

CONTRACT: C202266 ID: U-3306

CONTENTS

LINE	STATION	PLAN	PROFILE	XSECTS
-L-	10+65 to 15+00	4	-	-
-L-	15+00 to 154+00	4-15	16	17-108
-L-	154+00 to 155+29	15	-	-
-Y19-	12+00 to 19+14	15	-	109-113
R/W 1	20+00	114	115	N/A
R/W 2	29+00	116	117	N/A
R/W 3	83+00	118	119	N/A

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**

**ROADWAY
SUBSURFACE INVESTIGATION**

STATE PROJ. 34913.1.1 I.D. U-3306 F.A. PROJ. MASTP-1733(11)
 COUNTY ORANGE
 PROJECT DESCRIPTION CHAPEL HILL - SR 1733 (WEAVER DAIRY RD.) FROM NC 86 TO SR 1734 (ERWIN RD.)

INVENTORY

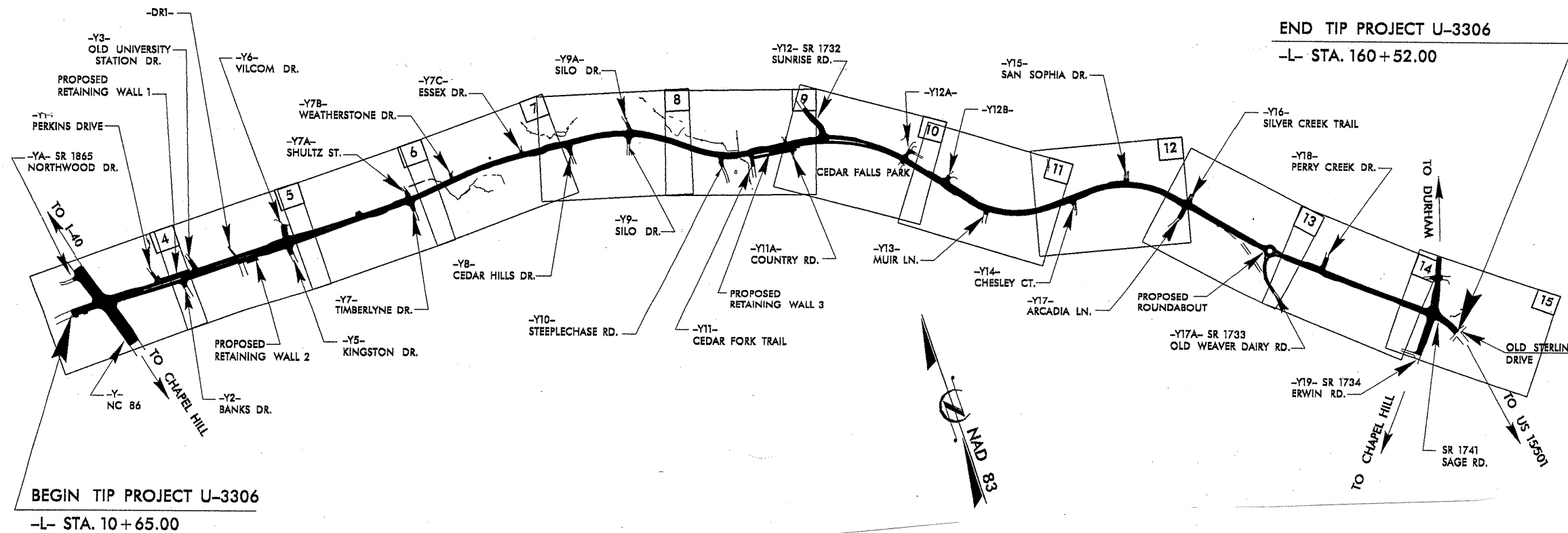
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3306	1	119
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34913.1.1	MASTP-1733(11)	PE	
34913.2.2	MASTP-1733(11)	RW & UTILITIES	
34913.3.ST1	STP-1733(15)	CONSTRUCTION	

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 BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL UNIT @ (919) 255-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA IS PART OF THE CONTRACT.

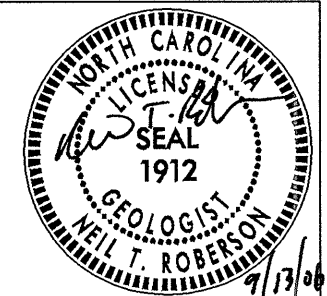
GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (ON-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**
- J.L. PEDRO
 - C.D. CZAJKA
 - D.W. DIXON
 - N.D. MOHS
 - C.E. POPE
 - M.L. REEDER

INVESTIGATED BY C.D. CZAJKA
 CHECKED BY N.T. ROBERSON
 SUBMITTED BY N.T. ROBERSON
 DATE SEPTEMBER 2006



DRAWN BY: C.D. CZAJKA, A.N. KARPA, W. D. FIELDS, J. L. PEDRO

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

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
U-3306	34913.1.1	2	119

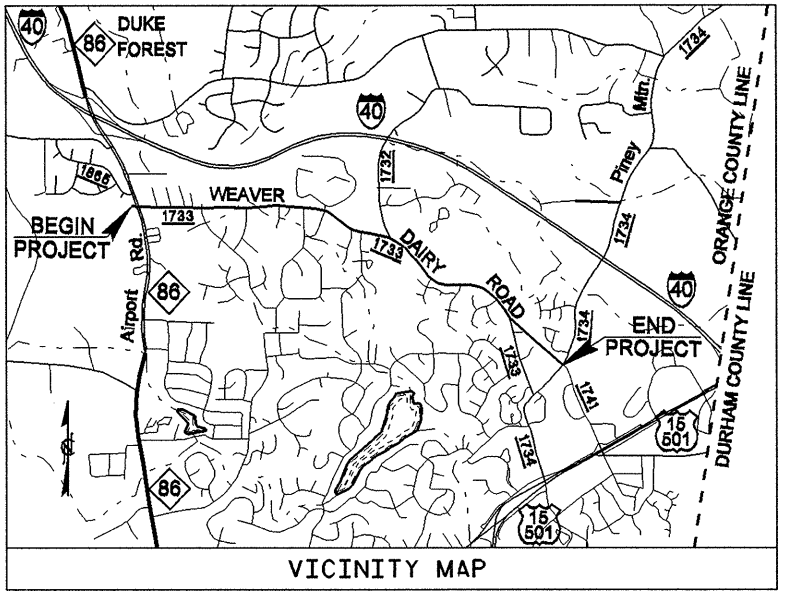
SOIL DESCRIPTION		GRADATION		ROCK DESCRIPTION		TERMS AND DEFINITIONS																																																																																								
<p>SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED OR WEATHERED EARTH MATERIALS WHICH CAN BE PENETRATED WITH A CONTINUOUS FLIGHT 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:</p> <p>VERY STIFF, GRAY SATY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGH PLASTIC, A-7-6</p>		<p>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)</p> <p>GAP-GRADED- INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.</p> <p>ANGULARITY OF GRAINS</p> <p>THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS ARE DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.</p>		<p>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.</p> <p>ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:</p>		<p>ALLUVIUM (ALLUV.) - SOILS WHICH HAVE BEEN TRANSPORTED BY WATER.</p> <p>AQUIFER - A WATER BEARING FORMATION OR STRATA.</p> <p>ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.</p> <p>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.</p> <p>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.</p> <p>CALCAREOUS (CAL.C.) - SOILS WHICH CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.</p> <p>COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.</p> <p>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.</p> <p>DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.</p> <p>DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.</p> <p>DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.</p> <p>FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SLIPS RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.</p> <p>FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.</p> <p>FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.</p> <p>FLOOD PLAIN (F.P.) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.</p> <p>FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.</p> <p>JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.</p> <p>LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.</p> <p>LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.</p> <p>MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.</p> <p>PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.</p> <p>RESIDUAL SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.</p> <p>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.</p> <p>SAPROLITE (SAP.) - RESIDUAL SOIL WHICH RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.</p> <p>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.</p> <p>SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.</p> <p>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N 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.</p> <p>STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.</p> <p>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 10 CENTIMETERS DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.</p> <p>TOPSOIL (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>																																																																																								
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GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD	< 2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 > 30	< 0.25 0.25 TO 0.5 0.5 TO 1 1 TO 2 2 TO 4 > 4																																																																																											
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TIP PROJECT: U-3306

CONTRACT:

See Sheet 1-A For Index of Sheets



VICINITY MAP

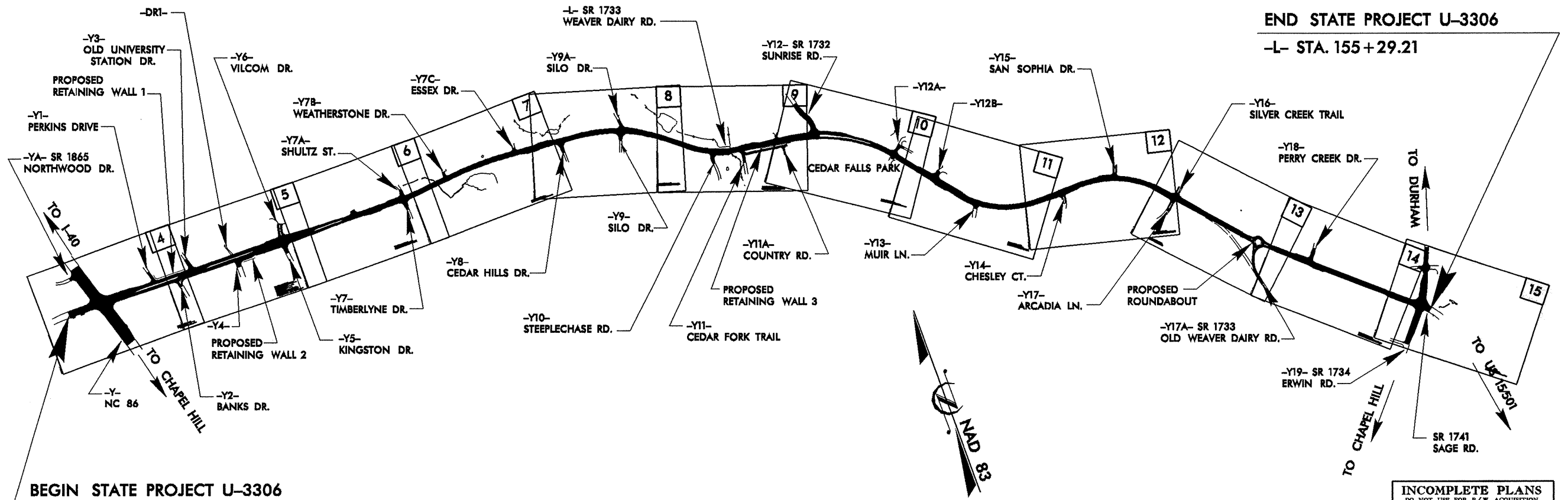
STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

ORANGE COUNTY

**LOCATION: CHAPEL HILL - SR 1733 (WEAVER DAIRY RD.)
 FROM NC 86 TO SR 1734 (ERWIN RD.)**

**TYPE OF WORK: GRADING, DRAINAGE, PAVING, RETAINING
 WALLS, SIDEWALK, CURB AND GUTTER
 AND SIGNALS**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3306	2A	119
STATE PROJ. NO.	P.A. PROJ. NO.	DESCRIPTION	
34913.1.1	MASTP-1733(11)	PE	



BEGIN STATE PROJECT U-3306

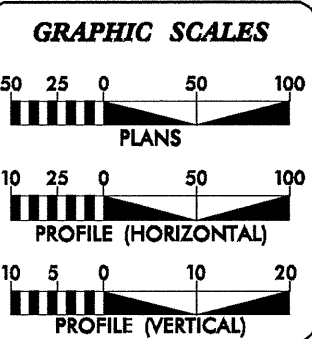
-L- STA. 10+65.00

END STATE PROJECT U-3306

-L- STA. 155+29.21

THIS PROJECT IS WITHIN THE CITY LIMITS OF CHAPEL HILL.
METHOD OF CLEARING _____

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



DESIGN DATA

ADT 2004 =	13400
ADT 2030 =	20300
DHV =	10 %
D =	55 %
T =	4 % *
VDP =	40 MPH
* TTST 3%	DUAL 1%

PROJECT LENGTH

TOTAL LENGTH TIP PROJECT U-3306 = 2.739 mi

Prepared in the Office of:
DIVISION OF HIGHWAYS
 1000 Birch Ridge Dr., Raleigh, NC, 27610

2002 STANDARD SPECIFICATIONS	
RIGHT OF WAY DATE: APRIL 21, 2006	JAMES A. SPEER, PE PROJECT ENGINEER
LETTING DATE: FEBRUARY 17, 2009	JOHN C. LANSFORD, PE PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.

**DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA**

SIGNATURE: _____ P.E.

STATE DESIGN ENGINEER

**DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION**

APPROVED: _____ DATE: _____

DIVISION ADMINISTRATOR



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

Michael F. Easley
GOVERNOR

P.O. BOX 25201, RALEIGH, N.C. 27611-5201

Lyndo Tippett
SECRETARY

August 22, 2006

STATE PROJECT: 34913.1.1 (U-3306)
FEDERAL PROJECT: MASTP-1733(11)
COUNTY: Orange
DESCRIPTION: Chapel Hill – SR 1733 (Weaver Dairy Rd.) from NC 86 to SR 1734 (Erwin Rd.)

SUBJECT: Geotechnical Report - Inventory

Project Description

This project consists of the widening of existing SR 1733 from two lanes to four lanes as well as the realignment of the existing roadway at the intersection of SR 1734 (Erwin Rd.). The proposed realignment will consist of a three-lane roadway with a roundabout at the proposed intersection with SR 1733 (Old Weaver Dairy Rd.).

A geotechnical investigation was conducted during February and March of 2005. Two drill machines, a CME-45C and CME-550 with automatic hammers, were used during the investigation. Standard Penetration Tests were performed at selected locations and additional borings were advanced using continuous flight augers. Representative soil samples were collected for visual classification in the field and selected samples were submitted for laboratory analysis by the Materials and Tests Unit. The following alignments were investigated:

<u>Line</u>	<u>Stations</u>
-L-	10+60 to 155+29
-Y19-	11+61 to 21+64

Areas of Special Geotechnical Interest

1) Highly Plastic Clays: Highly plastic clays (PI > 25) were encountered on the project at the following locations:

<u>Line</u>	<u>Stations</u>
-L-	17+25 to 19+75
-L-	21+75 to 22+25
-L-	25+25 to 30+75

-L-	33+25 to 36+75
-L-	42+75 to 48+75
-L-	58+75 to 60+75
-L-	65+75 to 69+25
-L-	81+75 to 88+25
-L-	98+75 to 99+25
-L-	133+25 to 154+00
-Y19-	11+75 to 18+25

A discussion of these highly plastic clay soils is located below in the section titled "Soil Properties".

2) Crystalline Rock: Crystalline rock was encountered at the following intervals:

<u>Line</u>	<u>Stations</u>
-L-	20+25 to 23+25
-L-	41+75 to 42+25
-L-	48+75 to 49+25
-L-	52+75 to 53+25

3) Groundwater: The following areas exhibit a high water table, seasonal high groundwater or the potential for groundwater related construction problems:

<u>Line</u>	<u>Stations</u>
-L-	22+25 to 23+25
-L-	48+75 to 49+75
-L-	61+25 to 63+25
-L-	79+75 to 80+25
-L-	138+50 to 151+00

4) Springs and Seeps: A wet weather spring or seep was encountered at:

<u>Line</u>	<u>Station</u>	<u>Offset (ft)</u>
-L-	148+00	60 RT

5) Lakes and Ponds: Lakes or ponds within close proximity of right of way are noted at the following locations.

<u>Line</u>	<u>Station</u>	<u>Offset (ft)</u>
-L-	39+00	78 RT
-L-	53+00	81 RT
-L-	62+00	100 LT
-L-	73+50	69 LT

- 6) Water Wells: Two water wells were found in close proximity of the proposed construction limits on the project and are located at the following locations.

<u>Line</u>	<u>Station</u>	<u>Offset (ft)</u>
-L-	152+46	139 LT
-Y19-	12+59	55 LT

Physiography and Geology

The project is located in gently rolling terrain of the Piedmont Physiographic Province. Land use along the project corridor consists of a homes, businesses, parks, and schools. Geologically, the project is located within the Carolina Slate Belt in the western portion and the Triassic Basin in the eastern portion. The project is underlain by meta-volcanic and meta-granitic rock in the Carolina Slate Belt, and Triassic sandstone and mudstone of the Chatham Group within the Durham Triassic Basin. Soils are derived from the weathering of the underlying meta-granite, meta-volcanic, and Triassic sandstone and mudstone.

Soil Properties

Soils encountered during this investigation are separated into five categories based on origin. They consist of roadway embankment, artificial fill, alluvial, residual, and Triassic soils.

Roadway Embankment soils are present along the existing roadway on the project. These soils are similar to and derived from the residual and Triassic soils encountered near the embankments on the project.

Artificial Fill soils are present in one area in the Covington Place subdivision from -L- Sta. 148+15 to Sta. 149+85 and consist of dark brown, medium stiff, moist, sandy clay (A-6). The artificial fill in this area is approximately six feet thick and is underlain by Triassic Residual sandy clays.

Alluvial soils are present in the floodplains of two small creeks that cross the project corridor. These soils consist primarily of gray, loose, saturated, silty sand (A-2-4) and brown, medium stiff, wet, sandy silt (A-4).

Residual soils are derived from the in-place weathering of the underlying meta-volcanic and meta-granitic crystalline rock. They consist primarily of orange-brown, white, and gray, medium stiff to stiff, dry to moist, sandy and silty clay (A-6, A-7) and orange-brown and tan-brown, medium stiff to hard, moist, sandy silt (A-4). The residual silty clays on the project exhibit plastic indices from 10 to 60. Lessor amounts of orange-brown and white, medium dense to very dense, dry, silty and clayey sand (A-2-4, A-2-6) are also present. Trace amounts of mica are present in the residual soils. Residual soils grade into weathered rock.

Triassic soils are derived from the weathering of underlying Triassic sandstone and mudstone from approximately -L- Sta. 124+80 to the end of the project. These soils consist of tan, orange-brown, and dark brown, medium stiff to hard, dry to moist, sandy and silty clay (A-6, A-7). The Triassic residual silty clays at the end of the project exhibit plastic indices from 11 to 51. Triassic residual soils grade into weathered rock.

Rock Properties

Weathered rock is derived from the underlying meta-granitic and meta-volcanic crystalline rock of the Carolina Slate Belt from the beginning of the project to approximately -L- Sta. 124+80. Weathered rock

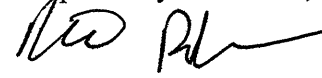
ranges in thickness from 0.7 to 7.0 feet and grades into crystalline rock. Areas of crystalline rock yielding either SPT or auger refusal are outlined in "Areas of Special Geotechnical Interest."

Weathered rock in the Triassic Basin is derived from the underlying Triassic non-crystalline sandstone and mudstone, and is on the eastern portion of the project from -L- Sta. 124+80 to the end of the project. Weathered rock ranges in thickness from less than 7.0 feet to more than 17.5 feet. Weathered rock grades into non-crystalline rock.

Groundwater

Groundwater was encountered in one-third of the borings throughout the project. Groundwater generally occurs within 2.0 to 10.0 feet of the ground surface. The borings where groundwater was encountered were typically on the western portion of the project up to -L- Station 84+50. Areas that exhibit high groundwater are outlined in "Areas of Special Geotechnical Interest."

Respectfully submitted,


for: Jaime Love Pedro
Engineering Geologist

BULK SAMPLES

The following bulk samples were taken for tests to determine the engineering properties of the soil:

<u>Sample No.</u>	<u>Location</u>	<u>Depth (ft)</u>	<u>Test</u>
CBR-1	-L-, 27+00, 47' LT	3.0 – 4.0	California Bearing Ratio
CBR-2	-L-, 152+00, CL	7.0 – 11.0	California Bearing Ratio

3B/119

EARTHWORK BALANCE SHEET

Volumes in Cubic Yards

PROJECT

U-3306

COUNTY

Orange

DATE : 4/22/2009

SHEET 1 OF 2

RD10S01C

LINE	STATION	STATION	TOTAL EXCAV. (UNCL.)	ROCK EXCAV.	UNDERCUT	UNSUIT. EXCAV.	SUITABLE EXCAV.	TOTAL EMB.	ROCK EMB.	EARTH EMB.	EMBANK. +20%	BORROW	SUITABLE WASTE	UNSUIT. WASTE	TOTAL WASTE
SUMMARY # 1 (LT)															
-L-	10+65.00	41+00.00	6349			1937	4412	4065		4065	4878	466		1937	1937
-Y-	15+50.00	19+79.51	188				188	113		113	136		52		52
-Y1-	10+84.19	11+50.00	15				15	90		90	108	93			
-Y3-	11+83.75	11+50.00	13				13	34		34	41	28			
-DR1-	10+87.56	11+20.00	27				27						27		27
-Y6-	10+83.53	11+75.00	49				49	17		17	20		29		29
	#1 Totals		6641			1937	4704	4319		4319	5183	587	108	1937	2045
SUMMARY # 2 (LT)															
-L-	41+00.00	71+00.00	1003				1003	3984		3984	4781	3778			
-Y7a-	10+35.01	11+00.00	17				17	11		11	13		4		4
-Y7b-	10+23.18	10+75.00	23				23	12		12	14		9		9
	#2 Totals		1043				1043	4007		4007	4808	3778	13		13
SUMMARY # 3 (LT)															
-L-	71+00.00	101+00.00	2380			1155	1225	7401		7401	8881	7656		1155	1155
-Y12-	10+75.00	13+75.00	30				30	329		329	395	365			
-Y12a-	10+50.00	11+14.75	7				7	55		55	66	59			
	#3 Totals		2417			1155	1262	7785		7785	9342	8080		1155	1155
SUMMARY # 4 (LT)															
-L-	101+00.00	131+00.00	376				376	934		934	1121	745			
-Y12B-	10+35.00	10+96.00	45				45	9		9	11		34		34
	#4 Totals		421				421	943		943	1132	745	34		34
SUMMARY # 5 (LT)															
-L-	131+00.00	153+50.00	21237		704	4684	16553	6478		6478	7774		8779	4684	13463
-Y18-	10+65.67	11+48.00	239				239						239		239
-Y19-	15+96.96	21+64.05	1231				1231	372		372	446		785		785
	#5 Totals		22707		704	4684	18023	6850		6850	8220		9803	4684	14487
	Lt. Side Total		33229		704	7776	25453	23904		23904	28685	13190	9958	7776	17734
SHEET TOTALS:			33229		704	7776	25453	23904		23904	28685	13190	9958	7776	17734

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.

EARTHWORK BALANCE SHEET

Volumes in Cubic Yards

3C/119

PROJECT U-3306

COUNTY Orange

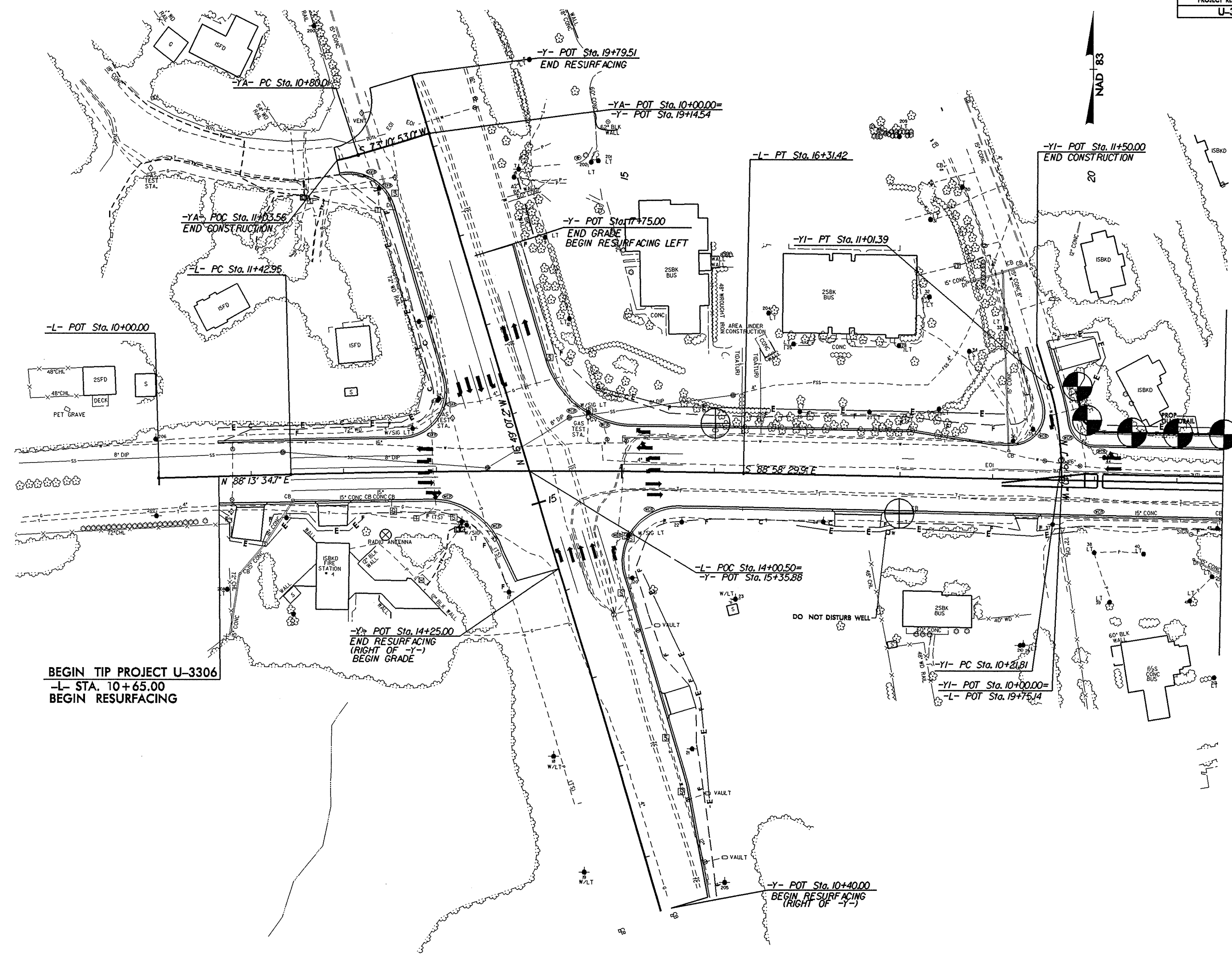
DATE : 4/22/2009

SHEET 2 OF 2

LINE	STATION	STATION	TOTAL EXCAV. (UNCL.)	ROCK EXCAV.	UNDERCUT	UNSUIT. EXCAV.	SUITABLE EXCAV.	TOTAL EMB.	ROCK EMB.	EARTH EMB.	EMBANK. +20%	BORROW	SUITABLE WASTE	UNSUIT. WASTE	TOTAL WASTE
SUMMARY # 6 (RT)															
-L-	10+65.00	41+00.00	810			120	690	2366		2366	2839	2149		120	120
-Y-	10+40.00	15+50.00	337				337	289		289	347	10			
-Y5-	11+00.00	11+25.00	23				23	14		14	17		6		6
	#6 Totals		1170			120	1050	2669		2669	3203	2159	6	120	126
SUMMARY # 7 (RT)															
-L-	41+00.00	71+00.00	2139			140	1999	6243		6243	7491	5492		140	140
-Y7-	10+73.32	11+15.00	18				18	15		15	18				
-Y8-	10+80.17	11+25.00	25				25	26		26	31	6			
-Y9-	10+50.00	11+00.00	35				35	9		9	11		24		24
	#7 Totals		2217			140	2077	6293		6293	7551	5498	24	140	164
SUMMARY # 8 (RT)															
-L-	71+00.00	101+00.00	490				490	3936		3936	4723	4233			
-Y10-	10+77.03	11+25.00	51				51	6		6	7		44		44
-Y11-	10+25.00	11+40.00	18				18	83		83	100	82			
-Y11A-	10+13.80	14+48.00	114				114	96		96	115	1			
	#8 Totals		673				673	4121		4121	4945	4316	44		44
SUMMARY # 9 (RT)															
-L-	101+00.00	131+00.00	152				152	1123		1123	1348	1196			
-Y17-	10+66.32	11+50.00	40				40	10		10	12		28		28
	#9 Totals		192				192	1133		1133	1360	1196	28		28
SUMMARY # 10 (RT)															
-L-	131+00.00	153+50.00	26976		650	5819	21159	5068		5068	6081		15078	5819	20897
-Y17a-	11+30.90	14+50.00	148				148	245		245	294	146			
-Y19-	11+60.90	15+25.00	706			249	457	24		24	29		428	249	677
	#10 Totals		27832		650	6068	21764	5337		5337	6404	146	15506	6068	21574
	Rt Side Total		32084		650	6328	25756	19553		19553	23463	13315	15608	6328	21936
	Total		65313		1354	14104	51209	43457		43457	52148	26505	25566	14104	39670
	Loss due to Clear & Grub		-2000				-2000					2000			
	Waste in Lieu of Borrow											-25566	-25566		-25566
	Add.Undercut				1650			1650		1650	1980	1980			
	Grand Total		63313		3004	14104	49209	45107		45107	54128	4919		14104	14104
SAY			63400		3050							4950			
	Shallow Undercut				2000										

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.



BEGIN TIP PROJECT U-3306
-L- STA. 10+65.00
BEGIN RESURFACING

MATCH LINE -L- STA 21+50 SEE SHEET 5

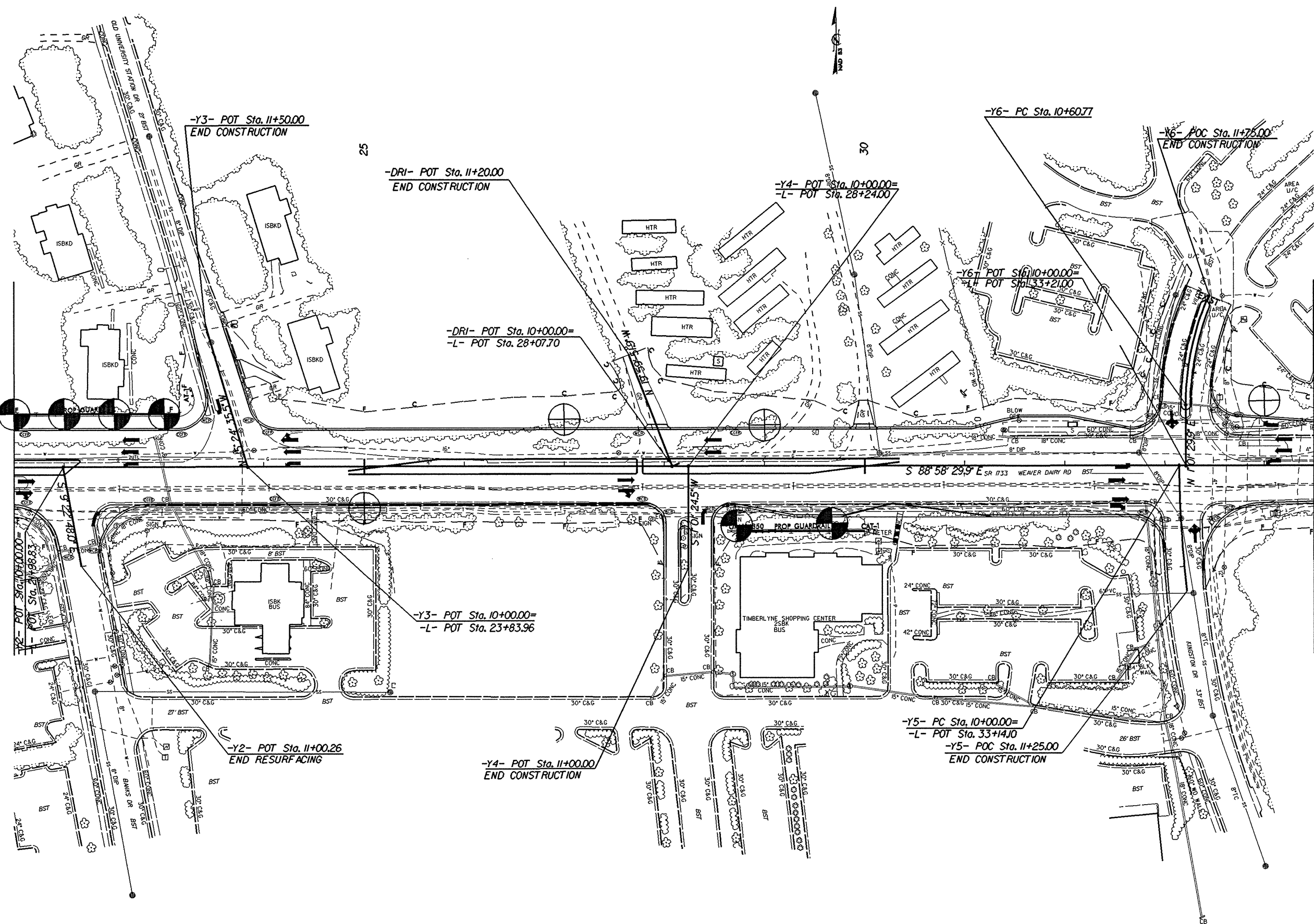
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8/17/99

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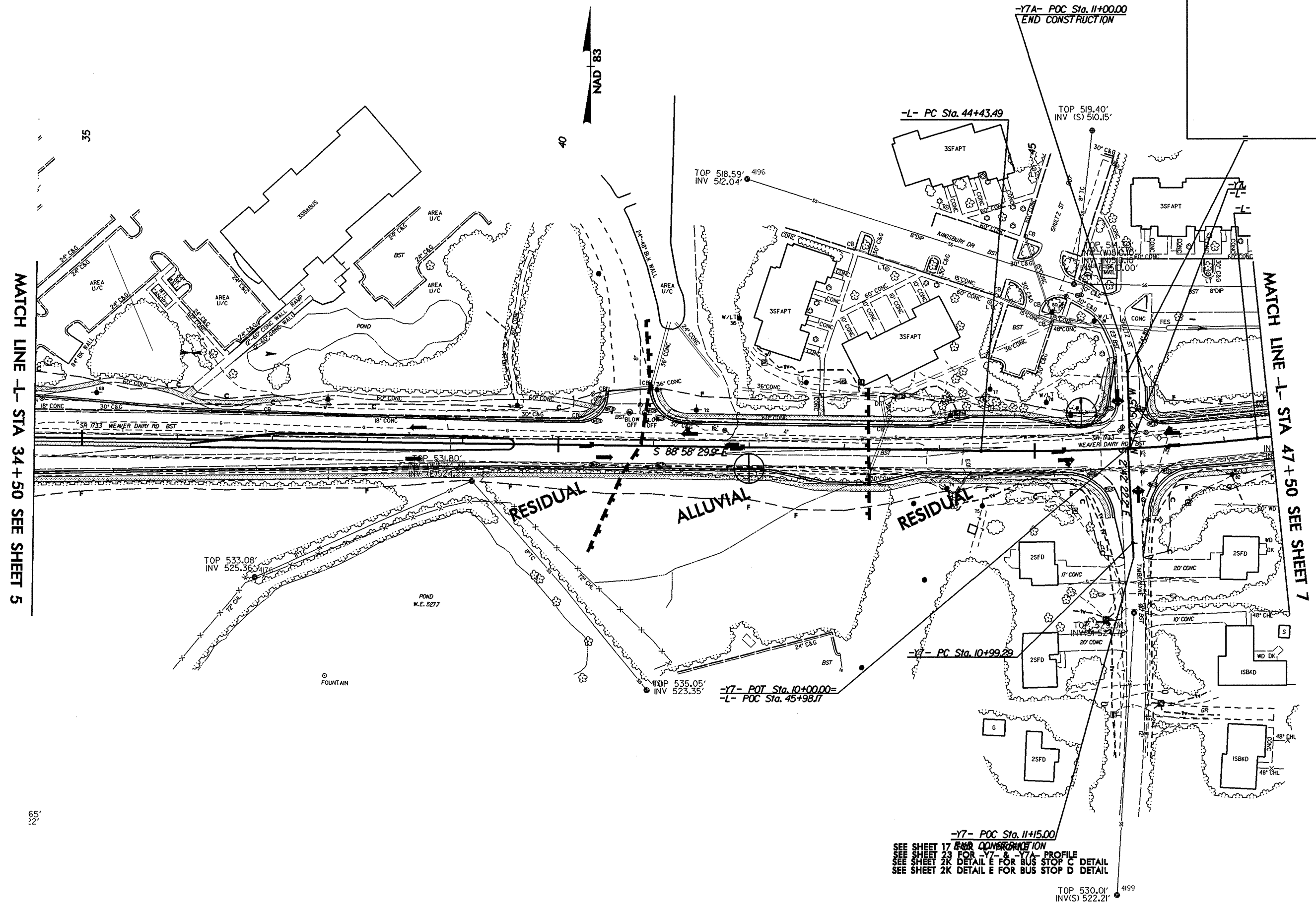
MATCH LINE -L- STA 21+50 SEE SHEET 4

MATCH LINE -L- STA 34+50 SEE SHEET 6



11/22/00

8/17/99



MATCH LINE -L- STA 34+50 SEE SHEET 5

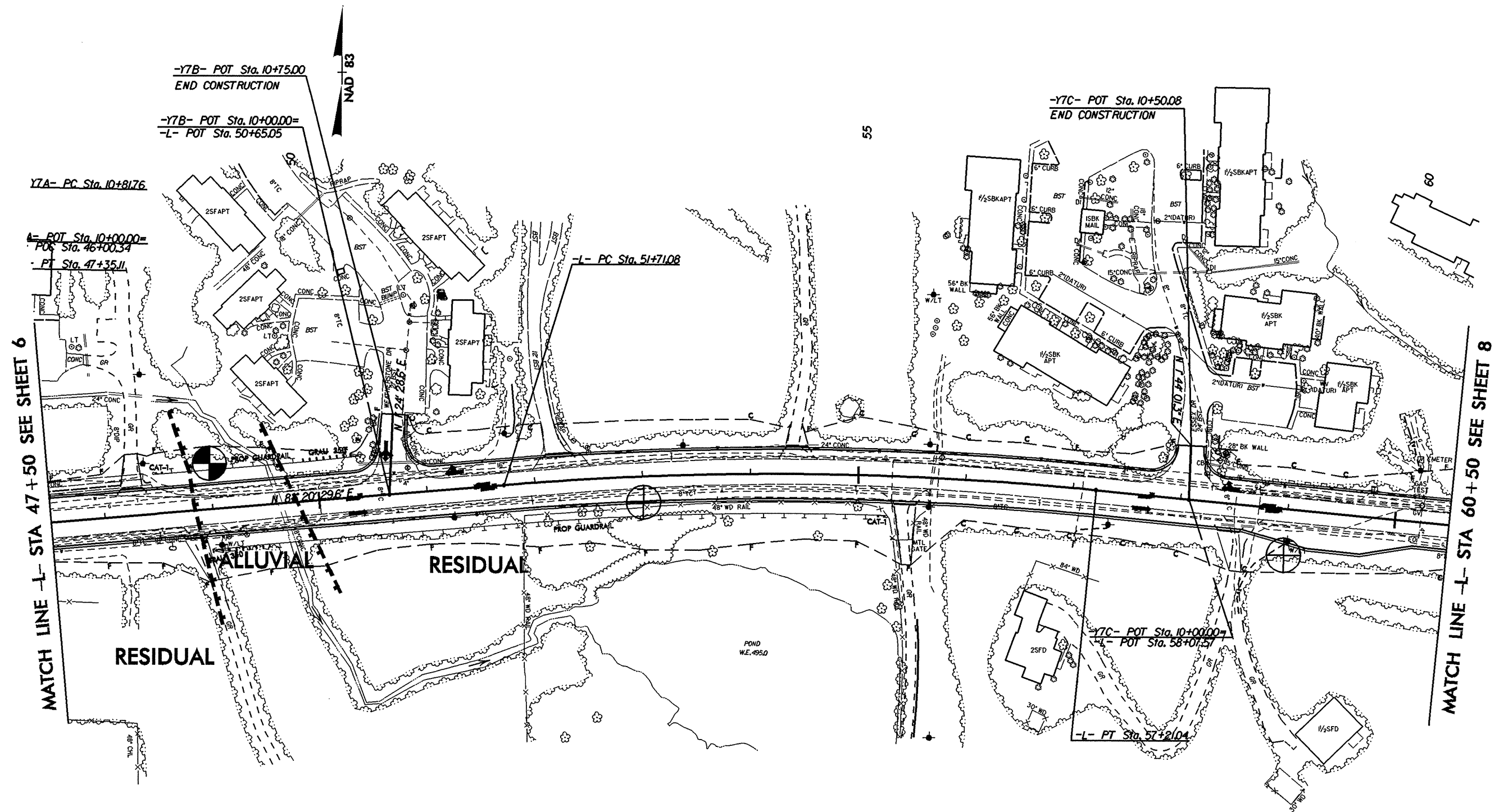
MATCH LINE -L- STA 47+50 SEE SHEET 7

-Y7- POC Sta. 11+15.00
 END CONSTRUCTION
 SEE SHEET 17 FOR CONSTRUCTION
 SEE SHEET 23 FOR -Y7- & -Y7A- PROFILE
 SEE SHEET 2K DETAIL E FOR BUS STOP C DETAIL
 SEE SHEET 2K DETAIL E FOR BUS STOP D DETAIL

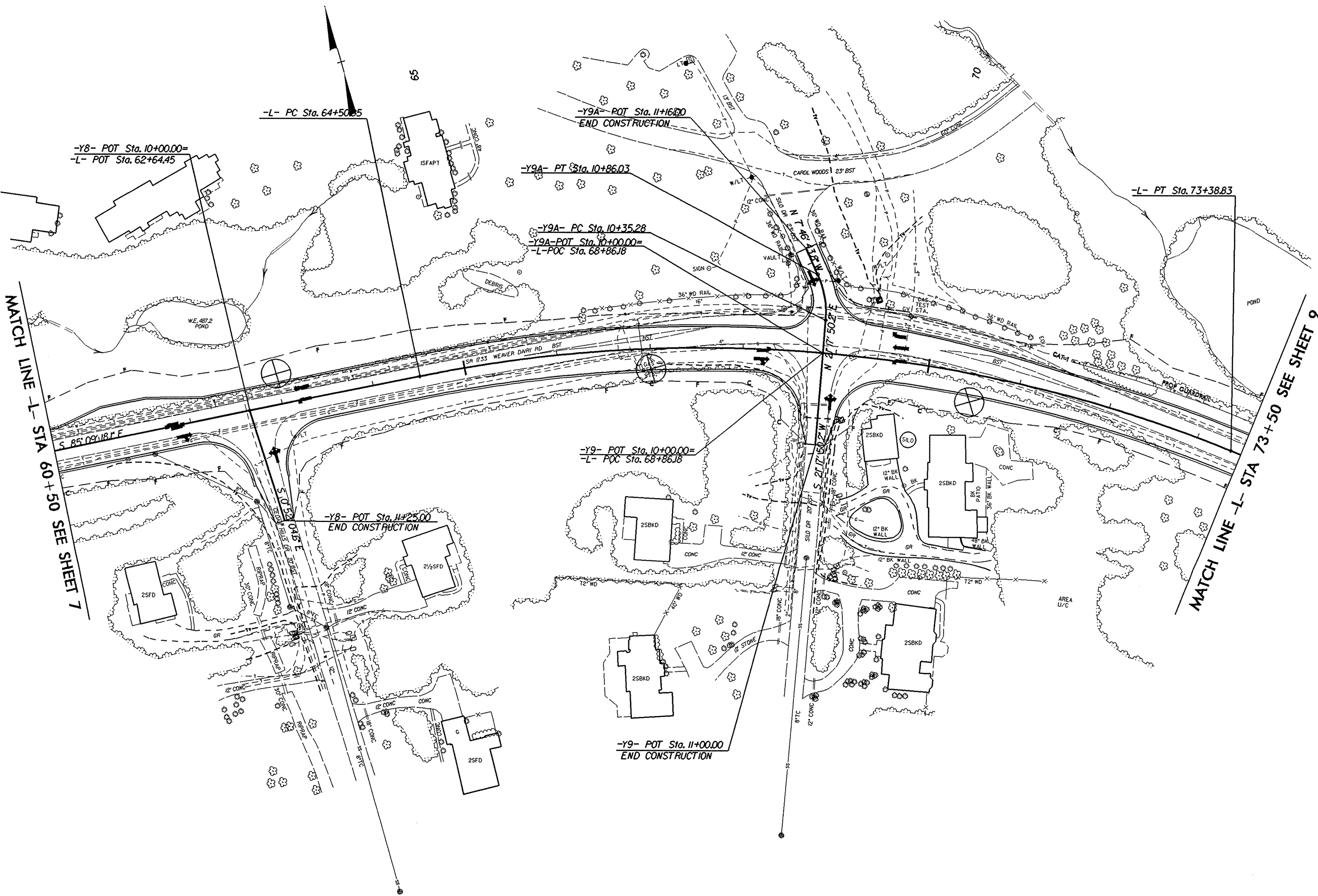
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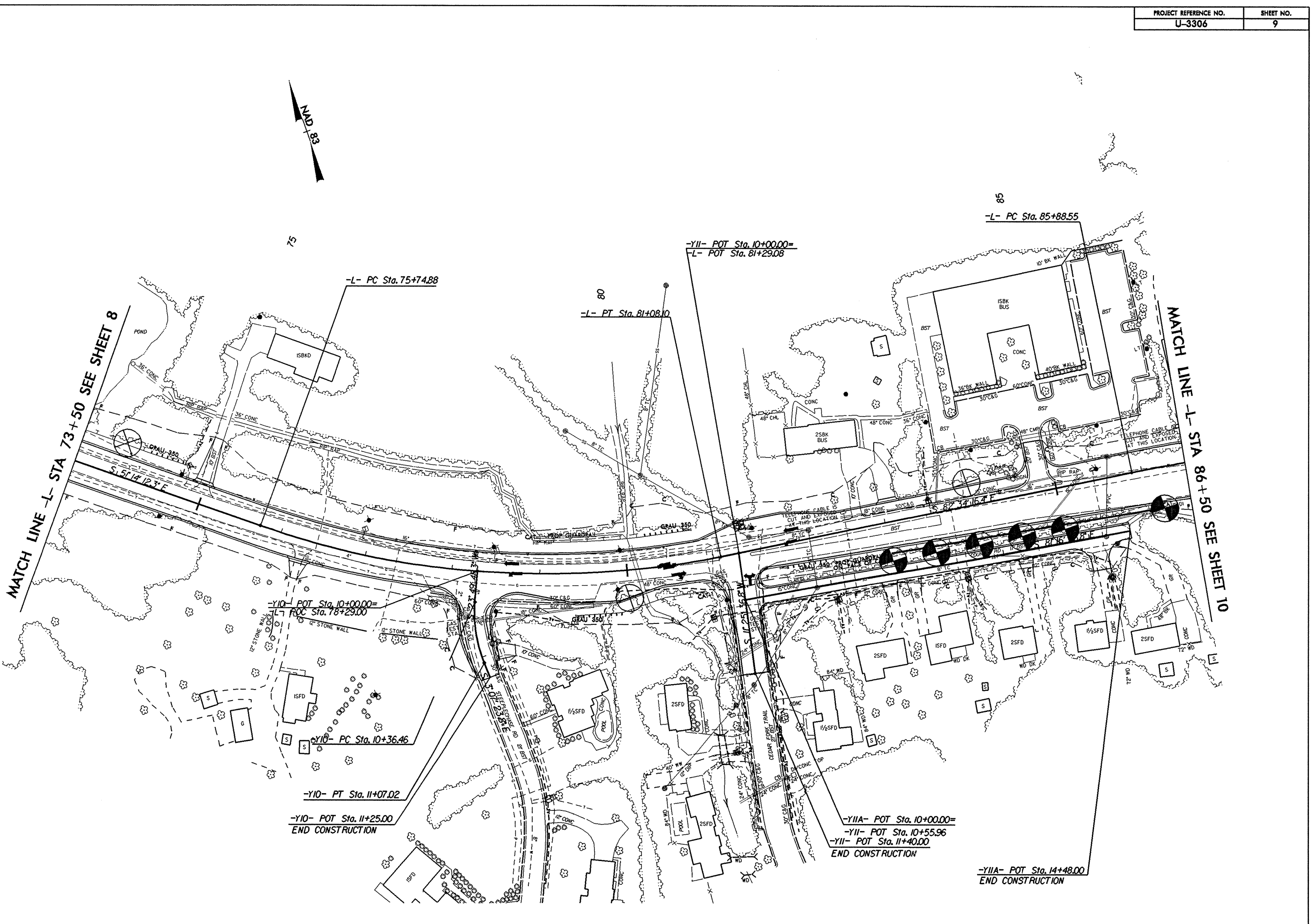
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MATCH LINE -L- STA 60+50 SEE SHEET 7

MATCH LINE -L- STA 73+50 SEE SHEET 9

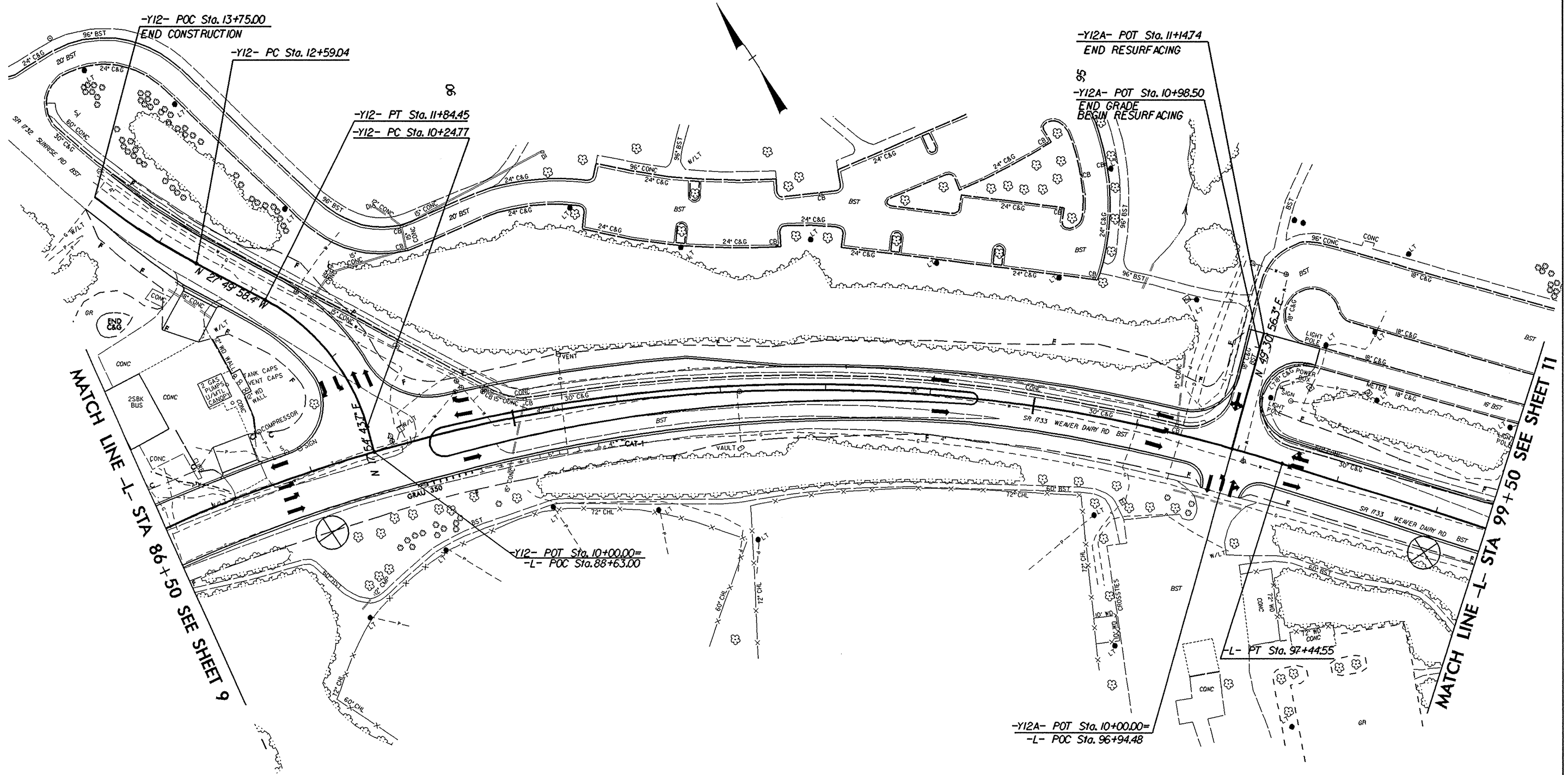
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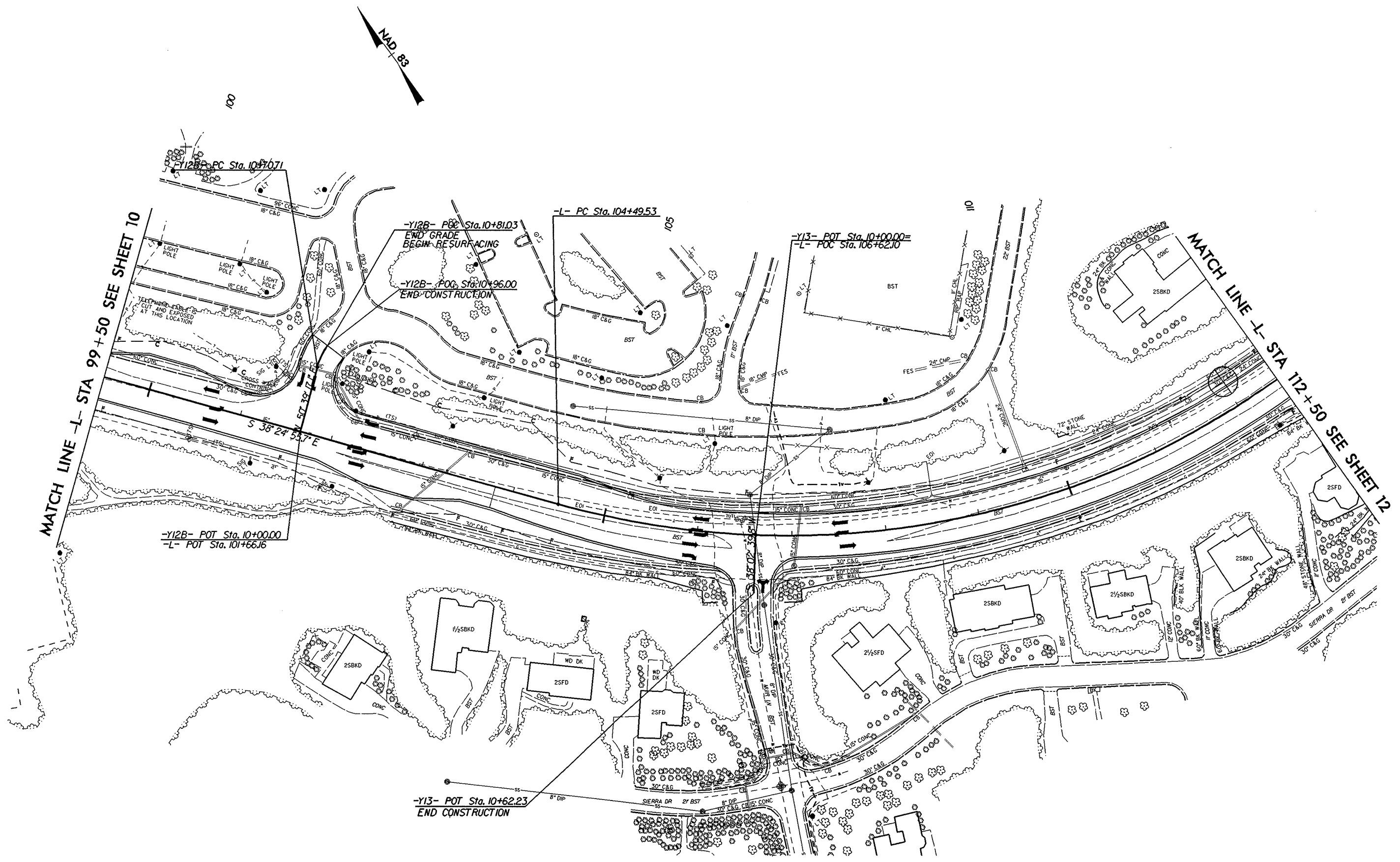
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PROJECT REFERENCE NO. U-3306	SHEET NO. 10
RW SHEET NO.	

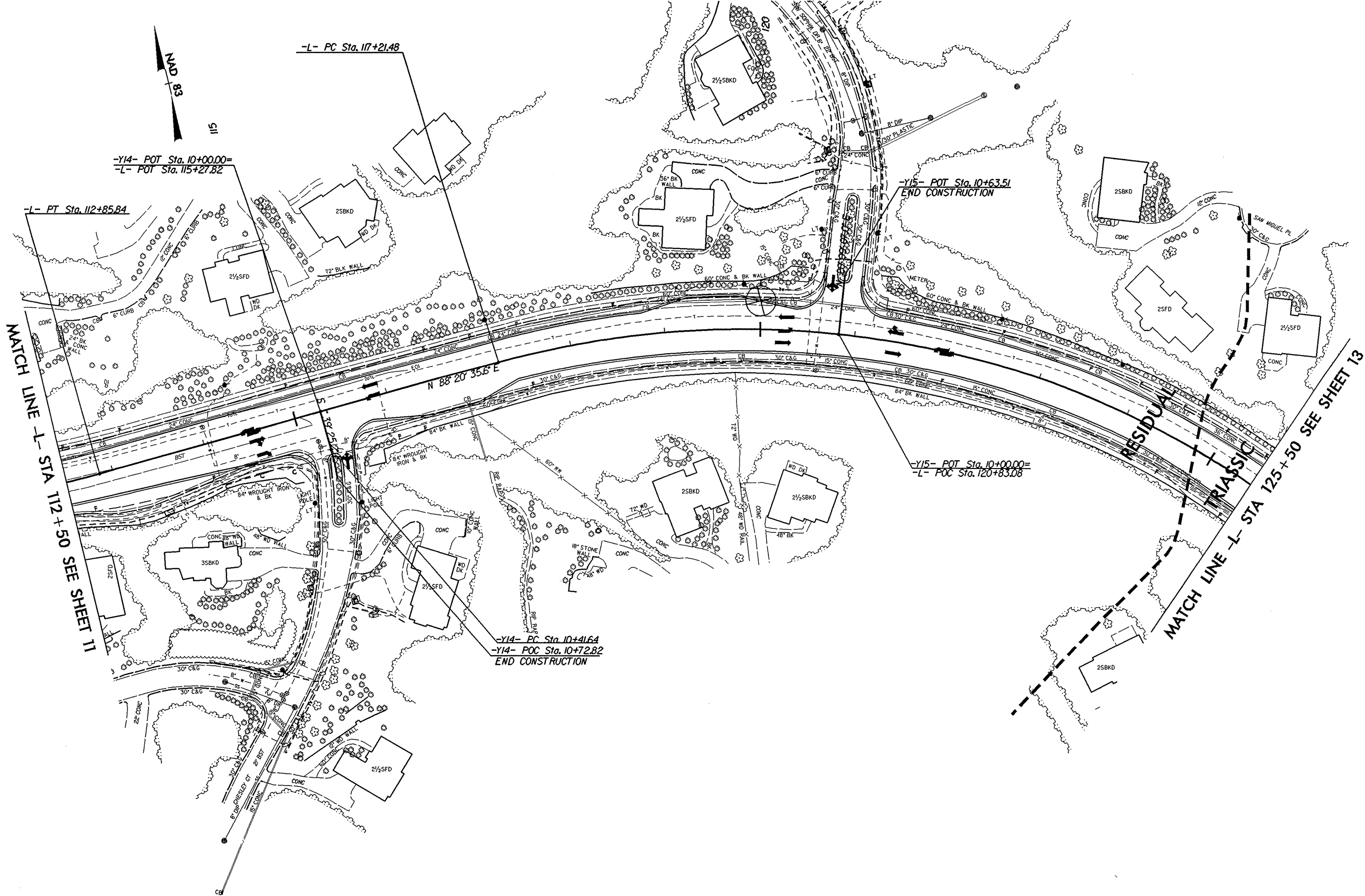


MATCH LINE -L- STA 99+50 SEE SHEET 11

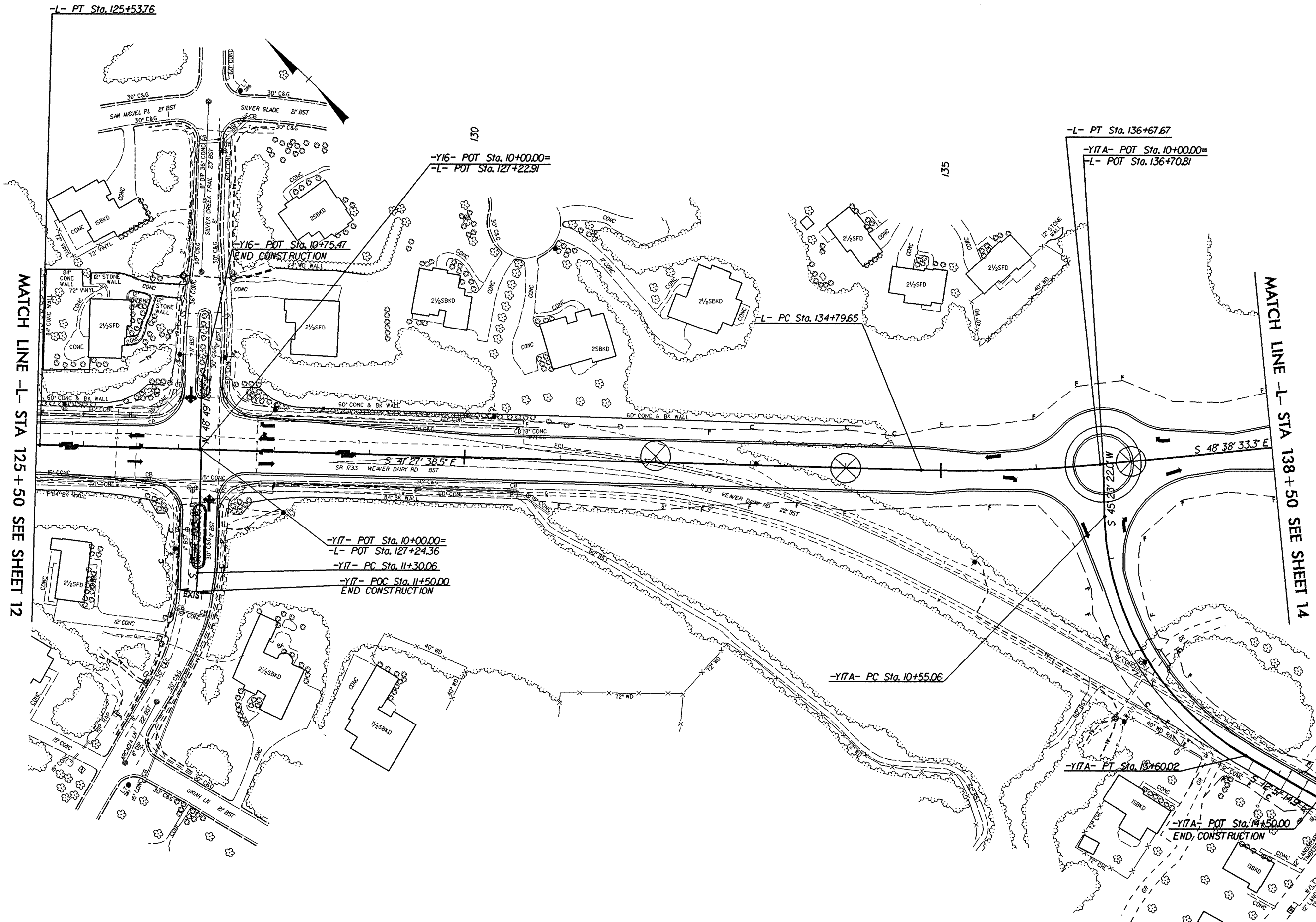


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 1/22/00

8/17/99



8/17/99



MATCH LINE -L- STA 125 + 50 SEE SHEET 12

MATCH LINE -L- STA 138 + 50 SEE SHEET 14

-L- PT Sta. 125+53.76

-L- PT Sta. 136+67.67

-Y17A- POT Sta. 10+00.00=
-L- POT Sta. 136+70.81

-Y16- POT Sta. 10+00.00=
-L- POT Sta. 127+22.91

-L- PC Sta. 134+79.65

-Y17- POT Sta. 10+00.00=
-L- POT Sta. 127+24.36
-Y17- PC Sta. 11+30.06
-Y17- POC Sta. 11+50.00
END CONSTRUCTION

-Y17A- PC Sta. 10+55.06

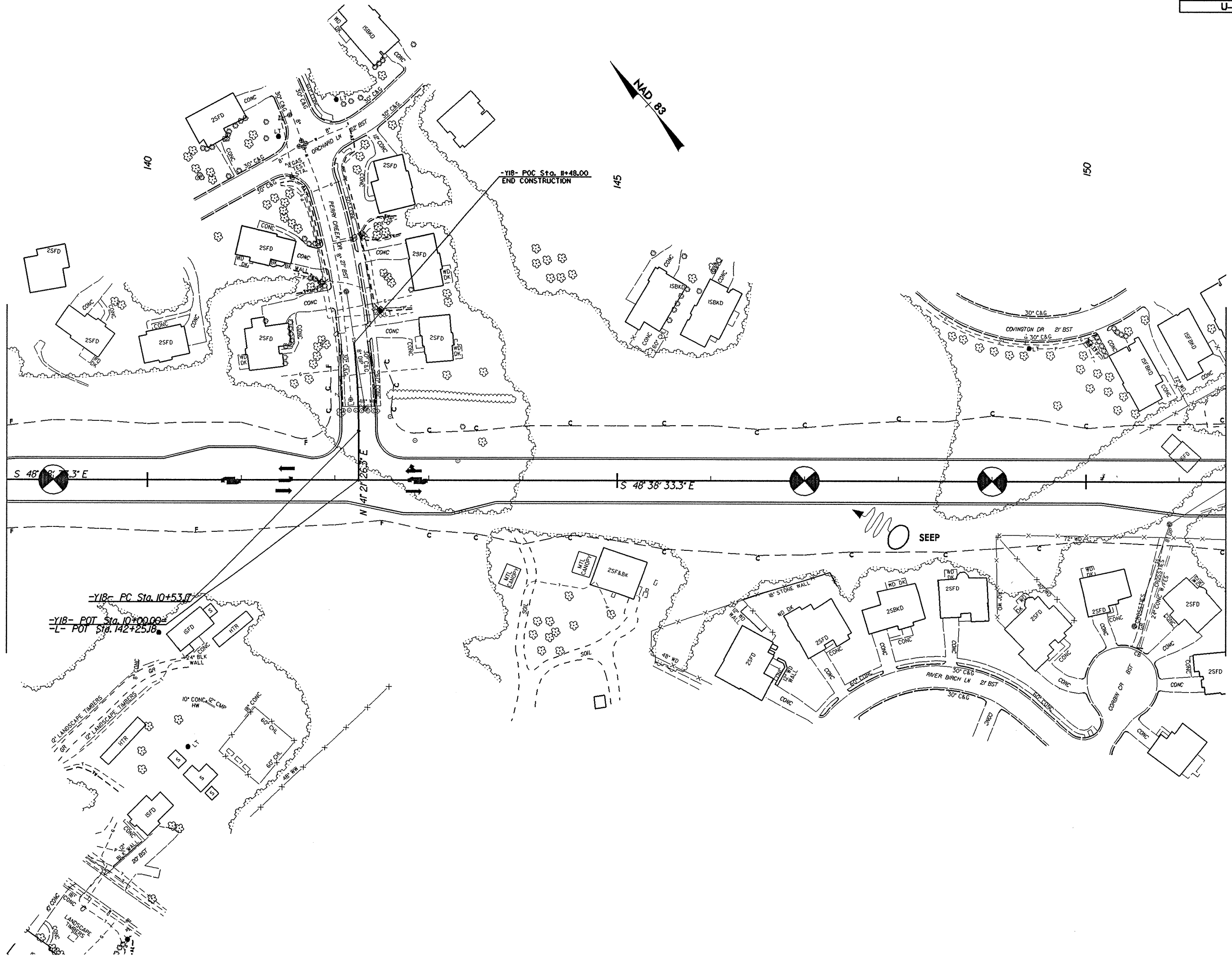
-Y17A- PT Sta. 13+60.02

-Y17A- POT Sta. 14+50.00
END CONSTRUCTION

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MATCH LINE -L- STA 138+50 SEE SHEET 13

MATCH LINE -L- STA 151+50 SEE SHEET 15

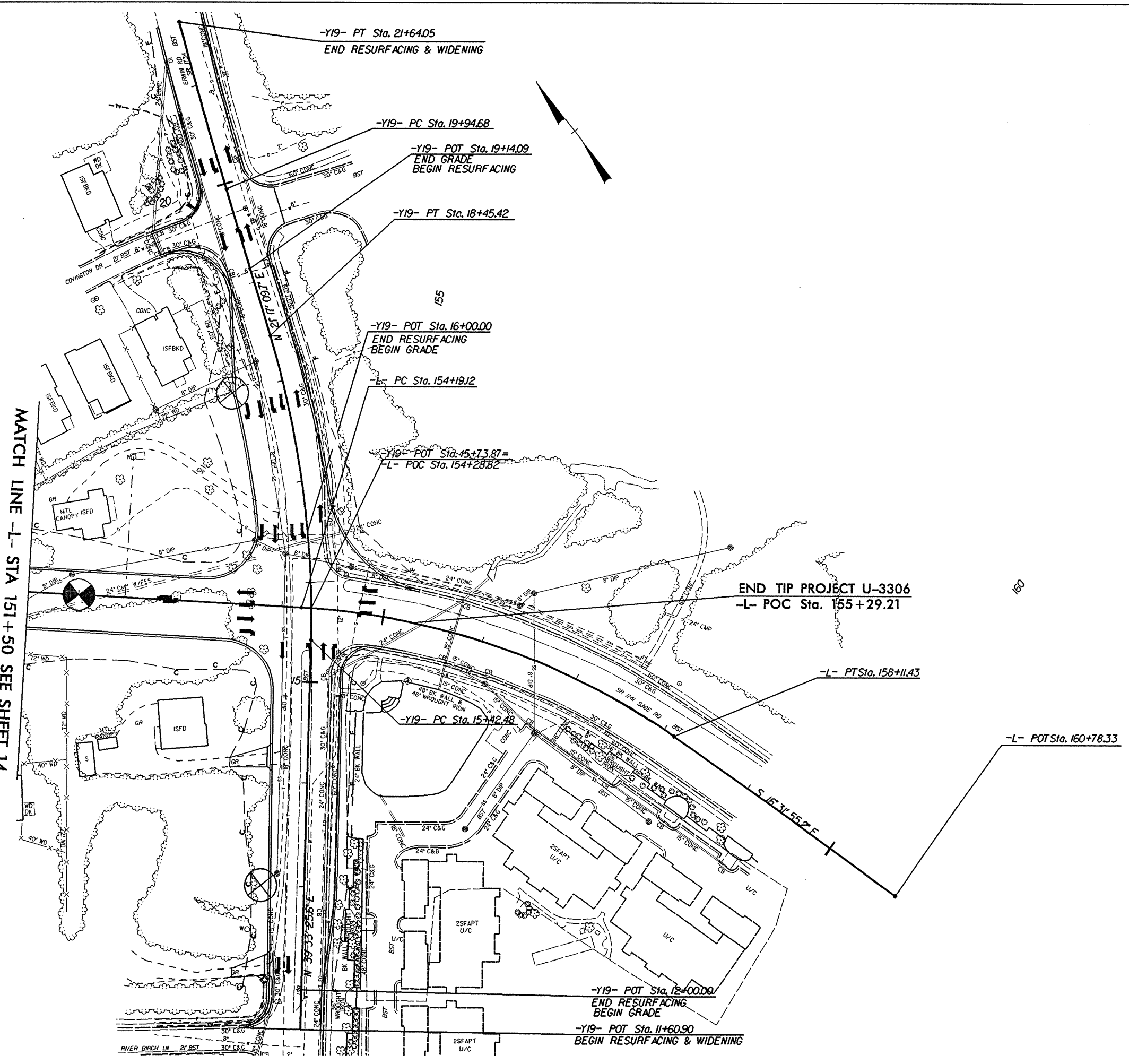


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MATCH LINE -L- STA 151+50 SEE SHEET 14

REVISIONS

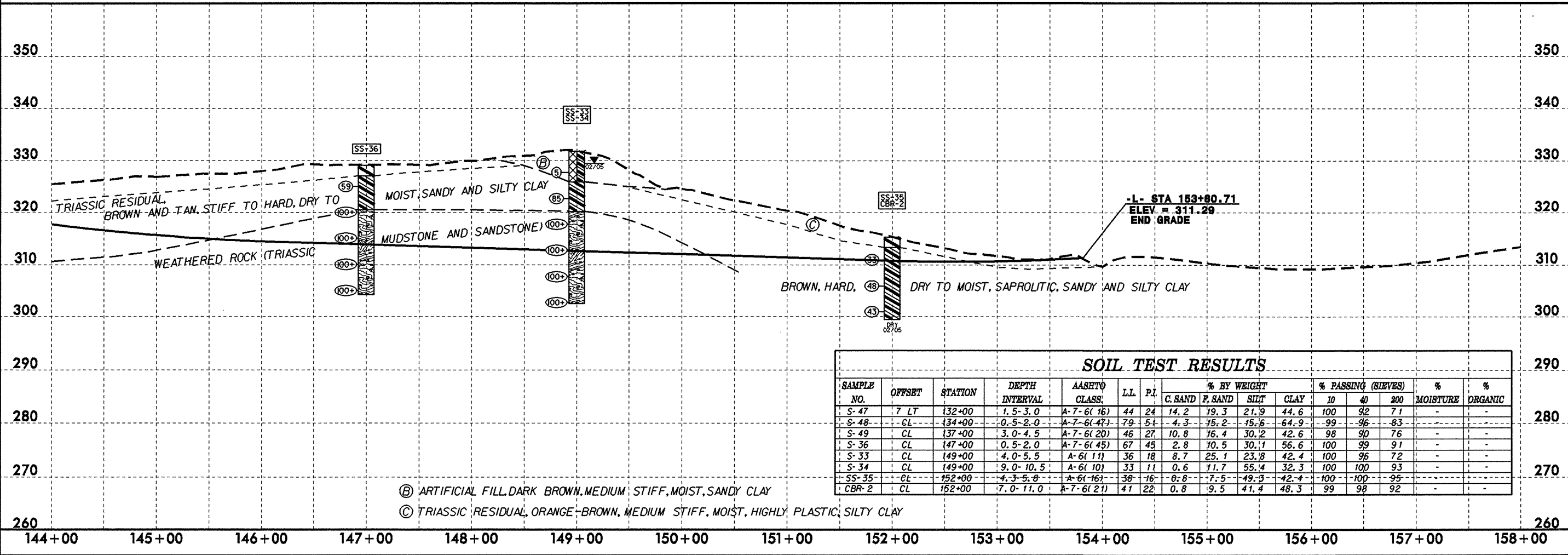
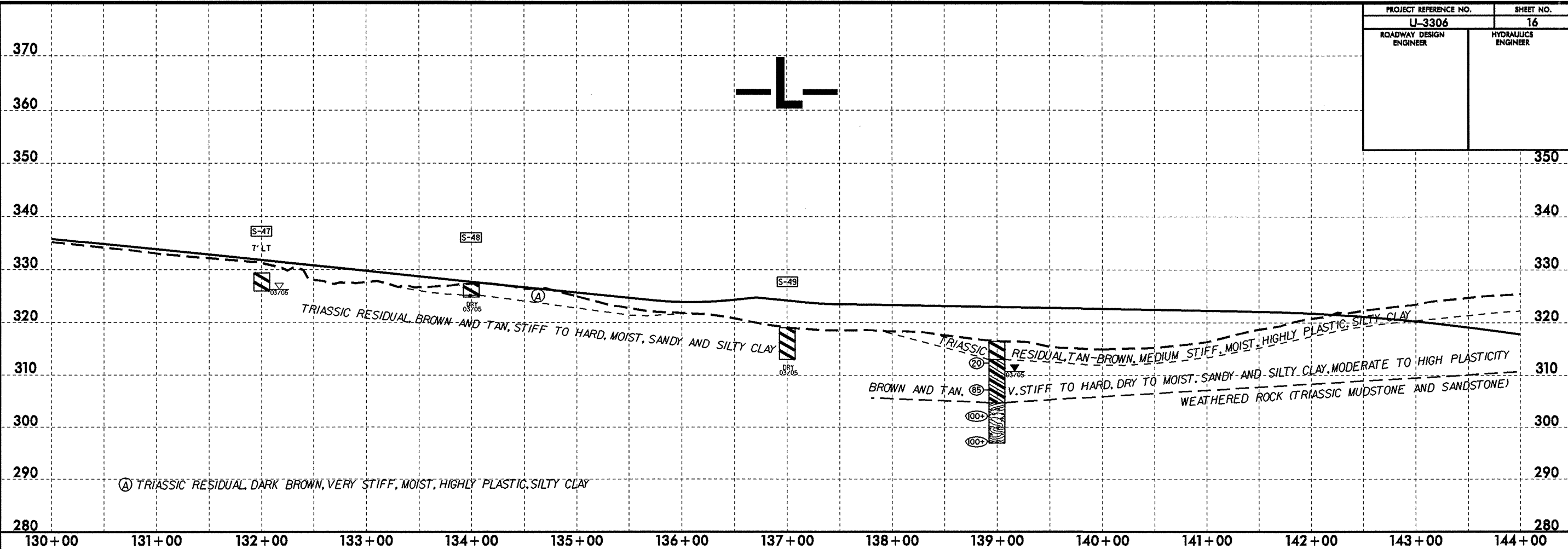
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RIVER BIRCH LN 27' BST 30' C&G

5/28/99

PROJECT REFERENCE NO.		SHEET NO.	
U-3306		16	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	



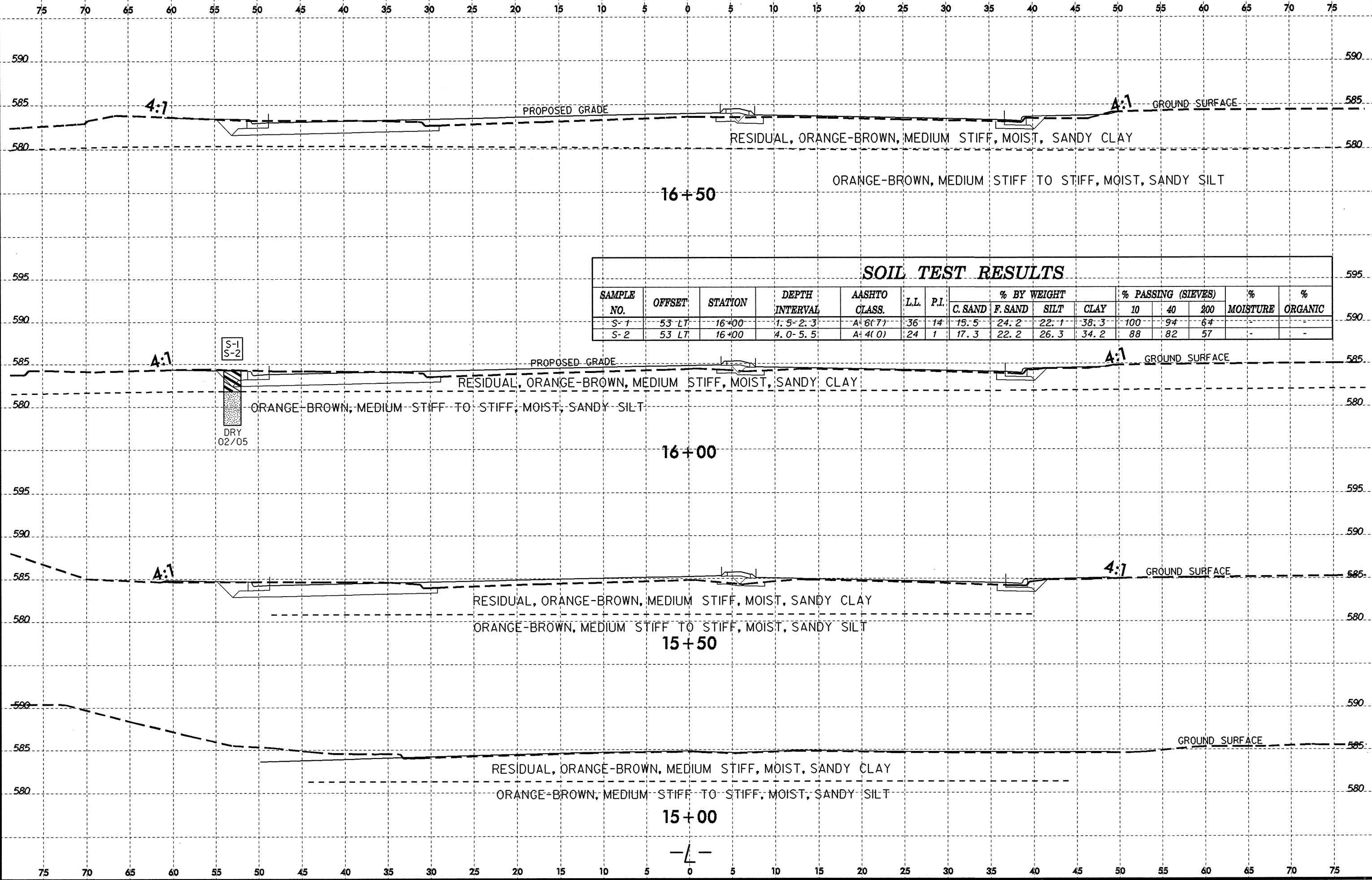
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-47	7 LT	132+00	1.5-3.0	A-7-6(16)	44	24	14.2	19.3	21.9	44.6	100	92	71	-	-
S-48	CL	134+00	0.5-2.0	A-7-6(47)	79	51	4.3	15.2	15.6	64.9	99	96	83	-	-
S-49	CL	137+00	3.0-4.5	A-7-6(20)	46	27	10.8	16.4	30.2	42.6	98	90	76	-	-
S-36	CL	147+00	0.5-2.0	A-7-6(45)	67	45	2.8	10.5	30.1	56.6	100	99	91	-	-
S-33	CL	149+00	4.0-5.5	A-6(11)	36	18	8.7	25.1	23.8	42.4	100	96	72	-	-
S-34	CL	149+00	9.0-10.5	A-6(10)	33	11	0.6	11.7	55.4	32.3	100	100	93	-	-
SS-35	CL	152+00	4.3-5.8	A-6(16)	38	16	0.8	7.5	49.3	42.4	100	100	95	-	-
CBR-2	CL	152+00	7.0-11.0	A-7-6(21)	41	22	0.8	9.5	41.4	48.3	99	98	92	-	-

- (B) ARTIFICIAL FILL, DARK BROWN, MEDIUM STIFF, MOIST, SANDY CLAY
- (C) TRIASSIC RESIDUAL, ORANGE-BROWN, MEDIUM STIFF, MOIST, HIGHLY PLASTIC, SILTY CLAY

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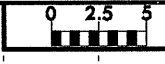


SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT			% PASSING (SIEVES)			% MOISTURE	% ORGANIC	
							C. SAND	F. SAND	SILT	CLAY	10	40			200
S-1	5.3 LT	16+00	1.5-2.3	A-6(7)	36	14	15.5	24.2	22.1	38.3	100	94	64	-	-
S-2	5.3 LT	16+00	4.0-5.5	A-4(0)	24	1	17.3	22.2	26.3	34.2	88	82	57	-	-

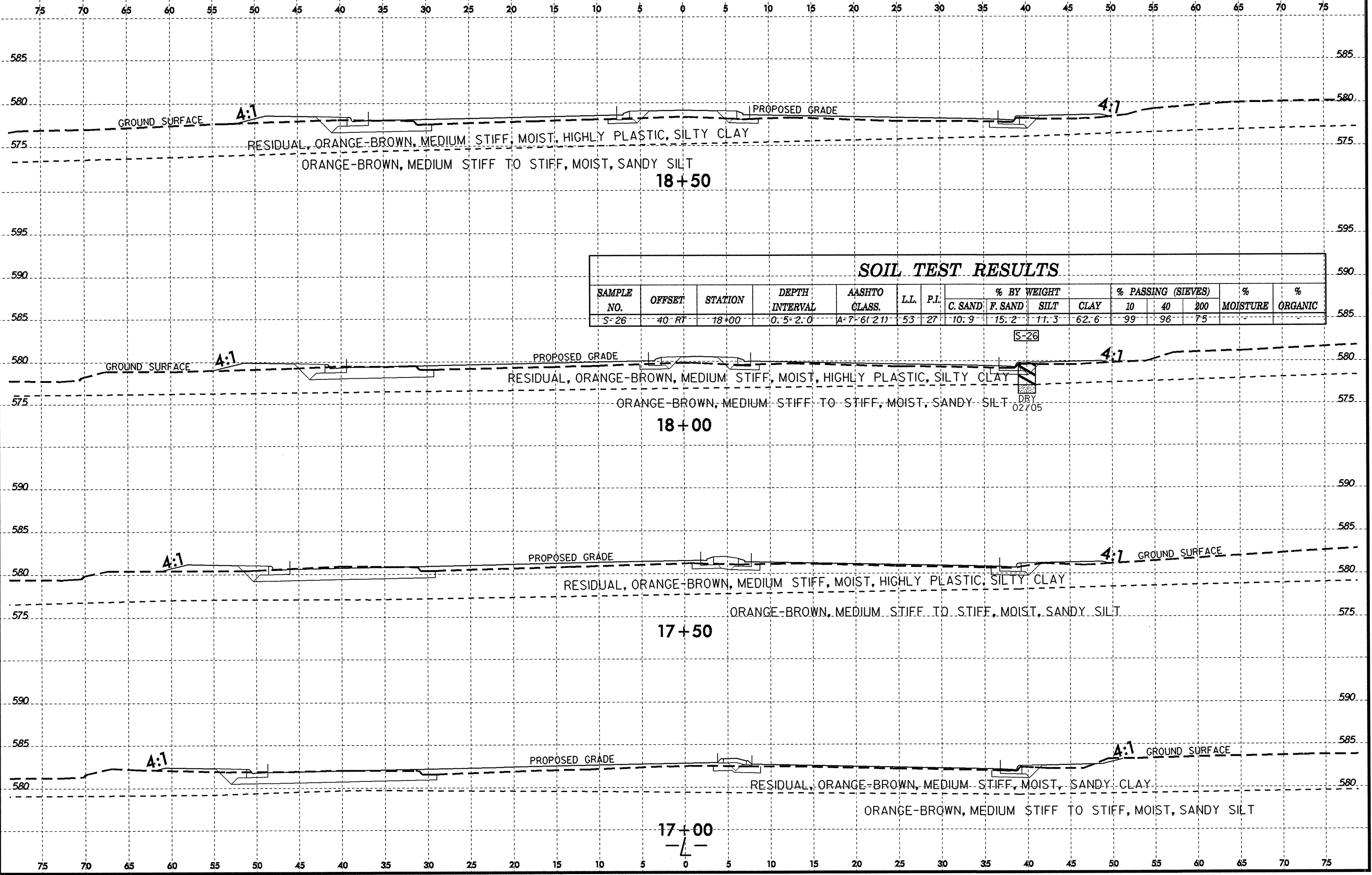
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S-2
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PROJ. REFERENCE NO. U-3306 SHEET NO. 18

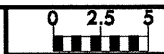


SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-26	40 RT	18+00	0.5-2.0	A-7-6(21)	53	27	10.9	15.2	11.3	62.6	99	96	75		

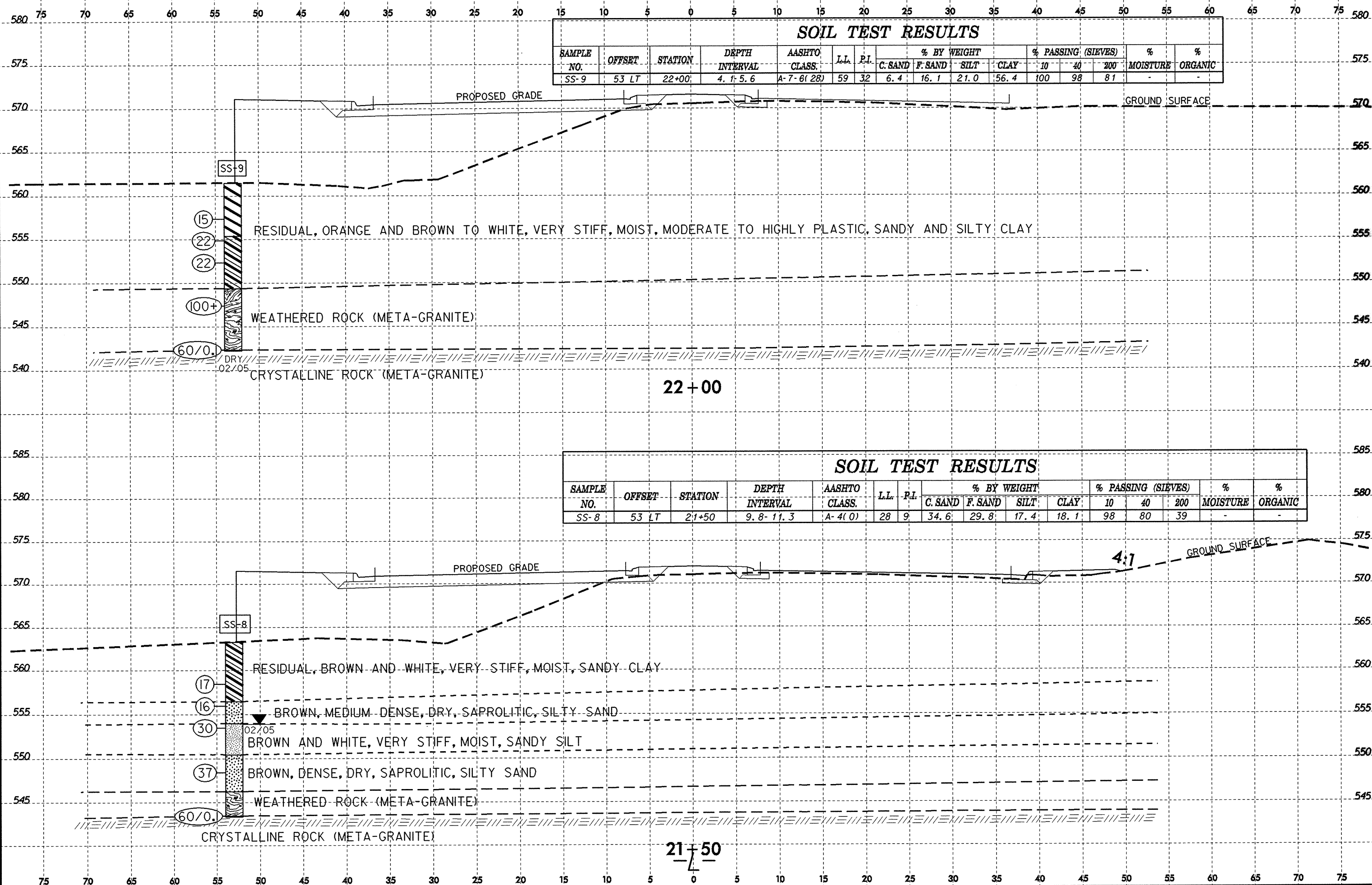
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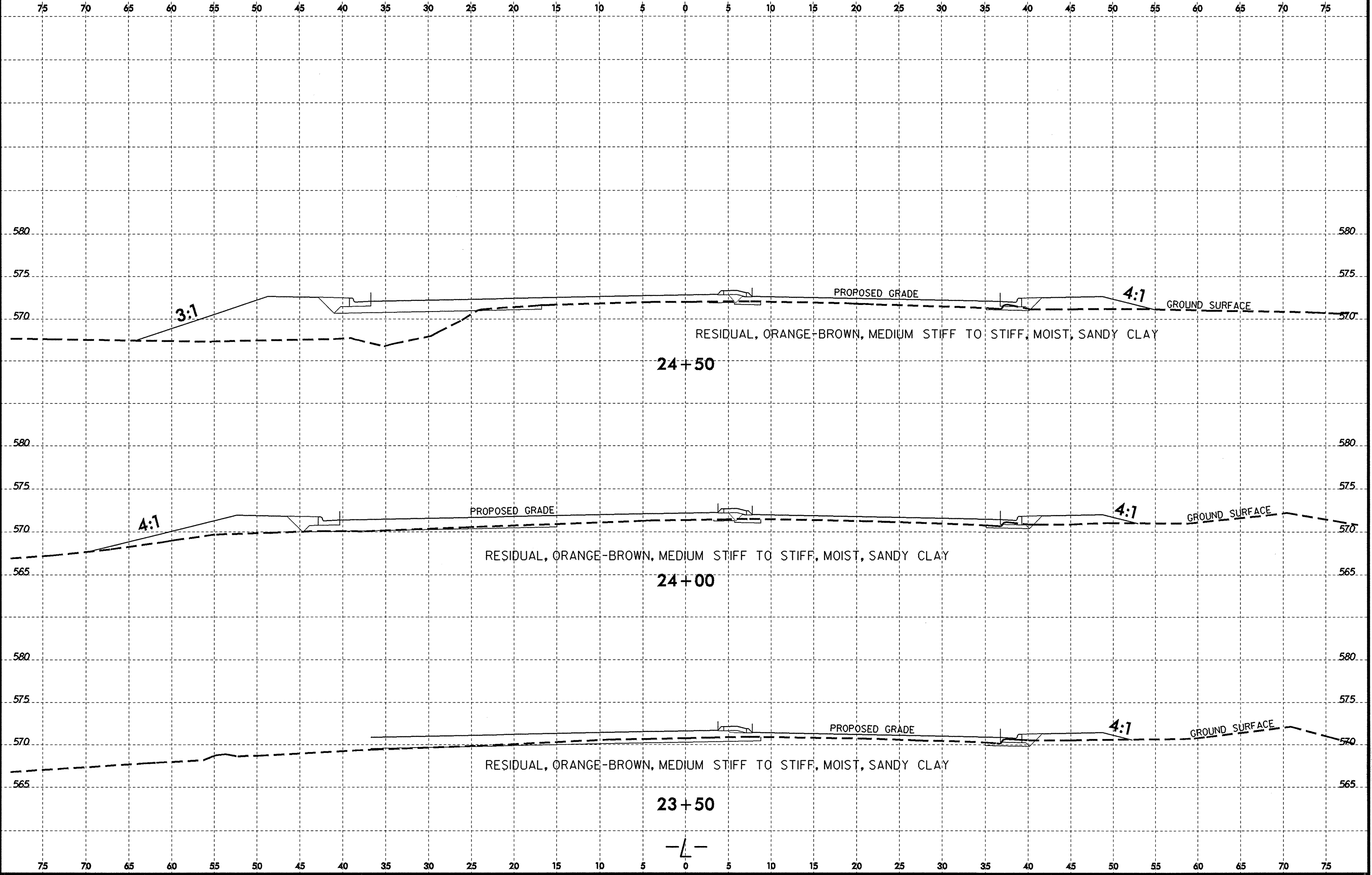
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-9	53 LT	22+00	4.1-5.6	A-7-6(28)	59	32	6.4	16.1	21.0	56.4	100	98	81	-	-

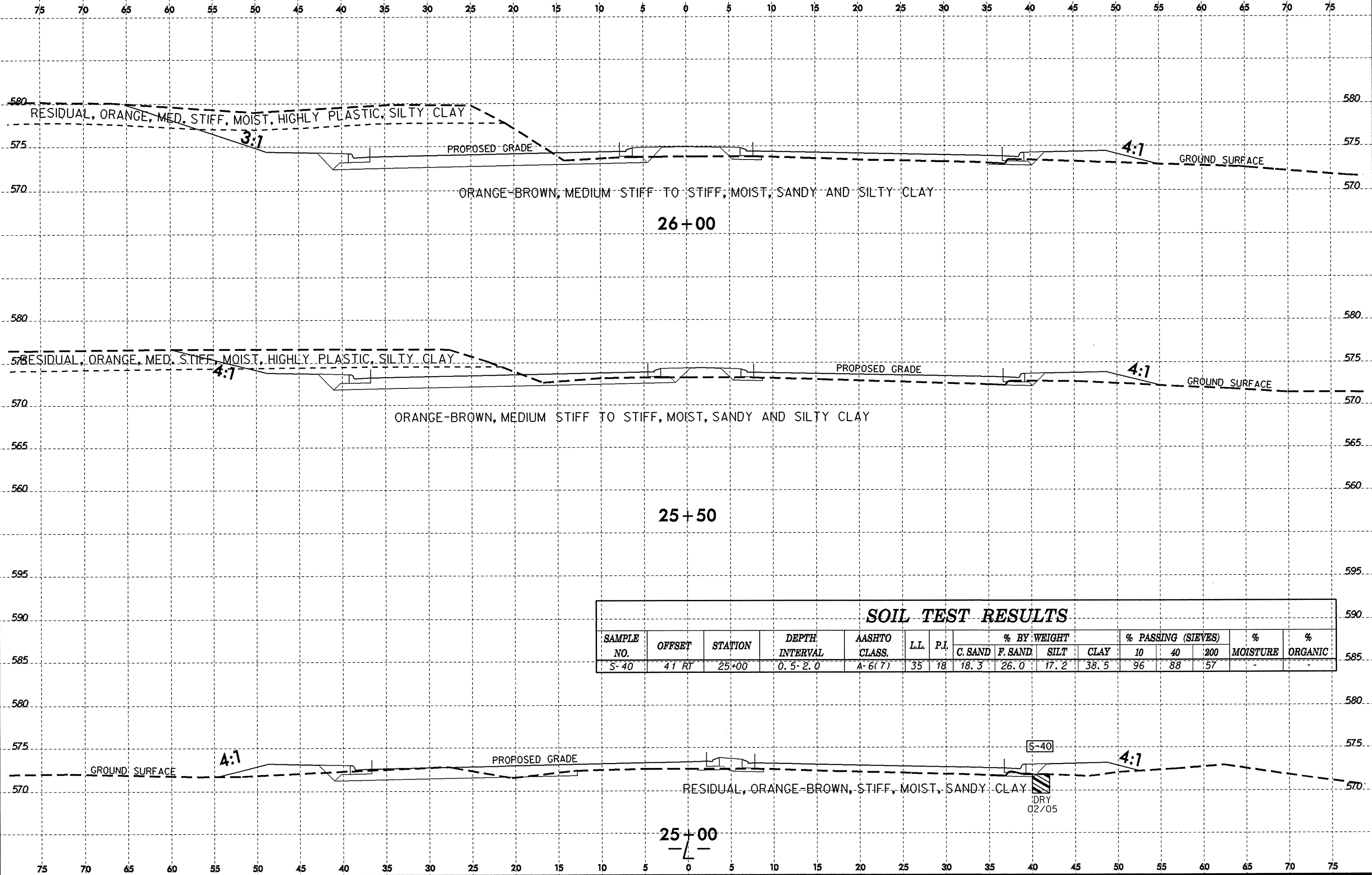
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-8	53 LT	21+50	9.8-11.3	A-4(0)	28	9	34.6	29.8	17.4	18.1	98	80	39	-	-



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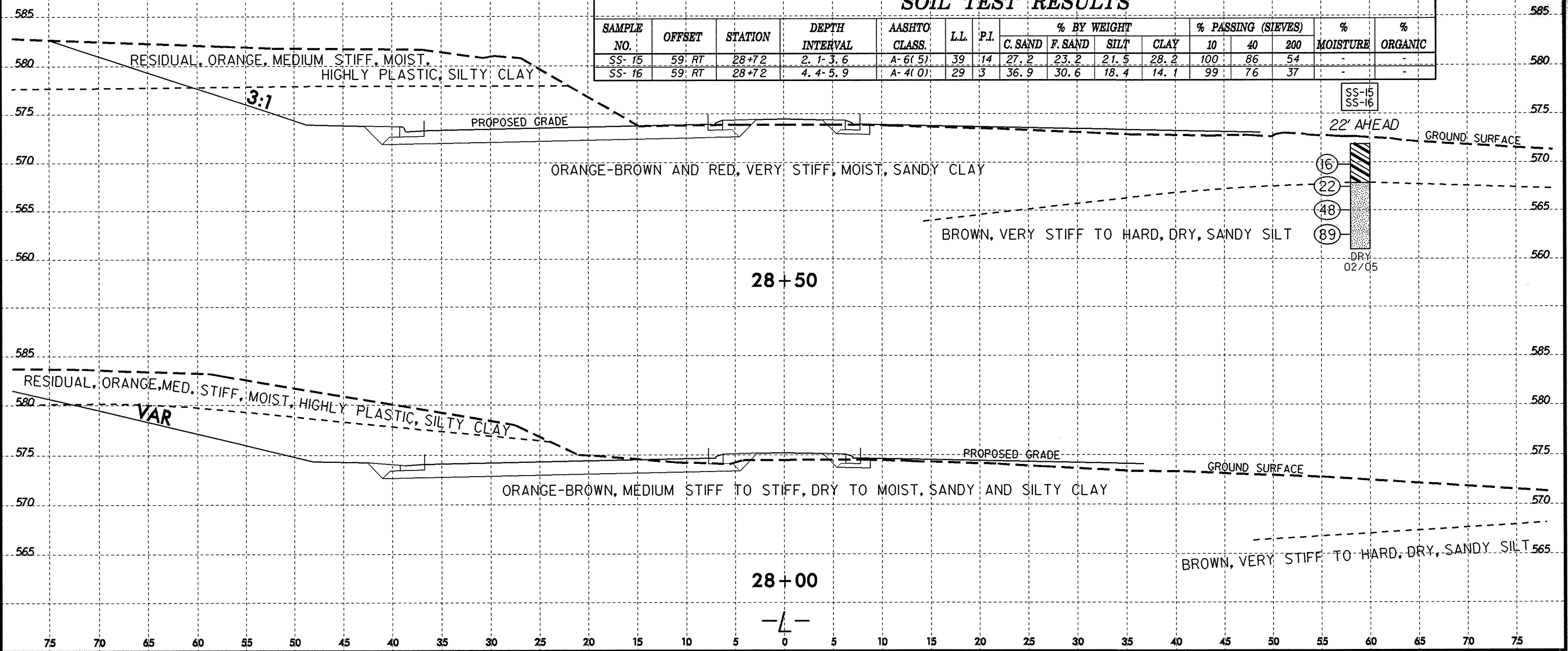
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-40	41 RT	25+00	0.5-2.0	A-6(7)	35	18	18.3	26.0	17.2	38.5	96	88	57	-	-

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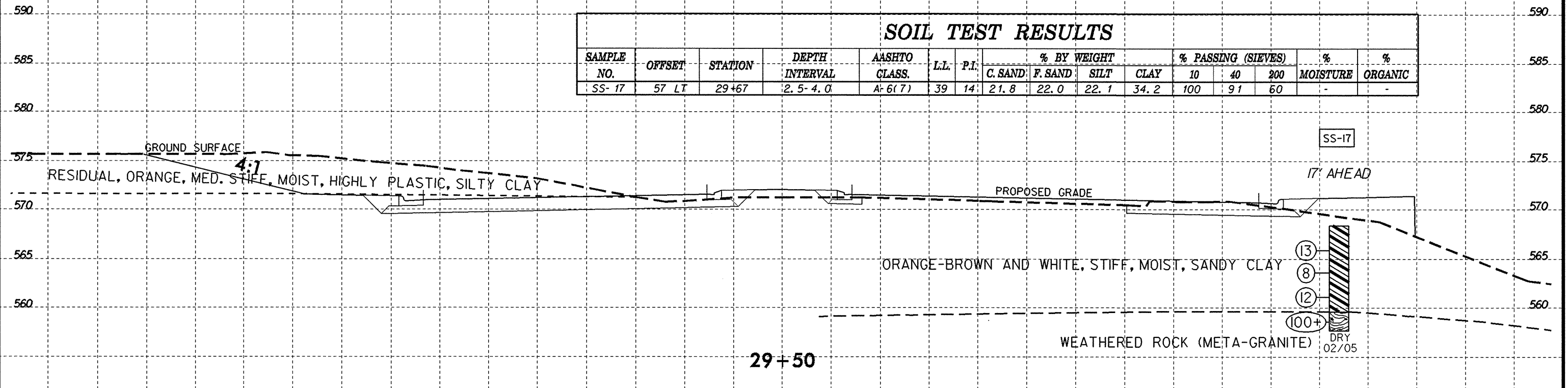
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							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-15	59' RT	28+7.2	2.1-3.6	A-6(5)	39	14	27.2	23.2	21.5	28.2	100	86	54	-	-
SS-16	59' RT	28+7.2	4.4-5.9	A-4(0)	29	3	36.9	30.6	18.4	14.1	99	76	37	-	-



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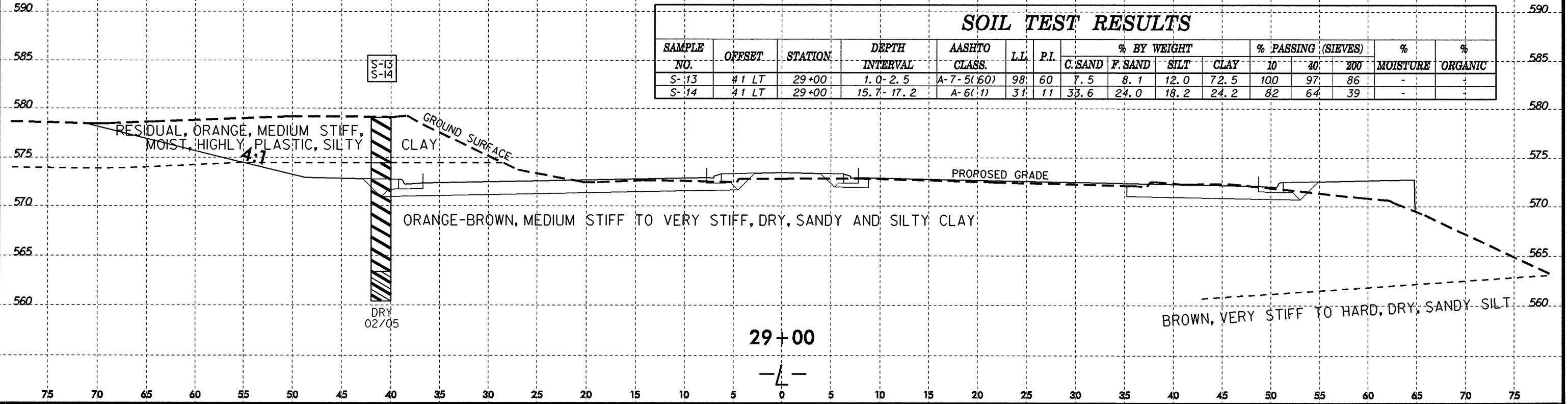
SOIL TEST RESULTS

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							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-17	57 LT	29+67	2.5-4.0	A-6(7)	39	14	21.8	22.0	22.1	34.2	100	91	60	-	-



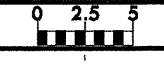
SOIL TEST RESULTS

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							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-13	41 LT	29+00	1.0-2.5	A-7-5(60)	98	60	7.5	8.1	12.0	72.5	100	97	86	-	-
S-14	41 LT	29+00	15.7-17.2	A-6(1)	31	11	33.6	24.0	18.2	24.2	82	64	39	-	-

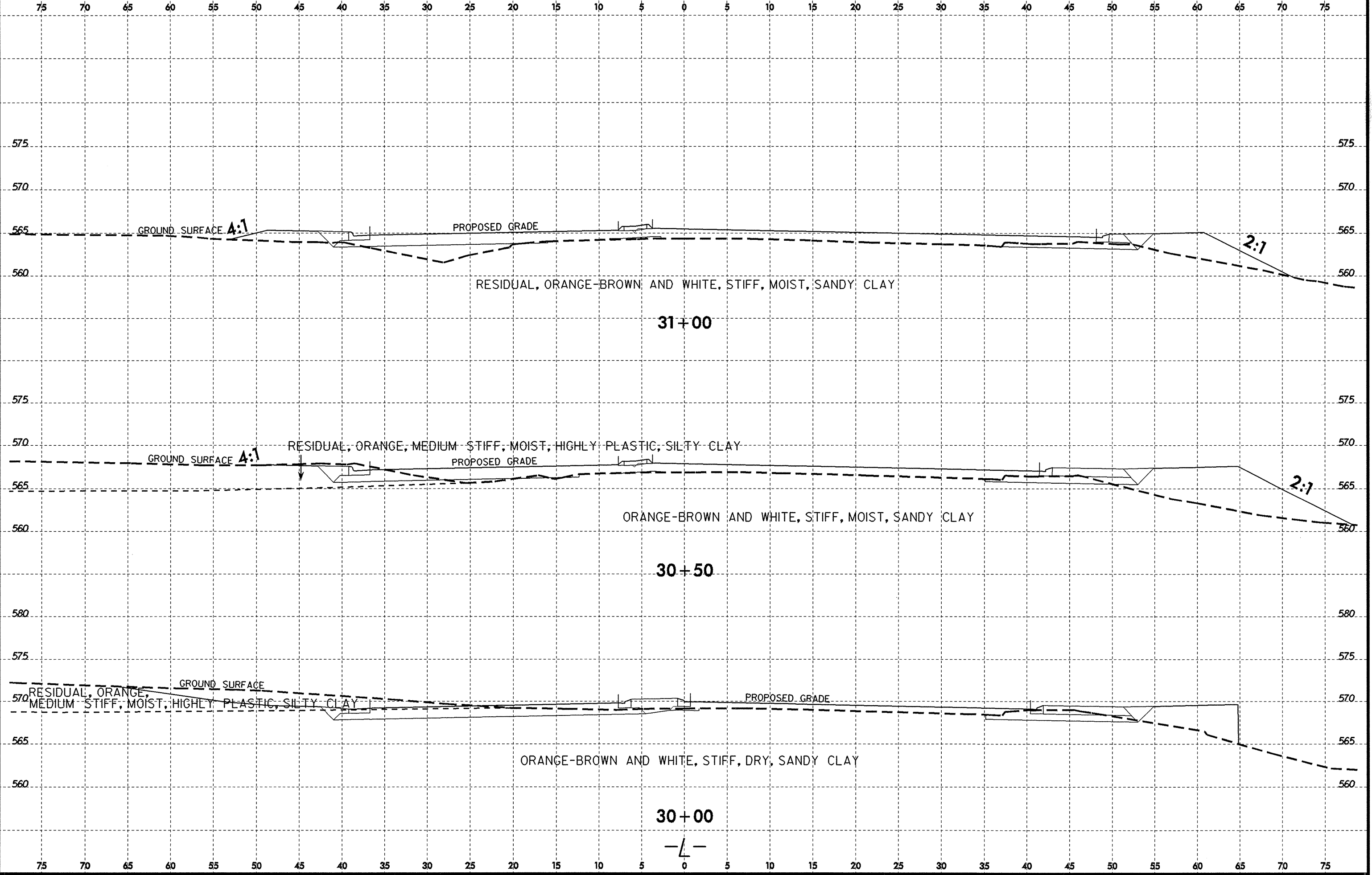


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PROJ. REFERENCE NO.	SHEET NO.
U-3306	28



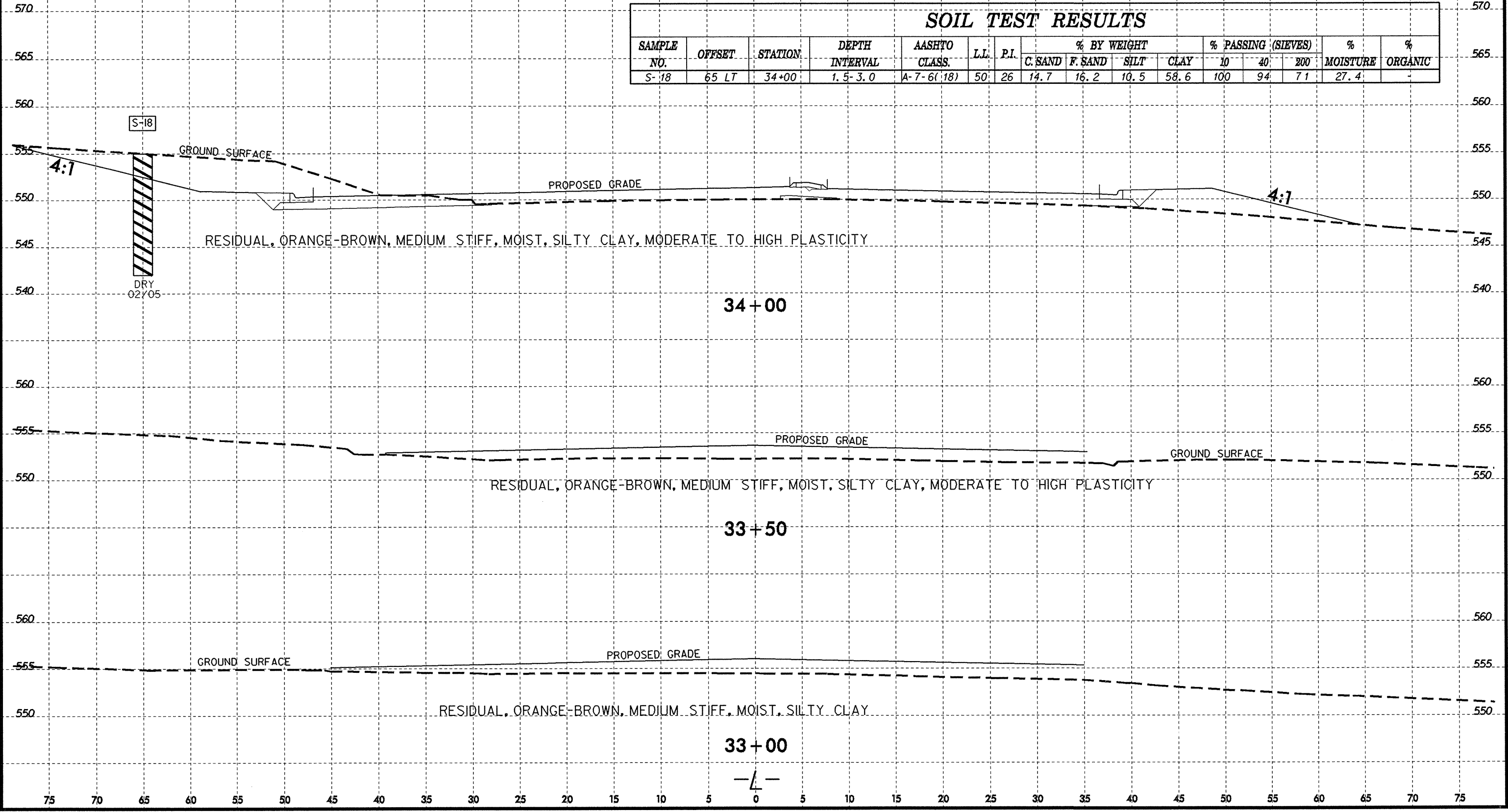
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75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-18	65 LT	34+00	1.5-3.0	A-7-6(18)	50	26	14.7	16.2	10.5	58.6	100	94	71	27.4	-

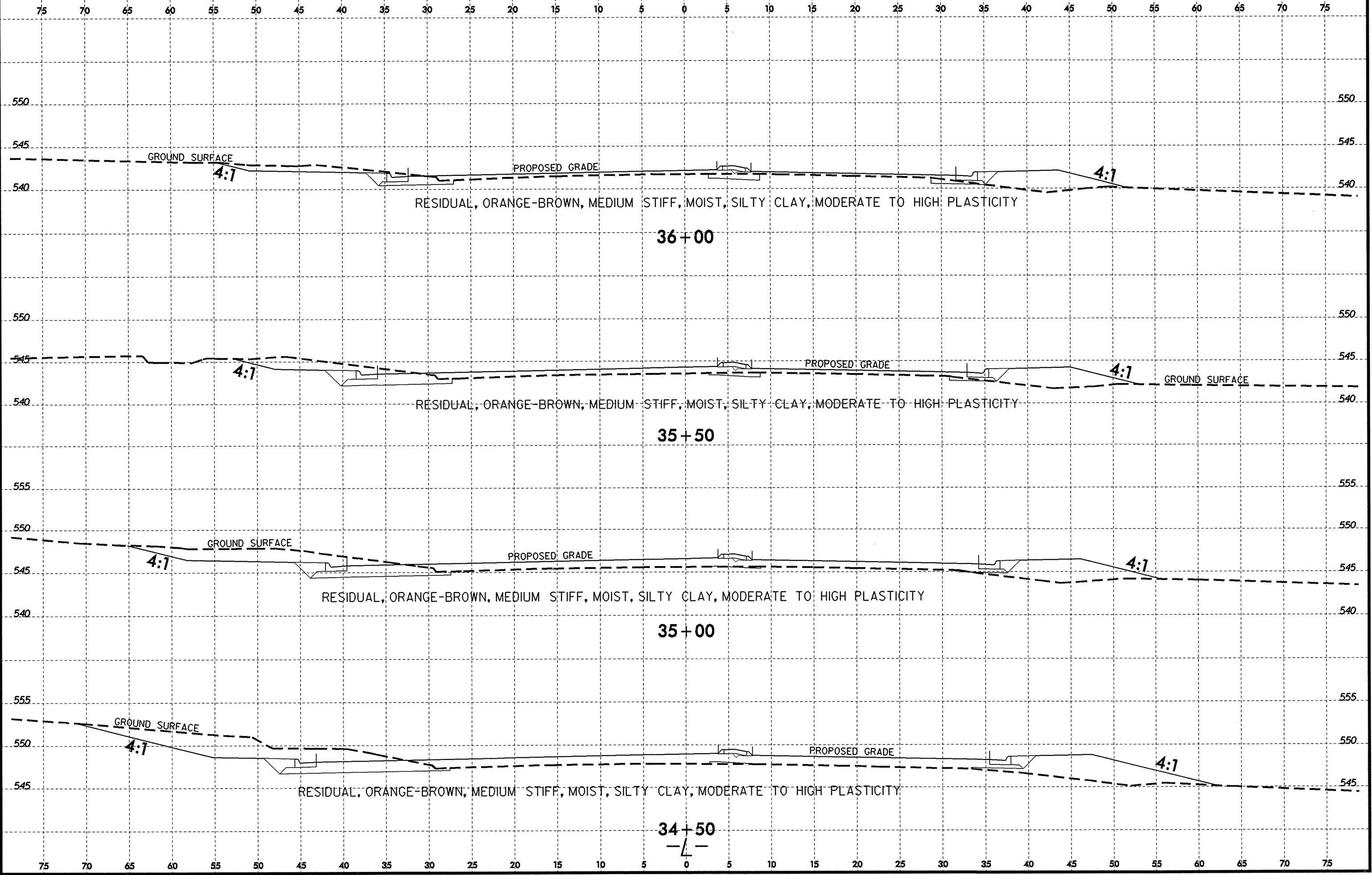


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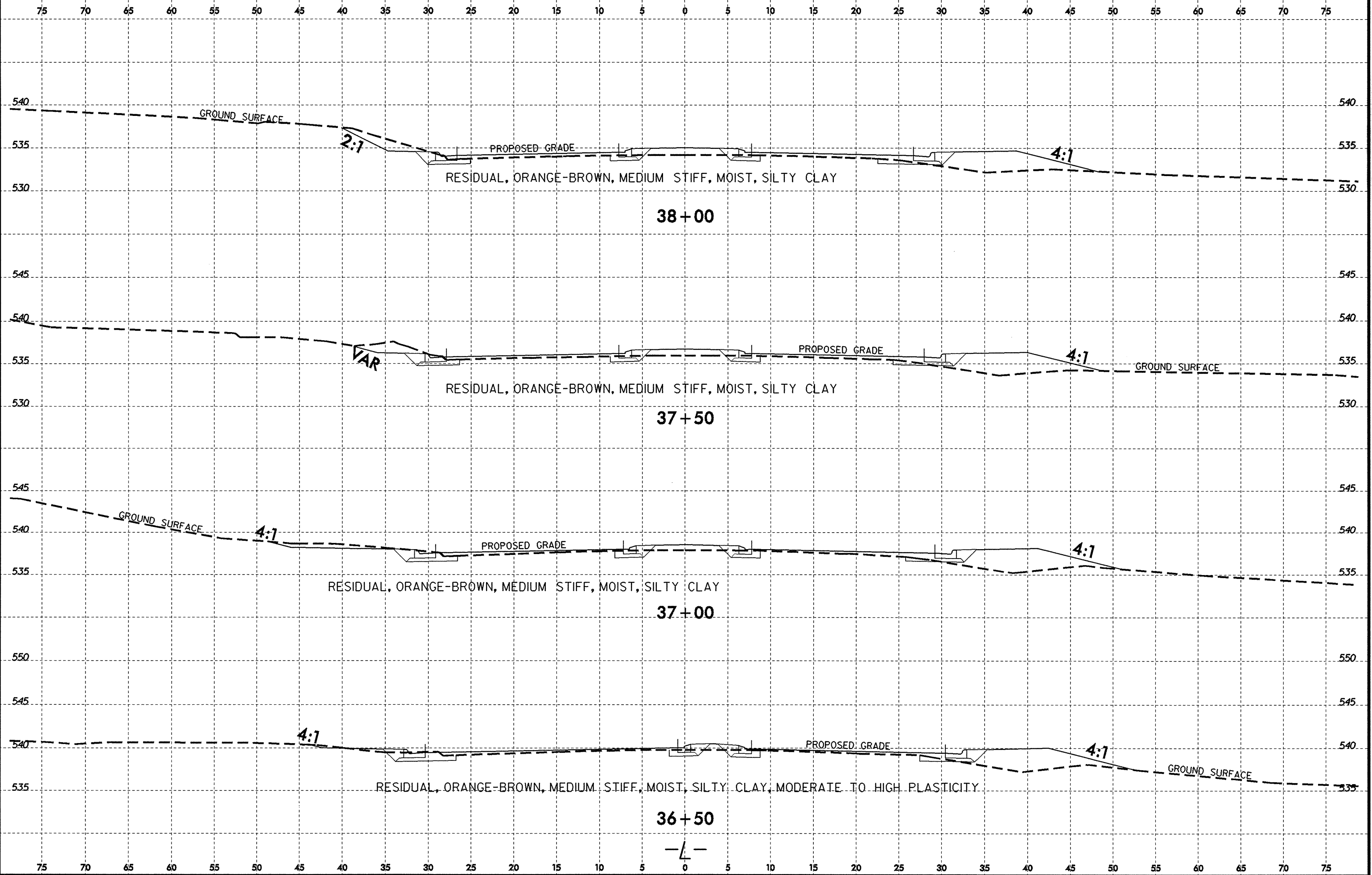


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U-3306	31



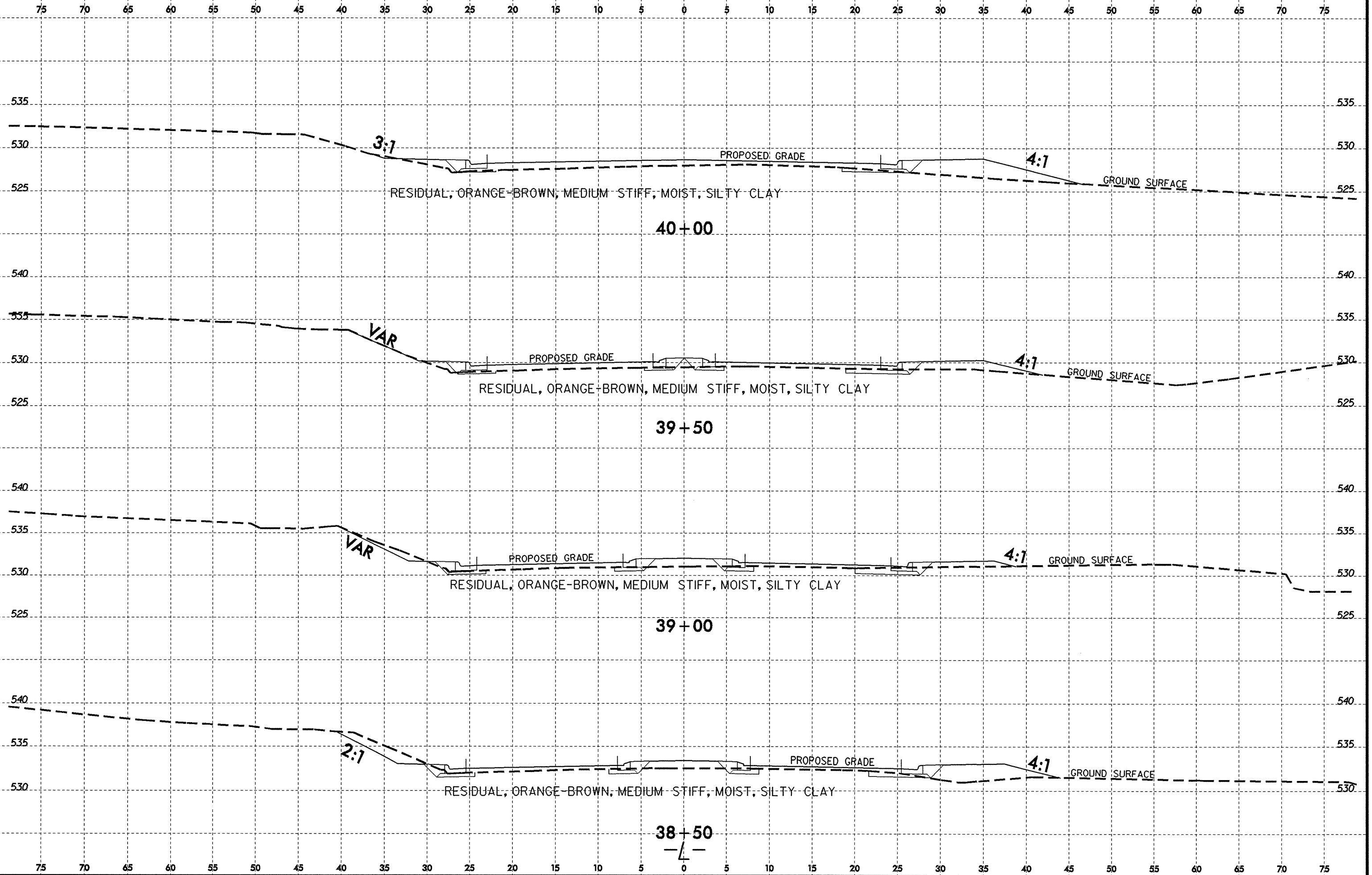
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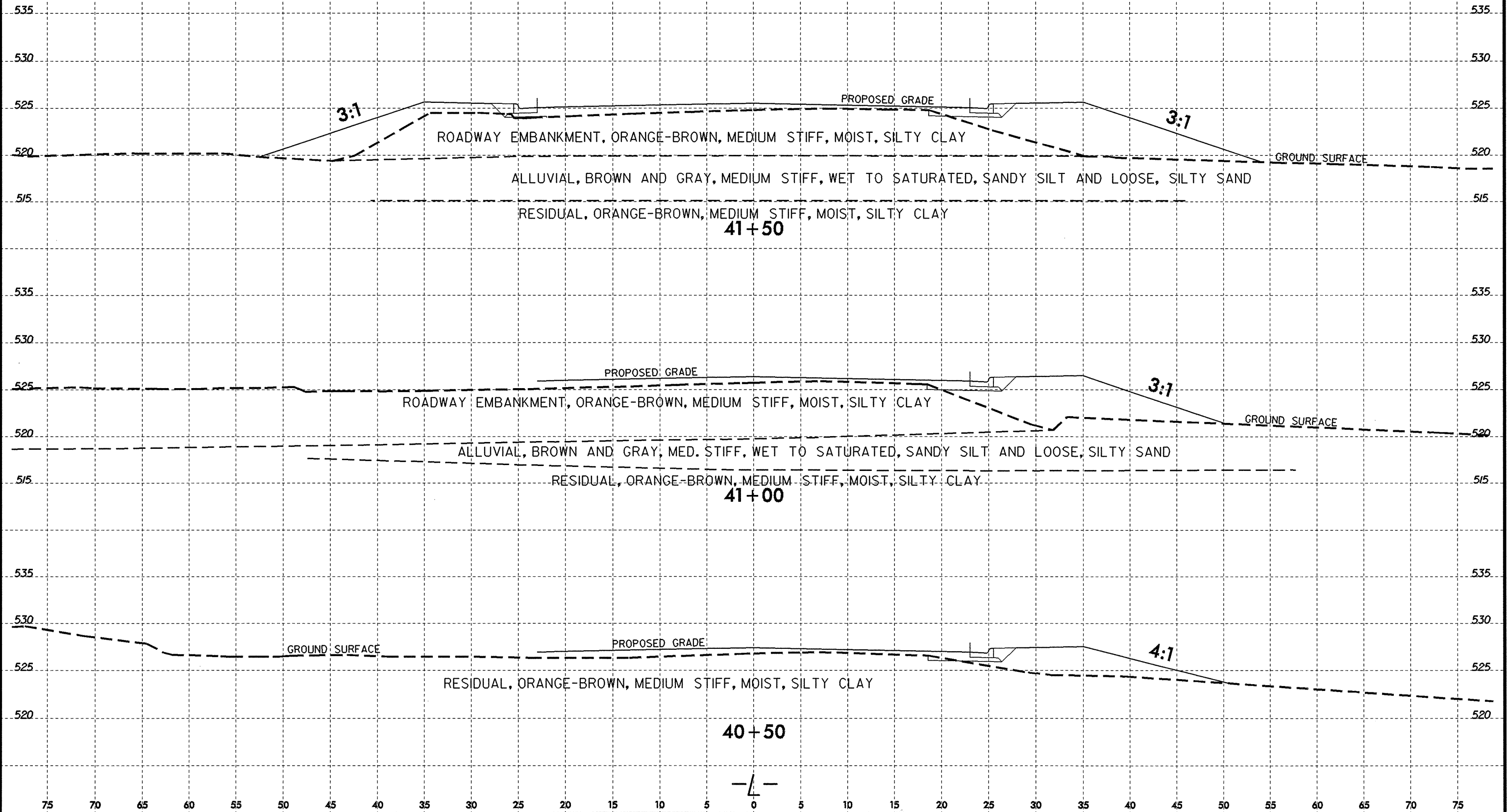


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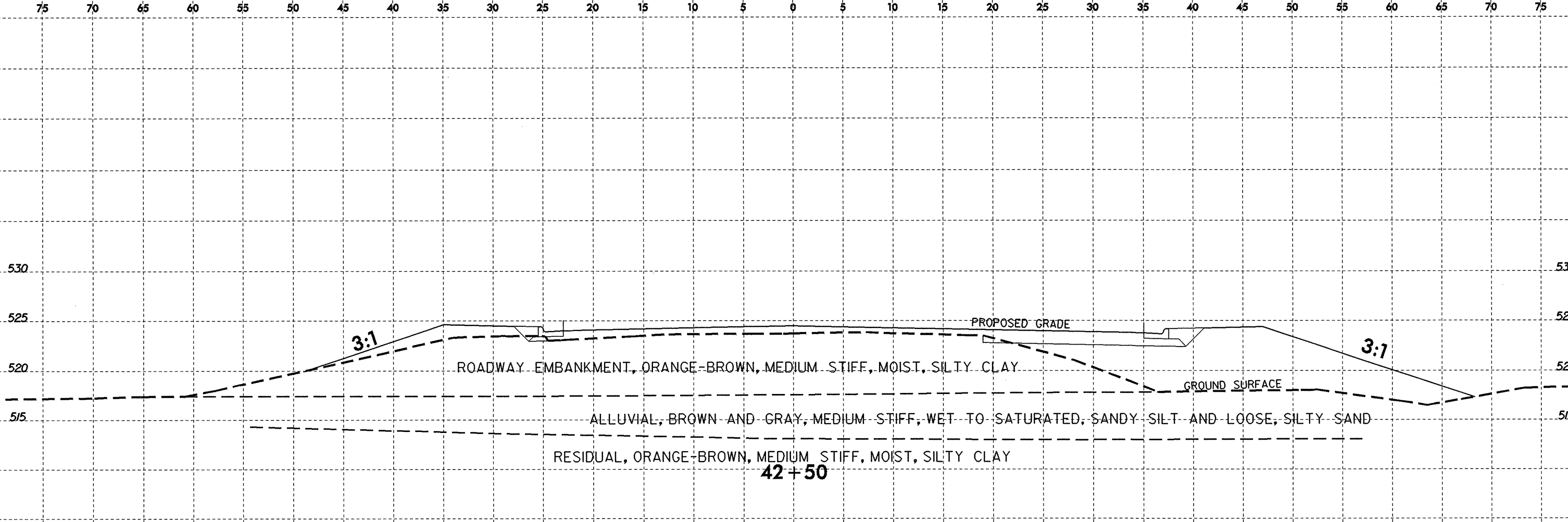
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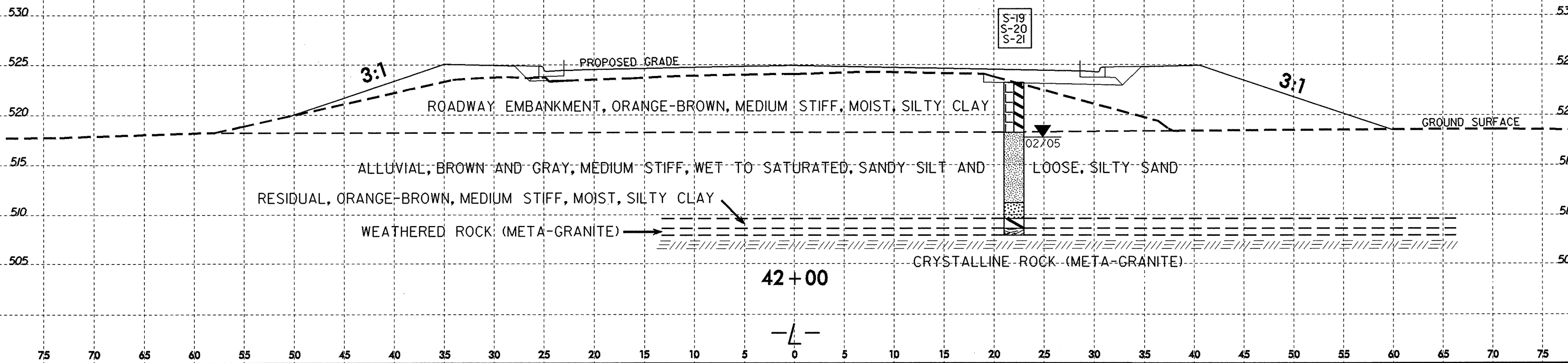
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8/23/99
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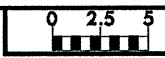


SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-19	22 RT	42+00	3.0-4.5	A-7-6(14)	48	25	16.8	19.0	15.8	48.5	96	88	64	-	-
S-20	22 RT	42+00	8.0-9.5	A-4(2)	27	9	20.0	34.1	17.6	28.3	98	91	51	-	-
S-21	22 RT	42+00	12.0-13.5	A-2-4(0)	20	3	34.1	31.9	13.7	20.2	91	79	34	-	-



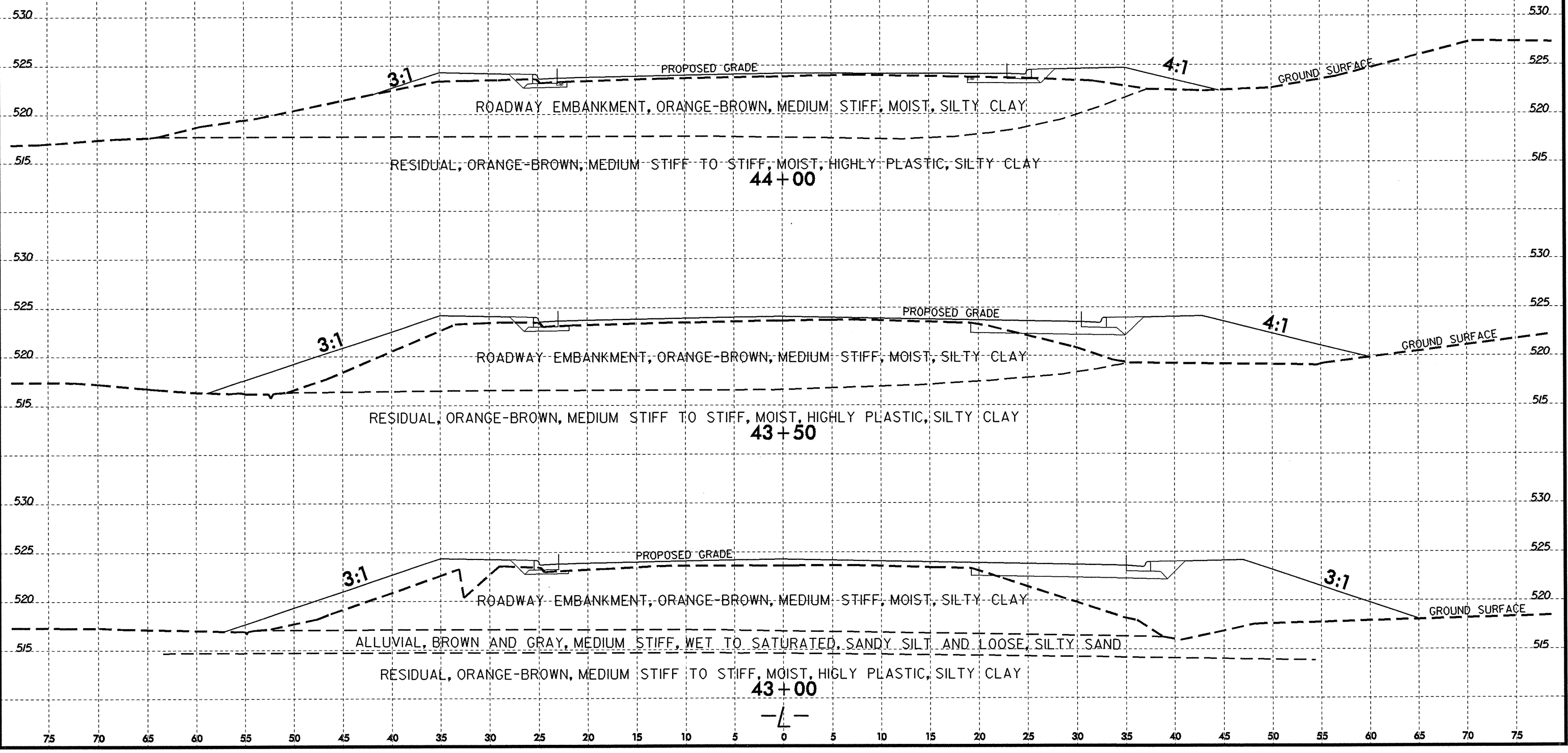
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8/23/99



PROJ. REFERENCE NO.	SHEET NO.
U-3306	36

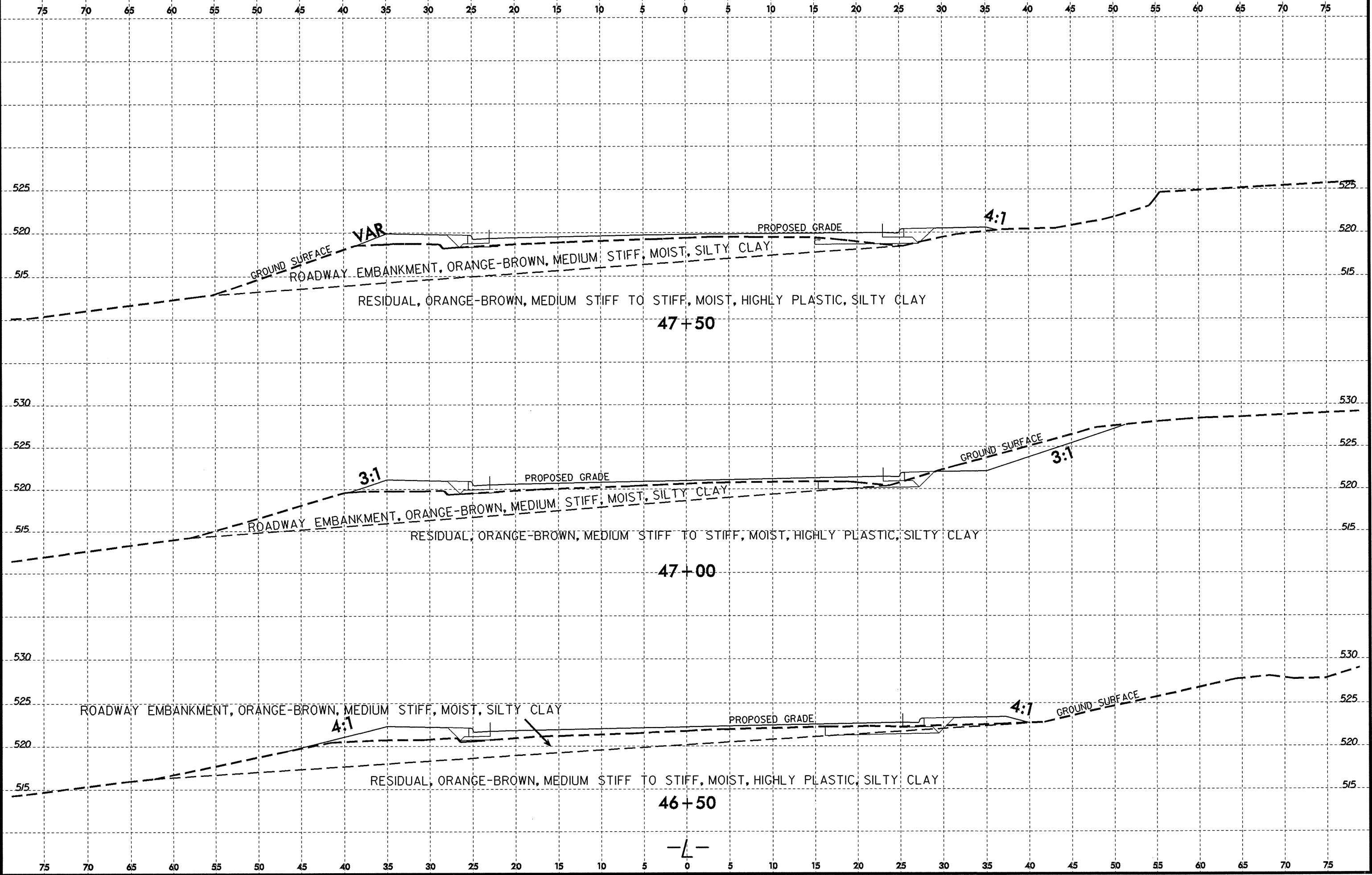
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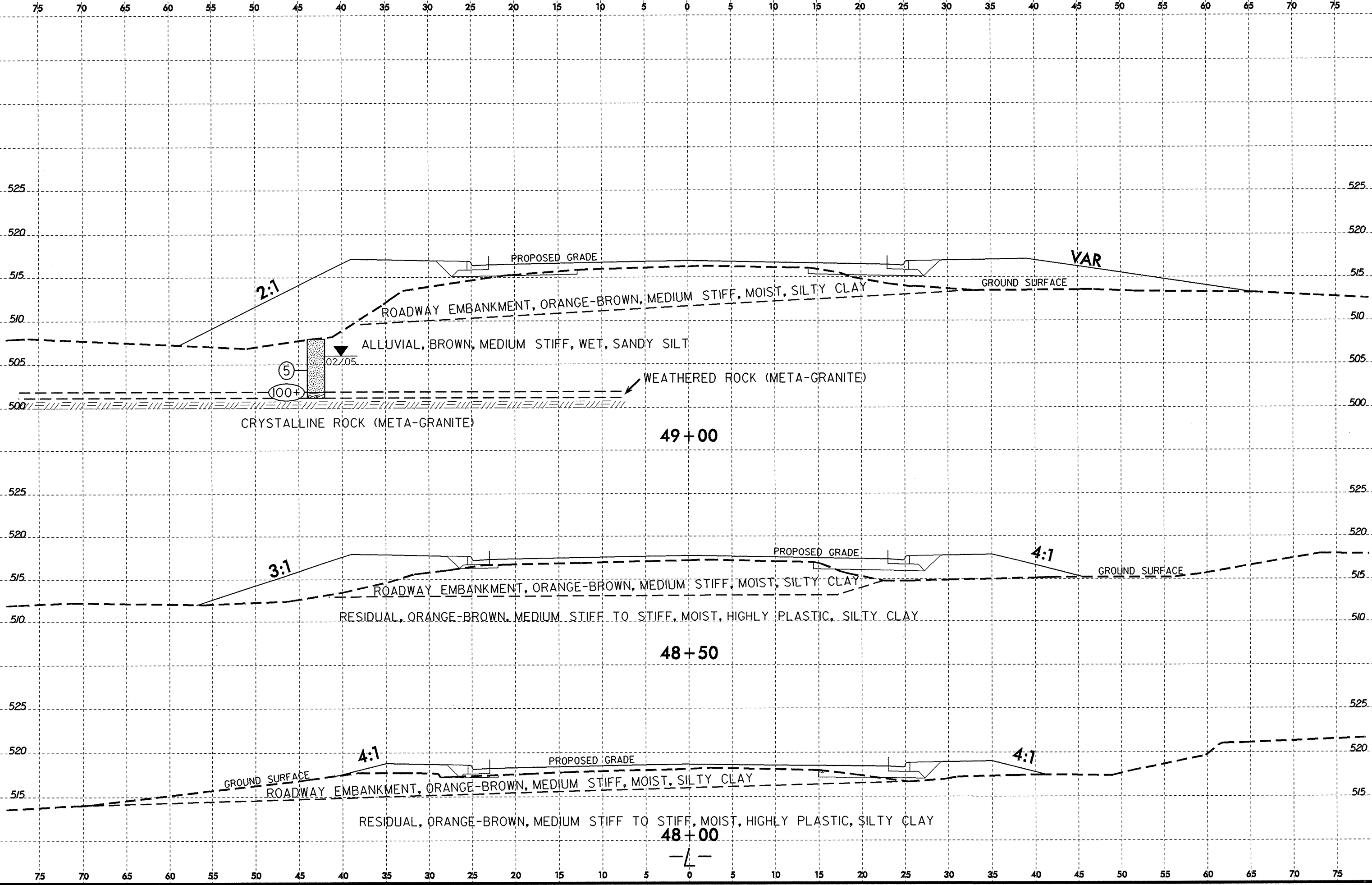
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8/23/99
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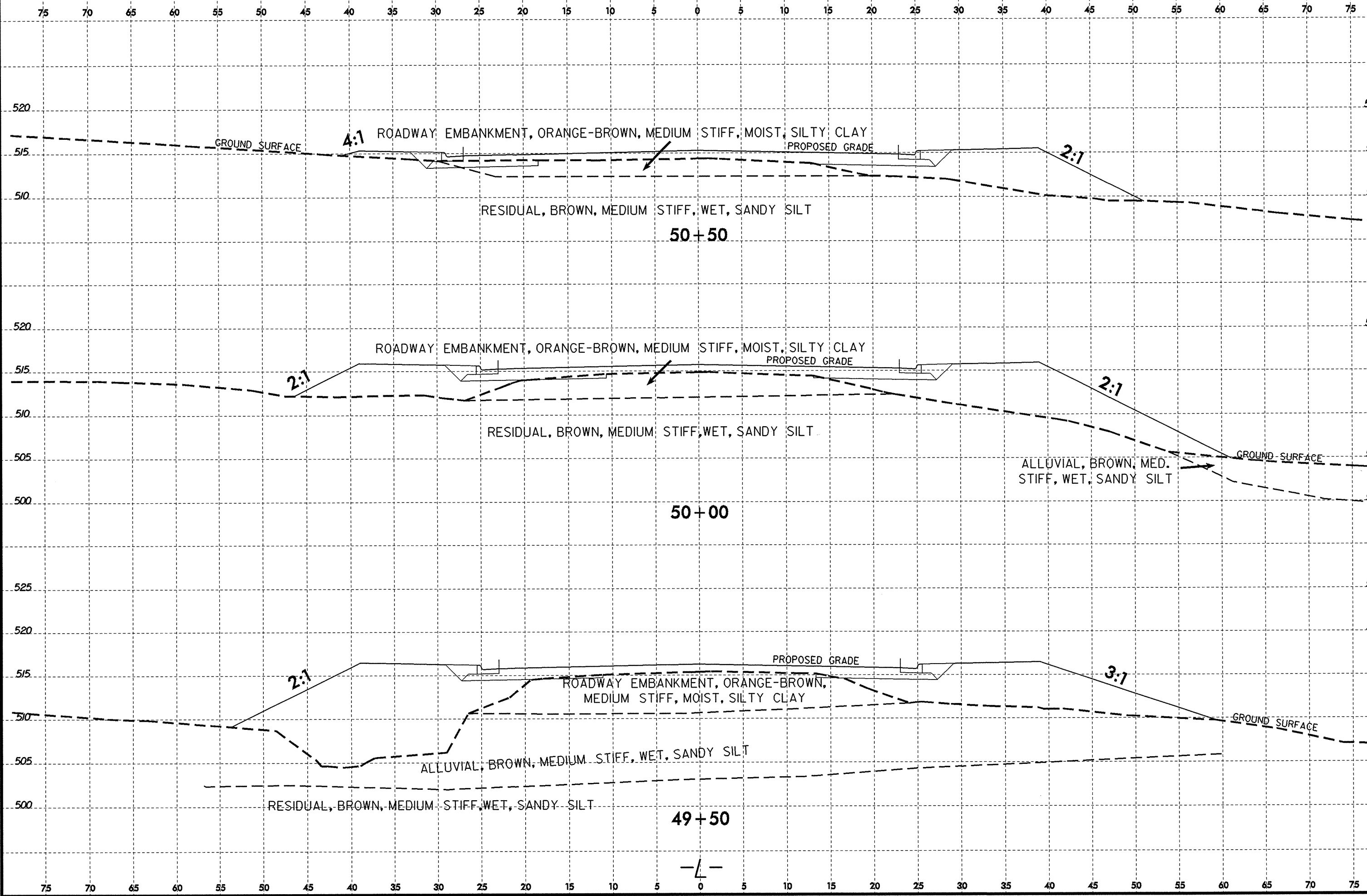


8/23/99



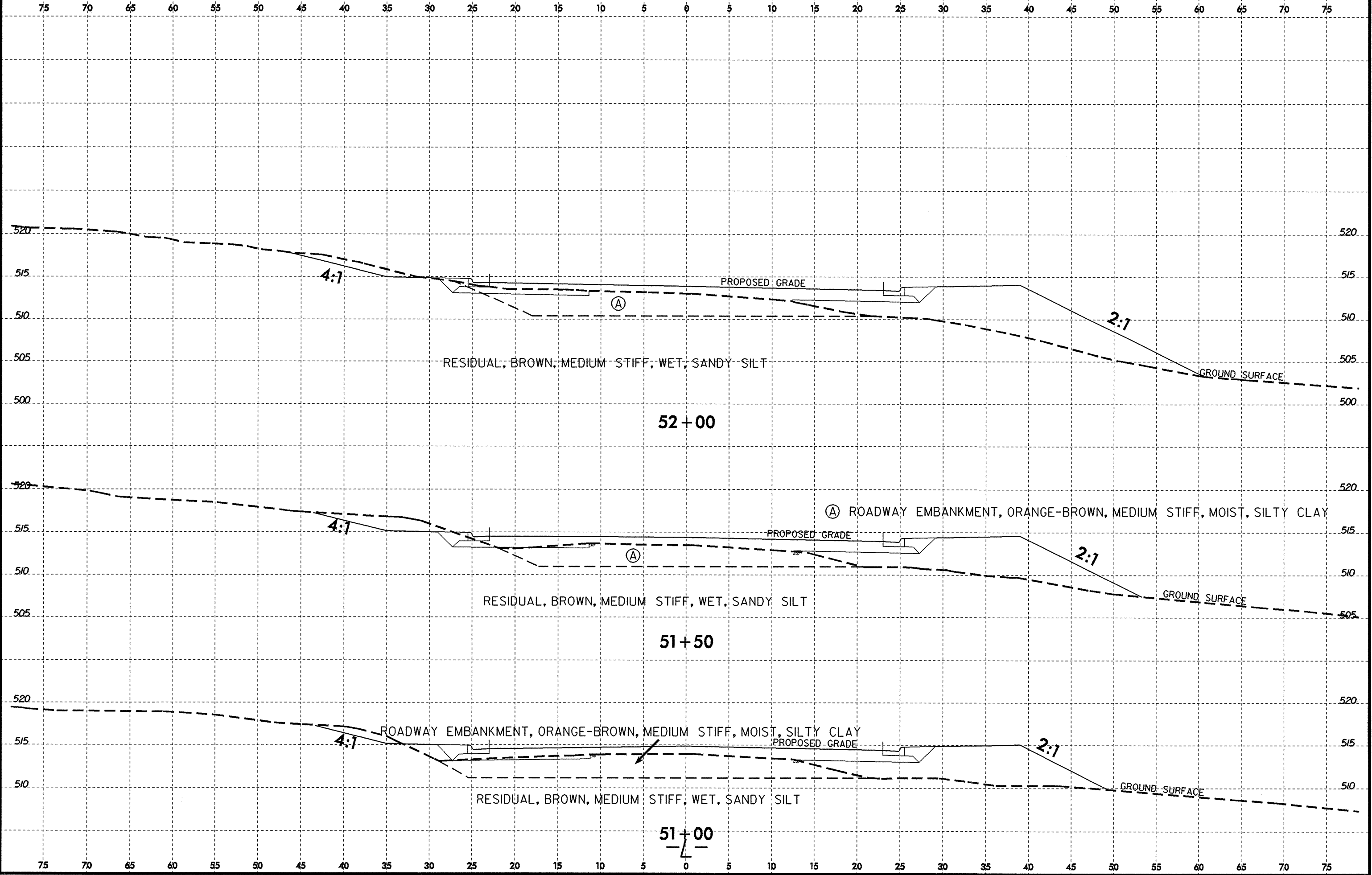
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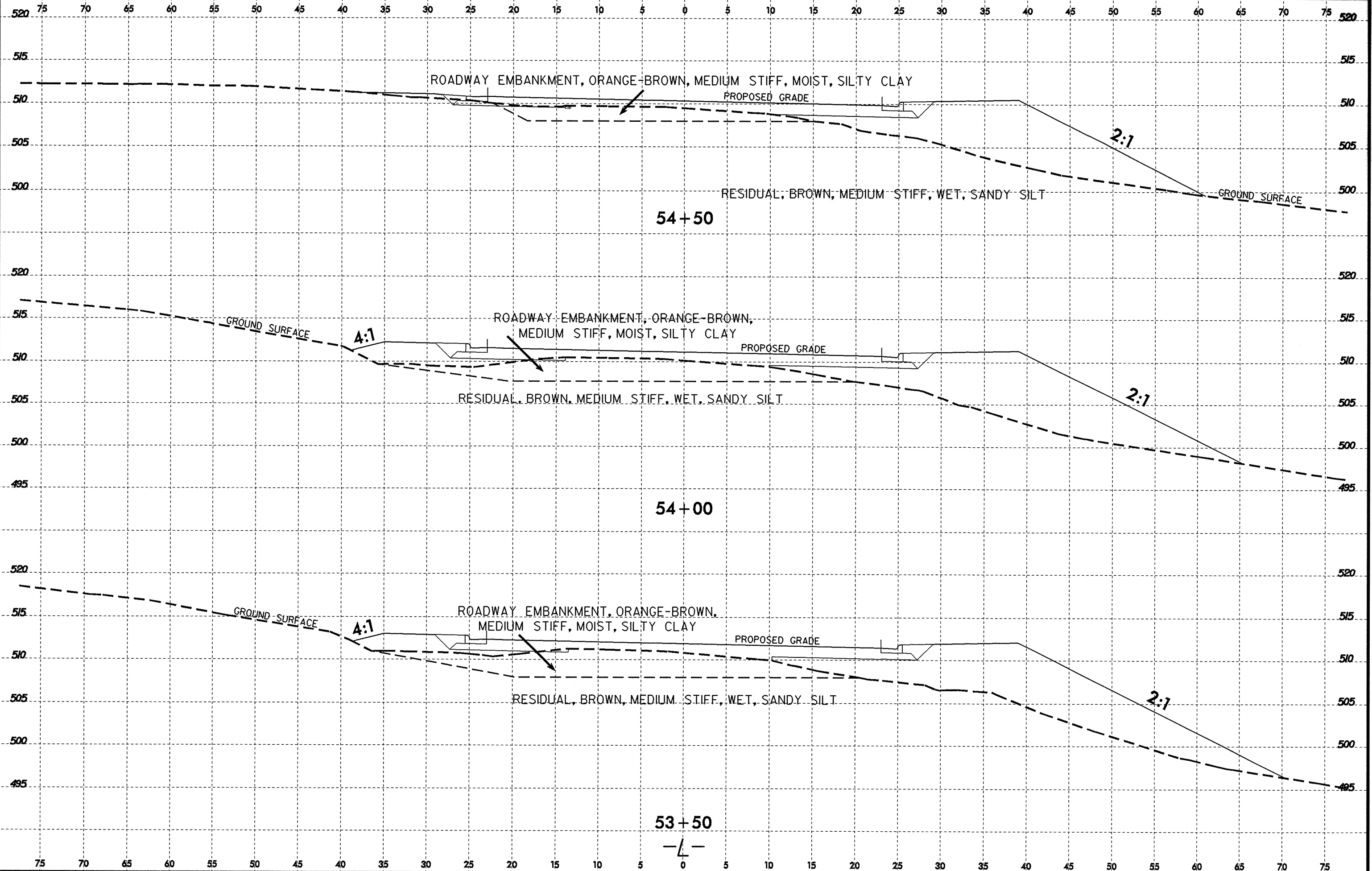


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8/23/99
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8/23/99

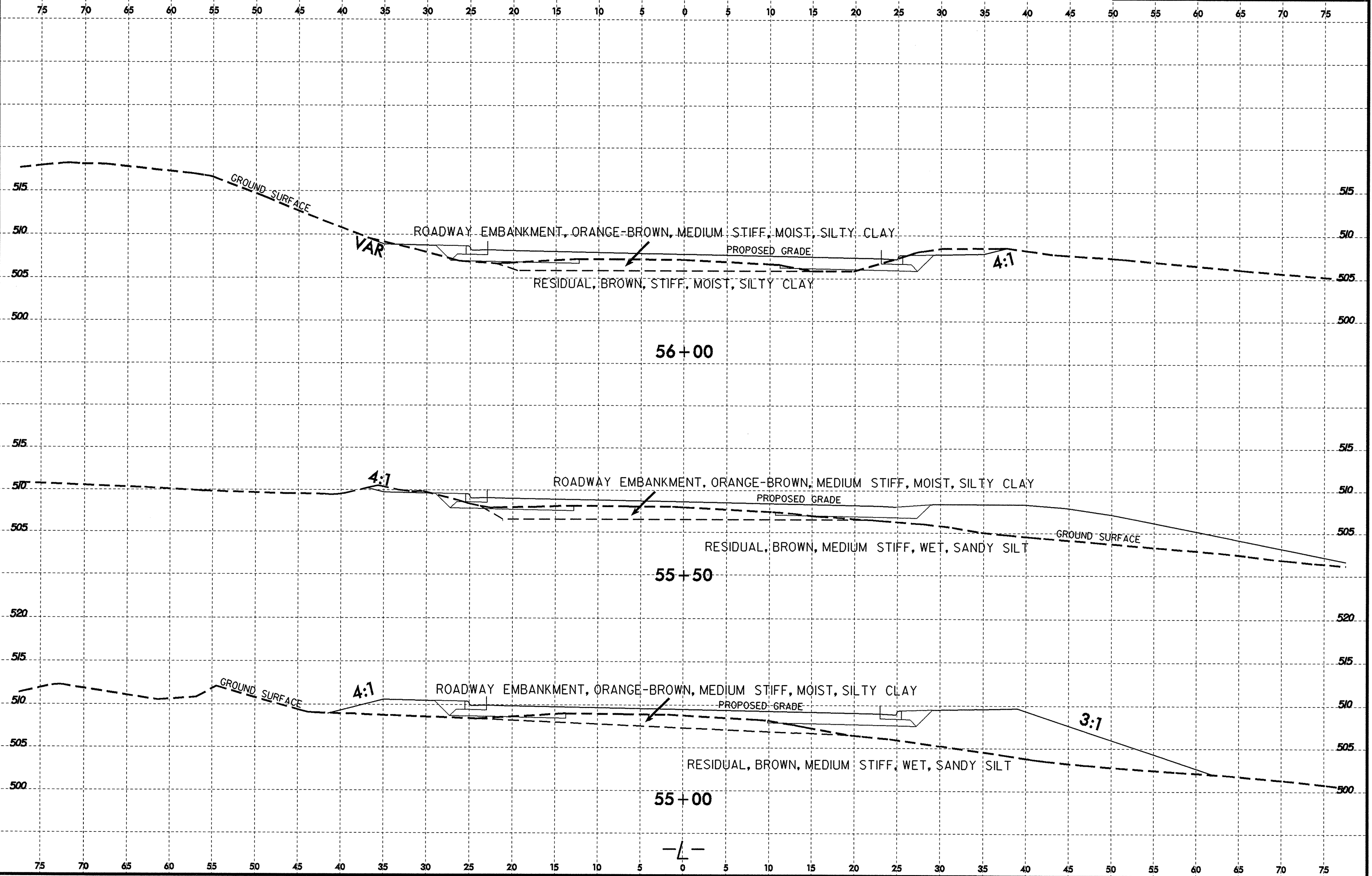


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8/23/99

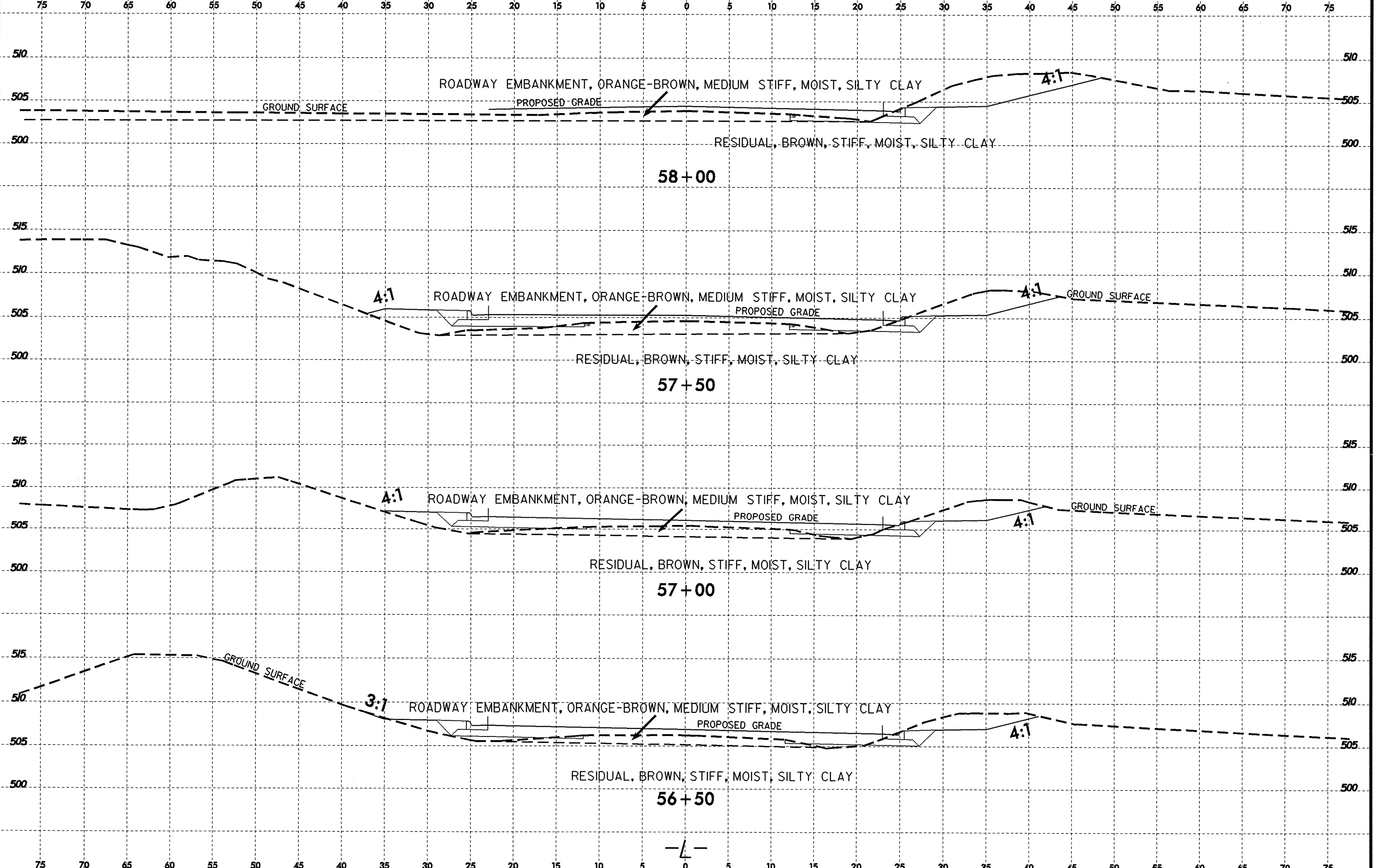


PROJ. REFERENCE NO.	SHEET NO.
U-3306	44

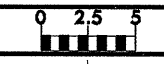


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8/23/99
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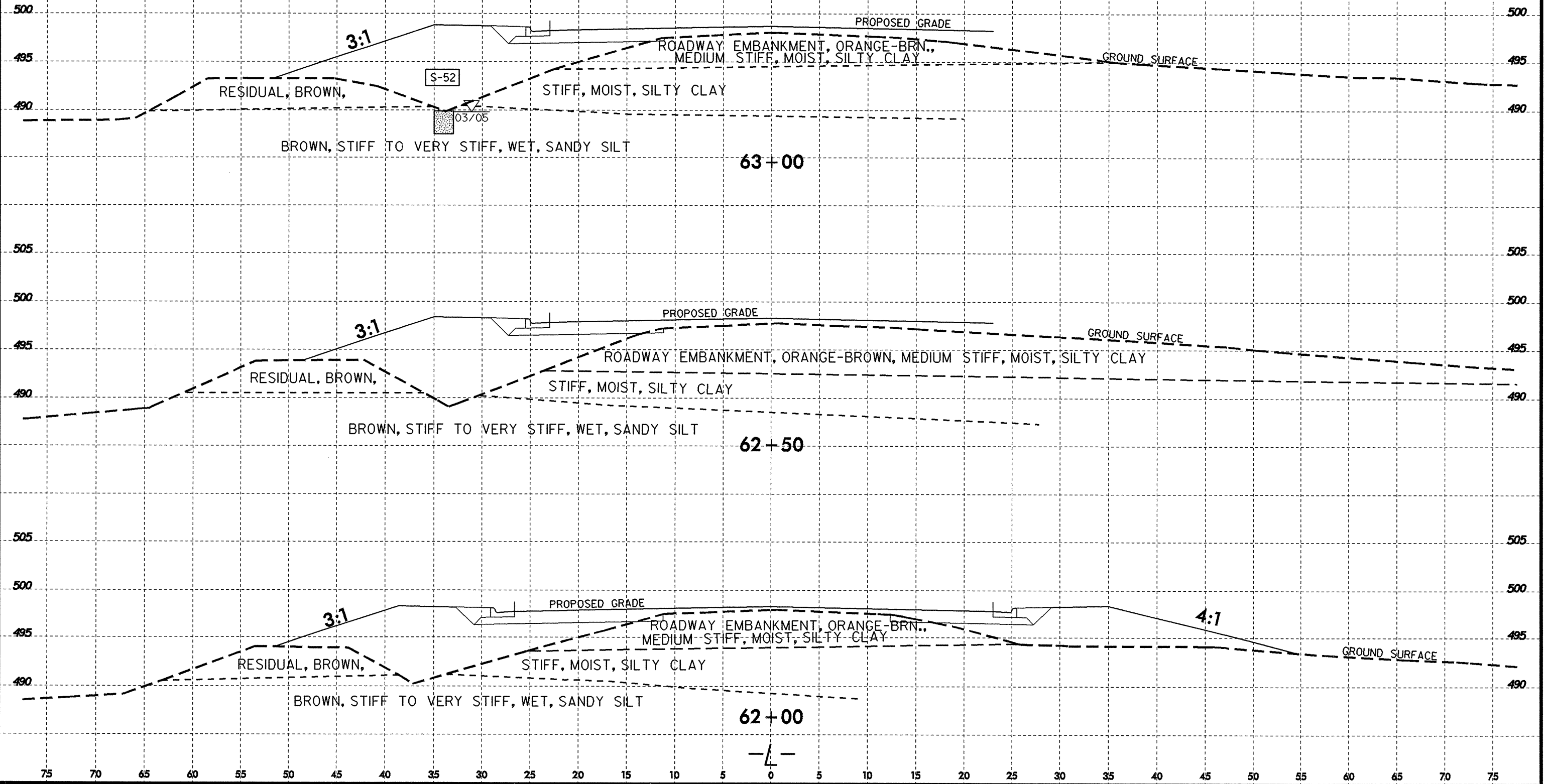


8/23/99



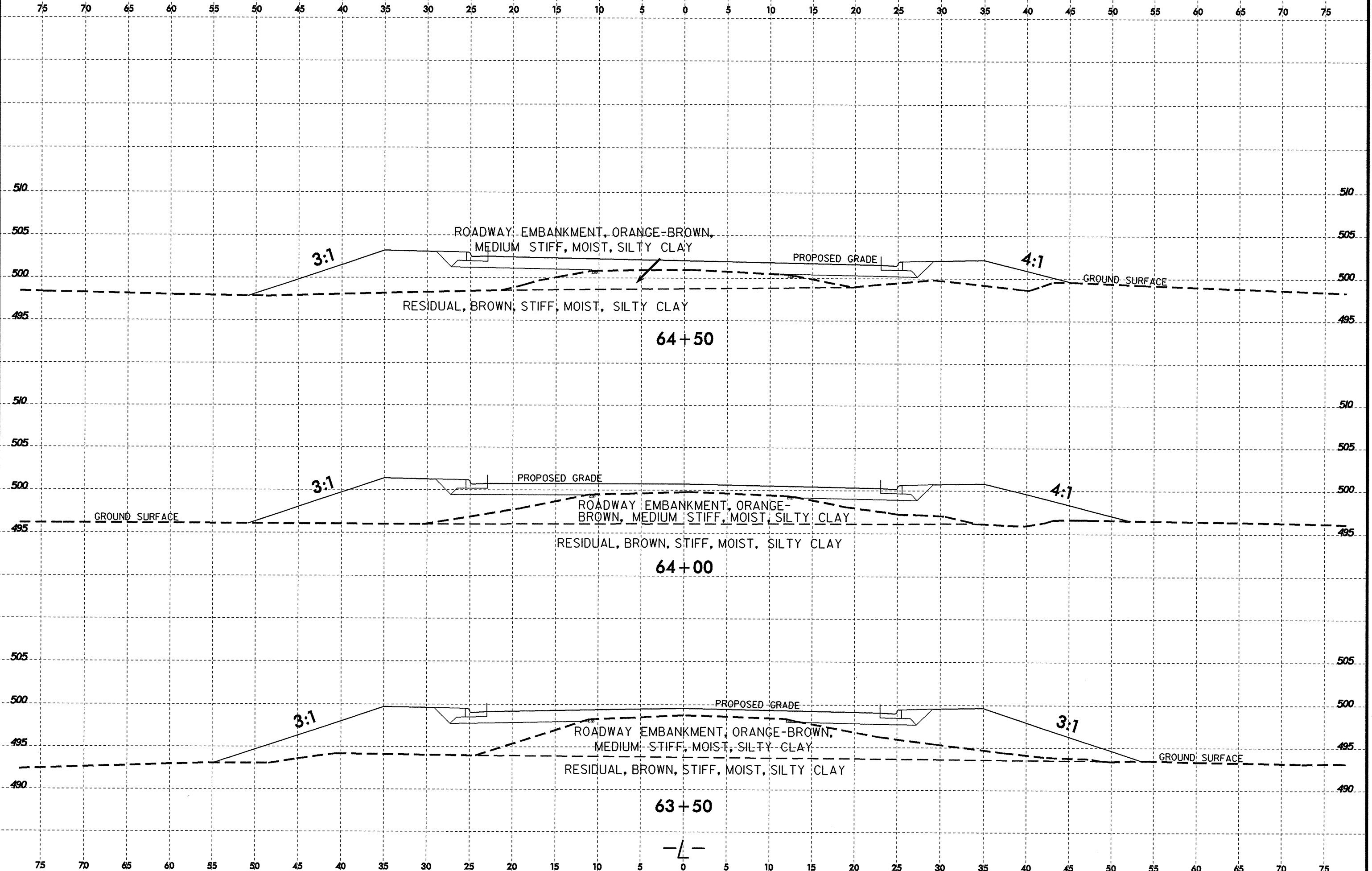
PROJ. REFERENCE NO.	SHEET NO.
U-3306	48

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-52	34 LT	63+00	0.5-2.0	A-4(0)	18	NP	15.0	48.6	26.2	10.2	100	95	44	-	-



10-AUG-2006 15:23 L:\ERD\Rel\g...tion\TIP\U3306_GEO\RDW\CADD_GEOTECH\asc\ur-3306_geo_xst-12.dgn

8/23/99



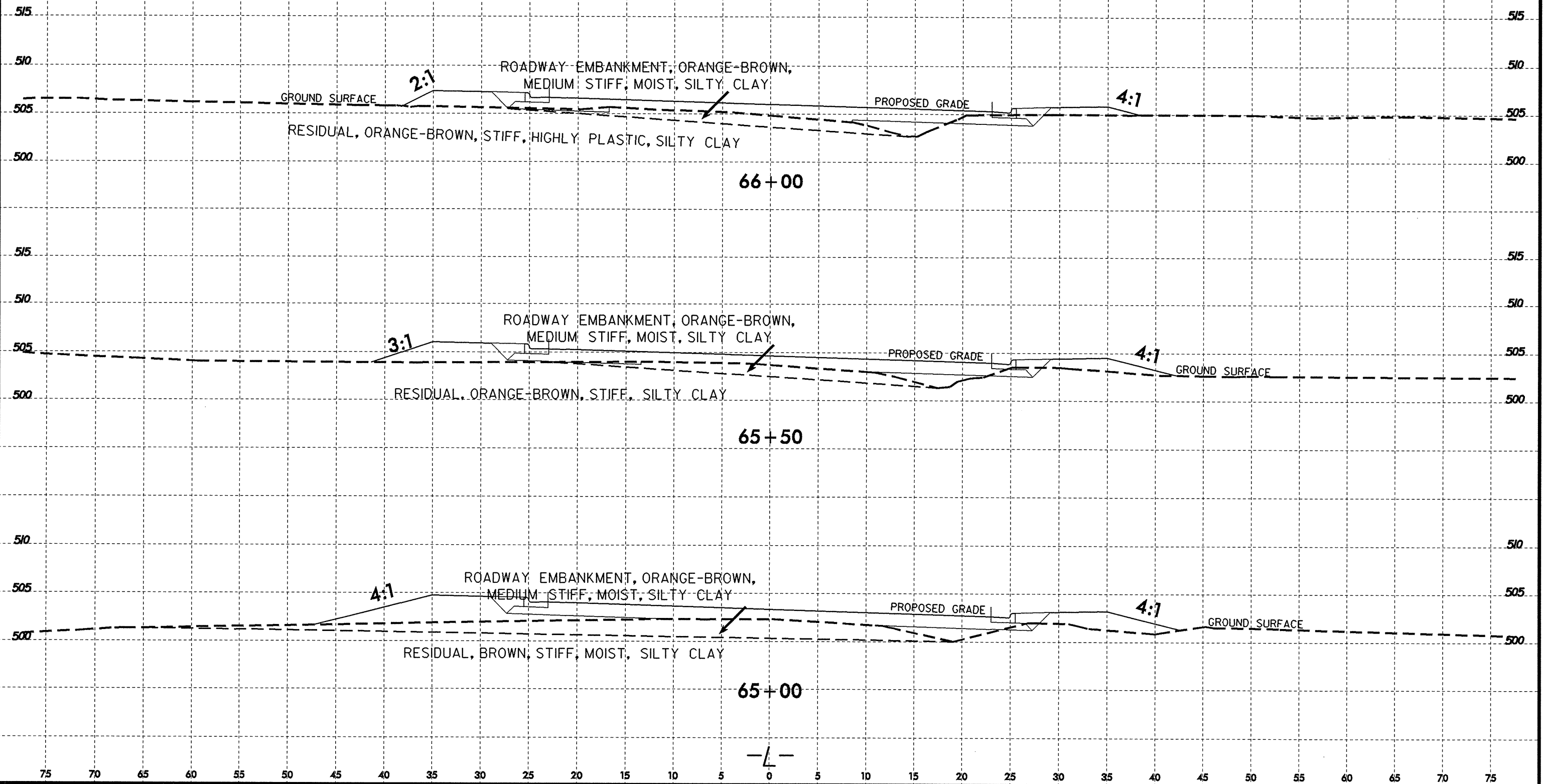
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8/23/99



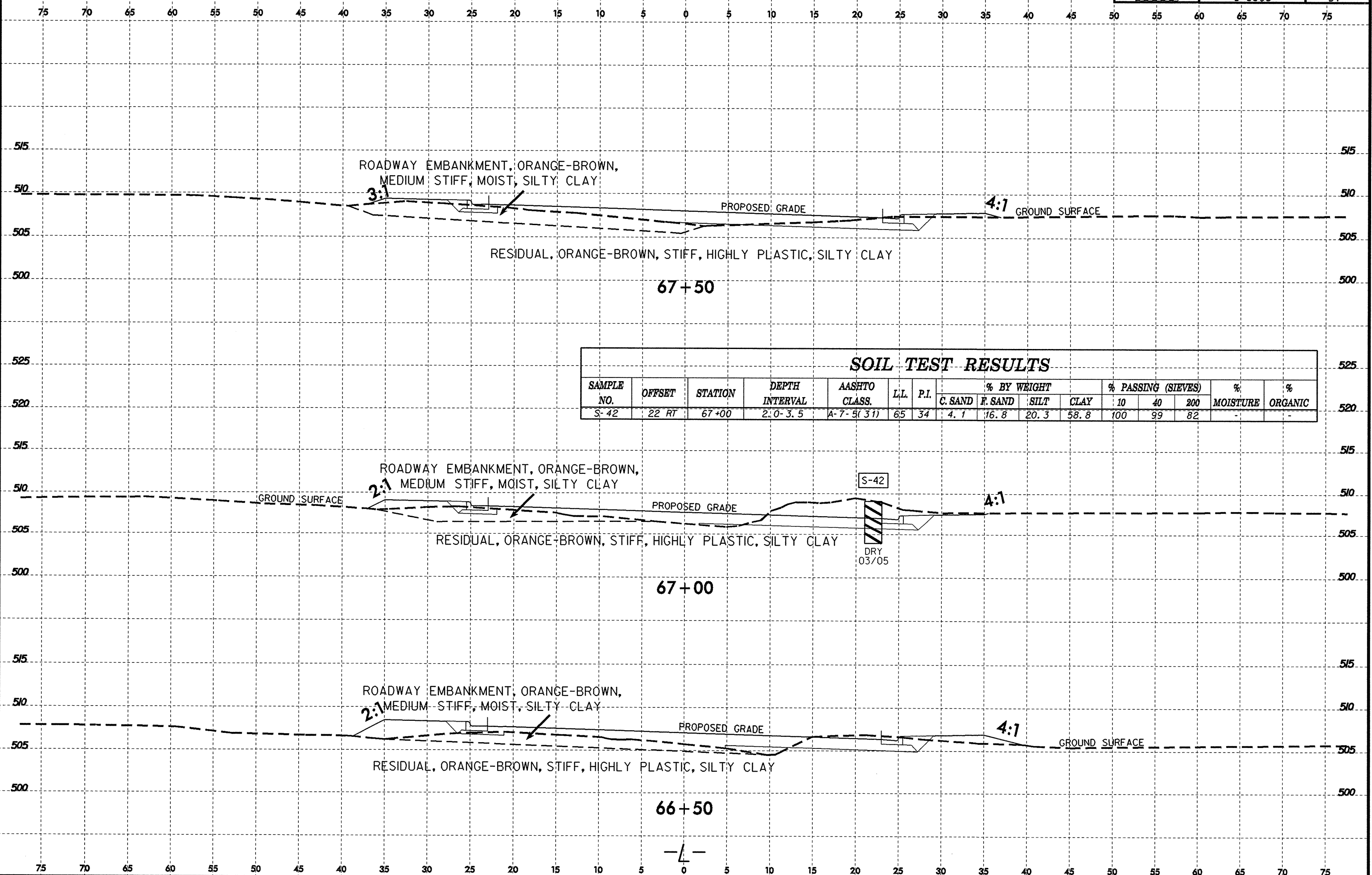
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U-3306	50

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 15224

8/23/99



SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-42	22 RT	67+00	2.0-3.5	A-7-5(31)	65	34	4.1	16.8	20.3	58.8	100	99	82	-	-

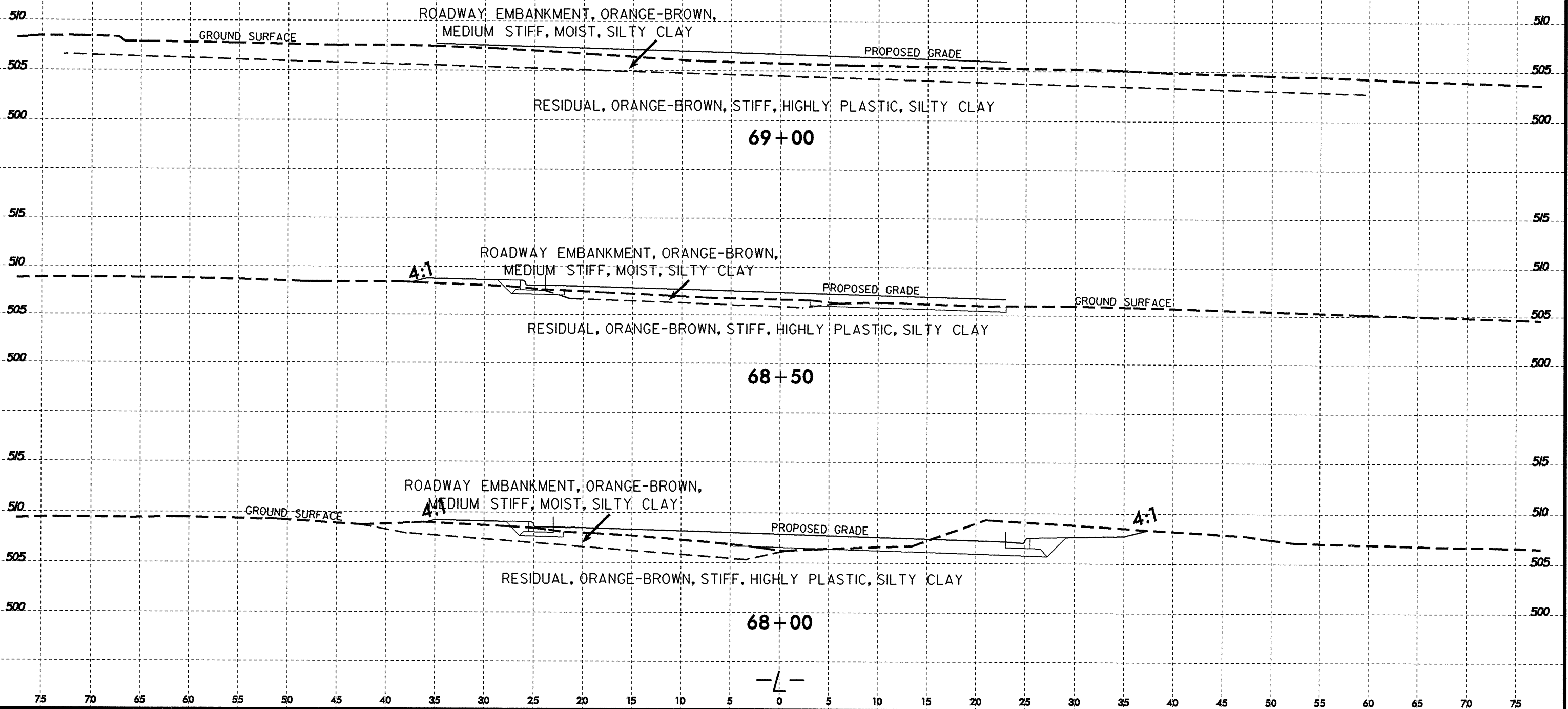
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8/23/99



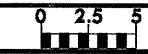
PROJ. REFERENCE NO.	SHEET NO.
U-3306	52

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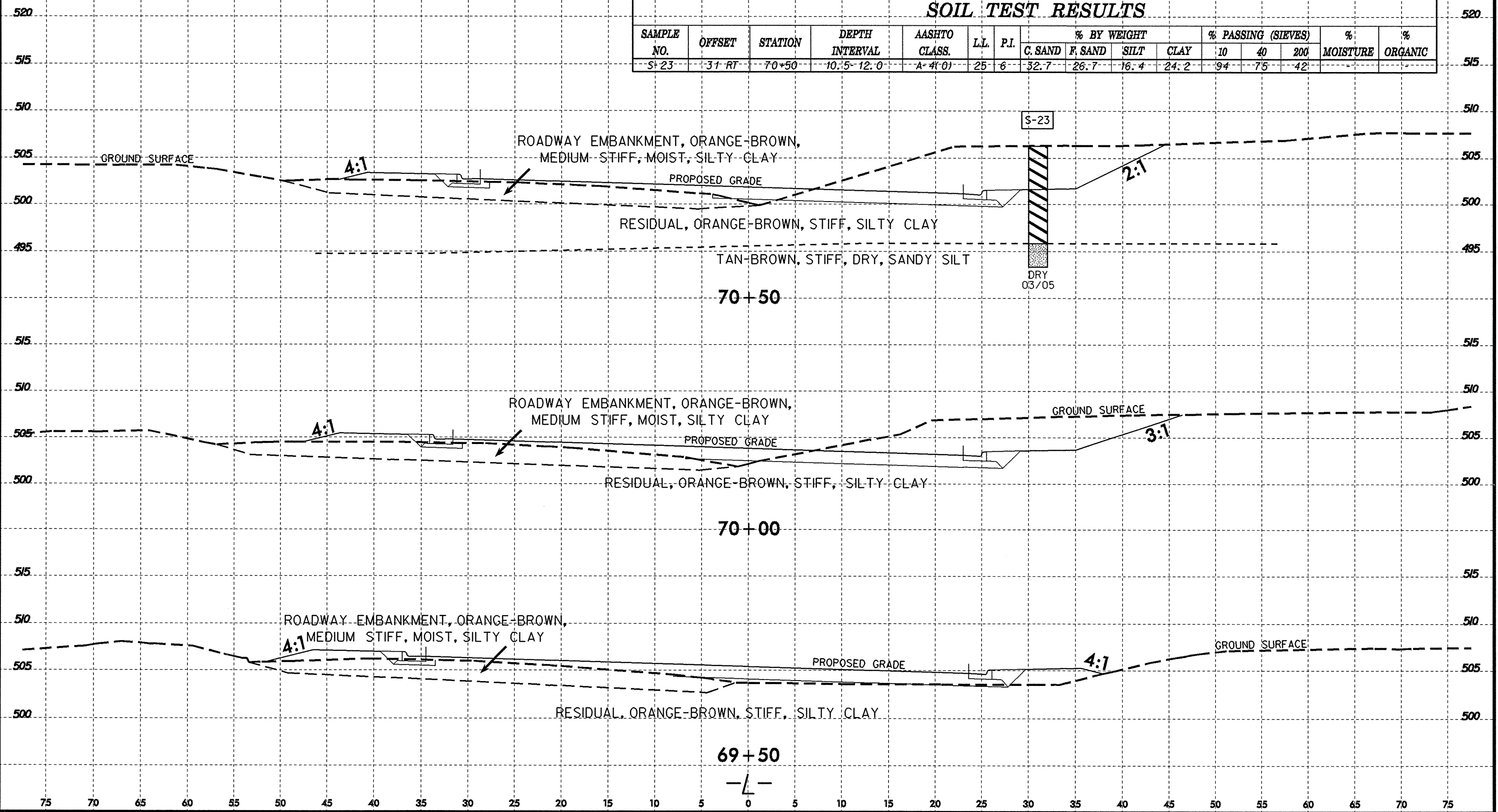
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8/23/99



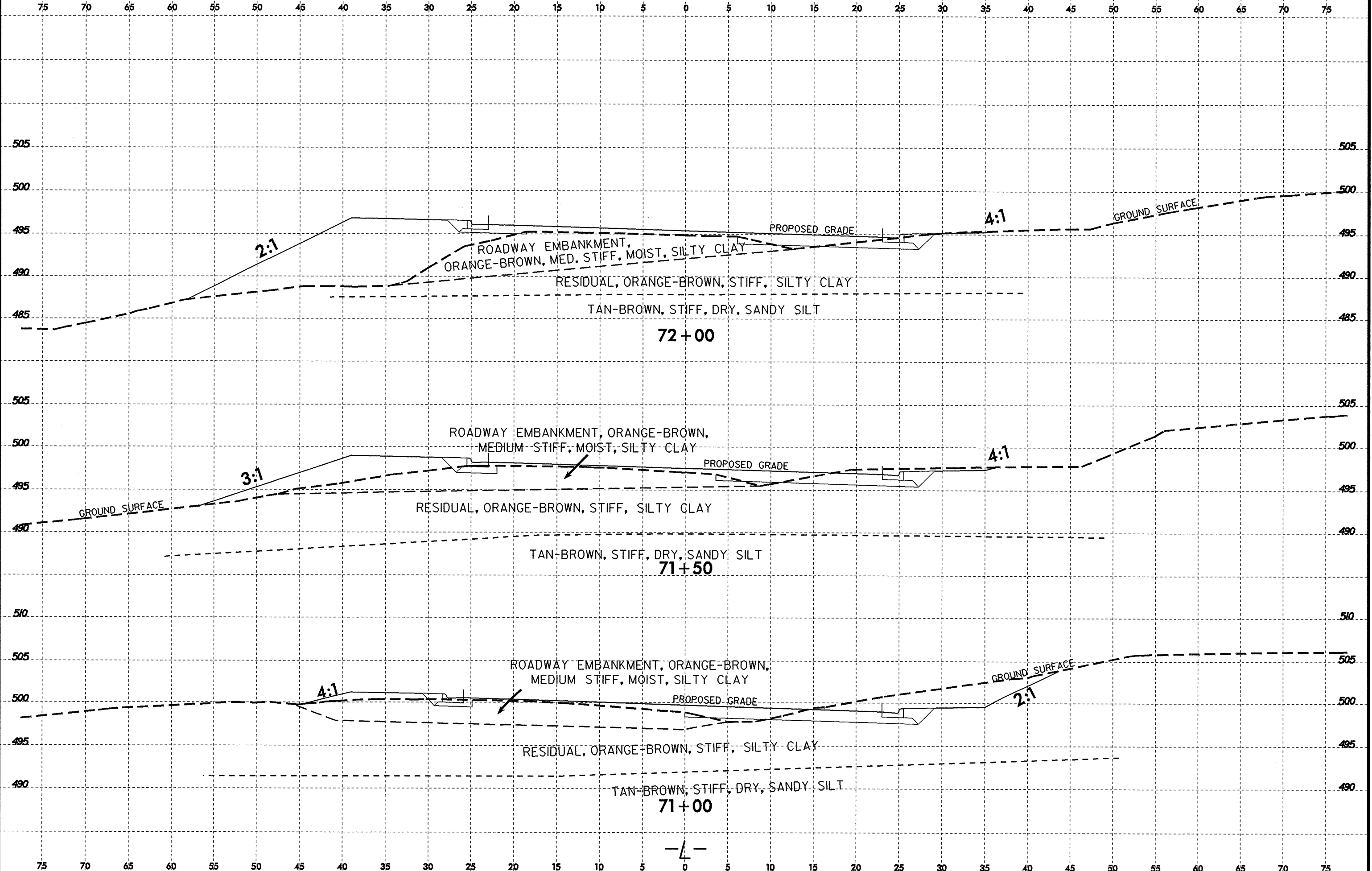
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SOIL TEST RESULTS															
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							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-23	31 RT	70+50	10.5-12.0	A-4(0)	25	6	32.7	26.7	16.4	24.2	94	75	42		



10-AUG-2006 15:25 L:\BRO-Hole\proj\1000\station\TIP\U3306-GEO-ROADWAY-CADD-GEOTECH\asc\ur-3306-geo-xst-12.dgn

8/23/99

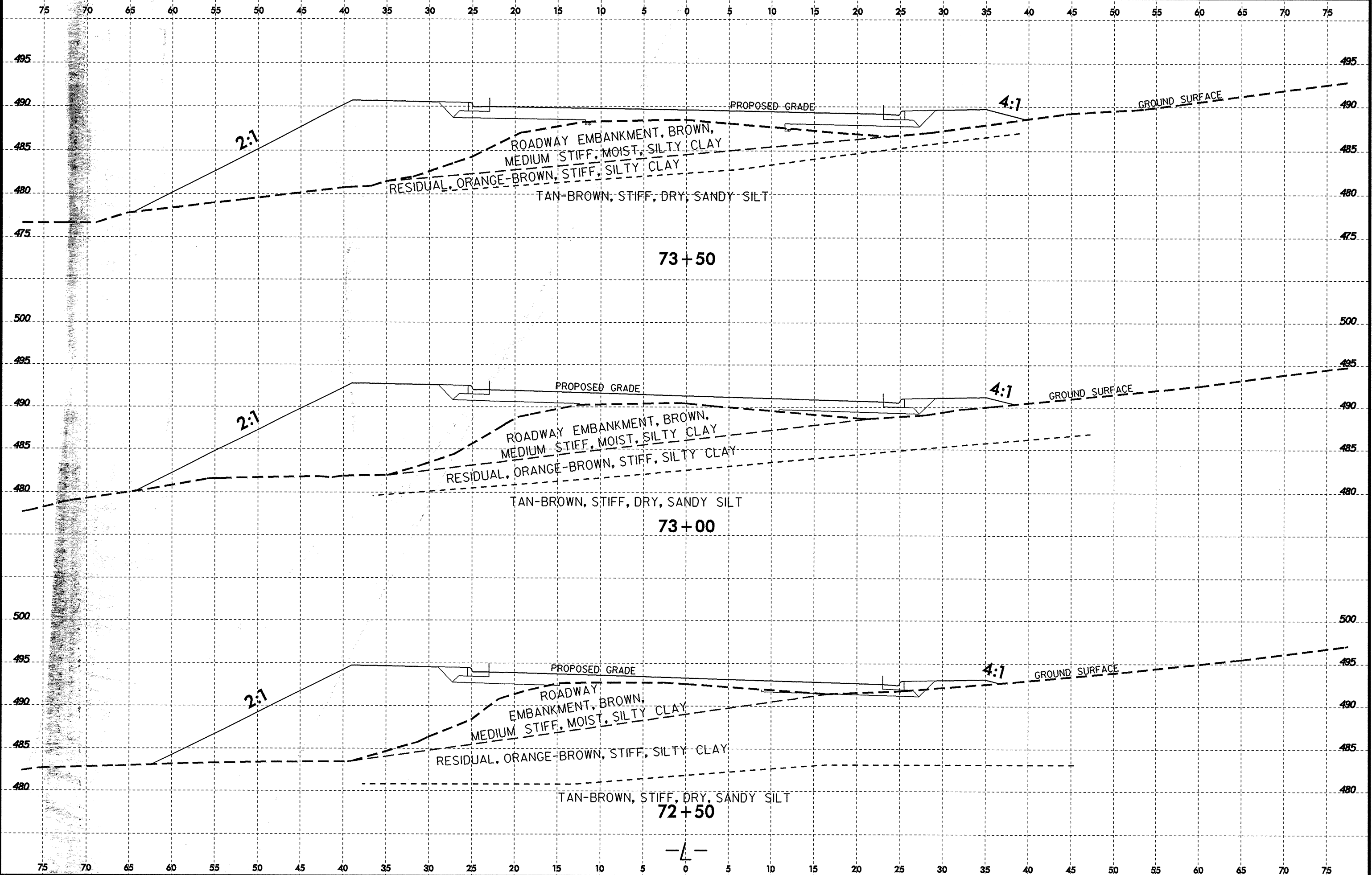


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8/23/09
10-AUG-2006 15:25
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PROJ. REFERENCE NO.	SHEET NO.
U-3306	55



73+50

73+00

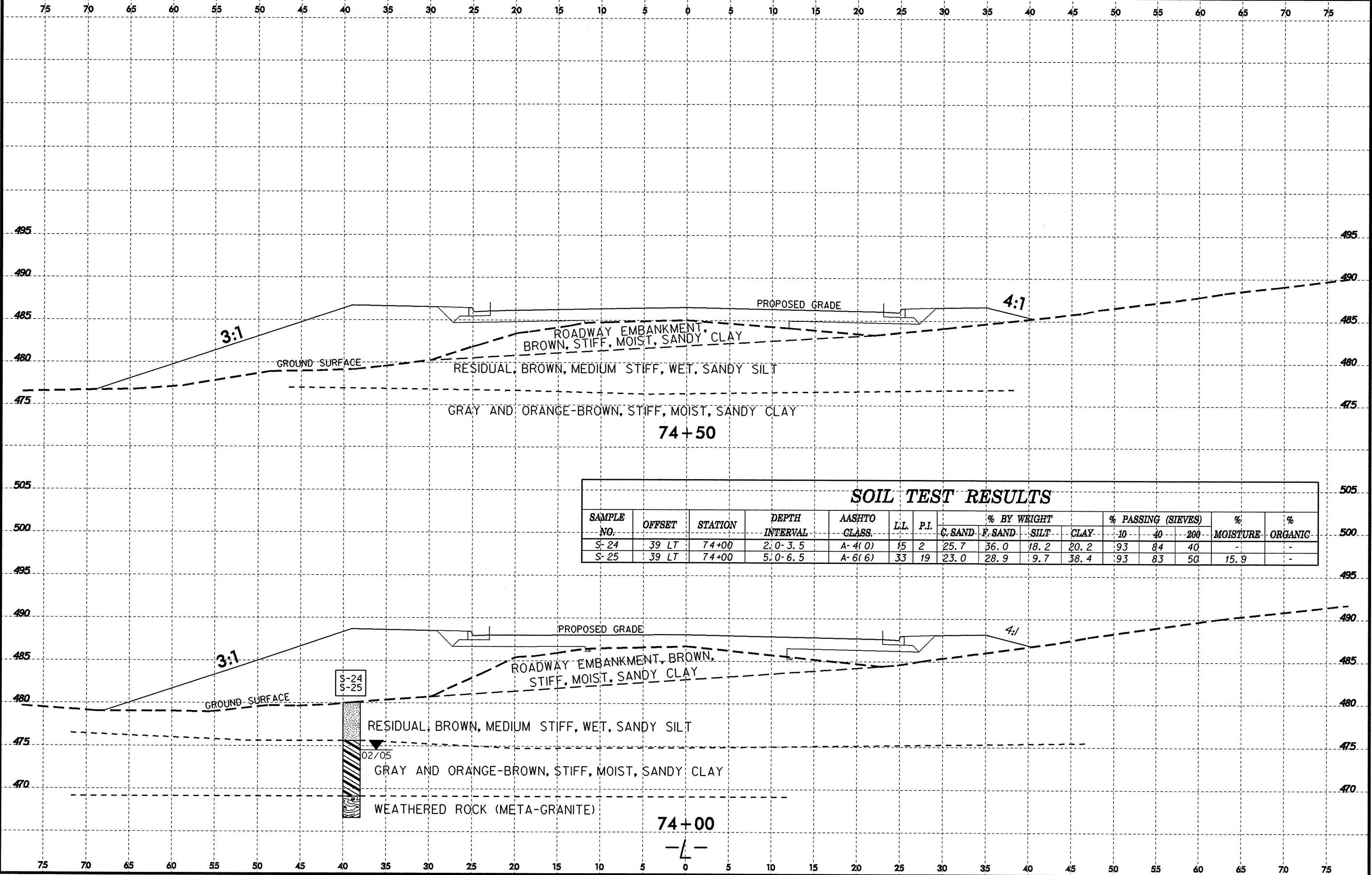
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8/23/99



PROJ. REFERENCE NO. U-3306 SHEET NO. 56

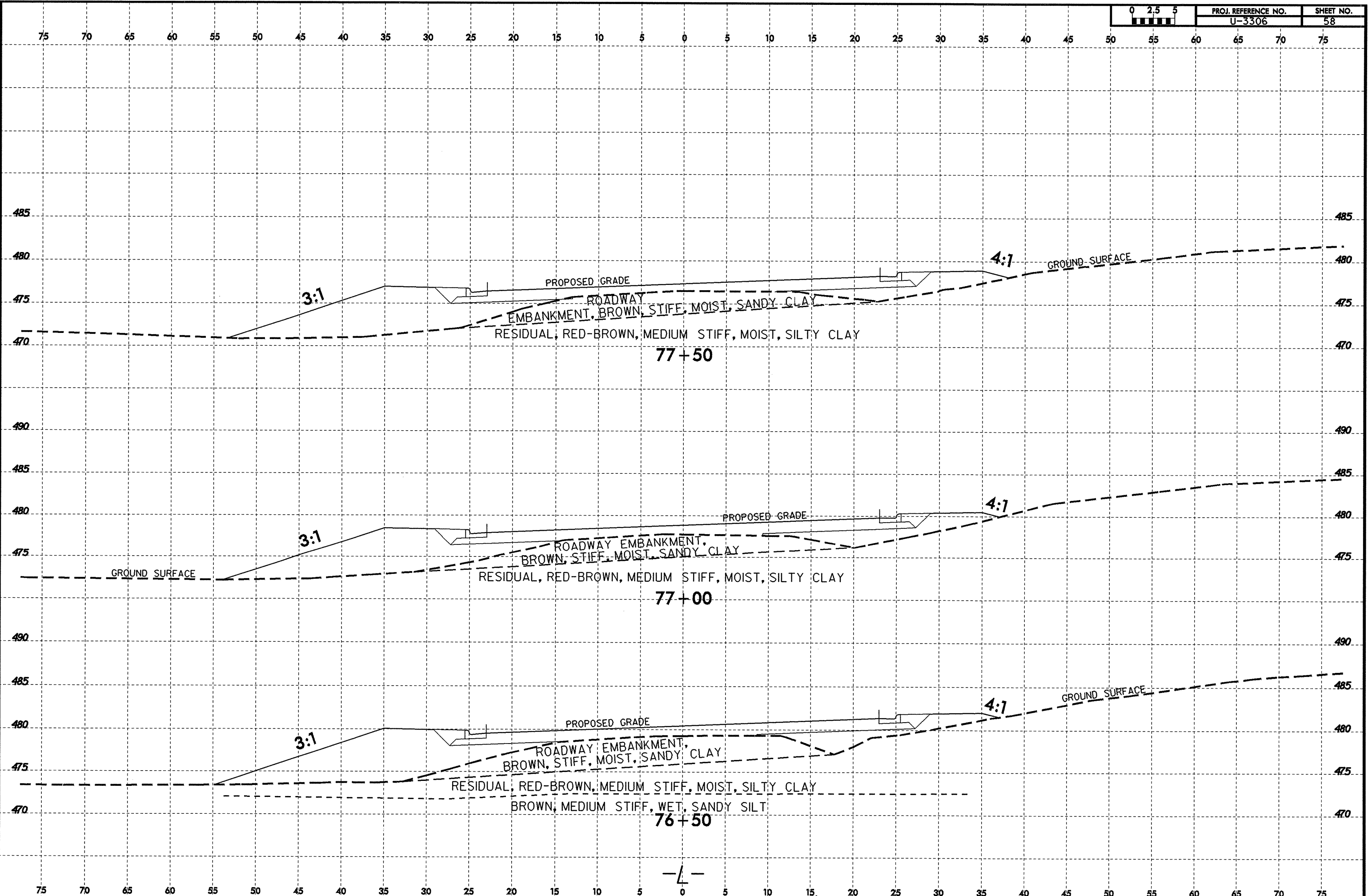


SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							G. SAND	F. SAND	SILT	CLAY	10	40	200		
S-24	39 LT	74+00	2.0-3.5	A-4(0)	15	2	25.7	36.0	18.2	20.2	93	84	40	-	-
S-25	39 LT	74+00	5.0-6.5	A-6(6)	33	19	23.0	28.9	9.7	38.4	93	83	50	15.9	-

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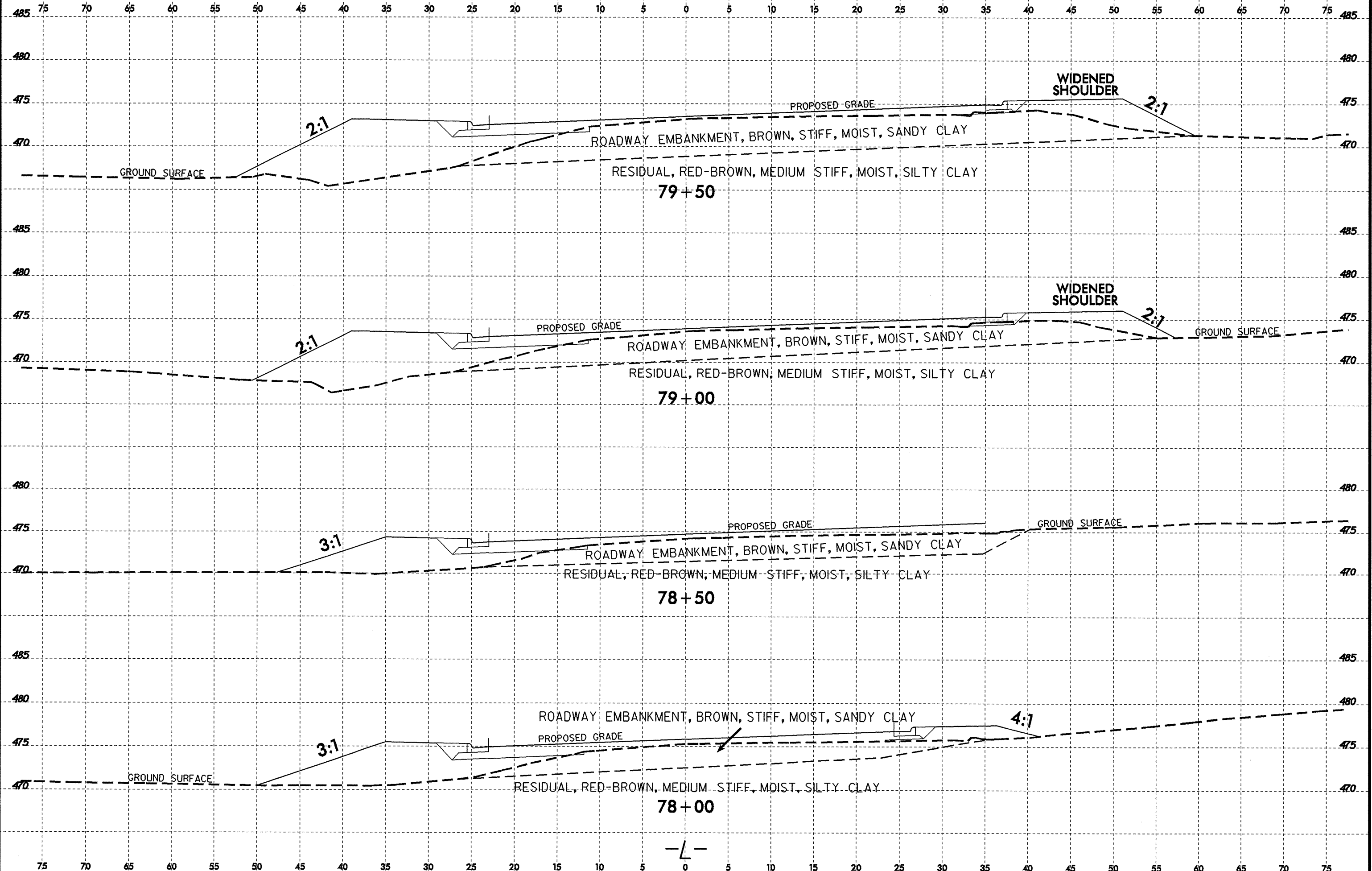
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8/23/99



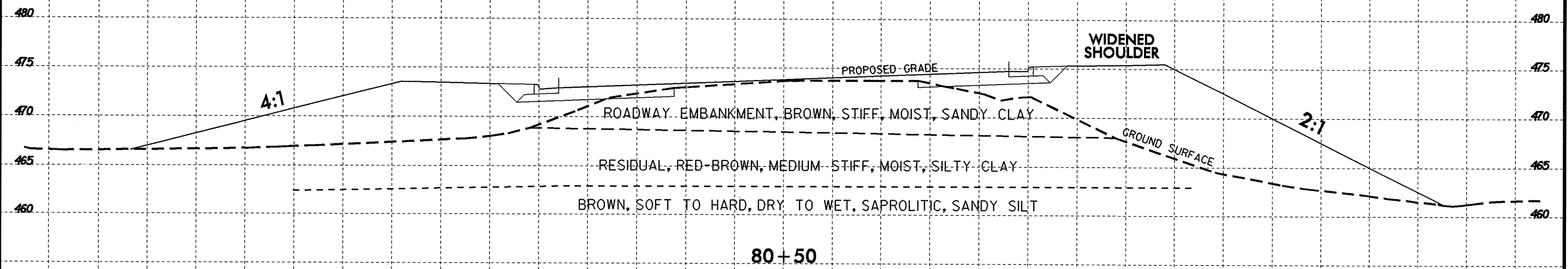
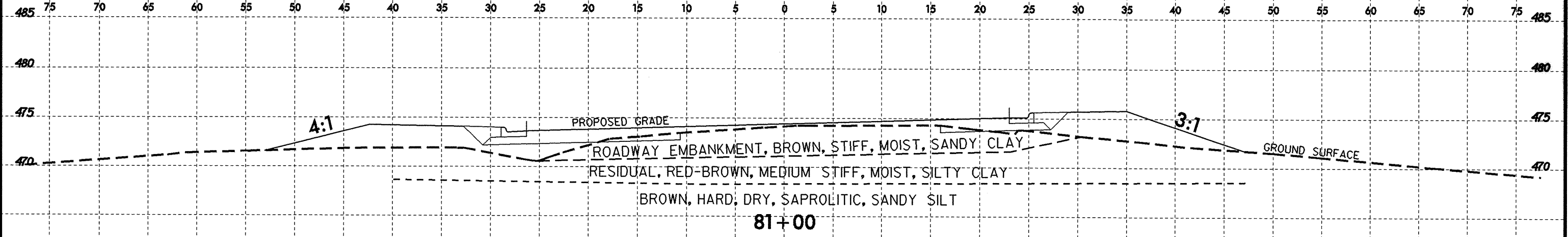
PROJ. REFERENCE NO.	SHEET NO.
U-3306	59



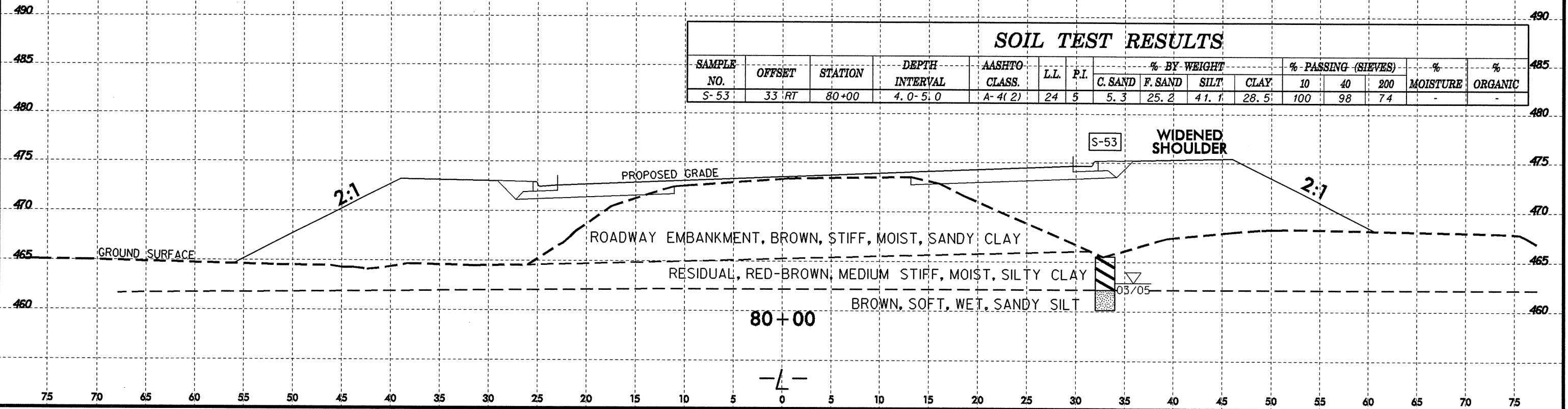
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SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-53	33 RT	80+00	4.0-5.0	A-4(2)	24	5	5.3	25.2	41.1	28.5	100	98	74	-	-

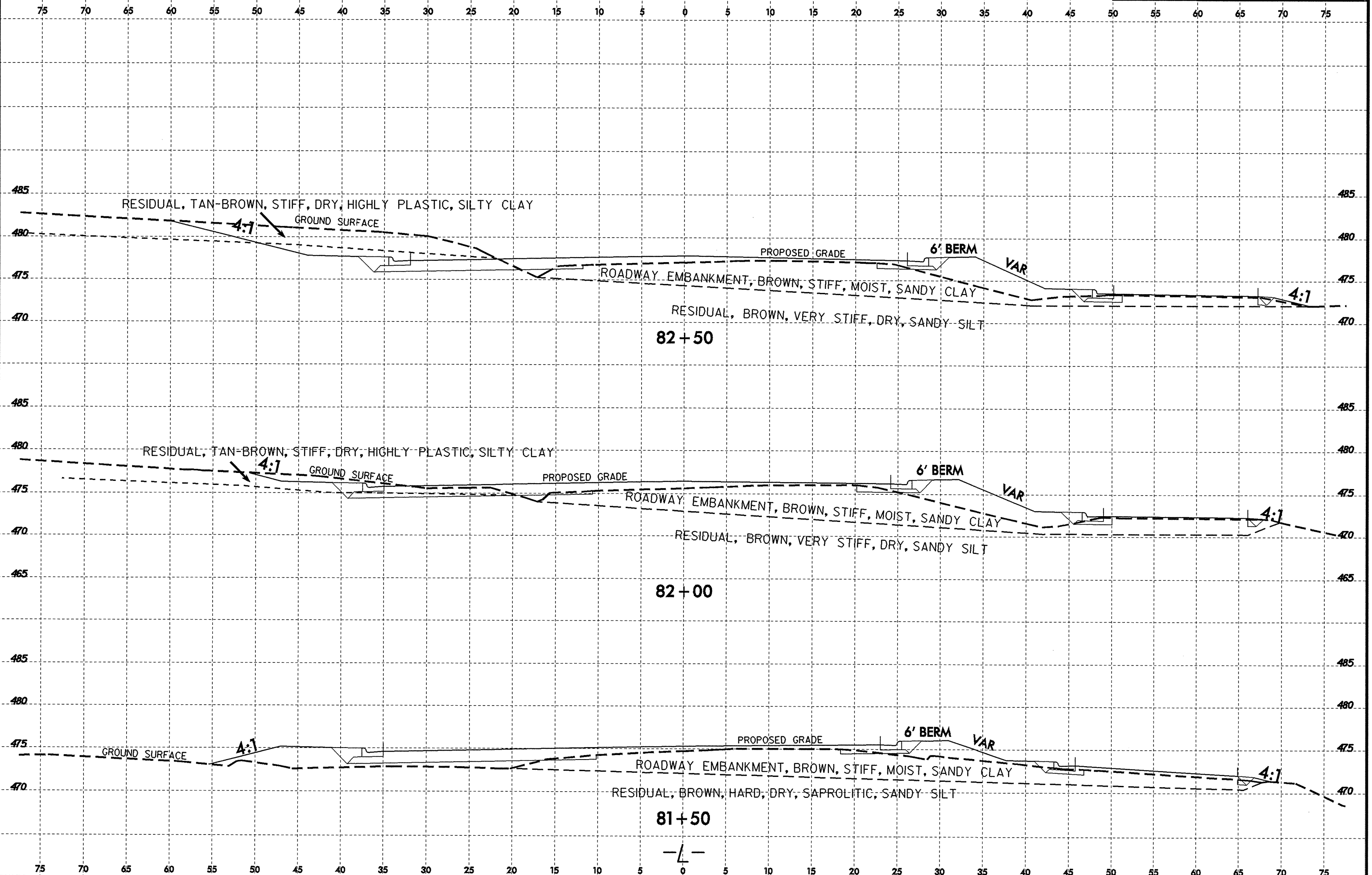


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8/23/99



PROJ. REFERENCE NO.	SHEET NO.
U-3306	61

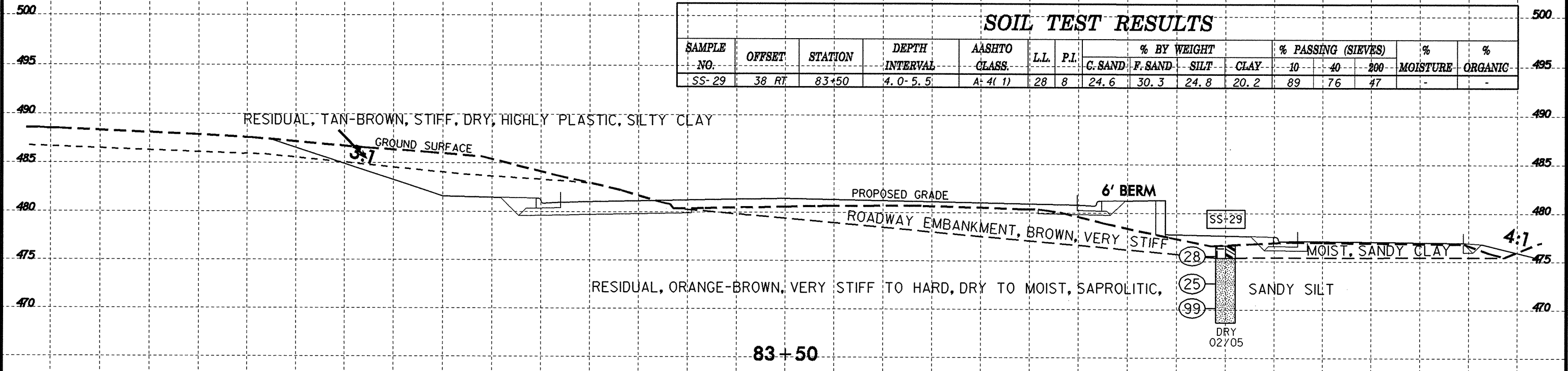


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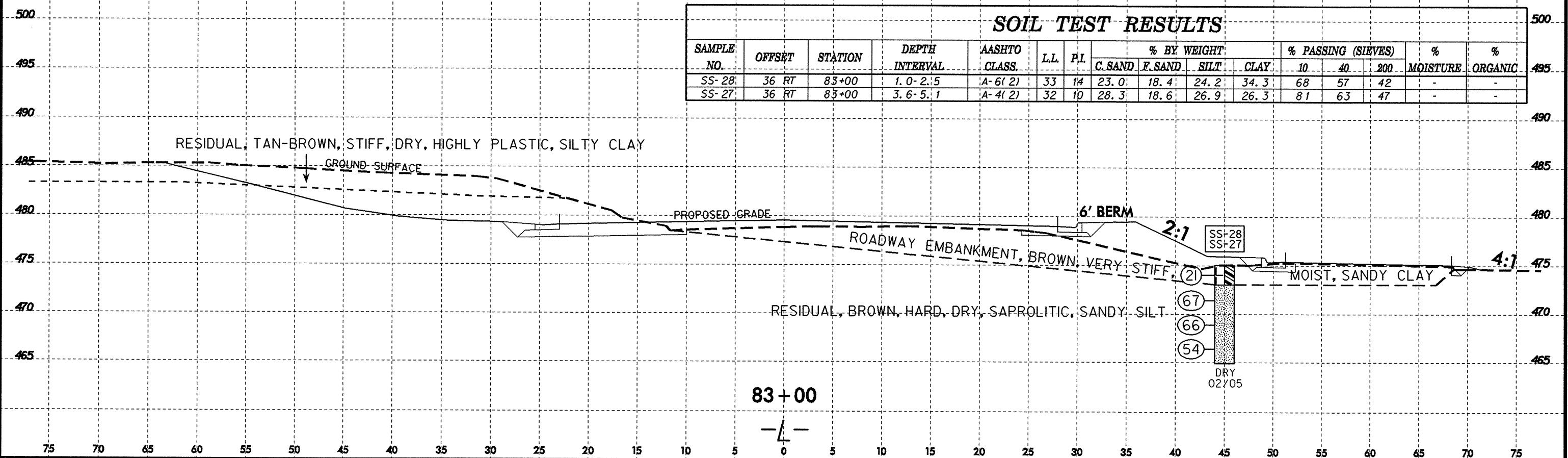
8/23/99



SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-29	38 RT	83+50	4.0-5.5	A-4(1)	28	8	24.6	30.3	24.8	20.2	89	76	47	-	-



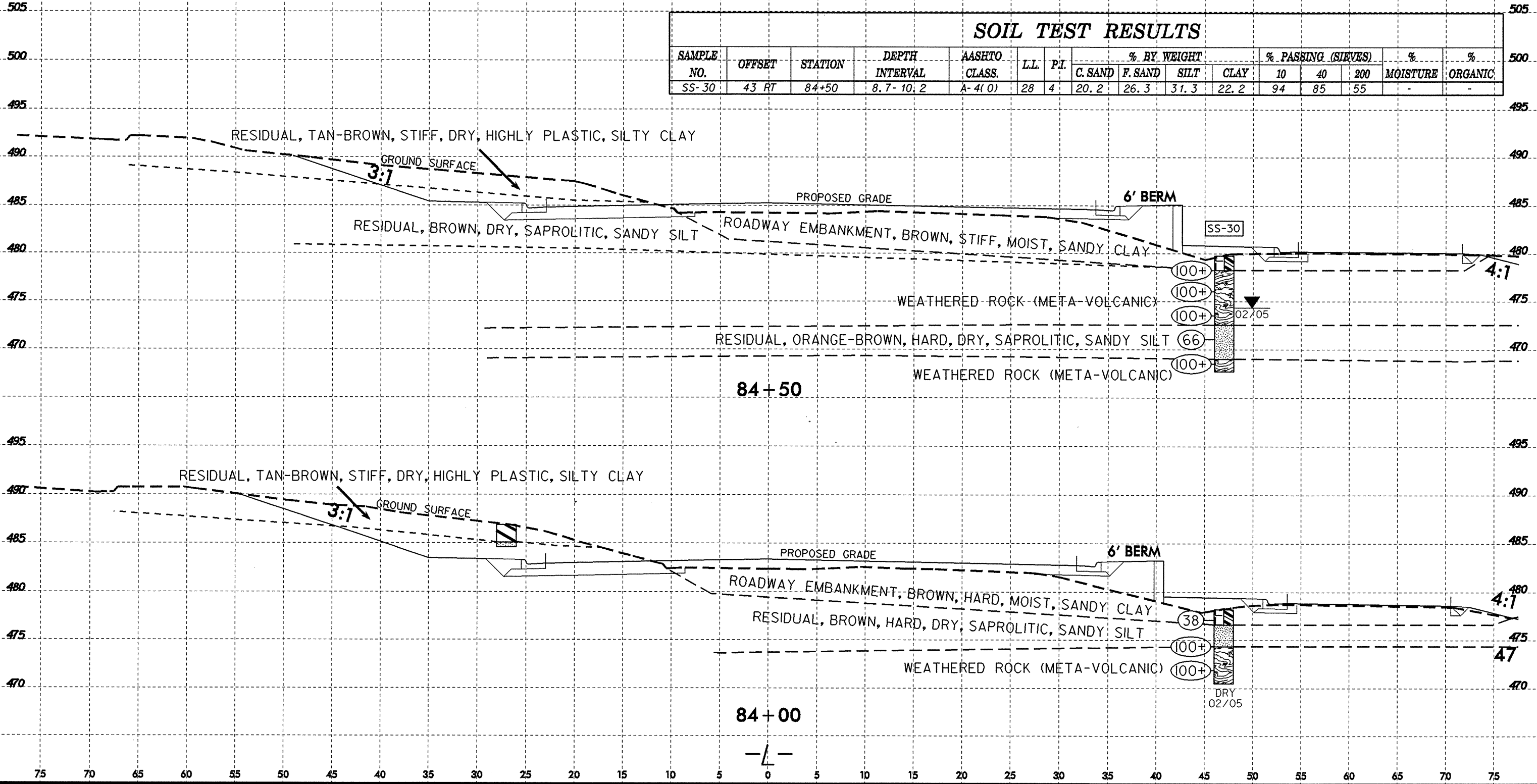
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							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-28	36 RT	83+00	1.0-2.5	A-6(2)	33	14	23.0	18.4	24.2	34.3	68	57	42	-	-
SS-27	36 RT	83+00	3.6-5.1	A-4(2)	32	10	28.3	18.6	26.9	26.3	81	63	47	-	-



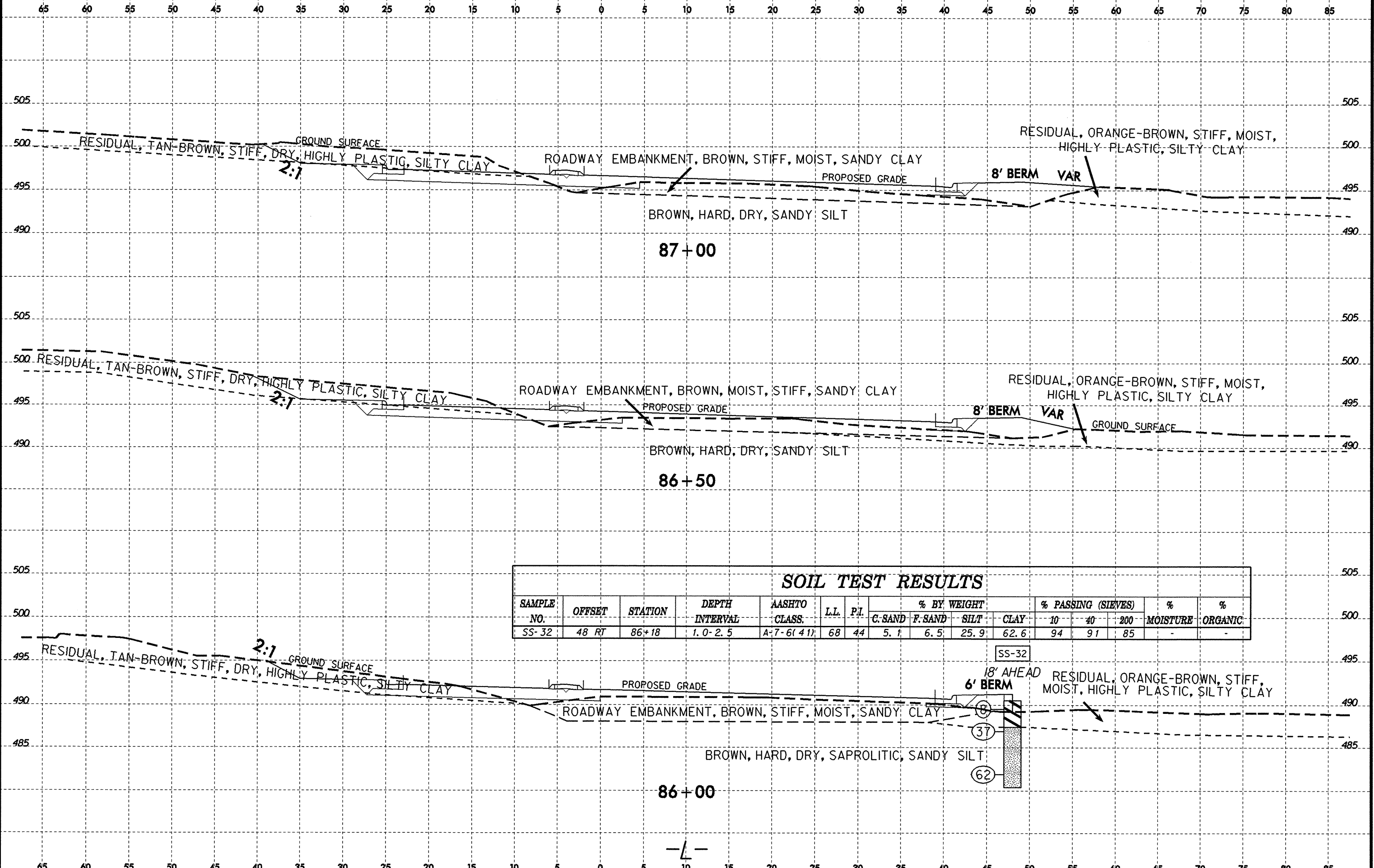
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SOIL TEST RESULTS

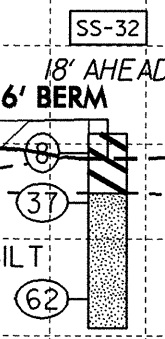
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							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-30	43 RT	84+50	8.7-10.2	A-4(0)	28	4	20.2	26.3	31.3	22.2	94	85	55	-	-



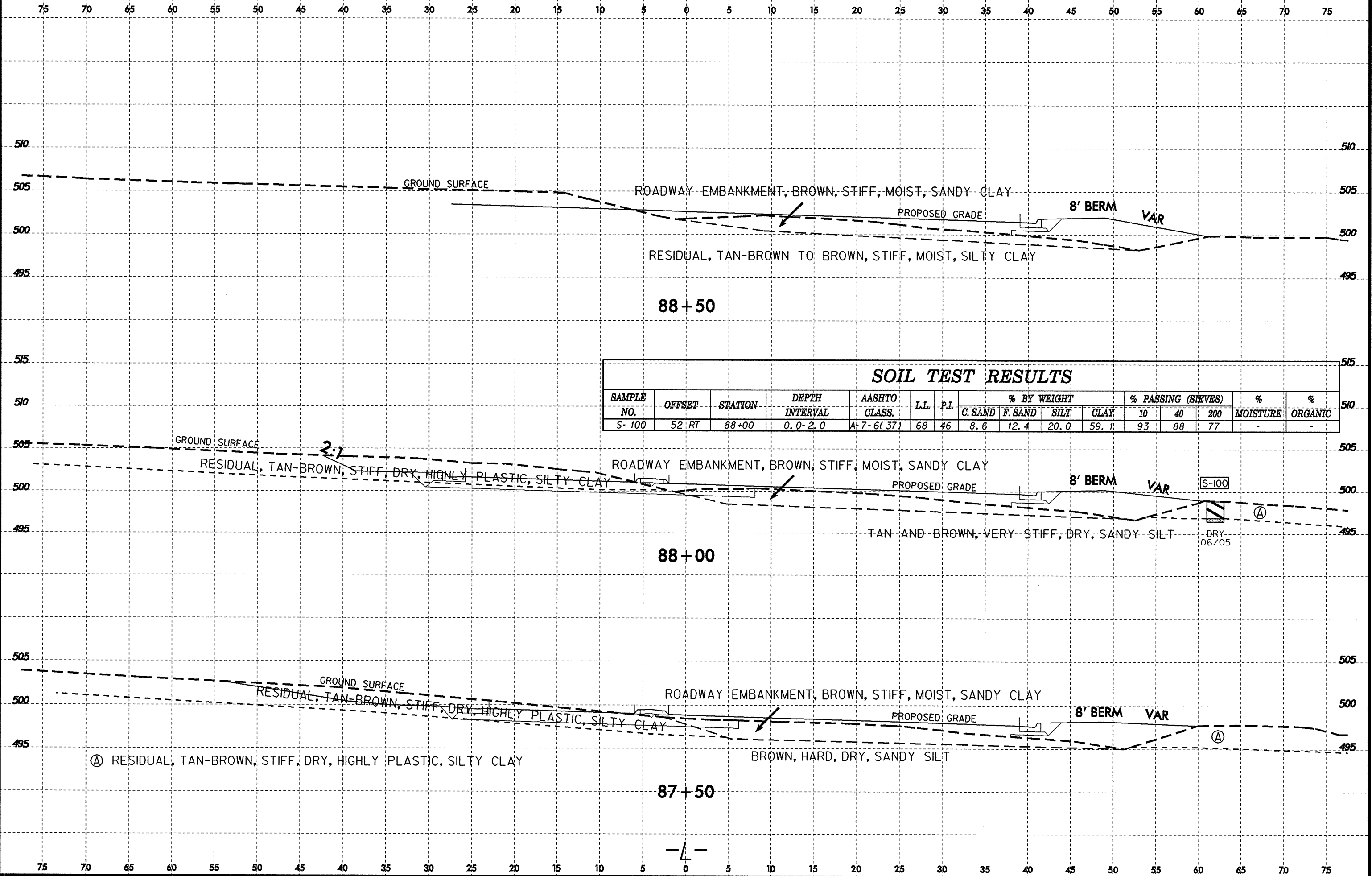
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SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-32	48 RT	86+18	1.0-2.5	A-7-6(41)	68	44	5.1	6.5	25.9	62.6	94	91	85	-	-



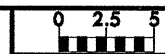
8/23/99



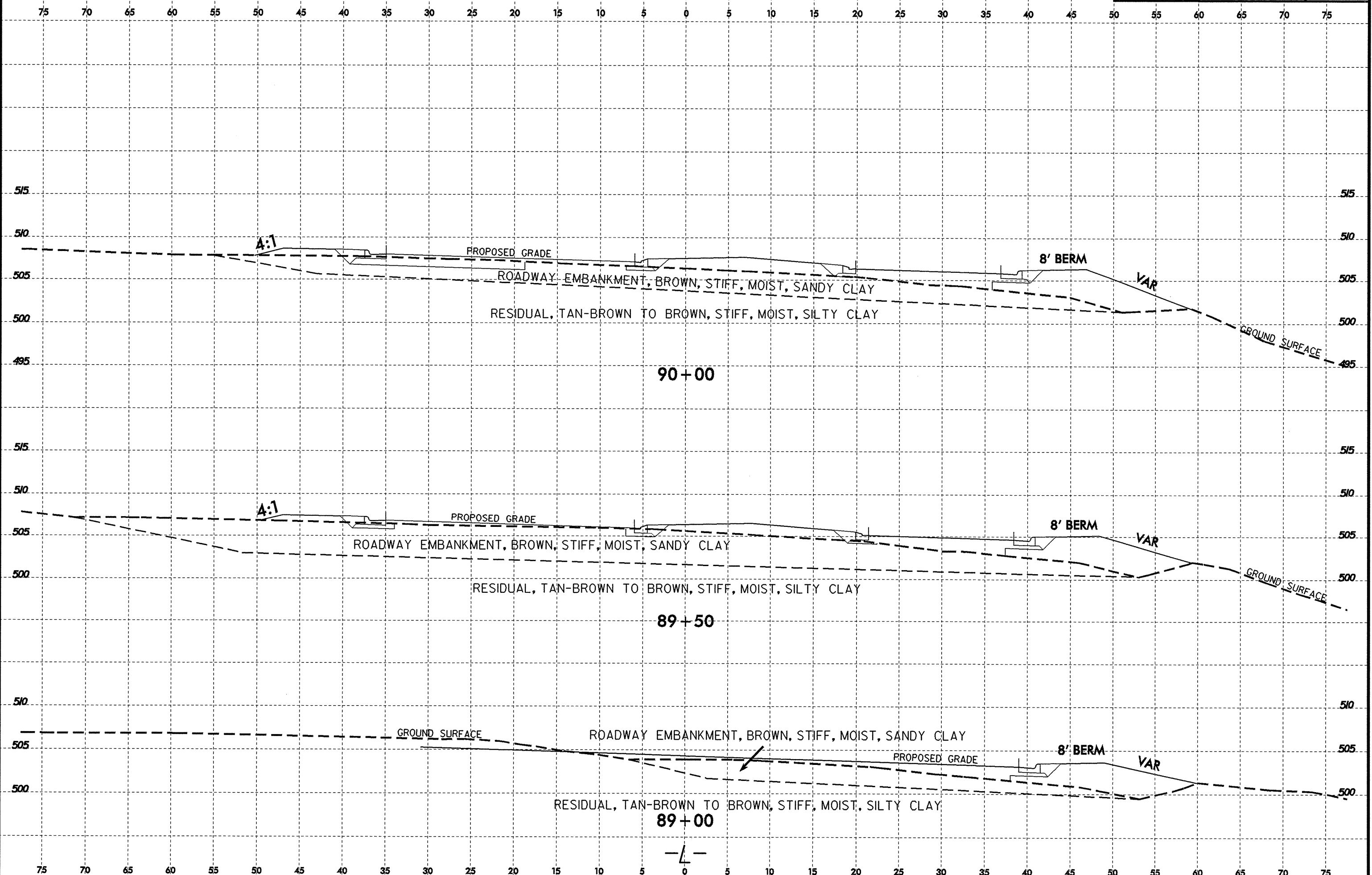
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-100	52' RT	88+00	0.0-2.0	A-7-6(37)	68	46	8.6	12.4	20.0	59.1	93	88	77	-	-

10-AUG-2006 15:34
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 AT 06/05/05

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PROJ. REFERENCE NO.	SHEET NO.
U-3306	67

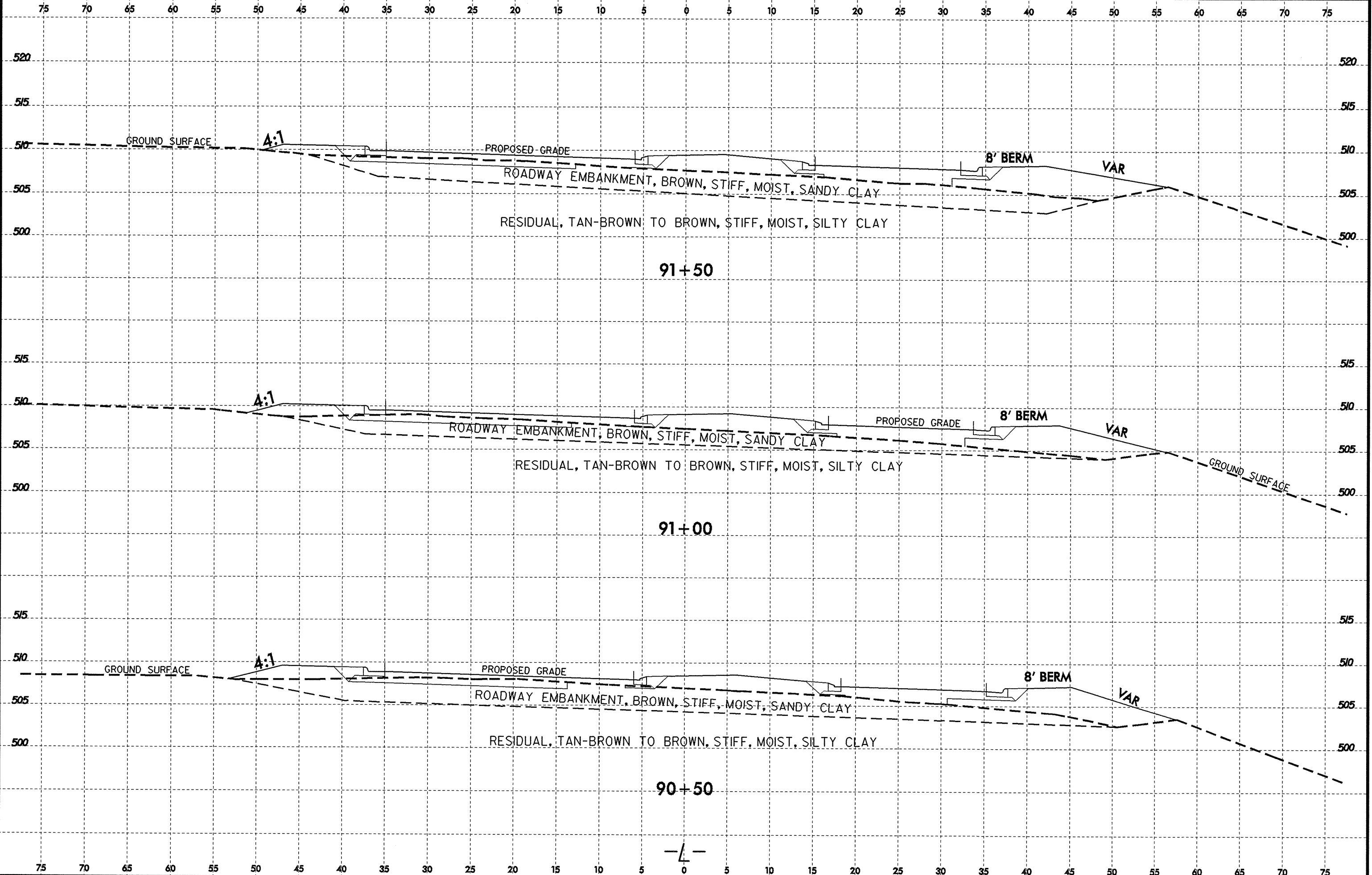


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PROJ. REFERENCE NO.	SHEET NO.
U-3306	68

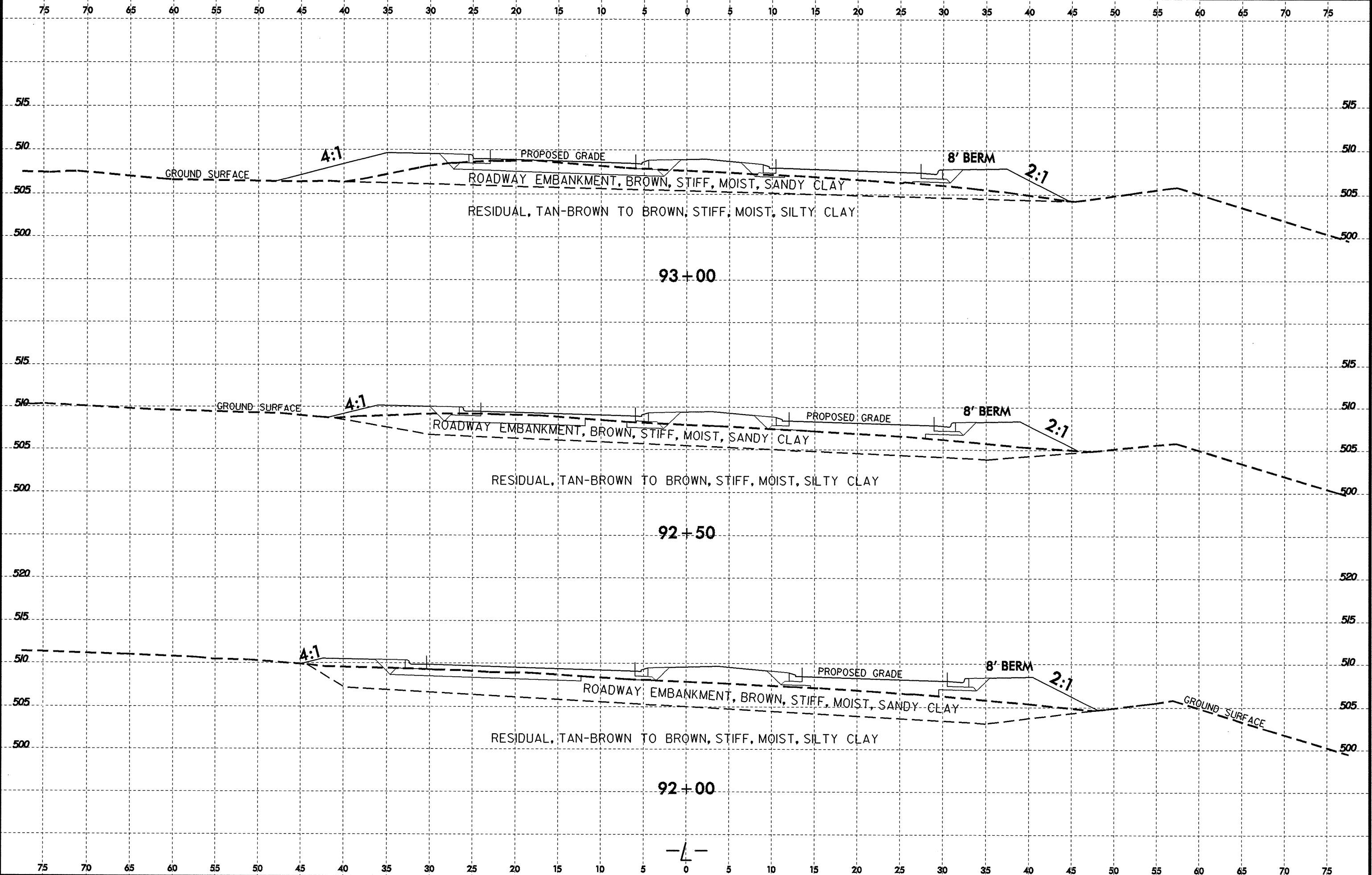


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8/23/99



PROJ. REFERENCE NO.	SHEET NO.
U-3306	69

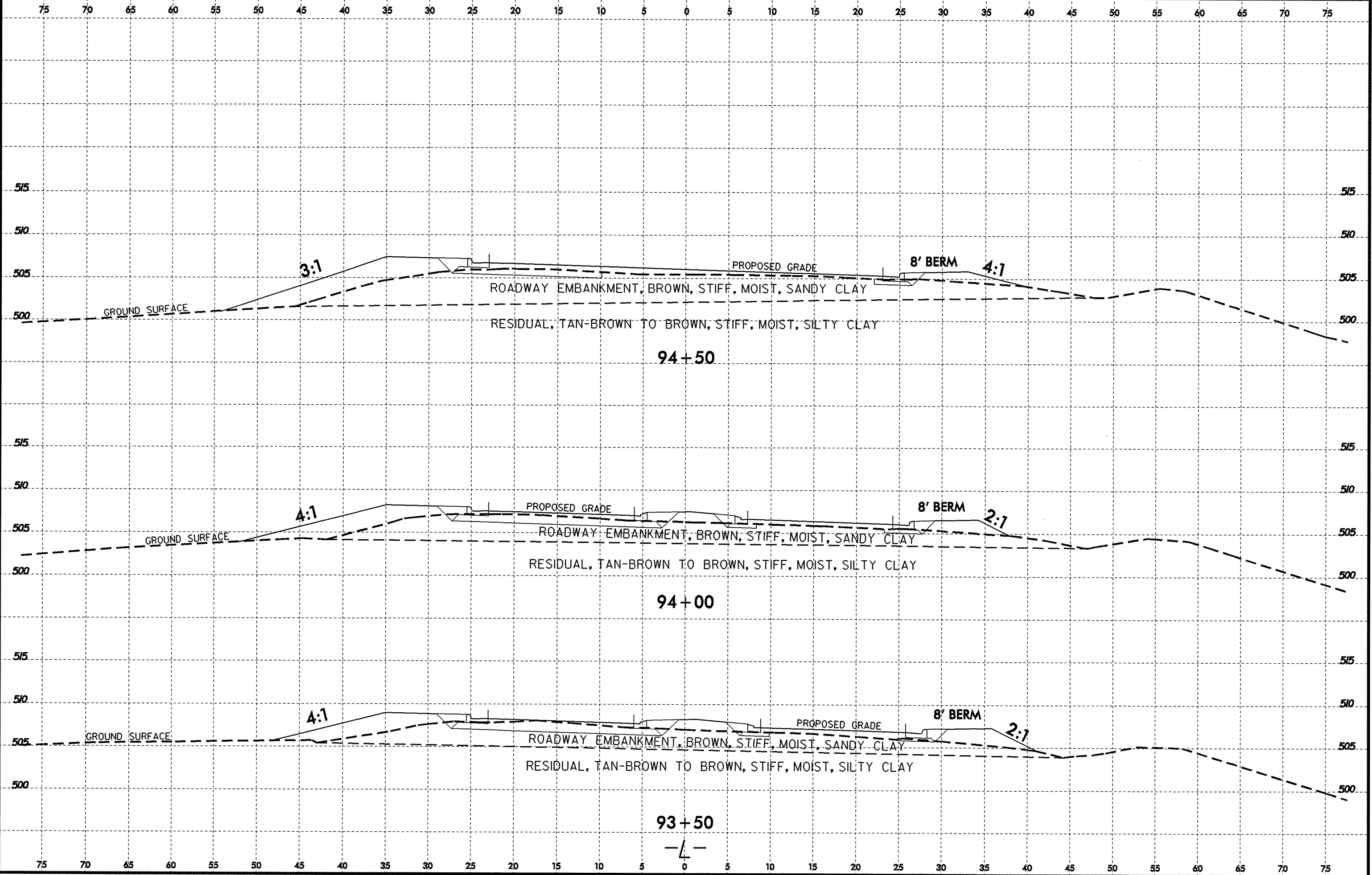


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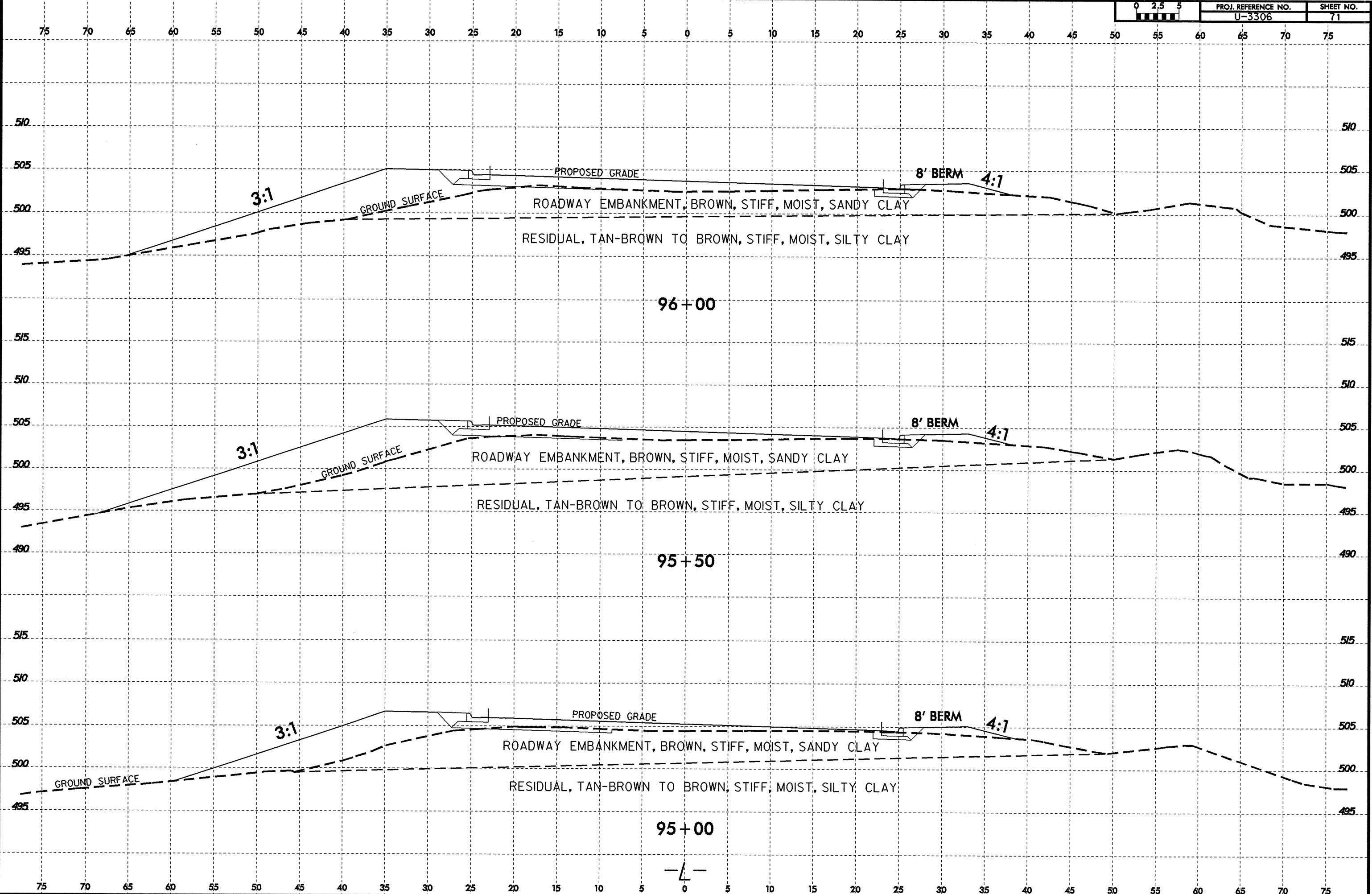
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U-3306	70



93+50

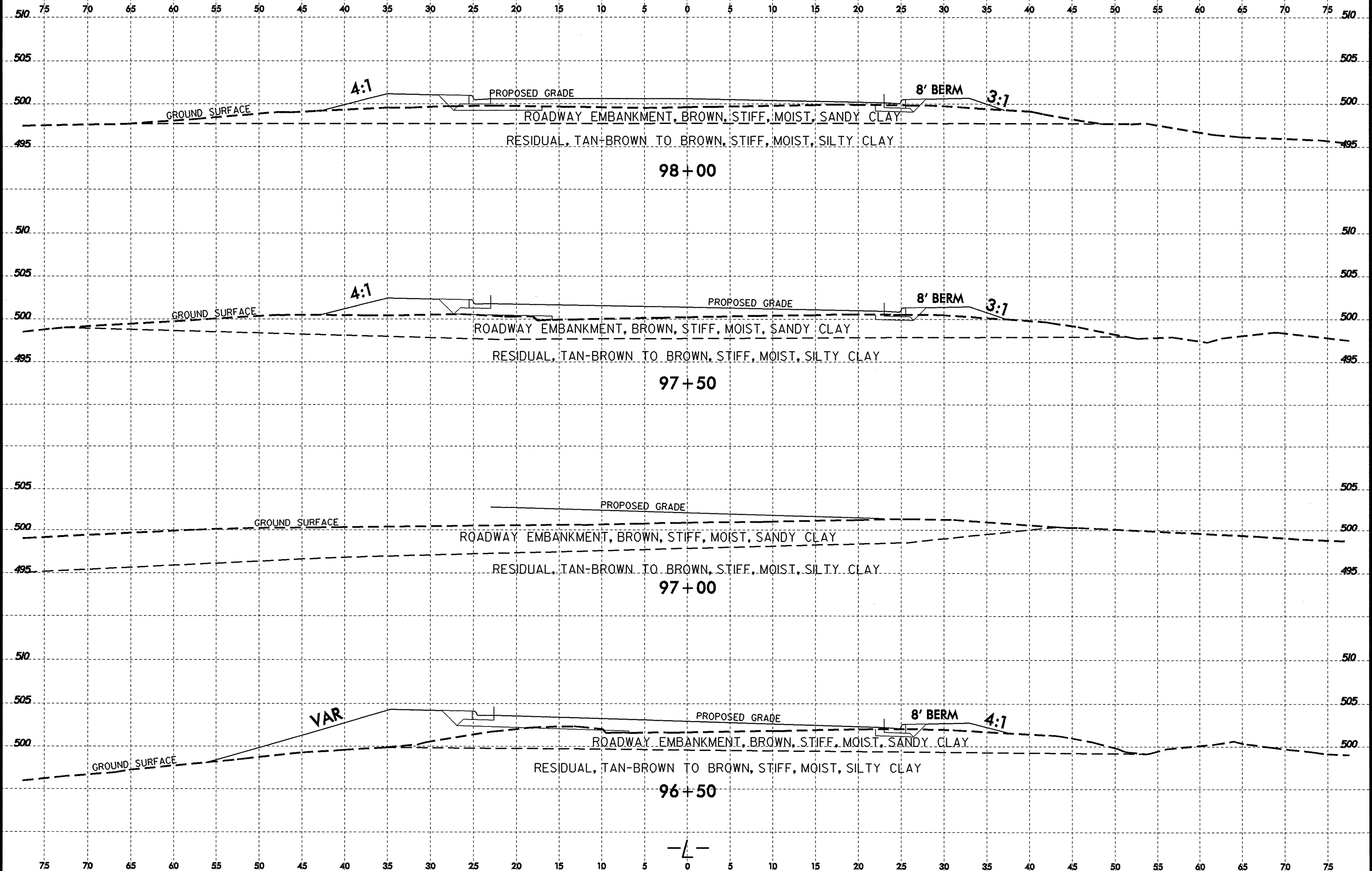
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0 2.5 5	PROJ. REFERENCE NO. U-3306	SHEET NO. 71
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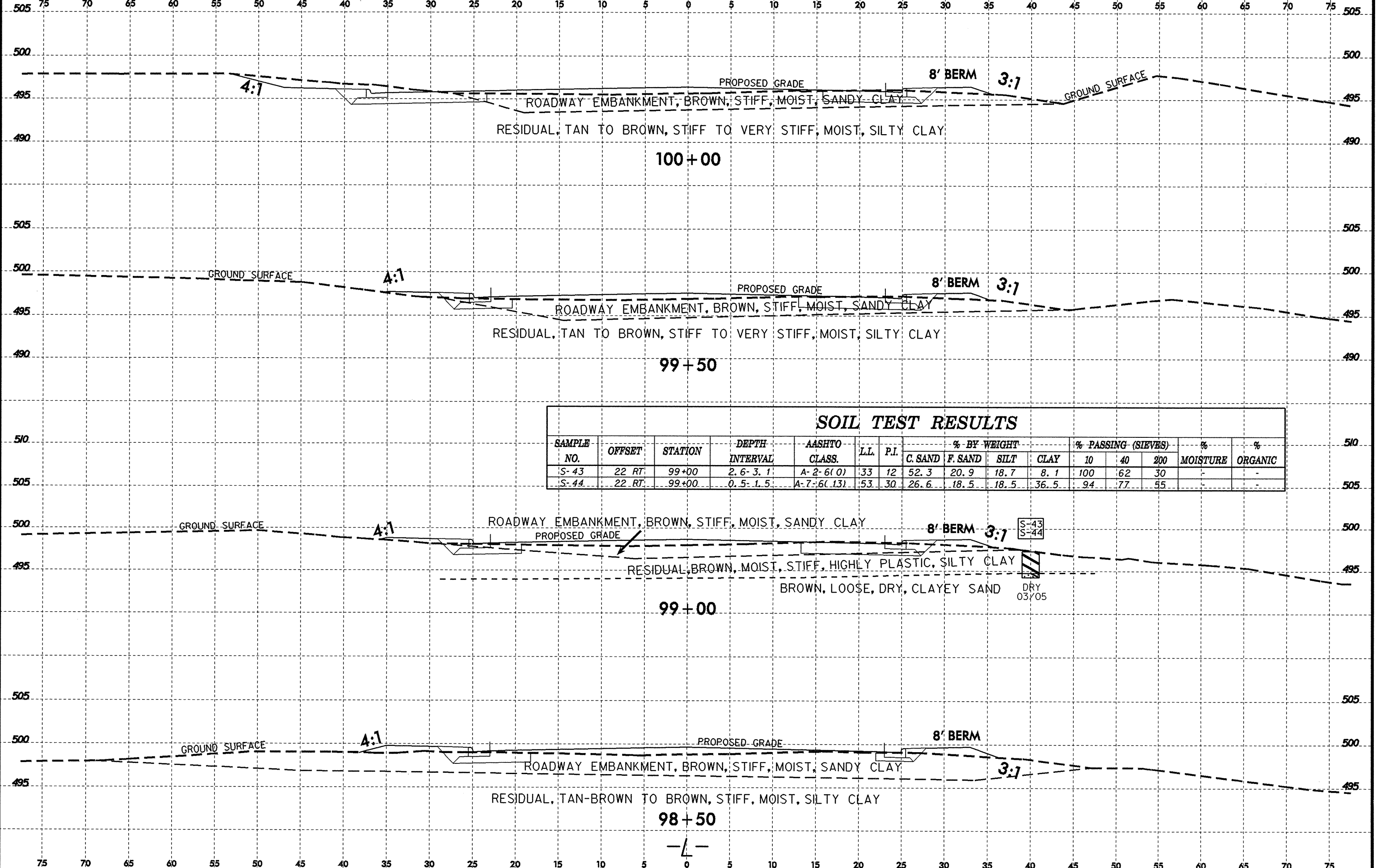
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0 2.5 5	PROJ. REFERENCE NO. U-3306	SHEET NO. 72
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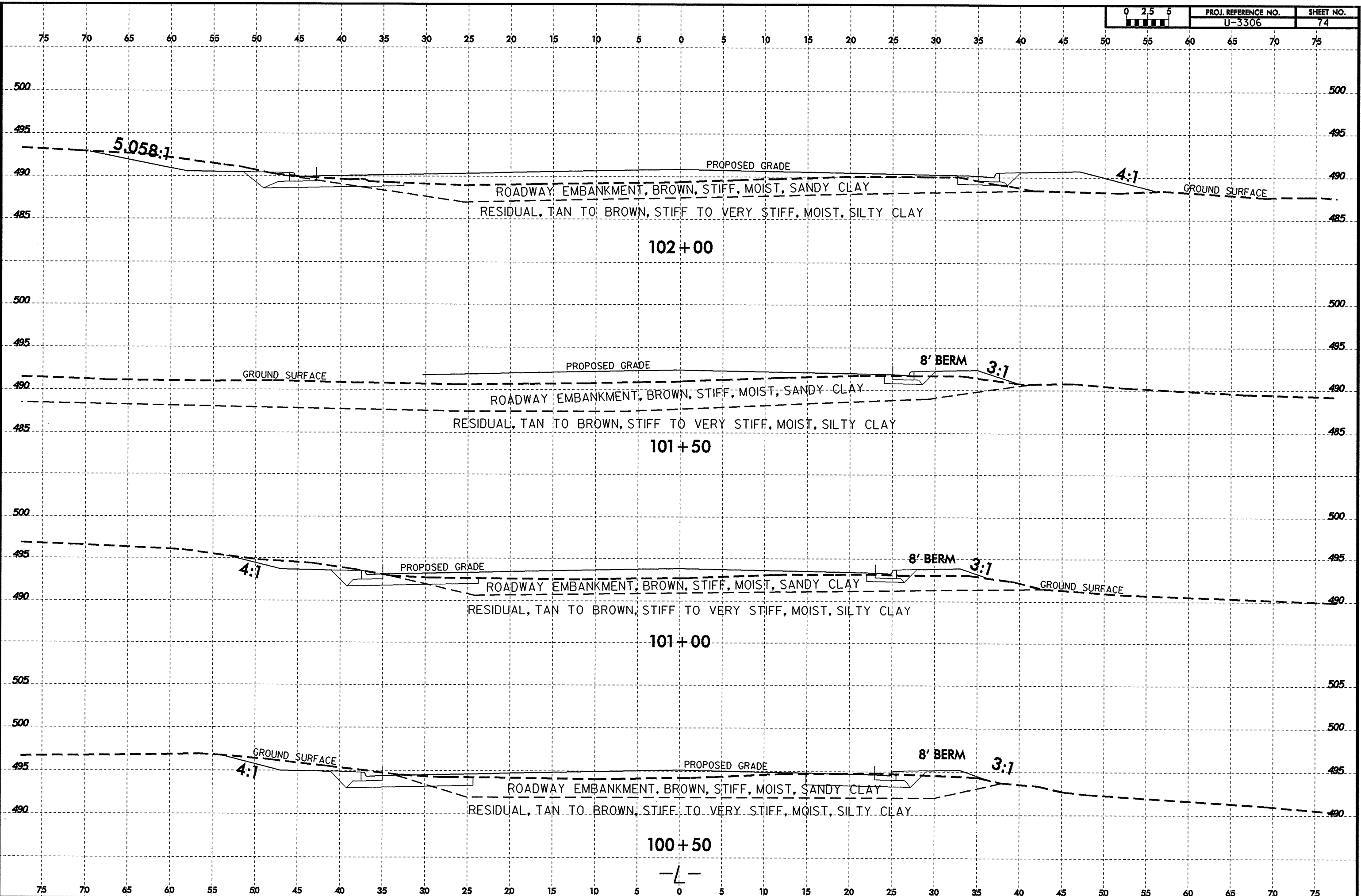
8/23/99



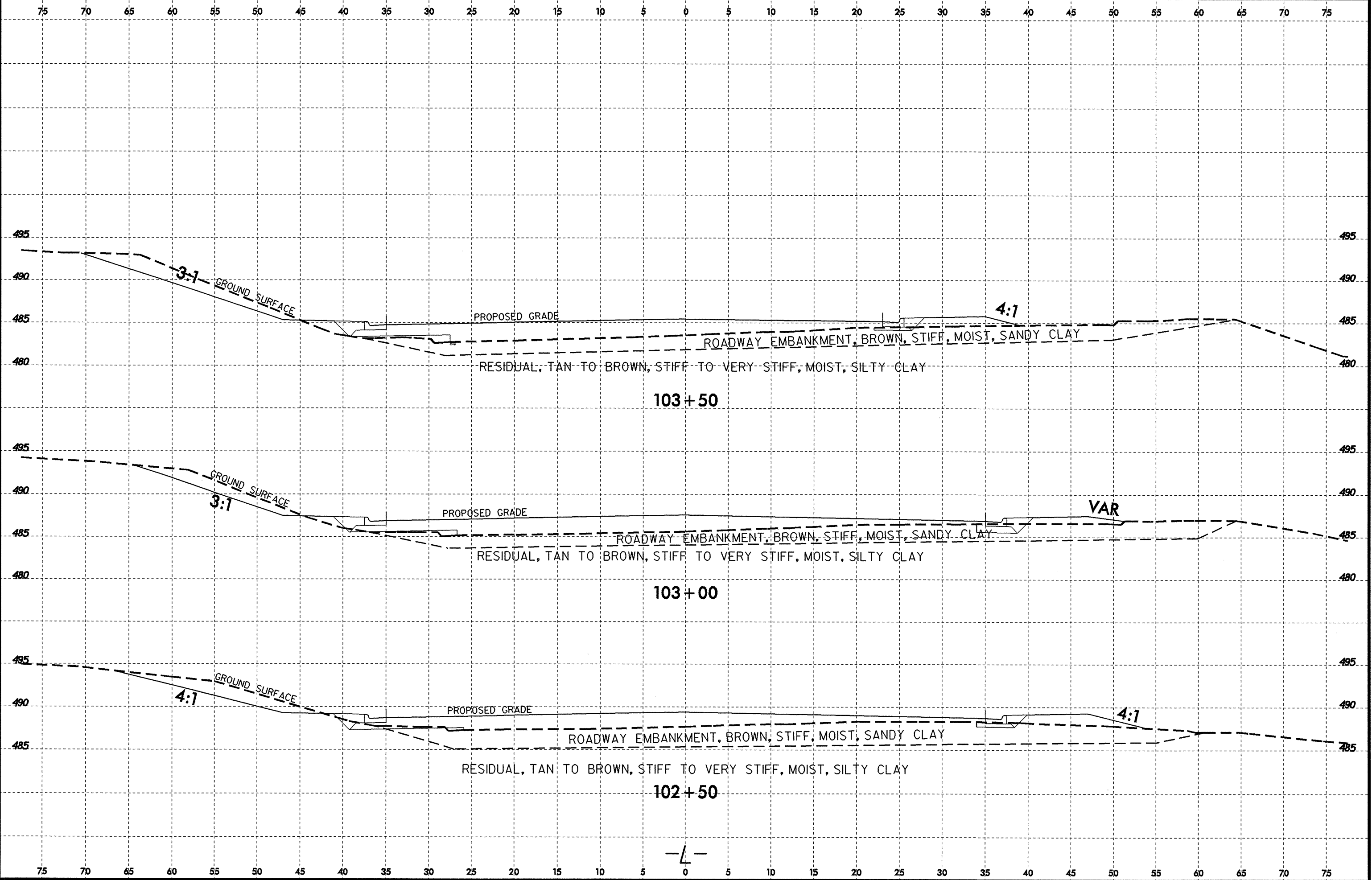
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-43	22 RT	99+00	2.6-3.1	A-2-6(0)	33	12	52.3	20.9	18.7	8.1	100	62	30	-	-
S-44	22 RT	99+00	0.5-1.5	A-7-6(13)	53	30	26.6	18.5	18.5	36.5	94	77	55	-	-

10-AUG-2006 15:36
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8/23/05
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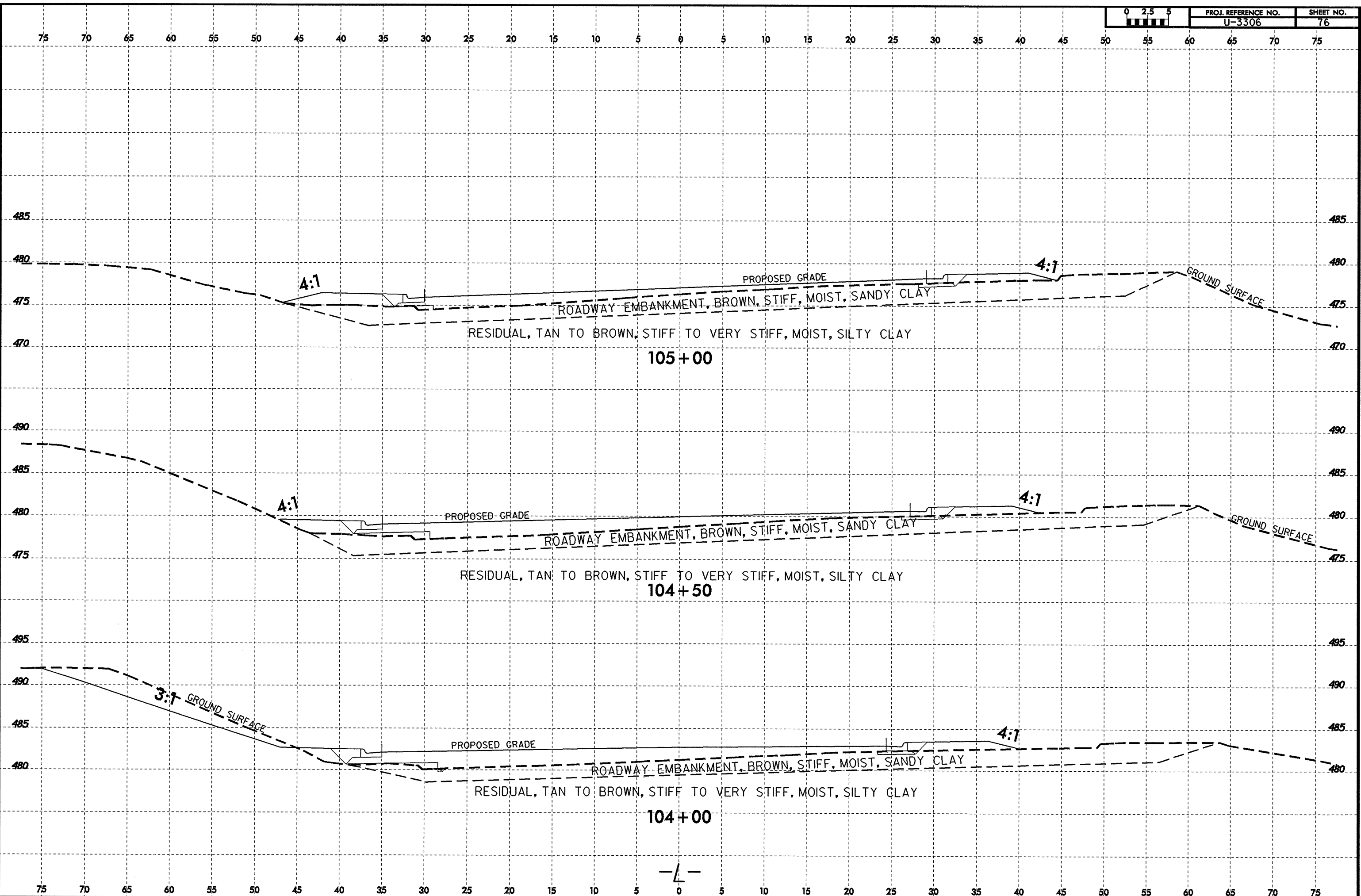
8/23/99



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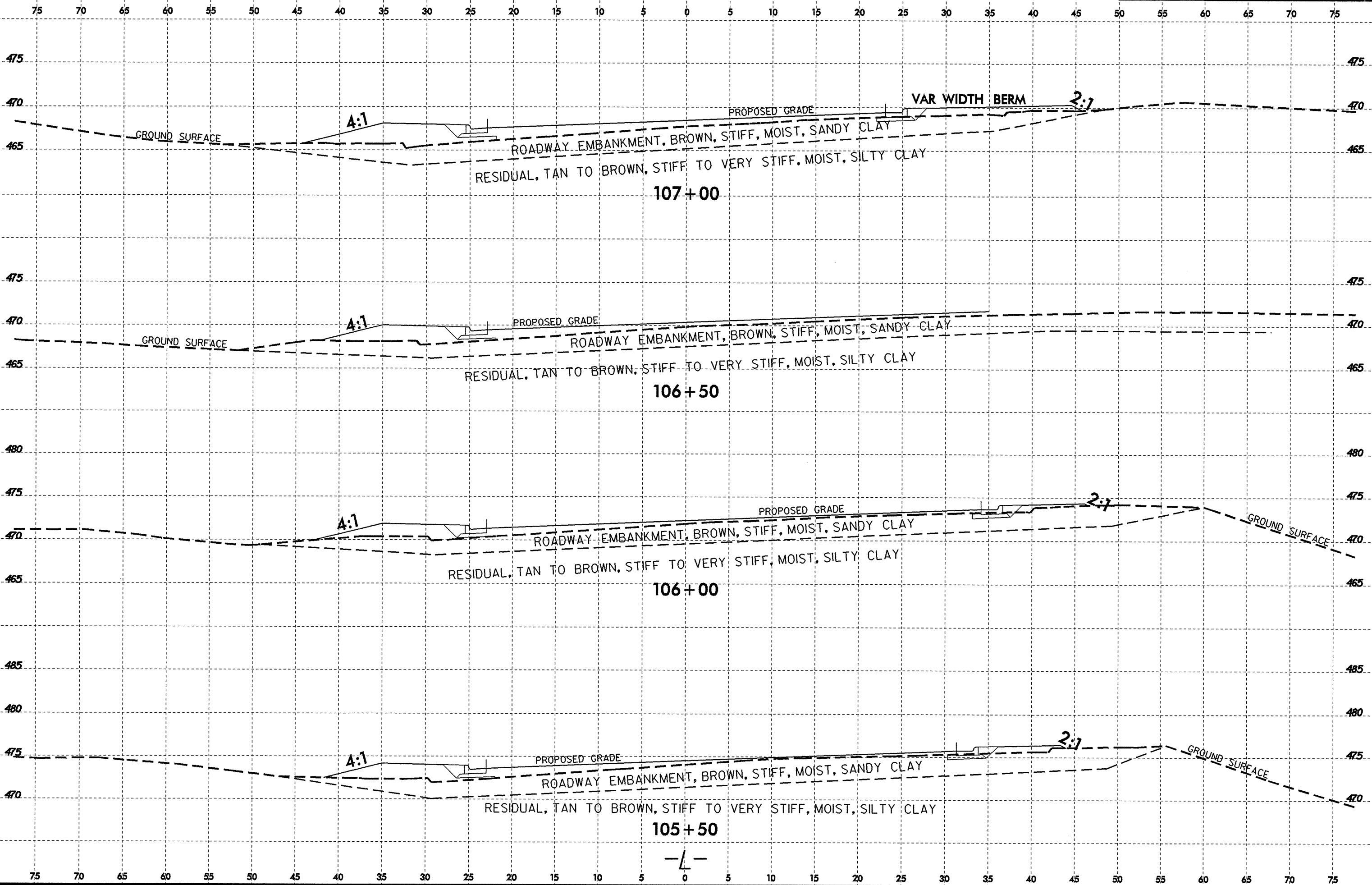
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0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	U-3306	76



8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	U-3306	77



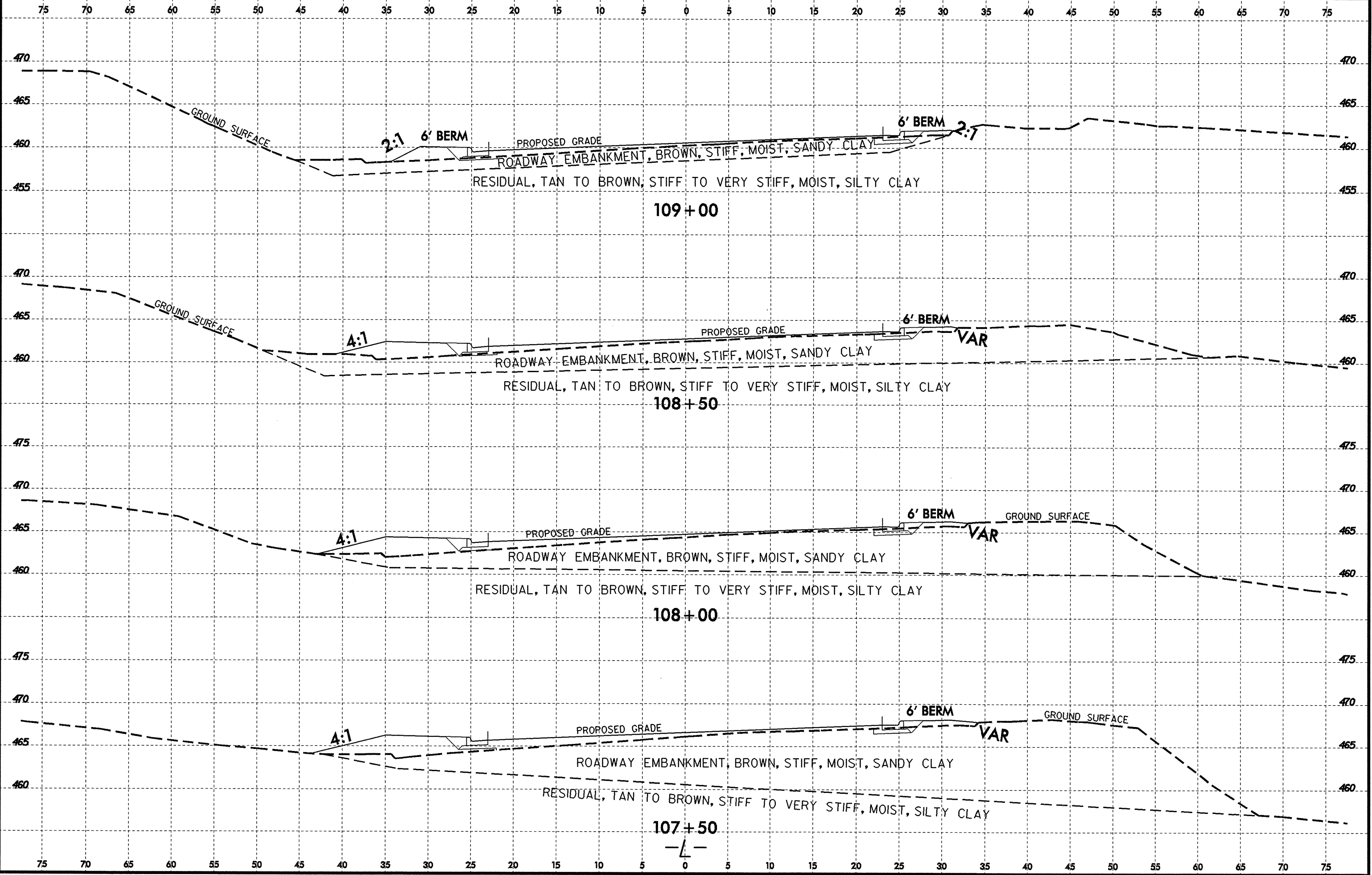
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8/23/99

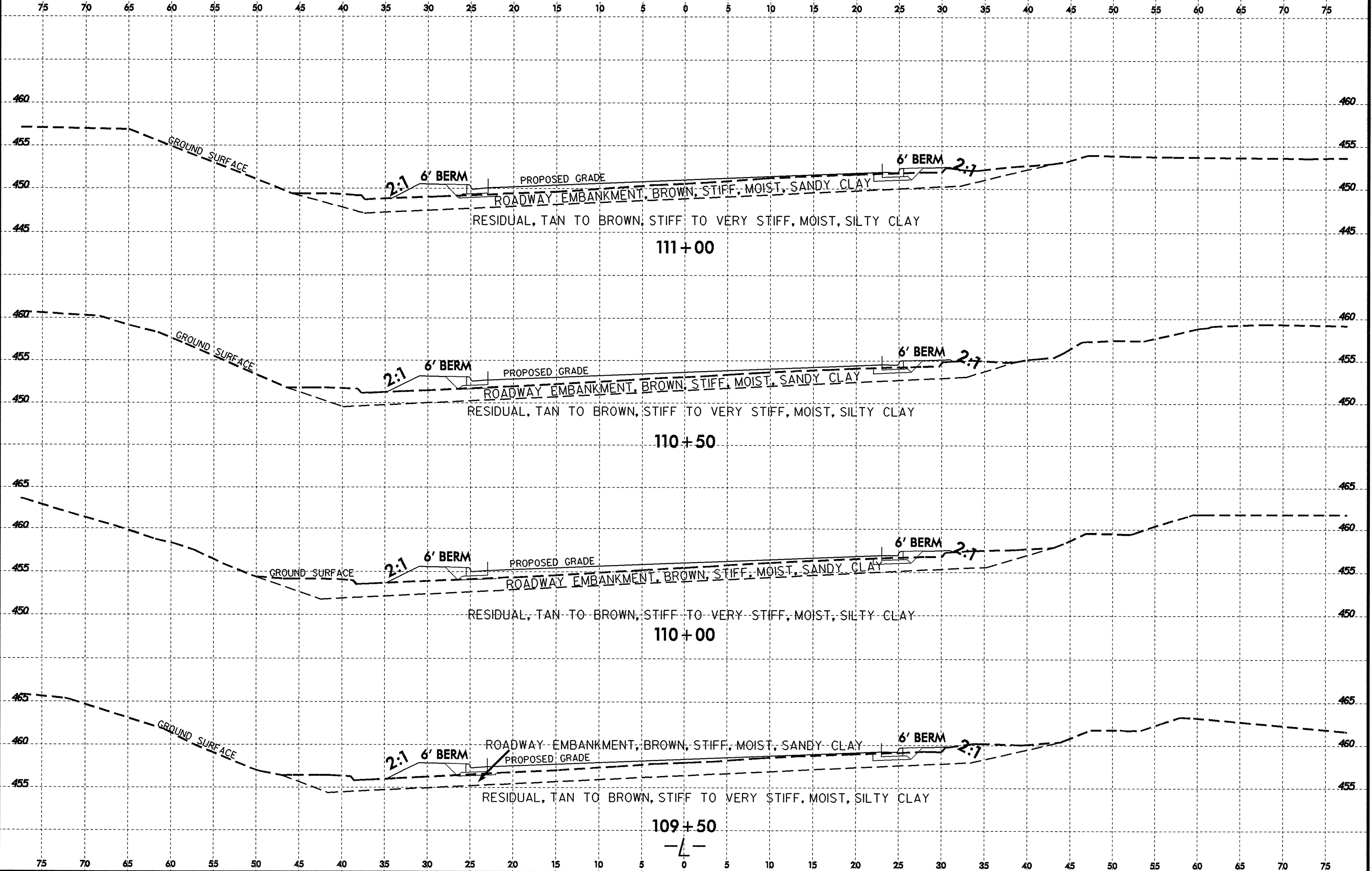


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U-3306	78



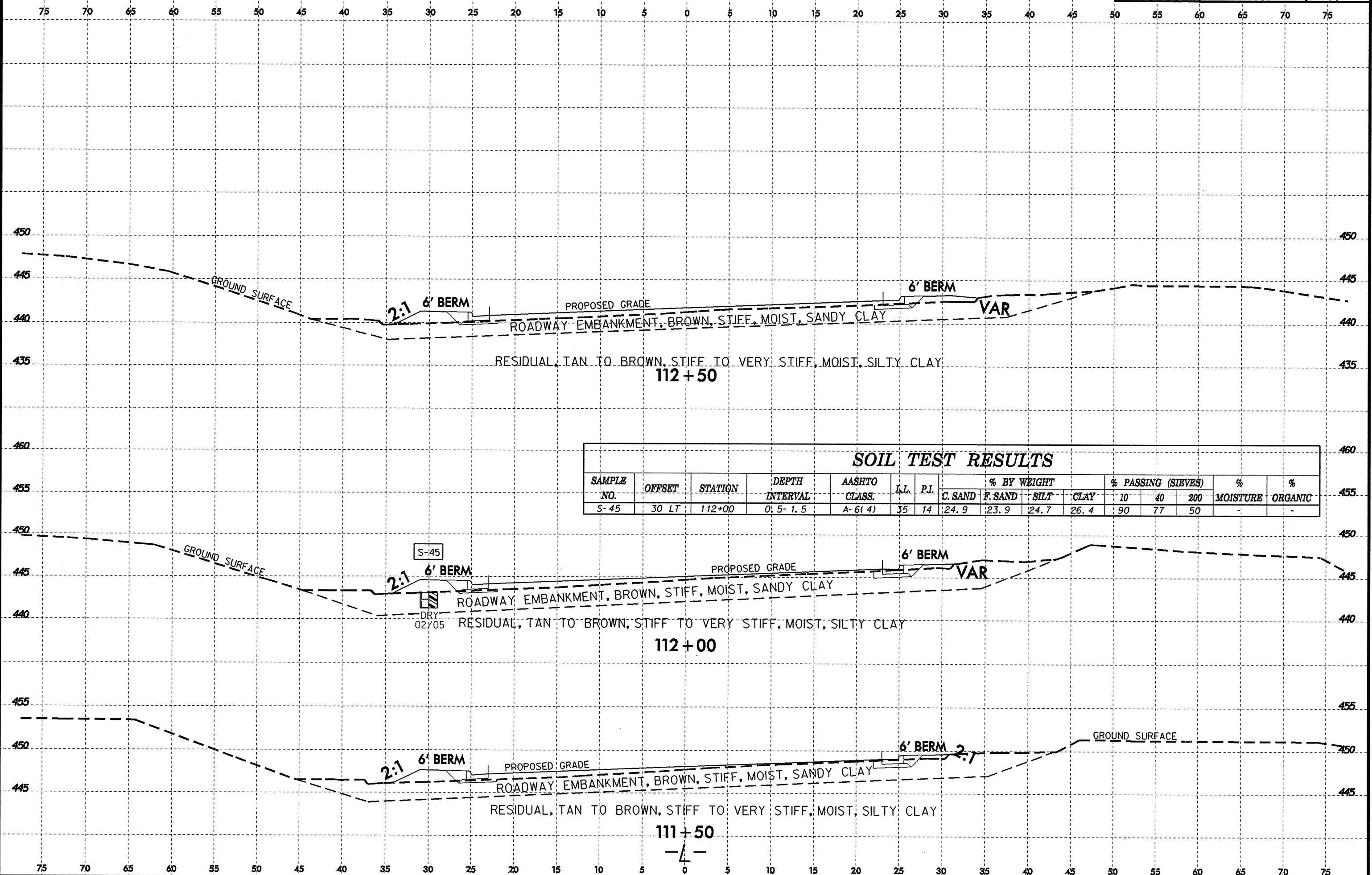
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8/23/99



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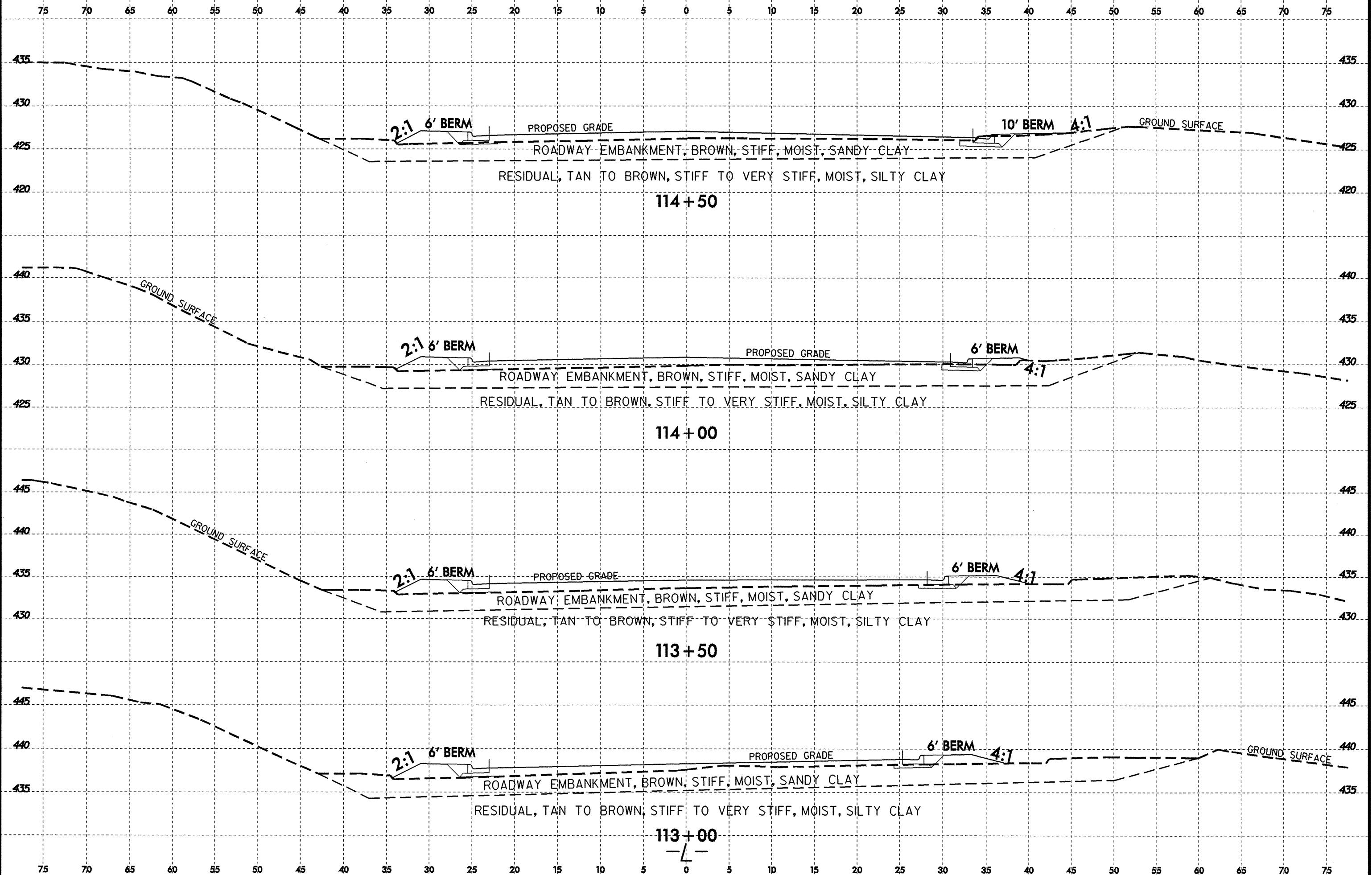
8/23/99



SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-45	30 LT	112+00	0.5-1.5	A-6(4)	35	14	24.9	23.9	24.7	26.4	90	77	50	-	-

I:\AUG-2006 0916
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 L:\V\RD\Rel\eng\112+00
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8/23/99

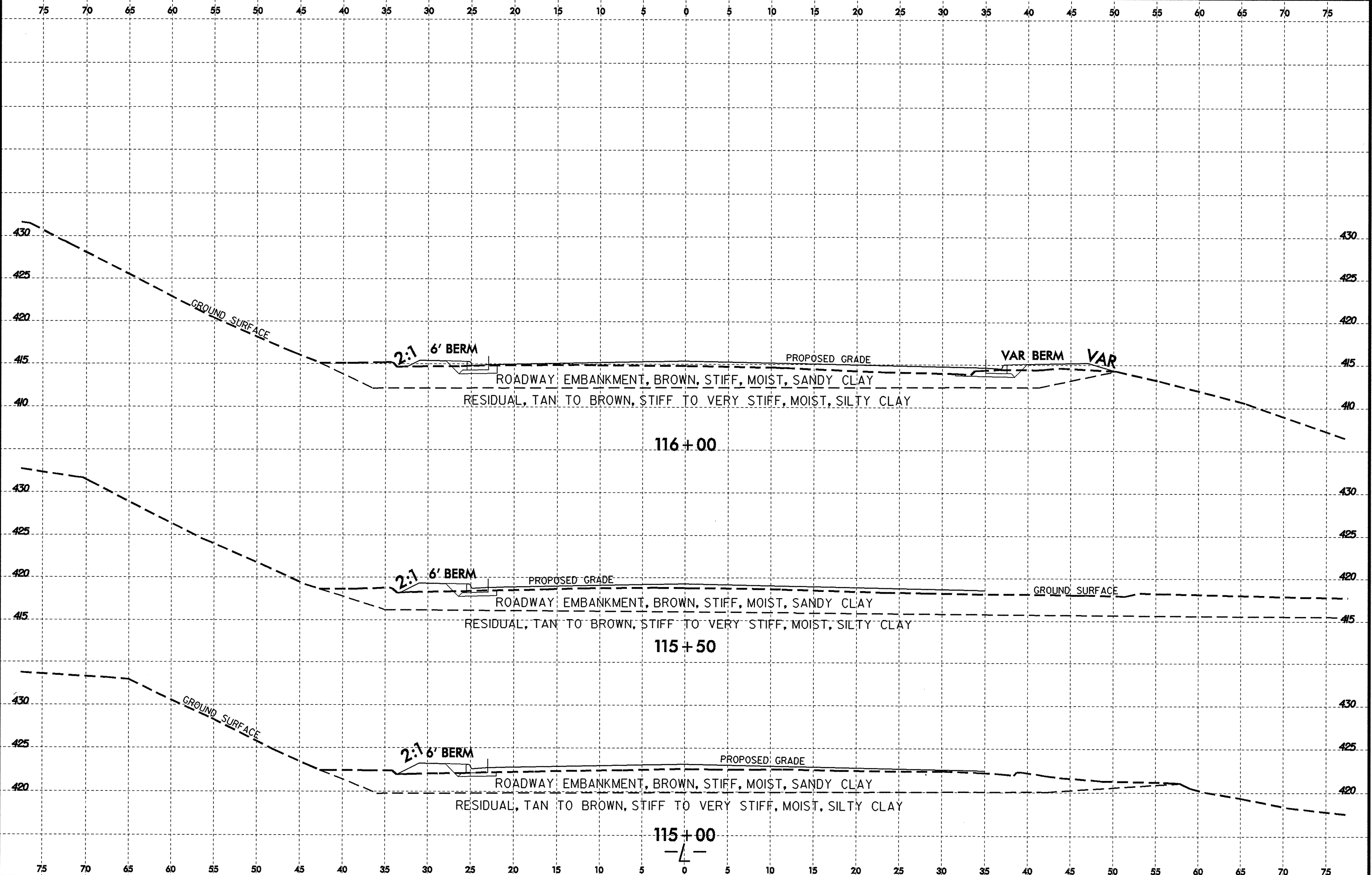


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8/23/99

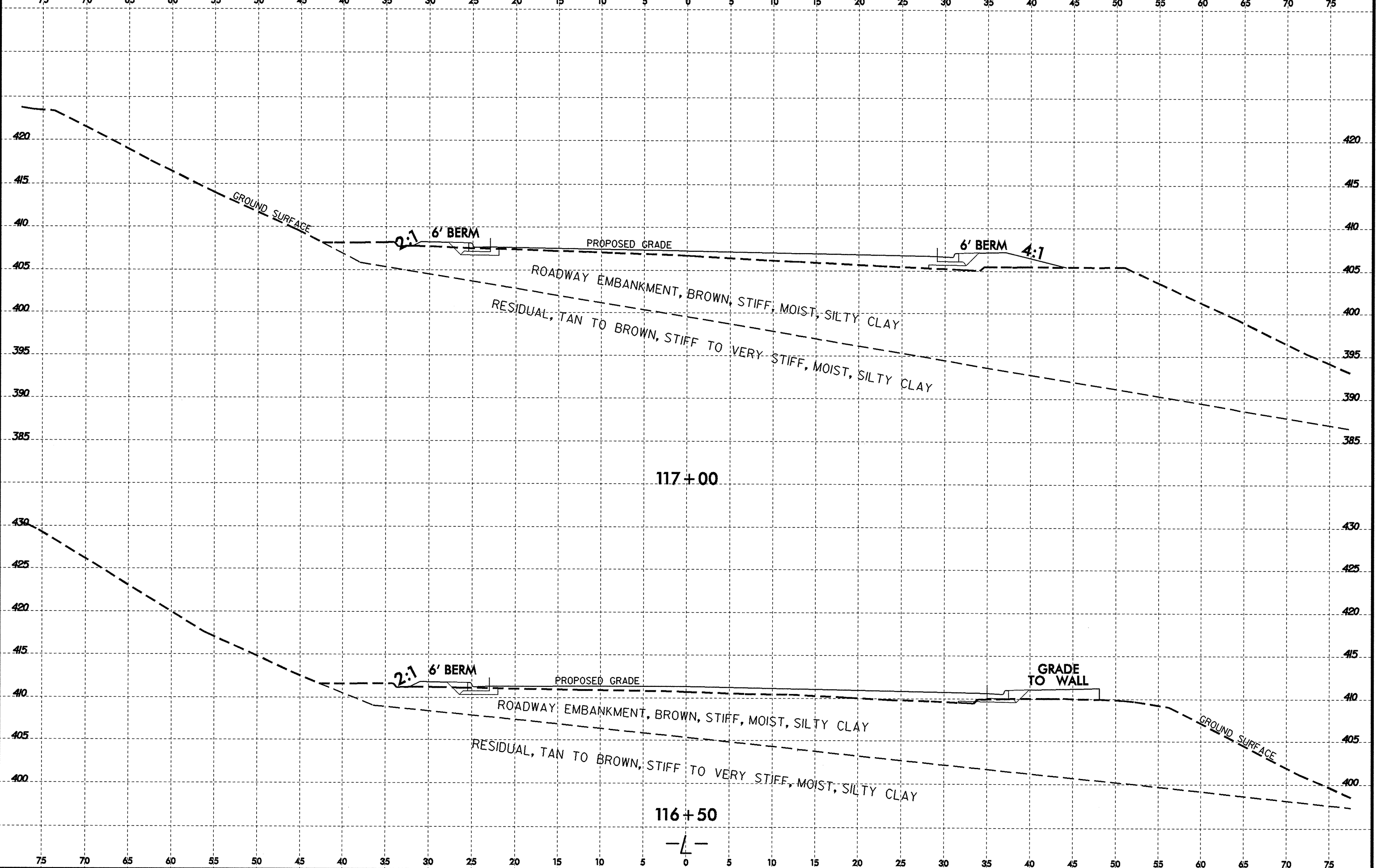


PROJ. REFERENCE NO.	SHEET NO.
U-3306	82



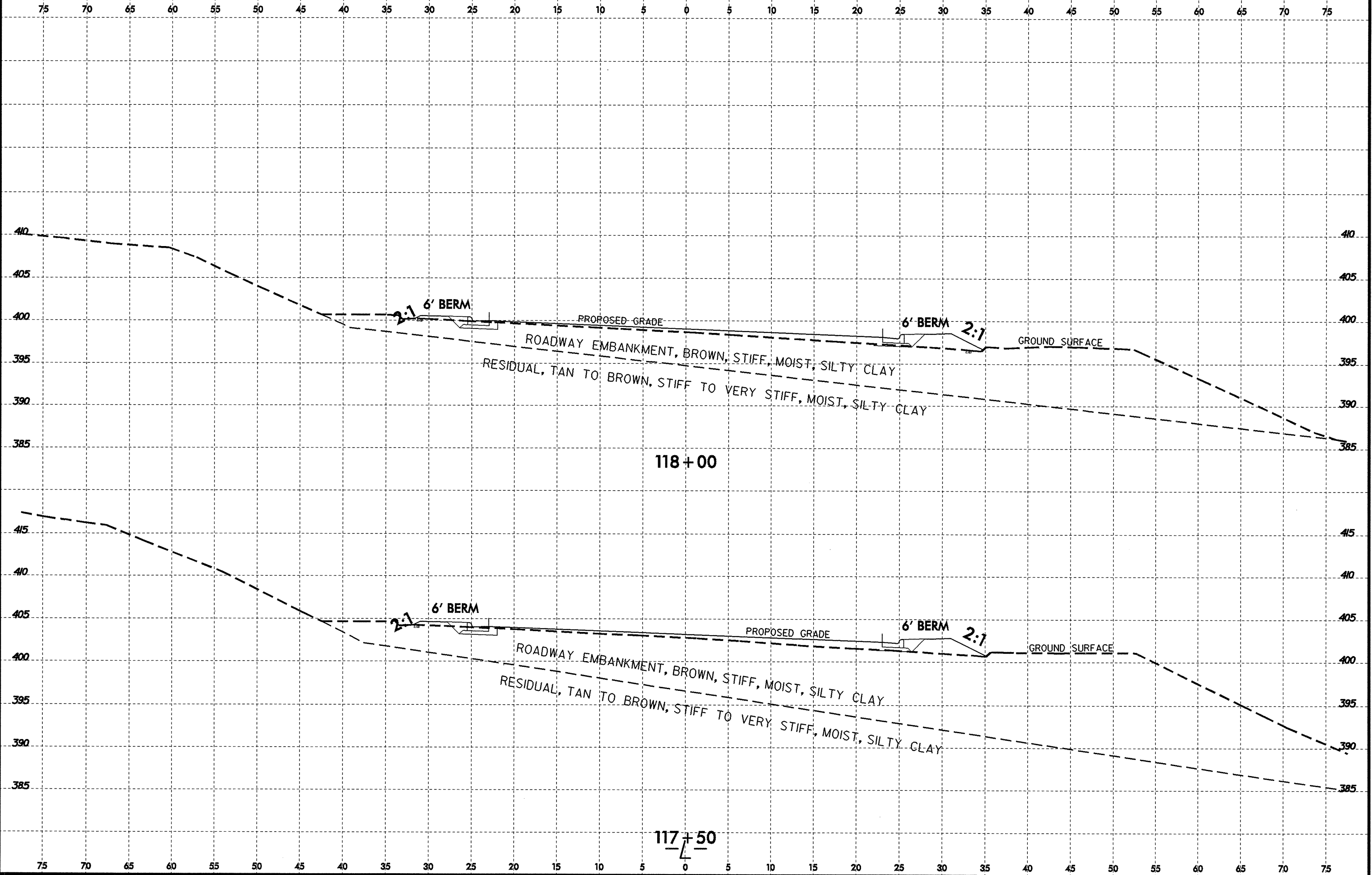
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8/23/99



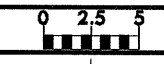
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8/23/99

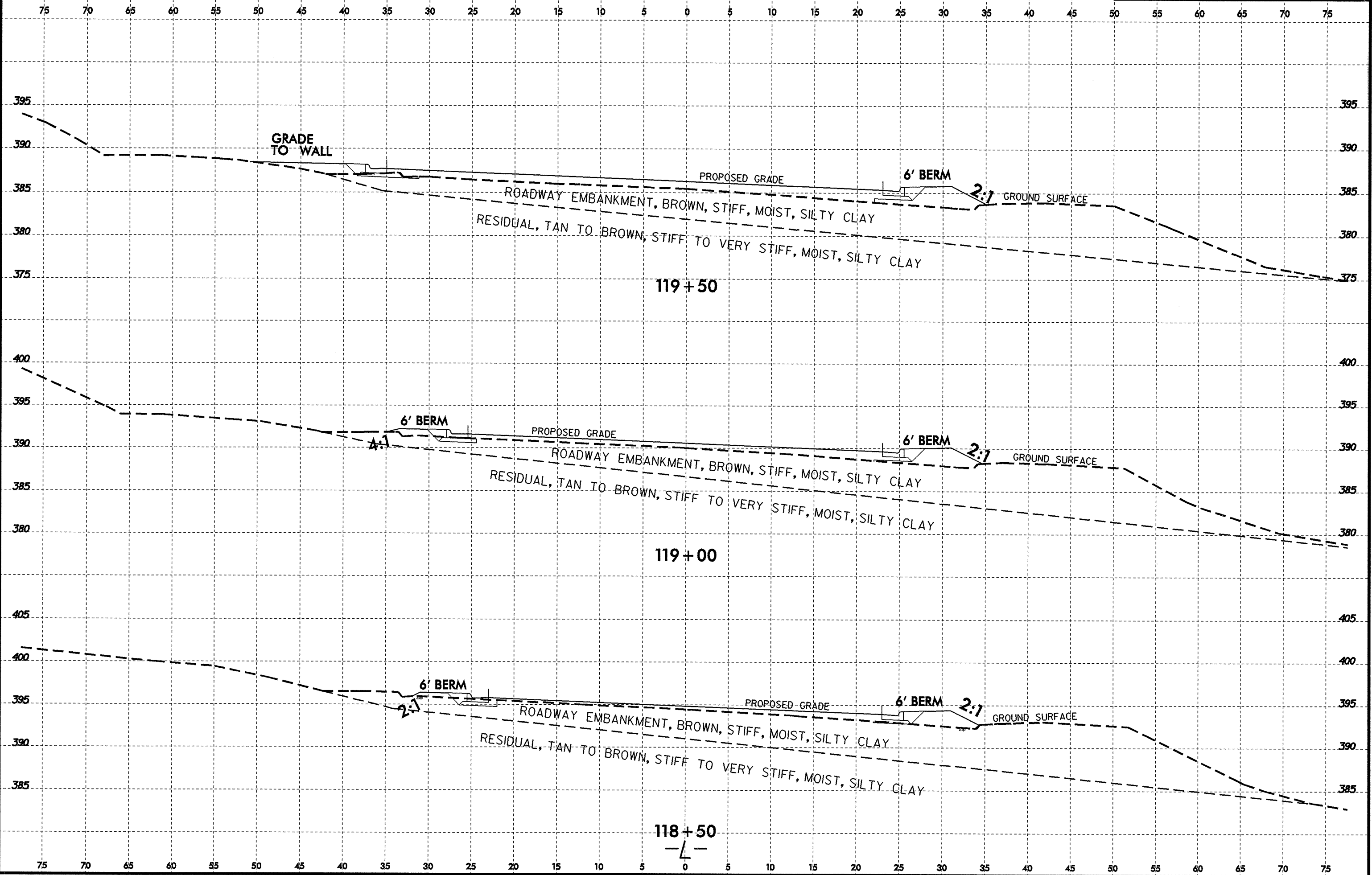


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8/23/99

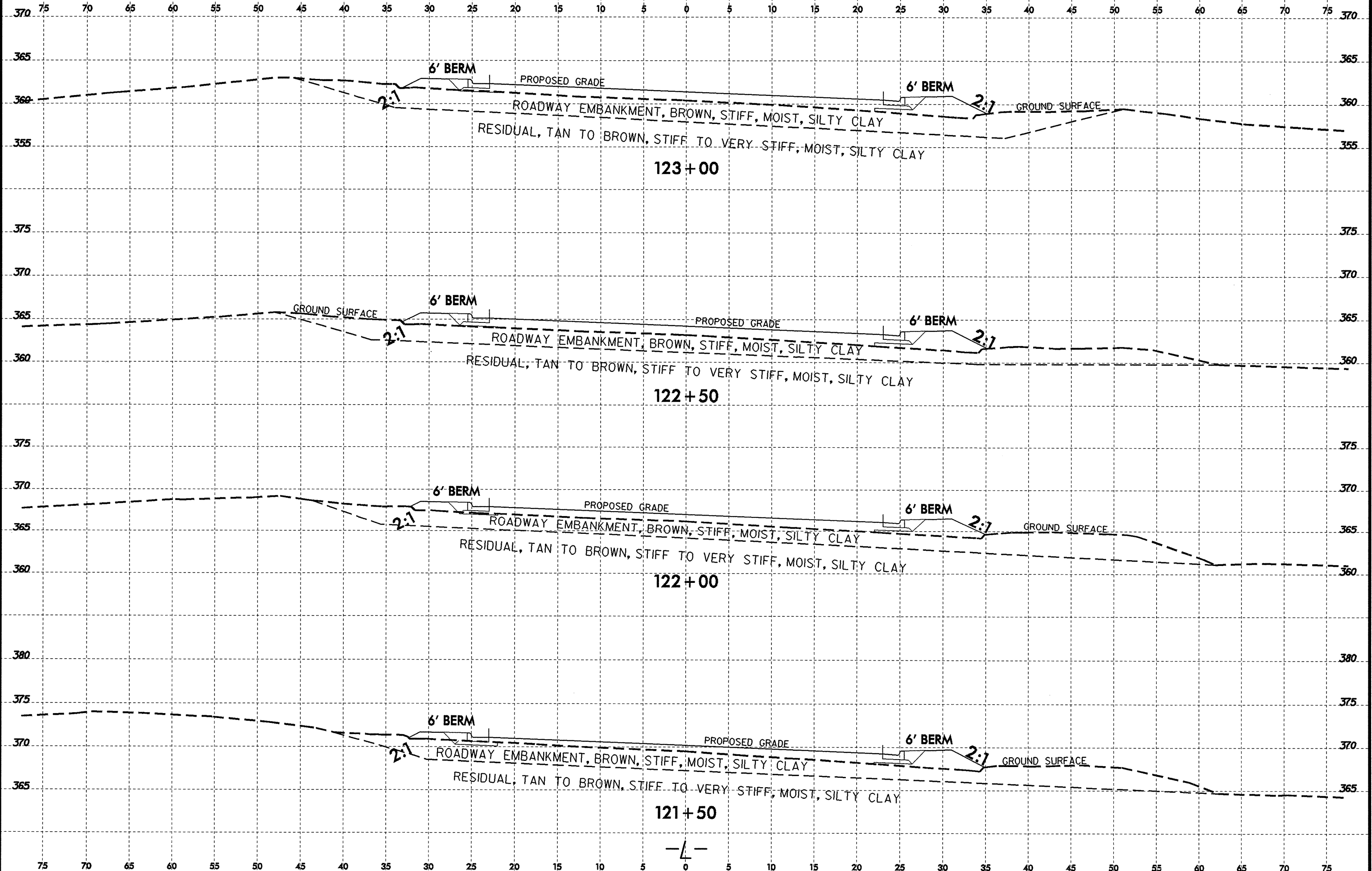


PROJ. REFERENCE NO.	SHEET NO.
U-3306	85



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8/23/99



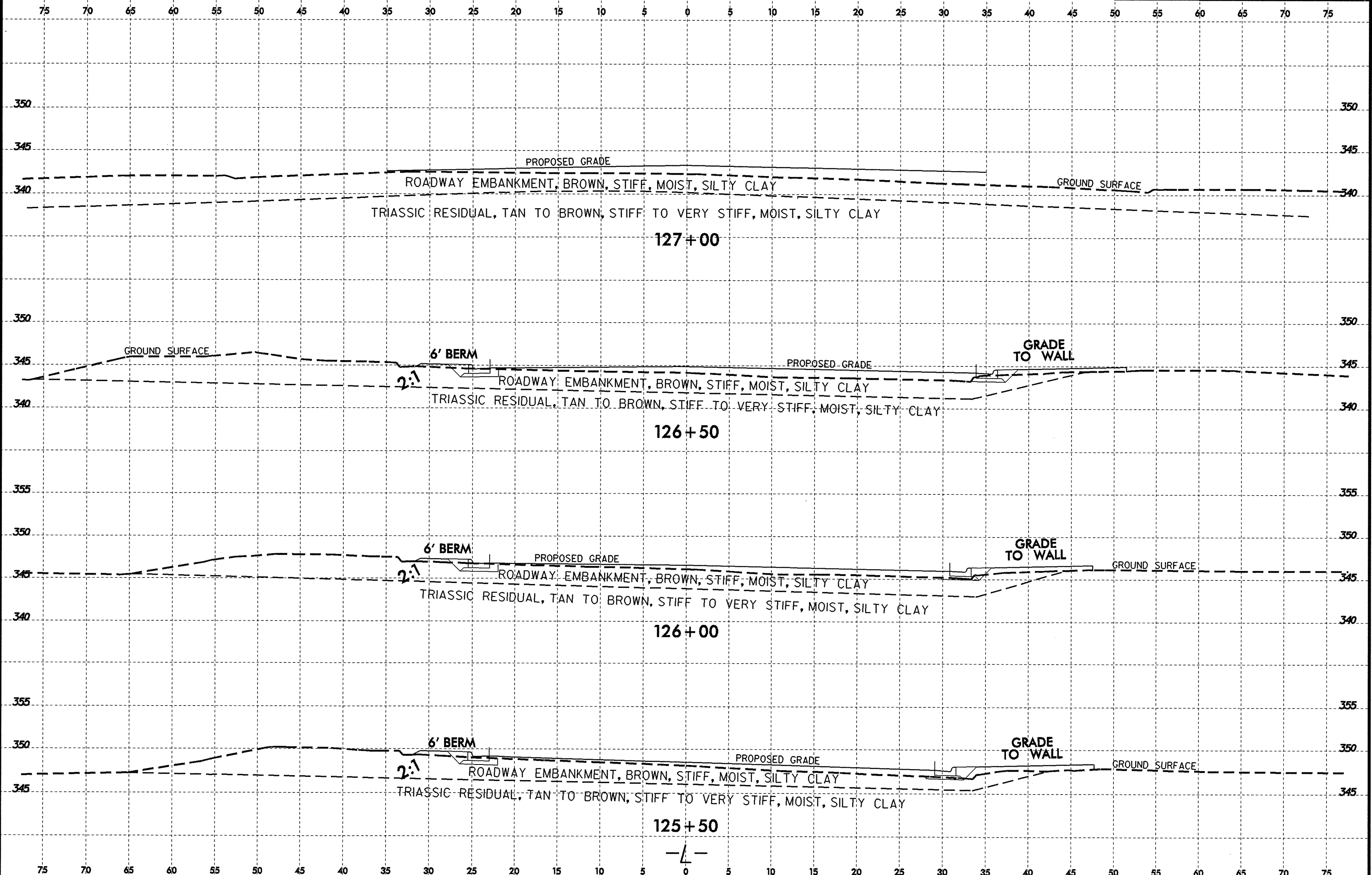
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8/23/99

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8/23/09



PROJ. REFERENCE NO.	SHEET NO.
U-3306	89

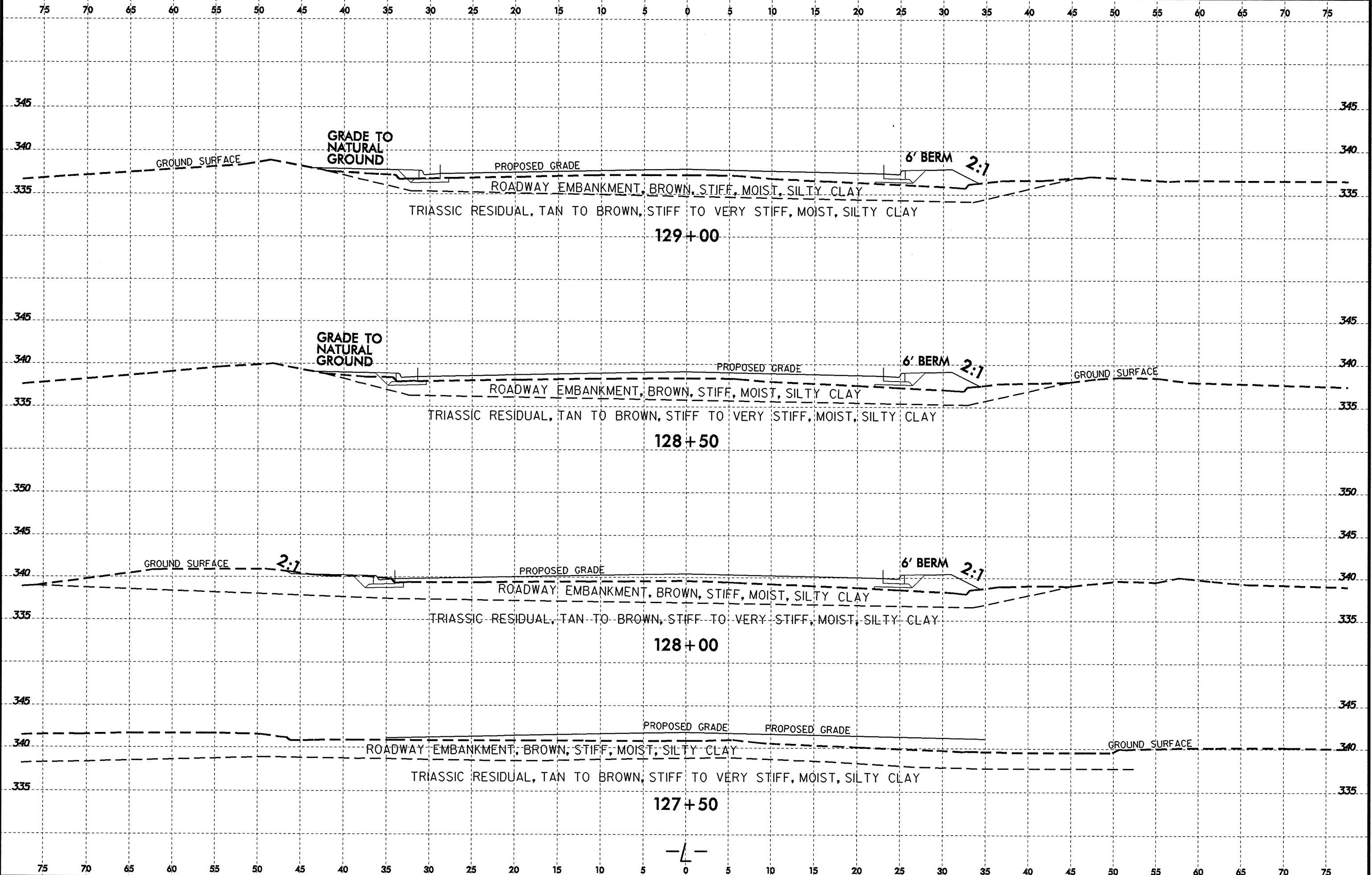


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AT 08/23/09

8/23/99
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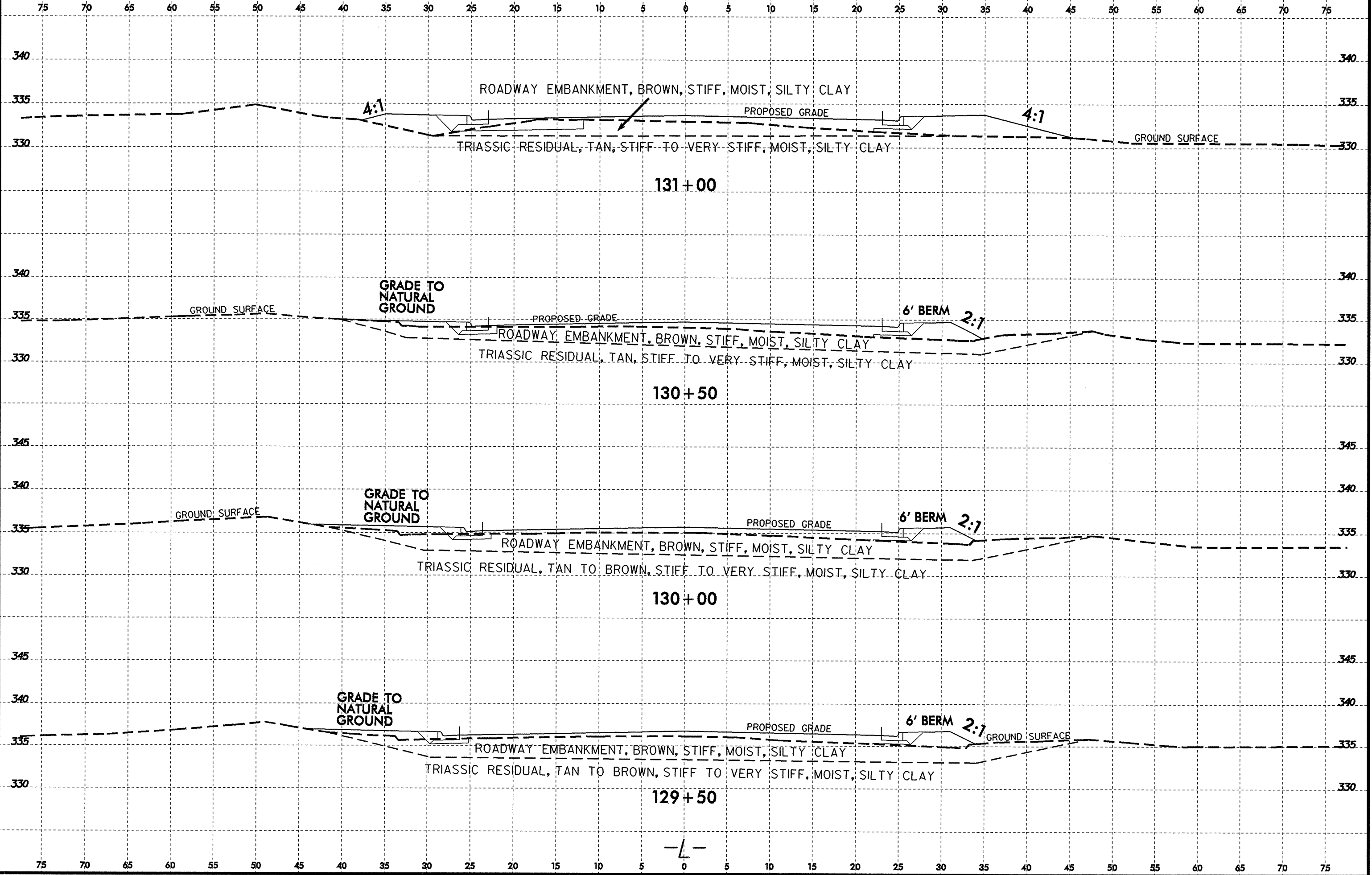


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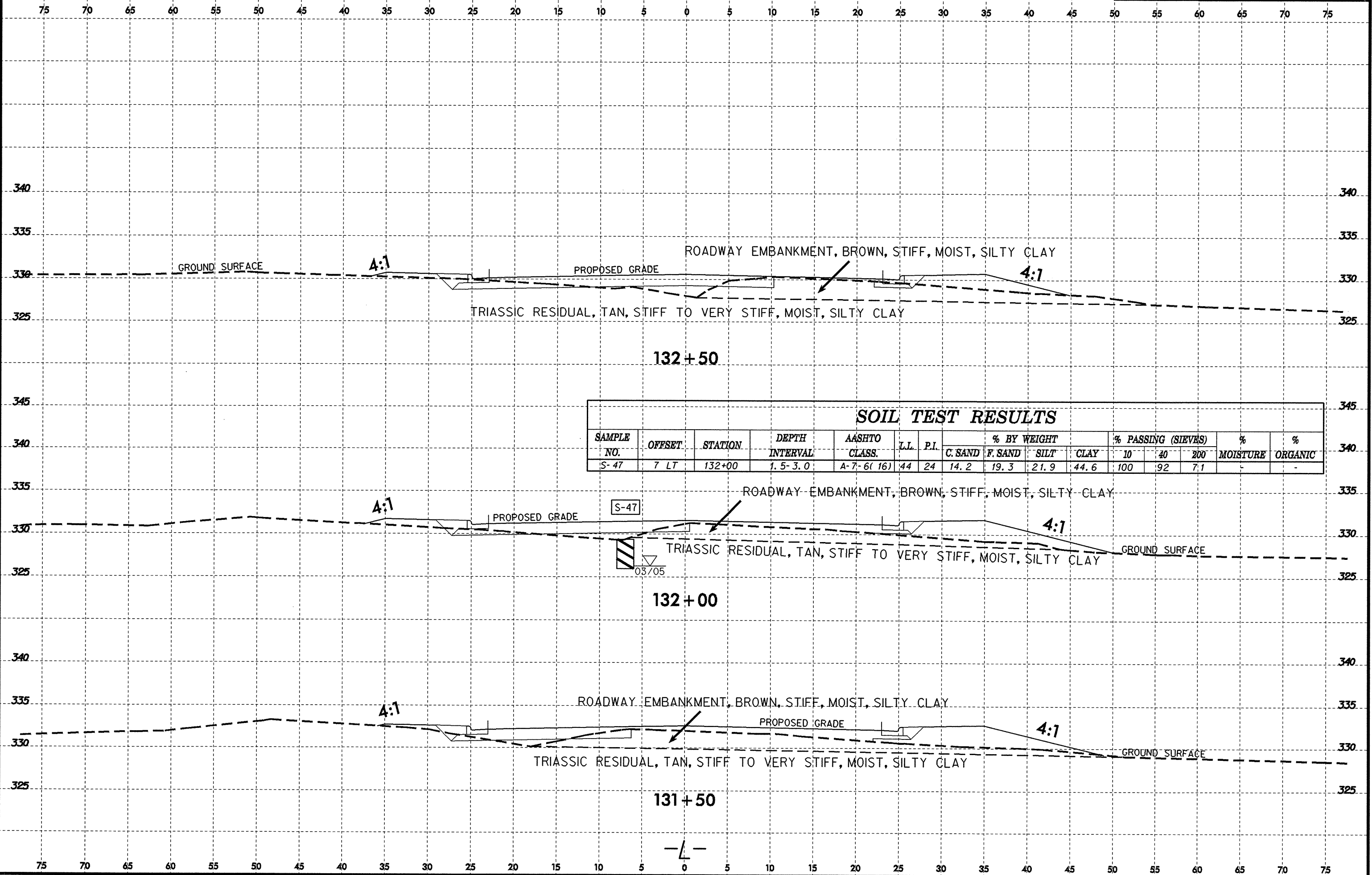
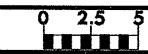
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8/23/99



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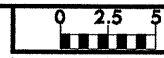
8/23/99



SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-47	7 LT	132+00	1.5-3.0	A-7-6(16)	44	24	14.2	19.3	21.9	44.6	100	92	7.1	-	-

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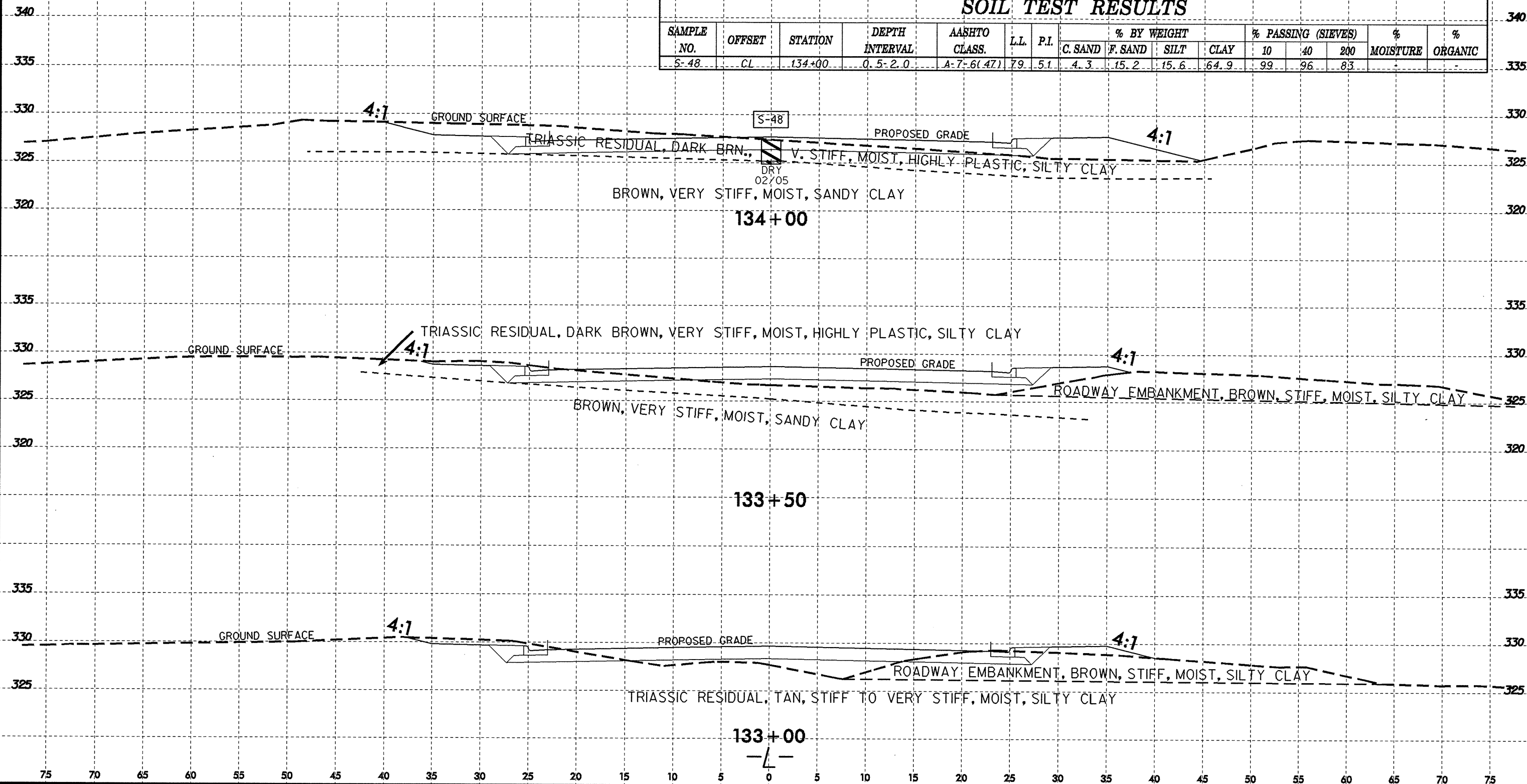
8/23/99



PROJ. REFERENCE NO. U-3306 SHEET NO. 93

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

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-48	CL	134+00	0.5-2.0	A-7-6(47)	79	51	4.3	15.2	15.6	64.9	99	96	83	-	-



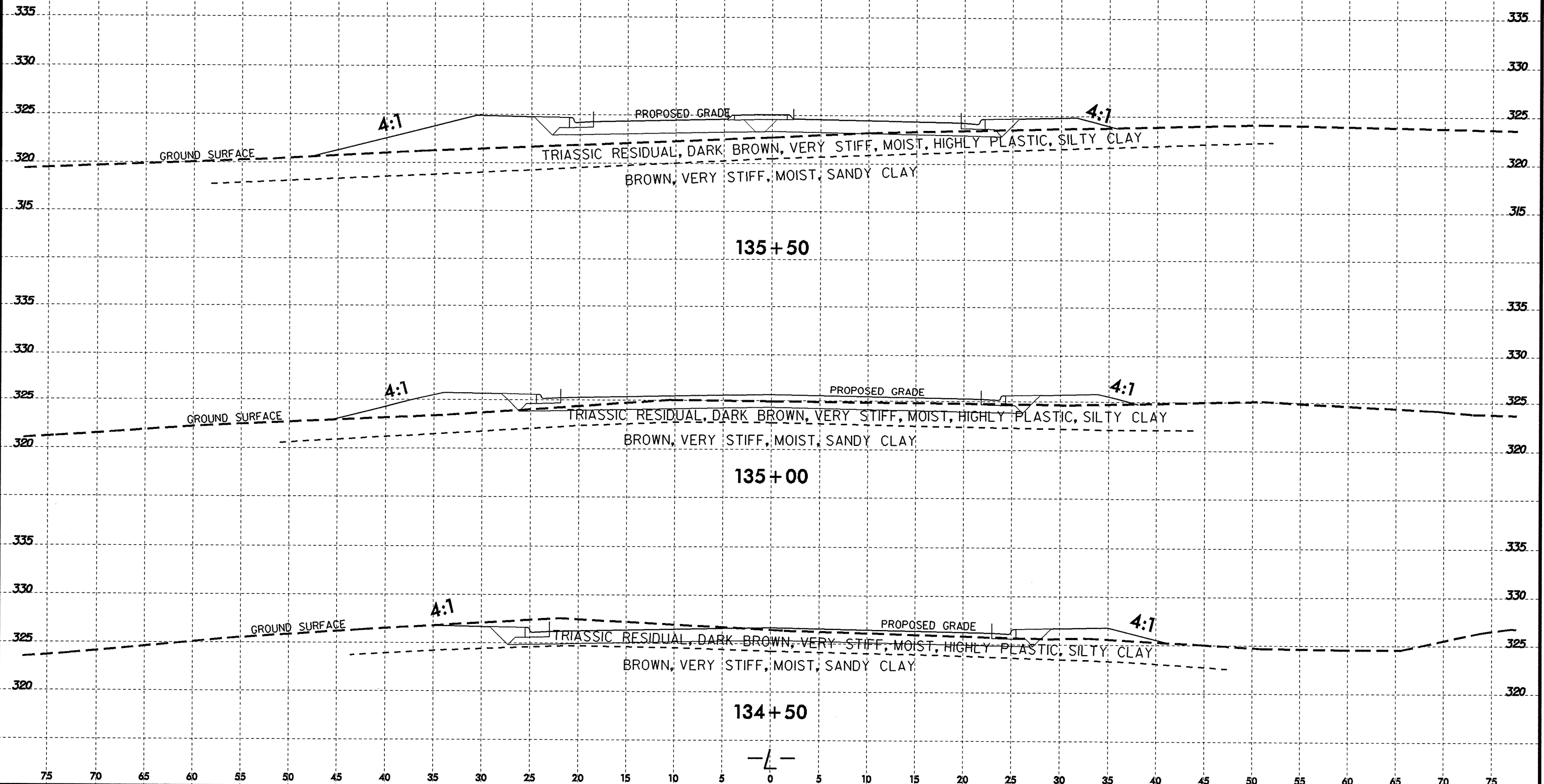
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8/23/99



PROJ. REFERENCE NO.	SHEET NO.
U-3306	94

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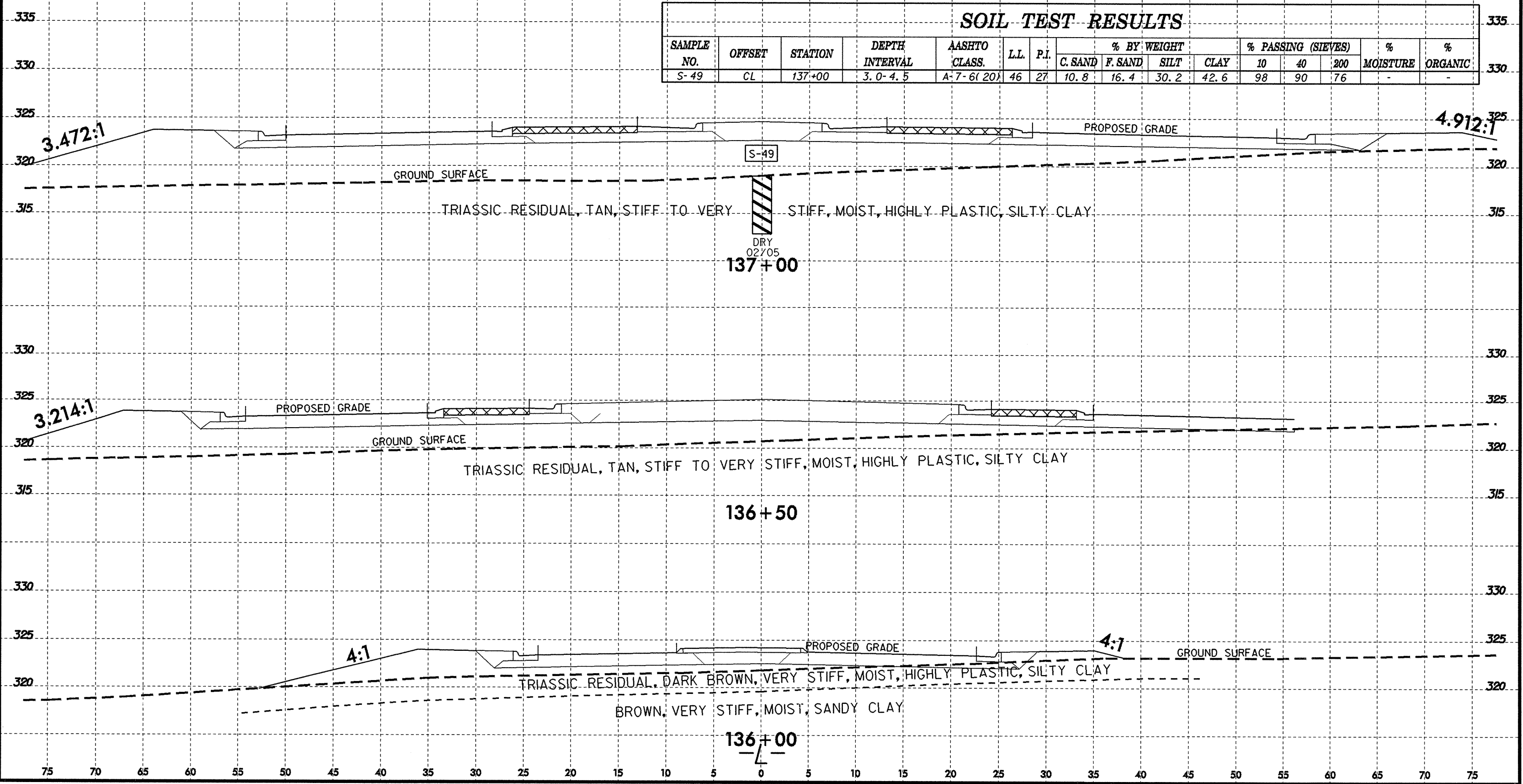


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8/23/99

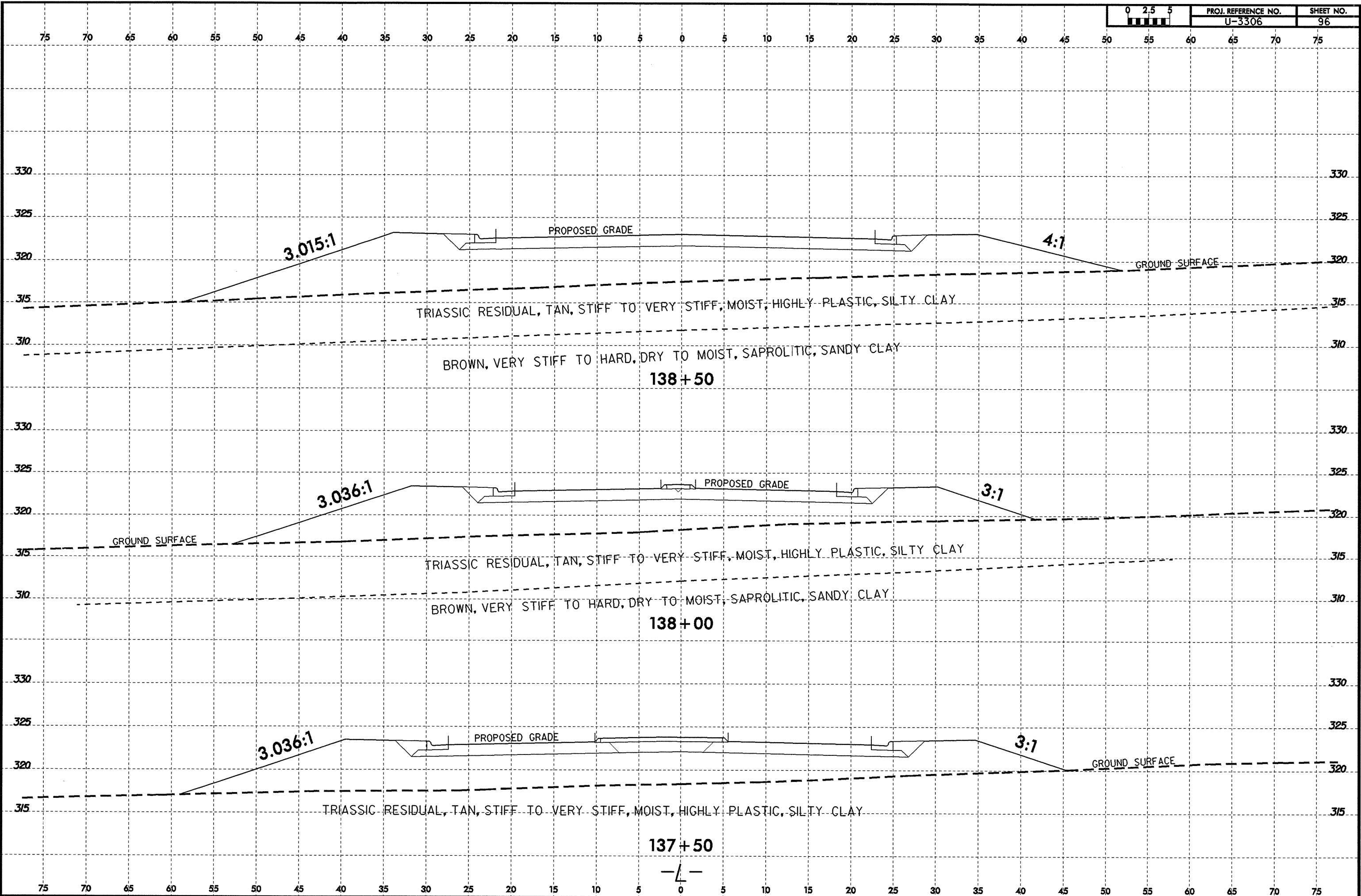
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-49	CL	137+00	3.0-4.5	A-7-6(20)	46	27	10.8	16.4	30.2	42.6	98	90	76	-	-



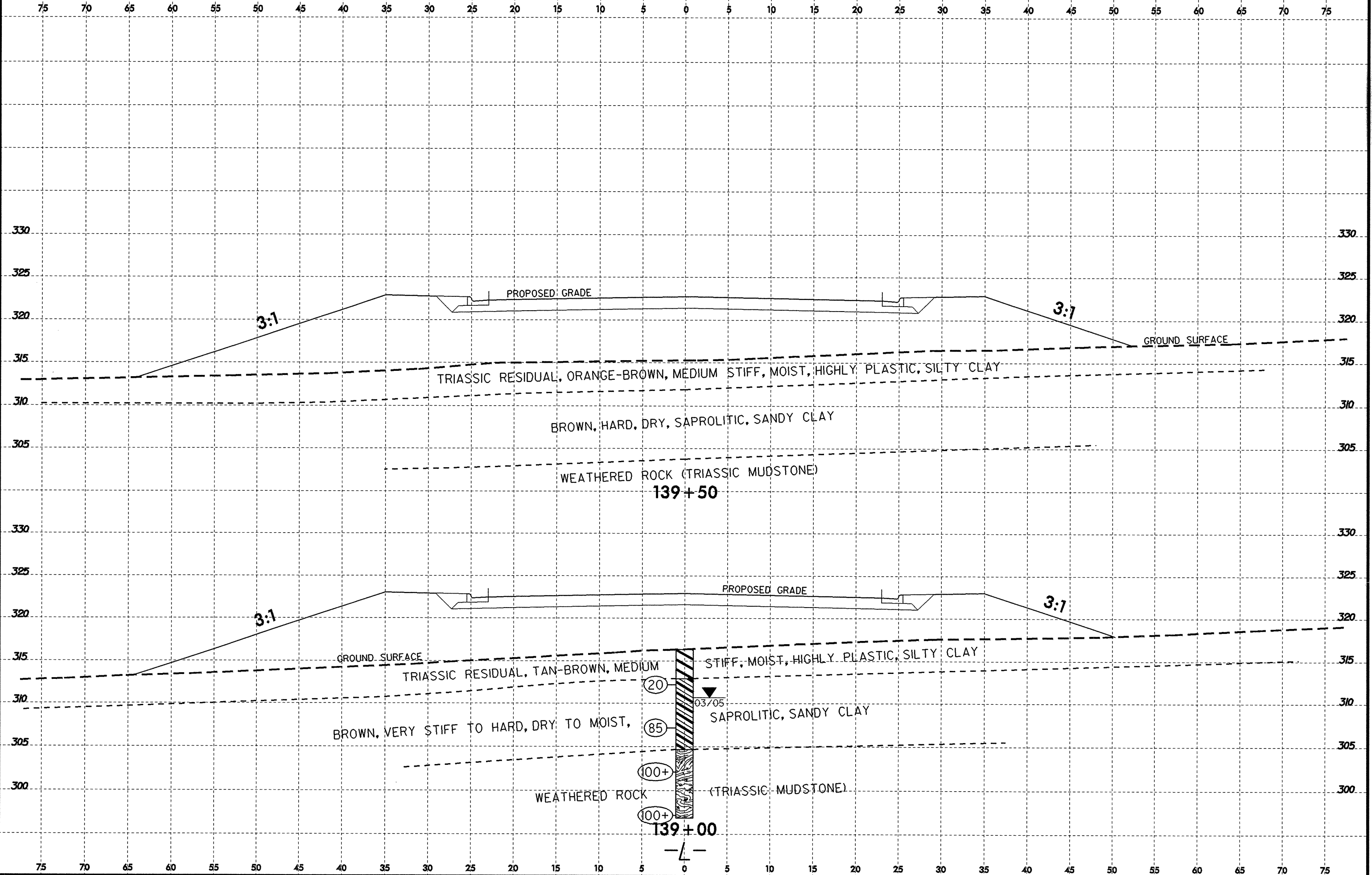
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8/23/99
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0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	U-3306	96

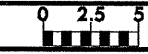


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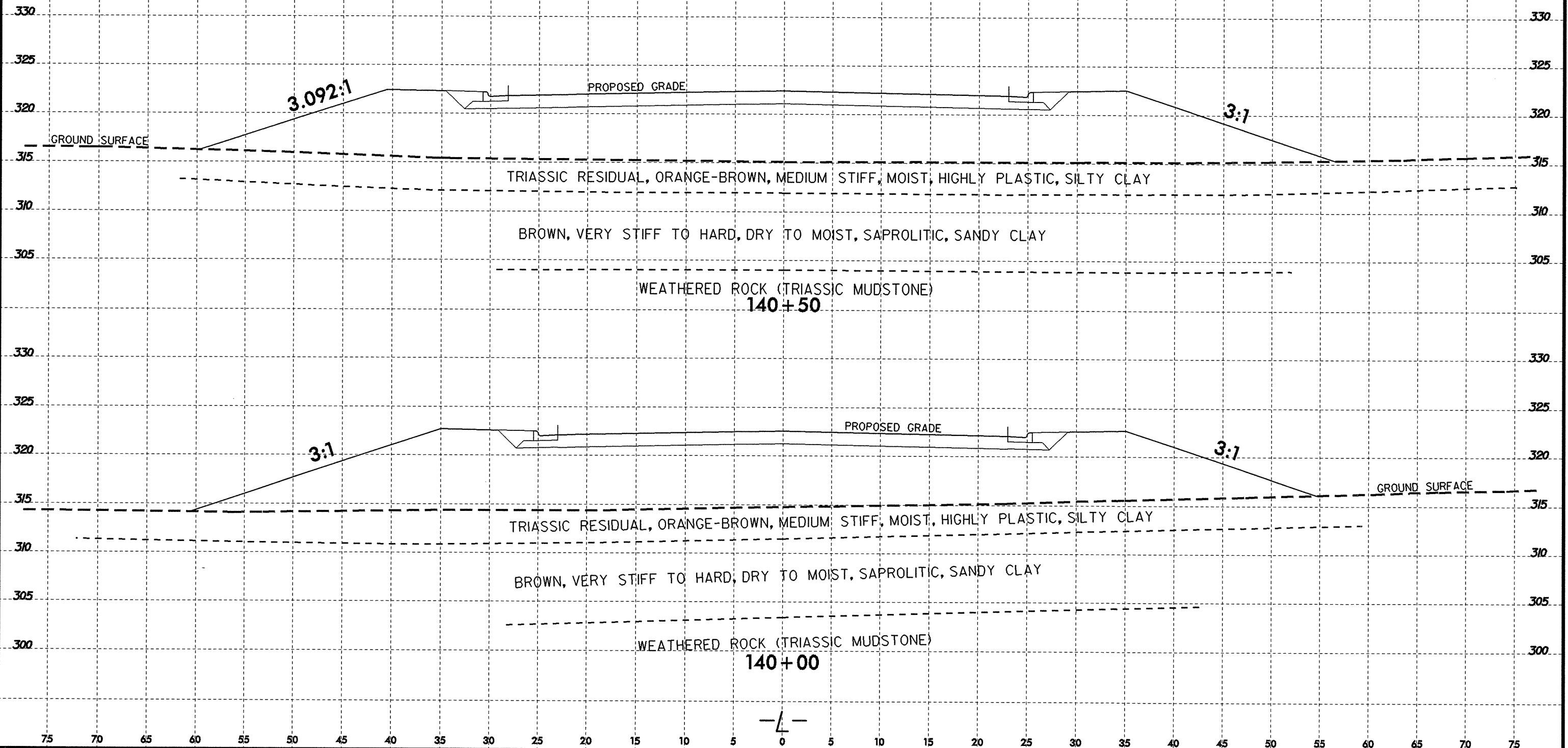
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8/23/99



PROJ. REFERENCE NO.	SHEET NO.
U-3306	98

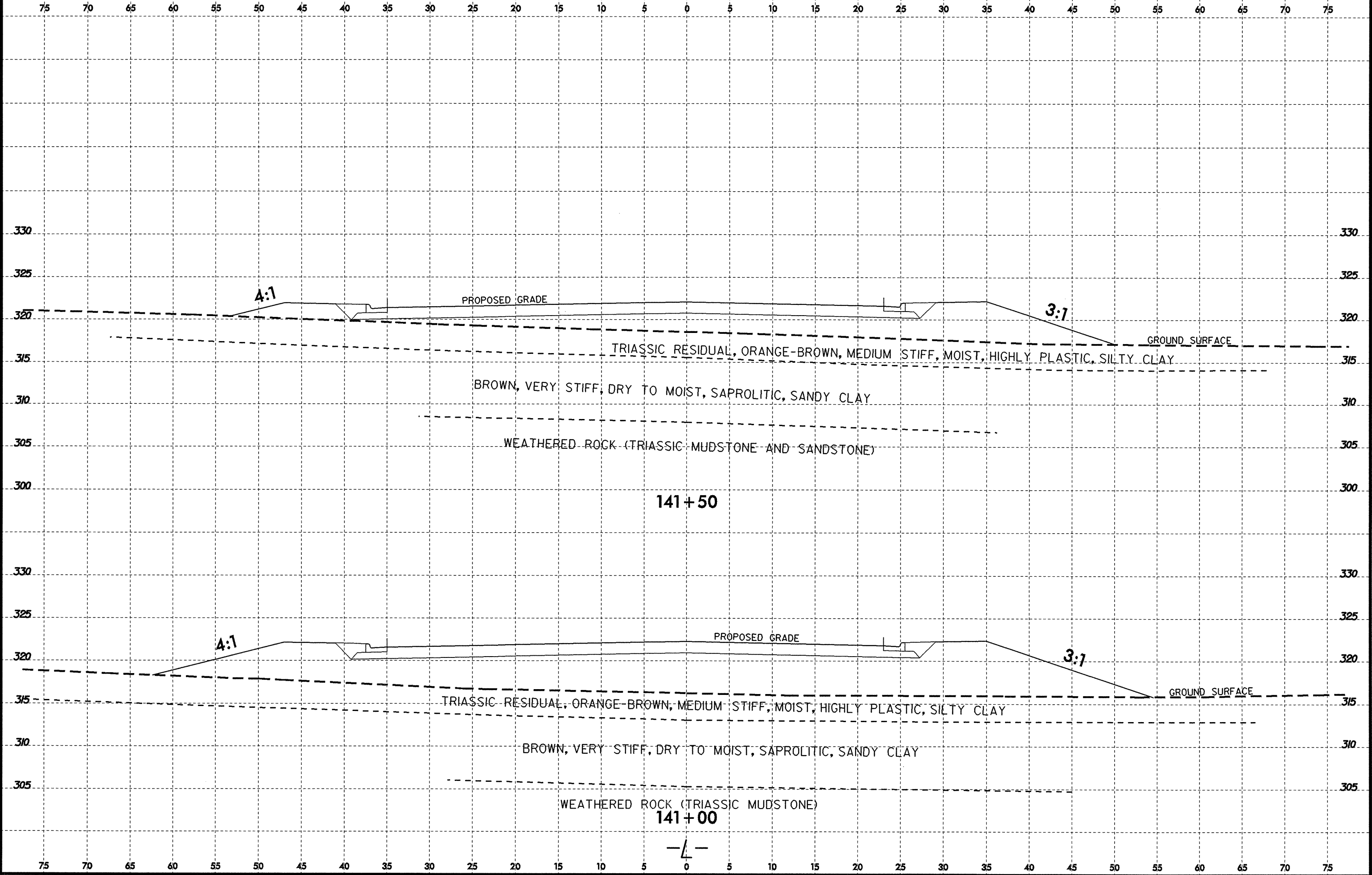
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8/23/99

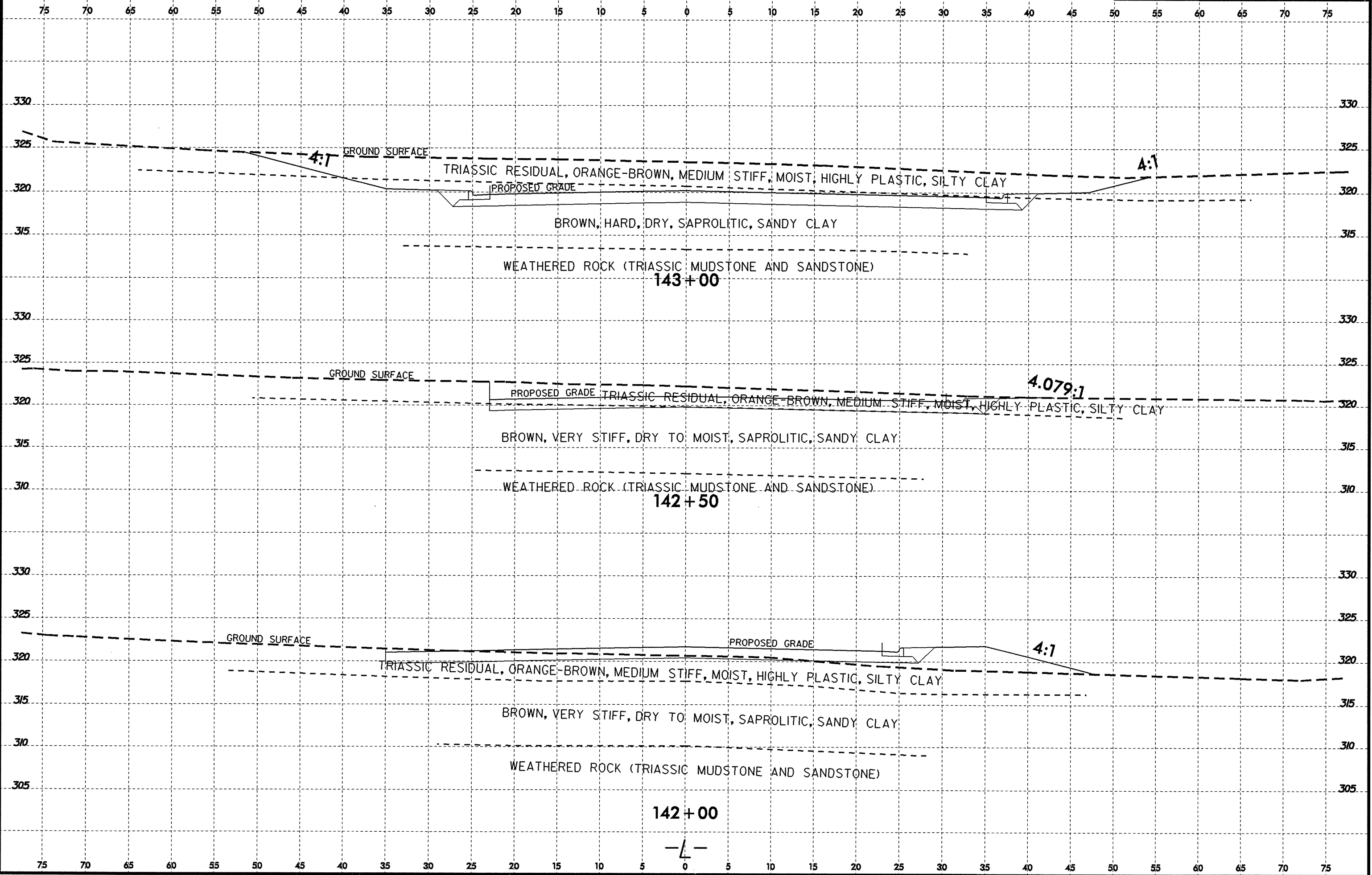


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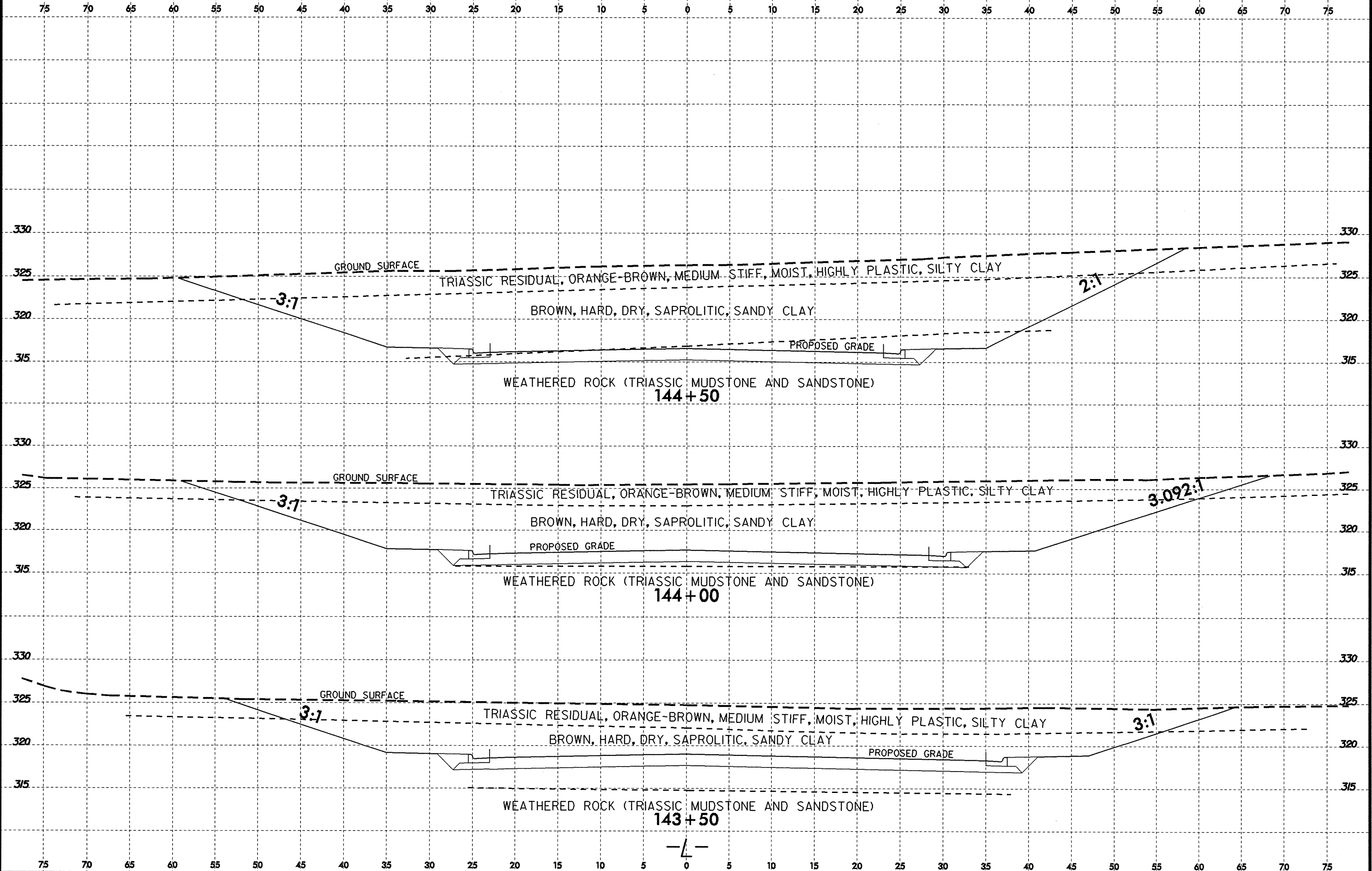
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U-3306	100



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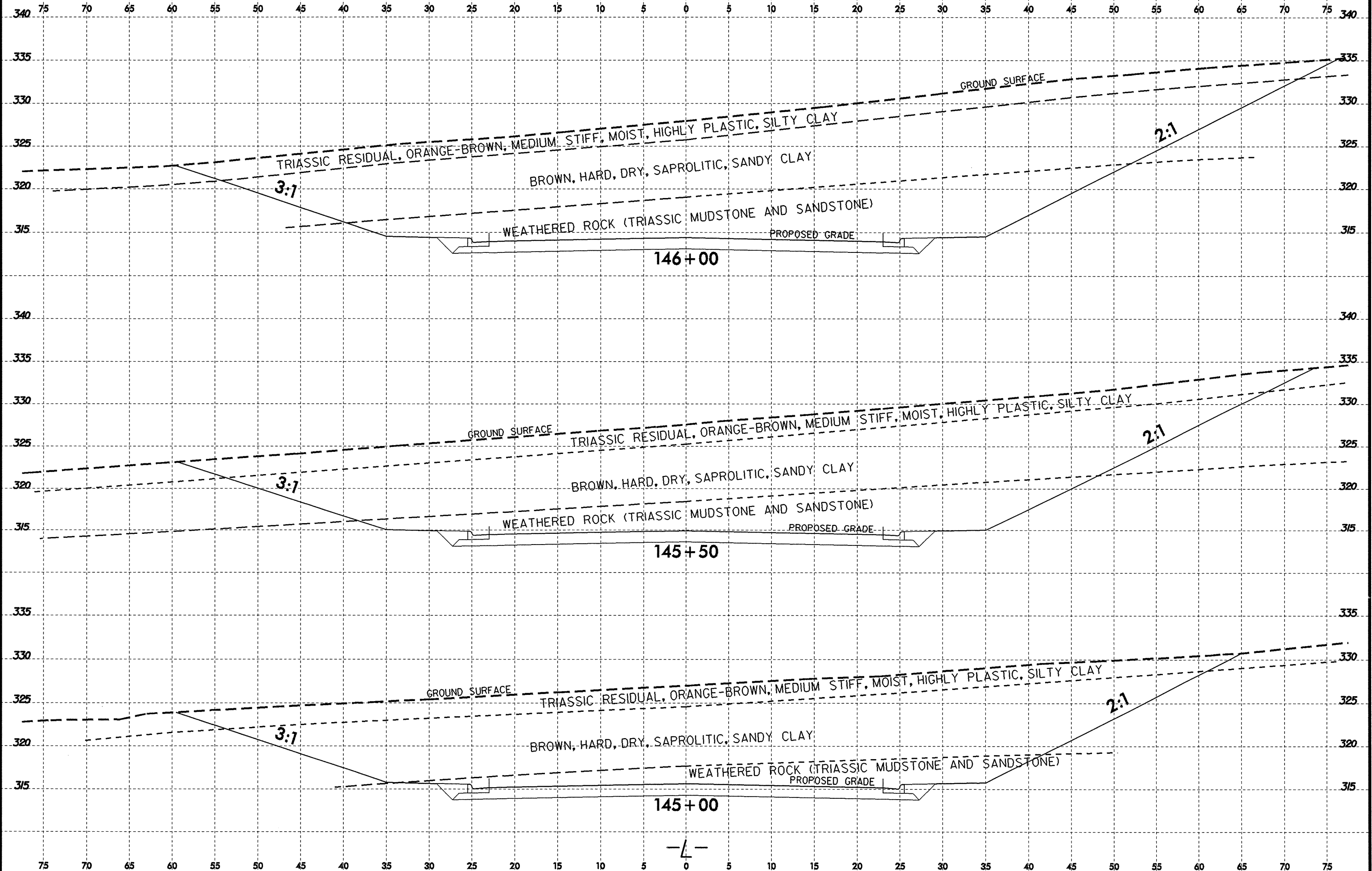
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8/23/99
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0 2.5 5	PROJ. REFERENCE NO. U-3306	SHEET NO. 102
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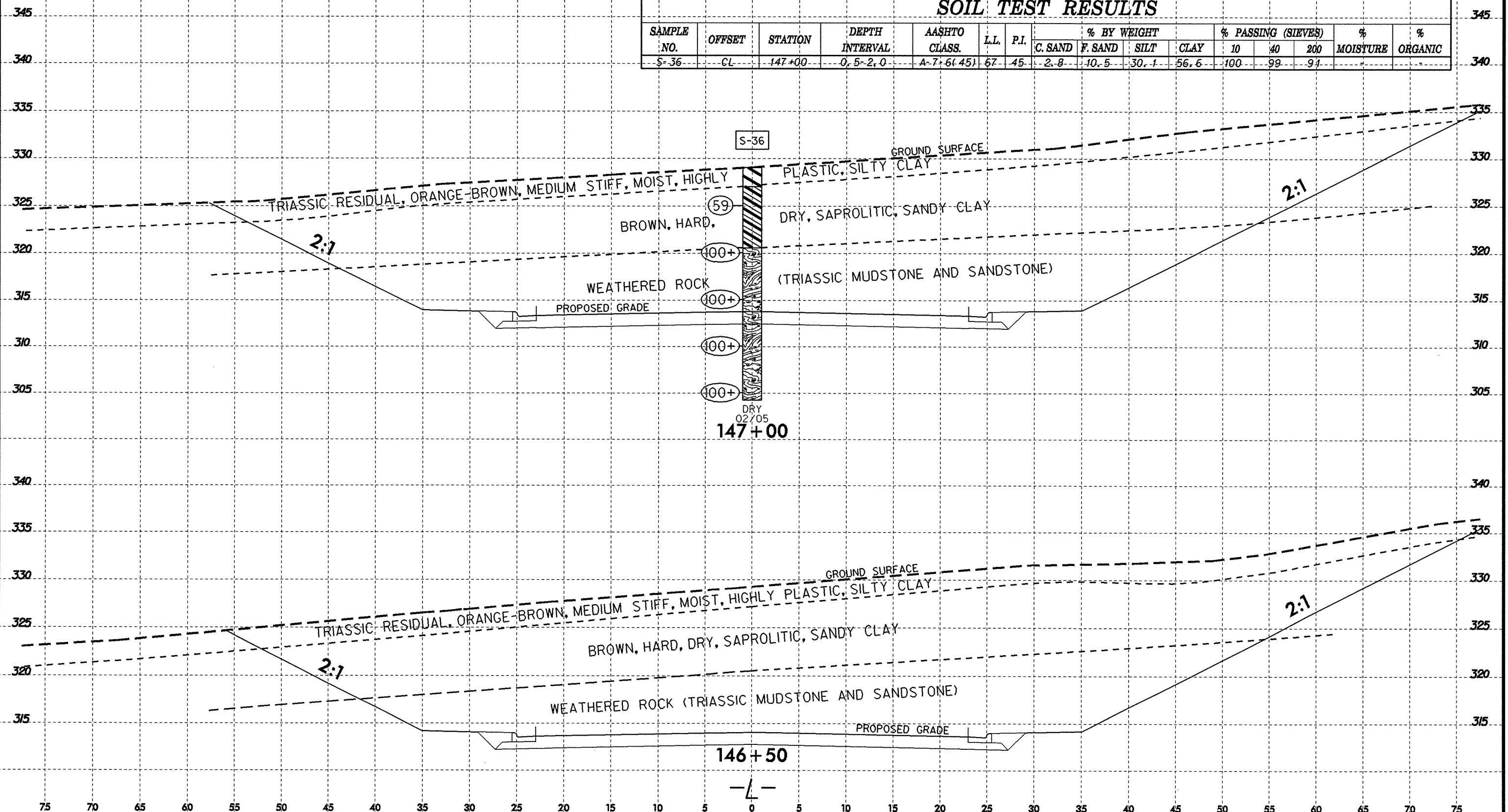


8/23/99

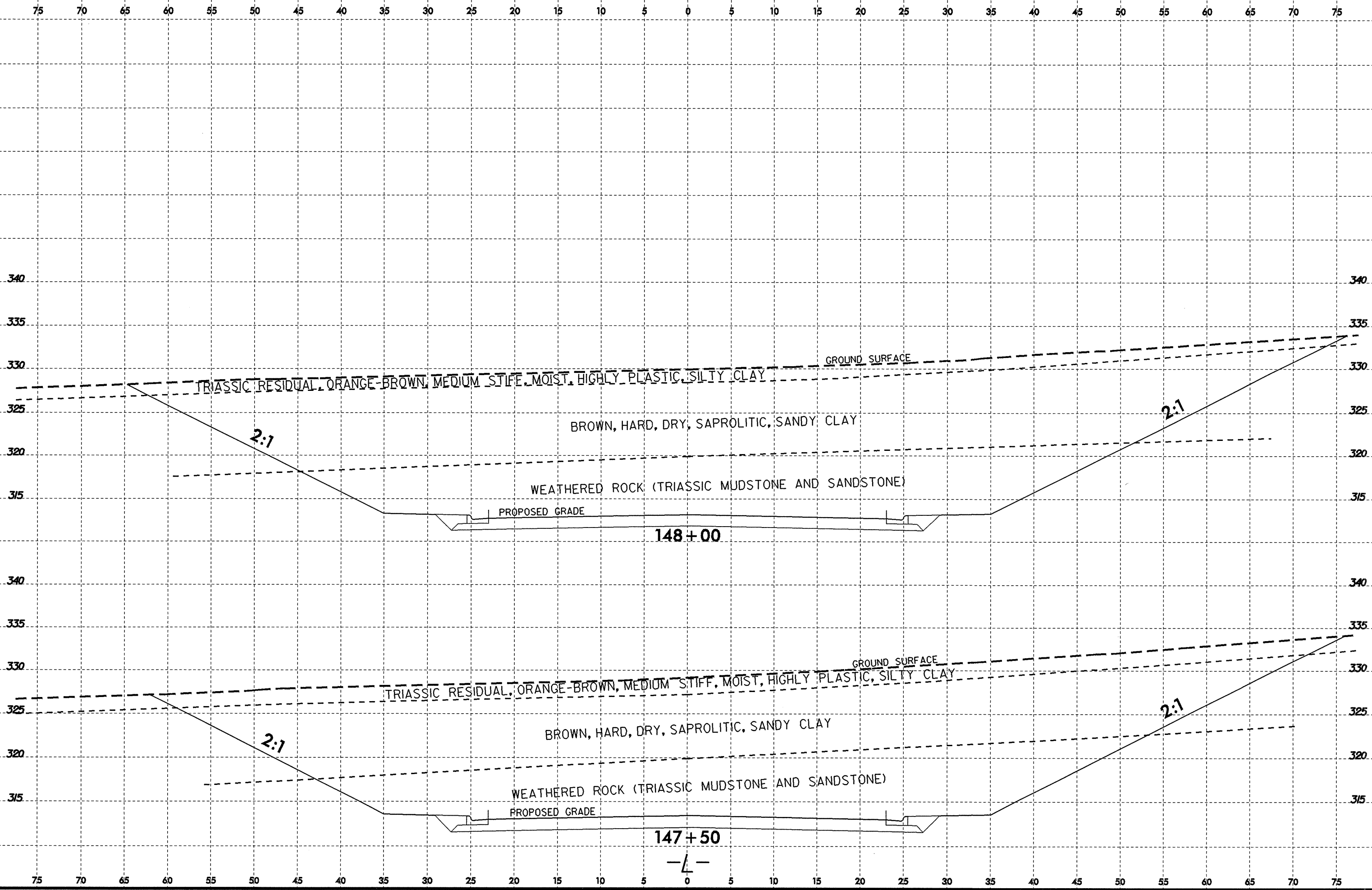


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SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-36	CL	147+00	0.5-2.0	A-7-6(45)	67	45	2.8	10.5	30.1	56.6	100	99	91		



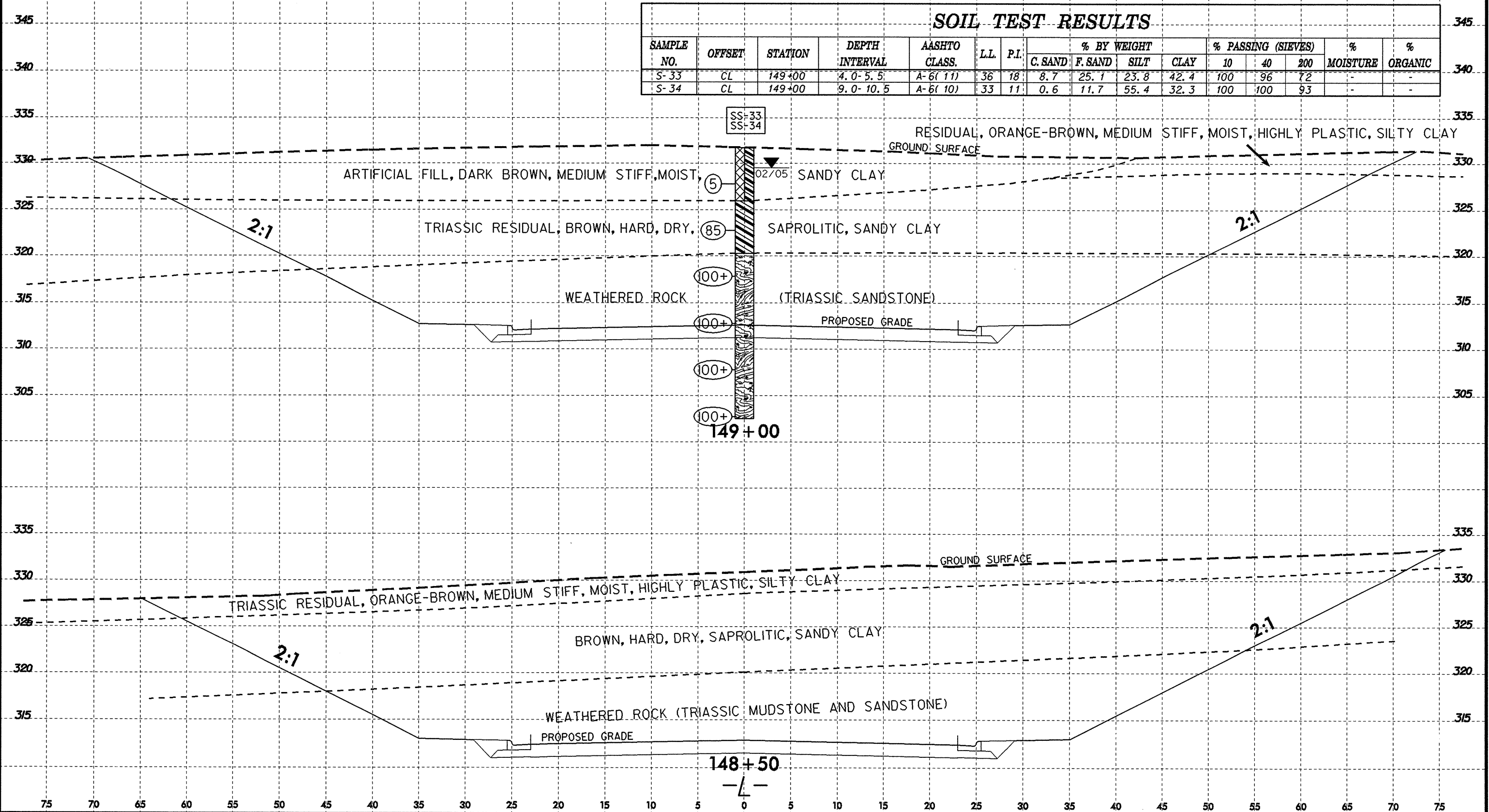
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8/23/99

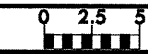
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-33	CL	149+00	4.0-5.5	A-6(11)	36	18	8.7	25.1	23.8	42.4	100	96	72	-	-
S-34	CL	149+00	9.0-10.5	A-6(10)	33	11	0.6	11.7	55.4	32.3	100	100	93	-	-

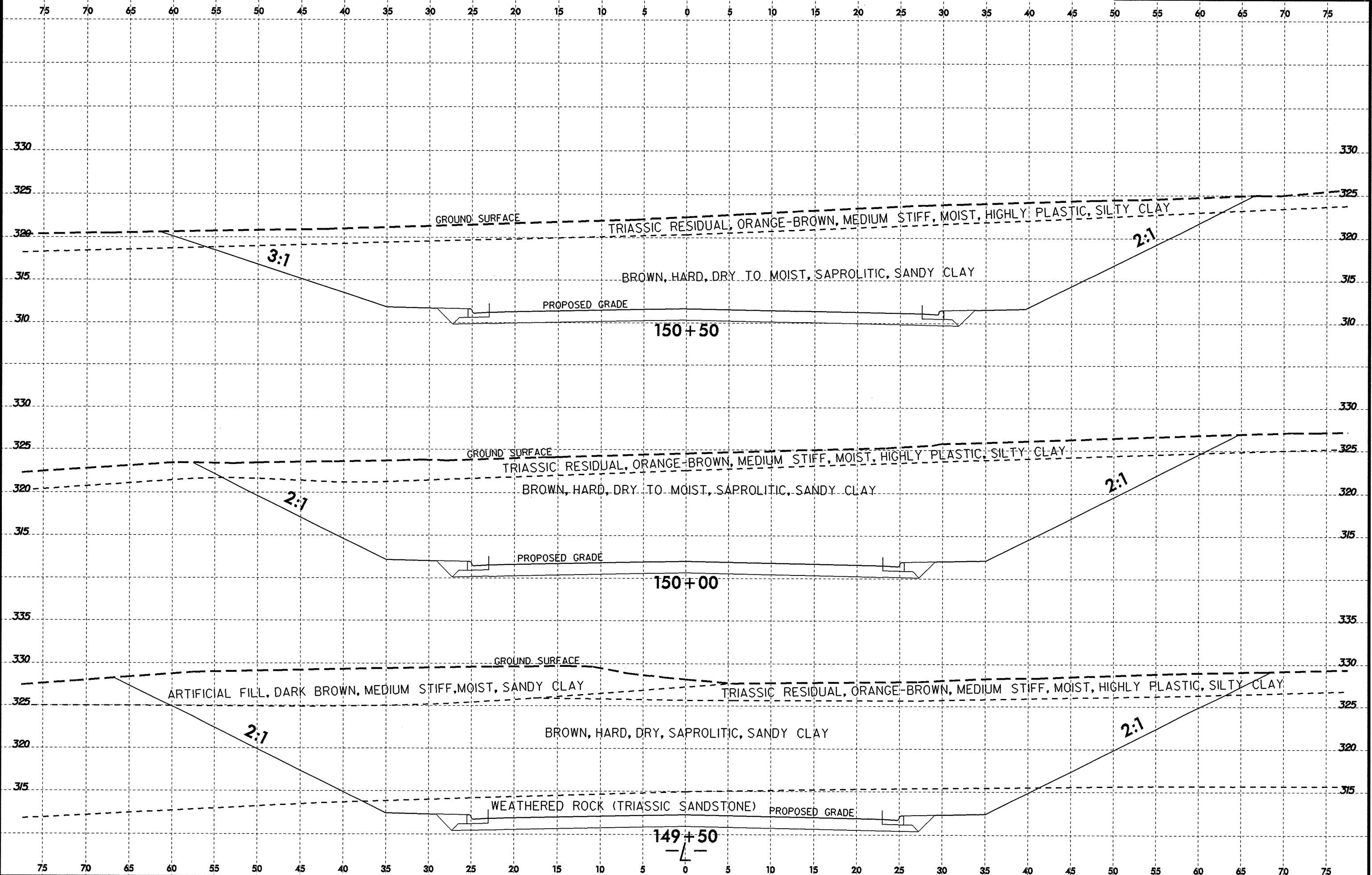


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8/23/09



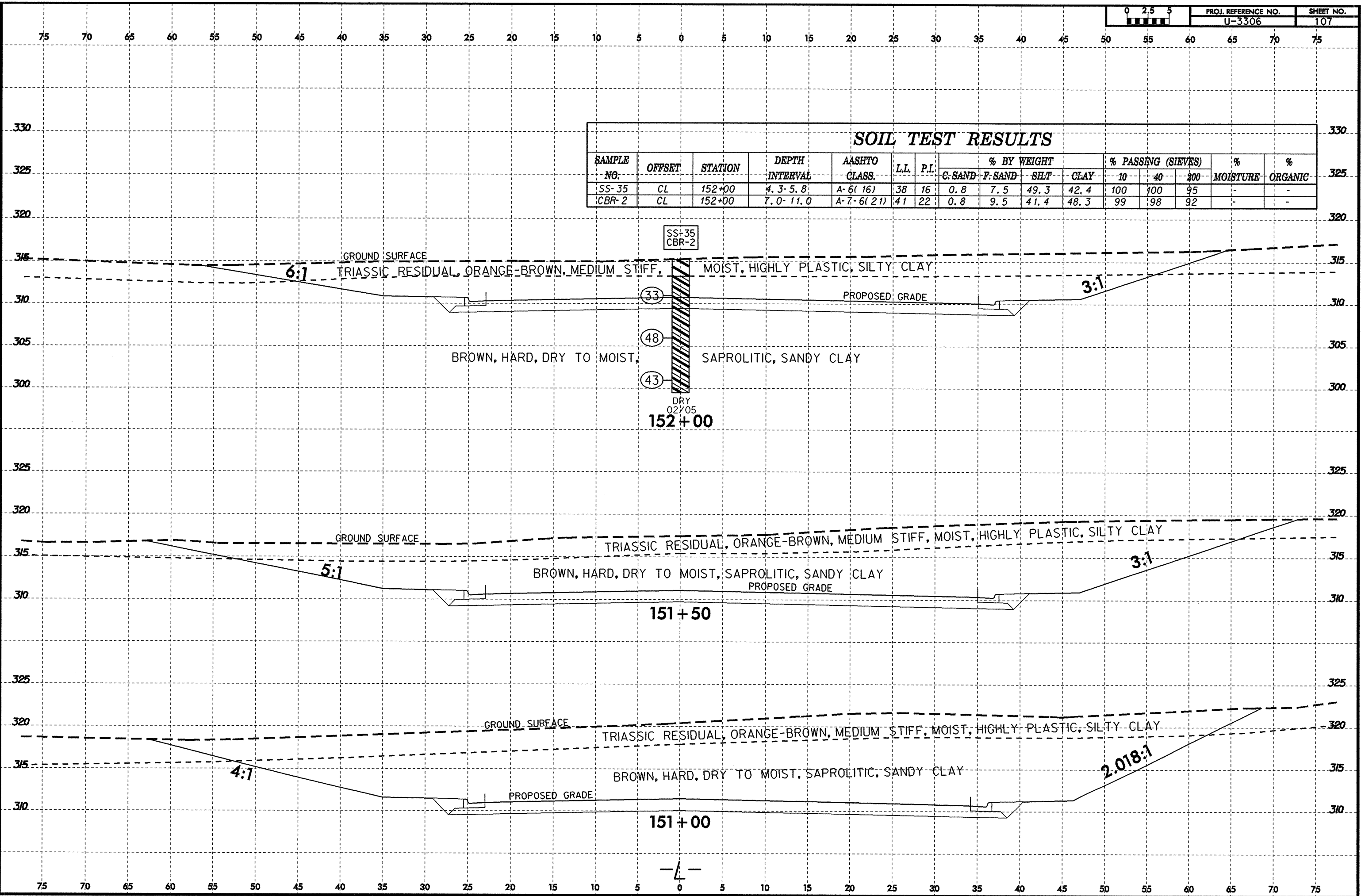
PROJ. REFERENCE NO.	SHEET NO.
U-3306	106



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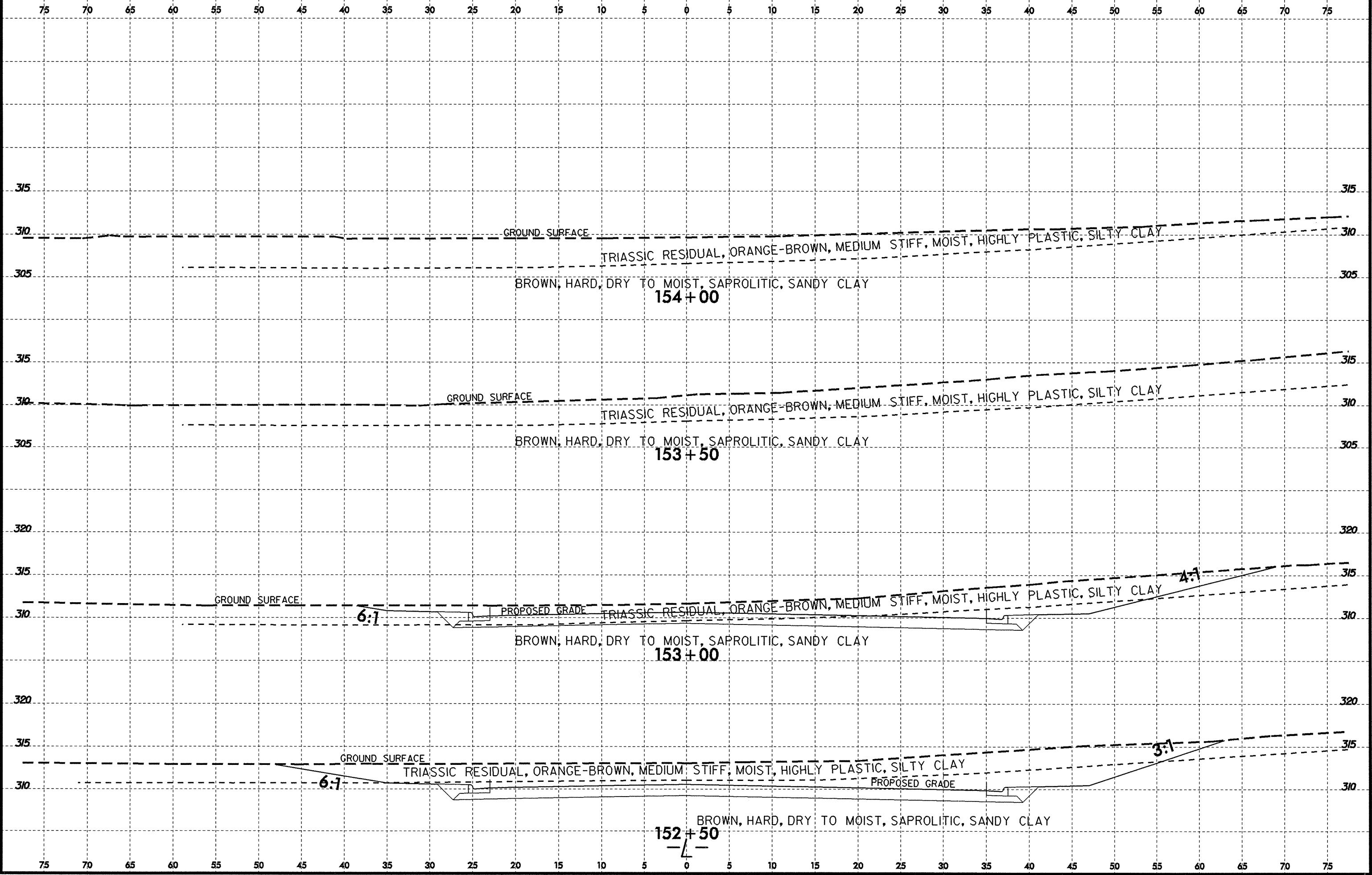
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							C. SAND	F. SAND	SILT	CLAY	-10	-40	-200		
SS-35	CL	152+00	4.3-5.8	A-6(16)	38	16	0.8	7.5	49.3	42.4	100	100	95	-	-
CBR-2	CL	152+00	7.0-11.0	A-7-6(21)	41	22	0.8	9.5	41.4	48.3	99	98	92	-	-

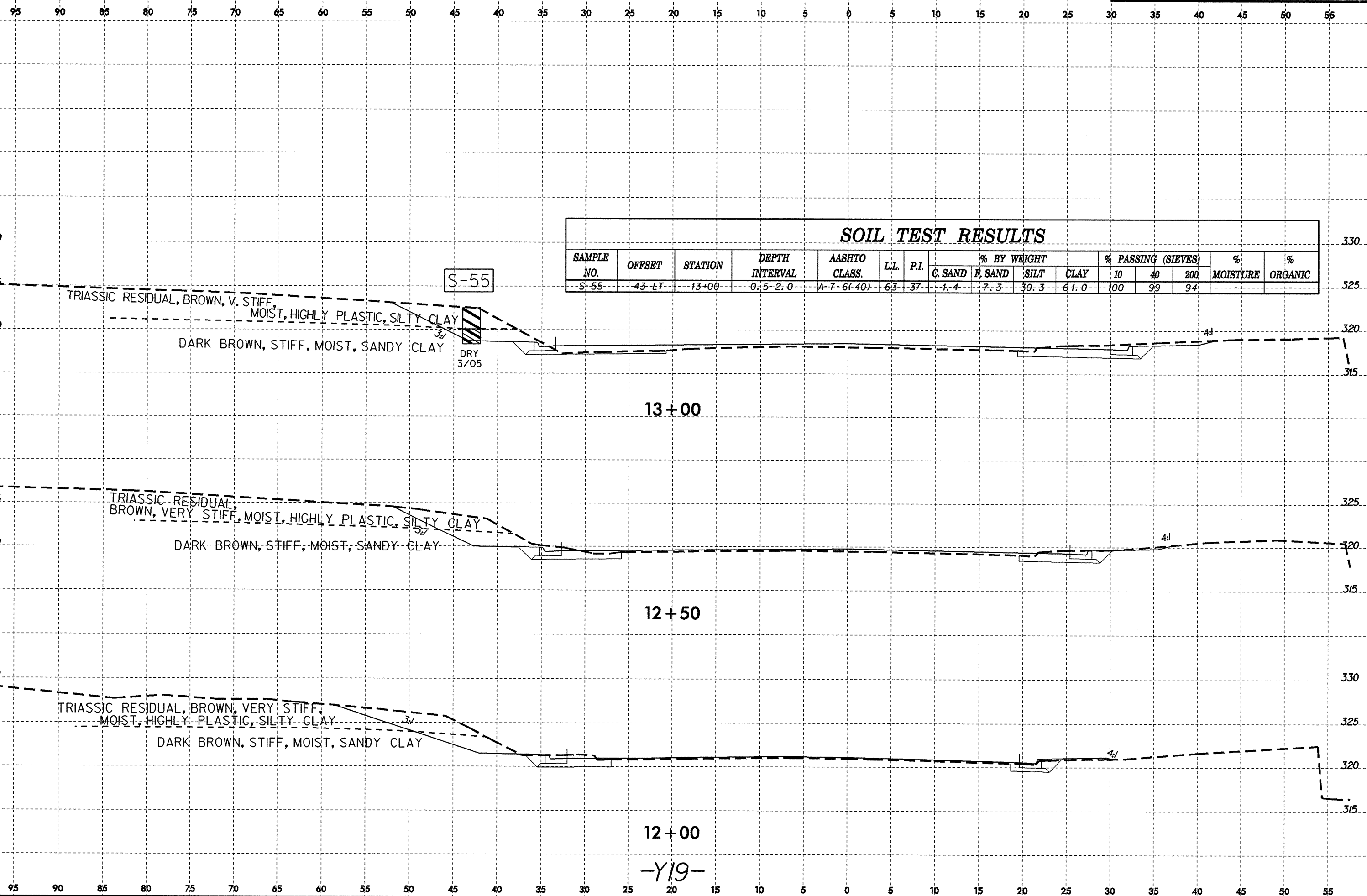


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							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-55	43-LT	13+00	0.5-2.0	A-7-6(40)	63	37	1.4	7.3	30.3	61.0	100	99	94		

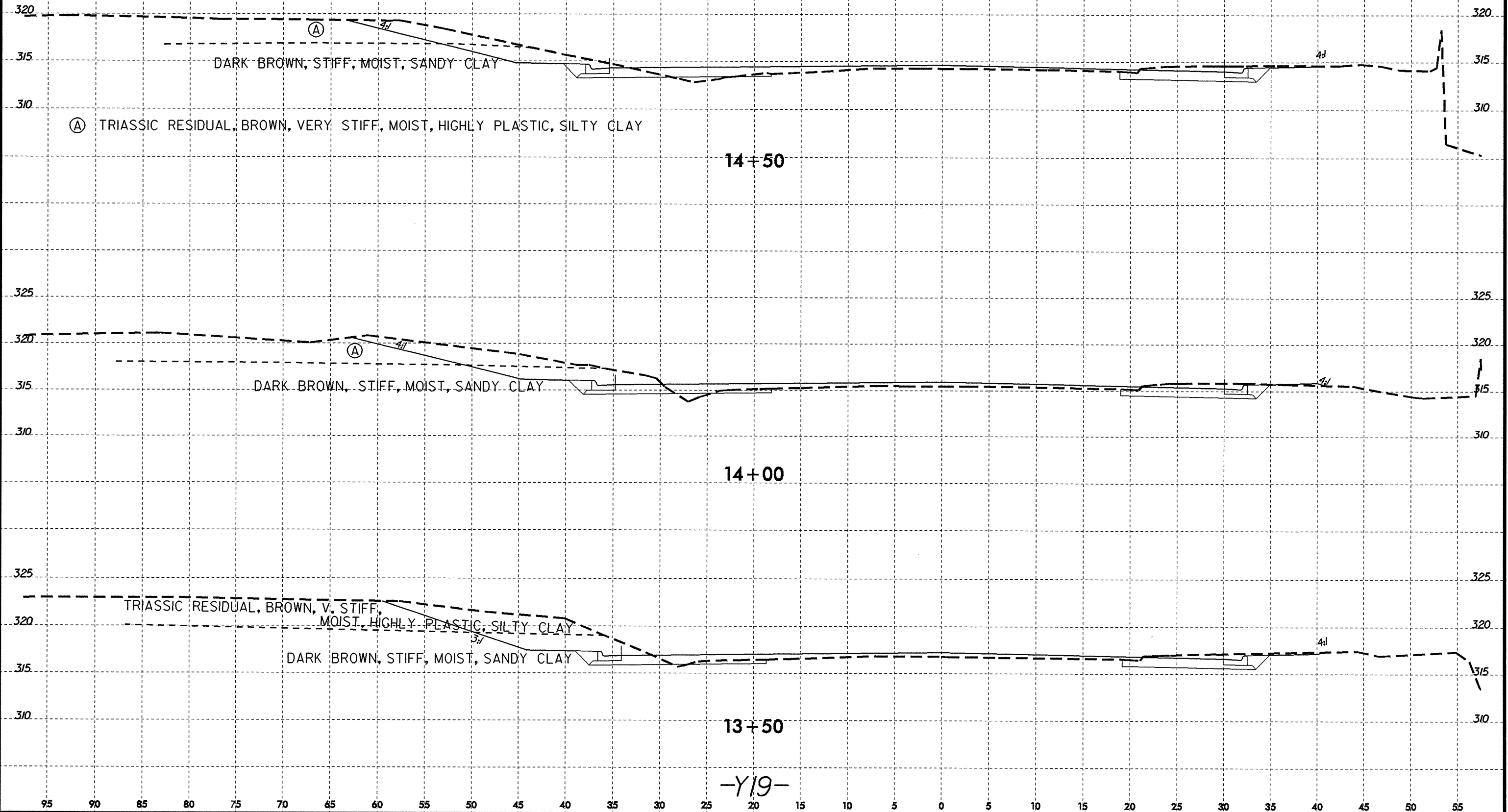
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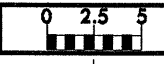
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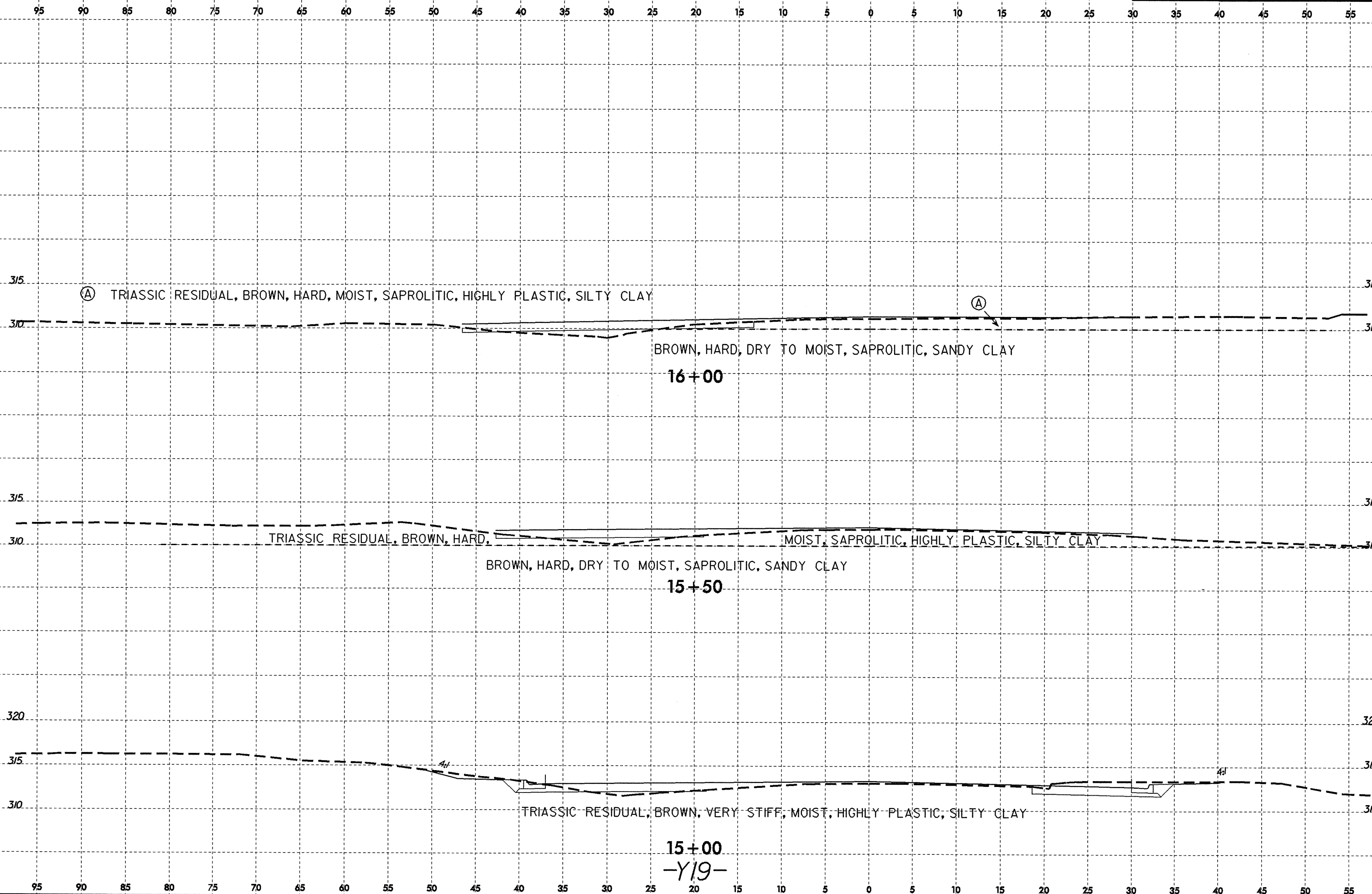
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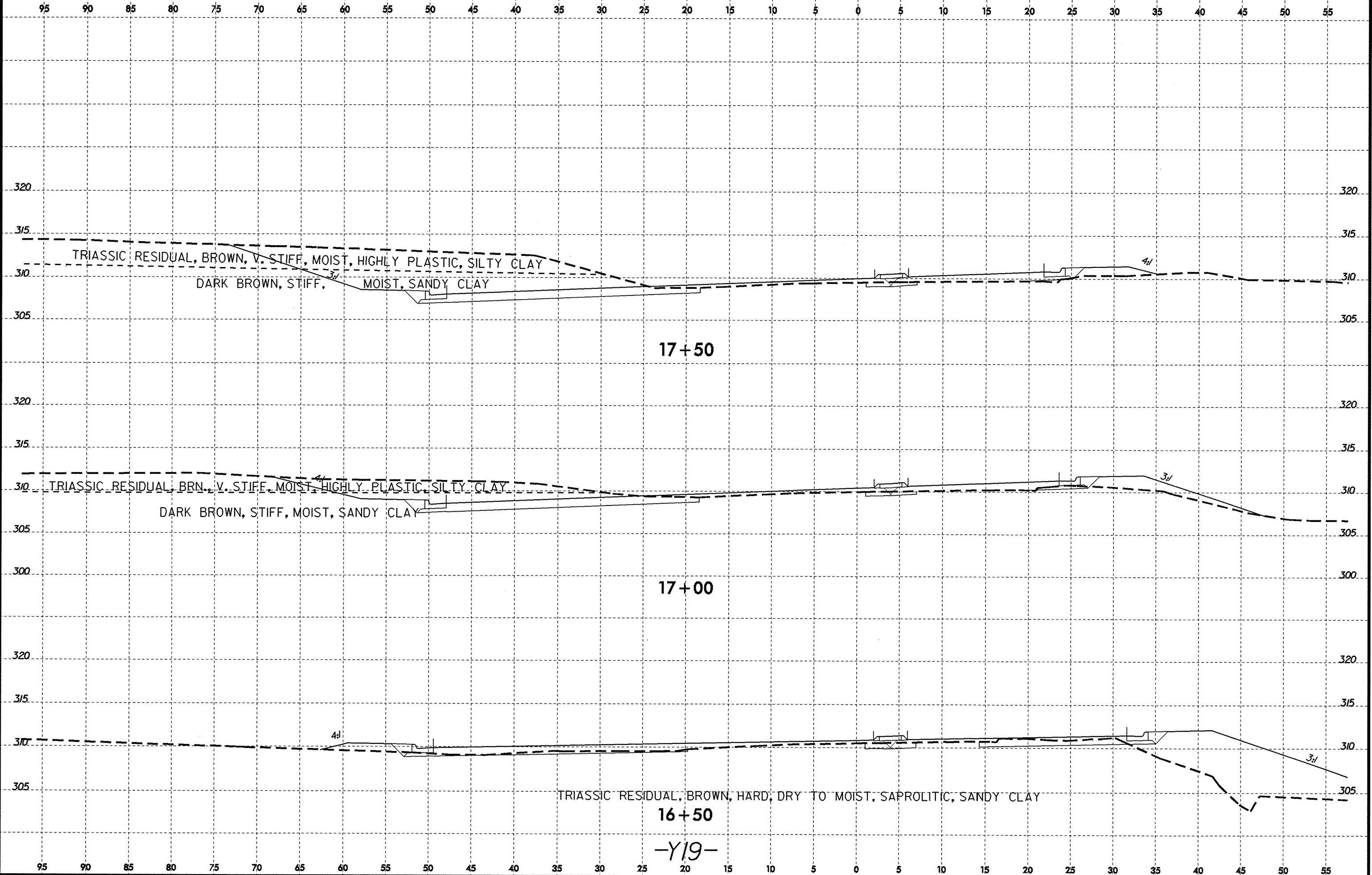
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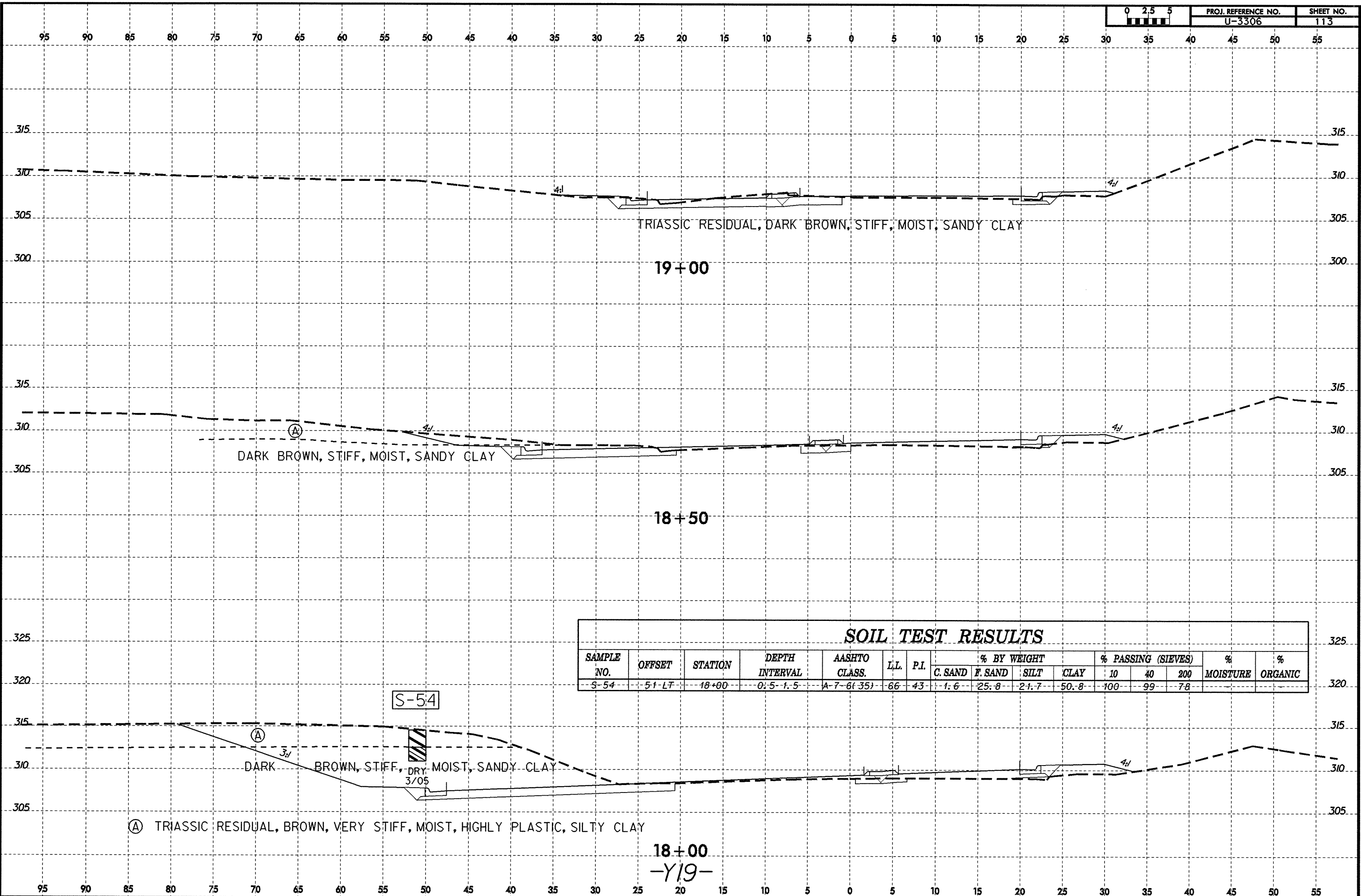
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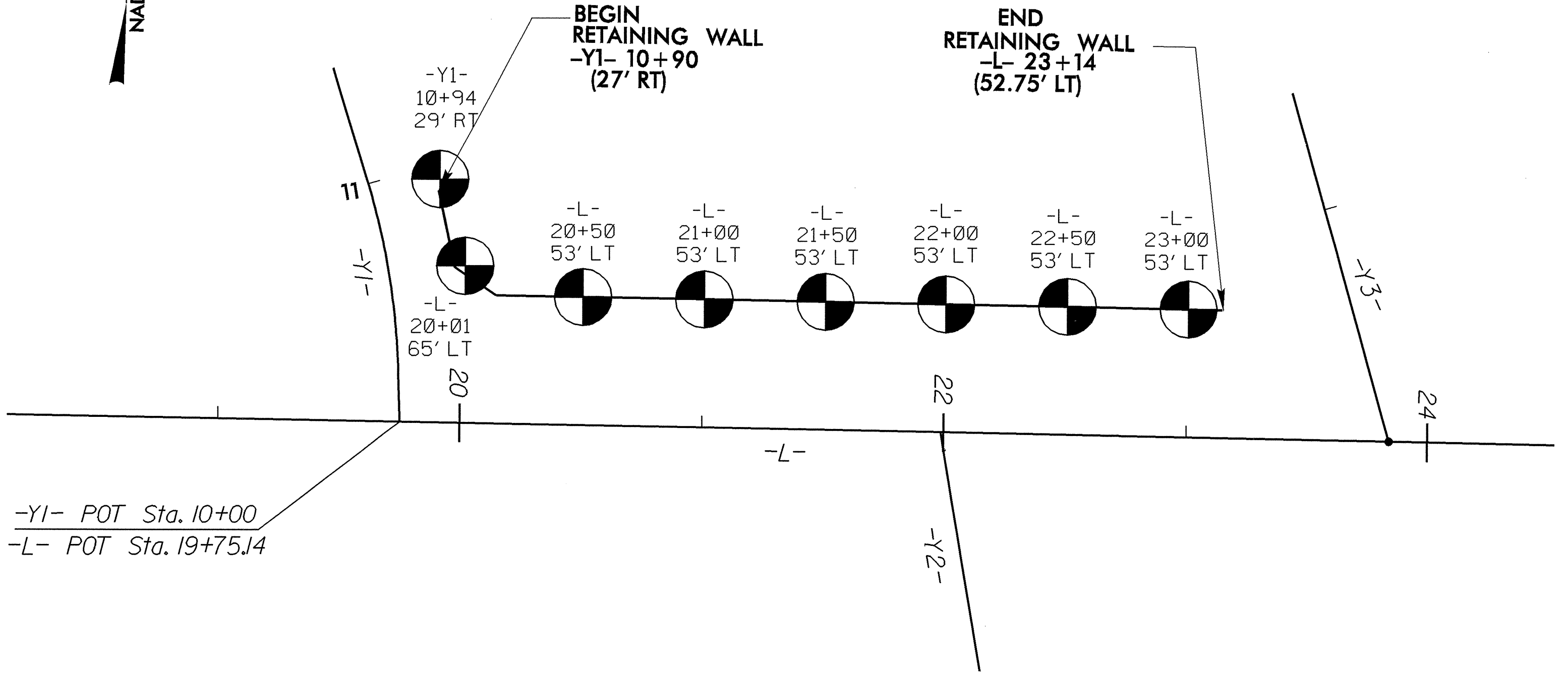
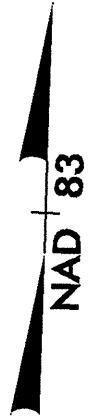
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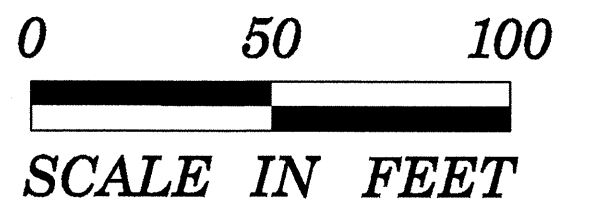
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-54	51-LT	18+00	0.5-1.5	A-7-6(35)	66	43	1.6	25.8	21.7	50.8	100	99	7.8		

18+00
-Y19-

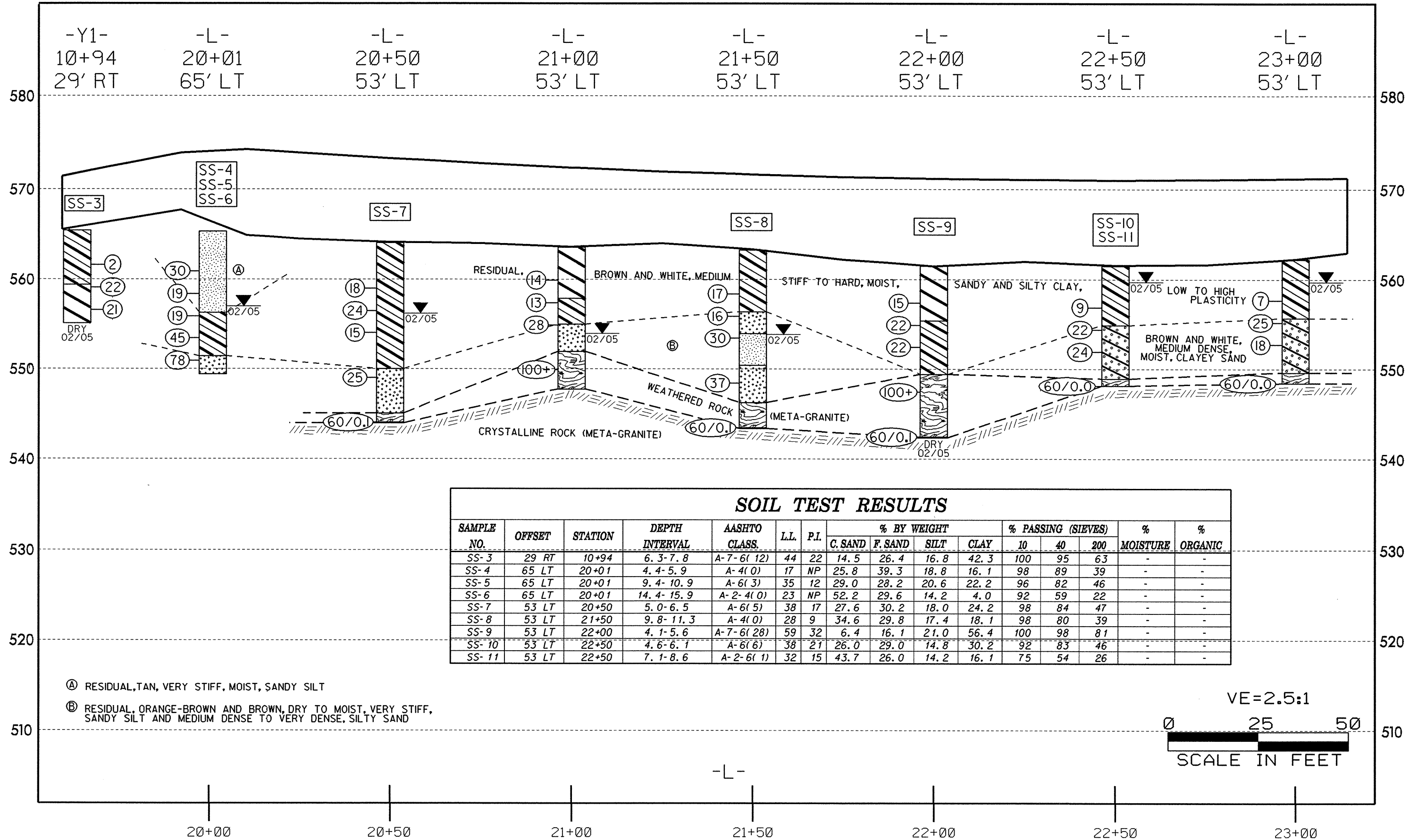
TEST SITE PLAN



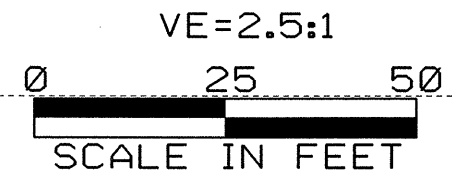
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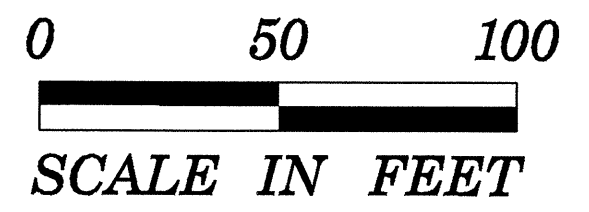
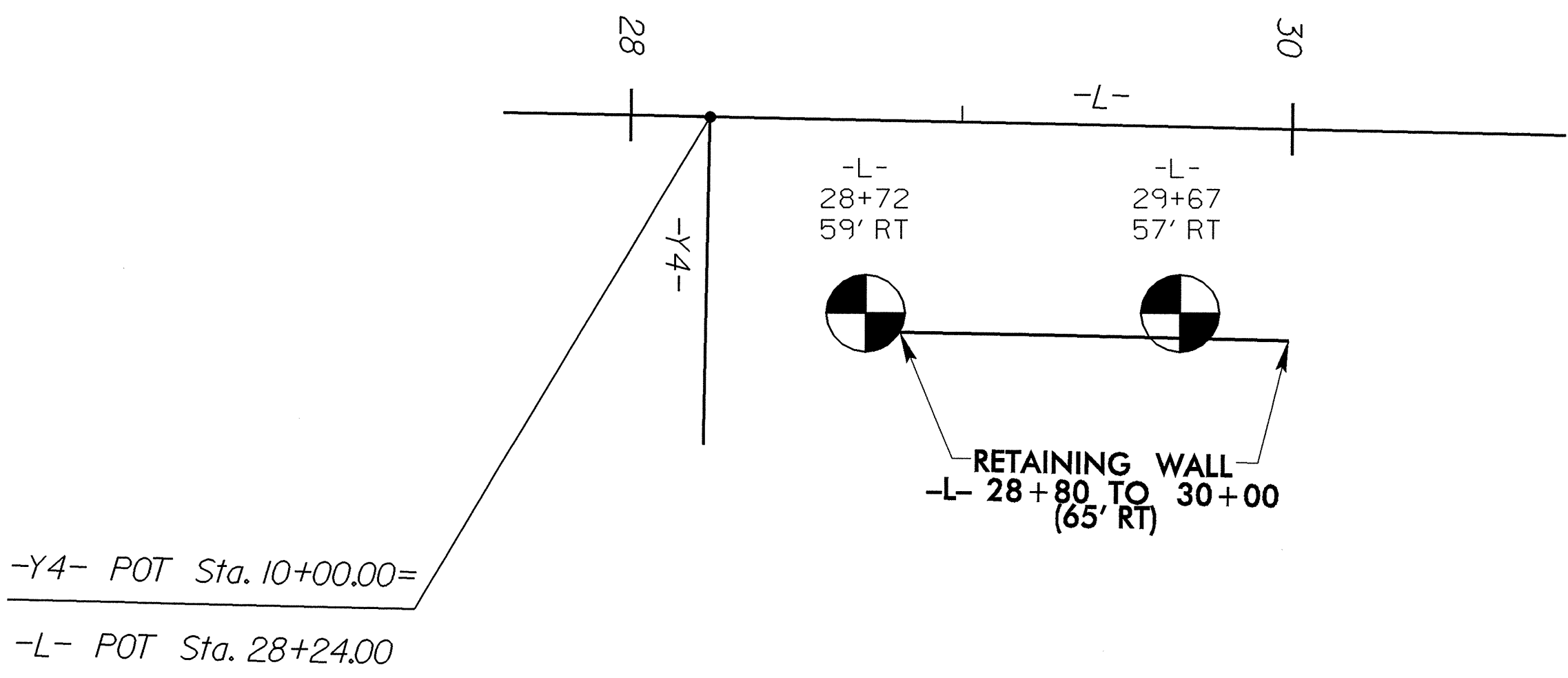
PROFILE THROUGH BORINGS ALONG RETAINING WALL I



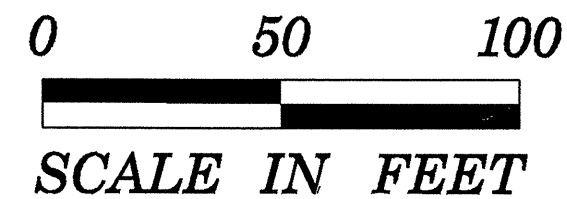
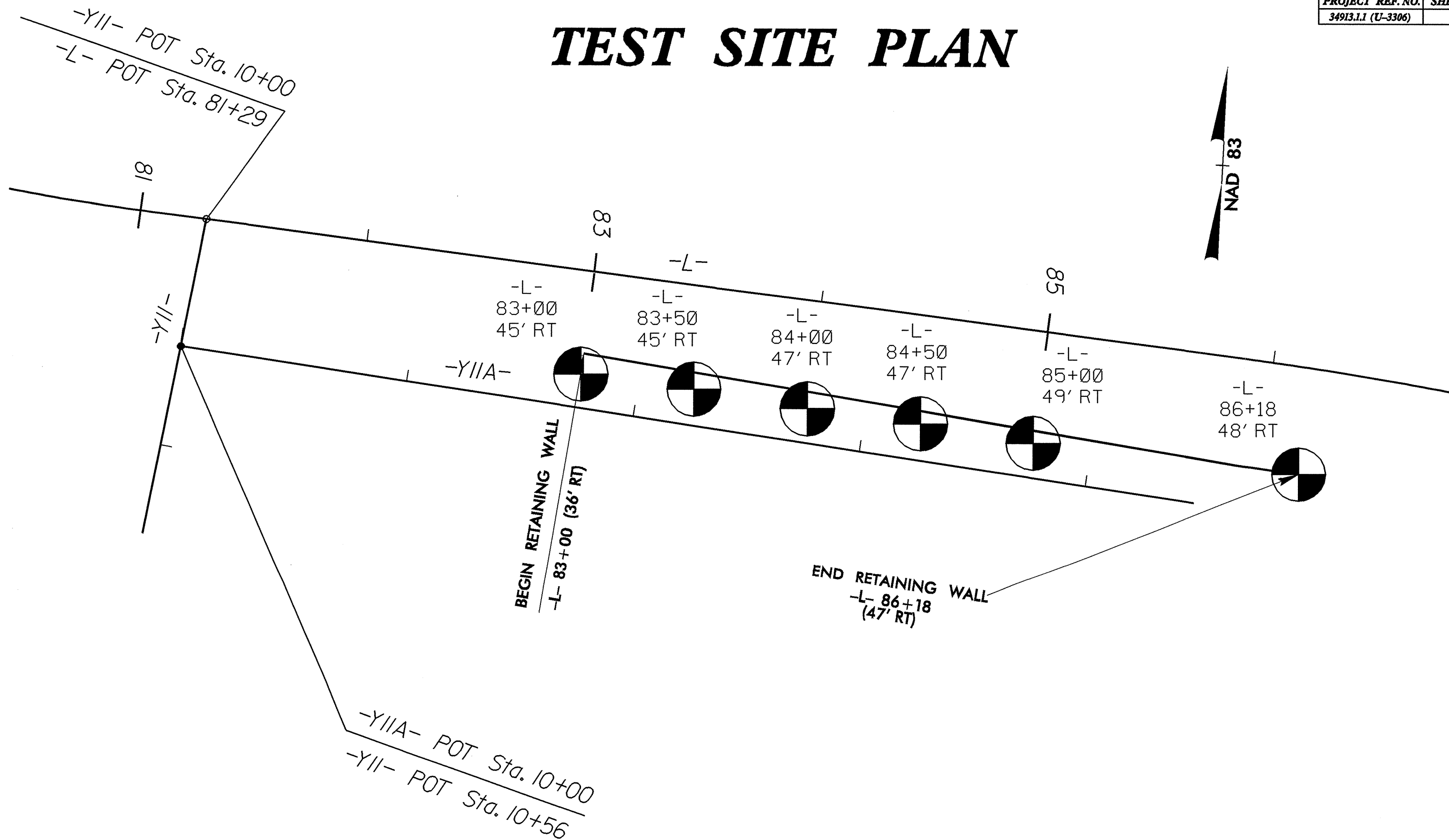
- Ⓐ RESIDUAL, TAN, VERY STIFF, MOIST, SANDY SILT
- Ⓑ RESIDUAL, ORANGE-BROWN AND BROWN, DRY TO MOIST, VERY STIFF, SANDY SILT AND MEDIUM DENSE TO VERY DENSE, SILTY SAND



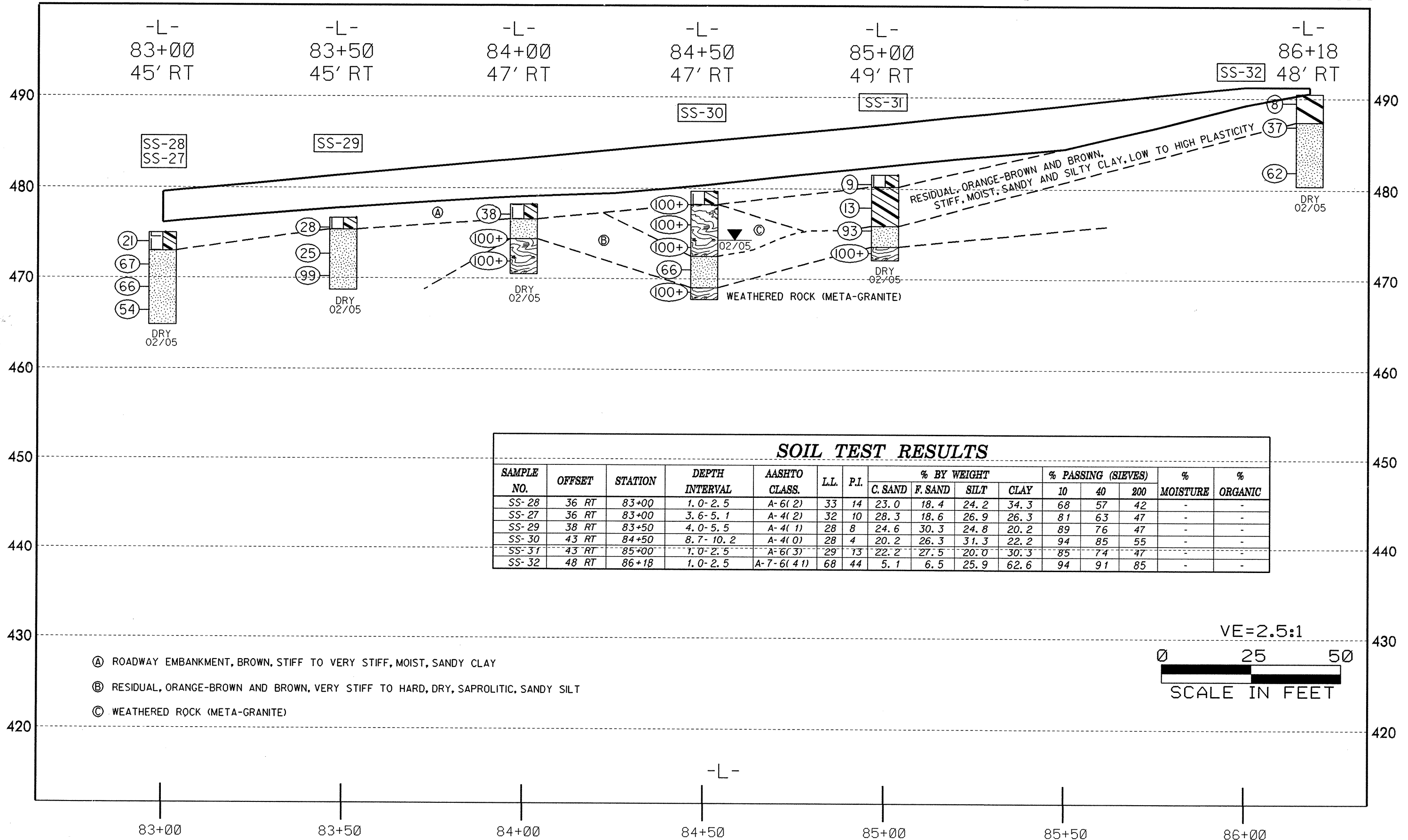
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TEST SITE PLAN



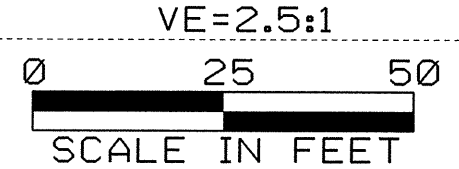
PROFILE THROUGH BORINGS ALONG RETAINING WALL 3



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-28	36 RT	83+00	1.0-2.5	A-6(2)	33	14	23.0	18.4	24.2	34.3	68	57	42	-	-
SS-27	36 RT	83+00	3.6-5.1	A-4(2)	32	10	28.3	18.6	26.9	26.3	81	63	47	-	-
SS-29	38 RT	83+50	4.0-5.5	A-4(1)	28	8	24.6	30.3	24.8	20.2	89	76	47	-	-
SS-30	43 RT	84+50	8.7-10.2	A-4(0)	28	4	20.2	26.3	31.3	22.2	94	85	55	-	-
SS-31	43 RT	85+00	1.0-2.5	A-6(3)	29	13	22.2	27.5	20.0	30.3	85	74	47	-	-
SS-32	48 RT	86+18	1.0-2.5	A-7-6(41)	68	44	5.1	6.5	25.9	62.6	94	91	85	-	-

- Ⓐ ROADWAY EMBANKMENT, BROWN, STIFF TO VERY STIFF, MOIST, SANDY CLAY
- Ⓑ RESIDUAL, ORANGE-BROWN AND BROWN, VERY STIFF TO HARD, DRY, SAPROLITIC, SANDY SILT
- Ⓒ WEATHERED ROCK (META-GRANITE)



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	34913.1.1 (U-3306)	1	8
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34913.1.1	MASTP-1733(11)	P.E. CONST.	

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 BALDWIN BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL UNIT @ (919) 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA IS PART OF THE CONTRACT.

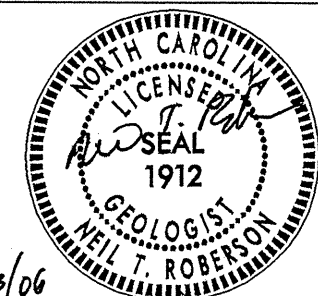
GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (UN-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.

PERSONNEL

- J.L. PEDRO
- C.D. CZAJKA
- D.W. DIXON
- N.D. MOHS
- C.E. POPE
- M.L. REEDER

INVESTIGATED BY C.D. CZAJKA
 CHECKED BY N.T. ROBERSON
 SUBMITTED BY N.T. ROBERSON
 DATE SEPTEMBER 2006



9/13/06

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

ROADWAY
SUBSURFACE INVESTIGATION

STATE PROJ. 34913.1.1 I.D. U-3306 F.A. PROJ. MASTP-1733(11)
 COUNTY ORANGE

PROJECT DESCRIPTION CHAPEL HILL - SR 1733 (WEAVER DAIRY RD.) FROM NC 86 TO SR 1734 (ERWIN RD.)

SITE DESCRIPTION RETAINING WALL 1 LEFT OF -L- STATION 20+00
RETAINING WALL 2 RIGHT OF -L- STATION 29+00
RETAINING WALL 3 RIGHT OF -L- STATION 83+00

WALL INVENTORY

CONTENTS:

SHEET	DESCRIPTION
1	TITLE SHEET
2	LEGEND
3	SITE PLAN RET. WALL 1
4	PROFILE RET. WALL 1
5	SITE PLAN RET. WALL 2
6	PROFILE RET. WALL 2
7	SITE PLAN RET. WALL 3
8	PROFILE RET. WALL 3

PROJECT: 34913.1.1 ID: U-3306

DRAWN BY: C.D. CZAJKA, A.N. KARPA, W. D. FIELDS, J. L. PEDRO

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.

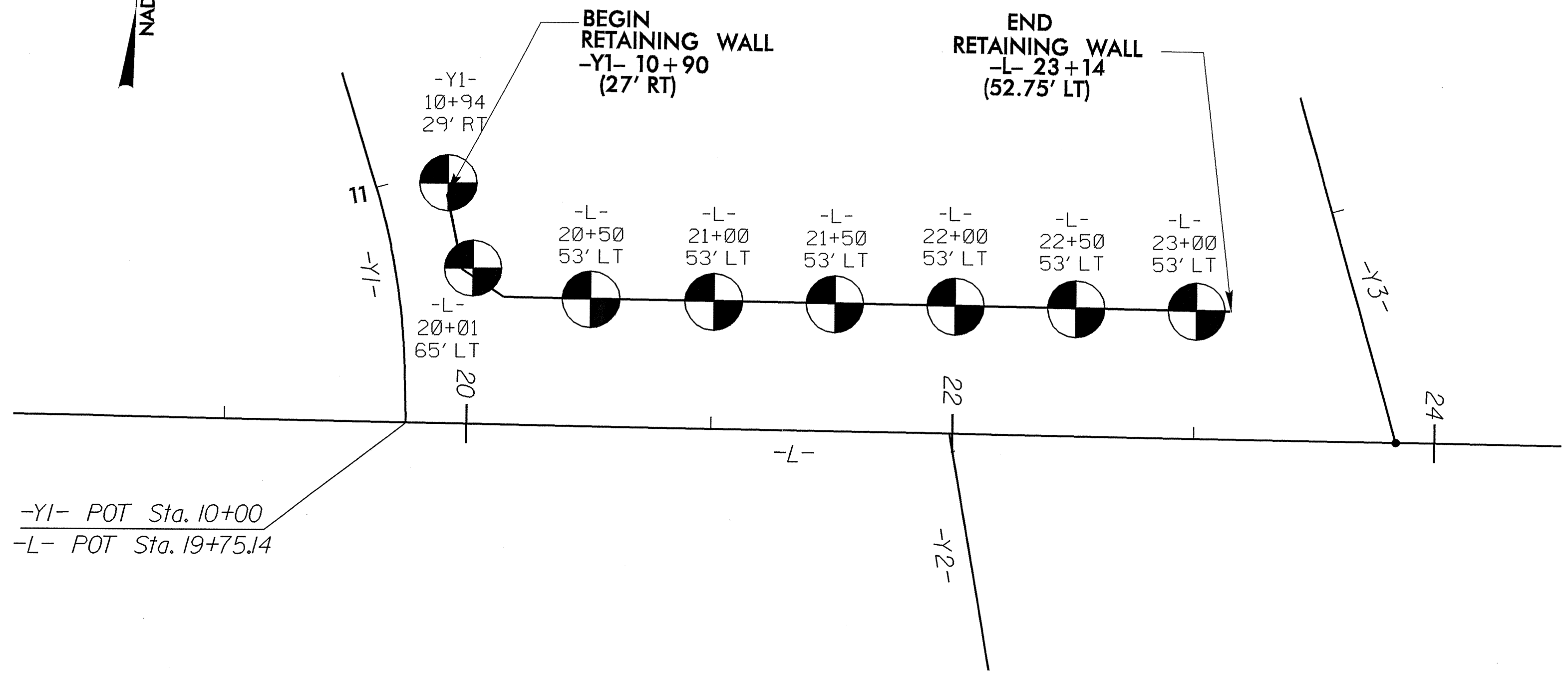
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

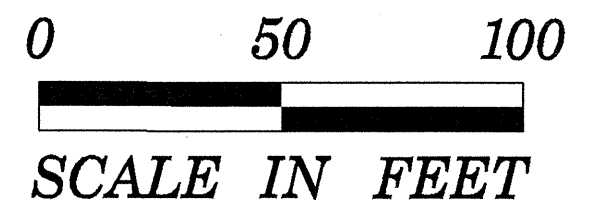
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

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 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, HARD 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.		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 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:		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 DISLOGGED 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 INTRODUCED 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 0.1 FOOT PER 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 (SROD) - 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		ANGULARITY OF GRAINS		WEATHERED ROCK (WR)		NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.	
GENERAL CLASS.		MINERALOGICAL COMPOSITION		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.	
GROUP CLASS.		COMPRESSIBILITY		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 PHYLLITE, SLATE, SANDSTONE, ETC.	
SYMBOL		PERCENTAGE OF MATERIAL		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.	
% PASSING		ORGANIC MATERIAL		WEATHERING		FRESH	
LIQUID LIMIT		GRANULAR SOILS		TRACE OF ORGANIC MATTER		ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE.	
PLASTIC INDEX		SILT-CLAY SOILS		LITTLE ORGANIC MATTER		VERY SLIGHT (V SLJ)	
GROUP INDEX		MUCK, PEAT		MODERATELY ORGANIC		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.	
USUAL TYPES OF MAJOR MATERIALS		SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS		SLIGHT (SLJ)	
GEN. RATINGS AS A SUBGRADE		GROUND WATER		TRACE OF ORGANIC MATTER		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.	
PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30		WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING		MODERATELY ORGANIC		MODERATE (MOD.)	
CONSISTENCY OR DENSENESS		STATIC WATER LEVEL AFTER 24 HOURS		MODERATELY ORGANIC		SEVERE (SEV)	
PRIMARY SOIL TYPE		MISCELLANEOUS SYMBOLS		MODERATELY ORGANIC		VERY SEVERE (V SEV)	
COMPACTNESS OR CONSISTENCY		ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION		SEVERE (SEV)		COMPLETE	
RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)		SOIL SYMBOL		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 KADLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN.		VERY HARD	
RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT²)		ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT		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. IF TESTED, YIELDS SPT N VALUES < 100 BPF.		HARD	
GENERAL		INFERRED SOIL BOUNDARY		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. IF TESTED, YIELDS SPT N VALUES < 100 BPF.		MODERATELY HARD	
GENERAL		INFERRED ROCK LINE		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. IF TESTED, YIELDS SPT N VALUES < 100 BPF.		MEDIUM HARD	
GENERAL		ALLUVIAL SOIL BOUNDARY		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. IF TESTED, YIELDS SPT N VALUES < 100 BPF.		SOFT	
GENERAL		DIP & DIP DIRECTION OF ROCK STRUCTURES		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. IF TESTED, YIELDS SPT N VALUES < 100 BPF.		VERY SOFT	
GENERAL		SOUNDING ROD		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. IF TESTED, YIELDS SPT N VALUES < 100 BPF.		VERY HARD	
TEXTURE OR GRAIN SIZE		ABBREVIATIONS		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. IF TESTED, YIELDS SPT N VALUES < 100 BPF.		HARD	
U.S. STD. SIEVE SIZE		AR - AUGER REFUSAL		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. IF TESTED, YIELDS SPT N VALUES < 100 BPF.		MODERATELY HARD	
OPENING (MM)		BT - BORING TERMINATED		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. IF TESTED, YIELDS SPT N VALUES < 100 BPF.		MEDIUM HARD	
BOULDER (BLDR.)		CL - CLAY		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. IF TESTED, YIELDS SPT N VALUES < 100 BPF.		SOFT	
COBBLE (COB.)		CPT - CONE PENETRATION TEST		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. IF TESTED, YIELDS SPT N VALUES < 100 BPF.		VERY SOFT	
GRAVEL (GR.)		CSE - COARSE		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. IF TESTED, YIELDS SPT N VALUES < 100 BPF.		VERY HARD	
COARSE SAND (CSE, SD.)		DMT - DILATOMETER TEST		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. IF TESTED, YIELDS SPT N VALUES < 100 BPF.		MODERATELY HARD	
FINE SAND (F SD.)		DPT - DYNAMIC PENETRATION TEST		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. IF TESTED, YIELDS SPT N VALUES < 100 BPF.		HARD	
SILT (SL.)		VOID RATIO		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. IF TESTED, YIELDS SPT N VALUES < 100 BPF.		MODERATELY HARD	
CLAY (CL.)		F - FINE		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. IF TESTED, YIELDS SPT N VALUES < 100 BPF.		MEDIUM HARD	
GRAIN SIZE		FOSS - FOSSILIFEROUS		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. IF TESTED, YIELDS SPT N VALUES < 100 BPF.		SOFT	
SOIL MOISTURE - CORRELATION OF TERMS		FRAC. - FRACTURED, FRACTURES		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. IF TESTED, YIELDS SPT N VALUES < 100 BPF.		VERY SOFT	
SOIL MOISTURE SCALE (ATTERBERG LIMITS)		FRAGS. - FRAGMENTS		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. IF TESTED, YIELDS SPT N VALUES < 100 BPF.		VERY HARD	
FIELD MOISTURE DESCRIPTION		EQUIPMENT USED ON SUBJECT PROJECT		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. IF TESTED, YIELDS SPT N VALUES < 100 BPF.		HARD	
GUIDE FOR FIELD MOISTURE DESCRIPTION		DRILL UNITS:		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. IF TESTED, YIELDS SPT N VALUES < 100 BPF.		MODERATELY HARD	
- SATURATED - (SAT.)		ADVANCING TOOLS:		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. IF TESTED, YIELDS SPT N VALUES < 100 BPF.		MEDIUM HARD	
USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE		CLAY BITS		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. IF TESTED, YIELDS SPT N VALUES < 100 BPF.		SOFT	
- WET - (W)		6" CONTINUOUS FLIGHT AUGER		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. IF TESTED, YIELDS SPT N VALUES < 100 BPF.		VERY SOFT	
SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE		6" HOLLOW AUGERS		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. IF TESTED, YIELDS SPT N VALUES < 100 BPF.		VERY HARD	
- MOIST - (M)		HARD FACED FINGER BITS		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. IF TESTED, YIELDS SPT N VALUES < 100 BPF.		MODERATELY HARD	
SOLID; AT OR NEAR OPTIMUM MOISTURE		TUNG-CARBIDE INSERTS		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. IF TESTED, YIELDS SPT N VALUES < 100 BPF.		HARD	
- DRY - (D)		CASING w/ ADVANCER		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. IF TESTED, YIELDS SPT N VALUES < 100 BPF.		MODERATELY HARD	
REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE		TRICONE * STEEL TEETH		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. IF TESTED, YIELDS SPT N VALUES < 100 BPF.		MEDIUM HARD	
PLASTICITY		TRICONE * TUNG-CARB.		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. IF TESTED, YIELDS SPT N VALUES < 100 BPF.		SOFT	
NONPLASTIC		CORE BIT		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. IF TESTED, YIELDS SPT N VALUES < 100 BPF.		VERY SOFT	
LOW PLASTICITY		PORTABLE HOIST		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. IF TESTED, YIELDS SPT N VALUES < 100 BPF.		VERY HARD	
MED. PLASTICITY		DRILL UNITS:		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. IF TESTED, YIELDS SPT N VALUES < 100 BPF.		MODERATELY HARD	
HIGH PLASTICITY		ADVANCING TOOLS:		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. IF TESTED, YIELDS SPT N VALUES < 100 BPF.		HARD	
COLOR		CLAY BITS		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. IF TESTED, YIELDS SPT N VALUES < 100 BPF.		MODERATELY HARD	
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.		6" CONTINUOUS FLIGHT AUGER		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. IF TESTED, YIELDS SPT N VALUES < 100 BPF.		MEDIUM HARD	
DRY STRENGTH		6" HOLLOW AUGERS		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. IF TESTED, YIELDS SPT N VALUES < 100 BPF.		SOFT	

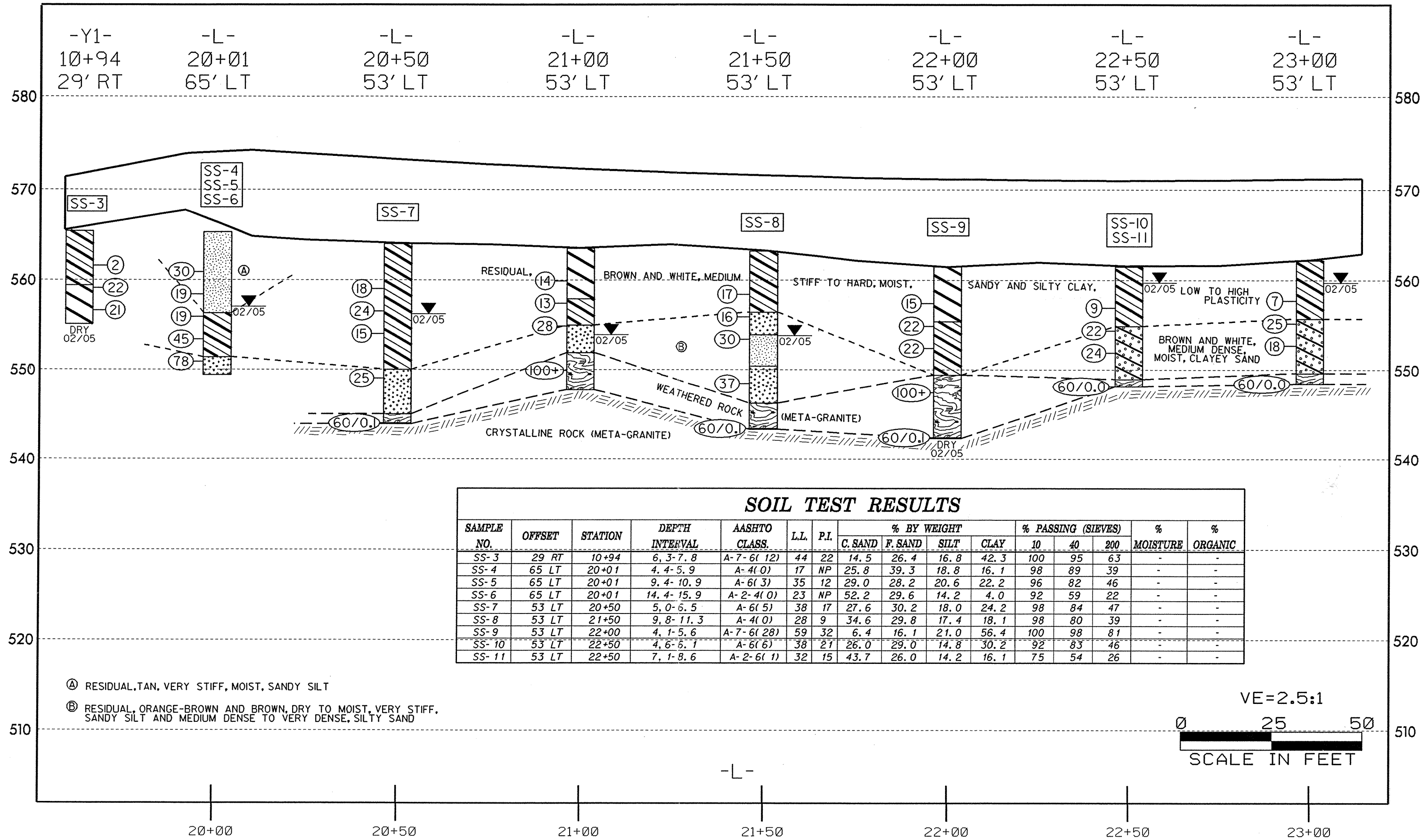
TEST SITE PLAN



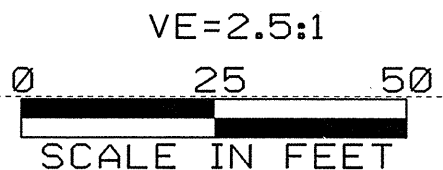
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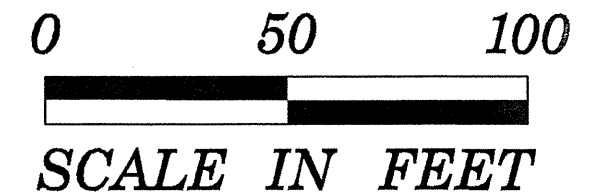
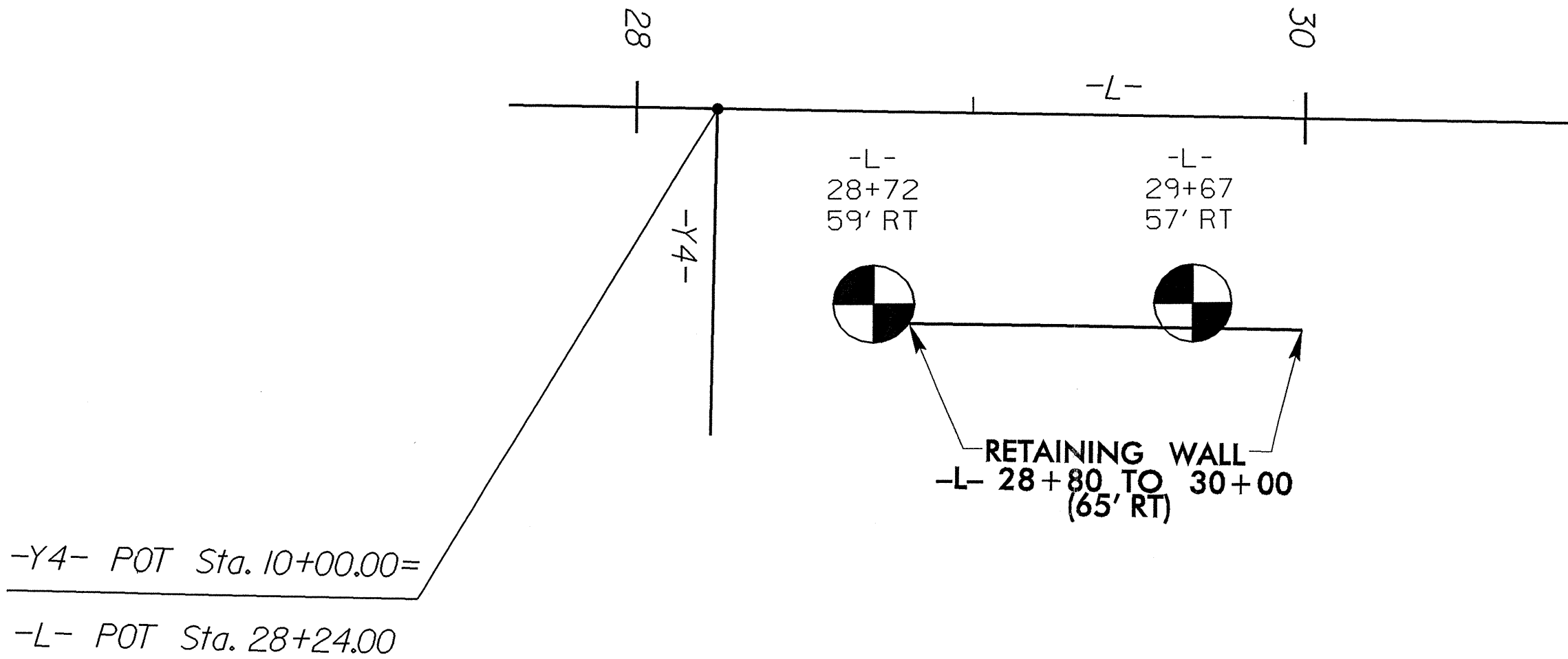
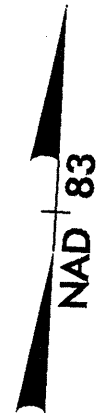
PROFILE THROUGH BORINGS ALONG RETAINING WALL I



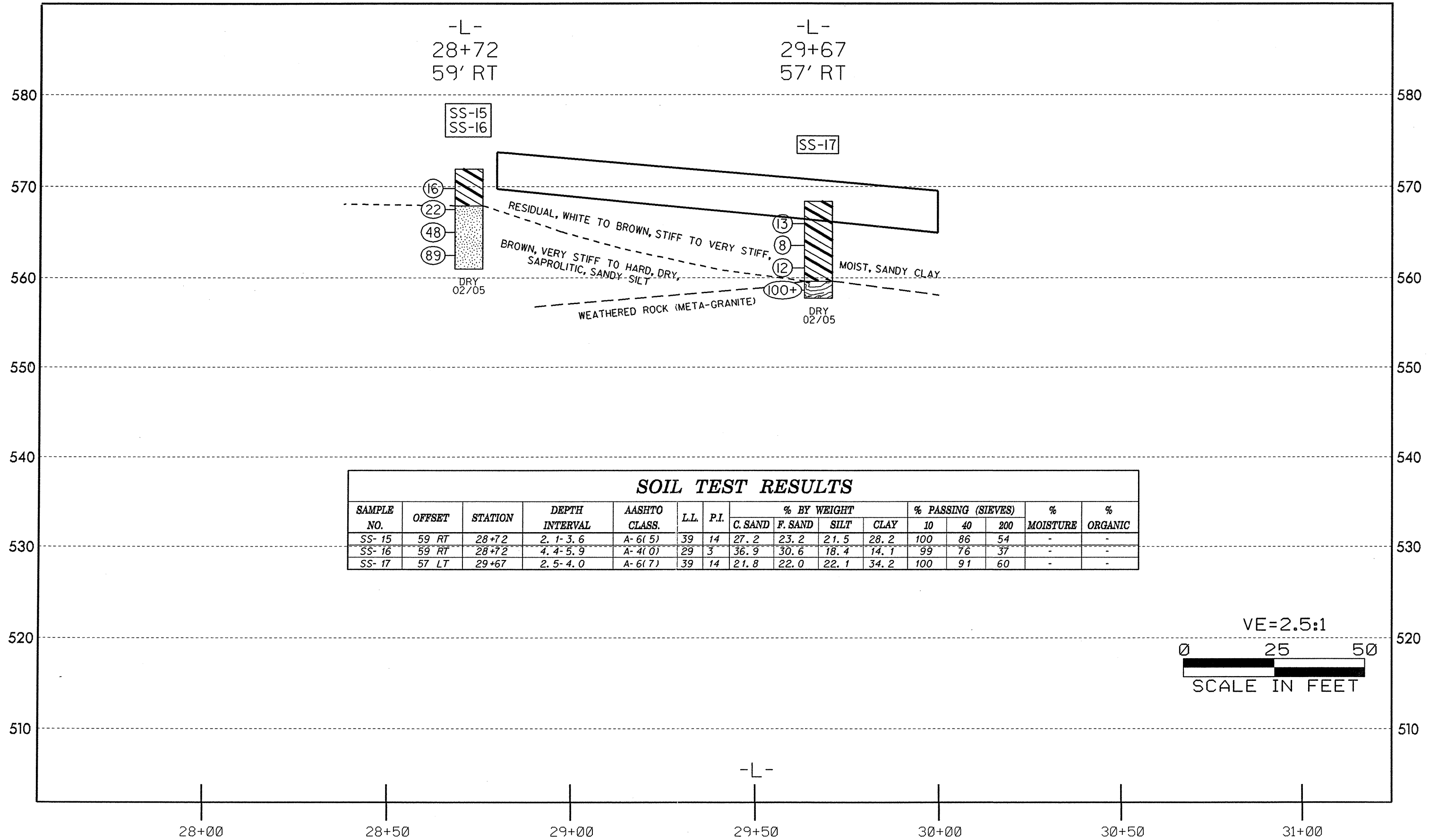
Ⓐ RESIDUAL, TAN, VERY STIFF, MOIST, SANDY SILT
 Ⓑ RESIDUAL, ORANGE-BROWN AND BROWN, DRY TO MOIST, VERY STIFF, SANDY SILT AND MEDIUM DENSE TO VERY DENSE, SILTY SAND



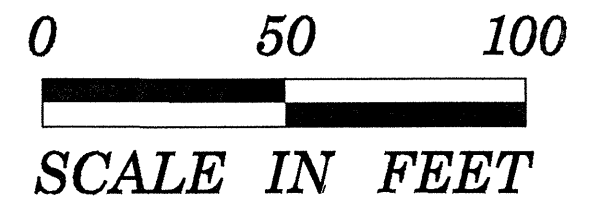
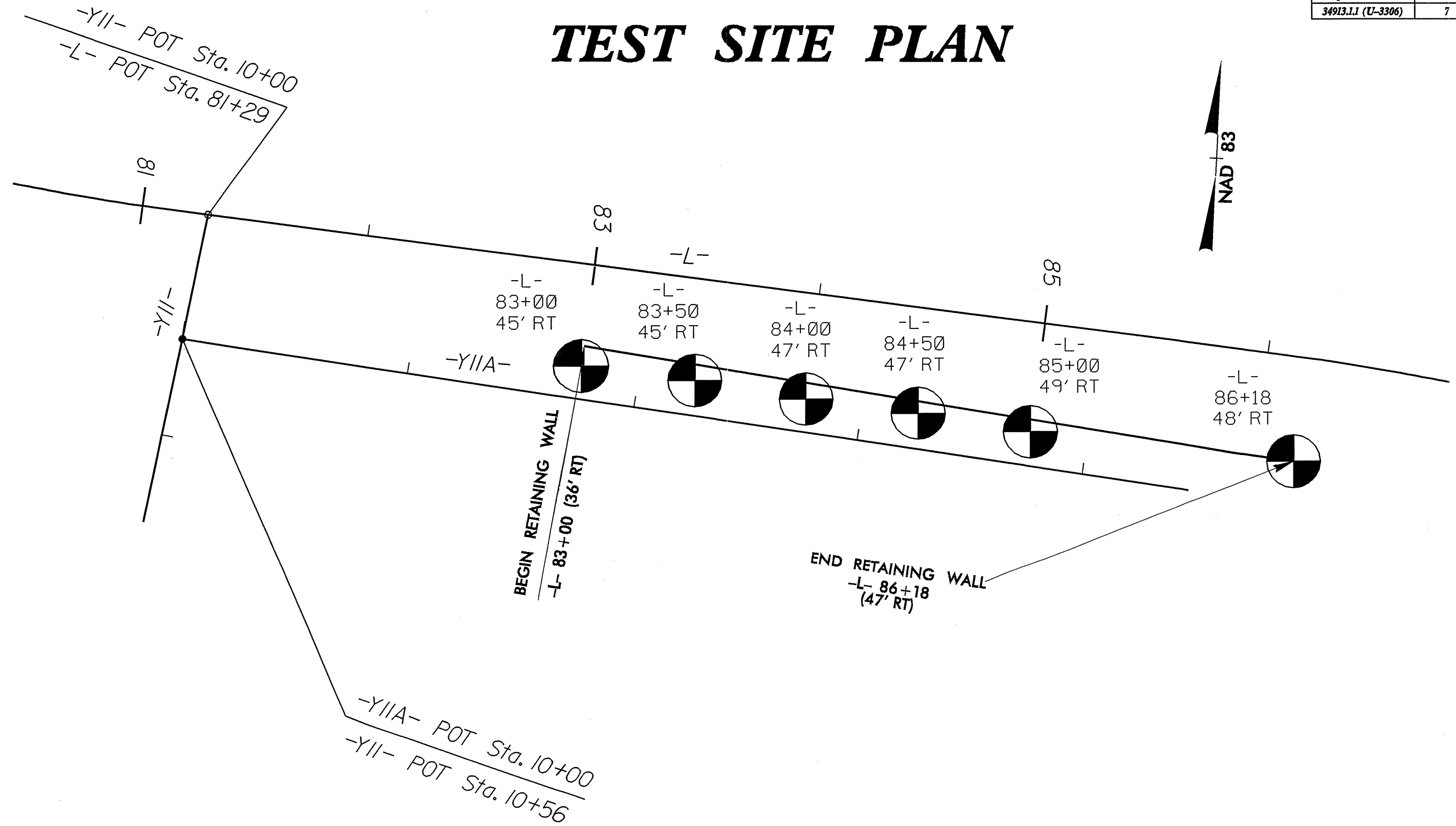
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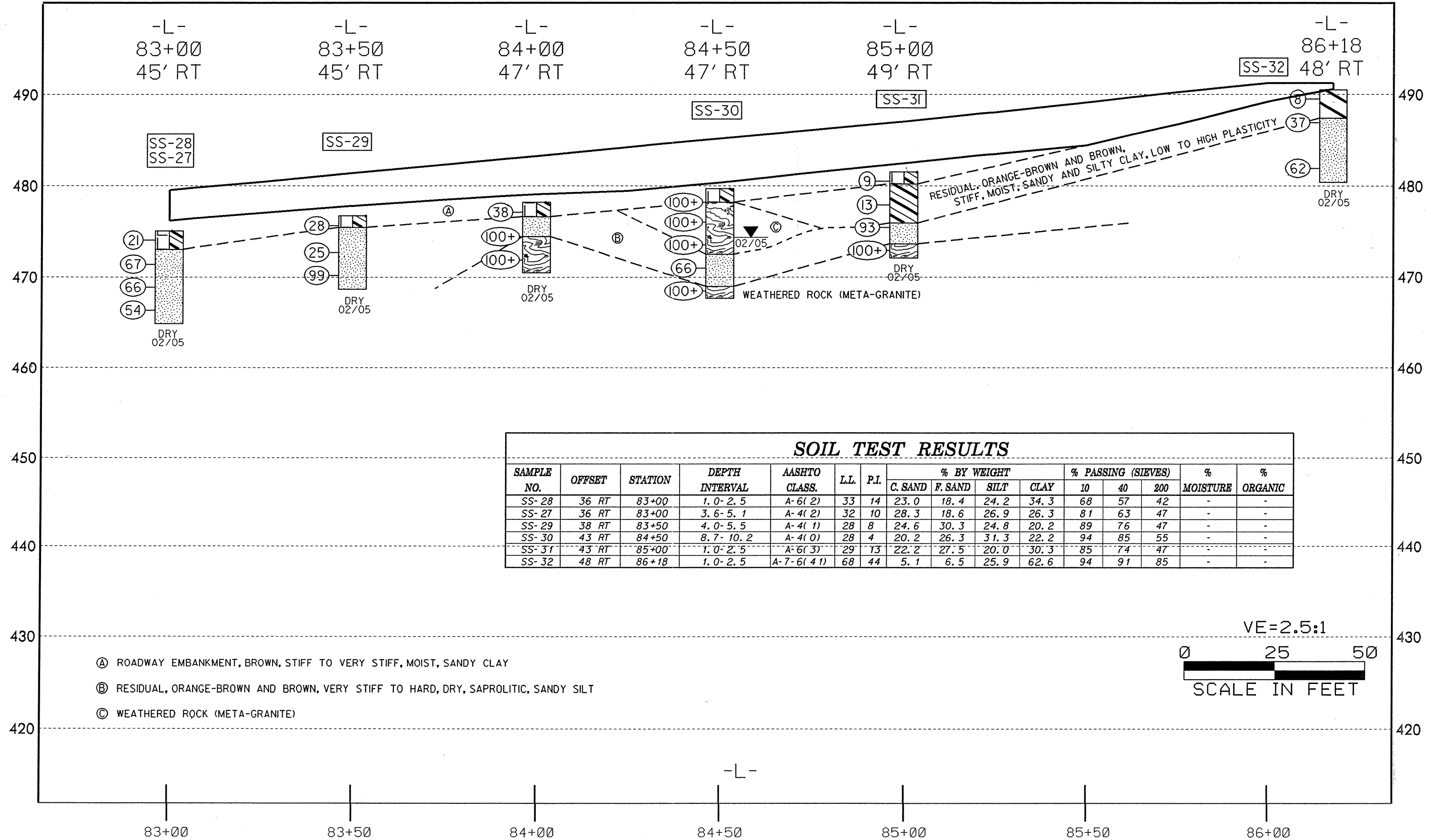
PROFILE THROUGH BORINGS ALONG RETAINING WALL 2



TEST SITE PLAN



PROFILE THROUGH BORINGS ALONG RETAINING WALL 3



SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-28	36 RT	83+00	1.0-2.5	A-6(2)	33	14	23.0	18.4	24.2	34.3	68	57	42	-	-
SS-27	36 RT	83+00	3.6-5.1	A-4(2)	32	10	28.3	18.6	26.9	26.3	81	63	47	-	-
SS-29	38 RT	83+50	4.0-5.5	A-4(1)	28	8	24.6	30.3	24.8	20.2	89	76	47	-	-
SS-30	43 RT	84+50	8.7-10.2	A-4(0)	28	4	20.2	26.3	31.3	22.2	94	85	55	-	-
SS-31	43 RT	85+00	1.0-2.5	A-6(3)	29	13	22.2	27.5	20.0	30.3	85	74	47	-	-
SS-32	48 RT	86+18	1.0-2.5	A-7-6(41)	68	44	5.1	6.5	25.9	62.6	94	91	85	-	-