 +	5.0	2:00/1.0		(4.8)				
		ŧ						· · · ·						- Very Dense, Gray - Fine to C	-Brown-Or barse SAN	range-White, Silt ID (A-2-4)	y	765		‡		1:52/1.0 2:03/1.0	98%	96%				
705		ţ					· · · · ·	· · · ·						-		· · ·		100	763.3	+ 50.5		1:31/1.0 1:47/1.0						
795		÷												_						+	3.2	2:01/1.0 2:07/1.0	(3.2)	(3.2) 100%		(1.9)	(1.0)	
		ţ					· · · · ·	· · · ·						-					760.1	53.7		4:12/1.0				100%	(1.9) 100%	ŀ
790	-	+												-						‡								
		DESCRIPTION         Bridge No. 729 on -Y2           NG NO.         B2-C         STATIC           AR ELEV.         813.8 ft         TOTAL           RIG/HAMMER EFF/DATE         HPC2473         CME           LER         J. Cain         START           DRIVE (ft)         DEPTH (ft)         BLOW COUNT         0           OR         DEPTH (ft)         BLOW COUNT         0           A         A         A         A           A         A         A         A           A         A         A         A           BLOW COUNT (ft)         BLOW COUNT         C         A           A         A         A         A         A           BLOW COUNT         A         A         A         A           A         A         A         A         A           A         A         A         A         A           BLOW COUNT         BLOW COUNT         A         A         A           A         A         A         A         A           B         A         A         A         A           B         A         A         A         A <t< td=""><td></td><td>· · · ·</td><td></td><td></td><td></td><td></td><td></td><td>-</td><td></td><td></td><td></td><td></td><td></td><td>‡</td><td></td><td></td><td></td><td></td><td></td><td></td><td>   </td><td></td></t<>					· · · ·						-						‡									
705	705					· · · · ·	· · · ·						-					-	ŧ									
785	/85	PESCRIPTION       Bridge No. 729 on -Y2FL         IG NO.       B2-C       STATION         AR ELEV.       813.8 ft       TOTAL DE         RG/HAMMER EFF./DATE       HPC2473       CME-550         ER       J. Cain       START DA         DEPTH       BLOW COUNT       0         Cf(ft)       DEPTH       BLOW COUNT       0         Cf(ft)       DEPTH       BLOW COUNT       0         AR       Image Reserves       Image Reserves       Image Reserves         AR       Image Reserves       Image Reserves       Image Reserves         DEPTH       BLOW COUNT       0       Image Reserves       Image Reserves         DEPTH       BLOW COUNT       0       Image Reserves       Image Reserves         Image Reserves       Image Reserves       Image Reserves       Image Reserves       Image Reserves         Image Reserves       Image Reserves       Image Reserves       Image Reserves       Image Reserves         Image Reserves       Image Reserves       Image Reserves       Image Reserves       Image Reserves         Image Reserves       Image Reserves       Image Reserves       Image Reserves       Image Reserves         Image Reserves       Image Reserves       Im						70		м		-						‡										
	782	ESCRIPTION       Bridge No. 729 on -Y2         3 NO.       B2-C       STATIC         R ELEV.       813.8 ft       TOTAL         Ig/HAMMER EFF./DATE       HPC2473 CME-         R J. Cain       START         RIVE (ft)       DEPTH (ft)       BLOW COUNT 0.5ft       0.5ft         Image: Comparison of the strength of the strengt of the strength of the strength of the strength of th				· · · ·	<b> </b> 	. — <u> </u>				<u>782.7</u> - CRYS	TALLINE I	ROCK	31.1		-	‡										
780		1														n-Black-White oderately Close	33.1			ŧ								
		ŧ						· · · ·							cture Space					‡								
		ł														6, GSI = 55 - 60	]		-	ŧ								
775		÷								+				AMPHIBOLITE,		ack-White Fracture Spacing	38.9			‡								
		ł						· · · ·		1				REC = 100%, F	.QD = 96%	6, GSI = 80 - 85			-	‡								
770		1												– Fresh, Very Ha GNEISS, with	rd, Black-V	White BIOTITE to Moderately	-			‡								
		ŧ													Fracture S					‡								
		ŧ												- REC = 99%, R	2D = 98%	, GSI = 80 - 85			-	‡								
765	-	$\pm$												_				19		‡								
		ŧ												762.0			51.8	11/5/19	-	‡								
		<u>+</u>			$\perp$			• • • •			_		S.		CK, with Mo	oderately Close	53.7	GDT		‡								
		ŧ												- Fra	cture Space	cing		DOT.0		‡								
		ŧ												- REC = 100%, R		%, GSI = 85 - 90 ation 760.1 ft In	] [	2 Z	-	‡								
		$\pm$														NITIC ROCK)		GPJ		‡								
		ł												-	Notes:	00 5 5 +			-	‡								
		Ŧ												1) Auge	Probe to 2	28.5 Feet		IDGE		ŧ								
		Ŧ												-				A-BR		ŧ								
		Ŧ												-				U-2579AA-BRIDGE 729	-	‡								
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		Ŧ												-				DOUBLE	_	Ŧ								
		ŧ												-				DO	-	£								
		Ŧ												-				CORE		Ŧ								
		‡												-				NCDOT	-	Ŧ								l
		<u>†</u>												_				NCE		1								1

# **GEOTECHNICAL BORING REPORT**

	-							
4			Y FORSY		GEOLOGIST A. Suttle		00010	
	er Futu	re I-74	from US 3		ALIGNMENT -Y2FLY0	<b>`</b> ^	1	
-85	.7 ft			G 841,633	EASTING 1,661,319	,A-	0 HR. 24 HR.	N/A 2.0
02/06	-		NORTHIN	DRILL METHOD S		НАММ		Automatic
	29/19		COMP. DA	TE 10/29/19	SURFACE WATER DEP			, latomatio
22.6 f	ft							
MP. IO.	STR REC. (ft) %	ATA RQD (ft) %	L O G ELEV.		DESCRIPTION AND REMARK	S		DEPTH (1
		(	-		Begin Coring @ 31.1 ft			
	(2.0) 100% (5.8) 100% (12.8)	(1.5) 75% (5.6) 97% (12.7)	782.7 780.7 780.7 780.7 780.7 780.7 780.7	Fresh, Very Hard, B	CRYSTALLINE ROCK Brown-Black-White BIOTITE G Close Fracture Spacing C = 100%, RQD = 75%, GSI = lack-White AMPHIBOLITE, with C = 100%, RQD = 96%, GSI = J, Black-White BIOTITE GNEIS	55 - 60 Wide Fr 80 - 85	acture Spa	acing
	99%	98%		· · ·	a, Black-White BIOTTLE GNEIS Moderately Close Fracture Spa EC = 99%, RQD = 98%, GSI = 8	cing	ery Close f	
	(1.9) 100%	(1.9) 100%	762.0	Fresh, Very Hard, I	Black-White-Brown GRANITIC I Close Fracture Spacing	ROCK, w	ith Modera	51. tely 53.
				REI Boring Terminate	C = 100%, RQD = 100%, GSI = d at Elevation 760.1 ft In Crysta ROCK) Notes:	85 - 90 Iline Rocl	(GRANIT	TIC
					1) Auger Probe to 28.5 Fee	ı		



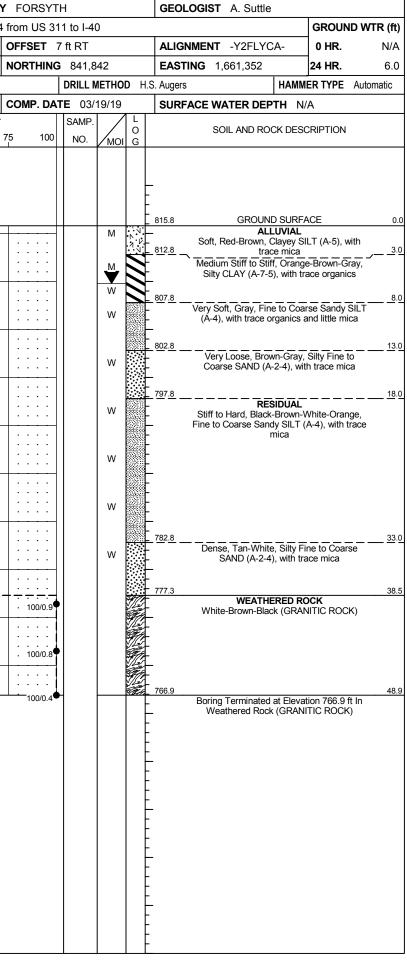
# Bridge No. 729 on –Y2FLYCA– over Future I-74 from US 311 to I-40 WBS: 34839.1.7 Tip No.: U-2579AA Rock Core Photographs: Boring: B2-C Station: 40+85 Offset: CL



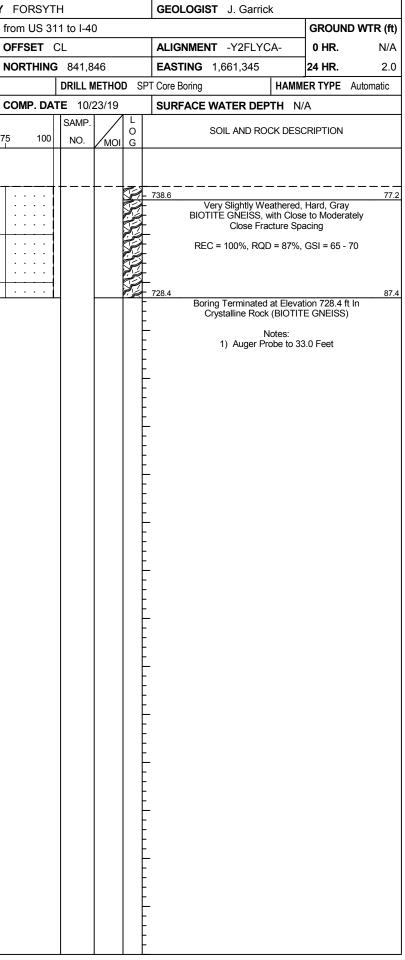
Begin Run 5 50.5 ft	Manager P					-D-12-
					AL.	A
	TONOTON					83
	0.0	0.2	0.4	0.6	0.8	<u>17 (7 4</u>
					SC	ALE



									DURE							· —									
	34839					<b>P</b> U-257			TY FORS				GEOL	OGIST A. Suttle	1		<b>3</b> 4839					P U-2579		COUNT	
SITE	DESCR		l Brid	ge No	. 729	on -Y2FL`	YCA- over	Future I-	74 from US	311 to I-4	10				GROUND WTR (ft)	SITE	DESCR		N Brid	lge No	. 729 (	on -Y2FLY	'CA- over	Future I-74	1 f
BORI	NG NO.	B3-A	L.		S	TATION	42+91		OFFSET	15 ft LT			ALIGN	MENT -Y2FLYCA-	0 HR. N/A	BOR	RING NO.	B3-E	3		S	TATION 4	42+96		c
COLL	AR ELI	<b>EV.</b> 81	5.9 ft		т	OTAL DE	PTH 34.	5 ft	NORTH	<b>NG</b> 841,	838		EASTI	<b>NG</b> 1,661,330	<b>24 HR.</b> 1.3	COL	LAR ELE	<b>EV.</b> 8 <sup>-</sup>	15.8 ft		т	OTAL DEP	<b>TH</b> 48.9	ft	N
DRILL	RIG/HA	MMER E	FF./DA	TE M	&W029	Diedrich D-	120 89% 0	9/07/2018	- 1	DRILL	METHO	DD H	I.S. Augers	HAMN	IER TYPE Automatic	DRIL	L RIG/HAI	MMER E	FF./DA	TE M	&W029	Diedrich D-1	20 89% 09	/07/2018	
DRIL	LER G	i. Akins			S	TART DA	TE 03/19	)/19	COMP.	<b>DATE</b> 03	/19/19	)	SURF	CE WATER DEPTH N	/A	DRIL	<b>LER</b> G	i. Akins	3		S	TART DAT	E 03/19/	/19	С
ELEV	DRIVE	DEPTH	BLC	W CO	UNT		BLOW	S PER FOO	)T	SAMP	. 💙/	L				ELEV	DRIVE	DEPTH	BLC	OW CO	JNT		BLOWS	PER FOOT	
(ft)	ELEV (ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50	75 1	00 NO.	мо	O I G	ELEV. (ft)	SOIL AND ROCK DES	DEPTH (ft)	(ft)	ELEV (ft)	(ft)		0.5ft	0.5ft	0	25	50	75
820		L														820		L							
	-	Ł											L				-	Ł							
	815.9												815.9	GROUND SURF	ACE 0.0		- 815.8 -								
815	-		WOH	2	2	4							_	ALLUVIAL Soft, Red-Brown, Clayey S	ILT (A-5), with	815			WOH	2	2	<b>4</b>			Ŧ
	812.4	3.5		WOH						.	M		<u>812.9</u>	trace mica Soft to Stiff, Orange-Brown-0			812.3	3.5							
810	809.9	E 6.0	WOH	WOH	3	• · · · · ·					W		F	(A-7-5), with trace	mica	810	809.8	6.0	WOH	2	5	7			
	-	+	3	4	6	· • 10					w		F				-	+	WOH	2	7	· • • •			T
	807.4	<u>F 8.5</u>	wон	2	2					•	w		F				807.3	8.5	WOH	WOH	1				
805	-	F					·   · · ·	· · · ·	· · · · ·				F			805	-	F							+
	802.4	13.5					· · · · ·			.			802.9	Very Soft, Gray, Fine to Coa	<u>13.0</u>		802.3	135						·   · · · · ·	
800	-	+	WOH	WOH	WOH	<b>∮</b> 0	· · · · ·	· · · · ·	· · · · · · · ·		W		-	(A-4), with little r	nica	800		-	WOH	WOH	WOH	<b>  ●</b> 0		.   .	
000	-	÷								-					10.0		-	÷							+
	797.4	18.5	3	6	11		· · · · ·	· · · · ·	· · · ·		w		7 <u>97.9</u>	RESIDUAL	<u>18.0</u>		797.3	18.5	4	4	6		•••	.   .	
795	-	ŧ				· · · •	11/	· · · ·	· · · ·	·			-	Medium Dense to Ver Tan-Orange-White, Silty F	ine to Coarse	795		ŧ			-	. • 10 .		· · · · ·	$\downarrow$
	792.4	- 23.5					:   :		· · · ·				-	SAND (A-2-4), with tr	ace mica		792.3	23.5				: : iX		.   .	
	-132.4	20.0	24	25	35		· · · · ·		· · · · ·		w		L				- 192.5	23.5	6	12	12		24	.   .	.
790	-	ŧ											-			790		ł							+
	787.4	28.5	21	9	15			·   · · ·	· · · ·				L				787.3	28.5	14	22	24			.	
785	-	Ł	21	5	15		. •24				W		_			785	-	Ł	14		24		?	<b>4</b> 6	
		F													00.5		-	F							
	782.4 781.5	7 <u>33.5</u> 7 <u>34.4</u>					·		- + - 100/0	j.2		977	- 782.4 - 781.5	WEATHERED R			782.3	33.5	8	29	19				
	-	ŧ	60/0.1						60/0	0.10			- 781.4	Tan-Orange-White (GRA CRYSTALLINE R		780	-	ŧ						·•••••••••••••••••••••••••••••••••••••	+
	-	Ŧ											ĘΙ	Tan-Orange-White (GRA Boring Terminated with	NITIC ROCK)		777.3	38.5							
	-	ŧ											-	Penetration Test Refusal at	Elevation 781.4	775	-	ŧ	36	64/0.4				·   · · · · ·	
	-	ŧ											-	ft In Crystalline Rock (GRA	NITIC ROCK)		-	ŧ							
	-	ŧ											Ę				772.3	43.5	12	88/0.3					
	-	+											-			770		+							+
	-	ŧ											-				767 3	485							
	-	ŧ											F				107.5	40.0	100/0.4	1				.	
																		48.5	100/0.4						_



												<u>.0G</u>																	
WBS	34839	9.1.7			ТІ	P U-257	79AA		COUN	TY F	ORSY	ТН			GEOLOG	IST J. Garrick			WBS	<b>3</b> 483	9.1.7			TI	<b>P</b> U-257	79AA	C	COUNTY	ſ
SITE	DESCR	RIPTION	<b>I</b> Bri	dge No	. 729 (	on -Y2FL	YCA-	over F	uture I-	74 fro	m US 3	11 to I-4	40				GROUND	WTR (ft)	SITE	DESC	RIPTIO	N Brid	dge No	o. 729 (	on -Y2FL	YCA- ove	er Futu	ure I-74	fro
BOR	ING NO	. ВЗ-С	>		S	ATION	43+0	0		OF	FSET	CL			ALIGNME	NT -Y2FLYCA-	0 HR.	N/A	BOR	ING NC	<b>).</b> B3-0	2		S	TATION	43+00			OF
COLI	LAR EL	<b>EV.</b> 81	15.8 ft		т	DTAL DE	PTH	87.4 fi	t	NO	RTHIN	<b>G</b> 841,	846		EASTING	1,661,345	24 HR.	2.0	COL	LAR EL	<b>.EV.</b> 8	15.8 ft		Т	OTAL DE	<b>PTH</b> 87	.4 ft		NC
DRILL	RIG/HA	MMER E	FF./DA	ATE HF	PC2473	CME-550	85% 0	2/06/201	9			DRILL	METHO	DD S	PT Core Boring	HAM	MER TYPE A	utomatic	DRIL	L RIG/HA	MMER	EFF./DA	ATE H	PC2473	CME-550	85% 02/06	/2019		
DRIL	<b>LER</b> J	. Cain			S	ART DA	<b>TE</b> 1	0/23/1	9	co	MP. DA	<b>TE</b> 10	/23/19		SURFACE	E WATER DEPTH	I/A		DRIL	LER				S	TART DA	<b>TE</b> 10/2	23/19		СС
ELEV	DRIVE ELEV	DEPTH	' <b> </b>	ow col					PER FOO			SAMP	. <b>V</b> /			SOIL AND ROCK DES	SCRIPTION		ELEV	DRIVE ELEV	DEPTH	·——	ow co	1				R FOOT	
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	Ę	50	75	100	NO.	Имо	I G	ELEV. (ft)			DEPTH (ft)	(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50		75
820		ł													_				740	+	+		+	-		N	latch L	Line	Τ-
		Ŧ													-						Ŧ							· · · · · · · · · · · · · · · · · · ·	
815		Ŧ							1						815.8	GROUND SURI		0.0	735		Ŧ								
		Ŧ										1		-	_ В	rown, Fine to Coarse Sa		)		-	Ŧ								
		Ŧ									· · · · · · ·				-						Ŧ						.		
810	-	Ŧ					· [				· · · ·	-			-				730		Ŧ							· · · · ·	+
		Ŧ					.   ï.								808.3	Gray-Brown, Silty CL	AY (A-7-5)	7.5			+						<u> </u>	<u></u>	_
805		Ŧ					·   r ·   r	· · · ·			· · · · · ·				-						Ŧ								
		Ŧ					.   ¦					]			-						Ŧ								
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800	-	Ŧ					-   r					-			_						Ŧ								
		Ŧ					:   ľ				· · · · · · ·				797.8			<u> </u>			Ŧ								
795		Ŧ					·   [.								– M	edium Dense, Gray-Bro Coarse SAND (A-2-4)	wn, Silty Fine t	D			Ŧ								
	-	Ŧ					·					]			-	gravel-sized rock fr					Ŧ								
		Ŧ									· · · · · · ·				-						Ŧ								
790	-	Ŧ										-									Ŧ								
		Ŧ									· · · · · · ·				-						Ŧ								
785		Ŧ					:   ľ								-						Ŧ								
		Ŧ					·  .								-						Ŧ								
	782.3	<u>† 33.5</u> 1	8	12	17		·   .						w		-						Ŧ								
780	-	ł				· · · ·	-     .    .		<u> </u>			-									Ŧ								
	777.3	38.5	25	62	38/0.4	· · ·	·   ŀ	· · ·			· · ·				776.8			39.0			Ŧ								
775		ł	25	02	30/0.4				· · ·	•	100/0.9	•			-	WEATHERED F Gray-Brown (GRANI	ROCK TIC ROCK)				1								
		+						· · ·	 		· · ·				-		,				ŧ								
	772.3	43.5	100/0.	2				· · ·	 		100/0.2	•			-						Ŧ								
770	-	ŧ							<u> </u>			1			-						ŧ								
	767.3	48.5	28	43	38	· · · ·		· · ·			r <del>: : :</del> :-			977	767.8	RESIDUAL		<u>48.0</u>			‡								
765	-	‡	20	10	00		·   ·			•	81		M		- '	Very Dense, Gray-Brown Coarse SAND (/	n, Silty Fine to A-2-4)				<u>+</u>								
	760.0	- 53.5				· · · ·		· · · · · ·			· · ·				- 762.3		,	53.5			ŧ								
760	102.5		48	52/0.1		· · · ·		· · ·			100/0.6	•				WEATHERED F Gray-Brown (GRANI		00.0			‡								
760	-	ŧ					: :		<u></u>			i			-	Clay-blown (Cloud				-	ŧ								
	757.3	58.5	100/0.	a		· · · ·		· · ·			 100/0.3	•			-						‡								
755	-	ŧ.		Ĭ			• •		· · ·	• •					-						‡								
	750.0	- - 63.5				· · · ·		· · · · · ·			· · · · · ·				-						ŧ								
750	102.0	+ 0.5.5	100/0.	4		· · · ·		· · · · · ·		·   ·	100/0.4	•			-						‡			1					
750	748.5	+ 67 3					:   :								- 748.5			67.3			‡			1					
	0.0	+	60/0.1			· · · ·		· · ·	 		· 60/0.1	<b>T</b>		P	- 748.4	CRYSTALLINE Gray-Brown (GRANI	ROCK	67.3			‡			1					
745	- -	‡					·   ·			•   •						lightly to Very Slightly W	eathered, Harc	,		.	‡			1					
745		‡				· · · ·		· · · · · ·			· · · · · ·			R	_ Gra -	ay GRANITIC ROCK, with Spacing	n Ciose Fractu	IE			‡			1					
740	· ·	‡				· · · ·	:   :	· · ·	 		· · ·				- -	REC = 96%, RQD = 62%	, GSI = 45 - 50	1			‡			1					
740		L		1					<u> </u>					بجفت						I		1							



# COUNT WBS 34839.1.7 **TIP** U-2579AA SITE DESCRIPTION Bridge No. 729 on -Y2FLYCA- over Future I-7 BORING NO. B3-C **STATION** 43+00 **COLLAR ELEV.** 815.8 ft TOTAL DEPTH 87.4 ft DRILL RIG/HAMMER EFF./DATE HPC2473 CME-550 85% 02/06/2019 **START DATE** 10/23/19 DRILLER J. Cain CORE SIZE NQ-2 TOTAL RUN 20.0 ft RUN ELEV (ft) RUN REC. RQD (ft) (ft) % % DRILL RATE (Min/ft) STRATA REC. RQD (ft) (ft) % % DEPTH RUN (ft) (ft) Samp. No. 3.0 0:46/1.0 (2.6) 1:34/1.0 87% 17% 2:04/1.0 (3.0) (2.3) 1:50/1.0 100% 77% 3.0 1:20/1.0 (3.0) (2.3) 1:50/1.0 100% 77% 5.0 2:07/1.0 (5.0) (4.4) 1:52/1.0 100% 88% 2:13/1.0 1:41/1.0 5.0 1:51/1.0 2:08/1.0 2:38/1.0 100% 100% 2:32/1.0 2:33/1.0 4.0 2:33/1.0 100% 4.0 2:33/1.0 (4.0) (2.8) 3:53/1.0 3:29/1.0 3:29/1.0 100% 10% 10% 748.4 - 67.4 (9.4) (6.1) 96% 62% 745.4 - 70.4 742.4 - 73.4 (10.2) (8.9) 100% 87% 737.4 - 78.4 732.4 - 83.4 728.4 - 87.4

ELEV (ft)

748.4

745

740

735

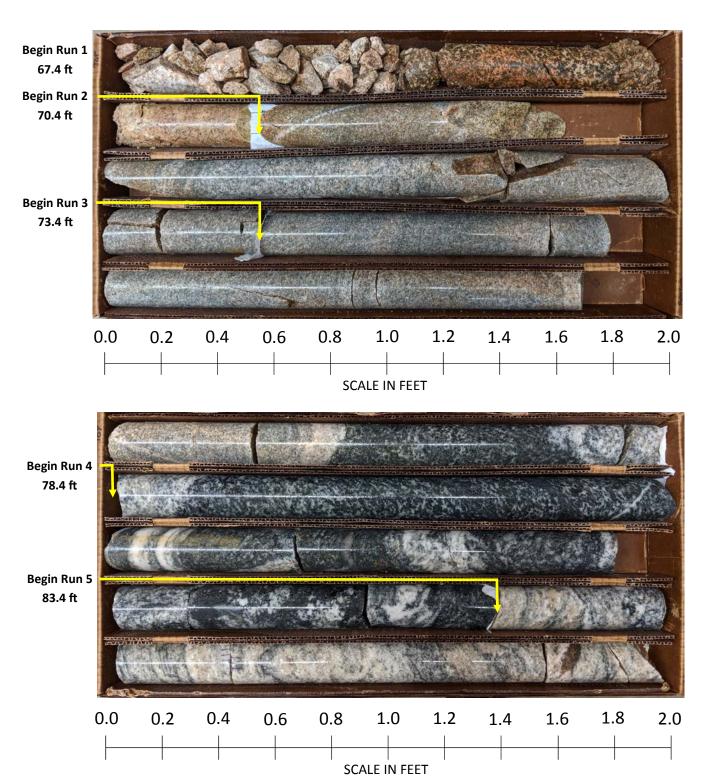
730

### **GEOTECHNICAL BORING REPORT CORE LOG**

ITY FORSYTH GEOLOGIST J. Garrier 74 from US 311 to I-40 OFFSET CL ALIGNMENT -Y2FLY0 NORTHING 841,846 EASTING 1,661,345 DRILL METHOD SPT Core Boring	GROUND WTR (ft)
OFFSET         CL         ALIGNMENT         -Y2FLY0           NORTHING         841,846         EASTING         1,661,345	CA- 0 HR. N/A
OFFSET         CL         ALIGNMENT         -Y2FLY0           NORTHING         841,846         EASTING         1,661,345	CA- 0 HR. N/A
NORTHING         841,846         EASTING         1,661,345	
	24 HR. 2.0
DRILL METHOD SPT Core Boring	
BRILL METTOD OF FORE Doing	HAMMER TYPE Automatic
COMP. DATE 10/23/19 SURFACE WATER DE	PTH N/A
D DESCRIPTION AND REMARK	κs
G ELEV. (ft)	DEPTH (ft)
Begin Coring @ 67.4 ft	
<ol> <li>T48.4 Slightly to Very Slightly Weathered, Hard, Gray (</li> </ol>	GRANITIC ROCK, with 67.4
Close Fracture Spacing	
REC = 96%, RQD = 62%, GSI =	45 - 50
738.6	77.2
Wery Slightly Weathered, Hard, Gray BIOTITE (	GNEISS, with Close to
Moderately Close Fracture Spa	acing
REC = 100%, RQD = 87%, GSI =	= 65 - 70
2 T	
5-1	
728.4 Boring Terminated at Elevation 728.4 ft In Crys	87.4 talline Rock (BIOTITE
GNEISS)	
Notes:	
1) Auger Probe to 33.0 Fee	et
-	
F	
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-	
-	
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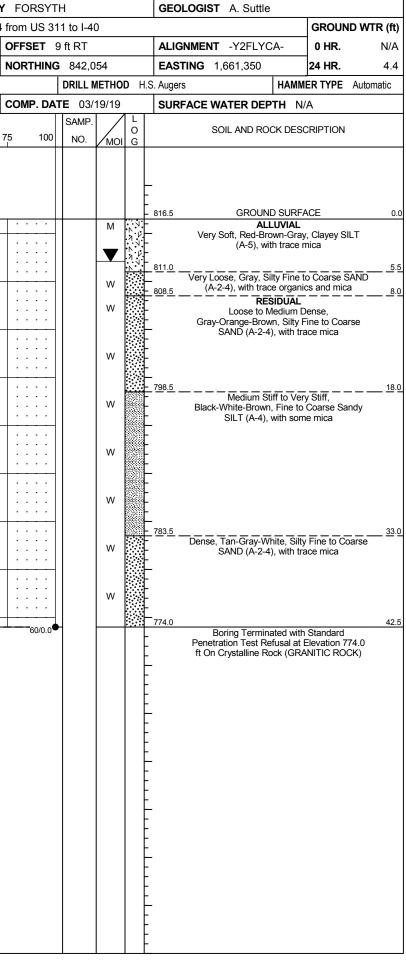


Bridge No. 729 on –Y2FLYCA– over Future I-74 from US 311 to I-40 WBS: 34839.1.7 Tip No.: U-2579AA Rock Core Photographs: Boring: B3-C Station: 43+00 Offset: CL





										URE																	_
	34839					IP U-25				FORS				0	GEOLOGIST A. Suttle	1		34839					P U-257			OUNTY	
SITE	DESCR	RIPTIO	N Brid	dge No	b. 729	on -Y2FL	YCA- ov	er Futi	ure I-74	from US	311 to I-4	10				GROUND WTR (ft)	SITE	DESCR	PTION	N Brid	ge No	o. 729 (	on -Y2FL	YCA- ove	er Futu	re I-74 f	fro
BOR	ING NO	. <u>B</u> 4- <i>A</i>	4		S	TATION	45+06			OFFSET	15 ft LT			A	LIGNMENT -Y2FLYCA-	0 HR. N/A	BOR	ing no.	B4-E	3		S	ATION	45+07		(	0
COLI	LAR EL	<b>EV.</b> 8	17.3 ft		Т	OTAL DE	PTH 4	7.4 ft		NORTHI	NG 842,0	051		E	ASTING 1,661,326	<b>24 HR.</b> 4.8	COL	LAR ELE	<b>V.</b> 8′	16.5 ft		т	DTAL DE	<b>PTH</b> 42	.5 ft	1	N
DRILL	RIG/HA	MMER E	EFF./DA	TE N	&W029	Diedrich D-	120 89%	09/07/2	2018		DRILL	METH	OD H	H.S. A	ugers HAMM	MER TYPE Automatic	DRIL	L RIG/HAM	MER E	FF./DA	TE M	1&W029	Diedrich D-	120 89%	09/07/20	018	_
DRIL	LER G	G. Akins	3		S	TART DA	<b>TE</b> 03/	19/19		COMP. D	ATE 03/	/20/19	9	s		J/A	DRIL	<b>LER</b> G	Akins	3		S	ART DA	<b>TE</b> 03/1	9/19	(	С
ELEV	DRIVE		1	ow cc					R FOOT		SAMP		/ L				ELEV	DRIVE	DEPTH	1	w co					R FOOT	
(ft)	ELEV (ft)	(ft)	·——	0.5ft		0	25	50		75 10	0 NO.	Имс	O DI G		SOIL AND ROCK DES	SCRIPTION DEPTH (ft)	(ft)	ELEV (ft)	(ft)	.—	0.5ft	_	0	25	50	7	5
								I		•		1													1		-
820																	820										
020		ŧ												F			020		-								
	817.3	1 0.0							<u> </u>					- 81					-								
815		Ŧ	WOH	WOH	2	•2						M	N N V	F	ALLUVIAL Very Soft to Soft, Red-Brov	wn, Clayey SILT	815	816.5 -	- 0.0	WOH	WOH	2	<u>ż</u>		• • •	1	Γ
	813.8	3.5		1		1							N N V	F	(A-5), with trace			0120	- 3.5				<u>}</u>				Γ
	011 2	+ + 6.0	1	1	2	<b>4</b> 3 · ·	· · · · · · ·	· ·	· · · · · · · ·					81		5.5		813.0	3.5 -	WOH	WOH	WOH		· · · · ·			
810		1 0.0	2	1	0	<b>∳</b> 1 <u> </u>						w			Very Loose, Gray, Silty Fine (A-2-4), with trace organ	to Coarse SAND hics and mica 8.0	810	810.5	6.0	1	1	2	$1 \cdot \cdot \cdot$		.		L
	808.8	8.5	1	1	0							l w			Very Soft to Medium Stiff,	, Gray, Fine to		808.0	8.5	'			<b>P</b> <sup>3</sup>		.		
		Ŧ			ľ									F	Coarse Sandy SILT (A-4),	with little mica		-	_	4	5	8					
805	-	‡					· · · ·		· · · ·		_11			F			805	4 4	-				<u> </u>		.		L
	803.8	+ 13.5 +	WOH	2	4				· · · ·			w		80		14.5		803.0	13.5			_	. /   . /				Ĺ
		t				Ē``	·   · ·								RESIDUAL Loose to Dense, Red-Tan-V				-	4	1	5	<b>•</b> 6 ·				Ĺ
800	798.8	- 18.5					$\rightarrow$			+ • • • •				-	to Coarse SAND (A-2-4), v	with trace mica	800	{ -	-								⊢
	190.0	+ 10.5	11	27	21			× •   • • • •	 			w		1				798.0	18.5	11	4	4					
795		‡					· · · · · · ·		· · · · · · · ·								705		-	''	- T		. 8	· · · · ·			
795	793.8	23.5												ł			795		-								F
		+	6	12	13	1	· •25 ·					w		-				793.0	23.5	6	9	12	\		.		
790		Ŧ												ļ			790		-								
	788.8	28.5					<u> </u>							-			100		-								F
		t	14	18	16		: : 3	4	· · · ·			W						788.0	28.5	8	10	11		21 · · ·			
785		ł															785		-					$\overline{\mathbf{x}}$	.		
	783.8	33.5	10	21	25			· \.						F				783.0	33.5								
		‡	16	21	25			· •46	· · · · ·			W						/03.0	- 33.5	18	27	13		:   : <b>: `</b>	40		
780		t						<u>: i</u>						ł			780		-					·   · · ¦			L
	778.8	- 38.5	7	18	25			.  .						-				778.0	38.5					·   · · [·			
		Ŧ	·		20			• <b>4</b> 3				w		ļ				-	-	19	12	25		· · · •			
775	-	‡					· · ·	· [·	· · · ·		_			£			775	774.0	-						.	• • •	Ļ
	773.8	+ 43.5 +	22	78/0.2	2		: : :	: <b>'</b> ÷+	<u></u>	<u>· 100/0.</u>			M	<u> </u>	3.8 WEATHERED R	43.5			42.5	60/0.0							<u> </u>
		ŧ									´				Black-White-Brown (GRA	NITIC ROCK)			-								
770	770.0	47.3	60/0.1							60/0.	1			77	0.0 9.9_/\CRYSTALLINE F	47.3 ROCK		-	_								
		Ŧ		1										F	Black-White-Brown (BIOT	FITE GNEISS)		1	-								
		‡												Ę	Boring Terminated witl Penetration Test Refusal at				-								
	-	ŧ												F	ft In Crystalline Rock (BIO				-								
		Ŧ												F				-	-								
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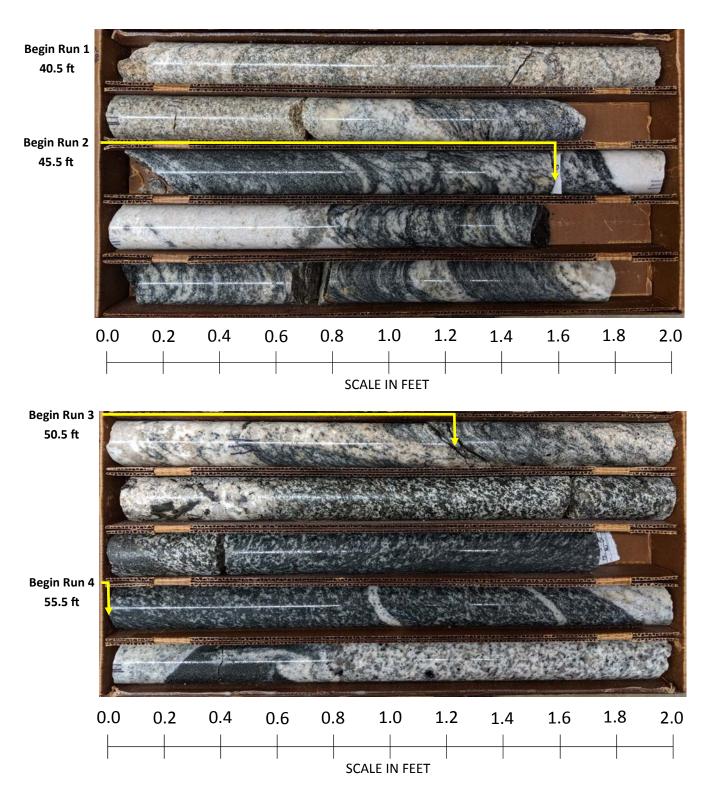
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	1	BORE LOG			1	ORE LOG	
<b>WBS</b> 34839.1.7		TY FORSYTH	GEOLOGIST A. Suttle	<b>WBS</b> 34839.1.7		Y FORSYTH	GEOLOGIST A. Suttle
SITE DESCRIPTION Bridge No.			GROUND WTR (ft)	SITE DESCRIPTION Bridge No. 7			GROUND WTR (1
BORING NO. B4-C	STATION 45+15	OFFSET CL	ALIGNMENT -Y2FLYCA- 0 HR. N/A	BORING NO. B4-C		OFFSET CL	ALIGNMENT -Y2FLYCA- 0 HR. N/
COLLAR ELEV. 816.5 ft	TOTAL DEPTH 60.5 ft	NORTHING 842,061	<b>EASTING</b> 1,661,340 <b>24 HR.</b> 3.5	COLLAR ELEV. 816.5 ft		NORTHING 842,061	EASTING 1,661,340 24 HR. 3
DRILL RIG/HAMMER EFF./DATE HPC		DRILL METHOD	SPT Core Boring HAMMER TYPE Automatic	DRILL RIG/HAMMER EFF./DATE HPC2	2473 CME-550 85% 02/06/2019	DRILL METHOD	SPT Core Boring HAMMER TYPE Automatic
DRILLER J. Cain	<b>START DATE</b> 10/22/19	COMP. DATE 10/23/19	SURFACE WATER DEPTH N/A	DRILLER J. Cain	<b>START DATE</b> 10/22/19	COMP. DATE 10/23/19	SURFACE WATER DEPTH N/A
ELEV DRIVE ELEV (ft) (ft) (ft) 0.5ft 0.5ft				CORE SIZE NQ-2	TOTAL RUN 20.0 ft		
(ft) (ft) (ft) 0.5ft 0.5ft	0.5ft 0 25 50	75 100 NO. MOI G	ELEV. (ft) DEPTH (ft)	ELEV RUN (ft) (ft) DEPTH RUN RATE (Min/ft) (Min/ft)	REC. RQD (ft) (ft) NO. (ft) (ft)		DESCRIPTION AND REMARKS
						G ELEV. (ft)	DEPTH
820			-	776 775 776.0 40.5 5.0 N=60/0.0	0 (5.0) (4.8) (3.2) (3.1)	776.0	Begin Coring @ 40.5 ft CRYSTALLINE ROCK 4
			- 816.5 GROUND SURFACE 0.0		(5.0)         (4.8)         (3.2)         (3.1)           100%         96%         100%         97%	Fresh, Hard, Black	-Brown-White GRANITIC ROCK, with Moderately Close Fracture Spacing 4
815		· · · · · ·		776         776.0         40.5         5.0         N=60/0.0           775         776.0         40.5         5.0         N=60/0.0           0:54/1.0         0:56/1.0         0:56/1.0         0:57/1.0           771.0         45.5         1:04/1.0         0:40/1.0	(7.1) (7.0)	BE	EC = 100%, RQD = 97%, GSI = 80 - 85
			Brown, Fine to Coarse Sandy SILT (A-4)		(4.9) (4.9) 98% 98%	Fresh, Very Hard	I, Black-White BIOTITE GNEISS with minor GRANITIC
		·   · · · ·					K, with Moderately Close Fracture Spacing
810			Gray, Silly Fille to Coarse SAIND (A-2-4)		(4.7) (4.3)	R 765.5 Fronk Vony Hard R	2EC = 97%, RQD = 96%, GSI = 80 - 85 3lack-White AMPHIBOLITE with minor GRANITIC ROCK,
			BOB.5	0:53/1.0	(4.7) (4.3) 94% 86% (6.0) (5.7) 97% 92%		Back-White AMPHIBOLITE with minor GRANITIC ROCK, Close to Moderately Close Fracture Spacing
805			E	761.0 55.5 0:53/1.0 765.5 0:53/1.0		R	REC = 97%, RQD = 92%, GSI = 75 - 80
		10000		760 5.0 0:57/1.0 1:03/1.0	(5.0) (5.0) 100% 100%	759.3	5
			Loose to Very Dense, White-Tan-Black-Brown, Silty Fine to Coarse	1:01/1.0 1:09/1.0		Fresh, Very Ha	ard, Pink-Brown-Black-White GRANITIC ROCK, with Moderately Close Fracture Spacing
800			SAND (A-2-4), with trace mica	756.0 60.5 1:36/1.0		756.0 RE	EC = 100%, RQD = 100%, GSI = 85 - 90
		· · · · · · · · · · · · · · · · · · ·				Boring Terminate	ed at Elevation 756.0 ft In Crystalline Rock (GRANITIC ROCK)
795		· · · · ·					Notes:
793.0 23.5		· · · · · ·   · · · · ·					1) Auger Probe to 23.5 Feet
37 6	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	· · · · · ·   M					
						-	
788.0 28.5 5 7	12	· · · · · ·       M					
785		· · · · ·					
783.0 33.5							
	22	· · · · · ·   M					
778.0 38.5 44 56/0.1		-+	2778.0 38.5 WEATHERED ROCK				
776.0 40.5 60/0.0		· · · 60/0.0	776.0 White-Tan-Brown (GRANITIC ROCK) 40.5 CRYSTALLINE ROCK				
			Fresh, Hard, Black-Brown-White GRANITIC				
			Spacing				
	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	REC = 100%, RQD = 97%, GSI = 80 - 85				
			CRYSTALLINE ROCK         Fresh, Hard, Black-Brown-White GRANITIC         Fresh, Hard, Black-Brown-White GRANITIC         ROCK, with Moderately Close Fracture         Spacing         REC = 100%, RQD = 97%, GSI = 80 - 85         Fresh, Very Hard, Black-White BIOTITE         GNEISS with minor GRANITIC ROCK, with         Moderately Close Fracture Spacing         51.0         REC = 97%, RQD = 96%, GSI = 80 - 85         Fresh, Very Hard, Black-White         AMPHIBOLITE with minor GRANITIC ROCK, with Close to Moderately Close Fracture         Yogs colspan="2">Spacing         759.3         Spacing         759.3         REC = 97%, RQD = 92%, GSI = 75 - 80				
			765.5 Moderately Close Fracture Spacing 51.0				
			REC = 97%, RQD = 96%, GSI = 80 - 85         Fresh, Very Hard, Black-White         Fresh, Very Hard, Black-White				
			AMPHIBOLITE with minor GRANITIC ROCK, with Close to Moderately Close Fracture				
		· · · · · · · · · · · · · · · · · · ·	759.3 Spacing 57.2				
			GRANITIC ROCK, with Moderately Close				
			Fracture Spacing				
			REC = 100%, RQD = 100%, GSI = 85 - 90           Boring Terminated at Elevation 756.0 ft In				
			Crystalline Rock (GRANITIC ROCK)				
			- Notes: - 1) Auger Probe to 23.5 Feet				
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## GEOTECHNICAL BORING REPORT CORE LOG

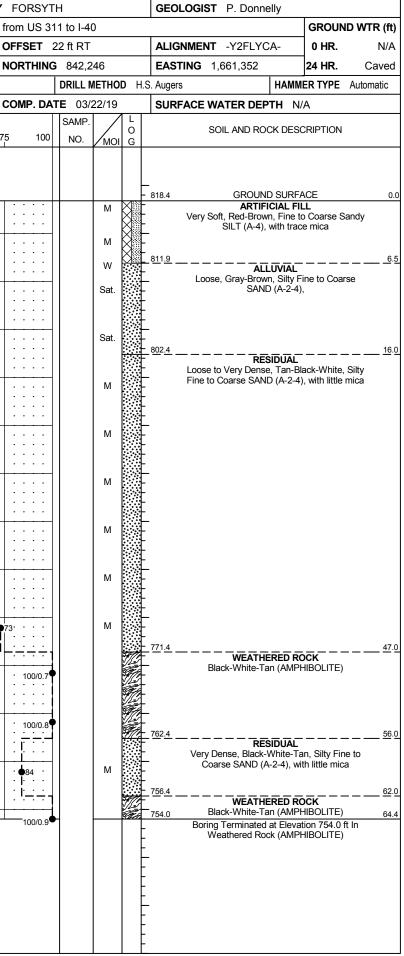


Bridge No. 729 on –Y2FLYCA– over Future I-74 from US 311 to I-40 WBS: 34839.1.7 Tip No.: U-2579AA Rock Core Photographs: Boring: B4-C Station: 45+15 Offset: CL

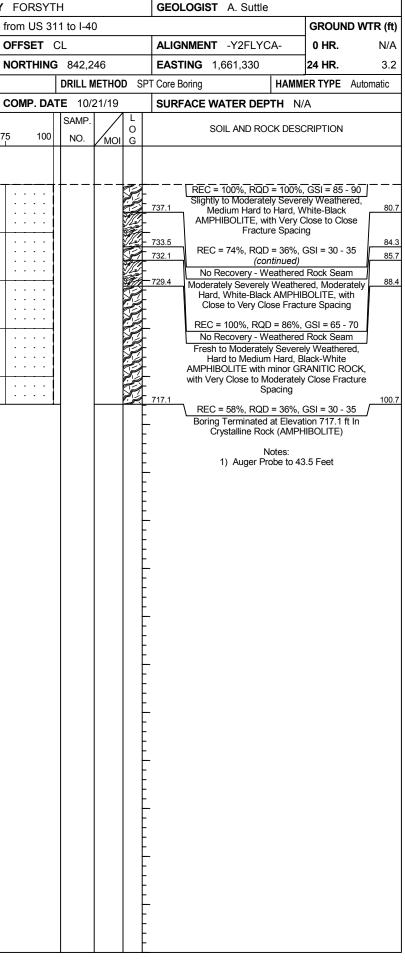




	34839					IP U-2					ORSYT				GEOLO	DGIST P. Donnelly	1	WBS 34839.1.7						<b>P</b> U-2579	COUNT		
				dge No					Future I		74 from US 311 to I-40						GROUND WTR (ft)	SITE DESCRIPTION Bridge No. 7							uture I-7	_	
BORI	NG NO	. B5-A	۸		S	TATION	46	+88		OF	FSET	17 ft LT			ALIGN	MENT -Y2FLYCA-	0 HR. N/A	BORING NO. B5-B						TATION 4	6+99		OF
COLL	AR EL	<b>EV.</b> 8 <sup>2</sup>	17.8 ft		Т	OTAL D	DEPTH	<b>H</b> 64.2	ft	NO	ORTHING	<b>3</b> 842,2	233		EASTI	<b>EASTING</b> 1,661,314 <b>24 HR.</b> 1.1			LAR ELI						<b>TH</b> 64.4 f		NC
DRILL	RIG/HA	MMER E	FF./DA	TE M	&W029	Diedrich	D-120	89% 09	07/2018			DRILL I	METHO	DD H	H.S. Augers	S. Augers HAMMER TYPE Automatic			L RIG/HA	MMER E	FF./DA	TE M	&W029	Diedrich D-12	20 89% 09/	07/2018	
DRIL		G. Akins	6		S	TART D	DATE	03/21/	19	co	MP. DA	<b>TE</b> 03/	21/19		SURFA	SURFACE WATER DEPTH N/A			LER G	. Akins	;		S	ART DAT	E 03/22/1	19	cc
ELEV	DRIVE ELEV	UEPIR	'⊢	ow co	1				PER FO							SOIL AND ROCK DES	CRIPTION	ELEV	DRIVE ELEV	DEPTH	' <b> </b>					PER FOO	
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	5	50	75	100	NO.	Имо	) G	ELEV. (ft)		DEPTH (ft)	(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50	75 I
820		Ŧ													F			820		Ļ							
	817.8	<u> </u>													817.8	GROUND SURFA	ACE 0.0		818.4	0.0	WOH	1	1	<u>.</u>			
815		‡		1	1		· · ·	· · · · ·					M	_		ALLUVIAL Very Loose, Brown-Gray,	Silty Fine to	815		+				$\mathbf{T}^2$ · · ·			·   ·
015	814.3	3.5	  WOH	WOH	WOH				+				м			Coarse SAND (A-2-4), with and mica	trace organics	015	814.9	3.5	WOH	WOH	WOH	<b>6</b> 0			
_	811.8	<u> </u>						· · · ·					IVI		-				812.4	6.0	WOH	2	4	L		· · · ·	·   ·
810	000 a <del>-</del>	±	1	0	0	<b>●</b> 0· ·	• •		· · ·	.			w					810	809.9	8.5				<b>•</b> 6 <u>.</u>			·
-	009.3	<u> </u>	WOH	WOH	WOH		::			.			Sat.						-	ŧ	2	4	5	· • 9 · ·			·   ·
		ŧ					· ·												-	Ł				. <b>!</b>			:
805	804.3	13.5		1		<del> </del>			+						L 803.8		14.0	805	804.9	13.5	3	3	4		+	<u> </u>	+
		Ŧ	'	1	9		10 .						M			RESIDUAL Loose to Medium D	)ense		-	Ł				. <u> </u>			·
800		ł				· ·	•••			.						Gray-Black-White-Tan, Silty SAND (A-2-4), with lit	Fine to Coarse	800	799.9	L 18.5				<b> </b>			•
	799.3	<u>† 18.5</u> †	8	7	7		14			.			м							-	9	5	8	· · • 13·			
		Ŧ					• •			.					F				-	F							
795	794.3	T 23.5					$\frac{1}{1}$	· · · ·							F			795	794.9	23.5	10	22	23				
		Ŧ	4	7	9		<b>•</b> 16						M		-				-	Ŧ						45	.   .
790		Ŧ					ΞŊ											790	789.9	28.5					·····		:
	789.3	<u>+</u> 28.5 +	10	18	12			<u>.</u>		.			м		-				- 709.9 -	- 20.5	5	4	6	€10			.   .
		‡						$\Psi^{30}$							-				-	+							
785	784 3	+ 33.5					· · ·	<u> ····</u>	· · ·	.								785	784.9	33.5	11	21	21				·
		+	15	17	9		::	26					м						-	ŧ		21	21		42	2	•
780	-	‡					: /	· · · · ·										700	-	ł						· · · ·	·   ·
/60	779.3	<u>+</u> 38.5	7	5	9	$\left  \right  $	1.		<u> </u>						-			780	779.9	38.5	8	11	10		21 · · · ·		
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775	774 0 -	+					· · ·		· · ·	.								775	774.9	43.5					· · · · ·	× · · ·	•
-	//4.3	<u> </u>	11	15	14			29		.			м						-	ŧ	17	29	44				<b>•</b> 73
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770	769.3	48.5		10			/		+									770	769.9	48.5	64	31/0.2		<u></u>	+	+	+
		Ŧ	12	12	11			23					M						-	Ł							
765		Ŧ					•				• • • •							765	764.9	L 53.5							
-	764.3	<u>† 53.5</u> †	9	80	20/0.1					·				477	763.8	WEATHERED RO	54.0				60	40/0.3					
		Ŧ								.	100/0.6					Black-White-Tan (AMP)			-	F							
760	759.3	T 58.5						· · · ·										760	759.9	58.5	20	30	54				
		Ŧ	100/0.4	4							100/0.4	•							-	Ŧ							
755		Ŧ						· · · · ·										755	754.9	L 63.5							
	754.3	63.5	53	47/0.2		<u> </u>			1	.	100/0.7	-			753.6		64.2		/54.9_	- 03.5	37	63/0.4					
		ŧ			1						100/0.7 -				F	Boring Terminated at Eleva Weathered Rock (AMP)	tion 753.6 ft In HIBOLITE)		-	ŧ							
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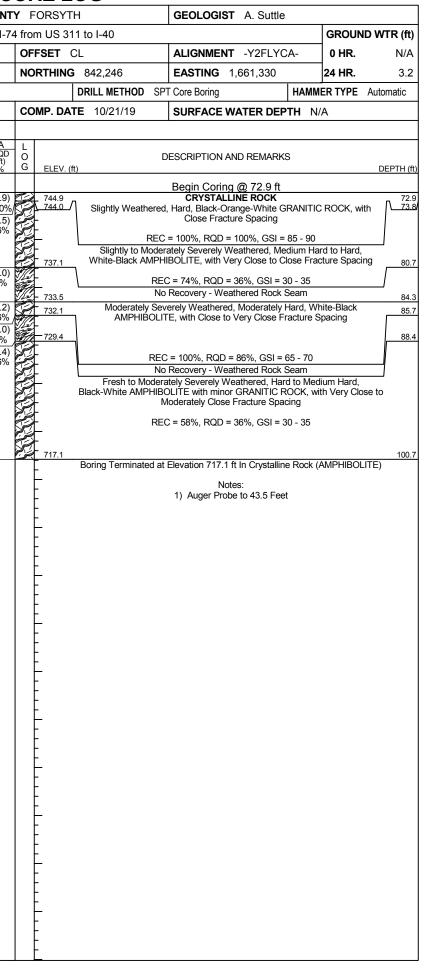


									<u> </u>								GEOLOGIST A. Suttle				]												
	34839					P U-2						Y FORSYTH						GIST A. Su	uttle	1		WBS 34839.1.7 SITE DESCRIPTION Bridge No.						TIP L		COUNT			
				dge No					er Fut	ture I-7	_	4 from US 311 to I-40 OFFSET CL								GROUND V	. ,				dge N					er Futu	ure I-74		
		. B5-C																ENT -Y2F		0 HR.	N/A	BORING NO. B5-C						STATI			OF		
COLI	AR ELI	<b>EV.</b> 81	7.8 ft		ТС	DTAL I	DEPT	<b>H</b> 10	0.7 ft	t	NO	RTHING	<b>3</b> 842,	,246		E/	ASTING	<b>G</b> 1,661,33	30	24 HR.	3.2	COLLAR ELEV. 817.8 ft						TOTAL DEPTH 100.7 ft					NC
		MMER E	FF./DA	TE H												SPT Co	T Core Boring HAMMER TYPE Automatic			DRILL RIG/HAMMER EFF./DATE HP						3 CME	-550 85	5% 02/06	/2019				
DRIL	LER J						DATE	10/2				MP. DA				SI	SURFACE WATER DEPTH N/A				DRILLER J. Cain						TAR	DAT	<b>E</b> 10/2			c	
ELEV	ELEV						0			ER FOO		100		P.  ▼∕	0			SOIL AND	ROCK DESC	CRIPTION		ELEV	DRIVE ELEV		··-		-					R FOOT	
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	2	5	50	)	75	100	NO.	_/м	DI G	ELE	EV. (ft)			[	DEPTH (ft)	(ft)	(ft)	(ft)	0.5ft	0.5ft	t 0.5ft	0		25	50		75 I
820		+														-						740		+		+		+		<u>M</u>	latch L		
	•	ŧ														817	.8	GRO	OUND SURFA	ACE	0.0			Ŧ				.	· · · · · ·		.	· · · · ·	
815		ŧ					· · ·	· · · · · ·		· · · · · ·		· · ·			, 🎆		0	Red-Brown, F	ine to Coarse	e Sandy SILT	2.0	735		‡				11	· · · · · ·			· · · · · · · ·	
010	-	ŧ														<u>014</u>		(A-4 Brown-Gray, S	), with trace n Silty Fine to C	nica Coarse SAND	_/ <u></u>	100		ŧ									1
		‡					· · · ·	· · · · · ·		· · · · · ·		· · · · · ·						-	(A-2-4)					‡					· · · · · ·			· · · · ·	-
810	_	‡					• •	· · ·			· ·											730		‡					• • •	· · ·			+.
	•	ŧ				· · ·		· · · ·		· · · · · ·	: :													‡				:	· · · · · ·			· · · · ·	
805		‡				· ·   · ·	· · ·	· · · ·		· · ·		· · · · · ·										725		‡					· · · · · ·			· · · · ·	
005	-	ŧ														-						125		‡									+
		‡				· · ·		· · ·		· · · · · ·		· · · ·				801	.8				<u> </u>			‡					· · · · · ·			· · · · ·	
800	-	‡					• •		• •		· ·							Tan-Brown, S	RESIDUAL Silty Fine to C	oarse SAND		720		‡						· · ·	· ·   ·		
		‡					· · ·	· · · ·		· · · · · ·									(A-2-4)					‡				11	· · · · · ·			· · · · ·	
705	•	ŧ				· ·   · ·	· · ·	· · ·		· · ·		· · ·												<u>+</u>				+					
795	-	ŧ																						‡									
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790	-	t					• •				• •													ŧ									
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785	-	ŧ				<u>.</u>																		Ŧ									
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780		£																						Ŧ									
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		Ŧ					•••																	Ŧ									
775	774.3	43.5														773	8				44.0			Ŧ									
		Ŧ	26	48	50/0.3					· · · · · · ·		100/0.8				3		WEA Black-White-I	ATHERED RC					Ŧ									
770		Ī														769					48.0			Ŧ									
	769.3	<u> </u>	22	19	13		••	. <b>Г</b> . • 32.		·				м				erv Stiff to Ha	RESIDUAL	ite-Brown, Silty				Ŧ									
		Ŧ					· · ·	, <b>,</b>		· · · ·		· · · · · · · · · · · · · · · · · · ·						Fine to Coarse	e SAND (A-2- mica	-4), with trace				Ŧ									
765	764.3	53.5	<u> </u>			<u>⊢</u>		<u> </u>			<u>·   ·</u>								micd					Ŧ									
	•	Ŧ	4	4	18		11	2		· · · ·	:   :	· · · ·		M		÷								Ŧ									
		Ŧ					· ·	· · · · · ·		· · · · · ·	·   ·	· · · · · ·												Ŧ									
	759.3	<u>† 58.5</u>	40	60/0.4			• • •				-+-	100/0.0			M	759	.3		ATHERED RO		58.5			Ŧ									
	•	Ŧ						· · · ·		· · · · · ·	·   ·	100/0.9							-Brown (AMF					Ŧ									
755	754.3	+ 63.5				· ·	•••	· · ·	•••		·   ·	• • •				1								‡									
		+	46	54/0.1	]	· ·   · ·		· · · · · ·	::	· · · · · ·		100/0.6												‡									
755		‡				· ·   · ·		· · · · · ·		· · · · · ·		· · ·				茅								‡									
	749.3	68.5	63	37/0.5		· ·					:   :													‡									
		‡				· ·   · ·		· · ·		· · · · · ·		100/1.0	[											‡									
745	744.9	72.9	00/0 0				• •		• •		·   ·					744	.9				72.9			‡									
		‡	60/0.0	"		· ·	· ·	· · ·	::	· · · · · ·	:   :	60/0.0				744		Slightly	Y Weathered,	Hard,	73.8			‡									
745		‡				· · ·		· · ·		· · ·		· · ·					Bla	ack-Orange-V Close	Vhite GRANIT Fracture Spa	FIC ROCK, with acing	ין אין			‡									
740		1		1											القبر	<u></u>				5	1					_							



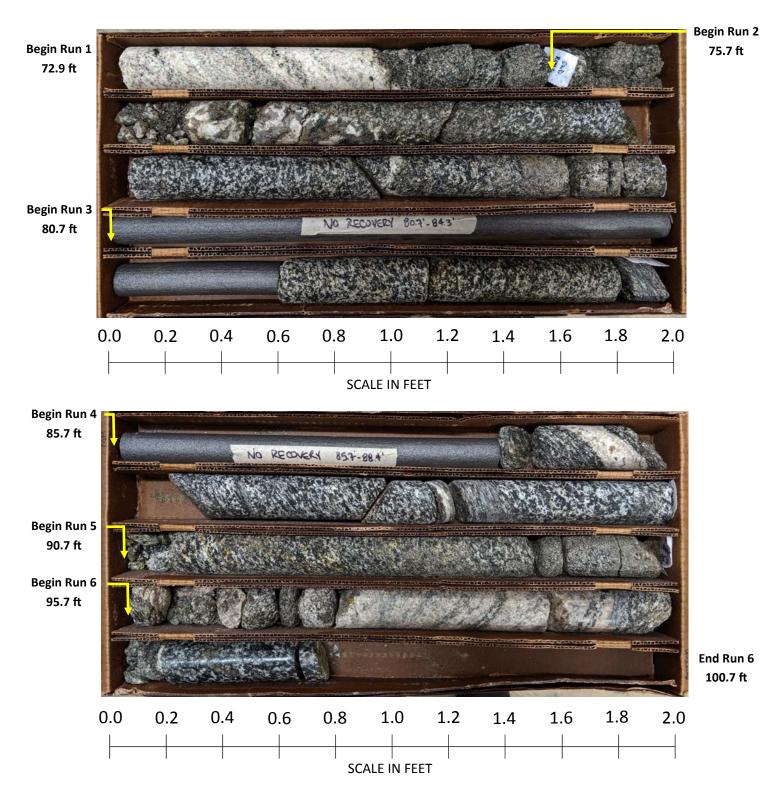
									С
WBS	34839	).1.7			TIP	U-257	'9AA	С	OUNT
SITE	DESCR	IPTION	Brid	ge No. 72	29 on ·	-Y2FL	YCA- ove	er Futu	re I-7
BOR	NG NO.	B5-C			STAT	ΓΙΟΝ	47+00		
COLI	AR ELE	<b>EV.</b> 81	7.8 ft		тот	AL DE	<b>PTH</b> 10	0.7 ft	
	. RIG/HAI		FF./DA	TE HPC2			85% 02/06		
DRIL		Cain						1/19	
-	E SIZE	NQ-2		DRILL	RI	AL RUI Jn			ATA
ELEV (ft)	ELEV (ft)	DEPTH (ft)	RUN (ft)	RATE (Min/ft)	REC. (ft) %	RQD (ft) %	SAMP. NO.	REC. (ft) %	RQD (ft) %
744.9	(14)			(	/0	70		76	70
	744.9	72.9	2.8	N=60/0.0 1:06/1.0	(1.6) 57%	(0.9) 32%		(0.9) \100%/	(0.9) 100%
	742.1	75.7	5.0	1:06/1.0 0:58/1.0 0:26/0.8	(4.4)	(2.5)		(5.1) 74%	(2.5)
740	-	-		0:43/1.0 0:49/1.0 0:37/1.0 0:38/1.0	88%	50%		7470	50 /0
	737.1	80.7	5.0	0:30/1.0	(1 4)	(1.0)		(0,0)	(0.0)
735	_	-	5.0	0:39/1.0 0:26/1.0	(1.4) 28%	(1.2) 24%		(0.0) 0%	(0.0) 0%
	- 732.1 <sup>-</sup>	85.7		0:27/1.0 0:27/1.0 0:34/1.0				(1.4)	(1.2)
730		- 00.7	5.0	0:36/1.0 0:39/1.0	(2.3) 46%	(1.7) 34%		100% (0.0)	86% (0.0)
100	-	-		0:28/1.0 0:28/1.0	-070	5470		(0.0) 0% (7.1)	(0.0) 0% (4.4)
	727.1	90.7	5.0	0:27/1.0	(2.1)	(1.3)		58%	36%
725	_	F		0:29/1.0 0:21/1.0	<b>4</b> 2%	26%			
	722.1	95.7		0:32/1.0 0:33/1.0					
720	-	Ľ	5.0	0:31/1.0 0:40/1.0	(2.7) 54%	(1.4) 28%			
	-	-		0:30/1.0 0:54/1.0					
	717.1	100.7		0:46/1.0					
	-	-							
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CDOT CORE DOUBLE U-2579AA-BRIDGE 729.GPJ NC\_DOT.GDT 11/4/19





# Bridge No. 729 on –Y2FLYCA– over Future I-74 from US 311 to I-40 WBS: 34839.1.7 Tip No.: U-2579AA Rock Core Photographs: Boring: B5-C Station: 47+00 Offset: CL



													1													
WBS         34839.1.7         TIP         U-2579AA							FORSY1				GEOLOGIST P. Donnelly		34839				TIP U-2579AA COUNTY									
SITE	DESCR		Bric	lge No	o. 729 d	on -Y2FLY	CA- over F	uture I-74	4 from US 311 to I-40					GROUND WTR (ft)							729 on -Y2FLYCA- over Future I-7					
BOR	NG NO	EB2-	-A		S	TATION 4	18+77		OFFSET	13 ft LT			ALIGNMENT -Y2FLYCA-	0 HR. N/A	BORING NO. EB2-B						TATION	48+83		0		
COLL	AR ELI	<b>EV.</b> 82	25.1 ft		т	OTAL DEP	<b>TH</b> 53.6 f	t	NORTHING	<b>G</b> 842,4	122		EASTING 1,661,307	<b>EASTING</b> 1,661,307 <b>24 HR.</b> 6.0			COLLAR ELEV. 823.7 ft						) ft	N		
DRILL	RIG/HA	MMER E	FF./DA	TE M	&W029	Diedrich D-12	20 89% 09/0	7/2018			METHO	D H.S	S. Augers HAMM	ER TYPE Automatic	DRILI	RIG/HAM	IMER E	FF./DA	TE M	W029	V029 Diedrich D-120 89% 09/07/2018					
DRIL	LER G	Akins	;		S	TART DAT	E 03/21/1	9	COMP. DATE 03/21/19				SURFACE WATER DEPTH N/A			DRILLER G. Akins						START DATE 03/21/19				
	DRIVE	DEPTH		ow co				PER FOOT		SAMP.		L							W COL				S PER FOO	<b>с</b>		
ELEV (ft)	ELEV (ft)	(ft)	·⊢		0.5ft	0		50	75 100		моі	O G	SOIL AND ROCK DESC ELEV. (ft)	CRIPTION DEPTH (ft)	ELEV (ft)	ELEV (ft)	(ft)		0.5ft		0	25	50	75		
	(11)							1								(11)										
830		╞											-		825	000.7	-									
		Ŧ										F				823.7 -	- 0.0	WOH	WOH	1	<b>↓</b> 1' • •			•		
825	825.1	+ 0.0											825.1 GROUND SURFA	ACE 0.0	820	820.2	- - 3.5					· · · · ·				
025	020.1		WOH	WOH	WOH	•0					М		RESIDUAL		020			2	1	2	<b>•</b> 3 • •					
	821.6 ·	- 3.5				:	$\left\{ \begin{array}{c} \cdot \\ \cdot $						$-\frac{822.6}{3}$ Very Soft, Red-Brown, Fine to SILT (A-4)	$\sim \text{Coarse Sandy} = \frac{2.5}{1}$		817.7	- 6.0	1	2	1		· · · · ·	·   · · ·			
820	. 021.0	- 0.0	22	23	22			 15			<b>M</b>		- White-Brown-Black-Red-Ora	e, 2000 Tan Silty	815	815.2	8.5				$\left  \begin{array}{c} \bullet 3 \\ \bullet \end{array} \right  \cdot \cdot \cdot \cdot$			•		
	819.1	6.0	6	13	16						M	F	Fine to Coarse SAND (A-2-4)	), with little mica		7	-	WOH	1	2	<b>•</b> 3					
	816.6	8.5							· · · · ·							1	-				;					
815	-	‡	2	3	5	. •8					М		_		810	810.2	13.5	1	2	3			· · · ·	·		
	•	t				.       .											-	'	2	5	●5	· · · · ·	·   · · ·	:		
	811.6	13.5	1	2	7							-				-	-						·   · · ·			
810	-	F	'	2	<i>'</i>	- <b>6</b> 9 · ·					M	-	-		805	805.2	18.5	1	1	2						
		ŧ				::::						-				1	-							:		
005	806.6	18.5	4	7	16	:::``					м				000		-				<u>i: : :</u>	· · · ·	· · · ·			
805	-	ŧ					<b>9</b> 23	+	<u> </u>				-		800	800.2	_	35	65/0.1							
						/ .										797.9	_ 25.8	60/0.1								
800	801.6	23.5	3	3	5						м	F					-									
	-	ŧ											-				-									
	796.6 ·	- 28.5															-									
795	-100.0	20.0	6	16	24		<b>4</b> 0				м	Ē	_			-	-									
	-	F										-	_			-	-									
	791.6 ·	33.5					· · i <u>·</u>	<u> </u>					791.6	33.5			-									
790	-	‡	100/0.4	1					• 100/0.4				-789.1 WEATHERED RC Black-White (MICA S				-									
	•	ŧ				::::;	+						RESIDUAL				-									
	786.6	38.5	18	9	12							Ľ	Medium Dense to Very Dense Silty Fine to Coarse SAND (A				-									
785	-	F		5	12		21	+	+		M	-	_ mica	,,,		-	-									
		ŧ										-				1	-									
700	781.6 ·	<u>+ 43.5</u>	24	27	27			•54			м						-									
780	-	ŧ					+ · · · · ·	<b>1</b> 34	<u> </u>				-				-									
	776.6 ·	- 48.5														-	-									
	//0.0 .	F 40.5	6	5	31		€36				м	F					-									
775	-	F										-	-				-									
	771.6 ·	- 53.5					: <u>j:</u>						771.6	53.5			-									
	-	t.	60/0.1						60/0.1	1			- CRYSTALLINE RO Black-White (MICA S				-									
	•	Ł										Ŀ	Boring Terminated with	Standard			-									
		F										F	Penetration Test Refusal at E ft In Cystalline Rock (MIC				-									
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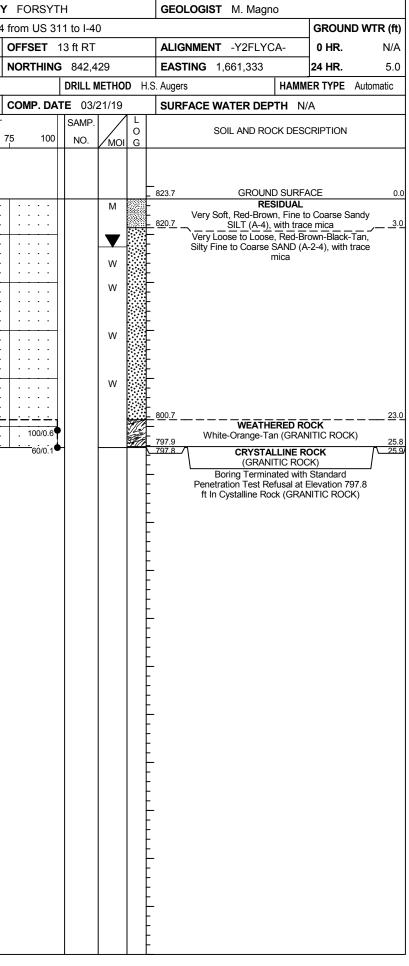




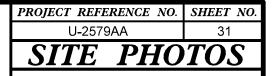
PHOTO 1: VIEW AT END BENT 1 LOOKING UPSTATION ALONG -Y2FLYCA- TOWARD EB-2



PHOTO 2: VIEW AT END BENT 2 LOOKING DOWNSTATION ALONG -Y1- (EXISTING HIGH POINT ROAD)



PHOTO 3: VIEW AT BENT 3 LOOKING WEST TOWARD SWAIM CREEK



BRIDGE NO. 729 ON -Y2FLYCA- OVER FUTURE I-74



PHOTO 4: VIEW AT END BENT 2 LOOKING DOWNSTATION ALONG -Y2FLYCA- TOWARD EB-1