

CONTRACT: C202064
ID: U-3309A

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

LINE	STATION	SHEET NUMBERS	
		PLAN	X-SECTS.
-L-	18+50 to 19+50	4	
	19+50 to 73+00	4-8	13-40
	73+00 to 80+00	8	
-PEDTR1-	10+00 to 10+48	5	
	10+48 to 16+95	5	19-22
	16+95 to 17+40	5	
-PEDTR2-	10+00 to 10+41	6	
	10+41 to 22+08	6,7	27-35
	22+08 to 22+42	7	
-PEDTR3-	10+00 to 10+29	9	
	10+29 to 16+17	9	43-46
	16+17 to 17+29	4,9	
-RPA-	10+00 to 16+50	8,11	
	16+50 to 17+50	8	41
	17+50 to 20+09	8	
-RPC-	10+00 to 16+50	8,12	
	16+50 to 17+50	8	42
	17+50 to 19+20	8	
-Y1-	10+00 to 13+00	9	
	13+00 to 20+50	4,9	43-46
	20+50 to 23+30	4	
-Y2-	10+00 to 22+83	4,10	
-Y3-	13+50 to 16+33	6	
-Y4-	10+00 to 13+37	5	
-Y5-	10+00 to 12+00	5	
-Y6-	10+00 to 13+32	7	
-Y7-	10+00 to 15+05	7	

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 GEOTECHNICAL ENGINEERING UNIT

ROADWAY SUBSURFACE INVESTIGATION

STATE PROJ. 34916.1.1 I.D. U-3309A F.A. PROJ. STP-2028(1)
 COUNTY DURHAM
 PROJECT DESCRIPTION SR 2028 (T. W. ALEXANDER DRIVE) FROM
SR 1121 (CORNWALLIS ROAD) TO EAST OF NC 147

INVENTORY

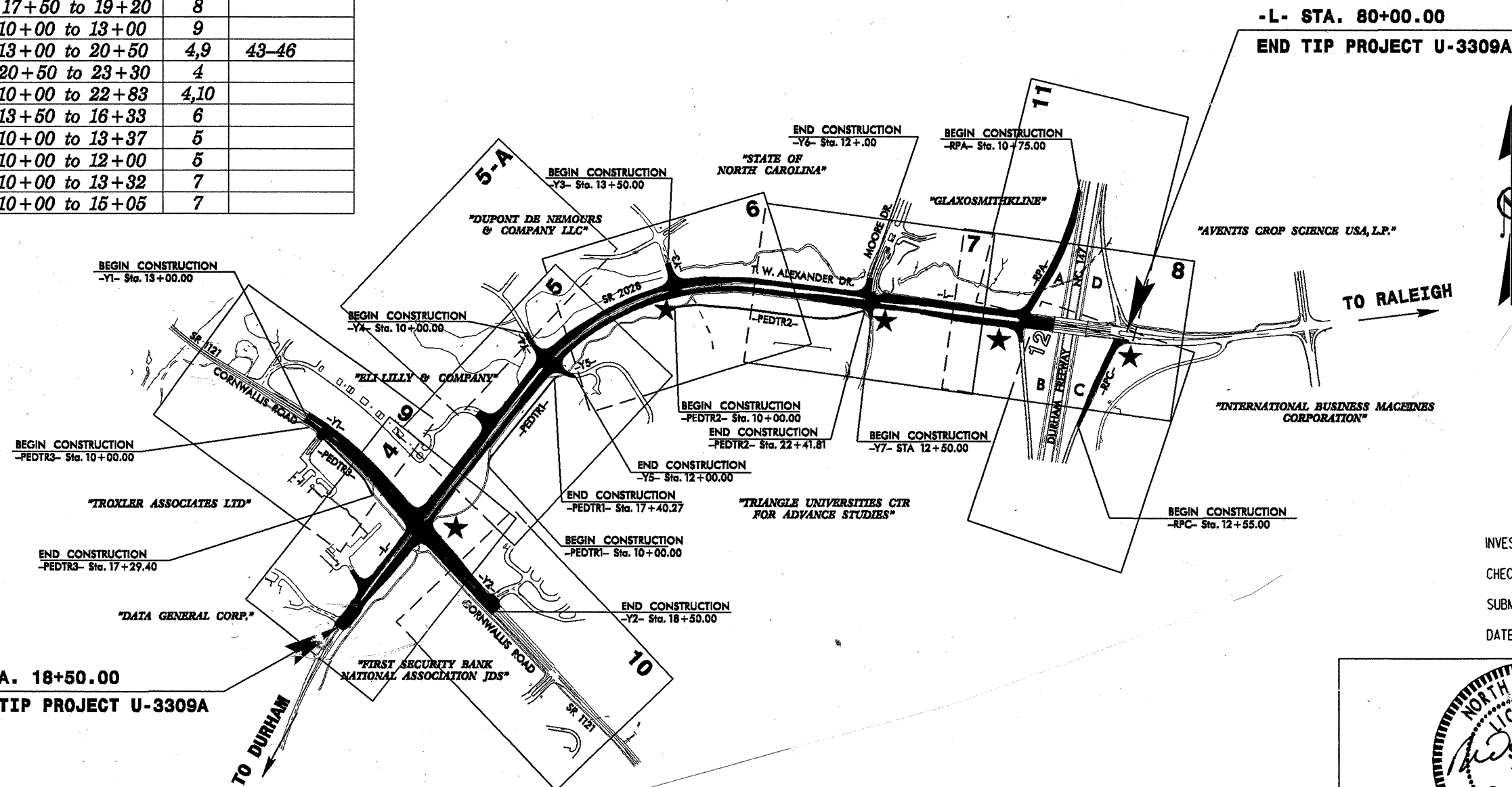
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3309A	1	46
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34916.1.1	STP-2028(1)	P.E.	
34916.2.1	STP-2028(1)	RW - UTIL	
34916.3.3	STP-2028(1)	CONST.	

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 RALEIGH 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.

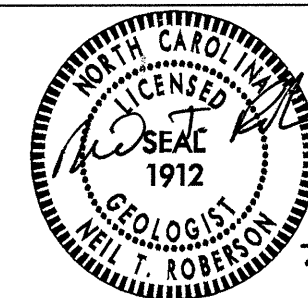
GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THIS PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.



- PERSONNEL
- J. L. PEDRO
 - J. I. MILKOVITS, JR.
 - O. B. OTT
 - H. R. CONLEY
 - D. W. DIXON
 - M. L. REEDER

INVESTIGATED BY J. I. MILKOVITS, JR.
 CHECKED BY N. T. ROBERSON
 SUBMITTED BY N. T. ROBERSON
 DATE JULY 2007



DRAWN BY: J. L. PEDRO

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

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

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL UNIT

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
U-3309A	34916.1.1	2	46

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

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 align="center"><i>VERY STIFF, GRAY SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HEAVY PLASTIC, A-7-6</i></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>POORLY GRADED</p> <p>GR-GRADED: INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.</p> <p>THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS ARE DESIGNATED BY THE TERMS: <u>ANGULAR</u>, <u>SUBANGULAR</u>, <u>SUBROUNDED</u>, OR <u>ROUNDED</u>.</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. 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 (CALC.) - 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 SIDES 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>																																																																																																																																																																								
<p>SOIL LEGEND AND AASHTO CLASSIFICATION</p> <table border="1"> <tr> <th>GENERAL CLASS.</th> <th colspan="7">GRANULAR MATERIALS (<85% PASSING #200)</th> <th colspan="7">SILT-CLAY MATERIALS (>85% PASSING #200)</th> <th colspan="3">ORGANIC MATERIALS</th> </tr> <tr> <th>GROUP CLASS.</th> <th>A-1</th><th>A-2</th><th>A-3</th><th>A-4</th><th>A-5</th><th>A-6</th><th>A-7</th> <th>A-1</th><th>A-2</th><th>A-3</th><th>A-4</th><th>A-5</th><th>A-6</th><th>A-7</th> <th>A-1, A-2</th><th>A-3</th><th>A-4, A-5</th><th>A-6, A-7</th> </tr> <tr> <th>SYMBOL</th> <td></td><td></td><td></td><td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> </tr> <tr> <th>% PASSING</th> <td>50 MX</td><td>30 MX50</td><td>10 MX50</td><td>10 MN</td><td>10 MN</td><td>10 MN</td><td>10 MN</td> <td>10 MN</td><td>10 MN</td><td>10 MN</td><td>10 MN</td><td>10 MN</td><td>10 MN</td><td>10 MN</td> <td>GRANULAR SOILS</td><td>SILT-CLAY SOILS</td><td>MUCK, PEAT</td><td>HIGHLY ORGANIC SOILS</td> </tr> <tr> <th>LIQUID LIMIT</th> <td>6 MX</td><td>N.P.</td><td>10 MX10</td><td>10 MN</td><td>10 MN</td><td>10 MN</td><td>10 MN</td> <td>10 MN</td><td>10 MN</td><td>10 MN</td><td>10 MN</td><td>10 MN</td><td>10 MN</td><td>10 MN</td> <td colspan="4">SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER</td> </tr> <tr> <th>PLASTIC INDEX</th> <td>0</td><td>0</td><td>0</td><td>4 MX</td><td>8 MX</td><td>12 MX</td><td>16 MX</td> <td>10 MN</td><td>10 MN</td><td>10 MN</td><td>10 MN</td><td>10 MN</td><td>10 MN</td><td>10 MN</td> <td colspan="4">SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER</td> </tr> <tr> <th>GROUP INDEX</th> <td>0</td><td>0</td><td>0</td><td>4 MX</td><td>8 MX</td><td>12 MX</td><td>16 MX</td> <td>10 MN</td><td>10 MN</td><td>10 MN</td><td>10 MN</td><td>10 MN</td><td>10 MN</td><td>10 MN</td> <td colspan="4">SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER</td> </tr> <tr> <th>USUAL TYPES OF MAJOR MATERIALS</th> <td>GRAVEL AND SAND</td><td>FINE SAND</td><td>SILT OR CLAYEY GRAVEL AND SAND</td><td>SILT SOILS</td><td>CLAYEY SOILS</td><td>CLAYEY SOILS</td><td>CLAYEY SOILS</td> <td>CLAYEY SOILS</td><td>CLAYEY SOILS</td><td>CLAYEY SOILS</td><td>CLAYEY SOILS</td><td>CLAYEY SOILS</td><td>CLAYEY SOILS</td><td>CLAYEY SOILS</td> <td colspan="4">SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER</td> </tr> <tr> <th>GEN. RATING AS A SUBGRADE</th> <td colspan="3">EXCELLENT TO GOOD</td><td colspan="4">FAIR TO POOR</td><td>FAIR TO POOR</td><td>POOR</td><td colspan="4">UNSATURABLE</td> </tr> </table> <p align="center">P.I. OF A-7-5 ≤ L.L. - 30 ; P.I. OF A-7-6 > L.L. - 30</p>		GENERAL CLASS.	GRANULAR MATERIALS (<85% PASSING #200)							SILT-CLAY MATERIALS (>85% PASSING #200)							ORGANIC MATERIALS			GROUP CLASS.	A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-1, A-2	A-3	A-4, A-5	A-6, A-7	SYMBOL																			% PASSING	50 MX	30 MX50	10 MX50	10 MN	10 MN	10 MN	10 MN	10 MN	10 MN	10 MN	10 MN	10 MN	10 MN	10 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT	HIGHLY ORGANIC SOILS	LIQUID LIMIT	6 MX	N.P.	10 MX10	10 MN	10 MN	10 MN	10 MN	10 MN	10 MN	10 MN	10 MN	10 MN	10 MN	10 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER				PLASTIC INDEX	0	0	0	4 MX	8 MX	12 MX	16 MX	10 MN	10 MN	10 MN	10 MN	10 MN	10 MN	10 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER				GROUP INDEX	0	0	0	4 MX	8 MX	12 MX	16 MX	10 MN	10 MN	10 MN	10 MN	10 MN	10 MN	10 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER				USUAL TYPES OF MAJOR MATERIALS	GRAVEL AND SAND	FINE SAND	SILT OR CLAYEY GRAVEL AND SAND	SILT SOILS	CLAYEY SOILS	CLAYEY SOILS	CLAYEY SOILS	CLAYEY SOILS	CLAYEY SOILS	CLAYEY SOILS	CLAYEY SOILS	CLAYEY SOILS	CLAYEY SOILS	CLAYEY SOILS	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER				GEN. RATING AS A SUBGRADE	EXCELLENT TO GOOD			FAIR TO POOR				FAIR TO POOR	POOR	UNSATURABLE				<p>MINERALOGICAL COMPOSITION</p> <p>MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.</p>		<p>WEATHERED ROCK (WR)</p> <p>CRYSTALLINE ROCK (CR)</p> <p>NON-CRYSTALLINE ROCK (NCR)</p> <p>COASTAL PLAIN SEDIMENTARY ROCK (CP)</p>		<p>NON-COASTAL PLAIN MATERIAL THAT YIELDS SPT N VALUES > 100 BLOWS PER FOOT.</p> <p>FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.</p> <p>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.</p> <p>COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEGS, ETC.</p>		<p>WEATHERING</p> <p>FRESH - ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE.</p> <p>VERY SLIGHT (V. SL.) - 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.</p> <p>SLIGHT (SL.) - 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.</p> <p>MODERATE (MOD.) - SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.</p> <p>MODERATELY SEVERE (MOD. SEV.) - ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION, ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. <i>IF TESTED, WOULD YIELD SPT REFUSAL</i></p> <p>SEVERE (SEV.) - ALL ROCKS EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT, SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. <i>IF TESTED, YIELDS SPT N VALUES > 100 B.P.F.</i></p> <p>VERY SEVERE (V. SEV.) - 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. <i>IF TESTED, YIELDS SPT N VALUES < 100 B.P.F.</i></p> <p>COMPLETE - ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.</p>	
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<p>COLOR</p> <p>DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YEL-BRN, BLUE-GRAY) MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.</p>		<p>INDURATION</p> <p>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.</p> <table border="1"> <tr> <th>FRIABLE</th> <th>RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.</th> </tr> <tr> <th>MODERATELY INDURATED</th> <th>GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.</th> </tr> <tr> <th>INDURATED</th> <th>GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.</th> </tr> <tr> <th>EXTREMELY INDURATED</th> <th>SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</th> </tr> </table>		FRIABLE	RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.	MODERATELY INDURATED	GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.	INDURATED	GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.	EXTREMELY INDURATED	SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.																																																																																																																																																																			
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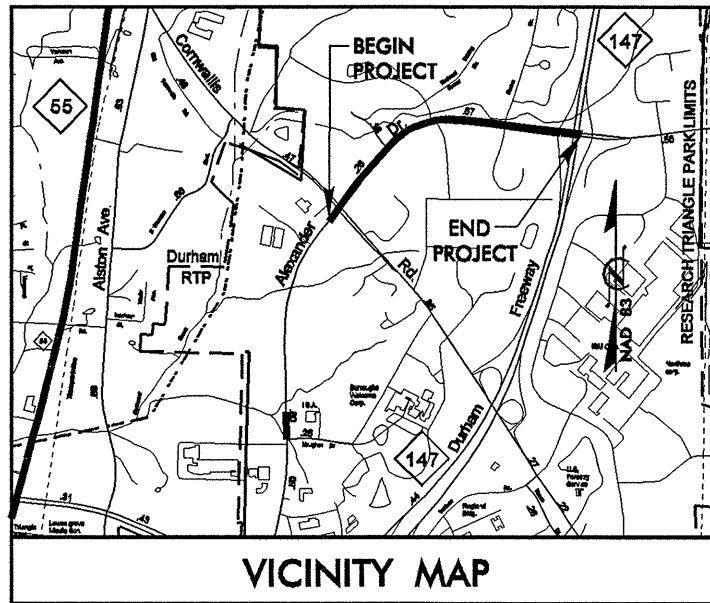
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

DURHAM COUNTY

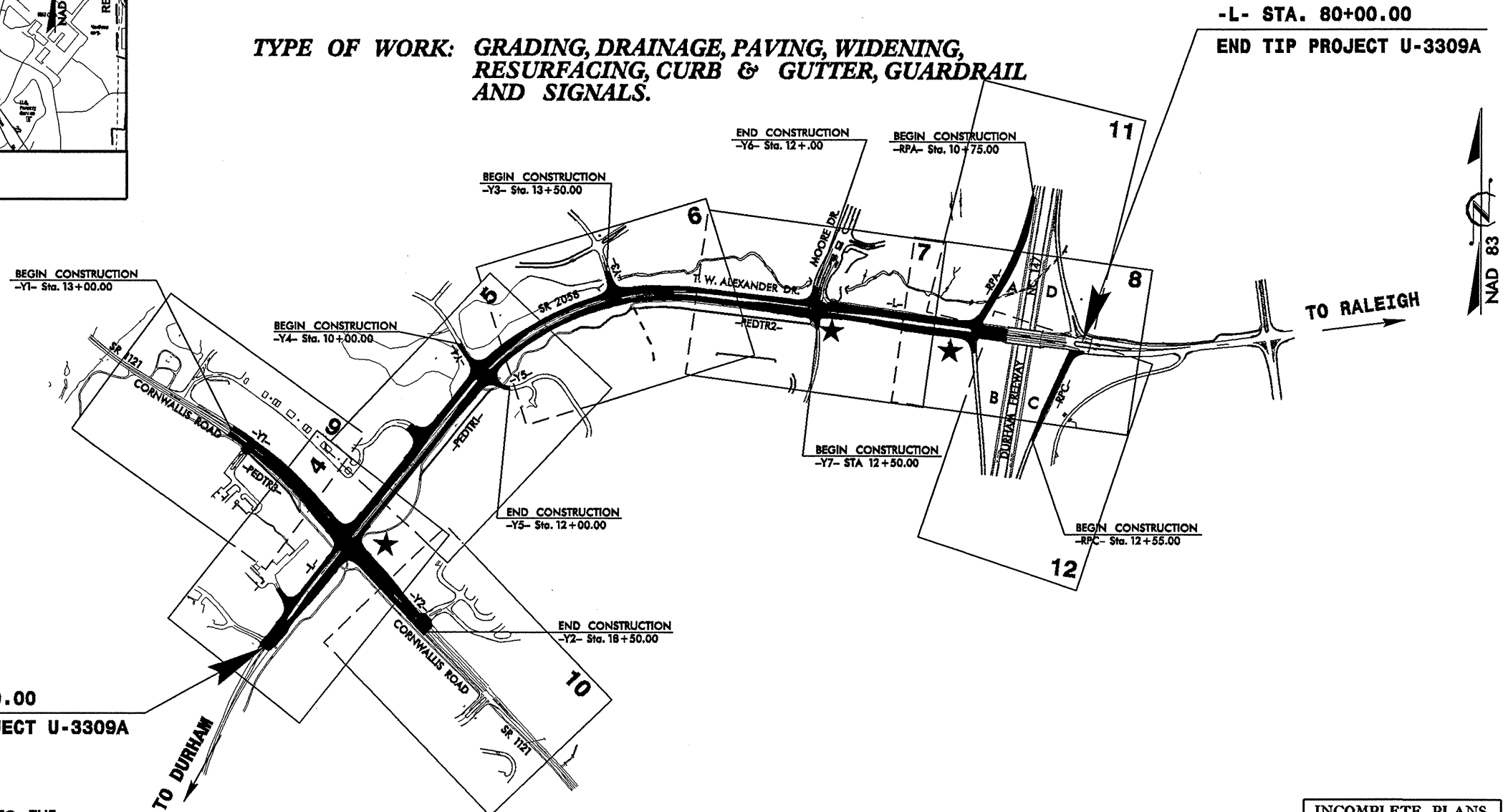
LOCATION: SR 2028 (T.W. ALEXANDER DRIVE) FROM
SR 1121 (CORNWALLIS ROAD) TO NC 147

TYPE OF WORK: GRADING, DRAINAGE, PAVING, WIDENING,
RESURFACING, CURB & GUTTER, GUARDRAIL
AND SIGNALS.

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3309A	2A	46
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34916.1.1	STP-2028(1)	P.E.	



VICINITY MAP



-L- STA. 18+50.00
BEGIN TIP PROJECT U-3309A

-L- STA. 80+00.00
END TIP PROJECT U-3309A

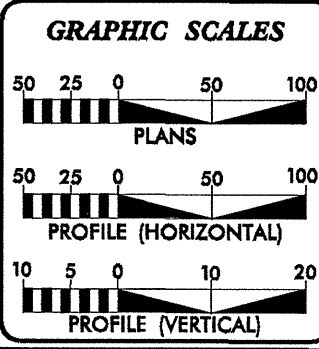
NOTES:
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE
LIMITS ESTABLISHED BY METHOD III.
THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

★ UPGRADE EXIST SIGNALS

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

CONTRACT: TIP PROJECT: U-3309A

CONTRACT: TIP PROJECT: U-3309A



DESIGN DATA

ADT 2005 =	16,800
ADT 2030 =	33,100
DHV =	11 %
D =	75 %
T =	3 % *
V =	60 MPH
* TTST 1	DUAL 2
CLASS =	URBAN COLLECTOR

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-3309A =	1.072 MI
TOTAL LENGTH STATE ROADWAY TIP PROJECT U-3309A =	1.072 MI

Prepared In the Office of:

DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: OCTOBER 19, 2007	JASON MOORE, P.E. PROJECT ENGINEER
LETTING DATE: FEBRUARY 17, 2009	BRYAN KEY, P.E. PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER	
SIGNATURE: _____	P.E.
ROADWAY DESIGN ENGINEER	
SIGNATURE: _____	P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER P.E.

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

Michael F. Easley
GOVERNOR

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

Lyndo Tippett
SECRETARY

July 9, 2007

STATE PROJECT: 34916.1.1 (U-3309A)
FEDERAL PROJECT: STP-2028(1)
COUNTIES: Durham
DESCRIPTION: SR 2028 (T. W. Alexander Drive) from SR 1121 (Cornwallis Road) to East of NC 147
SUBJECT: Geotechnical Report - Inventory

Project Description

This project consists of a proposed widening of a 1.1-mile stretch of T. W. Alexander Drive. This project also includes intersection improvements at Cornwallis Road, the addition of turn lanes at the NC 147 interchange, and three (3) pedestrian paths.

The geotechnical investigation was conducted during July of 2005 and June of 2007 using an ATV-mounted CME-550X drill machine with an automatic hammer. Standard Penetration Tests were performed at selected locations and additional borings were advanced using continuous flight augers and hand 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, totaling 2.0 miles, were investigated.

<u>Line</u>	<u>Stations</u>
-L-	18+50 to 80+00
-PEDTR1-	10+00 to 17+40
-PEDTR2-	10+00 to 22+42
-PEDTR3-	10+00 to 17+29
-RPA-	10+00 to 20+09
-RPC-	10+00 to 19+20

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>	<u>Offsets</u>
-L-	18+50 to 29+75	LT to RT

-L-	38+25 to 44+25	CL
-PEDTR1-	15+23 to 17+18	CL
-PEDTR2-	12+10 to 13+45	LT to RT

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

- 2) **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-	39+65, RT
-L-	43+65 to 47+50, RT

- 3) **Lakes and Ponds:** Two ponds are within close proximity of the right of way were noted at the following locations.

<u>Line</u>	<u>Station</u>	<u>Offset (ft)</u>
-L-	37+00 to 40+75	120 to 375 LT
-L-	41+25 to 50+00	105 LT

Physiography and Geology

The project is located in the central Piedmont Physiographic Province. The terrain is irregular with gently rolling hills. The area consists of businesses surrounded by woods. There is a small creek to the north of Alexander Drive that runs the length of the project and passes through two ponds.

Geologically, the project is located within the Durham sub-basin of the Deep River Triassic Basin. Soils are derived from the underlying bedrock which consists of Triassic age sedimentary rocks (interbedded sandstone, mudstone, and siltstone) of the Chatham group with scattered diabase dike intrusions.

Soil Properties

Soils encountered during this investigation are separated into two categories based on origin. They consist of roadway embankment and Triassic residual soils.

Roadway Embankment soils are present along the existing roadways on the project. At the beginning of the project, embankment soils consist of red-brown, medium stiff, moist, highly plastic, silty clay (A-7-6). The remainder of the project consists mainly of red-brown, stiff to very stiff, moist, silty clay (A-7-6) and minor amounts of red-brown, medium stiff, moist, sandy silt (A-4).

Triassic residual soils are derived from the weathering of underlying Triassic sandstone, siltstone and mudstone. Soils derived from Triassic mudstone and siltstone are the most common. These soils consist of tan and red-brown, medium stiff to hard, dry to moist, sandy and silty clay (A-6, A-7-6). Smaller amounts of red-brown, medium stiff to hard, moist, sandy silt (A-4) are also present. The surficial Triassic residual, silty clays exhibit moderate to high plastic indices from 19 to 51. Triassic residual soils grade into weathered rock with depth that retains the relict characteristics of the Triassic rock.

Rock Properties

Weathered rock in the Triassic Basin is derived from the underlying Triassic non-crystalline sandstone, siltstone, and mudstone. The Triassic mudstones and siltstones are moderately to highly degradable when exposed to air and water. Weathered rock occurs sporadically along -L- between Sta. 21+50 and Sta. 61+50.

Triassic sedimentary rocks underlie the project. These non-crystalline rocks consist of red-brown and light gray Triassic sandstone, siltstone, and mudstone. Several sporadic areas of non-crystalline rock occur from -L- Sta. 30+00 to Sta. 40+00.


Groundwater

Groundwater generally occurs well below the ground surface with the exception of two locations. Areas that exhibit high groundwater are outlined in "Areas of Special Geotechnical Interest." The potential for a perched water table is high in most of the upland areas where very dense or stiff, impermeable material underlies loose or soft surficial soils.

Ponds

Two ponds are located just north of -L- at Sta. 37+00 to 40+75, 120' to 375' LT and at Sta. 41+25 to 50+00, 105' LT. The ponds are fed by a small creek that runs the length of the project and flows east to west. The ponds may be affected by sedimentation from storm water runoff during construction of the project. One other pond along -Y1- (Cornwallis Road) just before Sta. 10+00, 250' LT, which is in close proximity of the project, should also be noted.

Prepared by,


Jaime Love Pedro
Engineering Geologist

BULK SAMPLES

The following bulk sample was 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-, 46+15, 59' RT	2.5 – 12.0	California Bearing Ratio
CBR-2	-L-, 62+66, 101' RT	2.5 – 13.7	California Bearing Ratio

EARTHWORK BALANCE SHEET

Volumes in Cubic Yards

PROJECT TIP # U-3309A

COUNTY Durham

DATE 2/18/2009

SHEET 3B OF 46 SHEETS

LINE	STATION	STATION	TOTAL EXCAV. (UNCL.)	ROCK EXCAV.	UNDERCUT EXCAV.	UNSUIT. EXCAV.	SUITABLE EXCAV.	TOTAL EMB.	ROCK EMB.	UNDERCUT EMB.	EARTH EMB.	EMBANK. 20%	BORROW	SUITABLE WASTE	UNSUIT. WASTE	TOTAL WASTE
-L- RT	18+50.00	27+00.00	84		215		84	1311			1311	1573	1489		215	215
-L- RT	27+00.00	40+50.00	1849		211	1113	736	2259			2259	2711	1975		1324	1324
-L- RT	40+50.00	63+00.00	13743			64	13679	3527			3527	4232		9447	64	9511
-L- RT	63+00.00	73+00.00	294				294	1837			1837	2204	1910			
SUBTOTAL			15970		426	1177	14793	8934			8934	10720	5374	9447	1603	11050
-L- LT	18+50.00	27+00.00	376		123	90	286	1500			1500	1800	1514		213	213
-L- LT	27+00.00	40+50.00	2347		2		2347	7003			7003	8404	6057		2	2
-L- LT	40+50.00	63+00.00	60				60	14674			14674	17609	17549			
-L- LT	63+00.00	73+00.00	62				62	3107			3107	3728	3666			
SUBTOTAL			2845		125	90	2755	26284			26284	31541	28786		215	215
-L- MED	18+50.00	27+00.00	8				8	490			490	588	580			
-L- MED	27+00.00	40+50.00	18				18	798			798	958	940			
-L- MED	40+50.00	63+00.00	52				52	1799			1799	2159	2107			
-L- MED	63+00.00	73+00.00	92				92	647			647	776	684			
SUBTOTAL			170				170	3734			3734	4481	4311			
-Y1- LT	12+00.00	22+84.89	142				142	853			853	1024	882			
-Y1- RT	12+00.00	22+84.89	41				41	1388			1388	1666	1625			
SUBTOTAL			183				183	2241			2241	2690	2507			
-Y2- LT	10+44.66	18+50.00	1331				1331	60			60	72		1259		1259
-Y2- RT	10+44.66	18+50.00	85				85	154			154	185	100			
SUBTOTAL			1416				1416	214			214	257	100	1259		1259
SHEET SUBTOTAL			20584		551	1267	19317	41407			41407	49689	41078	10706	1818	12524

*** 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

PROJECT TIP # U-3309A

COUNTY Durham

DATE 2/20/2009

SHEET 3C OF 46 SHEETS

LINE	STATION	STATION	TOTAL EXCAV. (UNCL.)	ROCK EXCAV.	UNDERCUT EXCAV.	UNSUIT. EXCAV.	SUITABLE EXCAV.	TOTAL EMB.	ROCK EMB.	UNDERCUT EMB.	EARTH EMB.	EMBANK. 20%	BORROW	SUITABLE WASTE	UNSUIT. WASTE	TOTAL WASTE
SHEET 1 SUBTOTAL			20584		551	1267	19317	41407			41407	49689	41078	10706	1818	12524
-Y3-	14+00.00	15+93.91	21				21	339			339	407	386			
-Y4-	10+50.00	12+80.72	33				33	2047			2047	2456	2423			
-Y5-	10+39.00	11+50.00	69				69	3			3	4		65		65
-Y6-	10+39.00	11+50.00	61				61	20			20	24		37		37
-Y7-	12+50.00	14+65.92	221				221	157			157	188		33		33
-RPA-	11+00.00	19+50.00	677				677	900			900	1080	403			
-RPC-	13+00.00	18+50.00	411				411	4			4	5		406		406
PROJECT SUBTOTAL			22077		551	1267	20810	44877		9100	44877	53853	44290	11247	1818	13065
ADDITIONAL UNDERCUT					9100			9100		9100		10920	10920		9100	9100
WASTE IN LIEU OF BORROW													-11247	-11247		-11247
LOSS DUE TO CLEARING & GRUBBING			-4500				-4500						4500			
LESS SELECT GRANULAR MATERIAL											-1667	-2000	-2000			
EST. SHOULDER MATERIAL								3150			3150	3780	3780			
PROJECT TOTALS			17577		9651	1267	16310	57127		9100	46360	66553	50243		10918	10918
EST 5% TO REPLACE TOP SOIL ON BORROW PIT													2512			
GRAND TOTALS			17577		9651								52755			
SAY			17600		9660								52760			

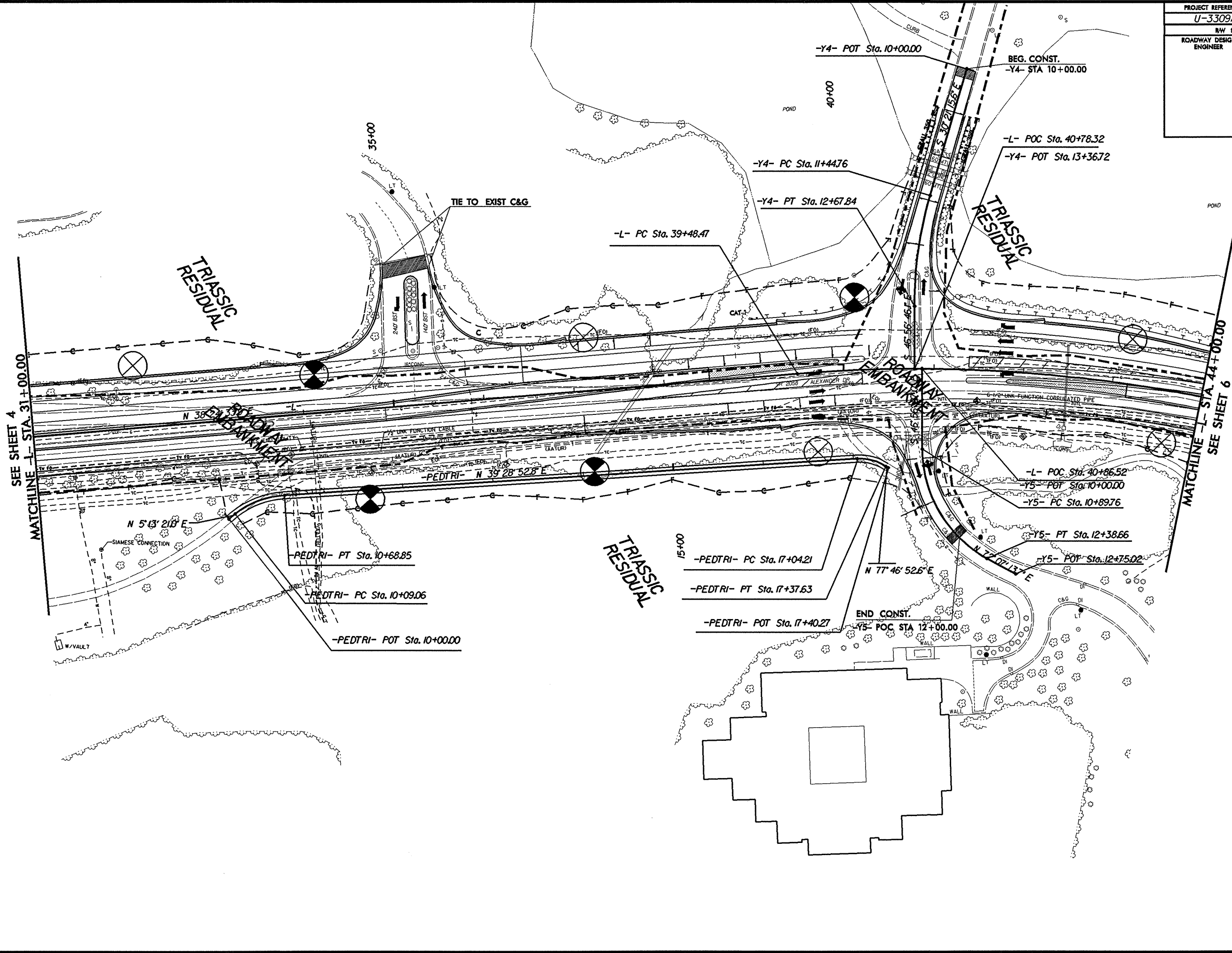
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-L-, -Y1-, and -Y2- Pavement Structure Volume = 2600 CY

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PROJECT REFERENCE NO. U-3309A	SHEET NO. 5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



REVISIONS

SEE SHEET 4
MATCHLINE -L- STA 31+00.00

MATCHLINE -L- STA 44+00.00
SEE SHEET 6

TRIASSIC RESIDUAL

TRIASSIC RESIDUAL

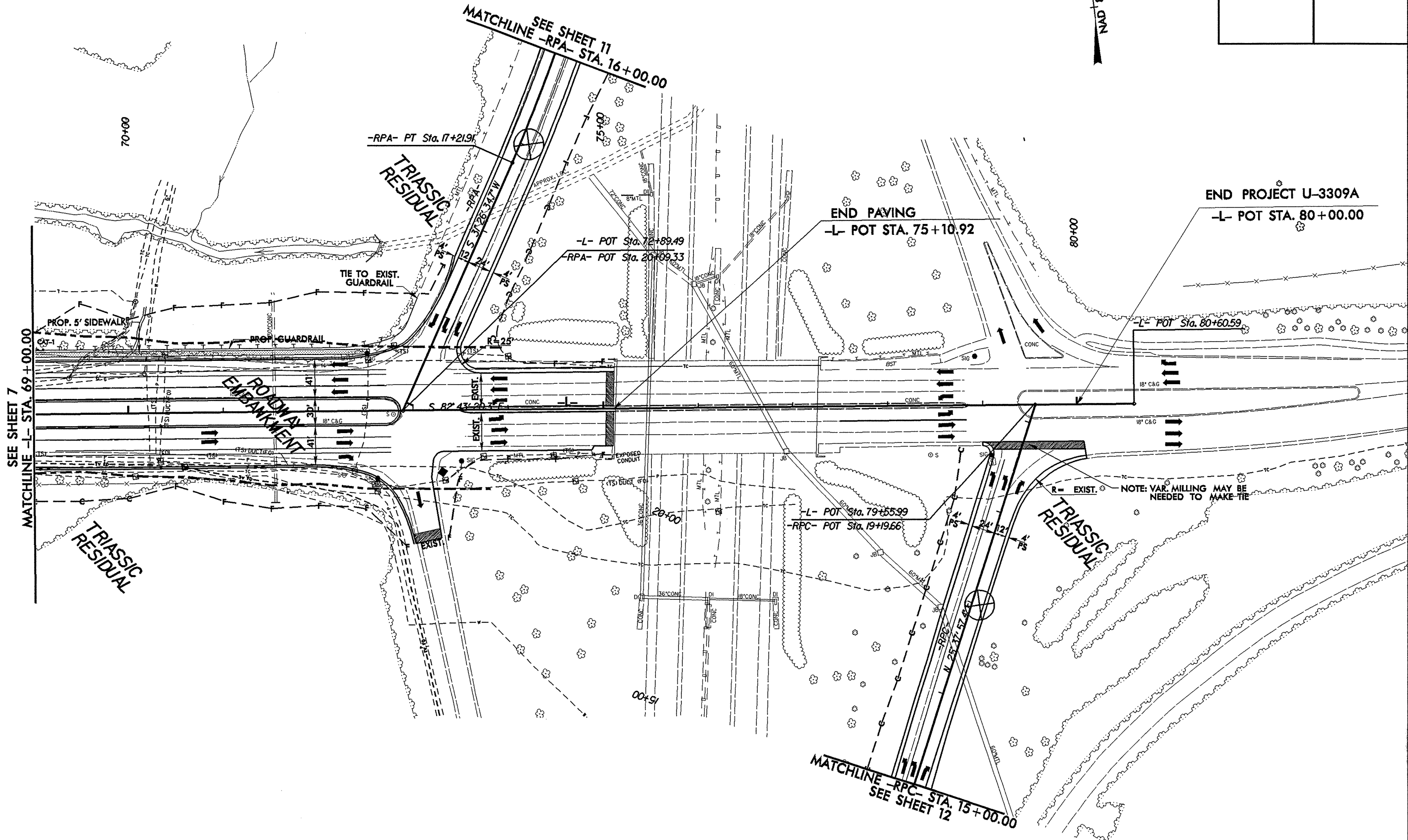
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ROADWAY EMBANKMENT

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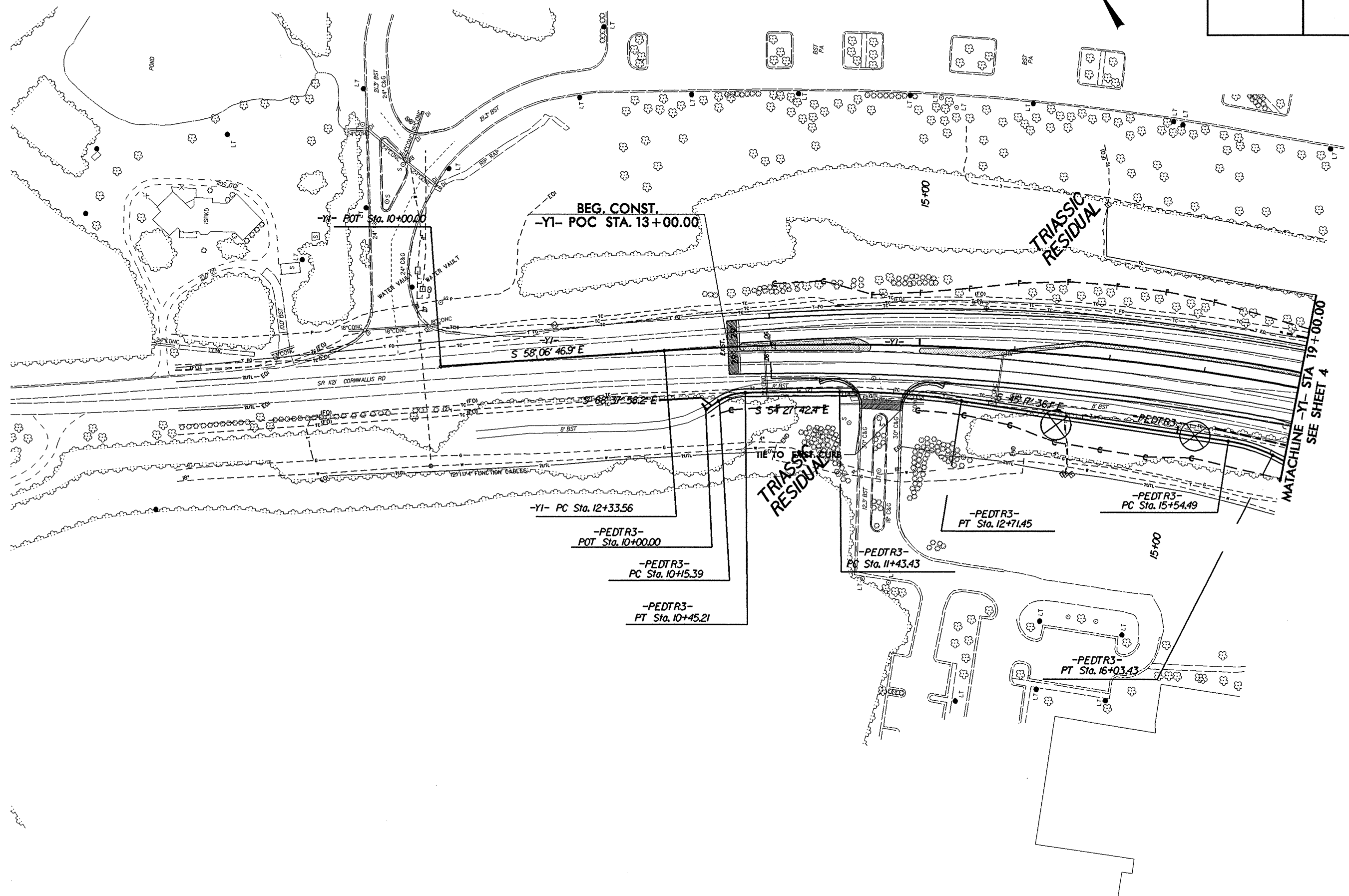
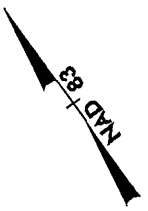


REVISIONS

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ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



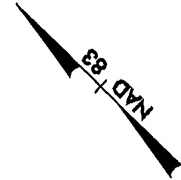
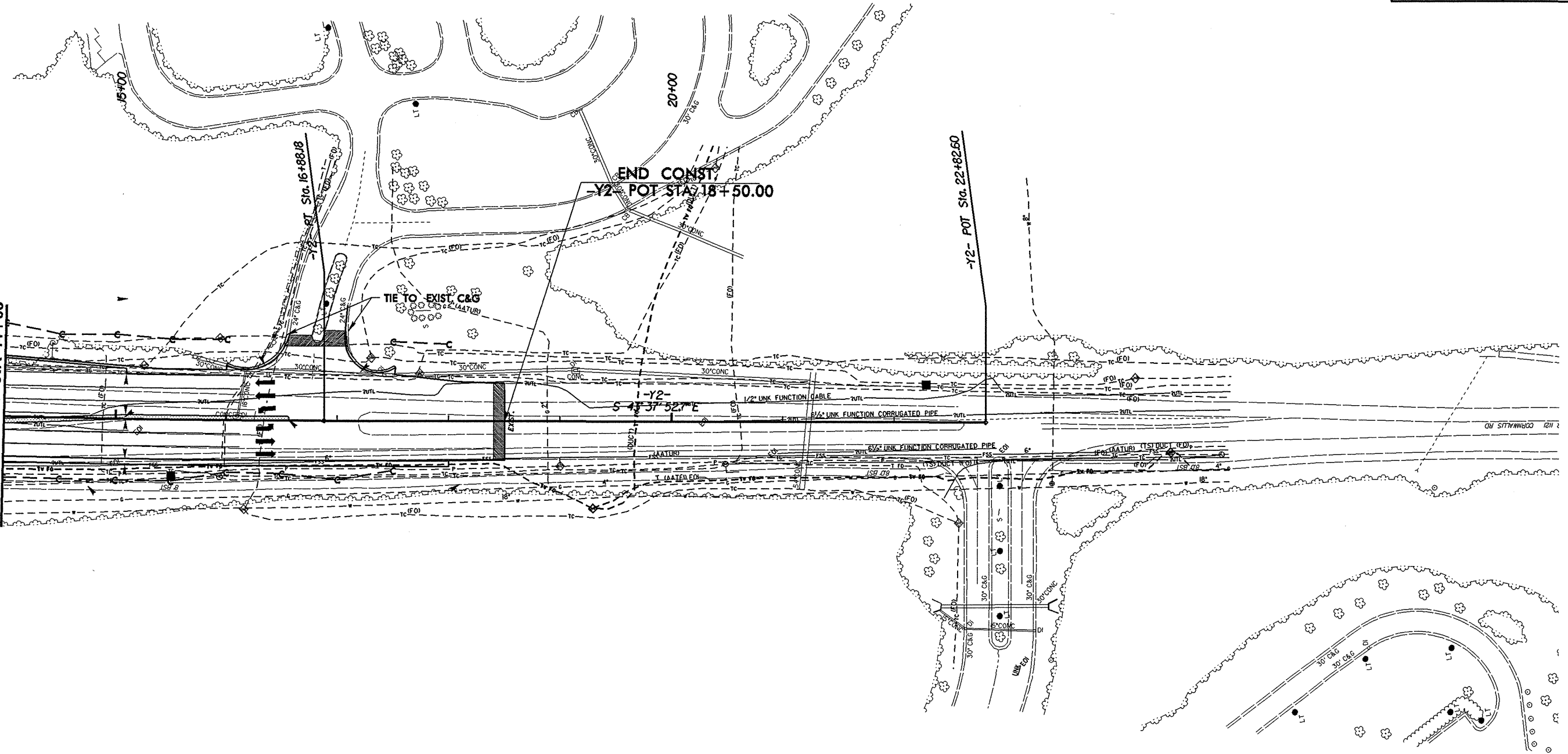
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8/17/99

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REVISIONS

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MATACHLINE -Y2- STA 14+00



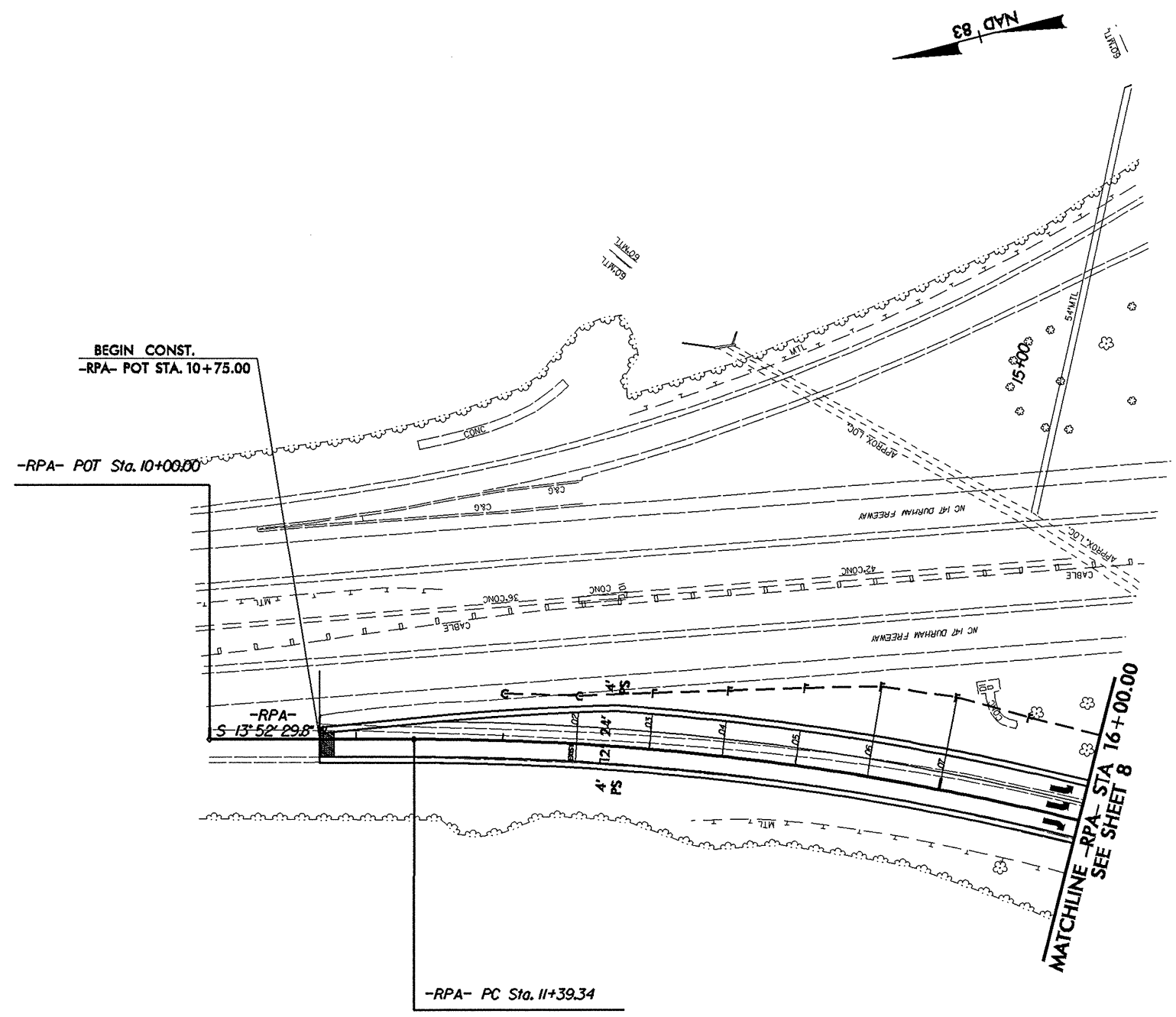
PROJECT REFERENCE NO. U-3309A	SHEET NO. 10
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

8/17/99

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REVISIONS

PROJECT REFERENCE NO. U-3309A	SHEET NO. 11
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

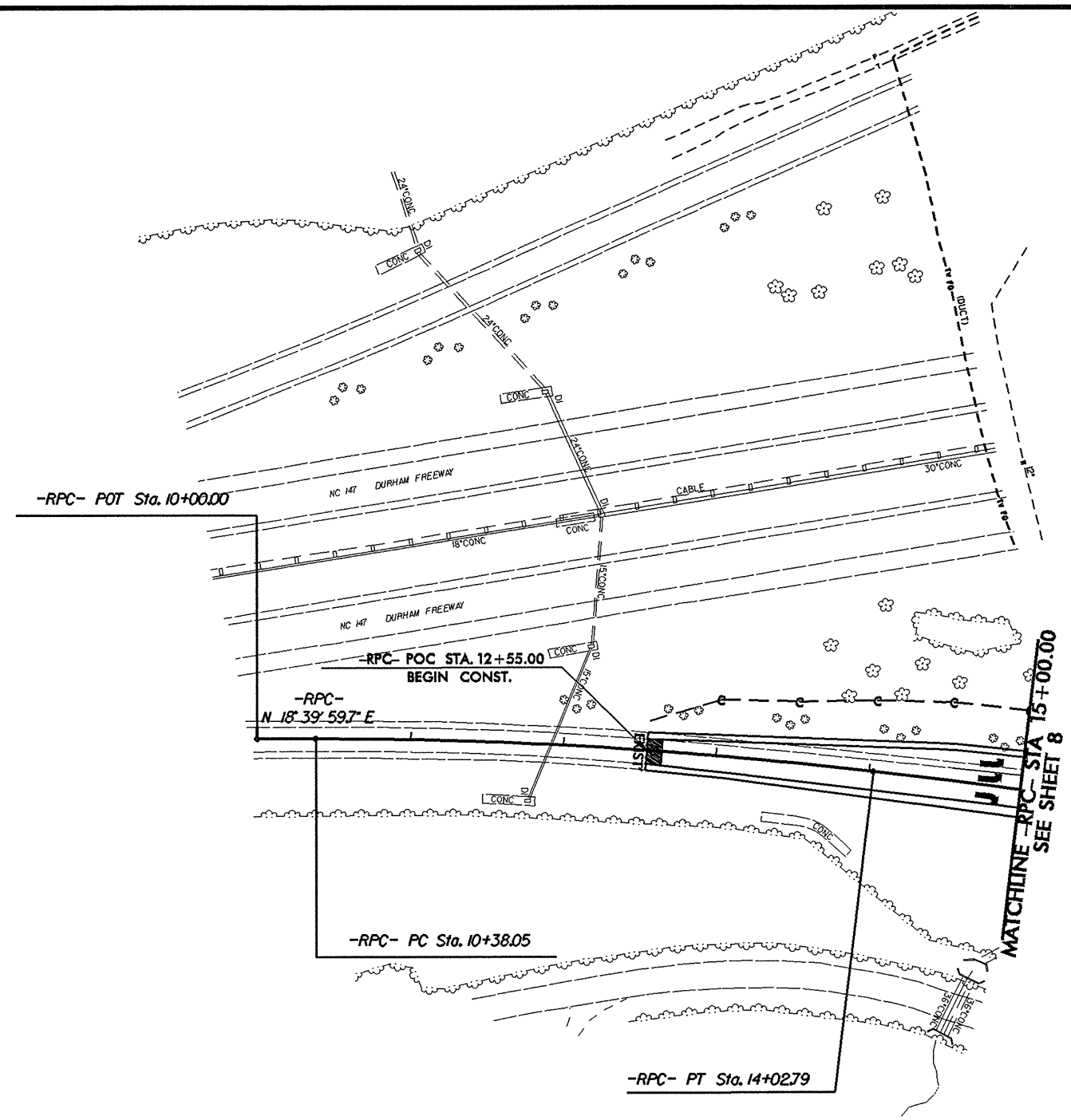


8/17/99

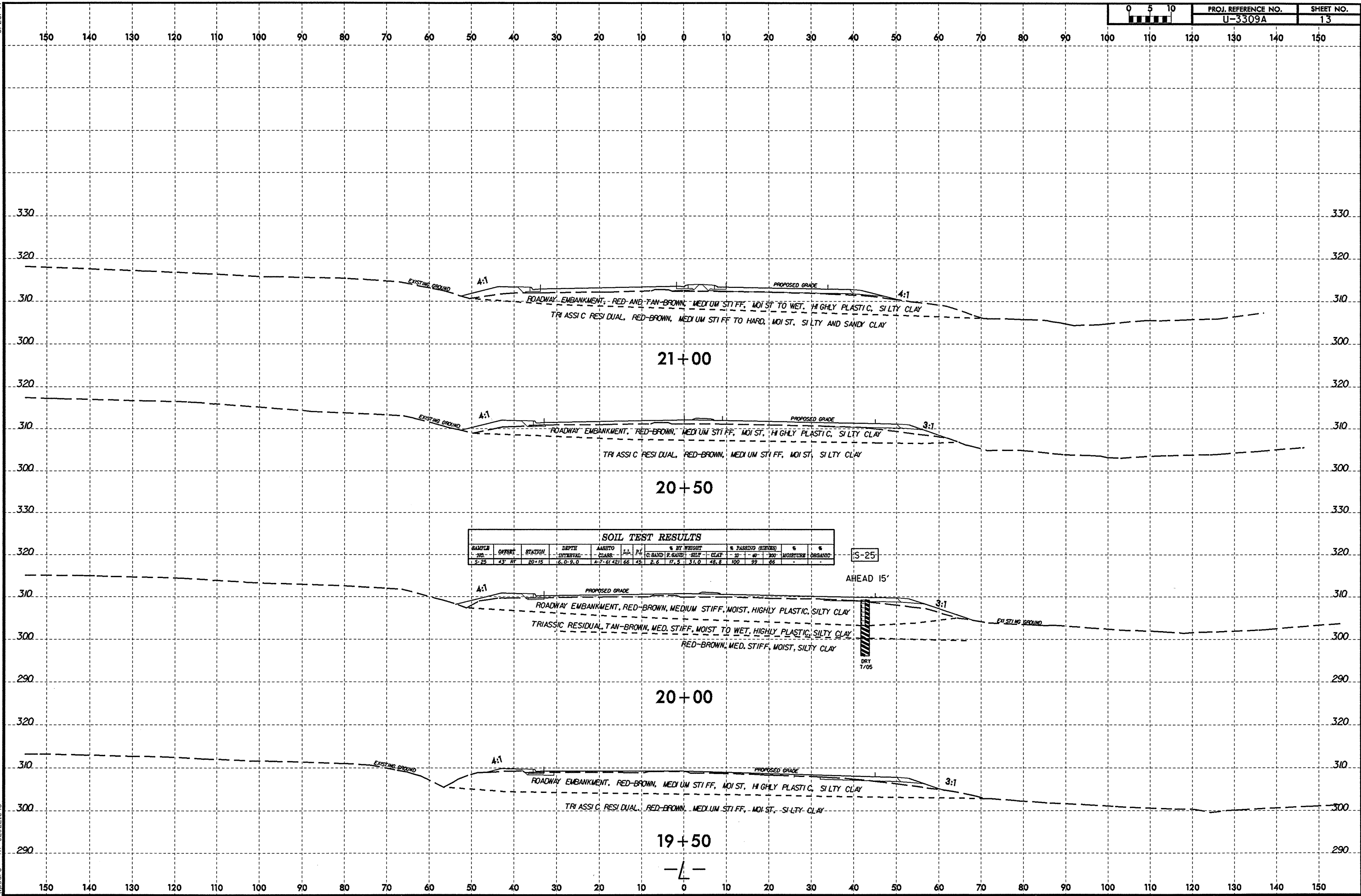
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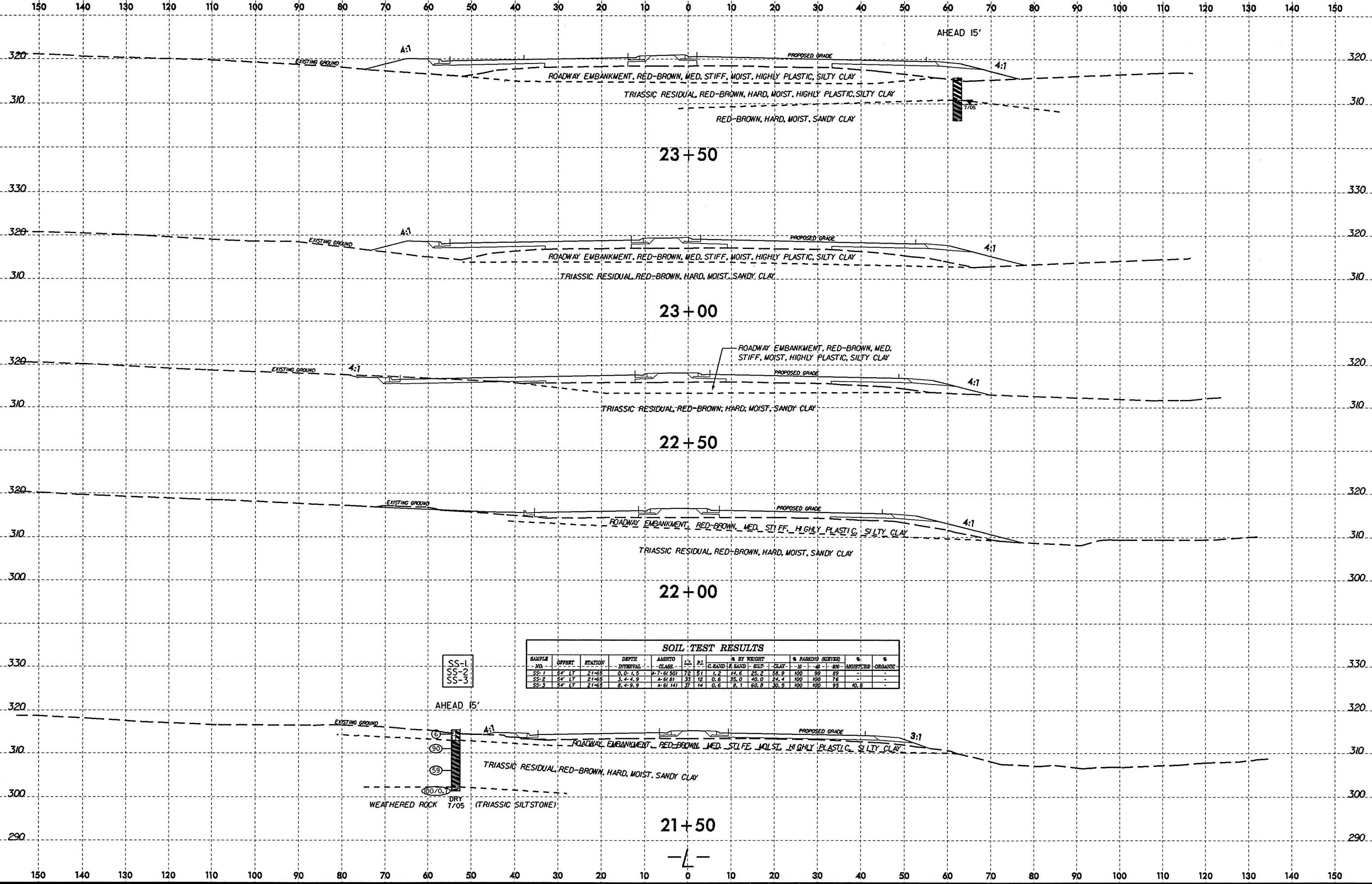
REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-3309A	12
RAW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



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SS-1
SS-2
SS-3

SAMPLE NO.	DEPTH	STATION	DEPTH INTERVAL	ASHFORD CLASS.	L.L.	P.L.	% BY WEIGHT				% PASSING (SIZES)			% MOISTURE	% ORGANIC
							C-SAND	F-SAND	SILT	CLAY	-10	-40	-200		
SS-1	6" LT	21+55	0, 0 - 1, 5	A-7-CL(SD)	72	57	1.2	24.8	25.2	55.9	100	99	99	-	-
SS-2	6" LT	21+55	3, 4 - 4, 9	A-6(8)	37	12	0.6	40.0	24.4	100	100	76	-	-	
SS-3	6" LT	21+55	8, 4 - 9, 9	A-6(14)	37	14	0.6	8.1	60.8	30.5	100	100	95	10.6	

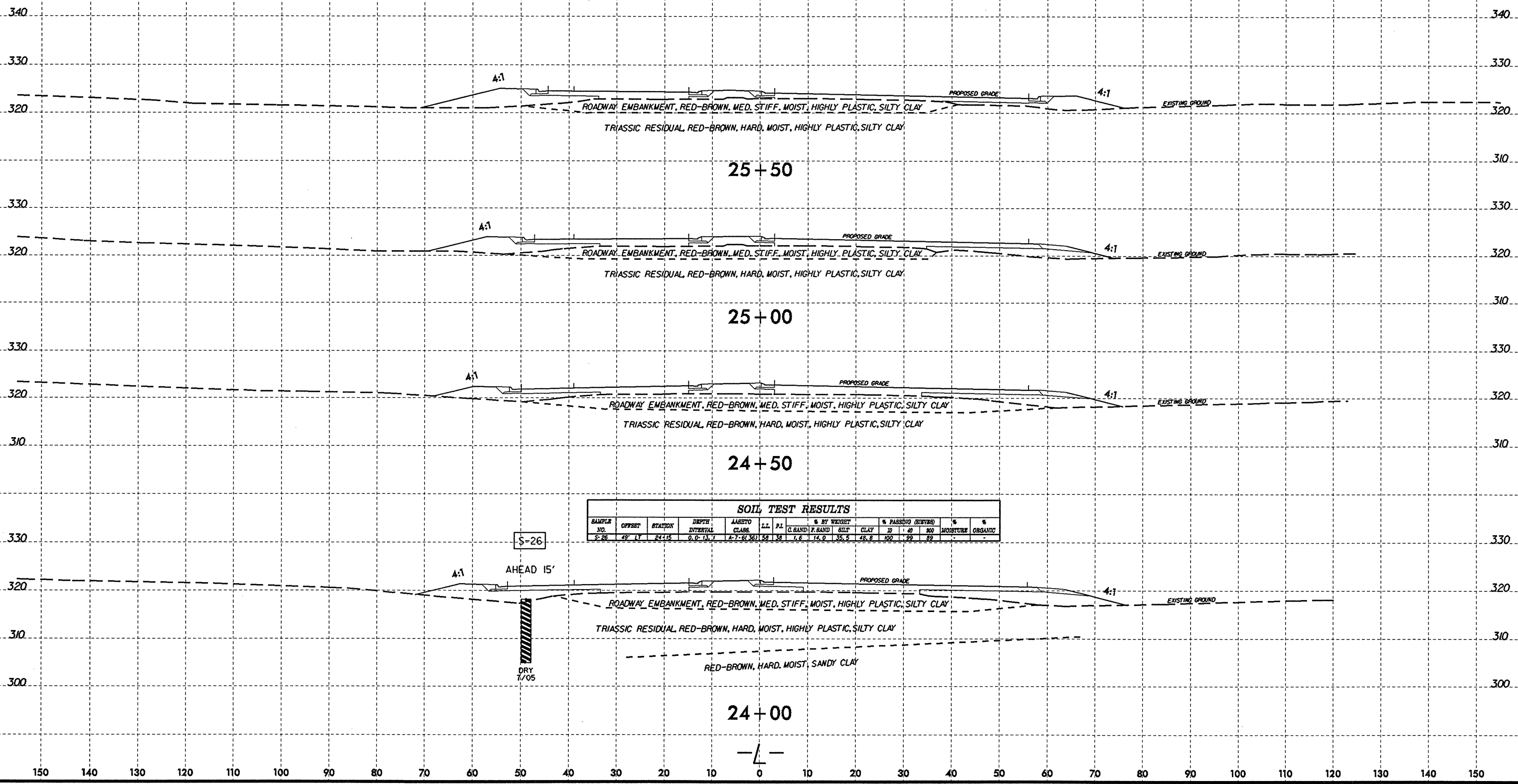
8/23/99



PROJ. REFERENCE NO.
U-3309A

SHEET NO.
15

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	ASTM CLASS.	LL	PL	% BY WEIGHT			% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							G.BAND	F.BAND	SILT	CLAY	10	40		
S-26	49' LY	24+15	0.0-13.1	A-7-6(50)	58	38	1.6	14.0	35.5	48.8	100	99	89	-

S-26

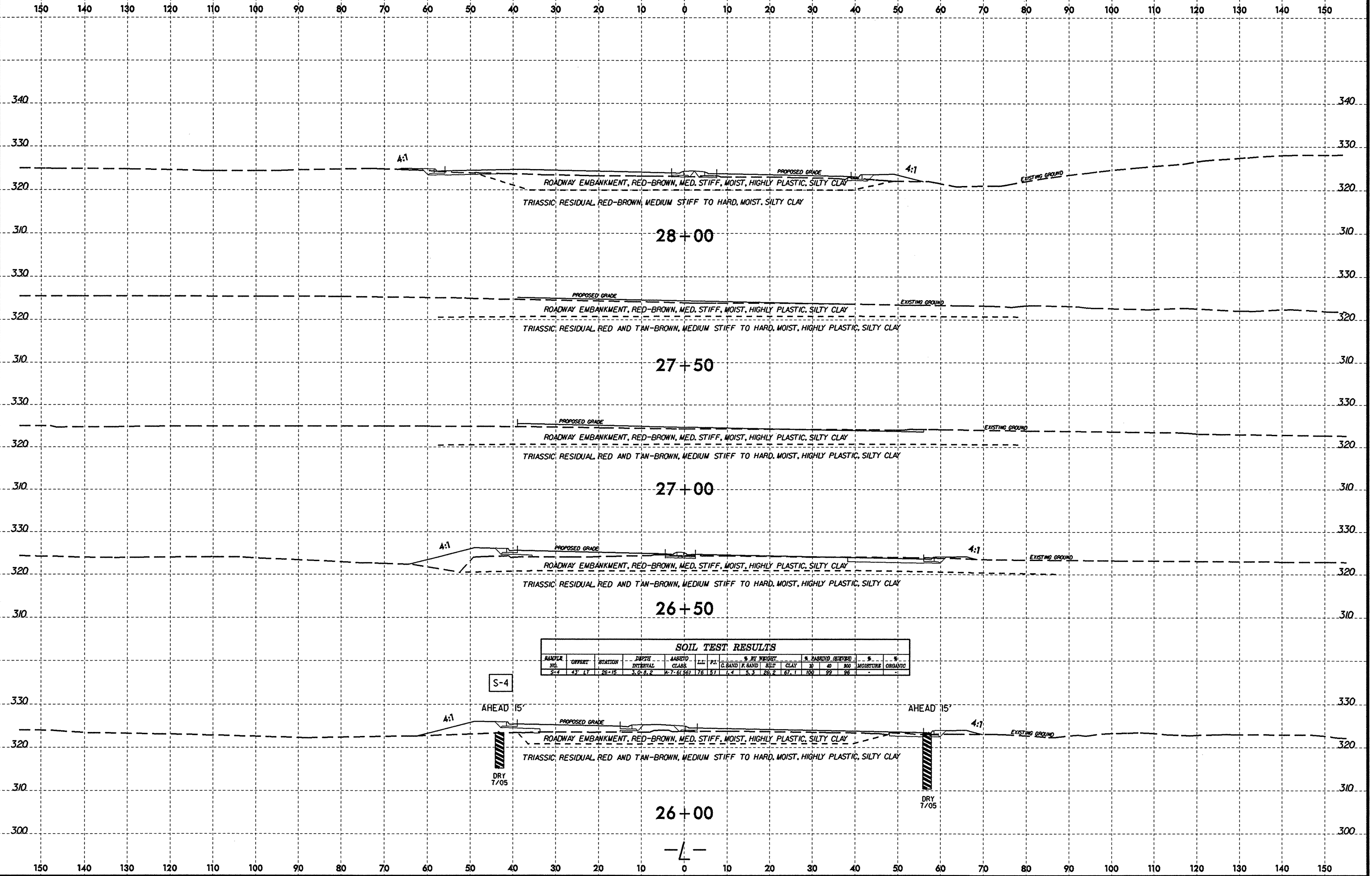
AHEAD 15'



DRY 7/05

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SOIL TEST RESULTS														
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AGGREGATE CLASS	L.L.	P.L.	% BY WEIGHT				% PASSED (REMOVED)		MOISTURE	ORGANIC
							G. BAND	F. BAND	SILT	CLAY	NO.	WT.		
S-4	43' LT	26+15	3.0-8.2	M-7-6(SB)	76	17	1.4	8.3	26.2	67.1	100	99	96	-

S-4

AHEAD 15'

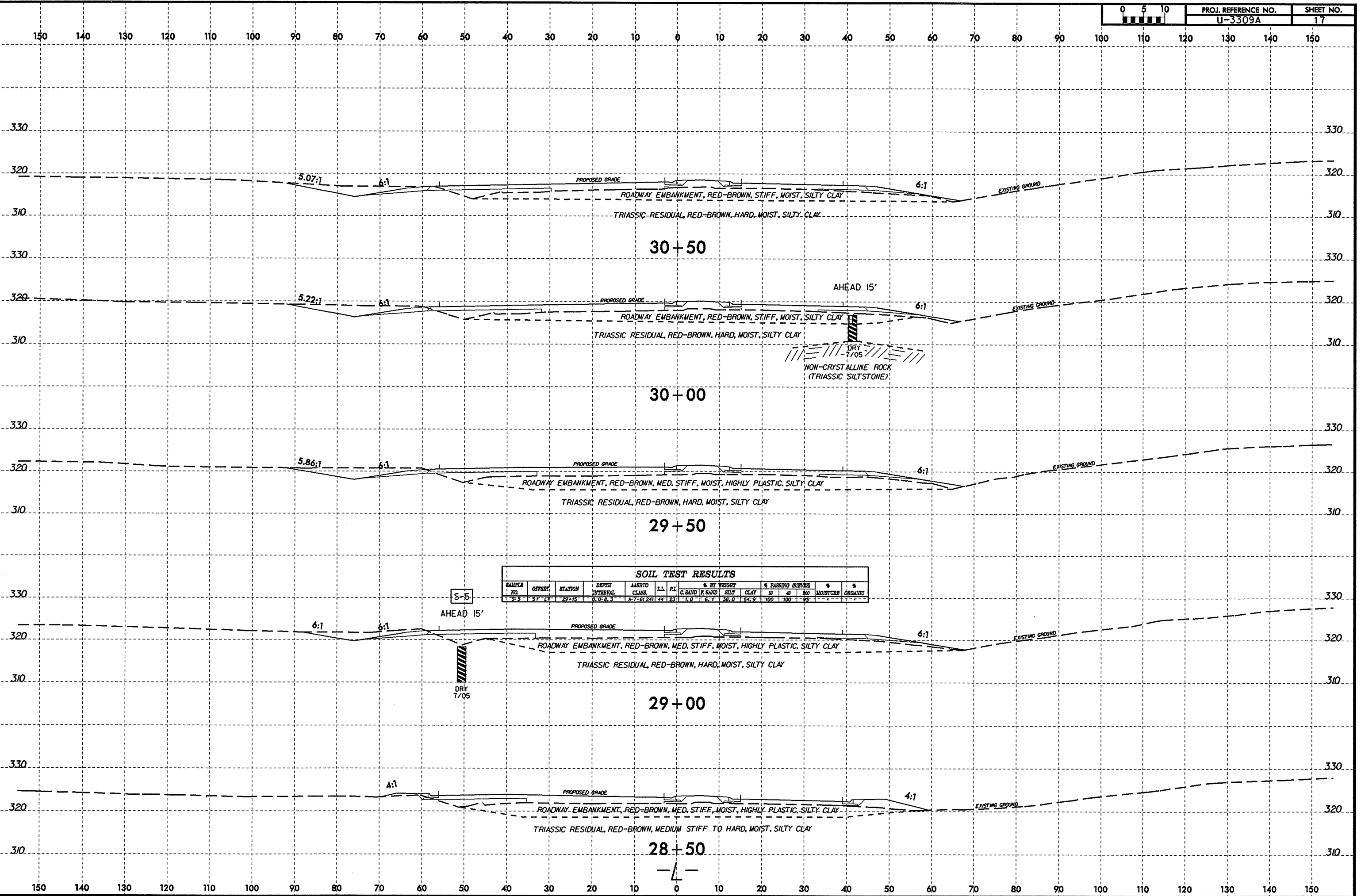
DRY
7/05

AHEAD 15'

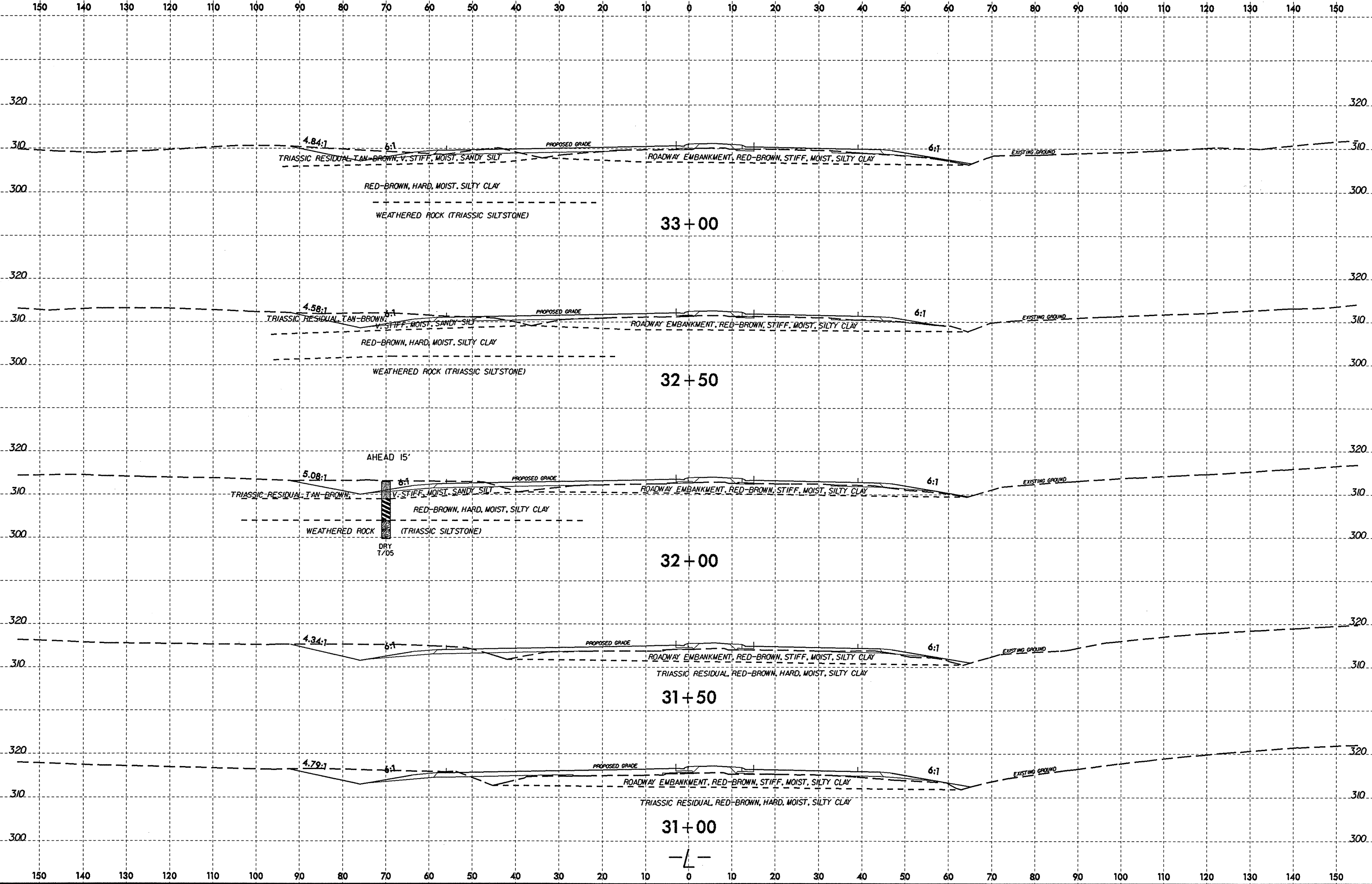
DRY
7/05

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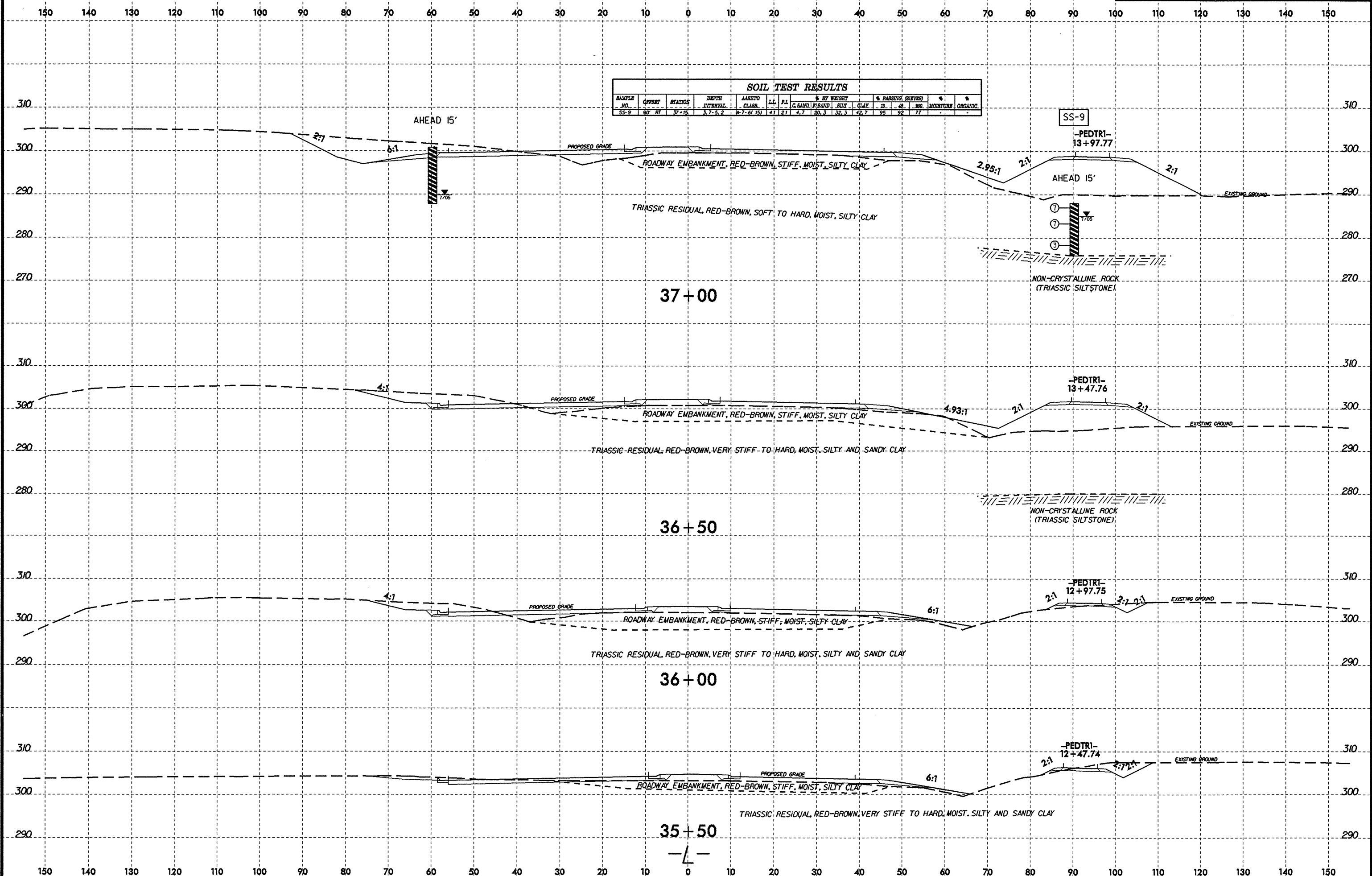
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8/23/99

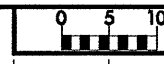


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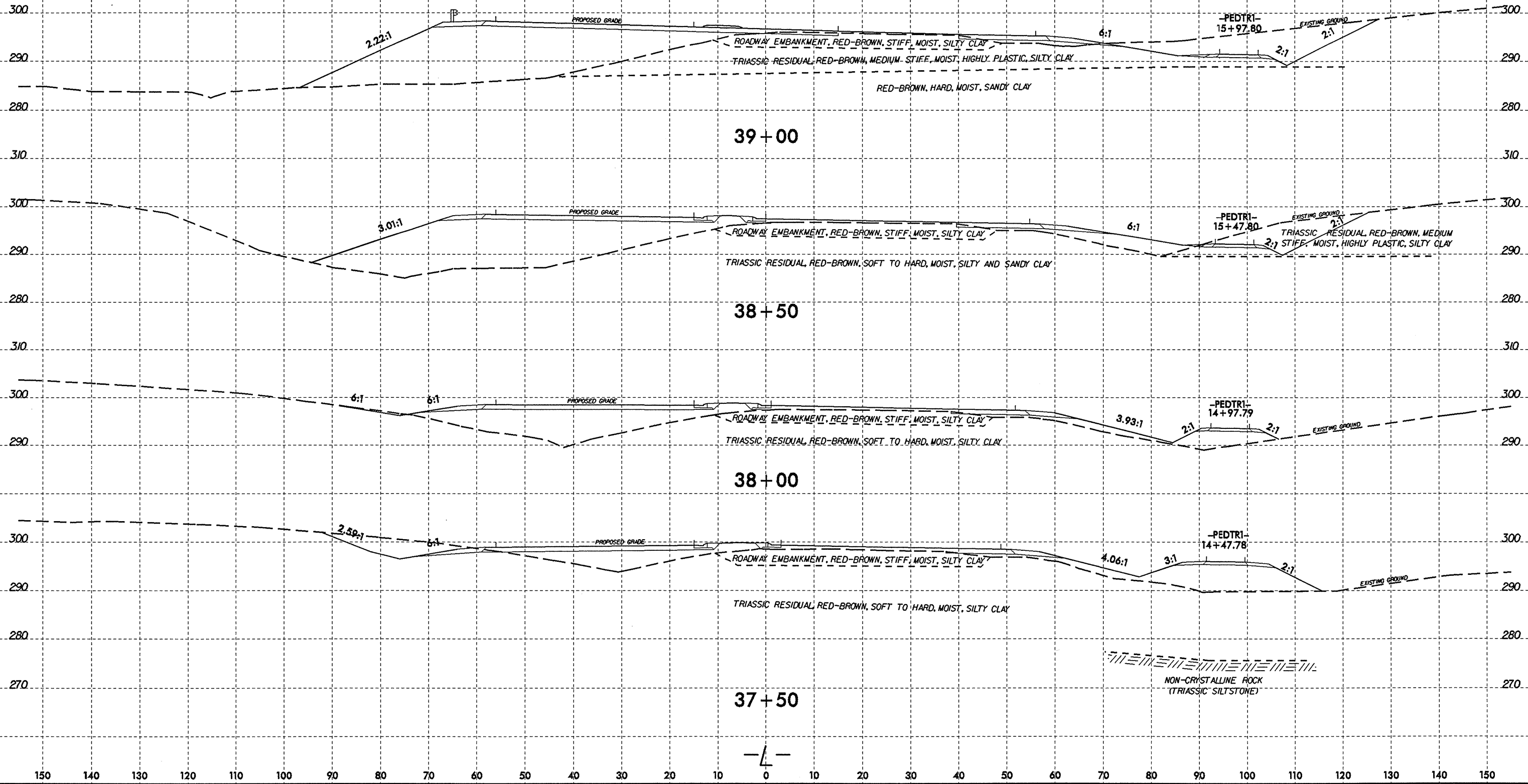
SOIL TEST RESULTS														
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.L.	% BY WEIGHT				% PASSING (SIEVES)			% ORGANIC
							G SAND	F SAND	SILT	CLAY	#10	#40	#200	
SS-9	90'	RT	37+15	4-7-61 (S)	41	21	4.7	20.3	32.3	42.7	95	92	77	-

8/23/99

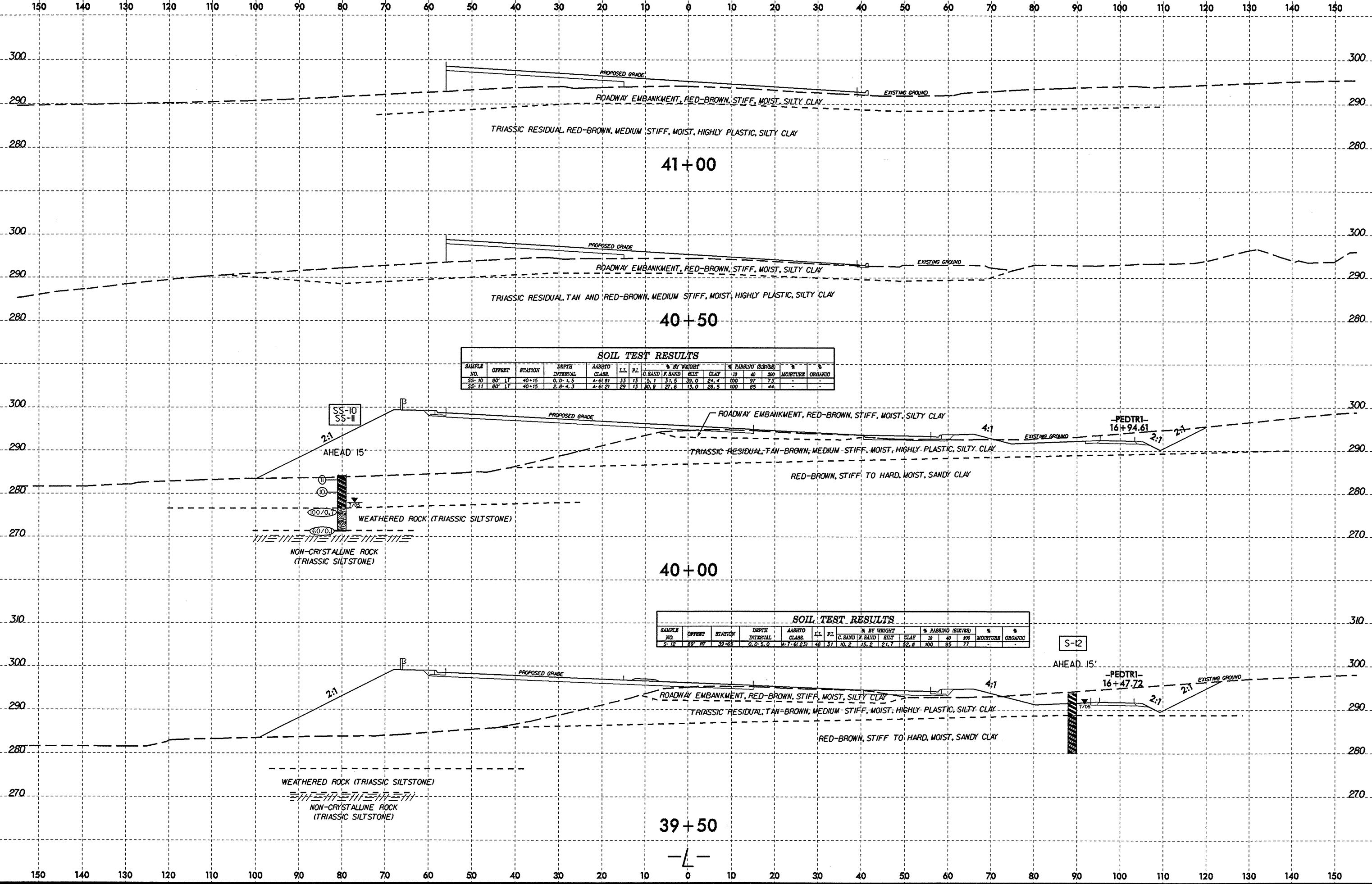


PROJ. REFERENCE NO.	SHEET NO.
U-3309A	21

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SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	PL	% BY WEIGHT				% PASSING (SIEVES)			%	%
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-10	80' LT	40+15	0.0-1.5	A-6(8)	33	15	5.1	31.5	35.0	24.4	100	97	73	-	-
SS-11	80' LT	40+15	2.8-4.3	A-6(8)	29	15	30.9	27.6	15.0	28.5	100	85	44	-	-

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	PL	% BY WEIGHT				% PASSING (SIEVES)			%	%
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-12	80' RT	39+65	0.0-5.0	A-7(6)(2)	48	31	10.2	15.2	21.7	52.8	100	85	77	-	-

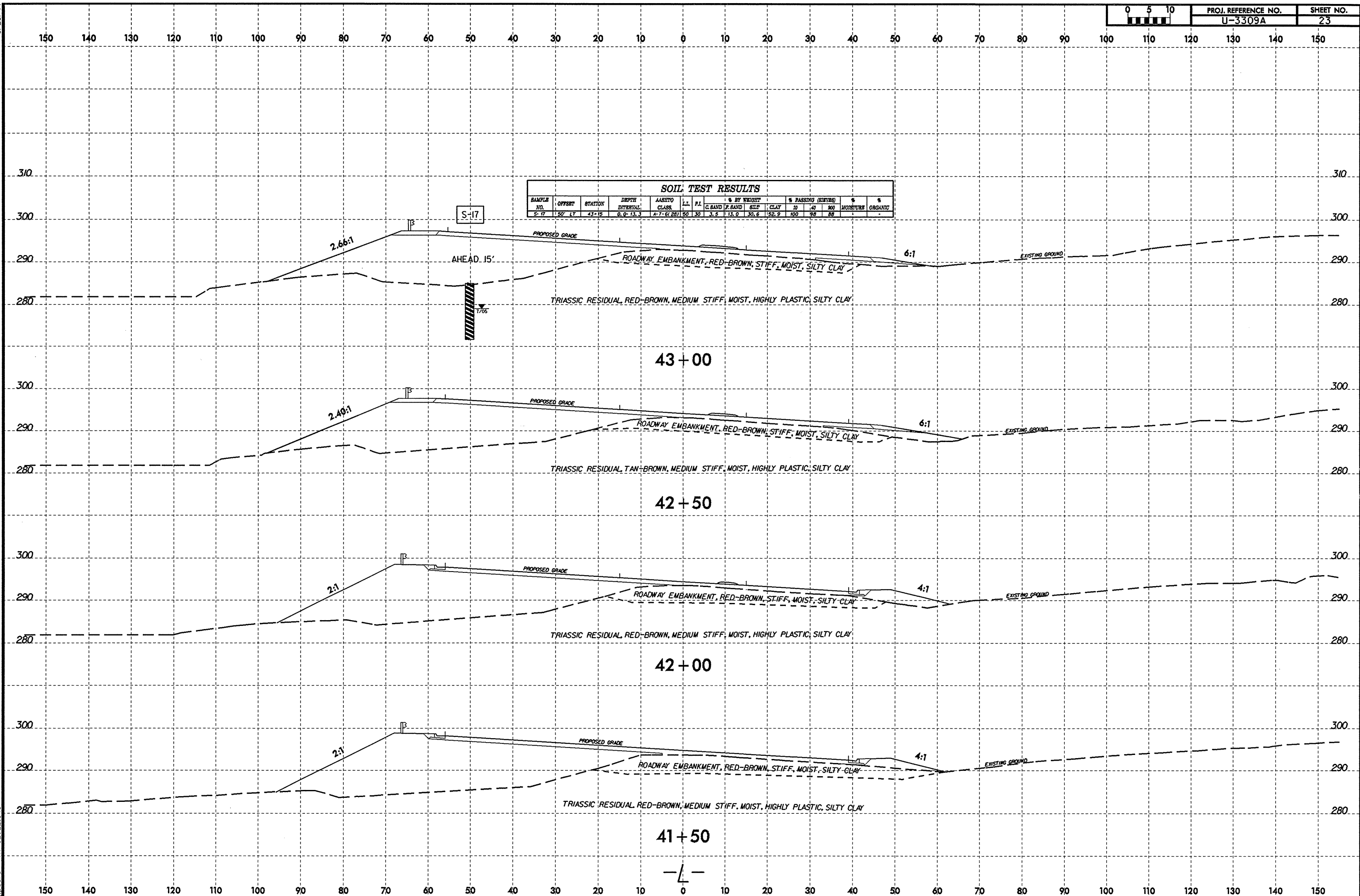
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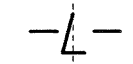


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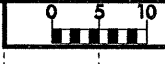
SOIL TEST RESULTS													
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	ASTM CLASS.	L.L.	P.L.	% BY WEIGHT				% MOISTURE	% ORGANIC	
							C. BAND	F. BAND	SILT	CLAY			
S-17	50' LT	43+15	0.0-13.3	A-7-61.2B1	50	30	3.5	13.0	30.6	52.9	100	98	88



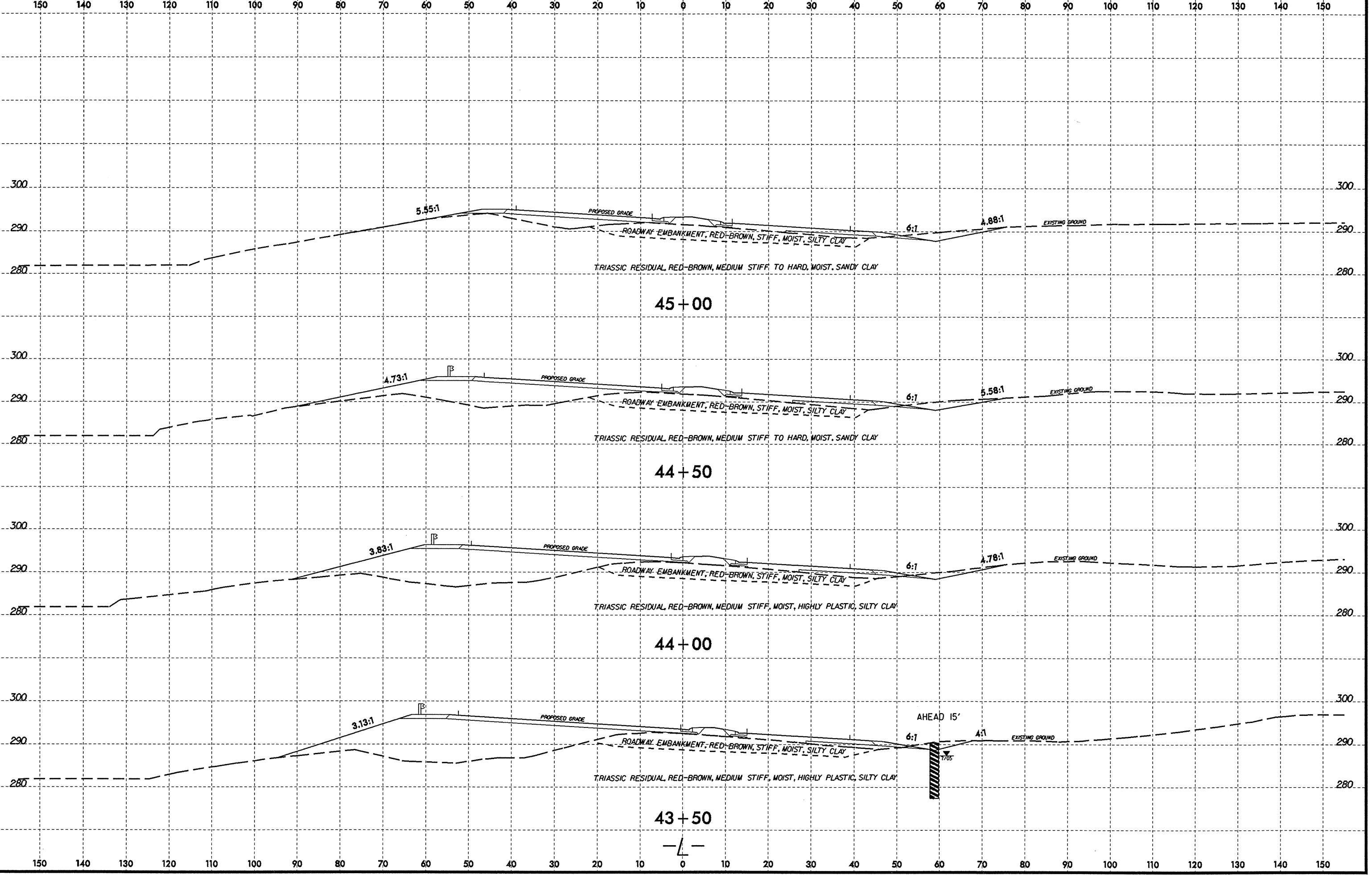
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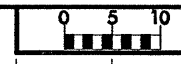
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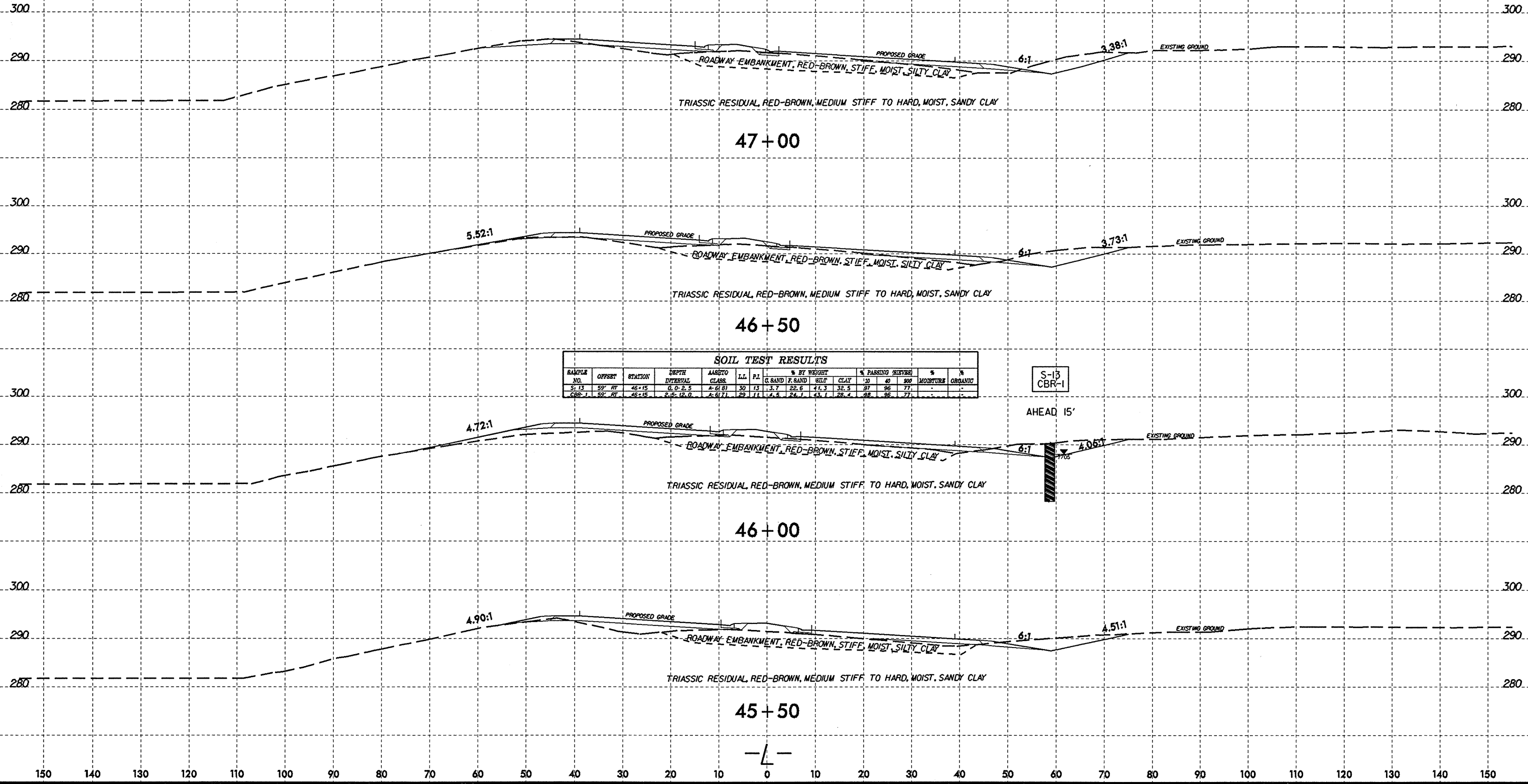
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U-3309A	24



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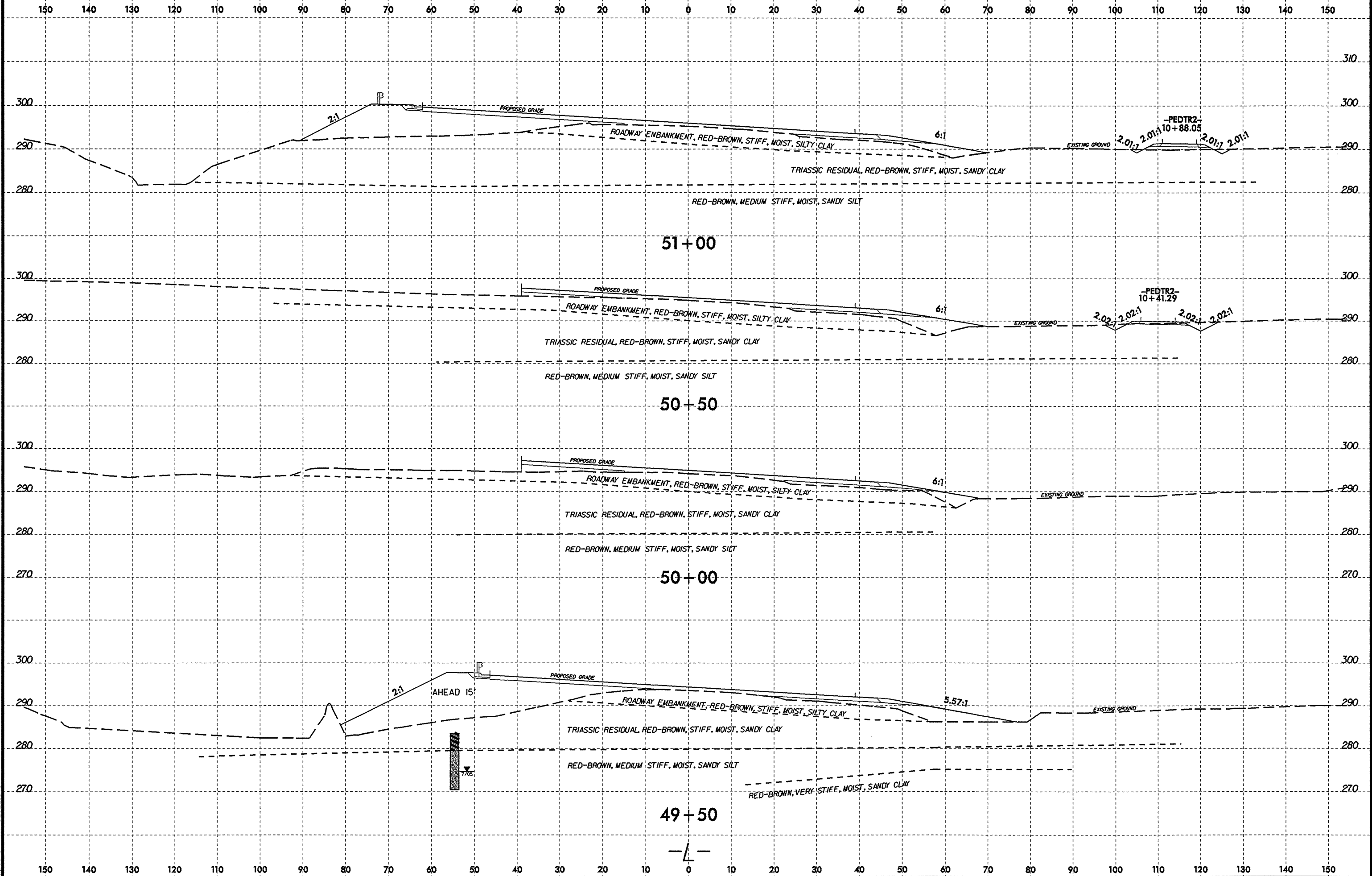
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AGGREGATE CLASS	LL	PL	% BY WEIGHT		% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C SAND	F SAND	NO. 10	NO. 40	NO. 200		
S-13	55' RT	46+15	6.0-2.5	A-2(8)	30	13	3.7	22.6	41.3	32.5	27	96	77
CBR-1	55' RT	46+15	2.5-12.0	A-6(7)	29	11	4.6	24.1	43.1	28.4	68	95	77

S-13
CBR-1

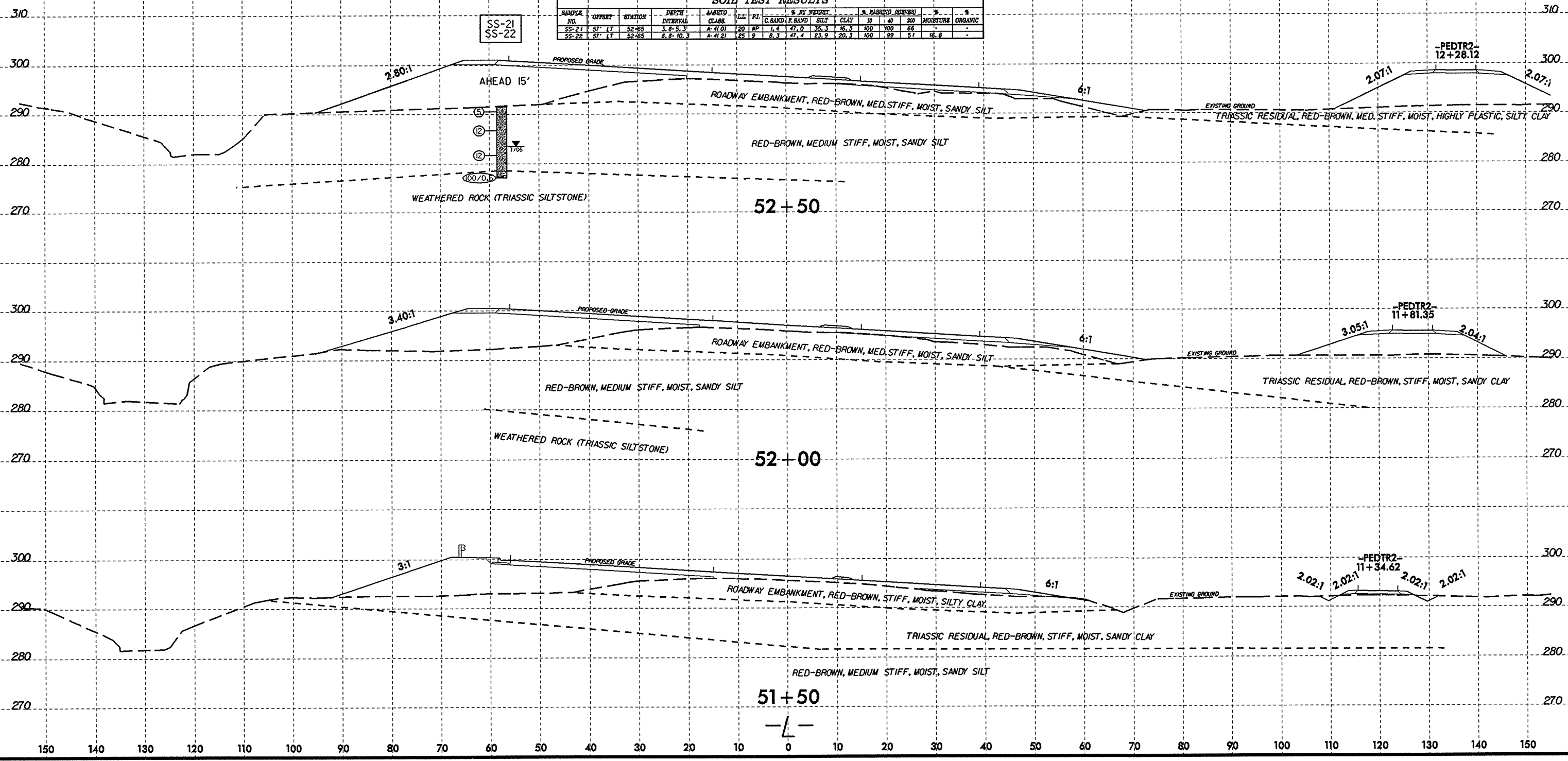
AHEAD 15'

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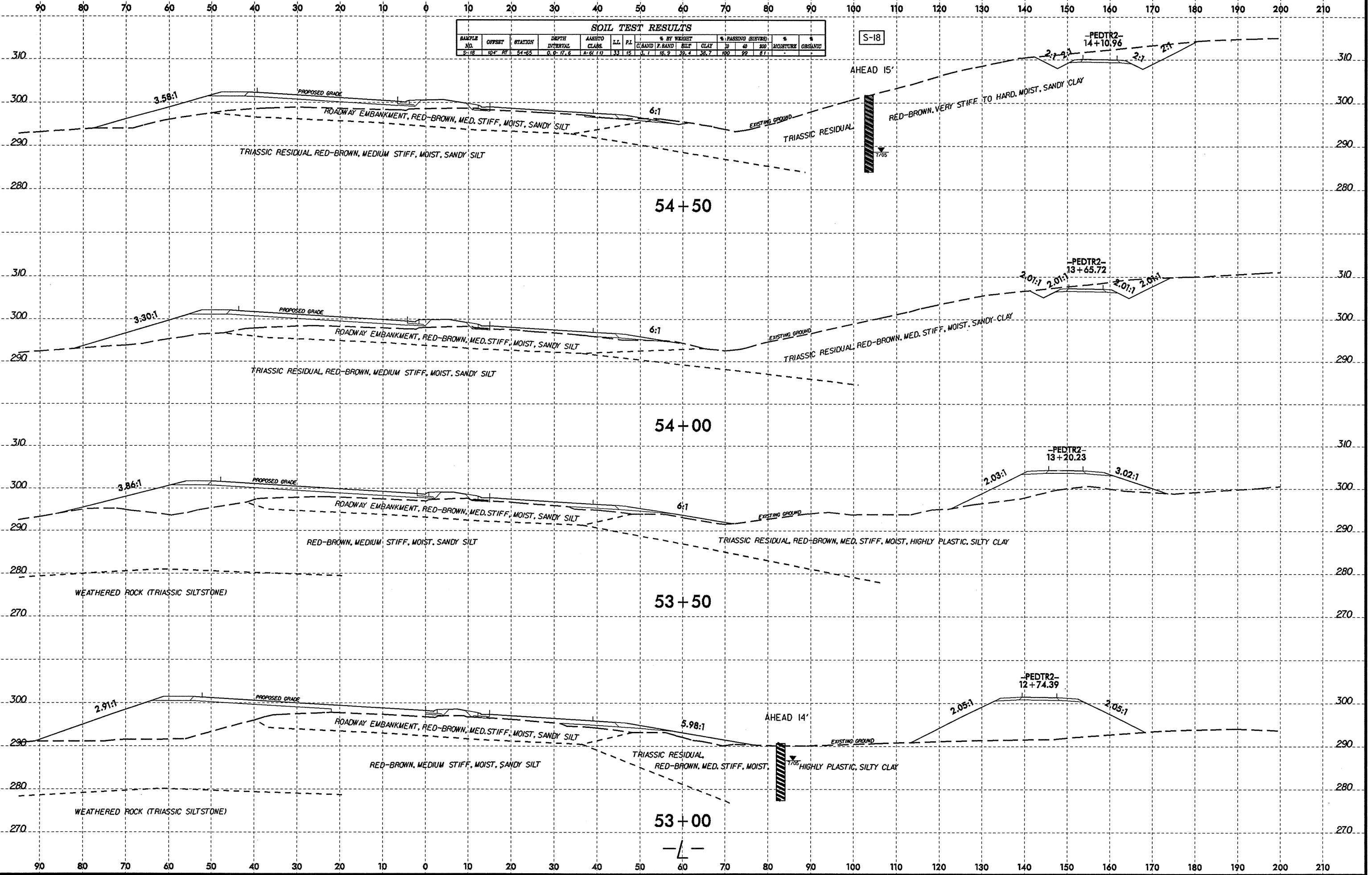
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							C BAND	F BAND	SILT	CLAY	20	40		
SS-21	57'-17"	52+85	3'-6" - 5'-3"	A-4(0)	20	10	1.4	47.0	35.3	16.3	100	100	66	-
SS-22	57'-17"	52+85	6'-6" - 10'-3"	A-4(2)	25	19	6.3	47.4	23.9	20.3	100	92	51	16.8



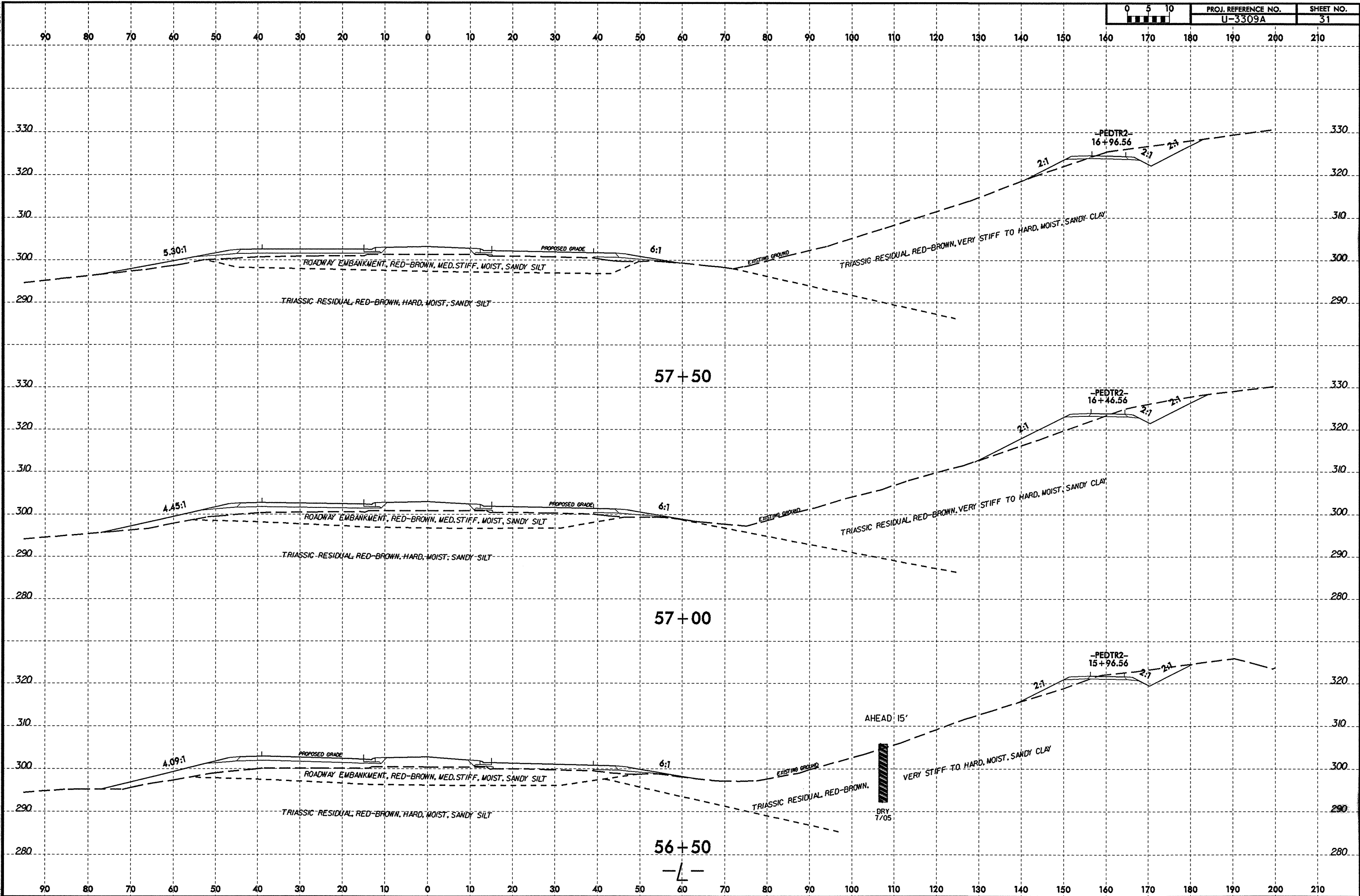
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 11/22/2006
 11/22/2006

SOIL TEST RESULTS														
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	PL	% BY WEIGHT			% PASSING (SIEVES)			% MOISTURE	% ORGANIC
S-18	104'	54+65	0.0-17.6	A-6(1)	33	16	S	1	16.9	39.4	38.7	60	99	41



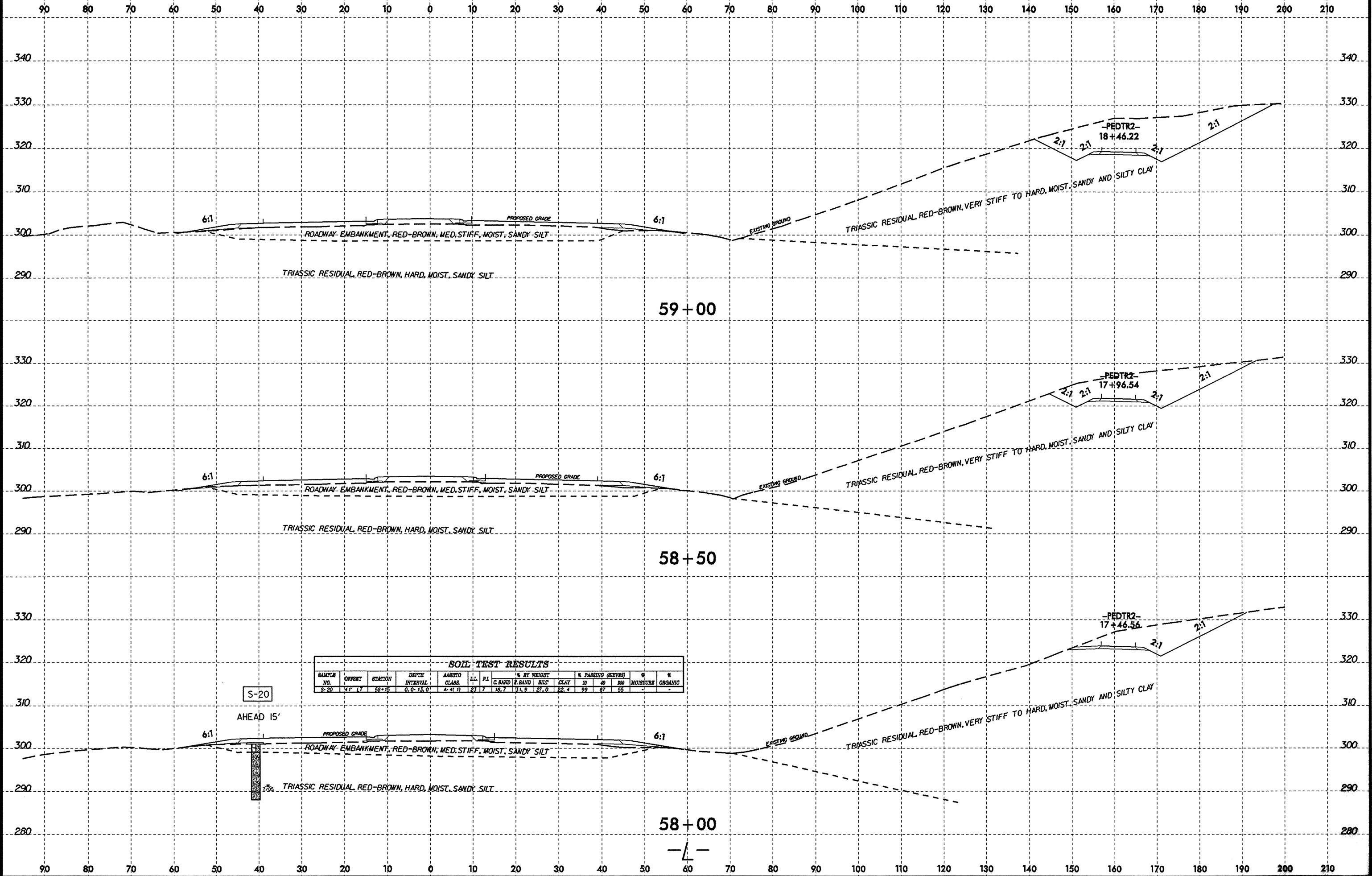
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8/23/99



PROJ. REFERENCE NO. U-3309A SHEET NO. 32



SOIL TEST RESULTS

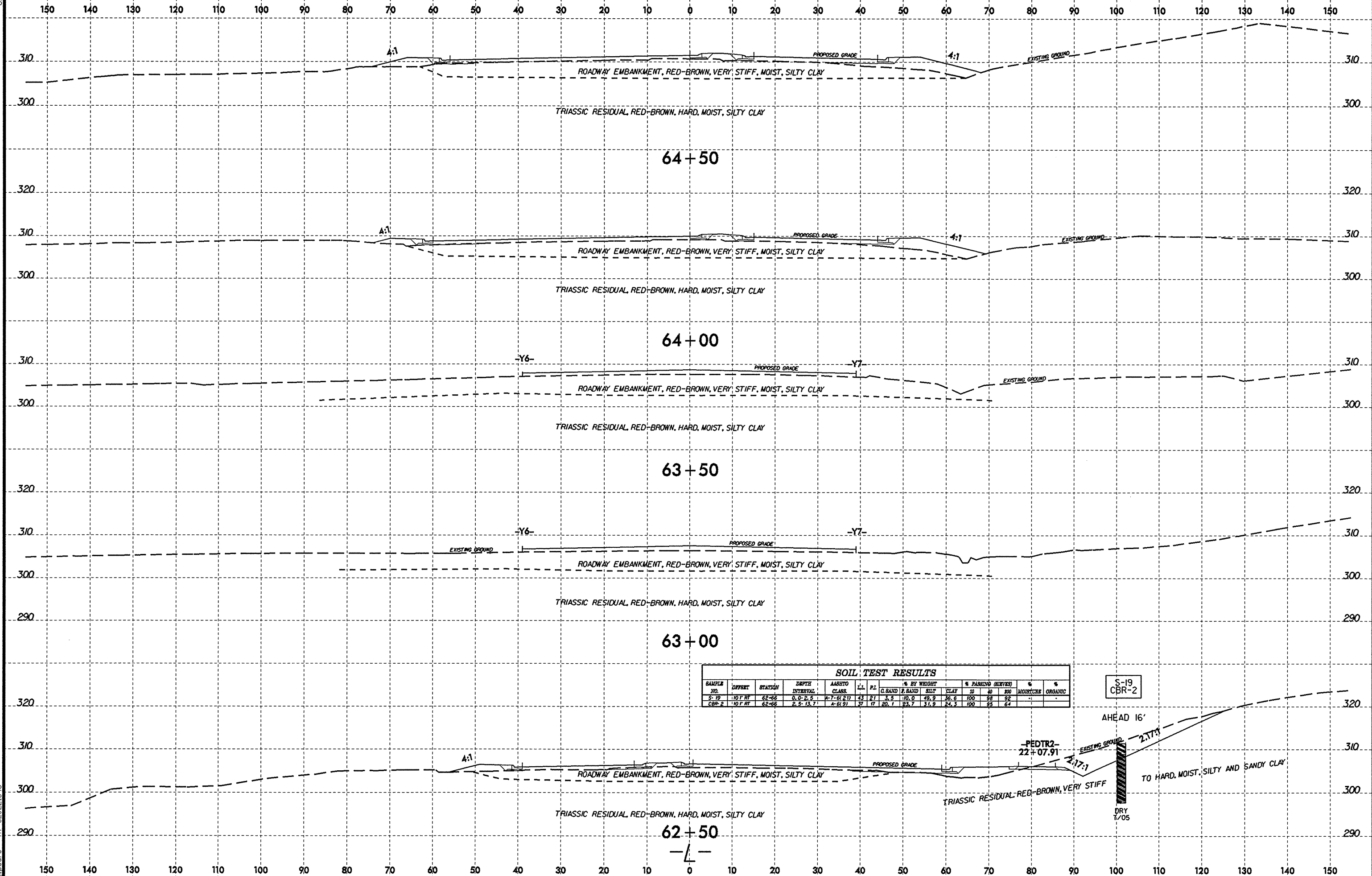
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							C. BAND	F. BAND	SILT	CLAY	30	40	200		
S-20	4' LT	58+15	0.0-13.0	A-4(1)	23.7	16.7	31.9	27.0	22.4	99	87	65	-	-	

S-20

AHEAD 15'

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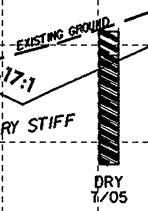


SOIL TEST RESULTS														
SAMPLE NO.	DEPTH	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	PS	% BY WEIGHT			% PASSING (SIZES)			% MOISTURE	% ORGANIC
							C. BAND	F. BAND	SILT	CLAY	10	40		
S-19	10 F RT	62+66	0.0-2.5	A-7-B(21)	43	21	3.5	10.0	49.9	36.6	100	98	92	-
CBR-2	10 F RT	62+66	2.5-13.7	A-6(9)	37	17	20.1	23.7	31.9	24.3	100	95	64	-

S-19
CBR-2

AHEAD 16'

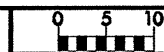
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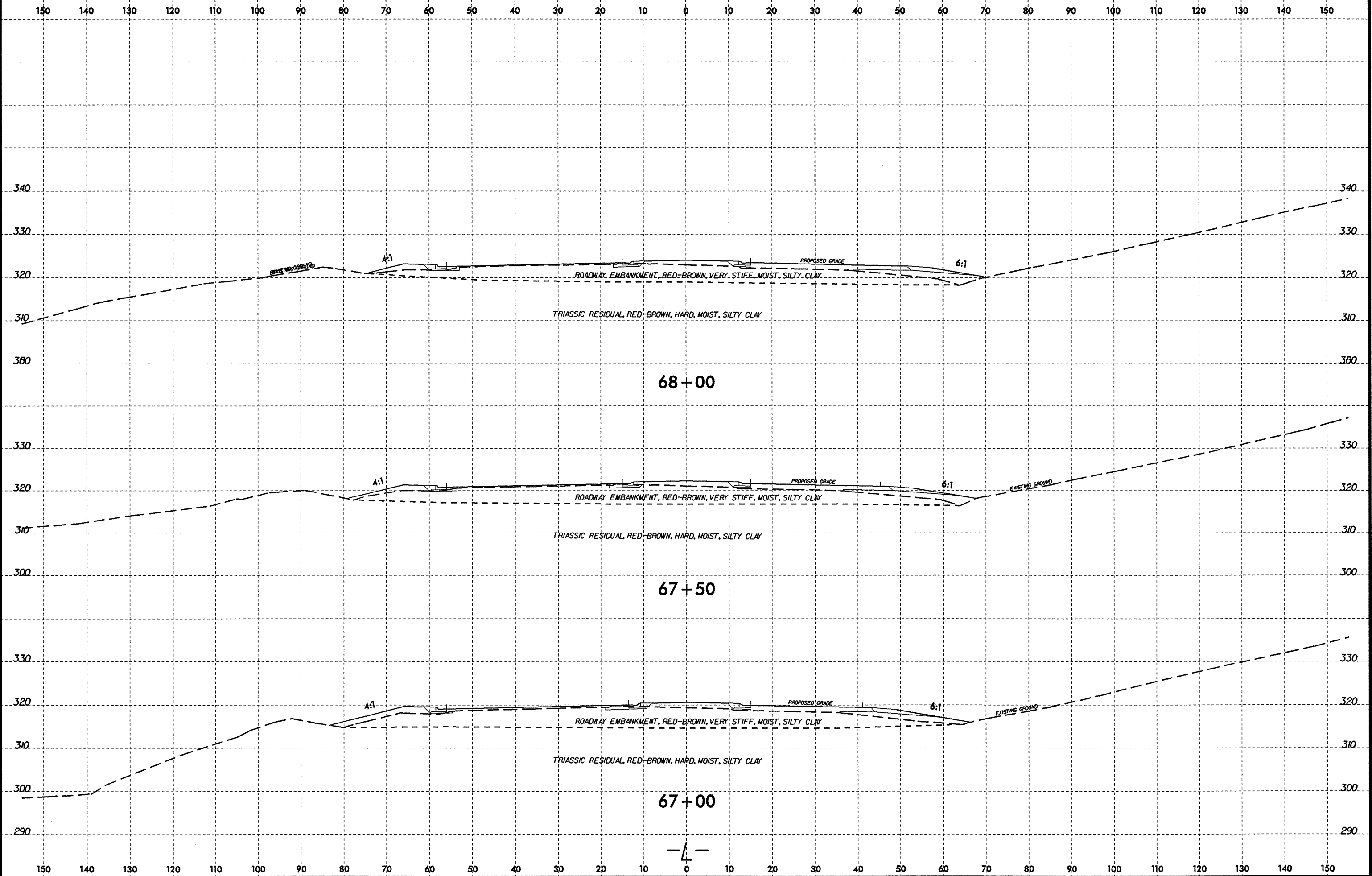
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DRY
T/05

8/23/99

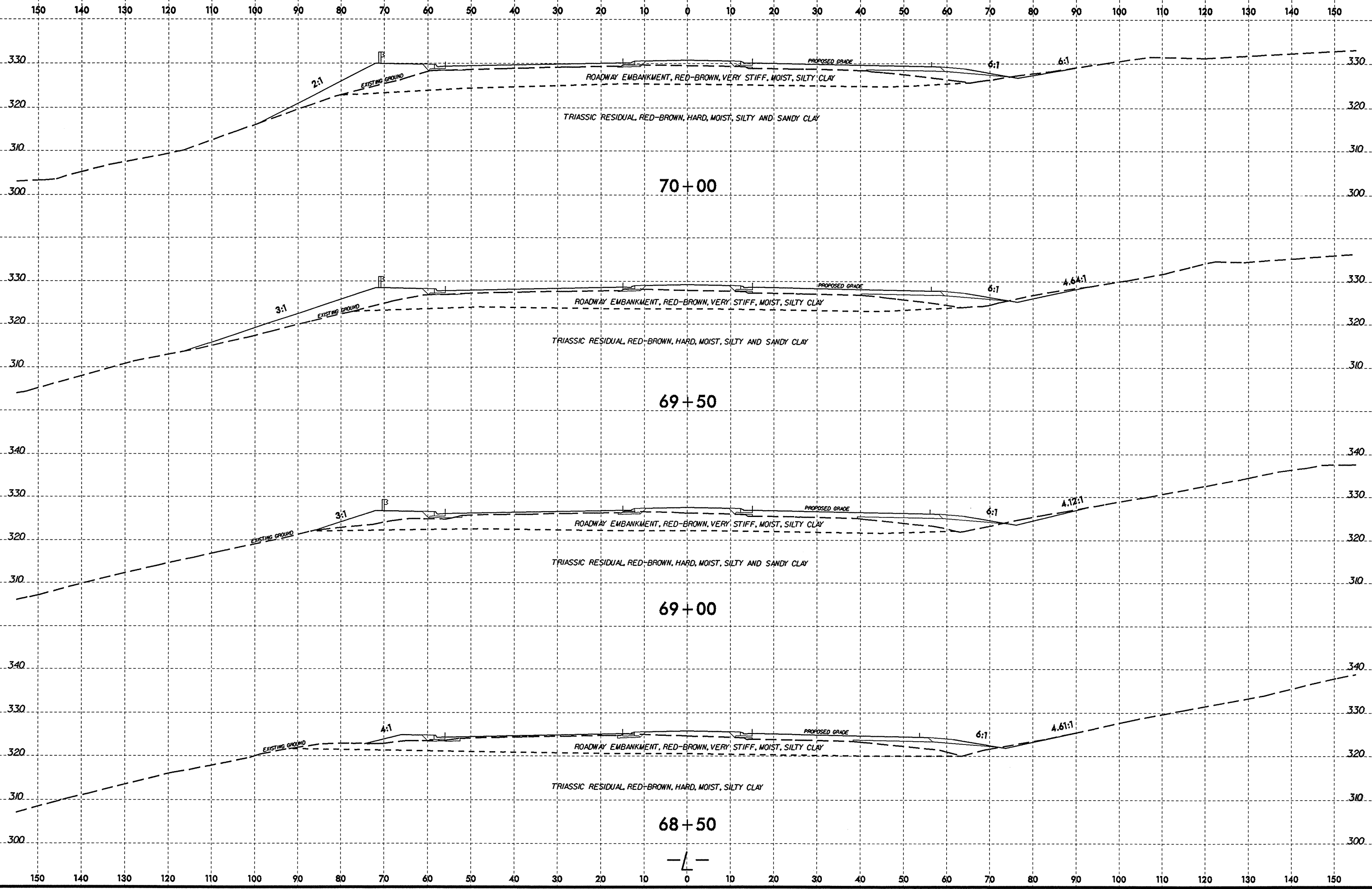


PROJ. REFERENCE NO.	SHEET NO.
U-3309A	37



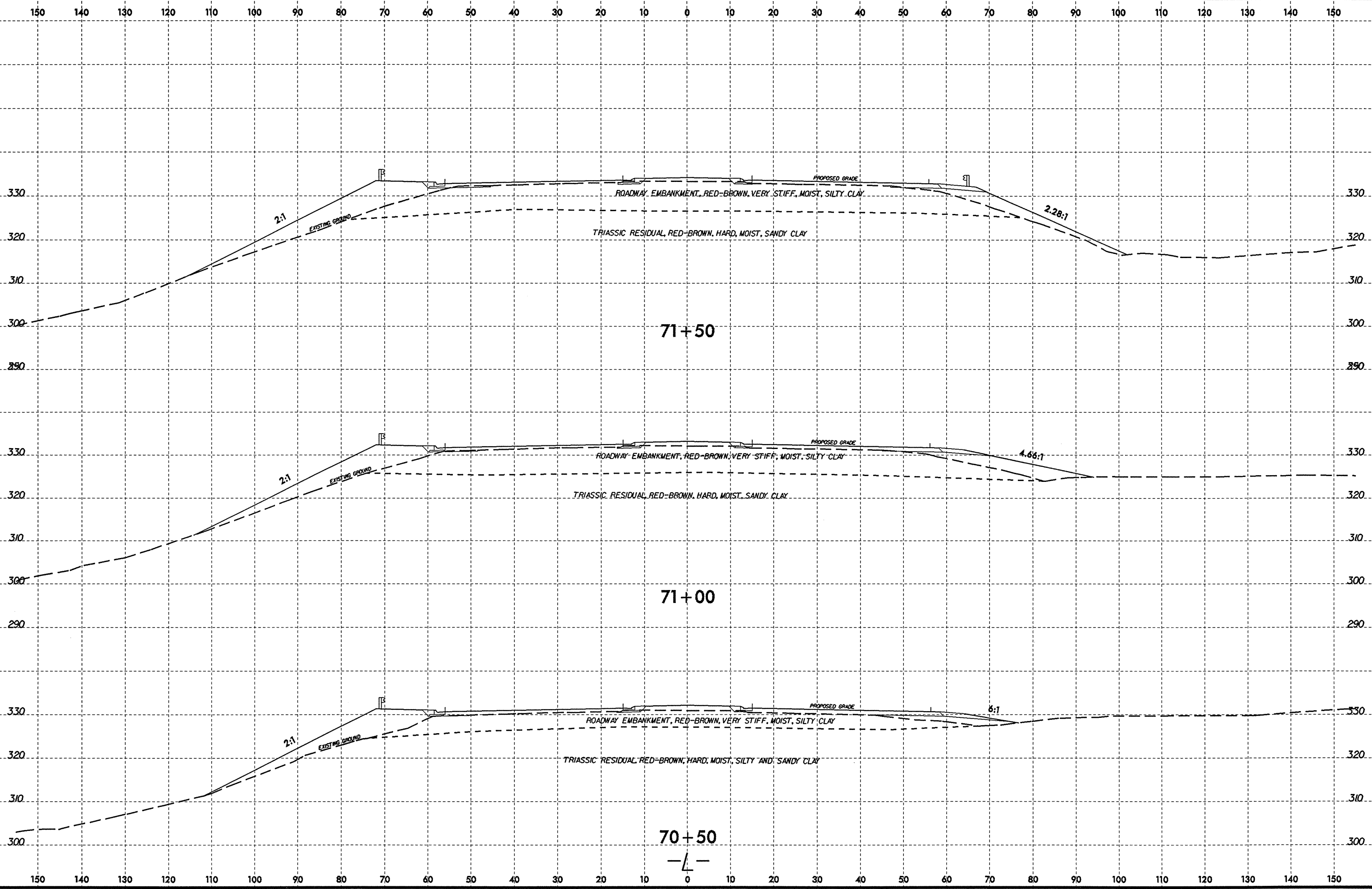
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8/23/99



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8/23/09



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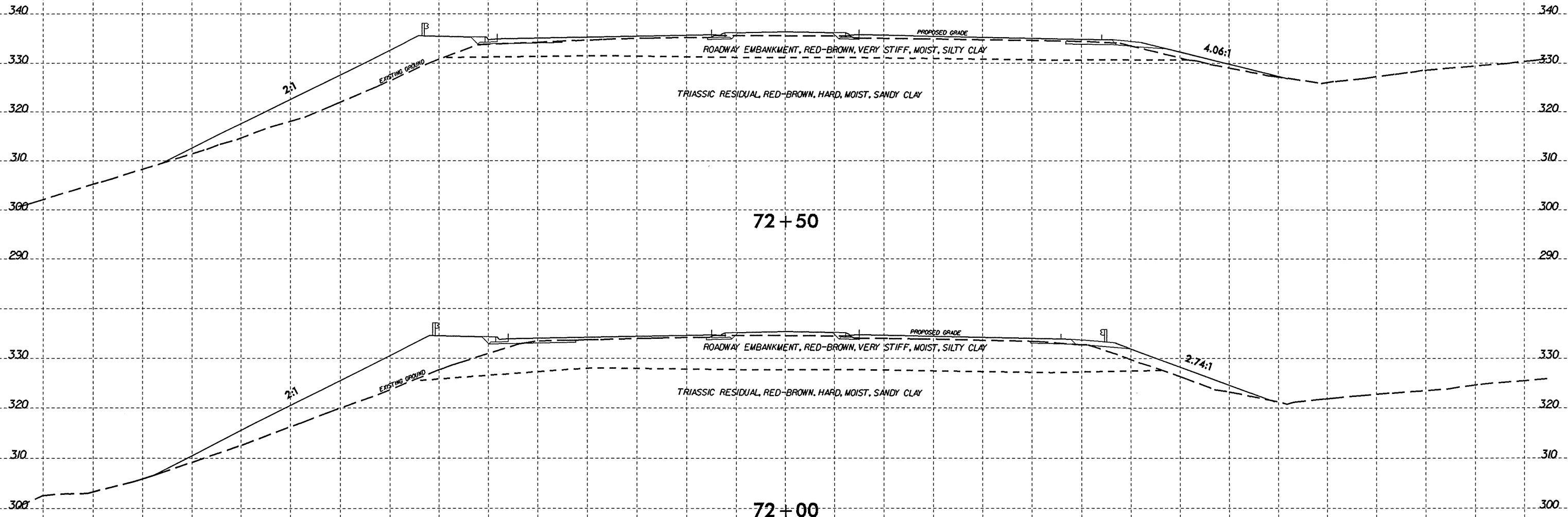
8/23/99



PROJ. REFERENCE NO.
U-3309A

SHEET NO.
40

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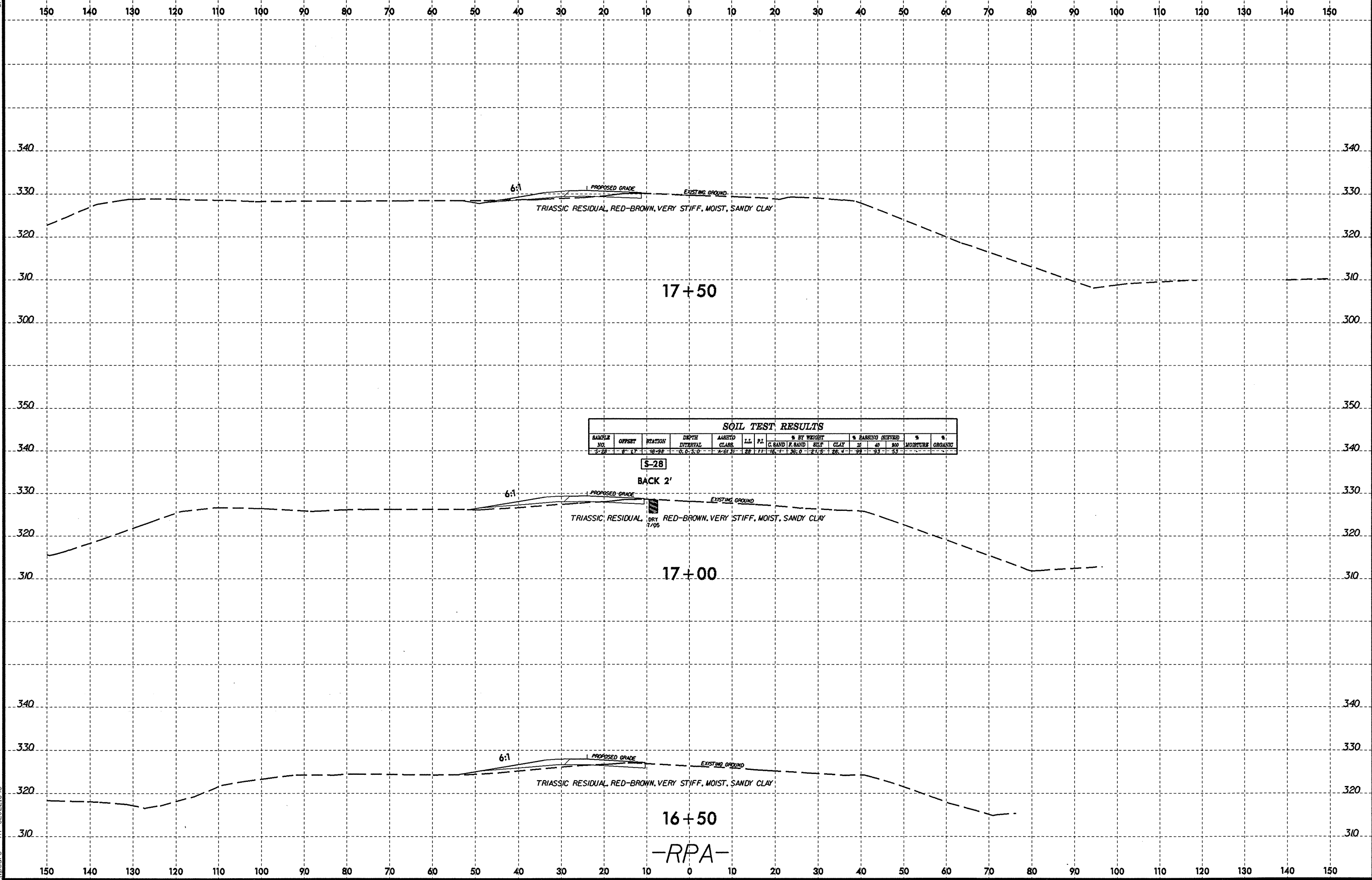


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SOIL TEST RESULTS

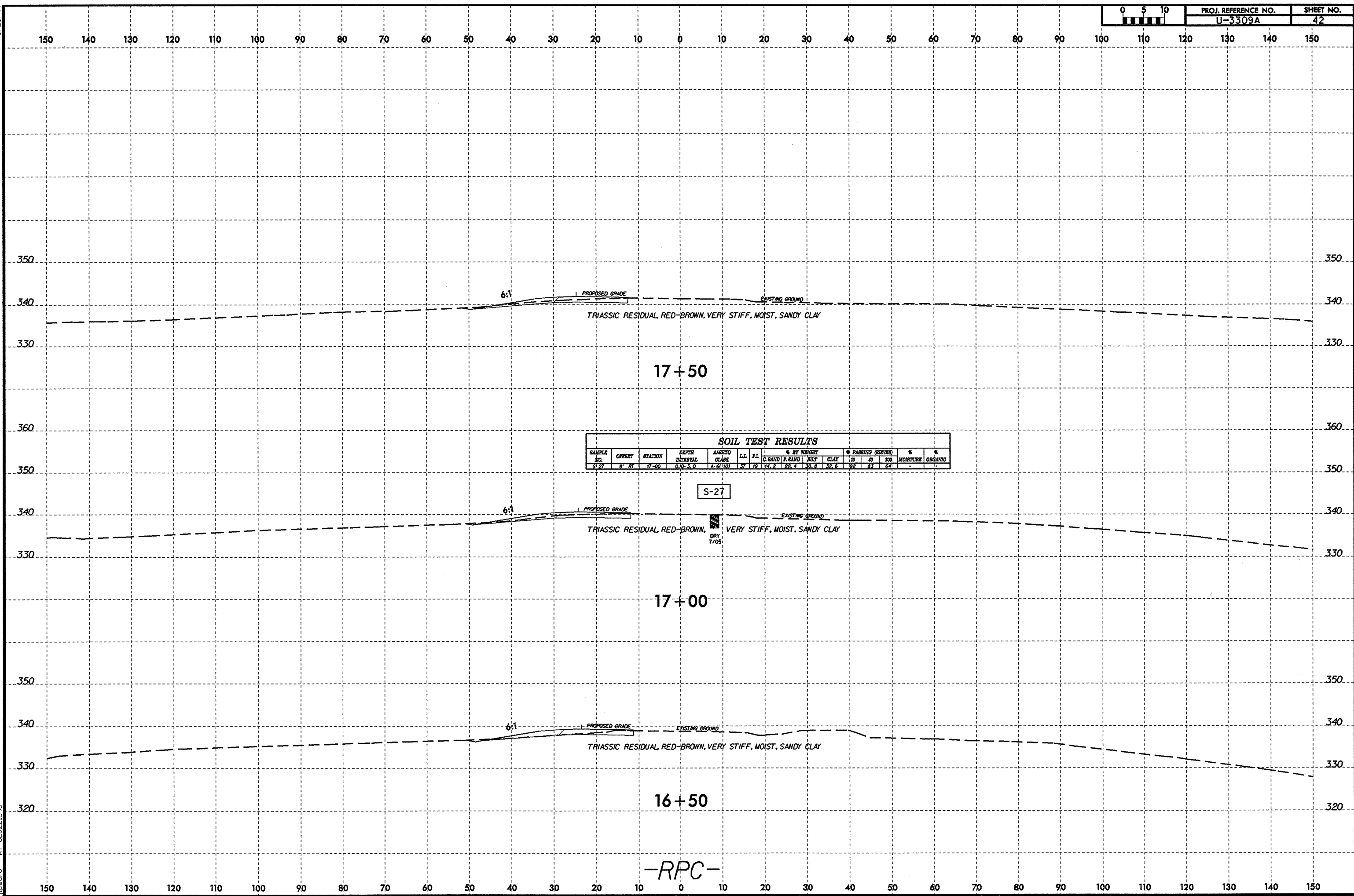
SAMPLER NO.	OFFSET	STATION	DEPTH INTERVAL	SAMPLE CLASS.	LL	PL	% BY WEIGHT				% BASED ON (DRIES)			MOISTURE %	ORGANIC %
							C. SAND	F. SAND	SILT	CLAY	30	40	60		
S-28	8'-17"	16+98	0'-0"-3'-0"	A-6(3)	28	11	16.1	36.0	21.5	26.4	99	93	53		

S-28

BACK 2'

TRIASSIC RESIDUAL, RED-BROWN, VERY STIFF, MOIST, SANDY CLAY
DRY 11/95

8/23/99
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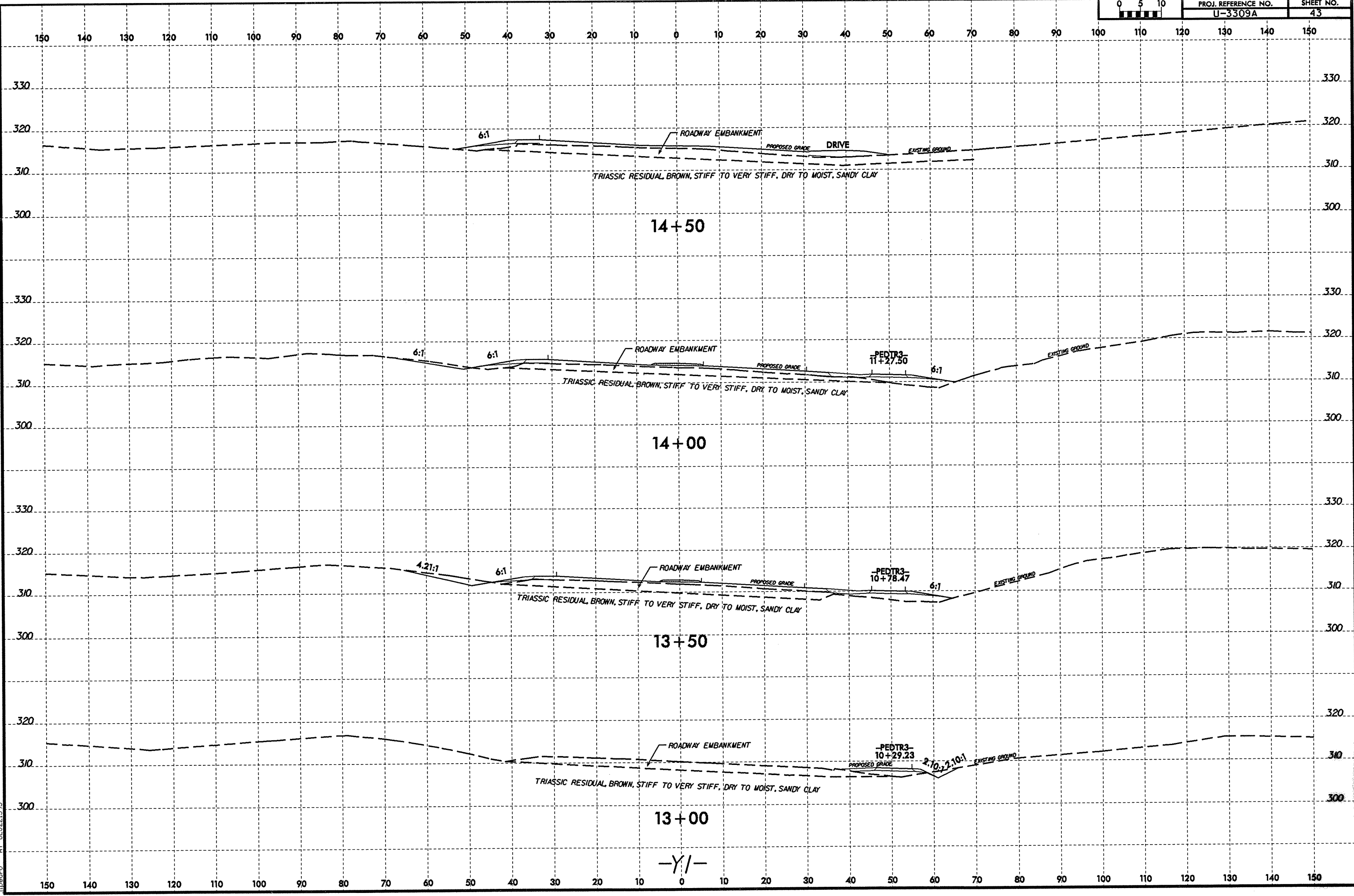
SOIL TEST RESULTS													
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	ASTM CLASS	LL	PI	% BY WEIGHT			% PASSING (SIEVES)		% MOISTURE	% ORGANIC
							G SAND	F SAND	SILT CLAY	# 20	# 40		
S-27	R-RT	17+00	0.0-3.0	A-6(10)	37	19	14.2	22.4	30.8	32.6	83	64	-

S-27

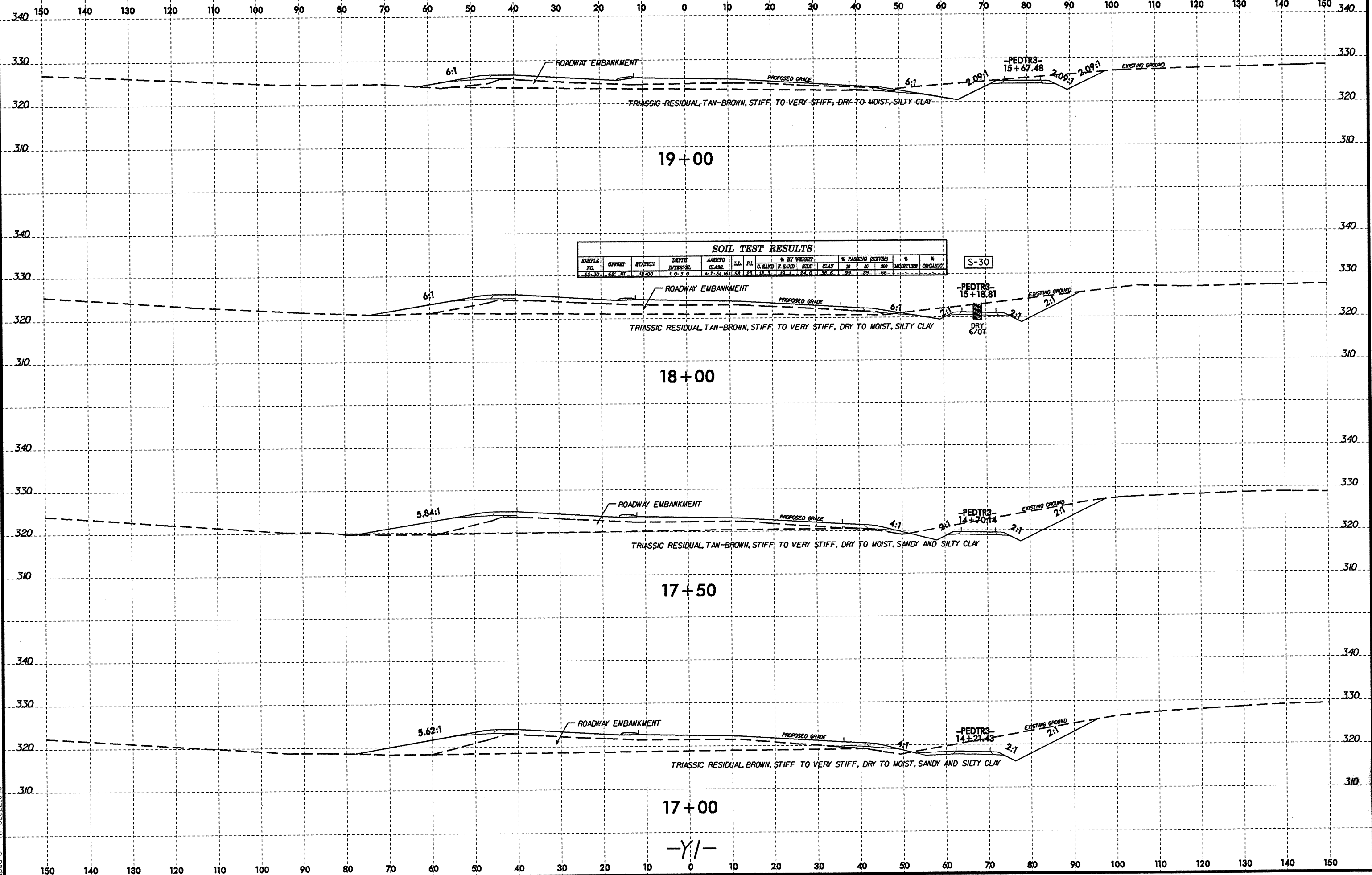
DRY 7/05

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8/23/99
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11/23/98
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8/23/99



SOIL TEST RESULTS														
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	LABORATORY	LL	PL	% BY WEIGHT			% PASSING (NO. 200)			% ORGANIC	
							C. SAND	F. SAND	SILT	CLAY	30	40	MOISTURE	
SS-30	68'	RY	18+00	1.0-3.0	A-7-61	55	25	18.5	78.7	24.0	99	89	1.65	

S-30

PEDTR3
15+67.48

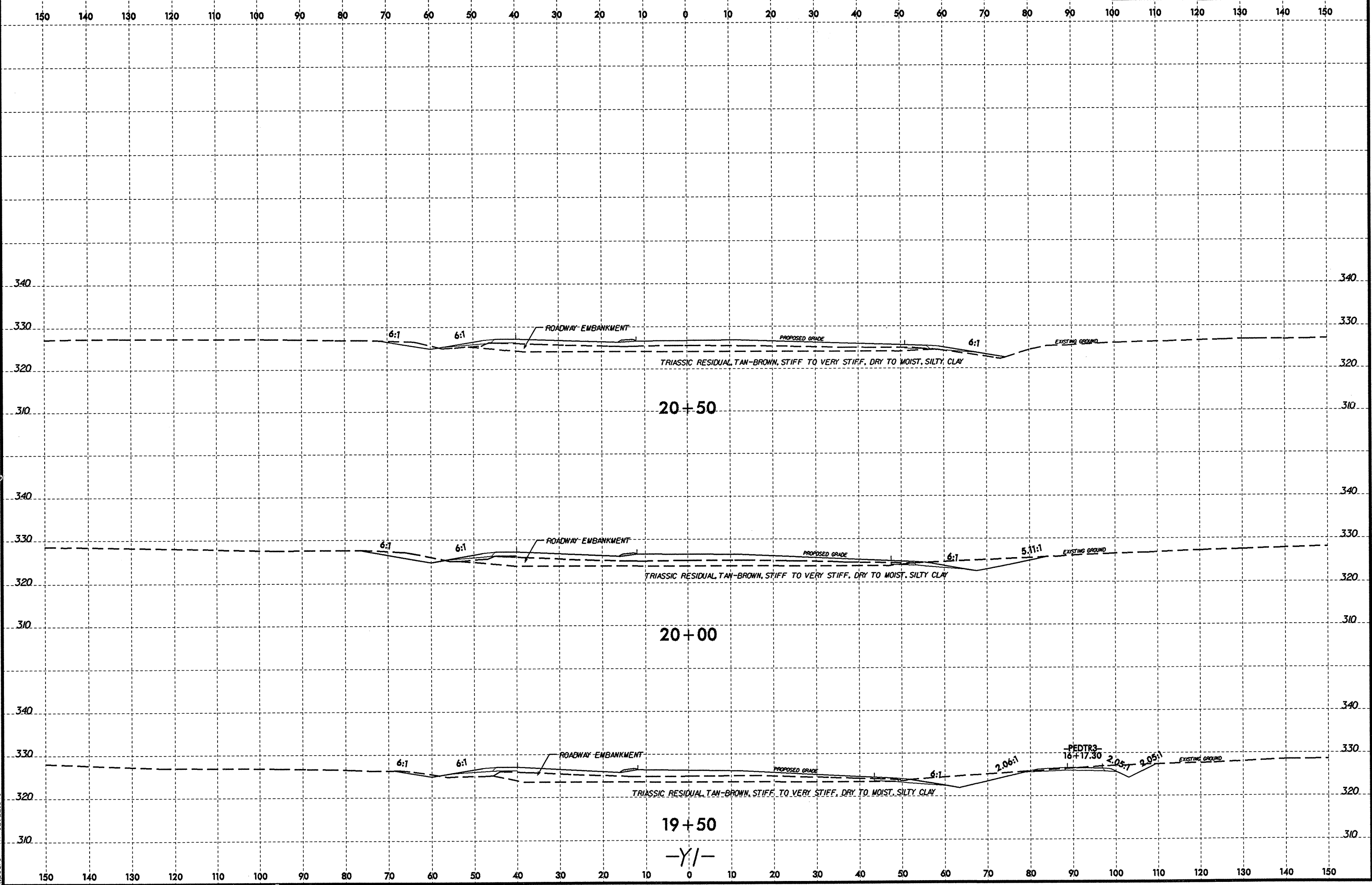
PEDTR3
15+18.81

PEDTR3
14+70.74

PEDTR3
14+21.43

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