

NOTE: SEE SHEET 2A FOR PLAN SHEET LAYOUT AT TIME OF INVESTIGATION

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3830	1	19
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33281.1.1	BRZ-1947(1)	P.E.	
33281.2.1	BRZ-1947(1)	ROW / UTILITIES	
33281.3.1	BRZ-1947(2)	CONSTRUCTION	

CONTENTS

LINE	STATION	PLAN	PROFILE
-L1-	15+50 TO 27+00	4	6
-L2-	33+75 TO 42+20	5	7

CROSS SECTIONS SECTIONS SHEETS

CROSS SECTIONS	SECTIONS	SHEETS
-L1-	22+00 TO 27+00	8-12
-L2-	34+00 TO 42+00	13-19

ROADWAY
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 33281.1.1 (B-3830) F.A. PROJ. BRZ-1947(1)
COUNTY COLUMBUS
PROJECT DESCRIPTION BRIDGE NO. 363 AND NO. 364 ON SR 1947
OVER FRIAR SWAMP

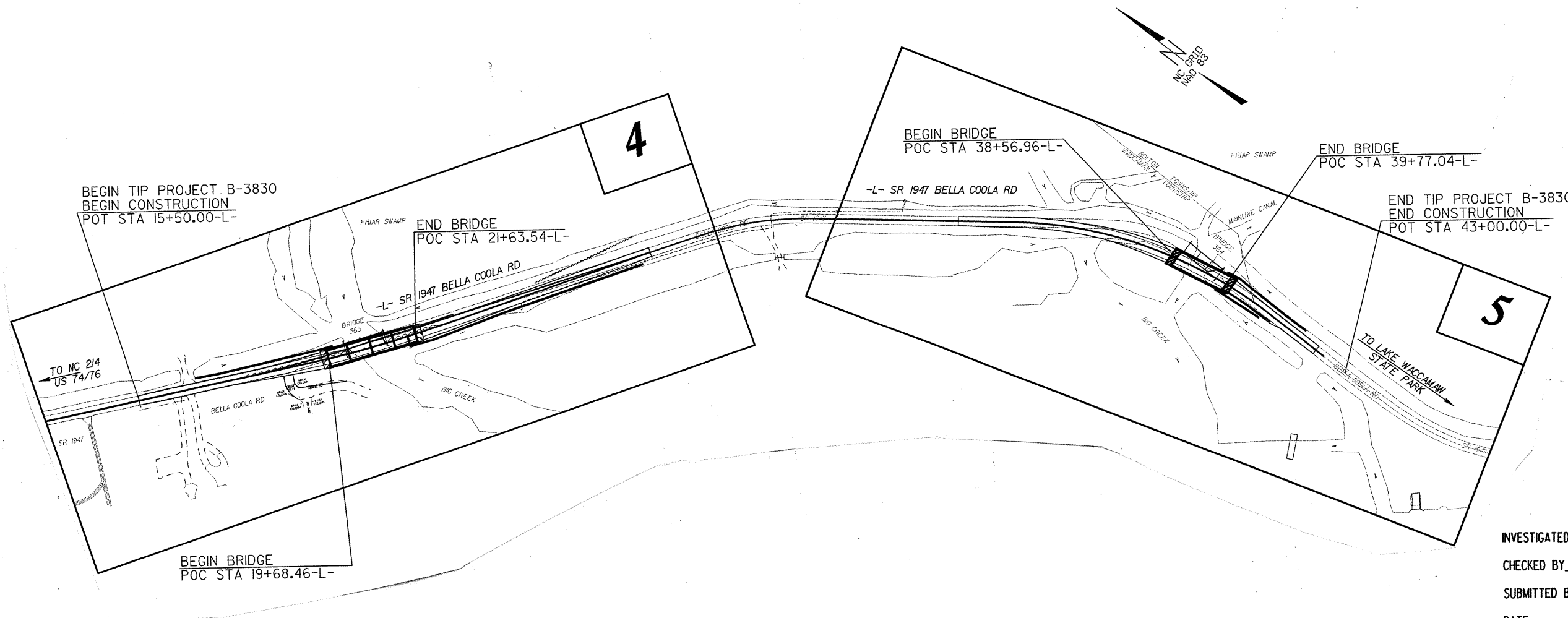
CAUTION NOTICE

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.

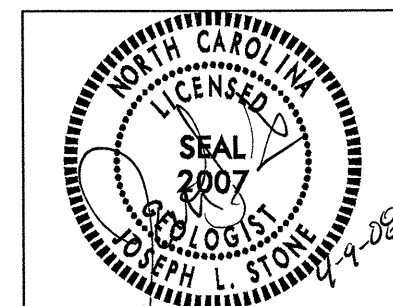
INVENTORY



PERSONNEL

- TCB
- LWD
- WNC
- RES
- JRS

INVESTIGATED BY J.L. STONE
CHECKED BY D.N. ARGENBRIGHT
SUBMITTED BY D.N. ARGENBRIGHT
DATE APRIL 2008



DRAWN BY: J.L. STONE, C.M. KENT

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 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.

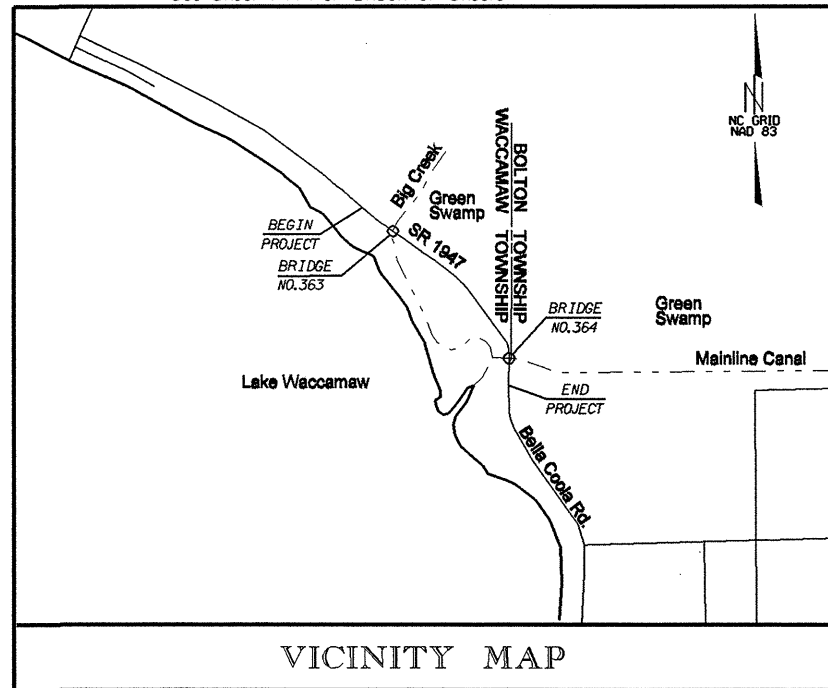
CONTRACT: C201923B ID: B-3830

09/08/09

TIP PROJECT: B-3830

CONTRACT:

See Sheet 1-A For Index of Sheets

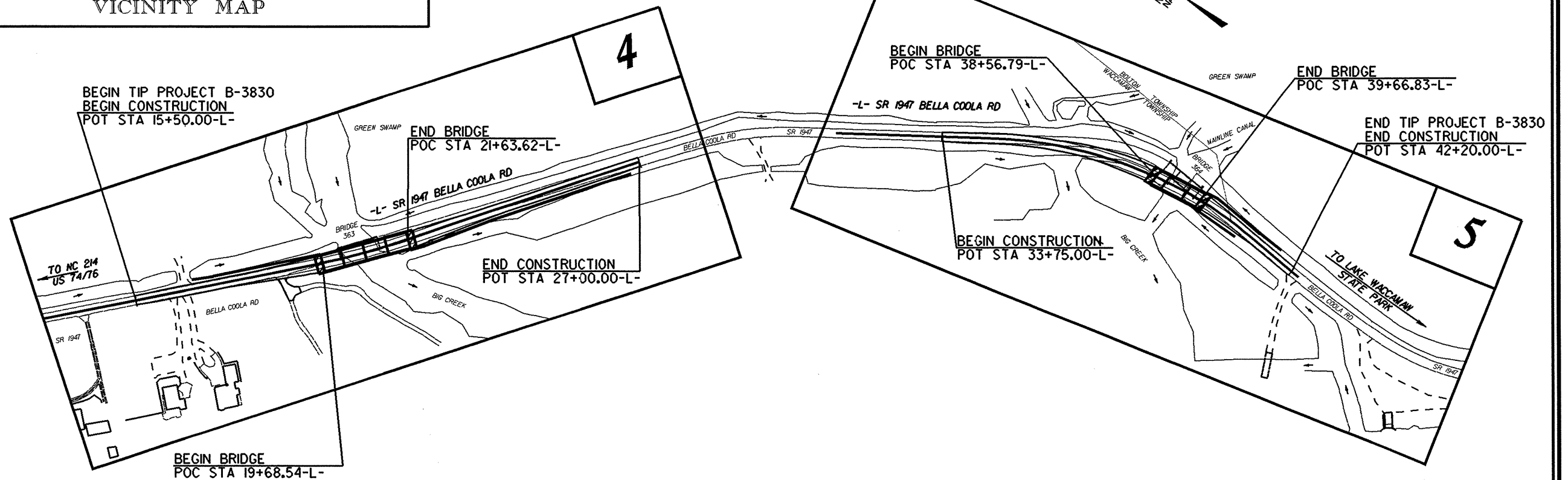


VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
COLUMBUS COUNTY

LOCATION: BRIDGE NO. 363 AND NO. 364 OVER FRIAR SWAMP ON SR 1947 (BELLA COOLA RD)
TYPE OF WORK: GRADING, PAVING, DRAINAGE, AND STRUCTURES.

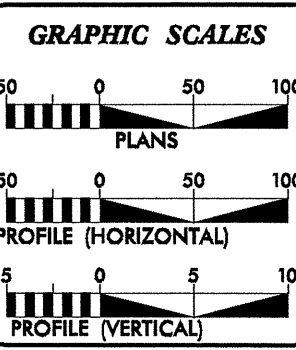
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3830	2A	19
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33281.1.1	BRZ-1947(1)	P.E.	



INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NCDOT CONTACT: DOUG TAYLOR, P.E.

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD ...



DESIGN DATA

ADT 2007 =	800
ADT 2027 =	1470
DHV =	14 %
D =	65 %
T =	3 % *
V =	50 MPH
* (TTST 1% + DUAL 2%)	
FUNC. CLASS. = RURAL LOCAL	

PROJECT LENGTH

LENGTH ROADWAY		
TIP PROJECT B-3830 =	0.320	MILES
LENGTH STRUCTURE		
TIP PROJECT B-3830 =	0.058	MILES
TOTAL LENGTH OF		
TIP PROJECT B-3830 =	0.378	MILES

Prepared In the Office of:
WILBUR SMITH ASSOCIATES
421 Fayetteville St, Suite 1303, Raleigh NC, 27601

2006 STANDARD SPECIFICATIONS	
RIGHT OF WAY DATE: MARCH 16, 2007	DAVID L. WILVER, P.E. PROJECT ENGINEER
LETTING DATE: MARCH 18, 2008	R.D. ODELL, P.E. PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.

**DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA**

STATE HIGHWAY DESIGN ENGINEER

FILE: 3830
DATE: 08/05/09



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

April 9, 2008

STATE PROJECT: 33281.1.1 B-3830
F.A. PROJECT: BRZ-1947(1)
COUNTY: Columbus
DESCRIPTION: Bridge No. 363 and No. 364 on SR 1947 over Friar Swamp
SUBJECT: Geotechnical Report – Inventory

Project Description

The proposed project is located in Columbus County, along the northeastern shore of Lake Waccamaw on SR 1947. Based on the current plans, proposed construction consists of raising the grade approximately 3 feet along Bridge No. 363 as well as realigning Bridge No. 364. The investigation of subsurface conditions was confined to areas of proposed construction.

The following line was investigated for this project:

<u>Line</u>	<u>Station (±)</u>
-L1-	15+50 to 27+00
-L2-	33+75 to 42+20

Areas of Special Geotechnical Interest

- 1) The entire project area was found to exhibit seasonal high ground water, or the potential for ground water related construction problems.

- 2) The following sections contain very soft, organic alluvial soils, which have the potential to cause embankment stability and or long term settlement problems.

<u>Line</u>	<u>Station (±)</u>
-L1-	20+50 to 27+00
-L2-	33+75 to 42+20

Physiography and Geology

This project is located in Columbus County within the Coastal Plain Physiographic Province. Topography along the project is flat with very poor surface drainage. Ground elevations along the project range from 29± feet above sea level along the bed of the Friar Swamp to 48± feet above sea level along the existing SR 1947 embankment. Surface water along the project flows directly into Friar Swamp.

This area is underlain by recent alluvial sediments and Cretaceous marine deposits belonging to the Peedee Formation.

Ground Water

Ground water data was collected during April 2007 during which period the area experienced normal precipitation conditions. Ground water elevations ranged from 40 to 42 feet above sea level.

Soils

Soils encountered during this investigation are separated into 3 categories: alluvial soils, roadway embankment soils and formational soils.

Alluvial deposits encountered are comprised of 5 to 8 or more feet of loose to medium dense sand and silty sand (A-3, A-2-4) and 2 to 12 feet of very soft muck. Laboratory analysis of a representative sample taken from within these muck deposits returned an organic content of 30 percent.

Soils classified as roadway embankment are composed of 1 to 7 feet of very loose to medium dense sand and silty sand (A-3, A-2-4).

Marine sediments belonging to the Cretaceous Peedee Formation are encountered at elevations ranging from 30 to 32 feet. The Peedee Formation in this area is composed of 2± of very soft sandy limestone underlain by 6 or more feet of very loose to dense silty sand.

Prepared by,

Joseph L. Stone, L.G.
Project Geologist

EARTHWORK BALANCE SHEET

Volumes in Cubic Yards

PROJECT TIP # B-3830

COUNTY Columbus

DATE 4/1/2008

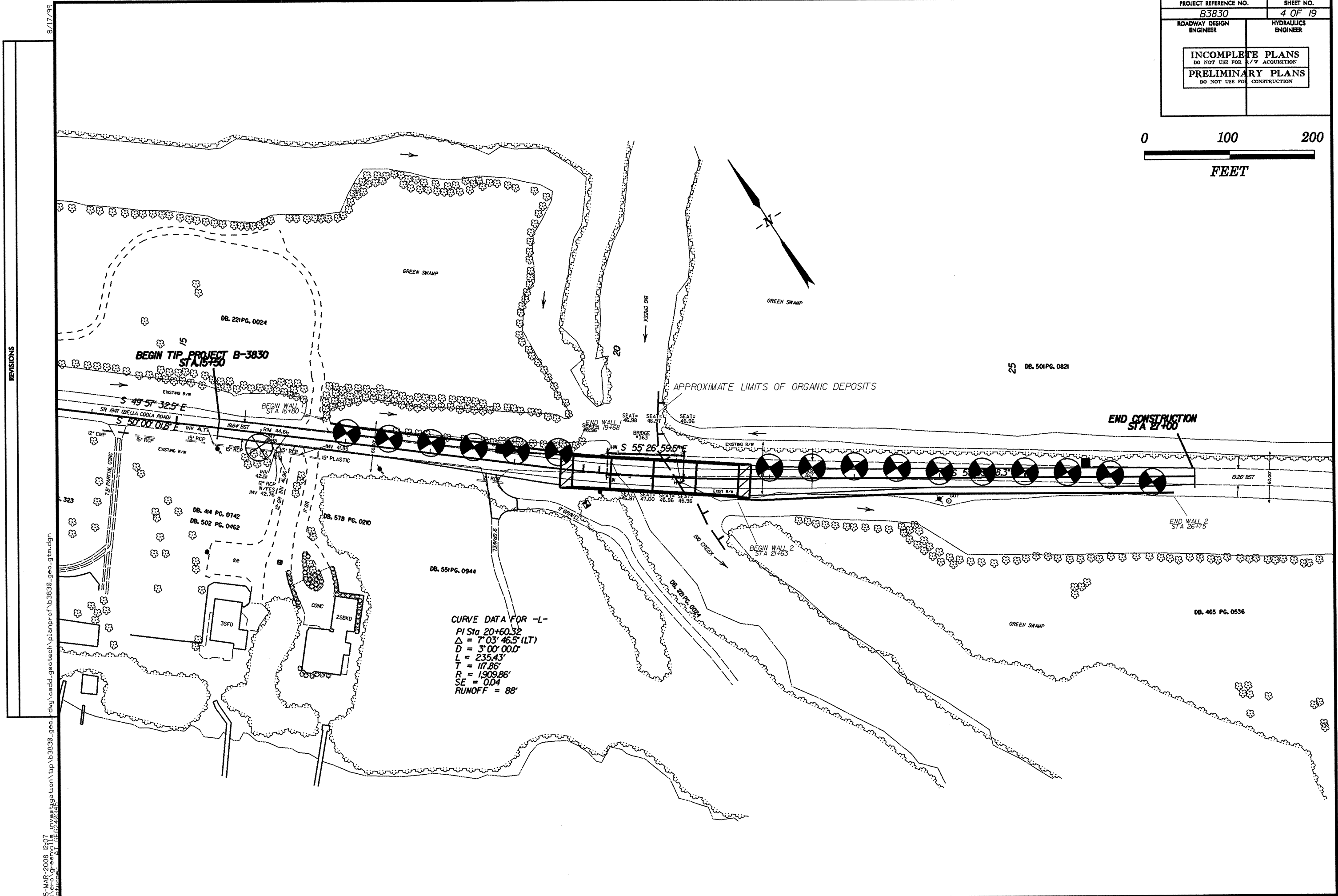
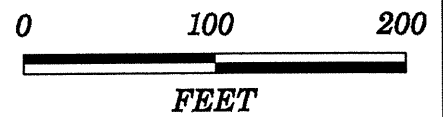
SHEET 1 OF 1 SHEETS

LINE	STATION	STATION	TOTAL EXCAV. (UNCL.)	ROCK EXCAV.	UNDERCUT EXCAV.	UNSUIT. EXCAV.	SUITABLE EXCAV.	TOTAL EMB.	ROCK EMB.	UNDERCUT EMB.	EARTH EMB.	EMBANK. 25%	BORROW	SUITABLE WASTE	UNSUIT. WASTE	TOTAL WASTE
-L-	15+50	19+68.46	15				15	1473			1473	1841	1826			
		SUBTOTAL	15				15	1473			1473	1841	1826			
-L-	21+63.54	27+00.00	108		1200		108	2053			2053	2566	2278		1020	1020
		SUBTOTAL	108		1200		108	2053			2053	2566	2278		1020	1020
-L-	33+75.00	38+56.96	36		3600		36	4610			4610	5763	5187		3060	3060
		SUBTOTAL	36		3600		36	4610			4610	5763	5187		3060	3060
-L-	39+77.04	42+20.00	50				50	244			244	305	255			
		SUBTOTAL	50				50	244			244	305	255			
PROJECT SUBTOTAL			209	0	4800	0	209	8380	0	0	8380	10475	9546	0	4080	4080
ADDITIONAL UNDERCUT					700										700	700
SHOULDER MATERIAL								35			35	44	44			
SELECT GRANULAR MATERIAL, CL. III								-3840			-3840	-4800	-4800			
LOSS DUE TO CLEARING & GRUBBING																
PROJECT TOTAL			209	0	5500	0	209	4575	0	0	4575	5719	4790	0	4780	4780
EST 5% TO REPLACE TOP SOIL ON BORROW PIT													240			
GRAND TOTAL			209										5030			
SAY			250										5100			

DDE 130 CY
 SELECT GRANULAR MATERIAL CONTINGENCY 700 CY

* EARTHWORK QUANTITIES ARE CALCULATED BY THE ROADWAY DESIGN UNIT. THESE EARTHWORK QUANTITIES ARE BASED IN PART ON SUBSURFACE DATA PROVIDED BY THE GEOTECHNICAL ENGINEERING UNIT.

PROJECT REFERENCE NO. B3830	SHEET NO. 4 OF 19
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

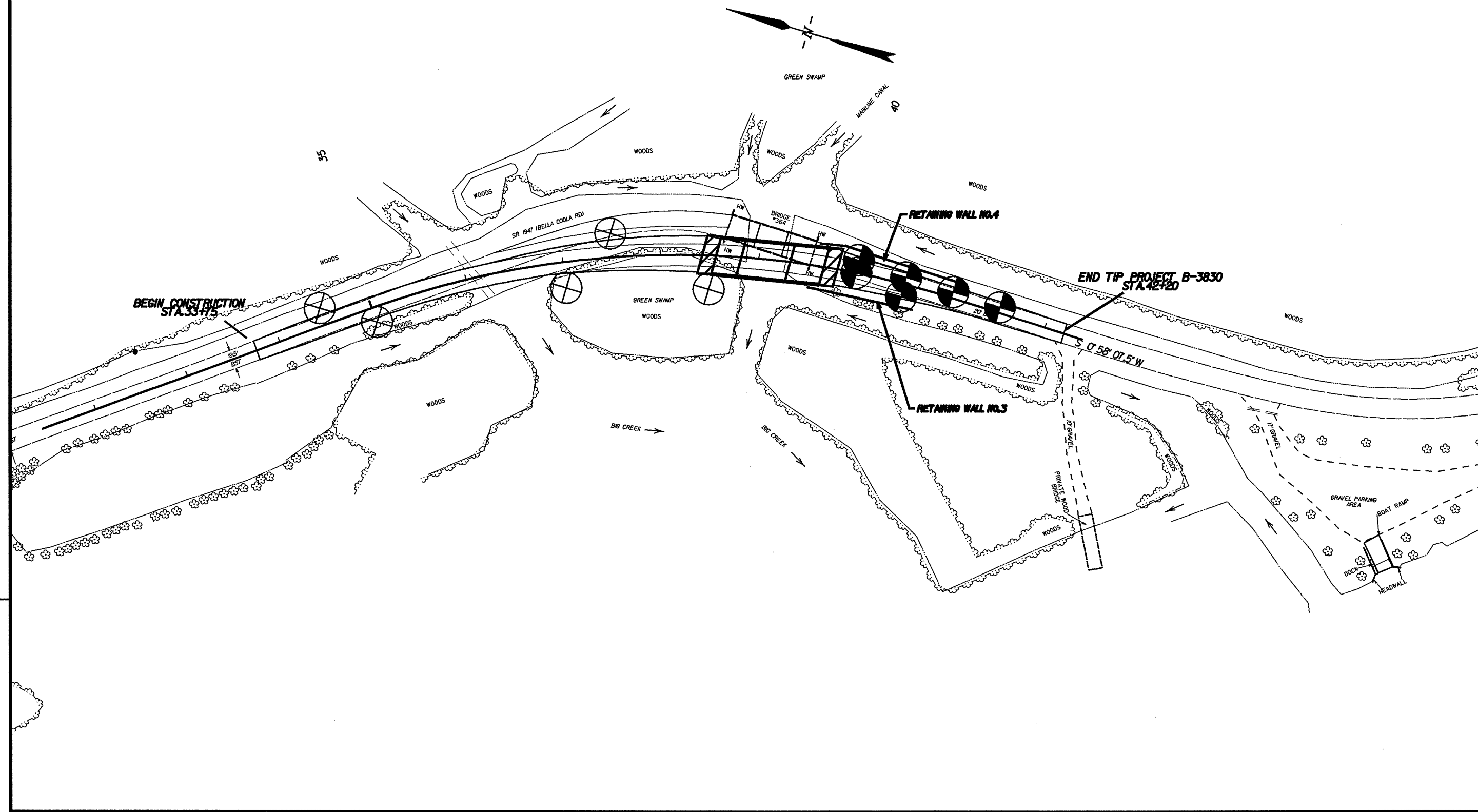
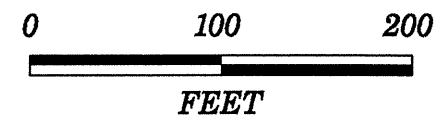


CURVE DATA FOR -L-
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 $D = 3^{\circ} 00' 00"$
 $L = 235.43'$
 $T = 117.86'$
 $R = 1909.86'$
 $SE = 0.04$
 $RUNOFF = 88'$

8/17/09
 REVISIONS
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 DB. 44 PG. 0142
 DB. 502 PG. 0462
 DB. 578 PG. 0210
 DB. 551 PG. 0944
 DB. 201 PG. 0924
 DB. 501 PG. 0821
 DB. 465 PG. 0536

8/17/99

PROJECT REFERENCE NO. B3830	SHEET NO. 5 OF 19
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



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SOIL TEST RESULTS

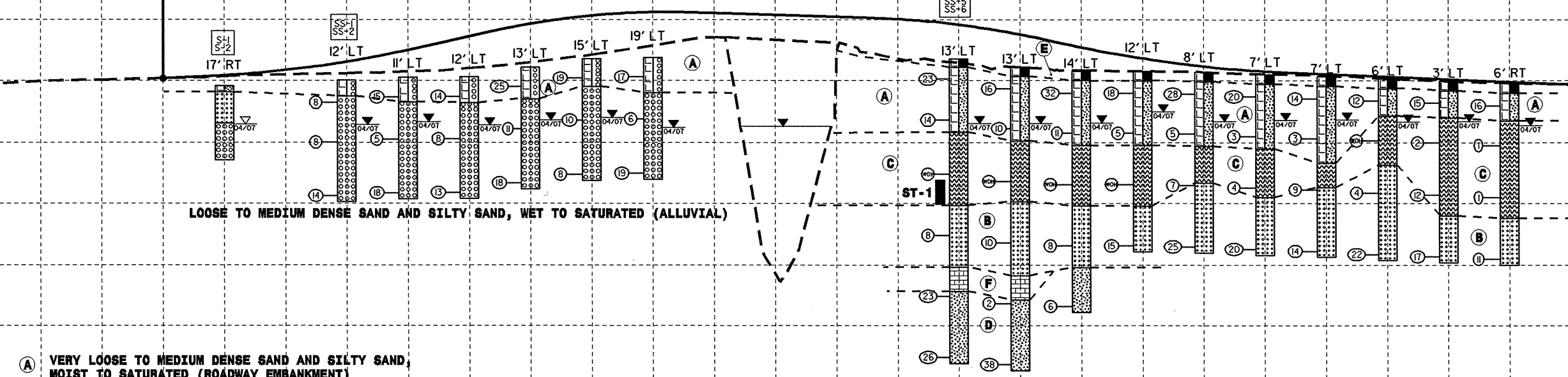
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-1	17' Rt	16+00	1.50-3.00	A-3(0)	24	NP	64.2	27.6	3.0	5.2	100	61	9	-	-
S-2	17' Rt	16+00	3.00-6.00	A-1-b(0)	17	NP	84.2	13.4	1.2	1.2	100	47	3	-	-
SS-1	12' Lt	17+00	1.80-2.30	A-1-b(0)	29	NP	82.2	11.4	6.1	0.4	100	43	8	-	-
SS-2	12' Lt	17+00	8.40-9.90	A-1-b(0)	18	NP	81.7	15.4	2.4	0.4	100	41	4	-	-
SS-3	13' Lt	22+00	0.70-2.20	A-2-4(0)	19	NP	6.5	51.3	7.7	4.5	100	79	13	-	-
SS-4	13' Lt	22+00	8.40-9.90	NOT ENOUGH SAMPLE											30.3
SS-5	13' Lt	22+00	13.40-14.90	A-3(0)	16	NP	70.7	29.2	0.1	0.0	100	60	1	-	-
SS-6	13' Lt	22+00	23.40-24.90	A-2-4(0)	19	NP	16.2	61.7	14.0	8.1	100	95	24	-	-

70
60
50
40
30
20
10
0
-10

70
60
50
40
30
20
10
0
-10

BEGIN PROJECT
 STA 15+50.00

END CONSTRUCTION
 STA 27+00.00



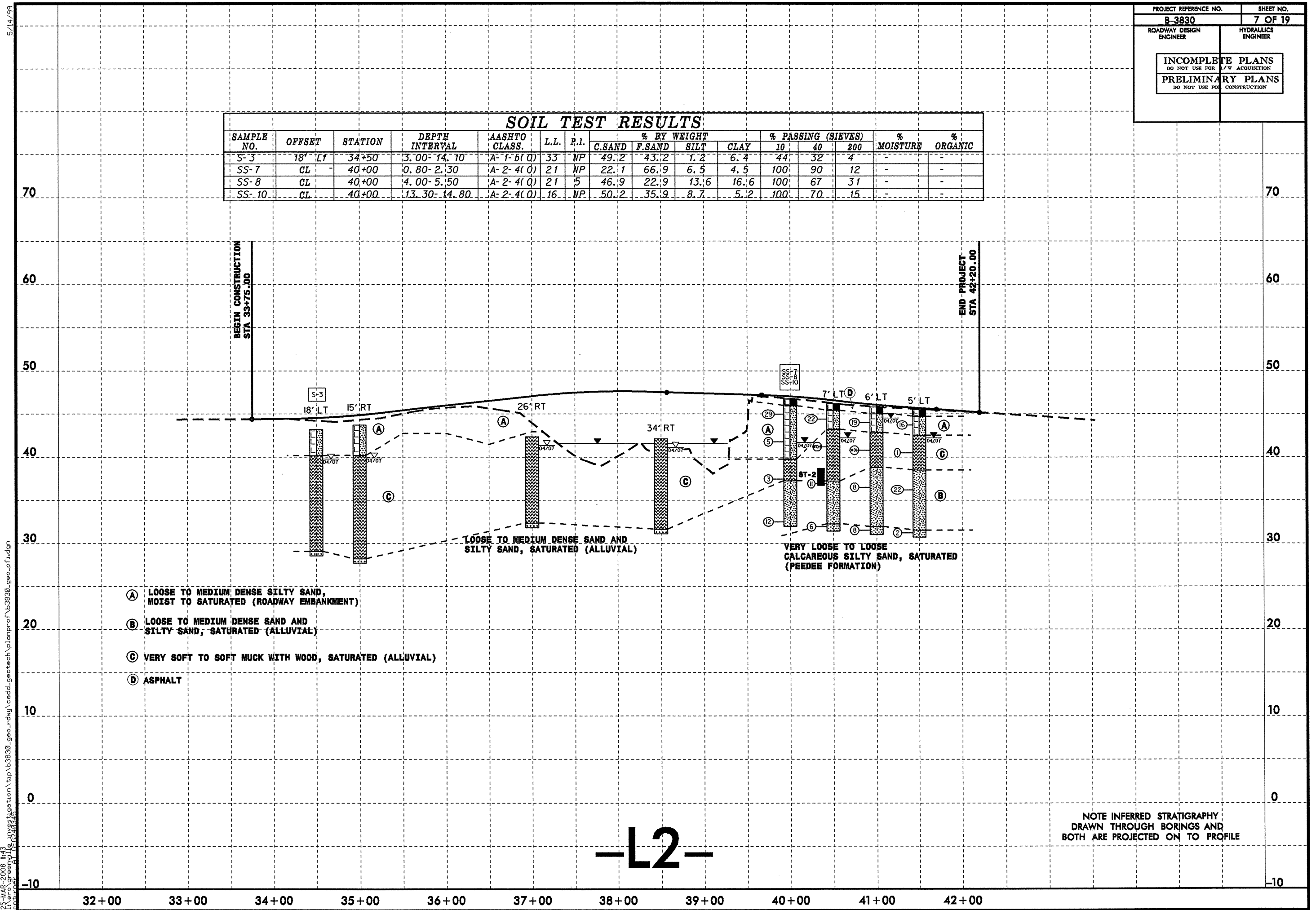
- (A) VERY LOOSE TO MEDIUM DENSE SAND AND SILTY SAND, MOIST TO SATURATED (ROADWAY EMBANKMENT)
- (B) LOOSE TO MEDIUM DENSE SAND AND SILTY SAND, SATURATED (ALLUVIAL)
- (C) VERY SOFT TO SOFT MUCK WITH WOOD, SATURATED (ALLUVIAL)
- (D) VERY LOOSE TO DENSE CALCAREOUS SILTY SAND, SATURATED (PEEDEE FORMATION)
- (E) ASPHALT
- (F) VERY SOFT LIMESTONE, (PEEDEE FORMATION)

NOTE INFERRED STRATIGRAPHY
 DRAWN THROUGH BORINGS AND
 BOTH ARE PROJECTED ON TO PROFILE

-L1-

14+00 15+00 16+00 17+00 18+00 19+00 20+00 21+00 22+00 23+00 24+00 25+00 26+00 27+00

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		
S-3	18' LT	34+50	3.00-14.10	A-1-b(0)	33	NP	49.2	43.2	1.2	6.4	44	32	4	-	-
SS-7	CL	40+00	0.80-2.30	A-2-4(0)	21	NP	22.1	66.9	6.5	4.5	100	90	12	-	-
SS-8	CL	40+00	4.00-5.50	A-2-4(0)	21	5	46.9	22.9	13.6	16.6	100	67	31	-	-
SS-10	CL	40+00	13.30-14.80	A-2-4(0)	16	NP	50.2	35.9	8.7	5.2	100	70	15	-	-



- (A) LOOSE TO MEDIUM DENSE SILTY SAND, MOIST TO SATURATED (ROADWAY EMBANKMENT)
- (B) LOOSE TO MEDIUM DENSE SAND AND SILTY SAND, SATURATED (ALLUVIAL)
- (C) VERY SOFT TO SOFT MUCK WITH WOOD, SATURATED (ALLUVIAL)
- (D) ASPHALT

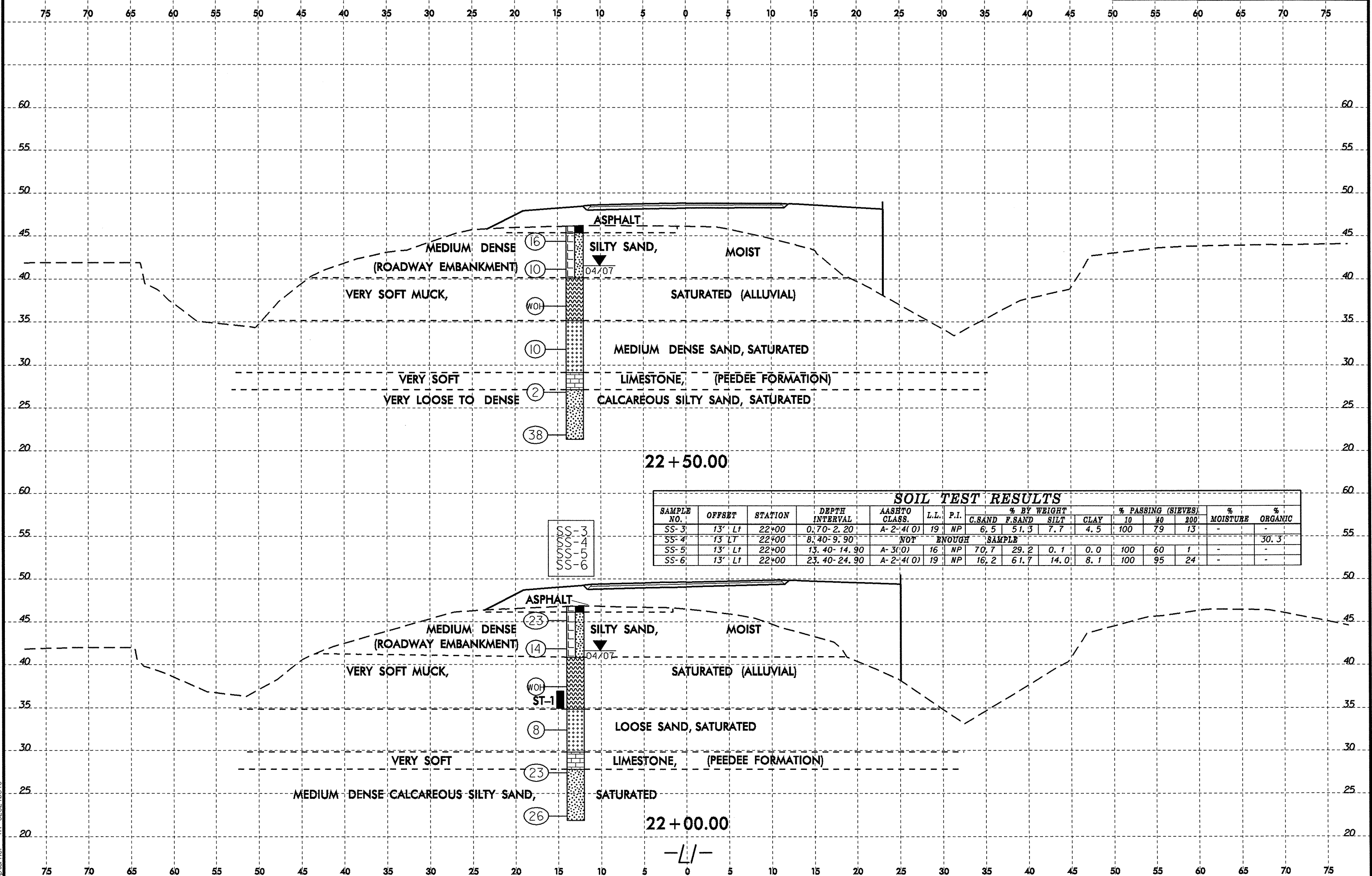
LOOSE TO MEDIUM DENSE SAND AND SILTY SAND, SATURATED (ALLUVIAL)

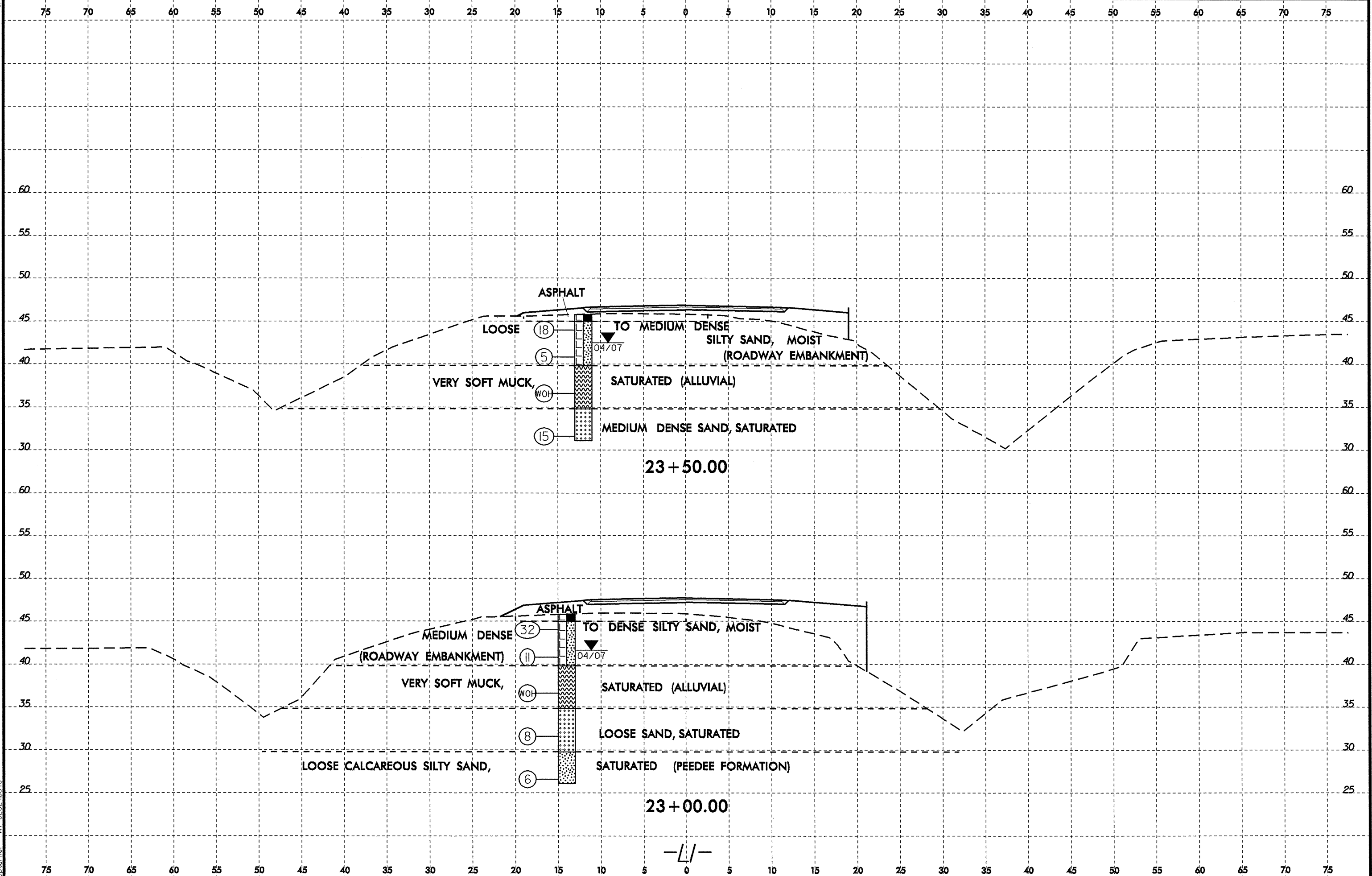
VERY LOOSE TO LOOSE CALCAREOUS SILTY SAND, SATURATED (PEEDEE FORMATION)

-L2-

NOTE INFERRED STRATIGRAPHY DRAWN THROUGH BORINGS AND BOTH ARE PROJECTED ON TO PROFILE

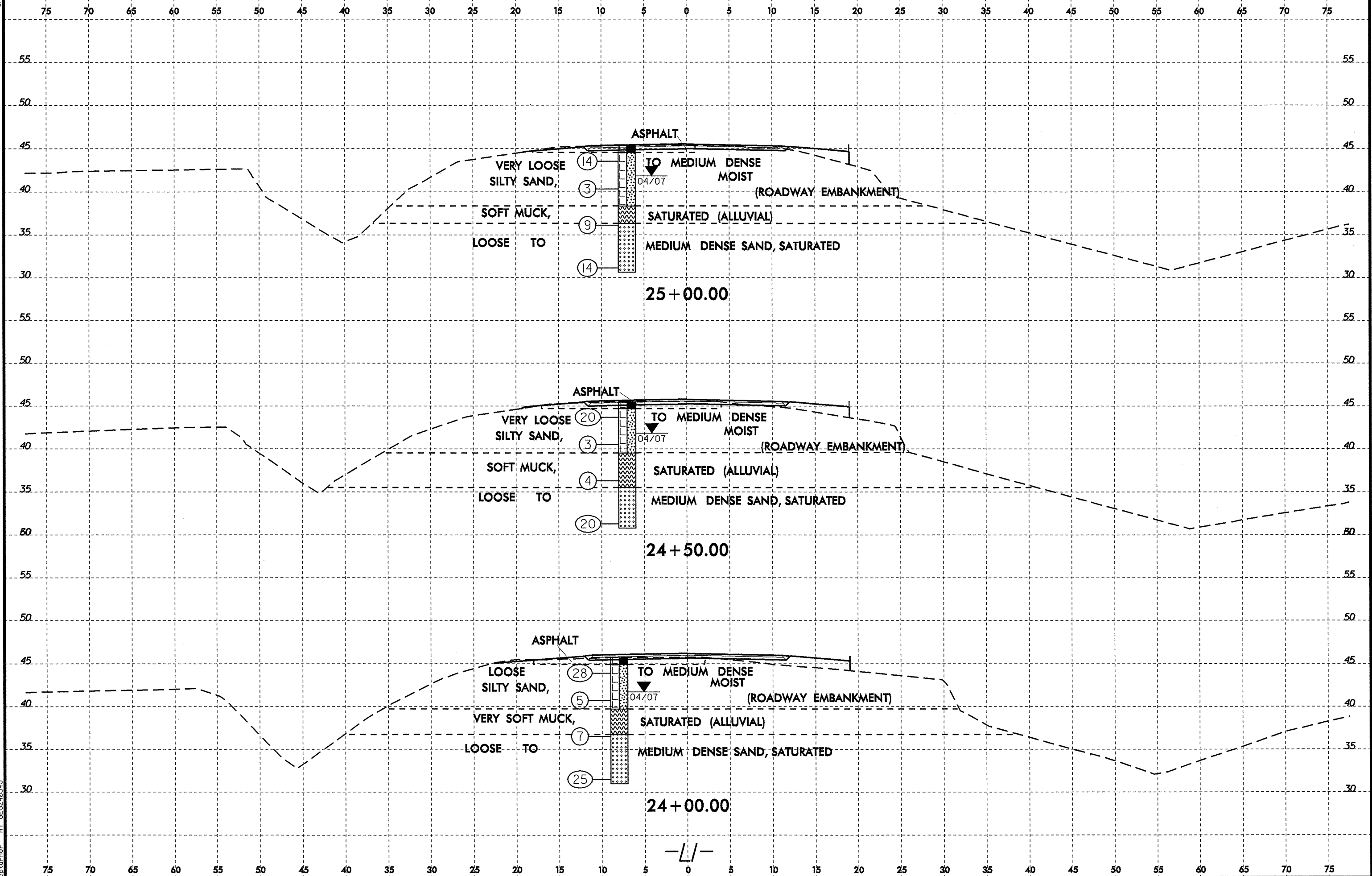
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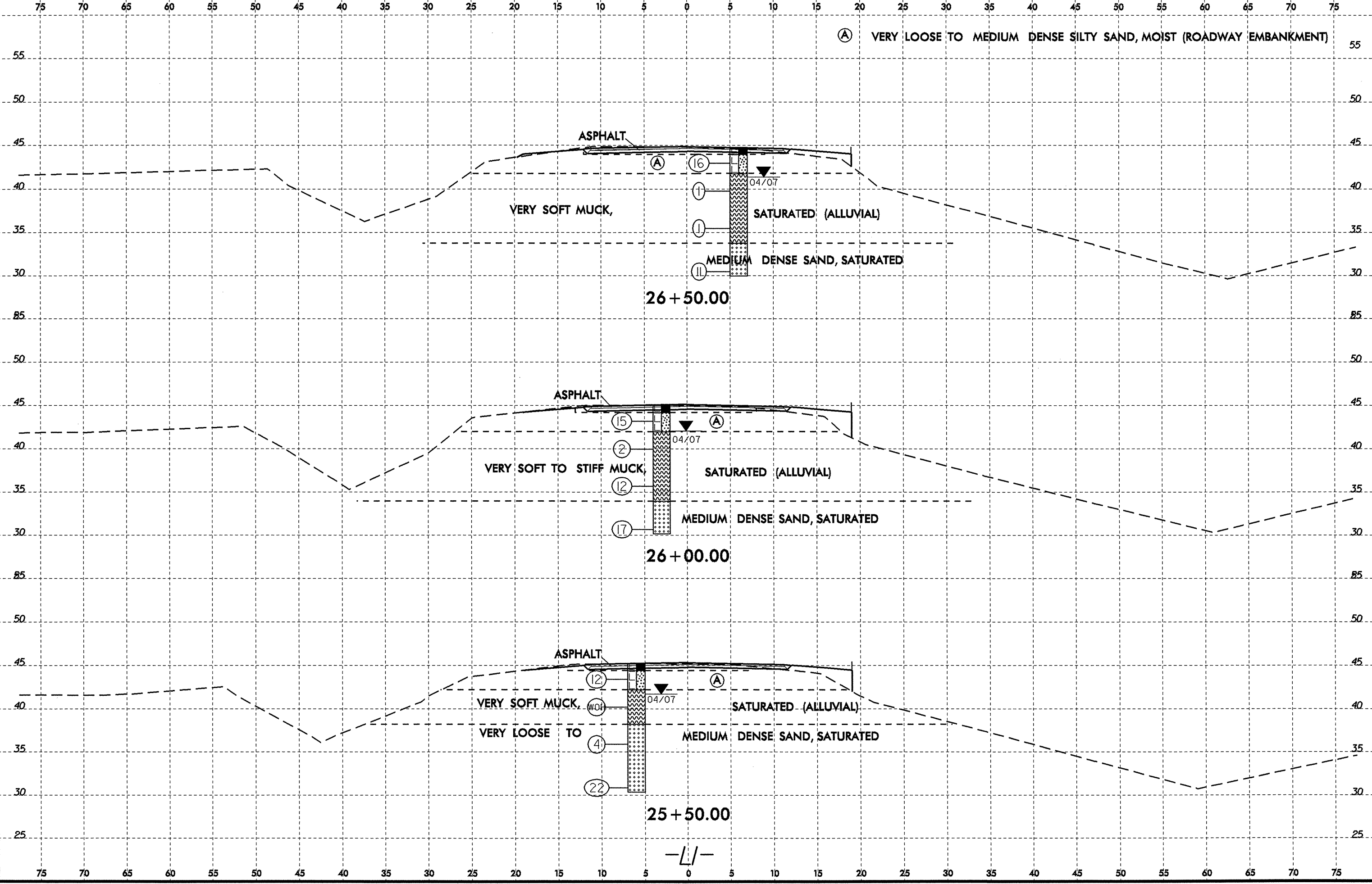


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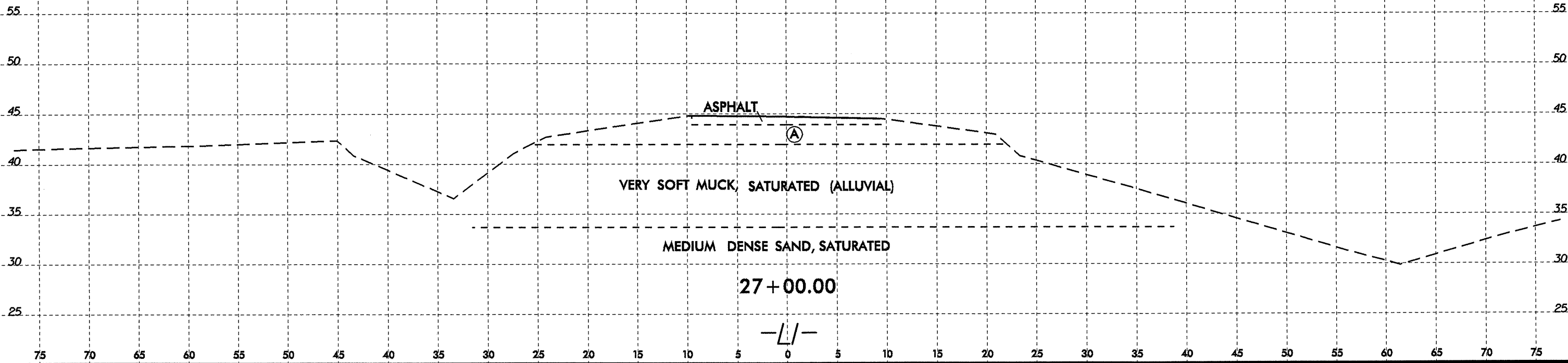
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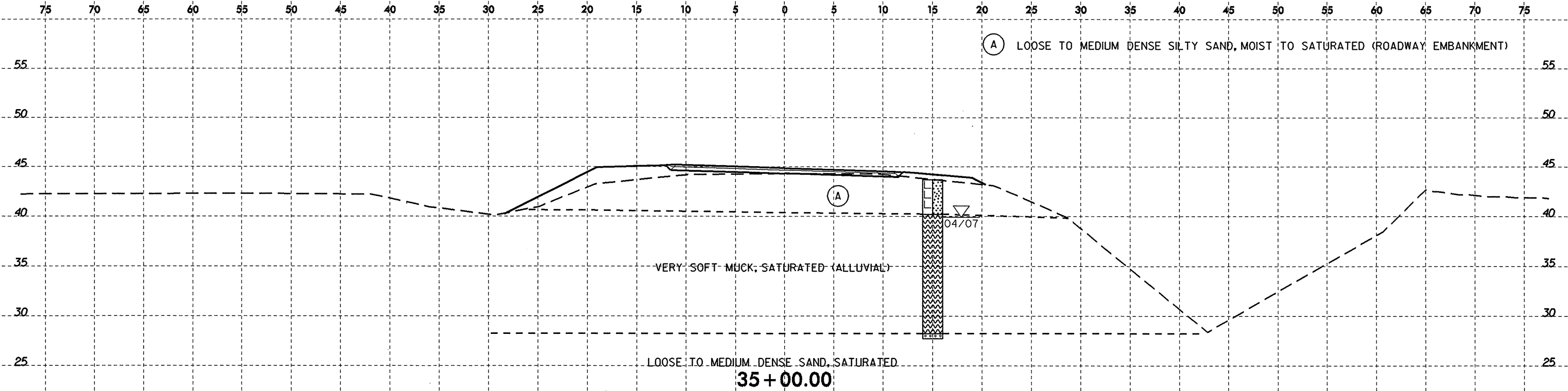
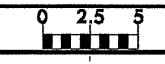
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Ⓐ VERY LOOSE TO MEDIUM DENSE SILTY SAND, MOIST (ROADWAY EMBANKMENT)



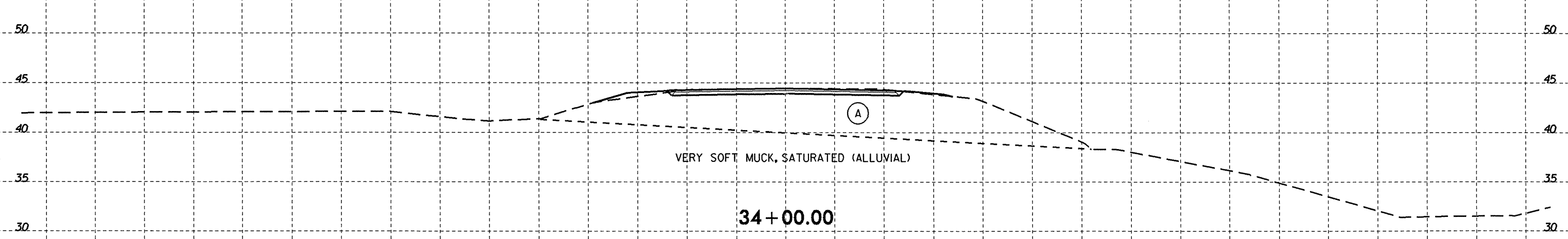
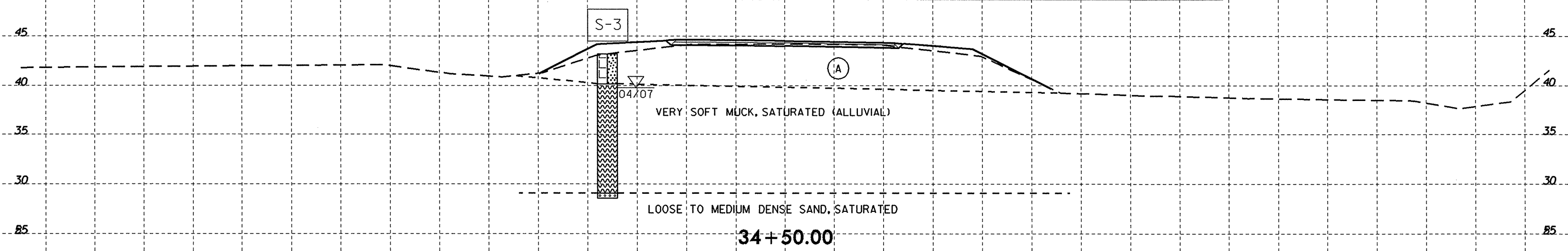
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SOIL TEST RESULTS

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		
S-3	18' Lt	34+50	3.00-14.10	A-1-b(0)	33	NP	49.2	43.2	1.2	6.4	44	32	4	-	-

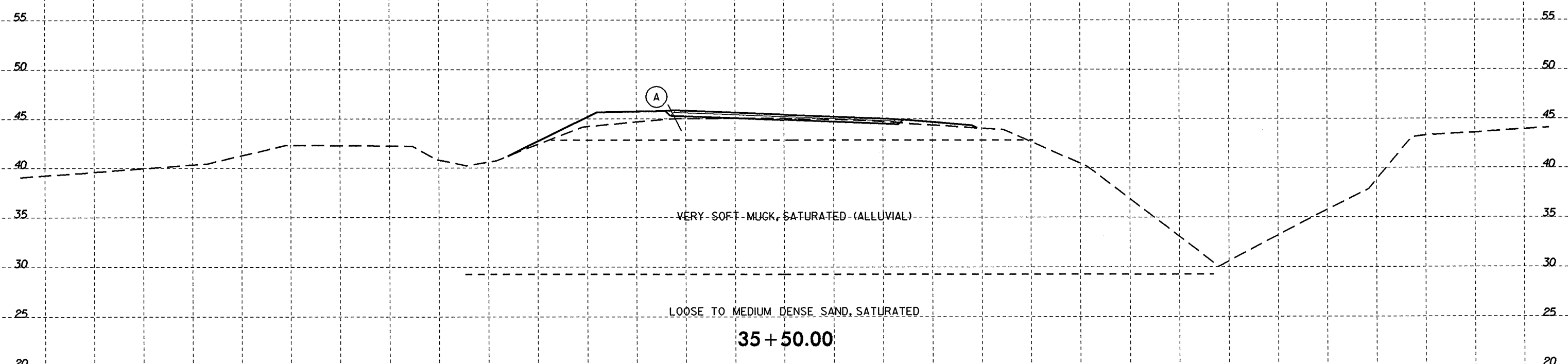
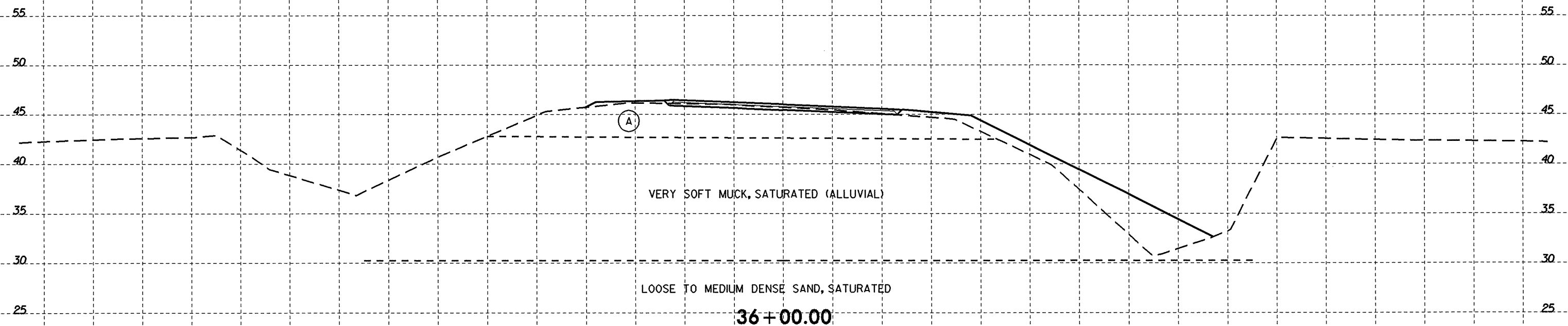


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(A) LOOSE TO MEDIUM DENSE SILTY SAND, MOIST TO SATURATED (ROADWAY EMBANKMENT)

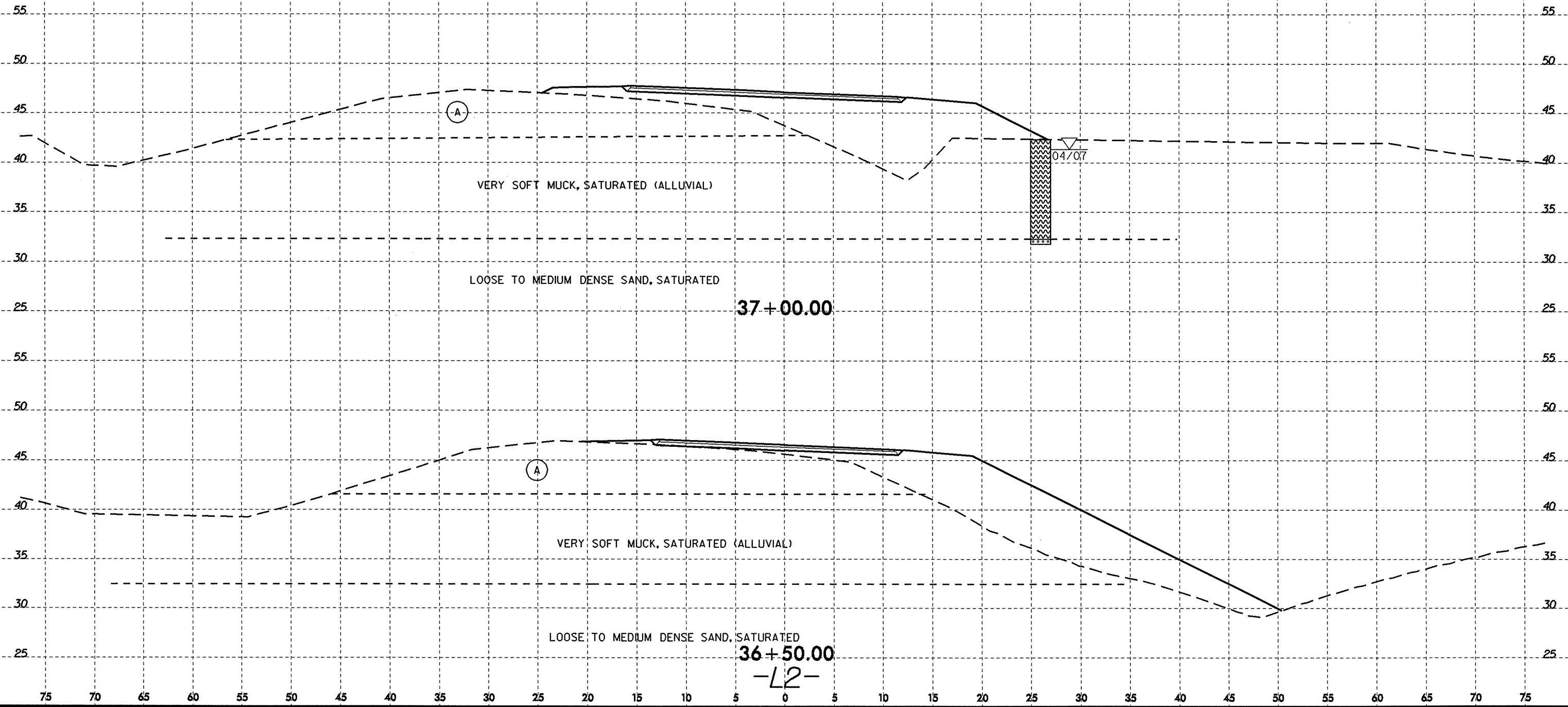


75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

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75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

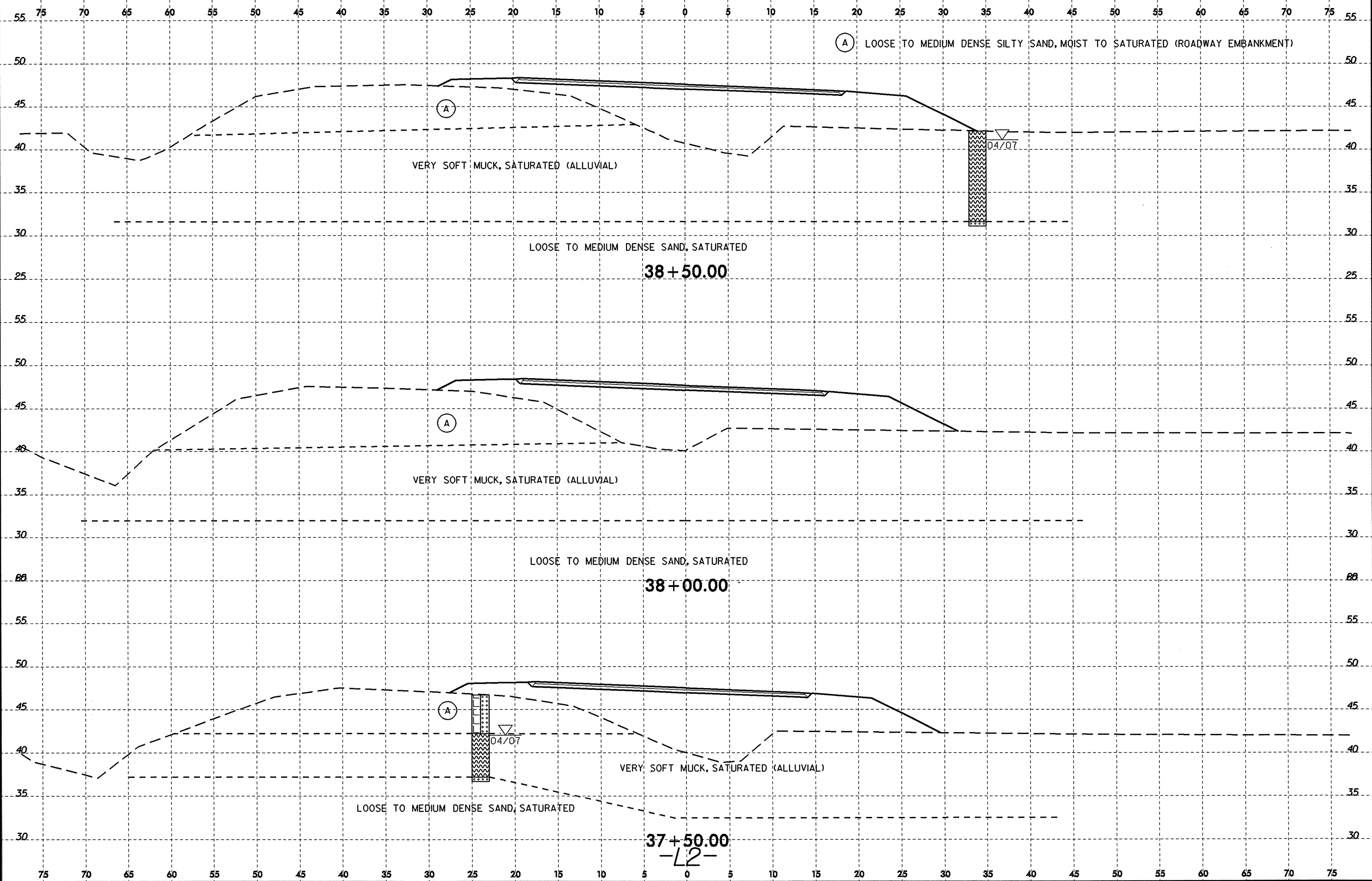
(A) LOOSE TO MEDIUM DENSE SILTY SAND, MOIST TO SATURATED (ROADWAY EMBANKMENT)



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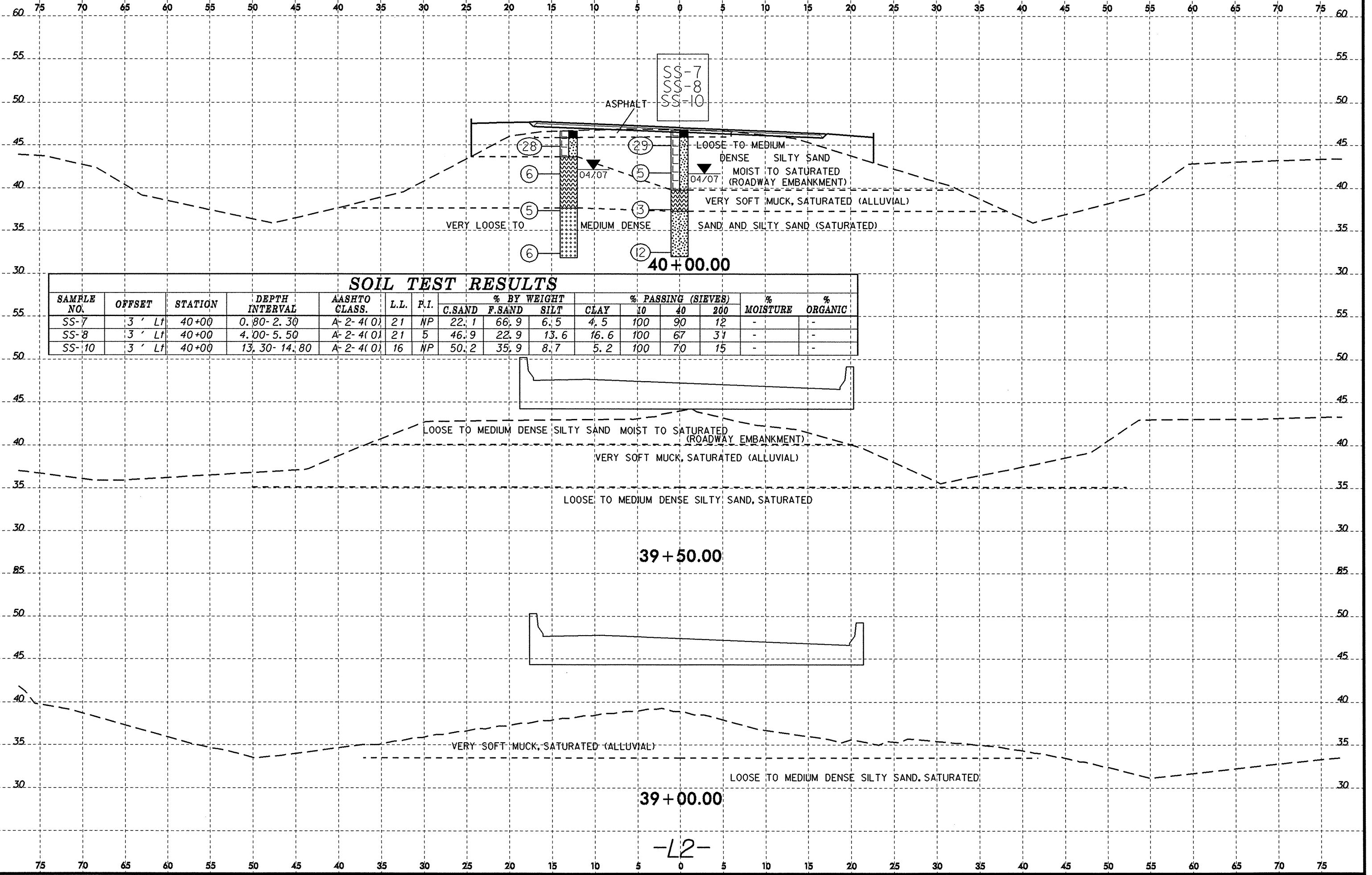
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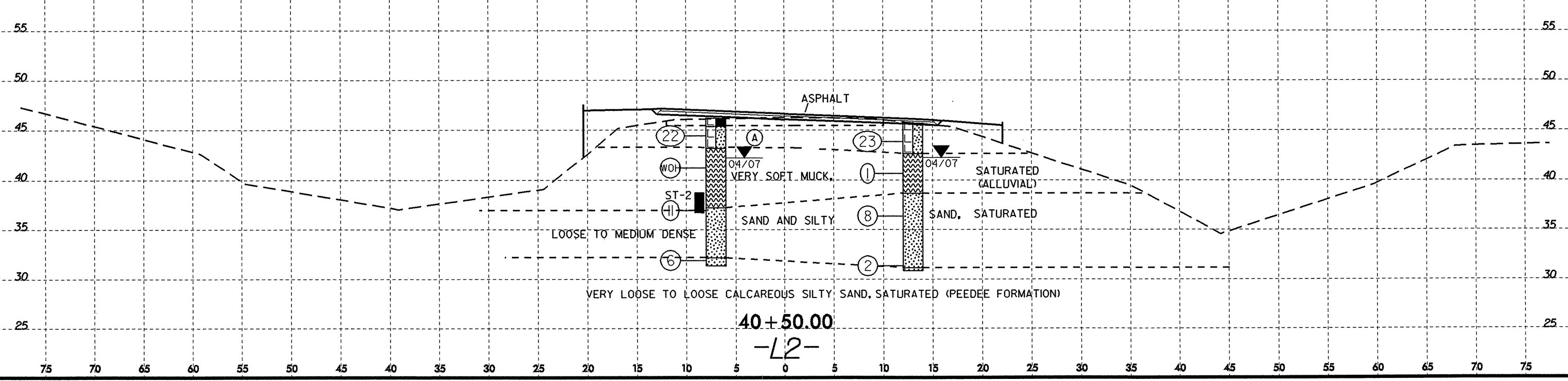
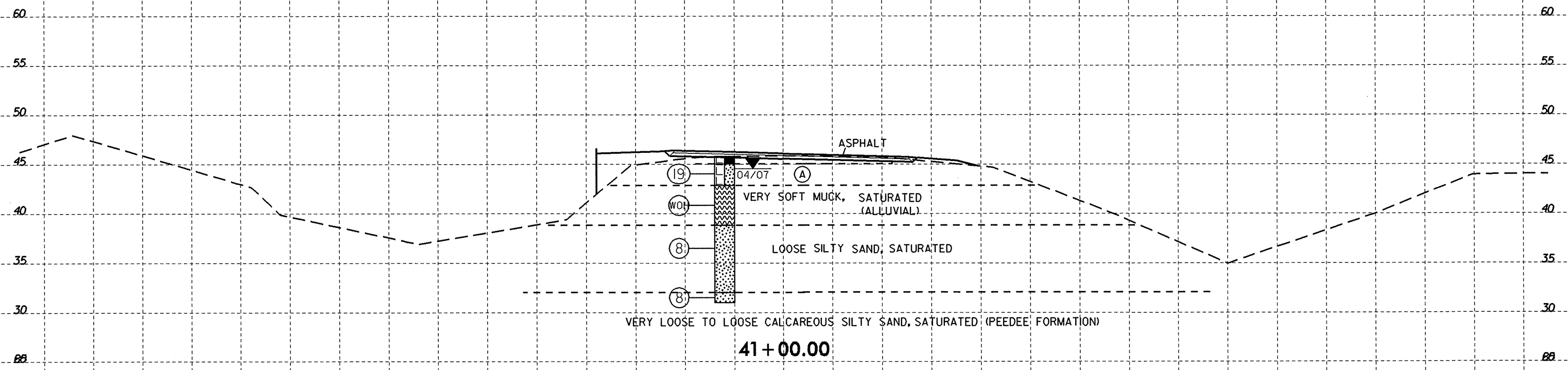


PROJ. REFERENCE NO.
B-3830

SHEET NO.
18 OF 19

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(A) LOOSE TO MEDIUM DENSE SILTY SAND, MOIST TO SATURATED (ROADWAY EMBANKMENT)

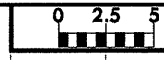


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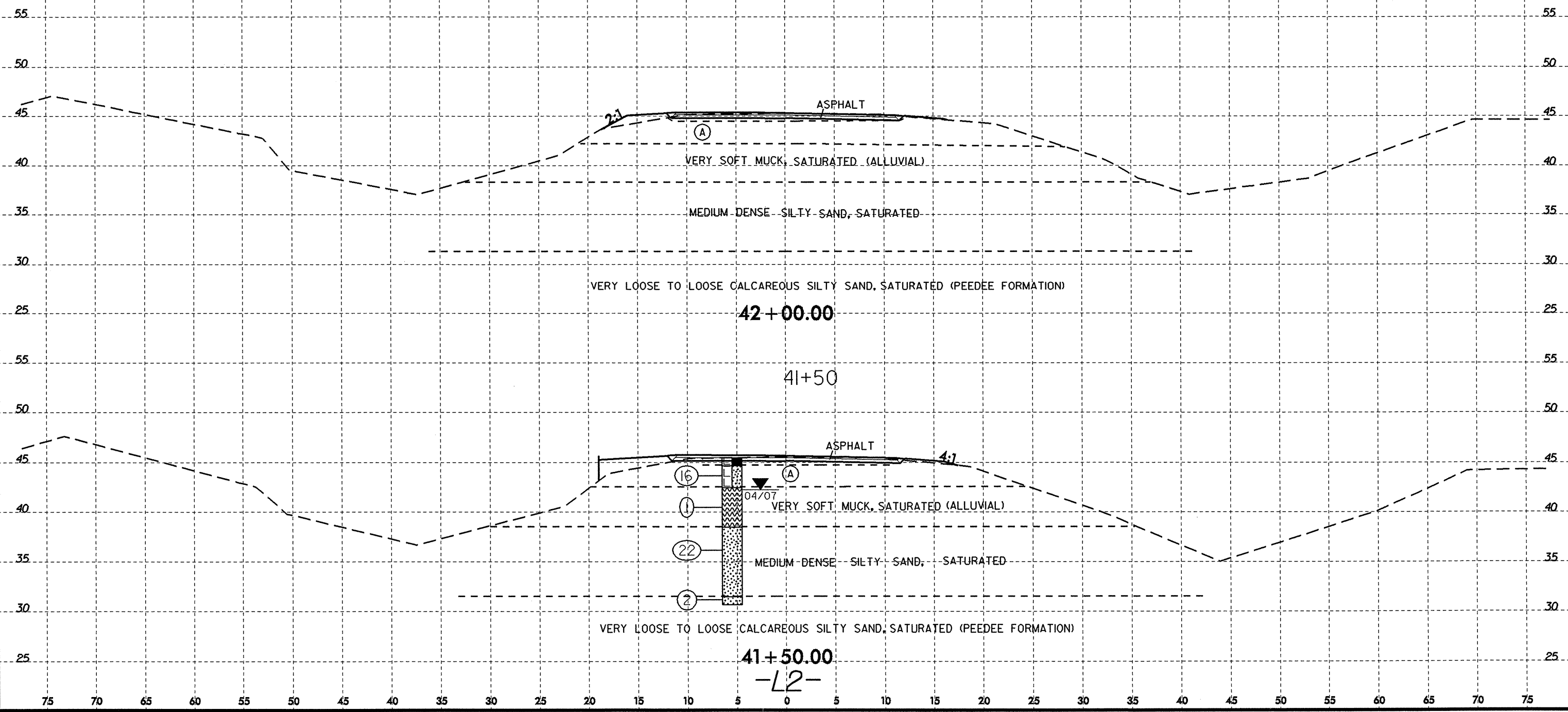
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(A) LOOSE TO MEDIUM DENSE SILTY SAND, MOIST TO SATURATED (ROADWAY EMBANKMENT)



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