

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

**EASTERN REGIONAL
DESIGN ENGINEER**

CONTENTS

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STRUCTURE
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 33563.1.1 (B-4218) F.A. PROJ. BRZ-1730(5)
COUNTY ORANGE
PROJECT DESCRIPTION BRIDGE NO. 108 ON -L- (SR 1730) OVER
NEW HOPE CREEK AT STATION 13+89.5

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 4919 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.

PROJECT: 33563.1.1
ID: B-4218

PERSONNEL

J. L. PEDRO

K. KUNTUKOVA

H. R. CONLEY

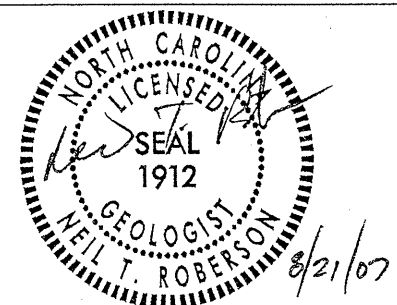
D. W. DIXON

INVESTIGATED BY J. L. PEDRO

CHECKED BY N. T. ROBERSON

SUBMITTED BY N. T. ROBERSON

DATE AUGUST 2007



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 IT IS CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

NOTE - BY HAVING REQUESTED THIS INFORMATION THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
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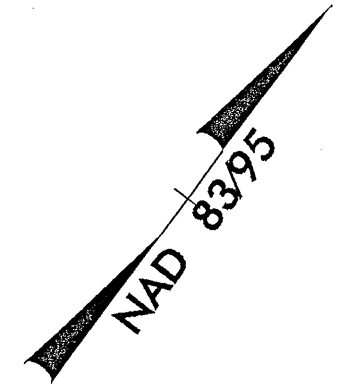
PROJECT REFERENCE NO. 33563.1.I(B-4218)	SHEET NO. 2
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SUBSURFACE INVESTIGATION

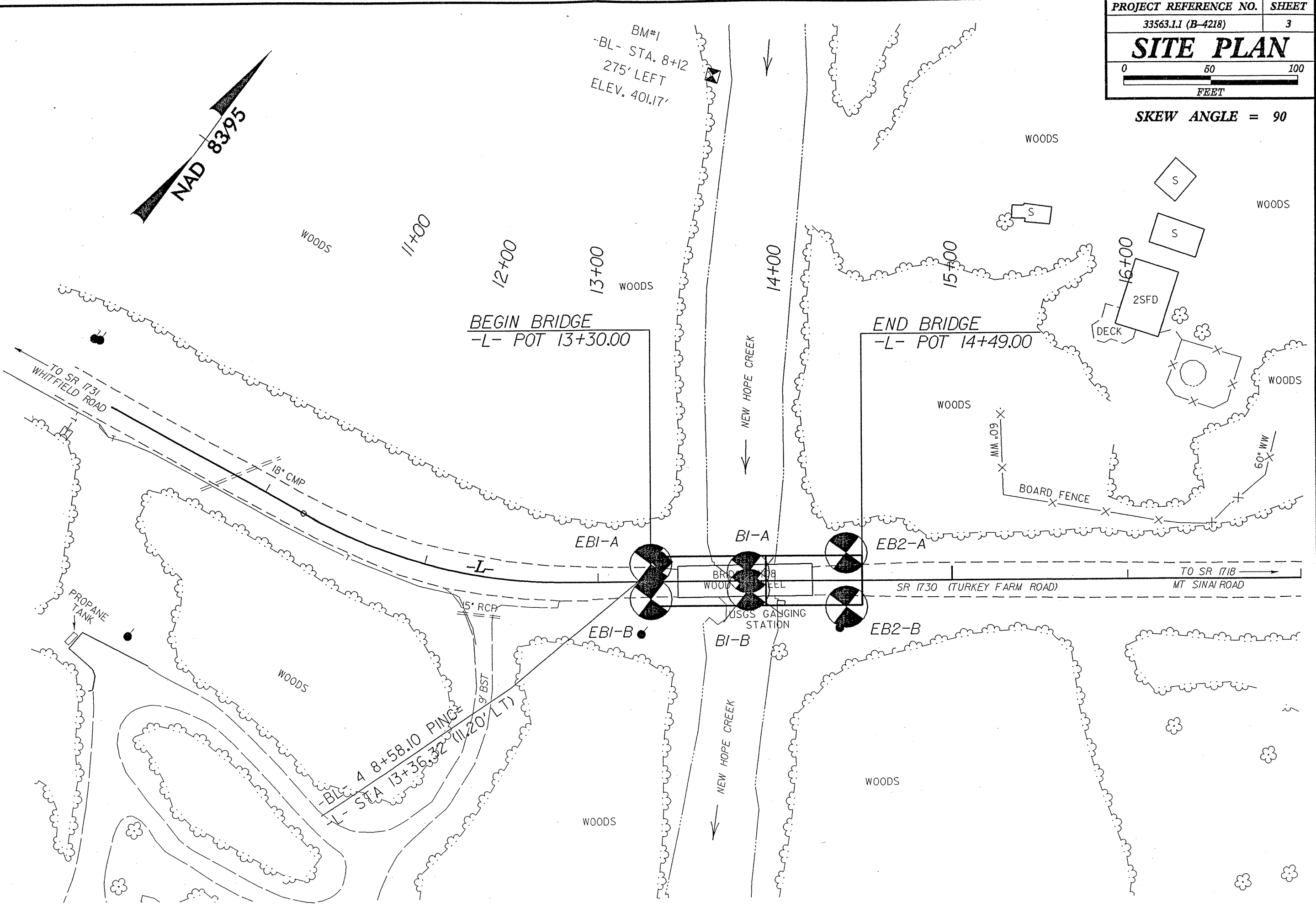
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION		GRADATION		ROCK DESCRIPTION		TERMS AND DEFINITIONS																																																																																																																			
<p>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 (AASHTO T296, 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:</p> <p style="text-align: center;"><i>VERY STIFF, GRAY, SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HEAVY PLASTIC, A-7-6</i></p>		<p>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.</p> <p style="text-align: center;">ANGULARITY OF GRAINS</p> <p>THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.</p>		<p>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 6.1 FOOT PER 60 BLOWS. IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK.</p> <p>ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:</p>		<p>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 DISLOGGED 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 INTRODUCED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (IN OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 6.1 FOOT PER 60 BLOWS. 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. BENCH MARK: BL-4 at -L- Sta. 13+36.32, Offset - 11.2' LT ELEVATION: 403.40 FT.</p>																																																																																																																			
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ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.</p> <p style="text-align: center;">COMPRESSIBILITY</p> <p>SLIGHTLY COMPRESSIBLE MODERATELY COMPRESSIBLE HIGHLY COMPRESSIBLE</p> <p style="text-align: center;">PERCENTAGE OF MATERIAL</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>ORGANIC MATERIAL</th> <th>GRANULAR SOILS</th> <th>SILT - CLAY SOILS</th> <th>OTHER MATERIAL</th> </tr> <tr> <td>TRACE OF ORGANIC MATTER</td> <td>2 - 3%</td> <td>3 - 5%</td> <td>TRACE</td> </tr> <tr> <td>LITTLE ORGANIC MATTER</td> <td>3 - 5%</td> <td>5 - 12%</td> <td>LITTLE</td> </tr> <tr> <td>MODERATELY ORGANIC</td> <td>5 - 10%</td> <td>12 - 20%</td> <td>SOME</td> </tr> <tr> <td>HIGHLY ORGANIC</td> <td>>10%</td> <td>>20%</td> <td>HIGHLY</td> </tr> </table> <p style="text-align: center;">GROUND WATER</p> <p>▽ WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING ▽ STATIC WATER LEVEL AFTER 24 HOURS ▽ PW PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA ○ SPRING OR SEEP</p>		ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL	TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE	LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE	MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME	HIGHLY ORGANIC	>10%	>20%	HIGHLY	<p>WEATHERED ROCK (WR) </p> <p>CRYSTALLINE ROCK (CR) </p> <p>NON-CRYSTALLINE ROCK (NCR) </p> <p>COASTAL PLAIN SEDIMENTARY ROCK (CP) </p>		<p>FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.</p> <p>VERY SLIGHT (V SL) 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.</p> <p>SLIGHT (SL) 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.</p> <p>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.</p> <p>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. <i>IF TESTED, WOULD YIELD SPT REFUSAL</i></p> <p>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. <i>IF TESTED, YIELDS SPT N VALUES > 100 BPF</i></p> <p>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. <i>IF TESTED, YIELDS SPT N VALUES < 100 BPF</i></p> <p>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.</p>	
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COLOR		INDURATION		INDURATION		INDURATION																																																																																																																			
<p>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.</p>		<p>INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.</p>		<p>INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.</p>		<p>INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.</p>																																																																																																																			

SKIEW ANGLE = 90

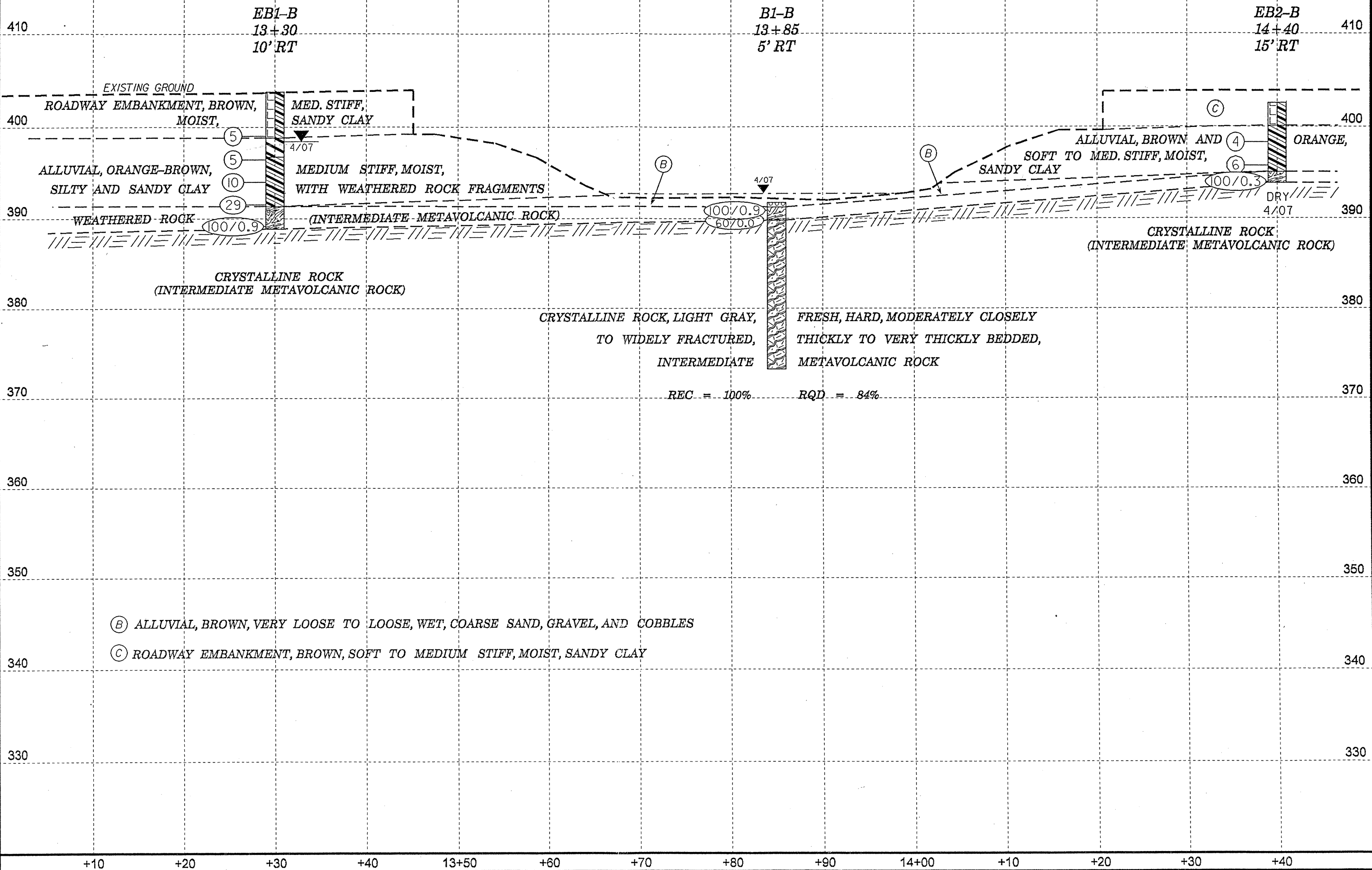


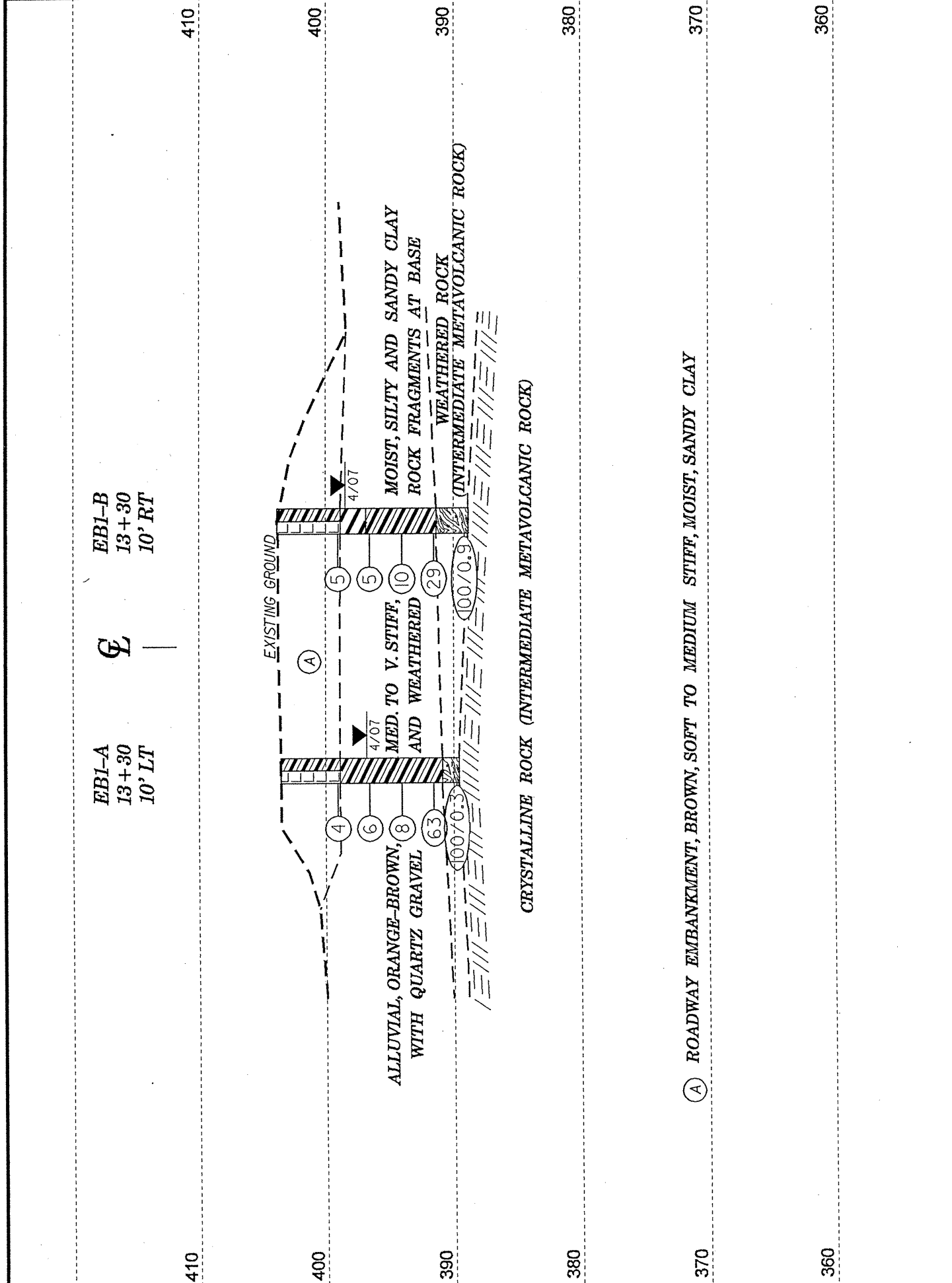
BM#1
-BL- STA. 8+12
275' LEFT
ELEV. 401.17'



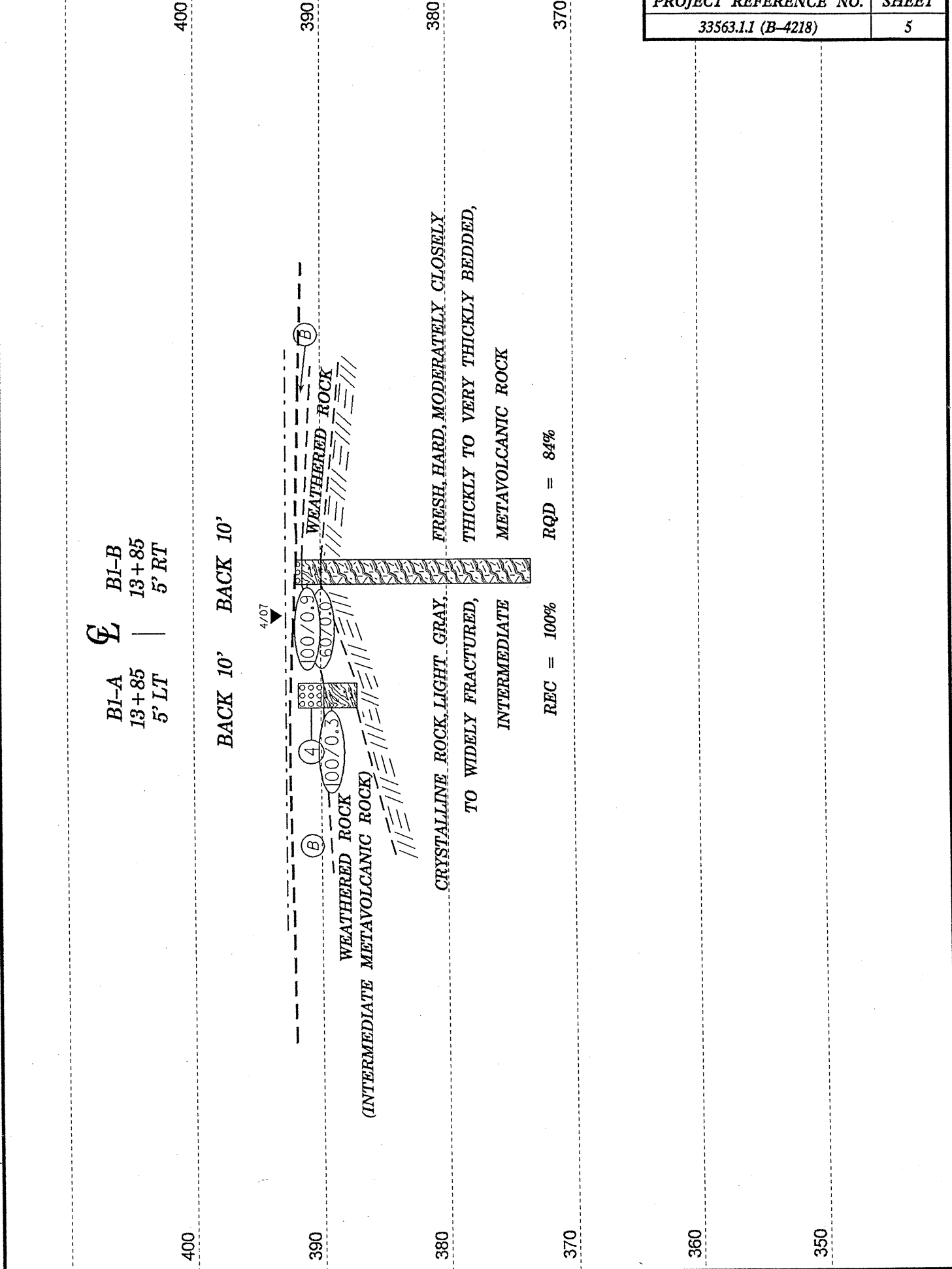
FENCE DIAGRAM THROUGH BORINGS PROJECTED ALONG -L-

	PROJECT REFERENCE NO.	SHEET
	33563.1.1 (B-4218)	4





HORIZ. SCALE 0 10 20 30 40
 CROSS SECTION THROUGH END BENT 1



HORIZ. SCALE 0 10 20 30 40
 CROSS SECTION THROUGH BENT 1

EB2-A
14+40
16' LT

|

EB2-B
14+40
15' RT

BACK 9'

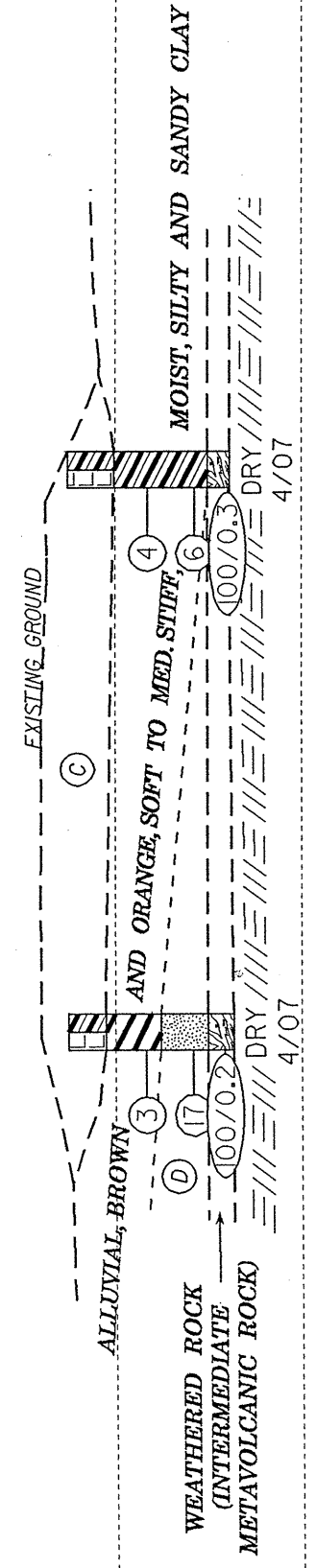
|

BACK 9'

410

|

410



CRYSTALLINE ROCK (INTERMEDIATE METAVOLCANIC ROCK)

380

|

380

Ⓒ ROADWAY EMBANKMENT, BROWN, SOFT TO MEDIUM STIFF, MOIST, SANDY CLAY

Ⓓ ALLUVIAL, BROWN, VERY STIFF, MOIST, SANDY SILT

370

|

370

360

|

360



PROJECT NO. 33563.1.1		ID. B-4218		COUNTY Orange		GEOLOGIST Pedro, J. L.									
SITE DESCRIPTION BRIDGE NO. 108 ON -L- (SR 1730) OVER NEW HOPE CREEK							GROUND WTR (ft)								
BORING NO. EB1-A		STATION 13+30		OFFSET 10ft LT		ALIGNMENT -L-									
COLLAR ELEV. 403.6 ft		TOTAL DEPTH 14.0 ft		NORTHING 815,992		EASTING 1,986,473									
DRILL MACHINE CME-550X		DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
START DATE 04/17/07		COMP. DATE 04/17/07		SURFACE WATER DEPTH N/A		DEPTH TO ROCK 14.0 ft									
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						
405													403.6	GROUND SURFACE	0.0
													398.9	ROADWAY EMBANKMENT Brown, SANDY CLAY	4.7
400.1	3.5												398.9	ALLUVIAL Orange-brown, SANDY CLAY with quartz gravel and weathered rock fragments (11.0-12.7)	4.7
397.6	6.0	2	3	1									398.9		
395.1	8.5	2	3	3									398.9		
392.6	11.0	3	4	4									398.9		
390.1	13.5	20	36	27									390.9	WEATHERED ROCK (Intermediate Metavolcanic Rock) Boring Terminated by Auger Refusal at Elevation 389.6 ft on CRYSTALLINE ROCK (Intermediate Metavolcanic Rock)	14.0
		100/0.3											389.6		

PROJECT NO. 33563.1.1		ID. B-4218		COUNTY Orange		GEOLOGIST Pedro, J. L.									
SITE DESCRIPTION BRIDGE NO. 108 ON -L- (SR 1730) OVER NEW HOPE CREEK							GROUND WTR (ft)								
BORING NO. EB1-B		STATION 13+30		OFFSET 10ft RT		ALIGNMENT -L-									
COLLAR ELEV. 403.8 ft		TOTAL DEPTH 15.0 ft		NORTHING 815,976		EASTING 1,986,485									
DRILL MACHINE CME-550X		DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
START DATE 04/17/07		COMP. DATE 04/17/07		SURFACE WATER DEPTH N/A		DEPTH TO ROCK 15.0 ft									
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						
405													403.8	GROUND SURFACE	0.0
													398.8	ROADWAY EMBANKMENT Brown, SANDY CLAY	5.0
400.0	3.8												398.8	ALLUVIAL Orange-brown, SILTY CLAY Orange, SANDY CLAY with weathered rock fragments	7.0
397.5	6.3	2	1	4									398.8		
395.0	8.8	1	2	3									398.8		
392.5	11.3	1	7	3									398.8		
390.0	13.8	7	13	16									390.9	WEATHERED ROCK (Intermediate Metavolcanic Rock) Boring Terminated by Auger Refusal at Elevation 388.8 ft on CRYSTALLINE ROCK (Intermediate Metavolcanic Rock)	15.0
		10	90/0.4										388.8		

NCDOT BORE DOUBLE B4218_GEO_BH.GPJ NC_DOT_GDT_08/17/07

PROJECT NO. 33563.1.1		ID. B-4218		COUNTY Orange		GEOLOGIST Pedro, J. L.							
SITE DESCRIPTION BRIDGE NO. 108 ON -L- (SR 1730) OVER NEW HOPE CREEK							GROUND WTR (ft)						
BORING NO. B1-A		STATION 13+85		OFFSET 5ft LT		ALIGNMENT -L-	0 HR. N/A						
COLLAR ELEV. 391.8 ft		TOTAL DEPTH 4.6 ft		NORTHING 816,022		EASTING 1,986,519	24 HR. N/A						
DRILL MACHINE CME-550X		DRILL METHOD NW Casing w/ SPT				HAMMER TYPE Automatic							
START DATE 04/24/07		COMP. DATE 04/24/07		SURFACE WATER DEPTH 0.9ft		DEPTH TO ROCK 4.6 ft							
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				
395													
391.8	0.0											▼	WATER SURFACE (04/24/07)
389.5	2.3	1	2	2	4							W	ALLUVIAL Brown, COARSE SAND and gravel
		100/0.3							100/0.3				WEATHERED ROCK (Intermediate Metavolcanic Rock)
													Boring Terminated with Casing Advancer Refusal at Elevation 387.2 ft on CRYSTALLINE ROCK (Intermediate Metavolcanic Rock)



NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 33563.1.1	ID. B-4218	COUNTY Orange	GEOLOGIST Pedro, J. L.
SITE DESCRIPTION BRIDGE NO. 108 ON -L- (SR 1730) OVER NEW HOPE CREEK			GROUND WTR (ft)
BORING NO. EB2-A	STATION 14+40	OFFSET 16ft LT	ALIGNMENT -L-
COLLAR ELEV. 402.6 ft	TOTAL DEPTH 8.9 ft	NORTHING 816,064	EASTING 1,986,556
DRILL MACHINE CME-550X	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
START DATE 04/18/07	COMP. DATE 04/18/07	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 8.9 ft

ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
		0.5ft	0.5ft	0.5ft	0	25	50	75	100						
405													402.6	GROUND SURFACE	0.0
													400.6	ROADWAY EMBANKMENT Brown, SANDY CLAY	2.0
399.4	3.2												397.6	ALLUVIAL Brown, SILTY CLAY	5.0
396.9	5.7	WOH	1	2									395.1	ALLUVIAL Brown, SANDY SILT	7.5
394.4	8.2	1	4	13									393.7	WEATHERED ROCK (Intermediate Metavolcanic Rock)	8.9
		100/0.2												Boring Terminated by Auger Refusal at Elevation 393.7 ft on CRYSTALLINE ROCK (Intermediate Metavolcanic Rock)	

PROJECT NO. 33563.1.1	ID. B-4218	COUNTY Orange	GEOLOGIST Pedro, J. L.
SITE DESCRIPTION BRIDGE NO. 108 ON -L- (SR 1730) OVER NEW HOPE CREEK			GROUND WTR (ft)
BORING NO. EB2-B	STATION 14+40	OFFSET 15ft RT	ALIGNMENT -L-
COLLAR ELEV. 402.6 ft	TOTAL DEPTH 8.7 ft	NORTHING 816,039	EASTING 1,986,575
DRILL MACHINE CME-550X	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
START DATE 04/18/07	COMP. DATE 04/18/07	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 8.7 ft

ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
		0.5ft	0.5ft	0.5ft	0	25	50	75	100						
405													402.6	GROUND SURFACE	0.0
													400.1	ROADWAY EMBANKMENT Brown, SANDY CLAY	2.5
399.3	3.3												397.6	ALLUVIAL Brown and orange, SANDY CLAY	5.0
396.8	5.8												395.1	ALLUVIAL Brown and orange, SANDY CLAY	7.5
394.3	8.3												393.9	WEATHERED ROCK (Intermediate Metavolcanic Rock)	8.7
		100/0.3												Boring Terminated by Auger Refusal at Elevation 393.9 ft on CRYSTALLINE ROCK (Intermediate Metavolcanic Rock)	

NCDOT BORE DOUBLE B4218_GEO_BH.GPJ NC_DOT_GDT_08/17/07

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	10' LT	13+30	3.5-4.7	A-6(9)	36	12	10.3	11.9	33.3	44.5	94	87	76	-	-
SS-2	10' LT	13+30	6.0-7.5	A-6(15)	38	16	1.2	15.6	38.7	44.5	100	100	90	-	-
SS-3	10' LT	13+30	8.5-10.0	A-6(4)	31	11	14.4	33.4	23.9	28.3	98	93	56	-	-

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-4	10' RT	13+30	6.3-7.0	A-7-6(21)	45	21	2.6	11.3	37.4	48.6	100	98	90	-	-

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	5' RT	13+85	0.0-0.5	A-1-a(0)	23	NP	66.3	14.4	15.3	4.0	48	22	10	-	-

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		

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-6	15' RT	14+40	3.3-4.8	A-6(13)	39	15	3.0	20.6	33.9	42.5	100	99	82	-	-



FIELD SCOUR REPORT

WBS: 33563.1.1 TIP: B-4218 COUNTY: Orange

DESCRIPTION(1): Bridge No. 108 on -L- (SR 1703) over New Hope Creek at Station 13+89.5

EXISTING BRIDGE

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

Bridge No.: 108 Length: 76' Total Bents: 4 Bents in Channel: 2 Bents in Floodplain: 2
Foundation Type: Timber piles on spread footings

EVIDENCE OF SCOUR(2)

Abutments or End Bent Slopes: None

Interior Bents: None visible

Channel Bed: None visible

Channel Bank: Contraction scour along banks

EXISTING SCOUR PROTECTION

Type(3): Wing walls

Extent(4): Walls = 6' H x 30' L

Effectiveness(5): Effective

Obstructions(6): Several large trees fallen in creek (from recent storm)

INSTRUCTIONS

- Describe the specific site's location, including route number and body of water crossed.
- Note scour evidence at existing end bents or abutments (e.g. undermining, sloughing, degradations).
- Note existing scour protection (e.g. rip rap).
- Describe extent of existing scour protection.
- Describe whether or not the scour protection appears to be working.
- Note obstructions such as dams, fallen trees, debris at bents, etc.
- Describe the channel bed material based on observation and/or samples. Include any lab results with report.
- Describe the channel bank material based on observation and/or samples. Include any lab results with report.
- Describe the material covering the banks (e.g. grass, trees, rip rap, none).
- Determine the approximate floodplain width from field observation or a topographic map.
- Describe the material covering the floodplain (e.g. grass, trees, crops).
- Use professional judgement to specify if the stream is degrading, aggrading, or static.
- Describe potential and direction of the stream to migrate laterally during the bridge's life (approx. 100 years).
- 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, brown, very loose, coarse sand and cobbles (SS-8)

Channel Bank Material(8): Alluvial, orange-brown, medium stiff, sandy clay (SS-3)

Channel Bank Cover(9): Trees, brush, and grass

Floodplain Width(10): +/- 250 feet

Floodplain Cover(11): Trees, brush, and grass

Stream is(12): Aggrading _____ Degrading Static _____

Channel Migration Tend.(13): Static

Observations and Other Comments: _____

DESIGN SCOUR ELEVATIONS(14)

Feet Meters _____

Interior Bent 1 = 388.0 feet

Comparison of DSE to Hydraulics Unit theoretical scour:

The DSE for Bent 1 is 2.2' higher than the overtopping scour event from the Hydraulics Report (dated 7-25-07).

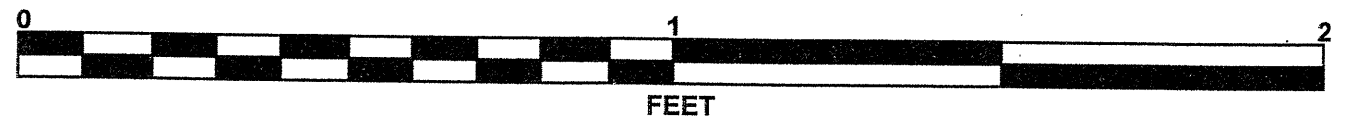
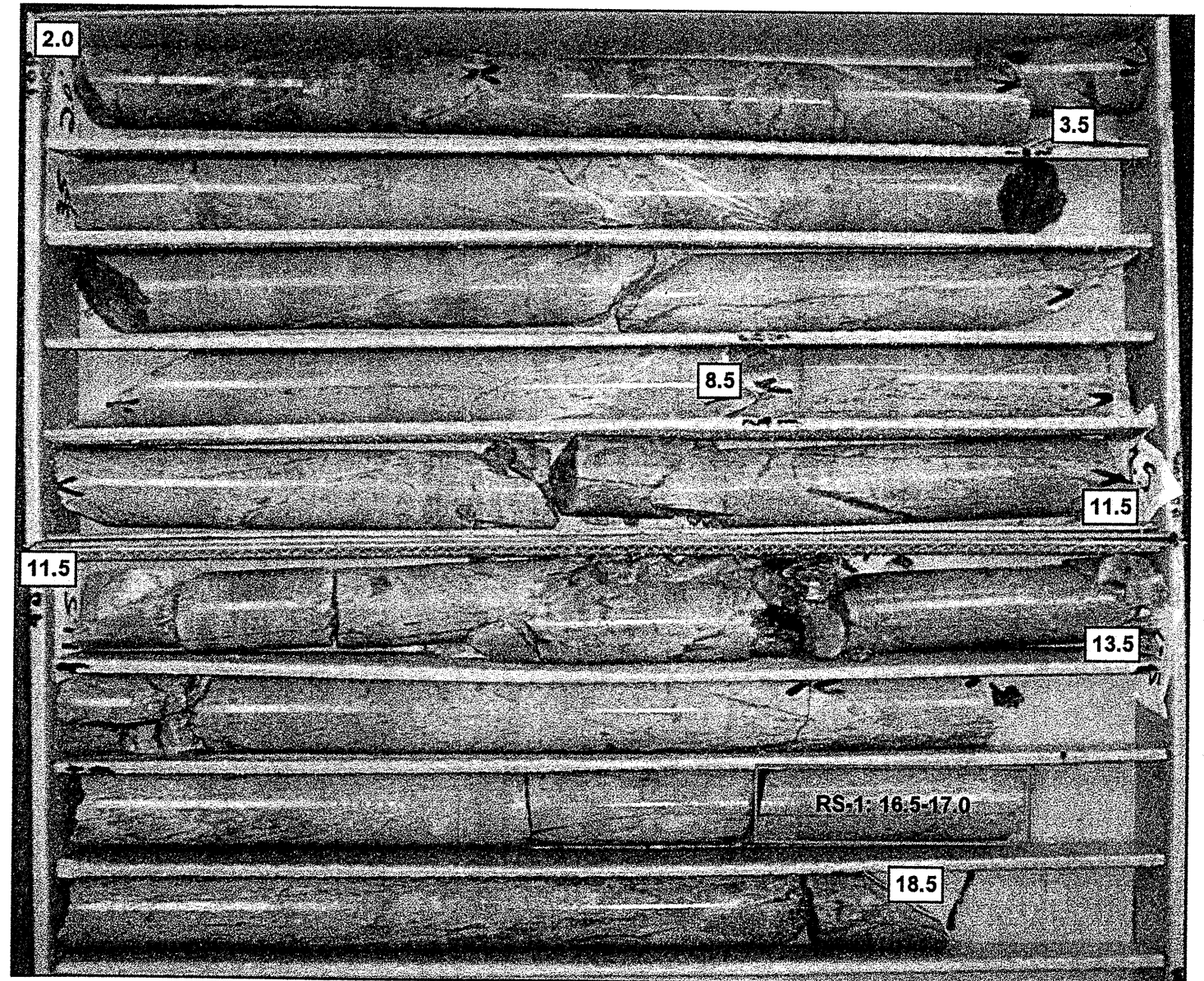
SOIL ANALYSIS RESULTS FROM CHANNEL BED AND BANK MATERIAL

	Bed	Bank				
Sample No.	SS-8	SS-3				
Retained #4	36	1				
Passed #10	48	98				
Passed #40	22	93				
Passed #200	10	56				
Coarse Sand	66.3	14.4				
Fine Sand	14.4	33.4				
Silt	15.3	23.9				
Clay	4.0	28.3				
LL	23	31				
PI	NP	11				
AASHTO	A-1-a(0)	A-6(4)				
Station	13+85	13+30				
Offset	5' RT	10' LT				
Depth	0.0-0.5	8.5-10.0				

Reported by: Jaime Love Pedro Date: 4-17-07
Jaime Love Pedro

CORE PHOTOGRAPH

B1-B
BOXES 1 & 2: 2.0 - 18.5 FEET



SITE PHOTOGRAPH

Bridge No. 108 on -L- (SR 1703) over New Hope Creek



Looking Upstream