

GEOTECHNICAL UNIT

SOIL AND ROCK CLASSIFICATION, LEGEND, AND ABBREVIATIONS

SOIL LEGEND AND AASHTO CLASSIFICATION										CONSISTENCY OR DENSENESS					
GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)				SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS		PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTANCE (N - VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH (qu) (kN / m ²)	
GROUP CLASS.	A-1	A-3	A-2		A-4	A-5	A-6	A-7	A-1,A-2 A-3	A-4,A-5 A-6,A-7	GENERALLY GRANULAR MATERIAL	VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE	< 4 4 TO 10 10 TO 30 30 TO 50 > 50	N/A	
SYMBOL															
% PASSING	#10 50 MX	#40 30 MX 50 MX	#200 15 MX 25 MX 10 MX	51 MN	35 MX 35 MX	35 MX 35 MX	35 MX 35 MX	36 MN 36 MN	36 MN 36 MN	36 MN 36 MN	GRANULAR SOILS				
(PASSING #40)	LL	PI	40 MX 41 MN 40 MX 41 MN		40 MX 41 MN	40 MX 41 MN	40 MX 41 MN	40 MX 41 MN	40 MX 41 MN	40 MX 41 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER	VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD	< 2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 > 30	< 25 25 TO 50 50 TO 100 100 TO 200 200 TO 400 > 400	
GROUP INDEX	0	0	0		4 MX	8 MX	12 MX	16 MX	NO MX	NO MX	HIGHLY ORGANIC SOILS				
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL & SAND	FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND		SILTY SOILS	CLAYEY SOILS									
* PI OF A-7-5 ≤ (LL-30); PI OF A-7-6 > (LL-30)															
TEXTURE OR GRAIN SIZE															
BOULDER	COBBLE	GRAVEL	COARSE SAND	MED. SAND	FINE SAND	SILT	CLAY								
GRAIN (mm)	305	75	2	0.6	0.425	0.2	0.075	0.005							
SIZE (IN)	12	3													
SOIL MOISTURE - CORRELATION OF TERMS															
SOIL MOISTURE SCALE (ATTERBERG LIMITS)		FIELD MOISTURE DESCRIPTION		GUIDE FOR FIELD MOISTURE DESCRIPTION											
LL	LIQUID LIMIT	-SATURATED- (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE												
PLASTIC RANGE (PI)	PLASTIC LIMIT	-WET- (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE												
OM	OPTIMUM MOISTURE	-MOIST- (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE												
SL	SHRINKAGE LIMIT	-DRY- (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE												
ROCK DESCRIPTION															
IN THE BROADEST MEANING, HARD ROCK IS CONSIDERED TO BE THAT INDURATED EARTH MATERIAL WHICH CANNOT BE SAMPLED BY CONVENTIONAL SOIL SAMPLING TOOLS OR TECHNIQUES. THE BOUNDARY BETWEEN SOIL AND ROCK IS ARBITRARY. TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF "WEATHERED ROCK". FOR THE PURPOSE OF THIS INVESTIGATION, THESE MATERIALS ARE DIVIDED AS FOLLOWS:															
TERM	SYMBOLS				DESCRIPTION										
HARD ROCK (HR)	CORED ROCK		INFERRED ROCK LINE ²		MATERIAL THAT CANNOT BE PENETRATED BY POWER AUGERS, EXCEPT IN THIN LEDGES, AND REQUIRES ROCK CORING TOOLS FOR OBTAINING A SAMPLE										
WEATHERED ROCK (WR)	HARD WEATHERED ROCK (HWR)		SOFT WEATHERED ROCK (SWR)		MATERIAL THAT CAN BE PENETRATED WITH GREAT DIFFICULTY USING POWER AUGERS AND YIELDS SPT REFUSAL										
	HARD WEATHERED ROCK (HWR)		SOFT WEATHERED ROCK (SWR)		MATERIAL THAT CAN BE PENETRATED WITH SOME DIFFICULTY USING POWER AUGERS AND YIELDS SPT VALUES > 100 BLOWS BUT < SPT REFUSAL										
¹ SPT REFUSAL ≤ 2.5 cm OF PENETRATION PER 50 BLOWS IN SPT. ² AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH AUGERS COULD NO LONGER PENETRATE. THE HARD ROCK SYMBOL IS SHOWN WHEN ROCK IS CORED AND ONLY TO THAT DEPTH CORED. A DESCRIPTION OF ROCK IS GIVEN, INCLUDING: CORE RECOVERY (REC.) - TOTAL LENGTH OF ROCK RECOVERED IN THE CORE BARREL DIVIDED BY THE TOTAL LENGTH OF THE CORE RUN TIMES 100%. ROCK QUALITY DESIGNATION (ROD) - TOTAL LENGTH OF SOUND ROCK SEGMENTS RECOVERED THAT ARE LONGER THAN OR EQUAL TO 10 cm DIVIDED BY THE TOTAL LENGTH OF THE CORE RUN TIMES 100%.															
MISCELLANEOUS SYMBOLS AND ABBREVIATIONS															
LL	ROADWAY EMBANKMENT WITH SOIL DESCRIPTION				SPT	SPT TEST BORING				SAMPLE DESIGNATIONS					
X	ARTIFICIAL FILL OTHER THAN ROADWAY EMBANKMENTS				⊕	AUGER BORING				S-BULK SAMPLE					
⊗	INFERRED SOIL BOUNDARIES				⊙	CORE BORING				SS-SPLIT SPOON SAMPLE					
↘	STRIKE AND DIP				△	PIEZOMETER INSTALLATION				ST-SHELBY TUBE SAMPLE					
↙	APPARENT DIP (NORMAL TO _____)				○	SLOPE INDICATOR INSTALLATION									
●	ROD SOUNDING				○	SPT N-VALUE									
					○	MONITORING WELL									
ABBREVIATIONS															
ALLUV.	ALLUVIUM				MIC.	MICACEOUS									
AR	AUGER REFUSAL				MOT.	MOTTLED									
BLDR.	BOULDER				N	BLOWS / 30 CM									
CALC.	CALCAREOUS				NS	NO SAMPLE TAKEN									
CL.	CLAY				ORG.	ORGANIC									
CLY.	CLAYEY				P.P.	POCKET PENETROMETER									
COB.	COBBLE				REF.	REFER TO									
CSE.	COARSE				RES.	RESIDUAL									
DPT.	DYNAMIC PENETRATION TEST				S.	SOFT									
EST.	ESTIMATED				SAT.	SATURATED									
F.	FINE				SD.	SAND									
FIAD.	FILLED IMMED. AFTER DRILLING				SDY.	SANDY									
FOSS.	FOSSILIFEROUS				SED(S).	SEDIMENT(S)									
FRAC.	FRACTURED				SL.	SILT, SILTY									
FRAG(S).	FRAGMENT(S)				SLI.	SLIGHTLY									
GR.	GRAVEL				SPT	STANDARD PENETRATION TEST									
GS.	SPECIFIC GRAVITY				TS.	TOPSOIL									
GW.	GROUND WATER				VST	VANE SHEAR TEST									
MED.	MEDIUM				V.	VERY									
					W/	WITH									
BENCH MARK: USGS MONUMENT '259JJS-195150' 15.3m LEFT															
OF STATION 52+32.6 (-L-)															
ELEVATION= 15.106 METERS															
STATE PROJECT NO. 8.1280401															
T.J.P. NO. B-1381 F.A. NO. BRS-8294(3)															
COUNTY SAMPSON ROUTE NC 411															
SITE DESCRIPTION BRIDGE #14 ON -L- (NC 411) OVER BLACK RIVER															
PROJECT GEOLOGIST R.A. RUSSELL SUBMITTED BY R.S. JOHNSON															
PERSONNEL T.L. VARGASON															
J.W. BAYLES															
J.K. WILKINS DATE SUBMITTED 10/95															



SEAL
Signature: *Richard S. Johnson*

PROJECT _____

TIP _____

CAUTION NOTICE

The Subsurface Information and the Subsurface Investigation on which it is based was 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 at the Highway Building by contacting the Geotechnical Unit. Neither the Subsurface Information nor the field boring logs, rock cores, or soil test data is part of the contract.

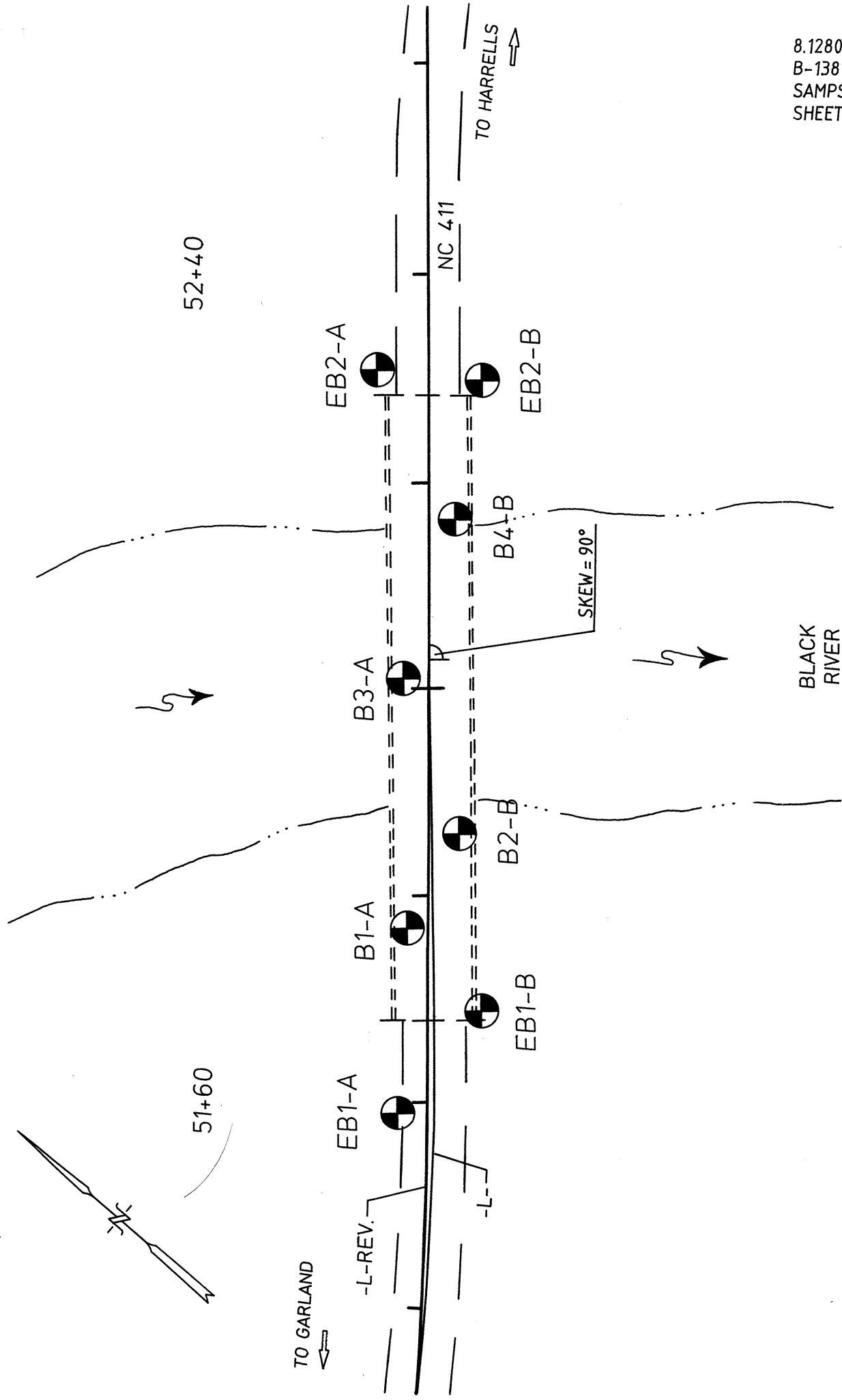
General soil and rock strata descriptions and indicated boundaries are based on a geotechnical interpretation of all available subsurface data and may not necessarily reflect the actual subsurface conditions between borings or between sampled strata within the borehole. The laboratory sample data and 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 temperature, precipitation and wind, as well as other non-climatic factors.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE INFORMATION 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 OPINIONS 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.

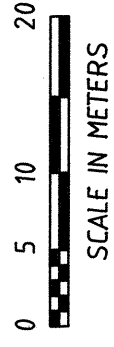
NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IS IT CONSIDERED TO BE A PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

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

TEST SITE PLAN

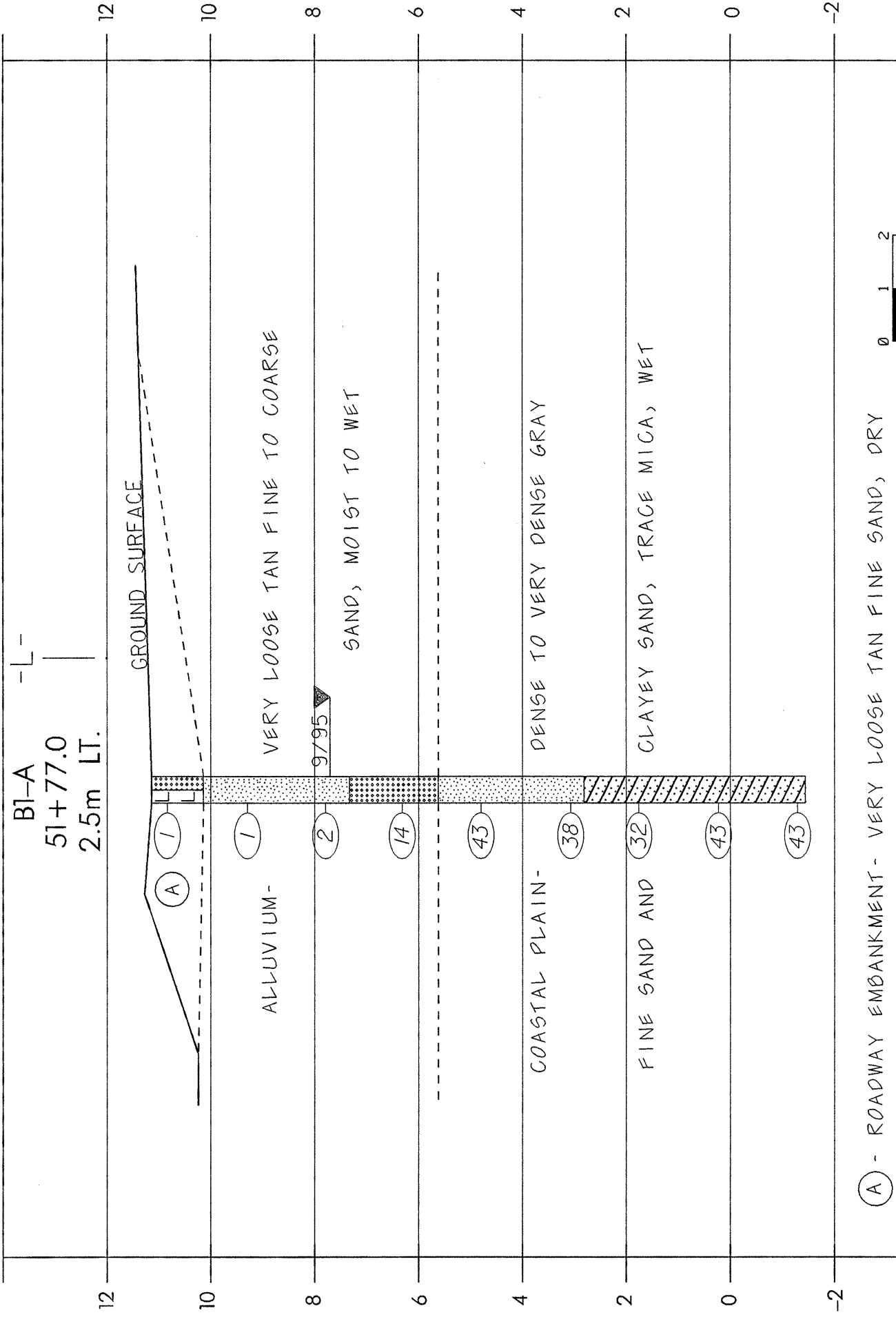


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B-1381
SAMPSON CO.
SHEET 2 OF 16



SECTION THROUGH BENT 1

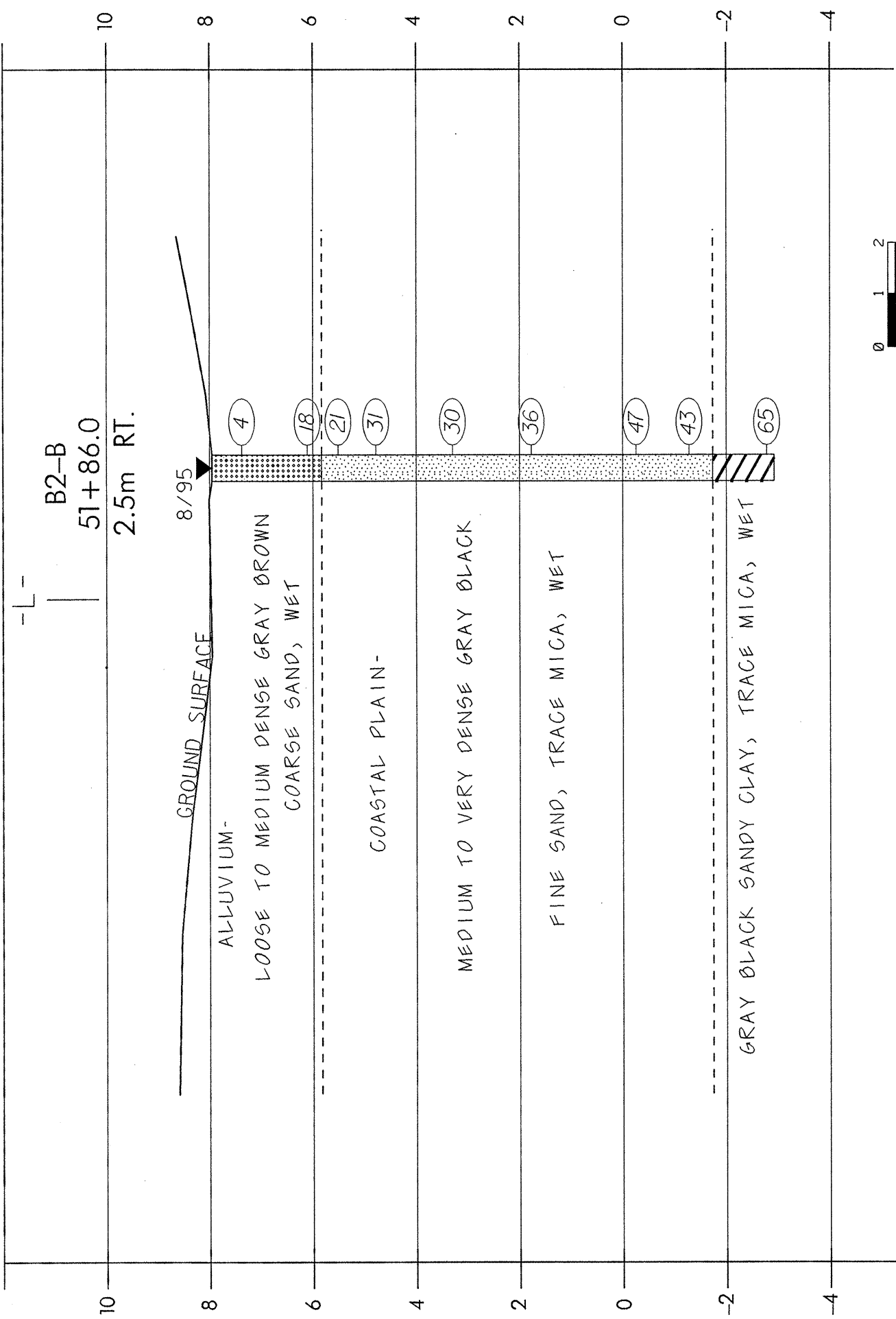
8.1280401 B-1381
SHEET 3 OF 16



(A) - ROADWAY EMBANKMENT- VERY LOOSE TAN FINE SAND, DRY

SECTION THROUGH BENT 2

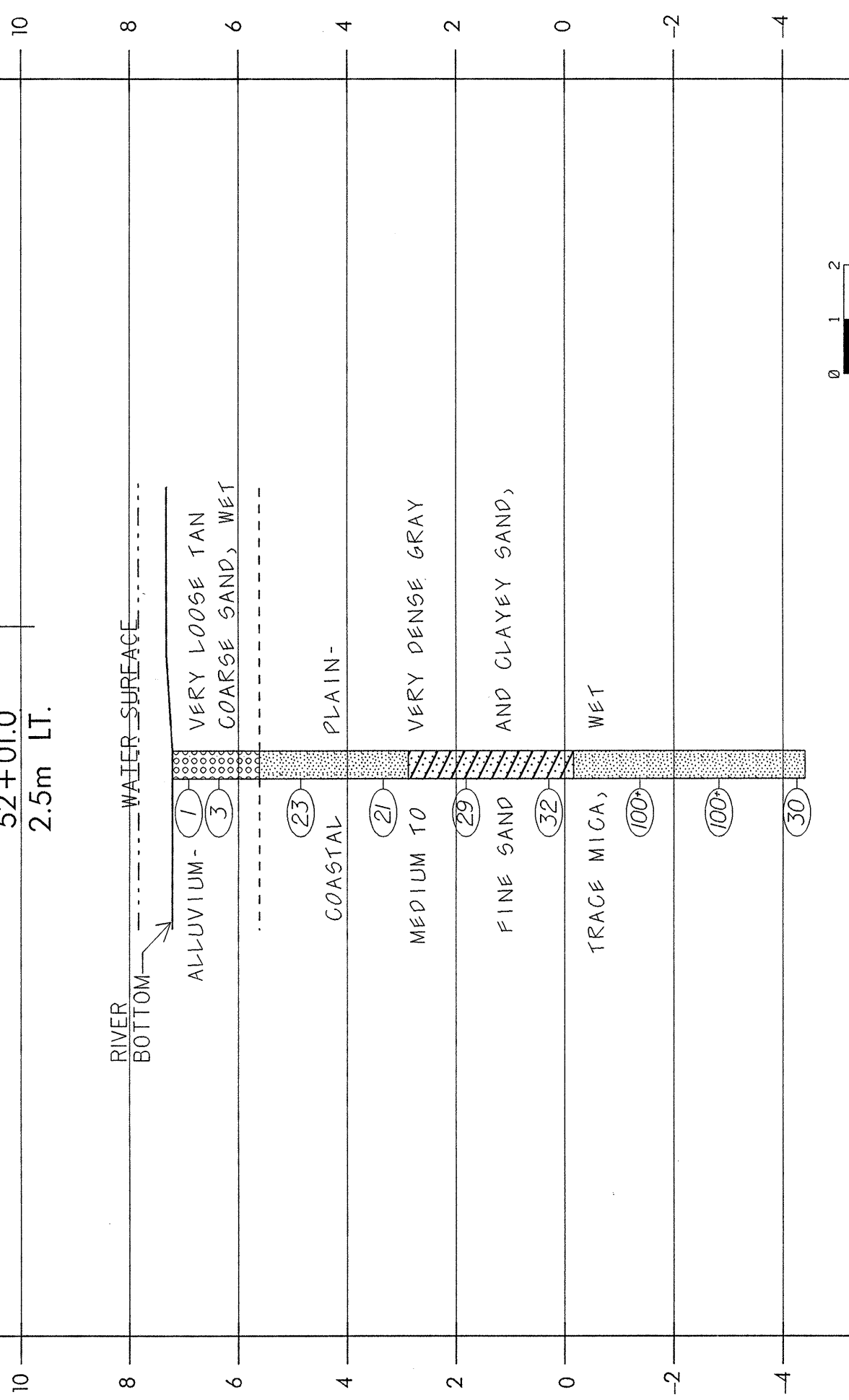
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SHEET 4 OF 16



SECTION THROUGH BENT 3

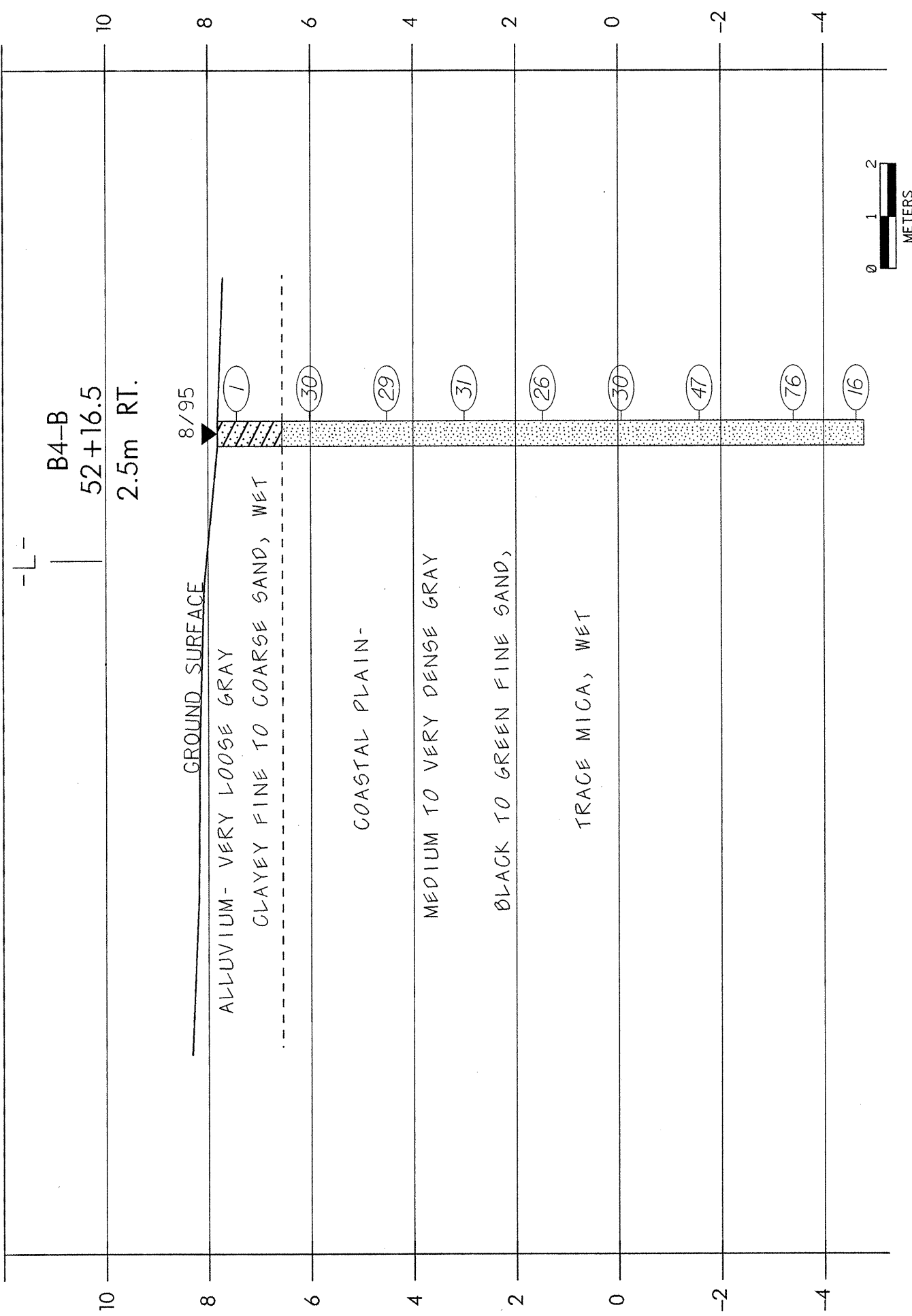
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B3-A
52+01.0
2.5m LT.
-L-



SECTION THROUGH BENT 4

8.1280401 B-1581
SHEET 6 OF 16



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 GEOTECHNICAL UNIT BORING LOG

SHEET 1 OF 1

PROJECT NO. 8.1280401	ID. B-1381	COUNTY SAMPSON	GEOLOGIST VARGASON T.L.
SITE DESCRIPTION BRIDGE #14 ON -L- (NC 411) OVER BLACK RIVER			GROUND WATER
BORING NO. EBI-B	BORING LOCATION 51+68.8	OFFSET 4.5m RT.	ALIGNMENT -L-
COLLAR ELEV. 14.74	NORTHING 0.00	EASTING 0.00	0 HR. N/A 24 HR. 6.50
TOTAL DEPTH 18.18	DRILL MACHINE MOBILE B-57	DRILL METHOD WASH BORING	HAMMER TYPE MANUAL
START DATE 8/29/95	COMPLETION DATE 8/29/95	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A

ELEV.	DEPTH	BLOW COUNT			PEN. (m)	BLOWS PER 30cm					SAMPLE NUMBER	LOG MOI.	LOG	SOIL AND ROCK DESCRIPTION	
		15cm	15cm	15cm		0	25	50	75	100					
14.74	0.00	2	3	2	0.3										
14.00	0.65	WOR	WOR	2	0.3										ROADWAY EMBANKMENT TAN FINE TO COARSE SAND
12.00	2.49	3	6	4	0.3										
10.00	4.01	3	4	6	0.3										
	5.54	5	5	7	0.3										ALLUVIUM TAN TO GRAY FINE SAND
8.00	7.09	3	4	5	0.3										
6.00	8.58	20	20	21	0.3										
4.00	10.13	8	12	16	0.3										
	11.65	11	10	17	0.3										
2.00	13.17	8	12	20	0.3										COASTAL PLAIN GRAY BLACK FINE SAND, TRACE MICA
0.00	14.69	10	15	21	0.3										
-2.00	16.21	7	11	15	0.3										
-3.44	17.73	9	14	16	0.3										BLACK SILTY CLAY WITH THIN LAMINAE OF SAND
-4.00						BORING TERMINATED AT ELEVATION -3.44 METERS IN BLACK SILTY CLAY (COASTAL PLAIN)									

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 GEOTECHNICAL UNIT BORING LOG SHEET 1 OF 1

PROJECT NO. 8.1280401	ID. B-1381	COUNTY SAMPSON	GEOLOGIST VARGASON T.L.
SITE DESCRIPTION BRIDGE #14 ON -L- (NC 411) OVER BLACK RIVER			GROUND WATER
BORING NO. B2-B	BORING LOCATION 51+86.0	OFFSET 2.5m RT.	ALIGNMENT -L-
COLLAR ELEV. 7.91	NORTHING 0.00	EASTING 0.00	0 HR. N/A 24 HR. 0.00
TOTAL DEPTH 10.88	DRILL MACHINE MOBILE B-57	DRILL METHOD WASH BORING	HAMMER TYPE MANUAL
START DATE 8/30/95	COMPLETION DATE 8/30/95	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A

ELEV.	DEPTH	BLOW COUNT			PEN. (m)	BLOWS PER 30cm					SAMPLE NUMBER	LOG	SOIL AND ROCK DESCRIPTION	
		15cm	15cm	15cm		0	25	50	75	100				
7.91	0.27	3	2	2	0.3	4								
	1.54	2	8	10	0.3	18								ALLUVIUM GRAY BROWN COARSE SAND
6.00	2.14	6	8	13	0.3	21								
	2.87	8	13	18	0.3	31								
4.00	4.36	9	13	17	0.3	30								
	5.88	12	16	20	0.3	36								COASTAL PLAIN GRAY BLACK FINE SAND, TRACE MICA
0.00	7.91	12	20	27	0.3	47								
	8.93	10	16	27	0.3	43								
-2.00	10.43	44	33	32	0.3	65								GRAY BLACK SANDY CLAY, TRACE MICA
-2.97														
-4.00														
-6.00														
-8.00														
-10.00														

BORING TERMINATED AT
 ELEVATION -2.97 METERS IN
 GRAY BLACK SANDY CLAY
 (COASTAL PLAIN)

**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG**

PROJECT NO. 8.1280401	ID. B-1381	COUNTY SAMPSON	GEOLOGIST VARGASON T.L.
SITE DESCRIPTION BRIDGE #14 ON -L- (NC 411) OVER BLACK RIVER			GROUND WATER
BORING NO. EB2-A	BORING LOCATION 52+31.0	OFFSET 5.0m LT.	ALIGNMENT -L-
COLLAR ELEV. 14.95	NORTHING 0.00	EASTING 0.00	0 HR. N/A 24 HR. 2.53
TOTAL DEPTH 13.66	DRILL MACHINE MOBILE B-57	DRILL METHOD WASH BORING	HAMMER TYPE MANUAL
START DATE 8/31/95	COMPLETION DATE 8/31/95	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A

ELEV.	DEPTH	BLOW COUNT			PEN. (m)	BLOWS PER 30cm					SAMPLE NUMBER	MOI.	LOG	SOIL AND ROCK DESCRIPTION	
		15cm	15cm	15cm		0	25	50	75	100					
14.95	0.00	1	1	2	0.3										
14.00	1.05	5	6	6	0.3										ROADWAY EMBANKMENT TAN BROWN FINE TO COARSE SAND
12.00	2.55	3	8	8	0.3										COASTAL PLAIN GRAY BLACK CLAYEY SAND
10.00	4.09	3	4	7	0.3										
8.00	5.61	4	6	8	0.3										GRAY BLACK CLAY
6.00	7.13	9	13	14	0.3										
4.00	8.65	26	30	26	0.3										
2.00	10.17	13	9	16	0.3										GRAY FINE SAND, TRACE MICA
1.29	11.59	14	21	24	0.3										
0.00	13.21	10	14	17	0.3										
															BORING TERMINATED AT ELEVATION 1.29 METERS IN GRAY FINE SAND (COASTAL PLAIN)

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION GEOTECHNICAL UNIT BORING LOG

SHEET 1 OF 1

PROJECT NO. 8.1280401	ID. B-1381	COUNTY SAMPSON	GEOLOGIST VARGASON T.L.
SITE DESCRIPTION BRIDGE #14 ON -L- (NC 411) OVER BLACK RIVER			GROUND WATER
BORING NO. EB2-B	BORING LOCATION 52+30.0	OFFSET 5.0m RT.	ALIGNMENT -L-
COLLAR ELEV. 14.92	NORTHING 0.00	EASTING 0.00	0 HR. N/A 24 HR. 2.62
TOTAL DEPTH 12.1	DRILL MACHINE MOBILE B-57	DRILL METHOD WASH BORING	HAMMER TYPE MANUAL
START DATE 9/6/95	COMPLETION DATE 9/6/95	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A

ELEV.	DEPTH	BLOW COUNT			PEN. (m)	BLOWS PER 30cm					SAMPLE NUMBER	LOG	SOIL AND ROCK DESCRIPTION
		15cm	15cm	15cm		0	25	50	75	100			
14.92	0.00	2	7	7	0.3							D	ROADWAY EMBANKMENT TAN FINE TO COARSE SAND
14.00	0.99	3	3	5	0.3							M	
12.00	2.51	1	3	7	0.3							▼	
	4.03	3	5	6	0.3							M	COASTAL PLAIN GRAY CLAY
	5.58	4	5	9	0.3							M	
8.00	7.08	28	46	54	0.29				100+			W	GRAY GREEN FINE TO COARSE SAND, TRACE MICA
6.00	8.60	35	50	50	0.28				100+	SS-41		W	
	10.14	8	11	17	0.3				28			W	
	11.65	10	14	18	0.3				32	SS-42		W	
2.82						BORING TERMINATED AT ELEVATION 2.82 METERS IN GRAY GREEN SAND (COASTAL PLAIN)							
2.00													
0.00													
-2.00													
-4.00													

PROJ. # - 8.1280401
ID NO. - B-1381
COUNTY - SAMPSON

EBI-A

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L. L.	P. I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-43	3.6m LT	51+59.0	8.48-8.93	A-7-5(56)	87	49	3.8	5.5	24.0	66.7	100	98	93		

EBI-B

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L. L.	P. I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-1	4.5m RT	51+68.8	0.00-0.45	A-3(0)	20	NP	53.7	39.2	3.0	4.0	88	64	7		
SS-2	4.5m RT	51+68.8	2.49-2.94	A-3(0)	15	NP	26.1	67.8	0.1	6.1	96	91	7		
SS-3	4.5m RT	51+68.8	4.01-4.46	A-3(0)	14	NP	25.3	69.9	0.8	4.0	100	95	6		
SS-4	4.5m RT	51+68.8	7.09-7.54	A-3(0)	16	NP	19.0	73.5	2.4	5.1	100	96	9		
SS-5	4.5m RT	51+68.8	8.58-9.03	A-2-4(0)	20	NP	17.6	69.5	5.9	7.1	100	97	15		
SS-6	4.5m RT	51+68.8	10.13-10.58	A-2-4(0)	30	8	4.0	76.6	4.2	15.2	100	99	21		
SS-7	4.5m RT	51+68.8	13.17-13.62	A-2-4(0)	31	4	0.6	79.2	5.1	15.2	100	100	23		
SS-8	4.5m RT	51+68.8	16.21-16.66	A-2-4(0)	28	9	15.1	66.8	5.1	13.1	100	96	20		
SS-9	4.5m RT	51+68.8	17.73-18.18	A-7-5(38)	78	42	3.2	19.4	20.8	56.6	100	98	80		

B1-A

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L. L.	P. I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-36	2.5m LT	51+77.0	0.00-0.45	A-3(0)	17	NP	30.1	64.2	1.6	4.0	100	97	7		
SS-37	2.5m LT	51+77.0	3.05-3.50	A-2-4(0)	24	NP	16.6	70.8	4.5	8.1	100	98	15		
SS-38	2.5m LT	51+77.0	4.52-4.97	A-3(0)	16	NP	79.8	19.9	0.3	0.0	100	56	1		
SS-39	2.5m LT	51+77.0	6.04-6.49	A-2-4(0)	29	4	1.4	81.0	5.5	12.1	100	100	19		
SS-40	2.5m LT	51+77.0	9.08-9.53	A-2-6(0)	33	11	0.3	79.0	5.6	15.2	100	100	23		

B2-B

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L. L.	P. I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-10	2.5m RT	51+86.0	0.27-0.72	A-3(0)	20	NP	60.0	35.8	1.2	3.0	98	73	5		
SS-11	2.5m RT	51+86.0	2.14-2.59	A-2-4(0)	30	7	7.9	70.3	5.7	16.2	100	98	23		
SS-12	2.5m RT	51+86.0	4.36-4.81	A-2-4(0)	24	NP	0.2	79.9	4.7	15.2	100	100	22		
SS-13	2.5m RT	51+86.0	7.41-7.86	A-2-4(0)	29	5	5.8	73.7	5.4	15.2	100	99	22		
SS-14	2.5m RT	51+86.0	10.43-10.88	A-7-6(7)	47	30	27.3	32.0	10.4	30.3	100	92	42		

PROJ. # - 8.1280401
 ID NO. - B-1381
 COUNTY - SAMPSON

B3-A**SOIL TEST RESULTS**

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L. L.	P. I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-30	2.5m LT	52+01.0	0.00-0.45	A-1-b(0)	17	NP	92.3	6.5	0.2	1.0	96	39	1		
SS-31	2.5m LT	52+01.0	2.06-2.51	A-2-4(0)	30	4	1.4	83.3	3.1	12.1	100	100	17		
SS-32	2.5m LT	52+01.0	5.10-5.55	A-2-6(0)	33	12	0.6	77.9	5.4	16.2	100	100	23		
SS-33	2.5m LT	52+01.0	8.14-8.59	A-2-4(0)	30	10	7.4	72.9	7.6	12.1	100	98	22		
SS-34	2.5m LT	52+01.0	9.65-10.10	A-2-4(0)	29	NP	10.9	76.9	6.2	6.1	100	95	15		
SS-35	2.5m LT	52+01.0	11.17-11.62	A-2-4(0)	15	NP	66.9	23.1	3.9	6.1	97	79	11		

B4-B**SOIL TEST RESULTS**

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L. L.	P. I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-15	2.5m RT	52+16.5	0.07-0.52	A-2-6(0)	34	15	44.2	30.9	6.7	18.2	79	54	20		
SS-16	2.5m RT	52+16.5	1.49-1.94	A-2-4(0)	21	NP	24.4	63.4	6.1	6.1	100	95	14		
SS-17	2.5m RT	52+16.5	4.51-4.96	A-2-4(0)	30	3	0.7	81.4	4.7	13.1	100	100	19		
SS-18	2.5m RT	52+16.5	7.57-8.02	A-2-4(0)	29	8	15.9	66.8	5.3	12.1	100	98	19		
SS-19	2.5m RT	52+16.5	10.91-11.37	A-2-4(0)	17	NP	24.6	66.3	4.0	5.1	100	99	15		

EB2-A**SOIL TEST RESULTS**

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L. L.	P. I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-20	5.0m LT	52+31.0	0.00-0.45	A-2-4(0)	15	NP	34.1	50.1	5.7	10.1	100	81	18		
SS-21	5.0m LT	52+31.0	1.05-1.50	A-2-4(0)	16	NP	62.1	24.4	2.3	11.1	95	65	14		
SS-22	5.0m LT	52+31.0	2.55-2.80	A-1-b(0)	19	NP	66.3	25.4	1.3	7.1	83	43	8		
SS-23	5.0m LT	52+31.0	2.80-3.00	A-2-4(0)	30	9	14.9	57.4	7.5	20.2	100	95	30		
SS-24	5.0m LT	52+31.0	4.09-4.54	A-7-5(75)	109	65	3.0	3.8	18.4	74.7	100	98	93		
SS-25	5.0m LT	52+31.0	5.61-6.06	A-7-5(81)	108	66	1.2	1.8	22.2	74.7	100	99	98		
SS-26	5.0m LT	52+31.0	7.13-7.58	A-7-6(61)	95	71	3.6	17.8	13.9	64.6	100	98	80		
SS-27	5.0m LT	52+31.0	8.65-9.10	A-2-4(0)	23	NP	30.7	52.0	6.2	11.1	99	87	19		
SS-28	5.0m LT	52+31.0	10.17-10.62	A-2-4(0)	30	4	0.4	83.6	3.8	12.1	100	100	18		
SS-29	5.0m LT	52+31.0	13.21-13.66	A-2-4(0)	31	7	4.0	73.6	5.2	17.2	100	99	23		

EB2-B**SOIL TEST RESULTS**

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L. L.	P. I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-41	5.0m RT	52+30.0	8.60-9.05	A-2-4(0)	18	NP	45.2	42.1	5.7	7.1	98	84	14		
SS-42	5.0m RT	52+30.0	11.65-12.10	A-2-4(0)	30	5	0.5	83.5	4.8	11.1	100	100	18		

GEOTECHNICAL UNIT FIELD SCOUR REPORT

PROJECT: 8.1280401 ID: B-1381 COUNTY: Sampson

DESCRIPTION(1): Bridge #14 on -L- (NC 411) over Black River

INFORMATION ON EXISTING BRIDGES Information obtained from field inspection
 microfilm (Reel: _____ Pos: _____)
 other

COUNTY BRIDGE NO. 14 BRIDGE LENGTH 60m NO. BENTS IN: CHANNE 5 FLOOD PLAIN 9

FOUNDATION TYPE: Timber piers and end bent abutments. Interior bents 5, 6, 8, have been reinforced with steel-H piles.

EVIDENCE OF SCOUR(2):

ABUTMENTS OR END BENT SLOPES: None at abutments. Some general scour of end bent slopes.

INTERIOR BENTS: General scour. Local scour at base of right piers.

CHANNEL BED: General degredational scour, local scour pockets

CHANNEL BANKS: General scour of banks. Bank on north side of river is being undermined and is unstable.

EXISTING SCOUR PROTECTION:

TYPE(3): Remnants of concrete slope protection at End Bent 2.

EXTENT(4) Undiscernable. Remains are broken up, some lying at edge of channel.

EFFECTIVENESS(5): Not effective

OBSTRUCTIONS(6) (DAMS, DEBRIS, ETC.): Trees, limbs and debris at bents 5, 6, and 7. Old timber abutments present between Interior Bents 1 and 2, and Interior Bent 8 and End Bent 2.

DESIGN INFORMATION

CHANNEL BED MATERIAL(7) (SAMPLE RESULTS ATTACHED): Loose, tan to brown, fine to coarse alluvial sand (A-3, A-1-B).

CHANNEL BANK MATERIAL(8) (SAMPLE RESULTS ATTACHED): Very loose to medium dense, brown, fine to coarse alluvial sand (A-2-4) and stiff to very stiff, gray, coastal plain clay (A-7-5).

FOUNDATION BEARING MATERIAL(9): Coastal plain, medium to very dense sand (A-3, A-2-4) and stiff to very stiff silty clay, sandy clay and clay (A-7-5, A-7-6)

CHANNEL BANK COVER(10): Grasses and trees

FLOOD PLAIN WIDTH(11): Approximately 65 meters

FLOOD PLAIN COVER(12): Grasses and trees

DESIGN INFORMATION CONT.

STREAM IS X DEGRADING AGGRADING (13)

OTHER OBSERVATIONS AND COMMENTS: _____

CHANNEL MIGRATION TENDENCY (14): Toward the north

CRITICAL SCOUR ELEVATION (15): _____

Interior Bent 1: 8.48

Interior Bent 2: 5.64

Interior Bent 3: 5.44

Interior Bent 4: 6.56

No scour is anticipated at End Bents 1 and 2 if recommended rip rap is used.

REPORTED BY: R. A. Russell DATE: 9/4/95
R. A. Russell

INSTRUCTIONS

- (1) GIVE THE DESCRIPTION OF THE SPECIFIC SITE GIVING ROUTE NUMBER AND BODY OF WATER CROSSED.
- (2) NOTE ANY EVIDENCE OF SCOUR AT THE EXISTING END BENTS OR ABUTMENTS (UNDERMINING, SLOUGHING, SCOUR LOCATIONS, DEGRADATIONS, ETC.)
- (3) NOTE ANY EXISTING SCOUR PROTECTION (RIP RAP, ETC.)
- (4) DESCRIBE THE EXTENT OF ANY EXISTING SCOUR PROTECTION.
- (5) DESCRIBE WHETHER OR NOT THE SCOUR PROTECTION APPEARS TO BE WORKING.
- (6) NOTE ANY DAMS, FALLEN TREES, DEBRIS AT BENTS, ETC.
- (7) DESCRIBE THE CHANNEL BED MATERIAL: A SAMPLE SHOULD BE TAKEN FOR GRAIN SIZE DISTRIBUTION, ATTACH LAB RESULTS.
- (8) DESCRIBE THE CHANNEL BANK MATERIAL: A SAMPLE SHOULD BE TAKEN FOR GRAIN SIZE DISTRIBUTION, ATTACH LAB RESULTS.
- (9) DESCRIBE THE FOUNDATION BEARING MATERIAL,
- (10) DESCRIBE THE BANK COVERING (GRASS, TREES, RIP RAP, NONE, ETC.)
- (11) GIVE THE APPROXIMATE FLOOD PLAIN WIDTH (ESTIMATE).
- (12) DESCRIBE THE FLOOD PLAIN COVERING (GRASS, TREES, CROPS, ETC.)
- (13) CHECK THE APPROPRIATE SPACE AS TO WHETHER THE STREAM IS DEGRADING OR AGGRADING
- (14) DESCRIBE THE POTENTIAL OF THE BODY OF WATER TO MIGRATE Laterally DURING THE LIFE OF THE BRIDGE (APPROXIMATELY 100 YEARS).
- (15) GIVE THE CRITICAL SCOUR ELEVATION EXPECTED OVER THE LIFE OF THE BRIDGE (APPROXIMATELY 100 YEARS). THIS CAN BE GIVEN AS AN ELEVATION RANGE ACROSS THE SITE, OR ON A BENT BY BENT BASIS WHERE VARIATIONS EXIST. DISCUSS RELATIONSHIP BETWEEN THE HYDRAULICS THEORETICAL SCOUR AND THE CRITICAL SCOUR ELEVATION. IF THE CRITICAL SCOUR ELEVATION IS DEPENDENT ON SCOUR COUNTER MEASURES, EXPLAIN. (RIPRAP ARMORING ON SLOPES, ETC.) THE CRITICAL SCOUR ELEVATION IS BASED ON THE ERODABILITY OF MATERIALS WITH CONSIDERATION FOR JOINTING, FOLIATION, BEDDING ORIENTATION AND FREQUENCY; CORE RECOVERY PERCENTAGE; PERCENTAGE RQD; DIFFERENTIAL WEATHERING, SHEAR STRENGTH; OBSERVATIONS AT EXISTING STRUCTURES; OTHER TESTS DEEMED APPROPRIATE; AND OVERALL GEOLOGIC CONDITIONS AT THE SITE.

PROJECT #: 8.1280401

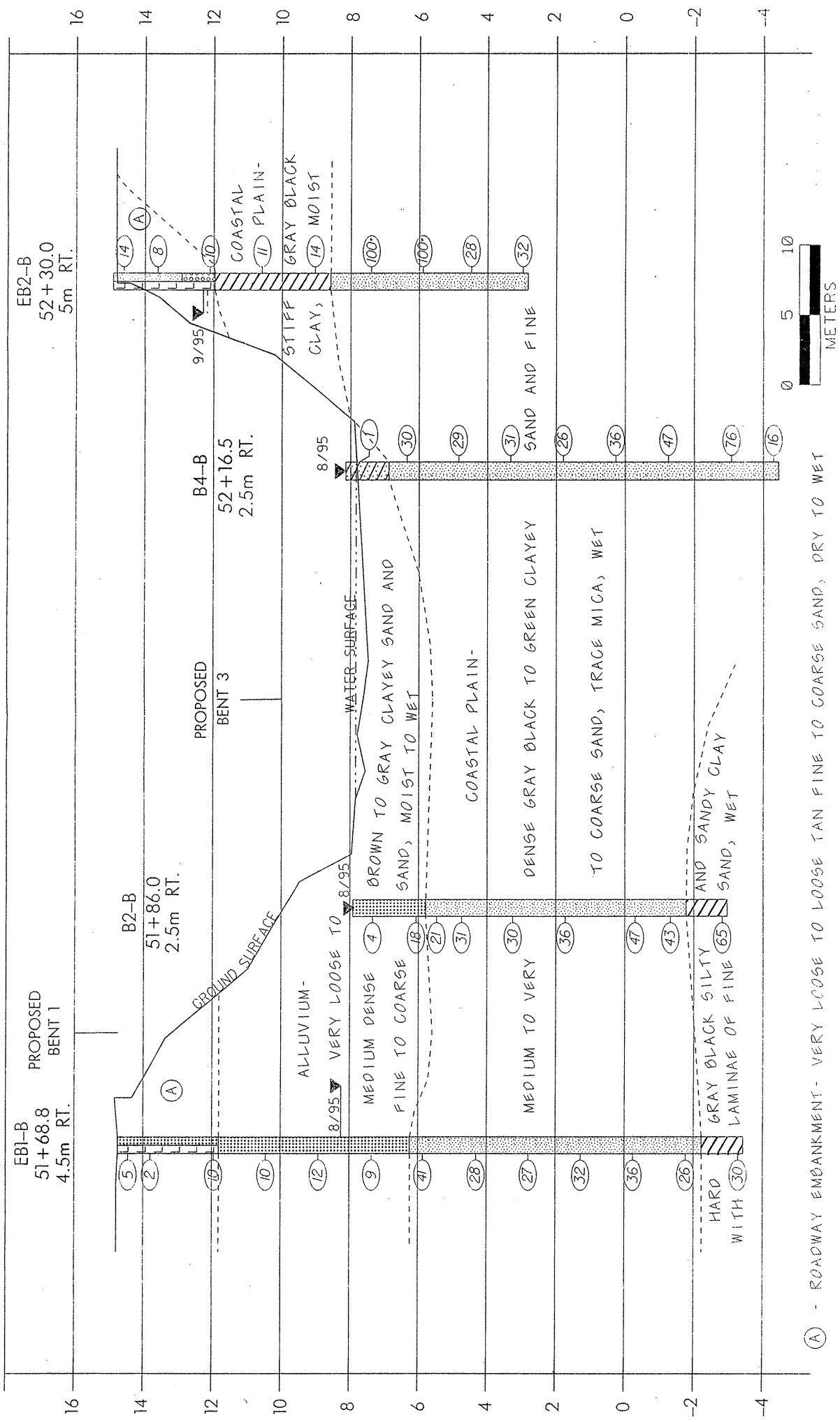
COUNTY: Sampson

DESCRIPTION: Bridge #14 on -L- (NC 411) over Black River

SAMPLE #	CHANNEL BED MATERIAL			CHANNEL BANK MATERIAL		
	SS-10	SS-30		SS-37	SS-23	SS-24
RETAINED #4	1	—		—	—	—
PASSING #10	98	96		100	100	100
PASSING #40	73	39		98	95	98
PASSING #200	5	1		15	30	93
COARSE SAND	60.0	92.3		16.6	14.9	3
FINE SAND	35.8	6.5		70.8	57.4	3.8
SILT	1.2	0.2		4.5	7.5	18.4
CLAY	3	1		8.1	20.2	74.7
LL	20	17		24	30	109
PL	NP	NP		NP	9	65
AASHTO CLASSIFICATION	A-3(0)	A-1-b(0)		A-2-4(0)	A-2-4(0)	A-7-5(75)
STATION	51+86.0	52+01.0		51+77.0	52+31.0	52+31.0
OFFSET	2.5m RT	2.5mLT		2.5m LT	5.0m LT	5.0mlt
DEPTH	0.27-0.72	0.00-0.45		3.05-3.50	2.80-3.00	4.09-4.54

PROFILE 4.5 METERS RIGHT OF -L-

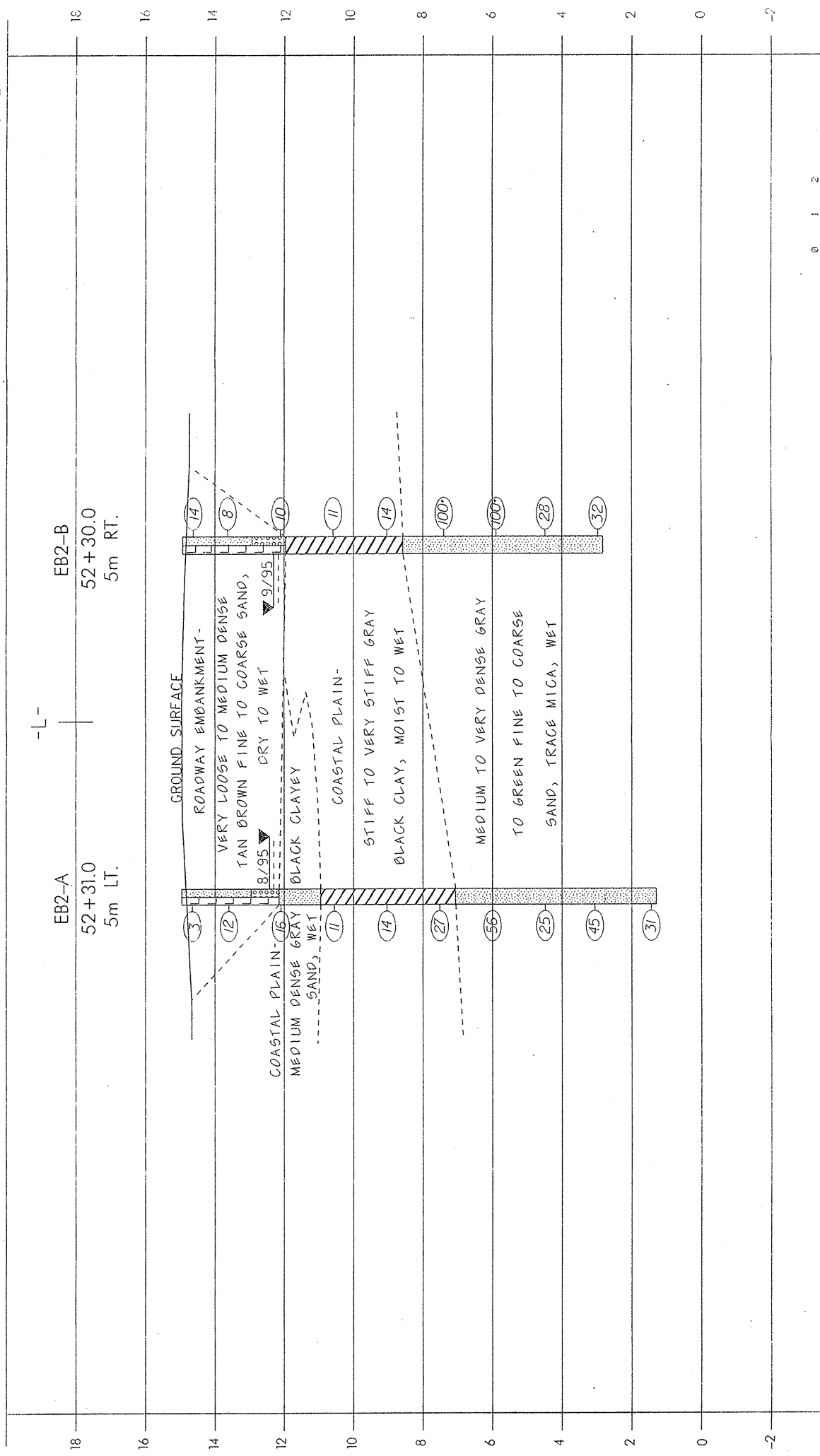
8.1280401 5-1381
APPENDIX 3



(A) - ROADWAY EMBANKMENT - VERY LOOSE TO LOOSE TAN FINE TO COARSE SAND, DRY TO WET

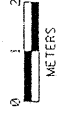
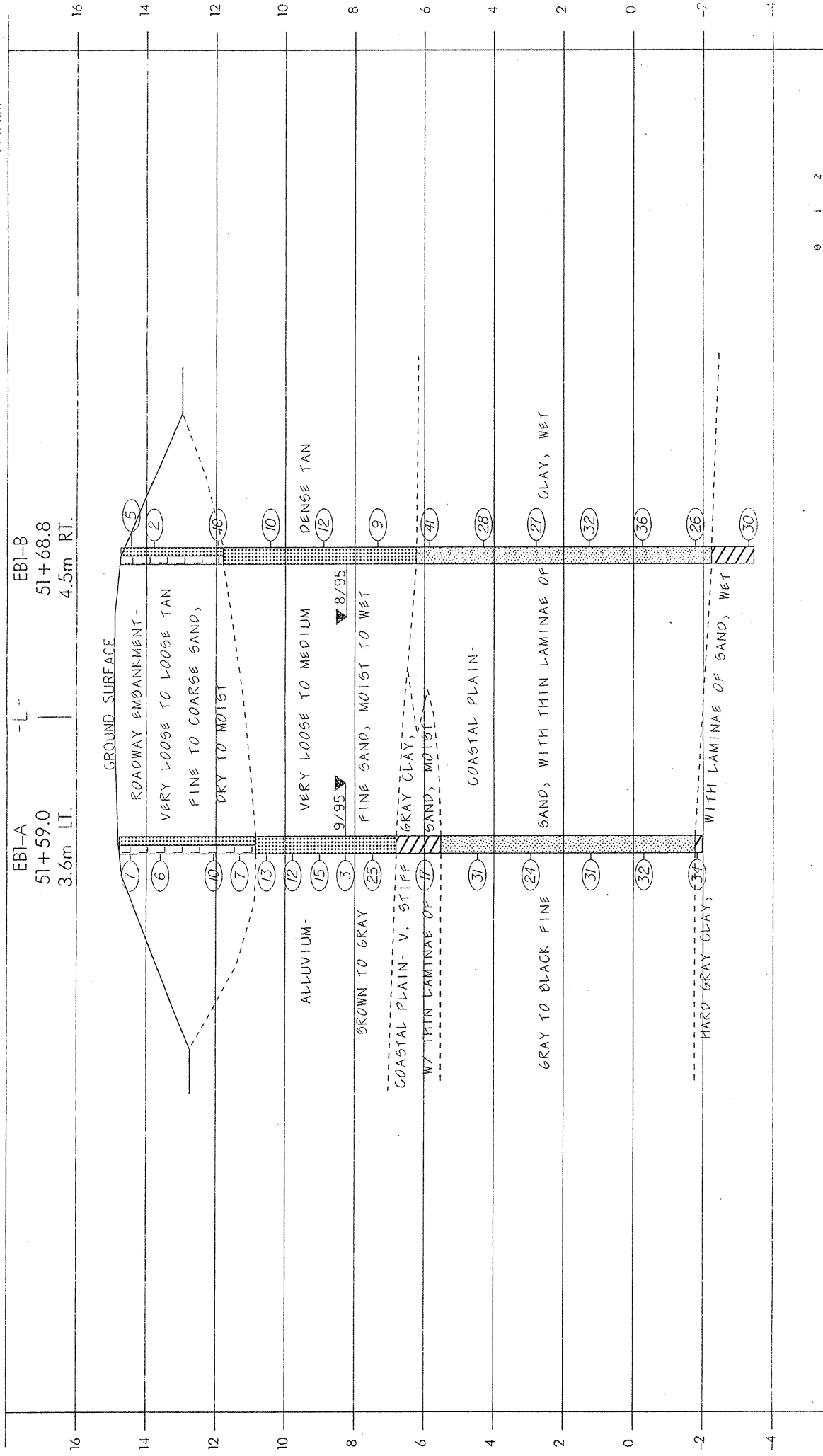
SECTION THROUGH END BENT 2

8.13.00501 B-138
APPENDIX 2



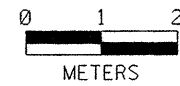
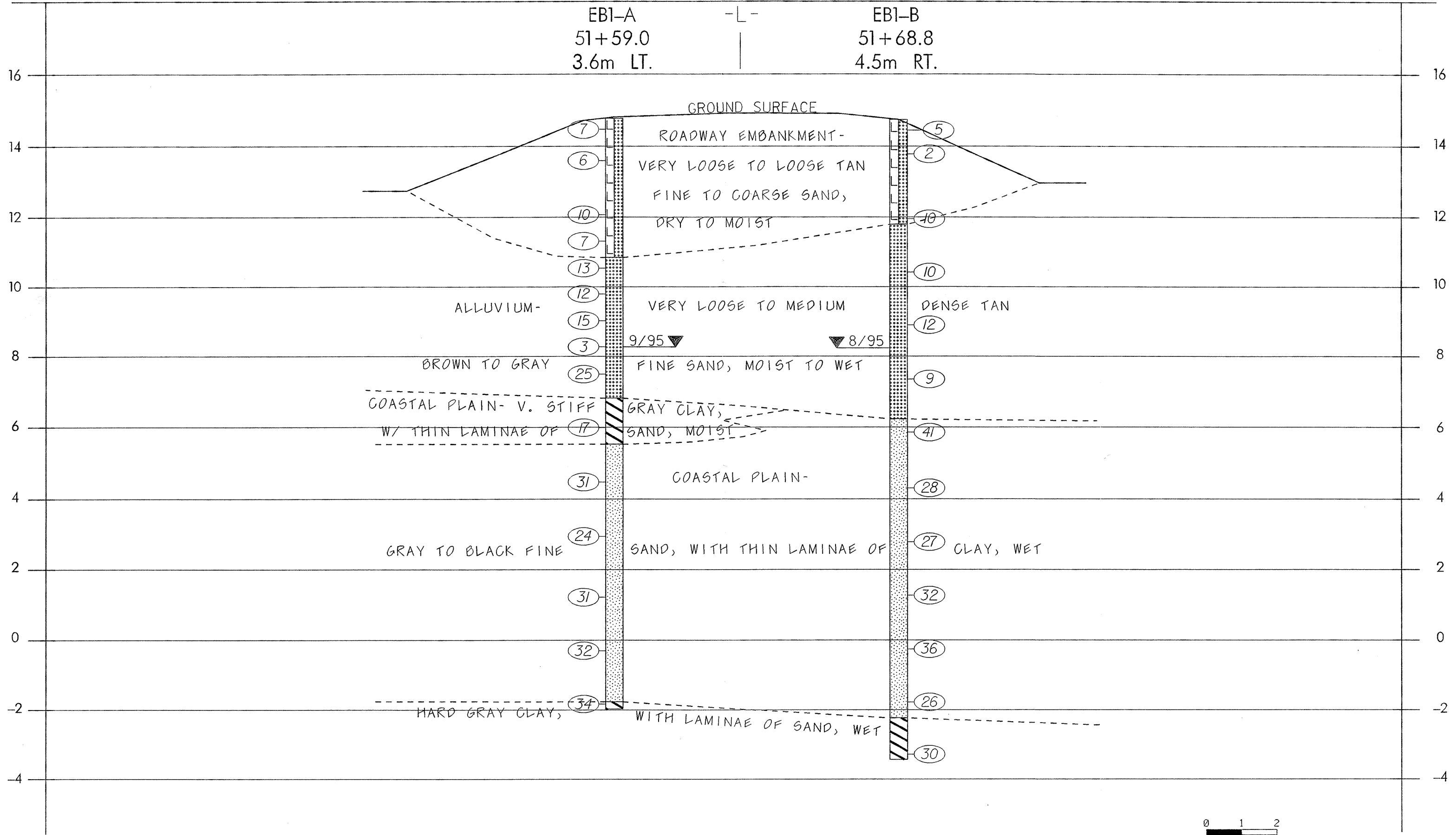
SECTION THROUGH END BENT 1

APPENDIX E-381
APPENDIX 7



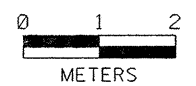
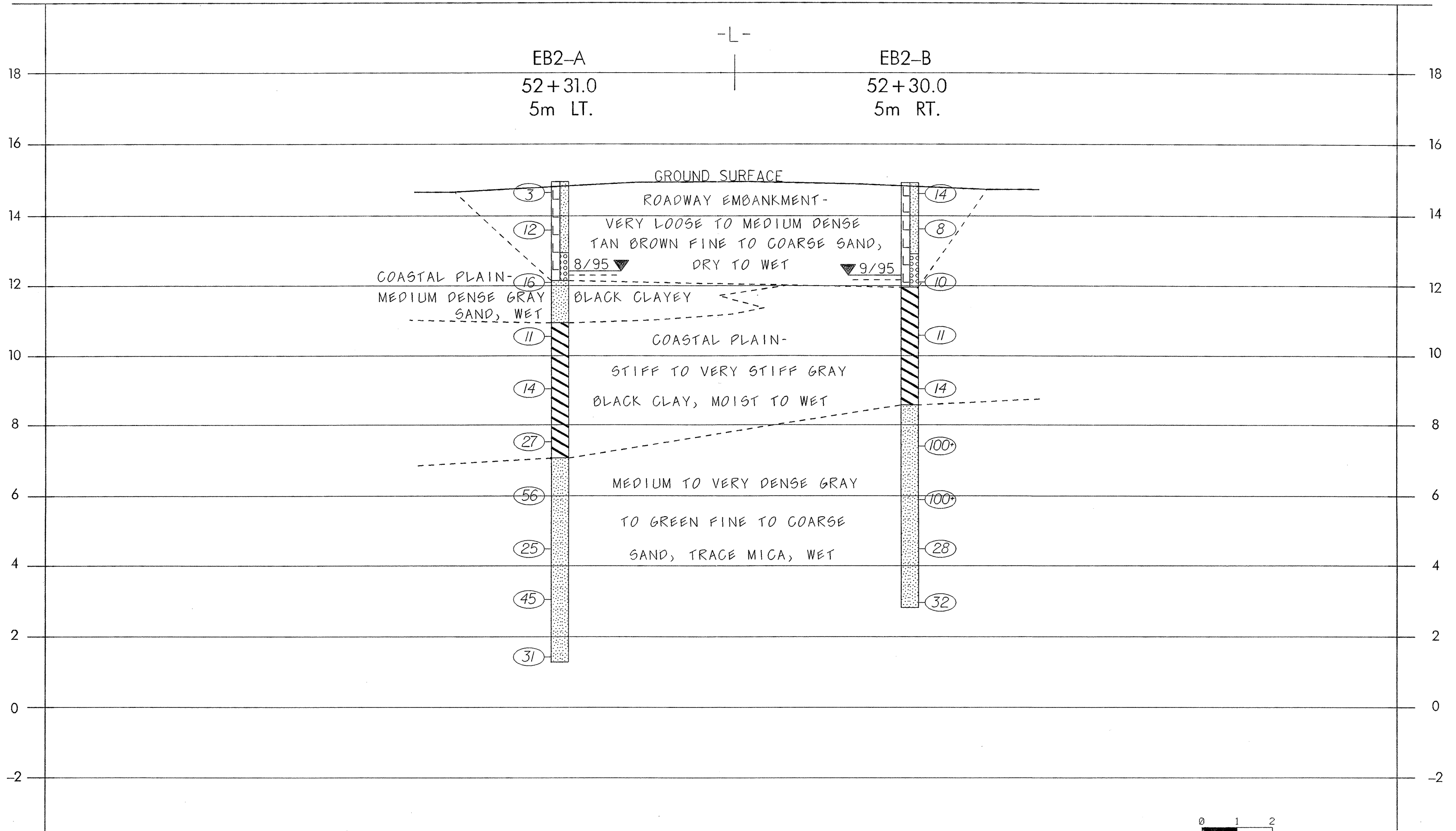
SECTION THROUGH END BENT 1

8.1280401 B-1381
APPENDIX 1



SECTION THROUGH END BENT 2

8.1280401 B-1381
APPENDIX 2



PROFILE 4.5 METERS RIGHT OF -L-

8.1280401 B-1381
APPENDIX 3

