

PROJECT: 45754

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3	SITE PLAN
4	PROFILE(S)
5-6	CROSS SECTION(S)
7-8	BORE LOG(S)
9	SITE PHOTOGRAPH(S)

STRUCTURE SUBSURFACE INVESTIGATION

COUNTY **STANLY**
SITE DESCRIPTION **BRIDGE NO. 160 ON SAM ROAD**
(SR 1253) OVER RAMSEY BRANCH

CAUTION NOTICE

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 SHALL CONDUCT SUCH SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

PERSONNEL

J.K. STICKNEY

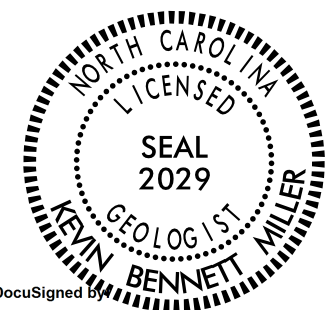
C.L. SMITH


M.R. MOORE

INVESTIGATED BY J.K. STICKNEY

DRAWN BY T.T. WALKER

CHECKED BY J.E. BEVERLY

SUBMITTED BY K.B. MILLERDATE OCTOBER 2016

DocuSigned by

957A789AED704CB...

10/31/2016

SIGNATURE

DATE _____

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

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

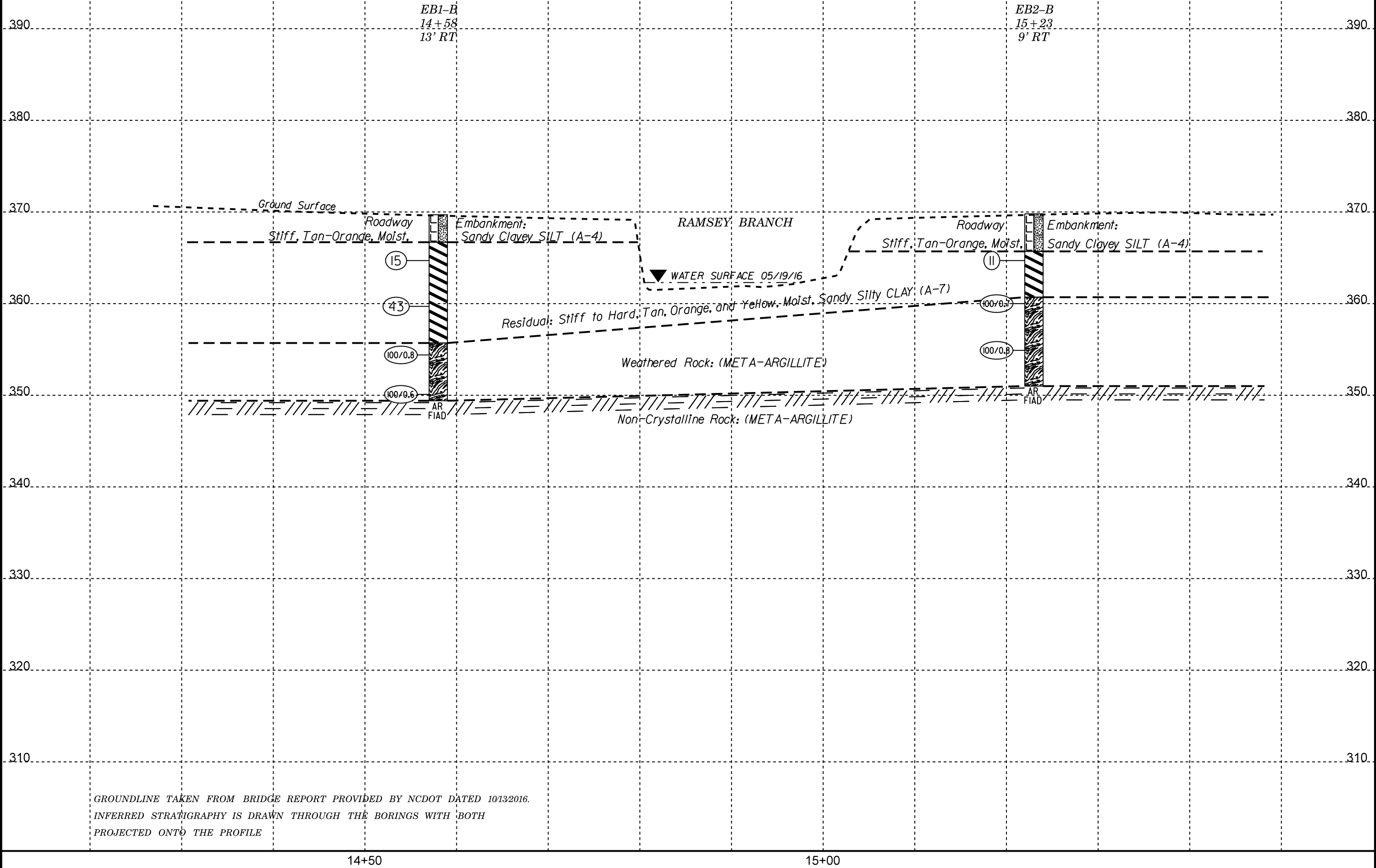
DIVISION OF HIGHWAYS

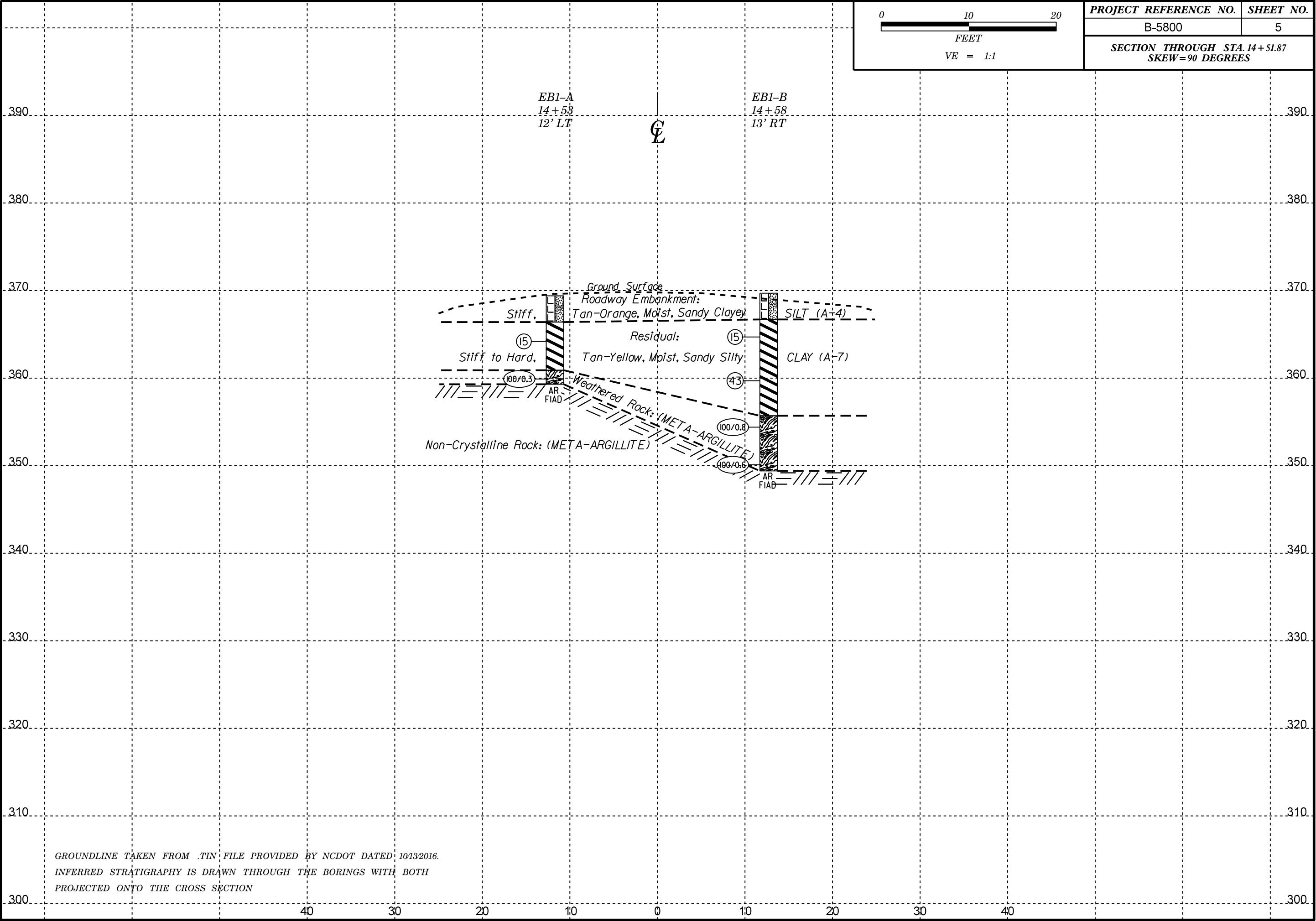
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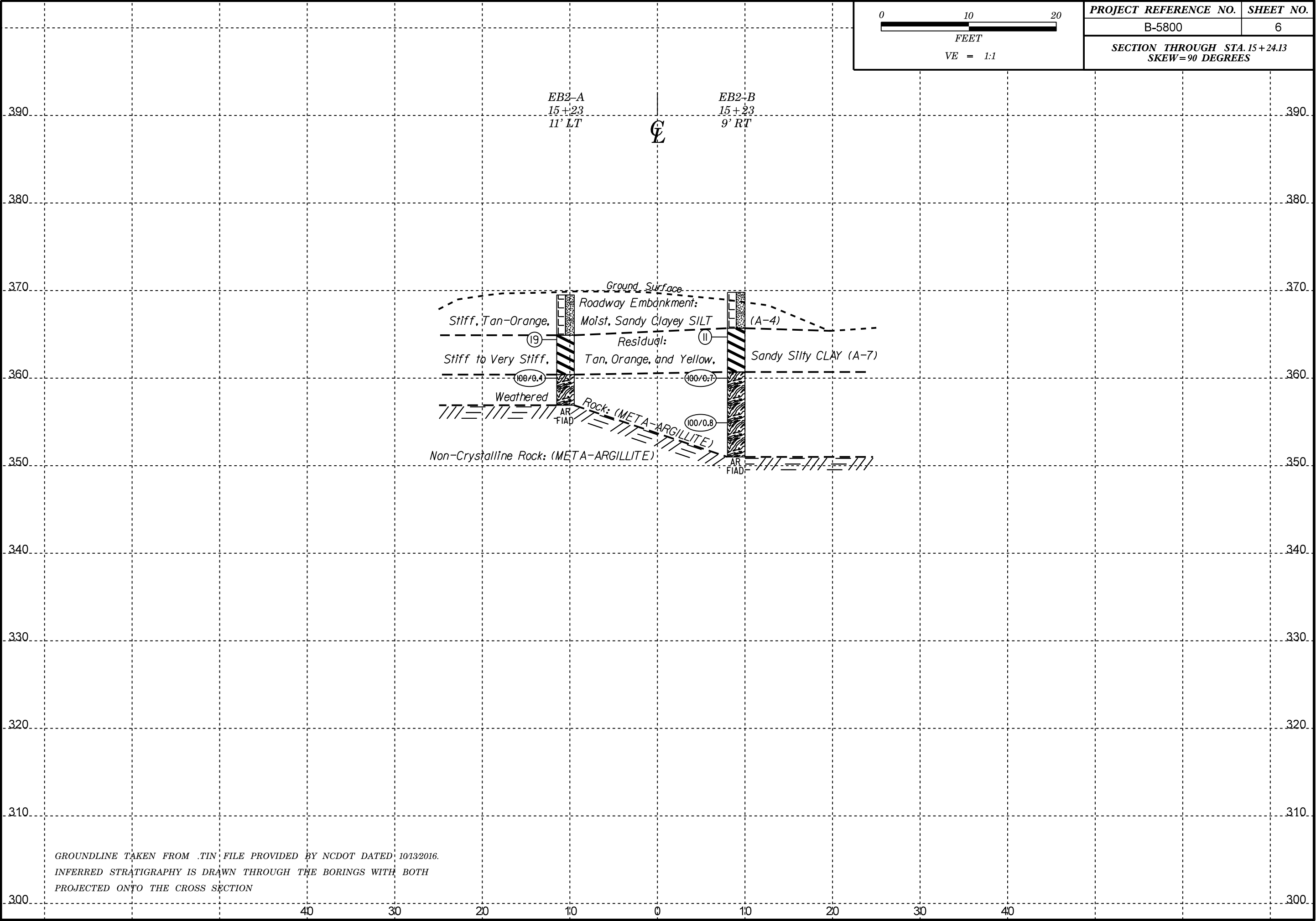
SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION										GRADATION										ROCK DESCRIPTION										TERMS AND DEFINITIONS									
SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6										WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.										HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:										ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS IN OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.									
SOIL LEGEND AND AASHTO CLASSIFICATION										ANGULARITY OF GRAINS										WEATHERED ROCK (WR)										CRISTALLINE ROCK (CR)									
GENERAL CLASS.		GRANULAR MATERIALS (≤ 35% PASSING #200)				SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS				A-1, A-2 A-3		A-4, A-5 A-6, A-7		A-1, A-2 A-3		A-4, A-5 A-6, A-7		A-1, A-2 A-3		A-4, A-5 A-6, A-7		A-1, A-2 A-3		A-4, A-5 A-6, A-7		A-1, A-2 A-3		A-4, A-5 A-6, A-7							
GROUP CLASS.	A-1	A-1-b	A-3	A-2-4	A-2-5	A-2-6	A-2-7	A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7								
SYMBOL																																							
% PASSING #10 #40 #200	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX									
MATERIAL PASSING #40 LL PI	-	-	40 MX 10 MX	40 MX 10 MX	40 MX 10 MX	40 MX 10 MX	40 MX 10 MX	40 MX 10 MX	40 MX 10 MX	40 MX 10 MX	40 MX 10 MX	40 MX 10 MX	40 MX 10 MX	40 MX 10 MX	40 MX 10 MX	40 MX 10 MX	40 MX 10 MX	40 MX 10 MX	40 MX 10 MX	40 MX 10 MX	40 MX 10 MX	40 MX 10 MX	40 MX 10 MX	40 MX 10 MX	40 MX 10 MX	40 MX 10 MX	40 MX 10 MX	40 MX 10 MX	40 MX 10 MX	40 MX 10 MX	40 MX 10 MX								
GROUP INDEX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0								
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS, GRAVEL, AND SAND	STONE FRAGS, GRAVEL, AND SAND	STONE FRAGS, GRAVEL, AND SAND	STONE FRAGS, GRAVEL, AND SAND	STONE FRAGS, GRAVEL, AND SAND	STONE FRAGS, GRAVEL, AND SAND	STONE FRAGS, GRAVEL, AND SAND	STONE FRAGS, GRAVEL, AND SAND	STONE FRAGS, GRAVEL, AND SAND	STONE FRAGS, GRAVEL, AND SAND	STONE FRAGS, GRAVEL, AND SAND	STONE FRAGS, GRAVEL, AND SAND	STONE FRAGS, GRAVEL, AND SAND	STONE FRAGS, GRAVEL, AND SAND	STONE FRAGS, GRAVEL, AND SAND	STONE FRAGS, GRAVEL, AND SAND	STONE FRAGS, GRAVEL, AND SAND	STONE FRAGS, GRAVEL, AND SAND	STONE FRAGS, GRAVEL, AND SAND	STONE FRAGS, GRAVEL, AND SAND	STONE FRAGS, GRAVEL, AND SAND	STONE FRAGS, GRAVEL, AND SAND	STONE FRAGS, GRAVEL, AND SAND	STONE FRAGS, GRAVEL, AND SAND	STONE FRAGS, GRAVEL, AND SAND	STONE FRAGS, GRAVEL, AND SAND	STONE FRAGS, GRAVEL, AND SAND	STONE FRAGS, GRAVEL, AND SAND	STONE FRAGS, GRAVEL, AND SAND	STONE FRAGS, GRAVEL, AND SAND									
GEN. RATING AS SUBGRADE	EXCELLENT TO GOOD				FAIR TO POOR				FAIR TO POOR				POOR				UNSUITABLE				UNSUITABLE				UNSUITABLE				UNSUITABLE				UNSUITABLE						
PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30																																							
CONSISTENCY OR DENSENESS										MISCELLANEOUS SYMBOLS										ROCK HARDNESS										FRACTURE SPACING									
PRIMARY SOIL TYPE		COMPACTNESS OR CONSISTENCY		RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)		RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)		ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION		DIP & DIP DIRECTION OF ROCK STRUCTURES		SLOPE INDICATOR INSTALLATION		CONE PENETROMETER TEST		SOUNDING ROD		TEST BORING WITH CORE		SPT N-VALUE		VERY HARD		HARD		MODERATELY HARD		MEDIUM HARD		SOFT		VERY SOFT							
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)		VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE		< 4 4 TO 10 10 TO 30 30 TO 50 > 50		N/A		ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT		AUGER BORING		CORE BORING		MONITORING WELL		PIEZOMETER INSTALLATION		UNDERCUT		UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE		UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL		CAN BE SCRATCHED BY KNIFE OR PICK, GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK, HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.		CAN BE SCRATCHED BY KNIFE OR PICK, GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK, HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.		CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.		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.		CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERMAIL.							
GENERALLY SILT-CLAY MATERIAL (COHESIVE)		VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD		< 2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 > 30		< 0.25 0.25 TO 0.5 0.5 TO 1.0 1 TO 2 2 TO 4 > 4		INFERRED SOIL BOUNDARY		CORE BORING		MONITORING WELL		PIEZOMETER INSTALLATION		UNDERCUT		UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE		UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL		UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL		CAN BE SCRATCHED BY KNIFE OR PICK, GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK, HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.		CAN BE SCRATCHED BY KNIFE OR PICK, GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK, HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.		CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.		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.		CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERMAIL.							
TEXTURE OR GRAIN SIZE										RECOMMENDATION SYMBOLS										ROCK HARDNESS										FRACTURE SPACING									
U.S. STD. SIEVE SIZE OPENING (MM)		4 4.76		10 2.00		40 0.42		60 0.25		200 0.075		270 0.053		UNDERCUT		UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE		UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL		UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL		UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL		CAN BE SCRATCHED BY KNIFE OR PICK, GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK, HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.		CAN BE SCRATCHED BY KNIFE OR PICK, GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK, HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.		CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.		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.		CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERMAIL.							
BOULDER (BLDR.)		COBBLE (COB.)		GRAVEL (GRV.)		COARSE SAND (CSE, SD.)		FINE SAND (F SD.)		SILT (SL.)		CLAY (CL.)		UNDERCUT		UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE		UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL		UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL		UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL		CAN BE SCRATCHED BY KNIFE OR PICK, GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK, HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.		CAN BE SCRATCHED BY KNIFE OR PICK, GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK, HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.		CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.		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.		CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERMAIL.							
GRAIN SIZE		305 12		75 3		2.0		0.25		0.05		0.005		UNDERCUT		UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE		UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL		UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL		UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL		CAN BE SCRATCHED BY KNIFE OR PICK, GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK, HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.		CAN BE SCRATCHED BY KNIFE OR PICK, GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK, HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.		CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.		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.		CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERMAIL.							
SOIL MOISTURE - CORRELATION OF TERMS										ABBREVIATIONS										ROCK HARDNESS										FRACTURE SPACING									
SOIL MOISTURE SCALE (ATTERBERG LIMITS)		FIELD MOISTURE DESCRIPTION		GUIDE FOR FIELD MOISTURE DESCRIPTION		AR - AUGER REFUSAL		MED. - MEDIUM		VST - VANE SHEAR TEST		WEA. - WEATHERED		UNIT WEIGHT		DRY UNIT WEIGHT		SAMPLE ABBREVIATIONS		S - BULK		SS - SPLIT SPOON		ST - SHELBY TUBE		RS - ROCK		RT - RECOMPACTED TRIAXIAL		CBR - CALIFORNIA BEARING RATIO		TERM		SPACING		TERM		THICKNESS	
LL - LIQUID LIMIT		- SATURATED - (SAT.)		USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE		CL - CLAY		MICA - MICACEOUS		WEA. - WEATHERED <td colspan="2">UNIT WEIGHT</td> <td colspan="2">DRY UNIT WEIGHT</td> <td colspan="2">SAMPLE ABBREVIATIONS</td> <td colspan="2">S - BULK</td> <td colspan="2">SS - SPLIT SPOON</td> <td colspan="2">ST - SHELBY TUBE</td> <td colspan="2">RS - ROCK</td> <td colspan="2">RT - RECOMPACTED TRIAXIAL</td> <td colspan="2">CBR - CALIFORNIA BEARING RATIO</td> <td colspan="2">TERM<td colspan="2">SPACING<td colspan="2">TERM<td colspan="2">THICKNESS</td></td></td></td>		UNIT WEIGHT		DRY UNIT WEIGHT		SAMPLE ABBREVIATIONS		S - BULK		SS - SPLIT SPOON		ST - SHELBY TUBE		RS - ROCK		RT - RECOMPACTED TRIAXIAL		CBR - CALIFORNIA BEARING RATIO		TERM <td colspan="2">SPACING<td colspan="2">TERM<td colspan="2">THICKNESS</td></td></td>		SPACING <td colspan="2">TERM<td colspan="2">THICKNESS</td></td>		TERM <td colspan="2">THICKNESS</td>		THICKNESS			
CPT - CONE PENETRATION TEST		- WET - (W)		SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE		CSE - COARSE		MOD. - MODERATELY		NP - NON PLASTIC		ORG. - ORGANIC		PMT - PRESSUREMETER TEST		S - BULK		SS - SPLIT SPOON		ST - SHELBY TUBE		RS - ROCK		RT - RECOMPACTED TRIAXIAL		CBR - CALIFORNIA BEARING RATIO		TERM <td colspan="2">SPACING<td colspan="2">TERM<td colspan="2">THICKNESS</td></td></td>		SPACING <td colspan="2">TERM<td colspan="2">THICKNESS</td></td>		TERM <td colspan="2">THICKNESS</td>		THICKNESS					
DMT - DILATOMETER TEST		- MOIST - (M)		SOLID; AT OR NEAR OPTIMUM MOISTURE		DPT - DYNAMIC PENETRATION TEST		SD. - SAND, SANDY		SL. - SILT, SILTY		SL. - SLIGHTLY		TRICONE		S - BULK		SS - SPLIT SPOON		ST - SHELBY TUBE		RS - ROCK		RT - RECOMPACTED TRIAXIAL		CBR - CALIFORNIA BEARING RATIO		TERM <td colspan="2">SPACING<td colspan="2">TERM<td colspan="2">THICKNESS</td></td></td>		SPACING <td colspan="2">TERM<td colspan="2">THICKNESS</td></td>		TERM <td colspan="2">THICKNESS</td>		THICKNESS					
F - FINE		- DRY - (D)		REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE		FOSS. - FOSSILIFEROUS		FRAC. - FRACTURED, FRACTURES		FRAGS. - FRAGMENTS		HL - HIGHLY		CME - 45C		CME - 55		CME - 550		VANE SHEAR TEST		PORTABLE HOIST		X CME-550X		CME - 45C		CME - 55		CME - 550		VANE SHEAR TEST		PORTABLE HOIST		X CME-550X			
LL - LIQUID LIMIT		- SATURATED - (SAT.)		USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE		CL - CLAY		MICA - MICACEOUS		WEA. - WEATHERED		UNIT WEIGHT		DRY UNIT WEIGHT		SAMPLE ABBREVIATIONS		S - BULK		SS - SPLIT SPOON		ST - SHELBY TUBE		RS - ROCK		RT - RECOMPACTED TRIAXIAL		CBR - CALIFORNIA BEARING RATIO		TERM <td colspan="2">SPACING<td colspan="2">TERM<td colspan="2">THICKNESS</td></td></td>		SPACING <td colspan="2">TERM<td colspan="2">THICKNESS</td></td>		TERM <td colspan="2">THICKNESS</td>		THICKNESS			
CPT - CONE PENETRATION TEST		- WET - (W)		SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE		CSE - COARSE		MOD. - MODERATELY		NP - NON PLASTIC		ORG. - ORGANIC		PMT - PRESSUREMETER TEST		S - BULK		SS - SPLIT SPOON		ST - SHELBY TUBE		RS - ROCK		RT - RECOMPACTED TRIAXIAL		CBR - CALIFORNIA BEARING RATIO		TERM <td colspan="2">SPACING<td colspan="2">TERM<td colspan="2">THICKNESS</td></td></td>		SPACING <td colspan="2">TERM<td colspan="2">THICKNESS</td></td>		TERM <td colspan="2">THICKNESS</td>		THICKNESS					
DMT - DILATOMETER TEST		- MOIST - (M)		SOLID; AT OR NEAR OPTIMUM MOISTURE		DPT - DYNAMIC PENETRATION TEST		SD. - SAND, SANDY		SL. - SILT, SILTY		SL. - SLIGHTLY		TRICONE		S - BULK		SS - SPLIT SPOON		ST - SHELBY TUBE		RS - ROCK		RT - RECOMPACTED TRIAXIAL		CBR - CALIFORNIA BEARING RATIO		TERM <td colspan="2">SPACING<td colspan="2">TERM<td colspan="2">THICKNESS</td></td></td>		SPACING <td colspan="2">TERM<td colspan="2">THICKNESS</td></td>		TERM <td colspan="2">THICKNESS</td>		THICKNESS					
F - FINE		- DRY - (D)		REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE		FOSS. - FOSSILIFEROUS		FRAC. - FRACTURED, FRACTURES		FRAGS. - FRAGMENTS		HL - HIGHLY		CME - 45C		CME - 55		CME - 550		VANE SHEAR TEST		PORTABLE HOIST		X CME-550X		CME - 45C		CME - 55		CME - 550		VANE SHEAR TEST		PORTABLE HOIST		X CME-550X			
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CPT - CONE PENETRATION TEST		- WET - (W)		SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE		CSE - COARSE		MOD. - MODERATELY		NP - NON PLASTIC		ORG. - ORGANIC		PMT - PRESSUREMETER TEST		S - BULK		SS - SPLIT SPOON		ST - SHELBY TUBE		RS - ROCK		RT - RECOMPACTED TRIAXIAL		CBR - CALIFORNIA BEARING RATIO		TERM <td colspan="2">SPACING<td colspan="2">TERM<td colspan="2">THICKNESS</td></td></td>		SPACING <td colspan="2">TERM<td colspan="2">THICKNESS</td></td>		TERM <td colspan="2">THICKNESS</td>		THICKNESS					
DMT - DILATOMETER TEST		- MOIST - (M)		SOLID; AT OR NEAR OPTIMUM MOISTURE		DPT - DYNAMIC PENETRATION TEST		SD. - SAND, SANDY		SL. - SILT, SILTY		SL. - SLIGHTLY		TRICONE		S - BULK		SS - SPLIT SPOON		ST - SHELBY TUBE		RS - ROCK		RT - RECOMPACTED TRIAXIAL		CBR - CALIFORNIA BEARING RATIO		TERM <td colspan="2">SPACING<td colspan="2">TERM<td colspan="2">THICKNESS</td></td></td>		SPACING <td colspan="2">TERM<td colspan="2">THICKNESS</td></td>		TERM <td colspan="2">THICKNESS</td>		THICKNESS					
F - FINE		- DRY - (D)		REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE		FOSS. - FOSSILIFEROUS		FRAC. - FRACTURED, FRACTURES		FRAGS. - FRAGMENTS		HL - HIGHLY		CME - 45C		CME - 55		CME - 550		VANE SHEAR TEST		PORTABLE HOIST		X CME-550X		CME - 45C		CME - 55											







NCDOT BORE DOUBLE B5800_GEO_BH_BRDG0160.GPJ NC_DOT_GDT 10/20/16

WBS 45754.1.1			TIP B-5800			COUNTY STANLY			GEOLOGIST Stickney, J. K.					
SITE DESCRIPTION Bridge No. 160 on Sam Road (SR 1253) over Ramsey Branch									GROUND WTR (ft) 0 HR. 11.5 24 HR. FIAD					
BORING NO. EB1-B			STATION 14+58			OFFSET 13 ft RT						ALIGNMENT -L-		
COLLAR ELEV. 369.7 ft			TOTAL DEPTH 20.3 ft			NORTHING 560,908						EASTING 1,611,693		
DRILL RIG/HAMMER EFF/DATE HFO0070 CME-550X 84% 05/20/2016						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic					
DRILLER Smith, C. L.			START DATE 09/21/16			COMP. DATE 09/21/16			SURFACE WATER DEPTH N/A					
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT				SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
370													369.7 GROUND SURFACE 0.0	
365	365.7	4.0	4	6	9								ROADWAY EMBANKMENT Tan-Orange, Sandy Clayey SILT (A-4) 366.7 3.0	
360	360.7	9.0	6	12	31								RESIDUAL Tan-Yellow, Sandy Silty CLAY (A-7)	
355	355.7	14.0	12	48	52/0.3								355.7 14.0	
350	350.7	19.0	68	32/0.1									WEATHERED ROCK (META-ARGILLITE) 349.4 20.3	
													Boring Terminated by Auger Refusal at Elevation 349.4 ft on Non-Crystalline Rock (META-ARGILLITE)	

NCDOT BORE DOUBLE B5800_GEO_BH_BRDG0160.GPJ NC_DOT_GDT 10/20/16

WBS 45754.1.1				TIP B-5800				COUNTY STANLY				GEOLOGIST Stickney, J. K.					
SITE DESCRIPTION Bridge No. 160 on Sam Road (SR 1253) over Ramsey Branch												GROUND WTR (ft)					
BORING NO. EB2-B				STATION 15+23				OFFSET 9 ft RT				ALIGNMENT -L-				0 HR. Dry	
COLLAR ELEV. 369.8 ft				TOTAL DEPTH 18.8 ft				NORTHING 560,860				EASTING 1,611,737				24 HR. FIAD	
DRILL RIG/HAMMER EFF./DATE HFO0070 CME-550X 84% 05/20/2016								DRILL METHOD H.S. Augers				HAMMER TYPE Automatic					
DRILLER Smith, C. L.				START DATE 09/21/16				COMP. DATE 09/21/16				SURFACE WATER DEPTH N/A					
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	/	L O G	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					MOI		
370														369.8	GROUND SURFACE	0.0	
365	365.7	4.1									M		365.7	ROADWAY EMBANKMENT		4.1	
			2	4	7									Tan-Orange, Sandy Clayey SILT (A-4)			
360	360.7	9.1												360.7	RESIDUAL		9.1
			8	52/0.2											Tan, Orange, and Yellow, Sandy Silty CLAY (A-7)		
355	355.7	14.1													WEATHERED ROCK		
			43	57/0.3											(META-ARGILLITE)		
															Boring Terminated by Auger Refusal at Elevation 351.0 ft on Non-Crystalline Rock (META-ARGILLITE)		18.8

SITE PHOTOGRAPHS



Photograph : At End Bent 1 looking towards End Bent 2