

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

**STRUCTURE
SUBSURFACE INVESTIGATION**

CONTENTS

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PROJ. REFERENCE NO. 38396.1.1 (B-4507) F.A. PROJ. _____
 COUNTY FORSYTH
 PROJECT DESCRIPTION BRIDGES 221 & 222 OVER MUDDY CREEK
ON US 421

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.

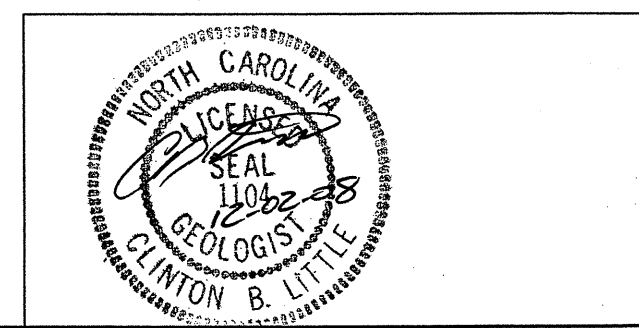
GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND 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.

PROJECT: 38396.1.1 ID: B-4507

PERSONNEL
J.K. STICKNEY
G.L. SMITH
M.D. MAULDIN

INVESTIGATED BY G.B. LITTLE
 CHECKED BY G.B. LITTLE
 SUBMITTED BY G.B. LITTLE
 DATE DECEMBER 2008



DRAWN BY: J.K. McCLURE

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.

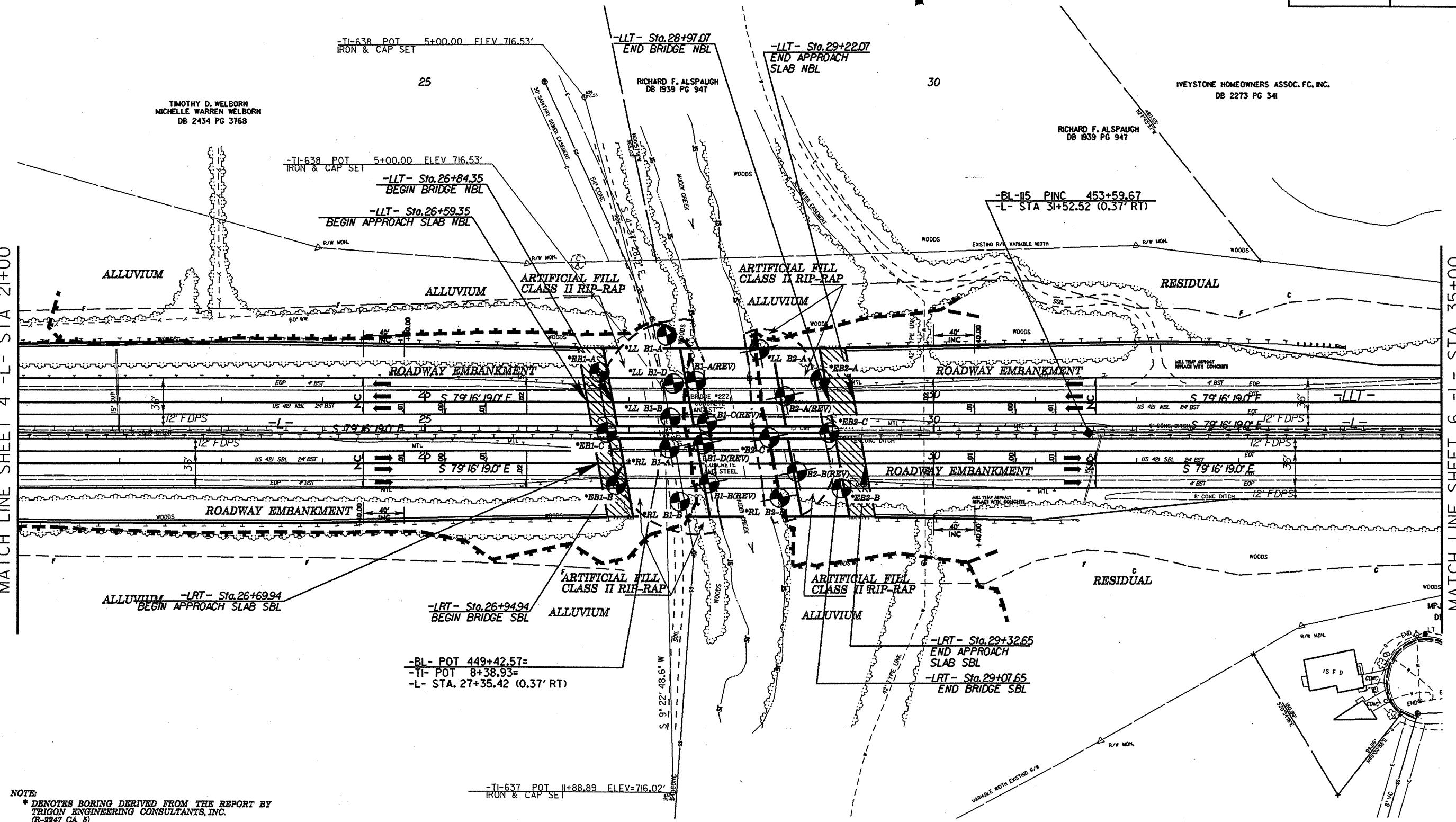
NOTE - BY HAVING REQUESTED THIS INFORMATION THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

8/17/99

PROJECT REFERENCE NO. B-4507	SHEET NO. 53
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

MATCH LINE SHEET 4 - L - STA 21+00

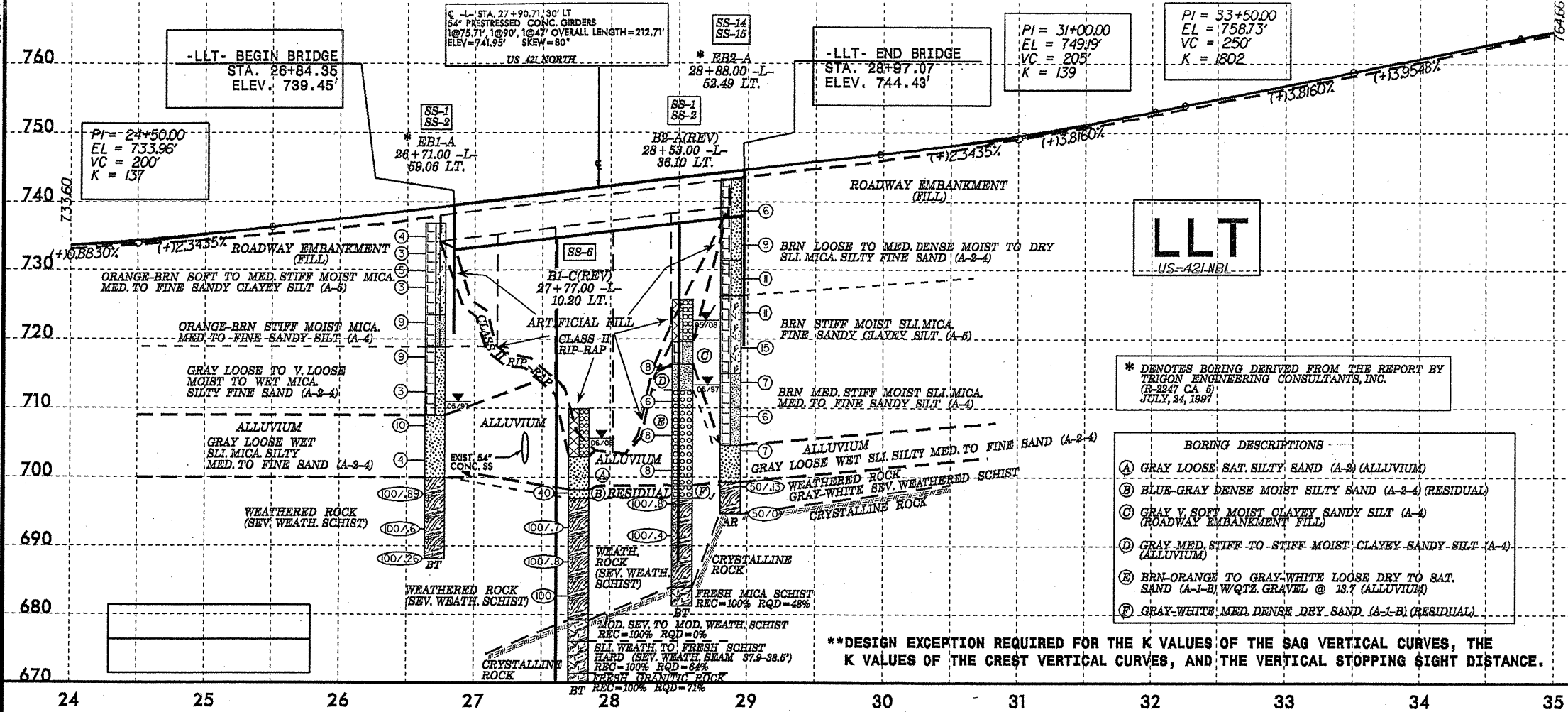
MATCH LINE SHEET 6 - L - STA 35+00



NOTE:
 * DENOTES BORING DERIVED FROM THE REPORT BY
 TRIGON ENGINEERING CONSULTANTS, INC.
 (R-2247 CA 5)
 JULY 24, 1997

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REVISIONS



LLT
US-421 NBL

* DENOTES BORING DERIVED FROM THE REPORT BY TRIGON ENGINEERING CONSULTANTS, INC. (B-2247 CA 5) JULY, 24, 1997

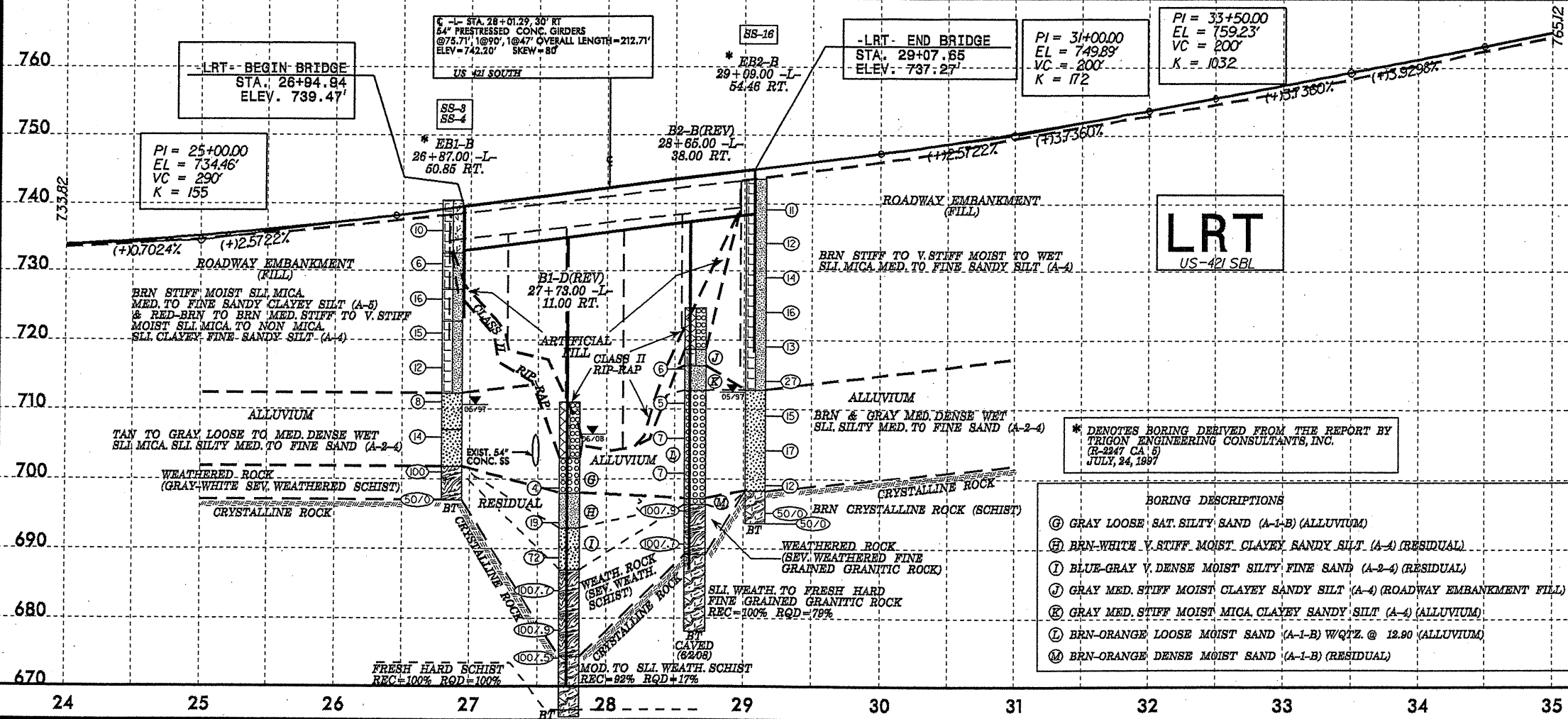
BORING DESCRIPTIONS

- (A) GRAY LOOSE SAT. SILTY SAND (A-2) (ALLUVIUM)
- (B) BLUE-GRAY DENSE MOIST SILTY SAND (A-2-4) (RESIDUAL)
- (C) GRAY V. SOFT MOIST CLAYEY SANDY SILT (A-4) (ROADWAY EMBANKMENT FILL)
- (D) GRAY MED. STIFF TO - STIFF MOIST CLAYEY SANDY SILT (A-4) (ALLUVIUM)
- (E) BRN-ORANGE TO GRAY-WHITE LOOSE DRY TO SAT. SAND (A-1-B) W/QTZ. GRAVEL @ 13.7 (ALLUVIUM)
- (F) GRAY-WHITE MED. DENSE DRY SAND (A-1-B) (RESIDUAL)

STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	= 10,000	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 721.43	FT
BASE DISCHARGE	= 12,000	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 722.44	FT
OVERTOPPING DISCHARGE	= N/A	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 732.94	FT

**DESIGN EXCEPTION REQUIRED FOR THE K VALUES OF THE SAG VERTICAL CURVES, THE K VALUES OF THE CREST VERTICAL CURVES, AND THE VERTICAL STOPPING SIGHT DISTANCE.



LRT
US-421 SBL

* DENOTES BORING DERIVED FROM THE REPORT BY TRIGON ENGINEERING CONSULTANTS, INC. (B-2247 CA 5) JULY, 24, 1997

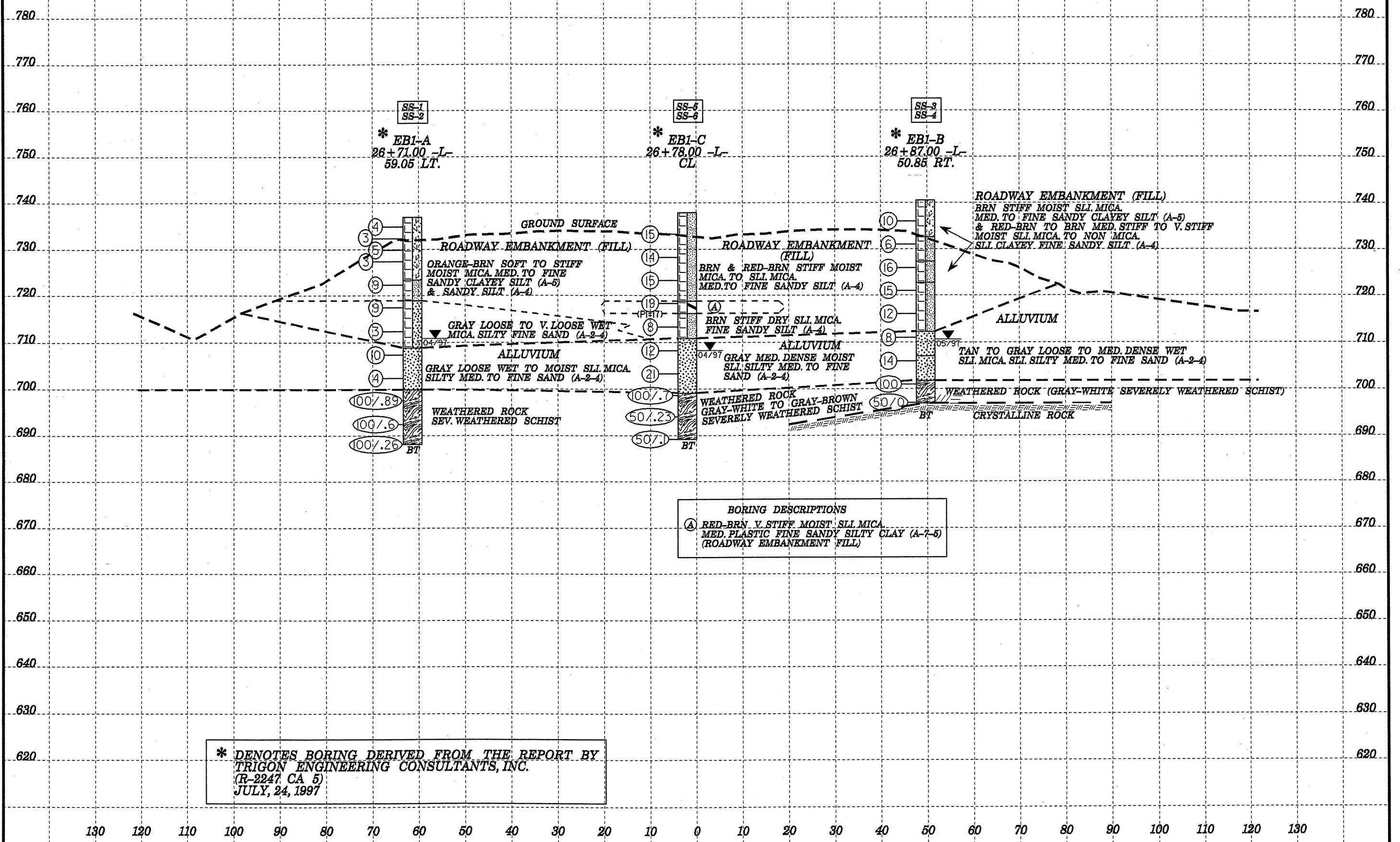
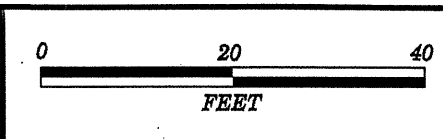
BORING DESCRIPTIONS

- (A) GRAY LOOSE SAT. SILTY SAND (A-1-B) (ALLUVIUM)
- (B) BRN-WHITE V. STIFF MOIST CLAYEY SANDY SILT (A-4) (RESIDUAL)
- (C) BLUE-GRAY V. DENSE MOIST SILTY FINE SAND (A-2-4) (RESIDUAL)
- (D) GRAY MED. STIFF MOIST CLAYEY SANDY SILT (A-4) (ROADWAY EMBANKMENT FILL)
- (E) GRAY MED. STIFF MOIST MICA CLAYEY SANDY SILT (A-4) (ALLUVIUM)
- (F) BRN-ORANGE LOOSE MOIST SAND (A-1-B) W/QTZ @ 12.90 (ALLUVIUM)
- (G) BRN-ORANGE DENSE MOIST SAND (A-1-B) (RESIDUAL)

STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	= 10,000	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 721.43	FT
BASE DISCHARGE	= 12,000	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 722.44	FT
OVERTOPPING DISCHARGE	= N/A	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 732.94	FT

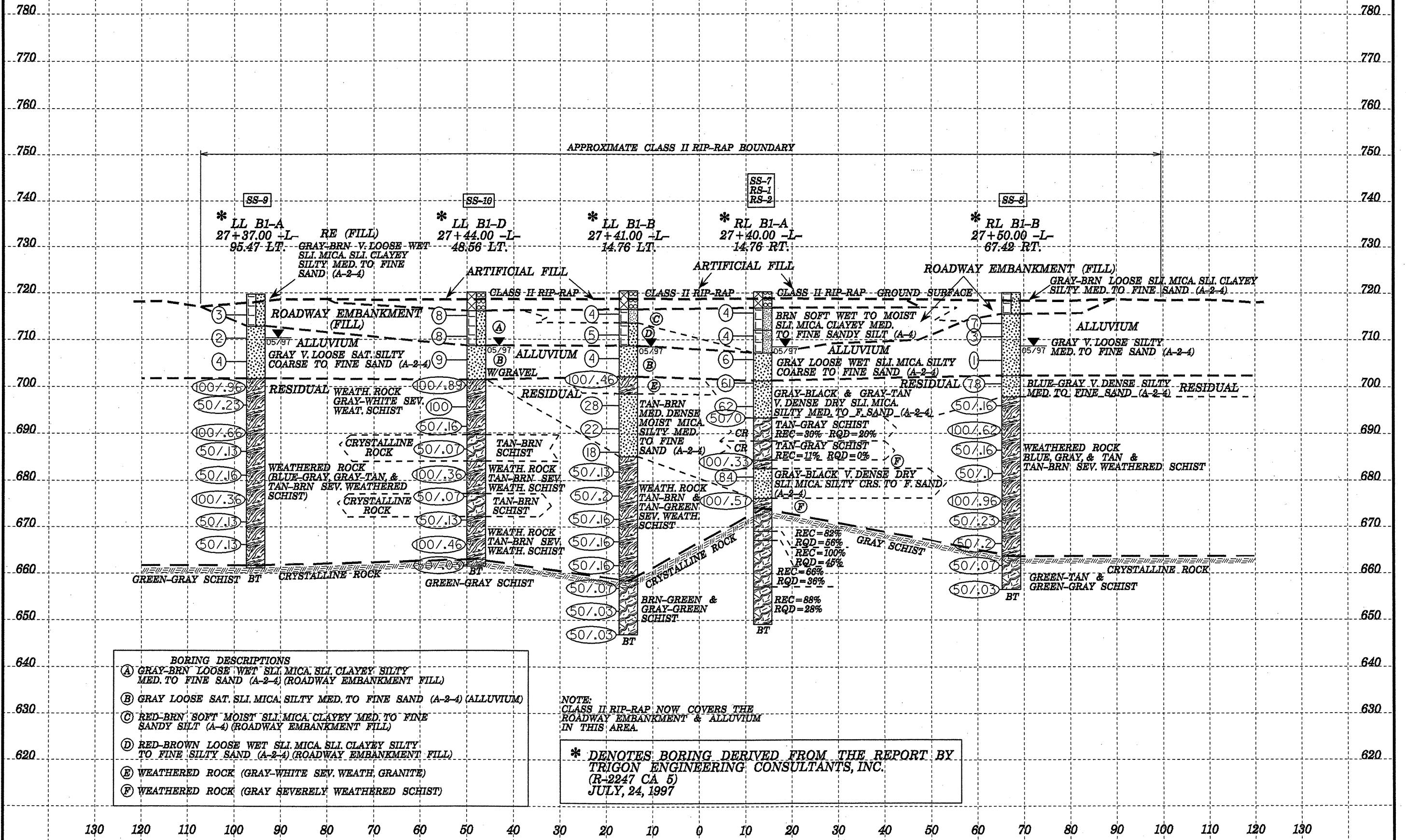
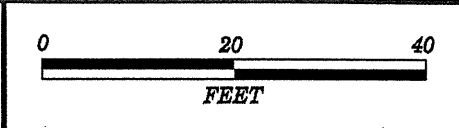
17-SEP-2008 09:57:37 gsc brd g0221&0222 - for ush cadd - geotech\site&sub\B4507 - geo.pl1.dgn
 17-SEP-2008 09:57:37 gsc brd g0221&0222 - for ush cadd - geotech\site&sub\B4507 - geo.pl1.dgn



BORING DESCRIPTIONS

(A) RED-BRN V. STIFF MOIST SLL MICA, MED. PLASTIC FINE SANDY SILTY CLAY (A-7-5) (ROADWAY EMBANKMENT FILL)

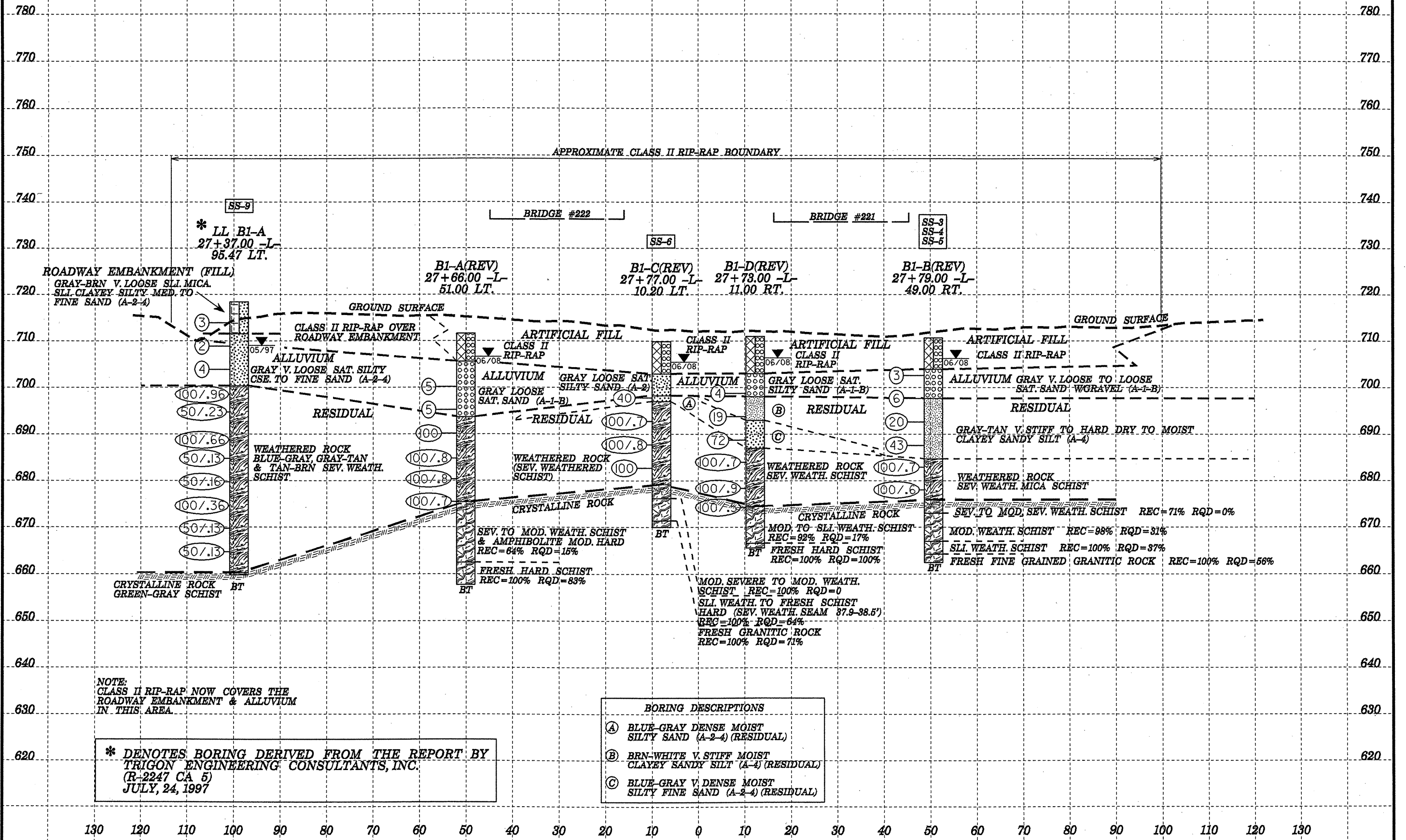
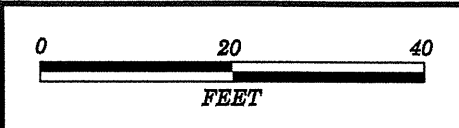
* DENOTES BORING DERIVED FROM THE REPORT BY TRIGON ENGINEERING CONSULTANTS, INC. (R-2247 CA 5) JULY, 24, 1997

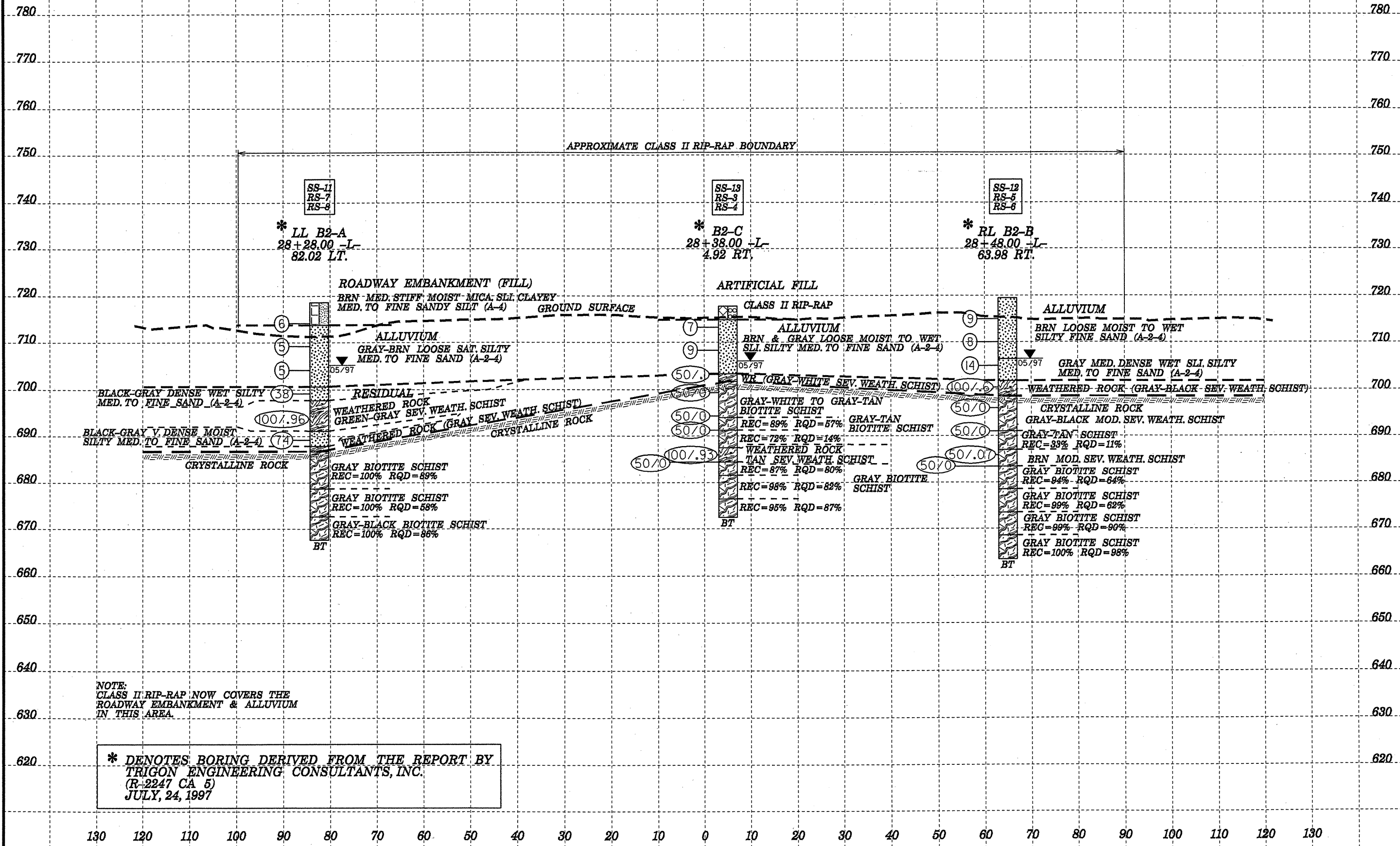


- BORING DESCRIPTIONS**
- (A) GRAY-BRN LOOSE WET SILTY MICA SILTY CLAYEY SILTY MED. TO FINE SAND (A-2-4) (ROADWAY EMBANKMENT FILL)
 - (B) GRAY LOOSE SAT. SILTY MICA SILTY MED. TO FINE SAND (A-2-4) (ALLUVIUM)
 - (C) RED-BRN SOFT MOIST SILTY MICA CLAYEY MED. TO FINE SANDY SILT (A-4) (ROADWAY EMBANKMENT FILL)
 - (D) RED-BROWN LOOSE WET SILTY MICA SILTY CLAYEY SILTY TO FINE SILTY SAND (A-2-4) (ROADWAY EMBANKMENT FILL)
 - (E) WEATHERED ROCK (GRAY-WHITE SEV. WEATH. GRANITE)
 - (F) WEATHERED ROCK (GRAY SEVERELY WEATHERED SCHIST)

NOTE:
CLASS II RIP-RAP NOW COVERS THE
ROADWAY EMBANKMENT & ALLUVIUM
IN THIS AREA.

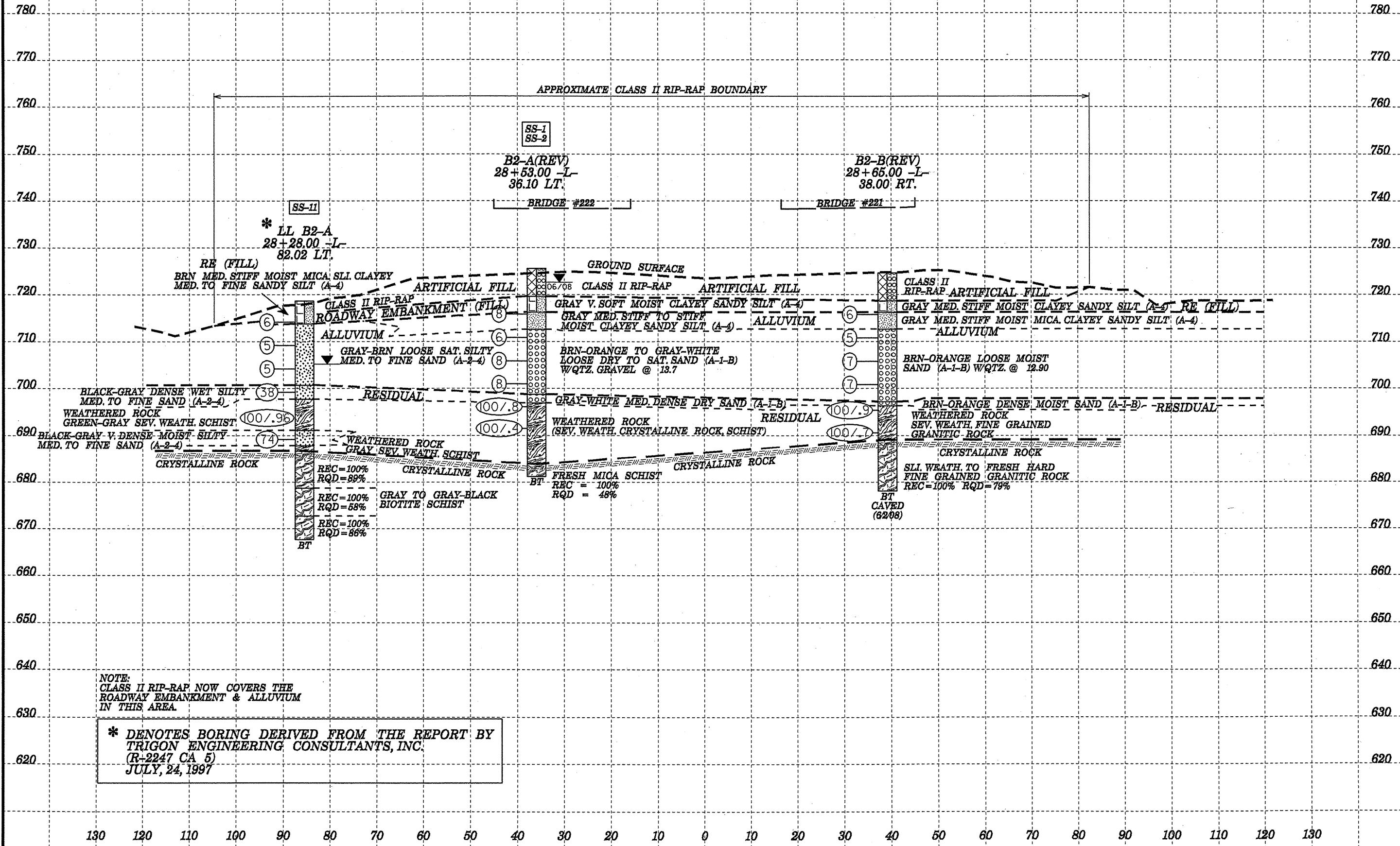
* DENOTES BORING DERIVED FROM THE REPORT BY
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JULY, 24, 1997





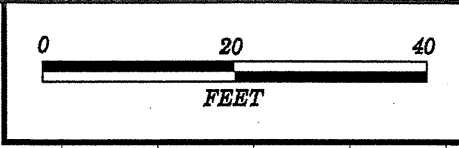
NOTE:
 CLASS II RIP-RAP NOW COVERS THE
 ROADWAY EMBANKMENT & ALLUVIUM
 IN THIS AREA.

* DENOTES BORING DERIVED FROM THE REPORT BY
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 (R-2247 CA 5)
 JULY, 24, 1997

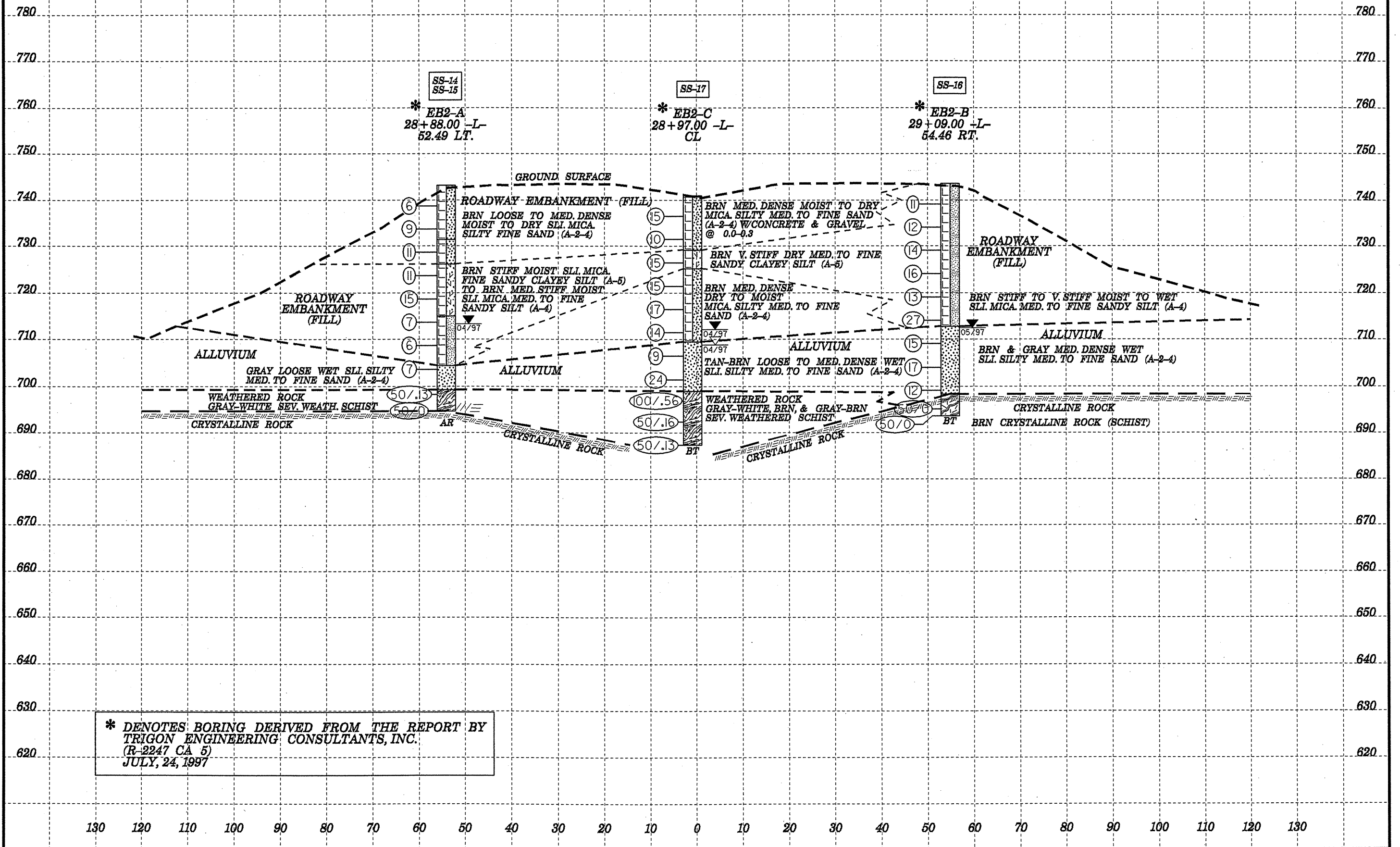


NOTE:
CLASS II RIP-RAP NOW COVERS THE
ROADWAY EMBANKMENT & ALLUVIUM
IN THIS AREA.

* DENOTES BORING DERIVED FROM THE REPORT BY
TRIGON ENGINEERING CONSULTANTS, INC.
(R-2247 CA 5)
JULY, 24, 1997



PROJECT REFERENCE NO.	SHEET
38396.1.I (B-4507)	10
Section Thru End Bent Two STA. 29+02.00 -L- SKEW=80°00'00"	



* DENOTES BORING DERIVED FROM THE REPORT BY TRIGON ENGINEERING CONSULTANTS, INC. (R-2247 CA 5) JULY, 24, 1997

PROJECT NO. 38396.1.1		ID. B-4507		COUNTY FORSYTH		GEOLOGIST W. M. SOBH								
SITE DESCRIPTION DUAL BRIDGES ON US 421 OVER MUDDY CREEK						GROUND WTR (ft)								
BORING NO. EB1-A		STATION 26+71		OFFSET 59ft LT		ALIGNMENT -L-								
COLLAR ELEV. 736.9 ft		TOTAL DEPTH 48.8 ft		NORTHING 848,588		EASTING 1,596,407								
DRILL MACHINE CME-850		DRILL METHOD ROTARY		HAMMER TYPE Automatic										
START DATE 04/30/97		COMP. DATE 04/30/97		SURFACE WATER DEPTH N/A		DEPTH TO ROCK N/A								
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					
740														
735.9	1.0	2	2	2										
733.4	3.5	2	1	2										
730.9	6.0	2	2	3										
728.4	8.5	2	1	2										
723.4	13.5	3	4	5										
718.4	18.5	3	4	5										
713.4	23.5	2	2	1										
708.4	28.5	3	5	5										
703.4	33.5	3	2	2										
698.4	38.5	62	38/39											
693.4	43.5	45	80	20/1										
688.4	48.5	100/26												

PROJECT NO. 38396.1.1		ID. B-4507		COUNTY FORSYTH		GEOLOGIST T. J. ROBERSON								
SITE DESCRIPTION DUAL BRIDGES ON US 421 OVER MUDDY CREEK						GROUND WTR (ft)								
BORING NO. EB1-C		STATION 26+78		OFFSET CL		ALIGNMENT -L-								
COLLAR ELEV. 737.8 ft		TOTAL DEPTH 48.6 ft		NORTHING 848,528		EASTING 1,596,403								
DRILL MACHINE CME-55 ATV		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
START DATE 04/29/97		COMP. DATE 04/29/97		SURFACE WATER DEPTH N/A		DEPTH TO ROCK N/A								
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					
740														
734.3	3.5	6	7	8										
729.3	8.5	6	7	7										
724.3	13.5	7	7	8										
719.3	18.5	6	9	10										
714.3	23.5	4	4	4										
709.3	28.5	3	6	6										
704.3	33.5	7	10	11										
699.3	38.5	68	32/2											
694.3	43.5	50/23												
689.3	48.5	50/1												

NCDOT BORE SINGLE R2247CC(B4507)_GEO_BH_ENGLISH(CURRENT)_L.GPJ_NC_DOT.GDT 09/16/08

NCDOT BORE SINGLE R2247CC(B4507)_GEO_BH_ENGLISH(CURRENT)_L.GPJ_NC_DOT.GDT 09/16/08

Boring Terminated at Elevation 688.1 ft IN SEVERELY WEATHERED CRYSTALLINE ROCK (SCHIST)
BORING DERIVED FROM THE REPORT BY TRIGON ENGINEERING CONSULTANTS, INC. (R-2247 CA 5) JULY 24, 1997

Boring Terminated at Elevation 689.2 ft IN SEVERELY WEATHERED CRYSTALLINE ROCK (SCHIST)
BORING DERIVED FROM THE REPORT BY TRIGON ENGINEERING CONSULTANTS, INC. (R-2247 CA 5) JULY 24, 1997

PROJECT NO. 38396.1.1		ID. B-4507		COUNTY FORSYTH		GEOLOGIST T. J. ROBERSON							
SITE DESCRIPTION DUAL BRIDGES ON US 421 OVER MUDDY CREEK							GROUND WTR (ft)						
BORING NO. EB1-B		STATION 26+87		OFFSET 51ft RT		ALIGNMENT -L-							
COLLAR ELEV. 740.5 ft		TOTAL DEPTH 43.5 ft		NORTHING 848,477		EASTING 1,596,402							
DRILL MACHINE CME-55 TM		DRILL METHOD ROTARY				HAMMER TYPE Automatic							
START DATE 05/01/97		COMP. DATE 05/01/97		SURFACE WATER DEPTH N/A		DEPTH TO ROCK 43.5 ft							
ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	25	50	75	100				
745													
													740.5 GROUND SURFACE 0.0
	3.5												ROADWAY EMBANKMENT BROWN STIFF SLIGHTLY MICACEOUS MEDIUM TO FINE SANDY CLAYEY SILT (A-5)
		3	5	5							SS-3	27%	
	8.5												ROADWAY EMBANKMENT RED-BROWN MEDIUM STIFF SLIGHTLY CLAYEY SLIGHTLY MICACEOUS FINE SANDY SILT (A-4)
		3	3	3							M		
	13.5												ROADWAY EMBANKMENT RED-BROWN TO BROWN VERY STIFF TO STIFF SLIGHTLY MICACEOUS SLIGHTLY CLAYEY FINE SANDY SILT (A-4)
		3	7	9							M		
	18.5												ROADWAY EMBANKMENT BROWN STIFF SLIGHTLY CLAYEY FINE SANDY SILT (A-4)
		6	6	9							M		
	23.5												
		4	5	7							M		
	28.5												
		5	4	4							W		ALLUVIAL TAN LOOSE SLIGHTLY MICACEOUS SLIGHTLY SILTY MEDIUM TO FINE SAND (A-2-4)
	33.5												
		5	6	8							SS-4	W	ALLUVIAL GRAY MEDIUM DENSE SLIGHTLY MICACEOUS SLIGHTLY SILTY MEDIUM TO FINE SAND (A-2-4)
	38.5												
		17	17	83							M		WEATHERED ROCK GRAY-WHITE SEVERELY WEATHERED SCHIST
	43.5												
		50/0											Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 697.0 ft ON CRYSTALLINE ROCK (SCHIST)
													BORING DERIVED FROM THE REPORT BY TRIGON ENGINEERING CONSULTANTS, INC. (R-2247 CA 5) JULY 24, 1997

NCDOT BORE SINGLE R2247CC(B4507)_GEO_BH_ENGLISH(CURRENT L).GPJ NC_DOT_GDT 09/16/08

PROJECT NO. 38396.1.1		ID. B-4507		COUNTY FORSYTH		GEOLOGIST J. D. HARDISTER								
SITE DESCRIPTION DUAL BRIDGES ON US 421 OVER MUDDY CREEK							GROUND WTR (ft)							
BORING NO. LL B1-A		STATION 27+37		OFFSET 95ft LT		ALIGNMENT -L-								
COLLAR ELEV. 718.4 ft		TOTAL DEPTH 58.6 ft		NORTHING 848,611		EASTING 1,596,479								
DRILL MACHINE CME-850		DRILL METHOD ROTARY			HAMMER TYPE Automatic									
START DATE 05/09/97		COMP. DATE 05/09/97		SURFACE WATER DEPTH N/A		DEPTH TO ROCK 58.1 ft								
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					
720													718.4	0.0
714.9	3.5	3	1	2							SS-9	W	711.5	6.9
709.9	8.5	1	1	1							Sat		700.4	18.0
704.9	13.5	2	2	2							Sat			
699.9	18.5	21	28	72/46							M			
694.9	23.5	50/23									M			
689.9	28.5	24	61	39/16							M			
684.9	33.5	50/13									D			
679.9	38.5	50/16									D			
674.9	43.5	100/36									D			
669.9	48.5	50/13									D			
664.9	53.5	50/13									D			
													660.3	58.1
													659.8	58.6

CRYSTALLINE ROCK
GREEN-GRAY SCHIST
 Boring Terminated at Elevation 659.8 ft IN
 CRYSTALLINE ROCK (SCHIST)
 BORING DERIVED FROM THE REPORT BY
 TRIGON ENGINEERING CONSULTANTS,
 INC.
 (R-2247 CA 5)
 JULY 24, 1997

NCDOT BORE SINGLE R2247CC(B4507)_GEO_BH_ENGLISH(CURRENT_L).GPJ NC_DOT_GDT_09/15/08

PROJECT NO. 38396.1.1		ID. B-4507		COUNTY FORSYTH		GEOLOGIST J. D. HARDISTER								
SITE DESCRIPTION DUAL BRIDGES ON US 421 OVER MUDDY CREEK							GROUND WTR (ft)							
BORING NO. LL B1-D		STATION 27+44		OFFSET 49ft LT		ALIGNMENT -L-								
COLLAR ELEV. 718.7 ft		TOTAL DEPTH 58.6 ft		NORTHING 848,564		EASTING 1,596,477								
DRILL MACHINE CME-850		DRILL METHOD ROTARY			HAMMER TYPE Automatic									
START DATE 05/05/97		COMP. DATE 05/06/97		SURFACE WATER DEPTH N/A		DEPTH TO ROCK 30.5 ft								
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					
720													718.7	0.0
714.7	4.0	2	3	5							SS-10	W	714.7	4.0
710.2	8.5	5	6	2							W		707.2	11.5
705.2	13.5	7	5	4							Sat		700.0	18.7
700.2	18.5	7	27	73/39							W			
695.2	23.5	76	24/5								M			
690.2	28.5	50/16									D			
685.2	33.5	50/07									D			
680.2	38.5	100/36									D			
675.2	43.5	50/07									D			
670.2	48.5	50/13									D			
665.2	53.5	100/46									D			
660.4	58.3	50/03									D		660.1	58.6

CRYSTALLINE ROCK
GREEN-GRAY CRYSTALLINE ROCK
 Boring Terminated at Elevation 660.1 ft IN
 CRYSTALLINE ROCK (SCHIST)
 BORING DERIVED FROM THE REPORT BY
 TRIGON ENGINEERING CONSULTANTS,
 INC.
 (R-2247 CA 5)
 JULY 24, 1997

NCDOT BORE SINGLE R2247CC(B4507)_GEO_BH_ENGLISH(CURRENT_L).GPJ NC_DOT_GDT_09/15/08

PROJECT NO. 38396.1.1		ID. B-4507		COUNTY FORSYTH		GEOLOGIST J. D. HARDISTER										
SITE DESCRIPTION DUAL BRIDGES ON US 421 OVER MUDDY CREEK							GROUND WTR (ft)									
BORING NO. LL B1-B	STATION 27+41	OFFSET 15ft LT	ALIGNMENT -L-				0 HR. NM									
COLLAR ELEV. 719.1 ft	TOTAL DEPTH 73.6 ft	NORTHING 848,531	EASTING 1,596,468				24 HR. 12.0									
DRILL MACHINE CME-850	DRILL METHOD ROTARY	HAMMER TYPE Automatic														
START DATE 05/06/97	COMP. DATE 05/07/97	SURFACE WATER DEPTH N/A		DEPTH TO ROCK 62.0 ft												
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)			
720														719.1	0.0	GROUND SURFACE
715.1	4.0	2	2	2								M		715.1	4.0	ARTIFICIAL FILL CLASS II RIP-RAP
710.6	8.5	3	3	2								W		712.2	6.9	ROADWAY EMBANKMENT RED-BROWN SOFT SLIGHTLY MICACEOUS CLAYEY MEDIUM TO FINE SANDY SILT (A-4)
705.6	13.5	2	1	3								Sat.		707.3	11.8	ROADWAY EMBANKMENT RED-BROWN LOOSE SLIGHTLY MICACEOUS SLIGHTLY CLAYEY SILTY TO FINE SILTY SAND (A-2-4)
700.6	18.5	100/46										M		700.7	18.4	ALLUVIAL GRAY LOOSE SLIGHTLY MICACEOUS SILTY MEDIUM TO FINE SAND (A-2-4)
695.6	23.5	11	14	14								M		697.1	22.0	WEATHERED ROCK GRAY-WHITE SEVERELY WEATHERED GRANITE
690.6	28.5	5	5	17								M				RESIDUAL TAN-BROWN MEDIUM DENSE MICACEOUS SILTY MEDIUM TO FINE SAND (A-2-4)
685.6	33.5	5	11	7								M				
680.6	38.5	50/13										D		683.7	35.4	WEATHERED ROCK TAN-BROWN AND TAN-GREEN SEVERELY WEATHERED SCHIST
675.6	43.5	50/2										D				
670.6	48.5	50/16										D				
665.6	53.5	50/16										D				
660.6	58.5	50/16										D				
655.6	63.5	50/07										D		657.1	62.0	CRYSTALLINE ROCK BROWN-GREEN AND GRAY-GREEN CRYSTALLINE ROCK (SCHIST)
650.6	68.5	50/03										D				
645.6	73.5	50/03										D		645.5	73.6	Boring Terminated at Elevation 645.5 ft IN CRYSTALLINE ROCK (SCHIST)
BORING DERIVED FROM THE REPORT BY TRIGON ENGINEERING CONSULTANTS,																

NCDOT BORE SINGLE R2247CC(B4507)_GEO_BH_ENGLISH(CURRENT_L).GPJ_NC_DOT.GDT 09/16/08

PROJECT NO. 38396.1.1		ID. B-4507		COUNTY FORSYTH		GEOLOGIST J. D. HARDISTER										
SITE DESCRIPTION DUAL BRIDGES ON US 421 OVER MUDDY CREEK							GROUND WTR (ft)									
BORING NO. LL B1-B	STATION 27+41	OFFSET 15ft LT	ALIGNMENT -L-				0 HR. NM									
COLLAR ELEV. 719.1 ft	TOTAL DEPTH 73.6 ft	NORTHING 848,531	EASTING 1,596,468				24 HR. 12.0									
DRILL MACHINE CME-850	DRILL METHOD ROTARY	HAMMER TYPE Automatic														
START DATE 05/06/97	COMP. DATE 05/07/97	SURFACE WATER DEPTH N/A		DEPTH TO ROCK 62.0 ft												
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)			
640																Match Line
INC. (R-2247 CA 5) JULY 24, 1997																

NCDOT BORE SINGLE R2247CC(B4507)_GEO_BH_ENGLISH(CURRENT_L).GPJ_NC_DOT.GDT 09/16/08

PROJECT NO. 38396.1.1		ID. B-4507		COUNTY FORSYTH		GEOLOGIST W. M. SOBH								
SITE DESCRIPTION DUAL BRIDGES ON US 421 OVER MUDDY CREEK							GROUND WTR (ft)							
BORING NO. RL B1-A		STATION 27+40		OFFSET 15ft RT		ALIGNMENT -L-								
COLLAR ELEV. 718.9 ft		TOTAL DEPTH 71.1 ft		NORTHING 848,502		EASTING 1,596,461								
DRILL MACHINE CME-850		DRILL METHOD ROTARY / CORE				HAMMER TYPE Automatic								
START DATE 05/01/97		COMP. DATE 05/02/97		SURFACE WATER DEPTH N/A		DEPTH TO ROCK 27.0 ft								
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					
720													718.9	0.0
715.4	3.5												715.4	3.5
710.4	8.5	2	1	3									710.7	8.2
705.4	13.5	2	2	2									705.8	13.1
700.4	18.5	2	3	3									699.9	19.0
695.4	23.5	9	23	38									691.9	27.0
691.9	27.0	28	34	28									686.9	32.0
682.9	36.0	50/0											682.9	36.0
680.4	38.5	100/33											681.2	37.7
675.4	43.5	49	51	33									674.9	44.0
		43	85	15/07									672.7	46.2
													667.7	51.2
													665.8	53.1
													655.8	63.1
													647.8	71.1

NCDOT BORE SINGLE R2247CC(B4507)_GEO_BH_ENGLISH(CURRENT)_L.GPJ_NC_DOT_GDT_09/16/08

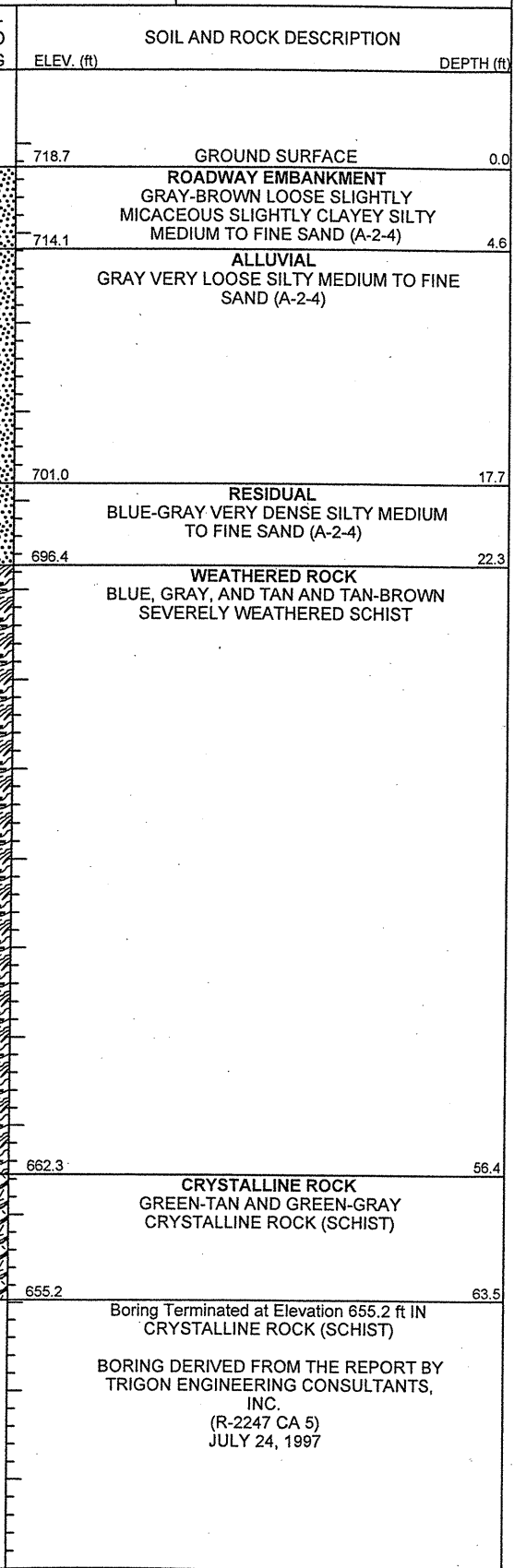
PROJECT NO. 38396.1.1		ID. B-4507		COUNTY FORSYTH		GEOLOGIST W. M. SOBH								
SITE DESCRIPTION DUAL BRIDGES ON US 421 OVER MUDDY CREEK							GROUND WTR (ft)							
BORING NO. RL B1-A		STATION 27+40		OFFSET 15ft RT		ALIGNMENT -L-								
COLLAR ELEV. 718.9 ft		TOTAL DEPTH 71.1 ft		NORTHING 848,502		EASTING 1,596,461								
DRILL MACHINE CME-850		DRILL METHOD ROTARY / CORE				HAMMER TYPE Automatic								
START DATE 05/01/97		COMP. DATE 05/02/97		SURFACE WATER DEPTH N/A		DEPTH TO ROCK 27.0 ft								
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					
640														
Match Line														
JULY 24, 1997														
(REFER TO ORIGINAL CORE LOG FOR CORE DATA)														

NCDOT BORE SINGLE R2247CC(B4507)_GEO_BH_ENGLISH(CURRENT)_L.GPJ_NC_DOT_GDT_09/16/08

Boring Terminated at Elevation 647.8 ft IN
CRYSTALLINE ROCK (SCHIST)
BORING DERIVED FROM THE REPORT BY
TRIGON ENGINEERING CONSULTANTS,
INC.
(R-2247 CA 5)

PROJECT NO. 38396.1.1		ID. B-4507		COUNTY FORSYTH		GEOLOGIST J. D. HARDISTER									
SITE DESCRIPTION DUAL BRIDGES ON US 421 OVER MUDDY CREEK							GROUND WTR (ft)								
BORING NO. RL B1-B		STATION 27+50		OFFSET 67ft RT		ALIGNMENT -L-									
COLLAR ELEV. 718.7 ft		TOTAL DEPTH 63.5 ft		NORTHING 848,449		EASTING 1,596,461									
DRILL MACHINE CME-850		DRILL METHOD ROTARY				HAMMER TYPE Automatic									
START DATE 05/09/97		COMP. DATE 05/12/97		SURFACE WATER DEPTH N/A		DEPTH TO ROCK 56.4 ft									
ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
		0.5ft	0.5ft	0.5ft	0	25	50	75	100						ELEV. (ft)
720														718.7	0.0
713.1	5.6	3	4	3										714.1	4.6
710.2	8.5	2	1	2											
705.2	13.5	1	0	1											
700.2	18.5	14	31	47										701.0	17.7
695.2	23.5	25	50/16											696.4	22.3
690.2	28.5	40	60/39												
685.2	33.5	50/16													
680.2	38.5	50/1													
675.2	43.5	46	54/46												
670.2	48.5	50/23													
665.2	53.5	50/2													
660.4	58.3	50/07												662.3	56.4
655.2	63.5	50/03												655.2	63.5

NCDOT BORE SINGLE R2247CC(B4507)_GEO_BH_ENGLISH(CURRENT_L).GPJ NC_DOT.GDT 09/15/08



Boring Terminated at Elevation 655.2 ft IN
CRYSTALLINE ROCK (SCHIST)
BORING DERIVED FROM THE REPORT BY
TRIGON ENGINEERING CONSULTANTS,
INC.
(R-2247 CA 5)
JULY 24, 1997

PROJECT NO. 38396.1.1	ID. B-4507	COUNTY FORSYTH	GEOLOGIST Stickney, J. K.
SITE DESCRIPTION BRIDGES 221 & 222 OVER MUDDY CREEK ON US 421			GROUND WTR (ft)
BORING NO. B1-A(REV)	STATION 27+66	OFFSET 51ft LT	ALIGNMENT -L-
COLLAR ELEV. 711.6 ft	TOTAL DEPTH 53.9 ft	NORTHING 848,562	EASTING 1,596,499
DRILL MACHINE CME-550X	DRILL METHOD NW Casing w/ SPT Core	HAMMER TYPE Automatic	
START DATE 06/12/08	COMP. DATE 06/12/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 36.3 ft

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				
715													GROUND SURFACE	0.0
710													ARTIFICIAL FILL CLASS II RIP-RAP	
705													ALLUVIAL GRAY LOOSE SAT. SAND (A-1-B)	6.0
700	701.1	10.5	2	2	3							Sat.		
695	696.1	15.5	1	2	3							Sat.		
690	691.1	20.5	11	16	84								WEATHERED ROCK (SEVERELY WEATHERED SCHIST)	18.0
685	686.1	25.5	19	40	60/3									
680	681.1	30.5	75	25/3										
675	676.1	35.5	61	39/2									CRYSTALLINE ROCK SEVERE TO MODERATELY WEATHERED SCHIST & AMPHIBOLITE MODERATELY HARD REC = 64% RQD = 15%	36.3
670														
665														
660													CRYSTALLINE ROCK FRESH HARD SCHIST REC = 100% RQD = 83%	49.1
655													Boring Terminated at Elevation 657.7 ft IN CRYSTALLINE ROCK	53.9
650														
645														
640														
635														

NCDOT BORE SINGLE B4507_GEO_BH_BRD0221&0222_FORSYTH.GPJ NC_DOT_GDT_11/25/08

PROJECT NO. 38396.1.1	ID. B-4507	COUNTY FORSYTH	GEOLOGIST Stickney, J. K.
SITE DESCRIPTION BRIDGES 221 & 222 OVER MUDDY CREEK ON US 421			GROUND WTR (ft)
BORING NO. B1-A(REV)	STATION 27+66	OFFSET 51ft LT	ALIGNMENT -L-
COLLAR ELEV. 711.6 ft	TOTAL DEPTH 53.9 ft	NORTHING 848,562	EASTING 1,596,499
DRILL MACHINE CME-550X	DRILL METHOD NW Casing w/ SPT Core	HAMMER TYPE Automatic	
START DATE 06/12/08	COMP. DATE 06/12/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 36.3 ft

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. (ft)	ROD (ft)		REC. (ft)	ROD (ft)			
675.3											Begin Coring @ 36.3 ft	
	675.3	36.3	2.8		(2.7)	(0.4)		(8.2)	(1.9)		CRYSTALLINE ROCK	36.3
	672.5	39.1	5.0		(2.4)	(0.0)		64%	15%		SEVERE TO MODERATELY WEATHERED SCHIST & AMPHIBOLITE MODERATELY HARD JOINT SPACING < 2" ROUGH	
670					48%	0%					Is(50)=24 ksf R1=4,R2=3,R3=5,R4=20,R5=7	
	667.5	44.1	5.0		(3.1)	(1.6)						
665					62%	31%						
	662.5	49.1	4.8		(4.8)	(4.0)		(4.8)	(4.0)		CRYSTALLINE ROCK	49.1
660					100%	83%		100%	83%		FRESH HARD SCHIST JOINT SPACING = 1.0' SMOOTH R1=12,R2=17,R3=20,R4=12,R5=7	
	657.7	53.9									Boring Terminated at Elevation 657.7 ft IN CRYSTALLINE ROCK	53.9
655												
650												
645												
640												
635												
630												
625												
620												
615												
610												
605												
600												

NCDOT CORE SINGLE B4507_GEO_BH_BRD0221&0222_FORSYTH.GPJ NC_DOT_GDT_11/24/08

PROJECT NO. 38396.1.1	ID. B-4507	COUNTY FORSYTH	GEOLOGIST Stickney, J. K.
SITE DESCRIPTION BRIDGES 221 & 222 OVER MUDDY CREEK ON US 421			GROUND WTR (ft)
BORING NO. B1-C(REV)	STATION 27+77	OFFSET 10ft LT	ALIGNMENT -L-
COLLAR ELEV. 709.9 ft	TOTAL DEPTH 39.9 ft	NORTHING 848,520	EASTING 1,596,502
DRILL MACHINE CME-550X	DRILL METHOD NW Casing w/ SPT Core	HAMMER TYPE Automatic	
START DATE 06/06/08	COMP. DATE 06/06/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 30.7 ft

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
710													GROUND SURFACE	0.0
													ARTIFICIAL FILL CLASS II RIP-RAP	
705														
													ALLUVIAL GRAY LOOSE SAT. SILTY SAND (A-2)	7.0
700	698.7	11.2	5	18	22								RESIDUAL BLUE-GRAY DENSE MOIST SILTY SAND (A-2-4)	11.7
695	693.7	16.2	56	44/2									WEATHERED ROCK SEVERELY WEATHERED SCHIST	13.0
690	688.7	21.2	41	59/3										
685	683.7	26.2	33	67/5										
680														
675														
670													CRYSTALLINE ROCK MOD. SEVERE TO MOD. WEATHERED SCHIST REC = 100% RQD = 0	30.7
													SLI. WEATHERED TO FRESH SCHIST HARD (SEVERELY WEATHERED SEAM 37.9-38.5')	33.8
													FRESH GRANITIC ROCK REC = 100% RQD = 64%	38.5
													FRESH GRANITIC ROCK REC = 100% RQD = 71%	39.9
													Boring Terminated at Elevation 670.0 ft IN CRYSTALLINE ROCK	

NCDOT BORE SINGLE B4507_GEO_BH_BRD0221&0222_FORSYTH.GPJ_NC_DOT.GDT 11/25/08

PROJECT NO. 38396.1.1	ID. B-4507	COUNTY FORSYTH	GEOLOGIST Stickney, J. K.
SITE DESCRIPTION BRIDGES 221 & 222 OVER MUDDY CREEK ON US 421			GROUND WTR (ft)
BORING NO. B1-C(REV)	STATION 27+77	OFFSET 10ft LT	ALIGNMENT -L-
COLLAR ELEV. 709.9 ft	TOTAL DEPTH 39.9 ft	NORTHING 848,520	EASTING 1,596,502
DRILL MACHINE CME-550X	DRILL METHOD NW Casing w/ SPT Core	HAMMER TYPE Automatic	
START DATE 06/06/08	COMP. DATE 06/06/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 30.7 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. (%)	RQD (%)		REC. (%)	RQD (%)			
679.2	679.2	30.7	4.2		(4.2)	(0.0)		(3.1)	(0.0)		Begin Coring @ 30.7 ft CRYSTALLINE ROCK	30.7
675	675.0	34.9	5.0		(5.0)	(4.0)		(4.7)	(3.0)		MOD. SEVERE TO MODERATELY WEATHERED SCHIST W/MINOR AMPHIBOLITE MODERATELY HARD JOINTS = <2" SMOOTH TO SLI. ROUGH Is(50)=NA R1=1,R2=3,R3=5,R4=6,R5=7	33.8
670	670.0	39.9						(1.4)	(1.0)		SLI. WEATHERED TO FRESH SCHIST HARD (SEVERELY WEATHERED SEAM 37.9-38.5') JOINT SPACING = 0.3' SMOOTH Is(50)=79ksf R1=7,R2=13,R3=10,R4=12,R5=7	38.5
											FRESH GRANITIC ROCK HARD JOINT SPACING = 0.5' ROUGH Is(50)=62 ksf R1=7,R2=13,R3=10,R4=25,R5=7	39.9
											Boring Terminated at Elevation 670.0 ft IN CRYSTALLINE ROCK	

NCDOT CORE SINGLE B4507_GEO_BH_BRD0221&0222_FORSYTH.GPJ_NC_DOT.GDT 11/25/08

PROJECT NO. 38396.1.1	ID. B-4507	COUNTY FORSYTH	GEOLOGIST Stickney, J. K.
SITE DESCRIPTION BRIDGES 221 & 222 OVER MUDDY CREEK ON US 421			GROUND WTR (ft)
BORING NO. B1-D(REV)	STATION 27+73	OFFSET 11ft RT	ALIGNMENT -L-
COLLAR ELEV. 711.0 ft	TOTAL DEPTH 45.4 ft	NORTHING 848,500	EASTING 1,596,494
DRILL MACHINE CME-550X	DRILL METHOD NW Casing w/ SPT Core	HAMMER TYPE Automatic	
START DATE 06/11/08	COMP. DATE 06/11/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 36.6 ft

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
715															
710														711.0	GROUND SURFACE
705															ARTIFICIAL FILL CLASS II RIP-RAP
700	699.7	11.3													ALLUVIAL GRAY LOOSE SAT. SILTY SAND (A-1-B)
695	694.7	16.3	2	2	2										RESIDUAL BRN-WHITE V. STIFF MOIST CLAYEY SANDY SILT (A-4)
690	689.7	21.3	5	11	8										BLUE-GRAY V. DENSE MOIST SILTY FINE SAND (A-2-4)
685	684.7	26.3	11	22	50										WEATHERED ROCK SEVERELY WEATHERED SCHIST
680	679.7	31.3	50	50/2											
675	674.7	36.3	15	33	67.4										
670			100/5												
665															
660															
655															
650															
645															
640															
635															

PROJECT NO. 38396.1.1	ID. B-4507	COUNTY FORSYTH	GEOLOGIST Stickney, J. K.
SITE DESCRIPTION BRIDGES 221 & 222 OVER MUDDY CREEK ON US 421			GROUND WTR (ft)
BORING NO. B1-D(REV)	STATION 27+73	OFFSET 11ft RT	ALIGNMENT -L-
COLLAR ELEV. 711.0 ft	TOTAL DEPTH 45.4 ft	NORTHING 848,500	EASTING 1,596,494
DRILL MACHINE CME-550X	DRILL METHOD NW Casing w/ SPT Core	HAMMER TYPE Automatic	
START DATE 06/11/08	COMP. DATE 06/11/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 36.6 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. (%)	RQD (%)		REC. (%)	RQD (%)			
674.4	674.4	36.6	3.8		(3.6)	(0.8)		(7.2)	(1.3)		Begin Coring @ 36.6 ft	36.6
670	670.6	40.4	5.0		(4.6)	(1.5)		(92%)	(30%)		CRYSTALLINE ROCK MODERATE TO SLIGHTLY WEATHERED SCHIST MODERATELY HARD JOINT SPACING <2" SMOOTH TO SLIGHTLY ROUGH IS-50=NA R1=2,R2=3,R3=5,R4=12,R5=7 ROCK TYPE = E	
665	665.6	45.4						(1.0)	(1.0)		FRESH HARD SCHIST NO JOINTS IS 50 =121 ksf R1=12,R2=20,R3=30,R4=25,R5=7 ROCK TYPE = E	44.4
660											Boring Terminated at Elevation 665.6 ft IN CRYSTALLINE ROCK	45.4
655												
650												
645												
640												
635												
630												
625												
620												
615												
610												
605												
600												
595												

NCDOT BORE SINGLE B4507_GEO_BH_BRD0221&0222_FORSYTH.GPJ_NC_DOT.GDT 11/25/08

NCDOT CORE SINGLE B4507_GEO_BH_BRD0221&0222_FORSYTH.GPJ_NC_DOT.GDT 11/24/08

PROJECT NO. 38396.1.1	ID. B-4507	COUNTY FORSYTH	GEOLOGIST Stickney, J. K.
SITE DESCRIPTION BRIDGES 221 & 222 OVER MUDDY CREEK ON US 421			GROUND WTR (ft)
BORING NO. B1-B(REV)	STATION 27+79	OFFSET 49ft RT	ALIGNMENT -L-
COLLAR ELEV. 710.7 ft	TOTAL DEPTH 48.2 ft	NORTHING 848,461	EASTING 1,596,493
DRILL MACHINE CME-550X	DRILL METHOD NW Casing w/ SPT Core	HAMMER TYPE Automatic	
START DATE 06/03/08	COMP. DATE 06/03/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 34.9 ft

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
715															
710													710.7	GROUND SURFACE	0.0
														ARTIFICIAL FILL CLASS II RIP-RAP	
705	703.6	7.1											703.9	ALLUVIAL GRAY V. LOOSE TO LOOSE SAT. SAND W/GRAVEL (A-1-B)	6.8
700	698.6	12.1	1	2	1							SS-3	Sat.		
695	693.6	17.1	0	1	5							Sat.		RESIDUAL GRAY-TAN V. STIFF TO HARD DRY TO MOIST CLAYEY SANDY SILT (A-4)	13.1
690	688.6	22.1	4	8	12							SS-4	M		
685	683.6	27.1	13	17	26							SS-5	M		
680	678.6	32.1	41	59/2										WEATHERED ROCK SEVERELY WEATHERED MICA SCHIST	26.0
675	673.0	37.1	63	37/1										CRYSTALLINE ROCK SEVERE TO MOD. SEV. WEATHERED SCHIST REC = 71% RQD = 0 MODERATELY WEATHERED SCHIST REC = 98% RQD = 31%	34.9
670															
665														SLIGHTLY WEATHERED SCHIST REC = 100% RQD = 37%	43.7
660														FRESH FINE GRAINED GRANITIC ROCK REC = 100% RQD = 56%	46.4
655														Boring Terminated at Elevation 662.5 ft IN CRYSTALLINE ROCK	48.2
650															
645															
640															
635															

NCDOT BORE SINGLE B4507_GEO_BH_BRDG0221&0222_FORSYTH.GPJ NC_DOT_GDT 11/25/08

PROJECT NO. 38396.1.1	ID. B-4507	COUNTY FORSYTH	GEOLOGIST Stickney, J. K.
SITE DESCRIPTION BRIDGES 221 & 222 OVER MUDDY CREEK ON US 421			GROUND WTR (ft)
BORING NO. B1-B(REV)	STATION 27+79	OFFSET 49ft RT	ALIGNMENT -L-
COLLAR ELEV. 710.7 ft	TOTAL DEPTH 48.2 ft	NORTHING 848,461	EASTING 1,596,493
DRILL MACHINE CME-550X	DRILL METHOD NW Casing w/ SPT Core	HAMMER TYPE Automatic	
START DATE 06/03/08	COMP. DATE 06/03/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 34.9 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. (%)	RQD (%)		REC. (%)	RQD (%)			
675.8	675.8	34.9	4.8		(4.0)	(0.9)		(2.0)	(0.0)		Begin Coring @ 34.9 ft	34.9
675					83%	18%		71%	0%		CRYSTALLINE ROCK	
											SEVERE TO MODERATELY SEVERE WEATHERED SCHIST MOD. HARD JOINT SPACING <2' IS(50)=X,R1=1,R2=3,R3=5,R4=12,R5=7	37.7
											MODERATELY WEATHERED MOD. HARD SCHIST JOINT SPACING 0.3' SMOOTH & SLICKENSIDED IS(50)=56 ksf R1=7,R2=8,R3=10,R4=8,R5=7	
670	671.0	39.7	5.0		(5.0)	(0.0)		(5.9)	(1.9)			43.7
					100%	0%					SLIGHTLY WEATHERED MICA SCHIST HARD JOINT SPACING = 0.35' SMOOTH TO SLIGHTLY ROUGH IS(50)=58 ksf R1=17,R2=8,R3=10,R4=20,R5=7	
665	666.0	44.7	3.5		(3.4)	(2.1)		(2.7)	(1.0)			46.4
					97%	60%					FRESH HARD FINE GRAINED GRANITIC ROCK JOINT SPACING = 0.3' SLIGHTLY ROUGH IS(50)=80ksf R1=7,R2=13,R3=10,R4=20,R5=7	
660	662.5	48.2						(1.8)	(1.0)			48.2
											Boring Terminated at Elevation 662.5 ft IN CRYSTALLINE ROCK	
655												
650												
645												
640												
635												
630												
625												
620												
615												
610												
605												
600												

NCDOT CORE SINGLE B4507_GEO_BH_BRDG0221&0222_FORSYTH.GPJ NC_DOT_GDT 11/24/08



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

PROJECT NO. 38396.1.1		ID. B-4507		COUNTY FORSYTH		GEOLOGIST J. D. HARDISTER									
SITE DESCRIPTION DUAL BRIDGES ON US 421 OVER MUDDY CREEK							GROUND WTR (ft)								
BORING NO. LL B2-A		STATION 28+28		OFFSET 82ft LT		ALIGNMENT -L-									
COLLAR ELEV. 718.7 ft		TOTAL DEPTH 51.0 ft		NORTHING 848,581		EASTING 1,596,566									
DRILL MACHINE CME-850		DRILL METHOD ROTARY / CORE				HAMMER TYPE Automatic									
START DATE 05/12/97		COMP. DATE 05/12/97		SURFACE WATER DEPTH N/A		DEPTH TO ROCK 32.0 ft									
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						
720													718.7	GROUND SURFACE	0.0
715.2	3.5	3	4	2								M	713.8	ROADWAY EMBANKMENT BROWN MEDIUM STIFF MICACEOUS SLIGHTLY CLAYEY MEDIUM TO FINE SANDY SILT (A-4)	4.9
710.2	8.5	3	3	2								Sat.		ALLUVIAL GRAY BROWN LOOSE SILTY MEDIUM TO FINE SAND (A-2-4)	
705.2	13.5	3	3	2								Sat.			
700.2	18.5	25	24	14								W	700.7	RESIDUAL BLACK-GRAY DENSE SILTY MEDIUM TO FINE SAND (A-2-4)	18.0
695.2	23.5	50	38	62/46								M	697.7	WEATHERED ROCK GREEN-GRAY SEVERELY WEATHERED SCHIST	21.0
690.2	28.5	20	37	37									691.1	RESIDUAL BLACK-GRAY VERY DENSE SILTY MEDIUM TO FINE SAND (A-2-4)	27.6
													687.9	WEATHERED ROCK GRAY SEVERELY WEATHERED SCHIST	30.8
													686.7	CRYSTALLINE ROCK GRAY CRYSTALLINE ROCK (BIOTITE SCHIST) REC=100% RQD=89%	32.0
													678.7	CRYSTALLINE ROCK GRAY CRYSTALLINE ROCK (BIOTITE SCHIST) REC=100% RQD=58%	40.0
													672.7	CRYSTALLINE ROCK GRAY-BLACK CRYSTALLINE ROCK (BIOTITE SCHIST) REC=100% RQD=86%	46.0
													667.7	Boring Terminated at Elevation 667.7 ft IN CRYSTALLINE ROCK (BIOTITE SCHIST)	51.0
														BORING DERIVED FROM THE REPORT BY TRIGON ENGINEERING CONSULTANTS, INC. (R-2247 CA 5) JULY 24, 1997 (REFER TO ORIGINAL CORE LOG FOR CORE DATA)	

PROJECT NO. 38396.1.1	ID. B-4507	COUNTY FORSYTH	GEOLOGIST Stickney, J. K.
SITE DESCRIPTION BRIDGES 221 & 222 OVER MUDDY CREEK ON US 421			GROUND WTR (ft)
BORING NO. B2-A(REV)	STATION 28+53	OFFSET 36ft LT	ALIGNMENT -L-
COLLAR ELEV. 725.6 ft	TOTAL DEPTH 44.4 ft	NORTHING 848,531	EASTING 1,596,582
DRILL MACHINE CME-550X	DRILL METHOD NW Casing w/ SPT Core	HAMMER TYPE Automatic	
START DATE 05/29/08	COMP. DATE 05/29/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 41.7 ft

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
730														
725													725.6	0.0
720													719.6	6.0
	716.9	8.7	1	3	5						SS-1	M	716.3	9.3
715														
	711.9	13.7	1	2	4						SS-2	D	712.6	13.0
710														
	706.9	18.7	1	3	5						Sat.			
705														
	701.9	23.7	1	3	5						Sat.			
700														
	696.9	28.7	27	73/3							D		696.9	28.7
695														
	691.9	33.7	100/4								D		691.9	100/4
690														
685														
680													683.9	41.7
													681.2	44.4
675														
670														
665														
660														
655														
650														

NCDOT BORE SINGLE B4507_GEO_BH_BRDG0221&0222_FORSYTH.GPJ NC_DOT.GDT 11/25/08

PROJECT NO. 38396.1.1	ID. B-4507	COUNTY FORSYTH	GEOLOGIST Stickney, J. K.
SITE DESCRIPTION BRIDGES 221 & 222 OVER MUDDY CREEK ON US 421			GROUND WTR (ft)
BORING NO. B2-A(REV)	STATION 28+53	OFFSET 36ft LT	ALIGNMENT -L-
COLLAR ELEV. 725.6 ft	TOTAL DEPTH 44.4 ft	NORTHING 848,531	EASTING 1,596,582
DRILL MACHINE CME-550X	DRILL METHOD NW Casing w/ SPT Core	HAMMER TYPE Automatic	
START DATE 05/29/08	COMP. DATE 05/29/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 41.7 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) %			
691.2												
690	691.2	34.4	5.0		(1.7)	(0.0)					Begin Coring @ 34.4 ft WEATHERED ROCK WEATHERED ROCK (SEVERELY WEATHERED MICA SCHIST) (continued)	
	686.2	39.4										
685			5.0		(2.7)	(1.3)						41.7
	681.2	44.4						(2.7)	(1.3)		CRYSTALLINE ROCK FRESH MICA SCHIST JOINT SPACING = 1.0' SMOOTH SURFACES Is(50)=46 KSF R1=7,R2=8,R3=20,R4=6,R5=7 Boring Terminated at Elevation 681.2 ft IN CRYSTALLINE ROCK	44.4
680												
675												
670												
665												
660												
655												
650												
645												
640												
635												
630												
625												
620												
615												

NCDOT CORE SINGLE B4507_GEO_BH_BRDG0221&0222_FORSYTH.GPJ NC_DOT.GDT 11/24/08

PROJECT NO. 38396.1.1	ID. B-4507	COUNTY FORSYTH	GEOLOGIST Stickney, J. K.
SITE DESCRIPTION BRIDGES 221 & 222 OVER MUDDY CREEK ON US 421			GROUND WTR (ft)
BORING NO. B2-B(REV)	STATION 28+65	OFFSET 38ft RT	ALIGNMENT -L-
COLLAR ELEV. 724.7 ft	TOTAL DEPTH 46.6 ft	NORTHING 848,456	EASTING 1,596,580
DRILL MACHINE CME-550X		DRILL METHOD NW Casing w/ SPT Core	
START DATE 06/02/08		COMP. DATE 06/02/08	
SURFACE WATER DEPTH N/A		DEPTH TO ROCK 35.6 ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
725													GROUND SURFACE	0.0
720													ARTIFICIAL FILL CLASS II RIP-RAP	
715	716.8	7.9	2	3	3							M	ROADWAY EMBANKMENT GRAY MED. STIFF MOIST CLAYEY SANDY SILT (A-4)	6.0
710	711.8	12.9	1	2	3							M	ALLUVIAL GRAY MED. STIFF MOIST MICA. CLAYEY SANDY SILT (A-4)	8.4
705	706.8	17.9	2	3	4							M	ALLUVIAL BRN-ORANGE LOOSE MOIST SAND (A-1-B) W/ QTZ. @ 12.90	12.0
700	701.8	22.9	1	2	5							M		
695	696.8	27.9	6	38	62/4							M	RESIDUAL BRN-ORANGE DENSE MOIST SAND (A-1-B)	27.5
690	691.8	32.9	31	35	65/2							M	WEATHERED ROCK SEVERELY WEATHERED FINE GRAINED GRANITIC ROCK	28.4
685													CRYSTALLINE ROCK SLIGHTLY WEATHERED TO FRESH HARD FINE GRAINED GRANITIC ROCK REC = 100% RQD = 79%	35.6
680														
675													Boring Terminated at Elevation 678.1 ft IN CRYSTALLINE ROCK	46.6

PROJECT NO. 38396.1.1	ID. B-4507	COUNTY FORSYTH	GEOLOGIST Stickney, J. K.
SITE DESCRIPTION BRIDGES 221 & 222 OVER MUDDY CREEK ON US 421			GROUND WTR (ft)
BORING NO. B2-B(REV)	STATION 28+65	OFFSET 38ft RT	ALIGNMENT -L-
COLLAR ELEV. 724.7 ft	TOTAL DEPTH 46.6 ft	NORTHING 848,456	EASTING 1,596,580
DRILL MACHINE CME-550X		DRILL METHOD NW Casing w/ SPT Core	
START DATE 06/02/08		COMP. DATE 06/02/08	
SURFACE WATER DEPTH N/A		DEPTH TO ROCK 35.6 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) %			
689.1											Begin Coring @ 35.6 ft	
685	689.1	35.6	3.0		(3.0) 100%	(2.0) 65%		(11.0) 100%	(8.7) 79%		CRYSTALLINE ROCK SLIGHTLY WEATHERED TO FRESH HARD FINE GRAINED GRANITIC ROCK JOINT SPACING = 0.6' SMOOTH SURFACES AVG. Is(50) =99 AXIAL; =82 DIAMETRIC R1=7,R2=17,R3=10,R4=12,R5=7	35.6
680	686.1	38.6	5.0		(5.0) 100%	(4.6) 91%						
675	681.1	43.6	3.0		(3.0) 100%	(2.2) 72%						
670	678.1	46.6									Boring Terminated at Elevation 678.1 ft IN CRYSTALLINE ROCK	46.6
665												
660												
655												
650												
645												
640												
635												
630												
625												
620												
615												
610												

NCDOT BORE SINGLE B4507_GEO_BH_BRDG0221&0222_FORSYTH.GPJ NC_DOT.GDT 11/25/08

NCDOT CORE SINGLE B4507_GEO_BH_BRDG0221&0222_FORSYTH.GPJ NC_DOT.GDT 11/24/08

PROJECT NO. 38396.1.1		ID. B-4507		COUNTY FORSYTH		GEOLOGIST T. J. ROBERSON									
SITE DESCRIPTION DUAL BRIDGES ON US 421 OVER MUDDY CREEK							GROUND WTR (ft)								
BORING NO. EB2-A		STATION 28+88		OFFSET 52ft LT		ALIGNMENT -L-									
COLLAR ELEV. 743.2 ft		TOTAL DEPTH 48.5 ft		NORTHING 848,541		EASTING 1,596,619									
DRILL MACHINE CME-55 TM		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
START DATE 04/30/97		COMP. DATE 04/30/97		SURFACE WATER DEPTH N/A		DEPTH TO ROCK 48.5 ft									
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						
745													743.2	GROUND SURFACE	0.0
739.7	3.5	2	2	4							M	ROADWAY EMBANKMENT BROWN LOOSE SLIGHTLY MICACEOUS SILTY FINE SAND (A-2-4)			
734.7	8.5	4	4	5							D				
729.7	13.5	4	5	6							D	ROADWAY EMBANKMENT BROWN MEDIUM DENSE SLIGHTLY MICACEOUS SILTY FINE SAND (A-2-4)	11.8		
724.7	18.5	4	5	6							SS-14	ROADWAY EMBANKMENT BROWN STIFF SLIGHTLY MICACEOUS FINE SANDY CLAYEY SILT (A-5)	17.1		
719.7	23.5	5	6	9							M				
714.7	28.5	4	3	4							W	ROADWAY EMBANKMENT BROWN MEDIUM STIFF SLIGHTLY MICACEOUS MEDIUM TO FINE SANDY SILT (A-4)	28.2		
709.7	33.5	3	3	3							M				
704.7	38.5	3	2	5							SS-15	ALLUVIAL GRAY LOOSE SLIGHTLY SILTY MEDIUM TO FINE SAND (A-2-4)	38.7		
699.7	43.5	25	35	50/13							M	WEATHERED ROCK GRAY-WHITE SEVERELY WEATHERED SCHIST	44.0		
694.7	48.5	50/0											694.7	Boring Terminated BY AUGER REFUSAL at Elevation 694.7 ft ON CRYSTALLINE ROCK (SCHIST)	48.5
BORING DERIVED FROM THE REPORT BY TRIGON ENGINEERING CONSULTANTS, INC. (R-2247 CA 5) JULY 24, 1997															

NCDOT BORE SINGLE R2247CC(B4507)_GEO_BH_ENGLISH(CURRENT_L)_GPJ_NC_DOT_GDT_09/15/08

PROJECT NO. 38396.1.1		ID. B-4507		COUNTY FORSYTH		GEOLOGIST T. J. ROBERSON									
SITE DESCRIPTION DUAL BRIDGES ON US 421 OVER MUDDY CREEK							GROUND WTR (ft)								
BORING NO. EB2-C		STATION 28+97		OFFSET CL		ALIGNMENT -L-									
COLLAR ELEV. 741.0 ft		TOTAL DEPTH 53.6 ft		NORTHING 848,488		EASTING 1,596,618									
DRILL MACHINE CME-45 TM		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
START DATE 04/29/97		COMP. DATE 04/29/97		SURFACE WATER DEPTH N/A		DEPTH TO ROCK N/A									
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						
745													741.9	GROUND SURFACE	0.0
737.5	3.5	6	7	8							M	ROADWAY EMBANKMENT CONCRETE AND GRAVEL ROADWAY EMBANKMENT BROWN VERY STIFF MEDIUM TO FINE SILTY MEDIUM TO FINE SAND (A-2-4)			
732.5	8.5	6	5	5							D				
727.5	13.5	7	7	8							SS-17	ROADWAY EMBANKMENT BROWN MEDIUM DENSE MICACEOUS SANDY CLAYEY SILT (A-5)	11.8		
722.5	18.5	6	7	8							D	ROADWAY EMBANKMENT BROWN MEDIUM DENSE MICACEOUS SILTY MEDIUM TO FINE SAND (A-2-4)	15.7		
717.5	23.5	7	8	9							D				
712.5	28.5	6	6	8							M				
707.5	33.5	5	3	6							W	ALLUVIAL TAN-BROWN LOOSE TO MEDIUM DENSE SLIGHTLY SILTY MEDIUM TO FINE SAND (A-2-4)	31.5		
702.5	38.5	11	11	13							W				
697.5	43.5	100/56									M	WEATHERED ROCK GRAY-WHITE, BROWN, AND GRAY-BROWN SEVERELY WEATHERED SCHIST	42.0		
692.5	48.5	50/16									D				
687.5	53.5	50/13									D		687.4	Boring Terminated at Elevation 687.4 ft IN SEVERELY WEATHERED CRYSTALLINE ROCK (SCHIST)	53.6
BORING DERIVED FROM THE REPORT BY TRIGON ENGINEERING CONSULTANTS, INC. (R-2247 CA 5) JULY 24, 1997															

NCDOT BORE SINGLE R2247CC(B4507)_GEO_BH_ENGLISH(CURRENT_L)_GPJ_NC_DOT_GDT_09/15/08



NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

PROJECT NO. 38396.1.1		ID. B-4507		COUNTY FORSYTH		GEOLOGIST T. J. ROBERSON										
SITE DESCRIPTION DUAL BRIDGES ON US 421 OVER MUDDY CREEK							GROUND WTR (ft)									
BORING NO. EB2-B		STATION 29+09		OFFSET 54ft RT		ALIGNMENT -L-	0 HR. NM									
COLLAR ELEV. 743.6 ft		TOTAL DEPTH 50.0 ft		NORTHING 848,432		EASTING 1,596,620	24 HR. 31.2									
DRILL MACHINE AD II ACKER T			DRILL METHOD ROTARY			HAMMER TYPE Automatic										
START DATE 05/02/97		COMP. DATE 05/02/97		SURFACE WATER DEPTH N/A		DEPTH TO ROCK 45.3 ft										
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							
745														743.6	0.0	GROUND SURFACE
740.1	3.5															ROADWAY EMBANKMENT BROWN STIFF TO VERY STIFF SLIGHTLY MICACEOUS MEDIUM TO FINE SANDY SILT (A-4)
735.1	8.5	6	5	6	11							M				
730.1	13.5	5	7	5	12							M				
725.1	18.5	7	7	7	14							M				
720.1	23.5	5	7	9	16							M				
715.1	28.5	5	6	7	13							W				
710.1	33.5	6	12	15	27							W		712.8	30.8	ALLUVIAL BROWN AND GRAY MEDIUM DENSE SLIGHTLY SILTY MEDIUM TO FINE SAND (A-2-4)
705.1	38.5	7	7	8	15							W				
700.1	43.5	6	8	9	17							W				
		6	7	5	12							W				
695.1	48.5											SS-16		698.3	45.3	CRYSTALLINE ROCK BROWN CRYSTALLINE ROCK (SCHIST)
693.6	50.0	50/0												693.6	50.0	Boring Terminated at Elevation 693.6 ft IN CRYSTALLINE ROCK (SCHIST)
		50/0														BORING DERIVED FROM THE REPORT BY TRIGON ENGINEERING CONSULTANTS, INC. (R-2247 CA 5) JULY 24, 1997

NCDOT BORE SINGLE R2247CC(64507)_GEO_BH_ENGLISH(CURRENT_L).GPJ NC_DOT.GDT 09/15/08



FIELD SCOUR REPORT

WBS: 38396.1.1 TIP: B-4507 COUNTY: Forsyth

DESCRIPTION(1): US 421 OVER MUDDY CREEK

EXISTING BRIDGE

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

Bridge No.: 221/222 Length: 213 Total Bents: 6 Bents in Channel: 1 Bents in Floodplain: 5
 Foundation Type: Concrete piles @ EB's, Bents 1&4, Footings Bents 2&3

EVIDENCE OF SCOUR(2)

Abutments or End Bent Slopes: significant scour/erosion has occurred in past, extensive quantities of Class II rip-rap placed as countermeasure

Interior Bents: as at end bents - extensive placement of Class II rip-rap

Channel Bed: unknown but likely

Channel Bank: banks extensively undermined and unstable

EXISTING SCOUR PROTECTION

Type(3): Class II rip-rap

Extent(4): extensive - both banks, channel bottom, around piers, wraps around approach embankment

Effectiveness(5): good

Obstructions(6): fallen trees and limbs, piled 8-10' high, caught on interior columns

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): Class II rip-rap over alluvial A-2-4 sand

Channel Bank Material(8): Class II rip-rap over alluvial sands and silts

Channel Bank Cover(9): rip-rap, weeds, underbrush

Floodplain Width(10): 1500'

Floodplain Cover(11): mature trees, brush, shrubs

Stream is(12): Aggrading Degrading Static

Channel Migration Tendency(13): Slight

Observations and Other Comments: _____

DESIGN SCOUR ELEVATIONS(14)

Feet x Meters

Bent One	689																			
Bent Two	699																			

Comparison of DSE to Hydraulics Unit theoretical scour:
 Bent One adjusted upward due to presence of weathered rock.
 Bent Two is equivalent to Hydraulics scour.

SOIL ANALYSIS RESULTS FROM CHANNEL BED AND BANK MATERIAL

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

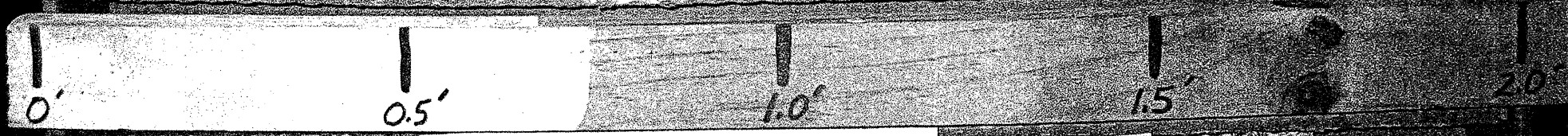
Template Revised 02/07/06

Reported by: Date: Nov. 2008
 Stickney, Little



BO
LO
1-800-4

NO 79737



B-4507 B1-A

B1-A (REV)

NO 79737 NO TOP



0' 0.5' 1.0' 1.5'

B-4507 B1-C

B1-C(REV)



37

41

42

42.6

45

0'

0.5'

1.0'

1.5'

2.0'

B-4507

B1-D

B1-D(REV)



B1-B
REV

140

141

142

143

144

145

146

147

148

0' 0.5' 1.0' 1.5' 2.0'

B-4507

B1-B

B1-B(REV)



B2-A(REV)



B2-B(REV)