

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

STRUCTURE
SUBSURFACE INVESTIGATION

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PROJ. REFERENCE NO. 33731.1.1 (B-4498) F.A. PROJ. BRSTP-1243(3)
COUNTY DAVIDSON
PROJECT DESCRIPTION BRIDGE NO. 199 ON SR 1243 OVER
ABBOTTS CREEK

SITE DESCRIPTION _____

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 1919 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

R. W. TODD

M. L. SMITH

A. C. SMITH

INVESTIGATED BY J. P. ROGERS

CHECKED BY C. B. LITTLE

SUBMITTED BY C. B. LITTLE

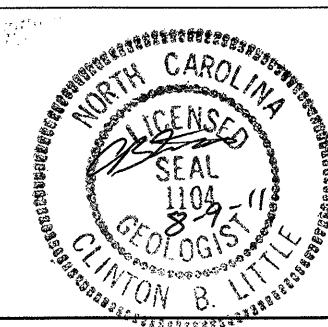
DATE July 2011

PROJECT: 33731.1.1 **ID: B-4498**

DRAWN BY: C. E. BURRIS

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

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



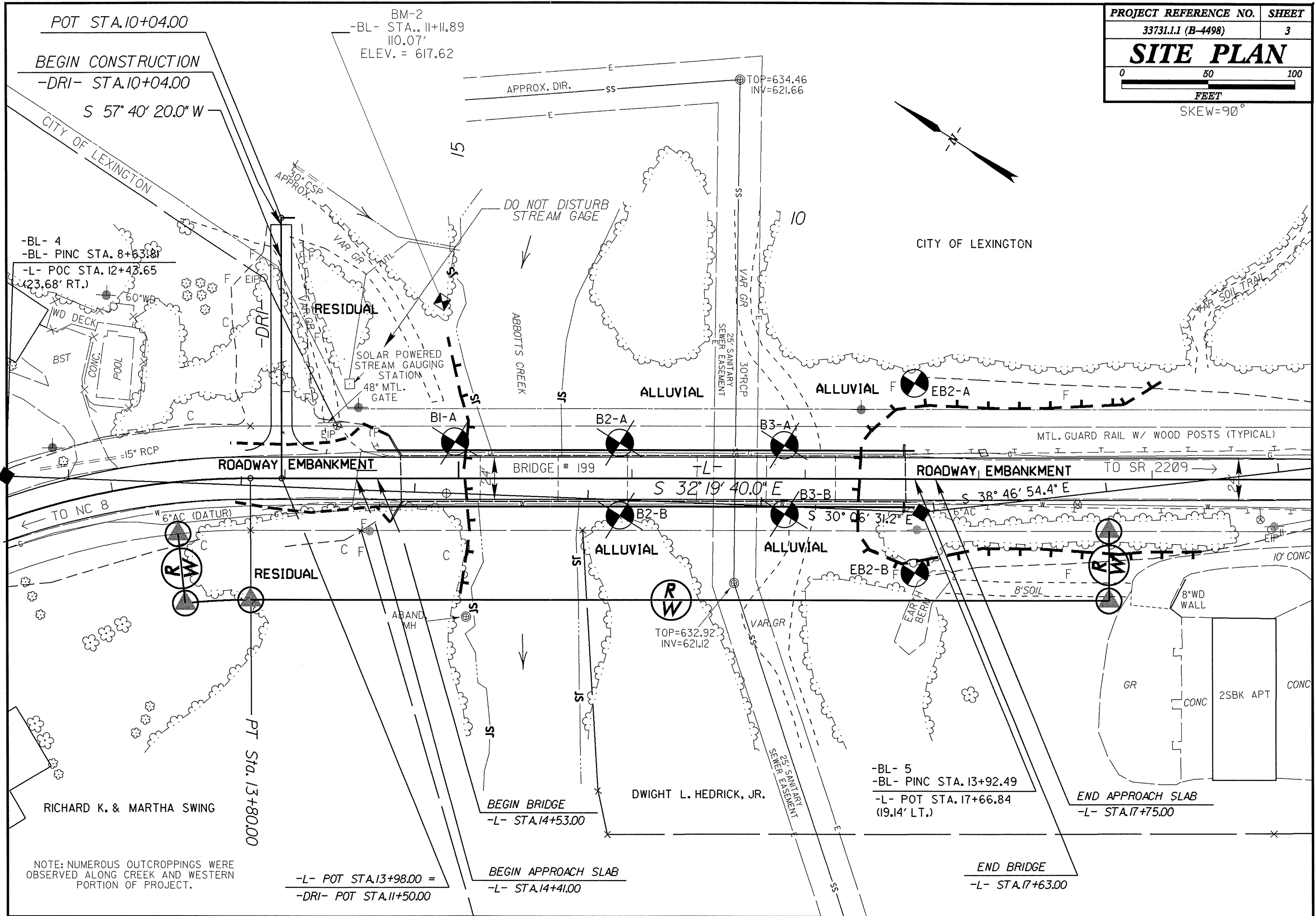
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

PROJECT REFERENCE NO. 33731.11 (B-4498)	SHEET NO. 2
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SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (ASTM 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, MEDIUM 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 DISLODGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (IN OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
SOIL LEGEND AND AASHTO CLASSIFICATION	MINERALOGICAL COMPOSITION	WEATHERING	
GENERAL CLASS. GRANULAR MATERIALS (≤ 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.	FRESH - ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE. VERY SLIGHT (V 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.	
COMPRESSIBILITY SLIGHTLY COMPRESSIBLE MODERATELY COMPRESSIBLE HIGHLY COMPRESSIBLE	PERCENTAGE OF MATERIAL ORGANIC MATERIAL TRACE OF ORGANIC MATTER LITTLE ORGANIC MATTER MODERATELY ORGANIC HIGHLY ORGANIC	WEATHERING FRESH VERY SLIGHT (V SL.) SLIGHT (SL.) MODERATE (MOD.) MODERATELY SEVERE (MOD. SEV.) SEVERE (SEV.) VERY SEVERE (V SEV.) COMPLETE	
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	TEST BORING AUGER BORING CORE BORING MONITORING WELL PIEZOMETER INSTALLATION SLOPE INDICATOR INSTALLATION CONE PENETROMETER TEST SOUNDING ROD	
CONSISTENCY OR DENSENESS	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	ROCK HARDNESS VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT	
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.)	SOIL MOISTURE - CORRELATION OF TERMS SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION	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.)	
PLASTICITY NONPLASTIC LOW PLASTICITY MED. PLASTICITY HIGH PLASTICITY	EQUIPMENT USED ON SUBJECT PROJECT DRILL UNITS: MOBILE B- BK-51 CME-45C CME-550 PORTABLE HOIST	ROCK HARDNESS VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT	
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.	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 2 15/16 TUNG-CARB. CORE BIT	ROCK HARDNESS VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT	
	FRACURE SPACING TERM VERY WIDE WIDE MODERATELY CLOSE CLOSE VERY CLOSE	ROCK HARDNESS VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT	
	BEDDING TERM VERY THICKLY BEDDED THICKLY BEDDED MODERATELY BEDDED THINLY BEDDED VERY THINLY BEDDED THICKLY LAMINATED THINLY LAMINATED	ROCK HARDNESS VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT	
	INDURATION FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. FRIABLE MODERATELY INDURATED INDURATED EXTREMELY INDURATED	ROCK HARDNESS VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT	
	NOTES: STRATIGRAPHY SHOWN THROUGH BORINGS	ROCK HARDNESS VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT	



NOTE: NUMEROUS OUTCROPPINGS WERE OBSERVED ALONG CREEK AND WESTERN PORTION OF PROJECT.

-L- POT STA. 13+98.00 =
-DRI- POT STA. 11+50.00

BEGIN APPROACH SLAB
-L- STA. 14+41.00

END BRIDGE
-L- STA. 17+63.00

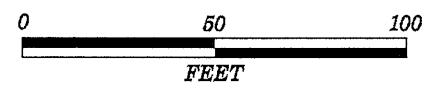
-BL- 5
-BL- PINC STA. 13+92.49
-L- POT STA. 17+66.84
(19.14' LT.)

-BL- 4
-BL- PINC STA. 8+63.81
-L- POC STA. 12+48.65
(23.68' RT.)

BM-2
-BL- STA. 11+11.89
110.07'
ELEV. = 617.62

TOP=632.92
INV=621.12

TOP=634.46
INV=621.66



PI = 13+46.00
EL = 655.77'
VC = 276'
K = 49
DS = 35 MPH

BM2
ELEV. = 617.62
N 750807 E 1633876
-L- 14+90.72, 101.71' LT.
-BL- 11+11.89, 110.07' LT.
RR SPIKE SET IN BASE OF 20" BIRCH TREE

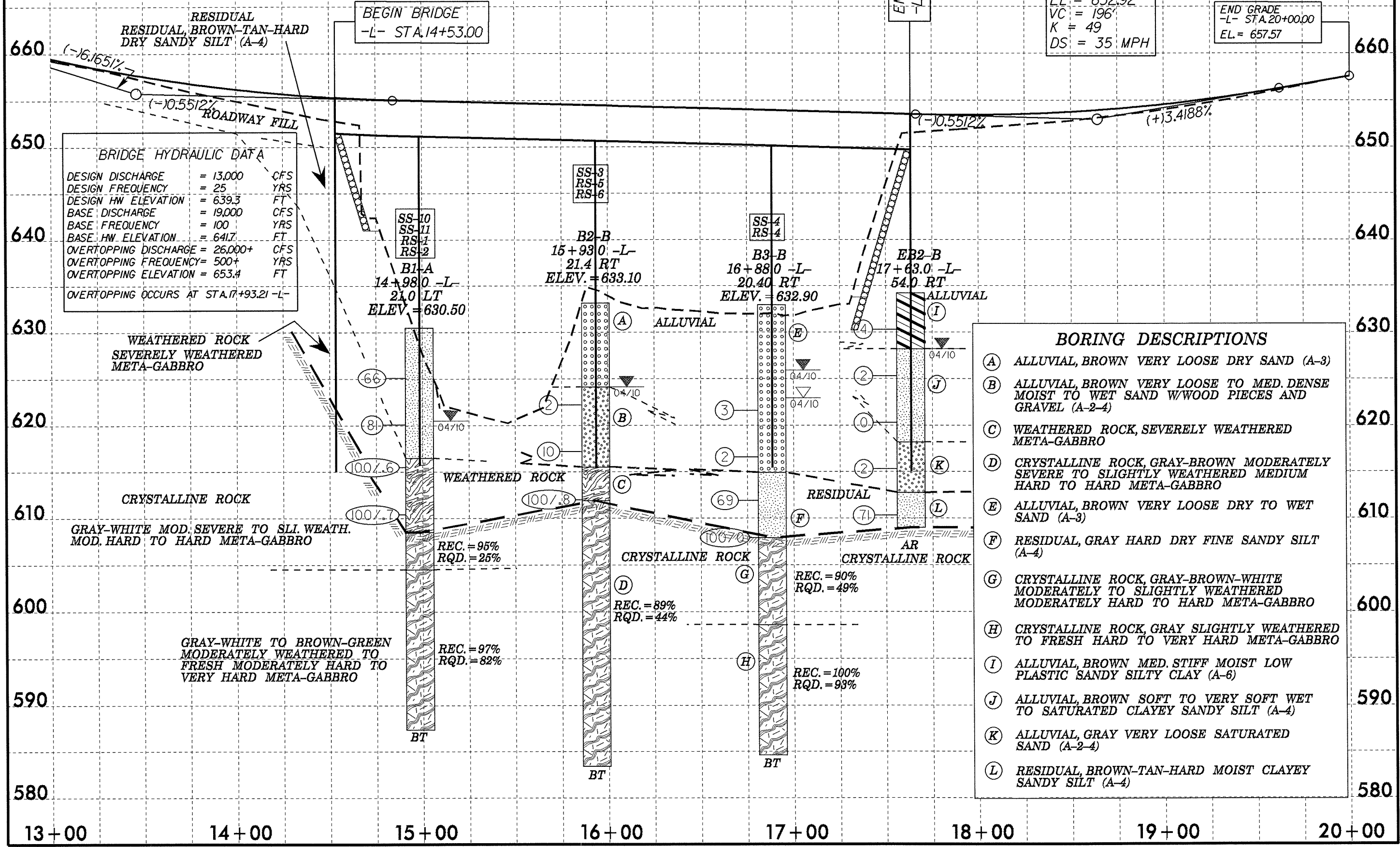
PI = 18+64.00
EL = 652.92'
VC = 196'
K = 49
DS = 35 MPH

END GRADE
-L- STA. 20+00.00
EL. = 657.57

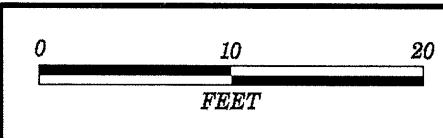
BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 13,000	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 639.3	FT
BASE DISCHARGE	= 19,000	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 641.7	FT
OVERTOPPING DISCHARGE	= 26,000+	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 653.4	FT

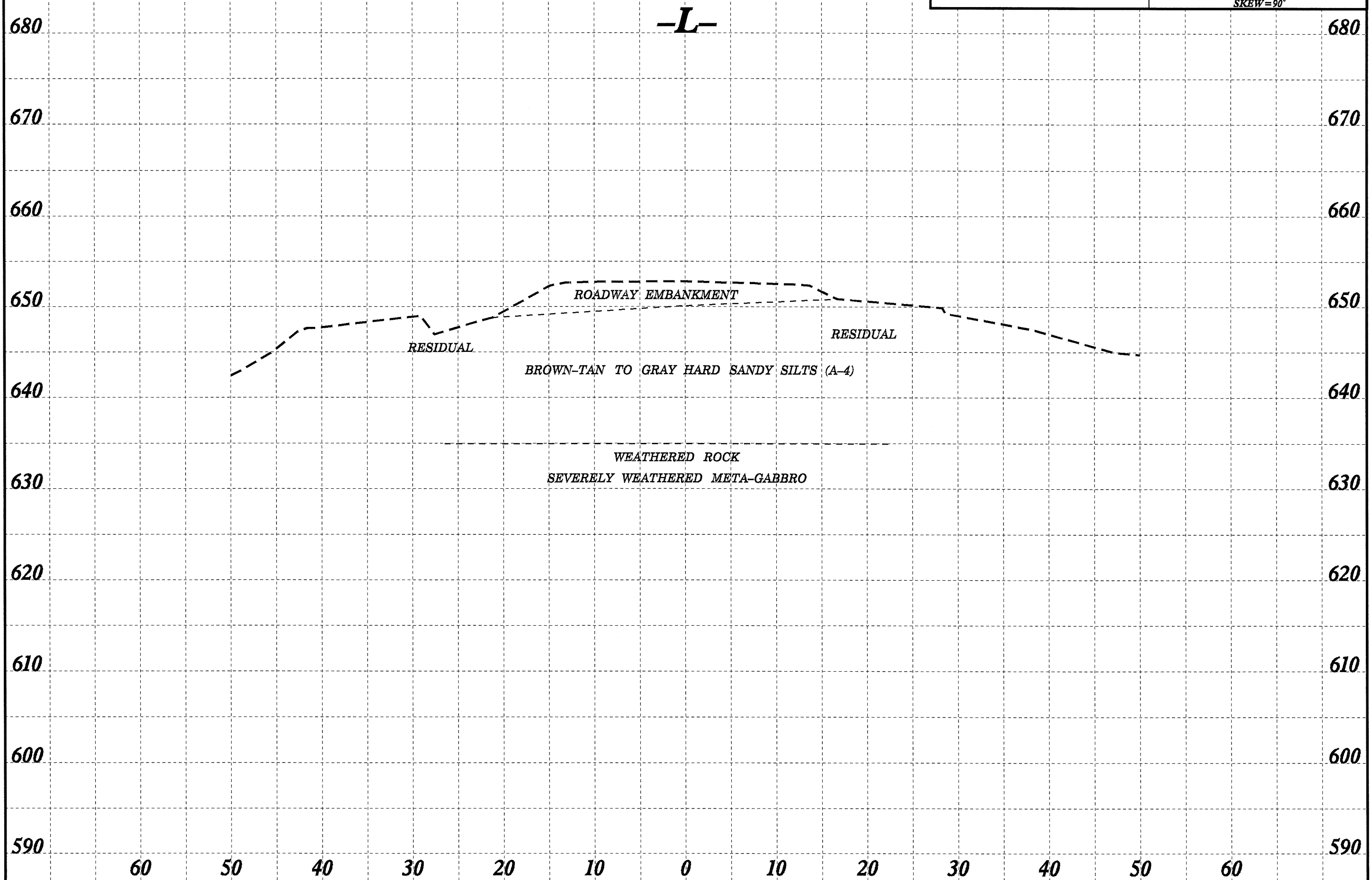
OVERTOPPING OCCURS AT STA. 17+93.21 -L-

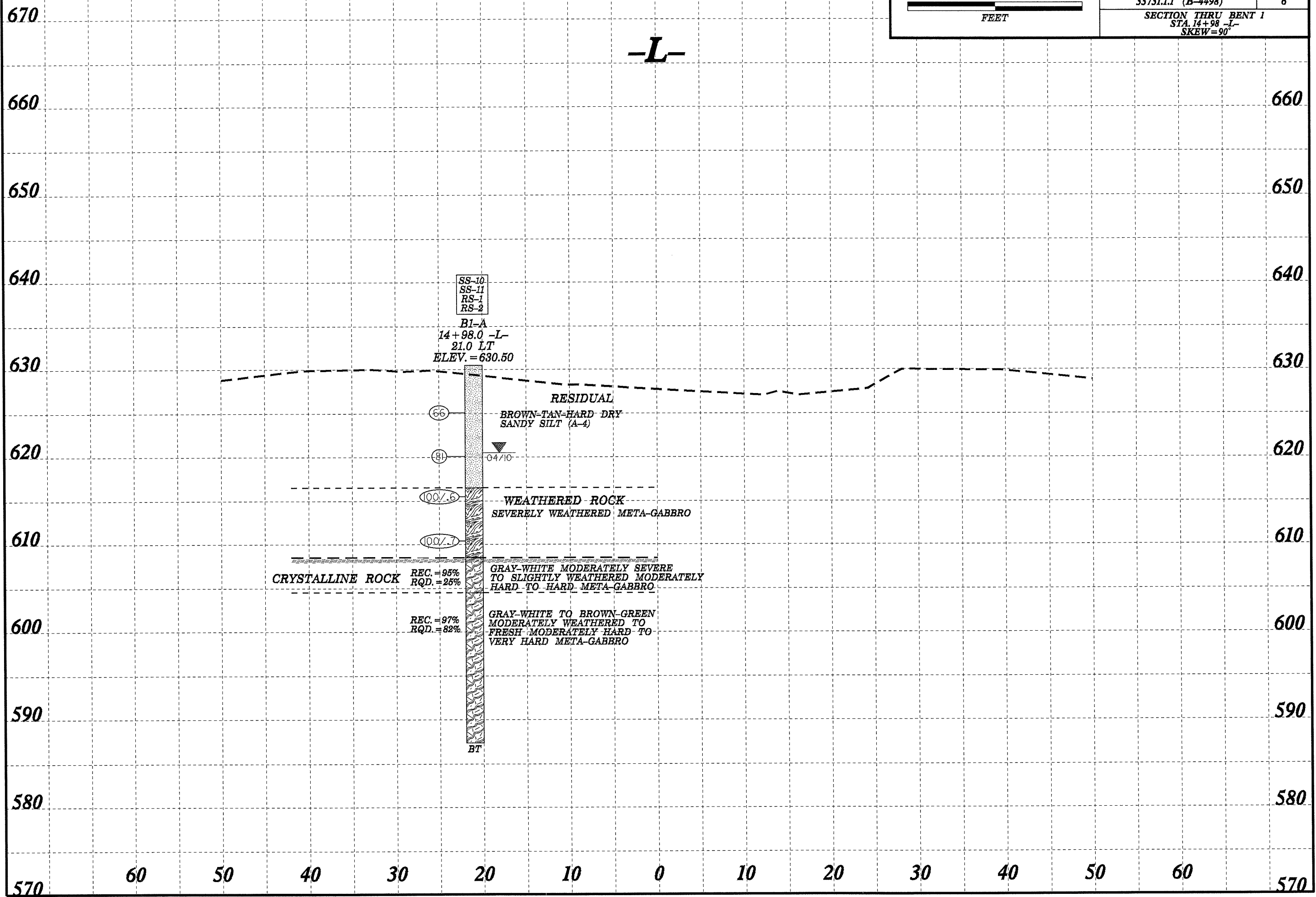
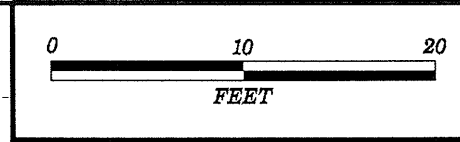


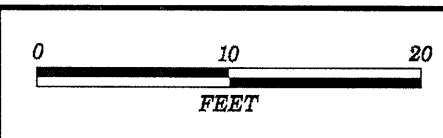
- BORING DESCRIPTIONS**
- (A) ALLUVIAL, BROWN VERY LOOSE DRY SAND (A-3)
 - (B) ALLUVIAL, BROWN VERY LOOSE TO MED. DENSE MOIST TO WET SAND W/WOOD PIECES AND GRAVEL (A-2-4)
 - (C) WEATHERED ROCK, SEVERELY WEATHERED META-GABBRO
 - (D) CRYSTALLINE ROCK, GRAY-BROWN MODERATELY SEVERE TO SLIGHTLY WEATHERED MEDIUM HARD TO HARD META-GABBRO
 - (E) ALLUVIAL, BROWN VERY LOOSE DRY TO WET SAND (A-3)
 - (F) RESIDUAL, GRAY HARD DRY FINE SANDY SILT (A-4)
 - (G) CRYSTALLINE ROCK, GRAY-BROWN-WHITE MODERATELY TO SLIGHTLY WEATHERED MODERATELY HARD TO HARD META-GABBRO
 - (H) CRYSTALLINE ROCK, GRAY SLIGHTLY WEATHERED TO FRESH HARD TO VERY HARD META-GABBRO
 - (I) ALLUVIAL, BROWN MED. STIFF MOIST LOW PLASTIC SANDY SILTY CLAY (A-6)
 - (J) ALLUVIAL, BROWN SOFT TO VERY SOFT WET TO SATURATED CLAYEY SANDY SILT (A-4)
 - (K) ALLUVIAL, GRAY VERY LOOSE SATURATED SAND (A-2-4)
 - (L) RESIDUAL, BROWN-TAN-HARD MOIST CLAYEY SANDY SILT (A-4)



PROJECT REFERENCE NO.	SHEET
33731.1.1 (B-4498)	5
SECTION THRU END BENT 1	
STA. 14+53 -L- SKEW=90°	

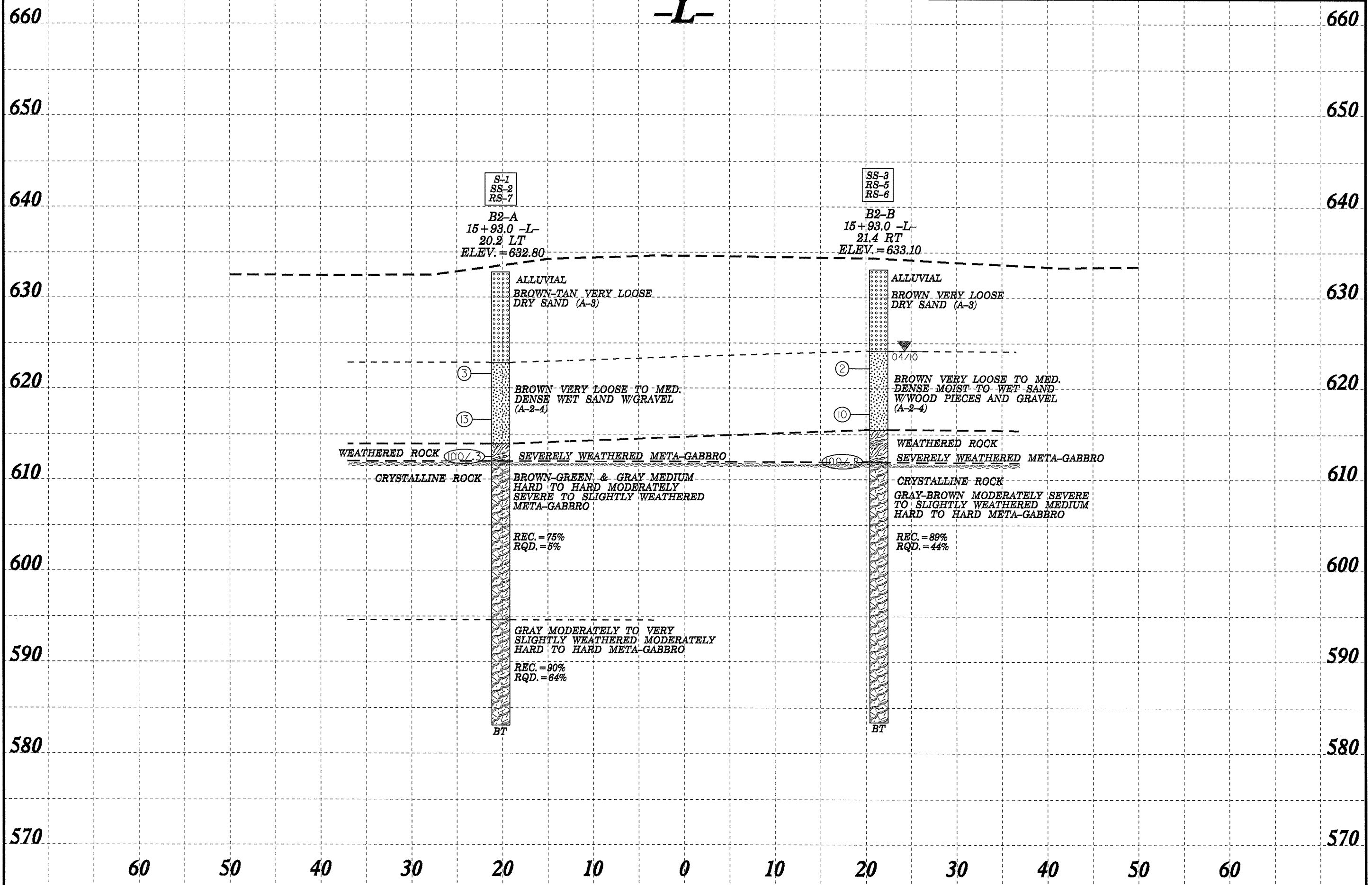






PROJECT REFERENCE NO.	SHEET
33731.1.1 (B-4498)	7
SECTION THRU BENT 2	
STA. 15+93 -L-	
SKEW = 90°	

-L-



S-1
SS-2
RS-7

B2-A
15+93.0 -L-
20.2 LT
ELEV. = 632.80

SS-3
RS-5
RS-6

B2-B
15+93.0 -L-
21.4 RT
ELEV. = 633.10

ALLUVIAL
BROWN-TAN VERY LOOSE
DRY SAND (A-3)

ALLUVIAL
BROWN VERY LOOSE
DRY SAND (A-3)

③
⑬
BROWN VERY LOOSE TO MED.
DENSE WET SAND W/GRAVEL
(A-2-4)

②
⑩
04/10
BROWN VERY LOOSE TO MED.
DENSE MOIST TO WET SAND
W/WOOD PIECES AND GRAVEL
(A-2-4)

WEATHERED ROCK (00/3)
CRYSTALLINE ROCK
SEVERELY WEATHERED META-GABBRO
BROWN-GREEN & GRAY MEDIUM
HARD TO HARD MODERATELY
SEVERE TO SLIGHTLY WEATHERED
META-GABBRO

WEATHERED ROCK (00/8)
CRYSTALLINE ROCK
SEVERELY WEATHERED META-GABBRO
GRAY-BROWN MODERATELY SEVERE
TO SLIGHTLY WEATHERED MEDIUM
HARD TO HARD META-GABBRO

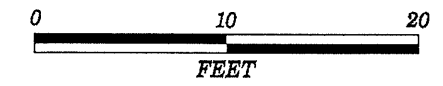
REC. = 75%
RQD. = 5%

REC. = 89%
RQD. = 44%

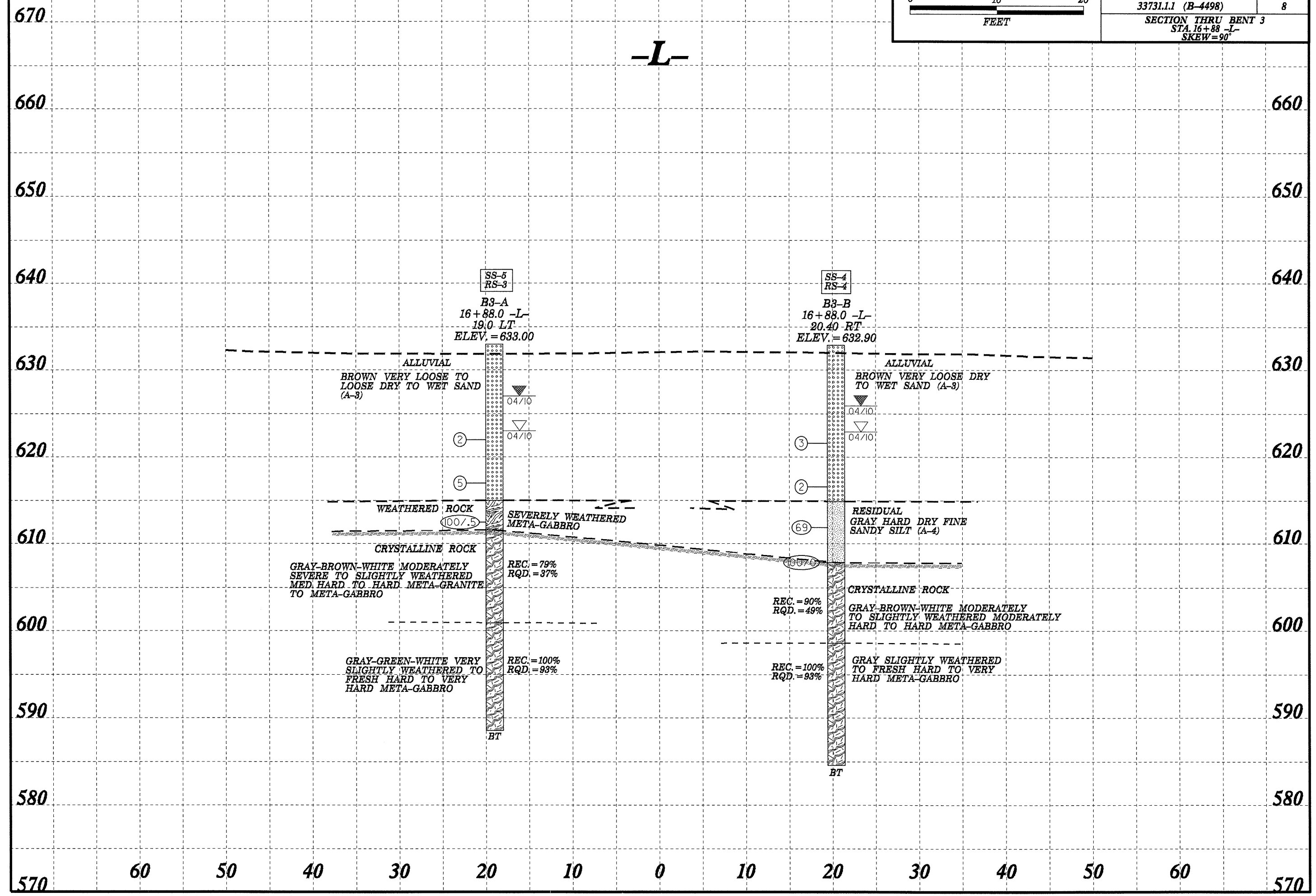
GRAY MODERATELY TO VERY
SLIGHTLY WEATHERED MODERATELY
HARD TO HARD META-GABBRO
REC. = 90%
RQD. = 64%

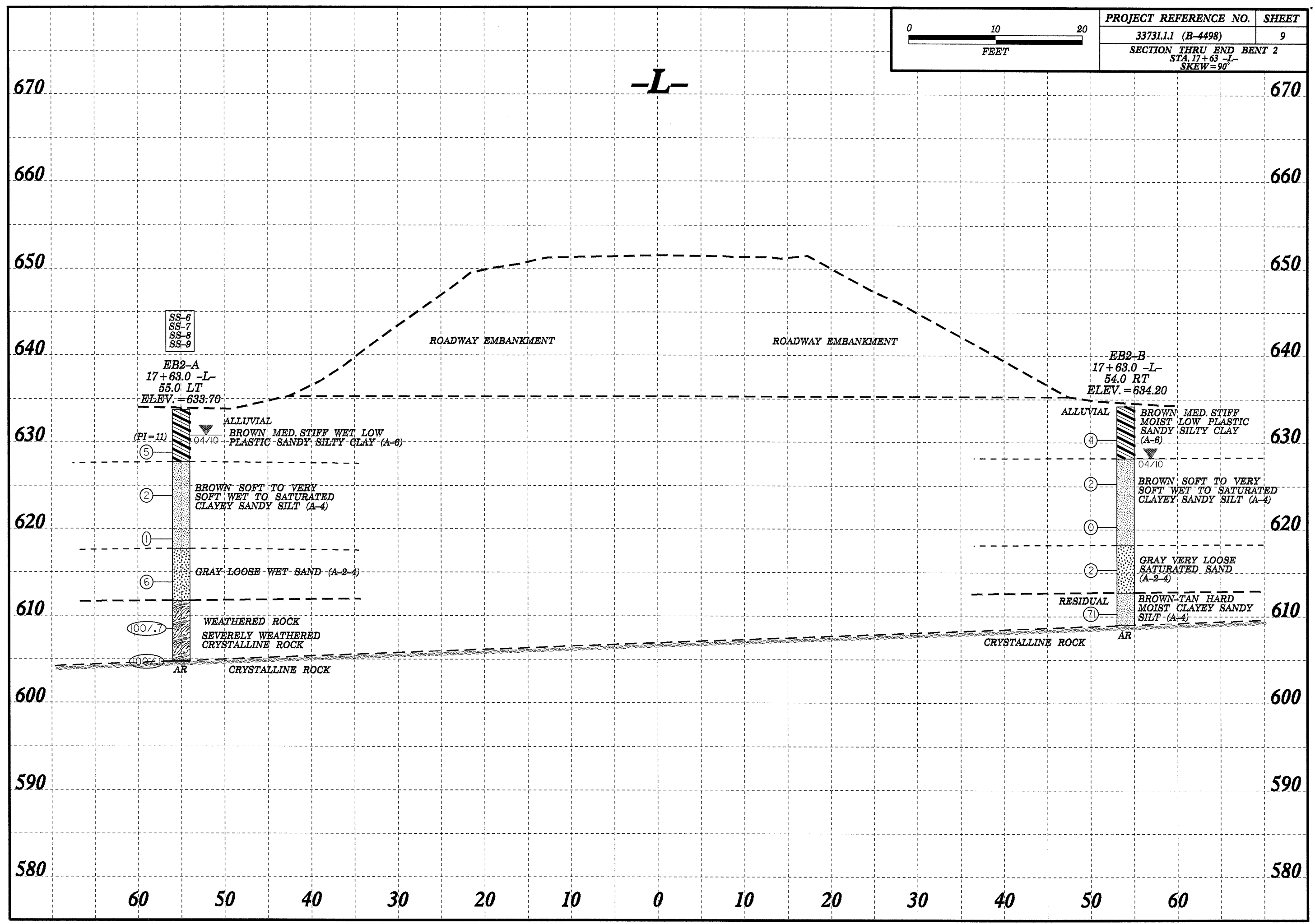
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BT



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PROJECT NO. 33731.1.1		ID. B-4498		COUNTY DAVIDSON		GEOLOGIST Todd, R. W.									
SITE DESCRIPTION BRIDGE NO. 199 ON SR 1243 OVER ABBOTT'S CREEK							GROUND WTR (ft)								
BORING NO. B1-A		STATION 14+98		OFFSET 21 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 630.5 ft		TOTAL DEPTH 43.1 ft		NORTHING 750,758		EASTING 1,633,811									
DRILL MACHINE CME-550X		DRILL METHOD NW Casing W/SPT & Core			HAMMER TYPE Automatic										
DRILLER Smith, M. L.		START DATE 04/22/10		COMP. DATE 04/22/10		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					
635															
630														630.5	0.0
625	626.1	4.4	16	26	40							SS-10	D		
620	621.1	9.4	31	32	49								D		
615	616.1	14.4	70	30/1								SS-11	D	616.5	14.0
610	611.1	19.4	50	50/2									D		
605														608.5	22.0
600												RS-1		604.5	26.0
595												RS-2			
590															
585														587.4	43.1
580															
575															
570															
565															
560															
555															

NCDOT BORE SINGLE B4498_GEO_BH_BRD0199_DAVIDSON.GPJ NC_DOT_GDT_05/26/10

PROJECT NO. 33731.1.1		ID. B-4498		COUNTY DAVIDSON		GEOLOGIST Todd, R. W.						
SITE DESCRIPTION BRIDGE NO. 199 ON SR 1243 OVER ABBOTT'S CREEK							GROUND WTR (ft)					
BORING NO. B1-A		STATION 14+98		OFFSET 21 ft LT		ALIGNMENT -L-						
COLLAR ELEV. 630.5 ft		TOTAL DEPTH 43.1 ft		NORTHING 750,758		EASTING 1,633,811						
DRILL MACHINE CME-550X		DRILL METHOD NW Casing W/SPT & Core			HAMMER TYPE Automatic							
DRILLER Smith, M. L.		START DATE 04/22/10		COMP. DATE 04/22/10		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 (%)			
608.5	608.5	22.0	6.5	1.2/1.0	(5.6) 86%	(3.0) 46%		(3.8) 95%	(1.0) 25%		Begin Coring @ 22.0 ft	
605											CRYSTALLINE ROCK	22.0
600	602.0	28.5	5.0	1/1.0	(5.0) 100%	(3.1) 62%	RS-1	(16.6) 97%	(14.0) 82%		GRAY-WHITE MODERATELY SEVERE TO SLIGHTLY WEATHERED MODERATELY HARD TO HARD META GABBRO WITH VERY CLOSE TO CLOSE FRACTURE SPACING	26.0
595	597.0	33.5	4.8	1.8/1.0	(4.7) 98%	(4.5) 94%	RS-2				CRYSTALLINE ROCK	
590	592.2	38.3	4.8	1.9/1.0	(4.5) 94%	(4.4) 92%					GRAY-WHITE TO BROWN-GREEN MODERATELY WEATHERED TO FRESH MODERATELY HARD TO VERY HARD META GABBRO WITH CLOSE TO MODERATELY CLOSE FRACTURE SPACING	
585	587.4	43.1									Boring Terminated at Elevation 587.4 ft in meta-gabbro	43.1
580												
575												
570												
565												
560												
555												
550												
545												
540												
535												
530												

ICDOT CORE SINGLE B4498_GEO_BH_BRD0199_DAVIDSON.GPJ NC_DOT_GDT_05/27/10

PROJECT NO. 33731.1.1	ID. B-4498	COUNTY DAVIDSON	GEOLOGIST Todd, R. W.
SITE DESCRIPTION BRIDGE NO. 199 ON SR 1243 OVER ABBOTT'S CREEK			GROUND WTR (ft)
BORING NO. B2-A	STATION 15+93	OFFSET 20 ft LT	ALIGNMENT -L-
COLLAR ELEV. 632.8 ft	TOTAL DEPTH 49.7 ft	NORTHING 750,677	EASTING 1,633,861
DRILL MACHINE CME-550X	DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Automatic	
DRILLER Smith, M. L.	START DATE 01/28/10	COMP. DATE 04/14/10	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						
635														GROUND SURFACE	632.8	0.0
630											S-1	D		ALLUVIAL BROWN-TAN VERY LOOSE DRY SAND (A-3)		
625																
620	622.6	10.2	1	2	1						SS-2	W		ALLUVIAL BROWN VERY LOOSE TO MED. DENSE WET SAND W/ GRAVEL (A-2.4)	622.8	10.0
615	617.6	15.2	5	8	5							W				
610	612.8	20.0												WEATHERED ROCK SEVERELY WEATHERED META-GABBRO	613.9	18.9
605														CRYSTALLINE ROCK BROWN-GREEN & GRAY MEDIUM HARD TO HARD MODERATELY SEVERE TO SLIGHTLY WEATHERED META-GABBRO	612.0	20.8
600											RS-7					
595																
590														CRYSTALLINE ROCK GRAY MODERATELY TO VERY SLIGHTLY WEATHERED MODERATELY HARD TO HARD META-GABBRO	594.6	38.2
585																
580																
575																
570																
565																
560																
555																

NCDOT BORE SINGLE B4498_GEO_BH_BRD0199_DAVIDSON.GPJ NC_DOT_GDT_05/26/10

PROJECT NO. 33731.1.1	ID. B-4498	COUNTY DAVIDSON	GEOLOGIST Todd, R. W.
SITE DESCRIPTION BRIDGE NO. 199 ON SR 1243 OVER ABBOTT'S CREEK			GROUND WTR (ft)
BORING NO. B2-A	STATION 15+93	OFFSET 20 ft LT	ALIGNMENT -L-
COLLAR ELEV. 632.8 ft	TOTAL DEPTH 49.7 ft	NORTHING 750,677	EASTING 1,633,861
DRILL MACHINE CME-550X	DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Automatic	
DRILLER Smith, M. L.	START DATE 01/28/10	COMP. DATE 04/14/10	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 (%)			
612	612.0	20.8	3.9	.75/1.0	(2.4)	(0.4)		(13.0)	(0.8)		Begin Coring @ 20.8 ft	
610	608.1	24.7	5.0	1/1.0	(3.7)	(0.4)		75%	5%		CRYSTALLINE ROCK BROWN-GREEN & GRAY MEDIUM HARD TO HARD MODERATELY SEVERE TO SLIGHTLY WEATHERED META-GABBRO WITH VERY CLOSE TO CLOSE FRACTURE SPACING	20.8
605	603.1	29.7	5.0	1.5/1.0	(4.0)	(0.0)	RS-7				R1=7 R2=3 R3=8 R4=3 R5=7 RMR=28	
600	598.1	34.7	5.0	0.5/1.0	(4.5)	(1.6)						
595	593.1	39.7	4.8	0.5/1.0	(4.8)	(3.1)		(10.4)	(7.4)		CRYSTALLINE ROCK GRAY MODERATELY TO VERY SLIGHTLY WEATHERED MODERATELY HARD TO HARD META-GABBRO WITH VERY CLOSE TO MODERATELY CLOSE FRACTURE SPACING	38.2
590	588.3	44.5	5.2	NM	(4.1)	(2.8)					R1=7 R2=13 R3=10 R4=9 R5=7 RMR=46	
585	583.1	49.7									Boring Terminated at Elevation 583.1 ft in meta-gabbro	49.7
580												
575												
570												
565												
560												
555												
550												
545												
540												
535												

NCDOT CORE SINGLE B4498_GEO_BH_BRD0199_DAVIDSON.GPJ NC_DOT_GDT_05/27/10

PROJECT NO. 33731.1.1	ID. B-4498	COUNTY DAVIDSON	GEOLOGIST Todd, R. W.
SITE DESCRIPTION BRIDGE NO. 199 ON SR 1243 OVER ABBOTT'S CREEK			GROUND WTR (ft)
BORING NO. B2-B	STATION 15+93	OFFSET 21 ft RT	ALIGNMENT -L-
COLLAR ELEV. 633.1 ft	TOTAL DEPTH 49.7 ft	NORTHING 750,655	EASTING 1,633,826
DRILL MACHINE CME-550X	DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Automatic	
DRILLER Smith, M. L.	START DATE 04/14/10	COMP. DATE 04/15/10	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				
635													633.1 GROUND SURFACE	0.0
630													ALLUVIAL BROWN VERY LOOSE DRY SAND (A-3)	
625	623.2	9.9											624.1 ALLUVIAL BROWN VERY LOOSE TO MED. DENSE MOIST TO WET SAND W WOOD PIECES AND GRAVEL (A-2-4)	9.0
620			1	1	1							M		
615	618.2	14.9	4	5	5							W		
610	613.2	19.9	6	16	84/3							D	615.5 WEATHERED ROCK SEVERELY WEATHERED META-GABBRO	17.6
610													611.9 CRYSTALLINE ROCK GRAY-BROWN MODERATELY SEVERE TO SLIGHTLY WEATHERED MEDIUM HARD TO HARD META-GABBRO	21.2
605														
600														
595														
590														
585														
580														
575														
570														
565														
560														
555														

VCDOT BORE SINGLE B4498_GEO_BH_BRD0199_DAVIDSON.GPJ NC_DOT.GDT 05/26/10

PROJECT NO. 33731.1.1	ID. B-4498	COUNTY DAVIDSON	GEOLOGIST Todd, R. W.
SITE DESCRIPTION BRIDGE NO. 199 ON SR 1243 OVER ABBOTT'S CREEK			GROUND WTR (ft)
BORING NO. B2-B	STATION 15+93	OFFSET 21 ft RT	ALIGNMENT -L-
COLLAR ELEV. 633.1 ft	TOTAL DEPTH 49.7 ft	NORTHING 750,655	EASTING 1,633,826
DRILL MACHINE CME-550X	DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Automatic	
DRILLER Smith, M. L.	START DATE 04/14/10	COMP. DATE 04/15/10	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) %	RQD (ft) %		REC. (ft) %	RQD (ft) %			
611.9	611.9	21.2	3.5	1/1.0	(3.5) 100%	(1.8) 51%		(25.4) 89%	(12.6) 44%		Begin Coring @ 21.2 ft	
610	608.4	24.7	5.0	.75/1.0	(4.7) 94%	(3.3) 66%					CRYSTALLINE ROCK GRAY-BROWN MODERATELY SEVERE TO SLIGHTLY WEATHERED MEDIUM HARD TO HARD META-GABBRO WITH VERY CLOSE TO MODERATELY CLOSE FRACTURE SPACING	21.2
605	603.4	29.7	5.0	1/1.0			RS-5				R1=7 R2=8 R3=10 R4=6 R5=7 RMR=38	
600	598.4	34.7	5.0	1/1.0	(4.2) 84%	(1.4) 28%	RS-6					
595	593.4	39.7	5.0	0.75/1.0								
590	588.4	44.7	5.0	1/1.0	(3.5) 70%	(1.6) 32%						
585	583.4	49.7	5.0	NM	(4.6) 92%	(3.1) 62%						
580											Boring Terminated at Elevation 583.4 ft in meta-gabbro	49.7
575												
570												
565												
560												
555												
550												
545												
540												
535												

VCDOT CORE SINGLE B4498_GEO_BH_BRD0199_DAVIDSON.GPJ NC_DOT.GDT 05/27/10

PROJECT NO. 33731.1.1	ID. B-4498	COUNTY DAVIDSON	GEOLOGIST Todd, R. W.
SITE DESCRIPTION BRIDGE NO. 199 ON SR 1243 OVER ABBOTT'S CREEK			GROUND WTR (ft)
BORING NO. B3-A	STATION 16+88	OFFSET 19 ft LT	ALIGNMENT -L-
COLLAR ELEV. 633.0 ft	TOTAL DEPTH 44.4 ft	NORTHING 750,596	EASTING 1,633,911
DRILL MACHINE CME-550X	DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Automatic	
DRILLER Smith, M. L.	START DATE 04/19/10	COMP. DATE 04/20/10	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	ELEV. (ft)	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
635													GROUND SURFACE	633.0	0.0
630													ALLUVIAL BROWN VERY LOOSE TO LOOSE DRY TO WET SAND (A-3)		
625															
620	623.0	10.0	1	1	1										
615	618.0	15.0	1	2	3										
610	613.0	20.0	100/5										WEATHERED ROCK SEVERELY WEATHERED META-GABBRO	615.0	18.0
605													CRYSTALLINE ROCK GRAY-BROWN-WHITE MODERATELY SEVERE TO SLIGHTLY WEATHERED MEDIUM HARD TO HARD META GRANITE TO META-GABBRO	611.6	21.4
600													CRYSTALLINE ROCK GRAY-GREEN-WHITE VERY SLIGHTLY WEATHERED TO FRESH HARD TO VERY HARD META-GABBRO	600.9	32.1
595															
590															
585															
580															
575															
570															
565															
560															
555															

NCDOT BORE SINGLE B4498_GEO_BH_BRD0199_DAVIDSON.GPJ NC_DOT.GDT 05/26/10

PROJECT NO. 33731.1.1	ID. B-4498	COUNTY DAVIDSON	GEOLOGIST Todd, R. W.
SITE DESCRIPTION BRIDGE NO. 199 ON SR 1243 OVER ABBOTT'S CREEK			GROUND WTR (ft)
BORING NO. B3-A	STATION 16+88	OFFSET 19 ft LT	ALIGNMENT -L-
COLLAR ELEV. 633.0 ft	TOTAL DEPTH 44.4 ft	NORTHING 750,596	EASTING 1,633,911
DRILL MACHINE CME-550X	DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Automatic	
DRILLER Smith, M. L.	START DATE 04/19/10	COMP. DATE 04/20/10	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 (%)			
611.6	611.6	21.4	3.4	0.3/1.0	(3.1)	(2.0)		(8.5)	(4.0)		Begin Coring @ 21.4 ft	
610	608.2	24.8	5.0	0.7/1.0	(4.4)	(2.0)					CRYSTALLINE ROCK GRAY-BROWN-WHITE MODERATELY SEVERE TO SLIGHTLY WEATHERED MEDIUM HARD TO HARD META GRANITE TO META-GABBRO WITH CLOSE FRACTURE SPACING	21.4
605	603.2	29.8	10.0	0.8/1.0	(9.4)	(7.6)					R1=12 R2=8 R3=10 R4=6 R5=7 RMR=43	
600							RS-3	(12.3)	(11.4)		CRYSTALLINE ROCK GRAY-GREEN-WHITE VERY SLIGHTLY WEATHERED TO FRESH HARD TO VERY HARD META-GABBRO WITH MODERATELY CLOSE TO WIDE FRACTURE SPACING	32.1
595	593.2	39.8	4.6	NM	(4.6)	(4.2)					R1=12 R2=20 R3=22 R4=18 R5=7 RMR=79	
590	588.6	44.4									Boring Terminated at Elevation 588.6 ft in meta-gabbro	44.4
585												
580												
575												
570												
565												
560												
555												

NCDOT CORE SINGLE B4498_GEO_BH_BRD0199_DAVIDSON.GPJ NC_DOT.GDT 05/27/10

PROJECT NO. 33731.1.1	ID. B-4498	COUNTY DAVIDSON	GEOLOGIST Todd, R. W.
SITE DESCRIPTION BRIDGE NO. 199 ON SR 1243 OVER ABBOTT'S CREEK			GROUND WTR (ft)
BORING NO. B3-B	STATION 16+88	OFFSET 20 ft RT	ALIGNMENT -L-
COLLAR ELEV. 632.9 ft	TOTAL DEPTH 48.3 ft	NORTHING 750,575	EASTING 1,633,878
DRILL MACHINE CME-550X	DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Automatic	
DRILLER Smith, M. L.	START DATE 04/16/10	COMP. DATE 04/19/10	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				
635													GROUND SURFACE	0.0
630													ALLUVIAL BROWN VERY LOOSE DRY TO WET SAND (A-3)	
625														
620	622.6	10.3	1	2	1							W		
615	617.6	15.3	1	1	1							SS-4		
610	612.9	20.0	30	43	26							D	RESIDUAL GRAY HARD DRY FINE SANDY SILT (A-4)	18.0
605	607.9	25.0	100/0										CRYSTALLINE ROCK GRAY-BROWN-WHITE MODERATELY TO SLIGHTLY WEATHERED MODERATELY HARD TO HARD META-GABBRO	25.0
600												RS-4		
595													CRYSTALLINE ROCK GRAY SLIGHTLY WEATHERED TO FRESH HARD TO VERY HARD META-GABBRO	34.3
590														
585														
580														
575														
570														
565														
560														
555														

NCDOT BORE SINGLE B4498_GEO_BH_BRDGG0199_DAVIDSON.GPJ_NC_DOT.GDT 05/26/10

PROJECT NO. 33731.1.1	ID. B-4498	COUNTY DAVIDSON	GEOLOGIST Todd, R. W.
SITE DESCRIPTION BRIDGE NO. 199 ON SR 1243 OVER ABBOTT'S CREEK			GROUND WTR (ft)
BORING NO. B3-B	STATION 16+88	OFFSET 20 ft RT	ALIGNMENT -L-
COLLAR ELEV. 632.9 ft	TOTAL DEPTH 48.3 ft	NORTHING 750,575	EASTING 1,633,878
DRILL MACHINE CME-550X	DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Automatic	
DRILLER Smith, M. L.	START DATE 04/16/10	COMP. DATE 04/19/10	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 (%)			
607.9	607.9	25.0	5.0	N=100/0 1.2/1.0 1/1.0	(4.1)	(1.7)		(8.4)	(4.6)		Begin Coring @ 25.0 ft	25.0
605											CRYSTALLINE ROCK GRAY-BROWN-WHITE MODERATELY TO SLIGHTLY WEATHERED MODERATELY HARD TO HARD META-GABBRO WITH VERY CLOSE TO CLOSE FRACTURE SPACING	
600	602.9	30.0	4.3	1.7/1.0	(4.3)	(2.9)					R1=12 R2=8 R3=10 R4=6 R5=7 RMR=43	34.3
595	598.6	34.3	5.1	0.6/1.0	(5.1)	(4.1)		(14.0)	(13.0)		CRYSTALLINE ROCK GRAY SLIGHTLY WEATHERED TO FRESH HARD TO VERY HARD META-GABBRO WITH CLOSE TO WIDE FRACTURE SPACING	
590	593.5	39.4	4.5	0.7/1.0	(4.5)	(4.5)					R1=12 R2=20 R3=20 R4=12 R5=7 RMR=71	
585	589.0	43.9	4.4	0.8/1.0	(4.4)	(4.4)						
580	584.6	48.3									Boring Terminated at Elevation 584.6 ft in meta-gabbro	48.3
575												
570												
565												
560												
555												
550												
545												
540												
535												
530												

NCDOT CORE SINGLE B4498_GEO_BH_BRDGG0199_DAVIDSON.GPJ_NC_DOT.GDT 05/27/10

PROJECT NO. 33731.1.1	ID. B-4498	COUNTY DAVIDSON	GEOLOGIST Todd, R. W.
SITE DESCRIPTION BRIDGE NO. 199 ON SR 1243 OVER ABBOTT'S CREEK			GROUND WTR (ft)
BORING NO. EB2-A	STATION 17+63	OFFSET 55 ft LT	ALIGNMENT -L-
COLLAR ELEV. 633.7 ft	TOTAL DEPTH 29.0 ft	NORTHING 750,552	EASTING 1,633,982
DRILL MACHINE CME-550X	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
DRILLER Smith, M. L.	START DATE 04/20/10	COMP. DATE 04/21/10	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				
635													GROUND SURFACE	0.0
630	629.8	3.9	1	2	3						SS-6	W	ALLUVIAL BROWN MED. STIFF WET (PI=11) LOW PLASTIC SANDY SILTY CLAY (A-6)	6.0
625	624.8	8.9	1	1	1						SS-7	W	ALLUVIAL BROWN SOFT TO VERY SOFT WET TO SATURATED CLAYEY SANDY SILT (A-4)	16.0
620	619.8	13.9	1	1	0						Sat.		ALLUVIAL GRAY LOOSE WET SAND (A-2-4)	22.0
615	614.8	18.9	3	3	3						SS-8	W	WEATHERED ROCK SEVERELY WEATHERED CRYSTALLINE ROCK	28.9
610	609.8	23.9	25	71	29/2						SS-9	D	CRYSTALLINE ROCK	29.0
605	604.8	28.9	100/1										Boring Terminated by Auger Refusal at Elevation 604.7 ft in crystalline rock	

NCDOT BORE SINGLE B4498_GEO_BH_BRDG0199_DAVIDSON.GPJ NC_DOT.GDT 05/26/10

PROJECT NO. 33731.1.1	ID. B-4498	COUNTY DAVIDSON	GEOLOGIST Todd, R. W.
SITE DESCRIPTION BRIDGE NO. 199 ON SR 1243 OVER ABBOTT'S CREEK			GROUND WTR (ft)
BORING NO. EB2-B	STATION 17+63	OFFSET 54 ft RT	ALIGNMENT -L-
COLLAR ELEV. 634.2 ft	TOTAL DEPTH 25.2 ft	NORTHING 750,494	EASTING 1,633,890
DRILL MACHINE CME-550X	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
DRILLER Smith, M. L.	START DATE 04/21/10	COMP. DATE 04/21/10	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				
635													GROUND SURFACE	0.0
630	631.3	2.9	1	2	2						M	W	ALLUVIAL BROWN MED. STIFF MOIST LOW PLASTIC SANDY SILTY CLAY (A-6)	6.0
625	626.3	7.9	1	1	1						W		ALLUVIAL BROWN SOFT TO VERY SOFT WET TO SATURATED CLAYEY SANDY SILT (A-4)	16.0
620	621.3	12.9	1	0	0						Sat.		ALLUVIAL GRAY VERY LOOSE SATURATED SAND (A-2-4)	21.5
615	616.3	17.9	1	1	1						Sat.		RESIDUAL BROWN-TAN-HARD MOIST CLAYEY SANDY SILT (A-4)	25.2
610	611.3	22.9	14	24	47						M		Boring Terminated by Auger Refusal at Elevation 609.0 ft on crystalline rock	

NCDOT BORE SINGLE B4498_GEO_BH_BRDG0199_DAVIDSON.GPJ NC_DOT.GDT 05/26/10

TEST RESULTS

PROJECT: 33731.1.1 (B-4498)

COUNTY: DAVIDSON

SITE DESCRIPTION: BRIDGE NO. 199 ON SR 1243 OVER ABBOTTS CREEK

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				
B1-A																		
SS-10	21.0 LT	14+98	4.40-5.90	A-4(0)	66	21	NP	15.9	28.8	49.2	6.0	81	74	52				
SS-11	21.0 LT	14+98	14.40-15.00	A-4(0)	100	26	2	8.5	40.5	45.0	6.0	96	93	60				
B2-A																		
S-1	20.2 LT	15+93 -L-	0.00-10.20	A-3(0)		25	NP	34.3	57.3	4.4	4.0	100	97	10				
SS-2	20.2 LT	15+93 -L-	10.20-11.70	A-2-4(0)	3	20	NP	46.2	41.5	8.3	4.0	71	60	11				
B2-B																		
SS-3	21.4 RT	15+93 -L-	19.90-21.20	A-4(1)	100	32	5	24.0	31.5	36.5	8.1	95	81	50				
B3-A																		
SS-5	19.0 LT	16+88	20.00-20.50	A-4(0)	100	26	NP	7.1	34.9	50.0	8.1	100	98	69				
B3-B																		
SS-4	20.4 RT	16+88	15.30-16.80	A-3(0)	2	21	NP	63.8	28.7	5.4	2.0	99	71	9				
EB2-A																		
SS-6	55.0 LT	17+63 -L-	3.90-5.40	A-6(8)	5	35	11	7.9	20.8	33.1	38.3	100	97	78				
SS-7	55.0 LT	17+63 -L-	8.90-11.40	A-4(0)	2	26	NP	3.0	61.9	23.0	12.1	100	100	47				
SS-8	55.0 LT	17+63 -L-	18.90-20.40	A-2-4(0)	6	21	NP	50.9	33.9	9.2	6.0	97	68	18				
SS-9	55.0 LT	17+63 -L-	23.90-25.10	A-4(1)	100	29	2	11.7	13.3	64.9	10.1	98	91	77				

ROCK SAMPLE RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	RQD	UNIT WT	Q(ksf)	E(Mpsi)
B1-A							
RS-1	21.0 LT.	14+98 -L-	29.0-29.5	97%	180.6	1161	5.68
RS-2	21.0 LT.	14+98 -L-	34.7-35.25	97%	171.1	6667	15.86
B2-A							
RS-7	20.2 LT	15+93	28.7-29.1	5%	168.2	1296	1.053
B2-B							
RS-5	21.4 RT	15+93	29.0-29.7	44%	172.5	1773	2.82
RS-6	21.4 RT	15+93	35.4-36.0	44%	172.1	1876	2.67
B3-A							
RS-3	19.0 LT	16+88	33.1-33.9	93%	170.8	3931	9.7
B3-B							
RS-4	20.4 RT	16+88	31.9-32.5	49%	171.5	2980	4.21



FIELD
 SCOUR REPORT

WBS: 33731.1.1 TIP: B-4498 COUNTY: DAVIDSON

DESCRIPTION(1): BR-199 ON SR 1243 OVER ABBOTT'S CREEK.

EXISTING BRIDGE

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

Bridge No.: 199 Length: 290' Total Bents: 8 Bents in Channel: 2 Bents in Floodplain: 6
 Foundation Type: END BENTS - PILES. INTERIOR BENTS - FOOTINGS ON ROCK.

EVIDENCE OF SCOUR(2)

Abutments or End Bent Slopes: NO

Interior Bents: MODERATE SCOUR AT ALL INTERIOR BENTS.

Channel Bed: N/A

Channel Bank: MODERATE TO SEVERE EROSION THROUGHOUT BRIDGE AREA.

EXISTING SCOUR PROTECTION

Type(3): REMNANT OF OLD ABUT. STILL IN PLACE. MAY PROVIDE SOME SCOUR PROTECTION

Extent(4): END BENT ONE ONLY

Effectiveness(5): OK

Obstructions(6): NONE - EXTREMELY CLEAN CREEK.

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): BOULDERS & COBBLES.

Channel Bank Material(8): BROWN SAND (ALLUV.) AS SS-1 (A-3) & SS-2 (A-2-4).

Channel Bank Cover(9): TREES - MANY LEANING TOWARDS CREEK WITH ROOTS EXPOSED.

Floodplain Width(10): APP. 400'.

Floodplain Cover(11): PRIVATE PROPERTY YARDS & TREES.

Stream is(12): Aggrading _____ Degrading _____ Static

Channel Migration Tendency(13): SLIGHT TENDENCY FOR AN EAST/SOUTHEAST MIGRATION.

Observations and Other Comments: CREEK LEVEL ROSE & FELL APP. 7' DURING THIS SPRINGS' INVESTIGATION.

DESIGN SCOUR ELEVATIONS(14)

Feet Meters _____

	BENTS										
	EB1	B1	B2	B3	EB2						
100 YR.	648	617	616	614	642						

Comparison of DSE to Hydraulics Unit theoretical scour:
 DESIGN SCOUR ELEVATIONS & HYDRAULICS' THEORETICAL SCOUR PREDICTIONS MATCH AT ALL BENTS. (Revision 4-29-11)

SOIL ANALYSIS RESULTS FROM CHANNEL BED AND BANK MATERIAL

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

Reported by: RW TODD
 C. Little 8-9-11

Date: 4/24/2010

33731.1.1 (B-4498)
DAVIDSON COUNTY
BRIDGE NO. 199 ON SR 1243 OVER ABBOTTS CREEK

B1-A PHOTOS



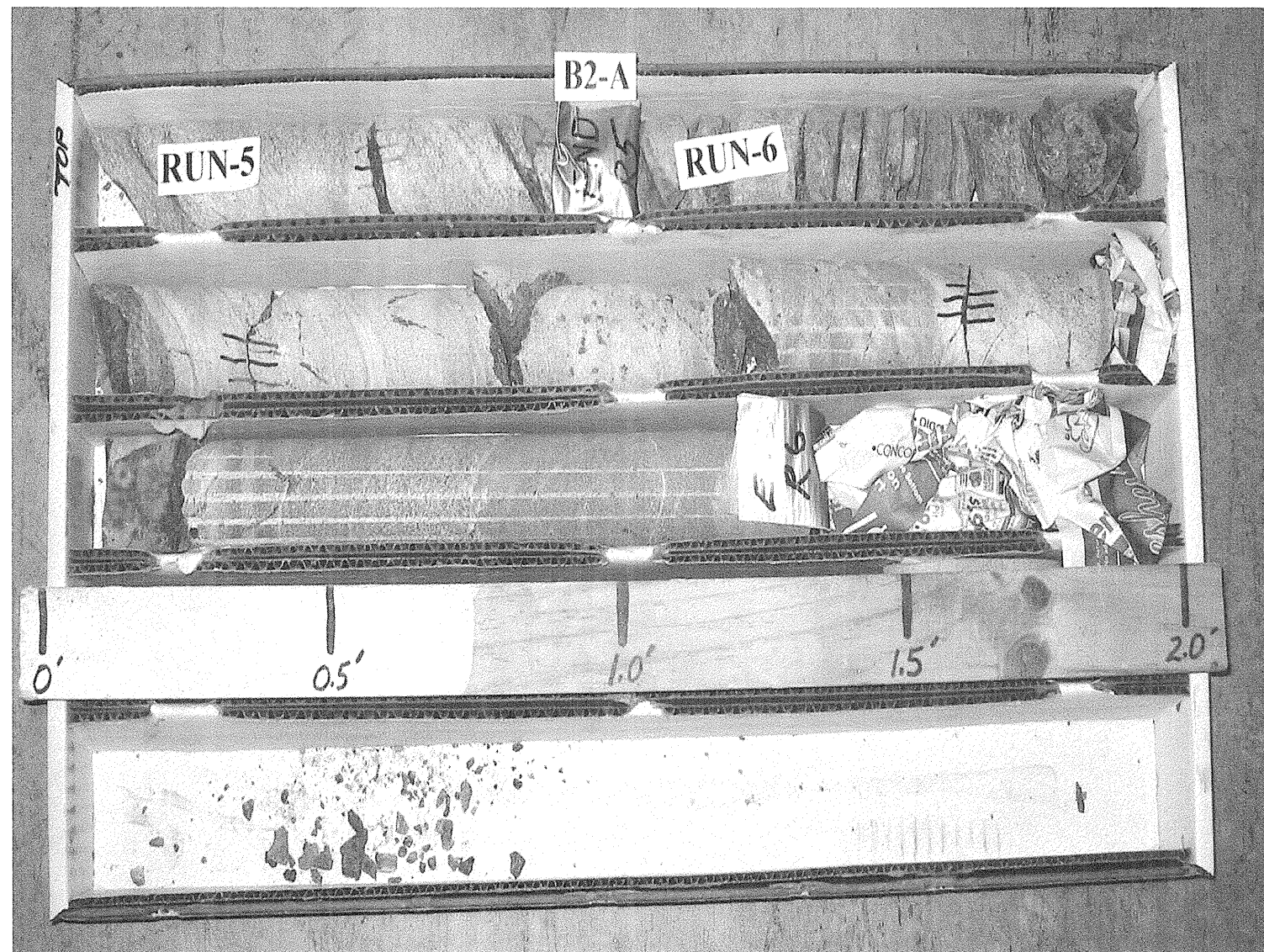
33731.1.1 (B-4498)
DAVIDSON COUNTY
BRIDGE NO.199 ON SR 1243 OVER ABBOTTS CREEK

B1-A & B2-A PHOTOS



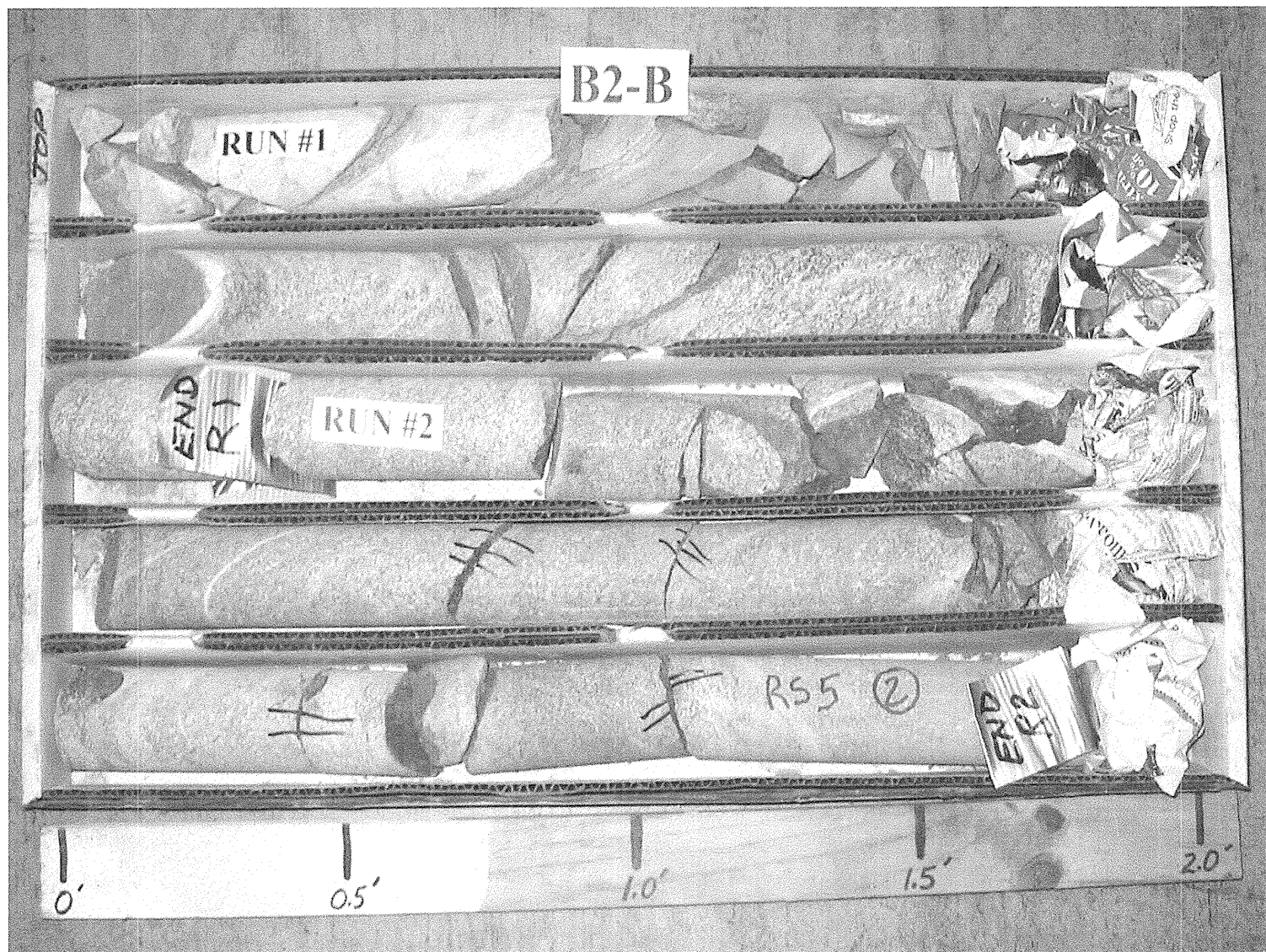
3373.1.1 (B-4498)
DAVIDSON COUNTY
BRIDGE NO. 199 ON SR 1243 OVER ABBOTTS CREEK

B2-A PHOTOS



33731.1.1 (B-4498)
DAVIDSON COUNTY
BRIDGE NO. 199 ON SR 1243 OVER ABBOTTS CREEK

B2-B PHOTOS



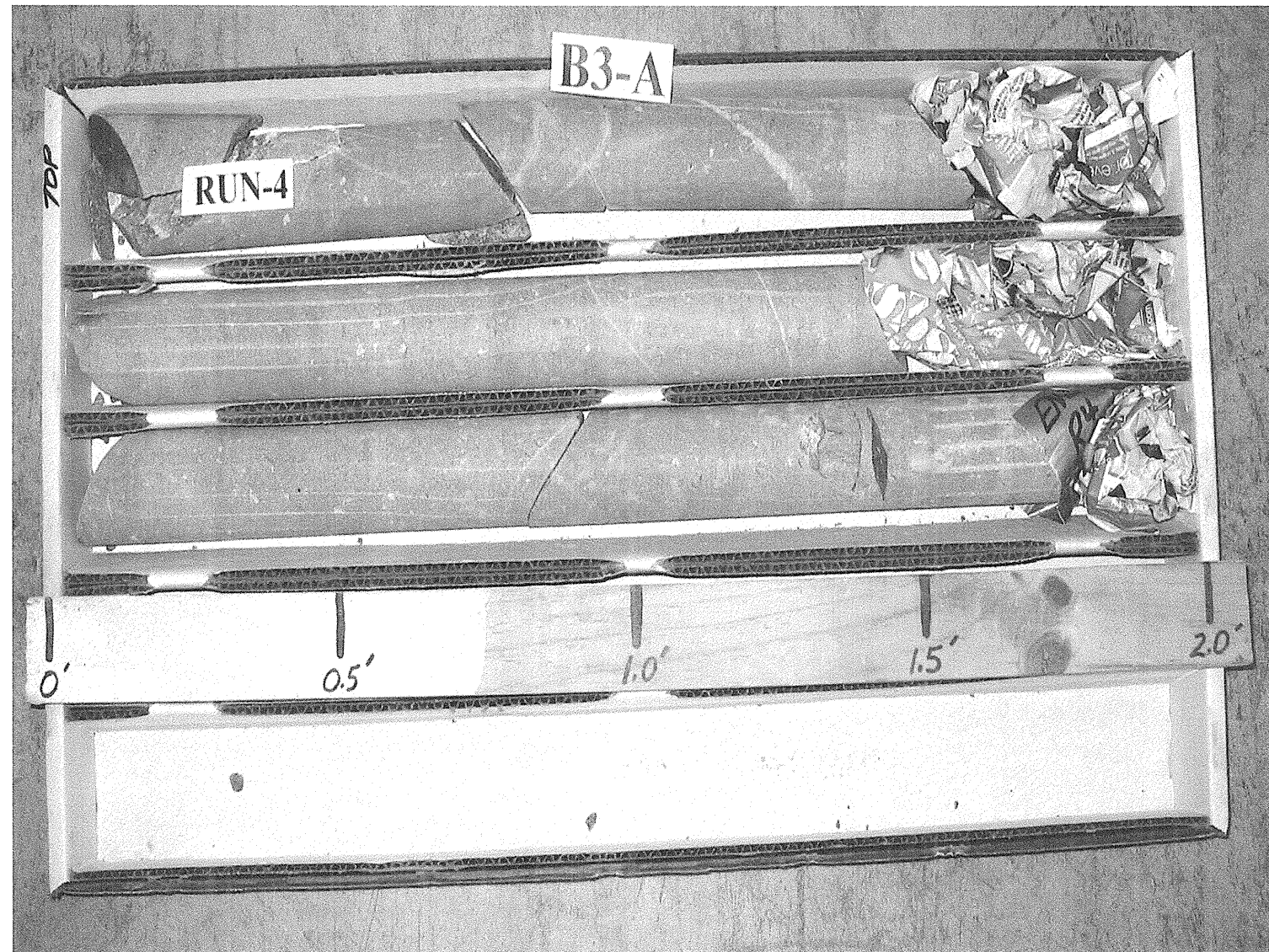
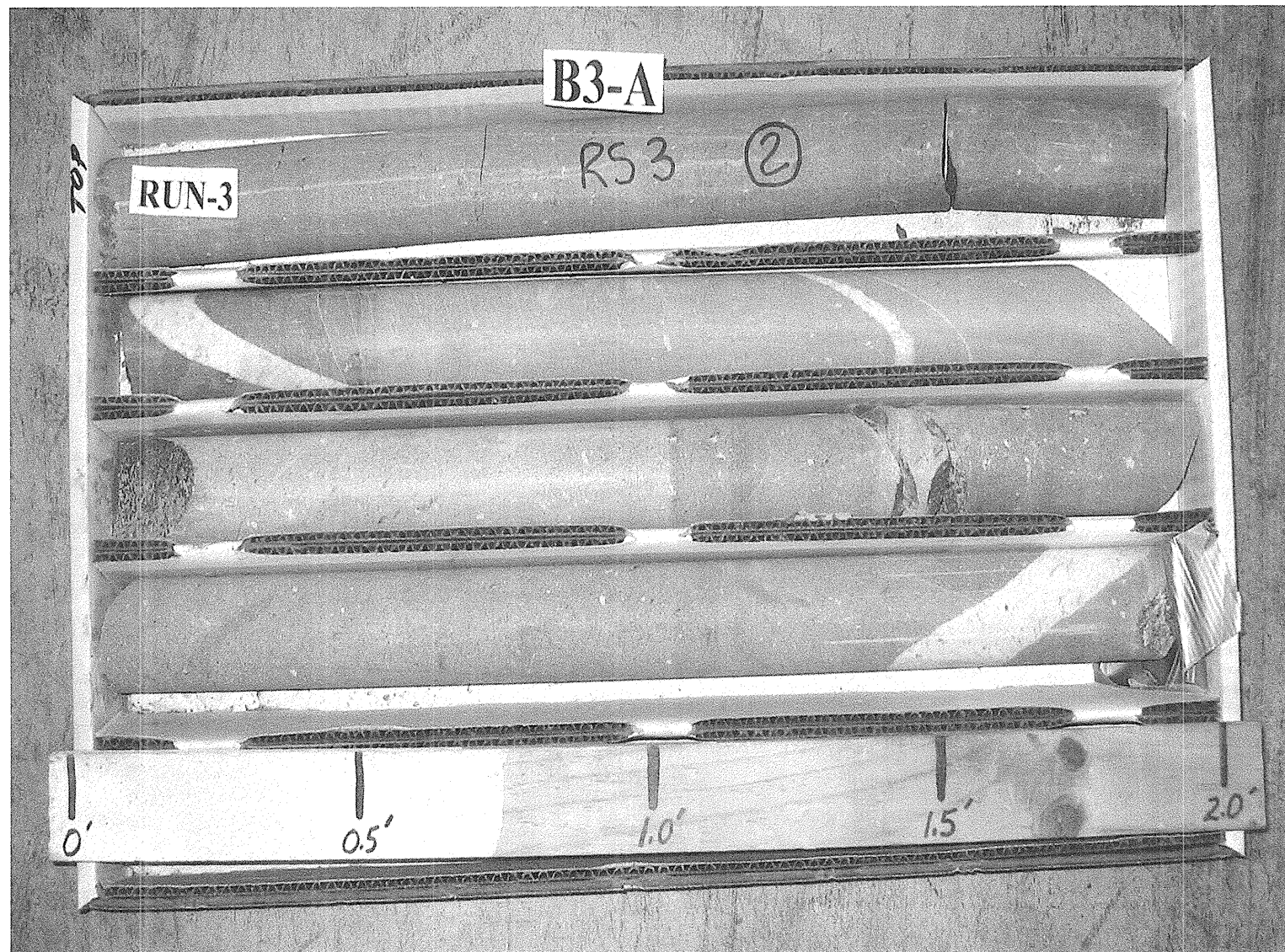
33731.1.1 (B-4498)
DAVIDSON COUNTY
BRIDGE NO. 199 ON SR 1243 OVER ABBOTTS CREEK

B2-B & B3-A PHOTOS



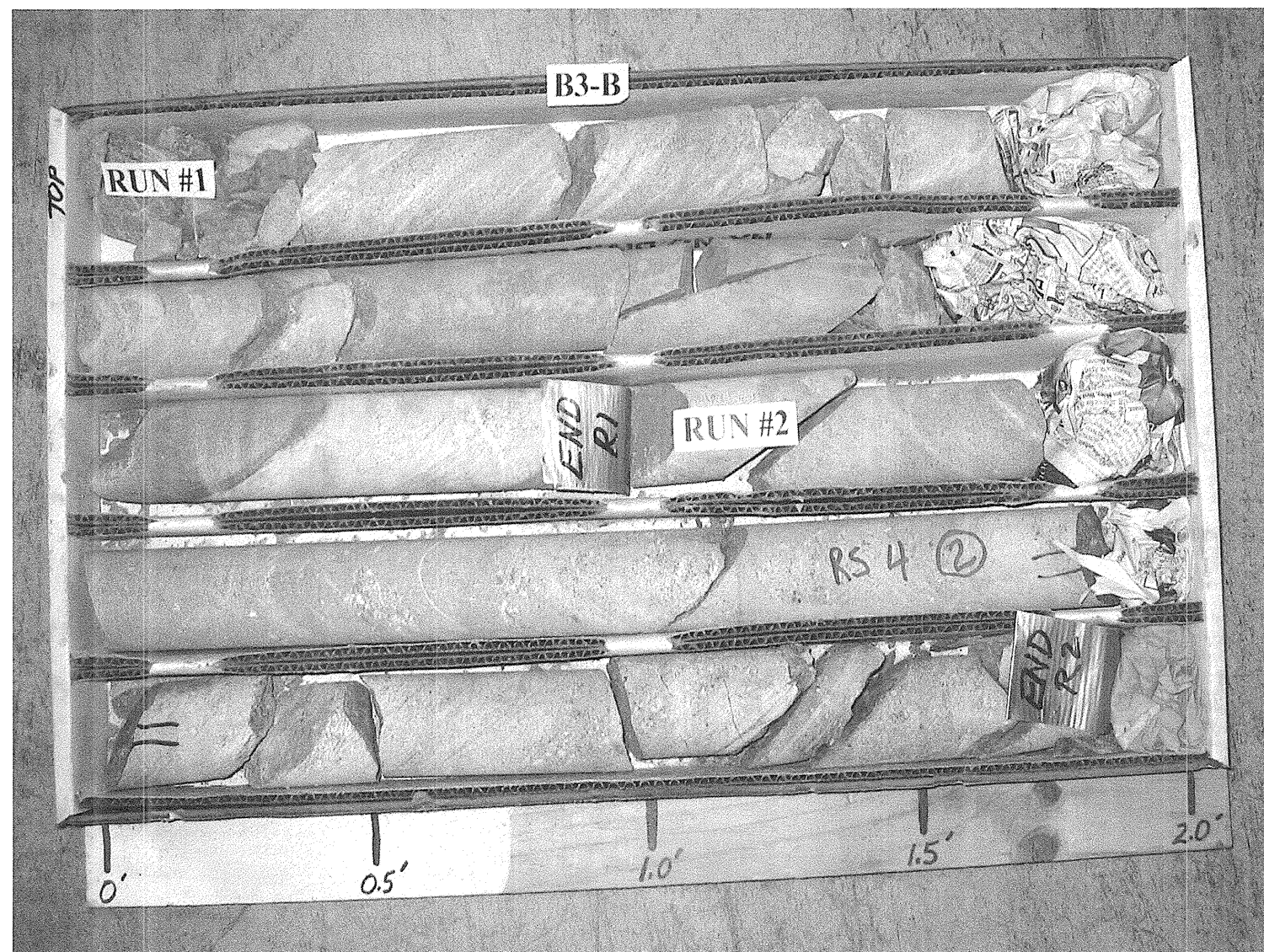
33731.1.1 (B-4498)
DAVIDSON COUNTY
BRIDGE NO. 199 ON SR 1243 OVER ABBOTTS CREEK

B3-A PHOTOS



33731.1.1 (B-4498)
DAVIDSON COUNTY
BRIDGE NO. 199 ON SR 1943 OVER ABBOTTS CREEK

B3-B PHOTOS



33731.1.1 (B-4498)
DAVIDSON COUNTY
BRIDGE NO. 199 ON SR 1943 OVER ABBOTTS CREEK

B3-B PHOTOS

