

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

STRUCTURE
SUBSURFACE INVESTIGATION

CONTENTS

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PROJ. REFERENCE NO. 42291.1.1(B-5132) F.A. PROJ. FSTR-BRZ-1436(2)
COUNTY HOKE
PROJECT DESCRIPTION REPLACE BRIDGE NO. 37 OVER RAFT
SWAMP ON SR 1436 (BALFOUR ROAD)

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) 707-6850. 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
P. PETRUCCI

M. WIGGINS

M. SMALL

INVESTIGATED BY P. WEAVER

CHECKED BY B. WELCH

SUBMITTED BY P. WEAVER

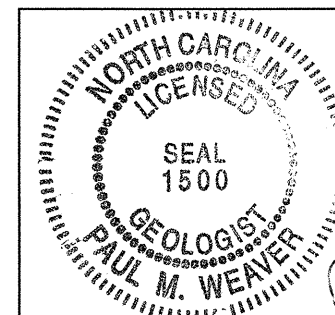
DATE 11/07/2012

PROJECT: 42291.1.1 ID: B-5132

DRAWN BY: P. PETRUCCI

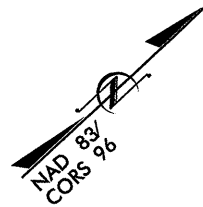
NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N.C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IT IS CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

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.



12/12/12

Paul M. Weaver



STONE TIMBER PRODUCTS INC
 DB 789 PG 190
 DB 232 PG 411
 MB 8 PG 49

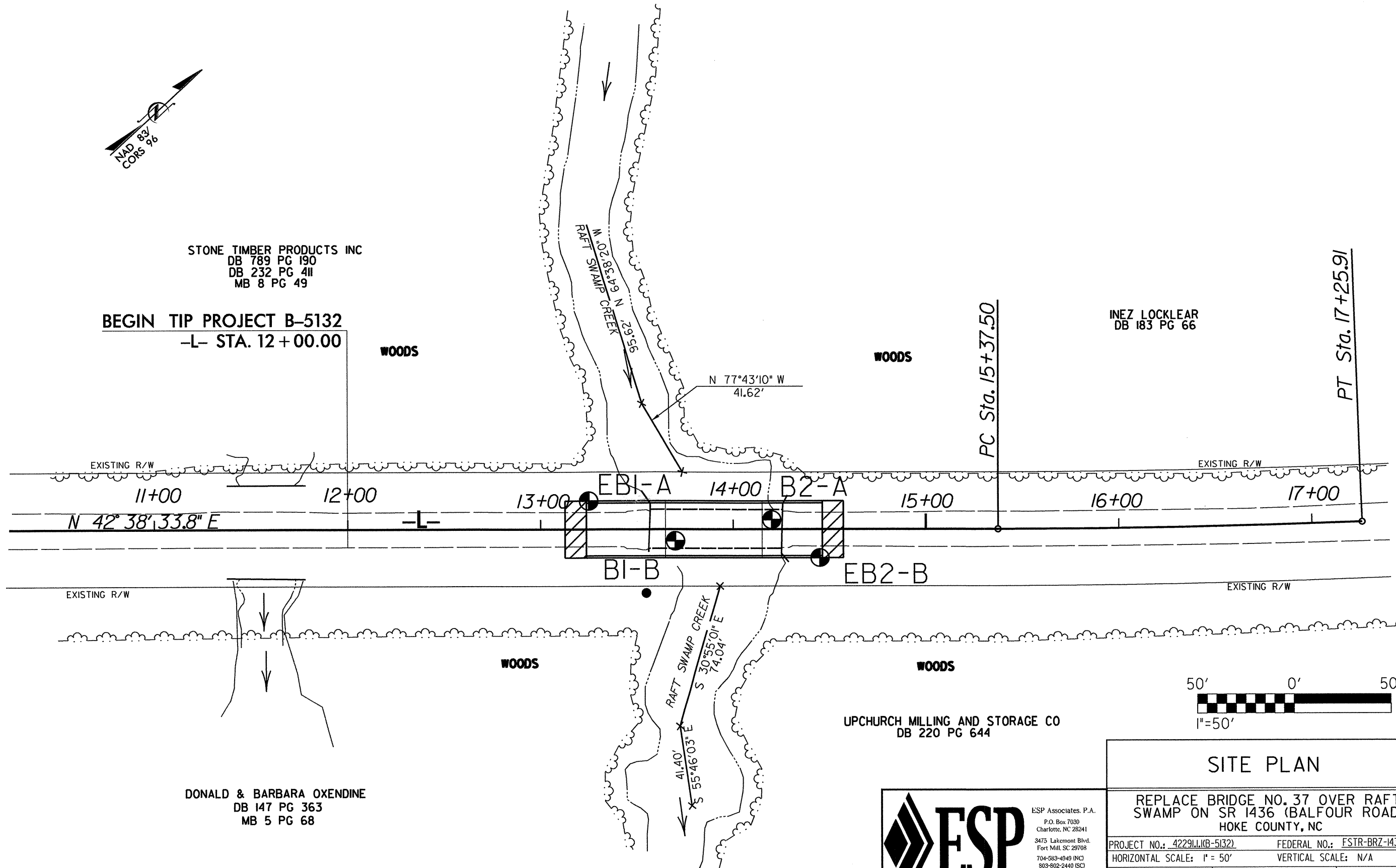
BEGIN TIP PROJECT B-5132
 -L- STA. 12+00.00

WOODS

WOODS

INEZ LOCKLEAR
 DB 183 PG 66

PT Sta. 17+25.91



EXISTING R/W

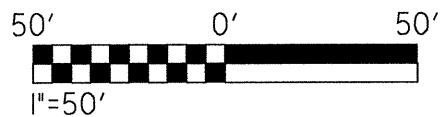
EXISTING R/W

EXISTING R/W

EXISTING R/W

DONALD & BARBARA OXENDINE
 DB 147 PG 363
 MB 5 PG 68

UPCHURCH MILLING AND STORAGE CO
 DB 220 PG 644



SITE PLAN

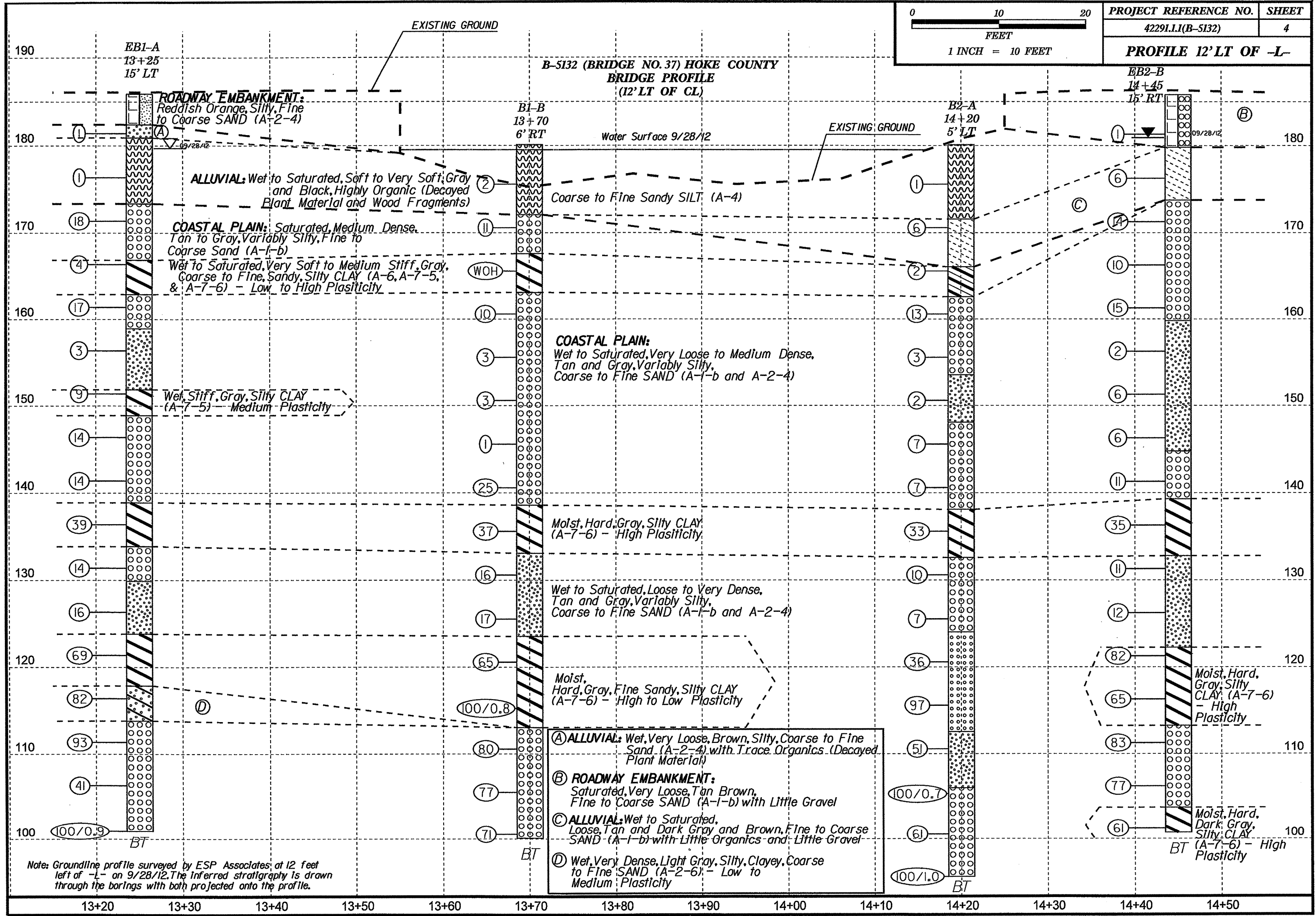
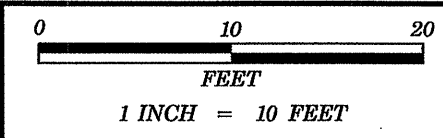
REPLACE BRIDGE NO. 37 OVER RAFT SWAMP ON SR 1436 (BALFOUR ROAD) HOKE COUNTY, NC



ESP Associates, P.A.
 P.O. Box 7030
 Charlotte, NC 28241
 3475 Lakemont Blvd.
 Fort Mill, SC 29708
 704-583-4949 (NC)
 803-602-2440 (SC)

PROJECT NO.: 42291.1.1(B-5132) FEDERAL NO.: FSTR-BRZ-1436(2)
 HORIZONTAL SCALE: 1" = 50' VERTICAL SCALE: N/A

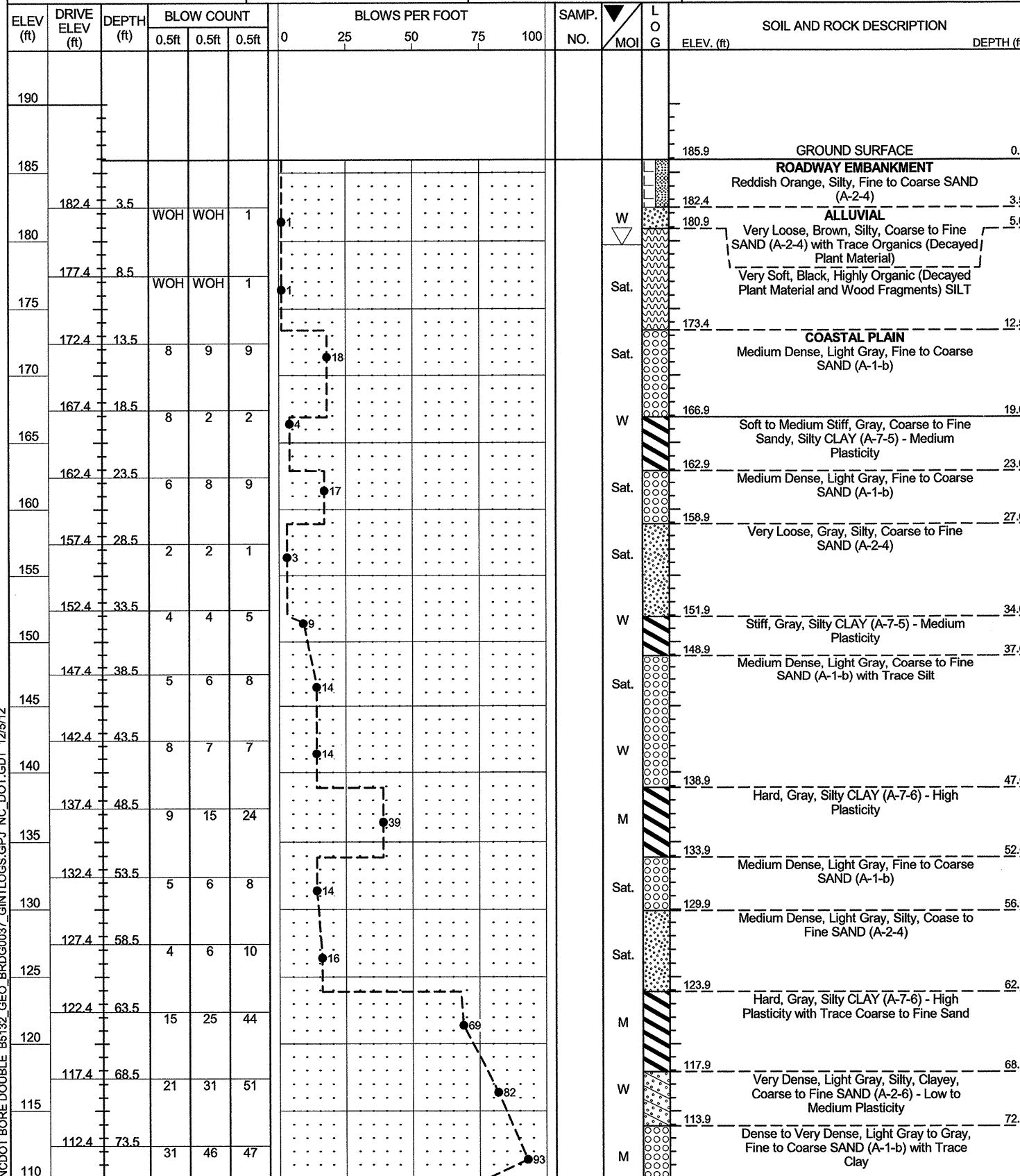
P. PETRUCCI 11/07/2012 DRAWING NO.: 3
 DRAWN BY DATE



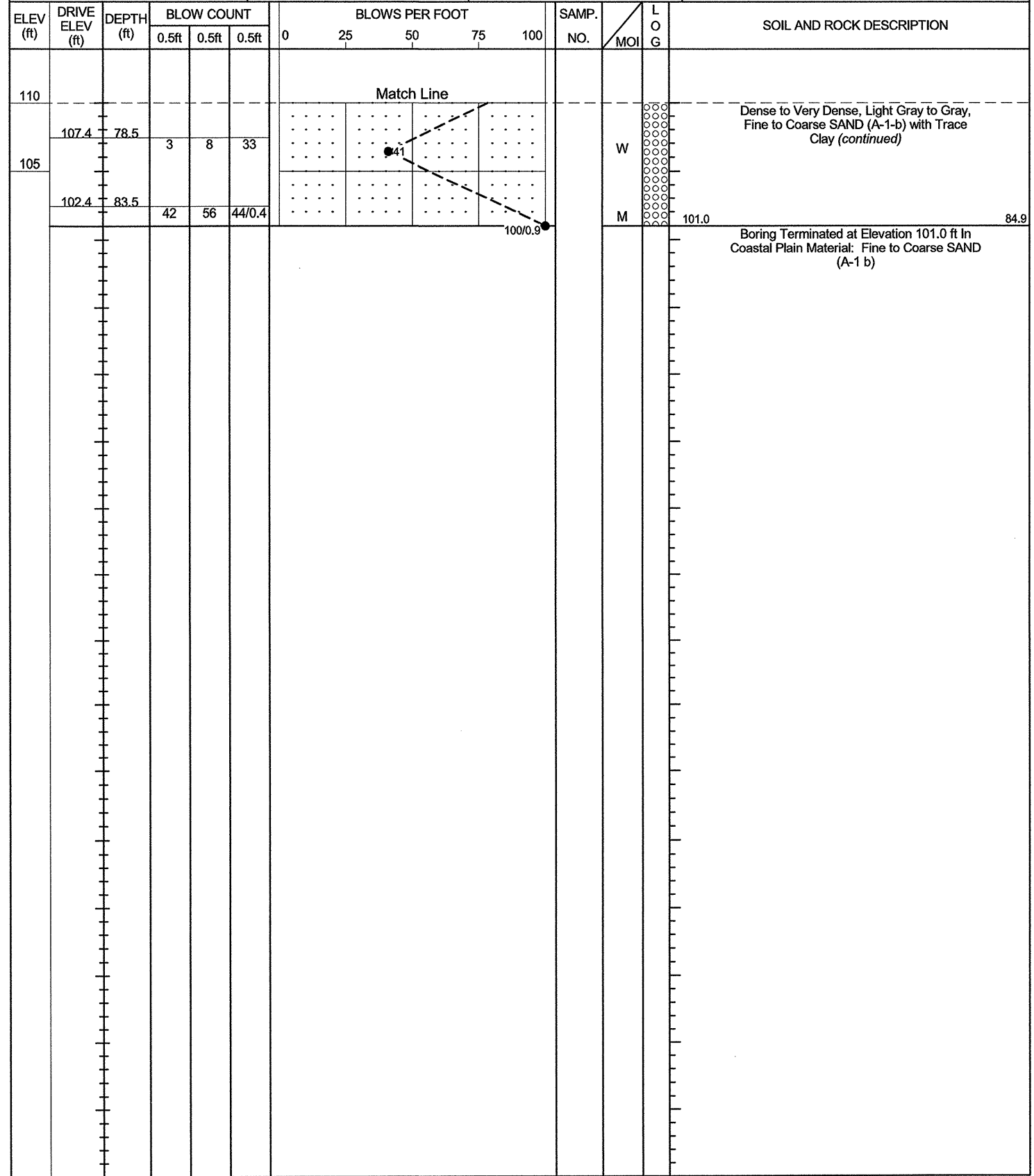


**NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT**

WBS 42291.1.1			TIP B-5132			COUNTY HOKE			GEOLOGIST Weaver, P.M.		
SITE DESCRIPTION Replace Bridge No. 37 over Raft Swamp on SR 1436								GROUND WTR (ft)			
BORING NO. EB1-A		STATION 13+25		OFFSET 15 ft LT		ALIGNMENT -L-		0 HR. 6.2			
COLLAR ELEV. 185.9 ft		TOTAL DEPTH 84.9 ft		NORTHING 406,754		EASTING 1,948,999		24 HR. FIAD			
DRILL RIG/HAMMER EFF./DATE MAD3964 CME-45C 83% 07/24/2012					DRILL METHOD Mud Rotary			HAMMER TYPE Automatic			
DRILLER Wiggins, M.			START DATE 09/28/12		COMP. DATE 09/28/12		SURFACE WATER DEPTH N/A				



WBS 42291.1.1			TIP B-5132			COUNTY HOKE			GEOLOGIST Weaver, P.M.		
SITE DESCRIPTION Replace Bridge No. 37 over Raft Swamp on SR 1436								GROUND WTR (ft)			
BORING NO. EB1-A		STATION 13+25		OFFSET 15 ft LT		ALIGNMENT -L-		0 HR. 6.2			
COLLAR ELEV. 185.9 ft		TOTAL DEPTH 84.9 ft		NORTHING 406,754		EASTING 1,948,999		24 HR. FIAD			
DRILL RIG/HAMMER EFF./DATE MAD3964 CME-45C 83% 07/24/2012					DRILL METHOD Mud Rotary			HAMMER TYPE Automatic			
DRILLER Wiggins, M.			START DATE 09/28/12		COMP. DATE 09/28/12		SURFACE WATER DEPTH N/A				



NCDOT BORE DOUBLE B5132_GEO_BRDG0037_GINTLOGS.GPJ NC_DOT_GDT 12/5/12

WBS 42291.1.1	TIP B-5132	COUNTY HOKE	GEOLOGIST Weaver, P.M.
SITE DESCRIPTION Replace Bridge No. 37 over Raft Swamp on SR 1436			GROUND WTR (ft)
BORING NO. B1-B	STATION 13+70	OFFSET 6 ft RT	ALIGNMENT -L-
COLLAR ELEV. 180.1 ft	TOTAL DEPTH 80.0 ft	NORTHING 406,773	EASTING 1,949,045
DRILL RIG/HAMMER EFF./DATE MAD3964 CME-45C 83% 07/24/2012		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Wiggins, M.	START DATE 09/27/12	COMP. DATE 09/27/12	SURFACE WATER DEPTH 0.6ft

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				
190														
185														
180														
175	176.6	3.5	1	1	1								ALLUVIAL Soft, Black, Highly Organic, Coarse to Fine Sandy SILT (A-4)	
170	171.6	8.5	5	5	6								COASTAL PLAIN Medium Dense, Light Tan, Fine to Coarse SAND (A-1-b)	8.0
165	166.6	13.5	WOH	WOH	WOH								Very Soft, Gray, Silty CLAY (A-7-6) - High Plasticity	12.5
160	161.6	18.5	4	4	6								Very Loose to Medium Dense, Gray to Light Gray, Fine To Coarse SAND (A-1-b) with Little Clay Below 38.5'	17.0
155	156.6	23.5	3	2	1								Note: Heavy Odor of Creosote in Sample at 23.5' and Medium Odor of Creosote in Sample at 28.5'	
150	151.6	28.5	3	1	2									
145	146.6	33.5	WOH	WOH	1									
140	141.6	38.5	8	11	14									
135	136.6	43.5	9	15	22								Hard, Gray, Silty CLAY (A-7-6) - High Plasticity	41.5
130	131.6	48.5	7	7	9								Medium Dense, Light Gray, Silty, Coarse to Fine SAND (A-2-4)	47.0
125	126.6	53.5	4	6	11									
120	121.6	58.5	9	23	42								Hard, Gray, Fine Sandy, Silty CLAY (A-7-6) - High to Low Plasticity	56.5
115	116.6	63.5	24	48	52/0.3									
110	111.6	68.5	24	31	49								Very Dense, Gray to Light Gray, Fine to Coarse SAND (A-1-b) with Trace Clay	67.0

WBS 42291.1.1	TIP B-5132	COUNTY HOKE	GEOLOGIST Weaver, P.M.
SITE DESCRIPTION Replace Bridge No. 37 over Raft Swamp on SR 1436			GROUND WTR (ft)
BORING NO. B1-B	STATION 13+70	OFFSET 6 ft RT	ALIGNMENT -L-
COLLAR ELEV. 180.1 ft	TOTAL DEPTH 80.0 ft	NORTHING 406,773	EASTING 1,949,045
DRILL RIG/HAMMER EFF./DATE MAD3964 CME-45C 83% 07/24/2012		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Wiggins, M.	START DATE 09/27/12	COMP. DATE 09/27/12	SURFACE WATER DEPTH 0.6ft

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				
110														
105	106.6	73.5	25	36	41								Very Dense, Gray to Light Gray, Fine to Coarse SAND (A-1-b) with Trace Clay (continued)	
	101.6	78.5	29	33	38								Boring Terminated at Elevation 100.1 ft In Coastal Plain Material: Coarse to Fine SAND (A-1-b)	80.0

NCDOT BORE DOUBLE B5132_GEO_BRDG0037_GINTLOGS.GPJ_NC_DOT_GDT_12/5/12



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

WBS 42291.1.1	TIP B-5132	COUNTY HOKE	GEOLOGIST Weaver, P.M.
SITE DESCRIPTION Replace Bridge No. 37 over Raft Swamp on SR 1436			GROUND WTR (ft)
BORING NO. B2-A	STATION 14+20	OFFSET 5 ft LT	ALIGNMENT -L-
COLLAR ELEV. 180.1 ft	TOTAL DEPTH 84.5 ft	NORTHING 406,817	EASTING 1,949,071
DRILL RIG/HAMMER EFF./DATE MAD3964 CME-45C 83% 07/24/2012		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Wiggins, M.	START DATE 09/26/12	COMP. DATE 09/27/12	SURFACE WATER DEPTH 0.8ft

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
190															
185															
180															
175	176.6	3.5	WOH	WOH	1									ALLUVIAL Very Soft, Gray and Black, Highly Organic, Coarse to Fine Sandy SILT (A-4)	
170	171.6	8.5	3	2	4									Loose, Tan and Brown, Fine to Coarse SAND (A-1 b) with Little Organics (Decayed Plant Material)	8.5
165	166.6	13.5	3	1	1									COASTAL PLAIN Soft, Light Gray, Silty CLAY (A-6)	14.0
160	161.6	18.5	8	6	7									Medium Dense to Very Loose, Tan to Gray, Fine to Coarse SAND (A-1-b) Note: Trace Wood Fragments at 23.5'	17.5
155	156.6	23.5	2	1	2									Very Loose, Gray, Silty, Coarse to Fine SAND (A-2-4)	26.5
150	151.6	28.5	1	1	1									Loose, Gray to Light Gray, Fine to Coarse SAND (A-1-b) with Trace Clay	32.0
145	146.6	33.5	3	2	5									Hard, Light Gray, Silty CLAY (A-7-6) - High Plasticity Note: Fairly Hard Drilling 45.0' to 47.5'	42.0
140	141.6	38.5	3	3	4									Medium Dense to Loose, Light Gray, Coarse to Fine SAND (A-1-b)	47.5
135	136.6	43.5	7	13	20									Dense to Very Dense, Light Gray, Silty, Fine SAND (A-3) with Layers of Dark Gray, High Plasticity, Silty CLAY (A-7-6) Note: Very Dense Material at 61.5'	56.0
130	131.6	48.5	6	5	5									Very Dense, Light Gray, Silty, Coarse to Fine SAND (A-2-4) with Trace Clay	67.5
125	126.6	53.5	3	2	5										
120	121.6	58.5	9	17	19										
115	116.6	63.5	26	38	59										
110	111.6	68.5	8	21	30										

WBS 42291.1.1	TIP B-5132	COUNTY HOKE	GEOLOGIST Weaver, P.M.
SITE DESCRIPTION Replace Bridge No. 37 over Raft Swamp on SR 1436			GROUND WTR (ft)
BORING NO. B2-A	STATION 14+20	OFFSET 5 ft LT	ALIGNMENT -L-
COLLAR ELEV. 180.1 ft	TOTAL DEPTH 84.5 ft	NORTHING 406,817	EASTING 1,949,071
DRILL RIG/HAMMER EFF./DATE MAD3964 CME-45C 83% 07/24/2012		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Wiggins, M.	START DATE 09/26/12	COMP. DATE 09/27/12	SURFACE WATER DEPTH 0.8ft

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
110															
105	106.6	73.5	28	60	40/0.2									Very Dense, Light Gray, Silty, Coarse to Fine SAND (A-2-4) with Trace Clay (continued)	74.0
100	101.6	78.5	22	31	30									Very Dense, Light Gray, Coarse to Fine SAND (A-1-b)	
	96.6	83.5	42	58/0.5										Boring Terminated at Elevation 95.6 ft In Coastal Plain Material: Coarse to Fine SAND (A-1-b)	84.5

NCDOT BORE DOUBLE B5132_GEO_BRDG0037_GINTLOGS.GPJ_NC_DOT_GDT_12/5/12



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

WBS 42291.1.1		TIP B-5132		COUNTY HOKE		GEOLOGIST Weaver, P.M.									
SITE DESCRIPTION Replace Bridge No. 37 over Raft Swamp on SR 1436							GROUND WTR (ft)								
BORING NO. EB2-B		STATION 14+45		OFFSET 15 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 185.8 ft		TOTAL DEPTH 85.0 ft		NORTHING 406,822		EASTING 1,949,103									
DRILL RIG/HAMMER EFF./DATE MAD3964 CME-45C 83% 07/24/2012		DRILL METHOD Mud Rotary		HAMMER TYPE Automatic											
DRILLER Wiggins, M.		START DATE 09/25/12		COMP. DATE 09/25/12		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
190															
185															
180	182.3	3.5	WOH	WOH	1										
175	177.3	8.5			1	3	3								
170	172.3	13.5			4	6	8								
165	167.3	18.5			2	8	2								
160	162.3	23.5			6	6	9								
155	157.3	28.5			2	1	1								
150	152.3	33.5			3	3	3								
145	147.3	38.5			2	3	3								
140	142.3	43.5			3	4	7								
135	137.3	48.5			10	15	20								
130	132.3	53.5			4	5	6								
125	127.3	58.5			4	5	7								
120	122.3	63.5			11	24	58								
115	117.3	68.5			15	24	41								
110	112.3	73.5			31	44	39								

WBS 42291.1.1		TIP B-5132		COUNTY HOKE		GEOLOGIST Weaver, P.M.									
SITE DESCRIPTION Replace Bridge No. 37 over Raft Swamp on SR 1436							GROUND WTR (ft)								
BORING NO. EB2-B		STATION 14+45		OFFSET 15 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 185.8 ft		TOTAL DEPTH 85.0 ft		NORTHING 406,822		EASTING 1,949,103									
DRILL RIG/HAMMER EFF./DATE MAD3964 CME-45C 83% 07/24/2012		DRILL METHOD Mud Rotary		HAMMER TYPE Automatic											
DRILLER Wiggins, M.		START DATE 09/25/12		COMP. DATE 09/25/12		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
110															
105	107.3	78.5			25	40	37								
	102.3	83.5			20	29	32								

NCDOT BORE DOUBLE B5132_GEO_BRD0037_GINTLOGS.GPJ_NC_DOT_GDT_12/5/12

SITE PHOTOGRAPHS
State Project No. 42291.1.1 – TIP No. B-5132 – Bridge No. 37 over Raft Swamp on SR 1436 – Hoke County, NC



View of Bridge Looking Upstation



View of Bridge Looking Downstation



View Downstream Looking From Bridge



View Upstream Looking From Bridge