

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.	U-4011	1	36
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
40221.1.1	STP-1959(2)	PE	
40221.2.1	STP-1959(2)	RW & UTILITIES	
40221.3.1	STP-1959(2)	CONST	

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LINE	STATION	PLAN	PROFILE	XSECT
-L-	15+00 TO 32+00	4, 5	8	10-23
-L-	32+50 TO 41+00	5, 6	8	
-L-	41+50 TO 44+50	6	8	24-26
-L-	45+00 TO 54+00	6, 7	9	
-Y-	12+00 TO 12+48	4		27
-Y1-	10+00 TO 11+25	5		28, 29
-Y2-	10+00 TO 16+00	6	9	
-DR-	10+81 TO 11+25	4		30
-DR1-	10+80 TO 11+77	5		31, 32
-DR3-	9+90 TO 11+00	6	9	33-35
-RWAL-	47+25 TO 50+43	6, 36	36	

ROADWAY
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 40221.1.1 (U-4011) F.A. PROJ. STP-1959(2)
COUNTY DURHAM
PROJECT DESCRIPTION SR 1959 (SOUTH MIAMI BLVD.) FROM SOUTH OF SR 2112 (METHODIST ST.) TO NORTH OF SR 1960 (BETHESDA AVE.)

INVENTORY

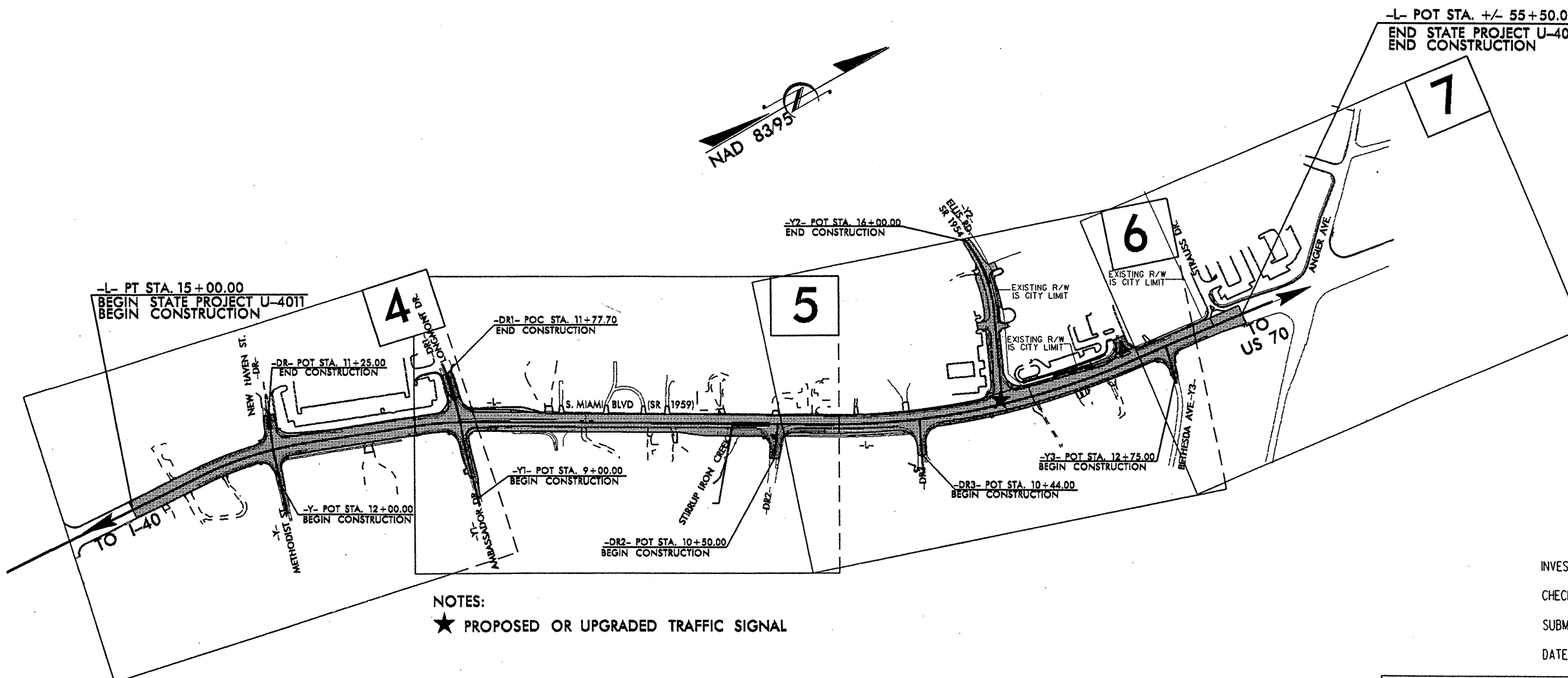
CAUTION NOTICE

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 1991 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.

CONTRACT: C202164 ID: U-4011



NOTES:
★ PROPOSED OR UPGRADED TRAFFIC SIGNAL

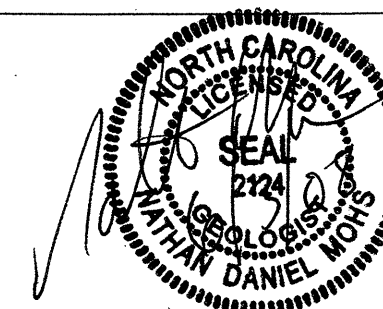
- PERSONNEL
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INVESTIGATED BY N.D. MOHS
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DATE JUNE 2008

DRAWN BY: J.R. MATULA, N.D. MOHS

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

PROJECT REFERENCE NO. 4022.L.I.(U-40II)	SHEET NO. 2
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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, HIGH 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) GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES. ANGULARITY OF GRAINS 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)	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, 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 DISLODGED 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 MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.	WEATHERING FRESH - ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE. VERY SLIGHT (V SL.) - ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY, ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE. SLIGHT (SL.) - ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS. MODERATE (MOD.) - SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK. MODERATELY SEVERE (MOD. SEV.) - ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. <i>IF TESTED, WOULD YIELD SPT REFUSAL.</i> SEVERE (SEV.) - 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 > 100 BPF.</i> VERY SEVERE (V SEV.) - ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. <i>IF TESTED, YIELDS SPT N VALUES < 100 BPF.</i> COMPLETE - ROCK REDUCED TO SOIL, ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS, SAPROLITE IS ALSO AN EXAMPLE.	COMPRESSION SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 31 MODERATELY COMPRESSIBLE LIQUID LIMIT EQUAL TO 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50 PERCENTAGE OF MATERIAL <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>ORGANIC MATERIAL</th> <th>GRANULAR SOILS</th> <th>SILT - CLAY SOILS</th> <th>OTHER MATERIAL</th> </tr> <tr> <td>TRACE OF ORGANIC MATTER</td> <td>2 - 3%</td> <td>3 - 5%</td> <td>TRACE</td> </tr> <tr> <td>LITTLE ORGANIC MATTER</td> <td>3 - 5%</td> <td>5 - 12%</td> <td>LITTLE</td> </tr> <tr> <td>MODERATELY ORGANIC</td> <td>5 - 10%</td> <td>12 - 20%</td> <td>SOME</td> </tr> <tr> <td>HIGHLY ORGANIC</td> <td>>10%</td> <td>>20%</td> <td>HIGHLY</td> </tr> <tr> <td></td> <td></td> <td></td> <td>35% AND ABOVE</td> </tr> </table> GROUND WATER 	ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL	TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE	LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE	MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME	HIGHLY ORGANIC	>10%	>20%	HIGHLY				35% AND ABOVE																																																																																
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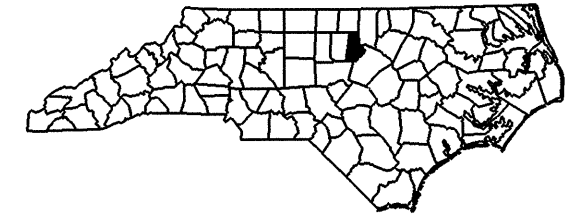
See Sheet 1-A For Index of Sheets

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

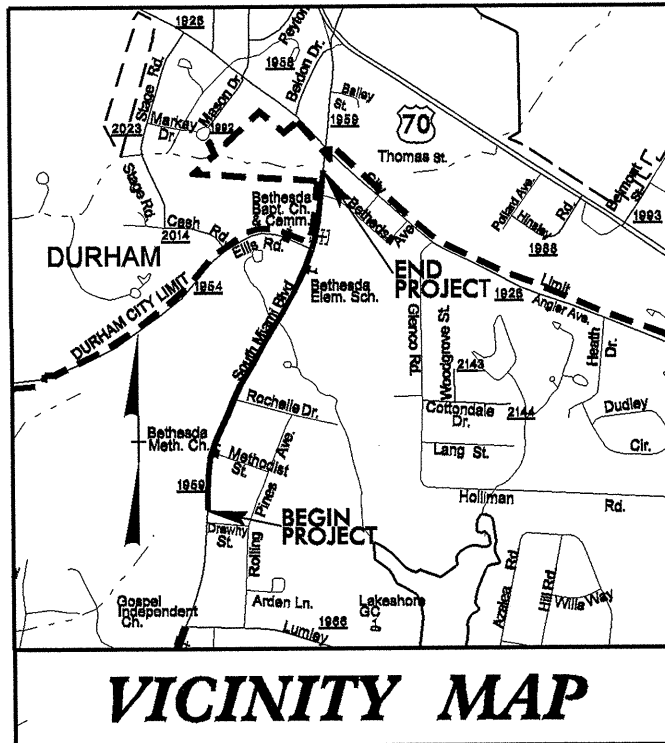
DURHAM COUNTY

LOCATION: SR 1959 (SOUTH MIAMI BLVD.) FROM SOUTH OF SR 2112 (METHODIST ST.) TO NORTH OF SR 1960 (BETHESDA AVE.)
TYPE OF WORK: WIDENING, DRAINAGE, GRADING, PAVING, CURB & GUTTER AND SIGNALS

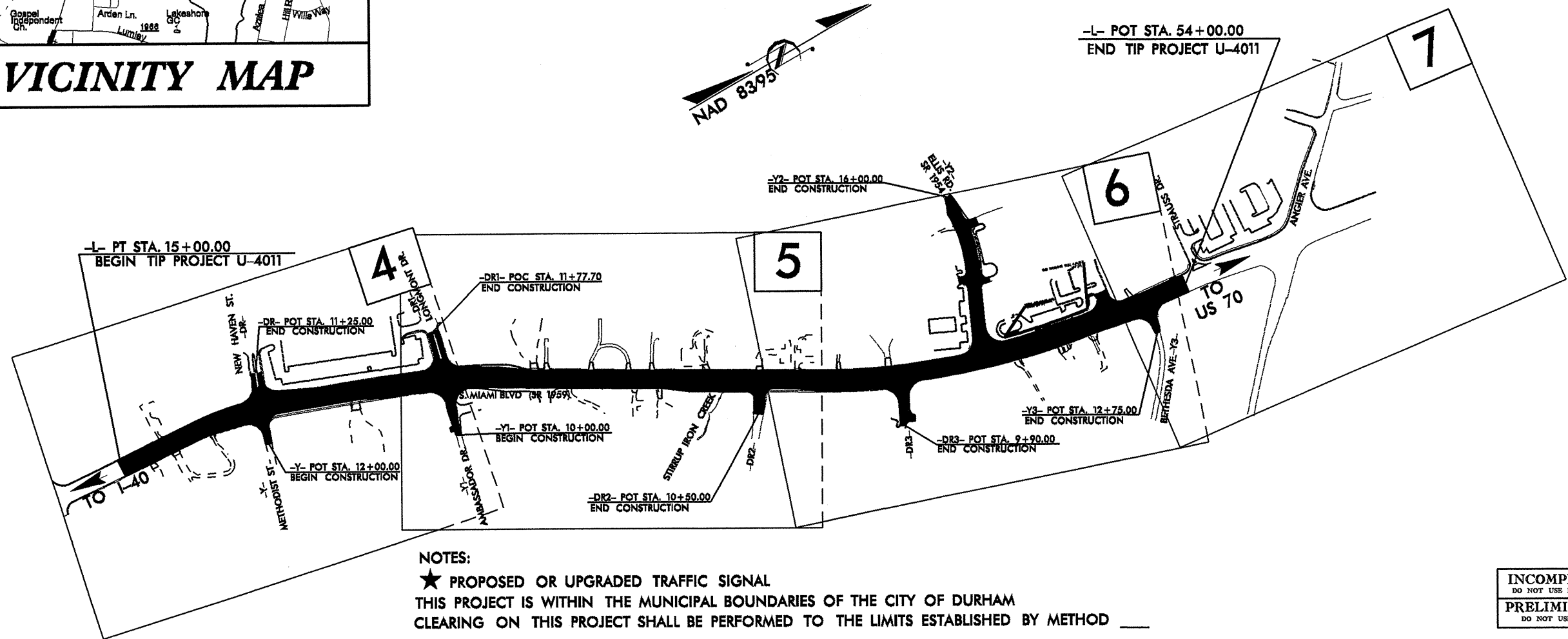
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-4011	2A	36
STATE PROJ. NO.	P.A. PROJ. NO.	DESCRIPTION	
40221.1.1	STP-1959(2)	PE	



TIP PROJECT: U-4011



VICINITY MAP

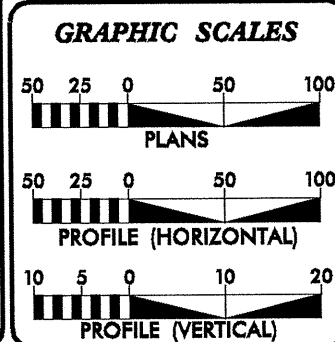


NOTES:

★ PROPOSED OR UPGRADED TRAFFIC SIGNAL
THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE CITY OF DURHAM
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 =	32,400
ADT 2030 =	55,000
DHV =	11 %
D =	70 %
T =	7 % *
V =	50 MPH
FUNCTIONAL CLASSIFICATION:	
URBAN MINOR ARTERIAL	
* TTST 3%	DUAL 4%

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-4011 =	0.739 MILES
TOTAL LENGTH OF TIP PROJECT U-4011 =	0.739 MILES

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

2006 STANDARD SPECIFICATIONS	
RIGHT OF WAY DATE: AUGUST 15, 2008	JASON MOORE, PE PROJECT ENGINEER
LETTING DATE: AUGUST 18, 2009	JEANIE TYSON 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

29-MAY-2008 14:50 i:\ero\Faleigh_investigation\tip\4011\geo_rdw\cadd\geotech\planproj\4011_rdy_tsh.dgn nmohts AT GE022654



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

Michael F. Easley
GOVERNOR

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

Lyndo Tippet
SECRETARY

May 29, 2008

STATE PROJECT: 40221.1.1 (U-4011)
FEDERAL PROJECT: STP-1959 (2)
COUNTY: Durham
DESCRIPTION: SR 1959 (South Miami Blvd.) from south of SR 2112 (Methodist St.) to north of SR 1960 (Bethesda Ave.)
SUBJECT: Geotechnical Report – Inventory

Project Description

This project consists of widening South Miami Blvd. (-L-, SR 1959) in Durham to four lanes with median and turn lanes. The project begins just south of the intersection of Methodist St. (SR 2112, -L- Sta. 20+42) and extends .74 miles north to Bethesda Ave. Ellis Rd. (-Y2-), is also being widened for 600 feet from the intersection with S. Miami Blvd. One retaining wall is also planned along the project at -L- Station 47+25.

The geotechnical field investigation was conducted during February and March 2008. The Geotechnical Engineering Unit's drilling crew used an ATV-mounted CME-550 drill machine during the field investigation. Standard Penetration Tests were performed in selected borings and additional borings were advanced using continuous flight augers. Representative soil samples were collected for visual classification in the field and submitted for laboratory analysis by NCDOT's Materials and Tests Unit.

The following alignments, totaling .89 miles, were investigated. Subsurface soil profiles, or cross-sections, of these alignments are included in this report:

<u>Line</u>	<u>Station</u>	<u>to</u>	<u>Station</u>
-L-	15+00	to	54+00
-Y2-	10+00	to	16+00
-DR3-	9+90	to	11+73

Areas of Special Geotechnical Interest

1) Highly Plastic Clay Soils: Occurrences of highly plastic clay soil (Plasticity Index greater than 25) are noted below:

<u>Alignment</u>	<u>Station</u>	<u>Offset</u>
-L-	18+35	60' LT
-L-	19+50	52' RT
-L-	19+65	63' LT
-L-	22+00	30' RT
-L-	24+35	60' RT
-L-	28+00	65' LT
-L-	30+60	35' RT
-L-	32+50	60' RT
-L-	48+00	55' LT
-L-	48+20	50' RT
-L-	48+87	46' LT
-L-	49+45	37' LT
-L-	49+87	42' LT
-DR3-	11+00	35' LT

Physiography and Geology

The project is located in the gently rolling terrain of the Eastern Piedmont area of North Carolina. A mixture of businesses, single-family homes, schools, and churches are located along the project corridor. Small creeks and ephemeral streams run across the project corridor, generally from right to left across the alignment.

Geologically the project lies within the Durham Triassic Basin which is part of a series of failed rifts stretching from South Carolina northward to New Jersey. These rift valleys formed during extensional, normal faulting in the Triassic Period some 200 million years ago. This rifting and separation of Africa from North America eventually formed the Atlantic Ocean.

The geology of the project area consists of Triassic age sedimentary rocks, primarily siltstone and sandstone, and recent alluvial soils. The depositional nature of the Triassic sediments created alternating beds of siltstone, mudstone and sandstone. Because of the active tectonic environment at the time of deposition, the soils derived from these deposits are highly variable and often laterally discontinuous.

Soil Properties

Soils encountered at the project site include roadway embankment soils, artificial fill, alluvial sediments, and Triassic residual soils.

Roadway embankment soil along the -L- alignment ranges up to 8 feet in height. Where sampled, the embankment soil consists of moist, medium stiff to stiff, silty clay, (AASHTO classifications of A-7-6).

Artificial fill soils within the project are associated with landscaping berms and parking lots. These soils are moist, soft to stiff, silty clay and sandy clay (A-7-6 and A-6).

Alluvial soils were deposited along a small creek which flows across the alignment at -L- Sta. 37+00. These soils consist of wet, loose, silty sand (A-2-4), with wood particles.

The Triassic residual soils are derived from the in-place weathering of the underlying sedimentary bedrock. These soils consist primarily of moist, soft to hard, silty clay (A-7-5 and A-7-6) and moist, stiff, sandy clay (A-6). Areas containing highly plastic soils (plasticity indices of greater than 25) are listed above in the section "Areas of Special Geotechnical Interest".

Rock Properties

Weathered rock occurs in several areas of the project. The weathered rock is derived from the underlying sedimentary rock of the Durham Triassic Basin, and consists of sandstone and siltstone. Weathered and non-crystalline siltstone in this area is known to be highly degradable when exposed to air and water.

Groundwater

Groundwater was encountered in several borings completed on this project. Groundwater, when encountered in Triassic residual soil or weathered rock, was variable across the project, ranging from 2 feet to 10 feet below the ground surface. Groundwater in borings located in alluvial areas was at 8.5 feet in depth. The field investigation was performed during a period of extreme drought across the region. Based on the investigation, groundwater is not anticipated to cause problems during construction.

Prepared by,



Nathan Mohs, LG
Engineering Geologist

EARTHWORK BALANCE SHEET

PROJECT: U-4011

COUNTY: Durham

Volumes in Cubic Yards
DATE: 6/4/2010

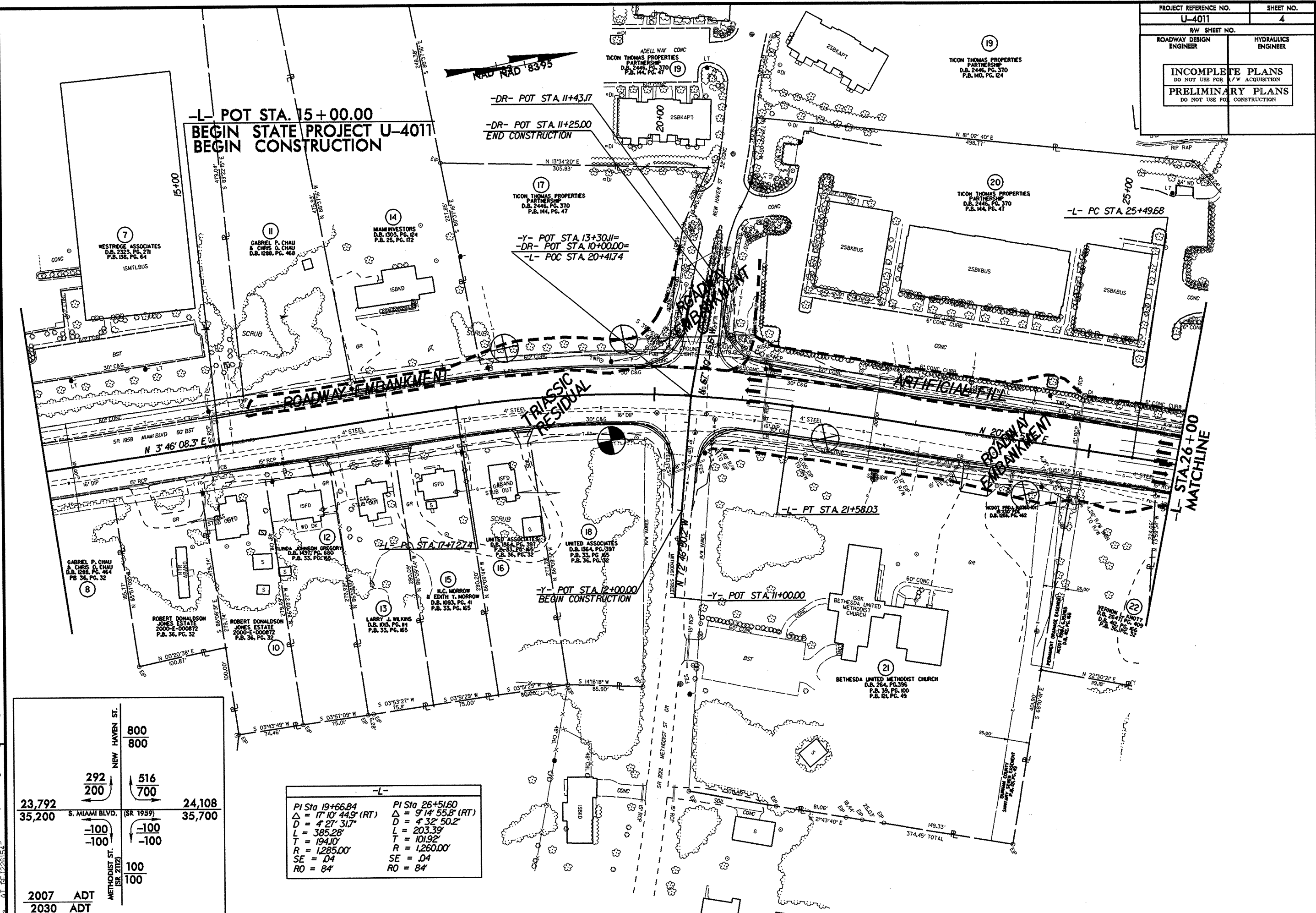
COMPILED BY: SEC

SHEET ³⁸ 36 OF SHEETS

STATION	STATION	EXCAVATION				EMBANKMENT				BORROW	WASTE			
		TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUIT. UNCLASS.	SUITABLE UNCLASS.	TOTAL	ROCK	EARTH		EMBANK. +20%	SUITABLE	UNSUIT.	TOTAL
-L- LT 15+00.00	-L- LT 55+50.00	2,060			514	1,546	1,290		1,290	1,548	2		514	514
-DR- 10+81.52	-DR- 11+25.00	54			33	21	2		2	2		19	33	52
-DR1- 10+80.50	-DR1- 11+77.70	39			15	24	22		22	26	2		15	15
-Y2- 10+76.24	-Y2- 16+00.00	923				923	157		157	188		735		735
SUBTOTAL		3,076			562	2,514	1,471		1,471	1,765	4	753	562	1,315
-L- RT 15+00	-L- RT 55+50.00	2,520			1,191	1,329	2,383		2,383	2,860	1,531		1,191	1,191
-Y- 12+00.00	-Y- 12+48.17	33			33		37		37	44	44		33	33
-Y1- 10+00.00	-Y1- 11+25.00	43			43		77		77	92	92		43	43
-DR2- 10+50.00	-DR2- 11+15.93	8				8	30		30	36	28			
-DR3- 10+44.00	-DR3- 11+00.00	6			3	3	23		23	28	25		3	3
SUBTOTAL		2,610			1,270	1,340	2,550		2,550	3,060	1,720		1,270	1,270
-Y3- 12+75.00	-Y3- 13+19.53	23				23	1		1	1		22		22
SUBTOTAL		23				23	1		1	1		22		22
SUBTOTAL														
TOTAL		5,709			1,832	3,877	4,022		4,022	4,826	1,724	775	1,832	2,607
LOSS DUE TO CLEARING & GRUBBING		-200				-200					200			
WASTE IN LIEU OF BORROW											-775	-775		-775
PROJECT TOTAL		5,509			1,832	3,677	4,022		4,022	4,826	1,149		1,832	1,832
											57			
GRAND TOTAL		5,509			1,832	3,677	4,022		4,022	4,826	1,207		1,832	1,832
SAY		5,600									1,300			
EST. SHALLOW UNDERCUT = 600 CUBIC YARDS														
EST. SHALLOW UNDERCUT BY STATIONS = 1,500 CUBIC YARDS														
TOTAL SHALLOW UNDERCUT = 2,100 CUBIC YARDS														
PER GEOTECH RECOMMENDATION, ESTIMATED 500 CUBIC YARDS OF UNDERCUT TO BE USED IN THE DISCRETION OF THE RESIDENT ENGINEER.														

NOTE: 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.

PROJECT REFERENCE NO.		SHEET NO.	
U-4011		4	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER			
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			



**-L- POT STA. 15+00.00
BEGIN STATE PROJECT U-4011
BEGIN CONSTRUCTION**

**-DR- POT STA. 11+43.77
-DR- POT STA. 11+25.00
END CONSTRUCTION**

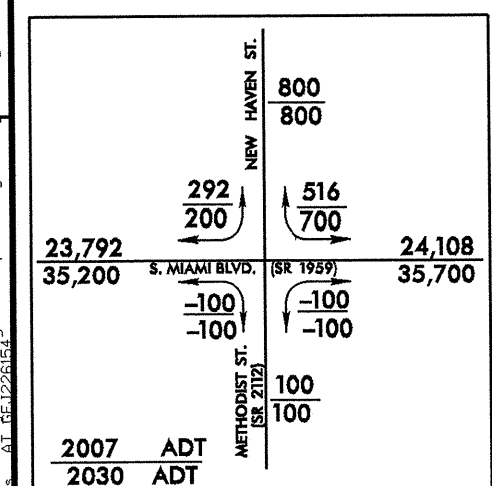
**-Y- POT STA. 13+30.11
-DR- POT STA. 10+00.00=
-L- POC STA. 20+417.4**

TRIASSIC RESIDUAL

ARTIFICIAL FILL

ROADWAY EMBANKMENT

**L- STA 26+00
MATCHLINE**



-L-	
PI Sta 19+66.84	PI Sta 26+51.60
$\Delta = 17^{\circ} 10' 44.9''$ (RT)	$\Delta = 9^{\circ} 14' 55.8''$ (RT)
$D = 4^{\circ} 27' 31.7''$	$D = 4^{\circ} 32' 50.2''$
$L = 385.28'$	$L = 203.39'$
$T = 194.10'$	$T = 101.92'$
$R = 1,285.00'$	$R = 1,260.00'$
$SE = .04$	$SE = .04$
$RO = 84'$	$RO = 84'$

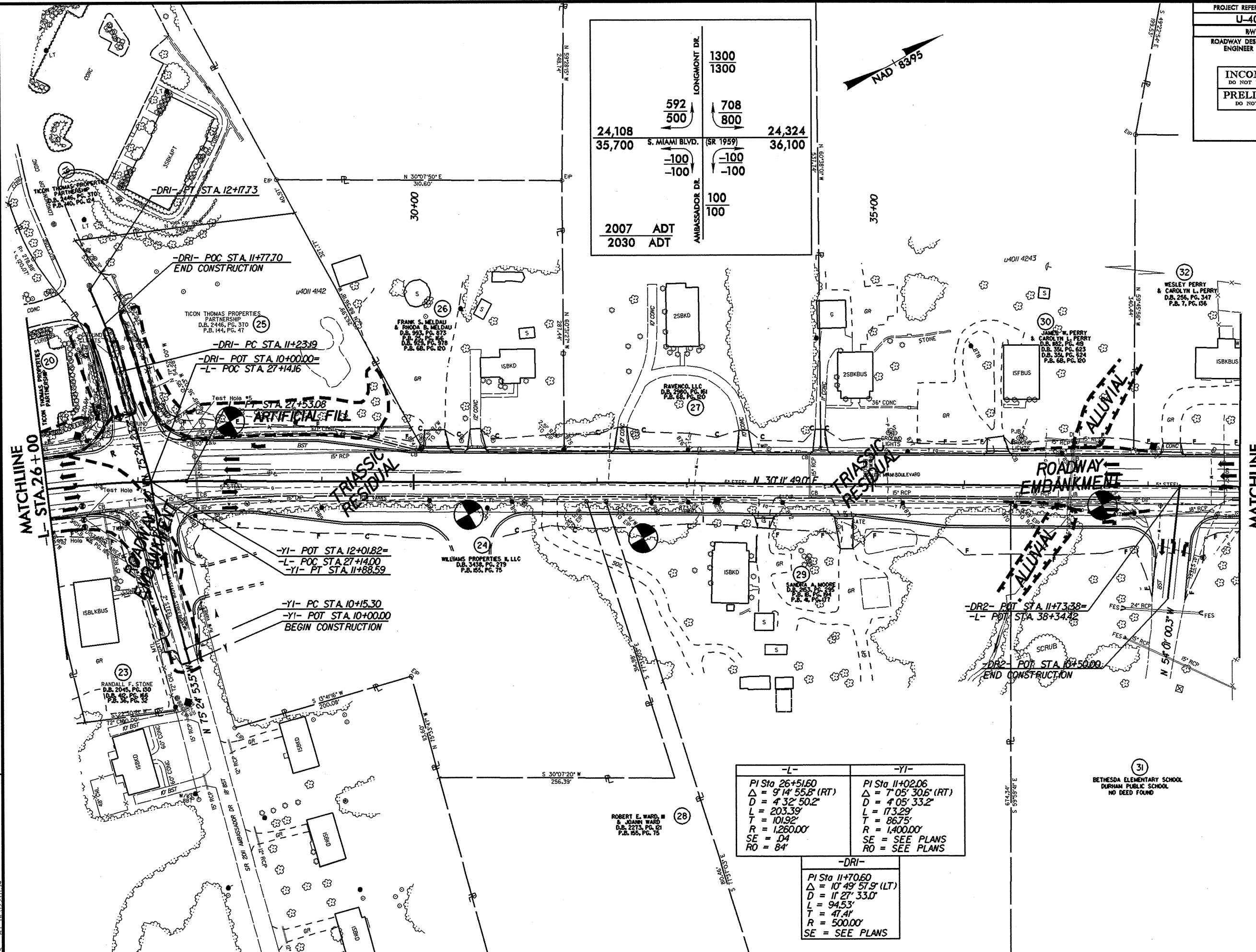
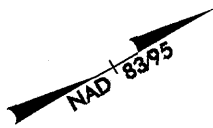
REVISIONS

8/17/99

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PROJECT REFERENCE NO.		SHEET NO.	
U-4011		5	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR ACQUISITION		PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

LONGMONT DR.		1300	
592		708	
500		800	
24,108	←	→	24,324
35,700			36,100
S. MIAMI BLVD. (SR 1959)		-100	
-100		-100	
2007 ADT		100	
2030 ADT		100	
AMBASSADOR DR.		100	



MATCHLINE
-L- STA. 26+00

MATCHLINE
-L- STA. 39+00

-DRI- PT STA. 12+17.73
-DRI- POC STA. 11+77.70
END CONSTRUCTION

-DRI- PC STA. 11+23.19
-DRI- POT STA. 10+00.00=
-L- POC STA. 27+14.16

-YI- POT STA. 12+01.82=
-L- POC STA. 27+14.00
-YI- PT STA. 11+88.59

-YI- PC STA. 10+15.30
-YI- POT STA. 10+00.00
BEGIN CONSTRUCTION

-DR2- POT STA. 11+73.38=
-L- POC STA. 38+34.42

-DR2- POT STA. 10+50.00
END CONSTRUCTION

-L-	-YI-
PI Sta 26+51.60	PI Sta 11+02.06
$\Delta = 9^{\circ} 14' 55.8''$ (RT)	$\Delta = 7^{\circ} 05' 30.6''$ (RT)
$D = 4^{\circ} 32' 50.2''$	$D = 4^{\circ} 05' 33.2''$
$L = 203.39'$	$L = 173.29'$
$T = 101.92'$	$T = 86.75'$
$R = 1,260.00'$	$R = 1,400.00'$
SE = .04	SE = SEE PLANS
RO = 84'	RO = SEE PLANS

-DRI-
PI Sta 11+70.60
$\Delta = 10^{\circ} 49' 57.9''$ (LT)
$D = 11^{\circ} 27' 33.0''$
$L = 94.53'$
$T = 47.41'$
$R = 500.00'$
SE = SEE PLANS

REVISIONS

8/17/99

04-JUN-2008 08:45
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31
BETHESDA ELEMENTARY SCHOOL
DURHAM PUBLIC SCHOOL
NO DEED FOUND

28
ROBERT E. WARD, III
& JOANN WARD
D.B. 2213, PG. 121
P.B. 55, PG. 75

24
WILLIAMS PROPERTIES, L.L.C.
D.B. 3438, PG. 279
P.B. 156, PG. 75

26
FRANK S. MELDAU
& RHODA S. MELDAU
D.B. 993, PG. 873
P.B. 62, PG. 85
L.E. 62, PG. 378
P.B. 68, PG. 20

25
TICON THOMAS PROPERTIES
PARTNERSHIP
D.B. 2446, PG. 370
P.B. 144, PG. 41

30
JAMES W. PERRY
& CAROLYN L. PERRY
D.B. 832, PG. 49
D.B. 354, PG. 623
D.B. 354, PG. 624
P.B. 65, PG. 60

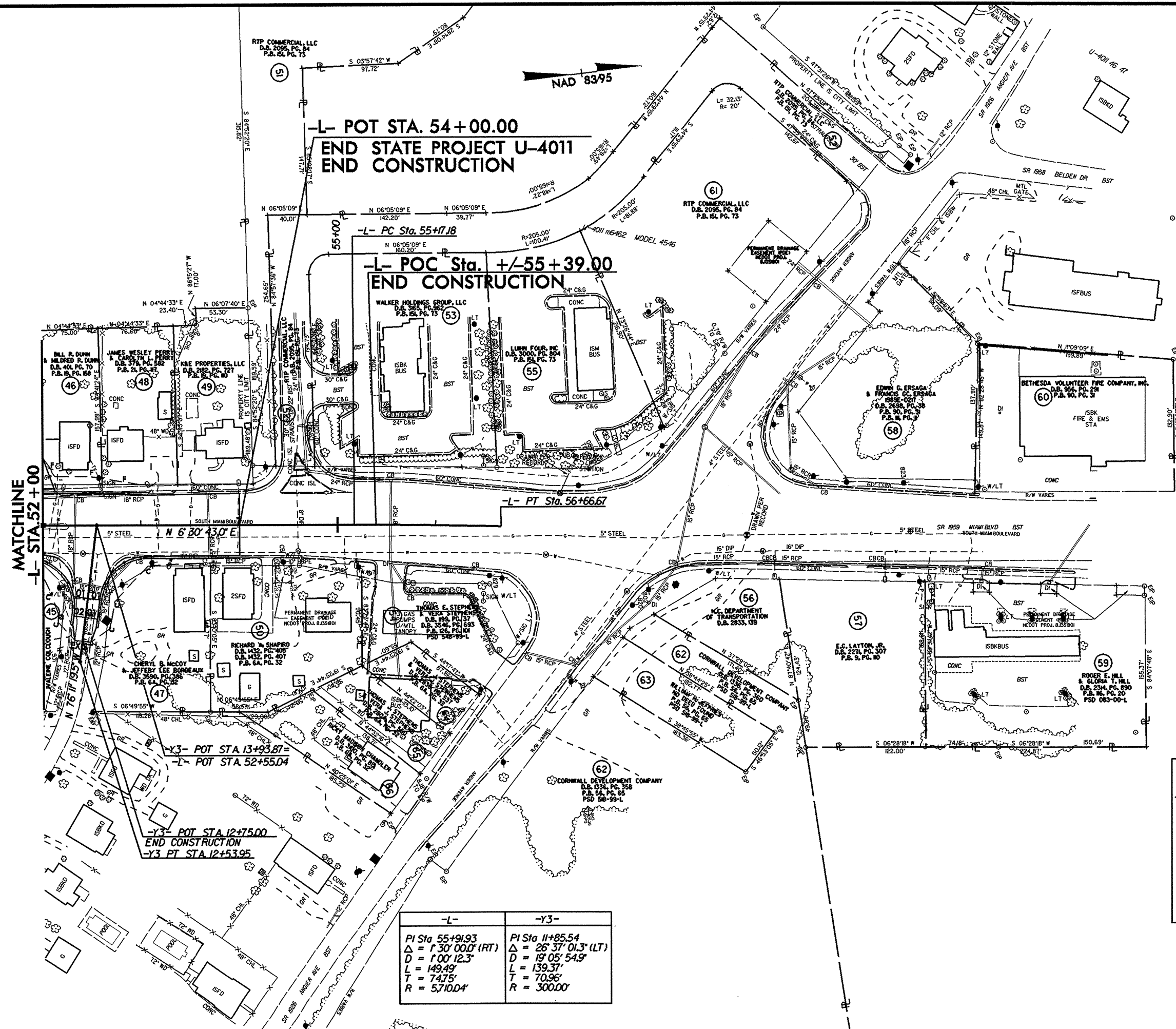
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WESLEY PERRY
& CAROLYN L. PERRY
D.B. 256, PG. 347
P.B. 7, PG. 156

23
RANDAL F. STONE
D.B. 2045, PG. 89
P.B. 36, PG. 88

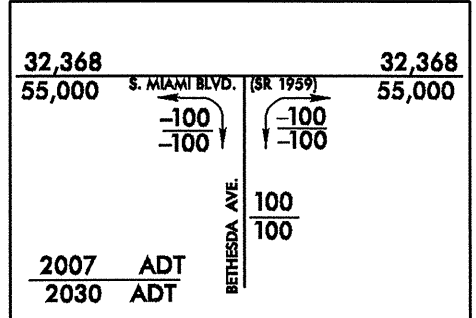
8/17/99

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PROJECT REFERENCE NO.		SHEET NO.	
U-4011		7	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER			
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			

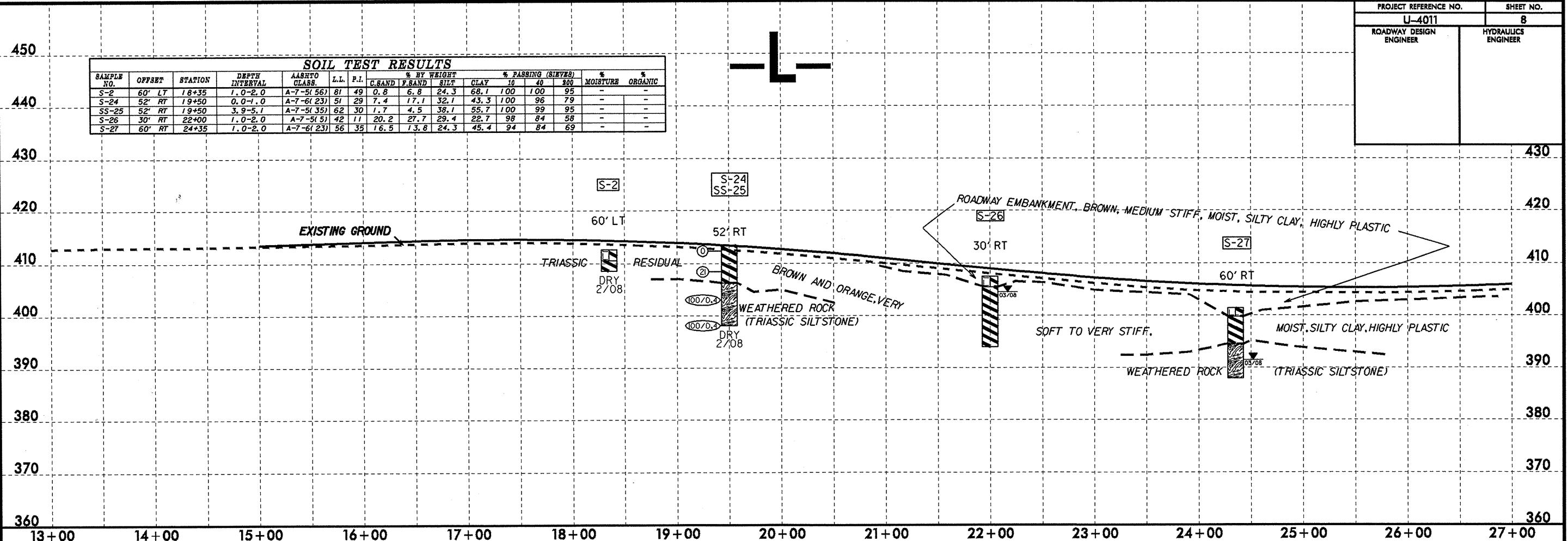


-L-	-Y3-
PI Sta 55+91.93	PI Sta 11+85.54
$\Delta = 1' 30'' 00.0''$ (RT)	$\Delta = 26' 37'' 01.3''$ (LT)
$D = 1' 00'' 12.3''$	$D = 19' 05'' 54.9''$
$L = 149.49'$	$L = 139.37'$
$T = 74.75'$	$T = 70.96'$
$R = 5710.04'$	$R = 300.00'$

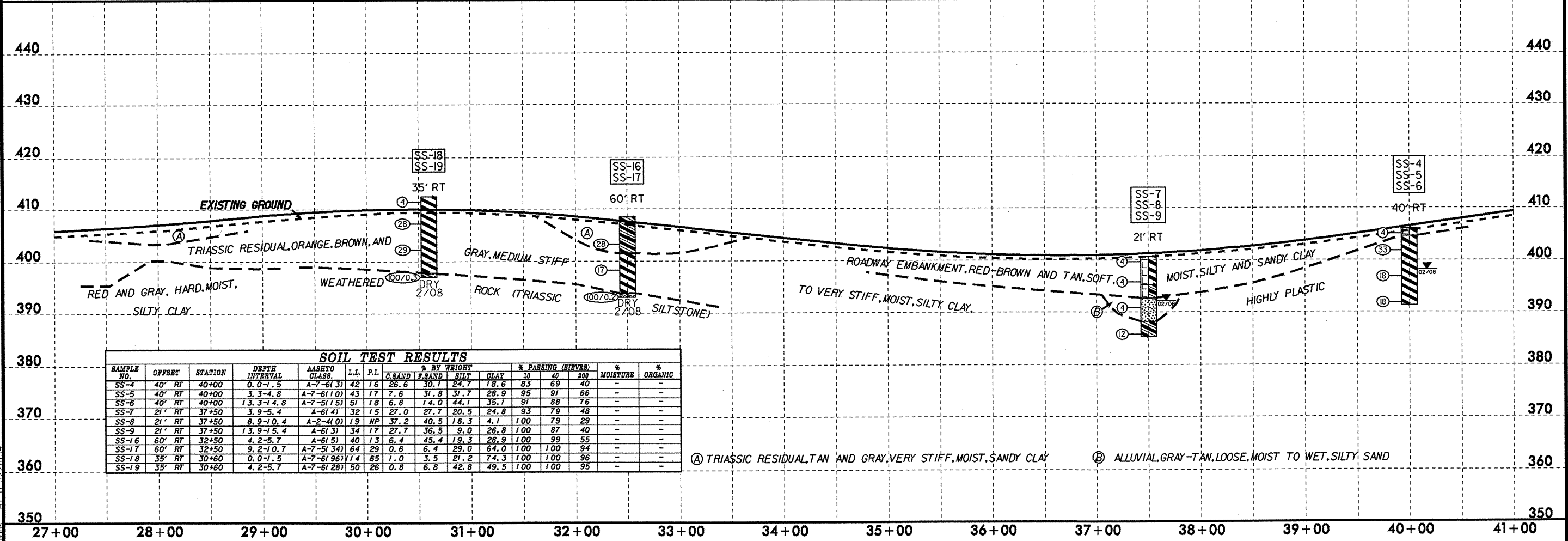


REVISIONS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							G.SAND	F.SAND	SILT	CLAY	10	40	200		
S-2	60' LT	18+35	1.0-2.0	A-7-5(56)	81	49	0.8	6.8	24.3	68.1	100	100	95	-	-
S-24	52' RT	19+50	0.0-1.0	A-7-6(23)	51	29	7.4	17.1	32.1	43.3	100	96	79	-	-
SS-25	52' RT	19+50	3.9-5.1	A-7-5(35)	62	30	1.7	4.5	38.1	55.7	100	99	95	-	-
S-26	30' RT	22+00	1.0-2.0	A-7-5(5)	42	11	20.2	27.7	29.4	22.7	98	84	58	-	-
S-27	60' RT	24+35	1.0-2.0	A-7-6(23)	56	35	16.5	13.8	24.3	45.4	94	84	69	-	-

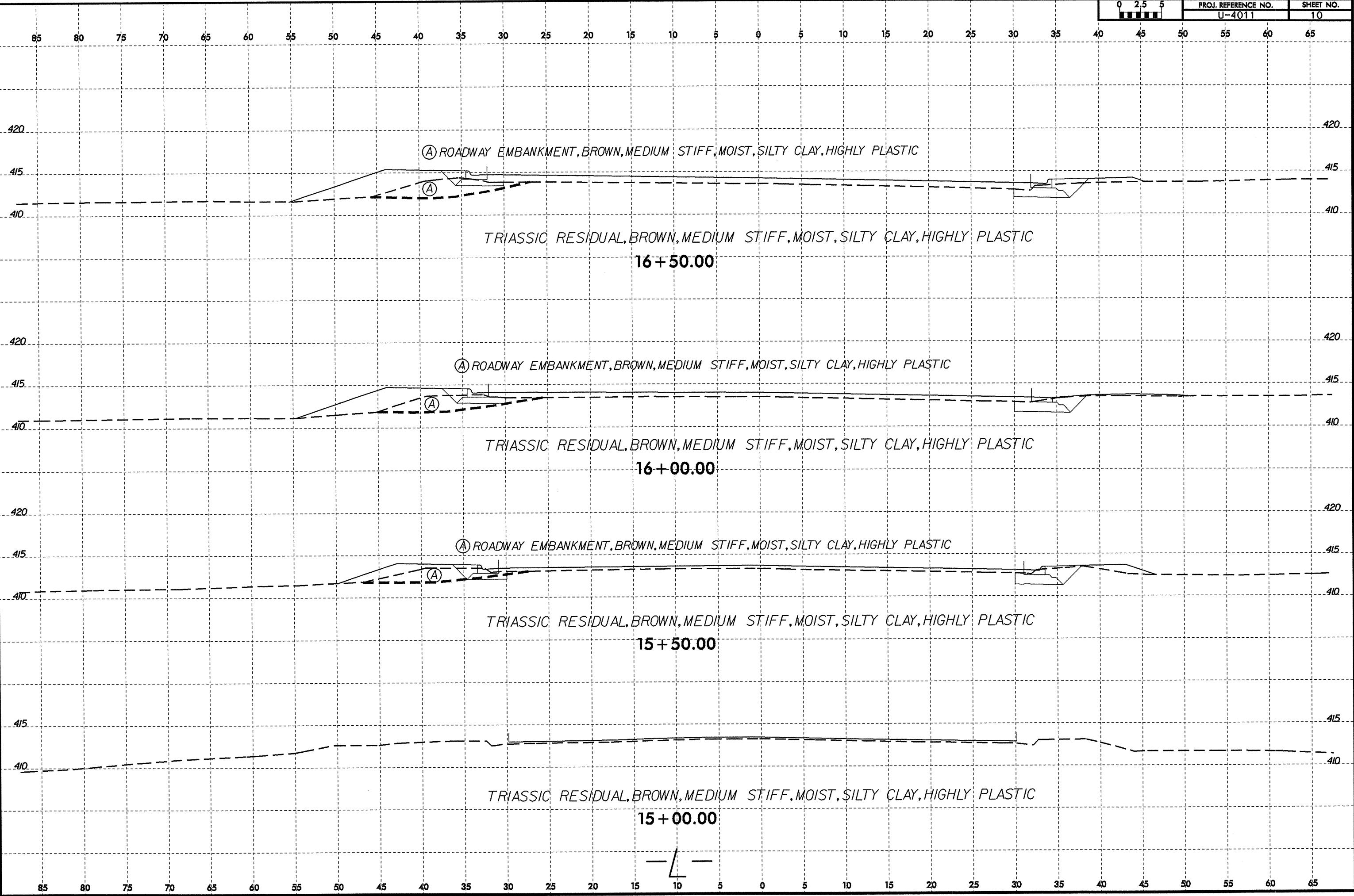


SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							G.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-4	40' RT	40+00	0.0-1.5	A-7-6(3)	42	16	26.6	30.1	24.7	18.6	83	69	40	-	-
SS-5	40' RT	40+00	3.3-4.8	A-7-6(10)	43	17	7.6	31.8	31.7	28.9	95	91	66	-	-
SS-6	40' RT	40+00	1.3-14.8	A-7-5(15)	51	18	6.8	14.0	44.1	35.1	91	88	76	-	-
SS-7	21' RT	37+50	3.9-5.4	A-6(4)	32	15	27.0	27.7	20.5	24.8	93	79	48	-	-
SS-8	21' RT	37+50	8.9-10.4	A-2-4(0)	19	NP	37.2	40.5	18.3	4.1	100	79	29	-	-
SS-9	21' RT	37+50	1.3-9-15.4	A-6(3)	34	17	27.7	36.5	9.0	26.8	100	87	40	-	-
SS-16	60' RT	32+50	4.2-5.7	A-6(5)	40	13	6.4	45.4	19.3	28.9	100	99	55	-	-
SS-17	60' RT	32+50	9.2-10.7	A-7-5(34)	64	29	0.6	6.4	29.0	64.0	100	100	94	-	-
SS-18	35' RT	30+60	0.0-1.5	A-7-6(96)	14	85	1.0	3.5	21.2	74.3	100	100	96	-	-
SS-19	35' RT	30+60	4.2-5.7	A-7-6(28)	50	26	0.8	6.8	42.8	49.5	100	100	95	-	-



5/28/99
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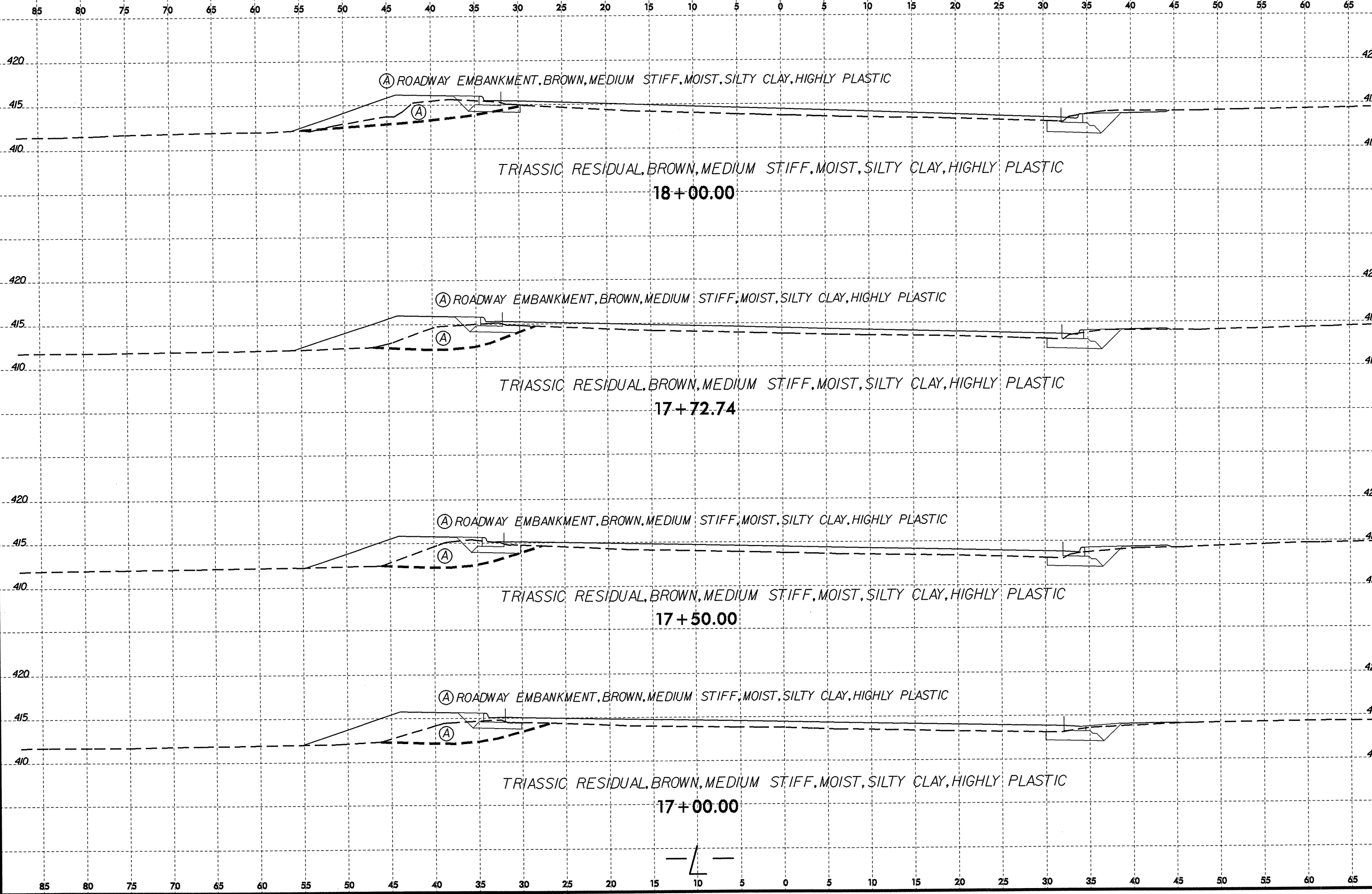
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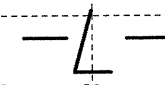
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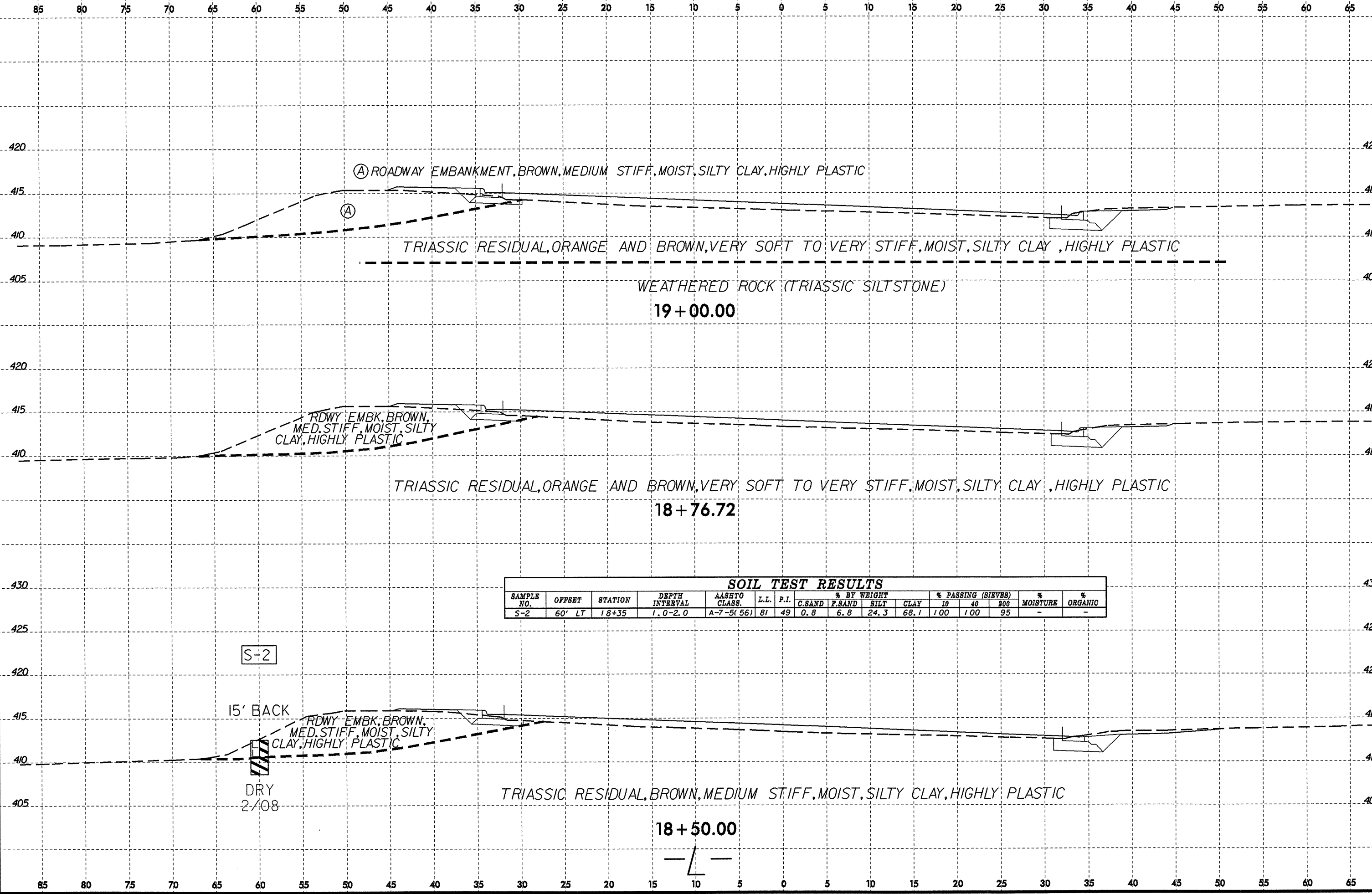
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U-4011	11



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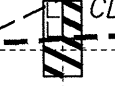
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SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-2	60' LT	18+35	1.0-2.0	A-7-5(56)	81	49	0.8	6.8	24.3	68.1	100	100	95	-	-

S-2

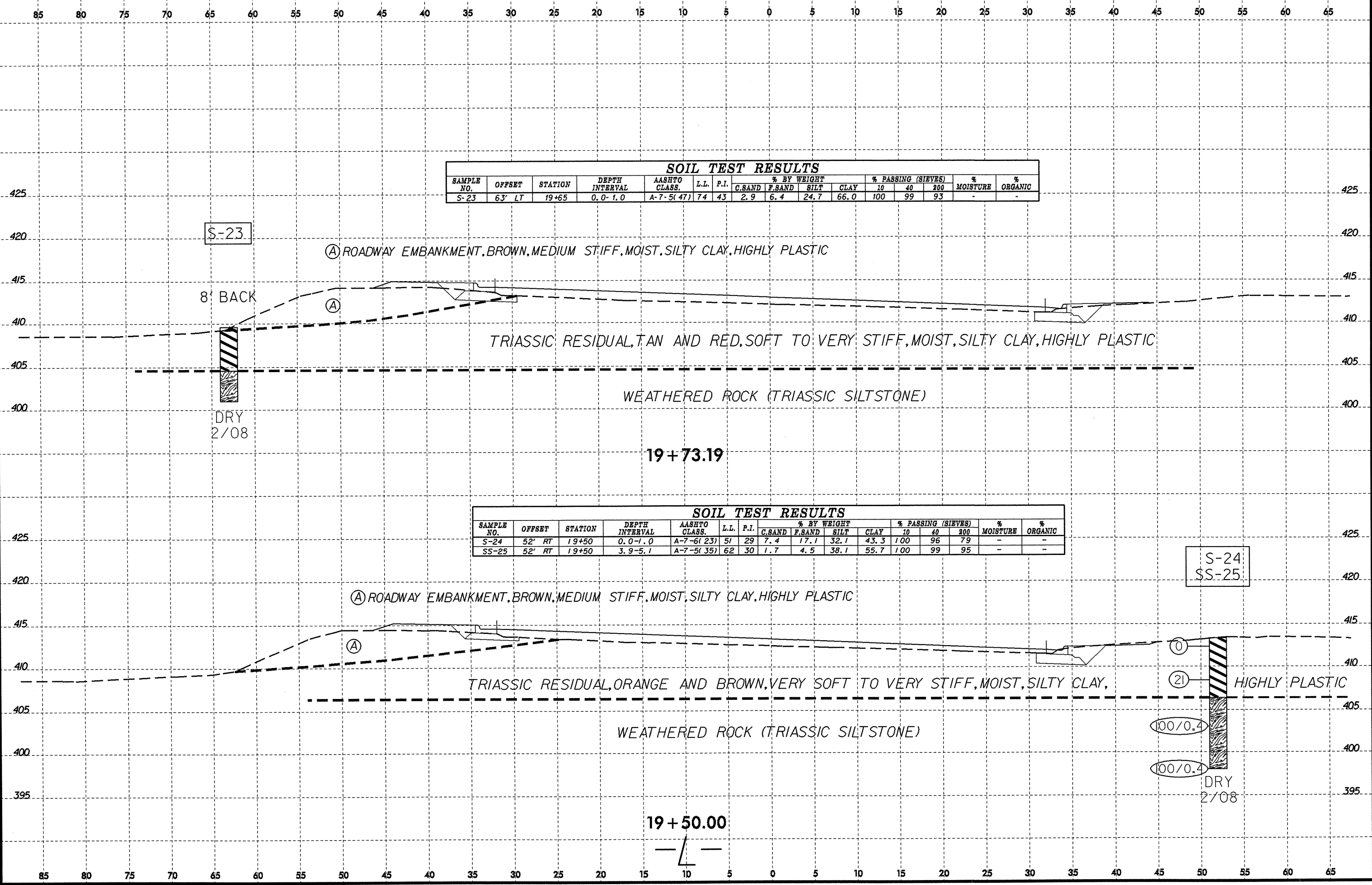
15' BACK



DRY
2/08

18+50.00

8/23/99
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SOIL TEST RESULTS

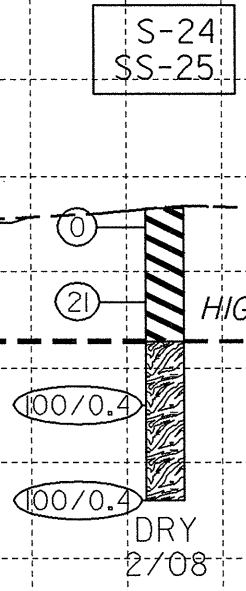
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							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-23	63' LT	19+65	0.0-1.0	A-7-5(47)	74	43	2.9	6.4	24.7	66.0	100	99	93	-	-

(A) ROADWAY EMBANKMENT, BROWN, MEDIUM STIFF, MOIST, SILTY CLAY, HIGHLY PLASTIC
 TRIASSIC RESIDUAL, TAN AND RED, SOFT TO VERY STIFF, MOIST, SILTY CLAY, HIGHLY PLASTIC
 WEATHERED ROCK (TRIASSIC SILTSTONE)

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-24	52' RT	19+50	0.0-1.0	A-7-6(23)	51	29	7.4	17.1	32.1	43.3	100	96	79	-	-
SS-25	52' RT	19+50	3.9-5.1	A-7-5(35)	62	30	1.7	4.5	38.1	55.7	100	99	95	-	-

(A) ROADWAY EMBANKMENT, BROWN, MEDIUM STIFF, MOIST, SILTY CLAY, HIGHLY PLASTIC
 TRIASSIC RESIDUAL, ORANGE AND BROWN, VERY SOFT TO VERY STIFF, MOIST, SILTY CLAY, HIGHLY PLASTIC
 WEATHERED ROCK (TRIASSIC SILTSTONE)

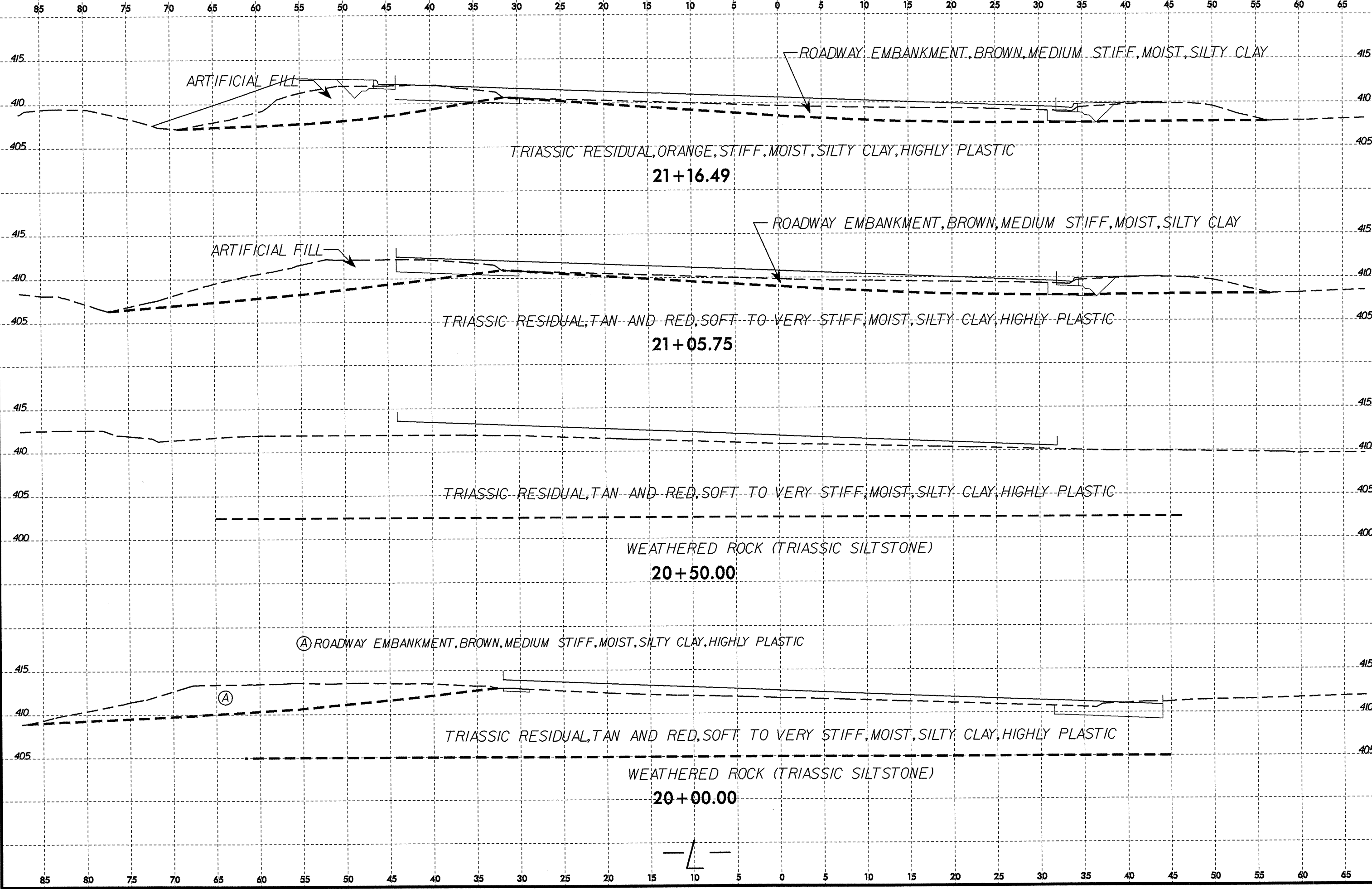


19+50.00

8/23/99

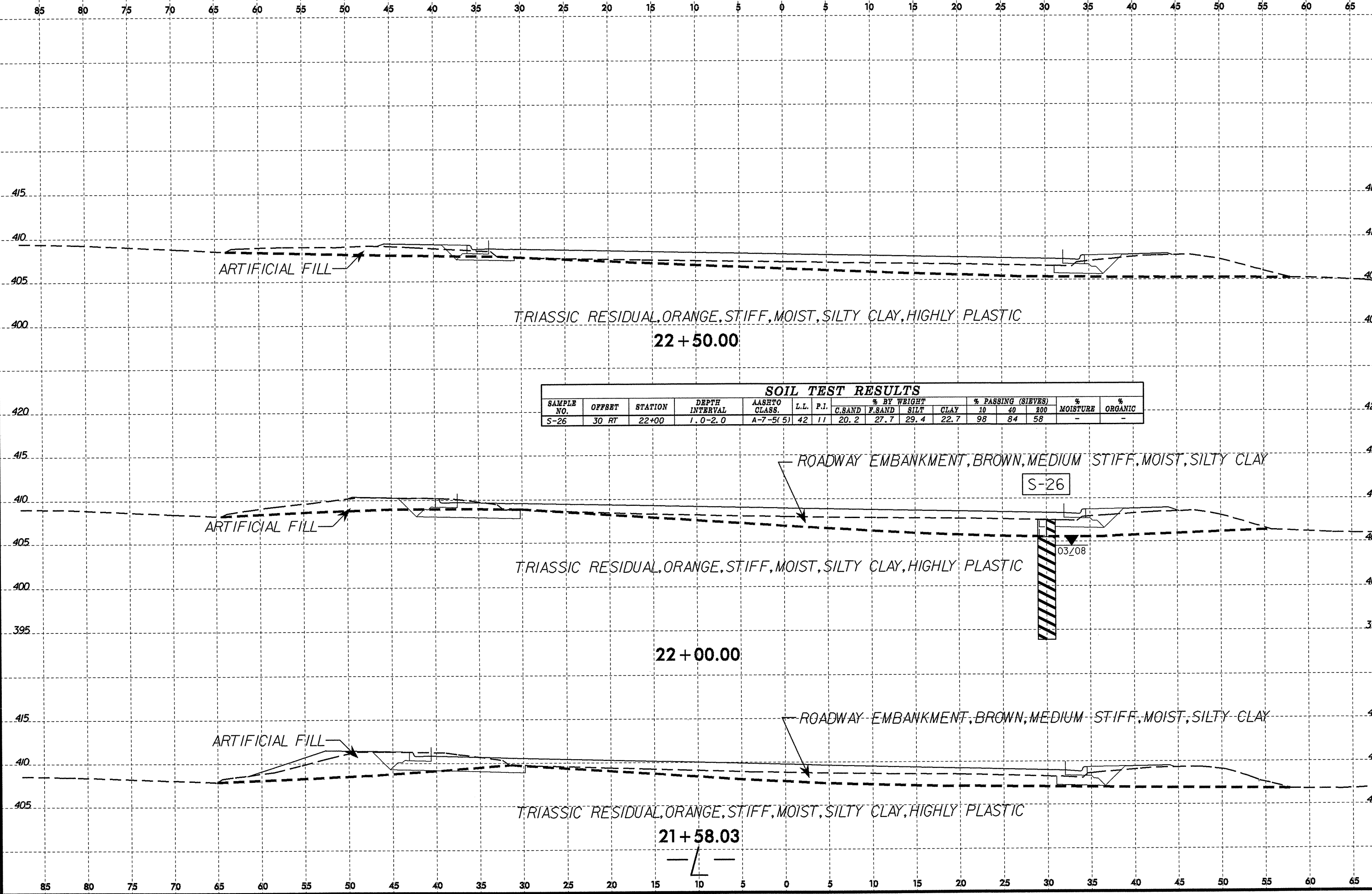


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TRIASSIC RESIDUAL, ORANGE, STIFF, MOIST, SILTY CLAY, HIGHLY PLASTIC
 22 + 50.00

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-26	30 RT	22+00	1.0-2.0	A-7-5(5)	42	11	20.2	27.7	29.4	22.7	98	84	58	-	-

ROADWAY EMBANKMENT, BROWN, MEDIUM STIFF, MOIST, SILTY CLAY

S-26

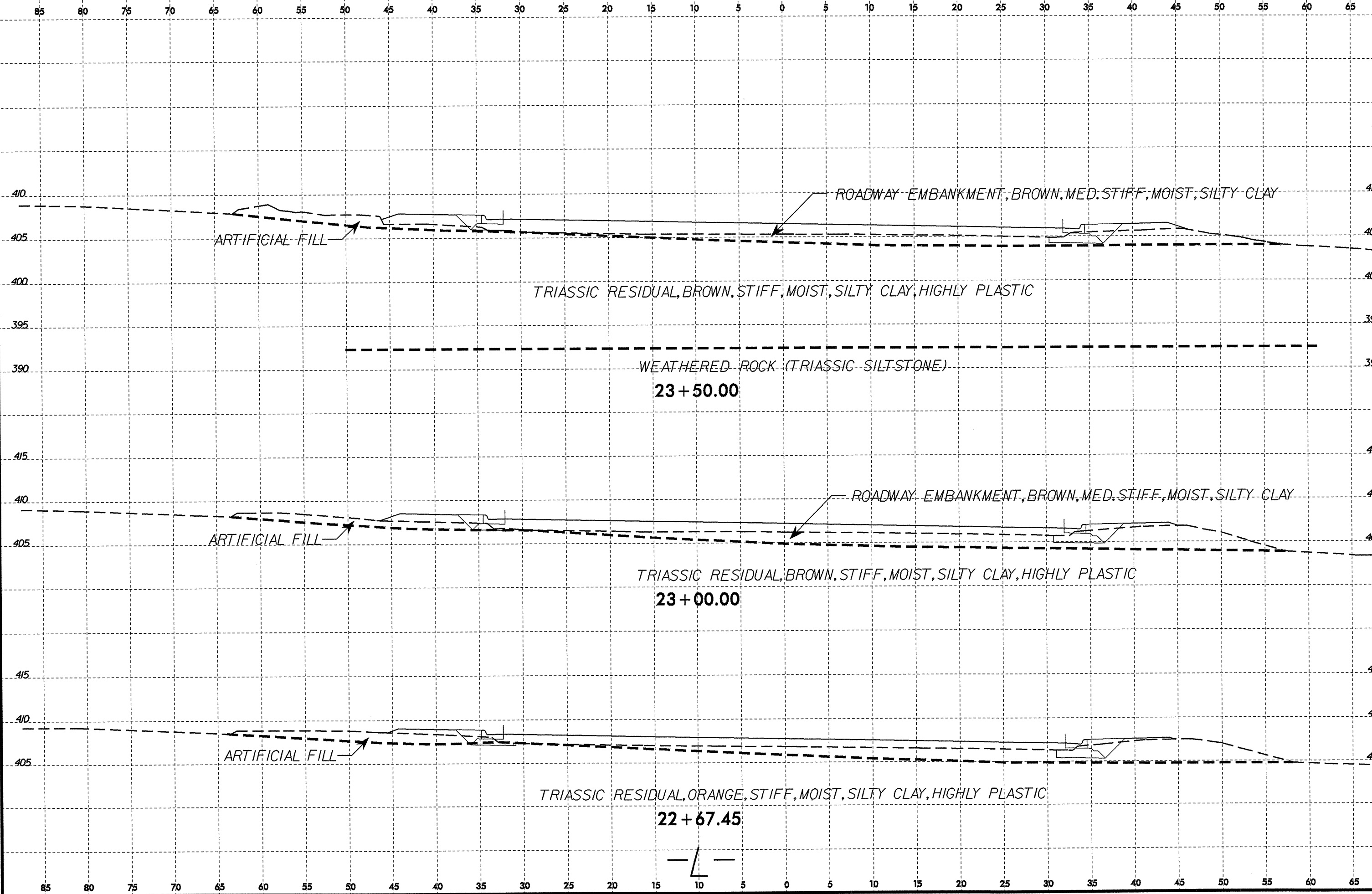
03/08

TRIASSIC RESIDUAL, ORANGE, STIFF, MOIST, SILTY CLAY, HIGHLY PLASTIC
 22 + 00.00

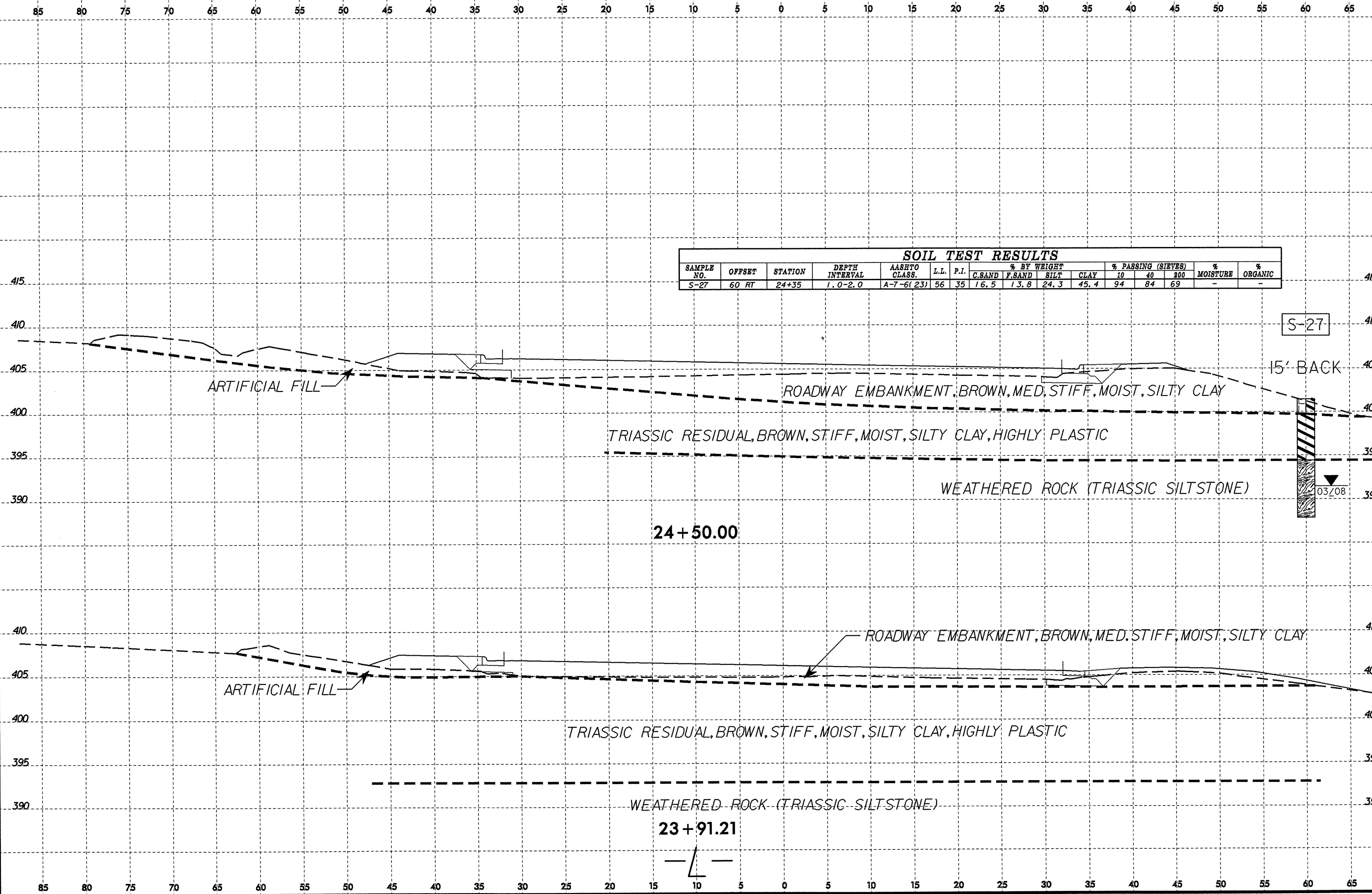
ROADWAY EMBANKMENT, BROWN, MEDIUM STIFF, MOIST, SILTY CLAY

TRIASSIC RESIDUAL, ORANGE, STIFF, MOIST, SILTY CLAY, HIGHLY PLASTIC
 21 + 58.03

8/23/99
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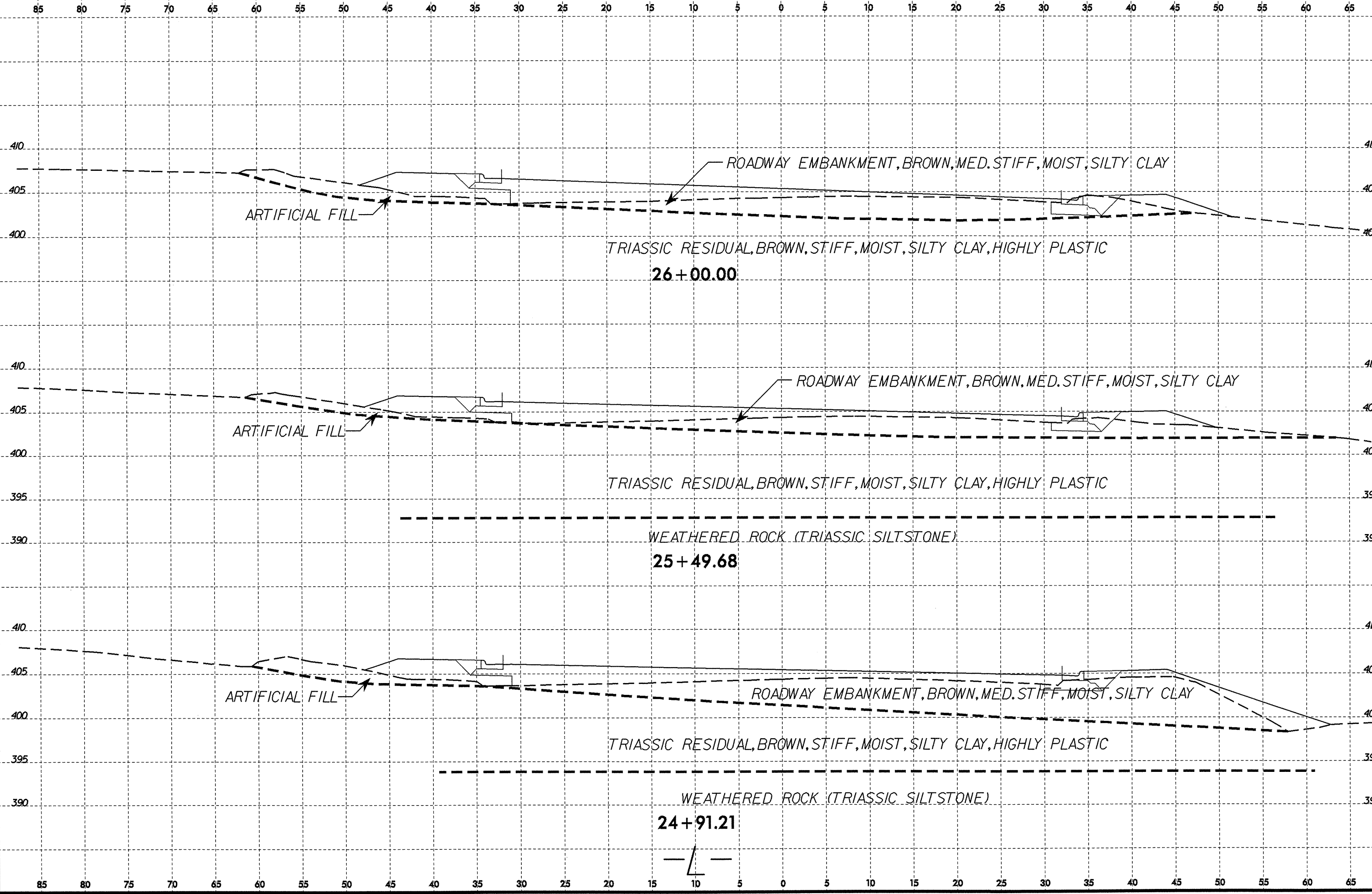
8/23/99



SOIL TEST RESULTS															
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							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-27	60 RT	24+35	1.0-2.0	A-7-6(23)	56	35	16.5	13.8	24.3	45.4	94	84	69	-	-

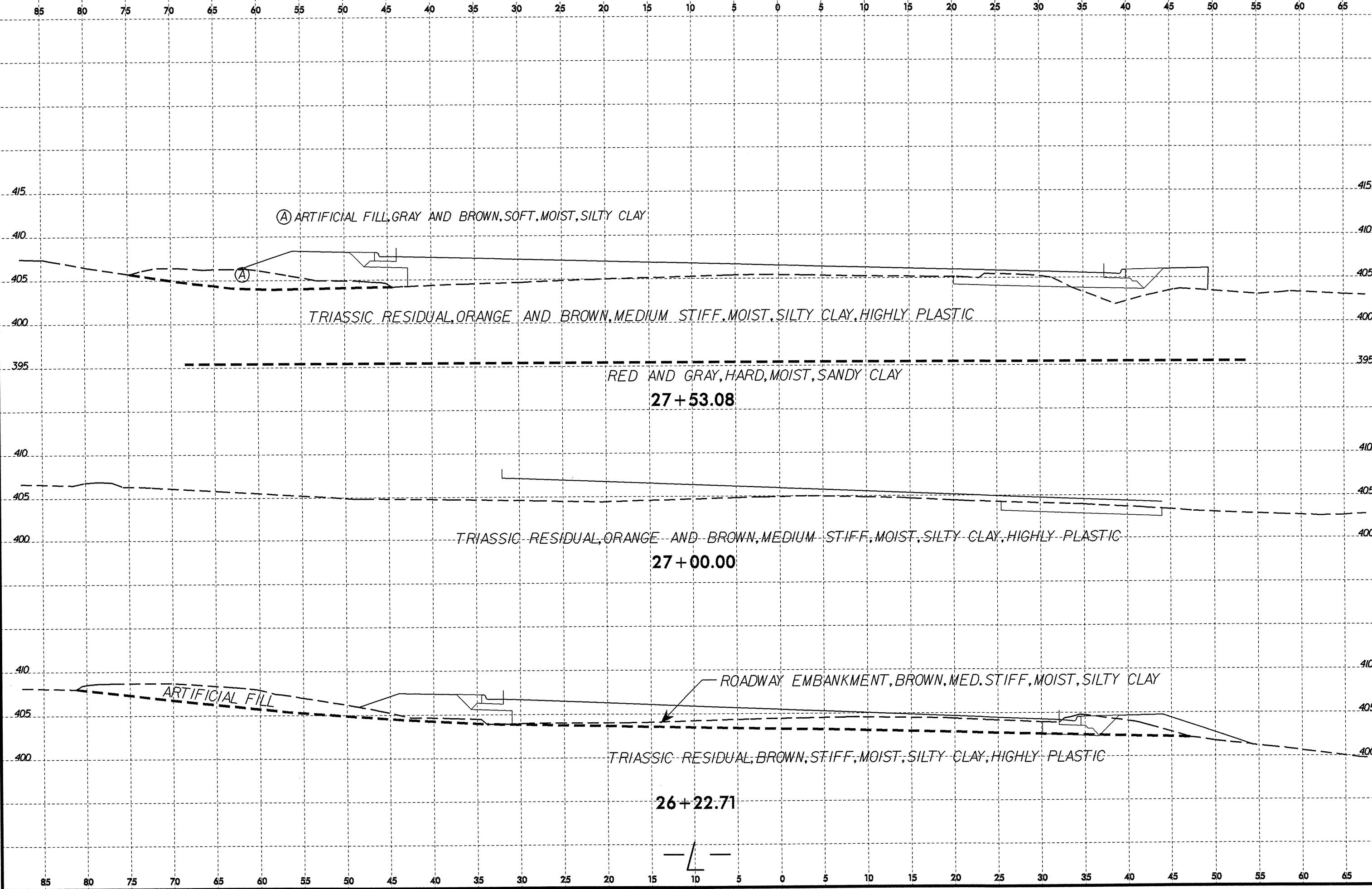
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8/23/99

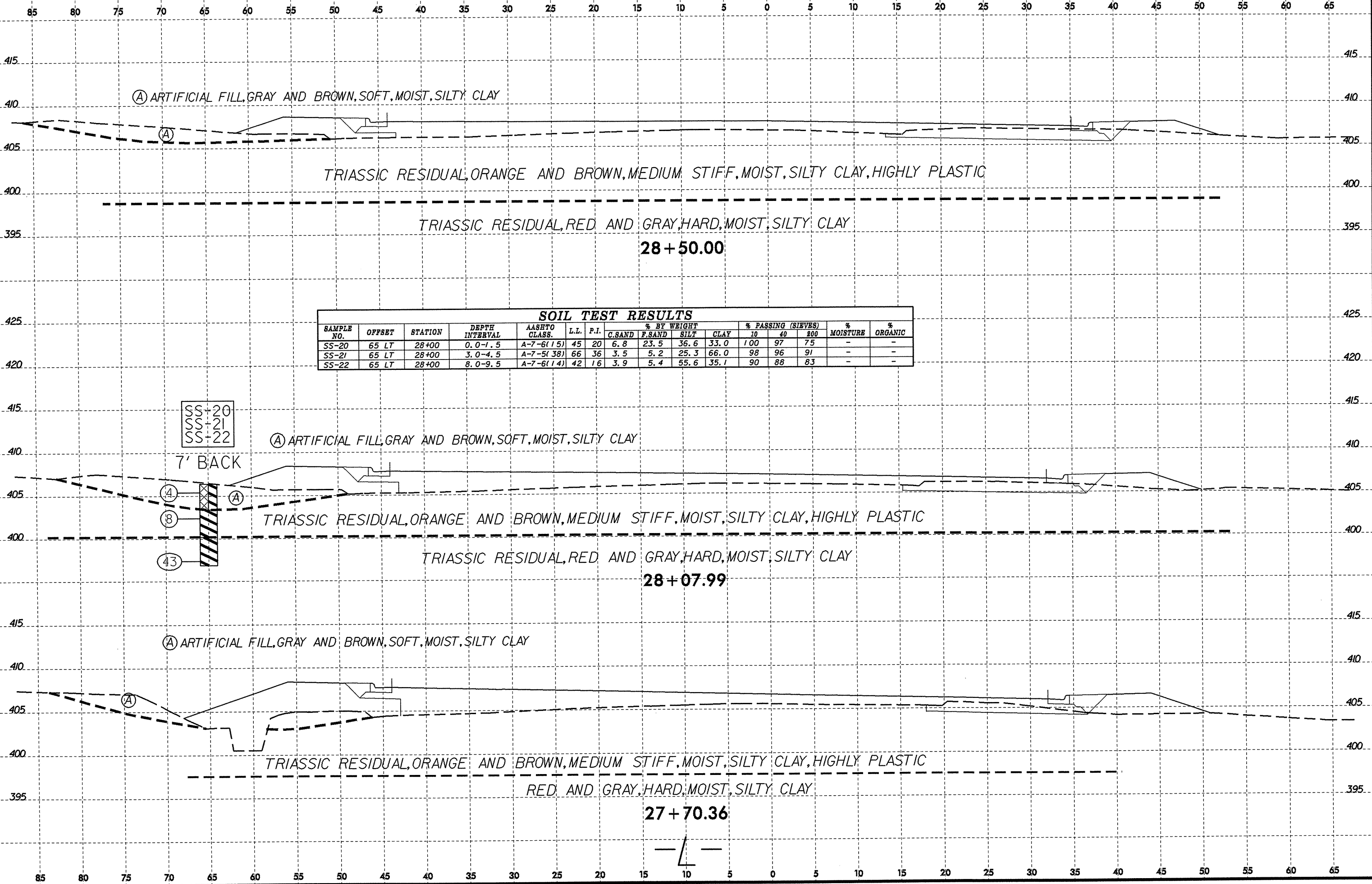


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8/23/99



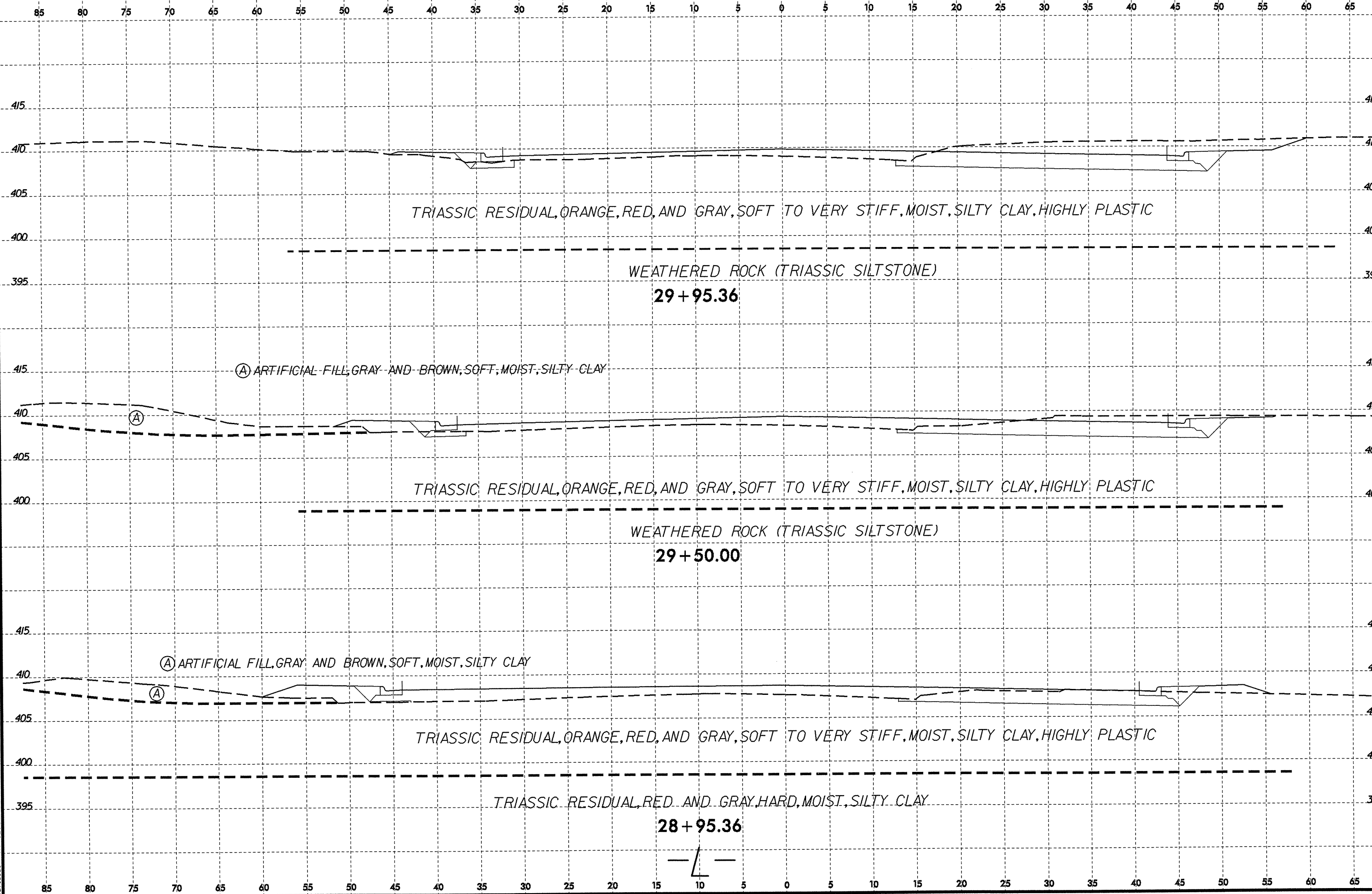
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SOIL TEST RESULTS

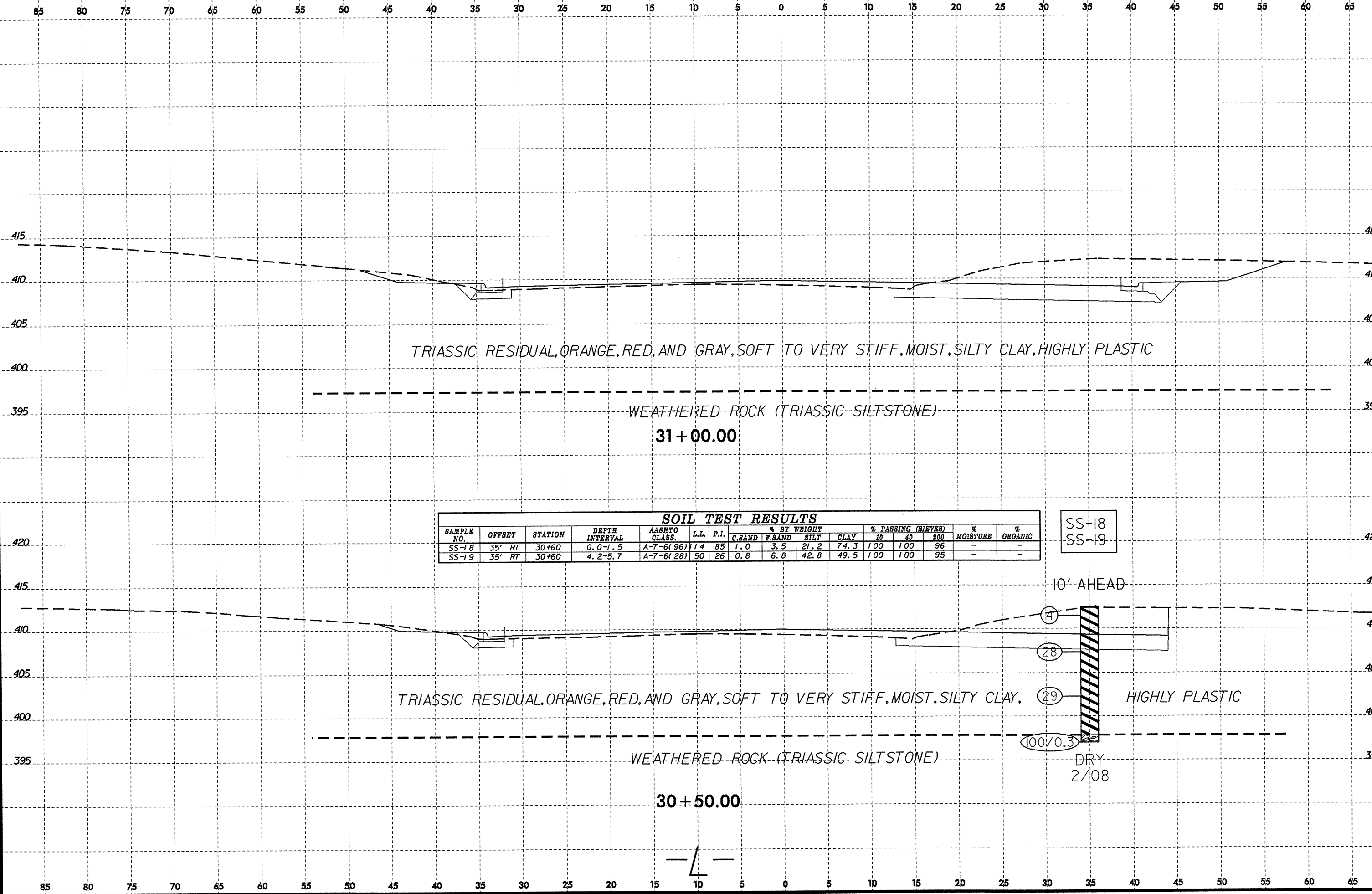
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							G. SAND	F. SAND	SILT	CLAY	20	40	800		
SS-20	65 LT	28+00	0.0-1.5	A-7-6(15)	45	20	6.8	23.5	36.6	33.0	100	97	75	-	-
SS-21	65 LT	28+00	3.0-4.5	A-7-5(38)	66	36	3.5	5.2	25.3	66.0	98	96	91	-	-
SS-22	65 LT	28+00	8.0-9.5	A-7-6(14)	42	16	3.9	5.4	55.6	35.1	90	88	83	-	-

8/23/99



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8/23/99



TRIASSIC RESIDUAL, ORANGE, RED, AND GRAY, SOFT TO VERY STIFF, MOIST, SILTY CLAY, HIGHLY PLASTIC

WEATHERED ROCK (TRIASSIC SILTSTONE)

31 + 00.00

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-18	35' RT	30+60	0.0-1.5	A-7-6(96)	14	85	1.0	3.5	21.2	74.3	100	100	96	-	-
SS-19	35' RT	30+60	4.2-5.7	A-7-6(28)	50	26	0.8	6.8	42.8	49.5	100	100	95	-	-

SS-18
SS-19

TRIASSIC RESIDUAL, ORANGE, RED, AND GRAY, SOFT TO VERY STIFF, MOIST, SILTY CLAY,

HIGHLY PLASTIC

WEATHERED ROCK (TRIASSIC SILTSTONE)

30 + 50.00

10' AHEAD

(4)

(28)

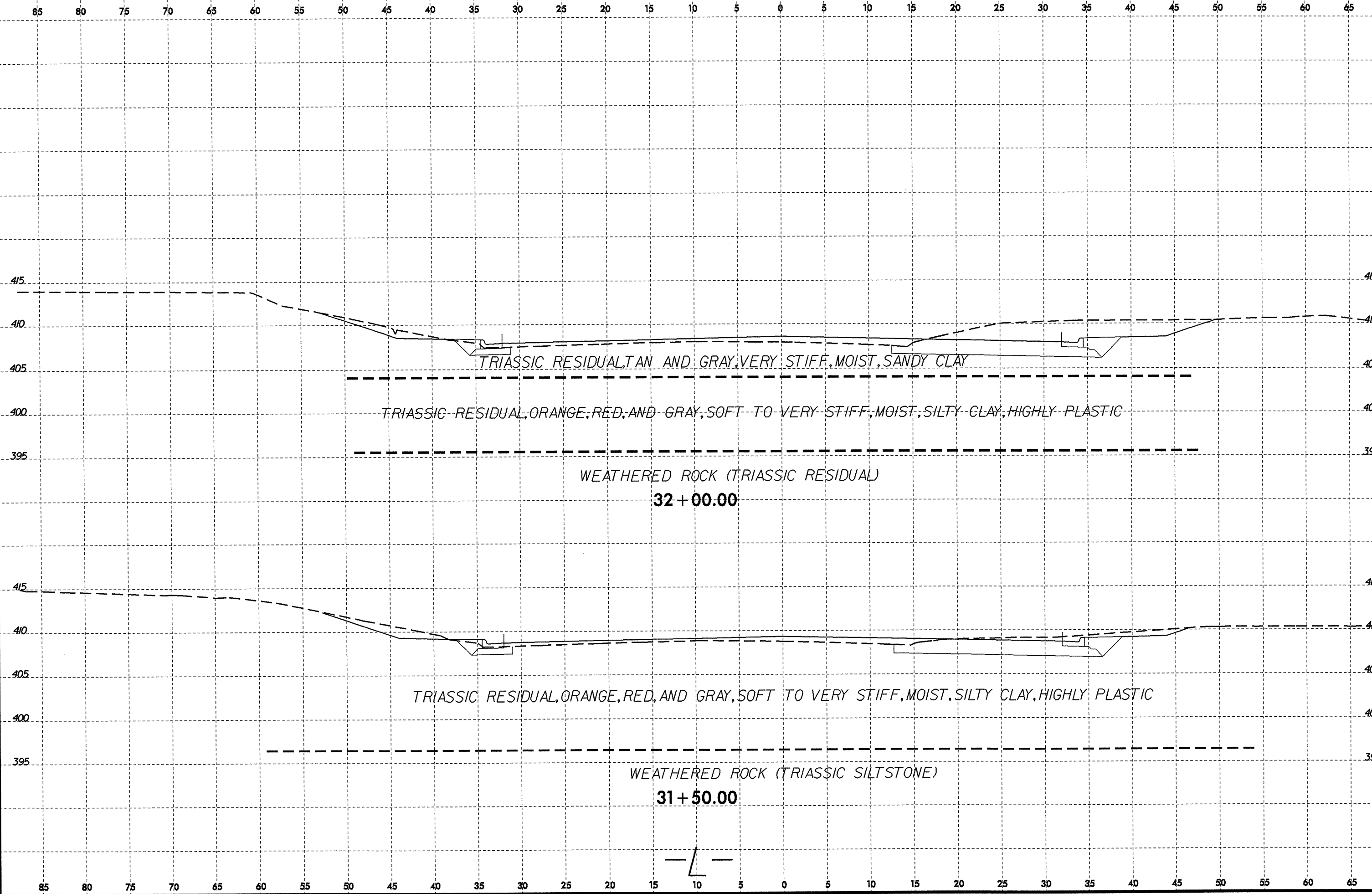
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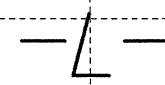
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2/08

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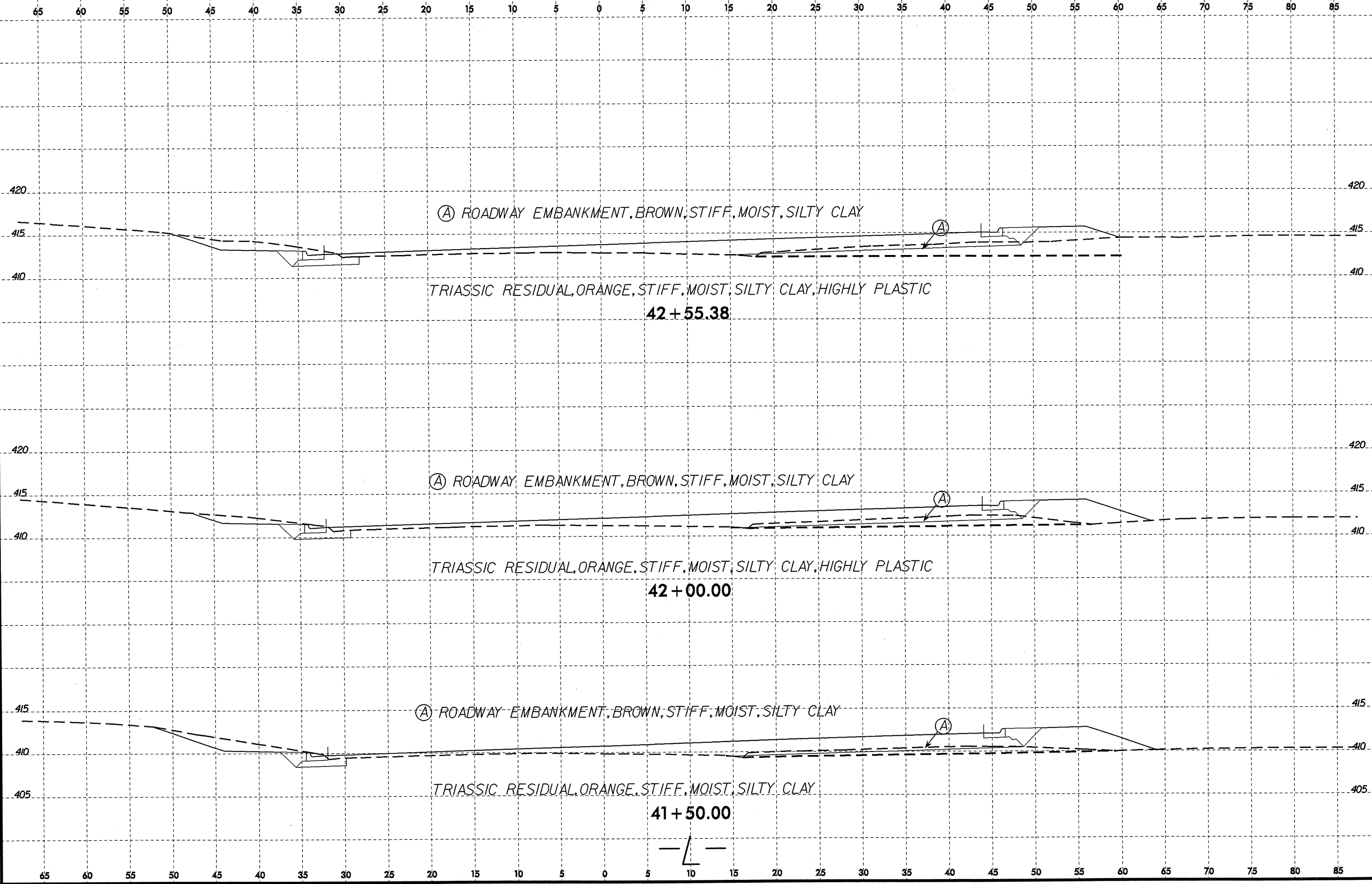
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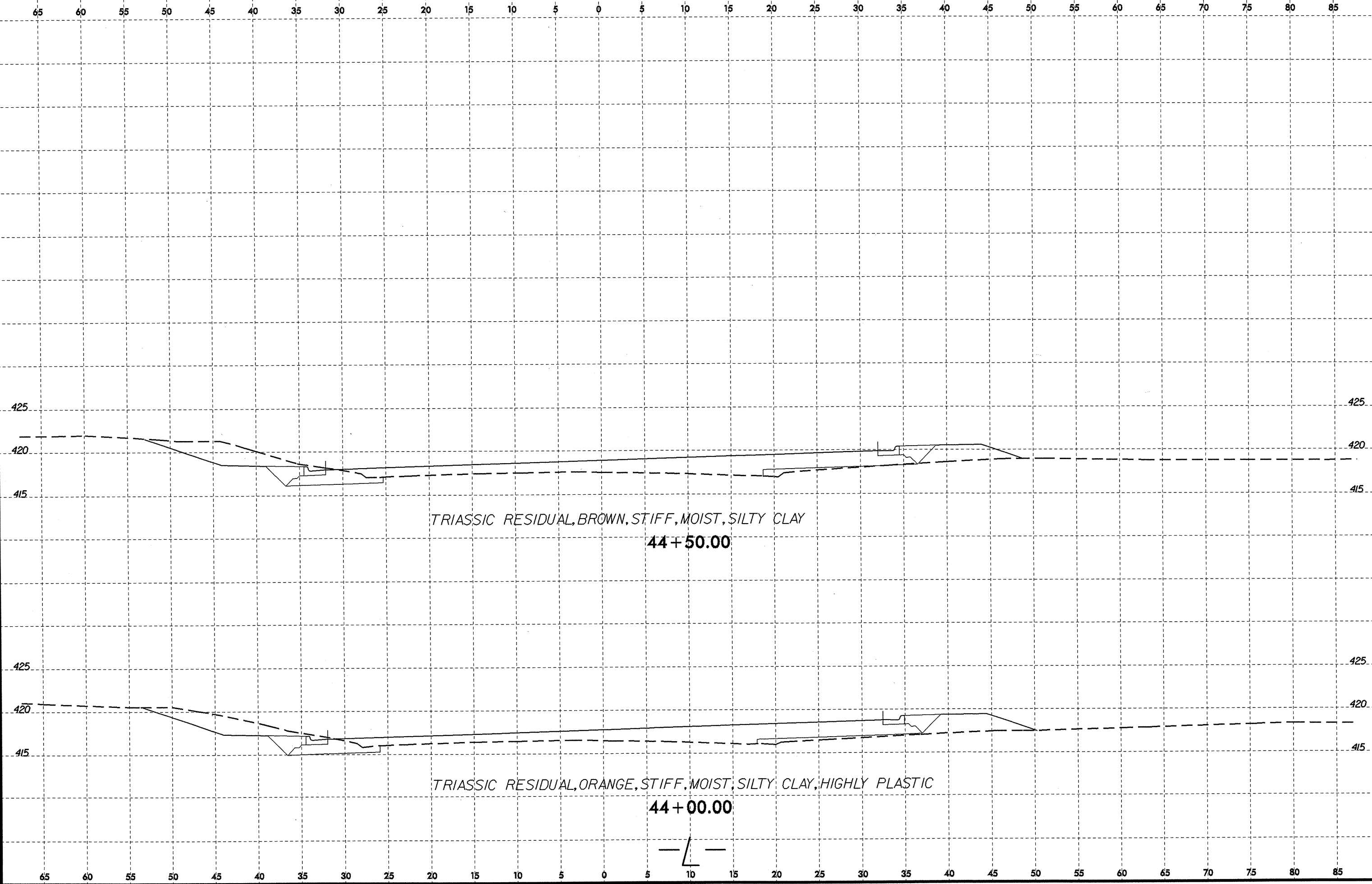
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8/23/99

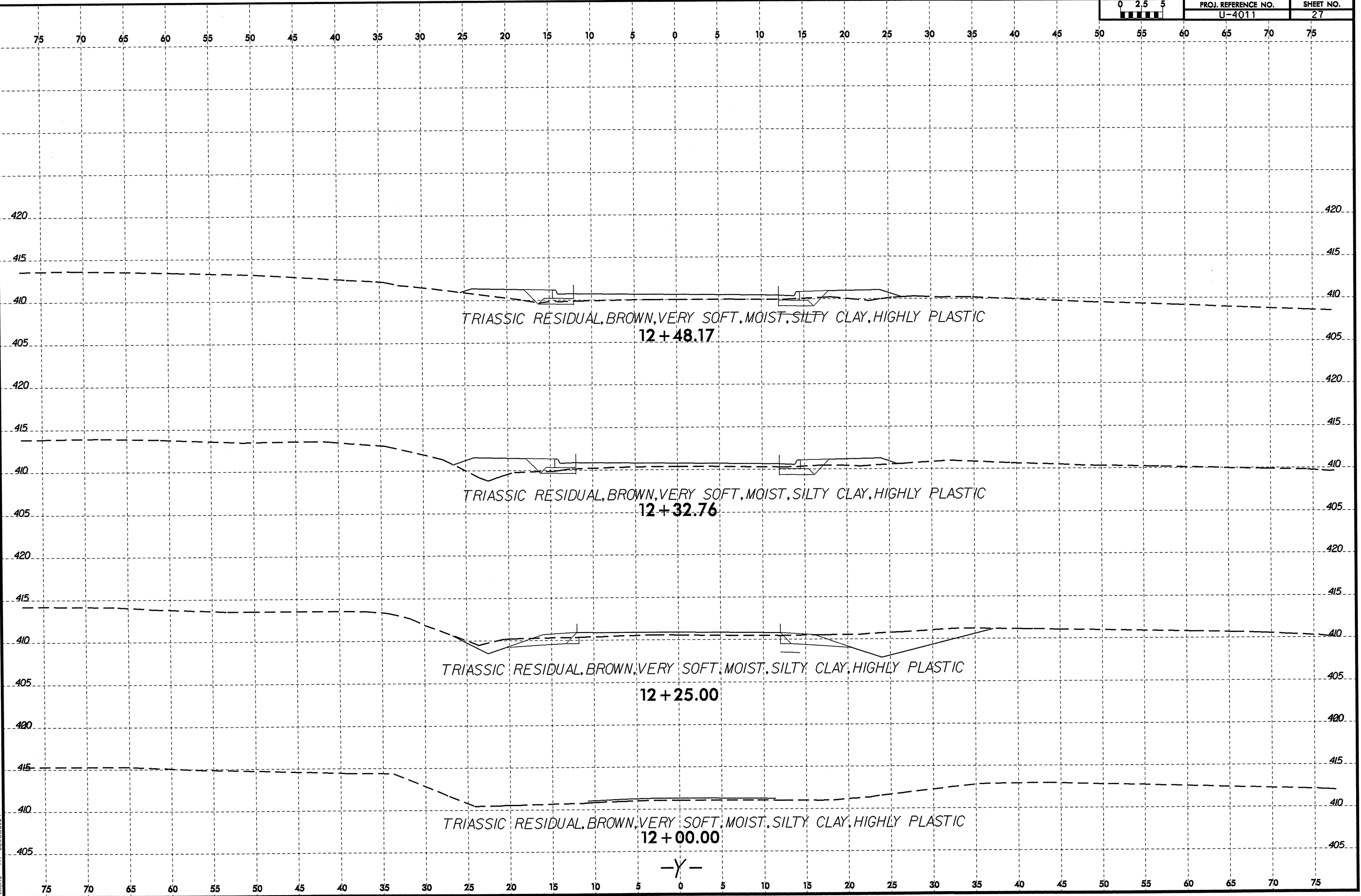


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8/23/99

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12+00-geo-xst-1.dgn
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TRIASSIC RESIDUAL, BROWN, VERY SOFT, MOIST, SILTY CLAY, HIGHLY PLASTIC
12 + 48.17

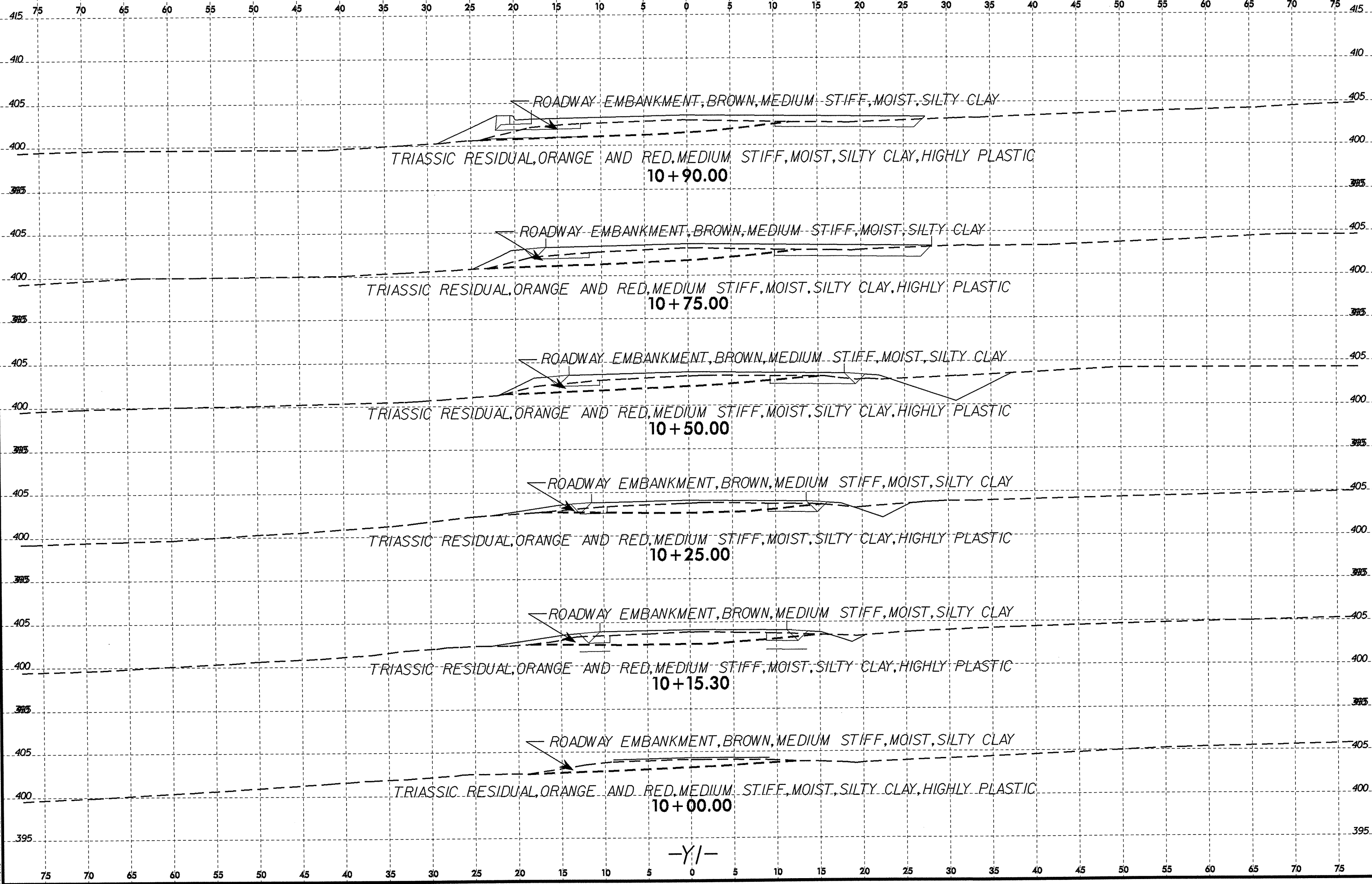
TRIASSIC RESIDUAL, BROWN, VERY SOFT, MOIST, SILTY CLAY, HIGHLY PLASTIC
12 + 32.76

TRIASSIC RESIDUAL, BROWN, VERY SOFT, MOIST, SILTY CLAY, HIGHLY PLASTIC
12 + 25.00

TRIASSIC RESIDUAL, BROWN, VERY SOFT, MOIST, SILTY CLAY, HIGHLY PLASTIC
12 + 00.00

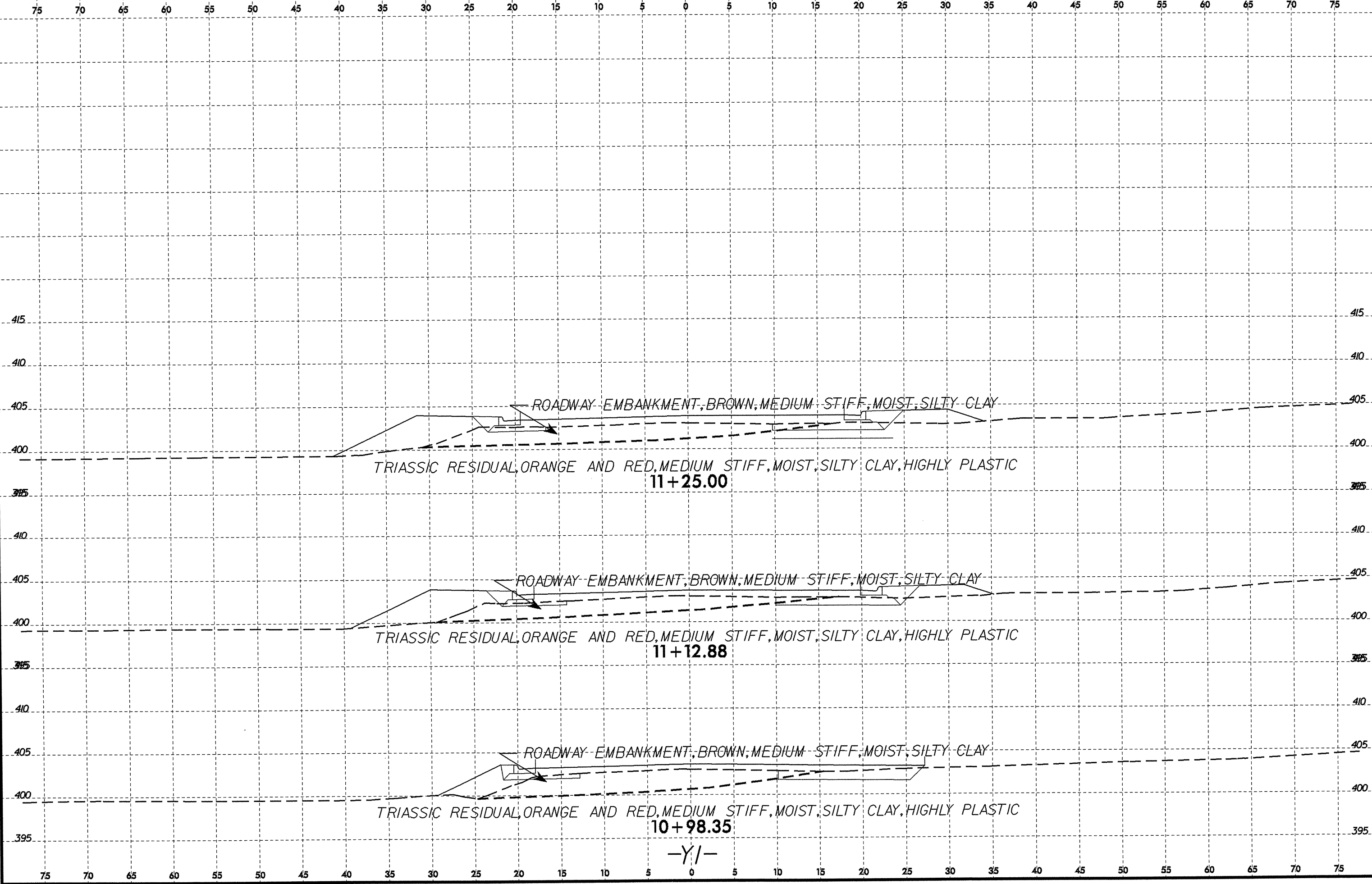
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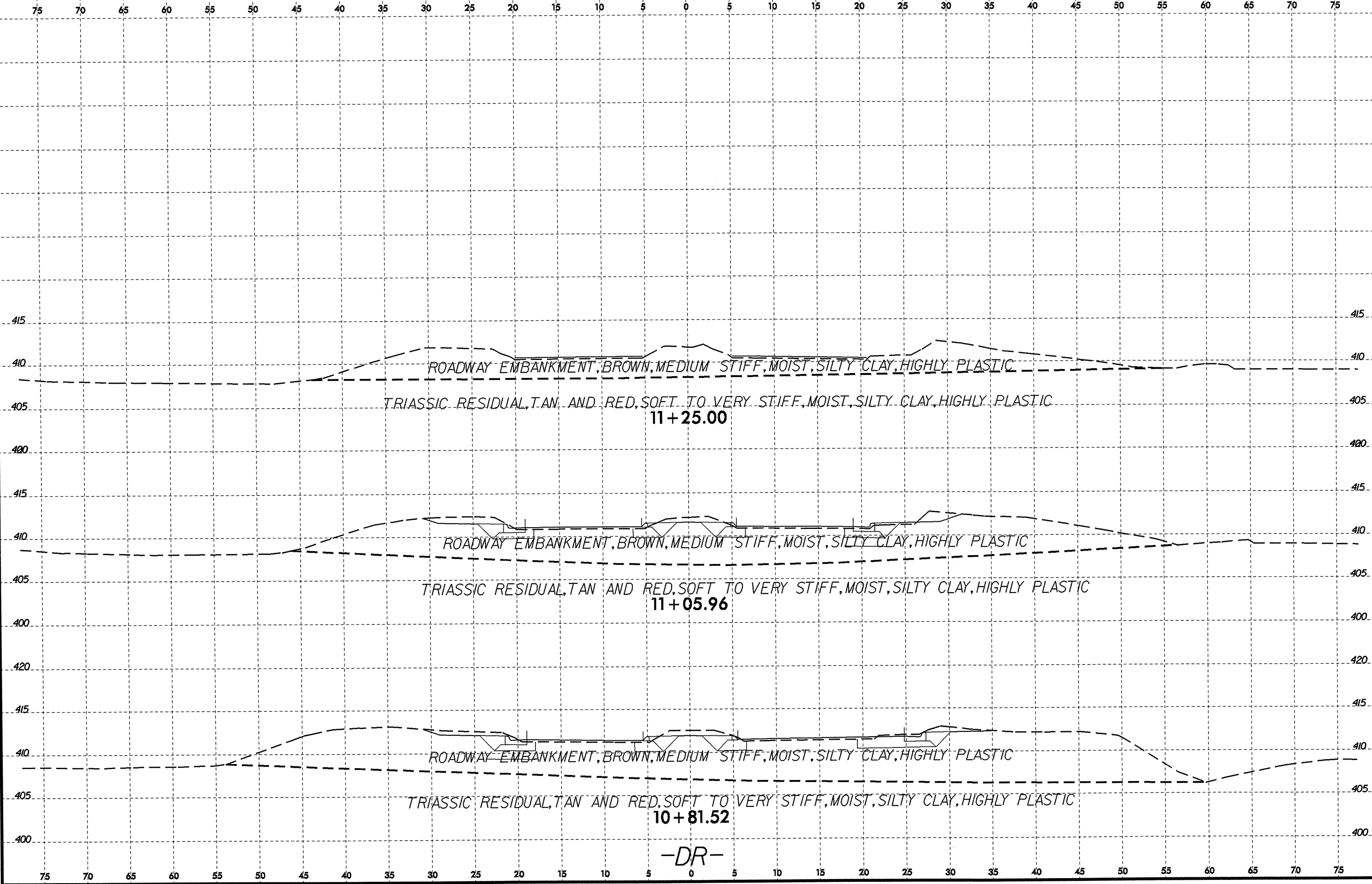
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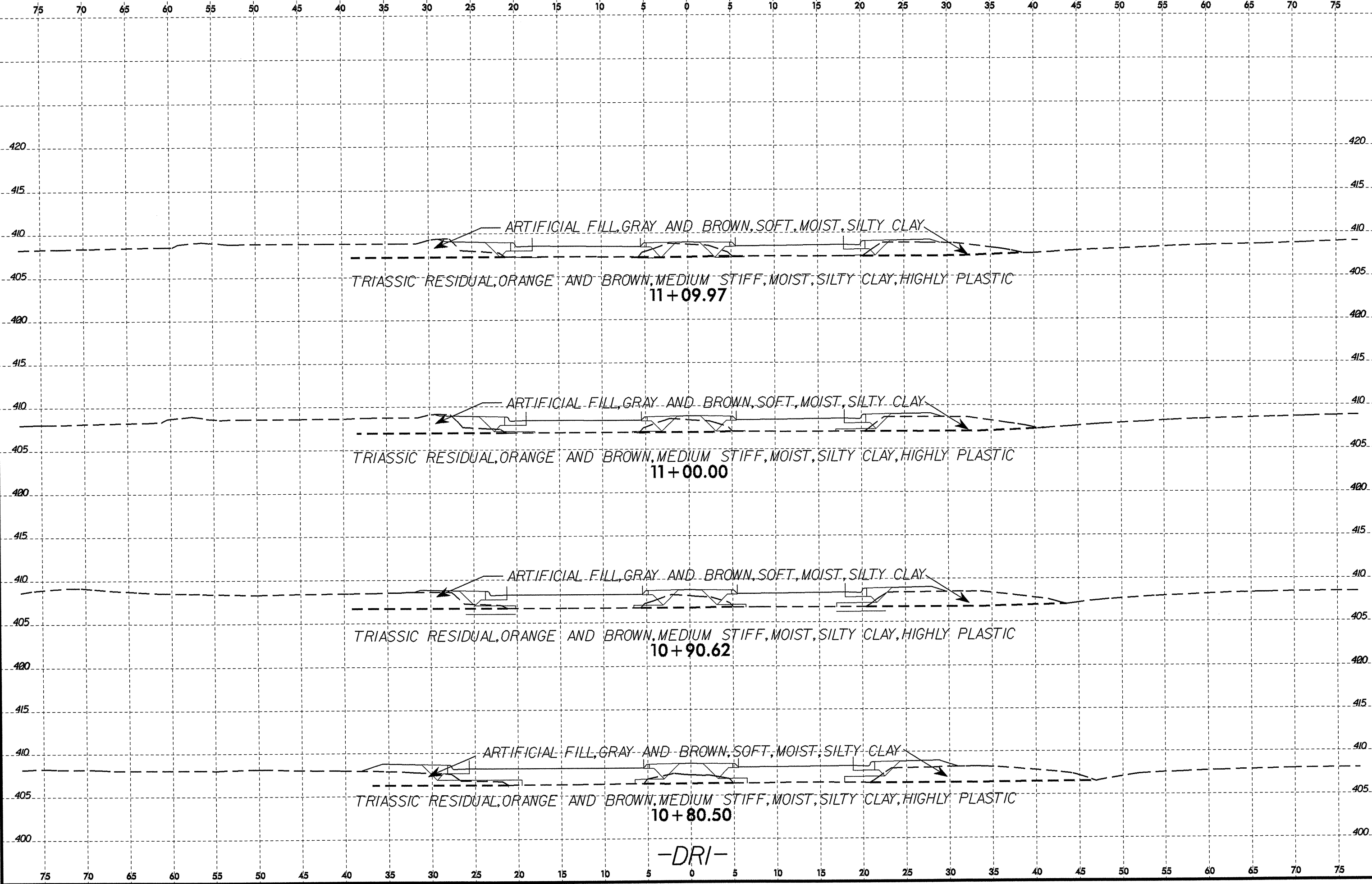
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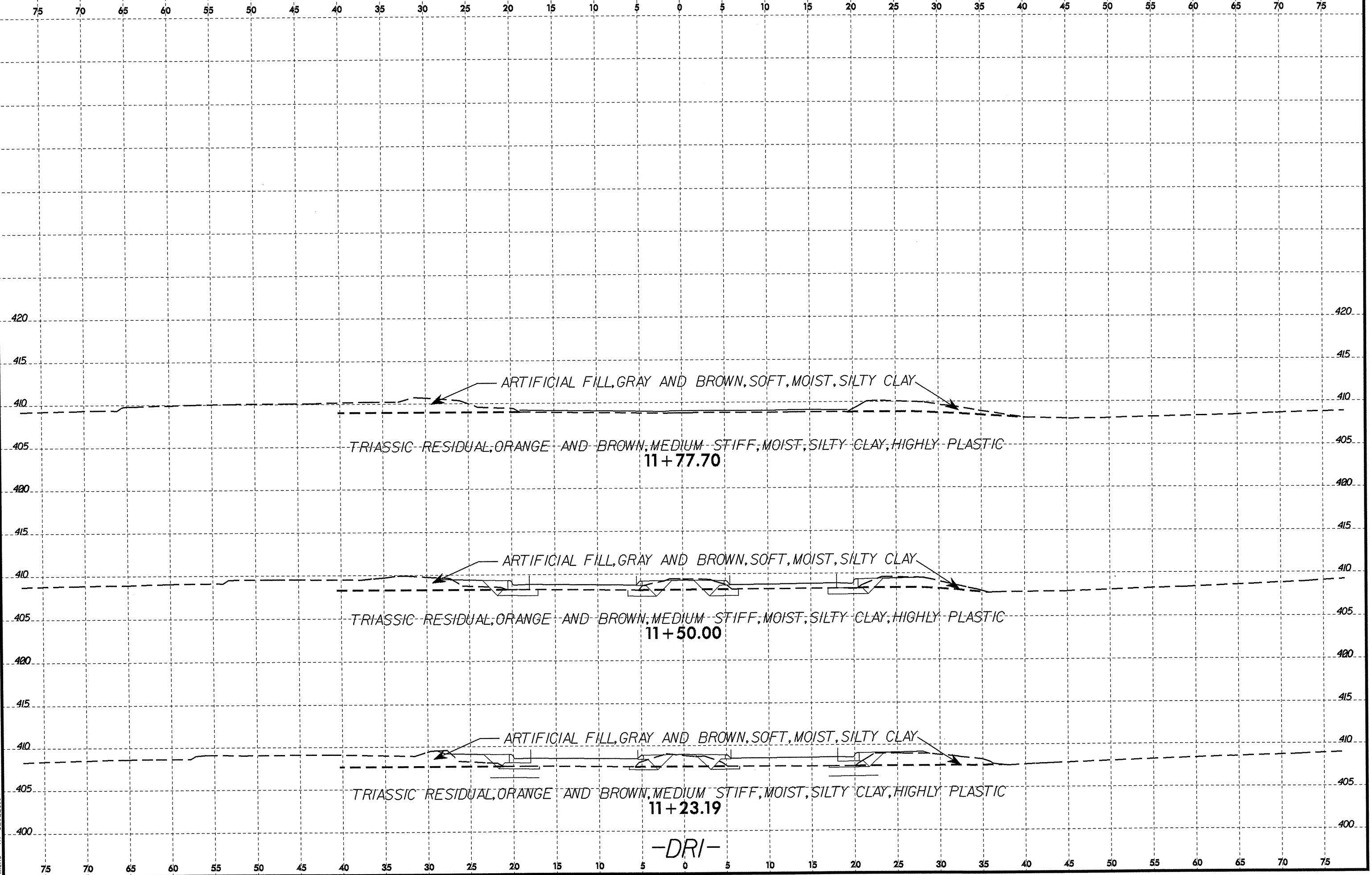


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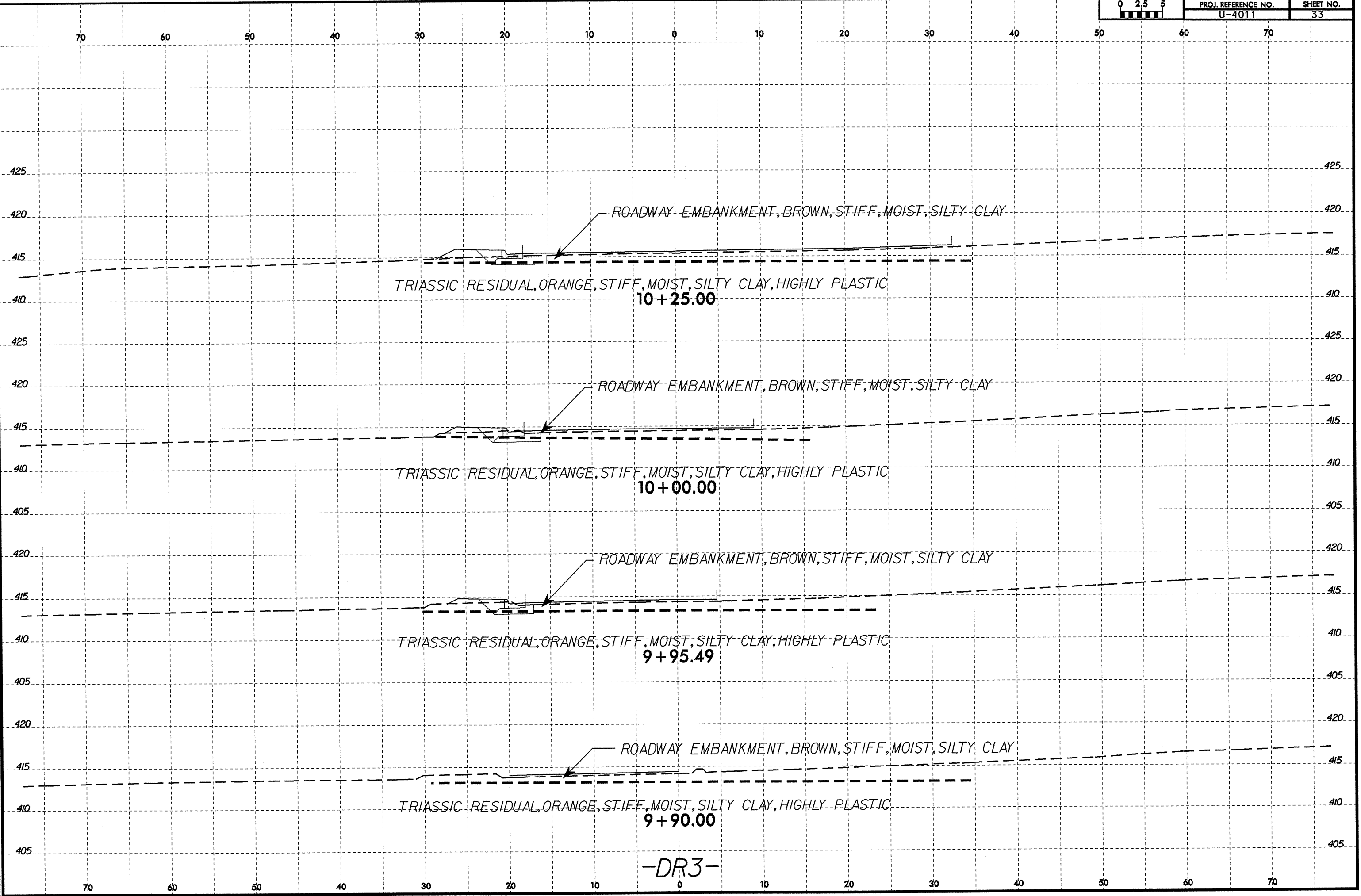


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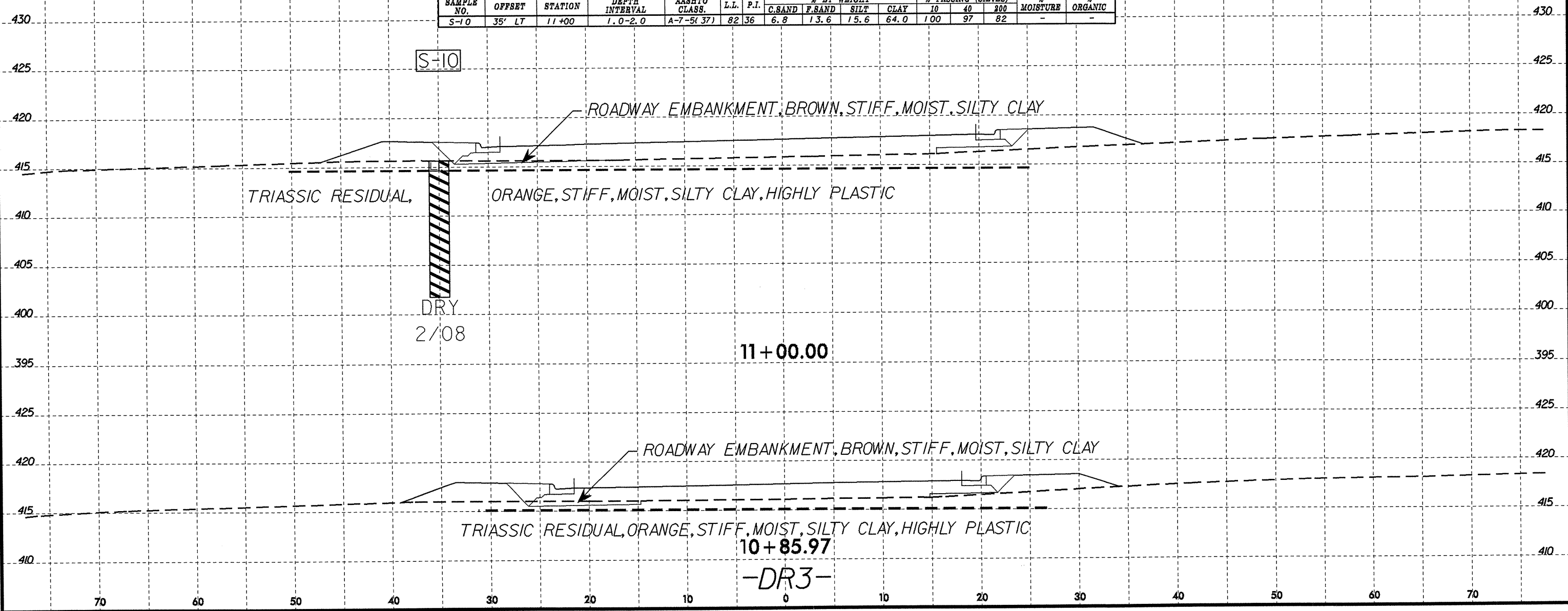
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SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-10	35' LT	11+00	1.0-2.0	A-7-5(37)	82	36	6.8	13.6	15.6	64.0	100	97	82	-	-

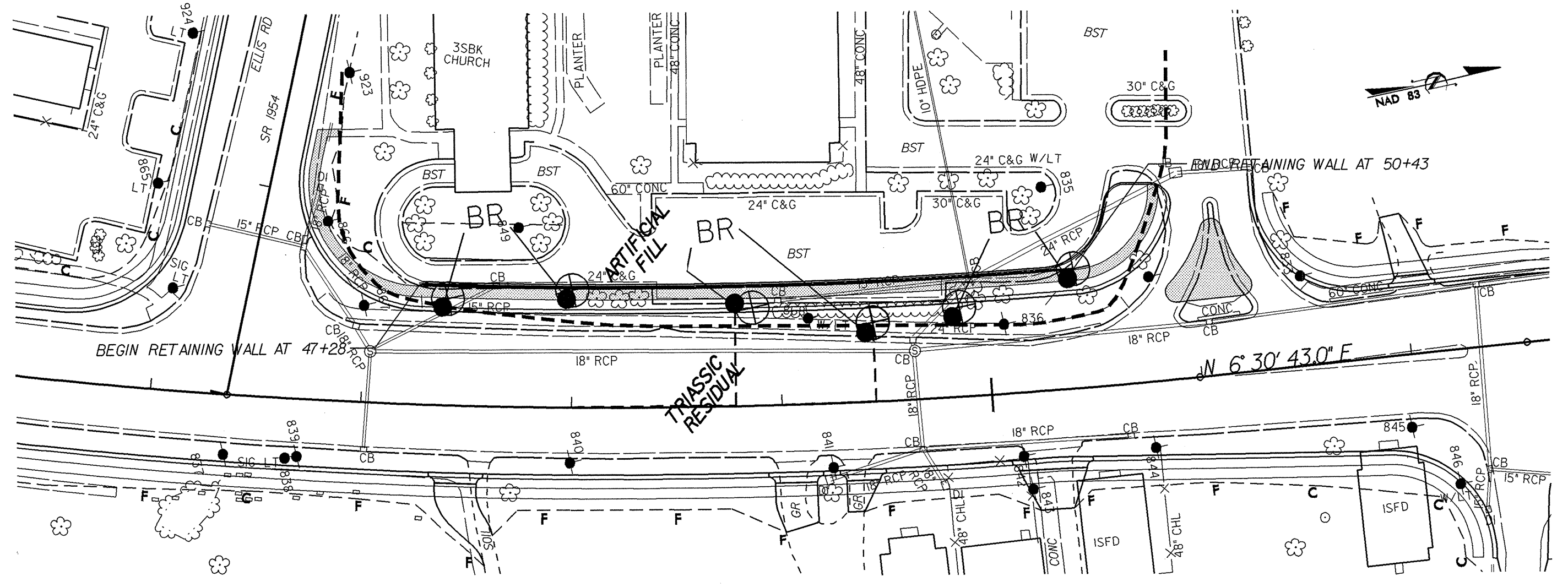
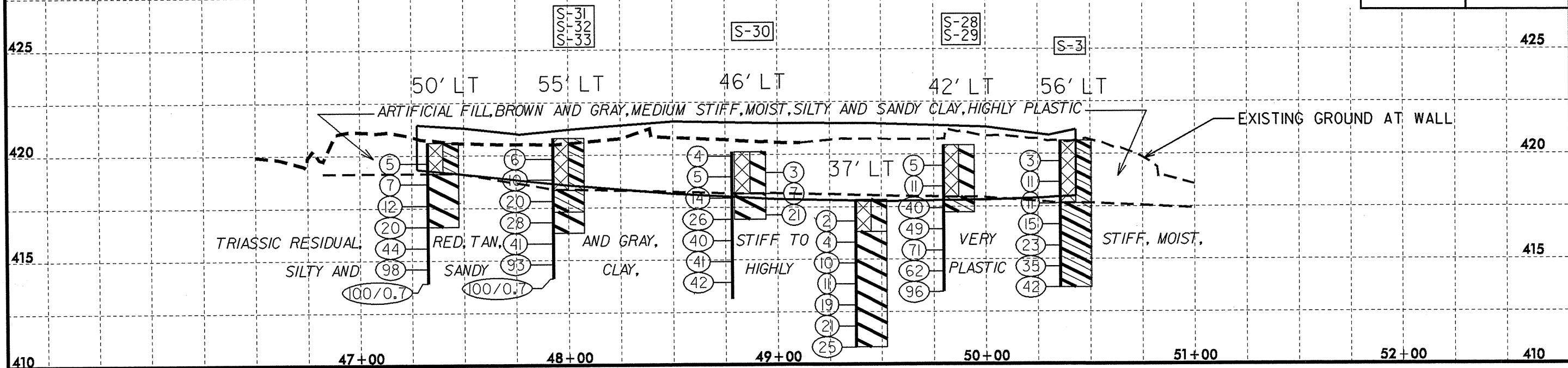


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PROJECT REFERENCE NO.	SHEET NO.
U-4011	36
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT			% PASSING (SIEVES)			% MOISTURE	% ORGANIC	
							G.SAND	F.SAND	SILT	CLAY	10	40			200
S-31	55' LT	48+00	0.0-2.5	A-6(5)	36	17	22.7	25.2	21.7	30.4	90	76	51	-	-
S-32	55' LT	48+00	2.5-3.5	A-6(11)	36	14	3.2	16.0	44.2	36.5	93	91	81	-	-
S-33	55' LT	48+00	3.5-4.5	A-7(6120)	55	28	10.8	20.3	20.3	48.7	98	91	72	-	-
S-30	46' LT	48+87	2.0-3.0	A-7(6129)	55	28	4.9	5.1	31.2	58.8	100	97	91	-	-
S-28	42' LT	49+87	0.0-2.5	A-7(6128)	57	37	8.1	20.3	22.9	48.7	98	94	76	-	-
S-29	42' LT	49+87	2.5-3.2	A-6(8)	35	13	9.1	20.3	38.1	32.5	95	90	72	-	-
S-3	56' LT	50+43	1.0-2.0	A-6(5)	39	19	21.7	20.2	27.1	31.0	71	61	45	-	-



CONTRACT: ID: U-4011

CONTENTS

LINE	STATION	SHEET
-RETAINING WALL 1-	47+28 TO 50+43	3

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

ROADWAY
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 40221.1.1 (U-4011) F.A. PROJ. STP-1959(2)
 COUNTY DURHAM
 PROJECT DESCRIPTION SR 1959 (SOUTH MIAMI BLVD.) FROM
SOUTH OF SR 2112 (METHODIST ST.) TO NORTH OF
SR 1960 (BETHESDA AVE.)
 SITE DESCRIPTION RETAINING WALL 1- LEFT OF -L- STA. 47+50
RETAINING WALL INVENTORY

STATE	STATE PROJECT REFERENCE NO.	SHEET	TOTAL SHEETS
N.C.	40221.1.1 (U-4011)	1	3
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
40221.1.1	STP-1959(2)	P.E.	
		RW & UTIL.	

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.

PERSONNEL

N. D. MOHS

H.R. CONLEY

D.W. DIXON

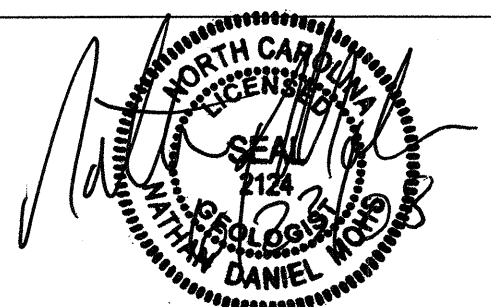
J.R. MATULA

INVESTIGATED BY N.D. MOHS

CHECKED BY K.B. MILLER

SUBMITTED BY N.T. ROBERSON

DATE JUNE 2008



DRAWN BY: J.R. MATULA, N.D. MOHS

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

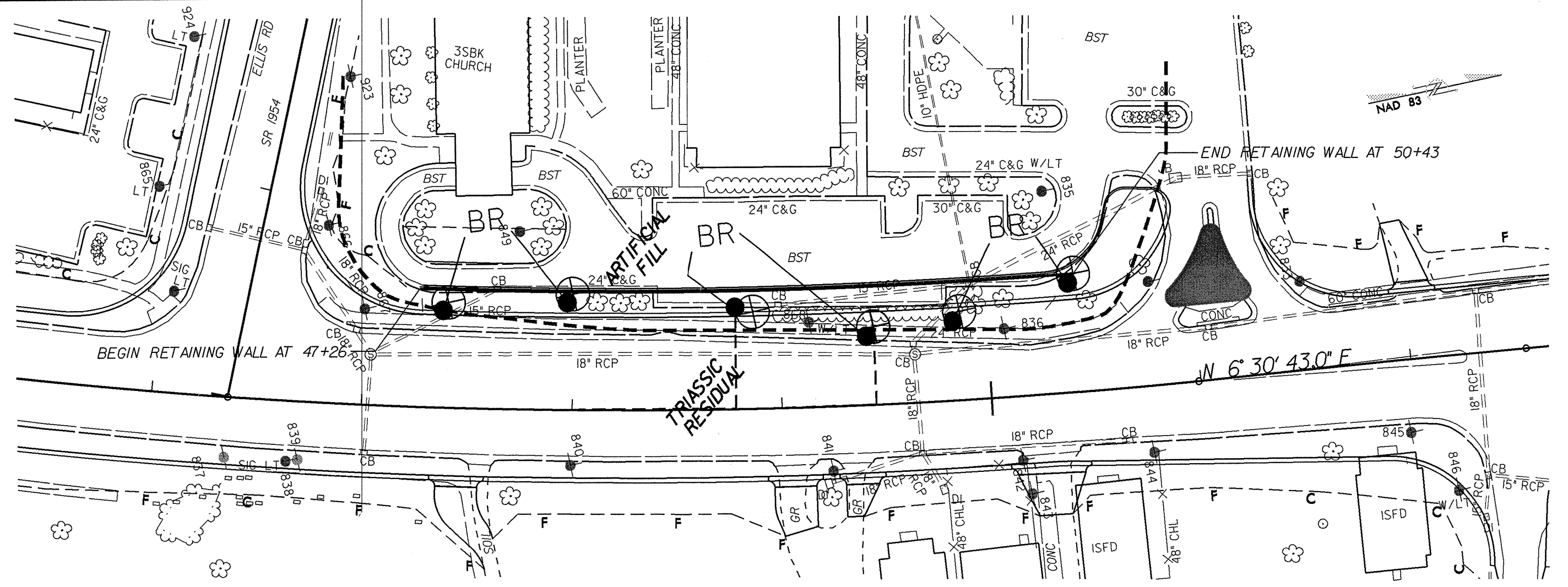
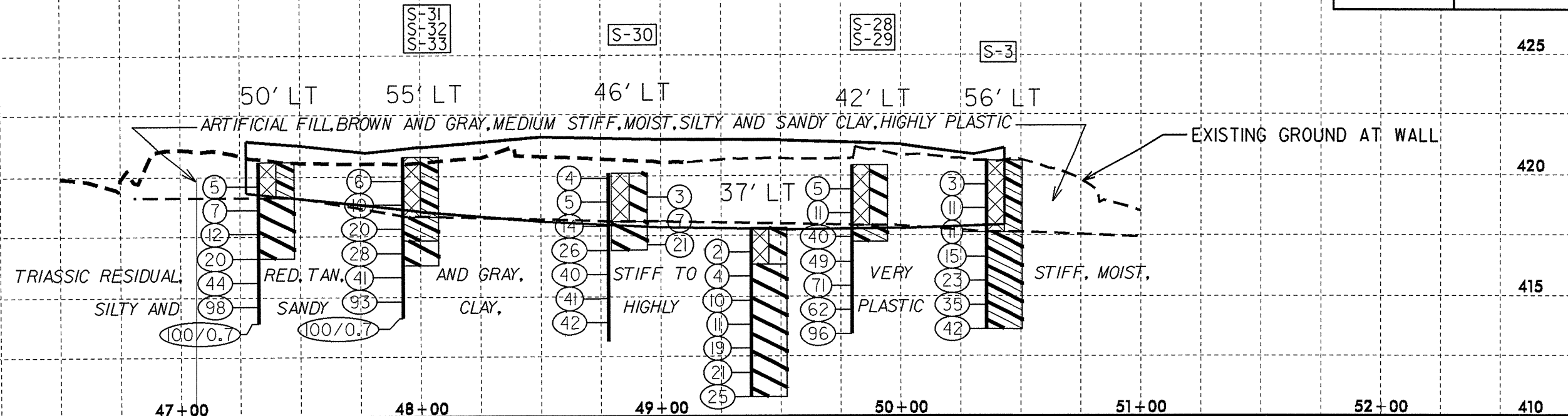
SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION				GRADATION				ROCK DESCRIPTION				TERMS AND DEFINITIONS																																																																																				
<p>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 (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:</p> <p align="center"><i>VERY STIFF, GRAY, SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGH PLASTIC, A-7-6</i></p>				<p>WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED) GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.</p> <p align="center">ANGULARITY OF GRAINS</p> <p>THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: <u>ANGULAR</u>, <u>SUBANGULAR</u>, <u>SUBROUNDED</u>, OR <u>ROUNDED</u>.</p>				<p>HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT 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:</p> <p>WEATHERED ROCK (WR) NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.</p> <p>CRYSTALLINE ROCK (CR) FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.</p> <p>NON-CRYSTALLINE ROCK (NCR) FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.</p> <p>COASTAL PLAIN SEDIMENTARY ROCK (CP) COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.</p>				<p>ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, 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.</p>																																																																																				
SOIL LEGEND AND AASHTO CLASSIFICATION				MINERALOGICAL COMPOSITION				WEATHERING																																																																																								
<p>GENERAL CLASS. GRANULAR MATERIALS (<= 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS</p> <table border="1"> <tr> <td>GROUP CLASS.</td> <td>A-1</td> <td>A-3</td> <td>A-2</td> <td>A-4</td> <td>A-5</td> <td>A-6</td> <td>A-7</td> <td>A-1, A-2</td> <td>A-4, A-5</td> <td>A-6, A-7</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>SYMBOL</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p>LIQUID LIMIT PLASTIC INDEX</p> <table border="1"> <tr> <td>GROUP INDEX</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> </table> <p>USUAL TYPES OF MAJOR MATERIALS</p> <table border="1"> <tr> <td>GEN. RATING AS A SUBGRADE</td> <td colspan="3">EXCELLENT TO GOOD</td> <td colspan="3">FAIR TO POOR</td> <td>FAIR TO POOR</td> <td>POOR</td> <td>UNSATURABLE</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p align="center">PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30</p>				GROUP CLASS.	A-1	A-3	A-2	A-4	A-5	A-6	A-7	A-1, A-2	A-4, A-5	A-6, A-7					SYMBOL															GROUP INDEX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	GEN. RATING AS A SUBGRADE	EXCELLENT TO GOOD			FAIR TO POOR			FAIR TO POOR	POOR	UNSATURABLE						<p>MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.</p> <p align="center">COMPRESSIBILITY</p> <p>SLIGHTLY COMPRESSIBLE MODERATELY COMPRESSIBLE HIGHLY COMPRESSIBLE</p> <p align="center">PERCENTAGE OF MATERIAL</p> <table border="1"> <tr> <td></td> <td>ORGANIC MATERIAL</td> <td>GRANULAR SOILS</td> <td>SILT - CLAY SOILS</td> <td>OTHER MATERIAL</td> </tr> <tr> <td>TRACE OF ORGANIC MATTER</td> <td>2 - 3%</td> <td>3 - 5%</td> <td></td> <td>TRACE 1 - 10%</td> </tr> <tr> <td>LITTLE ORGANIC MATTER</td> <td>3 - 5%</td> <td>5 - 12%</td> <td></td> <td>LITTLE 10 - 20%</td> </tr> <tr> <td>MODERATELY ORGANIC</td> <td>5 - 10%</td> <td>12 - 20%</td> <td></td> <td>SOME 20 - 35%</td> </tr> <tr> <td>HIGHLY ORGANIC</td> <td>>10%</td> <td>>20%</td> <td></td> <td>HIGHLY 35% AND ABOVE</td> </tr> </table> <p align="center">GROUND WATER</p> <p> WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING</p> <p> STATIC WATER LEVEL AFTER 24 HOURS</p> <p> PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA</p> <p> SPRING OR SEEP</p>					ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL	TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%		TRACE 1 - 10%	LITTLE ORGANIC MATTER	3 - 5%	5 - 12%		LITTLE 10 - 20%	MODERATELY ORGANIC	5 - 10%	12 - 20%		SOME 20 - 35%	HIGHLY ORGANIC	>10%	>20%		HIGHLY 35% AND ABOVE	<p align="center">WEATHERING</p> <p>FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.</p> <p>VERY SLIGHT (V SL.) ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN. CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.</p> <p>SLIGHT (SL.) ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.</p> <p>MODERATE (MOD.) SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.</p> <p>MODERATELY SEVERE (MOD. SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. <i>IF TESTED, WOULD YIELD SPT REFUSAL</i></p> <p>SEVERE (SEV.) ALL 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 > 100 BPF</i></p> <p>VERY SEVERE (V SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. <i>IF TESTED, YIELDS SPT N VALUES > 100 BPF</i></p> <p>COMPLETE ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.</p>			
GROUP CLASS.	A-1	A-3	A-2	A-4	A-5	A-6	A-7	A-1, A-2	A-4, A-5	A-6, A-7																																																																																						
SYMBOL																																																																																																
GROUP INDEX	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																																																		
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LITTLE ORGANIC MATTER	3 - 5%	5 - 12%		LITTLE 10 - 20%																																																																																												
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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-31	55' LT	48+00	0.0-2.5	A-6(5)	36	17	22.7	25.2	21.7	30.4	90	76	51	-	-
S-32	55' LT	48+00	2.5-3.5	A-6(11)	36	14	3.2	16.0	44.2	36.5	93	91	61	-	-
S-33	55' LT	48+00	3.5-4.5	A-7-6(20)	55	28	10.8	20.3	20.3	48.7	98	91	72	-	-
S-30	46' LT	48+87	2.0-3.0	A-7-6(29)	55	28	4.9	5.1	31.2	58.8	100	97	91	-	-
S-28	42' LT	49+87	0.0-2.5	A-7-6(28)	57	37	8.1	20.3	22.9	48.7	98	94	76	-	-
S-29	42' LT	49+87	2.5-3.2	A-6(8)	35	13	9.1	20.3	38.1	32.5	95	90	72	-	-
S-3	56' LT	50+43	1.0-2.0	A-6(5)	39	19	21.7	20.2	27.1	31.0	71	61	45	-	-

5/14/99



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