

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

CONTENTS

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STRUCTURE
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 33639.1.1 (B-4302) F.A. PROJ. BRZ-1301 (2)
 COUNTY WAKE
 PROJECT DESCRIPTION BRIDGE NO. 336 ON -L- (SR 1301) OVER
TERRIBLE CREEK

INVENTORY

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.

PROJECT: 33639.1.1 ID: B-4302

PERSONNEL

H.R. CONLEY

D.W. DIXON

N.D. MOHS

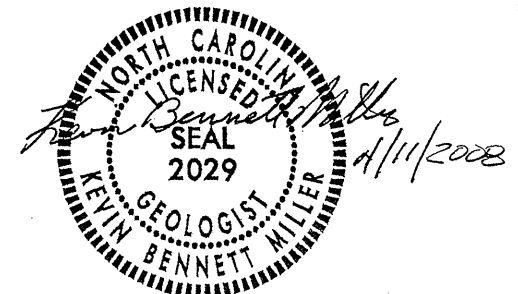
J.I. MILKOVITS, JR

INVESTIGATED BY **K.B. MILLER**

CHECKED BY **N.T. ROBERSON**

SUBMITTED BY **N.T. ROBERSON**

DATE **APRIL 2008**



DRAWN BY: **J.R. MATULA**

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.

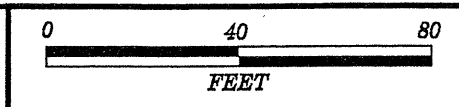
NOTE - BY HAVING REQUESTED THIS INFORMATION THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

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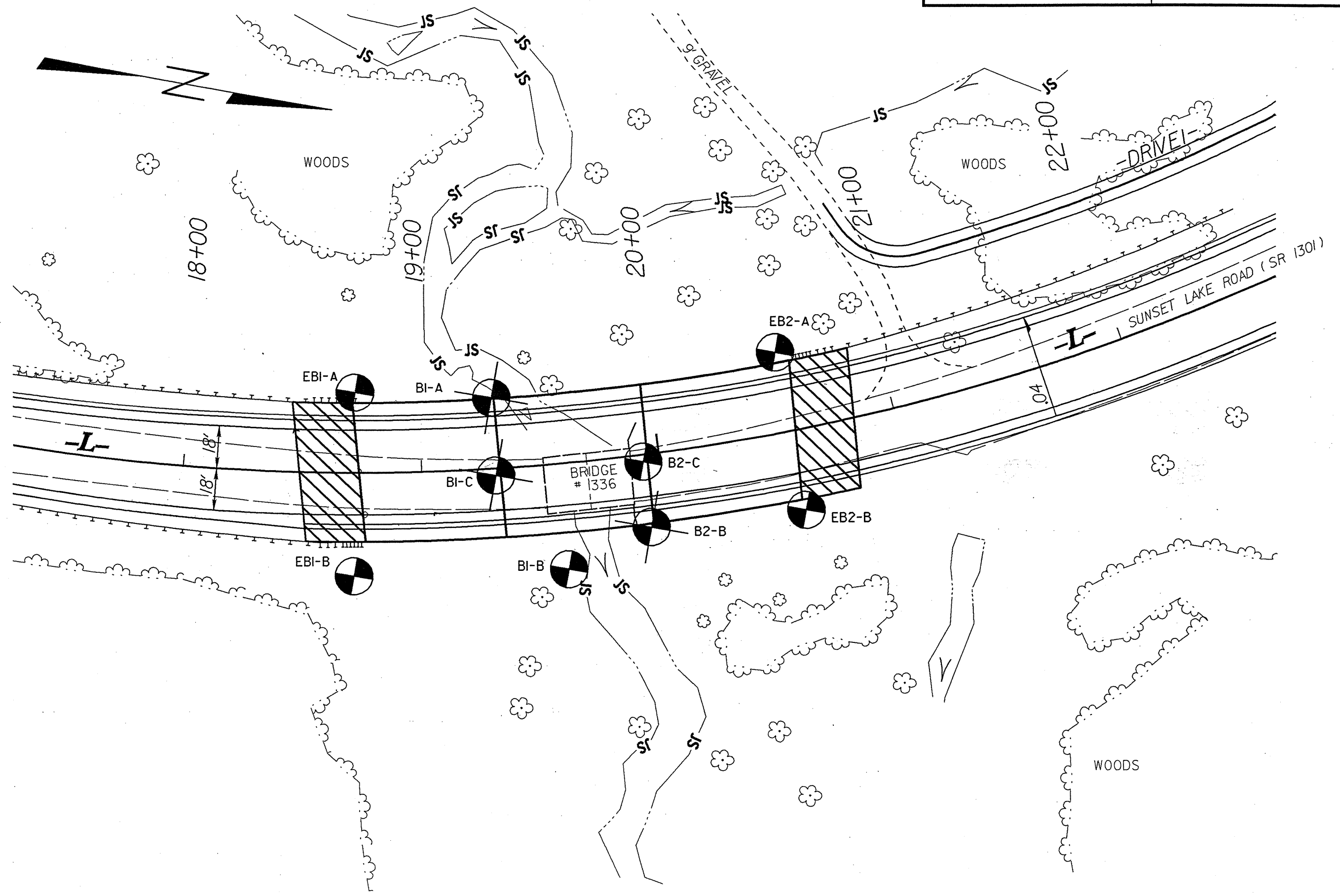
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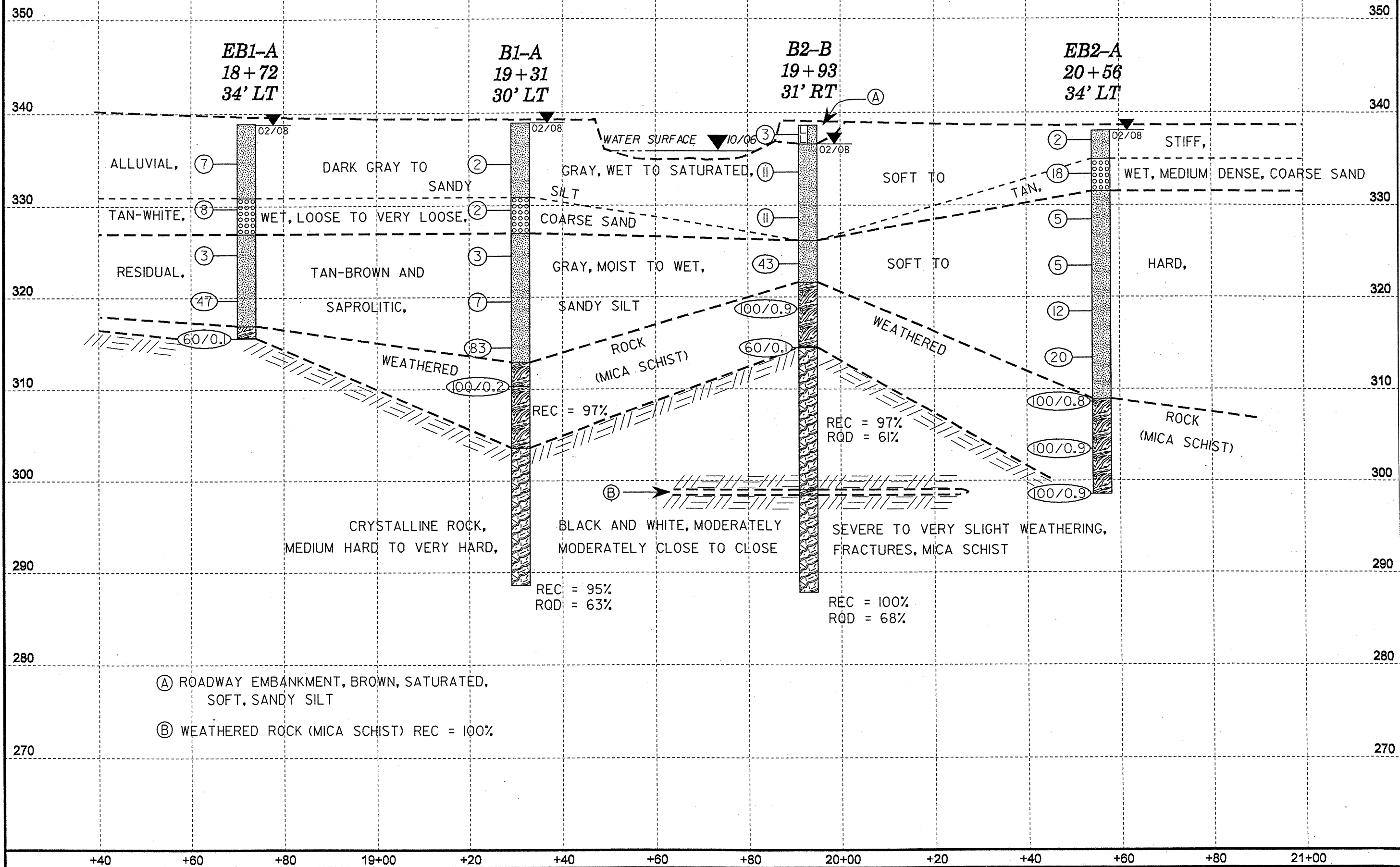
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

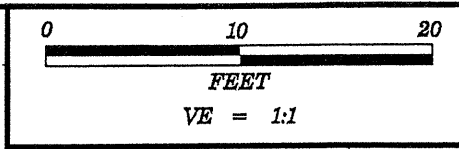
SOIL DESCRIPTION		GRADATION		ROCK DESCRIPTION		TERMS AND DEFINITIONS																																																																																																																																																																																								
<p>SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, 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, DARK GREY 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) GAP-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 60 BLOWS PER FOOT OF WEATHERED ROCK. 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 INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N 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 60 BLOWS PER FOOT. STRATA CORE RECOVERY (SRCR) - 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.</p>																																																																																																																																																																																								
<p style="text-align: center;">SOIL LEGEND AND AASHTO CLASSIFICATION</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>GENERAL CLASS.</th> <th colspan="7">GRANULAR MATERIALS (<= 35% PASSING #200)</th> <th colspan="7">SILT-CLAY MATERIALS (> 35% PASSING #200)</th> <th colspan="3">ORGANIC MATERIALS</th> </tr> <tr> <th>GROUP CLASS.</th> <th>A-1</th><th>A-1-a</th><th>A-1-b</th><th>A-2</th><th>A-2-1</th><th>A-2-2</th><th>A-2-3</th><th>A-2-4</th><th>A-2-5</th><th>A-2-6</th><th>A-2-7</th><th>A-3</th><th>A-4</th><th>A-5</th><th>A-6</th><th>A-7</th><th>A-1, A-2</th><th>A-3</th><th>A-4, A-5</th><th>A-6, A-7</th> </tr> <tr> <th>SYMBOL</th> <td colspan="7">[Pattern]</td> <td colspan="7">[Pattern]</td> <td colspan="3">[Pattern]</td> </tr> <tr> <th>% PASSING</th> <td colspan="7">50, 30, 15, 10, 5, 2, 0.85</td> <td colspan="7">40, 25, 15, 10, 5, 2, 0.85</td> <td colspan="3">10, 5, 2, 0.85</td> </tr> <tr> <th>LIQUID LIMIT</th> <td colspan="7">25, 20, 15, 10, 5, 0</td> <td colspan="7">25, 20, 15, 10, 5, 0</td> <td colspan="3">25, 20, 15, 10, 5, 0</td> </tr> <tr> <th>PLASTIC INDEX</th> <td colspan="7">4, 3, 2, 1, 0</td> <td colspan="7">4, 3, 2, 1, 0</td> <td colspan="3">4, 3, 2, 1, 0</td> </tr> <tr> <th>GROUP INDEX</th> <td colspan="7">0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10</td> <td colspan="7">0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10</td> <td colspan="3">0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10</td> </tr> <tr> <th>USUAL TYPES OF MAJOR MATERIALS</th> <td colspan="3">STONE FRAGS, GRAVEL, SAND</td> <td colspan="4">FINE SAND</td> <td colspan="4">SILTY OR CLAYEY GRAVEL AND SAND</td> <td colspan="3">SILTY SOILS</td> <td colspan="3">CLAYEY SOILS</td> <td colspan="3">SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER</td> <td colspan="3">HIGHLY ORGANIC SOILS</td> </tr> <tr> <th>GEN. RATINGS AS A SUBGRADE</th> <td colspan="7">EXCELLENT TO GOOD</td> <td colspan="7">FAIR TO POOR</td> <td colspan="3">FAIR TO POOR</td> <td colspan="3">POOR</td> <td colspan="3">UNSUITABLE</td> </tr> </table> <p>PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS ≥ LL - 30</p>		GENERAL CLASS.	GRANULAR MATERIALS (<= 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)							ORGANIC MATERIALS			GROUP CLASS.	A-1	A-1-a	A-1-b	A-2	A-2-1	A-2-2	A-2-3	A-2-4	A-2-5	A-2-6	A-2-7	A-3	A-4	A-5	A-6	A-7	A-1, A-2	A-3	A-4, A-5	A-6, A-7	SYMBOL	[Pattern]							[Pattern]							[Pattern]			% PASSING	50, 30, 15, 10, 5, 2, 0.85							40, 25, 15, 10, 5, 2, 0.85							10, 5, 2, 0.85			LIQUID LIMIT	25, 20, 15, 10, 5, 0							25, 20, 15, 10, 5, 0							25, 20, 15, 10, 5, 0			PLASTIC INDEX	4, 3, 2, 1, 0							4, 3, 2, 1, 0							4, 3, 2, 1, 0			GROUP INDEX	0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10							0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10							0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10			USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS, GRAVEL, SAND			FINE SAND				SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS			CLAYEY SOILS			SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER			HIGHLY ORGANIC SOILS			GEN. RATINGS AS A SUBGRADE	EXCELLENT TO GOOD							FAIR TO POOR							FAIR TO POOR			POOR			UNSUITABLE			<p style="text-align: center;">MINERALOGICAL COMPOSITION</p> <p>MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. 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>LIQUID LIMIT LESS THAN 31 LIQUID LIMIT EQUAL TO 31-50 LIQUID LIMIT GREATER THAN 50</p>		<p style="text-align: center;">WEATHERED ROCK (WR)</p> <p>NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.</p>		<p style="text-align: center;">CRYSTALLINE ROCK (CR)</p> <p>FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.</p>		<p style="text-align: center;">NON-CRYSTALLINE ROCK (NCR)</p> <p>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.</p>		<p style="text-align: center;">COASTAL PLAIN SEDIMENTARY ROCK (CP)</p> <p>COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.</p>	
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<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> <tr> <td></td> <td></td> <td></td> <td>35% AND ABOVE</td> </tr> </table>		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				35% AND ABOVE	<p style="text-align: center;">GROUND WATER</p> <p>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</p>		<p style="text-align: center;">WEATHERING</p> <p>FRESH: ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE. 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. 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. 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. <i>IF TESTED, WOULD YIELD SPT REFUSAL</i> 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> 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> 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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<p style="text-align: center;">COLOR</p> <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 style="text-align: center;">INDURATION</p> <p>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.</p> <p>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.</p>																																																																																																																																																																																												
<p style="text-align: center;">BENCH MARK: BL-101 AT STA. 19+39.84, 23' RT</p> <p style="text-align: right;">ELEVATION: 341.26 FT.</p>		<p>NOTES:</p>																																																																																																																																																																																												



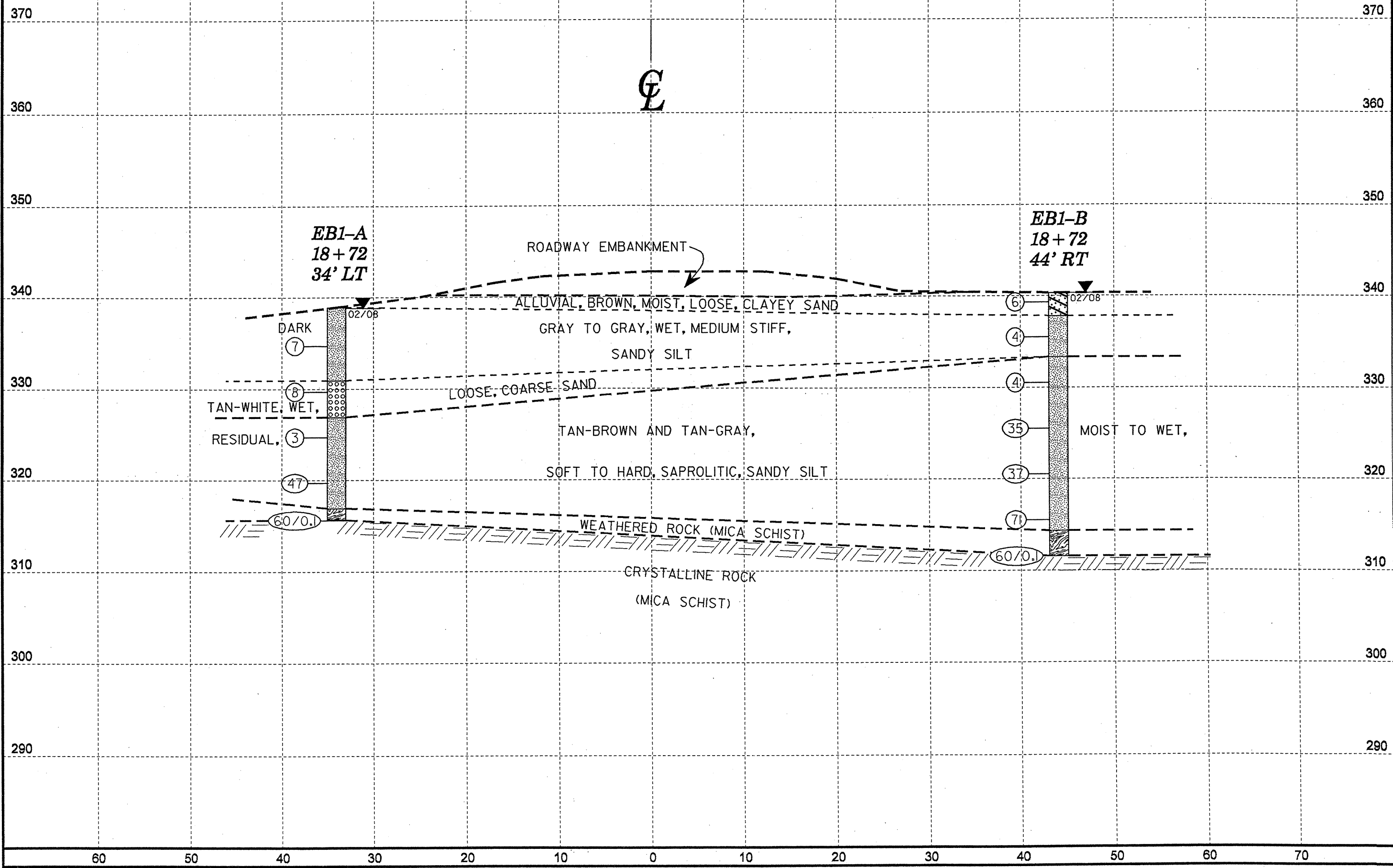
SITE PLAN

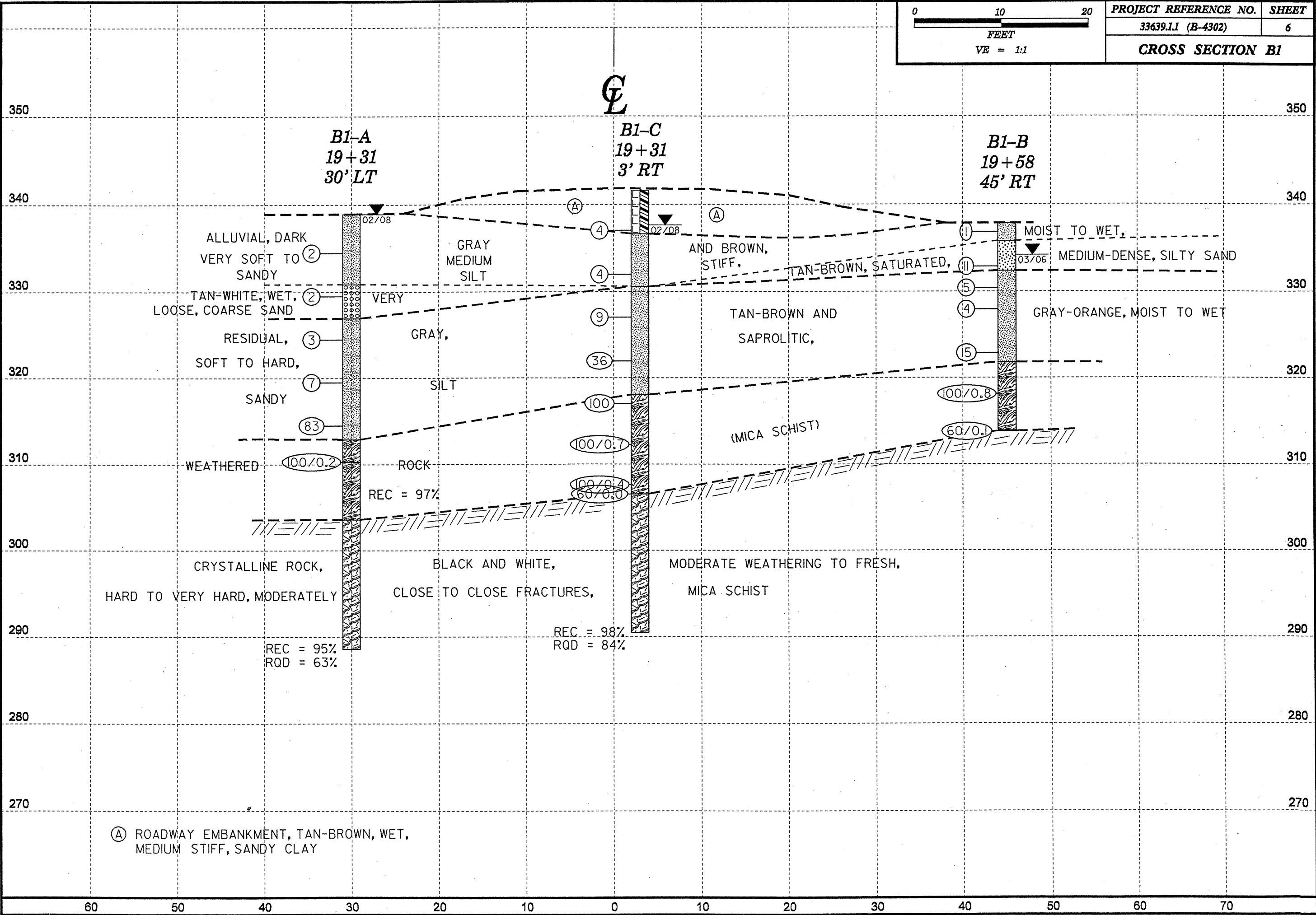
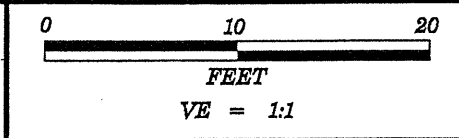


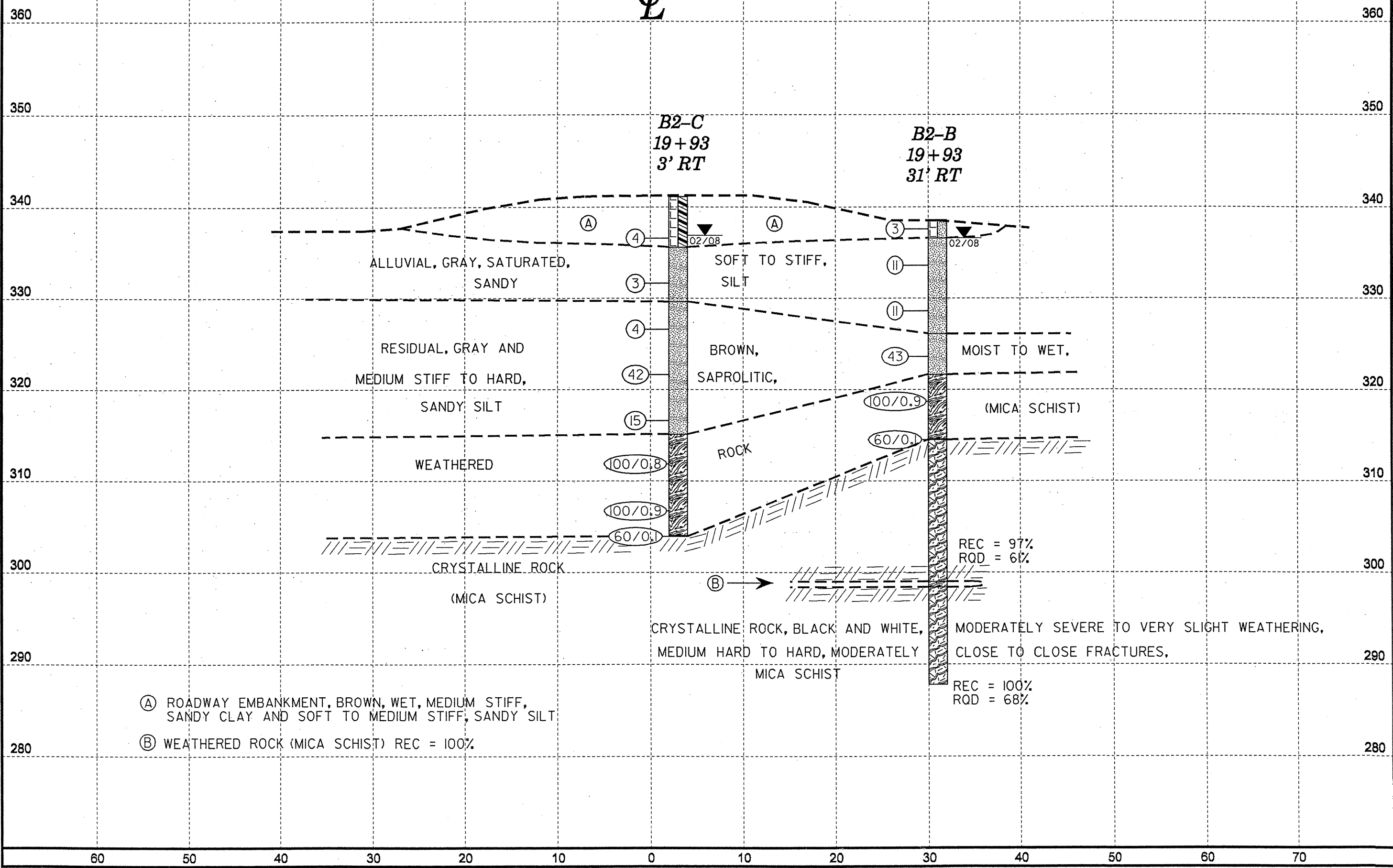
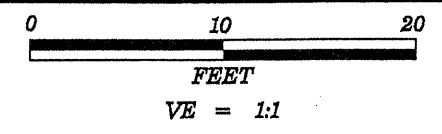




PROJECT REFERENCE NO.	SHEET
33639.1.1 (B-4302)	5
CROSS SECTION EB1	







CL

B2-C
19+93
3' RT

B2-B
19+93
31' RT

ALLUVIAL, GRAY, SATURATED,
SANDY

SOFT TO STIFF,
SILT

RESIDUAL, GRAY AND
MEDIUM STIFF TO HARD,
SANDY SILT

BROWN,
SAPROLITIC,

MOIST TO WET,
(MICA) SCHIST

WEATHERED

ROCK

CRYSTALLINE ROCK
(MICA SCHIST)

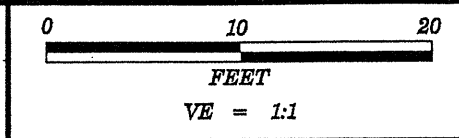
CRYSTALLINE ROCK, BLACK AND WHITE,
MEDIUM HARD TO HARD, MODERATELY
MICA SCHIST

REC = 97%
RQD = 61%

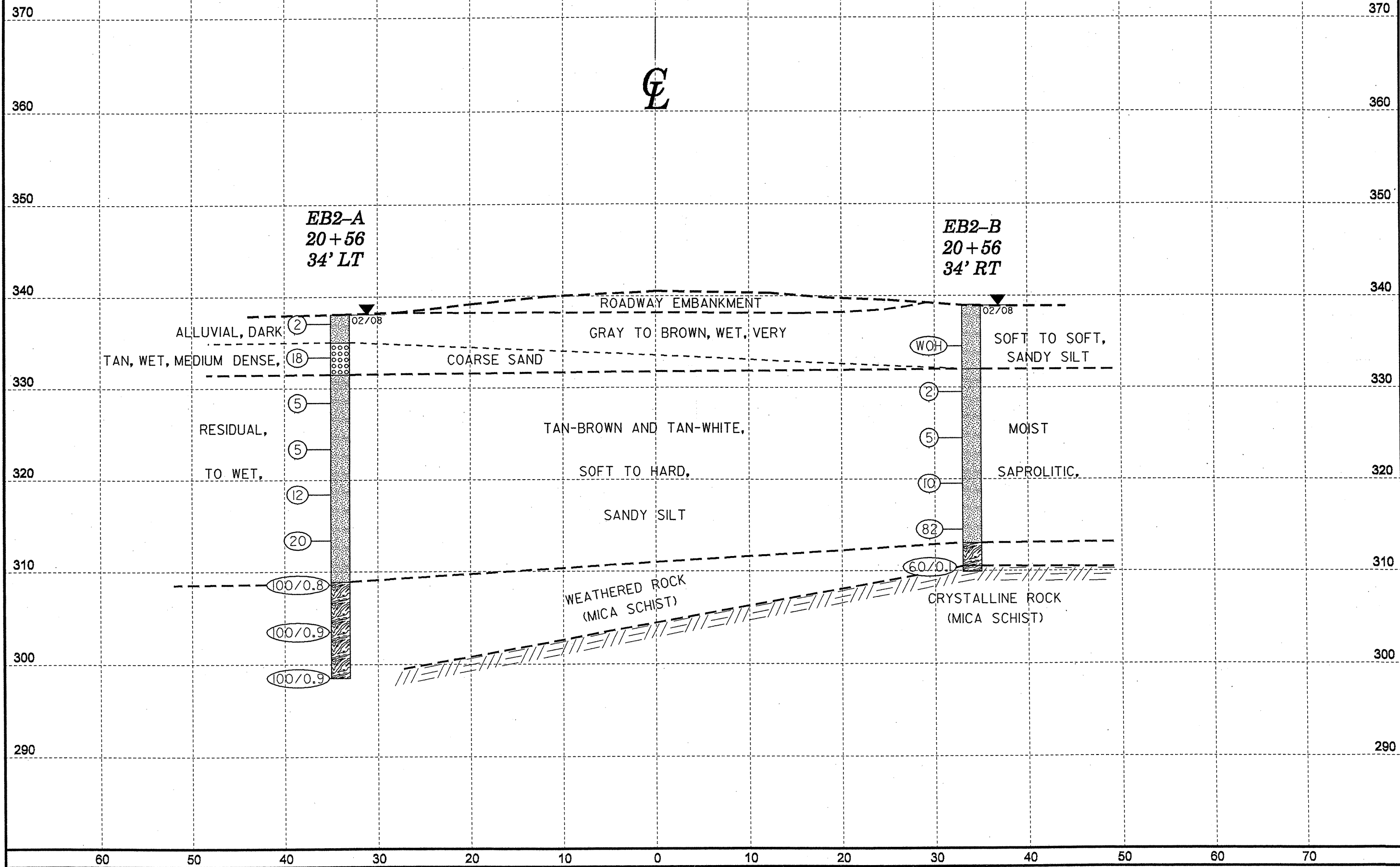
REC = 100%
RQD = 68%

(A) ROADWAY EMBANKMENT, BROWN, WET, MEDIUM STIFF,
SANDY CLAY AND SOFT TO MEDIUM STIFF, SANDY SILT

(B) WEATHERED ROCK (MICA SCHIST) REC = 100%



PROJECT REFERENCE NO.	SHEET
33639.11 (B-4302)	8
CROSS SECTION EB2	



NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 33639.1.1	ID. B-4302	COUNTY Wake	GEOLOGIST Milkovits, J. I.
SITE DESCRIPTION Bridge No. 336 on -L- (SR1301) over Terrible Creek			GROUND WTR (ft)
BORING NO. EB1-A	STATION 18+72	OFFSET 34ft LT	ALIGNMENT -L-
COLLAR ELEV. 338.9 ft	TOTAL DEPTH 23.3 ft	NORTHING 675,934	EASTING 2,067,167
DRILL MACHINE CME-550X	DRILL METHOD NW Casing w/ Core	HAMMER TYPE Automatic	
START DATE 02/19/08	COMP. DATE 02/19/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 23.2 ft

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				
340													GROUND SURFACE	0.0
335	335.7	3.2	1	2	5							W	ALLUVIAL DARK GRAY, SANDY SILT	
330	330.7	8.2	10	6	2							W	TAN-WHITE, COARSE SAND	8.0
325	325.7	13.2	1	1	2							W	RESIDUAL TAN-BROWN AND GRAY, SAPROLITIC, SANDY SILT	12.0
320	320.7	18.2	6	22	25						SS-9	M		
315	315.7	23.2	60/0.1			60/0.1							WEATHERED ROCK MICA SCHIST	23.2
													CRYSTALLINE ROCK MICA SCHIST	23.3
Boring Terminated with Standard Penetration Test Refusal at Elevation 315.6 ft in Mica Schist														

PROJECT NO. 33639.1.1	ID. B-4302	COUNTY Wake	GEOLOGIST Milkovits, J. I.
SITE DESCRIPTION Bridge No. 336 on -L- (SR1301) over Terrible Creek			GROUND WTR (ft)
BORING NO. EB1-B	STATION 18+72	OFFSET 44ft RT	ALIGNMENT -L-
COLLAR ELEV. 340.3 ft	TOTAL DEPTH 28.9 ft	NORTHING 675,947	EASTING 2,067,244
DRILL MACHINE CME-550X	DRILL METHOD NW Casing w/ Advancer	HAMMER TYPE Automatic	
START DATE 02/21/08	COMP. DATE 02/21/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 28.8 ft

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				
345													GROUND SURFACE	0.0
340	340.3	0.0										W	ALLUVIAL BROWN, CLAYEY SAND	2.5
335	336.5	3.8	3	2	2							W	GRAY SANDY SILT	7.0
330	331.5	8.8	1	2	2						SS-11	M	RESIDUAL TAN-GRAY AND TAN-BROWN, SAPROLITIC, SANDY SILT	
325	326.5	13.8	12	16	19						SS-12	M		
320	321.5	18.8	7	13	24							M		
315	316.5	23.8	12	34	37							M		
310	311.5	28.8	60/0.1			60/0.1							WEATHERED ROCK MICA SCHIST	28.8
													CRYSTALLINE ROCK MICA SCHIST	28.9
Boring Terminated with Standard Penetration Test Refusal at Elevation 311.4 ft in Mica Schist														

NCDOT BORE DOUBLE B4302_GEO_BH.GPJ NC_DOT.GDT 04/15/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

PROJECT NO. 33639.1.1	ID. B-4302	COUNTY Wake	GEOLOGIST Milkovits, J. I.
SITE DESCRIPTION Bridge No. 336 on -L- (SR1301) over Terrible Creek			GROUND WTR (ft)
BORING NO. B1-C	STATION 19+31	OFFSET 3ft RT	ALIGNMENT -L-
COLLAR ELEV. 341.6 ft	TOTAL DEPTH 51.1 ft	NORTHING 675,998	EASTING 2,067,191
DRILL MACHINE CME-550X	DRILL METHOD NW Casing w/ Advancer	HAMMER TYPE Automatic	
START DATE 02/14/08	COMP. DATE 02/14/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 35.1 ft

PROJECT NO. 33639.1.1	ID. B-4302	COUNTY Wake	GEOLOGIST Milkovits, J. I.
SITE DESCRIPTION Bridge No. 336 on -L- (SR1301) over Terrible Creek			GROUND WTR (ft)
BORING NO. B1-C	STATION 19+31	OFFSET 3ft RT	ALIGNMENT -L-
COLLAR ELEV. 341.6 ft	TOTAL DEPTH 51.1 ft	NORTHING 675,998	EASTING 2,067,191
DRILL MACHINE CME-550X	DRILL METHOD NW Casing w/ Advancer	HAMMER TYPE Automatic	
START DATE 02/14/08	COMP. DATE 02/14/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 35.1 ft

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				
345													GROUND SURFACE	0.0
340	338.0	3.6										W	ROADWAY EMBANKMENT TAN-BROWN, SANDY CLAY	
335	333.0	8.6	1	2	2							SS-6	ALLUVIAL DARK GRAY TO BROWN, SANDY SILT	5.1
330	328.0	13.6	2	2	2							W	RESIDUAL TAN-BROWN TO GRAY, SAPROLITIC, SANDY SILT	11.0
325	323.0	18.6	3	5	4							W		
320	318.0	23.6	9	14	22							SS-7	WEATHERED ROCK MICA SCHIST	23.6
315	313.0	28.6	56	41	59							W		
310	308.0	33.6	54	46/0.2								W		
305	306.5	35.1	100/0.4									W	CRYSTALLINE ROCK BLACK AND WHITE, MODERATE WEATHERING TO FRESH, HARD, MODERATELY CLOSE TO CLOSE FRACTURES, MICA SCHIST REC = 98% RQD = 84%	35.1
300	306.5	35.1	60/0.0									W		
295												RS-2		
290												W	Boring Terminated at Elevation 290.5 ft in Mica Schist	51.1

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC (%)	RQD (%)		REC (%)	RQD (%)			
306.5	306.5	35.1	1.0	0:45/1.0	(0.7)	(0.0)		(15.7)	(13.5)		Begin Coring @ 35.1 ft	
305	305.5	36.1	5.0	N=60/0.0 0:45/1.0 0:30/1.0 0:29/1.0 0:47/1.0 0:45/1.0	70%	0%		98%	84%		CRYSTALLINE ROCK BLACK AND WHITE, MODERATE WEATHERING TO FRESH, HARD, MODERATELY CLOSE TO CLOSE FRACTURES, MICA SCHIST	35.1
300	300.5	41.1	5.0	1:01/1.0 0:48/1.0 0:42/1.0 0:47/1.0 0:45/1.0	(5.0)	(5.0)						
295	295.5	46.1	5.0	0:54/1.0 0:45/1.0 0:48/1.0 0:55/1.0	100%	100%	RS-2					
290	290.5	51.1									Boring Terminated at Elevation 290.5 ft in Mica Schist	51.1

NCDOT BORE DOUBLE B4302_GEO_BH.GPJ NC DOT.GDT 04/15/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

PROJECT NO. 33639.1.1	ID. B-4302	COUNTY Wake	GEOLOGIST Mohs, N. D.
SITE DESCRIPTION Bridge No. 336 on -L- (SR1301) over Terrible Creek			GROUND WTR (ft)
BORING NO. B2-B	STATION 19+93	OFFSET 31ft RT	ALIGNMENT -L-
COLLAR ELEV. 338.6 ft	TOTAL DEPTH 50.8 ft	NORTHING 676,067	EASTING 2,067,202
DRILL MACHINE CME-550X	DRILL METHOD NW Casing w/ Advancer	HAMMER TYPE Automatic	
START DATE 02/15/08	COMP. DATE 02/15/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 24.1 ft

PROJECT NO. 33639.1.1	ID. B-4302	COUNTY Wake	GEOLOGIST Mohs, N. D.
SITE DESCRIPTION Bridge No. 336 on -L- (SR1301) over Terrible Creek			GROUND WTR (ft)
BORING NO. B2-B	STATION 19+93	OFFSET 31ft RT	ALIGNMENT -L-
COLLAR ELEV. 338.6 ft	TOTAL DEPTH 50.8 ft	NORTHING 676,067	EASTING 2,067,202
DRILL MACHINE CME-550X	DRILL METHOD NW Casing w/ Advancer	HAMMER TYPE Automatic	
START DATE 02/15/08	COMP. DATE 02/15/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 24.1 ft

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					
340	338.6	0.0												GROUND SURFACE	0.0
335	334.6	4.0	WOH	2	1						SS-8	Sat.		ROADWAY EMBANKMENT BROWN, SANDY SILT	2.0
330	329.6	9.0		4	3	8						Sat.		ALLUVIAL GRAY, SANDY SILT	
325	324.6	14.0		5	5	6						Sat.		RESIDUAL GRAY, SAPROLITIC, SANDY SILT	12.5
320	319.6	19.0		15	20	23						W		WEATHERED ROCK MICA SCHIST	17.0
315	314.6	24.0		68	32/0.4					100/0.9				CRYSTALLINE ROCK BLACK AND WHITE, MODERATELY SEVERE TO SLIGHT WEATHERING, MEDIUM HARD TO HARD, MODERATELY CLOSE TO CLOSE FRACTURES, MICA SCHIST REC = 97% RQD = 61%	24.0
310				60/0.1											
305															
300															
295															
290											RS-3			WEATHERED ROCK MICA SCHIST REC = 100%	39.6
285														CRYSTALLINE ROCK BLACK AND WHITE, MODERATE TO VERY SLIGHT WEATHERING, HARD, MODERATELY CLOSE TO CLOSE FRACTURES, MICA SCHIST REC = 100% RQD = 68%	40.2
280															
275															
270															
265															
260															
255															
250															
245															
240															
235															

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	RQD (%)		REC. (%)	RQD (%)			
314.5	314.5	24.1	1.7	1:07/1.0	(1.7)	(1.7)		(15.0)	(9.5)		Begin Coring @ 24.1 ft	
310	312.8	25.8	5.0	0:36/0.7	100%	100%		97%	61%		CRYSTALLINE ROCK BLACK AND WHITE, MODERATELY SEVERE TO SLIGHT WEATHERING, MEDIUM HARD TO HARD, MODERATELY CLOSE TO CLOSE FRACTURES, MICA SCHIST	
305	307.8	30.8	5.0	0:30/1.0 0:20/1.0 0:31/1.0 0:36/1.0 0:31/1.0	(4.5)	(3.5)		90%	70%			
300	302.8	35.8	5.0	0:35/1.0 0:36/1.0 0:39/1.0 0:36/1.0 0:39/1.0	(5.0)	(2.5)		100%	50%			
295	299.0	39.6	3.8	0:40/1.0 0:21/1.0 0:41/1.0 0:34/1.0	(3.8)	(1.8)		100%	47%			
290	297.8	40.8	5.6	0:25/1.0 0:32/1.0 0:28/1.0 0:31/1.0 0:32/1.0	(5.6)	(4.1)		100%	73%		WEATHERED ROCK MICA SCHIST	
285	292.8	45.8	5.0	0:32/1.0 0:30/1.0 0:30/1.0 0:34/1.0	(5.0)	(3.1)	RS-3	100%	62%		CRYSTALLINE ROCK BLACK AND WHITE, MODERATE TO VERY SLIGHT WEATHERING, HARD, MODERATELY CLOSE TO CLOSE FRACTURES, MICA SCHIST	
280	292.2	46.4	5.0	0:32/1.0 0:30/1.0 0:30/1.0 0:34/1.0	(5.0)	(3.1)		100%	62%			
275	287.8	50.8		0:27/1.0							Boring Terminated at Elevation 287.8 ft in Mica Schist	

NCDOT BORE DOUBLE B4302_GEO_BH.GPJ NC_DOT.GDT 04/15/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 33639.1.1	ID. B-4302	COUNTY Wake	GEOLOGIST Milkovits, J. I.
SITE DESCRIPTION Bridge No. 336 on -L- (SR1301) over Terrible Creek			GROUND WTR (ft)
BOHRING NO. EB2-A	STATION 20+56	OFFSET 34ft LT	ALIGNMENT -L-
COLLAR ELEV. 338.0 ft	TOTAL DEPTH 39.5 ft	NORTHING 676,105	EASTING 2,067,120
DRILL MACHINE CME-550X	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
START DATE 02/12/08	COMP. DATE 02/12/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 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						
340																
338.0	338.0	0.0												GROUND SURFACE	0.0	
335	334.4	3.6	7	10	8								SS-1	W	ALLUVIAL DARK GRAY, SANDY SILT	3.0
330	329.4	8.6	2	2	3								SS-2	W	TAN, COARSE SAND	6.5
325	324.4	13.6	2	2	3								SS-3	W	RESIDUAL TAN-BROWN, SAPROLITIC, SANDY SILT	
320	319.4	18.6	2	4	8								M	M		
315	314.4	23.6	8	8	12								SS-4	M		
310	309.4	28.6	12	34	66/0.3								M	M		
305	304.4	33.6	41	59/0.4											WEATHERED ROCK MICA SCHIST	29.1
300	299.4	38.6	20	80/0.4											WEATHERED ROCK MICA SCHIST	29.1
295																
290																
285																
280																
275																
270																
265																
260																

PROJECT NO. 33639.1.1	ID. B-4302	COUNTY Wake	GEOLOGIST Milkovits, J. I.
SITE DESCRIPTION Bridge No. 336 on -L- (SR1301) over Terrible Creek			GROUND WTR (ft)
BOHRING NO. EB2-B	STATION 20+56	OFFSET 34ft RT	ALIGNMENT -L-
COLLAR ELEV. 339.0 ft	TOTAL DEPTH 29.1 ft	NORTHING 676,129	EASTING 2,067,183
DRILL MACHINE CME-550X	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
START DATE 02/12/08	COMP. DATE 02/12/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 28.5 ft

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					
340															
339.0														GROUND SURFACE	0.0
335	335.5	3.5	WOH	WOH	WOH								W	ALLUVIAL DARK GRAY TO BROWN, SANDY SILT	3.0
330	330.5	8.5	WOH	WOH	2								W	RESIDUAL TAN-BROWN AND TAN-WHITE, SAPROLITIC, SANDY SILT	
325	325.5	13.5	2	2	3								M		
320	320.5	18.5	2	4	6								SS-5	M	
315	315.5	23.5	8	18	64								M		
310	310.5	28.5	60/0.1											WEATHERED ROCK MICA SCHIST	28.5
305														CRYSTALLINE ROCK MICA SCHIST	29.1
300															
295															
290															
285															
280															
275															
270															
265															
260															

NCDOT BORE DOUBLE B4302_GEO_BH.GPJ NC_DOT.GDT 04/16/08

EB1-A

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-9	34 LT	18+72	18.2-19.7	A-4(0)	28	NP	2.2	36.2	51.5	10.1	100	100	71	-	-

EB1-B

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-10	44 RT	18+63	0.0-1.5	A-2-6(0)	34	11	35.1	24.9	23.9	16.1	73	54	33	-	-
SS-11	44 RT	18+63	8.8-10.3	A-4(2)	37	6	5.0	58.4	28.5	8.0	99	97	57	-	-
SS-12	44 RT	18+63	13.8-15.3	A-4(0)	25	NP	2.0	37.1	54.8	6.0	93	92	69	-	-

B1-B

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-1A	22 RT	20+57	0.0-1.50	A-4(0)	28	4	30.4	38.7	22.9	8.1	98	82	37	-	-
SS-2A	22 RT	20+57	3.90-5.40	A-2-4(0)	25	2	44.9	33.2	15.8	6.0	78	56	21	-	-
SS-3A	22 RT	20+57	6.40-7.90	A-4(0)	34	2	14.5	52.8	28.7	4.0	100	92	47	-	-

B1-C

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	3 RT	19+31	3.6-5.1	A-6(4)	40	14	39.0	15.5	13.3	32.2	95	67	47	-	-
SS-7	3 RT	19+31	18.6-20.1	A-4(2)	27	4	2.6	27.6	57.7	12.1	100	99	80	-	-

B2-B

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	31 RT	19+93	0.0-1.5	A-4(0)	26	4	31.4	34.8	15.7	18.1	95	77	38	-	-

EB2-A

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	34 LT	20+56	0.0-1.5	A-4(0)	25	7	28.2	37.4	16.3	18.1	92	78	37	-	-
SS-2	34 LT	20+56	3.6-5.1	A-1-a(0)	20	NP	68.2	21.9	5.8	4.0	36	12	5	-	-
SS-3	34 LT	20+56	8.6-10.1	A-4(3)	32	5	2.4	38.4	49.1	10.1	98	97	74	-	-
SS-4	34 LT	20+56	18.6-20.1	A-4(3)	32	4	1.4	35.8	54.7	8.0	100	100	80	-	-

EB2-B

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-5	34 RT	20+56	18.5-20.0	A-4(1)	32	3	7.8	38.0	42.1	12.1	99	95	66	-	-

ROCK TEST RESULTS							
SAMPLE NO.	OFFSET	STATION	BORING NO.	DEPTH INTERVAL	UNIT WT. LB/FT3	UNCONFINED COMPRESSIVE STRENGTH KSI	SEC MOD @ 40% MPSI
RS-1	30 LT	19+31	B1-A	47.3-48.0	164	2.86	14.06
RS-2	3 RT	19+31	B1-C	44.9-45.6	169.7	11.25	15.8
RS-3	31 RT	19+93	B2-B	46.8-47.3	158.4	6.06	6.83



FIELD SCOUR REPORT

WBS: 33639.1.1 TIP: B-4302 COUNTY: Wake

DESCRIPTION(1): Bridge No. 336 on -L- (SR 1301) over Terrible Creek

EXISTING BRIDGE

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

Bridge No.: 336 Length: 37' Total Bents: 3 Bents in Channel: 1 Bents in Floodplain: 2
 Foundation Type: Timber piles

EVIDENCE OF SCOUR(2)

Abutments or End Bent Slopes: Large scour pocket at end bent 2

Interior Bents: Large scour pocket around bent 1

Channel Bed: Minor contraction

Channel Bank: Minor contraction

EXISTING SCOUR PROTECTION

Type(3): Timber Abutment wall

Extent(4): Across the end slope and 10+/- feet outside the edge of the bridge

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, very loose to medium dense, coarse and silty sand (A-1-a, A-2-4) - SS-2 and SS-2A

Channel Bank Material(8): Alluvial, loose, clayey sand (A-2-6) - SS-10 and soft to medium stiff, sandy silt (A-4) - SS-1 and SS-1A

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

Floodplain Width(10): 200 +/- feet

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

Stream is(12): Aggrading _____ Degrading Static _____

Channel Migration Tendency(13): Toward the northeast

Observations and Other Comments: _____

DESIGN SCOUR ELEVATIONS(14)

Feet Meters _____

BENTS

EB1	B1	B2	EB2						
N/A	331.7	333.7	N/A						

Comparison of DSE to Hydraulics Unit theoretical scour:

B1- the GASE is 2 feet lower than the theoretical elevation shown on the Bridge and Hydraulic Design Report

B2- the GASE is 2 feet higher than the theoretical elevation shown on the Bridge and Hydraulic Design Report

SOIL ANALYSIS RESULTS FROM CHANNEL BED AND BANK MATERIAL

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

See Sheet 16,
"Soil Test Results",
for samples:
SS-1 and SS1A
SS-2 and SS2A
SS-10

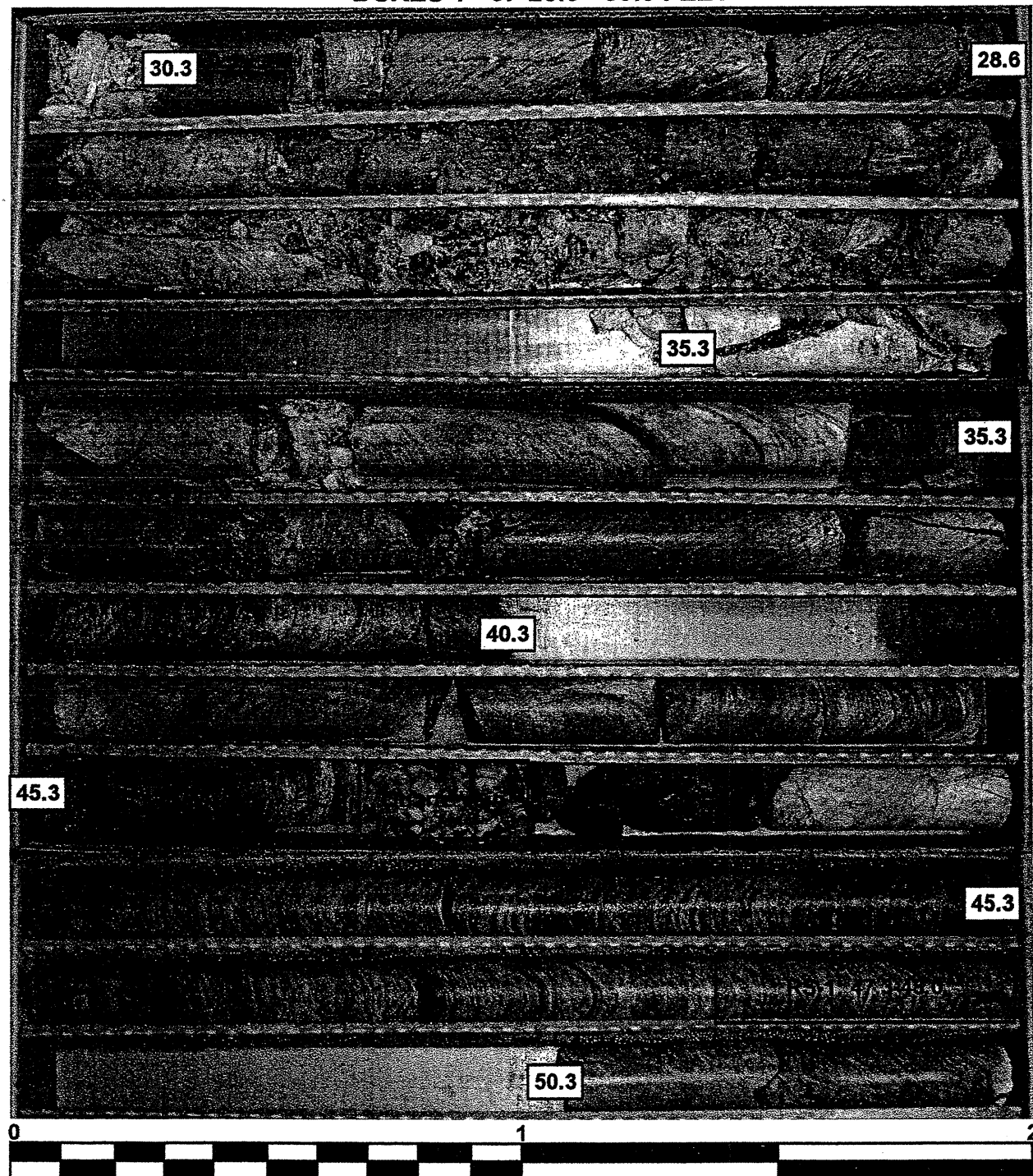
Reported by: Joseph I. Milkovits, Jr.

Date: 2/20/2008

CORE PHOTOGRAPHS

B1-A

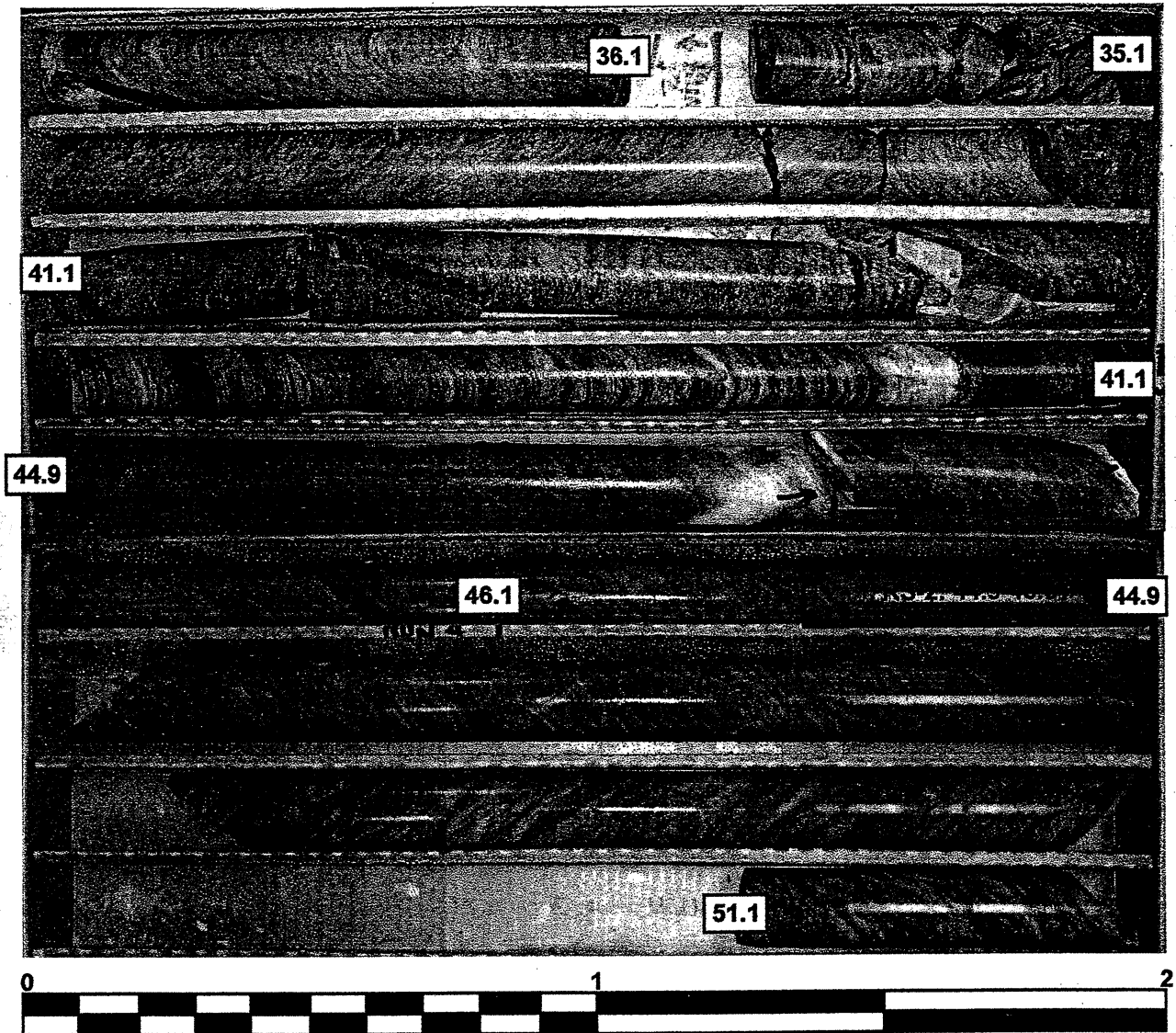
BOXES 1 - 3: 28.6 - 50.3 FEET



FEET

B1-C

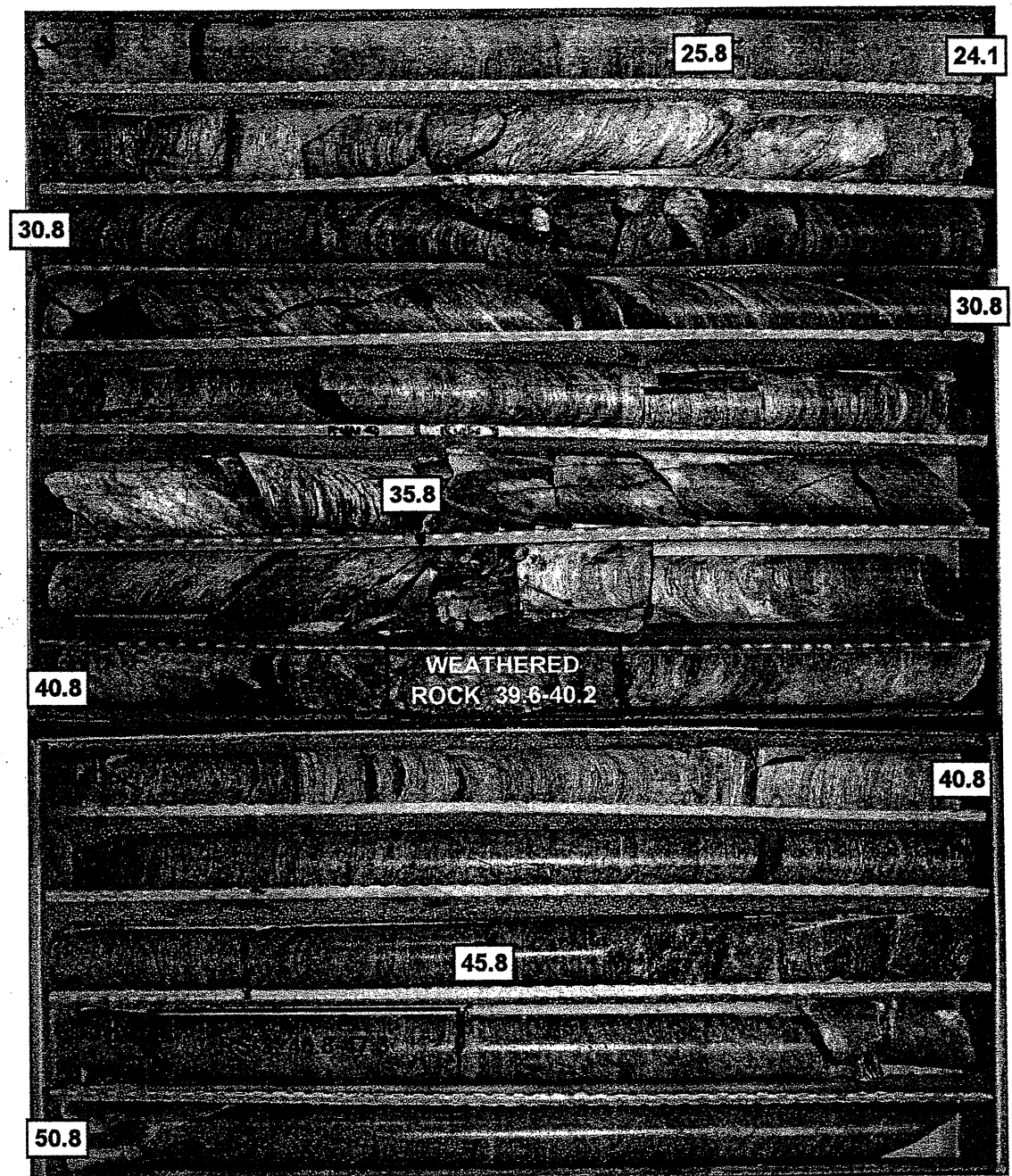
BOX 1 & 2: 35.1 - 51.1 FEET



FEET

CORE PHOTOGRAPHS

B2-B
BOXES 1 - 3: 24.1 - 50.8 FEET



SITE PHOTO

BRIDGE NO. 336 ON -L- (SR 1301) OVER TERRIBLE CREEK AT STA. 19+64



LOOKING WEST