

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

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-5826	1	66

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT 1919 TOT-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

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NOTES:

1. THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT.
2. 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.

PERSONNEL

N. O. MOORE

P. A. KELLY

D. G. PINTER

INVESTIGATED BY N. O. MOORE

DRAWN BY N. O. MOORE

CHECKED BY N. T. ROBERSON

SUBMITTED BY N. T. ROBERSON

DATE AUGUST 2018

**ROADWAY
SUBSURFACE INVESTIGATION**

COUNTY WAKE
PROJECT DESCRIPTION FALLS OF NEUSE ROAD
(SR 2000) FROM I-540 TO DURANT ROAD (SR 2006)

INVENTORY

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CROSS SECTIONS

LINE	STATION	PLAN	CROSS-SECTION
L	10+50-79+50	4-9	10-56
RPC	15+00-22+50	4,9	57-64
Y5	10+00-12+00	7	65-66

REFERENCE: U-5826

PROJECT: 44398



DocuSigned by:

Neil Roberson

8/29/2018

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SIGNATURE

DATE

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION										GRADATION										ROCK DESCRIPTION										TERMS AND DEFINITIONS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
<p>SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, VERY STIFF, GRAY, SILTY CLAY, MOIST 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. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.</p>										<p>HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:</p>										<p>ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
<p style="text-align: center;">SOIL LEGEND AND AASHTO CLASSIFICATION</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th rowspan="2">GENERAL CLASS.</th> <th colspan="5">GRANULAR MATERIALS (≤ 35% PASSING #200)</th> <th colspan="5">SILT-CLAY MATERIALS (> 35% PASSING #200)</th> <th colspan="5">ORGANIC MATERIALS</th> </tr> <tr> <th>A-1</th> <th>A-3</th> <th>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>A-1, A-2</th> <th>A-4, A-5</th> <th>A-6, A-7</th> <th>A-1, A-2</th> <th>A-4, A-5</th> <th>A-6, A-7</th> </tr> <tr> <td>GROUP CLASS.</td> <td>A-1-a</td> <td>A-1-b</td> <td>A-2-4</td> <td>A-2-5</td> <td>A-2-6</td> <td>A-2-7</td> <td>A-7-5</td> <td>A-7-6</td> <td>A-3</td> <td>A-3</td> <td>A-3</td> <td>A-3</td> <td>A-3</td> <td>A-3</td> <td>A-3</td> <td>A-3</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> <td></td> <td></td> <td></td> </tr> <tr> <td>% PASSING #10 #40 #200</td> <td>50 MX 30 MX 15 MX</td> <td>50 MX 25 MX 10 MX</td> <td>51 MN 35 MX 35 MX</td> <td>35 MX 35 MX</td> <td>35 MX 35 MX</td> <td>35 MX 35 MX</td> <td>36 MN 36 MN</td> <td>36 MN 36 MN</td> <td>36 MN 36 MN</td> <td>36 MN 36 MN</td> <td>36 MN 36 MN</td> <td>36 MN 36 MN</td> <td>36 MN 36 MN</td> <td>36 MN 36 MN</td> <td>36 MN 36 MN</td> <td>36 MN 36 MN</td> </tr> <tr> <td>MATERIAL PASSING #40 LL PI</td> <td>- 6 MX</td> <td>- NP</td> <td>40 MX 41 MN 10 MX 11 MN</td> <td>40 MX 41 MN 10 MX 11 MN</td> <td>40 MX 41 MN 10 MX 11 MN</td> <td>40 MX 41 MN 10 MX 11 MN</td> <td>40 MX 41 MN 10 MX 11 MN</td> <td>40 MX 41 MN 10 MX 11 MN</td> <td>40 MX 41 MN 10 MX 11 MN</td> <td>40 MX 41 MN 10 MX 11 MN</td> <td>40 MX 41 MN 10 MX 11 MN</td> <td>40 MX 41 MN 10 MX 11 MN</td> <td>40 MX 41 MN 10 MX 11 MN</td> <td>40 MX 41 MN 10 MX 11 MN</td> <td>40 MX 41 MN 10 MX 11 MN</td> <td>40 MX 41 MN 10 MX 11 MN</td> </tr> <tr> <td>GROUP INDEX</td> <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>NO MX</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></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> <td></td> <td></td> <td></td> </tr> <tr> <td>GEN. RATING AS SUBGRADE</td> <td colspan="5">EXCELLENT TO GOOD</td> <td colspan="5">FAIR TO POOR</td> <td>FAIR TO POOR</td> <td>POOR</td> <td>UNSUITABLE</td> <td></td> <td></td> <td></td> </tr> <tr> <td colspan="10">PI OF A-7-5 SUBGROUP IS ≤ LL - 30; PI OF A-7-6 SUBGROUP IS > LL - 30</td> <td colspan="10"></td> <td colspan="10"></td> </tr> <tr> <td colspan="10"> <p style="text-align: center;">CONSISTENCY OR DENSENESS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>PRIMARY SOIL TYPE</th> <th>COMPACTNESS OR CONSISTENCY</th> <th>RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)</th> <th>RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT²)</th> </tr> <tr> <td>GENERALLY GRANULAR MATERIAL (NON-COHESIVE)</td> <td>VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE</td> <td>< 4 4 TO 10 10 TO 30 30 TO 50 > 50</td> <td>N/A</td> </tr> <tr> <td>GENERALLY SILT-CLAY MATERIAL (COHESIVE)</td> <td>VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD</td> <td>< 2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 > 30</td> <td>< 0.25 0.25 TO 0.5 0.5 TO 1.0 1 TO 2 2 TO 4 > 4</td> </tr> </table> </td> <td colspan="10"> <p style="text-align: center;">MISCELLANEOUS SYMBOLS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td></td> <td>ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION</td> <td></td> <td>DIP & DIP DIRECTION OF ROCK STRUCTURES</td> <td></td> <td>SOIL SYMBOL</td> <td></td> <td>ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT</td> <td></td> <td>AUGER BORING</td> <td></td> <td>CONE PENETROMETER TEST</td> <td></td> <td>SOUNDING ROD</td> <td></td> <td>INFERRED SOIL BOUNDARY</td> <td></td> <td>CORE BORING</td> <td></td> <td>MONITORING WELL</td> <td></td> <td>PIEZOMETER INSTALLATION</td> <td></td> <td>SPT N-VALUE</td> <td></td> <td>INFERRED ROCK LINE</td> <td></td> <td>ALLUVIAL SOIL BOUNDARY</td> </tr> </table> </td> <td colspan="10"> <p style="text-align: center;">RECOMMENDATION SYMBOLS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td></td> <td>UNDERCUT</td> <td></td> <td>UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE</td> <td></td> <td>UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK</td> <td></td> <td>UNCLASSIFIED EXCAVATION - UNACCEPTABLE DEGRADABLE ROCK</td> </tr> </table> </td> <td colspan="10"> <p style="text-align: center;">ABBREVIATIONS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>AR - AUGER REFUSAL</td> <td>BT - BORING TERMINATED</td> <td>CL - CLAY</td> <td>CPT - CONE PENETRATION TEST</td> <td>CSE - COARSE</td> <td>DMT - DILATOMETER TEST</td> <td>DPT - DYNAMIC PENETRATION TEST</td> <td>e - VOID RATIO</td> <td>F - FINE</td> <td>FOSS. - FOSSILIFEROUS</td> <td>FRAC. - FRACTURED, FRACTURES</td> <td>FRAGS. - FRAGMENTS</td> <td>HI. - HIGHLY</td> <td>MED. - MEDIUM</td> <td>MICA. - MICACEOUS</td> <td>MOD. - MODERATELY</td> <td>NP - NON PLASTIC</td> <td>ORG. - ORGANIC</td> <td>PMT - PRESSUREMETER TEST</td> <td>SAP. - SAPROLITIC</td> <td>SD. - SAND, SANDY</td> <td>SL. - SILT, SILTY</td> <td>SLI. - SLIGHTLY</td> <td>TCR - TRICONE REFUSAL</td> <td>w - MOISTURE CONTENT</td> <td>V - VERY</td> <td>VST - VANE SHEAR TEST</td> <td>WEA. - WEATHERED</td> <td>γ_u - UNIT WEIGHT</td> <td>γ_d - DRY UNIT WEIGHT</td> </tr> <tr> <td colspan="10"></td> <td colspan="10"> <p style="text-align: center;">SAMPLE ABBREVIATIONS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>S - BULK</td> <td>SS - SPLIT SPOON</td> <td>ST - SHELBY TUBE</td> <td>RS - ROCK</td> <td>RT - RECOMPACTED TRIAXIAL</td> <td>CBR - CALIFORNIA BEARING RATIO</td> </tr> </table> </td> </tr> </table> </td> </tr> <tr> <td colspan="10"> <p style="text-align: center;">TEXTURE OR GRAIN SIZE</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>U.S. STD. 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MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.</p> </td> <td colspan="10"> <p style="text-align: center;">INDURATION</p> <p>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>FRIABLE</td> <td>RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.</td> </tr> <tr> <td>MODERATELY INDURATED</td> <td>GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.</td> </tr> <tr> <td>INDURATED</td> <td>GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.</td> </tr> <tr> <td>EXTREMELY INDURATED</td> <td>SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</td> </tr> </table> </td> <td colspan="10"> <p style="text-align: center;">BENCH MARK:</p> <p style="text-align: right;">ELEVATION: _____ FEET</p> <p style="text-align: center;">NOTES:</p> </td> </tr> </table>										GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)					SILT-CLAY MATERIALS (> 35% PASSING #200)					ORGANIC MATERIALS					A-1	A-3	A-2	A-4	A-5	A-6	A-7	A-1, A-2	A-4, A-5	A-6, A-7	A-1, A-2	A-4, A-5	A-6, A-7	A-1, A-2	A-4, A-5	A-6, A-7	GROUP CLASS.	A-1-a	A-1-b	A-2-4	A-2-5	A-2-6	A-2-7	A-7-5	A-7-6	A-3	A-3	A-3	A-3	A-3	A-3	A-3	A-3	SYMBOL																	% PASSING #10 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX 10 MX	51 MN 35 MX 35 MX	35 MX 35 MX	35 MX 35 MX	35 MX 35 MX	36 MN 36 MN	36 MN 36 MN	36 MN 36 MN	36 MN 36 MN	36 MN 36 MN	36 MN 36 MN	36 MN 36 MN	36 MN 36 MN	36 MN 36 MN	36 MN 36 MN	MATERIAL PASSING #40 LL PI	- 6 MX	- NP	40 MX 41 MN 10 MX 11 MN	40 MX 41 MN 10 MX 11 MN	40 MX 41 MN 10 MX 11 MN	40 MX 41 MN 10 MX 11 MN	40 MX 41 MN 10 MX 11 MN	40 MX 41 MN 10 MX 11 MN	40 MX 41 MN 10 MX 11 MN	40 MX 41 MN 10 MX 11 MN	40 MX 41 MN 10 MX 11 MN	40 MX 41 MN 10 MX 11 MN	40 MX 41 MN 10 MX 11 MN	40 MX 41 MN 10 MX 11 MN	40 MX 41 MN 10 MX 11 MN	40 MX 41 MN 10 MX 11 MN	GROUP INDEX	0	0	0	4 MX	8 MX	12 MX	16 MX	NO MX									USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND	FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND	SILTY SOILS	CLAYEY SOILS												GEN. 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MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.</p>										<p style="text-align: center;">INDURATION</p> <p>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>FRIABLE</td> <td>RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.</td> </tr> <tr> <td>MODERATELY INDURATED</td> <td>GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.</td> </tr> <tr> <td>INDURATED</td> <td>GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.</td> </tr> <tr> <td>EXTREMELY INDURATED</td> <td>SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</td> </tr> </table>										FRIABLE	RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.	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AR - AUGER REFUSAL	BT - BORING TERMINATED	CL - CLAY	CPT - CONE PENETRATION TEST	CSE - COARSE	DMT - DILATOMETER TEST	DPT - DYNAMIC PENETRATION TEST	e - VOID RATIO	F - FINE	FOSS. - FOSSILIFEROUS	FRAC. - FRACTURED, FRACTURES	FRAGS. - FRAGMENTS	HI. - HIGHLY	MED. - MEDIUM	MICA. - MICACEOUS	MOD. - MODERATELY	NP - NON PLASTIC	ORG. - ORGANIC	PMT - PRESSUREMETER TEST	SAP. - SAPROLITIC	SD. - SAND, SANDY	SL. - SILT, SILTY	SLI. - SLIGHTLY	TCR - TRICONE REFUSAL	w - MOISTURE CONTENT	V - VERY	VST - VANE SHEAR TEST	WEA. - WEATHERED	γ _u - UNIT WEIGHT	γ _d - DRY UNIT WEIGHT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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<p style="text-align: center;">COLOR</p> <p>DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.</p>										<p style="text-align: center;">INDURATION</p> <p>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>FRIABLE</td> <td>RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.</td> </tr> <tr> <td>MODERATELY INDURATED</td> <td>GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.</td> </tr> <tr> <td>INDURATED</td> <td>GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.</td> </tr> <tr> <td>EXTREMELY INDURATED</td> <td>SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</td> </tr> </table>										FRIABLE	RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.	MODERATELY INDURATED	GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.	INDURATED	GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.	EXTREMELY INDURATED	SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.	<p style="text-align: center;">BENCH MARK:</p> <p style="text-align: right;">ELEVATION: _____ FEET</p> <p style="text-align: center;">NOTES:</p>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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See Sheet 1A For Index of Sheets
See Sheet 1B for Conventional Symbols

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

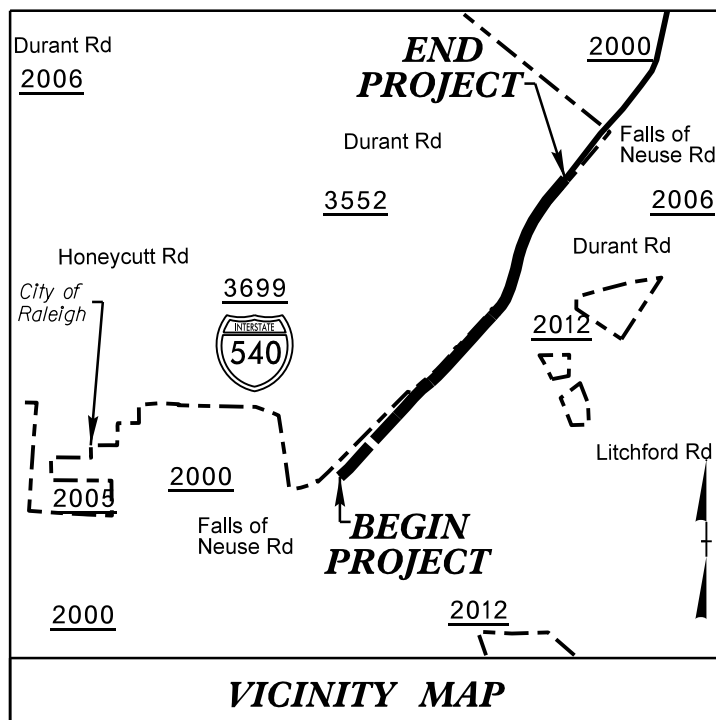
WAKE COUNTY

**LOCATION: FALLS OF NEUSE ROAD (SR 2000)
FROM I-540 TO DURANT ROAD (SR 2006)**

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND SIGNALS

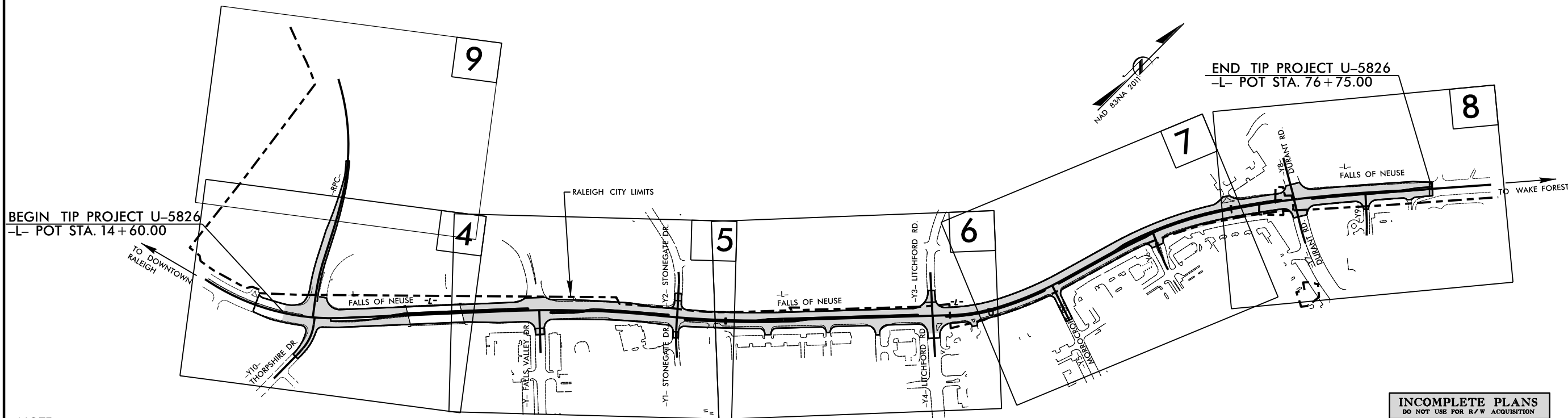
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-5826	2A	66
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
44398.1.1	NA	P.E.	

TIP PROJECT: U-5826



VICINITY MAP

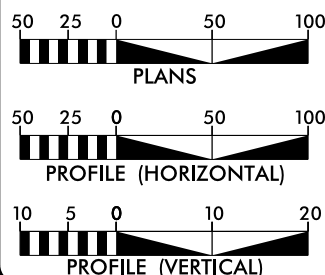
25% PLANS SUBMITTAL



- NOTE:**
1. THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE CITY OF RALEIGH.
 2. CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD _____.

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES



DESIGN DATA

ADT 2019 = 53,576
ADT 2039 = 64,456
K = 8 %
D = 60 %
T = 3 % *
V = 50 MPH
* TTST = 1% DUAL 2%
FUNC CLASS = MINOR ARTERIAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-5826 = 1.123 MILES
LENGTH EXIST. STRUCTURE TIP PROJECT U-5826 = 0.054 MILES
TOTAL LENGTH TIP PROJECT U-5826 = 1.177 MILES

Prepared in the Office of:
KCI Associates of N.C., P.A.
4505 Falls of Neuse Road
Suite 400
Raleigh, NC 27609
Phone (919) 783-9214
Fax (919) 783-9266

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
DECEMBER 15, 2018

LETTING DATE:
DECEMBER 17, 2019

NCDOT CONTACT: JOHN W. BRAXTON JR.
SENIOR PROJECT ENGINEER

Plans Prepared For:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr.
Raleigh NC, 27610

CHARLES L. FLOWE, P.E.
PROJECT ENGINEER

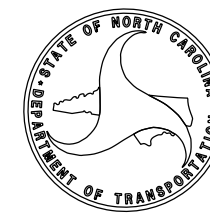
BRYAN E. HOUGH, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.



22-AUG-2018 14:34 S:\EPD\RA\RA\Investigation\TIP\U5826_GEO_RDWY\CADD_GEO\TECH\PlanProf\U-5826_Rdy_tsh.dgn \$\$\$\$USERNAME\$\$\$\$

CONTRACT:



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

August 15, 2018

STATE PROJECT: 44398.1.1 (U-5826)
 FEDERAL PROJECT: N/A
 COUNTY: Wake
 DESCRIPTION: SR 2000 (Falls of Neuse Rd.) from I-540 to SR 2006 (Durant Rd.)
 SUBJECT: Geotechnical Report – Inventory

The Geotechnical Engineering Unit has completed a subsurface investigation for this project and presents the following inventory.

Project Description

This project consists of widening existing SR 2000 (-L-, Falls of Neuse Rd.) from just south of I-540 to approximately 700 feet north of SR 2006 (-Y8-, Durant Rd.).

A geotechnical investigation was conducted during June and July of 2018. A combination of 61 hand auger borings and 3 SPT borings were performed by the Geotechnical Engineering Unit. A track-mounted CME-55 drill machine was used to access and drill borings along the -RPC- alignment. Representative soil samples were collected for visual classification in the field and selected samples were submitted for laboratory analysis by the Materials and Tests Unit.

The following alignments, totaling 1.48 miles, were investigated. Subsurface plans and cross sections of these alignments are included in this report.

<u>Line</u>	<u>Stations</u>
-L-	13+00 to 75+76
-RPC-	15+26 to 21+87
-Y-	10+59 to 11+17
-Y1-	10+43 to 10+76
-Y2-	11+15 to 11+97
-Y3-	10+97 to 11+61
-Y4-	10+35 to 12+13
-Y5-	10+36 to 12+00
-Y10-	10+44 to 12+36

Mailing Address:
 NC DEPARTMENT OF TRANSPORTATION
 GEOTECHNICAL ENGINEERING UNIT
 1589 MAIL SERVICE CENTER
 RALEIGH NC 27699-1589

Telephone: 919-707-6850
 Fax: 919-250-4237
 Customer Service: 1-877-368-4968
 Website: www.ncdot.gov

Location:
 CENTURY CENTER COMPLEX
 ENTRANCE B-2
 1020 BIRCH RIDGE DRIVE
 RALEIGH NC

Physiography and Geology

The project is located within the city limits of Raleigh, and within the Piedmont Physiographic Province. Geologically, the project is located within the Raleigh Belt consisting of lineated felsic mica gneiss and soils derived from the in-place weathering of these materials. The terrain is relatively flat to gently rolling within an urban area that is a mixture of businesses, single-family homes and woods.

Soils Properties

Soils encountered during this investigation are roadway embankment and residual.

Roadway Embankment soils are present along all existing roadways such as Falls of Neuse Road and I-540. These soils primarily consist of orange-brown, medium stiff to stiff, moderately to highly plastic, dry to moist silty and sandy clay with gravel (A-7-5, A-7-6 and A-6) with lesser amounts of orange-brown, medium dense to dense, dry to moist, clayey and silty sand with gravel (A-2-7, A-2-4).

Residual soils are also present along the entire project corridor. The majority of these soils are characterized by moderate to high plasticity, red to orange, dry to moist, stiff to very stiff, silty and sandy clay (A-7-5, A-7-6 and A-6) with lesser amounts of orange and red, medium dense to dense, moist, silty sand (A-2-4).

Groundwater

Groundwater measurements were taken in June and July of 2018 during average rainfall conditions. Groundwater was absent in most borings; however, groundwater was encountered at one location. The static water level in the boring at -L- Station 35+00, 56 feet right was 2.2 feet from the surface.

Areas of Special Geotechnical Interest

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

<u>Line</u>	<u>Stations</u>
-L-	13+00 to 55+25
-L-	62+25 to 71+75
-RPC-	15+26 to 21+25
-Y5-	10+36 to 12+00

- 2) High Groundwater: The following area exhibits groundwater within 6.0 feet of proposed grade:

<u>Line</u>	<u>Stations</u>	<u>Offsets</u>
-L-	35+00	56' RT

- 3) Water Wells: No water wells were noted within or in close proximity to the construction limits during this investigation.


8/17/99

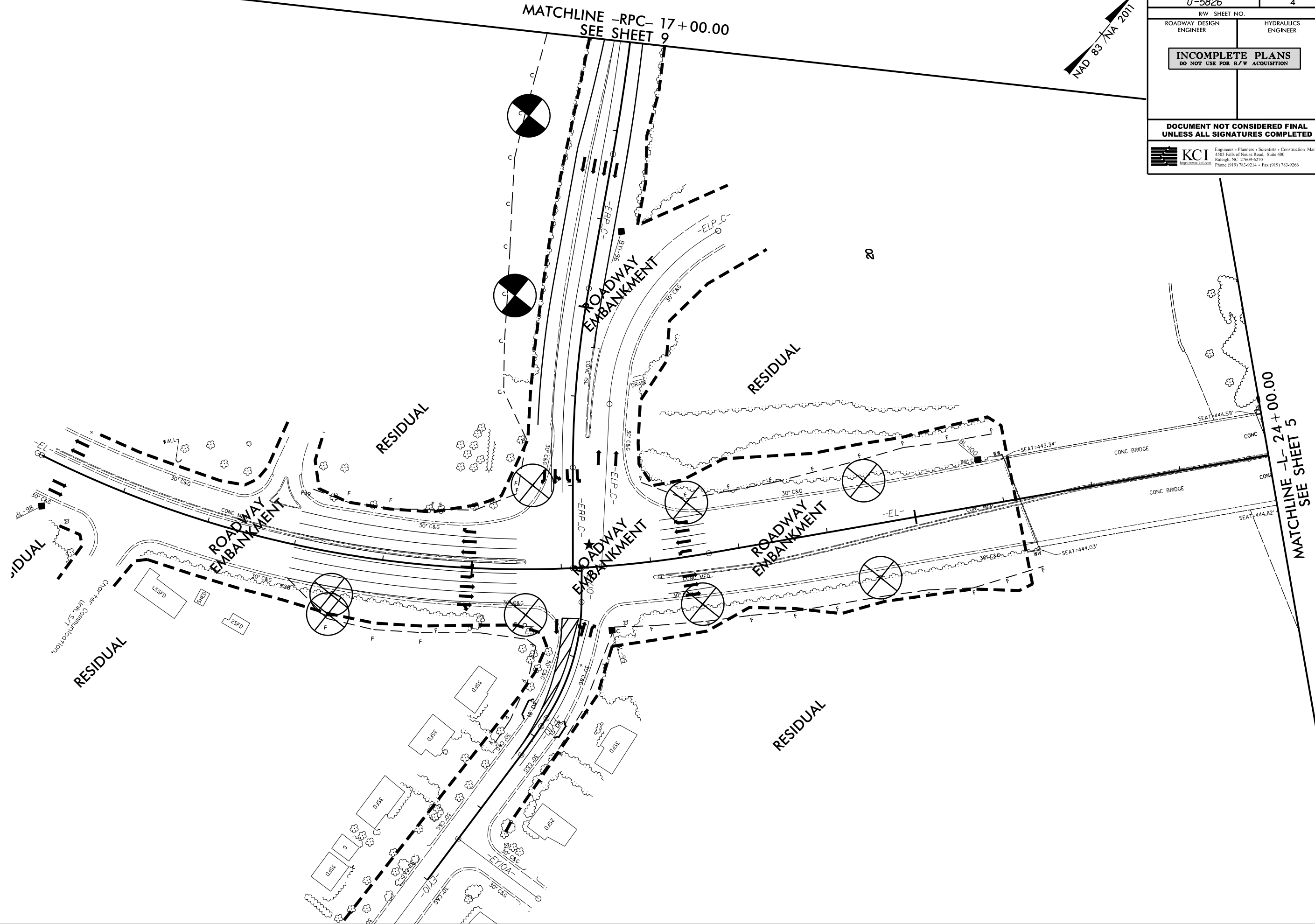
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\$\$\$\$USERNAME\$\$\$\$

REVISIONS


MATCHLINE -RPC- 17+00.00
SEE SHEET 9

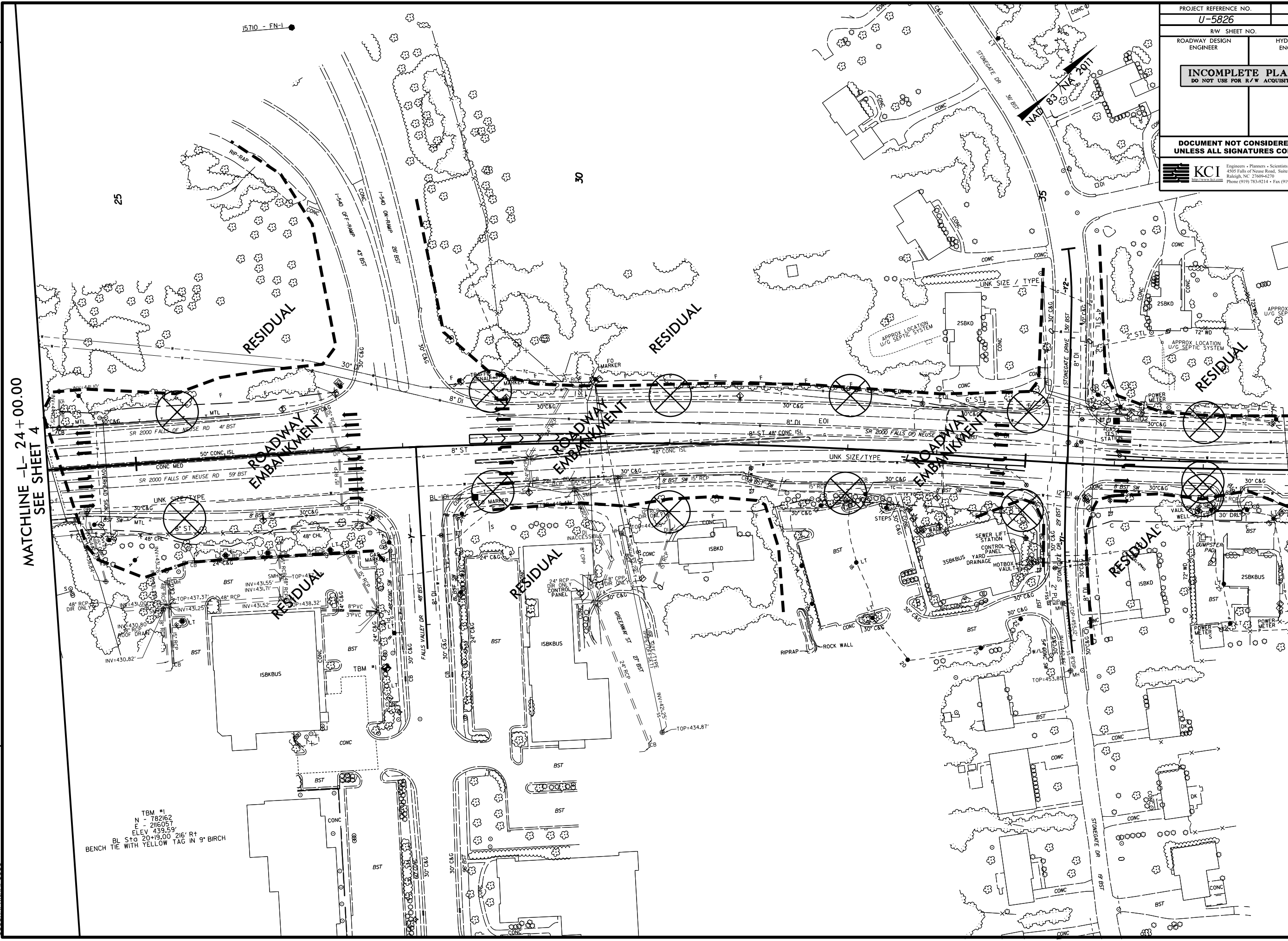


PROJECT REFERENCE NO. U-5826	SHEET NO. 4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
 KCI <small>Engineers • Planners • Scientists • Construction Managers 4505 Falls of Neuse Road, Suite 400 Raleigh, NC 27609-6270 Phone (919) 783-9214 • Fax (919) 783-9266</small>	



MATCHLINE -L- 24+00.00
SEE SHEET 5

PROJECT REFERENCE NO. U-5826	SHEET NO. 5
R/W SHEET NO. ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
 KCI <small>Engineers • Planners • Scientists • Construction Managers 4505 Falls of Neuse Road, Suite 400 Raleigh, NC 27609-4270 Phone (919) 783-9214 • Fax (919) 783-9266</small>	




REVISIONS

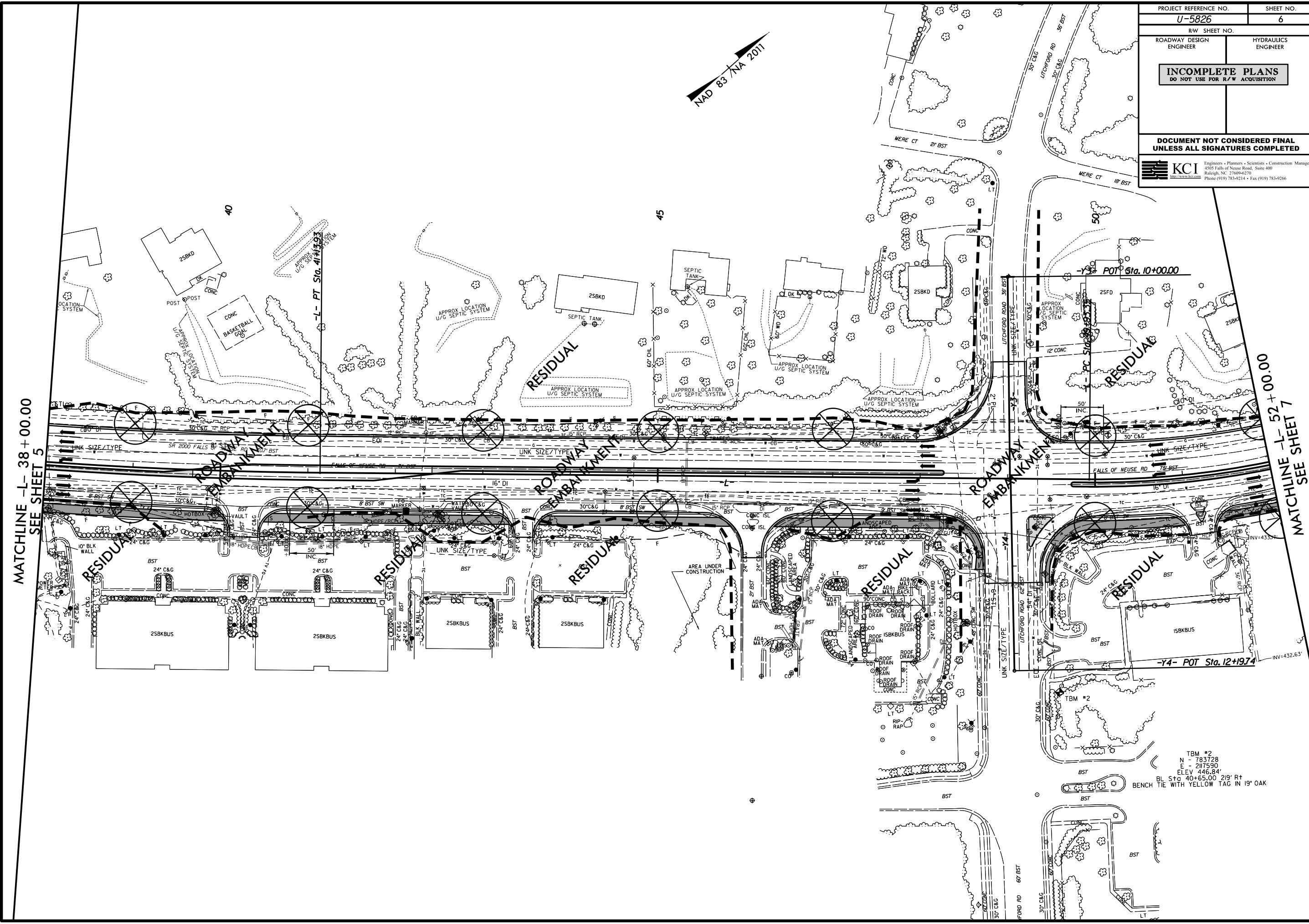
MATCHLINE -L- 24 + 00.00
SEE SHEET 4

MATCHLINE -L- 38 + 00.00
SEE SHEET 6

TBM #1
 N = 782162
 E = 2116057
 ELEV 439.59'
 BL Sta 20+19.00 216' R+
 BENCH TIE WITH YELLOW TAG IN 9" BIRCH

2-AUG-2018 10:28 S:\PROJECTS\2018\Investigation\TIP\U5826_GEO_R\WY\CADD_GEO\TECH\Plan\Prof\U-5826_GEO_psh_5.dgn
 8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-5826	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
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MATCHLINE -L- 38 + 00.00
SEE SHEET 5

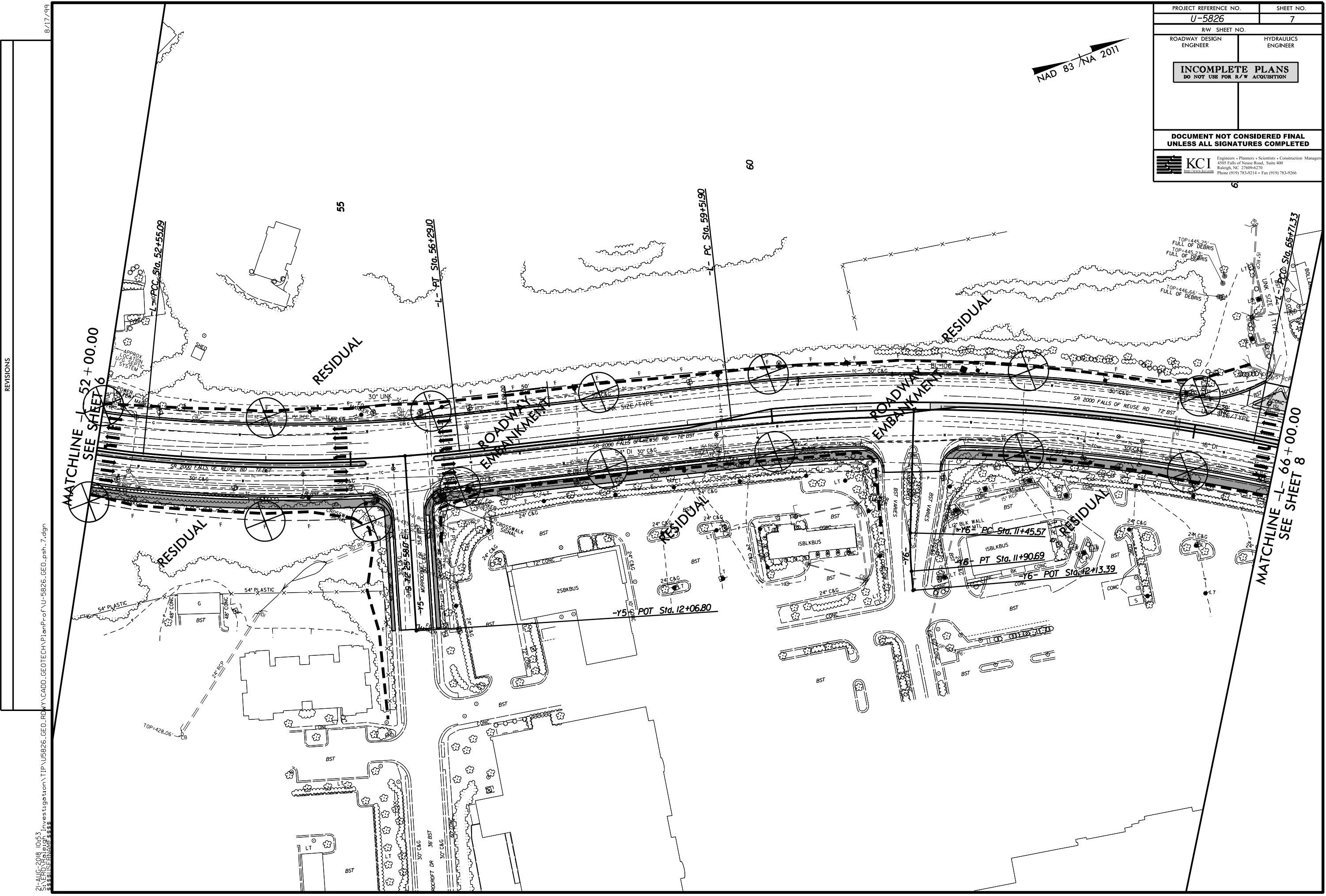
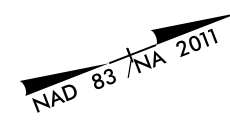
MATCHLINE -L- 52 + 00.00
SEE SHEET 7

TBM #2
N - 783728
E - 207590
ELEV 446.84'
BL Sta 40+65.00 219' Rt
BENCH TIE WITH YELLOW TAG IN 19' OAK

REVISIONS


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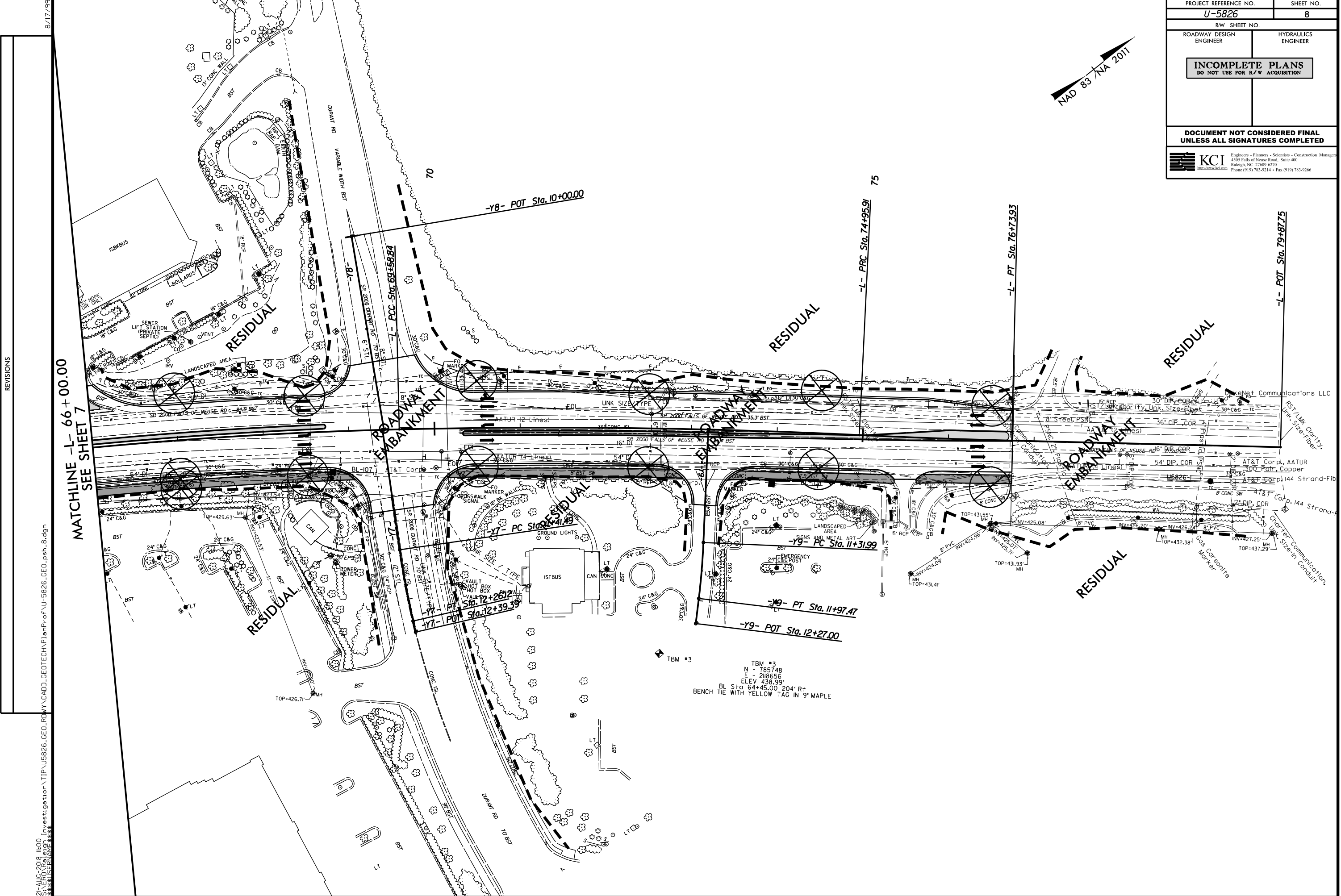
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R/W SHEET NO.	
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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
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REVISIONS

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 8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-5826	8
R/W SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
 KCI <small>Engineers • Planners • Scientists • Construction Managers 4505 Falls of Neuse Road, Suite 400 Raleigh, NC 27609-4270 Phone (919) 783-9214 • Fax (919) 783-9266</small>	




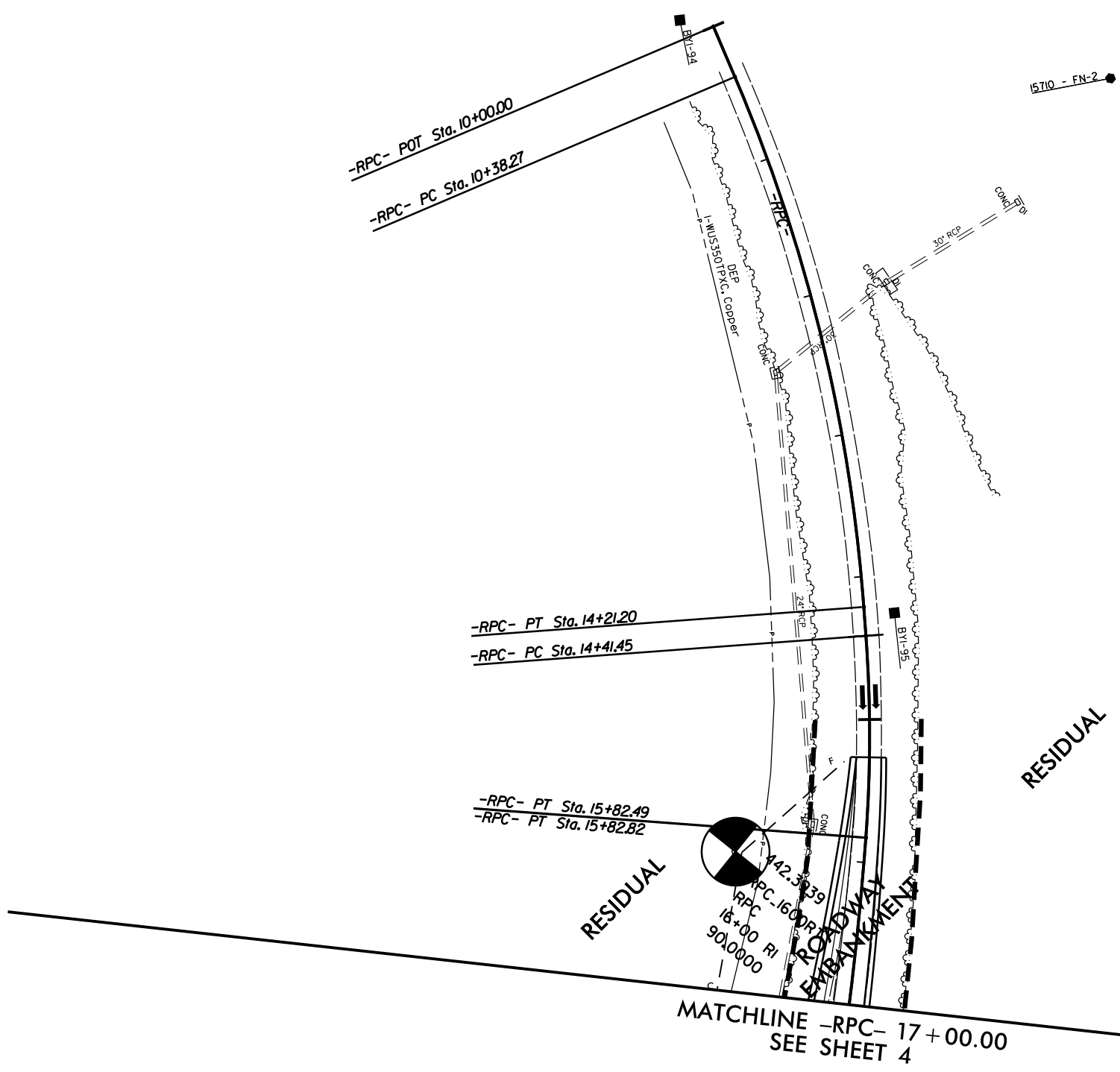
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SEE SHEET 7

REVISIONS

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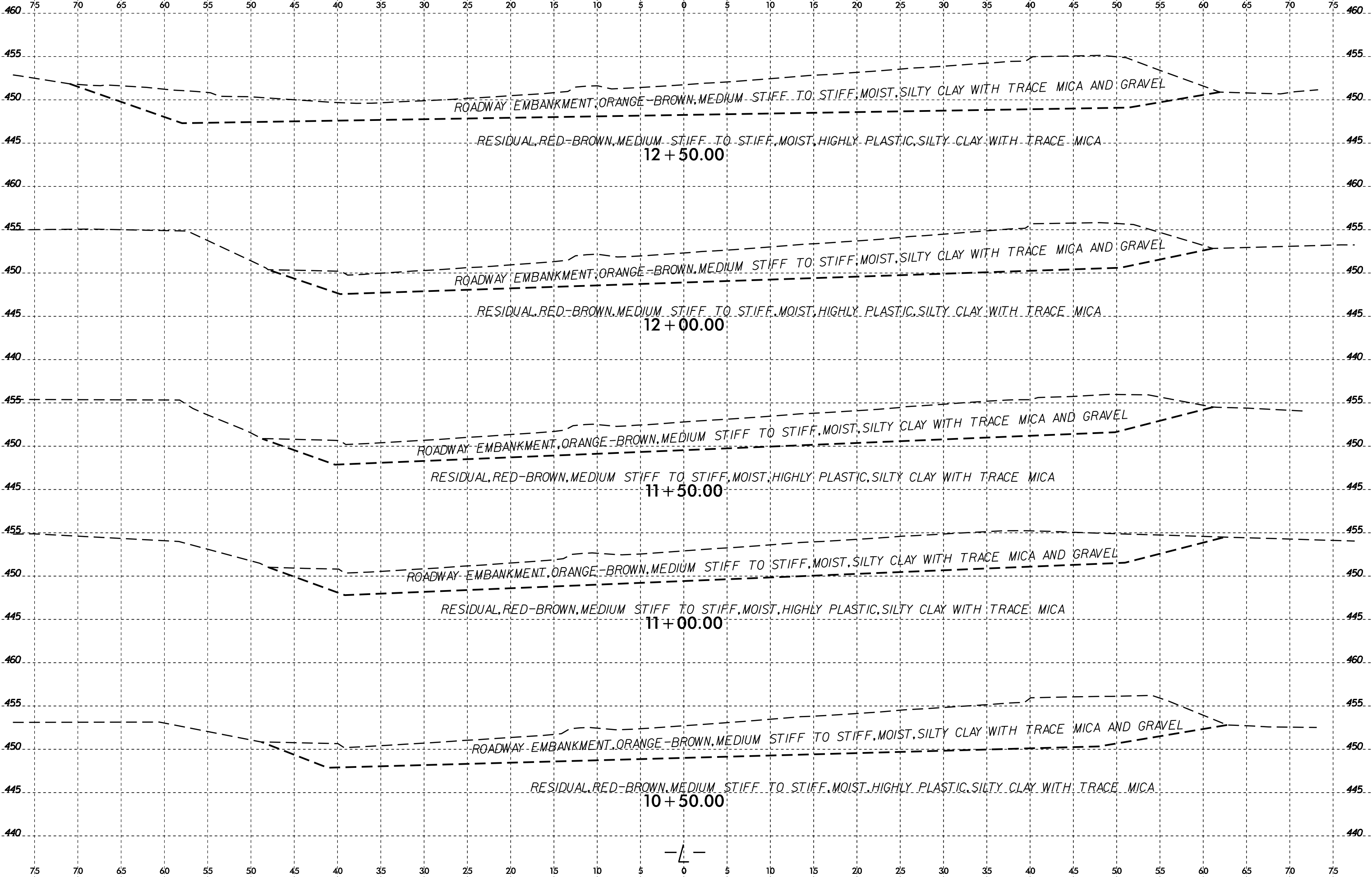
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 N - 785748
 E - 218656
 ELEV 438.99'
 BL Sta 64+45.00, 204' R+
 BENCH TIE WITH YELLOW TAG IN 9' MAPLE

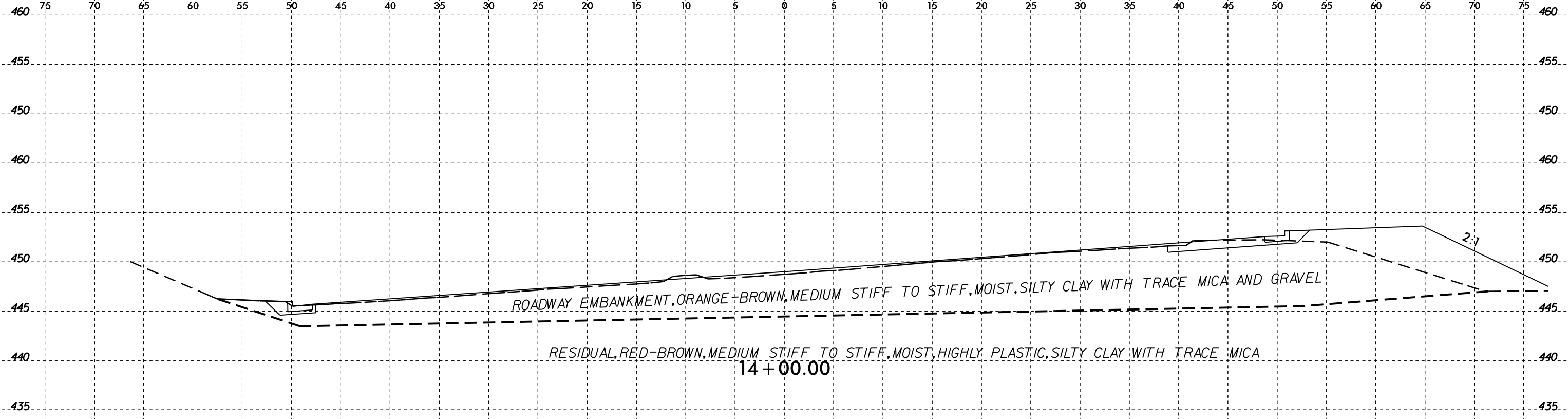
PROJECT REFERENCE NO.	SHEET NO.
U-5826	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
 KCI Engineers • Planners • Scientists • Construction Managers 4505 Falls of Neuse Road, Suite 400 Raleigh, NC 27609-6270 Phone (919) 783-9214 • Fax (919) 783-9266	



REVISIONS
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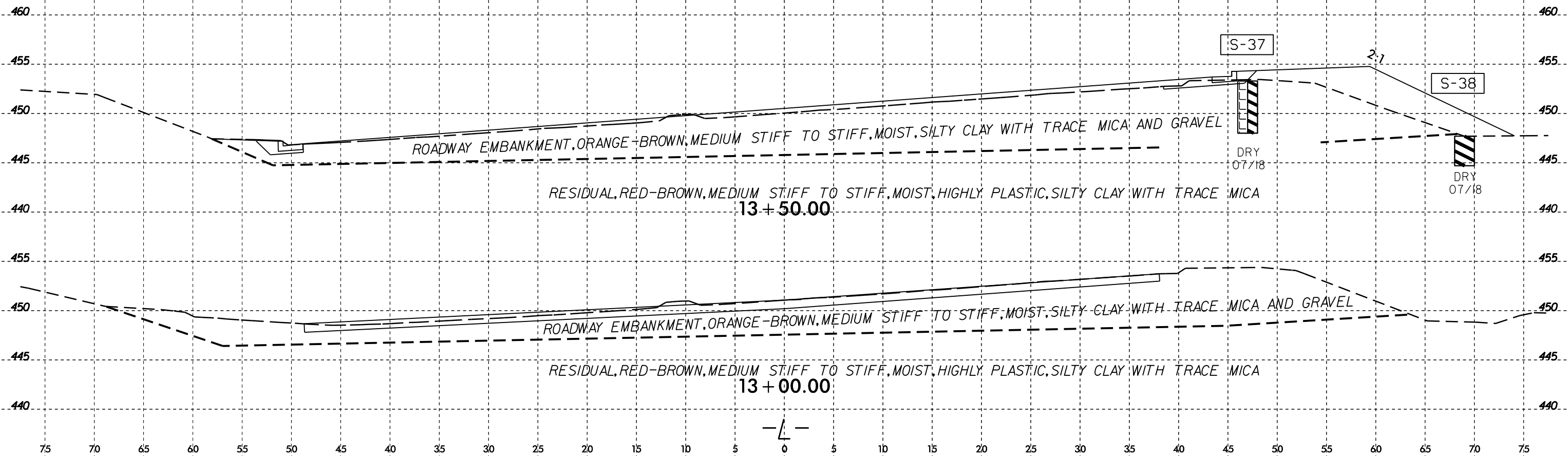
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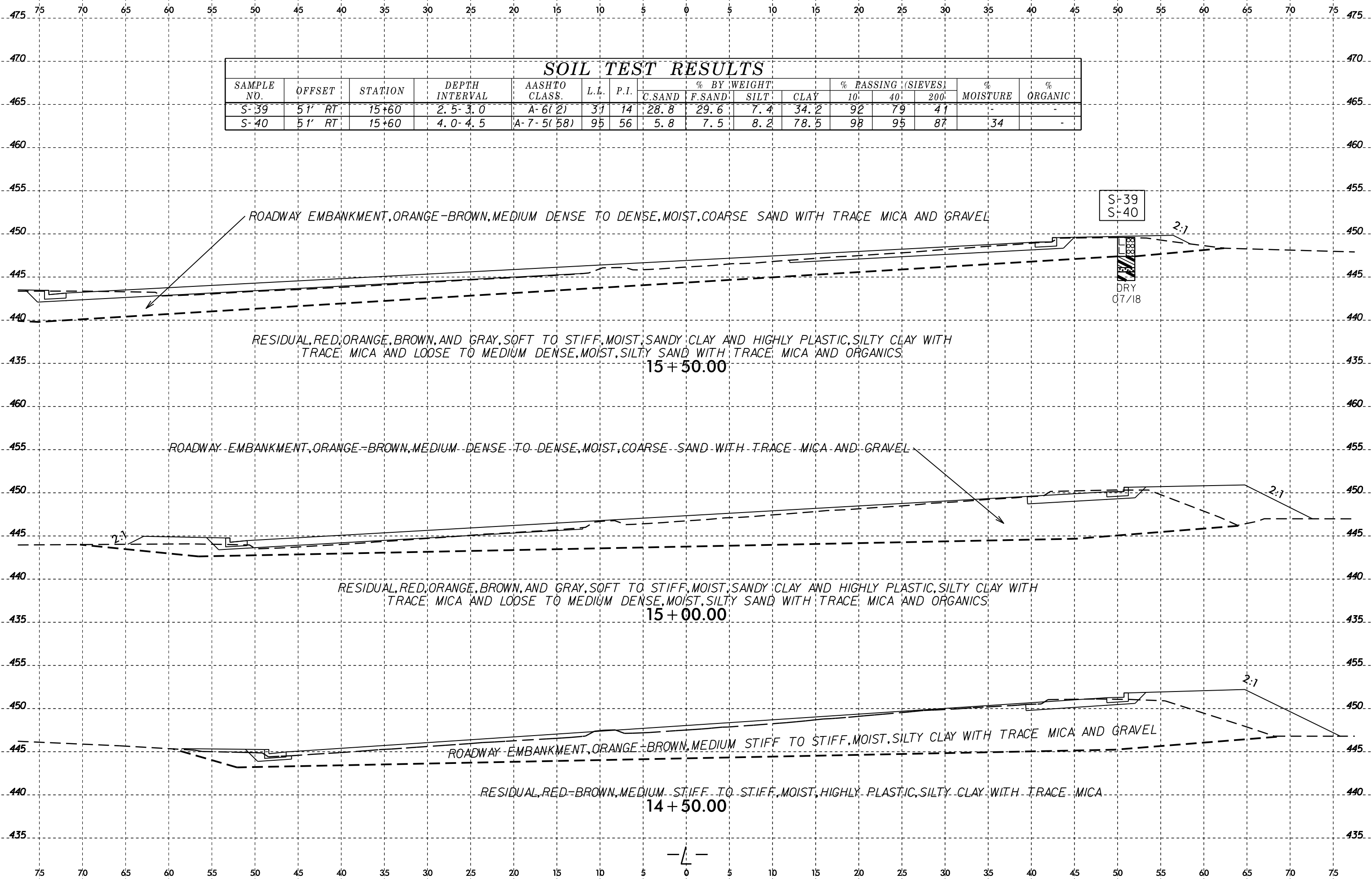
SOIL TEST RESULTS

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-37	47' RT	13+50	0.5-1.0	A-7-5(17)	60	19	4.4	29.0	32.3	34.2	98	96	74	-	-
S-38	69' RT	13+50	0.5-1.0	A-7-5(18)	60	29	9.5	26.6	7.6	56.4	96	92	64	-	-

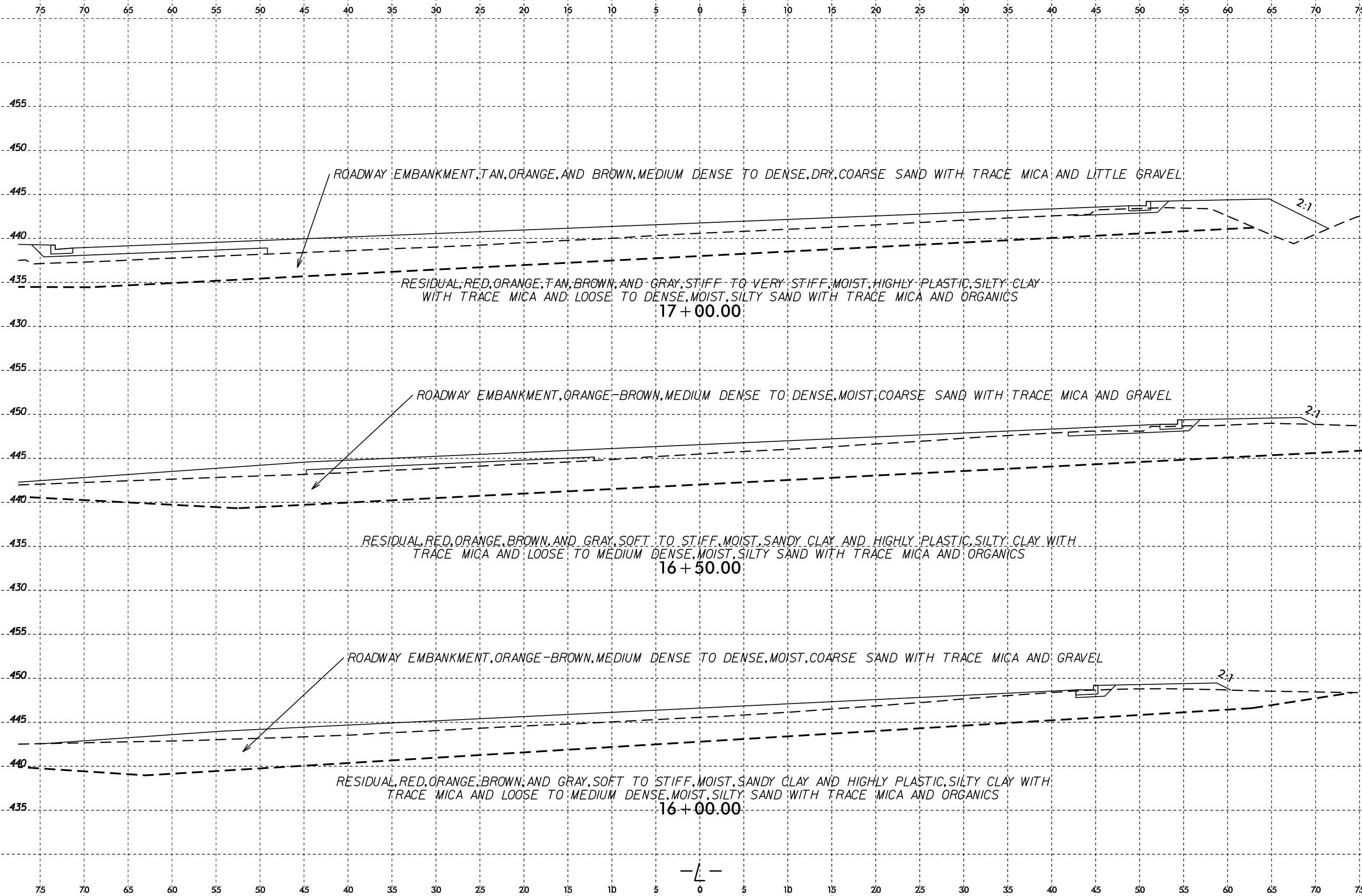


SOIL TEST RESULTS

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-39	51' RT	15+60	2.5-3.0	A-6(2)	31	14	28.8	29.6	7.4	34.2	92	79	41	-	-
S-40	51' RT	15+60	4.0-4.5	A-7-5(58)	95	56	5.8	7.5	8.2	78.5	98	95	87	34	-



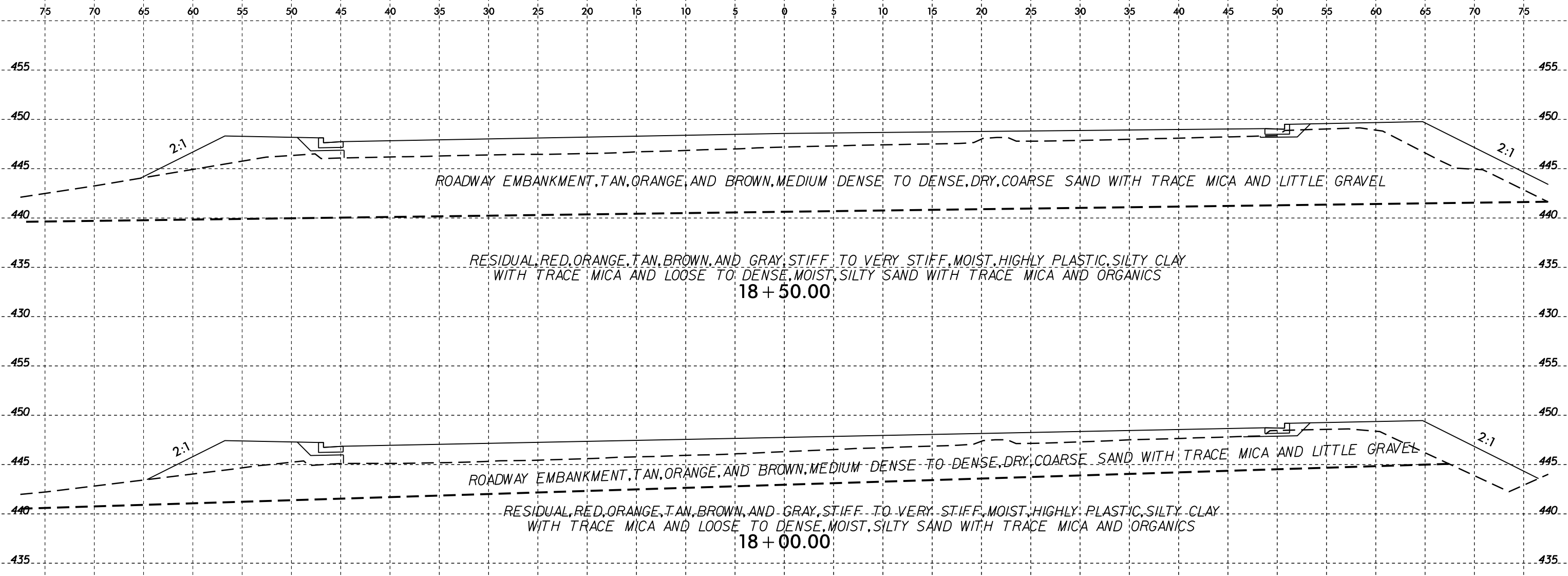
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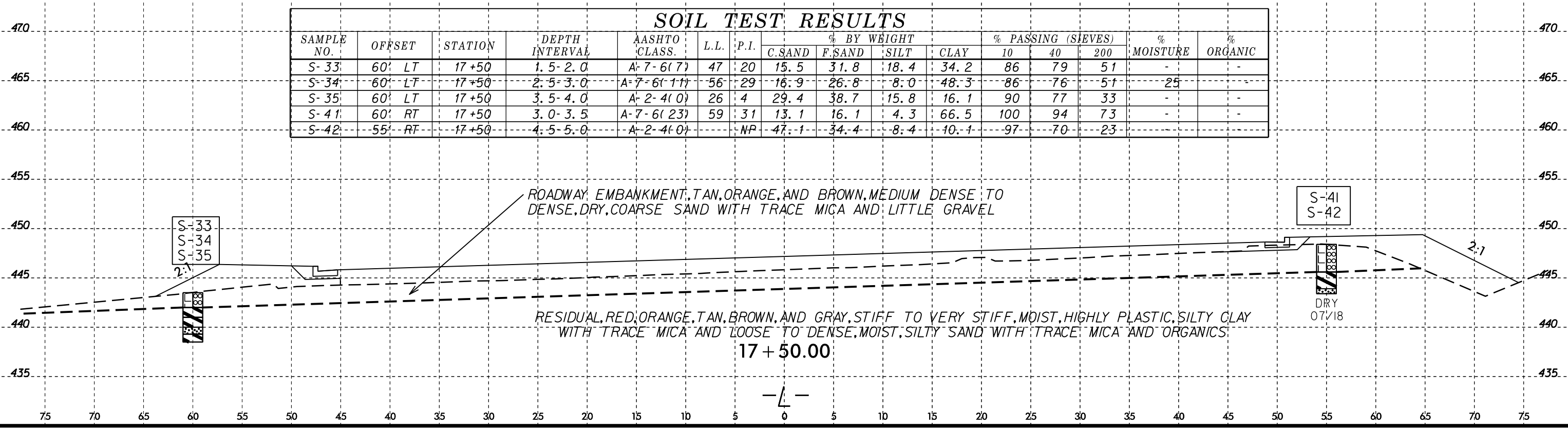


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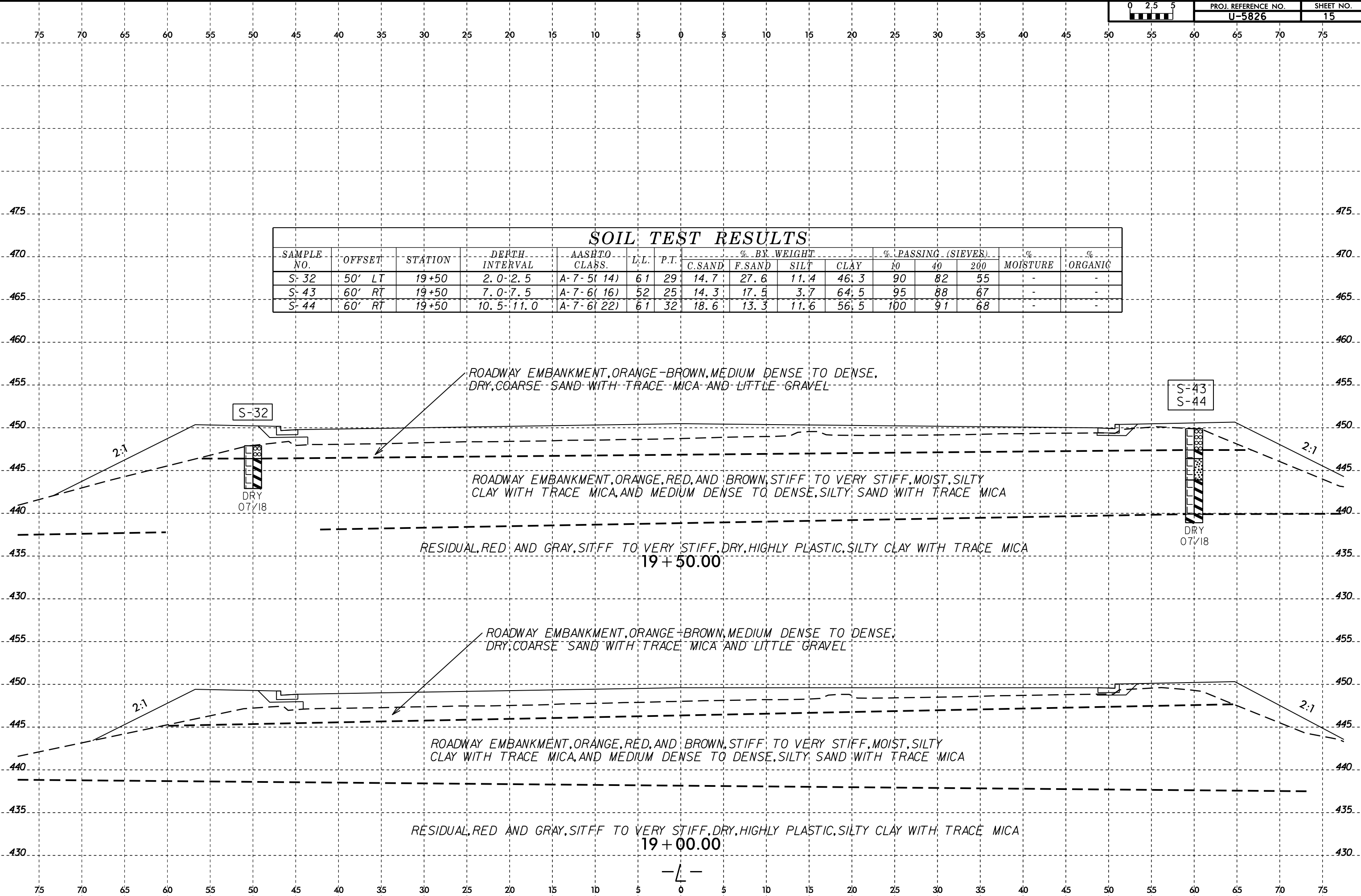


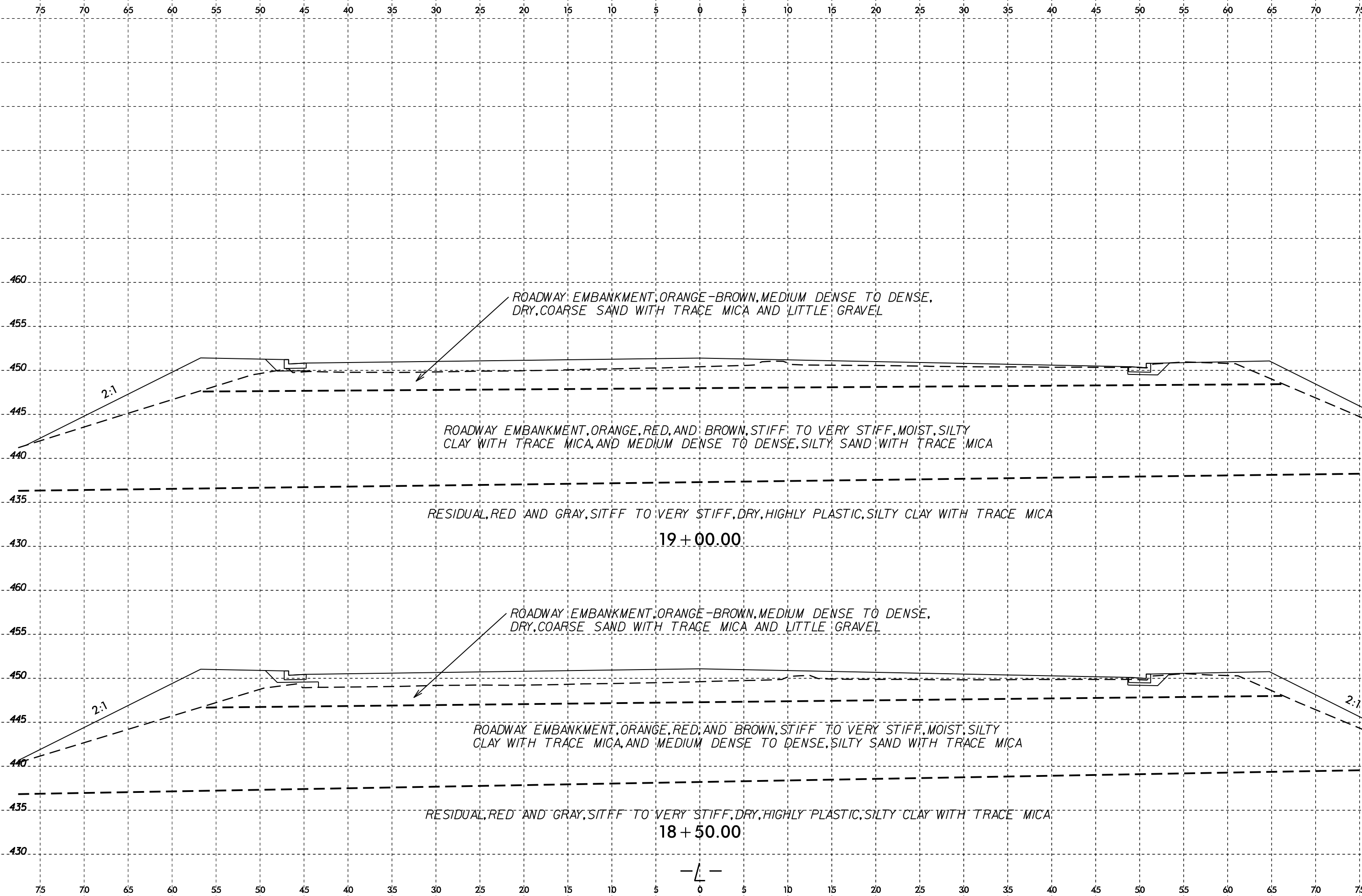
SOIL TEST RESULTS

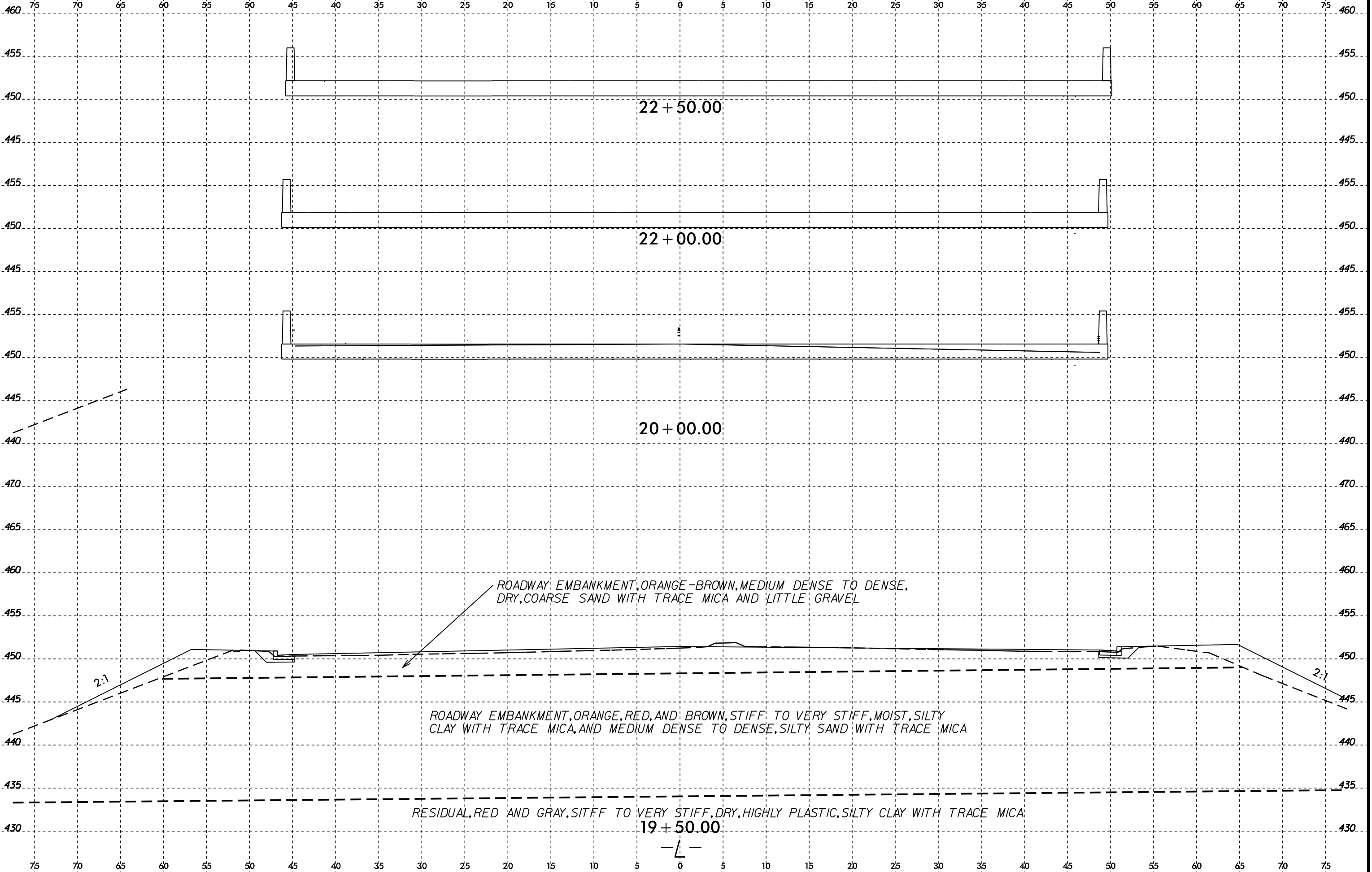
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-33	60' LT	17+50	1.5-2.0	A-7-6(7)	47	20	15.5	31.8	18.4	34.2	86	79	51	-	-
S-34	60' LT	17+50	2.5-3.0	A-7-6(11)	56	29	16.9	26.8	8.0	48.3	86	76	51	25	-
S-35	60' LT	17+50	3.5-4.0	A-2-4(0)	26	4	29.4	38.7	15.8	16.1	90	77	33	-	-
S-41	60' RT	17+50	3.0-3.5	A-7-6(23)	59	31	13.1	16.1	4.3	66.5	100	94	73	-	-
S-42	55' RT	17+50	4.5-5.0	A-2-4(0)	-	NP	47.1	34.4	8.4	10.1	97	70	23	-	-

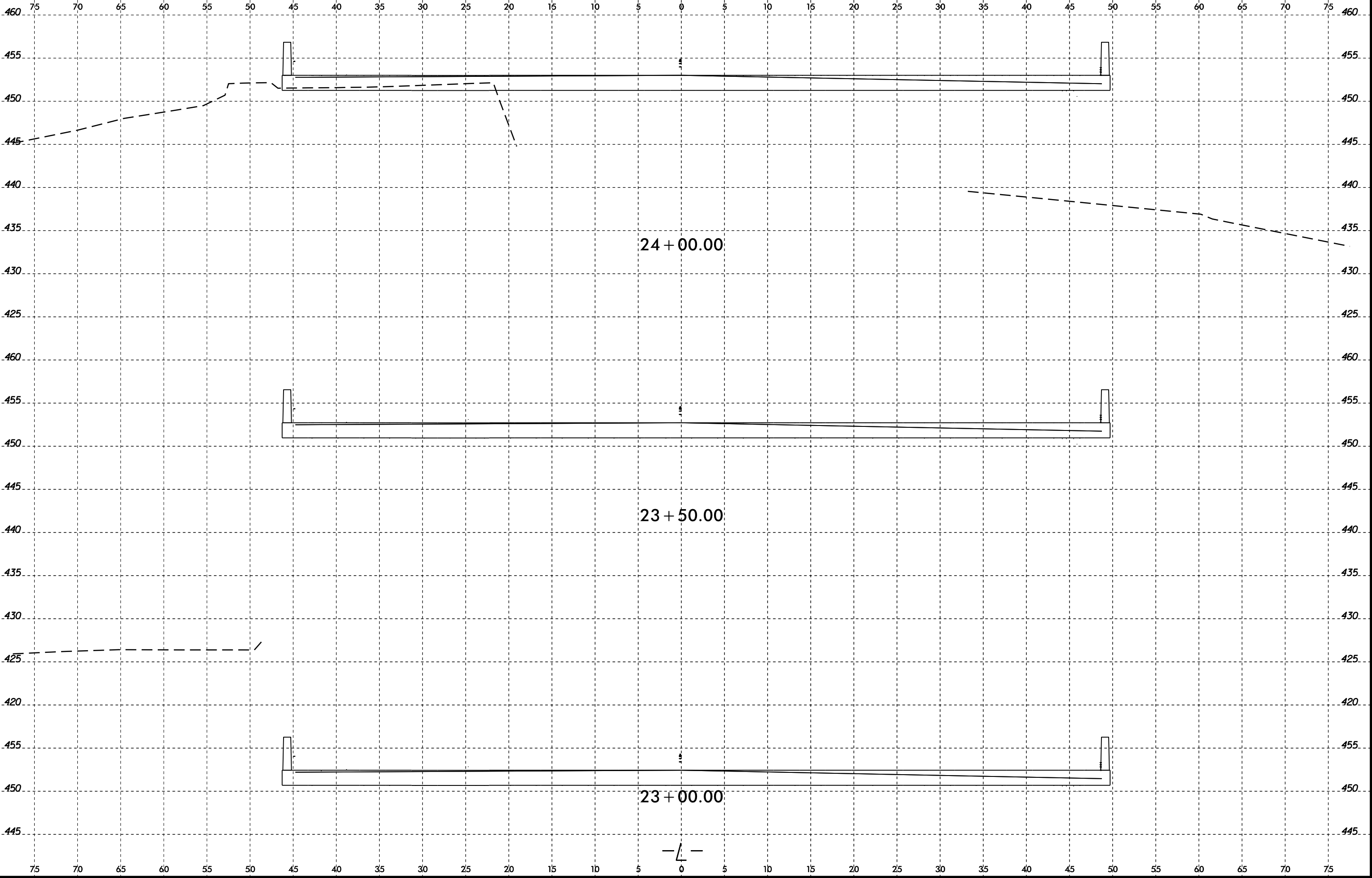


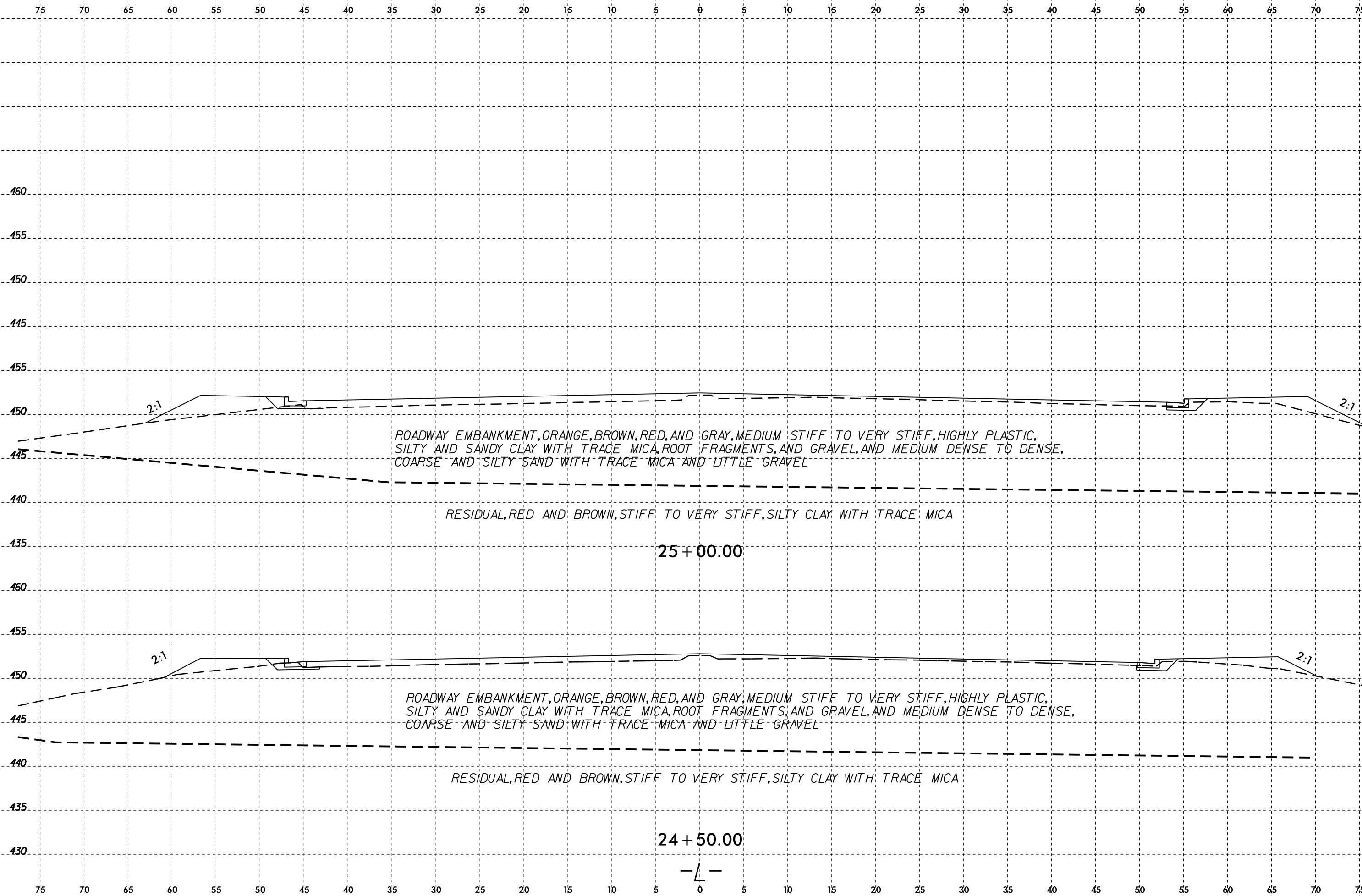
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.T.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-32	50' LT	19+50	2.0-2.5	A-7-5(14)	61	29	14.7	27.6	11.4	46.3	90	82	55	-	-
S-43	60' RT	19+50	7.0-7.5	A-7-6(16)	52	25	14.3	17.5	3.7	64.5	95	88	67	-	-
S-44	60' RT	19+50	10.5-11.0	A-7-6(22)	61	32	18.6	13.3	11.6	56.5	100	91	68	-	-



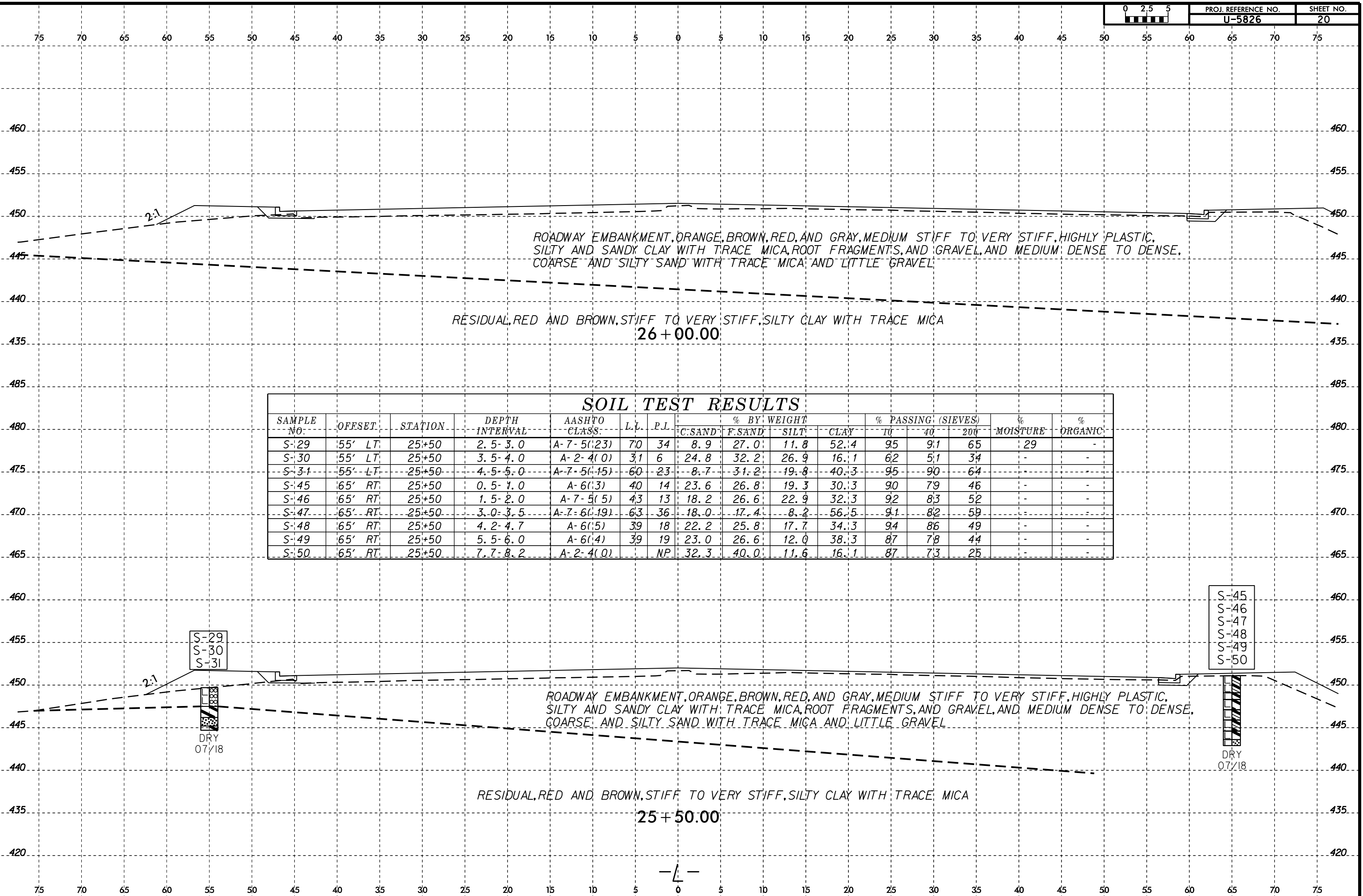








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 \$\$\$\$SUBSERIALNAME\$\$\$\$



ROADWAY EMBANKMENT, ORANGE, BROWN, RED, AND GRAY, MEDIUM STIFF TO VERY STIFF, HIGHLY PLASTIC,
 SILTY AND SANDY CLAY WITH TRACE MICA, ROOT FRAGMENTS, AND GRAVEL, AND MEDIUM DENSE TO DENSE,
 COARSE AND SILTY SAND WITH TRACE MICA AND LITTLE GRAVEL

RESIDUAL, RED AND BROWN, STIFF TO VERY STIFF, SILTY CLAY WITH TRACE MICA
 26 + 00.00

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS	L.L.	P.L.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	#10	#40	#200		
S-29	55' LT	25+50	2.5-3.0	A-7-5(23)	70	34	8.9	27.0	11.8	52.4	95	91	65	29	-
S-30	55' LT	25+50	3.5-4.0	A-2-4(0)	31	6	24.8	32.2	26.9	16.1	62	51	34	-	-
S-31	55' LT	25+50	4.5-5.0	A-7-5(15)	60	23	8.7	31.2	19.8	40.3	95	90	64	-	-
S-45	65' RT	25+50	0.5-1.0	A-6(3)	40	14	23.6	26.8	19.3	30.3	90	79	46	-	-
S-46	65' RT	25+50	1.5-2.0	A-7-5(5)	43	13	18.2	26.6	22.9	32.3	92	83	52	-	-
S-47	65' RT	25+50	3.0-3.5	A-7-6(19)	63	36	18.0	17.4	8.2	56.5	91	82	59	-	-
S-48	65' RT	25+50	4.2-4.7	A-6(15)	39	18	22.2	25.8	17.7	34.3	94	86	49	-	-
S-49	65' RT	25+50	5.5-6.0	A-6(4)	39	19	23.0	26.6	12.0	38.3	87	78	44	-	-
S-50	65' RT	25+50	7.7-8.2	A-2-4(0)		NP	32.3	40.0	11.6	16.1	87	73	25	-	-

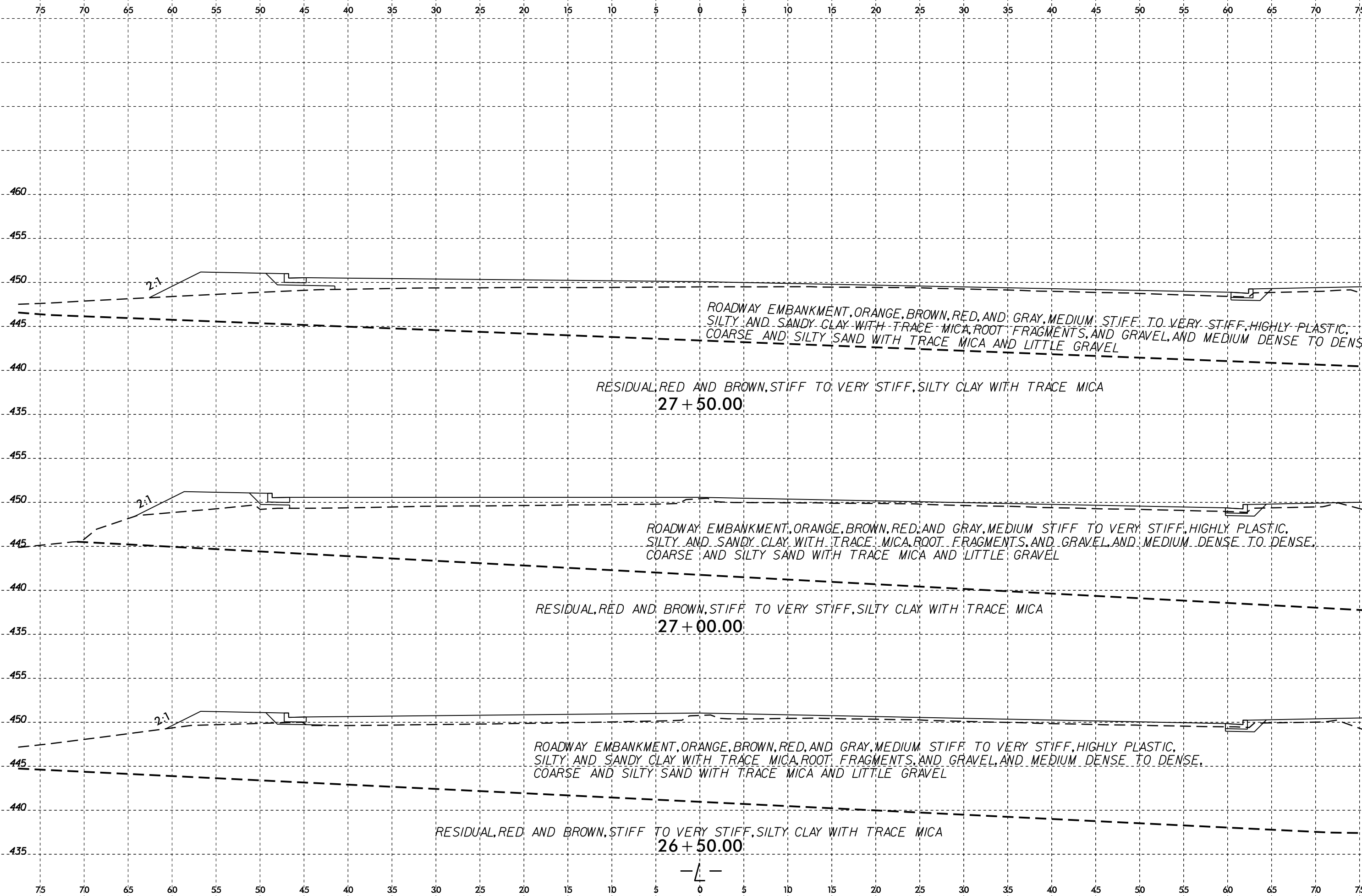
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 SILTY AND SANDY CLAY WITH TRACE MICA, ROOT FRAGMENTS, AND GRAVEL, AND MEDIUM DENSE TO DENSE,
 COARSE AND SILTY SAND WITH TRACE MICA AND LITTLE GRAVEL

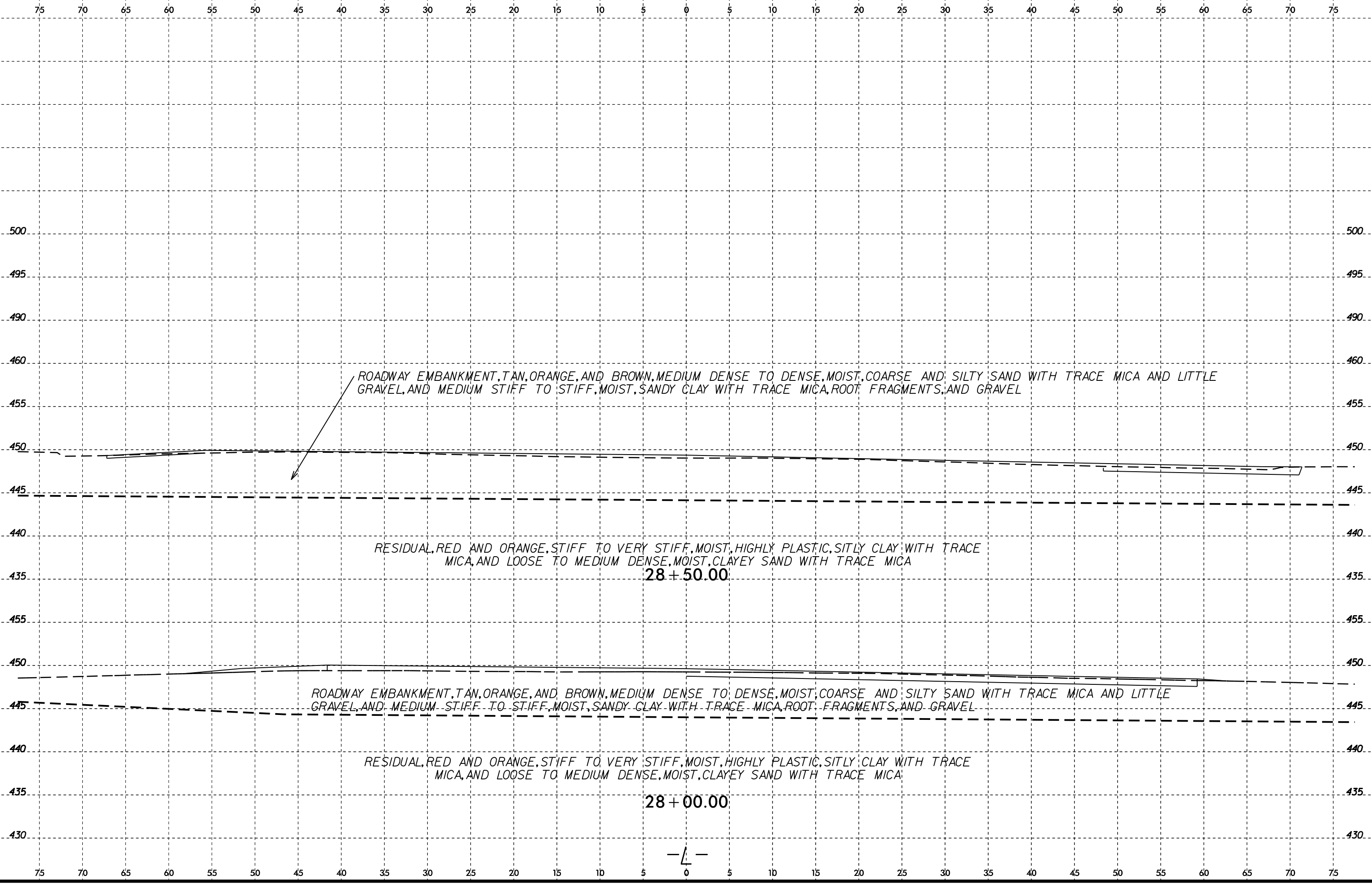
RESIDUAL, RED AND BROWN, STIFF TO VERY STIFF, SILTY CLAY WITH TRACE MICA
 25 + 50.00

S-29
 S-30
 S-31
 DRY
 07/18

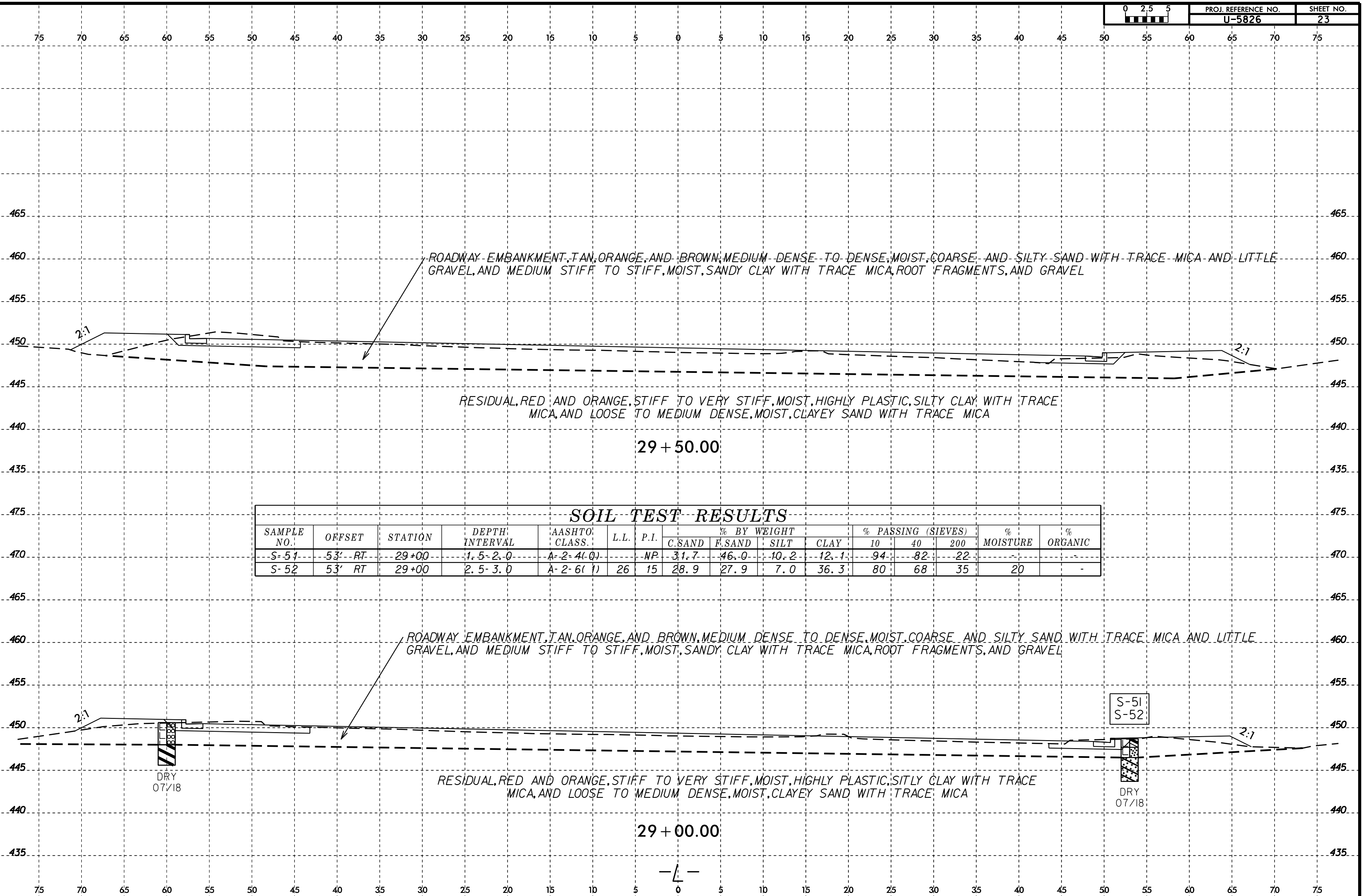
S-45
 S-46
 S-47
 S-48
 S-49
 S-50
 DRY
 07/18

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ROADWAY EMBANKMENT, TAN, ORANGE, AND BROWN, MEDIUM DENSE TO DENSE, MOIST, COARSE AND SILTY SAND WITH TRACE MICA AND LITTLE GRAVEL, AND MEDIUM STIFF TO STIFF, MOIST, SANDY CLAY WITH TRACE MICA, ROOT FRAGMENTS, AND GRAVEL

RESIDUAL, RED AND ORANGE, STIFF TO VERY STIFF, MOIST, HIGHLY PLASTIC, SILTY CLAY WITH TRACE MICA, AND LOOSE TO MEDIUM DENSE, MOIST, CLAYEY SAND WITH TRACE MICA

29 + 50.00

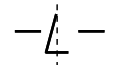
SOIL TEST RESULTS

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-51	53' RT	29+00	1.5-2.0	A-2-4(0)	-	NP	31.7	46.0	10.2	12.1	94	82	22	-	-
S-52	53' RT	29+00	2.5-3.0	A-2-6(1)	26	15	28.9	27.9	7.0	36.3	80	68	35	20	-

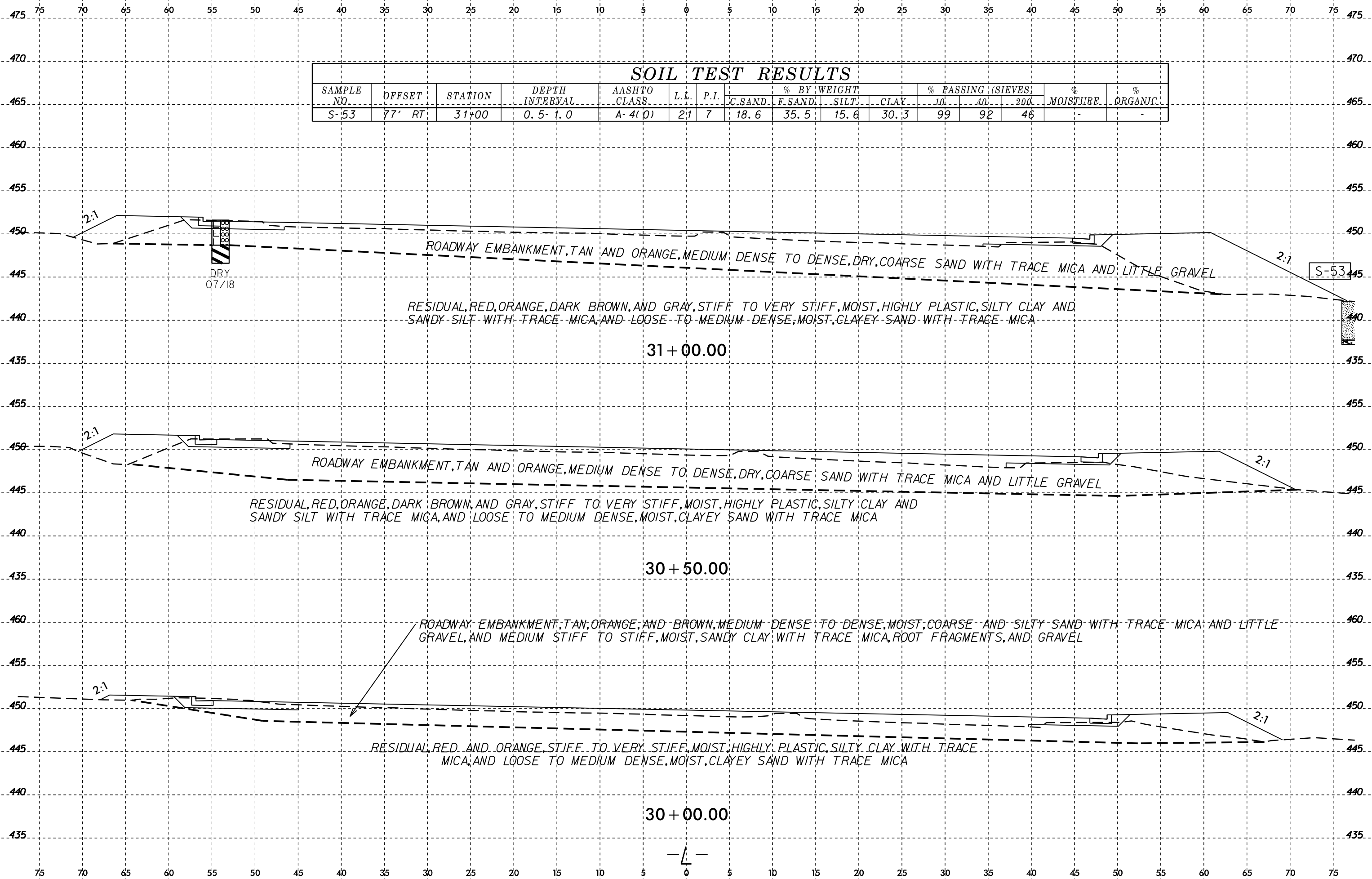
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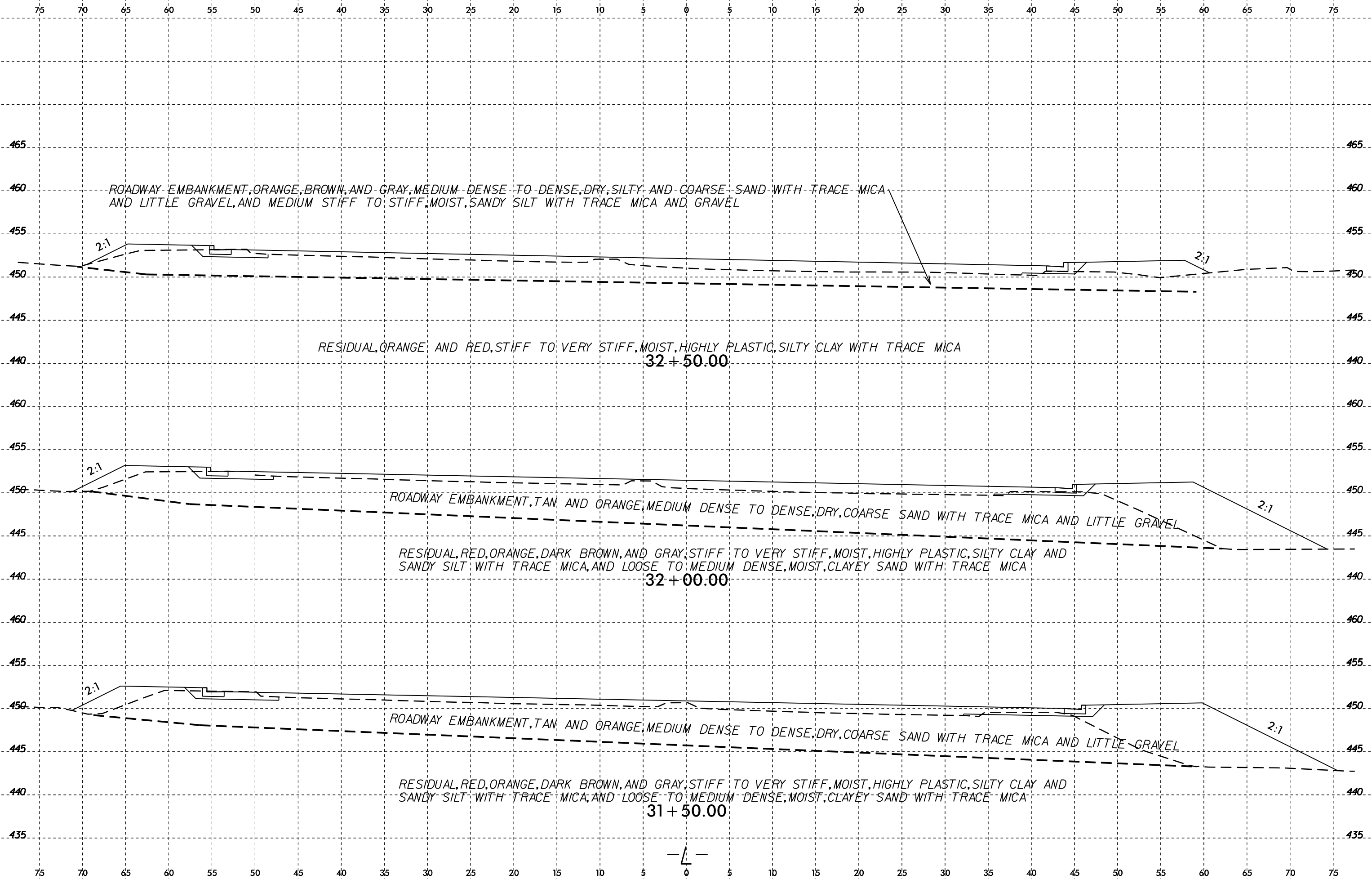
RESIDUAL, RED AND ORANGE, STIFF TO VERY STIFF, MOIST, HIGHLY PLASTIC, SILTY CLAY WITH TRACE MICA, AND LOOSE TO MEDIUM DENSE, MOIST, CLAYEY SAND WITH TRACE MICA

29 + 00.00

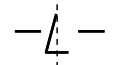


SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-53	77' RT	31+00	0.5-1.0	A-4(0)	21	7	18.6	35.5	15.6	30.3	99	92	46	-	-

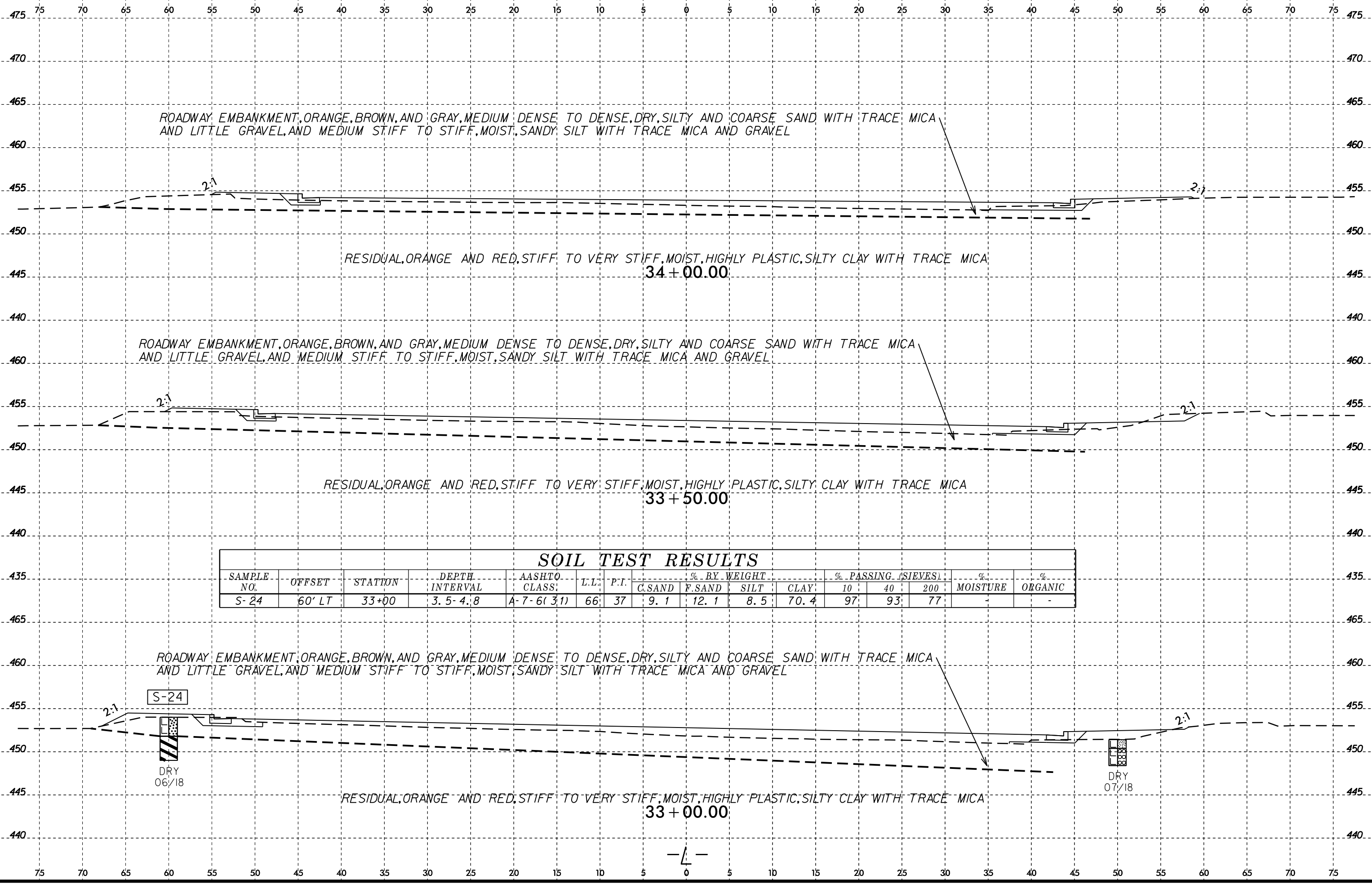




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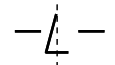


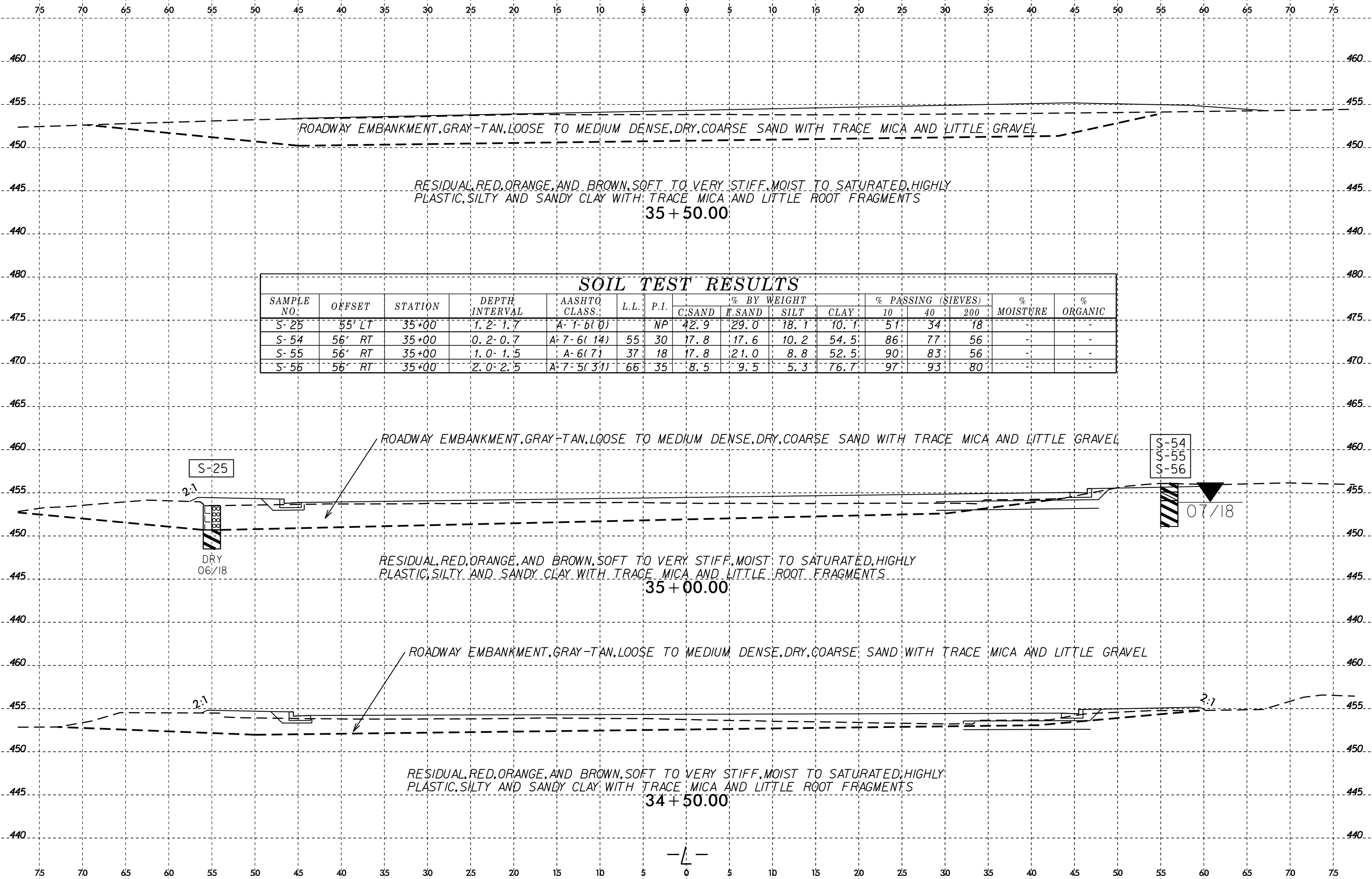
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SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-24	60' LT	33+00	3.5-4.8	A-7-6(31)	66	37	9.1	12.1	8.5	70.4	97	93	77	-	-

S-24

DRY
06/18

DRY
07/18



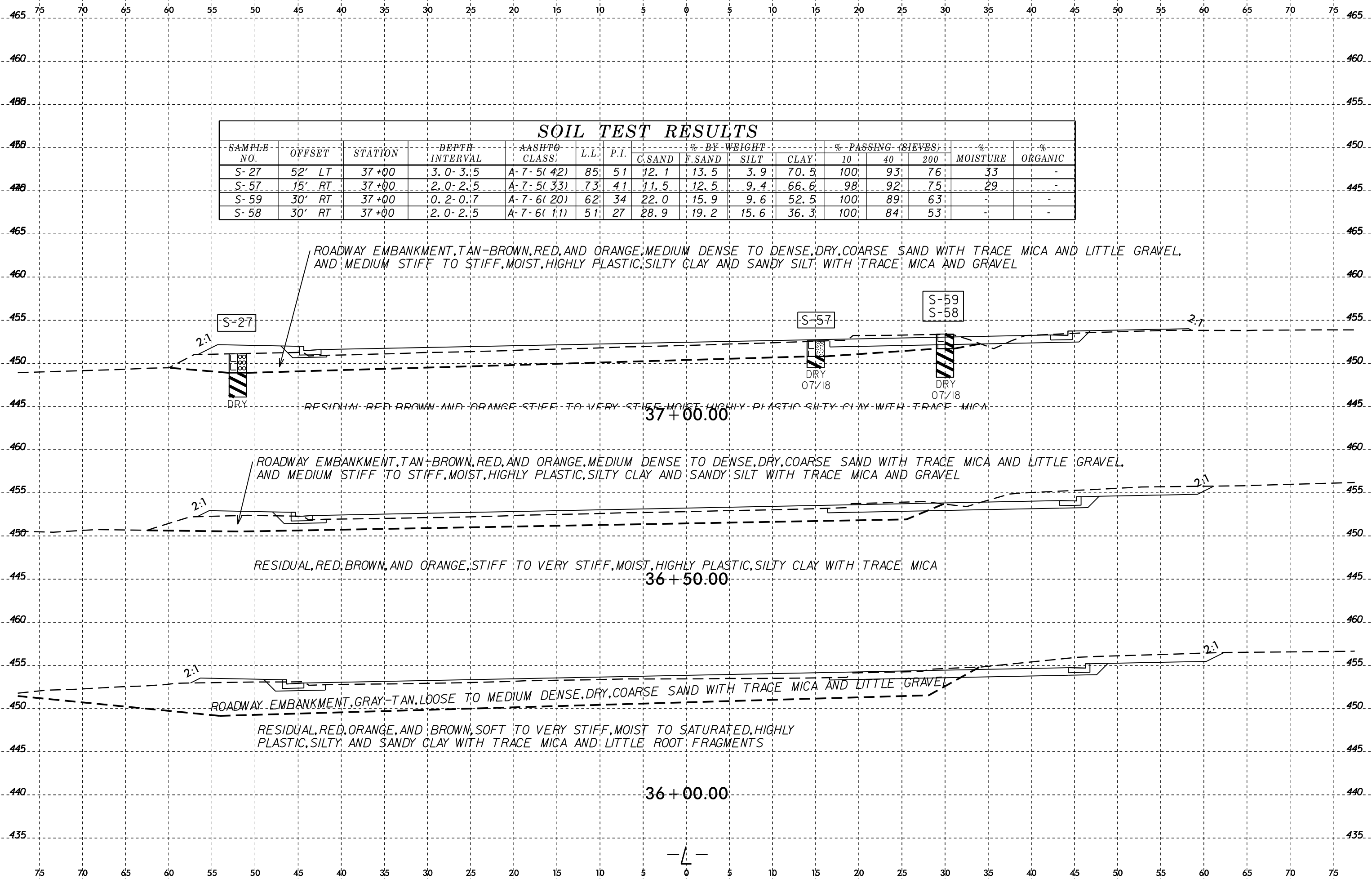


SOIL TEST RESULTS

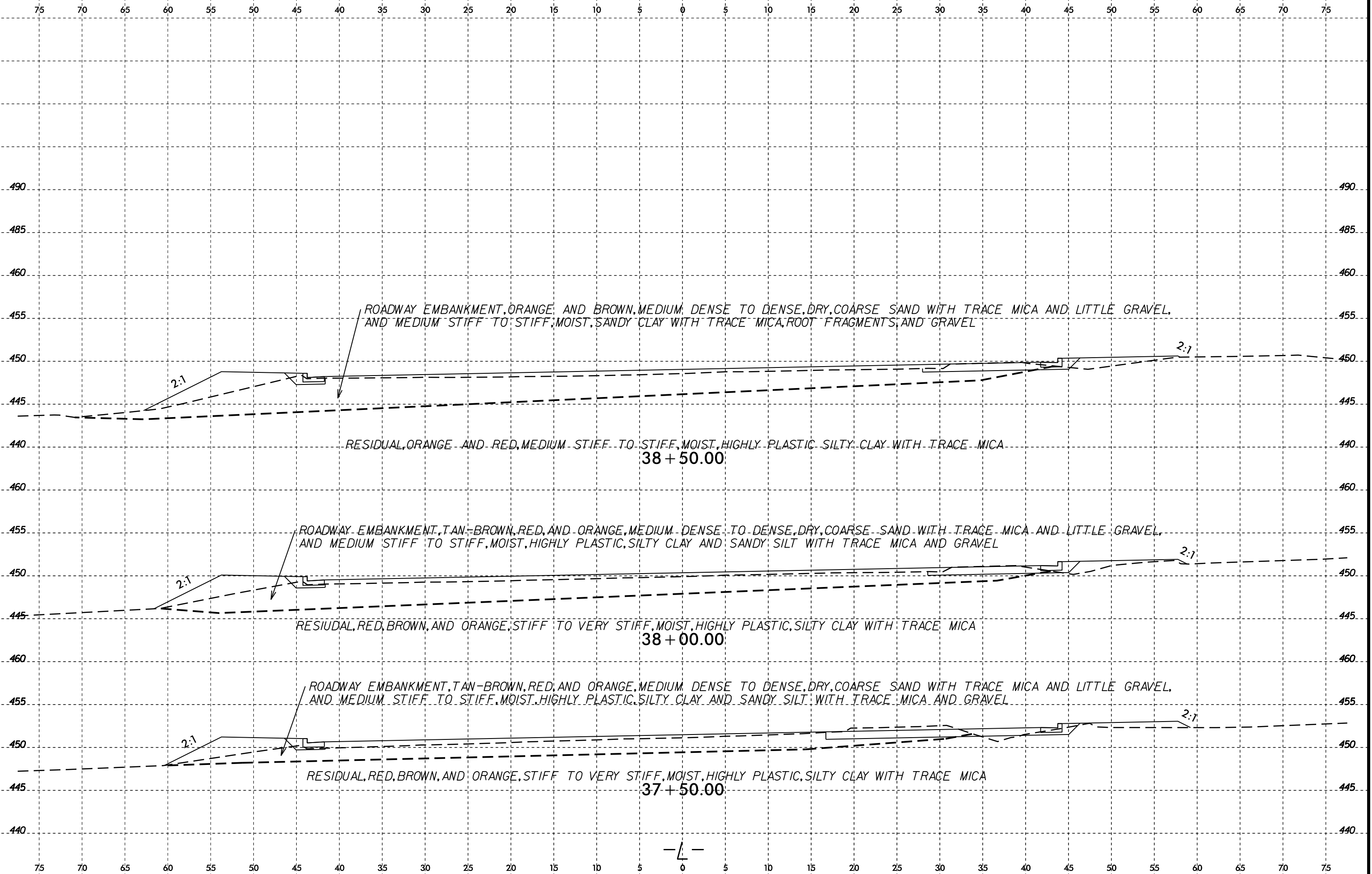
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-25	55' LT	35+00	1.2-1.7	A-1-b(0)		NP	42.9	29.0	18.1	10.1	51	34	18	-	-
S-54	56' RT	35+00	0.2-0.7	A-7-6(14)	55	30	17.8	17.6	10.2	54.5	86	77	56	-	-
S-55	56' RT	35+00	1.0-1.5	A-6(7)	37	18	17.8	21.0	8.8	52.5	90	83	56	-	-
S-56	56' RT	35+00	2.0-2.5	A-7-5(31)	66	35	8.5	9.5	5.3	76.7	97	93	80	-	-

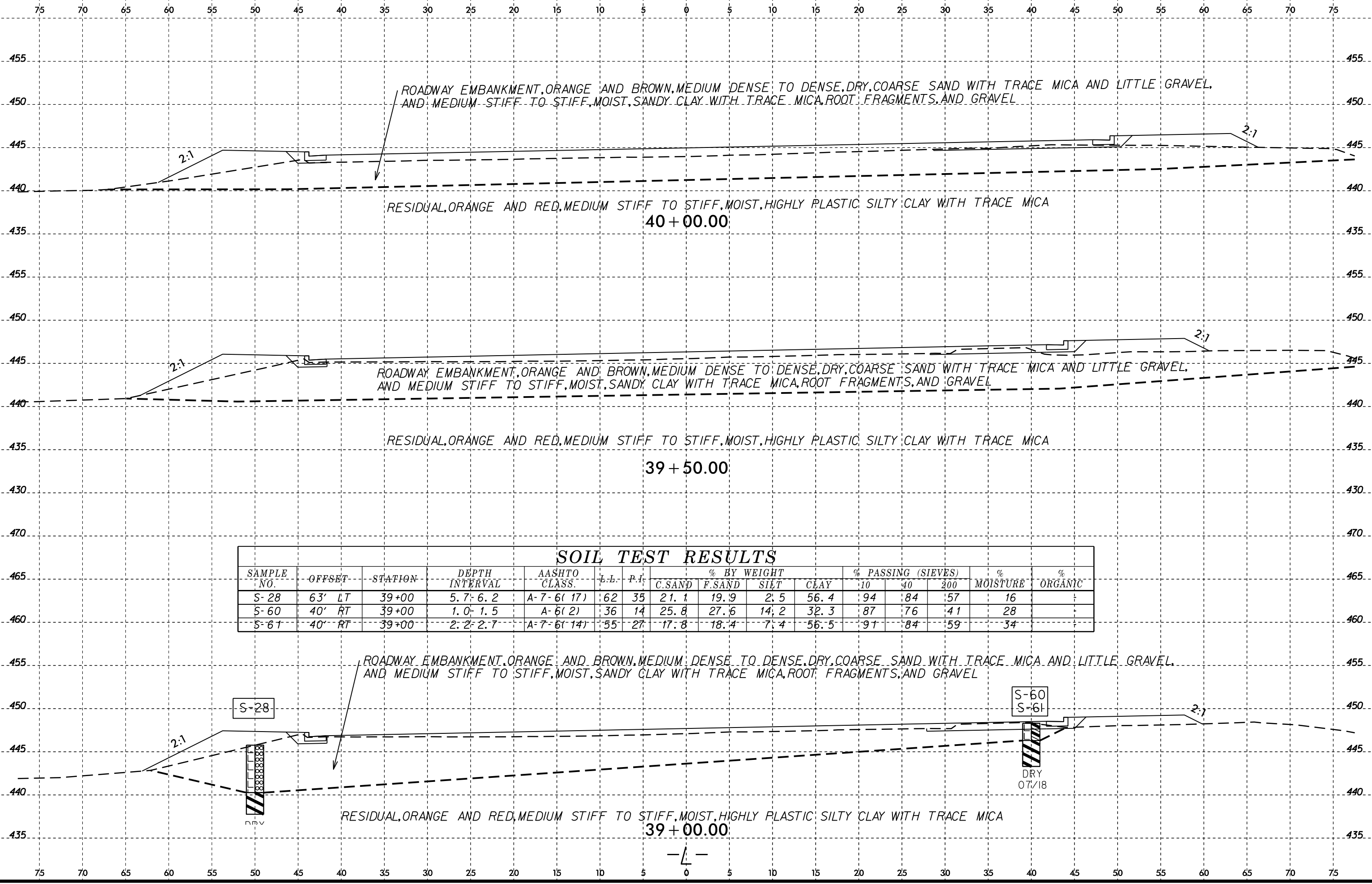
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 \$\$\$\$SUBSERIALNAME\$\$\$\$

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-27	52' LT	37+00	3.0-3.15	A-7-5(42)	85	51	12.1	13.5	3.9	70.5	100	93	76	33	-
S-57	15' RT	37+00	2.0-2.5	A-7-5(33)	73	41	11.5	12.5	9.4	66.6	98	92	75	29	-
S-59	30' RT	37+00	0.2-0.7	A-7-6(20)	62	34	22.0	15.9	9.6	52.5	100	89	63	-	-
S-58	30' RT	37+00	2.0-2.5	A-7-6(11)	51	27	28.9	19.2	15.6	36.3	100	84	53	-	-



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###SUBSERIAL###





ROADWAY EMBANKMENT, ORANGE AND BROWN, MEDIUM DENSE TO DENSE, DRY, COARSE SAND WITH TRACE MICA AND LITTLE GRAVEL,
AND MEDIUM STIFF TO STIFF, MOIST, SANDY CLAY WITH TRACE MICA, ROOT FRAGMENTS, AND GRAVEL

RESIDUAL, ORANGE AND RED, MEDIUM STIFF TO STIFF, MOIST, HIGHLY PLASTIC SILTY CLAY WITH TRACE MICA
40 + 00.00

ROADWAY EMBANKMENT, ORANGE AND BROWN, MEDIUM DENSE TO DENSE, DRY, COARSE SAND WITH TRACE MICA AND LITTLE GRAVEL,
AND MEDIUM STIFF TO STIFF, MOIST, SANDY CLAY WITH TRACE MICA, ROOT FRAGMENTS, AND GRAVEL

RESIDUAL, ORANGE AND RED, MEDIUM STIFF TO STIFF, MOIST, HIGHLY PLASTIC SILTY CLAY WITH TRACE MICA
39 + 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-28	63' LT	39+00	5.7-6.2	A-7-6(17)	62	35	21.1	19.9	2.5	56.4	94	84	57	16	
S-60	40' RT	39+00	1.0-1.5	A-6(2)	36	14	25.8	27.6	14.2	32.3	87	76	41	28	
S-61	40' RT	39+00	2.2-2.7	A-7-6(14)	55	27	17.8	18.4	7.4	56.5	91	84	59	34	

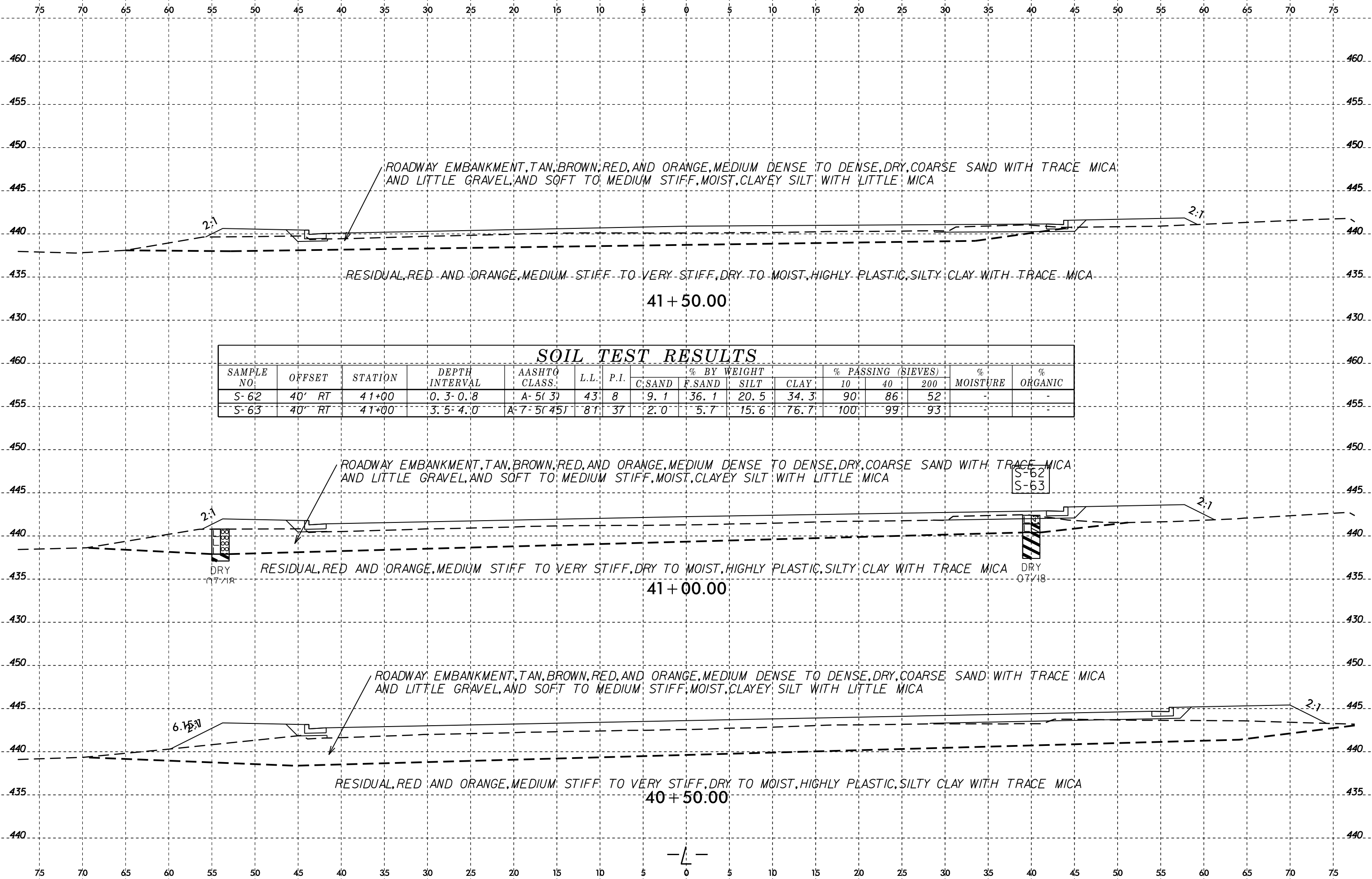
ROADWAY EMBANKMENT, ORANGE AND BROWN, MEDIUM DENSE TO DENSE, DRY, COARSE SAND WITH TRACE MICA AND LITTLE GRAVEL,
AND MEDIUM STIFF TO STIFF, MOIST, SANDY CLAY WITH TRACE MICA, ROOT FRAGMENTS, AND GRAVEL

S-28

S-60
S-61

DRY
07/18

RESIDUAL, ORANGE AND RED, MEDIUM STIFF TO STIFF, MOIST, HIGHLY PLASTIC SILTY CLAY WITH TRACE MICA
39 + 00.00

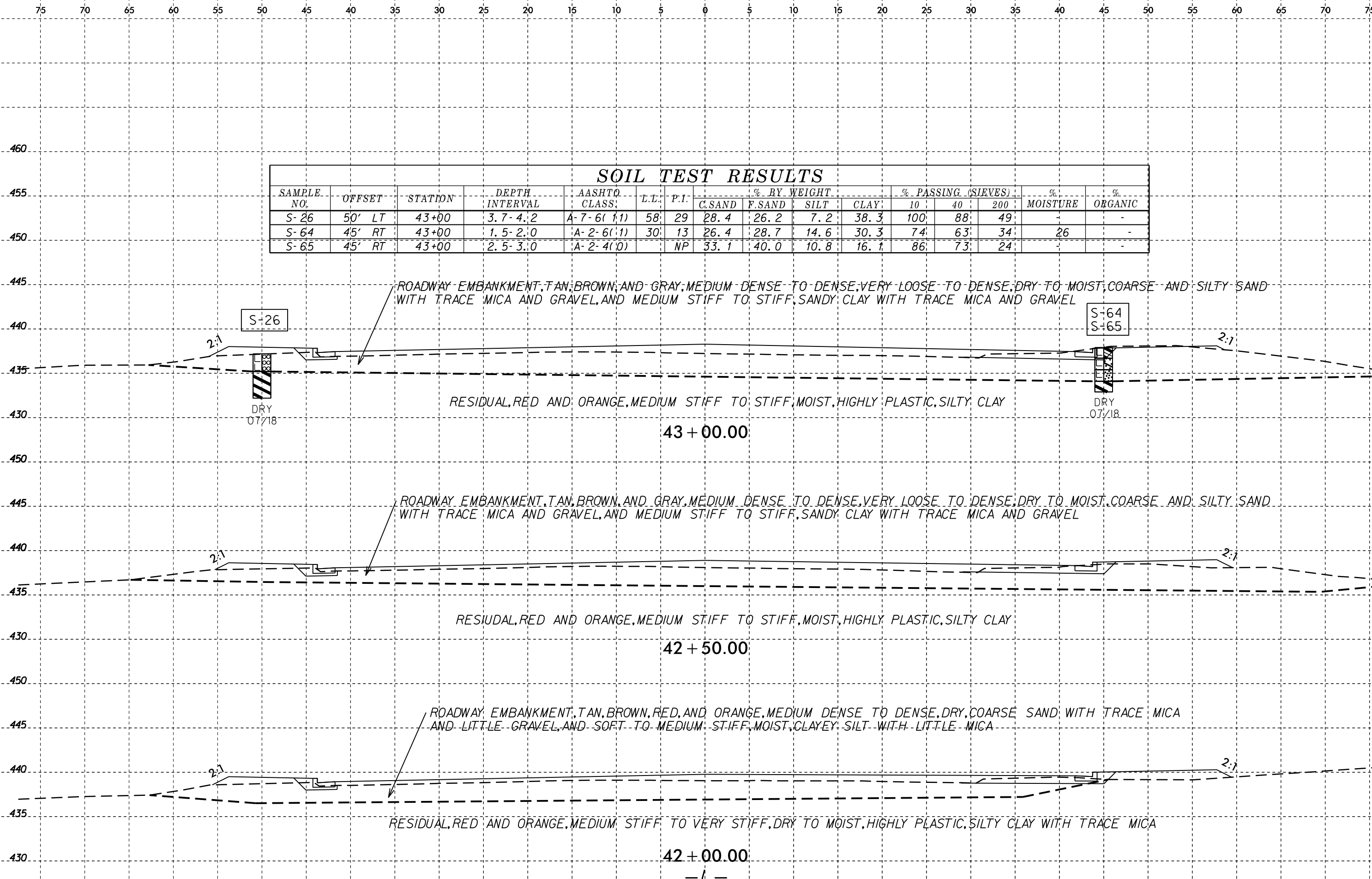


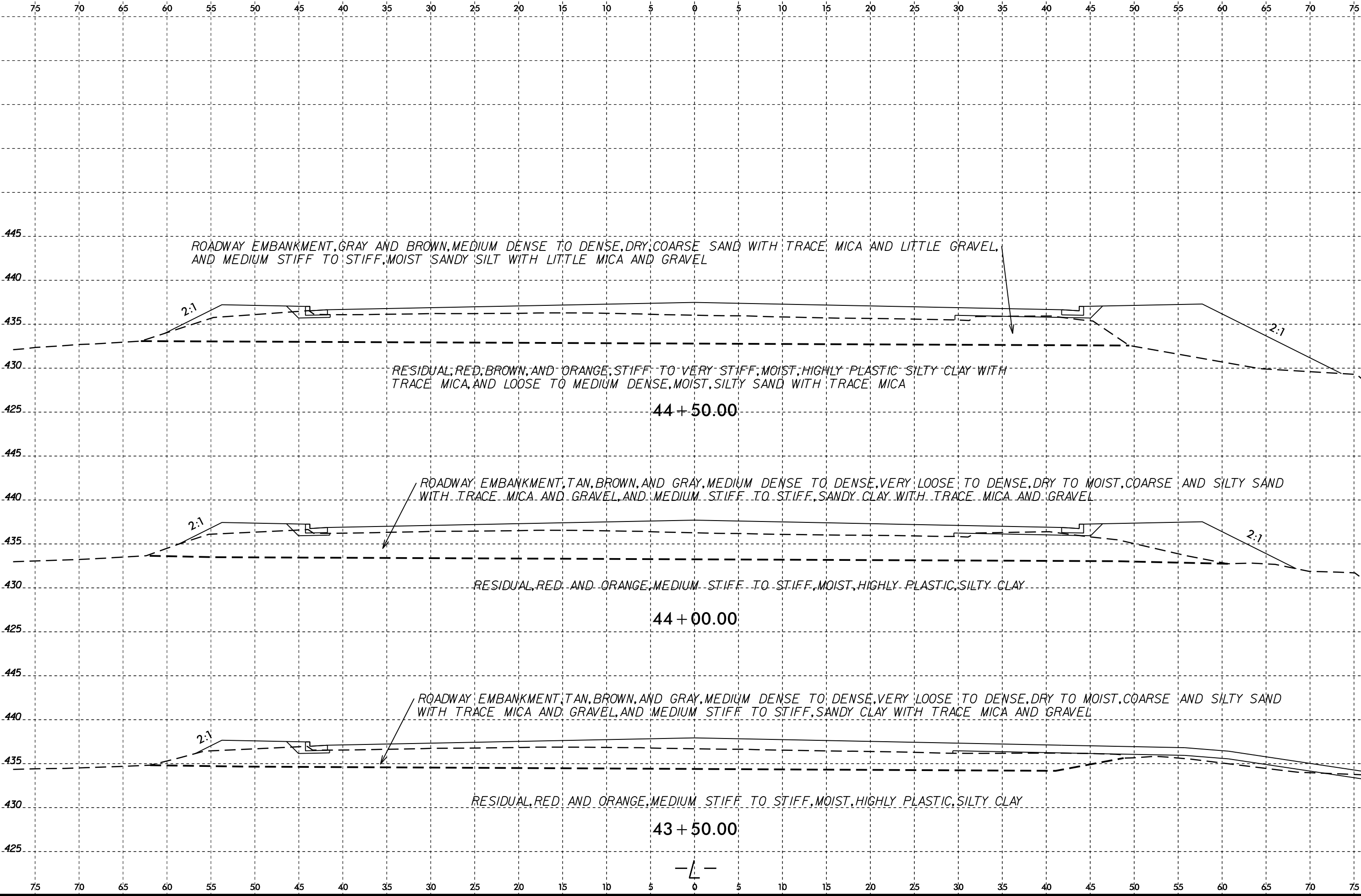
SOIL TEST RESULTS

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-62	40' RT	41+00	0.3-0.8	A-5(3)	43	8	9.1	36.1	20.5	34.3	90	86	52	-	-
S-63	40' RT	41+00	3.5-4.0	A-7-5(45)	81	37	2.0	5.7	15.6	76.7	100	99	93	-	-

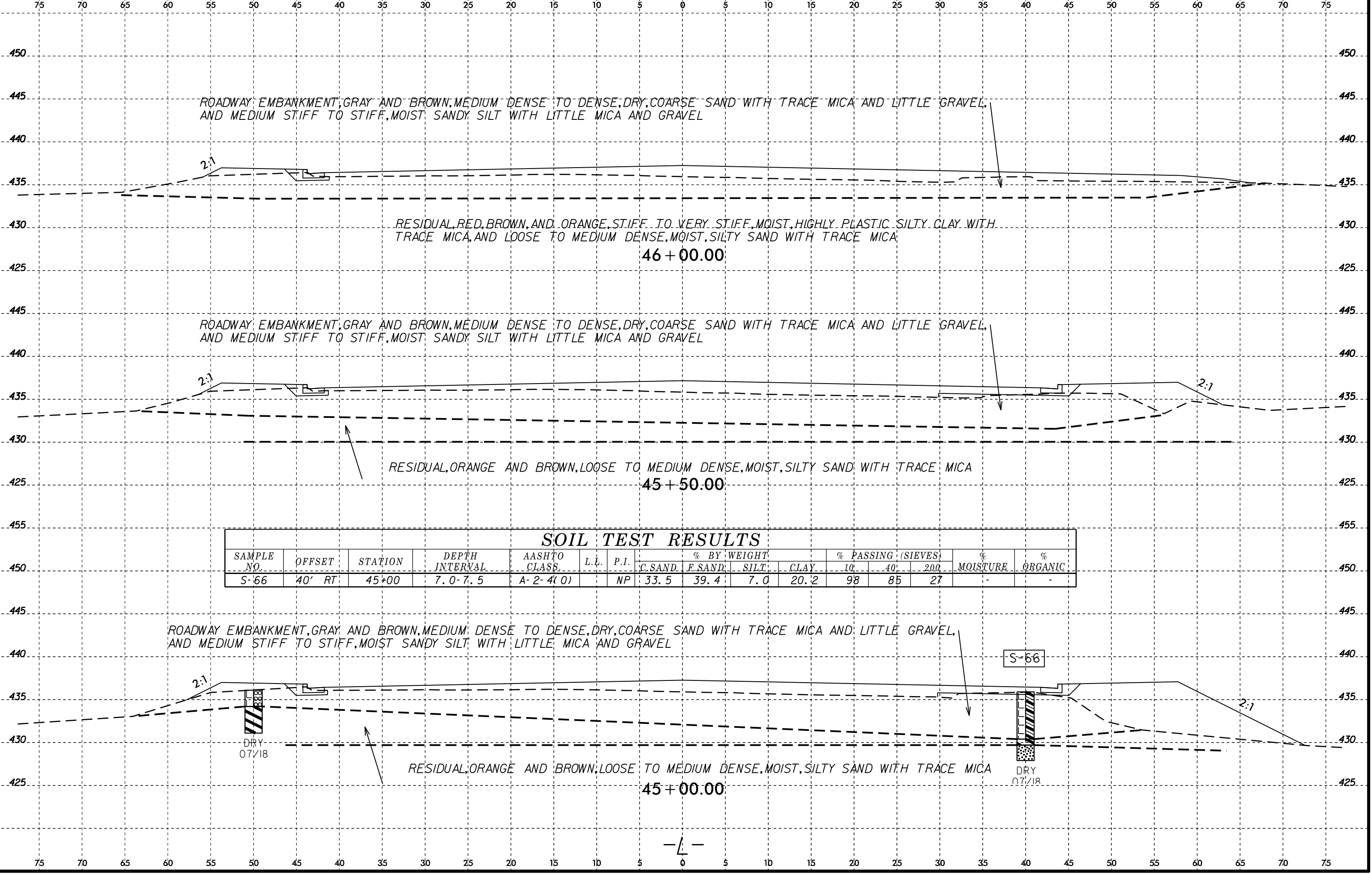
SOIL TEST RESULTS

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	50' LT	43+00	3.7-4.2	A-7-6(1,1)	58	29	28.4	26.2	7.2	38.3	100	88	49	-	-
S-64	45' RT	43+00	1.5-2.0	A-2-6(1,1)	30	13	26.4	28.7	14.6	30.3	74	63	34	26	-
S-65	45' RT	43+00	2.5-3.0	A-2-4(0)	NP		33.1	40.0	10.8	16.1	86	73	24	-	-





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ROADWAY EMBANKMENT, GRAY AND BROWN, MEDIUM DENSE TO DENSE, DRY, COARSE SAND WITH TRACE MICA AND LITTLE GRAVEL, AND MEDIUM STIFF TO STIFF, MOIST SANDY SILT WITH LITTLE MICA AND GRAVEL

RESIDUAL, RED, BROWN, AND ORANGE, STIFF TO VERY STIFF, MOIST, HIGHLY PLASTIC SILTY CLAY WITH TRACE MICA, AND LOOSE TO MEDIUM DENSE, MOIST, SILTY SAND WITH TRACE MICA

46 + 00.00

ROADWAY EMBANKMENT, GRAY AND BROWN, MEDIUM DENSE TO DENSE, DRY, COARSE SAND WITH TRACE MICA AND LITTLE GRAVEL, AND MEDIUM STIFF TO STIFF, MOIST SANDY SILT WITH LITTLE MICA AND GRAVEL

RESIDUAL, ORANGE AND BROWN, LOOSE TO MEDIUM DENSE, MOIST, SILTY SAND WITH TRACE MICA

45 + 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-66	40' RT	45+00	7.0-7.5	A-2-4(0)		NP	33.5	39.4	7.0	20.2	98	85	27	-	-

ROADWAY EMBANKMENT, GRAY AND BROWN, MEDIUM DENSE TO DENSE, DRY, COARSE SAND WITH TRACE MICA AND LITTLE GRAVEL, AND MEDIUM STIFF TO STIFF, MOIST SANDY SILT WITH LITTLE MICA AND GRAVEL

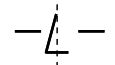
RESIDUAL, ORANGE AND BROWN, LOOSE TO MEDIUM DENSE, MOIST, SILTY SAND WITH TRACE MICA

45 + 00.00

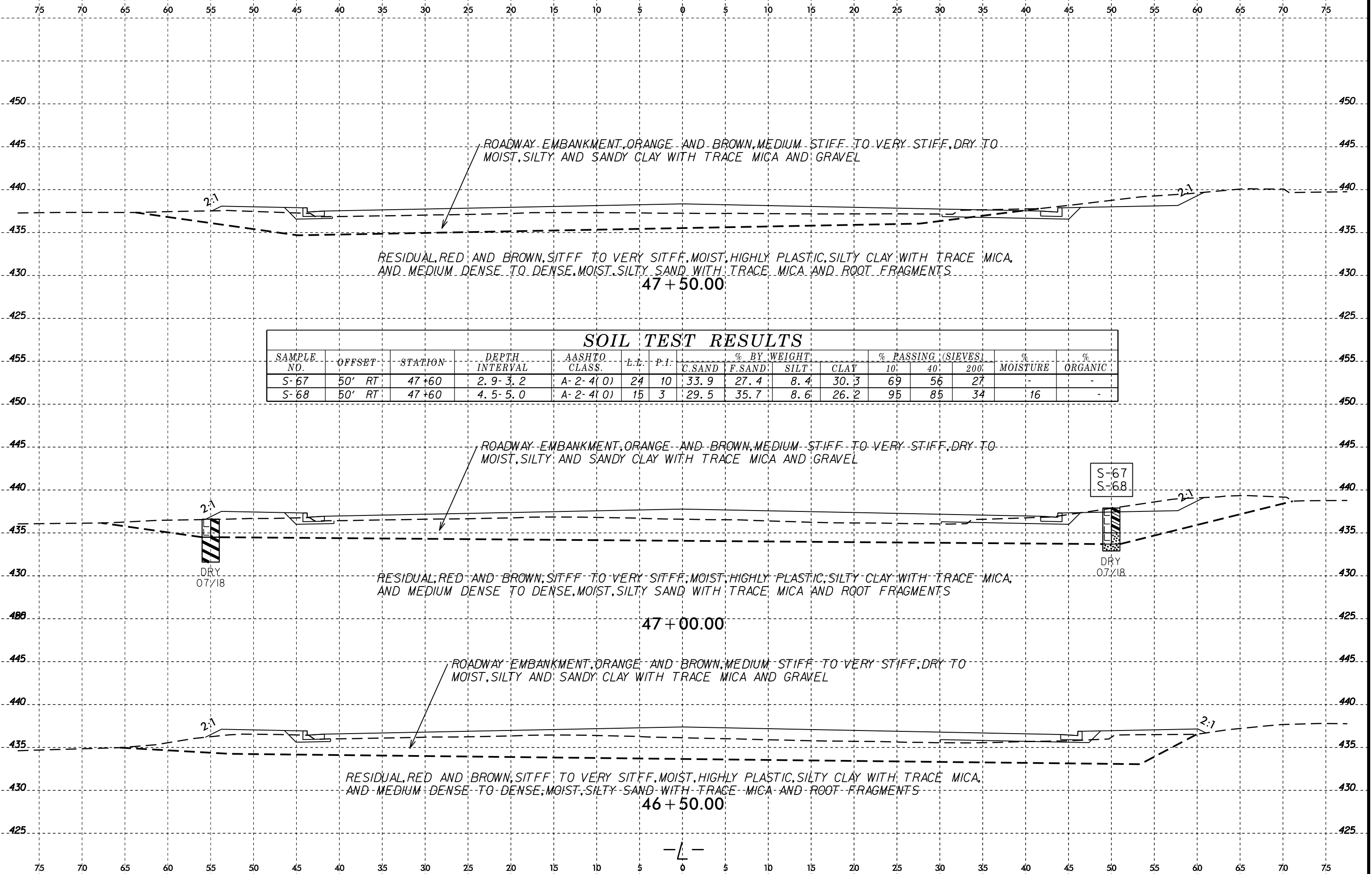
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DRY
07/18

DRY
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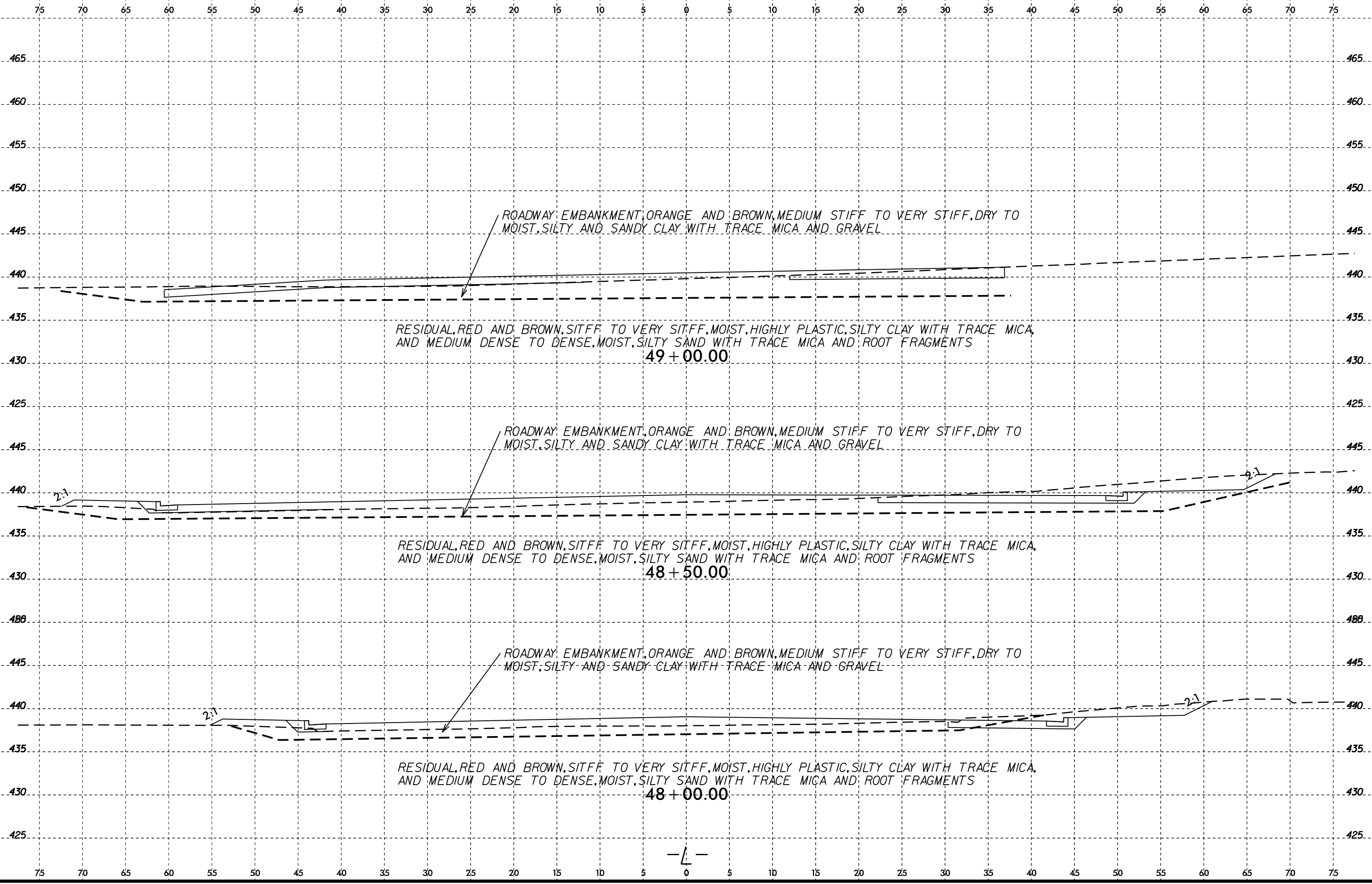


SOIL TEST RESULTS																
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC	
							C. SAND	F. SAND	SILT	CLAY	10'	40'	200'			
S-67	50' RT	47+60	2.9-3.2	A-2-4(0)	24	10	33.9	27.4	8.4	30.3	69	56	27	-	-	
S-68	50' RT	47+60	4.5-5.0	A-2-4(0)	15	3	29.5	35.7	8.6	26.2	95	85	34	16	-	

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 DRY
 07/18

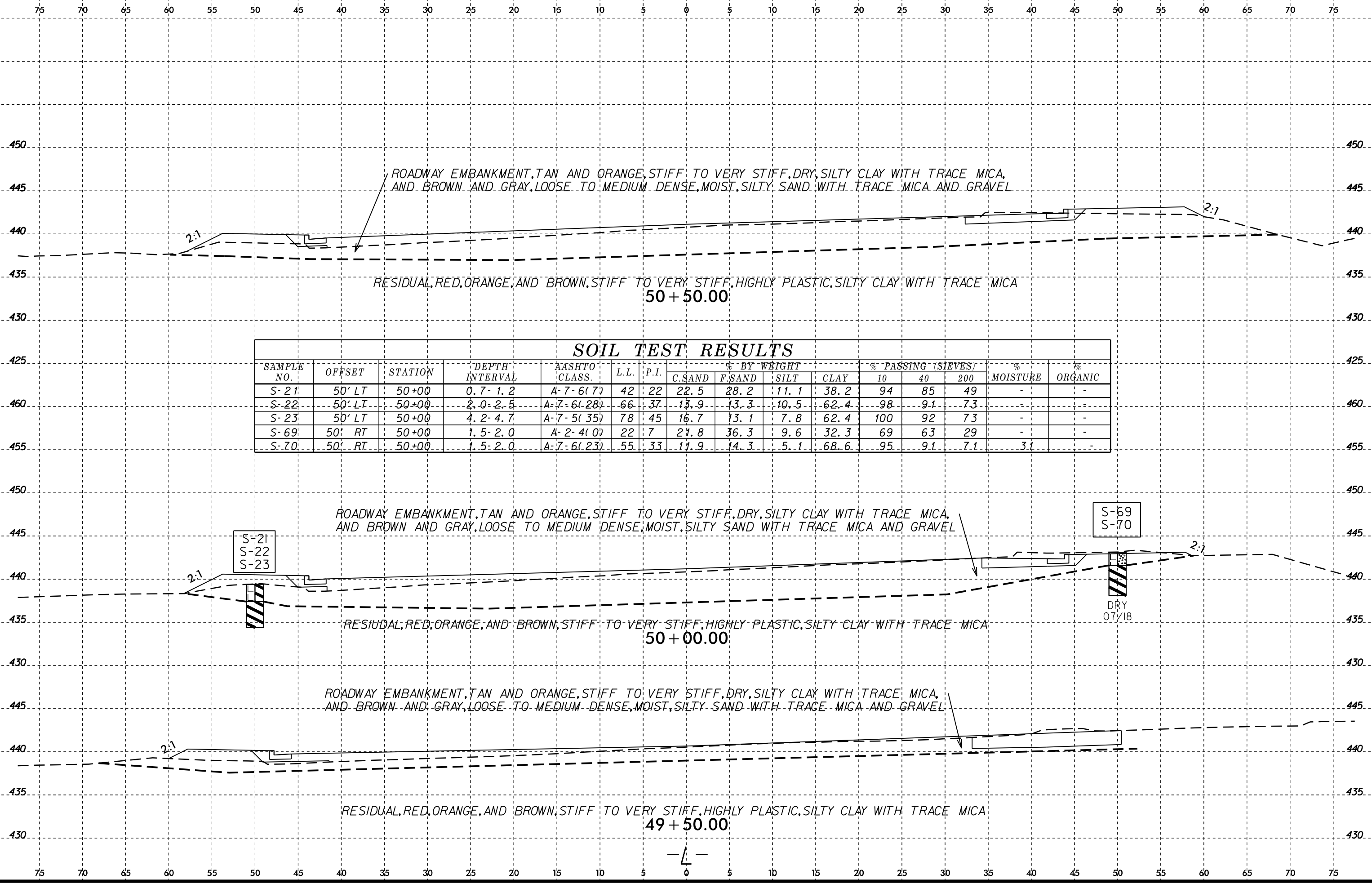
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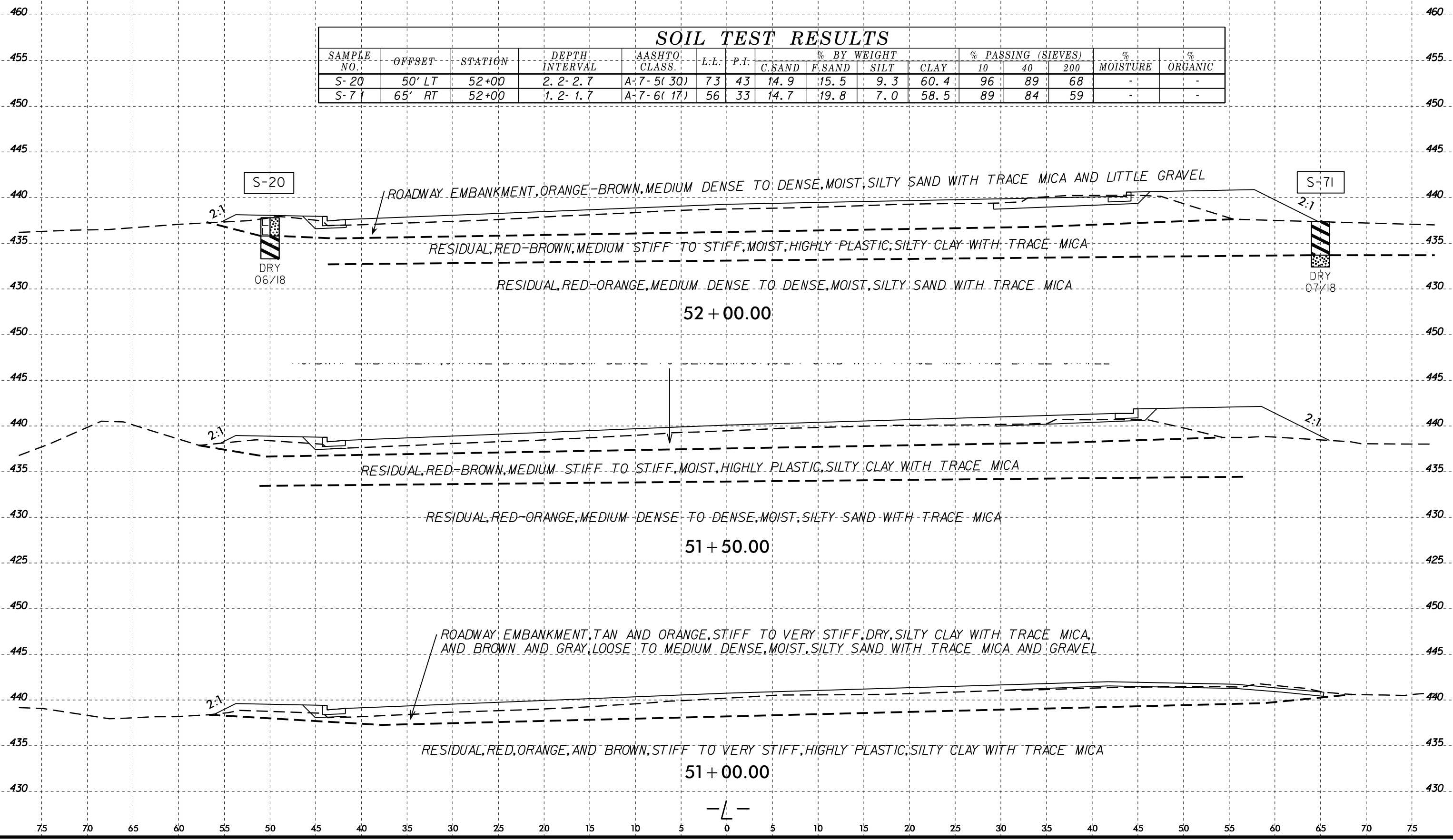


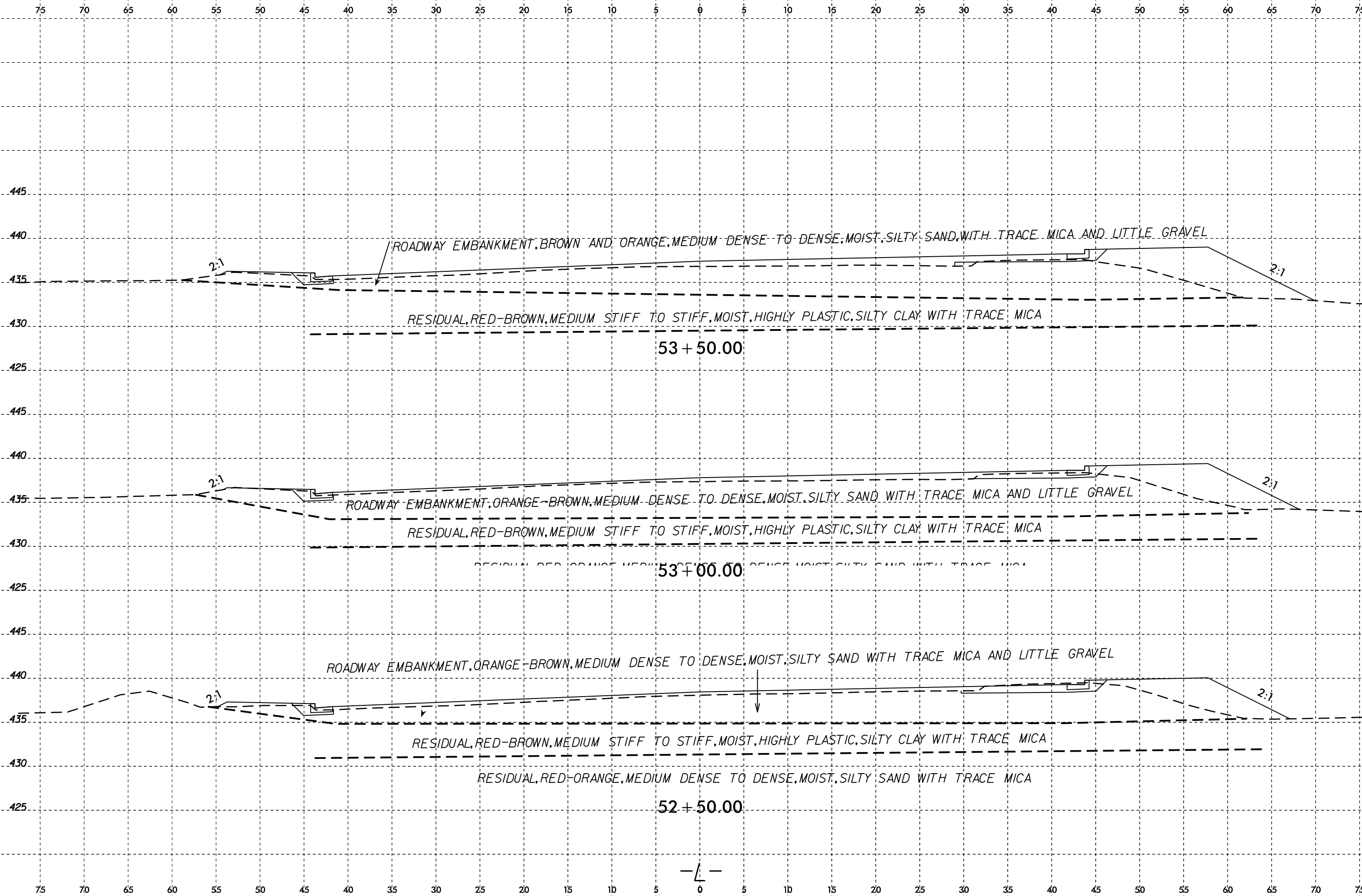


SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-21	50' LT	50+00	0.7- 1.2	A-7-6(7)	42	22	22.5	28.2	11.1	38.2	94	85	49	-	-
S-22	50' LT	50+00	2.0- 2.5	A-7-6(28)	66	37	13.9	13.3	10.5	62.4	98	91	73	-	-
S-23	50' LT	50+00	4.2- 4.7	A-7-5(35)	78	45	16.7	13.1	7.8	62.4	100	92	73	-	-
S-69	50' RT	50+00	1.5- 2.0	A-2-4(0)	22	7	21.8	36.3	9.6	32.3	69	63	29	-	-
S-70	50' RT	50+00	1.5- 2.0	A-7-6(23)	55	33	11.9	14.3	5.1	68.6	95	91	71	3.1	-

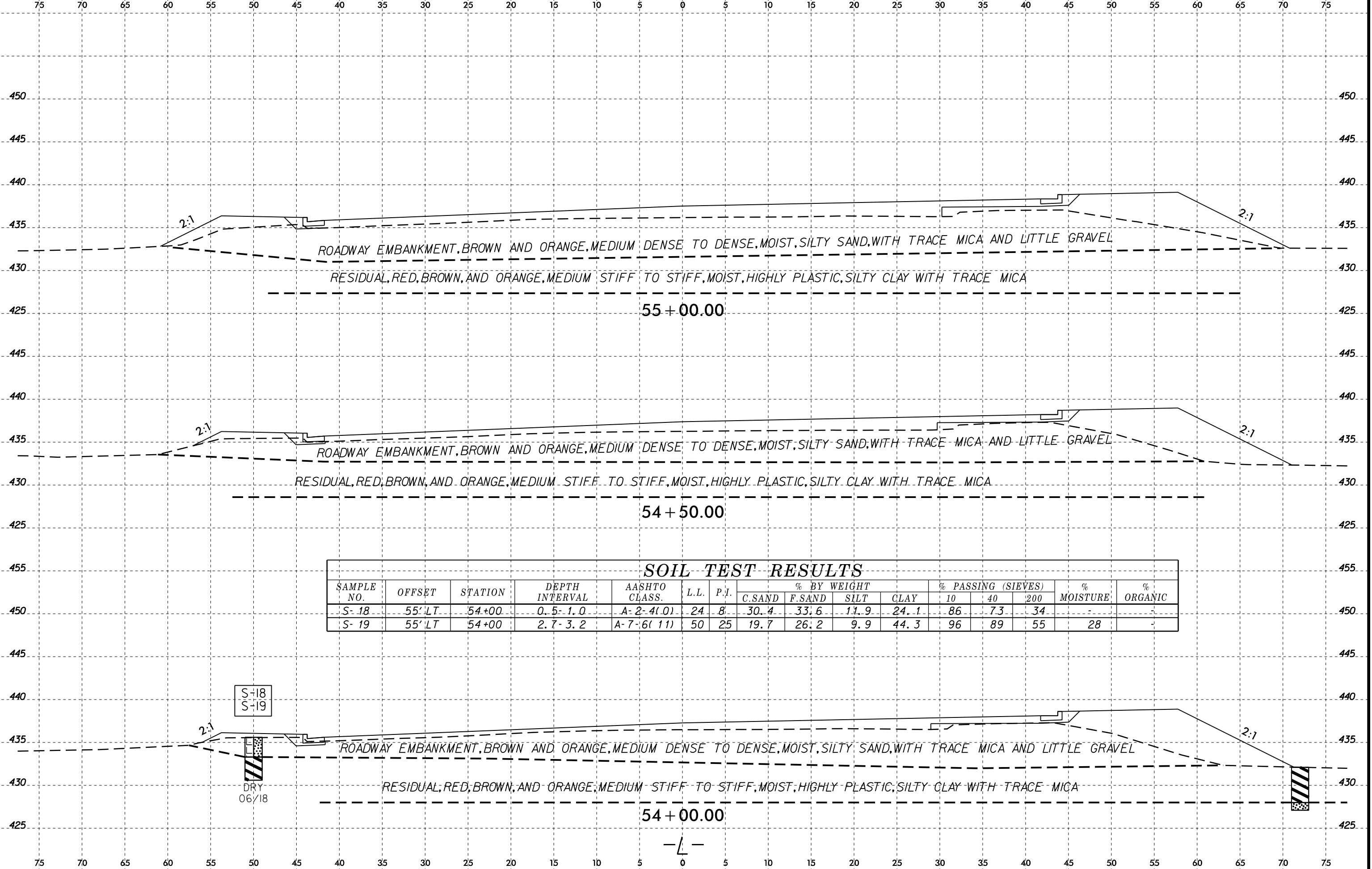
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 \$\$\$SUBSERIALNAME\$\$\$

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-20	50' LT	52+00	2.2-2.7	A-7-5(30)	73	43	14.9	15.5	9.3	60.4	96	89	68	-	-
S-71	65' RT	52+00	1.2-1.7	A-7-6(17)	56	33	14.7	19.8	7.0	58.5	89	84	59	-	-





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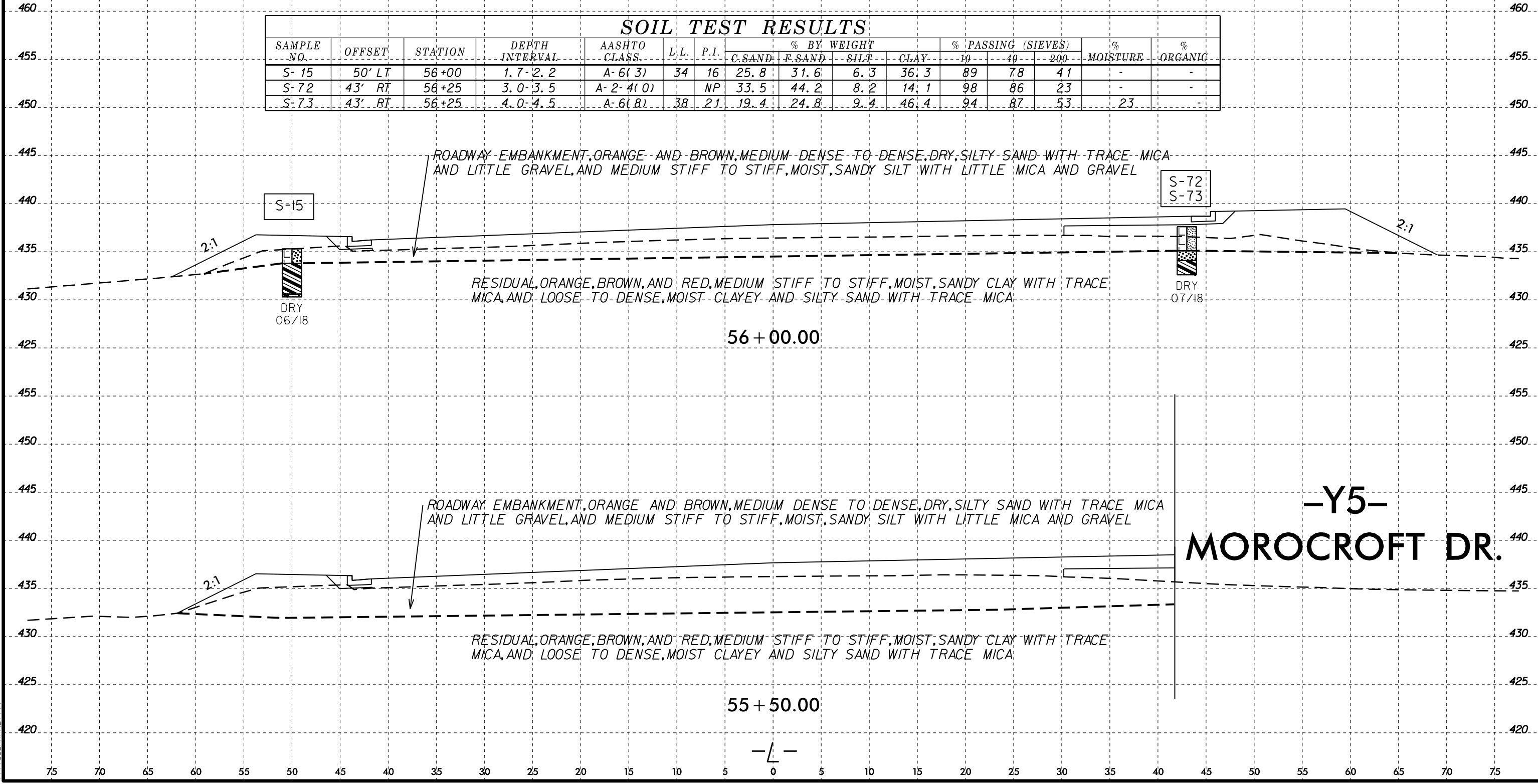


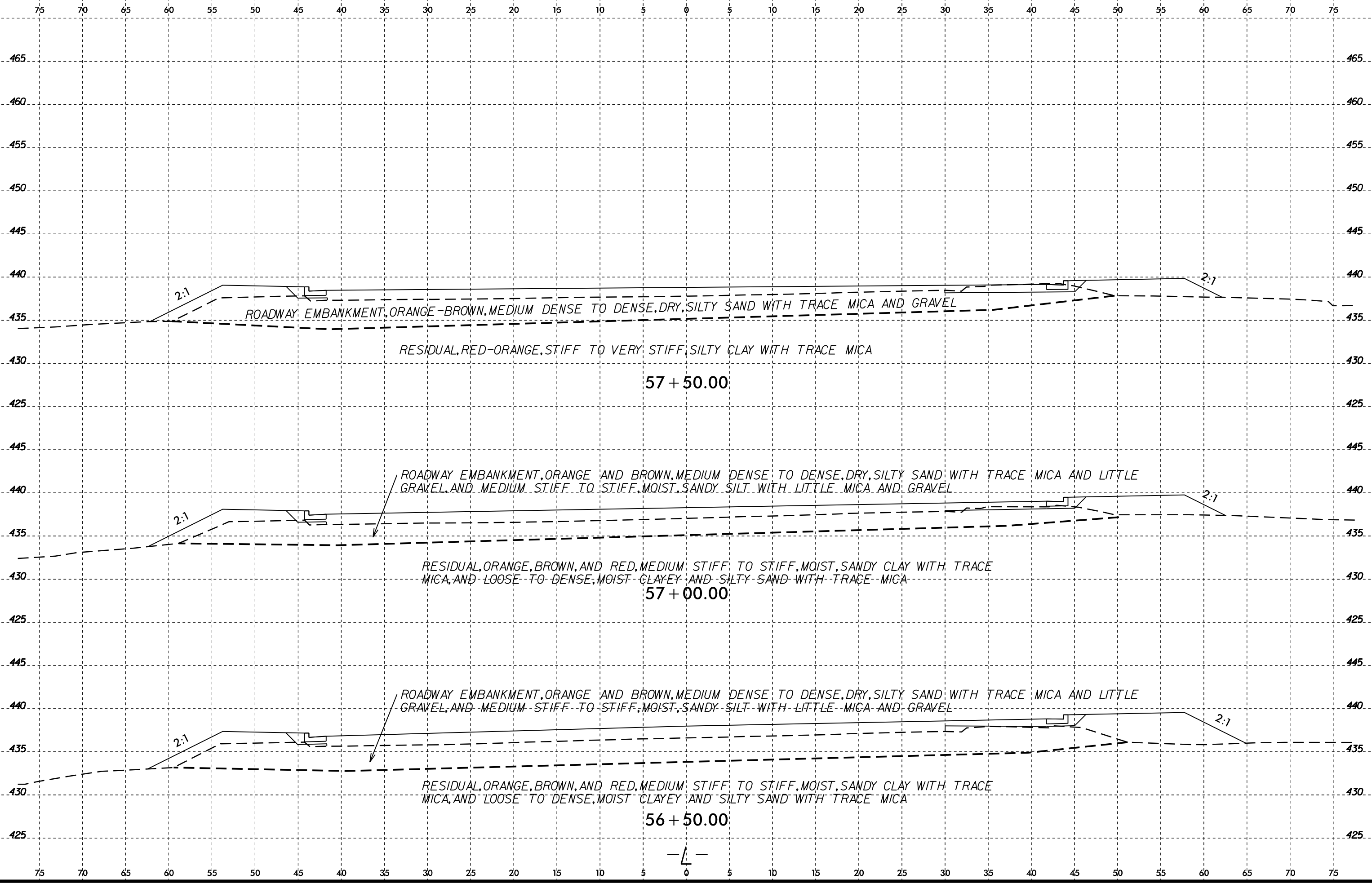
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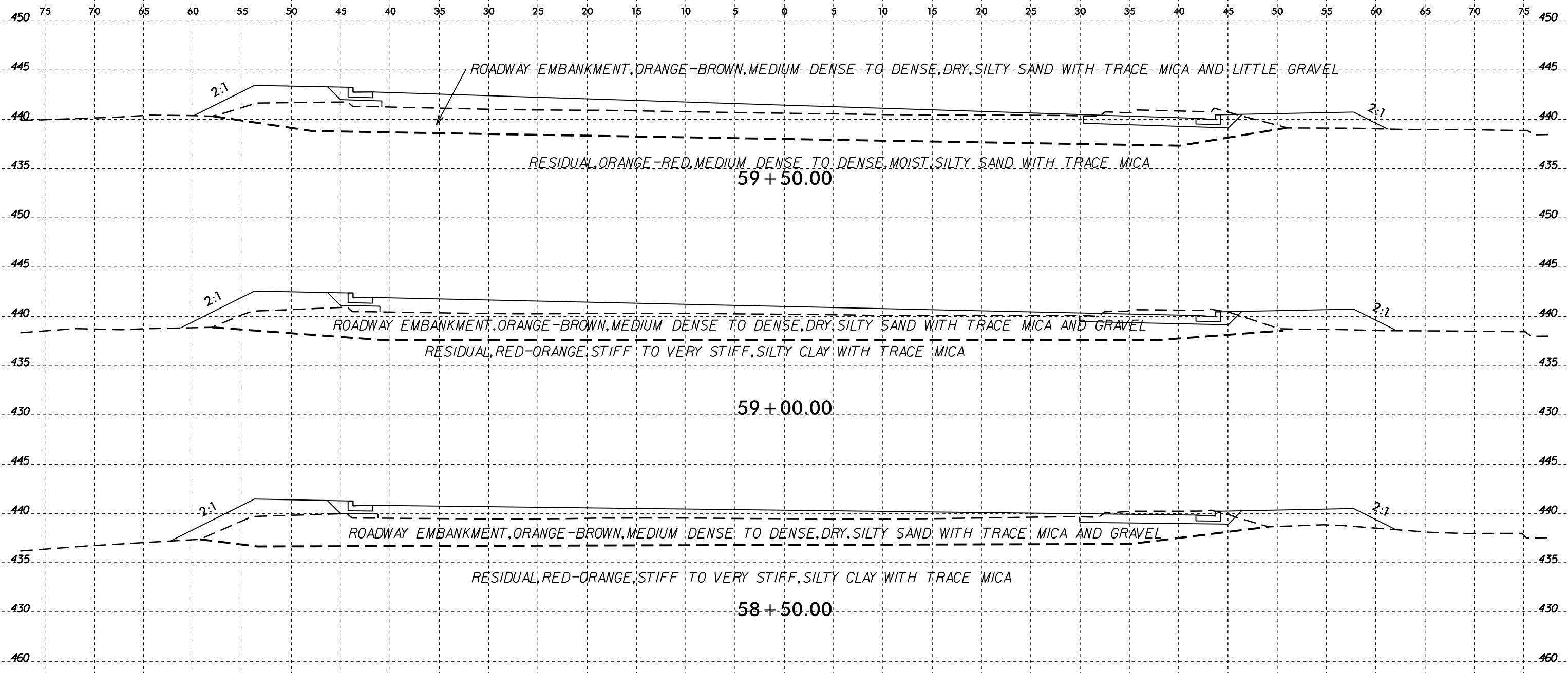
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							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-18	55' LT	54+00	0.5 - 1.0	A-2-4(0)	24	8	30.4	33.6	11.9	24.1	86	73	34	-	-
S-19	55' LT	54+00	2.7 - 3.2	A-7-6(11)	50	25	19.7	26.2	9.9	44.3	96	89	55	28	-

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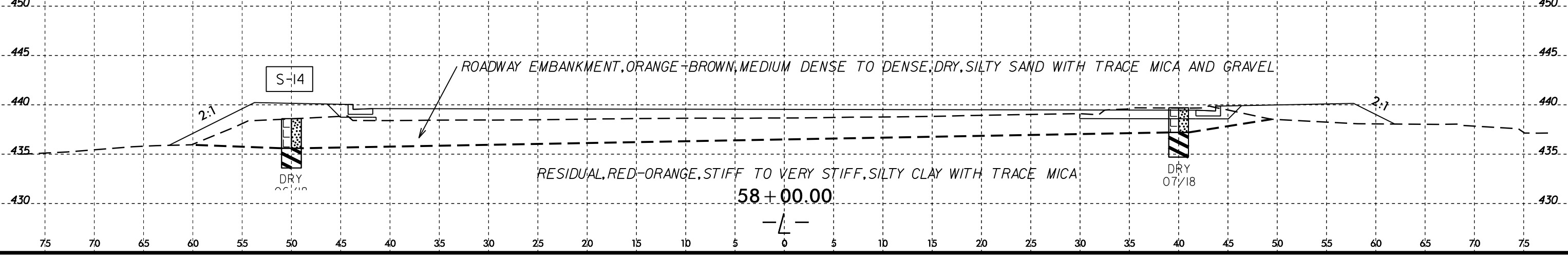
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							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-15	50' LT	56+00	1.7'-2.2'	A-6(3)	34	16	25.8	31.6	6.3	36.3	89	78	41	-	-
S-72	43' RT	56+25	3.0'-3.5'	A-2-4(0)		NP	33.5	44.2	8.2	14.1	98	86	23	-	-
S-73	43' RT	56+25	4.0'-4.5'	A-6(8)	38	21	19.4	24.8	9.4	46.4	94	87	53	23	-



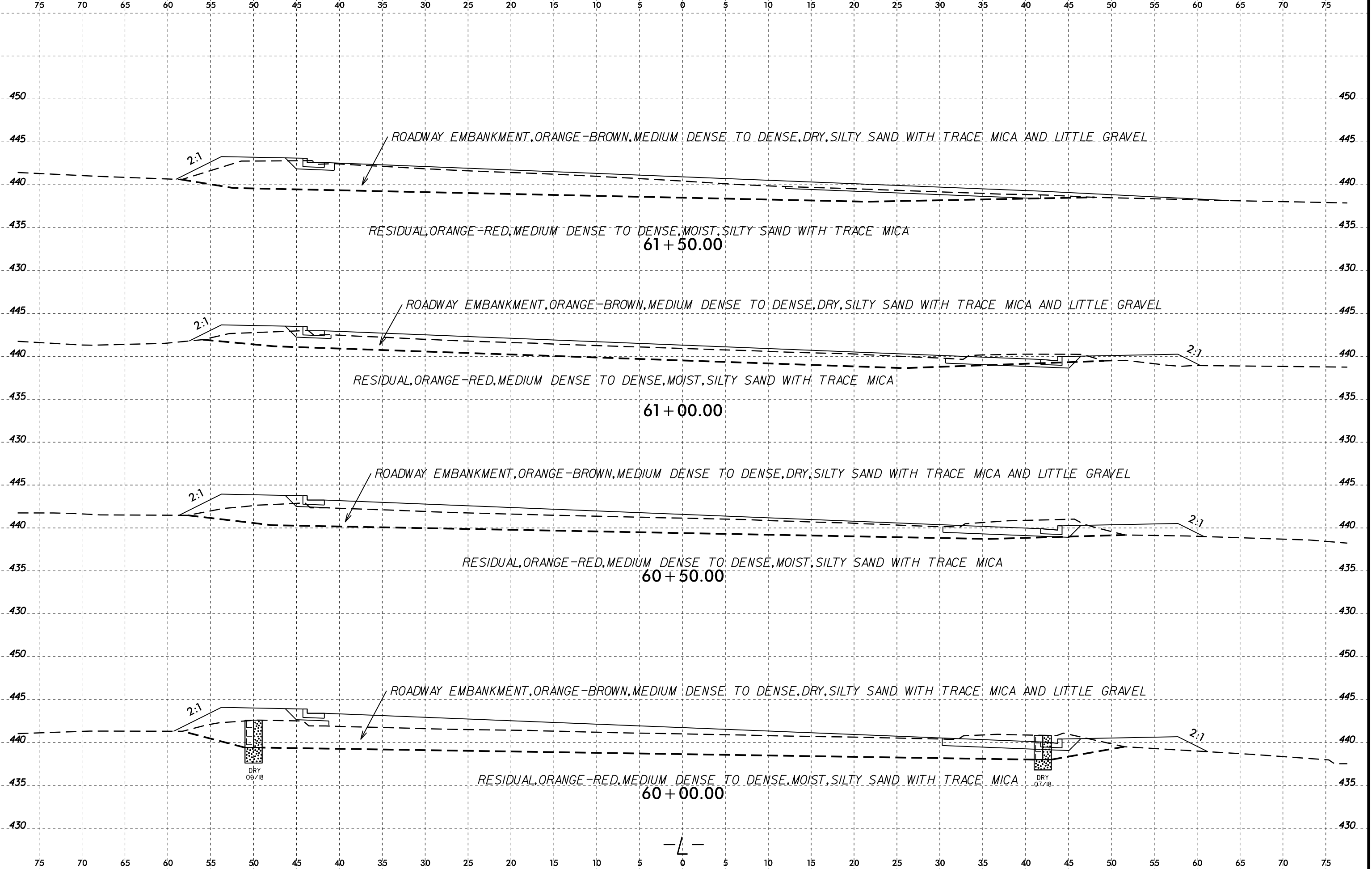




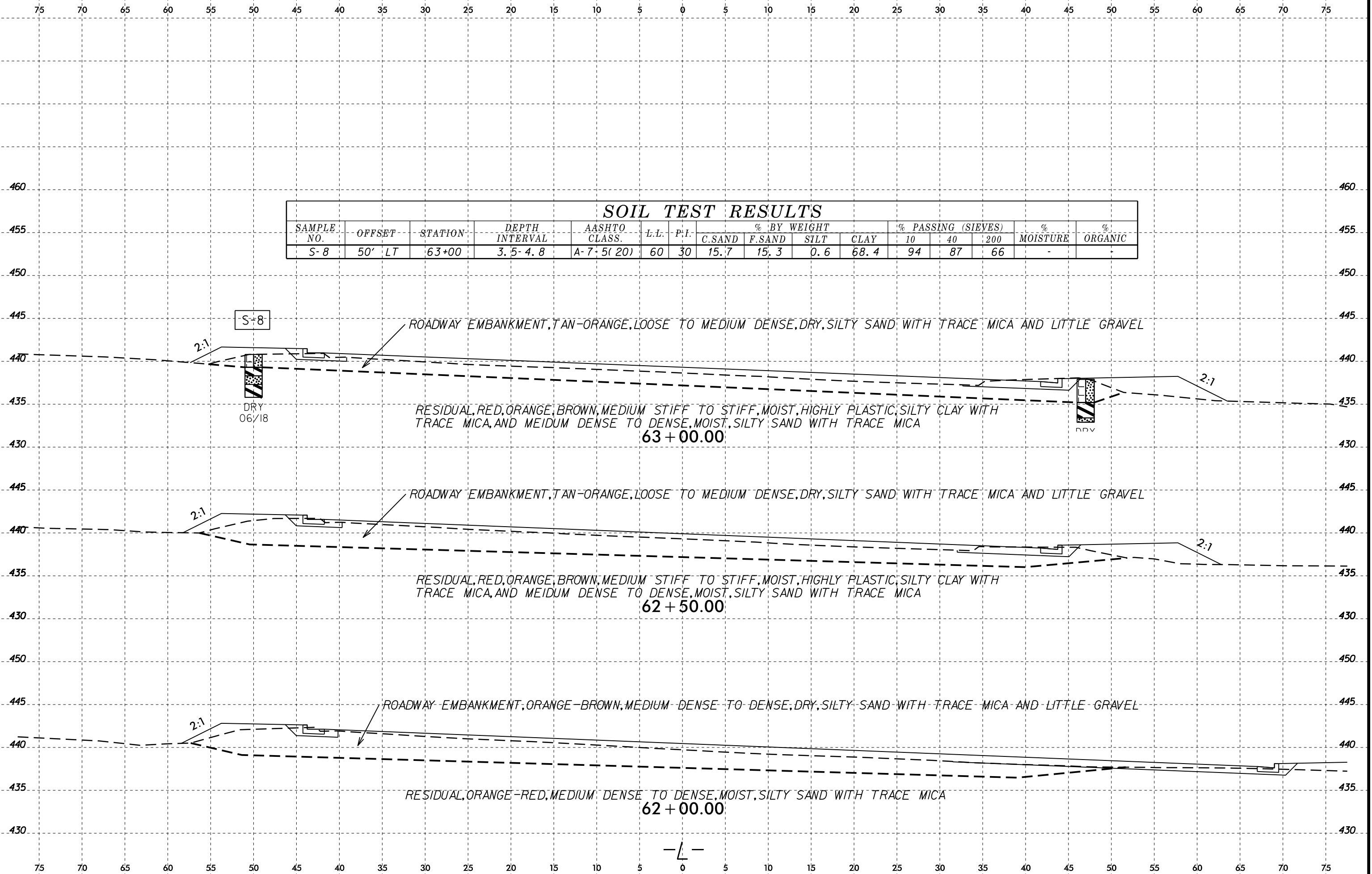
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							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-14	50' LT	58+00	3.2-3.7	A-7-6(7)	43	21	23.6	28.0	6.1	42.3	96	87	49	-	-



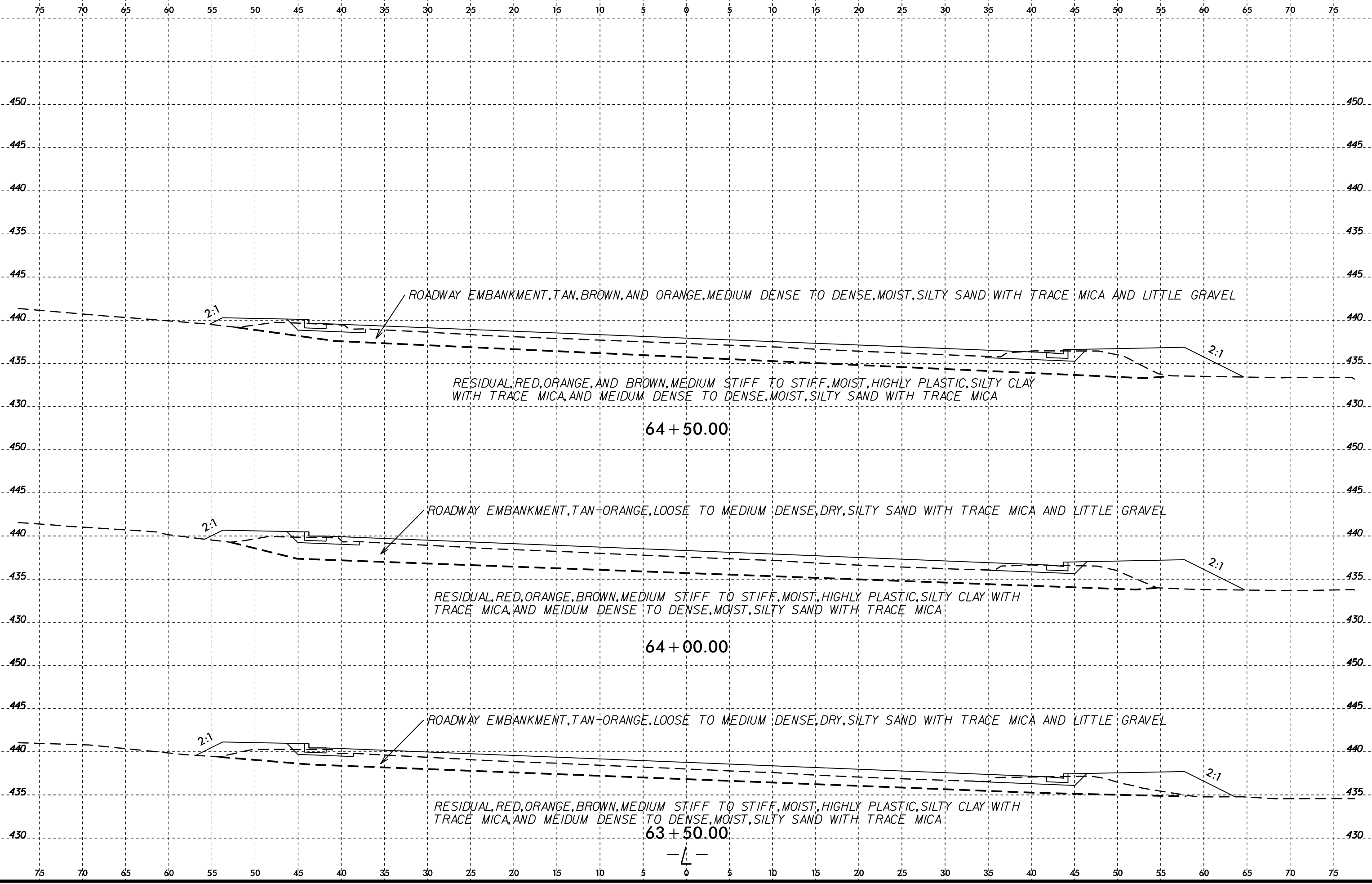
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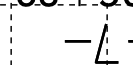
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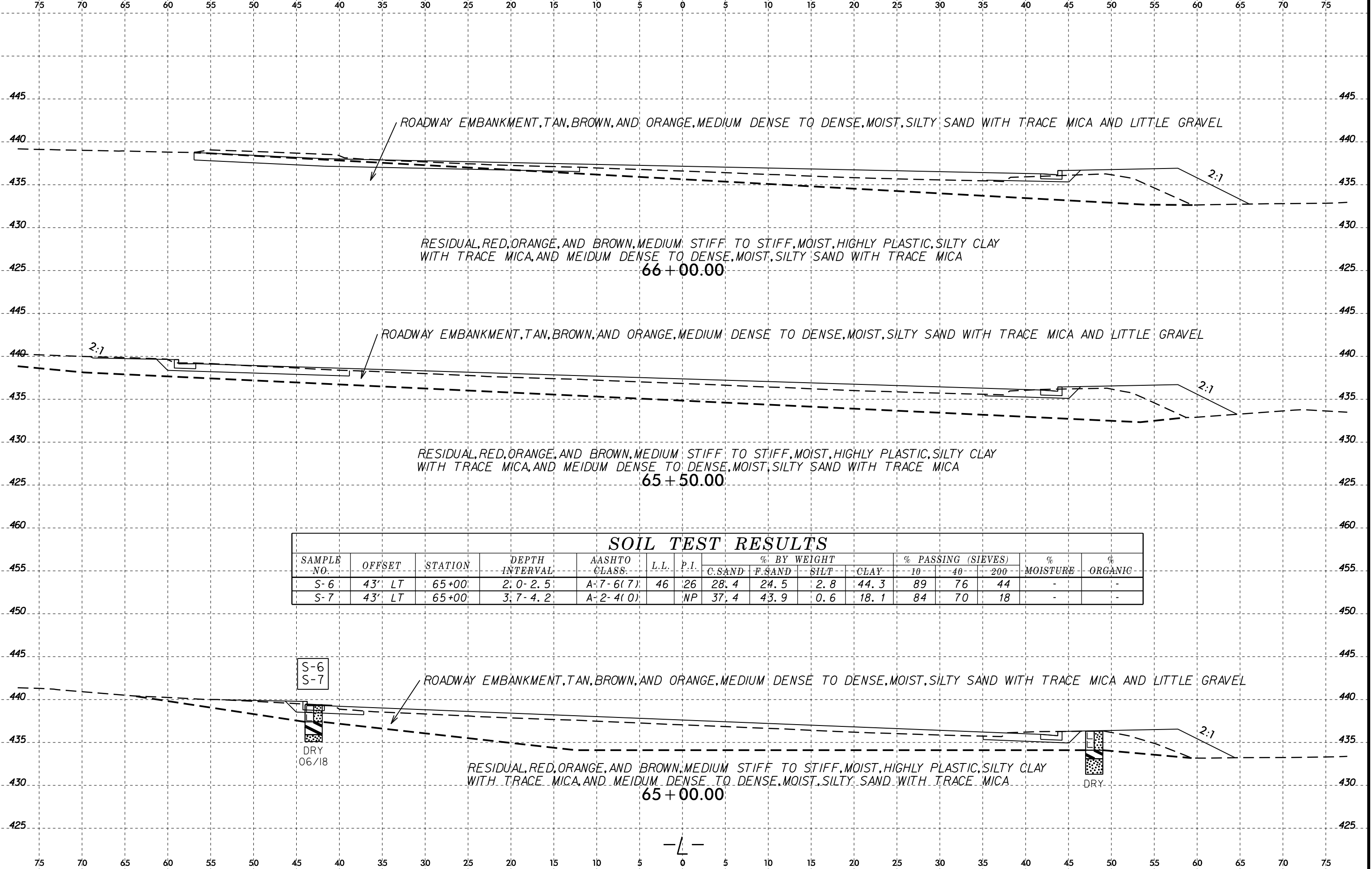
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							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-8	50' LT	63+00	3.5-4.8	A-7.5(20)	60	30	15.7	15.3	0.6	68.4	94	87	66	-	-



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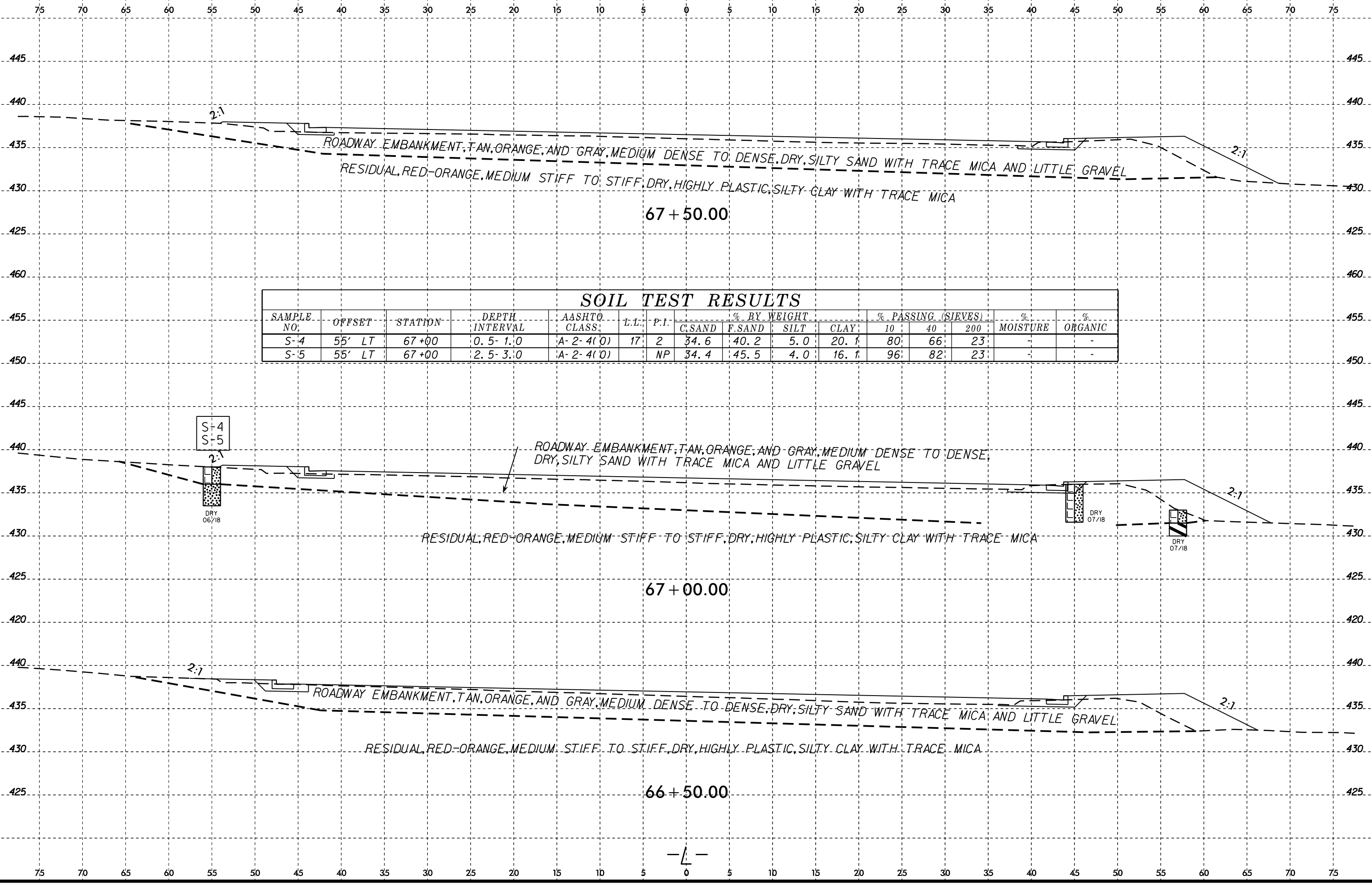


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							C.SAND	F.SAND	SILT	CLAY	-10-	-40-	-200-		
S-6	43' LT	65+00'	2.0-2.5	A-7-6(7)	46	26	28.4	24.5	2.8	44.3	89	76	44	-	-
S-7	43' LT	65+00'	3.7-4.2	A-2-4(0)		NP	37.4	43.9	0.6	18.1	84	70	18	-	-

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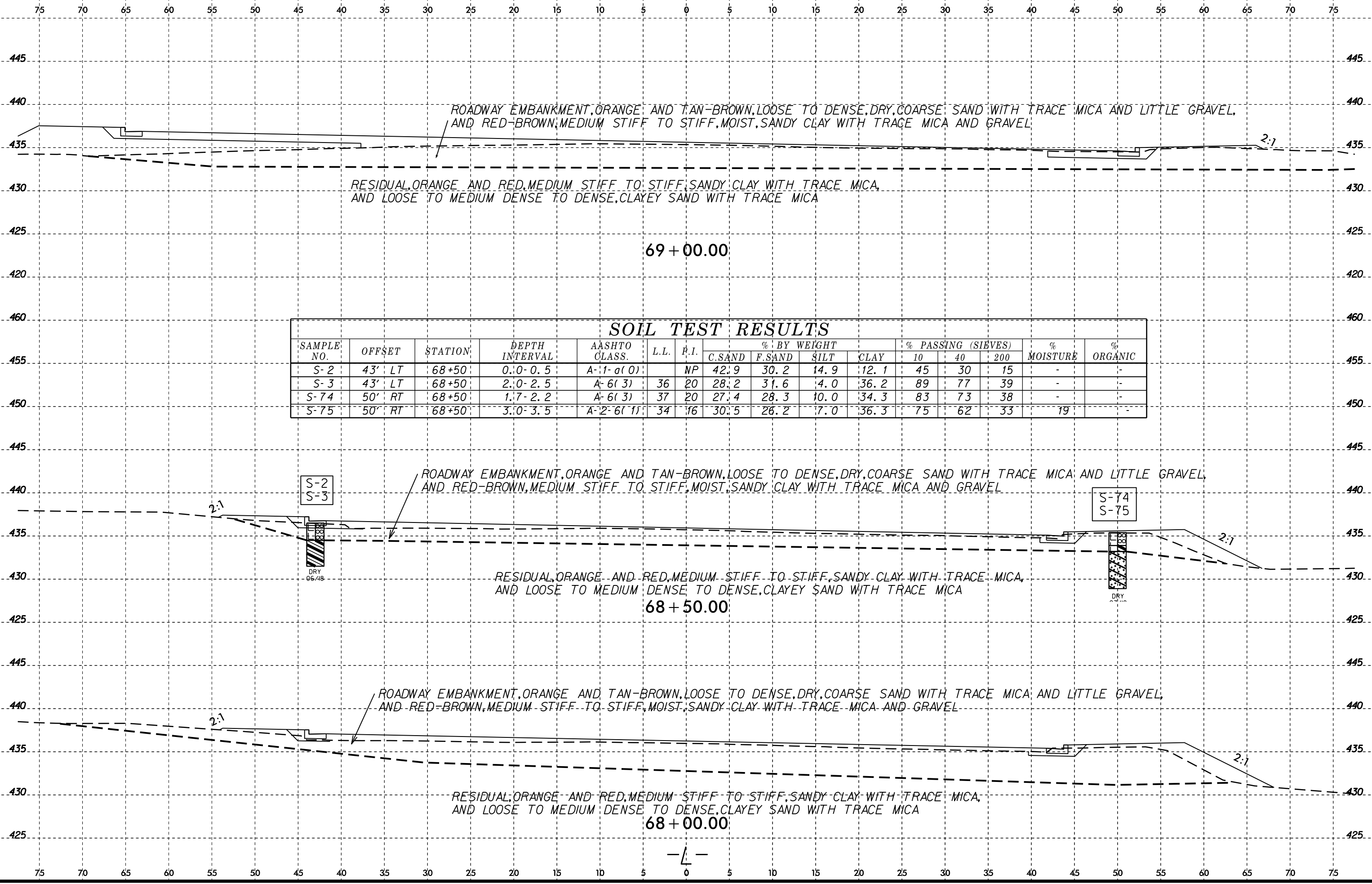


SOIL TEST RESULTS

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-4	55' LT	67+00	0.5-1.0	A-2-4(0)	17	2	34.6	40.2	5.0	20.1	80	66	23	-	-
S-5	55' LT	67+00	2.5-3.0	A-2-4(0)		NP	34.4	45.5	4.0	16.1	96	82	23	-	-

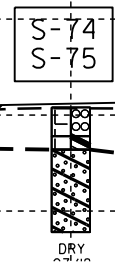
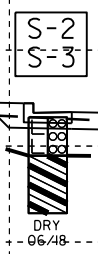
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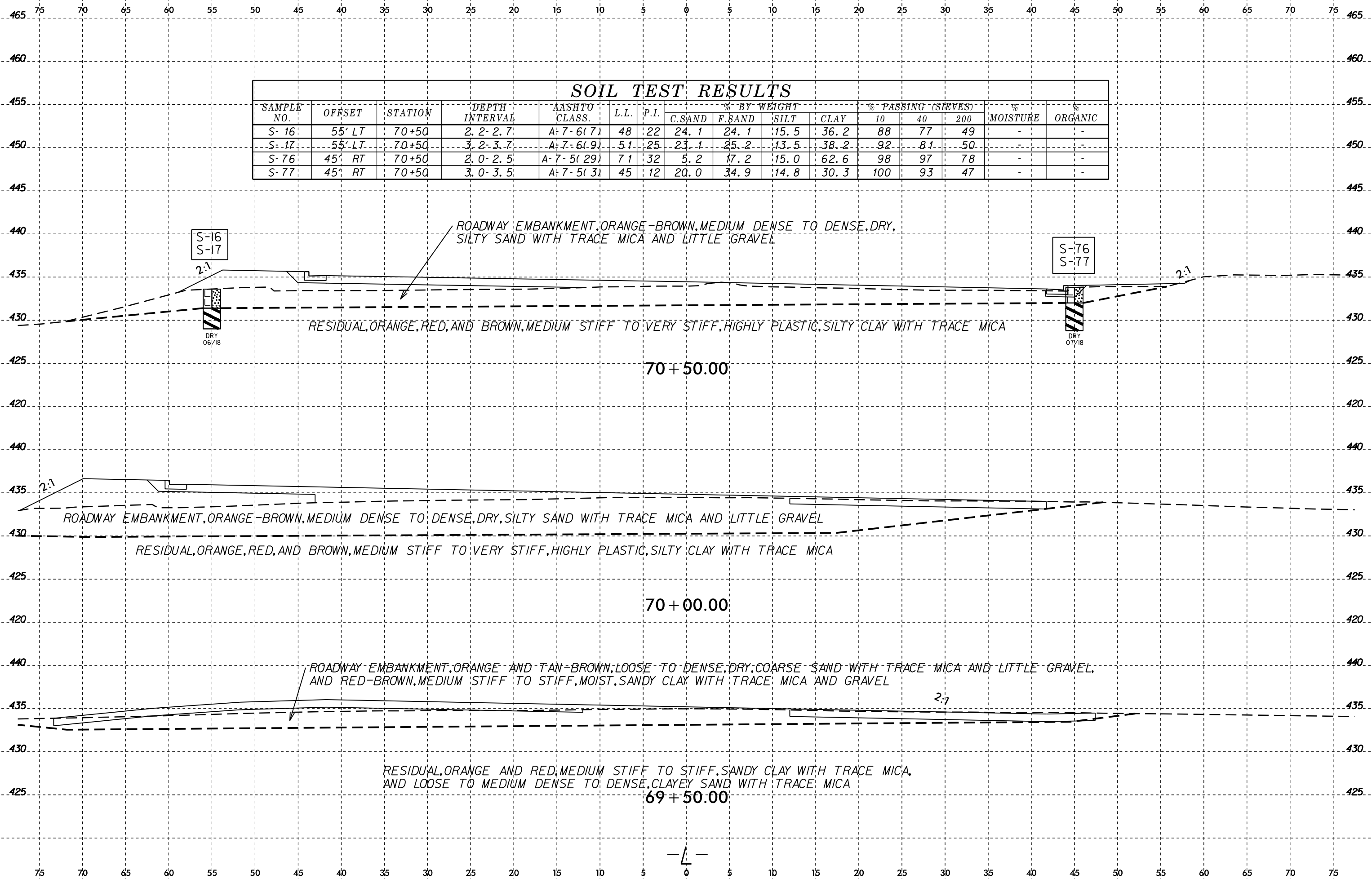
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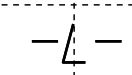
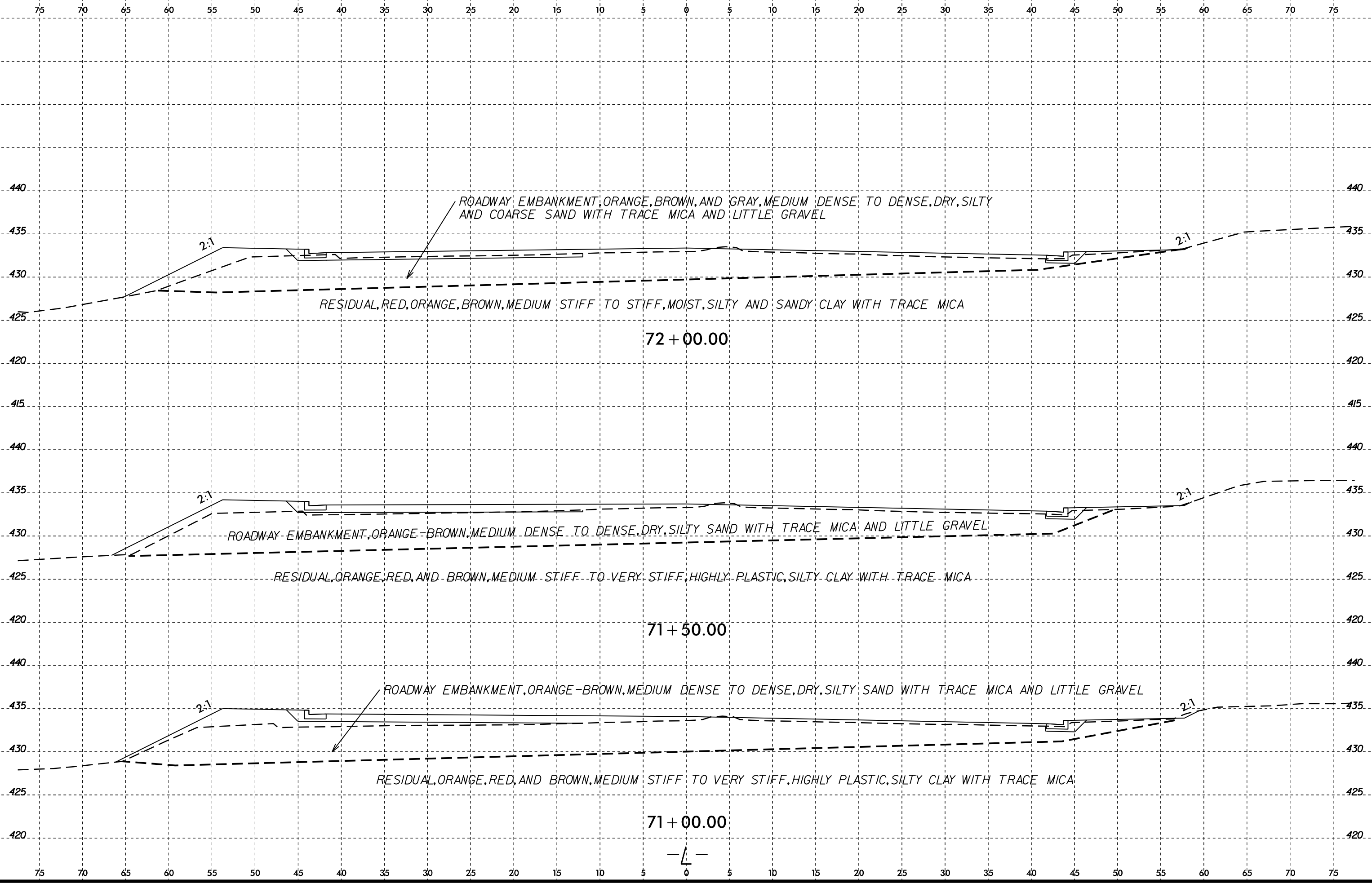
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							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-2	43' LT	68+50	0.0-0.5	A-1-a(0)		NP	42.9	30.2	14.9	12.1	45	30	15	-	-
S-3	43' LT	68+50	2.0-2.5	A-6(3)	36	20	28.2	31.6	4.0	36.2	89	77	39	-	-
S-74	50' RT	68+50	1.7-2.2	A-6(3)	37	20	27.4	28.3	10.0	34.3	83	73	38	-	-
S-75	50' RT	68+50	3.0-3.5	A-2-6(1)	34	16	30.5	26.2	7.0	36.3	75	62	33	19	-



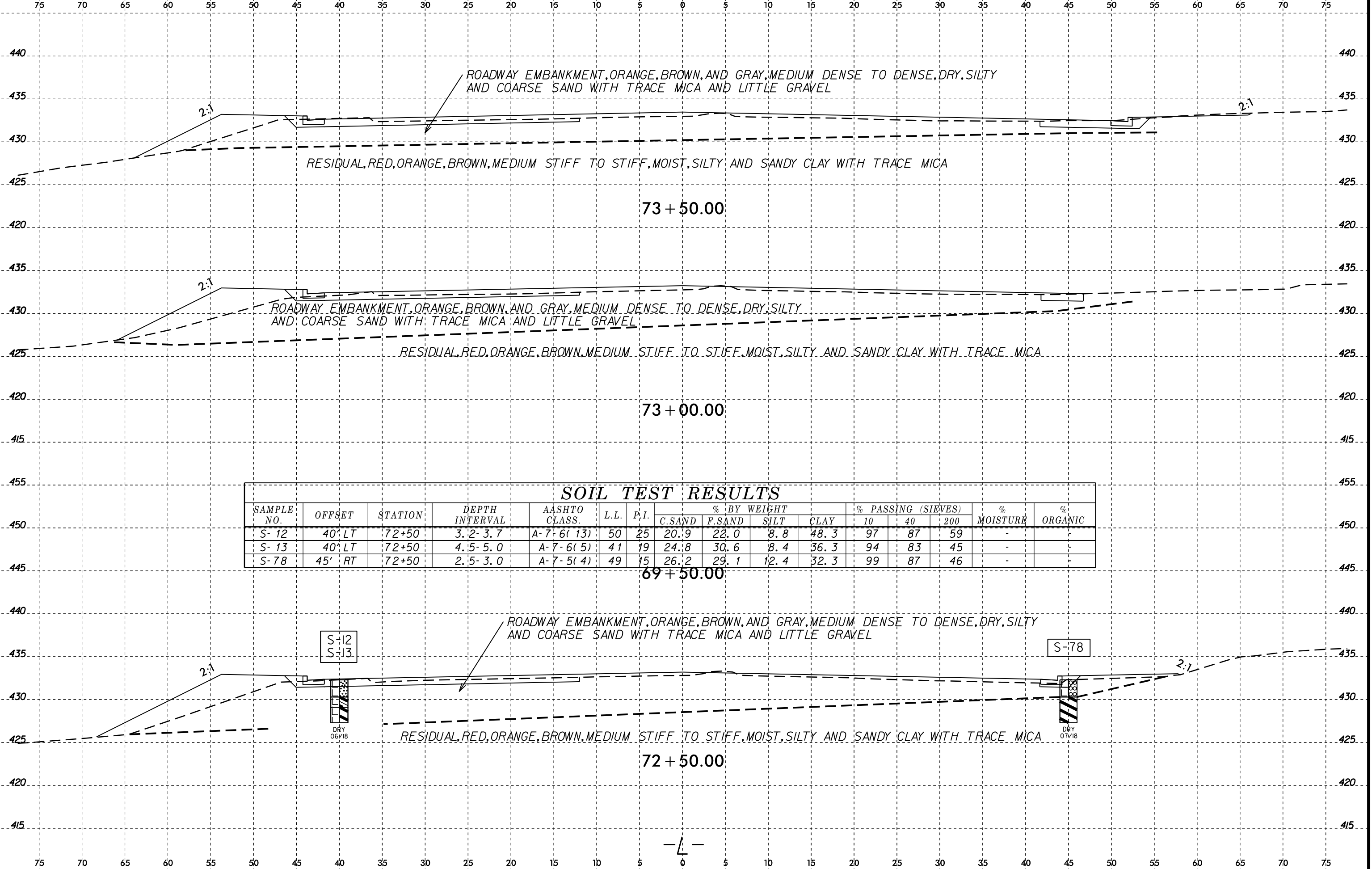
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (STEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-16	55' LT	70+50	2.2-2.7	A-7-6(7)	48	22	24.1	24.1	15.5	36.2	88	77	49	-	-
S-17	55' LT	70+50	3.2-3.7	A-7-6(9)	51	25	23.1	25.2	13.5	38.2	92	81	50	-	-
S-76	45' RT	70+50	2.0-2.5	A-7-5(29)	71	32	5.2	17.2	15.0	62.6	98	97	78	-	-
S-77	45' RT	70+50	3.0-3.5	A-7-5(3)	45	12	20.0	34.9	14.8	30.3	100	93	47	-	-





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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-12	40' LT	72+50	3.2-3.7	A-7-6(13)	50	25	20.9	22.0	8.8	48.3	97	87	59	-	-
S-13	40' LT	72+50	4.5-5.0	A-7-6(5)	41	19	24.8	30.6	8.4	36.3	94	83	45	-	-
S-78	45' RT	72+50	2.5-3.0	A-7-5(4)	49	15	26.2	29.1	12.4	32.3	99	87	46	-	-

S-12
S-13

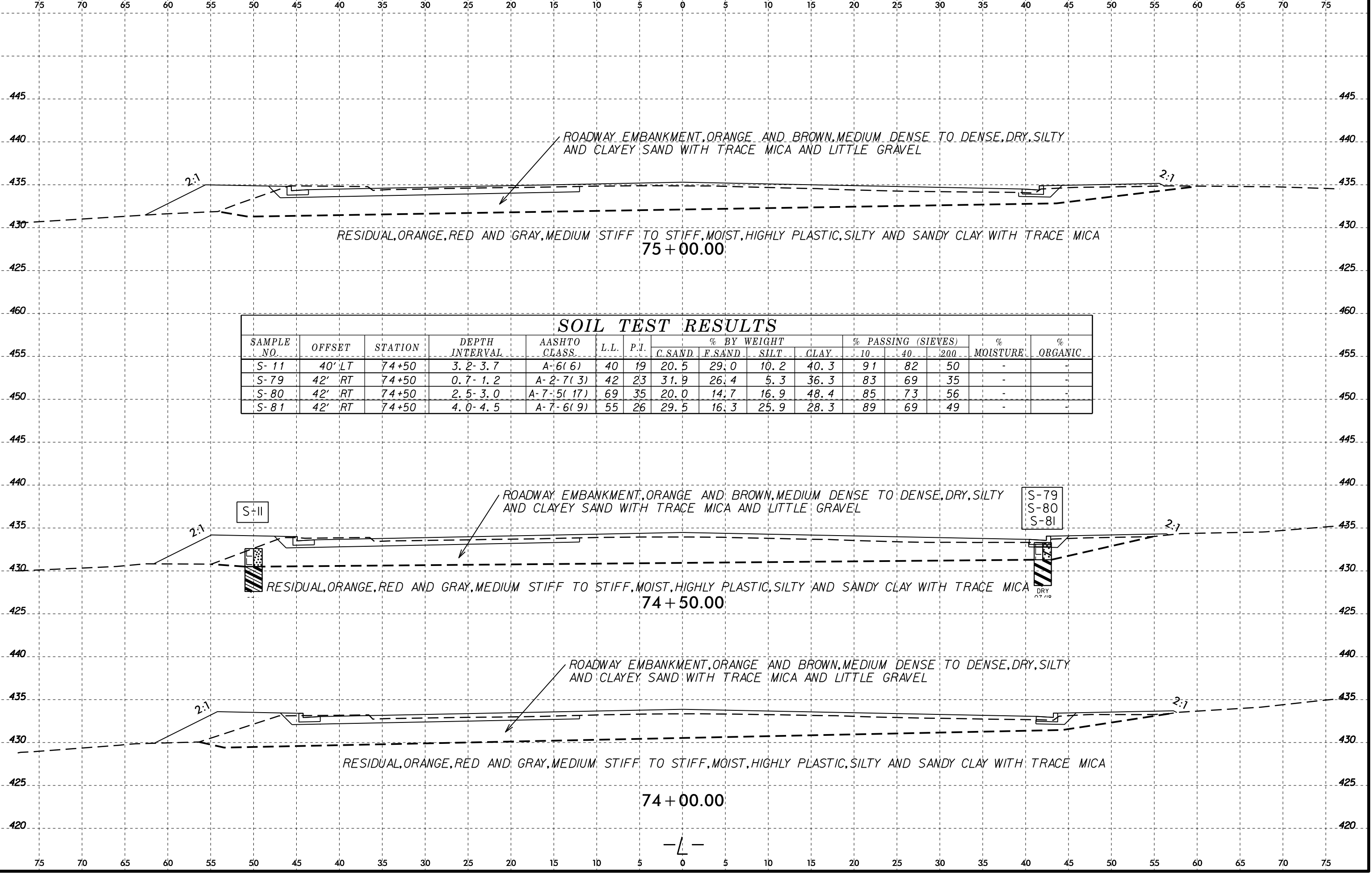
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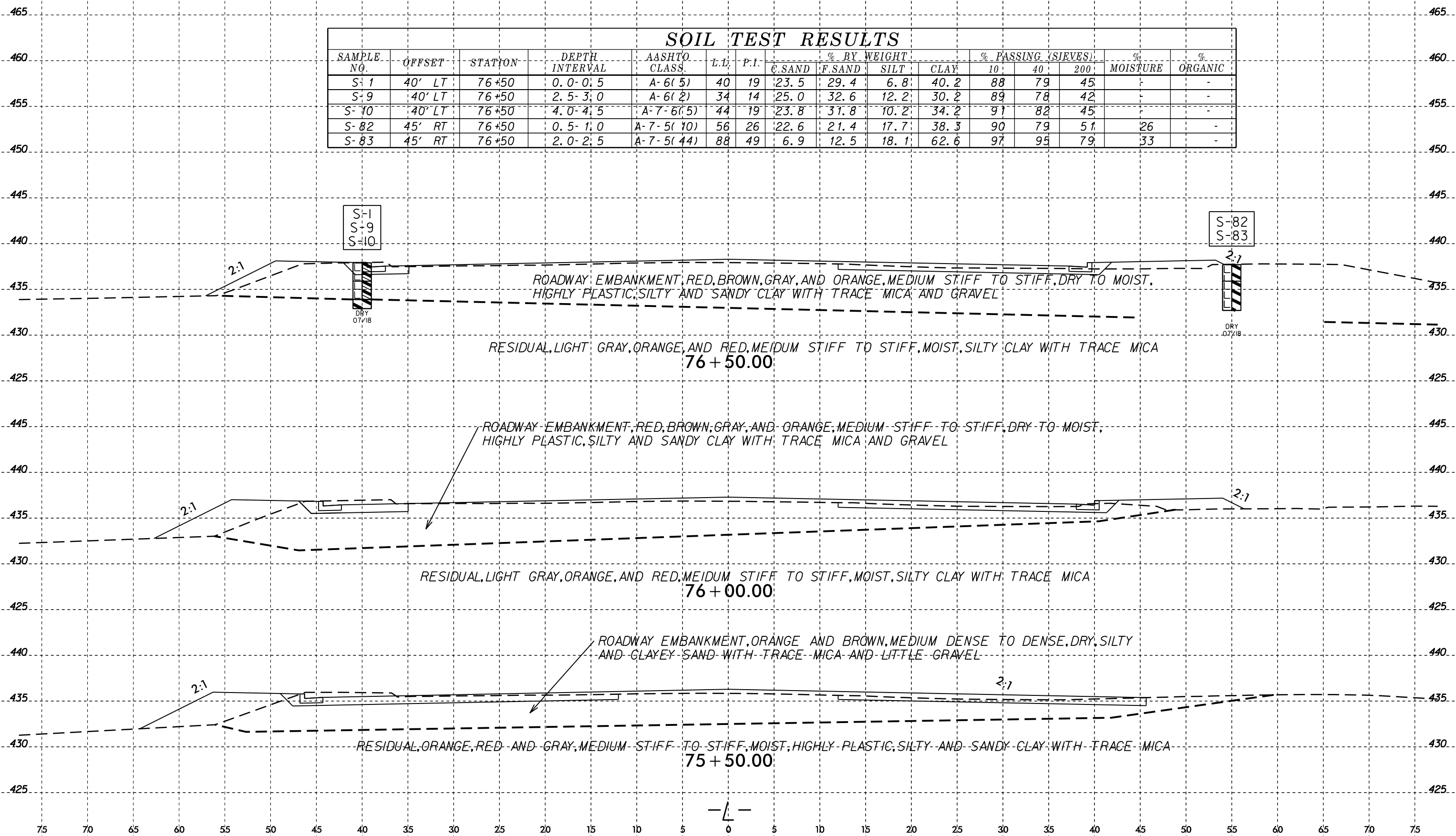
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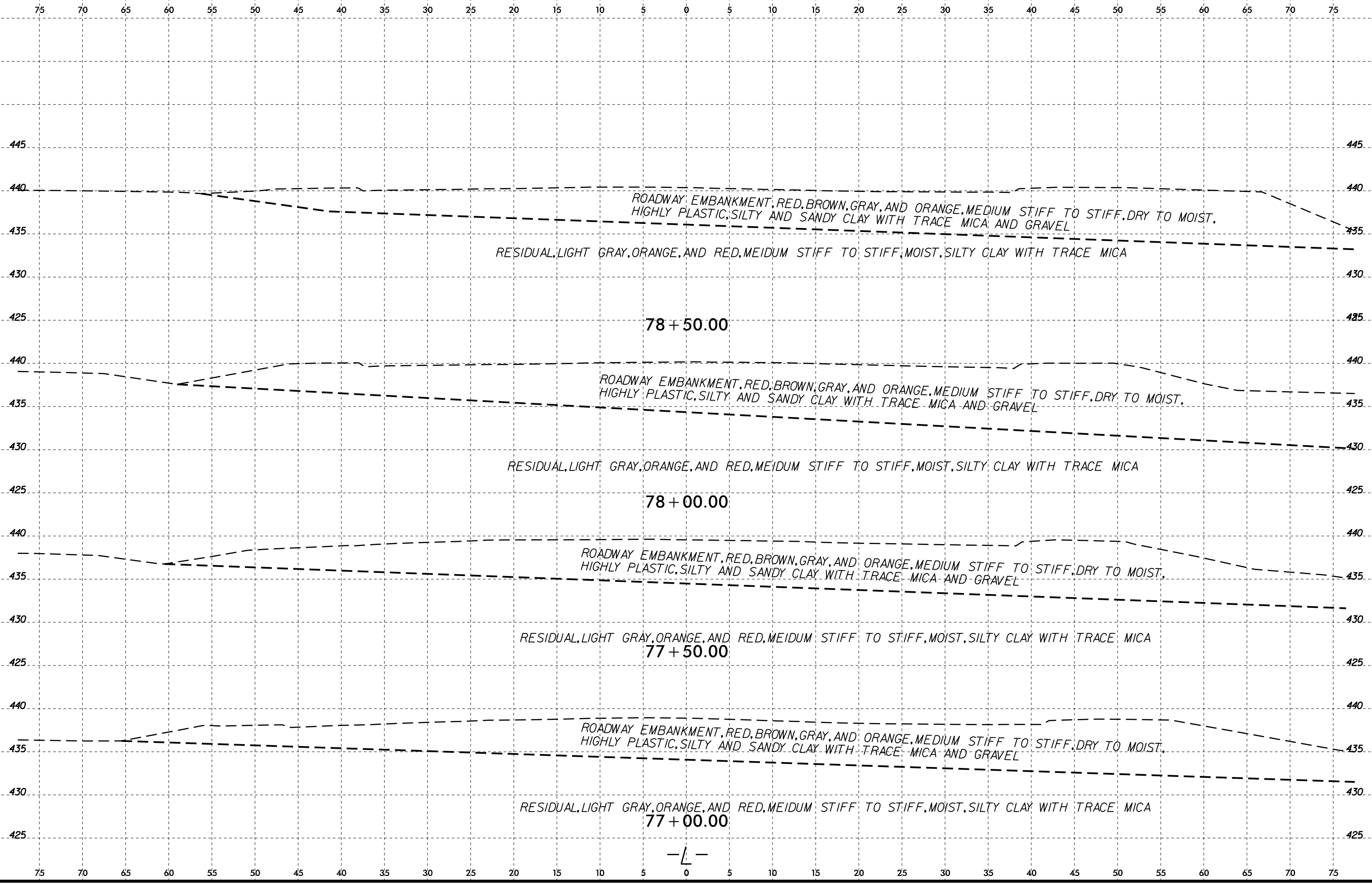
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							C. SAND	F. SAND	SILT	CLAY	-10	40	200		
S-11	40' LT	74+50	3.2-3.7	A-6(6)	40	19	20.5	29.0	10.2	40.3	91	82	50	-	-
S-79	42' RT	74+50	0.7-1.2	A-2-7(3)	42	23	31.9	26.4	5.3	36.3	83	69	35	-	-
S-80	42' RT	74+50	2.5-3.0	A-7-5(17)	69	35	20.0	14.7	16.9	48.4	85	73	56	-	-
S-81	42' RT	74+50	4.0-4.5	A-7-6(9)	55	26	29.5	16.3	25.9	28.3	89	69	49	-	-

S-79
 S-80
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SOIL TEST RESULTS

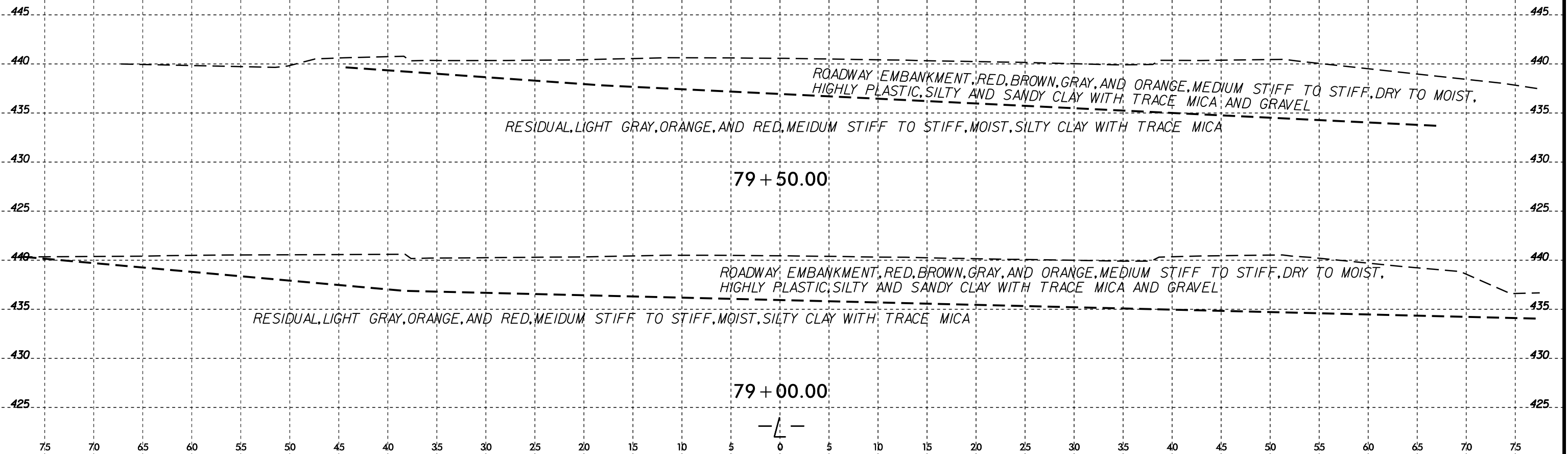
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							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-1	40' LT	76+50	0.0-0.5	A-6(5)	40	19	23.5	29.4	6.8	40.2	88	79	45	-	-
S-9	40' LT	76+50	2.5-3.0	A-6(2)	34	14	25.0	32.6	12.2	30.2	89	78	42	-	-
S-10	40' LT	76+50	4.0-4.5	A-7-6(5)	44	19	23.8	31.8	10.2	34.2	91	82	45	-	-
S-82	45' RT	76+50	0.5-1.0	A-7-5(10)	56	26	22.6	21.4	17.7	38.3	90	79	51	26	-
S-83	45' RT	76+50	2.0-2.5	A-7-5(44)	88	49	6.9	12.5	18.1	62.6	97	95	79	33	-

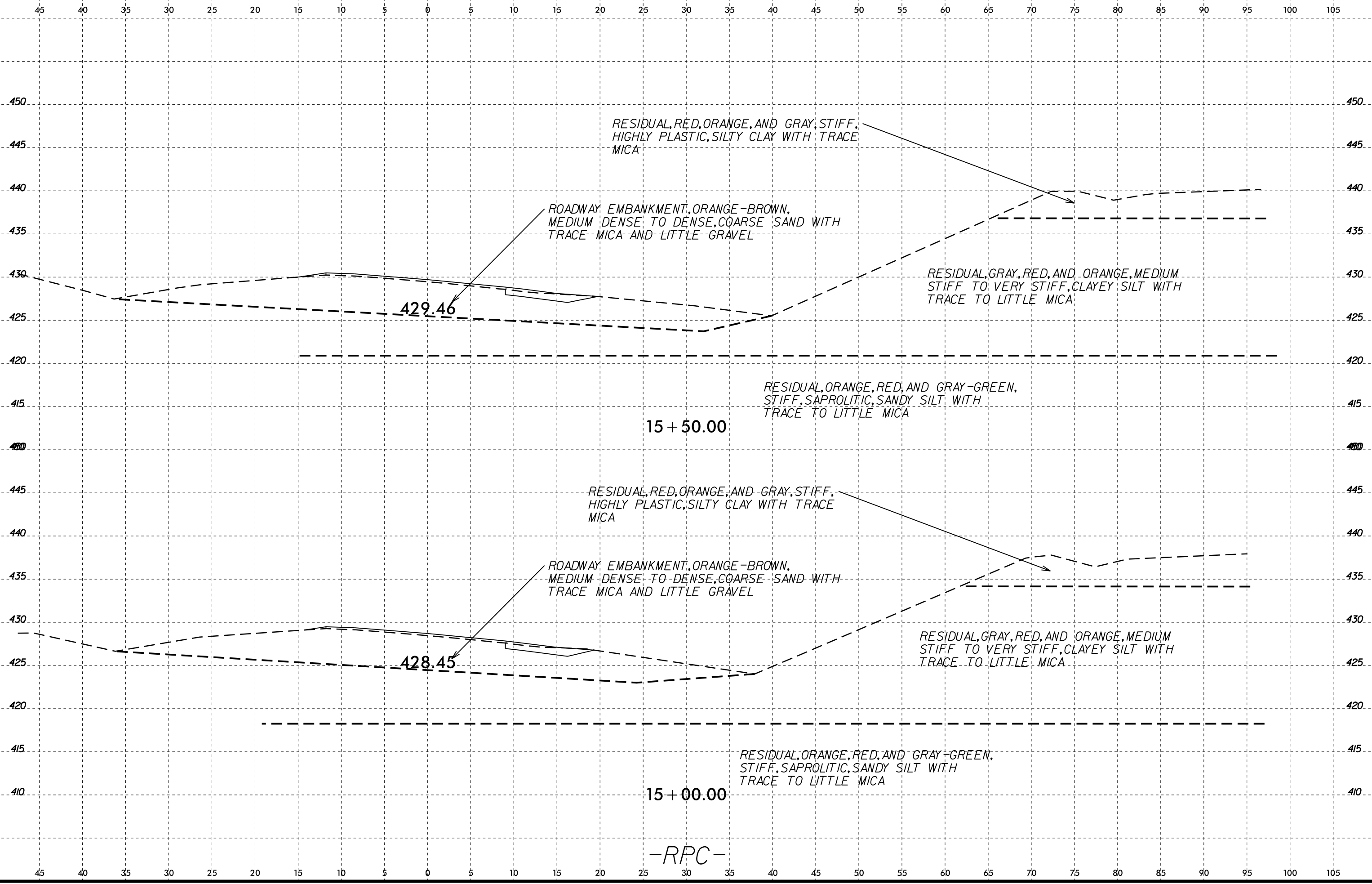




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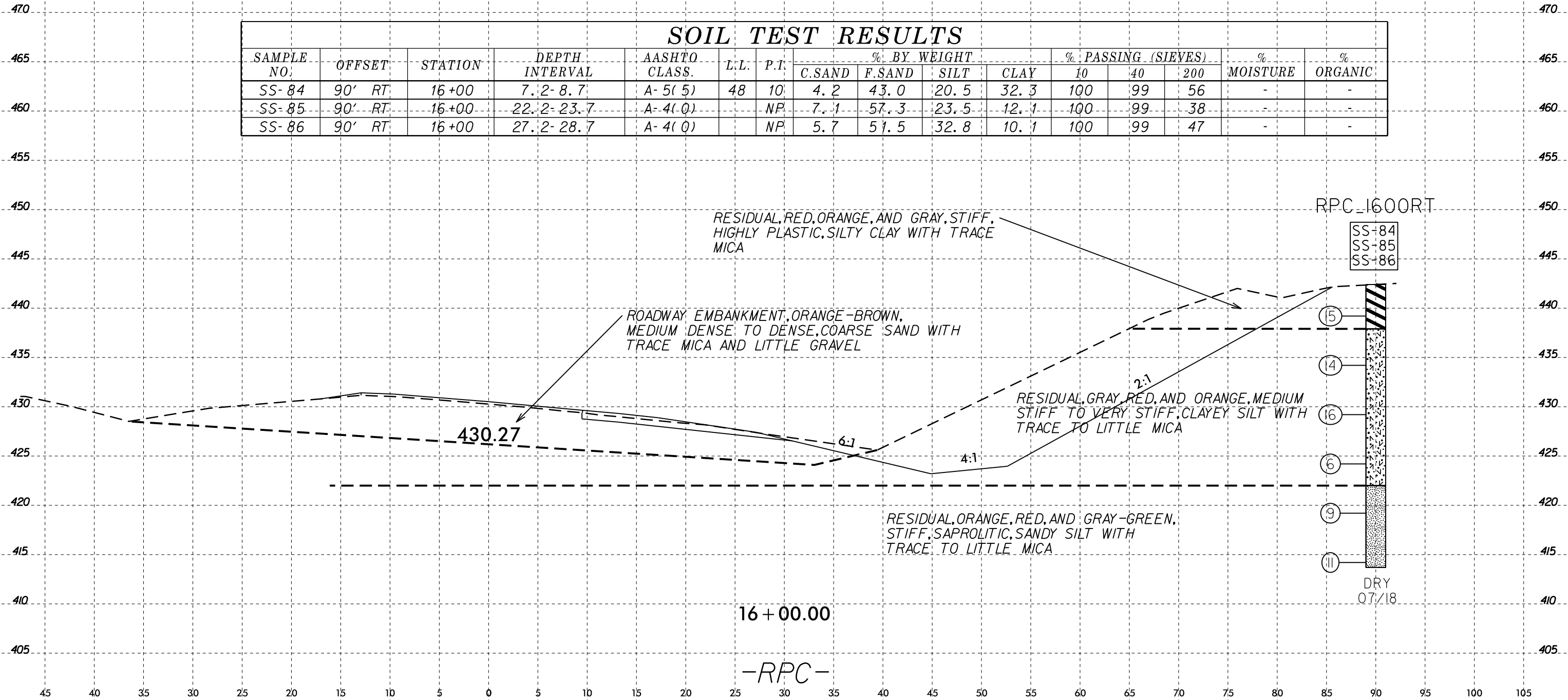




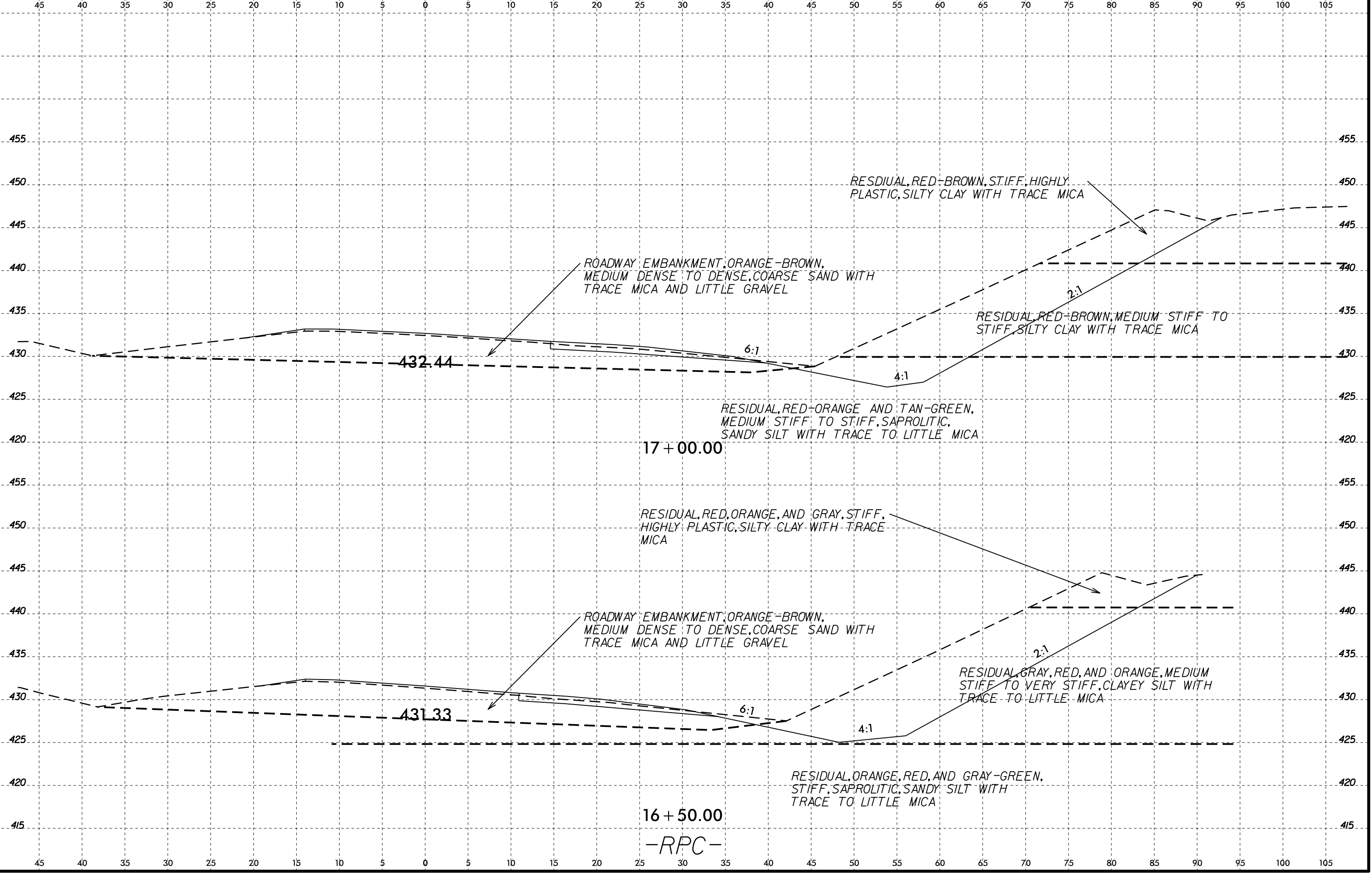
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SOIL TEST RESULTS

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							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-84	90' RT	16+00	7.2-8.7	A-5(5)	48	10	4.2	43.0	20.5	32.3	100	99	56	-	-
SS-85	90' RT	16+00	22.2-23.7	A-4(0)		NP	7.1	57.3	23.5	12.1	100	99	38	-	-
SS-86	90' RT	16+00	27.2-28.7	A-4(0)		NP	5.7	51.5	32.8	10.1	100	99	47	-	-



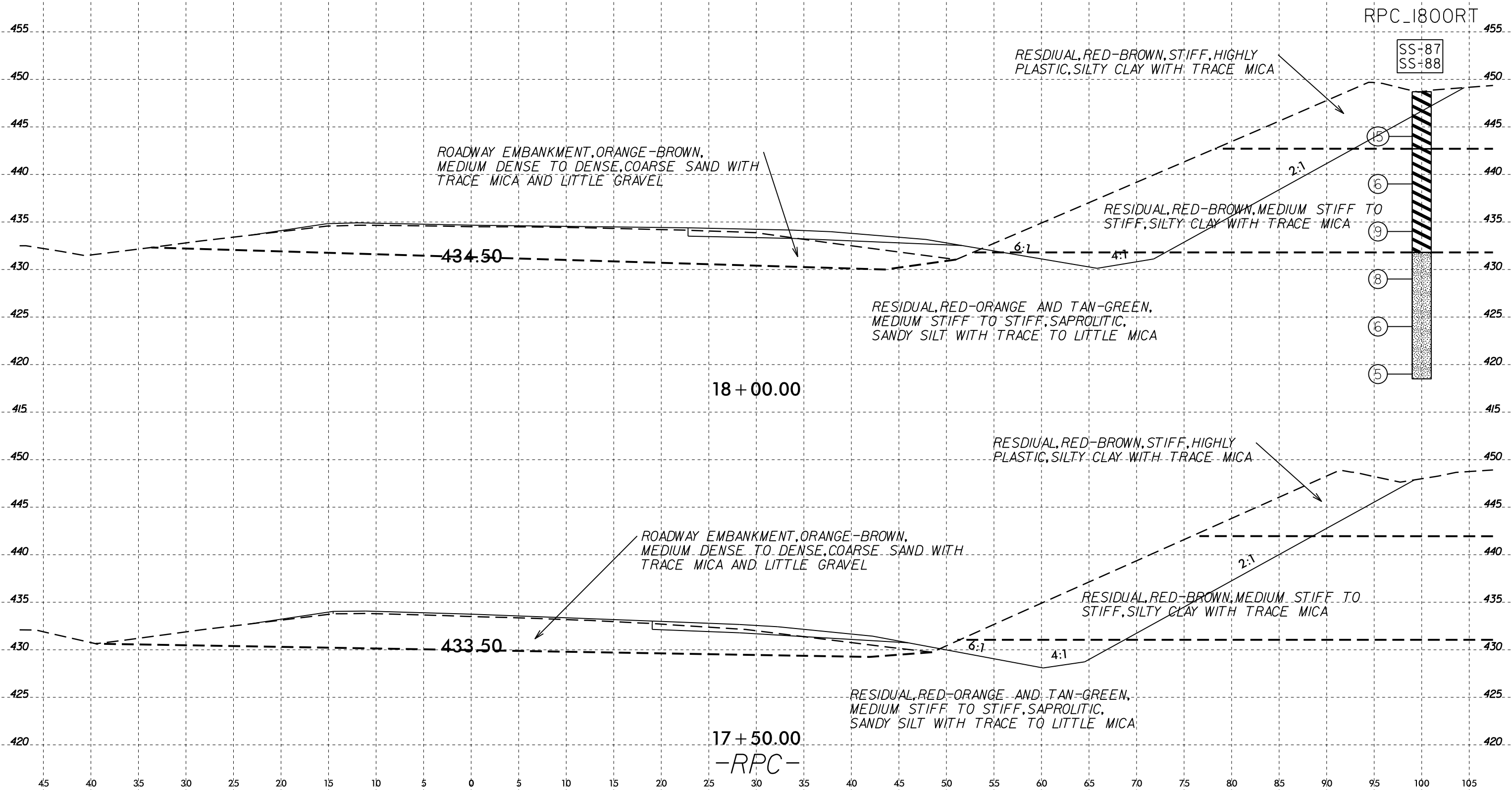
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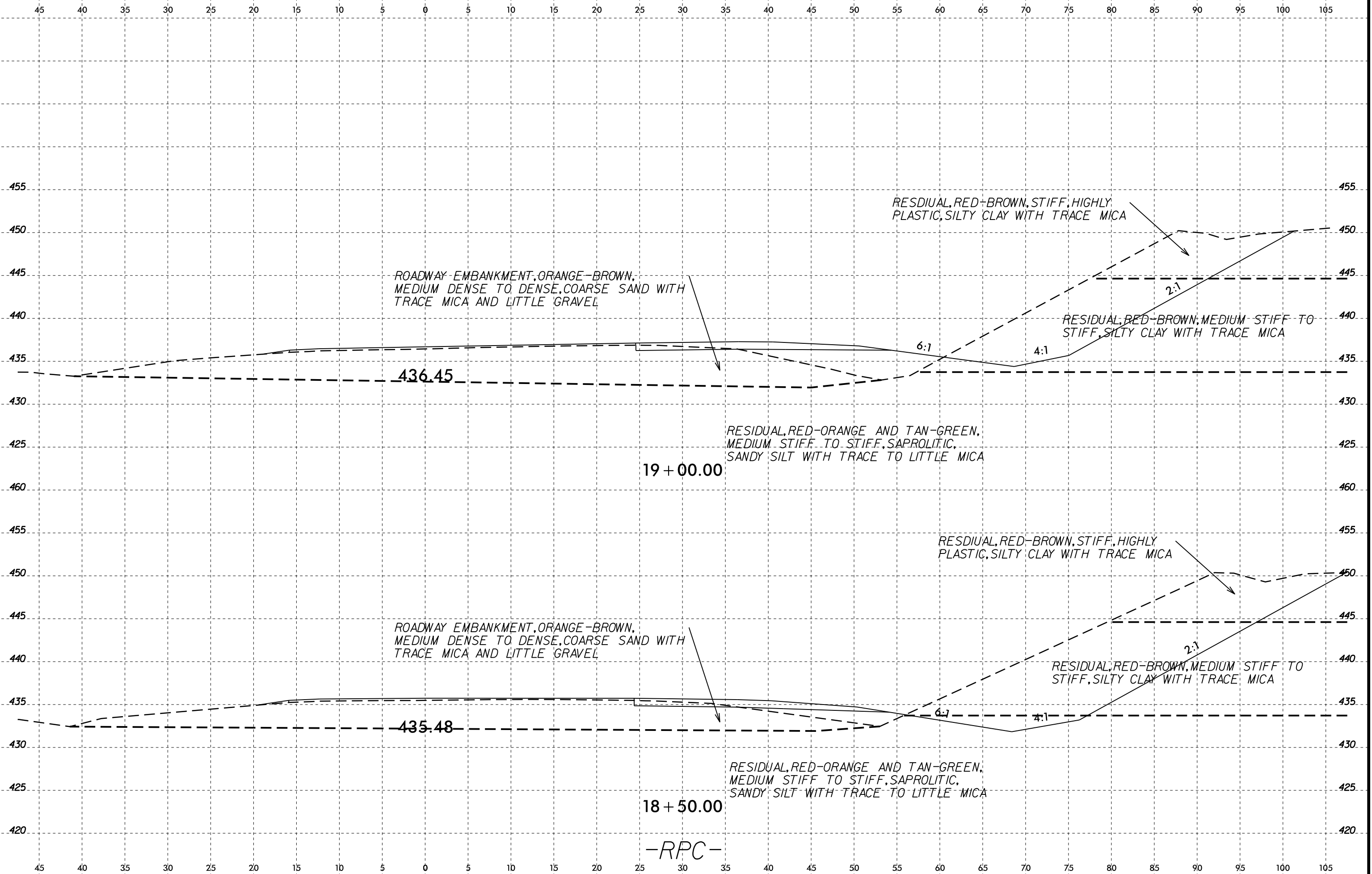
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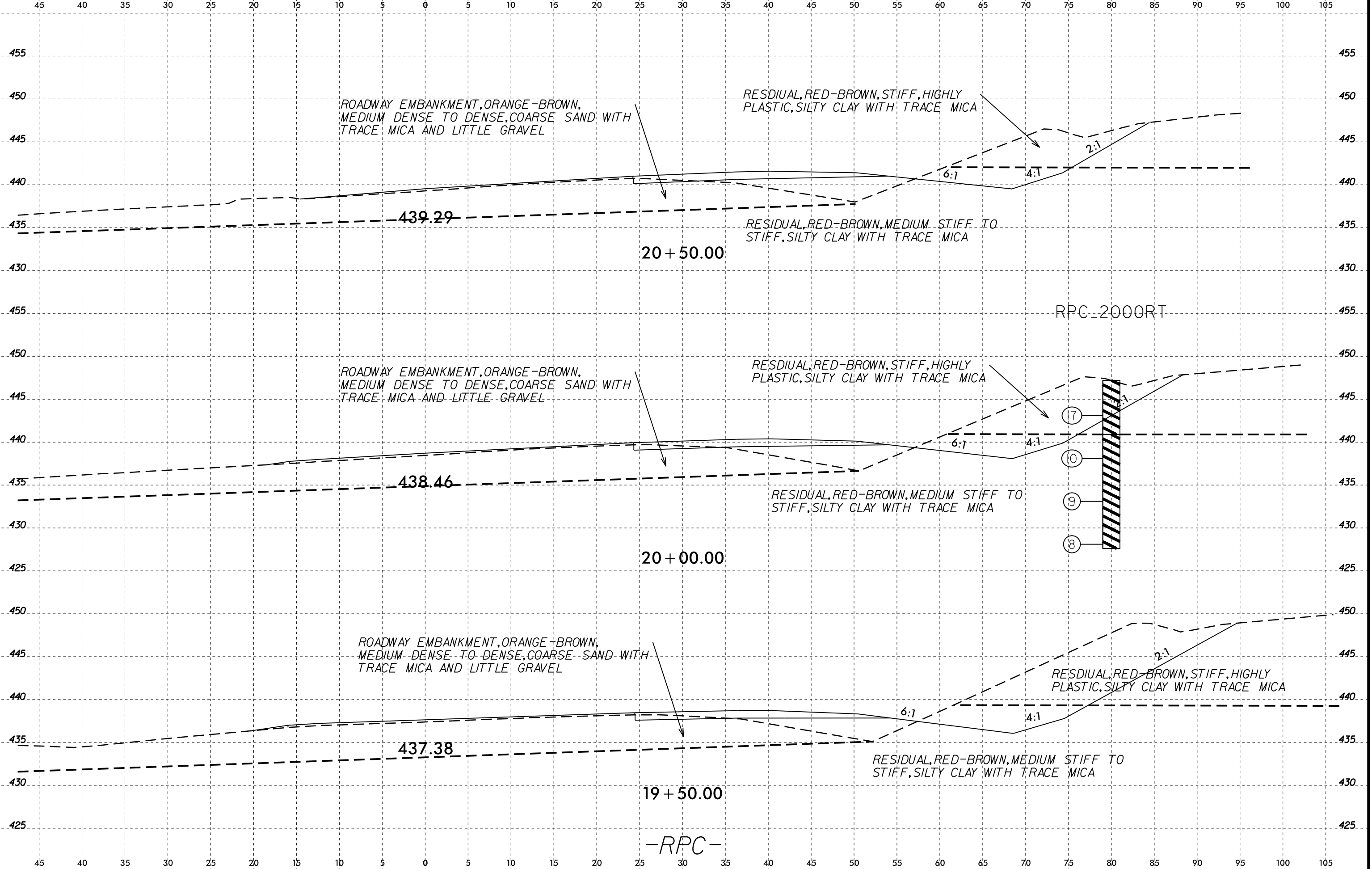
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							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-87	100' RT	18+00	3.7-9.2	A-7-5(22)	63	31	5.0	26.4	18.1	50.5	99	96	68	-	-
SS-88	100' RT	18+00	8.7-10.2	A-7-5(21)	60	24	2.6	24.4	28.6	44.4	100	99	76	-	-



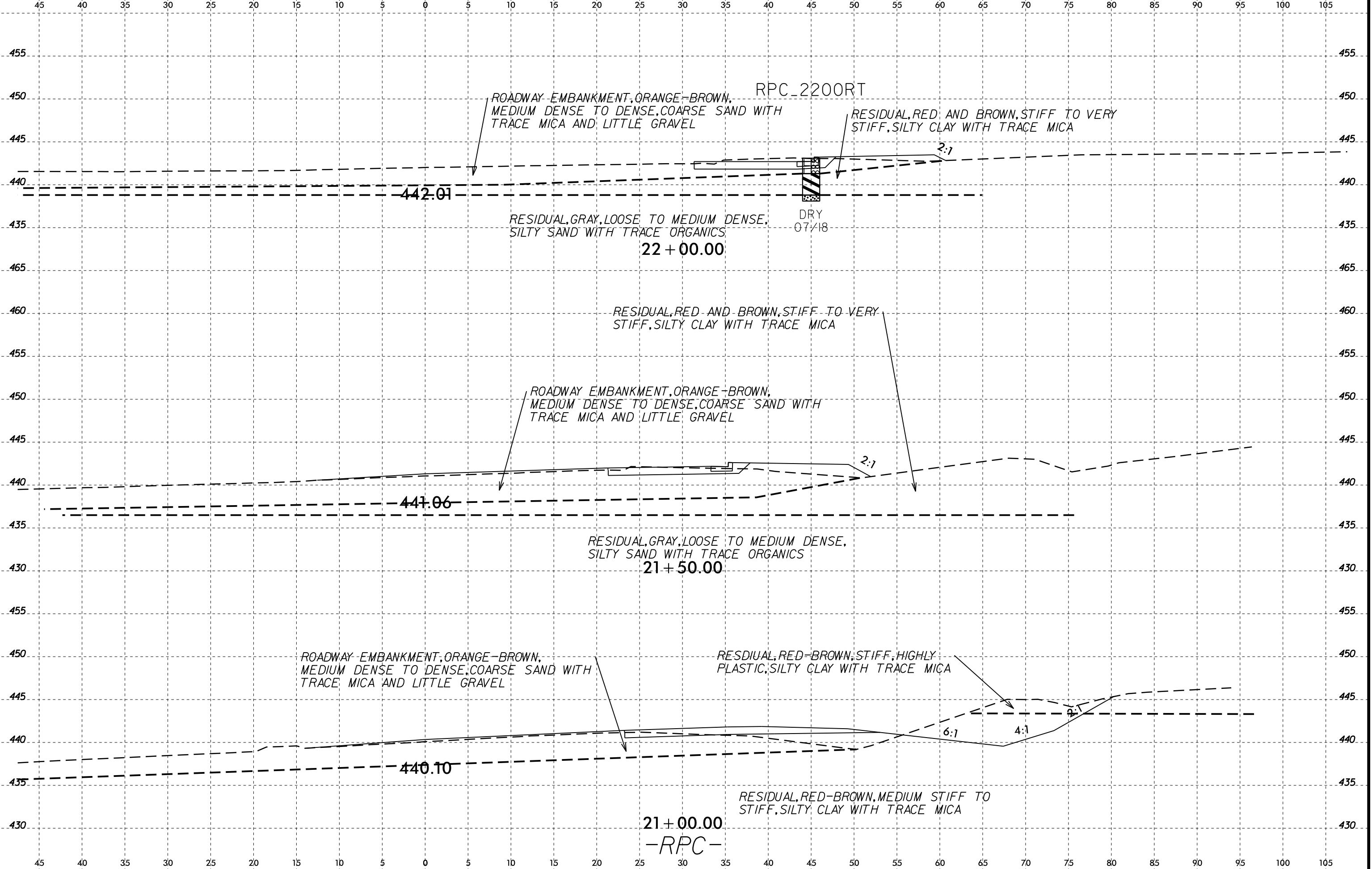
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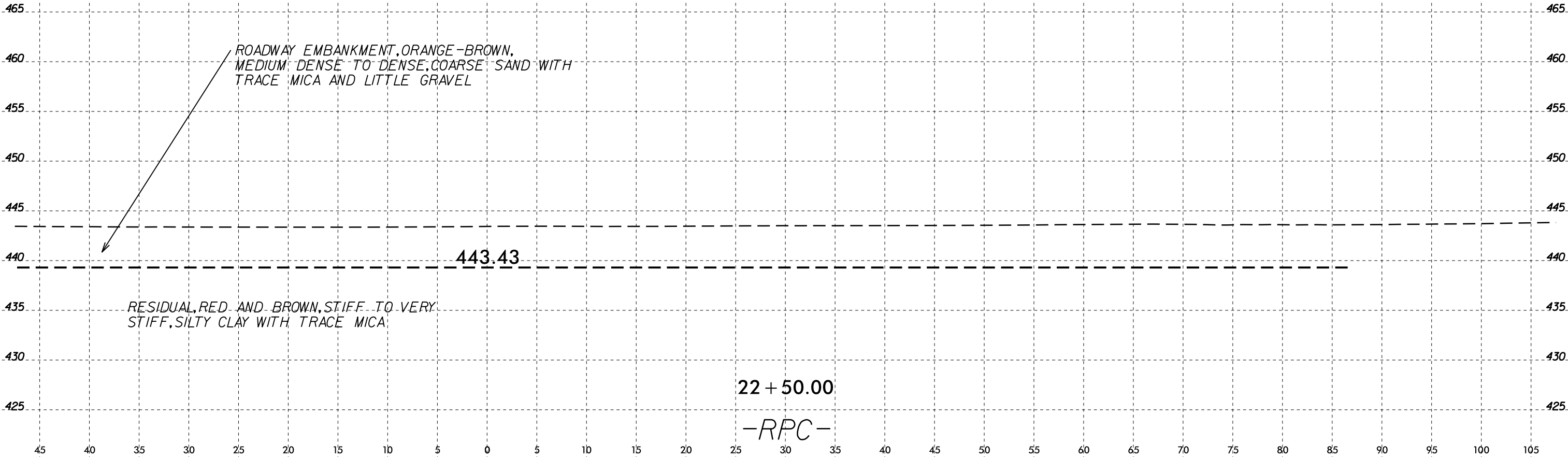
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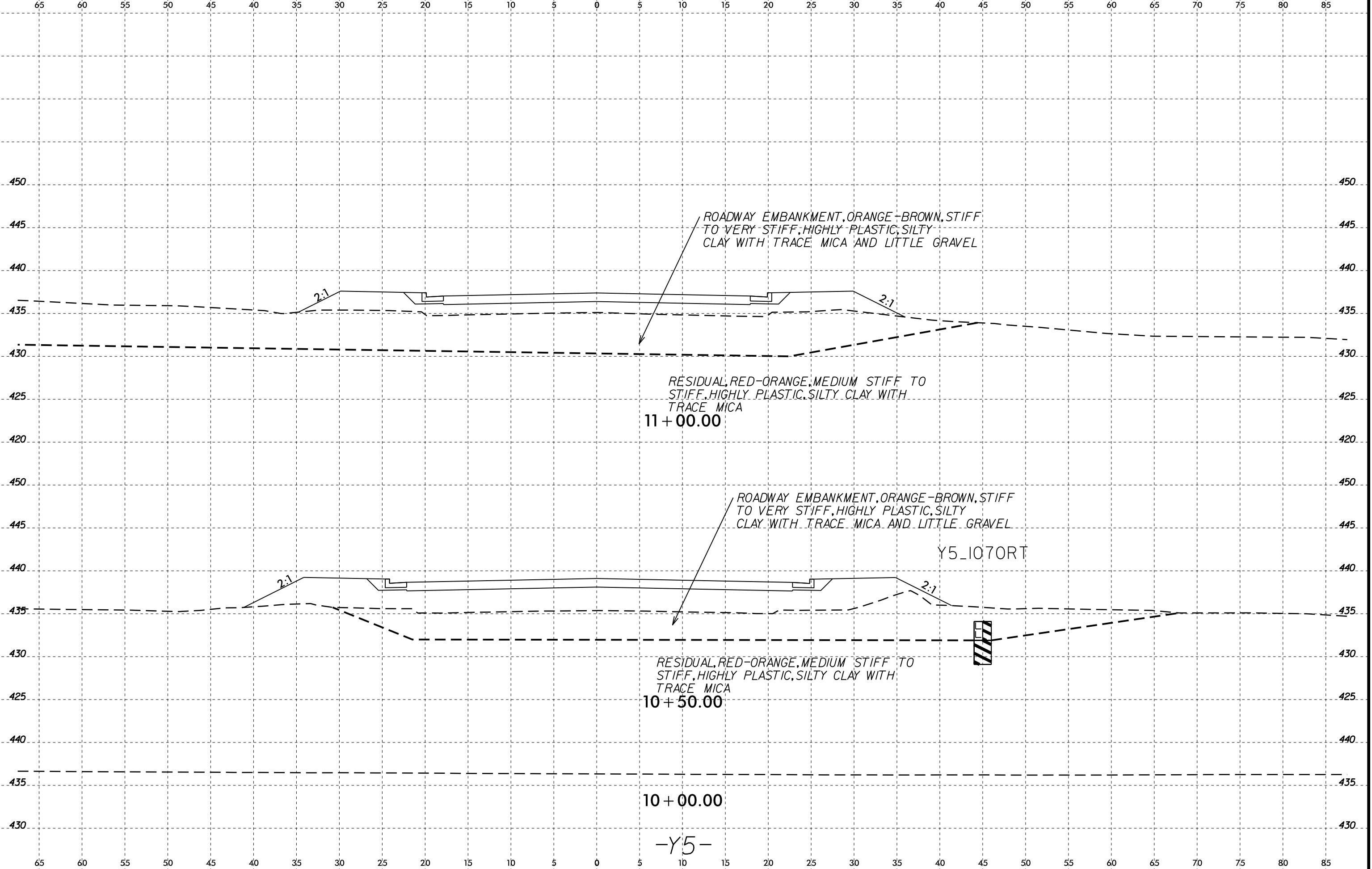
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6/23/16



ROADWAY EMBANKMENT, ORANGE-BROWN, STIFF TO VERY STIFF, HIGHLY PLASTIC, SILTY CLAY WITH TRACE MICA AND LITTLE GRAVEL

RESIDUAL, RED-ORANGE, MEDIUM STIFF TO STIFF, HIGHLY PLASTIC, SILTY CLAY WITH TRACE MICA
11 + 00.00

ROADWAY EMBANKMENT, ORANGE-BROWN, STIFF TO VERY STIFF, HIGHLY PLASTIC, SILTY CLAY WITH TRACE MICA AND LITTLE GRAVEL

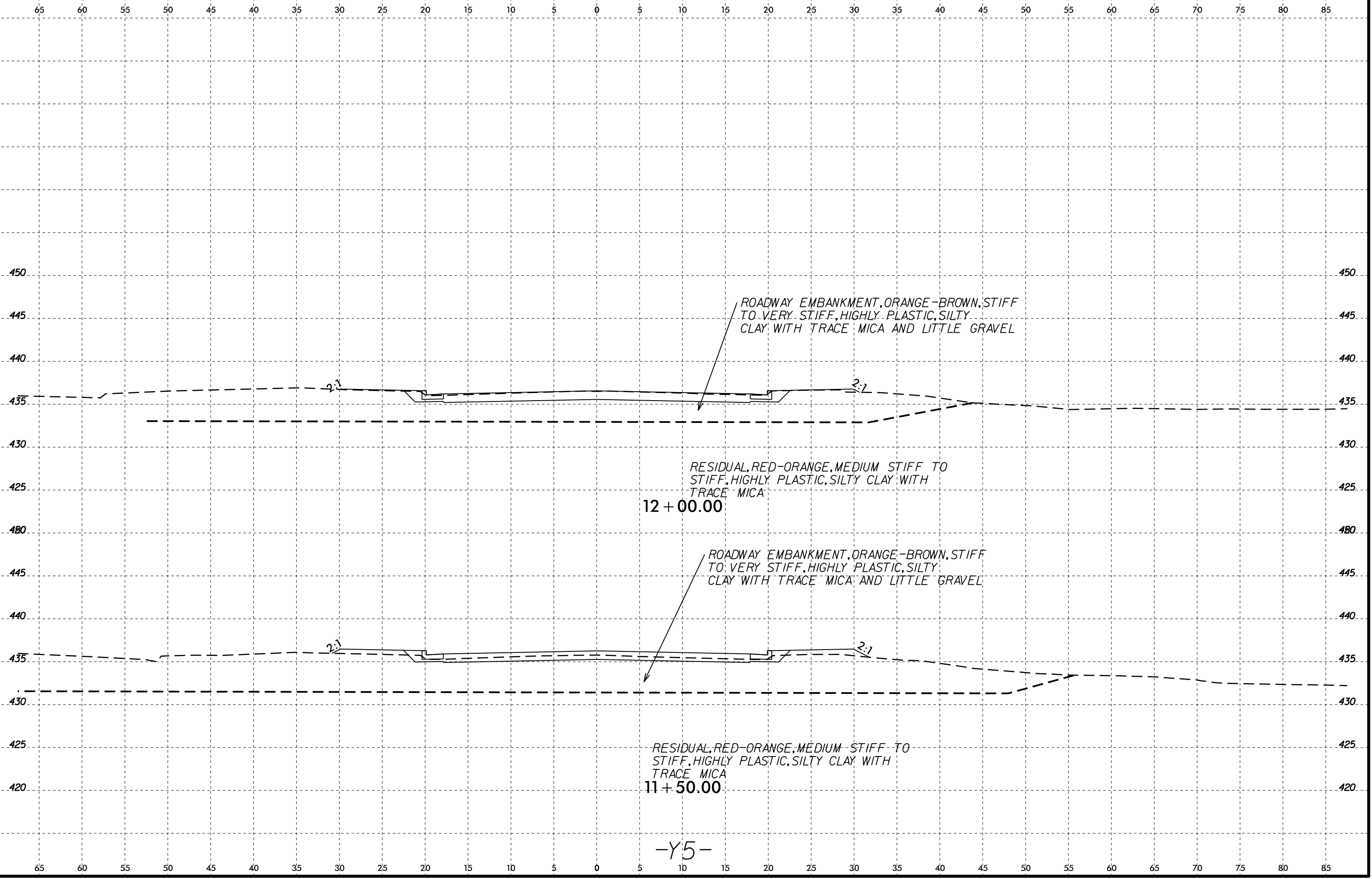
RESIDUAL, RED-ORANGE, MEDIUM STIFF TO STIFF, HIGHLY PLASTIC, SILTY CLAY WITH TRACE MICA
10 + 50.00

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ROADWAY EMBANKMENT, ORANGE-BROWN, STIFF TO VERY STIFF, HIGHLY PLASTIC, SILTY CLAY WITH TRACE MICA AND LITTLE GRAVEL

RESIDUAL, RED-ORANGE, MEDIUM STIFF TO STIFF, HIGHLY PLASTIC, SILTY CLAY WITH TRACE MICA

12 + 00.00

ROADWAY EMBANKMENT, ORANGE-BROWN, STIFF TO VERY STIFF, HIGHLY PLASTIC, SILTY CLAY WITH TRACE MICA AND LITTLE GRAVEL

RESIDUAL, RED-ORANGE, MEDIUM STIFF TO STIFF, HIGHLY PLASTIC, SILTY CLAY WITH TRACE MICA

11 + 50.00

-Y5-