

PROJECT: 33716.1.1 ID: B-4467

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	33716.1.1 B-4467	1	11

CONTENTS

SHEET	DESCRIPTION
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4	PROFILE
5-6	CROSS SECTIONS
7-10	BORE LOG REPORTS
11	SCOUR REPORT

STRUCTURE  
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 33716.1.1 B-4467 F.A. PROJ. BRZ-1111(7)  
COUNTY CLAY  
PROJECT DESCRIPTION BRIDGE NO. 3 ON SR 1111 OVER  
BRASSTOWN 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 (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

M.M. HAGER

P.Q. LOCKAMY

D.O. CHEEK

G.K. ROSE

R.D. CHILDERS

INVESTIGATED BY J.W. MANN

CHECKED BY W.D. FRYE

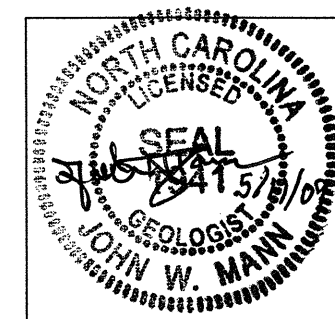
SUBMITTED BY W.D. FRYE

DATE 05/11/09

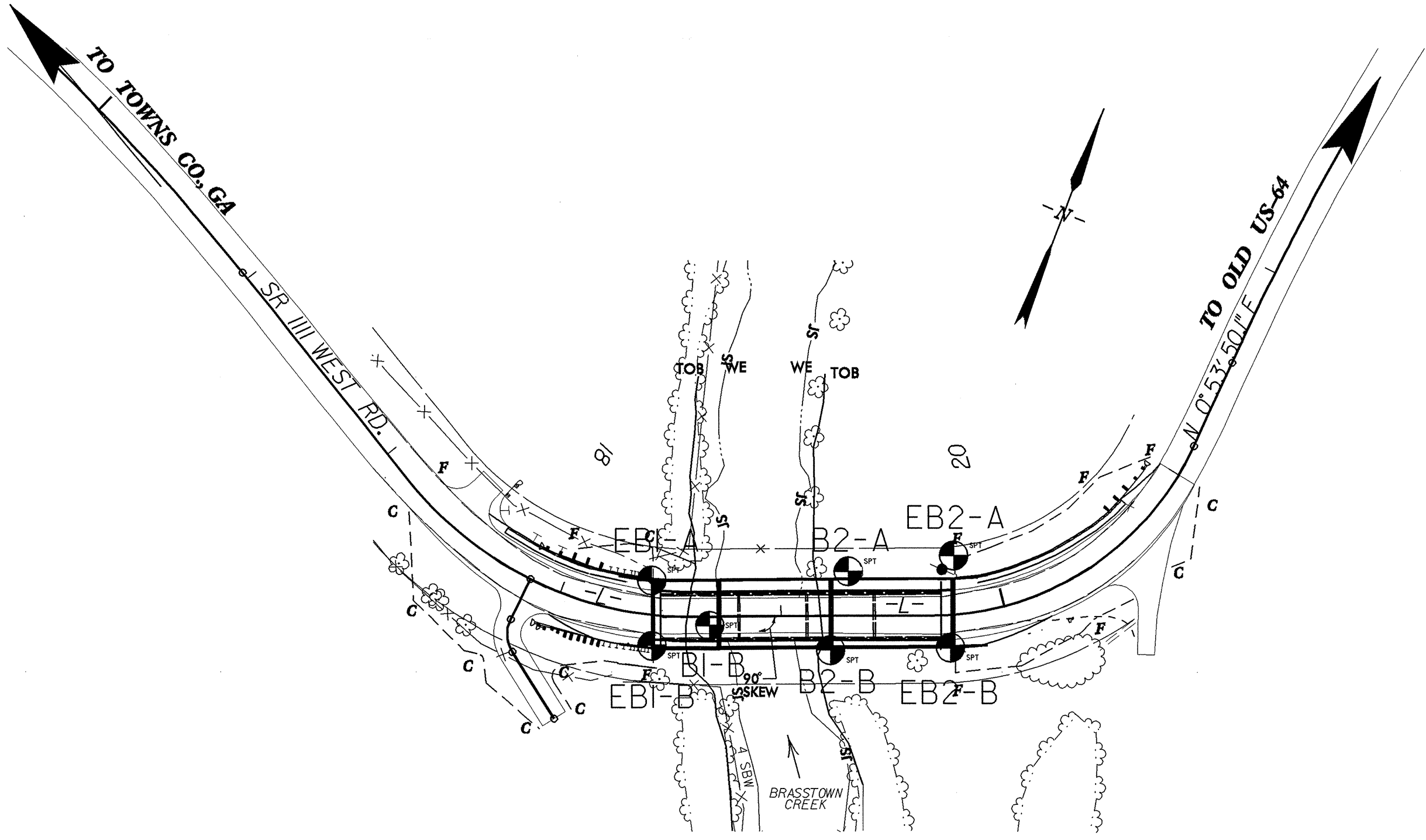
DRAWN BY: J.W. MANN

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.

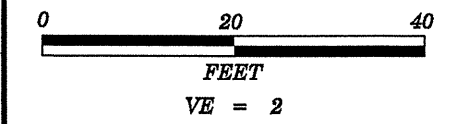
NOTE - BY HAVING REQUESTED THIS INFORMATION THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.







1730



PROJECT REFERENCE NO.	SHEET
33716.1.1 B-4467	4 OF 11
PROFILE 15' LT. OF -L-	

1720

1720

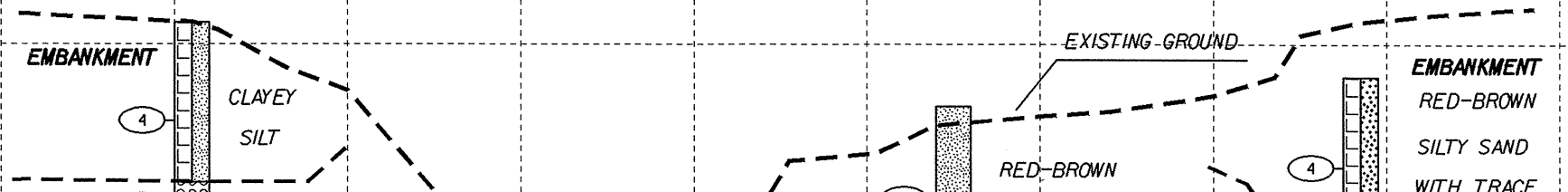
EB1-A  
18+42  
15 LT

B2-A  
19+30  
20 LT

EB2-A  
19+77  
26 LT

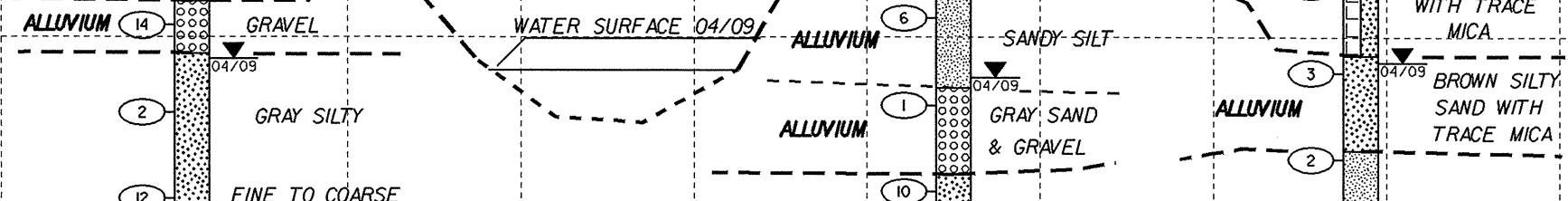
1710

1710



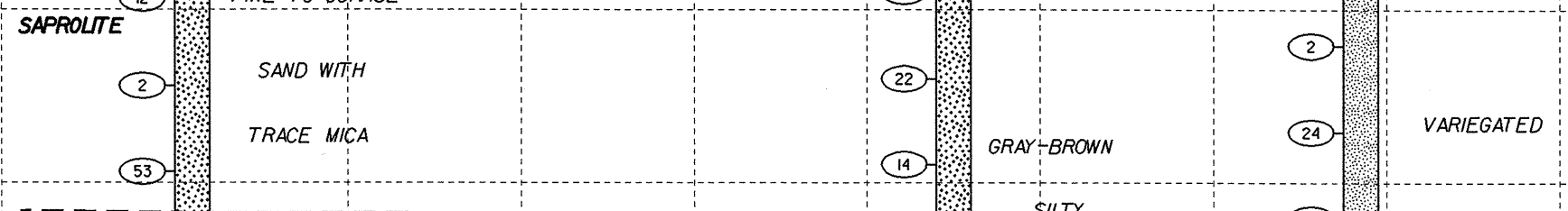
1700

1700



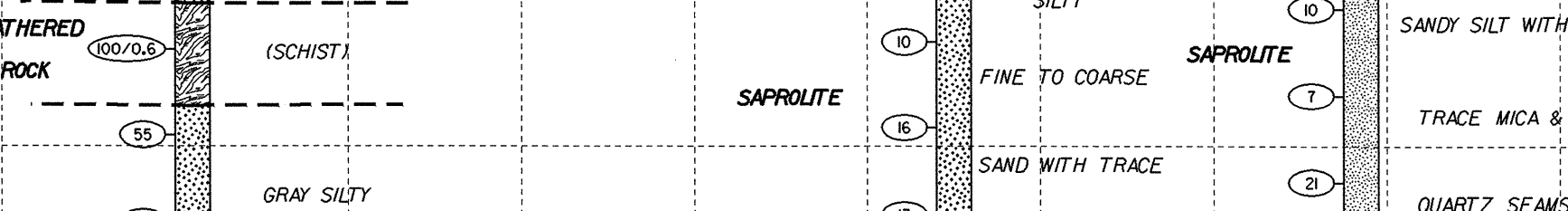
1690

1690



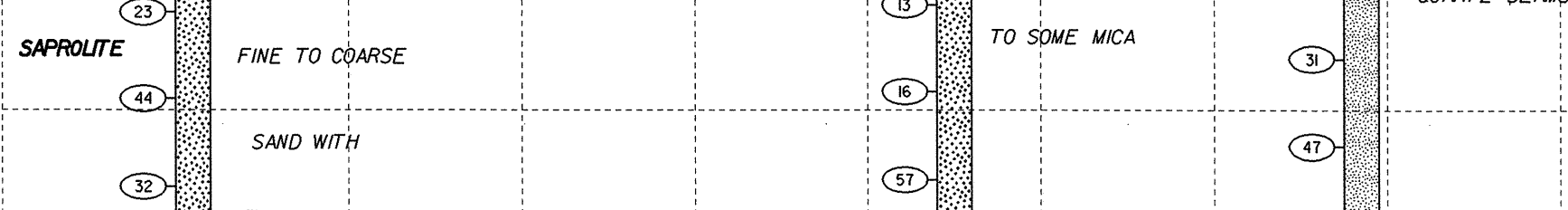
1680

1680



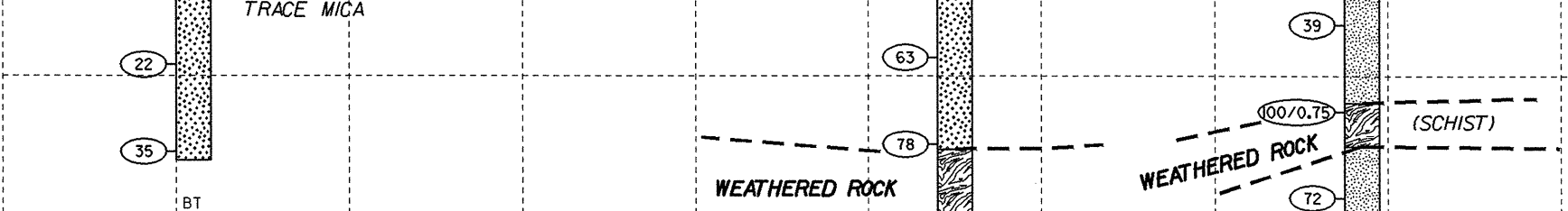
1670

1670



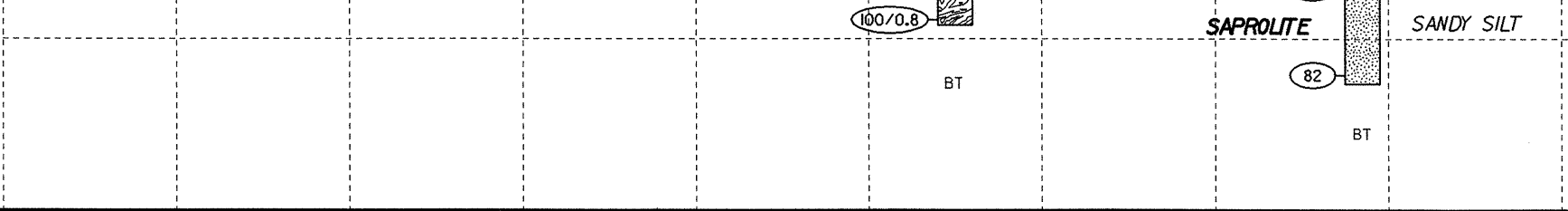
1660

1660



1650

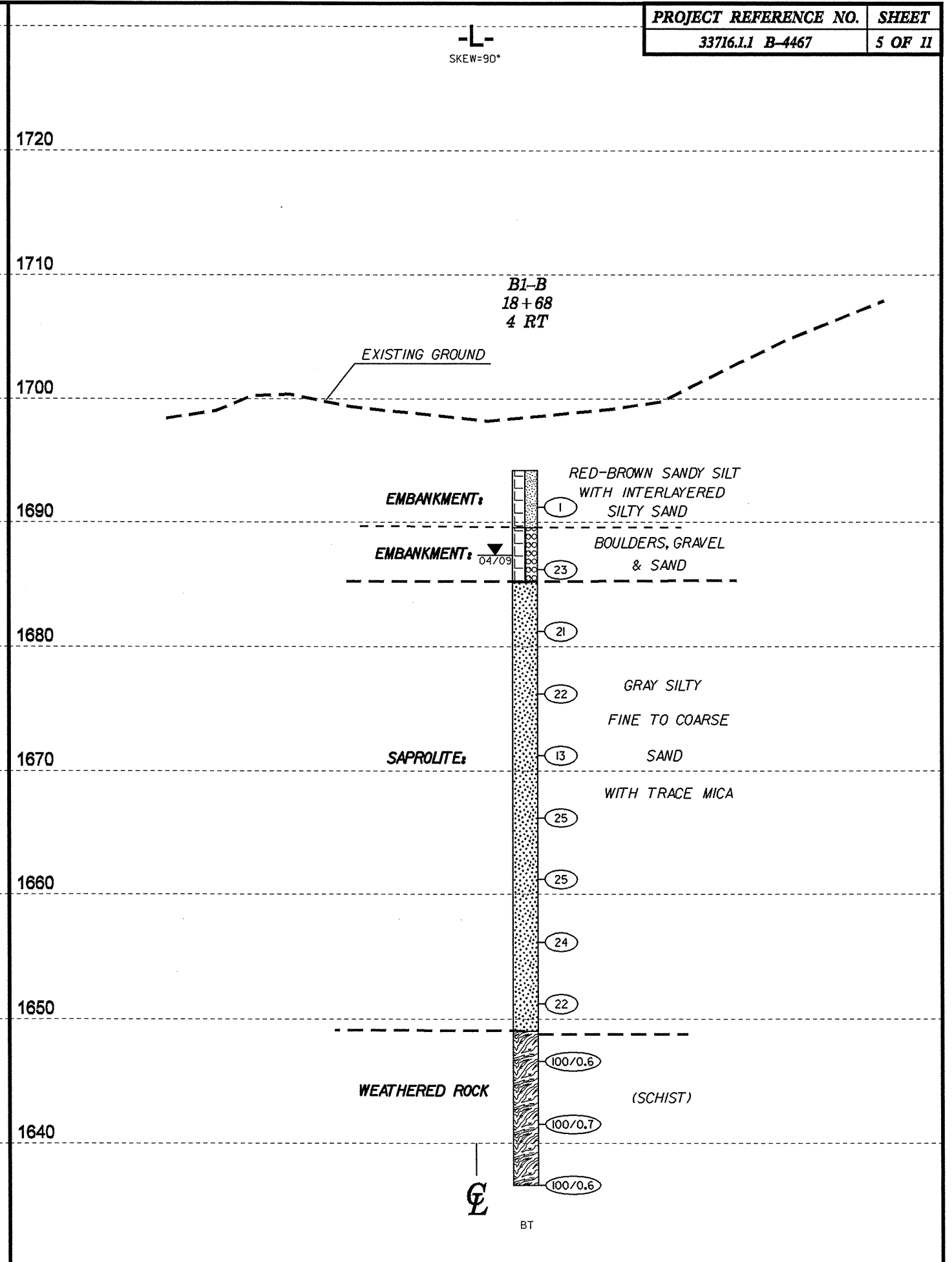
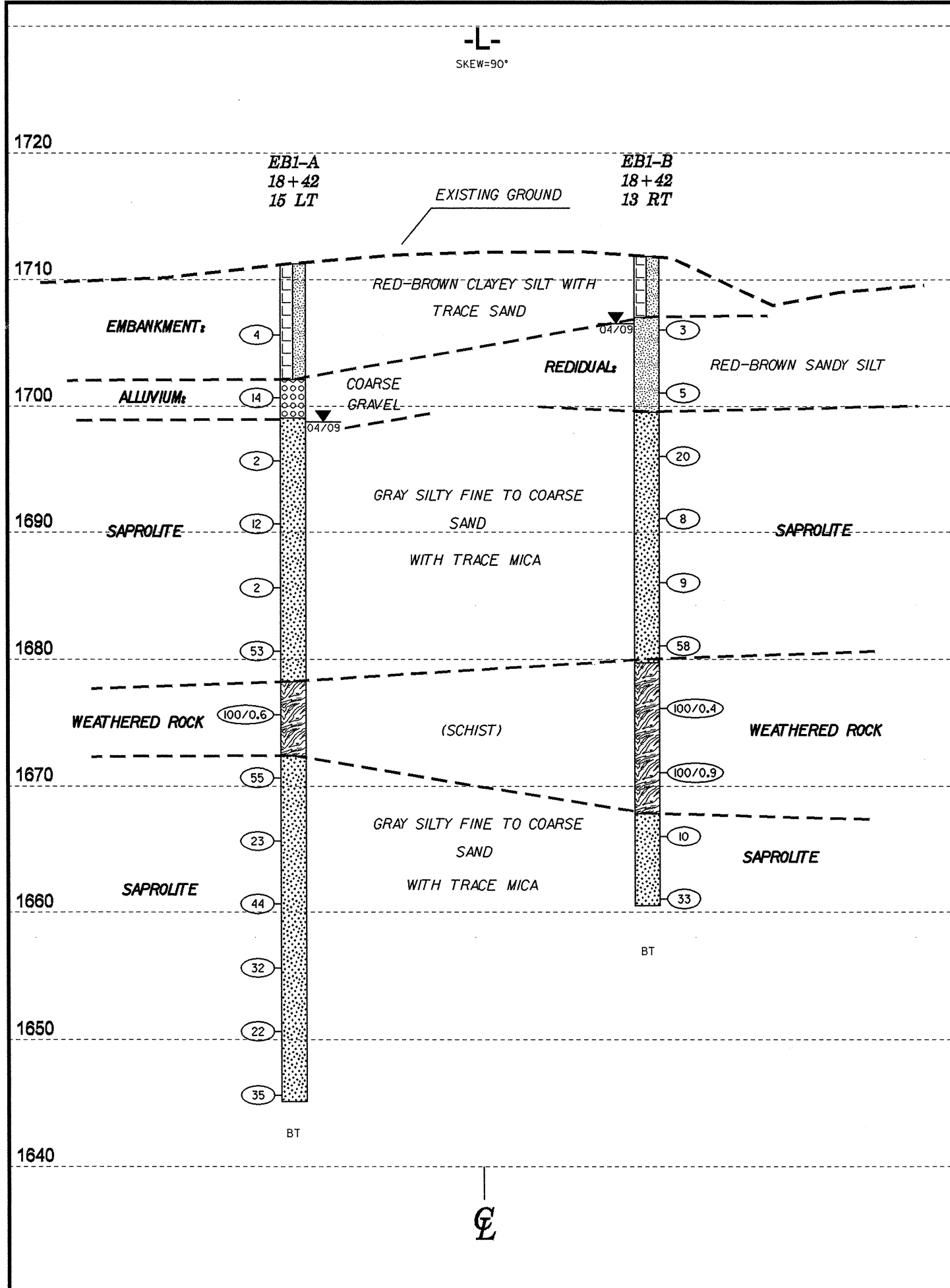
1650

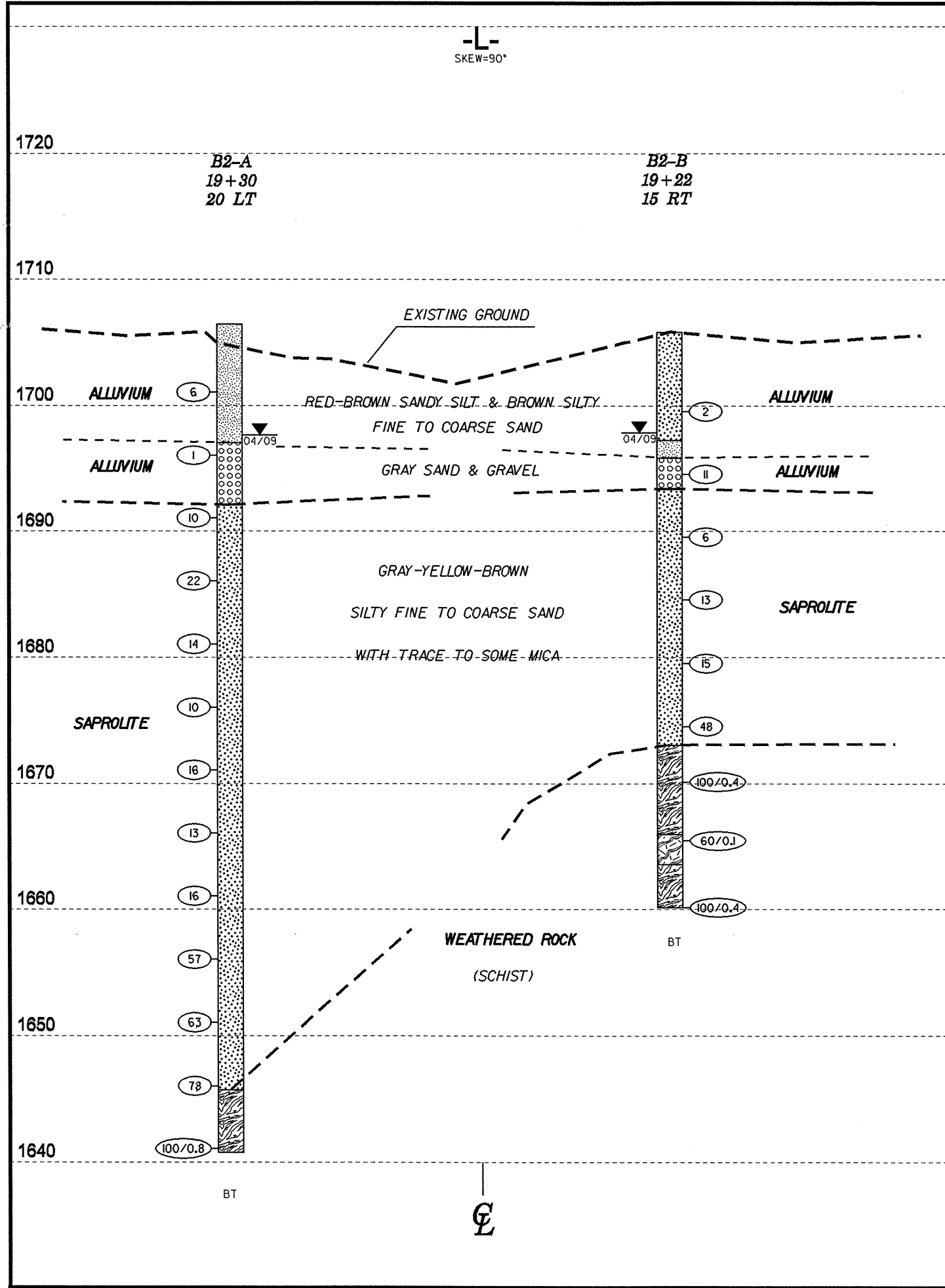


1640

1640

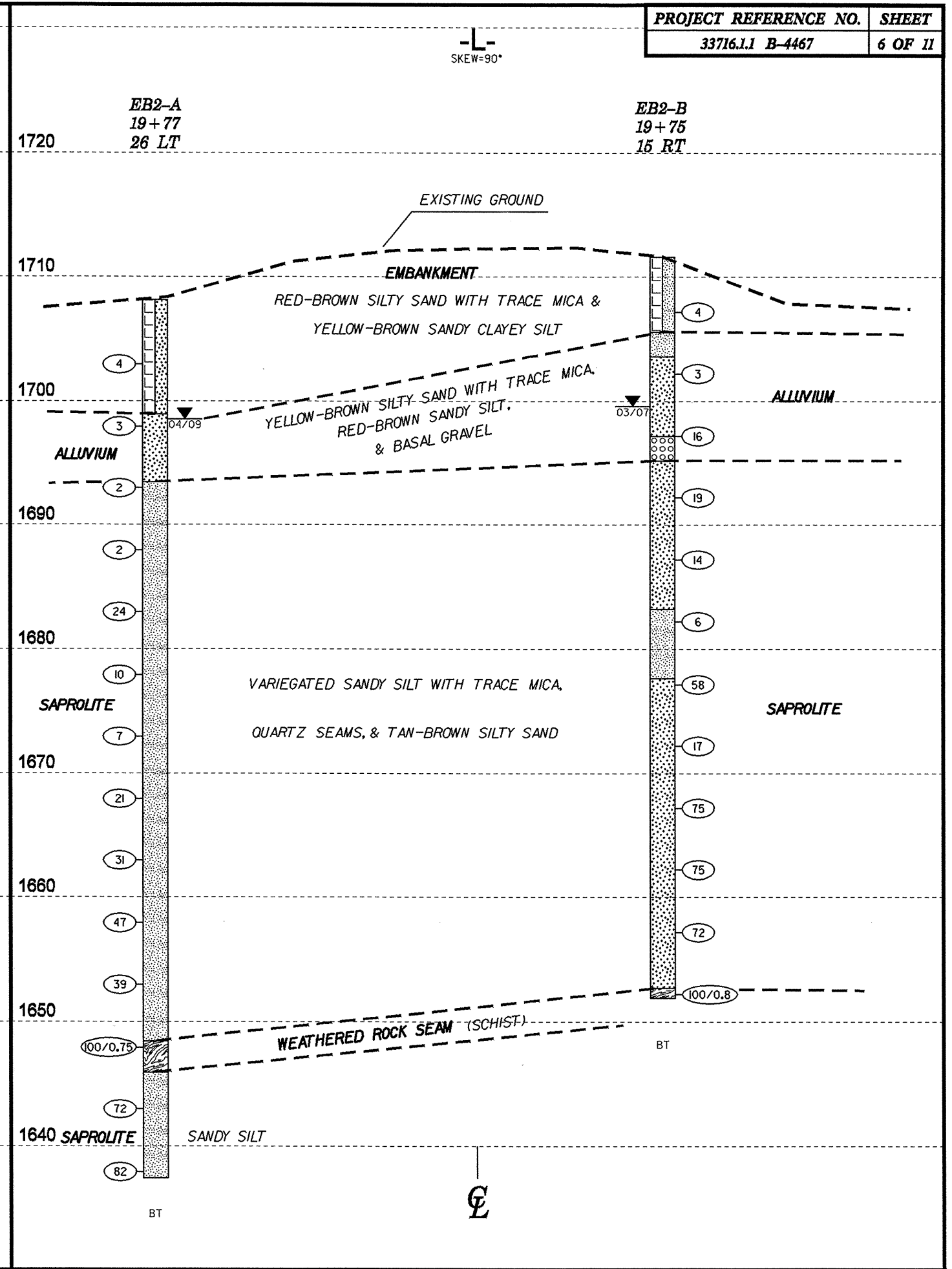
17+80 18+00 18+20 18+40 18+60 18+80 19+00 19+20 19+40 19+60 19+80 20+00 20+20 20+40





HORIZ. SCALE 0 10 20 (FEET) VE = 1

**SECTION THRU BENT TWO**



HORIZ. SCALE 0 10 (FEET) VE = 20

**SECTION THRU END BENT TWO**



PROJECT NO. 33716.1.1	ID. B-4467	COUNTY Clay	GEOLOGIST Hager, M. M.
SITE DESCRIPTION Bridge No. 3 on SR 1111 over Brasstown Creek			GROUND WTR (ft)
BORING NO. EB1-A	STATION 18+42	OFFSET 15ft LT	ALIGNMENT -L-
COLLAR ELEV. 1,711.2 ft	TOTAL DEPTH 66.1 ft	NORTHING 486,726	EASTING 534,509
DRILL MACHINE CME-550X	DRILL METHOD NW Casing w/ SPT	HAMMER TYPE Automatic	
START DATE 04/16/09	COMP. DATE 04/16/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
1715															
1710														1,711.2	0.0
1705	1,706.6	4.6	1	2	2										
1700	1,701.6	9.6	4	5	9									1,702.0	9.2
1695	1,696.6	14.6	1	1	1									1,699.0	12.2
1690	1,691.6	19.6	2	4	8										
1685	1,686.6	24.6	1	0	2										
1680	1,681.6	29.6	14	36	17										
1675	1,676.6	34.6	34	63	37/0.1										100/0.6
1670	1,671.6	39.6	27	36	19									1,672.3	38.9
1665	1,666.6	44.6	6	11	12										
1660	1,661.6	49.6	16	20	24										
1655	1,656.6	54.6	20	15	17										
1650	1,651.6	59.6	13	9	13										
1645	1,646.6	64.6	13	15	20										
1640															
1635															

PROJECT NO. 33716.1.1	ID. B-4467	COUNTY Clay	GEOLOGIST Hager, M. M.
SITE DESCRIPTION Bridge No. 3 on SR 1111 over Brasstown Creek			GROUND WTR (ft)
BORING NO. EB1-B	STATION 18+42	OFFSET 13ft RT	ALIGNMENT -L-
COLLAR ELEV. 1,711.8 ft	TOTAL DEPTH 51.3 ft	NORTHING 486,699	EASTING 534,521
DRILL MACHINE CME-550X	DRILL METHOD NW Casing w/ SPT	HAMMER TYPE Automatic	
START DATE 04/15/09	COMP. DATE 04/05/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
1715															
1710														1,711.8	0.0
1705	1,707.0	4.8	1	1	2									1,707.0	4.8
1700	1,702.0	9.8	1	2	3										
1695	1,697.0	14.8	4	8	12									1,699.5	12.3
1690	1,692.0	19.8	2	4	4										
1685	1,687.0	24.8	4	5	4										
1680	1,682.0	29.8	66	28	30										
1675	1,677.0	34.8	100/0.4												100/0.4
1670	1,672.0	39.8	46	54/0.4											100/0.9
1665	1,667.0	44.8	2	4	6										
1660	1,662.0	49.8	8	11	22										
1655															
1650															
1645															
1640															
1635															

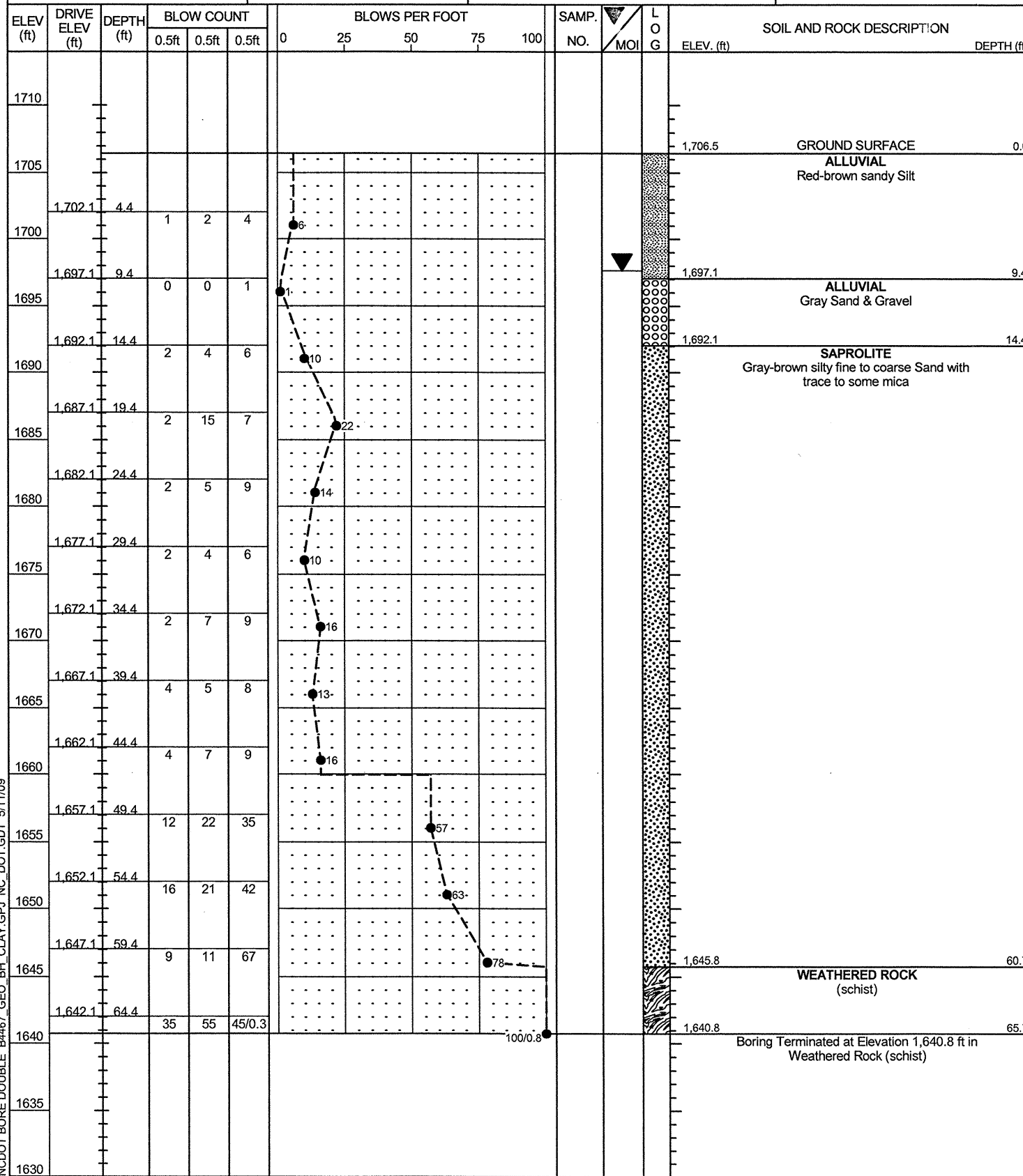
NCDOT BORE DOUBLE B4467\_GEO\_BH\_CLAY.GPJ NC\_DOT.GDT 5/11/09



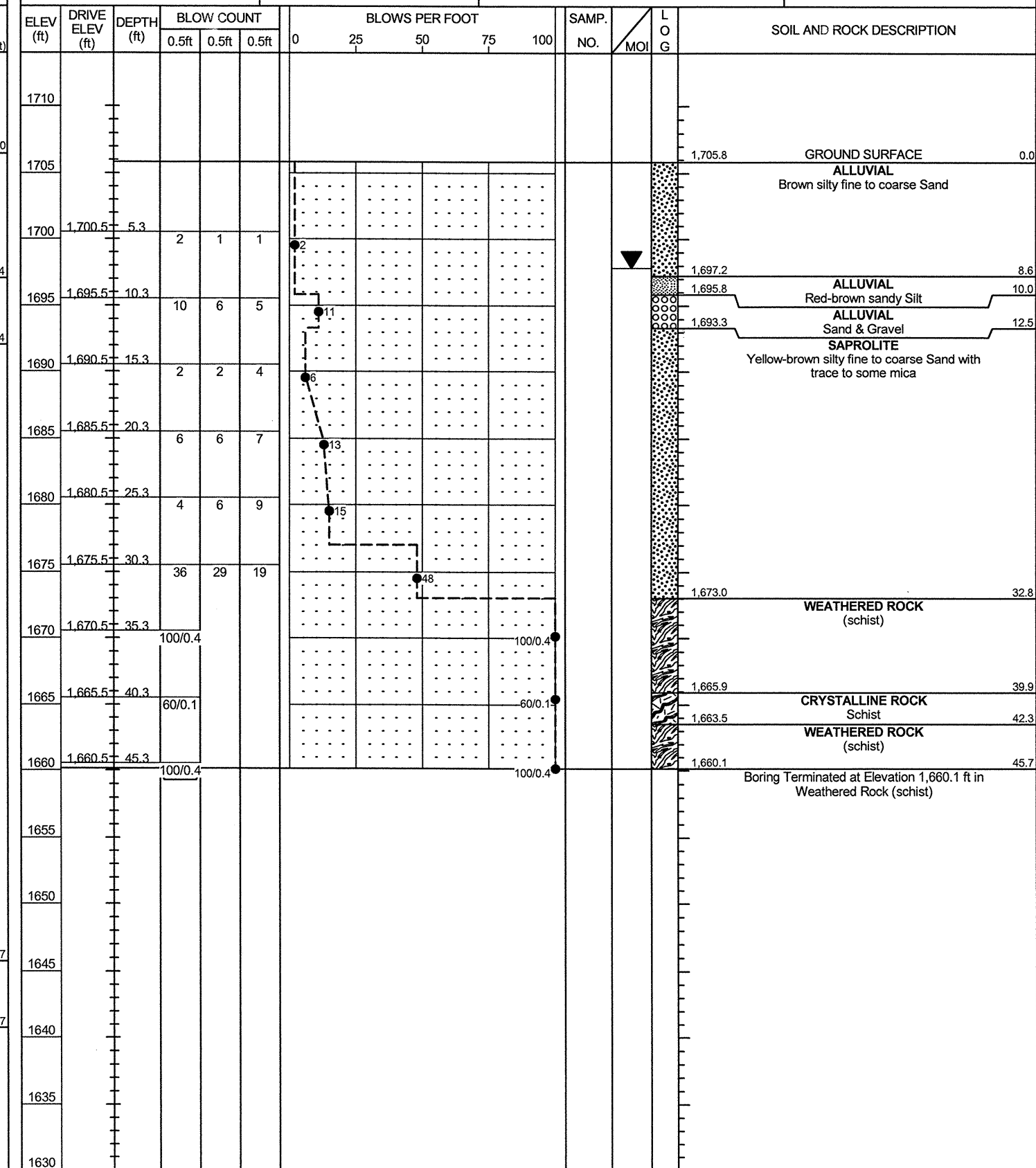




PROJECT NO. 33716.1.1	ID. B-4467	COUNTY Clay	GEOLOGIST Hager, M. M.
SITE DESCRIPTION Bridge No. 3 on SR 1111 over Brasstown Creek			GROUND WTR (ft)
BORING NO. B2-A	STATION 19+30	OFFSET 20ft LT	ALIGNMENT -L-
COLLAR ELEV. 1,706.5 ft	TOTAL DEPTH 65.7 ft	NORTHING 486,765	EASTING 534,588
DRILL MACHINE CME-550X	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
START DATE 04/06/09	COMP. DATE 04/06/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A



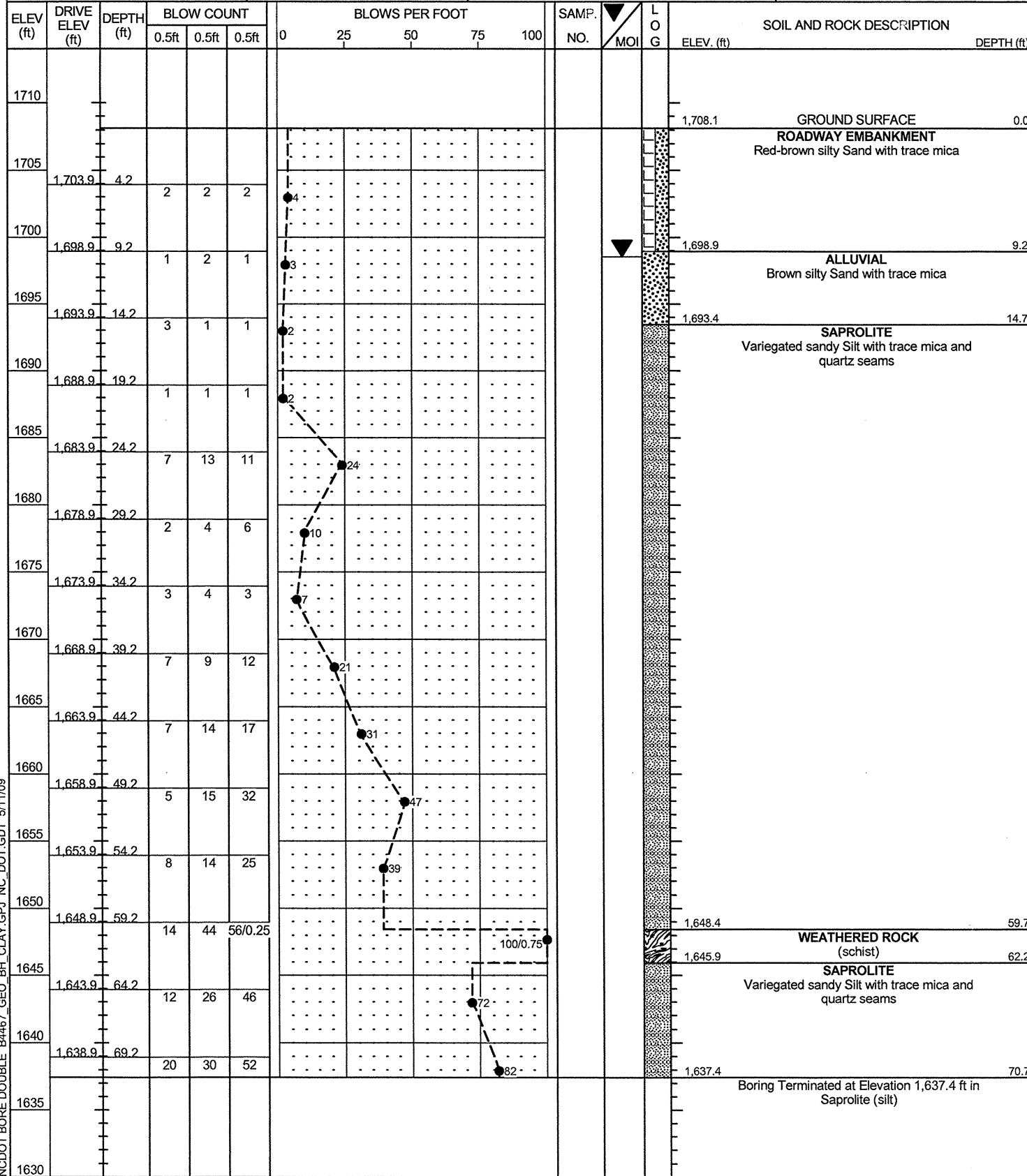
PROJECT NO. 33716.1.1	ID. B-4467	COUNTY Clay	GEOLOGIST Hager, M. M.
SITE DESCRIPTION Bridge No. 3 on SR 1111 over Brasstown Creek			GROUND WTR (ft)
BORING NO. B2-B	STATION 19+22	OFFSET 15ft RT	ALIGNMENT -L-
COLLAR ELEV. 1,705.8 ft	TOTAL DEPTH 45.7 ft	NORTHING 486,729	EASTING 534,595
DRILL MACHINE CME-550X	DRILL METHOD NW Casing w/ SPT	HAMMER TYPE Automatic	
START DATE 04/15/09	COMP. DATE 04/15/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 39.9 ft



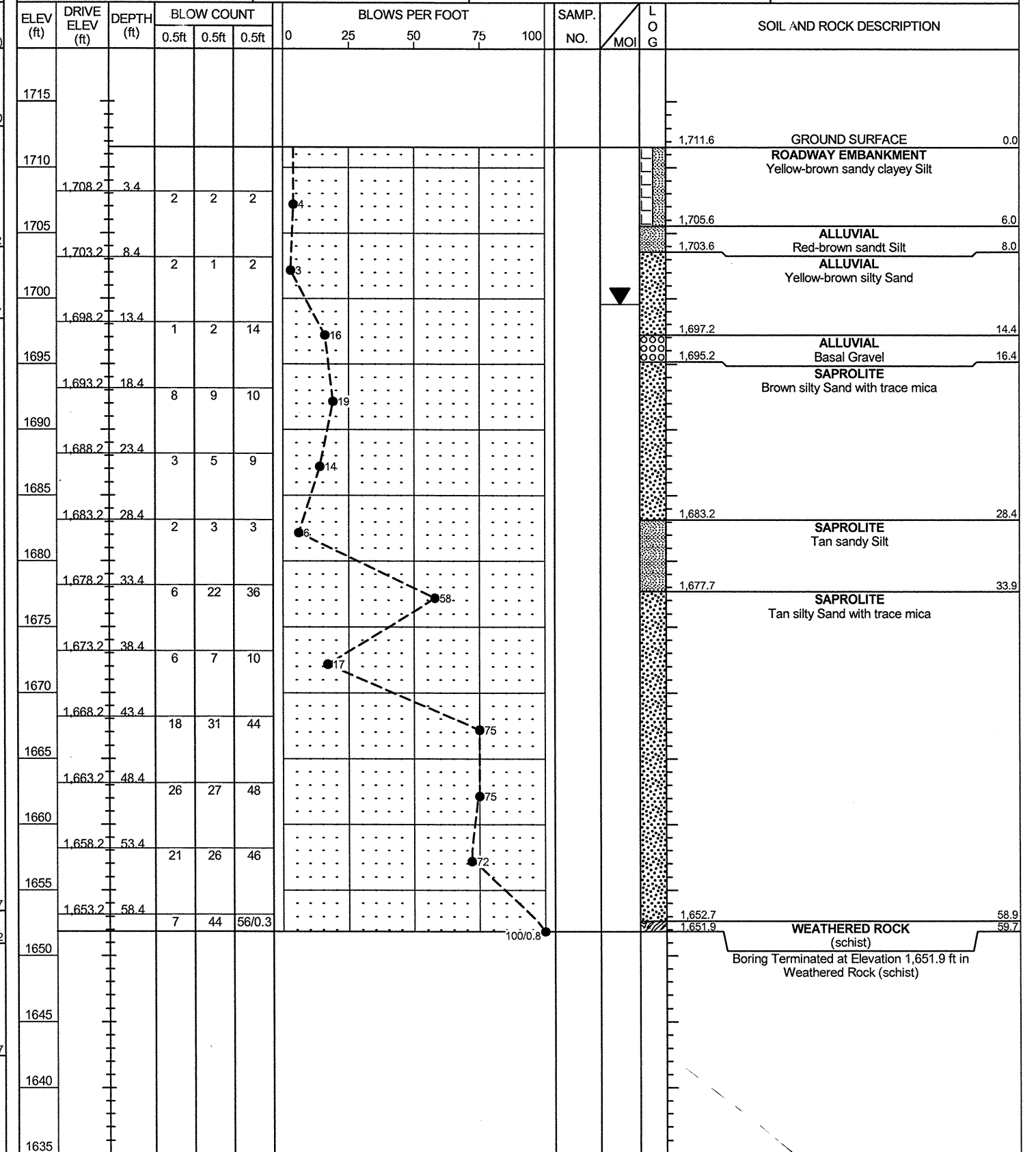
NCDOT BORE DOUBLE B4467\_GEO\_BH\_CLAY.GPJ\_NC\_DOT.GDT\_5/11/09



PROJECT NO. 33716.1.1	ID. B-4467	COUNTY Clay	GEOLOGIST Mann, J. W.
SITE DESCRIPTION Bridge No. 3 on SR 1111 over Brasstown Creek			GROUND WTR (ft)
BORING NO. EB2-A	STATION 19+77	OFFSET 26ft LT	ALIGNMENT -L-
COLLAR ELEV. 1,708.1 ft	TOTAL DEPTH 70.7 ft	NORTHING 486,790	EASTING 534,628
DRILL MACHINE CME-550X	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
START DATE 04/08/09	COMP. DATE 04/08/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A



PROJECT NO. 33716.1.1	ID. B-4467	COUNTY Clay	GEOLOGIST Lockamy, P. Q.
SITE DESCRIPTION Bridge No. 3 on SR 1111 over Brasstown Creek			GROUND WTR (ft)
BORING NO. EB2-B	STATION 19+75	OFFSET 15ft RT	ALIGNMENT -L-
COLLAR ELEV. 1,711.6 ft	TOTAL DEPTH 59.7 ft	NORTHING 486,752	EASTING 534,643
DRILL MACHINE CME-550X	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
START DATE 03/28/07	COMP. DATE 03/28/07	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A



NCDOT BORE DOUBLE B4467\_GEO\_BH\_CLAY.GPJ\_NC\_DOT\_GDT\_5/11/09



# FIELD SCOUR REPORT

WBS: 33716.1.1 TIP: B-4467 COUNTY: CLAY

DESCRIPTION(1): Bridge No. 3 on SR 1111 over Brasstown Creek

### EXISTING BRIDGE

Information from: Field Inspection  Microfilm \_\_\_\_\_ (reel \_\_\_\_\_ pos: \_\_\_\_\_)  
 Other (explain) BSR dated Nov. 2008

Bridge No.: 3 Length: 125' Total Bents: 5 Bents in Channel: 2 Bents in Floodplain: 3  
 Foundation Type: \_\_\_\_\_

#### EVIDENCE OF SCOUR(2)

Abutments or End Bent Slopes: None noted.

Interior Bents: None noted.

Channel Bed: None noted

Channel Bank: Minor undercutting on both upstream banks.

#### EXISTING SCOUR PROTECTION

Type(3): Rock stacked vertical abutment from previous structure.

Extent(4): Located between End Bent 1 & Bent 1.

Effectiveness(5): Good protection for end bent.

Obstructions(6): None

#### INSTRUCTIONS

- 1 Describe the specific site's location, including route number and body of water crossed.
- 2 Note scour evidence at existing end bents or abutments (e.g. undermining, sloughing, degradations).
- 3 Note existing scour protection (e.g. rip rap).
- 4 Describe extent of existing scour protection.
- 5 Describe whether or not the scour protection appears to be working.
- 6 Note obstructions such as dams, fallen trees, debris at bents, etc.
- 7 Describe the channel bed material based on observation and/or samples. Include any lab results with report.
- 8 Describe the channel bank material based on observation and/or samples. Include any lab results with report.
- 9 Describe the material covering the banks (e.g. grass, trees, rip rap, none).
- 10 Determine the approximate floodplain width from field observation or a topographic map.
- 11 Describe the material covering the floodplain (e.g. grass, trees, crops).
- 12 Use professional judgement to specify if the stream is degrading, aggrading, or static.
- 13 Describe potential and direction of the stream to migrate laterally during the bridge's life (approx. 100 years).
- 14 Give the design scour elevation (DSE) expected over the life of the bridge (approx. 100 years). This elevation can be given as a range across the site, or for each bent. Discuss the relationship between the Hydraulics Unit theoretical scour and the DSE. If the DSE is dependent on scour counter measures, explain (e.g. rip rap armoring on slopes). The DSE is based on the erodability of materials, giving consideration to the influence of joints, foliation, bedding characteristics, % core recovery, % RQD, differential weathering, shear strength, observations at existing structures, other tests deemed appropriate, and overall geologic conditions at the site.

### DESIGN INFORMATION

Channel Bed Material(7): Boulders, cobbles, silt & sand

Channel Bank Material(8): Silt & sand

Channel Bank Cover(9): Trees, shrubbery

Floodplain Width(10): ~1000 ft.

Floodplain Cover(11): \_\_\_\_\_

Stream is(12): Aggrading \_\_\_\_\_ Degrading  Static \_\_\_\_\_

Channel Migration Tendency(13): Toward interior Bent 1.

Observations and Other Comments: \_\_\_\_\_

#### DESIGN SCOUR ELEVATIONS(14)

Feet  Meters \_\_\_\_\_

#### BENTS

B1	B2								
1693	1695.5								

Comparison of DSE to Hydraulics Unit theoretical scour:  
 DSE in agreement with BSR dated November, 2008.

#### SOIL ANALYSIS RESULTS FROM CHANNEL BED AND BANK MATERIAL

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

Reported by: J.W. Mann Date: 3/21/2009