

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	34431 (R-2417C)	1	15

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

STRUCTURE
SUBSURFACE INVESTIGATION

CONTENTS

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PROJ. REFERENCE NO. 34431 (R-2417C) F.A. PROJ. STP-NHF-421(2)

COUNTY LEE

PROJECT DESCRIPTION US 421/NC 87 SANFORD BYPASS
FROM EAST OF NC 42 TO NC 87 NEAR SR 1138

SITE DESCRIPTION DUAL BRIDGES ON -LREV- (US 421/NC 87)
OVER -Y- (US 421)

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.

PROJECT: 34431 **ID: R-2417C**

PERSONNEL

CC MURRAY

J. ESTEP

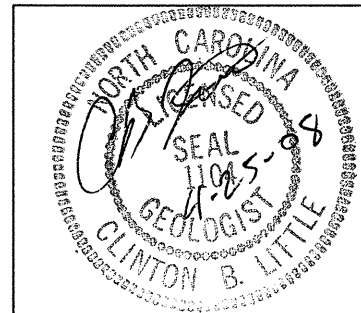
M.R. MOORE

INVESTIGATED BY MURRAY

CHECKED BY LITTLE / JKM

SUBMITTED BY LITTLE

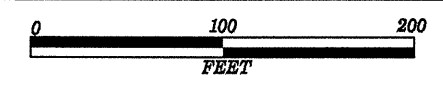
DATE APRIL 2008



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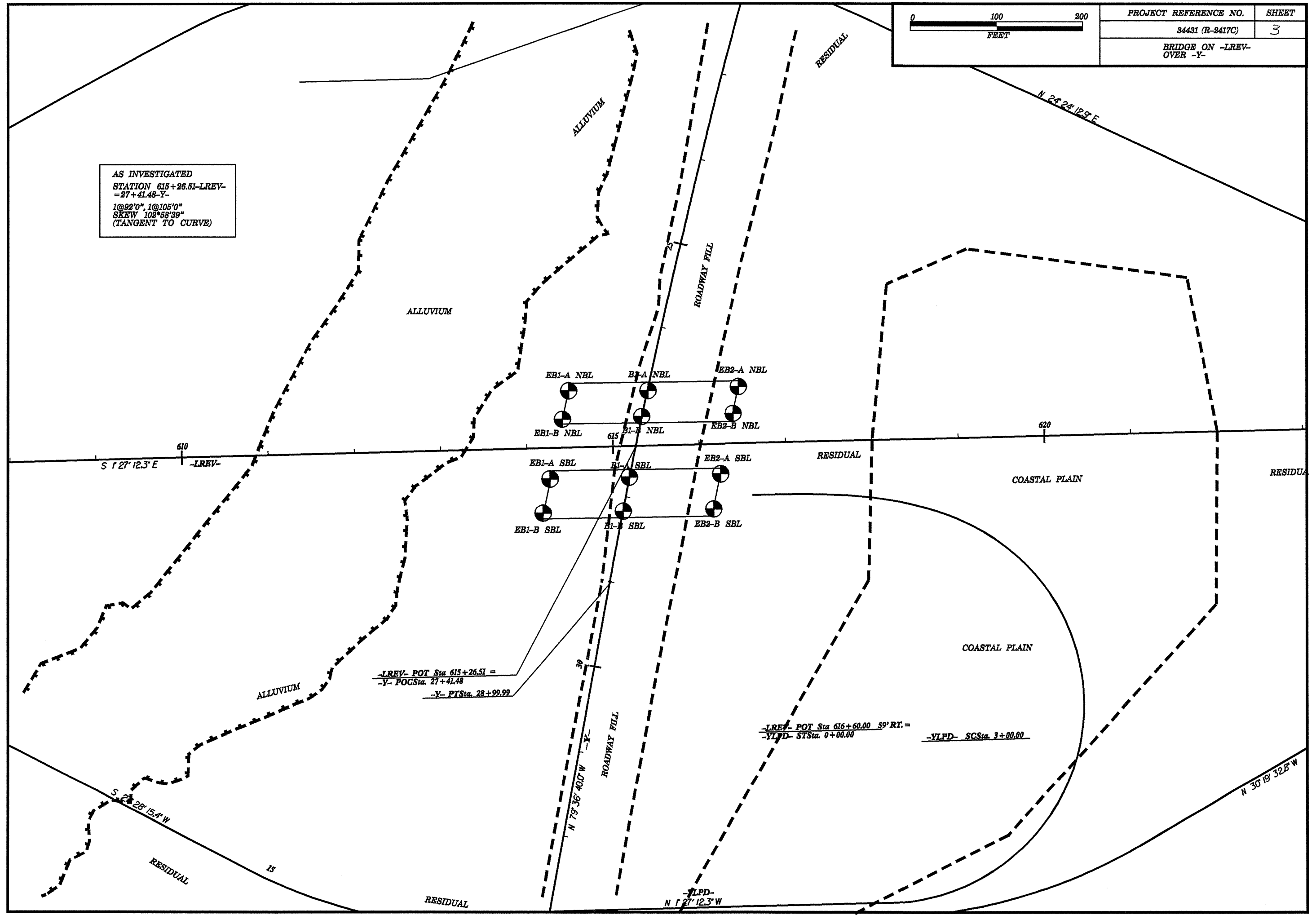
NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IT IS CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

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.



PROJECT REFERENCE NO.	SHEET
94431 (R-2417C)	3
BRIDGE ON -LREV- OVER -Y-	

AS INVESTIGATED
 STATION 615+26.51-LREV-
 =27+41.48-Y-
 1@92'0", 1@105'0"
 SKEW 102°58'39"
 (TANGENT TO CURVE)

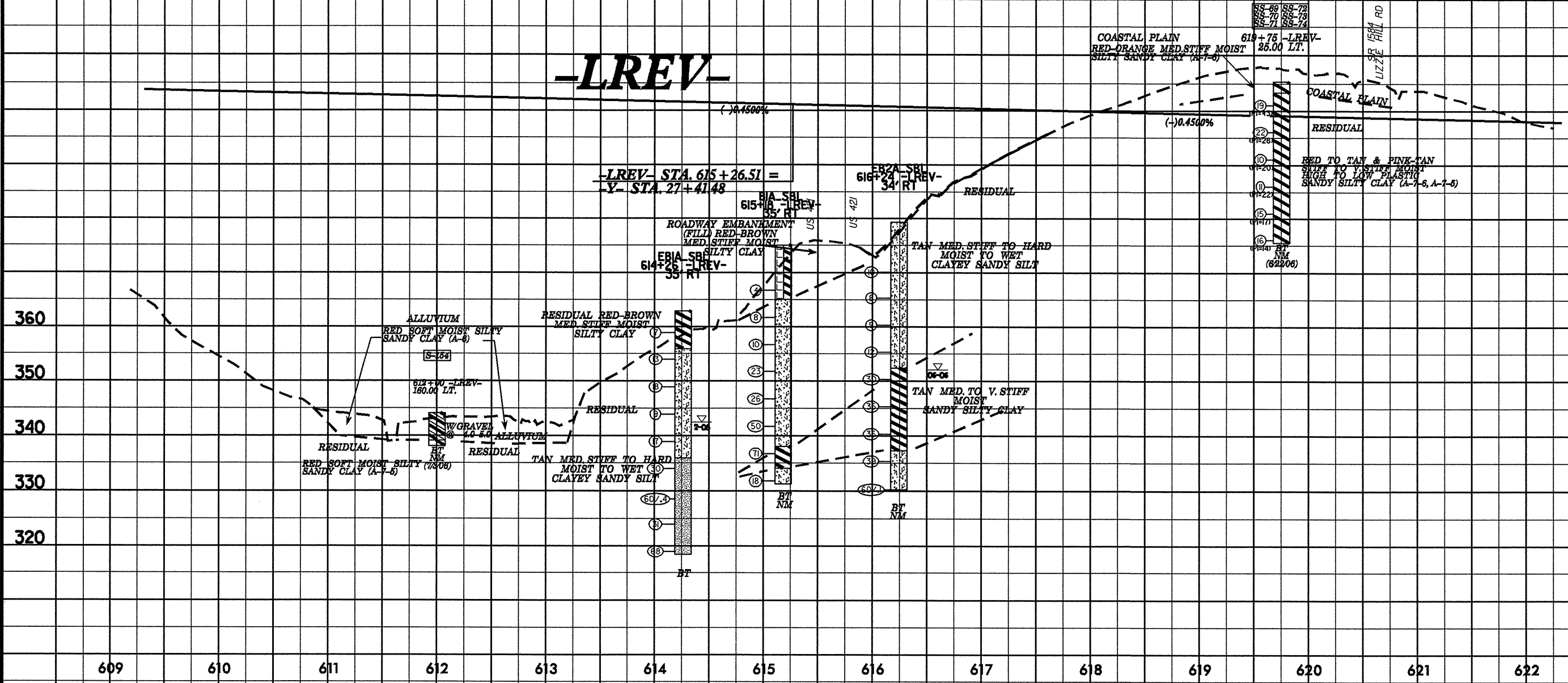


-LREV- POT Sta 615+26.51 =
 -Y- POCSta. 27+41.48
 -Y- FTSa. 28+92.99

-LREV- POT Sta 616+60.00 59' RT. =
 -VLPD- STSta. 0+00.00

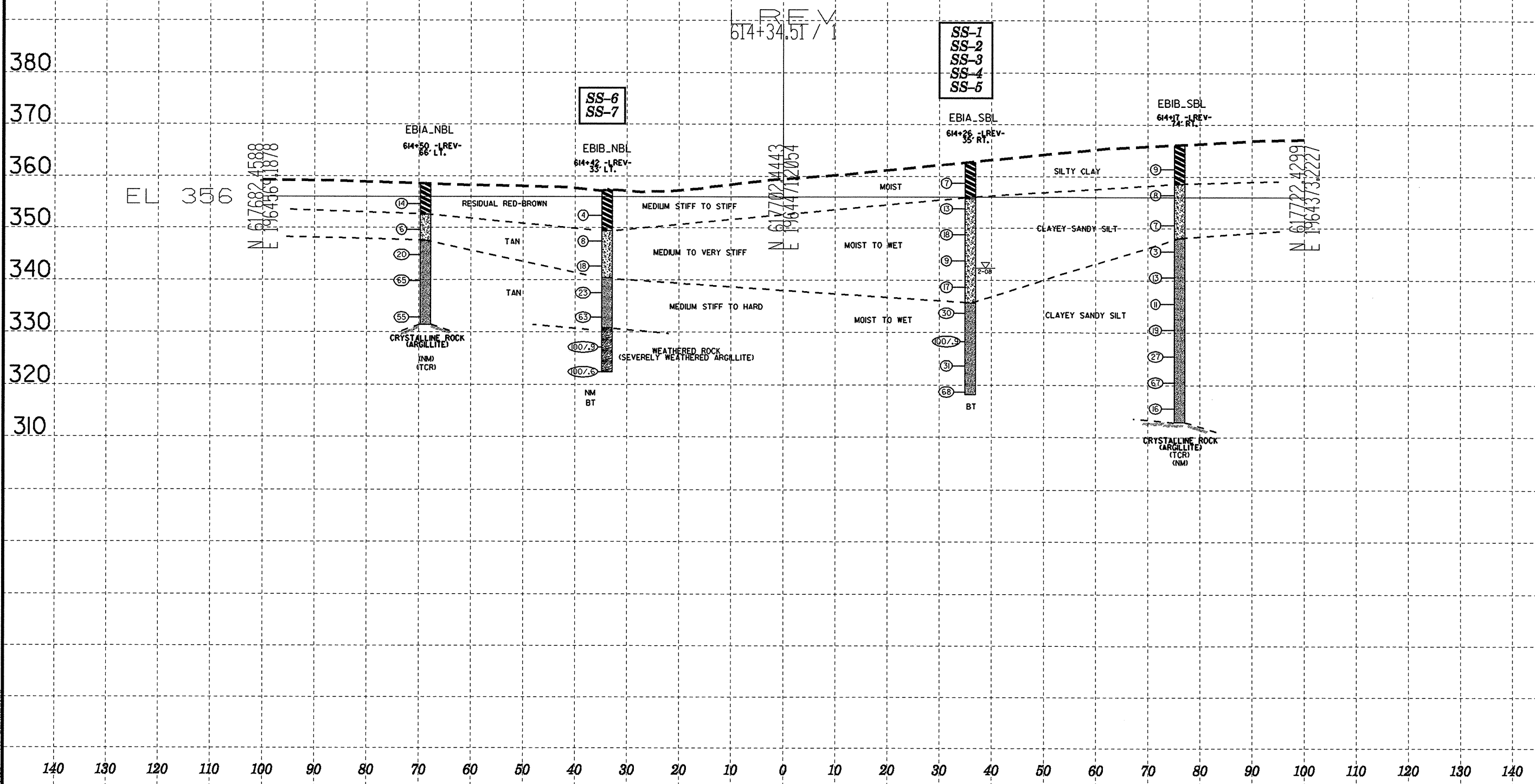
-VLPD- SCSta. 3+00.00

PROJECT REFERENCE NO. 34481 (R-2417C)	SHEET NO. 4
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



5/28/99

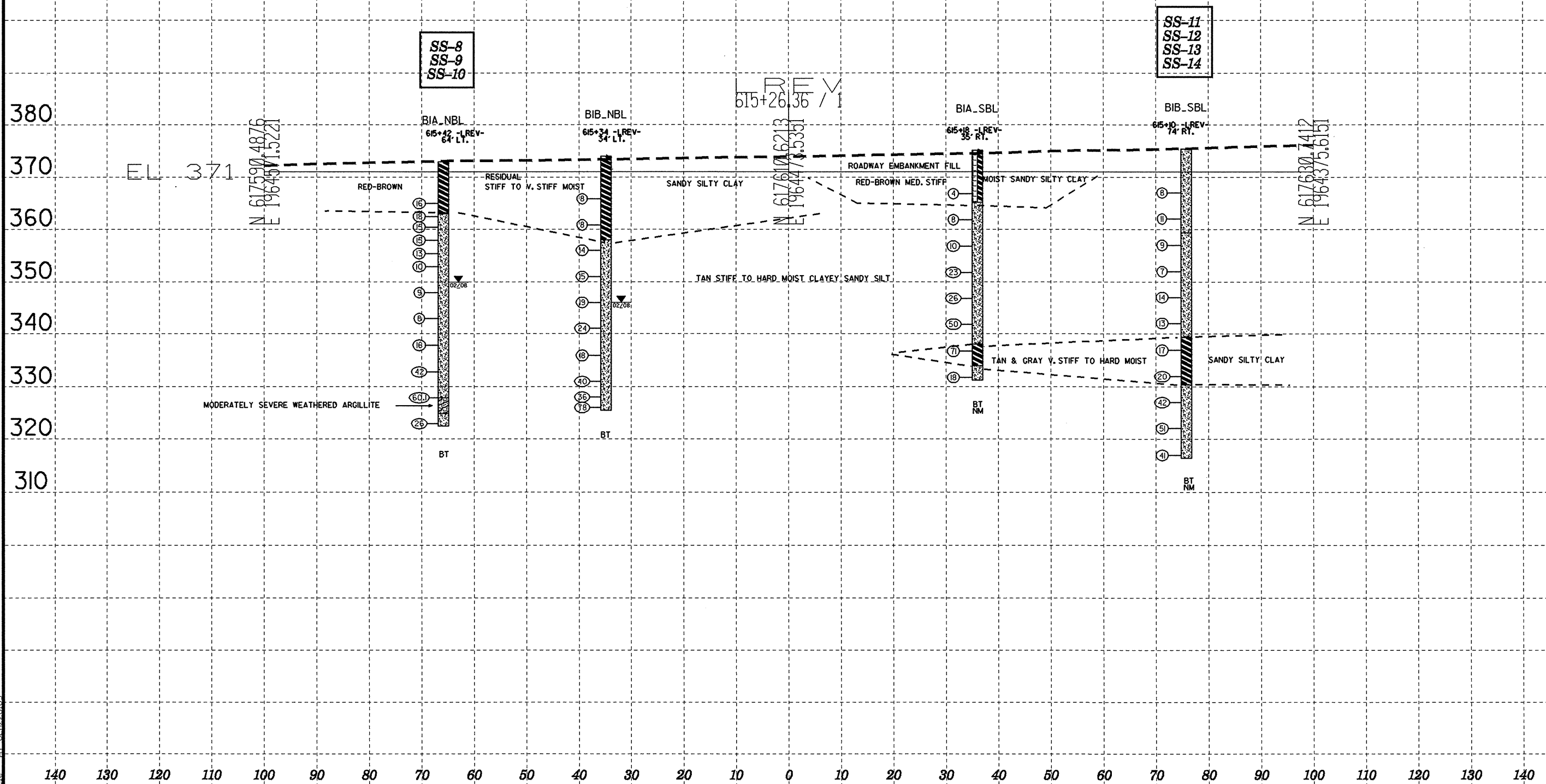
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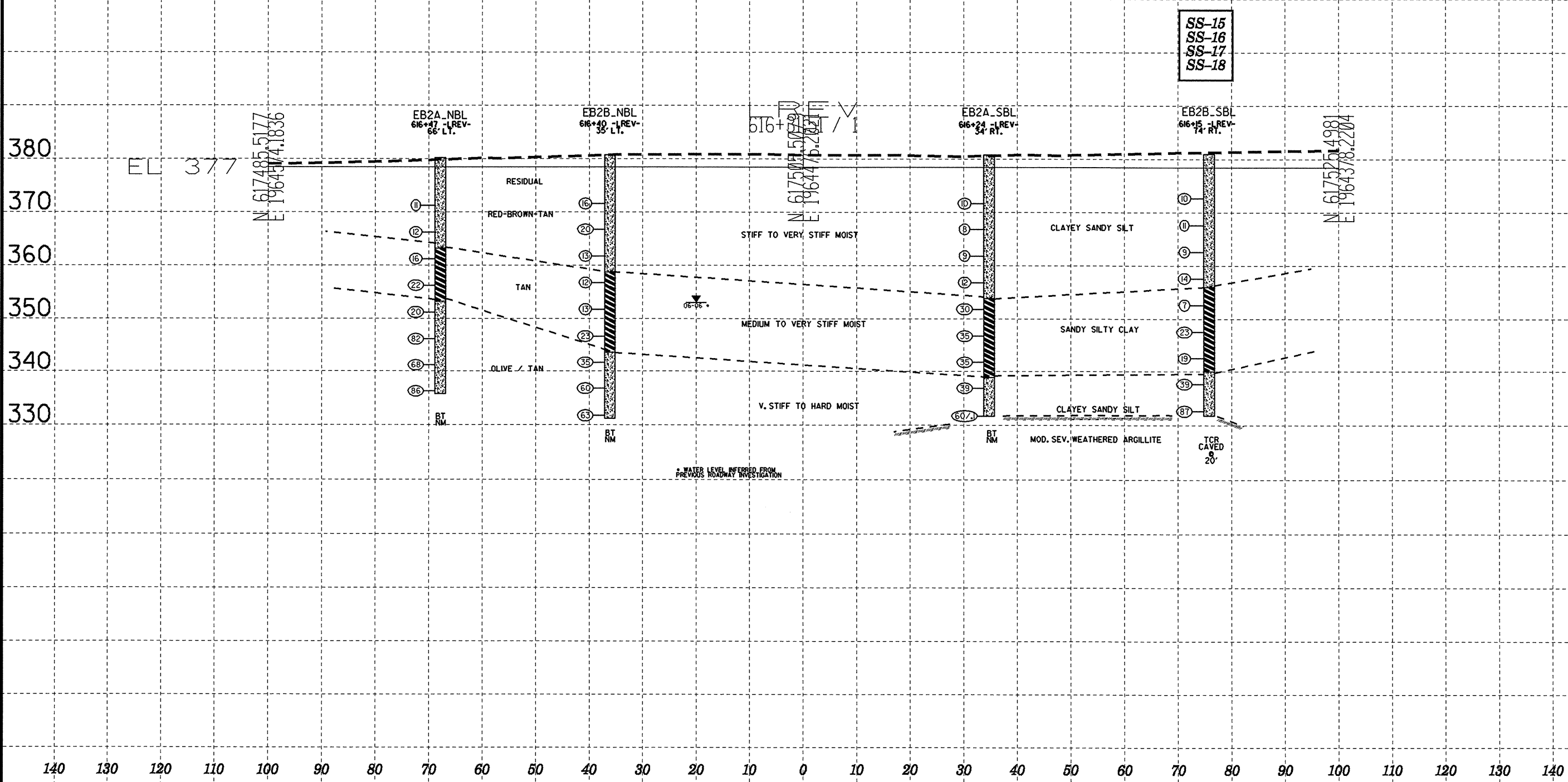
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SECTION THROUGH END BENT TWO



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PROJECT NO. 34431.1.1	ID. R2417C	COUNTY LEE	GEOLOGIST Murray, C. C.
SITE DESCRIPTION US 421 - NC 87 (SANFORD BYPASS) OVER US421 BETWEEN NC 42 & NC 87			GROUND WTR (ft)
BORING NO. EB1A_NBL	STATION 614+50	OFFSET 66ft LT	ALIGNMENT -LREV-
COLLAR ELEV. 358.7 ft	TOTAL DEPTH 27.1 ft	NORTHING 617,689	EASTING 1,964,538
DRILL MACHINE CME-550X	DRILL METHOD NW Casing w/ Advancer	HAMMER TYPE Automatic	
START DATE 02/12/08	COMP. DATE 02/12/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 27.1 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				
360													GROUND SURFACE	0.0
355	355.8	2.9	4	6	8							M	RESIDUAL RED-BRN & TAN STIFF MOIST LOW PLASTIC (PI=13) SILTY CLAY (A-7-5)	6.0
350	350.8	7.9	3	3	3							M	RESIDUAL TAN MED. STIFF MOIST CLAYEY SANDY SILT (A-5)	11.0
345	346.0	12.7	4	8	12							M	RESIDUAL TAN HARD MOIST CLAYEY SANDY SILT (A-4)	27.1
340	341.0	17.7	12	24	41							M		
335	334.0	24.7	11	26	29							M		
330													Boring Terminated with TRI-CONE REFUSAL at Elevation 331.6 ft ON SEVERELY WEATHERED ARGILLITE	

NCDOT BORE SINGLE R2417C_GEO_BRDG_LEE.GPJ NC_DOT_GDT_04/25/08

PROJECT NO. 34431.1.1	ID. R2417C	COUNTY LEE	GEOLOGIST Murray, C. C.
SITE DESCRIPTION US 421 - NC 87 (SANFORD BYPASS) OVER US 421 BETWEEN NC 42 & NC 87			GROUND WTR (ft)
BORING NO. EB1B_NBL	STATION 614+42	OFFSET 33ft LT	ALIGNMENT -LREV-
COLLAR ELEV. 357.3 ft	TOTAL DEPTH 34.9 ft	NORTHING 617,696	EASTING 1,964,504
DRILL MACHINE CME-550X	DRILL METHOD NW Casing w/ Advancer	HAMMER TYPE Automatic	
START DATE 02/12/08	COMP. DATE 02/12/08	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				
360													GROUND SURFACE	0.0
355	353.3	4.0	1	2	2							M	RESIDUAL RED BRN SOFT TO MED. STIFF MOIST LOW PLASTIC (PI=13) SILTY CLAY (A-7-5)	8.0
350	348.3	9.0	2	4	4							SS-6 M	RESIDUAL TAN STIFF TO V. STIFF MOIST CLAYEY SANDY SILT (A-5)	17.0
345	343.5	13.8	4	6	12							M		
340	338.5	18.8	8	10	13							SS-7 M	RESIDUAL GRY-TAN V. STIFF TO HARD WET CLAYEY SANDY SILT (A-4)	26.5
335	333.8	23.5	10	24	39							W		
330	328.5	28.8	13	31	69/4								WEATHERED ROCK	
325	323.5	33.8	19	75	25/1									
320													Boring Terminated at Elevation 322.4 ft IN WEATHERED ROCK	

NCDOT BORE SINGLE R2417C_GEO_BRDG_LEE.GPJ NC_DOT_GDT_04/23/08

PROJECT NO. 34431.1.1		ID. R2417C		COUNTY LEE		GEOLOGIST Murray, C. C.									
SITE DESCRIPTION US 421 - NC 87 (SANFORD BYPASS) OVER US 421 BETWEEN NC 42 & NC 87							GROUND WTR (ft)								
BORING NO. EB1A_SBL		STATION 614+26		OFFSET 35ft RT		ALIGNMENT -LREV-									
COLLAR ELEV. 363.0 ft		TOTAL DEPTH 44.5 ft		NORTHING 617,710		EASTING 1,964,436									
DRILL MACHINE CME-550X		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
START DATE 02/12/08		COMP. DATE 02/12/08		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					
365															
360	360.0	3.0	4	3	4									363.0	0.0
355	355.0	8.0	4	5	8									356.0	7.0
350	350.0	13.0	5	8	10										
345	345.0	18.0	3	4	5										
340	340.0	23.0	3	8	9										
335	335.0	28.0	4	10	20									336.0	27.0
330	330.0	33.0	11	40	60/4										
325	325.0	38.0	10	16	15										
320	320.0	43.0	7	20	48									318.5	44.5
315															
310															
305															
300															
295															
290															
285															

NCDOT BORE SINGLE R2417C_GEO_BRDG_LEE.GPJ NC_DOT.GDT 04/23/08

PROJECT NO. 34431.1.1		ID. R2417C		COUNTY LEE		GEOLOGIST Murray, C. C.									
SITE DESCRIPTION US 421 - NC 87 (SANFORD BYPASS) OVER US 421 BETWEEN NC 42 & NC 87							GROUND WTR (ft)								
BORING NO. EB1B_SBL		STATION 614+17		OFFSET 74ft RT		ALIGNMENT -LREV-									
COLLAR ELEV. 366.5 ft		TOTAL DEPTH 53.2 ft		NORTHING 617,718		EASTING 1,964,397									
DRILL MACHINE CME-550X		DRILL METHOD NW Casing w/ Advancer		HAMMER TYPE Automatic											
START DATE 02/12/08		COMP. DATE 02/12/08		SURFACE WATER DEPTH N/A		DEPTH TO ROCK 53.2 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					
370															
365														366.5	0.0
360	362.9	3.6	2	4	5										
355	357.9	8.6	3	3	5										
350	352.0	14.5	3	3	4										
345	347.0	19.5	3	1	2										
340	342.0	24.5	2	4	9										
335	337.0	29.5	3	4	7										
330	332.0	34.5	4	8	11										
325	327.0	39.5	6	11	16										
320	322.0	44.5	15	22	45										
315	317.0	49.5	4	5	11										
310															
305															
300															
295															
290															

NCDOT BORE SINGLE R2417C_GEO_BRDG_LEE.GPJ NC_DOT.GDT 04/23/08

PROJECT NO. 34431.1.1		ID. R2417C		COUNTY LEE		GEOLOGIST Murray, C. C.										
SITE DESCRIPTION US 421 - NC 87 (SANFORD BYPASS) OVER US 421 BETWEEN NC 42 & NC 87							GROUND WTR (ft)									
BORING NO. B1A_SBL		STATION 615+18		OFFSET 35ft RT		ALIGNMENT -LREV-										
COLLAR ELEV. 375.1 ft		TOTAL DEPTH 43.8 ft		NORTHING 617,618		EASTING 1,964,438										
DRILL MACHINE CME-550X		DRILL METHOD NW Casing w/ Advancer			HAMMER TYPE Automatic											
START DATE 02/12/08		COMP. DATE 02/12/08		SURFACE WATER DEPTH N/A		DEPTH TO ROCK N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
380																
375														375.1	GROUND SURFACE	0.0
370															ROADWAY EMBANKMENT RED BRN MED. STIFF MOIST LOW PLASTIC (PI=13) SANDY SILTY CLAY (A-7-5)	
365	367.8	7.3	1	2	2									365.1	RESIDUAL TAN STIFF MOIST SANDY CLAYEY SILT (A-5)	10.0
360	362.8	12.3	3	3	5											
355	357.8	17.3	2	4	6											
350	352.8	22.3	4	9	14											
345	347.8	27.3	7	11	15											
340	342.8	32.3	11	21	29											
335	337.8	37.3	18	26	45									338.1	RESIDUAL TAN STIFF MOIST LOW PLASTIC SANDY SILTY CLAY (A-7-5)	37.0
330	332.8	42.3	7	8	10									334.1	RESIDUAL TAN V. STIFF MOIST CLAYEY SANDY SILT (A-5)	41.0
														331.3	RESIDUAL TAN V. STIFF MOIST CLAYEY SANDY SILT (A-5)	43.8
															Boring Terminated at Elevation 331.3 ft IN HARD CLAYEY SANDY SILT (A-5)	

NCDOT BORE SINGLE R2417C_GEO_BRDG_LEE.GPJ NC_DOT_GDT 04/23/08

PROJECT NO. 34431.1.1		ID. R2417C		COUNTY LEE		GEOLOGIST Murray, C. C.										
SITE DESCRIPTION US 421 - NC 87 (SANFORD BYPASS) OVER US 421 BETWEEN NC 42 & NC 87							GROUND WTR (ft)									
BORING NO. B1B_SBL		STATION 615+10		OFFSET 74ft RT		ALIGNMENT -LREV-										
COLLAR ELEV. 375.4 ft		TOTAL DEPTH 58.9 ft		NORTHING 617,625		EASTING 1,964,399										
DRILL MACHINE CME-550X		DRILL METHOD NW Casing w/ Advancer			HAMMER TYPE Automatic											
START DATE 02/12/08		COMP. DATE 02/12/08		SURFACE WATER DEPTH N/A		DEPTH TO ROCK N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
380																
375														375.4	GROUND SURFACE	0.0
370															RESIDUAL RED BRN & TAN WITH QUARTZ SEAM STIFF MOIST SANDY CLAYEY SILT (A-5)	
365	368.0	7.4	3	3	5									365.1		
360	363.0	12.4	2	5	6											
355	358.0	17.4	3	3	6											
350	353.0	22.4	2	3	4											
345	348.0	27.4	3	5	9											
340	343.0	32.4	2	5	8											
335	338.0	37.4	3	7	10									339.4	RESIDUAL TAN TO TAN-GRY MED. STIFF TO STIFF MOIST CLAYEY SANDY SILT (A-5)	16.0
330	333.0	42.4	4	8	12											
325	328.0	47.4	7	18	24											
320	323.0	52.4	12	22	29											
315	318.0	57.4	9	19	22											
														339.4	RESIDUAL TAN & GRY V. STIFF MOIST LOW PLASTIC (PI=13) SANDY SILTY CLAY (A-7-5)	36.0
														330.4	RESIDUAL TAN & GRY HARD MOIST CLAYEY SANDY SILT (A-5)	45.0
														316.5	Boring Terminated at Elevation 316.5 ft IN V. STIFF CLAYEY SANDY SILT (A-5)	58.9

NCDOT BORE SINGLE R2417C_GEO_BRDG_LEE.GPJ NC_DOT_GDT 04/23/08

PROJECT NO. 34431.1.1		ID. R2417C		COUNTY LEE		GEOLOGIST Murray, C. C.										
SITE DESCRIPTION US 421 - NC 87 (SANFORD BYPASS) OVER US 421 BETWEEN NC 42 & NC 87						GROUND WTR (ft)										
BORING NO. EB2A_NBL		STATION 616+47		OFFSET 66ft LT		ALIGNMENT -LREV-										
COLLAR ELEV. 378.8 ft		TOTAL DEPTH 44.5 ft		NORTHING 617,492		EASTING 1,964,543										
DRILL MACHINE CME-550X		DRILL METHOD NW Casing w/ Advancer			HAMMER TYPE Automatic											
START DATE 02/12/08		COMP. DATE 02/12/08		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 MOI	L O G ELEV. (ft)	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
380														378.8	GROUND SURFACE	0.0
375															RESIDUAL RED-BRN AND TAN STIFF MOIST CLAYEY SANDY SILT (A-5)	
370	370.8	8.0	4	5	6											
365	365.8	13.0	4	5	7											
360	360.8	18.0	4	7	9									361.8	RESIDUAL TAN STIFF TO V. STIFF MOIST LOW PLASTIC (PI=11) SANDY SILTY CLAY (A-7-5)	17.0
355	355.8	23.0	4	10	12											
350	350.8	28.0	5	8	12									351.8	RESIDUAL TAN HARD MOIST CLAYEY SANDY SILT (A-5)	27.0
345	345.8	33.0	12	17	65											
340	340.8	38.0	10	23	45											
335	335.8	43.0	18	35	51									334.3	Boring Terminated at Elevation 334.3 ft IN HARD CLAYEY SANDY SILT (A-5)	44.5
330																
325																
320																
315																
310																
305																
300																

NCDOT BORE SINGLE R2417C_GEO_BRDG_LEE.GPJ_NC_DOT_GDT_04/23/08

PROJECT NO. 34431.1.1		ID. R2417C		COUNTY LEE		GEOLOGIST Murray, C. C.										
SITE DESCRIPTION US 421 - NC 87 (SANFORD BYPASS) OVER US 421 BETWEEN NC 42 & NC 87						GROUND WTR (ft)										
BORING NO. EB2B_NBL		STATION 616+40		OFFSET 35ft LT		ALIGNMENT -LREV-										
COLLAR ELEV. 379.5 ft		TOTAL DEPTH 49.5 ft		NORTHING 617,498		EASTING 1,964,511										
DRILL MACHINE CME-550X		DRILL METHOD NW Casing w/ Advancer			HAMMER TYPE Automatic											
START DATE 02/12/08		COMP. DATE 02/12/08		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 MOI	L O G ELEV. (ft)	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
380														379.5	GROUND SURFACE	0.0
375															RESIDUAL RED-BROWN & TAN STIFF TO V. STIFF MOIST CLAYEY SANDY SILT (A-5)	
370	371.3	8.2	6	8	8											
365	366.5	13.0	5	8	12											
360	361.5	18.0	2	5	8											
355	356.5	23.0	3	5	7											
350	351.5	28.0	2	5	8											
345	346.5	33.0	5	10	13											
340	341.5	38.0	8	14	21											
335	336.5	43.0	16	25	35											
330	331.5	48.0	29	29	34											
325																
320																
315																
310																
305																
300																

NCDOT BORE SINGLE R2417C_GEO_BRDG_LEE.GPJ_NC_DOT_GDT_04/25/08

PROJECT NO. 34431.1.1	ID. R2417C	COUNTY LEE	GEOLOGIST Murray, C. C.
SITE DESCRIPTION US 421 - NC 87 (SANFORD BYPASS) OVER US 421 BETWEEN NC 42 & NC 87			GROUND WTR (ft)
BORING NO. EB2A_SBL	STATION 616+24	OFFSET 34ft RT	ALIGNMENT -LREV-
COLLAR ELEV. 379.4 ft	TOTAL DEPTH 49.1 ft	NORTHING 617,512	EASTING 1,964,442
DRILL MACHINE CME-550X	DRILL METHOD NW Casing w/ Advancer	HAMMER TYPE Automatic	
START DATE 02/12/08	COMP. DATE 02/12/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 49.1 ft

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION	ELEV. (ft)	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
380													GROUND SURFACE	379.4	0.0
375													RESIDUAL RED-BRN GRY & TAN MED. STIFF MOIST CLAYEY SANDY SILT (A-5)		
370	371.2	8.2	4	5	5							M			
365	366.4	13.0	3	3	5							M			
360	361.4	18.0	3	4	5							M			
355	356.4	23.0	4	5	7							M			
350	351.4	28.0	6	12	18							M			
345	346.4	33.0	6	15	20							M			
340	341.4	38.0	5	11	24							M			
335	336.4	43.0	8	14	25							M			
330	331.4	48.0	16	61	60/1							M			
325															
320															
315															
310															
305															
300															

NCDOT BORE SINGLE R2417C_GEO_BRDG_LEE.GPJ NC_DOT_GDT_05/07/08

PROJECT NO. 34431.1.1	ID. R2417C	COUNTY LEE	GEOLOGIST Murray, C. C.
SITE DESCRIPTION US 421 - NC 87 (SANFORD BYPASS) OVER US 421 BETWEEN NC 42 & NC 87			GROUND WTR (ft)
BORING NO. EB2B_SBL	STATION 616+15	OFFSET 74ft RT	ALIGNMENT -LREV-
COLLAR ELEV. 379.6 ft	TOTAL DEPTH 49.2 ft	NORTHING 617,520	EASTING 1,964,402
DRILL MACHINE CME-550X	DRILL METHOD NW Casing w/ Advancer	HAMMER TYPE Automatic	
START DATE 02/12/08	COMP. DATE 02/12/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION	ELEV. (ft)	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
380													GROUND SURFACE	379.6	0.0
375													RESIDUAL RED-BRN AND TAN STIFF MOIST CLAYEY SANDY SILT (A-5)		
370	372.2	7.4	3	4	6							SS-15	M		
365	367.2	12.4	3	4	7							SS-16	M		
360	362.2	17.4	2	3	6								M		
355	357.2	22.4	3	5	9								M		
350	352.2	27.4	3	3	4							SS-17	M		
345	347.2	32.4	3	8	15								M		
340	342.2	37.4	5	8	11								M		
335	337.2	42.4	4	14	25							SS-18	M		
330	332.2	47.4	11	38	49								M		
325															
320															
315															
310															
305															
300															

NCDOT BORE SINGLE R2417C_GEO_BRDG_LEE.GPJ NC_DOT_GDT_05/07/08

Boring Terminated with Standard Penetration Test Refusal at Elevation 330.3 ft in SEVERELY WEATHERED ARGILLITE

Boring Terminated with TRI-CONE REFUSAL at Elevation 330.4 ft ON SEVERELY WEATHERED ARGILLITE
CAVED @ 20'

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAY
MATERIALS & TESTS UNIT
SOILS LABORATORY

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAY
MATERIALS & TESTS UNIT
SOILS LABORATORY

T. I. P. No. R-2417C

T. I. P. No. R-2417C

REPORT ON SAMPLES OF SOILS FOR QUALITY

REPORT ON SAMPLES OF SOILS FOR QUALITY

Project 3443111 County LEE Owner _____
 Date: Sampled 2/7/08 Received 3/7/08 Reported 3/12/08
 Sampled from _____ By C C MURRAY
 Submitted by N WAINAINA 1995 Standard Specifications

Project 3443111 County LEE Owner _____
 Date: Sampled 2/7/08 Received 3/7/08 Reported 3/12/08
 Sampled from _____ By C C MURRAY
 Submitted by N WAINAINA 1995 Standard Specifications

744050 TO 744068
 4/25/08

744050 TO 744068
 4/25/08

TEST RESULTS

TEST RESULTS

Proj. Sample No.	SS-1	SS-2	SS-3	SS-4	SS-5	SS-6
Lab. Sample No.	744050	744051	744052	744053	744054	744055
Retained #4 Sieve %	-	-	-	-	-	-
Passing #10 Sieve %	100	100	100	100	100	100
Passing #40 Sieve %	97	97	97	94	93	96
Passing #200 Sieve %	83	78	78	64	71	71

Proj. Sample No.	SS-7	SS-8	SS-9	SS-10	SS-11	SS-12
Lab. Sample No.	744056	744057	744058	744059	744060	744061
Retained #4 Sieve %	-	-	-	-	-	-
Passing #10 Sieve %	100	100	100	100	100	98
Passing #40 Sieve %	96	97	98	98	99	95
Passing #200 Sieve %	73	72	76	80	91	75

MINUS NO. 10 FRACTION

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%						
Coarse Sand Ret - #60 %	7.1	6.3	5.5	13.2	11.2	6.7
Fine Sand Ret - #270 %	16.4	24.5	24.9	34.5	29.0	33.5
Silt 0.05 - 0.005 mm %	37.9	48.9	51.3	42.2	51.7	47.7
Clay < 0.005 mm %	38.5	20.3	18.3	10.1	8.1	12.2
Passing #40 Sieve %	-	-	-	-	-	-
Passing #200 Sieve %	-	-	-	-	-	-

SOIL MORTAR - 100%						
Coarse Sand Ret - #60 %	8.1	6.3	4.3	4.7	1.8	4.9
Fine Sand Ret - #270 %	31.0	31.6	29.6	26.4	14.0	30.2
Silt 0.05 - 0.005 mm %	50.7	39.8	47.9	50.7	55.8	44.6
Clay < 0.005 mm %	10.1	22.3	18.3	18.3	28.4	20.3
Passing #40 Sieve %	-	-	-	-	-	-
Passing #200 Sieve %	-	-	-	-	-	-

L. L.	51	49	48	39	40	41
P. I.	17	6	8	3	8	7
AASHTO Classification	A-7-5(17)	A-5(8)	A-5(9)	A-4(2)	A-4(6)	A-5(6)
Station	614+26	614+26	614+26	614+26	614+26	614+42
OFFSET	35 R	35 RT	35 RT	35 RT	35 RT	33LT
ALIGNMENT	L REV	L REV	L REV	L REV	L REV	L REV
Depth (Ft)	3.00	8.00	18.00	28.00	38.00	9.00
to	4.50	9.50	19.50	29.50	39.50	10.50

L. L.	38	52	48	44	54	53
P. I.	3	13	9	9	9	9
AASHTO Classification	A-4(3)	A-7-5(11)	A-5(9)	A-5(9)	A-5(14)	A-5(10)
Station	614+42	615+42	615+42	615+42	615+10	615+10
OFFSET	33LT	64LT	64LT	64LT	74RT	74RT
ALIGNMENT	L REV	L REV	L REV	L REV	L REV	L REV
Depth (Ft)	18.80	7.00	11.50	39.00	7.40	17.40
to	20.30	8.50	13.00	40.50	8.90	18.90

cc: C C MURRAY
 Soils File

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAY
 MATERIALS & TESTS UNIT
 SOILS LABORATORY

T. I. P. No. R-2417C

REPORT ON SAMPLES OF SOILS FOR QUALITY

Project 3443111 County LEE Owner _____
 Date: Sampled 2/7/08 Received 3/7/08 Reported 3/12/08
 Sampled from _____ By C C MURRAY
 Submitted by N WAINAINA 1995 Standard Specifications

744050 TO 744068
 4/25/08

TEST RESULTS

Proj. Sample No.	SS-13	SS-14	SS-15	SS-16	SS-17	SS-18
Lab. Sample No.	744062	744063	744064	744065	744066	744067
Retained #4 Sieve	% -	-	-	-	-	-
Passing #10 Sieve	% 100	100	100	100	100	100
Passing #40 Sieve	% 98	98	100	99	99	99
Passing #200 Sieve	% 81	79	79	83	81	79

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%						
Coarse Sand Ret - #60	% 4.1	4.7	0.6	1.8	1.8	2.2
Fine Sand Ret - #270	% 26.0	27.0	32.9	27.6	28.2	31.4
Silt 0.05 - 0.005 mm	% 47.7	52.1	44.2	52.3	51.7	52.1
Clay < 0.005 mm	% 22.3	16.2	22.3	18.3	18.3	14.2
Passing #40 Sieve	% -	-	-	-	-	-
Passing #200 Sieve	% -	-	-	-	-	-

L. L.	51	44	49	48	46	41
P. I.	12	9	8	9	11	9
AASHTO Classification	A-7-5(13)	A-5(9)	A-5(10)	A-5(11)	A-7-5(11)	A-5(8)
Station	615+10	615+10	616+15	616+15	616+15	616+15
OFFSET	74RT	74RT	74RT	74RT	74RT	74RT
ALIGNMENT	L REV	L REV	L REV	L REV	L REV	L REV
Depth (Ft)	37.40	47.40	7.40	12.40	27.40	42.40
to	38.90	48.90	8.90	13.90	28.90	43.90

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAY
 MATERIALS & TESTS UNIT
 SOILS LABORATORY

T. I. P. No. R-2417C

REPORT ON SAMPLES OF SOILS FOR QUALITY

Project 3443111 County LEE Owner _____
 Date: Sampled 2/7/08 Received 3/7/08 Reported 3/12/08
 Sampled from _____ By C C MURRAY
 Submitted by N WAINAINA 1995 Standard Specifications

744050 TO 744068
 4/25/08

TEST RESULTS

Proj. Sample No.	SS-19				
Lab. Sample No.	744068				
Retained #4 Sieve	% -				
Passing #10 Sieve	% 100				
Passing #40 Sieve	% 98				
Passing #200 Sieve	% 80				

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%					
Coarse Sand Ret - #60	% 5.7				
Fine Sand Ret - #270	% 22.1				
Silt 0.05 - 0.005 mm	% 43.8				
Clay < 0.005 mm	% 28.4				
Passing #40 Sieve	% -				
Passing #200 Sieve	% -				

L. L.	46				
P. I.	15				
AASHTO Classification	A-7-5(14)				
Station	614+00				
OFFSET	165LT				
ALIGNMENT	L REV				
Depth (Ft)	0.00				
to	1.50				

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	34431 (R-2417C)	1	5

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

STRUCTURE
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 34431 (R-2417C) F.A. PROJ. STP-NHF-421(2)

COUNTY LEE

PROJECT DESCRIPTION US 421/NC 87 SANFORD BYPASS
FROM EAST OF NC 42 TO NC 87 NEAR SR 1138

SITE DESCRIPTION CULVERT @ 612+27 -LREV-

CONTENTS

<u>SHEET</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4	PROFILE ALONG CULVERT
5	SOIL SAMPLE TEST RESULTS

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-PLACED) 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.

ID: R-2417C

PROJECT: 34431

PERSONNEL

CC MURRAY

J. ESTEP

M.R. MOORE

INVESTIGATED BY **MURRAY**

CHECKED BY **LITTLE**

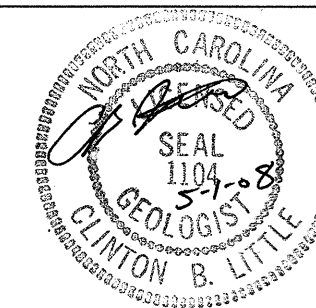
SUBMITTED BY **LITTLE**

DATE **APRIL 2008**

DRAWN BY: **LITTLE**

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

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



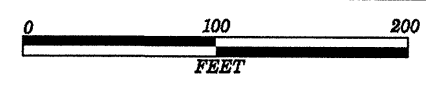
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

PROJECT REFERENCE NO. 34431 (R-2417C)	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 (AASHTO T206, 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. EXAMPLES: <i>VERY STIFF, GRAY SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HEAVY PLASTIC, A-7-5</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 60 BLOWS, IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS: WEATHERED ROCK (WR) NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED. CRYSTALLINE ROCK (CR) FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL, IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC. NON-CRYSTALLINE ROCK (NCR) FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLITE, SLATE, SANDSTONE, ETC. COASTAL PLAIN SEDIMENTARY ROCK (CP) COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOADED 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 (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 60 BLOWS. STRATA CORE RECOVERY (SPEC.) - 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.	
COMPRESSION	PERCENTAGE OF MATERIAL	GROUND WATER	
SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 31 MODERATELY COMPRESSIBLE LIQUID LIMIT EQUAL TO 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50	ORGANIC MATERIAL GRANULAR SOILS SILT-CLAY SOILS OTHER MATERIAL TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10% LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20% MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35% HIGHLY ORGANIC >10% >20% HIGHLY 35% AND ABOVE	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	
CONSISTENCY OR DENSENESS	MISCELLANEOUS SYMBOLS		
PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)	ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT INFERRED SOIL BOUNDARY INFERRED ROCK LINE ALLUVIAL SOIL BOUNDARY DIP & DIP DIRECTION OF ROCK STRUCTURES SOUNDING ROD	SPT TEST BORING AUGER BORING CORE BORING MONITORING WELL PIEZOMETER INSTALLATION SLOPE INDICATOR INSTALLATION SPT N-VALUE SPT REFUSAL	SAMPLE DESIGNATIONS S - BULK SAMPLE SS - SPLIT SPOON SAMPLE ST - SHELBY TUBE SAMPLE RS - ROCK SAMPLE RT - RECOMPACTED TRIAXIAL SAMPLE CBR - CALIFORNIA BEARING RATIO SAMPLE
VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE	AR - AUGER REFUSAL BT - BORING TERMINATED CL - CLAY CPT - CONE PENETRATION TEST CSE - COARSE DNT - DILATOMETER TEST DPT - DYNAMIC PENETRATION TEST o - VOID RATIO F - FINE FOSS. - FOSSILIFEROUS FRAC. - FRACTURED, FRACTURES FRAGS. - FRAGMENTS	HI. - HIGHLY MED. - MEDIUM MICA - MICACEOUS MOD. - MODERATELY NP - NON PLASTIC ORG. - ORGANIC PMT - PRESSUREMETER TEST SAP. - SAPROLITIC SD. - SAND, SANDY SL. - SILT, SILTY SLI. - SLIGHTLY TCR - TRICONE REFUSAL	# - MOISTURE CONTENT V - VERY VST - VANE SHEAR TEST WEA. - WEATHERED % - UNIT WEIGHT % _d - DRY UNIT WEIGHT
TEXTURE OR GRAIN SIZE		ABBREVIATIONS	
U.S. STD. SIEVE SIZE OPENING (MM) 4 10 40 60 200 270 4.76 2.00 0.42 0.25 0.075 0.053	BOULDER (BLDR.) COBBLE (COB.) GRAVEL (GR.) COARSE SAND (CSE, SD.) FINE SAND (F SD.) SILT (SL.) CLAY (CL.)	MOBILE B- BK-51 CME-45C CME-550 PORTABLE HOIST	ADVANCING TOOLS: CLAY BITS 6" CONTINUOUS FLIGHT AUGER 8" HOLLOW AUGERS HARD FACED FINGER BITS TUNG.-CARBIDE INSERTS CASING w/ ADVANCER TRICONE *STEEL TEETH TRICONE *TUNG.-CARB. CORE BIT
SOIL MOISTURE - CORRELATION OF TERMS			
SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION	LL - LIQUID LIMIT PL - PLASTIC LIMIT OM - OPTIMUM MOISTURE SL - SHRINKAGE LIMIT	- SATURATED - (SAT.) USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE - WET - (W) SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE - DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE	
PLASTICITY		EQUIPMENT USED ON SUBJECT PROJECT	
NONPLASTIC 0-5 LOW PLASTICITY 6-15 MED. PLASTICITY 16-25 HIGH PLASTICITY 26 OR MORE	PLASTICITY INDEX (PI) DRY STRENGTH VERY LOW SLIGHT MEDIUM HIGH	DRILL UNITS: MOBILE B- BK-51 CME-45C CME-550 PORTABLE HOIST	HAMMER TYPE: AUTOMATIC MANUAL CORE SIZE: B- N- H- HAND TOOLS: POST HOLE DIGGER HAND AUGER SOUNDING ROD VANE SHEAR TEST
COLOR			FRACATURE SPACING
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.			TERM SPACING VERY WIDE MORE THAN 10 FEET WIDE 3 TO 10 FEET MODERATELY CLOSE 1 TO 3 FEET CLOSE 0.16 TO 1 FEET VERY CLOSE LESS THAN 0.16 FEET
			BEDDING
			TERM THICKNESS VERY THICKLY BEDDED > 4 FEET THICKLY BEDDED 1.5 - 4 FEET THINLY BEDDED 0.16 - 1.5 FEET VERY THINLY BEDDED 0.03 - 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET THINLY LAMINATED < 0.008 FEET
			INDURATION
			FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.
			NOTES:
			BENCH MARK: ELEVATION: _____ FT.



PROJECT REFERENCE NO.	SHEET
34431 (R-2417C)	3

-Y- POC Sta. 21+71.53 =
 -YRPA- POT Sta. 16+73.69 =
 -YRPB- POT Sta. 21+21.77

BEGIN SPECIAL MEDIAN
 GRADING STA 23+35.10

END SPECIAL MEDIAN
 GRADING STA 31+61.00

-LREV- POT Sta 616+60.00 59' RT. =
 -YLPD- STSta. 0+00.00

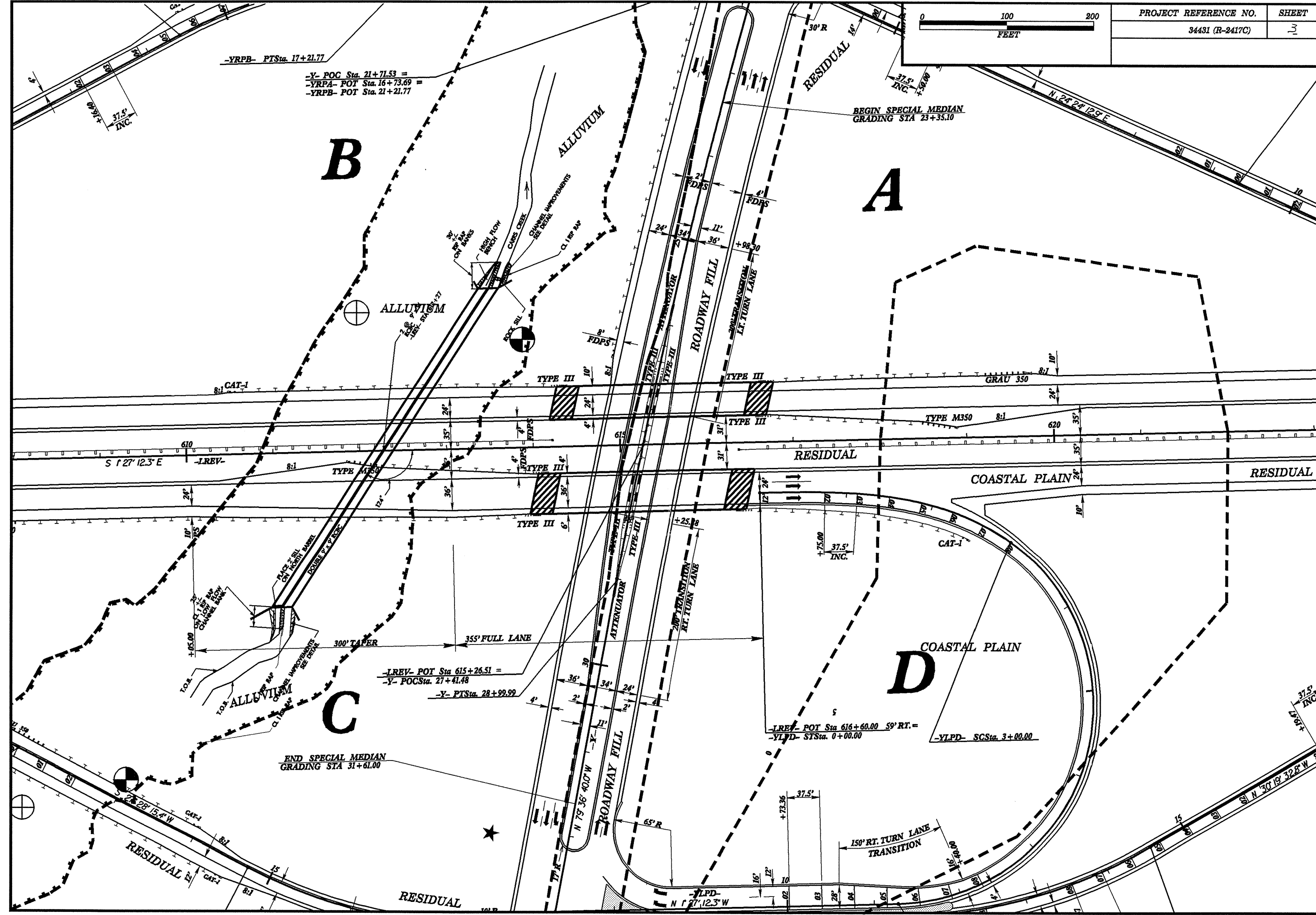
-YLPD- SCSta. 3+00.00

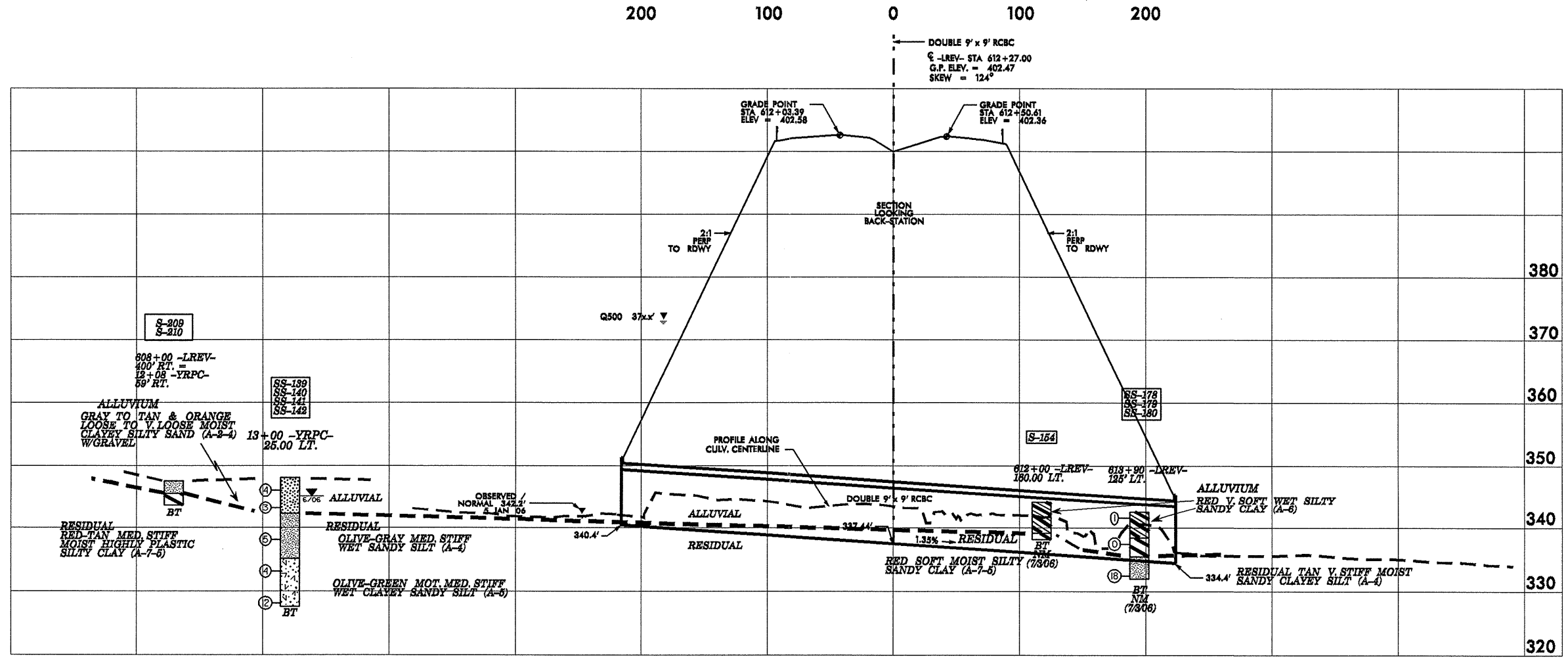
B

A

C

D





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

STRUCTURE
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 34431.1.1 F.A. PROJ. STP-NHF-421(2)
COUNTY LEE
PROJECT DESCRIPTION US 421 - NC 87 (SANFORD BYPASS)
FROM EAST OF NC 42 TO NC 87
SITE DESCRIPTION BRIDGE No. 137
ON -19FLY- OVER -LRev- (SANFORD BYPASS)

CONTENTS

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CAUTION NOTICE

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

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION, AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THIS PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

PERSONNEL

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T. PEREZ

INVESTIGATED BY S&ME, INC.

CHECKED BY A.F. RIGGS, JR.

SUBMITTED BY S&ME, INC.

DATE APRIL 4, 2008

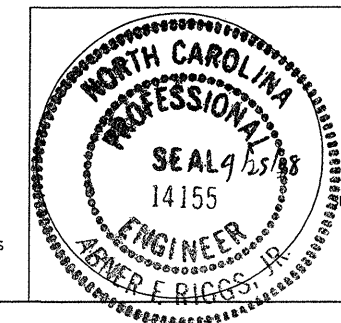
For Letting

PROJECT: 34431.1.1 ID: R-2417C

DRAWN BY: T. PEREZ

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.



A.F. Riggs, Jr.
SIGNATURE

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

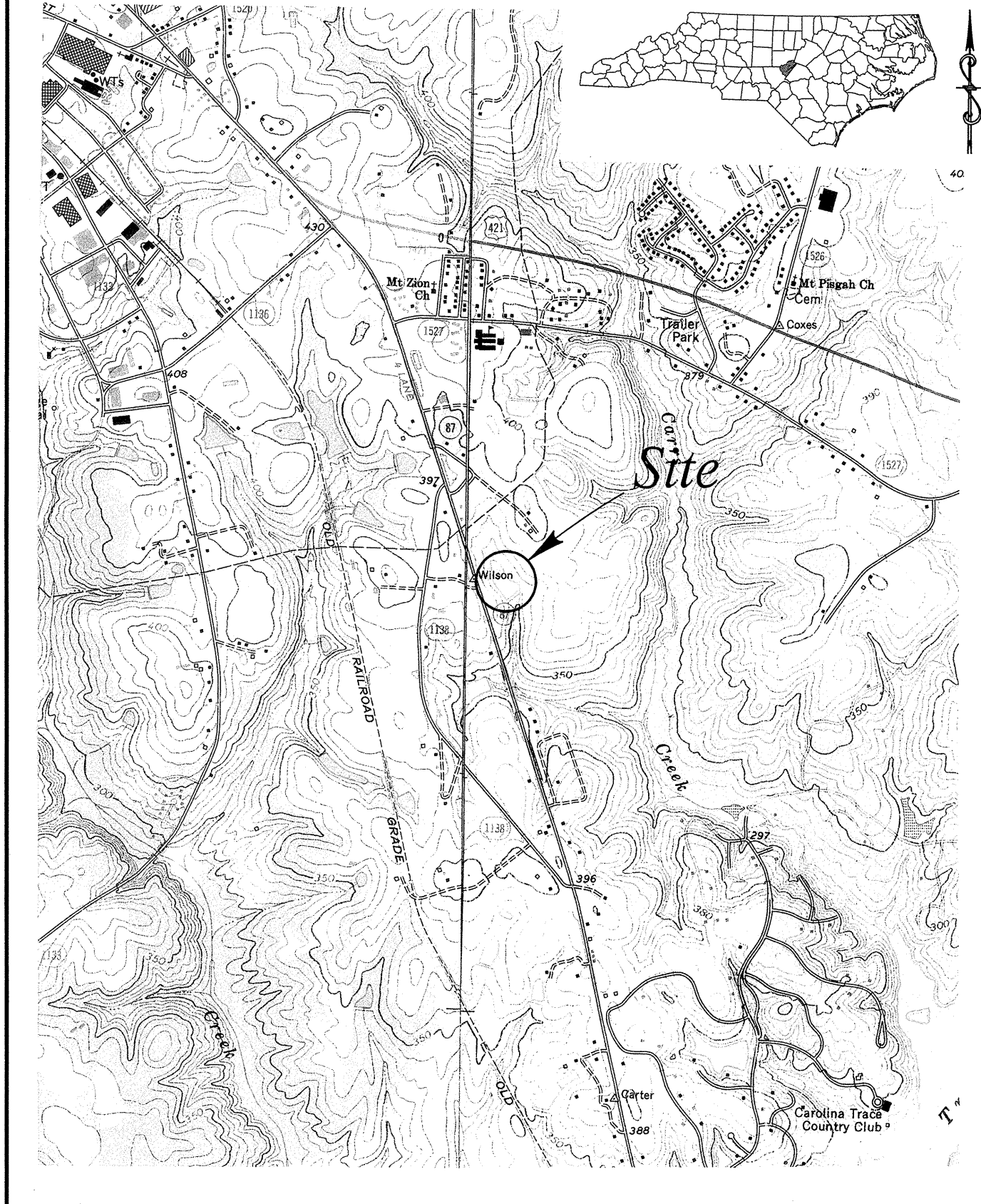
SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
R-2417C	34431.1.1	2	16

SOIL DESCRIPTION										GRADATION										ROCK DESCRIPTION										TERMS AND DEFINITIONS									
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED OR WEATHERED EARTH MATERIALS WHICH CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND WHICH YIELDS LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM AND 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, HIGH 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 ARE DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.										HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WHEN 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 WHICH 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 IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS WHICH 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 (F.P.) - 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 SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (R.Q.D.) - 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 WHICH 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, WHICH 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 B.P.F. 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 LESS THAN 0.1 FOOT PENETRATION WITH 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 (S.R.Q.D.) - 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 (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.									
SOIL LEGEND AND AASHTO CLASSIFICATION										MINERALOGICAL COMPOSITION										WEATHERING																			
GENERAL CLASS. GRANULAR MATERIALS (<95% PASSING #200) SILT-CLAY MATERIALS (>95% 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 VERY SLIGHT (V. SLI.) SLIGHT (SLI.) MODERATE (MOD.) MODERATELY SEVERE (MOD. SEV.) SEVERE (SEV.) VERY SEVERE (V. SEV.) COMPLETE																			
GROUP CLASS. A-1-a, A-1-b, A-2, A-2-4, A-2-5, A-2-6, A-2-7, A-4, A-5, A-6, A-7, A-7-5, A-7-6, A-3, A-1, A-2, A-3, A-4, A-5, A-6, A-7										COMPRESSIBILITY SLIGHTLY COMPRESSIBLE MODERATELY COMPRESSIBLE HIGHLY COMPRESSIBLE LIQUID LIMIT LESS THAN 30 LIQUID LIMIT 31-50 LIQUID LIMIT GREATER THAN 50										ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE. CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY, ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE. 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. 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. 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> ALL ROCKS 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> 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> 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.																			
SYMBOL										PERCENTAGE OF MATERIAL ORGANIC MATERIAL TRACE OF ORGANIC MATTER LITTLE ORGANIC MATTER MODERATELY ORGANIC HIGHLY ORGANIC										WEATHERING																			
% PASSING # 10, # 40, # 200										GROUND WATER WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING. STATIC WATER LEVEL AFTER 24 HOURS. PERCHED WATER, SATURATED ZONE OR WATER BEARING STRATA HOLE CAVE SPRING OR SEEPAGE																													
LIQUID LIMIT PLASTIC INDEX										MISCELLANEOUS SYMBOLS ROADWAY EMBANKMENT WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL OTHER THAN ROADWAY EMBANKMENTS INFERRED SOIL BOUNDARIES INFERRED ROCK LINE ALLUVIAL SOIL BOUNDARY DIP/DIP DIRECTION OF ROCK STRUCTURES SOUNDING ROD WATER LOSS																													
GROUP INDEX										SOUNDING ROD WATER LOSS																													
USUAL TYPES OF MAJOR MATERIALS										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 FRAGS - FRAGMENTS MED. - MEDIUM																													
GEN. RATING AS A SUBGRADE										EQUIPMENT USED ON SUBJECT PROJECT DRILL UNITS: MOBILE B- BK-51 CME-45C CME-550x PORTABLE HOIST OTHER OTHER																													
CONSISTENCY OR DENSENESS										ADVANCING TOOLS: DRAG BITS 6" CONTINUOUS FLIGHT AUGER 8" HOLLOW AUGERS HARD FACED FINGER BITS TUNG-CARBIDE INSERTS CASING w/ ADVANCER TRICONE 2-7/8" STEEL TEETH TRICONE TUNG-CARB. CORE BIT OTHER 3-1/4" H.S.A.																													
TEXTURE OR GRAIN SIZE										HAMMER TYPE: AUTOMATIC MANUAL CORE SIZE: B N WD4 H HAND TOOLS: POST HOLE DIGGER HAND AUGER SOUNDING ROD VANE SHEAR TEST OTHER																													
U.S. STD. SIEVE SIZE OPENING (MM)										FRACTURE SPACING TERM SPACING VERY WIDE WIDE MODERATELY CLOSE CLOSE VERY CLOSE																													
BOULDER (BLDR.) COBBLE (COB.) GRAVEL (GR.) COARSE SAND (CSE. SD.) FINE SAND (F. SD.) SILT (SL.) CLAY (CL.)										BEDDING TERM THICKNESS VERY THICKLY BEDDED THICKLY BEDDED THINLY BEDDED VERY THINLY BEDDED THICKLY LAMINATED THINLY LAMINATED																													
GRAIN SIZE										INDURATION FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. FRIABLE MODERATELY INDURATED INDURATED EXTREMELY INDURATED																													
SOIL MOISTURE - CORRELATION OF TERMS																																							
SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION																																							
LL - LIQUID LIMIT PL - PLASTIC LIMIT OM - OPTIMUM MOISTURE SL - SHRINKAGE LIMIT																																							
PLASTICITY																																							
NONPLASTIC LOW PLASTICITY MED. PLASTICITY HIGH PLASTICITY																																							
COLOR																																							
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YEL-BRN, BLUE-GRAY) MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.																																							

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
R-2417C	34431.1.1	3	16



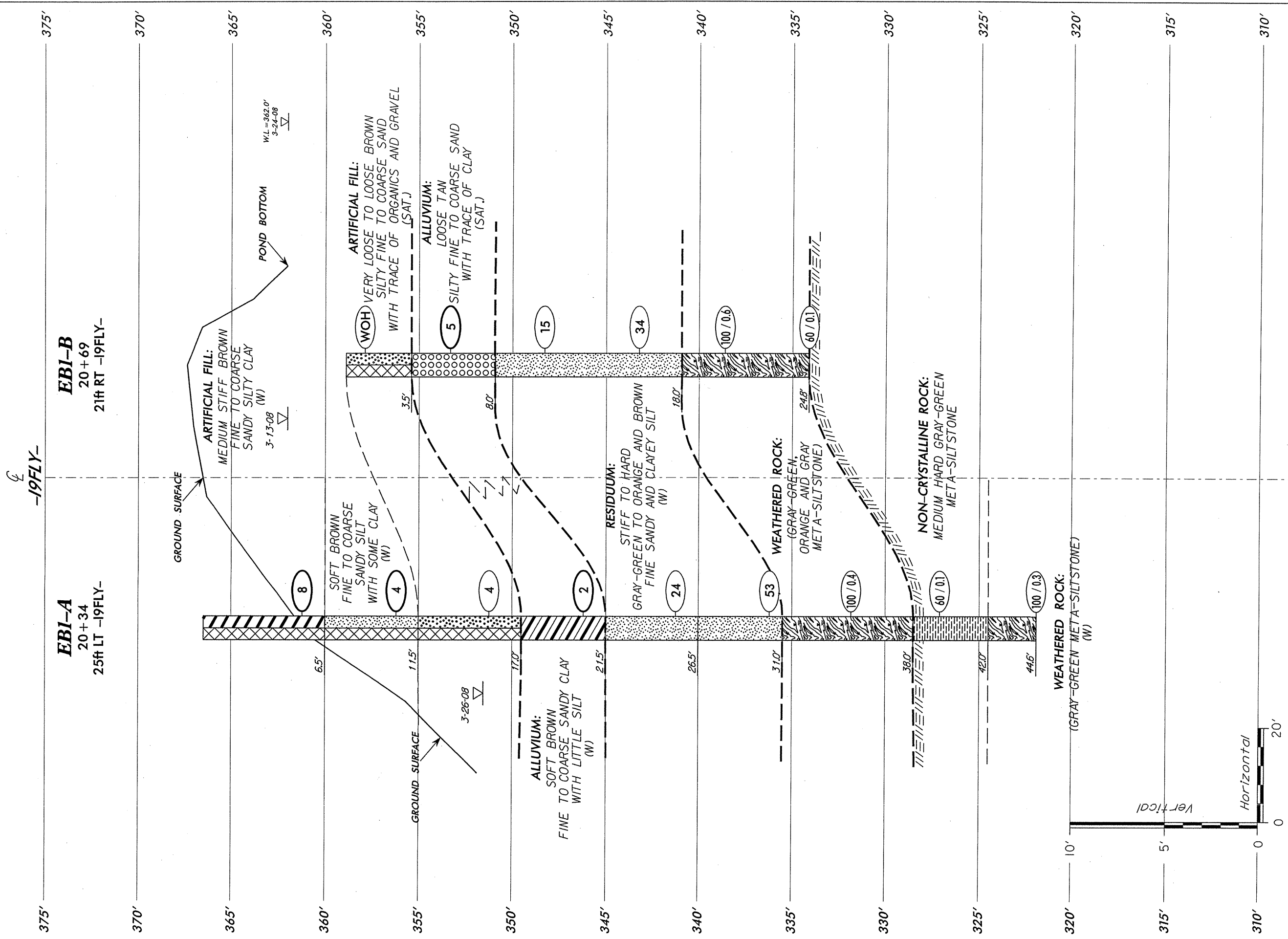
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SCALE:	1:24,000
CHECKED BY:	AFR
DRAWN BY:	TRP
DATE:	APRIL 2008
JOB NO.	1051-08-045



SITE VICINITY MAP
 BRIDGE No. 137
 ON -19FLY- OVER -LRev- (SANFORD BYPASS)
 STATE PROJECT NO. 34431.1.1 TIP NO. R-2417C
 FEDERAL I.D. NO. STP-NHF-42 (12)
 LEE COUNTY, NORTH CAROLINA

GENERALIZED SUBSURFACE CROSS SECTION THROUGH END BENT No. 1



NOTE: STRATIGRAPHY IS DRAWN FROM BORING TO BORING.

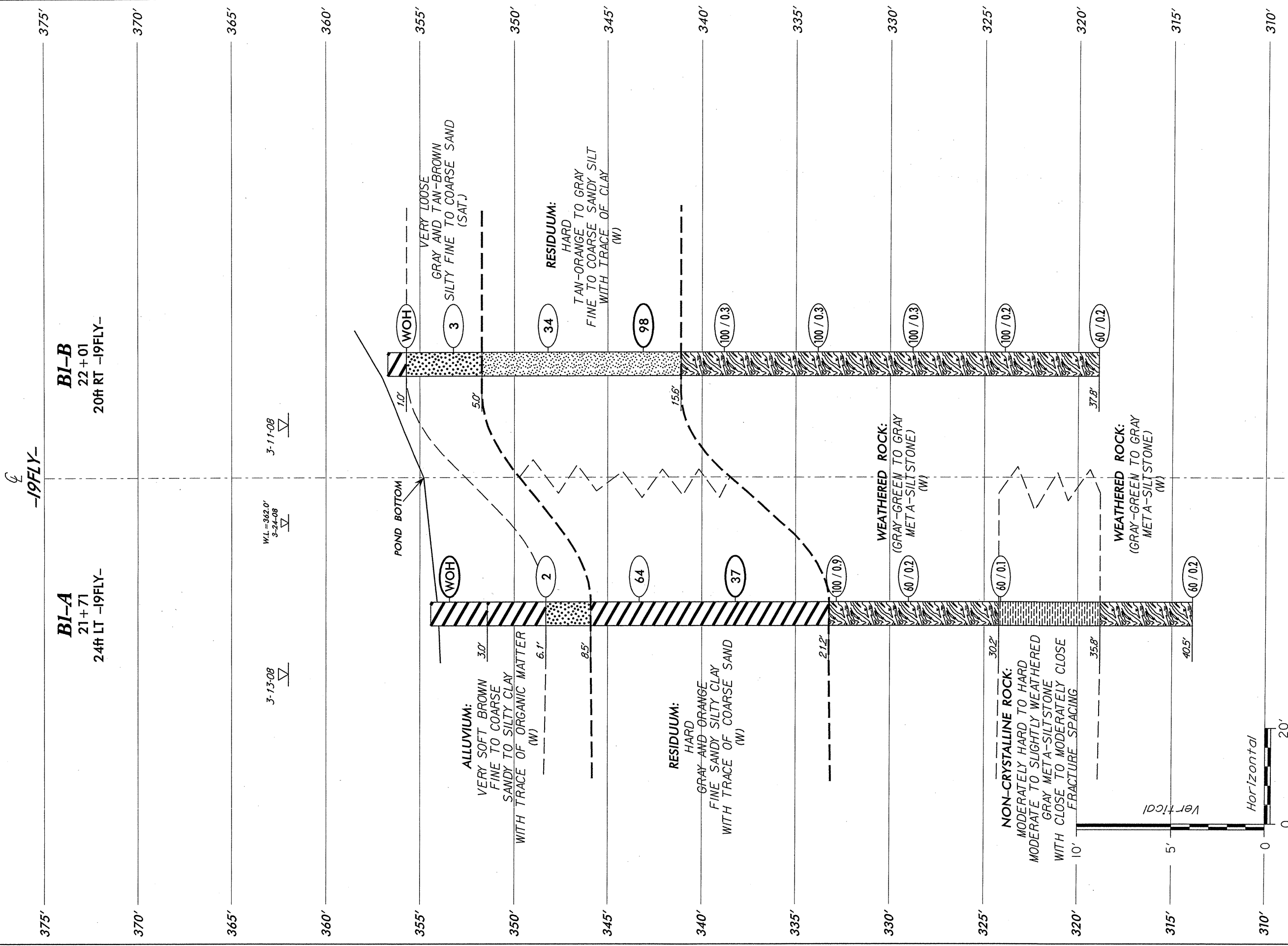
GENERALIZED SUBSURFACE CROSS SECTION

THROUGH END BENT No. 1
 BRIDGE No. 137
 ON -19FLY- OVER -LRv- (SANFORD BYPASS)
 TIP No. R-2417C STATE PROJECT No. 34431.1.1 FEDERAL I.D. STP-NHF-42 (2)
 LEE COUNTY, NORTH CAROLINA



SCALE:	(V) 1" = 5'	APPROVED BY:	AFR
	(H) 1" = 20'	DRAWN BY:	TRP
DATE:	APRIL 2008	JOB NO.:	1051-08-045
		SHEET	6 OF 16

GENERALIZED SUBSURFACE CROSS SECTION THROUGH INTERIOR BENT No.1



NOTE: STRATIGRAPHY IS DRAWN FROM BORING TO BORING.

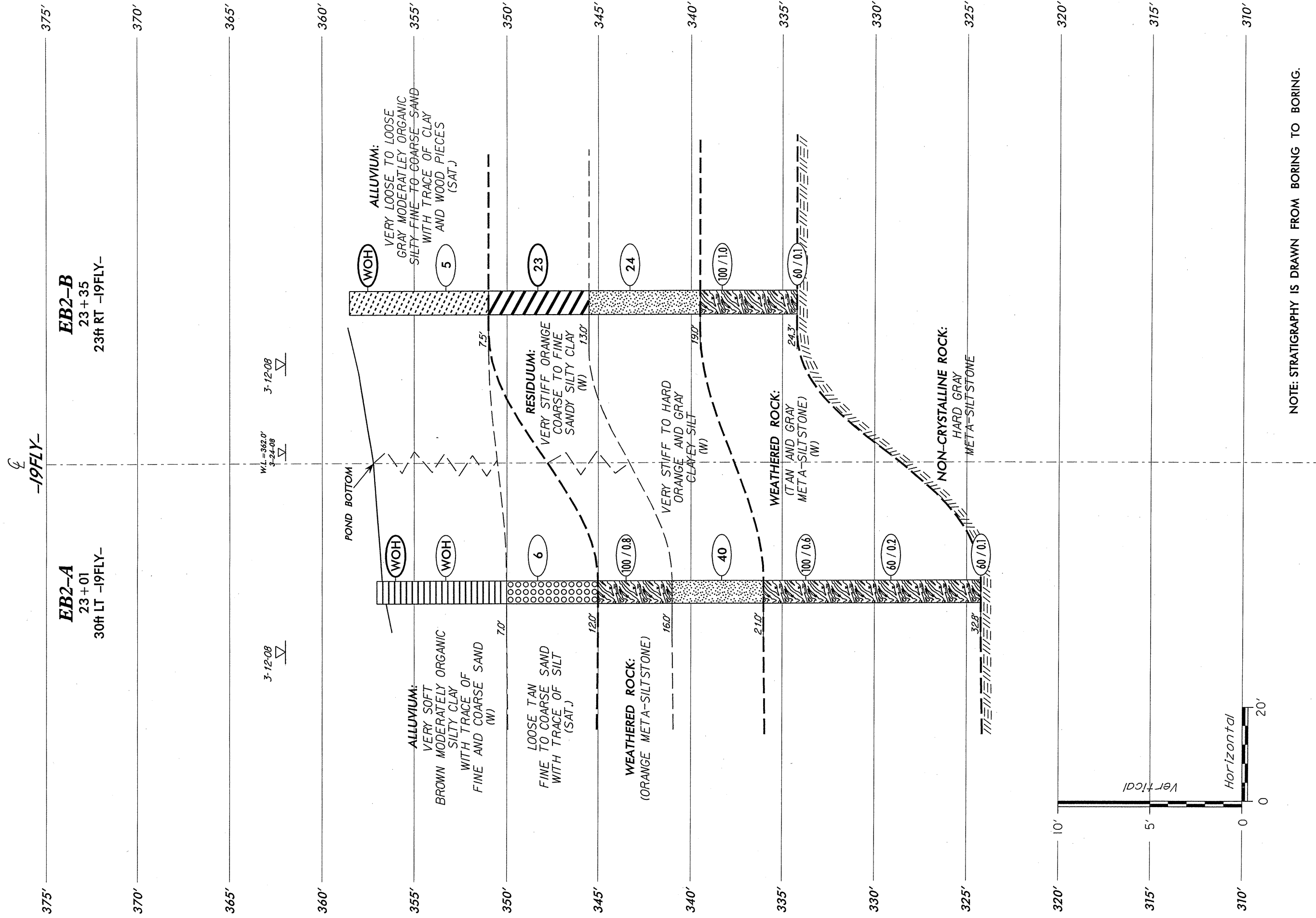
GENERALIZED SUBSURFACE CROSS SECTION

THROUGH INTERIOR BENT No. 1
 BRIDGE No. 137
 ON -19FLY- OVER -LRcv- (SANFORD BYPASS)
 TIP No. R-2417C STATE PROJECT No. 34431.1.1 FEDERAL I.D. STP-NHF-42 (I2)
 LEE COUNTY, NORTH CAROLINA



SCALE:	(V) 1" = 5'	APPROVED BY:	AFR
	(H) 1" = 20'	DRAWN BY:	TRP
DATE:	APRIL 2008	JOB NO.	1051-08-045
		SHEET	7 OF 16

GENERALIZED SUBSURFACE CROSS SECTION THROUGH END BENT No. 2



NOTE: STRATIGRAPHY IS DRAWN FROM BORING TO BORING.

GENERALIZED SUBSURFACE CROSS SECTION

THROUGH END BENT No. 2
 BRIDGE No. 137
 ON -19FLY- OVER -LRV- (SANFORD BYPASS)
 TIP No. R-24117C STATE PROJECT No. 3443 I.I. FEDERAL I.D. STP-NHF-42 (2)
 LEE COUNTY, NORTH CAROLINA



SCALE:	(V) 1" = 5' (H) 1" = 20'	APPROVED BY:	AFR
DATE:	APRIL 2008	DRAWN BY:	TRP
JOB NO.	1051-08-045	SHEET	8 OF 16

PROJECT NO. 34431.1.1	ID. R-2417C	COUNTY Lee	GEOLOGIST N. Bradley
SITE DESCRIPTION Bridge #137 on I9FLY over -LRev- Sanford Bypass			GROUND WTR (ft)
BORING NO. EB1-A	STATION 20+34	OFFSET 25ft LT	ALIGNMENT -I9FLY-
COLLAR ELEV. 366.6 ft	TOTAL DEPTH 44.6 ft	NORTHING 612,684	EASTING 1,963,542
DRILL MACHINE CME-550	DRILL METHOD 3-1/4" HSA	HAMMER TYPE Automatic	
START DATE 03/26/08	COMP. DATE 03/26/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 38.0 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						
370														366.6	GROUND SURFACE	0.0
365															Artificial Fill: Medium Stiff Brown Fine to Coarse Sandy Silty CLAY (A-7-5)	6.5
360		4.3	4	3	5						SS-1	24.3%		360.1	Soft Brown Fine to Coarse Sandy SILT (A-4) with Some Clay	11.5
355		9.3	2	2	2						SS-2	22.0%		355.1	Loose Brown Silty Fine SAND (A-2-4) with Trace of Gravel	17.0
350		14.3	2	2	2						Sat.			349.6	Alluvium: Soft Brown Fine to Coarse Sandy CLAY (A-6) with Little Silt	21.5
345		19.3	2	1	1						SS-3	12.4%		345.1	Residuum Very Stiff Brown Fine Sandy SILT (A-4)	26.5
340		24.3	10	11	13						W			340.1	Hard Gray-Green Clayey SILT (A-4)	31.0
335		29.3	32	26	27						W			335.6	Weathered Rock (Gray-Green Meta-Siltstone)	38.0
330		34.3	100/0.4								W			328.6	Non-Crystalline Rock: Medium Hard Gray-Green Meta-Siltstone	42.0
325		39.3	60/0.1								W			324.6	Weathered Rock (Gray-Green Meta-Siltstone)	44.6
320		44.3	100/0.3								W			322.0	Boring Terminated at Elevation 322.0 ft in Weathered Rock: (Gray-Green Meta-Siltstone)	
315															1) Advanced 3-1/4" HSA to 44.3 feet.	

NCDOT BORE SINGLE 045.GPJ NC_DOT.GDT 4/3/08

PROJECT NO. 34431.1.1	ID. R-2417C	COUNTY Lee	GEOLOGIST L. Raup
SITE DESCRIPTION Bridge #137 on I9FLY over -LRev- Sanford Bypass			GROUND WTR (ft)
BORING NO. EB1-B	STATION 20+69	OFFSET 21ft RT	ALIGNMENT -I9FLY-
COLLAR ELEV. 359.0 ft	TOTAL DEPTH 24.8 ft	NORTHING 612,737	EASTING 1,963,565
DRILL MACHINE CME-45C	DRILL METHOD Rotary Wash w/2-7/8" Tricone&NW Casing	HAMMER TYPE Manual	
START DATE 03/13/08	COMP. DATE 03/13/08	SURFACE WATER DEPTH 3.0ft	DEPTH TO ROCK N/A

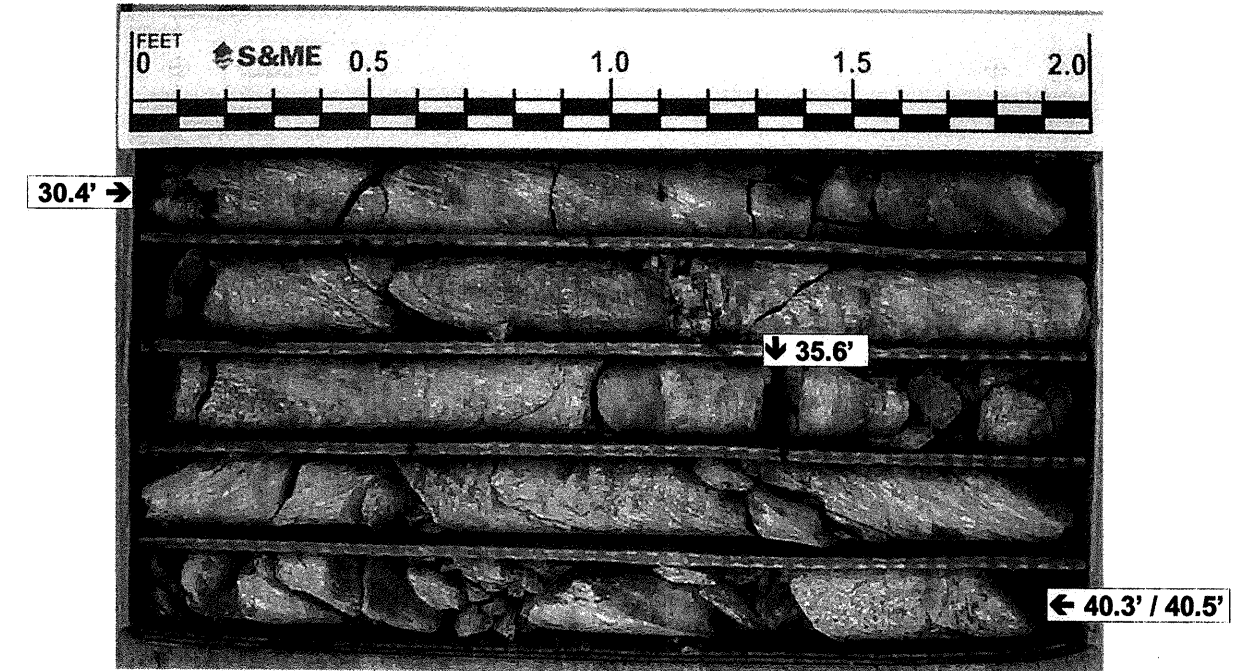
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100							
															WATER SURFACE (03/13/08)		
															359.0	POND BOTTOM	0.0
355	354.4	4.6	4	3	2						SS-4	Sat.		355.5	Artificial Fill: Very Loose Brown Silty Fine to Coarse SAND (A-2-4) With of Trace Organic Matter	3.5	
350	349.4	9.6	4	5	10						W			351.0	Alluvium: Loose Tan Silty Fine to Coarse SAND (A-1-b) with Trace of Clay	8.0	
345	344.3	14.7	17	19	15						W			341.0	Residuum: Stiff to Hard Gray-Green to Orange Clayey SILT (A-4)	18.0	
340	339.3	19.7	80	20/0.1							W			334.2	Weathered Rock: (Orange and Gray Meta-Siltstone)	24.8	
335	334.3	24.7	60/0.1								W				Boring Terminated with Standard Penetration Test Refusal at Elevation 334.2 ft on Non-Crystalline Rock: Hard Gray Meta-Siltstone.		
330															1) Advanced NW Casing to 9.6 feet (4.0 feet temporary casing).		
325															2) Advanced 2-7/8" Tricone Roller to 24.7 feet.		
320															3) Pond water used as drilling fluid.		
315															4) Approximate drilling fluid density 62.4 pcf.		
310															5) No loss of drilling fluid observed.		

NCDOT BORE SINGLE 045.GPJ NC_DOT.GDT 4/4/08

PROJECT NO. 34431.1.1		ID. R-2417C		COUNTY Lee		GEOLOGIST L. Raup						
SITE DESCRIPTION Bridge #137 on I9FLY over -LRev- Sanford Bypass							GROUND WTR (ft)					
BORING NO. B1-A		STATION 21+71		OFFSET 24ft LT		ALIGNMENT -I9FLY-						
COLLAR ELEV. 354.5 ft		TOTAL DEPTH 40.5 ft		NORTHING 612,798		EASTING 1,963,472						
DRILL MACHINE CME-45C		DRILL METHOD Rotary Wash w/2-7/8" Tricone&NW Casing&NWD4				HAMMER TYPE Manual						
START DATE 03/13/08		COMP. DATE 03/13/08		SURFACE WATER DEPTH 7.5ft		DEPTH TO ROCK 30.2 ft						
CORE SIZE NWD4		TOTAL RUN 9.9 ft		DRILLER M. Moseley								
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (%)	RUN ROD (%)	SAMP. NO.	STRATA REC. (%)	STRATA ROD (%)	LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
324.1	324.1	30.4	5.0	3:30	(5.0)	(4.2)		(5.2)	(4.2)		Begin Coring @ 30.4 ft	
320	319.1	35.4		2:30	100%	84%		100%	81%		Non-Crystalline Rock: Moderately Hard to Hard Moderate to Slightly Weathered Gray Meta-Siltstone	
315	314.2	40.3	4.9	2:00	(4.3)	(0.2)		(4.1)	N/A		With Close to Moderately Close Fracture Spacing 1 Vertical Fracture from 31.8 to 32.3 feet, 3 Joints at 10 to 20 degrees, 2 Joints at 40 to 50 degrees(continued)	35.6
310				2:15	88%	4%		87%			Weathered Rock: (Soft to Medium Hard Severe to Moderately Severe Weathered Gray Meta-Siltstone With Close to Moderately Close Fracture Spacing) 4 Joints at 40 degrees	40.5
305				2:30							Boring Terminated at Elevation 314.0 ft in Weathered Rock: (Medium Hard Gray Meta-Siltstone).	
300				2:00							1) Advanced NW Casing to 10.1 feet (8.5 feet temporary casing). 2) Advanced 2-7/8" Tricone Roller to 30.4 feet. 3) Advanced NWD4 Core Barrel from 30.4 to 40.3 feet. 4) Pond Water Used as Drilling Fluid. 5) Approximate Drilling Fluid Density 62.4 pcf. 6) No Loss of Drilling Fluid Observed.	
295				2:00/0.9								
290				N=60/0.2								
285												
280												
275												
270												
265												
260												
255												
250												
245												

CORE PHOTOS

Project No.: 1051-08-045	ID No.: R-2417C	Location: Lee Co., NC	Boring No.: B1-A
Site Description: Bridge No. 137 on -I9FLY- over -LRev- (Sanford Bypass)			Driller: M. Moseley
Collar Elev.: 354.5 ft.	Core Size: NWD4	Equipment: CME-45C	Geologist: L. Raup
Elev. at T.D.: 314.0 ft.	Total Depth: 40.5 ft.	Total Run: 9.9 ft.	Date: 3/13/2008



Box 1 of 1
 Top of Box @ 30.4 feet; Bottom of Box @ 40.5 feet



PROJECT NO. 34431.1.1	ID. R-2417C	COUNTY Lee	GEOLOGIST L. Raup/S. Johnson
SITE DESCRIPTION Bridge #137 on I9FLY over -LRev- Sanford Bypass			GROUND WTR (ft)
BORING NO. B1-B	STATION 22+01	OFFSET 20ft RT	ALIGNMENT -I9FLY-
COLLAR ELEV. 356.8 ft	TOTAL DEPTH 37.8 ft	NORTHING 612,848	EASTING 1,963,490
DRILL MACHINE CME-45C	DRILL METHOD Rotary Wash w/2-7/8" Tricone&NW Casing	HAMMER TYPE Automatic	
START DATE 03/11/08	COMP. DATE 03/12/08	SURFACE WATER DEPTH 5.2ft	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					
	360														
	356.8	0.0													
355	354.3	2.5	WOH	WOH	WOH	WOH						W		0.0	
			1	1	2							Sat.	Very Soft Gray Silty Clay (A-7-5) With Trace of Organic Matter	1.0	
350	349.3	7.5										W	Very Loose Gray Silty Fine SAND (A-2-4)	5.0	
			18	17	17										
345	344.2	12.6										W	Residuum: Hard Tan-Orange to Gray Fine to Coarse Sandy SILT (A-4) with Trace of Clay		
			26	33	65							SS-7	11.6%		
340	339.2	17.6										W	Weathered Rock: (Gray-Green Meta-Siltstone)	15.6	
			100/0.3												
335	334.2	22.6										W			
			100/0.3												
330	329.2	27.6										W			
			100/0.3												
325	324.2	32.6										W			
			100/0.2												
320	319.2	37.6										W			
			60/0.2												
315															
310															
305															
300															
295															
290															
285															
280															

NCDOT BORE SINGLE 045.GPJ NC.DOT.GDT 4/2/08

- Boring Terminated at Elevation 319.0 ft in Weathered Rock: (Gray-Orange Meta-Siltstone).
- 1) Advanced NW Casing to 7.5 feet (6.1 feet temporary casing).
 - 2) Advanced 2-7/8" Tricone Roller to 37.6 feet.
 - 3) Pond Water Used as Drilling Fluid.
 - 4) Approximate Drilling Fluid Density 62.4 pcf.
 - 5) No Loss of Drilling Fluid Observed.

SUMMARY OF LABORATORY TEST DATA

Soil Classification and Gradation

S&ME Project #:	1051-08-045	Test Date(s):	3/28 - 4/2/2008
State Project No.:	34431.1.1	County: Lee	Report Date: 4/2/2008
Federal ID No.:	STP-NHF-421(2)	TIP No.: R-2417C	
Project Name:	Bridge No. 137 on -I9FLY- Over -LRev-		
Client Name:	NCDOT		
Client Address:	Raleigh, North Carolina		

Boring No.	Sample No.	Sample Depth (Feet)	AASHTO Classification	Total % Passing					Total Mortar Fraction				LL	PL	PI	Organic Content %	Moisture Content %
				Sieve #					Coarse Sand	Fine Sand	Silt	Clay					
				10	40	60	200	270									
EB1-A	SS-1	4.3	A-7-5 (12)	93	82	76	68	63	18	15	33	34	51	34	17	ND	24.3
EB1-A	SS-2	9.3	A-4 (1)	91	61	51	38	35	45	17	17	21	33	23	10	ND	22.0
EB1-A	SS-3	19.3	A-6 (2)	92	67	55	40	35	40	22	19	19	38	22	16	ND	12.4
EB1-B	SS-4	4.6	A-1-b (0)	89	42	30	19	16	66	16	10	8	14	13	1	ND	ND
B1-A	SS-5	0.0	A-7-5 (11)	98	87	83	78	76	16	6	34	44	44	31	13	ND	56.2
B1-A	SS-6	15.2	A-7-6 (12)	99	97	95	78	64	4	32	39	25	41	26	15	ND	28.2
B1-B	SS-7	12.6	A-4 (1)	100	61	54	43	37	46	18	30	6	39	31	8	ND	11.6
EB2-A	SS-8	0.0	A-7-5 (21)	100	98	97	94	91	3	6	41	50	54	37	17	13.3	148.8
EB2-B	SS-9	0.0	A-2-4 (0)	97	68	53	30	26	45	28	15	12	36	33	3	6.2	ND
EB2-B	SS-10	9.2	A-7-5 (18)	100	93	89	75	65	11	24	41	24	62	43	19	ND	31.5

Notes: ND=Not Determined, N.P.=Nonplastic

Technical Responsibility:

B. Riggs



Signature

Geotechnical Engineer

Position



Photograph No. 1:
This photograph was taken from the south approach, along the -I9FLY- alignment, looking northwest.



Photograph No. 3:
This photograph was taken from the left side of the -I9FLY- alignment, looking northeast, across proposed End Bent No. 1.



Photograph No. 2:
This photograph was taken from the right side of the -I9FLY- alignment, looking southwest, across proposed End Bent No. 1.



Photograph No. 4:
This photograph was taken from the right side of the -I9FLY- alignment, looking south, across proposed Interior Bent No. 1.



Photograph No. 5:
This photograph was taken from the left side of the -I9FLY- alignment, looking north, across proposed Interior Bent No. 1.



Photograph No. 7:
This photograph was taken from the left side of the -I9FLY- alignment, looking north, across proposed End Bent No. 2.



Photograph No. 6:
This photograph was taken from the right side of the -I9FLY- alignment, looking south, across proposed End Bent No. 2.



Photograph No. 8:
This photograph was taken from the north approach, along the -I9FLY- alignment, looking southeast.