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REFERENC

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DESCRIPTION TITLE SHEET LEGEND SITE PLAN & PROFILE BORING LOGS SOIL TEST RESULTS

STATE OF NORTH CAROLINA

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

STRUCTURE SUBSURFACE INVESTIGATION

COUNTY ASHE

US 221 FROM US 221 BYPASS PROJECT DESCRIPTION __ TO US 221 BUSINESS/NC 88 IN JEFFERSON

SITE DESCRIPTION **SOUND BARRIER WALL NW7B** FROM -L- STA. 820+00 TO -L- STA. 836+85

INVENTORY

8 51 4 $\boldsymbol{\omega}$ C PROJE

STATE N.C.

TOTAL SHEETS NO.

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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 REVEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL LENGINEERING UNIT AT 1991 707-6850. THE SUBSIFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOLI TEST DATA ARE NOT PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GENERAL SOL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARES 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 DECREE OF RELIMBLITY INHERMT IN THE STANDARD TEST WETHOD. THE OBSERVED WATER LEVELS OR SOL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOL 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 CALIFORED THAT TO AND WIND, AS HELE AS SHOWN ON THE BUBSURFACE 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 CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATION AS HE DEEMS NECESSART TO SATISTY 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 FROM THE ACTUAL CONDENSATION OF FOR ANY EXTENSION OF TIME FOR ANY REASON RESULTING FOR THE ACTUAL CONTENS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

- NOTES: I. 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 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

D. Goodnight
E. Estep
INVESTIGATED BY RK&K, LLP
DRAWN BY A. Bozorgi
CHECKED BY M. Snyder
SUBMITTED BY RK&K, LLP
DATE December 2018
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SIGNATURE DATE
DOCUMENT NOT CONSIDERED FINAL

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
SOIL IS CONSIDERED UNCONSOLID BE PENETRATED WITH A CONTINUC ACCORDING TO THE STANDARD PI IS BASED ON THE AASHTO S	ATED.SEMI-CONSOLIDATED.OR WEATHERED US FLIGHT POWER AUGER AND YIELD LESS INETRATION TEST (AASHTO T 206.ASTM D (STEM. BASIC DESCRIPTIONS GENERALLY I	EARTH MATERIALS THAT CAN 3 THAN 100 BLOWS PER FOOT 1586). SOIL CLASSIFICATION NCLUDE THE FOLLOWING:	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.	HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TEST ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIEL SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN Ø BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK
CONSISTENCY, COLOR, TEXTURE, MO AS MINERALOGICAL COMPO	ISTURE, AASHTO CLASSIFICATION, AND OTHE SITION, ANGULARITY, STRUCTURE, PLASTICIT	R PERTINENT FACTORS SUCH Y,ETC. FOR EXAMPLE,	ANGULARITY OF GRAINS	REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:
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 SP
GENERAL GRANN AR MATE	END AND AASHTU CLASSIFI	CATION	MINERALOGICAL COMPOSITION	ROCK (WR) 100 BLOWS PER FOOT IF TESTED.
CLASS. (≤ 35% PASSING	*200) (> 35% PASSING *200)	ORGANIC MATERIALS	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC.	CRYSTALLINE ROCK (CR)
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.	GNEISS, GABBRU, SCHIST, ETC.
ULASS. A-1-a A-1-b A-2-4 A	1-2-5 A-2-6 A-2-7	A-3 A-6, A-7	SLIGHTLY COMPRESSIBLE LL < 31	ROCK (NCR)
SYMBOL 00000000000			MODERATELY COMPRESSIBLE LL = 31 - 50	COASTAL PLAIN COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT
2 PASSING *10 50 MX		GRANULAR SILT- MUCK,	PERCENTAGE OF MATERIAL	(CP) SHELL BEDS, ETC.
*40 30 MX 50 MX 51 MN *200 15 MX 25 MX 10 MX 35 MX 1	5 MX 35 MX 35 MX 36 MN 36 MN 36 MN 36 MN	SOILS SOILS PEAT		
MATERIAL			TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10%	HAMMER IF CRYSTALLINE.
PASSING #40		SOILS WITH	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
PI 6 MX NP 10 MX 1	0 MX 11 MN 11 MN 10 MX 10 MX 11 MN 11 MN	LITTLE OR HIGHLY	HIGHLY ORGANIC > 10% > 20% HIGHLY 35% AND ABOVE	OF A CRYSTALLINE NATURE.
GROUP INDEX Ø Ø Ø	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 R
USUAL TYPES STONE FRAGS. FINE SIL	TY OR CLAYEY SILTY CLAYEY	MATTER	✓ WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING	CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMME
MATERIALS SAND SAND GRA	VEL AND SAND SOILS SOILS		STATIC WATER LEVEL AFTER <u>24</u> HOURS	MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFEC
GEN. RATING EXCELLENT TO	GOOD FAIR TO POOR	FAIR TO POOR UNSUITABLE	✓ PW PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA	DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGT
PLOF A-7-5 SUE	GR0UP IS ≤ 11 - 30 + PL0E A-7-6 SUBGR0UP IS	>11 - 301	SPRING OR SEEP	WITH FRESH ROCK.
CO	NSISTENCY OR DENSENESS		MISCELLANEOUS SYMBOLS	SEVERE AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE
COMPAC	TNESS OR RANGE OF STANDARD	RANGE OF UNCONFINED		(MOD. SEV.) AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND IF TESTED, WOULD YIELD SPT REFUSAL
CONSI	STENCY (N-VALUE)	(TONS/FT ²)	WITH SOIL DESCRIPTION OF ROCK STRUCTURES	SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND
GENERALLY VERY	L00SE < 4		SOIL SYMBOL	(SEV.) REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS TO SOME EXTENT, SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN.
GRANULAR MEDIUI	1 DENSE 10 TO 30	N/A		IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF
(NON-COHESIVE) DE	NSE 30 TO 50 DENSE > 50			VERY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS A SEVERE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS
VERY	SOFT < 2	< 0.25	INFERRED SOIL BOUNDARY CORE BORING • SOUNDING ROD	(V SEV.) REMAINING, SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THA
GENERALLY S SILT-CLAY MEDIU	0FT 2 TO 4 1 STIFF 4 TO 8	0.25 TO 0.5 0.5 TO 1.0		COMPLETE ROCK REDUCED TO SOIL, ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY
MATERIAL ST	TFF 8 TO 15	1 TO 2		SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGER
Н	ARD > 30	> 4	INSTALLATION	ROCK HARDNESS
	TEXTURE OR GRAIN SIZE		RECOMMENDATION SYMBOLS	VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIME
U.S. STD. SIEVE SIZE	4 10 40 60 200	270	UNDERCUT UNCLASSIFIED EXCAVATION - UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE	SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.
OPENING (MM)	4.78 2.00 0.42 0.23 0.07	0.055	SHALLOW UNCLASSIFIED EXCAVATION - USED IN THE TOP 3 FEET OF	HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER I TO DETACH HAND SPECIMEN.
BOULDER COBBLE ((BLDR.) (COB.)	GRAVEL SAND SAND	(SL.) (CL.)		MODERATELY CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES D
CDAIN MM 205 75	(CSE, SU.) (F SU	.,		HARD EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE BY MODERATE BLOWS.
SIZE IN. 12 3	2.0 0.23	0.00 0.000	BT - BORING TERMINATED MICA MICACEOUS WEA WEATHERED	MEDIUM CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE
SOIL MOI	STURE - CORRELATION OF	TERMS	CL CLAY MOD MODERATELY 7 - UNIT WEIGHT	HARD CAN BE EXCAVATED IN SMALL CHIPS TO PEICES I INCH MAXIMUM SIZE BY HARD POINT OF A GEOLOGIST'S PICK.
SOIL MOISTURE SCALE	FIELD MOISTURE GUIDE FOR I	FIELD MOISTURE DESCRIPTION		SOFT CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK, CAN BE EXCAVATED IN
	DESCRIPTION		DPT - DYNAMIC PENETRATION TEST SAP SAPROLITIC S - BULK	FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POL PIECES CAN BE BROKEN BY FINGER PRESSURE.
	- SATURATED - USUALLY LI (SAT.) FROM BELOW	JUID; VERY WET, USUALLY / 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
LL LIQUID LIMIT			FOSS FOSSILIFEROUS SLI SLIGHTLY RS - ROCK	FINGERNAIL.
RANGE <	- WET - (W) SEMISOLID; F ATTAIN OPT	REQUIRES DRYING TO MUM MOISTURE	FRAGS FRAGMENTS W - MOISTURE CONTENT CBR - CALIFORNIA BEARING	FRACTURE SPACING BEDDING
VEL PLASTIC LIMIT			HI HIGHLY V - VERY RATIO	TERM SPACING TERM
OM _ OPTIMUM MOISTURE	- MOIST - (M) SOLID; AT O	R NEAR OPTIMUM MOISTURE	DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE:	WIDE 3 TO 10 FEET THICKLY BEDDED
SL SHRINKAGE LIMIT			CME-45C CLAY BITS X AUTOMATIC MANUAL	CLOSE 0.16 TO 1 FOOT VERY THINLY BEDDED 0.
	- DRY - (D) REQUIRES AN ATTAIN OPT	DDITIONAL WATER TO MUM MOISTURE	6' CONTINUOUS FLIGHT AUGER	VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.0 THINLY LAMINATED
	PLASTICITY			INDURATION
	PLASTICITY INDEX (PI)	DRY STRENGTH	CME-550 HARD FACED FINGER BITS	FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, H
NON PLASTIC	0-5 6-15	VERY LOW	VANE SHEAR TEST	FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE RINW BY HAMMER DISINTEGRATES SAMPLE
MODERATELY PLASTIC	16-25	MEDIUM		GRAINS CAN BE SEPARATED FROM SAMPLE WITH S
HIGHLY PLASTIC	26 OR MORE	HIGH	PORTABLE HOIST	MUDERATELY INDURATED BREAKS EASILY WHEN HIT WITH HAMMER.
	CULUR		X Mobile B-57 ATV	INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL
DESCRIPTIONS MAY INCLUDE COL	OR OR COLOR COMBINATIONS (TAN, RED,	YELLOW-BROWN, BLUE-GRAY).	CORE BIT VANE SHEAR TEST	SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPL
MUDIFIERS SUCH AS LIGH	I, DARK, SIREAKED, ETC. ARE USED TO D	SURIBE APPEARANCE.	凵 凵 凵	EXTREMELY INDURATED SAMPLE BREAKS ACROSS GRAINS.



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	TERMS AND DEFINITIONS
ED. AN INFERRED	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
1 FOOT PER 60	AQUIFER - A WATER BEARING FORMATION OR STRATA.
IS UFIEN	ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
	ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING
'T N VALUES >	A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC. <u>ARTESIAN</u> - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT
OCK THAT NCLUDES GRANITE,	WHICH II IS ENCOUNTERED, BUT WHICH DUES NUT NECESSARILY RISE TO UK ABOVE THE GROUND SURFACE.
AL PLAIN	CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
IF TESTED.	<u>CULLUVIUM</u> - HOLK FRAGMENTS MIXED WITH SUIL DEPUSITED BY GRAVITY ON SLOPE OF AT BUTTOM OF SLOPE.
STONE, CEMENTED	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.
RINGS UNDER	DIKE - A TABULAR BUDT OF LOREDUS RULK THAT LUTS ALROSS THE STRUCTURE OF AUJACENT ROCKS OR CUTS MASSIVE ROCK.
COATINGS IE OPEN	<u>DIP</u> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
HAMMER BLOWS IF	DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
OCK UP TO AL FELDSPAR	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
H BLOWS.	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
IS. IN AY. ROCK HAS	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.
H AS LUMPARED	FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
FELDSPARS DULL	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.
WHEN STRUCK.	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO
EVIDENT BUT	ITS LATERAL EXTENT.
HAE KHOLINIZED	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 AFRATION AND LACK OF GOOD DRAINAGE.
RE DISCERNIBLE	PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE
T ONLY MINOR	OF AN INTERVENING IMPERVIOUS STRATUM.
VALUES < 100 BPF	RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
IN 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.
	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.
BLOWS REQUIRED	SILL - AN INTRUSIVE BODY OF ICNEOUS 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.
OR PICK POINT.) BLOWS OF THE	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
N FRAGMENTS	STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY
NI. SMALL, THIN	STRATA ROCK QUALITY DESIGNATION (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL
. PIECES 1 INCH HED READILY BY	THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.
THICKNESS	BENCH MAKK:
4 FEET	ELEVATION: FEET
1.5 - 4 FEET .16 - 1.5 FEET	
03 - 0.16 FEET	NUTES:
08 - 0.03 FEET < 0.008 FEET	BUREHULE ELEVATIONS DETERMINED FROM PROVIDED .TIN FILE AND GPS
	ABBREVIATIONS:
EAT, PRESSURE, ETC.	F.I.A.D FILLED IMMEDIATELY AFTER DRILLING
TEEL PROBE;	
PROBE;	
.E;	
	DATE: 8-15-14





GEOTECHNICAL BORING REPORT BORE LOG

WBS 34518.1.FR6	TIP R-2915E COUNT	TY ASHE	GEOLOGIST D. Goodnight		WBS	34518.1	I.FR6		Т	IP R-291	5E COUN	ITY ASHE			GEOLOGIST D. Goodni	ght
SITE DESCRIPTION US 221 Fro	m US 221 Bypass to US 221 Busi	ness/NC 88 - Sound Barrier Wa	II NW7B	GROUND WTR (ft)	SITE D	DESCRIF	TION	US 221	From U	JS 221 Byp	ass to US 221 Bus	siness/NC 88 -	- Sound E	Barrier W	all NW7B	GROUND WTR (ft)
BORING NO. NW7B 10+00	STATION 10+00	OFFSET 5 ft RT	ALIGNMENT -NW7B-	0 HR. Dry	BORIN	NG NO.	NW7B	11+00	s	STATION ²	11+00	OFFSET	5 ft RT		ALIGNMENT -NW7B-	0 HR. 9.8
COLLAR ELEV. 2,902.2 ft	TOTAL DEPTH 15.0 ft	NORTHING 980,470	EASTING 1,273,197	24 HR. 9.3	COLL	AR ELE\	/. 2,90	0.5 ft	Т	OTAL DEP	TH 15.0 ft	NORTHING	G 980,50	05	EASTING 1,273,290	24 HR. 9.0
DRILL RIG/HAMMER EFF./DATE TRIE	8016 MOBILE B-57 95% 03/19/2018	DRILL METHOD H.	S. Augers HAMN	IER TYPE Automatic	DRILL	RIG/HAMI	MER EFF	./DATE	TRI8016	MOBILE B-5	7 95% 03/19/2018		DRILL M	ETHOD	H.S. Augers	HAMMER TYPE Automatic
DRILLER Estep, J. E.	START DATE 07/31/18	COMP. DATE 07/31/18	SURFACE WATER DEPTH N	/A	DRILL	ER Est	ep, J. E		S	TART DAT	E 07/31/18	COMP. DA	TE 07/3	31/18	SURFACE WATER DEPT	H N/A
ELEV (ft) DRIVE ELEV (ft) DEPTH BLOW COUNT (ft) 0.5ft 0.5ft	NT BLOWS PER FOO 0.5ft 0 25 50	T SAMP. V L 75 100 NO. MOI G	SOIL AND ROCK DES	CRIPTION DEPTH (ft)	ELEV (ft)	DRIVE ELEV (ft)	EPTH (ft) 0	BLOW C	COUNT 5ft 0.5ft	0	BLOWS PER FO	OT 75 100	SAMP. NO.	MOI G	SOIL AND ROCH	(DESCRIPTION
(II) (II) 0.5tt 0.5tt 2905 - - - - 2900 - 3 3 - 2,898.7 3.5 3 3 - 2,898.7 8.5 - 7 3 2,893.7 8.5 - - - 2,898.7 13.5 4 6 - 2,888.7 13.5 4 6 - 2,888.7 13.5 4 6 - - - - - - - - - - - - - - -	0.5tt 0 25 50 3 6 4 7 7 7 7 7 1 4 4	/3 100 NO. /MOI G 	ELEV. (ft) 2,902.2 GROUND SURF ROADWAY EMBAN Tan-brown, sandy SiLT (A-4 trace mica 2,896.7 RESIDUAL Brown, gray, tan, silty S/ saprolitic 2,887.2 Boring Terminated at Elevat Residual: silty SAND	DEPTH (ft) ACE 0.0 IKMENT 4), some gravel, 55 AND (A-2-4), 15.0 D (A-2-4)	2900 2895 2895 2890			2 3 2 7 2 1 5 2 3 3	5tt 0.5tt 3 3 5 1 2 2 3 3				NO. ,	✓ MOI G 26% L 54% L W W W	2,900.5 GROUND: ROADWAY EI Tan, sandy SILT (A-5 Brown, tan, gray, sand (A-7-5), little orga 2,891.5 Tan and gray, silty SAI fragm 2,885.5 Boring Terminated at Residual: silty	SURFACE 0.0 VBANKMENT i), trace gravel, trace ca3.0 y slightly plastic CLAY nics, trace gravel DUAL ND (A-2-4), trace rock tents 15.0 Elevation 2,885.5 ft in SAND (A-2-4)

SHEET 5 OF 14

GEOTECHNICAL BORING REPORT BORE LOG

SHEET 6 OF 14

GEOTECHNICAL BORING REPORT BORE LOG

W	BS 3	4518.1.FF	26			TIP	R-2915	5E	C	COUNT	Y ASH	E			G	GEOLOGIS	T D. Goc	odnight			WE	3S 345	18.1.FI	R6		Т	FIP F	R-2915E		COUNT	Y ASHE				GEOL	.OGIST D	. Goodnigh	t		
SI	TE DE	SCRIPTIC	DN U	JS 221	Fron	n US	221 Byp	ass to	US 22	1 Busir	ness/NC	88 - S	Sound E	Barrier	Wall N	W7B			GROUN	ND WTR (ft	SI	E DESC	RIPTIC	ON US	S 221 I	From U	JS 22	21 Bypass	to US 2	221 Busir	ness/NC 88	- Sound	Barrie	r Wal	II NW7B			GROU	ND WTR (ff	t)
В	ORING	NO. NW	/7B 1	4+00		ST	TION 1	14+00			OFFSE	T 5 f	ft RT		A		T -NW7E	3-	0 HR.	11.8	BC	RING NO	0 . NV	V7B 15	5+00	S	STATI	ION 15+	00		OFFSET	5 ft RT			ALIGN	IMENT -M	W7B-	0 HR.	Dr	y
C	OLLAF	RELEV. 2	2,896	.5 ft		то	TAL DEP	TH 1	5.0 ft		NORTH	IING	980,5	89	E	EASTING	1,273,578		24 HR.	9.9	CC	LLAR E	LEV.	2,895.	3 ft	Т	ΓΟΤΑΙ	AL DEPTH	15.0 ft	t	NORTHIN	IG 980,6	15		EAST	ING 1,27	3,675	24 HR.	10.2	2
DF	RILL RI	G/HAMMER	EFF./	DATE	TRI80	D16 M	OBILE B-5	7 95%	03/19/2	2018	•	0	ORILL M	IETHOD	H.S. A	Augers		HAMN	IER TYPE	Automatic	DR	ILL RIG/H	AMMEF	R EFF./D	ATE 1	rri8016	6 MOBI	BILE B-57 9	5% 03/19	9/2018	•	DRILL	IETHO	DDH.	S. Augers		HA	MMER TYPE	Automatic	
D	RILLEI	R Estep,	J. E.			ST	ART DAT	E 07	/31/18		COMP	DATE	E 07/3	31/18	s	SURFACE \	WATER DF	EPTH N	/A		DR	ILLER	Estep,	J. E.		S	STAR	RT DATE	07/31/1	8	COMP. D	ATE 07/	31/18		SURF		ER DEPTH	N/A		
EL	EV DF		H E	BLOW C	COUN	т		BLC	OWS PE	R FOOT		:	SAMP.						CRIPTION		ELE		, DEP	тн ві		JUNT			BLOWS F	PER FOOT	-	SAMP.				SOIL	AND ROCK D	ESCRIPTION	I	
(f	it) ((ft) (ft)	0.5	5ft 0.5	5ft 0	.5ft	0	25	50	1	75 	100	NO.	моі	G EL	.EV. (ft)				DEPTH (t) (ft) (ft)	(ft)	0.51	ft 0.5f	t 0.5ft	0	25	5	50	75 10	NO.	моі	G						
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00	28	$\frac{1}{10}$	_			+	• • • •	· · ·	• •			•			- 2,8	896.5	GROU ROADWA	IND SURF	ACE KMENT	0		_	‡												- 2.895.3		GROUND SU	RFACE	C	0.0
20	95	+ + +	2	2 2	2	4	6	+						мL		Tan, s	sandy silty hi	ighly plasti	c CLAY (A-	-7-6),	205	2,894.3	3 1.0) 6	4	4	11.						050/	FN	-	RO. Tan bro		ANKMENT		_
	_2,8	93.0 3.5	1	2	2	3	• · · ·	· ·	· ·	· · · ·	. .	•		M	S			to intio gre				2,891.	8 3.5	5			119	· P ⁸ · · ·	· · · ·			55-62	25%		2,892.3	<u>(A-7-5)</u>	, trace organi	s, trace grav	<u>el 3</u>	<u>3.0</u>
28	90 2,8	90.5 6.0	w	он ма	ж	он .	Г Г.	· ·	••			<u>.</u> -	09.92	240/							289	0	±	2	1	1	• 2	2 · · ·					w		_	Tan, gray,	sandy clayey organics, trac	' SILT (A-5), ti e gravel	race	
	2,8	88.0 8.5					0				. .	: [33-00	34% L	2,8	888.5	· R	FSIDUAL		8		2,009.	1 0.0	1	WOH	1 1	- ↓						w		- 28873				Q	8 0
		ŧ)H 1			1	· ·	· ·		.	: -	SS-61	W		Tan,	silty SAND (/	A-2-5), little	e to some r	nica,		2,886.	<u>8 8.5</u>	wo	H 1	2	- [<mark>'</mark>]						1 ///				RESIDU	AL	⁰	<u></u>
28	85	÷					$\frac{1}{1}$	+			<u> </u>				-			Saprolitic			288	5	\pm								<u> </u>		<u> </u>		-	ran, fine s	andy SILT, III	tie mica, sapr	OIITIC	
	_2,8	83.0 13.5	; 1	2	2	3	↓ ●5	· ·	••		.	·		w	- 28	881 5				15		2.881.	8 	5											-					
		1					•							•1		Boring	g Terminater	d at Elevat	ion 2,881.5	5 ft in			-	1	1	1	• 2	2 • • •					w	1 1	2,880.3				15	5.0
		ŧ													E		Residual.		(A-2-3)				ŧ												-	Re	sidual: sandy	SILT (A-5)	3 11 11	
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WBS 34518.1.FR6 TIP R-2915E COUNTY ASHE	GEOLOGIST D. Goodnight	WBS 34518.1.FR6 TIP R-2915E COUN	TY ASHE	GEOLOGIST D. Goodnight
SITE DESCRIPTION US 221 From US 221 Bypass to US 221 Business/NC 88 - Sound	d Barrier Wall NW7B GROUND WTR (ft)	SITE DESCRIPTION US 221 From US 221 Bypass to US 221 Bus	iness/NC 88 - Sound Barrier Wall	GROUND WTR (ft)
BORING NO. NW7B 16+00 STATION 16+00 OFFSET 5 ft RT	Г ALIGNMENT -NW7В- 0 HR. 11.3	BORING NO. NW7B 17+00 STATION 17+00	OFFSET 5 ft RT	ALIGNMENT -NW7B- 0 HR. 11.0
COLLAR ELEV. 2,893.7 ft TOTAL DEPTH 15.0 ft NORTHING 980,6	D,640 EASTING 1,273,772 24 HR. 8.1	COLLAR ELEV. 2,892.6 ft TOTAL DEPTH 15.0 ft	NORTHING 980,666	EASTING 1,273,868 24 HR. 8.0
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 95% 03/19/2018 DRILL M	L METHOD H.S. Augers HAMMER TYPE Automatic	DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 95% 03/19/2018	DRILL METHOD H.S	S. Augers HAMMER TYPE Automatic
DRILLER Estep, J. E. START DATE 08/01/18 COMP. DATE 08/	8/01/18 SURFACE WATER DEPTH N/A	DRILLER Estep, J. E. START DATE 08/01/18	COMP. DATE 08/01/18	SURFACE WATER DEPTH N/A
ELEV DRIVE ELEV DEPTH BLOW COUNT BLOWS PER FOOT SAMP. (ft) (ft) 0.5ft 0.5ft 0.25 50 75 100 NO	P. L O SOIL AND ROCK DESCRIPTION	ELEV DRIVE DEPTH BLOW COUNT BLOWS PER FOO	T SAMP. L 75 100 NO VIEW O	SOIL AND ROCK DESCRIPTION
	2,893.7 GROUND SURFACE 0.0 ROADWAY EMBANKMENT M	2895 		- 2,892.6 GROUND SURFACE 0.0 ROADWAY EMBANKMENT
2890 2,890.2 3.5 2,887.7 6.0 2 5 8 2885 2,885.2 8.5 1 WOH 1 1 WOH 1 2880 2,880.2 12,5	M Image: Constraint of the second	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	· · · · · · · SS-63 28% ↓ · · · · · · · · · · · · · · · · · ·	Tan-brown to tan, sandy silty moderately plastic CLAY (A-7-5/A-7-6). trace to little gravel, trace organics
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	W 2,878.7 Tan-brown, silty SAND (A-2-4), little mica	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	· · · · · · · · · · · · · · · · · · ·	 RESIDUAL Tan-brown, silty fine SAND (A-2-4), saprolitic 2.877.6 15.0
	Borng Terminated at Elevation 2,873.7 it in Residual: sity SAND (A-2-4)			Boring Terminated at Elevation 2,877.6 ft in Residual: silty SAND (A-2-4)

WBS 34518.1.FR6	TIP R-2915E COUN	TY ASHE	GEOLOGIST D. Goodnight		WBS 34518.1.FF	R6	TIP R-2915E	COUNTY ASHE		GEOLOGIST D. Goodnight	:
SITE DESCRIPTION US 221 Fro	om US 221 Bypass to US 221 Bus	iness/NC 88 - Sound Barrier Wa	II NW7B	GROUND WTR (ft)	SITE DESCRIPTIO	N US 221 Fr	om US 221 Bypass to US 2	21 Business/NC 88	- Sound Barrier Wa	all NW7B	GROUND WTR (ft)
BORING NO. NW7B 18+00	STATION 18+00	OFFSET 5 ft RT	ALIGNMENT -NW7B-	0 HR. 11.4	BORING NO. NV	/7B 19+00	STATION 19+00	OFFSET	5 ft RT	ALIGNMENT -NW7B-	0 HR. 11.5
COLLAR ELEV. 2,891.0 ft	TOTAL DEPTH 15.0 ft	NORTHING 980,691	EASTING 1,273,965	24 HR. 5.0	COLLAR ELEV.	2,889.8 ft	TOTAL DEPTH 15.0 ft	NORTHIN	G 980,717	EASTING 1,274,062	24 HR. 0.5
DRILL RIG/HAMMER EFF./DATE TRI	8016 MOBILE B-57 95% 03/19/2018	DRILL METHOD H	.S. Augers HAM	MER TYPE Automatic	DRILL RIG/HAMMER	EFF./DATE TR	RI8016 MOBILE B-57 95% 03/19	2018	DRILL METHOD	I.S. Augers HA	MMER TYPE Automatic
DRILLER Estep, J. E.	START DATE 08/01/18	COMP. DATE 08/01/18	SURFACE WATER DEPTH	N/A	DRILLER Estep,	J. E.	START DATE 08/01/1	COMP. DA	ATE 08/01/18	SURFACE WATER DEPTH	N/A
ELEV COUP (ft) DRIVE DEPTH BLOW COUP (ft) 0.5ft 0.5ft	NT BLOWS PER FOO 0.5ft 0 25 50	0T SAMP. ↓ L 75 100 NO. MOI G	SOIL AND ROCK DE	SCRIPTION DEPTH (ft)	ELEV DRIVE ELEV (ft) (ft)	H BLOW COU 0.5ft 0.5ft	JNT BLOWS F 0.5ft 0 25 5	ER FOOT 0 75 100	SAMP. L NO. MOI G	SOIL AND ROCK D	ESCRIPTION
2895		L	2,891.0 GROUND SUR ROADWAY EMBA	FACE 0.0 NKMENT	2890 2,888.8= 1.0 2,886.3 3.5 2885	2 3 2 2		· · · · · · · · · · · · · · · · · · ·	SS-65 M L	2,889.8 GROUND SU ROADWAY EMB Tan and gray, silty SAND little grav	RFACE 0.0 ANKMENT (A-2-5), little mica, rel
2,887.5 3.5	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	· · · · · · · M L	_ Tan, sandy SILT (A-4) -), little gravel	2,883.8 - 6.0	1 2	$\begin{array}{c c} \hline 1 \\ \hline 0 \\ \hline 0 \\ \hline 3 \\ \hline 1 \\ \hline 0 \\ \hline 3 \\ \hline 1 \\ \hline 0 \\ \hline 1 \\ 1 \\$	· · · · · · · · · · · ·	М		
2885 2,885.0 6.0 2,882.5 8.5 2,882.5 8.5 2880 3 2	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	· · · · · · · · · · · · · · · · · · ·	- 2,885.5 - Tan-gray, sandy silty CL/ - gravel - 2,882.0 - RESIDUAI Grav to tan, silty SAND (A	AY (A-7-6), little5.5	2,881.3 8.5 2880 2,876.3 13.5 2875	4 2 , , 1 WOH	WOH		_ w	2.881.8 RESIDU Gray, fine sandy SILT Gray, fine sandy SILT fragments, sa	AL
			-	<i></i>						Boring Terminated at Ele Residual: sandv	vation 2,874.8 ft in SILT (A-4)
DOI BOKE DOUBLE R2015E GEO NWYB.GPJ NC_DDT GDT 1212/12/18			2,876.0 Boring Terminated at Eleva Residual: silty SAN	15.0 ation 2,876.0 ft in ID (A-2-4)							

WE	S 345	18.1.FR6	6			TIP	R-291	5E		COL	JNTY	ASH	Ξ				GE	OLOG	ist D	. Goo	dnight				v	/BS 34	4518.1	.FR6			Т	ΓΙΡ	R-2915	Ε	C	OUNTY	ASHE					GEOLOG	JIST [. Good	night			
SIT	E DESC	RIPTION	N US	221	From	n US	221 By	pass	to US 2	221 B	usine	ss/NC	88 - 8	Sound	Barri	er Wa	all NW7	'B				GRO		NTR (ft) S	ITE DE	SCRIP	TION	US 2	221 Fr	rom U	JS 22	221 Bypa	ass to L	JS 221	Busine	ess/NC 88	- Soun	d Bar	rier V	Vall	NW7B				GROUN		R (ft)
во	RING N	0 . NW7	7B 20	+00		ST	TION	20+0	0		0	OFFSE	T 5	ft RT			ALI	GNME	ENT -N	W7B	-	ОН	IR.	10.9	ЭВ	ORING	NO.	NW7E	3 21+0	00	S	STAT	TION 2	1+00			OFFSET	5 ft RT				ALIGNM	ENT -!	NW7B-		0 HR.		Dry
со	LLAR E	LEV. 2,	,888.5	i ft		то	TAL DE	РТН	15.0 f	t	1	NORTH	ING	980,7	742		EAS	STING	i 1,274	4,158		24 H	IR.	7.2	2 C	OLLAR	RELEV	1. 2,88	86.8 ft	t	Т	ΓΟΤΑ	AL DEP	TH 15	.0 ft		NORTHIN	G 980	,768			EASTING	3 1,27	4,255		24 HR.		4.8
DRI	LL RIG/H	AMMER E	EFF./D/	ATE	TRI80) 16 M	OBILE B-	57 95	% 03/19	9/2018				DRILL	METH	OD H	I.S. Auge	ers			HAN	MER TY	'PE Au	Itomatic	D	RILL RIG	G/HAMN	IER EF	F./DAT	E TR	RI8016	6 MOE	BILE B-5	7 95% 0	3/19/20	18		DRILL	. METI	HOD	H.S	. Augers			HAMM	ER TYPE	Autom	atic
DR	ILLER	Estep, J	I. E.			ST	ART DA	TE (08/01/1	8	(COMP.	DAT	E 08/	01/1	3	SUF	RFACE		ER DE	PTH	N/A			D	RILLEF	R Est	ep, J. I	E.		S	STAF	RT DAT	E 08/0)1/18		COMP. DA	TE 0	3/01/*	18		SURFAC	EWAT	ER DEP	•TH N/	Ą		
ELE		E DEPTH	I BL	OW C	OUNT	Г		В	LOWS	PER F	оот			SAMP.					SOIL			SCRIPT	ION		El	EV DR		EPTH	BLOV	W COL	UNT			BLOV	VS PER	FOOT		SAM	P.				SOIL	AND RO		RIPTION		
(ft)	(ft)	(ft)	0.5ft	0.5f	ť 0.	5ft	0	25		50	7	5	100	NO.	/м	DI G	ELEV.	(ft)	OOIL,		SORDE			DEPTH (ft) (ft) (ft)	(ft)	0.5ft	0.5ft	0.5ft	t 0)	25	50	-	75 100	NO.		101 0	<u> </u>				ONDEON			
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	2 887	$\frac{1}{5+10}$				+	1	• • •		· ·			•				- 2,888. -	5	RO	GROUI	ND SUR	FACE NKMEN	т	0	.0		‡														Ę			000101		~ -		
000			3	2	;	3	∮ 5	· ·	· · ·	· · · ·	· · · ·	· · ·	·		м		_	Tar	n to brow	/n, sanc	ly CLAY	(A-6), lit	tle grave	el		2,8	85.8	1.0		-			1		.							2,886.8	RC	GROUN	D SURFA	ICE KMENT		0.0
288	2,885.	0 3.5	2	3	;	3	6.			+					м		-								20	200	+	25	3	2	3		∳ ⁵	<u> </u>				SS-6	6 31	% L		Ta (an and b A-7-5), t	rown, sa ace grav	ndy highl el, trace	 plastic C prganics, I 	LAY little	
	2,882.	5 6.0	3	3		2		· ·	· · ·		· · · ·	· · ·			M		_									,0	<u></u>	3.5	2	2	1	14	j 3	· · · ·	.	· · ·	· · · · ·		N					, i	mica			
288	2,880.	0 8.5					¶ ⁵	• •	• • •	· ·	•••	• • •	•		- WI.		<u>- 2,880.</u>	5						8	0 28	380 2,8	80.8	6.0	1	WOH	15	┨┝	· · · ·		.				l v	vL	L	.2,879.8						7.0
		ŧ			4	2	•3 · ·	· ·	· · ·		· · · ·	· · ·	•		w		-	Gra	ay, sandy	/ SILT (A-4), littl	e mica, f	trace roo	:k		2,8	78.3	8.5	6	6	q		· · • • •		.	· · · · · ·						В	3rown, ta	RES n, sandy	SIDUAL SILT (A-4), trace m	nica,	
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287	2,875.	0 13.5	1	2		3	6 5	<u>. .</u>		<u> </u>					w		- 2 873	5						15	0	375		10 5					./	+				1										
		1					4 °											Bo	ring Tern	minated	l at Elev	ation 2,8	73.5 ft in	1		2,8	73.3	13.5	1	1	3		∕ •4 <u></u>		.	· · ·	· · · ·		v	٧		2,871.8						15.0
		1															-		T C	Sidual.	Sandy O		/				1														L	. Bo	oring Terr Re	minated a sidual: s	at Elevati andy SIL	on 2,871.8 - (A-4)	8 ft in	
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WE	3S 34	518.1.FR	6			TIP	R-2915	iΕ	C	OUNTY	ASHE				GEO	LOGIST D.G	oodnight			WBS	S 34518	3.1.FR6	6		ТІ	FIP F	R-2915E		COUNT	Y ASHE				GEOL	OGIST	D. Good	night		
SI	E DES	CRIPTIO	NU	S 221	From	US	221 Bypa	ass to l	JS 221	Busine	ess/NC 88	- Soun	d Barr	rier Wa	all NW7E	3		GROUND	WTR (ft)	SITE	E DESCR	RIPTION	N US	221 F	rom U	JS 22	21 Bypas	s to US :	221 Busir	ness/NC 88	3 - Sound	Barrie	er Wal	II NW7B			G		VTR (ft)
BC	RING	10 . NW	7B 22	2+00		STA	TION 2	2+00			OFFSET	5 ft RT			ALIG	NMENT -NW	7B-	0 HR.	Dry	BOR	RING NO	. NW7	7B 23+	+00	S	STATI	ION 23	+00		OFFSET	5 ft RT			ALIGN	MENT	-NW7B-		HR.	6.8
cc	ILLAR	ELEV . 2	2,885.	3 ft		тот	AL DEP	TH 15	5.0 ft		NORTHIN	G 980	,793		EAS	FING 1,274,3	52	24 HR.	5.6	COL	LAR ELI	EV. 2,	,884.5	ft	т	ΟΤΑΙ		H 15.0 f	ť	NORTHIN	IG 980,	819		EASTI	NG 1,2	274,448	24	HR.	0.0
DR	ILL RIG	HAMMER	EFF./C	ATE	TRI80	16 M	DBILE B-57	7 95% (03/19/20	18		DRILL	. METH	IOD	I.S. Auger	S	HAM	MER TYPE A	utomatic	DRIL	L RIG/HA	MMER E	EFF./DA	ATE T	RI8016	MOBI	BILE B-57	95% 03/1	9/2018	•	DRILL	METHO	DD H.	.S. Augers			HAMMER	TYPE Aut	iomatic
DR	ILLER	Estep, .	J. E.			STA	RT DAT	E 08/0	01/18		COMP. D	ATE 08	3/01/1	8	SUR	FACE WATER	DEPTH	N/A		DRIL	LLER E	step, J	J. E.		S	STAR	T DATE	08/01/1	8	COMP. D	ATE 08	/01/18		SURF/	ACE WA	TER DEP	TH N/A		
ELE			н в	LOW C	OUNT	·		BLO	WS PEF	RFOOT		SAM	P. 🔻	L		SOIL AND	D ROCK DE	SCRIPTION		ELEV	/ DRIVE ELEV	DEPTH	H BLC	ow co	UNT			BLOWS	PER FOOT	Г Г	SAMP	· /			SO	IL AND RO	CK DESCRI	PTION	
(π) (ft) (π)	0.5	ft 0.51	ft 0.5	5ft	0	25	50	-	75 100) NO.	_/м	OI G	ELEV. (1	ft)			DEPTH (ft	(π)	(ft)	(π)	0.5ft	0.5ft	0.5ft	0	2	5	50	75 10	0 NO.	И	I G						
289	0	_													F					2885		<u> </u>												-2,884.5		GROUN	D SURFACE		0.0
		ŧ													F						2,883.5	† 1.0 †	1	2	3	┤│╏		· · · · ·		· · · · · ·		м		-	R Tan, brc	20ADWAY	EMBANKM layey sandy	ENT SILT (A-4)	
288	5	ŧ													2,885.3	GR	OUND SUR	FACE	0.0	2880	2,881.0	3.5	2	2	1	$- \begin{bmatrix} I \\ I \end{bmatrix}$	• • • •	· · · · ·		· · · · · ·				-	,trace	organics, f	trace to som	e gravel	
	2,88	4.3 1.0	2	2		3	· · ·						М		-	ROADI Tan, sandy C	NAY EMBA	NKMENT), trace to some			2,878.5	6.0		Ļ,			3					IVI		2,879.0					5.5
	2,88	1.8 3.5	- 2	1		<u> </u>			.						2 <u>,881.3</u>		gravel		4.0		2 876 0	+ + ₈₅		4	13			· · · · ·				W		-	Tan, bro	own, gray, s	fragments	A-2-4), little	
288	0 2,87	9.3 6.0					¶3····	· ·						<u>/</u>	-	Gray to tan, si	RESIDUAI ilty SAND (A	L \-2-4), little mica	,	2875		+ 0.0	10	3	3	┨┝┥	6	· · · · ·				Sat.		_	mica,	Some rock	inaginento,	sapronte	
	0.07	, †	1	1	6	5	• 7		.				W	/	-		saprolitic					Ŧ				11.								-					
287	'5	<u></u>	6	3	3	3	• • • • • •		.				w	1	-					2870	2,871.0	13.5	3	4	6		• • • •	· · · · ·		· · · · · ·				-					
		Ŧ					1	· ·				1			-							†	-				- • 10					~~~		-2,869.5	Boring T	erminated ;	at Elevation	2,869.5 ft in	15.0
	2,87	<u>1.8 13.5</u>	1	2		,			.					,								Ŧ											F	-	R	Residual: sil	ty SAND (A-	2-4)	
		+	+ ·		+-		• <u>4</u> · · ·	• •				4		/	2,870.3	Boring Termina	ated at Elev	ation 2,870.3 ft	15.0 n		-	Ŧ											F	_					
		Ŧ													F	Residu	al: silty SAN	ID (A-2-4)				Ŧ											F	-					
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١	VBS	34518.1	.FR6			TI	P R-2918	5E	C	COUNT	ASHE				GEOL	.OGIST D. God	odnight		WB	35 3451	8.1.FR6		Т	IP R-2	915E	COUNT	Y ASHE			GEOL	.OGIST D. Goodnigl	nt	
\$	SITE I	DESCRIP	TION	US 2	221 Fr	om US	6 221 Byp	ass to	US 22 ⁻	1 Busin	ess/NC 8	8 - Sour	nd Ba	rrier V	Vall NW7B		GR	OUND WTR (ft)	SIT	E DESCR	RIPTION	US 221	From U	JS 221 E	Bypass to L	JS 221 Busir	ness/NC 88	- Sound	Barrier W	all NW7B		GROUNI	D WTR (ft)
E	BORI	NG NO.	NW7E	B 24+	00	ST	ATION 2	24+00			OFFSET	5 ft R	Т		ALIG	MENT -NW7E	3- O H	IR. 7.7	BO	RING NO) . NW7	B 25+00	S	TATION	25+00		OFFSET	5 ft RT		ALIG	MENT -NW7B-	0 HR.	7.4
0	OLL	AR ELE\	. 2,8	882.6 f	t	т	TAL DEP	PTH 15	5.0 ft		NORTHI	NG 980	0,844		EAST	ING 1,274,545	24 H	IR. 2.3	CO	LLAR EL	. EV. 2,8	381.5 ft	T (DEPTH 15	.0 ft	NORTHIN	G 980,8	370	EAST	ING 1,274,642	24 HR.	5.5
[RILL	RIG/HAMI	IER EF	F./DA	TE TR	18016	MOBILE B-5	57 95%	03/19/20	018		DRIL	L ME1	HOD	H.S. Augers		HAMMER TY	PE Automatic	DRI	ILL RIG/HA	MMER E	FF./DATE	TRI8016	MOBILE	B-57 95% C	03/19/2018		DRILL	METHOD	H.S. Augers	н.	AMMER TYPE	Automatic
ſ	RILL	.ER Est	ep, J.	E.		ST	ART DAT	E 08/	/01/18		COMP. D	DATE 0	08/01	18	SURF	ACE WATER DI	E PTH N/A		DR	ILLER E	Estep, J.	E.	S	START D	DATE 08/0)1/18	COMP. DA	ATE 08/	01/18	SURF	ACE WATER DEPTH	N/A	
E	LEV	DRIVE ELEV	EPTH	BLO	W COL	JNT		BLO	WS PEI	R FOOT		SAM	1P.			SOIL AND F	OCK DESCRIPT	ION	ELE	V DRIVE ELEV	DEPTH	BLOW C	OUNT		BLOV	WS PER FOOT	Г	SAMP.			SOIL AND ROCK	DESCRIPTION	
_	(π)	(ft)	(π)	0.5ft	0.5ft	0.5ft	0	25	50		75 10	0 NC).		ELEV. (ft))		DEPTH (f) (π)) (ft)	(π)	0.5ft 0.5f	ft 0.5ft	0	25	50	75 100	NO.	MOI G				
2	885														L				2885	5	\downarrow									L			
		Į.													2,882.6	GROL	JND SURFACE	0.			‡									È		1054.05	
2	880	2,881.6+ +	1.0	2	4	4			•••	· · · · ·			•	M	\$	ROADWA Tan to gray, san	AY EMBANKMEN dy CLAY (A-7-6),	T trace to	2880	2,880.5	1.0				•••					- 2,881.5	GROUND S RESIDI	JRFACE JAL	0.0
ſ		2,879.1	3.5	2	1	3	<u> </u>						Γ		<u>2,879.6</u>	Little mi	ica, trace gravel	<u>3.</u>		2 878 0	+ 35	5 5	5	.,•1	10			SS-67	33%	}	Tan-brown, sandy silty (A-7-5), trace ro	highly plastic CL/ ck fragments	AY
		2,876.6	6.0	_			•		•••	· · · · ·						Tan, sandy CLAY	(A-7-6), trace to l	little mica, itic		2,878.0		1 WOI	H 1	•1 · ·	· · · ·	· · · · · · ·	· · · · · ·		w E	2 876 0			5.5
2	875	2 874 1	85	1	3	1	• 4		•••	· · · ·			1	~	2,874.6			<u>8.</u>	2875	2,875.5	6.0	1 1	1		•••				Sat.		Tan-brown, silty	SAND (A-2-4)	
	Ē	<u>,,,,,,,,</u>	0.0	1	1	4	•5			· · · · ·				Ν		Brown, gray, silty	y SAND (A-2-4), s	saprolitic		2,873.0	8.5	2 2	2	- <u>1</u> .	· · · · · · · ·	· · · · · · ·				- -			
	870	‡					1:::		· · ·	· · · · ·									2970	· 0	‡				· · · · · · · ·	· · · · · · · · · · · ·	· · · · · ·		Sat.				
	.070	2,869.1	13.5	3	3	5	1					_							2070	-	+							1					
	-	 ‡		5	5		• • 8 <u>•</u> •						H	//	<u>: 2,867.6</u> -	Boring Terminate	d at Elevation 2,8	15.0 67.6 ft in		2,868.0	- 13.5 -	2 4	6	- : 🍾	· · · · ·	· · · · · · ·	· · · · · ·		w	- 2,866.5			15.0
		+													<u>-</u>	Residual:	silty SAND (A-2-4	1)		-	+									-	Boring Terminated at E Residual: silty S	evation 2,866.5 f AND (A-2-4)	ft in
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US 221 from US 221 Bypass to US 221 Business/ NC 88 in Jefferson, NC Sound Barrier Wall NW7B

SOIL TEST RESULTS															
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	<i>P.I.</i>	% BY WEIGHT				% PASSING SIEVE			0/ MOISTUDE	%
							C. SAND	F. SAND	SILT	CLAY	10	40	200	70 MOISTURE	ORGANIC
SS-56	11+00	5' RT	1.0-2.5	A-5(3)	47	10	19	39	20	22	100	90	49	26	N/A
SS-57	11+00	5' RT	6.0-7.5	A-7-5(5)	43	12	11	37	22	30	94	89	56	54	N/A
SS-58	12+00	5' RT	6.0-7.5	A-2-4(0)	24	0	18	48	9	25	70	64	29	30	N/A
SS-59	13+00	5' RT	6.0-7.5	A-7-6(14)	50	21	9	25	17	49	96	92	68	33	N/A
SS-60	14+00	5' RT	6.0-7.5	A-7-6(18)	55	27	9	23	17	51	93	89	69	34	N/A
SS-61	14+00	5' RT	8.5-10.0	A-2-5(0)	62	10	18	48	14	20	73	68	31	71	N/A
SS-62	15+00	5' RT	1.0-2.5	A-7-5(3)	46	14	13	29	23	35	67	63	43	25	N/A
SS-63	17+00	5' RT	1.0-2.5	A-7-6(10)	48	23	13	28	15	44	86	80	56	28	N/A
SS-64	17+00	5' RT	8.5-10.0	A-7-5(13)	56	18	6	39	36	19	100	98	67	81	N/A
SS-65	19+00	5' RT	1.0-2.5	A-2-5(0)	43	6	20	43	15	22	68	61	29	23	N/A
SS-66	21+00	5' RT	1.0-2.5	A-7-5(17)	66	26	6	34	10	50	91	89	62	33	N/A
SS-67	25+00	5' RT	1.0-2.5	A-7-5(27)	68	34	8	19	13	60	94	90	72	33	N/A