CONTENTS

2826B

SHEET **DESCRIPTION** TITLE SHEET LEGEND SITE PLAN PROFILE(S) BORE LOGS SOIL TEST RESULTS

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 34871.1.1 (U-2826B) F.A. PROJ. **NHF-52(4)** COUNTY FORSYTH PROJECT DESCRIPTION US 52 FROM SR 4326 (STADIUM DRIVE) TO SR 2264 (AKRON DRIVE) INCLUDING MARTIN LUTHER KING, JR. DRIVE SITE DESCRIPTION RETAINING WALL #1 STA. 17 + 78 TO 20 + 25 -MLKRB-

STATE	STATE PROJECT REFERENCE NO.	SHEET	TOTAL
N.C.	34871.1.1 (U-2826B)	1	5

CAUTION NOTICE

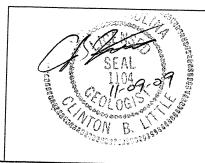
THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY. PLANNING, AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FELD BORNING LOSS, ROCK CORES, AND SOLL TEST DATA AVAILABLE MAY BE REVUEED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT 1999 250-4088. NRITHER THE SUBSURFACE PLANS AND REPORTS, AND THE FILE BURBURFACE PLANS AND REPORTS. NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE 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 BOREADOR LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABLITY INHERENT IN THE STRANDARD TEST METHOD. THE OSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE WYESTIGATIONS ARE AS RECORDED AT THE TABLE OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES. PRECIPITATION, AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

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

_	C.C. MURRAY
	J.E. ESTEP
	M.R. MOORE
<u>-</u> -	
INVESTIGATED BY	C.C. MURRAY
CHECKED BY	C.B. LITTLE
SUBMITTED BY	C.B. LITTLE
DATE	NOVEMBER 2009

PERSONNEL



DRAWN BY: J.K. McCLURE

NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IT IS CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

NOTE - 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.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

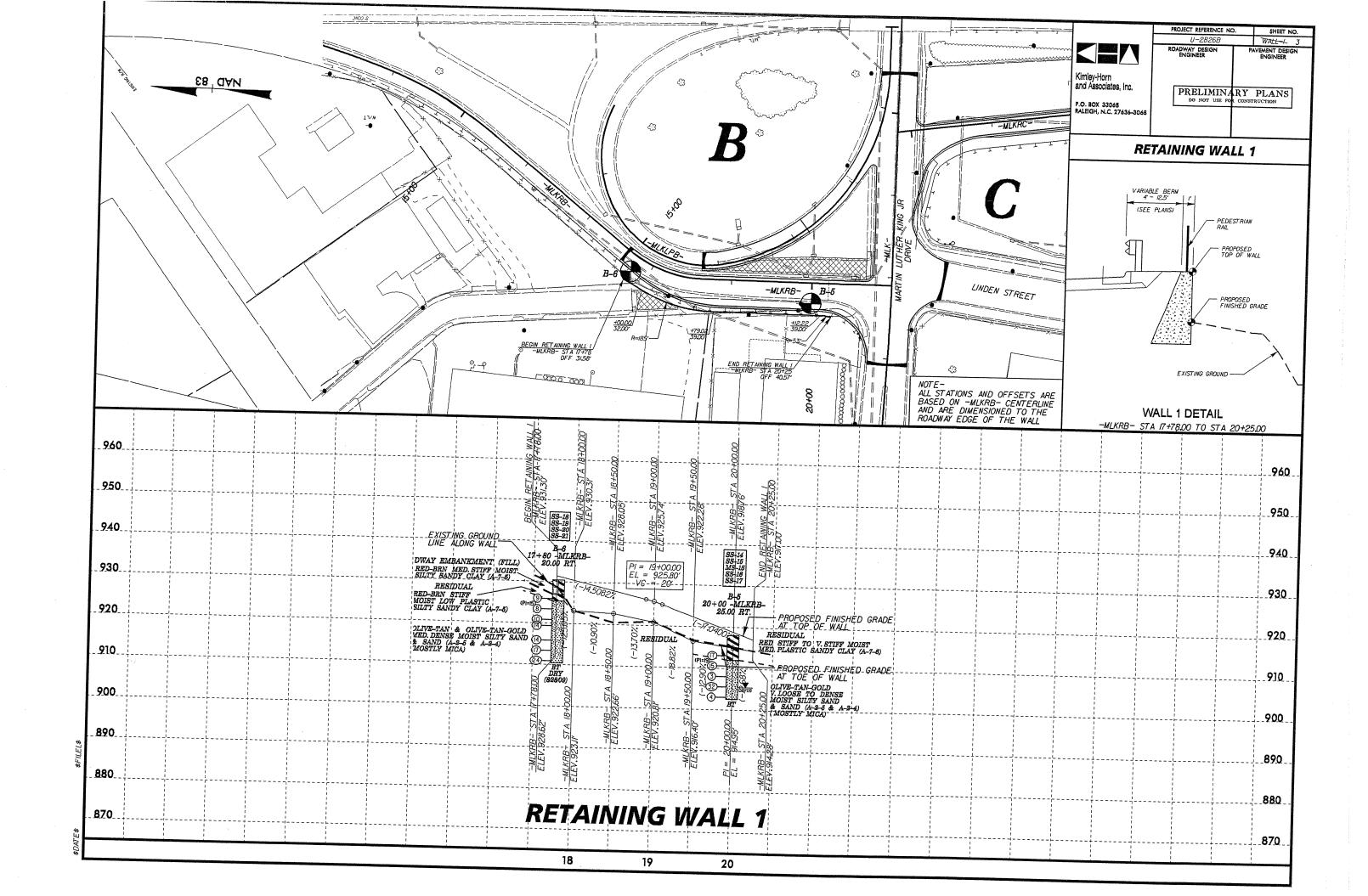
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

	SOIL AND DOOR A DOOR		
CON DESCRIPTION	SOIL AND ROCK LEGEND, TE	RMS, SYMBOLS, AND ABBREVIATIONS	
SOIL DESCRIPTION	CDADATION		
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN JAM BI DUR PER POOT ACCESSION OF THE POWER AUG	WELL GRADED - INDICATED A GOOD DESCRIPTION	ROCK DESCRIPTION	TERMS AND DEFINITIONS
	POORLY GRADED	HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL.	ALL LOST IN
CONSISTENCY, COLOR, TEXTUPE MOISTUPE AGENTS OF AGENTS DESCRIPTIONS GENERALLY SHALL INCLUDE:	GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.		ALLUVIUM (ALLUV.) - SDILS THAT HAVE BEEN TRANSPORTED BY WATER.
AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:	ANGULARITY OF GRAINS	OF WEATHERED BOOK	The second of the state of the
VERY STIFF, GRAY, SOLTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HISRUY PLASTIC, A-7-6	THE ANGULARITY OR ROUNDNESS OF BOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR,	ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:	ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
SOIL LEGEND AND AASHTO CLASSIFICATION	SOBNITIONAL THE SOBROUNDED, OR ROUNDED.	WEATHERED WONLEGGETAL PLAIN MATERIAL	ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS,
GENERAL GRANULAR MATERIALS SILT-CLAY MATERIALS	MINERALOGICAL COMPOSITION	ROCK (WR)	OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.
CLASS. (≤ 35% PASSING *200) (> 35% PASSING *200) DRGANIC MATERIALS	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KADLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.	CRYSTALLINE ROCK (CR) FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT ROCK (CR) VOULD YIELD SPT REFUSAL IF TESTED, ROCK TYPE INCLUDES CRANITE	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 DR ABOVE THE
GROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1 A-2 A-4 A-5	STORY TO STORY TO STORY TO STORY	ROCK (CR) WOULD YIELD SPT REFUSAL IF TESTED, ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.	GROOM SUPFACE.
CLASS. A-1-0 A-1-b A-2-4 A-2-5 A-2-6 A-2-7 A-7-6 A-3 A-6, A-7	COMPRESSIBILITY	NON-CRYSTALLINE FINE TO COARSE GRAIN METAMORPHUTC AND NON COASTAL DUTY	CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
SYMBOL 0000000000	SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 31 MODERATELY COMPRESSIBLE LIQUID LIMIT FOUNT TO SEE	ROCK (NCR) SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED, ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, FTC.	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT POTTOY
2 PASSING	HIGHLY COMPRESSIBLE LIQUID LIMIT EQUAL TO 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50	COASTAL PLAIN COASTAL PLAIN SEDIMENTS CEMENTED INTO DOCK BUT	or score.
* 10 50 MX	PERCENTAGE OF MATERIAL	SEDIMENTARY ROCK SPT REFUSAL ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS. ETC.	CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL
# 40 38 MX 58 MX 51 MN	ORGANIC MATERIAL GRANULAR SILT - CLAY	WEATHERING	THE STATE OF THE EXPRESSED AS A PERCENTAGE.
501LS	TRACE OF ORGANIC MATTER 2 - 3% 3 - 5%		DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.
LIQUID LIMIT HAW AS MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN SOILS WITH	LITTLE ORGANIC MATTER 3 - 5% 5 - 13% TRACE 1 - 10%	FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE.	DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE
THE HX IS MX II MN II MN IS MX IS MX II MN II MN I TITLE OR	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,	HORIZONTAL.
GROUP INDEX 6 0 0 4 MX 8 MX 12 MX 16 MX No MX MODERATE ORGANIC	HIGHLY 35% AND ABOVE	(V SLI.) CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF	DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF
USUAL TYPES STONE FRAGS. TANK OF SOILS	GROUND WATER	OF A CRISTALLINE NATURE.	THE ETTE OF DIE, MEASURED CLOCKWISE FROM NORTH.
DF MAJOR GRAVEL, AND FINE SILTY OR CLAYEY SILTY CLAYEY DRGANIC MATERIALS SAND GRAVEL AND SAND SOILS SOILS MATTER	WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING	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
SEN. RATING	STATIC WATER LEVEL AFTER 24 HOURS	(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 REEHIJVE TO DIE ANOTHER PARALLEL TO THE FRACTURE.
AS A EXCELLENT TO GOOD FAIR TO POOR FAIR TO		MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLODATION AND WEATHERING FERRORS	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
SUBGRADE POOR CHOSELLARD	25 THATA	TOTAL DEPARTURE ROCKS, MUST FELDSPARS ARE DULL AND DISCOLORED COME CLOSE OF ALL DESCRIPTIONS	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM
PI OF A-7-5 SUBGROUP IS ≤ LL - 30; PI OF A-7-6 SUBGROUP IS > LL - 30	SPRING OR SEEP	DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.	THICK! PRIERIAL.
CONSISTENCY OR DENSENESS	MISCELLANEOUS SYMBOLS		FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY
PRIMARY SOIL TYPE COMPACTNESS OR RANGE OF STANDARD RANGE OF UNCONFINED PENETRATION RESISTENCE COMPRESSIVE STRENGTH		SEVERE AND DISCOURSED AND A MAIDENTY SHOW MAD INVESTIGATION BOOK CHARGE ALL FELDSPARS DULL	i e
CONSISTENCY PENETRATION RESISTENCE COMPRESSIVE STRENGTH (N-VALUE) (TONS/FT2)	RDADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION PSPT MATT TEST BORING SPT N-VALUE SPT N-VALUE	THOSE OF THE CHILD OF EXCHANGED WITH A BEDLEDGIST'S PICK, ROCK GIVES TO LINK COUNTY OF THE COUNTY	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN
GENERALLY VERY LODSE <4		I FESTED, WOOLD TIELD SPT REFUSAL	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
GRANULAR LOOSE 4 TO 10 MATERIAL MEDIUM DENSE 10 TO 20 N/A	SOIL SYMBOL AUGER BORING REF SPT REFUSAL	SEVERE ALL ROCK EXCEPT DUARTZ DISCOLORED OR STAINED ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KADLINIZED TO SOME	
MATERIAL MEDIUM DENSE 10 TO 30 N/A (NON-COHESIVE) DENSE 30 TO 50	ARTIFICIAL FILL (AF) OTHER CORE BORING TEST W/ CORE	I LATENIA DUME FRADMENTS DE STRONG ROCK TISTIAL LA REMAIN	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO
VERY DENSE >50	THAN ROADWAY EMBANKMENT CORE BORING TEST W/ CORE BORING	IF TESTED, YIELDS SPT N VALUES > 100 BPF	LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.
VERY SOFT <2	INFERRED SOIL BOUNDARY MONITORING WELL	VERY SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT	MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS AND
GENERALLY SOFT 2 TO 4 (0.25 SILT-CLAY MEDIUM STIFF 4 TO 8 0.25 TO 0.50	-	THE PARS IS EFFECTIVELY REDUCED TO SUIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK	SOLES BOOKEET INDICATES PURK REKATION AND LACK OF GOOD DRAINAGE
MATERIAL STIFF 9 10 15 0.5 TO 1.0	INFERRED ROCK LINE A PIEZOMETER INSTALLATION	VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. IF TESTED, VIELDS SPT N VALUES < 100 BPF	PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PROPERTY
(COHESIVE) VERY STIFF 15 TO 30 1 TO 2	****** ALLUVIAL SOIL BOUNDARY SLOPE INDICATOR	COMPLETE ROCK REDUCED TO SOUL POOR EARDIC NOT DISCEPTIFIE OF DISCEPTIFIES	THE THE THE PART OF THE PART O
330 >4	25/925 DIP & DIP DIRECTION OF INSTALLATION	SCHITTERED CUNCENTHATIONS, QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS CARROLLED TO	RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
TEXTURE OR GRAIN SIZE	POCK ETBUCTUPEO	ALSO AN EXAMPLE.	ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF
S STD SIEVE SIZE	CONE PENETROMETER TEST	ROCK HARDNESS	ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF EXPRESSED AS A PERCENTAGE.
S. STO. STEVE SIZE 4 10 40 60 200 270 PENING (MM) 4.76 2.00 0.42 0.25 0.075 0.053	● SDUNDING ROD	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
Store store	ADDDEVIATIONS	SEVERHE HARD BEDWS OF THE GEOLOGIST'S PICK.	FANERY ROCK.
BOULDER COBBLE GRAVEL COARSE FINE SILT CLAY (BLDR.) (COB.) (GR.) SAND SAND SILT CLAY	ABBREVIATIONS AR - AUGER REFUSAL MED - MEDIUM	HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED	SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND
(CR.) (CSE. SD.) (F SD.) (SL.) (CL.)	BT - BORING TERMINATED VST - VANE SHEAR TEST	TO DETHUM HAND SPECIMEN.	
SPAIN MM 305 75 2.0 0.25 0.05 0.005	CL CLAY MOD MODERATELY	MUDERATELY CAN BE SCRATCHED BY KNIFE OR PICK, GOLIGES OR GROOVES TO BUE INCLUDE DEED AND THE	TO THE BEDDING ON SCHISTOSITT OF THE INTRODED ROCKS.
51ZE 1N. 12 3	OFF COME PENETRATION IEST NP - NON PLASTIC Y- DRY UNIT WEIGHT	HARD EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.	SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT REPULTS FROM FRICTION ALONG A FAULT OR
SOIL MOISTURE - CORRELATION OF TERMS	DMT - DI ATMETER TEST	1	· · · · · · · · · · · · · · · · · · ·
SOIL MOISTURE SCALE FIELD MOISTURE COURSE FOR THE SOURCE FOR THE S	DPT - DYNAMIC PENETRATION THE - IN THE SHIPLE ABBREVIATIONS	THAT BE EXCAVATED IN SMALL CHIPS TO PEICES I INCH MAXIMUM SIZE BY HARD 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
(ATTERBERG LIMITS) DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION	e - VOID RATID SD SAND, SANDY	FORM OF A GEOLOGIST'S PICK.	" E MOI OUTSIDE DIMPETER SPLIT SPITIN SAMPLER SPT REFUSAL TO DENETRATION COURT TO SE
- SATURATED - USUALLY LIQUID; VERY WET, USUALLY	SL SILT, SILTY ST - QUELDY TUDE	SOLI CHI BE SHOVED OR GOUGED HEADILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS	THAT ELL FOUT FER BU BLOWS.
(SAT.) FROM REI DW THE CROWN TANK	FRAC - EPACTURED FRACTURES RS - ROCK	FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.	STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH
STIC LIQUID LIMIT	FRAGS FRAGMENTS 40 - MOISTURE CONTENT	VERY CAN BE CARVED WITH KNIFF CAN BE EXCAVATED BEADY V WITH BOWN OF DAY	TO THE LINE THE PARTY OF THE PA
ANGE SEMISOLID; REQUIRES DRYING TO	HI HIGHLY V - VERY RATIO	IN THICK IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE, CAN BE SCRATCHED BEADY V DV	STRATA ROCK DUALITY DESIGNATION (SROOD) - A MEASURE OF ROCK DUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EDUAL TO DR GREATER THAN 4 INCHES DIVIDED BY THE
PI) PL PLASTIC LIMIT ATTAIN OPTIMUM MOISTURE	EQUIPMENT USED ON SUBJECT PROJECT	F INGERNAIL.	TERROTT OF STRAIN AND EXPRESSED AS A PERCENTAGE.
		FRACTURE SPACING BEDDING -	TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
OM DPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE	DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE:	TERM SPACING IERM IHICKNESS	DENOTE MADIC
SL SHRINKAGE LIMIT	MOBILE B- CLAY BITS X AUTOMATIC MANUAL	MORE IMAN 10 FEET	BENCH MARK:
REQUIRES ADDITIONAL WATER TO	6' CONTINUOUS FLIGHT AUGER COOR OUT	WIDE 3 TO 10 FEET THICKLY BEDDED 1.5 - 4 FEET _ MODERATELY CLOSE 1 TO 3 FEET THINLY BEDDED 0.16 - 1.5 FEET _	
- DRY - (D) ATTAIN OPTIMUM MOISTURE	LURE SIZE:	CLOSE 0.16 TO 1 FFFT VERY THINLY BEDDED 0.03 - 0.16 FFFT	ELEVATION: FT.
PLASTICITY	X 8 HOLLOW AUGERS	VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET N	IOTES:
D. CONTROL OF THE CON	CME-45C HARD FACED FINGER BITS	THINLY LAMINATED COURSE INDURATION	BORING ELEVATIONS DERIVED FROM THE U2826B_LS_TNL_08IIIO.TIN FILE.
PLASTIC 3.5	X TING -CAPRIDE INCOPTS	FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.	1 lander
PLASTICITY 6-15	X CME-550		
D. PLASTICITY 16-25 MEDIUM	CASING W/ ADVANCER	FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.	
20 of More night	PORTABLE HOIST TRICONE STEEL TEETH POST HOLE DIGGER		
COLOR	TRICONE TUNG,-CARB, HAND AUGER	MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.	
SCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY).			
		INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.	
The second of the contract,	VANE SHEAR TEST	EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE:	
		SAMPLE BREAKS ACROSS GRAINS.	

PROJECT REFERENCE NO. 3487I.I.I (U-2826B)

SHEET NO.



BORELOG REPORT

PROJECT NO. 34871.1.1 ID. U-2826B COUNTY FORSYTH GEOLOGIST Murray, C. C. SITE DESCRIPTION RETAINING WALL 1 STA. 17+78 TO 20+25 -MLKRB- (RAMP B) GROUND WTR (ft) BORING NO. B-6 STATION 17+80 OFFSET 20ft RT ALIGNMENT MLKRB 0 HR. COLLAR ELEV. 930.4 ft TOTAL DEPTH 20.0 ft **NORTHING** 859,818 **EASTING** 1,634,457 24 HR. Dry DRILL MACHINE CME-550X DRILL METHOD H.S. Augers HAMMER TYPE Automatic **START DATE** 08/27/09 COMP. DATE 08/27/09 SURFACE WATER DEPTH N/A DEPTH TO ROCK N/A BLOWS PER FOOT SAMP. MOI G SOIL AND ROCK DESCRIPTION 50 75 100 NO. 935 930 GROUND SURFACE ROADWAY EMBANKMENT RED-BRN MED. STIFF MOIST SILTY SANDY CLAY (A-7-5) 926.9 М 925 925.4 RESIDUAL
RED-BRN STIFF MOIST LOW (PI=15)
PLASTIC SILTY SANDY CLAY (A-7-5) SS-18 924.4 + 6.0 921 9 1 8 5 RESIDUAL OLIVE-TAN & OLIVE-TAN-GOLD MED.
DENSE MOIST SILTY SAND & SAND (A-2-5
& A-2-4) (MOSTLY MICA) 920 9204 10.0 SS-19 Μ М 916.9 I 13.5 915 SS-20 M 9144 16.0 910 SS-21 M Boring Terminated at Elevation 910.4 ft IN MED. DENSE MOIST SAND (A-2-4) 905 900 895 890 885 880 870 865 860

NCDOT GEOTECHNICAL ENGINEERING UNIT

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	OJECT N					. U-2826			COUNT	Y FOR	SYTH			GEOLOGIST	Murray, C. C.	
SIT	E DESCI	RIPTIC	ON R	ETAIN	,		ΓA. 17+78 T	O 20+25 -							GROUND	WTR (f
	RING NO					STATION			OFFSE	r 25ft F	RT		ALIGNMEN	T MLKRB	0 HR.	Dry
	LLAR EL						EPTH 15.4		NORTH	NG 85	9,592		EASTING	1,634,427	24 HR.	12.5
	RT DAT						THOD H.S		Γ					HAMMER TY	PE Automatic	
ELEV	DRIVE	DEPTI		OW C		JOIVIP. D	ATE 08/27/0		SURFA		7	PTH I	V/A	DEPTH TO R	OCK N/A	
(ft)	ELEV (ft)	(ft)		t 0.5ff		0		PER FOOT		OO NO	'/	O G	S ELEV. (ft)	OIL AND ROCK [DEPTH (fi
920		-					-		T				918.0	GROUND SU RESIDU	Al	0.0
915	914.1 911.6	3.9	4	7	10	1 1				SS-1	14 M		_ (PI=1	STIFF TO V. STI 9) PLASTIC SAN	FF MOIST MED. DY CLAY (A-7-6)	
910	909.1	8.9	7	7	8		5			SS-1	M 5 39%		912.0 OLIVE MOIS	-TAN-GOLD V. LO ST SILTY SAND & A-2-4) (MOSTL	SAND (A-2-5 &	6.0
905	906.6		5	15	17		32			SS-1	6 M		-			
900						 		<u>L···</u>	<u> </u>	SS-1	7 M		. L	Terminated at Ele OOSE MOIST SA	vation 902.6 ft IN ND (A-2-5)	15.4
895	‡												Other Sa M-15 (<u>mples:</u> 8.9 - 10.4)		
890	T + +											-				
885	Į Į											-				
880	‡ +											-			•	
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PROJECT: 34871.1.1 (U-2826B) COUNTY: FORSYTH

SITE DESCRIPTION: RETAINING WALL #1, STA. 17+78 TO 20+25 -MLKRB-

SHEET

5

E(MPsi)

SOIL S	AMPLE RES	ULTS								÷									
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS	N	L.L.	P.I.	C SAND	% BY WEIC				SSING S	SIEVES	%	%	UNIT	VOID	ROCK SAMPLE RESULTS SAMPLE NO. OFFSET STATION DEPTH ROD UNIT WIT
		B-6						C. SAND	F. SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC	WT. (d)	RATIO	SIMILEN BEFTH ROD UNITWI
SS-18 SS-19 SS-20 SS-21	20 RT 20 RT 20 RT 20 RT	17+80 17+80 17+80 17+80 B-5	3.5-5.0 8.5-10.0 13.5-15.0 18.5-20.0	A-7-5(3) A-2-5(0) A-2-4(0) A-2-4(0)	9 10 14 24	49 42 39 38	15 NP NP NP	34.6 46.5 50.5 45.9	27.2 36.8 34.8 42.7	12.1 10.7 10.7 9.5	26.2 6.0 4.0 2.0	97 98 97 100	79 72 68 77	42 21 19 17					INTERVAL (pcf)
SS-14 SS-15 SS-16 SS-17	25 RT 25 RT 25 RT 25 RT	20+00 20+00 20+00 20+00	3.9-5.4 8.9-10.4 11.4-12.9 13.9-15.4	A-7-6(5) A-2-5(0) A-2-4(0) A-2-5(0)	17 3 32 4	44 61 40 51	19 NP NP NP	32.6 33.8 44.7 41.4	24.5 44.1 42.9 45.3	6.6 14.1 8.5 9.3	36.2 8.0 4.0 4.0	99 96 99	81 78 70 77	45 28 19 20	38.6				

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

CONTENTS DESCRIPTION SHEET

STRUCTURE SUBSURFACE INVESTIGATION

STA. 10 + 50 TO 12 + 00 - Y2 - (LEO ST.)

TITLE SHEET LEGEND SITE PLAN PROFILE(S) BORE LOGS SOIL TEST RESULTS

PROJ. REFERENCE NO. 34871.1.1 (U-2826B) F.A. PROJ. **NHF-52(4)** COUNTY FORSYTH PROJECT DESCRIPTION US 52 FROM SR 4326 (STADIUM DRIVE) TO SR 2264 (AKRON DRIVE) INCLUDING MARTIN LUTHER KING, JR. DRIVE SITE DESCRIPTION RETAINING WALL #2

STATE STATE PROJECT REFERENCE NO. N.C. 34871.1.1 (U-2826B) 1

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 ENORMERING UNIT AT 1919 250-0408. NETHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

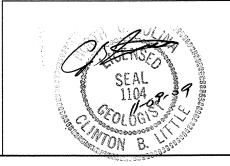
GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORNIOS OR BETWEEN SAMPLED STRATA WITHIN THE BORENOLE, THE LABORATORY SAMPLE DATA AND THE IN STILL (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DESCREE OF RELIABLITY INNERENT IN THE STANDARD TEST METHAD. THE OBSERVED WATER LEVELS OR SOIL MOSTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION, THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS THE ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION, AND WIND, AS WELL AS QTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS THE BIDDER ON THE AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REPER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT, THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY INFORMATION ON THIS PROJECT, THE DEPARTMENT DUES NOT WARRAND ON CALARATICE THE SUPPLICATOR OF ACCURACY OF THE INVESTIGATION MADE, NOR THEIR 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 THIS PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

-	J.E. ESTEP
	M.R. MOORE
Applacement	
INVESTIGATED BY	C.C. MURRAY
CHECKED BY	C.B. LITTLE
SUBMITTED BY	C.B. LITTLE

NOVEMBER 2009

PERSONNEL C.C. MURRAY



48

2826B

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

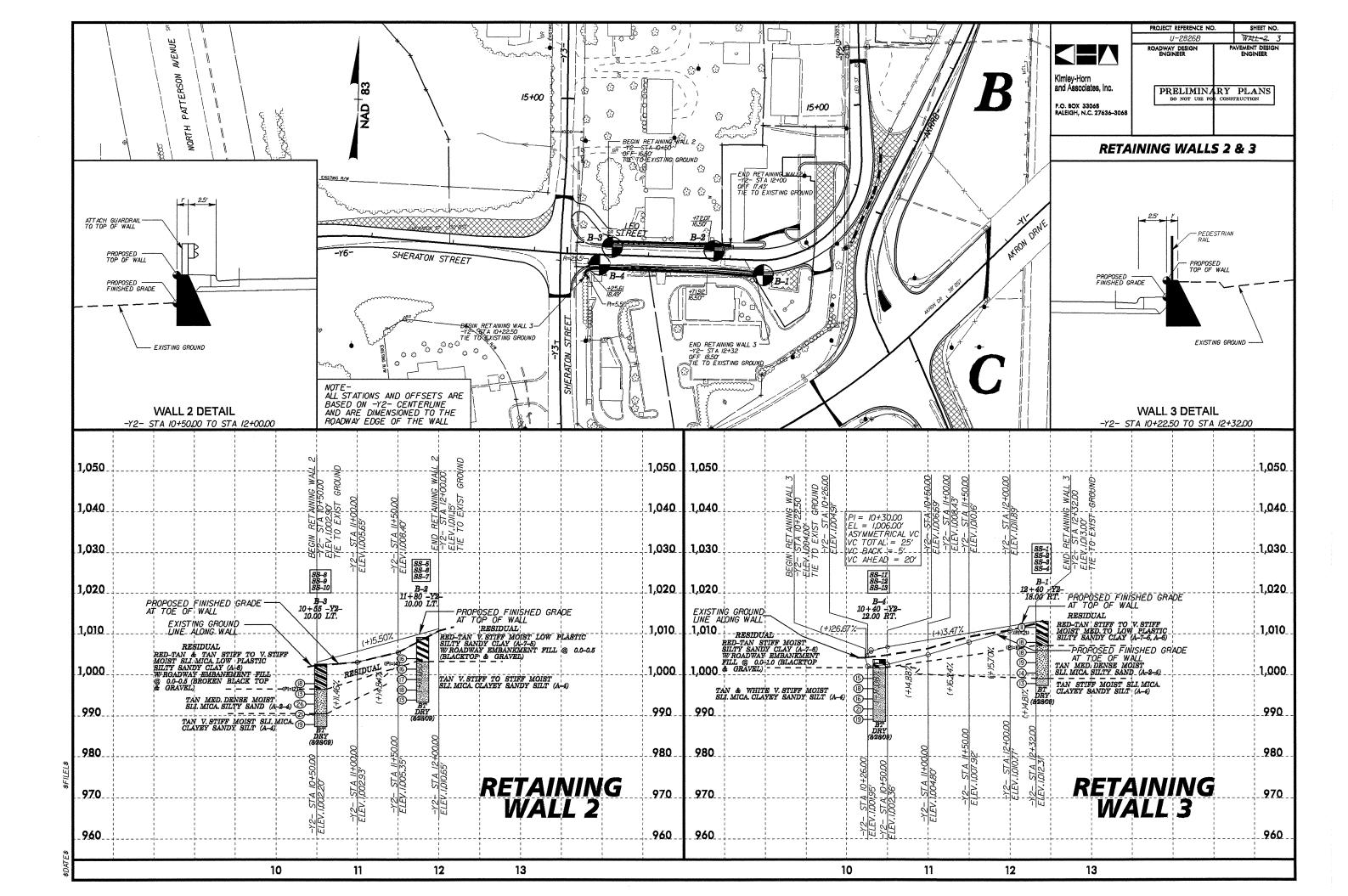
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

	SOIL AND ROCK LEGEND, TERM	S, SYMBOLS, AND ABBREVIATIONS	
SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS
	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.	HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL, AN INFERRED	ALLUVIUM (ALLUV.) - SDILS THAT HAVE BEEN TRANSPORTED BY WATER.
SDIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN	UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED)	ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.	AQUIFER - A WATER BEARING FORMATION OR STRATA.
100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO 1206, ASTM D-1586). SOIL	GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.	IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE	ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
CLASSIFICATION IS BASED ON THE AASHTO SYSTEM, BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH	ANGULARITY OF GRAINS	OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:	ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS,
AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:	THE ANGULARITY OR ROUNDNESS OF 601L GRAINS IS DESIGNATED BY THE TERMS; ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.	WEATHERED NON-COASTAL PLAIN MATERIAL THAT WOULD VIELD SPT N VALUES > 100	OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.
VERY STIFF, GRAC, SITY CLAC, MOIST WITH INTERBEDDED FINE SAND LAVERS, HIGHLY PLASTIC, A-7-6	MINERALOGICAL COMPOSITION	ROCK (WR) 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
SOIL LEGEND AND AASHTO CLASSIFICATION GENERAL GRANULAR MATERIALS SILT-CLAY MATERIALS CONSUM MATERIALS	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS	CRYSTALLINE FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED, ROCK TYPE INCLUDES GRANITE,	GROUND SURFACE.
GENERAL GRANULAR MATERIALS SILT-CLAY MATERIALS CLASS. (≤ 35% PASSING *200) (> 35% PASSING *200) ORGANIC MATERIALS	WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.	GNEISS, GABBRO, SCHIST, ETC.	CALCAREOUS (CALC.) - 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	COMPRESSIBILITY	NON-CRYSTALLINE FINE TO COARSE GRAIN METAMORPHIC AND NON-CDASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YELD SPT REFUSAL IF TESTED, ROCK TYPE	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM
CLASS. A-1-0 A-1-b A-2-4 A-2-5 A-2-5 A-2-7 A-7-6 A-3 A-6, A-7	SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 31	INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.	OF SLOPE.
SYMBOL COCCOCCOCC	MODERATELY COMPRESSIBLE LIQUID LIMIT EQUAL TO 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 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.
(PASSING	PERCENTAGE OF MATERIAL	(CP) SHELL BEDS, ETC.	DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT
* 10 GRANULAR SILT MUCK,	ORGANIC MATERIAL SOILS SOILS OTHER MATERIAL	WEATHERING	ROCKS OR CUTS MASSIVE ROCK.
* 40 38 MX 58 MX 51 MN	TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10%	FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE.	DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE
	LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20%	VERY SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN,	HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF
PLACTIC INDEX 6 MX NP 10 MV 10 MV 11 MN 11 MN 10 MV 10 MV 11 MN 11 MN	MDDERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35% HIGHLY ORGANIC >10% >20% HIGHLY 35% AND ABOVE	(V SLI.) CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF	THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
GROUP INDEX 0 0 0 0 4 MX 8 MX 12 MX 16 MX No MX MODERATE DRGANIC	GROUND WATER	OF A CRYSTALLINE NATURE.	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE
AMOUNTS OF SOILS	✓ WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING	SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO (SLI.) 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR	SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
OF THEOR COMPCE AND GRAVE AND SAND SOUS SOUS MAILER	STATIC WATER LEVEL AFTER 24 HOURS	CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
MATERIALS SARU		MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM
AS A EXCELLENT TO GOOD FAIR TO POOR POOR POOR UNSUITABLE	PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA	(MOD.) GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY, ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED	PARENT MATERIAL.
SUBURAUE	SPRING OR SEEP	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 CONSISTENCY OR DENSENESS	MISCELLANEOUS SYMBOLS	MODERATELY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL SEVERE AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN
RANGE OF STANDARD RANGE OF UNCONFINED		(MOD.SEV.) AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK.	THE FIELD.
PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY PENETRATION RESISTENCE (N-VALUE) (TONS/FT2)	ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION PSPT N-VALUE SPT DET DAT TEST BORING SPT N-VALUE SPT N-VALUE	IF TESTED, WOULD YIELD SPT REFUSAL	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
VERY LODGE	SPI REFUSAL	SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED (SEV.) IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO
CRANIII AR LOOSE 4 TO 10	SUL STRIBUL	EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN.	ITS LATERAL EXTENT.
MATERIAL MEDIUM DENSE 10 TO 30	ARTIFICIAL FILL (AF) OTHER - CORE BORING TEST W/ CORE BORING THAN ROADWAY EMBANKMENT	IF TESTED, YIELDS SPT N VALUES > 100 BPF	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
(NON-COHESIVE) VERY DENSE >50	MW C	VERY SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT (V SEV.) THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK	SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
VERY SOFT <2 <0.25	an Emile Gold Bookstin	REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR	PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN
GENERALLY SOFT 2 TO 4 0.25 TO 0.50	INFERRED ROCK LINE A PIEZOMETER INSTALLATION	VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. IF TESTED, YIELDS SPT N VALUES < 100 BPF	INTERVENING IMPERVIOUS STRATUM.
MATERIAL STIFF 8 TO 15 1 TO 2	ALLUVIAL SDIL BOUNDARY SLOPE INDICATOR	COMPLETE ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS, QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS, SAPROLITE IS	RESIDUAL (RES.) SDIL - SDIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
(COHESIVE) VERY STIFF 15 TO 30 2 TO 4 HARD >30 >4	INSTALLATION	ALSO AN EXAMPLE.	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
	25/825 DIP & DIP DIRECTION OF ROCK STRUCTURES	ROCK HARDNESS	EXPRESSED AS A PERCENTAGE.
TEXTURE OR GRAIN SIZE		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
U.S. STD. SIEVE SIZE 4 10 40 60 200 270	● SOUNDING ROD	SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.	PARENT ROCK. 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	ABBREVIATIONS	HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY, HARD HAMMER BLOWS REQUIRED	RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL
BOULDER COBBLE GRAVEL COARSE FINE SILT CLAY	AR - AUGER REFUSAL MED MEDIUM VST - VANE SHEAR TEST	TO DETACH HAND SPECIMEN.	TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.
(BLDR,) (COB,) (GR,) (CSE, SD,) (F SD,) (SL,) (CL,)	BT - BORING TERMINATED MICA MICACEOUS WEA WEATHERED	MODERATELY CAN BE SCRATCHED BY KNIFE OR PICK, GOUGES OR GROOVES TO 0,25 INCHES DEEP CAN BE HARD EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK, HAND SPECIMENS CAN BE DETACHED	SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT REGULTS FROM FRICTION ALONG A FAULT OR
GRAIN MM 305 75 2.0 0.25 0.05 0.005	CL CLAY MOD MODERATELY 7- UNIT WEIGHT CPT - CONE PENETRATION TEST NP - NON PLASTIC 7 DRY UNIT WEIGHT	BY MODERATE BLOWS.	SLIP PLANE.
SIZE IN. 12 3	CSE CDARSE DRG DRGANIC	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 WITH
SOIL MOISTURE - CORRELATION OF TERMS	DMT - DILATOMETER TEST PMT - PRESSUREMETER TEST SAMPLE ABBREVIATIONS DPT - DYNAMIC PENETRATION TEST SAP SAPROLITIC S - BULK	HARD CAN BE EXCAVATED IN SMALL CHIPS TO PEICES I INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.	A 2 INCH DUTSIDE DIAMETER SPLIT SPOON SAMPLER, SPT REFUSAL IS PENETRATION EQUAL TO OR LESS
SOIL MOISTURE SCALE FIELD MOISTURE GUIDE FOR FIELD MOISTURE DESCRIPTION (ATTERBERG LIMITS) DESCRIPTION	e - VOID RATIO SD SAND, SANDY SS - SPLIT SPOON	SOFT CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS	THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH
(ATTERBERG LIMITS) DESCRIPTION CORP. 1 STATE OF	F - FINE SL SILT, SILTY ST - SHELBY TUBE	FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.	OF STRATUM AND EXPRESSED AS A PERCENTAGE.
- SATURATED - USUALLY LIQUID; VERY WET, USUALLY (SAT.) FROM BELOW THE GROUND WATER TABLE	FOSS FOSSILIFEROUS SLI SLIGHTLY RS - ROCK FRAC FRACTURED, FRACTURES TCR - TRICONE REFUSAL RT - RECOMPACTED TRIAXIAL		STRATA ROCK QUALITY DESIGNATION (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY
LL _ LIQUID LIMIT	FRAGS FRAGMENTS # - MOISTURE CONTENT CBR - CALIFORNIA BEARING	SOFT OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY 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.
PLASTIC SEMISOLID; REQUIRES DRYING TO	HI HIGHLY V - VERY RATIO	FINGERNAIL.	TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
RANGE - WET - (W) ATTAIN OPTIMUM MOISTURE	EQUIPMENT USED ON SUBJECT PROJECT	FRACTURE SPACING BEDDING TERM SPACING IERM THICKNESS	
PLL + PLASTIC LIMIT	DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE:	JENU STRUMO STRU	BENCH MARK:
OM OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE	CLAY BITS X AUTOMATIC MANUAL	WIDE 3 TO 10 FFFT THICKLY BEDDED 1.5 - 4 FEE!	ELEVATION: FT.
SL SHRINKAGE LIMIT	- MOBILE B -	MODERATELY CLUSE 1 TO 3 FEET VERY THINKY REDDED 0.03 - 0.16 FEET	
REQUIRES ADDITIONAL WATER TO - DRY - (D) ATTAIN OPTIMUM MOISTURE	Cont. Sizzi	VERY CLOSE USES LESS THAN DIS FEFT THICKLY LAMINATED 0.008 - 0.003 FEET	NOTES:
HITAIN OF ITHOU POSTONE	- NULLUW HUDERS	INDURATION C.0.008 FEET	BORING ELEVATIONS DERIVED FROM THE U2826B_LS_TNL_08 10.TIN FILE.
PLASTICITY	CME-45C HARD FACED FINGER BITS	INDUCH I ION FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.	
PLASTICITY INDEX (PI) DRY STRENGTH	TUNGCARBIDE INSERTS		
NDNPLASTIC 0-5 VERY LOW LDW PLASTICITY 6-15 SLIGHT	X CME-550 CASING W/ ADVANCER	FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.	
MED. PLASTICITY 16-25 MEDIUM	PORTABLE HOIST TRICONE STEEL TEETH POST HOLE DIGGER	WODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE:	
HIGH PLASTICITY 26 OR MORE HIGH		MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.	
COLOR	SOLINDING BOD	INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE;	
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY).	CORE BIT SOUNDING TOD	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.	

PROJECT REFERENCE NO. 3487I.I.I (U-2826B)

SHEET NO.





PRO.	JECT N	O . 348	371.1.	1	ID.	U	J-2826B		cou	NTY	FORSY	TH			GEOLOGIST N	lurray, C. C.	
SITE	DESCR	IPTIO	N RE	TAININ	NG W	ALI	L 2 STA. 10+	+50 TO 12+00) -Y2- (L	EO ST	ī.)					GROUND W	TR (f
BOR	NG NO	. B-3			S	TA	ATION 10+55	5	OFF	SET 1	Oft LT			ALIGNMEN	T Y2	0 HR.	Dry
COLI	AR EL	EV. 1,	002.5	ft	T	ОТ	TAL DEPTH	15.2 ft	NOR	THING	871,3	65		EASTING 1	1,633,469	24 HR.	Dry
RIL	L MACH	IINE C	ME-5	50X	D	RI	LL METHOD	H.S. Augers							HAMMER TYP	PE Automatic	
TAF	RT DATI	€ 08/2	7/09		С	ON	VIP. DATE 08	3/27/09	SUR	FACE	WATER	R DEF	TH I	N/A	DEPTH TO RO	OCK N/A	
LEV	DRIVE ELEV	DEPTH	BLC	ow co	UNT	\prod	BL	OWS PER FO	OT		SAMP.	V	L		OIL AND ROCK D	ESCRIPTION	
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	Щ	0 25	50 	75	100	NO.	MO		ELEV. (ft)	OIL AND NOON D		PTH (
															•		
005		_												_			
	-													- - 1,002.5	GROUND SUI	RFACE	 8
000		-		·		П				::				1122217	ROADWAY EMB	ANKMENT /	
000	998.8 -	- - 3.7]			-						RESIDUA	NL .	
	996.3	- - 6.2	5	7	11		18				SS-8	М			D-TAN & TAN STIF T SLI. MICA. LOW	(PI=12) PLASTIC	6
95	_	-	6	6	7	1	13		· · ·			М			SILTY SANDY C	NL .	
	993.8 -	- 8.7 -	7	12	14	$\ \cdot \ $	26			::	SS-9	м		– TAN M –	ED. DENSE MOIS SAND (A-2	T SLI. MICA. SILTY ?-4)	,
90	991.3	11.2	8	10	11	$\ \ $::		м		- - 990.5			12
180	988.8	- - 13.7				<u> </u>								- TAN \	RESIDUA 7. STIFF MOIST SL	I. MICA. CLAYEY	
		<u>-</u>	9	9	10	╀	• • • • • • • • • • • • • • • • • • •	· · · l · · ·	-	· · l	SS-10	M		987.3 Boring	SANDY SILT	(A-4) ration 987.3 ft IN V.	15
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NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

SHEET 4

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PRO	JECT N	O. 348	371.1.	1	ID.	U-	2826B					С	OUN	1TY	FC	RSY	ГН			. (GEOLOGIST Mur	ray, C. C.	
SITE	DESCR	IPTIO	N RE	FAININ	IG W	ALL	2 STA	4. 10	0+50	TO 1	12+00	-Y2	- (LE	:O ST	۲.)							GROUND W	TR (ft)
BOR	ING NO	B-2			s	TA	TION	11+8	80			0	FFS	ET ´	10f	t LT				ALIGNMENT	Г Ү2	0 HR.	Dry
COL	LAR ELI	E V. 1,	009.1	ft	Т	OTA	AL DE	PTH	15.8	3 ft		N	ORT	HING	;	371,36	33			EASTING 1	,633,594	24 HR.	Dry
DRIL	L MACH	IINE C	ME-5	50X	D	RIL	L MET	НО	D H.	S. A	ugers										HAMMER TYPE	Automatic	
STAI	RT DATE	€ 08/2	7/09		С	OM	P. DA	TE (08/27	/09		s	URF	ACE	W	ATER	DEP	ТН	N	/A	DEPTH TO ROC	K N/A	
ELEV	DRIVE ELEV	DEPTH	'	W CO	T	$\left\ \cdot \right\ _{2}$			BLOW		R FOC			400	1	AMP.	lacktriangledown/	O		S	OIL AND ROCK DES	CRIPTION	
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	10		25 		50		75		100	╀	NO.	/MOI	G	+	ELEV. (ft)		DE	PTH (ft)
1010	-	-																	F	1,009.1	GROUND SURF.	ACE	<u>8.9</u>
	1	-																		1,000.0	ROADWAY EMBAN BLACKTOP AND		0.5
1005	1.004.8	- - 4.3					[-							1	RED.	RESIDUAL TAN V. STIFF MOIST		
	-	•	6	7	9		• • • 1	6		:		:				SS-5	M			1,003.1 PLA	STIC SILTY SANDY	CLAY (A-7-5)	6.0
	1,002.3	6.8	6	8	8	1	•1	6		:							М		ł	TAN V.	RESIDUAL STIFF TO STIFF MO	DIST SLI. MICA.	
1000	999.8-	<u>9.3</u>	6	7	10	╂	· · •	17		-		-			H	SS-6	М		t	-	CLAYEY SANDY SI	LT (A-4)	
	997.3	11.8	10	9	9	$\ \ $]			:		:	: :	: :	r				t				
995	994.8	- - 14.3] -	· · · /•	18 .		-	• • •	-			L		M		t	_			
	-	-	8	6	7	╄-	· ·•13			<u>· </u>	• • •	<u>. l</u>	• •	· ·	╀	SS-7	M		ŧ	993.3 Boring	Terminated at Eleva	tion 993.3 ft IN	15.8
990		-																	F	STIFF	MOIST CLAYEY SA	NDY SILT (A-4)	
		-																	F	-			
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PROJECT: 34871.1.1 (U-2826B)

10 LT

10 LT

10 LT

10 LT

10 LT

10 LT

10+55

10+55

10+55

B-2

11+80

11+80

11+80

COUNTY: FORSYTH

SS-8

SS-9

SS-10

SS-5

SS-6

SS-7

SITE DESCRIPTION: RETAINING WALL #2, STA. 10+50 to 12+00 -Y2- (LEO ST.)

3.7-5.2

8.7-10.2

13.7-15.2

4.3-5.8

9.3-10.8

14.3-15.8

A-6(4)

A-2-4(0)

A-4(0)

A-7-5(8)

A-4(1)

A-4(0)

18

39

34

26 31

16 47

17 36

13 35

12

NP

14

8

12.7

21.7

16.1

11.5

15.5

27.0

40.4

54.1

47.5

33.0

47.3

42.3

18.7 28.2

16.1 8.0

18.3 18.1 100

19.3 36.2 99

17.1 20.1 95

20.7 10.1 93

100

92

94

88

SOIL SAMPLE RES	ULTS																RO	CK SA	MPLE RES	ULTS					
SAMPLE NO. OFFSET	STATION	DEPTH	AASHTO	N	L.L.	P.I.		% BY WEIGHT		% PA	SSING SI	IEVES	%	%	UNIT	VOID	SAMPLE N	<i>).</i>	OFFSET	STATION	DEPTH	RQD	UNIT WT	Q(ksf)	E(MPsi)
		INTERVAL	CLASS				C. SAND	F. SAND SI	ILT CLAY	10	40	200	MOISTURE	ORGANIC	WT. (d)	RATIO					INTERVAL		(pcf)		
	B-3																								

35

61

45

37

D: U-2826B

ROJECT: 34871.1.1

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

CONTENTS

HEET	DESCRIPTION
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
3	PROFILE(S)
4	BORE LOGS
5	SOIL TEST RESULTS

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFEREN	ICE NO. 3487	1.1.1 (U-28.	26B)	F.A. PROJ. N	HF-52(4)
COUNTY FO	RSYTH				
PROJECT DESC	RIPTION _US	52 FROM	SR 4326	(STADIUM	DRIVE)
TO SR 2264	(AKRON I	DRIVE) INC	CLUDING		
MARTIN LU	THER KIN	G, JR. DRIV	E		
SITE DESCRIPT	ION RETAI	VING WAI	L #3		
STA. 10 + 22.56					

 STATE	STATE PROJECT	reference no.	SHEET NO.	TOTAL SHEETS
N.C.	34871.1.1	(U-2826B)	1	5

CAUTION NOTICE

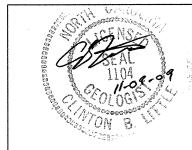
THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING, AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FELD BORING LOSS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, CEOTECHNICAL ENGINEERING UNIT AT 1991 SCO-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE 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 BORFHOLE. THE LABORATORY SAMPLE DATA AND THE IN STUT (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABLITY INNERENT IN THE STANDARD TEST METHOD. THE OSSERVED WATER LEVELS OR SOIL MOSITURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION, AND WIND, AS WELL AS OTHER NON-CLUMATIC PACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCLIMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT MARRANT 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 THIS PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OF FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

_	J.E. ESTEP
_	M.R. MOORE
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_	
INVESTIGATED B	Y_C.C. MURRAY
CHECKED BY	C.B. LITTLE
	C.B. LITTLE
DATE	NOVEMBER 2009

PERSONNEL C.C. MURRAY



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

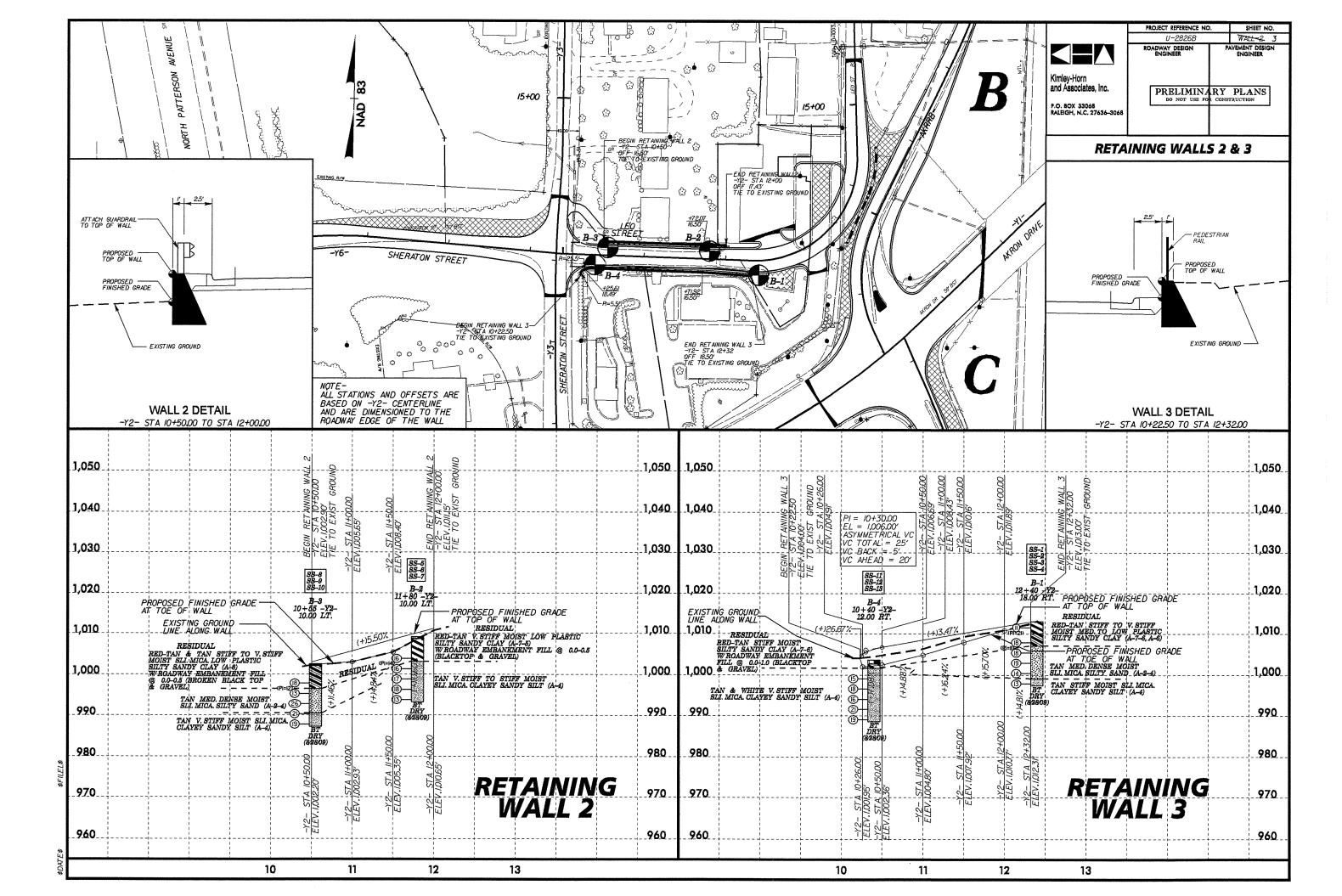
	SOIL AND ROCK LEGEND, TERMS	S, SYMBOLS, AND ABBREVIATIONS	
SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 180 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO TZ8G, ASTM D-1596). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM, BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE: VEN SIFF, BAY, SIT OM, NOST WITH MERREDUED FIRE SAND DUERS, HERD PLAST, A-7-6	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE, (ALSO POORLY GRADED) GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES, ANGULARITY OF GRAINS THE ANGULARITY OR ROUNDNESS OF BOIL GRAINS IS DESIGNATED BY THE TERMS; ANGULAR, SUBRINGLAR, SUBROUNDED, OR ROUNDED.	HARD ROCK IS NON-COASTA, PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO ON LESS THAN 01 FOOT PER 60 BLOWS. IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS: WEATHERED NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. ADUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.
SOIL LEGEND AND AASHTO CLASSIFICATION	MINERALOGICAL COMPOSITION	RUCK (WR) 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
GENERAL GRANULAR MATERIALS SILT-CLAY MATERIALS ORGANIC MATERIALS	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.	CRYSTALLINE ROCK (CR) FINE TO COMPSE SHAMI NONCOUR AND METHAPORPHIC NOCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.	GROUND SURFACE. CALCAREDUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
CLASS. (≤ 35% PASSING *200) (> 35% PASSING *200) (> 36% PASSING *200) (COMPRESSIBILITY SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 31	NDN-CRYSTALLINE FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED, ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.
SYMBOL 000000000000000000000000000000000000	MODERATELY COMPRESSIBLE LIQUID LIMIT EQUAL TO 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50	COASTAL PLAIN COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SEDIMENTARY ROCK SHELL BEDS. ETC.	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.
% PASSING GRANULAR SILT- GRANULAR SOILS SOILS SOILS SOILS	PERCENTAGE OF MATERIAL GRANULAR SILT - CLAY ORGANIC MATERIAL SOILS SOILS DTHER MATERIAL	WEATHERING FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER	DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.
* 200 15 MA 25 MA 16 MA 35 MX 35 MX 35 MX 35 MX 35 MN 35 MN 35 MN 35 MN	TRACE OF DRGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10% LITTLE DRGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20%	HAMMER IF CRYSTALLINE.	DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
LIQUID LIMIT PLASTIC INDEX 6 MX NP 18 MX 14 MN 48 MX 41 MN 18 MX 41 MN 18 MX 41 MN SOILS WITH PLASTIC INDEX 6 MX NP 18 MX 18 MX 18 MX 11 MN 18 MX 18 MX 11 MN 11 MN LITTLE OR HIGHLY GROUP INDEX 8 8 8 8 4 MX 8 MX 12 MX 15 MX No MX MODERATE ORGANIC	MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35% HIGHLY ORGANIC >10% >20% HIGHLY 35% AND ABOVE GROUND WATER	VERY SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, (V SLI.) CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.	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
USUAL TYPES STONE FRAGS. FINE SILTY OR CLAYEY SILTY CLAYEY DRGANIC	✓ WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING	SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO (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 MATTER	STATIC WATER LEVEL AFTER 24 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
GEN.RATING AS A EXCELLENT TO GOOD FAIR TO POOR FAIR TO POOR UNSUITABLE SUBGRADE	√PW PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA	(MDD.) GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY, ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED	PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY
Pl OF A-7-5 SUBGROUP IS ≤ LL - 30 ; Pl OF A-7-6 SUBGROUP IS > LL - 30	OMG SPRING OR SEEP	WITH FRESH ROCK. MODERATELY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, IN GRANITOID ROCKS, ALL FELDSPARS DULL	THE STREAM.
CONSISTENCY OR DENSENESS COMPACTNESS OR RANGE OF STANDARD RANGE OF UNCONFINED	MISCELLANEOUS SYMBOLS FI READWAY EMBANKMENT (RE) SPI NEVALUE SPI NEVALUE SPI NEVALUE SPI NEVALUE SPI NEVALUE	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.	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.
PRIMARY SOIL TYPE COMPACTINESS OR CONSISTENCY PENETRATION RESISTENCE COMPRESSIVE STRENGTH (N-VALUE) (TONS/FT ²)	WITH SOIL DESCRIPTION VST PHT	IF TESTED, WOULD YIELD SPT REFUSAL. SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED.	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
GENERALLY VERY LOOSE 44 CONSTRUCTOR 4 TO 10	SOIL SYMBOL AUGER BORING REF— SPT REFUSAL	(SEV.) IN STRENGTH TO STRONG SOIL, IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT, SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN.	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.
GRANULAR	ARTIFICIAL FILL (AF) OTHER — CORE BORING TEST W/ CORE BORING BORING	IF TESTED, YIELDS SPT N VALUES > 100 BPF VERY SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT	LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTILED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN
VERY DENSE >50	INFERRED SOIL BOUNDARY MONITORING WELL	(V SEV.) THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH DAILY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINDR	SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN
VERY SUFT	INFERRED ROCK LINE A PIEZOMETER INSTALLATION	VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. IF TESTED, YIELDS SPT N VALUES (100 BPF	INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
MATERIAL STIFF 8 TO 15 1 TO 2 (COHESIVE) VERY STIFF 15 TO 30 2 TO 4	SLOPE INDICATOR INSTALLATION	COMPLETE ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.	ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF
HARD >30 >4	25/925 DIP & DIP DIRECTION OF ROCK STRUCTURES CONE PENETROMETER TEST	ROCK HARDNESS	ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
TEXTURE OR GRAIN SIZE U.S. STD. SIEVE SIZE 4 10 40 60 200 270	● SOUNDING RDD	VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.
OPENING (MM) 4,76 2,00 0.42 0.25 0.075 0.053	ABBREVIATIONS	HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.	SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.
BOULDER COBBLE GRAVEL SAND SAND SLT CLAY (BLDR.) (COB.) (GR.) (CSE. SD.) (F SD.) (SL.) (CL.)	AR - AUGER REFUSAL MED MEDIUM VST - VANE SHEAR TEST BT - BORING TERMINATED MICA MICACEOUS WEA WEATHERED CL CLAY MOD MODERATELY 7'- UNIT WEIGHT	MODERATELY CAN BE SCRATCHED BY KNIFE OR PICK, GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE HARD EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK, HAND SPECIMENS CAN BE DETACHED	SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.
GRAIN MM 305 75 2.0 0.25 0.005 0.005 SIZE IN. 12 3	CPT - CONE PENETRATION TEST NP - NON PLASTIC ,	BY MODERATE BLOWS. 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 WITH
SOIL MOISTURE - CORRELATION OF TERMS SOIL MOISTURE SCALE FIELD MOISTURE GUIDE FOR FIELD MOISTURE DESCRIPTION (ATTERBERG LIMITS) DESCRIPTION	DMT - DILATOMETER TEST PMT - PRESSUREMETER TEST <u>SAMPLE ABBREVIATIONS</u> DPT - DYNAMIC PENETRATION TEST SAP SAPROLITIC S - BULK • - VOID RATID SD SAND, SANDY SS - SPLIT SPOON	HARD CAN BE EXCAVATED IN SMALL CHIPS TO PEICES I INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. SOFT CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK, CAN BE EXCAVATED IN FRAGMENTS	A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.
- SATURATED - USUALLY LIQUID; VERY WET, USUALLY	F - FINE SL SILT, SILTY ST - 9HELBY TUBE FIOSS FOSSILIFEROUS SLI SLIGHTLY RS - MOCK FRACE FRACTURED. FRACTURES TER - TRICOME REFUSAL RT - RECOMPACTED TRIAXIAL	FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.	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
LL LIQUID LIMIT SEMISOLID: REQUIRES DRYING TO	FRAGS FRAGMENTS ## - MDISTURE CONTENT CBR - CALIFORNIA BEARING HI HIGHLY V - VERY RATIO	VERY CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES I INCH SOFT OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.	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.
RANGE - WET - (W) SEPHISOLIDE REGISTRES BRITING TO (P) PL PLASTIC LIMIT - WET - (W) ATTAIN OPTIMUM MOISTURE	EQUIPMENT USED ON SUBJECT PROJECT	FRACTURE SPACING BEDDING TERM SPACING TERM THICKNESS	IOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER. BENCH MARK:
OM OPTIMUM MOISTURE - MOIST - (M) SOLID: AT OR NEAR OPTIMUM MOISTURE	DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE: X AUTOMATIC MANUAL	VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED > 4 FEET	
SL SHRINKAGE LIMIT	MOBILE B CLAY BITS	MODERATELY CLOSE	ELEVATION: FT.
- DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE	BK-51 S* CONTINUOUS FLIGHT AUGER CORE SIZE:	VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET THINLY LAMINATED < 0.008 FEET	NOTES: BORING ELEVATIONS DERIVED FROM THE U2826B_LS_TNL_08 10.TIN FILE.
PLASTICITY	CME-45C HARD FACED FINGER BITS -N	INDURATION	
PLASTICITY INDEX (PI) DRY STRENGTH NDNPLASTIC 8-5 VERY LOW	X TUNGCARBIDE INSERTS -H	FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.	
NONTLASTICT	CASING W/ ADVANCER HAND TOOLS:	GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.	
HIGH PLASTICITY 26 OR MORE HIGH	PORTABLE HOIST TRICONE STEEL TEETH POST HOLE DIGGER TRICONE TUNGCARB. HAND AUGER	MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.	
COLOR	CORE BIT SDUNDING 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). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.	VANE SHEAR TEST	EXTREMELY INDURATED SHARP HAMMER BLOWS REDUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.	
		OHITICE DICHICS CHUIDS UNING.	

PROJECT REFERENCE NO.

3487I.I.I (U-2826B)

SHEET NO.

2





PRO	JECT N						REP U-2826B			COUN	YTY	FORSY	TH	***************************************		(GEOLOGIST M	urray, C. C.	
SITI	DESCR	RIPTIO	N RE	ΓΑΙΝΙΝ	1G N	VAL	LL 3 STA.	10+22.50	ΓΟ 12+3	2 -Y2-	(LEO	ST.)						GROUND V	VTR (fi
BOI	RING NO	. B-4			1	ST	ATION 10	+40		OFFS	ET 1	2ft RT			ALIG	MENT	Г Y2	0 HR.	Dry
COI	LAR EL	EV. 1,	003.6	ft		TO	TAL DEPT	H 15.0 ft		NORT	HING	871,3	44		EAST	ING 1	,633,453	24 HR.	Dry
DRI	LL MACI	HINE (CME-5	50X		DR	ILL METH	OD H.S.	Augers								HAMMER TYP	E Automatic	
STA	RT DAT		7/09			CO	MP. DATE	08/27/09)	SURF	ACE	WATER	R DEP	1 HT	V/A		DEPTH TO RO	OCK N/A	
ELE\ (ft)	ELEV	DEPTH	'	OW CO				BLOWS F			100	SAMP.		0		S	OIL AND ROCK DI	ESCRIPTION	
(11)	(ft)	(ft)	0.5ft	0.5ft	0.5f	+	0 2	5 5	0	75	100	NO.	MOI	G	ELEV. (ft)	1			EPTH (
1005	1 -	<u> </u>						-							 _ 1,003.6		GROUND SUF	RFACE	0
	-									::	::			V	- 1,002.6 - 1,001.6	l	ROADWAY EMBA BLACKTOP AND		1.
1000	1,000 1	3.5	7	7	8	4	.			<u> </u>		SS-11	М		_ \	RED	RESIDUA TAN STIFF MOIS		1
	997.6	6.0					15			: :		33-11			-		CLAY (A-7	-6)]
995	995.1	8.5	8	9	9		18			: :			M		-	TAN &	WHITE V. STIFF I	MOIST SLI. MICA	
	-	F	8	8	8		•16					SS-12	М		_		OLATET GARDT	OILI (A-4)	
	992.6 -	İ	8	10	11	1	9 2	1		1::			М						
990	990.1	13.5	7	7	12	\dashv	• 19			+		SS-13	м		- 988.6				15.
	-					T	ula,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					<u> </u>				Boring STIFF	Terminated at Elev MOIST CLAYEY S	ation 988.6 ft IN \	7.
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SHEET

PRO	JECT N	0. 348	371.1.	1	ID.	U	I-2826B	N. D. W. W. W. W. W. W. W.		COUNTY	FORSY	TH	-		GEO	LOGIST	Murray, C. C.	
SITE	DESCR	IPTIO	N RE	TAINII	NG W	٩LI	L 3 STA. 1	0+22.50	TO 12+32	2 -Y2- (LEC	ST.)						GROUND \	WTR (ft)
BOR	ING NO	. B-1			S	TA	TION 12	+40		OFFSET	18ft RT			ALIGNME	NT Y2		0 HR.	Dry
COL	LAR EL	EV. 1,	013.1	ft	T	ОТ	AL DEPT	'H 15.7 ft		NORTHIN	G 871,3	34		EASTING	1,633	,654	24 HR.	Dry
DRIL	L MACH	IINE (ME-5	50X	D	RII	LL METH	OD H.S.	Augers						НА	MMER TY	'PE Automatic	
STA	RT DAT	E 08/2	7/09		C	ON	/IP. DATE	08/27/09	9	SURFACE	WATER	R DEF	1 HT	N/A	DE	PTH TO R	ROCK N/A	
ELEV	DRIVE ELEV	DEPTH	BLC	ow co	UNT				PER FOOT		SAMP.	V	O L		SOIL A	ND ROCK I	DESCRIPTION	
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	11	0 2	5	50	75 100	NO.	МО		ELEV. (ft)				DEPTH (ft
1015		-												_				
	1,012.6-	- 0.5	<u> </u>	<u></u>		H	-11		T	 				1,013.1	G	ROUND SU		0.0
1010	-	- -	5	5	6		Q 11				SS-1	M				STIFF MO	IST MED. (PI=21) IDY CLAY (A-7-6)	3.0
***********	1,008.9	4.2	5	7	11	$\ \ $					SS-2	м		- RI	D-TAN'	V. STIFF MO	OIST LOW (PI=11) NDY CLAY (A-6)	
	1,006.4	6.7					· · · • 18				33-2			1,007.1			ST SLI. MICA. SIL	6,0 TY
1005	1,003.9	92	8	8	10	$\ \cdot\ $	• 18			-		М		-		SAND (A	-2-4)	
	-	-	7	9	10		19				SS-3	М.		-				
1000	1,001.4	11.7	6	8	6	1 [14			1		М		<u> </u>				
	998.9	14.2	5	6	7	$\ \ $					SS-4	м		999.1 - 997.4			I. MICA. CLAYEY	14.0 15.7
		-				Ħ	V 13_1		L		1		1 2	Bo	ring Tern	SANDY SIL	levation 997.4 ft IN	ī
995	-	_												ST -	IFF MOIS	ST CLAYEY	SANDY SILT (A-4	1)
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PROJECT: 34871.1.1 (U-2826B)

COUNTY: FORSYTH

SITE DESCRIPTION: RETAINING WALL #3, STA. 10+22.50 to 12+32-Y2- (LEO ST.)

SOIL S	SAMPLE RES	SULTS																	ROCI	SAMPLE RE	SULTS					
SAMPLE NO.	OFFSET	STATION	DEPTH	AASHTO	N	L.L.	P.I.		% BY WEIG	HT		% PA	SSING S	SIEVES	%	%	UNIT	VOID	SAMPLE NO.	OFFSET	STATION	DEPTH	RQD	UNIT WT	Q(ksf)]
			INTERVAL	CLASS				C. SAND	F. SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC	WT. (d)	RATIO				INTERVAL		(pcf)		
		B-4																								
SS-11	12 RT	10+40	1.0-2.5	A-4(0)	15	32	4	13.3	53.5	23.1	10.1	99	94	47												
SS-12	12 RT	10+40	8.5-10.0	A-4(0)	16	32	1	10.3	54.9	22.7	12.1	99	96	46												
SS-13	12 RT	10+40	13.5-15.0	A-4(0)	19	33	4	16.1	53.7	20.1	10.1	96	90	39												
		B-1																								
SS-1	18 RT	12+40	0.5-2.0	A-7-6(9)	11	43	21	12.5	28.4	12.9	46.3	90	84	57												
SS-2	18 RT	12+40	4.2-5.7	A-6(3)	18	40	11	22.1	32.8	16.9	28.2	96	85	49												
SS-3	18 RT	12+40	9.2-10.7	A-2-4(0)	19	34	NP	30.6	49.3	12.1	8.0	98	84	27												
SS-4	18 RT	12+40	14.2-15.7	A-4(0)	13	37	3	13.9	45.9	30.2	10.1	99	93	50												

CONTENTS SHEET

DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT

DESCRIPTION TITLE SHEET LEGEND SITE PLAN 3 PROFILE(S)

BORE LOGS

SOIL TEST RESULTS

STRUCTURE SUBSURFACE INVESTIGATION

STATE OF NORTH CAROLINA

F.A. PROJ. **NHF-52(4)** PROJ. REFERENCE NO. 34871.1.1 (U-2826B) COUNTY FORSYTH PROJECT DESCRIPTION US 52 FROM SR 4326 (STADIUM DRIVE) TO SR 2264 (AKRON DRIVE) INCLUDING MARTIN LUTHER KING, JR. DRIVE SITE DESCRIPTION RETAINING WALL #4 STA. 20 + 05 TO 20 + 50 - I40RA

STATE STATE PROJECT REFERENCE NO. SHEET NO. 34871.1.1 (U-2826B) 1 5

CAUTION NOTICE

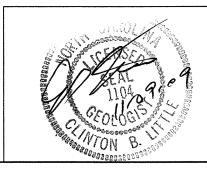
THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING, AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FELD BORING LOGS, ROCK COPES, AND SOLI TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING LINIT AT 1999 250-408B. REHITER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A CENTERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDAMIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSUPFACE DATA AND MAY NOT INCESSARILY REFLECT THE ACTUAL SUBSUPFACE CONDITIONS BETWEEN BORRIGS OR BETWEEN SAMPLED STRATA WITHIN THE BORRHOLE, THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIBILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION FLES WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLUMATIC 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 THE EDUCEMENTAL 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 SUPPLICENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE 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 SATISTY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THIS PRODUCT, THE
CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR
ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM
THOSE INDICATED IN THE SUBSURFACE INFORMATION.

	J.E. ESTEP
	M.R. MOORE
INVESTIGATED BY	C.C. MURRAY
CHECKED BY	C.B. LITTLE
	C.B. LITTLE
DATE	NOVEMBER 2009

PERSONNEL C.C. MURRAY



.2826B

48

PROJECT REFERENCE NO. SHEET NO. 3487I.I.I (U-2826B) 2

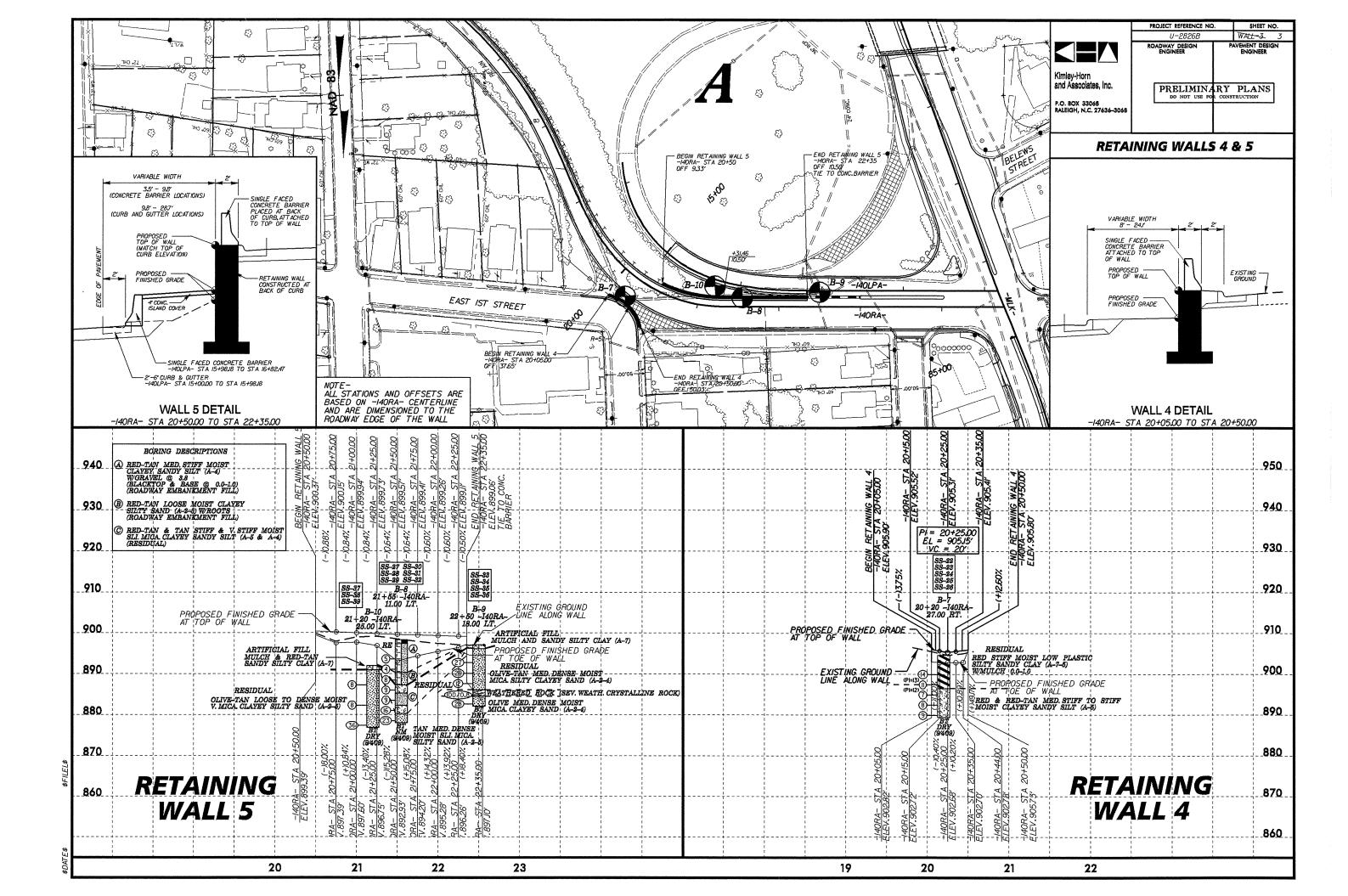
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

	SOIL AND ROCK LEGEND, TER	MS, SYMBOLS, AND ABBREVIATIONS	
SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTIO 1206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTIO SYSTEM, BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED) GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES. ANGULARITY OF GRAINS THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS, ANGULAR.	HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EDUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. ADUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLAÇEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS,
AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE: VERY STR.F, BRANCITY CH. MOST WITH INTEREDIDED FINE SHIP LIVERS, RIVELY PLATC, A-7-6 COLUMN TO STRUCTURE OF THE SHIP AND ANGULARITY COLUMN TO STRUCTURE.	THE ANOUART OR ROUNDED. OR ROUNDED. MINERALOGICAL COMPOSITION	WEATHERED NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.	OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE
SOIL LEGEND AND AASHTO CLASSIFICATION GENERAL CRANULAR MATERIALS SILT-CLAY MATERIALS CLASS, (≤ 35% PASSING *200) (> 35% PASSING *200) ORGANIC MATERIALS	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.	CRYSTALLINE ROCK (CR) FINE TO COARSE GRAIN IONEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRD. SCHIST. ETC.	GROUND SUFFACE. CALCAREOUS (CALC.) - 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-2-8 A-3 A-6, A-7	COMPRESSIBILITY SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 31	NON-CRYSTALLINE ROCK (NCR) FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YELLD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC. COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.
SYMBOL 000000000000000000000000000000000000	MODERATELY COMPRESSIBLE LIQUID LIMIT EQUAL TO 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50 PERCENTAGE OF MATERIAL	COASTAL PLAIN COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SEDIMENTARY ROCK SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED (CP) SHELL BEDS, ETC.	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.
	ORGANIC MATERIAL ORGANIC MATERIAL ORGANIC MATERIAL SOILS SOILS OTHER MATERIAL	WEATHERING	<u>DIKE</u> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.
# 2000 15 MX 25 MX 10 MX 35 MX 35 MX 35 MX 35 MX 36 MN 36 MN 36 MN 36 MN 36 MN S MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN	TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10% LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20%	FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE.	DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
LIDUID LIMIT 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48	MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35% HIGHLY ORGANIC >10% >20% HIGHLY 35% AND ABOVE	VERY SLIGHT ROCK GENERALLY FRESH, DINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, (SLI,) CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY, ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.	DIP DIRECTION GIP AZIMUTHO - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
GROUP INDEX 6 8 8 4 MX 8 MX 12 MX 15 MX No MX MODERATE AMOUNTS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS OF SOILS	GROUND WATER	SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
MATERIALS SAND SAND GRAVEL AND SAND SOILS SOILS MATTER	STATIC WATER LEVEL AFTER 24 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
GEN.RATING AS A SUBGRADE EXCELLENT TO GOOD FAIR TO POOR FAIR TO POOR POOR UNSUITABLE	PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA SPRING OR SEEP	(MOD.) GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY, ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.	PARENT MATERIAL. 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 CONSISTENCY OR DENSENESS	MISCELLANEOUS SYMBOLS	MODERATELY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL SEVERE AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENSTH (MOD. SEV.) AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNKY SOUND WHEN STRUCK.	THE FIELD. A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.
PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY COMPACTNESS OR PENETRATION RESISTENCE COMPRESSIVE STRENGTH (TONS/F12)	ROADWAY EMBANKMENT (RE) THE STEEL BORING SPT N-VALUE WITH SOIL DESCRIPTION SPT N-VALUE VST PHT	IF TESTED, WOULD YIELD SPT REFUSAL	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
GENERALLY VERY LOOSE (4	SOIL SYMBOL AUGER BORING REF— SPT REFUSAL	SEVERE ALL ROCK EXCEPT DUARTZ DISCOLORED OR STAINED, ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED (SEV.) IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KADLINIZED TO SOME EXTENT, SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN.	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.
GRANULAR MEDIUM DENSE	ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT INFERRED SOIL BOUNDARY MONITORING WELL	VERY SEVERE ALL ROCK EXCEPT DUARITZ DISCOLORED OR STAINED, ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT (V SEV.) THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING, SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR	LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOTJ. THREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN
GENERALLY SOFT 2 TO 4 0.25 TO 0.50 SILT-CLAY MEDIUM STIFF 4 TO 8 0.5 TO 1.0	INFERRED ROCK LINE A PIEZOMETER INSTALLATION	VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. IF TESTED, VIELDS SPT N VALUES < 100 BPF COMPLETE ROCK REDUCED TO SOIL, ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND	INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
MATERIAL STIFF 8 TO 15 1 TO 2 (COHESIVE) VERY STIFF 15 TO 30 2 TO 4	SLOPE INDICATOR INSTALLATION 25/025 DIP & DIP DIRECTION OF	SCATTERED CONCENTRATIONS, QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS, SAPROLITE IS ALSO AN EXAMPLE.	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
TEXTURE OR GRAIN SIZE	ROCK STRUCTURES ONE PENETROMETER TEST	ROCK HARDNESS VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK, BREAKING OF HAND SPECIMENS REQUIRES	EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE
U.S. STD. SIEVE SIZE 4 10 40 60 200 270 OPENING (MM) 4.76 2.00 0.42 0.25 0.075 0.053	SOUNDING ROD ABBREVIATIONS	SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK. HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED	PARENT ROCK. <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
BOULDER	AR - AUGER REFUSAL MED MEDIUM VST - VANE SHEAR TEST BT - BORING TERMINATED MICA MICACEOUS WEA WEATHERED	TO DETACH HAND SPECIMEN. MODERATELY CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE	TO THE BEDDING OR SCHISTOSITY OF THE INTRUCED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR
GRAIN MM 305 75 2.0 0.25 0.05 0.005 SIZE IN. 12 3	CL CLAY MOD MODERATELY 7 - UNIT WEIGHT CPT - COME PENETRATION TEST NP - NON PLASTIC 7 - DRY UNIT WEIGHT	HARD EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS. MEDIUM CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT.	SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF
SOIL MOISTURE - CORRELATION OF TERMS	CSE COARSE ORG DRGANIC DMT - DILATOMETER TEST PMT - PRESSUREMETER TEST SAMPLE ABBREVIATIONS DPT - DYNAMIC PENETRATION TEST SAP SAPROLITIC S - BULK SAP SAPROLITIC S - BULK	HARD CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.	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 1S PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.
SUIL MUISIONE SCALE FIELD MUISIONE GUIDE FOR FIELD MOISTURE DESCRIPTION DESCRIPTION - SATURATED - USUALLY LIQUID: VERY WET, USUALLY	e - VOID RATIO	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 PIECES CAN BE BROKEN BY FINGER PRESSURE.	STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.
(SAT.) FROM BELOW THE GROUND WATER TABLE	FRAC FRACTURED, FRACTURES TCR - TRICONE REFUSAL RT - RECOMPACTED TRIAXI, FRAGS FRAGMENTS # - MOISTURE CONTENT CBR - CALIFORNIA BEARING HI HIGHLY V - VERY RATIO		STRATA ROCK DUALITY DESIGNATION (SROD - A MEASURE OF FOCK 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.
PLASTIC SEMISOLID: REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE (P) PLASTIC LIMIT	EQUIPMENT USED ON SUBJECT PROJECT	FRACTURE SPACING BEDDING	TOPSDIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
PLL TENSITE CAME AND ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF ALL OF AL	DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE: X AUTOMATIC MANUAL	TERM SPACING TERM THICKNESS VERY WIDE MORE THAN 10 FEET THICKLY BEDDED > 4 FEET THICKLY BEDDED 1.5 - 4 FEET	BENCH MARK:
OM OPTIMUM MOISTURE - MOIST - (M) SOLID, AT OR NEAR OPTIMUM MOISTURE SL SHRINKAGE LIMIT	MOBILE B CLAY BITS	MIDE 3 10 10 FEET THINLY BEDDED 0.16 - 1.5 FEET WEBY THINLY BEDDED 0.03 - 0.16 FEET	ELEVATION: FT.
- DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE	BK-51 S* CONTINUOUS FLIGHT AUGER CORE SIZE: X 8* HOLLOW AUGERS	VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET THINLY LAMINATED < 0.008 FEET CLOSE THICKLY LAMINATED < 0.008 FEET	NOTES: BORING ELEVATIONS DERIVED FROM THE U2826B_LS_TNL_08 0.TIN FILE.
PLASTICITY	CME-45C HARD FACED FINGER BITS -N	INDURATION FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.	
PLASTICITY INDEX (PI) DRY STRENGTH NONPLASTIC 8-5 VERY LOW	X TUNG-CARBIDE INSERTS -H	EDIAR F RUBBING WITH FINGER FREES NUMEROUS GRAINS:	
LOW PLASTICITY 6-15 SLIGHT MED. PLASTICITY 16-25 MEDIUM HIGH PLASTICITY 26 OR MORE HIGH	CASING W/ ADVANCER HAND TOOLS: PORTABLE HOIST TRICONE STEEL TEETH POST HOLE DIGGER	GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.	
COLOR	TRICONE	INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE;	
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.	CORE BIT SOUNDING ROD VANE SHEAR TEST	DIFFICULT TO BREAK WITH HAMMER. EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.	



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PROJECT: 34871.1.1 (U-2826B)

COUNTY: FORSYTH

SITE DESCRIPTION: RETAINING WALL #4, STA. 20+05 TO 20+50 -I40RA-

SOIL S	AMPLE RES	ULTS																	ROCI	K SAMPLE RE	SULTS					
SAMPLE NO.	OFFSET	STATION	DEPTH	AASHTO	N	L.L.	P.I.		% BY WEIG	HT		% PAS	SSING S	IEVES	%	%	UNIT	VOID	SAMPLE NO.	OFFSET	STATION	DEPTH	RQD	UNIT WT	Q(ksf)	E(MPsi)
			INTERVAL	CLASS				C. SAND	F. SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC	WT. (d)	RATIO				INTERVAL		(pcf)		
		B-7																								
SS-22	27 RT	20+20	3.6-5.1	A-7-5(11)	14	58	13	5.0	35.6	27.1	32.2	100	98	68												
SS-23	27 RT	20+20	6.1-7.6	A-7-5(6)	11	47	12	9.1	42.3	24.5	24.2	99	96	58												
SS-24	27 RT	20+20	8.6-10.1	A-5(3)	7	48	9	10.1	48.1	21.7	20.1	99	95	51												
SS-25	27 RT	20+20	11.1-12.6	A-5(0)	8	41	5	13.3	54.2	18.4	14.1	98	94	41												
SS-26	27 RT	20+20	13.6-15.1	A-5(0)	9	45	2	17.1	51.6	19.2	12.1	99	93	41												

CONTENTS

2826B

48

DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SHEET I TITLE SHEET LEGEND SITE PLAN PROFILE(S) 4-5 BORE LOGS SOIL TEST RESULTS

STRUCTURE SUBSURFACE INVESTIGATION

STATE OF NORTH CAROLINA

PROJ. REFERENCE NO. 34871.1.1 (U-2826B) F.	.A. PROJ. <i>NHF-32(4)</i>
COUNTY FORSYTH	
PROJECT DESCRIPTION US 52 FROM SR 4326 (STADIUM DRIVE)
TO SR 2264 (AKRON DRIVE) INCLUDING	
MARTIN LUTHER KING, JR. DRIVE	
SITE DESCRIPTION RETAINING WALL #5	
STA. 20+50 TO 22+35 -I40RA-	

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, CEOTECHNICAL ENGINEERING UNIT AT (1919) 250-0408. NETHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

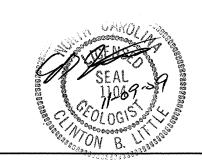
CENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS DETWEEN BORNINGS OR BETWEEN SAMPLED STRATA MITHIN THE BORENOLE. THE LABORATORY SAMPLE DATA AND THE IN STILL UN-PLACED TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABLITY INNERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOSITURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS AND VARY CONSIDERABLE WITH TIME ACCORPING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION, AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE 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 RECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THIS PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY RESON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THE ACTUAL CONDITIONS.

	J.E. ESTEP
	M.R. MOORE
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•	
INVESTIGATED E	BY C.C. MURRAY
CHECKED BY	C.B. LITTLE
CHIRMITTED BY	C.B. LITTLE
SUDMITTED BY	

PERSONNEL

C.C. MURRAY



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

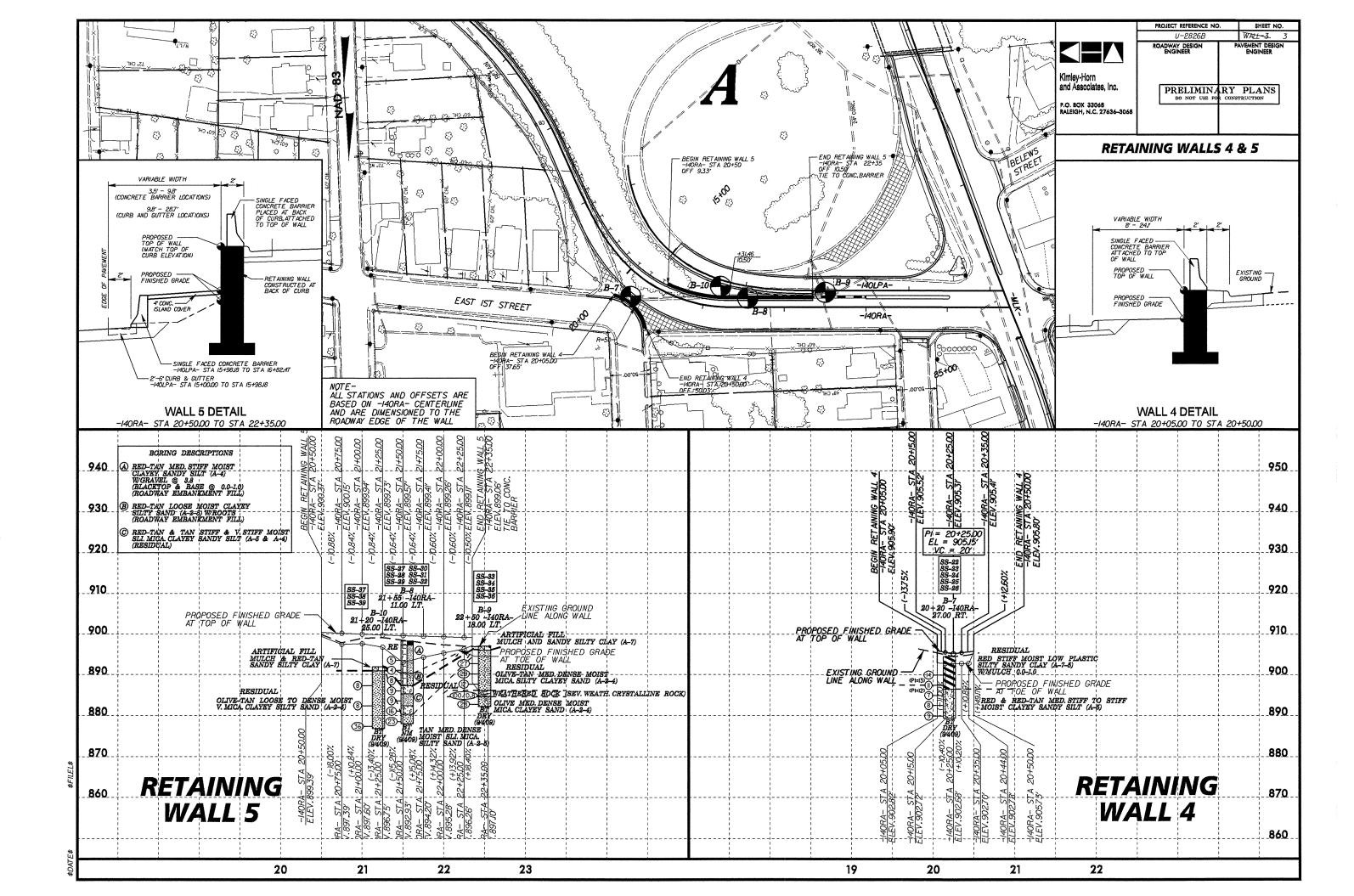
	SOIL AND ROCK LEGEND, TERM	S, SYMBOLS, AND ABBREVIATIONS					
SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS				
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 180 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T286, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. LINIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED) GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES. ANGULARITY OF GRAINS	HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. ADUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEDUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARRILLAGEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS,				
AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE: VERY STIFF, BRAN, SETY CLU, MOST WITH INTERBEDDED FINE SAND LAVERS, HIGHEY PLASTIC, A-7-6	THE ANGULARITY OR ROUNDNESS OF 601L GRAINS IS DESIGNATED BY THE TERMS; ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.	WEATHERED NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100	OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.				
SOIL LEGEND AND AASHTO CLASSIFICATION	MINERALOGICAL COMPOSITION	ROCK (WR) BLOWS PER FOOT IF TESTED. FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT	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				
GENERAL GRANULAR MATERIALS SILT-CLAY MATERIALS ORGANIC MATERIALS	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS	MOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE,	GROUND SURFACE.				
CLASS. (\$\leq 35% PASSING *200) (> 35% PASSING *200)	WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE. COMPRESSIBILITY	GNEISS, GABBRO, SCHIST, ETC. NON-CRYSTALLINE FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN CONTROL OF THE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN CONTROL OF THE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN CONTROL OF THE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN CONTROL OF THE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN CONTROL OF THE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN CONTROL OF THE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN CONTROL OF THE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN CONTROL OF THE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN CONTROL OF THE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN CONTROL OF THE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN CONTROL OF THE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN CONTROL OF THE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN CONTROL OF THE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN CONTROL OF THE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN CONTROL OF THE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN CONTROL OF THE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN CONTROL OF THE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN CONTROL OF THE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN CONTROL OF THE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN CONTROL OF THE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN CONTROL OF THE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN CONTROL OF THE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN CONTROL OF THE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN CONTROL OF THE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN CONTROL OF THE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN CONTROL OF THE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN CONTROL OF THE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN CONTROL OF THE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN CONTROL OF THE TO COARSE GRAIN METAMORPHIC PLAIN PLAIN PLAIN PLAIN PLAIN PLAIN PLAIN PLAIN PLAI	CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM				
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-1-0 A-1-0 A-2-4 A-2-5 A-2-7 A-4, A-5 A-6, A-7	SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 31	ROCK (NCR) SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.	OF SLOPE.				
SYMBOL 0000 0000000000000000000000000000000	MODERATELY COMPRESSIBLE LIQUID LIMIT EQUAL TO 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50	COASTAL PLAIN COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SEDIMENTARY ROCK SPT REFUSAL, ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED CPP SHELL BEDS, ETC.	CORE RECOVERY IREC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.				
% PASSING SILT- GRANULAR SILT- MUCK,	PERCENTAGE OF MATERIAL GRANULAR SILT - CLAY	WEATHERING	DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.				
30 MX 50 MX 51 MN 30 MX 55 MX 15 MN 10 MX 35 MX 35 MX 35 MX 35 MX 35 MX 35 MX 35 MX 36 MN 36 MN 36 MN 36 MN	ORGANIC MATERIAL SOILS OTHER MATERIAL TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10% LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20%	FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE.	DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.				
LIDUID LIMIT 48 MX 41 MN 40 MX 41 MN 48 MX 41 MN 48 MX 41 MN 40 MX 41 MN SOILS WITH PLASTIC INDEX 6 MX NP 18 MX 19 MX 11 MN 11 MN 10 MX 11 MN 11 MN LITTLE OR HIGHLY	MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35% HIGHLY ORGANIC >10% >20% HIGHLY 35% AND ABOVE	VERY SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, (V SLIJ.) CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.	<u>DIP DIRECTION (DIP AZIMUTH) -</u> THE DIRECTION OR BEARING OF THE HDRIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.				
GROUP INDEX 6 6 8 4 MX 8 MX 12 MX 16 MX No MX MODERATE AMOUNTS OF ORGANIC SOILS USUAL TYPES STONE FRAGS. FINE SILTY OR CLAYEY SILTY CLAYEY ORGANIC	GROUND WATER ✓ WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING	SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO SLIJ 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.				
OF MAJOR GRAVEL, AND SAND GRAVEL AND SAND SOILS SOILS MATTER	▼ STATIC WATER LEVEL AFTER 24 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				
GEN.RATING AS A EXCELLENT TO GOOD FAIR TO POOR POOR UNSUITABLE	<u>∇P₩</u> PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA	(MOD.) GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS	PARENT MATERIAL.				
SUBGRADE	O-MA 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,				
P] OF A-7-5 SUBGROUP IS ≤ LL - 30; PI OF A-7-6 SUBGROUP IS > LL - 30	MISCELLANEOUS SYMBOLS	MODERATELY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, IN GRANITOID ROCKS, ALL FELDSPARS DULL SEVERE AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION, ROCK SHOWS SEVERE LOSS OF STRENGTH	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN				
CONSISTENCY OR DENSENESS RANGE OF STANDARD RANGE OF UNCONFINED		(MOD. SEV.) AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK.	THE FIELD.				
PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY PENETRATION RESISTENCE (N-VALUE) (TONS/FTZ)	ROADWAY EMBANKMENT (RE) SPT DOT DATE TEST BORING SPT N-VALUE VST PAT	IF TESTED, WOULD YIELD SPT REFUSAL SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.				
GENERALLY VERY LOOSE 4	SOIL SYMBOL AUGER BORING REF SPT REFUSAL	(SEV.) IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KADLINIZED TO SOME	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.				
LOOSE	ARTIFICIAL FILL (AF) OTHER - CORE BORING TEST W/ CORE	EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. IF TESTED, YIELDS SPI N VALUES > 100 BPF	LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.				
(NON-COHESIVE) DENSE 30 TO 50 VERY DENSE >50	THAN ROADWAY EMBANKMENT	VERY SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT	MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.				
VERY SOFT <2 <0.25	INFERRED SOIL BOUNDARY "O MONITORING WELL	(V SEV.) THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING, SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR	PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN				
GENERALLY SOFT 2 TO 4 0.25 TO 0.50 SILT-CLAY MEDIUM STIFF 4 TO 8 0.5 TO 1.0	INFERRED ROCK LINE A PIEZOMETER INSTALLATION	VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. <u>IF TESTED, YIELDS SPT N VALUES < 100 BPF</u> COMPLETE ROCK REDUCED TO SOIL, ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND	INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.				
MATERIAL STIFF 8 TO 15 1 TO 2 (COHESIVE) VERY STIFF 15 TO 30 2 TO 4	SLOPE INDICATOR	SCATTERED CONCENTRATIONS, QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS, SAPROLITE IS	ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF				
HARD >30 >4	Z5/825 DIP & DIP DIRECTION OF A ROCK STRUCTURES COMP PENETROMETER TEST	ALSO AN EXAMPLE. ROCK HARDNESS	ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.				
TEXTURE OR GRAIN SIZE	ROCK STRUCTURES ONE PENETROMETER TEST	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				
U.S. STD. SIEVE SIZE 4 10 40 60 200 270 OPENING (MM) 4.76 2.00 0.42 0.25 0.075 0.053	● SOUNDING ROD	SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.	PARENT ROCK. 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 BOULDER COBBLE GRAVEL COARSE SAND SAND SAND FINE SILT CLAY	ABBREVIATIONS AR - AUGER REFUSAL MED MEDIUM VST - VANE SHEAR TEST	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.				
(BLDR.) (COB.) (GR.) (GSE. SD.) (F SD.) (SL.) (CL.) GRAIN MM 305 75 2.0 0.25 0.005 0.005	BT - BORING TERMINATED MICA MICACEOUS WEA WEATHERED CL CLAY MOD MODERATELY CPT - CONE PENETRATION TEST NP - NON PLASTIC 2. DRY UNIT WEIGHT	MODERATELY CAN BE SCRATCHED BY KNIFE OR PICK, GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE HARD EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK, HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.	SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT REGULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.				
SIZE IN. 12 3	CSE COARSE ORG ORGANIC	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 I INCH MAXIMUM SIZE BY HARD 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				
SOIL MOISTURE - CORRELATION OF TERMS SOIL MOISTURE SCALE FIELD MOISTURE COURSE OF FIELD MOISTURE OF CONTROL	DMT - DILATOMETER TEST PMT - PRESSUREMETER TEST <u>SAMPLE ABBREVIATIONS</u> DPT - DYNAMIC PENETRATION TEST <u>SAP.</u> - SAPROLITIC S - BULK	POINT OF A GEOLOGIST'S PICK.	A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER, SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.				
GUIDE FOR FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION - SATURATED - USUALLY LIQUID; VERY WET, USUALLY	e - VOID RATIO SD SAND, SANDY SS - SPLIT SPOON F - FINE SL SILT, SILTY ST - SHELBY TUBE FOSS FOSSILIFEROUS SLI SLIGHTLY RS - ROCK	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 PIECES CAN BE BROKEN BY FINGER PRESSURE.	STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.				
(SAT.) FROM BELOW THE GROUND WATER TABLE LL _ LIQUID LIMIT	FRAC FRACTURED, FRACTURES TCR - TRICONE REFUSAL RT - RECOMPACTED TRIAXIAL FRAGS FRAGMENTS # - MOISTURE CONTENT CBR - CALIFORNIA BEARING HI HIGHLY V - VERY RATIO	VERY CAN BE CARVED WITH KNIFE, CAN BE EXCAVATED READILY WITH POINT OF PICK, PIECES 1 INCH SOFT OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE, CAN BE SCRATCHED READILY BY FINGERNALL.	STRATA ROCK DUALITY DESIGNATION (SROD) - A MEASURE OF ROCK DUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EDUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.				
PLASTIC SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE	EQUIPMENT USED ON SUBJECT PROJECT	FRACTURE SPACING BEDDING	TOPSDIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.				
(PI) PL PLASTIC LIMIT HITHIN OF THICK PROJECTION	DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE:	TERM SPACING TERM THICKNESS	BENCH MARK:				
OM OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE	TABLE DIVITOR TO TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE TO THE TABLE T	VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED > 4 FEET WIDE 3 TO 10 FEET THICKLY BEDDED 1.5 - 4 FEET	ELEVATION: FT.				
SL SHRINKAGE LIMIT	MORITE B-	MODERATELY CLOSE 1 TO 3 FEET THINLY BEDUED 0.03 - 0.16 FEET VERY THINLY BEDDED 0.03 - 0.16 FEET					
REQUIRES ADDITIONAL WATER TO - DRY - (D) ATTAIN OPTIMUM MOISTURE	D DV 51	VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET THINLY LAMINATED 4.008 FEET	NOTES: BORING ELEVATIONS DERIVED FROM THE U2826B_LS_TNL_08 0,TIN FILE.				
PLASTICITY	I A B HOLLOW HOUSENS	INDURATION	SALIN SELECTIONS SERVED FROM THE SESSONS THE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE SALINE				
PLASTICITY PLASTICITY INDEX (PI) DRY STRENGTH	CME-45C	FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.					
NONPLASTIC 0-5 VERY LOW	X CME-550	FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS: GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.					
LOW PLASTICITY 6-15 SLIGHT MED. PLASTICITY 16-25 MEDIUM	CASING WY ADVANCER HAND TOOLS: PORTABLE HOIST TRICONE	MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE;					
HIGH PLASTICITY 26 OR MORE HIGH	TRICONE TUNGCARB. HAND AUGER	BREAKS EASILY WHEN HIT WITH HAMMER.					
COLOR	CORE BIT SDUNDING 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). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.	VANE SHEAR TEST	EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE;					
Cook to Electioning of Electronic of the Cook to be considered the control of the control of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the cook of the		SAMPLE BREAKS ACROSS GRAINS.					

SHEET NO.

2

PROJECT REFERENCE NO.

3487I.I.I (U-2826B)





<u> </u>							826B					UNTY		TH			GEOLOGIST M	ırray, C. C.	
SITE	DESCF	RIPTIO	N RE	TAININ	NG WA	ALL 5	STA.	20+50	ОТО	22+35 -	140R	A- (RAN	IP A)					GROUND V	VTR (ft
3OR	ING NO	. В-10			S	TATI	ON 2	21+20			OF	FSET 2	25ft LT			ALIGNMEN	NT 140RA	0 HR.	Dry
COLLAR ELEV. 891.9 ft					T	OTA	L DEP	TH 1	5.1 ft	· · · · · · · · · · · · · · · · · · ·	NO	RTHING	856,1	87		EASTING	1,637,395	24 HR.	Dry
DRIL	L MACI	HINE (ME-5	50X	D	RILL	METI	HOD	H.S.	Augers		-					HAMMER TYP	E Automatic	
START DATE 09/03/09					C	OMP	. DAT	E 09/	03/09)	su	RFACE	WATE	R DEF	TH I	N/A	DEPTH TO RO	CK N/A	
LEV	DRIVE ELEV	DEPTH	` 	ow co						PER FOC			SAMP.	V/	L		SOIL AND ROCK DE	SCRIPTION	
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0		25		i0	75	100	NO.	MOI		ELEV. (ft)			DEPTH (f
895	-	-																	
	-	F														- 891.9	GROUND SUR	FACE	0.
890	-	-				·		T			. .		1	<u> </u>	X.	890.9	ARTIFICIAL I	FILL	1.
	888.3 ⁻	3.6														- INIOL	-CH & RED-TAN SAN (A-7)		
	-	F	4	4	4	:	8	: :			: :	: : :	SS-37	М			RESIDUA I E-TAN LOOSE TO D	ENSE MOIST V	
885	_	-				lĿ	<u> </u>	<u> </u>		• • •	<u> </u>					- м -	IICA. CLAYEY SILTY	SAND (A-2-5)	
	883.3	8.6	3	3	5	{ :		: :			: :	: : :	SS-38	м		-			
880	-	-				:'	1 8 . ` ` .	: :	: :		: :	: : :	00-00	101		-			
	878.3 ⁻	13.6						\. ·			. .					-			•
			7	8	28	Ц.	· · ·		36 .	<u> </u>	<u>. :</u>		SS-39	M		876.8	ng Terminated at Elev	ration 070 0 6 1N	15.
875	_															_ DE	ENSE MOIST CLAYE	Y SILTY SAND	
	-															-	(A-2-5)		
870	-															-			
	-	-														-			
	-															-			
865	-															-			
																-			
860	_	-														"			
]	-																	
		_														-		•	
855	-	_																	
	1	-														_			
850	_	-										**				<u>.</u>			
	1	-						-								-			
345	‡	-														_			
343	1	-																	
	1	-			-											- -			
340	1	-														-			
	‡	-														<u>.</u>			
335	‡	-														- -			
333	1	- -																	
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330		-														-			
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225	‡	·								•						<u>.</u>			
325	+	-														-			
	‡	.														<u>-</u> -			
320	+	-														-			
	‡	.										4				-			
115	+	.		-												-			



SHEET 4

PROJECT NO. 34871.1.1 ID. U-2826B											NTY	FORSY	TH		GEOL00	GEOLOGIST Murray, C. C.					
SITE DESCRIPTION RETAINING WALL 5 STA. 20+50 TO 22+35 -14										40RA	- (RAN	IP A)				GROUND W					
BOR	ING NO.	. B-8			S	TATION	21+5	5	~~~	OFF	SET 1	11ft LT			ALIGNMENT 140RA	NT 140RA 0 H					
COLI	LAR ELI	EV. 89	8.3 ft		T	OTAL DE	PTH	20.3 ft		NOR	THING	856,2	03		EASTING 1,637,363	3	24 HR.	Dry			
DRIL	L MACH	HINE C	ME-5	50X	D	RILL ME	THOD	H.S. /	Augers						HAMM	HAMMER TYPE Automatic					
STAF	RT DATE	= 09/0				OMP. DA				<u> </u>	FACE	WATER	DEP		I/A DEPTH TO ROCK N/A						
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	0.5ft	0.5ft		0	25 		PER FOO	75 	100	SAMP.	MOI	LOG	SOIL AND ELEV. (ft)	ROCK DESCR		DEPTH (ft)			
900		-														UND SURFAC		0.0			
895	894.5	- - - 3.8 -	2	3	2	•5						SS-27	M		BLACH ROADW RED-TAN MEI	AY EMBANKN (TOP AND BA AY EMBANKN D. STIFF MOIS (A-4) W/ GRA\	SE MENT T CLAYEY	1.0			
890	892.0 889.5	6.3 - - 8.8	2	1	3	4							M		- - 890.3 - ROADW	AY EMBANKN	MENT	8.0			
885	887.0 884.5	- 11.3 - - 13.8	4	4	5	. l . ∮ 9 ·						SS-28 SS-29	M		- 885.3 RED-TAN S	A-2-5) W/ ROC RESIDUAL FIFF MOIST SI	I. MICA.	11.0			
	882.0	16.3	7	7	5 9							SS-30 SS-31	M		- 882.3 RED-TAN S	SANDY SILT RESIDUAL FIFF MOIST SI	I. MICA.	16.0			
880	879.5	- - 18.8 -	4	9	14		23					SS-32	M		878.0 TAN V. STIFF M	SANDY SILT RESIDUAL IOIST SLI. MIC IDY SILT (A-5)	A. CLAYEY	18.0			
875	1	- - -													TAN MED. DENS	RESIDUAL					
870	+	- -													Boring Termina MED. DENSE N						
865		-		,											· · ·			•			
860		-													• • • •						
855		-													· · -						
850	+	-																			
845	+	- -													- - -						
840		- -													-						
835	† 	-												-	- - -						
830	1			-											-			***************************************			
840 840 835 830 825	+														-						
820						1															

NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

PRO	JECT N	O. 348	371.1 <i>.</i> ′	1	ID.	U-2826E	3		COUNTY	FORSY	TH			GEOLOGIST M	urray, C. C.		
SITE	DESCR	RIPTIO	N RE	TAININ	IG WA	LL 5 STA	۱. 20+	50 TO 22+35 -	140RA- (RAN	IPA)					GROUND W	TR (ft	
BOR	ING NO	. B-9			S ⁻	TATION	22+50	0	OFFSET	18ft LT			ALIGNMEN	IT I40RA	0 HR.	Dry	
COL	LAR EL	EV . 89	7.0 ft		TO	OTAL DE	PTH	14.9 ft	NORTHING	856,2	02		EASTING	1,637,267	24 HR.	Dry	
DRILL MACHINE CME-550X						RILL ME	THOD	H.S. Augers						HAMMER TYP	E Automatic		
START DATE 09/03/09						OMP. DA	TE 09	9/03/09	SURFACE	WATE	R DEP	1 HT	V/A	DEPTH TO RO	ROCK N/A		
ELEV	DRIVE ELEV	DEPTH	BLC	w co	UNT			LOWS PER FOO		SAMP.	V	L		SOIL AND ROCK DE	AND ROCK DESCRIPTION		
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50 	75 100	NO.	МОІ		ELEV. (ft)			EPTH (ft)	
900		-				,							-				
005	-						. .		.				897.0 896.0	GROUND SUR ARTIFICIAL	FILL	0.0	
895	893.6 -	3.4		47	40		- -						-	CH AND SANDY SI RESIDUA	L		
	891.1	5.9	7	17	10		27			SS-33	M		- OLIV	/E-TAN MED. DENS SILTY CLAYEY SA			
890	 888.6 -	8.4	13	14	15		2	9		SS-34	М		<u> </u>				
	886.1	10.9	6	8	4	♥ 12				SS-35	М		_ 886.1			10.9	
885	883.6 -	F	38	42	58/.3		- - - -		100/0.8	•	М		884.5 (SE	WEATHERED V. WEATH. CRYST	ROCK ALLINE ROCK)	12.5	
			19	9	19	<u> </u>	- 128	3		SS-36	М		882.1 OLIVE	RESIDUA MED. DENSE MOIS	ST MICA, CLAYE	Y 14.9	
880	-	+												SAND (A-2- ng Terminated at Ele	vation 882.1 ft IN		
	-												- ME	ED. DENSE MOIST ((A-2-4)	CLAYEY SAND		
875	-	-											_				
	-	Ė	İ										_ 				
870	-												_	•			
	-	-											-				
865	-																
	-	-											<u>-</u>	•			
860	_												-				
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855	-	.											-				
	-																
850	<u>-</u>	_											-		•		
830	-	-											-				
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845	-	-					•										
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840	_												- 				
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835	7	<u> </u>											,				
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825													- -				
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wing.

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PROJECT: 34871.1.1 (U-2826B)

COUNTY: FORSYTH

SITE DESCRIPTION: RETAINING WALL #5, STA. 20+50 TO 22+35 -I40RA-

SOIL	SAMPLE RES	SULTS										ROCK SAMPLE RESULTS															
SAMPLE NO	OFFSET	STATION	DEPTH	AASHTO	N	L.L.	P.I.		% BY WEIC	SHT		% PA	SSING S	IEVES	%	%	UNIT	VOID	SA	AMPLE NO.	OFFSET	STATION	DEPTH	RQD	UNIT WT	Q(ksf)	E(MPsi)
			INTERVAL	CLASS				C. SAND	F. SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC	WT. (d)	RATIO					INTERVAL		(pcf)		
		B-10																									
SS-37	25 LT	21+20	3.6-5.1	A-2-5(0)	8	46	5	15.1	59.0	15.8	10.1	98	90	34													
SS-38	25 LT	21+20	8.6-10.1	A-2-5(0)	8	47	2	34.0	44.7	13.2	8.1	96	78	27													
SS-39	25 LT	21+20	13.6-15.1	A-2-5(0)	36	46	3	31.4	44.5	14.0	10.1	98	82	30													
		B-8																									
SS-27	11 LT	21+55	3.8-5.3	A-4(0)	5	40	7	16.3	47.7	17.8	18.1	86	78	37													
SS-28	11 LT	21+55	8.8-10.3	A-2-5(0)	8	42	4	15.9	57.4	14.6	12.1	97	90	34													
SS-29	11 LT	21+55	11.3-12.8	A-5(0)	9	44	4	12.9	56.0	19.0	12.1	95	92	38													
SS-30	11 LT	21+55	13.8-15.3	A-4(0)	9	36	4	12.1	55.6	20.2	12.1	99	96	42													
SS-31	11 LT	21+55	16.3-17.8	A-5(0)	16	45	4	18.5	48.5	20.8	12.1	94	86	40													
SS-32	11 LT	21+55	18.8-20.3	A-2-5(0)	23	63	NP	30.8	52.8	10.4	6.0	94	80	23													
		B-9																									
SS-33	17 LT	22+50	3.4-5.9	A-2-4(0)	27	30	1	26.4	43.9	13.6	16.1	98	86	35													
SS-34	17 LT	22+50	5.9-7.4	A-2-4(0)	29	26	NP	26.0	54.4	9.6	10.1	98	89	25													
SS-35	17 LT	22+50	8.4-9.9	A-2-4(0)	12	34	3	31.8	43.5	12.6	12.1	99	85	30													
SS-36	17 LT	22+50	13.4-14.9	A-2-4(0)	36	36	NP	27.8	56.4	5.7	10.1	78	72	17													