

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

STRUCTURE
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 34416.1.1 (R-2303C) F.A. PROJ. STPNHF-F-8-2(17)
COUNTY SAMPSON
PROJECT DESCRIPTION NC 24 FROM SR 1404 (DOWDY RD.) TO
SR 1303 (MITCHELL LOOP RD.)

SITE DESCRIPTION BRIDGE NO. 33 AND 432 ON -L- (NC 24)
OVER BEARSKIN SWAMP AT STA. 1081+04.5

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CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING, AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 250-4088. 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 BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELED ON ONLY TO THE DEGREE OF RELIABILITY 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. 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 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 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.

PROJECT: 34416.1.1 ID: R-2303C

PERSONNEL

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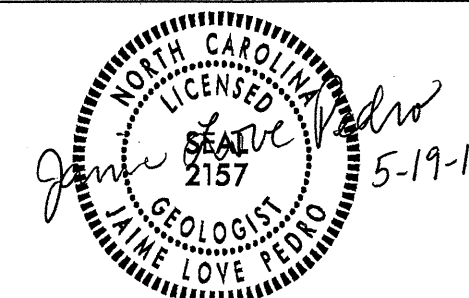
CONSULTANT: S&ME

INVESTIGATED BY J. L. PEDRO

CHECKED BY N. T. ROBERSON

SUBMITTED BY J. L. PEDRO

DATE MAY 2011



DRAWN BY: J. L. PEDRO

NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IS IT 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
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GEOTECHNICAL ENGINEERING UNIT**

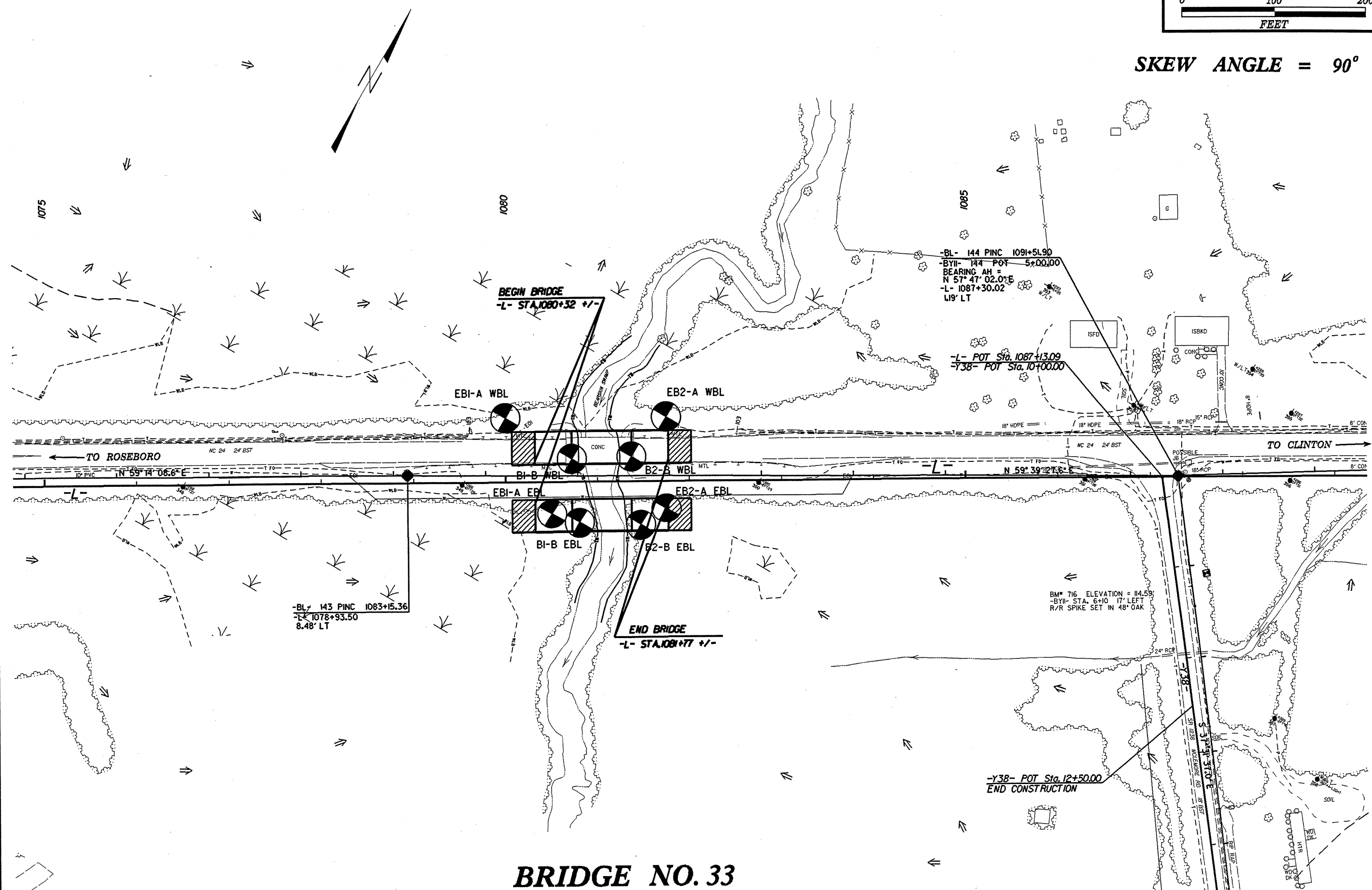
PROJECT REFERENCE NO. 34416.I.(R-2303C)	SHEET NO. 2
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SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

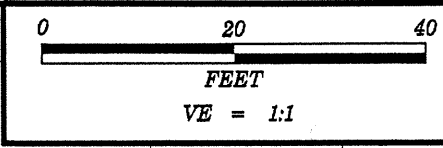
SOIL DESCRIPTION					GRADATION					ROCK DESCRIPTION					TERMS AND DEFINITIONS														
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (ASTM T208, 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 AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLES: <i>VERY STIFF, SANDY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i>					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. DAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES. THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.					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: WEATHERED ROCK (WR) NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED. CRYSTALLINE ROCK (CR) FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC. NON-CRYSTALLINE ROCK (NCR) FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC. COASTAL PLAIN SEDIMENTARY ROCK (CP) COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.					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, 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 (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. 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) (PT) - 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 (SRQD) - 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					MINERALOGICAL COMPOSITION					WEATHERING																			
GENERAL CLASS. GRANULAR MATERIALS (<= 35% PASSING #200) SILT-CLAY MATERIALS (> 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.					FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE. VERY SLIGHT (V SLI) ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN. CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE. SLIGHT (SLI) 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 CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS. MODERATE (MOD.) SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN 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. MODERATELY SEVERE (MOD. SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. IF TESTED, WOULD YIELD SPT REFUSAL. SEVERE (SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. IF TESTED, YIELDS SPT N VALUES > 100 BPF. VERY SEVERE (V SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT 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 VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. IF TESTED, YIELDS SPT N VALUES < 100 BPF. 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.					COMPRESSIBILITY SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 31 MODERATELY COMPRESSIBLE LIQUID LIMIT EQUAL TO 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50					WEATHERING FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE. VERY SLIGHT (V SLI) ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN. CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE. SLIGHT (SLI) 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 CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS. MODERATE (MOD.) SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN 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. MODERATELY SEVERE (MOD. SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. IF TESTED, WOULD YIELD SPT REFUSAL. SEVERE (SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. IF TESTED, YIELDS SPT N VALUES > 100 BPF. VERY SEVERE (V SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT 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 VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. IF TESTED, YIELDS SPT N VALUES < 100 BPF. 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.									
PERCENTAGE OF MATERIAL ORGANIC MATERIAL GRANULAR SOILS SILT-CLAY SOILS OTHER MATERIAL TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10% LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20% MODERATELY ORGANIC > 10% 12 - 20% SOME 20 - 35% HIGHLY ORGANIC > 10% > 20% HIGHLY 35% AND ABOVE					GROUND WATER WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING STATIC WATER LEVEL AFTER 24 HOURS PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA SPRING OR SEEP					MISCELLANEOUS SYMBOLS ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT INFERRED SOIL BOUNDARY INFERRED ROCK LINE ALLUVIAL SOIL BOUNDARY DIP & DIP DIRECTION OF ROCK STRUCTURES SPT DPT DMT VST PHT TEST BORING AUGER BORING CORE BORING MONITORING WELL PIEZOMETER INSTALLATION SLOPE INDICATOR INSTALLATION CONE PENETROMETER TEST SOUNDING ROD																			
CONSISTENCY OR DENSENESS PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)					ABBREVIATIONS AR - AUGER REFUSAL BT - BORING TERMINATED CL - CLAY CPT - CONE PENETRATION TEST CSE - COARSE DMT - DILATOMETER TEST DPT - DYNAMIC PENETRATION TEST e - VOID RATIO F - FINE FOSS - FOSSILIFEROUS FRAC. - FRACTURED, FRACTURES FRAGS. - FRAGMENTS HL - HIGHLY MED. - MEDIUM MICA - MICACEDOUS MOD. - MODERATELY NP - NON PLASTIC ORG. - ORGANIC PMT - PRESSUREMETER TEST SAP. - SAPROLITIC SD. - SAND, SANDY SL. - SILT, SILTY SLI. - SLIGHTLY TCR - TRICONE REFUSAL w - MOISTURE CONTENT V - VERY VST - VANE SHEAR TEST WEA. - WEATHERED w - UNIT WEIGHT w _d - DRY UNIT WEIGHT SAMPLE ABBREVIATIONS S - BULK SS - SPLIT SPOON ST - SHELBY TUBE RS - ROCK RT - RECOMPACTED TRIAXIAL RATIO CBR - CALIFORNIA BEARING RATIO					ROCK HARDNESS VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK. HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN. MODERATELY HARD 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. MEDIUM HARD CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 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 FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE. VERY SOFT 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 FINGER NAIL.																			
TEXTURE OR GRAIN SIZE U.S. STD. SIEVE SIZE OPENING (MM) 4 10 40 60 200 270 4.76 2.00 0.42 0.25 0.075 0.053																													
BOULDER (BLDR.) COBBLE (COB.) GRAVEL (GR.) COARSE SAND (CSE. SD.) FINE SAND (F SD.) SILT (SL.) CLAY (CL.)																													
GRAIN SIZE MM 305 75 2.0 0.25 0.05 0.005 IN. 12 3																													
SOIL MOISTURE - CORRELATION OF TERMS SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION																													
LL - LIQUID LIMIT PL - PLASTIC LIMIT OM - OPTIMUM MOISTURE SL - SHRINKAGE LIMIT					- SATURATED - (SAT.) USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE - WET - (W) SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE - DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE																								
PLASTICITY NONPLASTIC LOW PLASTICITY MED. PLASTICITY HIGH PLASTICITY					PLASTICITY INDEX (PI) DRY STRENGTH 0-5 VERY LOW 6-15 SLIGHT 16-25 MEDIUM 26 OR MORE HIGH																								
COLOR 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.																													
EQUIPMENT USED ON SUBJECT PROJECT DRILL UNITS: MOBILE B- BK-51 CME-45C CME-550 PORTABLE HOIST D-50					ADVANCING TOOLS: CLAY BITS 6" CONTINUOUS FLIGHT AUGER 8" HOLLOW AUGERS HARD FACED FINGER BITS TUNG-CARBIDE INSERTS CASING w/ ADVANCER TRICONE *STEEL TEETH TRICONE *TUNG-CARB. CORE BIT 3/4" HOLLOW AUGERS					HAMMER TYPE: AUTOMATIC MANUAL CORE SIZE: B N H HAND TOOLS: POST HOLE DIGGER HAND AUGER SOUNDING ROD VANE SHEAR TEST																			
										FRACTURE SPACING TERM SPACING VERY WIDE MORE THAN 10 FEET WIDE 3 TO 10 FEET MODERATELY CLOSE 1 TO 3 FEET CLOSE 0.16 TO 1 FEET VERY CLOSE LESS THAN 0.16 FEET					BEDDING TERM THICKNESS VERY THICKLY BEDDED > 4 FEET THICKLY BEDDED 1.5 - 4 FEET THINLY BEDDED 0.16 - 1.5 FEET VERY THINLY BEDDED 0.03 - 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET THINLY LAMINATED < 0.008 FEET														
										INDURATION FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.																			
										BENCH MARK: BM #716 at -BY11- Sta. 6+10.17' LT; Railroad spike in 48' Oak Tree ELEVATION: 114.59 FT.																			
										NOTES:																			

SKIEW ANGLE = 90°

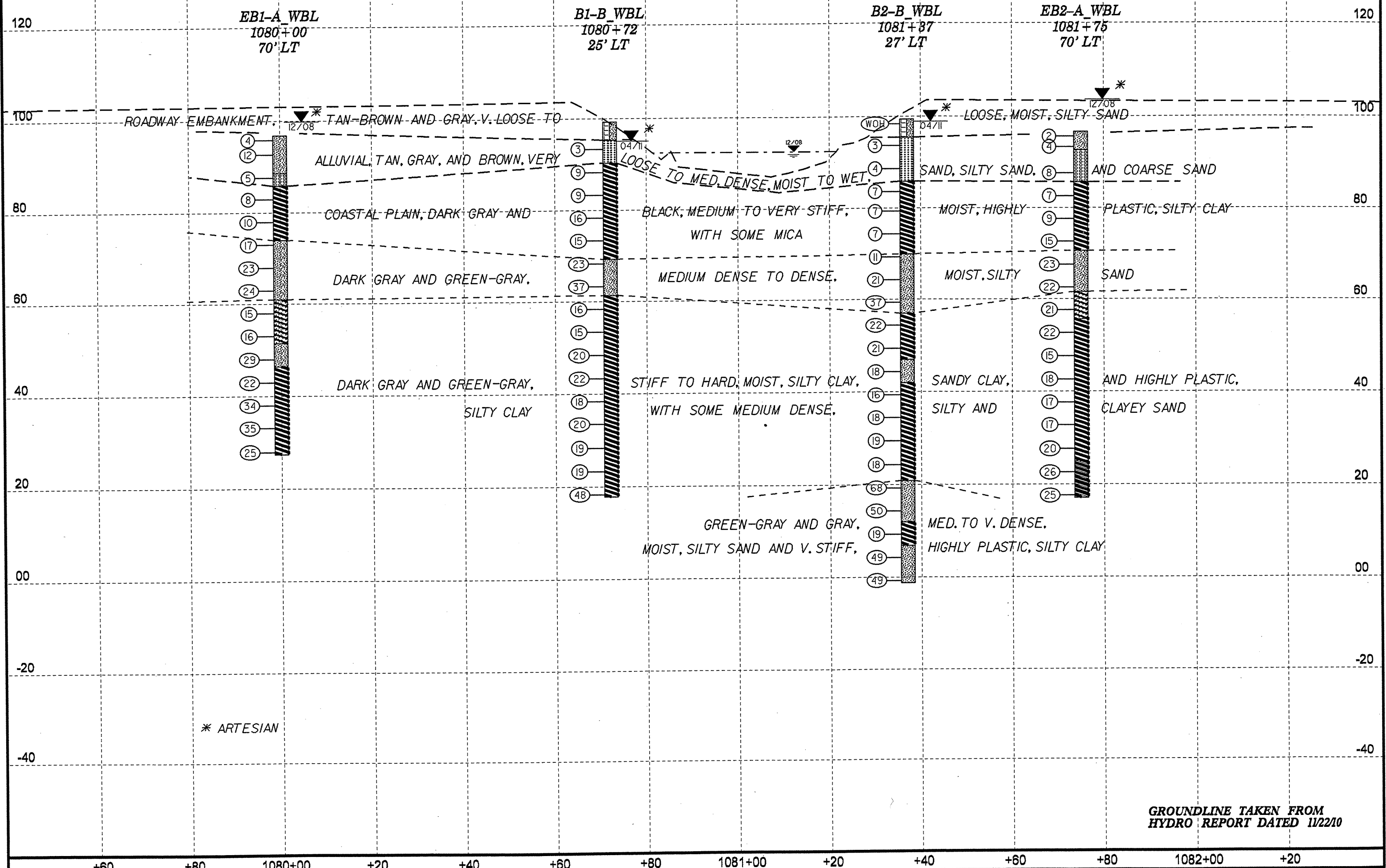


BRIDGE NO. 33

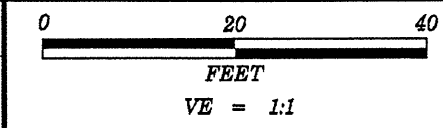
WESTBOUND LANE



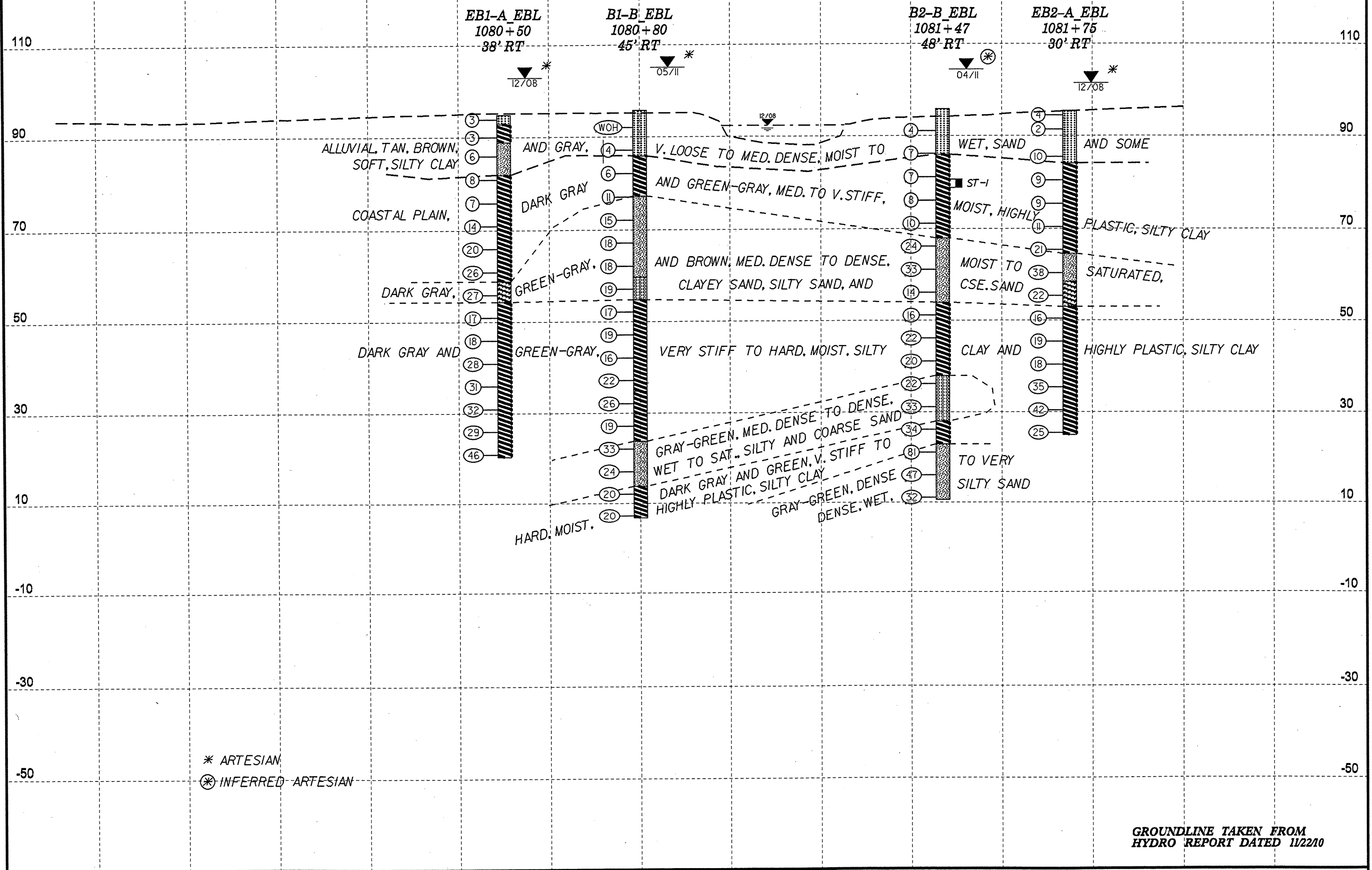
PROJECT REFERENCE NO.	SHEET
34416.1.1 (R-2303C)	4
FENCE DIAGRAM THROUGH BORINGS PROJECTED ALONG -L-	



EASTBOUND LANE

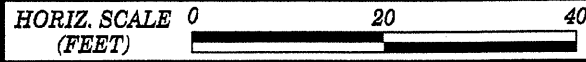


PROJECT REFERENCE NO.	SHEET
34416.1.1 (R-2303C)	5
FENCE DIAGRAM THROUGH BORINGS PROJECTED ALONG -L-	



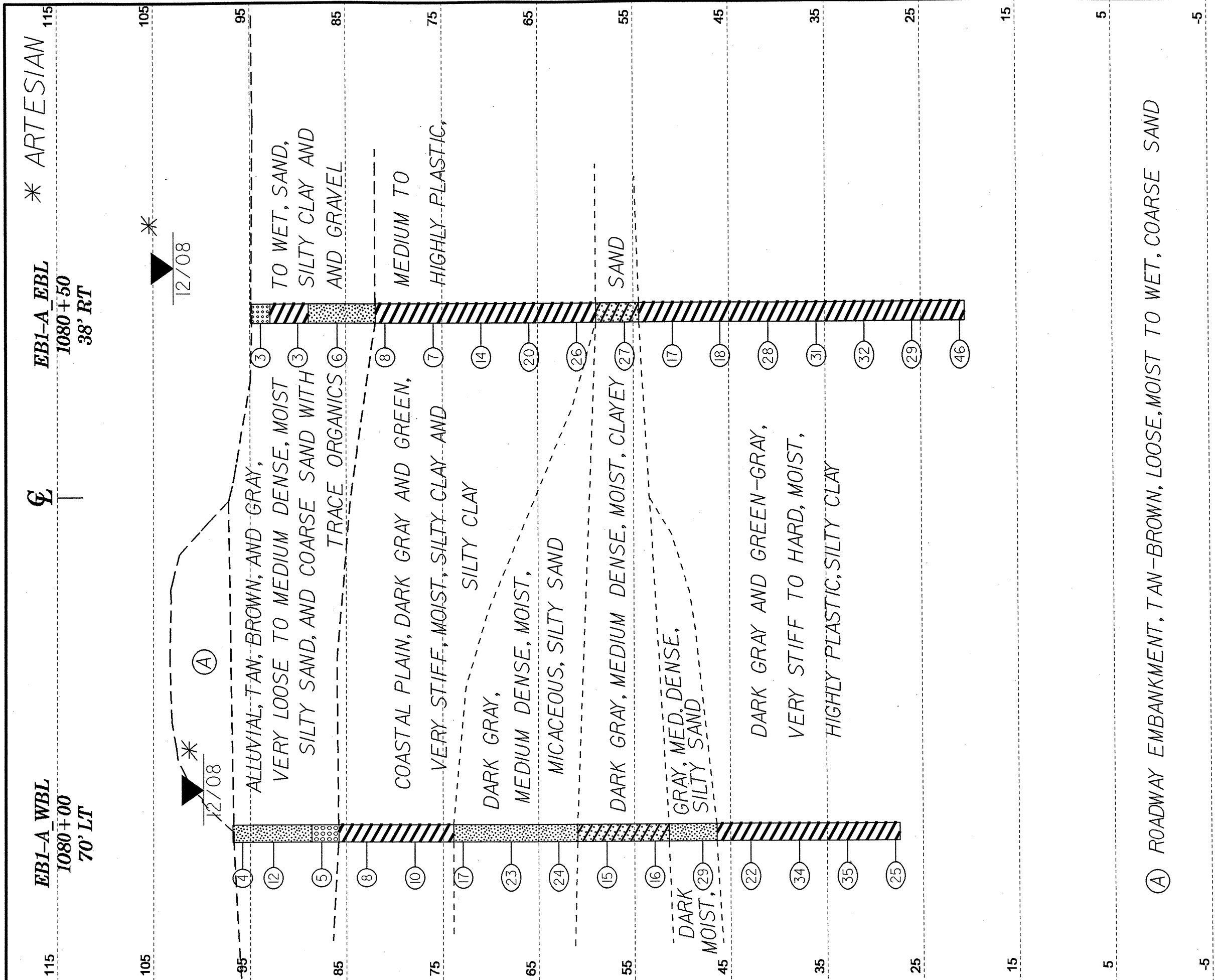
* ARTESIAN
 ⊛ INFERRED ARTESIAN

GROUNDLINE TAKEN FROM
 HYDRO REPORT DATED 11/22/10

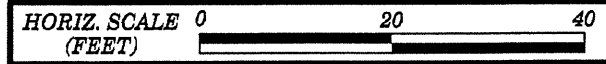
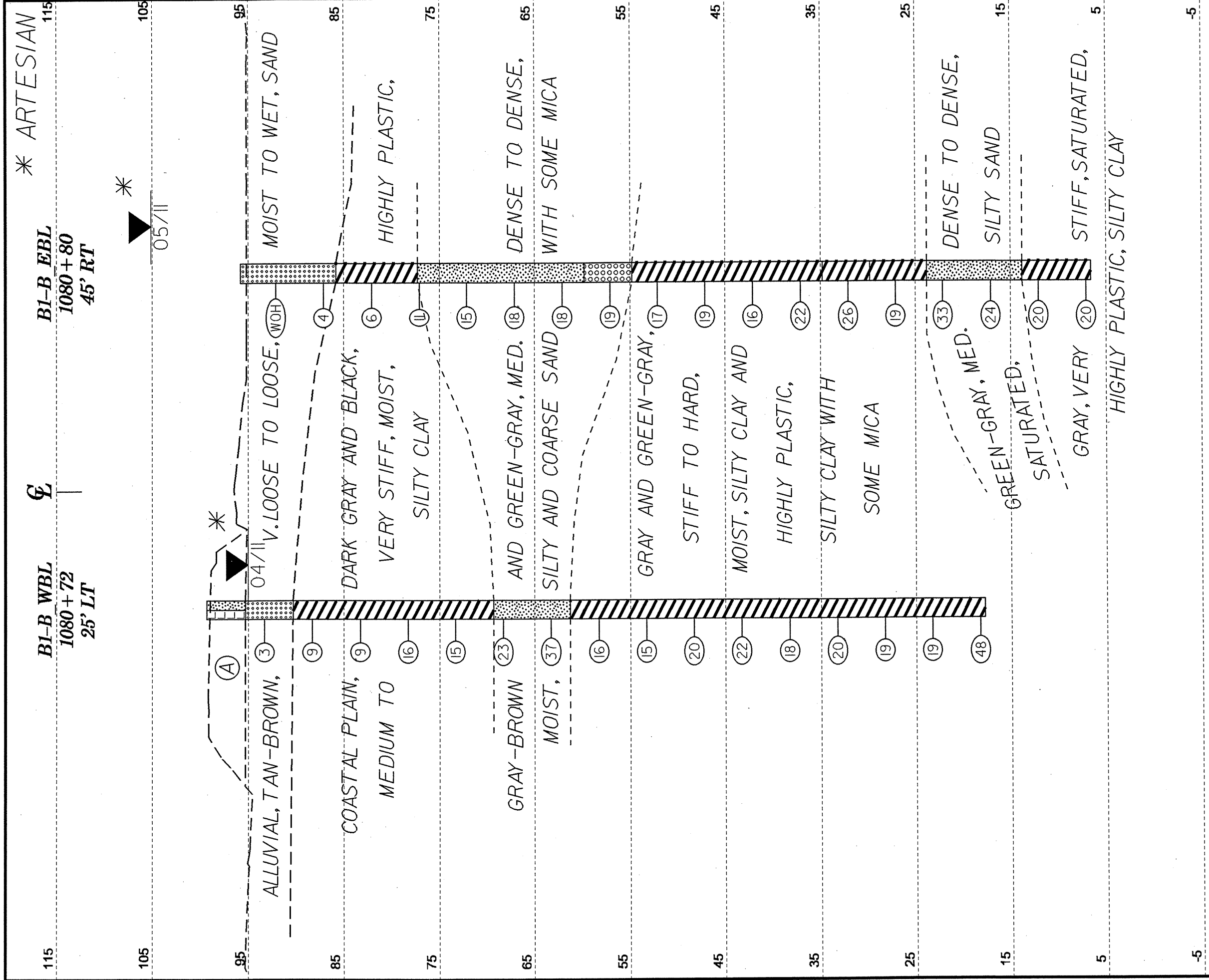


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CROSS SECTION THROUGH END BENT 1



PROJECT REFERENCE NO.	SHEET
34416.1.1 (R-2303C)	6



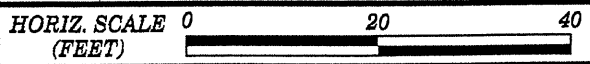
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CROSS SECTION THROUGH BENT 1

(A) ROADWAY EMBANKMENT, TAN-BROWN, LOOSE, MOIST TO WET, COARSE SAND

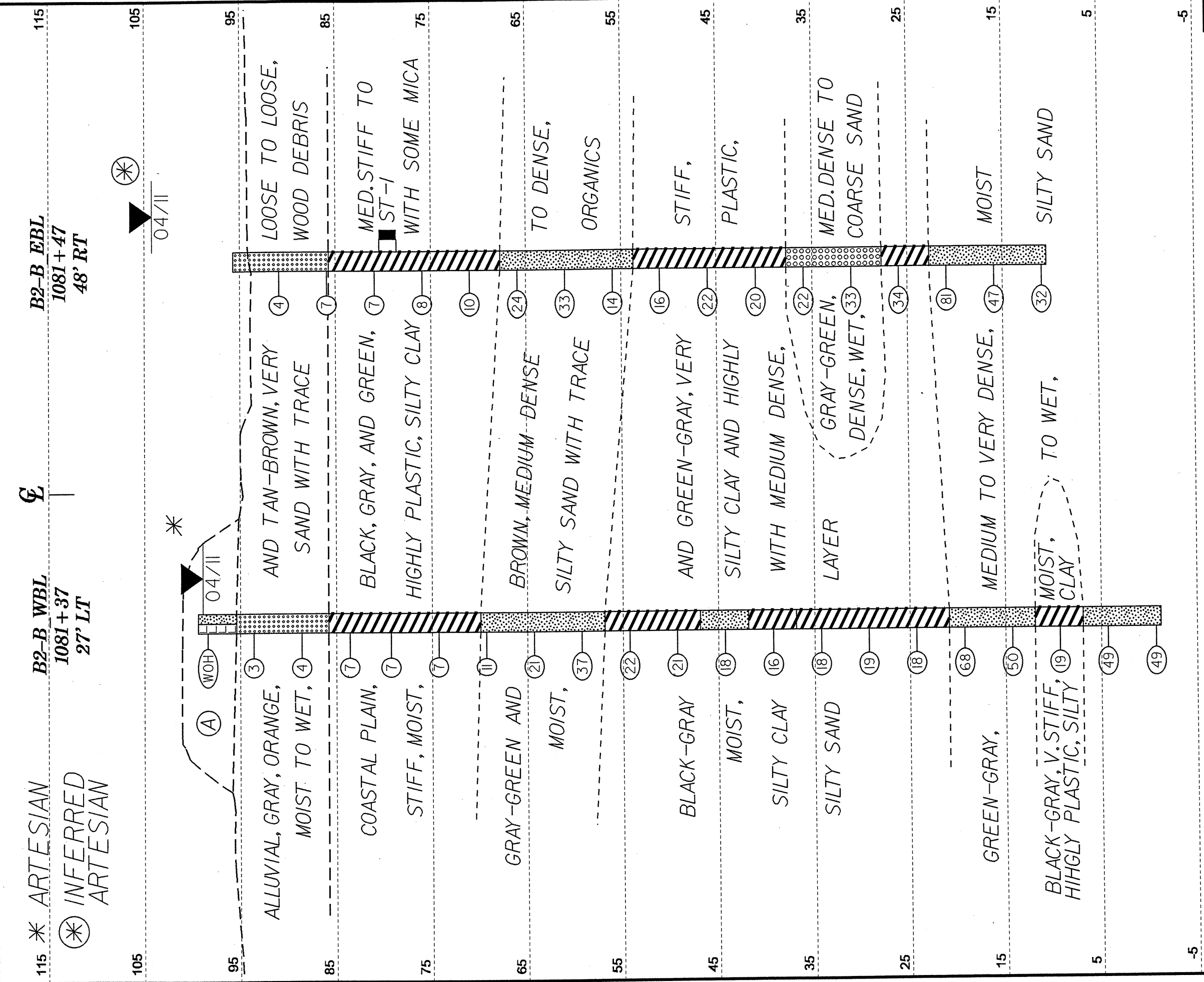
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VE = 2:1

CROSS SECTION THROUGH BENT 2



115 * ARTESIAN
 * INFERRED ARTESIAN

B2-B WBL
 1081+37
 27' LT

B2-B EBL
 1081+47
 48' RT

☉

105

04/11

95

95

85

85

75

75

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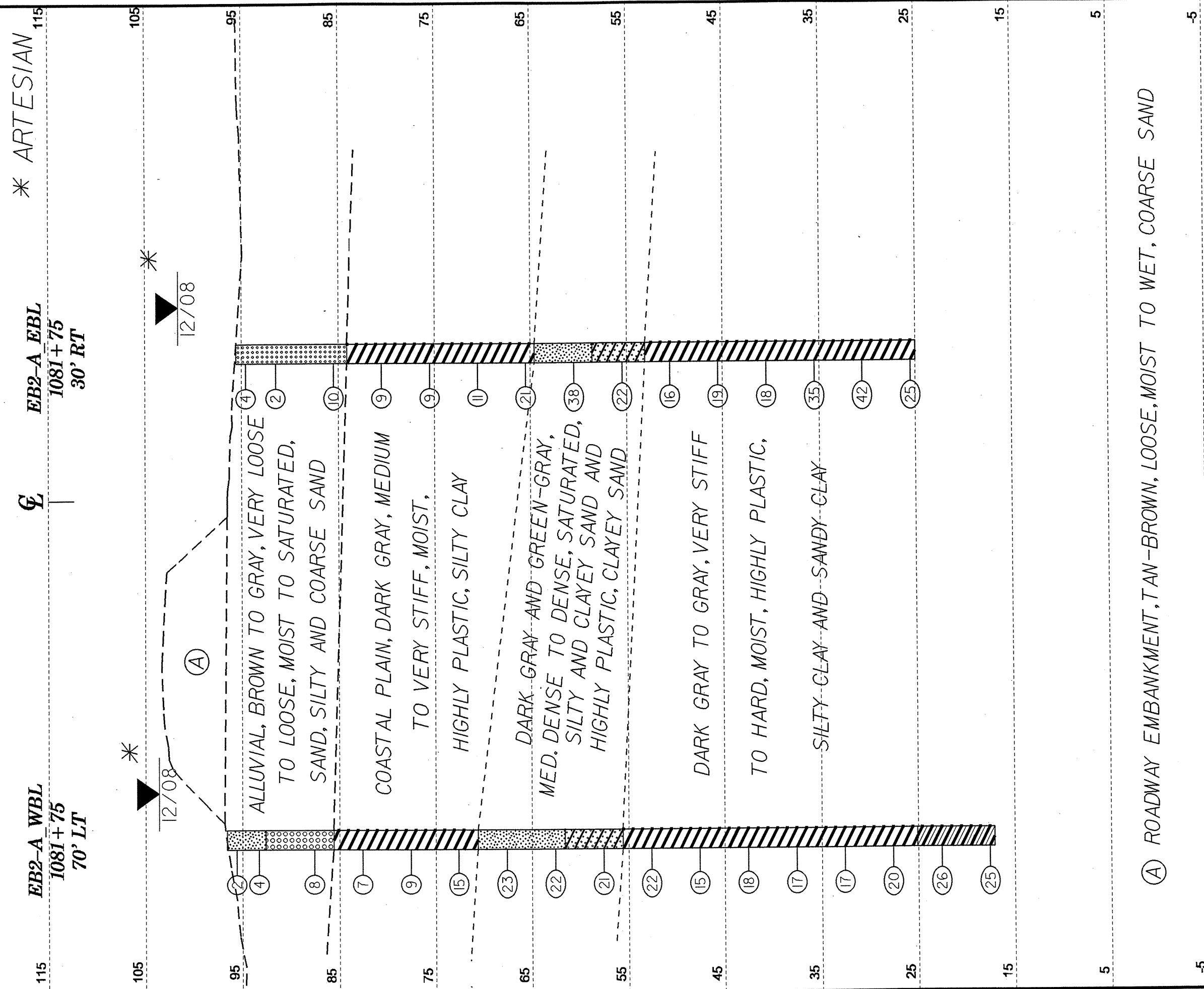
-25

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-5

-5

☉ ROADWAY EMBANKMENT, TAN-BROWN, V. LOOSE TO LOOSE, MOIST TO WET, COARSE SAND



VE = 2:1

CROSS SECTION THROUGH END BENT 2

(A) ROADWAY EMBANKMENT, TAN-BROWN, LOOSE, MOIST TO WET, COARSE SAND

WBS 34416.1.1		TIP R-2303C		COUNTY SAMPSON		GEOLOGIST CONSULTANT									
SITE DESCRIPTION BRIDGE NO. 33 ON -L- (NC 24) OVER BEARSKIN SWAMP							GROUND WTR (ft)								
BORING NO. EB1A_WBL		STATION 1080+00		OFFSET 70 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 96.8 ft		TOTAL DEPTH 69.4 ft		NORTHING 442,322		EASTING 2,166,444									
DRILL RIG/HAMMER EFF./DATE SME R-2 DIEDRICH D-50 84% 00/00/0000				DRILL METHOD Mud Rotary		HAMMER TYPE Automatic									
DRILLER Contract Driller		START DATE 12/17/08		COMP. DATE 12/18/08		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
100															
	96.8	0.0	2	2	2	4						SS-269	W	96.8	GROUND SURFACE 0.0
95	93.6	3.2	4	5	7	12							M		ALLUVIAL GRAY-BROWN AND TAN, SILTY SAND WITH TRACE ORGANICS
90	88.6	8.2	3	3	2	5						SS-271	W	88.6	TAN-WHITE, COARSE SAND
85	83.9	12.9	3	4	4	8						SS-272	55%	85.8	COASTAL PLAIN DARK GRAY, HIGHLY PLASTIC, SILTY CLAY
80	78.9	17.9	4	4	6	10							M		
75	73.9	22.9	6	7	10	17						SS-274	M	73.9	DARK GRAY, MICACEOUS, SILTY SAND
70	68.9	27.9	5	10	13	23							M		
65	63.9	32.9	7	12	12	24						SS-276	M	60.9	DARK GRAY, CLAYEY SAND
60	58.9	37.9	6	6	9	15						SS-277	M		
55	53.9	42.9	6	7	9	16							M		
50	48.9	47.9	8	14	15	29						SS-279	M	51.4	DARK GRAY, SILTY SAND
45	43.9	52.9	6	8	14	22						SS-280	M	46.4	DARK GRAY AND GREEN-GRAY, HIGHLY PLASTIC, SILTY CLAY
40	38.9	57.9	10	14	20	34							M		
35	33.9	62.9	11	15	20	35						SS-282	M		
30	28.9	67.9	8	10	15	25						SS-283	M	27.4	Boring Terminated at Elevation 27.4 ft IN COASTAL PLAIN (SILTY CLAY)

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34416.1.1	TIP R-2303C	COUNTY SAMPSON	GEOLOGIST Pedro, J. L.
SITE DESCRIPTION BRIDGE NO. 33 ON -L- (NC 24) OVER BEARSKIN SWAMP			GROUND WTR (ft) 0 HR. N/A 24 HR. 0.5
BORING NO. B2B_WBL	STATION 1081+37	OFFSET 27 ft LT	ALIGNMENT -L-
COLLAR ELEV. 99.4 ft	TOTAL DEPTH 100.6 ft	NORTHING 442,356	EASTING 2,166,584
DRILL RIG/HAMMER EFF./DATE RFO0067 CME-550X 77% 03/15/2010		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Dixon, D. W.	START DATE 04/26/11	COMP. DATE 04/27/11	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
100	99.4	0.0	WOH	WOH	WOH							M	GROUND SURFACE ROADWAY EMBANKMENT TAN-GRAY, SILTY SAND	0.0
95	94.6	4.8	2	1	2							M	ALLUVIAL TAN-BROWN, ORANGE, AND GRAY, SAND WITH SOME WOOD DEBRIS	4.0
90	89.6	9.8	1	2	2							W		
85	84.6	14.8	2	3	4							M	COASTAL PLAIN DARK GRAY, HIGHLY PLASTIC, SILTY CLAY WITH SOME MICA	13.6
80	80.3	19.1	2	3	4							M		
75	75.3	24.1	2	3	4							M		
70	70.3	29.1	3	5	6						SS-16	M	GREEN-GRAY, SILTY SAND WITH TRACE LEAFY MATERIAL	29.5
65	65.3	34.1	3	8	13							M		
60	60.3	39.1	7	18	19							M		
55	55.3	44.1	7	10	12							M	GRAY-GREEN, HIGHLY PLASTIC, SILTY CLAY	42.5
50	50.3	49.1	6	7	14							M		
45	45.3	54.1	5	8	10							M	GREEN-GRAY, SILTY SAND WITH SOME SMALL CLAY NODULES	52.5
40	40.3	59.1	5	7	9						SS-17	M	GRAY, HIGHLY PLASTIC, SILTY CLAY	57.5
35	35.3	64.1	5	8	10						SS-18	M	GRAY, SILTY CLAY WITH SOME MICA	62.5
30	30.3	69.1	7	8	11							M		
25	25.3	74.1	5	8	10							M		
20	20.3	79.1										M		78.5

NCDOT BORE DOUBLE R2303C_BR33_GEO_BH.GPJ NC_DOT.GDT 5/16/11

WBS 34416.1.1	TIP R-2303C	COUNTY SAMPSON	GEOLOGIST Pedro, J. L.
SITE DESCRIPTION BRIDGE NO. 33 ON -L- (NC 24) OVER BEARSKIN SWAMP			GROUND WTR (ft) 0 HR. N/A 24 HR. 0.5
BORING NO. B2B_WBL	STATION 1081+37	OFFSET 27 ft LT	ALIGNMENT -L-
COLLAR ELEV. 99.4 ft	TOTAL DEPTH 100.6 ft	NORTHING 442,356	EASTING 2,166,584
DRILL RIG/HAMMER EFF./DATE RFO0067 CME-550X 77% 03/15/2010		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Dixon, D. W.	START DATE 04/26/11	COMP. DATE 04/27/11	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
20			17	30	38							W	GREEN-GRAY, SILTY SAND WITH SOME MICA (continued)	
15	15.3	84.1	11	23	27							W		11.9
10	10.3	89.1	7	8	11						SS-20	M	GRAY, HIGHLY PLASTIC, SILTY CLAY	87.5
5	5.3	94.1	12	15	34							W	GRAY, SILTY SAND	92.5
0	0.3	99.1	5	19	30							W	Boring Terminated at Elevation -1.2 ft IN COASTAL PLAIN (SILTY SAND)	100.6

Match Line

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34416.1.1	TIP R-2303C	COUNTY SAMPSON	GEOLOGIST CONSULTANT	
SITE DESCRIPTION BRIDGE NO. 33 ON -L- (NC 24) OVER BEARSKIN SWAMP				GROUND WTR (ft)
BORING NO. EB2A_WBL	STATION 1081+75	OFFSET 70 ft LT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 96.6 ft	TOTAL DEPTH 79.5 ft	NORTHING 442,412	EASTING 2,166,594	24 HR. -7.0
DRILL RIG/HAMMER EFF/DATE SME R-2 DIETRICH D-50 84% 00/00/0000		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER Contract Driller	START DATE 12/22/08	COMP. DATE 12/23/08	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	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
110																
96.6	96.6	0.0	1	1	1									96.6	GROUND SURFACE	0.0
95	94.3	2.3	1	1	3									92.6	ALLUVIAL BROWN, SILTY SAND	4.0
90	88.6	8.0	5	4	4									85.6	GRAY, COARSE SAND	11.0
85	83.6	13.0	2	3	4										COASTAL PLAIN DARK GRAY, HIGHLY PLASTIC, SILTY CLAY	
80	78.6	18.0	3	3	6											
75	73.6	23.0	3	5	10											
70	68.6	28.0	4	11	12									70.6	DARK GRAY, SILTY SAND	26.0
65	63.6	33.0	8	10	12											
60	58.6	38.0	7	10	11									61.6	GRAY, CLAYEY SAND	35.0
55	53.6	43.0	7	9	13									55.6	GRAY HIGHLY PLASTIC, SILTY CLAY	41.0
50	48.6	48.0	5	7	8											
45	43.6	53.0	7	8	10											
40	38.6	58.0	6	8	9											
35	33.6	63.0	5	7	10											
30																

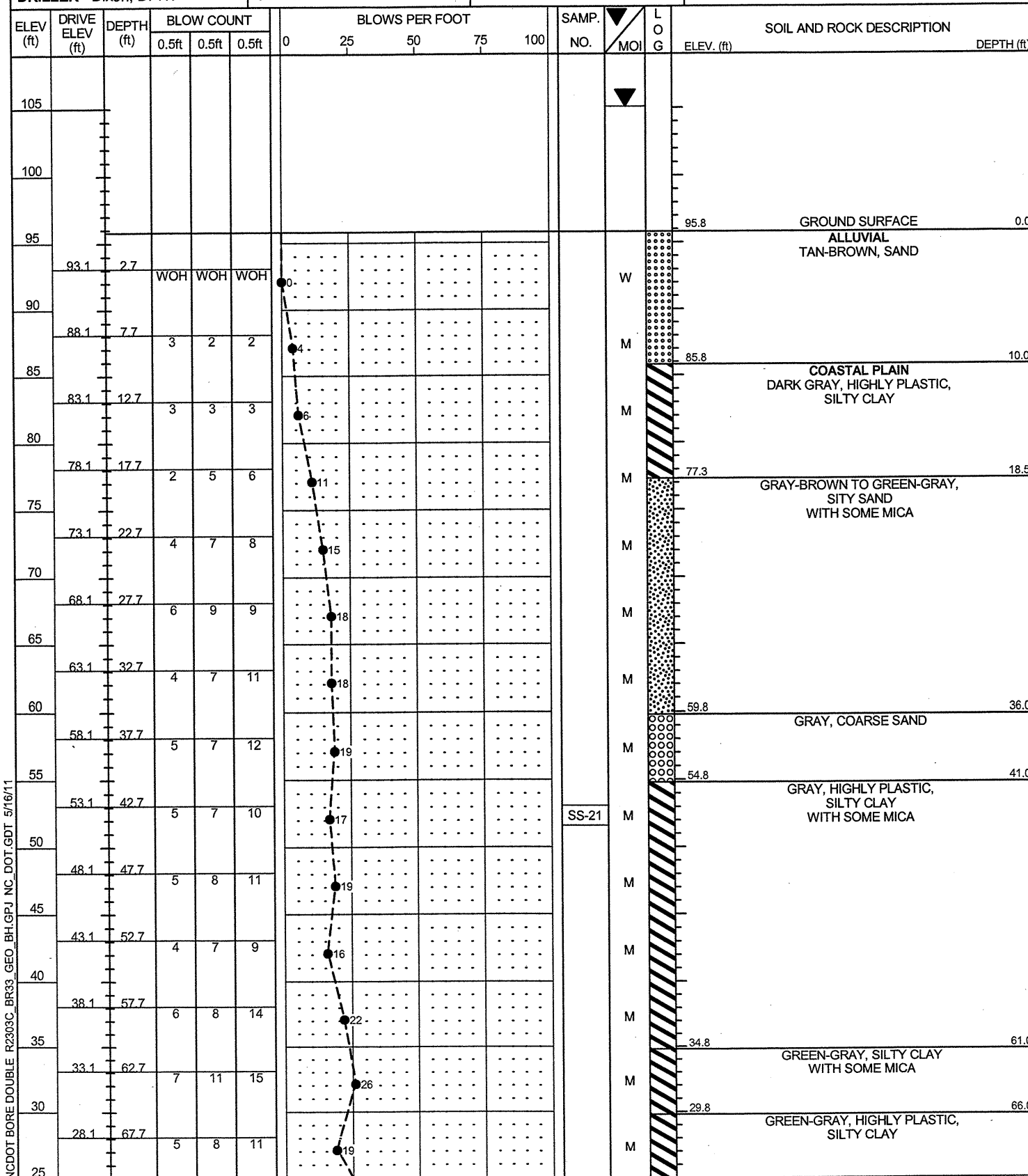
WBS 34416.1.1	TIP R-2303C	COUNTY SAMPSON	GEOLOGIST CONSULTANT	
SITE DESCRIPTION BRIDGE NO. 33 ON -L- (NC 24) OVER BEARSKIN SWAMP				GROUND WTR (ft)
BORING NO. EB2A_WBL	STATION 1081+75	OFFSET 70 ft LT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 96.6 ft	TOTAL DEPTH 79.5 ft	NORTHING 442,412	EASTING 2,166,594	24 HR. -7.0
DRILL RIG/HAMMER EFF/DATE SME R-2 DIETRICH D-50 84% 00/00/0000		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
DRILLER Contract Driller	START DATE 12/22/08	COMP. DATE 12/23/08	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	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
30																
28.6	28.6	68.0	6	9	11											
25	23.6	73.0	5	7	19									25.1	GRAY HIGHLY PLASTIC, SILTY CLAY (continued)	71.5
20	18.6	78.0	7	10	15										GRAY, SANDY CLAY	
														17.1	Boring Terminated at Elevation 17.1 ft IN COASTAL PLAIN (SANDY CLAY)	79.5

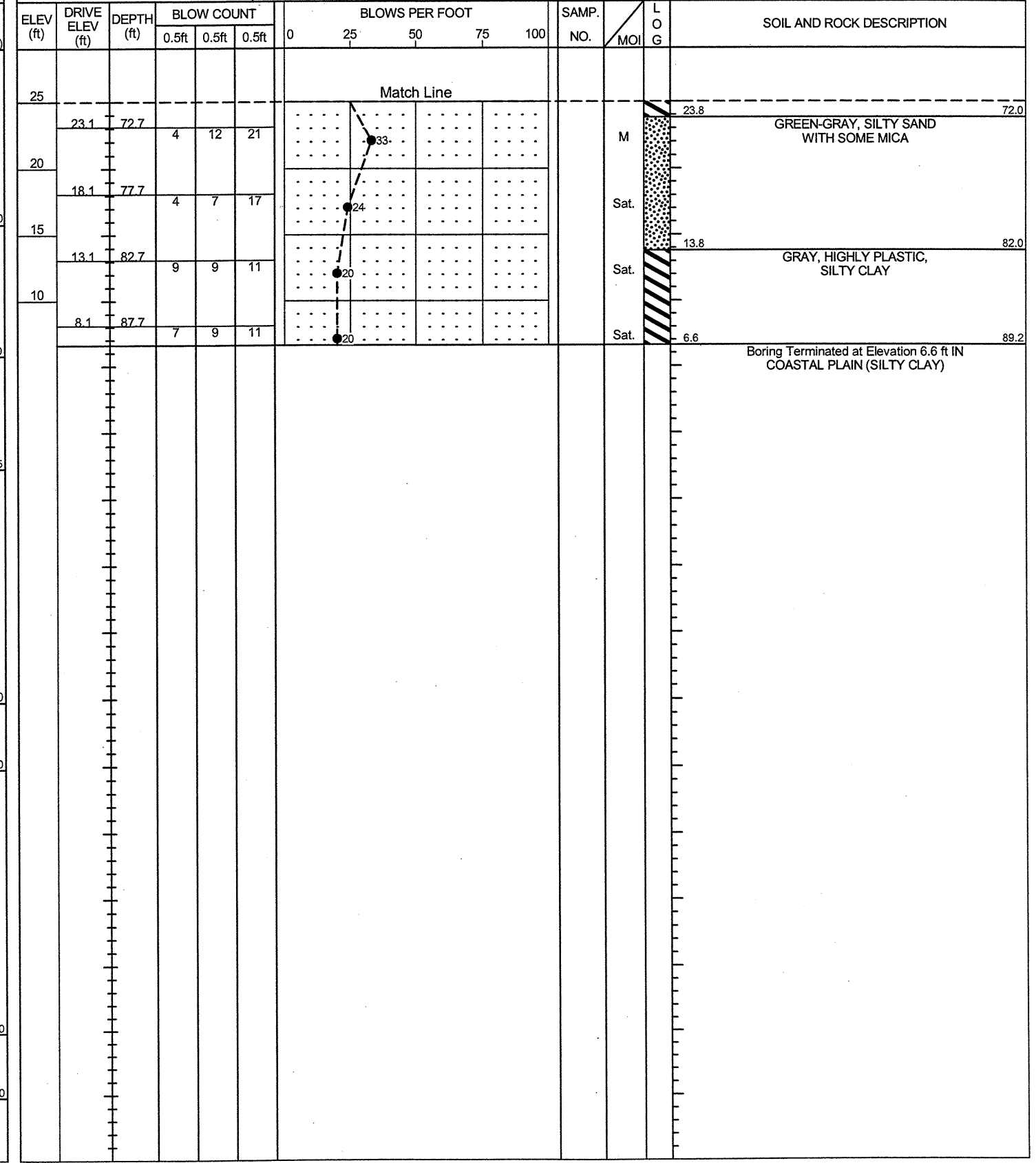
NCDOT BORE DOUBLE R2303C_BR33_GEO_BH.GPJ NC_DOT_GDT 5/19/11

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34416.1.1	TIP R-2303C	COUNTY SAMPSON	GEOLOGIST Pedro, J. L.
SITE DESCRIPTION BRIDGE NO. 432 ON -L- (NC 24) OVER BEARSKIN SWAMP			GROUND WTR (ft)
BORING NO. B1B_EBL	STATION 1080+80	OFFSET 45 ft RT	ALIGNMENT -L- 0 HR. N/A
COLLAR ELEV. 95.8 ft	TOTAL DEPTH 89.2 ft	NORTHING 442,265	EASTING 2,166,572 24 HR. -9.3
DRILL RIG/HAMMER EFF./DATE RFO0067 CME-550X 77% 03/15/2010		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Dixon, D. W.	START DATE 04/29/11	COMP. DATE 05/02/11	SURFACE WATER DEPTH N/A



WBS 34416.1.1	TIP R-2303C	COUNTY SAMPSON	GEOLOGIST Pedro, J. L.
SITE DESCRIPTION BRIDGE NO. 432 ON -L- (NC 24) OVER BEARSKIN SWAMP			GROUND WTR (ft)
BORING NO. B1B_EBL	STATION 1080+80	OFFSET 45 ft RT	ALIGNMENT -L- 0 HR. N/A
COLLAR ELEV. 95.8 ft	TOTAL DEPTH 89.2 ft	NORTHING 442,265	EASTING 2,166,572 24 HR. -9.3
DRILL RIG/HAMMER EFF./DATE RFO0067 CME-550X 77% 03/15/2010		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Dixon, D. W.	START DATE 04/29/11	COMP. DATE 05/02/11	SURFACE WATER DEPTH N/A



NCDOT BORE DOUBLE R2303C_BR33_GEO_BH.GPJ NC_DOT.GDT 5/16/11

NC DOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34416.1.1	TIP R-2303C	COUNTY SAMPSON	GEOLOGIST Oti, O. B.
SITE DESCRIPTION BRIDGE NO. 432 ON -L- (NC 24) OVER BEARSKIN SWAMP			GROUND WTR (ft)
BORING NO. B2B_EBL	STATION 1081+47	OFFSET 48 ft RT	ALIGNMENT -L- 0 HR. N/A
COLLAR ELEV. 95.7 ft	TOTAL DEPTH 85.3 ft	NORTHING 442,296	EASTING 2,166,631 24 HR. -8.5
DRILL RIG/HAMMER EFF./DATE RFO0067 CME-550X 77% 03/15/2010		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Dixon, D. W.	START DATE 04/18/11	COMP. DATE 04/21/11	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
100														
95													GROUND SURFACE	0.0
91.9	91.9	3.8	1	1	3						SS-8	W	ALLUVIAL TAN-BROWN, SAND	
86.9	86.9	8.8	1	3	4							W		
81.9	81.9	13.8	2	3	4						SS-9	M	COASTAL PLAIN BLACK, GRAY, AND GREEN, HIGHLY PLASTIC, SILTY CLAY	
76.9	76.9	18.8	2	3	5							M		
71.9	71.9	23.8	2	4	6						SS-10	M		
66.9	66.9	28.8	5	9	15						SS-11	M	GRAY-GREEN AND BROWN, SILTY SAND	28.0
61.9	61.9	33.8	7	15	18							M		
56.9	56.9	38.8	2	4	10							M		
51.9	51.9	43.8	4	6	10						SS-12	M	BLACK-GRAY, HIGHLY PLASTIC, SILTY CLAY	42.0
46.9	46.9	48.8	5	10	12							M		
41.9	41.9	53.8	6	8	12							M		
36.9	36.9	58.8	3	8	14						SS-13	W	GRAY-GREEN, COARSE SAND	58.0
31.9	31.9	63.8	7	15	18							W		
26.9	26.9	68.8	11	15	19						SS-14	W	BLACK-GREEN, HIGHLY PLASTIC, SILTY CLAY	68.0
21.9	21.9	73.8	12	34	47						SS-15	W	GRAY-GREEN, SILTY SAND	73.0

WBS 34416.1.1	TIP R-2303C	COUNTY SAMPSON	GEOLOGIST Oti, O. B.
SITE DESCRIPTION BRIDGE NO. 432 ON -L- (NC 24) OVER BEARSKIN SWAMP			GROUND WTR (ft)
BORING NO. B2B_EBL	STATION 1081+47	OFFSET 48 ft RT	ALIGNMENT -L- 0 HR. N/A
COLLAR ELEV. 95.7 ft	TOTAL DEPTH 85.3 ft	NORTHING 442,296	EASTING 2,166,631 24 HR. -8.5
DRILL RIG/HAMMER EFF./DATE RFO0067 CME-550X 77% 03/15/2010		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Dixon, D. W.	START DATE 04/18/11	COMP. DATE 04/21/11	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
20														
16.9	16.9	78.8	5	17	30								GRAY-GREEN, SILTY SAND (continued)	
11.9	11.9	83.8	13	14	18							W		
												W		
													Boring Terminated at Elevation 10.4 ft IN COASTAL PLAIN (SILTY SAND)	85.3
													Other Samples: ST-1 (15.3 - 17.1)	

NC DOT BORE DOUBLE R2303C_BR33_GEO_BH.GPJ NC_DOT.GDT 5/25/11

WBS 34416.1.1		TIP R-2303C		COUNTY SAMPSON		GEOLOGIST CONSULTANT								
SITE DESCRIPTION BRIDGE NO. 432 ON -L- (NC 24) OVER BEARSKIN SWAMP							GROUND WTR (ft)							
BORING NO. EB2A_EBL		STATION 1081+75		OFFSET 30 ft RT		ALIGNMENT -L-								
COLLAR ELEV. 95.5 ft		TOTAL DEPTH 70.6 ft		NORTHING 442,326		EASTING 2,166,646								
DRILL RIG/HAMMER EFF./DATE SME R-2 DIEDRICH D-50 84% 00/00/0000				DRILL METHOD Mud Rotary		HAMMER TYPE Automatic								
DRILLER Contract Driller		START DATE 12/23/08		COMP. DATE 12/24/08		SURFACE WATER DEPTH N/A								
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
100														
95	95.5	0.0	1	1	3									95.5 GROUND SURFACE 0.0
90	92.4	3.1	1	1	1									
85	86.4	9.1	4	5	5									
80	81.4	14.1	4	4	5									84.0 COASTAL PLAIN 11.5
75	76.4	19.1	3	4	5									
70	71.4	24.1	4	5	6									
65	66.4	29.1	7	10	11									
60	61.4	34.1	11	17	21									64.5 GREEN-GRAY, SILTY SAND 31.0
55	56.4	39.1	7	10	12									58.5 DARK GRAY, HIGHLY PLASTIC, CLAYEY SAND 37.0
50	51.4	44.1	6	8	8									53.0 DARK GRAY, HIGHLY PLASTIC, SILTY CLAY 42.5
45	46.4	49.1	7	9	10									
40	41.4	54.1	7	9	9									
35	36.4	59.1	8	15	20									
30	31.4	64.1	17	17	25									
25	26.4	69.1	9	11	14									24.9 Boring Terminated at Elevation 24.9 ft IN COASTAL PLAIN (SILTY CLAY) 70.6

EB1A WBL

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-269	70 LT	1080+00	0.0-1.5	A-2-4(0)	21	NP	34.2	54.3	7.4	4.1	97	88	13	-	-
SS-271	70 LT	1080+00	8.2-9.7	A-1-b(0)	19	NP	96.2	3.7	0.1	0.0	83	12	0	-	-
SS-272	70 LT	1080+00	12.9-14.4	A-7-5(55)	82	50	4.3	4.7	27.2	63.8	100	97	93	55.3	-
SS-274	70 LT	1080+00	22.9-24.4	A-2-4(0)	26	NP	1.4	78.4	9.9	10.3	98	97	26	-	-
SS-276	70 LT	1080+00	32.9-34.4	A-2-4(0)	23	NP	45.3	46.5	4.1	4.1	100	99	11	-	-
SS-277	70 LT	1080+00	37.9-39.4	A-2-6(0)	33	13	37.2	33.5	10.7	18.5	89	72	29	-	-
SS-279	70 LT	1080+00	47.9-49.4	A-2-4(0)	25	3	76.2	10.1	7.7	6.0	100	52	15	-	-
SS-280	70 LT	1080+00	52.9-54.4	A-7-6(60)	86	57	3.9	7.8	20.4	67.9	100	97	91	-	-
SS-282	70 LT	1080+00	62.9-64.4	A-7-6(19)	48	27	1.6	37.9	21.4	39.1	100	99	73	-	-
SS-283	70 LT	1080+00	67.9-69.4	A-7-6(45)	68	48	0.8	22.0	26.8	50.4	100	100	87	-	-

B1B WBL

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-1	25 LT	1080+72	5.0-6.5	A-3(0)	22	NP	52.7	39.1	2.1	6.1	100	81	10	-	-
SS-2	25 LT	1080+72	10.0-11.5	A-7-5(65)	89	56	1.2	3.9	23.5	71.4	100	99	97	-	-
SS-3	25 LT	1080+72	25.0-26.5	A-7-6(33)	82	59	34.1	5.7	11.2	49.0	100	69	61	-	-
SS-4	25 LT	1080+72	30.0-31.5	A-2-4(0)	25	NP	1.0	72.6	9.1	17.3	100	99	31	-	-
SS-5	25 LT	1080+72	40.0-41.5	A-7-6(20)	45	29	1.0	31.0	19.0	49.0	100	99	74	-	-
SS-6	25 LT	1080+72	50.0-51.5	A-7-5(80)	108	71	2.9	3.7	24.1	69.4	100	98	94	-	-
SS-7	25 LT	1080+72	65.0-66.5	A-7-6(34)	60	42	1.0	30.2	23.9	44.9	100	99	79	-	-

B2B WBL

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-16	27 LT	1081+37	29.5-30.6	A-7-6(38)	71	42	2.5	20.4	23.7	53.5	100	99	82	-	-
SS-17	27 LT	1081+37	59.1-60.6	A-7-6(66)	88	60	1.4	5.3	21.2	72.0	100	99	95	-	-
SS-18	27 LT	1081+37	64.1-65.6	A-7-6(19)	47	23	0.6	30.5	27.8	41.2	100	100	79	-	-
SS-19	27 LT	1081+37	79.1-80.6	A-2-4(0)	22	NP	36.7	54.0	5.1	4.1	100	73	11	-	-
SS-20	27 LT	1081+37	89.1-90.6	A-7-6(35)	62	44	5.8	20.2	24.7	49.4	100	96	79	-	-

EB2A WBL

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-297	70 LT	1081+75	0.0-1.5	A-2-4(0)	23	9	78.2	9.7	3.9	8.2	97	40	13	-	-
SS-298	70 LT	1081+75	8.0-9.5	A-1-b(0)	21	NP	70.0	24.5	3.5	2.1	76	44	5	-	-
SS-299	70 LT	1081+75	13.0-14.5	A-7-5(65)	93	58	4.9	2.5	24.7	67.9	100	96	94	-	-
SS-300	70 LT	1081+75	28.0-29.5	A-2-4(0)	26	NP	0.4	78.8	12.6	8.2	100	100	25	-	-
SS-301	70 LT	1081+75	38.0-39.5	A-2-7(1)	43	21	67.9	9.7	8.0	14.4	98	43	23	-	-
SS-302	70 LT	1081+75	43.0-44.5	A-7-6(32)	67	44	21.6	9.3	19.8	49.4	100	81	72	-	-
SS-303	70 LT	1081+75	58.0-59.5	A-7-6(30)	61	35	2.7	29.4	24.7	43.2	100	98	80	-	-
SS-304	70 LT	1081+75	73.0-74.5	A-6(9)	37	21	19.8	26.1	19.1	35.0	100	84	58	-	-

EB1A EBL

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-284	35 RT	1080+50	0.0-1.5	A-3(0)	22	NP	67.7	27.6	4.6	0.0	100	68	5	-	-
SS-285	35 RT	1080+50	3.9-5.4	A-7-6(4)	43	17	32.7	25.5	15.0	26.7	100	86	43	-	-
SS-286	35 RT	1080+50	8.0-9.5	A-2-4(0)	23	NP	43.4	43.6	8.8	4.1	97	75	15	-	-
SS-287	35 RT	1080+50	13.0-14.5	A-7-5(51)	78	45	0.8	6.6	28.8	63.8	100	100	94	-	-
SS-289	35 RT	1080+50	23.0-24.5	A-7-6(11)	46	24	3.9	47.1	16.0	32.9	100	98	56	-	-
SS-292	35 RT	1080+50	38.0-39.5	A-2-7(2)	41	20	53.3	17.5	8.6	20.6	100	77	31	-	-
SS-293	35 RT	1080+50	43.0-44.5	A-7-6(47)	76	55	0.6	22.0	19.8	57.6	100	100	81	-	-
SS-296	35 RT	1080+50	58.0-59.5	A-7-6(28)	62	42	1.6	32.1	16.9	49.4	100	99	70	-	-

B1B EBL

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-21	45 RT	1080+80	42.7-44.2	A-7-6(18)	53	32	1.9	40.5	18.5	39.1	100	99	64	-	-

B2B EBL

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-8	48 RT	1081+47	3.8-5.3	A-3(0)	24	NP	43.5	49.5	1.9	5.1	92	72	8	-	-
SS-9	48 RT	1081+47	13.8-15.3	A-7-5(70)	98	66	5.5	3.3	21.8	69.4	98	94	91	-	-
ST-1	48 RT	1081+47	15.3-17.1	A-7-5(62)	89	58	3.1	3.5	32.4	61.1	97	95	92	54	-
SS-10	48 RT	1081+47	23.8-25.3	A-7-6(21)	57	30	5.9	28.6	18.6	46.9	100	97	70	-	-
SS-11	48 RT	1081+47	28.8-30.3	A-2-4(0)	25	NP	11.2	69.3	7.2	12.2	100	100	24	-	-
SS-12	48 RT	1081+47	43.8-45.3	A-7-6(48)	75	50	2.4	13.5	16.7	67.3	100	99	87	-	-
SS-13	48 RT	1081+47	58.8-60.3	A-1-b(0)	NEM	NEM	90.7	3.4	0.8	5.1	98	12	6	-	-
SS-14	48 RT	1081+47	68.8-70.3	A-7-6(37)	64	42	6.1	19.4	19.4	55.1	100	94	83	-	-
SS-15	48 RT	1081+47	73.8-75.3	A-2-4(0)	26	NP	47.1	38.0	4.7	10.2	97	61	17	-	-

EB2A EBL

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-305	30 RT	1081+75	0.0-1.5	A-3(0)	19	NP	62.3	30.0	3.5	4.1	100	68	8	-	-
SS-306	30 RT	1081+75	9.1-10.6	A-3(0)	22	NP	45.5	50.4	4.1	0.0	100	87	5	-	-
SS-307	30 RT	1081+75	0.0-0.0	A-7-5(73)	99	60	0.8	1.9	23.3	74.1	100	99	98	-	-
SS-308	30 RT	1081+75	34.1-35.6	A-2-4(0)	23	NP	17.0	69.9	9.1	4.0	100	100	17	-	-
SS-309	30 RT	1081+75	39.1-40.6	A-2-7(3)	47	27	53.3	14.1	12.3	20.2	96	57	33	-	-
SS-310	30 RT	1081+75	44.1-45.6	A-7-5(63)	91	54	2.4	4.2	22.6	70.7	100	98	95	-	-
SS-311	30 RT	1081+75	64.1-65.6	A-7-6(43)	74	46	5.1	18.8	23.6	52.5	100	96	84	-	-



**FIELD
 SCOUR REPORT**

WBS: 34416.1.1 TIP: R-2303C COUNTY: Sampson

DESCRIPTION(1): Bridge No. 33 on -L- (NC 24) over Bearskin Swamp

EXISTING BRIDGE

Information from: Field Inspection Microfilm (reel pos:
 Other (explain)

Bridge No.: 33 Length: 75 Total Bents: 3 Bents in Channel: 1 Bents in Floodplain: 2
 Foundation Type: Footings on piles

EVIDENCE OF SCOUR(2)

Abutments or End Bent Slopes: None

Interior Bents: Local scour around both footings in creek

Channel Bed: None

Channel Bank: Some contraction scour along banks

EXISTING SCOUR PROTECTION

Type(3): Concrete caps around embankment

Extent(4): 60' W x 10' H

Effectiveness(5): Effective

Obstructions(6): Large trees fallen across creek up and downstream

INSTRUCTIONS

- 1 Describe the specific site's location, including route number and body of water crossed.
- 2 Note scour evidence at existing end bents or abutments (e.g. undermining, sloughing, degradations).
- 3 Note existing scour protection (e.g. rip rap).
- 4 Describe extent of existing scour protection.
- 5 Describe whether or not the scour protection appears to be working.
- 6 Note obstructions such as dams, fallen trees, debris at bents, etc.
- 7 Describe the channel bed material based on observation and/or samples. Include any lab results with report.
- 8 Describe the channel bank material based on observation and/or samples. Include any lab results with report.
- 9 Describe the material covering the banks (e.g. grass, trees, rip rap, none).
- 10 Determine the approximate floodplain width from field observation or a topographic map.
- 11 Describe the material covering the floodplain (e.g. grass, trees, crops).
- 12 Use professional judgement to specify if the stream is degrading, aggrading, or static.
- 13 Describe potential and direction of the stream to migrate laterally during the bridge's life (approx. 100 years).
- 14 Give the design scour elevation (DSE) expected over the life of the bridge (approx. 100 years). This elevation can be given as a range across the site, or for each bent. Discuss the relationship between the Hydraulics Unit theoretical scour and the DSE. If the DSE is dependent on scour counter measures, explain (e.g. rip rap armoring on slopes). The DSE is based on the erodability of materials, giving consideration to the influence of joints, foliation, bedding characteristics, % core recovery, % RQD, differential weathering, shear strength, observations at existing structures, other tests deemed appropriate, and overall geologic conditions at the site.

DESIGN INFORMATION

Channel Bed Material(7): Alluvial, tan-brown, loose, silty sand (SS-297)

Channel Bank Material(8): Alluvial, tan-brown, loose, sand (SS-8)

Channel Bank Cover(9): Grass, trees, and brush

Floodplain Width(10): +/- 750 feet

Floodplain Cover(11): Grass, trees, and brush

Stream is(12): Aggrading Degrading Static

Channel Migration Tend.(13): West towards End Bent 1

Observations and Other Comments: Large scour hole between Bent 1 and End Bent 2 on the upstream side

DESIGN SCOUR ELEVATIONS(14)

Feet Meters

BENTS		
	B1	B2
Westbound	89.0'	89.0'
Eastbound	90.0'	85.8'

Comparison of DSE to Hydraulics Unit theoretical scour:

The DSE agrees with the 100-year theoretical from the Hydraulics report dated (11-22-10) for three of the four proposed interior bents. The westbound Bent 1 elevation was adjusted up from 84.1'

SOIL ANALYSIS RESULTS FROM CHANNEL BED AND BANK MATERIAL

Bed or Bank							
Sample No.							
Retained #4							
Passed #10							
Passed #40							
Passed #200							
Coarse Sand							
Fine Sand							
Silt							
Clay							
LL							
PI							
AASHTO							
Station							
Offset							
Depth							

See Sheets 18-19,
 "Soil Test Results",
 for samples:
 SS-297
 SS-8

Reported by: Jaime Love Pedro
 Jaime Love Pedro

Date: 3/21/2011

SITE PHOTOGRAPH

Bridge No. 33 on -L- (NC 24) over Bearskin Swamp



Looking North towards NC 24 (WBL)

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	34416.1.1 (R-2303C)	1	21

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

STRUCTURE SUBSURFACE INVESTIGATION

CONTENTS

SHEET	DESCRIPTION
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4-5	PROFILE(S)
6-9	CROSS SECTION(S)
10-17	BORE LOG(S)
18-19	SOIL TEST RESULTS
20	SCOUR REPORT
21	SITE PHOTOGRAPHS

PROJ. REFERENCE NO. 34416.1.1 (R-2303C) F.A. PROJ. STPNHF-F-8-2(17)
 COUNTY SAMPSON
 PROJECT DESCRIPTION NC 24 FROM SR 1404 (DOWDY RD.) TO
SR 1303 (MITCHELL LOOP RD.)

SITE DESCRIPTION BRIDGE NO. 25 AND 431 ON -L- (NC 24)
OVER LITTLE COHARIE CREEK AT STA. 943+12.5

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 FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 250-4088. 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 BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY 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 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 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.

PERSONNEL

O. B. OTT

D. W. DIXON

J. R. TURNAGE

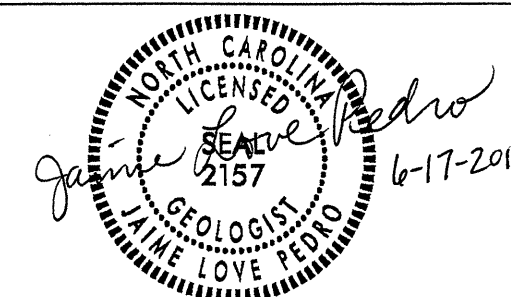
CONSULTANT: S&ME

INVESTIGATED BY J. L. PEDRO

CHECKED BY N. T. ROBERSON

SUBMITTED BY J. L. PEDRO

DATE JUNE 2011



PROJECT: 34416.1.1 ID: R-2303C

DRAWN BY: J. L. PEDRO

NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N.C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IS IT 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

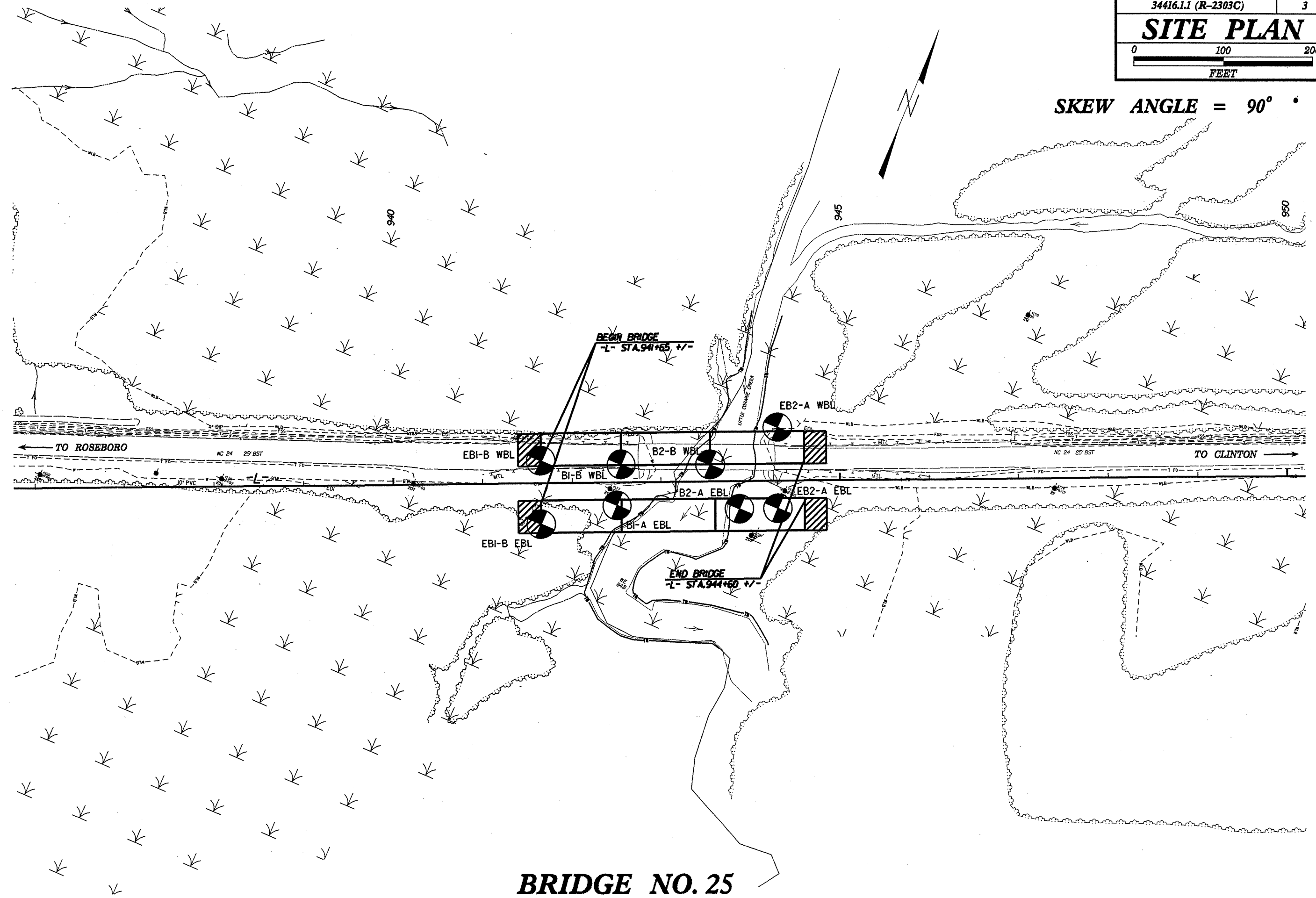
SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

PROJECT REFERENCE NO. 34416.II (R-2303C)	SHEET NO. 2
---------------------------------------------	----------------

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 BLDWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T208, 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 AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE: <i>VERY STIFF, GRAV. SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGH PLASTIC, A-7-6</i>		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.		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 BLDWS. 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, 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 BLDWS 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 BLDWS. STRATA CORE RECOVERY (SCRC) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SRQD) - 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		MINERALOGICAL COMPOSITION		WEATHERING					
GENERAL CLASS. GRANULAR MATERIALS (< 35% PASSING #200) SILT-CLAY MATERIALS (> 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.		WEATHERED ROCK (WR) CRYSTALLINE ROCK (CR) NON-CRYSTALLINE ROCK (NCR) COASTAL PLAIN SEDIMENTARY ROCK (CP)					
GROUP CLASS. A-1, A-1-b, A-2, A-2-1, A-2-5, A-2-6, A-2-7, A-4, A-5, A-6, A-7, A-7-5, A-7-6, A-3, A-6, A-7		COMPRESSIBILITY		ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE. VERY SLIGHT (V SL.) SLIGHT (SL.) MODERATE (MOD.) MODERATELY SEVERE (MOD. SEV.) SEVERE (SEV.) VERY SEVERE (V SEV.) COMPLETE					
SYMBOL		PERCENTAGE OF MATERIAL		ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN. CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLDWS IF OF A CRYSTALLINE NATURE. 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 CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLDWS. SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLDWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK. MODERATELY SEVERE (MOD. SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES 'CLUNK' SOUND WHEN STRUCK. IF TESTED, WOULD YIELD SPT REFUSAL. SEVERE (SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. IF TESTED, YIELDS SPT N VALUES > 100 BPF. VERY SEVERE (V SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT 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 VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. IF TESTED, YIELDS SPT N VALUES < 100 BPF. 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.					
% PASSING # 10 # 40 # 200		SLIGHTLY COMPRESSIBLE MODERATELY COMPRESSIBLE HIGHLY COMPRESSIBLE		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.					
LIQUID LIMIT PLASTIC INDEX		GROUND WATER		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.					
GROUP INDEX		WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING STATIC WATER LEVEL AFTER 24 HOURS PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA SPRING OR SEEP		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.					
USUAL TYPES OF MAJOR MATERIALS		MISCELLANEOUS SYMBOLS		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.					
GEN. RATING AS A SUBGRADE		ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT INFERRED SOIL BOUNDARY INFERRED ROCK LINE ALLUVIAL SOIL BOUNDARY DIP & DIP DIRECTION OF ROCK STRUCTURES		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.					
PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30		TEST BORING W/ CORE AUGER BORING CORE BORING MONITORING WELL PIEZOMETER INSTALLATION SLOPE INDICATOR INSTALLATION CONE PENETROMETER TEST SOUNDING ROD		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.					
CONSISTENCY OR DENSENESS		ABBREVIATIONS		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.					
PRIMARY SOIL TYPE		AR - AUGER REFUSAL BT - BORING TERMINATED CL - CLAY CPT - CONE PENETRATION TEST CSE - COARSE DMT - DILATOMETER TEST DPT - DYNAMIC PENETRATION TEST e - VOID RATIO F - FINE FOSS - FOSSILIFEROUS FRAC - FRACTURED, FRACTURES FRAGS - FRAGMENTS HL - HIGHLY		MED. - MEDIUM MICA - MICA MOD. - MODERATELY NP - NON PLASTIC ORG. - ORGANIC PMT - PRESSUREMETER TEST SAP. - SAPROLITIC SD. - SAND, SANDY SL. - SILT, SILTY SLI. - SLIGHTLY TCR - TRICONE REFUSAL w - MOISTURE CONTENT V - VERY		VST - VANE SHEAR TEST WEA. - WEATHERED W - UNIT WEIGHT W _d - DRY UNIT WEIGHT SAMPLE ABBREVIATIONS S - BULK SS - SPLIT SPOON ST - SHELBY TUBE RS - ROCK RT - RECOMPACTED TRIAXIAL CBR - CALIFORNIA BEARING RATIO			
RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)		EQUIPMENT USED ON SUBJECT PROJECT		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.					
RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/F ²)		DRILL UNITS: MOBILE B- BK-51 CME-45C CME-550 PORTABLE HOIST D-50		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.					
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)		ADVANCING TOOLS: CLAY BITS 6" CONTINUOUS FLIGHT AUGER 8" HOLLOW AUGERS HARD FACED FINGER BITS TUNG-CARBIDE INSERTS CASING w/ ADVANCER TRICONE * STEEL TEETH TRICONE * TUNG-CARB. CORE BIT 3/4" HOLLOW AUGERS		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.					
GENERALLY SILT-CLAY MATERIAL (COHESIVE)		HAMMER TYPE: AUTOMATIC MANUAL CORE SIZE: B N H HAND TOOLS: POST HOLE DIGGER HAND AUGER SOUNDING ROD VANE SHEAR TEST		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.					
VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD		FRACTURE SPACING		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.					
VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE		BEDDING		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.					
4 TO 10 10 TO 30 30 TO 50 >50		INDURATION		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.					
2 TO 4 4 TO 8 8 TO 15 15 TO 30 >30		FRIABLE MODERATELY INDURATED INDURATED EXTREMELY INDURATED		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.					
0.25 TO 0.50 0.5 TO 1.0 1 TO 2 2 TO 4 >4		TEXTURE OR GRAIN SIZE		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.					
U.S. STD. SIEVE SIZE OPENING (MM)		BENCH MARK: NCGS SA20 on SE Wingwall of existing NC 24 Bridge over Little Coharie Creek ELEVATION: 94.76 FT.		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.					
4 10 40 60 200 270		NOTES:		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.					
4.76 2.00 0.42 0.25 0.075 0.053				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.					
BOULDER (BLDR.) COBBLE (COB.) GRAVEL (GR.) COARSE SAND (CSE, SD.) FINE SAND (F SD.) SILT (SL.) CLAY (CL.)				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.					
GRAIN MM 305 75 2.0 0.25 0.05 0.005				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.					
SOIL MOISTURE SCALE (ATTERBERG LIMITS)				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.					
FIELD MOISTURE DESCRIPTION				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.					
GUIDE FOR FIELD MOISTURE DESCRIPTION				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.					
SATURATED (SAT.)				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.					
WET (W)				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.					
MOIST (M)				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.					
DRY (D)				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.					
PLASTICITY				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.					
PLASTICITY INDEX (PI)				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.					
DRY STRENGTH				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.					
NONPLASTIC LOW PLASTICITY MED. PLASTICITY HIGH PLASTICITY				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.					
0-5 6-15 16-25 26 OR MORE				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.					
VERY LOW SLIGHT MEDIUM HIGH				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.					
COLOR				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.					
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.				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.					

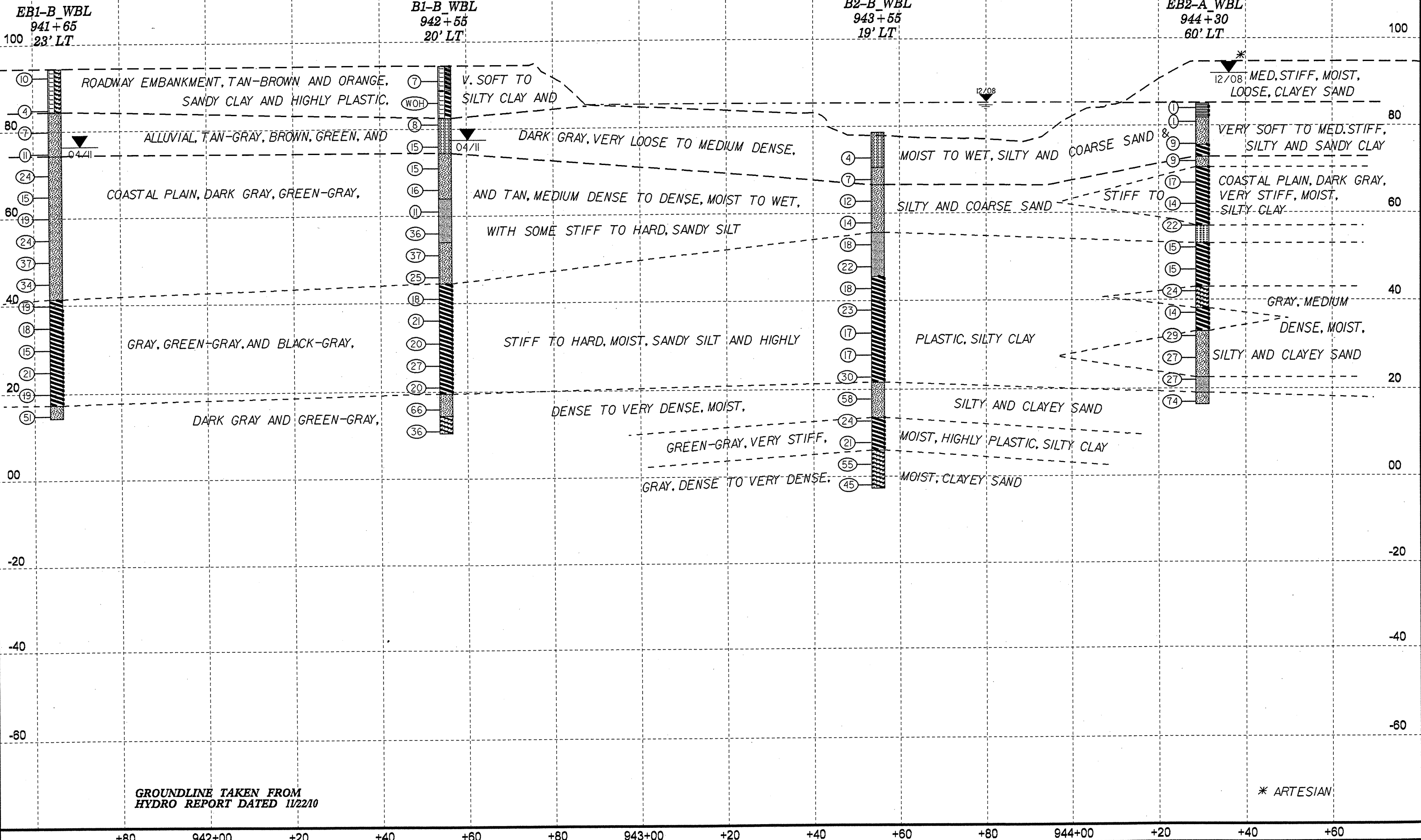
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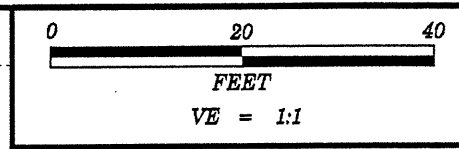
BRIDGE NO. 25

WESTBOUND LANE

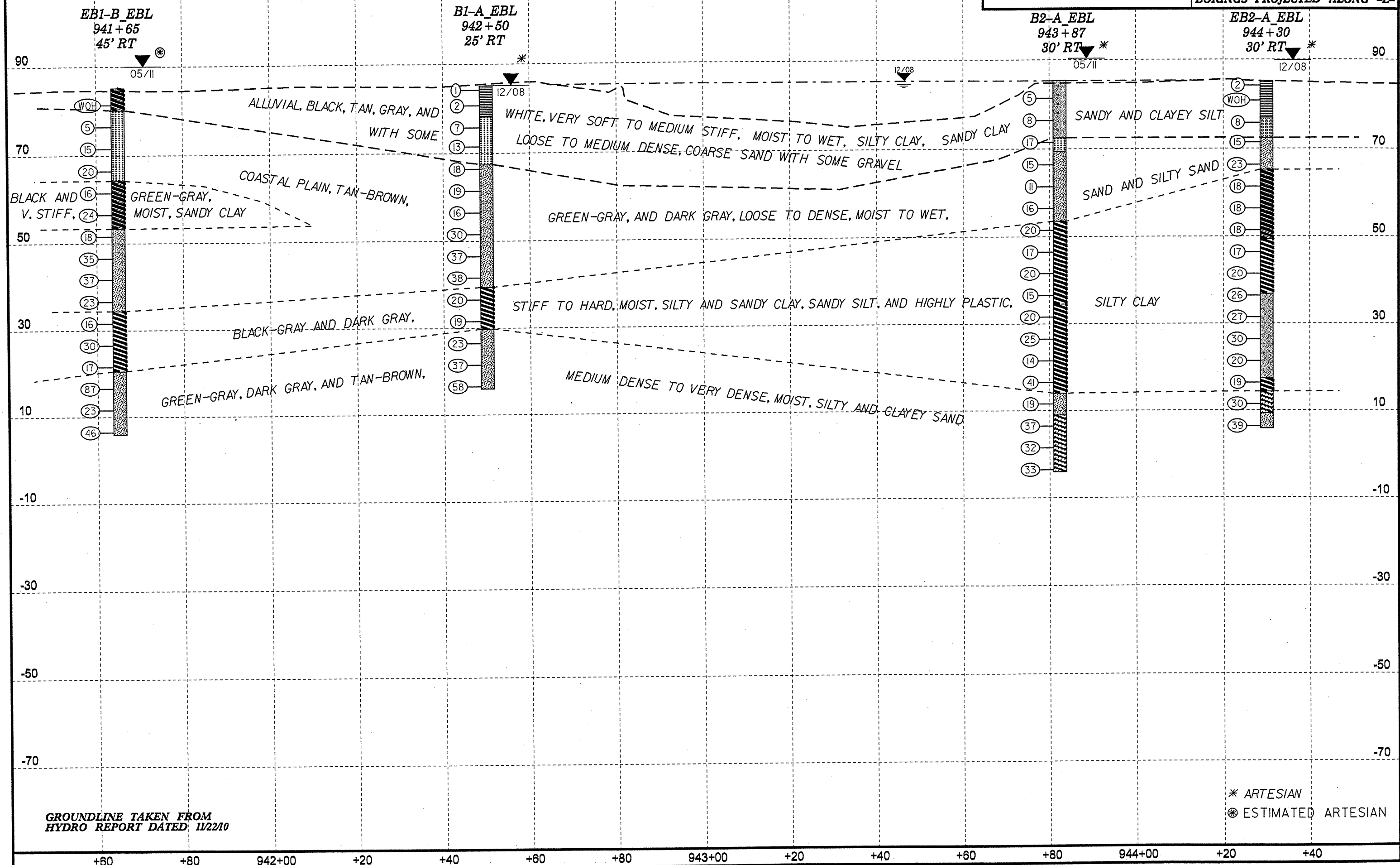
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	SHEET 4
FENCE DIAGRAM THROUGH BORINGS PROJECTED ALONG -L-	



EASTBOUND LANE

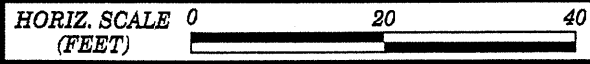


PROJECT REFERENCE NO.	SHEET
34416.1.1 (R-2303C)	5
FENCE DIAGRAM THROUGH BORINGS PROJECTED ALONG -L-	



GROUNDLINE TAKEN FROM HYDRO REPORT DATED 11/22/10

* ARTESIAN
 ⊗ ESTIMATED ARTESIAN

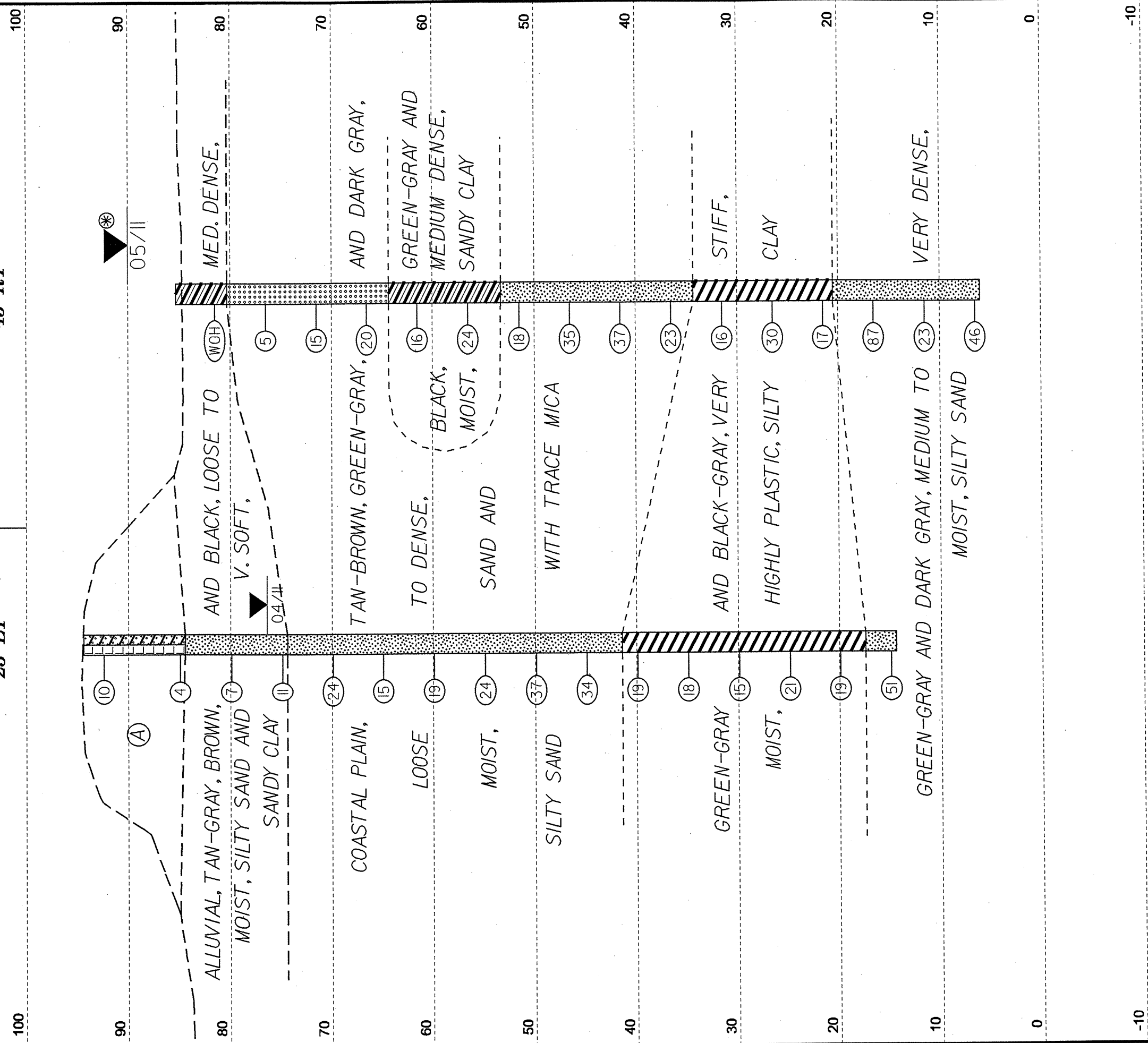


VE = 2:1

CROSS SECTION THROUGH END BENT 1

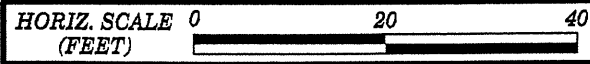
EBl-B_WBL
941+65
23' LT

EBl-B_EBL
941+65
45' RT



(A) ROADWAY EMBANKMENT, TAN-BROWN, MEDIUM DENSE, MOIST, CLAYEY SAND

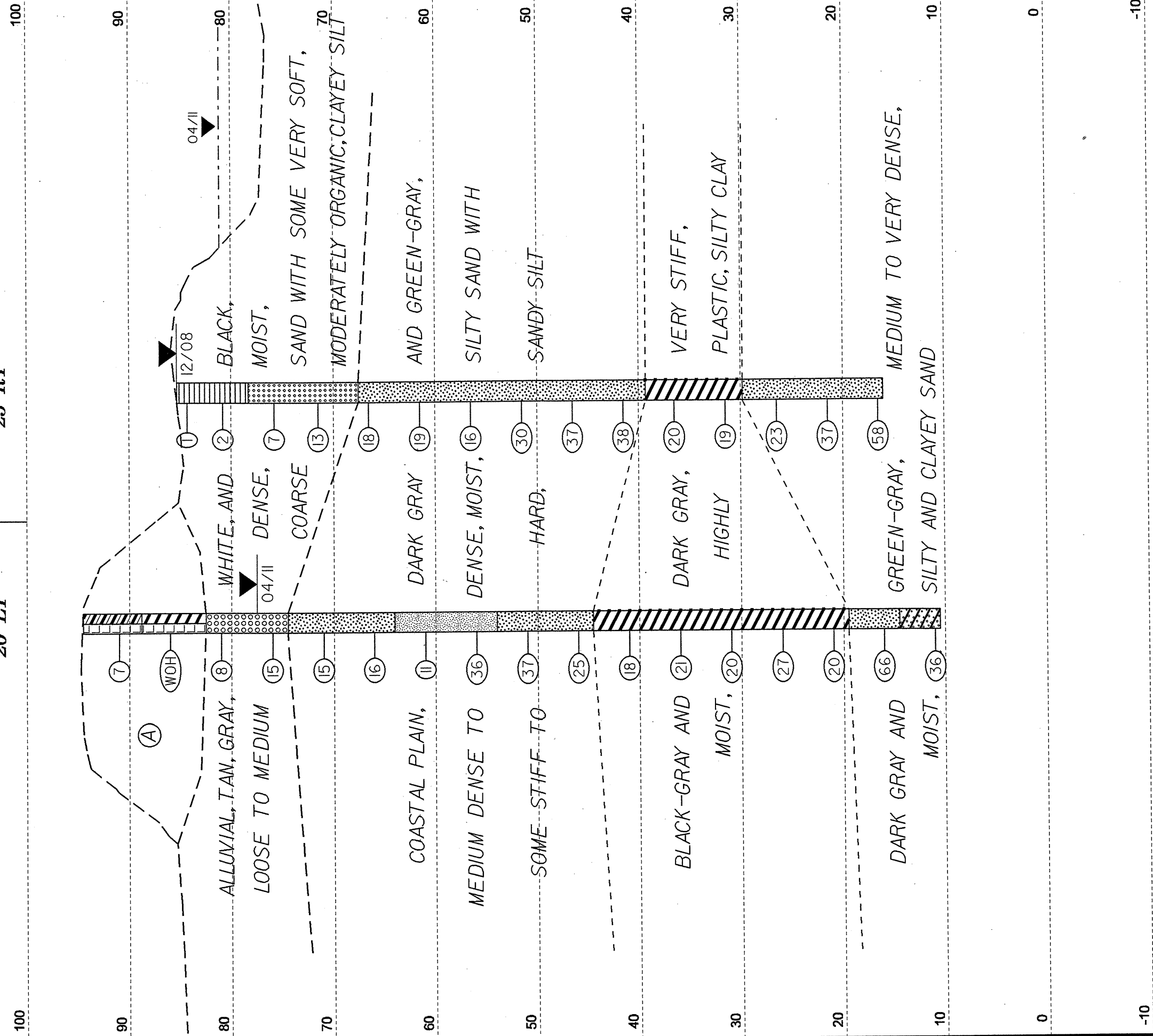
⊛ ESTIMATED ARTESIAN



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CROSS SECTION THROUGH BENT 1

BI-B WBL 942+55 20' LT
 BI-A EBL 942+50 25' RT



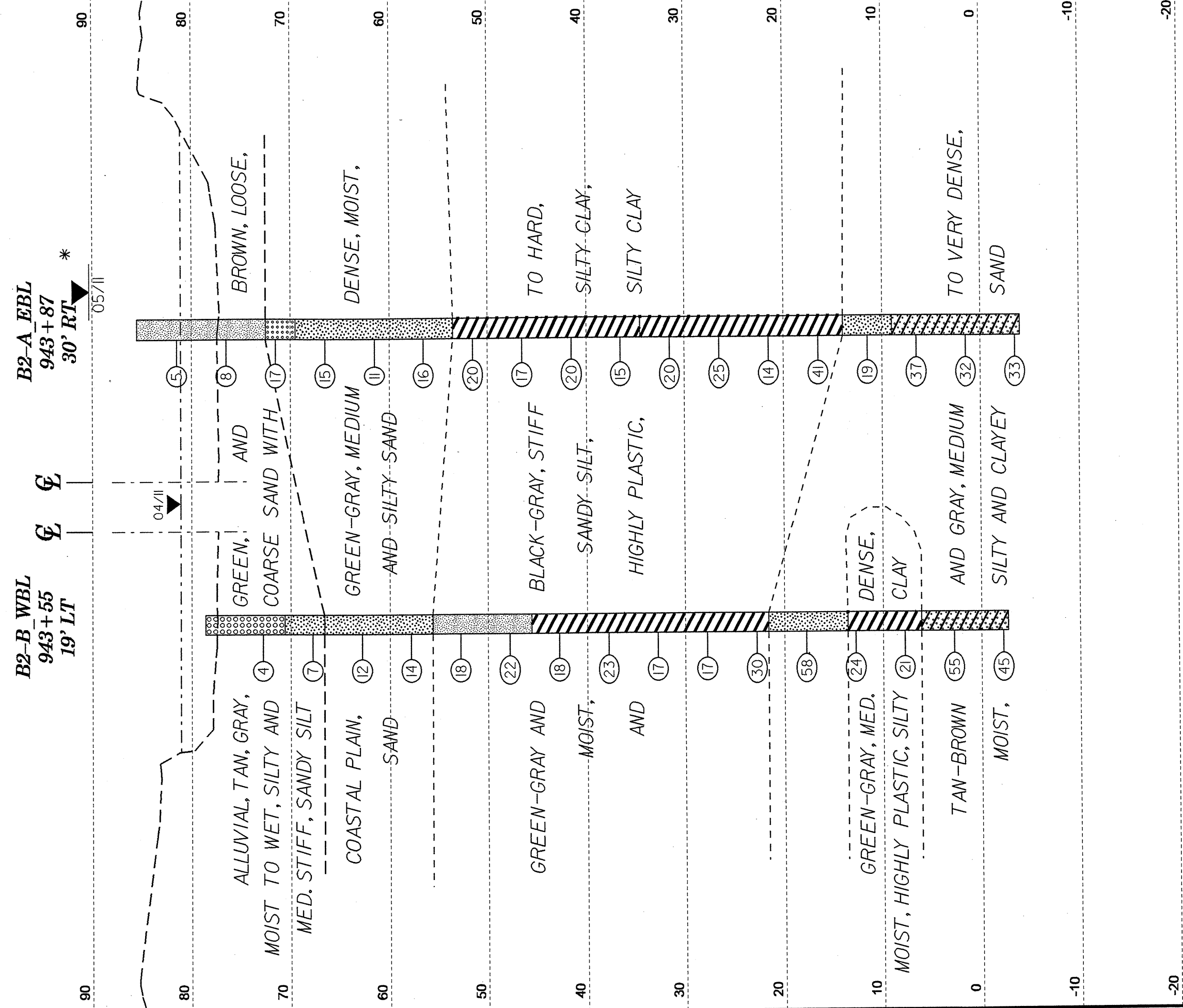
Ⓐ ROADWAY EMBANKMENT, TAN-BROWN AND ORANGE, VERY SOFT TO MEDIUM STIFF, MOIST, SANDY CLAY AND HIGHLY PLASTIC, SILTY CLAY

-10
-20
-30

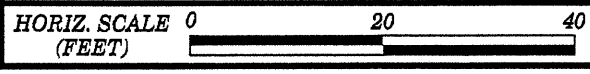


VE = 2:1

CROSS SECTION THROUGH BENT 2



* ARTESIAN



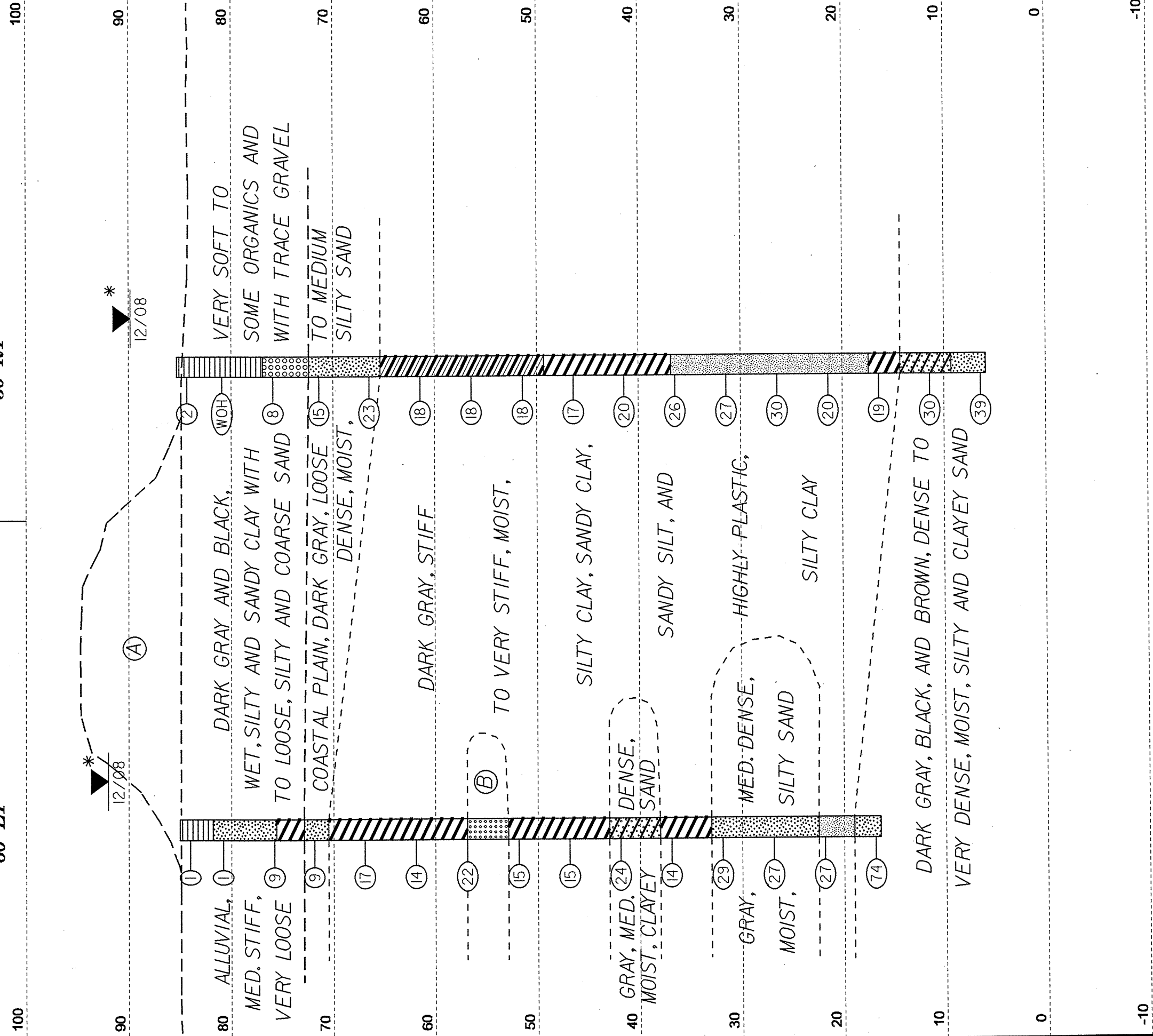
VE = 2:1

CROSS SECTION THROUGH END BENT 2

EB2-A_WBL
944+30
60' LT

EB2-A_EBL
944+30
30' RT

CL



Ⓐ ROADWAY EMBANKMENT, TAN-BROWN, LOOSE, MOIST, CLAYEY SAND AND MEDIUM STIFF, MOIST, SANDY CLAY

Ⓑ COASTAL PLAIN, DARK GRAY, MEDIUM-DENSE, WET, COARSE SAND

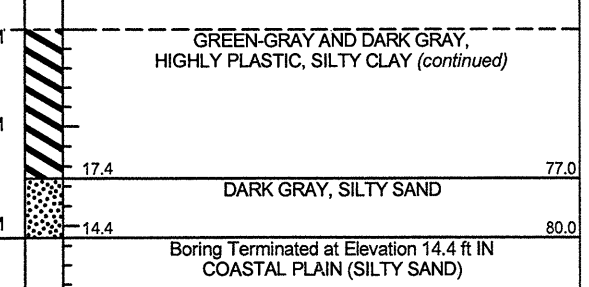
* ARTESIAN

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34416.1.1		TIP R-2303C		COUNTY SAMPSON		GEOLOGIST Oti, O. B.										
SITE DESCRIPTION BRIDGE NO. 25 ON -L- (NC 24) OVER LITTLE COHARIE CREEK							GROUND WTR (ft)									
BORING NO. EB1B_WBL		STATION 941+65		OFFSET 23 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 94.4 ft		TOTAL DEPTH 80.0 ft		NORTHING 438,534		EASTING 2,153,283										
DRILL RIG/HAMMER EFF./DATE RFO0067 CME-550X 77% 03/15/2010				DRILL METHOD Mud Rotary		HAMMER TYPE Automatic										
DRILLER Dixon, D. W.		START DATE 04/11/11		COMP. DATE 04/12/11		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
105																
100																
95																
	93.4	1.0	4	6	4											
90																
	85.9	8.5	2	2	2											
85																
	80.9	13.5	1	1	6											
80																
	75.9	18.5	7	4	7											
75																
	70.9	23.5	6	12	12											
70																
	65.9	28.5	3	6	9											
65																
	60.9	33.5	5	8	11											
60																
	55.9	38.5	5	11	13											
55																
	50.9	43.5	9	15	22											
50																
	45.9	48.5	9	14	20											
45																
	40.9	53.5	5	8	11											
40																
	35.9	58.5	5	8	10											
35																
	30.9	63.5	5	7	8											
30																
	25.9	68.5	6	10	11											
25																

WBS 34416.1.1		TIP R-2303C		COUNTY SAMPSON		GEOLOGIST Oti, O. B.										
SITE DESCRIPTION BRIDGE NO. 25 ON -L- (NC 24) OVER LITTLE COHARIE CREEK							GROUND WTR (ft)									
BORING NO. EB1B_WBL		STATION 941+65		OFFSET 23 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 94.4 ft		TOTAL DEPTH 80.0 ft		NORTHING 438,534		EASTING 2,153,283										
DRILL RIG/HAMMER EFF./DATE RFO0067 CME-550X 77% 03/15/2010				DRILL METHOD Mud Rotary		HAMMER TYPE Automatic										
DRILLER Dixon, D. W.		START DATE 04/11/11		COMP. DATE 04/12/11		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
25																
	20.9	73.5	6	8	11											
20																
	15.9	78.5	6	18	33											
15																

NCDOT BORE DOUBLE R2303C_BR25_GEO_BH.GPJ NC_DOT.GDT 6/22/11



NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34416.1.1		TIP R-2303C		COUNTY SAMPSON		GEOLOGIST Oti, O. B.									
SITE DESCRIPTION BRIDGE NO. 25 ON -L- (NC 24) OVER LITTLE COHARIE CREEK							GROUND WTR (ft)								
BORING NO. B1B_WBL		STATION 942+55		OFFSET 20 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 94.5 ft		TOTAL DEPTH 84.0 ft		NORTHING 438,567		EASTING 2,153,366									
DRILL RIG/HAMMER EFF./DATE RFO0067 CME-550X 77% 03/15/2010				DRILL METHOD Mud Rotary		HAMMER TYPE Automatic									
DRILLER Dixon, D. W.		START DATE 04/07/11		COMP. DATE 04/08/11		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
95														94.5	0.0
	92.0	2.5	2	2	5										
90														88.8	5.7
	87.0	7.5	WOH	WOH	WOH										
85														82.5	12.0
	82.0	12.5	1	2	6										
80														74.5	20.0
	77.0	17.5	3	6	9										
75														64.0	30.5
	72.0	22.5	3	6	9										
70														54.0	40.5
	67.0	27.5	4	7	9										
65														44.5	50.0
	62.0	32.5	3	5	6										
60														36	
	57.0	37.5	7	16	20										
55														25	
	52.0	42.5	11	14	23										
50														18	
	47.0	47.5	6	11	14										
45														21	
	42.0	52.5	5	7	11										
40														20	
	37.0	57.5	5	9	12										
35														27	
	32.0	62.5	6	9	11										
30														20	
	27.0	67.5	10	14	13										
25														20	
	22.0	72.5	7	9	11										
20														19.5	75.0
	17.0	77.5	13	26	40										
15															

WBS 34416.1.1		TIP R-2303C		COUNTY SAMPSON		GEOLOGIST Oti, O. B.									
SITE DESCRIPTION BRIDGE NO. 25 ON -L- (NC 24) OVER LITTLE COHARIE CREEK							GROUND WTR (ft)								
BORING NO. B1B_WBL		STATION 942+55		OFFSET 20 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 94.5 ft		TOTAL DEPTH 84.0 ft		NORTHING 438,567		EASTING 2,153,366									
DRILL RIG/HAMMER EFF./DATE RFO0067 CME-550X 77% 03/15/2010				DRILL METHOD Mud Rotary		HAMMER TYPE Automatic									
DRILLER Dixon, D. W.		START DATE 04/07/11		COMP. DATE 04/08/11		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
15														14.5	80.0
	12.0	82.5	11	16	20										
														10.5	84.0

NCDOT BORE DOUBLE R2303C_BR25_GEO_BH.GPJ NC_DOT.GDT 6/22/11

WBS 34416.1.1		TIP R-2303C		COUNTY SAMPSON		GEOLOGIST CONSULTANT								
SITE DESCRIPTION BRIDGE NO. 25 ON -L- (NC 24) OVER LITTLE COHARIE CREEK							GROUND WTR (ft)							
BORING NO. EB2A_WBL		STATION 944+30		OFFSET 60 ft LT		ALIGNMENT -L-								
COLLAR ELEV. 85.0 ft		TOTAL DEPTH 68.6 ft		NORTHING 438,674		EASTING 2,153,511								
DRILL RIG/HAMMER EFF./DATE SME R-2 DIEDRICH D-50 84% 00/00/0000				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic								
DRILLER Contract Driller		START DATE 12/12/08		COMP. DATE 12/12/08		SURFACE WATER DEPTH 0.3ft								
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
90														
85	85.0	0.0												85.0 WATER SURFACE (12/12/08) 0.0
			1	WOH	1	1					SS-254	W		ALLUVIAL BLACK, SANDY CLAY WITH LITTLE ORGANICS
	81.8	3.2	1	WOH	1	1					SS-256	W		BLACK, SILTY SAND WITH LITTLE ORGANICS AND QUARTZ GRAVEL
80														
	76.8	8.2	3		5	4						W		DARK GRAY, SILTY CLAY WITH QUARTZ GRAVEL
75														
	72.9	12.1	2		3	6					SS-257	M		COASTAL PLAIN DARK GRAY, SILTY SAND
70														
	67.9	17.1	7		7	10					SS-258	M		DARK GRAY, SILTY CLAY
65														
	62.9	22.1	5		6	8						M		
60														
	57.9	27.1	6		10	12					SS-260	W		DARK GRAY, COARSE SAND
55														
	52.9	32.1	5		6	9					SS-261	M		GRAY, HIGHLY PLASTIC, SILTY CLAY
50														
	47.9	37.1	6		6	9						M		
45														
	42.9	42.1	6		10	14					SS-263	M		GRAY, CLAYEY SAND
40														
	37.9	47.1	5		6	8						M		GRAY, HIGHLY PLASTIC, SILTY CLAY
35														
	32.9	52.1	8		12	17						M		GRAY, SILTY SAND
30														
	27.9	57.1	7		12	15						M		
25														
	22.9	62.1	6		7	20					SS-267	M		GRAY, SANDY SILT
20														
	17.9	67.1	15		32	42					SS-268	M		DARK GRAY, SILTY SAND
														Boring Terminated at Elevation 16.4 ft IN COASTAL PLAIN (SILTY SAND)



**NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT**

WBS 34416.1.1		TIP R-2303C		COUNTY SAMPSON		GEOLOGIST Oti, O. B.								
SITE DESCRIPTION BRIDGE NO. 431 ON -L- (NC 24) OVER LITTLE COHARIE CREEK								GROUND WTR (ft)						
BORING NO. EB1B_EBL		STATION 941+65		OFFSET 45 ft RT		ALIGNMENT -L-		0 HR. N/A						
COLLAR ELEV. 85.3 ft		TOTAL DEPTH 79.3 ft		NORTHING 438,472		EASTING 2,153,310		24 HR. -4.7						
DRILL RIG/HAMMER EFF/DATE RFO0067 CME-550X 77% 03/15/2010				DRILL METHOD Mud Rotary		HAMMER TYPE Automatic								
DRILLER Dixon, D. W.		START DATE 05/05/11		COMP. DATE 05/05/11		SURFACE WATER DEPTH N/A								
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
90														
85													GROUND SURFACE	0.0
	82.5	2.8	WOH	WOH	WOH								ALLUVIAL BLACK-GRAY, SANDY CLAY	5.0
80													COASTAL PLAIN TAN-BROWN, SAND	
	77.5	7.8	1	3	2									
75														
	72.5	12.8	5	7	8									
70														
	67.5	17.8	5	11	9									
65													GREEN-GRAY AND BLACK, SANDY CLAY	21.0
	62.5	22.8	3	6	10									
60														
	57.5	27.8	4	10	14									
55														
	52.5	32.8	3	7	11								GREEN-GRAY, SILTY SAND	32.0
50														
	47.5	37.8	6	14	21									
45														
	42.5	42.8	6	14	23									
40														
	37.5	47.8	5	14	9									
35														
	32.5	52.8	4	6	10								BLACK-GRAY, HIGHLY PLASTIC, SILTY CLAY	51.0
30														
	27.5	57.8	6	12	18									
25														
	22.5	62.8	4	8	9									
20													GREEN-GRAY, SILTY SAND	64.8
	17.5	67.8	9	25	62									
15														
	12.5	72.8	5	9	14									
10														

WBS 34416.1.1		TIP R-2303C		COUNTY SAMPSON		GEOLOGIST Oti, O. B.								
SITE DESCRIPTION BRIDGE NO. 431 ON -L- (NC 24) OVER LITTLE COHARIE CREEK								GROUND WTR (ft)						
BORING NO. EB1B_EBL		STATION 941+65		OFFSET 45 ft RT		ALIGNMENT -L-		0 HR. N/A						
COLLAR ELEV. 85.3 ft		TOTAL DEPTH 79.3 ft		NORTHING 438,472		EASTING 2,153,310		24 HR. -4.7						
DRILL RIG/HAMMER EFF/DATE RFO0067 CME-550X 77% 03/15/2010				DRILL METHOD Mud Rotary		HAMMER TYPE Automatic								
DRILLER Dixon, D. W.		START DATE 05/05/11		COMP. DATE 05/05/11		SURFACE WATER DEPTH N/A								
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
10														
	7.5	77.8	14	20	26								GREEN-GRAY, SILTY SAND (continued)	79.3
													Boring Terminated at Elevation 6.0 ft IN COASTAL PLAIN (SILTY SAND)	

NCDOT BORE DOUBLE R2303C_BR25_GEO_BH.GPJ NC_DOT_GDT 6/22/11

WBS 34416.1.1		TIP R-2303C		COUNTY SAMPSON		GEOLOGIST CONSULTANT								
SITE DESCRIPTION BRIDGE NO. 431 ON -L- (NC 24) OVER LITTLE COHARIE CREEK							GROUND WTR (ft)							
BORING NO. B1A_EBL		STATION 942+50		OFFSET 25 ft RT		ALIGNMENT -L-								
COLLAR ELEV. 85.3 ft		TOTAL DEPTH 69.3 ft		NORTHING 438,524		EASTING 2,153,380								
DRILL RIG/HAMMER EFF/DATE SME R-2 DIEDRICH D-50 84% 00/00/0000				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic								
DRILLER Contract Driller		START DATE 12/09/08		COMP. DATE 12/09/08		SURFACE WATER DEPTH N/A								
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
90														
85	85.3	0.0	1	1	0	1								GROUND SURFACE 0.0
80	81.8	3.5	1	1	1	2					SS-207	M		ALLUVIAL BLACK, MODERATELY ORGANIC, CLAYEY SILT
75	76.8	8.5	4	4	3	7					SS-208	W		TAN AND WHITE, COARSE SAND AND GRAVEL
70	72.5	12.8	7	6	7	13					SS-209	W		
65	67.5	17.8	6	8	10	18					SS-210	M		COASTAL PLAIN DARK GRAY, SILTY SAND
60	62.5	22.8	7	7	12	19						M		
55	57.5	27.8	6	7	9	16						M		
50	52.5	32.8	13	12	18	30						M		
45	47.5	37.8	13	16	21	37					SS-214	M		
40	42.5	42.8	15	17	21	38						M		
35	37.5	47.8	7	9	11	20					SS-216	M		DARK GRAY, HIGHLY PLASTIC, SILTY CLAY
30	32.5	52.8	6	8	11	19					SS-217	M		
25	27.5	57.8	7	10	13	23					SS-218	M		DARK GRAY, SILTY SAND
20	22.5	62.8	7	13	24	37						M		
	17.5	67.8	16	29	29	58					SS-220	M		
														Boring Terminated at Elevation 16.0 ft IN COASTAL PLAIN (SILTY SAND) 69.3

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34416.1.1	TIP R-2303C	COUNTY SAMPSON	GEOLOGIST Oti, O. B.
SITE DESCRIPTION BRIDGE NO. 431 ON -L- (NC 24) OVER LITTLE COHARIE CREEK			GROUND WTR (ft)
BORING NO. B2A_EBL	STATION 943+87	OFFSET 30 ft RT	ALIGNMENT -L-
COLLAR ELEV. 85.5 ft	TOTAL DEPTH 89.5 ft	NORTHING 438,575	EASTING 2,153,507
DRILL RIG/HAMMER EFF/DATE RFO0067 CME-550X 77% 03/15/2010		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Dixon, D. W.	START DATE 05/13/11	COMP. DATE 05/17/11	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
90														
85	82.5	3.0	1	1	4						SS-136	M	GROUND SURFACE ALLUVIAL TAN-BROWN, SANDY SILT WITH SOME GRAVEL	0.0
80	77.5	8.0	3	4	4							M		
75	72.5	13.0	3	8	9							M	COASTAL PLAIN GREEN-GRAY, SAND	13.0
70	67.5	18.0	5	6	9							M	GREEN-GRAY, SILTY SAND	16.0
65	62.5	23.0	4	5	6							M		
60	57.5	28.0	3	6	10							M		
55	52.5	33.0	4	8	12							M	BLACK-GRAY, SILTY CLAY	32.0
50	47.5	38.0	4	7	10							M		
45	42.5	43.0	4	8	12							M		
40	37.5	48.0	4	6	9							M		
35	32.5	53.0	3	7	13							M	BLACK-GRAY, HIGHLY PLASTIC, SILTY CLAY	51.0
30	27.5	58.0	5	10	15							M		
25	22.5	63.0	4	7	7							M		
20	17.5	68.0	9	15	26							M		
15	12.5	73.0	5	9	10							M	TAN-BROWN, SILTY SAND	71.5

WBS 34416.1.1	TIP R-2303C	COUNTY SAMPSON	GEOLOGIST Oti, O. B.
SITE DESCRIPTION BRIDGE NO. 431 ON -L- (NC 24) OVER LITTLE COHARIE CREEK			GROUND WTR (ft)
BORING NO. B2A_EBL	STATION 943+87	OFFSET 30 ft RT	ALIGNMENT -L-
COLLAR ELEV. 85.5 ft	TOTAL DEPTH 89.5 ft	NORTHING 438,575	EASTING 2,153,507
DRILL RIG/HAMMER EFF/DATE RFO0067 CME-550X 77% 03/15/2010		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Dixon, D. W.	START DATE 05/13/11	COMP. DATE 05/17/11	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
10														
5	7.5	78.0	9	17	20							M	TAN-BROWN, CLAYEY SAND	76.5
0	2.5	83.0	9	14	18							M		
	-2.5	88.0	6	16	17							M		
Boring Terminated at Elevation -4.0 ft IN COASTAL PLAIN (CLAYEY SAND)														

NCDOT BORE DOUBLE R2303C_BR25_GEO_BH.GPJ NC_DOT_GDT 6/22/11

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34416.1.1		TIP R-2303C		COUNTY SAMPSON		GEOLOGIST CONSULTANT										
SITE DESCRIPTION BRIDGE NO. 431 ON -L- (NC 24) OVER LITTLE COHARIE CREEK							GROUND WTR (ft)									
BORING NO. EB2A_EBL		STATION 944+30		OFFSET 30 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 85.3 ft		TOTAL DEPTH 79.4 ft		NORTHING 438,592		EASTING 2,153,547										
DRILL RIG/HAMMER EFF/DATE SME R-2 DIETRICH D-50 84% 00/00/0000				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Contract Driller		START DATE 12/10/08		COMP. DATE 12/10/08		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
90																
85	85.3	0.0													85.3	GROUND SURFACE
80	81.9	3.4	WOH	WOH	WOH											ALLUVIAL BLACK, MODERATELY ORGANIC, SILTY CLAY
75	76.9	8.4	6	5	3										76.9	GRAY-BROWN, COARSE SAND AND GRAVEL
70	72.4	12.9	5	7	8										72.4	COASTAL PLAIN DARK GRAY, SILTY SAND
65	67.4	17.9	8	10	13										65.3	DARK GRAY, SANDY CLAY
60	62.4	22.9	6	8	10											DARK GRAY, SANDY CLAY
55	57.4	27.9	6	8	10											DARK GRAY, SANDY CLAY
50	52.4	32.9	7	8	10											DARK GRAY, SANDY CLAY
45	47.4	37.9	7	8	9										49.3	DARK GRAY, HIGHLY PLASTIC, SILTY CLAY
40	42.4	42.9	6	8	12											DARK GRAY, SANDY SILT
35	37.4	47.9	10	11	15										36.8	DARK GRAY, SANDY SILT
30	32.4	52.9	9	12	15											DARK GRAY, SANDY SILT
25	27.4	57.9	9	12	18											DARK GRAY, SANDY SILT
20	22.4	62.9	8	8	12											DARK GRAY, SANDY SILT
15	17.4	67.9	7	8	11										17.4	DARK GRAY, HIGHLY PLASTIC, SILTY CLAY
10	12.4	72.9	14	15	15										14.3	DARK GRAY AND BLACK, CLAYEY SAND

WBS 34416.1.1		TIP R-2303C		COUNTY SAMPSON		GEOLOGIST CONSULTANT										
SITE DESCRIPTION BRIDGE NO. 431 ON -L- (NC 24) OVER LITTLE COHARIE CREEK							GROUND WTR (ft)									
BORING NO. EB2A_EBL		STATION 944+30		OFFSET 30 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 85.3 ft		TOTAL DEPTH 79.4 ft		NORTHING 438,592		EASTING 2,153,547										
DRILL RIG/HAMMER EFF/DATE SME R-2 DIETRICH D-50 84% 00/00/0000				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Contract Driller		START DATE 12/10/08		COMP. DATE 12/10/08		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
10																
	7.4	77.9	14	17	22										9.3	BROWN-GRAY, SILTY SAND
															5.9	Boring Terminated at Elevation 5.9 ft IN COASTAL PLAIN (SILTY SAND)

NCDOT BORE DOUBLE R2303C_BR25_GEO_BH.GPJ NC_DOT.GDT 6/23/11

EB1-B WBL

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-114A	23 LT	941+65	1.0-2.5	A-2-6(0)	30	15	59.0	18.0	5.6	17.5	94	60	23	-	-
SS-115	23 LT	941+65	13.5-15.0	A-2-4(0)	21	NP	42.6	44.6	6.7	6.1	100	83	16	-	-
SS-116	23 LT	941+65	23.5-25.0	A-2-4(0)	27	2	0.9	74.7	8.1	16.3	100	100	29	-	-
SS-117	23 LT	941+65	38.5-40.0	A-2-4(0)	26	NP	1.4	74.7	5.5	18.4	100	100	27	-	-
SS-118	23 LT	941+65	48.5-50.0	A-2-4(0)	26	NP	1.9	77.7	8.2	12.2	100	100	21	-	-
SS-119	23 LT	941+65	53.5-55.0	A-7-6(59)	79	55	0.6	8.6	23.5	67.3	100	100	94	-	-
SS-120	23 LT	941+65	73.5-75.0	A-7-5(59)	84	52	0.6	8.8	21.2	69.4	100	100	95	-	-
SS-121	23 LT	941+65	78.5-80.0	A-2-4(0)	25	NP	39.6	48.5	4.8	7.1	97	66	16	-	-

EB2-A WBL

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-254	60 LT	944+30	0.0-1.5	A-6(3)	38	13	22.9	33.2	23.7	20.1	94	81	47	-	8.5
SS-256	60 LT	944+30	3.2-4.7	A-2-4(0)	25	5	35.6	38.6	11.7	14.0	81	67	23	-	-
SS-257	60 LT	944+30	12.1-13.6	A-2-4(0)	29	6	0.8	75.3	7.4	16.5	100	100	29	-	-
SS-258	60 LT	944+30	17.1-18.6	A-7-6(10)	41	21	0.2	47.7	15.0	37.0	100	100	59	-	-
SS-260	60 LT	944+30	28.1-28.6	A-3(0)	26	NP	67.9	23.7	4.3	4.1	100	70	9	-	-
SS-261	60 LT	944+30	32.1-33.6	A-7-5(57)	82	52	1.6	9.3	25.3	63.8	100	99	93	-	-
SS-263	60 LT	944+30	42.1-43.6	A-2-6(0)	33	11	69.1	16.5	6.2	8.2	88	41	14	-	-
SS-267	60 LT	944+30	62.5-63.6	A-4(0)	30	5	13.8	56.6	13.2	16.5	96	91	36	-	-
SS-268	60 LT	944+30	67.1-68.6	A-2-4(0)	26	NP	3.9	78.4	11.5	6.2	95	93	25	-	-

B1-B WBL

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-109	20 LT	942+55	2.5-4.0	A-6(2)	30	14	29.2	31.0	17.3	22.4	94	79	42	-	-
SS-110	20 LT	942+55	7.5-9.0	A-7-6(30)	60	33	2.2	19.4	23.3	55.1	100	99	83	-	-
SS-111	20 LT	942+55	42.5-44.0	A-2-4(0)	24	NP	1.2	81.6	6.9	10.2	100	100	20	-	-
SS-112	20 LT	942+55	52.5-54.0	A-7-6(57)	77	54	0.4	9.6	24.7	65.3	100	100	94	-	-
SS-113	20 LT	942+55	62.5-64.0	A-7-6(30)	62	44	1.4	31.2	16.3	51.0	100	99	71	-	-
SS-114	20 LT	942+55	77.5-79.0	A-2-4(0)	28	NP	4.1	87.6	4.3	4.1	91	90	12	-	-

B2-B WBL

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-100	19 LT	943+55	4.8-6.3	A-1-b(0)	25	NP	74.7	21.0	1.2	3.1	96	49	5	-	-
SS-101	19 LT	943+55	9.8-11.3	A-2-4(0)	27	1	0.8	77.8	9.2	12.2	100	100	25	-	-
SS-102	19 LT	943+55	14.8-16.3	A-2-4(0)	26	1	0.6	78.0	7.1	14.3	100	100	26	-	-
SS-103	19 LT	943+55	24.8-26.3	A-4(0)	28	1	0.8	70.0	8.8	20.4	100	100	36	-	-
SS-104	19 LT	943+55	34.8-36.3	A-7-6(50)	78	50	2.9	13.3	22.7	61.2	100	98	88	-	-
SS-105	19 LT	943+55	44.8-46.3	A-7-6(30)	60	40	0.8	29.4	14.7	55.1	100	100	75	-	-
SS-106	19 LT	943+55	59.8-60.3	A-2-4(0)	25	NP	21.3	66.0	5.5	7.1	99	91	16	-	-
SS-107	19 LT	943+55	64.8-66.3	A-7-6(37)	62	38	1.6	13.3	25.9	59.2	100	99	88	-	-
SS-108	19 LT	943+55	74.8-76.3	A-2-6(0)	31	13	59.0	17.7	10.1	13.3	100	65	25	-	-

EB1-B EBL

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-122	45 RT	941+65	2.8-4.3	A-6(8)	36	14	7.2	33.6	31.0	28.2	100	99	67	-	-
SS-123	45 RT	941+65	7.8-9.3	A-3(0)	24	NP	69.2	21.7	4.0	5.0	100	79	10	-	-
SS-124	45 RT	941+65	22.8-24.3	A-6(3)	34	13	0.6	54.9	14.3	30.2	100	100	49	-	-
SS-125	45 RT	941+65	32.8-34.3	A-2-4(0)	29	5	2.0	70.6	7.2	20.1	100	100	31	-	-
SS-126	45 RT	941+65	37.8-39.3	A-2-4(0)	25	NP	2.6	79.7	6.6	11.1	100	100	20	-	-
SS-127	45 RT	941+65	52.8-54.3	A-7-6(29)	61	44	5.4	30.2	20.1	44.3	100	98	70	-	-
SS-128	45 RT	941+65	67.8-69.3	A-2-4(0)	27	NP	2.0	81.0	10.0	7.0	100	99	26	-	-

B1-A EBL

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-207	25 RT	942+50	3.5-5.0	A-5(3)	55	5	18.5	35.3	32.1	14.1	100	93	52	-	17.5
SS-208	25 RT	942+50	8.5-10.0	A-3(0)	25	NP	85.8	13.0	1.2	0.0	100	58	1	-	-
SS-209	25 RT	942+50	12.8-14.5	A-3(0)	25	NP	71.6	24.0	2.4	2.0	95	83	5	-	-
SS-210	25 RT	942+50	17.8-19.3	A-2-4(0)	29	4	0.8	73.0	6.0	20.2	100	100	31	-	-
SS-214	25 RT	942+50	37.8-39.3	A-2-4(0)	26	NP	2.6	82.5	6.9	8.1	100	100	18	-	-
SS-216	25 RT	942+50	47.8-49.3	A-7-6(17)	53	36	6.5	41.7	13.5	38.3	100	97	58	-	-
SS-217	25 RT	942+50	52.8-54.3	A-7-6(37)	66	47	2.4	24.2	14.9	58.5	100	99	77	-	-
SS-218	25 RT	942+50	57.8-59.3	A-2-4(0)	30	9	3.2	67.7	8.9	20.2	100	99	32	-	-
SS-220	25 RT	942+50	67.8-69.3	A-2-4(0)	27	NP	1.2	81.3	9.5	8.1	100	100	22	-	-

B2-A EBL

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-136	30 RT	943+87	3.0-4.5	A-4(2)	29	9	3.8	53.9	22.1	20.1	100	99	52	-	-

EB2-A EBL

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-237	30 RT	944+30	0.0-1.5	A-7-5(5)	51	11	13.7	36.9	35.3	14.1	100	95	54	-	14.4
SS-239	30 RT	944+30	8.4-9.9	A-1-b(0)	23	NP	61.7	25.8	4.4	8.1	51	29	7	-	-
SS-240	30 RT	944+30	12.9-14.4	A-2-4(0)	26	3	1.2	77.8	6.9	14.1	100	100	24	-	-
SS-242	30 RT	944+30	22.9-24.4	A-6(6)	38	18	0.4	58.9	14.5	26.2	100	100	50	-	-
SS-245	30 RT	944+30	37.9-39.4	A-7-6(51)	78	55	3.8	13.3	20.4	62.5	100	99	85	-	-
SS-246	30 RT	944+30	42.9-44.4	A-7-6(11)	44	24	4.4	45.0	14.3	36.3	100	97	57	-	-
SS-247	30 RT	944+30	48.5-49.4	A-4(0)	24	NP	3.4	70.8	11.7	14.1	100	99	36	-	-
SS-248	30 RT	944+30	52.9-54.4	A-4(3)	31	10	4.2	55.0	14.5	26.2	100	99	57	-	-
SS-250	30 RT	944+30	62.9-64.4	A-4(0)	27	6	6.7	63.7	11.5	18.1	100	99	38	-	-
SS-251	30 RT	944+30	67.9-69.4	A-7-6(54)	73	50	0.2	11.5	27.8	60.5	100	100	95	-	-
SS-252	30 RT	944+30	72.9-74.4	A-2-6(1)	37	16	52.6	15.7	9.5	22.2	76	49	26	-	-
SS-253	30 RT	944+30	77.9-79.4	A-2-4(0)	24	4	40.5	36.7	16.7	6.0	100	83	27	-	-



**FIELD
 SCOUR REPORT**

WBS: 34416.1.1 TIP: R-2303C COUNTY: Sampson

DESCRIPTION(1): Bridge No. 25 on -L- (NC 24) over Little Coharie River Creek

EXISTING BRIDGE

Information from: Field Inspection Microfilm _____ (reel _____ pos: _____)
 Other (explain) _____

Bridge No.: 25 Length: 150' Total Bents: 5 Bents in Channel: 3 Bents in Floodplain: 2
 Foundation Type: Concrete caps on piles at End Bents and footing on piles at Interior Bents

EVIDENCE OF SCOUR(2)

Abutments or End Bent Slopes: None

Interior Bents: Not visible

Channel Bed: Some scour holes scattered on the upstream side of the bridge

Channel Bank: Some contraction scour along all banks

EXISTING SCOUR PROTECTION

Type(3): Concrete slope protection wrapped around the embankment

Extent(4): 50' W x 8'H

Effectiveness(5): Effective

Obstructions(6): None

INSTRUCTIONS

- 1 Describe the specific site's location, including route number and body of water crossed.
- 2 Note scour evidence at existing end bents or abutments (e.g. undermining, sloughing, degradations).
- 3 Note existing scour protection (e.g. rip rap).
- 4 Describe extent of existing scour protection.
- 5 Describe whether or not the scour protection appears to be working.
- 6 Note obstructions such as dams, fallen trees, debris at bents, etc.
- 7 Describe the channel bed material based on observation and/or samples. Include any lab results with report.
- 8 Describe the channel bank material based on observation and/or samples. Include any lab results with report.
- 9 Describe the material covering the banks (e.g. grass, trees, rip rap, none).
- 10 Determine the approximate floodplain width from field observation or a topographic map.
- 11 Describe the material covering the floodplain (e.g. grass, trees, crops).
- 12 Use professional judgement to specify if the stream is degrading, aggrading, or static.
- 13 Describe potential and direction of the stream to migrate laterally during the bridge's life (approx. 100 years).
- 14 Give the design scour elevation (DSE) expected over the life of the bridge (approx. 100 years). This elevation can be given as a range across the site, or for each bent. Discuss the relationship between the Hydraulics Unit theoretical scour and the DSE. If the DSE is dependent on scour counter measures, explain (e.g. rip rap armoring on slopes). The DSE is based on the erodability of materials, giving consideration to the influence of joints, foliation, bedding characteristics, % core recovery, % RQD, differential weathering, shear strength, observations at existing structures, other tests deemed appropriate, and overall geologic conditions at the site.

DESIGN INFORMATION

Channel Bed Material(7): Alluvial, tan-gray, loose, coarse sand (SS-100)

Channel Bank Material(8): Alluvial, tan-brown, medium stiff, sandy silt (SS-136)

Channel Bank Cover(9): Grass, brush, and trees

Floodplain Width(10): more than 1000 ft

Floodplain Cover(11): Grass, brush, and trees

Stream is(12): Aggrading _____ Degrading Static _____

Channel Migration Tend.(13): towards End Bent 2

Observations and Other Comments: Old timber piles showing in creek

DESIGN SCOUR ELEVATIONS(14)

Feet x Meters

BENTS		
	B1	B2
WBL	82.5	61.6
EBL	79.5	67.5

Comparison of DSE to Hydraulics Unit theoretical scour:

The DSE agrees with the Hydraulics Unit's theoretical scour elevations at Bent 1 from the report dated 11-22-10.

The DSE should be raised to 5 feet below the historical scour elevations at Bent 2.

SOIL ANALYSIS RESULTS FROM CHANNEL BED AND BANK MATERIAL

Bed or Bank							
Sample No.							
Retained #4							
Passed #10							
Passed #40							
Passed #200							
Coarse Sand							
Fine Sand							
Silt							
Clay							
LL							
PI							
AASHTO							
Station							
Offset							
Depth							

See Sheets 18 and 19, "Soil Test Results", for samples: SS-100 SS-136

Reported by: Jaime Love Pedro
 Jaime Love Pedro

Date: 3/21/2011

SITE PHOTOGRAPH

Bridge No. 25 on -L- (NC 24) over Little Coharie Creek



Looking West towards NC 24 (WBL)