Ö REFERENCE

CONTENTS

DESCRIPTION

LEGEND (SOIL & ROCK)

BORE LOGS AND CORE REPORT

TITLE SHEET

SITE PLAN

CORE PHOTO

PROFILE

SHEET NO.

5-9

STATE OF NORTH CAROLINA

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

STRUCTURE SUBSURFACE INVESTIGATION

COUNTY ONSLOW

PROJECT DESCRIPTION BRIDGE NO. 31 ON -L- (NC 50) OVER SANDY RUN CREEK AT -L- STA. 23 + 71.5

STATE PROJECT REFERENCE NO. B-5626

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES, THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT 1991 707-6550. 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 LIKE-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE DESTREED HAVE THE VELES OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY YARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS,

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

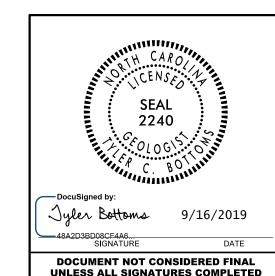
- IES:
 THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N.C. DEPARTMENT
 OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS
 OR CONTRACT FOR THE PROJECT.
 BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS
 FOR INCREASED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

D.N. ARGENBRIGHT S.N. ZIMARINO R.E. SMITH D.G. PINTER INVESTIGATED BY __T.C. BOTTOMS DRAWN BY _T.C. BOTTOMS

CHECKED BY __D.N. ARGENBRIGHT

DATE JUNE 2019

PERSONNEL



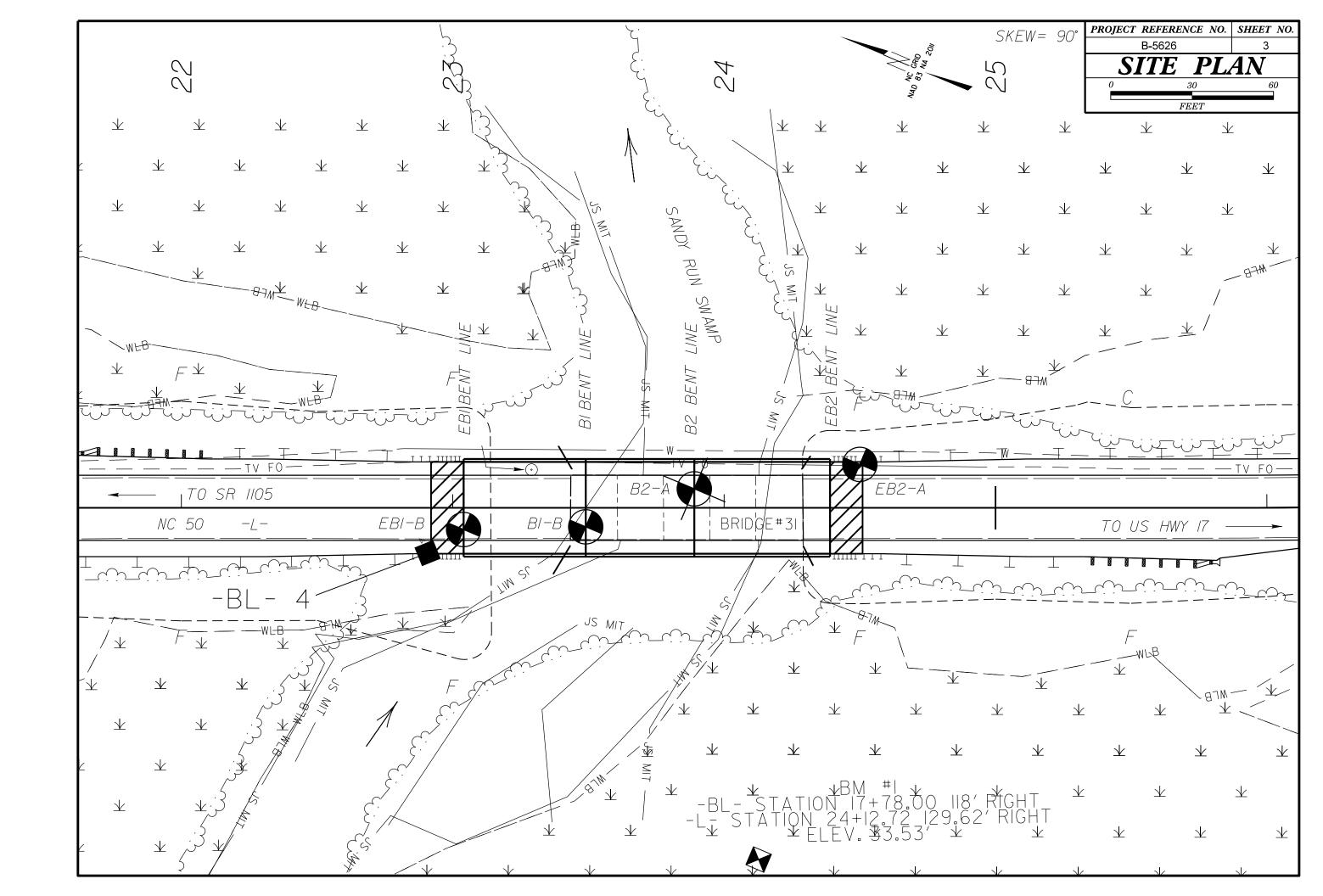
PROJECT REPERENCE NO. SHEET NO. 2

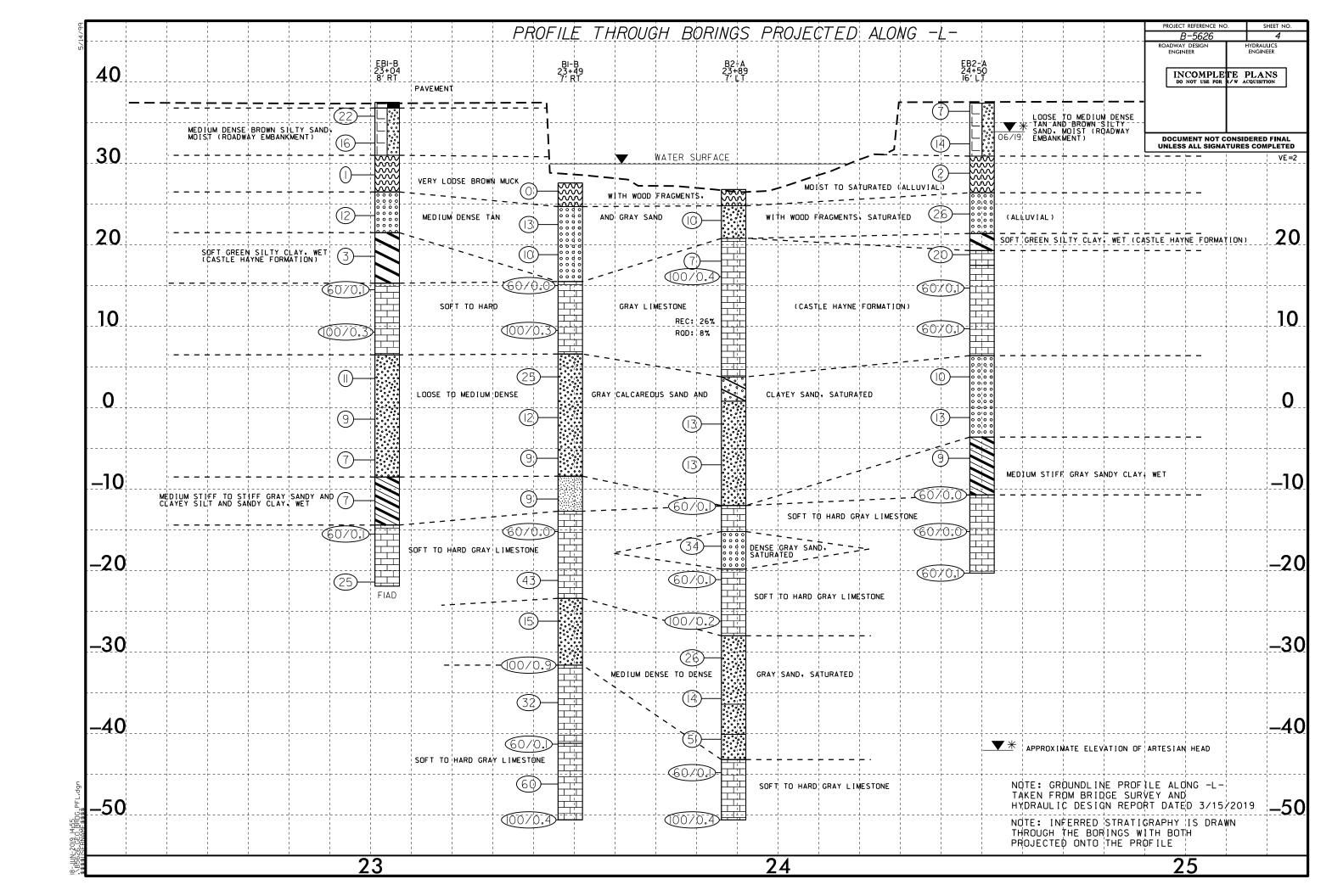
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

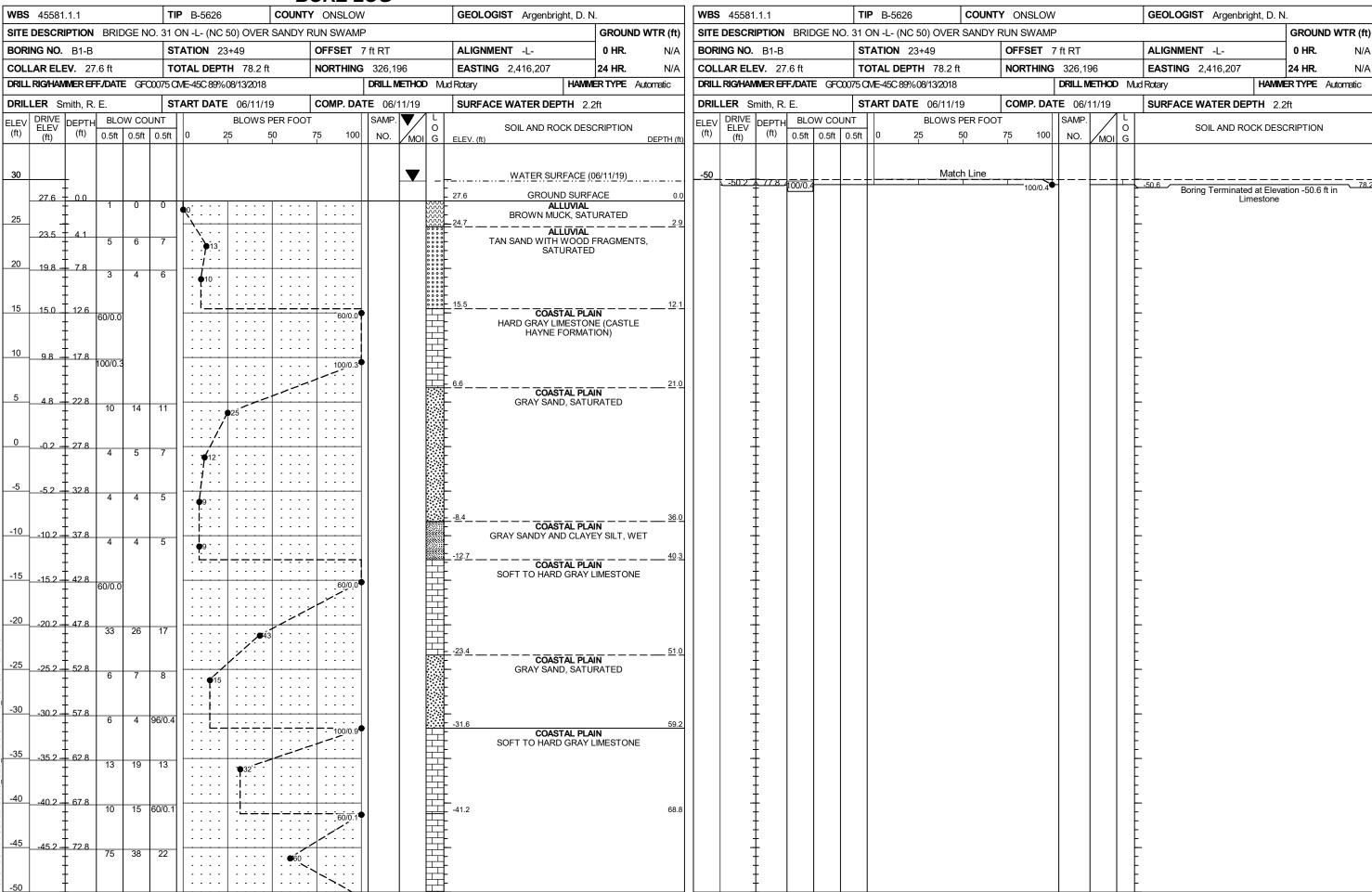
SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS		
SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE.	HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL.	ALLUYIUM (ALLUY.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.		
ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION	GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.	SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN	AQUIFER - A WATER BEARING FORMATION OR STRATA.		
IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH	ANGULARITY OF GRAINS	REPRESENTED BY A ZONE OF WEATHERED ROCK.	ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.		
AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, 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:	ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:	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.		
SOIL LEGEND AND AASHTO CLASSIFICATION	ANGULAR, <u>SUBANGULAR, SUBROUNDED</u> , OR <u>ROUNDED</u> .	WEATHERED // NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > ROCK (WR) 100 BLOWS PER FOOT IF TESTED.	ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT		
GENERAL GRANULAR MATERIALS SILT-CLAY MATERIALS ORGANIC MATERIALS	MINERALOGICAL COMPOSITION	CRYSTALLINE CRYSTALLINE CRYSTALLINE CRYSTALLINE	WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND		
LLASS. (≤ 35% PASSING "200) (> 35% PASSING "200)	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.	ROCK (CR) WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.	SURFACE. <u>CALCAREOUS (CALC.)</u> - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.		
GROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-4, A-5 CLASS. A-1-a A-1-b A-2-4 A-2-5 A-2-6 A-2-7 A-2-5 A-2-6 A-2-7 A-3-4 A-3 A-6, A-7	COMPRESSIBILITY	NON-CRYSTALLINE FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM		
SYMBOL 000000000000000000000000000000000000	SLIGHTLY COMPRESSIBLE LL < 31	ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.	OF SLOPE.		
7. PASSING	MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50	COASTAL PLAIN COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SEDIMENTARY ROCK SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, 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.		
*10 50 MX GRANULAR SILI- MUCK,	PERCENTAGE OF MATERIAL	CP) SHELL BEDS. ETC. WEATHERING	DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT		
*40 30 MX 50 MX 51 MN SOLS SOILS SOI	GRANULAR SILT - CLAY ORGANIC MATERIAL SOILS SOILS OTHER MATERIAL	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 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 COATINGS IF OPEN,	DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE		
LL 40 MX 41 MN LITTLE OR PI 6 MX NP 10 MX 10 MX 11 MN 11 MN 10 MX 10 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 8 8 8 4 4 MX 8 MX 12 MX 16 MX NO MX AND 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 CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.	SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.		
OF MAJOR GRAVEL, AND SAND GRAVEL AND SAND SOILS SOILS	▼ STATIC WATER LEVEL AFTER <u>24</u> HOURS	MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM		
CEN PATING	<u> </u>	(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	SPRING OR SEEP	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	-	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 FIELD.		
CONSISTENCY OR DENSENESS RANGE OF STANDARD RANGE OF UNCONFINED	MISCELLANEOUS SYMBOLS	SEVERE AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH (MOD. SEV.) AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES 'CLUNK' SOUND WHEN STRUCK.	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.		
PRIMARY SOIL TYPE COMPACTNESS OR PENETRATION RESISTENCE COMPRESSIVE STRENGTH	ROADWAY EMBANKMENT (RE) 25/025 DIP & DIP DIRECTION	<u>IF TESTED, WOULD YIELD SPT REFUSAL</u>	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO		
(N-VALUE) (TUNS/FT=)	WITH SOIL DESCRIPTION OF ROCK STRUCTURES	SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC CLEAR AND EVIDENT BUT (SEV.) REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED	ITS LATERAL EXTENT.		
GENERALLY VERY LOOSE < 4 GRANULAR LOOSE 4 TO 10	SOIL SYMBOL Opt ont test boring SLOPE INDICATOR INSTALLATION	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.		
MATERIAL DENSE 10 10 30 N/A	ARTIFICIAL FILL (AF) OTHER AUGER BORING CONE PENETROMETER	IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF VERY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC ELEMENTS ARE DISCERNIBLE	MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.		
(NON-COHESIVE) VERY DENSE > 50	THAN ROADWAY EMBANKMENT TEST	SEVERE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK	PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE		
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 THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. <u>IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF</u>	OF AN INTERVENING IMPERVIOUS STRATUM.		
GENERALLY SOFT 2 TO 4 0.25 TO 0.5 SILT-CLAY MEDIUM STIFF 4 TO 8 0.5 TO 1.0	INFERRED ROCK LINE MONITORING WELL TEST BORING WITH CORE	COMPLETE ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND	RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF		
MATERIAL STIFF 8 TO 15 1 TO 2 COHESIVE) VERY STIFF 15 TO 30 2 TO 4	PIEZOMETER COT NO MANUE	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	***** ALLUVIAL SOIL BOUNDARY \(\triangle \text{ INSTALLATION } \) SPT N-VALUE	ROCK HARDNESS	RUN AND EXPRESSED AS A PERCENTAGE.		
TEXTURE OR GRAIN SIZE	RECOMMENDATION SYMBOLS	VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK, BREAKING OF HAND SPECIMENS REQUIRES	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.		
U.S. STD. SIEVE SIZE 4 10 40 60 200 270	UNDERCUT UNCLASSIFIED EXCAVATION - UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT 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	LICED IN THE TOP 2 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 SAND SAND SILT CLAY	ONDERCOT ACCEPTABLE DEGRADABLE NOCK	MODERATELY 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		
(CSE, SD.) (F SD.)	ABBREVIATIONS	HARD EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK, HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.	OR SLIP PLANE.		
GRAIN MM 305 75 2.0 0.25 0.05 0.005 SIZE IN. 12 3	AR - AUGER REFUSAL MED MEDIUM VST - VANE SHEAR TEST BT - BORING TERMINATED MICA MICACEOUS WEA WEATHERED	MEDIUM CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT.	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		
SOIL MOISTURE - CORRELATION OF TERMS	☐ CL CLAY MOD MODERATELY 7 - UNIT WEIGHT	HARD CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE	WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.		
SOLI MOISTURE SCALE FIELD MOISTURE	CPT - CONE PENETRATION TEST NP - NON PLASTIC $\gamma_{ m d}$ - DRY UNIT WEIGHT CSE COARSE ORG ORGANIC	POINT OF A GEOLOGIST'S PICK. SOFT CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS	STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY		
(ATTERBERG LIMITS) DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION	DMT - DILATOMETER TEST PMT - PRESSUREMETER TEST SAMPLE ABBREVIATIONS DPT - DYNAMIC PENETRATION TEST SAP SAPROLITIC S - BULK	FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN	TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.		
- SATURATED - USUALLY LIQUID; VERY WET, USUALLY	DPT - DYNAMIC PENETRATION TEST SAP SAPROLITIC S - BULK e - VOID RATIO SD SAND, SANDY SS - SPLIT SPOON	PIECES CAN BE BROKEN BY FINGER PRESSURE. VERY CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH	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		
(SAT.) FROM BELOW THE GROUND WATER TABLE LL _ LIQUID LIMIT	F - FINE SL SILT, SILTY ST - SHELBY TUBE FOSS FOSSILIFEROUS SLI SLIGHTLY RS - ROCK	SOFT OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY	THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.		
PLASTIC SEMISOLID; REQUIRES DRYING TO	FRAC FRACTURED, FRACTURES TCR - TRICONE REFUSAL RT - RECOMPACTED TRIAXIAL	FINGERNAIL.	TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.		
(PI) PL PLASTIC LIMIT ATTAIN OPTIMUM MOISTURE	FRAGS FRAGMENTS	FRACTURE SPACING BEDDING TERM SPACING TERM THICKNESS	BENCH MARK: BM #1		
	EQUIPMENT USED ON SUBJECT PROJECT	VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED 4 FEET	N=326089.0847 E=2416118.9858 ELEVATION: 33.53 FEET		
OM OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE SL SHRINKAGE LIMIT	DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE:	WIDE 3 TO 10 FEET THICKLY BEDDED 1.5 - 4 FEET MODERATELY CLOSE 1 TO 3 FEET THINLY BEDDED 0.16 - 1.5 FEET	- -		
REQUIRES ADDITIONAL WATER TO	X CME-45C CLAY BITS X AUTOMATIC MANUAL	CLOSE 0.16 TO 1 FOOT VERY THINLY BEDDED 0.03 - 0.16 FEET VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET	NOTES:		
- DRY - (D) ATTAIN OPTIMUM MOISTURE	X CME-55 G* CONTINUOUS FLIGHT AUGER CORE SIZE:	THINLY LAMINATED < 0.008 FEET	FIAD: FILLED IMMEDIATELY AFTER DRILLING		
PLASTICITY	8* HOLLOW AUGERSH	INDURATION			
PLASTICITY INDEX (PI) DRY STRENGTH	CME-550 HARD FACED FINGER BITS XN W	FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.			
NON PLASTIC 0-5 VERY LOW SLIGHTLY PLASTIC 6-15 SLIGHT	VANE SHEAR TEST TUNGCARBIDE INSERTS HAND TOOLS:	FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.			
MODERATELY PLASTIC 16-25 MEDIUM	X CASING W/ ADVANCER POST HOLE DIGGER	CRAINC CAN BE CERARATER FROM CAMPLE WITH CIFEL BRODE			
HIGHLY PLASTIC 26 OR MORE HIGH	PORTABLE HOIST X TRICONE 2 15/6 STEEL TEETH HAND AUGER	MODERATELY INDURATED BREAKS EASILY WHEN HIT WITH HAMMER.			
COLOR	TRICONE TUNGCARB. SOUNDING ROD	INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.			
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY).	X CORE BIT VANE SHEAR TEST	CHARD HAMMED DI ONE DECITIOEN TO DREAM CAMBLE.			
MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.		EXTREMELY INDURATED SAMPLE BREAKS ACROSS GRAINS.	DATE: 8-15-14		

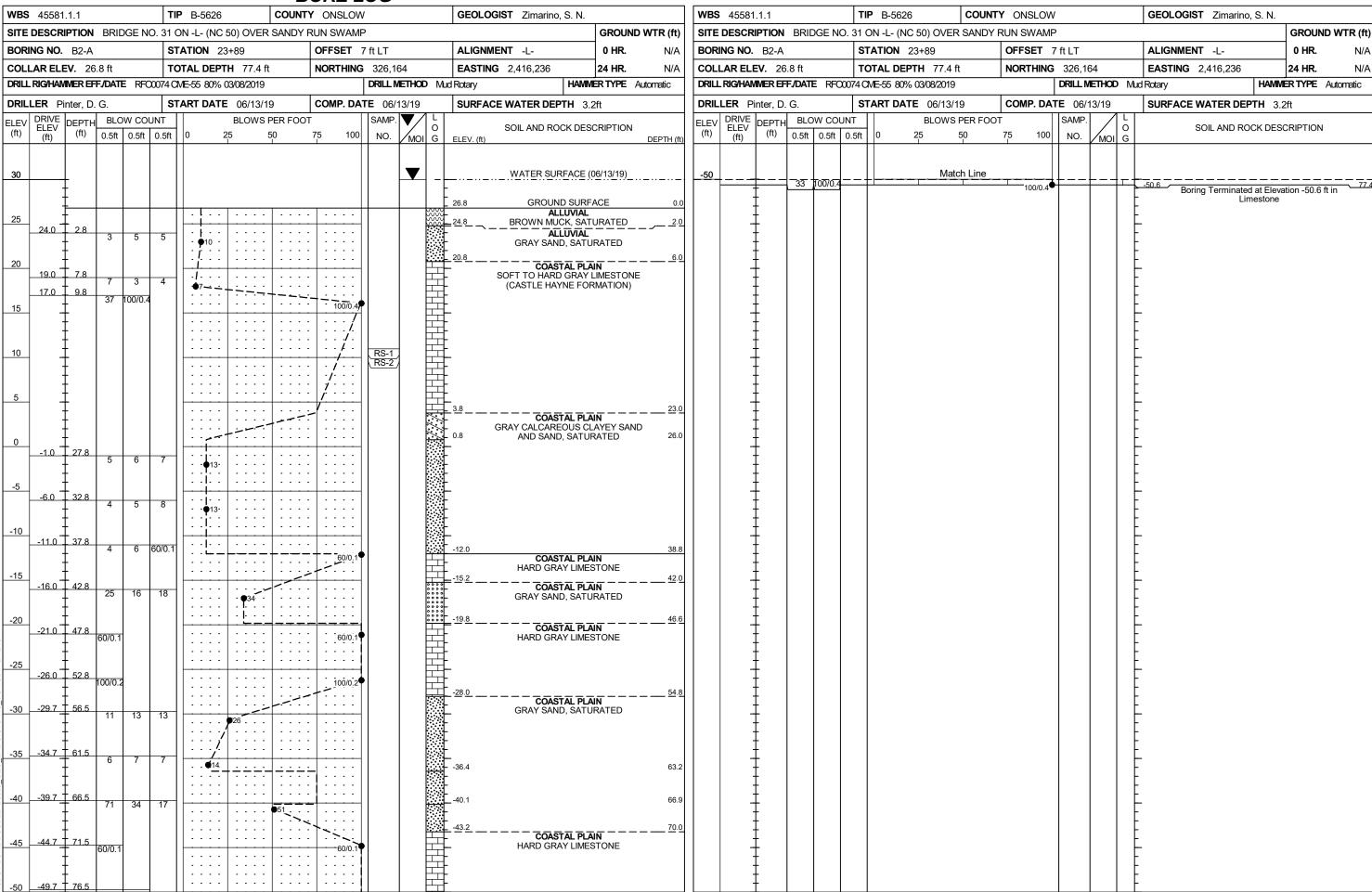




						UKE L				
WBS	45581.1.1			TI	P B-5626 COUNT	Y ONSLOW			GEOLOGIST Argenbright, D. N	
SITE	DESCRIPTION	I BRII	DGE N	O. 31 (ON -L- (NC 50) OVER SANDY F	RUN SWAMP				GROUND WTR (ft)
BOR	ING NO. EB1-	В		S	TATION 23+04	OFFSET 8	ft RT		ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 37.5 ft		TO	OTAL DEPTH 59.4 ft	NORTHING	326,23	37	EASTING 2,416,189	24 HR. FIAD		
DRILL	RIG/HAMMER E	FF./DAT	E GFC	00075 C	DME-45C 89% 08/13/2018		DRILL M	ETHOD Mud	Rotary HAMM	ER TYPE Automatic
DRIL	LER Smith, F	R. E.		S	TART DATE 06/11/19	COMP. DAT	E 06/1	4/19	SURFACE WATER DEPTH N/A	4
ELEV (ft)	DRIVE ELEV (ft) DEPTI (ft)	'	0.5ft		BLOWS PER FOOT 0 25 50	75 100	SAMP. NO.	MOI G	SOIL AND ROCK DESC	CRIPTION DEPTH (fi
40									37.5 GROUND SURFA	ACE 0
35	36.8 = 0.7	10	11	11					36.8 PAVEMENT ROADWAY EMBANI BROWN SILTY SAND	(MENT
	33.5 + 4.0	4	8	8	16				31.0	6
30_	29.6 + 7.9	WOH	WOH	1	• · · · · · · · · · · · · · · · · · · ·			******	ALLUVIAL BROWN MUCK, MOIST TO	SATURATED
25	24.6 + 12.9	2	6	6					26.5 ALLUVIAL TAN SAND WITH WOOD I	
20	<u> </u>				. 1			0000	SATURATED 21.5 COASTAL PLA	16
20_	19.6 + 17.9	1	1	2	4 3 · · · · · · · · · · · · · · · · · · ·				GREEN SILTY CLAY, WE HAYNE FORMAT	ET (CASTLE ION)
15	14.6 - 22.9	60/0.1	П			- 60/0.1			15.3 COASTAL PLA HARD GRAY LIMES	
0	9.6 + 27.9	100/0.	3			100/0.3				TONE
5	4.6 + 32.9	100/0.	9						6.5 COASTAL PLA GRAY SAND, SATU	
	† ±	8	5	6	1 . •11. 7				3,000	VII 25
0	-0.4 - 37.9	3	4	5	• • • • • • • • • • • • • • • • • • •					
-5	-5.5 - 42.9	4	3	4	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			-		
10	-10.5 + 47.9								-8.6 COASTAL PLA	N 46
	-10.5 47.9	4	3	4	:				GRAY SANDY CLAY	
15	-15.5 - 52.9	60/0.1				60/0.1			-14.5 COASTAL PLA SOFT TO HARD GRAY L	
20	-20.5 - 57.9	12	45	40		1				
		13	15	10	♦ 25				-22.0 Boring Terminated at Eleva Limestone	59 tion -22.0 ft in
	+									
	‡									
	‡									







											KE L	50					
	45581					B-562					NSLOW			GEOLOGIST Zimaring	o, S. N.	1	
SITE	DESCR	IPTION	BRII	DGE NO.	31 ON	l -L- (N	C 50) OV	ER SA	NDY I	RUN	SWAMP					GROUN	D WTR (ft)
BORI	NG NO.	B2-A			STA	TION	23+89			OF	FSET 7	ft LT		ALIGNMENT -L-		0 HR.	N/A
		EV . 26	_				PTH 77			NC	RTHING			EASTING 2,416,236		24 HR.	N/A
DRILL	.RIG/HAN	VIMER EF	F/DAT	E RFC00	74 CME	-55 80%	6 03/08/20)19				DRILL METHOD) Mud	Rotary	HAMM	ER TYPE	Automatic
DRIL	LER P	inter, D.	G.		STAI	RT DA	TE 06/1	3/19		CC	MP. DAT	E 06/13/19		SURFACE WATER DE	PTH 3.2	2ft	
COR	E SIZE	NW					1 13.9 f										
ELEV	RUN ELEV	DEPTH		DRILL RATE	REC.	UN RQD	SAMP. NO.	REC.	RQD	P			DI	ESCRIPTION AND REMAR	KS		
(ft)	(ft)	(ft)	(ft)	(Min/ft)	(ft) %	(ft) %	NO.	(ft) %	(ft) %	G	ELEV. (ft)					DEPTH (ft)
20.79 20	_							(4.5)	(1.4)	Ь.	20.8			Begin Coring @ 6.0 ft COASTAL PLAIN			6.0
		Ŧ		N=7				26%	8%	片	- 20.0	SOFT TO HA	ARD GF	RAY LIMESTONE (CASTLE	HAYNE I	FORMATIC	
	15.9	I I 10.9		N=100/0.4	4					井	E						
15	-	Ŧ -	3.9	00:05/1.0 00:09/1.0	(0.3)	(0.0)				H	F						
	12.0	T 14.8		00:17/1.0 00:44/0.9		070				H	F						
10		Ŧ	5.0	00:08/1.0 01:51/1.0	(2.6) 52%	(1.5) 30%				H	F						
		Ŧ		03:06/1.0		0070				Ħ	F						
ŀ	7.0	19.8	5.0	00:17/1.0	(1.6)	(0.4)				Ħ	F						
5	_	‡	0.0	00:07/1.0 00:44/1.0	I 32%	8%				Ħ	3.8						23.0
	2.0	24.8		00:06/1.0 00:03/1.0						\	3.0 -			COASTAL PLAIN			
0	2.0	‡		00.03/1.0							0.8	GRAY CAI	CARE	OUS CLAYEY SAND AND	SAND, SA	TURATEL	26.0
	-	‡		N=13							-						
		‡		N=13							ļ.						
-5	-	‡															
	,	‡		N=13							t						
40		‡									t						
-10	-	‡															
		‡		N=60/0.1							-12.0			COASTAL PLAIN			38.8
-15		ŧ								臣	15.2			HARD GRAY LIMESTON	E		42.0
		ŧ		N=34						0000	L			COASTAL PLAIN GRAY SAND, SATURATE	 -D		
		ŧ								0000	E				_		
-20	-	$\frac{1}{2}$									<u>-19.8</u>			COASTAL PLAIN			46.6
		Ŧ		N=60/0.1						臣	F			HARD GRAY LIMESTON	E		
-25		Ŧ								Ħ	F						
		Ŧ		N=100/0.2						臣	F						
		Ŧ									<u>-28.0</u>			COASTAL PLAIN			<u>54</u> .8
-30	_	Ŧ		N=26							<u> </u>			GRAY SAND, SATURATE	D		
		‡									F						
-35		‡									-						
	-	‡		N=14							- 36.4						63.2
		‡									ļ						
-40	_	‡		N=51							40.1						66.9
	,	‡															
45		‡									<u>-43.2</u> -			COASTAL PLAIN			70.0
-45	-	‡		N=60/0.1						臣	 - -			HARD GRAY LIMESTON	E		
		‡								异	<u>}</u>						
-50	-	‡		N=100/0	,					臣	-50.6						77.4
		‡	1	N=100/0.4	1					۲	-50.0	Bori	ng Ter	minated at Elevation -50.6 f	t in Limes	tone	11.4
		ŧ									_						
	_	ł									F						
		Ŧ									F						
		Ť	I	1	1	1			I	1	┌						



								D	UKE I	_06	1						
WBS	45581	1.1.1			TI	P B-5626		COUNTY	Y ONSLO	Ν			GEOLOGIST Zir	narino,	S. N.		
SITE	DESCR	IPTION	BRID	DGE N	O. 31 (ON -L- (NC 50) OVER	SANDY F	RUN SWAM	IP			•			GROUN	ID WTR (ft)
BORI	ING NO.	EB2-	A		S	TATION 24+	50		OFFSET	16 ft L	Г		ALIGNMENT -L-			0 HR.	N/A
COLI	LAR ELI	EV . 37	7.4 ft		т	OTAL DEPTH	57.7 ft		NORTHIN	G 326.	.111		EASTING 2,416	.268		24 HR.	3.5 ART
				E GFO		ME-45C 89% 08					METHOD) Mu			HAMIN	ER TYPE	
	LER S					TART DATE		2	COMP. DA				SURFACE WATE	D DED			
			1	OW CO				PER FOOT		SAMI		1 L T	SURFACE WATE	K DEF	TIT IN/	Α	
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	0.5ft			0 25		50 	75 100	11	17	0	SOIL A	ND RO	CK DES	CRIPTION	DEPTH (ft)
40													_				
	37.4	0.0											37.4 G	ROUN	D SURF	ACE	0.0
0.5	07.4	† "	2	3	4	7								DWAY	EMBAN	KMENT	
35	-	<u>†</u>				- '\			 				- I AN AND I	SKOWI	N SILTT	SAND, IVIC	101
	33.4	4.0	5	8	6	14											
30		Ŧ						: : : :					30.9		LUVIAL		6.5
- 00	29.8 -	7.6	WOH	1	1	<u> </u>				11		****		VN MU	CK WITI	H WOOD	
	:	‡										****	FRAGMEN 26.4	TS, MC	DIST TO	SATURAT	ED11.0
25	24.8 -	12.6										****			LUVIAL		
	24.0	T 12.0	10	14	12		26					0000	IAN	SAND	, SATUF	RATED	
	:	‡				:::::/							21.4				16.0
20	19.8 –	17.6							1	↓			19.3 GREEN S		TAL PLA	IN ET (CASTI	
	:	‡	5	12	8	20								AYNE F	ORMAT	TOŇ)	19.9
		+				: +-				!		井			TAL PLA GRAY	JIN LIMESTON	
15	14.8 -	22.6	60/0.1						60/0.1	.		H	•				
	:	‡	00/0.1							!		耳					
40	:	‡								1		岀					
10	9.8 -	27.6	60/0.1						60/0.1	∳		井	-				
		Ŧ							.+-:								
5		‡					 . <u></u>	- :					6.4	COAS	TAL PLA		31.0
<u> </u>	4.8 -	32.6	6	4	6	. 510				1		0000	GRA			IRATED	
		t				• • •											
0	-0.2 -	37.6				-						0000					
	-0.2 -	T 37.0	5	5	8	· · • 13·											
		‡				: : : :						0000	-3.6				41.0
-5	-5.2 -	42.6				- 1							GP/		TAL PLA DY CLA		
		İ	4	4	5	9::							GIV	NI OAN	DI CLA	1, VVL1	
		+															
-10	-10.2 -	47.6	3	60/0.0		-				1			-10.7				48.1
	:	‡	"	00/0.0		: : -T		T :		ĬI .			НДЕ		TAL PLA Y LIMES		
	:	‡								1			104	(D OIV	VI LIIVILV	STONE	
-15	-15.2 -	52.6	60/0.0	1					60/0.0	∳			-				
		+				• • • •				11		井					
-20		Ŧ						: : : :		il –		≕					
	-20.2 -	<u> 57.6</u>	60/0.1						60/0.1	•		 	20.3 Boring Teri	minated	l at Eleva	ation -20.3	57.7 ft in
	:	‡											-	Lim	nestone		
		±										 				ATION OF	
	-	Ŧ										F	- AF	(I ESIA	N HEAD	: 33.9"	
	:	‡															
		±											_				
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	1	Т	1	1	1	l				1	1	ıt					



B2-A 10.9' TO 24.8'

