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**CONTRACT: ID: W-5313**

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

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**ROADWAY**  
**SUBSURFACE INVESTIGATION**

PROJ. REFERENCE NO. 46136.1.1 (W-5313) F.A. PROJ. STP-1221(15)  
 COUNTY ROWAN  
 PROJECT DESCRIPTION SR 1221 (OLD BEATTY FORD ROAD) FROM  
SR 1337 (LENTZ ROAD) TO SR 2335 (LOWER STONE  
CHURCH ROAD)

**INVENTORY**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	46136.1.1 (W-5313)	1	132
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
46136.1.1	STP-1221(15)	P.E.	
		RW & UTIL.	

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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 1991 701-6850. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

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

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

PERSONNEL  
**R. TOOTHMAN**

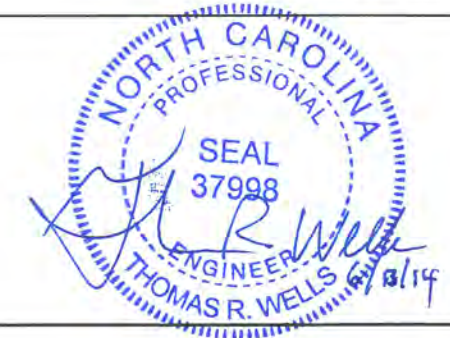
**G. LOWDERMILK**

INVESTIGATED BY D. GOODNIGHT

CHECKED BY T. WELLS

SUBMITTED BY KLEINFELDER

DATE JUNE 2014



DRAWN BY: W. FELDER

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

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

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

## SUBSURFACE INVESTIGATION

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

SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE: <i>VERY STIFF, GRAY-SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i>	<b>WELL GRADED</b> - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. <b>UNIFORM</b> - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED) <b>GAP-GRADED</b> - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES. <b>ANGULARITY OF GRAINS</b> THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: <b>ANGULAR</b> , <b>SUBANGULAR</b> , <b>SUBROUNDED</b> , OR <b>ROUNDED</b> .	<b>HARD ROCK</b> IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS: <b>WEATHERED ROCK (WR)</b> <b>CRYSTALLINE ROCK (CR)</b> <b>NON-CRYSTALLINE ROCK (NCR)</b> <b>COASTAL PLAIN SEDIMENTARY ROCK (CP)</b>	<b>ALLUVIUM (ALLUV.)</b> - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. <b>AQUIFER</b> - A WATER BEARING FORMATION OR STRATA. <b>ARENACEOUS</b> - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. <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. <b>ARTESIAN</b> - 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. <b>CALCAREOUS (CALC.)</b> - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. <b>COLLUVIUM</b> - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. <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. <b>DIKE</b> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. <b>DIP</b> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. <b>DIP DIRECTION (DIP AZIMUTH)</b> - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. <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. <b>FISSILE</b> - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. <b>FLOAT</b> - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL. <b>FLOOD PLAIN (FP)</b> - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. <b>FORMATION (FM)</b> - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. <b>JOINT</b> - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. <b>LEDGE</b> - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. <b>LENS</b> - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. <b>MOTTLED (MOTJ.)</b> - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. <b>PERCHED WATER</b> - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. <b>RESIDUAL (RES.) SOIL</b> - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. <b>ROCK QUALITY DESIGNATION (RQD)</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. <b>SAPROLITE (SAP.)</b> - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. <b>SILL</b> - 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. <b>SLICKENSIDE</b> - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. <b>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT)</b> - NUMBER OF BLOWS (IN OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. <b>STRATA CORE RECOVERY (SREC.)</b> - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. <b>STRATA ROCK QUALITY DESIGNATION (SRQD)</b> - 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. <b>TOPSOIL (TS)</b> - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
<b>SOIL LEGEND AND AASHTO CLASSIFICATION</b>	<b>MINERALOGICAL COMPOSITION</b>	<b>WEATHERING</b>	
GENERAL CLASS. GRANULAR MATERIALS (≤ 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.	<b>FRESH</b> ROCK FRESH, CRYSTALLINE BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE. <b>VERY SLIGHT (V SL.)</b> 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. <b>SLIGHT (SL.)</b> 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. <b>MODERATE (MOD.)</b> 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. <b>MODERATELY SEVERE (MOD. SEV.)</b> 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> <b>SEVERE (SEV.)</b> ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. <i>IF TESTED, YIELDS SPT N VALUES &gt; 100 BPF</i> <b>VERY SEVERE (V SEV.)</b> 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> <b>COMPLETE</b> 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.	
<b>SOIL LEGEND AND AASHTO CLASSIFICATION</b>	<b>COMPRESSION</b>	<b>GROUND WATER</b>	
GROUP CLASS. A-1, A-2, A-3, A-4, A-5, A-6, A-7, A-7.5, A-7.6	SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 31 MODERATELY COMPRESSIBLE LIQUID LIMIT EQUAL TO 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50	<b>▽</b> WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING <b>▽</b> STATIC WATER LEVEL AFTER 24 HOURS <b>▽PW</b> PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA <b>○</b> SPRING OR SEEP	
<b>SOIL LEGEND AND AASHTO CLASSIFICATION</b>	<b>PERCENTAGE OF MATERIAL</b>	<b>MISCELLANEOUS SYMBOLS</b>	
SYMBOL % PASSING # 10 # 40 # 200	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	<b>ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION</b> <b>SOIL SYMBOL</b> <b>ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT</b> <b>INFERRED SOIL BOUNDARY</b> <b>INFERRED ROCK LINE</b> <b>ALLUVIAL SOIL BOUNDARY</b> <b>DIP &amp; DIP DIRECTION OF ROCK STRUCTURES</b> <b>SPT DPT DMT VST PMT TEST BORING W/ CORE</b> <b>AUGER BORING</b> <b>CORE BORING</b> <b>MONITORING WELL</b> <b>PIEZOMETER INSTALLATION</b> <b>SLOPE INDICATOR INSTALLATION</b> <b>CONE PENETROMETER TEST</b> <b>SOUNDING ROD</b>	
<b>CONSISTENCY OR DENSENESS</b>	<b>GROUND WATER</b>	<b>ABBREVIATIONS</b>	
PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/F <sup>2</sup> )	<b>AR</b> - AUGER REFUSAL <b>BT</b> - BORING TERMINATED <b>CL</b> - CLAY <b>CPT</b> - CONE PENETRATION TEST <b>CSE</b> - COARSE <b>DMT</b> - DILATOMETER TEST <b>DPT</b> - DYNAMIC PENETRATION TEST <b>e</b> - VOID RATIO <b>F</b> - FINE <b>FOSS</b> - FOSSILIFEROUS <b>FRAC.</b> - FRACTURED, FRACTURES <b>FRAGS.</b> - FRAGMENTS <b>HI.</b> - HIGHLY <b>MED.</b> - MEDIUM <b>MICA.</b> - MICACEOUS <b>MOD.</b> - MODERATELY <b>NP</b> - NON PLASTIC <b>ORG.</b> - ORGANIC <b>PMT</b> - PRESSUREMETER TEST <b>SAP.</b> - SAPROLITIC <b>SD.</b> - SAND, SANDY <b>SL.</b> - SILT, SILTY <b>SLI.</b> - SLIGHTLY <b>TCR</b> - TRICONE REFUSAL <b>w</b> - MOISTURE CONTENT <b>V</b> - VERY <b>VST</b> - VANE SHEAR TEST <b>WEA.</b> - WEATHERED <b>γ</b> - UNIT WEIGHT <b>γ<sub>d</sub></b> - DRY UNIT WEIGHT <b>S</b> - BULK <b>SS</b> - SPLIT SPOON <b>ST</b> - SHELBY TUBE <b>RS</b> - ROCK <b>RT</b> - RECOMPACTED TRIAXIAL <b>CBR</b> - CALIFORNIA BEARING RATIO		
<b>TEXTURE OR GRAIN SIZE</b>	<b>TEXTURE OR GRAIN SIZE</b>	<b>EQUIPMENT USED ON SUBJECT PROJECT</b>	
U.S. STD. SIEVE SIZE OPENING (MM) 4 10 40 60 200 270 4.76 2.00 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 75 2.0 0.25 0.05 0.005 IN. 12 3	<b>DRILL UNITS:</b> <input type="checkbox"/> MOBILE B- <input type="checkbox"/> BK-51 <input type="checkbox"/> CME-45C <input type="checkbox"/> CME-550 <input type="checkbox"/> PORTABLE HOIST <input checked="" type="checkbox"/> CME-55	
<b>SOIL MOISTURE - CORRELATION OF TERMS</b>	<b>SOIL MOISTURE - CORRELATION OF TERMS</b>	<b>ADVANCING TOOLS:</b> <input type="checkbox"/> CLAY BITS <input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER <input checked="" type="checkbox"/> 8" HOLLOW AUGERS <input type="checkbox"/> HARD FACED FINGER BITS <input type="checkbox"/> TUNG-CARBIDE INSERTS <input type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER <input type="checkbox"/> TRICONE * STEEL TEETH <input type="checkbox"/> TRICONE * TUNG-CARB. <input type="checkbox"/> CORE BIT	
SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION	LL - LIQUID LIMIT PL - PLASTIC LIMIT OM - OPTIMUM MOISTURE SL - SHRINKAGE LIMIT - SATURATED - (SAT) USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE - WET - (W) SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE - DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE	<b>HAMMER TYPE:</b> <input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL <b>CORE SIZE:</b> <input type="checkbox"/> -B <input type="checkbox"/> -N <input type="checkbox"/> -H <b>HAND TOOLS:</b> <input type="checkbox"/> POST HOLE DIGGER <input type="checkbox"/> HAND AUGER <input type="checkbox"/> SOUNDING ROD <input type="checkbox"/> VANE SHEAR TEST	
<b>PLASTICITY</b>	<b>PLASTICITY</b>	<b>FRACTURE SPACING</b>	
NONPLASTIC LOW PLASTICITY MED. PLASTICITY HIGH PLASTICITY	PLASTICITY INDEX (PI) DRY STRENGTH 0-5 VERY LOW 6-15 SLIGHT 16-25 MEDIUM 26 OR MORE HIGH	<b>TERM SPACING</b> 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	
<b>COLOR</b>	<b>COLOR</b>	<b>BEDDING</b>	
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.	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.	<b>TERM THICKNESS</b> 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	
		<b>INDURATION</b>	
		<b>FRIABLE</b> RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. <b>MODERATELY INDURATED</b> GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. <b>INDURATED</b> GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. <b>EXTREMELY INDURATED</b> SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.	
		<b>BENCH MARK: BORING ELEVATIONS OBTAINED USING W5313_LS_TIN_TIN DATED 12/19/13</b>	
		<b>NOTES: FIAD - FILLED IN AFTER DRILLING</b>	

09/08/09

TIP PROJECT: W-5313

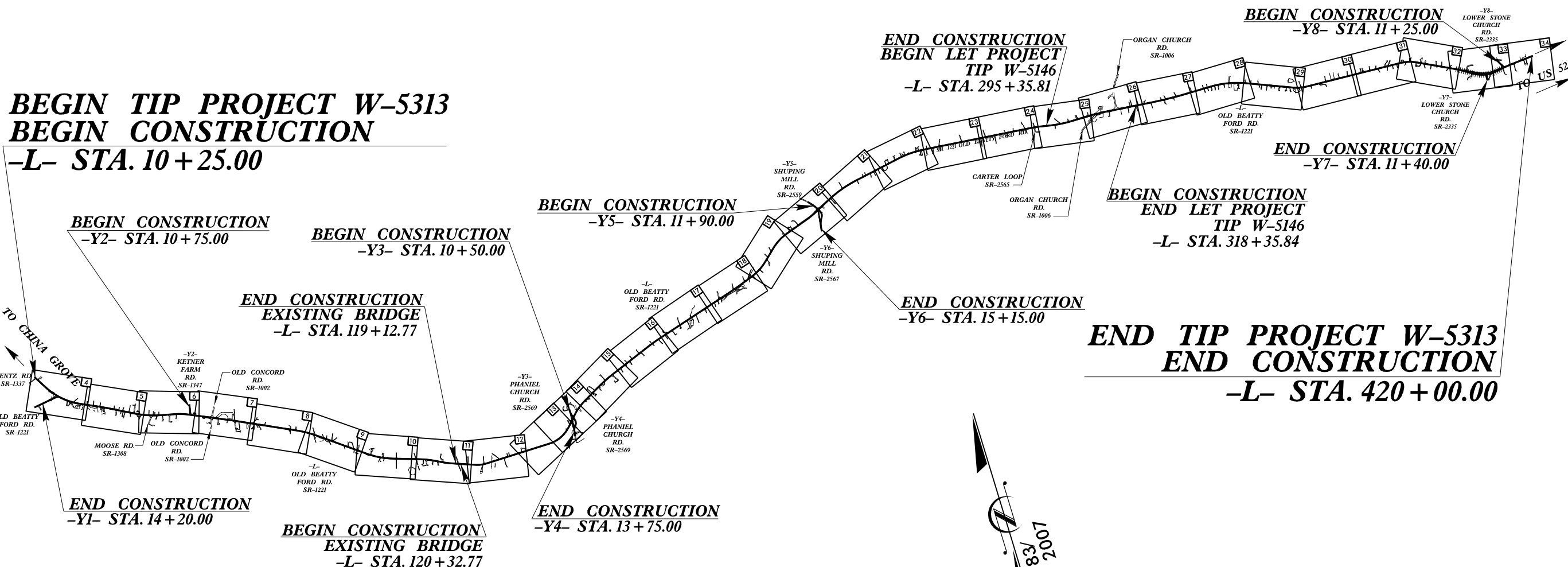
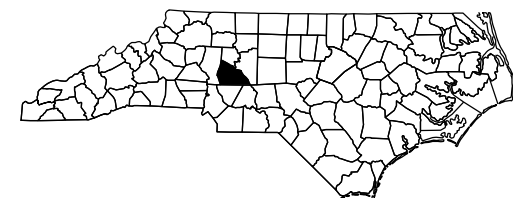
CONTRACT: 46136.1.1

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

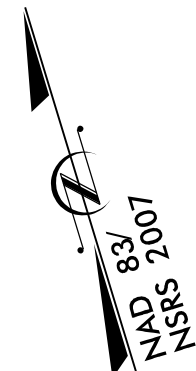
**ROWAN COUNTY**

**LOCATION: SR 1221 (OLD BEATTY FORD ROAD)  
FROM SR 1337 (LENTZ ROAD) TO  
SR 2335 (LOWER STONE CHURCH ROAD)**  
**TYPE OF WORK: WIDENING, RESURFACING, DRAINAGE, SIGNING**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	W-5313	2A	132
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
46136.1.1	STP-1221(15)	P.E.	



THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.  
THERE IS NO CONTROL OF ACCESS ON THIS PROJECT.  
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD



**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 2015 = 4334 ADT 2035 = 5667 DHV = 10 % D = 65 % T = 8 % * V = 50 MPH * TTST = 3 DUAL = 5 FUNC CLASS = RUAL COLLECTOR SUB REGIONAL TIER</p>	<p><b>PROJECT LENGTH</b></p> <p>LENGTH OF ROADWAY TIP PROJECT W-5313 = 7.30 MILES LENGTH OF EXISTING STRUCTURE TIP PROJECT W-5313 = 0.02 MILES LENGTH OF LET TIP PROJECT W-5146 = 0.44 MILES TOTAL LENGTH OF TIP PROJECT W-5313 = 7.76 MILES</p>	<p>Prepared in the Office of: <b>DIVISION OF HIGHWAYS</b> 1000 Birch Ridge Dr., Raleigh NC, 27610</p> <p>2012 STANDARD SPECIFICATIONS</p> <p>RIGHT OF WAY DATE: <u>MARCH 21, 2014</u></p> <p>LETTING DATE: <u>SEPTEMBER 15, 2015</u></p> <p>TONY HOUSER, PE. PROJECT ENGINEER</p> <p>LEE ANN MOORE PROJECT DESIGN ENGINEER</p>	<p>HYDRAULICS ENGINEER</p> <p>SIGNATURE: _____ P.E.</p> <p>ROADWAY DESIGN ENGINEER</p> <p>SIGNATURE: _____ P.E.</p>	
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June 13, 2104  
File No. 138804 | GSO14R0146

STATE PROJECT: 46136.1.1 (W-5313)  
FEDERAL PROJECT: STP-1221(15)  
COUNTY: Rowan  
DESCRIPTION: SR 1221 (Old Beatty Ford Road) from SR 1337 (Lentz Road) to SR 2335 (Lower Stone Church Road)

**SUBJECT: Geotechnical Report - Inventory**

**Project Description**

This project consists of the proposed 7.4 mile widening of Old Beatty Ford Road (-L-) from Lentz Road to Lower Stone Church Road. This project includes of the reconstruction of portions of the intersections with Lentz Road (-Y1-), Ketner Farm Road (-Y2-), Phaniel Church Road (-Y3- and -Y4-), Shuping Mill Road (-Y5- and -Y6-), and Lower Stone Church Road (-Y7- and -Y8-).

The geotechnical investigation was conducted during January of 2014. One drill machine, a CME-55, with automatic hammers, was used during the investigation. Standard Penetration Tests were performed at each boring location. Representative soil samples were collected for visual classification in the field and selected samples were submitted for laboratory analysis by Kleinfelder, Inc.

The following alignments, totaling 7.8 miles, were investigated.

<u>Line</u>	<u>Stations</u>
-L-	10+25 to 295+35.81
-L-	318+35.84 to 420+00
-Y1-	10+00 to 14+20
-Y2-	10+75 to 12+60.70
-Y3-	10+50 to 12+24.08
-Y4-	10+00 to 13+75
-Y5-	11+90 to 13+33.49
-Y6-	10+00 to 15+15
-Y7-	10+00 to 11+40
-Y8-	11+25 to 12+84.99

**Areas of Special Geotechnical Interest**

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

<u>Line</u>	<u>Stations</u>	<u>Offsets</u>
-L-	27+30 to 32+70	LT to RT
-L-	37+30 to 47+70	LT to RT
-L-	92+60 to 97+60	LT to RT
-L-	162+30 to 167+70	LT to RT
-L-	179+20 to 180+20	LT to RT
-L-	208+50 to 209+30	LT to RT
-L-	257+30 to 277+60	LT to RT
-L-	282+30 to 287+60	LT to RT
-L-	318+36 to 337+70	LT to RT
-L-	350+60 to 351+60	LT to RT
-L-	367+60 to 377+60	LT to RT
-L-	392+00 to 402+60	LT to RT
-Y4-	11+80 to 13+75	LT to RT
-Y6-	10+00 to 15+15	LT to RT

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

2) Artificial Fill: Several areas of artificial fill occur at the following locations.

<u>Line</u>	<u>Station</u>	<u>Offset (ft)</u>
-L-	84+50	26 RT to 38 RT
-L-	154+79	19 RT to 31 RT
-L-	189+86	16 RT to 28 RT

3) Alluvial: The following locations were found to have very soft to soft alluvial soils.

<u>Line</u>	<u>Station</u>	<u>Offset (ft)</u>
-L-	179+20 to 180+20	LT to RT
-L-	208+60 to 209+70	LT to RT
-L-	397+20 to 398+60	LT to RT

4) Ponds: One pond is located within close proximity of the right of way on this project. This was noted at the following location:

<u>Line</u>	<u>Station</u>	<u>Offset (ft)</u>
-L-	190+27 to 191+55	30 RT to 185 RT

5) Rock Outcrops: Several rock outcrops were observed along the existing roadway at the following locations:

<u>Line</u>	<u>Stations</u>	<u>Offsets</u>
-L-	227+50 to 233+00	LT
-L-	228+30 to 229+00	RT
-Y5-	10+00 to 13+00	RT

### **Physiography and Geology**

The project is located in the Piedmont Physiographic Province. The project corridor is comprised primarily of residential and agricultural properties. The general topography of the site consists of rolling hills with flat to moderate slopes along the existing roadways.

Geologically, the project is located within the Charlotte Belt. Soils are derived from the underlying metamorphic bedrock primarily consisting of metavolcanic rock with areas of intrusive granite in the eastern portion of the project.

### **Soil Properties**

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

Roadway Embankment soils are present along the existing roadways (-L-) on the project. These soils consist of moist, medium stiff to very stiff, medium plasticity, brown, tan-red, and brown-green, coarse to fine sandy clay (A-6) and moist, medium stiff, high plasticity, brown to brown-green, coarse to fine sandy, silty clay (A-7-5). The plasticity index of the roadway embankment soils tested ranged from 29 to 32.

Artificial Fill soils are present in several small isolated areas throughout the project adjacent to the existing roadway (-L-). The artificial soils encountered consist of moist, stiff, non-plastic, tan, fine sandy silt (A-4), moist, non-plastic, tan, fine to coarse sand with gravel (A-1-b), and moist, stiff, medium plasticity, gray and brown, silty, coarse to fine sandy clay (A-6). The plasticity index of the artificial fill soils tested was 16.

Alluvial soils are present along several streams that cross the existing roadway (-L-). The alluvial soils encountered consist of wet, very soft to stiff, non-plastic, coarse to fine sandy silt (A-4), wet, soft to stiff, high plasticity, coarse to fine sandy, silty clay (A-7-5), wet, soft, low plasticity, fine sandy, clayey silt (A-5), and wet, very loose to loose, non-plastic, tan, silty, coarse to fine sand (A-2-4). Alluvial soils are also present in a pond near the project right of way and are further discussed in the "Ponds" section of this report. The plasticity index of the alluvial soils tested was 54.

Residual soils are derived from the weathering of underlying metavolcanic rock. These majority of the residual soils encountered consist of moist to wet, medium stiff to hard, non-plastic, fine sandy silt (A-4), moist, stiff to very stiff, low plasticity, coarse to fine sandy, clayey silt (A-5), moist, stiff to hard, medium plasticity, silty, fine sandy clay (A-6), and moist to wet, medium stiff to very stiff, medium to high plasticity, coarse to fine sandy, silty clay (A-7-5 and A-7-6). Minor amounts of moist to wet, loose to very dense, non-plastic to low plasticity, clayey, silty, coarse to fine sand (A-2-4 and A-2-5) are also present. The plasticity index of the residual soils tested ranged from 17 to 68.

### **Rock Properties**

Weathered rock was encountered along the existing roadways (-L-) at elevations ranging from 688.5 to 796.0 feet (MSL). The majority of the weathered rock consists of tan and gray-green metavolcanic with some isolated areas of granite.

Crystalline rock was encountered along the existing roadways (-L-) at elevations ranging from 687.1 to 749.9 feet (MSL). The crystalline rock consists of metavolcanic.

Several rock outcrops were observed near the intersection of Old Beatty Ford Road (-L-) and Shuping Mill Road (-Y5-).

### **Groundwater**

Groundwater generally occurs well below the ground surface with the exception of several isolated locations along the existing roadways (-L-) of the project. Groundwater was encountered at depths ranging from 0.1 to 12 feet below the existing ground surface. Areas with shallow groundwater were influenced by the weather during the investigation.

### **Ponds**

One pond is located near the project right of way. This pond is listed by alignment, station, and offsets in the "Areas of Special Geotechnical Interest." This pond was investigated. Alluvial soils consist of brown and gray, sandy silts (A-4) and silty clays (A-7-5).

Prepared by,



Thomas R. Wells, P.E.  
Senior Professional



Xavier C. Barrett, P.E.  
Principal Professional

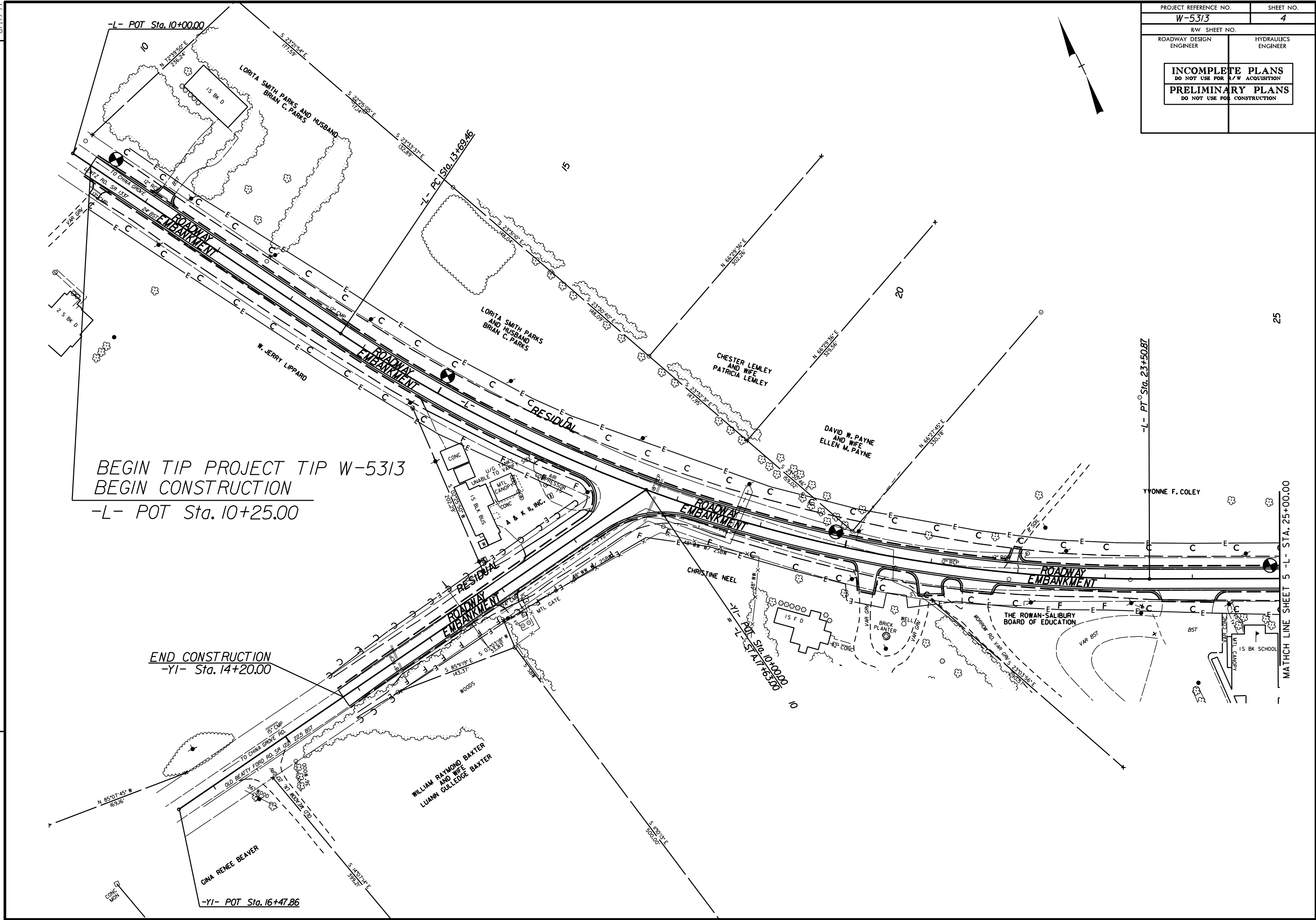
TRW/XCB:cas

PROJECT REFERENCE NO. <b>W-5313</b>	SHEET NO. <b>4</b>
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

REVISIONS



25

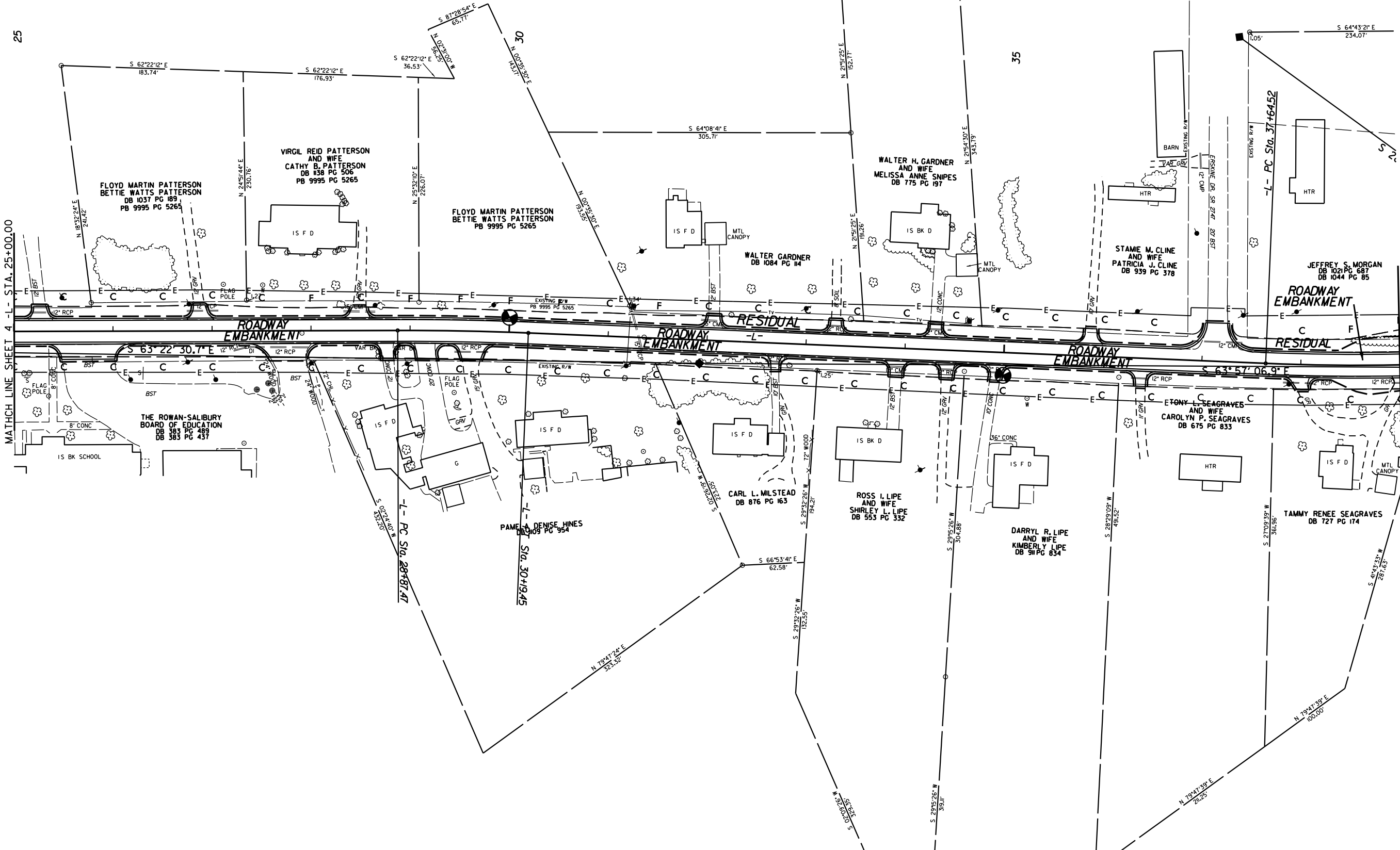
MATCH LINE SHEET 5 -L- STA. 25+00.00

BEGIN TIP PROJECT TIP W-5313  
BEGIN CONSTRUCTION  
-L- POT Sta. 10+25.00

END CONSTRUCTION  
-YI- Sta. 14+20.00

-YI- POT Sta. 16+47.86

PROJECT REFERENCE NO. <b>W-5313</b>	SHEET NO. <b>5</b>
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	



REVISIONS

\*\*\*CITY ENGINEERING DEPARTMENT \*\*\*  
\*\*\*SANITARY ENGINEERING SECTION \*\*\*  
\*\*\*L.C. RICHMOND \*\*\*

MATCH LINE SHEET 4 - L - STA. 25+00.00

MATCH LINE SHEET 6 - L - STA. 39+00.00

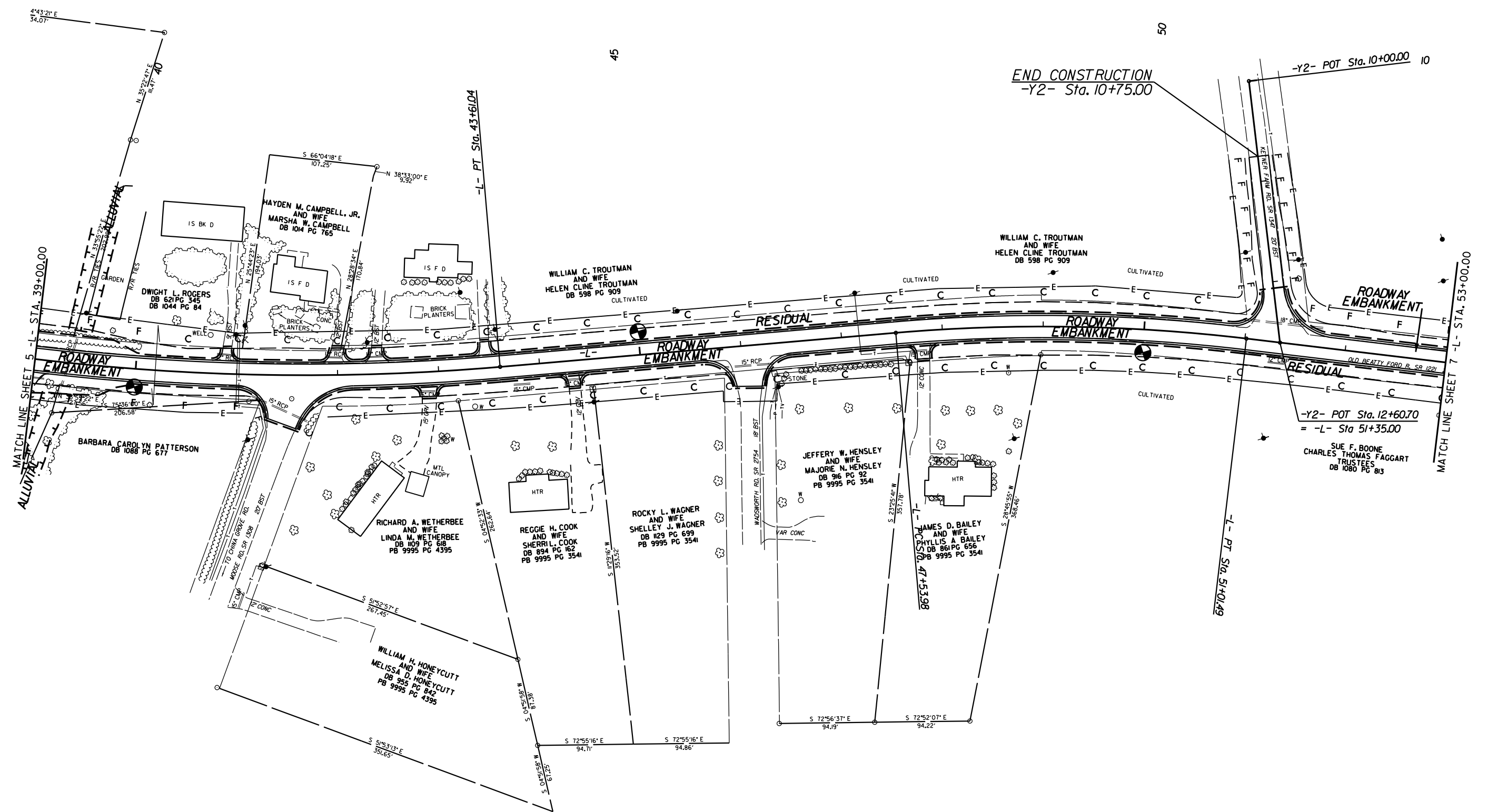


PROJECT REFERENCE NO.	SHEET NO.
<b>W-5313</b>	<b>6</b>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR A/W ACQUISITION <b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	

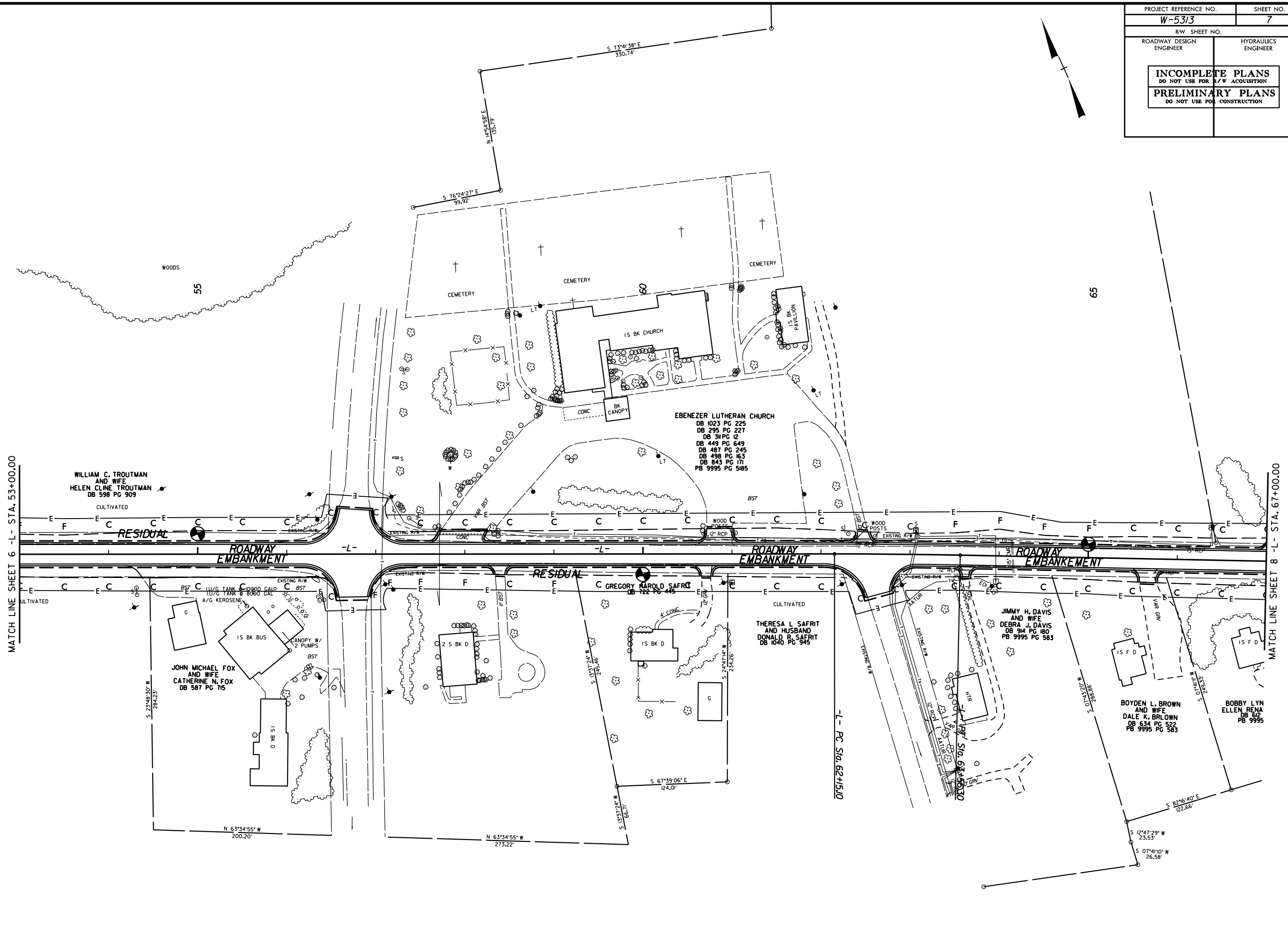


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REVISIONS



PROJECT REFERENCE NO.		SHEET NO.	
W-5313		7	
RW SHEET NO.		HYDRAULICS ENGINEER	
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			



REVISIONS

MATCH LINE SHEET 6 - L - STA. 53+00.00

MATCH LINE SHEET 8 - L - STA. 67+00.00

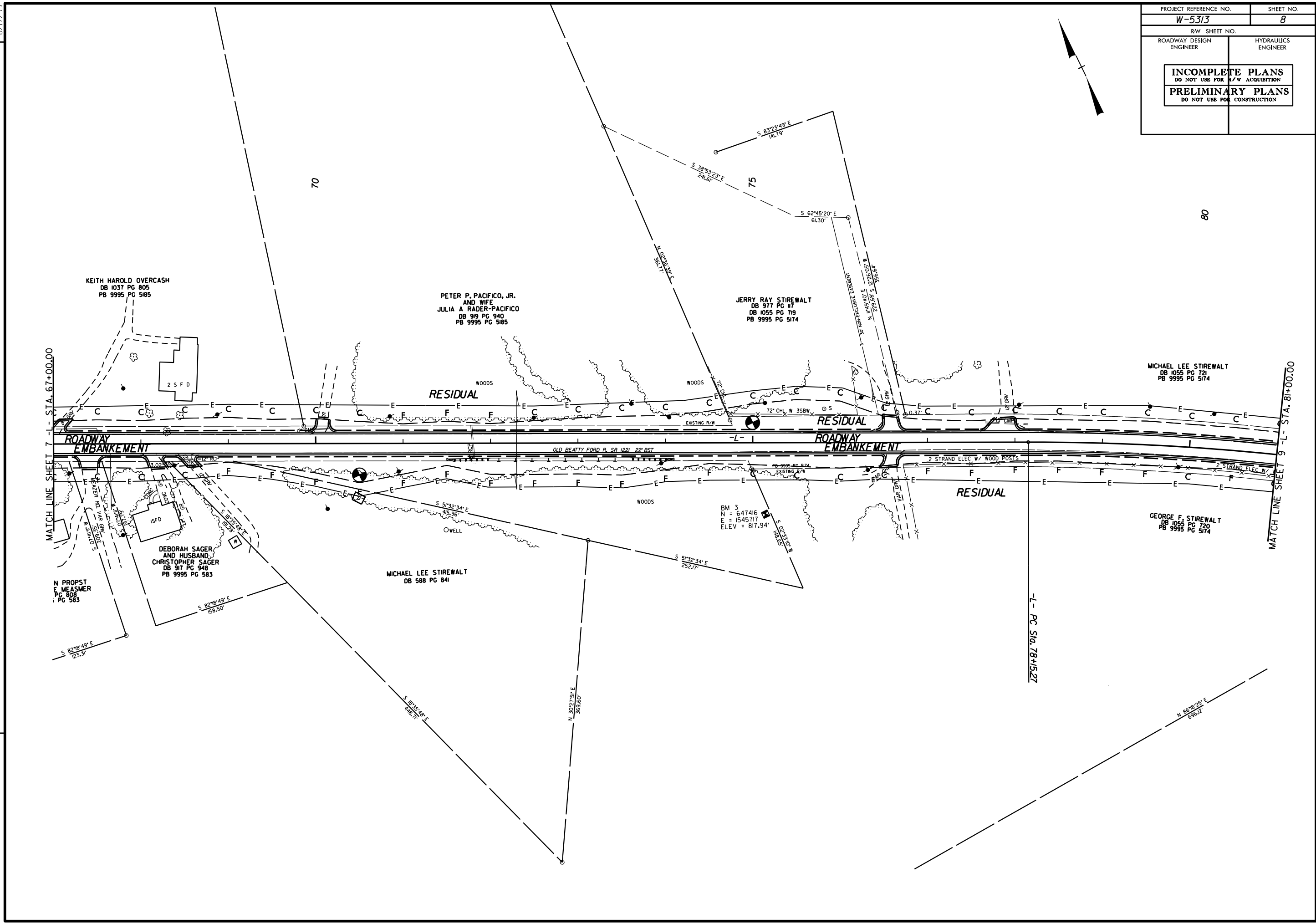
-L- PC Sta. 62+51.0

8/17/99

PROJECT REFERENCE NO. <b>W-5313</b>	SHEET NO. <b>8</b>
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	



REVISIONS



80

MATCH LINE SHEET 7

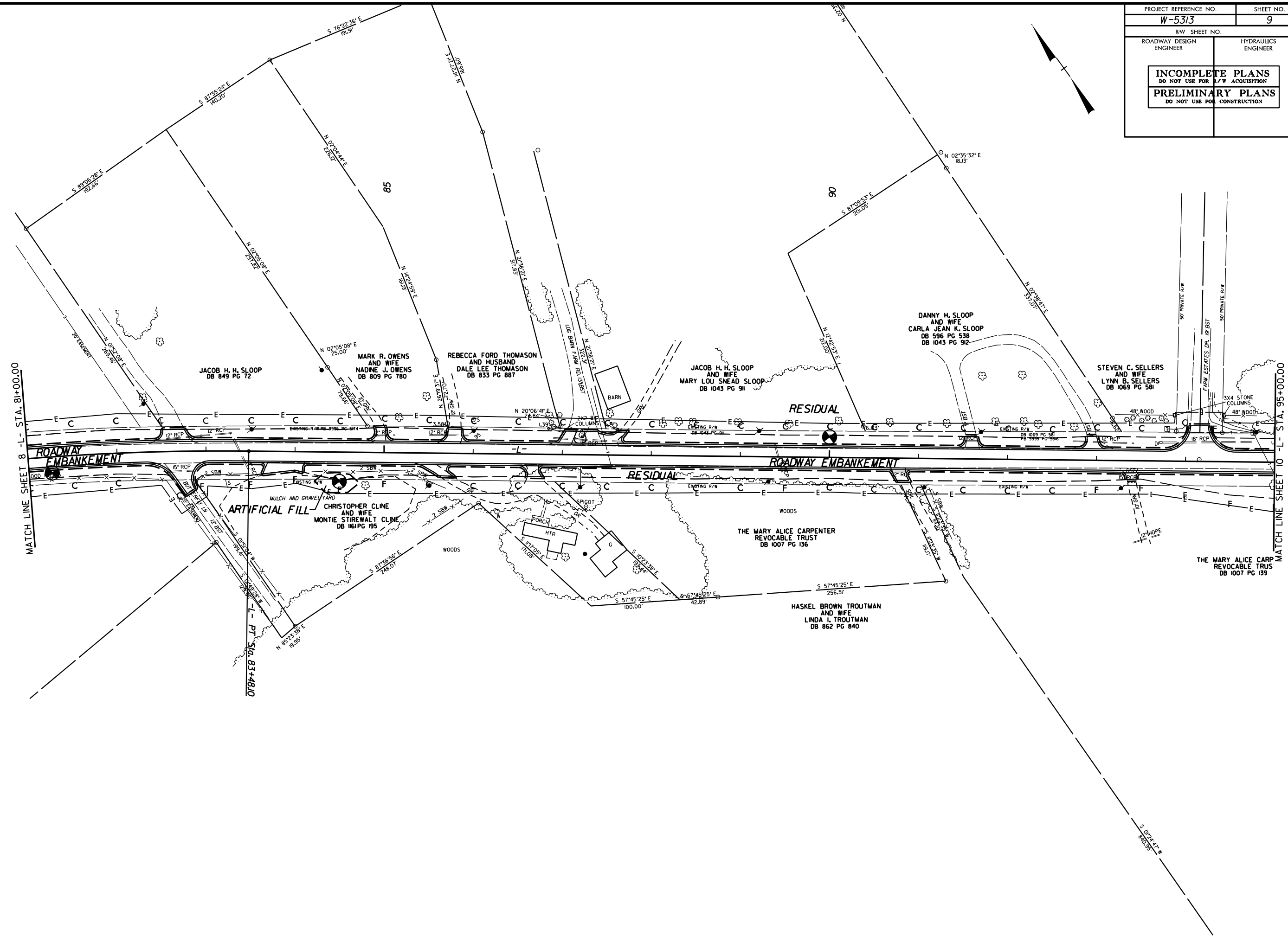
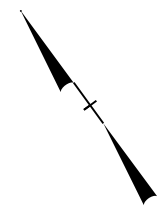
MATCH LINE SHEET 9

-L- PC Sta. 78+15.27

N 88°18'25" E  
636.02'

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
<b>W-5313</b>	<b>9</b>
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR ACQUISITION	
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	



REVISIONS

MATCH LINE SHEET 8 - L - STA. 81+00.00

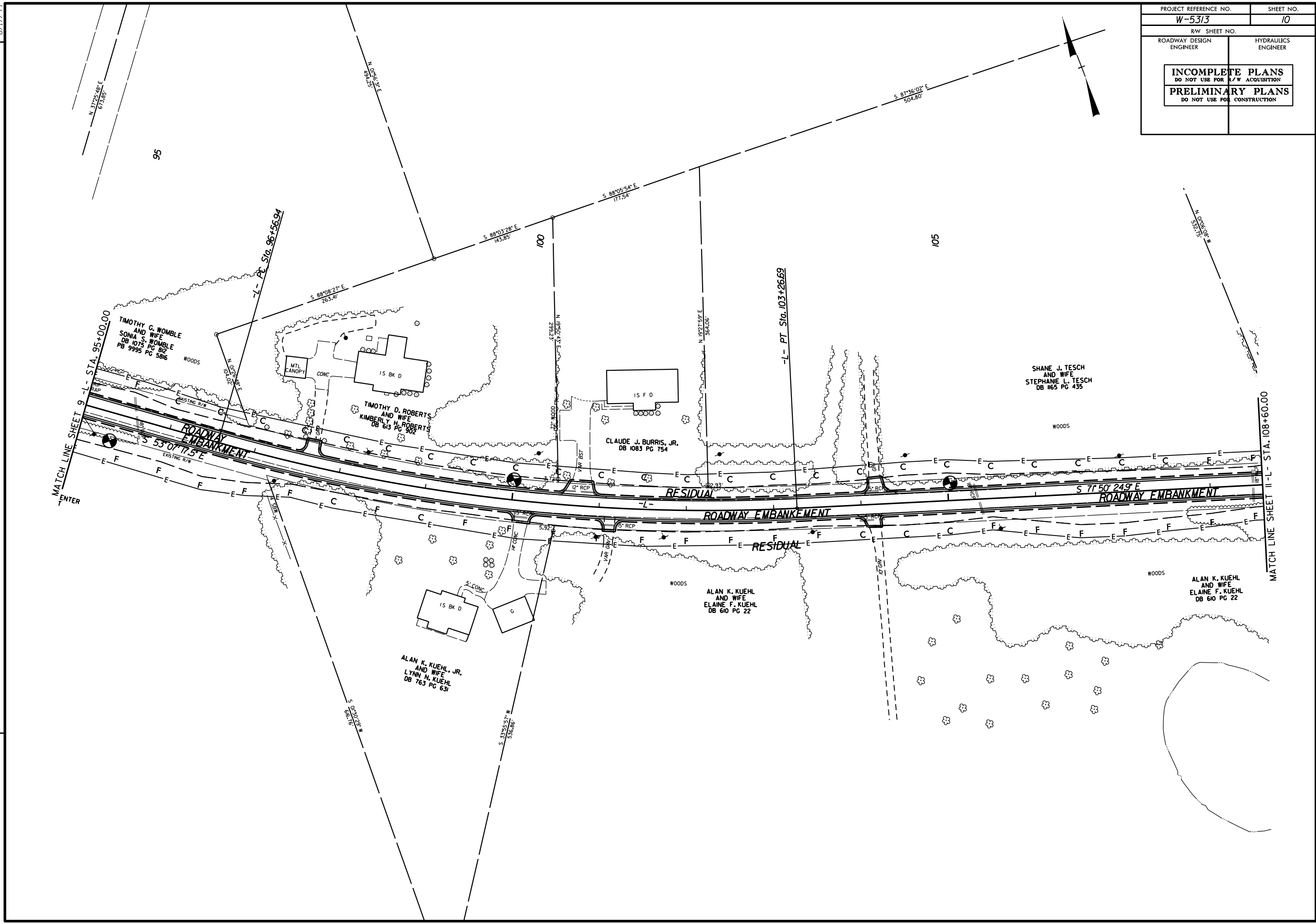
MATCH LINE SHEET 10 - L - STA. 95+00.00

- L - PT STA. 83+48.10

8/17/99

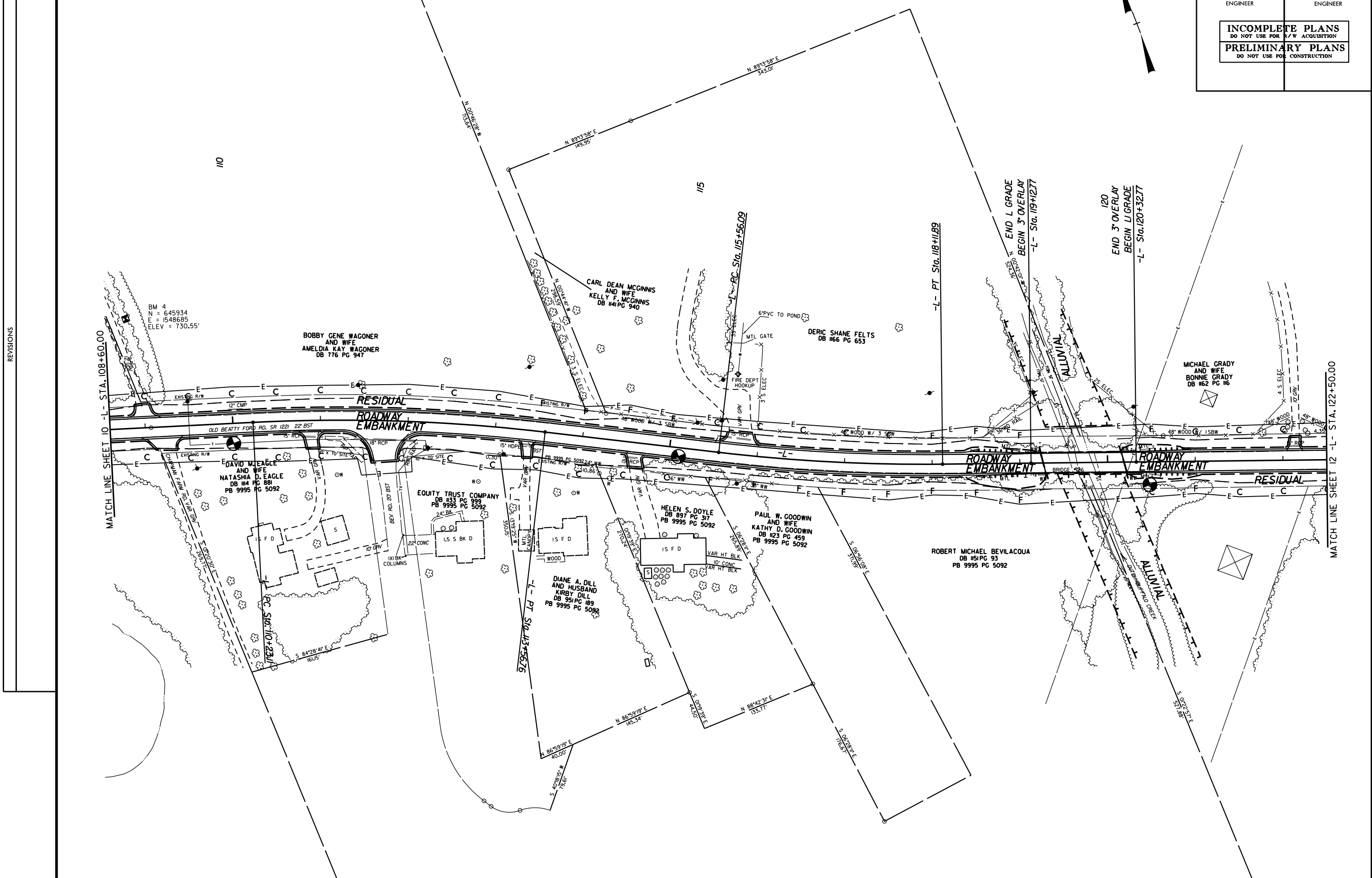
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RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR A/W ACQUISITION <b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	

REVISIONS



8/17/99

PROJECT REFERENCE NO.		SHEET NO.	
W-5313		11	
RW SHEET NO.		HYDRAULICS ENGINEER	
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			



MATCH LINE SHEET 10 - L - STA. 108+60.00

MATCH LINE SHEET 12 - L - STA. 122+50.00

REVISIONS

BM 4  
 N = 645934  
 E = 1548685  
 ELEV = 730.55'

BOBBY GENE WAGONER  
 AND WIFE  
 AMELDIA KAY WAGONER  
 DB 776 PG 947

CARL DEAN MCGINNIS  
 AND WIFE  
 KELLY F. MCGINNIS  
 DB 141 PG 940

DERIC SHANE FELTS  
 DB #66 PG 653

MICHAEL GRADY  
 AND WIFE  
 BONNIE GRADY  
 DB #62 PG #6

DAVID M. EAGLE  
 AND WIFE  
 NATASHA D. EAGLE  
 DB #14 PG 881  
 PB 9995 PG 5092

EQUITY TRUST COMPANY  
 DB #33 PG 999  
 PB 9995 PG 5092

HELEN S. DOYLE  
 DB 897 PG 317  
 PB 9995 PG 5092

PAUL W. GOODWIN  
 AND WIFE  
 KATHY D. GOODWIN  
 DB #23 PG 459  
 PB 9995 PG 5092

ROBERT MICHAEL BEVILACQUA  
 DB #51 PG 93  
 PB 9995 PG 5092

DIANE A. DILL  
 AND HUSBAND  
 KIRBY DILL  
 DB 951 PG 189  
 PB 9995 PG 5082

110

115

120

PC Sta. 110+23.11

PT Sta. 113+56.75

PC Sta. 115+56.09

PT Sta. 118+11.89

END L GRADE  
BEGIN 3' OVERLAY  
-L- Sta. 119+12.77

END 3' OVERLAY  
BEGIN LI GRADE  
-L- Sta. 120+32.77

OLD BEATTY FORD RD. SR 1221 22' BST

12' CMP

15' RCP

15' HDPE

10' SITE

15' HDPE

15' HDPE

15' HDPE

15' HDPE

15' HDPE

15' HDPE

15' HDPE

15' HDPE

15' HDPE

15' HDPE

15' HDPE

15' HDPE

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15' HDPE

15' HDPE

15' HDPE

15' HDPE

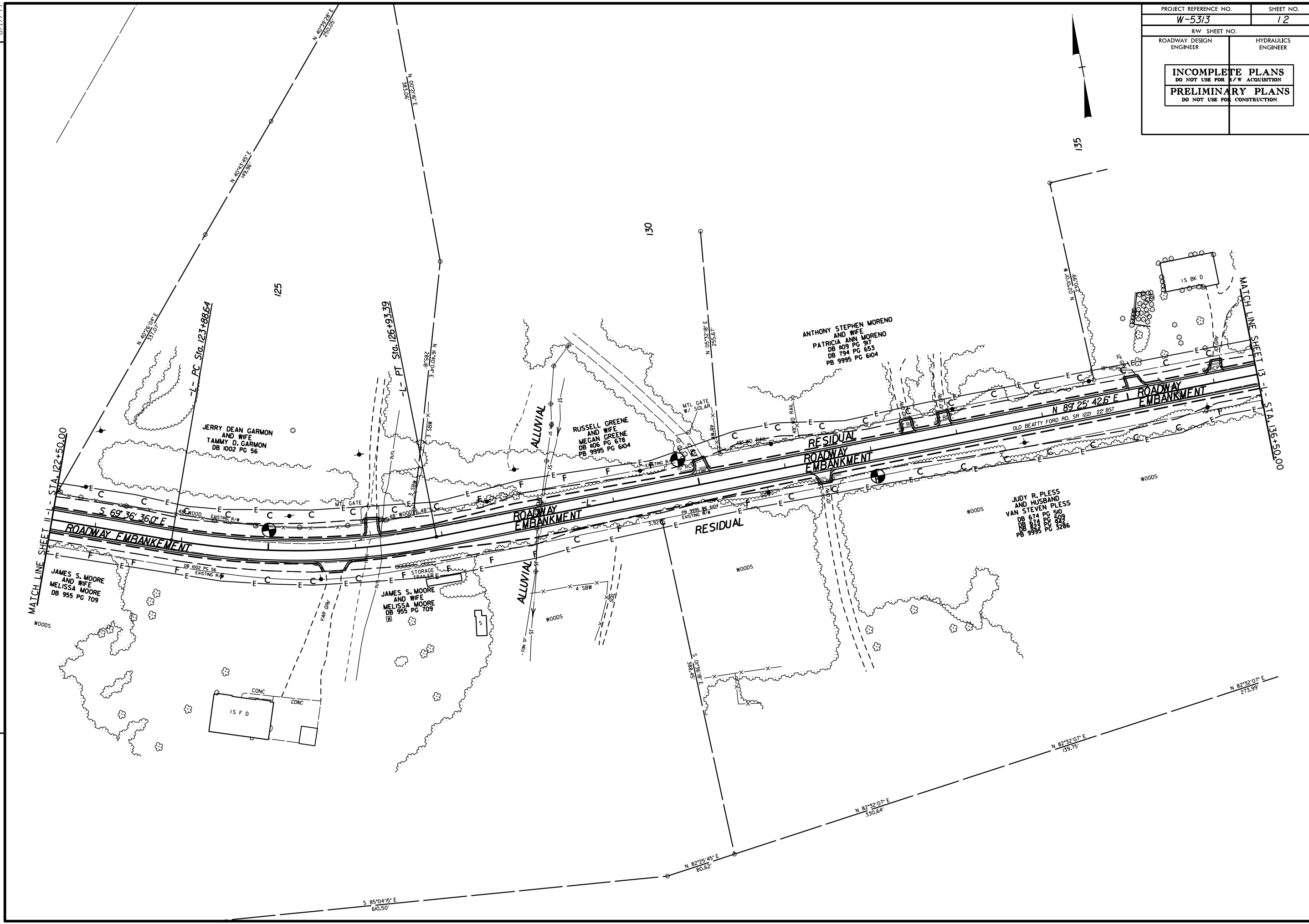
15' HDPE

8/17/99

PROJECT REFERENCE NO. <b>W-5313</b>	SHEET NO. <b>12</b>
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	



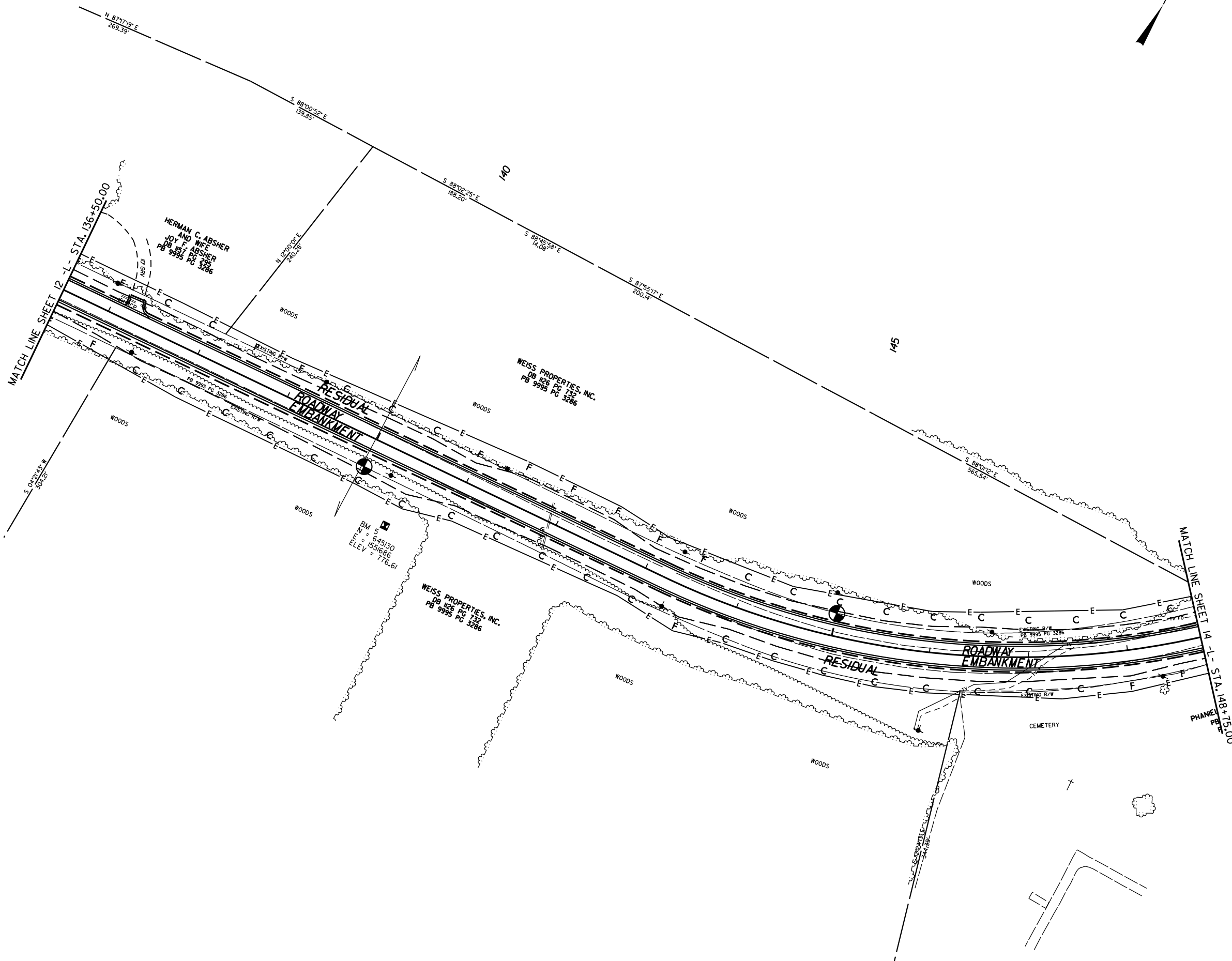
REVISIONS



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REVISIONS

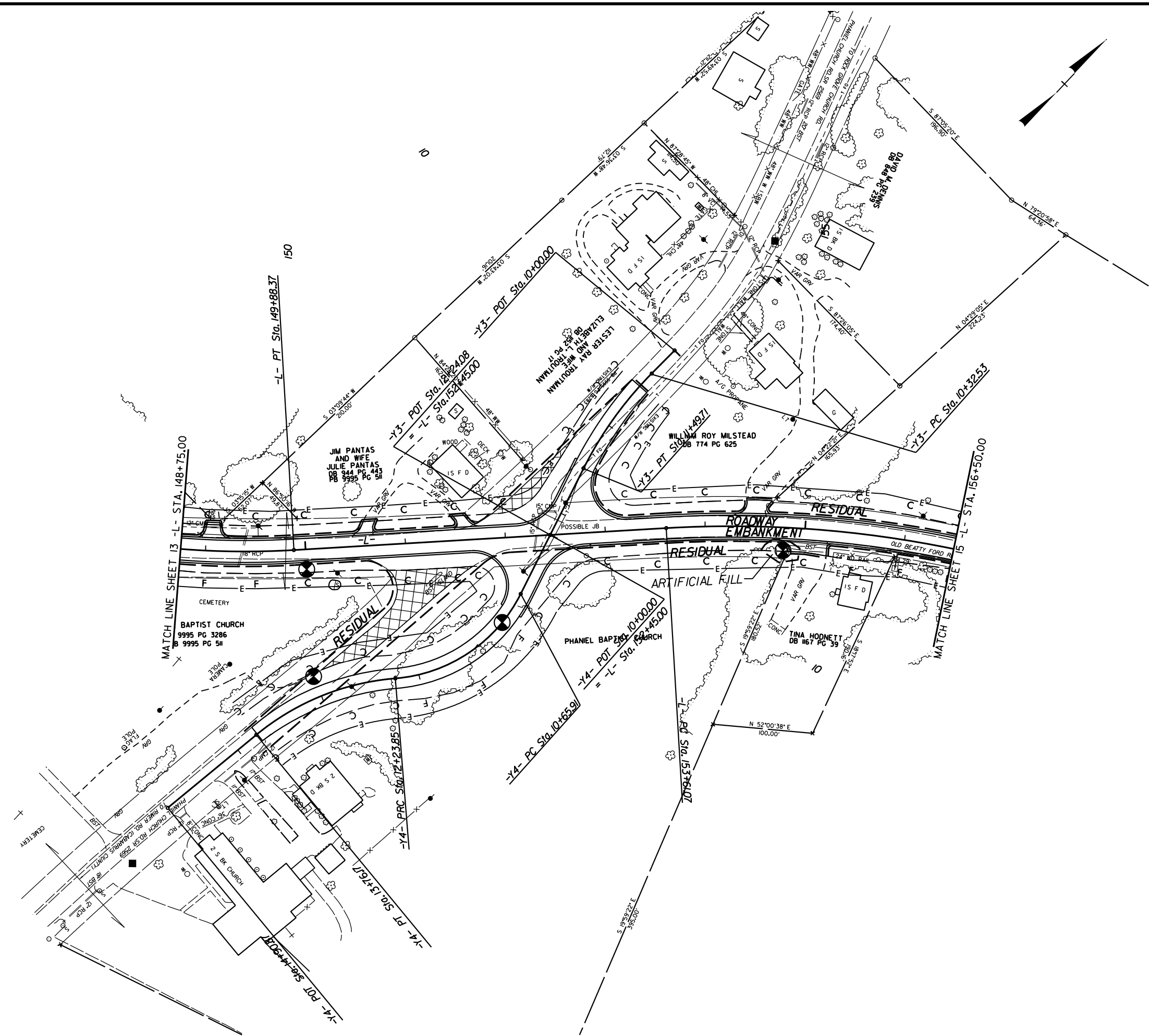
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RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR ACQUISITION <b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	





5/14/99

PROJECT REFERENCE NO.	SHEET NO.
W-5313	14
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	

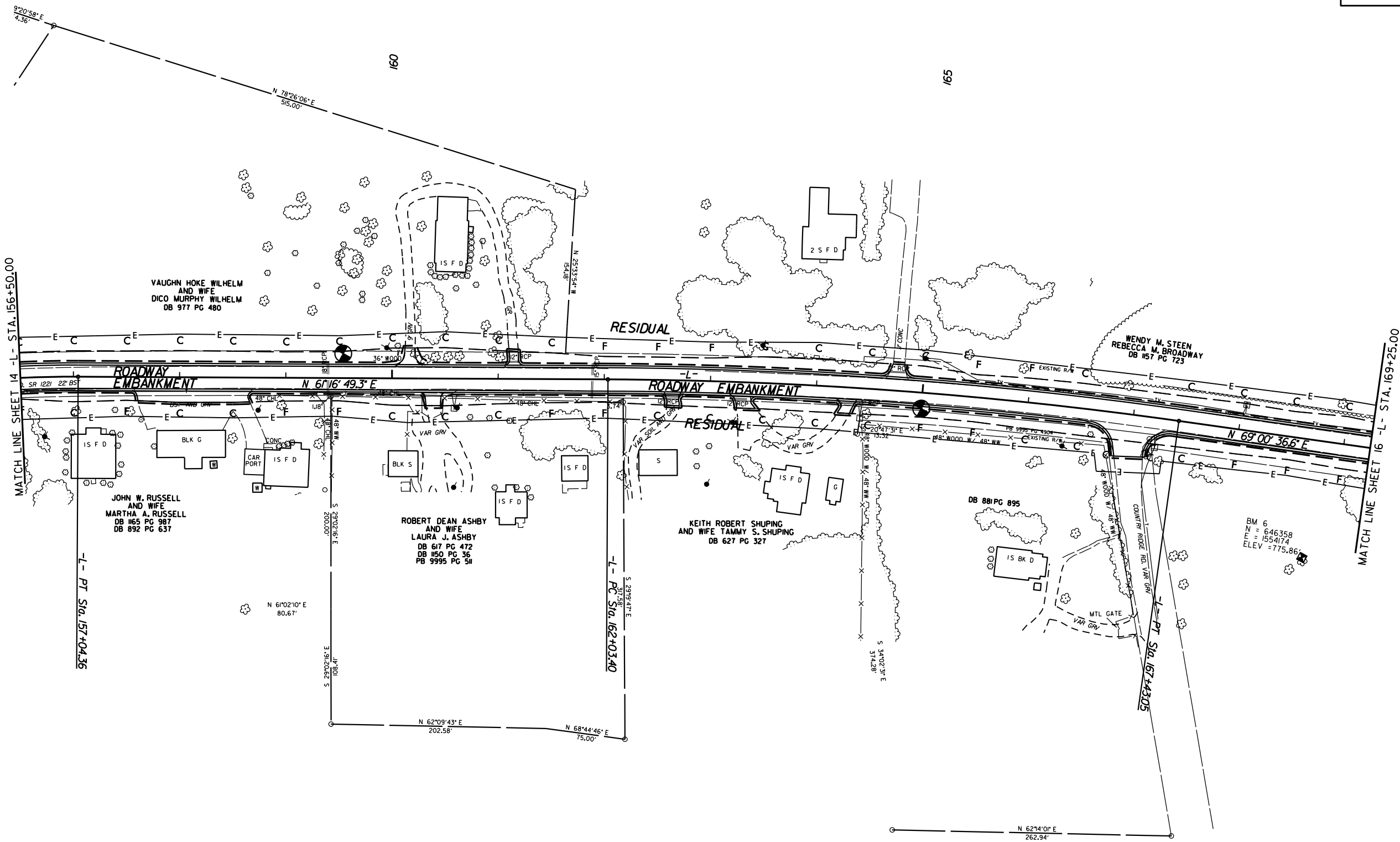


8/17/99

PROJECT REFERENCE NO. <b>W-5313</b>	SHEET NO. <b>15</b>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR ACQUISITION <b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	



REVISIONS



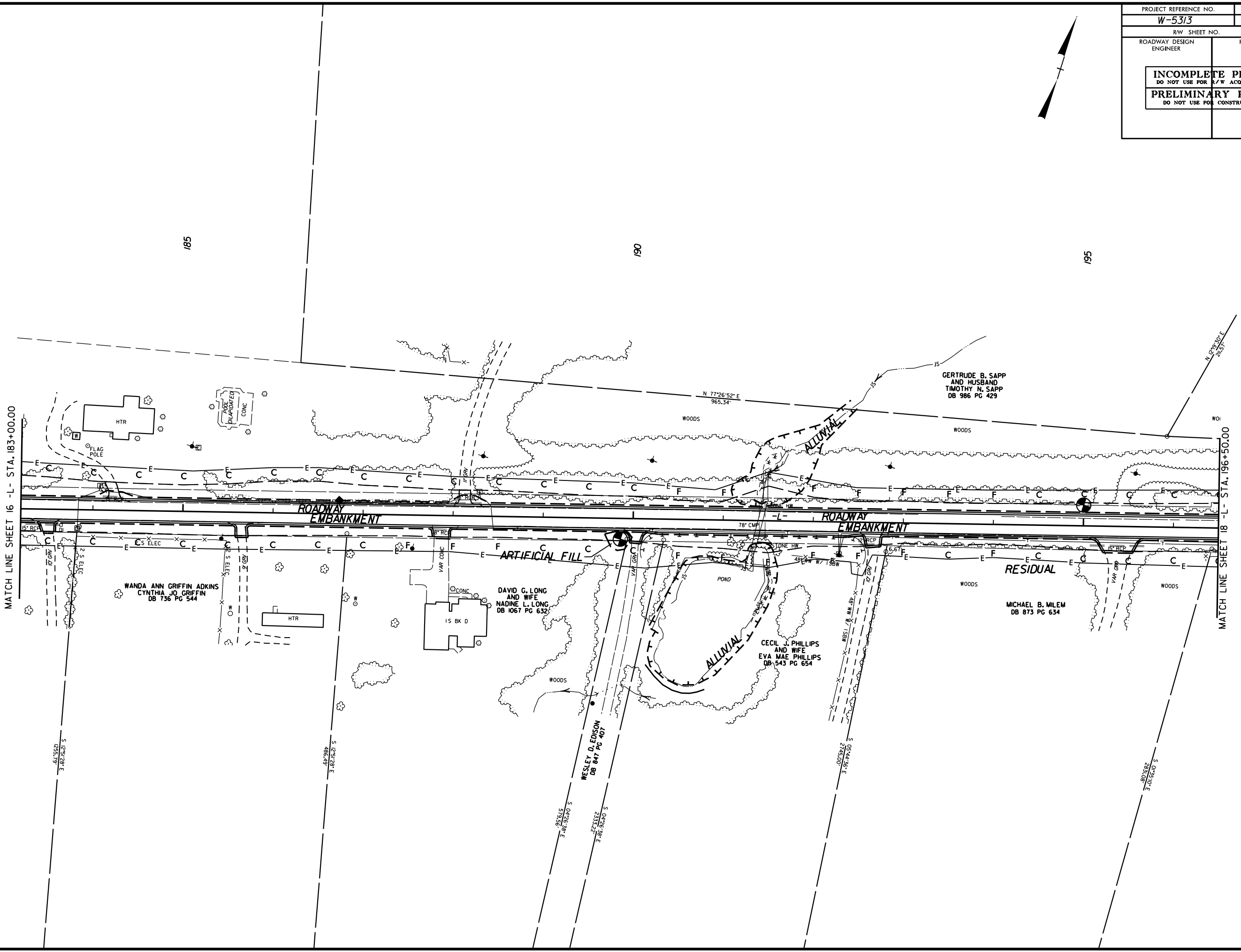
262.94'



8/17/99

REVISIONS

PROJECT REFERENCE NO. <b>W-5313</b>	SHEET NO. <b>17</b>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR ACQUISITION <b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	

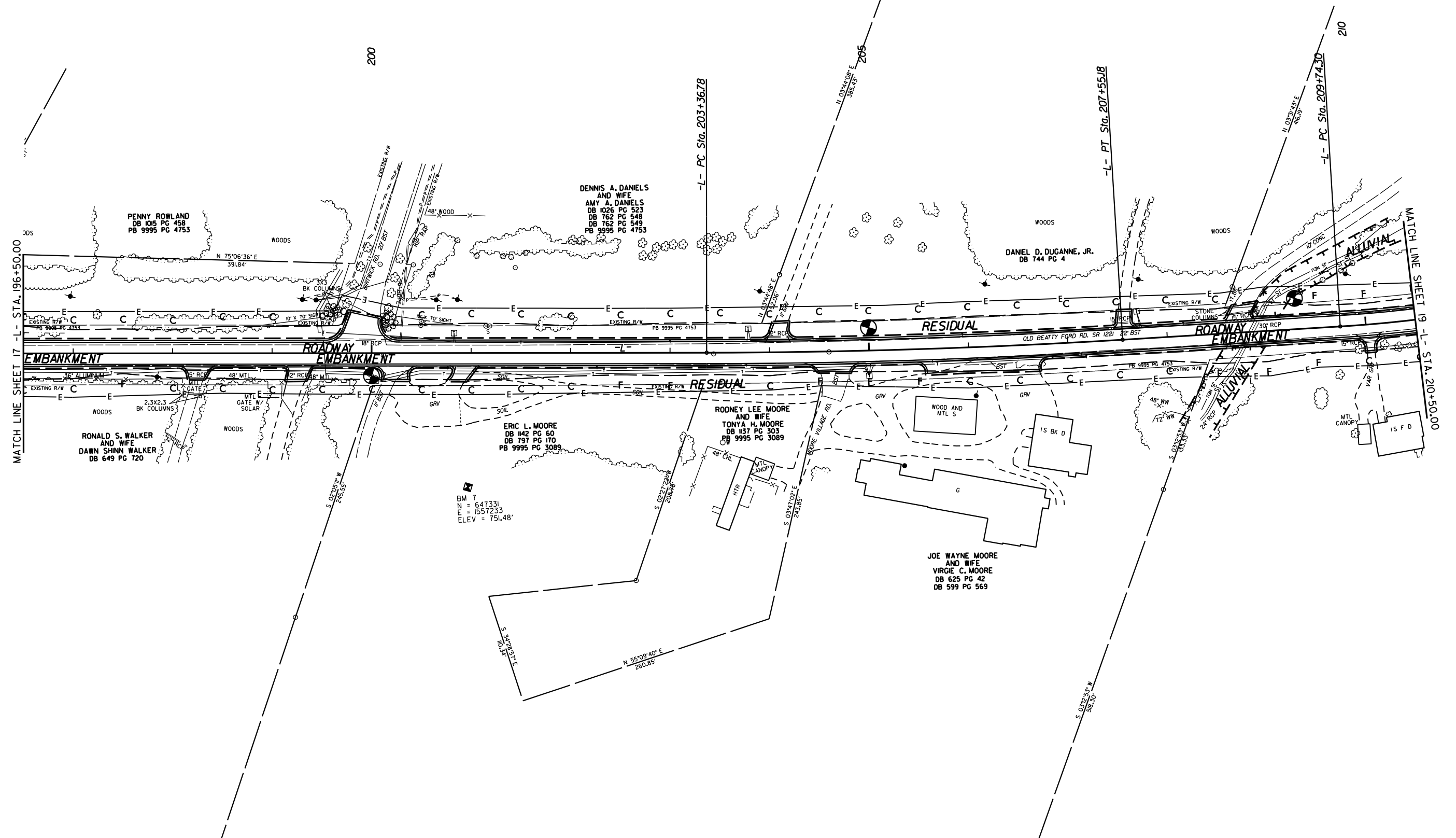


8/17/99

PROJECT REFERENCE NO. <b>W-5313</b>	SHEET NO. <b>18</b>
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	



REVISIONS



MATCH LINE SHEET 17 - L - STA. 196+50.00

MATCH LINE SHEET 19 - L - STA. 210+50.00

200

205

210

PENNY ROWLAND  
DB 1005 PG 458  
PB 9995 PG 4753

DENNIS A. DANIELS  
AND WIFE  
AMY A. DANIELS  
DB 1026 PG 523  
DB 762 PG 548  
DB 762 PG 549  
PB 9995 PG 4753

DANIEL D. DUGANNE, JR.  
DB 744 PG 4

RONALD S. WALKER  
AND WIFE  
DAWN SHINN WALKER  
DB 649 PG 720

ERIC L. MOORE  
DB 142 PG 60  
DB 797 PG 170  
PB 9995 PG 3089

RODNEY LEE MOORE  
AND WIFE  
TONYA H. MOORE  
DB 137 PG 303  
PB 9995 PG 3089

JOE WAYNE MOORE  
AND WIFE  
VIRGIE C. MOORE  
DB 625 PG 42  
DB 599 PG 569

BM 7  
N = 647331  
E = 1557233  
ELEV = 751.48'

MATCH LINE SHEET 17 - L - STA. 196+50.00

MATCH LINE SHEET 19 - L - STA. 210+50.00

200

205

210

PENNY ROWLAND  
DB 1005 PG 458  
PB 9995 PG 4753

DENNIS A. DANIELS  
AND WIFE  
AMY A. DANIELS  
DB 1026 PG 523  
DB 762 PG 548  
DB 762 PG 549  
PB 9995 PG 4753

DANIEL D. DUGANNE, JR.  
DB 744 PG 4

RONALD S. WALKER  
AND WIFE  
DAWN SHINN WALKER  
DB 649 PG 720

ERIC L. MOORE  
DB 142 PG 60  
DB 797 PG 170  
PB 9995 PG 3089

RODNEY LEE MOORE  
AND WIFE  
TONYA H. MOORE  
DB 137 PG 303  
PB 9995 PG 3089

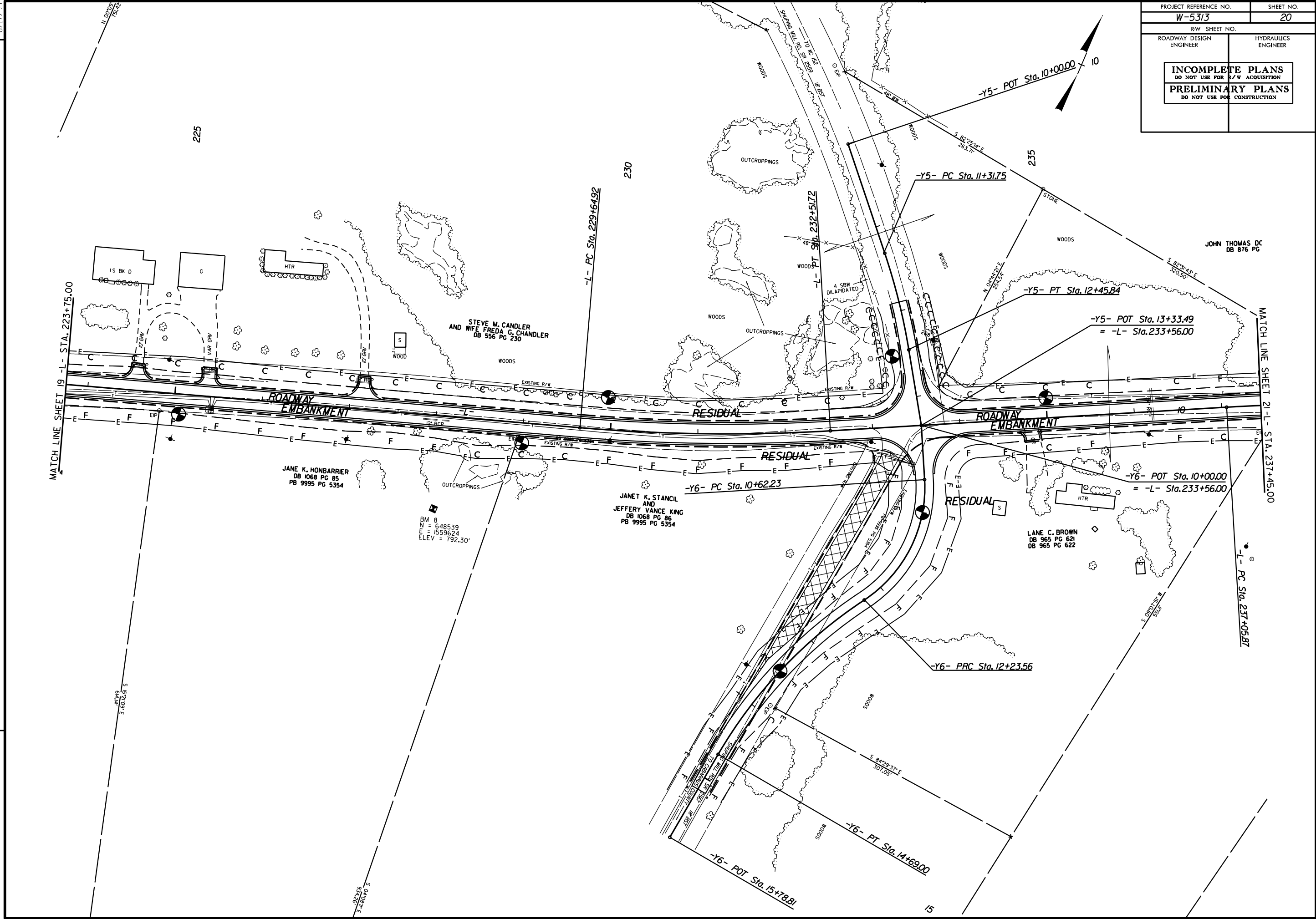
JOE WAYNE MOORE  
AND WIFE  
VIRGIE C. MOORE  
DB 625 PG 42  
DB 599 PG 569

BM 7  
N = 647331  
E = 1557233  
ELEV = 751.48'



PROJECT REFERENCE NO. <b>W-5313</b>	SHEET NO. <b>20</b>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR ACQUISITION <b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	

8/17/99

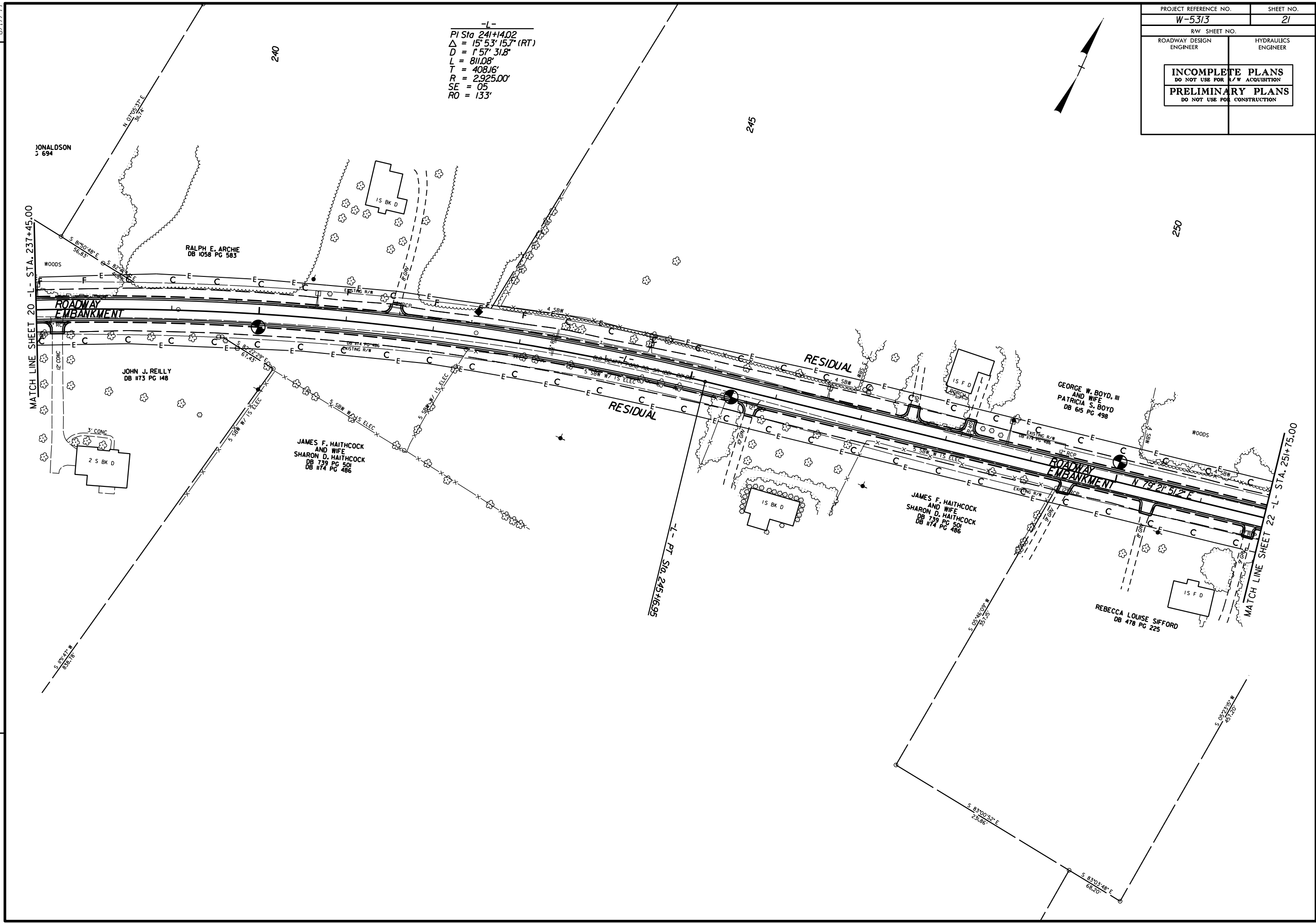


REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
W-5313	21
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 241+4.02  
 $\Delta = 15^{\circ} 53' 15.7" (RT)$   
 $D = 1^{\circ} 57' 31.8"$   
 $L = 811.08'$   
 $T = 408.16'$   
 $R = 2925.00'$   
 $SE = 05$   
 $RO = 133'$



MATCH LINE SHEET 20 -L- STA. 237+45.00

MATCH LINE SHEET 22 -L- STA. 251+75.00

REVISIONS

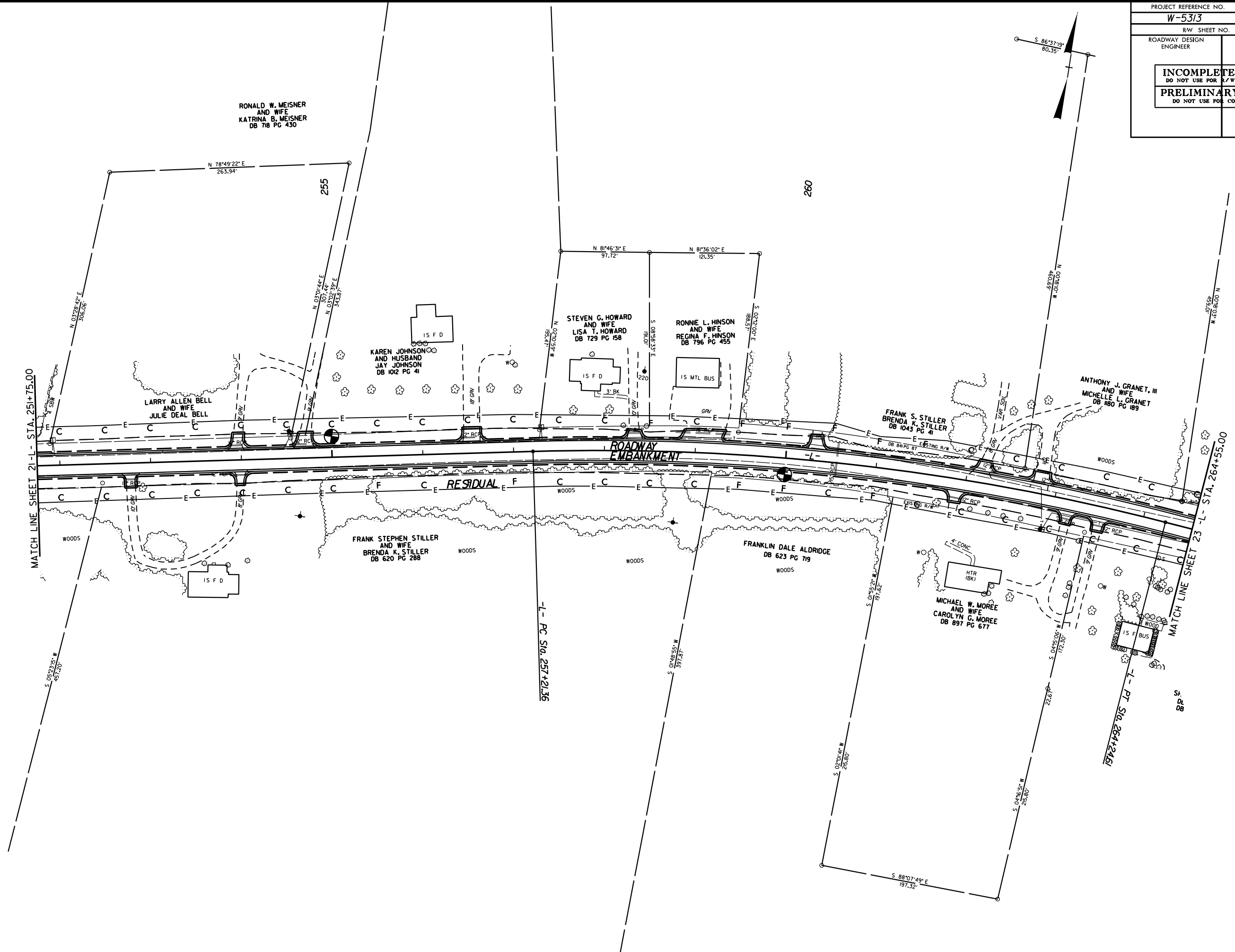
8/17/99



8/17/99

REVISIONS

PROJECT REFERENCE NO.		SHEET NO.	
W-5313		22	
RW SHEET NO.		HYDRAULICS	
ROADWAY DESIGN ENGINEER		ENGINEER	
<b>INCOMPLETE PLANS</b> DO NOT USE FOR ACQUISITION <b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION			



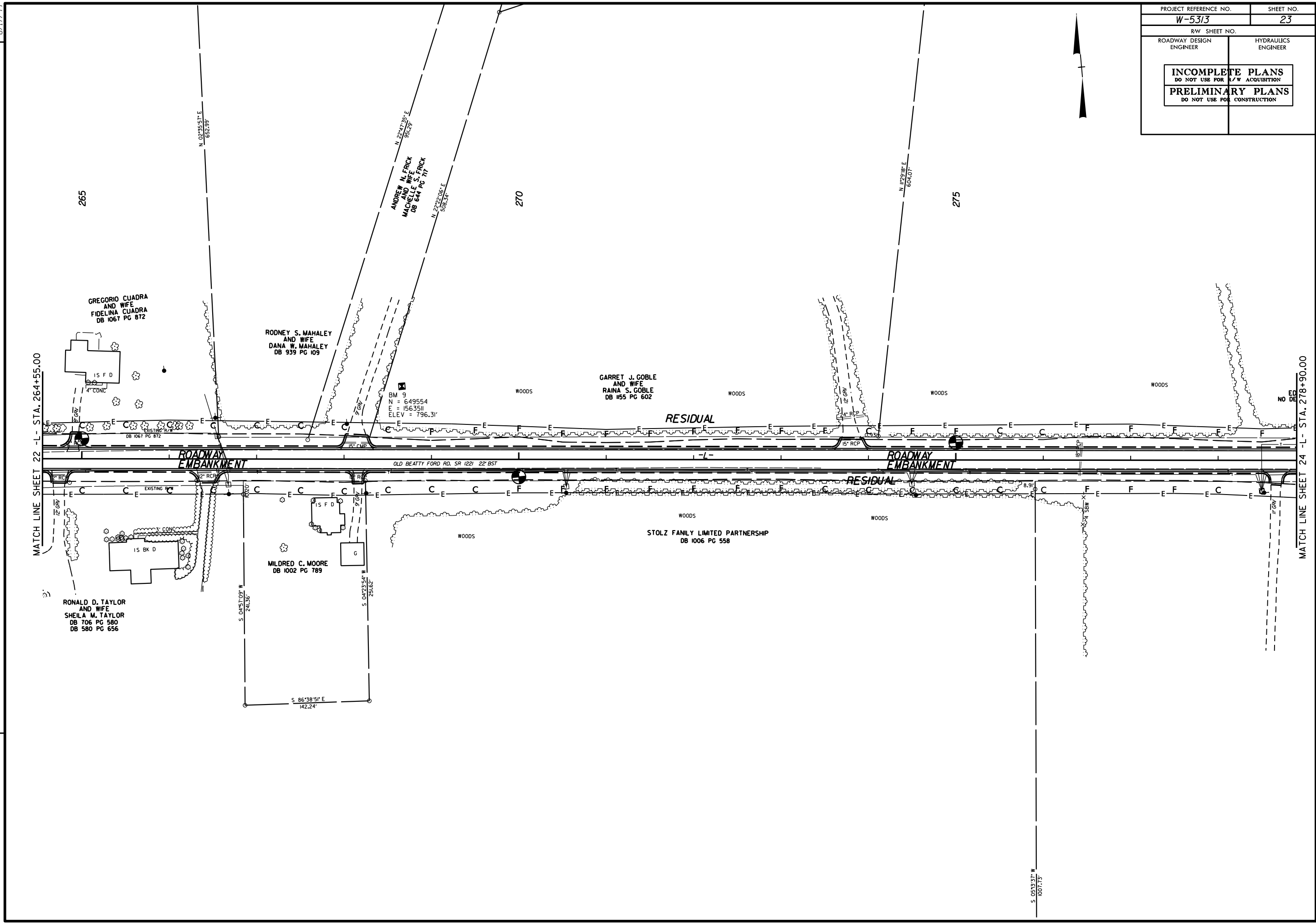
PROJECT REFERENCE NO. <b>W-5313</b>	SHEET NO. <b>23</b>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR ACQUISITION <b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	



REVISIONS

MATCH LINE SHEET 22 -L- STA. 264+55.00

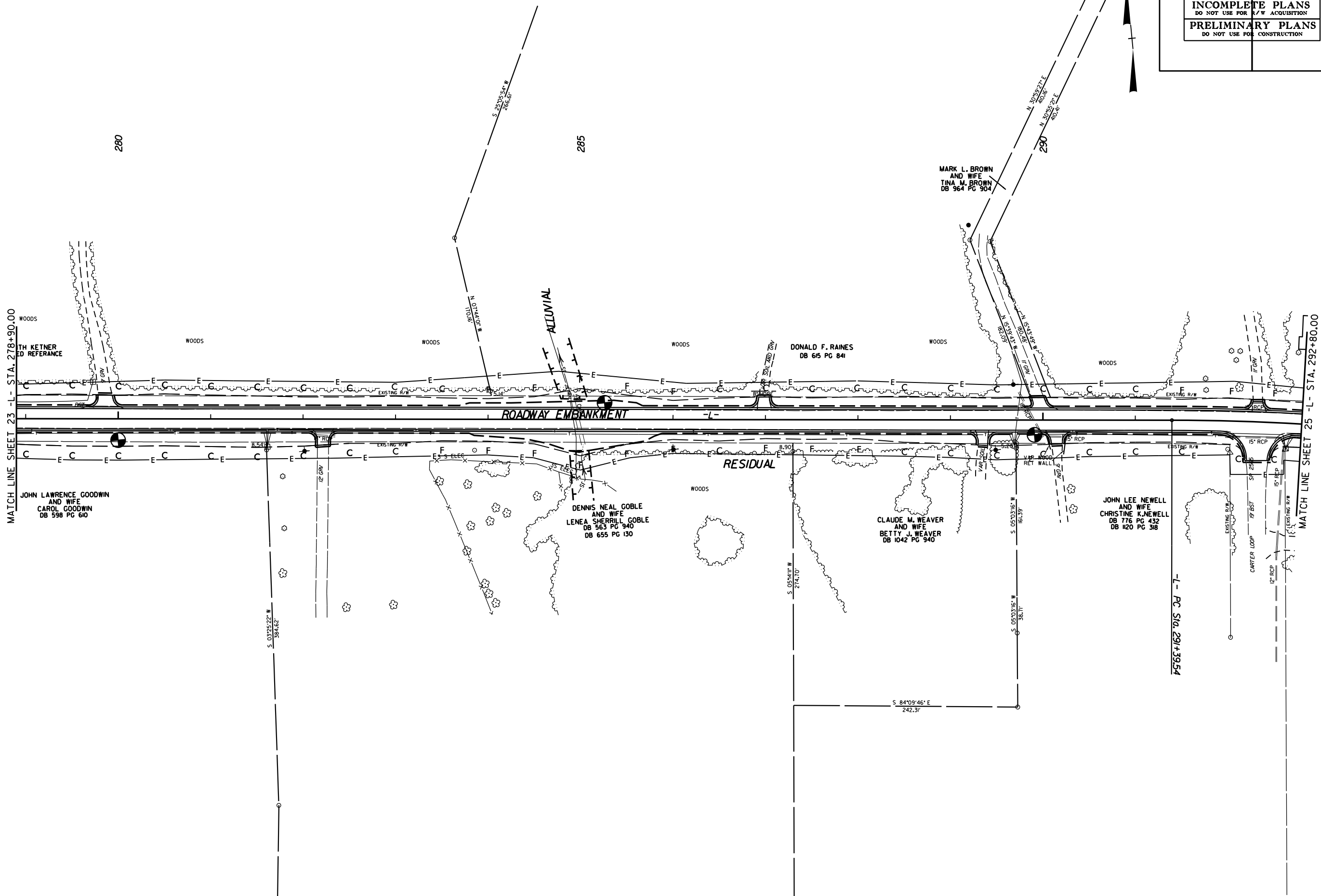
MATCH LINE SHEET 24 -L- STA. 278+90.00



S 05°53'37" W 1007.73'

8/17/99

PROJECT REFERENCE NO. <b>W-5313</b>	SHEET NO. <b>24</b>
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	



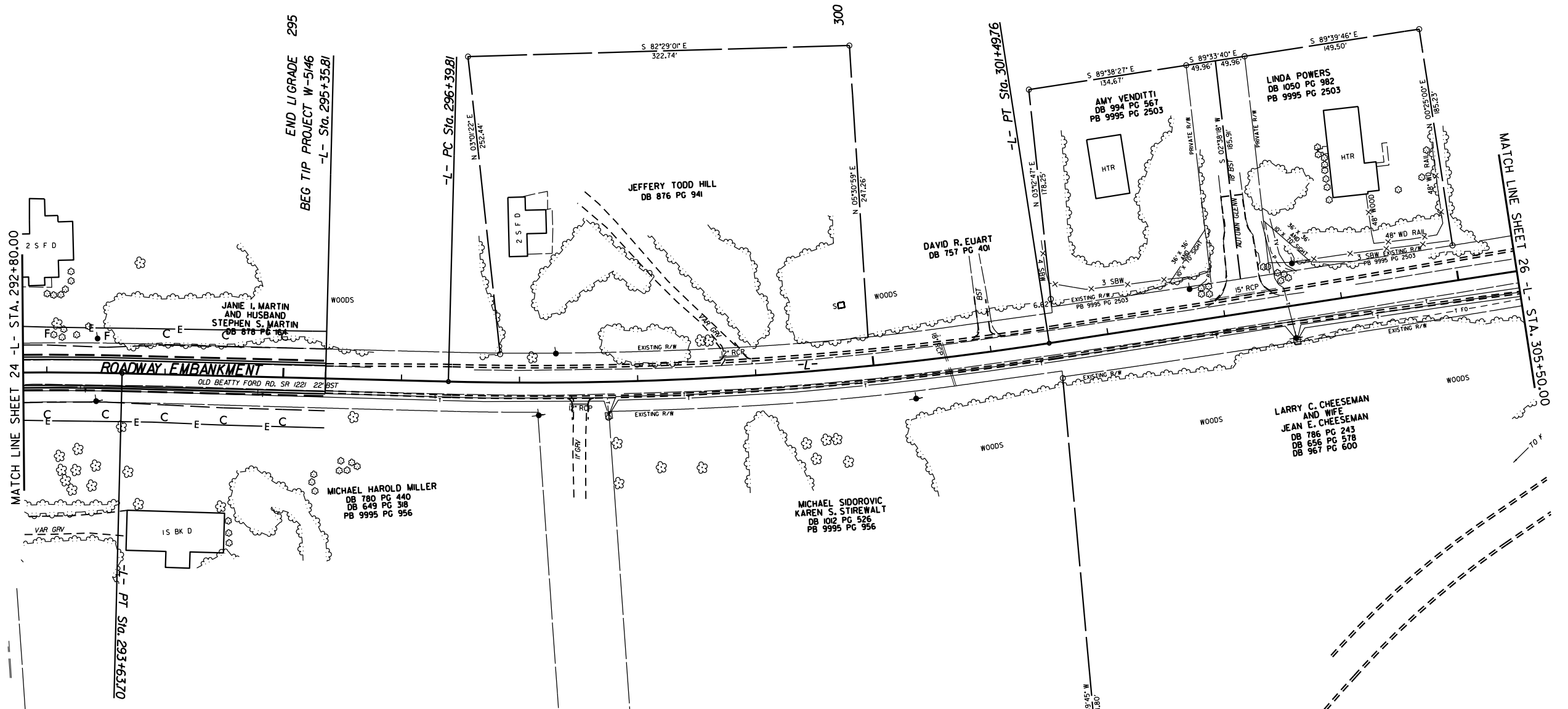
REVISIONS

-L- PC Sta. 291+39.54

8/17/99

REVISIONS

PROJECT REFERENCE NO. <b>W-5313</b>	SHEET NO. <b>25</b>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR ACQUISITION	
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	



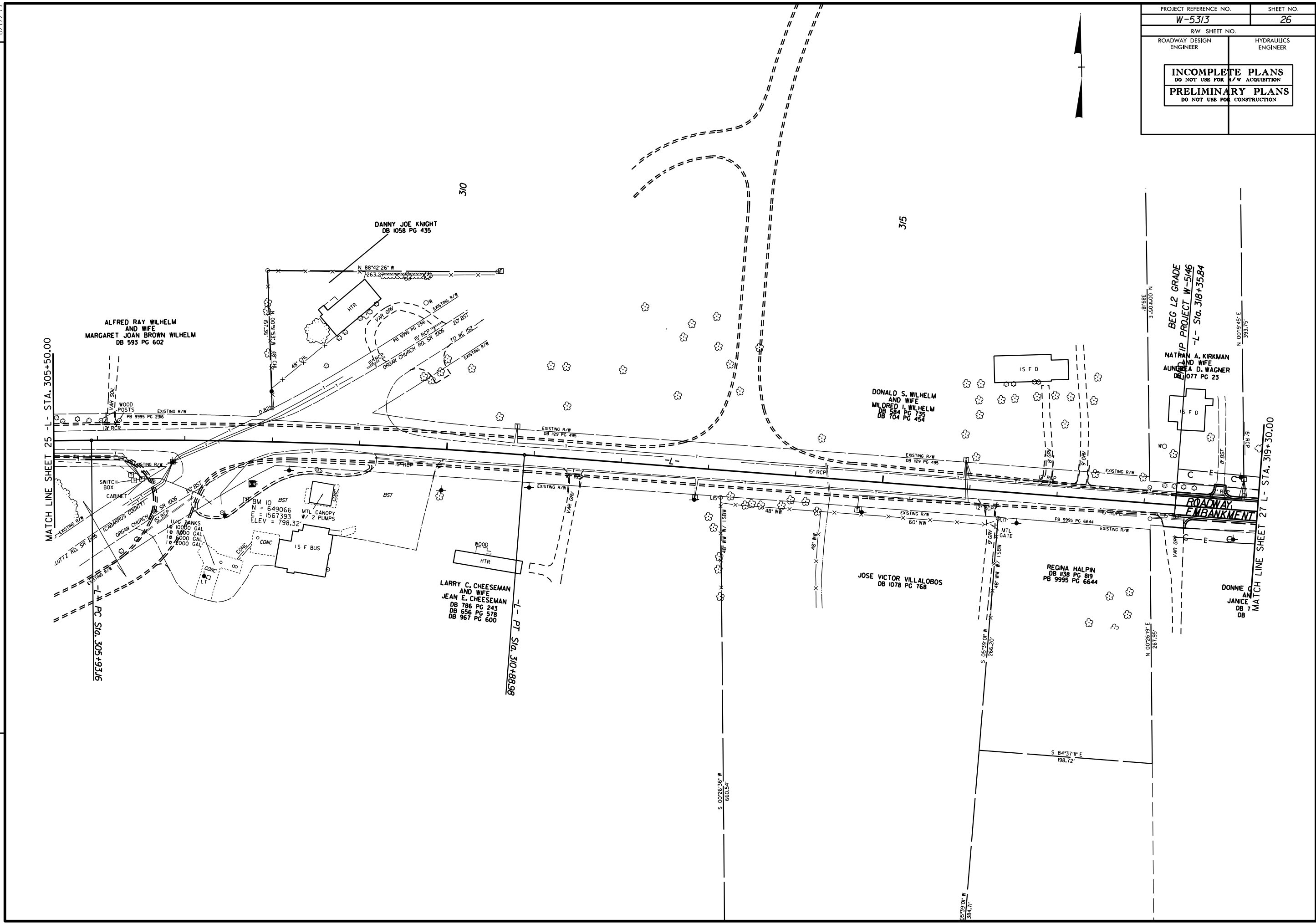
8/17/99

8/17/99

PROJECT REFERENCE NO. <b>W-5313</b>		SHEET NO. <b>26</b>	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
<b>INCOMPLETE PLANS</b> DO NOT USE FOR ACQUISITION <b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION			



REVISIONS



MATCH LINE SHEET 25 -L- STA. 305+50.00

ALFRED RAY WILHELM  
AND WIFE  
MARGARET JOAN BROWN WILHELM  
DB 593 PG 602

DANNY JOE KNIGHT  
DB 1058 PG 435

DONALD S. WILHELM  
AND WIFE  
MILDRED I. WILHELM  
DB 584 PG 735  
DB 704 PG 454

LARRY C. CHEESEMAN  
AND WIFE  
JEAN E. CHEESEMAN  
DB 786 PG 243  
DB 656 PG 378  
DB 967 PG 600

JOSE VICTOR VILLALOBOS  
DB 1078 PG 768

REGINA HALPIN  
DB 1138 PG 819  
PB 9995 PG 6644

DONNIE C.  
AN  
JANICE  
DB 7  
DB

NATHAN A. KIRKMAN  
AND WIFE  
ALUNDA D. WAGNER  
DB 1077 PG 23

MATCH LINE SHEET 26 -L- STA. 305+93.16

MATCH LINE SHEET 27 -L- STA. 319+30.00

BEG L2 GRADE  
PROJECT W-5146  
-L- Sta. 318+35.84

ROADWAY  
EMBANKMENT

WUTZ RD. SR 236

ORGAN CHURCH RD. SR 1006

U/G TANKS  
10000 GAL  
8000 GAL  
2000 GAL

IS F BUS

WOOD  
HTR

WOOD  
HTR

IS F D

IS F D

IS F D

IS F D

IS F D

IS F D

IS F D

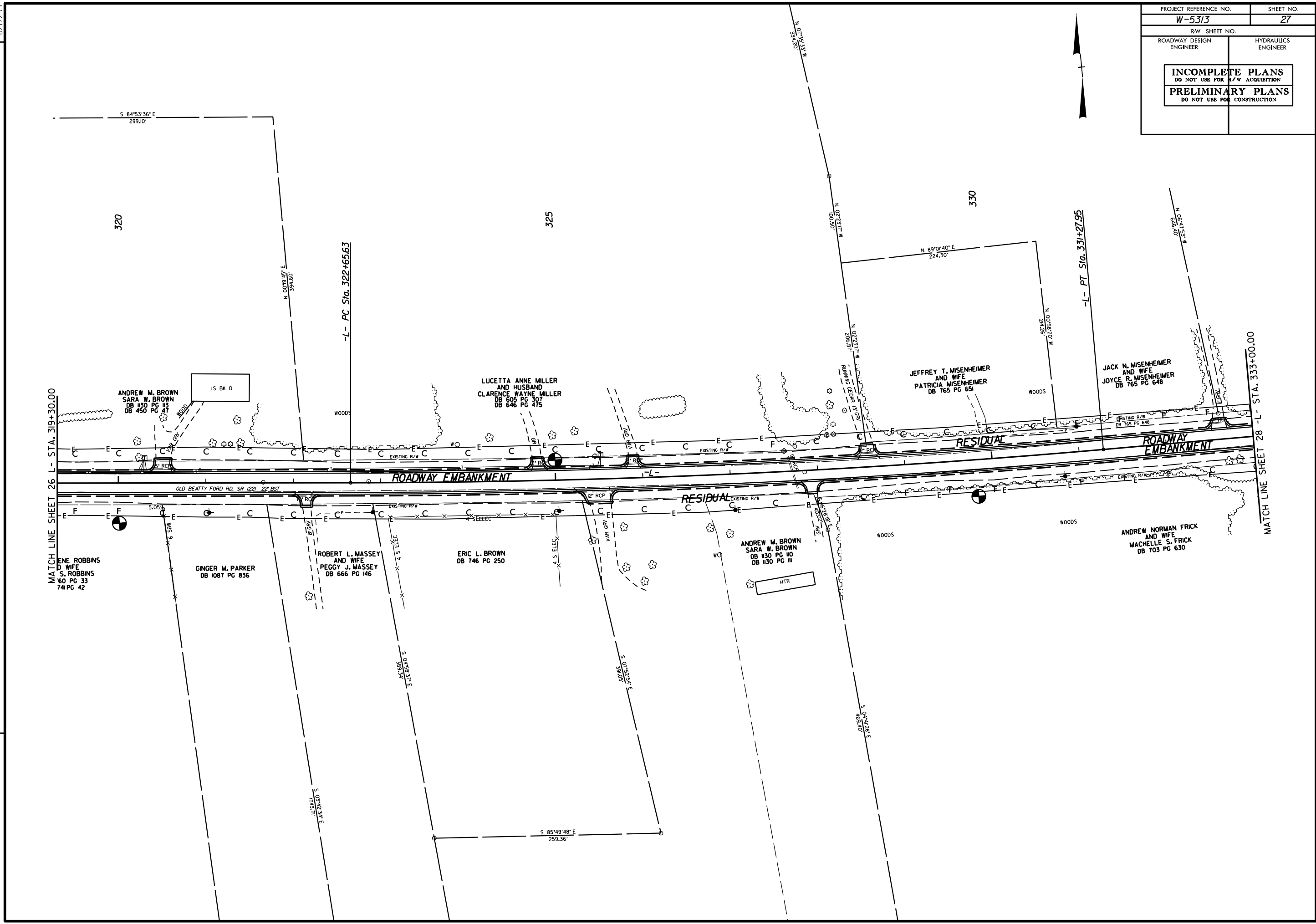
IS F D

IS F D

8/17/99

REVISIONS

PROJECT REFERENCE NO. <b>W-5313</b>	SHEET NO. <b>27</b>
RW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	
<b>INCOMPLETE PLANS</b> DO NOT USE FOR ACQUISITION	
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	



MATCH LINE SHEET 26 -L- STA. 319+30.00

MATCH LINE SHEET 28 -L- STA. 333+00.00

ANDREW M. BROWN  
SARA W. BROWN  
DB 130 PG 13  
DB 450 PG 47

LUCETTA ANNE MILLER  
AND HUSBAND  
CLARENCE WAYNE MILLER  
DB 605 PG 307  
DB 646 PG 475

JEFFREY T. MISENHEIMER  
AND WIFE  
PATRICIA MISENHEIMER  
DB 765 PG 651

JACK N. MISENHEIMER  
AND WIFE  
JOYCE R. MISENHEIMER  
DB 765 PG 648

ENE ROBBINS  
D WIFE  
S. ROBBINS  
60 PG 33  
741 PG 42

GINGER M. PARKER  
DB 1087 PG 836

ROBERT L. MASSEY  
AND WIFE  
PEGGY J. MASSEY  
DB 666 PG 146

ERIC L. BROWN  
DB 746 PG 250

ANDREW M. BROWN  
SARA W. BROWN  
DB 130 PG 13  
DB 130 PG 13

ANDREW NORMAN FRICK  
AND WIFE  
MACHELLE S. FRICK  
DB 703 PG 630

S 84°53'36" E  
299.10'

N 00°19'45" E  
394.60'

-L- PC Sta. 322+65.63

325

330

-L- PT Sta. 331+27.95

N 89°01'40" E  
224.30'

N 00°19'45" E  
394.60'

S 85°49'48" E  
259.36'

S 04°42'28" E  
1465.40'

S 03°42'34" E  
1135.11'

S 11°28'50" S  
311.85'

S 01°52'54" E  
312.85'

S 4°5' ELEC.

A.S. ELEC.

HTR

1S BK D

OLD BEAUTY FORD RD. SR 1221 22' BST

ROADWAY EMBANKMENT

RESIDUAL

RESIDUAL

ROADWAY EMBANKMENT

WOODS

WOODS

WOODS

WOODS

E C

E C

E C

E C

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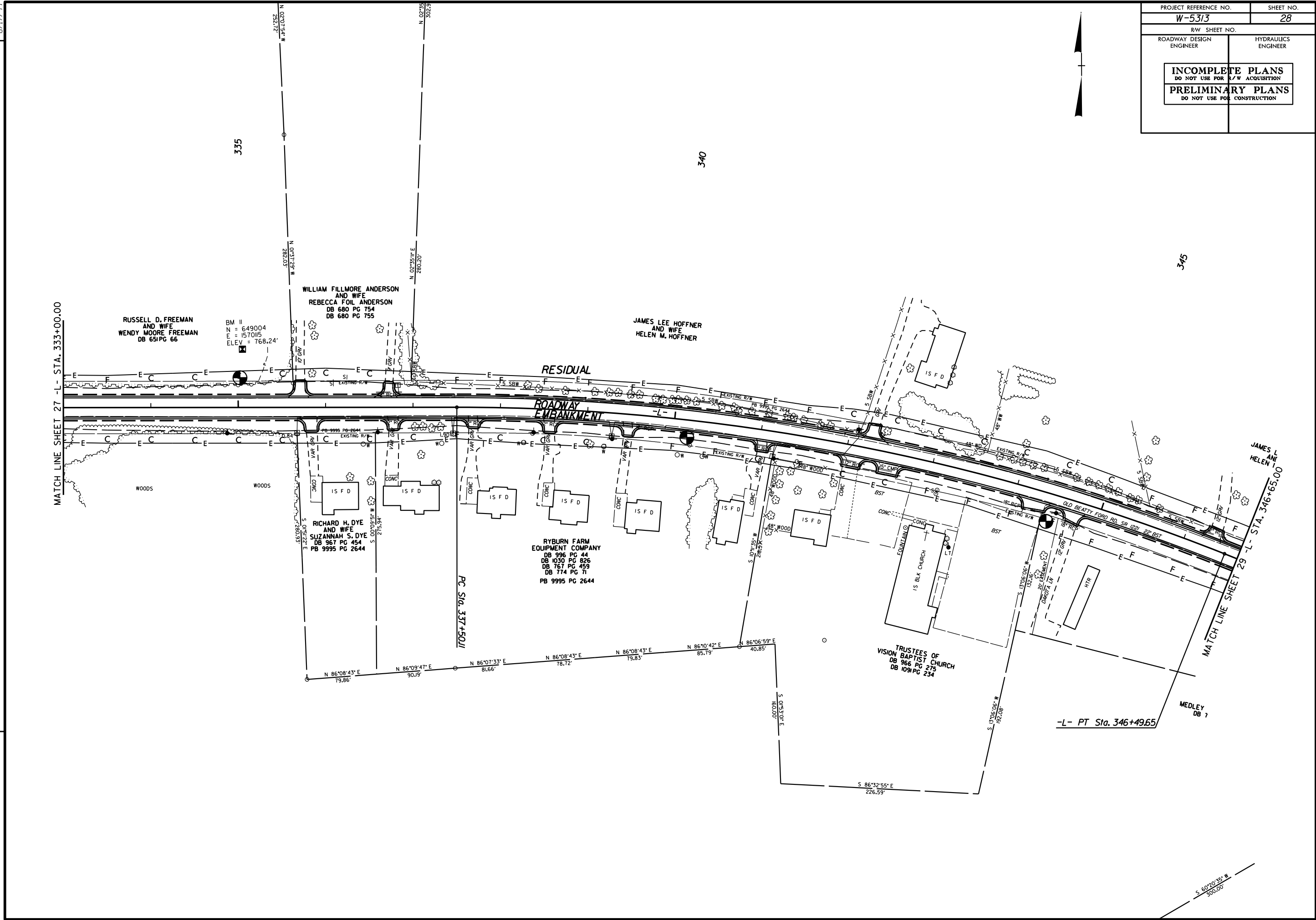
E C

PROJECT REFERENCE NO. <b>W-5313</b>	SHEET NO. <b>28</b>
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

REVISIONS



345

MATCH LINE SHEET 29 - L- STA. 346+65.00

-L- PT Sta. 346+49.65

MEDLEY DB 7

S 60°20'35" W  
300.00

8/17/99

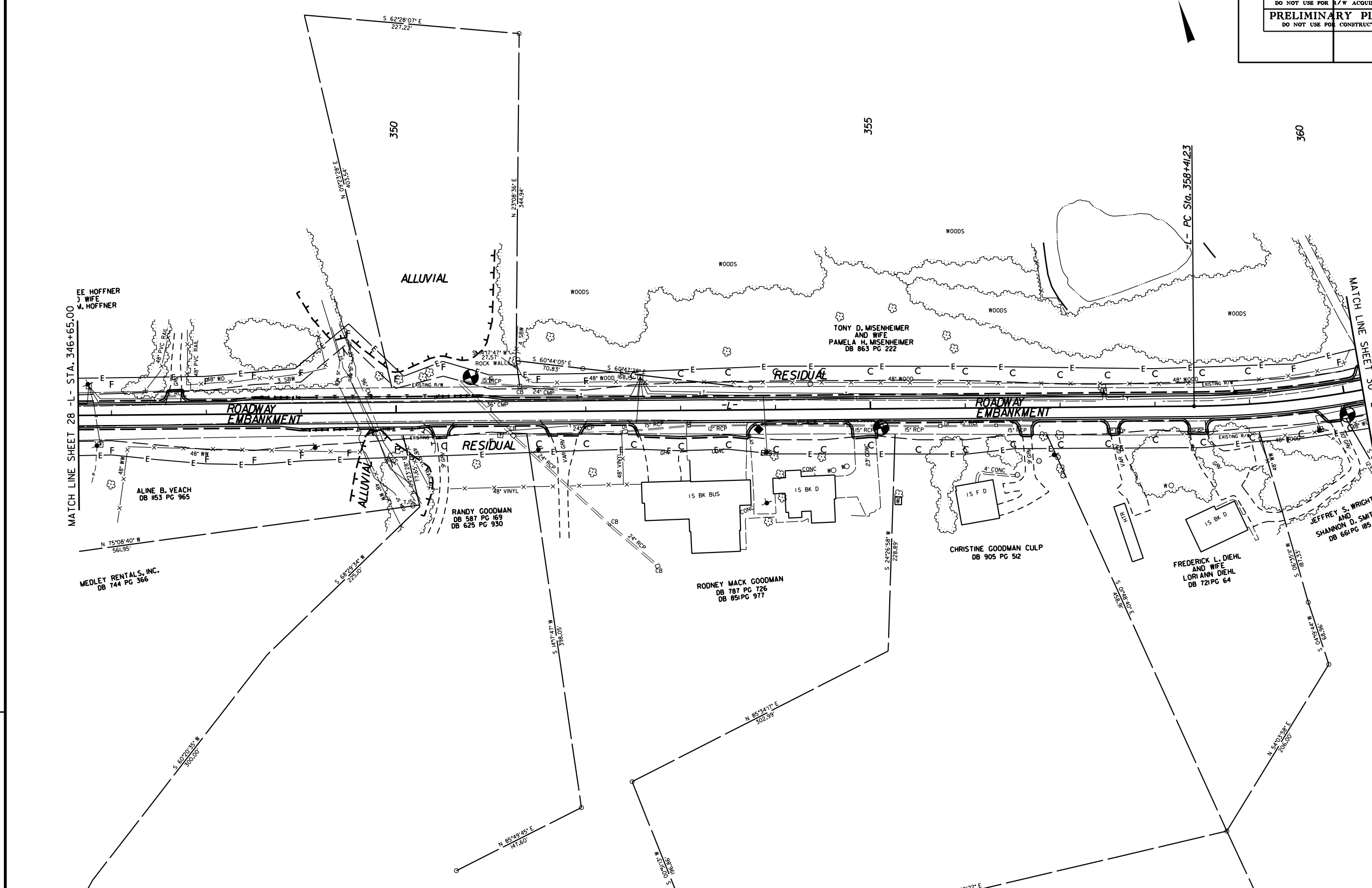
PROJECT REFERENCE NO.	SHEET NO.
W-5313	29
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR ACQUISITION <b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	



REVISIONS

MATCH LINE SHEET 28 - L - STA. 346+65.00

MATCH LINE SHEET 30 - L - STA. 360+20.00

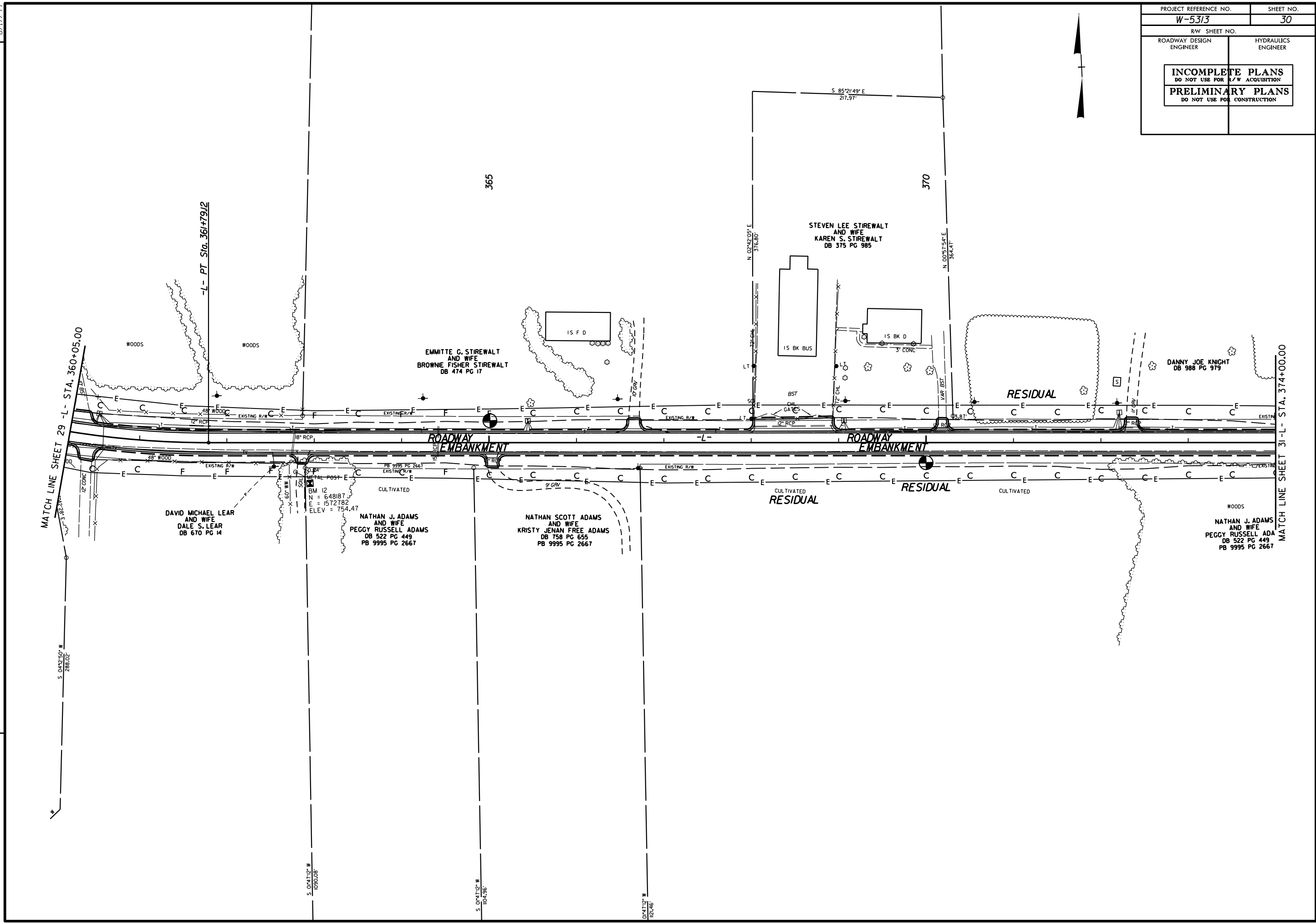




8/17/99

REVISIONS

PROJECT REFERENCE NO. <b>W-5313</b>	SHEET NO. <b>30</b>
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	



MATCH LINE SHEET 29 -L- STA. 360+05.00

MATCH LINE SHEET 31 -L- STA. 374+00.00

S. 0°15'50" W  
288.02'

S. 01°47'12" W  
1090.08'

S. 01°47'12" W  
104.96'

01°47'12" W  
1121.46'

N. 02°42'05" E  
376.80'

N. 00°57'54" E  
364.47'

S. 85°21'49" E  
217.97'

-L- PT Sta. 361+79.12

WOODS

WOODS

EMMITTE G. STIREWALT AND WIFE  
BROWNIE FISHER STIREWALT  
DB 474 PG 17

IS F D

STEVEN LEE STIREWALT AND WIFE  
KAREN S. STIREWALT  
DB 375 PG 985

IS BK BUS

IS BK D

RESIDUAL

DANNY JOE KNIGHT  
DB 988 PG 979

ROADWAY EMBANKMENT

ROADWAY EMBANKMENT

RESIDUAL

DAVID MICHAEL LEAR AND WIFE  
DALE S. LEAR  
DB 670 PG 14

NATHAN J. ADAMS AND WIFE  
PEGGY RUSSELL ADAMS  
DB 522 PG 449  
PB 9995 PG 2667

NATHAN SCOTT ADAMS AND WIFE  
KRISTY JENAN FREE ADAMS  
DB 758 PG 655  
PB 9995 PG 2667

WOODS  
NATHAN J. ADAMS AND WIFE  
PEGGY RUSSELL ADA  
DB 522 PG 449  
PB 9995 PG 2667

BM 12  
N = 648187  
E = 1572782  
ELEV = 754.47

CULTIVATED

CULTIVATED  
RESIDUAL

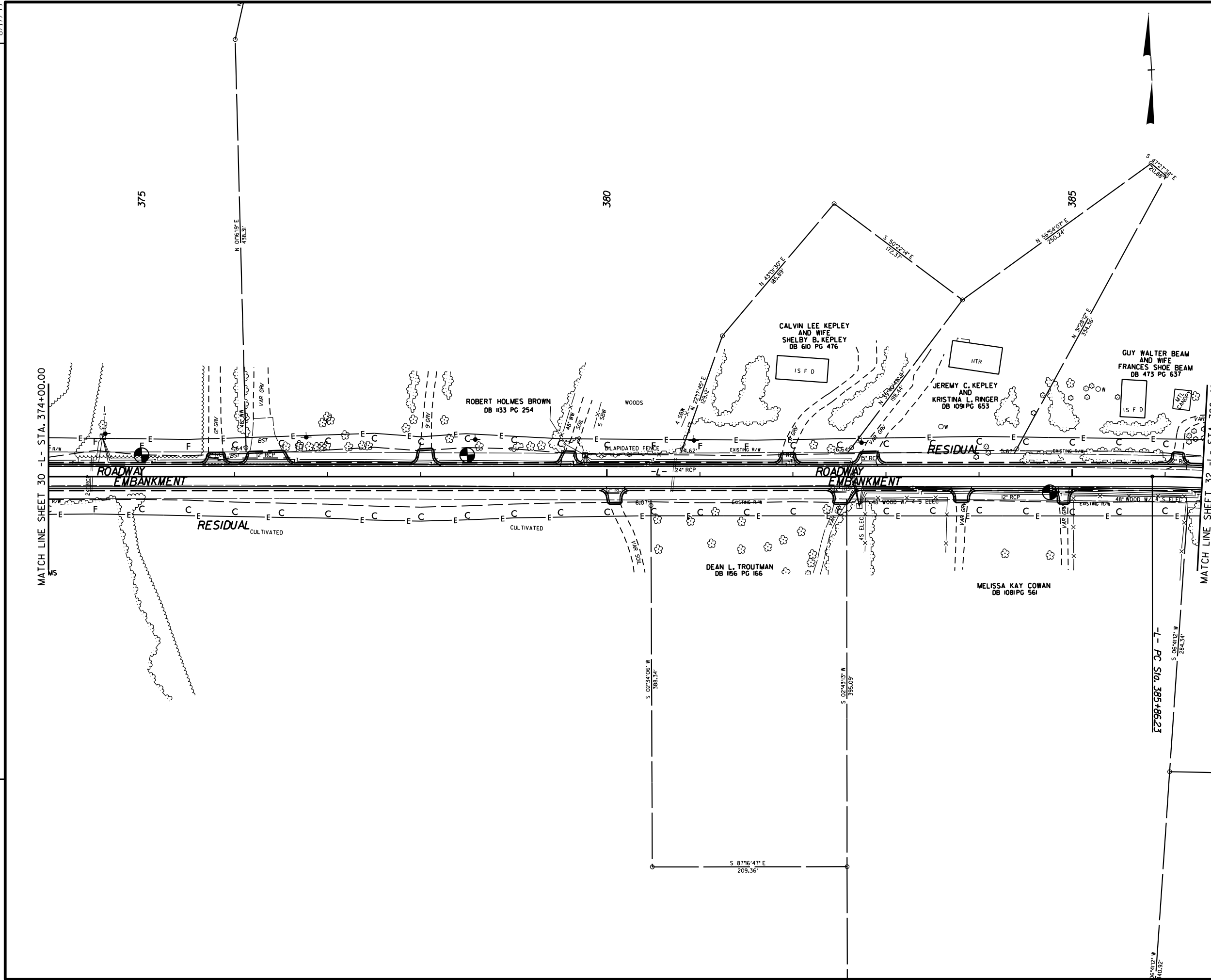
CULTIVATED

WOODS

PROJECT REFERENCE NO. <b>W-5313</b>	SHEET NO. <b>31</b>
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

REVISIONS



MATCH LINE SHEET 30 - L - STA. 374+00.00

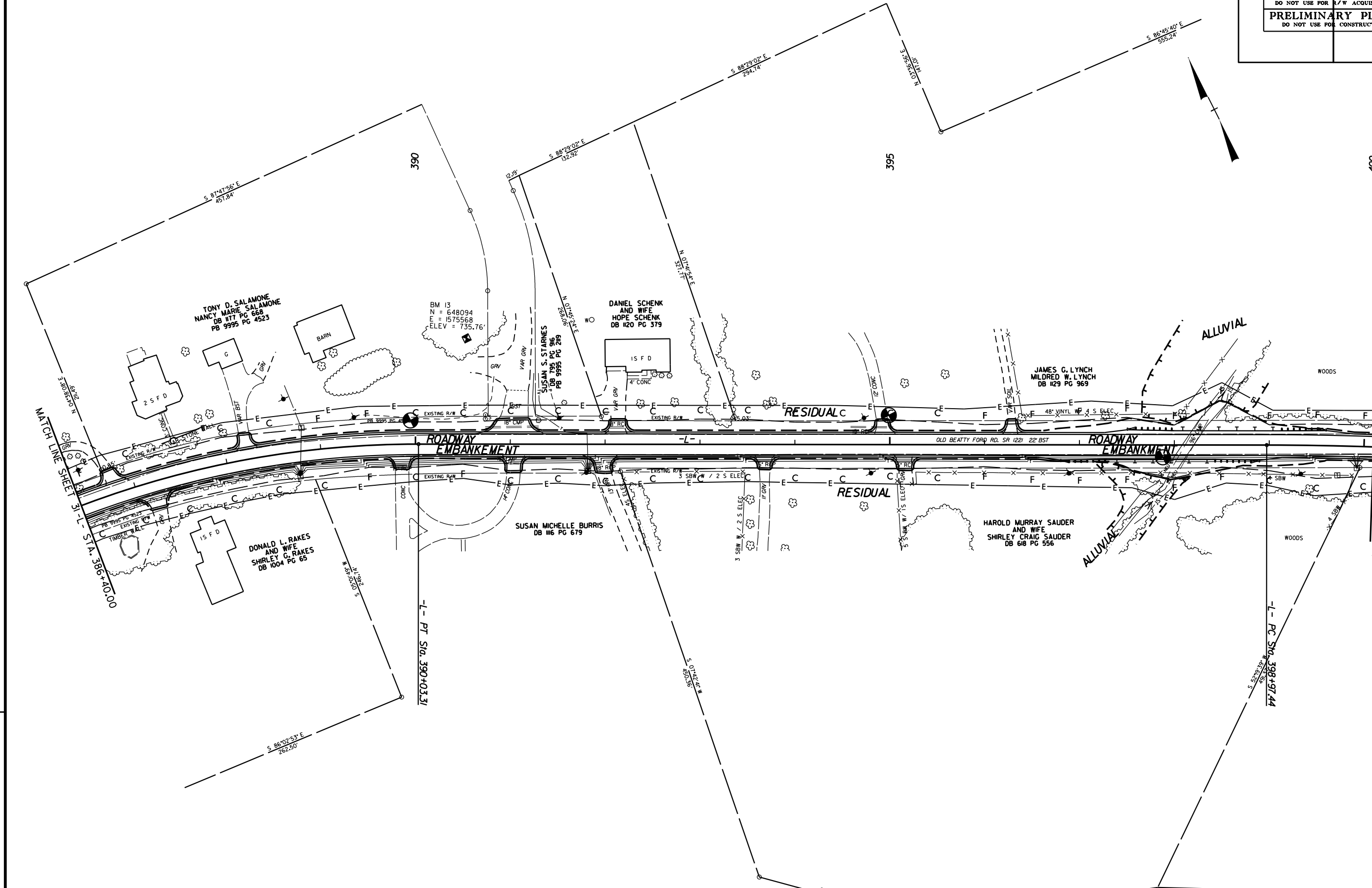
MATCH LINE SHEET 32 - L - STA. 386+40.00

-L- PC Sta. 385+86.23

PROJECT REFERENCE NO.	SHEET NO.
W-5313	32
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR ACQUISITION <b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	

8/17/99

REVISIONS



MATCH LINE SHEET 31 - L - STA. 386+10.00

-L- PT Sta. 390+03.31

-L- PC Sta. 398+97.44

MATCH LINE SHEET 33 - L - STA. 400+10.00

400

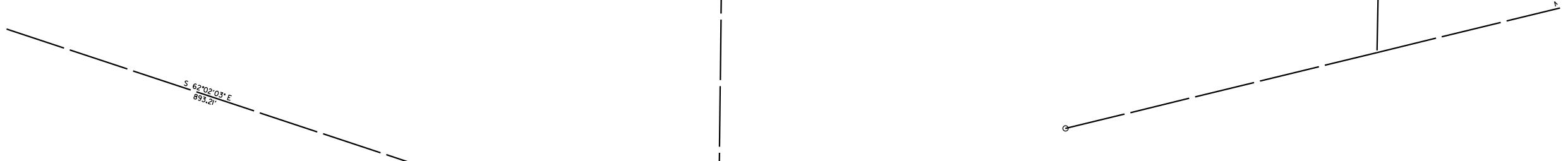
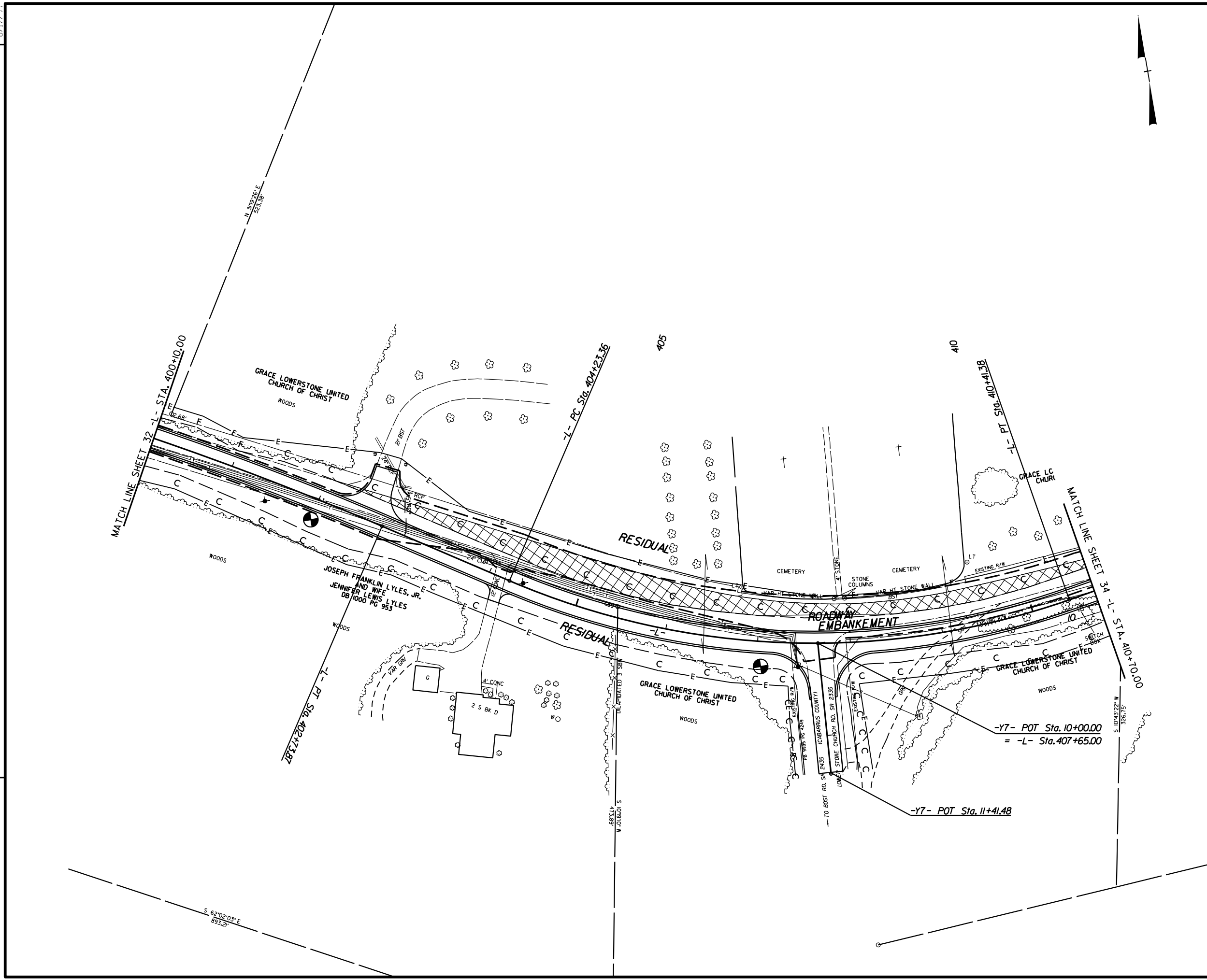


S 87°47'56" E 457.84  
 S 88°29'02" E 294.74  
 S 88°29'02" E 132.92  
 S 86°45'40" E 555.24  
 N 03°16'56" E 107.74  
 S 87°29'02" E 12.49  
 N 26°45'24" E 268.96  
 N 32°11" E 12.11  
 S 86°32'53" E 262.50  
 S 48°19'43" E 173.16  
 S 71°03'07" E 255.05

8/17/99

REVISIONS

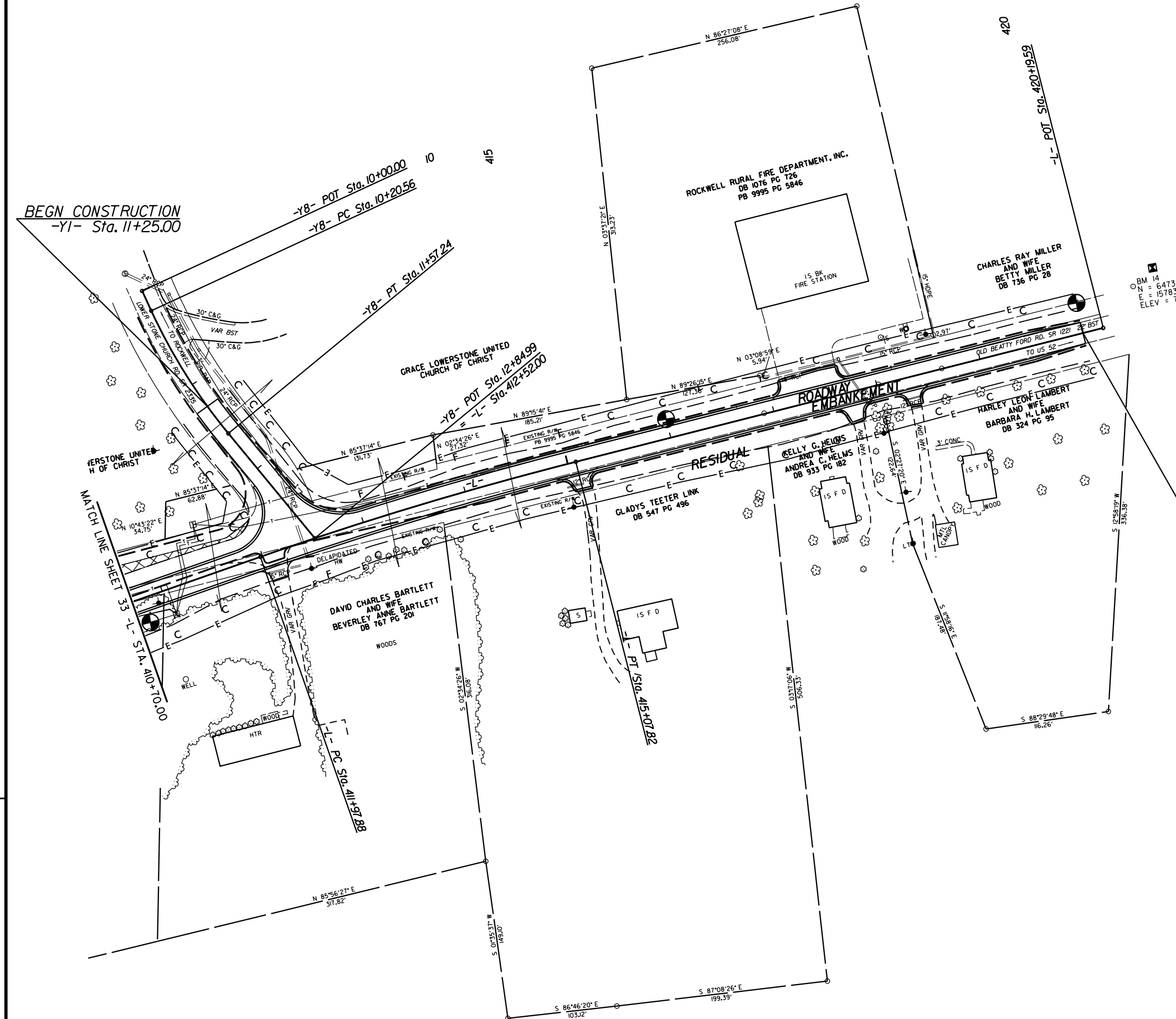
PROJECT REFERENCE NO. <b>W-5313</b>	SHEET NO. <b>33</b>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR ACQUISITION	
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	



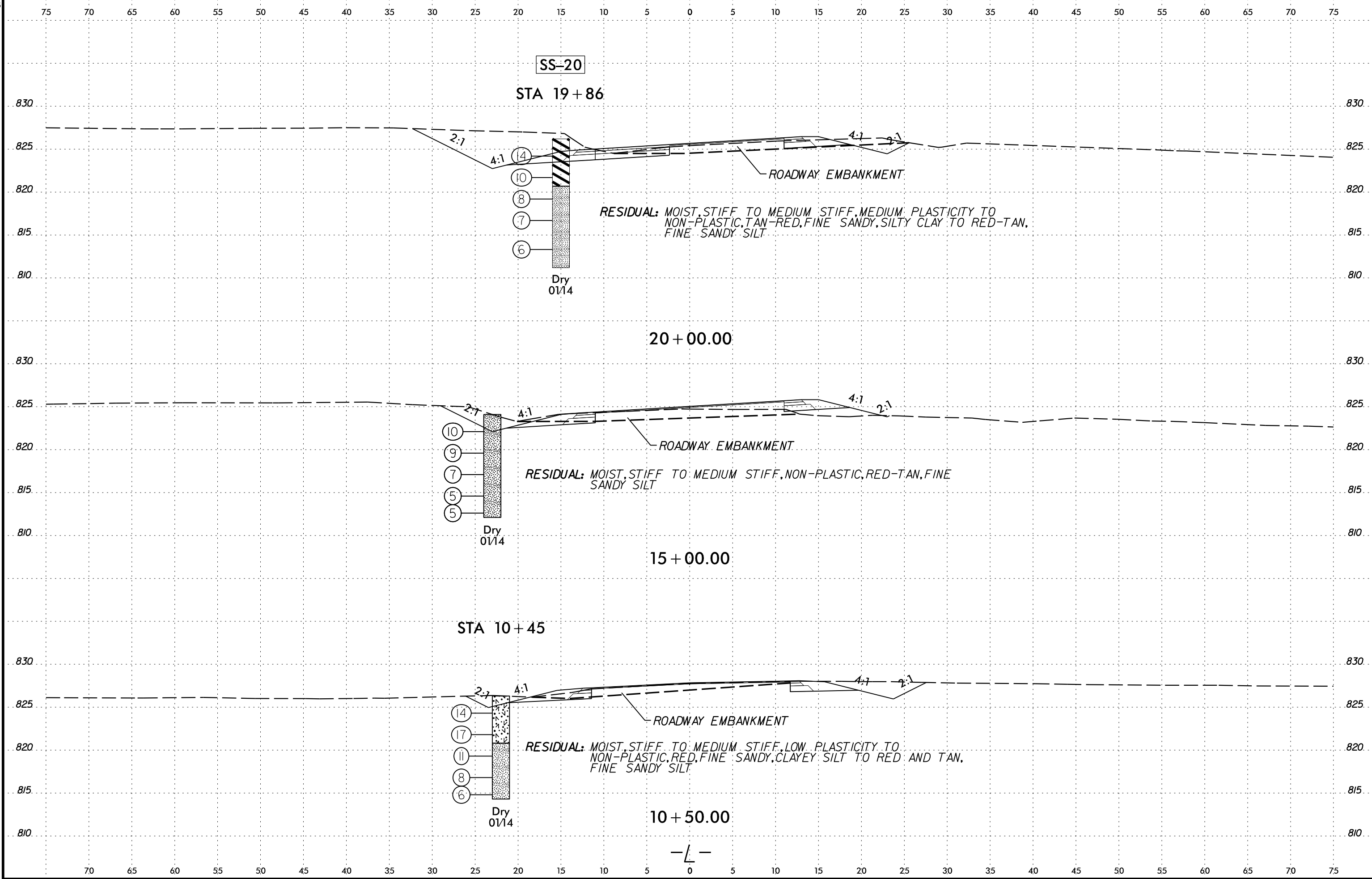
8/17/99

REVISIONS

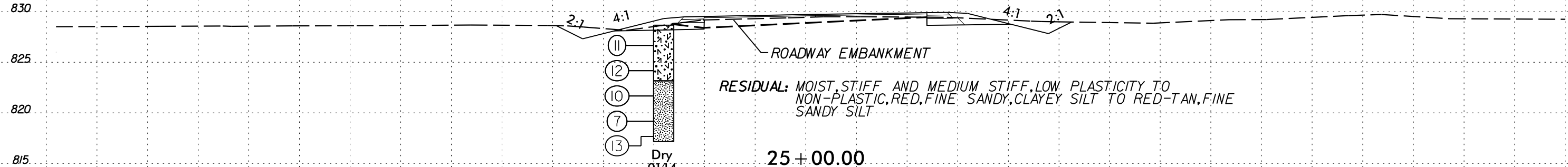
PROJECT REFERENCE NO. <b>W-5313</b>	SHEET NO. <b>34</b>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR A/W ACQUISITION <b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	



END TIP PROJECT W-5313  
 END CONSTRUCTION  
 -L- POT Sta. 420+00.00



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



STA 24+89

830  
825  
820  
815

ROADWAY EMBANKMENT

RESIDUAL: MOIST, STIFF AND MEDIUM STIFF, LOW PLASTICITY TO  
NON-PLASTIC, RED, FINE SANDY, CLAYEY SILT TO RED-TAN, FINE  
SANDY SILT

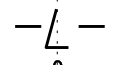
- 11
- 12
- 10
- 7
- 13

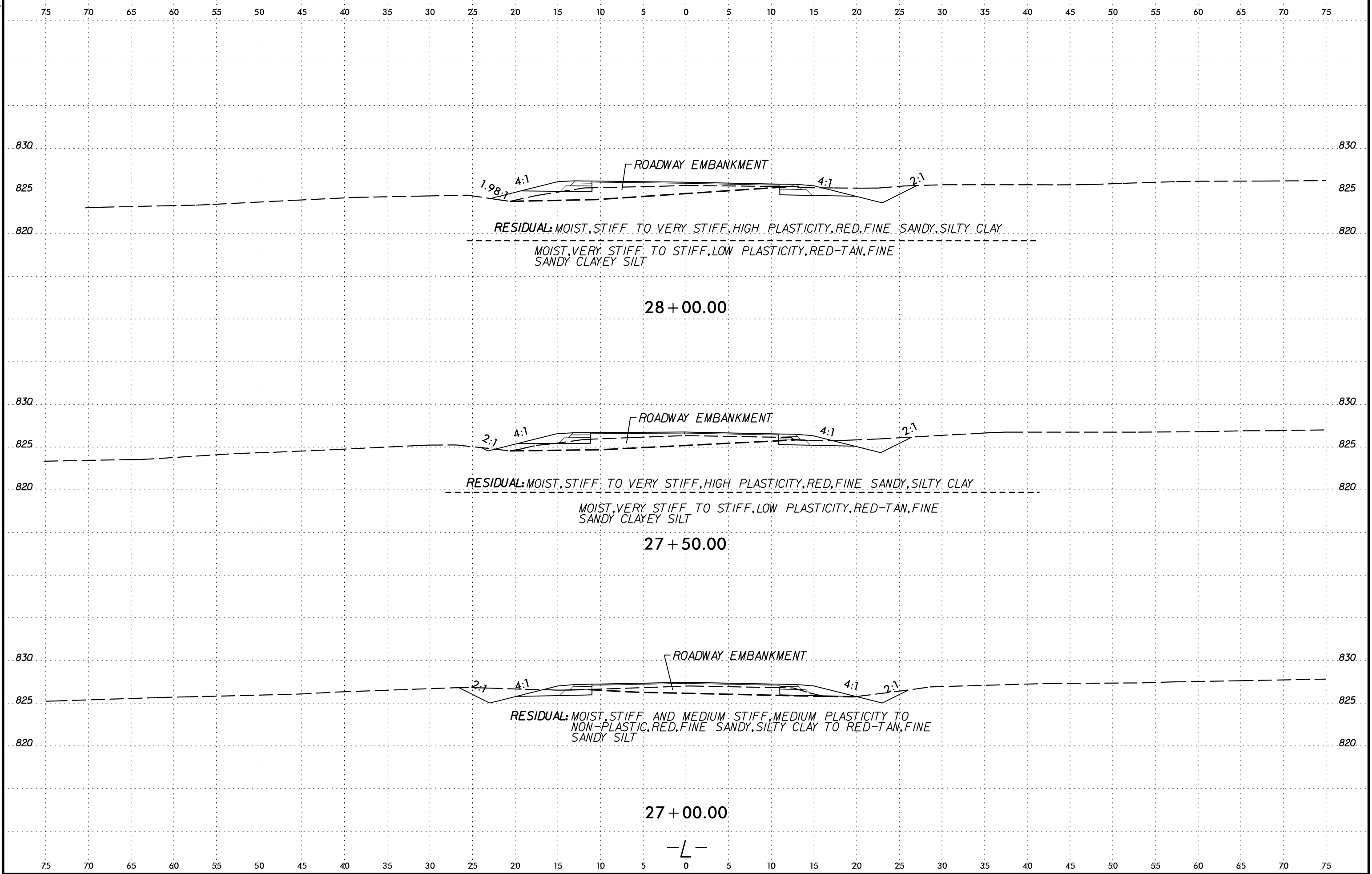
Dry 01/14

25+00.00

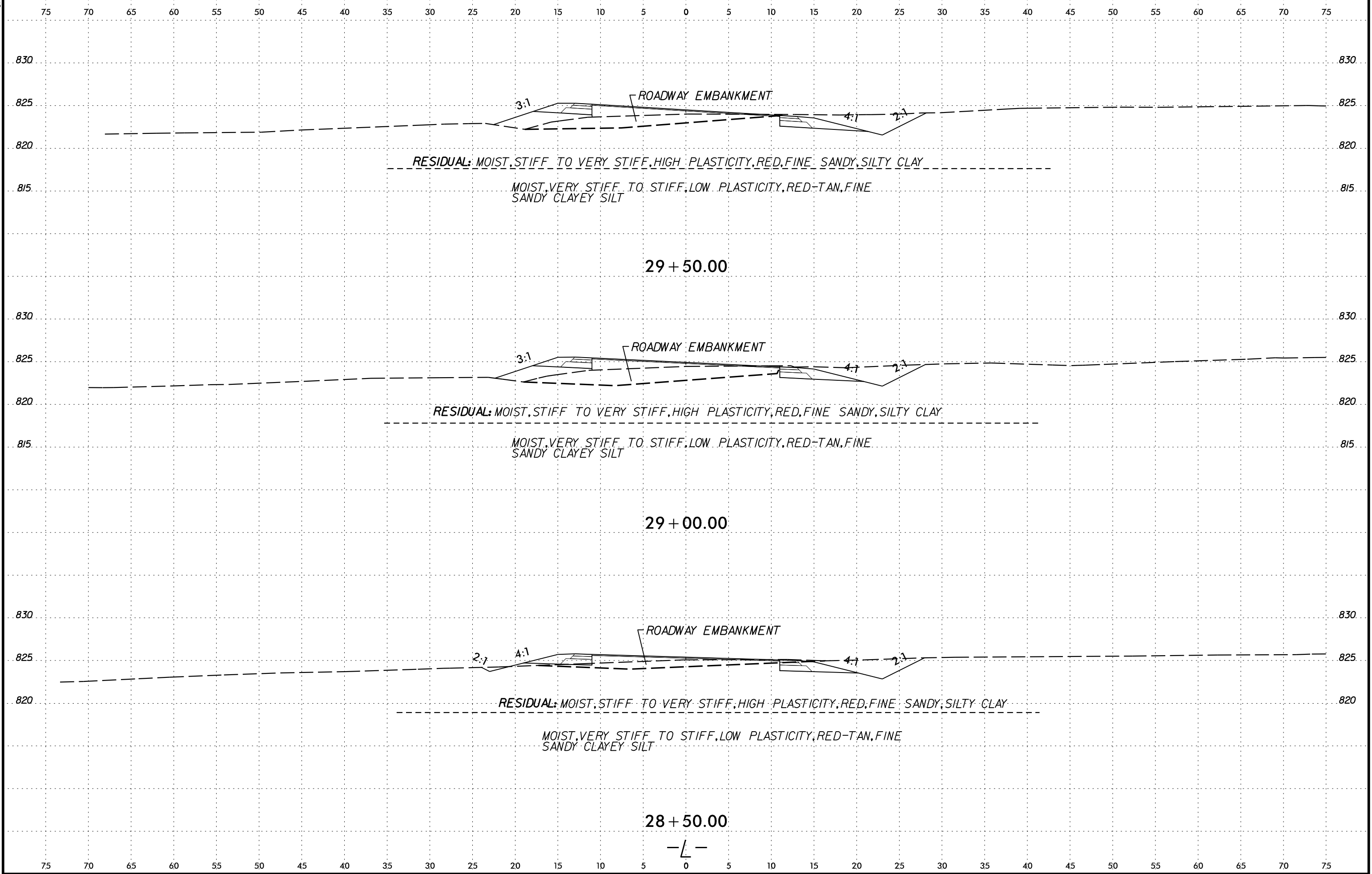
830  
825  
820  
815

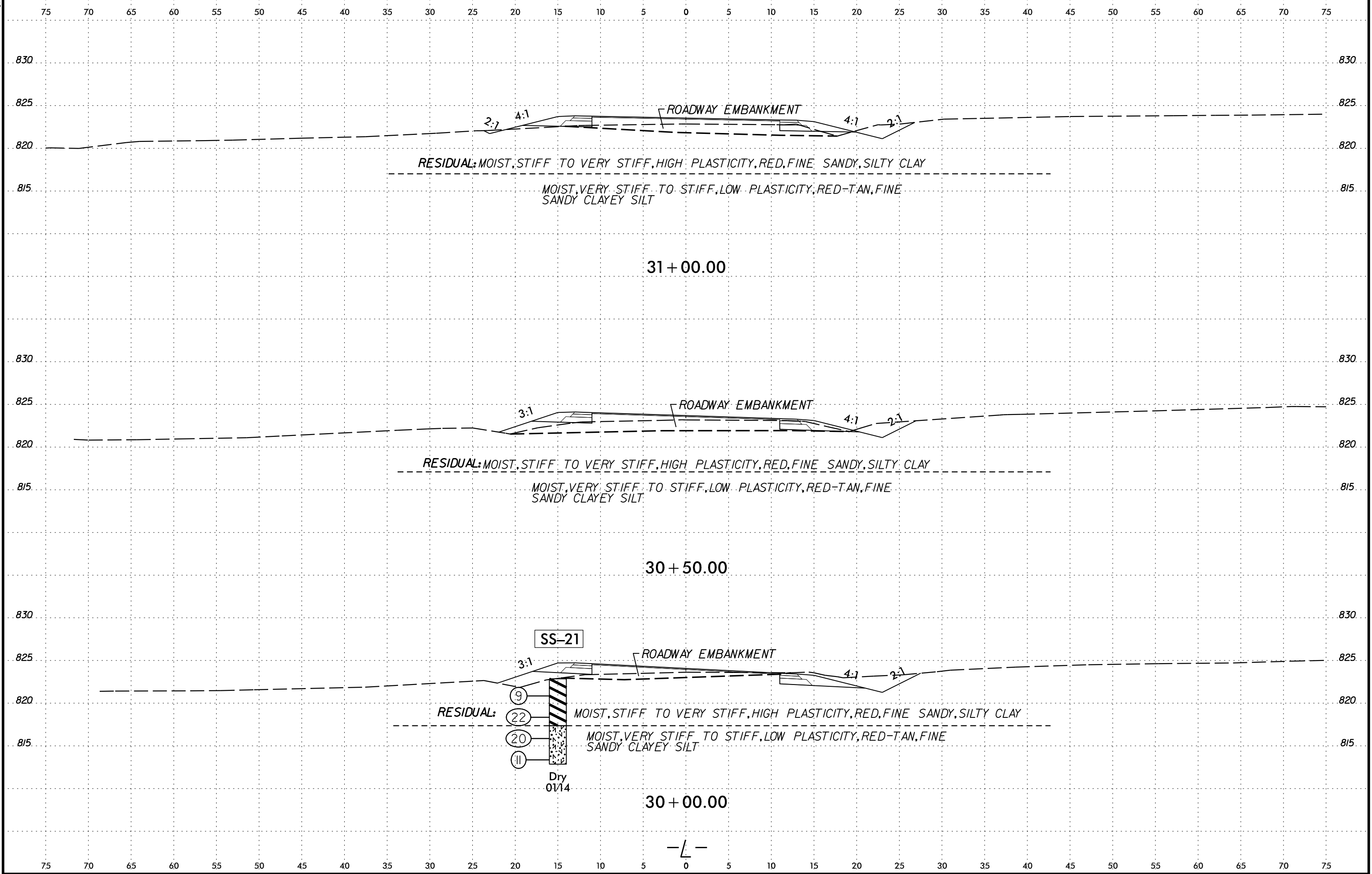
75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

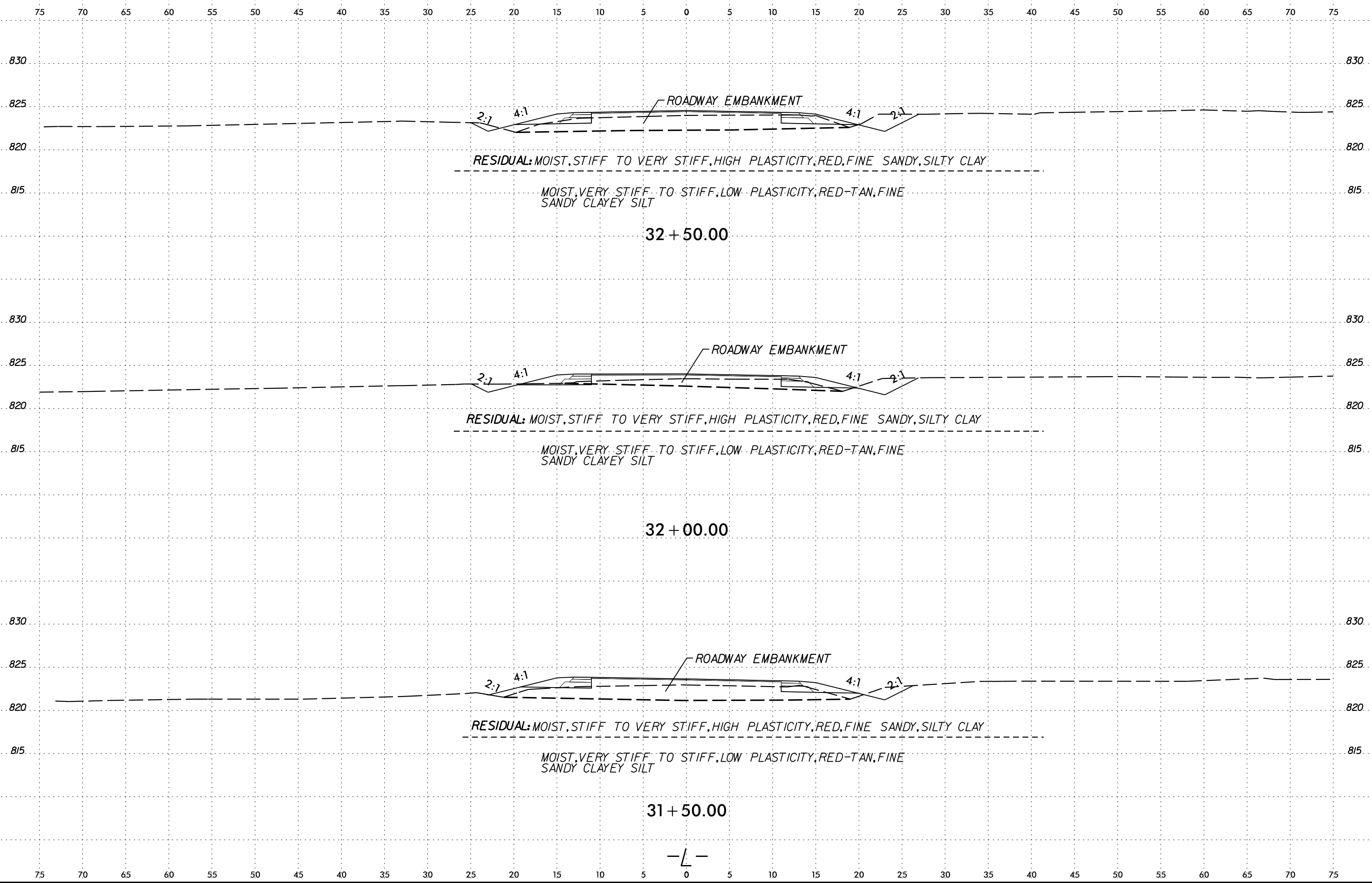




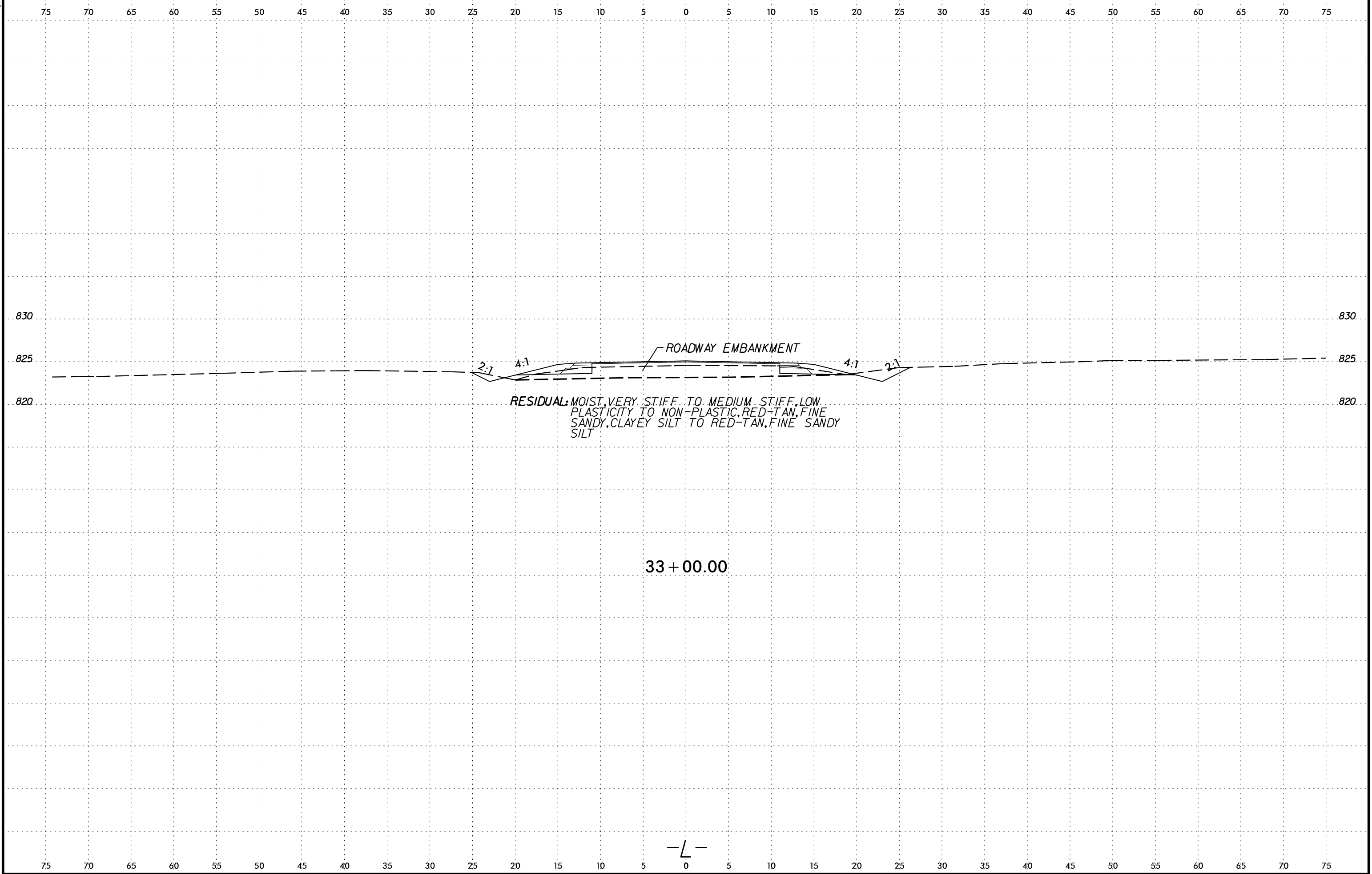


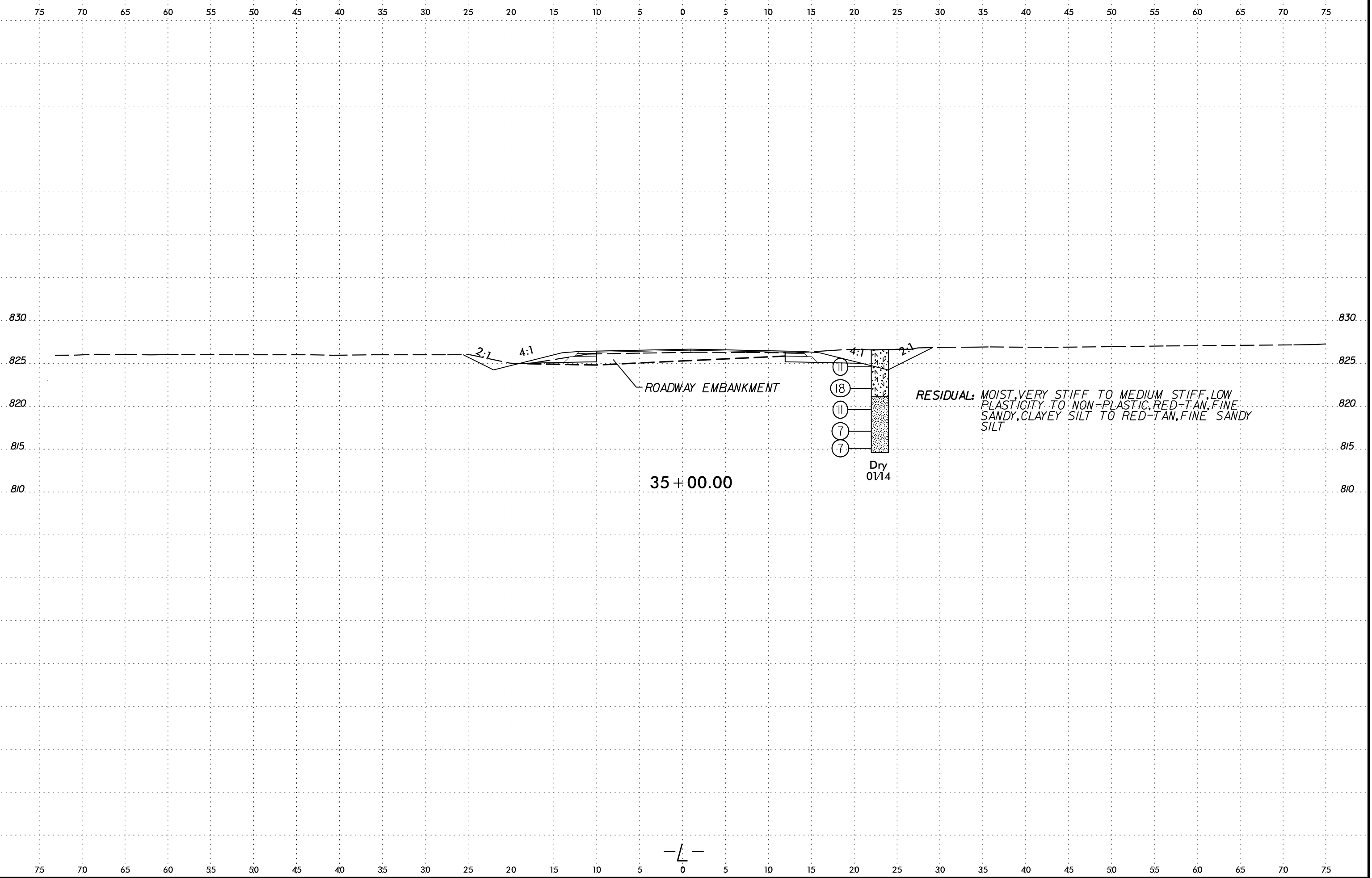


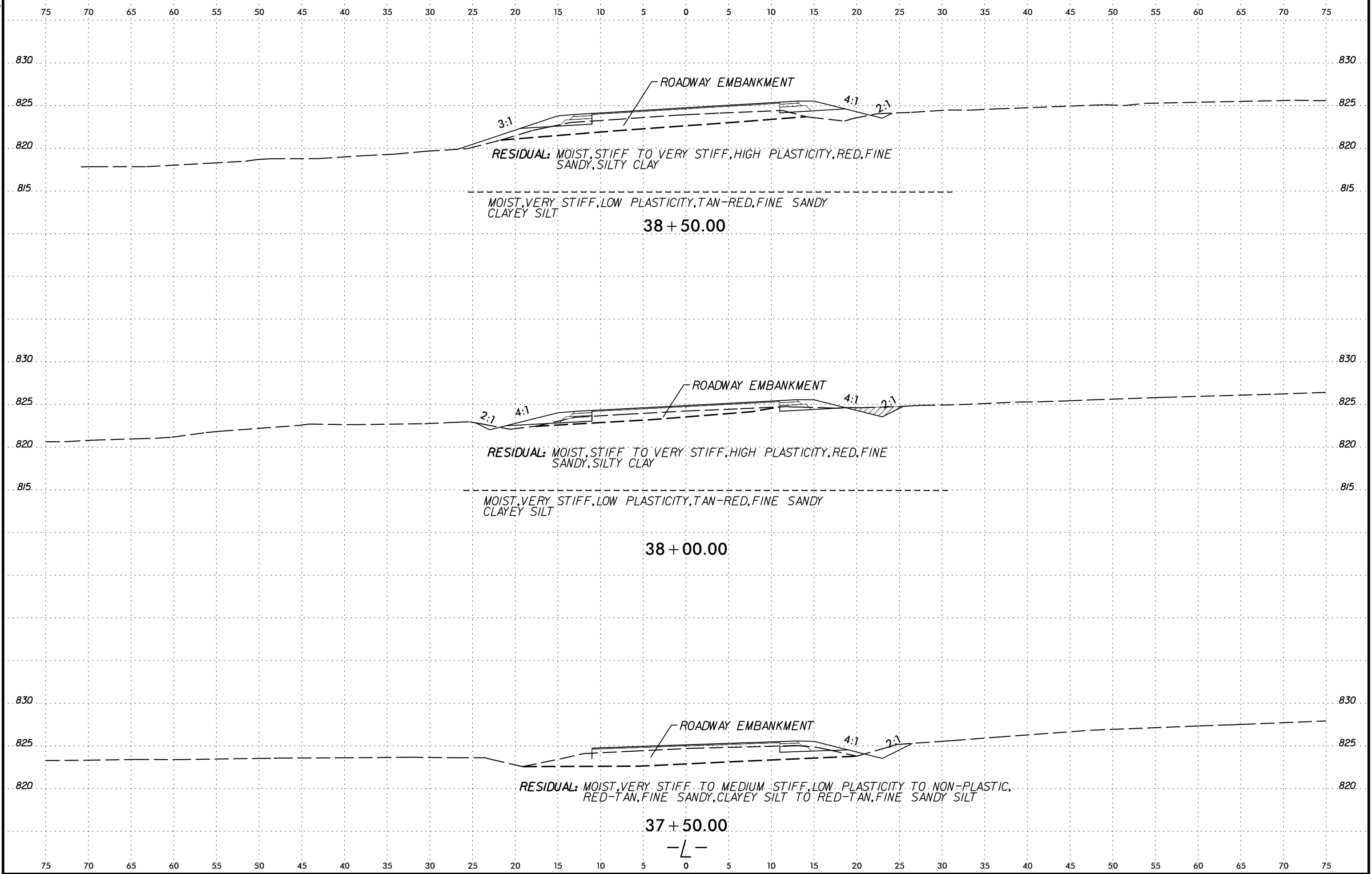


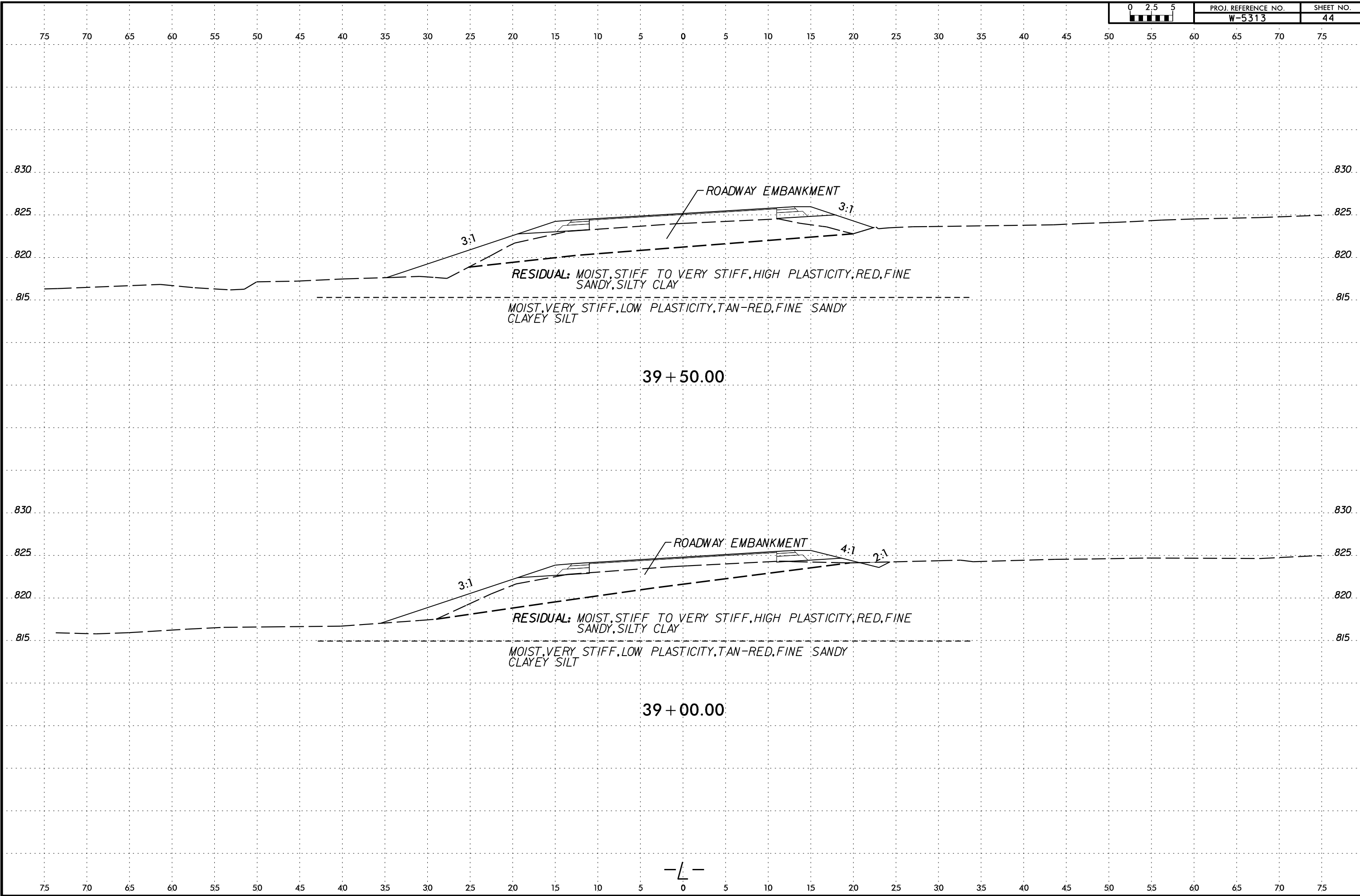


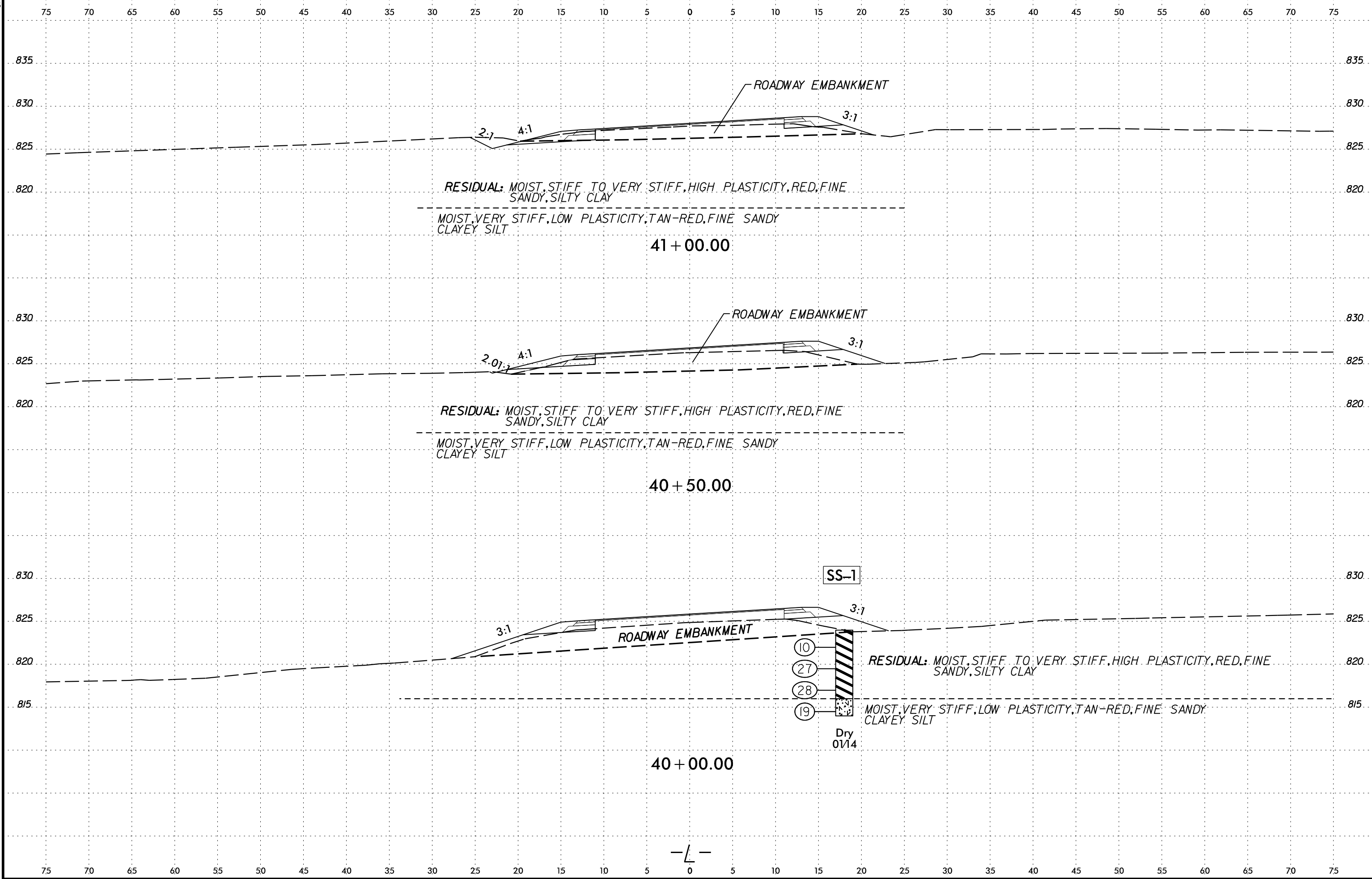
8/23/99











41 + 00.00

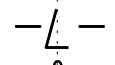
40 + 50.00

40 + 00.00

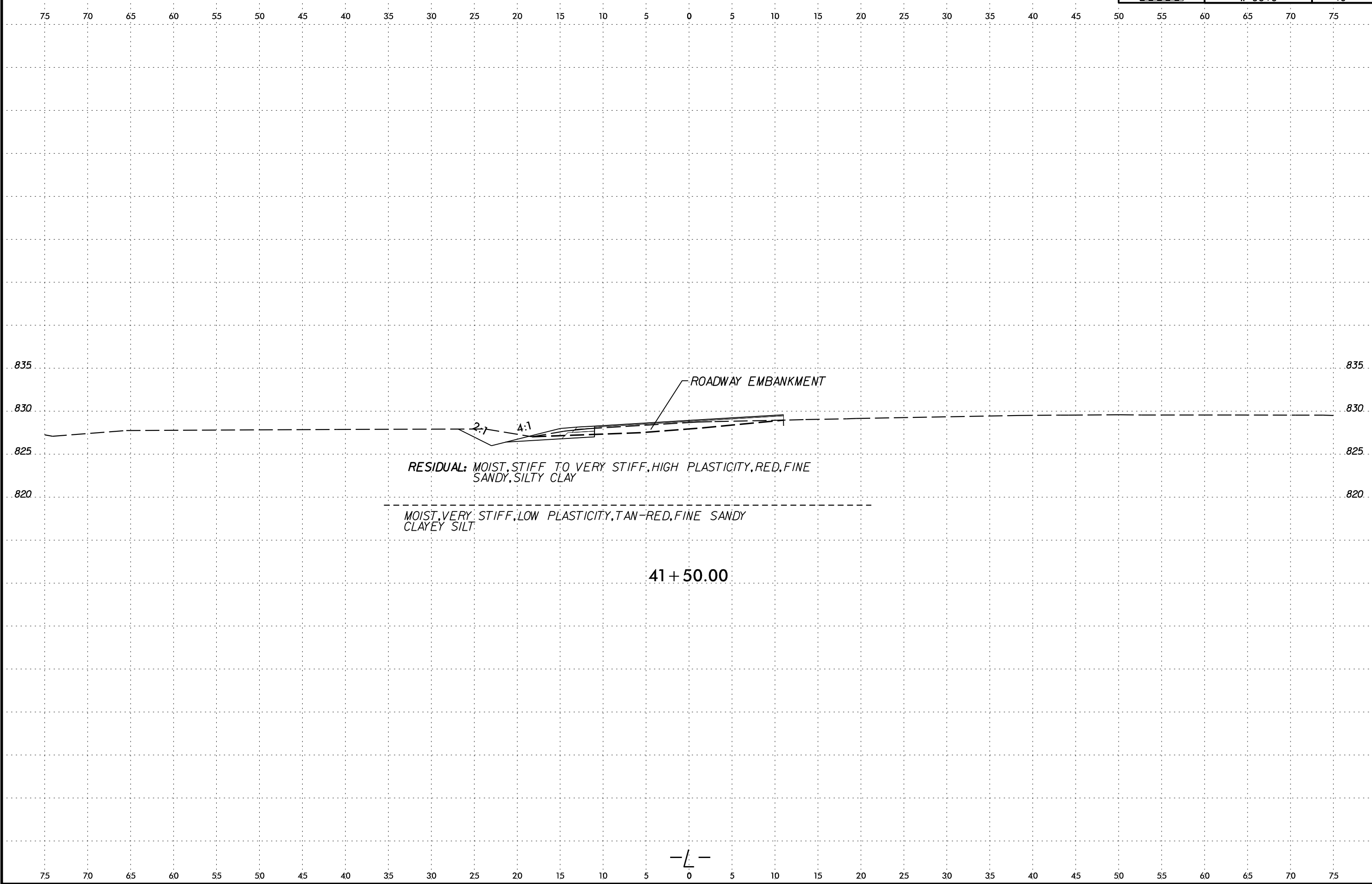
SS-1

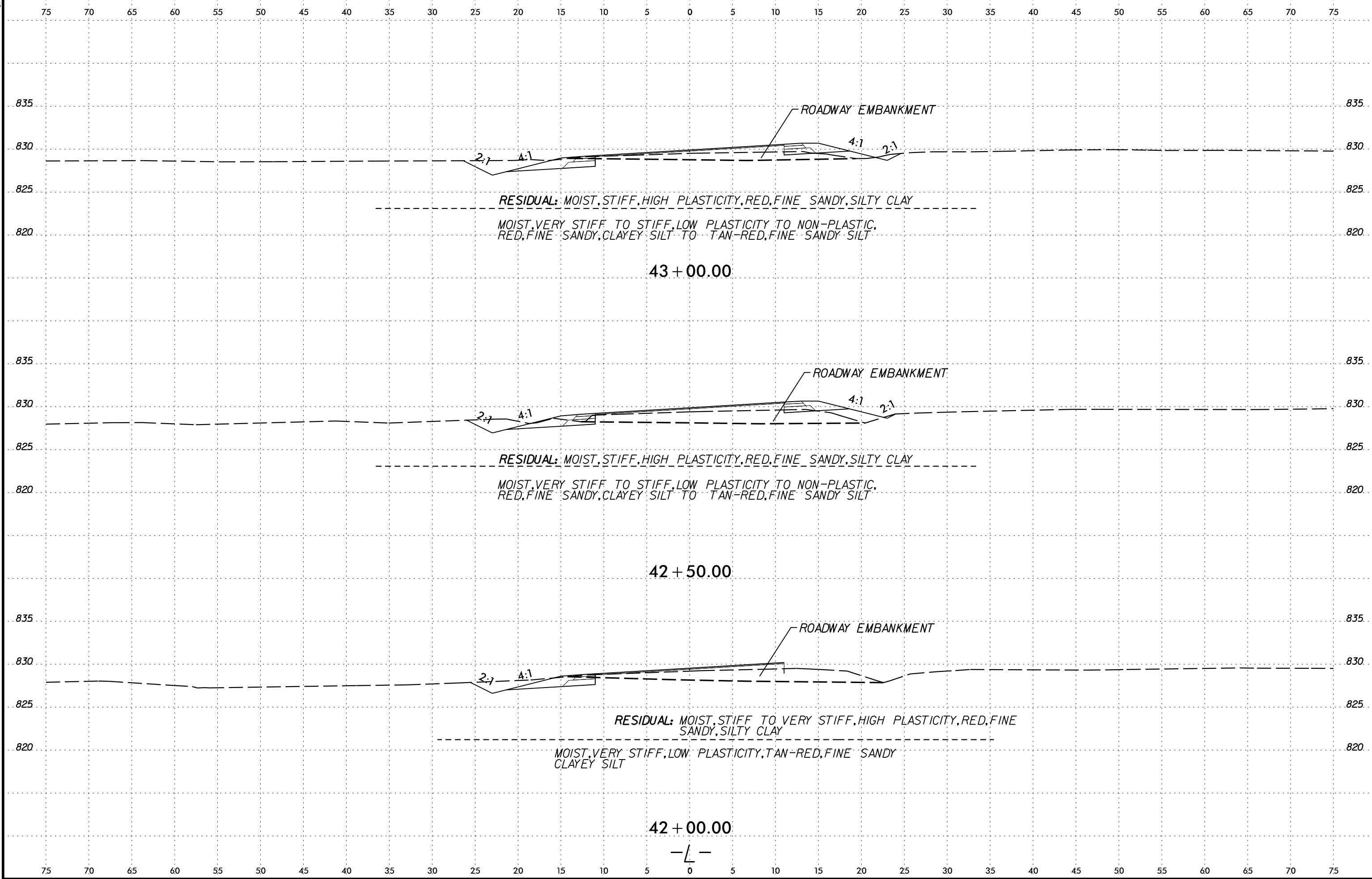
- 10
- 27
- 28
- 19

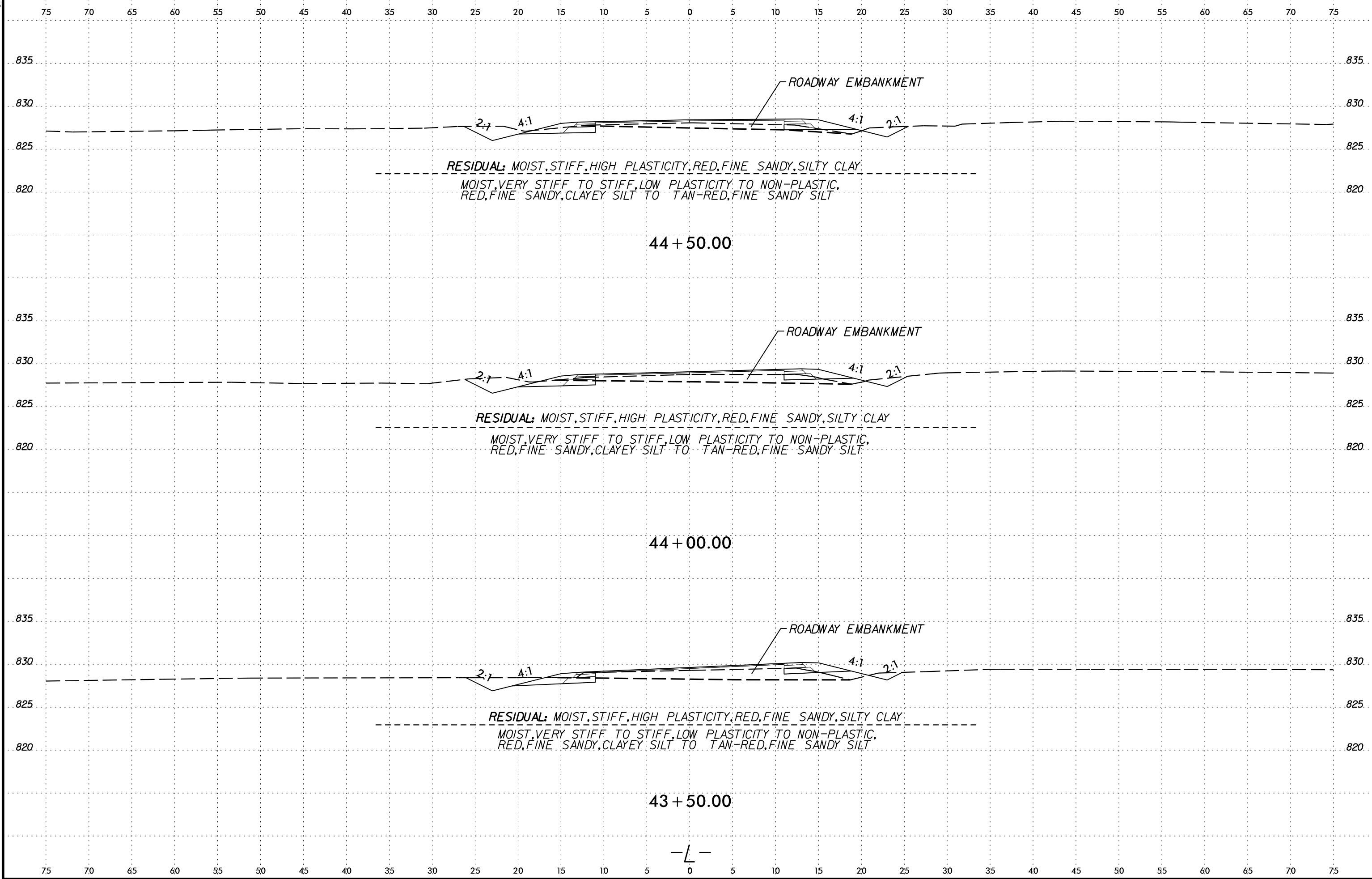
Dry 01/14

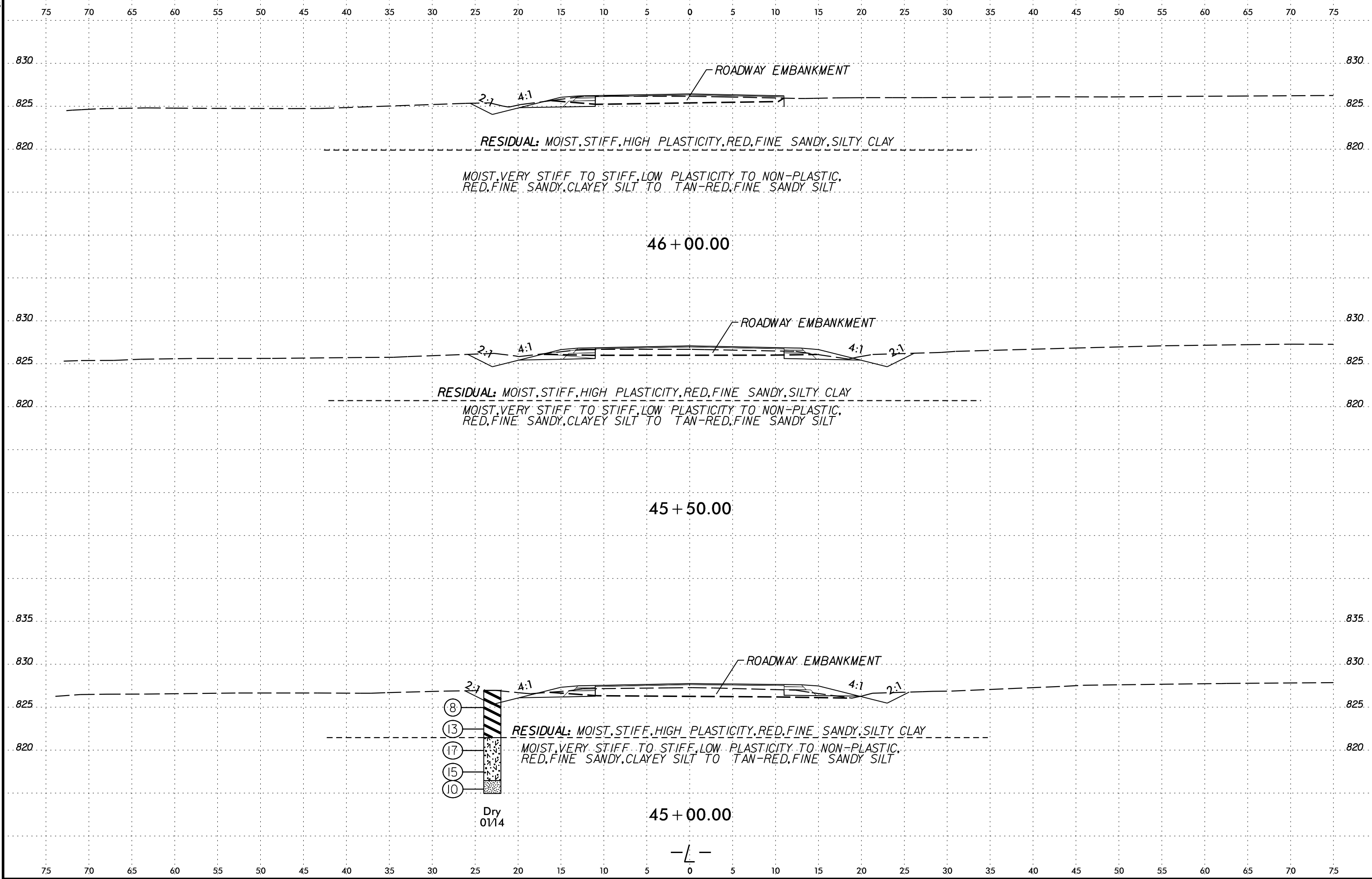


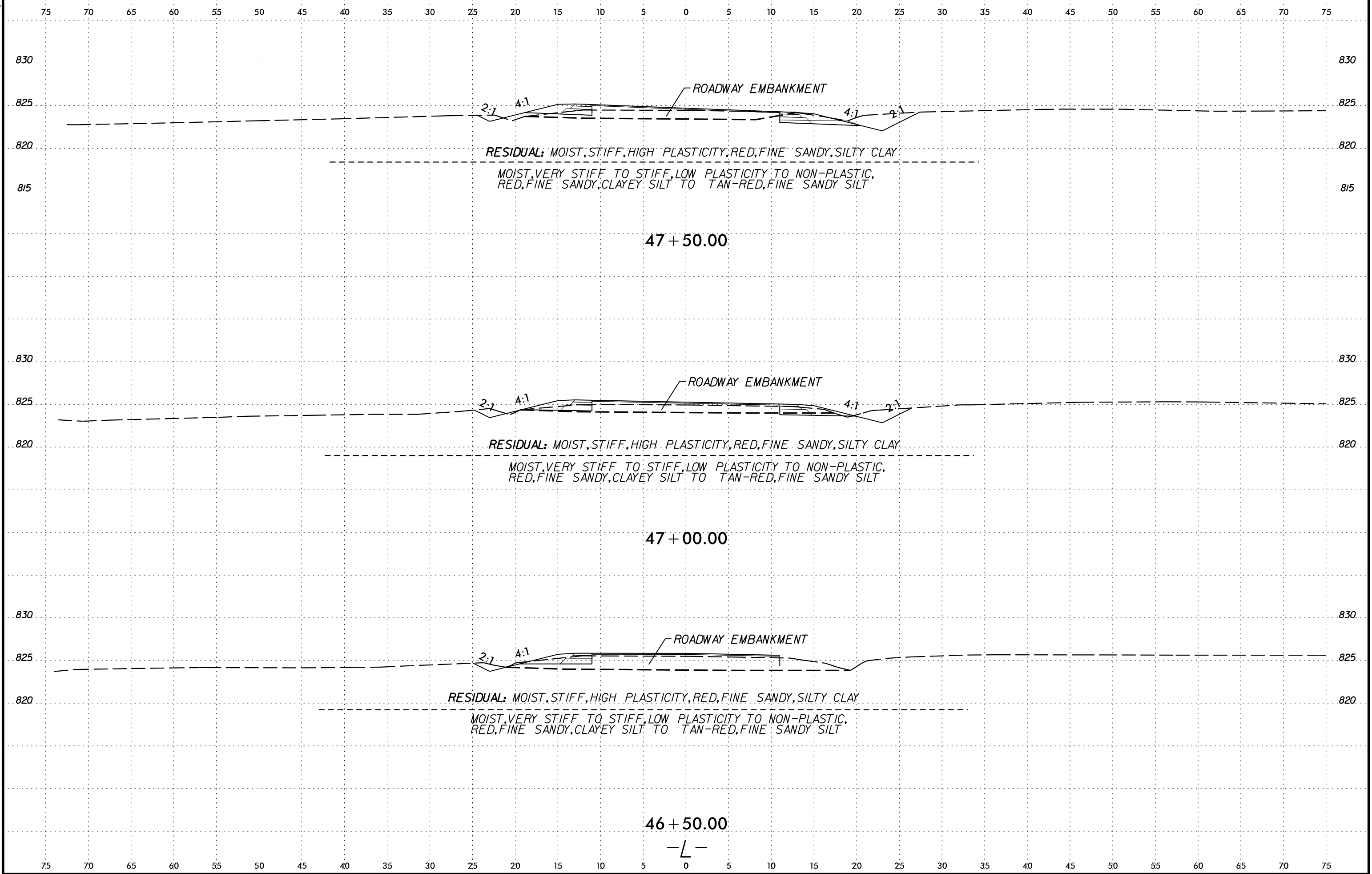


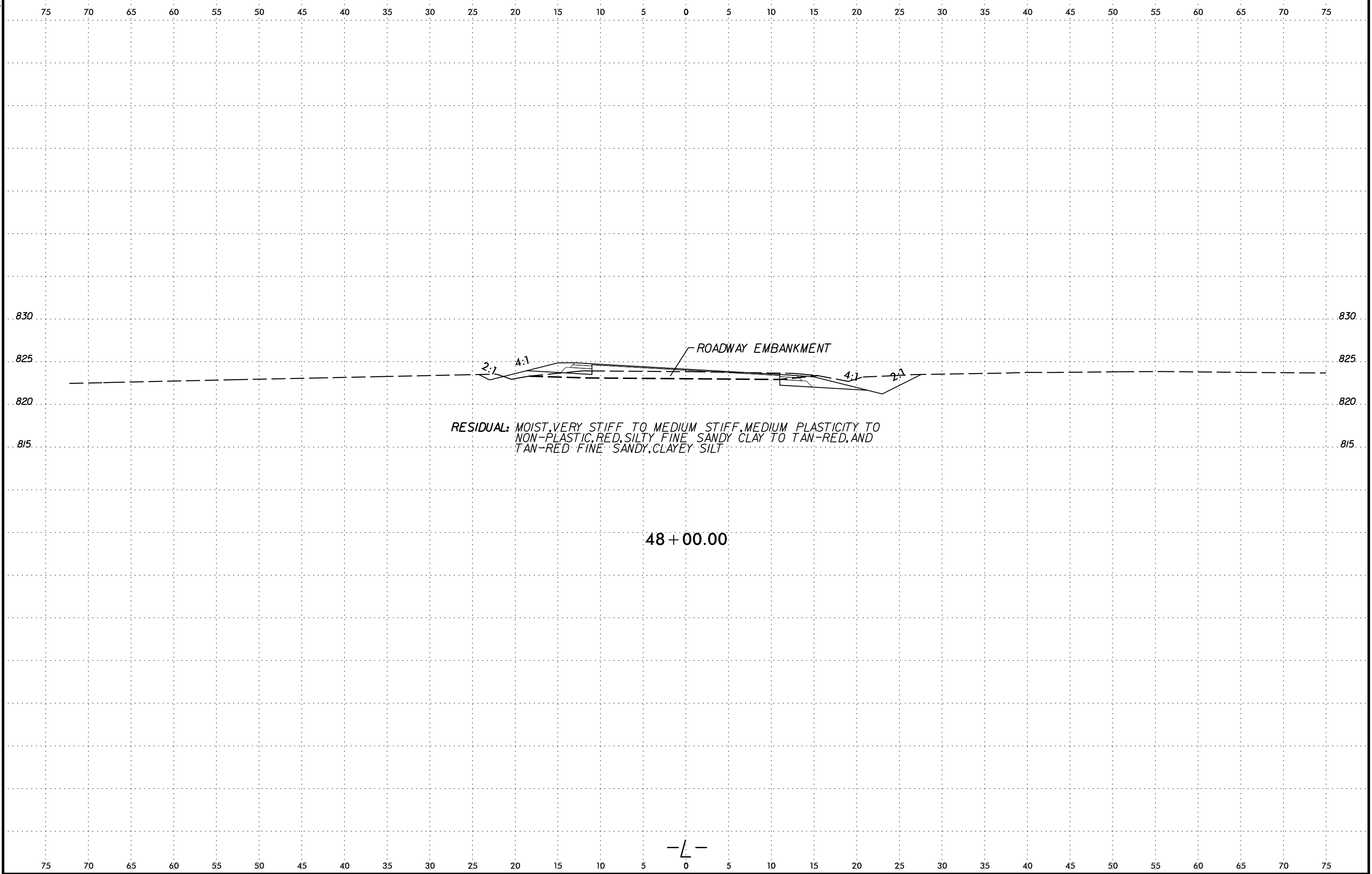


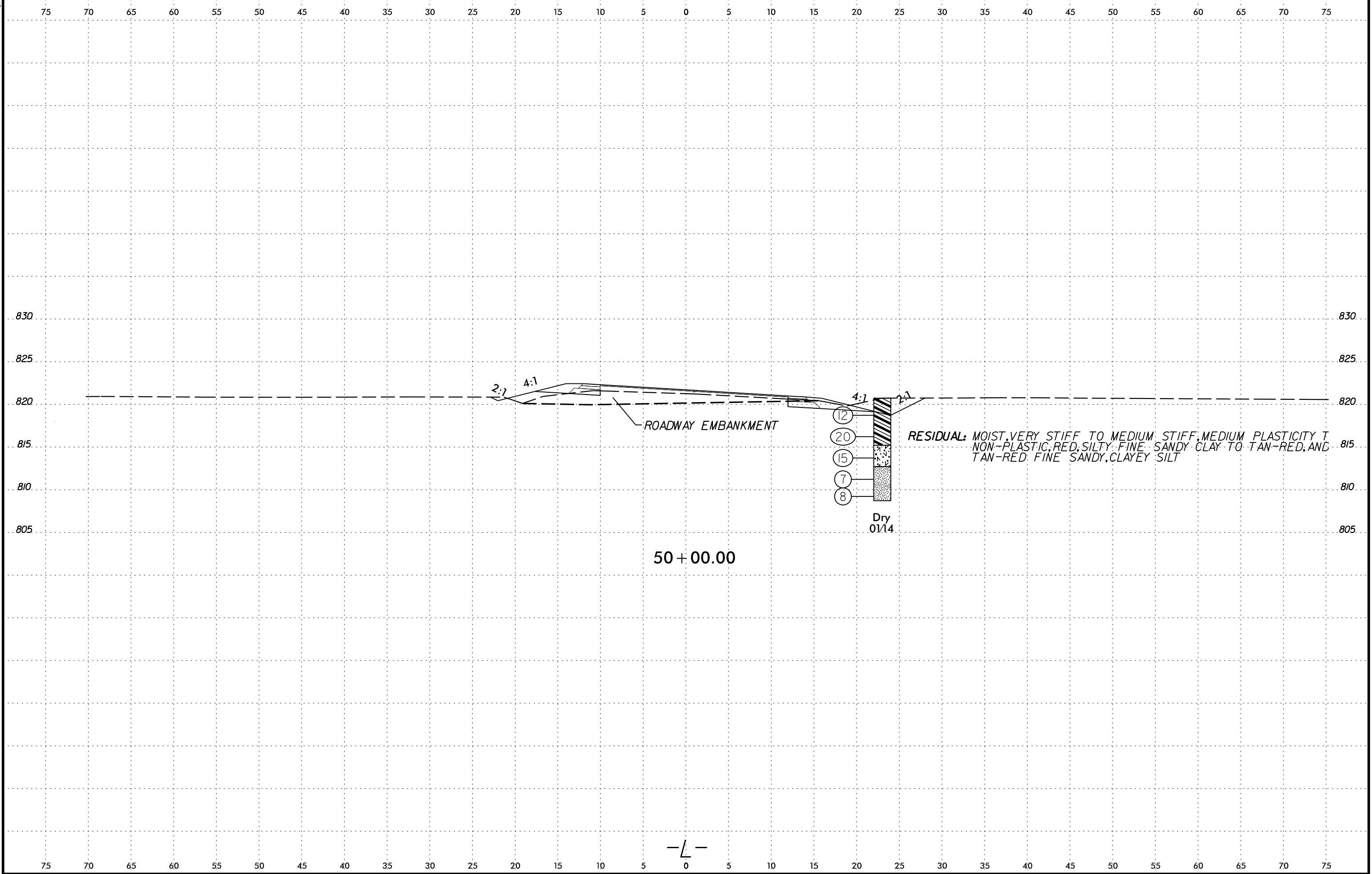






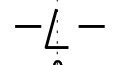


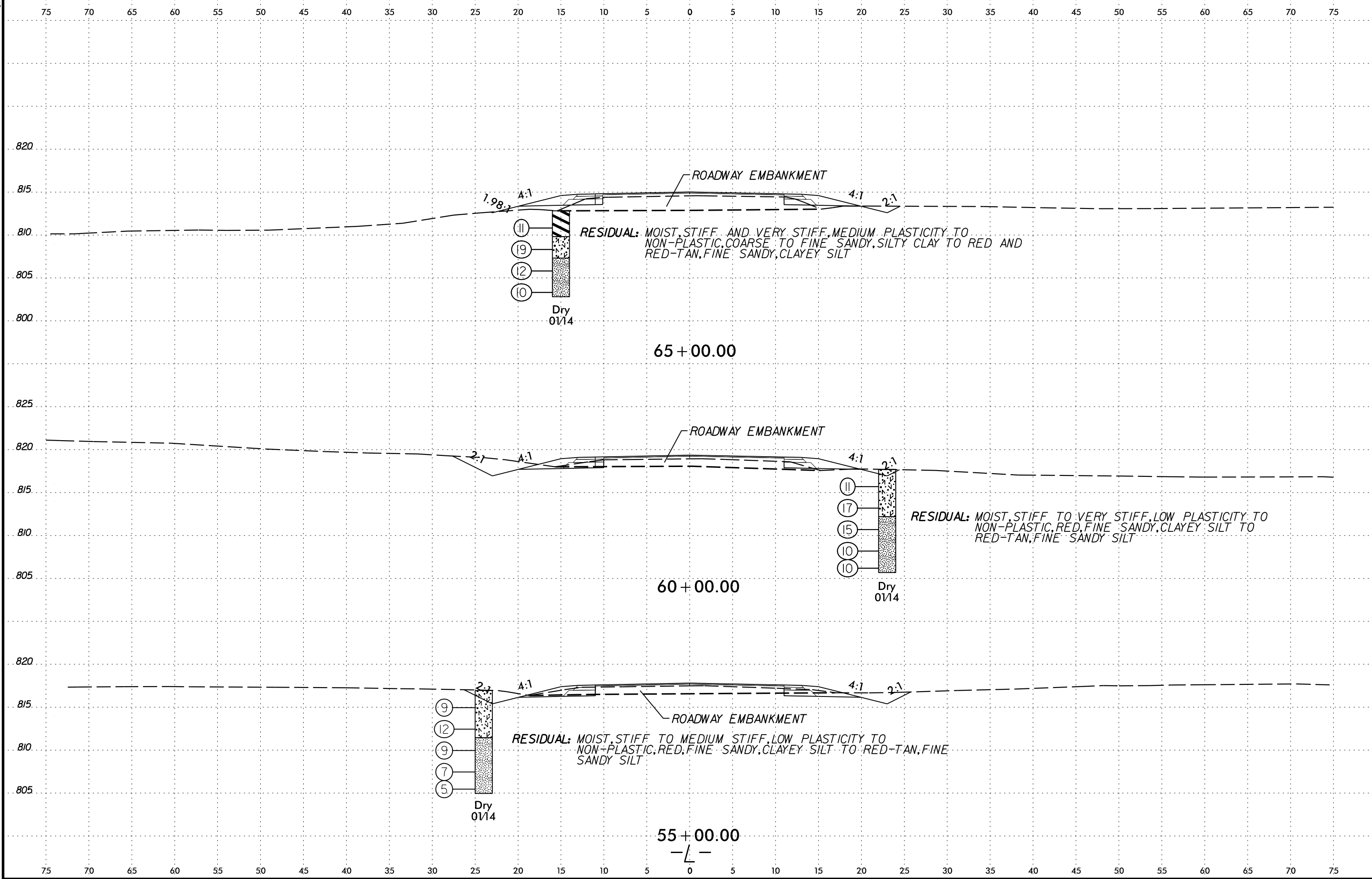




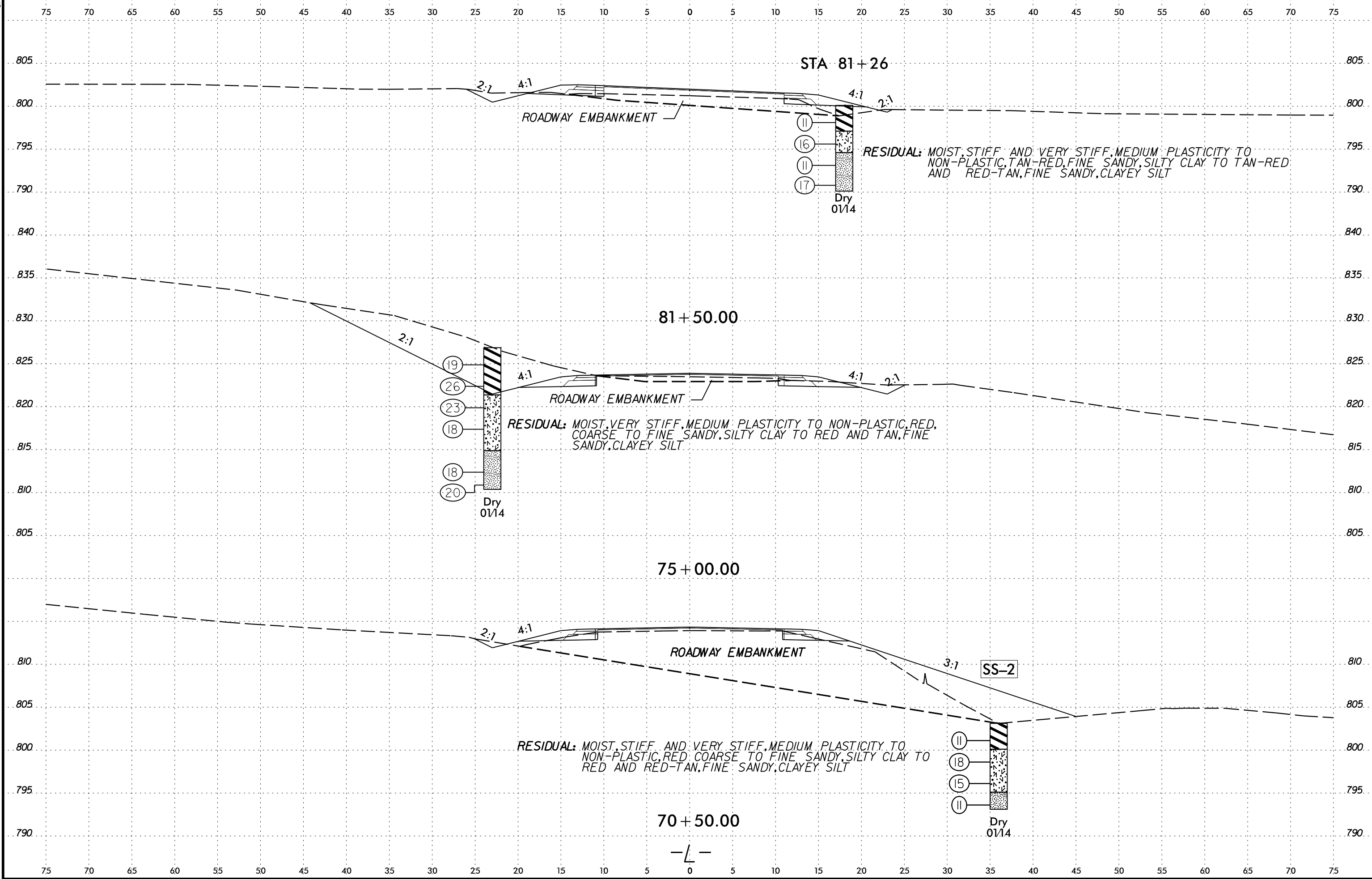
RESIDUAL: MOIST, VERY STIFF TO MEDIUM STIFF, MEDIUM PLASTICITY TO  
 NON-PLASTIC; RED, SILTY FINE SANDY CLAY TO TAN-RED, AND  
 TAN-RED, FINE SANDY, CLAYEY SILT

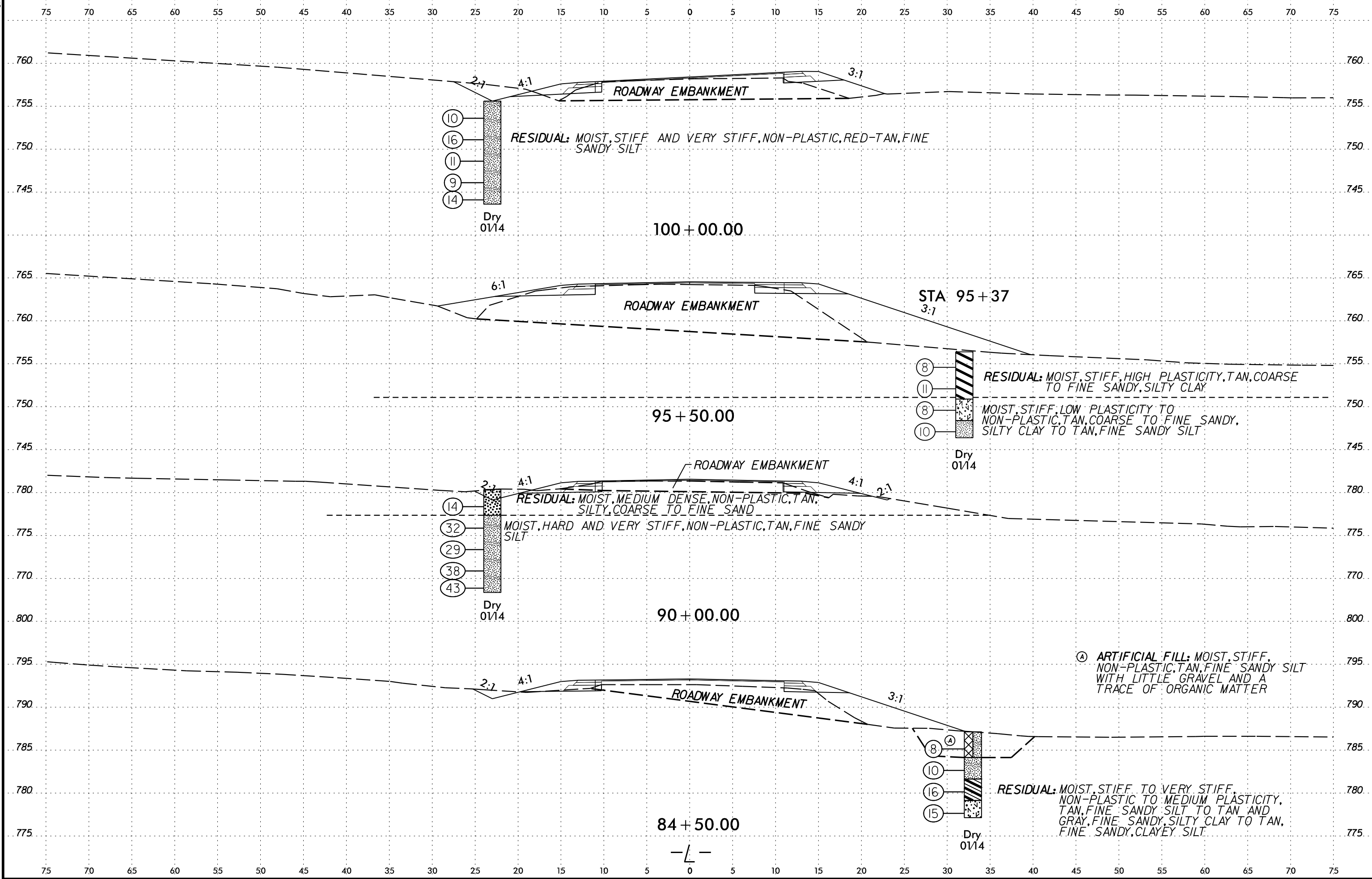
50+00.00

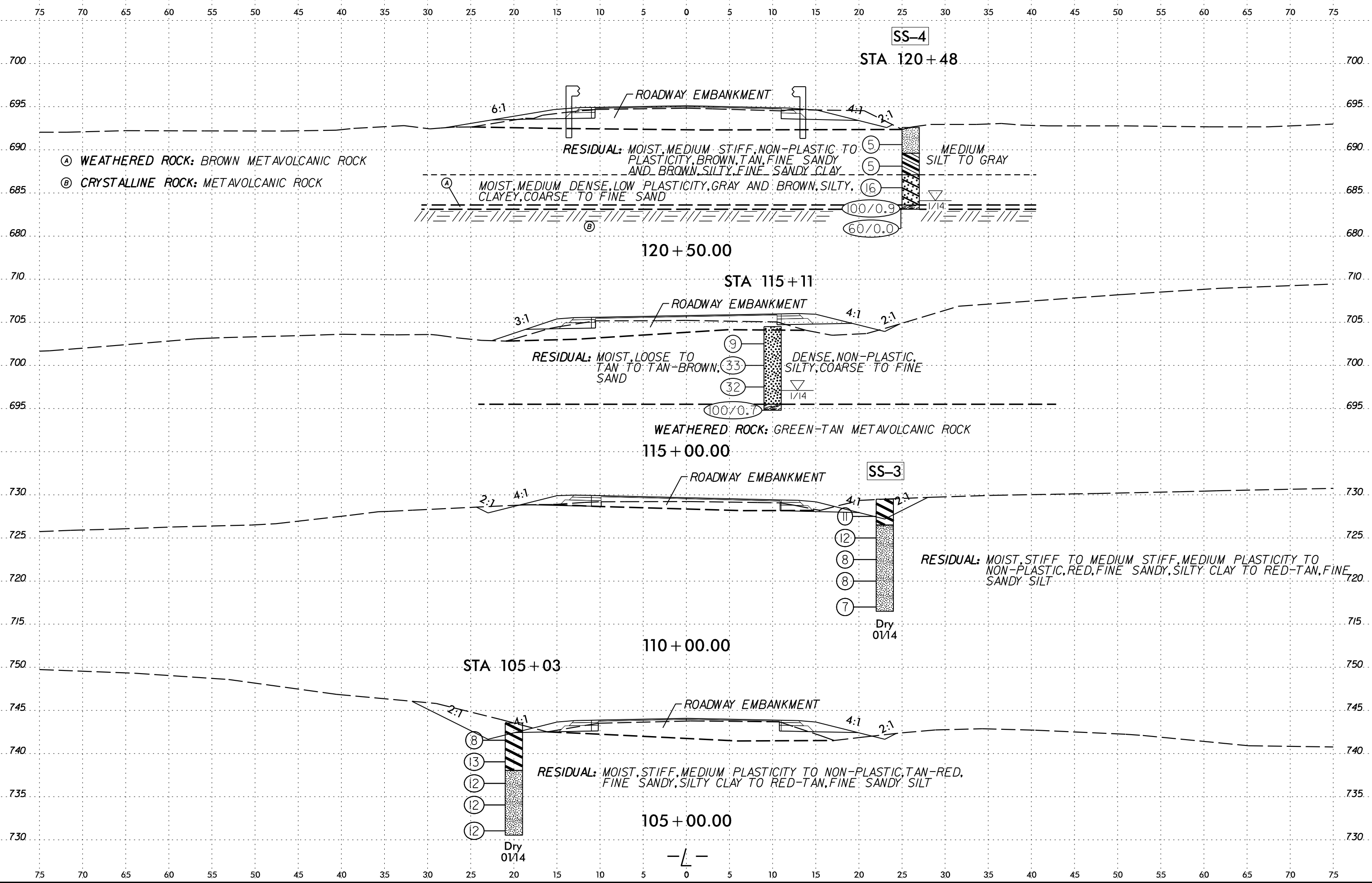


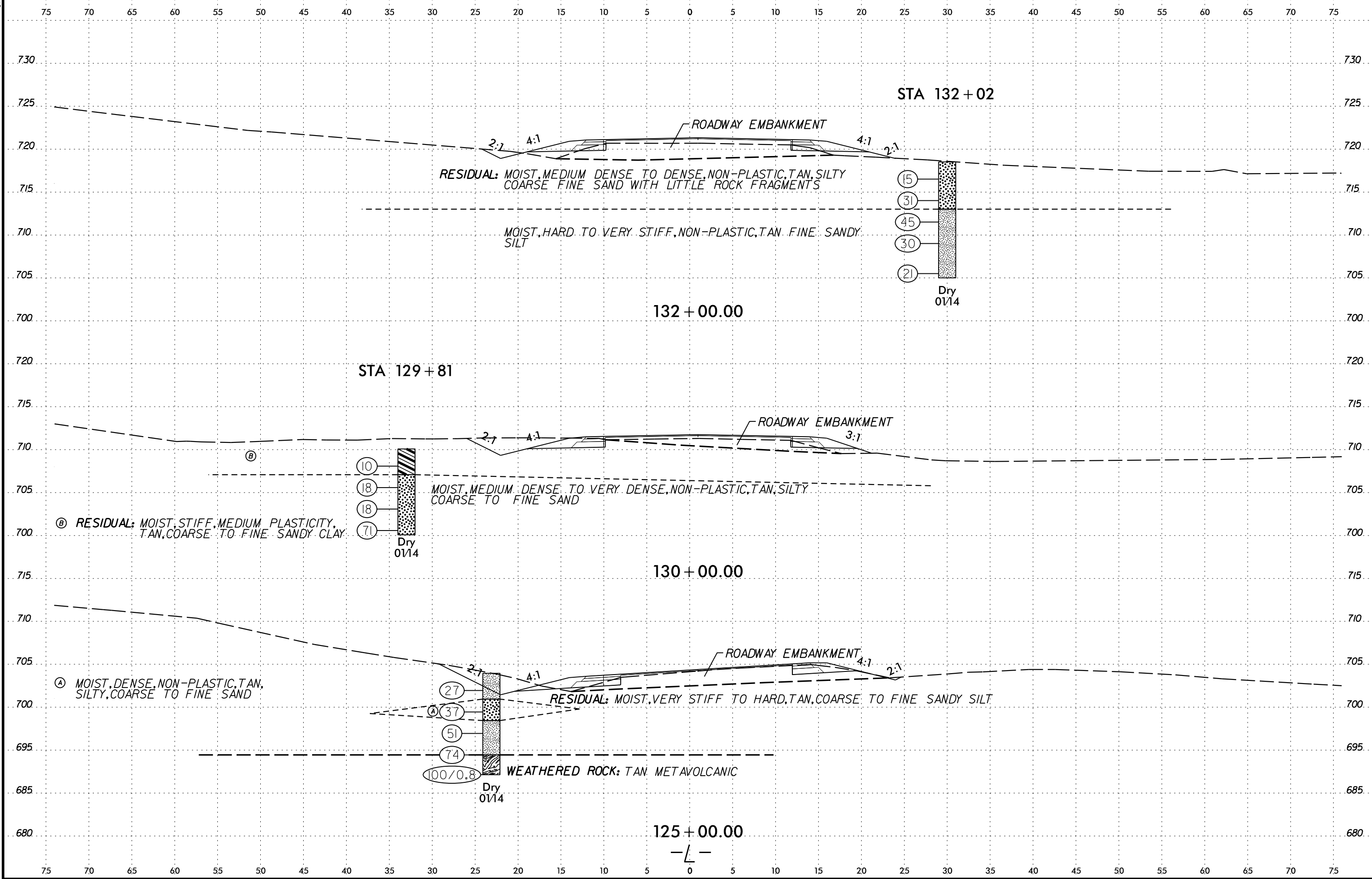


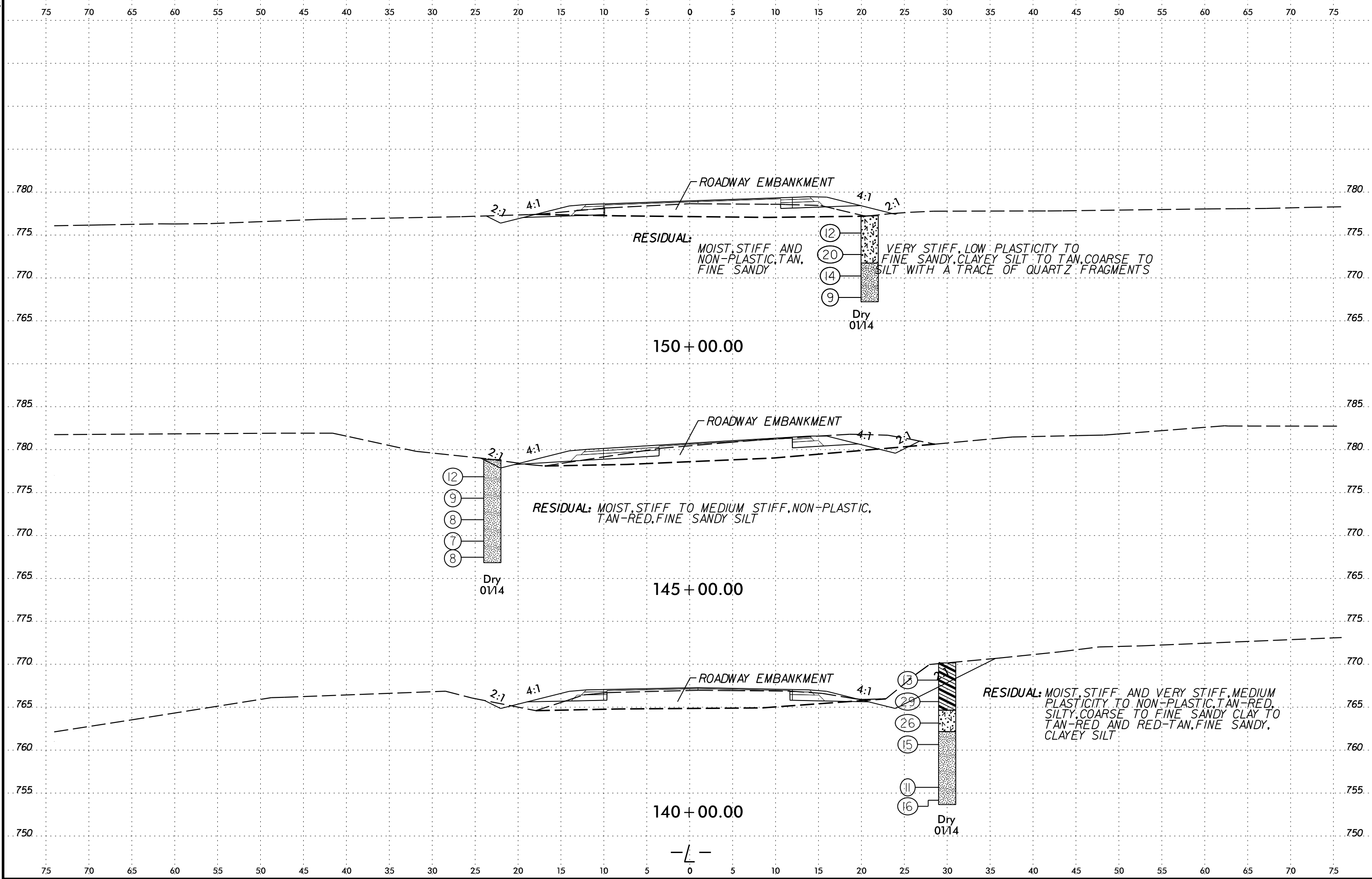


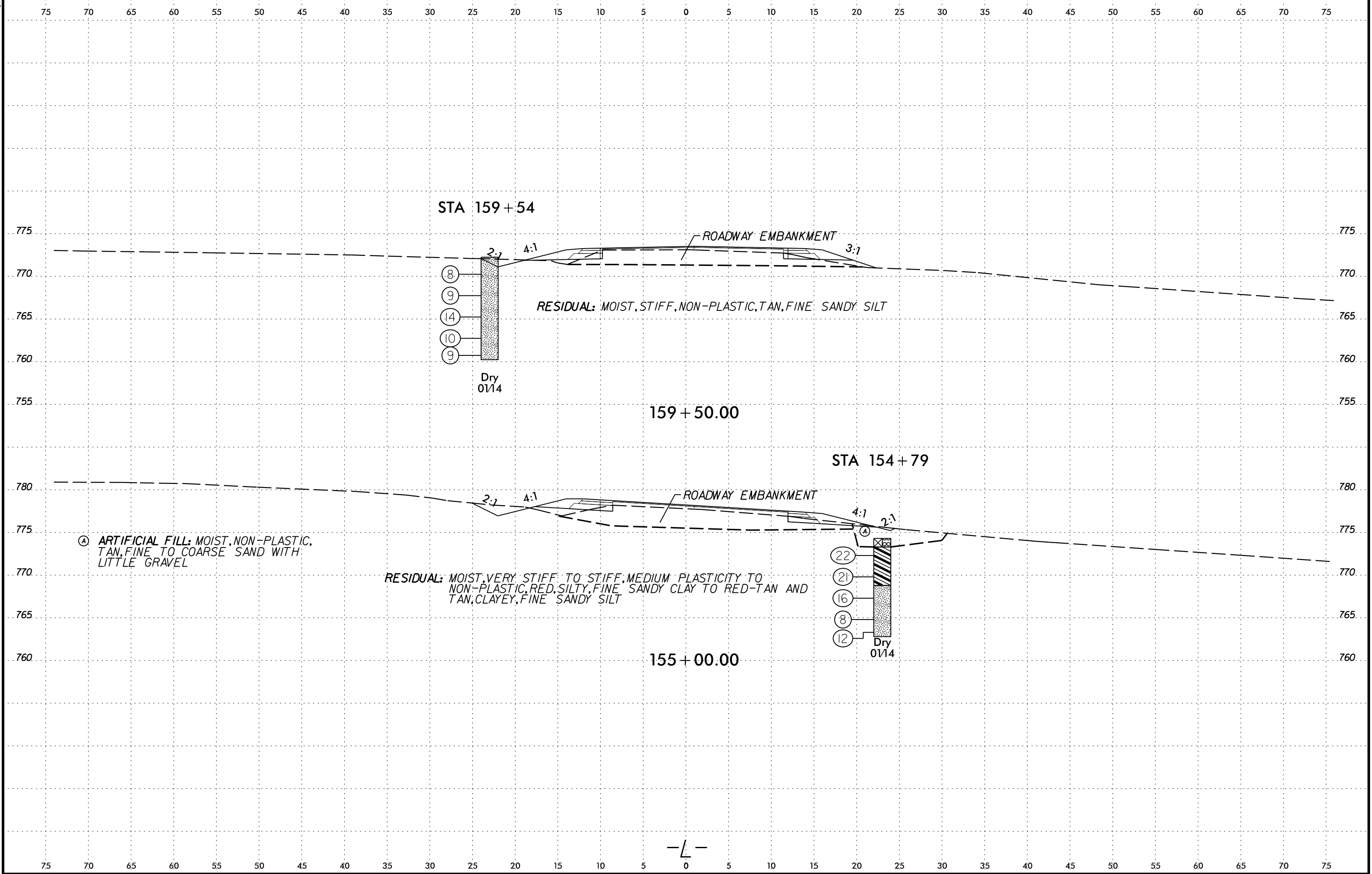












STA 159+54

ROADWAY EMBANKMENT

RESIDUAL: MOIST, STIFF, NON-PLASTIC, TAN, FINE SANDY SILT

- 8
- 9
- 14
- 10
- 9

Dry 01/14

159+50.00

STA 154+79

ROADWAY EMBANKMENT

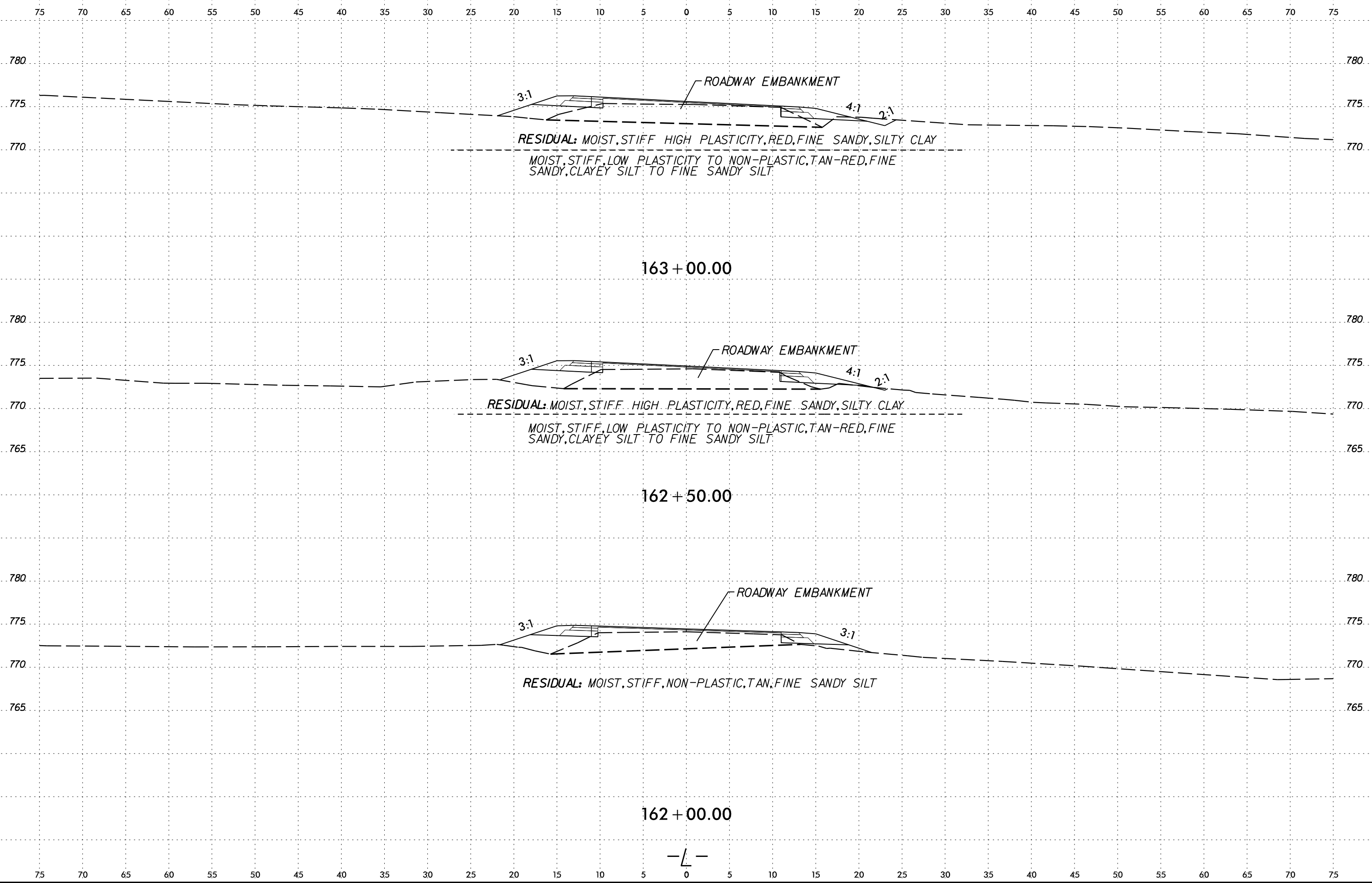
RESIDUAL: MOIST, VERY STIFF TO STIFF, MEDIUM PLASTICITY TO NON-PLASTIC, RED, SILTY, FINE SANDY CLAY TO RED-TAN AND TAN, CLAYEY, FINE SANDY SILT

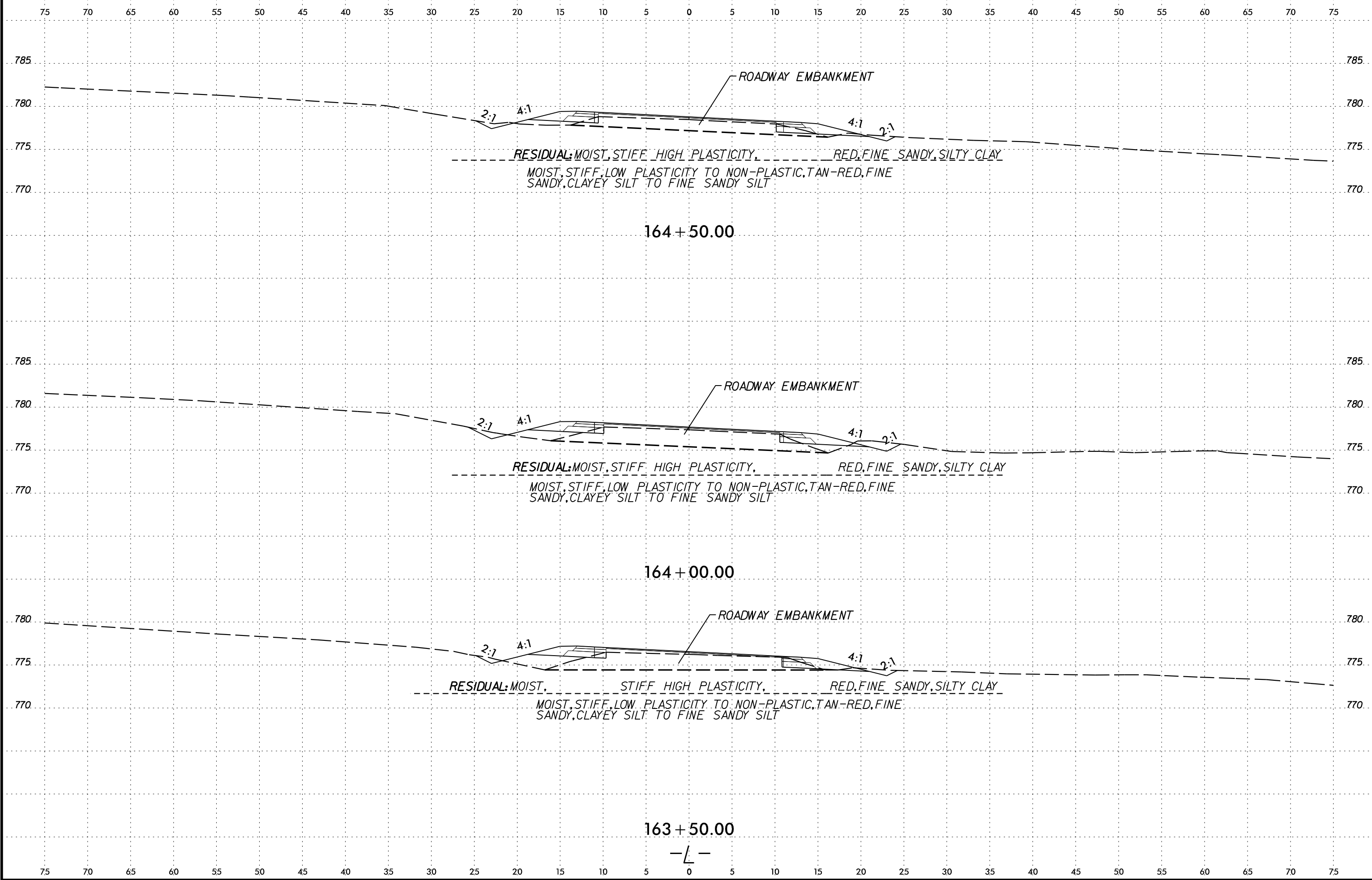
ARTIFICIAL FILL: MOIST, NON-PLASTIC, TAN, FINE TO COARSE SAND WITH LITTLE GRAVEL

- 22
- 21
- 16
- 8
- 12

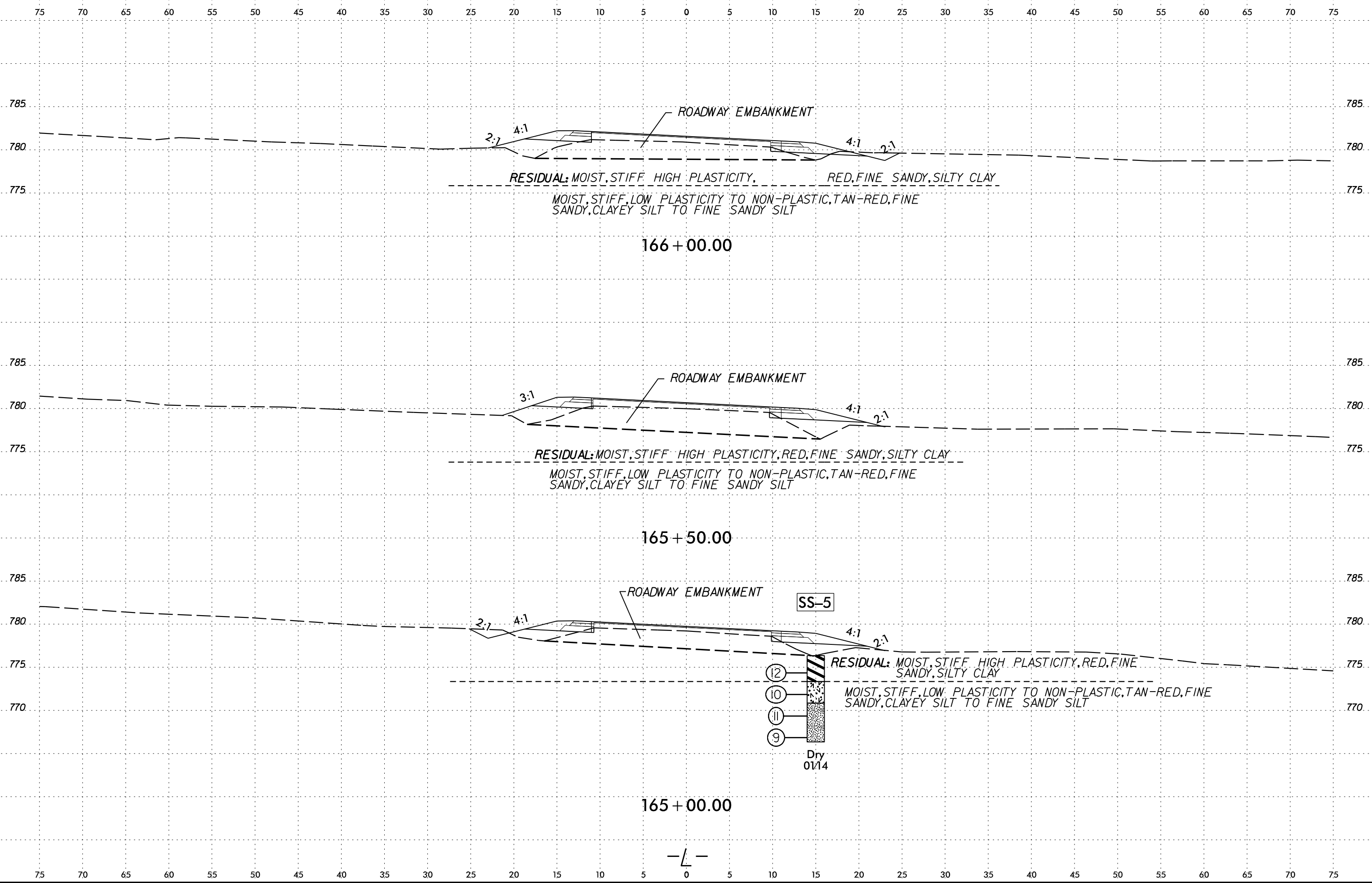
Dry 01/14

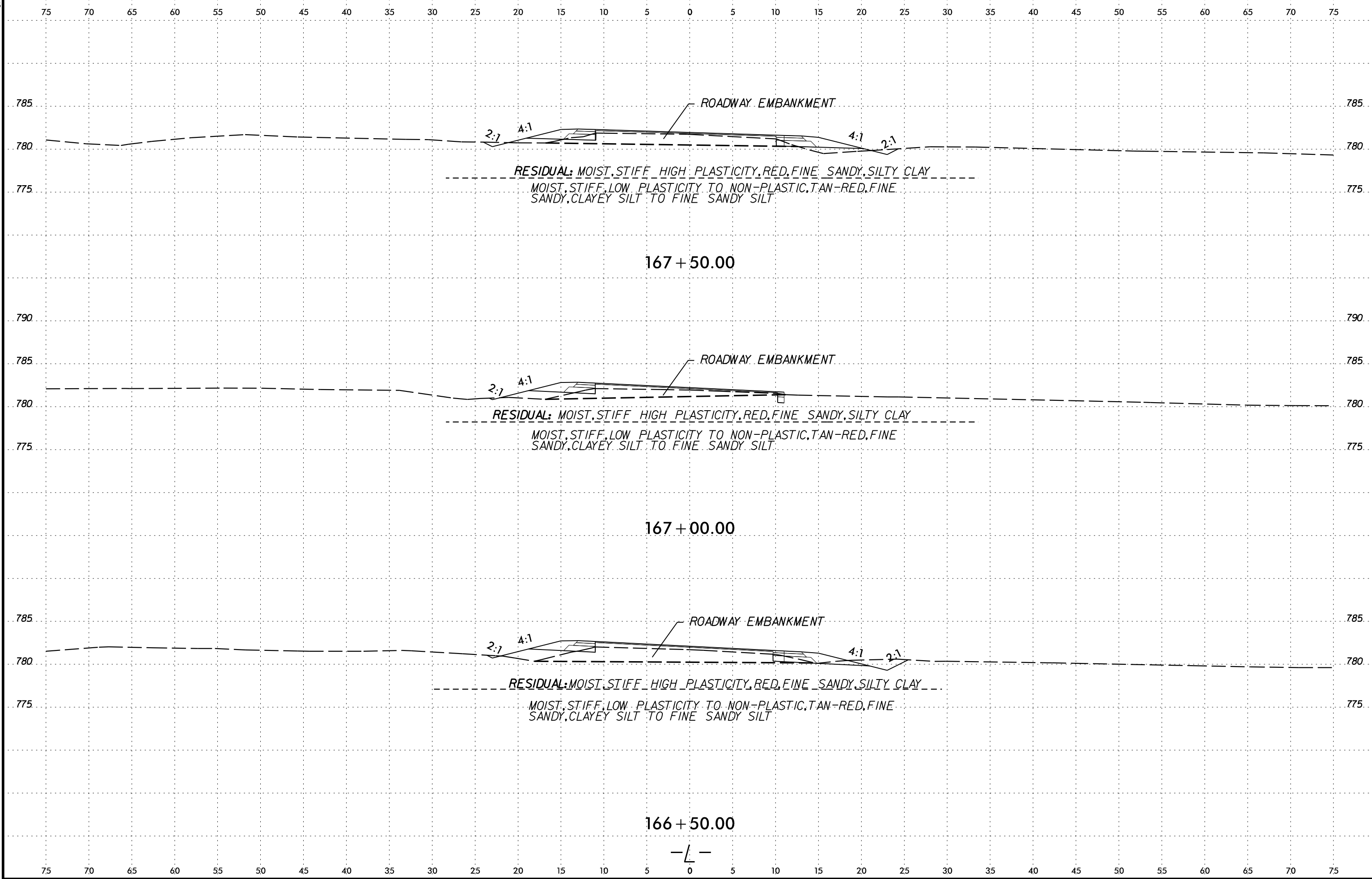
155+00.00



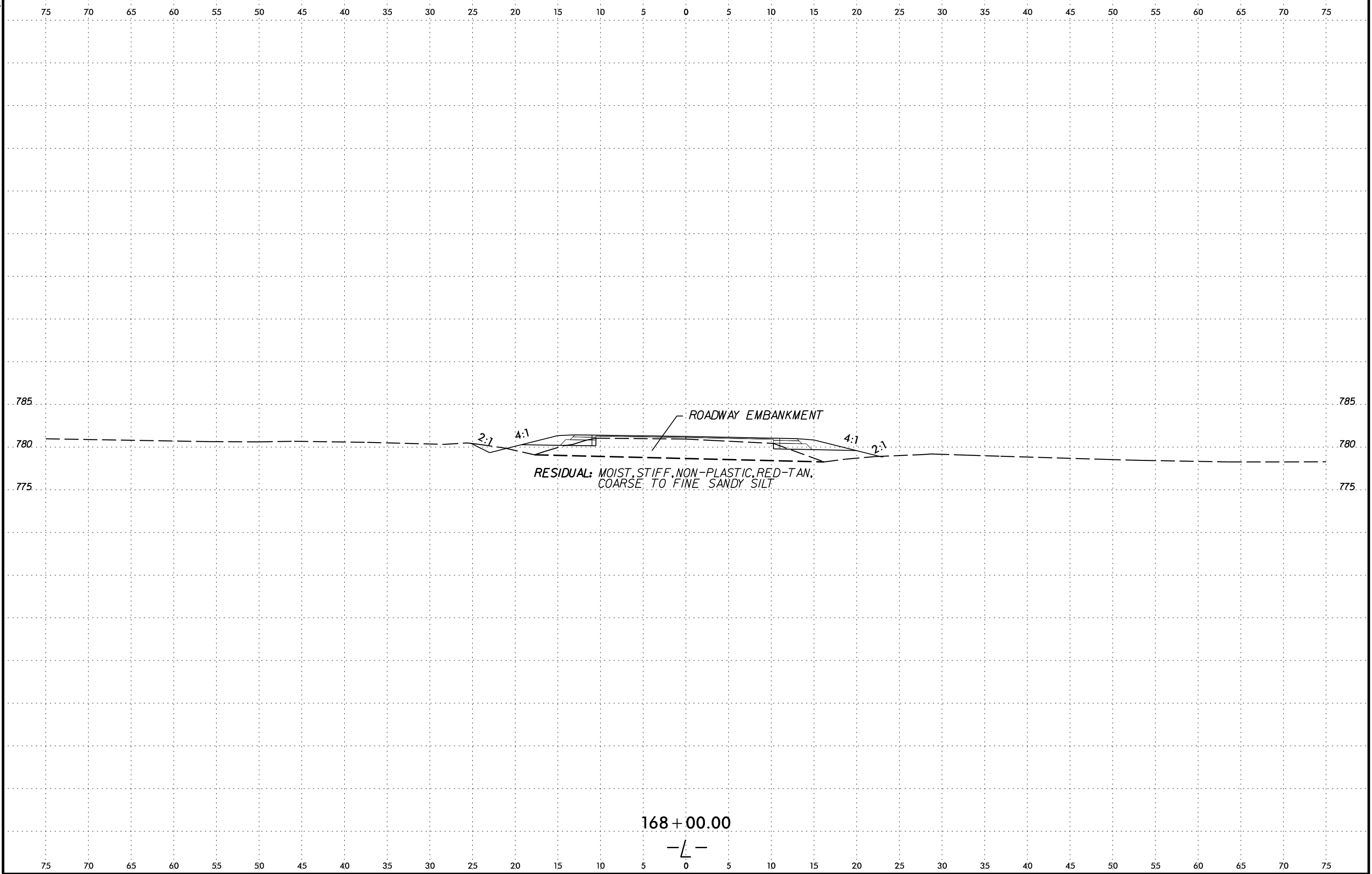


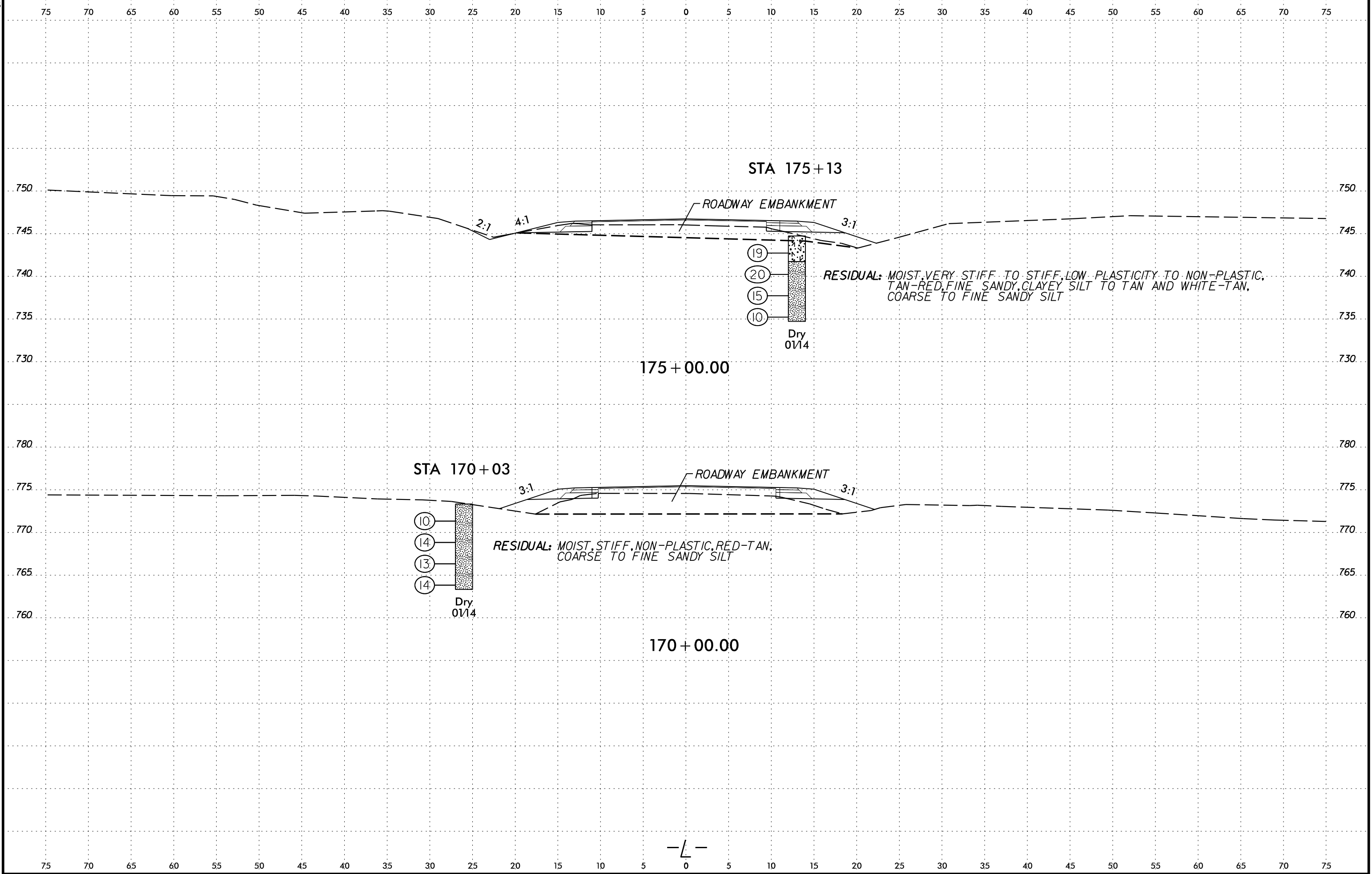


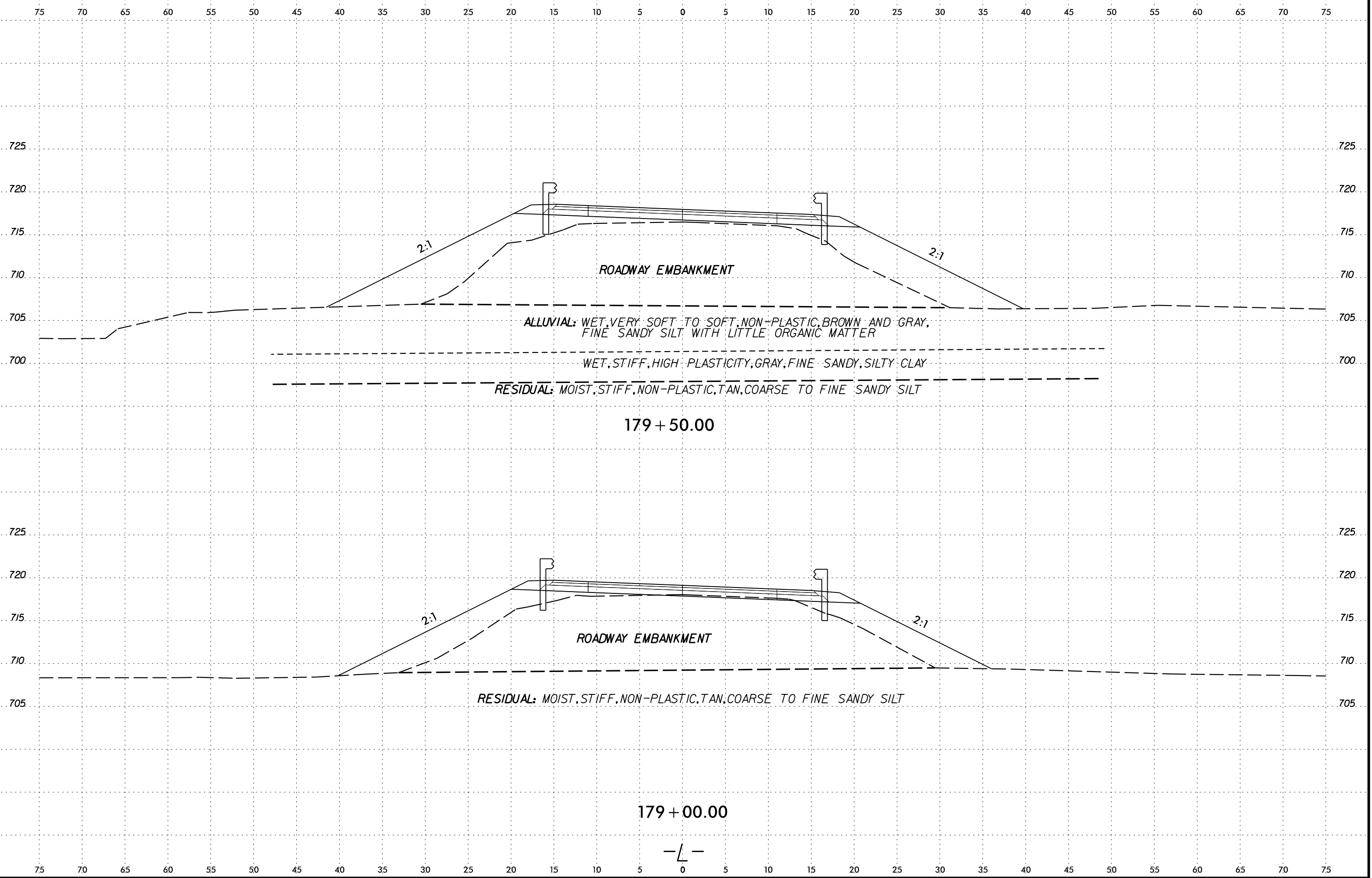


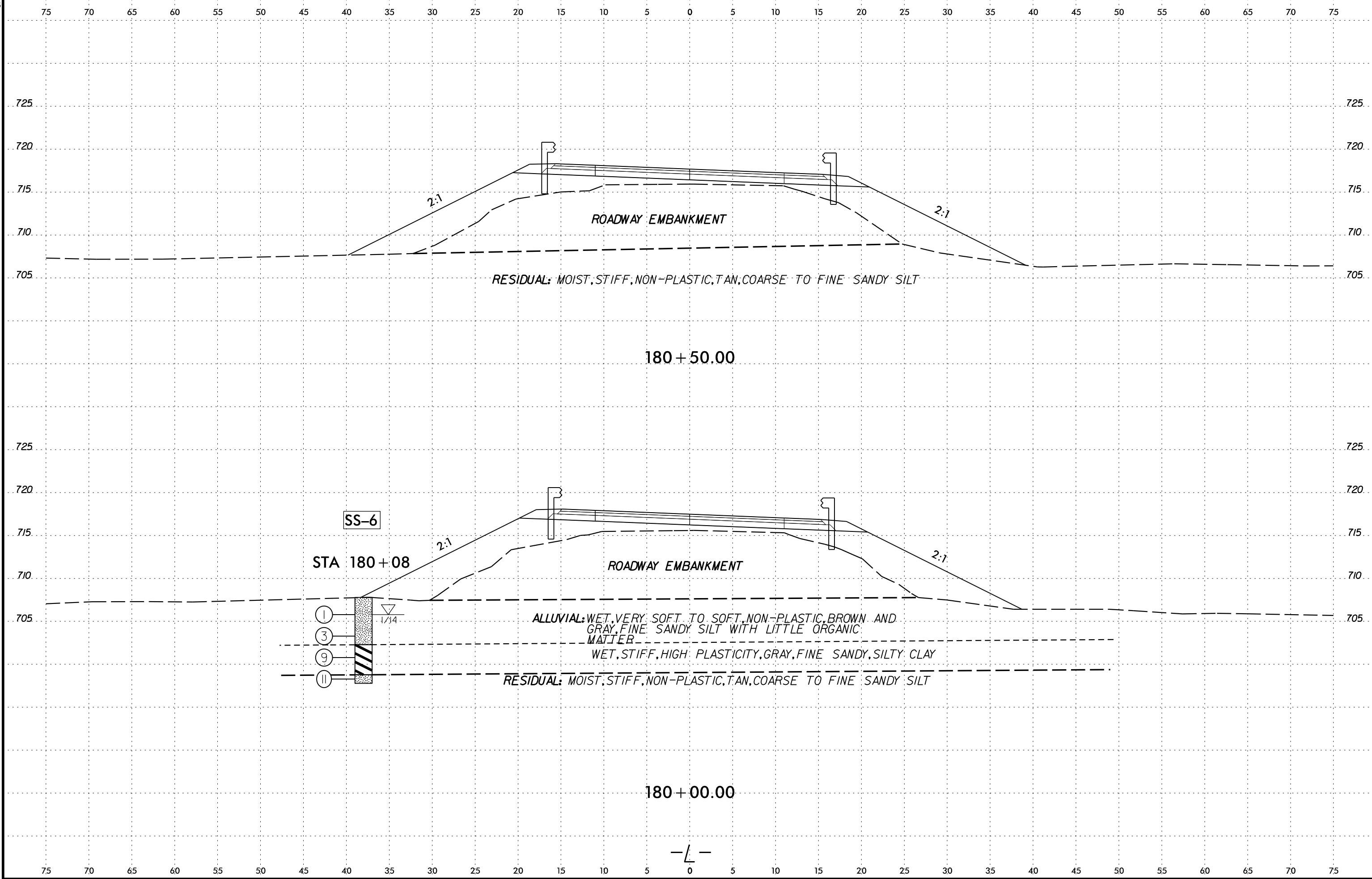


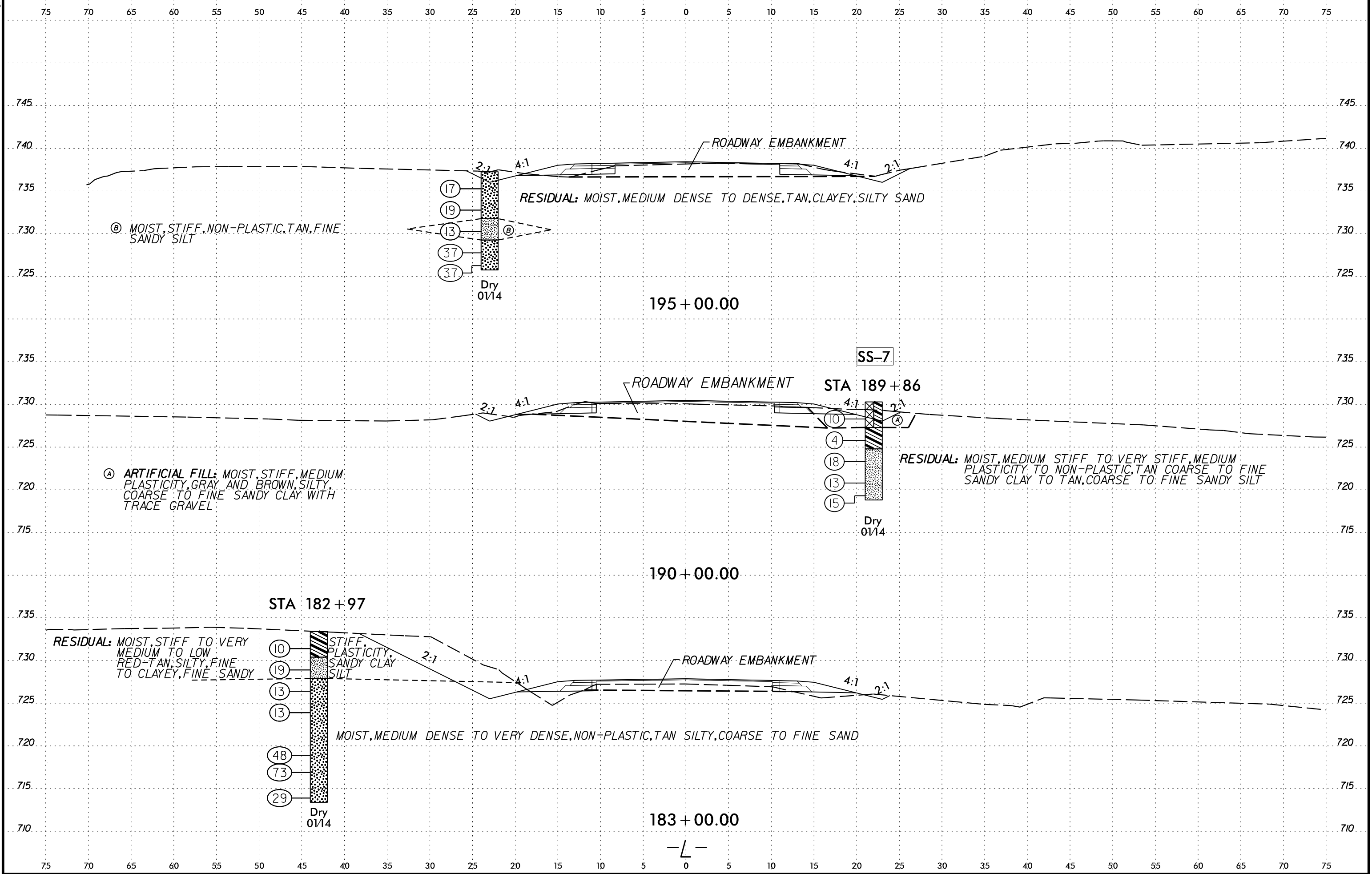
8/23/99

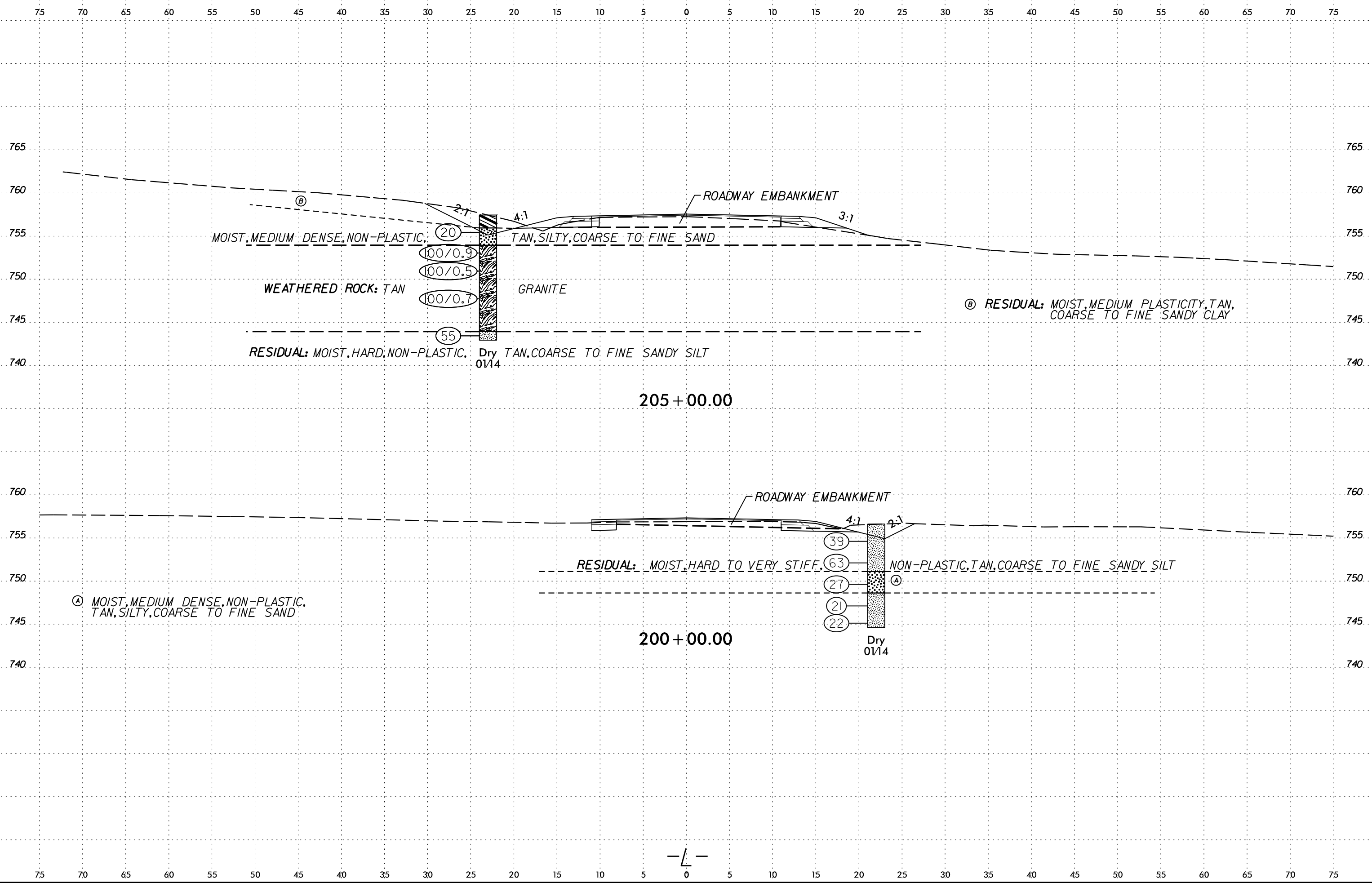




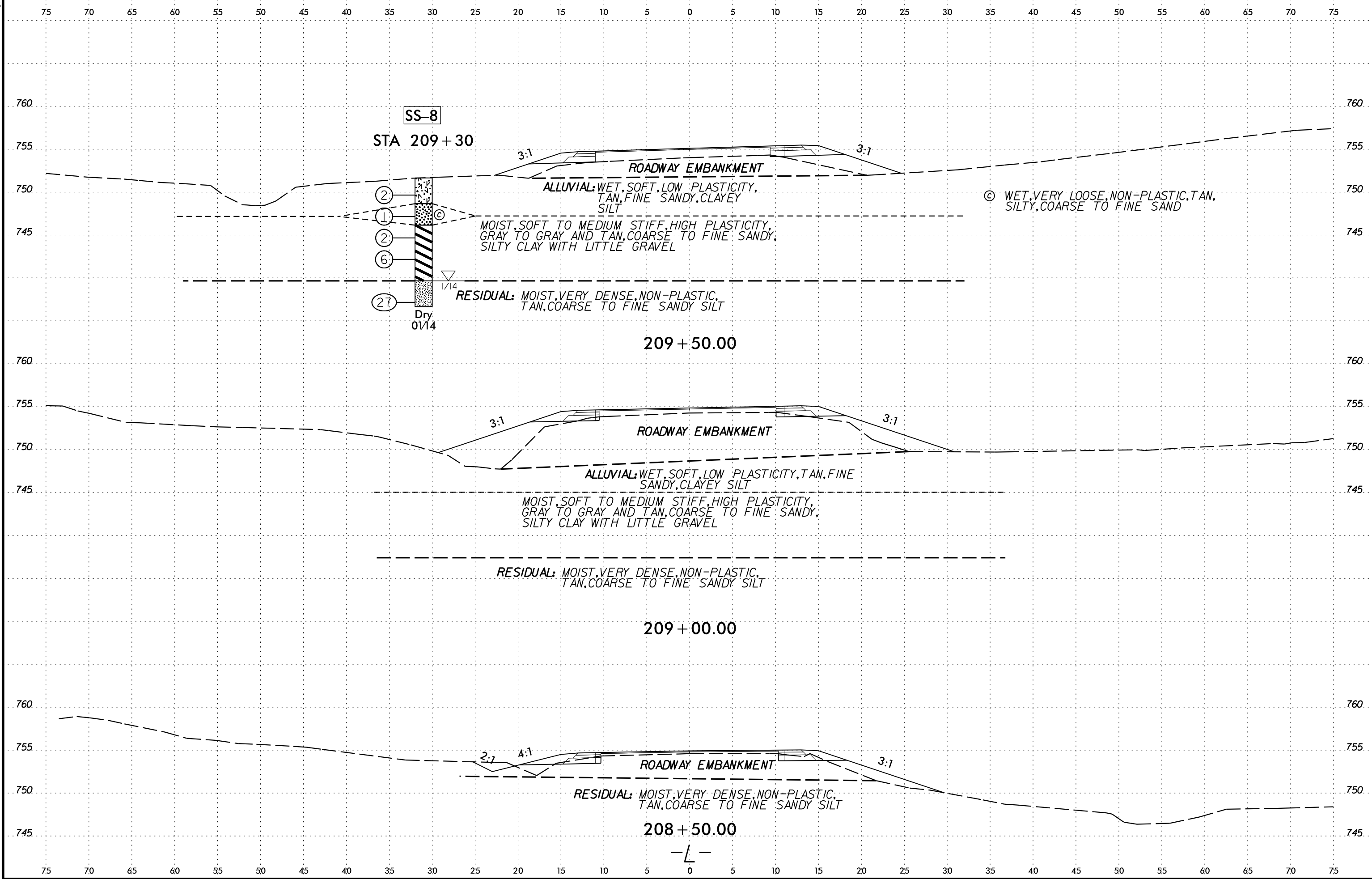


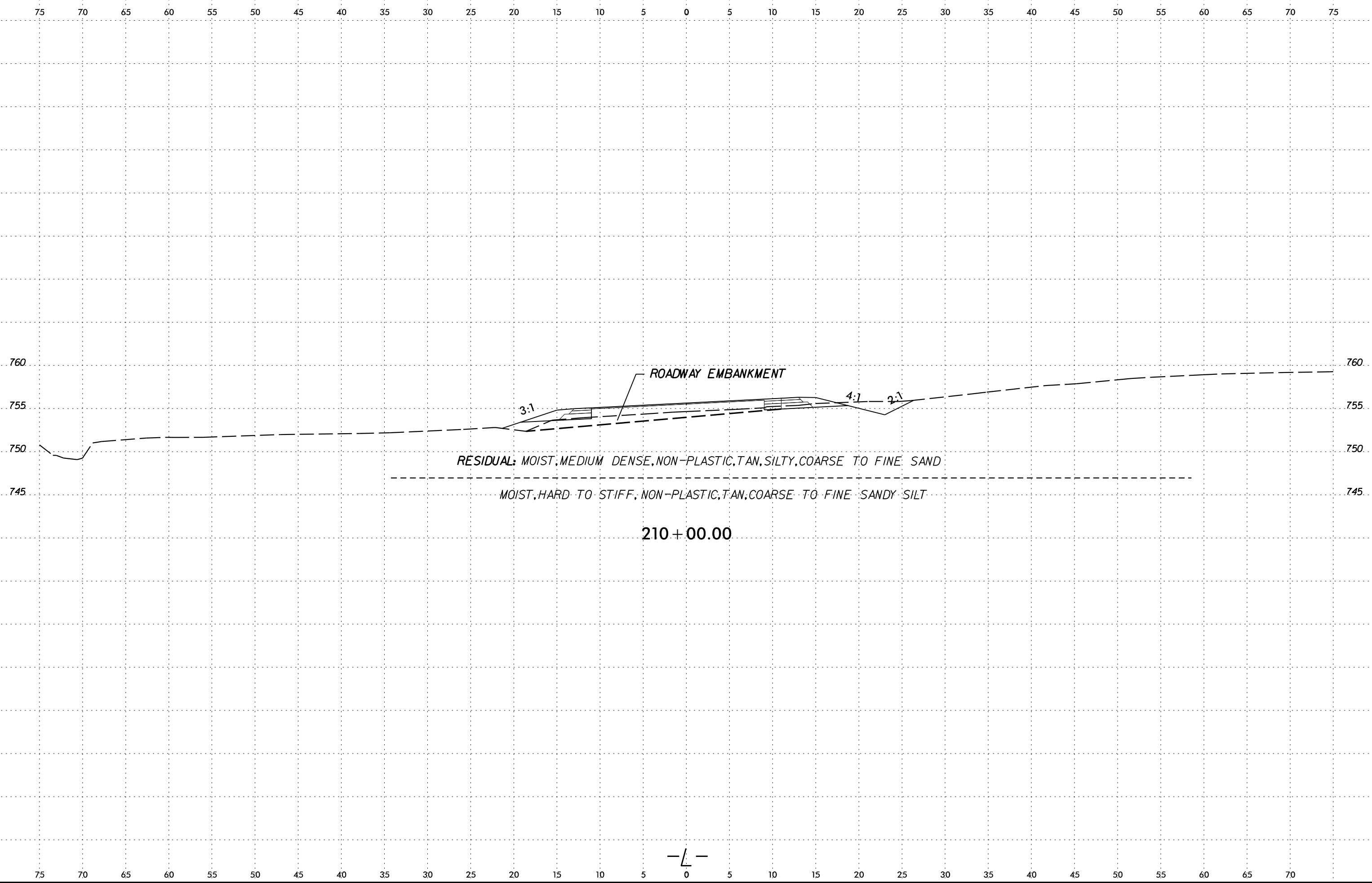




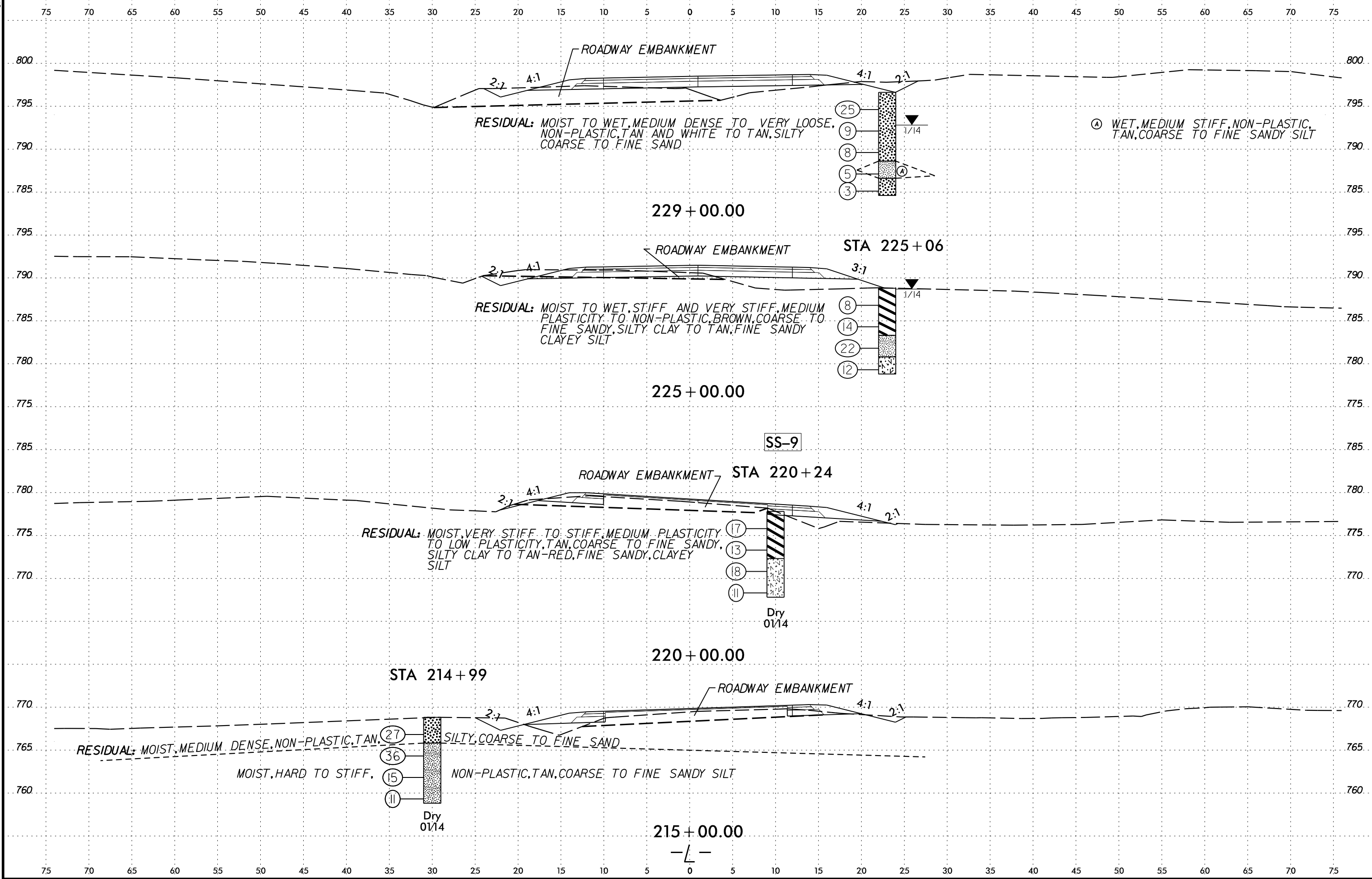


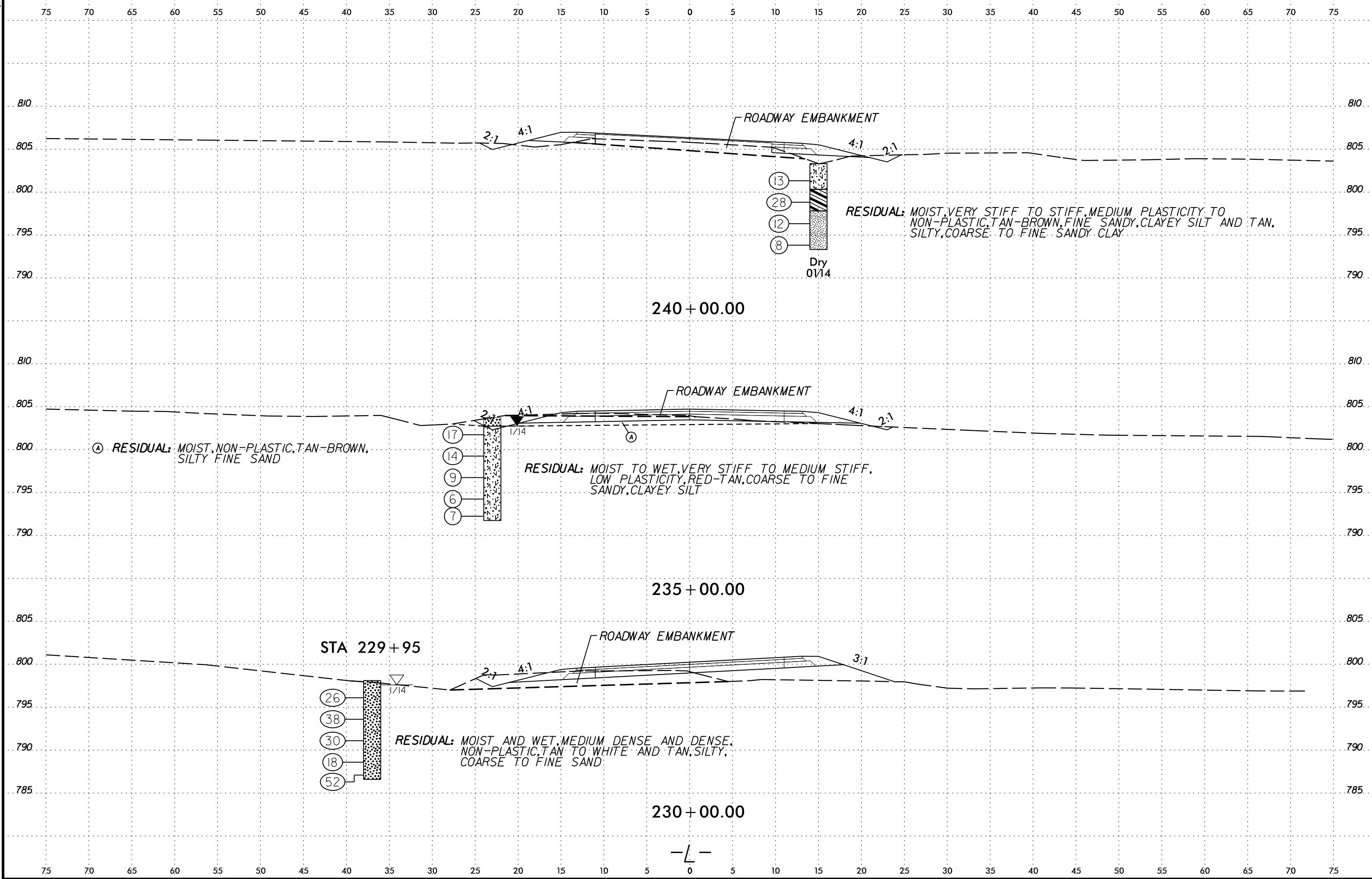


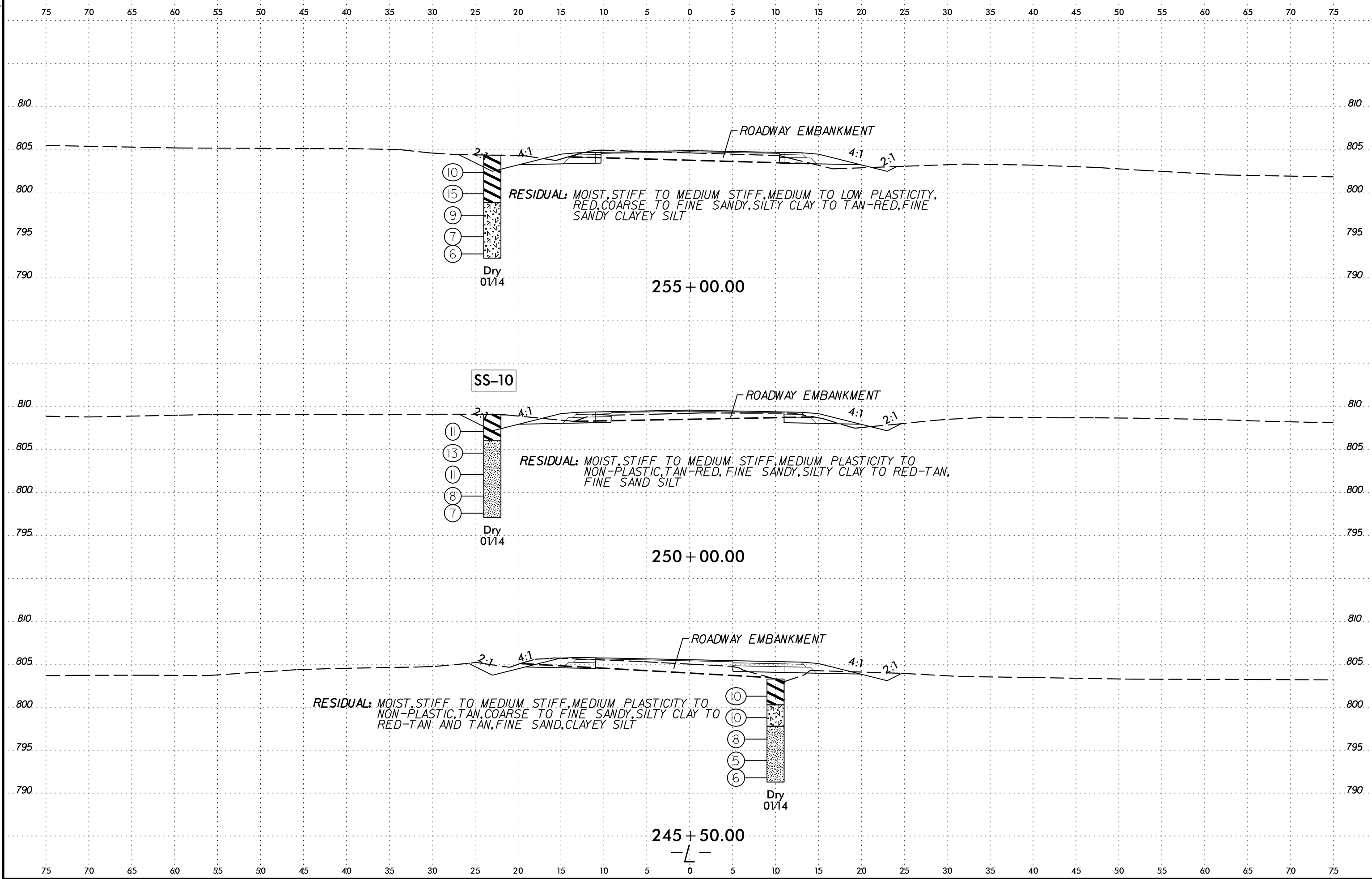


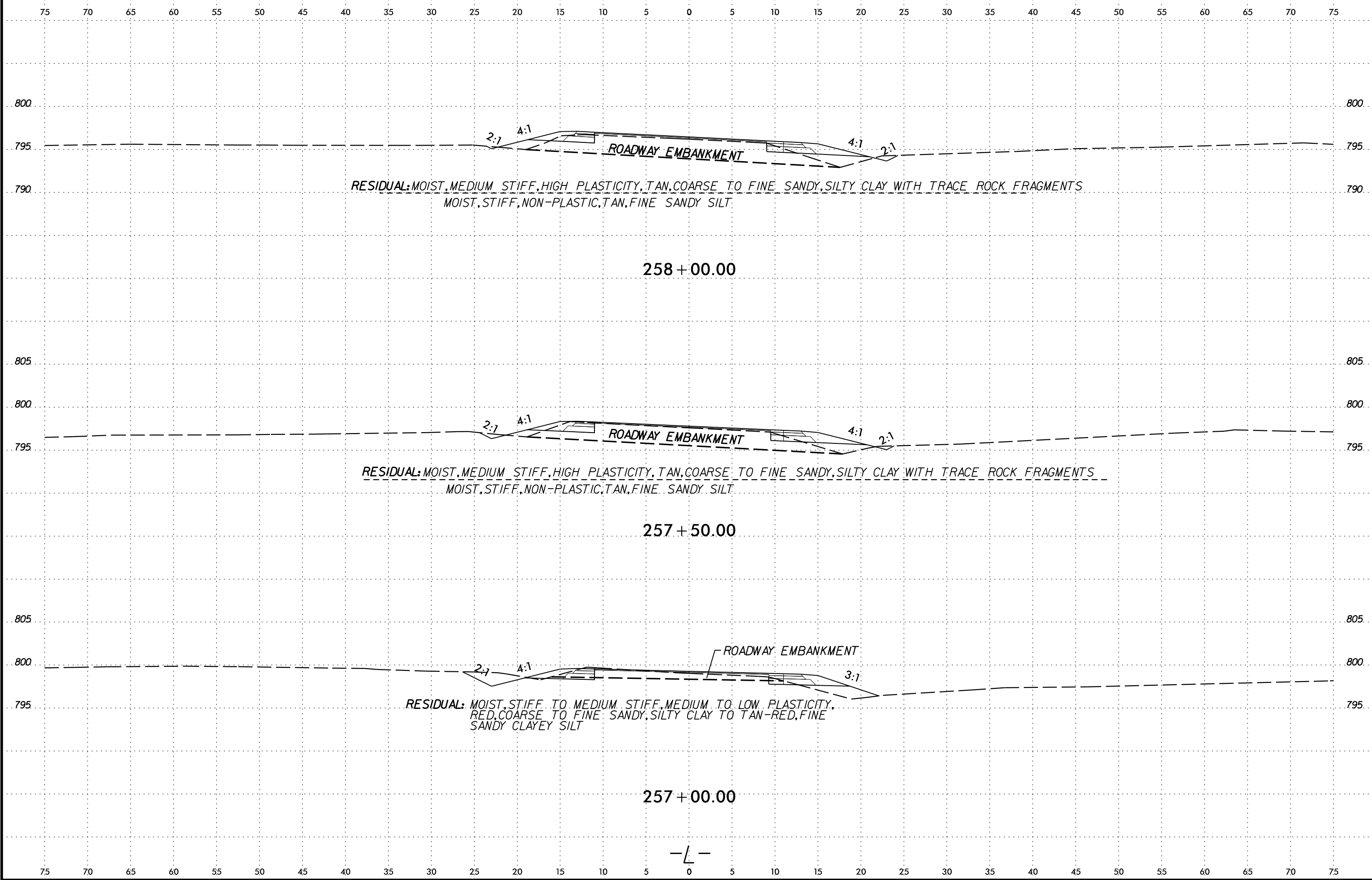


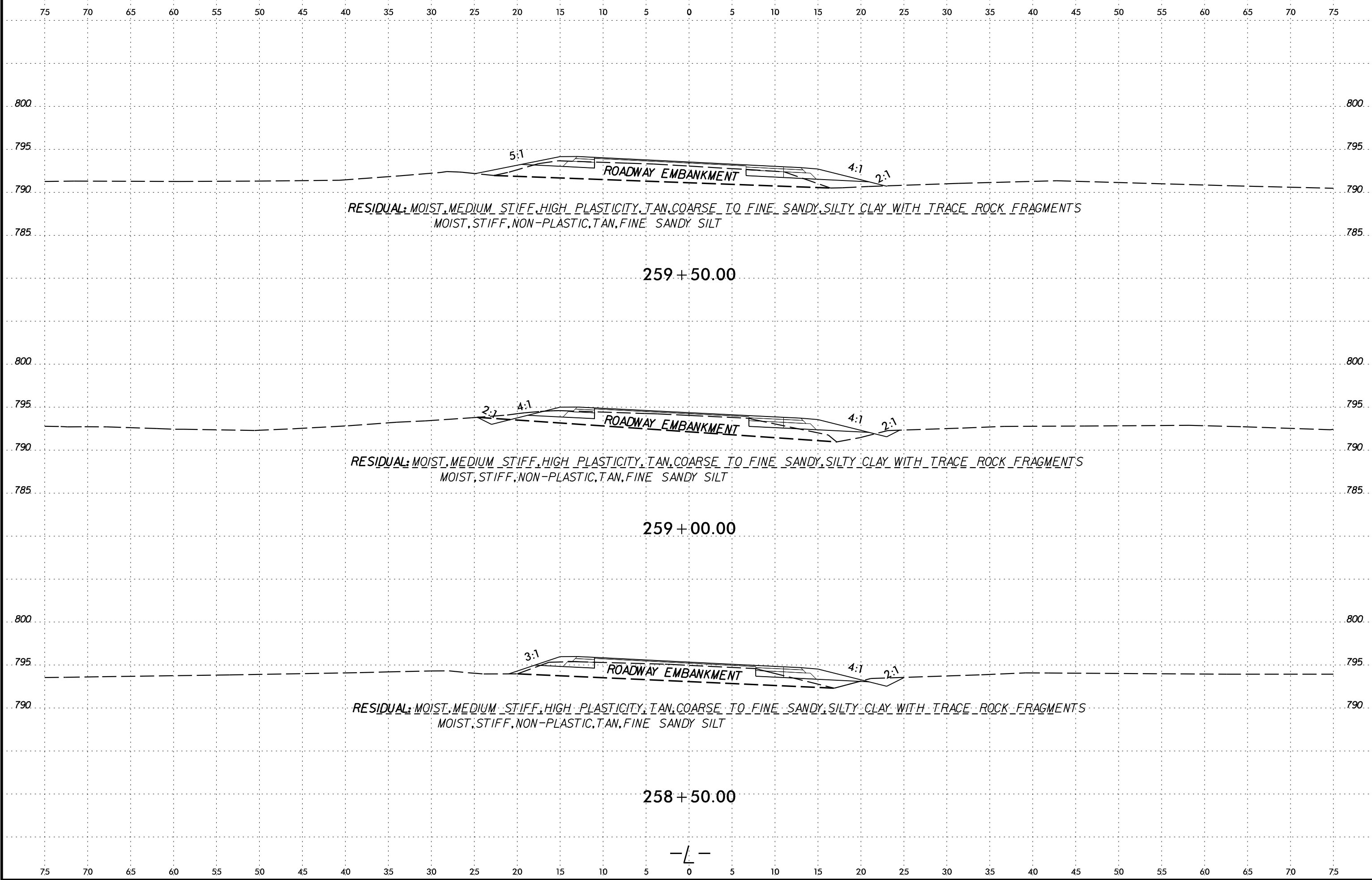
8/23/99

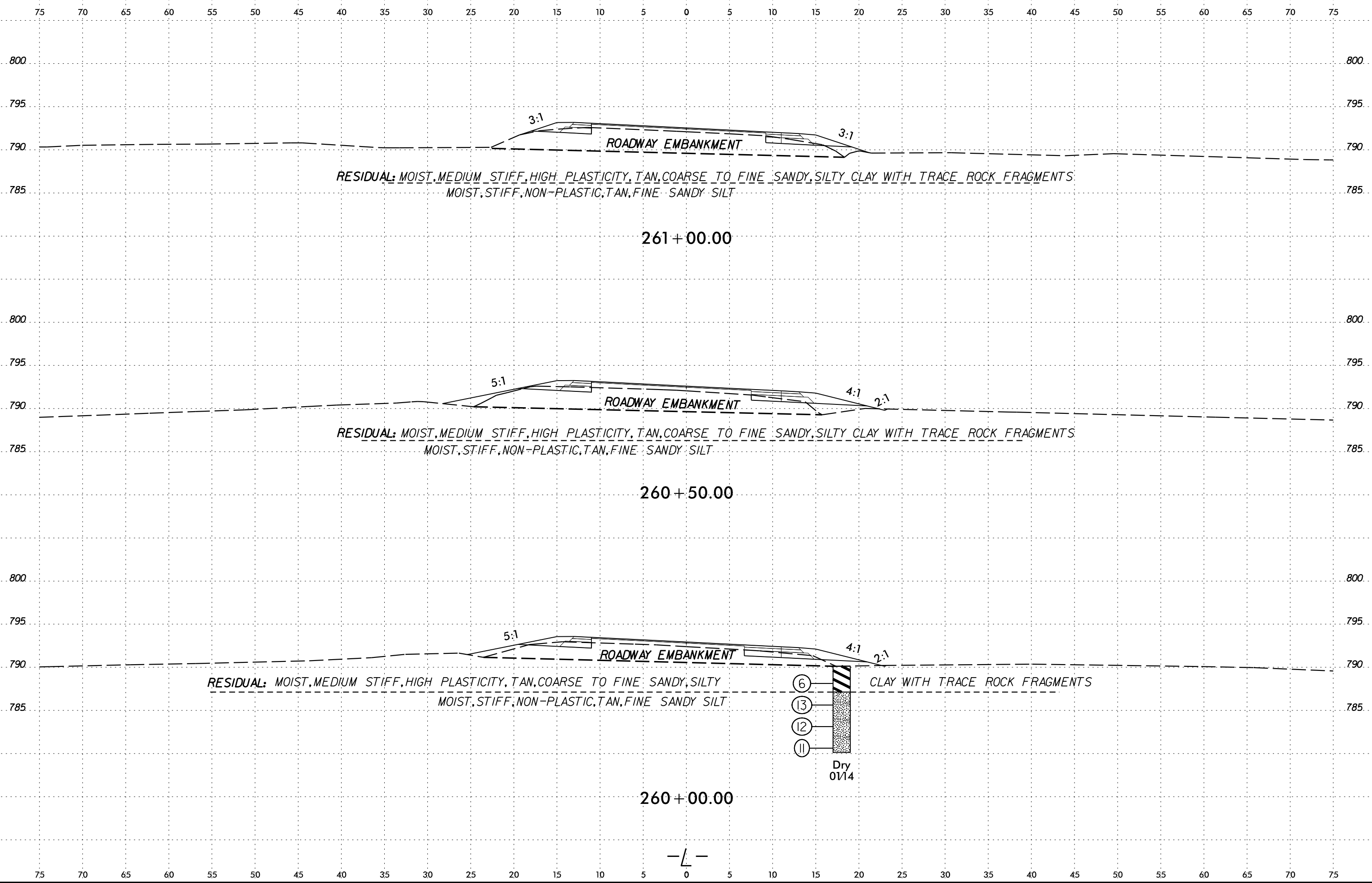




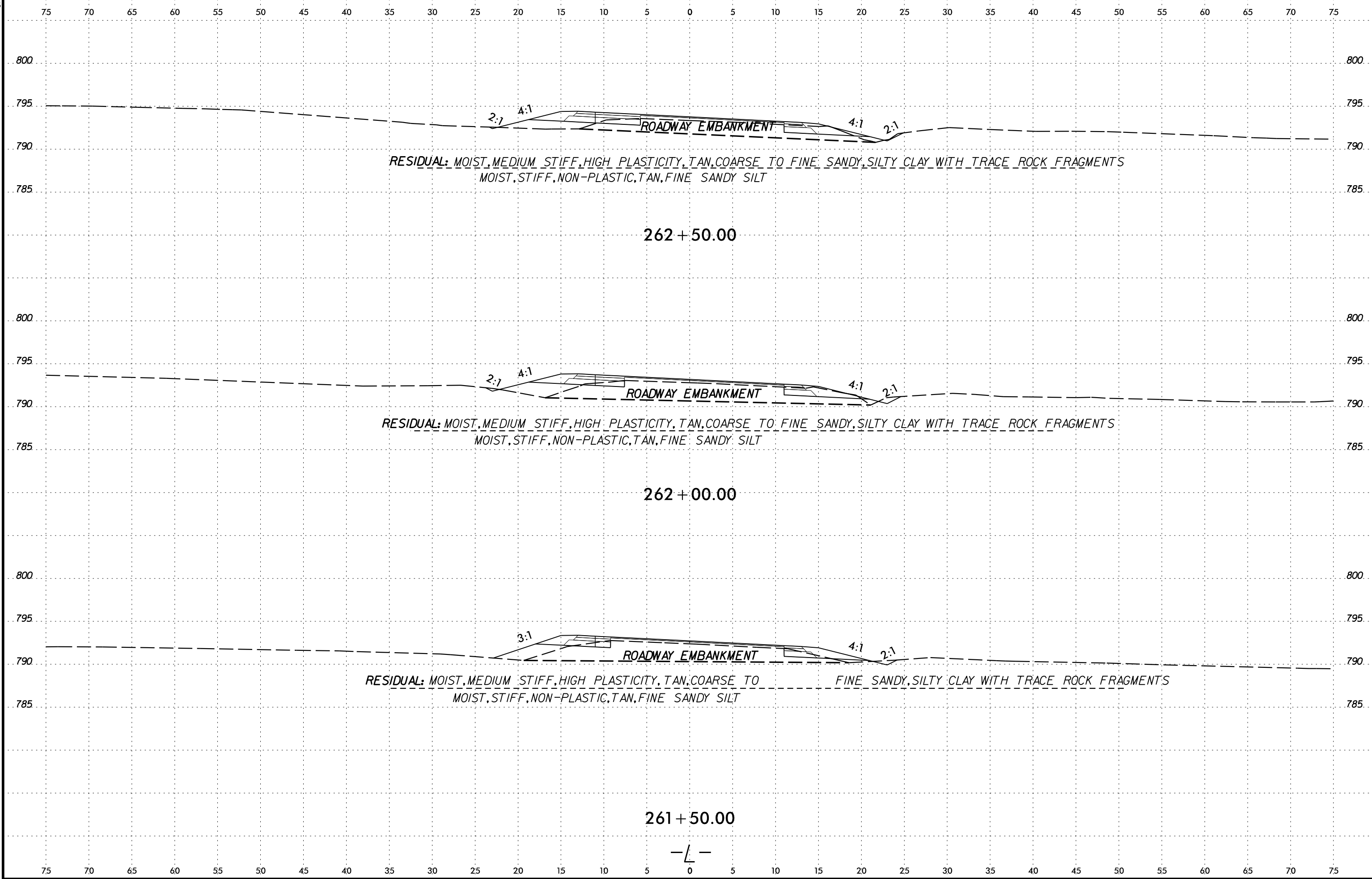


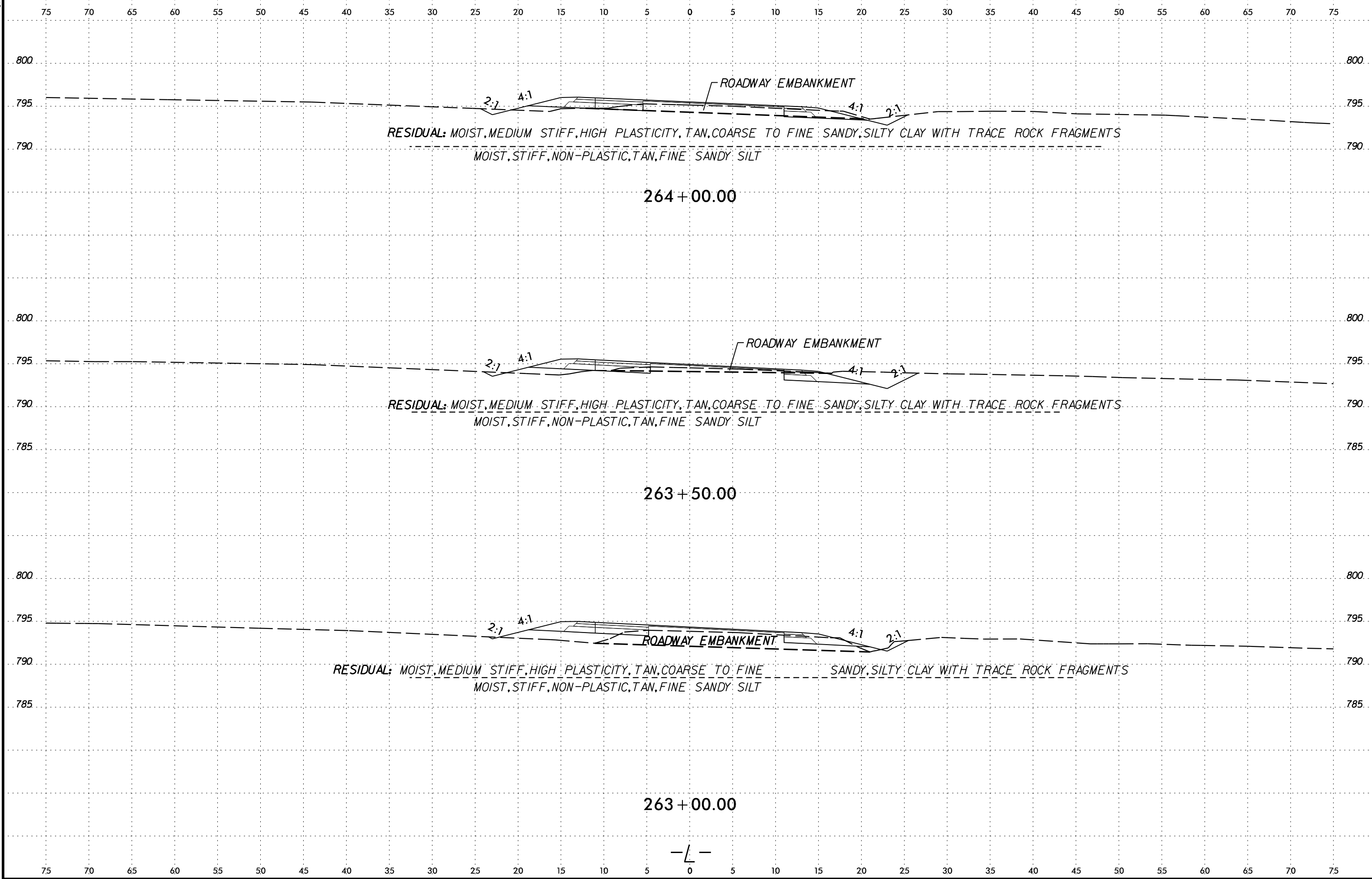


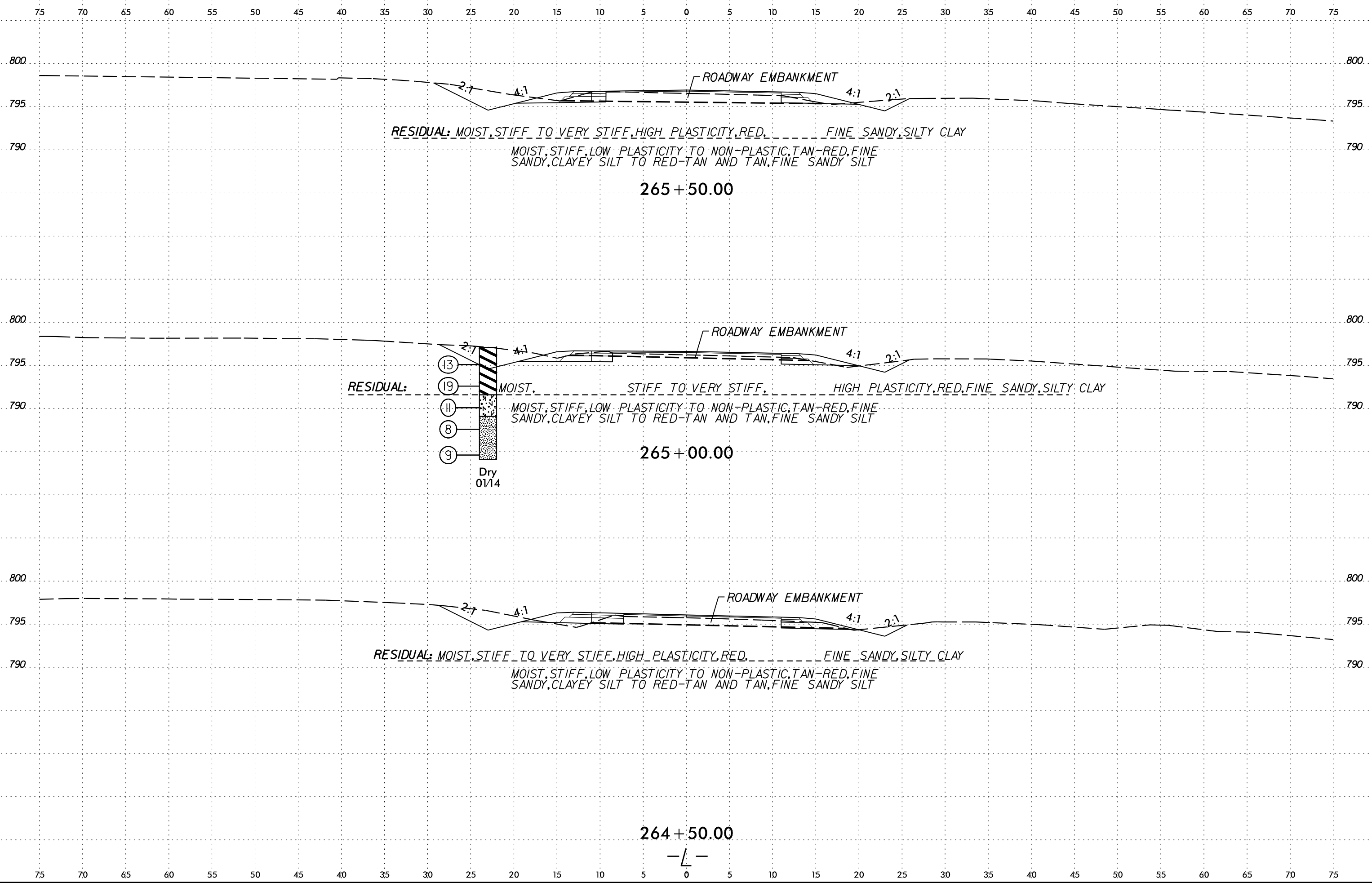


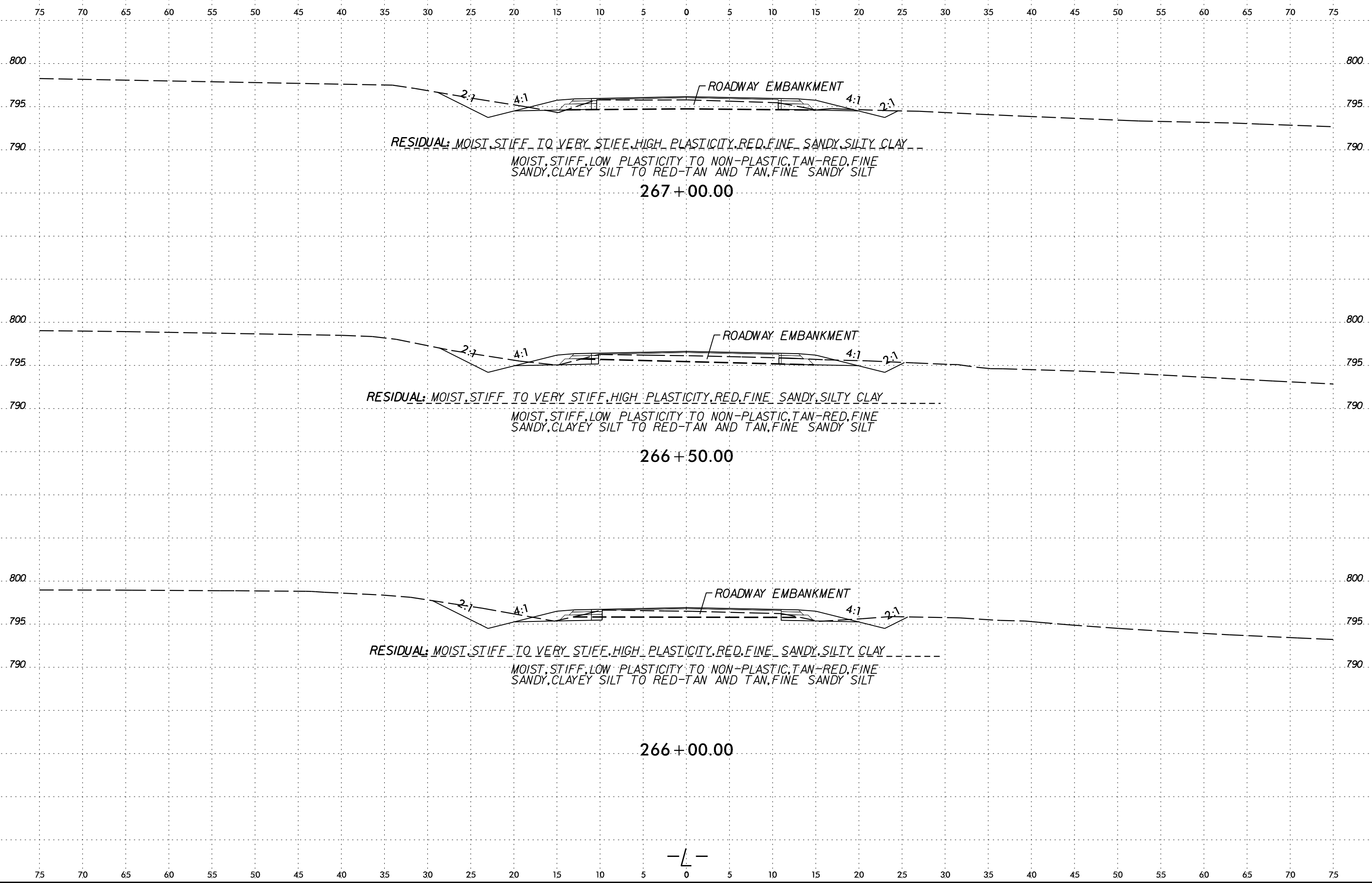


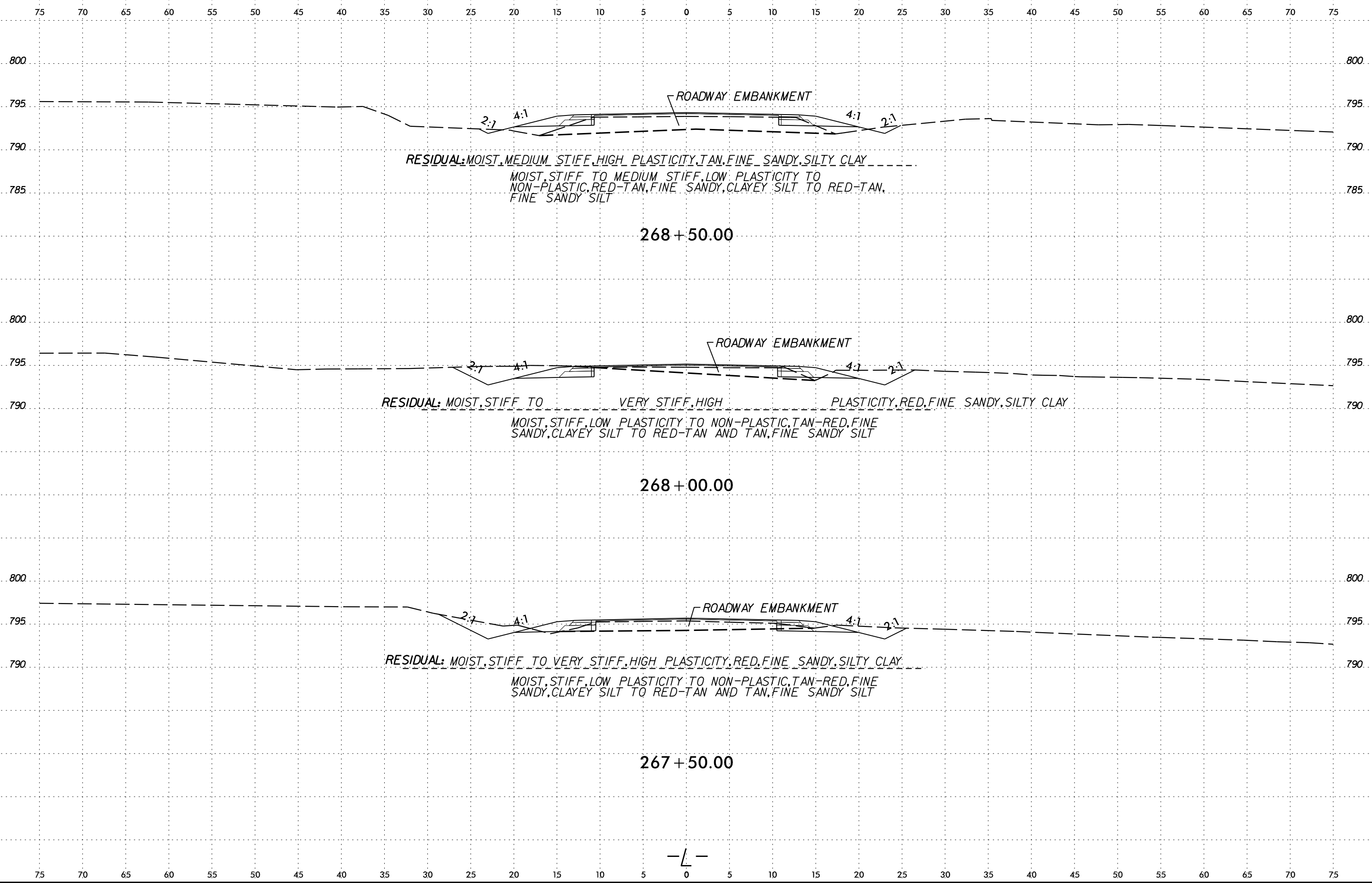


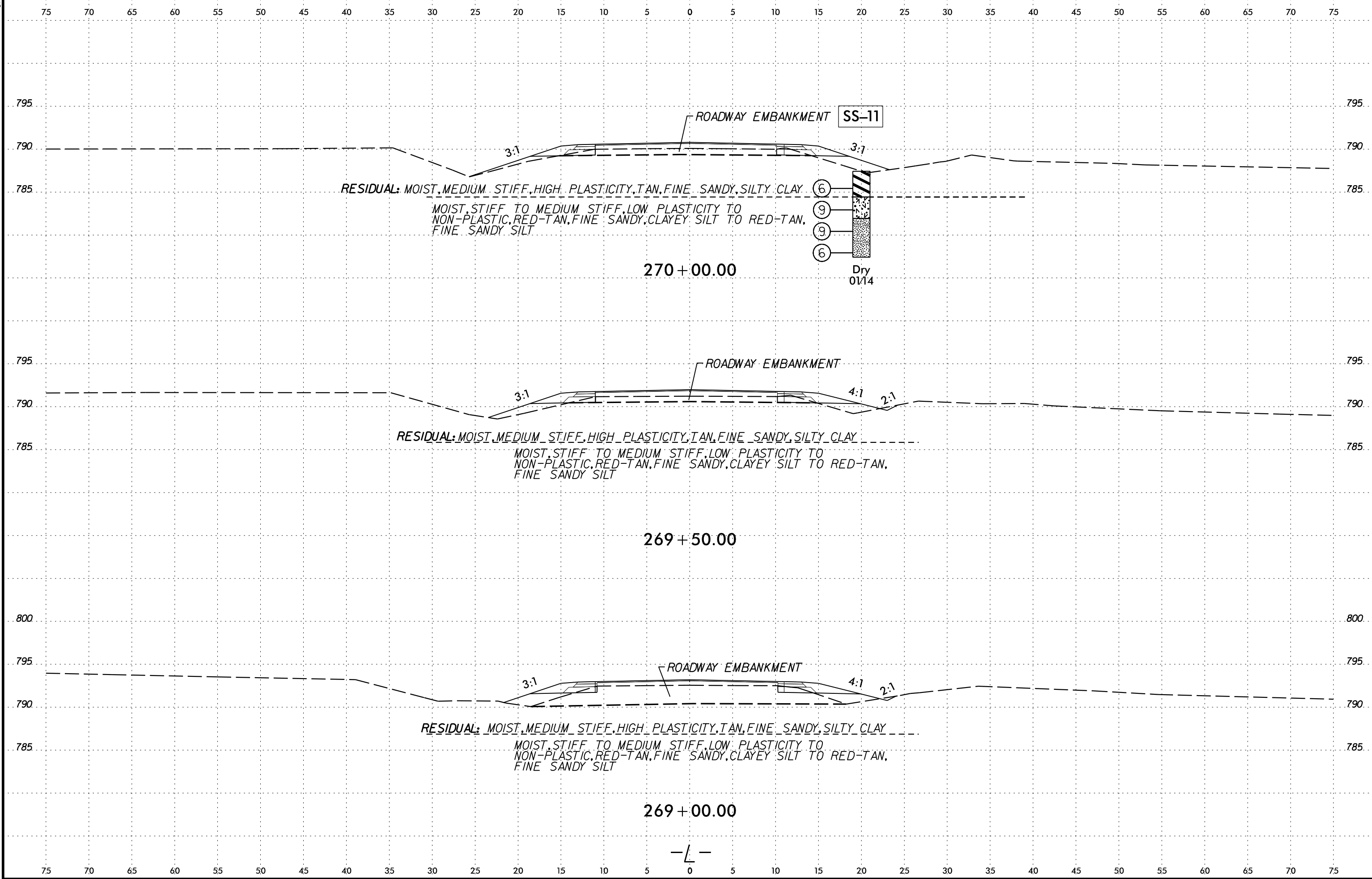


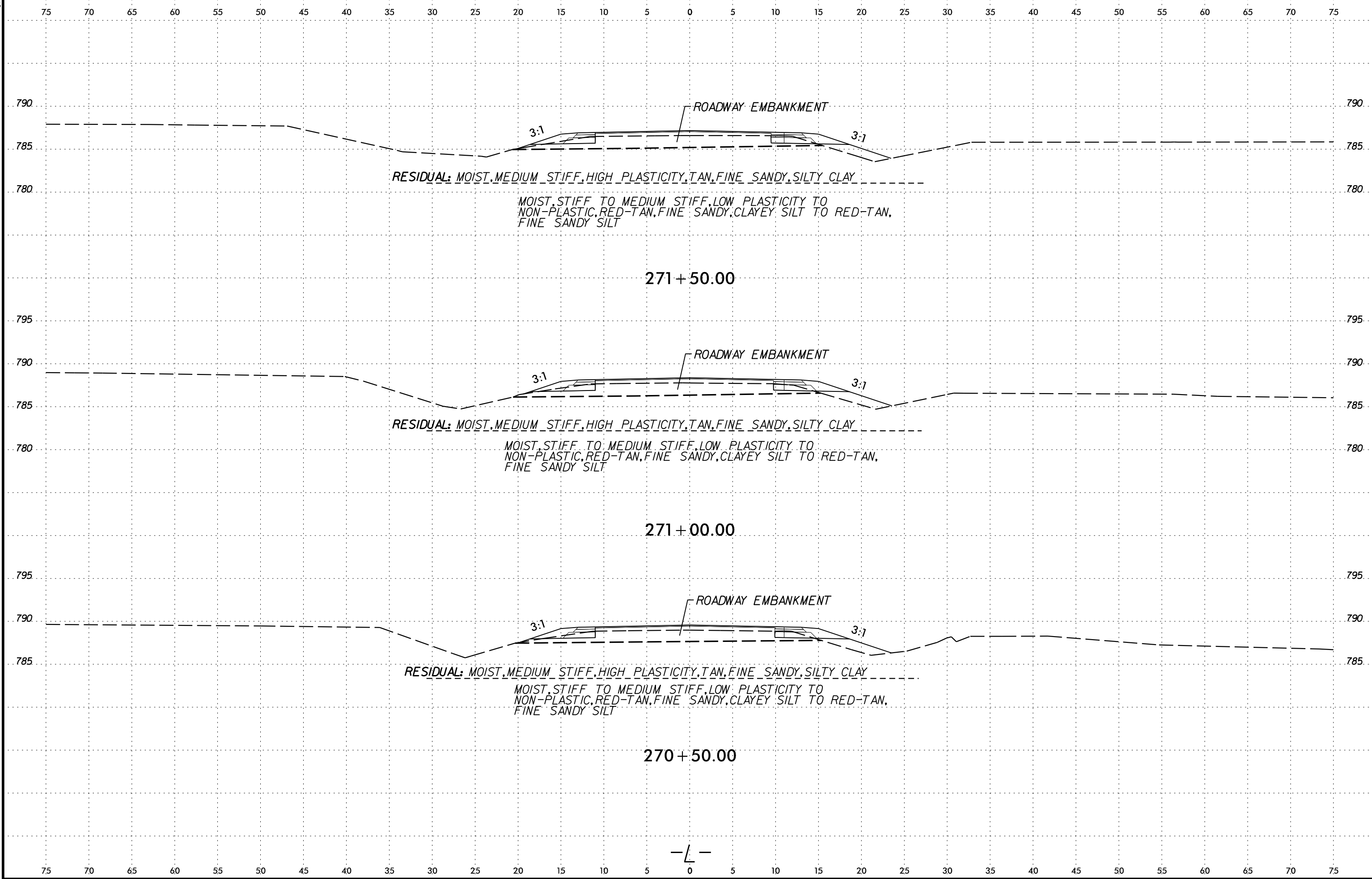


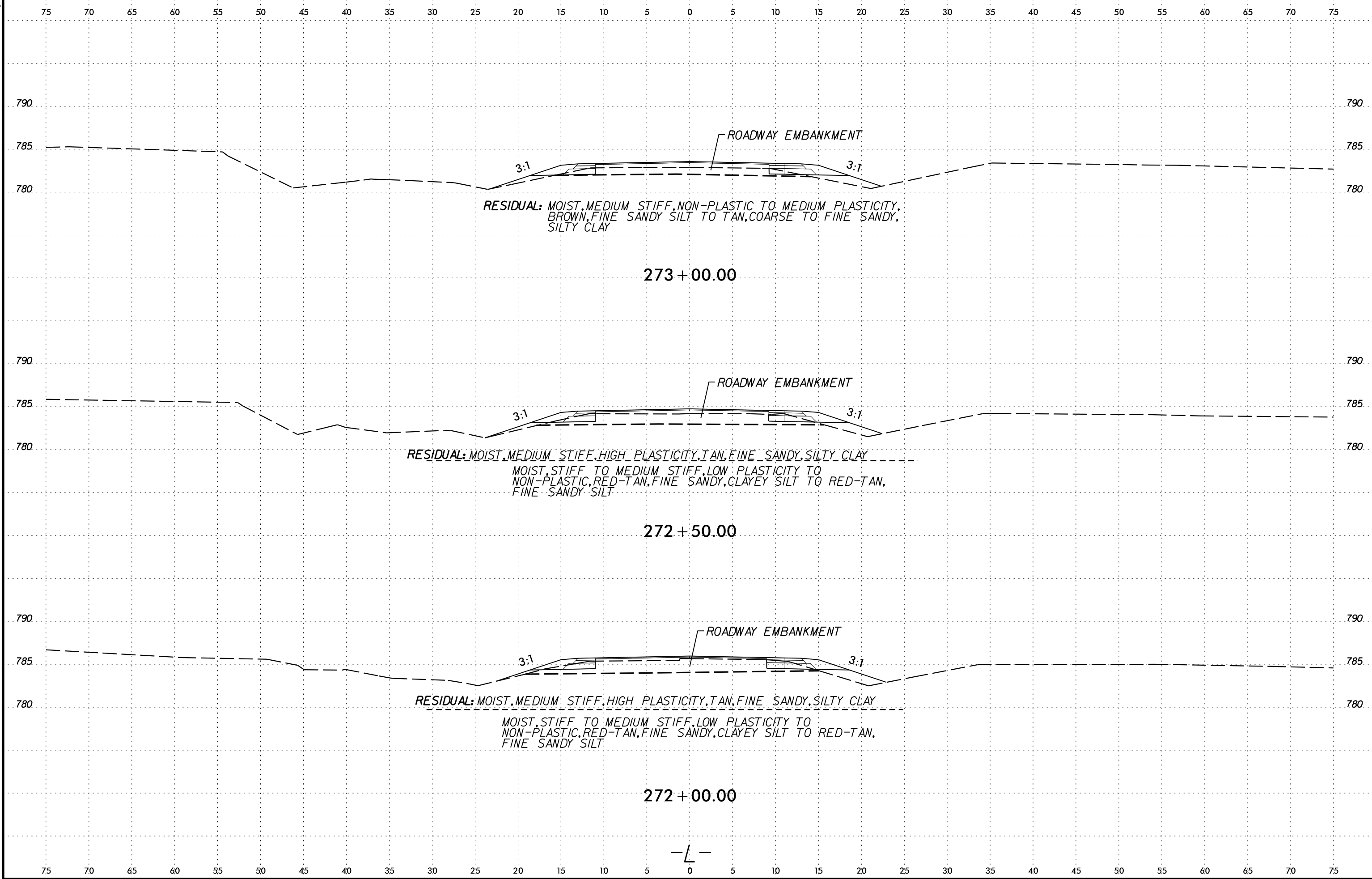




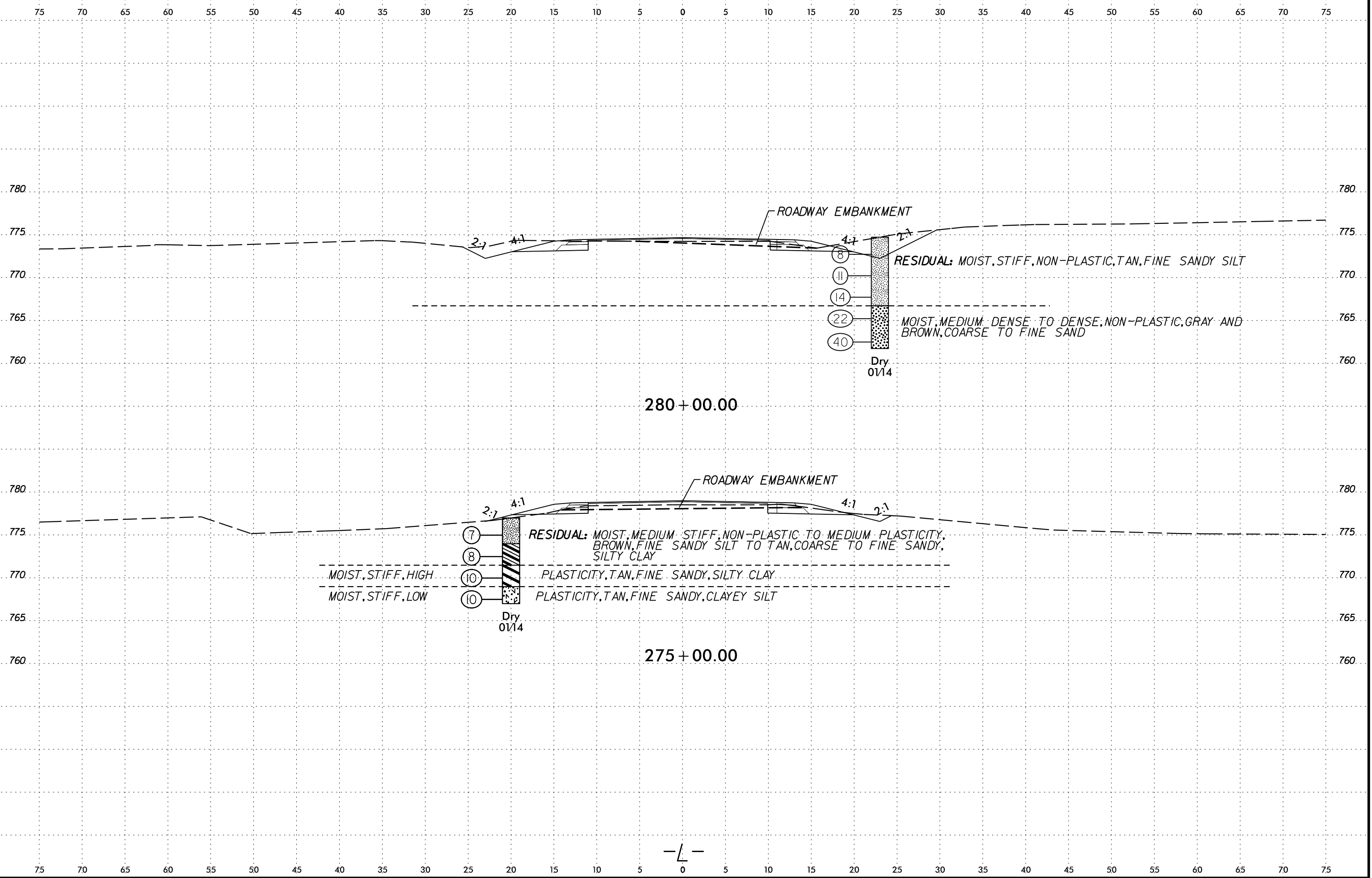


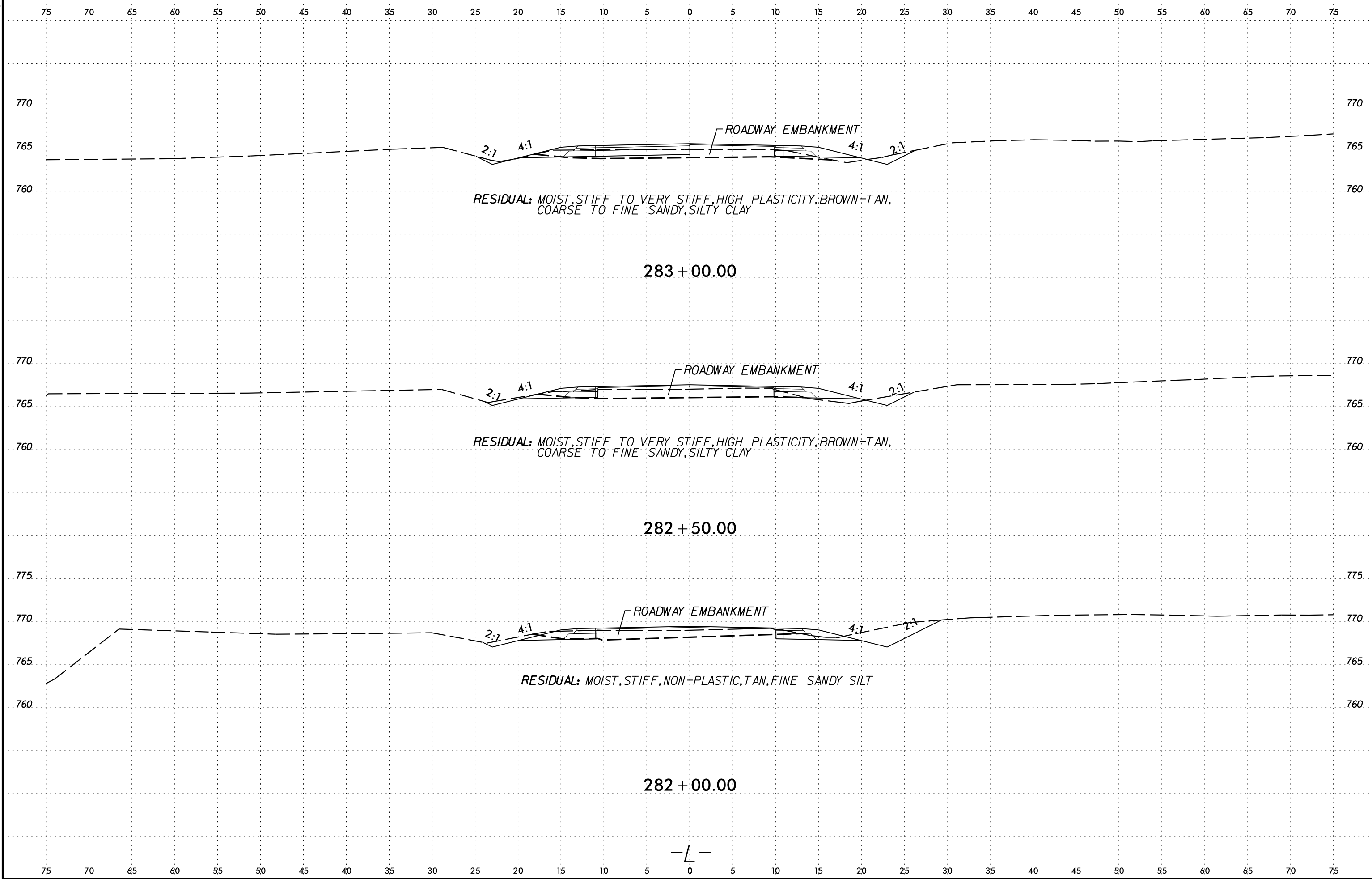


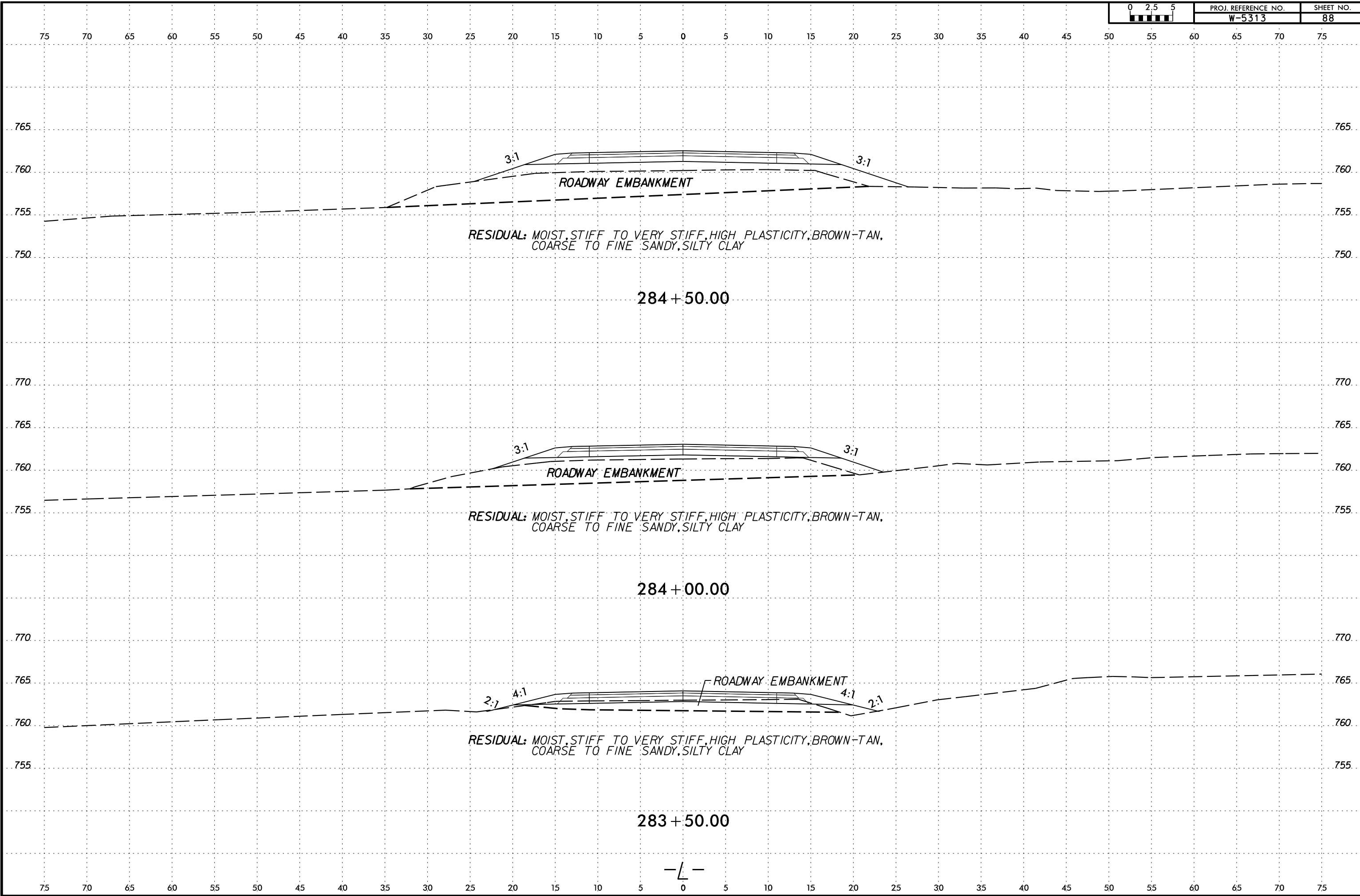




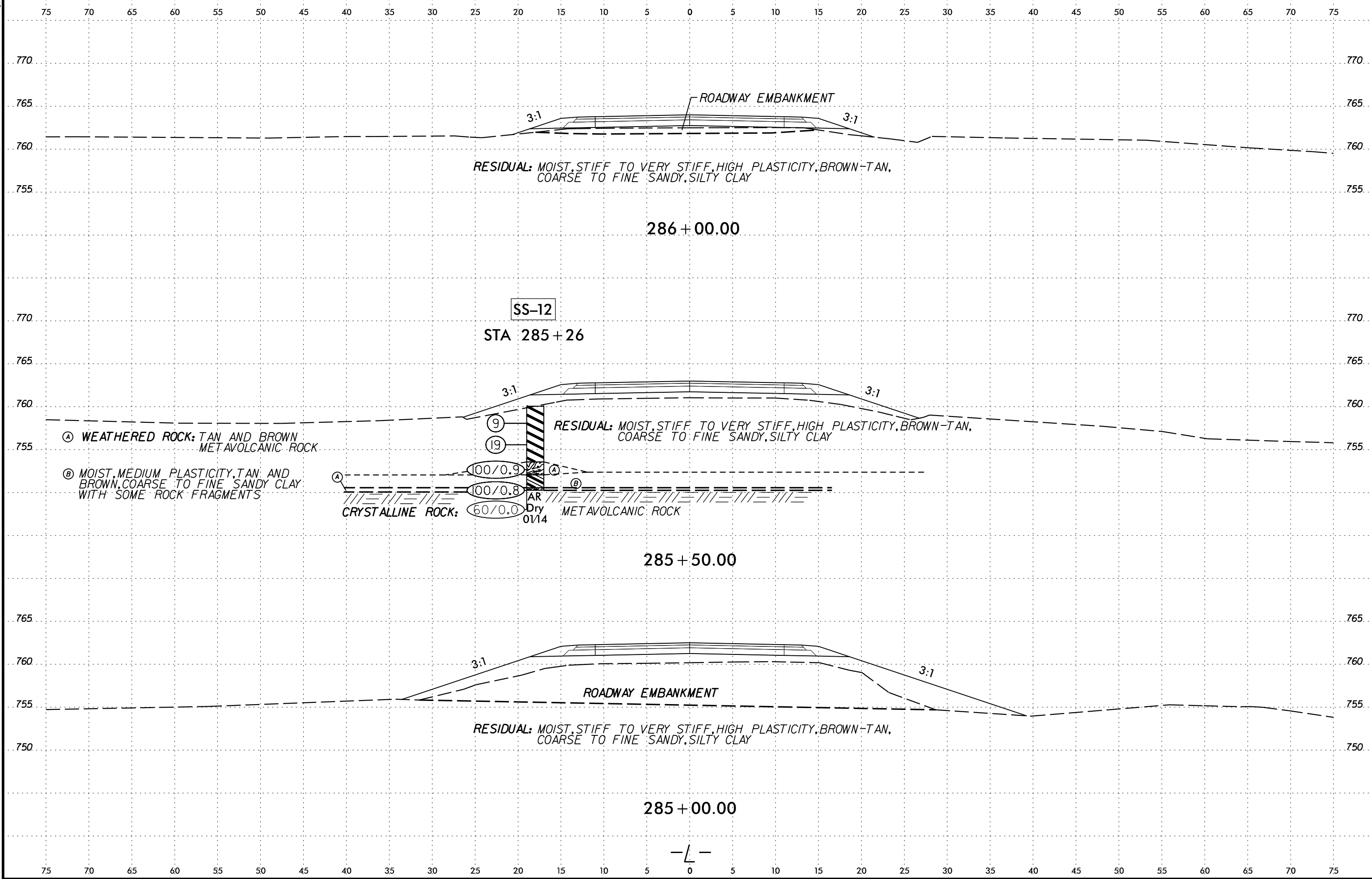


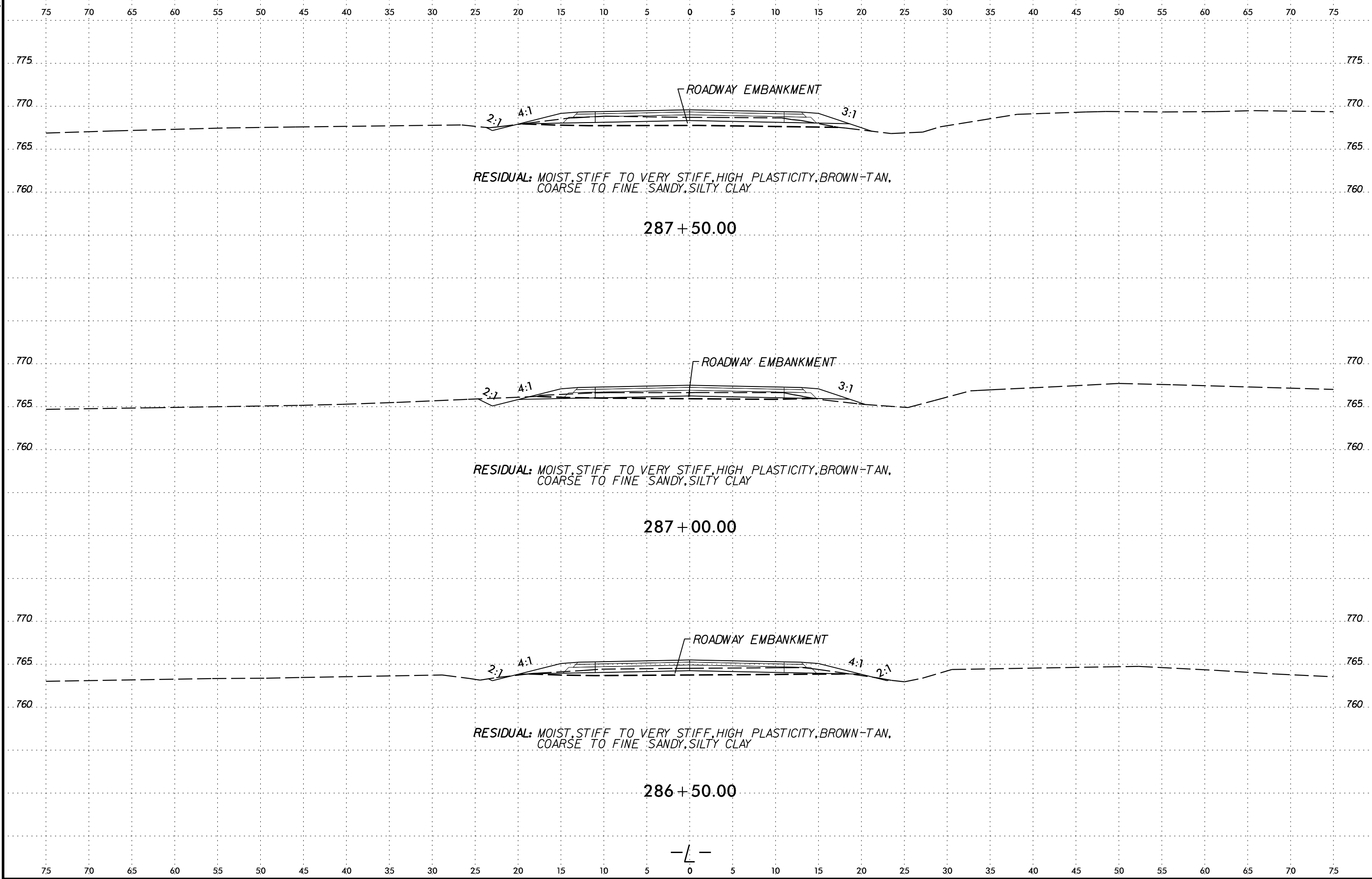


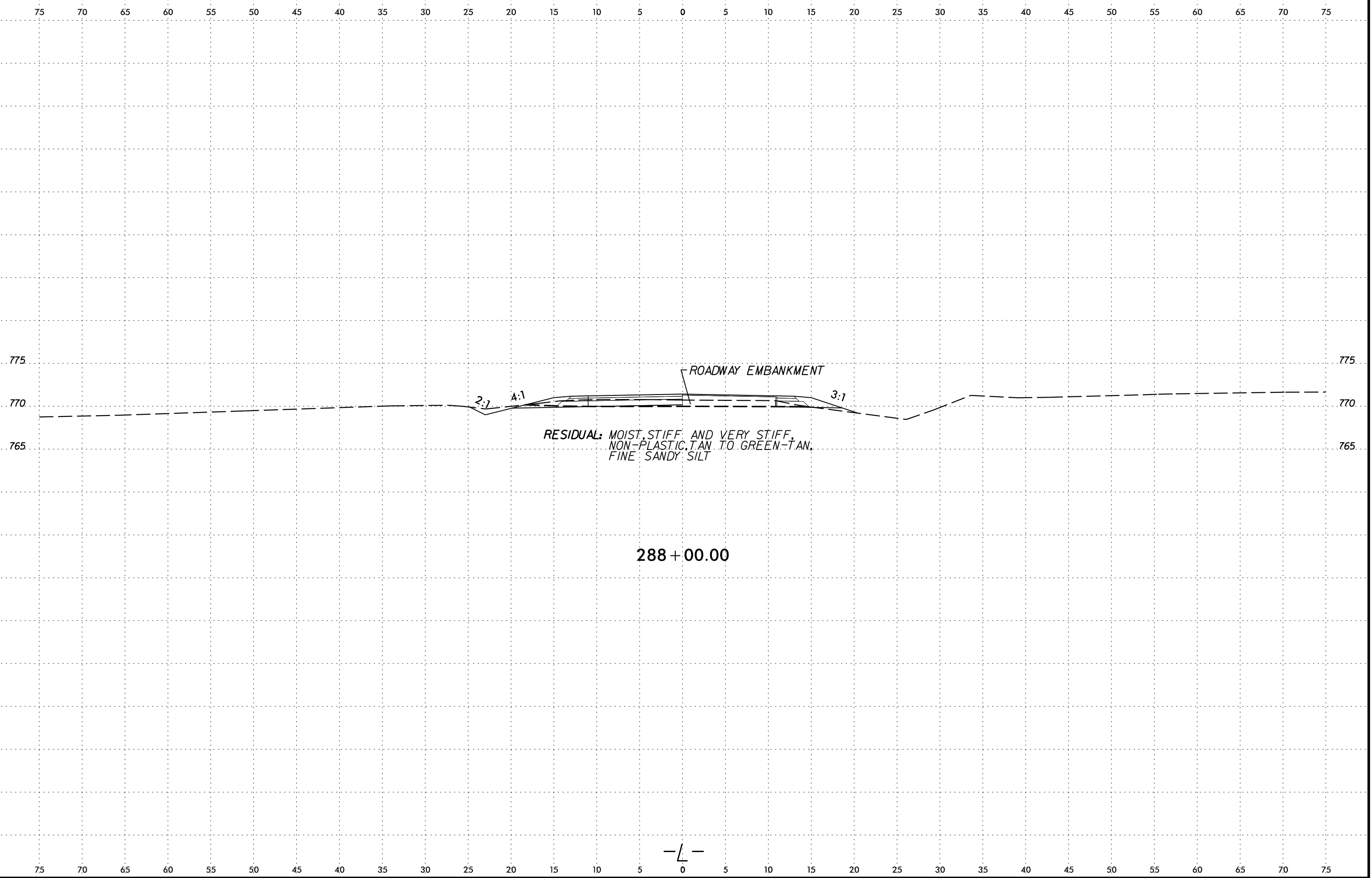


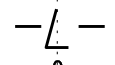
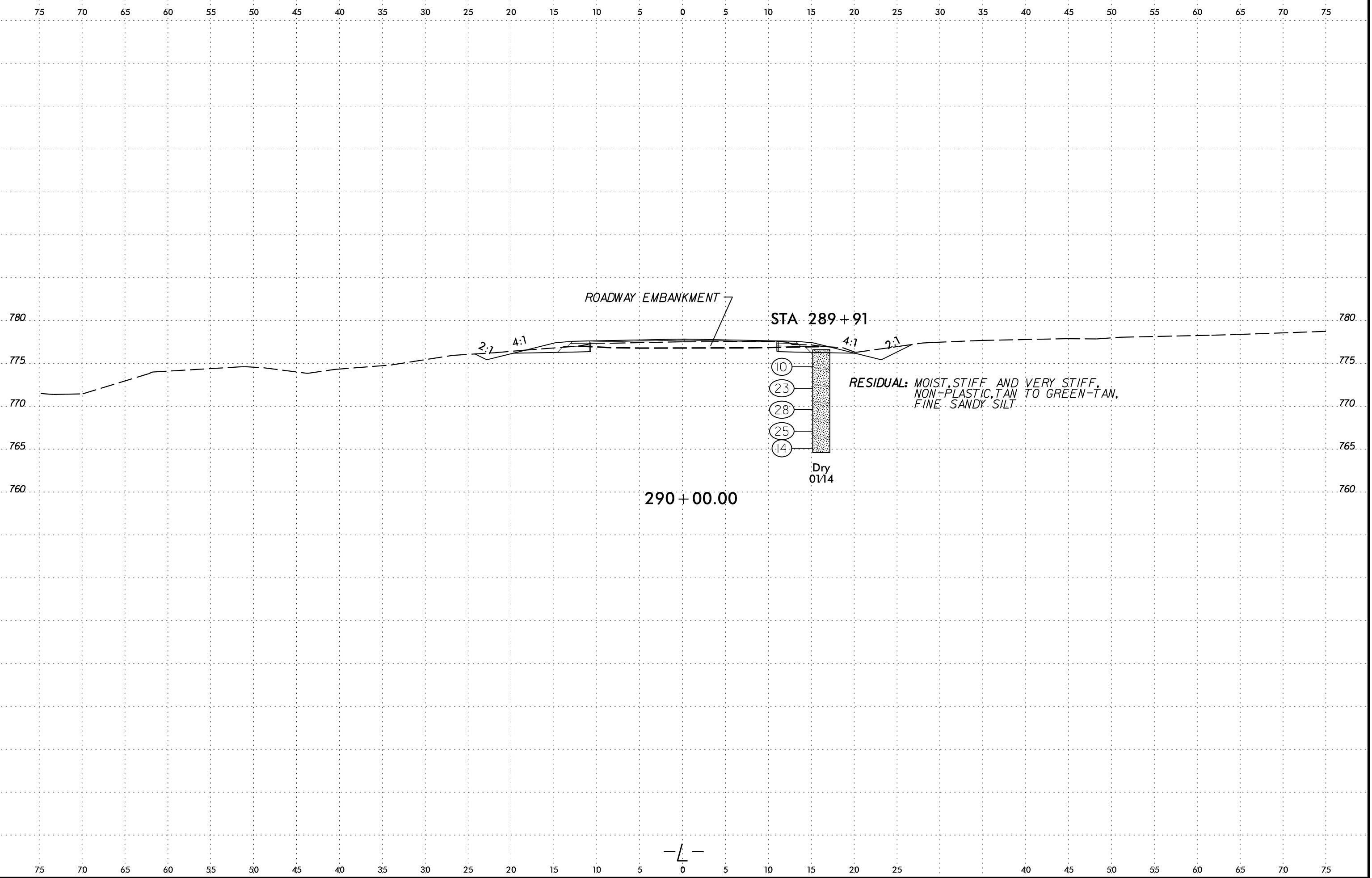


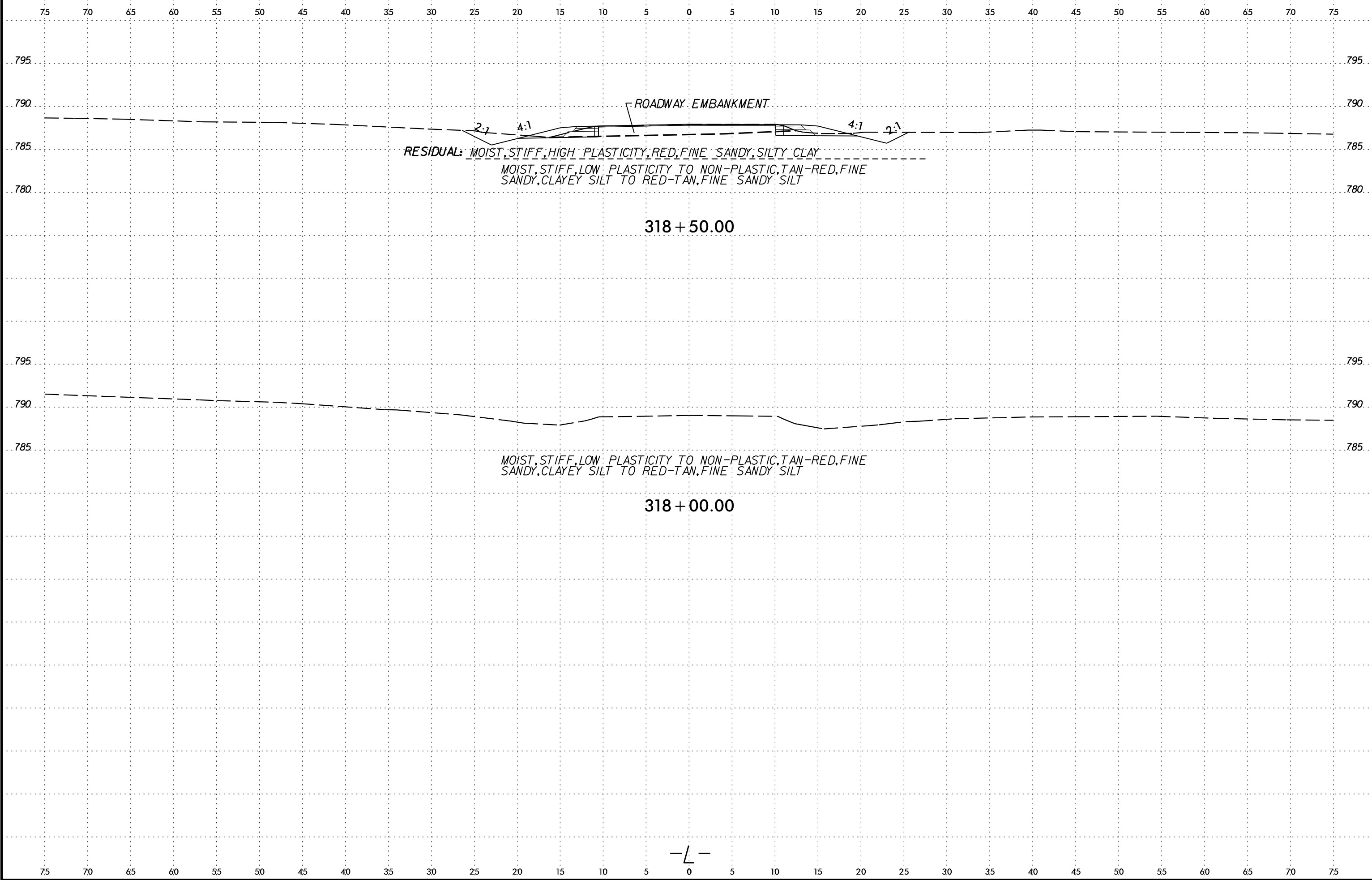
8/23/99



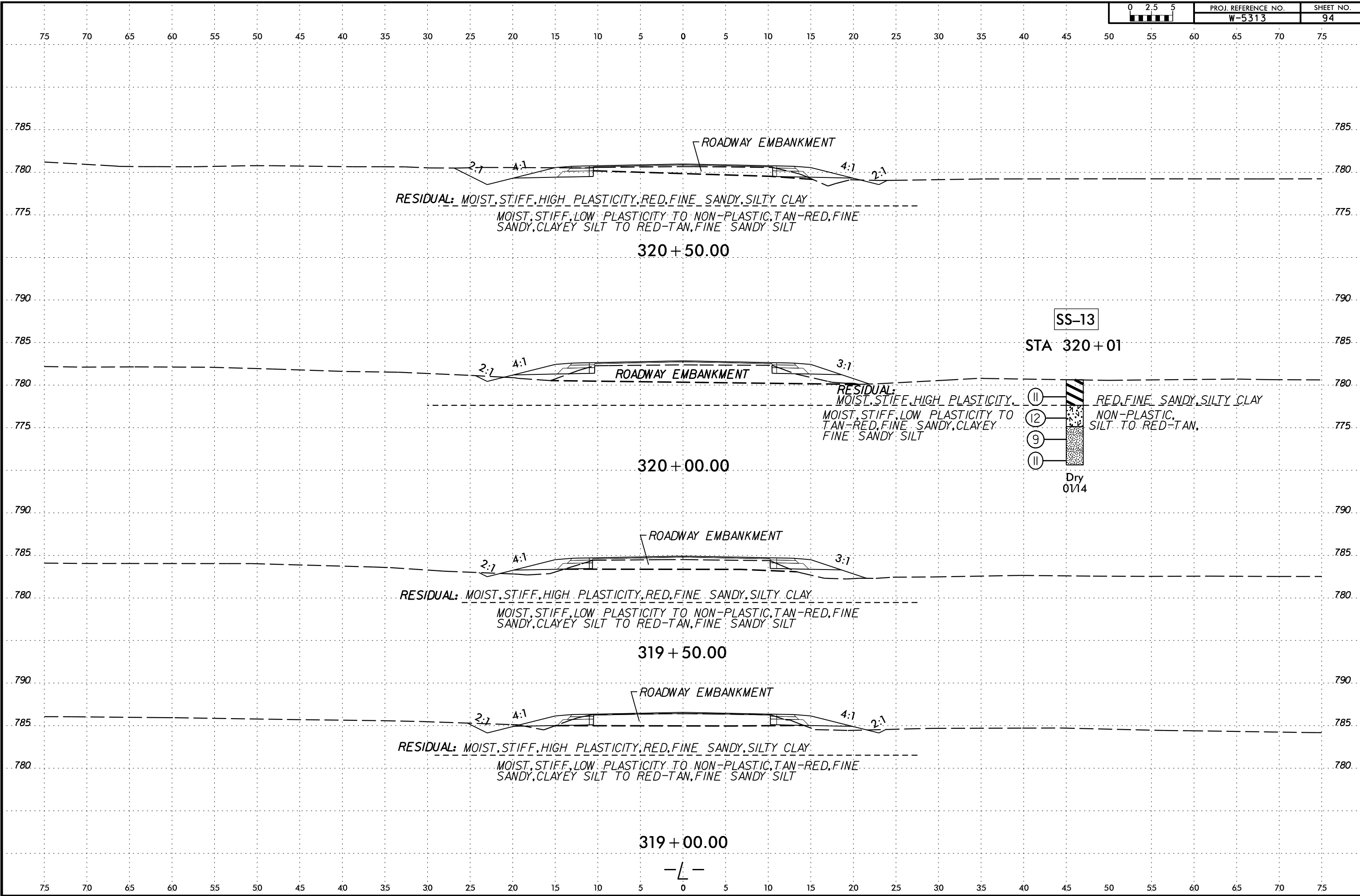


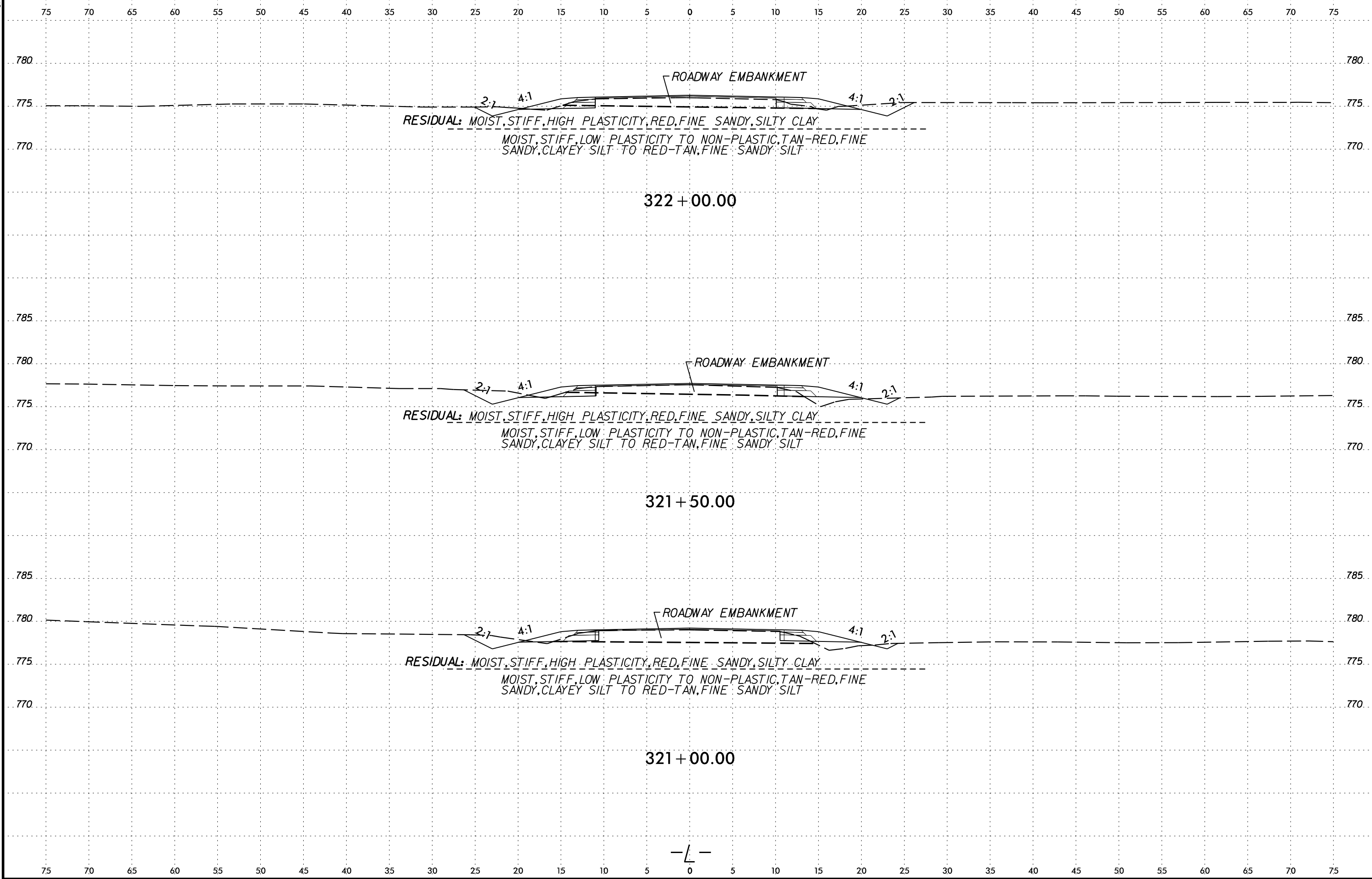


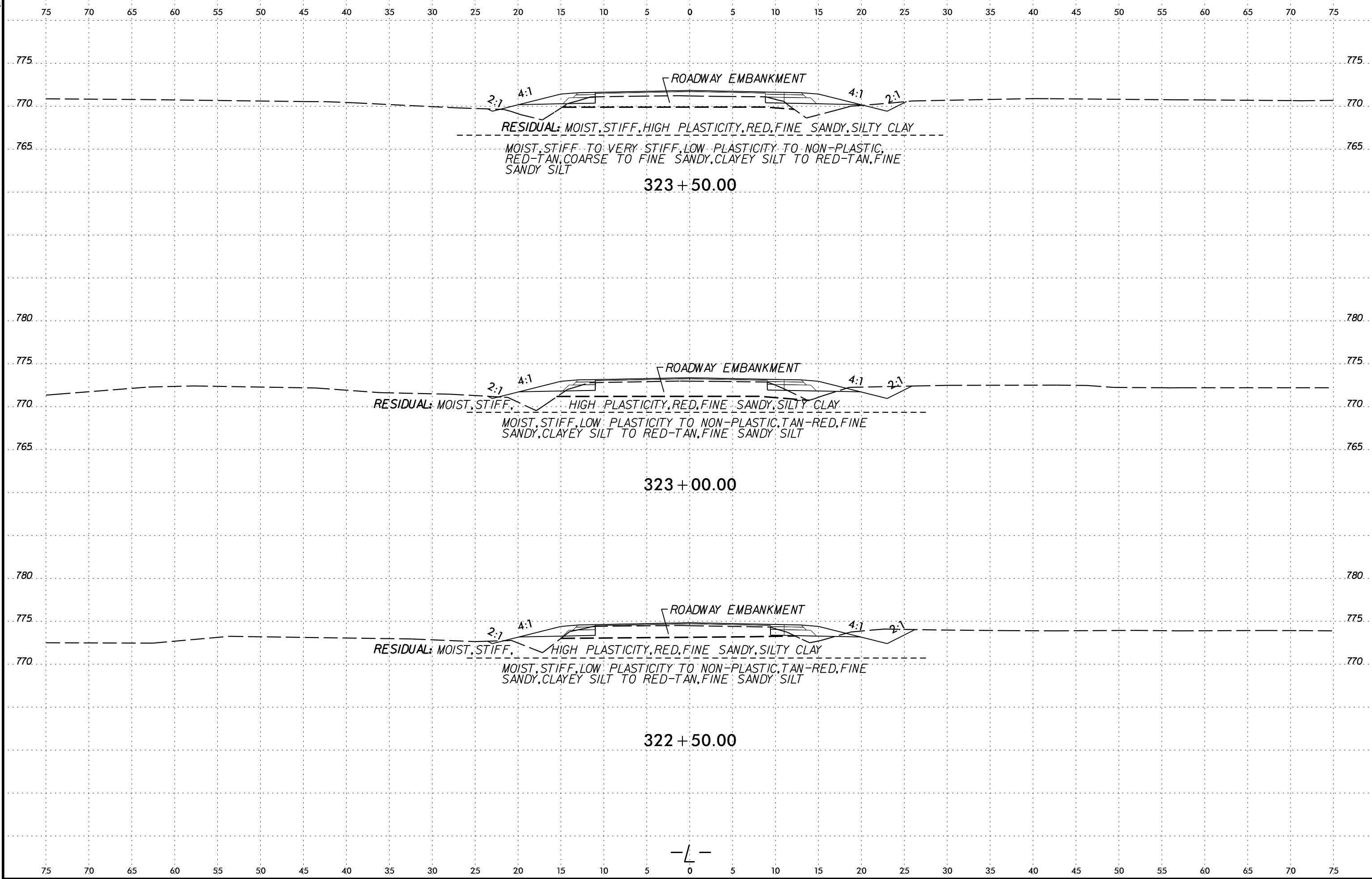


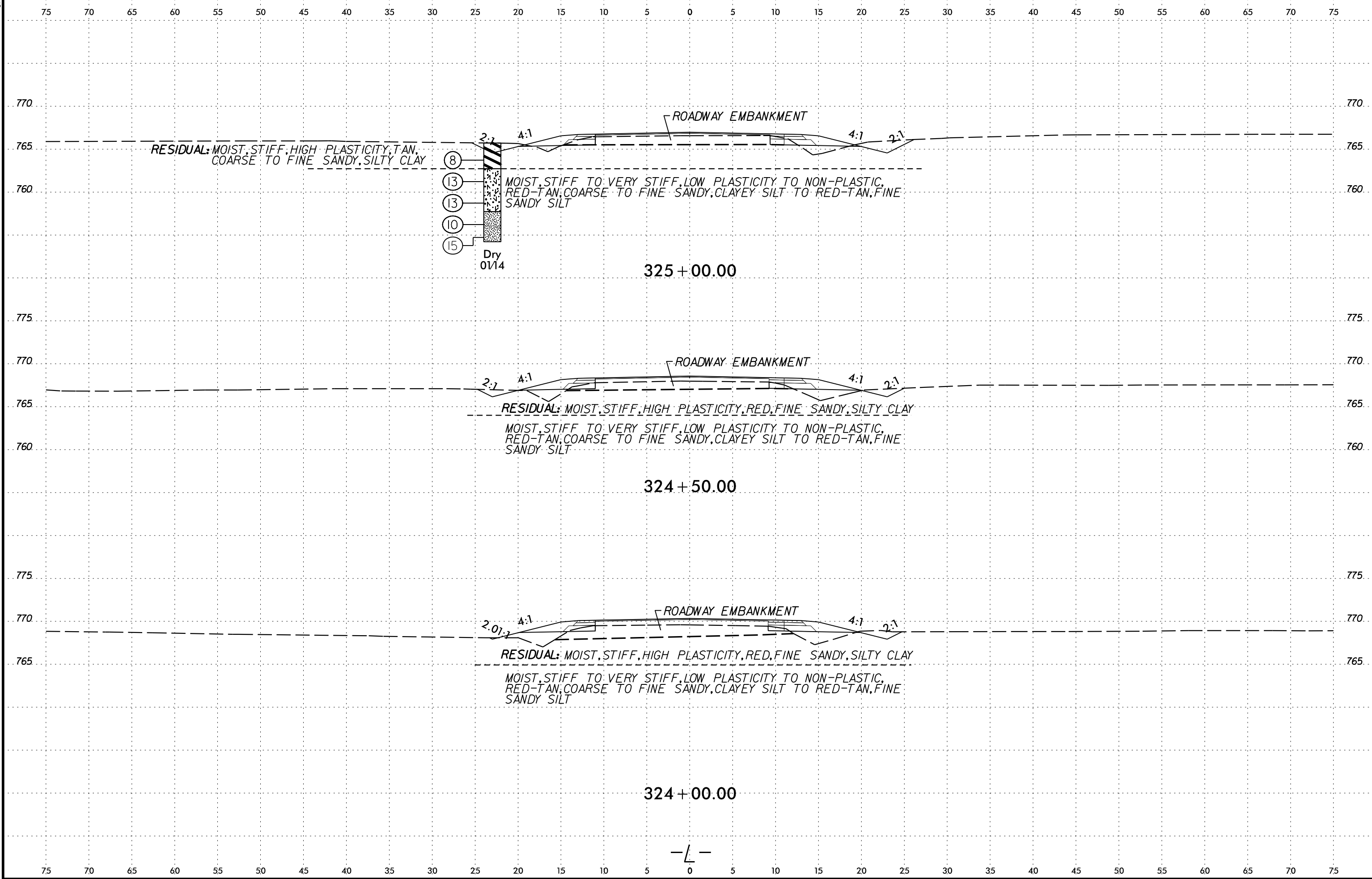


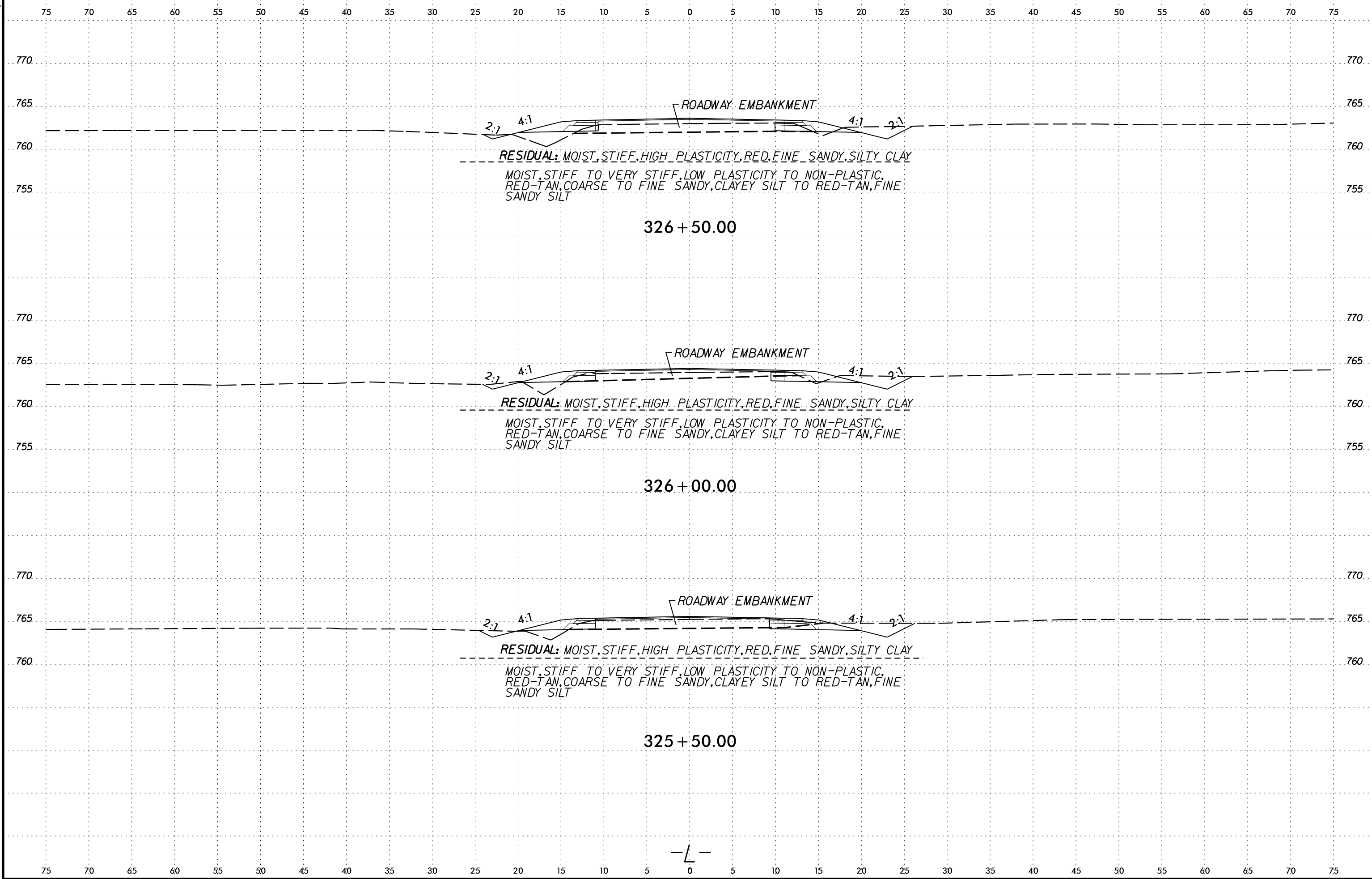


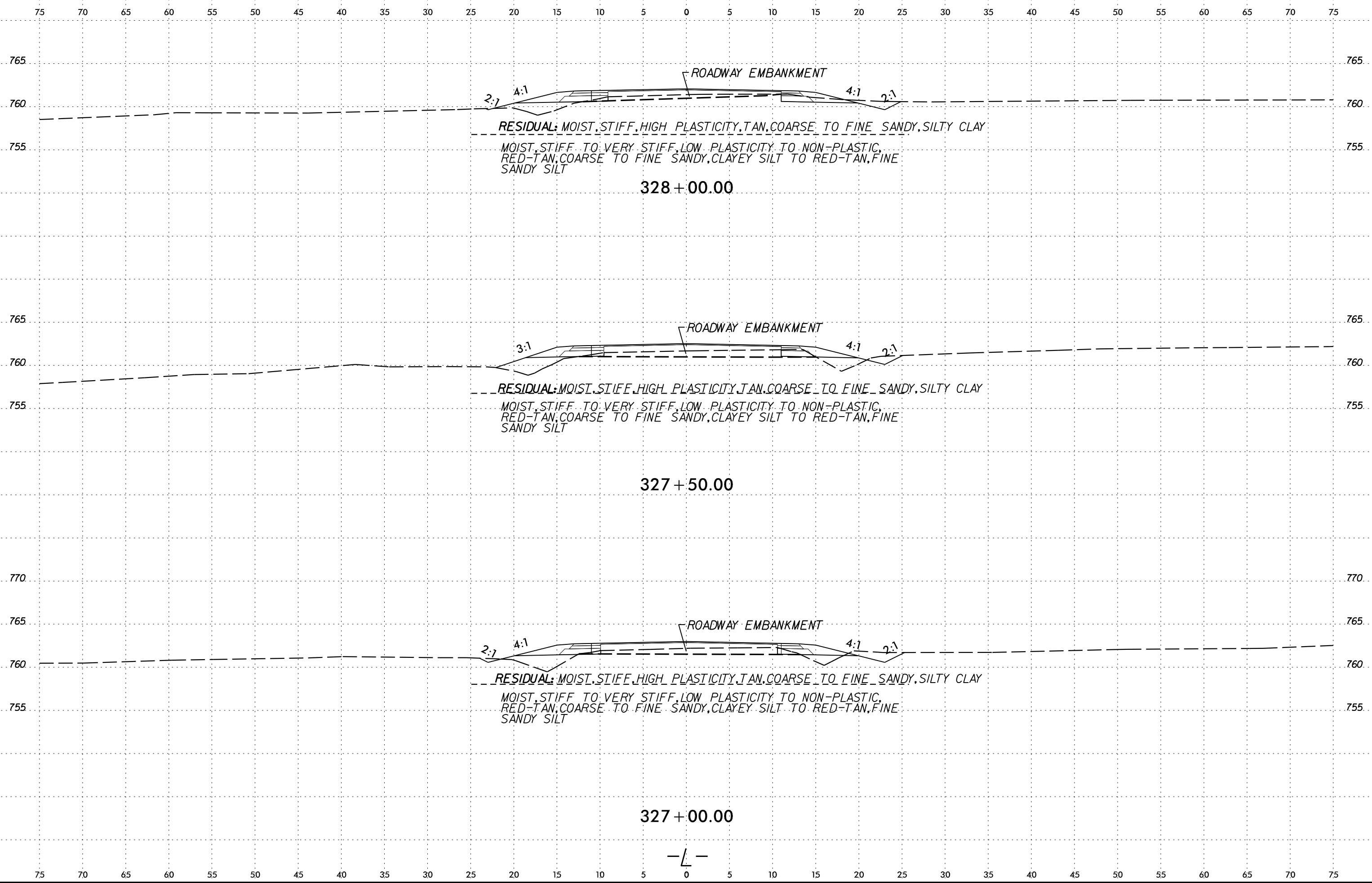












ROADWAY EMBANKMENT

2:1 4:1 4:1 2:1

RESIDUAL: MOIST, STIFF, HIGH PLASTICITY, TAN, COARSE TO FINE SANDY, SILTY CLAY  
 MOIST, STIFF TO VERY STIFF, LOW PLASTICITY TO NON-PLASTIC,  
 RED-TAN, COARSE TO FINE SANDY, CLAYEY SILT TO RED-TAN, FINE SANDY SILT

328 + 00.00

ROADWAY EMBANKMENT

3:1 4:1 2:1

RESIDUAL: MOIST, STIFF, HIGH PLASTICITY, TAN, COARSE TO FINE SANDY, SILTY CLAY  
 MOIST, STIFF TO VERY STIFF, LOW PLASTICITY TO NON-PLASTIC,  
 RED-TAN, COARSE TO FINE SANDY, CLAYEY SILT TO RED-TAN, FINE SANDY SILT

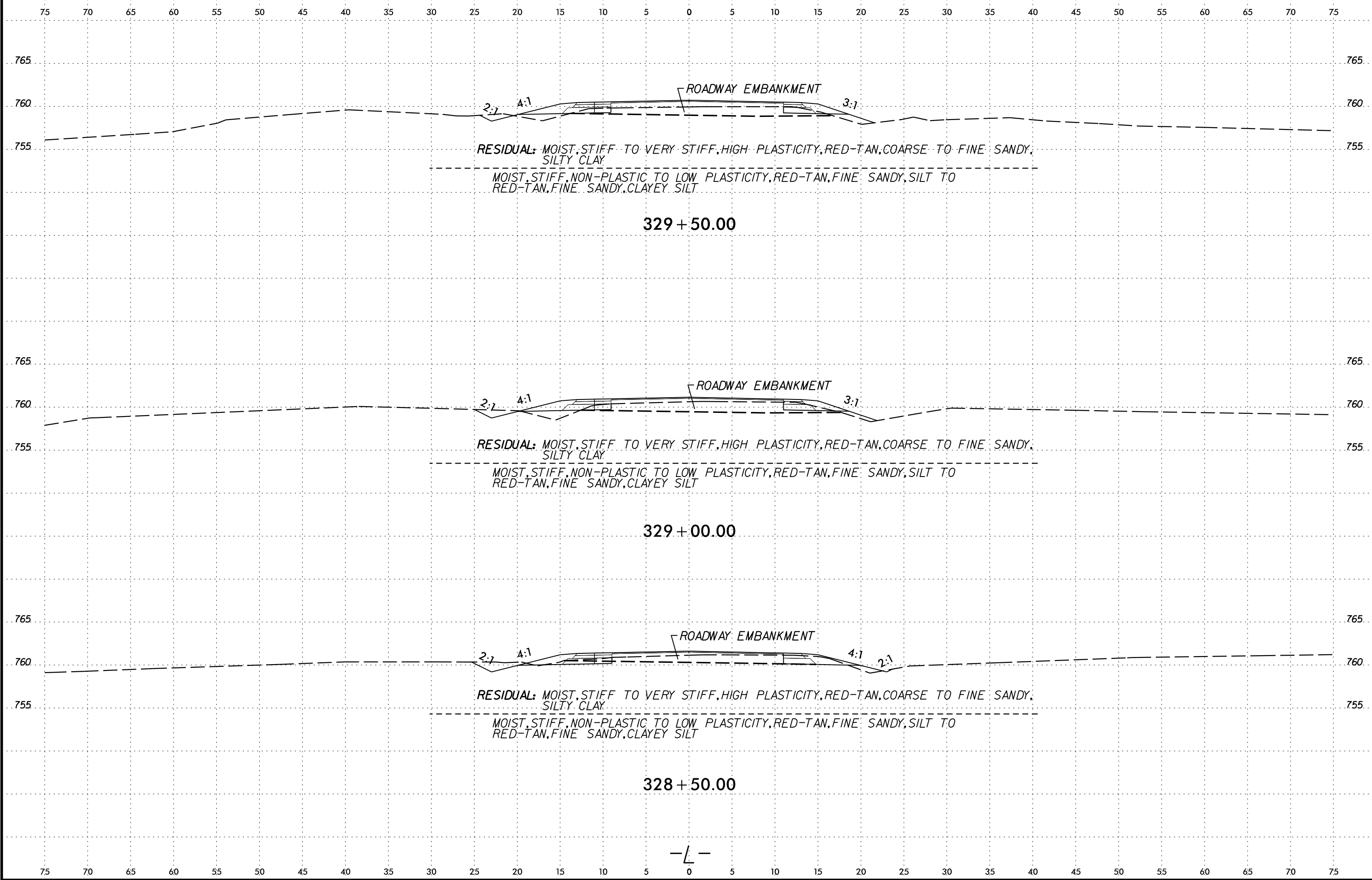
327 + 50.00

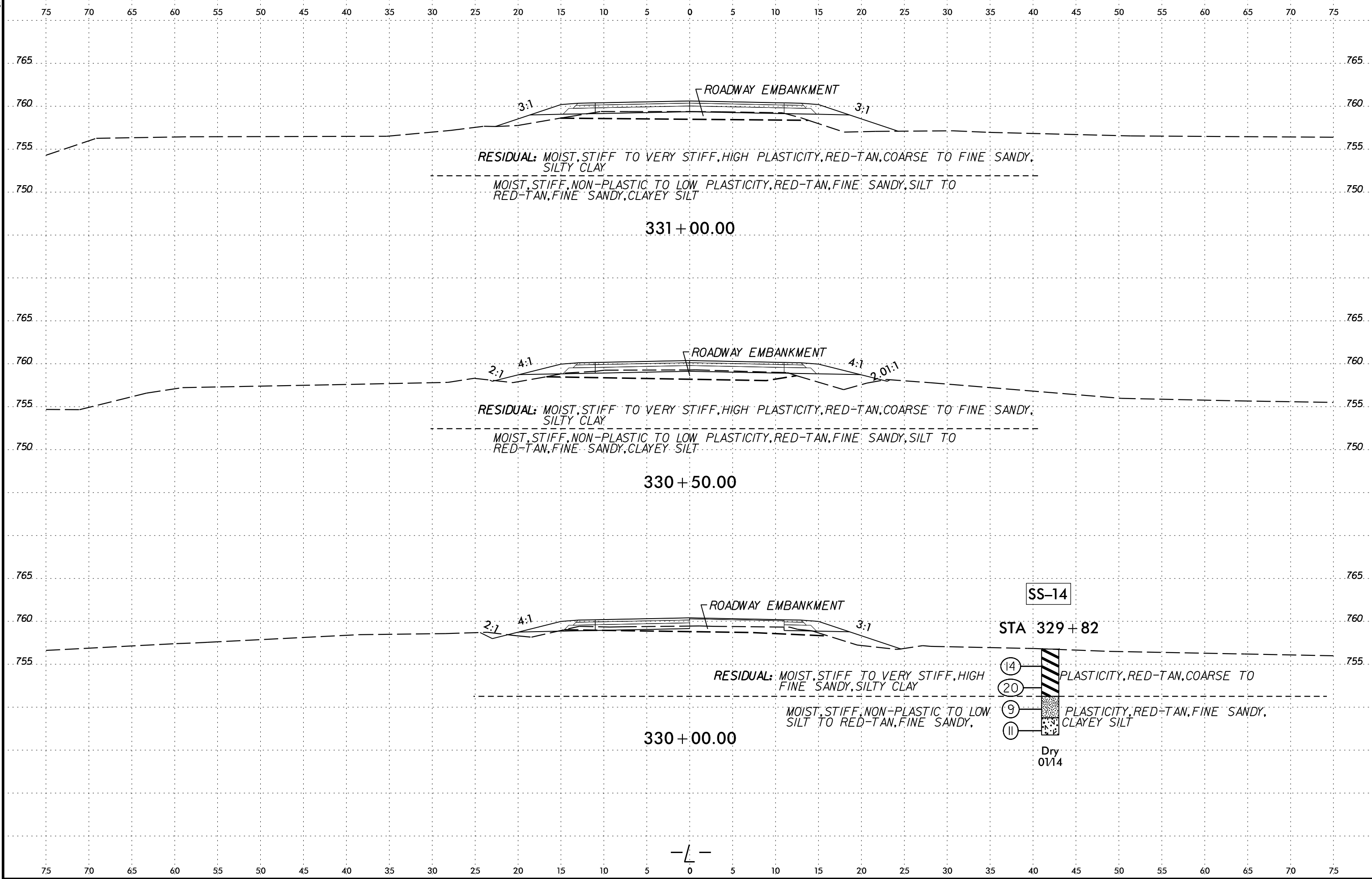
ROADWAY EMBANKMENT

2:1 4:1 4:1 2:1

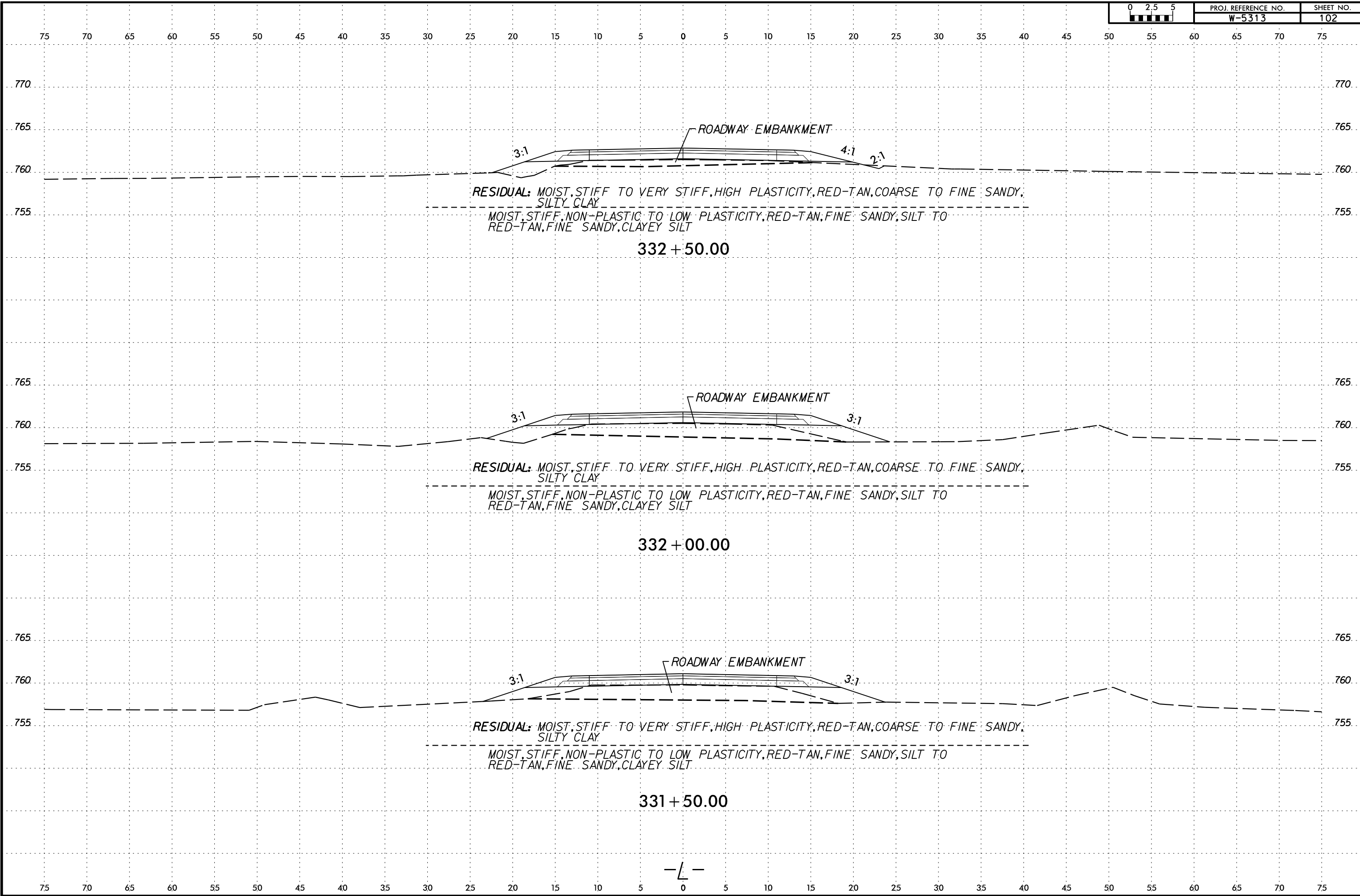
RESIDUAL: MOIST, STIFF, HIGH PLASTICITY, TAN, COARSE TO FINE SANDY, SILTY CLAY  
 MOIST, STIFF TO VERY STIFF, LOW PLASTICITY TO NON-PLASTIC,  
 RED-TAN, COARSE TO FINE SANDY, CLAYEY SILT TO RED-TAN, FINE SANDY SILT

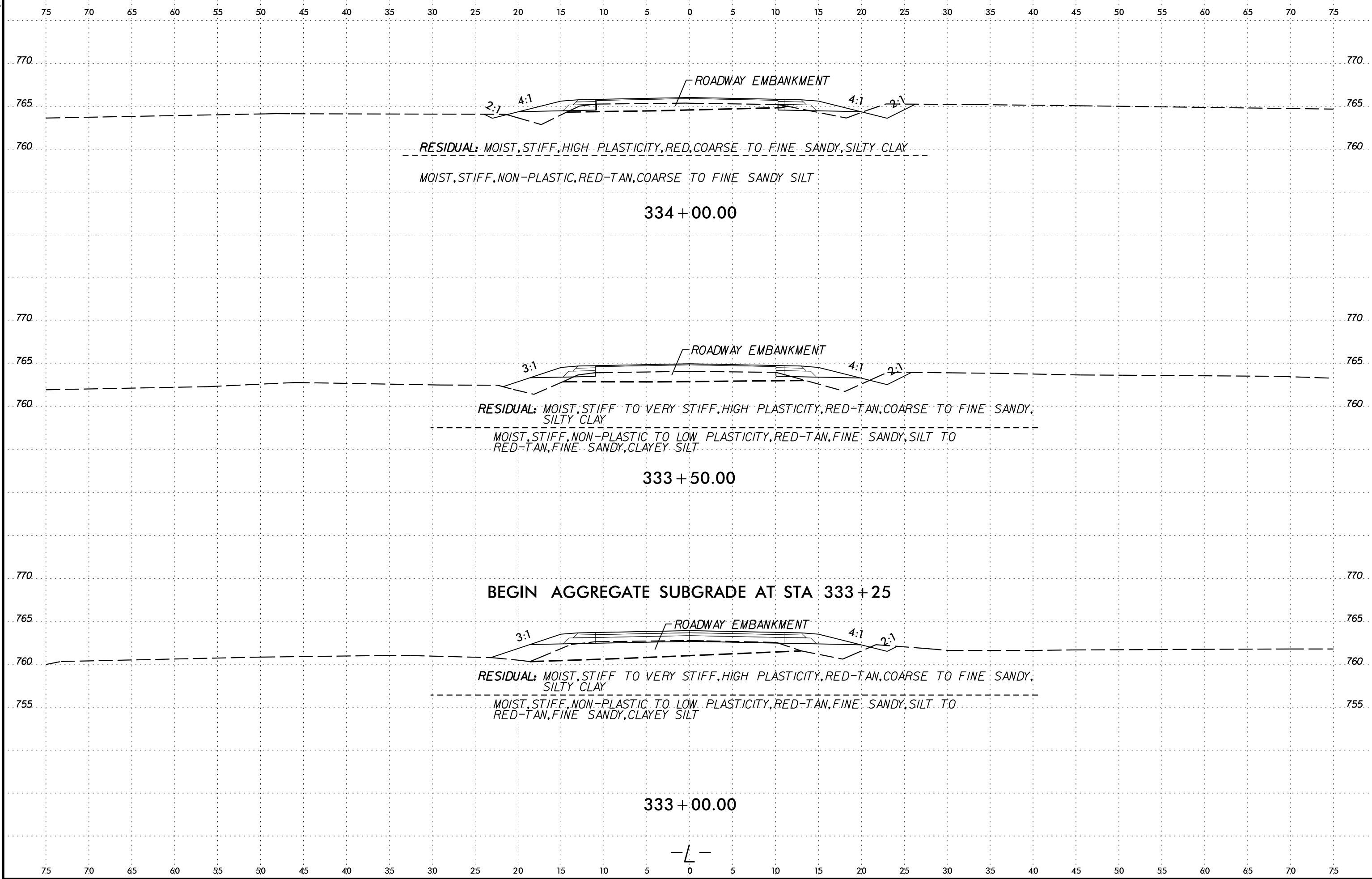
327 + 00.00

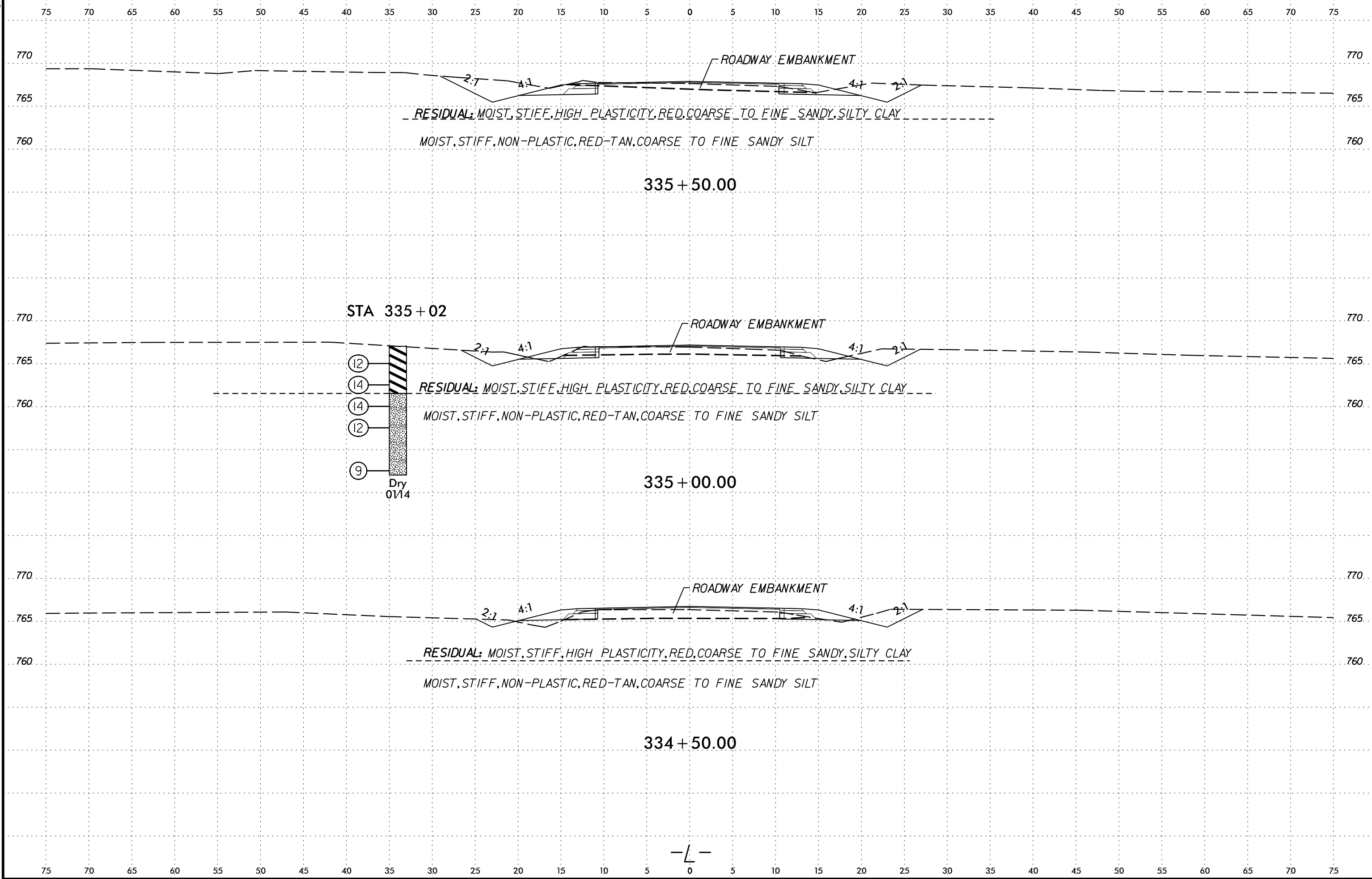


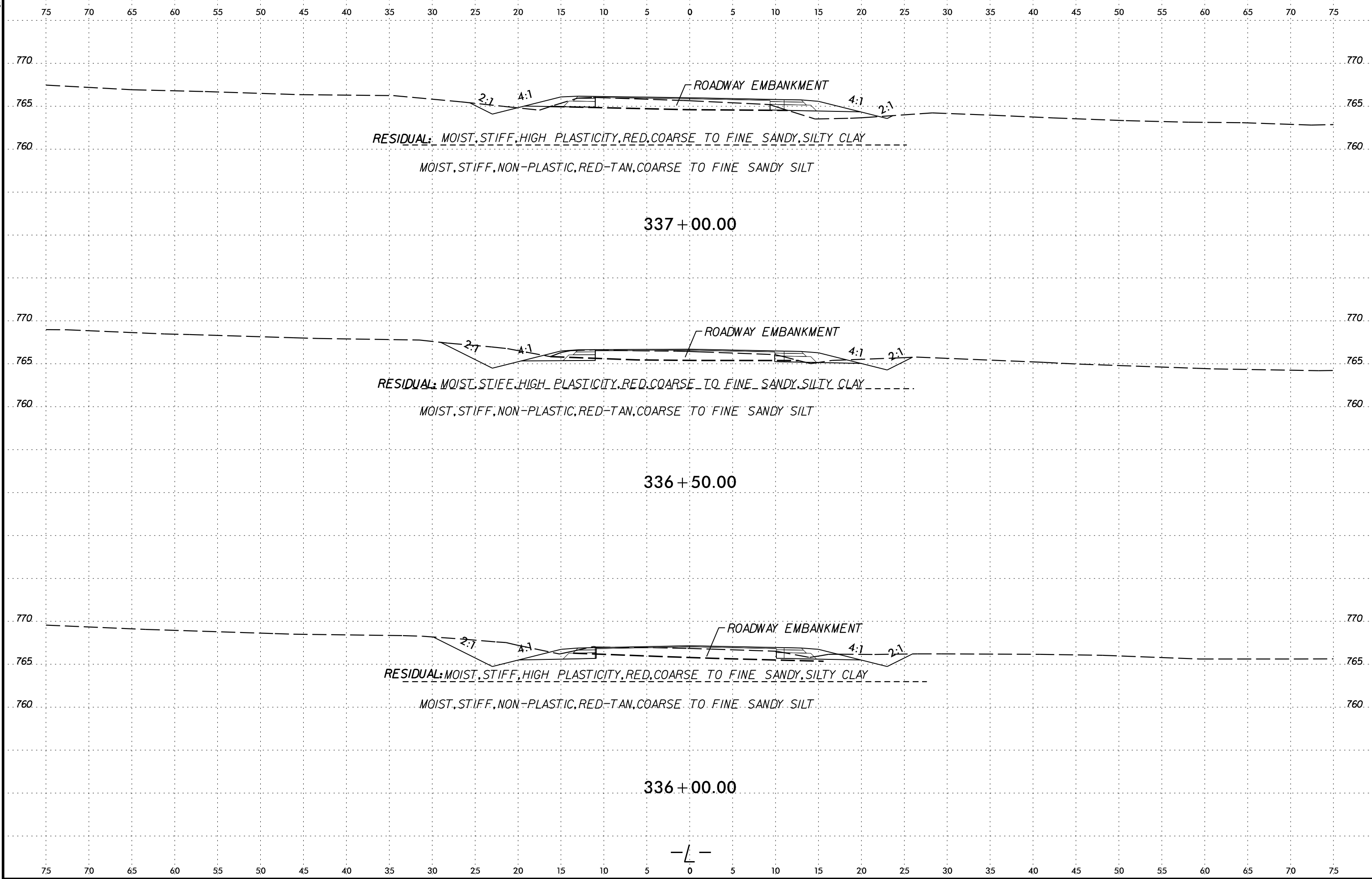


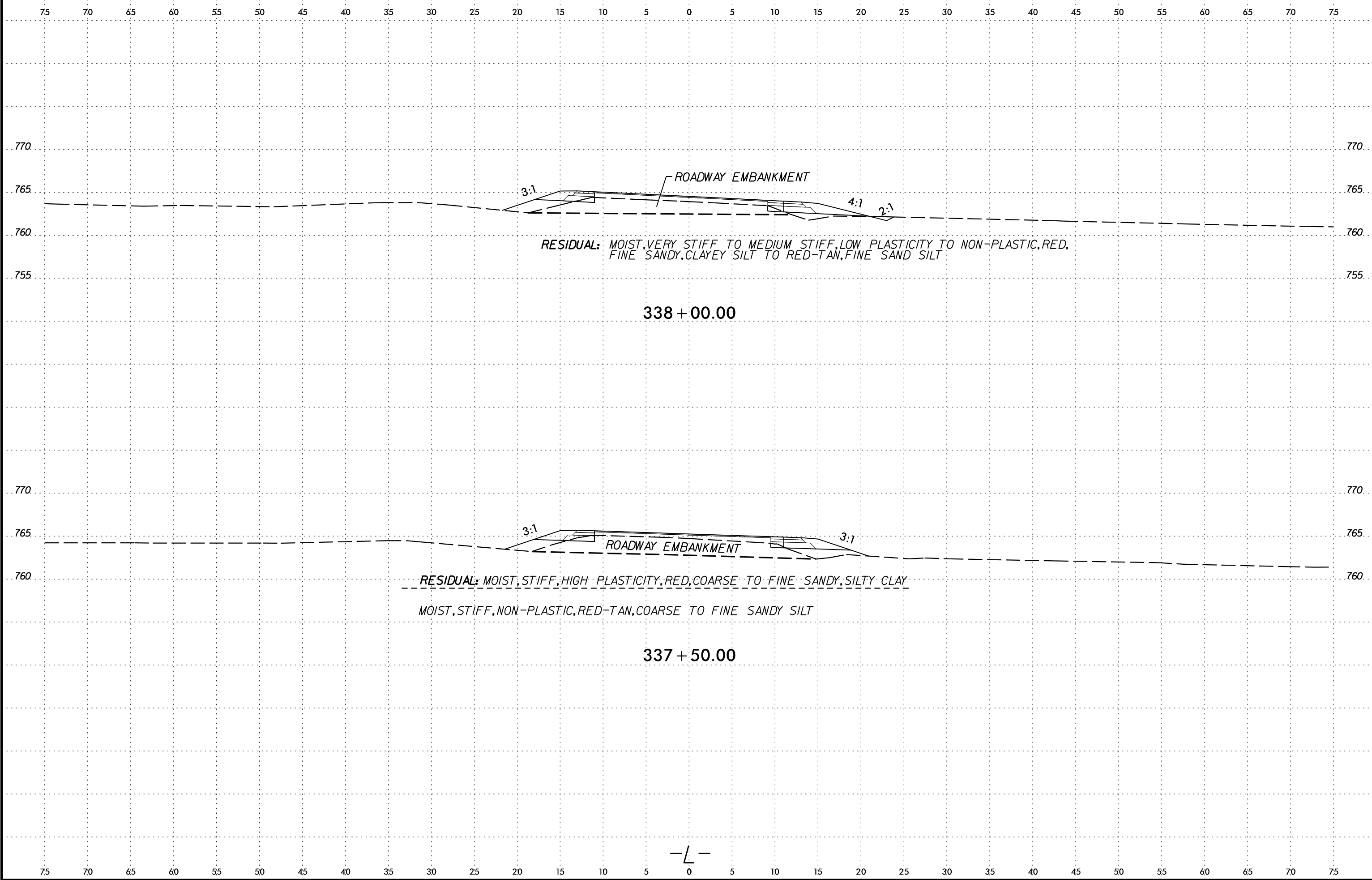


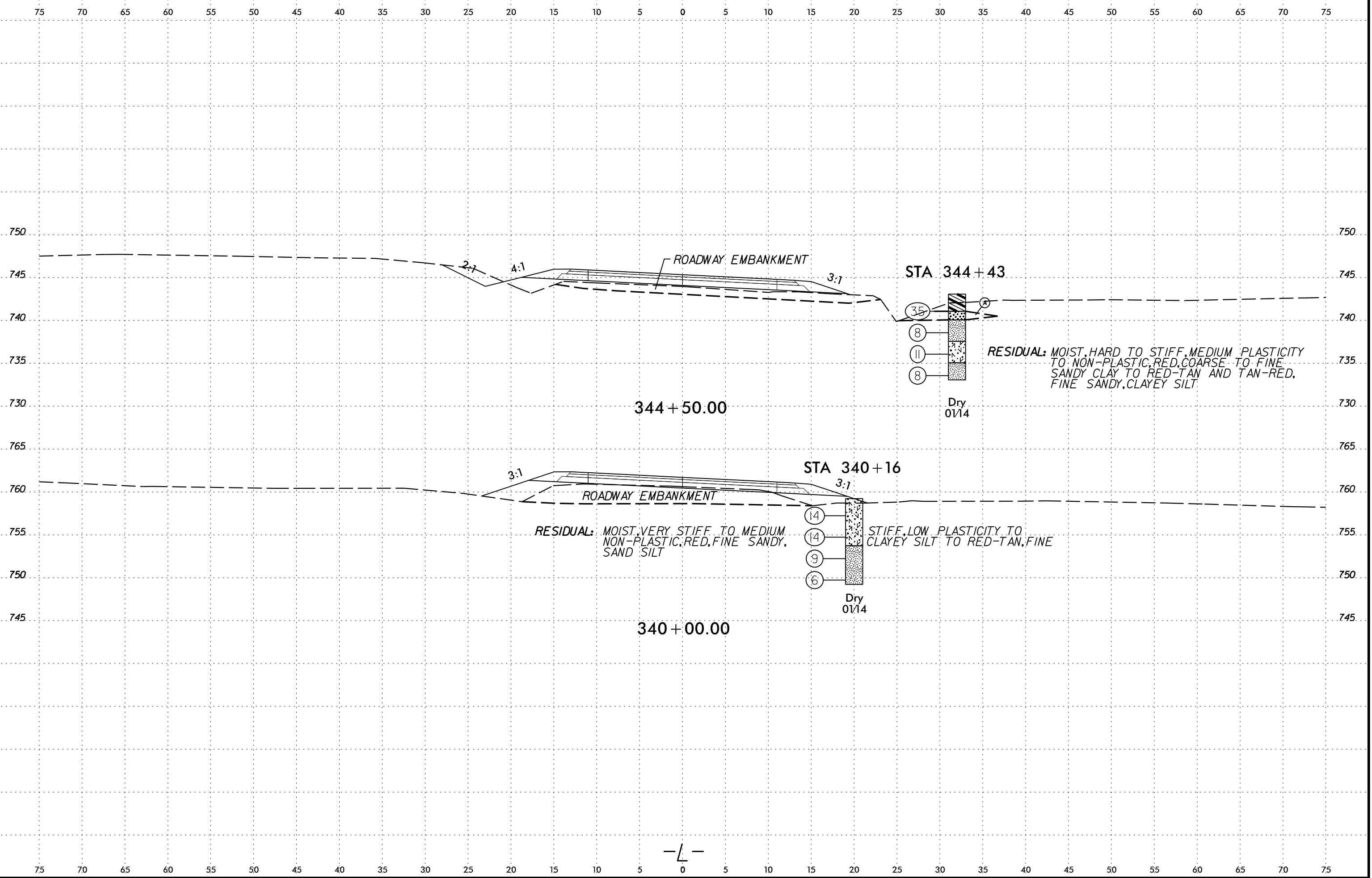


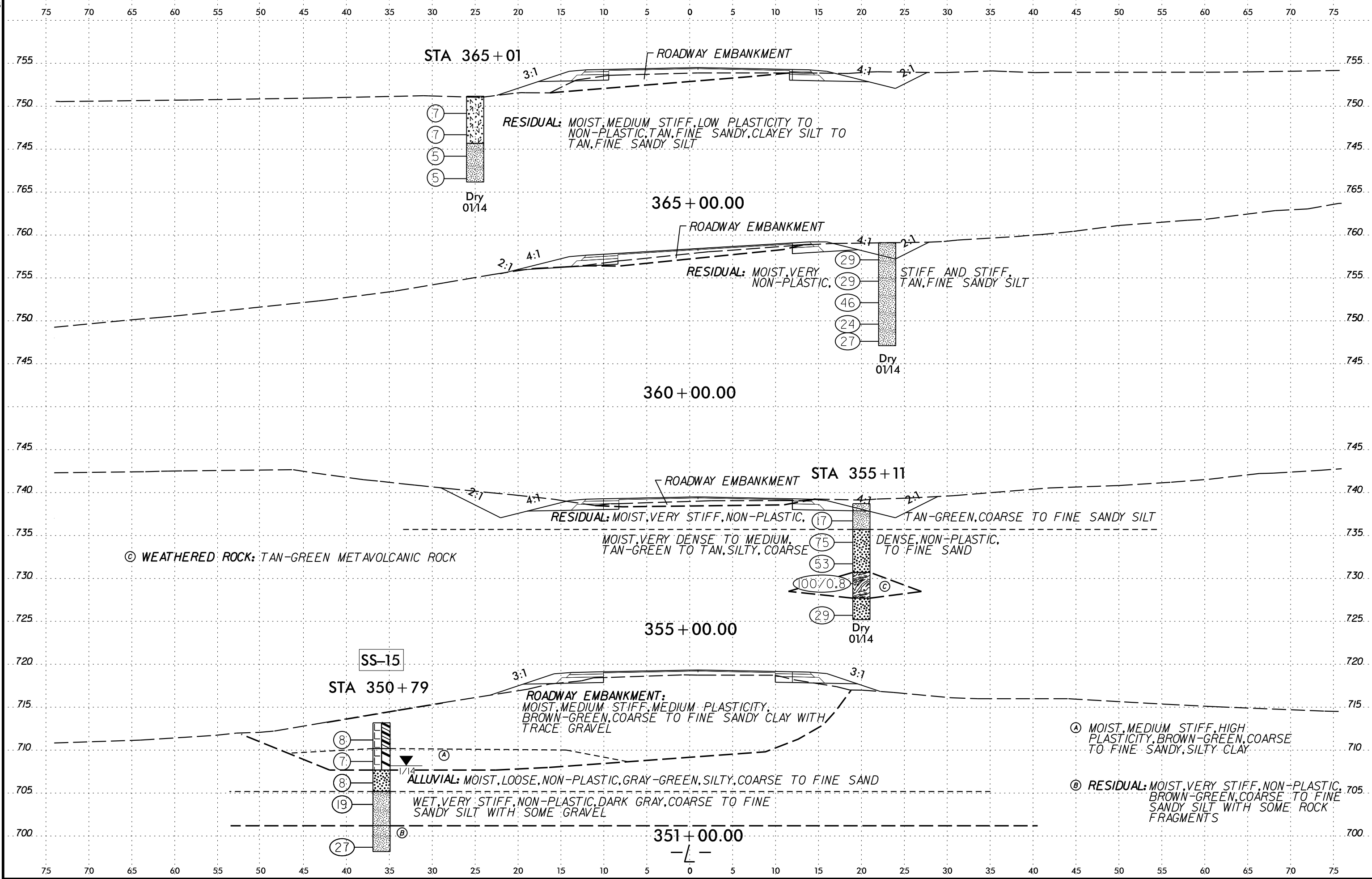


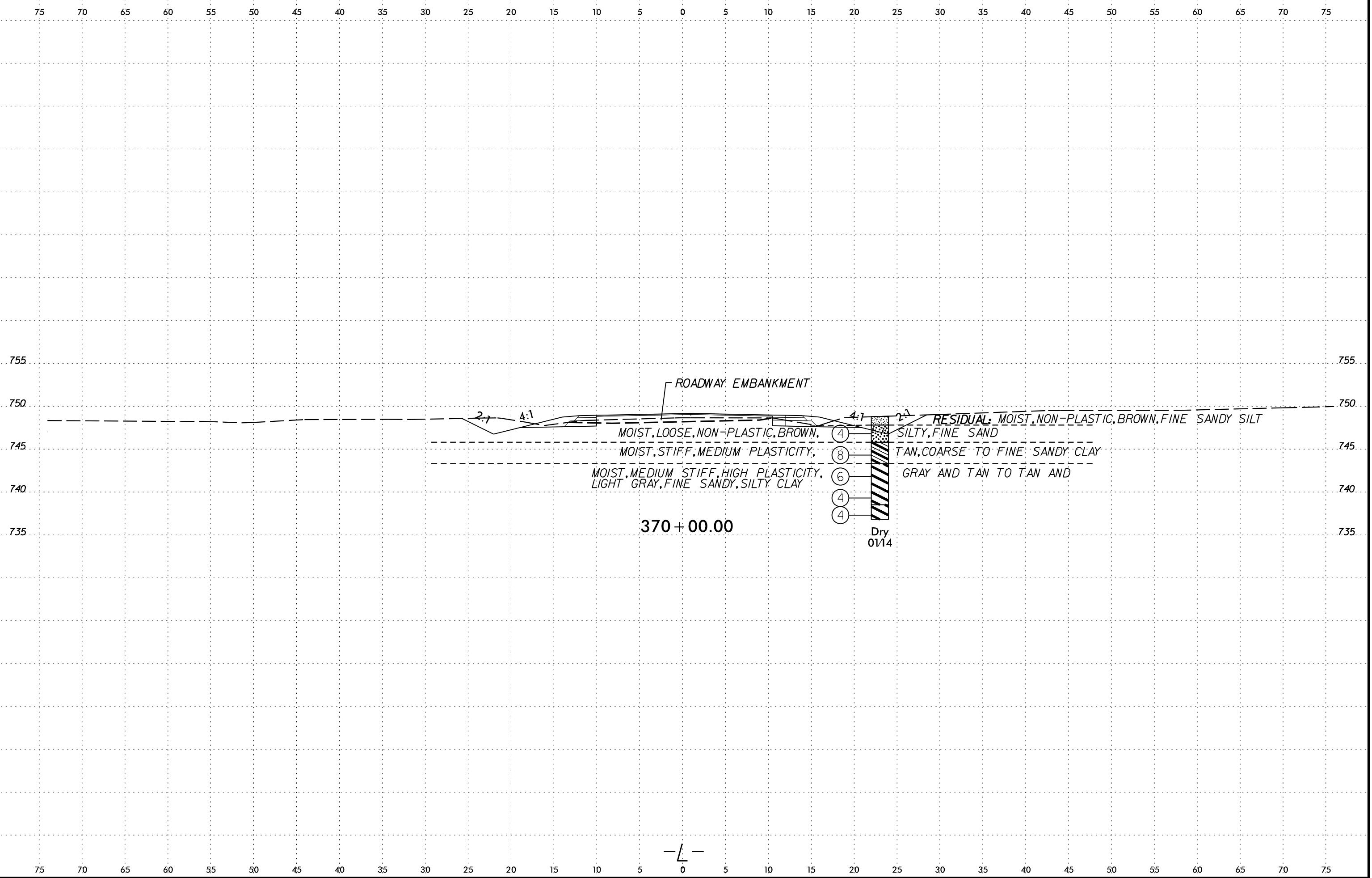




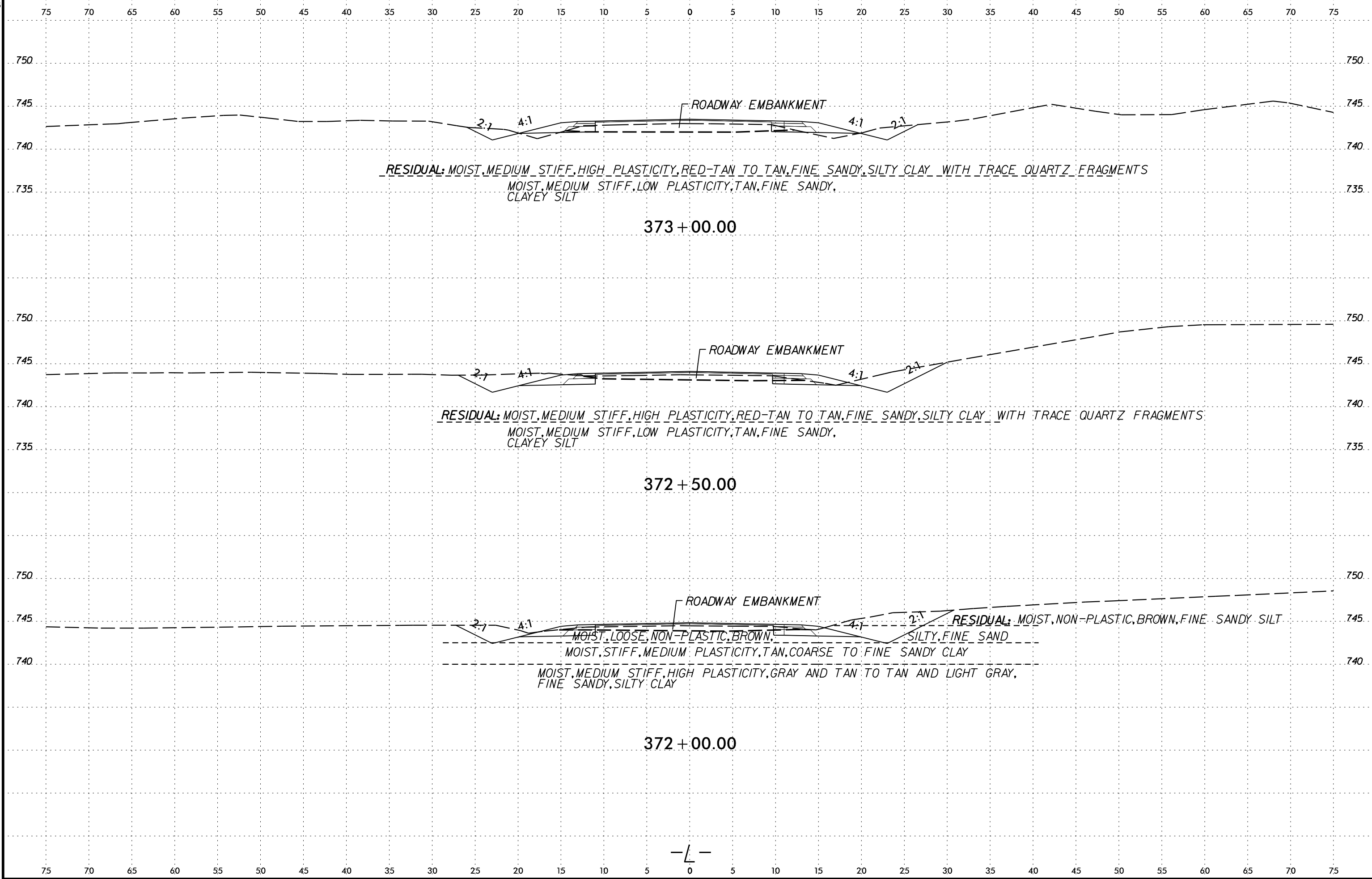


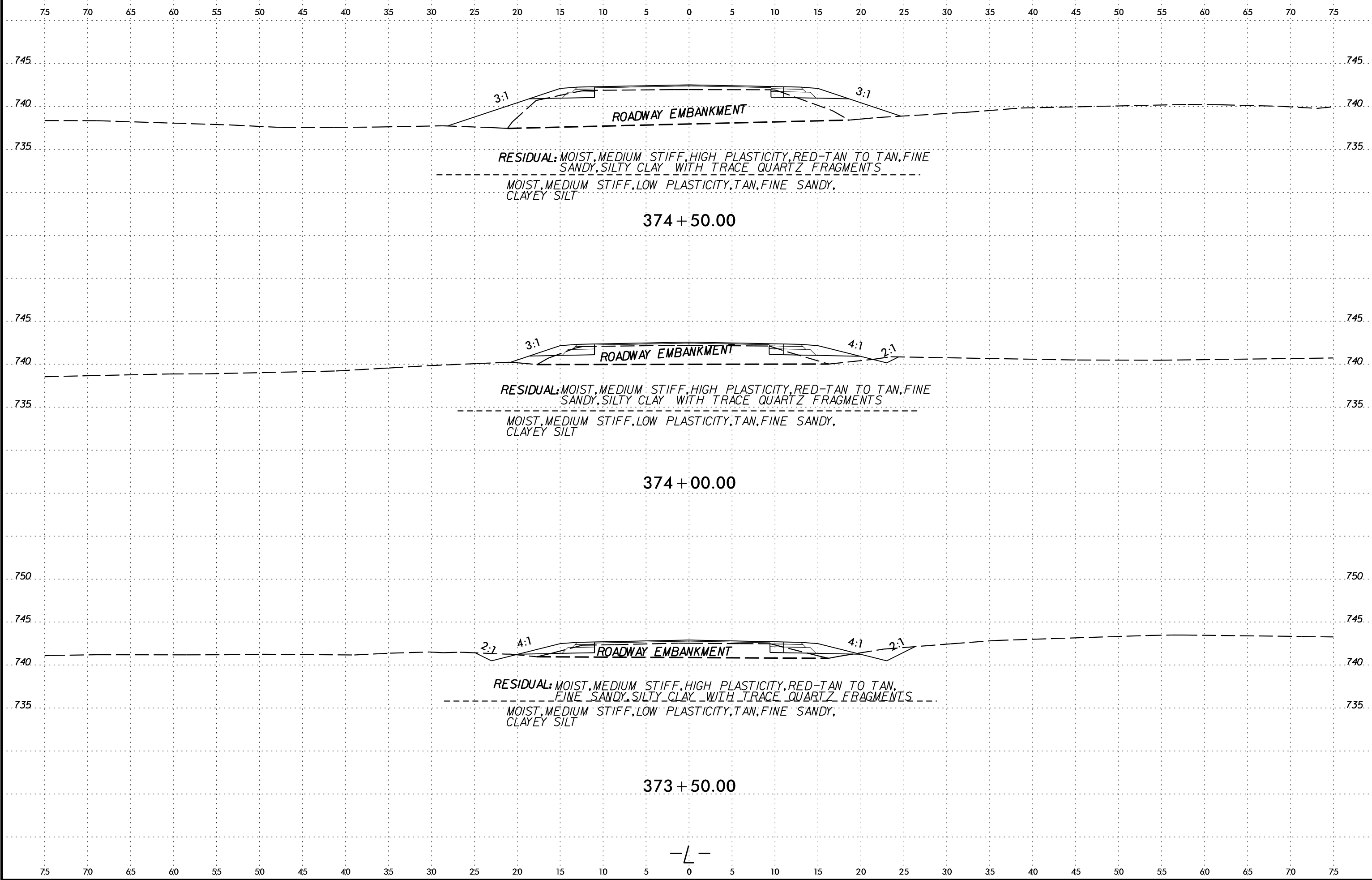


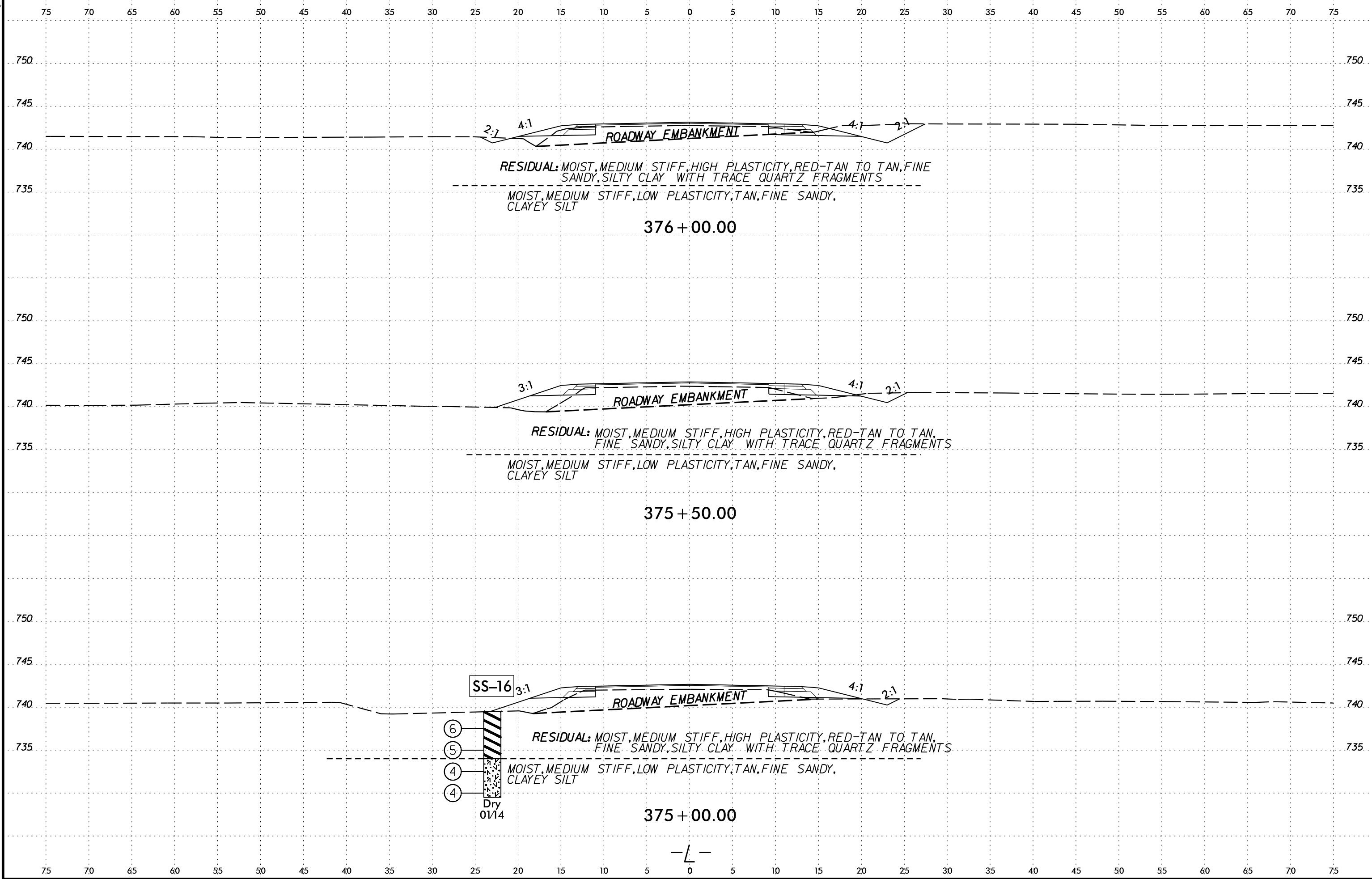


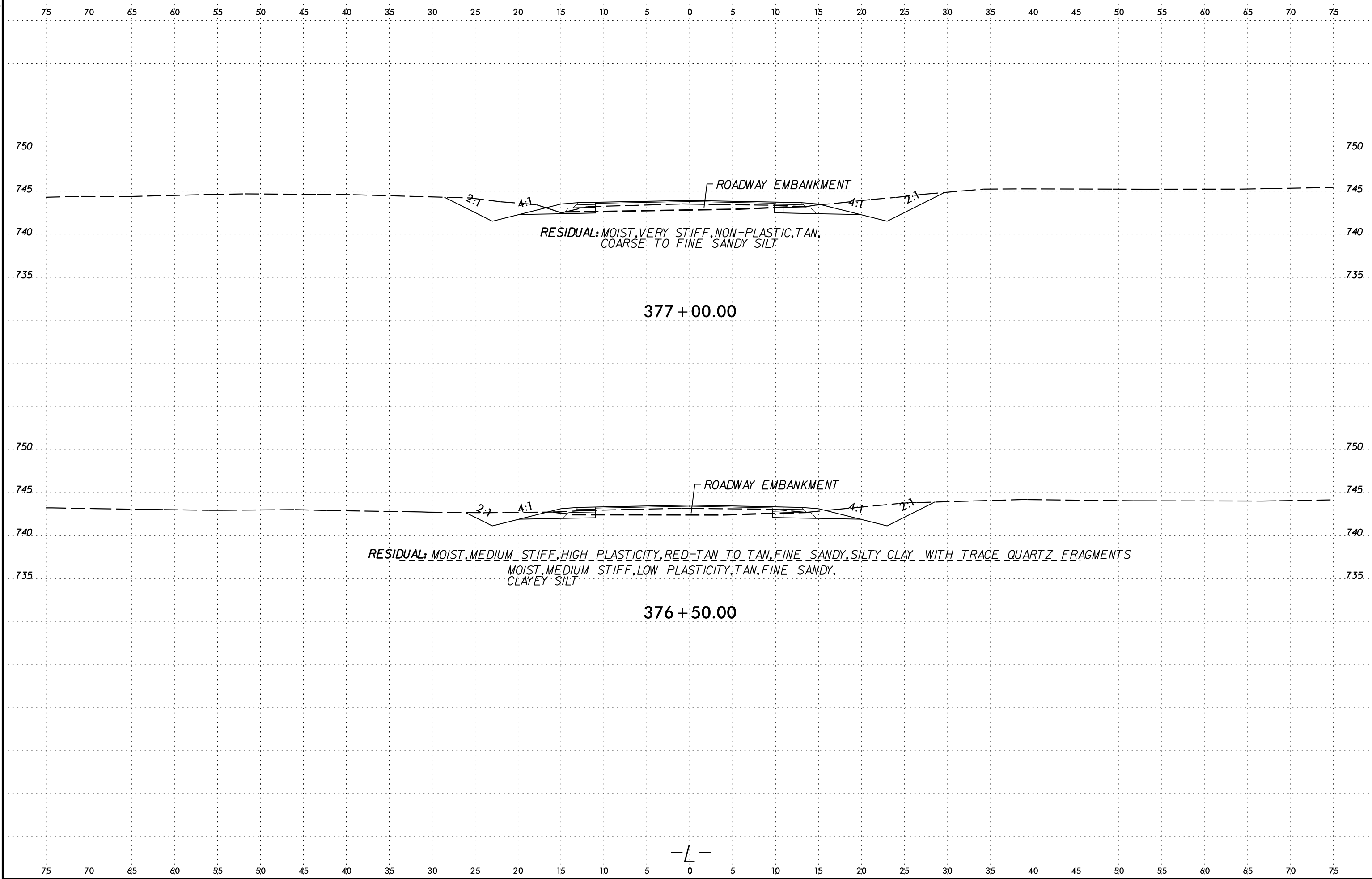


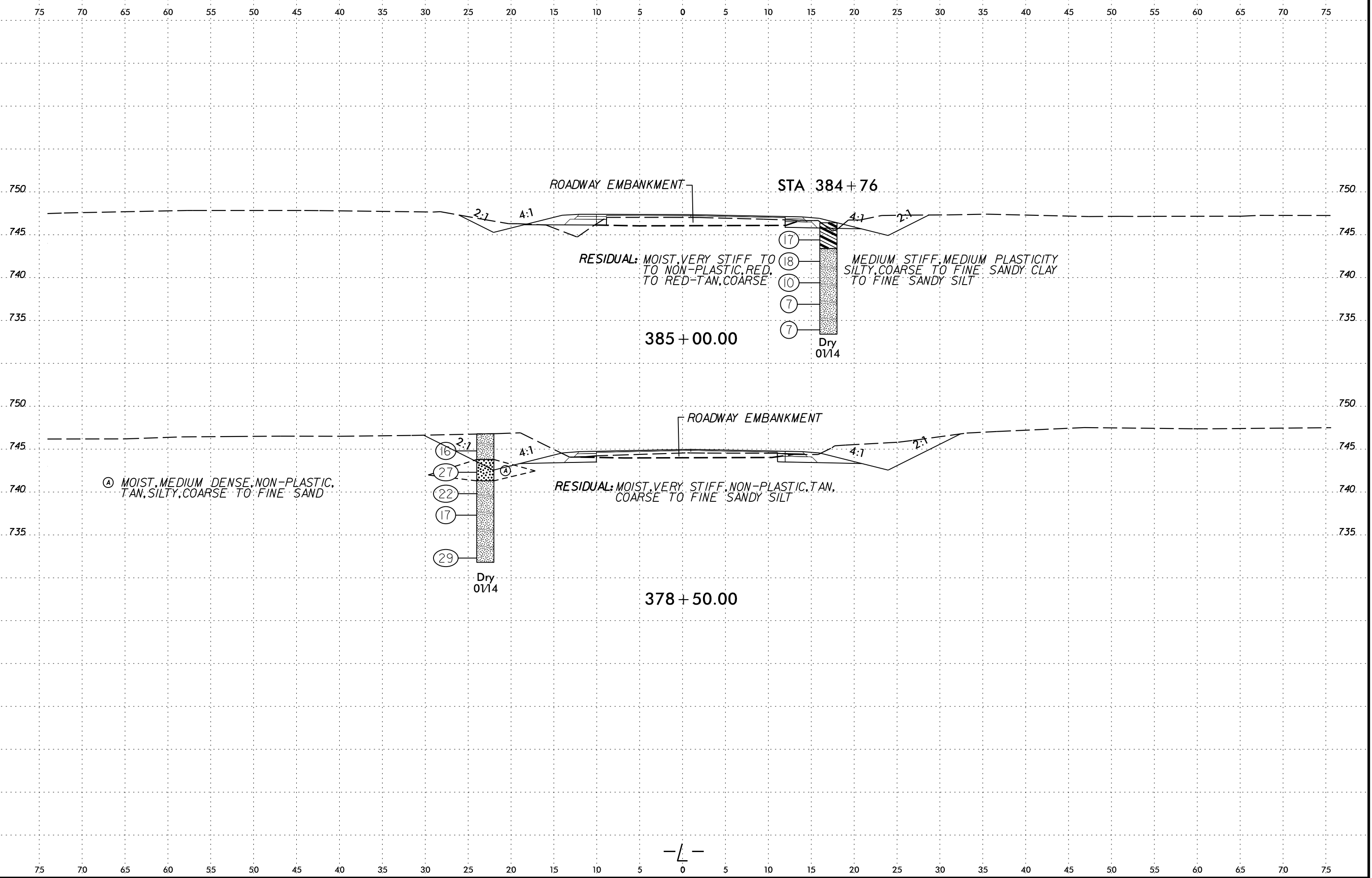


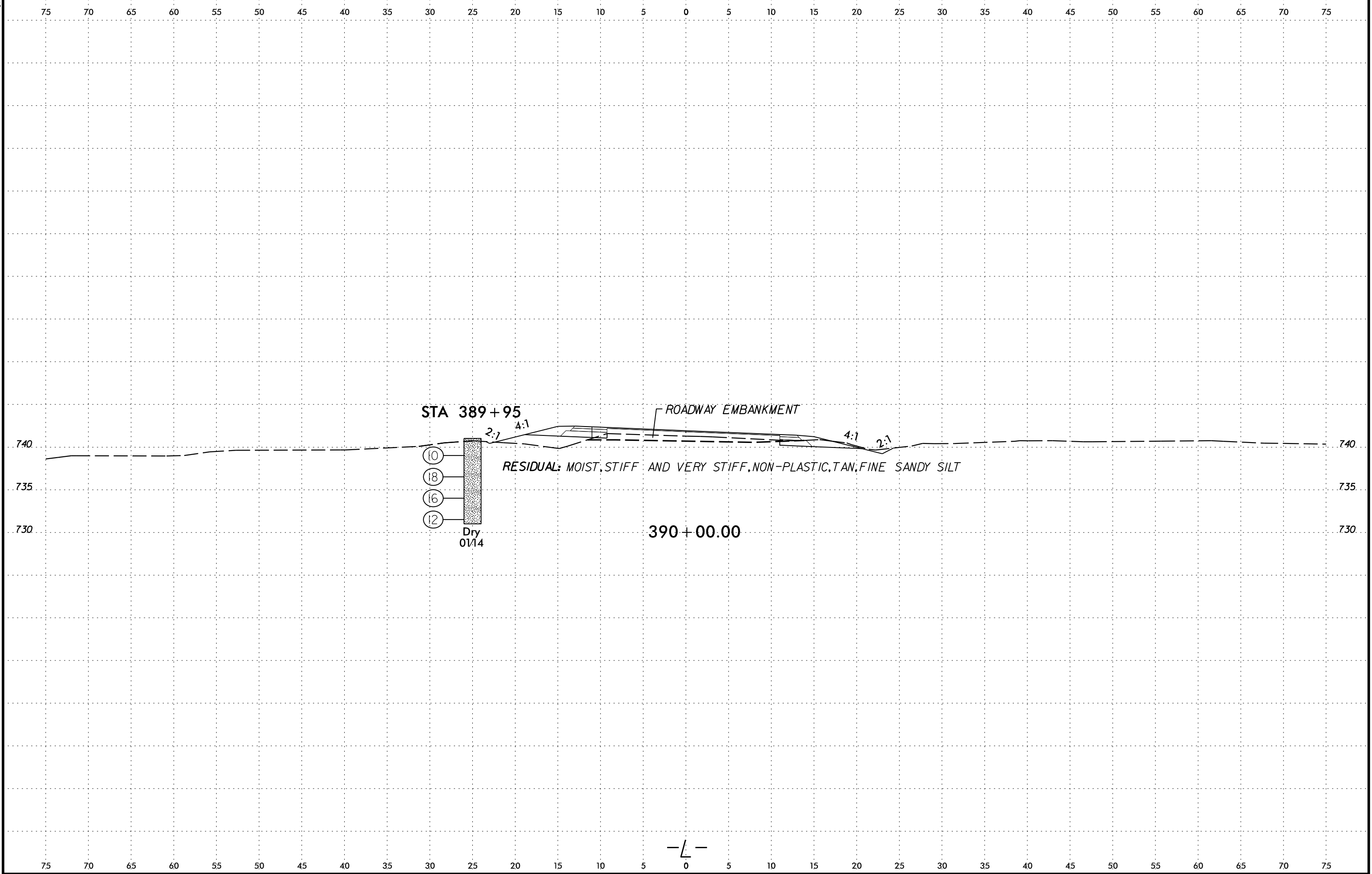






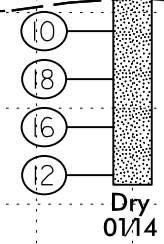
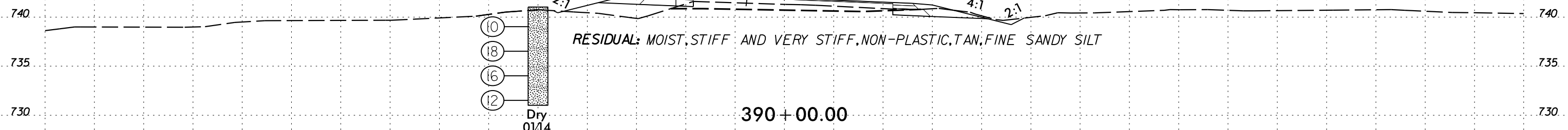






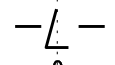
STA 389+95

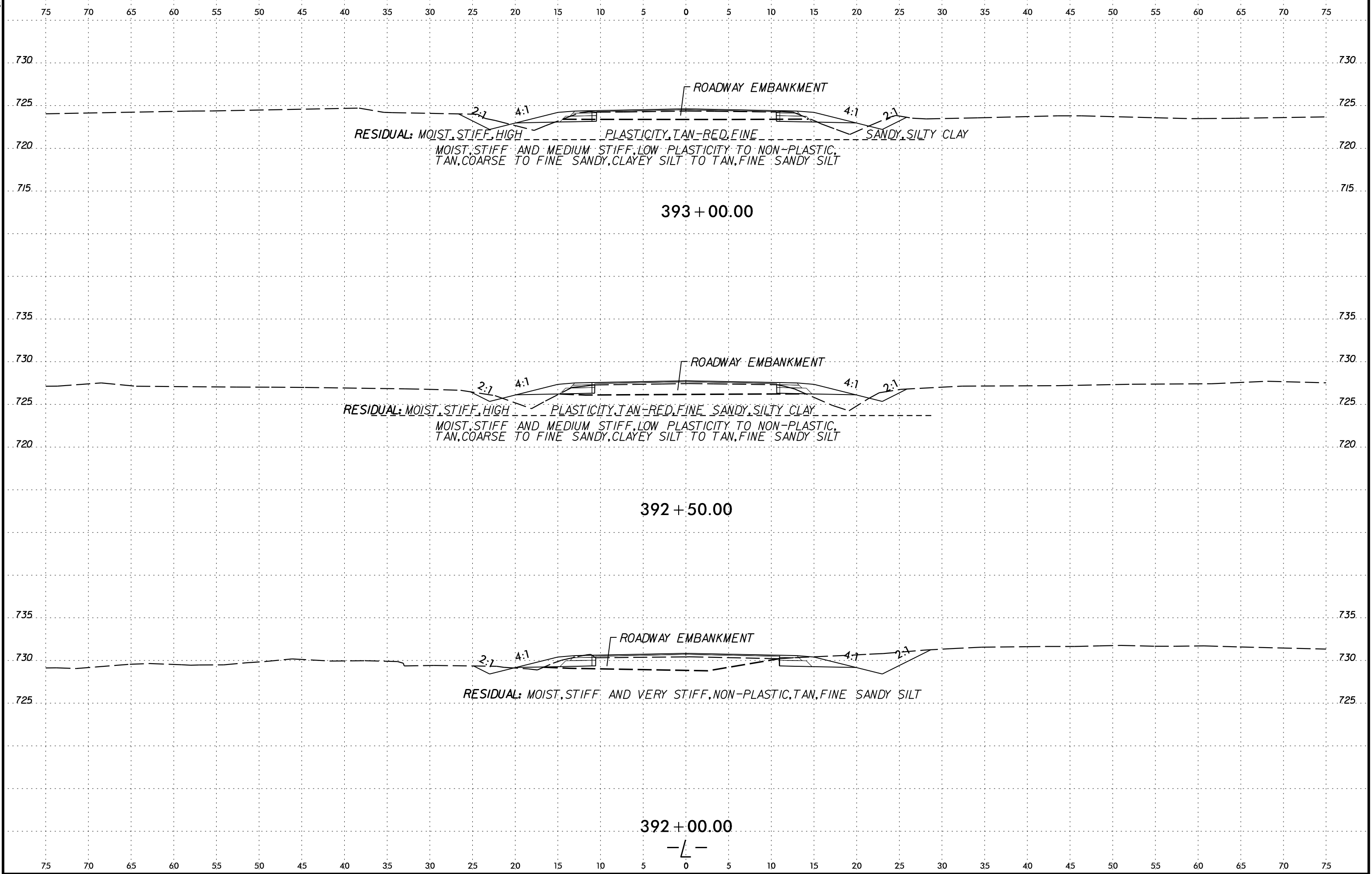
ROADWAY EMBANKMENT

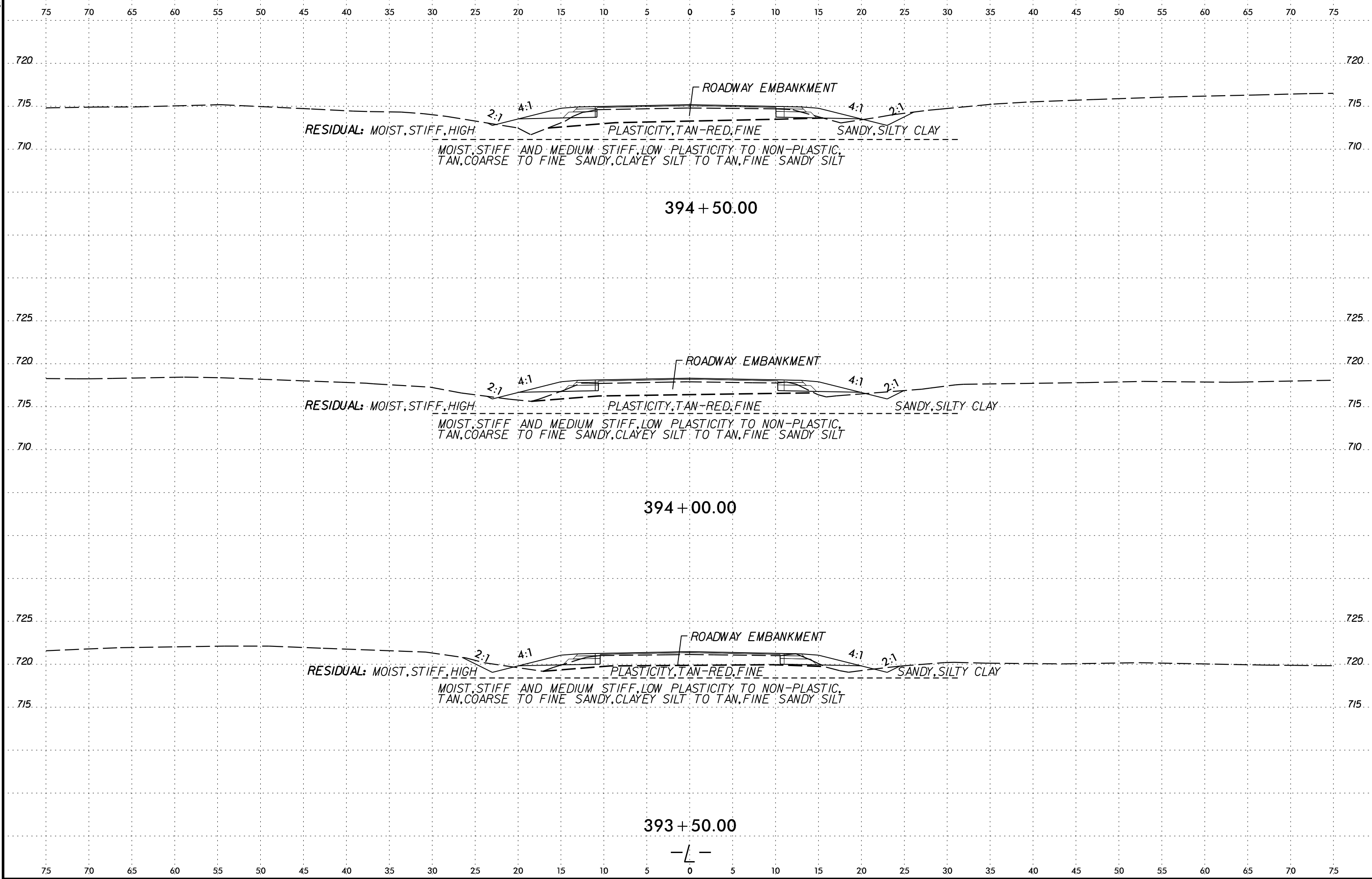


RESIDUAL: MOIST, STIFF AND VERY STIFF, NON-PLASTIC, TAN, FINE SANDY SILT

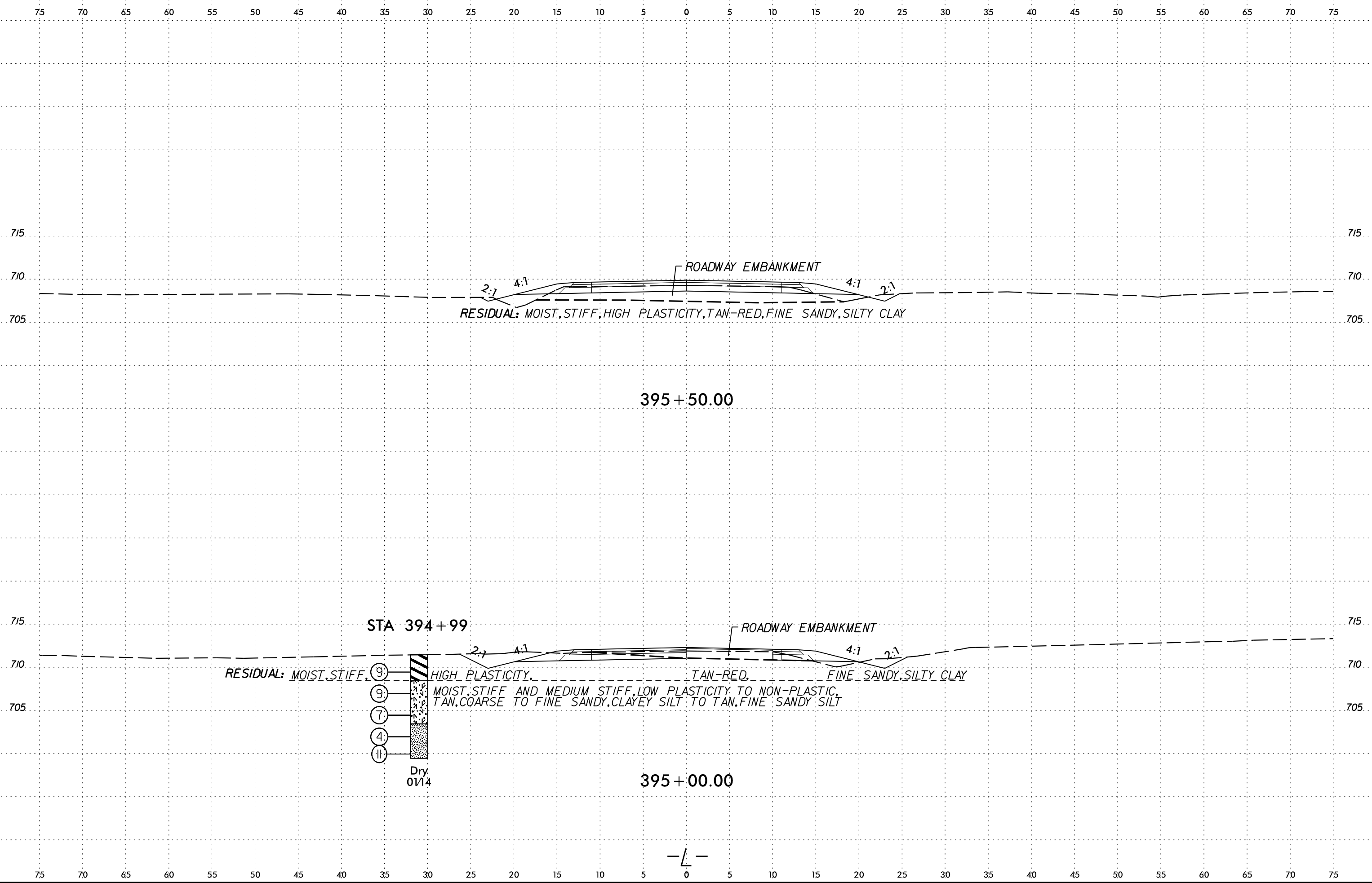
390+00.00











ROADWAY EMBANKMENT

RESIDUAL: MOIST, STIFF, HIGH PLASTICITY, TAN-RED, FINE SANDY, SILTY CLAY

395 + 50.00

STA 394 + 99

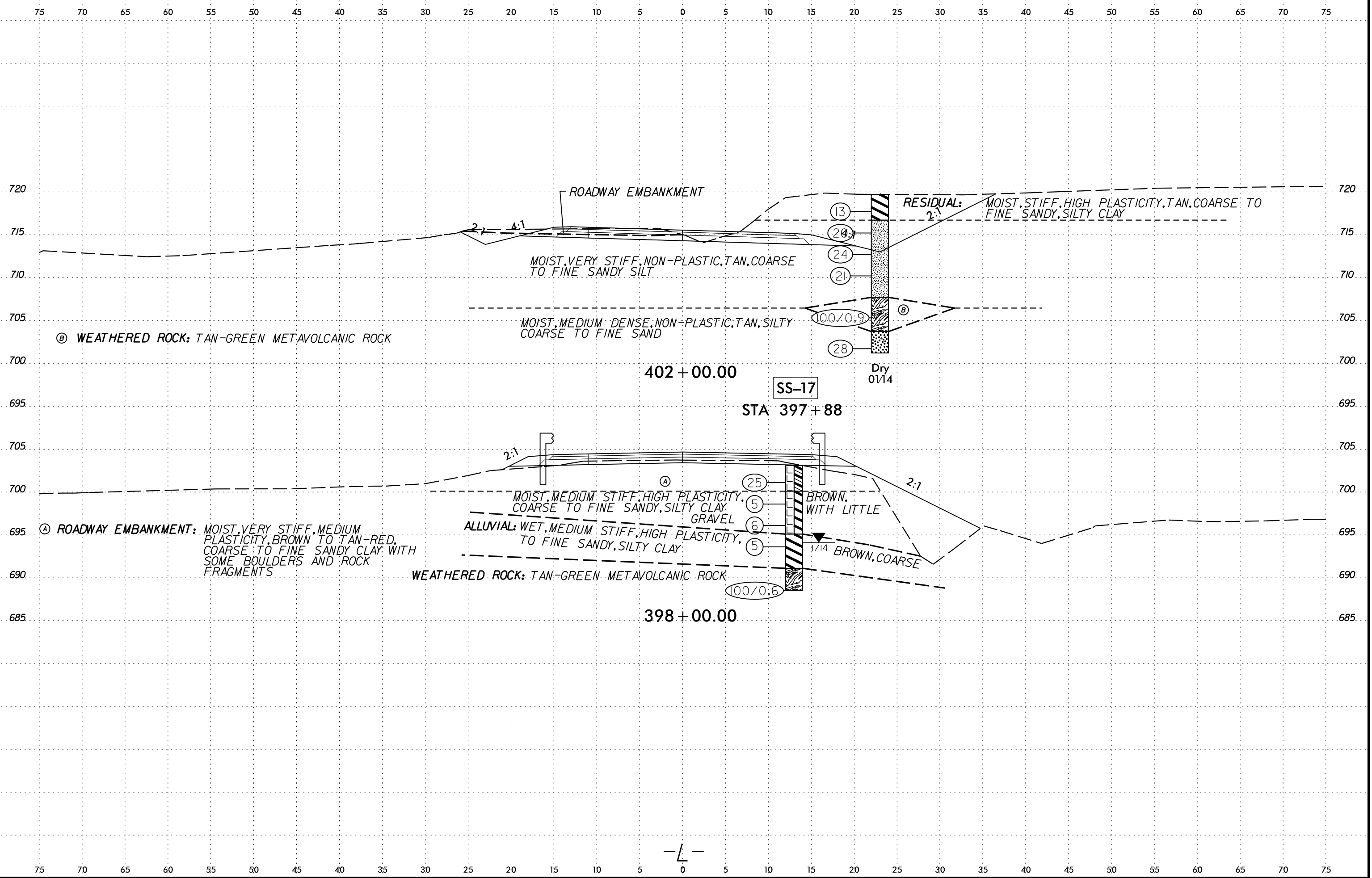
RESIDUAL: MOIST, STIFF, HIGH PLASTICITY, TAN-RED, FINE SANDY, SILTY CLAY

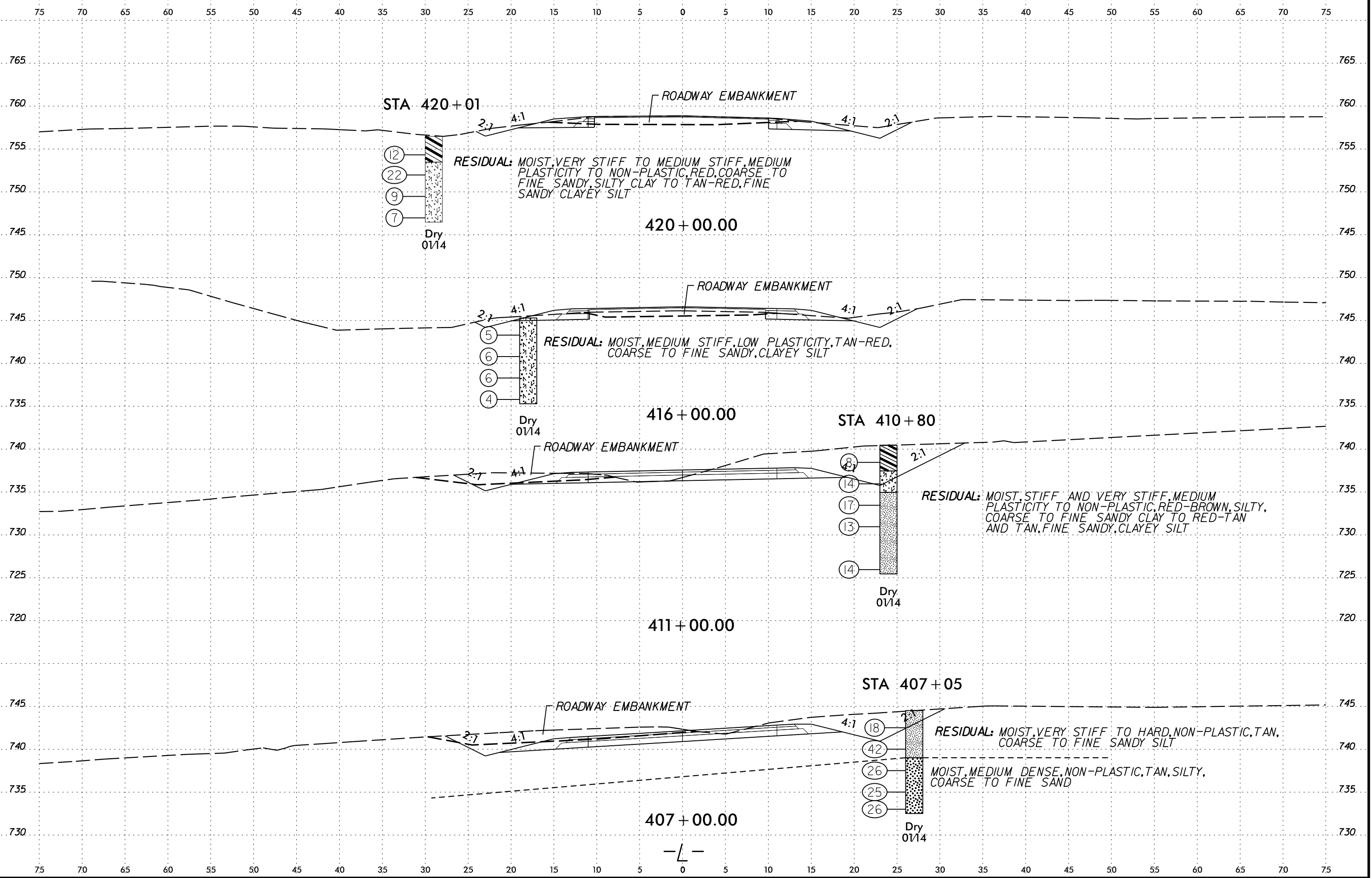
MOIST, STIFF AND MEDIUM STIFF, LOW PLASTICITY TO NON-PLASTIC, TAN, COARSE TO FINE SANDY, CLAYEY SILT TO TAN, FINE SANDY SILT

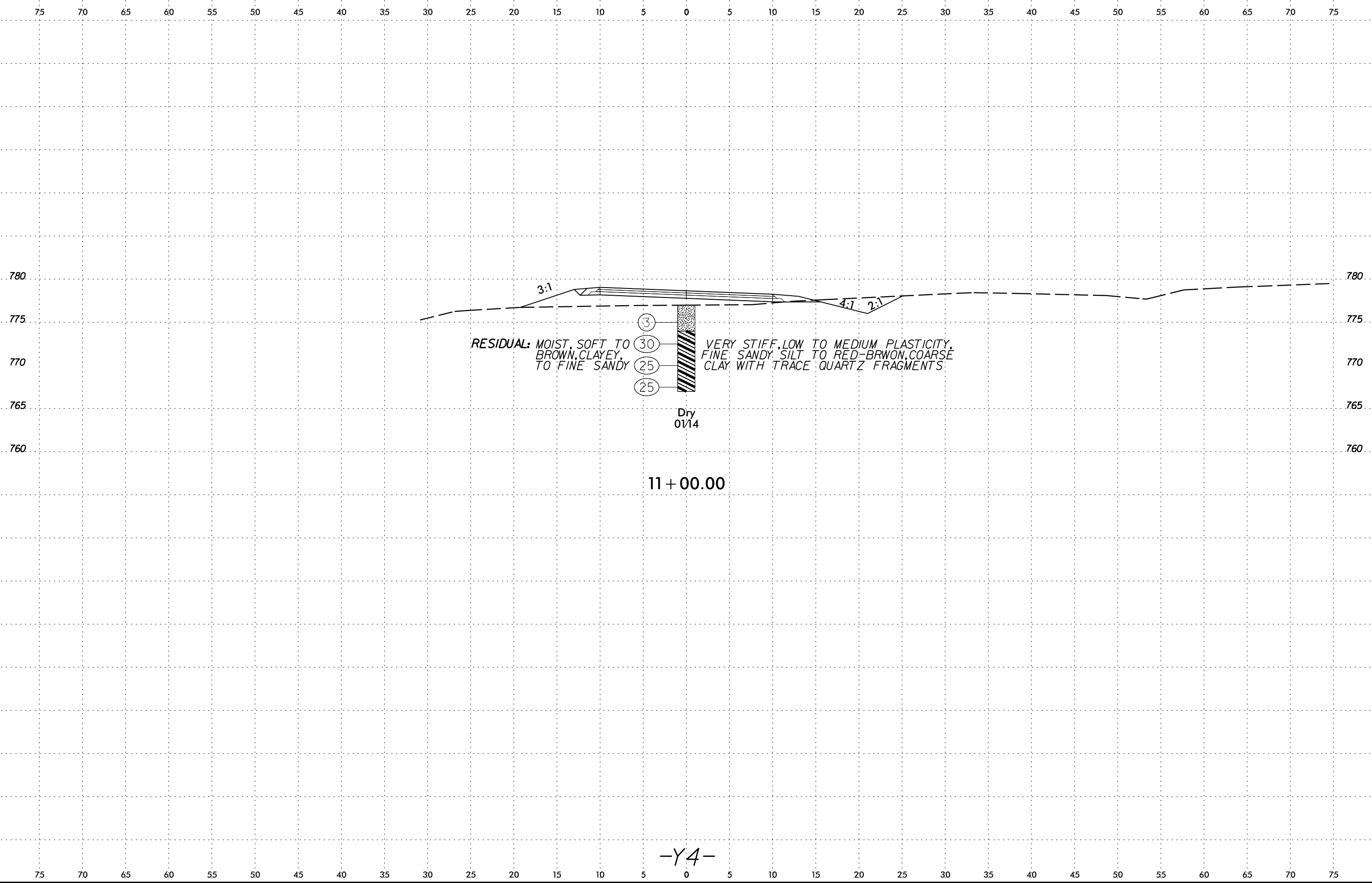
Dry 01/14

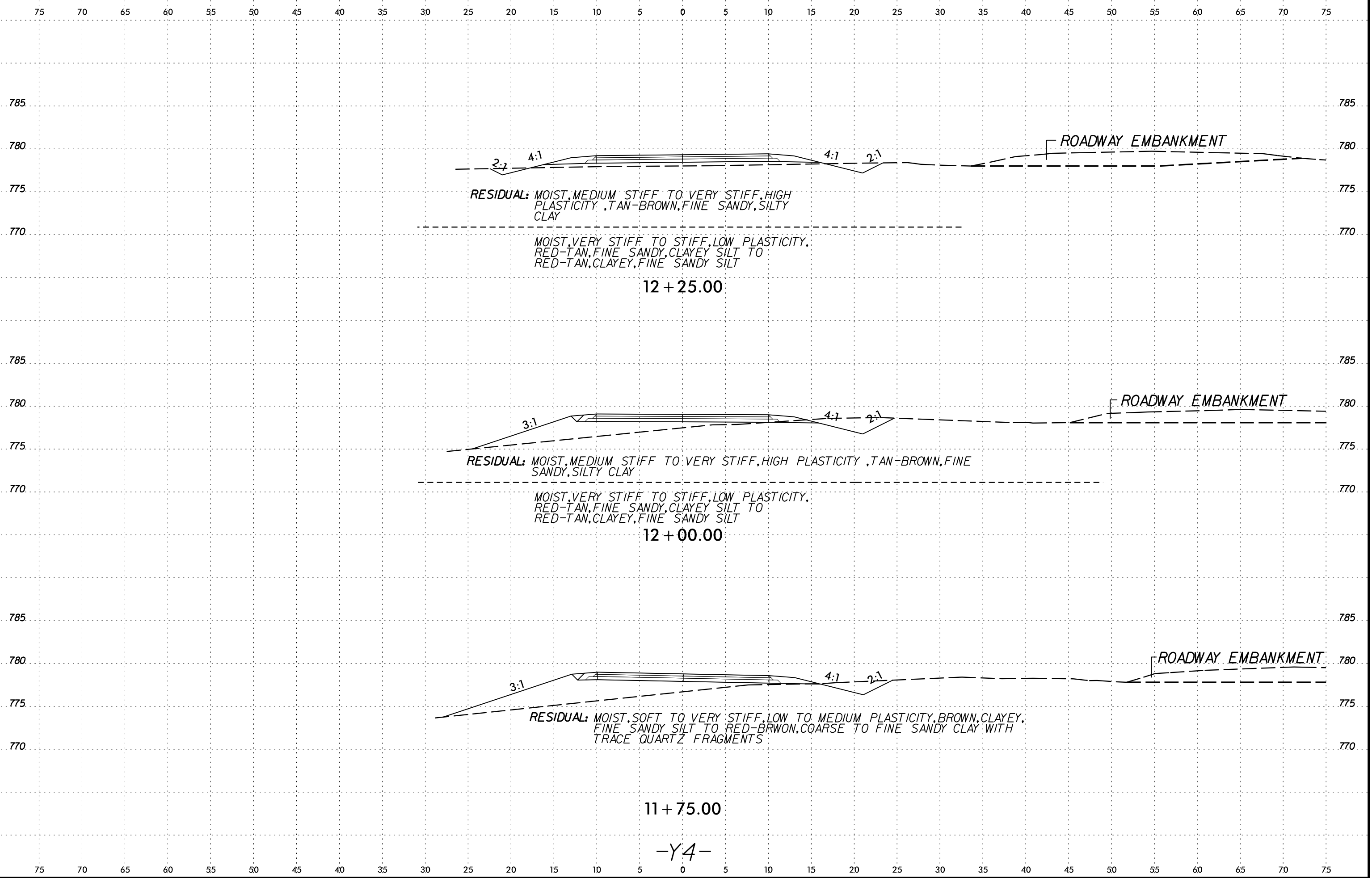
395 + 00.00

—/—







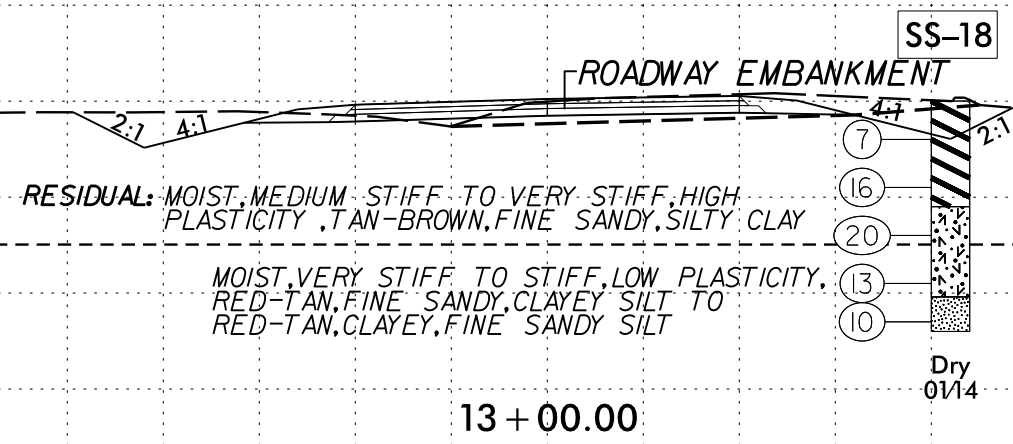


75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

785 785

780 780

775 775



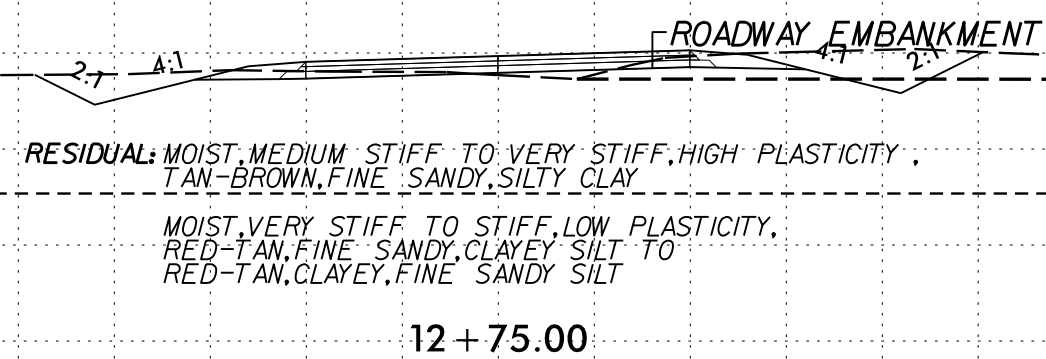
13 + 00.00

785 785

780 780

775 775

770 770



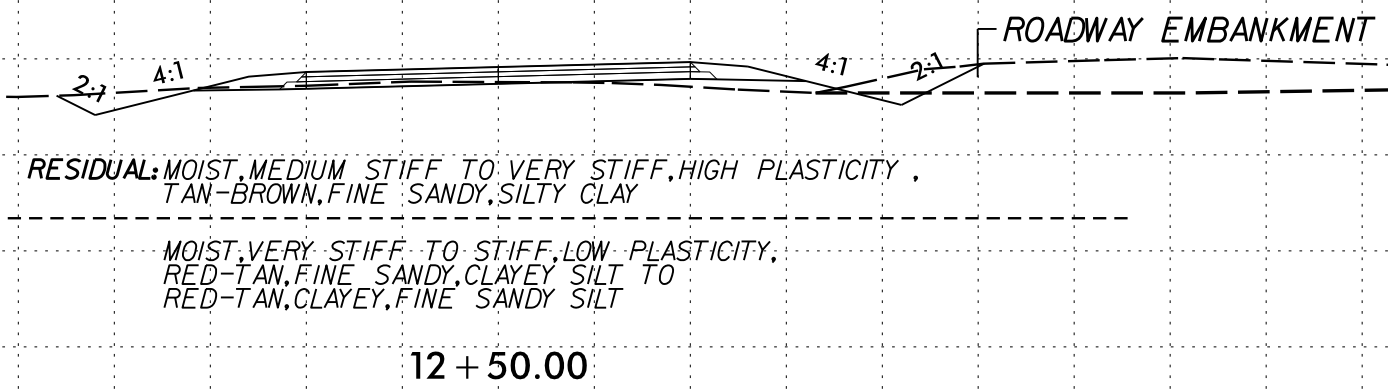
12 + 75.00

785 785

780 780

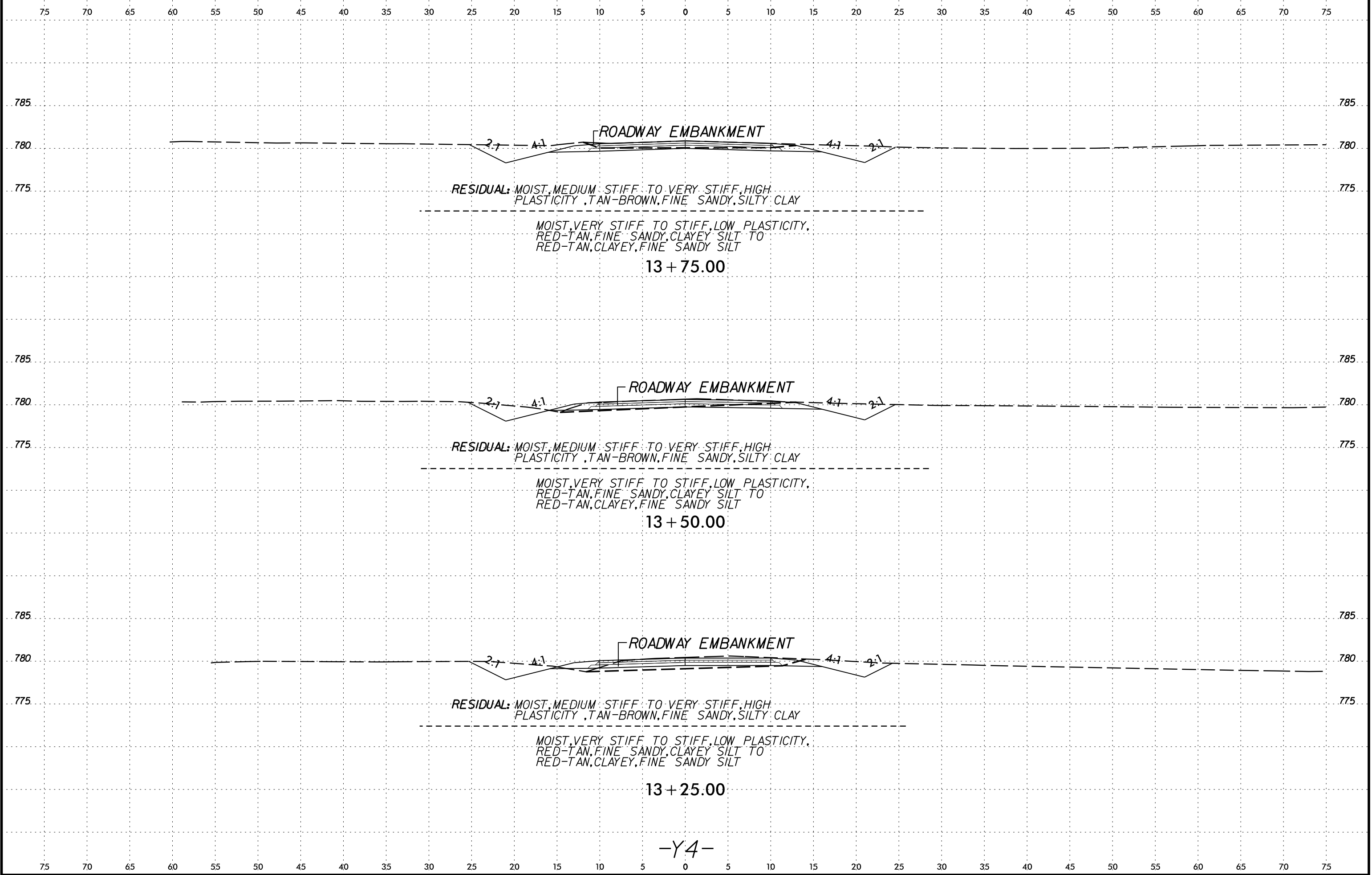
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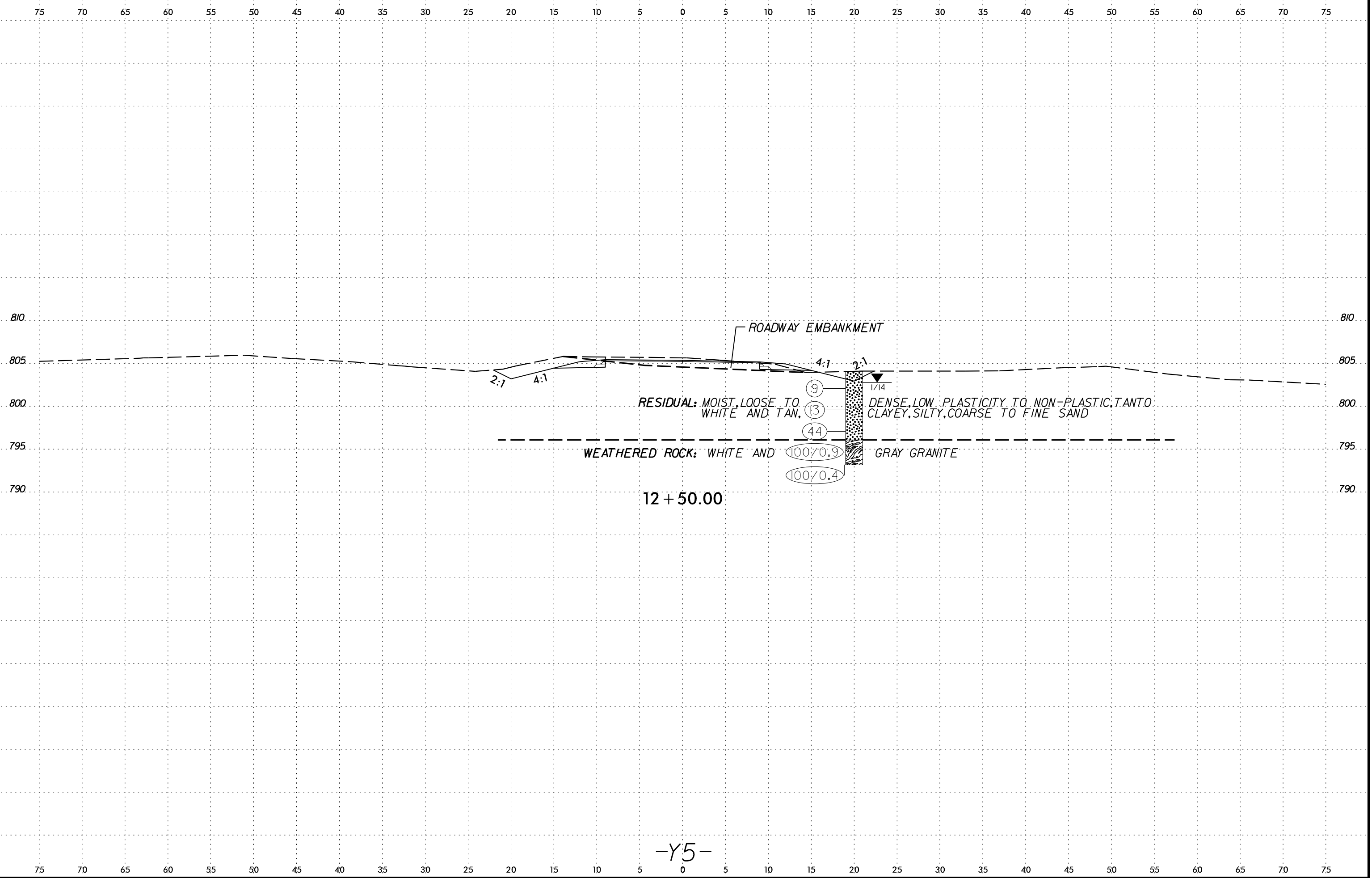
770 770



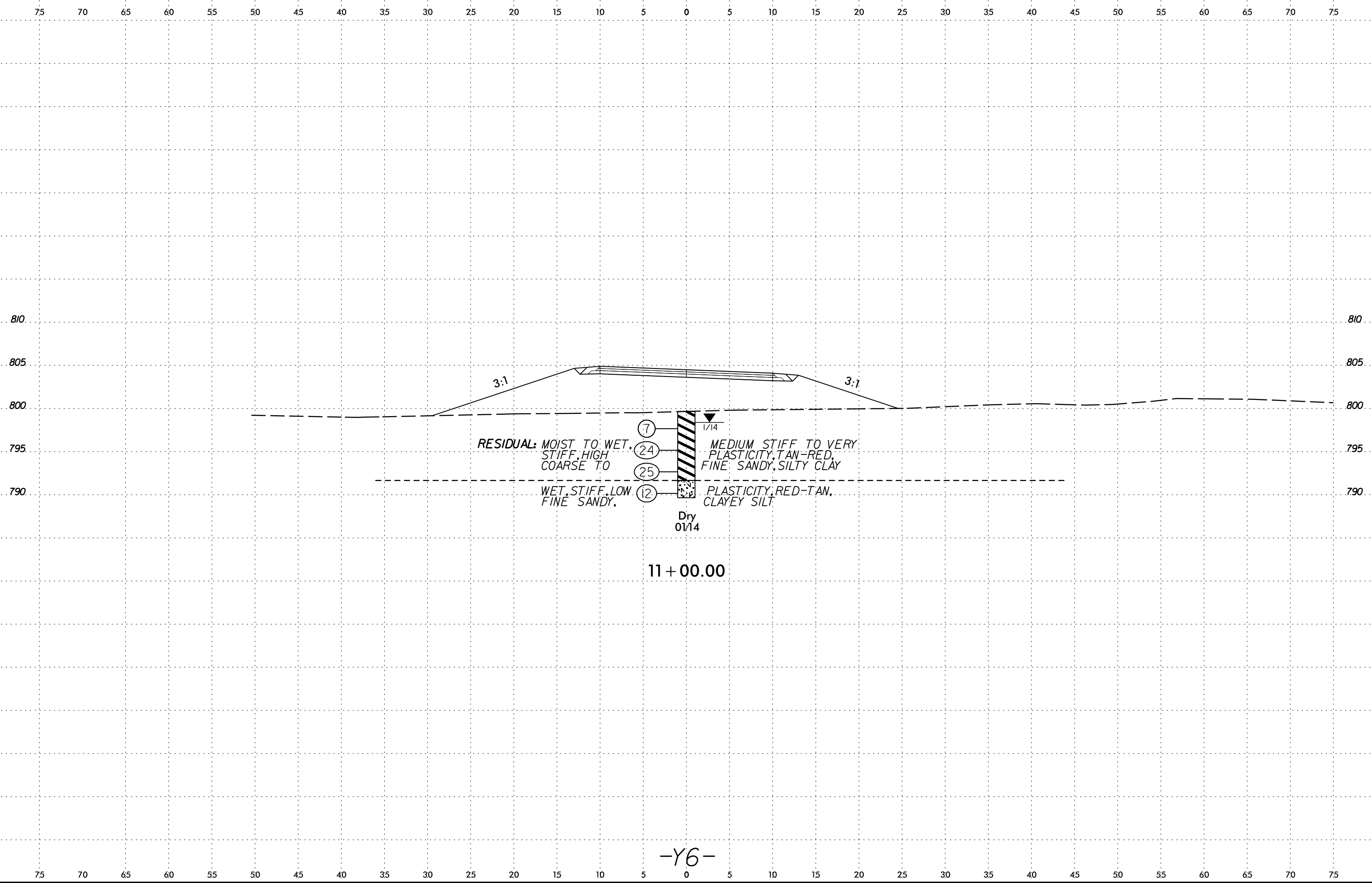
12 + 50.00

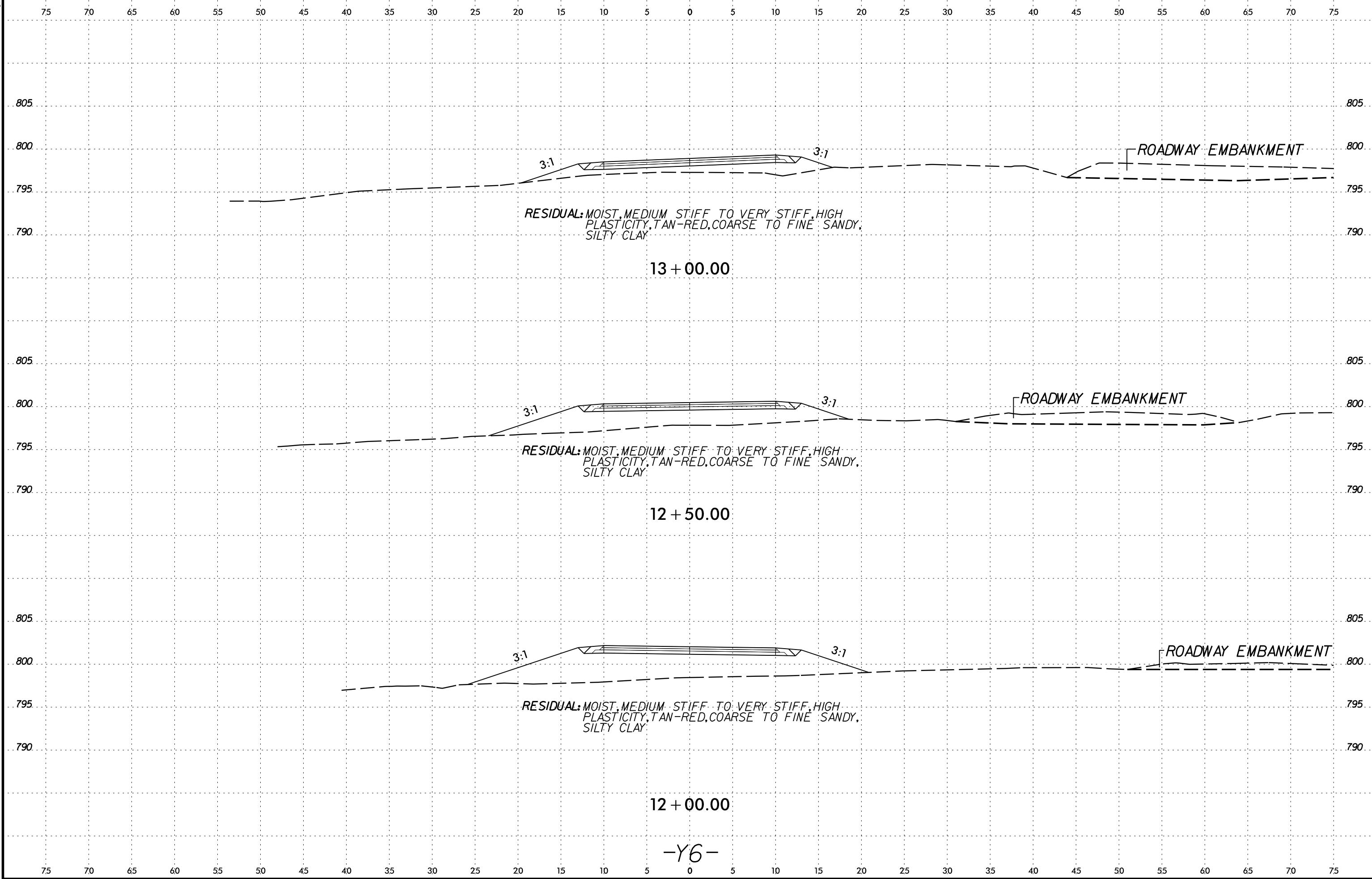
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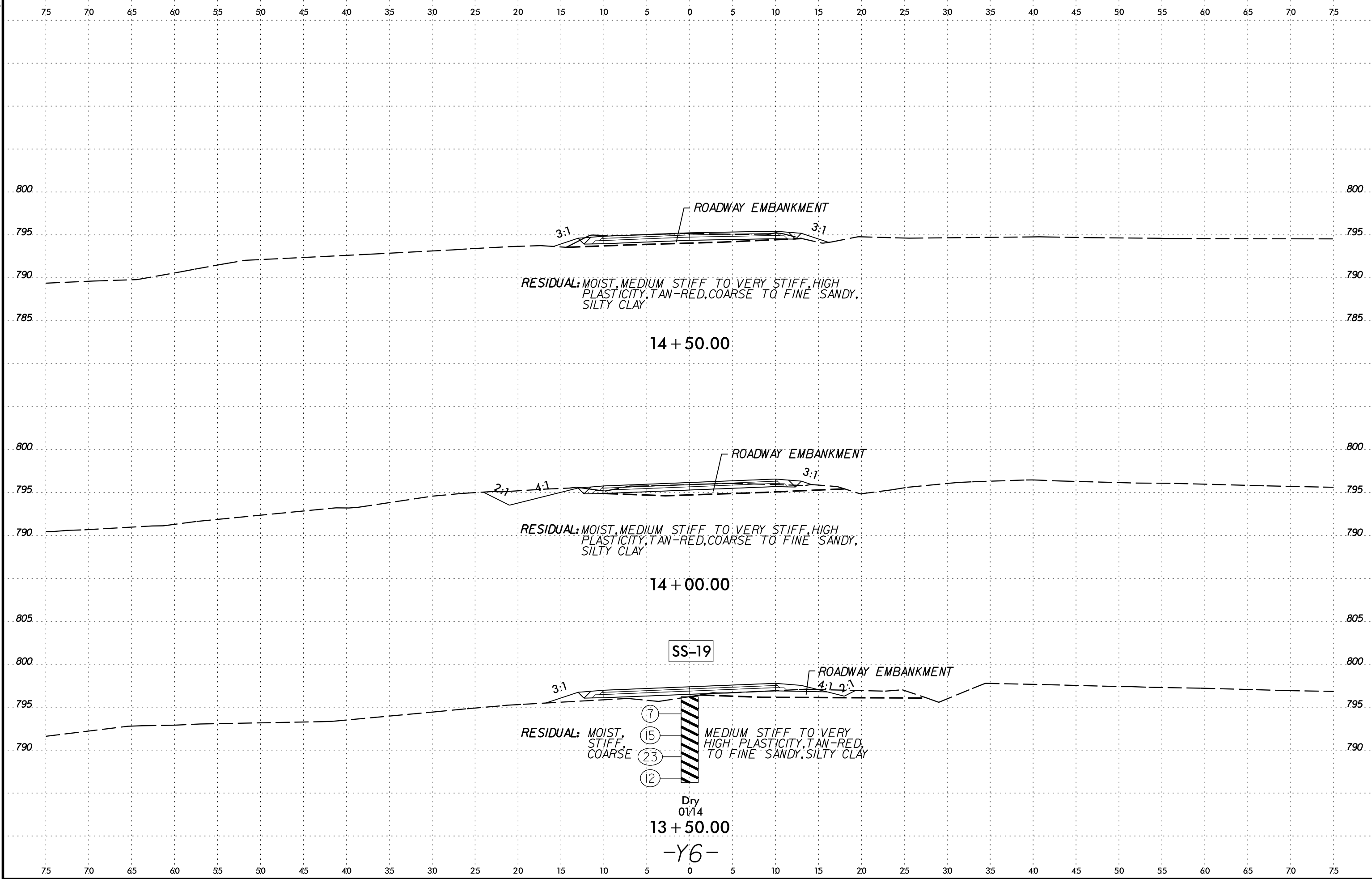


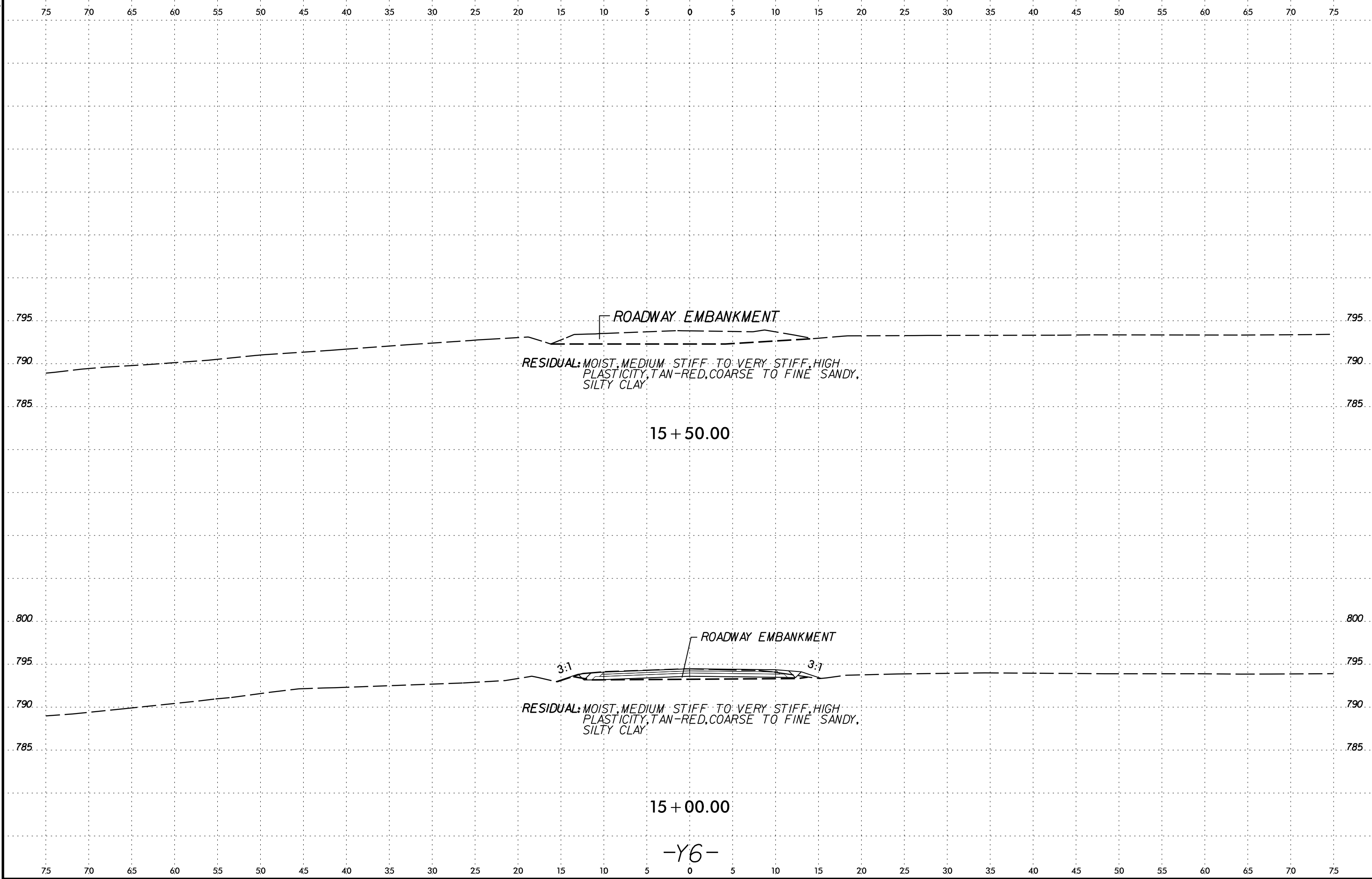












**SUMMARY OF LABORATORY TEST DATA**

**PROJECT NO. 46136.1.1 (W-5313)**

**FA NO. STP-1221(15)**

**COUNTY: ROWAN**

**SR 1221 (OLD BEATTY FORD ROAD) FROM SR 1337 (LENTZ ROAD) TO SR 2335 (LOWER STONE CHURCH ROAD)**

Sample No.	Boring Number	Station	Offset	Alignment	Sample Depth (ft.)	Natural Moisture Content (%)	AASHTO Class (Group Index)	N-Value (blows/ ft.)	Atterberg Limits			Gradation Results							
									L.L.	P.L.	P.I.	Pass #10 Sieve	Pass #40 Sieve	Pass #200 Sieve	Retained #270 Sieve	Coarse Sand (%)	Fine Sand (%)	Silt (%)	Clay (%)
SS-1	L_4000	40+00	18' RT	-L-	3.5-5.0	30.6	A-7-5(45)	27	75	37	38	100	99	95	7	1.2	5.9	14.7	78.2
SS-2	L_7050	70+50	36' RT	-L-	1.0-2.5	27.9	A-7-5(24)	11	56	34	22	100	98	90	12	2.7	9.6	23.4	64.2
SS-3	L_11000	110+00	23' RT	-L-	1.0-2.5	30.4	A-7-5(25)	11	59	35	24	100	99	85	18	4.0	14.1	26.1	55.9
SS-4	L_12048	120+48	26' RT	-L-	3.5-5.0	27.4	A-6(12)	5	34	17	17	99	97	82	23	3.8	19.4	25.3	51.5
SS-5	L_16500	165+00	15' RT	-L-	1.0-2.5	45.2	-	12	-	-	-	-	-	-	-	-	-	-	-
SS-6	L_18008	180+08	38' LT	-L-	6.0-7.5	41.7	A-7-5(60)	9	99	45	54	100	98	90	12	3.3	8.6	26.8	61.3
SS-7	L_18986	189+86	22' RT	-L-	1.0-2.5	23.0	A-6(6)	10	34	18	16	92	81	57	44	18.8	24.7	22.9	33.5
SS-8	L_20930	209+30	31' LT	-L-	1.0-2.5	27.7	-	2	-	-	-	-	-	-	-	-	-	-	-
SS-9	L_22024	220+24	10' RT	-L-	1.0-2.5	28.6	A-7-6(8)	17	50	24	26	84	65	46	48	28.6	18.9	14.2	38.3
SS-10	L_25000	250+00	23' LT	-L-	1.0-2.5	32.8	A-7-5(27)	11	61	38	23	100	100	91	11	1.9	9.2	36.9	52.0
SS-11	L_27000	270+00	20' RT	-L-	1.0-2.5	44.2	A-7-5(42)	6	76	41	35	100	99	93	8	2.3	5.6	27.6	64.5
SS-12	L_28526	285+26	18' LT	-L-	1.0-2.5	31.5	A-7-6(24)	9	55	27	28	95	91	79	21	7.5	13.5	24.7	54.3
SS-13	L_32001	320+01	46' LT	-L-	1.0-2.5	40.1	A-7-5(43)	11	74	36	38	100	99	91	11	1.6	9.6	26.9	61.9
SS-14	L_32982	329+82	42' RT	-L-	1.0-2.5	24.1	A-7-6(19)	14	51	22	29	97	87	70	30	15.0	15.0	2.8	67.2
SS-15	L_35079	350+79	37' LT	-L-	3.5-5.0	26.8	A-7-6(21)	7	51	22	29	96	94	73	30	5.7	24.1	35.0	35.2
SS-16	L_37500	375+00	23' LT	-L-	1.0-2.5	30.0	A-7-6(59)	6	93	25	68	98	96	80	21	7.1	13.6	16.7	62.6
SS-17	L_39788	397+88	13' RT	-L-	3.5-5.0	24.8	A-7-6(24)	5	59	27	32	95	89	73	27	11.9	14.8	33.7	39.6
SS-18	Y4_1300	13+00	21' RT	-Y4-	1.0-2.5	31.4	A-7-6(20)	7	56	28	28	99	91	72	30	12.6	17.7	14.7	55.0
SS-19	Y6_1350	13+50	CL	-Y6-	1.0-2.5	22.1	A-7-6(14)	7	44	18	26	96	85	62	39	18.4	20.3	18.6	42.8
SS-20	L_1986	19+86	15' LT	-L-	1.0-2.5	29.1	A-7-5(29)	14	59	34	25	100	99	94	9	1.2	7.4	31.5	59.9
SS-21	L_3000	30+00	15' LT	-L-	3.5-5.0	28.2	A-7-5(42)	22	73	37	36	100	99	94	9	1.4	7.3	21.6	69.7

SS = Split-Barrel Sample (ASTM-D-1586) ST = Shelby Tube (Undisturbed) Sample

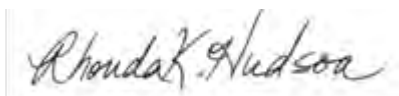
S = Grab Sample

NP -- Non Plastic

NA-- Non Applicable

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Lab Technician: NCDOT Certification No.: 111-06-1203



Rhonda Hudson