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STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4811 38581.1.1	1	14

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

STRUCTURE
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. B-4811 38581.1.1 F.A. PROJ. _____
COUNTY RUTHERFORD
PROJECT DESCRIPTION BRIDGE NO. 87 ON US 64 OVER BROAD RIVER

SITE DESCRIPTION _____

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CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING, AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE, THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE 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
DC ELLIOTT

DO CHEEK

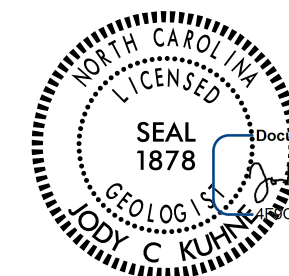
C COFFEY

INVESTIGATED BY JC KUHNE

CHECKED BY _____

SUBMITTED BY JC KUHNE

DATE 1/28/2015



Doc Signed by: Jody C. Kuhne
#00666A1BC400...

PROJECT: 38581 ID: B-4811

DRAWN BY: JC KUHNE

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

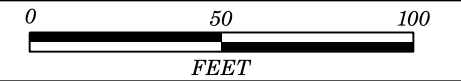
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SUBSURFACE INVESTIGATION

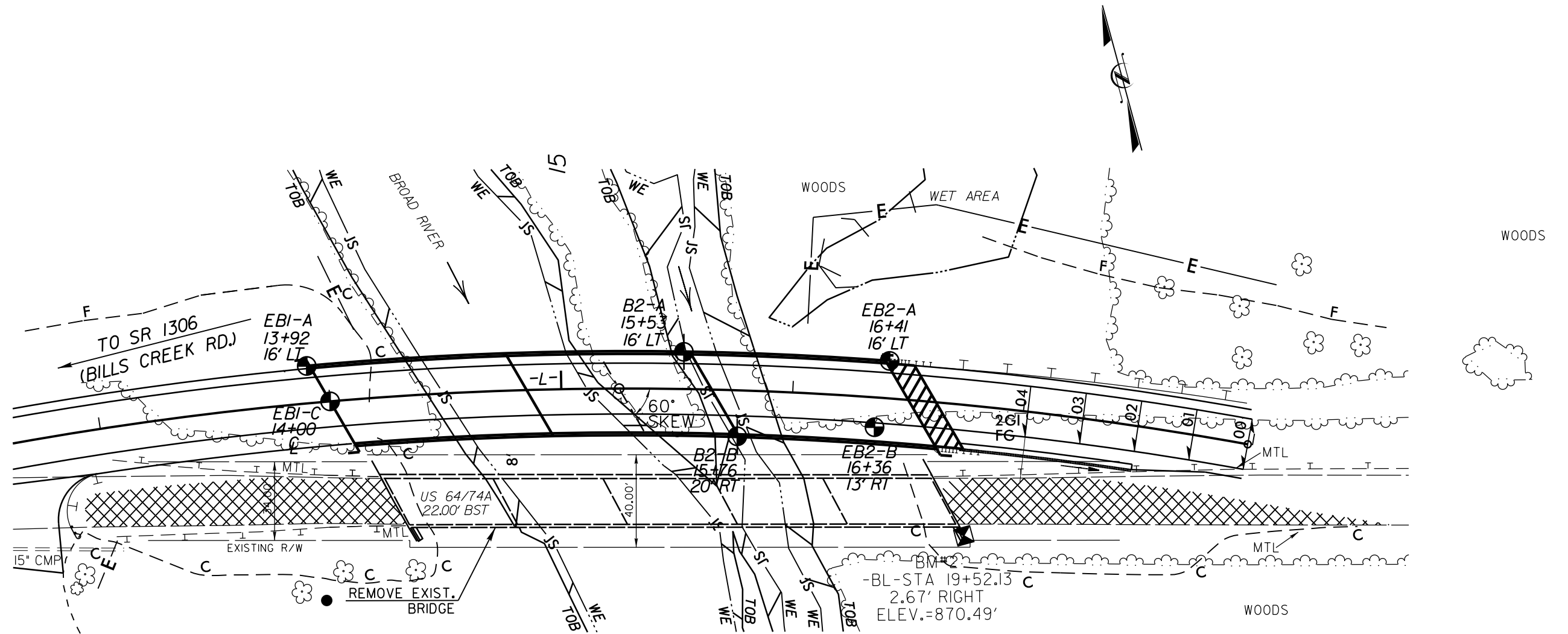
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

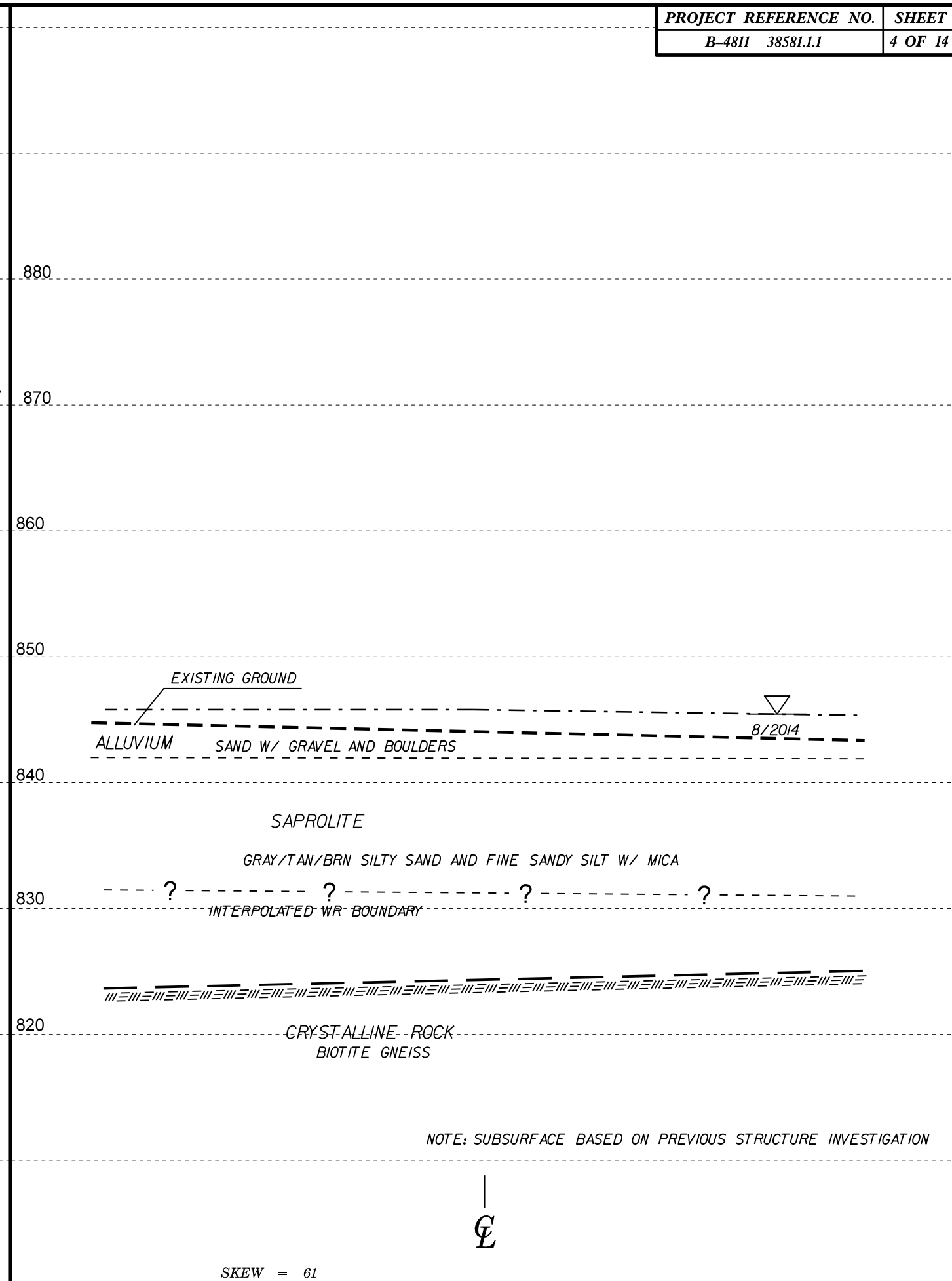
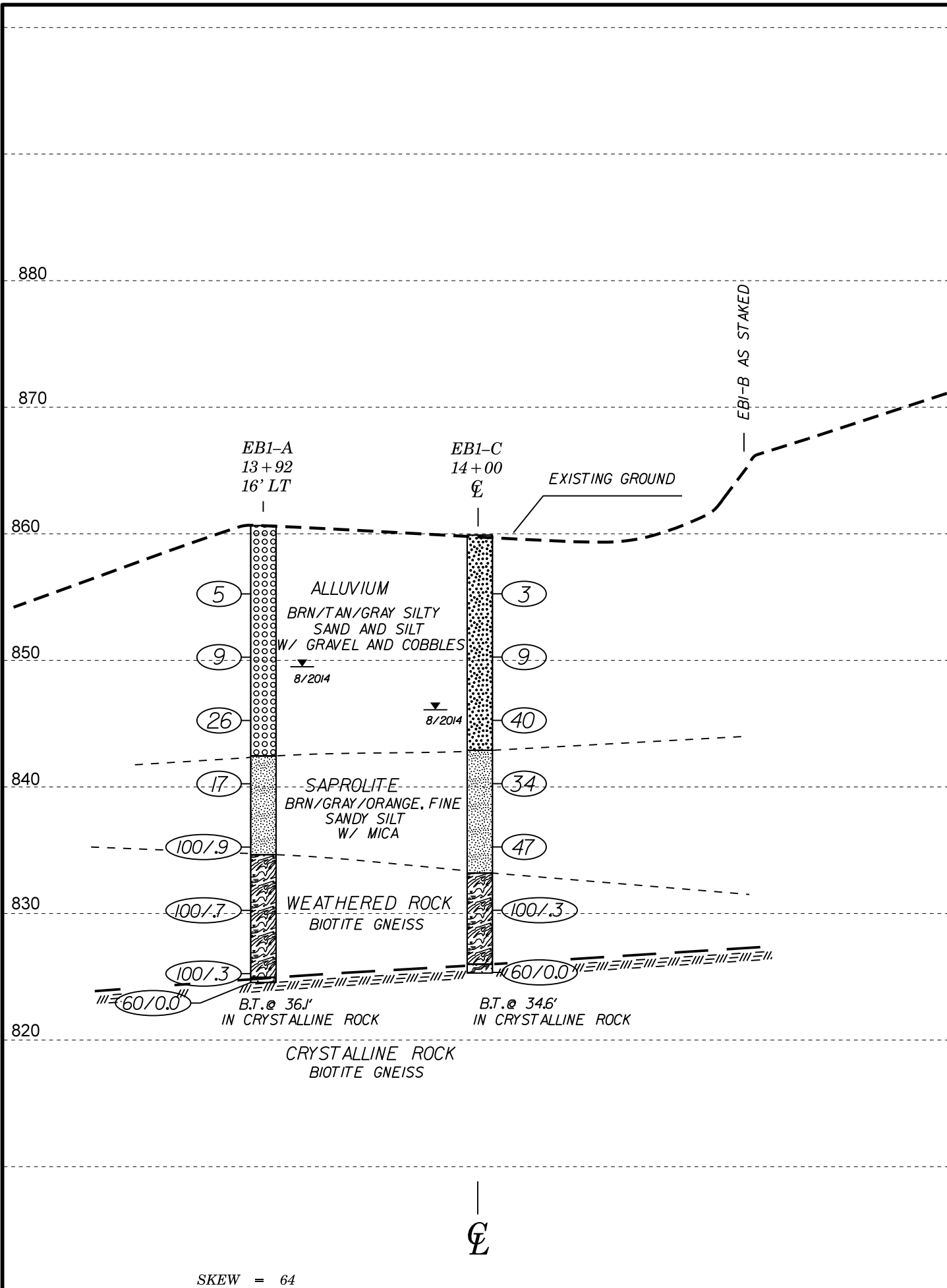
SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, 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. ANGULARITY OF GRAINS 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) CRYSTALLINE ROCK (CR) NON-CRYSTALLINE ROCK (NCR) COASTAL PLAIN SEDIMENTARY ROCK (CP)	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 (IN OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
SOIL LEGEND AND AASHTO CLASSIFICATION GENERAL CLASS. GRANULAR MATERIALS (≤ 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS GROUP CLASS. A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-3 A-4, A-5 A-6, A-7 SYMBOL % PASSING LIQUID LIMIT PLASTIC INDEX GROUP INDEX USUAL TYPES OF MAJOR MATERIALS GEN. RATING AS A SUBGRADE	MINERALOGICAL COMPOSITION MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE. COMPRESSIBILITY SLIGHTLY COMPRESSIBLE MODERATELY COMPRESSIBLE HIGHLY COMPRESSIBLE PERCENTAGE OF MATERIAL ORGANIC MATERIAL TRACE OF ORGANIC MATTER LITTLE ORGANIC MATTER MODERATELY ORGANIC HIGHLY ORGANIC 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	WEATHERING FRESH VERY SLIGHT (V SLI.) SLIGHT (SLI.) MODERATE (MOD.) MODERATELY SEVERE (MOD. SEV.) SEVERE (SEV.) VERY SEVERE (V SEV.) COMPLETE	
CONSISTENCY OR DENSENESS PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)	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	TEST BORING SPT DPT VST CPT DMT SAMPLE DESIGNATIONS S - BULK SAMPLE SS - SPLIT SPOON SAMPLE ST - SHELBY TUBE SAMPLE RS - ROCK SAMPLE RT - RECOMPACTED TRIAXIAL SAMPLE CBR - CALIFORNIA BEARING RATIO SAMPLE SPT N-VALUE SPT REFUSAL	
TEXTURE OR GRAIN SIZE U.S. STD. SIEVE SIZE OPENING (MM) BOULDER (BLDR.) COBBLE (COB.) GRAVEL (GR.) COARSE SAND (CSE. SD.) FINE SAND (F. SD.) SILT (SL.) CLAY (CL.)	ABBREVIATIONS AR - AUGER REFUSAL BT - BORING TERMINATED CL - CLAY CPT - CONE PENETRATION TEST CSE. - COARSE DMT - DILATOMETER TEST DPT - DYNAMIC PENETRATION TEST e - VOID RATIO F - FINE FOSS. - FOSSILIFEROUS FRAC. - FRACTURED, FRACTURES FRAGS. - FRAGMENTS HI. - 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 γ _u - UNIT WEIGHT γ _d - DRY UNIT WEIGHT	ROCK HARDNESS VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT	
SOIL MOISTURE - CORRELATION OF TERMS SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION			
PLASTICITY NONPLASTIC LOW PLASTICITY MED. PLASTICITY HIGH PLASTICITY			
COLOR DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.			
	EQUIPMENT USED ON SUBJECT PROJECT DRILL UNITS: MOBILE B- BK-51 CME-45C CME-550 PORTABLE HOIST	ADVANCING TOOLS: CLAY BITS 6" CONTINUOUS FLIGHT AUGER 8" HOLLOW AUGERS HARD FACED FINGER BITS TUNG.-CARBIDE INSERTS CASING w/ ADVANCER TRICONE *STEEL TEETH TRICONE *TUNG.-CARB. CORE BIT	FRACTURE SPACING TERM SPACING VERY WIDE MORE THAN 10 FEET WIDE 3 TO 10 FEET MODERATELY CLOSE 1 TO 3 FEET CLOSE 0.16 TO 1 FEET VERY CLOSE LESS THAN 0.16 FEET BEDDING TERM THICKNESS VERY THICKLY BEDDED > 4 FEET THICKLY BEDDED 1.5 - 4 FEET THINLY BEDDED 0.16 - 1.5 FEET VERY THINLY BEDDED 0.03 - 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET THINLY LAMINATED < 0.008 FEET INDURATION FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.
			NOTES: BENCH MARK: BM 2.2.67' RT OF -BL- STA. 19+52.13 ELEVATION: 870.49 FT.

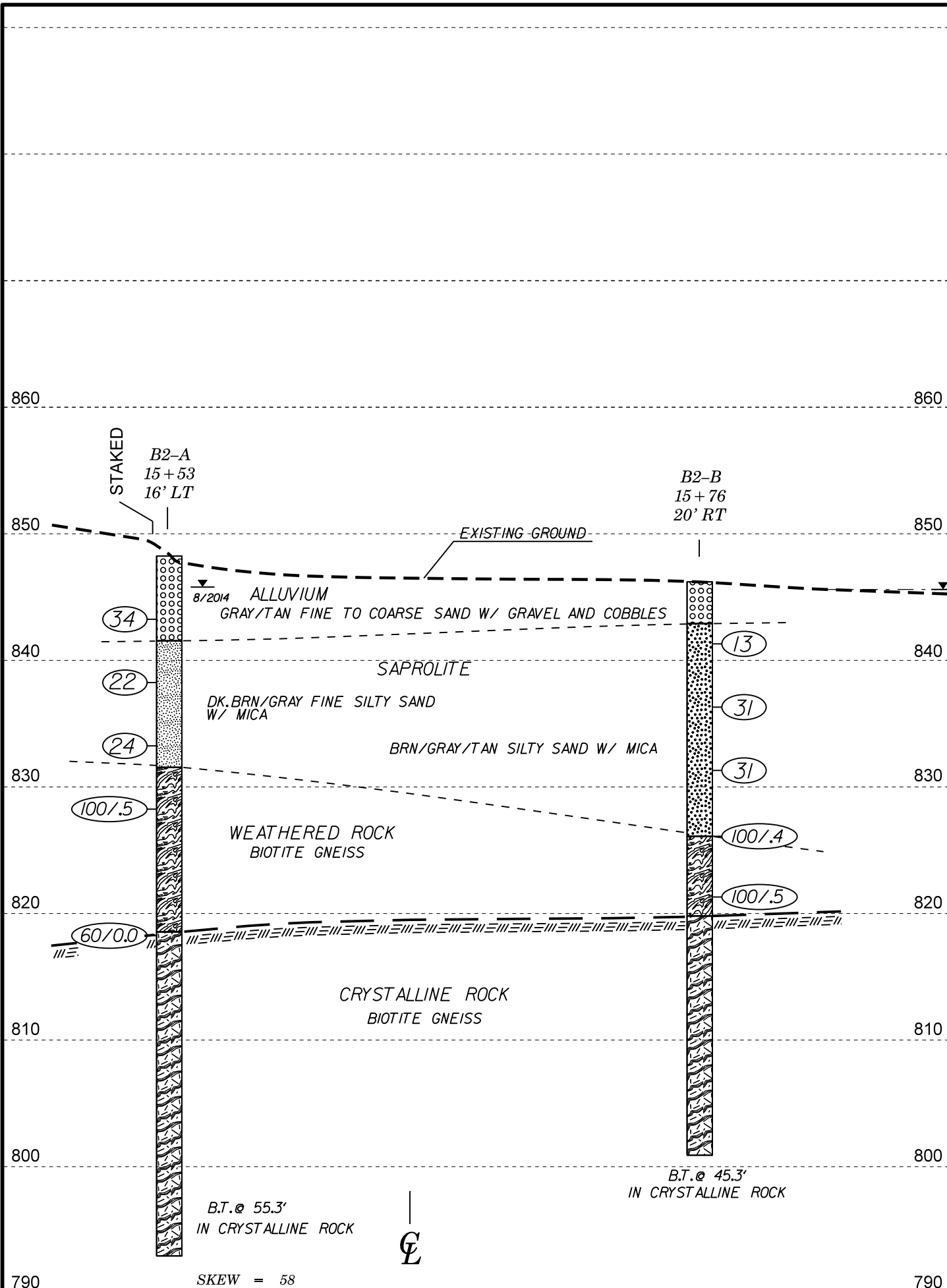
SITE PLAN



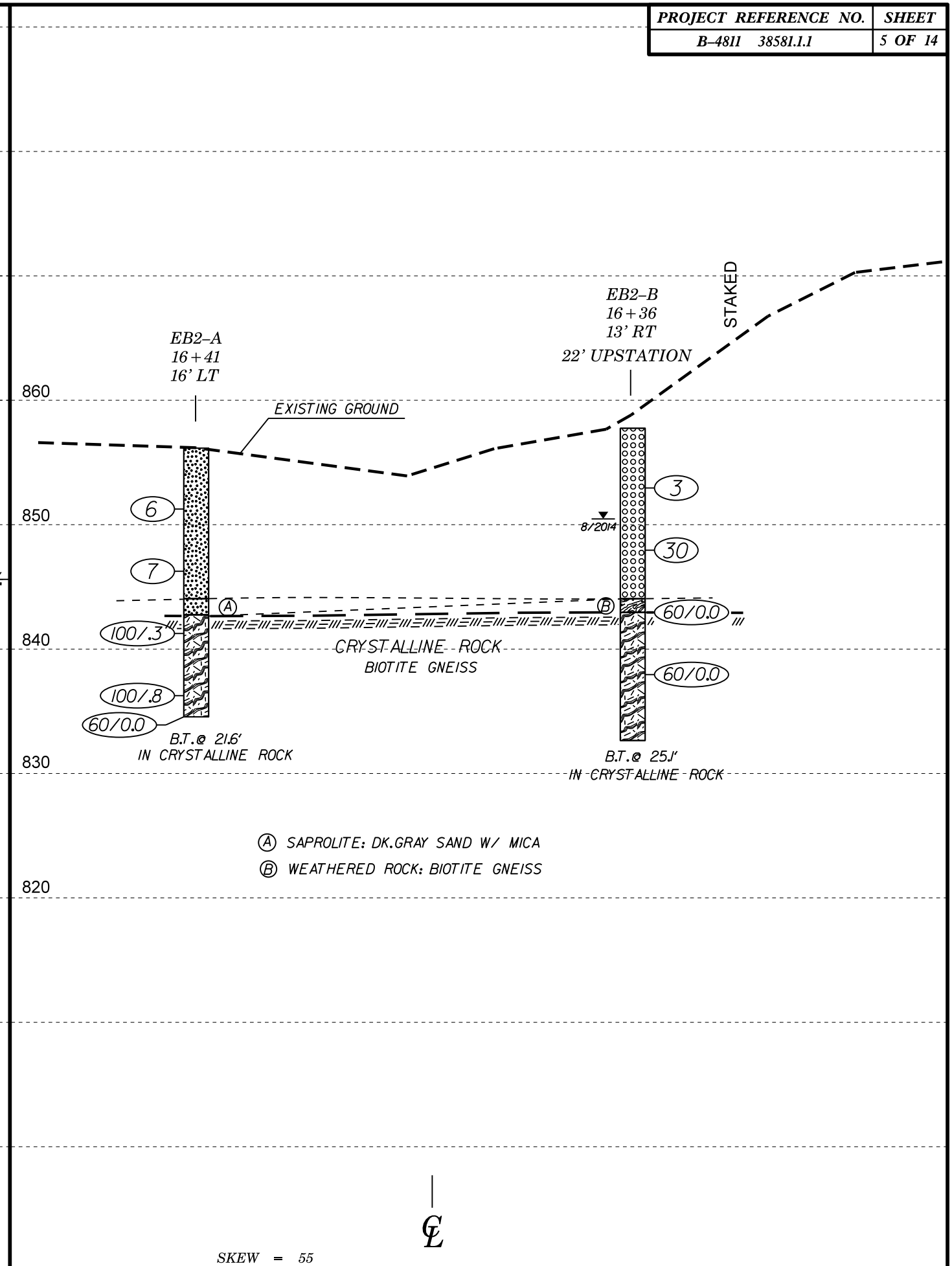
AVG. SKEW = 60
SEE XSC FOR PER-BENT SKEW



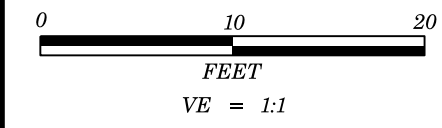




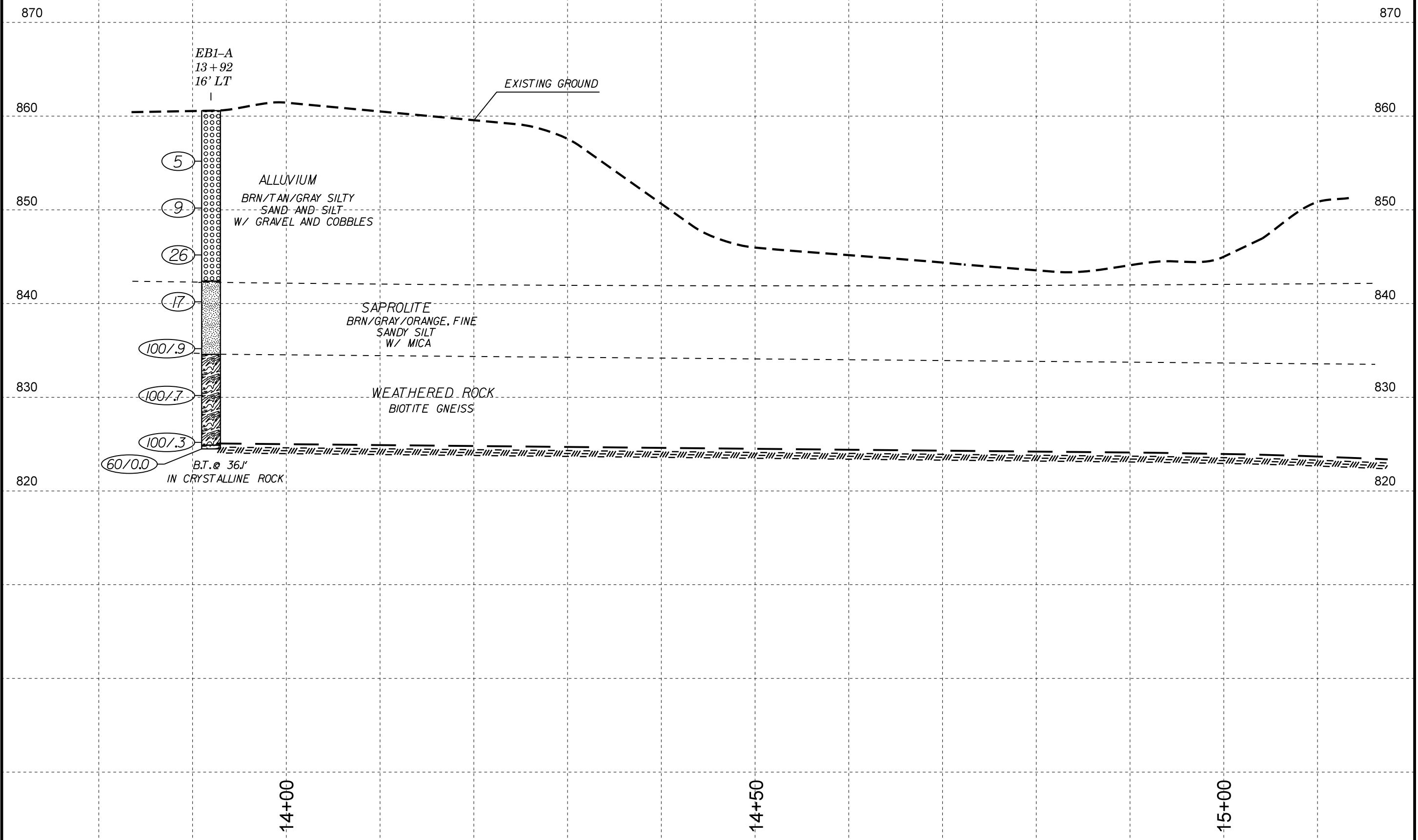
HORIZ. SCALE 0 10 20 (FEET) VE = 1:1 **SECTION THROUGH B-2**

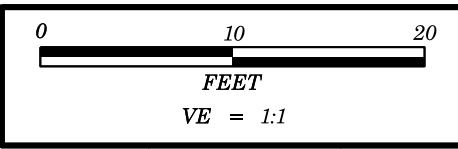


HORIZ. SCALE 0 10 20 (FEET) VE = 1:1 **SECTION THROUGH EB-2**

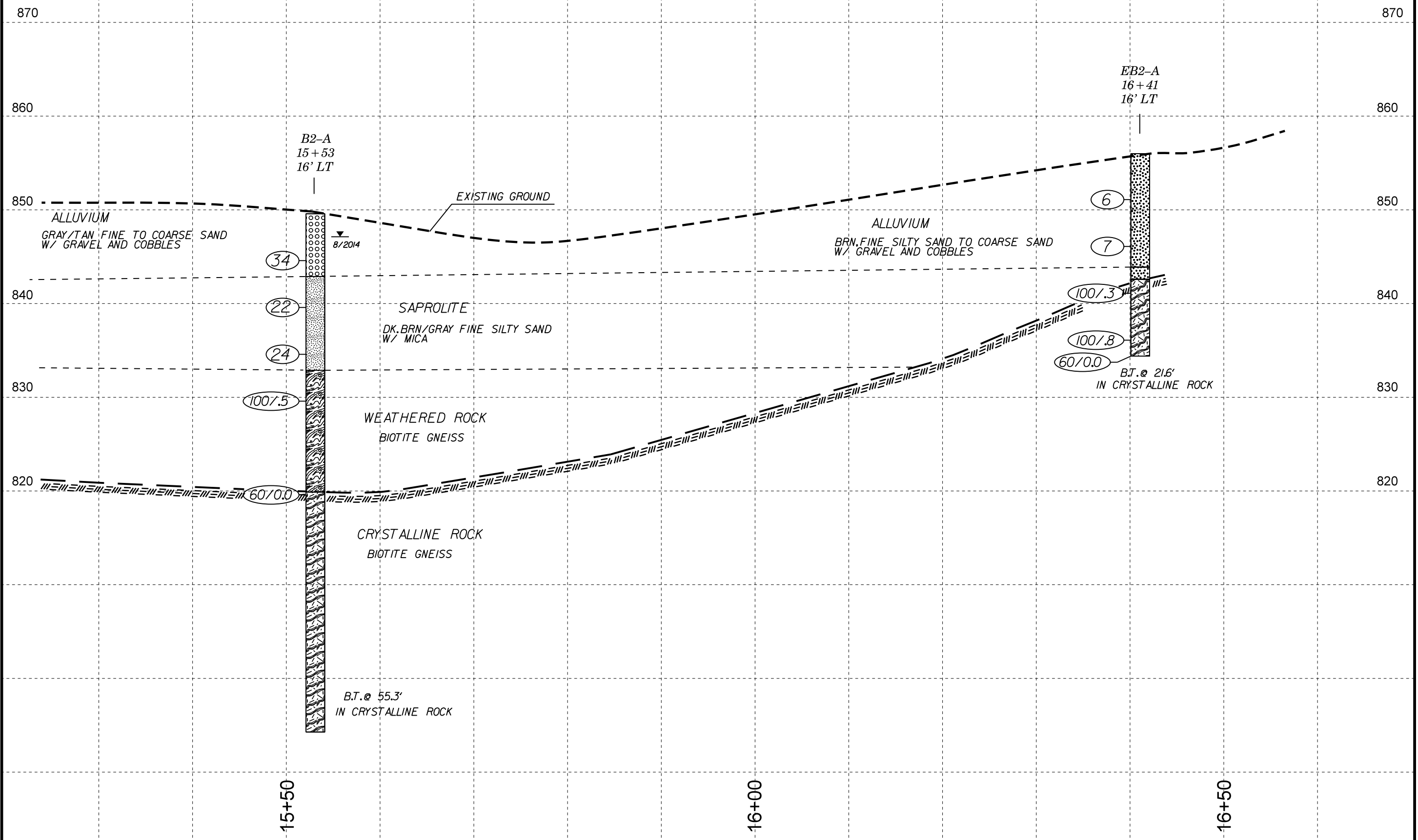


PROJECT REFERENCE NO.	SHEET
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LT PROFILE ALONG -L-	





PROJECT REFERENCE NO.	SHEET
B-4811 38581.1.1	7 OF 14
LT PROFILE ALONG -L-	



WBS 38581.1.1		TIP B-4811		COUNTY RUTHERFORD		GEOLOGIST Elliott, D. C.										
SITE DESCRIPTION BRIDGE NO. 087 ON US 64 OVER BROAD RIVER							GROUND WTR (ft)									
BORING NO. EB1-A							0 HR. N/A									
STATION 13+92							24 HR. 11.2 Caved									
COLLAR ELEV. 860.7 ft		TOTAL DEPTH 36.2 ft		NORTHING 624,672		EASTING 1,057,045										
DRILL RIG/HAMMER EFF./DATE AFO0134 CME-45C 88% 05/14/2014				DRILL METHOD NW Casing w/ SPT		HAMMER TYPE Automatic										
DRILLER Cheek, D. O.		START DATE 08/06/14		COMP. DATE 08/06/14		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
865																
860															860.7	0.0
855	855.3	5.4														
850	851.3	9.4														
845	845.3	15.4														
840	840.3	20.4														
835	835.3	25.4														
830	830.3	30.4														
825	825.3	35.4														
	822.6	38.1														

NCDOT BORE SINGLE B-4811_BORELOGS.GPJ NC_DOT.GDT 8/20/14

WBS 38581.1.1		TIP B-4811		COUNTY RUTHERFORD		GEOLOGIST Elliott, D. C.										
SITE DESCRIPTION BRIDGE NO. 087 ON US 64 OVER BROAD RIVER							GROUND WTR (ft)									
BORING NO. EB1-C							0 HR. N/A									
STATION 14+00							24 HR. 13.8 Caved									
COLLAR ELEV. 859.5 ft		TOTAL DEPTH 34.6 ft		NORTHING 624,655		EASTING 1,057,050										
DRILL RIG/HAMMER EFF./DATE AFO0134 CME-45C 88% 05/14/2014				DRILL METHOD NW Casing w/ Advancer		HAMMER TYPE Automatic										
DRILLER Cheek, D. O.		START DATE 08/07/14		COMP. DATE 08/07/14		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
860																
855	854.9	4.6														
850	849.9	9.6														
845	844.9	14.6														
840	839.9	19.6														
835	834.9	24.6														
830	829.9	29.6														
825	824.9	34.6														

NCDOT BORE SINGLE B-4811_BORELOGS.GPJ NC_DOT.GDT 8/19/14



WBS 38581.1.1		TIP B-4811		COUNTY RUTHERFORD		GEOLOGIST Elliott, D. C.									
SITE DESCRIPTION BRIDGE NO. 087 ON US 64 OVER BROAD RIVER							GROUND WTR (ft)								
BORING NO. B2-A		STATION 15+53		OFFSET 16 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 849.6 ft		TOTAL DEPTH 55.3 ft		NORTHING 624,636		EASTING 1,057,203									
DRILL RIG/HAMMER EFF./DATE AFO0134 CME-45C 88% 05/14/2014				DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Automatic									
DRILLER Cheek, D. O.		START DATE 07/30/14		COMP. DATE 07/30/14		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					
850														GROUND SURFACE	0.0
845	844.6	5.0	8	17	17									ALLUVIAL GRAY/TAN FINE TO COARSE SAND W/ GRAVEL AND COBBLES	
840	839.6	10.0	2	7	15									SAPROLITE DK. BRN/ GRAY FINE SANDY SILT. SOME MICA	6.7
835	834.6	15.0													
830	829.6	20.0	11	11	13									WEATHERED ROCK GRAY/BRN/WHT SAND WITH HARD ROCK SEAMS. SOME MICA	16.7
825			100/5												
820	819.6	30.0	60/0.0											CRYSTALLINE ROCK WHT. TO LT. GRAY, POORLY FOLIATED, GRANITIC BIOTITE GNEISS	29.7
815															
810															
805															
800															
795															
														Boring Terminated WITH CASING ADVANCER REFUSAL at Elevation 794.3 ft IN CRYSTALLINE ROCK, BIOTITE GNEISS	55.3

NCDOT BORE SINGLE B4811_BORELOGS.GPJ NC_DOT_GDT 8/19/14



WBS 38581.1.1		TIP B-4811		COUNTY RUTHERFORD		GEOLOGIST Elliott, D. C.						
SITE DESCRIPTION BRIDGE NO. 087 ON US 64 OVER BROAD RIVER							GROUND WTR (ft)					
BORING NO. B2-A		STATION 15+53		OFFSET 16 ft LT		ALIGNMENT -L-						
COLLAR ELEV. 849.6 ft		TOTAL DEPTH 55.3 ft		NORTHING 624,636		EASTING 1,057,203						
DRILL RIG/HAMMER EFF./DATE AFO0134 CME-45C 88% 05/14/2014				DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Automatic						
DRILLER Cheek, D. O.		START DATE 07/30/14		COMP. DATE 07/30/14		SURFACE WATER DEPTH N/A						
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		L O G	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	ROD (%)		REC. (%)	ROD (%)			
818.55	818.6	31.0	4.3	0:12/0.3	(3.6)	(2.9)					Begin Coring @ 31.0 ft	
815	814.3	35.3		1:34/1.0 1:36/1.0 1:22/1.0	84%	67%					CRYSTALLINE ROCK (continued)	
			5.0	0:52/1.0 1:26/1.0 0:57/1.0 0:55/1.0 0:58/1.0	(3.9)	(2.7)						
810	809.3	40.3		0:46/1.0 2:13/1.0 2:41/1.0 3:21/1.0	78%	54%						
805	804.3	45.3		0:46/1.0 1:23/1.0 1:11/1.0 1:21/1.0 1:26/1.0 1:20/1.0	(5.1)	(4.9)						
			5.0	1:09/1.0 3:10/1.0 3:01/1.0 3:48/1.0 3:54/1.0	86%	44%						
800	799.3	50.3			(4.8)	(4.7)						
			5.0		96%	94%						
795	794.3	55.3										
											Boring Terminated WITH CASING ADVANCER REFUSAL at Elevation 794.3 ft IN CRYSTALLINE ROCK, BIOTITE GNEISS	55.3

NCDOT CORE SINGLE B4811_BORELOGS.GPJ NC_DOT_GDT 8/19/14

WBS 38581.1.1		TIP B-4811		COUNTY RUTHERFORD		GEOLOGIST Elliott, D. C.										
SITE DESCRIPTION BRIDGE NO. 087 ON US 64 OVER BROAD RIVER							GROUND WTR (ft)									
BORING NO. B2-B		STATION 15+76		OFFSET 20 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 846.2 ft		TOTAL DEPTH 45.3 ft		NORTHING 624,594		EASTING 1,057,216										
DRILL RIG/HAMMER EFF./DATE AFO0134 CME-45C 88% 05/14/2014		DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Automatic												
DRILLER Cheek, D. O.		START DATE 07/29/14		COMP. DATE 07/29/14		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
850																
845														846.2	GROUND SURFACE	0.0
840	841.3	4.9	4	7	6									842.9	ALLUVIAL GRAY/BRN SAND W/ GRAVEL AND COBBLES SAPROLITE BRN/GRAY/TAN, FINE SANDY SILT W/ SOME MICA	3.3
835	836.4	9.8	6	13	18											
830	831.3	14.9	16	13	18											
825	826.3	19.9	100/4											826.1	WEATHERED ROCK TAN/GRAY/ORANGE SILTY SAND W/ SOME MICA	20.1
820	820.3	25.9	100/5											819.8	CRYSTALLINE ROCK WHT. TO DK. GRAY, POORLY FOLIATED GRANITIC BIOTITE GNEISS	26.4
815																
810																
805														800.9	Boring Terminated WITH CASING ADVANCER REFUSAL at Elevation 800.9 ft IN CRYSTALLINE ROCK, BIOTITE GNEISS	45.3

NCDOT BORE SINGLE B4811_BORELOGS.GPJ NC_DOT_GDT 8/19/14

WBS 38581.1.1		TIP B-4811		COUNTY RUTHERFORD		GEOLOGIST Elliott, D. C.						
SITE DESCRIPTION BRIDGE NO. 087 ON US 64 OVER BROAD RIVER							GROUND WTR (ft)					
BORING NO. B2-B		STATION 15+76		OFFSET 20 ft RT		ALIGNMENT -L-						
COLLAR ELEV. 846.2 ft		TOTAL DEPTH 45.3 ft		NORTHING 624,594		EASTING 1,057,216						
DRILL RIG/HAMMER EFF./DATE AFO0134 CME-45C 88% 05/14/2014		DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Automatic								
DRILLER Cheek, D. O.		START DATE 07/29/14		COMP. DATE 07/29/14		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 (%)			
819.79												
	819.8	26.4	3.9	1:12/0.9 0:49/1.0 0:43/1.0 0:37/1.0	(2.7) 69%	(0.4) 10%					Begin Coring @ 26.4 ft	
815	815.9	30.3	5.0	0:37/1.0 0:42/1.0 1:22/1.0 1:57/1.0 2:06/1.0	(4.8) 96%	(3.4) 68%					CRYSTALLINE ROCK	26.4
810	810.9	35.3	5.0	2:17/1.0 2:31/1.0 2:01/1.0 1:40/1.0 2:07/1.0	(4.6) 92%	(4.3) 86%						
805	805.9	40.3	5.0	2:23/1.0 2:04/1.0 1:52/1.0 2:13/1.0 2:17/1.0	(5.0) 100%	(4.7) 94%						
	800.9	45.3									Boring Terminated WITH CASING ADVANCER REFUSAL at Elevation 800.9 ft IN CRYSTALLINE ROCK, BIOTITE GNEISS	45.3

NCDOT CORE SINGLE B4811_BORELOGS.GPJ NC_DOT_GDT 8/19/14

WBS 38581.1.1		TIP B-4811		COUNTY RUTHERFORD		GEOLOGIST Elliott, D. C.									
SITE DESCRIPTION BRIDGE NO. 087 ON US 64 OVER BROAD RIVER							GROUND WTR (ft)								
BORING NO. EB2-A		STATION 16+41		OFFSET 16 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 856.1 ft		TOTAL DEPTH 21.6 ft		NORTHING 624,608		EASTING 1,057,288									
DRILL RIG/HAMMER EFF./DATE AFO0134 CME-45C 88% 05/14/2014		DRILL METHOD NW Casing w/ SPT		HAMMER TYPE Automatic											
DRILLER Cheek, D. O.		START DATE 07/25/14		COMP. DATE 07/25/14		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
860															
														856.1	0.0
855															
	851.2	4.9													
850															
	846.2	9.9													
845															
	841.2	14.9													
840															
	836.2	19.9													
835															
	834.5	21.6													

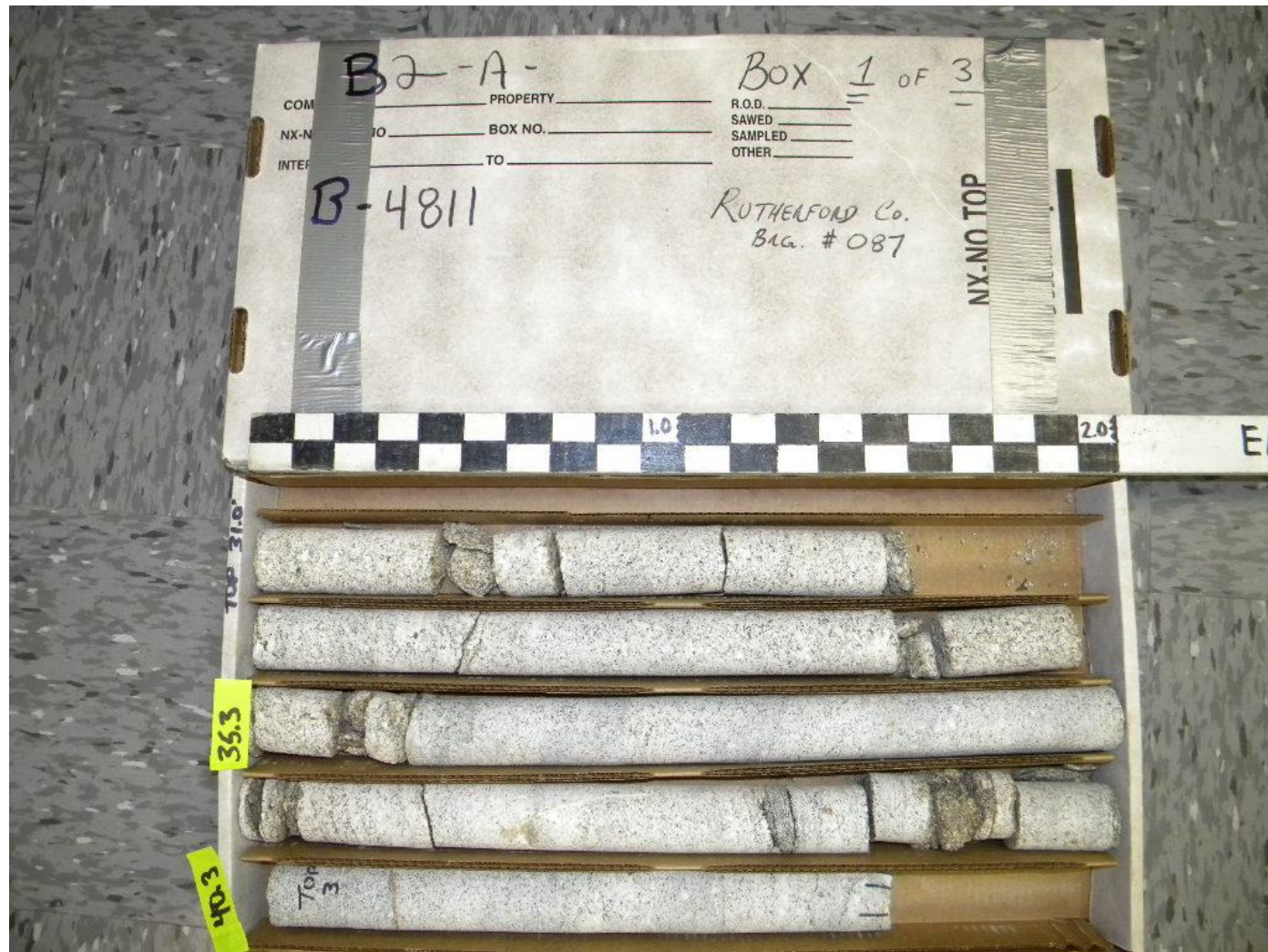
WBS 38581.1.1		TIP B-4811		COUNTY RUTHERFORD		GEOLOGIST Elliott, D. C.									
SITE DESCRIPTION BRIDGE NO. 087 ON US 64 OVER BROAD RIVER							GROUND WTR (ft)								
BORING NO. EB2-B		STATION 16+36		OFFSET 13 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 857.7 ft		TOTAL DEPTH 25.1 ft		NORTHING 624,583		EASTING 1,057,274									
DRILL RIG/HAMMER EFF./DATE AFO0134 CME-45C 88% 05/14/2014		DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Automatic											
DRILLER Cheek, D. O.		START DATE 07/28/14		COMP. DATE 07/28/14		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
860															
														857.7	0.0
855															
	852.9	4.8													
850															
	847.9	9.8													
845															
	842.9	14.8													
840															
	837.9	19.8													
835															

B-4811 38581.1.1

BORING B2-A

BOX 1 OF 3

DEPTH: 31.0-41.8



B-4811 38581.1.1

BORING B2-A

BOX 2 OF 3

DEPTH: 41.8-50.3

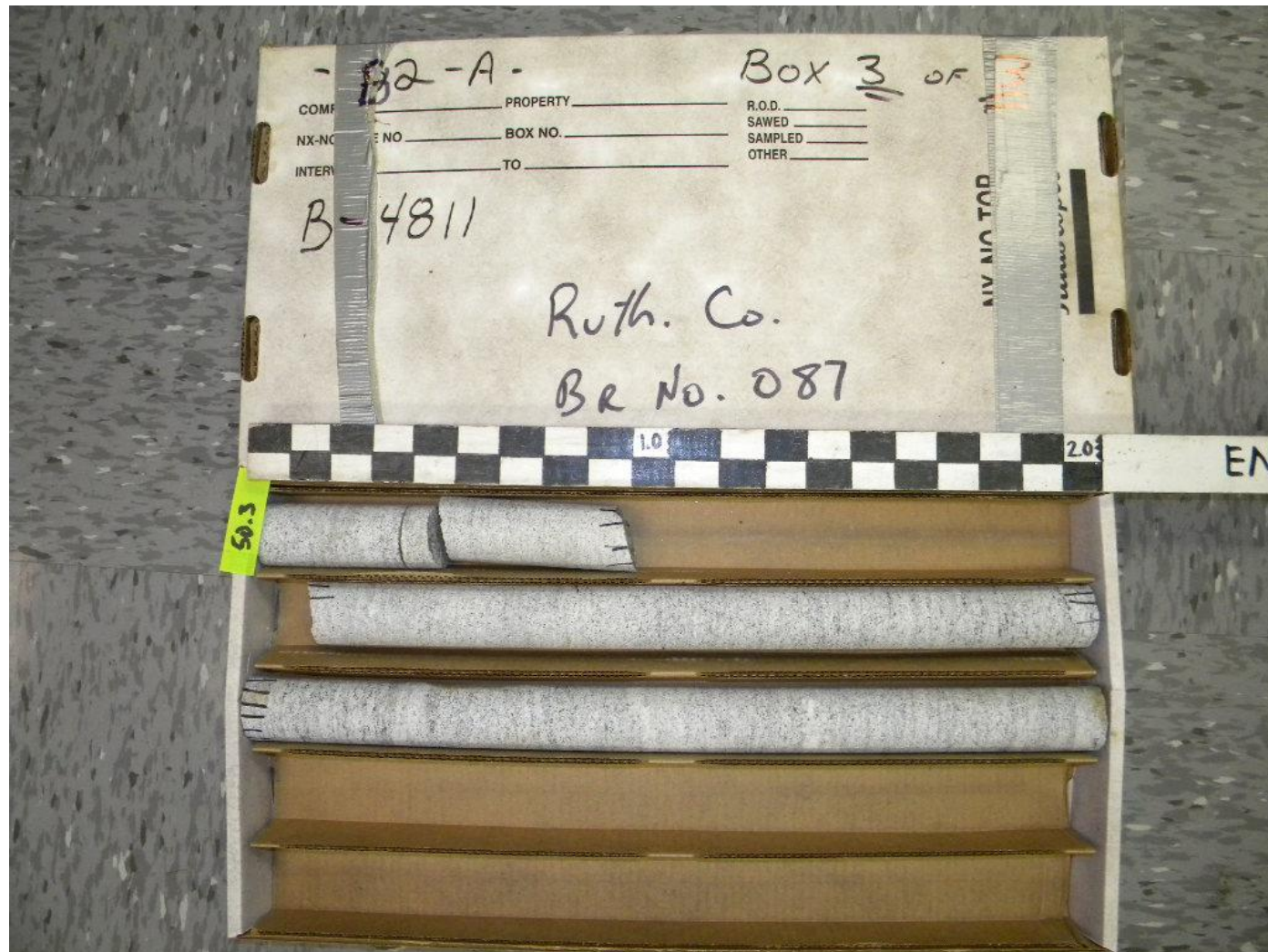


B-4811 38581.1.1

BORING B1-B

BOX 3 OF 3

DEPTH: 50.3-55.3



B-4811 38581.1.1

BORING B2-B

BOX 1 OF 2

DEPTH: 26.4-39.6



B-4811 38581.1.1

BORING B2-B

BOX 2 OF 2

DEPTH: 39.6-45.3

