

**CONTRACT: C201966 ID: U-3303A**

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

LINE	STATION	PLAN	XSECTS
-L-	10+50 TO 76+00	4-9	10-51
-Y3-	10+50 TO 15+00	4	52
-Y5-	15+50 TO 16+50	5	53
-Y7-	13+50 TO 16+50	6	54
-Y8-	13+50 TO 18+00	6	55-56
-Y10-	11+00 TO 11+50	7	57
-Y11-	12+00 TO 12+50	7	58
-Y12-	12+00 TO 14+00	8	59-60
-Y13-	17+00 TO 17+50	8	61

# STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 GEOTECHNICAL ENGINEERING UNIT

## ROADWAY SUBSURFACE INVESTIGATION

STATE PROJ. 34911.1.1 I.D. U-3303A F.A. PROJ. STP-1306 (8)  
 COUNTY ALAMANCE  
 PROJECT DESCRIPTION BURLINGTON- SR 1306/SR 1363 (MEBANE ST)  
FROM SR 1158 (HUFFMAN MILL RD) TO NC 62

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3303A	1	61
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34911.1.1	STP-1306(8)	P.E.	
34911.2.3	STP-1306(15)	RW	
34911.3.2	STP-1306(15)	CONSTR.	

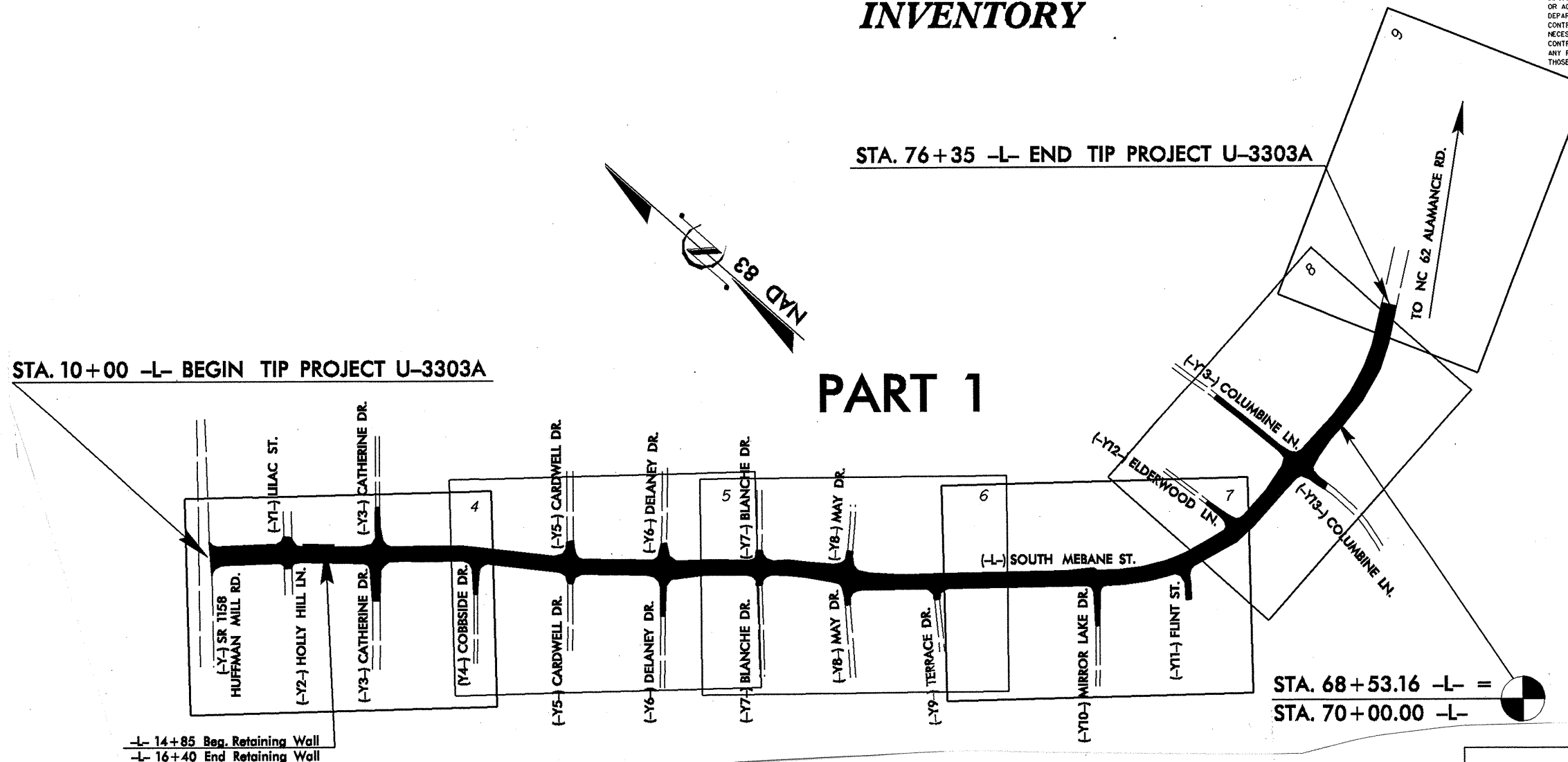
### CAUTION NOTICE

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.

### INVENTORY



### PART 1

#### PERSONNEL

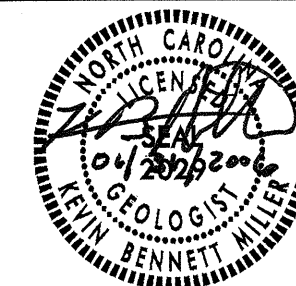
- JLP
- OBO
- HRC
- DWD
- WNC
- MLR
- NDM

INVESTIGATED BY K. B. MILLER  
 CHECKED BY N. T. ROBERSON  
 SUBMITTED BY N. T. ROBERSON  
 DATE JANUARY 2006

DRAWN BY: K. B. MILLER

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

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
U-3303A	34911.1.1	2	61

## SUBSURFACE INVESTIGATION

### SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

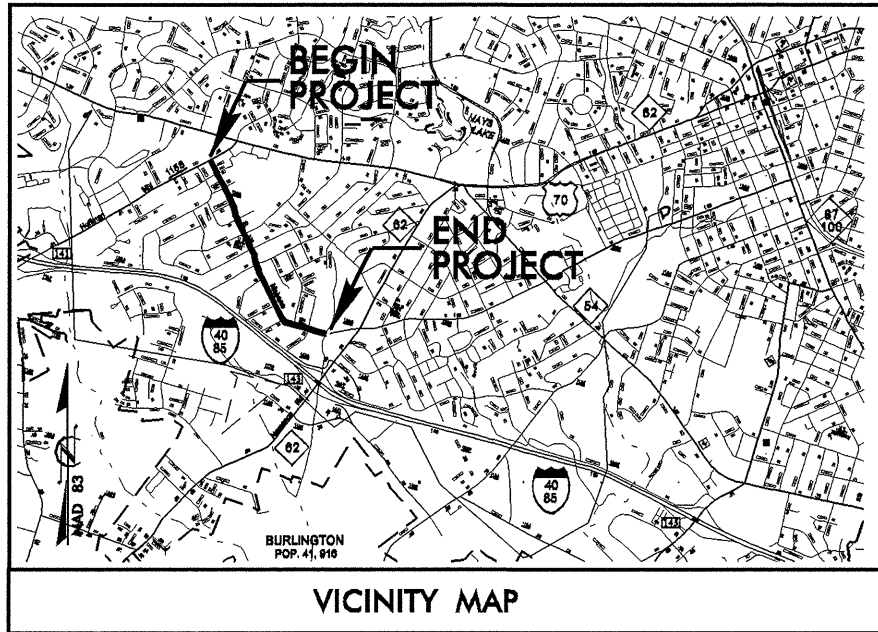
SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS																																																																																																																																																
<p>SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED OR WEATHERED EARTH MATERIALS 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 style="text-align: center;"><i>VERY STIFF, GRAY SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i></p>	<p><b>WELL GRADED</b>- 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><b>GAP-GRADED</b>- 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: <b>ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.</b></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><b>ALLUVIUM (ALLUV.)</b>- SOILS WHICH HAVE BEEN TRANSPORTED BY WATER.</p> <p><b>AQUIFER</b> - A WATER BEARING FORMATION OR STRATA.</p> <p><b>ARENACEOUS</b> - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.</p> <p><b>ARGILLACEOUS</b> - 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><b>ARTESIAN</b> - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.</p> <p><b>CALCAREOUS (CALC.)</b>- SOILS WHICH CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.</p> <p><b>COLLUVIUM</b> - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.</p> <p><b>CORE RECOVERY (REC.)</b>- TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.</p> <p><b>DIKE</b> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.</p> <p><b>DIP</b> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.</p> <p><b>DIP DIRECTION (DIP AZIMUTH)</b>- THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.</p> <p><b>FAULT</b> - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.</p> <p><b>FISSILE</b> - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.</p> <p><b>FLOAT</b> - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.</p> <p><b>FLOOD PLAIN (F.P.)</b>- LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.</p> <p><b>FORMATION (FM.)</b>- A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.</p> <p><b>JOINT</b> - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.</p> <p><b>LEDGE</b> - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.</p> <p><b>LENS</b> - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.</p> <p><b>MOTTLED (MTJ.)</b>- IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.</p> <p><b>PERCHED WATER</b> - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.</p> <p><b>RESIDUAL SOIL</b> - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.</p> <p><b>ROCK QUALITY DESIGNATION (R.Q.D.)</b>- 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><b>SAPROLITE (SAP.)</b>- RESIDUAL SOIL WHICH RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.</p> <p><b>SILL</b> - 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><b>SLICKENSIDE</b> - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.</p> <p><b>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT)</b>- 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><b>STRATA CORE RECOVERY (SREC.)</b>- TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.</p> <p><b>STRATA ROCK QUALITY DESIGNATION (S.R.Q.D.)</b>- 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><b>TOPSOIL (T.S.)</b>- SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>																																																																																																																																																
<p><b>SOIL LEGEND AND AASHTO CLASSIFICATION</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>GENERAL CLASS.</th> <th colspan="4">GRANULAR MATERIALS (&gt;85% PASSING #200)</th> <th colspan="4">SILT-CLAY MATERIALS (&gt;85% PASSING #200)</th> <th colspan="4">ORGANIC MATERIALS</th> </tr> <tr> <td>GROUP CLASS.</td> <td>A-1</td> <td>A-3</td> <td>A-2</td> <td>A-4</td> <td>A-5</td> <td>A-6</td> <td>A-7</td> <td>A-1, A-2</td> <td>A-3</td> <td>A-4, A-5</td> <td>A-6, A-7</td> <td></td> <td></td> </tr> <tr> <td>SYMBOL</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> <td>% PASSING</td> <td>50</td> <td>30</td> <td>10</td> <td>10</td> <td>10</td> <td>10</td> <td>10</td> <td>10</td> <td>10</td> <td>10</td> <td>10</td> <td></td> <td></td> </tr> <tr> <td>LIQUID LIMIT</td> <td>6</td> <td>N.P.</td> <td>40</td> <td>40</td> <td>40</td> <td>40</td> <td>40</td> <td>40</td> <td>40</td> <td>40</td> <td>40</td> <td></td> <td></td> </tr> <tr> <td>PLASTIC INDEX</td> <td>0</td> <td>0</td> <td>0</td> <td>4</td> <td>8</td> <td>12</td> <td>16</td> <td>16</td> <td>16</td> <td>16</td> <td>16</td> <td></td> <td></td> </tr> <tr> <td>GROUP INDEX</td> <td>0</td> <td>0</td> <td>0</td> <td>4</td> <td>8</td> <td>12</td> <td>16</td> <td>16</td> <td>16</td> <td>16</td> <td>16</td> <td></td> <td></td> </tr> <tr> <td>USUAL TYPES OF MAJOR MATERIALS</td> <td>STONE FRAGS. GRAVEL AND SAND</td> <td>FINE SAND</td> <td>SILTY OR CLAYEY GRAVEL AND SAND</td> <td>SILTY SOILS</td> <td>CLAYEY SOILS</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>GENERATING AS A SUBGRADE</td> <td colspan="4">EXCELLENT TO GOOD</td> <td colspan="4">FAIR TO POOR</td> <td>FAIR TO POOR</td> <td>POOR</td> <td>UNSATURABLE</td> <td></td> <td></td> </tr> </table> <p style="text-align: center;">P.I. OF A-7-5 ≤ L.L. - 30 ; P.I. OF A-7-6 &gt; L.L. - 30</p>	GENERAL CLASS.	GRANULAR MATERIALS (>85% PASSING #200)				SILT-CLAY MATERIALS (>85% PASSING #200)				ORGANIC MATERIALS				GROUP CLASS.	A-1	A-3	A-2	A-4	A-5	A-6	A-7	A-1, A-2	A-3	A-4, A-5	A-6, A-7			SYMBOL														% PASSING	50	30	10	10	10	10	10	10	10	10	10			LIQUID LIMIT	6	N.P.	40	40	40	40	40	40	40	40	40			PLASTIC INDEX	0	0	0	4	8	12	16	16	16	16	16			GROUP INDEX	0	0	0	4	8	12	16	16	16	16	16			USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL AND SAND	FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND	SILTY SOILS	CLAYEY SOILS									GENERATING AS A SUBGRADE	EXCELLENT TO GOOD				FAIR TO POOR				FAIR TO POOR	POOR	UNSATURABLE			<p><b>MINERALOGICAL COMPOSITION</b></p> <p>MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.</p> <p><b>COMPRESSIBILITY</b></p> <p>SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 30 MODERATELY COMPRESSIBLE LIQUID LIMIT 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50</p> <p><b>PERCENTAGE OF MATERIAL</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>ORGANIC MATERIAL</th> <th>GRANULAR SOILS</th> <th>SILT-CLAY SOILS</th> <th>OTHER MATERIAL</th> </tr> <tr> <td>TRACE OF ORGANIC MATTER</td> <td>2 - 3%</td> <td>3 - 5%</td> <td>TRACE 1 - 10%</td> </tr> <tr> <td>LITTLE ORGANIC MATTER</td> <td>3 - 5%</td> <td>5 - 12%</td> <td>LITTLE 10 - 20%</td> </tr> <tr> <td>MODERATELY ORGANIC</td> <td>5 - 10%</td> <td>12 - 20%</td> <td>SOME 20 - 35%</td> </tr> <tr> <td>HIGHLY ORGANIC</td> <td>&gt;10%</td> <td>&gt;20%</td> <td>HIGHLY 35% AND ABOVE</td> </tr> </table> <p><b>GROUND WATER</b></p> <p> WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING.</p> <p> STATIC WATER LEVEL AFTER 24 HOURS.</p> <p> PERCHED WATER, SATURATED ZONE OR WATER BEARING STRATA</p> <p> SPRING OR SEEPAGE</p>	ORGANIC MATERIAL	GRANULAR SOILS	SILT-CLAY SOILS	OTHER MATERIAL	TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE 1 - 10%	LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE 10 - 20%	MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME 20 - 35%	HIGHLY ORGANIC	>10%	>20%	HIGHLY 35% AND ABOVE	<p><b>WEATHERING</b></p> <p>FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE.</p> <p>VERY SLIGHT (V. SLI.) 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 (SLI.) 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 &gt; 100 BPF</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 &lt; 100 BPF</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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See Sheet 1-A For Index of Sheets

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**ALAMANCE COUNTY**

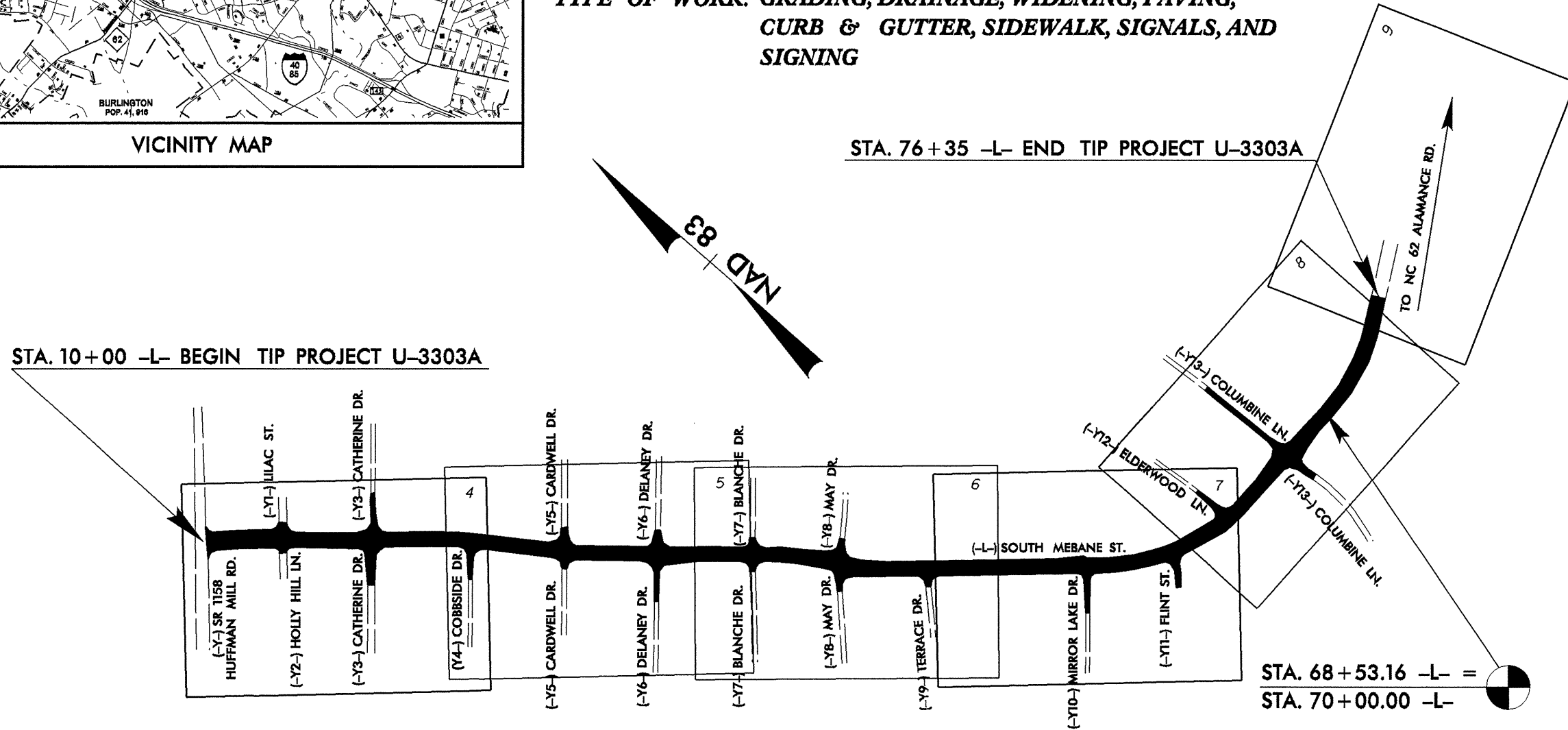
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3303A	2A	61
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34911.1.1	STP-1306(15)	P.E., RW	



**LOCATION: BURLINGTON - SR 1306 (SOUTH MEBANE ST.)  
FROM SR 1158 (HUFFMAN MILL RD.)  
TO NC 62 (ALAMANCE RD.)**

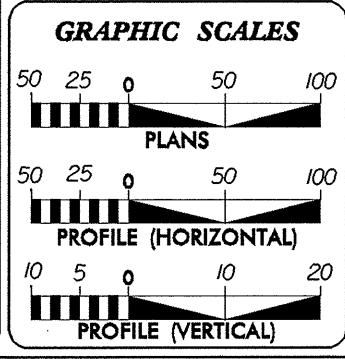
**TYPE OF WORK: GRADING, DRAINAGE, WIDENING, PAVING,  
CURB & GUTTER, SIDEWALK, SIGNALS, AND  
SIGNING**

STA. 76+35 -L- END TIP PROJECT U-3303A



CLEARING NOTE METHOD II .  
THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF BURLINGTON.

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



**DESIGN DATA**

ADT 2005 =	21,175
ADT 2025 =	33,100
DHV =	10 %
D =	55 %
T =	3 % *
V =	40 MPH
* TTST 2%	DUAL 1%

**PROJECT LENGTH**

LENGTH ROADWAY F.A.PROJECT STP-1306(8) =	1.26 MI
TOTAL LENGTH STATE PROJECT 34911JJ =	1.26 MI

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

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:  
APRIL 21, 2006

LETTING DATE:  
JANRUARY 15, 2008

**JIMMY GOODNIGHT**  
PROJECT ENGINEER

**TIM GOINS**  
PROJECT DESIGN ENGINEER

**HYDRAULICS ENGINEER**

SIGNATURE: \_\_\_\_\_ P.E.

**ROADWAY DESIGN ENGINEER**

SIGNATURE: \_\_\_\_\_ P.E.

**DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA**

STATE DESIGN ENGINEER \_\_\_\_\_ P.E.

**DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION**

APPROVED \_\_\_\_\_ DATE \_\_\_\_\_  
DIVISION ADMINISTRATOR

PROJECT: 34911.1.1 TIP PROJ: U-3303A  
 26-JAN-2006 19:06 L:\ERO\Role\Investigation\TIP\U3303A.GEO.RD\WY\CADD.GEOTECH\Geotech\U3303a-geo\_r.dwy\_inv\_title sheet & legend.dgn  
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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 Tippet  
SECRETARY

January 31, 2006

STATE PROJECT: 34911.1.1 (U-3303A)  
FEDERAL PROJECT: STP-1306(8)  
COUNTY: Alamance  
DESCRIPTION: Burlington– SR 1306 (Mebane St) from SR 1158 (Huffman Mill Rd) to NC 62  
SUBJECT: Geotechnical Report – Inventory

**Project Description**

This project consists of the widening of existing Mebane St. (SR 1306, –L– Sta. 10+00 to 76+35) from two lanes to four lanes with medians, turn lanes, curb and gutter and sidewalks. The widening is generally symmetrical along the existing roadway except for a section from –L– Sta. 55+00± to 62+00± where the alignment shifts left onto new location.

The geotechnical field investigation was conducted from September to December 2005 by NCDOT field personnel. An ATV-mounted CME-550 drill machine with an automatic hammer, a hand auger and a Dynamic Cone Penetrometer (DCP) were used during the investigation. Standard Penetration Tests were advanced using hollow stem augers at select locations. Additional borings along the alignment were advanced with continuous flight augers or hand auger. DCP tests were performed in areas where proposed subgrade was at or near the natural ground surface and results will be reported in the Pavement Design Investigation. Representative soil samples were collected for visual classification in the field and for laboratory analysis by the Materials and Tests Unit.

The following alignments, totaling 1.6 miles, were investigated. Subsurface cross-sections, of these alignments are included in this report.

Line	Station (±)
–L–	10+00 to 76+35
–Y3–	10+42 to 15+04
–Y5–	14+94 to 16+50
–Y7–	13+23 to 16+93
–Y8–	13+50 to 18+42
–Y10–	10+34 to 11+73

–Y11–	10+34 to 12+52
–Y12–	11+96 to 14+16
–Y13–	15+55 to 17+66

**Areas of Special Geotechnical Interest**

- 1) Highly Plastic Clay Soils: Intervals containing highly plastic clay soils (plasticity indices of greater than 25) are noted below:

Line	Station (±)
–L–	10+30 to 26+75
–L–	27+75 to 43+75
–L–	46+25 to 66+25
–Y3–	10+42 to 15+04
–Y5–	14+94 to 16+50
–Y7–	13+23 to 16+93
–Y8–	13+50 to 15+25
–Y10–	10+75 to 11+73
–Y11–	11+75 to 12+52
–Y12–	11+96 to 14+16
–Y13–	16+75 to 17+66

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

- 2) Crystalline Rock: Crystalline rock was encountered in a boring at –L– Sta. 72+50/60’ LT.

**Physiography and Geology**

The project is located in the Piedmont area of North Carolina. The project corridor is primarily composed of single family homes and wooded lots. However, there are some businesses located at either end of the project limits. The topography of the area is generally gently rolling. Geologically, the project is located within the Carolina Slate Belt. Soils are derived from the weathering of the underlying bedrock that is composed of metamorphosed granitic and diorite intrusions and mafic volcanic rocks. Locally, these rock units are typically weakly foliated and trend in a northeasterly direction.

**Soil Properties**

Roadway Embankment Soils: Existing roadway embankments are generally three to five feet in height. Embankment soils encountered consist mostly of moist, stiff, sandy clay (A-6) and moist, stiff, sandy silty clay (A-7-6). One occurrence of dry, loose, sand (A-2-4) was noted near the end of the project at –L– Sta. 76+00/15’ RT.

Alluvial Soils: Alluvial soil was encountered in one boring at –L– Sta. 72+50/60’ LT. The alluvial soil consists of approximately 8 feet of moist to saturated, very soft to medium stiff, sandy silt (A-4). The alluvial soil occurs along a narrow stream that crosses under the existing alignment via two 36” concrete pipes.

Residual Soils: Residual soils along the project corridor are derived from in-situ weathering of the underlying bedrock. The majority of the residual soils are highly plastic, moist, medium stiff to stiff, silty clay (A-7-5, A-7-6) and sandy clay (A-6). Minor amounts of moist, medium stiff to very stiff, sandy silt (A-4) are also present.

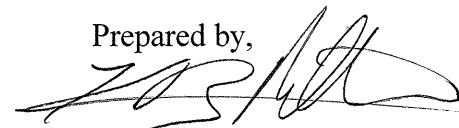
**Rock Properties**

Weathered rock and/or crystalline rock were encountered in three borings along the project. The weathered rock is derived from the underlying Carolina Slate Belt bedrock. The weathered rock occurs at depths ranging from twelve to thirteen feet, and consists of metamorphosed granite and diorite. Crystalline meta-diorite bedrock was encountered in a boring at -L- Sta. 72+50/60' LT at a depth of eight feet.

**Groundwater**

Due in part to unusually dry conditions at the time of the investigation, groundwater was only encountered in four borings. At -L- Sta. 41+00/30' LT groundwater was noted around elevation 627', approximately 5 feet below the ground surface. Groundwater was measured near elevation 620', 5 feet below natural ground at -L- Sta. 43+00/30' LT. At -L- Sta. 67+00/30' LT groundwater was encountered at elevation 615', nearly 3.5 feet below natural ground. Groundwater was measured at elevation 606', 1.5 feet below the ground surface at -L- Sta. 72+50/60' LT. These borings were located adjacent to low lying areas or small streams.

Prepared by,



Kevin B. Miller, LG  
Project Geologist

# EARTHWORK BALANCE SHEET

Volumes in Cubic Yards

PROJECT TIP # U-3303A

COUNTY Alamance

DATE 12/1/2008

SHEET \_\_\_ OF \_\_\_ SHEETS

LINE	STATION	STATION	TOTAL EXCAV. (UNCL.)	ROCK EXCAV.	UNDERCUT EXCAV.	UNSUIT. EXCAV.	SUITABLE EXCAV.	TOTAL EMB.	UNDERCUT EMB.	EARTH EMB.	EMBANK. 20%	BORROW	SUITABLE WASTE	UNSUIT. WASTE	TOTAL WASTE
L	10+00.00LT	40+00.00LT	3329	0	1272	1430	1899	4702	1272	3430	5642	3743	0	2702	2702
Y1	13+40.00	14+54.83	42	0	0	0	42	288	0	288	346	304	0	0	0
Y3	10+41.95	13+07.00	493	0	0	0	493	18	0	18	22	0	471	0	471
Y7	13+23.17	14+73.25	207	0	0	0	207	49	0	49	59	0	148	0	148
<b>SUBTOTAL SUMMARY NO. 1</b>			4071		1272	1430	2641	5057	1272	3785	6069	4047	619	2702	3321
L	40+50.00 LT	70+50.00LT	3422	0	1496	1463	1959	5042	1496	3546	6050	4091	0	2959	2959
Y8	13+50.00	15+39.99	335	0	0	0	335	21	0	21	25	0	310	0	310
Y12	11+96.33	14+16.33	1438	0	0	0	1438	1	0	1	1	0	1437	0	1437
<b>SUBTOTAL SUMMARY NO. 2</b>			5195		1496	1463	3732	5064	1496	3568	6076	4091	1747	2959	4706
L	71+00.00LT	76+00.00LT	357	0	0	0	357	611	0	611	733	376	0	0	0
<b>SUBTOTAL SUMMARY NO. 3</b>			357	0	0	0	357	611	0	611	733	376	0	0	0
L	10+00.00RT	40+00.00RT	3224	0	1594	1892	1332	4124	1594	2530	4949	3617	0	3486	3486
Y3	14+50	15+03.98	492	0	0	0	492	6	0	6	7	0	485	0	485
Y5	14+93.77	16+50.43	344	0	0	0	344	7	0	7	8	0	336	0	336
Y7	15+41.26	16+92.60	323	0	0	0	323	36	0	36	43	0	280	0	280
<b>SUBTOTAL SUMMARY NO. 4</b>			4383		1594	1892	2491	4173	1594	2579	5007	3617	1101	3486	4587
L	40+50.00RT	70+50.00RT	1588	0	869	822	766	8333	869	7464	10000	9234	0	1691	1691
Y8	16+08.39	18+41.90	592	0	0	0	592	31	0	31	37	0	555	0	555
Y9	10+34.10	11+88.90	160	0	0	0	160	87	0	87	104	0	56	0	56
Y10	10+34.00	11+73.00	314	0	0	0	314	7	0	7	8	0	306	0	306
Y11	10+34.04	12+52.17	442	0	0	0	442	5	0	5	6	0	436	0	436
Y13	15+54.92	17+66.13	295	0	0	0	295	64	0	64	77	0	218	0	218
<b>SUBTOTAL SUMMARY NO. 5</b>			3391		869	822	2569	8527	869	7658	10232	9234	1571	1691	3262
L	71+00.00RT	76+00.00RT	342	0	0	0	342	905	0	905	1086	744	0	0	0
<b>SUBTOTAL SUMMARY NO. 6</b>			342	0	0	0	342	905	0	905	1086	744	0	0	0
<b>PROJECT SUBTOTAL</b>			17739	0	5231	5607	12132	24337	5231	19106	29203	22109	5038	10838	15876

\* 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.







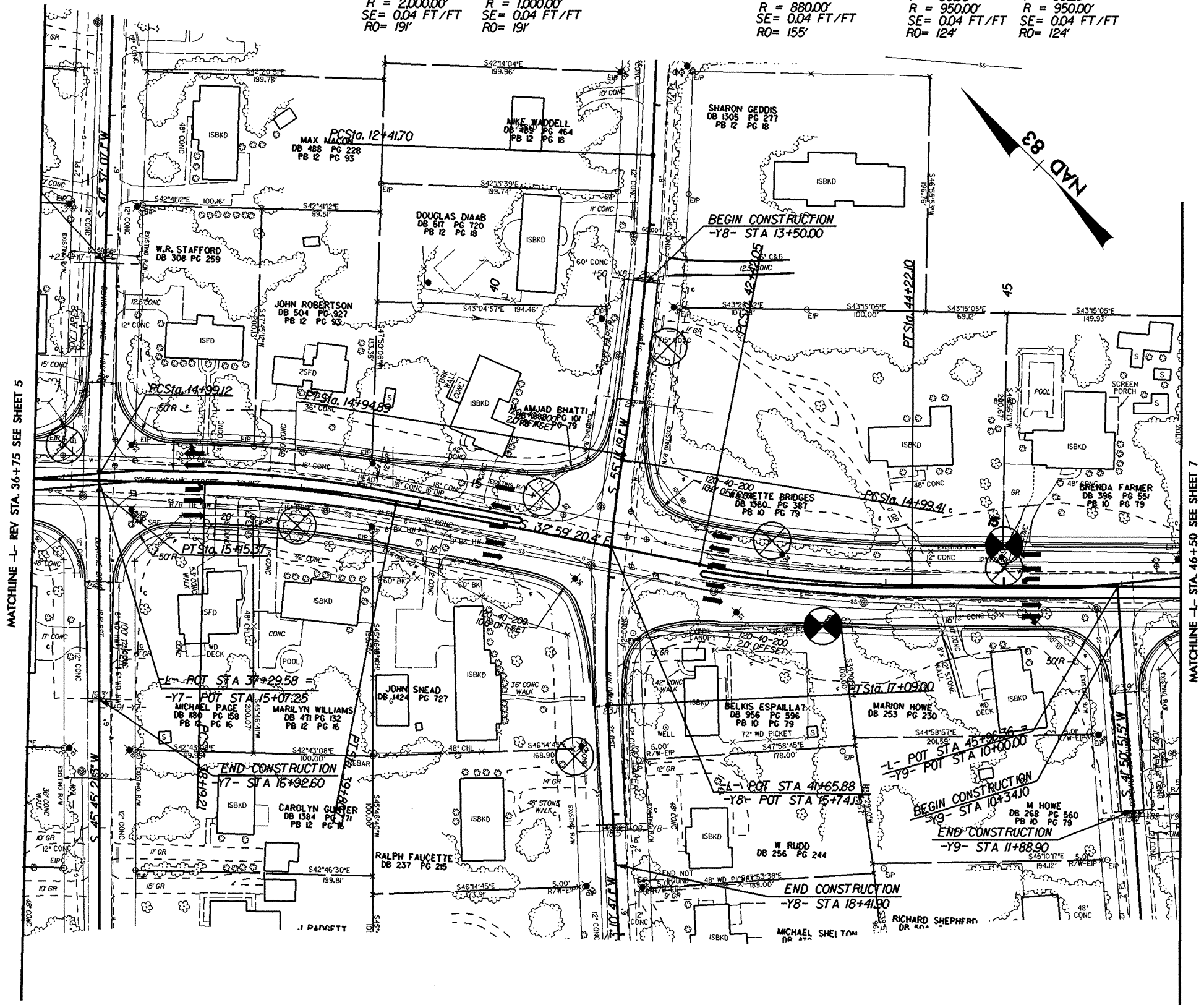
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REVISIONS

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

-Y8-	-Y9-	-L-
PI Sta 13+68.46 $\Delta = 7' 15" 12.6' (RT)$ $D = 2' 51' 53.2"$ $L = 253.20'$ $T = 126.77'$ $R = 2,000.00'$ $SE = 0.04 FT/FT$ $RO = 19'$	PI Sta 16+04.59 $\Delta = 12' 00' 32.1' (LT)$ $D = 5' 43' 46.5"$ $L = 209.60'$ $T = 105.18'$ $R = 1,000.00'$ $SE = 0.04 FT/FT$ $RO = 19'$	PI Sta 14+17.64 $\Delta = 9' 45' 25.3' (LT)$ $D = 6' 30' 39.2"$ $L = 149.86'$ $T = 75.11'$ $R = 880.00'$ $SE = 0.04 FT/FT$ $RO = 155'$
PI Sta 39+00.17 $\Delta = 9' 44' 29.1' (RT)$ $D = 6' 01' 52.1"$ $L = 161.52'$ $T = 80.95'$ $R = 950.00'$ $SE = 0.04 FT/FT$ $RO = 124'$	PI Sta 43+32.35 $\Delta = 10' 51' 32.3' (LT)$ $D = 6' 01' 52.1"$ $L = 180.05'$ $T = 90.29'$ $R = 950.00'$ $SE = 0.04 FT/FT$ $RO = 124'$	



MATCHLINE -L- REY STA 36+75 SEE SHEET 5

MATCHLINE -L- STA 46+50 SEE SHEET 7

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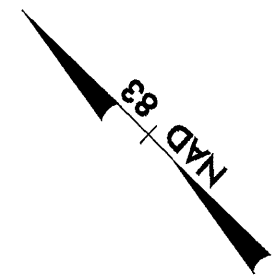
PROJECT REFERENCE NO. U-3303A	SHEET NO. 7
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR A/W ACQUISITION <b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	

-L-

PI Sta 58+83.20  
 $\Delta = 46^\circ 28' 14.3" (LT)$   
 $D = 5^\circ 43' 46.5"$   
 $L = 811.07'$   
 $T = 429.33'$   
 $R = 1000.00'$   
 $SE = 0.04 FT/FT$   
 $RO = 124'$

-YII-

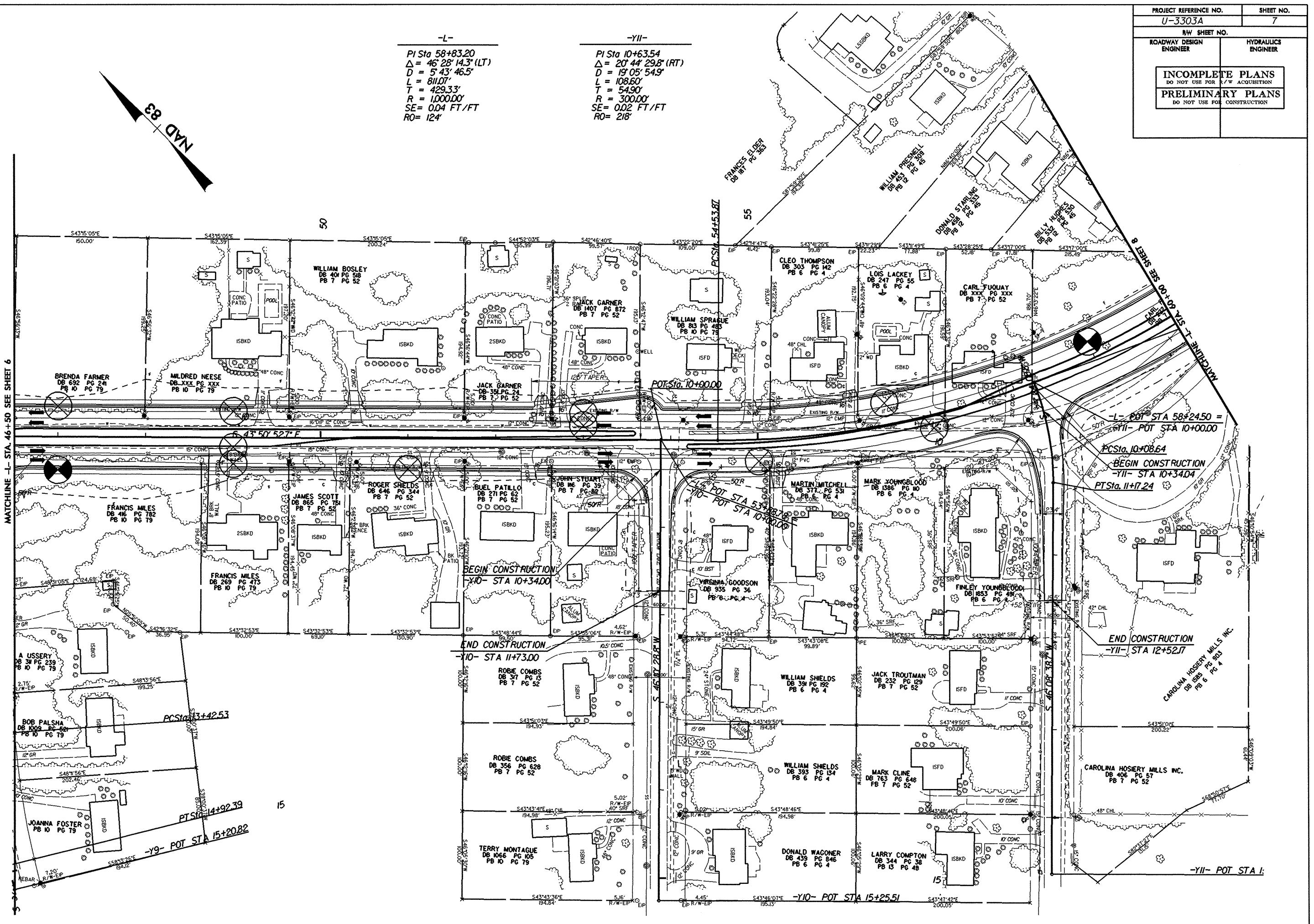
PI Sta 10+63.54  
 $\Delta = 20^\circ 44' 29.8" (RT)$   
 $D = 19^\circ 05' 54.9"$   
 $L = 108.60'$   
 $T = 54.90'$   
 $R = 300.00'$   
 $SE = 0.02 FT/FT$   
 $RO = 218'$



REVISIONS

MATCHLINE -L- STA. 46+50 SEE SHEET 6

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-L- POT STA 58+24.50 =  
 -YII- POT STA 10+00.00  
 PCSSta. 10+08.64  
 BEGIN CONSTRUCTION  
 -YII- STA 10+34.04  
 PTSta. 11+17.24

BEGIN CONSTRUCTION  
-YII- STA 10+34.00

END CONSTRUCTION  
-YII- STA 11+73.00

END CONSTRUCTION  
-YII- STA 12+52.17

-YII- POT STA 15+25.51

-YII- POT STA 1:

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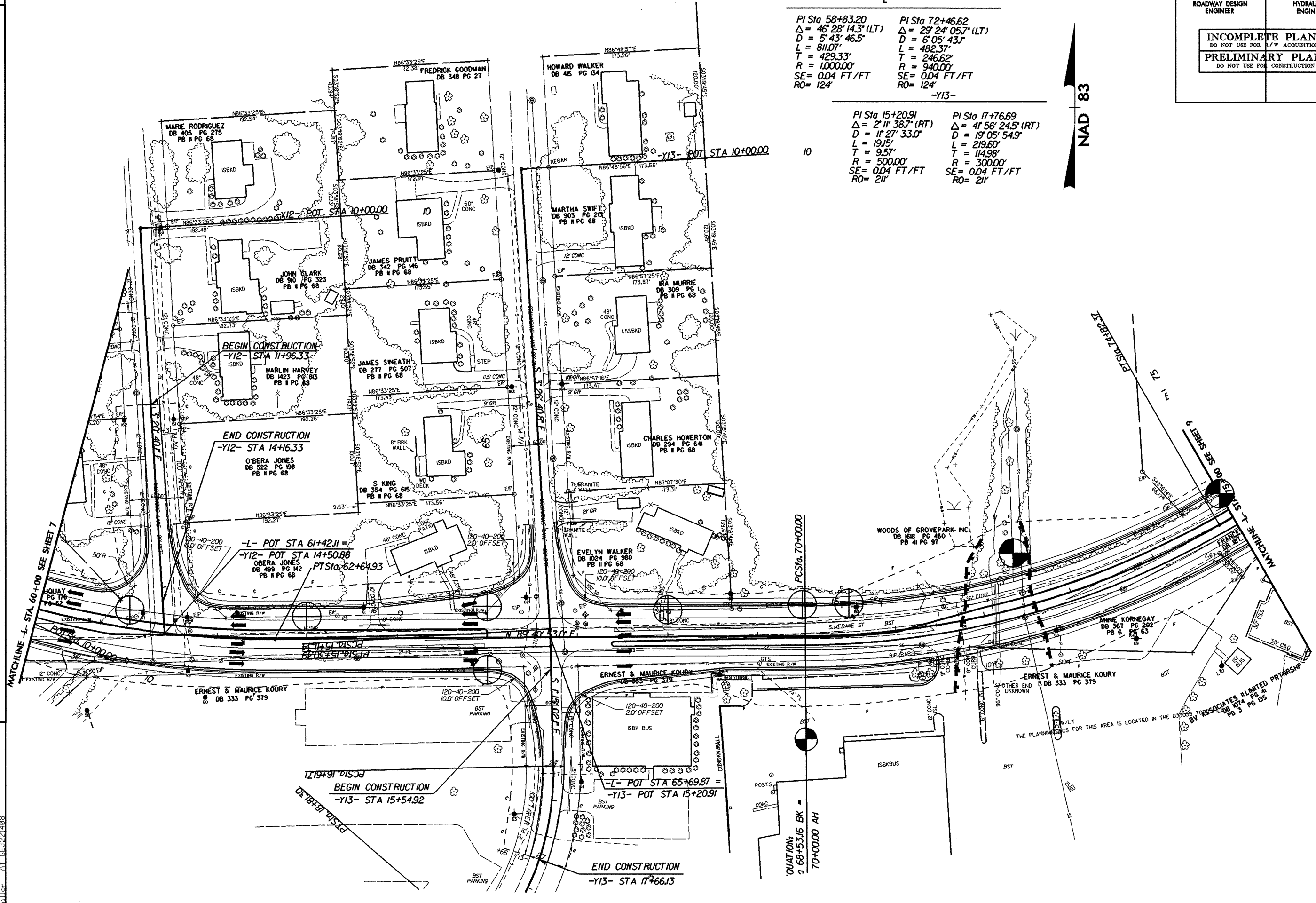
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U-3303A	8
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION <b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	

-L-

PI Sta 58+83.20 Δ = 46° 28' 14.3" (LT) D = 5' 43' 46.5" L = 811.07' T = 429.33' R = 1000.00' SE = 0.04 FT/FT RO = 124'	PI Sta 72+46.62 Δ = 29° 24' 05.7" (LT) D = 6' 05' 43.1" L = 482.37' T = 246.62' R = 940.00' SE = 0.04 FT/FT RO = 124'
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-Y13-

PI Sta 15+20.91 Δ = 2° 11' 38.7" (RT) D = 11' 27' 33.0" L = 19.15' T = 9.57' R = 500.00' SE = 0.04 FT/FT RO = 211'	PI Sta 17+76.69 Δ = 41° 56' 24.5" (RT) D = 19' 05' 54.9" L = 219.60' T = 114.98' R = 300.00' SE = 0.04 FT/FT RO = 211'
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REVISIONS

MATCHLINE -L- STA 60+00 SEE SHEET 7  
 POT STA 10+00.00  
 POT STA 14+50.88  
 POT STA 15+20.91  
 POT STA 17+76.69

MATCHLINE -L- STA 75+00 SEE SHEET 9  
 POT STA 10+00.00  
 POT STA 14+50.88  
 POT STA 15+20.91  
 POT STA 17+76.69

END CONSTRUCTION  
 -Y13- STA 17+66.13

BEGIN CONSTRUCTION  
 -Y13- STA 15+54.92

END CONSTRUCTION  
 -Y12- STA 14+16.33

BEGIN CONSTRUCTION  
 -Y12- STA 11+96.33

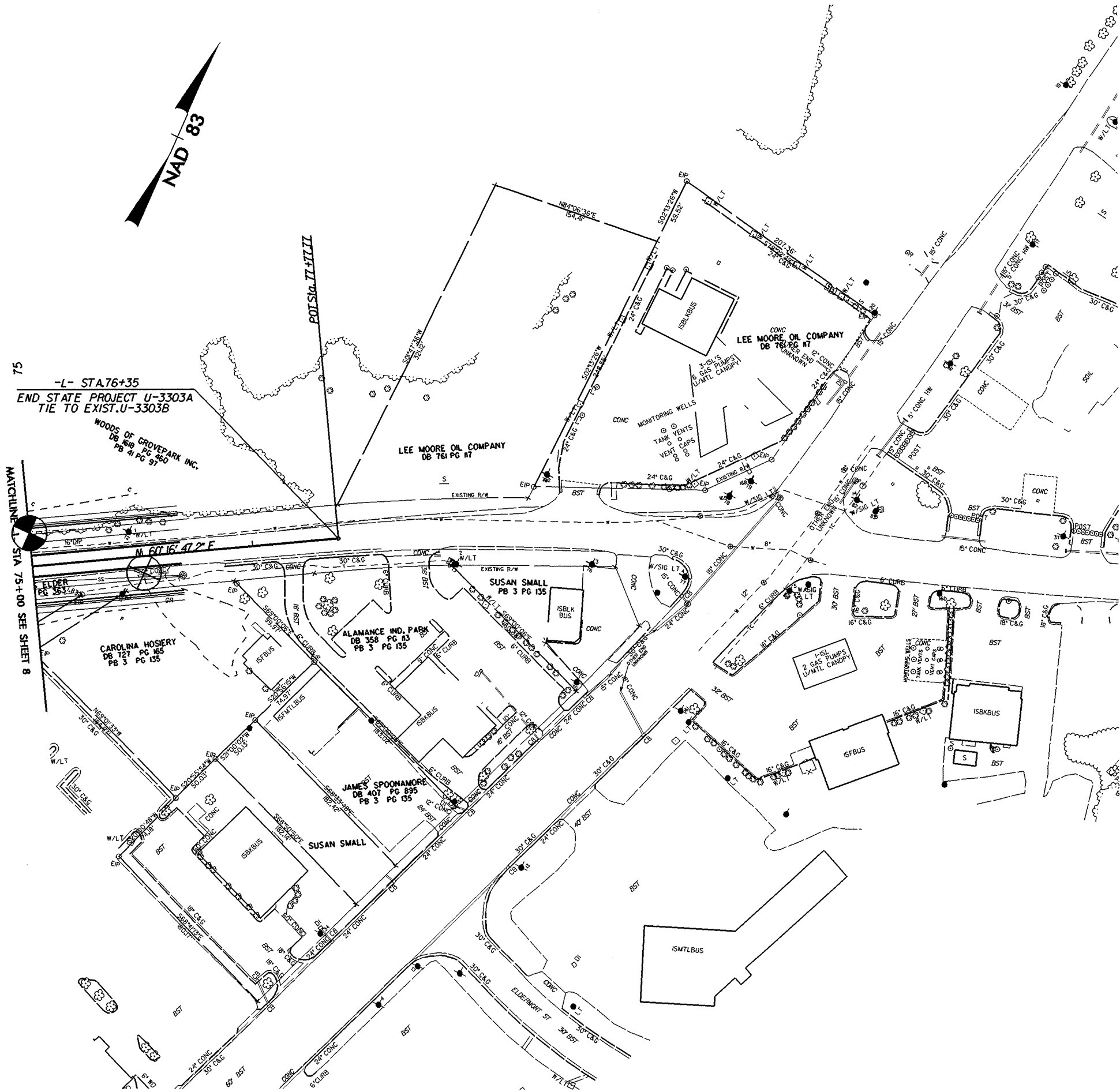
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 1 68+53.16 BK =  
 70+00.00 AH

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R/W SHEET NO.	
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INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

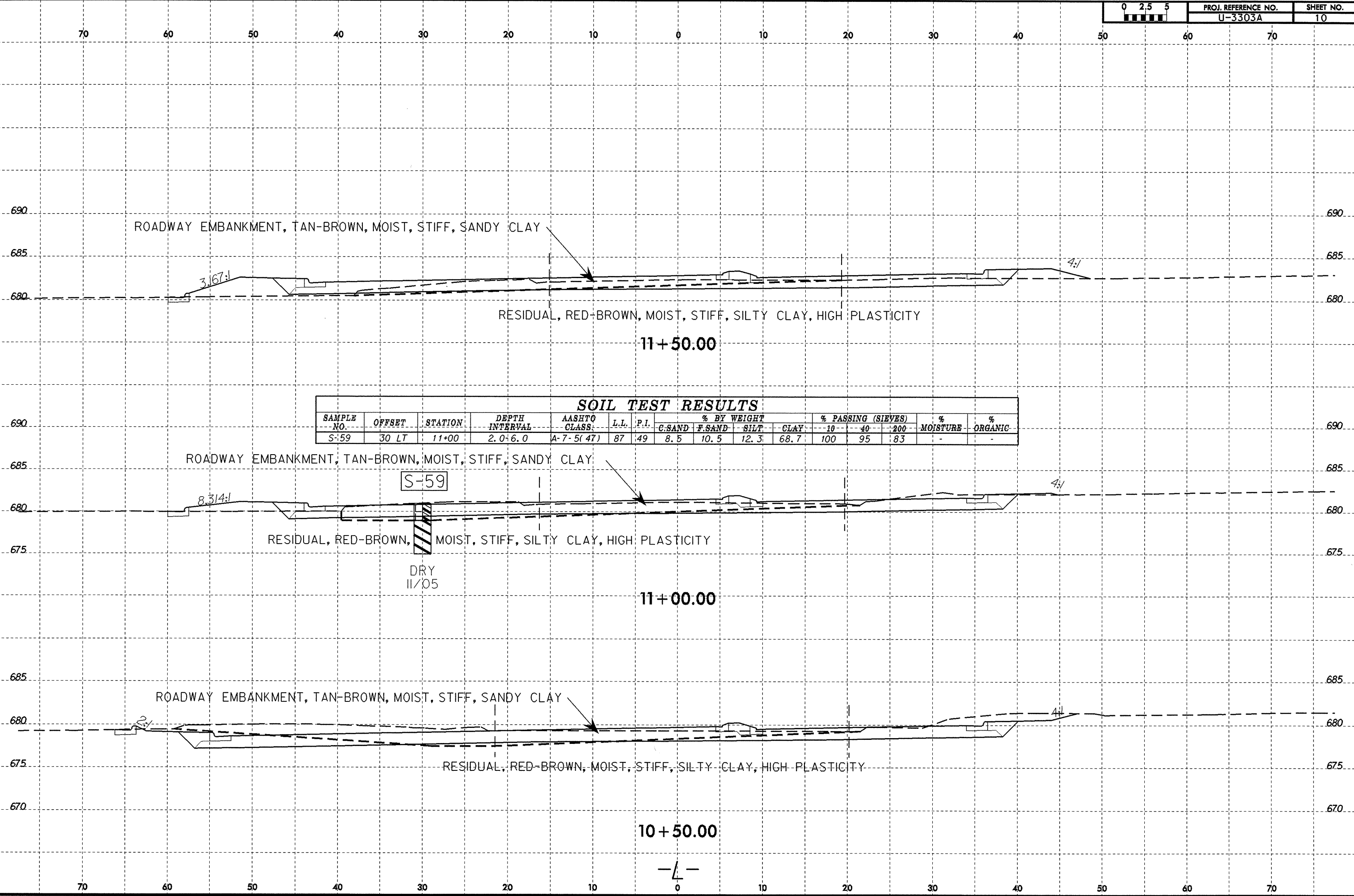
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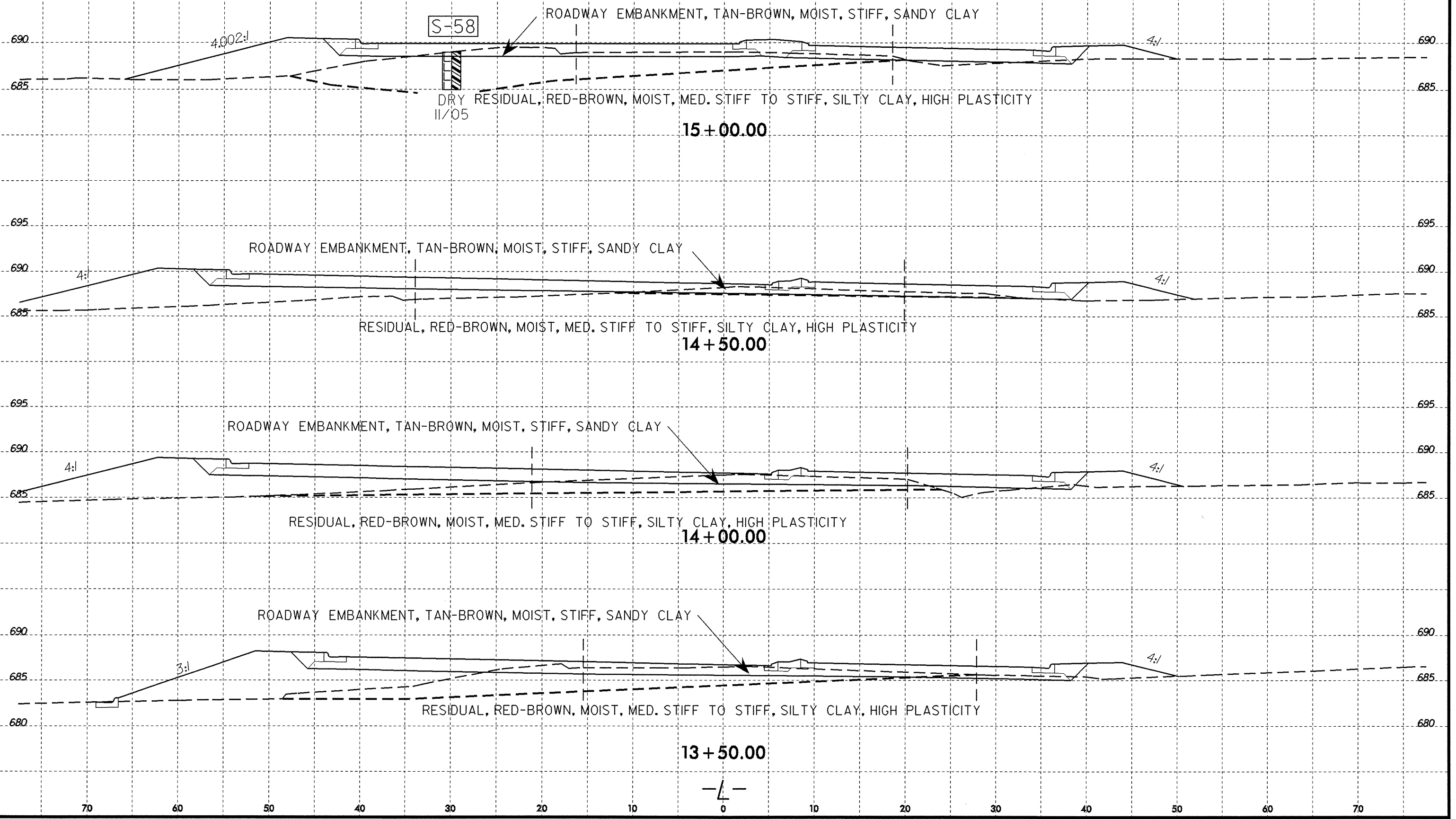
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SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	-10	-40	-200		
S-59	30 LT	11+00	2.0-6.0	A-7-5(47)	87	49	8.5	10.5	12.3	68.7	100	95	83	-	-

-4-



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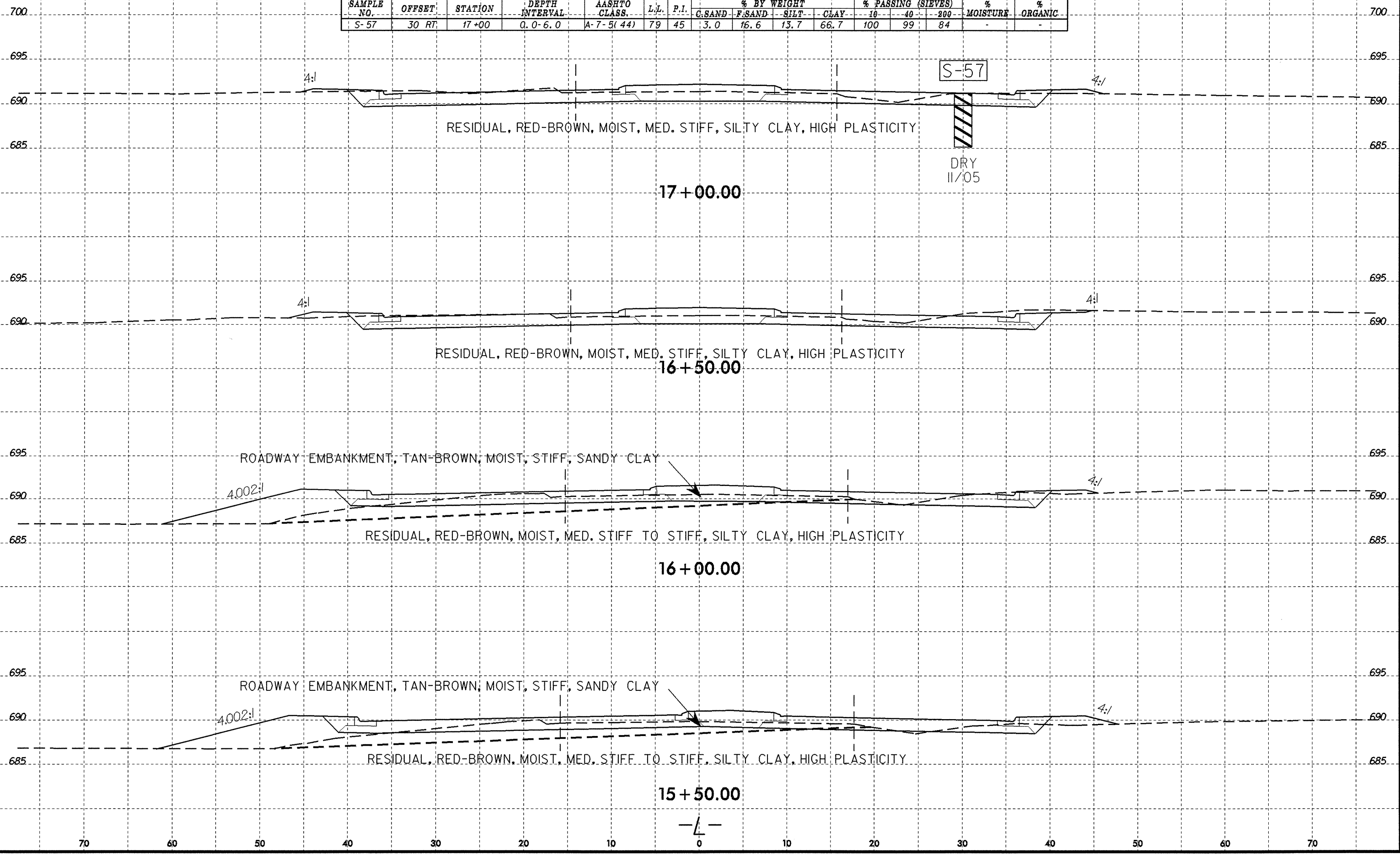
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							C.SAND	F.SAND	SILT	CLAY	10	40	200		
							S-58	30 LT	15+00	0.0-4.0	A-6(3)	30	13		



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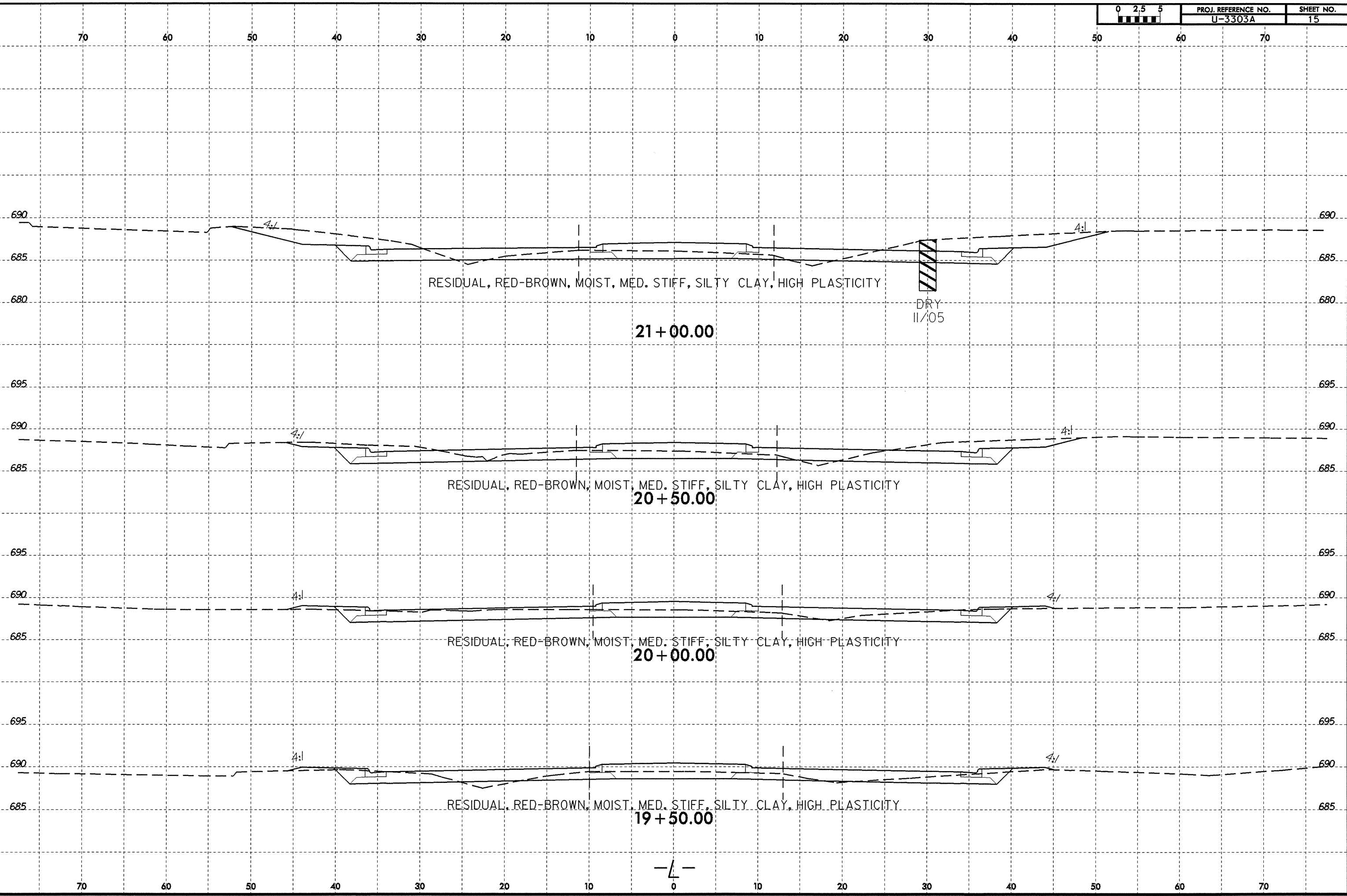
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							G.SAND	F.SAND	SILT	CLAY	10	40	200		
S-57	30 RT.	17+00	0.0-6.0	A-7-5(44)	79	45	3.0	16.6	13.7	66.7	100	99	84	-	-





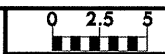


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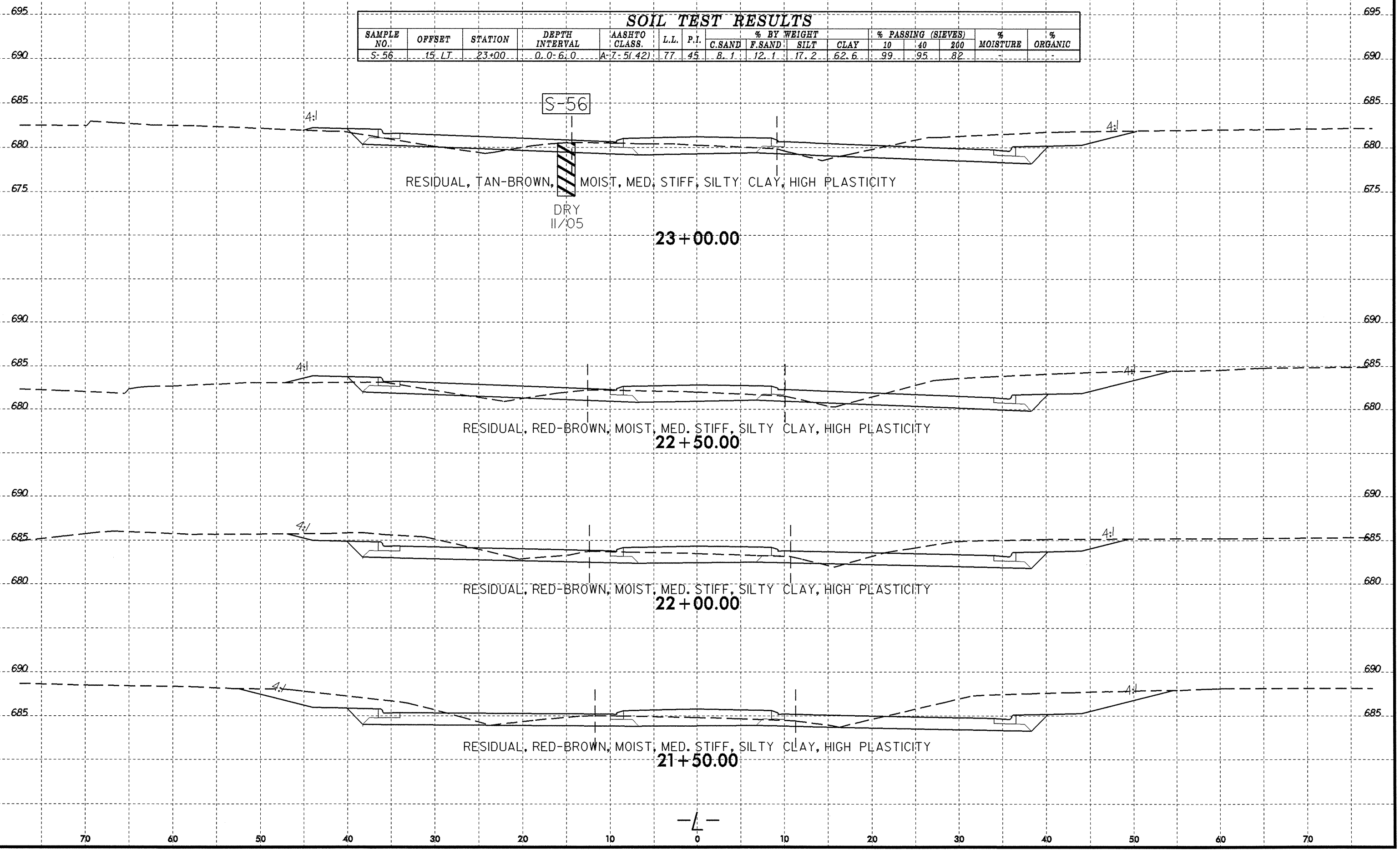


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 KMiller  
 6/22/06

8/23/99



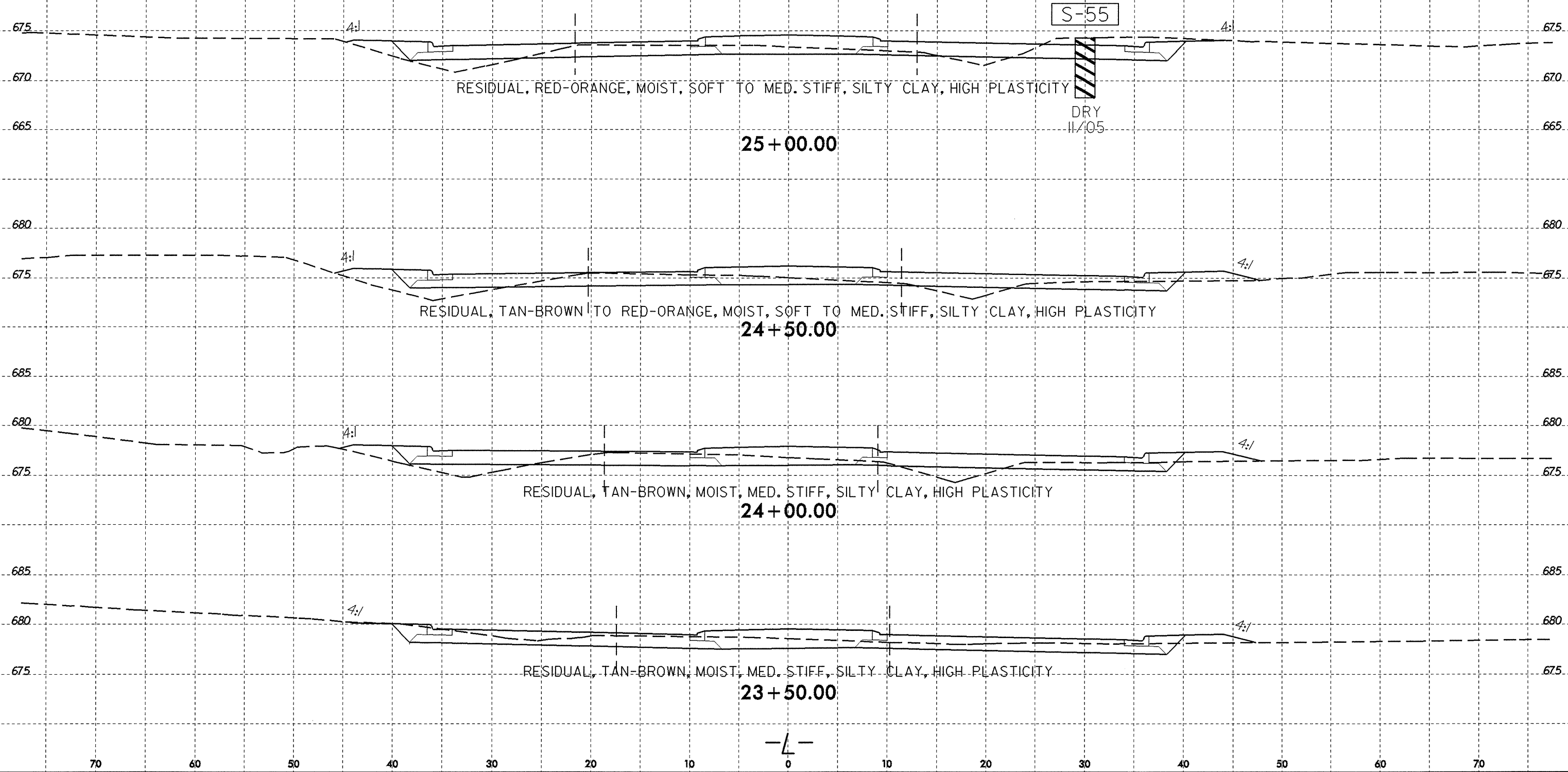
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-56	15 LT	23+00	0.0-6.0	A-7-5(42)	77	45	8.1	12.1	17.2	62.6	99	95	82	-	-



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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-55	30 RT	25+00	0.0-6.0	A-7-5(36)	82	41	5.6	21.6	20.4	52.4	99	97	76	-	-

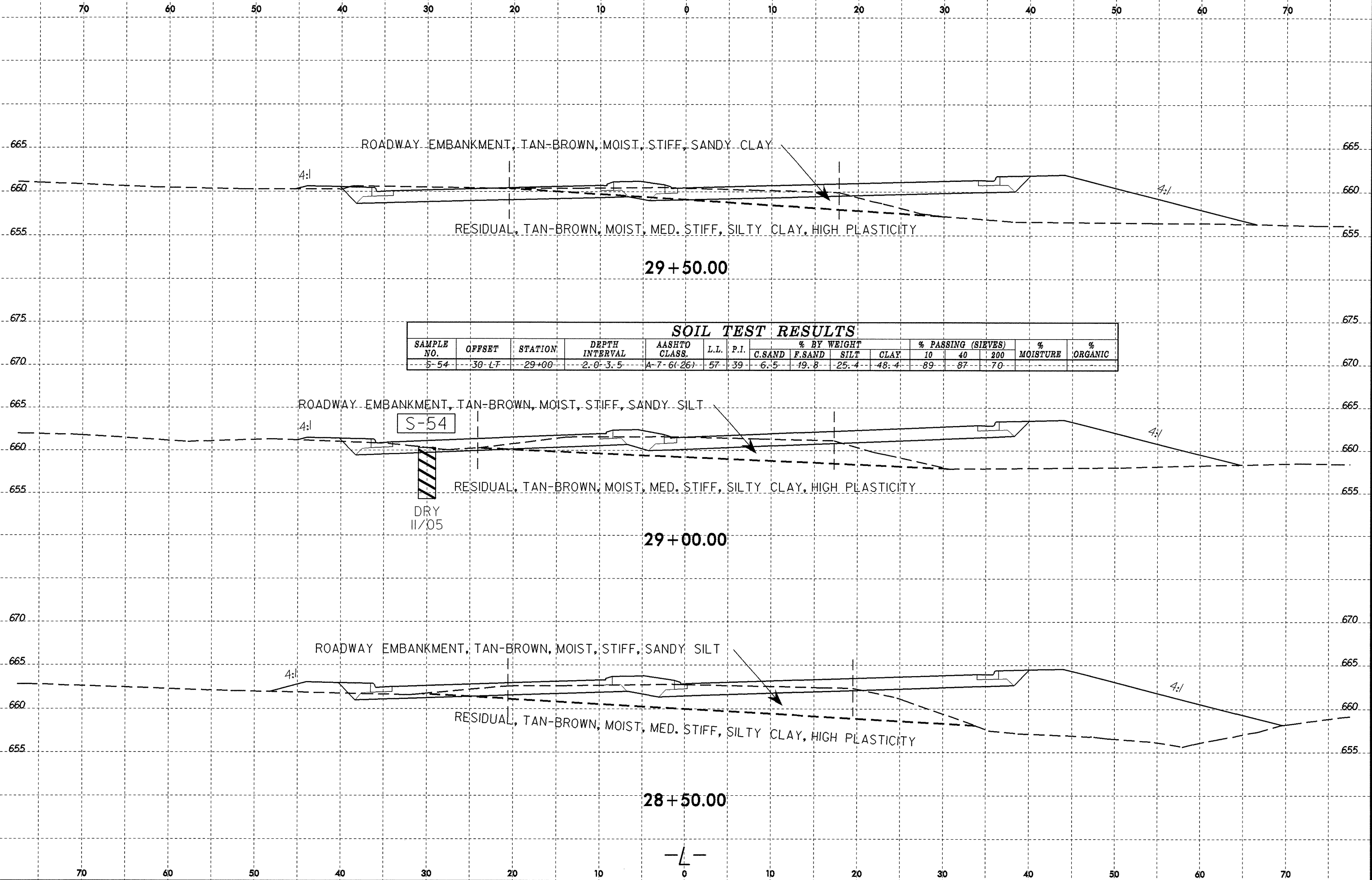


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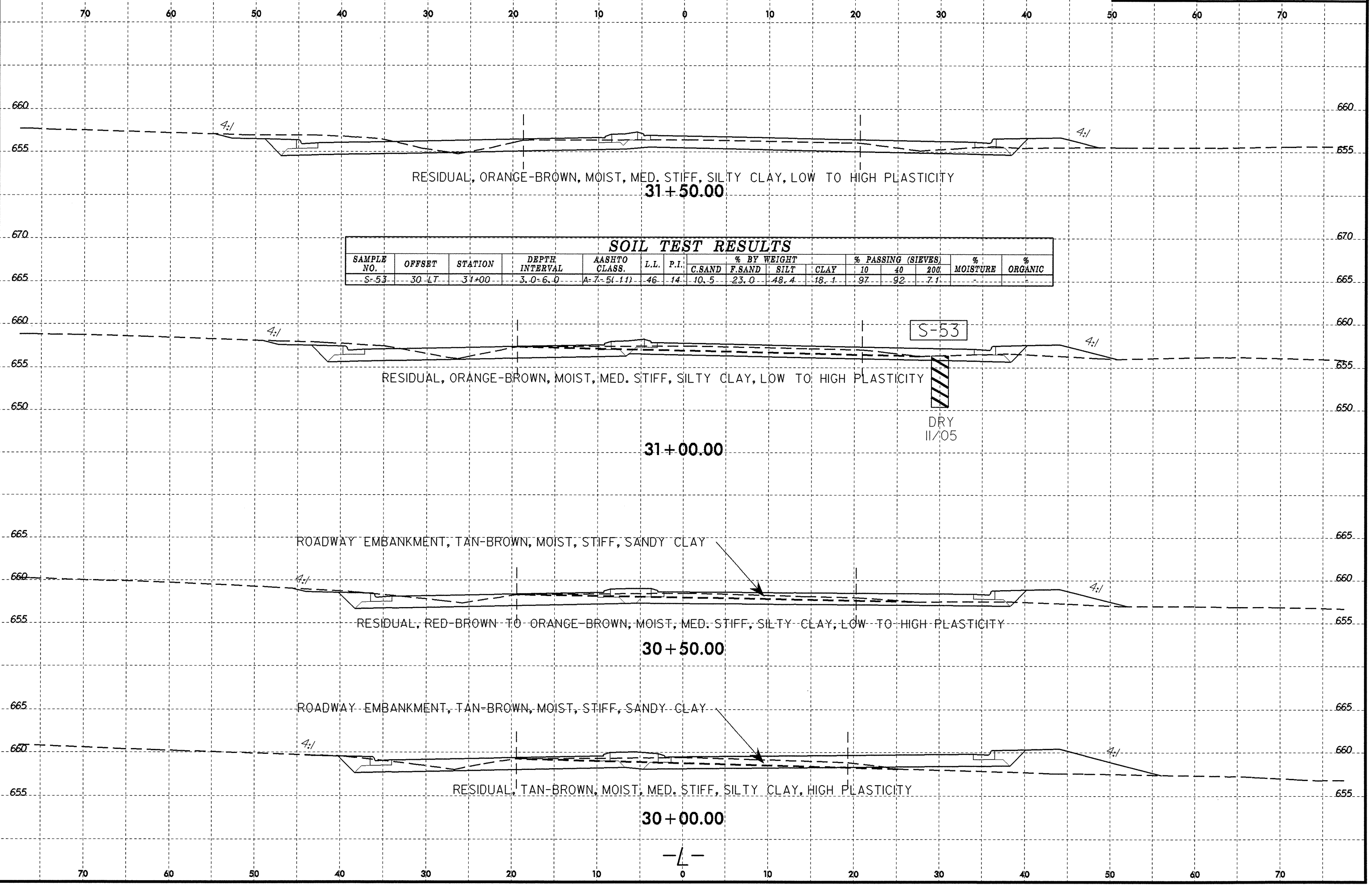
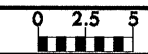


SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-54	30-LT	29+00	2.0-3.5	A-7-6(26)	57	39	6.5	19.8	25.4	48.4	89	87	70		

25-JAN-2006 15:35  
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KbMiller AT GEJ221486

-L-

8/23/99



RESIDUAL, ORANGE-BROWN, MOIST, MED. STIFF, SILTY CLAY, LOW TO HIGH PLASTICITY  
31+50.00

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-53	30 LT	31+00	3.0-6.0	A-7-5(11)	46	14	10.5	23.0	48.4	18.1	97	92	71		

RESIDUAL, ORANGE-BROWN, MOIST, MED. STIFF, SILTY CLAY, LOW TO HIGH PLASTICITY

S-53

DRY 11/05

31+00.00

ROADWAY EMBANKMENT, TAN-BROWN, MOIST, STIFF, SANDY CLAY

RESIDUAL, RED-BROWN TO ORANGE-BROWN, MOIST, MED. STIFF, SILTY CLAY, LOW TO HIGH PLASTICITY

30+50.00

ROADWAY EMBANKMENT, TAN-BROWN, MOIST, STIFF, SANDY CLAY

RESIDUAL, TAN-BROWN, MOIST, MED. STIFF, SILTY CLAY, HIGH PLASTICITY

30+00.00

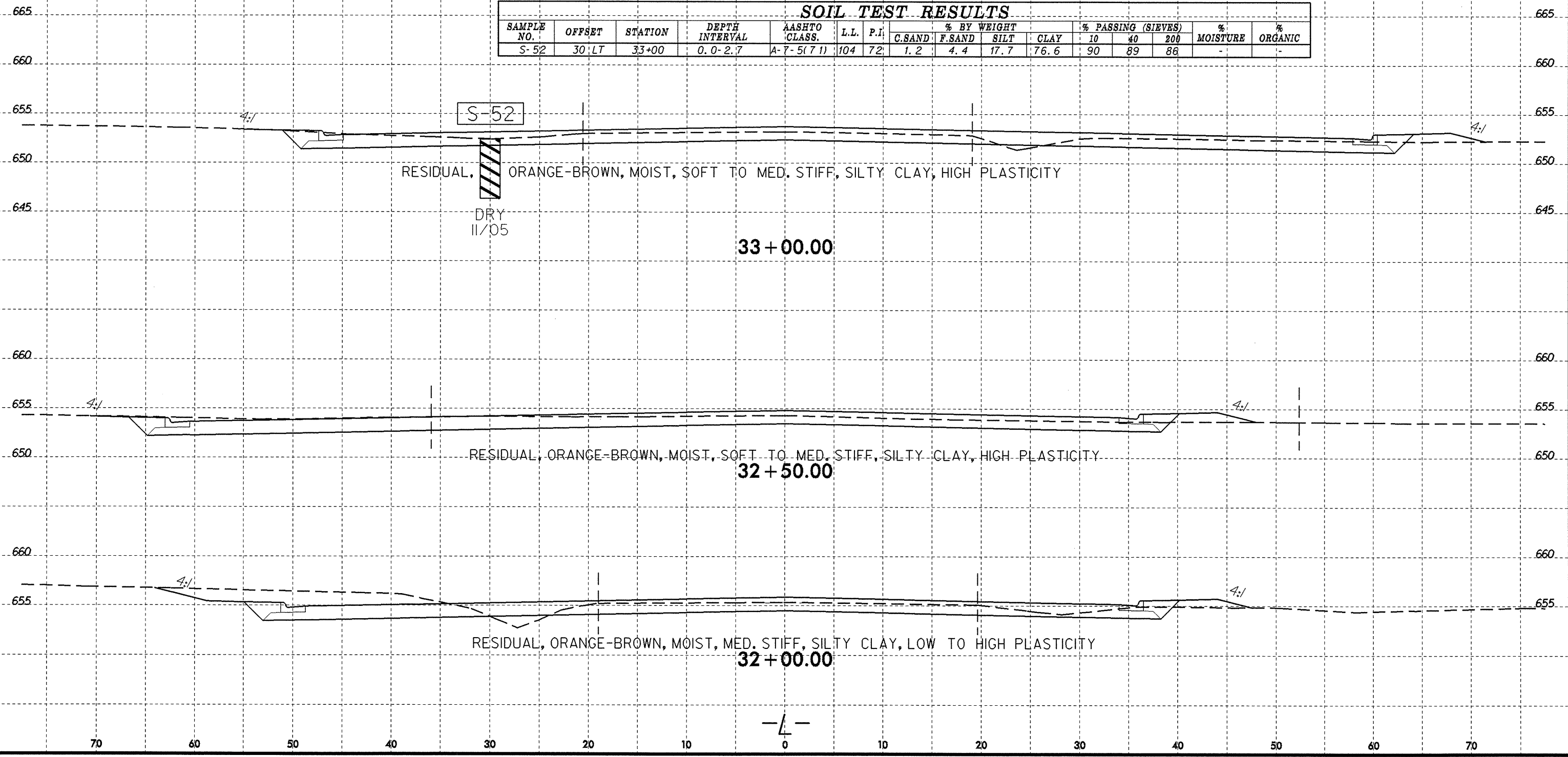
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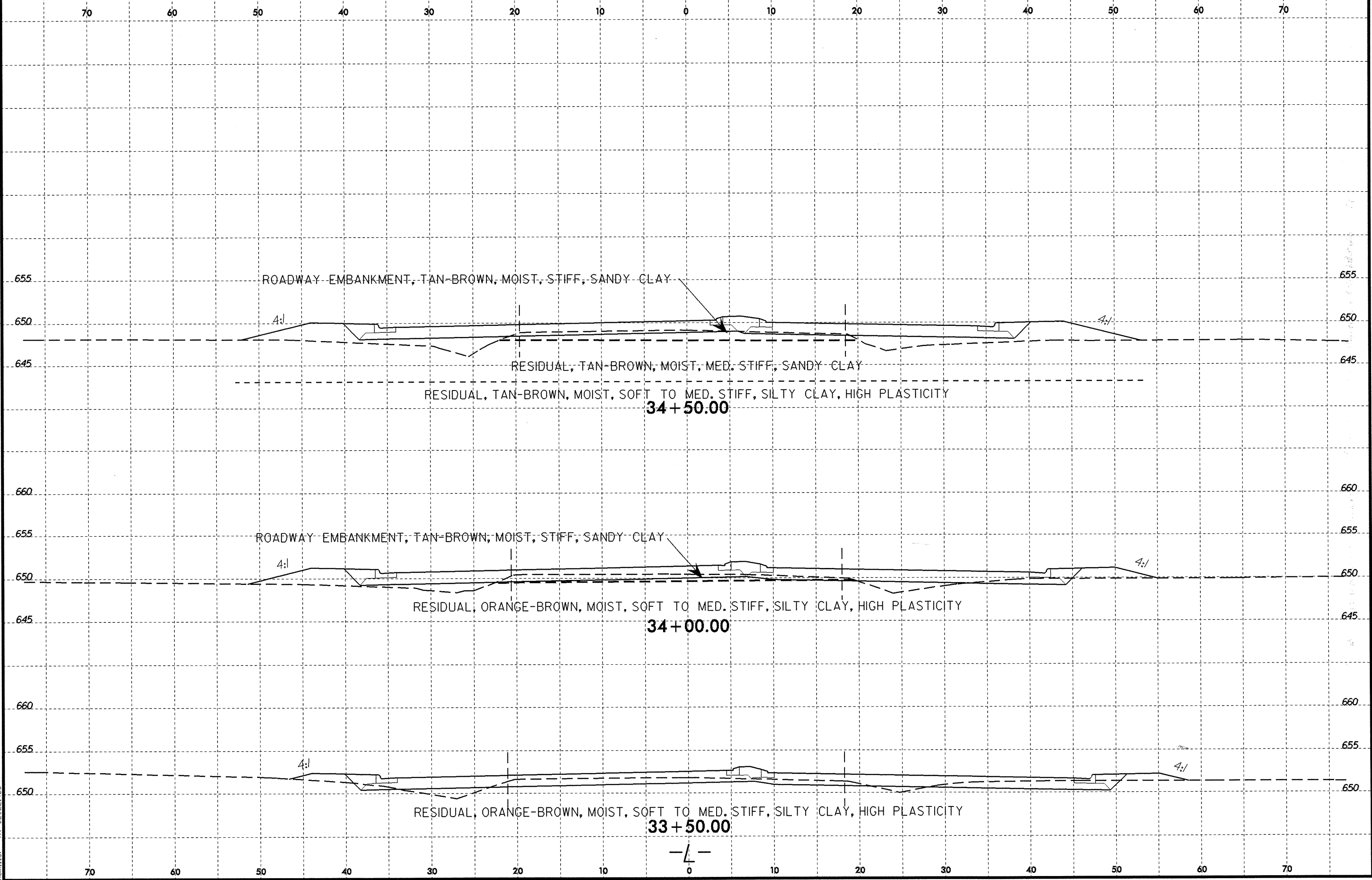
8/23/99

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-52	30' LT	33+00	0.0-2.7	A-7-5(7.1)	104	72	1.2	4.4	17.7	76.6	90	89	86	-	-

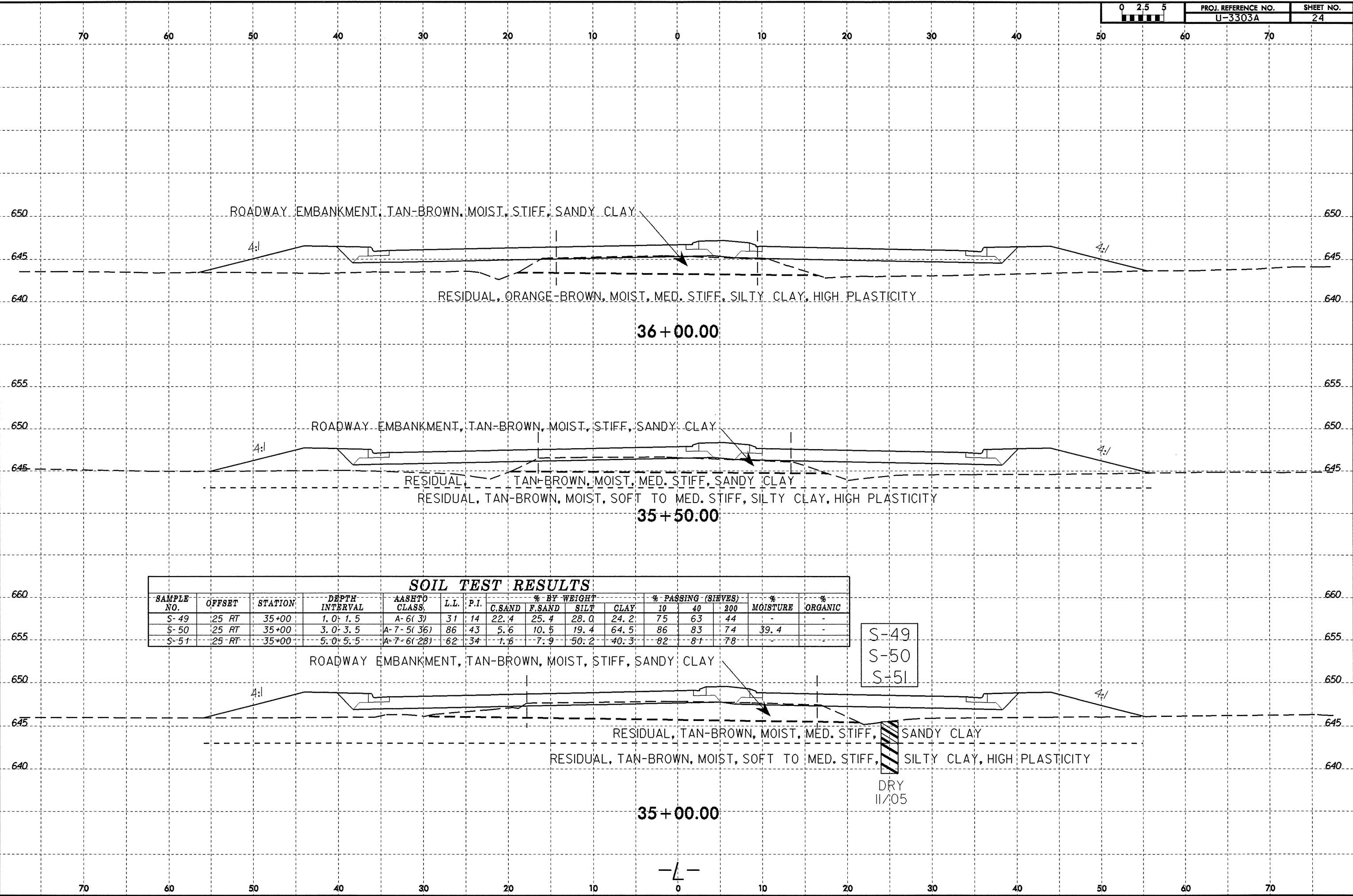


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Kbmler



8/23/99



**SOIL TEST RESULTS**

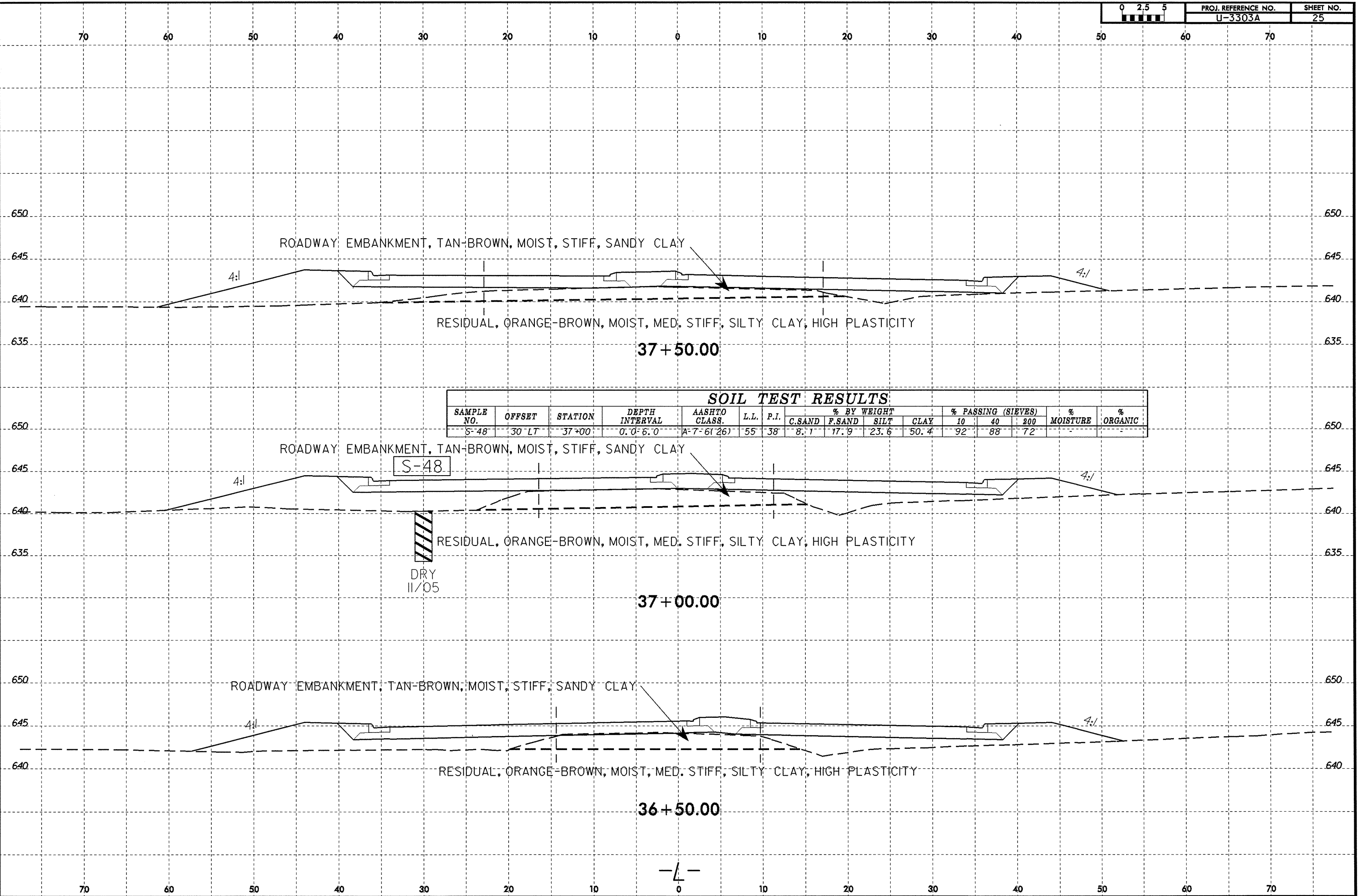
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							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-49	25 RT	35+00	1.0-1.5	A-6(3)	31	14	22.4	25.4	28.0	24.2	75	63	44	-	-
S-50	25 RT	35+00	3.0-3.5	A-7-5(36)	86	43	5.6	10.5	19.4	64.5	86	83	74	39.4	-
S-51	25 RT	35+00	5.0-5.5	A-7-6(28)	62	34	1.6	7.9	50.2	40.3	82	81	78	-	-

S-49  
S-50  
S-51

DRY  
11/05

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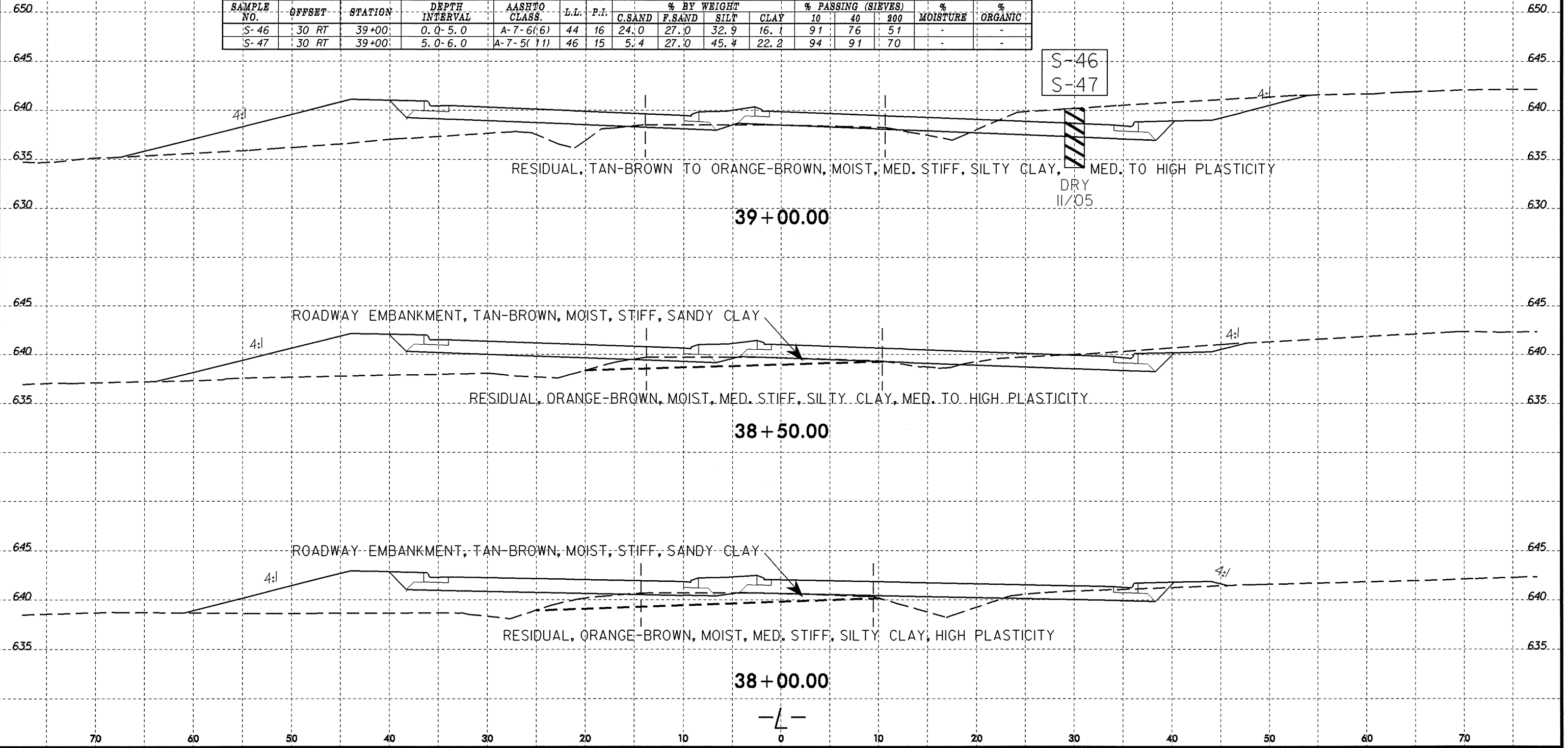
**SOIL TEST RESULTS**

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							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-48	30' LT	37+00	0.0-6.0	A-7-6(26)	55	38	8.1	17.9	23.6	50.4	92	88	72	-	-

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 Miller

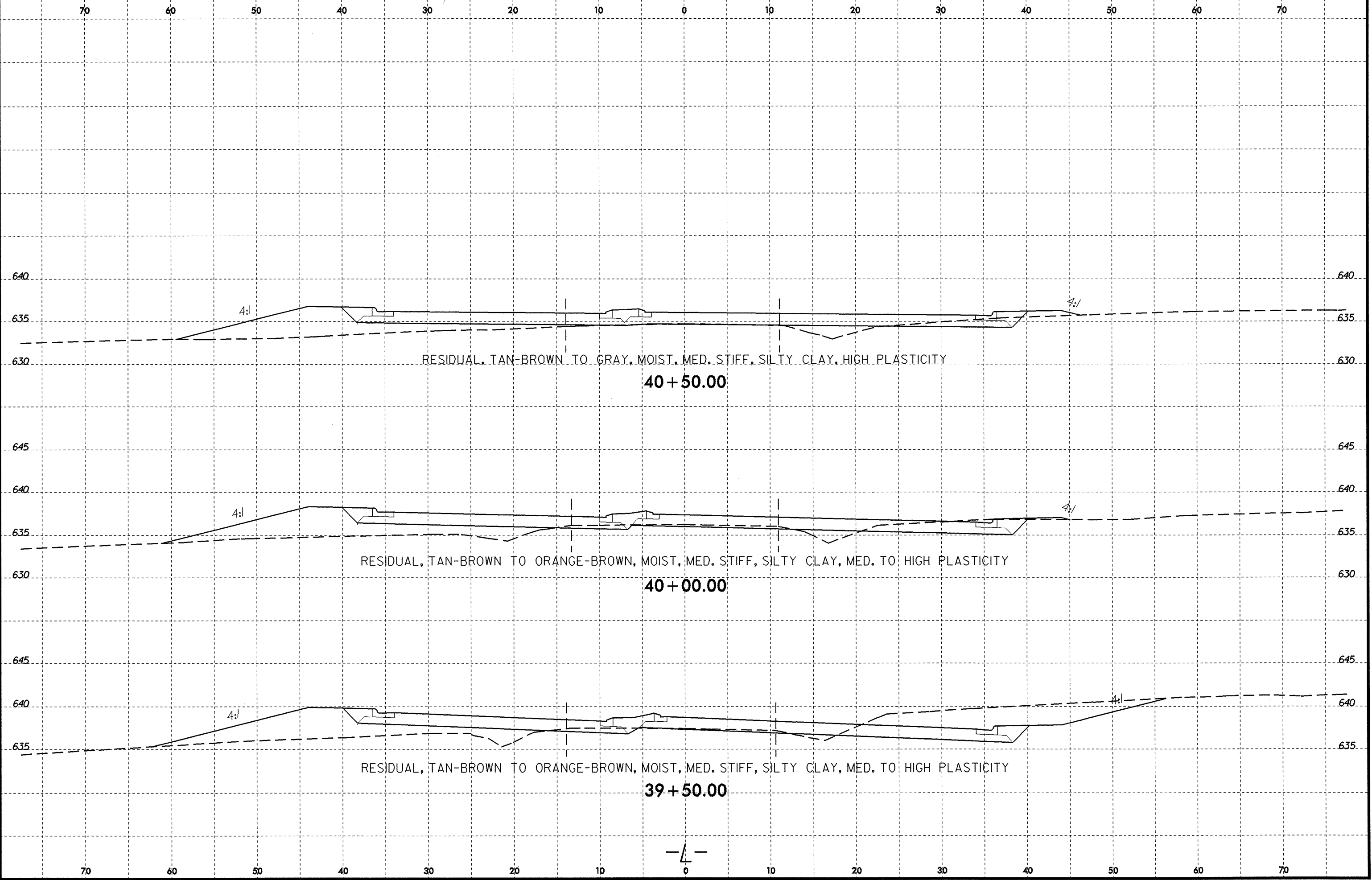
8/23/99

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-46	30 RT	39+00	0.0-5.0	A-7-6(6)	44	16	24.0	27.0	32.9	16.1	91	76	51	-	-
S-47	30 RT	39+00	5.0-6.0	A-7-5(11)	46	15	5.4	27.0	45.4	22.2	94	91	70	-	-

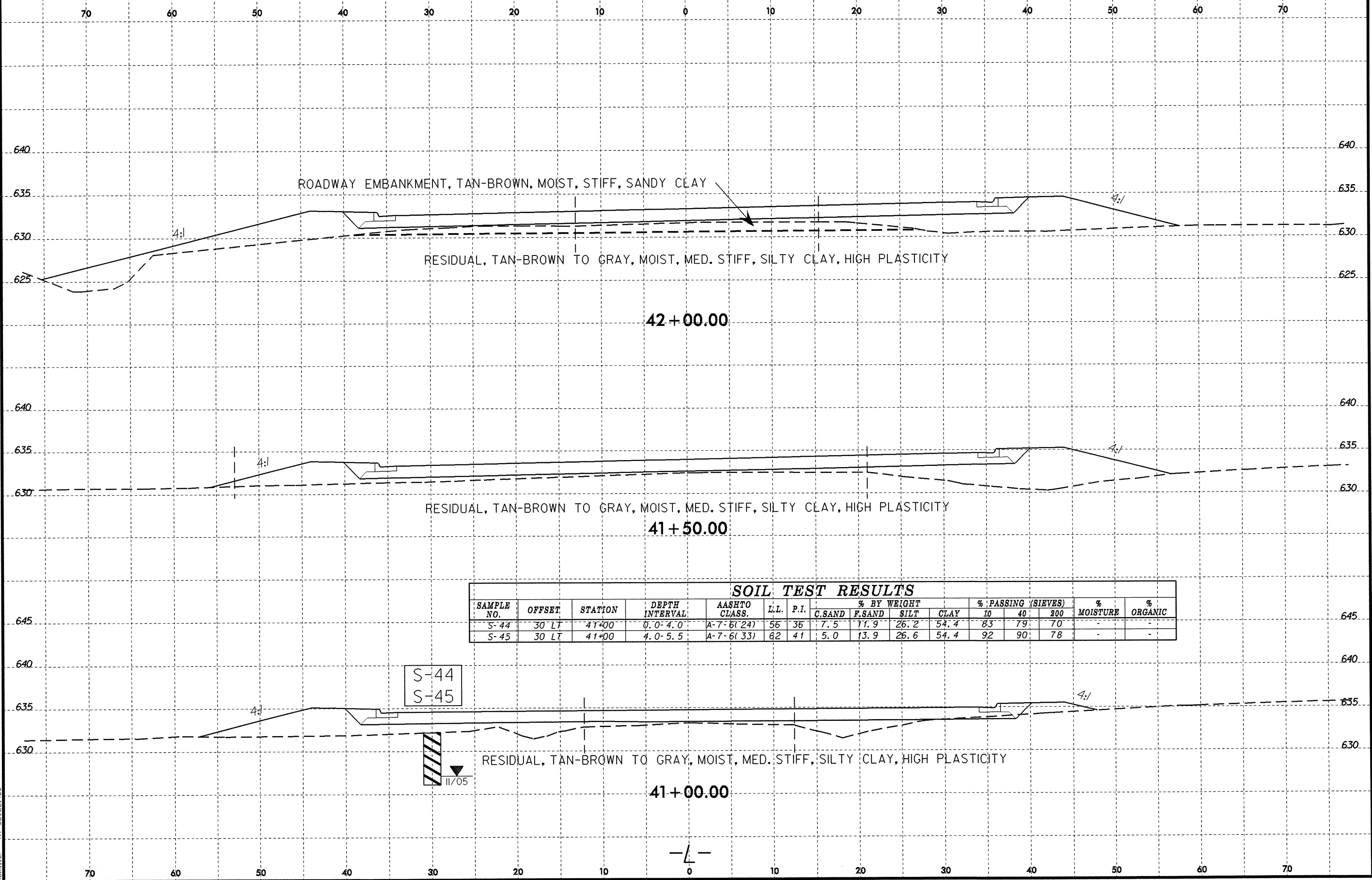


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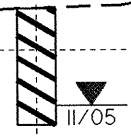
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 KMiller



**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-44	30 LT	41+00	0.0-4.0	A-7-6(24)	56	36	7.5	11.9	26.2	54.4	83	79	70	-	-
S-45	30 LT	41+00	4.0-5.5	A-7-6(33)	62	41	5.0	13.9	26.6	54.4	92	90	78	-	-

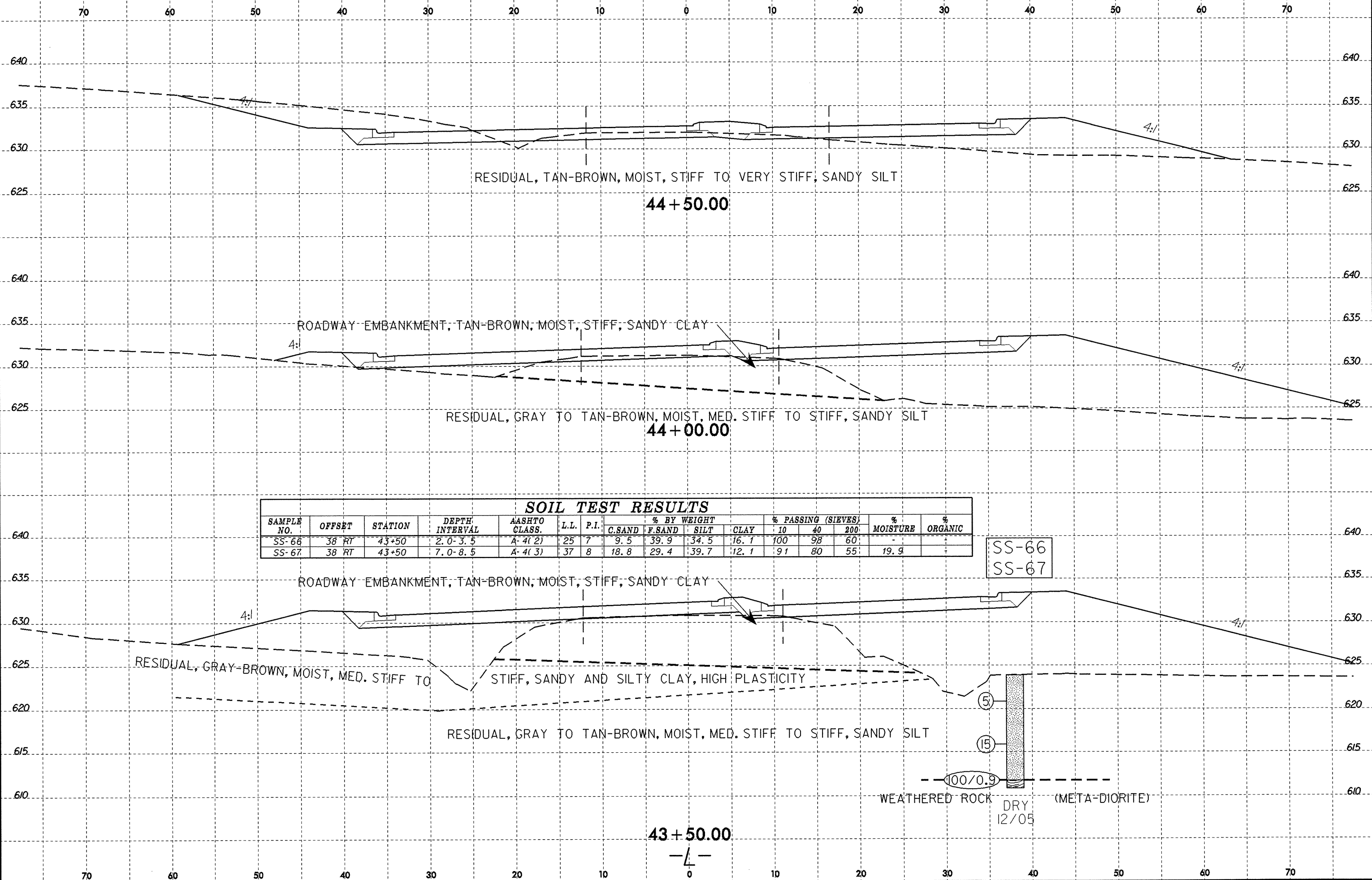
S-44  
 S-45



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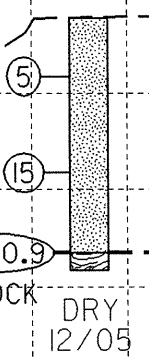




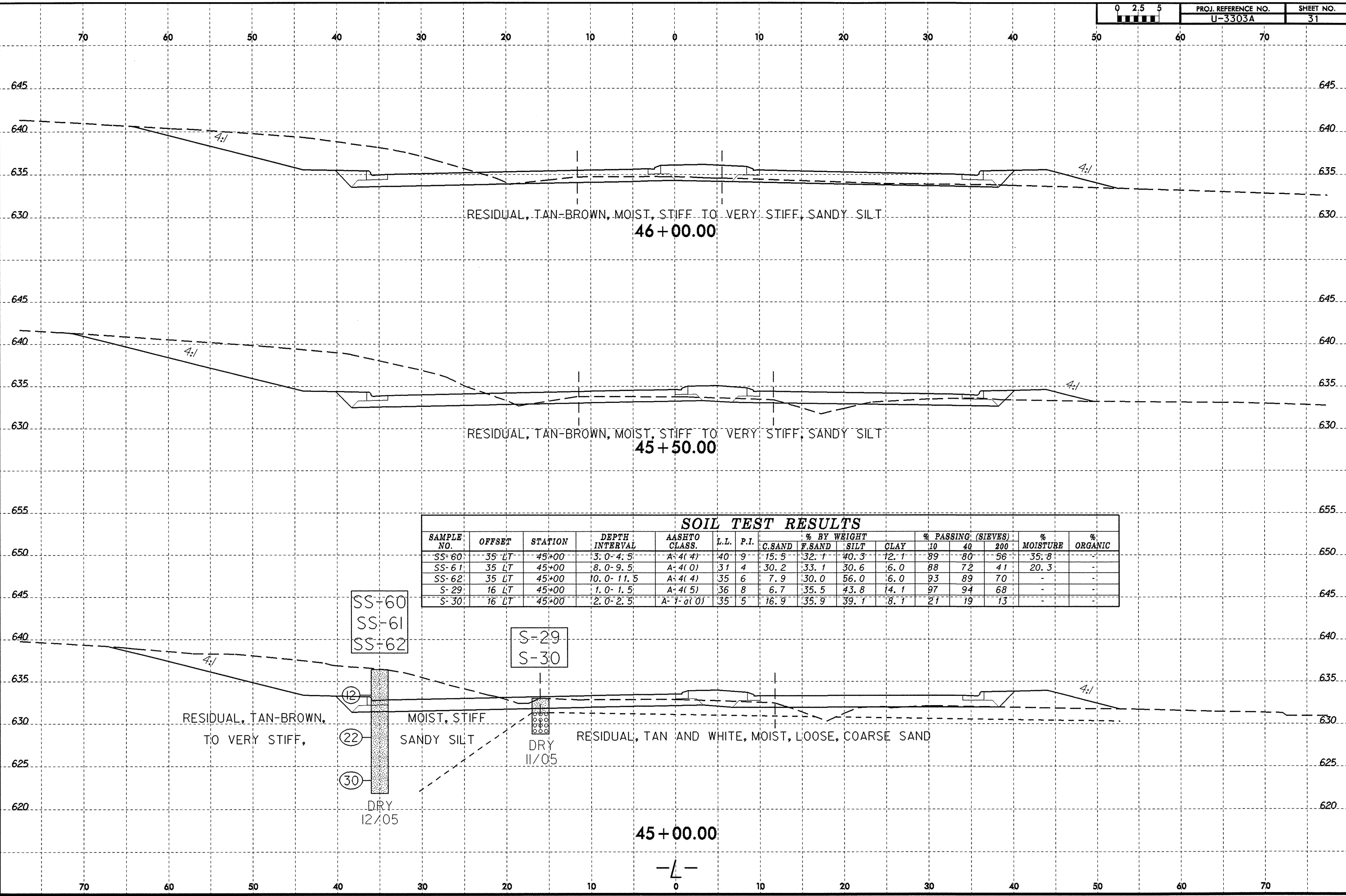
**SOIL TEST RESULTS**

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		
SS-66	38 RT	43+50	2.0-3.5	A-4(2)	25	7	9.5	39.9	34.5	16.1	100	98	60	-	-
SS-67	38 RT	43+50	7.0-8.5	A-4(3)	37	8	18.8	29.4	39.7	12.1	91	80	55	19.9	-

SS-66  
SS-67



WEATHERED ROCK (META-DIORITE)  
DRY 12/05

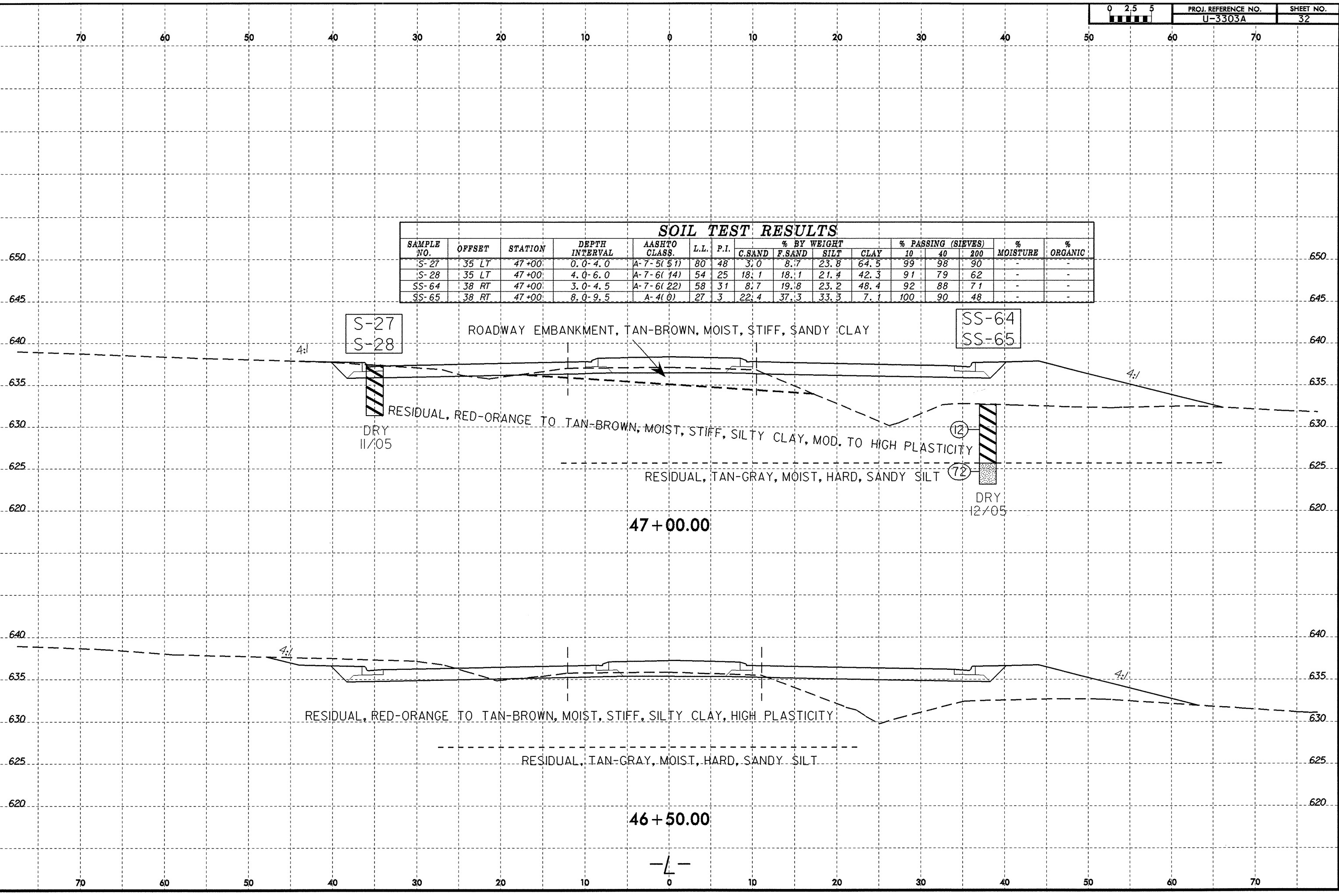


**SOIL TEST RESULTS**

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-60	35 LT	45+00	3.0-4.5	A-4(4)	40	9	15.5	32.1	40.3	12.1	89	80	56	35.8	-
SS-61	35 LT	45+00	8.0-9.5	A-4(0)	31	4	30.2	33.1	30.6	6.0	88	72	41	20.3	-
SS-62	35 LT	45+00	10.0-11.5	A-4(4)	35	6	7.9	30.0	56.0	6.0	93	89	70	-	-
S-29	16 LT	45+00	1.0-1.5	A-4(5)	36	8	6.7	35.5	43.8	14.1	97	94	68	-	-
S-30	16 LT	45+00	2.0-2.5	A-7-a(0)	35	5	16.9	35.9	39.1	8.1	21	19	13	-	-

8/23/93  
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 Miller AT 06/22/05

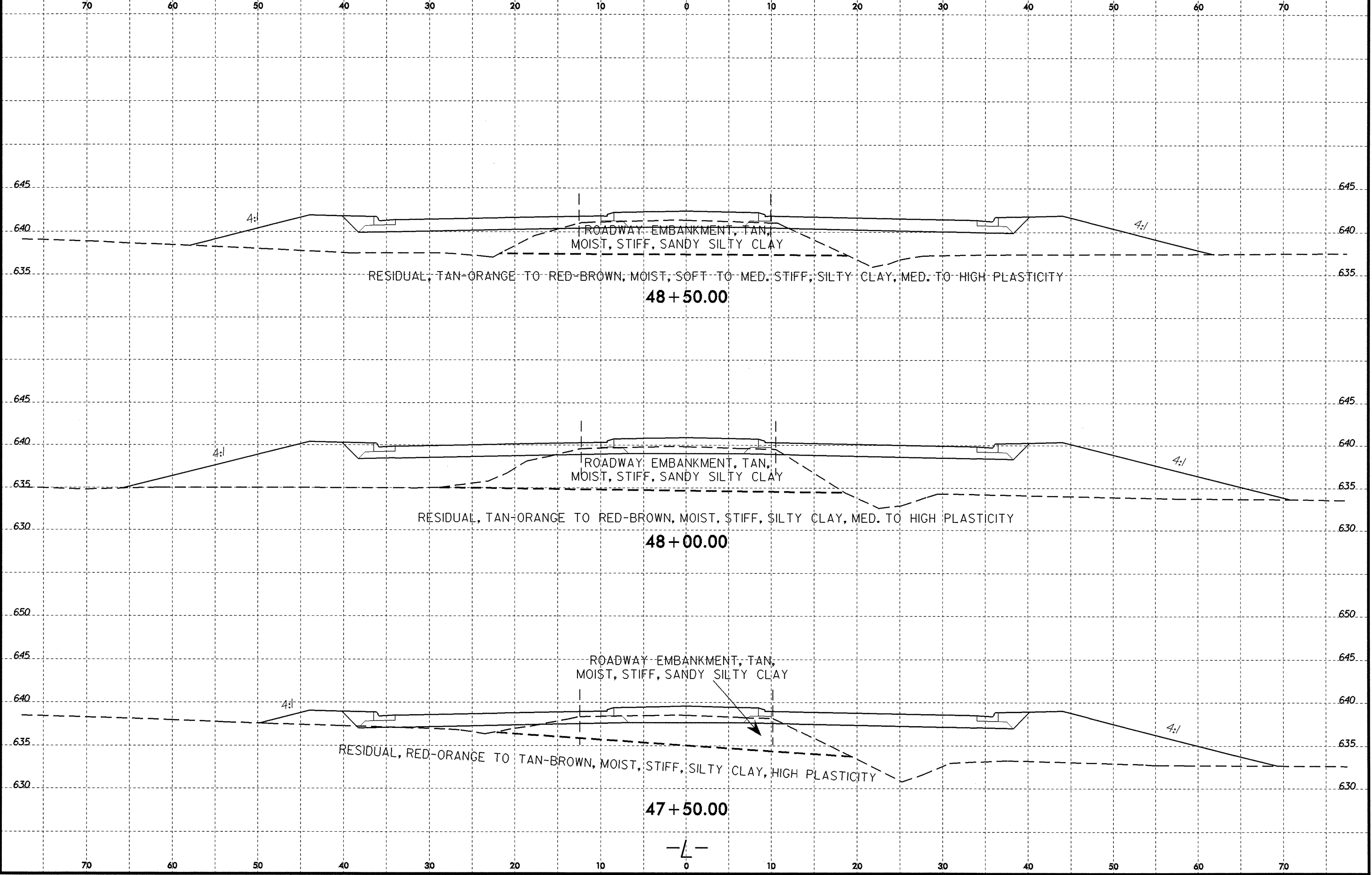
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							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-27	35 LT	47+00	0.0-4.0	A-7-5(51)	80	48	3.0	8.7	23.8	64.5	99	98	90	-	-
S-28	35 LT	47+00	4.0-6.0	A-7-6(14)	54	25	18.1	18.1	21.4	42.3	91	79	62	-	-
SS-64	38 RT	47+00	3.0-4.5	A-7-6(22)	58	31	8.7	19.8	23.2	48.4	92	88	71	-	-
SS-65	38 RT	47+00	8.0-9.5	A-4(0)	27	3	22.4	37.3	33.3	7.1	100	90	48	-	-



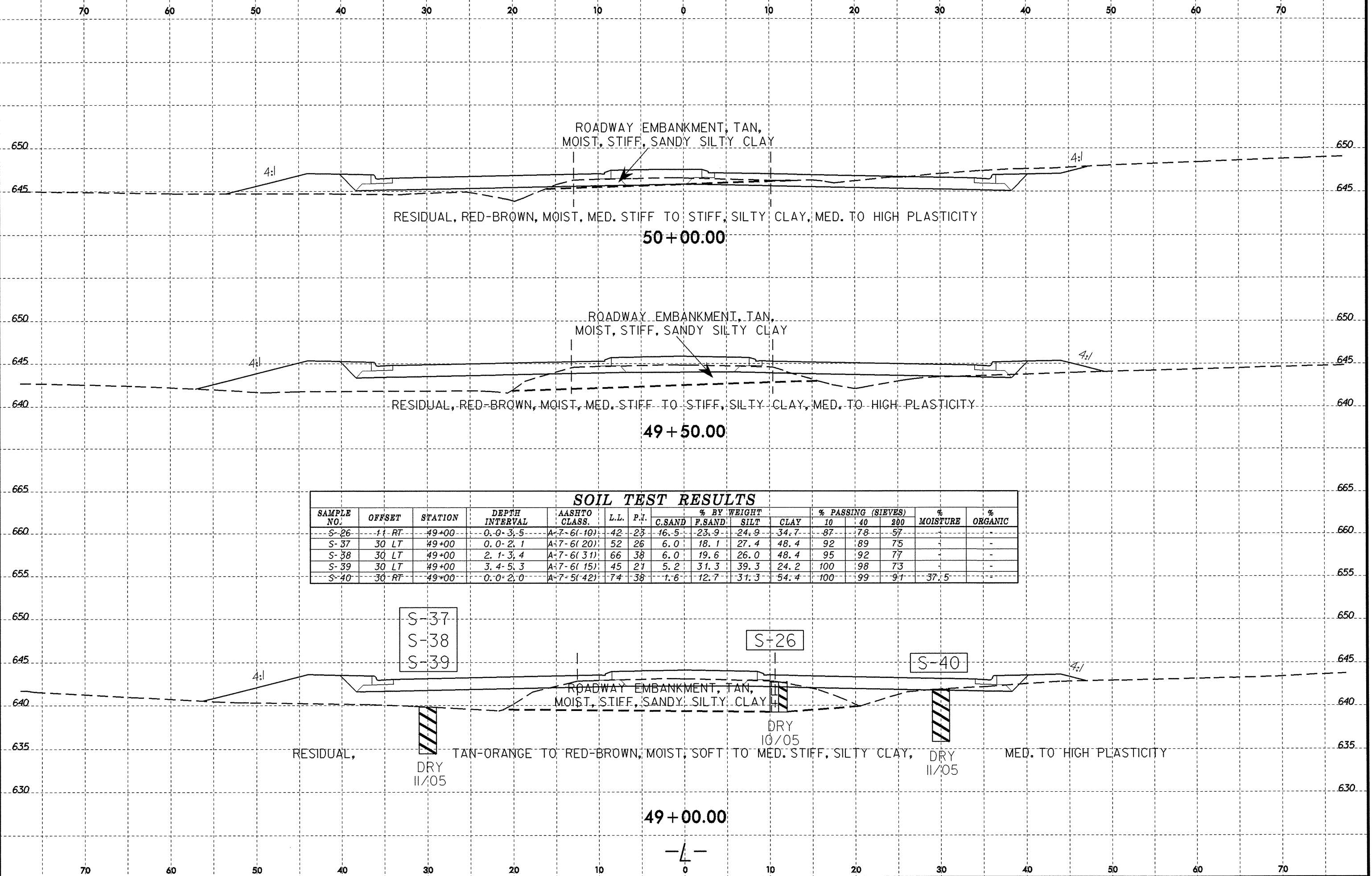
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 KMiller

8/23/05

8/23/99  
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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-26	-11 RT	49+00	0.0-3.5	A-7-6(10)	42	23	16.5	23.9	24.9	34.7	87	78	57	-	-	
S-37	30 LT	49+00	0.0-2.1	A-7-6(20)	52	26	6.0	18.1	27.4	48.4	92	89	75	-	-	
S-38	30 LT	49+00	2.1-3.4	A-7-6(31)	66	38	6.0	19.6	26.0	48.4	95	92	77	-	-	
S-39	30 LT	49+00	3.4-5.3	A-7-6(15)	45	21	5.2	31.3	39.3	24.2	100	98	73	-	-	
S-40	30 RT	49+00	0.0-2.0	A-7-5(42)	74	38	1.6	12.7	31.3	54.4	100	99	91	37.5	-	

S-37  
S-38  
S-39

S-26

S-40

DRY  
11/05

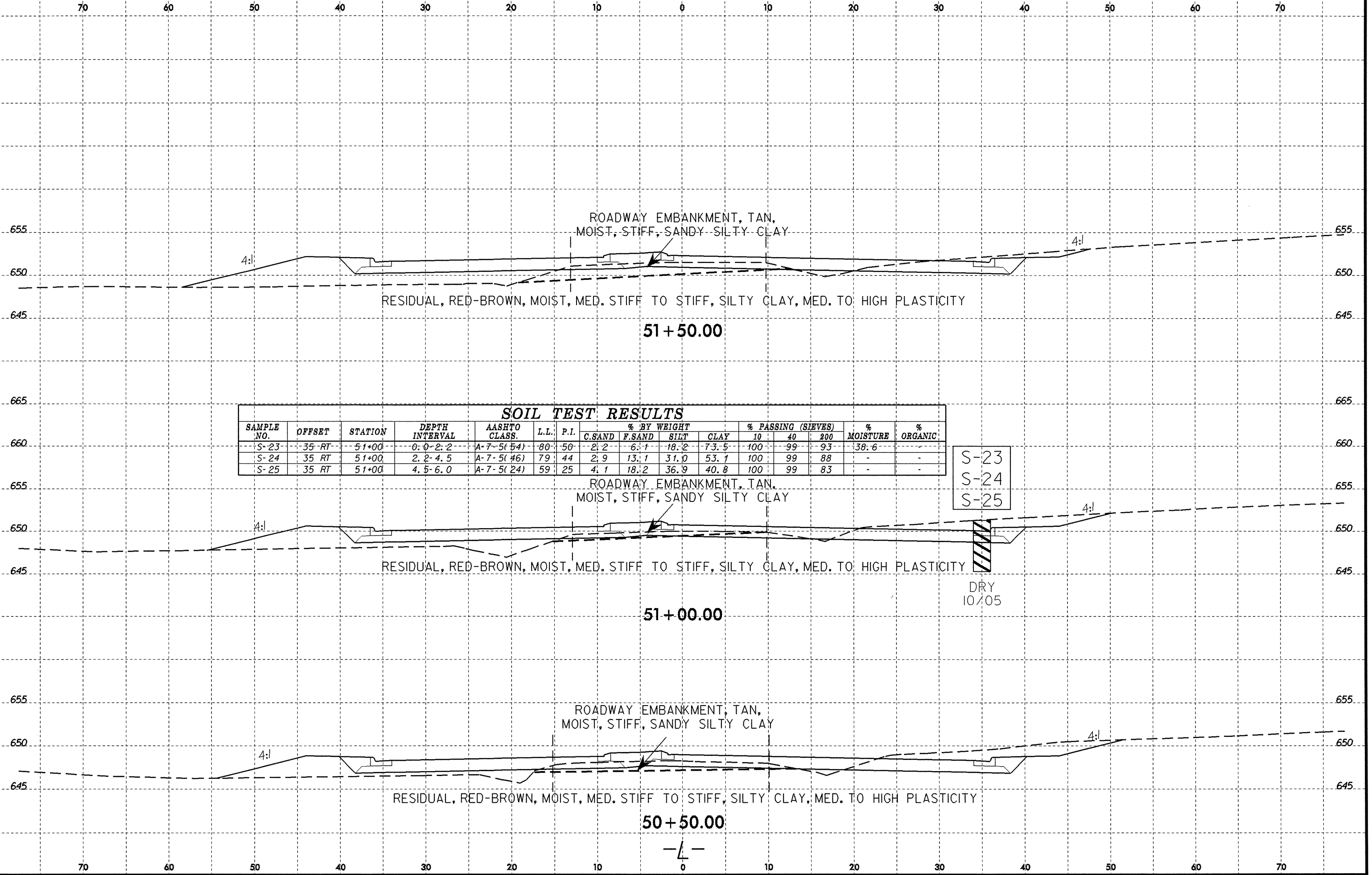
DRY  
10/05

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49+00.00

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8/23/99



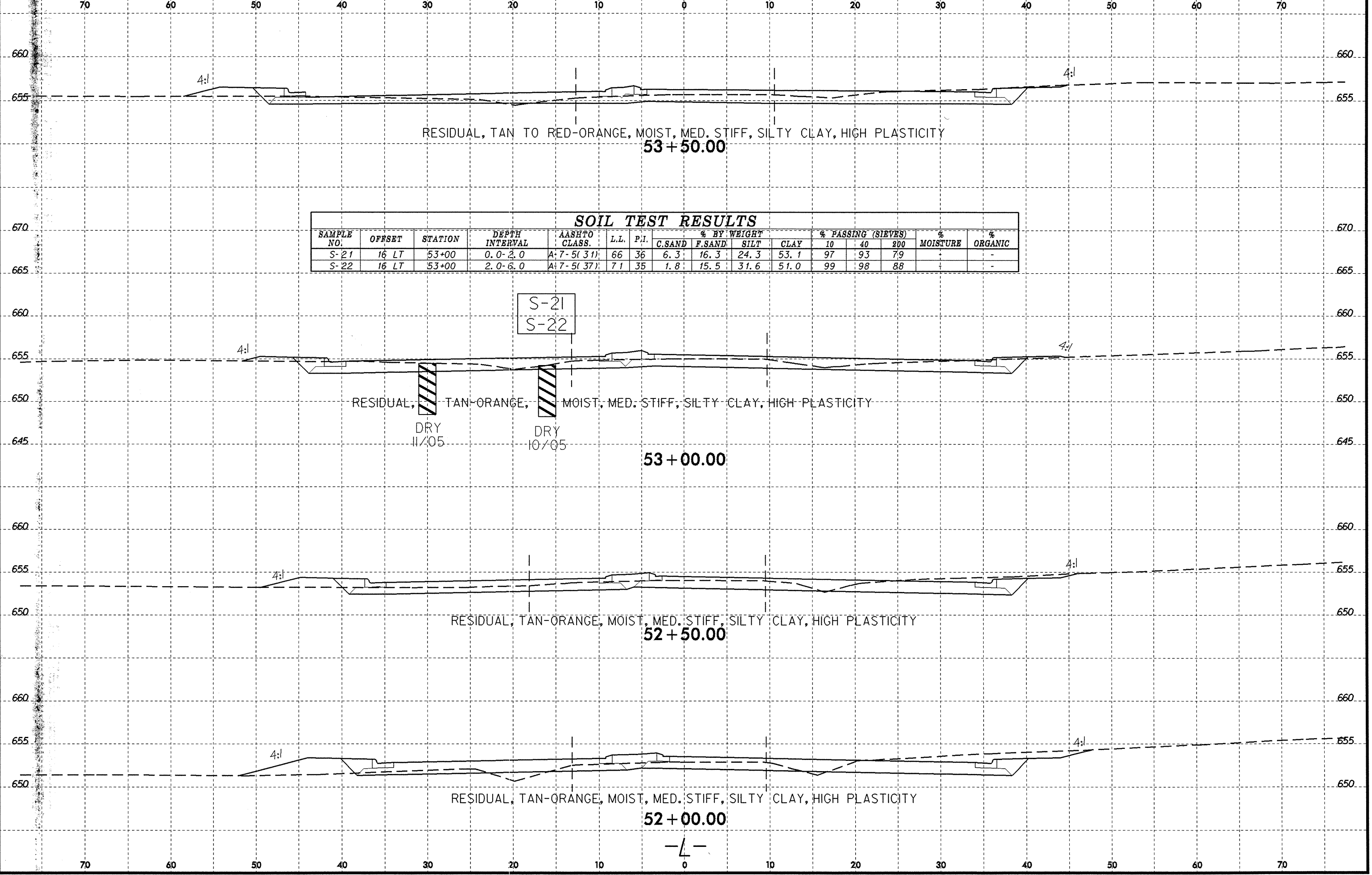
**SOIL TEST RESULTS**

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-23	35 RT	51+00	0.0-2.2	A-7-5(54)	80	50	2.2	6.1	18.2	73.5	100	99	93	38.6	-
S-24	35 RT	51+00	2.2-4.5	A-7-5(46)	79	44	2.9	13.1	31.0	53.1	100	99	88	-	-
S-25	35 RT	51+00	4.5-6.0	A-7-5(24)	59	25	4.1	18.2	36.9	40.8	100	99	83	-	-

S-23  
S-24  
S-25

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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-21	16 LT	53+00	0.0-2.0	A-7-5(31)	66	36	6.3	16.3	24.3	53.1	97	93	79	-	-
S-22	16 LT	53+00	2.0-6.0	A-7-5(37)	71	35	1.8	15.5	31.6	51.0	99	98	88	-	-

S-21  
S-22

RESIDUAL, TAN-ORANGE, MOIST, MED. STIFF, SILTY CLAY, HIGH PLASTICITY  
 DRY 11/05  
 DRY 10/05

53+00.00

RESIDUAL, TAN-ORANGE, MOIST, MED. STIFF, SILTY CLAY, HIGH PLASTICITY

52+50.00

RESIDUAL, TAN-ORANGE, MOIST, MED. STIFF, SILTY CLAY, HIGH PLASTICITY

52+00.00

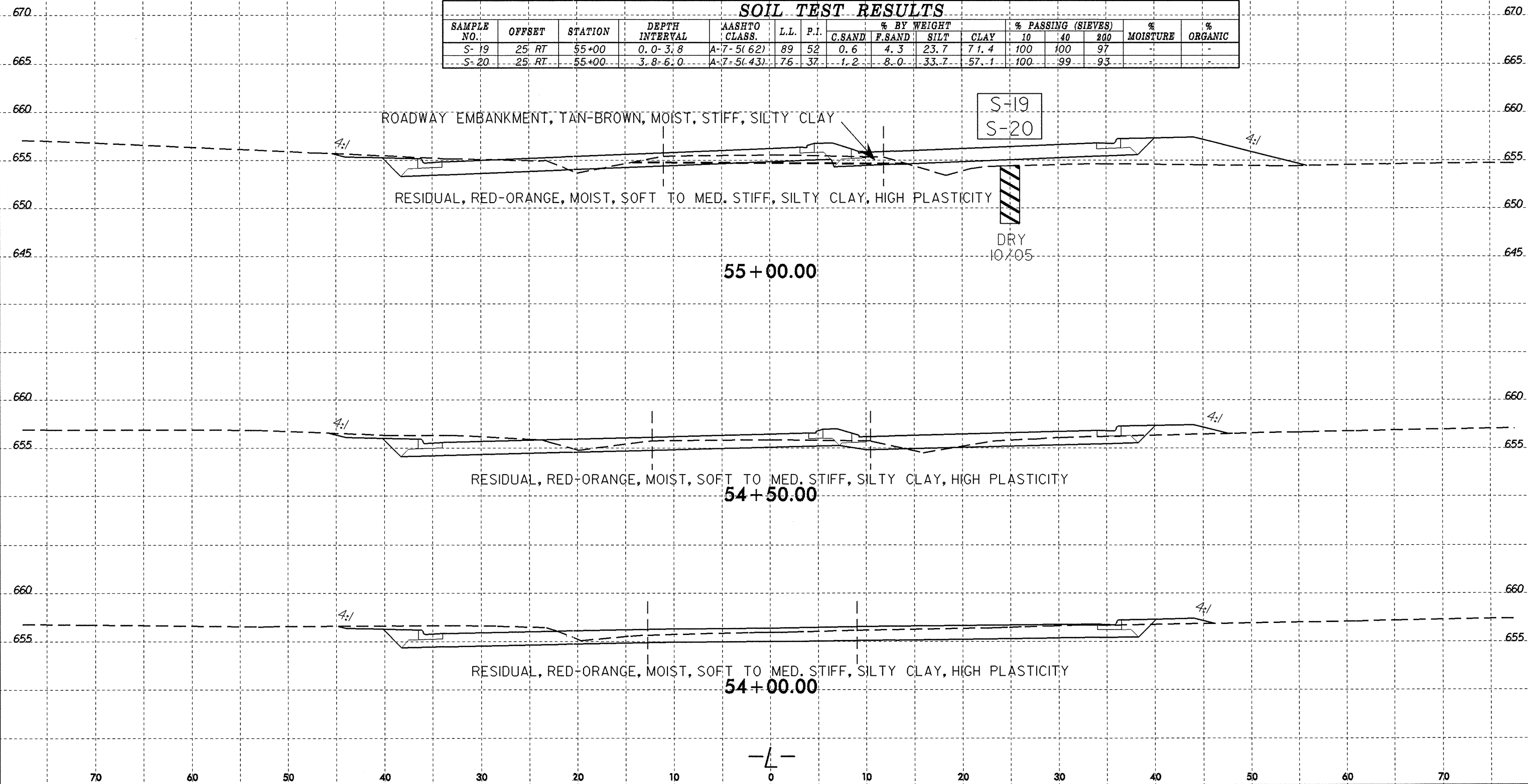
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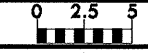
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SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-19	25 RT	55+00	0.0-3.8	A-7-5(62)	89	52	0.6	4.3	23.7	71.4	100	100	97	-	-
S-20	25 RT	55+00	3.8-6.0	A-7-5(43)	76	37	1.2	8.0	33.7	57.1	100	99	93	-	-



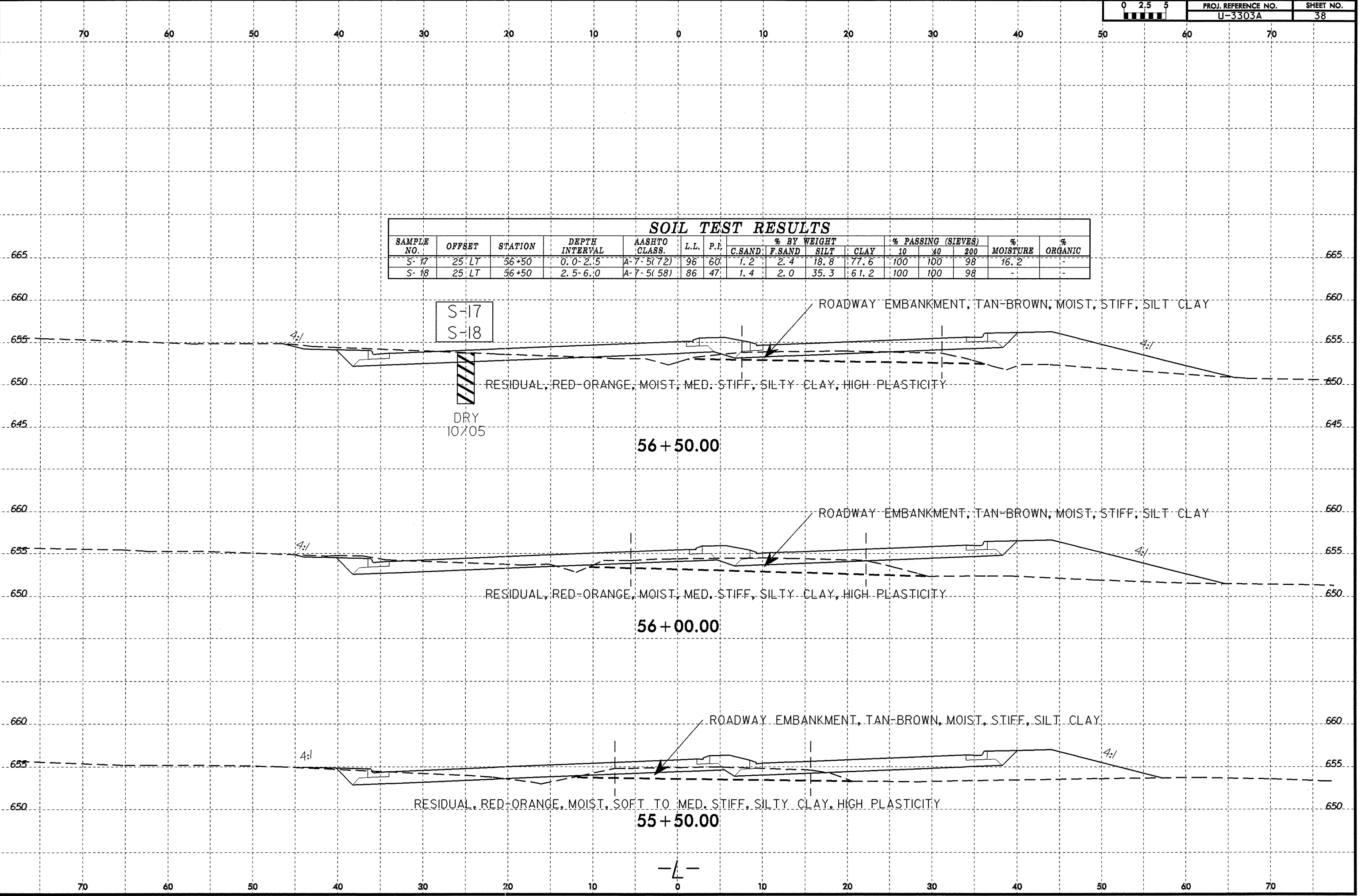
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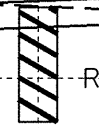
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SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-17	25 LT	56+50	0.0-2.5	A-7-5(72)	96	60	1.2	2.4	18.8	77.6	100	100	98	16.2	-
S-18	25 LT	56+50	2.5-6.0	A-7-5(58)	86	47	1.4	2.0	35.3	61.2	100	100	98	-	-



S-17  
S-18



DRY  
10/05

56 + 50.00

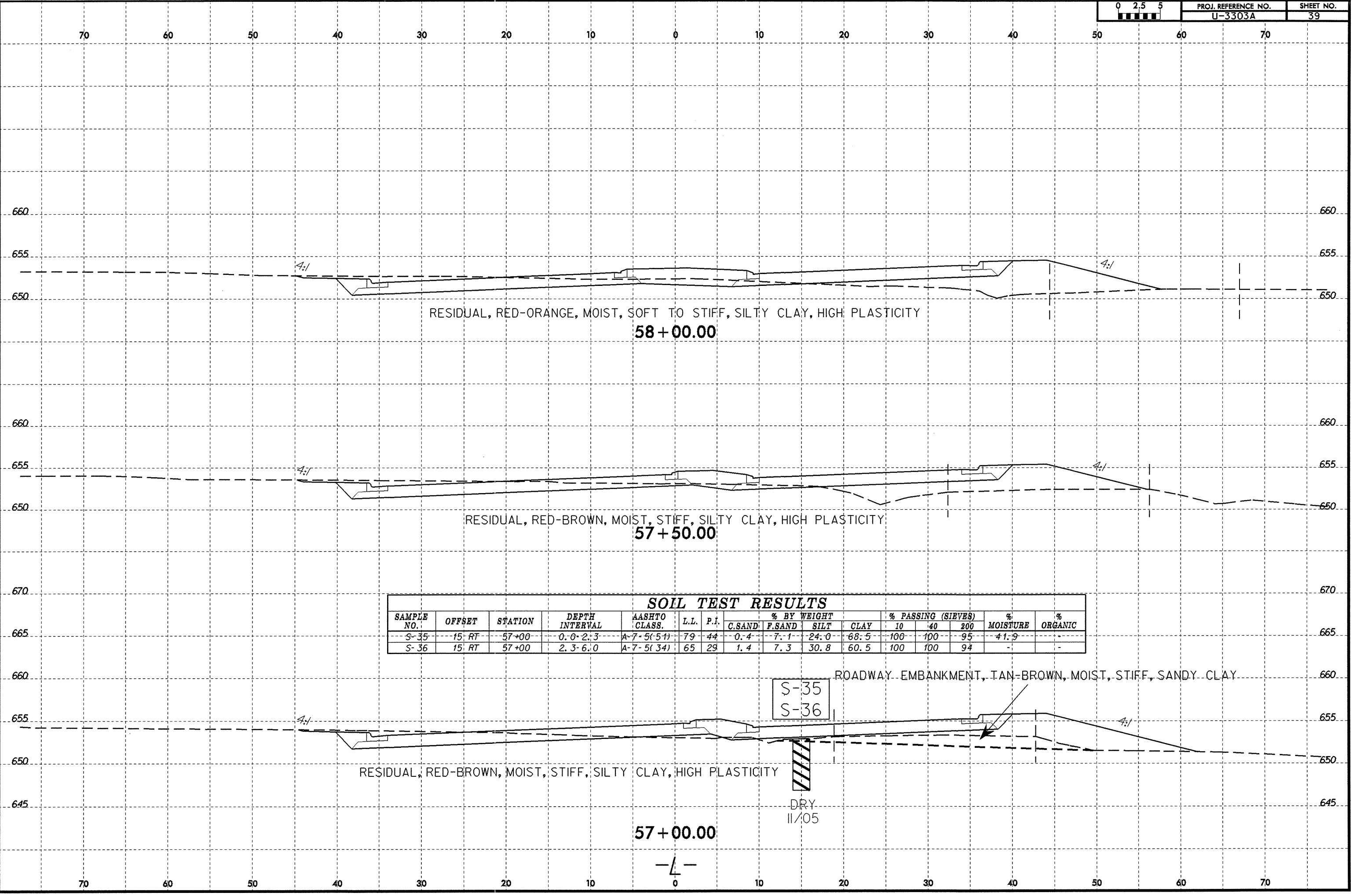
56 + 00.00

55 + 50.00



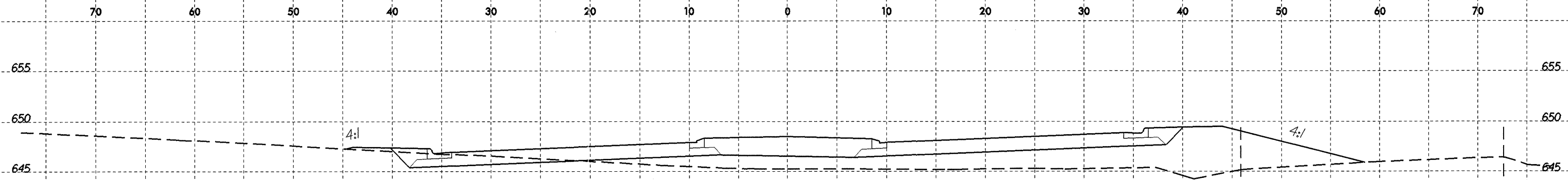
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KMiller

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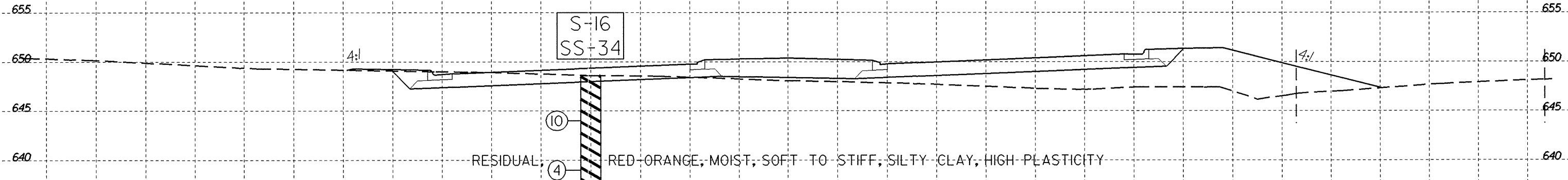
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-35	15 RT	57+00	0.0-2.3	A-7-5(51)	79	44	0.4	7.1	24.0	68.5	100	100	95	41.9	-
S-36	15 RT	57+00	2.3-6.0	A-7-5(34)	65	29	1.4	7.3	30.8	60.5	100	100	94	-	-

26 JAN 2006 18:25  
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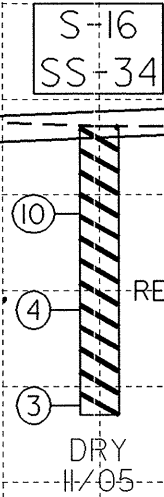


RESIDUAL, RED-ORANGE, MOIST, SOFT TO STIFF, SILTY CLAY, HIGH PLASTICITY  
**59+50.00**

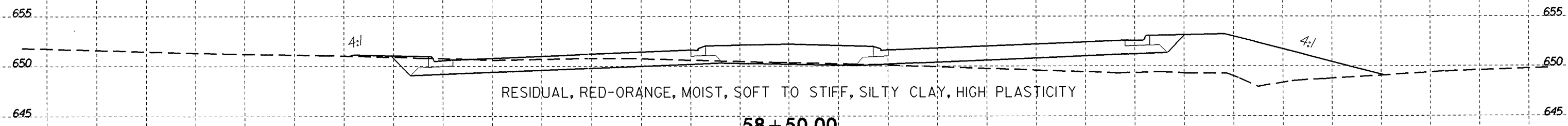
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-16	20 LT	59+00	0.0-1.8	A-7-5(42)	73	43	4.9	10.6	21.2	63.3	99	97	86	-	-
SS-34	20 LT	59+00	8.6-10.1	A-7-5(35)	71	32	1.4	13.7	38.5	46.4	100	100	89	-	-



RESIDUAL, RED-ORANGE, MOIST, SOFT TO STIFF, SILTY CLAY, HIGH PLASTICITY



**59+00.00**

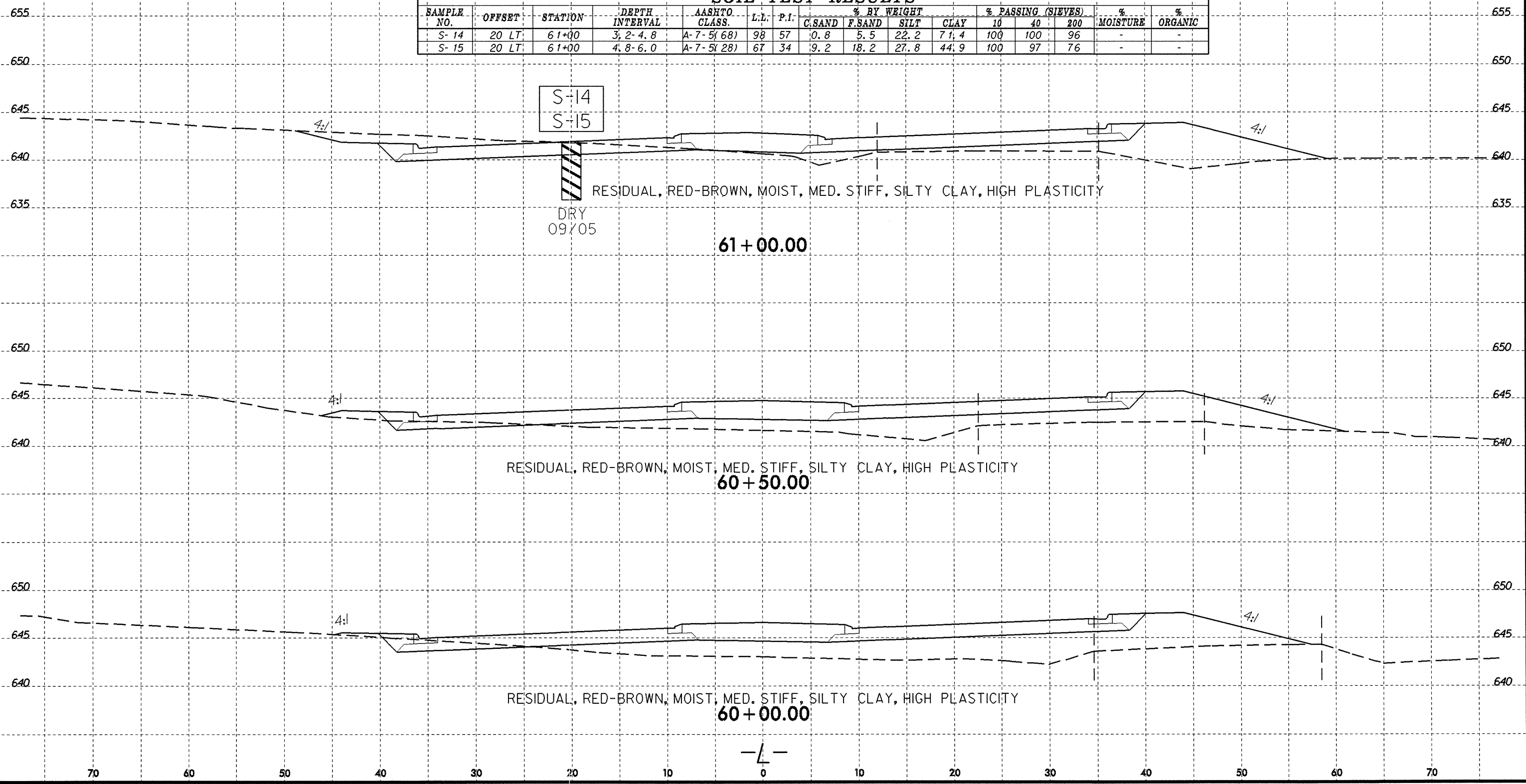


RESIDUAL, RED-ORANGE, MOIST, SOFT TO STIFF, SILTY CLAY, HIGH PLASTICITY

**58+50.00**

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-14	20 LT	61+00	3.2-4.8	A-7-5(68)	98	57	0.8	5.5	22.2	71.4	100	100	96	-	-
S-15	20 LT	61+00	4.8-6.0	A-7-5(28)	67	34	9.2	18.2	27.8	44.9	100	97	76	-	-

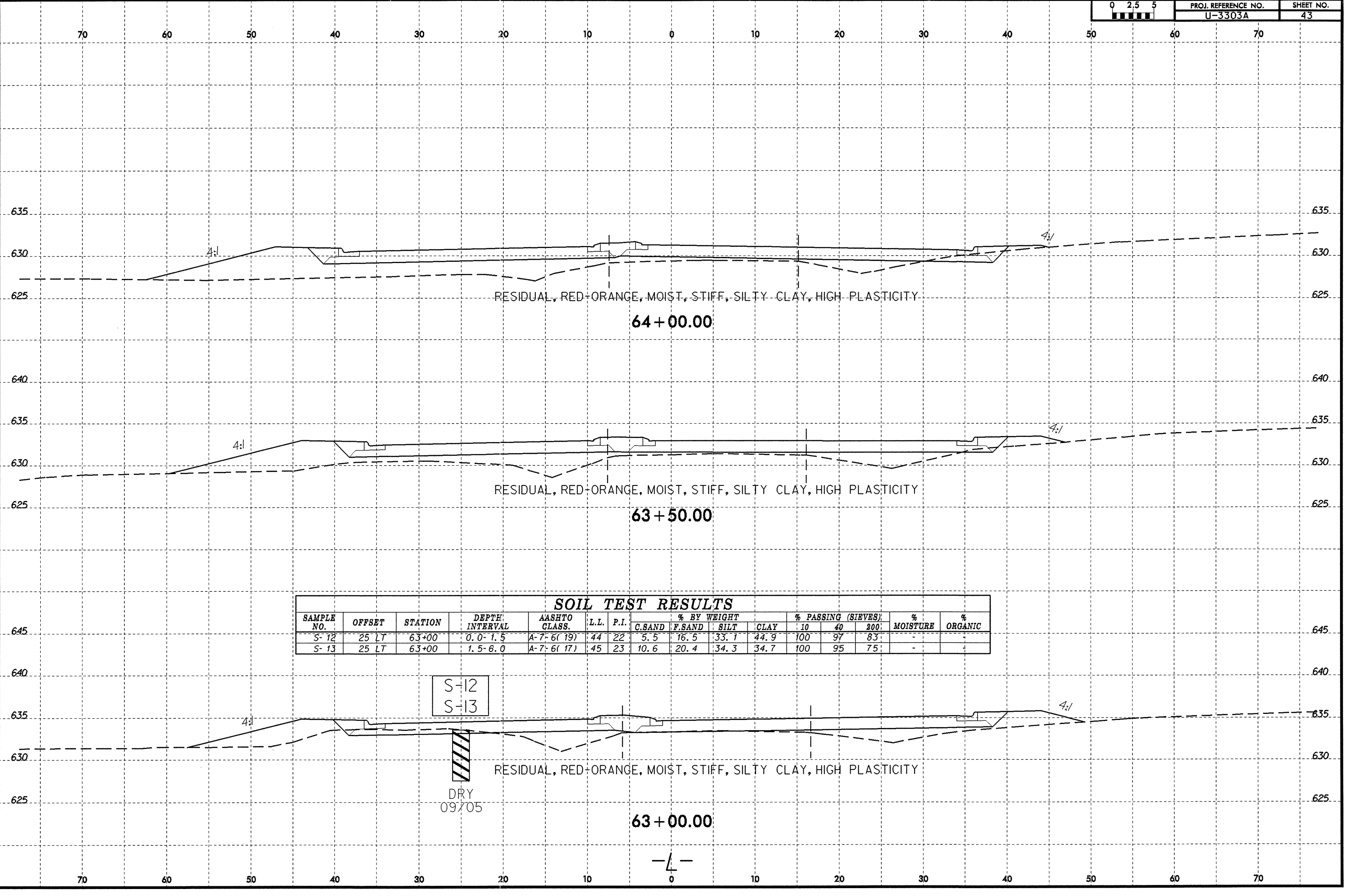
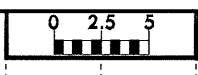


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 K Miller  
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-4-



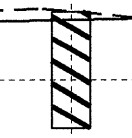
8/23/99



**SOIL TEST RESULTS**

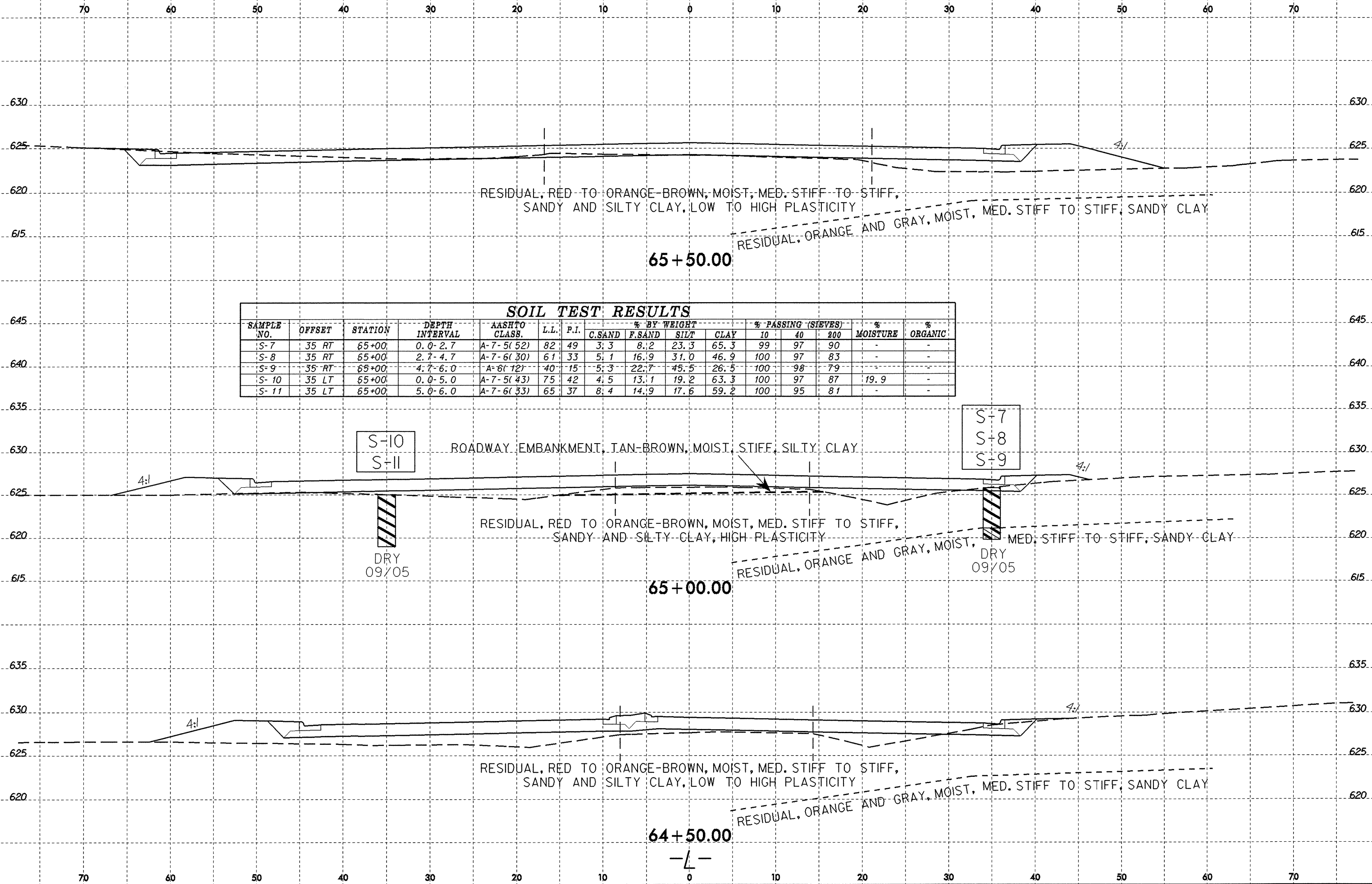
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							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-12	25 LT	63+00	0.0-1.5	A-7-6(19)	44	22	5.5	16.5	33.7	44.9	100	97	83	-	-
S-13	25 LT	63+00	1.5-6.0	A-7-6(17)	45	23	10.6	20.4	34.3	34.7	100	95	75	-	-

S-12  
S-13



DRY  
09/05

26 JAN 2006 18:25  
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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-7	35 RT	65+00	0.0-2.7	A-7-5(52)	82	49	3.3	8.2	23.3	65.3	99	97	90	-	-
S-8	35 RT	65+00	2.7-4.7	A-7-6(30)	61	33	5.1	16.9	31.0	46.9	100	97	83	-	-
S-9	35 RT	65+00	4.7-6.0	A-6(12)	40	15	5.3	22.7	45.5	26.5	100	98	79	-	-
S-10	35 LT	65+00	0.0-5.0	A-7-5(43)	75	42	4.5	13.1	19.2	63.3	100	97	87	19.9	-
S-11	35 LT	65+00	5.0-6.0	A-7-6(33)	65	37	8.4	14.9	17.6	59.2	100	95	81	-	-

70 60 50 40 30 20 10 0 10 20 30 40 50 60 70

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625 625

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70 60 50 40 30 20 10 0 10 20 30 40 50 60 70

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-3	30' LT	67+00	1.0-2.0	A-4(4)	28	9	9.6	28.2	37.8	24.5	98	93	71	-	-
S-4	30' LT	67+00	3.0-3.5	A-4(3)	25	8	11.8	29.8	35.9	22.4	97	90	65	-	-
S-5	30' LT	67+00	5.0-5.5	A-6(9)	37	17	16.7	24.1	28.6	30.6	96	86	63	-	-
S-6	30' LT	67+00	5.5-6.0	A-7-6(25)	55	34	9.4	20.2	27.6	42.9	97	92	74	-	-

S-3  
S-4  
S-5  
S-6

4:1  
RESIDUAL, RED-BROWN, DRY TO WET, MED. STIFF, SANDY SILT  
RESIDUAL, TAN AND GRAY, WET, MED. STIFF TO STIFF, SANDY AND SILTY CLAY, MED. TO HIGH PLASTICITY  
67+00.00

4:1  
RESIDUAL, RED-BROWN, DRY TO WET, MED. STIFF, SANDY SILT  
66+50.00

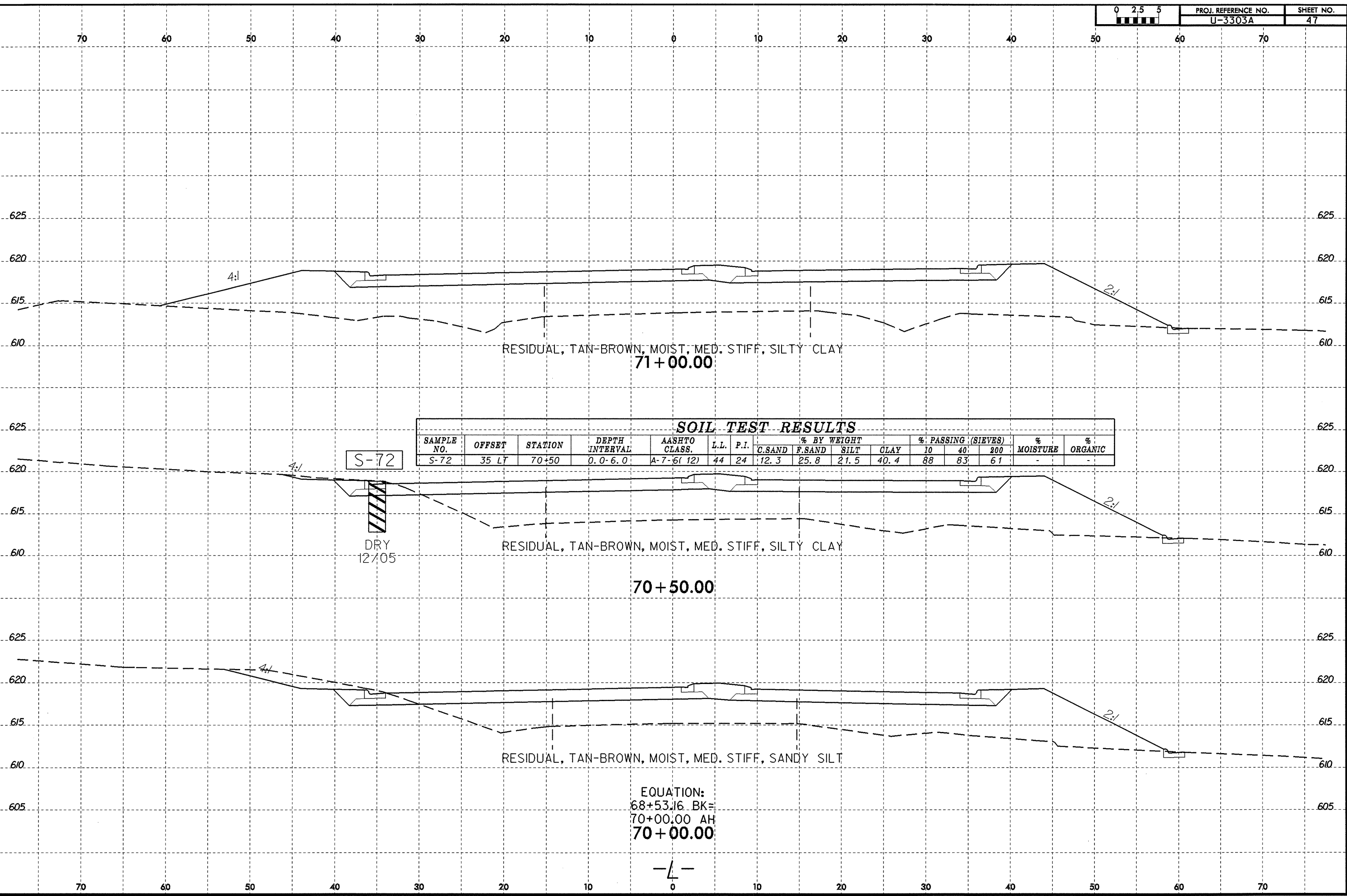
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RESIDUAL, RED TO ORANGE-BROWN, MOIST, MED. STIFF TO STIFF, SILTY CLAY, HIGH PLASTICITY  
66+00.00

-L-





8/23/95



**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-72	35 LT	70+50	0.0-6.0	A-7-6(12)	44	24	12.3	25.8	21.5	40.4	88	83	61	-	-

EQUATION:  
68+53.16 BK=  
70+00.00 AH  
70+00.00

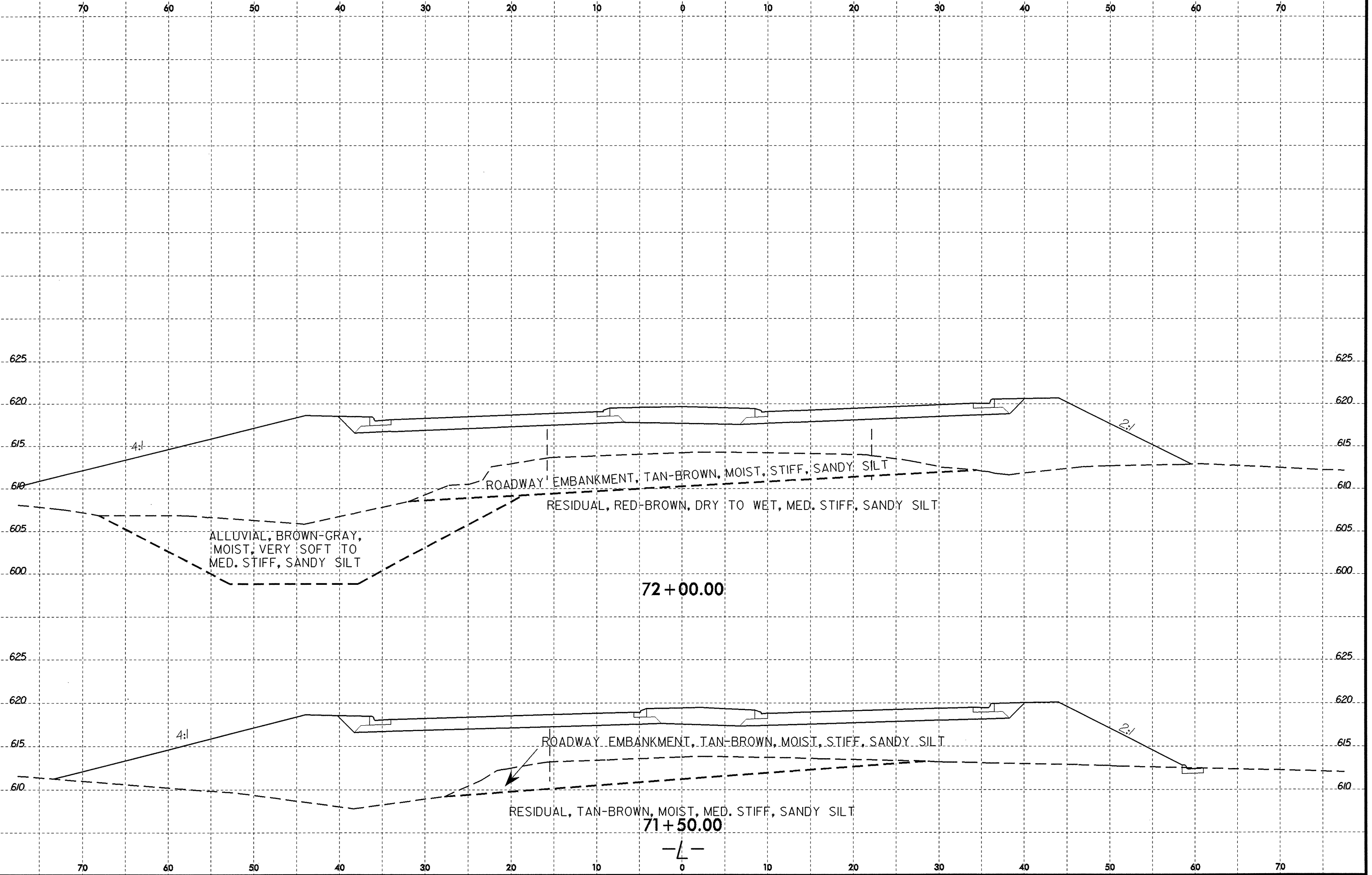
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KMiller

8/23/96

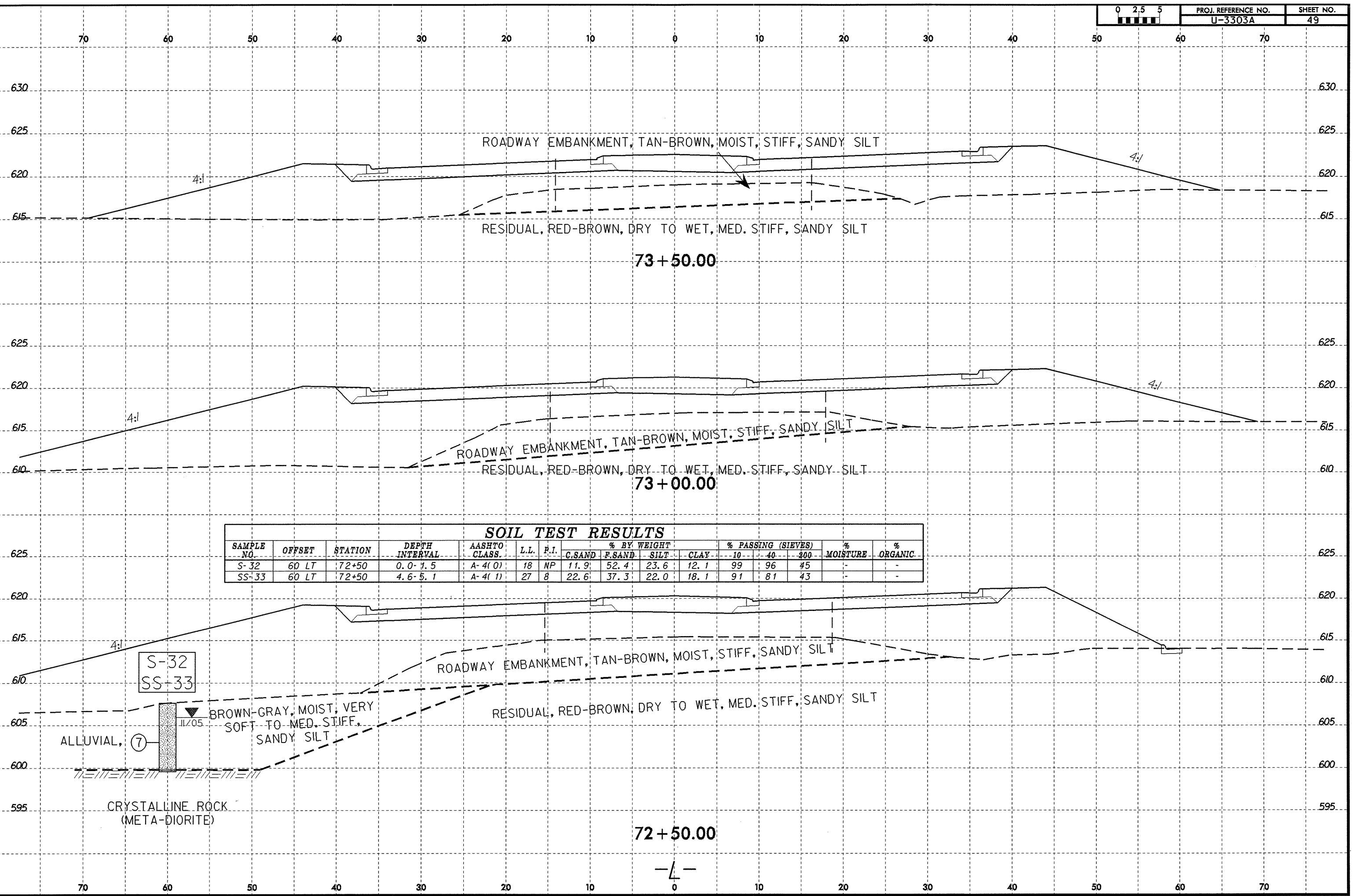


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U-3303A	48



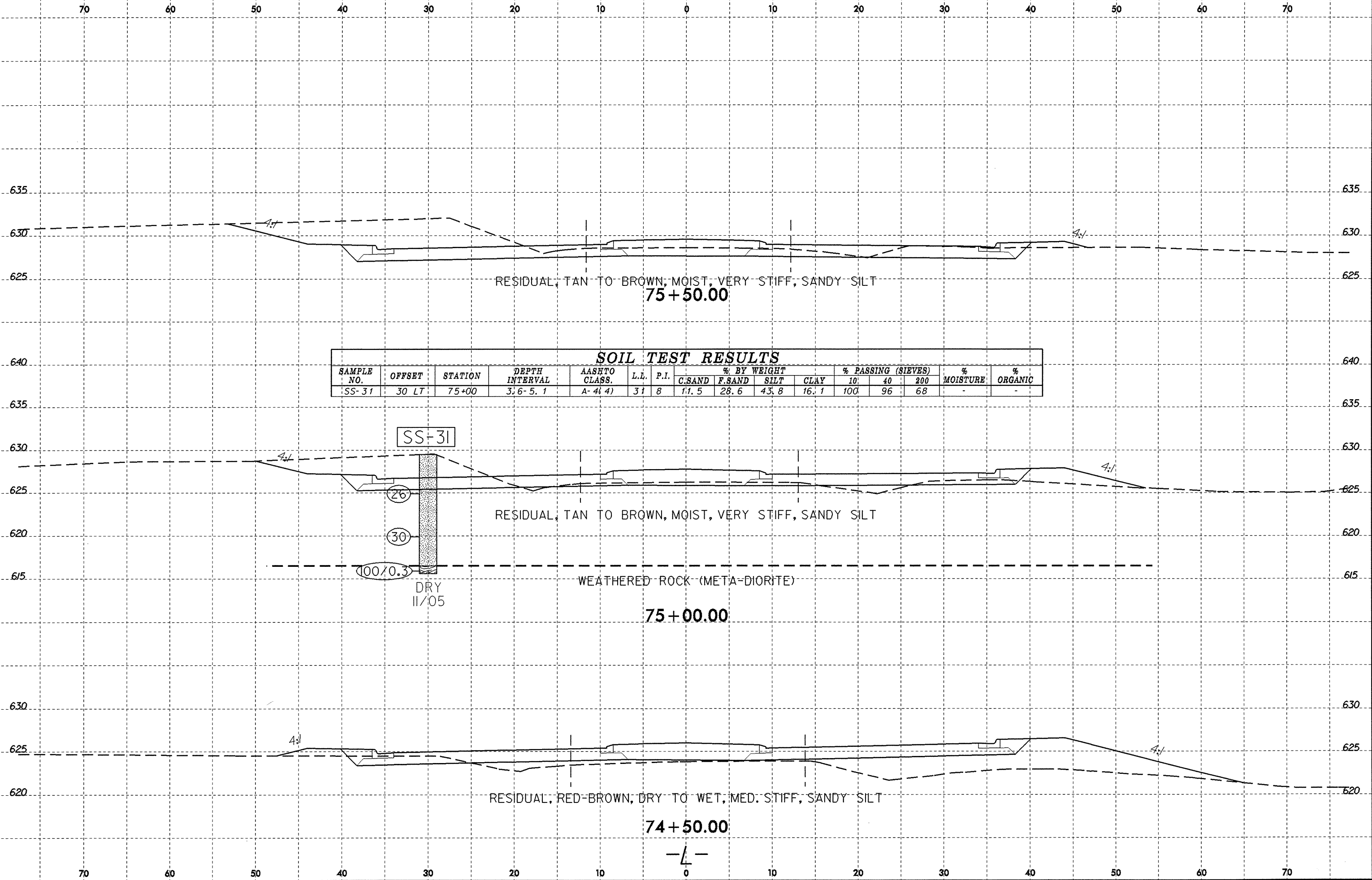
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 KMiller

8/23/95



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8/23/99

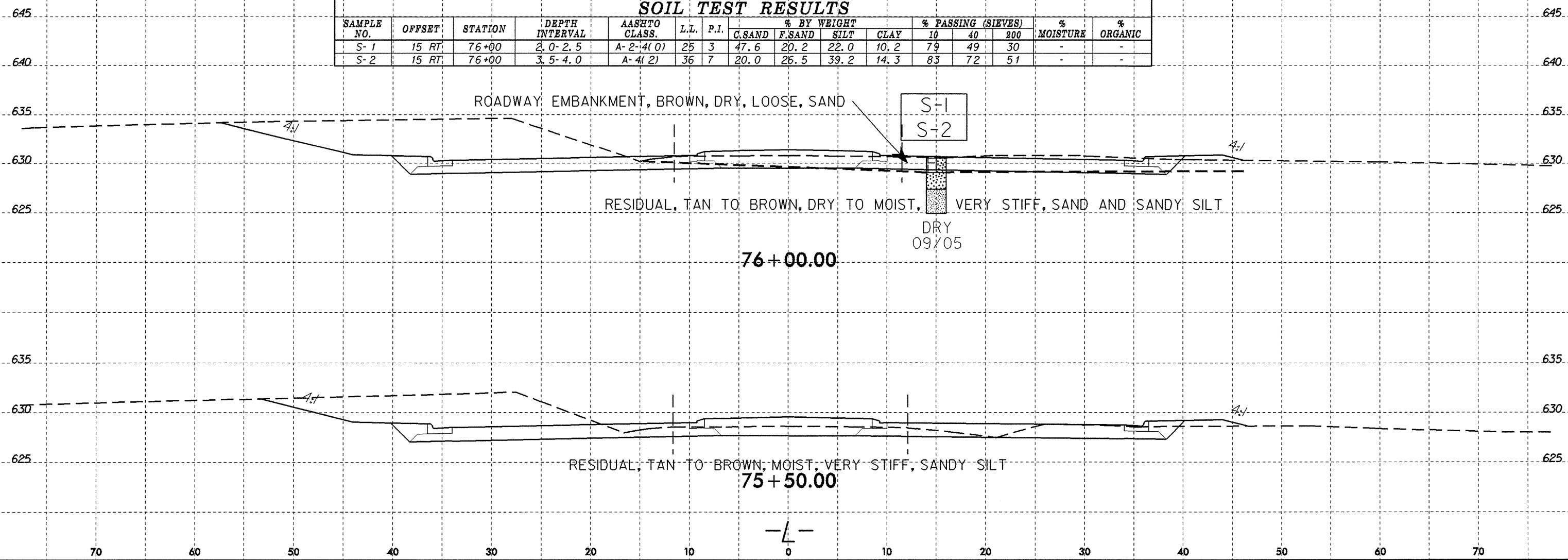


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 KMiller

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 Miller

70 60 50 40 30 20 10 0 10 20 30 40 50 60 70

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	15 RT	76+00	2.0-2.5	A-2-4(0)	25	3	47.6	20.2	22.0	10.2	79	49	30	-	-
S-2	15 RT	76+00	3.5-4.0	A-4(2)	36	7	20.0	26.5	39.2	14.3	83	72	51	-	-



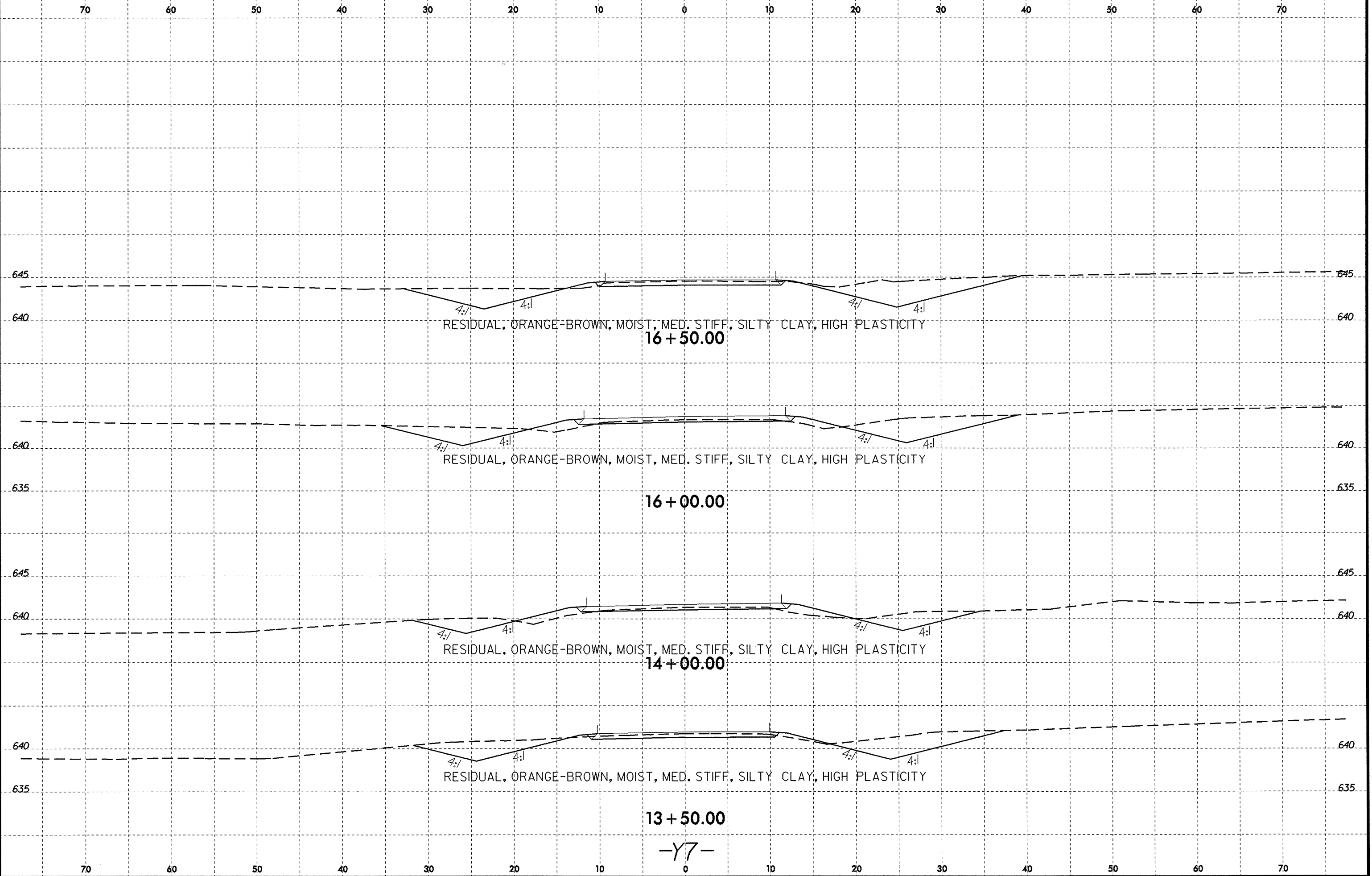
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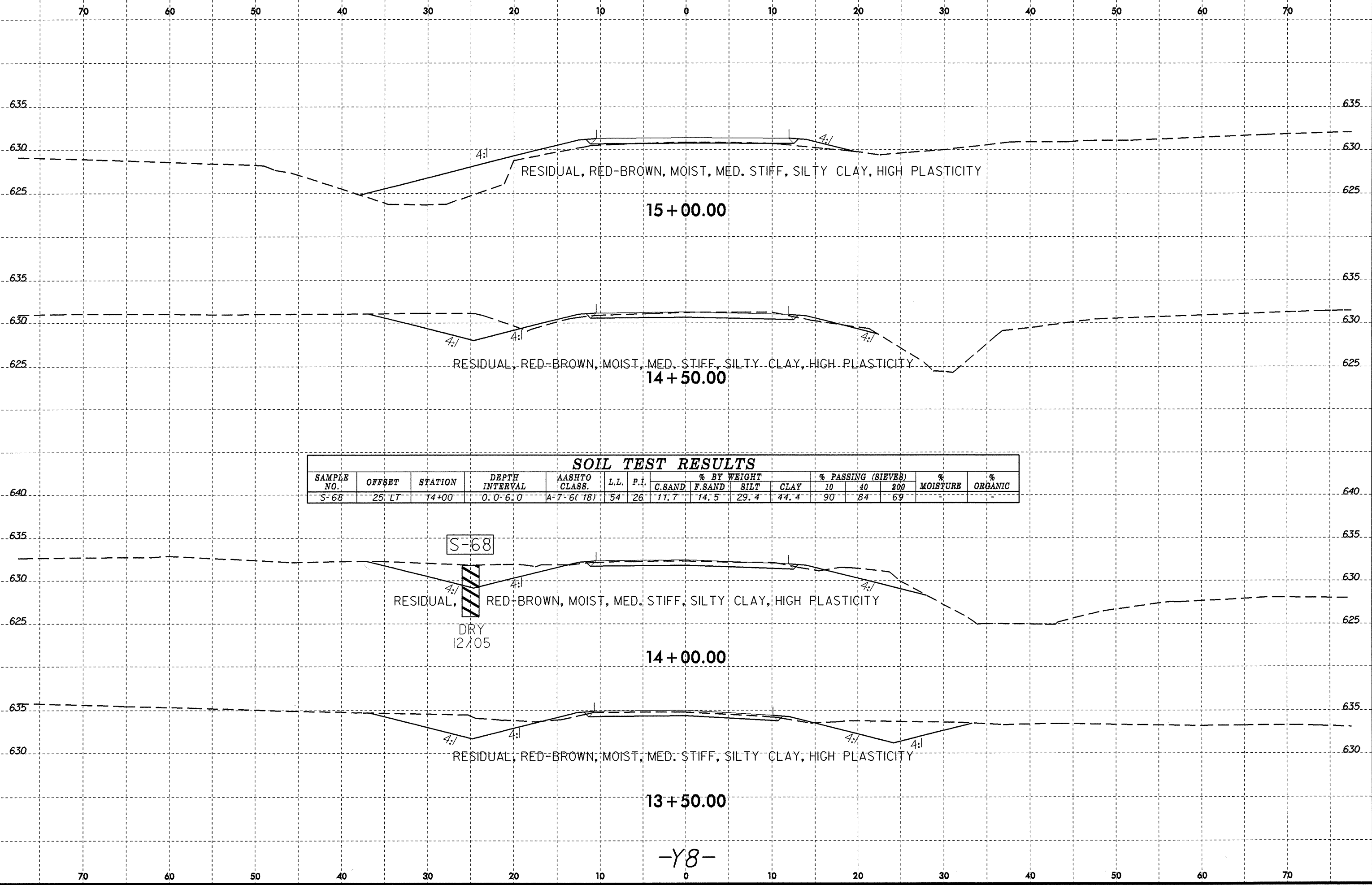
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KMiller AT 06321408



13+50.00

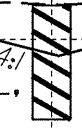
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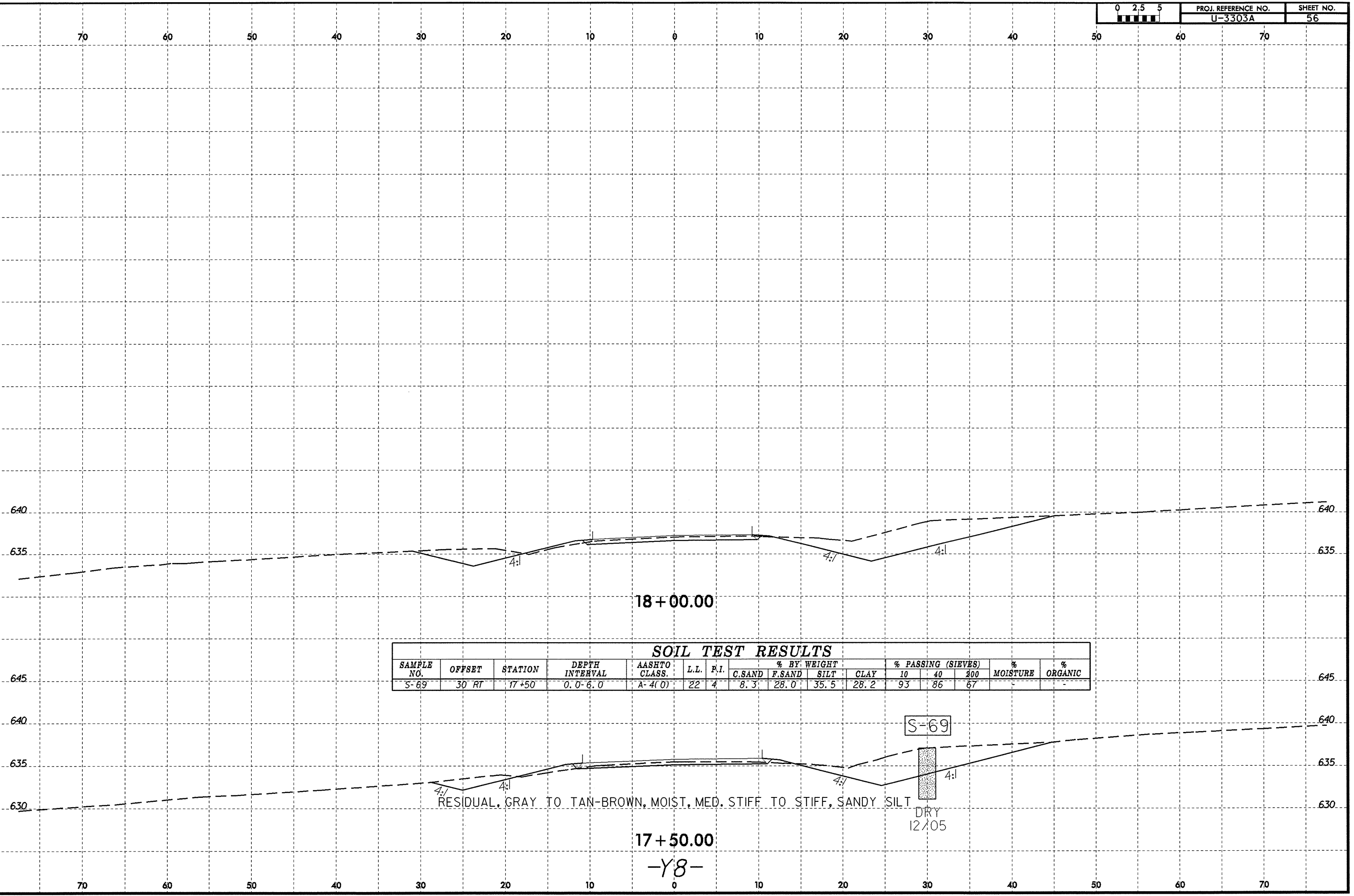
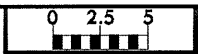
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-68	25' LT	14+00	0.0-6.0	A-7-6(18)	54	26	11.7	14.5	29.4	44.4	90	84	69		

S-68



DRY  
12/05

8/23/95



18+00.00

17+50.00

-Y8-

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							G.SAND	F.SAND	SILT	CLAY	10	40	200		
S-69	30 RT	17+50	0.0-6.0	A-4(0)	22	4	8.3	28.0	35.5	28.2	93	86	67	-	-

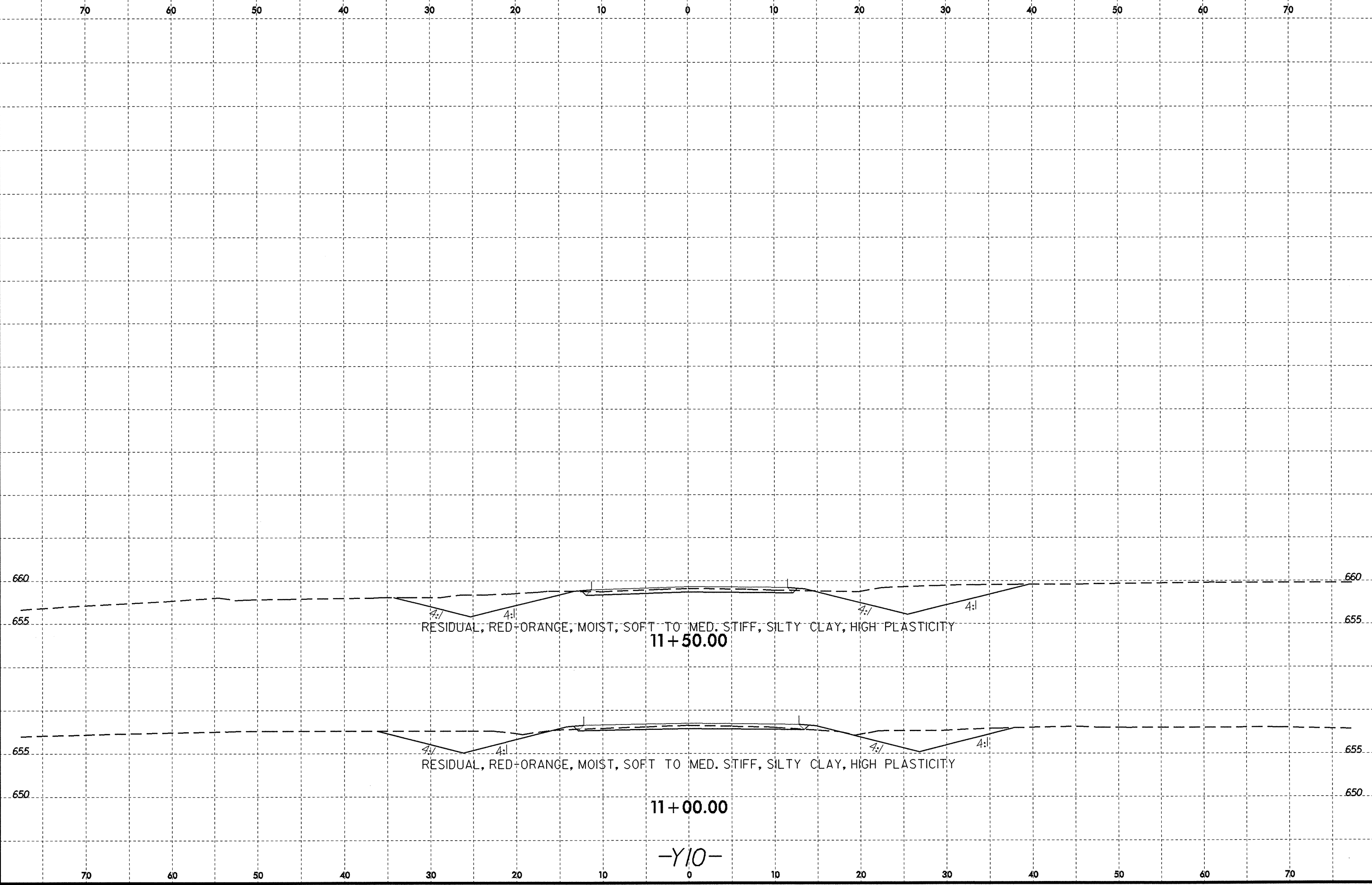
RESIDUAL, GRAY TO TAN-BROWN, MOIST, MED. STIFF TO STIFF, SANDY SILT

S-69

DRY  
12/05

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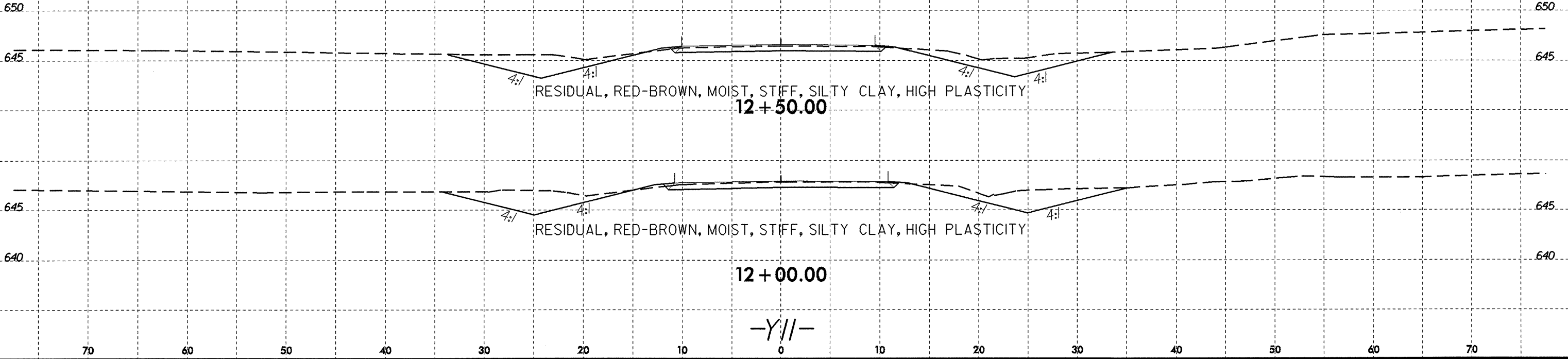
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8/23/93



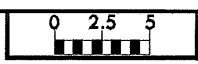
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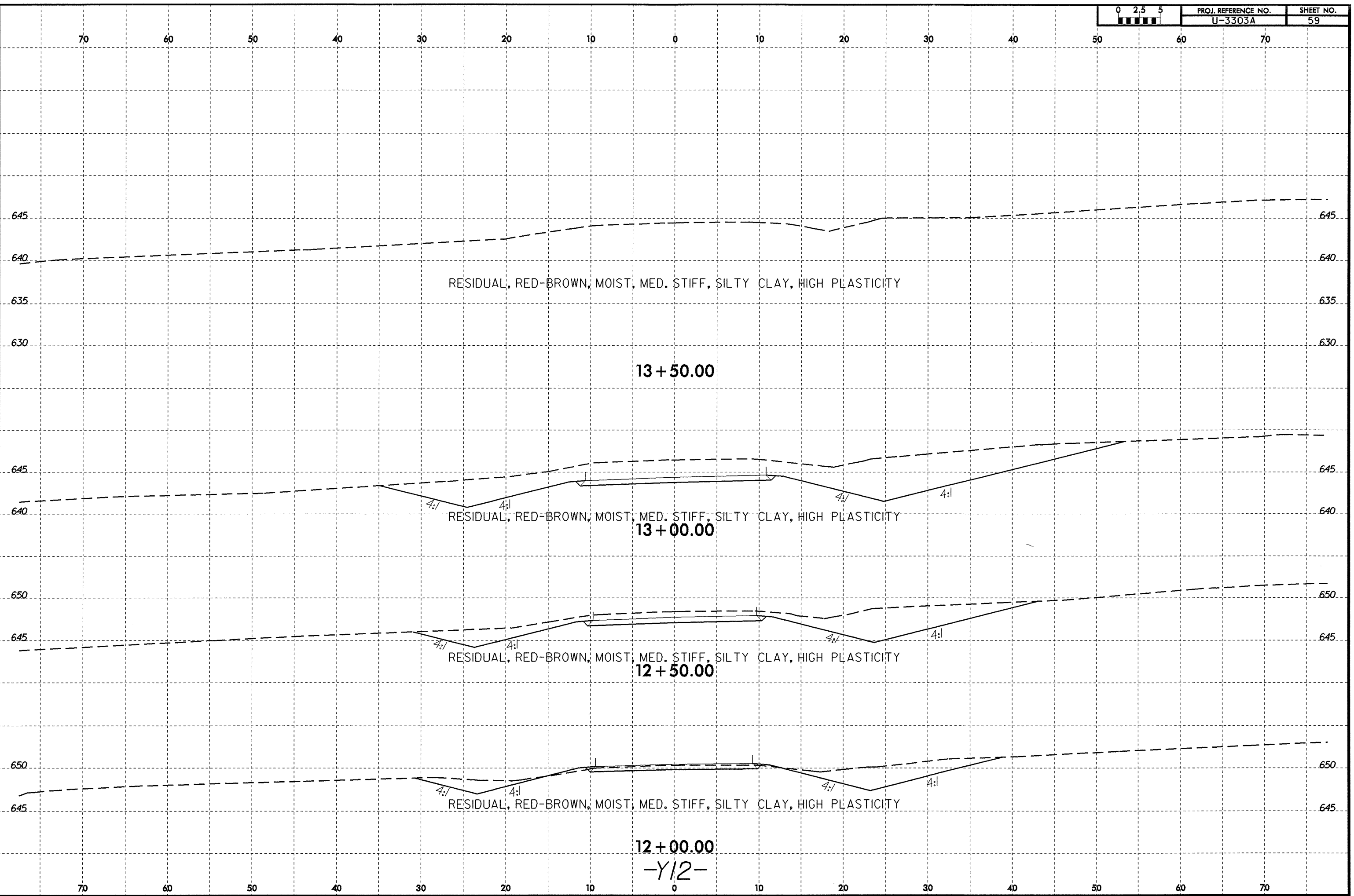


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 jreid

8/23/95



PROJ. REFERENCE NO.	SHEET NO.
U-3303A	59



13 + 50.00

13 + 00.00

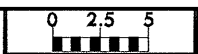
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12 + 00.00

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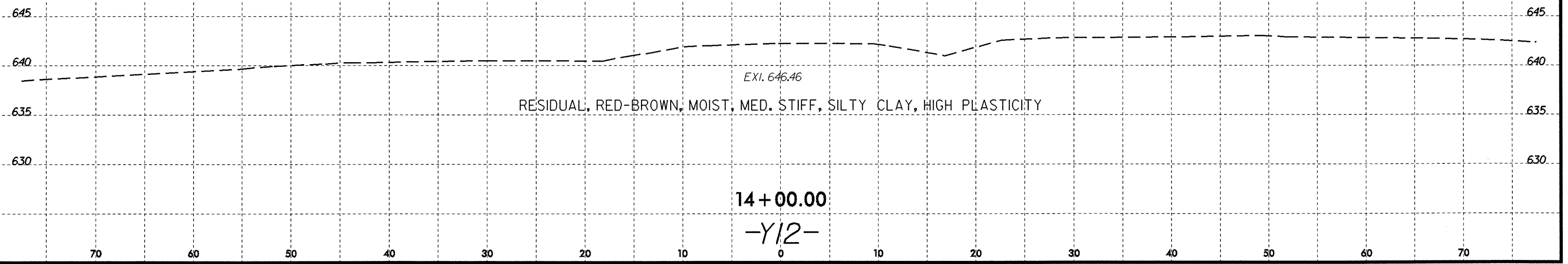
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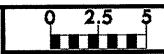
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 K Miller

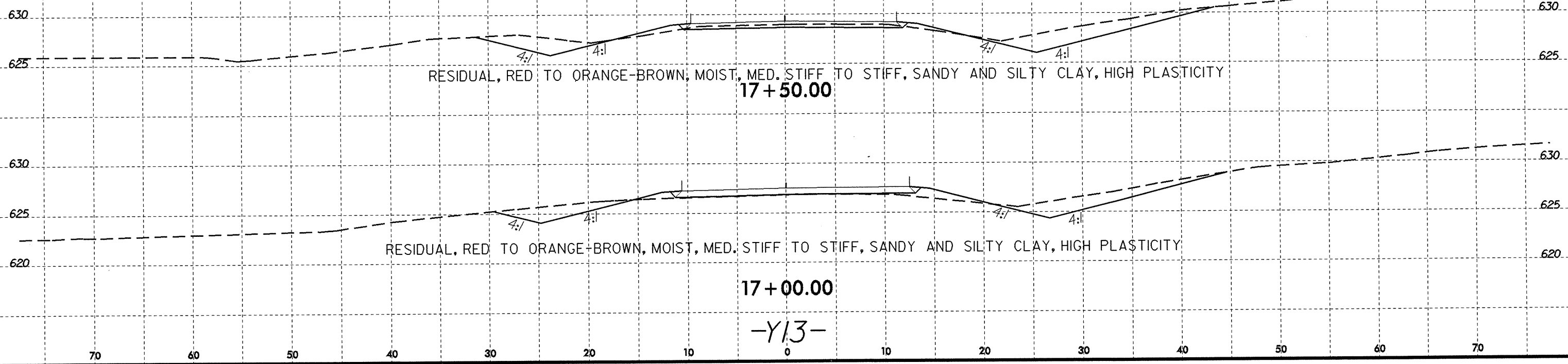
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PROJ. REFERENCE NO.  
U-3303A

SHEET NO.  
61

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RESIDUAL, RED TO ORANGE-BROWN, MOIST, MED. STIFF TO STIFF, SANDY AND SILTY CLAY, HIGH PLASTICITY  
17+50.00

RESIDUAL, RED TO ORANGE-BROWN, MOIST, MED. STIFF TO STIFF, SANDY AND SILTY CLAY, HIGH PLASTICITY  
17+00.00

-Y13-

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Kbml1er



**CONTENTS**

LINE	STATION	PLAN	XSECTS
-L-	72+30-144+00	4-9	10-24
-Y1-	12+91-23+00	5	25
-Y14-	16+00-24+10	9	25

NOTE: REFER TO SHEET 2A FOR PLAN SHEET LAYOUT AT THE TIME OF INVESTIGATION

**STATE OF NORTH CAROLINA**

**DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
GEOTECHNICAL UNIT**

**ROADWAY  
SUBSURFACE INVESTIGATION**

STATE PROJ. 34911.1.1 I.D. U-3303B F.A. PROJ. STP-1306(8)

COUNTY ALAMANCE

PROJECT DESCRIPTION BURLINGTON- SR 1306-1363 (MEBANE ST.)  
FROM NC 62 TO NC 54 (CHAPEL HILL RD.)

**INVENTORY**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3303B	1	25
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34911.1.1	STP-1306(8)	P.E.	
34911.2.3	STP-1306(15)	R/W	
34911.3.2	STP-1306(15)	CONSTR.	

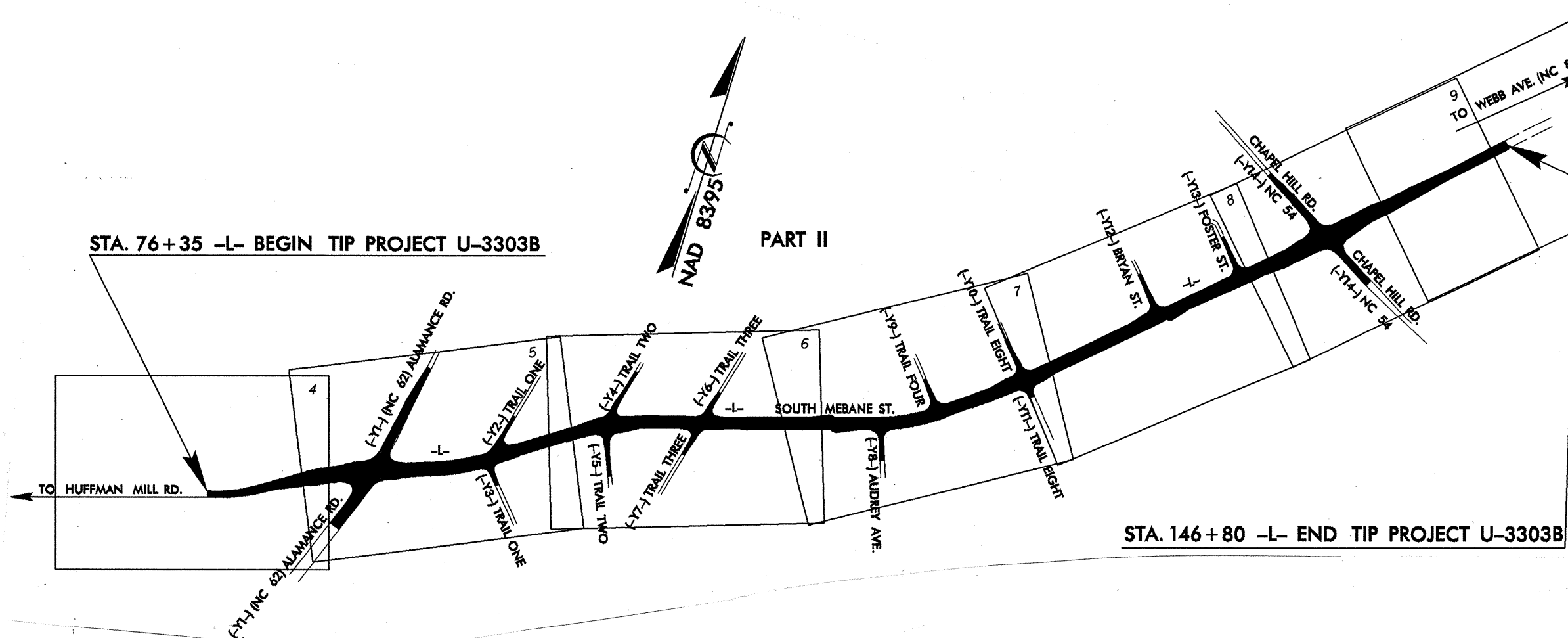
**CAUTION NOTICE**

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) 250-4009. 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.

PROJECT: C201966 ID: U-3303B



STA. 76+35 -L- BEGIN TIP PROJECT U-3303B

PART II

STA. 146+80 -L- END TIP PROJECT U-3303B

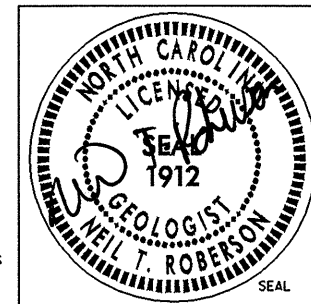
- PERSONNEL
- E. C. CAMPBELL
  - O. B. OTI
  - H. R. CONLEY
  - D. W. DIXON
  - C. E. POPE
  - W. T. DUGGINS

INVESTIGATED BY N. T. ROBERSON  
 CHECKED BY D. N. ARGENBRIGHT  
 SUBMITTED BY K. J. KIM  
 DATE DECEMBER, 2003

DRAWN BY: A. N. KARPA

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

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
U-3303B	34911.1	2	25

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 SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY 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 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="4">GRANULAR MATERIALS (&lt;math&gt;55\%&lt;/math&gt; PASSING #200)</th> <th colspan="4">SILT-CLAY MATERIALS (&lt;math&gt;1-85\%&lt;/math&gt; PASSING #200)</th> <th colspan="4">ORGANIC MATERIALS</th> </tr> <tr> <th>GROUP CLASS.</th> <th>A-1</th> <th>A-3</th> <th colspan="2">A-2</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-4, A-5</th> <th>A-6, A-7</th> <th colspan="3"></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 colspan="3"></td> </tr> <tr> <th>% PASSING</th> <td>50 MX</td> <td>30 MX</td> <td>50 MX</td> <td>50 MN</td> <td>35 MX</td> <td>35 MN</td> <td>35 MN</td> <td>35 MN</td> <td>35 MN</td> <td>35 MN</td> <td>35 MN</td> <td colspan="3"></td> </tr> <tr> <th>LIQUID LIMIT INDEX</th> <td>6 MX</td> <td>N.P.</td> <td>10 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>10 MN</td> <td colspan="3"></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>20 MX</td> <td>20 MN</td> <td>20 MN</td> <td>20 MN</td> <td colspan="3"></td> </tr> <tr> <th>USUAL TYPES OF MAJOR MATERIALS</th> <td>STONE FRAGS. 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ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.</p> <p>COMPRESSIBILITY</p> <p>SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 30</p> <p>MODERATELY COMPRESSIBLE LIQUID LIMIT 31-50</p> <p>HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50</p>		<p>MINERALOGICAL COMPOSITION</p> <p>PERCENTAGE OF MATERIAL</p> <table border="1"> <tr> <th>ORGANIC MATERIAL</th> <th>GRANULAR SOILS</th> <th>SILT-CLAY SOILS</th> <th>OTHER MATERIAL</th> </tr> <tr> <td>TRACE OF ORGANIC MATTER</td> <td>2 - 3%</td> <td>3 - 5%</td> <td>TRACE 1 - 10%</td> </tr> <tr> <td>LITTLE ORGANIC MATTER</td> <td>3 - 5%</td> <td>5 - 12%</td> <td>LITTLE 10 - 20%</td> </tr> <tr> <td>MODERATELY ORGANIC</td> <td>5 - 10%</td> <td>12 - 20%</td> <td>SOME 20 - 35%</td> </tr> <tr> <td>HIGHLY ORGANIC</td> <td>&gt;10%</td> <td>&gt;20%</td> <td>HIGHLY 35% AND ABOVE</td> </tr> </table>		ORGANIC MATERIAL	GRANULAR SOILS	SILT-CLAY SOILS	OTHER MATERIAL	TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE 1 - 10%	LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE 10 - 20%	MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME 20 - 35%	HIGHLY ORGANIC	>10%	>20%	HIGHLY 35% AND ABOVE	<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. SLI.) 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 (SLI.) 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. 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QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.</p>	
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<p>TEXTURE OR GRAIN SIZE</p> <table border="1"> <tr> <th>U.S. STD. SIEVE SIZE OPENING (MM)</th> <th>4</th> <th>10</th> <th>40</th> <th>60</th> <th>200</th> <th>270</th> </tr> <tr> <td></td> <td>4.76</td> <td>2.0</td> <td>0.42</td> <td>0.25</td> <td>0.075</td> <td>0.053</td> </tr> </table> <table border="1"> <tr> <th>BOULDER (BLDR.)</th> <th>COBBLE (COB.)</th> <th>GRAVEL (GR.)</th> <th>COARSE SAND (CSE. SD.)</th> <th>FINE SAND (F. SD.)</th> <th>SILT (SL.)</th> <th>CLAY (CL.)</th> </tr> <tr> <td>GRAIN SIZE MM 305 IN. 12"</td> <td>75 3"</td> <td>2.0</td> <td>0.25</td> <td>0.05</td> <td>0.005</td> <td></td> </tr> </table>		U.S. STD. SIEVE SIZE OPENING (MM)	4	10	40	60	200	270		4.76	2.0	0.42	0.25	0.075	0.053	BOULDER (BLDR.)	COBBLE (COB.)	GRAVEL (GR.)	COARSE SAND (CSE. SD.)	FINE SAND (F. SD.)	SILT (SL.)	CLAY (CL.)	GRAIN SIZE MM 305 IN. 12"	75 3"	2.0	0.25	0.05	0.005		<p>EQUIPMENT USED ON SUBJECT PROJECT</p> <p>DRILL UNITS:</p> <p>MOBILE B- BK-51 CME-45C CME-550 PORTABLE HOIST OTHER OTHER</p> <p>ADVANCING TOOLS:</p> <p>CLAY BITS 6" CONTINUOUS FLIGHT AUGER 8" HOLLOW AUGERS HARD FACED FINGER BITS CASING w/ ADVANCER TRICONE STEEL TEETH TRICONE TUNG.-CARR. CORE BIT OTHER</p> <p>HAMMER TYPE:</p> <p>AUTOMATIC MANUAL</p> <p>CORE SIZE:</p> <p>B N H</p> <p>HAND TOOLS:</p> <p>POST HOLE DIGGER HAND AUGER SOUNDING ROD VANE SHEAR TEST OTHER</p>		<p>FRACURE SPACING</p> <table border="1"> <tr> <th>TERM</th> <th>SPACING</th> </tr> <tr> <td>VERY WIDE</td> <td>MORE THAN 10 FEET</td> </tr> <tr> <td>WIDE</td> <td>3 TO 10 FEET</td> </tr> <tr> <td>MODERATELY CLOSE</td> <td>1 TO 3 FEET</td> </tr> <tr> <td>CLOSE</td> <td>0.16 TO 1 FEET</td> </tr> <tr> <td>VERY CLOSE</td> <td>LESS THAN 0.16 FEET</td> </tr> </table> <p>BEDDING</p> <table border="1"> <tr> <th>TERM</th> <th>THICKNESS</th> </tr> <tr> <td>VERY THICKLY BEDDED</td> <td>&gt; 4 FEET</td> </tr> <tr> <td>THICKLY BEDDED</td> <td>1.5 - 4 FEET</td> </tr> <tr> <td>THINLY BEDDED</td> <td>0.16 - 1.5 FEET</td> </tr> <tr> <td>VERY THINLY BEDDED</td> <td>0.03 - 0.16 FEET</td> </tr> <tr> <td>THICKLY LAMINATED</td> <td>0.008 - 0.03 FEET</td> </tr> <tr> <td>THINLY LAMINATED</td> <td>&lt; 0.008 FEET</td> </tr> </table> <p>INDURATION</p> <p>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.</p> <p>FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.</p> <p>MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.</p> <p>INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.</p> <p>EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</p>		TERM	SPACING	VERY WIDE	MORE THAN 10 FEET	WIDE	3 TO 10 FEET	MODERATELY CLOSE	1 TO 3 FEET	CLOSE	0.16 TO 1 FEET	VERY CLOSE	LESS THAN 0.16 FEET	TERM	THICKNESS	VERY THICKLY BEDDED	> 4 FEET	THICKLY BEDDED	1.5 - 4 FEET	THINLY BEDDED	0.16 - 1.5 FEET	VERY THINLY BEDDED	0.03 - 0.16 FEET	THICKLY LAMINATED	0.008 - 0.03 FEET	THINLY LAMINATED	< 0.008 FEET																																																																																						
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09/08/99

**PROJECT: 34911.1.1 TIP PROJ.: U-3303B**

See Sheet 1-A For Index of Sheets

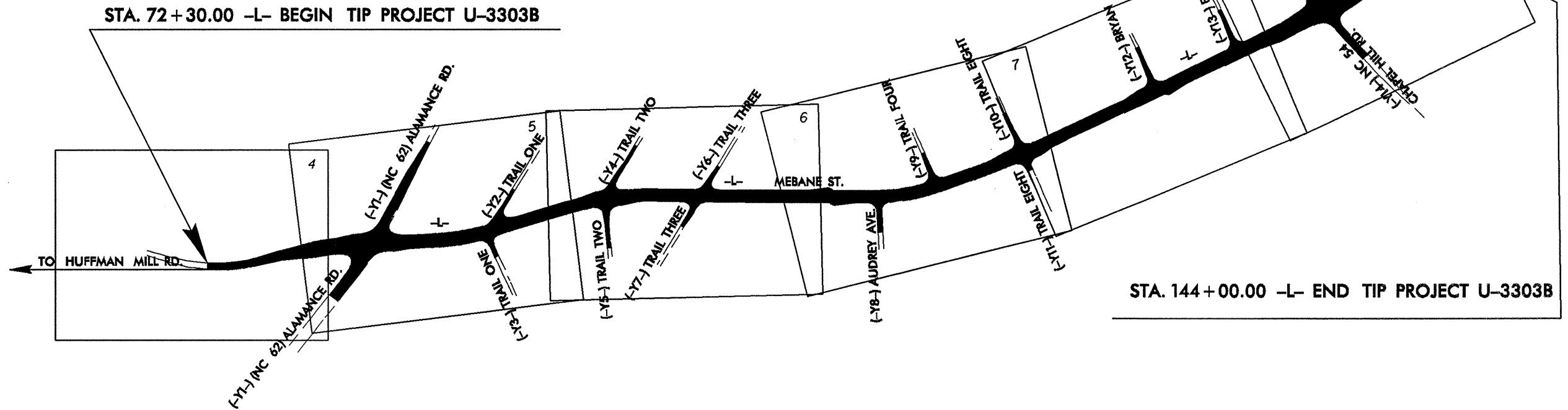
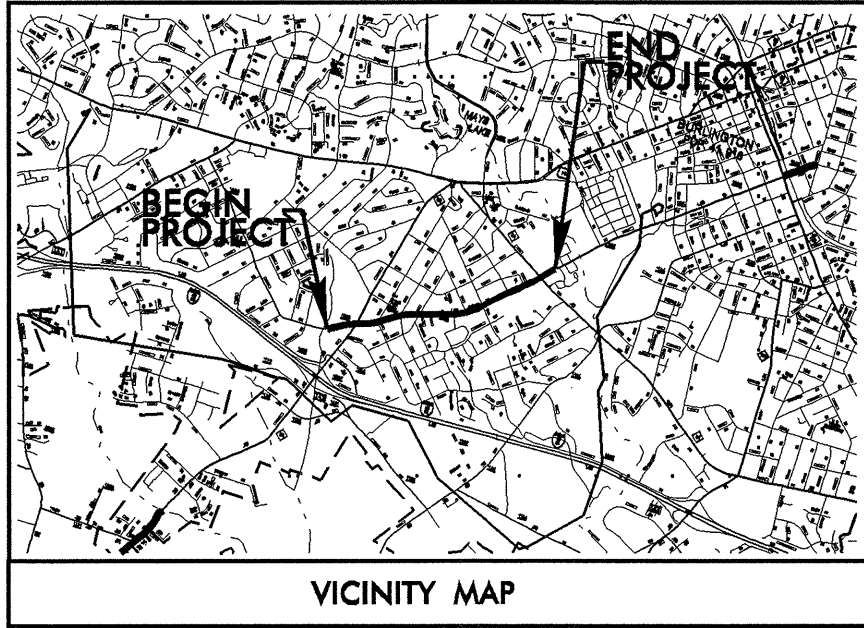
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**ALAMANCE COUNTY**

**LOCATION: BURLINGTON - SR 1306-1363 (MEBANE ST.)  
FROM NC 62 TO NC 54 (CHAPEL HILL RD.)**

**TYPE OF WORK: GRADING, DRAINAGE, WIDENING, PAVING,  
CURB & GUTTER, SIDEWALK, SIGNALS and  
SIGNING**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3303B	2A	25
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34911.1.1	STP-1306(8)	P.E.	



CLEARING NOTE METHOD  
THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF BURLINGTON.

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

<p><b>GRAPHIC SCALES</b></p> <p>50 25 0 50 100 PLANS</p> <p>50 25 0 50 100 PROFILE (HORIZONTAL)</p> <p>10 5 0 10 20 PROFILE (VERTICAL)</p>	<p><b>DESIGN DATA</b></p> <p>ADT 2005 = 21,175 ADT 2025 = 33,100 DHV = 10 % D = 55 % T = 3 % * V = 40 MPH * TTST 2% DUAL 1%</p>	<p><b>PROJECT LENGTH</b></p> <p>Length Roadway F.A. Project 8.2473101 = 7170 Total Length State Project 8.2473101 = 7170</p>	<p>Prepared in the Office of: <b>DIVISION OF HIGHWAYS</b> 1000 Birch Ridge Dr., NC, 27610</p> <p>2002 STANDARD SPECIFICATIONS</p> <p>RIGHT OF WAY DATE: MARCH 2004</p> <p>LETTING DATE: FEBRUARY 2006</p>	<p><b>HYDRAULICS ENGINEER</b></p> <p>_____ P.E.</p> <p><b>ROADWAY DESIGN ENGINEER</b></p> <p>_____ P.E.</p>	<p><b>DIVISION OF HIGHWAYS</b> STATE OF NORTH CAROLINA</p> <p>_____ P.E.</p> <p>STATE DESIGN ENGINEER</p> <p><b>DEPARTMENT OF TRANSPORTATION</b> FEDERAL HIGHWAY ADMINISTRATION</p> <p>_____ APPROVED DIVISION ADMINISTRATOR</p> <p>_____ DATE</p>
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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

December 9, 2003

STATE PROJECT: 34911.1.1 (U-3303B)  
FEDERAL PROJECT: STP- 1306(8)  
COUNTY: Alamance  
  
DESCRIPTION: Burlington – SR 1306-1363 (Mebane St.) from NC 62 to NC 54  
(Chapel Hill Rd.)  
  
SUBJECT: Geotechnical Report - Inventory

**Project Description**

This project consists of the widening of SR 1306-1363 (-L-) beginning just west of NC 62 eastward to just east of NC 54.

A geotechnical investigation was conducted in August and November of 2003. A CME-45C ATV-mounted drill machine with automatic hammer was used during the investigation. Standard Penetration Tests were performed at selected locations and additional borings were advanced using continuous flight or 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.

Subsurface cross sections for the following lines are included in this report.

<u>Line</u>	<u>Station</u>	<u>Location</u>
-L-	72+30 to 144+00	SR 1306-1363
-Y1-	12+92 to 19+19	NC 62
-Y14-	16+00 to 20+65	NC 54

**Areas of Special Geotechnical Interest**

- 1) Groundwater: Groundwater was encountered within 6.0 feet of proposed grade at the following location:

<u>Line</u>	<u>Station</u>
-L-	126+75 to 127+25

- 2) Highly Plastic Clays: Highly plastic silty clays occur on the project in the following areas:

<u>Line</u>	<u>Stations</u>
-L-	100+75 to 123+25
-L-	127+25 to 131+75

**Physiography and Geology**

The project is located in the Piedmont area of North Carolina. Land use along the project corridor consists of a combination of private homes and businesses. Geologically, the project is located within the Carolina Slate Belt. Soils are derived from weathering of the underlying meta-volcanic rock.

**Soil Properties**

Residual Soils: Residual soils consisting of clays, silts, and sands are derived from the in-place weathering of the underlying meta-volcanic rocks. They consist primarily of red to tan-brown, medium stiff to hard, moist to wet, plastic to highly plastic, sandy and silty clay (AASHTO classification of A-6, A-7). Tan-brown, medium dense, moist to wet, silty and clayey sand (A-2-4, A-2-6) and tan-brown, very stiff to hard, moist, sandy silt (A-4) are also present. Residual soils grade into weathered rock in most locations.

Roadway Embankment Soils: A small amount of roadway embankment soil was encountered in the existing shallow roadway embankment areas. They consist primarily of brown, medium stiff, moist, sandy clay (A-6).

**Rock Properties**

No rock was encountered within 6 feet of proposed subgrade on this project.

**Groundwater**

Groundwater was encountered within 6.0 feet below proposed grade in the one area noted above in "Areas of Special Geotechnical Interest".

Respectfully submitted,  
*N. T. Roberson*  
N. T. Roberson  
Project Geologist

## EARTHWORK BALANCE SHEET IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	ROCK EXCAVATION	UNDERCUT EXCAVATION	UNSUITABLE EARTH EXCAVATION	SUITABLE EARTH EXCAVATION	TOTAL EMB'T	EARTH EMBANKMENT	UNDERCUT EMB'T	EMB'T + % 20	BORROW	SUITABLE WASTE	UNSUITABLE WASTE	TOTAL WASTE
-L- 76+50 TO 106+50 LT	1331	0	1573	846	485	5361	3788	1573	6433	5948	0	2419	2419
-Y1- 12+50 TO 18+50 LT	923	0	0	0	923	497	497	0	596	0	327	0	327
-Y2- 10+50 TO 12+50 LT	70	0	0	0	70	269	269	0	323	253	0	0	0
-Y4- 9+50 TO 12+50 LT	36	0	0	0	36	1172	1172	0	1406	1370	0	0	0
-Y6- 10+50 TO 12+50 LT	141	0	0	0	141	139	139	0	167	26	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL NO 1	2501	0	1573	846	1655	7438	5865	1573	8926	7597	327	2419	2746
-L- 106+50 TO 136+50.00 LT	950	0	4683	92	858	8835	4152	4683	10602	9744	0	4775	4775
-Y9- 10+00 TO 12+50 LT	269	0	0	0	269	27	27	0	32	0	237	0	237
-Y10- 9+50 TO 12+00 LT	78	0	0	0	78	237	237	0	284	206	0	0	0
-Y12- 10+00 TO 12+50 LT	490	0	0	0	490	40	40	0	48	0	442	0	442
-Y13- 10+00 TO 12+98 LT	99	0	0	0	99	654	654	0	785	686	0	0	0
-Y14- 10+60 TO 20+65 LT	98	0	0	0	98	501	501	0	601	503	0	0	0
SUBTOTAL NO 2	1984	0	4683	92	1892	10294	5611	4683	12353	11139	679	4775	5454
-L- 136+50 TO 144+50.00 LT	515	0	0	0	515	1145	1145	0	1374	859	0	0	0
SUBTOTAL NO 3	515	0	0	0	515	1145	1145	0	1374	859	0	0	0
-L- 76+50 TO 106+50 RT	3422	0	1355	365	3057	4302	2947	1355	5162	2105	0	1720	1720
-Y1- 20+00 TO 23+50 RT	102	0	0	0	102	878	878	0	1054	952	0	0	0
-Y3- 10+00 TO 12+00 RT	114	0	0	0	114	131	131	0	157	43	0	0	0
-Y5- 10+00 TO 12+75 RT	797	0	0	0	797	4	4	0	5	0	792	0	792
-Y7- 10+00 TO 12+50 RT	39	0	0	0	39	300	300	0	360	321	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTALS NO 4	4474	0	1355	365	4109	5615	4260	1355	6738	3421	792	1720	2512
-L- 106+50 TO 136+50.00 RT	1314	0	4428	569	745	9558	5130	4428	11470	10725	0	4997	4997
-Y8- 10+00 TO 12+50 RT	160	0	0	0	160	48	48	0	58	0	102	0	102
-Y11- 10+00 TO 11+50 RT	59	0	0	0	59	18	18	0	22	0	37	0	37
-Y14- 20+65 TO 24+00 RT	1170	0	0	0	1170	357	357	0	428	0	742	0	742
	0	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTALS NO 5	2703	0	4428	569	2134	9981	5553	4428	11977	10725	881	4997	5878
-L- 136+50 TO 144+50.00 RT	1875	0	0	0	1875	102	102	0	122	0	1753	0	1753
	0	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTALS NO 6	1875	0	0	0	1875	102	102	0	122	0	1753	0	1753
PROJECT SUBTOTALS	14052	0	12039	1872	12180	34575	22536	12039	41490	33741	4431	13911	18342

PAVEMENT STRUCTURE VOLUME :	0	CUBIC YARDS	
DRAINAGE DITCH EXCAVATION :	0	CUBIC YARDS	
SHOULDER BORROW:	0	CUBIC YARDS	
UNDERCUT EXCAVATION	0	CUBIC YARDS	(Contingency Item)
CLASS IV SUBGRADE STABILIZATION	#REF!	TONS	(Backfill Material To Replace Shallow Undercut Excavation)

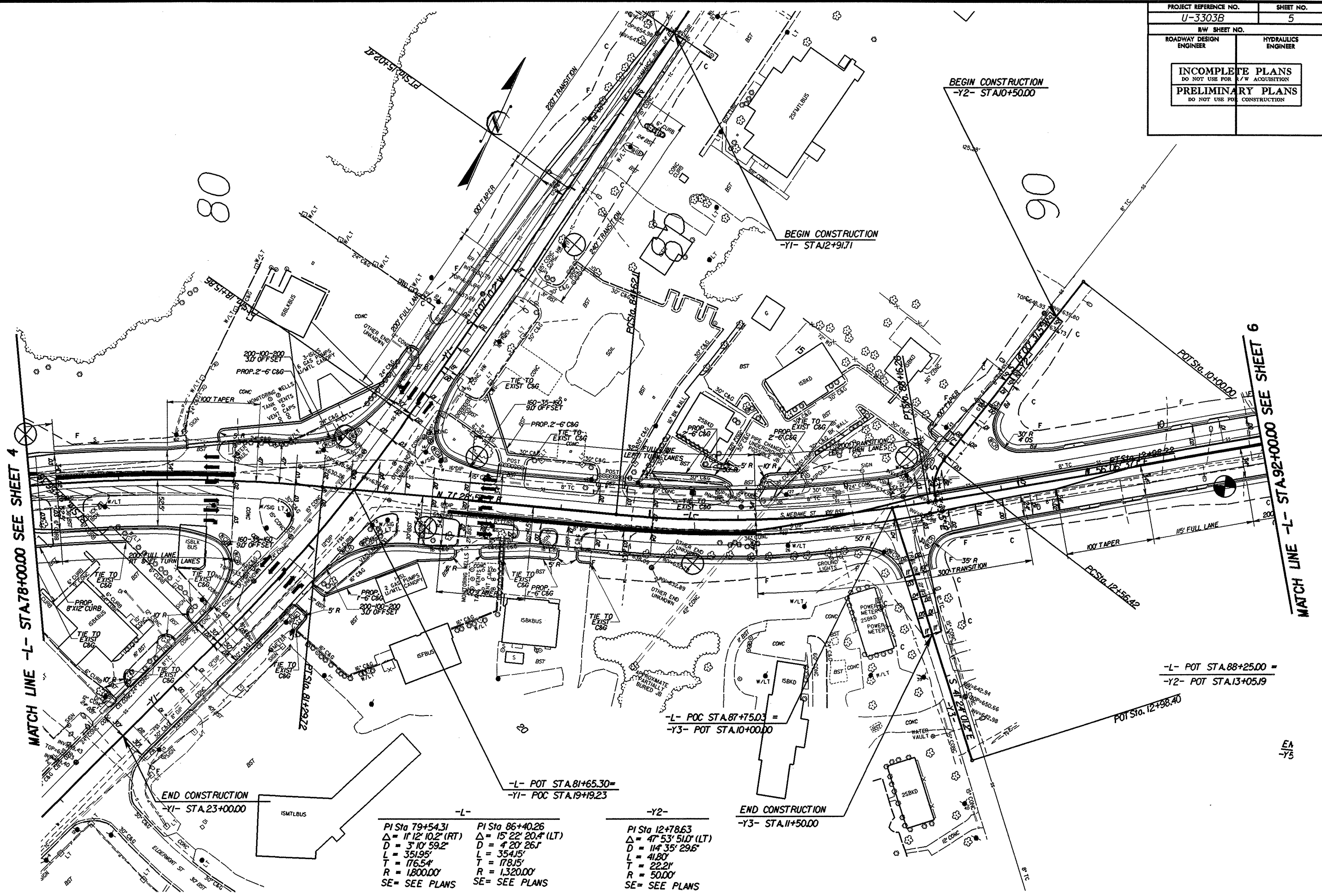
EARTHWORK QUANTITIES ARE CALCULATED BY THE ROADWAY DESIGN UNIT. THESE EARTHWORK Q  
ARE BASED IN PART ON SUBSURFACE DATA PROVIDED BY THE GEOTECHNICAL ENGINEERING UNIT.



8/17/99

PROJECT REFERENCE NO. U-3303B	SHEET NO. 5
RAW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION <b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	

REVISIONS



MATCH LINE -L- STA.78+00.00 SEE SHEET 4

MATCH LINE -L- STA.92+00.00 SEE SHEET 6

END CONSTRUCTION  
-Y1- STA.23+00.00

-L- POT STA.81+65.30 =  
-Y1- POT STA.19+19.23

-L- POT STA.87+75.03 =  
-Y3- POT STA.10+00.00

END CONSTRUCTION  
-Y3- STA.11+50.00

-L- POT STA.88+25.00 =  
-Y2- POT STA.13+05.19

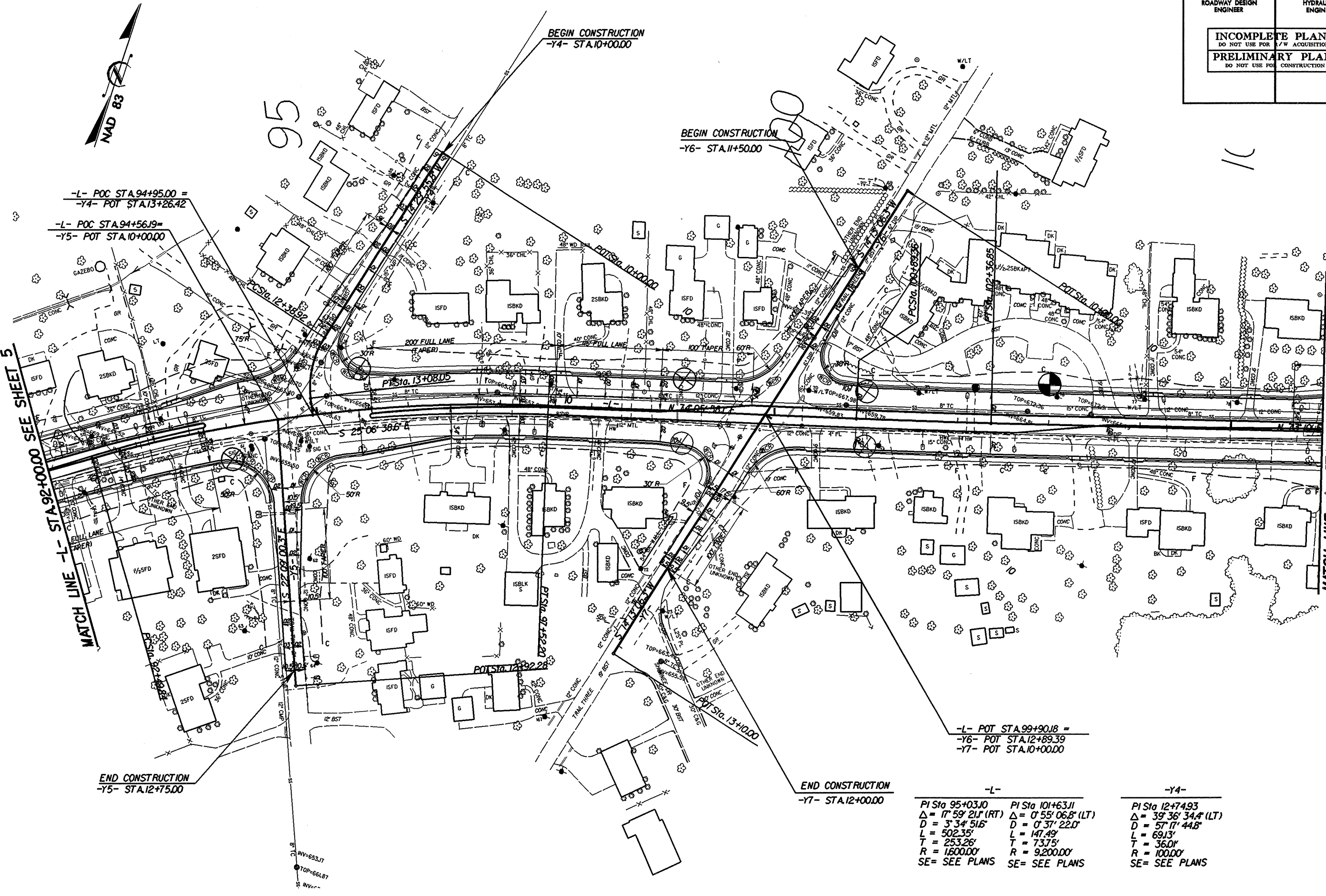
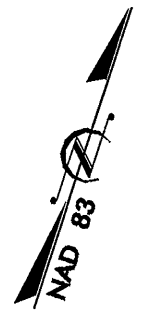
-L-	-L-
PI Sta 79+54.31	PI Sta 86+40.26
$\Delta = 11' 12" 10.2" (RT)$	$\Delta = 15' 22" 20.4" (LT)$
$D = 3' 10' 59.2"$	$D = 4' 20' 26.1"$
$L = 351.95'$	$L = 354.15'$
$T = 176.54'$	$T = 178.15'$
$R = 1800.00'$	$R = 1320.00'$
SE = SEE PLANS	SE = SEE PLANS

-Y2-
PI Sta 12+78.63
$\Delta = 47' 53" 51.0" (LT)$
$D = 114' 35" 29.6"$
$L = 41.80'$
$T = 22.21'$
$R = 50.00'$
SE = SEE PLANS

EA  
-Y5

8/17/99

PROJECT REFERENCE NO. U-3303B		SHEET NO. 6	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
<b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION <b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION			



-L- POC STA.94+95.00 =  
-Y4- POT STA.13+26.42

-L- POC STA.94+56.19 =  
-Y5- POT STA.10+00.00

BEGIN CONSTRUCTION  
-Y4- STA.10+00.00

BEGIN CONSTRUCTION  
-Y6- STA.11+50.00

MATCH LINE -L- STA.92+00.00 SEE SHEET 5

MATCH LINE -L- STA.106+00.00 SEE SHEET 7

END CONSTRUCTION  
-Y5- STA.12+75.00

END CONSTRUCTION  
-Y7- STA.12+00.00

-L- POT STA.99+90.18 =  
-Y6- POT STA.12+89.39  
-Y7- POT STA.10+00.00

-L-	-Y4-
PI Sta 95+03.0	PI Sta 101+63.11
$\Delta = 17^{\circ} 59' 21.1''$ (RT)	$\Delta = 0^{\circ} 55' 06.8''$ (LT)
D = 3' 34' 51.6"	D = 0' 37' 22.0"
L = 502.35'	L = 147.49'
T = 253.26'	T = 73.75'
R = 1600.00'	R = 9.200.00'
SE= SEE PLANS	SE= SEE PLANS

PI Sta 12+74.93
$\Delta = 39^{\circ} 36' 34.4''$ (LT)
D = 57' 17' 44.8"
L = 69.13'
T = 36.0'
R = 100.00'
SE= SEE PLANS

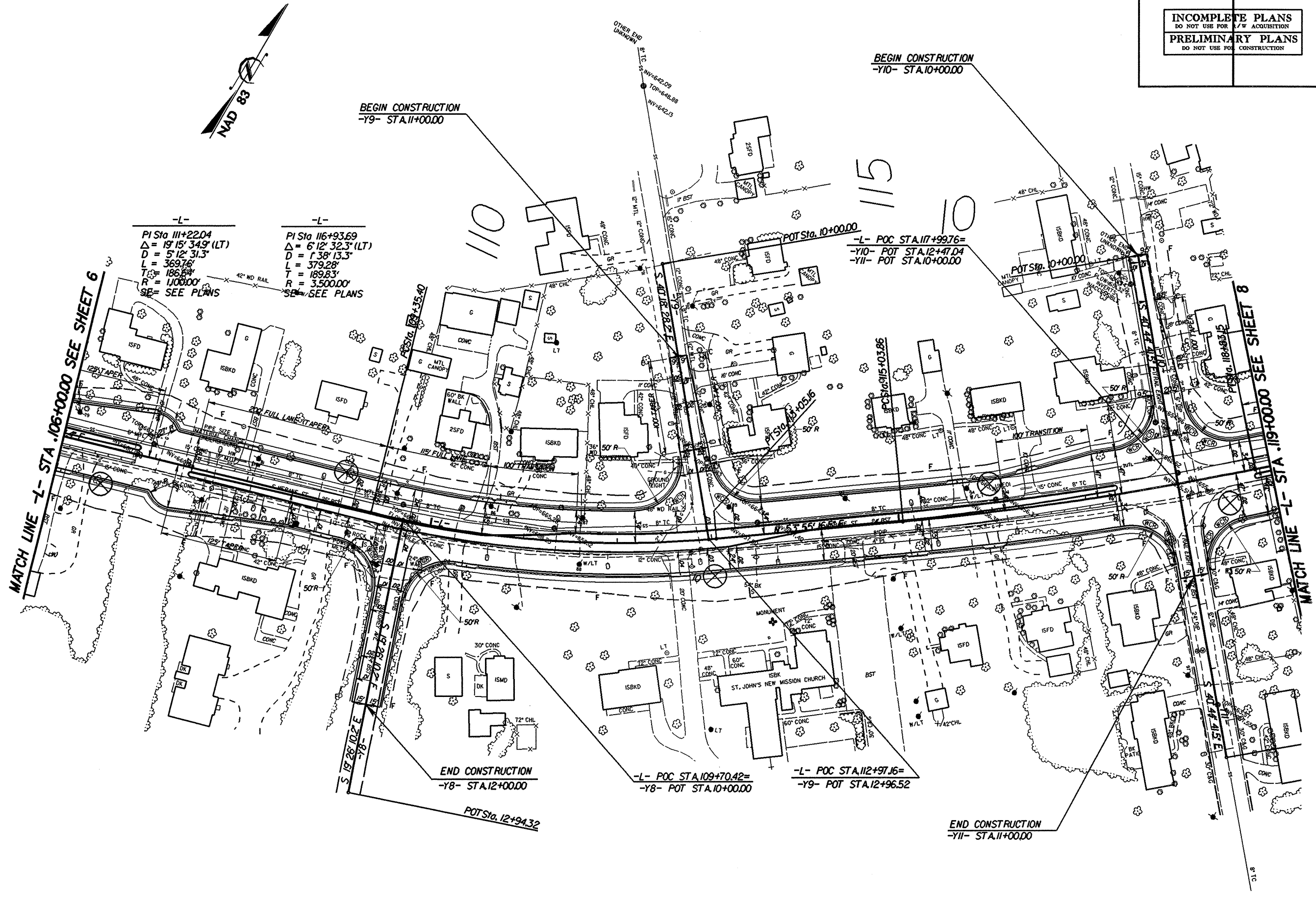
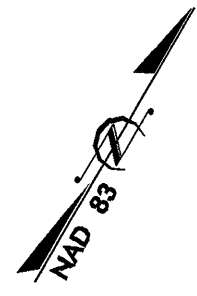
REVISIONS

\*\*\*\*\*  
 SYSTEM TIME: 8/17/99 10:00 AM  
 USER: JSM  
 \*\*\*\*\*



PROJECT REFERENCE NO. U-3303B		SHEET NO. 7	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
<b>INCOMPLETE PLANS</b> DO NOT USE FOR A/W ACQUISITION <b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION			

8/17/99



-L-  
 PI Sta 111+22.04  
 $\Delta = 19' 15" 34.9" (LT)$   
 $D = 5' 12" 31.3"$   
 $L = 369.76'$   
 $T = 186.83'$   
 $R = 1,000.00'$   
 SE = SEE PLANS

-L-  
 PI Sta 116+93.69  
 $\Delta = 6' 12" 32.3" (LT)$   
 $D = 1' 38" 13.3"$   
 $L = 379.28'$   
 $T = 189.83'$   
 $R = 3,500.00'$   
 SE = SEE PLANS

-L- POC STA.117+99.76=  
 -Y10- POT STA.12+47.04  
 -Y11- POT STA.10+00.00

END CONSTRUCTION  
 -Y8- STA.12+00.00

-L- POC STA.109+70.42=  
 -Y8- POT STA.10+00.00

-L- POC STA.112+97.16=  
 -Y9- POT STA.12+96.52

END CONSTRUCTION  
 -Y11- STA.11+00.00

MATCH LINE -L- STA .106+00.00 SEE SHEET 6

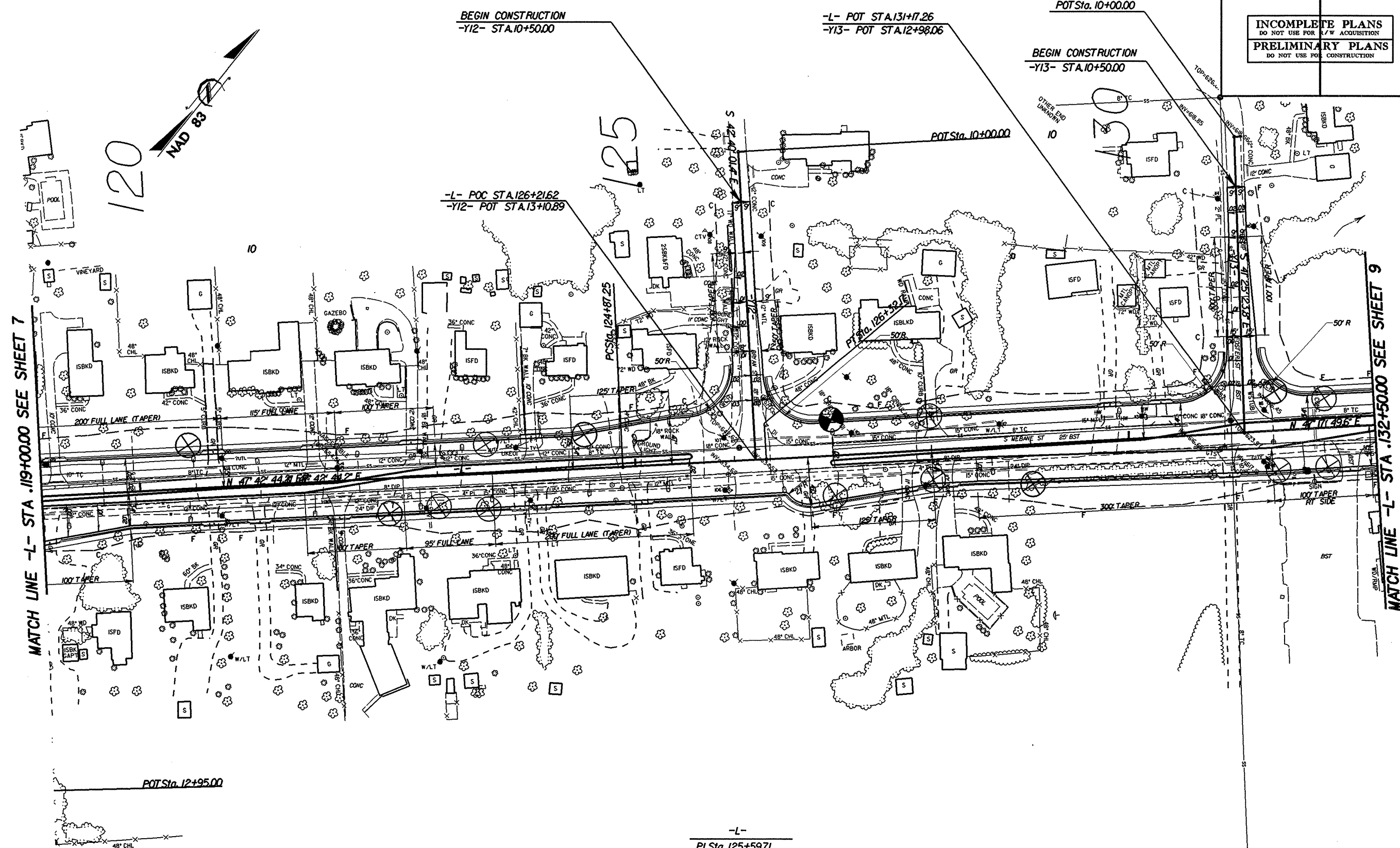
MATCH LINE -L- STA .119+00.00 SEE SHEET 8

REVISIONS

\*\*\*\*\*  
 SYSTEMS  
 \*\*\*\*\*

PROJECT REFERENCE NO. U-3303B		SHEET NO. 8	
R/W SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
<b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION <b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION			

8/17/99



MATCH LINE -L- STA .19+00.00 SEE SHEET 7

MATCH LINE -L- STA .132+50.00 SEE SHEET 9

BEGIN CONSTRUCTION  
-Y12- STA.10+50.00

-L- POT STA.131+17.26  
-Y13- POT STA.12+98.06

BEGIN CONSTRUCTION  
-Y13- STA.10+50.00

-L- POC STA.126+21.62  
-Y12- POT STA.13+10.89

-L-  
 PI Sta 125+59.71  
 $\Delta = 0' 24' 54.6''$  (LT)  
 $D = 0' 17' 11.3''$   
 $L = 144.92'$   
 $T = 72.46'$   
 $R = 20,000.00'$   
 SE = SEE PLANS

REVISIONS

\*\*\*\*\*  
 SYSTEMS DESIGN  
 \*\*\*\*\*



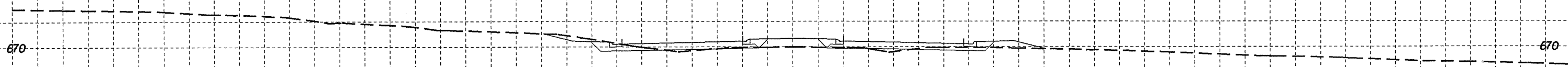




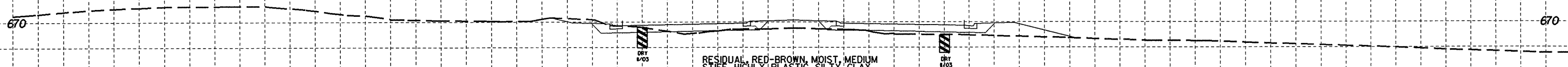




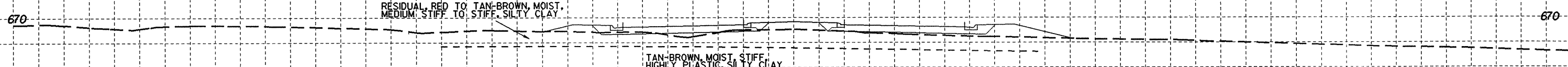
150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150



RESIDUAL, RED-BROWN, MOIST, MEDIUM STIFF, HIGHLY PLASTIC, SILTY CLAY  
101+50.000



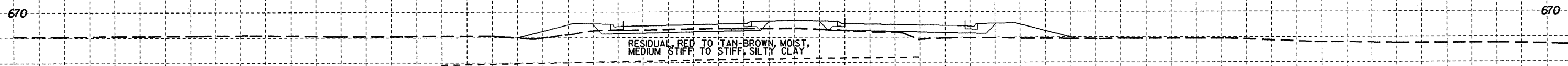
RESIDUAL, RED-BROWN, MOIST, MEDIUM STIFF, HIGHLY PLASTIC, SILTY CLAY  
101+00.000



RESIDUAL, RED TO TAN-BROWN, MOIST, MEDIUM STIFF TO STIFF, SILTY CLAY

TAN-BROWN, MOIST, STIFF, HIGHLY PLASTIC, SILTY CLAY

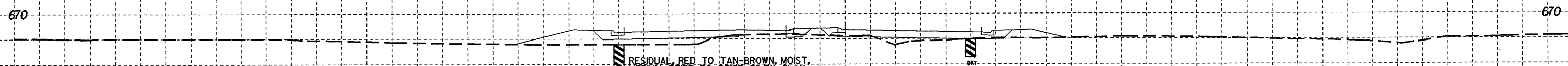
100+50.000



RESIDUAL, RED TO TAN-BROWN, MOIST, MEDIUM STIFF TO STIFF, SILTY CLAY

TAN-BROWN, MOIST, STIFF, HIGHLY PLASTIC, SILTY CLAY

100+00.000



RESIDUAL, RED TO TAN-BROWN, MOIST, MEDIUM STIFF TO STIFF, SILTY CLAY

TAN-BROWN, MOIST, STIFF, HIGHLY PLASTIC, SILTY CLAY

99+00.000



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

SYSTEMS  
LAYOUT  
REVISIONS  
DATE

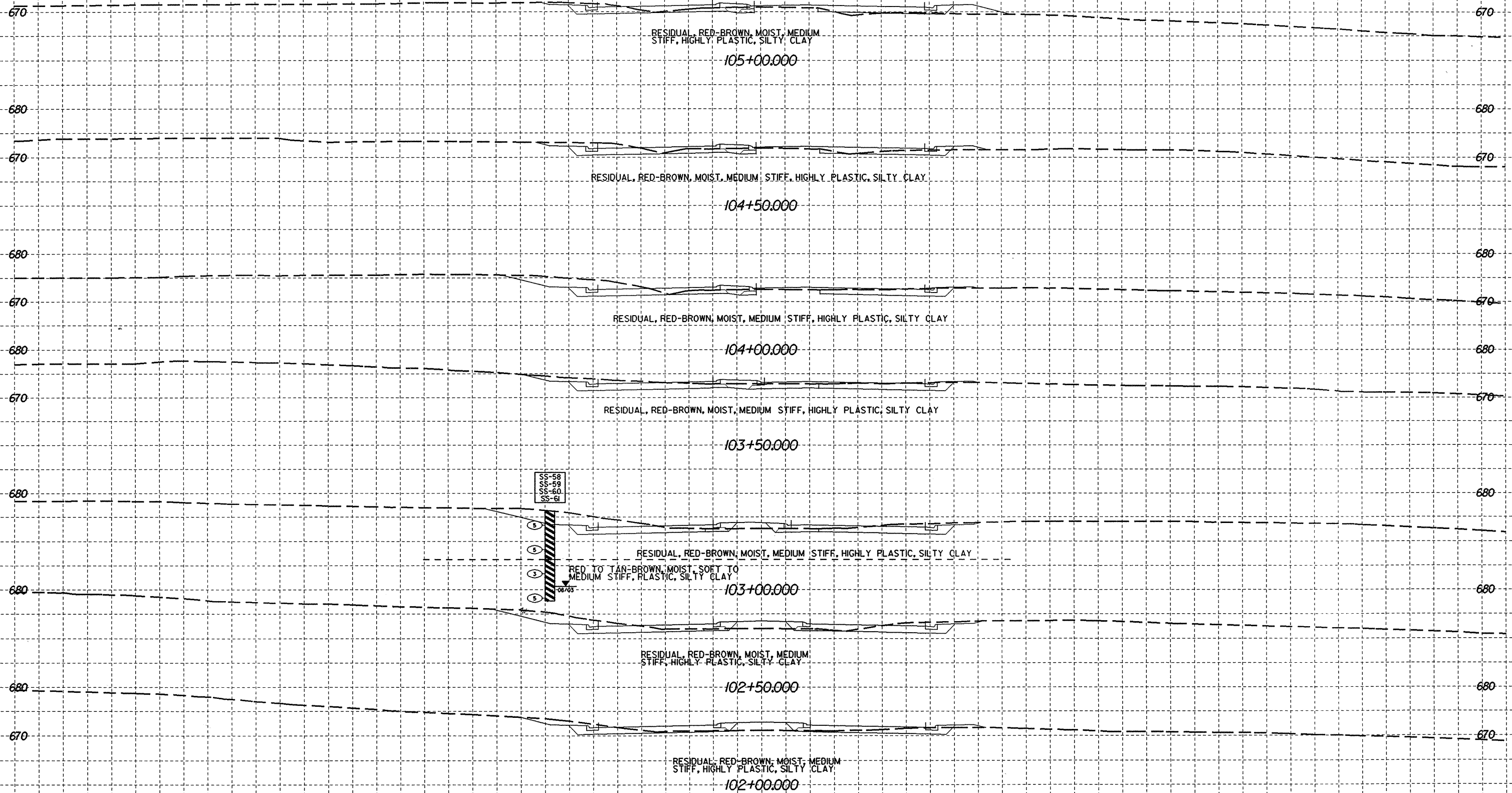
8/23/99



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	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-58	44' LT	103+00	2.00-3.50	A-7-5(70)	96	59	1.0	2.4	17.2	79.3	100	99	97	-	-
S-59	44' LT	103+00	7.00-8.50	A-7-5(36)	83	45	6.1	4.9	17.8	71.2	80	77	73	-	-
S-60	44' LT	103+00	12.00-13.50	A-7-5(28)	70	25	3.7	17.7	44.0	34.6	100	99	84	-	-
S-61	44' LT	103+00	17.00-18.50	A-7-5(13)	60	15	12.4	25.4	39.8	22.4	100	94	69	-	-



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

\*\*\*\*\*CYTIME\*\*\*\*\*  
\*\*\*\*\*ADGN\*\*\*\*\*  
\*\*\*\*\*USERAME\*\*\*\*\*



8/23/99



PROJ. REFERENCE NO. U-3303B 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

670 670

ROADWAY EMBANKMENT

RESIDUAL, TAN-BROWN, MOIST, MEDIUM STIFF, HIGHLY PLASTIC, SILTY CLAY

108+00.000

670 670

ROADWAY EMBANKMENT

RESIDUAL, TAN-BROWN, MOIST, MEDIUM STIFF, HIGHLY PLASTIC, SILTY CLAY

TAN-BROWN, MOIST, MEDIUM STIFF, SILTY CLAY

107+50.000

670 670

ROADWAY EMBANKMENT

RESIDUAL, TAN-BROWN, MOIST, MEDIUM STIFF, HIGHLY PLASTIC, SILTY CLAY

TAN-BROWN, MOIST, MEDIUM STIFF, SILTY CLAY

107+00.000

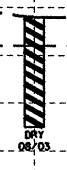
670 670

ROADWAY EMBANKMENT

RESIDUAL, TAN-BROWN, MOIST, MEDIUM STIFF, HIGHLY PLASTIC, SILTY CLAY

TAN-BROWN, MOIST, MEDIUM STIFF, SILTY CLAY

106+50.000



670 670

ROADWAY EMBANKMENT

RESIDUAL, TAN TO RED-BROWN, MOIST, MEDIUM STIFF, HIGHLY PLASTIC, SILTY CLAY

106+00.000

670 670

ROADWAY EMBANKMENT

RESIDUAL, RED-BROWN, MOIST, MEDIUM STIFF, HIGHLY PLASTIC, SILTY CLAY

105+50.000

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

SYSTEMS CONNECTIONS  
DATE: 08/23/99  
DRAWN BY: [unreadable]  
CHECKED BY: [unreadable]

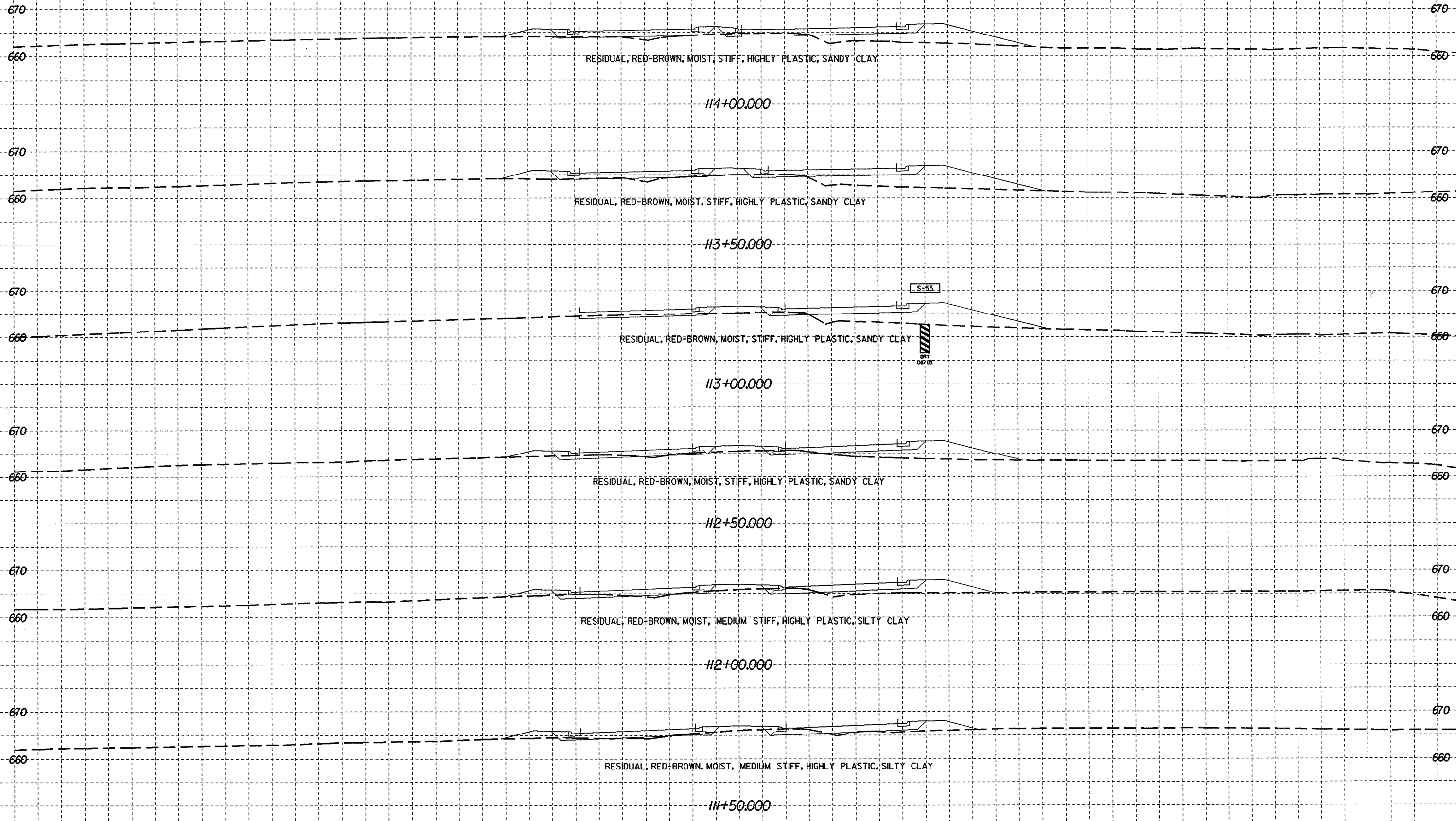


8/23/99

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	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-55	40' RT	113+00	0.00-6.00	A-6(12)	39	23	8.3	23.4	25.5	42.7	89	86	65	-	-



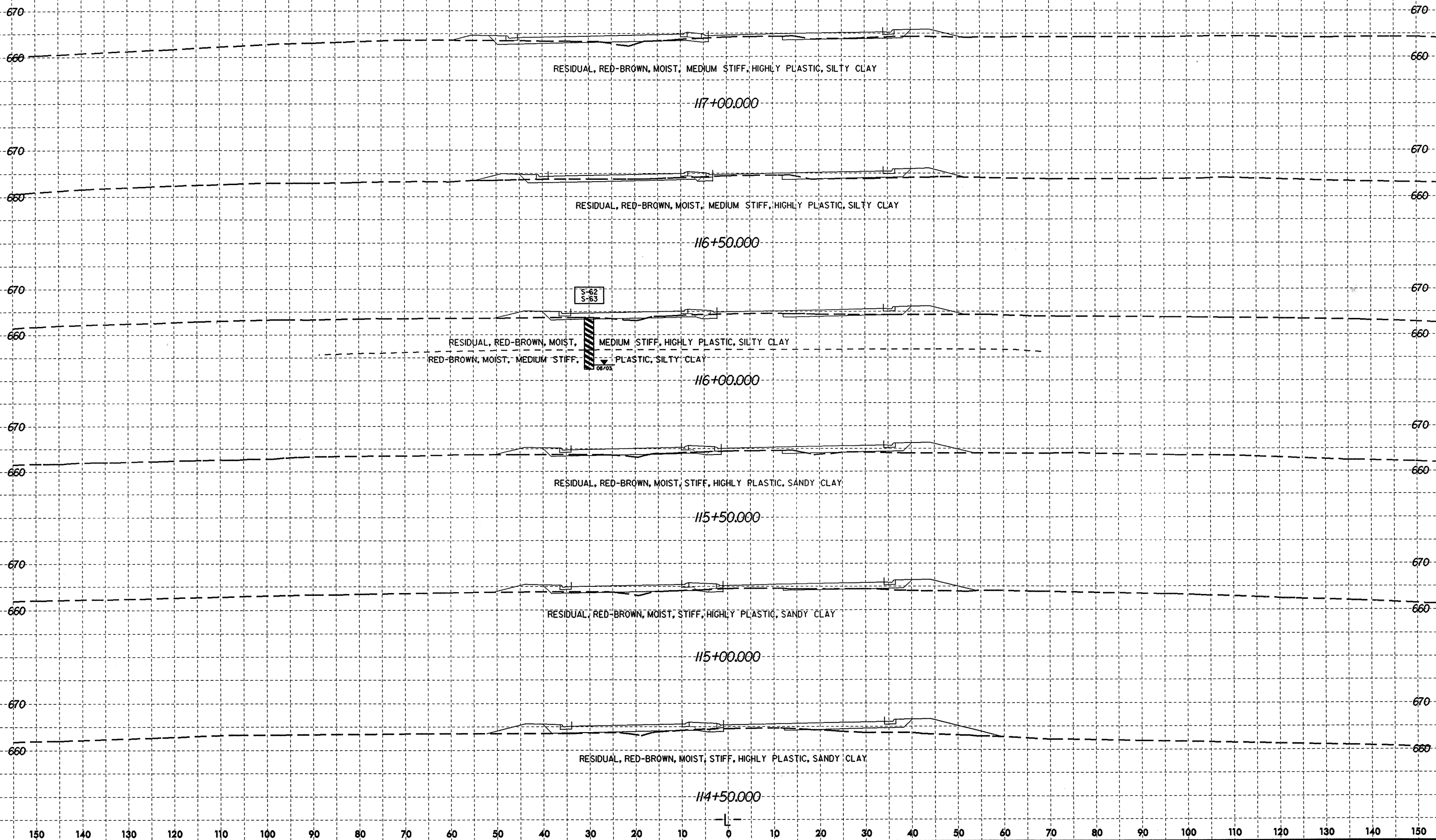
SYSTEMS TIME: 8/23/99 10:00 AM  
 USER: J. W. BROWN  
 PROJECT: U-3303B  
 SHEET: 17

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

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	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-62	30' RT	116+00	0.00-7.00	A-7-5(63)	88	58	1.8	6.9	16.0	75.3	100	99	93	-	-
S-63	30' LT	116+00	7.00-11.90	A-7-5(31)	66	27	1.8	9.6	29.6	59.0	100	100	91	-	-



SYTIME  
LAWRENCE  
LAWRENCE  
LAWRENCE

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

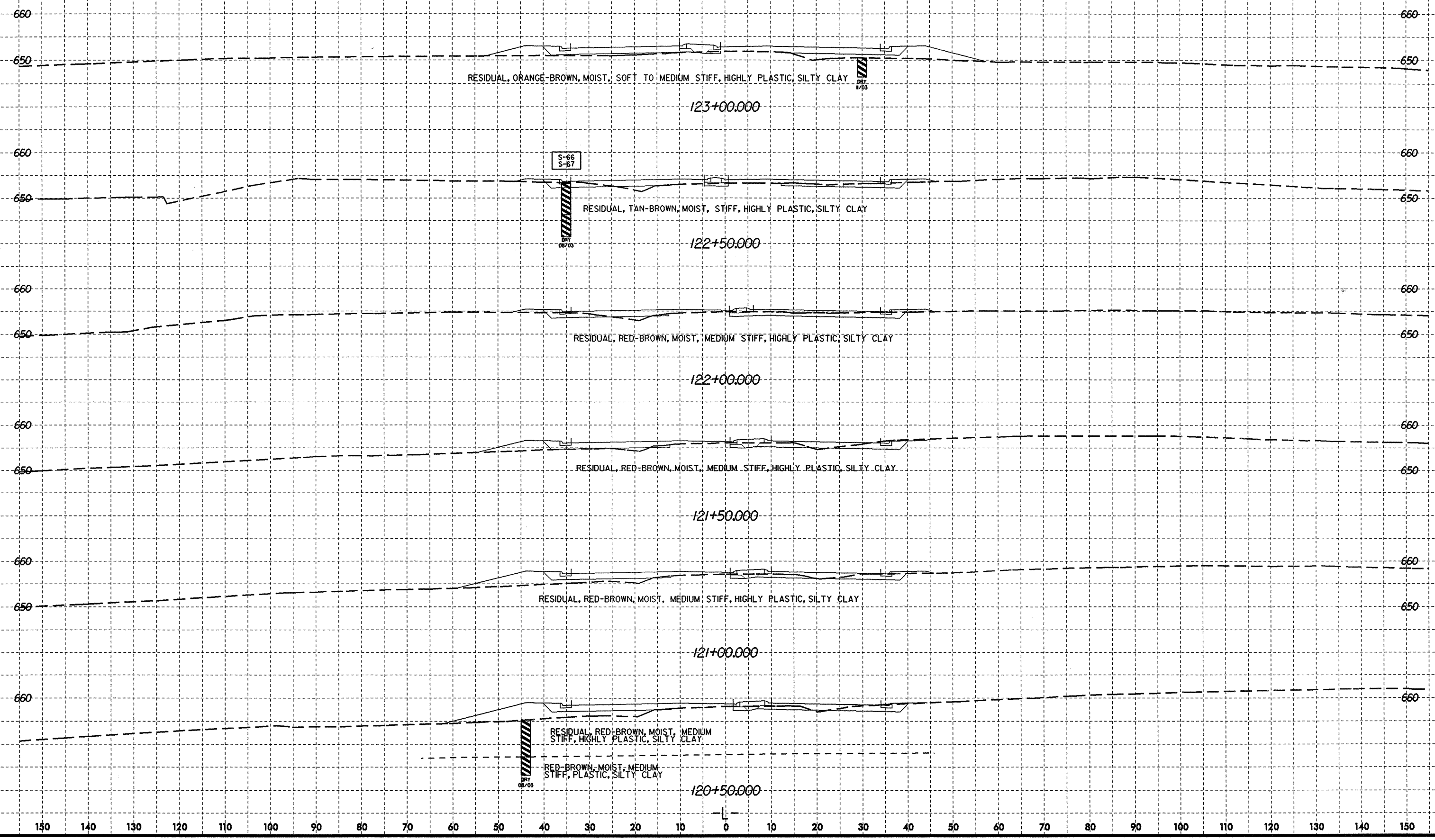


8/23/99

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	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-66	35' RT	122+50	0.00-7.00	A-7-5(65)	94	56	1.2	4.9	16.6	77.3	100	100	95	-	-
S-67	35' RT	122+50	7.00-11.50	A-7-5(34)	68	36	5.3	15.9	28.0	50.9	100	99	83	-	-



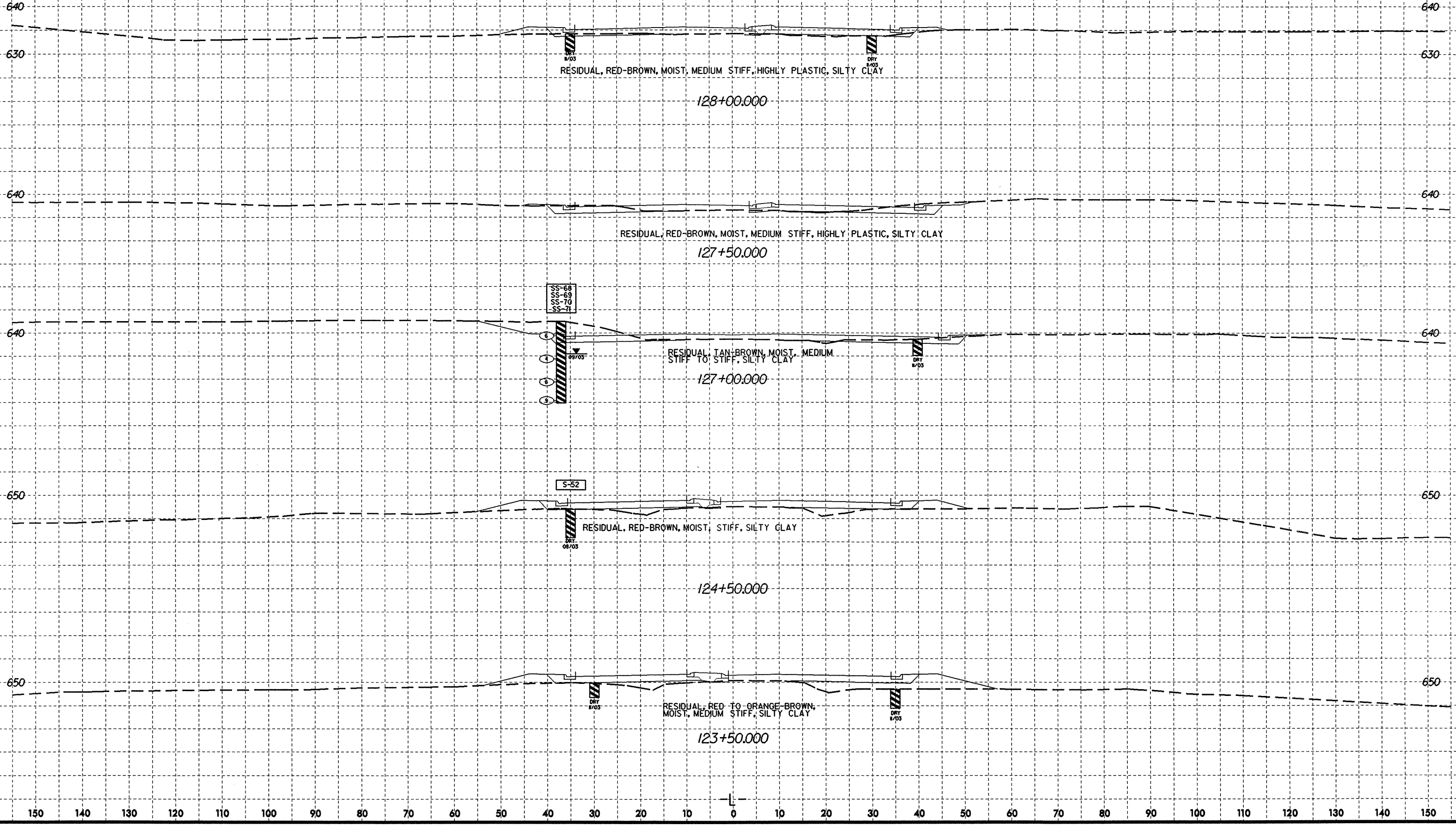
\*\*\*\*\*SYSTEMS\*\*\*\*\*  
 \*\*\*\*\*ADDITIONS\*\*\*\*\*  
 \*\*\*\*\*DELETIONS\*\*\*\*\*  
 \*\*\*\*\*REVISIONS\*\*\*\*\*

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

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

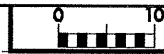
### SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-52	35' LT	124+50	0.00-6.00	A-7-6(19)	48	28	7.1	24.6	21.5	46.8	100	98	72	-	-
S-68	37' LT	127+00	2.10-3.60	A-7-5(19)	54	20	1.8	19.7	33.7	44.8	100	100	82	-	-
S-69	37' LT	127+00	7.10-8.60	A-7-5(32)	73	24	1.4	11.0	40.8	46.8	100	100	92	-	-
S-70	37' LT	127+00	11.10-12.60	A-7-5(33)	75	29	2.6	14.9	45.9	36.6	100	99	87	-	-
S-71	37' LT	127+00	2.10-3.60	A-7-5(13)	63	11	4.5	30.7	48.5	16.3	100	98	74	-	-



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

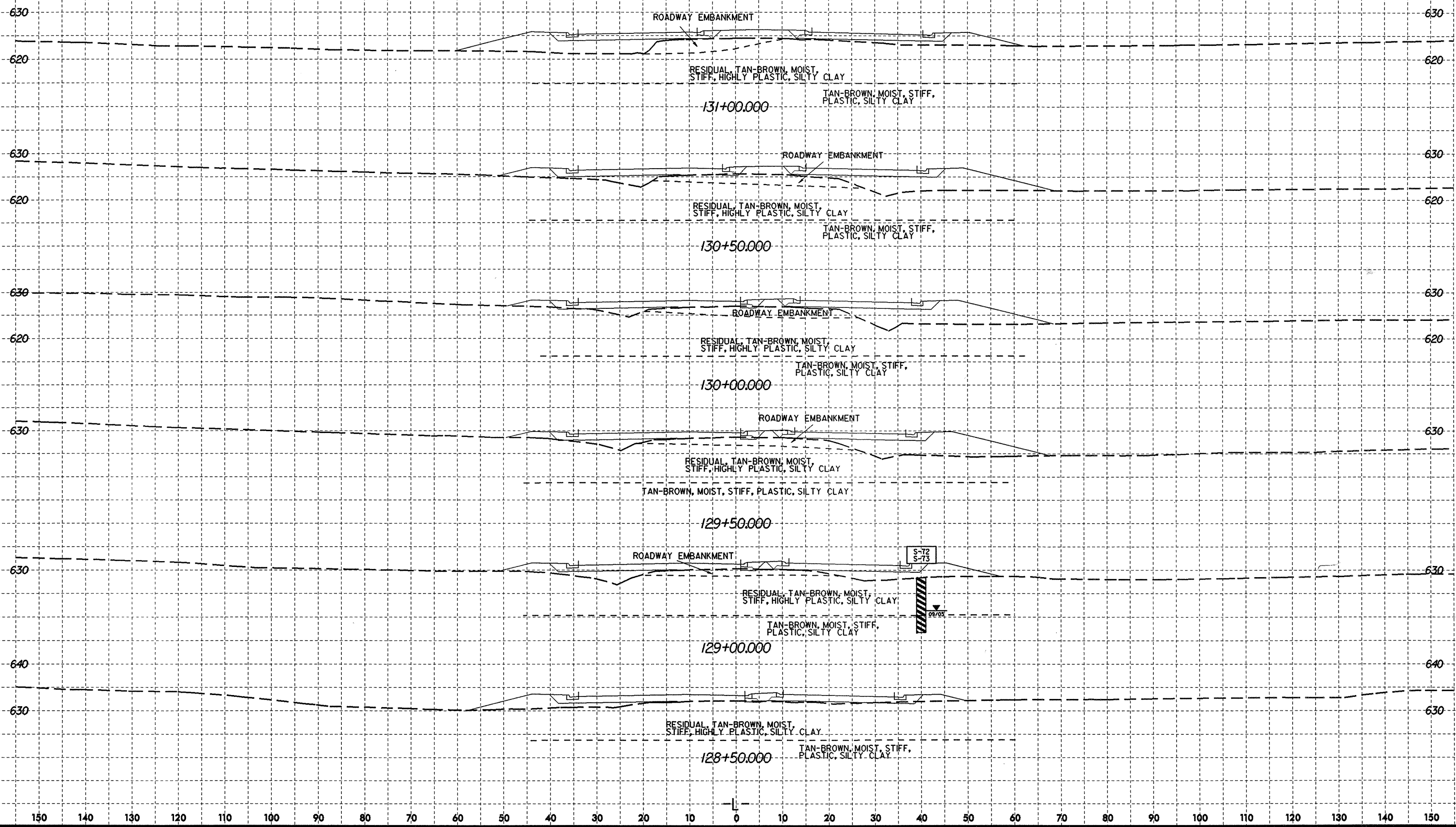
8/23/99



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	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-72	40' RT	129+00	0.00-8.00	A-7-5(49)	91	56	6.3	17.3	17.4	59.0	100	99	79	-	-
S-73	40' RT	129+00	8.00-11.60	A-7-5(14)	53	16	9.6	22.8	41.2	26.4	100	98	73	-	-



\*\*\*\*\*SYSTEMS\*\*\*\*\*  
\*\*\*\*\*DGN\*\*\*\*\*  
\*\*\*\*\*ENR\*\*\*\*\*

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







