

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-4481	1	9
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
38386.1.1	BRZ-1831(3)	PE	
38386.2.1	BRZ-1831(3)	RW & UTIL	
38385.3.1	BRZ-1824(1)	CONSTR.	

CONTENTS

LINE	STATION	PLAN	PROFILE
-L-	13+00 TO 23+50	4	5

ROADWAY  
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 38386.1.1 (B-4481) F.A. PROJ. BRZ-1831(3)

COUNTY COLUMBUS

PROJECT DESCRIPTION BRIDGE NO. 279 AND NO. 288 OVER

LIVINGSTON CREEK AND APPROACHES ON SR 1831

(SWIMMING HOLE ROAD)

INVENTORY

CROSS SECTIONS

LINE	STATION	SHEET
-L-	13+00 TO 14+42	6
-L-	15+77 TO 18+00	7-8
-L-	22+17 TO 23+50	9

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.

ID: B-4481

CONTRACT: C203155

PERSONNEL

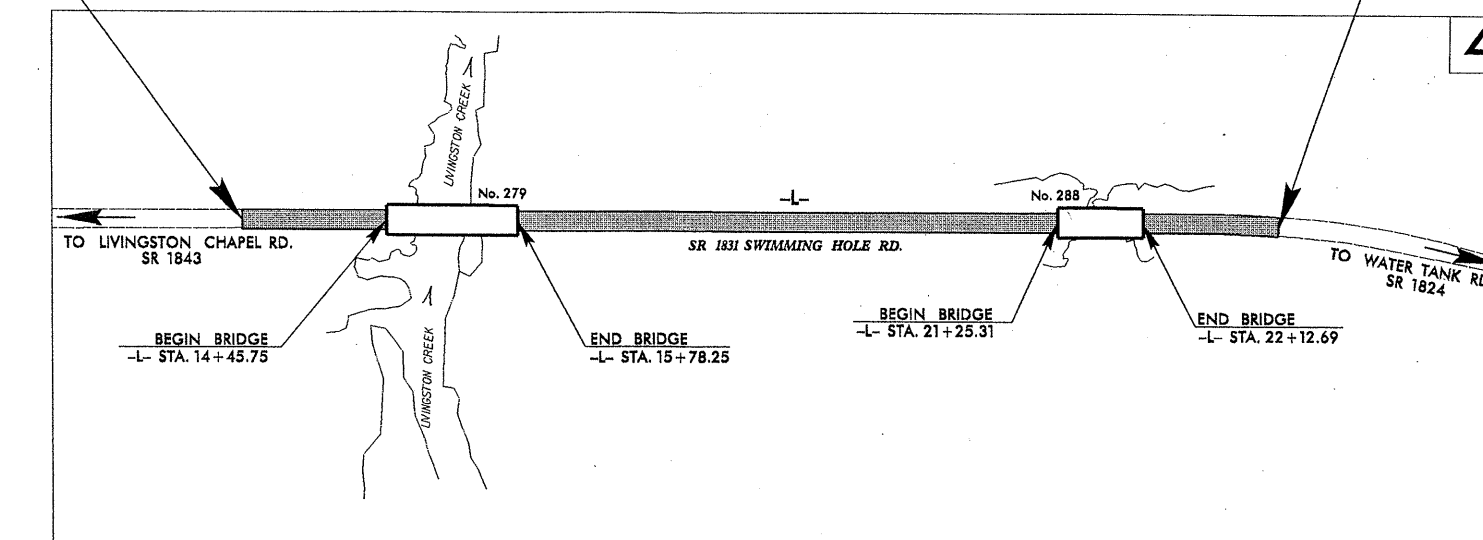
C.M. WRIKE

R.E. SMITH

D.G. PINTER

BEGIN TIP PROJECT B-4481  
-L- POT STA 13+00.00

END TIP PROJECT B-4481  
-L- POC STA. 23+50.00

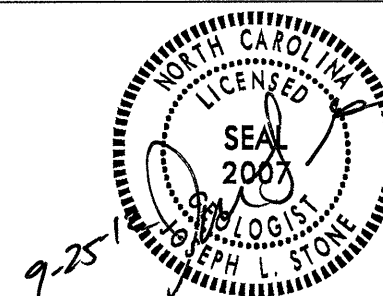


INVESTIGATED BY J.L. STONE  
CHECKED BY D.N. ARGENBRIGHT  
SUBMITTED BY D.N. ARGENBRIGHT  
DATE SEPTEMBER 2012

DRAWN BY: C.P. TURNER

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.



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

PROJECT REFERENCE NO. B-4481  
 SHEET NO. 2

**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 (ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE: VERY STIFF, GRAY, SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGH PLASTIC, A-7-6		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.		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 PER FOOT 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:		ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. ADUIFIER - 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 DISLODGED 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 (IN 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 PER FOOT. STRATA CORE RECOVERY (SCRC) - 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. 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STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE  
GOVERNOR

EUGENE A. CONTI, JR.  
SECRETARY

September 25, 2012

STATE PROJECT: 38386.1.1 (B-4481)  
F.A. PROJECT: BRZ-1831 (3)  
COUNTY: Columbus  
DESCRIPTION: Bridge(s) No. 279 and 288 on SR 1831 over Livingston Creek

SUBJECT: Geotechnical Inventory Report

**Project Description**

This project is located at the existing crossings over Livingston Creek on SR 1831 in Columbus County. This geotechnical investigation was confined to the areas of proposed construction.

Fieldwork was conducted in August of 2012. Hand auger borings and soil probes were completed at various offsets along the project corridor. Representative soil samples were collected for visual classification in the field and for laboratory analysis by the Materials and Tests Unit.

The following alignment was investigated. Subsurface profiles and selected cross sections of this alignment are included in this report.

<u>Line</u>	<u>Station(±)</u>
-L-	13+00 to 23+50

**Areas of Special Geotechnical Interest**

- 1) The entire project was found to exhibit seasonal high ground water.

- 2) The following sections were found to exhibit organic soils which have the potential to cause embankment/subgrade and or slope stability problems during construction.

<u>Line</u>	<u>Station(±)</u>
-L-	13+00 to 17+70
-L-	21+54 to 23+50

- 3) The following sections were found to exhibit cohesive soils which have the potential to cause embankment/subgrade and or slope stability problems during construction.

<u>Line</u>	<u>Station(±)</u>
-L-	15+18 to 17+80

**Physiography and Geology**

This project corridor is located within the Coastal Plain Physiographic Province. Topography along the project is nearly flat to gently sloping. Natural ground elevations ranged from 34± feet above sea level along the existing SR 1831 embankment to 15± feet above sea level along the bed of Livingston Creek.

Surficial soils in this area have been classified as alluvial sediments.

**Ground Water**

Ground water data was collected in August of 2012, during a time of normal precipitation. Ground water elevations ranged from 20± to 26± feet above sea level.

**Soils**

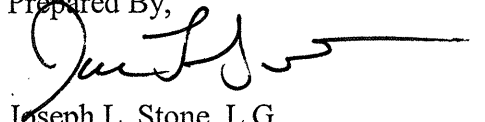
Soils encountered within this project area have been divided into two categories, alluvial soils and roadway embankment.

Roadway embankment soils were found along the existing SR 1831 corridor. They are composed of 6± to 12± feet of loose to medium dense sand.

Alluvial soils were found within the Livingston Creek floodplain. These units were comprised of 6 or more feet of loose sand (A-2-4), 2 or more feet of very soft sandy silt and sandy clay (A-4, A-6). A moisture sample collected within this cohesive unit shows a natural

moisture content of 32.2%. Organic soils were also encountered; these soils were found to be composed of 3± feet to 5± feet of very loose sand (A-2-4) and very soft sandy silt (A-4) with trace to little amounts of organic material. Laboratory analyses of these soils show they contain 3.9% to 8.3% organic material and 40.5% natural moisture. Vane shear tests completed within these soils show shear strength values ranging from 84 psf to 1838 psf. It should be noted that anomalously high shear strength values exhibited in these types of soils are likely attributed to wood and root material encountered in the process of running the vane shear tests.

Prepared By,



Joseph L. Stone, L.G.  
Project Geological Engineer

# Earthwork Balance Sheet

3B

Volumes in Cubic Yards

PROJECT: B-4481

COUNTY: Columbus

DATE: 4/23/2013

COMPILED BY: MJD

SHEET 1 OF 1 SHEETS

STATION	STATION	EXCAVATION					EMBANKMENT				BORROW	WASTE			
		TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUIT. UNCLASS.	SUITABLE UNCLASS.	TOTAL	ROCK	EARTH	EMBANK. +25%		ROCK	SUITABLE	UNSUIT.	TOTAL
<u>-L-</u> 13+00.00	14+45.75 (BEGIN BRIDGE)	21				21	348		348	435	414				
	<b>SUBTOTAL</b>	21				21	348		348	435	414				
15+78.25 (END BRIDGE)	21+25.31 (BEGIN BRIDGE)	30				30	168		168	210	180				
	<b>SUBTOTAL</b>	30				30	168		168	210	180				
22+12.69 (END BRIDGE)	23+50.00	15				15	43		43	54	39				
	<b>SUBTOTAL</b>	15				15	43		43	54	39				
<b>TOTAL</b>		66				66	559		559	699	633				
<b>PROJECT TOTAL</b>		66				66	559		559	699	633				
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT											32				
<b>GRAND TOTAL</b>		66				66	559		559	699	664				
<b>SAY</b>		70									700				

NOTE: 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.

Note: Approximate quantities only. Unclassified Excavation, Borrow Excavation, Fine Grading, Clearing and Grubbing, and Removal of Existing Pavement will be paid for at the contract lump sum price for "Grading".

EST. UNDERCUT EXCAVATION = 400 CY

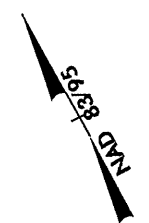
EST. SELECT GRANULAR MATERIAL = 400 CY

EST. SHALLOW UNDERCUT = 100 CY

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REVISIONS



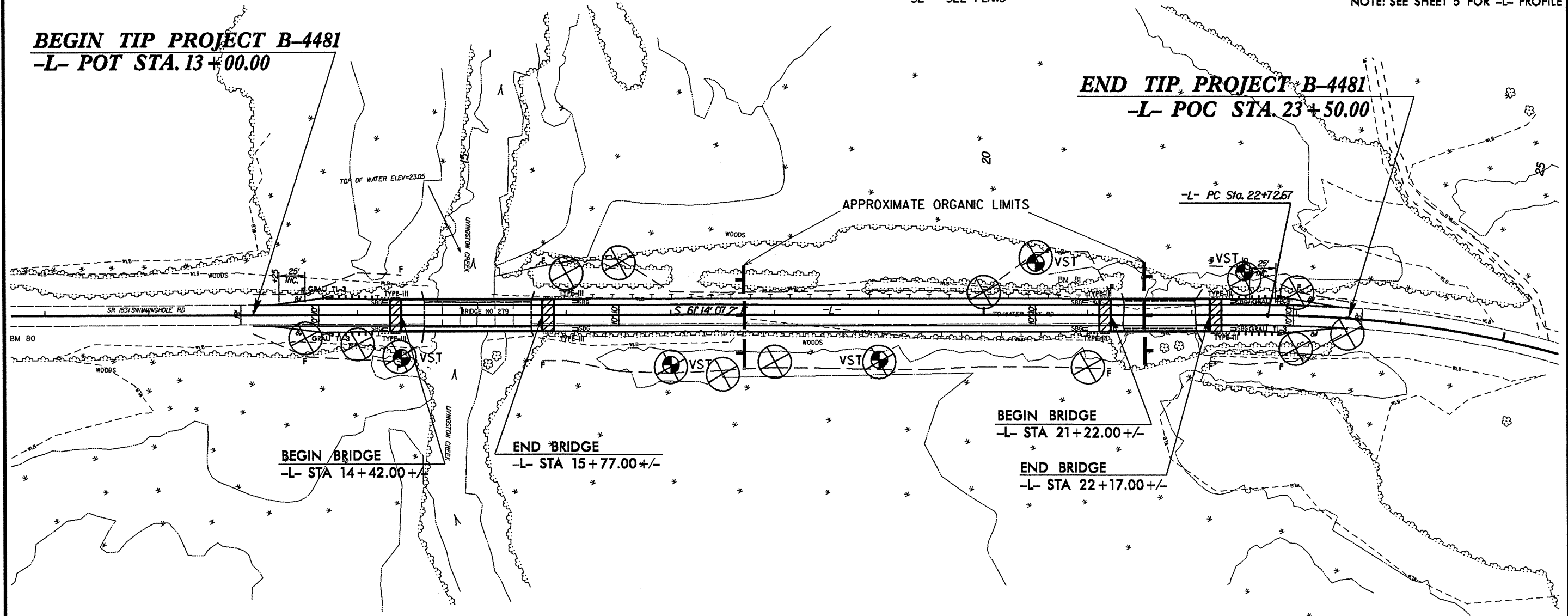
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RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION	
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	

NOTE: SEE SHEET 5 FOR -L- PROFILE

-L-  
 PI Sta 24+90.67  
 $\Delta = 23^{\circ}14'32.3" (RT)$   
 $D = 5'24"18.9"$   
 $L = 429.99'$   
 $T = 217.99'$   
 $R = 1060.00'$   
 SE = SEE PLANS

**BEGIN TIP PROJECT B-4481**  
**-L- POT STA. 13+00.00**

**END TIP PROJECT B-4481**  
**-L- POC STA. 23+50.00**



**BEGIN BRIDGE**  
**-L- STA 14+42.00 +/-**

**END BRIDGE**  
**-L- STA 15+77.00 +/-**

**BEGIN BRIDGE**  
**-L- STA 21+22.00 +/-**

**END BRIDGE**  
**-L- STA 22+17.00 +/-**

**-L- PC Sta. 22+72.67**

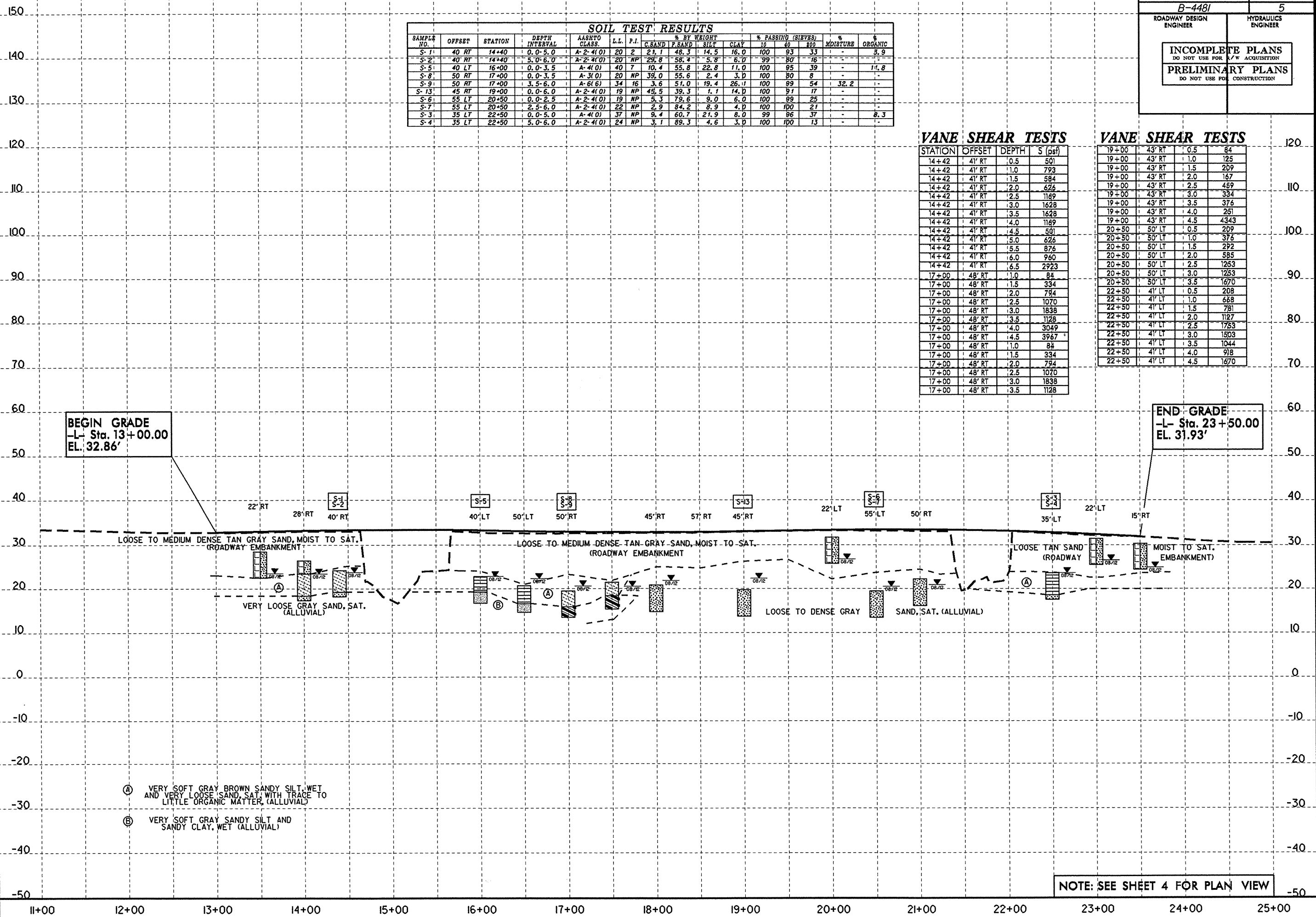
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PROJECT REFERENCE NO. <b>B-4481</b>	SHEET NO. <b>5</b>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR ACQUISITION	
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	

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	40 RT	14+40	0.0-5.0	A-2-4(0)	20	2	21.1	48.3	14.5	16.0	100	93	33	-	5.9
S-2	40 RT	14+40	5.0-6.0	A-2-4(0)	20	NP	29.8	58.4	5.8	6.0	99	80	16	-	-
S-5	40 LT	16+00	0.0-3.5	A-4(0)	40	7	10.4	55.8	22.8	11.0	100	95	39	-	11.8
S-8	50 RT	17+00	0.0-3.5	A-3(0)	20	NP	39.0	55.6	2.4	3.0	100	80	8	-	-
S-9	50 RT	17+00	3.5-6.0	A-6(6)	34	16	3.6	51.0	19.4	26.1	100	99	54	32.2	-
S-13	45 RT	19+00	0.0-6.0	A-2-4(0)	19	NP	45.5	39.3	1.1	14.0	100	91	17	-	-
S-6	55 LT	20+50	0.0-2.5	A-2-4(0)	19	NP	5.3	79.6	9.0	6.0	100	99	25	-	-
S-7	55 LT	20+50	2.5-6.0	A-2-4(0)	22	NP	2.9	84.2	8.9	4.0	100	100	21	-	-
S-3	35 LT	22+50	0.0-5.0	A-4(0)	37	NP	9.4	60.7	21.9	8.0	99	96	37	-	8.3
S-4	35 LT	22+50	5.0-6.0	A-2-4(0)	24	NP	3.1	89.3	4.6	3.0	100	100	13	-	-

VANE SHEAR TESTS			
STATION	OFFSET	DEPTH	S (psf)
14+42	41' RT	0.5	501
14+42	41' RT	1.0	793
14+42	41' RT	1.5	584
14+42	41' RT	2.0	626
14+42	41' RT	2.5	1169
14+42	41' RT	3.0	1628
14+42	41' RT	3.5	1628
14+42	41' RT	4.0	1169
14+42	41' RT	4.5	501
14+42	41' RT	5.0	626
14+42	41' RT	5.5	876
14+42	41' RT	6.0	960
14+42	41' RT	6.5	2923
17+00	48' RT	1.0	84
17+00	48' RT	1.5	334
17+00	48' RT	2.0	794
17+00	48' RT	2.5	1070
17+00	48' RT	3.0	1838
17+00	48' RT	3.5	1128
17+00	48' RT	4.0	3049
17+00	48' RT	4.5	3967
17+00	48' RT	1.0	84
17+00	48' RT	1.5	334
17+00	48' RT	2.0	794
17+00	48' RT	2.5	1070
17+00	48' RT	3.0	1838
17+00	48' RT	3.5	1128

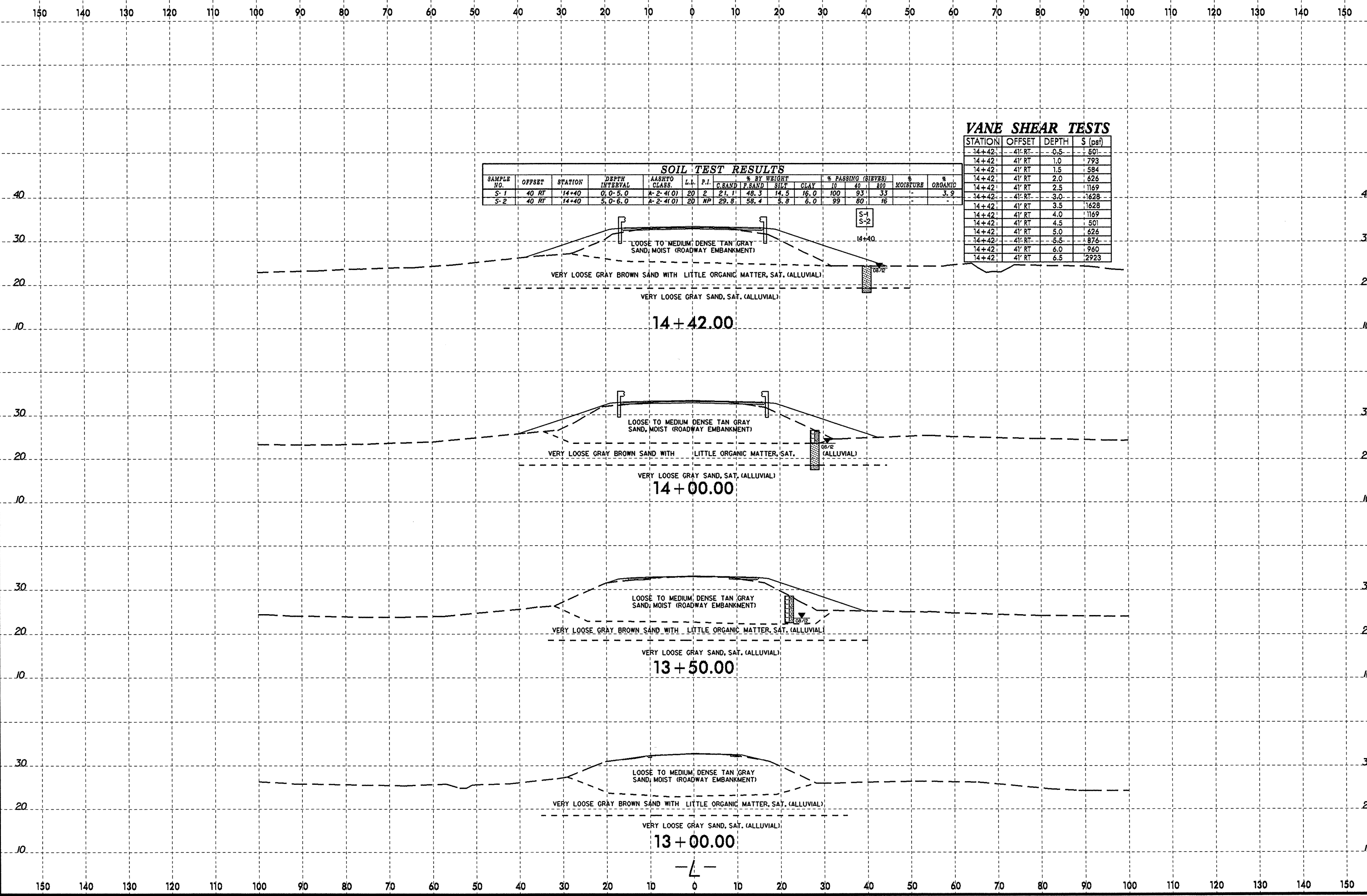
VANE SHEAR TESTS			
STATION	OFFSET	DEPTH	S (psf)
19+00	43' RT	0.5	84
19+00	43' RT	1.0	125
19+00	43' RT	1.5	209
19+00	43' RT	2.0	167
19+00	43' RT	2.5	459
19+00	43' RT	3.0	334
19+00	43' RT	3.5	376
19+00	43' RT	4.0	251
19+00	43' RT	4.5	4343
20+50	50' LT	0.5	209
20+50	50' LT	1.0	376
20+50	50' LT	1.5	292
20+50	50' LT	2.0	585
20+50	50' LT	2.5	1253
20+50	50' LT	3.0	1253
20+50	50' LT	3.5	1670
22+50	41' LT	0.5	208
22+50	41' LT	1.0	668
22+50	41' LT	1.5	781
22+50	41' LT	2.0	1127
22+50	41' LT	2.5	1753
22+50	41' LT	3.0	1503
22+50	41' LT	3.5	1044
22+50	41' LT	4.0	918
22+50	41' LT	4.5	1670



NOTE: SEE SHEET 4 FOR PLAN VIEW



8/23/99



**SOIL TEST RESULTS**

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	ASHFTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-1	40 RT	14+40	0.0-5.0	A-2-4(0)	20	2	21.1	48.3	14.5	16.0	100	93	33	-	3.9
S-2	40 RT	14+40	5.0-6.0	A-2-4(0)	20	NP	29.8	56.4	5.8	6.0	99	80	16	-	-

**VANE SHEAR TESTS**

STATION	OFFSET	DEPTH	S (psf)
14+42	41' RT	0.5	501
14+42	41' RT	1.0	793
14+42	41' RT	1.5	584
14+42	41' RT	2.0	626
14+42	41' RT	2.5	1169
14+42	41' RT	3.0	1628
14+42	41' RT	3.5	1628
14+42	41' RT	4.0	1169
14+42	41' RT	4.5	501
14+42	41' RT	5.0	626
14+42	41' RT	5.5	876
14+42	41' RT	6.0	960
14+42	41' RT	6.5	2923

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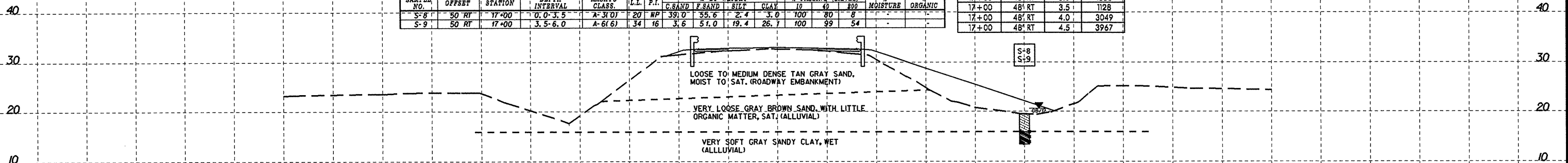
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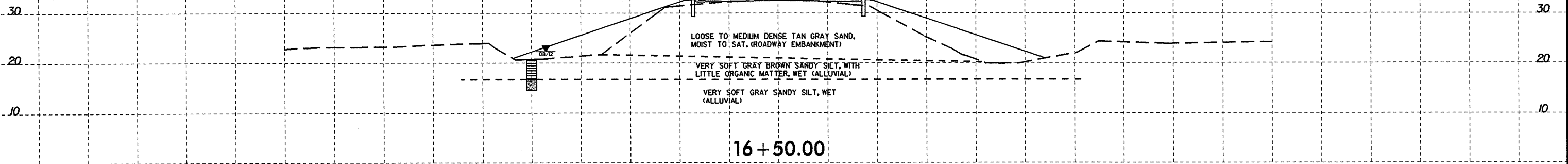
**VANE SHEAR TESTS**

STATION	OFFSET	DEPTH	S (psf)
17+00	48' RT	1.0	84
17+00	48' RT	1.5	334
17+00	48' RT	2.0	794
17+00	48' RT	2.5	1070
17+00	48' RT	3.0	1838
17+00	48' RT	3.5	1128
17+00	48' RT	4.0	3049
17+00	48' RT	4.5	3967

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-8	50 RT	17+00	0.0-3.5	A-3(0)	20	NP	39.0	55.6	2.4	3.0	100	80	8	-	-
S-9	50 RT	17+00	3.5-6.0	A-6(6)	34	16	3.6	51.0	19.4	26.1	100	99	54	-	-

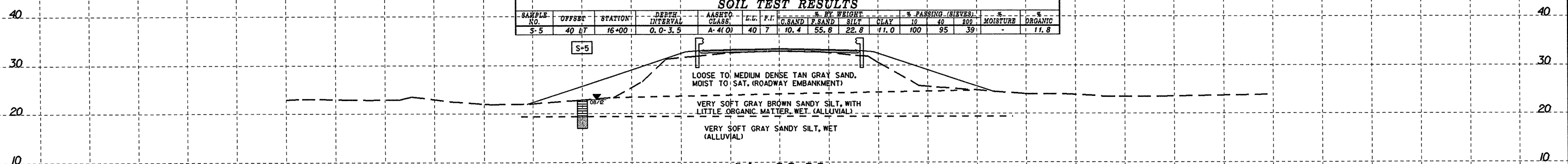


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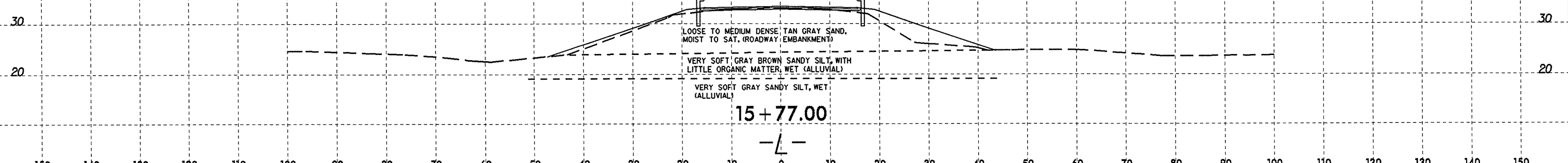


16+50.00

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-5	40 LT	16+00	0.0-3.5	A-4(0)	40	7	10.4	55.8	22.8	11.0	100	95	39	-	11.8



16+00.00



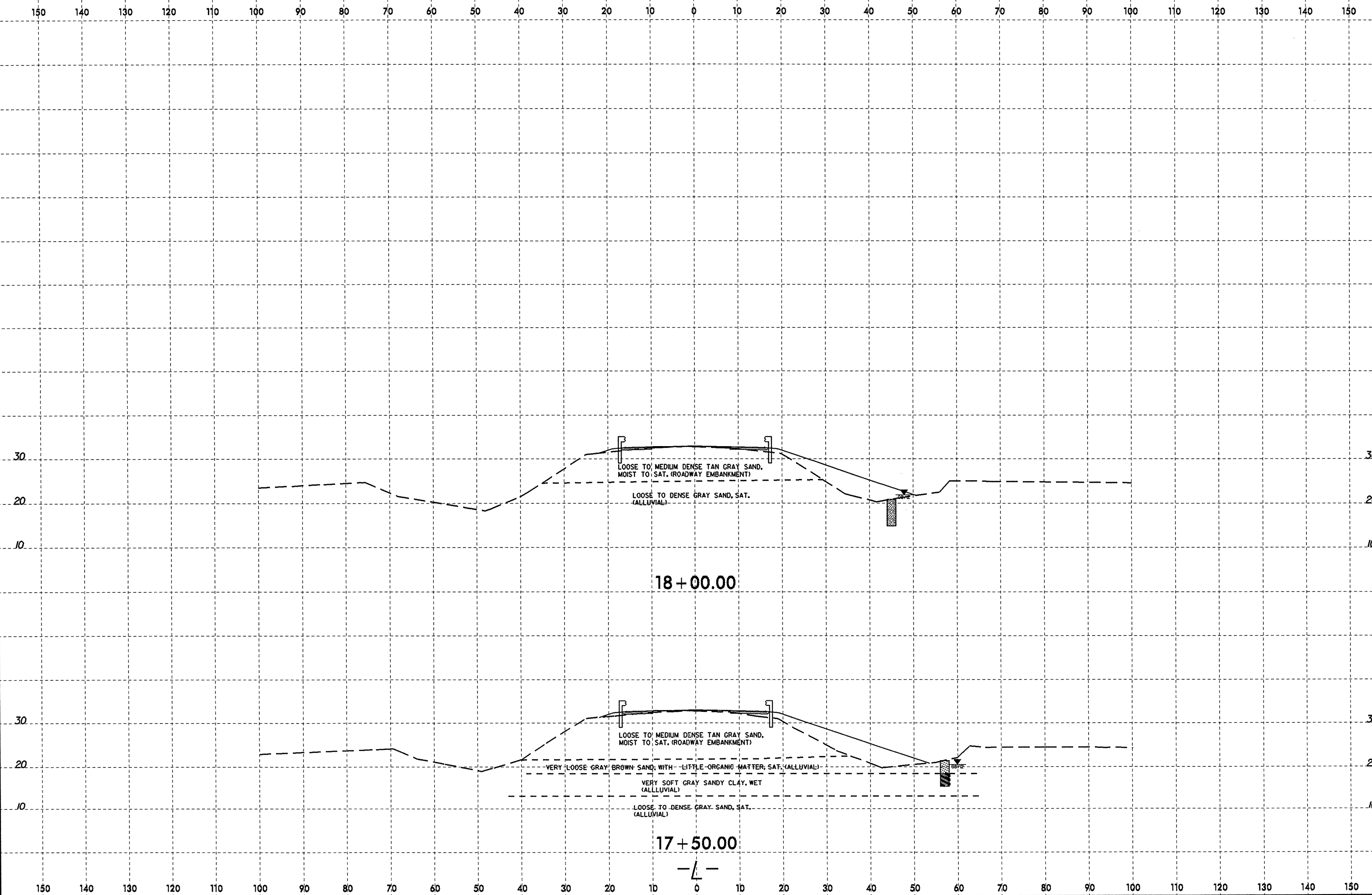
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-L-

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