

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

**STRUCTURE
SUBSURFACE INVESTIGATION**

PROJ. REFERENCE NO. 42246.1.1 (B-5109) F.A. PROJ. BRSTP-0218(7)

COUNTY UNION

PROJECT DESCRIPTION BRIDGE # 29 OVER GOOSE CREEK ON
HIGHWAY NC 218 BETWEEN SR 1543 AND SR 2323

SITE DESCRIPTION _____

CONTENTS

<u>SHEET</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4	PROFILE
5-8	CROSS SECTIONS
9-16	BORE LOG & CORE REPORTS
17	SOIL TEST RESULTS
18-23	CORE PHOTOGRAPHS
24	SITE PHOTOGRAPH

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
J. K. STICKNEY

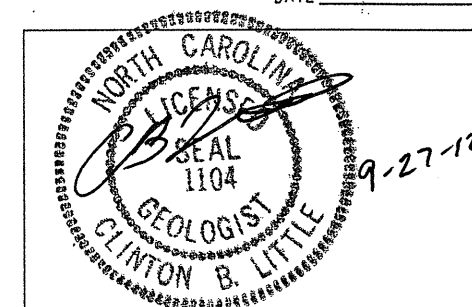
C. L. SMITH

INVESTIGATED BY R. Q. CALLAWAY

CHECKED BY C. B. LITTLE

SUBMITTED BY C. B. LITTLE

DATE AUGUST 2012



ID: B-5109

PROJECT: 42246.1.1

DRAWN BY: J. K. McCLURE /R. Q. CALLAWAY

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

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

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

PROJECT REFERENCE NO. 42246.II (B-5109) SHEET NO. 2

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 (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, GRAY, SILTY 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) GAP-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 INCORPORATED 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 - A FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHALE-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 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 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.	
GROUP CLASS. A-1, A-1-b, A-2, A-2-4, A-2-5, A-2-6, A-2-7, A-4, A-5, A-6, A-7, A-1, A-2, A-3, A-4, A-5, A-6, A-7	COMPRESSIBILITY SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 31 MODERATELY COMPRESSIBLE LIQUID LIMIT EQUAL TO 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50	PERCENTAGE OF MATERIAL 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 10 - 20% MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35% HIGHLY ORGANIC >10% >20% HIGHLY 35% AND ABOVE	
SYMBOL	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 SOUNDING ROD	
% PASSING #10, #40, #200	CONCENTRATIONS OF MATERIAL ORGANIC MATTER GRANULAR SOILS SILT-CLAY SOILS OTHER MATERIAL	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 PEICES 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.	
LIQUID LIMIT PLASTIC INDEX	TEXTURE OR GRAIN SIZE U.S. STD. SIEVE SIZE OPENING (MM) 4, 10, 40, 60, 200, 270 4.75, 2.00, 0.42, 0.25, 0.075, 0.053	ABBREVIATIONS AR - AUGER REFUSAL BT - BORING TERMINATED CL - CLAY CPT - CONE PENETRATION TEST CSE - COARSE DMT - DILATOMETER TEST DPT - DYNAMIC PENETRATION TEST F - FINE FOSS - FOSSILIFEROUS FRAC. - FRACTURED, FRACTURES FRAGS. - FRAGMENTS HL - HIGHLY MED. - MEDIUM MICA - MICACEOUS 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 S - BULK SS - SPLIT SPOON ST - SHELBY TUBE RS - ROCK RT - RECOMPACTED TRIAXIAL CBR - CALIFORNIA BEARING RATIO	
GROUP INDEX	SOIL MOISTURE - CORRELATION OF TERMS SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION	EQUIPMENT USED ON SUBJECT PROJECT DRILL UNITS: MOBILE B-51, BK-51, CME-45C, CME-550, PORTABLE HOIST ADVANCING TOOLS: CLAY BITS, 6" CONTINUOUS FLIGHT AUGER, 8" HOLLOW AUGERS, HARD FACED FINGER BITS, TUNG-CARBIDE INSERTS, CASING w/ ADVANCER, TRICONE 2 1/8" TUNG-CARB. CORE BIT HAMMER TYPE: AUTOMATIC, MANUAL CORE SIZE: B, N, NO/NQ, H HAND TOOLS: POST HOLE DIGGER, HAND AUGER, SOUNDING ROD, VANE SHEAR TEST	
USUAL TYPES OF MAJOR MATERIALS	PLASTICITY NONPLASTIC, LOW PLASTICITY, MED. PLASTICITY, HIGH PLASTICITY	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.	
GEN. RATING AS A SUBGRADE	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.		

PCC Sta. 13+32.54

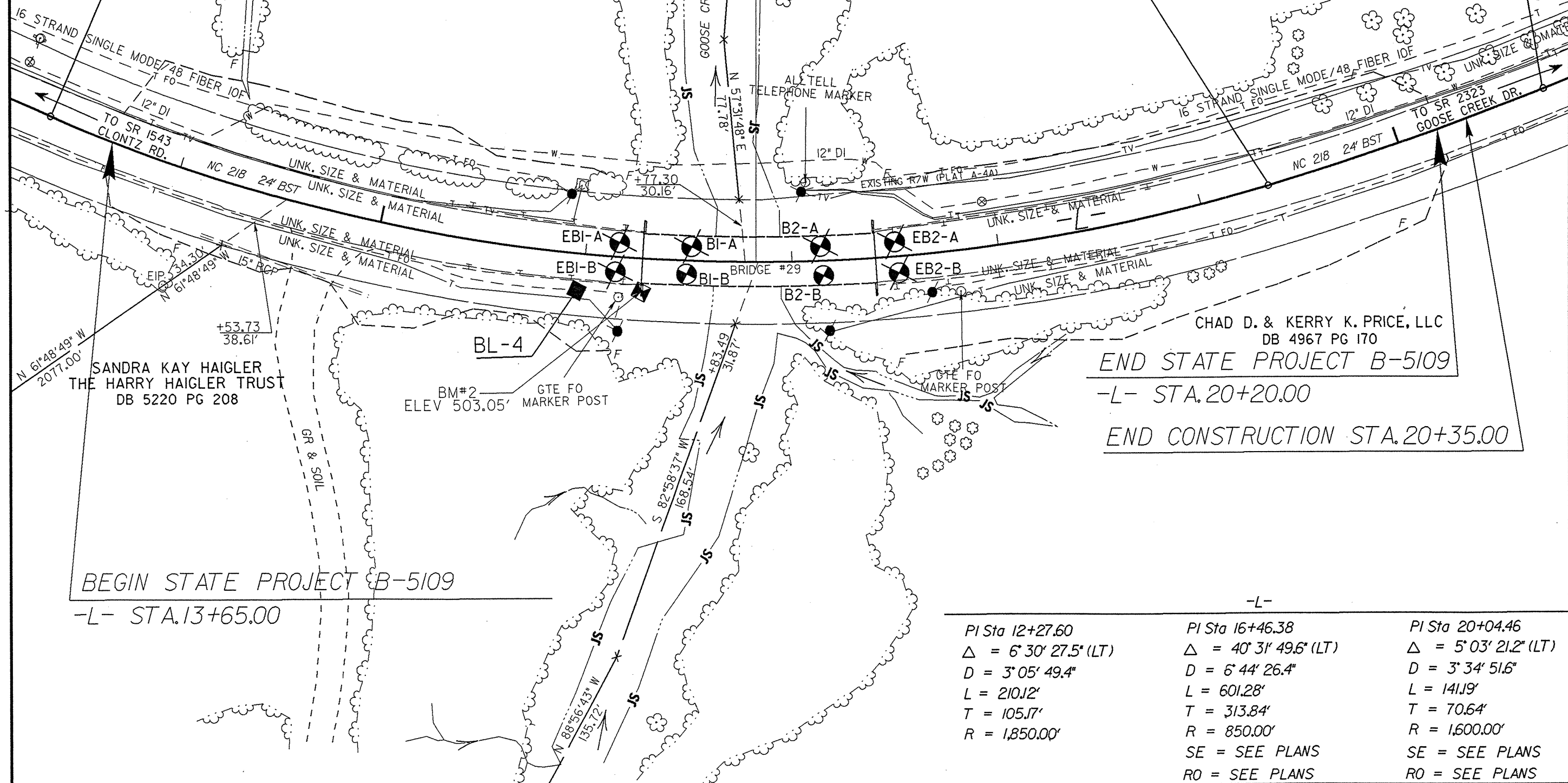
JIMMY W. DUNCAN
CAROLYN F. DUNCAN
DB 318 PG 425

MICHAEL ODELL ALLEN
PAMELA PRITCHARD ALLEN
DB 1353 PG 242

PT Sta. 20+75.01

PCC Sta. 19+33.82

CL STA. 16+82.5 -L-
1 @ 35', 1 @ 65', 1 @ 35'
90 Deg. Skew



SANDRA KAY HAIGLER
THE HARRY HAIGLER TRUST
DB 5220 PG 208

CHAD D. & KERRY K. PRICE, LLC
DB 4967 PG 170

END STATE PROJECT B-5109

-L- STA. 20+20.00

END CONSTRUCTION STA. 20+35.00

BEGIN STATE PROJECT B-5109

-L- STA. 13+65.00

PI Sta 12+27.60
Δ = 6' 30" 27.5" (LT)
D = 3' 05" 49.4"
L = 210.12'
T = 105.17'
R = 1,850.00'

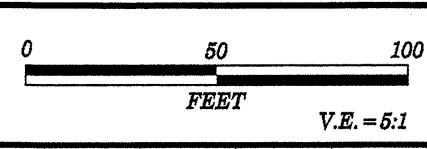
PI Sta 16+46.38
Δ = 40' 31" 49.6" (LT)
D = 6' 44" 26.4"
L = 601.28'
T = 313.84'
R = 850.00'

PI Sta 20+04.46
Δ = 5' 03" 21.2" (LT)
D = 3' 34" 51.6"
L = 141.19'
T = 70.64'
R = 1,600.00'

SE = SEE PLANS
RO = SEE PLANS

SE = SEE PLANS
RO = SEE PLANS

BM * 2 ELEV. 503.05'
DESCRIPTION: CHISED SQUARE ON NW SIDE
OF BRIDGE WING WALL



PROJECT REFERENCE NO.	SHEET
42246.1.1 (B-5109)	4
Profile -L- Bridge 029 over Goose Creek on NC 218 between SR 1543 and SR 2323	

-L-

BEGIN GRADE -L- STA. 13+65.00
ELEV. 507.90'

BEGIN BRIDGE
STA. 16+11.00+/-

☉ Sta 16+82.5 -L-
| @ 35'; | @ 65'; | @ 35' -- 36" PSG
90' Skew
☉ Elev = 504.52'

END BRIDGE
STA. 17+50.00+/-

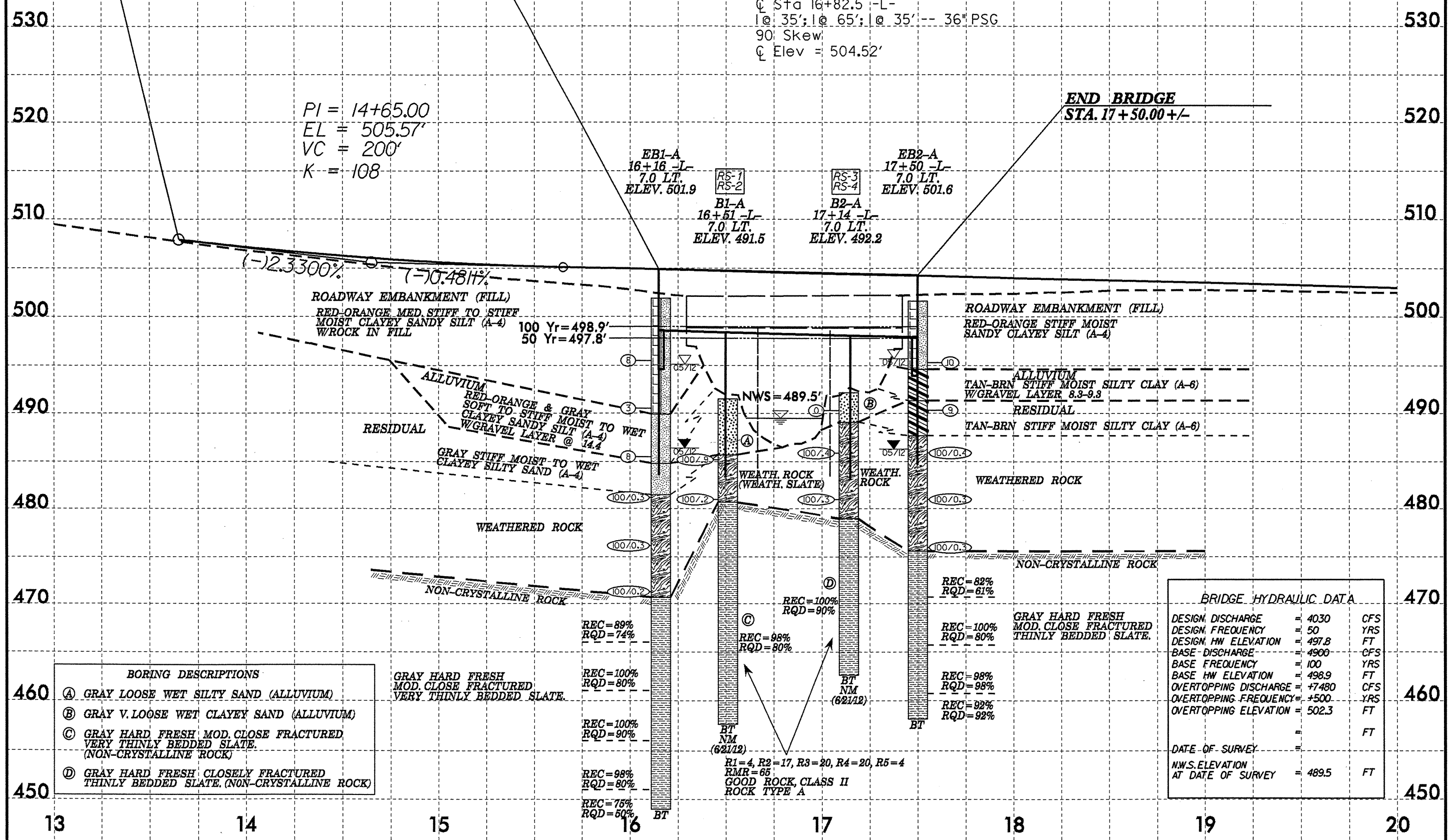
PI = 14+65.00
EL = 505.57'
VC = 200'
K = 108

EB1-A
16+16 -L-
7.0 LT.
ELEV. 501.9

RS-1
RS-2
B1-A
16+51 -L-
7.0 LT.
ELEV. 491.5

RS-3
RS-4
B2-A
17+14 -L-
7.0 LT.
ELEV. 492.2

EB2-A
17+50 -L-
7.0 LT.
ELEV. 501.6



BORING DESCRIPTIONS

Ⓐ	GRAY LOOSE WET SILTY SAND (ALLUVIUM)
Ⓑ	GRAY V. LOOSE WET CLAYEY SAND (ALLUVIUM)
Ⓒ	GRAY HARD FRESH MOD. CLOSE FRACTURED VERY THINLY BEDDED SLATE. (NON-CRYSTALLINE ROCK)
Ⓓ	GRAY HARD FRESH CLOSELY FRACTURED THINLY BEDDED SLATE. (NON-CRYSTALLINE ROCK)

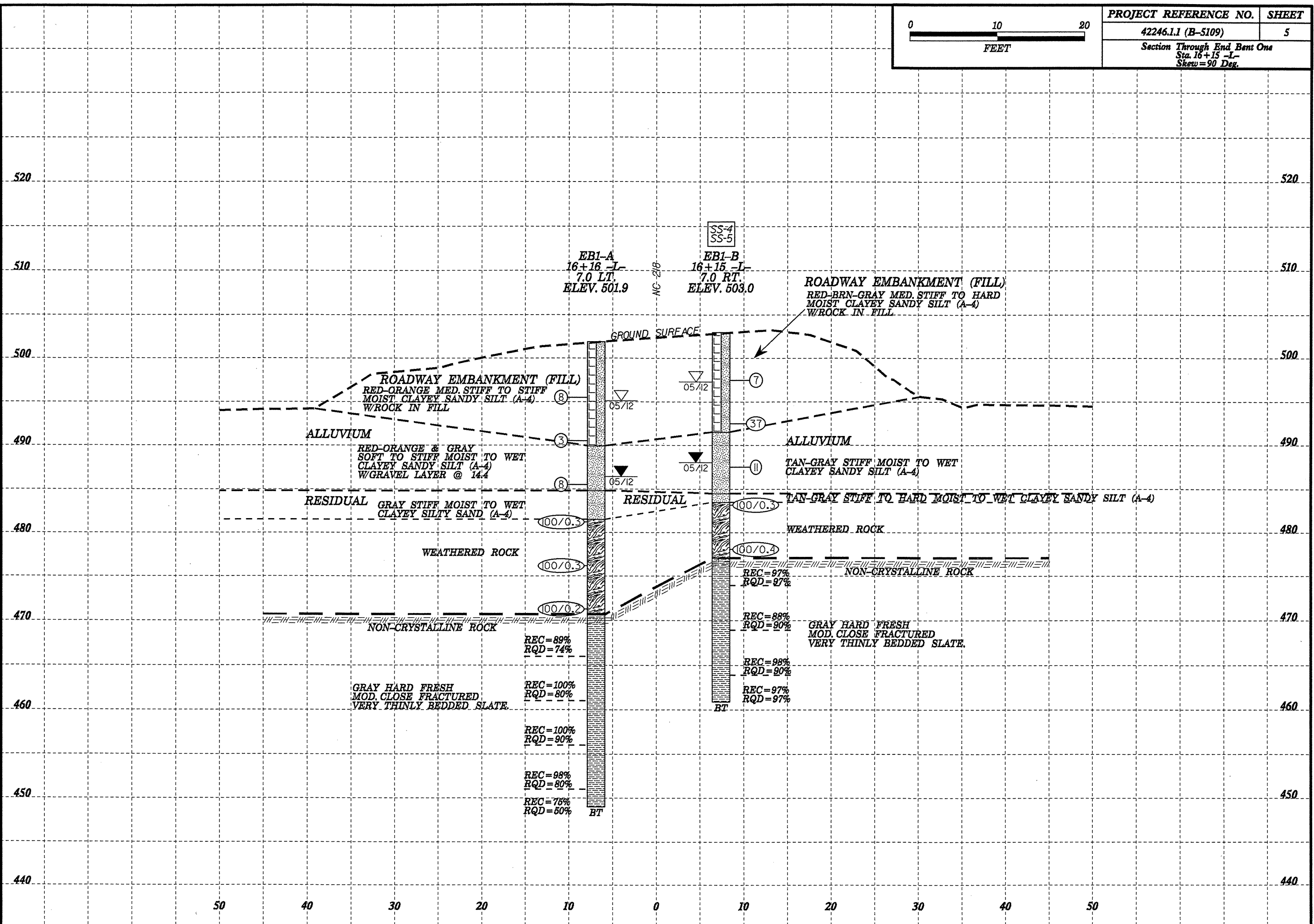
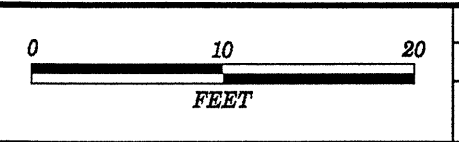
REC=89%	RQD=74%
REC=100%	RQD=80%
REC=100%	RQD=90%
REC=98%	RQD=80%
REC=75%	RQD=50%

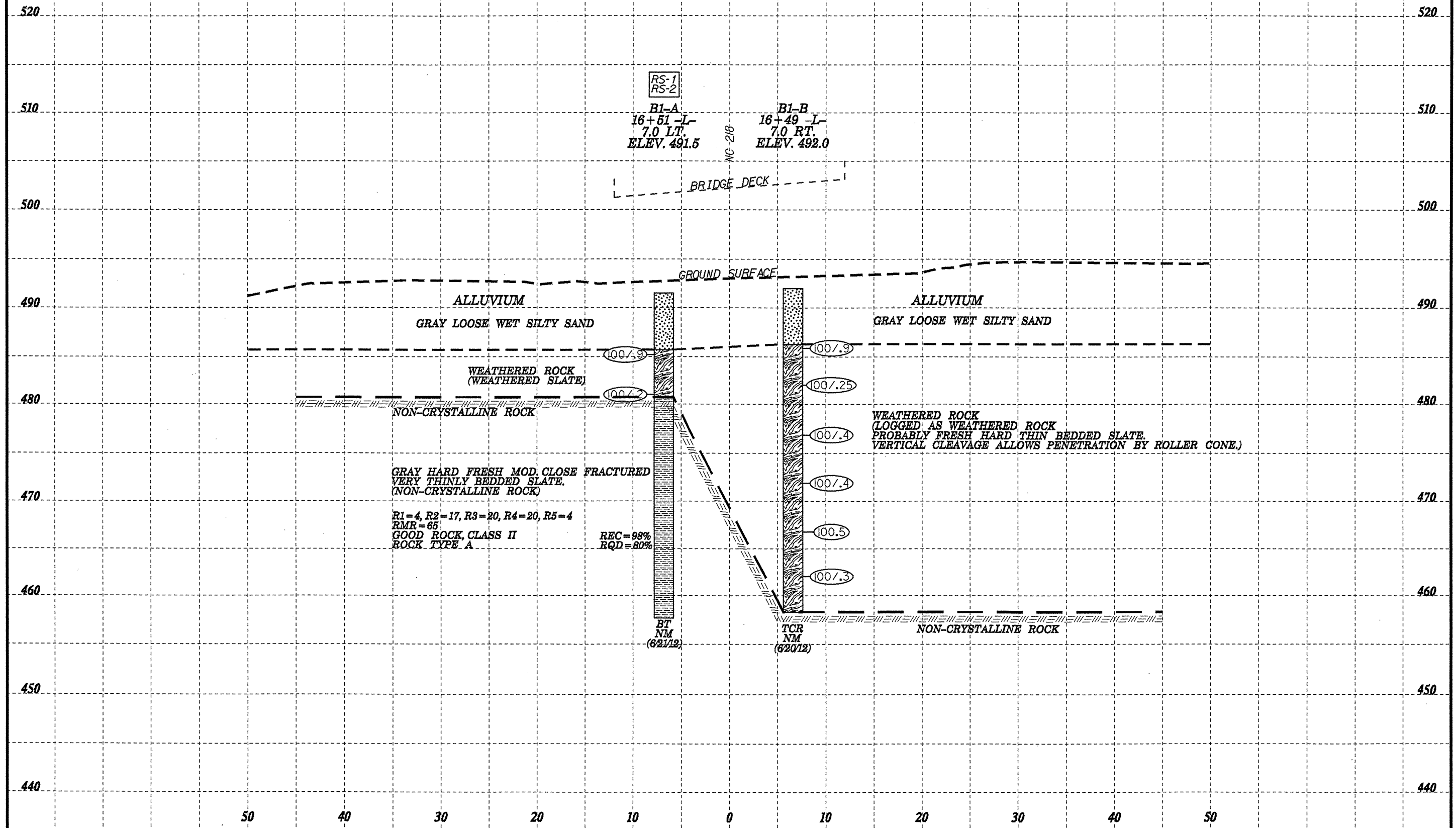
REC=100%	RQD=90%
REC=82%	RQD=61%
REC=100%	RQD=90%
REC=98%	RQD=98%
REC=92%	RQD=92%

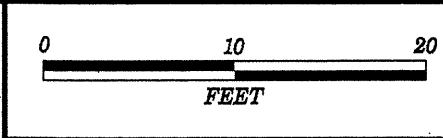
GRAY HARD FRESH MOD. CLOSE FRACTURED THINLY BEDDED SLATE.

BRIDGE HYDRAULIC DATA

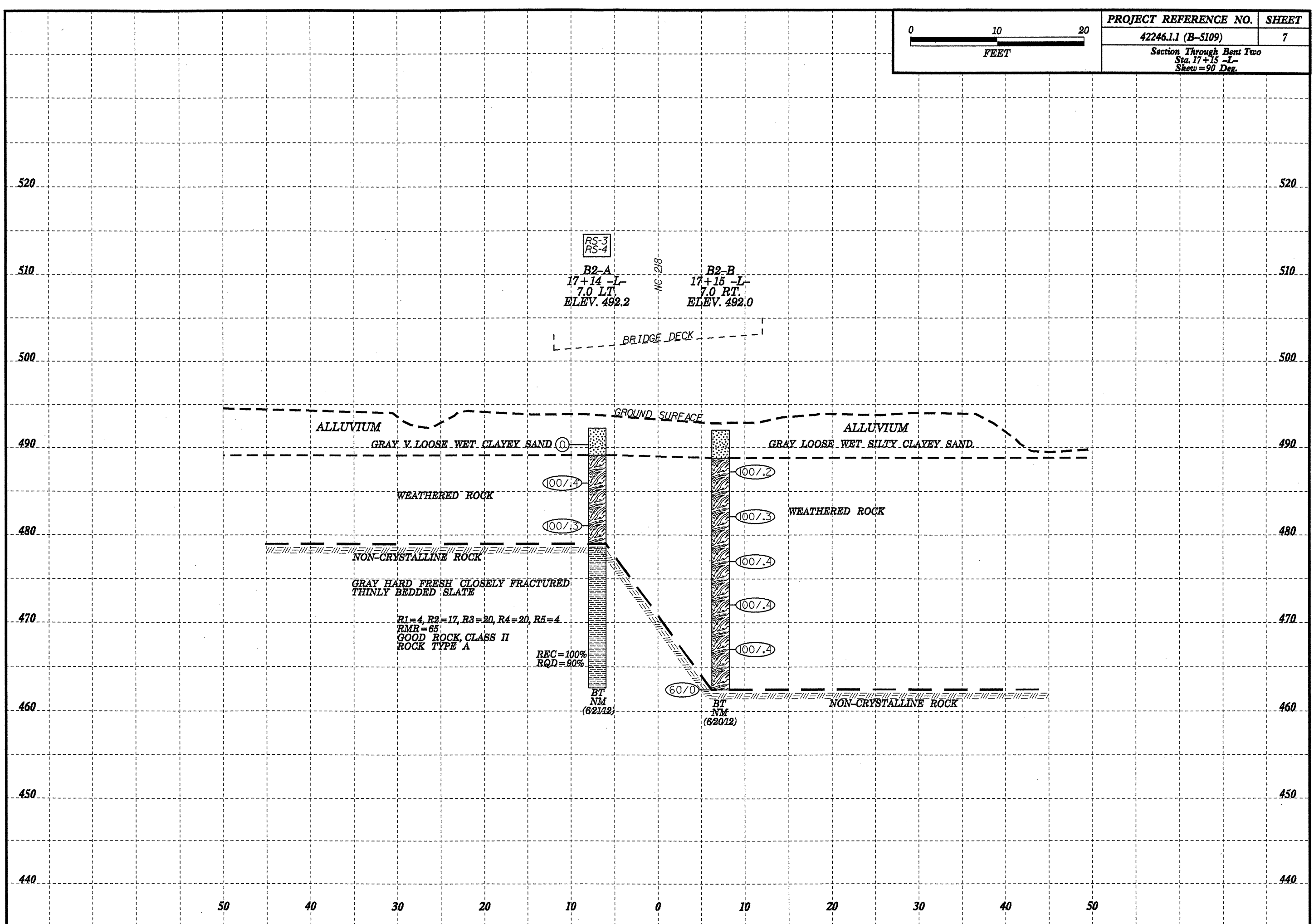
DESIGN DISCHARGE	= 4030	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 497.8	FT
BASE DISCHARGE	= 4900	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 498.9	FT
OVERTOPPING DISCHARGE	= +7480	CFS
OVERTOPPING FREQUENCY	= +500	YRS
OVERTOPPING ELEVATION	= 502.3	FT
DATE OF SURVEY	=	FT
N.W.S. ELEVATION AT DATE OF SURVEY	= 489.5	FT

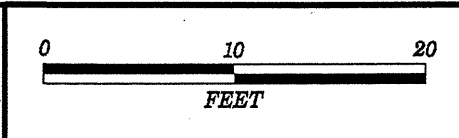




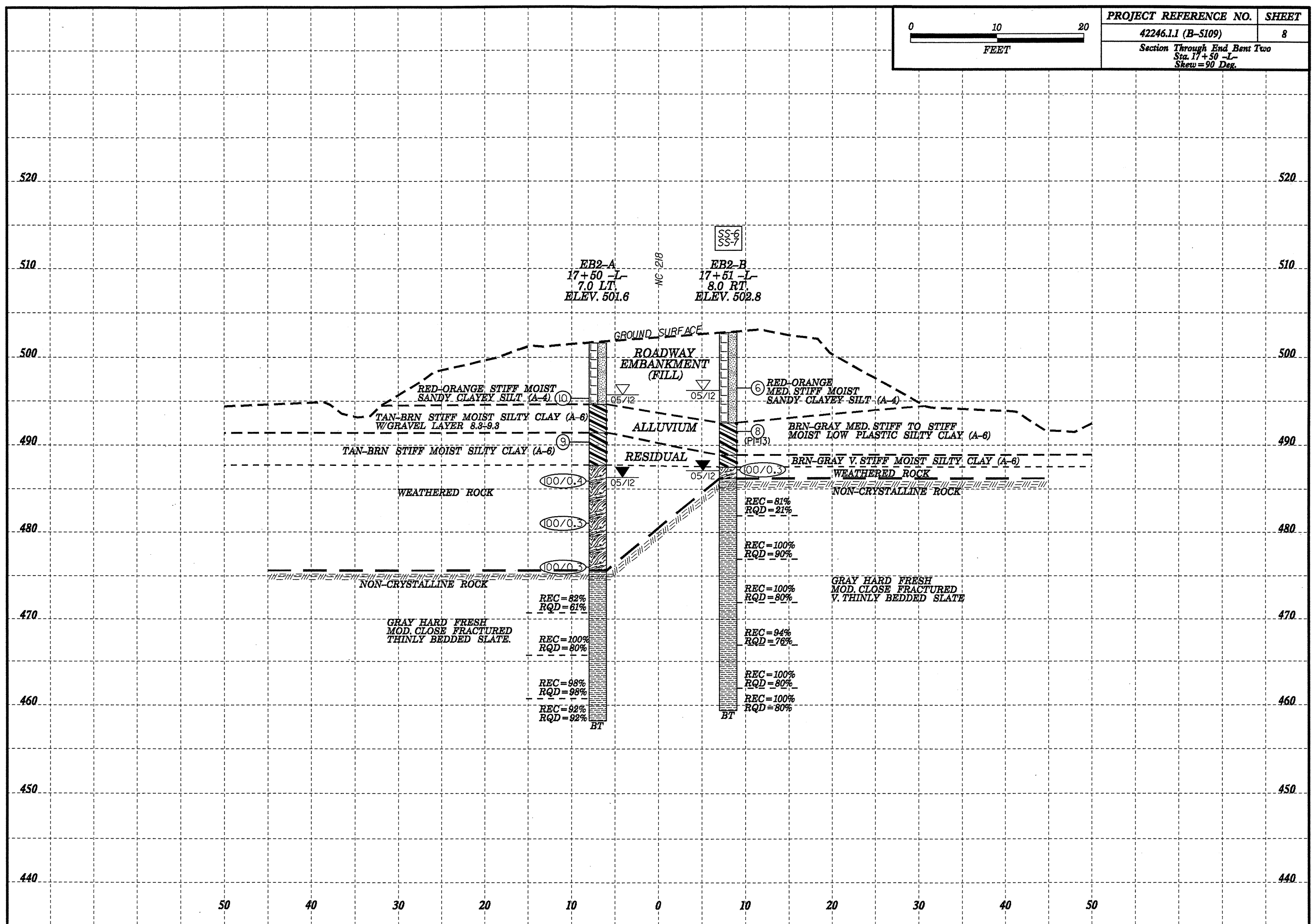


PROJECT REFERENCE NO.	SHEET
42246.1.1 (B-5109)	7
Section Through Bent Two Sta. 17+15 -L- Skew=90 Deg.	





PROJECT REFERENCE NO.	SHEET
42246.1.1 (B-5109)	8
Section Through End Bent Two Sta. 17+50 -L- Skew = 90 Deg.	



WBS 42246.1.1	TIP B-5109	COUNTY UNION	GEOLOGIST Stickney, J. K.
SITE DESCRIPTION BRIDGE 029 OVER GOOSE CREEK ON NC-218 BETWEEN SR 1543 AND SR 2323			GROUND WTR (ft)
BORING NO. EB1-A	STATION 16+16	OFFSET 7 ft LT	ALIGNMENT -L-
COLLAR ELEV. 501.9 ft	TOTAL DEPTH 52.9 ft	NORTHING 511,790	EASTING 1,536,096
DRILL RIG/HAMMER EFF./DATE HFO0072 CME-550 89% 09/02/2009		DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Automatic
DRILLER Smith, C. L.	START DATE 05/30/12	COMP. DATE 05/30/12	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					
505															
														501.9	0.0
500															
495	496.5	5.4	2	3	5										
490	491.5	10.4	2	2	1										
485	486.5	15.4	2	3	5										
480	481.5	20.4	100/0.3												
475	476.5	25.4	100/0.3												
470	471.5	30.4	100/0.2												
465															
460															
455															
450															

NCDOT BORE SINGLE B5109_GEO_BH_BRD0029_UNION.GPJ_NC_DOT.GDT 7/30/12

WBS 42246.1.1	TIP B-5109	COUNTY UNION	GEOLOGIST Stickney, J. K.
SITE DESCRIPTION BRIDGE 029 OVER GOOSE CREEK ON NC-218 BETWEEN SR 1543 AND SR 2323			GROUND WTR (ft)
BORING NO. EB1-A	STATION 16+16	OFFSET 7 ft LT	ALIGNMENT -L-
COLLAR ELEV. 501.9 ft	TOTAL DEPTH 52.9 ft	NORTHING 511,790	EASTING 1,536,096
DRILL RIG/HAMMER EFF./DATE HFO0072 CME-550 89% 09/02/2009		DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Automatic
DRILLER Smith, C. L.	START DATE 05/30/12	COMP. DATE 05/30/12	SURFACE WATER DEPTH N/A

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 (%)			
470.7												
470	470.7	31.2	4.7		(4.2)	(3.5)					Begin Coring @ 31.2 ft	31.2
465	466.0	35.9	5.0		(5.0)	(4.0)					NON-CRYSTALLINE ROCK	
460	461.0	40.9	5.0		(5.0)	(4.5)					31.2 - 52.9 GRAY, HARD, FRESH, MODERATELY CLOSE FRACTURED, VERY THINLY BEDDED SLATE. BEDDING AND CLEAVAGE DIPS DIVERGE AT ROUGHLY 30 DEGREES, RESULTING IN MANY HIGH ANGLE FRACTURES IN THE CORE.	
455	456.0	45.9	5.0		(4.9)	(4.0)						
450	451.0	50.9	2.0		(1.5)	(1.0)						
	449.0	52.9			75%	50%					Boring Terminated at Elevation 449.0 ft IN NON-CRYSTALLINE ROCK	52.9

NCDOT CORE SINGLE B5109_GEO_BH_BRD0029_UNION.GPJ_NC_DOT.GDT 7/30/12

WBS 42246.1.1	TIP B-5109	COUNTY UNION	GEOLOGIST Stickney, J. K.
SITE DESCRIPTION BRIDGE 029 OVER GOOSE CREEK ON NC-218 BETWEEN SR 1543 AND SR 2323			GROUND WTR (ft)
BORING NO. EB1-B	STATION 16+15	OFFSET 7 ft RT	ALIGNMENT -L-
COLLAR ELEV. 503.0 ft	TOTAL DEPTH 42.1 ft	NORTHING 511,785	EASTING 1,536,083
DRILL RIG/HAMMER EFF./DATE HFO0072 CME-550 89% 09/02/2009		DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Automatic
DRILLER Smith, C. L.	START DATE 05/23/12	COMP. DATE 05/23/12	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	ELEV. (ft)	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
505															503.0	0.0
														GROUND SURFACE		
														ROADWAY EMBANKMENT		
														RED-BRN-GRAY MED. STIFF TO HARD		
														MOIST CLAYEY SANDY SILT (A-4) W/		
														ROCK IN FILL		
500	498.5	4.5	2	3	4											
495	493.5	9.5	7	23	14											
490	488.5	14.5	3	6	5											
485	483.5	19.5	100/0.3													
480	478.5	24.5	100/0.4													
475																
470																
465																

Boring Terminated at Elevation 460.9 ft IN NON-CRYSTALLINE ROCK																
---	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

WBS 42246.1.1	TIP B-5109	COUNTY UNION	GEOLOGIST Stickney, J. K.
SITE DESCRIPTION BRIDGE 029 OVER GOOSE CREEK ON NC-218 BETWEEN SR 1543 AND SR 2323			GROUND WTR (ft)
BORING NO. EB1-B	STATION 16+15	OFFSET 7 ft RT	ALIGNMENT -L-
COLLAR ELEV. 503.0 ft	TOTAL DEPTH 42.1 ft	NORTHING 511,785	EASTING 1,536,083
DRILL RIG/HAMMER EFF./DATE HFO0072 CME-550 89% 09/02/2009		DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Automatic
DRILLER Smith, C. L.	START DATE 05/23/12	COMP. DATE 05/23/12	SURFACE WATER DEPTH N/A

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft)	ROD (ft)		REC. (%)	ROD (%)			
477.1	477.1	25.9	3.2		(3.1)	(3.1)					Begin Coring @ 25.9 ft	
475	473.9	29.1	5.0		(4.4)	(4.5)					NON-CRYSTALLINE ROCK	25.9
					88%	90%					25.9 - 42.1 GRAY, HARD, FRESH, MODERATELY CLOSE FRACTURED, VERY THINLY BEDDED SLATE. BEDDING PLANE FRACTURES DOMINATE, DIPPING AT AROUND 45 DEGREES TO CORE.	
470	468.9	34.1	5.0		(4.9)	(4.5)						
					98%	90%						
465	463.9	39.1	3.0		(2.9)	(2.9)						
					97%	97%						
	460.9	42.1									Boring Terminated at Elevation 460.9 ft IN NON-CRYSTALLINE ROCK	42.1

Boring Terminated at Elevation 460.9 ft IN NON-CRYSTALLINE ROCK												
---	--	--	--	--	--	--	--	--	--	--	--	--

NCDOT BORE SINGLE B5109_GEO_BH_BRD0029_UNION.GPJ_NC_DOT.GDT 7/30/12

NCDOT BORE SINGLE B5109_GEO_BH_BRD0029_UNION.GPJ_NC_DOT.GDT 7/30/12

WBS 42246.1.1		TIP B-5109		COUNTY UNION		GEOLOGIST Stickney, J. K.										
SITE DESCRIPTION BRIDGE 029 OVER GOOSE CREEK ON NC-218 BETWEEN SR 1543 AND SR 2323							GROUND WTR (ft)									
BORING NO. B1-A		STATION 16+51		OFFSET 7 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 491.5 ft		TOTAL DEPTH 33.8 ft		NORTHING 511,758		EASTING 1,536,110										
DRILL RIG/HAMMER EFF./DATE HFO0072 CME-550 89% 09/02/2009		DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Automatic												
DRILLER Smith, C. L.		START DATE 06/20/12		COMP. DATE 06/20/12		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
495																
490														491.5	GROUND SURFACE	0.0
485	486.2	5.3	15	85/4										485.7	ALLUVIAL 0 - 5.8 LOOSE, WET, GRAY SILTY SAND	5.8
480	481.2	10.3	100/2											480.7	WEATHERED ROCK 5.8 - 10.8 WEATHERED SLATE, TRICONE REFUSAL AT BASE.	10.8
475															NON-CRYSTALLINE ROCK	
470																
465																
460																
														457.7	Boring Terminated at Elevation 457.7 ft IN NON-CRYSTALLINE ROCK	33.8

NCDOT BORE SINGLE B5109 GEO_BH_BRDG0029 UNION.GPJ NC_DOT.GDT 9/13/12

WBS 42246.1.1		TIP B-5109		COUNTY UNION		GEOLOGIST Stickney, J. K.					
SITE DESCRIPTION BRIDGE 029 OVER GOOSE CREEK ON NC-218 BETWEEN SR 1543 AND SR 2323							GROUND WTR (ft)				
BORING NO. B1-A		STATION 16+51		OFFSET 7 ft LT		ALIGNMENT -L-					
COLLAR ELEV. 491.5 ft		TOTAL DEPTH 33.8 ft		NORTHING 511,758		EASTING 1,536,110					
DRILL RIG/HAMMER EFF./DATE HFO0072 CME-550 89% 09/02/2009		DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Automatic							
DRILLER Smith, C. L.		START DATE 06/20/12		COMP. DATE 06/20/12		SURFACE WATER DEPTH N/A					
CORE SIZE NO/NQ		TOTAL RUN 23.0 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		L O G	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	RQD (%)	REC. (%)	RQD (%)			
480.7	480.7	10.8	5.0		(4.9) 98%	(4.0) 80%	(22.6) 98%	(18.3) 80%		Begin Coring @ 10.8 ft NON-CRYSTALLINE ROCK	10.8
475	475.7	15.8	5.0		(4.8) 96%	(4.0) 80%				10.8 - 33.8 GRAY, HARD, FRESH, MODERATELY CLOSE FRACTURED, VERY THINLY BEDDED SLATE R1=4 R2=17 R3=20 R4=20 R5=4 RMR=65 GOOD ROCK, CLASS II, ROCK TYPE A	
470	470.7	20.8	5.0		(5.0) 100%	(3.8) 76%					
465	465.7	25.8	5.0		(4.9) 98%	(4.0) 80%					
460	460.7	30.8	3.0		(3.0) 100%	(2.5) 83%					
	457.7	33.8								Boring Terminated at Elevation 457.7 ft IN NON-CRYSTALLINE ROCK	33.8

NCDOT CORE SINGLE B5109 GEO_BH_BRDG0029 UNION.GPJ NC_DOT.GDT 9/13/12

WBS 42246.1.1	TIP B-5109	COUNTY UNION	GEOLOGIST Stickney, J. K.
SITE DESCRIPTION BRIDGE 029 OVER GOOSE CREEK ON NC-218 BETWEEN SR 1543 AND SR 2323			GROUND WTR (ft)
BORING NO. B1-B	STATION 16+49	OFFSET 7 ft RT	ALIGNMENT -L-
COLLAR ELEV. 492.0 ft	TOTAL DEPTH 33.7 ft	NORTHING 511,754	EASTING 1,536,097
DRILL RIG/HAMMER EFF./DATE HFO0072 CME-550 89% 09/02/2009		DRILL METHOD NW Casing w/ SPT	HAMMER TYPE Automatic
DRILLER Smith, C. L.	START DATE 06/19/12	COMP. DATE 06/19/12	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			ELEV. (ft)	DEPTH (ft)		
495														492.0	0.0	GROUND SURFACE
490																ALLUVIAL 0 - 5.7' V. LOOSE WET GRAY SILTY SAND
485	487.3	4.7	1	25	75/4							W		486.3	5.7	WEATHERED ROCK 5.7' - 33.7' LOGGED AS WEATHERED ROCK. PROBABLY FRESH, HARD, THIN BEDDED SLATE. VERTICAL CLEAVAGE ALLOWS PENETRATION BY ROLLER CONE.
480	482.3	9.7			100/25											
475	477.3	14.7			100/4											
470	472.3	19.7			100/4											
465	467.3	24.7			100/5											
460	462.3	29.7			100/3											
														458.3	33.7	NON-CRYSTALLINE ROCK ROLLER CONE REFUSAL: IMPLIED ROCK Boring Terminated at Elevation 458.3 ft ON NON-CRYSTALLINE ROCK

NCDOT BORE SINGLE B5109_GEO_BH_BRDG0029_UNION.GPJ NC_DOT.GDT 7/30/12

WBS 42246.1.1			TIP B-5109			COUNTY UNION			GEOLOGIST Stickney, J. K.								
SITE DESCRIPTION BRIDGE 029 OVER GOOSE CREEK ON NC-218 BETWEEN SR 1543 AND SR 2323								GROUND WTR (ft)									
BORING NO. B2-A		STATION 17+14		OFFSET 7 ft LT		ALIGNMENT -L-		0 HR.		N/A							
COLLAR ELEV. 492.2 ft		TOTAL DEPTH 29.6 ft		NORTHING 511,702		EASTING 1,536,139		24 HR.		N/A							
DRILL RIG/HAMMER EFF./DATE HFO0072 CME-550 89% 09/02/2009				DRILL METHOD NW Casing W/SPT & Core			HAMMER TYPE Automatic										
DRILLER Smith, C. L.			START DATE 06/20/12		COMP. DATE 06/20/12		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							
495																	
	491.3	0.9													492.2	GROUND SURFACE	0.0
490		0			0	0	0	0	0	0	0	0	0	0	489.1	ALLUVIAL 0 - 3.1 V. LOOSE WET GRAY CLAYEY SAND	3.1
485	486.3	5.9			100/4											WEATHERED ROCK 3.1 - 13.2 WEATHERED ROCK	
480	481.3	10.9			100/3												
															479.0	NON-CRYSTALLINE ROCK REFUSAL AT 13.2', COMMENCE CORING	13.2
475																	
470																	
465																	
															462.6	Boring Terminated at Elevation 462.6 ft IN NON-CRYSTALLINE ROCK	29.6

NCDOT BORE SINGLE B5109_GEO_BH_BRDG0029_UNION.GPJ NC_DOT.GDT 9/13/12

WBS 42246.1.1			TIP B-5109			COUNTY UNION			GEOLOGIST Stickney, J. K.			
SITE DESCRIPTION BRIDGE 029 OVER GOOSE CREEK ON NC-218 BETWEEN SR 1543 AND SR 2323								GROUND WTR (ft)				
BORING NO. B2-A		STATION 17+14		OFFSET 7 ft LT		ALIGNMENT -L-		0 HR.		N/A		
COLLAR ELEV. 492.2 ft		TOTAL DEPTH 29.6 ft		NORTHING 511,702		EASTING 1,536,139		24 HR.		N/A		
DRILL RIG/HAMMER EFF./DATE HFO0072 CME-550 89% 09/02/2009				DRILL METHOD NW Casing W/SPT & Core			HAMMER TYPE Automatic					
DRILLER Smith, C. L.			START DATE 06/20/12		COMP. DATE 06/20/12		SURFACE WATER DEPTH N/A					
CORE SIZE NO/NQ			TOTAL RUN 16.4 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	RQD (ft) %		REC. (ft) %	RQD (ft) %			
479	479.0	13.2	3.3		(3.3)	(3.1)		(16.4)	(14.7)		Begin Coring @ 13.2 ft NON-CRYSTALLINE ROCK	13.2
475	475.7	16.5	5.0		(5.0)	(4.4)	RS-3	100%	88%		13.2' - 29.6' GRAY, HARD, FRESH THINLY BEDDED, CLOSELY FRACTURED SLATE WITH NEAR VERTICAL FOLIATION. R1=4 R2=17 R3=20 R4=20 R5=4 RMR=65 GOOD ROCK, CLASS II ROCK TYPE A	
470	470.7	21.5	5.0		(5.0)	(4.4)		100%	88%			
465	465.7	26.5	3.1		(3.1)	(2.8)	RS-4	100%	90%			
	462.6	29.6									Boring Terminated at Elevation 462.6 ft IN NON-CRYSTALLINE ROCK	29.6

NCDOT CORE SINGLE B5109_GEO_BH_BRDG0029_UNION.GPJ NC_DOT.GDT 9/13/12

WBS 42246.1.1	TIP B-5109	COUNTY UNION	GEOLOGIST Stickney, J. K.
SITE DESCRIPTION BRIDGE 029 OVER GOOSE CREEK ON NC-218 BETWEEN SR 1543 AND SR 2323			GROUND WTR (ft)
BORING NO. B2-B	STATION 17+15	OFFSET 7 ft RT	ALIGNMENT -L-
COLLAR ELEV. 492.0 ft	TOTAL DEPTH 29.6 ft	NORTHING 511,694	EASTING 1,536,127
DRILL RIG/HAMMER EFF./DATE HFO0072 CME-550 89% 09/02/2009	DRILL METHOD NW Casing w/ SPT	HAMMER TYPE Automatic	
DRILLER Smith, C. L.	START DATE 06/19/12	COMP. DATE 06/19/12	SURFACE WATER DEPTH N/A

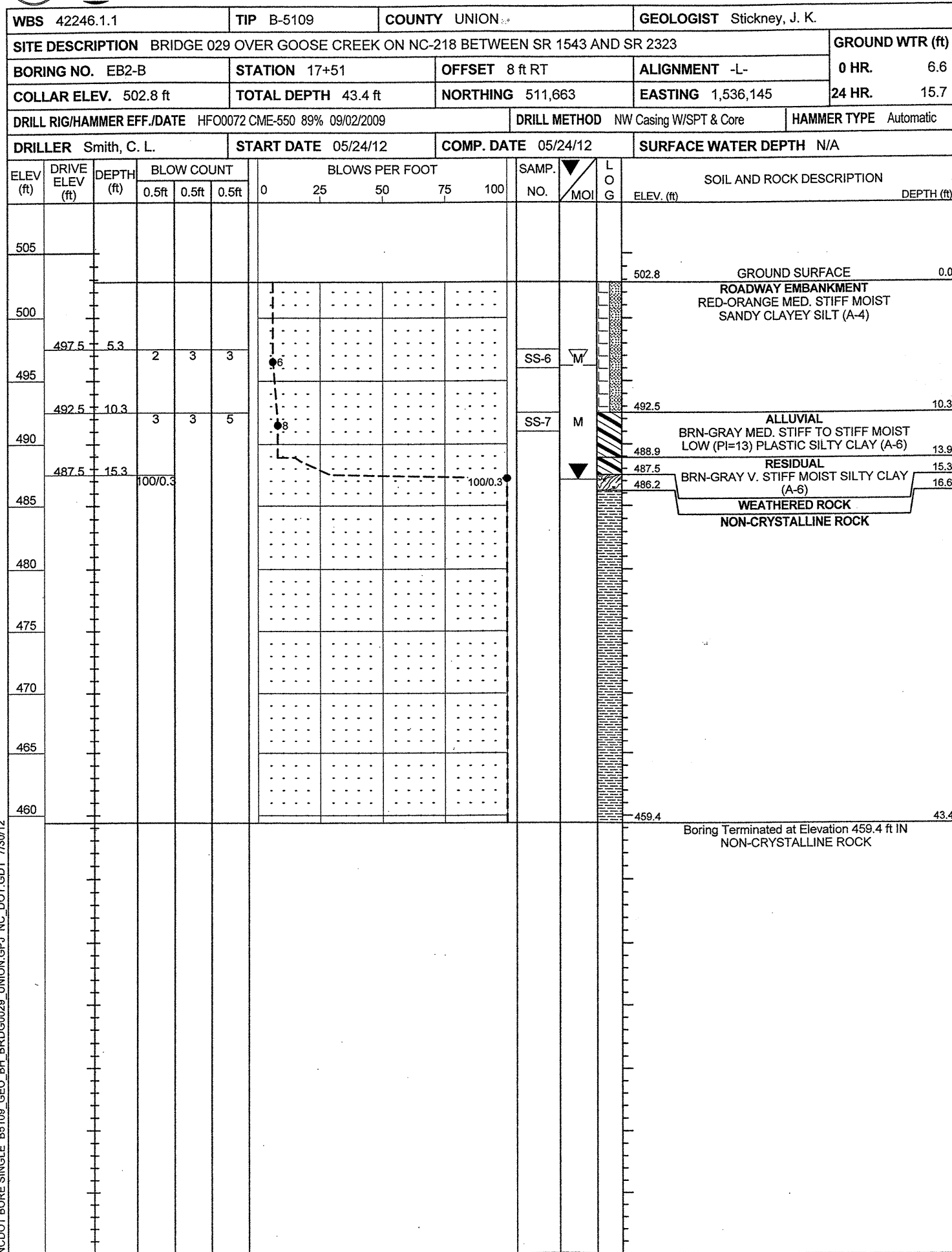
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
495																
														492.0	GROUND SURFACE	0.0
490															ALLUVIAL	
														488.8	0 - 3.2 GRAY LOOSE WET SILTY CLAYEY SAND.	3.2
	487.4	4.6									100/2		W		WEATHERED ROCK	
485															3.2 - 29.6 WEATHERED ROCK	
	482.4	9.6									100/3					
480																
	477.4	14.6									100/4					
475																
	472.4	19.6									100/4					
470																
	467.4	24.6									100/4					
465																
	462.4	29.6									60/0			462.4	Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 462.4 ft ON NON-CRYSTALLINE ROCK	29.6

WBS 42246.1.1		TIP B-5109		COUNTY UNION		GEOLOGIST Stickney, J. K.									
SITE DESCRIPTION BRIDGE 029 OVER GOOSE CREEK ON NC-218 BETWEEN SR 1543 AND SR 2323							GROUND WTR (ft)								
BORING NO. EB2-A		STATION 17+50		OFFSET 7 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 501.6 ft		TOTAL DEPTH 43.4 ft		NORTHING 511,671		EASTING 1,536,157									
DRILL RIG/HAMMER EFF./DATE HFO0072 CME-550 89% 09/02/2009		DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Automatic											
DRILLER Smith, C. L.		START DATE 05/29/12		COMP. DATE 05/29/12		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					
505															
														501.6	0.0
500															
495	496.3	5.3	1	2	8										
490	491.3	10.3	9	5	4										
485	486.3	15.3	100/0.4												
480	481.3	20.3	100/0.3												
475	476.3	25.3	100/0.3												
470															
465															
460															
														458.2	43.4
Boring Terminated at Elevation 458.2 ft IN NON-CRYSTALLINE ROCK															

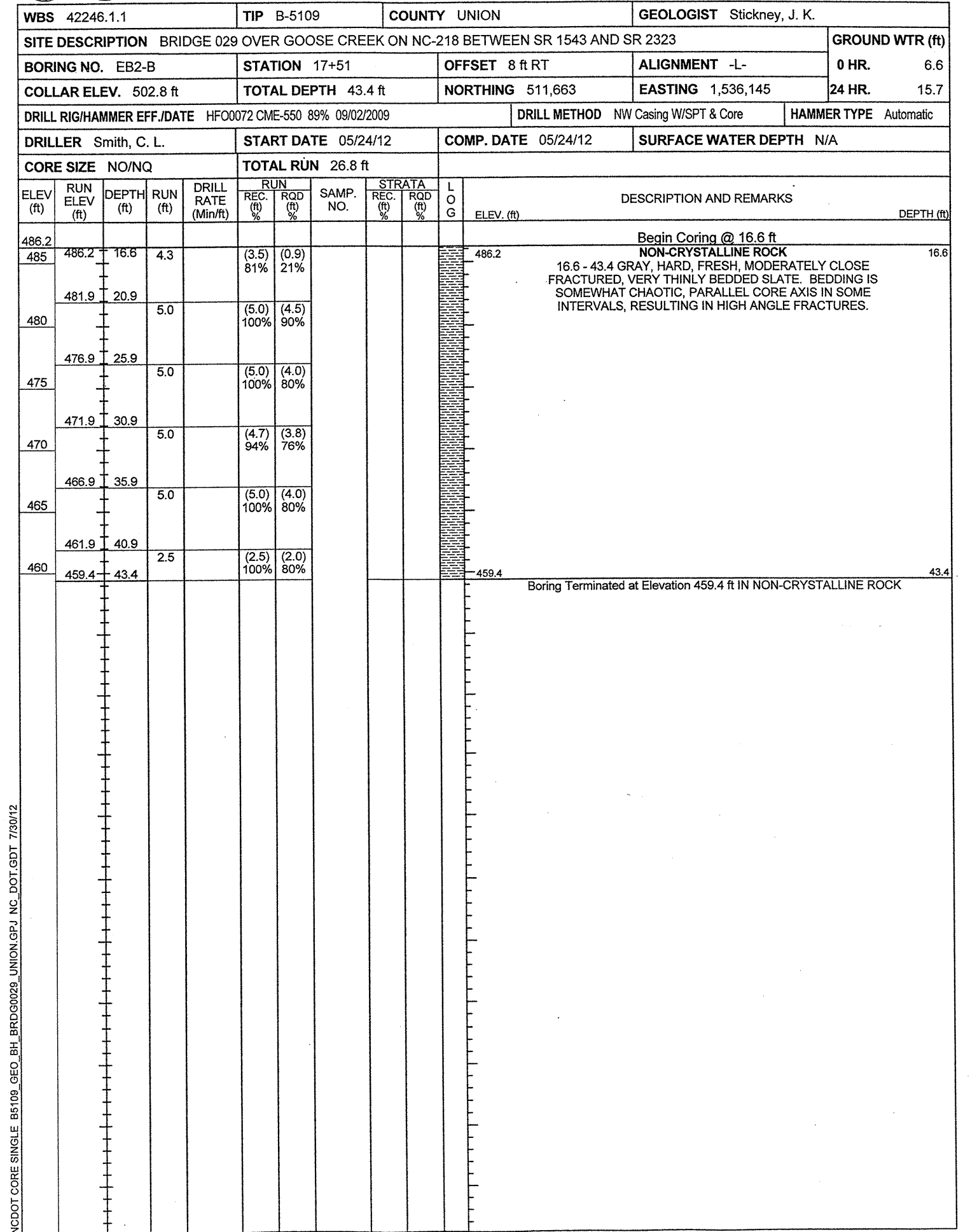
NCDOT BORE SINGLE B5109 GEO_BH_BRD0029 UNION.GPJ NC_DOT.GDT 7/30/12

WBS 42246.1.1		TIP B-5109		COUNTY UNION		GEOLOGIST Stickney, J. K.						
SITE DESCRIPTION BRIDGE 029 OVER GOOSE CREEK ON NC-218 BETWEEN SR 1543 AND SR 2323							GROUND WTR (ft)					
BORING NO. EB2-A		STATION 17+50		OFFSET 7 ft LT		ALIGNMENT -L-						
COLLAR ELEV. 501.6 ft		TOTAL DEPTH 43.4 ft		NORTHING 511,671		EASTING 1,536,157						
DRILL RIG/HAMMER EFF./DATE HFO0072 CME-550 89% 09/02/2009		DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Automatic								
DRILLER Smith, C. L.		START DATE 05/29/12		COMP. DATE 05/29/12		SURFACE WATER DEPTH N/A						
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 (%)			
475.6	475.6	26.0	4.9		(4.0)	(3.0)						26.0
470	470.7	30.9	5.0		(5.0)	(4.0)						
465	465.7	35.9	5.0		(4.9)	(4.9)						
460	460.7	40.9	2.5		(2.3)	(2.3)						
	458.2	43.4			92%	92%						43.4
Boring Terminated at Elevation 458.2 ft IN NON-CRYSTALLINE ROCK												

NCDOT CORE SINGLE B5109 GEO_BH_BRD0029 UNION.GPJ NC_DOT.GDT 7/30/12



NCDOT BORE SINGLE B5109_GEO_BH_BRDG0029_UNION.GPJ NC_DOT.GDT 7/30/12



NCDOT BORE SINGLE B5109_GEO_BH_BRDG0029_UNION.GPJ NC_DOT.GDT 7/30/12

TEST RESULTS

PROJECT: 42246.1.1 (B-5109)

COUNTY: UNION

SITE DESCRIPTION: BRIDGE NO. 029 OVER GOOSE CREEK ON NC 218 BETWEEN SR 1543 AND SR 2323

SHEET

17

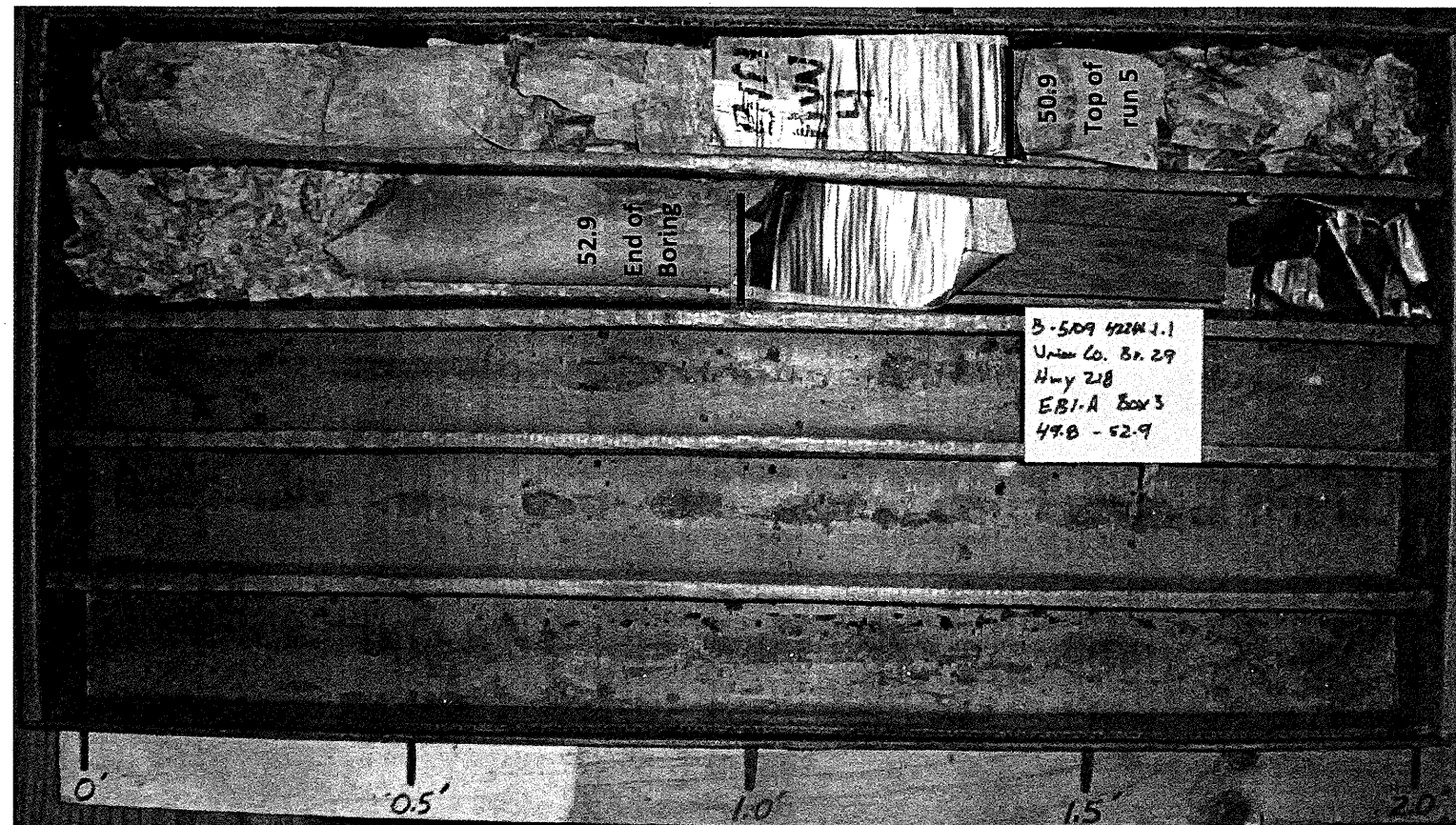
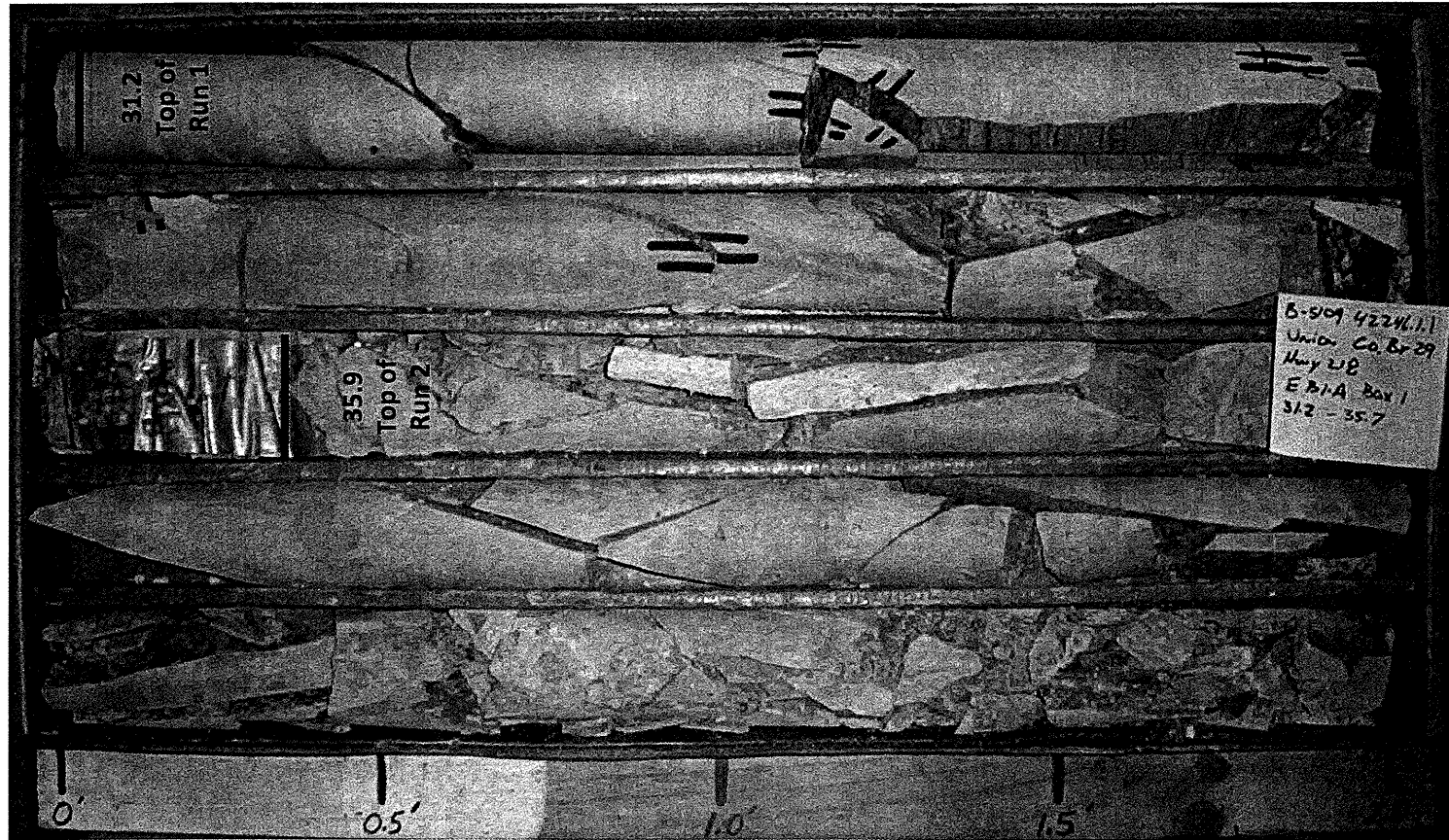
SOIL SAMPLE RESULTS

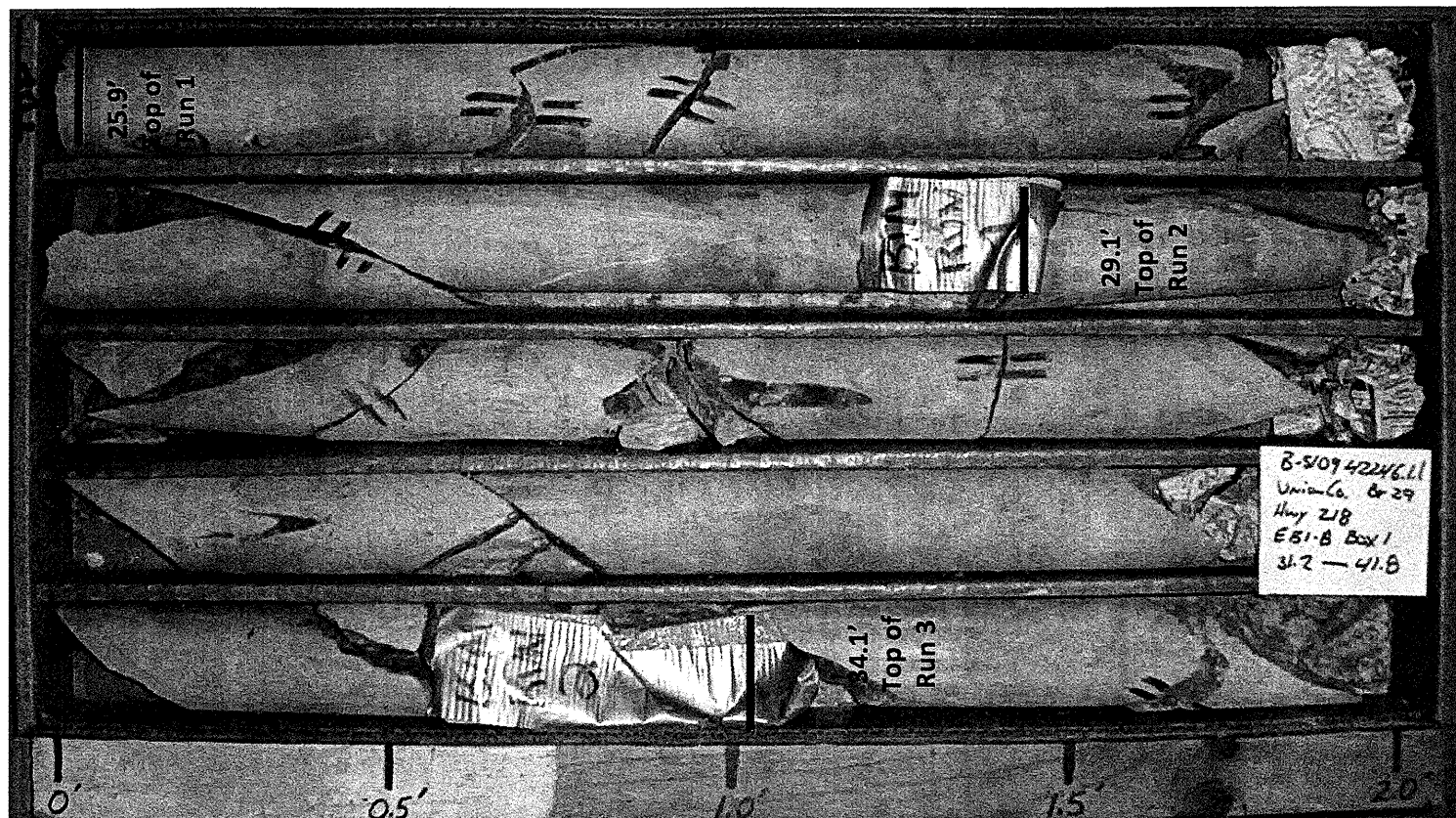
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS	N	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVES			%	%	UNIT WT. (d)	VOID RATIO
								C. SAND	F. SAND	SILT	CLAY	10	40	200				
EB1-B																		
SS-4	7.4 RT.	16+15	5.0-6.0	A-4(7)	7	40	8	12.8	14.6	58.5	14.2	100	92	77	-	-		
SS-5	7.4 RT.	16+15	15.0-16.0	A-4(0)	11	20	3	28.7	25.1	34.0	12.1	99	87	49	-	-		
EB2-B																		
SS-6	8.0 RT.	17+51	5.8-6.8	A-4(7)	6	37	8	11.9	10.7	47.0	30.4	95	88	77	-	-		
SS-7	8.0 RT.	17+51	10.8-11.8	A-6(14)	8	37	13	1.0	4.5	54.0	40.5	100	100	96	-	-		

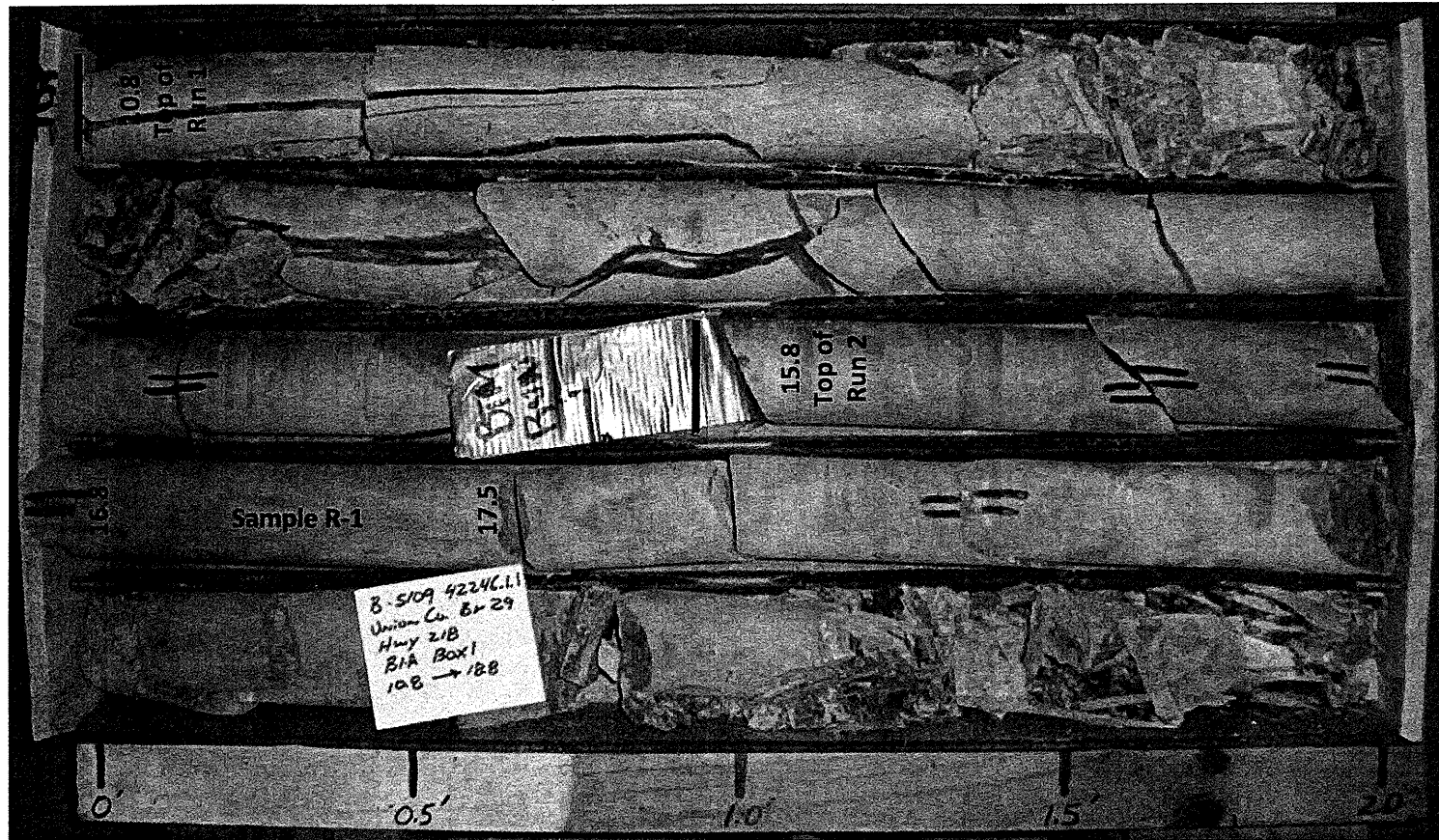
ROCK SAMPLE RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	RQD	UNIT WT (pcf)	Q(ksf)	E(MPsi)
B1-A							
RS-1	7.0 LT.	16+51 -L-	16.8-17.5	80%	170.9	1142	10.54
RS-2	7.0 LT.	16+51 -L-	24.2-25.2	76%	172.4	578.88	21
B2-A							
RS-3	7.0 LT.	17+14 -L-	14.2-14.9	94%	171.8	468	20.1
RS-4	7.0 LT.	17+14 -L-	23.8-24.4	88%	171.4	753.12	17.99

B-5109
EB1-A







B-5109
B2-A

SHEET
21

