

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

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4252	1	4.8
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33594.1.1	BRSTP-311(14)	P.E.	
33594.2.1	BRSTP-311(14)	RW & Utilities	
33594.3.1	BRSTP-311(22)	CONST.	

CONTENTS

LINE	STATION	PLAN	XSECT
-L-	12+75-41+50	4-6	8-32
-Y-	13+15-26+69	4,7	33-43
-Y1-	10+00-15+19	5	44-46
-Y4-	10+00-13+00	7	47-48

ROADWAY
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 33594.1.1 (B-4252) F.A. PROJ. BRSTP-311(14)
COUNTY ROCKINGHAM
PROJECT DESCRIPTION BRIDGE NO. 95 ON -L- (US 311) OVER
BIG BEAVER ISLAND CREEK AND BRIDGE NO. 67
ON -L- (US 311) OVER LITTLE BEAVER ISLAND CREEK
INVENTORY

CAUTION NOTICE

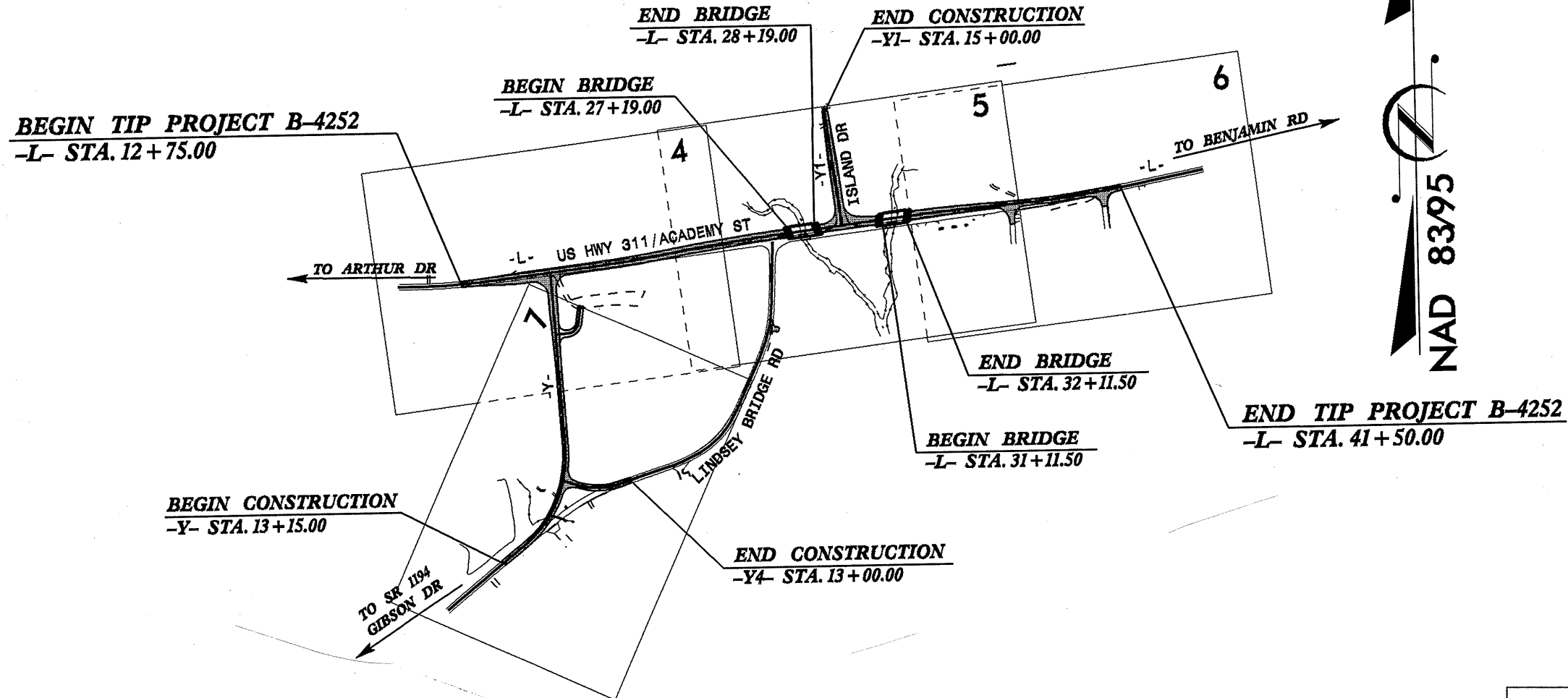
THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING, AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 250-4088. 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.

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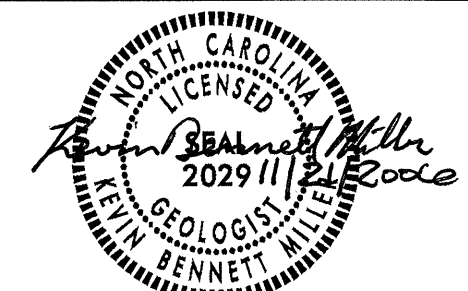
CONTRACT: C201855



PERSONNEL

OBO
HRC
DWD
LWD

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



DRAWN BY: W. D. FIELDS, K. B. MILLER

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

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

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

PROJECT REFERENCE NO. 33594.I.I (B-4252)	SHEET NO. 2
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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 T296, 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, BRN. SATY CLM, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i>		WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED) POORLY GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES. THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.		HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS: WEATHERED ROCK (WR) CRYSTALLINE ROCK (CR) NON-CRYSTALLINE ROCK (NCR) COASTAL PLAIN SEDIMENTARY ROCK (CP)		ALLOUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE 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 (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.			
SOIL LEGEND AND AASHTO CLASSIFICATION		MINERALOGICAL COMPOSITION		WEATHERING					
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.		FRESH VERY SLIGHT (V SLI.) SLIGHT (SLI.) MODERATE (MOD.) MODERATELY SEVERE (MOD. SEV.) SEVERE (SEV.) VERY SEVERE (V SEV.) COMPLETE					
GROUP CLASS. A-1, A-1-b, A-3, A-2-4, A-2-5, A-2-6, A-2-7, A-4, A-5, A-6, A-7, A-7-5, A-7-6, A-1, A-2, A-3, A-4, A-5, A-6, A-7		COMPRESSIBILITY SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 31 MODERATELY COMPRESSIBLE LIQUID LIMIT EQUAL TO 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50		ROCK GENERALLY FRESH, CRYSTALLINE BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE. 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. 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. 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. 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. IF TESTED, YIELDS SPT REFUSAL. 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. IF TESTED, YIELDS SPT N VALUES > 100 BPF. ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. IF TESTED, YIELDS SPT N VALUES < 100 BPF. 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.		PERCENTAGE OF MATERIAL ORGANIC MATERIAL 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		WEATHERING ROCK FRESH, CRYSTALLINE BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE. 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. 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. 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. 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. IF TESTED, YIELDS SPT REFUSAL. 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. IF TESTED, YIELDS SPT N VALUES > 100 BPF. ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. IF TESTED, YIELDS SPT N VALUES < 100 BPF. 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.	
LIQUID LIMIT PLASTIC INDEX GROUP INDEX		GROUND WATER WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING STATIC WATER LEVEL AFTER 24 HOURS PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA SPRING OR SEEP		MISCELLANEOUS SYMBOLS ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT INFERRED SOIL BOUNDARY INFERRED ROCK LINE ALLUVIAL SOIL BOUNDARY DIP & DIP DIRECTION OF ROCK STRUCTURES SOUNDING ROD		ROCK HARDNESS VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT			
CONSISTENCY OR DENSENESS PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)		ABBREVIATIONS 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 HL - 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 # - MOISTURE CONTENT v - VERY VST - VANE SHEAR TEST WEA. - WEATHERED γ - UNIT WEIGHT γ _d - DRY UNIT WEIGHT		EQUIPMENT USED ON SUBJECT PROJECT DRILL UNITS: MOBILE B- BK-51 CME-45C CME-550 PORTABLE HOIST ADVANCING TOOLS: CLAY BITS 6" CONTINUOUS FLIGHT AUGER 8" HOLLOW AUGERS HARD FACED FINGER BITS TUNG-CARBIDE INSERTS CASING w/ ADVANCER TRICONE * STEEL TEETH TRICONE * TUNG-CARB. CORE BIT HAMMER TYPE: AUTOMATIC MANUAL CORE SIZE: B N H HAND TOOLS: POST HOLE DIGGER HAND AUGER SOUNDING ROD VANE SHEAR TEST		FRACTURE SPACING BEDDING TERM SPACING THICKNESS VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED > 4 FEET WIDE 3 TO 10 FEET THICKLY BEDDED 1.5 - 4 FEET MODERATELY CLOSE 1 TO 3 FEET THINLY BEDDED 0.16 - 1.5 FEET CLOSE 0.16 TO 1 FEET VERY THINLY BEDDED 0.03 - 0.16 FEET VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET THINLY LAMINATED < 0.008 FEET INDURATION FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. 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.			
TEXTURE OR GRAIN SIZE U.S. STD. SIEVE SIZE OPENING (MM) 4 10 40 60 200 270 BOULDER (BLDR.) COBBLE (COB.) GRAVEL (GR.) COARSE SAND (CSE. SD.) FINE SAND (F SD.) SILT (SL.) CLAY (CL.)		SOIL MOISTURE - CORRELATION OF TERMS SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION LL - LIQUID LIMIT SATURATED (SAT.) USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE PL - PLASTIC LIMIT WET - (W) SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE OM - OPTIMUM MOISTURE MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE SL - SHRINKAGE LIMIT DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE		COLOR 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.		BENCH MARK: ELEVATION: FT. NOTES:			

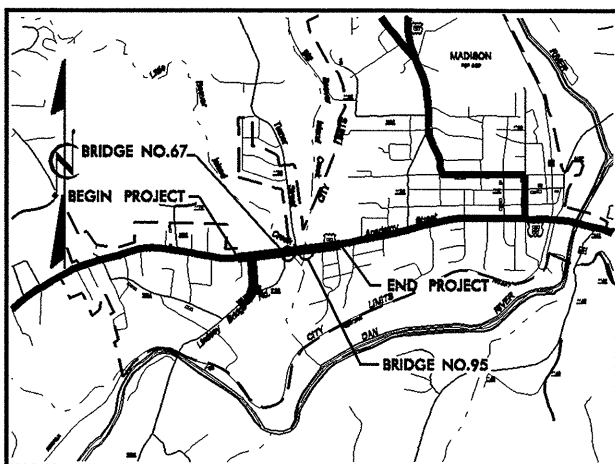
See Sheet 1-A For Index of Sheets

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ROCKINGHAM COUNTY

LOCATION: BRIDGE NO. 95 OVER BIG BEAVER ISLAND CREEK ON US 311 AND BRIDGE NO. 67 OVER LITTLE BEAVER ISLAND CREEK ON US 311
TYPE OF WORK: GRADING, DRAINAGE, PAVING & STRUCTURES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4252	2A	48
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33594.1.1	BRSTP-311(14)	P.E.	



VICINITY MAP

25% Plans

(THIS PROJECT IS IN THE MUNICIPAL BOUNDARIES OF MADISON.)

BEGIN TIP PROJECT B-4252
-L- STA. 12+75.00

BEGIN BRIDGE
-L- STA. 27+19.00

END BRIDGE
-L- STA. 28+19.00

END CONSTRUCTION
-Y1- STA. 15+00.00

END BRIDGE
-L- STA. 32+11.50

BEGIN BRIDGE
-L- STA. 31+11.50

END TIP PROJECT B-4252
-L- STA. 41+50.00

BEGIN CONSTRUCTION
-Y- STA. 13+15.00

END CONSTRUCTION
-Y4- STA. 13+00.00



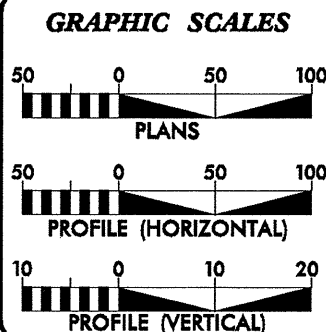
** DESIGN EXCEPTION REQUIRED FOR HORIZONTAL & VERTICAL DESIGN (-Y-).

NCDOT CONTACT: CATHY HOUSER, P.E.
ROADWAY DESIGN - ENGINEERING COORDINATION

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

CONTRACT:



DESIGN DATA

ADT 2007 =	13840
ADT 2027 =	20240
DHV =	10 %
D =	65 %
T =	3 % *
V =	50 MPH
* TTST 1	DUAL 2

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4252	=	0.507 MI.
LENGTH STRUCTURES TIP PROJECT B-4252	=	0.038 MI.
TOTAL LENGTH OF TIP PROJECT B-4252	=	0.545 MI.

Prepared In the Office of:

KO & ASSOCIATES, P.C.
Consulting Engineers
1011 Schaub Dr., Suite 202, Raleigh, NC 27606
(919) 851-8066

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: **JANUARY 19, 2007**

LETTING DATE: **JANUARY 15, 2008**

DAVID C. WALLER, PE
PROJECT ENGINEER

BRIAN A. WILES, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER P.E.

01-NOV-2006 15:13 L:\ERO\RAleig\Investigation\TIP\B4252.GEO_RDWY_approaches&realignment\CADD.GEOTECH\PlanProf\b4252_rdy_inv_tsh.dgn wdfields AT GE0221400



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

November 21, 2006

STATE PROJECT: 33594.1.1 (B-4252)
FEDERAL PROJECT: BRSTP-311(14)
COUNTY: Rockingham

DESCRIPTION: Bridge No. 95 on -L- (US 311) over Big Beaver Island Creek and
Bridge No. 67 on -L- (US 311) over Little Beaver Island Creek

SUBJECT: Geotechnical Report – Inventory

The Geotechnical Engineering Unit has completed the subsurface investigation for this project and presents the following report including plan sheets and cross sections.

Project Description

The project will encompass widening and other improvements along US 311 to accommodate the replacement structures. Also included is the realignment of the intersection with SR 1138 (Lindsay Bridge Rd.) to a new location approximately 1,000 feet west from its existing location along US 311. The total length of the roadway project is 0.915 miles.

Standard Penetration Tests and auger borings were advanced using a CME-550 drill machine equipped with an automatic hammer. Hand auger borings were performed where access was limited. Representative soil samples were collected for visual classification in the field and were submitted to the Materials and Tests Unit for laboratory analysis.

Areas of Special Geotechnical Interest

- 1) The following sections contain cohesive soils with Plastic Indices of 26 or greater and percent passing No. 200(75µm) sieve greater than 70:

<u>Line</u>	<u>Station (±)</u>
-L-	14+50 to 22+00
-Y-	21+50 to 26+00
-Y1-	13+00 to 14+50

- 2) The following intervals were found to exhibit a high water table, seasonal high ground water or the potential for ground water related construction problems:

<u>Line</u>	<u>Station (±)</u>
-L-	16+00 to 22+50
-Y-	17+50 to 26+00

Physiography & Geology

The project is located in gently rolling terrain of the Piedmont Physiographic Province in the town of Madison. Geologically, the project lies within the Triassic Dan River Basin, the smallest of three exposed Triassic Basins in North Carolina. These basins began forming during the early Mesozoic as Africa started to separate from North America. Sediment filled the basins as the steep margin walls were eroded. From these deposits, sedimentary rocks formed including conglomerate, sandstone, siltstone and mudstone. Typically, soils formed in the Triassic Basins exhibit poor engineering qualities not limited to high Plastic Indices and high percent passing No. 200 sieve.

Soil Properties

Soils encountered at the site include alluvial and Triassic residual soils. Weathered rock and Non-crystalline rock were also found to exist throughout the project. Roadway embankment and artificial fill soils were present along the project, but were not investigated.

Alluvial deposits encountered within the floodplain of Little Beaver Island Creek are approximately 12 feet thick comprised of tan-brown, saturated, loose, sand (A-2-4) and tan-gray, moist to saturated, medium stiff, sandy silt (A-4).

Triassic residual soils present at the site range in thickness from 5.0 to over 30.5 feet. These soils primarily consist of tan-brown, moist, medium stiff to hard, sandy silt, sandy clay and silty clay (A-4, A-6, A-7-5, A-7-6). Plasticity indices for the cohesive soils range from 2 to 56.

Weathered siltstone was encountered at elevations ranging from 547.0 to 608.2 feet.

Non-crystalline rock, siltstone, was noted at elevations ranging from 546.0 to 600.0 feet along alignments -L- and -Y-.

Groundwater

Groundwater levels range from 8.0 to 23.6 feet below natural ground. Seasonal fluctuations in the water table can be expected.

Prepared by,

Kevin B. Miller, LG
Project Geological Engineer

EARTHWORK BALANCE SHEET

IN CUBIC YARDS

PROJECT **B-4252** COUNTY **ROCKINGHAM** Volumes in Cubic **YARDS** DATE **1/22/2008** COMPILED BY: **BAW** SHEET **1 OF 1** SHEETS

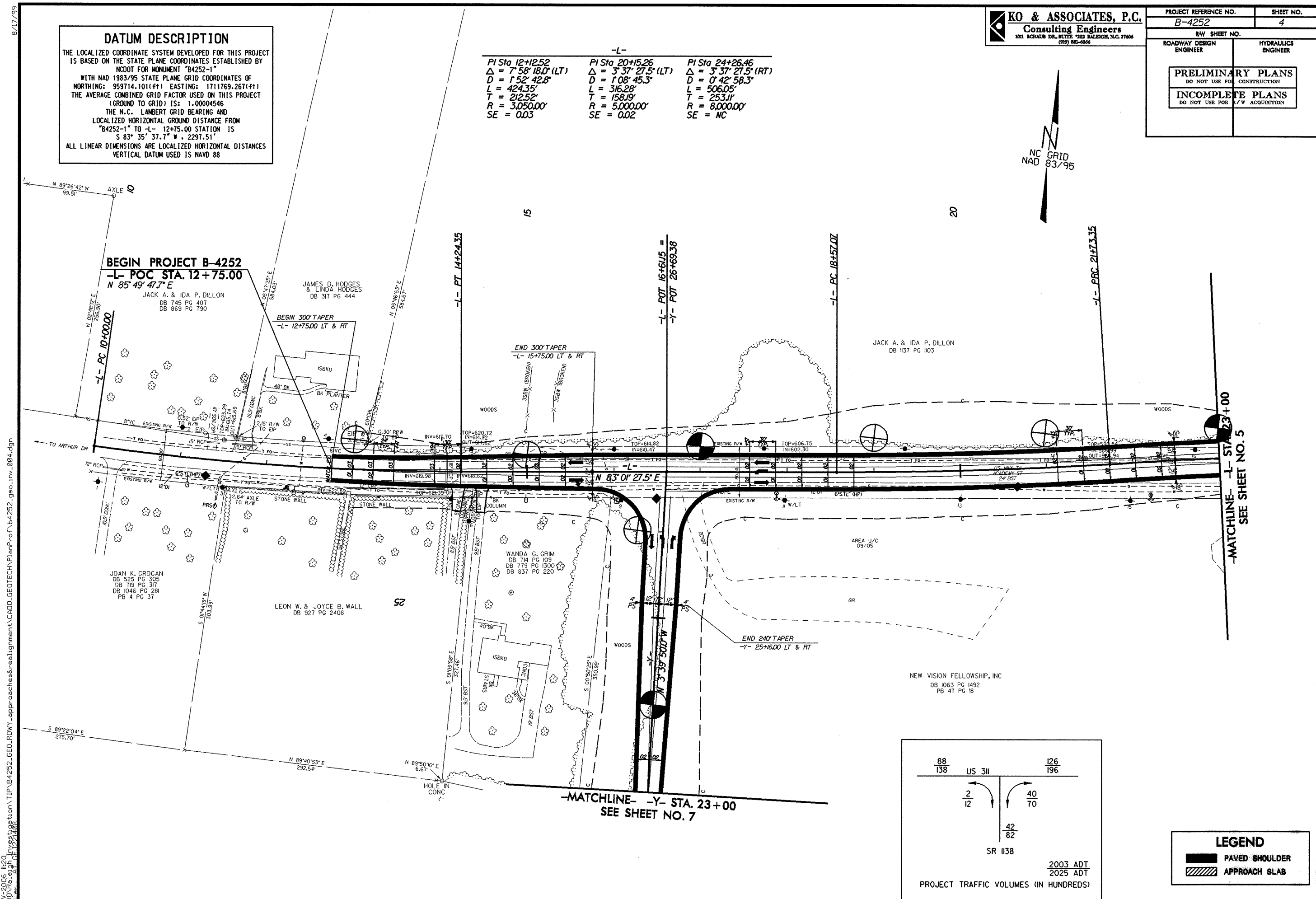
STATION	STATION	EXCAVATION				EMBANKMENT				BORROW	WASTE				
		TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUIT. UNCLASS.	SUITABLE UNCLASS.	TOTAL	ROCK	EARTH		EMBANK. (+) 20 %	ROCK	SUITABLE	UNSUIT.	TOTAL
SUMMARY NO. 1															
	-L- 12+75 TO 27+19 (BRIDGE)	12388		1075	7467	4921	3079		3079	3695			1226	8542	9768
	-Y- 13+15 TO 26+00	31308		2108	13924	17384	4501		4501	5402			11982	16032	28014
	-Y4- 10+50 TO 13+00	336				336	844		844	1013	677				
	-DR1- 10+20 TO 11+98.68	1411			1411									1411	1411
	TOTAL SUMMARY NO. 1	45443		3183	22802	22641	8424		8424	10110	677		13208	25985	39193
SUMMARY NO. 2															
	-L- 28+19 (BRIDGE) TO 31+11.50 (BRIDGE)	702				702	2981		2981	3578	2876				
	-Y1- 10+50 TO 15+00	140			102	38	1186		1186	1424	1386			102	102
	TOTAL SUMMARY NO. 2	842			102	740	4167		4167	5002	4262			102	102
SUMMARY NO. 3															
	-L- 32+11.50 (BRIDGE) TO 41+50	6962				6962	5552		5552	6663			299		299
	TOTAL SUMMARY NO. 3	6962				6962	5552		5552	6663			299		299
	SUB-TOTAL (SUMMARY 1 THRU 3)	53247		3183	22904	30343	18143		18143	21775	4939		13507	26087	39594
	EST. LOSS DUE TO CLEARING & GRUBBING	-450				-450							-450		-450
	ADDITIONAL UNDERCUT			200			200		200	240	240			200	200
	EARTH WASTE TO REPLACE BORROW										-5179		-5179		-5179
	PROJECT TOTALS	52797		3383		29893	18343		18343	22015			7878	26287	34165
	SAY	52800		3400									7880		34175
	EST. DDE = 690 CY														
	EST. SHOULDER CONSTRUCTION = 1400 CY														
	EST. SELECT GRANULAR MATERIAL = 300 CY														

Earthwork quantities are calculated by the Roadway Design Unit. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

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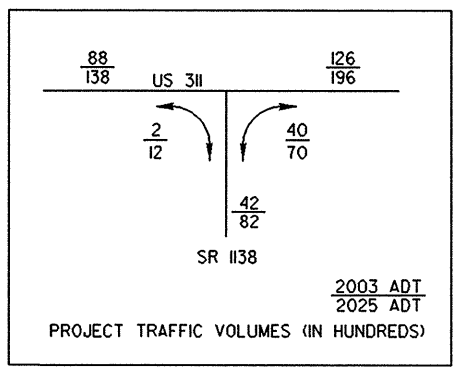
DATUM DESCRIPTION
 THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4252-1" WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 959714.101(±) EASTING: 1711769.261(±) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.00004546 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4252-1" TO -L- 12+75.00 STATION IS S 83° 35' 37.7" W, 2297.51' ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

-L-		
PI Sta 12+12.52	PI Sta 20+15.26	PI Sta 24+26.46
Δ = 7° 58' 18.0" (LT)	Δ = 3° 37' 27.5" (LT)	Δ = 3° 37' 27.5" (RT)
D = 1' 52' 42.8"	D = 1' 08' 45.3"	D = 0' 42' 58.3"
L = 424.35'	L = 316.28'	L = 506.05'
T = 212.52'	T = 158.19'	T = 253.11'
R = 3,050.00'	R = 5,000.00'	R = 8,000.00'
SE = 0.03	SE = 0.02	SE = NC



-MATCHLINE- L- STA. 23+00
SEE SHEET NO. 5

-MATCHLINE- -Y- STA. 23+00
SEE SHEET NO. 7



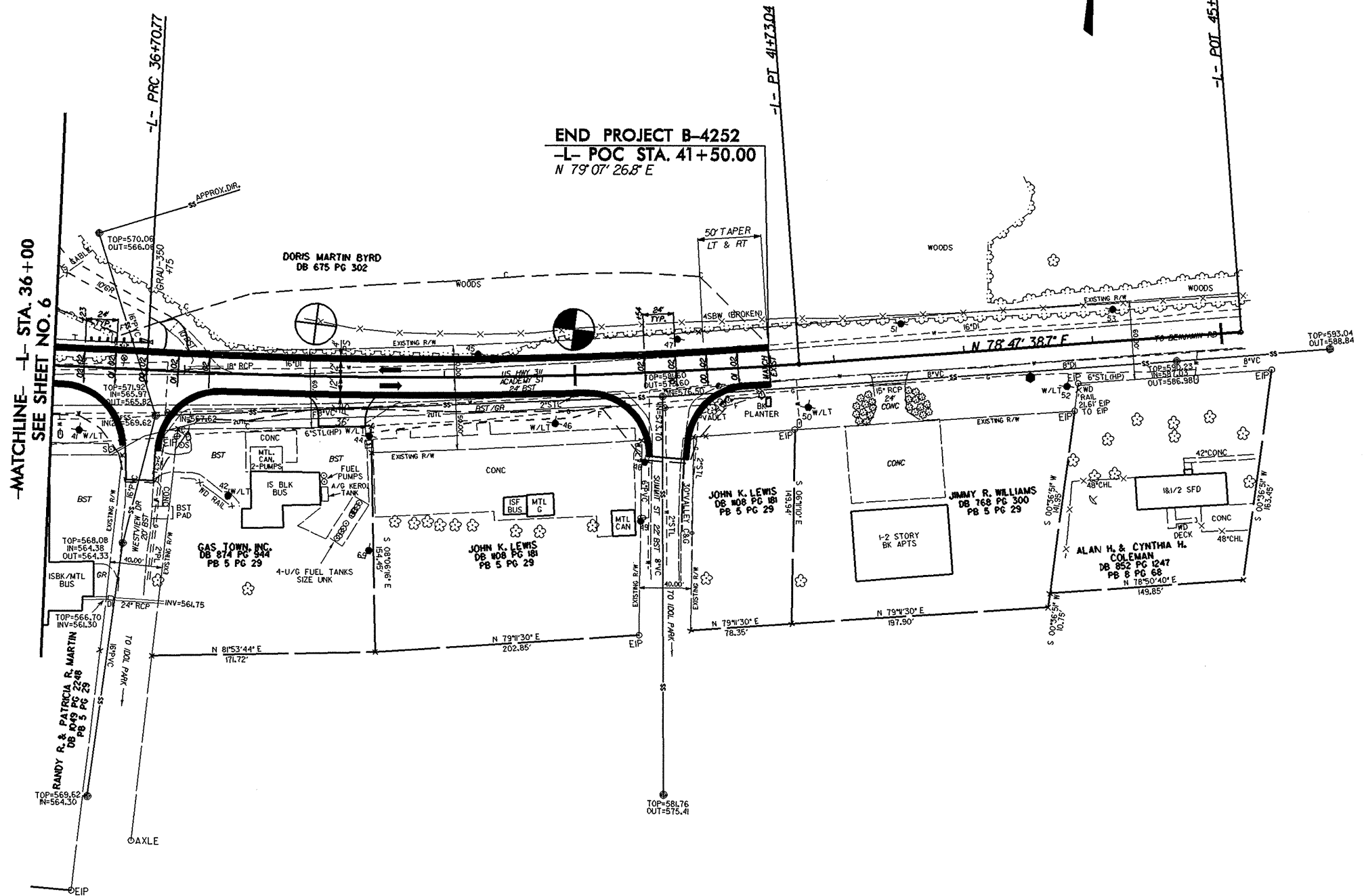
LEGEND
 PAVED SHOULDER
 APPROACH SLAB

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PROJECT REFERENCE NO. B-4252	SHEET NO. 6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	

-L-

PI Sta 34+63.88	PI Sta 39+22.24
$\Delta = 2^{\circ} 57' 51.2" (RT)$	$\Delta = 7^{\circ} 11' 40.1" (LT)$
$D = 0^{\circ} 42' 58.3"$	$D = 1^{\circ} 25' 56.6"$
$L = 413.89'$	$L = 502.27'$
$T = 206.99'$	$T = 251.46'$
$R = 8,000.00'$	$R = 4,000.00'$
SE = NC	SE = 0.02



END PROJECT B-4252
-L- POC STA. 41+50.00
 N 79° 07' 26.8" E

-MATCHLINE- STA. 36+00
SEE SHEET NO. 6

LEGEND

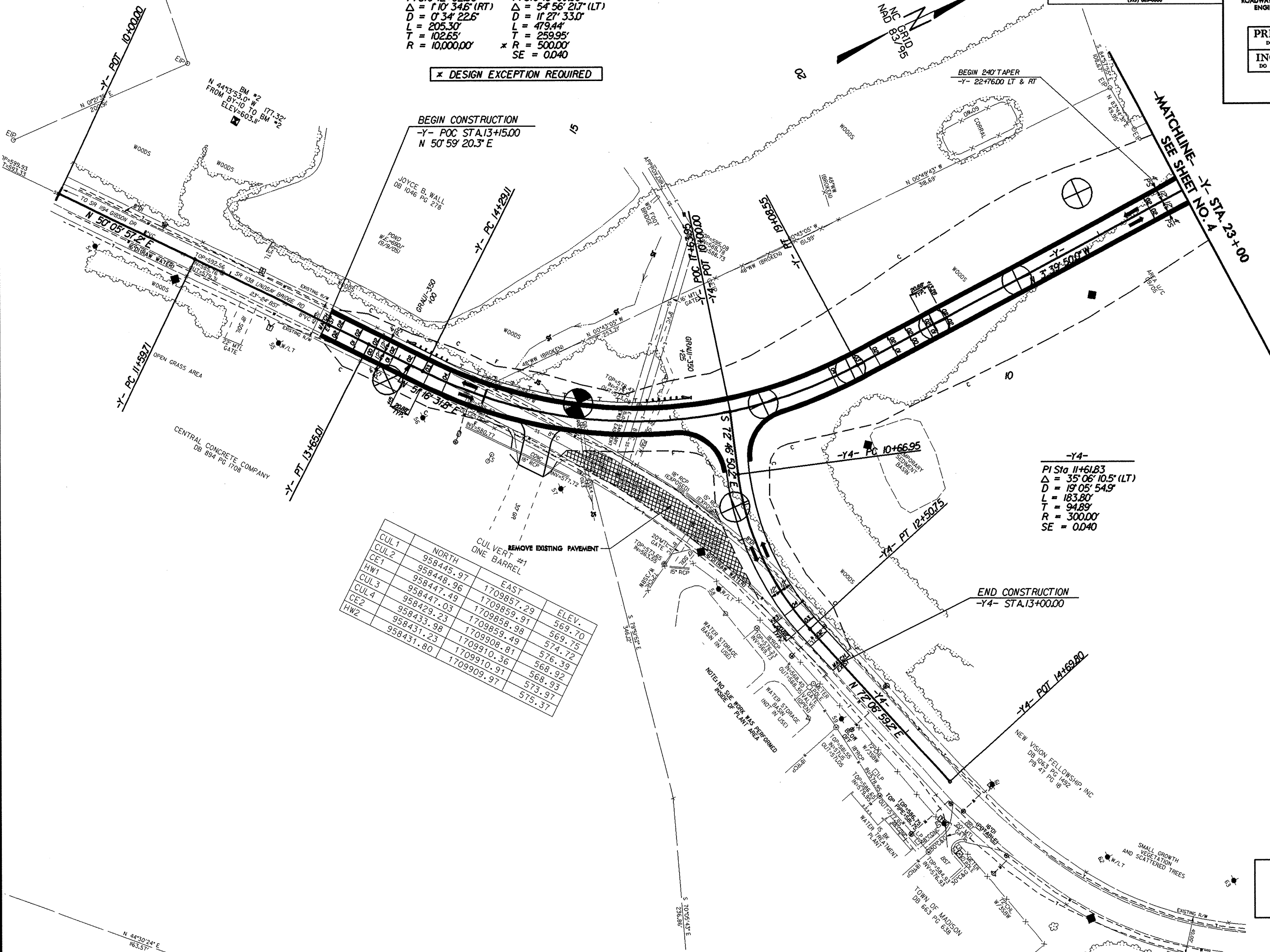
	PAVED SHOULDER
	APPROACH SLAB

PROJECT REFERENCE NO. B-4252	SHEET NO. 7
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	

-Y-

PI Sta 12+62.36	PI Sta 16+89.06
$\Delta = 110^\circ 34' 26"$ (RT)	$\Delta = 54^\circ 56' 21"$ (LT)
D = 0' 34' 22.6"	D = 1' 27' 33.0"
L = 205.30'	L = 479.44'
T = 102.65'	T = 259.95'
R = 10,000.00'	* R = 500.00'
	SE = 0.040

*** DESIGN EXCEPTION REQUIRED**



REMOVE EXISTING PAVEMENT
CULVERT #1
ONE BARREL

CUL	NORTH	EAST	ELEV.
CUL1	958445.97	1709857.29	569.70
CE1	958448.96	1709859.91	569.75
HW1	958447.49	1709858.98	574.72
CUL3	958447.03	1709859.49	576.39
CE2	958429.23	1709908.81	568.92
CUL4	958433.98	1709910.36	568.93
HW2	958431.23	1709910.91	573.97
	958431.80	1709909.97	575.37

-Y4-

PI Sta 11+61.83
$\Delta = 35^\circ 06' 10.5"$ (LT)
D = 19' 05' 54.9"
L = 183.80'
T = 94.89'
R = 300.00'
SE = 0.040

LEGEND

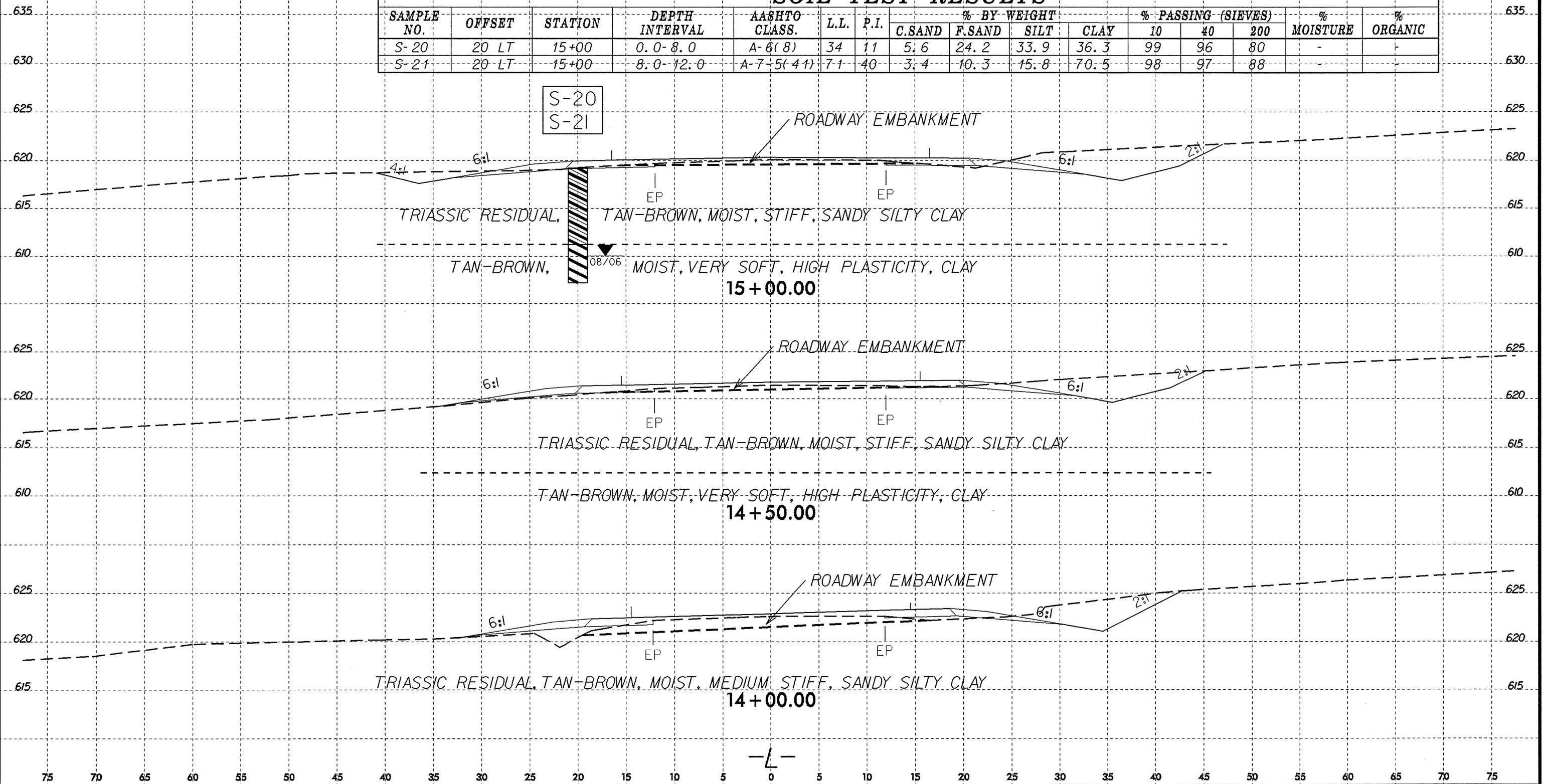
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8/23/99

SOIL TEST RESULTS

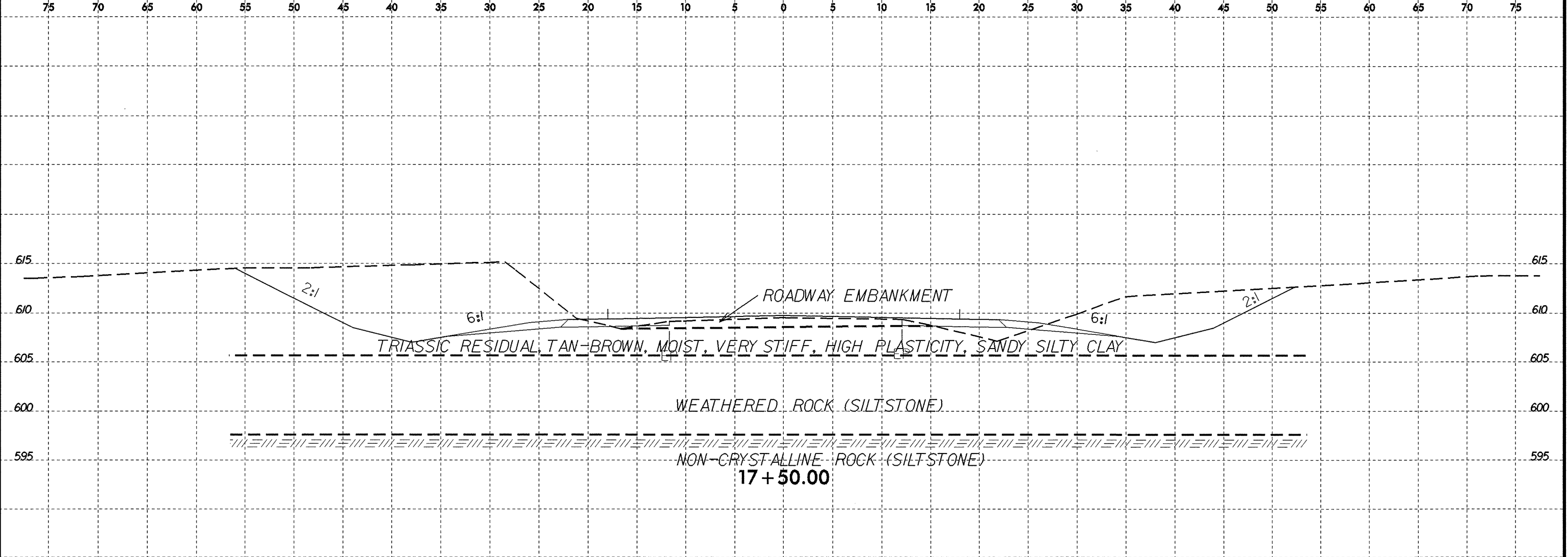
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							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-20	20 LT	15+00	0.0-8.0	A-6(8)	34	11	5.6	24.2	33.9	36.3	99	96	80	-	-
S-21	20 LT	15+00	8.0-12.0	A-7-5(41)	71	40	3.4	10.3	15.8	70.5	98	97	88	-	-

S-20
S-21

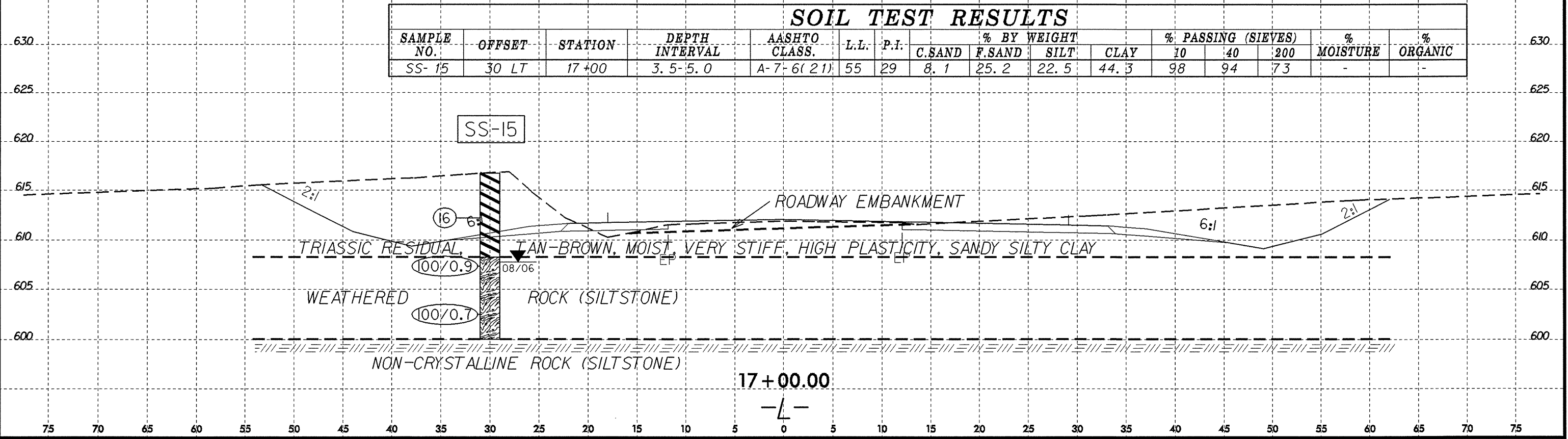


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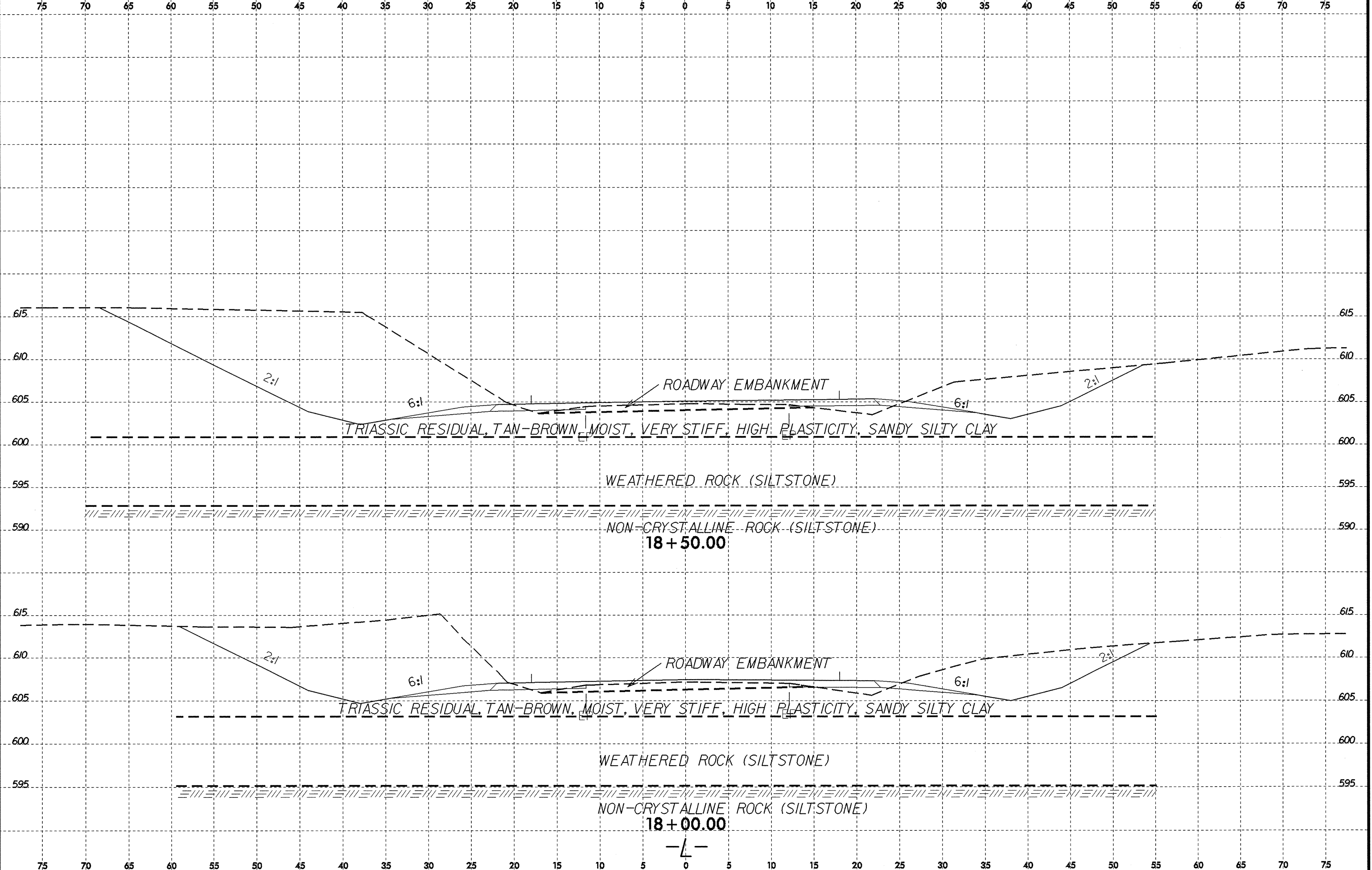


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							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-15	30 LT	17+00	3.5-5.0	A-7-6(21)	55	29	8.1	25.2	22.5	44.3	98	94	73	-	-



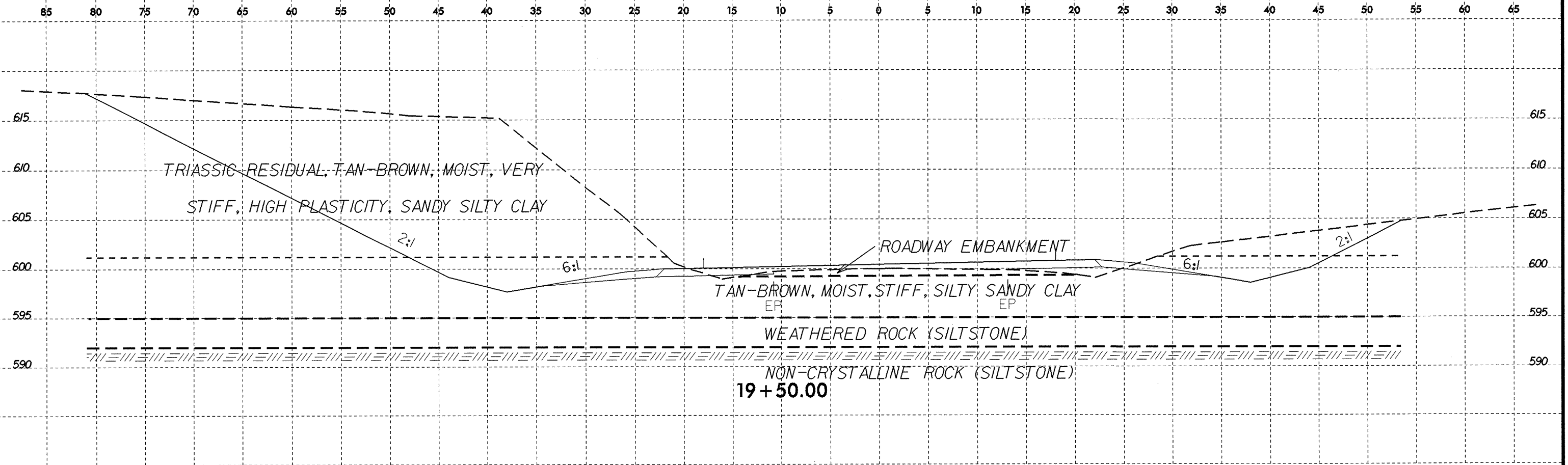
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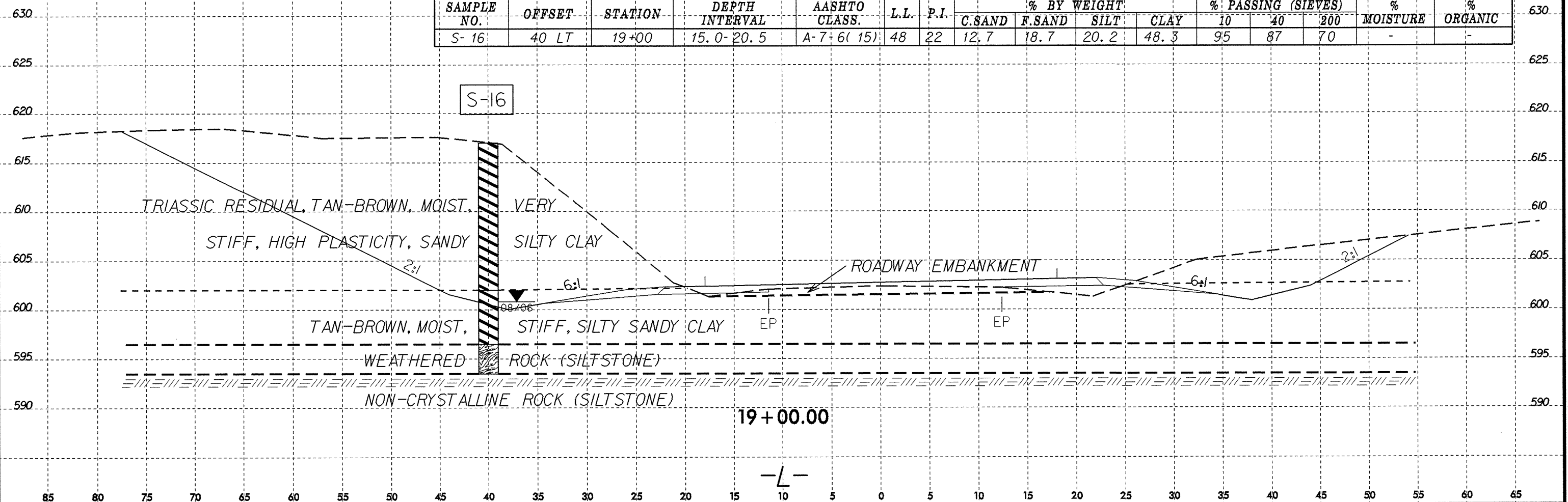


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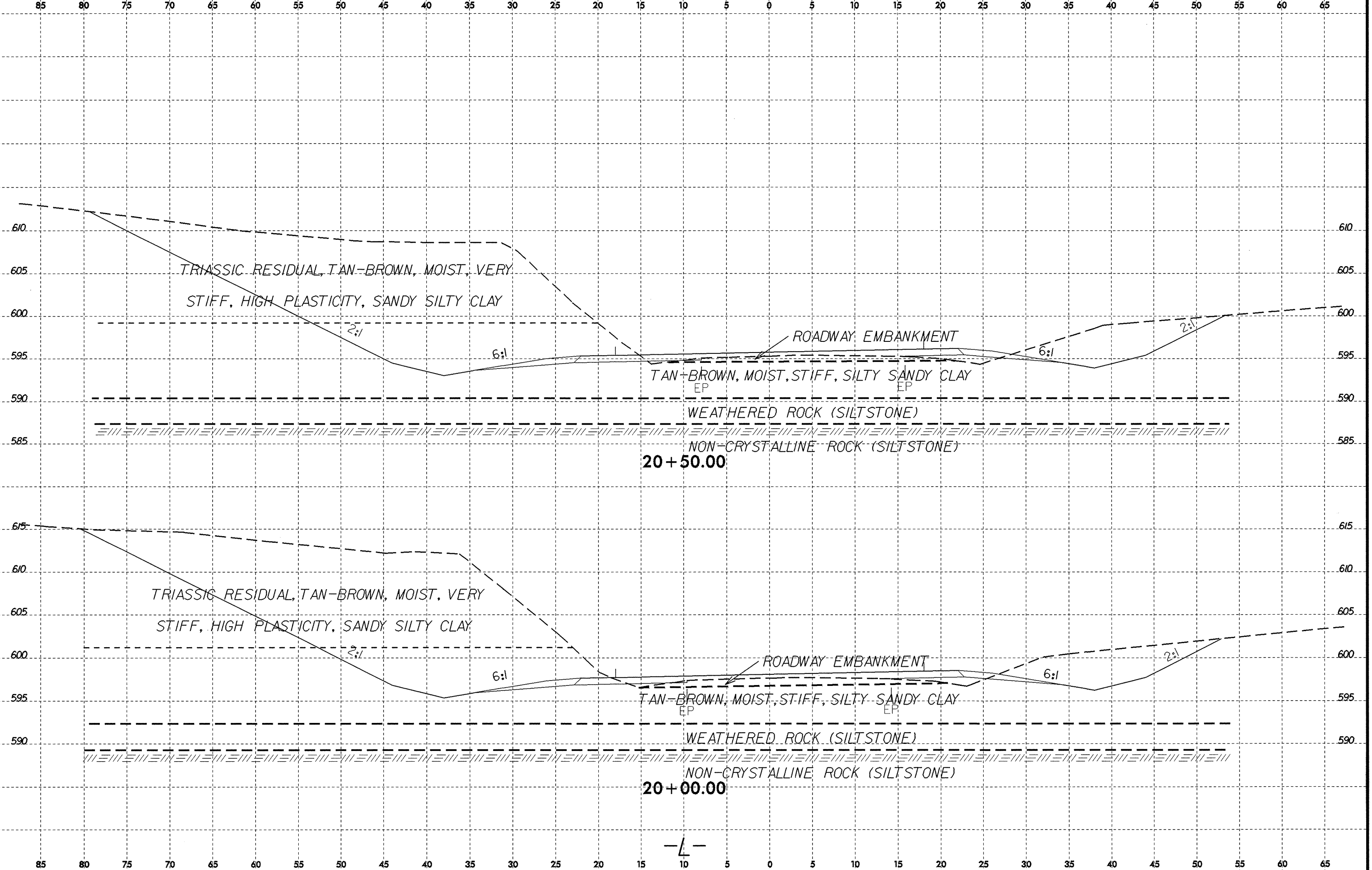


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							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-16	40 LT	19+00	15.0-20.5	A-7-6(15)	48	22	12.7	18.7	20.2	48.3	95	87	70	-	-



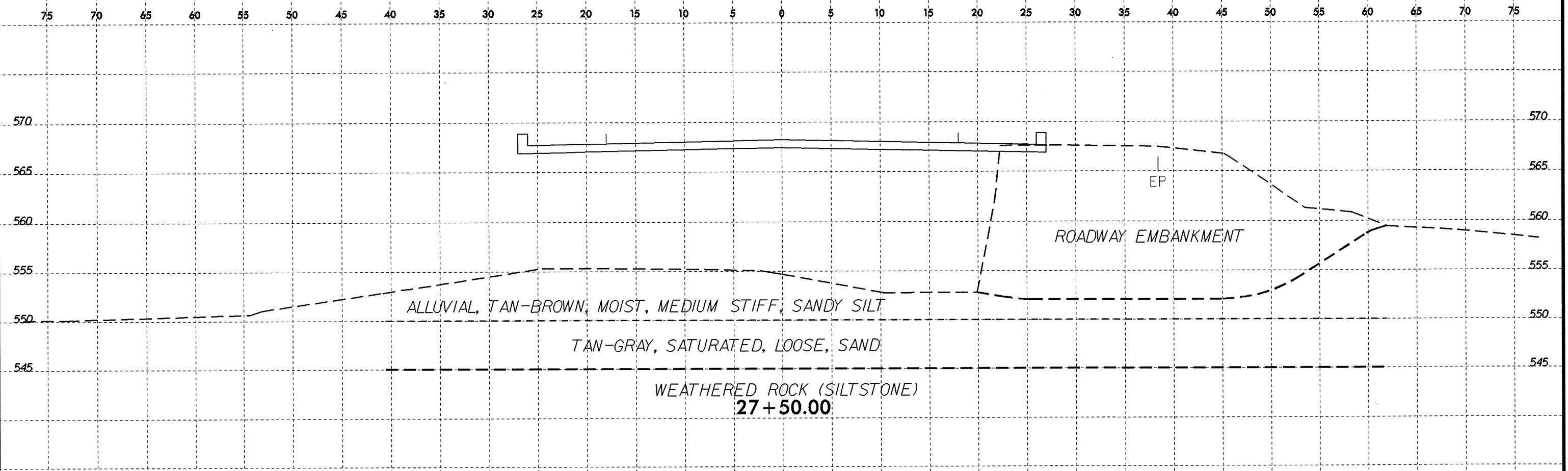
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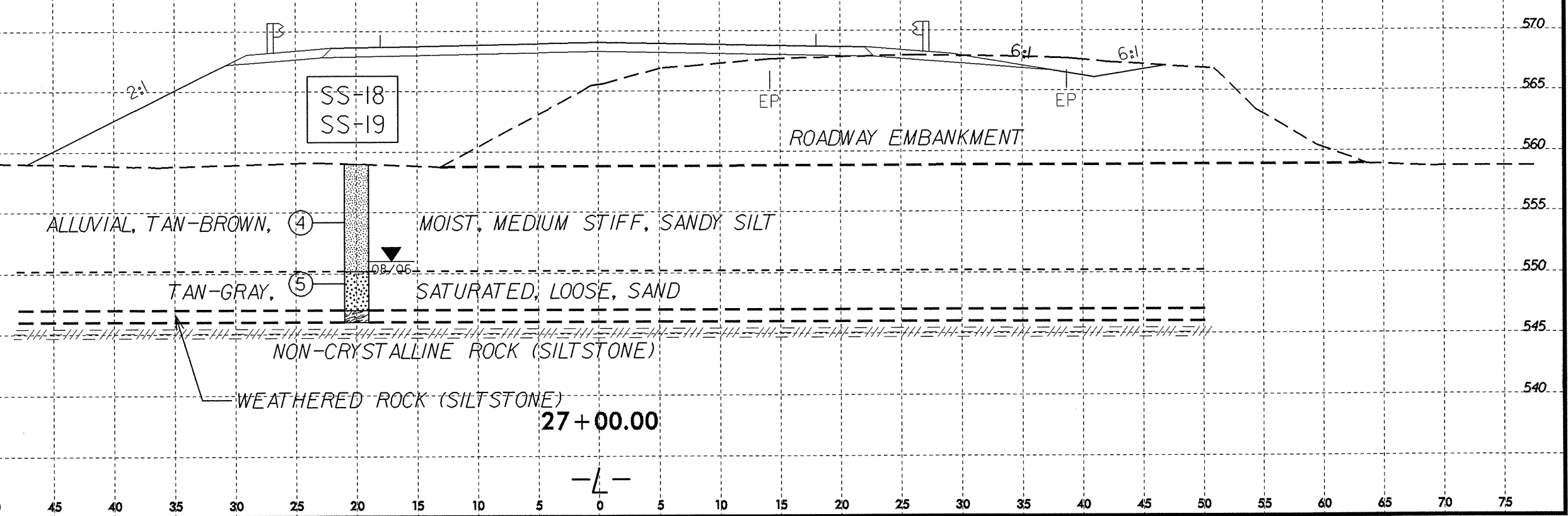


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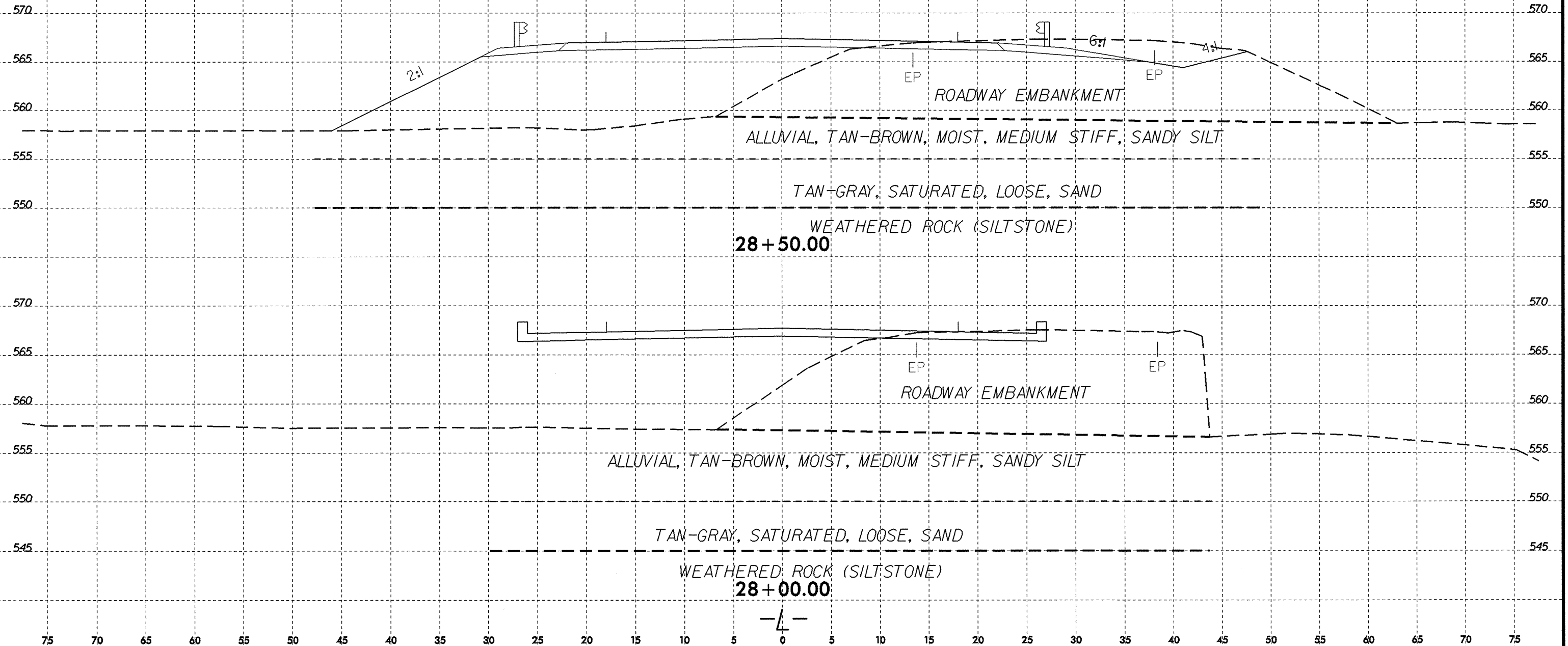


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							C.SAND	F.SAND	SILT	CLAY	10	40	200		
							SS-18	20 LT	27+00	3.8-5.3	A-4(4)	32	8		
SS-19	20 LT	27+00	8.8-10.3	A-2-4(0)	19	NP	69.5	18.5	3.9	8.1	96	91	13	-	-



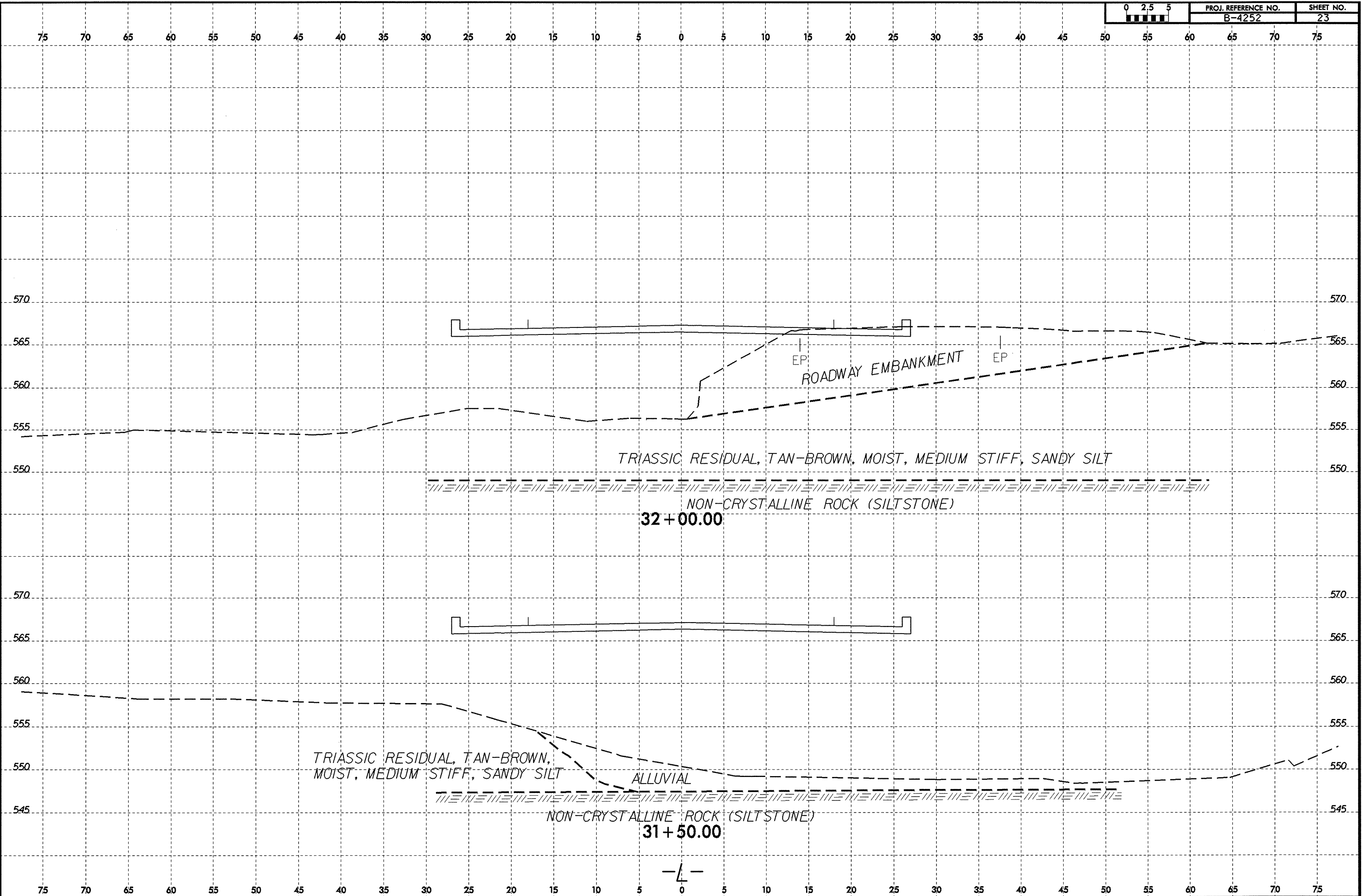
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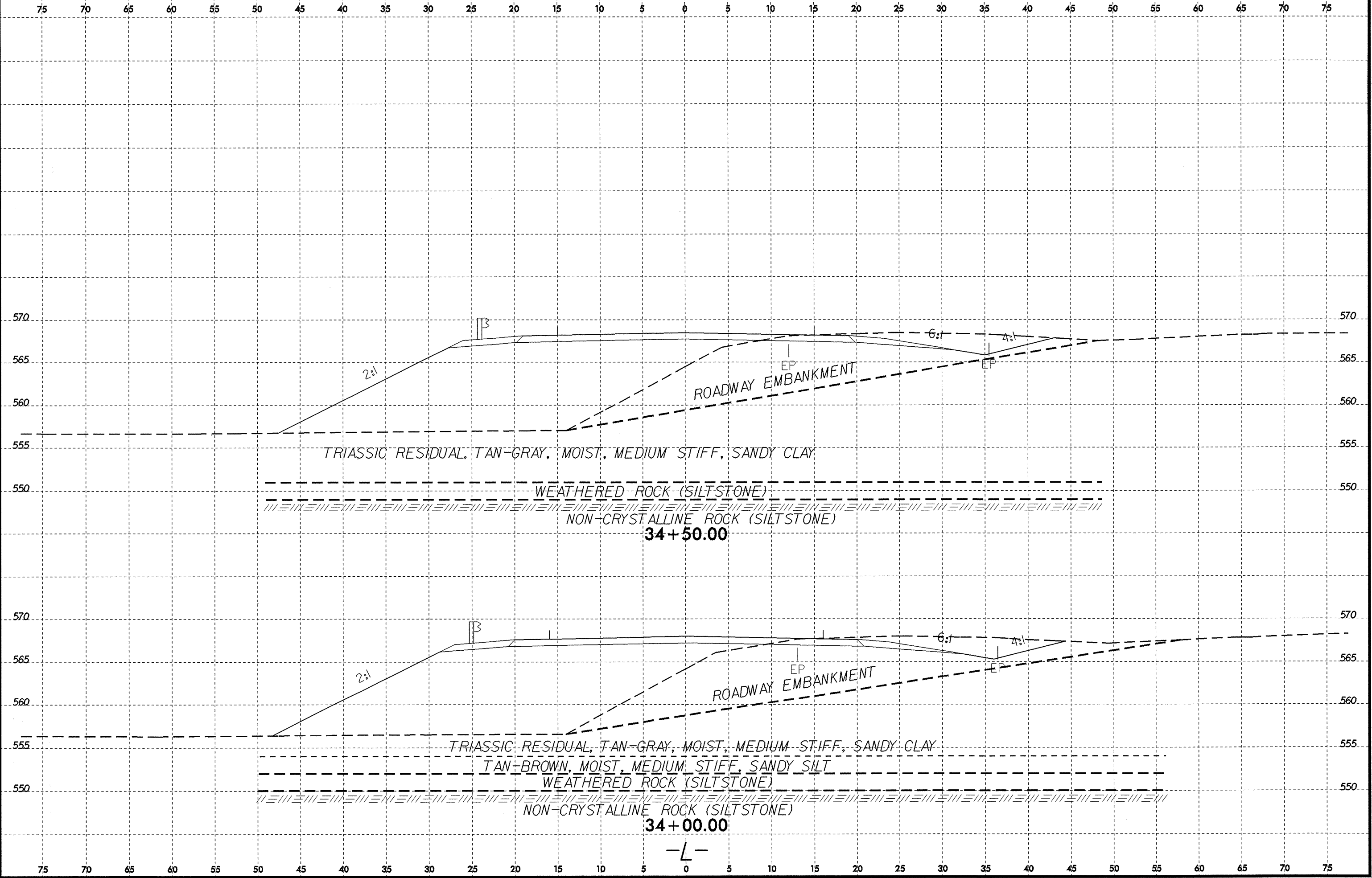


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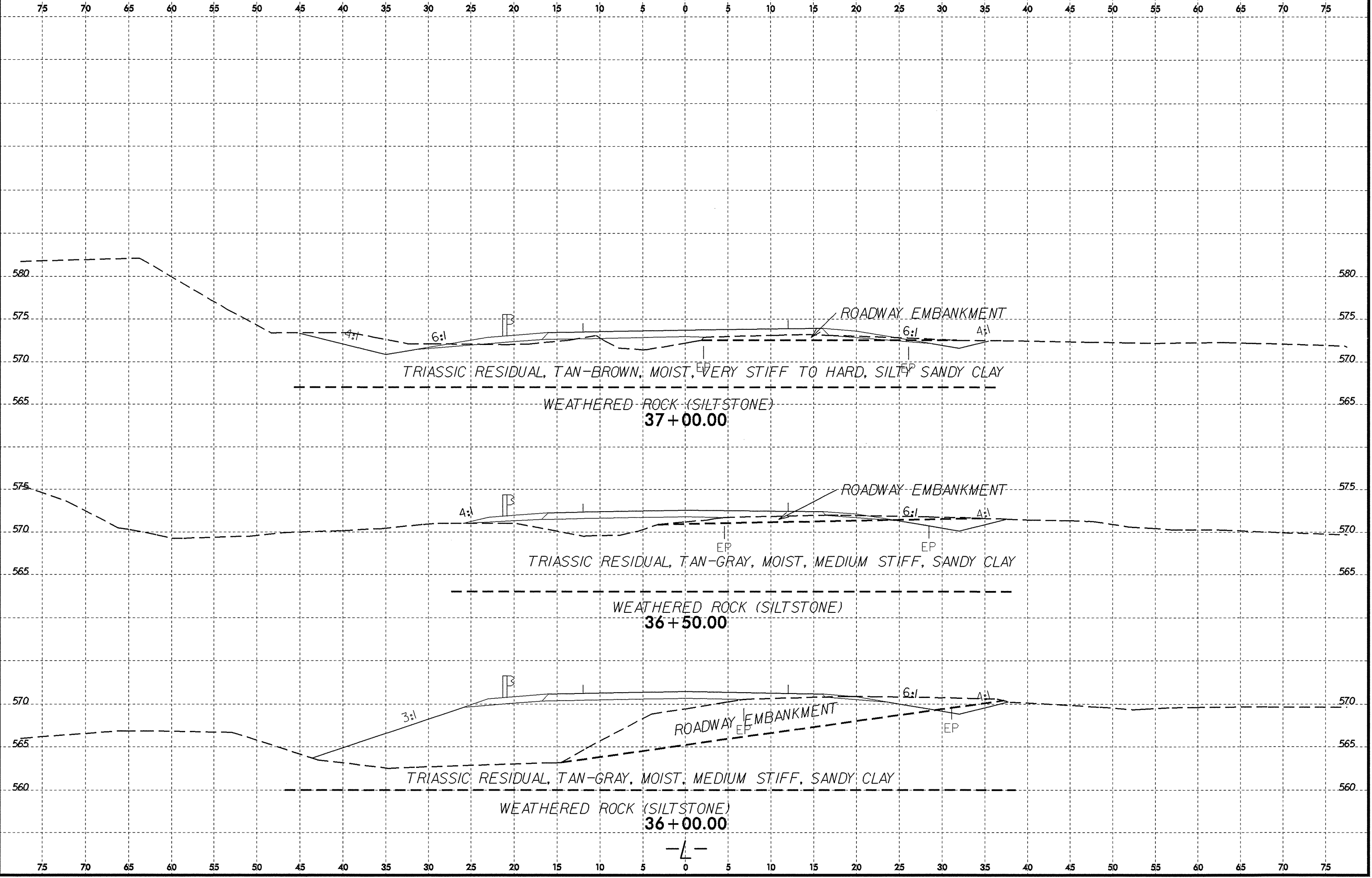
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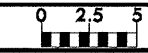
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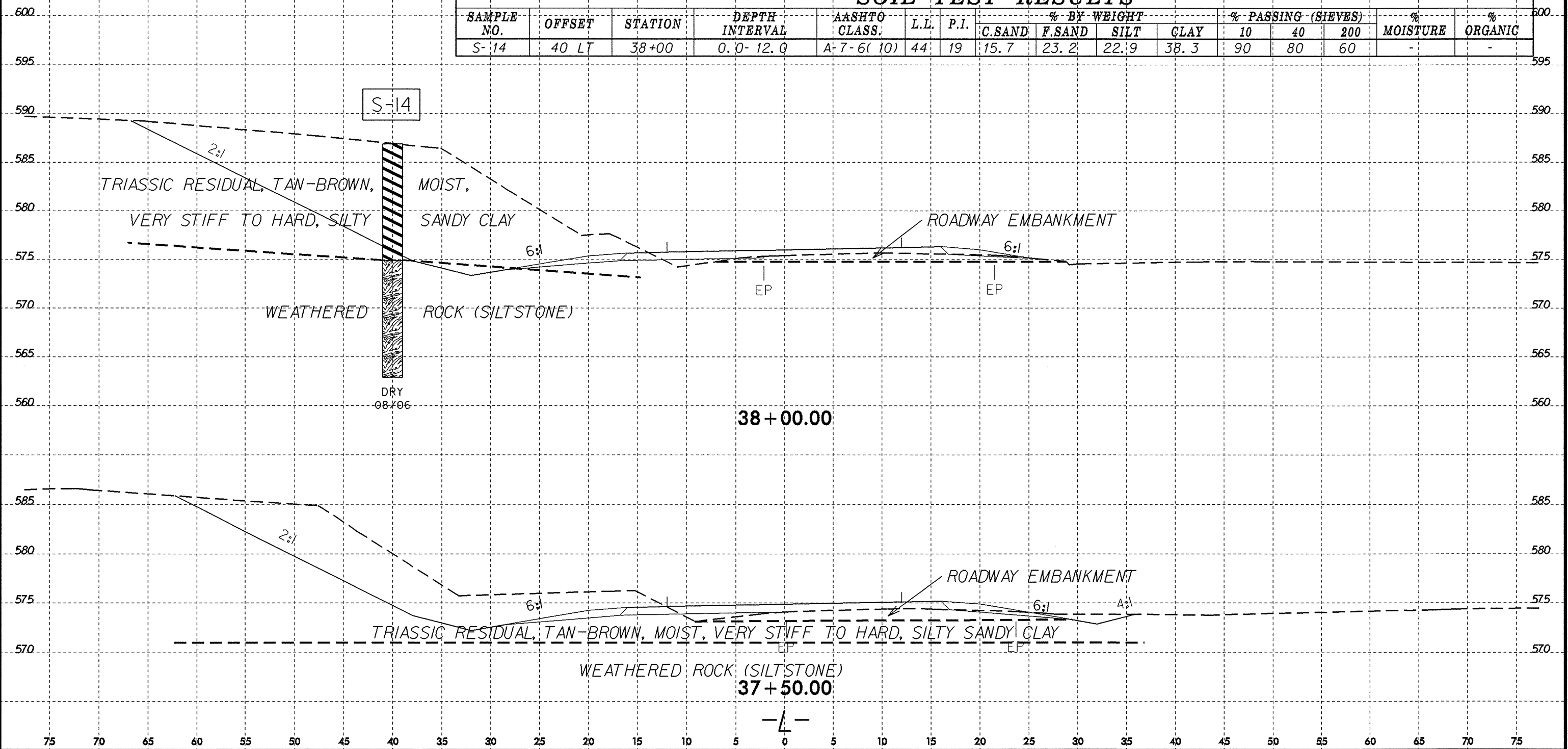


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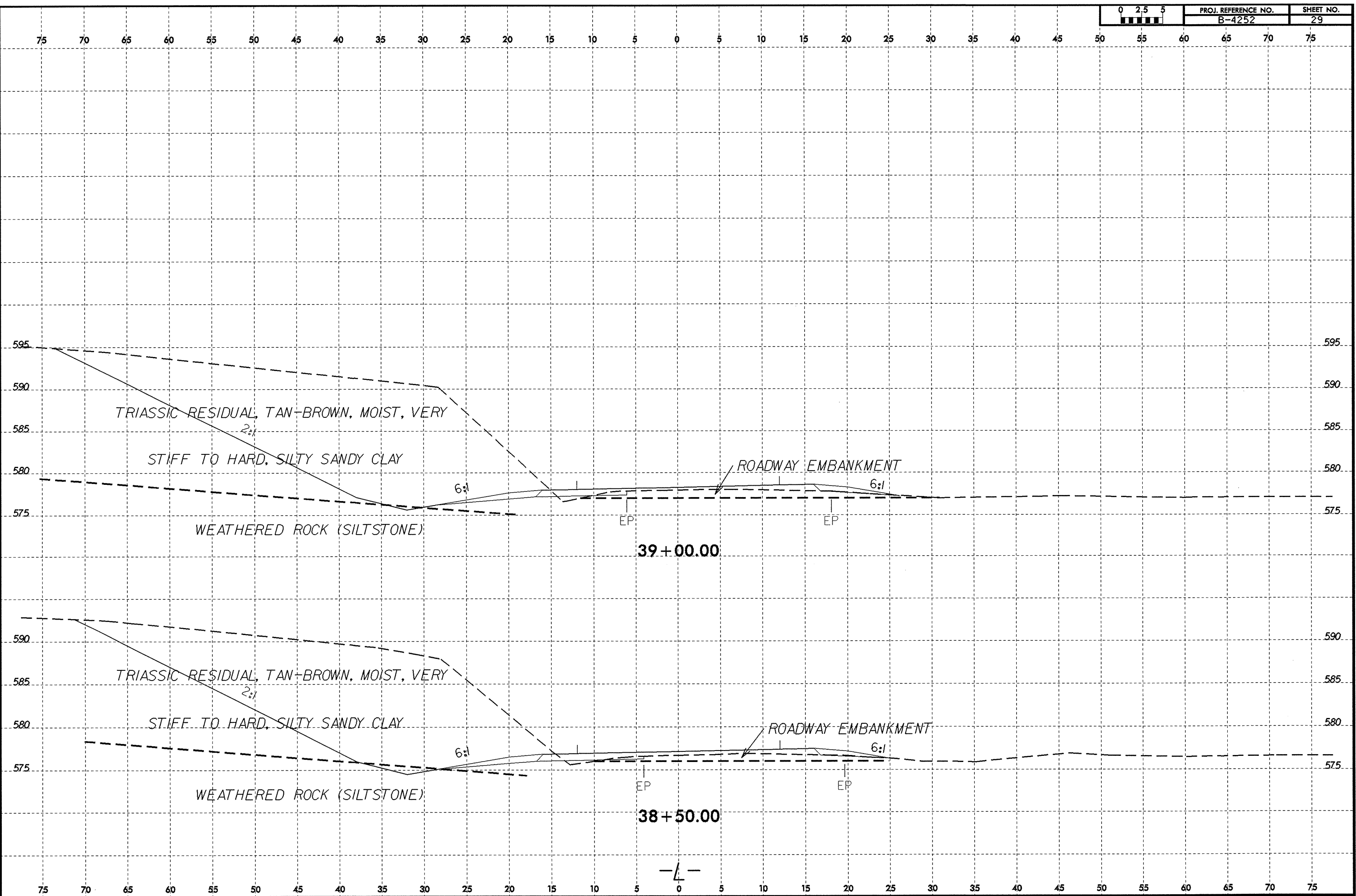
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							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-14	40 LT	38+00	0.0-12.0	A-7-6(10)	44	19	15.7	23.2	22.9	38.3	90	80	60	-	-



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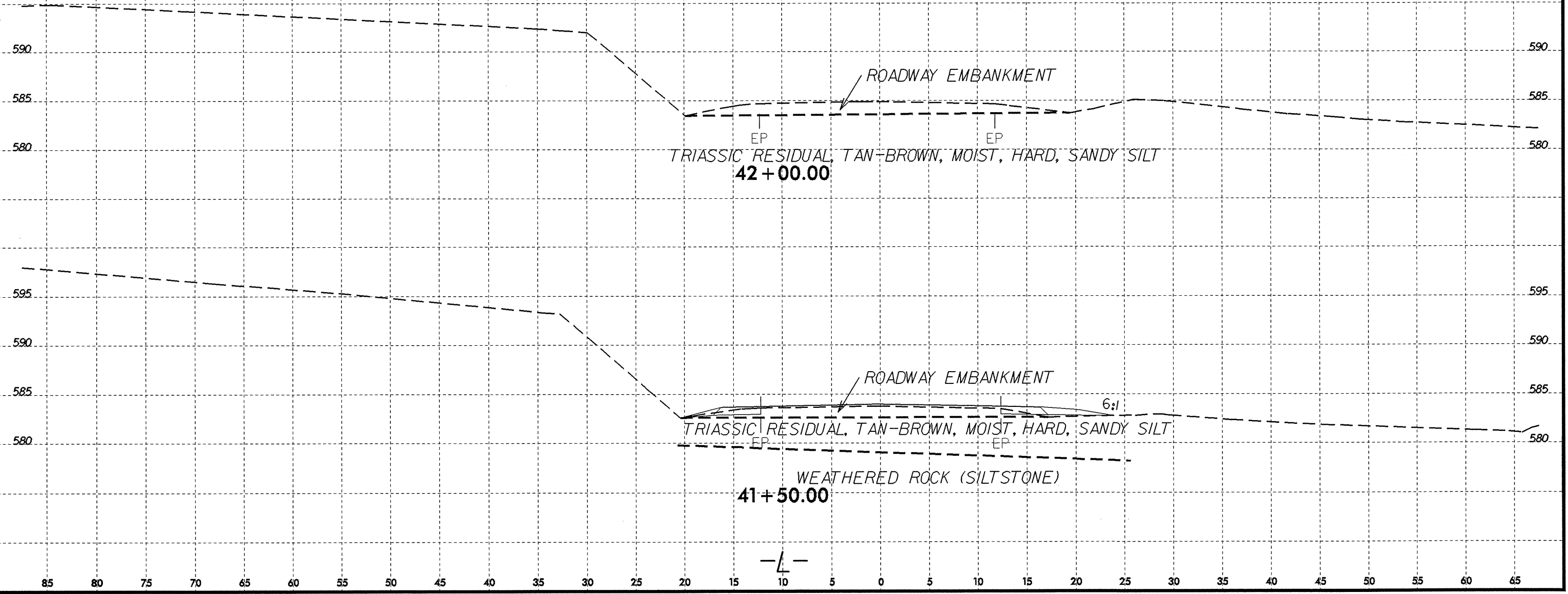
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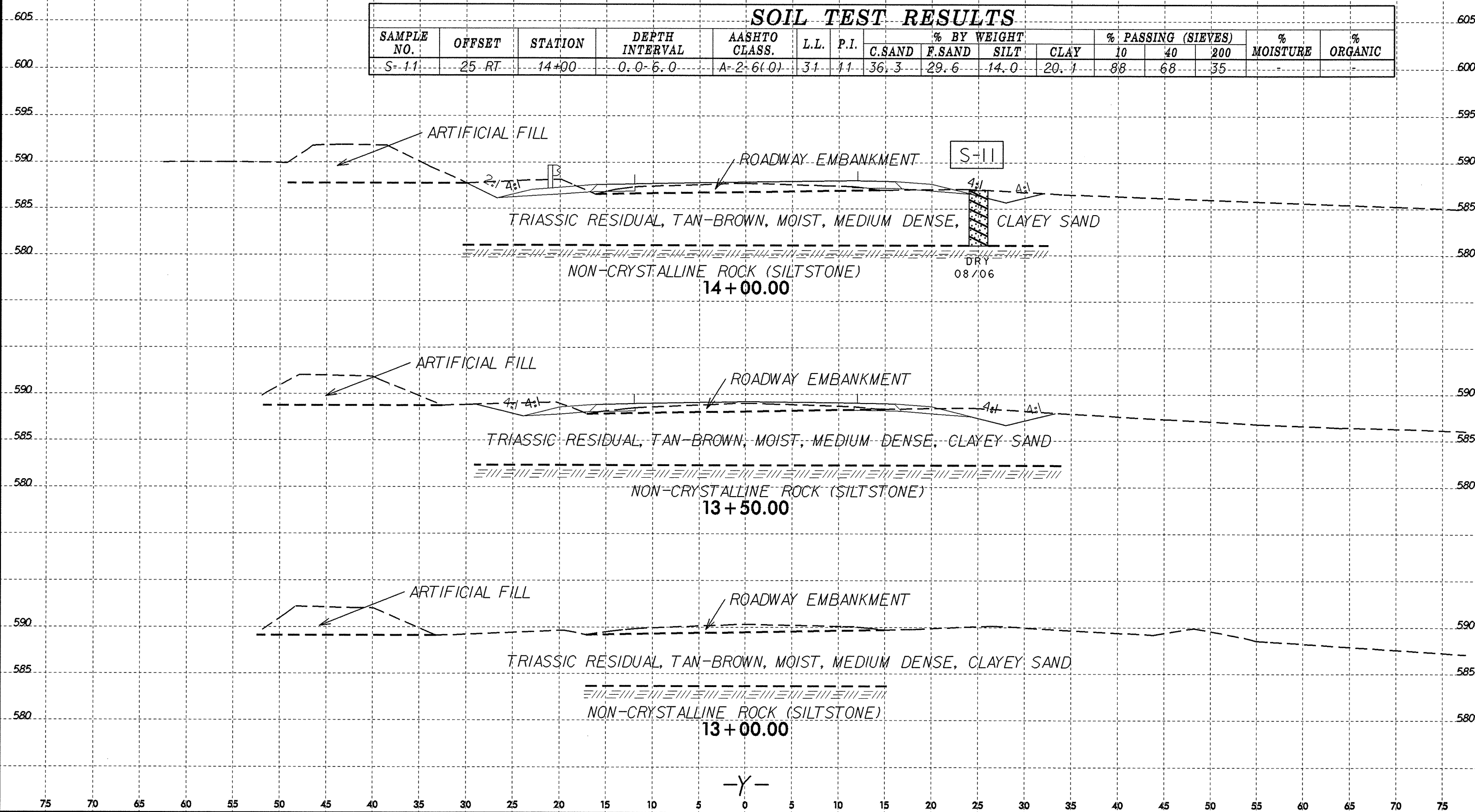
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SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-11	25 RT	14+00	0.0-6.0	A-2-6(0)	31	11	36.3	29.6	14.0	20.1	88	68	35		

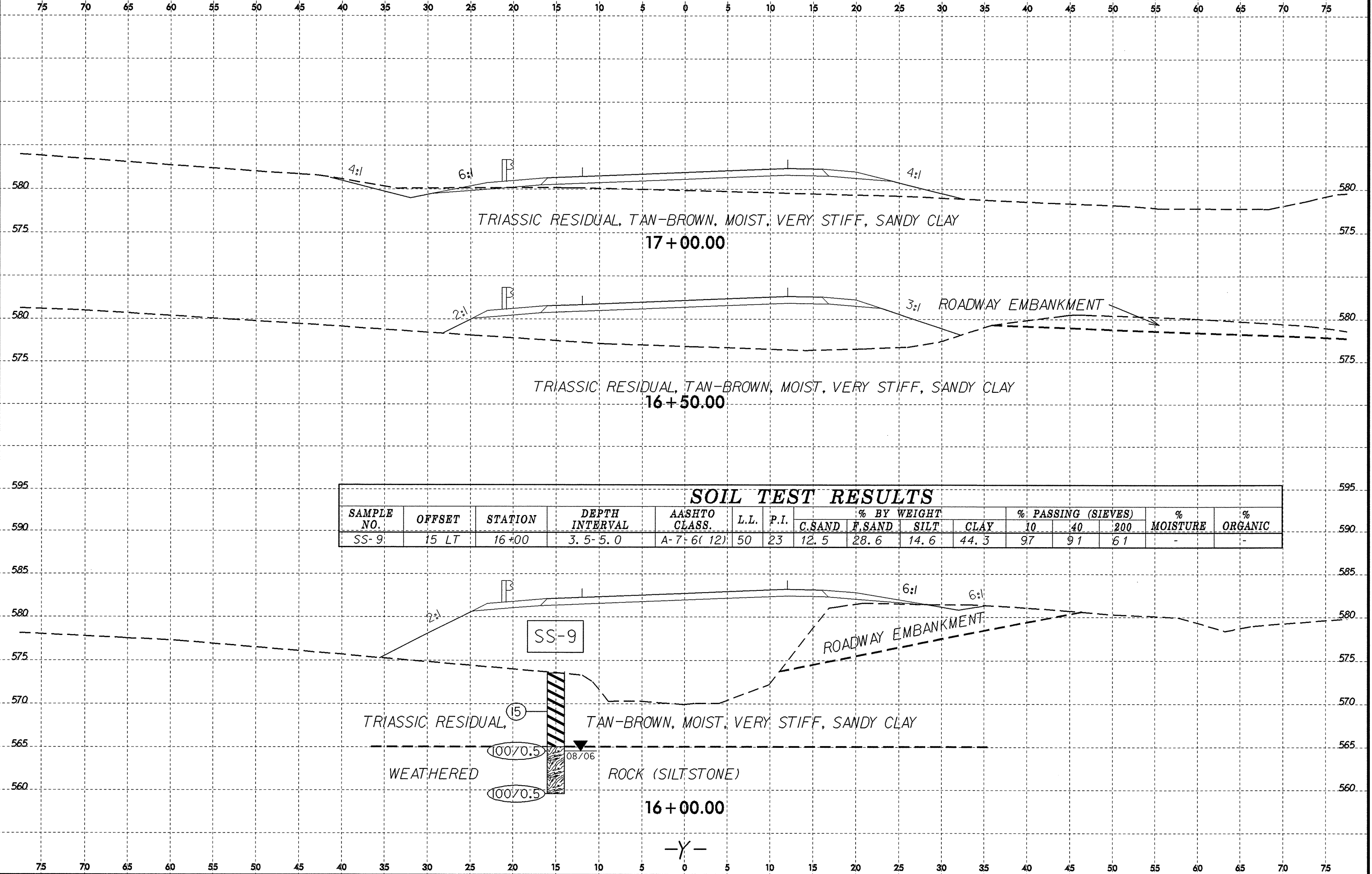
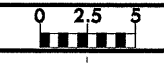


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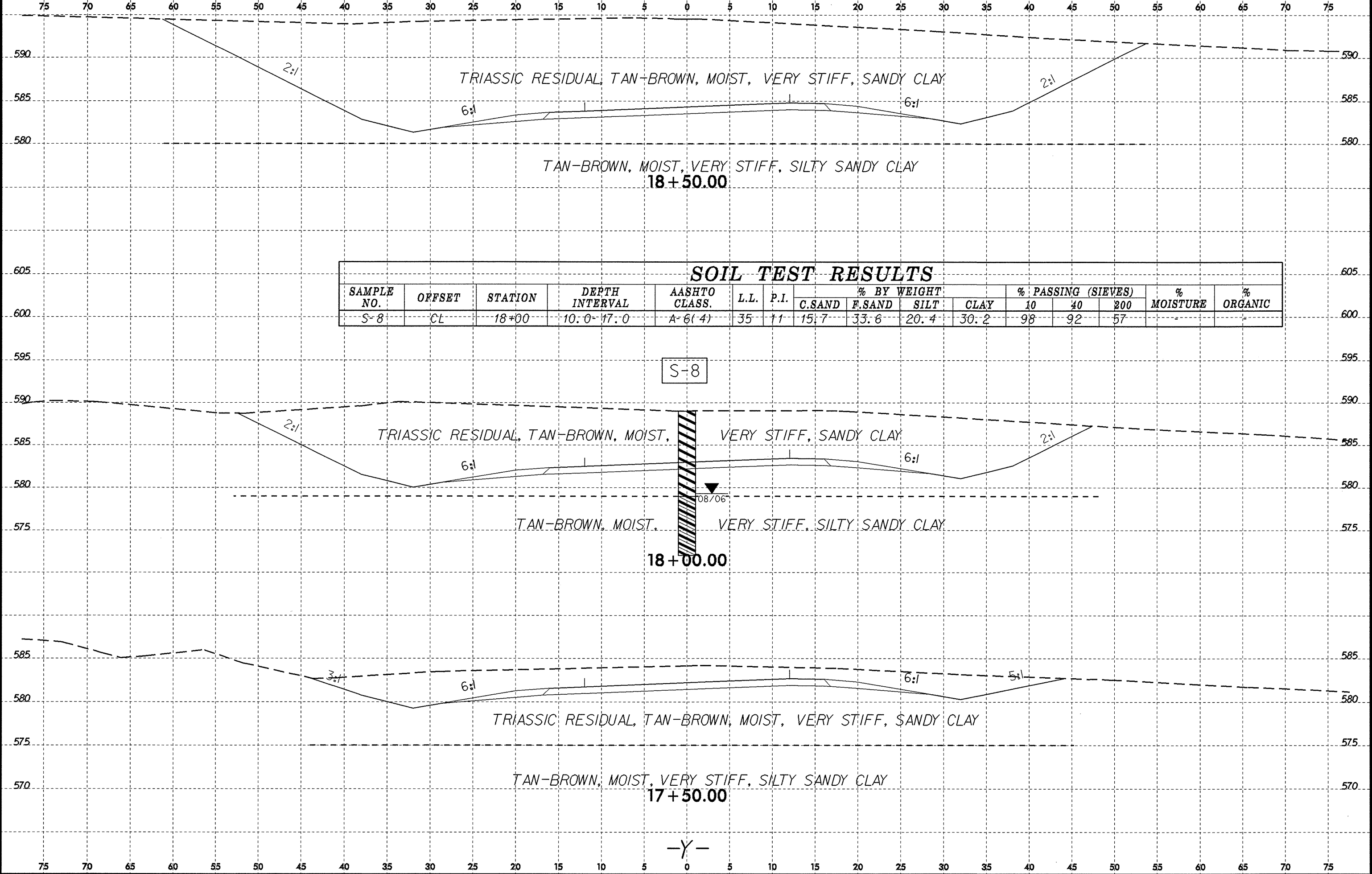


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							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-9	15 LT	16+00	3.5-5.0	A-7-6(12)	50	23	12.5	28.6	14.6	44.3	97	91	61	-	-

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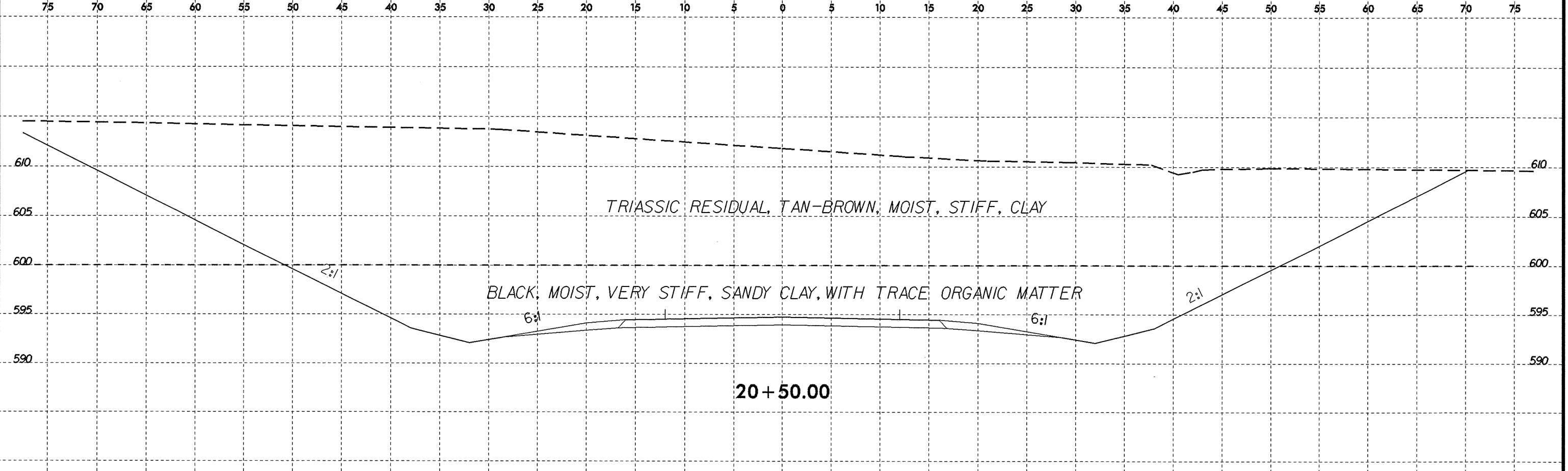
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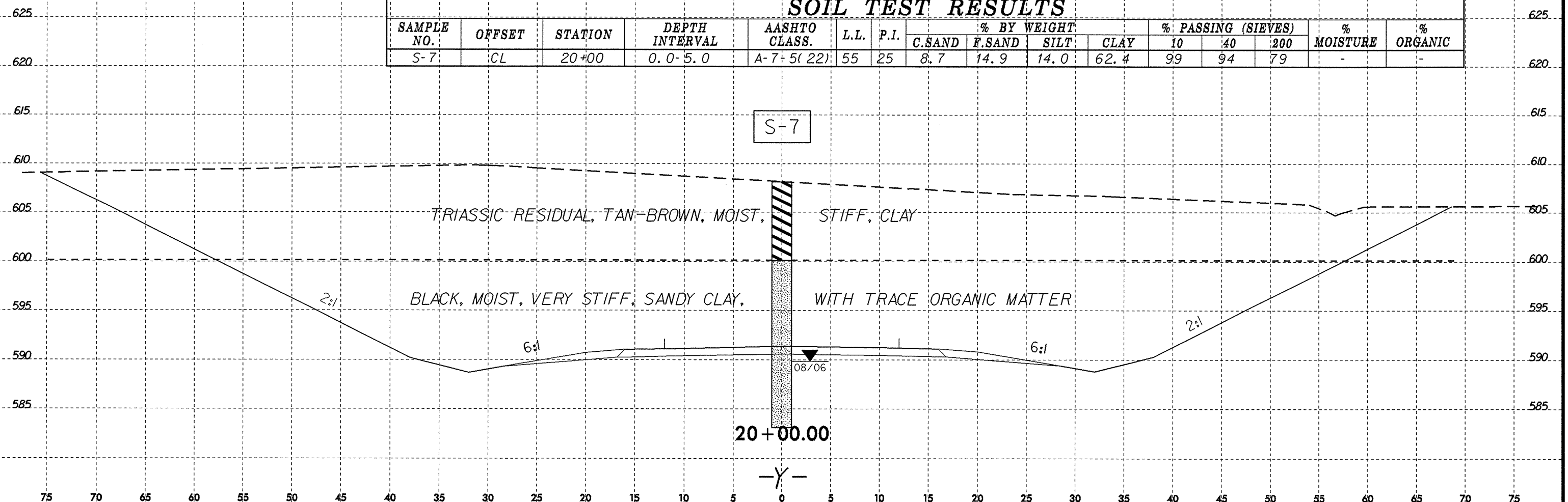


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SOIL TEST RESULTS

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-7	CL	20+00	0.0-5.0	A-7+5(22)	55	25	8.7	14.9	14.0	62.4	99	94	79	-	-

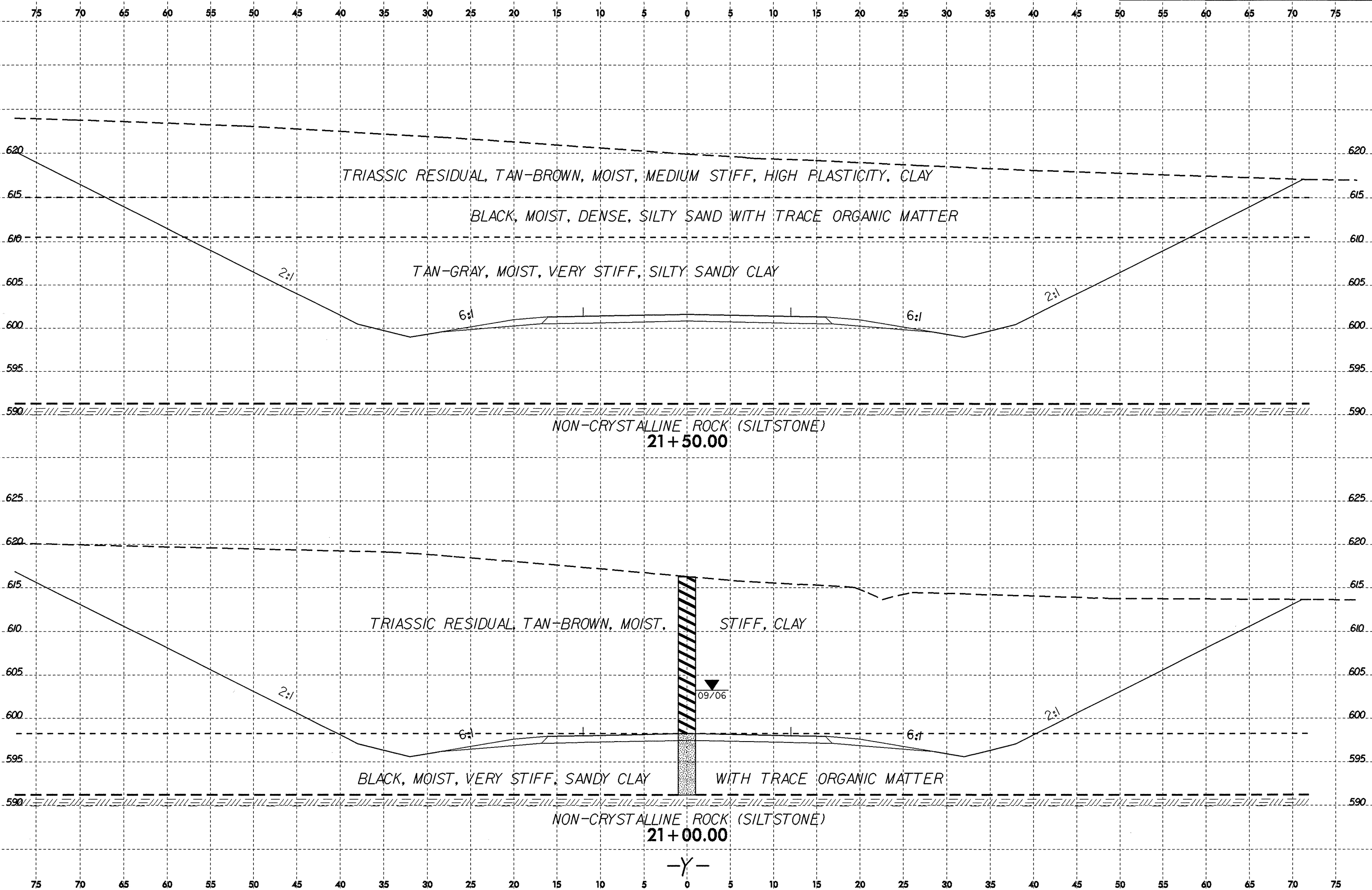
S-7



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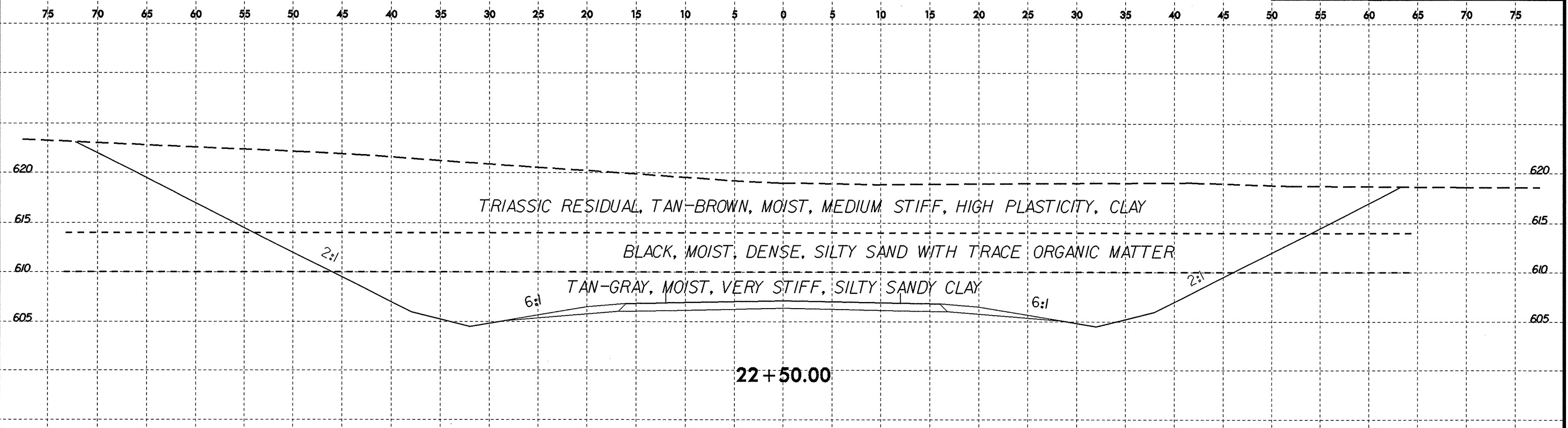
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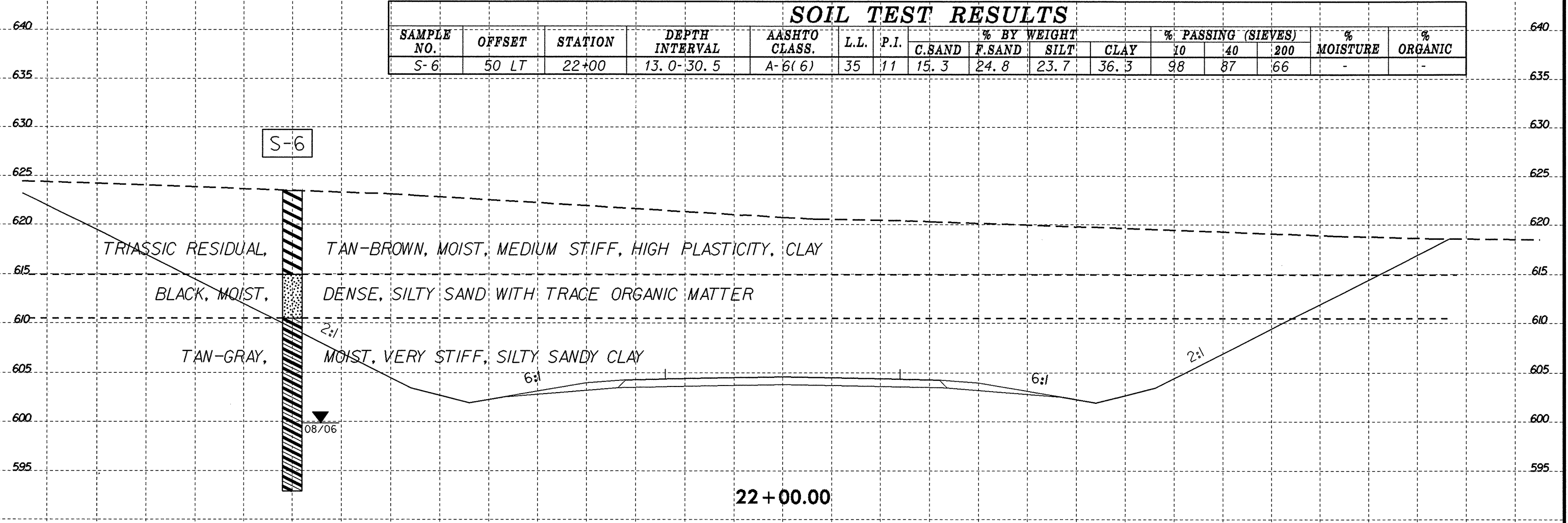
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22 + 50.00

SOIL TEST RESULTS

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							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-6	50 LT	22+00	13.0-30.5	A-6(6)	35	11	15.3	24.8	23.7	36.3	98	87	66	-	-



22 + 00.00

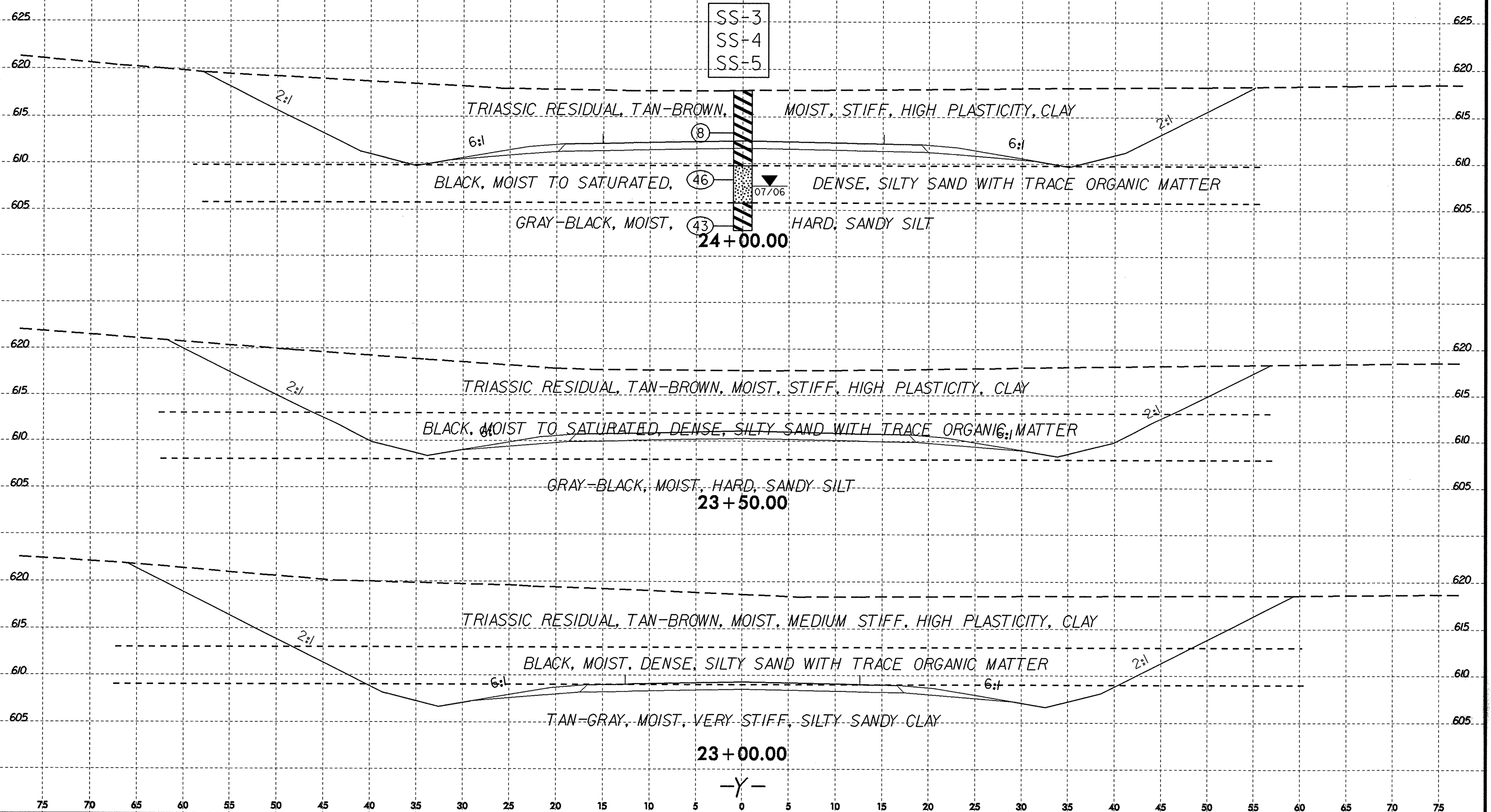
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SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-3	CL	24+00	3.5-5.0	A-7-6(29)	58	30	4.2	10.7	18.6	66.5	98	96	86	-	-
SS-4	CL	24+00	8.5-10.0	A-2-4(0)	37	9	42.3	29.4	14.2	14.1	85	60	29	-	-
SS-5	CL	24+00	13.5-15.0	A-7-6(6)	46	18	20.9	40.9	24.1	14.1	97	87	48	-	-



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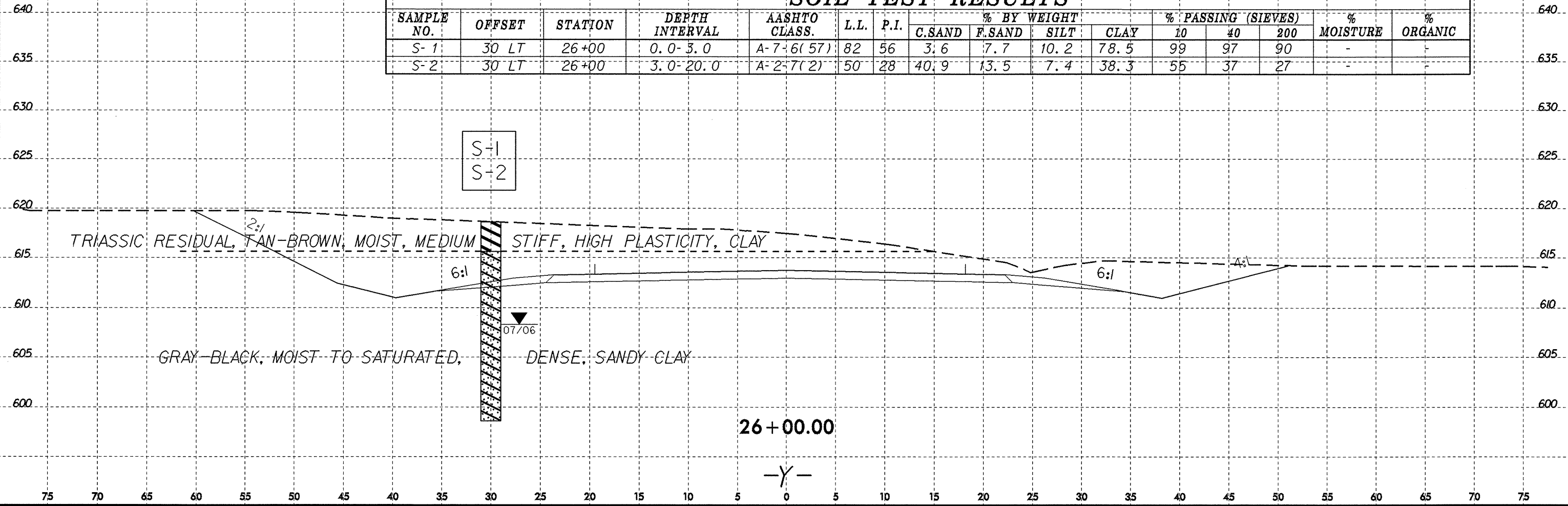


PROJ. REFERENCE NO.
B-4252

SHEET NO.
43

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

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-1	30 LT	26+00	0.0-3.0	A-7-6(57)	82	56	3.6	7.7	10.2	78.5	99	97	90	-	-
S-2	30 LT	26+00	3.0-20.0	A-2-7(2)	50	28	40.9	13.5	7.4	38.3	55	37	27	-	-



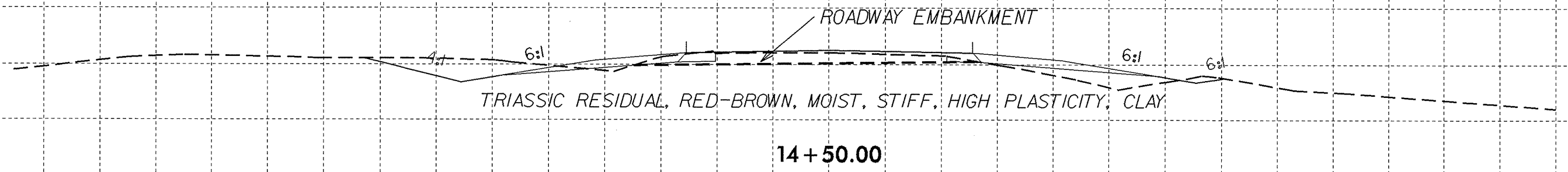
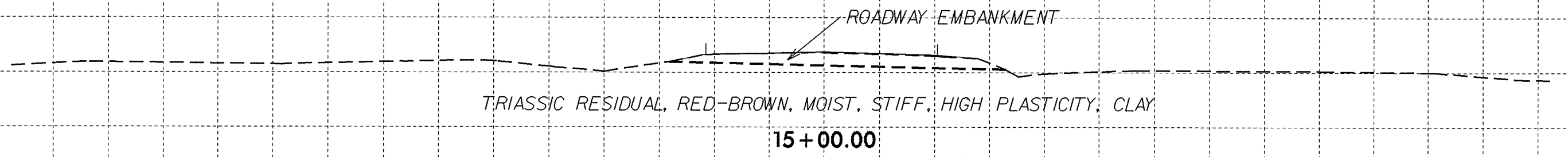
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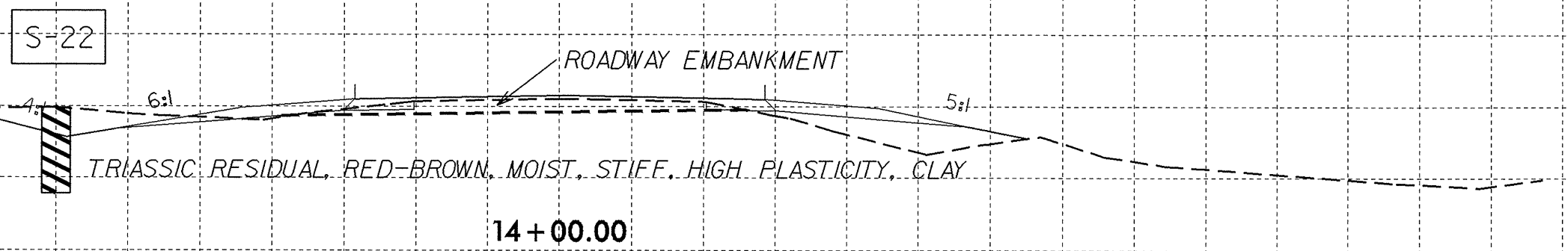
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SOIL TEST RESULTS

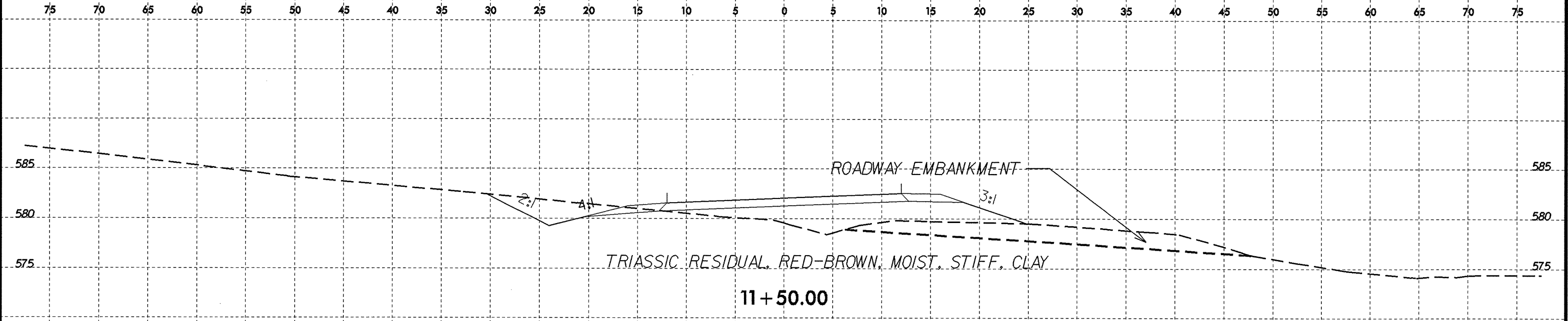
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							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-22	35 LT	14+00	0.0-6.0	A-7-5(32)	63	31	4.7	9.9	13.6	71.9	100	98	88	-	-



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

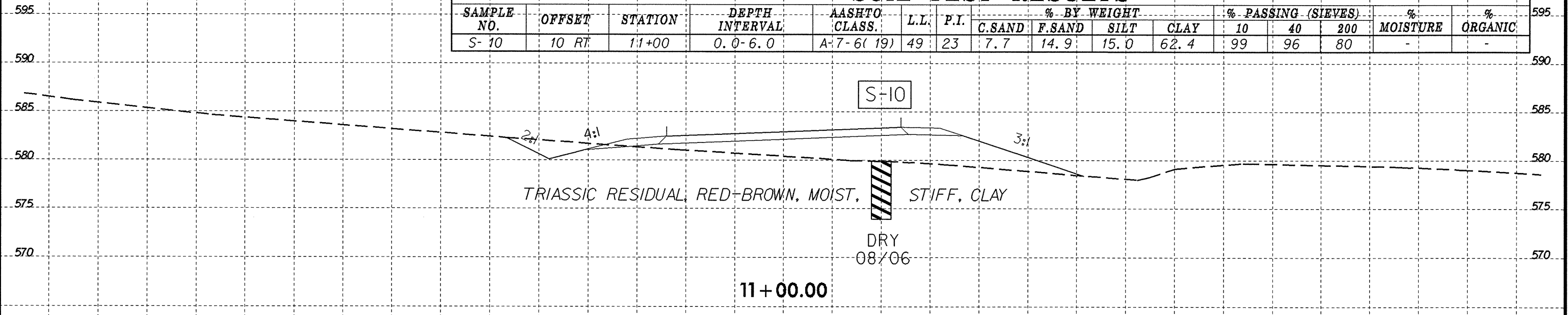
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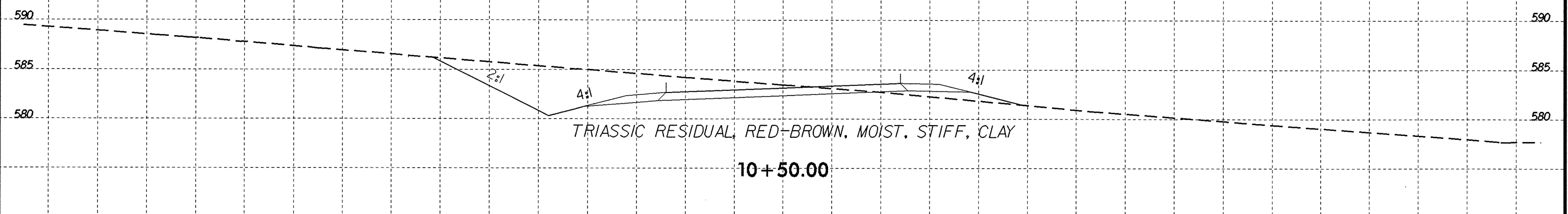
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SOIL TEST RESULTS

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-10	10 RT	11+00	0.0-6.0	A-7-6(19)	49	23	7.7	14.9	15.0	62.4	99	96	80	-	-



11+00.00



10+50.00

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