STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	34820.1.1 (U-2524C)	1	183

ID: U-2524C

CONTRACT: C203197

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

CONTENTS

LINE	STATION	PLAN	PROFILE	XSECT
-L-	265+75 to 275+00	4, 5	27	
-L-	275+00 to 284+00	5, 6	27, 28	79–97
-L-	284+00 to 296+50	6, 7	28, 29	
-L-	296+50	7	29	98, 99
-L-	296+50 to 297+50	7	29	
-L-	297+50 to 302+50	7	29	100–108
-L-	302+50 to 303+50	7	29	
-L-	303+50	7	29	109, 110
-L-	303+50 to 311+00	7, 8	29, 30	
-L-	311+00	8	30	111, 112
-L-	311+00 to 316+00	8	30	
-L-	316+00	8	30	113, 114
-L-	316+00 to 318+00	8	30	
-L-	318+00	8	30	115
-L-	318+00 to 368+50	8–12	30–34	
-L-	368+50 to 374+50	12	34	116–131
-L-	374+50 to 416+00	12–14	34–37	
-L-	416+00	14	37	132, 133
-L-	416+00 to 421+50	14, 15	37, 38	
-L-	421+50	15	38	134
-L-	421+50 to 424+00	15	38	
-L-	424+00	15	38	135
-L-	424+00 to 425+50	15	38	
-L-	425+50 to 431+00	15	38	136–157
-L-	431+00 to 453+50	15–17	38–40	
-L-	453+50	17	40	158
-L-	453+50 to 457+50	17	40	
-L-	457+50	17	40	158
-L-	457+50 to 459+50	17	40	
-L-	459+50 to 460+00	17	40	159, 160
-L-	460+00 to 462+00	17	40, 41	
-L-	462+00	17	41	161
-L-	462+00 to 463+50	17, 18	41	
-L-	463+50 to 467+50	18	41	162–166
-L-	467+50 to 509+00	18–20	41–44	
-L-	509+00	20	44	167
-L-	509+00 to 510+00	20	44	
-L-	510+00	20	44	168
-L-	510+00 to 513+00	20	44	
-L-	513+00	20	44	169
-L-	513+00 to 519+00	20	44, 45	
-Y-	21+50 to 28+00	5	46	
-Y2-	18+50 to 27+00	9, 21	47, 48	
-Y3-	18+00 to 35+00	13, 14	49, 50	
-Y6-	17+00 to 32+16	16, 23, 24	51, 52	
-Y8-	11+00 to 27+00	19, 25, 26	53, 54	
-RPAY4-	0+00 to 14+38	14, 15	55, 56	
-RPBY4-	0+00 to 13+03	14	57, 58	
-RPCY4-	0+00 to 13+30	14	59, 60	
-RPDY4-	0+00 to 16+05	14, 15	61, 62	
-SPAY4-	0+00 to 4+44	14	63	
-SPBY4-	0+00 to 5+54	14	64	
-SPCY4-	0+00 to 4+91	14	65	
-SPDY4-	0+00 to 4+43	14	66	
-RPAY8-	0+00 to 14+54	19, 20	67, 68	
-RPBY8-	0+00 to 13+91	19	69, 70	
-RPCY8-	0+00 to 13+79	19	71, 72	
-RPDY8-	0+00 to 14+59	19, 20	73, 74	
-SPAY8-	0+00 to 4+66	19	75	
-SPBY8-	0+00 to 4+92	19	76	
-SPCY8-	0+00 to 4+08	19	77	
-SPDY8-	0+00 to 4+65	19	78	

RETAINING WALLS:

-RWL1-	-L- 319+50 LT	8	170, 171
-RWL2-	-L- 333+00 RT	9, 10	172, 173
-RWL3-	-L- 357+50 LT	11	170, 171
-RWL4-	-L- 425+00 RT	15, 16	174–177
-RWL5-	-L- 448+50 RT	16, 17	176, 177
-RWL6-	-L- 470+50 RT	18, 19	178, 179
-RWL7-	-L- 491+00 LT	19	180, 181
-RWL8-	-L- 491+00 RT	19	180, 181
-RWL9-	-L- 496+50 LT	19	182, 183
-RWL10-	-L- 496+50 RT	19	182, 183

DRAWN BY: *T.T. WALKER, N.D.MOHS, T.P. MOOREFIELD*

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

ROADWAY SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. *34820.1.1 (U-2524C)* F.A. PROJ. *STP-NHF-121-1(1)*

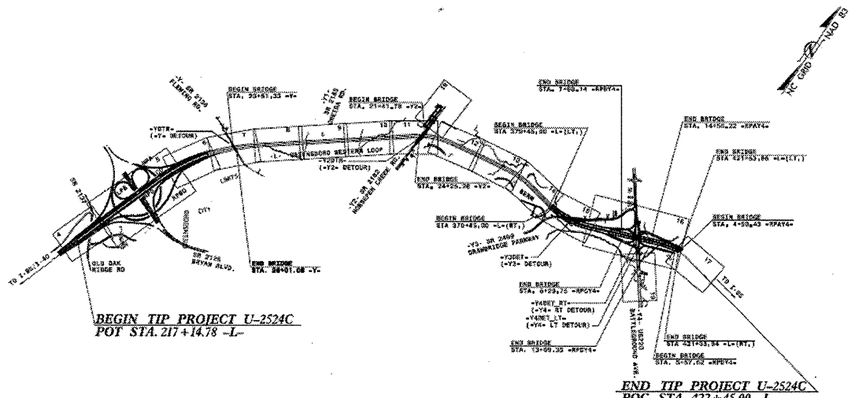
COUNTY *GUILFORD*

PROJECT DESCRIPTION *GREENSBORO WESTERN LOOP FROM SOUTH OF BRYAN BLVD. TO 2380 FEET EAST OF SR 2303 (LAWNDALE DR.)*

INVENTORY

This project contains 1 ADDENDUM. Refer to it as well as to this Subsurface Investigation.

This project contains 1 INFILTRATION BASIN. Refer to it as well as to this Subsurface Investigation.



BEGIN TIP PROJECT U-2524C
POT STA. 217+14.78 -L-

END TIP PROJECT U-2524C
POC STA 422+45.00 -L-
END CONSTRUCTION

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.

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INVESTIGATED BY *T.P. MOOREFIELD*

CHECKED BY *T.P. MOOREFIELD*

SUBMITTED BY *N.T. ROBERSON*

DATE *SEPTEMBER 2007*

NORTH CAROLINA LICENSED SEAL 1301 GEOLOGIST THOMAS P. MOOREFIELD 9-24-07

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PROJECT REFERENCE NO.	SHEET NO.
34820.1.1 (U-2524C)	2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

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:

VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5 A-7-6			
SYMBOL														
% PASSING • 10 • 40 • 200	50 MX 30 MX 15 MX	50 MX 25 MX	51 MN 10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
LIQUID LIMIT PLASTIC INDEX	6 MX		NP	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
GROUP INDEX	0		0	0		4 MX		8 MX	12 MX	16 MX	No MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND		FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS				
GEN. RATING AS A SUBGRADE	EXCELLENT TO GOOD							FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE

PI OF A-7-6 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTENCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH ($TONS/FT^2$)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE	<4 4 TO 10 10 TO 30 30 TO 50 >50	N/A
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD	<2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 >30	<0.25 0.25 TO 0.50 0.5 TO 1.0 1 TO 2 2 TO 4 >4

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE	4	10	40	60	200	270
OPENING (MM)	4.76	2.00	0.42	0.25	0.075	0.053

BOULDER (BLDR.)	COBBLE (COB.)	GRAVEL (GR.)	COARSE SAND (CSE. SD.)	FINE SAND (F SD.)	SILT (SL.)	CLAY (CL.)

GRAIN SIZE	MM	305	75	2.0	0.25	0.05	0.005
	IN.	12	3				

SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
LL — LIQUID LIMIT		
PLASTIC RANGE (PI)	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
PL — PLASTIC LIMIT		
OM — OPTIMUM MOISTURE	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
SL — SHRINKAGE LIMIT		
	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
NONPLASTIC	0-5	VERY LOW
LOW PLASTICITY	6-15	SLIGHT
MED. PLASTICITY	16-25	MEDIUM
HIGH PLASTICITY	26 OR MORE	HIGH

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.

GRADATION

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.

MINERALOGICAL COMPOSITION

MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

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

ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%
MODERATELY ORGANIC	5 - 10%	12 - 20%
HIGHLY ORGANIC	>10%	>20%

OTHER MATERIAL	
TRACE	1 - 10%
LITTLE	10 - 20%
SOME	20 - 35%
HIGHLY	35% AND ABOVE

GROUND WATER

- WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING
- STATIC WATER LEVEL AFTER 24 HOURS
- PW — 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
- 25/025 — DIP & DIP DIRECTION OF ROCK STRUCTURES
- SOUNDING ROD
- SPT CPT DPT DMT PMT VST — TEST BORING
- AUGER BORING
- CORE BORING
- MW — MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- SPT N-VALUE
- REF — SPT REFUSAL

SAMPLE DESIGNATIONS
S - BULK SAMPLE
SS - SPLIT SPOON SAMPLE
ST - SHELBY TUBE SAMPLE
RS - ROCK SAMPLE
RT - RECOMPACTED TRIAXIAL SAMPLE
CBR - CALIFORNIA BEARING RATIO SAMPLE

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
HI. - HIGHLY
MED. - MEDIUM
MICA. - MICACEOUS
MOD. - MODERATELY
NP - NON PLASTIC
ORG. - ORGANIC
PMT - PRESSUREMETER TEST
SAP. - SAPROLITIC
SD. - SAND, SANDY
SL. - SILT, SILTY
SLI. - SLIGHTLY
TCR - TRICONE REFUSAL
w - MOISTURE CONTENT
V - VERY
VST - VANE SHEAR TEST
WEA. - WEATHERED
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- ■ MOBILE B-57
- ■ BK-51
- ■ CME-45C
- ■ CME-550
- □ PORTABLE HOIST
- ■ CME-850 TRAX
- □ _____

ADVANCING TOOLS:
- □ CLAY BITS
- ■ 6" CONTINUOUS FLIGHT AUGER
- ■ 8" HOLLOW AUGERS
- ■ HARD FACED FINGER BITS
- □ TUNG.-CARBIDE INSERTS
- □ CASING □ W/ ADVANCER
- ■ TRICONE 2½ " 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
- ■ 1" SOIL PROBE

ROCK DESCRIPTION

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)	NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.
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.
NON-CRYSTALLINE ROCK (NCR)	FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.
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.

WEATHERING

FRESH	ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.
VERY SLIGHT (V SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.
SLIGHT (SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.
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. *IF TESTED, WOULD YIELD SPT REFUSAL*
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. *IF TESTED, YIELDS SPT N VALUES > 100 BPF*
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. *IF TESTED, YIELDS SPT N VALUES < 100 BPF*
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.

ROCK HARDNESS

VERY HARD	CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.
HARD	CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.
MODERATELY HARD	CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.
MEDIUM HARD	CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.
SOFT	CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.
VERY SOFT	CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.

FRACTURE SPACING

TERM	SPACING
VERY WIDE	MORE THAN 10 FEET
WIDE	3 TO 10 FEET
MODERATELY CLOSE	1 TO 3 FEET
CLOSE	0.16 TO 1 FEET
VERY CLOSE	LESS THAN 0.16 FEET

BEDDING

TERM	THICKNESS
VERY THICKLY BEDDED	> 4 FEET
THICKLY BEDDED	1.5 - 4 FEET
THINLY BEDDED	0.16 - 1.5 FEET
VERY THINLY BEDDED	0.03 - 0.16 FEET
THICKLY LAMINATED	0.008 - 0.03 FEET
THINLY LAMINATED	< 0.008 FEET

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.

TERMS AND DEFINITIONS

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.

BENCH MARK:

ELEVATION: FT.

NOTES:

REVISED 02/23/06

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2524C	2A	183
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34820.1.13	STP-NHF-121-1(1)	P.E.	

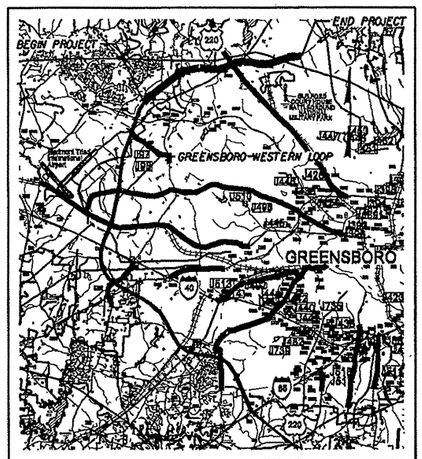
See Sheet 1-A For Index of Sheets

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

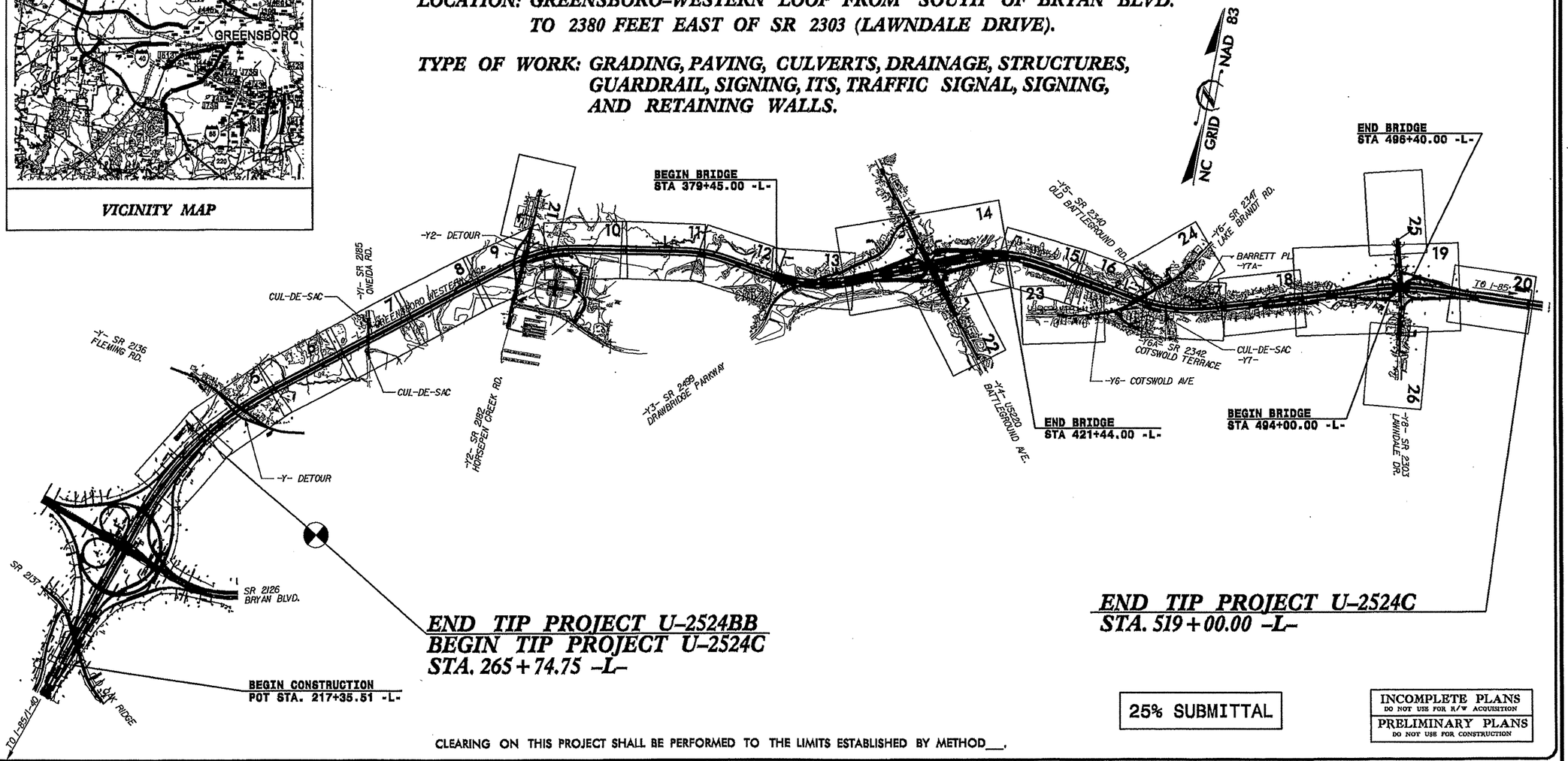
GUILFORD COUNTY

LOCATION: GREENSBORO-WESTERN LOOP FROM SOUTH OF BRYAN BLVD. TO 2380 FEET EAST OF SR 2303 (LAWNDALE DRIVE).

TYPE OF WORK: GRADING, PAVING, CULVERTS, DRAINAGE, STRUCTURES, GUARDRAIL, SIGNING, ITS, TRAFFIC SIGNAL, SIGNING, AND RETAINING WALLS.



VICINITY MAP



25% SUBMITTAL

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD___.

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

50 25 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2008 = 41,985
ADT 2028 = 71,908
DHV = 10 %
D = 60 %
T = 15 %
(5% TTST & 10% DUAL)
V = 70 MPH
FUNCT. CLASS. = FREEWAY

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-2524C = 3.955 MILES
LENGTH STRUCTURES TIP PROJECT U-2524C = 0.841 MILES
TOTAL LENGTH OF TIP PROJECT U-2524C = 4.796 MILES

Prepared in the Office of:
Parsons
401 Harrison Oaks Blvd., Suite 200
Cary, N.C. for the
DIVISION OF HIGHWAYS

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
APRIL 21, 2006

LETTING DATE:
APRIL 15, 2008

VICTOR M. CHAVEZ, P.E.
PROJECT ENGINEER

DAVID GARRETT
PROJECT DESIGN ENGINEER

NCDOT CONTACT: CATHY S. HOUSER, P.E.
PROJECT ENGINEER
ROADWAY DESIGN

ROBERT J. STROUP, P.E.
PROJECT DESIGN ENGINEER
ROADWAY DESIGN

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER P.E.

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR DATE

PROJECT: 34820.1.13 TIP PROJECT: U-2524C

09/08/99

10-SEP-2007 13:28
I:\ero\raleigh investigation\tip\u2524c_geo_rdwy\cadd_geotech\planprof\u2524c_geo_tsh.dgn
tmoorefield AT GEJ214499

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

Michael F. Easley
GOVERNOR

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

Lyndo Tippett
SECRETARY

September 14, 2007

STATE PROJECT: 34820.1.1 (U-2524C)
FEDERAL PROJECT: STP-NHF-121-1(1)
COUNTY: Guilford

DESCRIPTION: Greensboro Western Loop from South of Bryan Blvd. to 2380 feet East of SR 2303 (Lawndale Dr.)

SUBJECT: Geotechnical Report – Inventory

Project Description

This project consists of a new six to eight lane roadway, 4.8 miles in length, in the northwestern portion of the City of Greensboro. Grading on this segment of the Greensboro Western Loop begins just north of Bryan Boulevard at the end of U-2524BB, which is currently under construction. The proposed roadway (-L-) proceeds northeastward through undeveloped woods and pastures until -L- Sta. 379+45. At that point, a 4199-foot long bridge is to be constructed over Drawbridge Parkway (-Y3-), the Horsepen Creek floodplain, and Battleground Avenue (-Y4-) (see Plan Sheet Nos. 13 through 15). A single-point interchange with associated off- and on- ramp bridges will provide access to Battleground Avenue. The proposed roadway extends eastward from the end of the bridge (-L- Sta. 421+44), through a wooded area, until it reaches Cotswold Avenue (at approximately -L- Sta. 450+00, see Plan Sheet No. 17). From that point, the proposed -L- alignment parallels Cotswold Avenue to its intersection with Lawndale Boulevard (-Y8-). A proposed single-point interchange provides access to Lawndale Boulevard (see Plan Sheet No. 19). From Lawndale Boulevard, the project extends 2400 feet eastward to its terminus at -L- Sta. 519+00. The project includes ten retaining walls. Six of the walls are proposed to limit the project's impact on existing structures and facilities. Four retaining walls are proposed at the Lawndale interchange.

This subsurface investigation report includes borings from several different investigations undertaken during the past 14 years. In February 1993, the NCDOT's geotechnical unit's field crew drilled six borings in the landfill area just north of Fleming Road (see Plan Sheet Nos. 5 and 6), using an ATV-mounted BK-51 with a manual hammer. In June and July 1994, and in August 1995, the NCDOT Geotechnical Unit completed a subsurface investigation for the project U-2524D, which consisted of a proposed four-lane roadway connecting Old Battleground Road to Lawndale Drive. This roadway was never constructed. Instead, a two-lane roadway (Cotswold Avenue) was constructed along the same corridor. ATV-mounted CME-45C and BK-51 drill machines with manual hammers were used during the 1994 and 1995 field investigations. Four borings completed by the Geotechnical Unit's crew during the U-2524BB subsurface investigation (August 2000), are included in this report, as well as ten borings which were drilled on a preliminary -L- alignment between Fleming Road (-Y3-) and Cotswold Avenue (August 2004). All NCDOT Geotechnical Unit borings drilled since 2000 were completed using an ATV-mounted CME-550 drill machine with an automatic hammer. The remainder of the borings used for the investigation of this project were completed during the period July through October 2006 using four drill crews (the Geotechnical Unit field crew and three consultant drilling crews). The Trigon Engineering drill crews used an ATV-mounted B-57 drill machine with a manual hammer, as well as a track-mounted CME-850 with an automatic hammer. S&ME used an ATV-mounted BK-51 with a manual hammer. Throughout the various investigations, 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 7.7 miles, were investigated. Subsurface soil profiles, or cross-sections, of these alignments are included in this report:

Line	Station		
-L-	265+74	to	519+00
-Y-	21+50	to	28+00
-Y2-	18+50	to	27+00
-Y3-	18+00	to	35+00
-Y6-	17+00	to	32+16
-Y8-	11+00	to	27+00
-RPAY4-	0+00	to	14+38
-RPBY4-	0+00	to	13+03
-RPCY4-	0+00	to	13+30
-RPDY4-	0+00	to	16+05
-SPAY4-	0+00	to	4+44
-SPBY4-	0+00	to	5+54
-SPCY4-	0+00	to	4+91
-SPDY4-	0+00	to	4+43
-RPAY8-	0+00	to	14+54
-RPBY8-	0+00	to	13+91
-RPCY8-	0+00	to	13+79
-RPDY8-	0+00	to	14+59
-SPAY8-	0+00	to	4+66
-SPBY8-	0+00	to	4+92
-SPCY8-	0+00	to	4+08
-SPDY8-	0+00	to	4+65

-L-	430+50	72 RT
-L-	431+00	121 RT
-L-	501+00	CL
-RPAY4	5+87	4 RT
-RPBY4-	10+50	CL
-RPDY8-	5+74	CL
-RWL1-	10+00	CL
-RWL1-	10+66	11 RT
-RWL3-	10+20	CL
-RWL3-	10+80	11 RT
-RWL3-	11+40	21 RT
-RWL3-	12+00	CL
-RWL4-	11+50	30 LT
-RWL4-	12+10	2 LT
-RWL4-	12+50	30 LT
-RWL4-	13+00	10 LT
-RWL4-	13+50	30 LT
-RWL4-	14+50	41 LT
-RWL4-	15+00	1 RT
-RWL4-	15+50	46 LT
-RWL4-	16+00	3 LT
-RWL4-	18+00	4 LT
-RWL4-	18+55	21 LT
-RWL4-	19+00	CL
-RWL4-	19+50	34 LT
-RWL4-	19+95	5 RT
-RWL4-	20+50	15 LT
-RWL4-	21+00	8 RT
-RWL4-	26+50	28 RT
-RWL7-	11+45	14 LT
-RWL7-	12+45	16 LT
-RWL8-	12+45	6 RT
-RWL9-	11+75	7 RT

3) Buried Landfill (-L- 275+28 to 283+10): A landfill containing up to sixty feet of artificial fill soil occurs just north of Fleming Rd. (see Plansheet Nos. 5 and 6). The fill consists of soil intermixed with construction debris and woody material. The landfill is discussed in detail below in the section entitled "Buried Landfill".

4) Spring (-L- 345+27/ 49'RT): A flowing spring is located within the cut slope at this site (see Plansheet No. 10). At the time of this investigation, a steady stream of water flowed from this hillside spring.

Physiography and Geology

The project is located in the Piedmont area of North Carolina. A mixture of homes, apartments, condominiums, townhomes, pastures, wooded areas, and wetlands are located along the project corridor. The terrain is moderately rolling. The proposed roadway crosses the Horsepen Creek floodplain just south and north of Battleground Avenue. The Horsepen Creek floodplain is a significant wetland area, approximately 500 to 1,000 feet in width. Horsepen Creek flows northward in to Lake Brandt. Several small streams and wet-weather runs cross the -L- alignment as well.

Geologically, the project is located along the northeast-trending boundary of the Carolina Slate Belt and the Charlotte Belt. Soils within the Charlotte Belt are derived from the weathering of the underlying bedrock composed of granite intrusions. Soils within the Carolina Slate Belt are derived from metamorphosed granite and diorite intrusions. The Carolina Slate Belt rock units are generally foliated, and trend in a northeasterly direction.

Soil Properties

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

Roadway embankment soil occurs in several locations on the project. Approximately ten feet of roadway embankment soil, consisting of medium stiff to stiff, moist silty clay, overlies alluvial soil where Battleground Avenue crosses the Horsepen Creek floodplain. Two to three feet of roadway embankment soil occurs beneath Cotswold Avenue at its intersection with Lawndale Avenue (-Y8-). The gray-brown, stiff, moist sandy clay (A-7-6) overlies either residual soil or alluvial soil.

Artificial fill soil was encountered in several areas on the project. The most significant occurrence of artificial fill soil is the buried landfill located just north of Fleming Road (see Plan Sheets Nos. 5 and 6). The landfill contains up to 60 feet of silty clay (A-7-6) and sandy clay (A-6) with minor amounts of sandy silt (A-4) and silty sand (A-2-4) soil, intermixed with pieces of concrete, bricks, and wood. Organic content (by weight) of samples retrieved from the 2006 borings ranged from 3.1% to 21.0%. The landfill is discussed in detail later in this report. Other occurrences of artificial fill soil generally consist of medium stiff to stiff silty clay (A-7-6) and sandy clay (A-6). These soils occur in fill areas constructed for townhome and apartment sites, parking areas, landscape berms, sewerlines, pipelines, and other similar areas.

Alluvial soils occur in the small creeks which flow across the alignment in several areas. These soils generally consist of loose, silty sand (A-2-4). Alluvial soil also occurs within the Horsepen Creek floodplain. The floodplain is approximately 500 to 800 feet in width in the vicinity of Battleground Avenue (see Plan Sheets Nos. 13 and 14).. The alluvial soil within the floodplain is up to 22 feet thick, consisting of interbedded loose silty sand (A-2-4) and clayey sand (A-2-6), and medium stiff to stiff sandy clay (A-6) and silty clay (A-7-6) (see Profile Sheet Nos. 37, 55 through 66, and Cross-section Sheet Nos. 132 and 133). Trace amounts of

organic material occur within the alluvial soils in the floodplain. Alluvial soil also occurs in several places beneath the Cotswold Avenue roadway embankment from -L- 480+50 to its intersection with Lawndale Avenue (-Y8-) (see Plan Sheet No. 19, and Profile Sheet Nos.42 and 43). The alluvial soil was deposited along a small creek, which flowed eastward, generally in the same location as the existing Cotswold Avenue. The alluvial soil is 3 to 5 feet in thickness and consists of loose to medium dense, silty sand (A-2-4) with minor gravel, interbedded with soft to medium stiff, sandy clay (A-6). Alluvial soil also occurs along Richland Creek from -RPCY8- 2+25, across -RPCY8- from 12+00 to 13+70, -RPDY8- 12+30 to 15+00, -RPAY8- 6+20 to 8+90, and on -L- from 495+00/CL to approximately 510+00/LT. These alluvial soils are 3 to 5 feet in thickness, and consist of medium stiff sandy clay (A-6), silty clay (A-7-6), and sandy silt (A-4) interbedded with loose silty sand (A-2-4) and gravel.

The residual soils are derived from the in-place weathering of the underlying metamorphosed granite, gabbro, and diorite bedrock. Clay soil is the most common soil in the project area. These clay soils are generally medium stiff to stiff and consist of sandy clay and silty clay (A-6, A-7-5, and A-7-6). Significant amounts of medium stiff to hard, moist, sandy silt (A-4) are also present. Residual, highly plastic "cap" clays occur at the ground surface over several areas of the project. 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 and crystalline rock occur in several areas of the project. The weathered rock is derived from the underlying Carolina Slate Belt and Charlotte Belt bedrock and ranges from 1 to 15 feet or more in thickness. The crystalline bedrock consists mostly of granite and diorite, and metamorphosed granite (meta-granite), diorite (meta-diorite), and gneiss.

Groundwater

Groundwater was encountered in numerous borings. Groundwater depths in residual soil are variable across the project, ranging from 1 to 41 feet below the ground surface. Groundwater is shallow in alluvial floodplain soils, generally occurring 2 to 3 feet below the ground surface. Groundwater measurements from the borings completed during the years 1993 through 1995 may not reflect the current groundwater conditions. Based on this investigation, groundwater is not anticipated to cause problems during construction.

Buried Landfill (-L- 275+28 to 283+10)

A buried landfill is located just north of Fleming Road (see Plan Sheet Nos. 5 and 6, Profile Sheet No. 27 and 28, and Cross-section Sheet Nos. 79 to 97). The landfill contains up to 60 feet of fill soil. The landfill was initially investigated in 1993. Reports from that period indicate that the fill material was placed in the landfill approximately 15 years before the investigation (late 1970's). The fill material is believed to have come from the expansion of the nearby Piedmont Triad International Airport. The fill soil appears to be free of garbage and rubbish. No fill material has been added since the investigation in 1993.

Six Standard Penetration Test borings were drilled in 1993 through the fill material to residual. The percentage (by volume) of wood and other organic material retrieved in the sampler was estimated for each drive in the artificial fill soil. No soil samples, or organic samples, were analyzed from the 1993 investigation. Thirteen additional SPT borings were drilled in 2006 to further delineate the landfill material. Soil samples were taken and analyzed for soil quality and organic content.

The landfill soils consist mostly of silty clay (A-7-6) and sandy clay (A-6) with minor amounts of sandy silt (A-4) and silty sand (A-2-4) intermixed with pieces of concrete, bricks, and wood. Of the 35 SPT drives (borings completed in 1993) that encountered organic material, 43% consisted of greater than 49% organics (estimated by volume). The organic material was generally comprised of woody material, believed to be derived from rotting stumps, trees, organic-rich alluvial soils. Twenty-six percent of the drives contained organic percentages of 10 to 49%. Organic content (by weight) of samples retrieved from the 2006 borings ranged from 3.1% to 21.0%. Ninety-two percent of the 38 samples submitted contained 10% or less organics.

No void spaces were noted in any of the field logs. Each of the nineteen borings was advanced to residual soil without difficulty, suggesting the scarcity of large pieces of concrete, or similar construction debris. Groundwater was encountered in eleven of the 2006 borings. Groundwater elevations ranged from ±866 feet in residual soil at 276+50, to ±841 feet in fill soil left of 281+50. The 1993 groundwater measurements suggest that the water table was lower 13 years ago.

Spring (-L- 345+27/ 49'RT

A flowing spring is located within the cut slope at this site (see Plansheet No. 10). At the time of this investigation, a steady stream of water flowed from this hillside spring.

Debris Piles (-L- 343+00 to 344+00)

Two debris piles occur to the left and right of -L- 344+00. Each area is approximately 100 feet in length and 50 feet in width. The debris is comprised of an old car, appliance pieces, cans, bottles, and various construction scrap.

Retaining Wall No. 1 (-L- 319+50 LT)

This 275-foot long wall is proposed to reduce the impact on an adjacent stream and sewer line easement (see Plan Sheet No. 8 and Retaining Wall Sheet No. 170). This fill wall, approximately 14 feet in height, is situated on both alluvial soil and residual soil. The alluvial soil consists of loose to medium dense silty sand, six to ten feet in thickness, overlying weathered rock. The residual soil consists of very stiff sandy clay (A-6) and stiff clayey silt (A-5).

Retaining Wall No. 2 (-L- 333+00 RT)

Retaining Wall No. 2 is 862 feet in length. The wall is designed to limit the impact on the City of Greensboro's recreation facilities adjacent to the proposed roadway (see Plan Sheet Nos. 9 and 10, and Retaining Wall Sheet No. 172). This cut wall, which is up to 30 feet in

height, is situated in competent residual soil. The residual soil consists of four to eleven feet of stiff to hard, silty clay (A-7-5 and A-7-6), overlying stiff to hard, clayey silt (A-5) and sandy silt (A-4), or medium dense to very dense, silty sand (A-2-4 and A-2-5) and coarse sand (A-1-b). Groundwater was encountered at, or below, the base of the proposed wall.

Retaining Wall No. 3 (-L- 357+50 LT)

Retaining Wall No. 2 is a fill wall, approximately 16 feet in height and 225 feet in length. The wall limits the encroachment on a small stream that flows parallel to the roadway (see Plan Sheet No. 11, and Retaining Wall Sheet No. 170). The wall is to be constructed on seven to ten feet of embankment fill which is to be placed over residual soil and alluvial soil. The residual soil occurs from -RWL3- 9+75 to 11+10, and consists of very stiff, silty clay (A-7-5 and A-7-6). The remainder of the fill (11+10 to 12+00) will be placed over six feet of very stiff, moist sandy and silty alluvial clay (A-7-6 and A-6). Groundwater was encountered at 12 to 24 feet below the present ground surface.

Retaining Wall No. 4 (-L- 425+00 RT)

This 1650-foot long wall is proposed to reduce the impact on an adjacent apartment complex (see Plan Sheet Nos. 15 and 16, and Retaining Wall Sheet Nos. 174 and 176). This cut wall ranges from 30 to 35 feet in height. Weathered rock and crystalline rock is expected to occur within the wall excavation from -RWL4- 11+25 to 13+75. The remainder of the wall is situated in residual soil consisting of a surface layer of stiff to very stiff, silty clay (A7-5 and A-7-6) overlying medium stiff to very stiff, clayey silt (A-5) or sandy silt (A-4), and loose to dense, silty sand (A-2-4) and coarse sand (A-1-b). Weathered rock and crystalline rock occur beneath the residual soils, and the base of the wall, except as noted above. A berm of artificial fill soil has been constructed at the tree line behind the apartment complex (approximately -RWL4- 12+80 to 18+20). The fill soil is three to twelve feet thick and consists of very soft to medium stiff, silty clay. Groundwater was encountered in numerous borings below the base of the proposed wall.

Retaining Wall No. 5 (-L- 448+50 RT)

Retaining Wall No. 5 is 300 feet in length and 12 to 15 feet in height. This cut wall is proposed to minimize the impact on the adjacent apartment complex (see Plan Sheet Nos. 16 and 17, and Retaining Wall Sheet No. 176). Artificial fill soil and residual soil occurs at the site. The fill soil consists of six feet very stiff, moist, silty clay (A-7-5), located at -RWL5- 11+35 to 12+35. The residual soils consist of stiff to hard, moist to wet, silty clay (A-7-5) and clayey silt (A-5), and medium dense, moist silty sand (A-2-4). Groundwater was encountered three to five feet below the base of the proposed wall.

Retaining Wall No. 6 (-L- 470+50 RT)

Retaining Wall No. 6 is 965 feet in length. The wall is designed to limit the impact on the homes which are located at the top of the cut slope (see Plan Sheet Nos. 18 and 19, and Retaining Wall Sheet No. 178). This cut wall, which is up to 16 feet in height, is situated in competent residual soil. The residual soil consists of a two to seven-foot thick soft to very stiff, silty cap clay (A-7-5 and A-7-6) at the ground surface. Below the surface clay, the soil consists of stiff to very stiff, dry, clayey silt (A-5) and sandy silt (A-4), and loose to medium dense, dry to wet, silty sand (A-2-4) and coarse sand (A-1-b). Groundwater was encountered in several of the borings below the base of the proposed wall.

Retaining Wall No. 7 (-L- 491+00 LT)

Retaining Wall No. 7, 307 feet in length, is located within the single-point interchange at Lawndale Drive (-Y8-), (see Plan Sheet No. 19, and Retaining Wall Sheet No. 180). This fill wall, up to 34 feet in height, is situated on roadway embankment soil underlain by artificial fill and alluvial soil. The roadway embankment is two to four feet thick. Artificial fill is six feet thick and consists of stiff, moist, silty clay (A-7-6). The alluvial soil consists of medium stiff to very stiff, dry to moist, sandy silt (A-4), and sandy clay (A-6), and loose to medium dense, moist to wet, clayey sand (A-2-6) and coarse sand (A-1-b). Groundwater was encountered below the base of the proposed wall in all three borings.

Retaining Wall No. 8 (-L- 491+00 RT)

Retaining Wall No. 8 is 307 feet in length. This wall also occurs within the single-point interchange at Lawndale Drive (-Y8-), (see Plan Sheet No. 19, and Retaining Wall Sheet 180). This wall, which is up to 30 feet in height, is situated on residual and alluvial soil. The residual soil consists of nine to fourteen foot of medium stiff to stiff, moist, silty clay (A-7-5) and (A-7-6) and sandy clay (A-6). Medium stiff, clayey silt (A-5), hard, sandy silt (A-4), and loose to dense, moist to wet, silty sand (A-2-4) and coarse sand (A-1-b) underlie the residual clays. The alluvial soils occur from 11+75 to the end of the wall, and consist of medium stiff, moist, silty clay (A-7-6), stiff, moist, sandy silt (A-4), and medium dense, moist, coarse sand (A-1-b). Groundwater was encountered in all borings below the base of the proposed wall.

Retaining Wall No. 9 (-L- 496+50 LT)

Retaining Wall No. 9 is 465 feet in length. This fill wall is located within the single-point interchange at Lawndale Drive (-Y8-), (see Plan Sheet No. 19, and Retaining Wall Sheet 182). This wall, which is up to 35 feet in height, is situated on artificial fill, residual soil, and alluvial soil. The artificial fill consists of stiff, sandy clay (A-6), and very stiff, sandy silt (A-4). This fill is associated with the construction of the adjacent apartments. Residual soils consist of stiff, sandy clay (A-6), and medium to very dense, moist to wet, silty sand (A-2-4), and coarse sand (A-1-b). Alluvial soils are loose, wet, silty sand (A-2-4), and medium stiff, moist to wet, sandy silt (A-4). Richland Creek flows under the proposed wall at -RWL9- 11+25. Groundwater was encountered in all borings below the base of the proposed wall.

Retaining Wall No. 10 (-L- 496+50 RT)

Retaining Wall No. 10 is 153 feet in length. This wall is part of the single-point interchange with Lawndale Drive (-Y8-), (see Plan Sheet No. 19, and Retaining Wall Sheet 182). This wall, which is up to 27 feet in height, is situated on artificial fill underlain by alluvial and residual soil. Artificial fill consists of stiff, sandy clay (A-6), four to seven feet thick. Alluvial soils consist of stiff, moist, silty clay (A-7-6), and medium dense, saturated, silty sand (A-2-4). Groundwater was encountered in all borings below the base of the proposed wall.

Bulk Samples

The following bulk samples were taken for tests to determine engineering properties of the soil.

Sample No.	Location	Depth (ft)	Test
ST-1	-L-, 266+67, RT	22.4-24.4	Triaxial CU
RT-1	-L-, 271+00, CL	7.1-17.1	Remolded Triaxial
CBR-1	-L-, 271+00, CL	22.1-31.4	California Bearing Ratio
RT-2	-L-, 450+80, LT	10.0-25.0	Remolded Triaxial
CBR-2	-L-, 450+80, LT	25.0-28.0	California Bearing Ratio
RT-1	-L-, 476+85, CL	2.0-20.0	Remolded Triaxial
CBR-1	-L-, 476+85, CL	20.0-28.7	California Bearing Ratio
ST-1	-L-, 509+00, LT	0.0-1.0	Triaxial CU

Prepared by,

Thomas P. Moorefield
Project Geological Engineer

COMPUTED BY: JMP	DATE	3/1/2013	
CHECKED BY: TG	DATE	5/3/2013	

PROJECT NO.	SHEET NO.
TIP # U-2524C	1 OF 2

EARTHWORK BALANCE SHEET

IN CUBIC YARDS

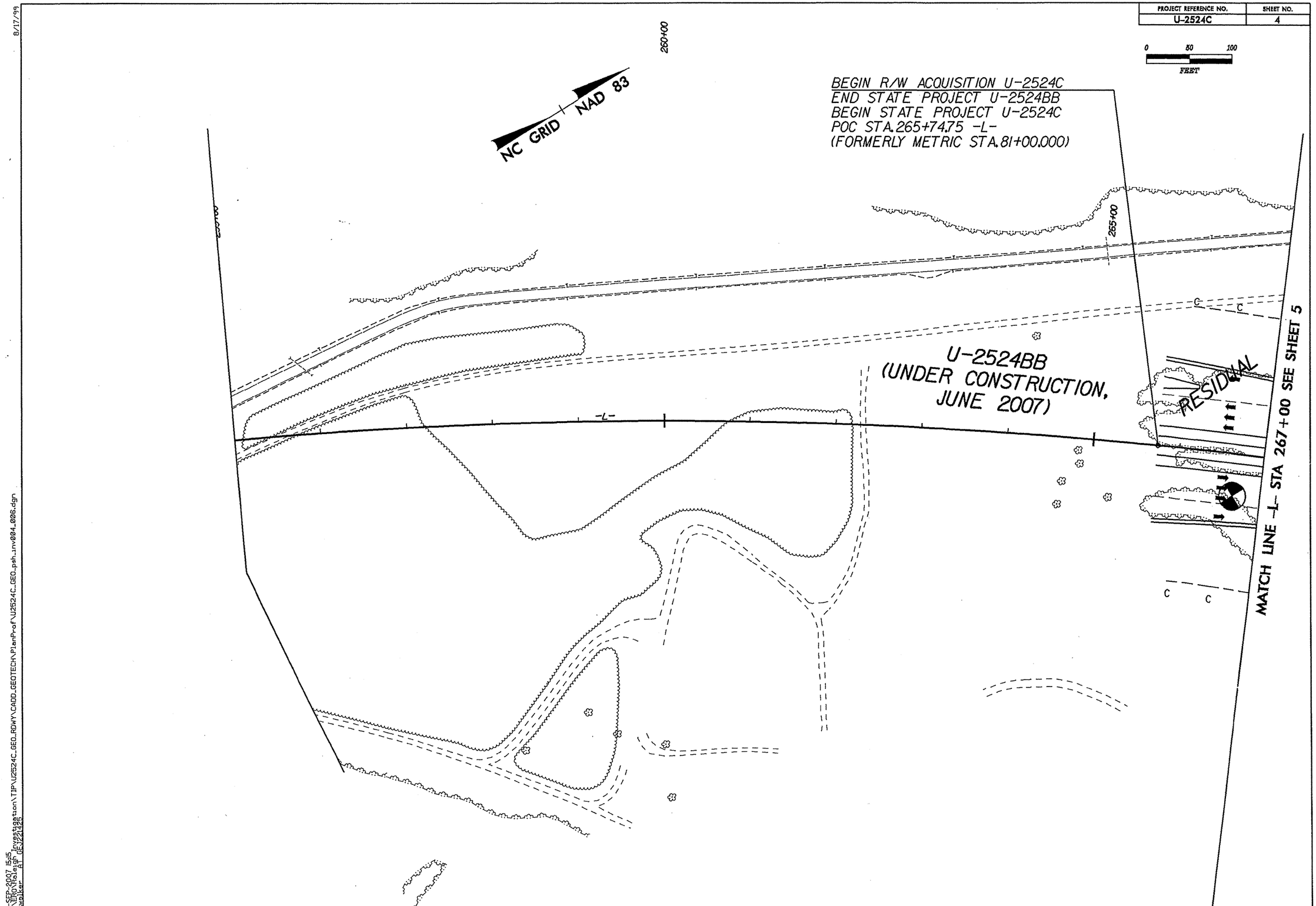
LOCATION	UNCLASSIFIED EXCAVATION	ROCK EXCAVATION	UNDERCUT EXCAVATION	UNSUITABLE EARTH EXCAVATION	SUITABLE EARTH EXCAVATION	TOTAL EMB'T	EARTH EMBANKMENT	ROCK EMB'T	EMB'T + % 20	BORROW	ROCK WASTE	SUITABLE WASTE	UNSUITABLE WASTE	TOTAL WASTE
PHASE I SUMMARY 1														
-L- 217+14.78 TO 247+50	11591	0	0	0	11591	243	243	0	292	0	0	11299	0	11299
-LPB- 3+90.00 TO 12+73.50	815	0	0	0	815	494	494	0	593	0	0	222	0	222
-RPBD- 32+80 TO 61+59.24	2867	0	0	0	2867	583	583	0	697	0	0	2170	0	2170
SUBTOTAL SUMMARY 1	15273	0	0	0	15273	1320	1320	0	1582	0	0	13691	0	13691
PHASE I SUMMARY 2														
-L- 248+00 TO 265+50	10541	0	0	0	10541	724	724	0	869	0	0	9672	0	9672
-RPA- 32+81 TO 45+27.55	1734	0	0	0	1734	263	263	0	316	0	0	1418	0	1418
-RPD- 32+83 TO 64+79.65	1355	0	0	0	1355	0	0	0	0	0	0	1355	0	1355
SUBTOTAL SUMMARY 2	13630	0	0	0	13630	987	987	0	1185	0	0	12445	0	12445
PHASE I SUMMARY 3														
-L- 266+00 TO 271+50	144077	0	0	0	144077	0	0	0	0	0	0	144077	0	144077
-L- 276+00 TO 296+00	84023	0	74928	75736	8287	227950	227950	0	273540	265253	0	0	150664	150664
-Y- DTR 11+99 TO 24+58	5497	0	0	0	5497	3015	3015	0	3618	0	0	1879	0	1879
SUBTOTAL SUMMARY 3	233597	0	74928	75736	157861	230965	230965	0	277158	265253	0	145956	150664	296620
PHASE I SUMMARY 4														
-L- 296+00 TO 326+00	217099	0	3020	14131	202968	108665	108665	0	130398	0	0	72570	17151	89721
-Y1- 11+00.00 TO 16+00	801	0	0	0	801	31	31	0	37	0	0	764	0	764
SUBTOTAL SUMMARY 4	217900	0	3020	14131	203769	108696	108696	0	130435	0	0	73334	17151	90485
PHASE I SUMMARY 5														
-L- 326+00 TO 329+00	33612	0	0	0	33612	0	0	0	0	0	0	33612	0	33612
-L- 334+50 TO 356+00	327821	0	0	0	327821	14045	14045	0	16854	0	0	310967	0	310967
-Y2-DTR (BECOMES -Y2- RT IN FINAL PHASE)	1559	0	0	0	1559	7104	7104	0	8525	6966	0	0	0	0
SUBTOTAL SUMMARY 5	362992	0	0	0	362992	21149	21149	0	25379	6966	0	344579	0	344579
PHASE I SUMMARY 6														
-L- 356+00 TO 379+45 (BEGIN BRIDGE)	83938	10869	0	0	73069	158234	147365	10869	187707	103769	0	0	0	0
-Y3- 18+00 TO 35+00	2115	0	0	0	2115	2907	2907	0	3488	1373	0	0	0	0
-Y3DET- 11+82 TO 19+46	221	0	0	0	221	2900	2900	0	3480	3259	0	0	0	0
Hazardous Spill Basin 1 -L- RT. 380+00	1905	0	0	0	1905	10	10	0	12	0	0	1893	0	1893
Hazardous Spill Basin 2 -L- RT. 387+20	1510	0	0	0	1510	0	0	0	0	0	0	1510	0	1510
Hazardous Spill Basin 3 -L- RT. 398+70	1260	0	0	0	1260	0	0	0	0	0	0	1260	0	1260
SUBTOTAL SUMMARY 6	90949	10869	0	0	80080	164051	153182	10869	194687	108401	0	4663	0	4663
PHASE I SUMMARY 7														
-L- 421+53.86 (END BRIDGE) TO 422+45	1327	0	0	0	1327	12561	12561	0	15073	13746	0	0	0	0
-Y4DET_LT- 11+46 TO 19+25	219	0	0	0	219	10211	10211	0	12253	12034	0	0	0	0
-Y4DET_RT- 11+22 TO 18+98	174	0	0	0	174	16151	16151	0	19381	19207	0	0	0	0
-RPAY4- 14+56.22 TO 17+93	0	0	0	0	0	26006	26006	0	31207	31207	0	0	0	0
-RPBY4- 7+68 TO 11+35	0	0	0	0	0	28498	28498	0	34198	34198	0	0	0	0
-RPCY4- 8+29 TO 11+78	0	0	0	0	0	26432	26432	0	31718	31718	0	0	0	0
-RPDY4- 13+69.35 TO 16+23	0	0	0	0	0	15437	15437	0	18524	18524	0	0	0	0
-SPAY4- 0+00 TO 3+19	0	0	0	0	0	2912	2912	0	3494	3494	0	0	0	0
-SPBY4- 0+00 TO 3+50	0	0	0	0	0	8728	8728	0	10474	10474	0	0	0	0
-SPCY4-0+00 TO 4+02.30	0	0	0	0	0	12908	12908	0	15490	15490	0	0	0	0
-SPDY4- 0+00 TO 2+20	0	0	0	0	0	4874	4874	0	5849	5849	0	0	0	0
-Y4- RT. 28+10 TO 31+70	348	0	0	0	348	4229	4229	0	5075	4727	0	0	0	0
-Y4- LT. 26+70 TO 29+00	287	0	0	0	287	258	258	0	310	23	0	0	0	0
SUBTOTAL SUMMARY 7	2355	0	0	0	2355	169205	169205	0	203046	200691	0	0	0	0
SUBTOTAL	936696	10869	77948	89867	835960	696373	685504	10869	833472	581311	0	594668	167815	762483
WASTE IN LIEU OF BORROW PHASE I										-581311		-581311		-581311
SUBTOTAL PHASE I	936696	10869	77948	89867	835960	696373	685504	10869	833472	0	0	13357	167815	181172

COMPUTED BY: JMP	DATE 3/1/2013	PROJECT NO.	SHEET NO.
CHECKED BY: TG	DATE 5/3/2013	TIP # U-2524C	2 OF 2

EARTHWORK BALANCE SHEET

IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	ROCK EXCAVATION	UNDERCUT EXCAVATION	UNSUITABLE EARTH EXCAVATION	SUITABLE EARTH EXCAVATION	TOTAL EMB'T	EARTH EMBANKMENT	ROCK EMB'T	EMB'T + % 20	BORROW	ROCK WASTE	SUITABLE WASTE	UNSUITABLE WASTE	TOTAL WASTE
SUBTOTAL PHASE I	936696	10869	77948	89867	835960	696373	685504	10869	833472	0	0	13357	167815	181172
PHASE 2 SUMMARY 1														
-Y- 19+50 TO 31+50	968	0	0	0	968	70	70	0	84	0	0	884	0	884
SUBTOTAL SUMMARY 1	968	0	0	0	968	70	70	0	84	0	0	884	0	884
PHASE 2 SUMMARY 2														
-Y2-LT 16+03 TO 28+03	723	0	0	0	723	628	628	0	754	31	0	0	0	0
SUBTOTAL SUMMARY 2	723	0	0	0	723	628	628	0	754	31	0	0	0	0
PHASE 2 SUMMARY 3														
-DRV4- 10+50 TO 11+00	42	0	0	0	42	142	142	0	170	128	0	0	0	0
-DRV5- 10+25 TO 11+00	42	0	0	0	42	183	183	0	220	178	0	0	0	0
SUBTOTAL SUMMARY 3	84	0	0	0	84	325	325	0	390	306	0	0	0	0
PHASE 2 SUMMARY 4														
-DRV3- 10+75.72 TO 11+95	43	0	0	0	43	520	520	0	624	581	0	0	0	0
-DRV2- 10+50 TO 11+48.23	116	0	0	0	116	35	35	0	42	0	0	74	0	74
SUBTOTAL SUMMARY 4	159	0	0	0	159	555	555	0	666	581	0	74	0	74
SUBTOTAL	1934	0	0	0	1934	1578	1578	0	1894	918	0	958	0	958
WASTE IN LIEU OF BORROW PHASE 2										-918		-918		-918
SUBTOTAL PHASE 2	1934	0	0	0	1934	1578	1578	0	1894	0	0	40	0	40
PHASE 3 SUMMARY 1														
-Y- DTR REMOVAL	3015	0	0	0	3015	5497	5497	0	6596	3581	0	0	0	0
-L- 271+50 TO 276+00	97998	0	103	1839	96159	103	103	0	124	0	0	96035	1942	97977
SUBTOTAL SUMMARY 1	101013	0	103	1839	99174	5600	5600	0	6720	3581	0	96035	1942	97977
PHASE 3 SUMMARY 2														
-Y2-RT 15+50 TO 28+03.26	809	0	0	0	809	564	564	0	677	0	0	132	0	132
-L- 329+00 TO 334+50	103563	0	0	0	103563	0	0	0	0	0	0	103563	0	103563
-Y3-DETOUR REMOVAL	2900	0	0	0	2900	221	221	0	265	0	0	2635	0	2635
-DRV1- 10+22.80 TO 13+02.48	69	0	0	0	69	635	635	0	762	693	0	0	0	0
SUBTOTAL SUMMARY 2	107341	0	0	0	107341	1420	1420	0	1704	693	0	106330	0	106330
SUBTOTAL	208354	0	103	1839	206515	7020	7020	0	8424	4274	0	202365	1942	204307
WASTE IN LIEU OF BORROW PHASE 3										-4274		-4274		-4274
SUBTOTAL PHASE 3	208354	0	103	1839	206515	7020	7020	0	8424	0	0	198091	1942	200033
PHASE 4 SUMMARY 1														
-Y4DET_LT- (REMOVAL)	10211	0	0	0	10211	219	219	0	263	0	0	9948	0	9948
-Y4DET_RT- (REMOVAL)	16151	0	0	0	16151	174	174	0	209	0	0	15942	0	15942
-RPAY4- 17+93 TO 19+25	0	0	0	0	0	2065	2065	0	2478	2478	0	0	0	0
-RPBY4- 11+35 TO 13+24	0	0	0	0	0	3551	3551	0	4261	4261	0	0	0	0
-RPCY4- 11+78 TO 13+11	0	0	0	0	0	2672	2672	0	3206	3206	0	0	0	0
-RPDY4- 16+23 TO 17+42	0	0	0	0	0	3445	3445	0	4134	4134	0	0	0	0
-SPAY4- 3+19 TO 4+28	0	0	0	0	0	1546	1546	0	1855	1855	0	0	0	0
-SPBY4- 3+50 TO 5+49	0	0	0	0	0	1560	1560	0	1872	1872	0	0	0	0
-SPCY4- 4+02 TO 5+00	0	0	0	0	0	1597	1597	0	1916	1916	0	0	0	0
-SPDY4- 2+20 TO 3+60	0	0	0	0	0	2852	2852	0	3422	3422	0	0	0	0
-Y4- RT. 21+00 TO 28+10	430	0	0	0	430	1342	1342	0	1610	1180	0	0	0	0
-Y4- RT. 31+70 TO 39+00	342	0	0	0	342	1679	1679	0	2015	1673	0	0	0	0
-Y4- LT. 21+00 TO 26+70	227	0	0	0	227	165	165	0	198	0	0	29	0	29
-Y4- LT. 29+00 TO 39+00	924	0	0	0	924	6047	6047	0	7256	6332	0	0	0	0
Hazardous Spill Basin 4 -Y4- LT. 26+18	1955	0	0	0	1955	0	0	0	0	0	0	1955	0	1955
Hazardous Spill Basin 5 -Y4- RT. 33+77	2925	0	0	0	2925	0	0	0	0	0	0	2925	0	2925
SUBTOTAL	33165	0	0	0	33165	28914	28914	0	34695	32329	0	30799	0	30799
WASTE IN LIEU OF BORROW PHASE 4										-30799		-30799		-30799
SUBTOTAL PHASE 4	33165	0	0	0	33165	28914	28914	0	34695	1530	0	0	0	0
PROJECT SUBTOTALS	1180149	10869	78051	91706	1077574	733885	723016	10869	878485	1530	0	211488	169757	381245
LOSS DUE TO CLEAR. & GRUB	-26500				-26500					0		-26500		-26500
GRADE POINT UNDERCUT			445	0	0	445	445	0	534	534		0	445	445
CONTINGENCY UNDERCUT	0		1000		0	1000	1000	0	1200	1200		0	1000	1000
SHOULDER MATERIAL						53490	53490	0	64188	64188				
SELECT GRANULAR MAT. TO REPL. BORROW									-3600	-3600				
PROJECT TOTALS	1153649	10869	79496	91706	1051074	788820	777951	10869	940807	63852	0	184988	171202	356190
REPLACE TOP SOIL BOR. PITS										3193				
GRAND TOTALS	1153649		79496							67045				
SAY	**1153700**		**79496**							**67100**				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U-2524C
SHEET NO.
4
0
50
100
FEET
260+00
NC GRID NAD 83
BEGIN R/W ACQUISITION U-2524C
END STATE PROJECT U-2524BB
BEGIN STATE PROJECT U-2524C
POC STA.265+74.75 -L-
(FORMERLY METRIC STA.81+00.000)
265+00
U-2524BB
(UNDER CONSTRUCTION,
JUNE 2007)
-L-
RESIDUAL
MATCH LINE -L- STA 267+00 SEE SHEET 5
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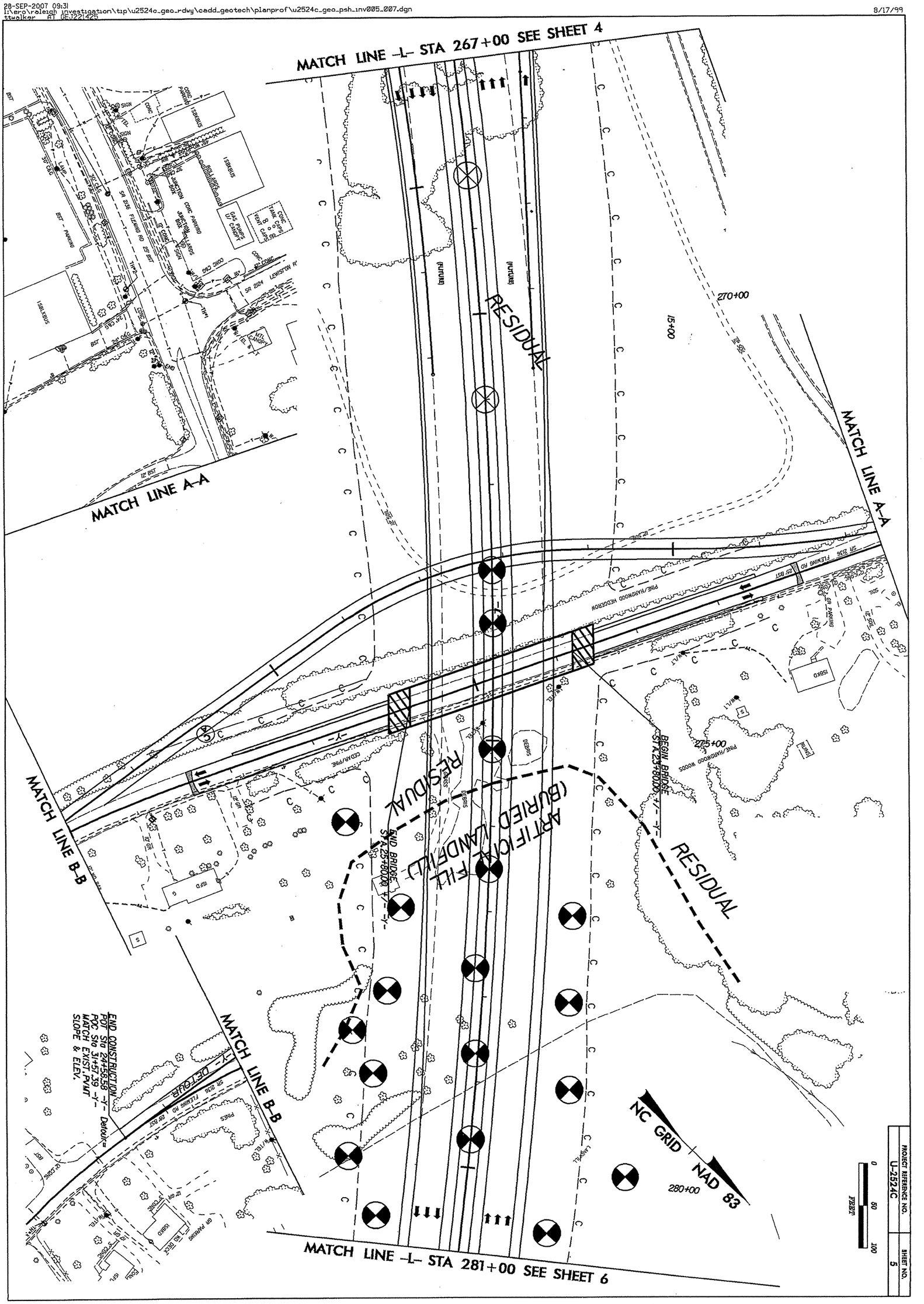

MATCH LINE –L– STA 281+00 SEE SHEET 5

ARTIFICIAL FILL (BURIED LANDFILL)

RESIDUAL

RESIDUAL

RESIDUAL

285+00

290+00

295+00

NC GRID | NAD 83

MATCH LINE –L– STA 295+00 SEE SHEET 7

PROJECT REFERENCE NO.	SHEET NO.
U-2524C	6

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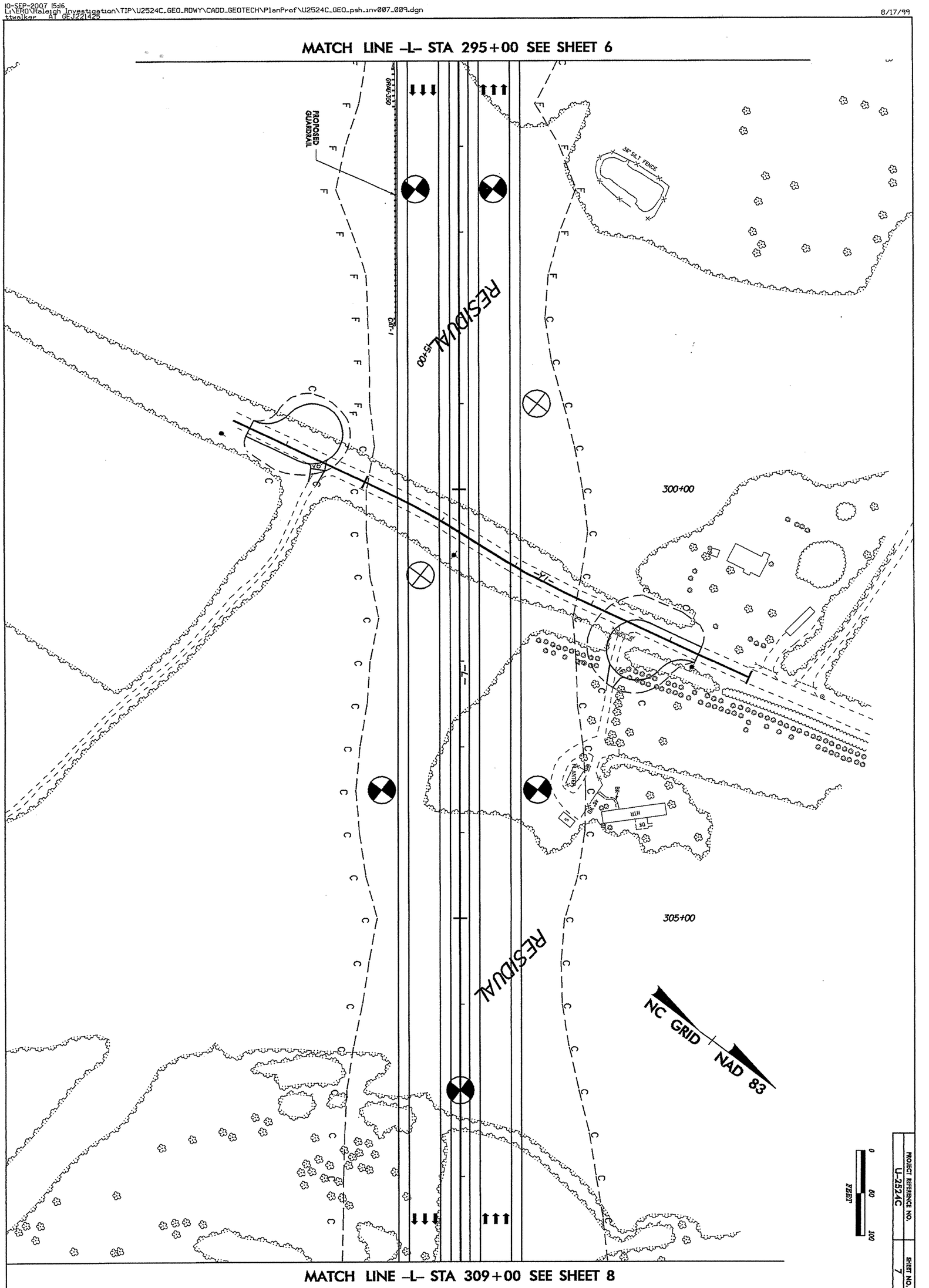

PROJECT REFERENCE NO. U-2524C

SHEET NO. 7

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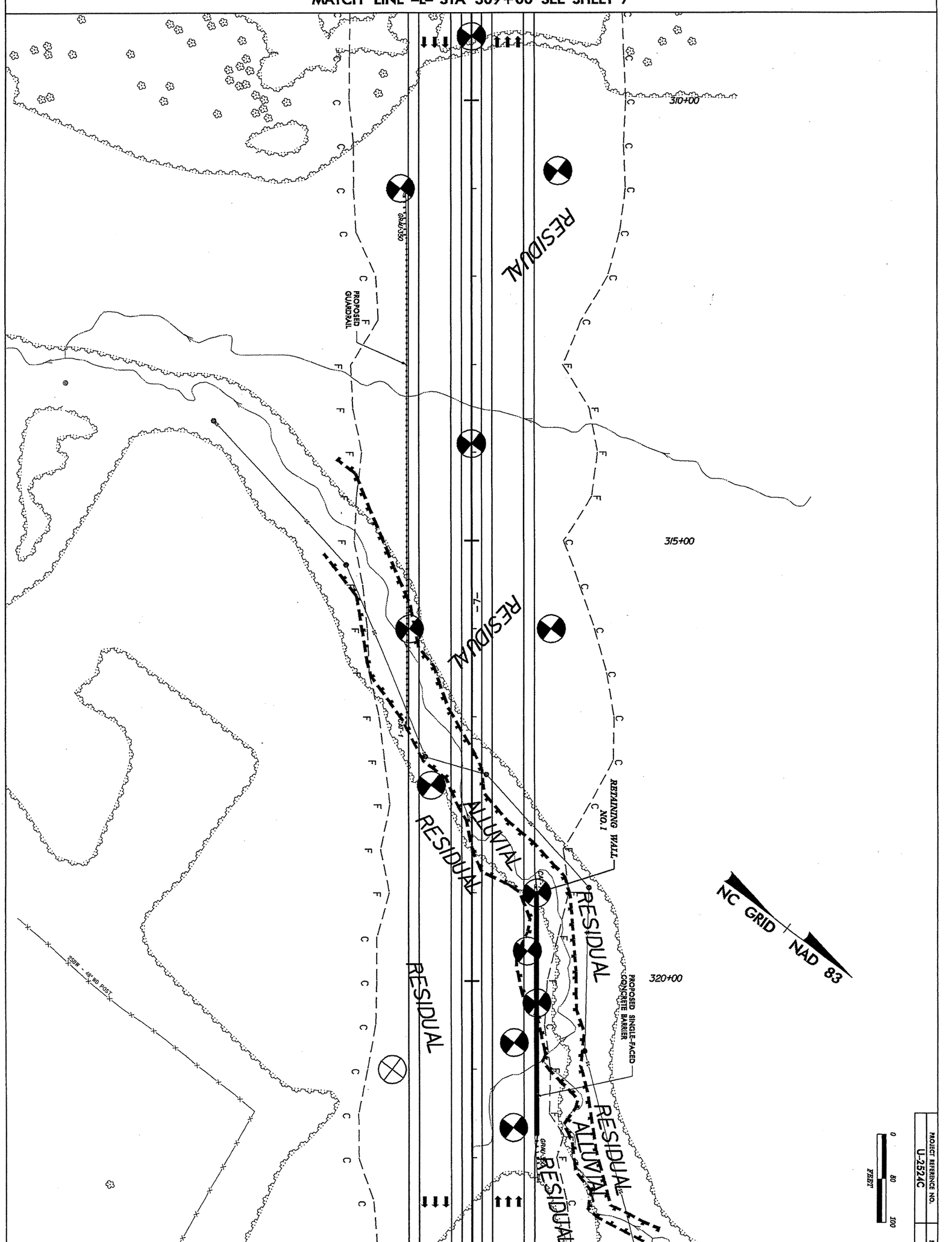
MATCH LINE -L- STA 309+00 SEE SHEET 7



MATCH LINE -L- STA 323+00 SEE SHEET 9

PROJECT REFERENCE NO.	SHEET NO.
U-2524C	8

PROJECT REFERENCE NO.	SHEET NO.
U-2524C	9

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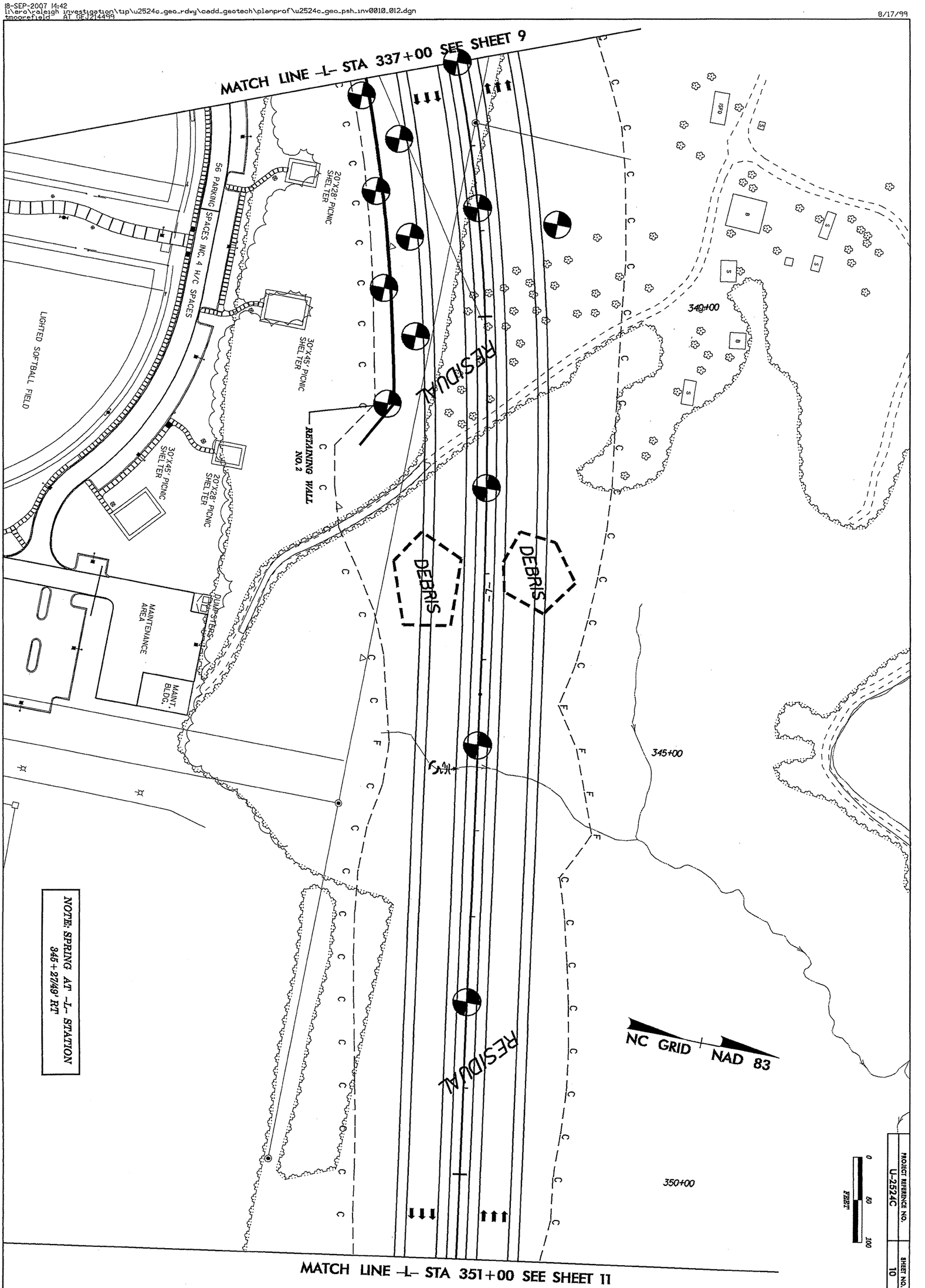

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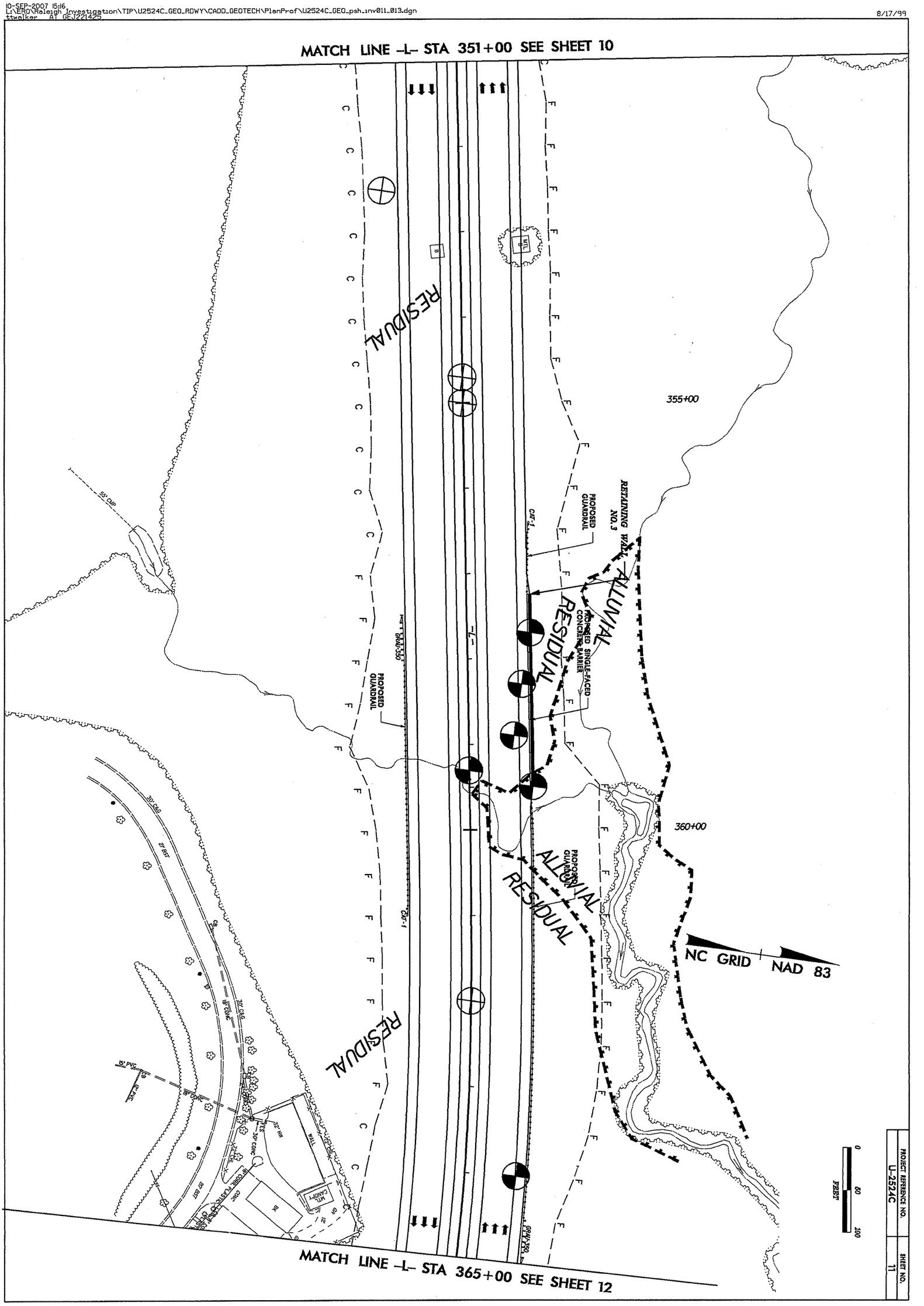

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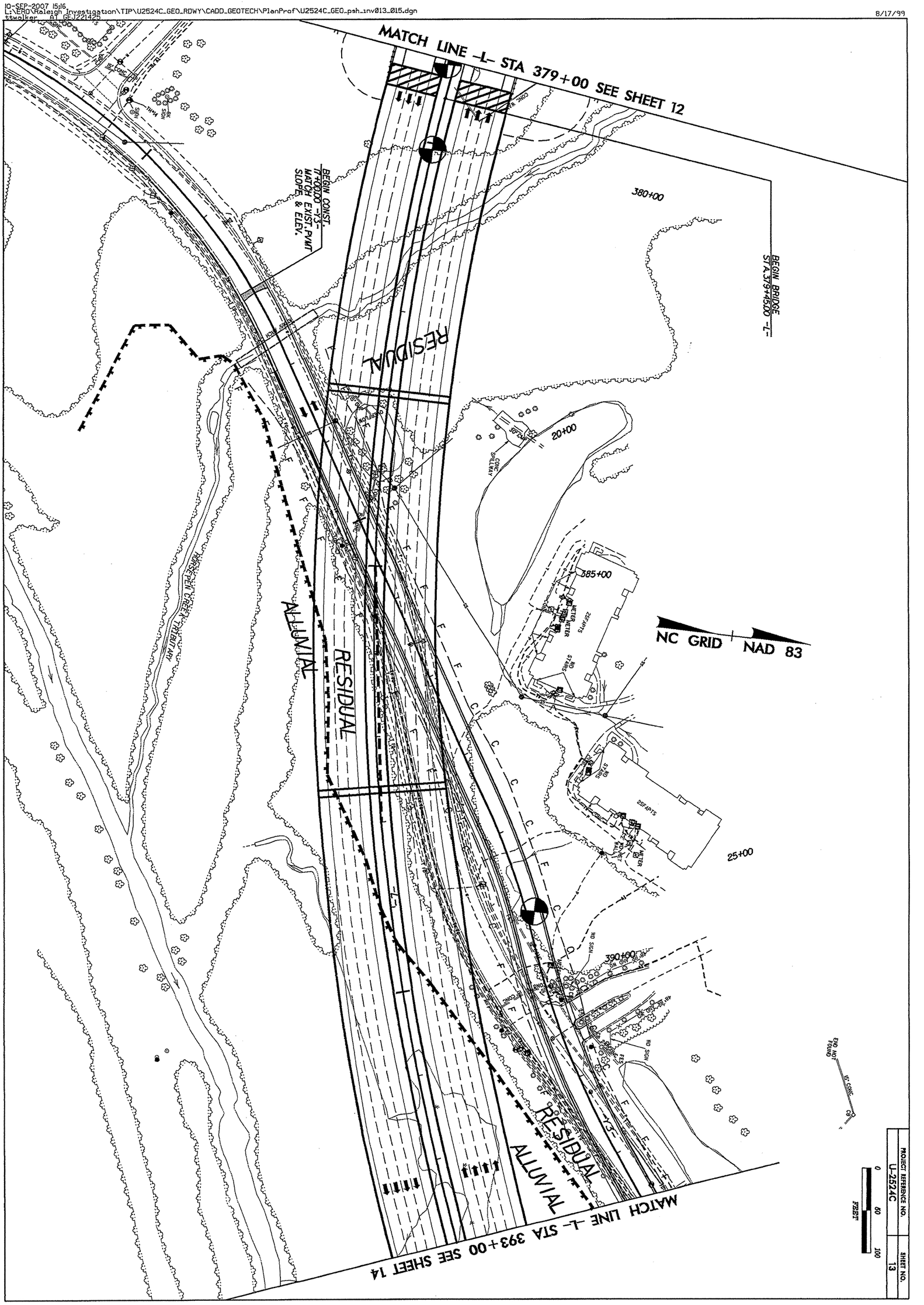
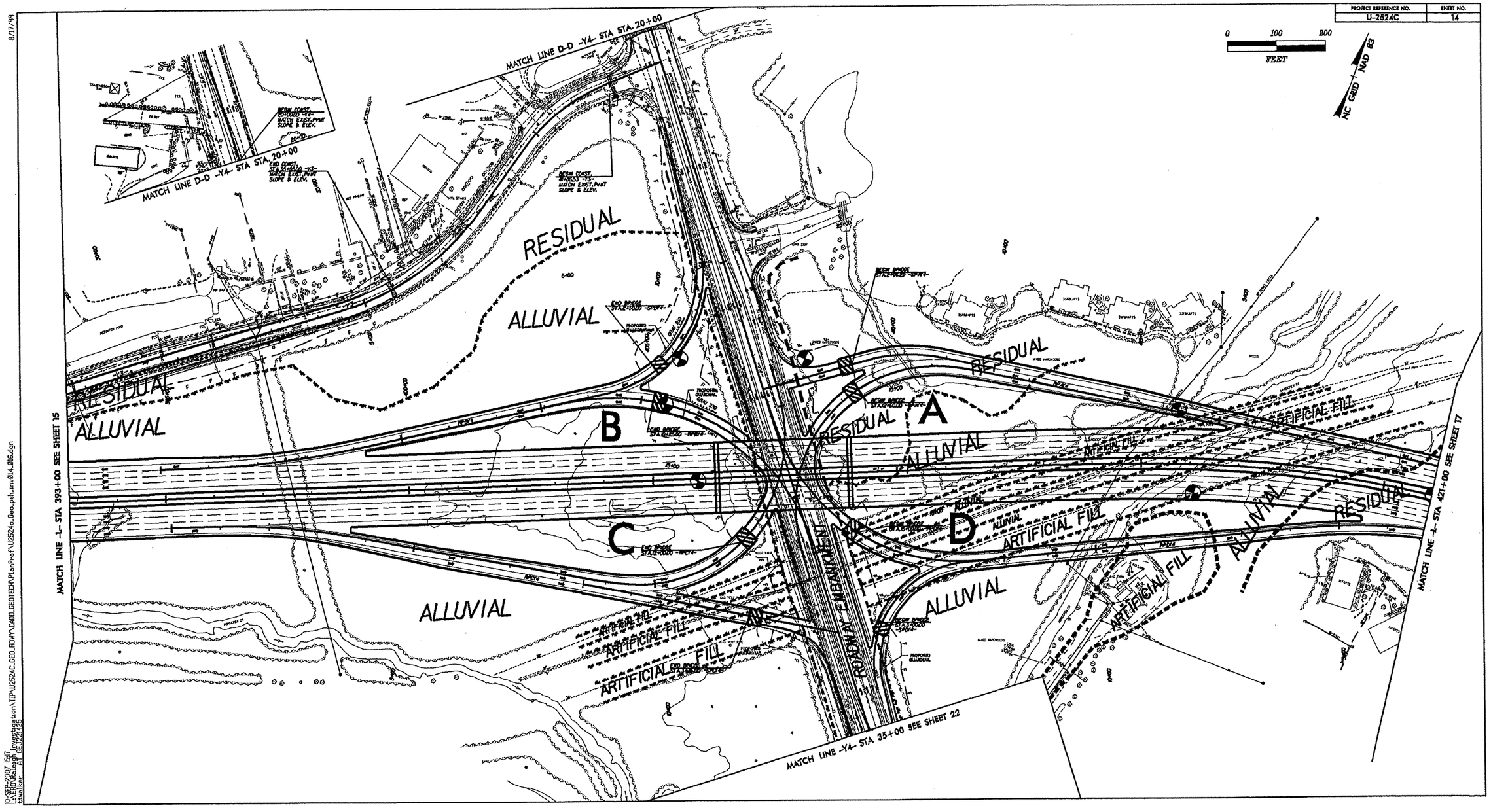
8/17/99





8/17/99

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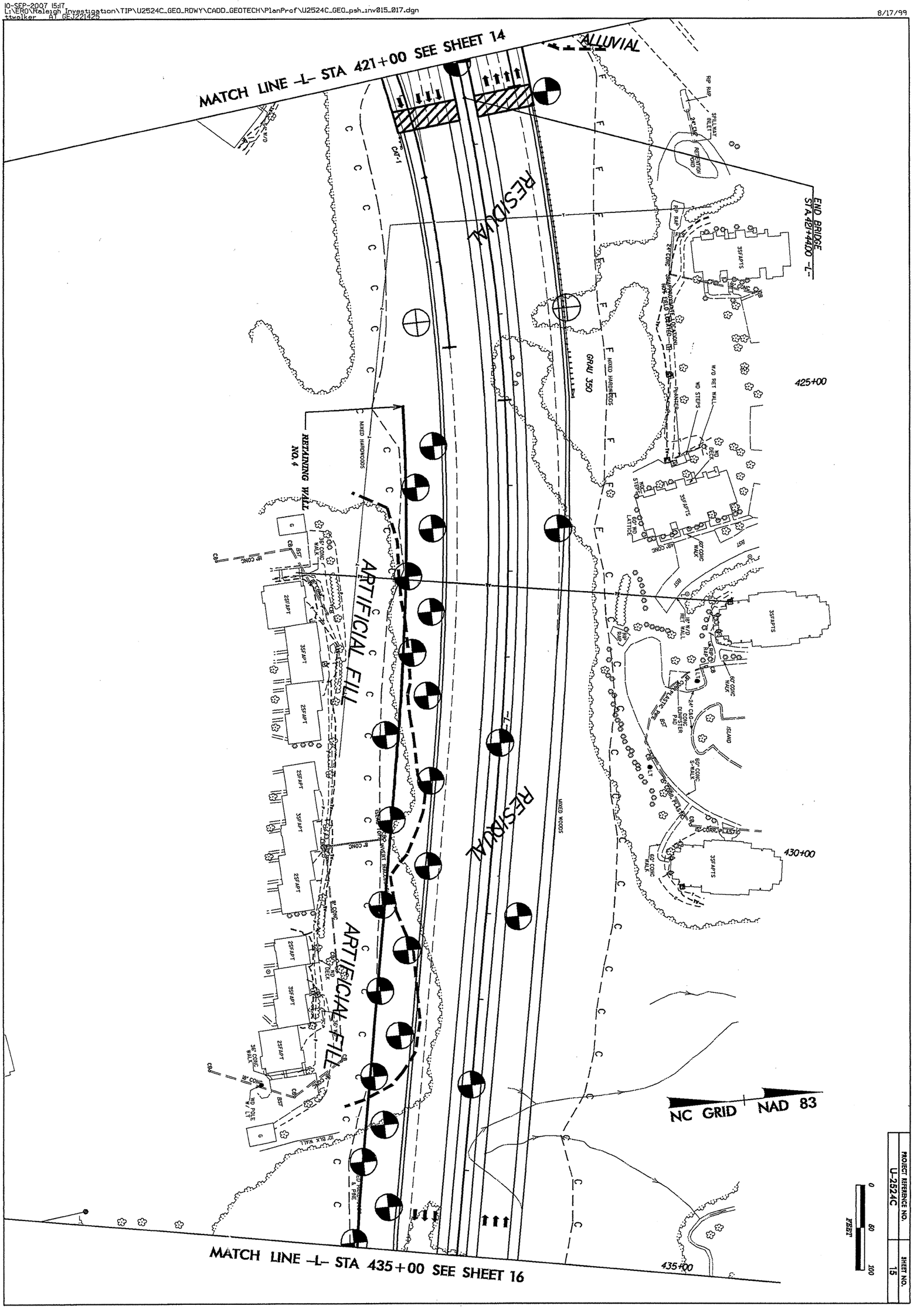

8/17/99

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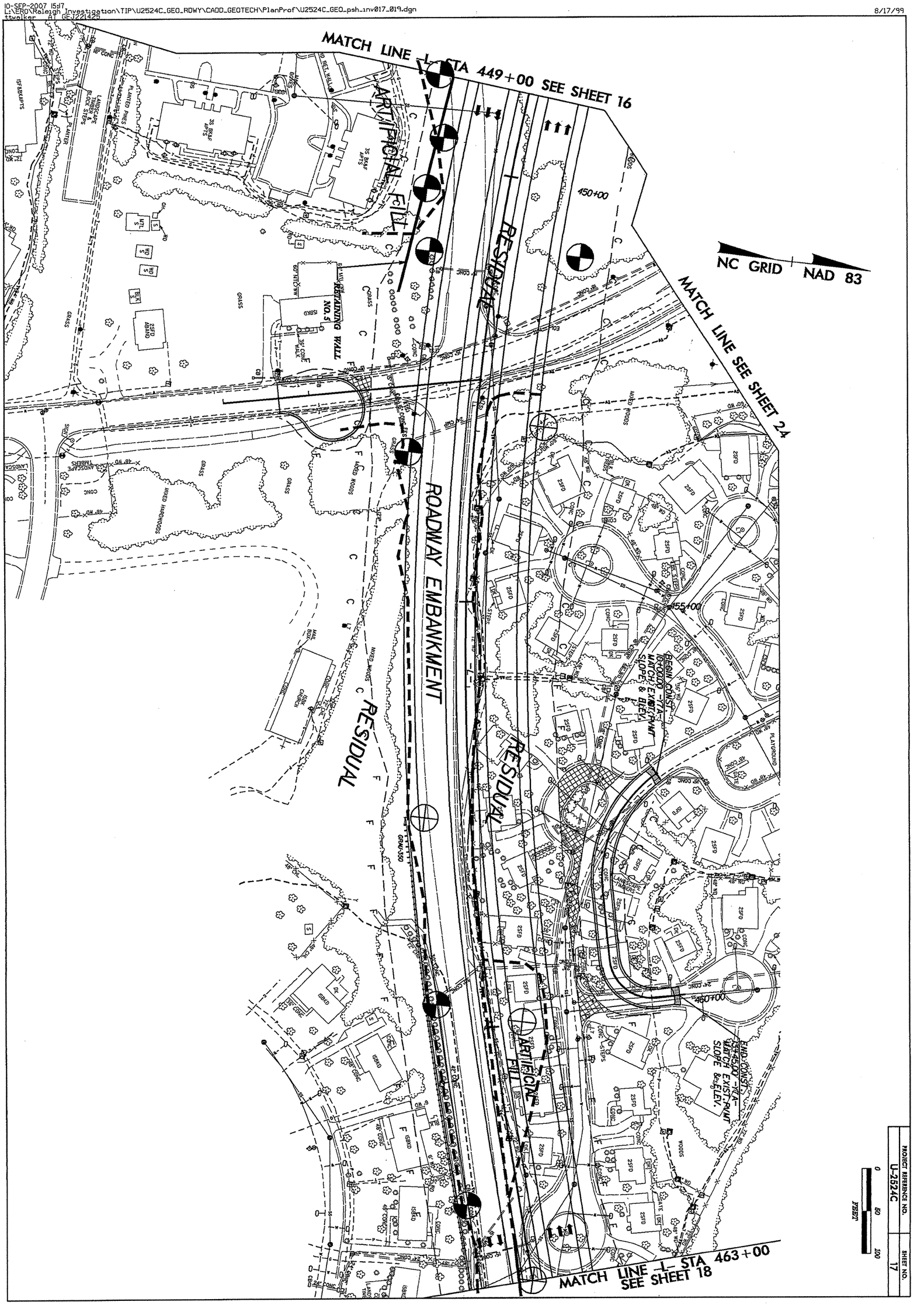
ttwalker AT GEJ221425

8/17/99



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U-2524C	18

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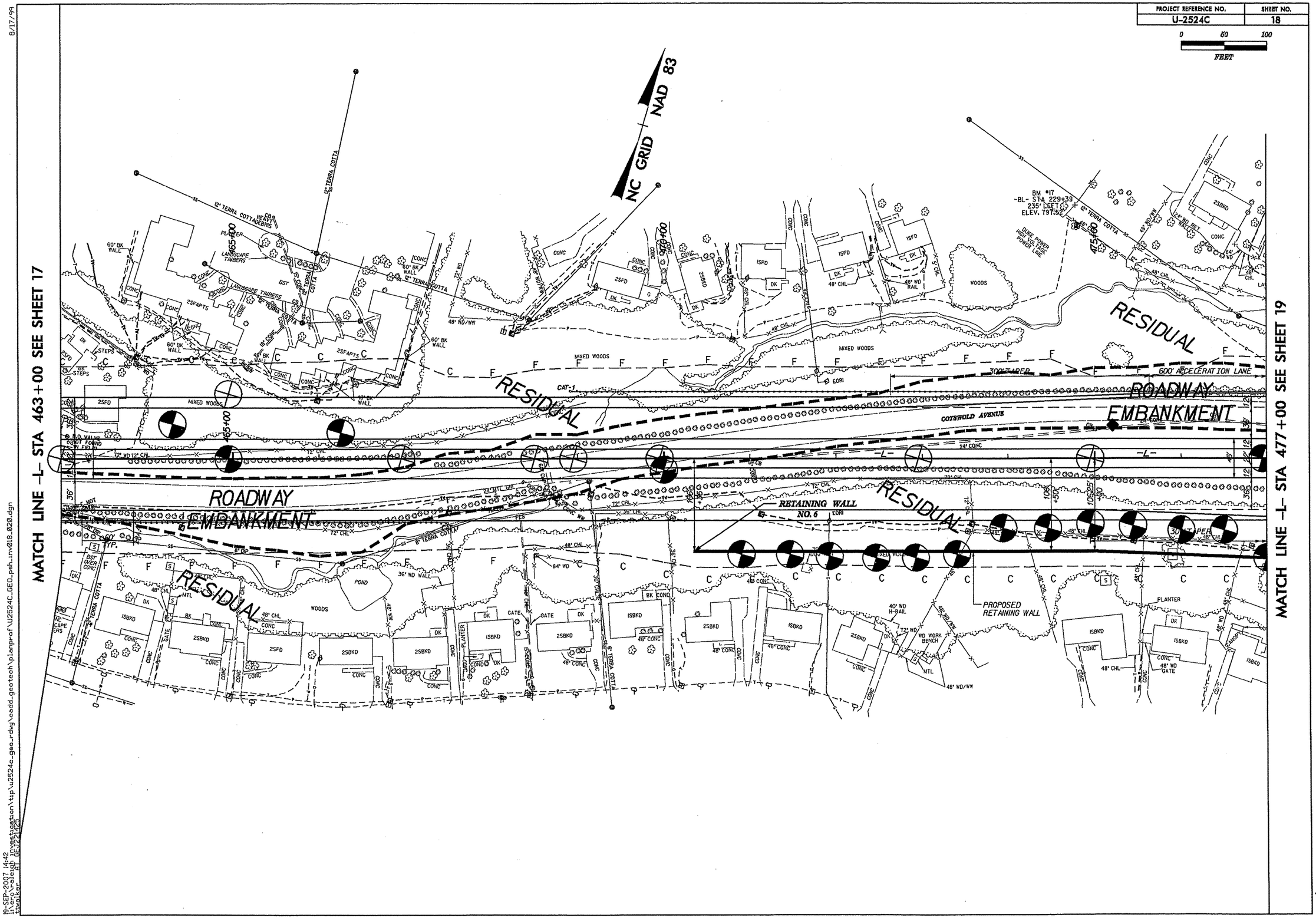

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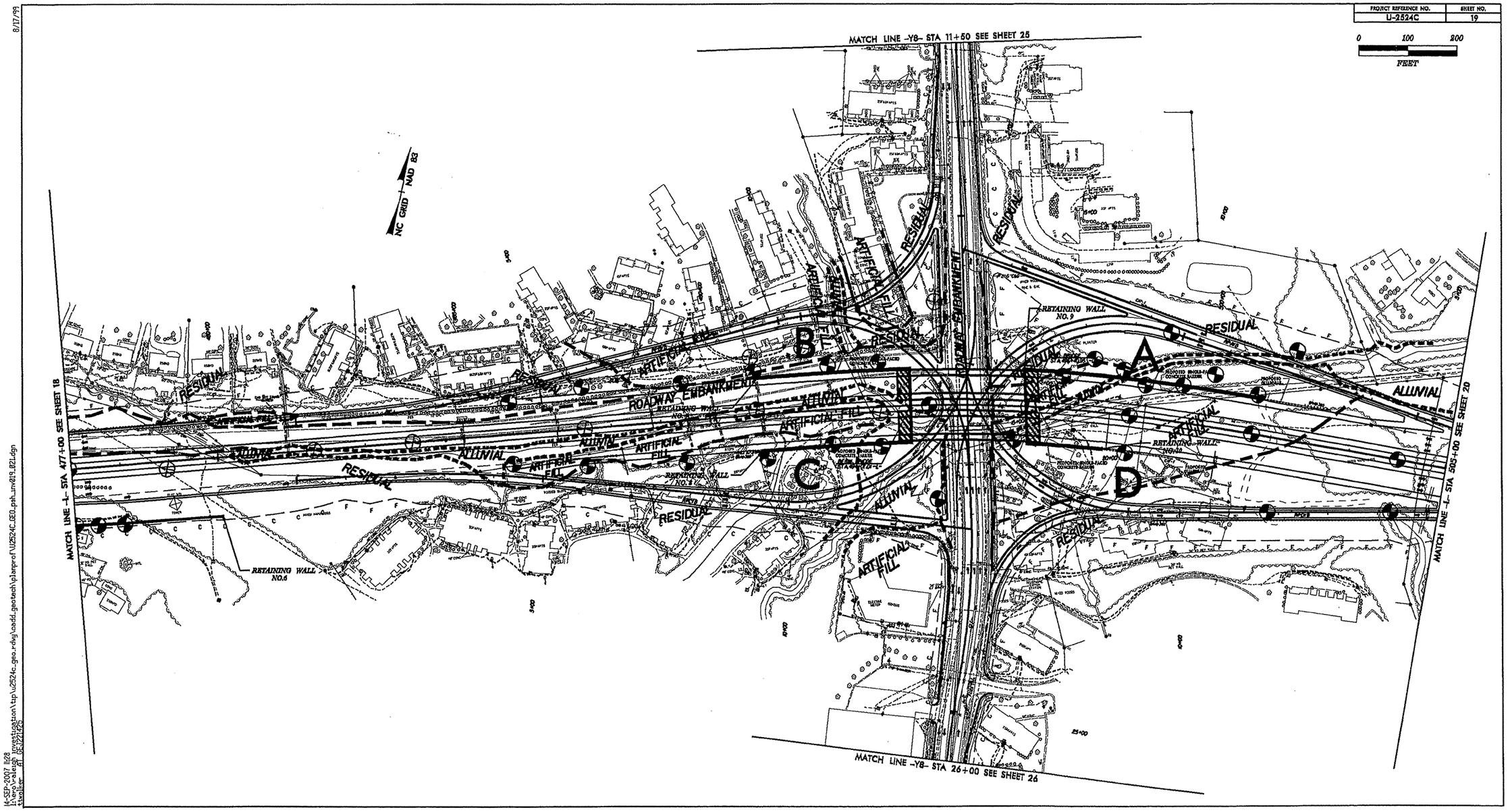

8/17/99

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ttwalker AT GEJ221425

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2524C	20

0 50 100
FEET

NC GRID NAD 83

MATCH LINE -L- STA 505+00 SEE SHEET 19

505+00

510+00

515+00

END CONSTRUCTION
END STATE PROJECT U-2524C
BEGIN STATE PROJECT U-2525
POT STA. 519+00.00 -L-

MIXED WOODS

ALLUVIAL

GRAV-350

-L-

RESIDUAL

CAT-1

RESIDUAL

500+00

10-SEP-2007 15:19
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tkoelker AT GEU221425

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2524C	21

0 50 100
FEET

NC GRID NAD 83

15+00

ISBKD

ISBKD

4" CMP

PINES

ISBK

12" CONC

12" CONC

12" CONC

-Y2-

-Y2- Detour

RESIDUAL

MATCH LINE -L- STA 19+00 SEE SHEET 9

42" CONC

GATE

15" CONC

15" CONC

GATE

GRASS 15" CONC

GRASS

FLAG POLE

18" CONC

15" CONC

15" CONC

15" CONC

CB

24" CONC

GRASS

CANOPY

CANOPY

ISBK
CALDWELL ACADEMY SCHOOL

BK

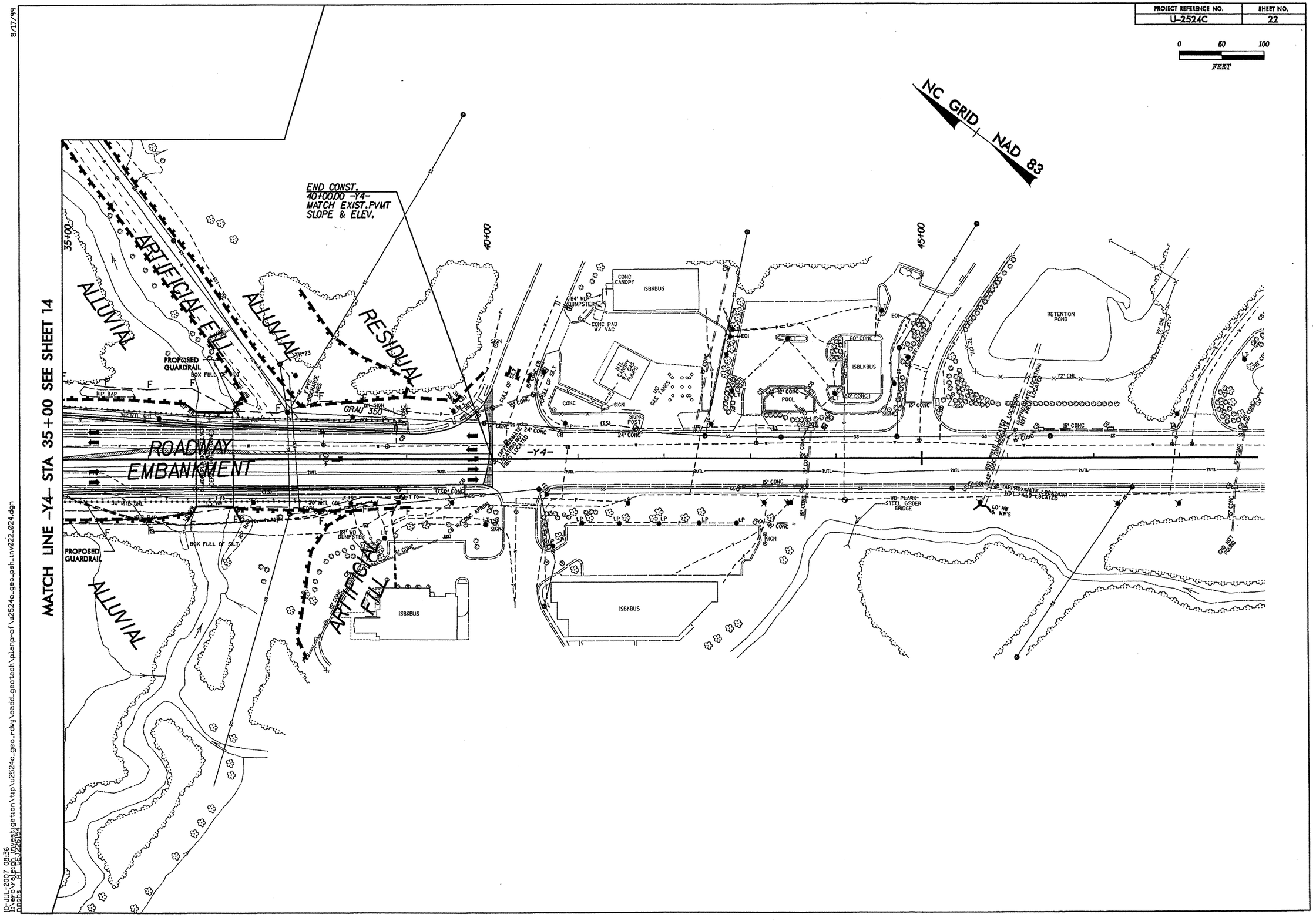
CONC

BEGIN CONSTRUCTION
PC Sta 10+00.00 -Y2- Detour=
Sta 14+99.73 -Y2-
MATCH EXIST. PVMT
SLOPE & ELEV.

15+00

10-JUL-2007 08:34
n:\work\planning\projects\transportation\tip\u2524c_geo_rdwg\cadd_geotech\planprof\u2524c_geo_psh_inv021_023.dgn
mpope

PROJECT REFERENCE NO.	SHEET NO.
U-2524C	22



MATCH LINE -Y4- STA 35+00 SEE SHEET 14

8/17/99

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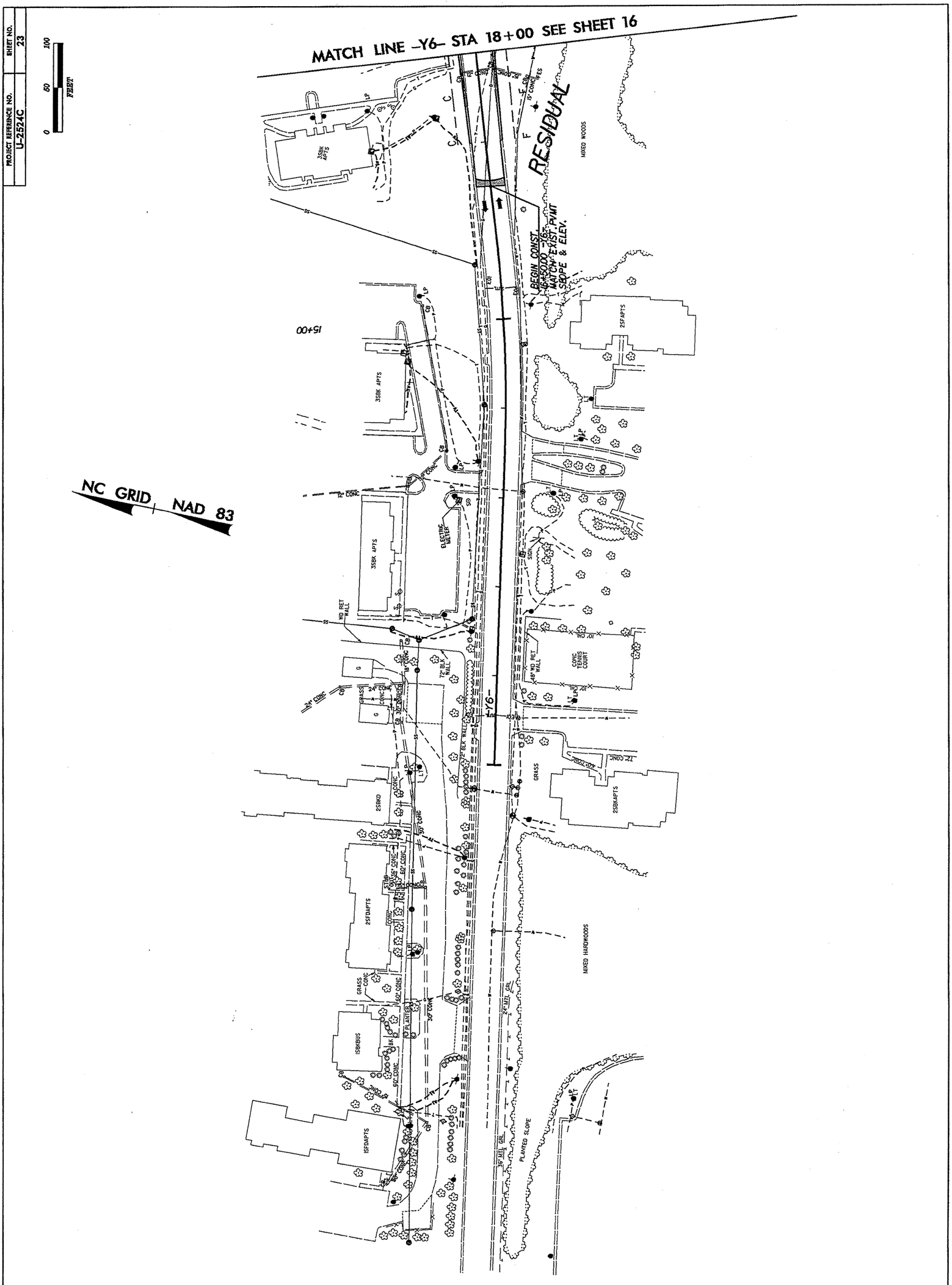
pmphs AT GE1226154



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mmohs AT GEV226154

8/17/99

10-JUL-2007 08:38
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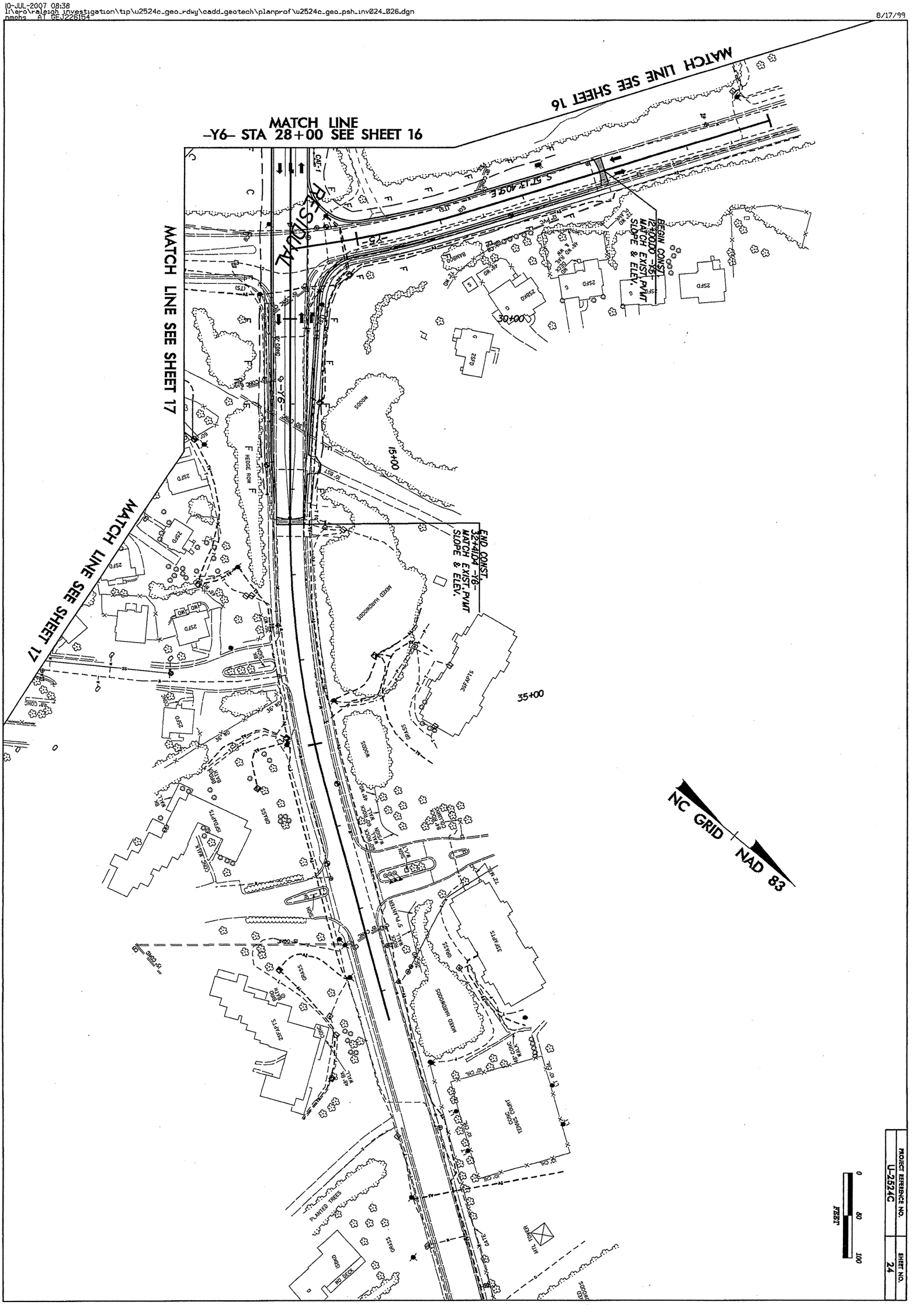
nmohs AT GEJ226154
8/17/99



8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2524C	25

0 50 100
FEET

NC GRID | NAD 83

BEGIN CONST.
10+00.00 -Y8-
MATCH EXIST.PVMT
SLOPE & ELEV.

RESIDUAL

Y8

MATCH LINE -Y8- STA 11+50 SEE SHEET 19

10-JUL-2007 08:39
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mmoss

PROJECT REFERENCE NO.	SHEET NO.
U-2524C	26

0 50 100
FEET

MATCH LINE -Y8- STA 26+00 SEE SHEET 19

8/17/99

10-JUL-2007 08:40
l:\ero\raleigh investigation\tip\u2524c_geo_rdwy\cadd_geotech\planprof\u2524c_geo_psh_inv026_028.dgn
nmohs AT GEJ226154

PROJECT REFERENCE NO.	SHEET NO.
U-2524C	27

(A) RESIDUAL, RED-TAN, MEDIUM STIFF, MOIST, SILTY CLAY

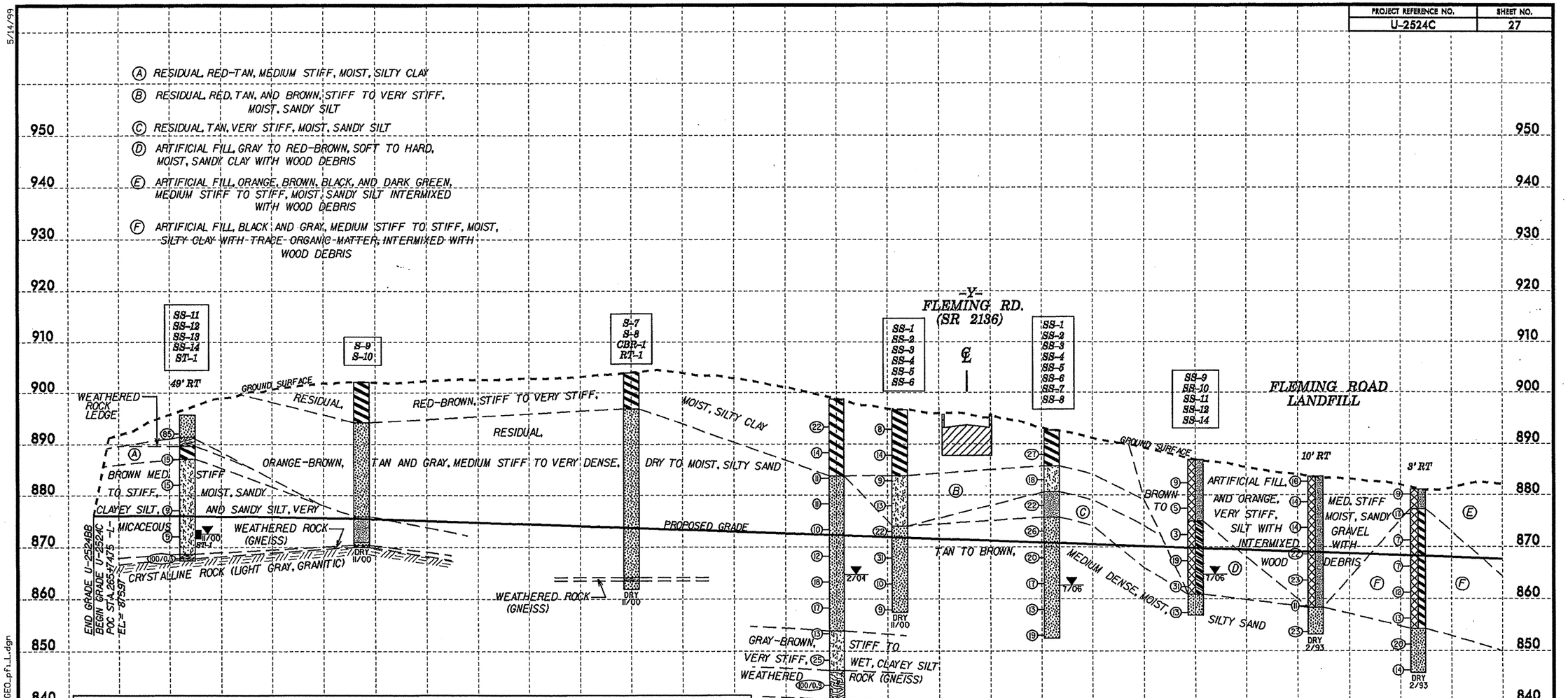
(B) RESIDUAL, RED, TAN, AND BROWN, STIFF TO VERY STIFF, MOIST, SANDY SILT

(C) RESIDUAL, TAN, VERY STIFF, MOIST, SANDY SILT

(D) ARTIFICIAL FILL, GRAY TO RED-BROWN, SOFT TO HARD, MOIST, SANDY CLAY WITH WOOD DEBRIS

(E) ARTIFICIAL FILL, ORANGE, BROWN, BLACK, AND DARK GREEN, MEDIUM STIFF TO STIFF, MOIST, SANDY SILT INTERMIXED WITH WOOD DEBRIS

(F) ARTIFICIAL FILL, BLACK AND GRAY, MEDIUM STIFF TO STIFF, MOIST, SILTY CLAY WITH TRACE ORGANIC MATTER, INTERMIXED WITH WOOD DEBRIS



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-11	49' RT	266+67	2.6-4.1	A-2-4(0)	33	NP	39.9	31.4	16.6	12.1	85	63	29	–	–
SS-12	49' RT	266+67	7.6-9.1	A-7-5(14)	57	16	6.6	30.0	51.3	12.1	97	92	72	35.3	–
SS-13	49' RT	266+67	12.6-14.0	A-5(0)	43	NP	30.2	32.0	25.7	12.1	96	77	42	17.2	–
SS-14	49' RT	266+67	22.4-24.0	A-5(0)	48	NP	26.4	39.7	21.9	12.1	99	88	39	44.0	–
ST-1	49' RT	266+67	22.4-24.4	A-2-4(0)	34	4	49.8	25.8	16.3	8.1	93	57	27	19.7	–
S-9	CL	268+37	8.0-22.0	A-2-4(0)	30	NP	49.1	26.6	12.2	12.1	88	57	25	–	–
S-10	CL	268+37	27.0-32.0	A-4(0)	36	NP	36.5	30.2	19.2	14.1	98	75	37	–	–
S-7	CL	271+00	12.1-17.1	A-2-4(0)	27	NP	43.7	29.8	14.4	12.1	99	70	31	–	–
S-8	CL	271+00	22.1-27.1	A-2-4(0)	31	NP	43.6	29.8	14.6	12.1	99	72	31	–	–
CBR-1	CL	271+00	22.1-31.4	A-2-4(0)	37	10	44.9	28.0	13.1	14.1	97	67	32	–	–
RT-1	CL	271+00	7.1-17.1	A-4(0)	30	NP	33.8	34.0	18.1	14.1	97	77	38	–	–
SS-1	CL	273+62	2.8-4.3	A-7-6(18)	55	29	22.6	15.3	13.8	48.3	100	85	65	–	–
SS-2	CL	273+62	7.8-9.3	A-7-5(4)	46	14	30.2	27.8	19.8	22.2	100	79	47	–	–
SS-3	CL	273+62	12.8-14.2	A-5(11)	41	10	34.8	27.8	21.2	16.1	100	77	42	–	–
SS-4	CL	273+62	22.7-24.2	A-2-4(0)	33	NP	49.9	33.4	10.6	6.0	100	70	20	–	–
SS-5	CL	273+62	33.9-34.2	A-2-4(0)	32	NP	36.3	46.1	9.6	8.1	100	89	21	–	–
SS-6	CL	273+62	37.7-39.2	A-2-4(0)	36	4	44.8	28.1	17.0	10.1	99	68	32	–	–
SS-1	CL	275+10	3.7-5.2	A-7-6(6)	42	16	39.1	13.2	15.3	32.4	98	79	52	–	–
SS-2	CL	275+10	8.7-10.2	A-5(0)	51	NP	13.2	45.2	19.4	22.3	100	96	50	–	–
SS-3	CL	275+10	13.7-15.2	A-4(0)	30	4	35.7	29.6	18.5	16.2	98	75	40	–	–
SS-4	CL	275+10	18.7-20.2	A-2-4(0)	32	4	45.0	27.0	15.9	12.2	97	66	33	–	–
SS-5	CL	275+10	23.7-25.0	A-2-4(0)	32	NP	40.7	30.2	18.9	10.1	100	74	35	–	–
SS-6	CL	275+10	28.7-30.0	A-2-4(0)	34	NP	44.0	29.4	14.5	12.2	90	59	29	–	–
SS-7	CL	275+10	33.7-35.0	A-2-4(0)	40	NP	38.9	32.6	18.3	10.1	100	75	34	–	–
SS-8	CL	275+10	38.7-40.0	A-2-4(0)	36	NP	47.4	26.7	15.7	10.1	99	65	31	–	–
SS-9	CL	276+50	3.5-5.0	A-4(11)	25	6	19.7	26.1	31.9	22.3	83	71	51	–	–
SS-10	CL	276+50	8.5-10.0	A-4(4)	35	9	15.2	28.0	34.5	22.3	92	80	60	–	5.8
SS-11	CL	276+50	13.5-15.0	A-6(8)	37	15	12.4	26.5	30.7	30.4	91	84	63	–	7.7
SS-12	CL	276+50	18.5-20.0	A-6(2)	39	13	19.5	25.1	23.0	32.4	65	57	40	–	8.0
SS-14	CL	276+50	28.5-30.0	A-2-5(0)	42	6	48.2	20.9	16.7	14.2	96	59	35	–	–

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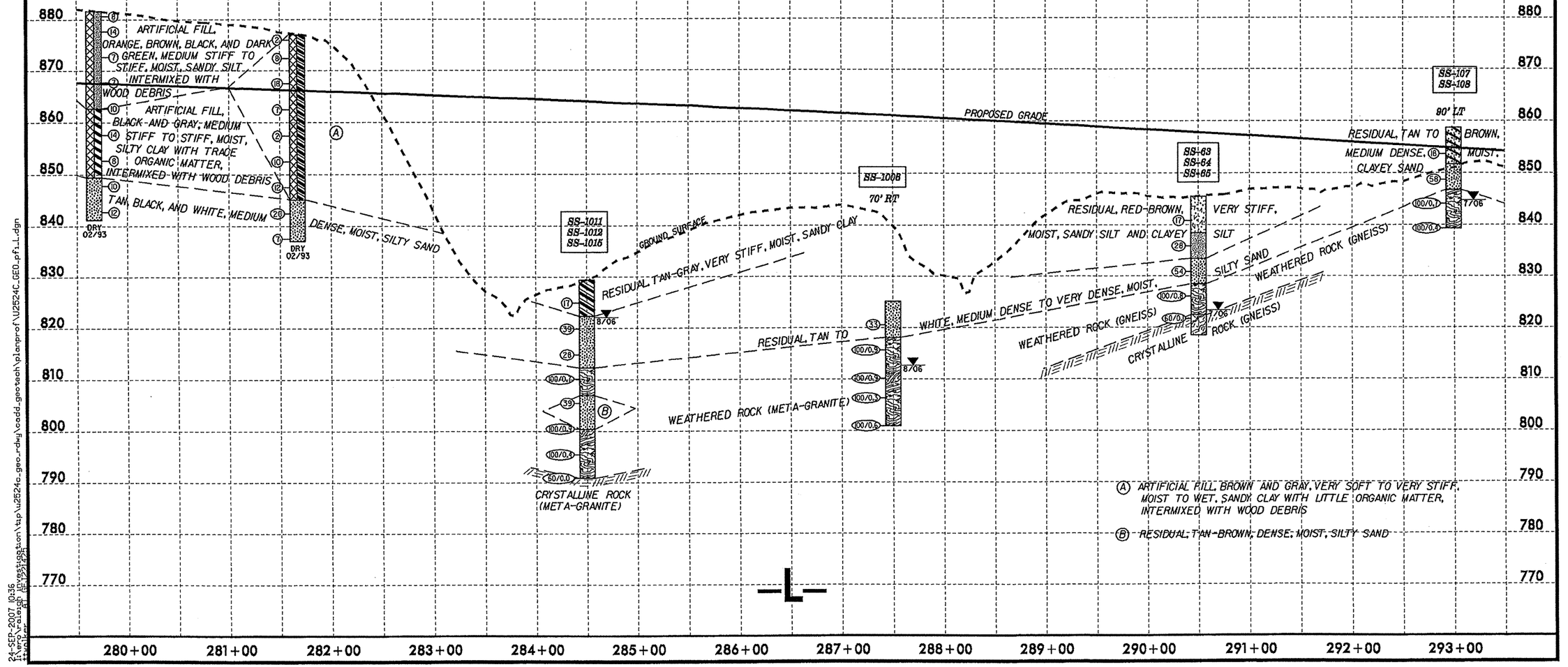
tmalker AT GE12125R

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
U-2524C	28

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-1011	CL	284+50	3.5-5.0	A-6(11)	29	14	38.8	26.1	10.0	25.1	95	67	37	-	-
SS-1012	CL	284+50	8.5-10.0	A-2-4(0)	28	3	52.9	26.7	11.3	9.0	91	57	22	-	-
SS-1015	CL	284+50	23.5-25.0	A-2-4(0)	31	NP	45.8	30.5	15.7	8.0	96	69	27	-	-
SS-1006	70' RT	287+50	3.5-5.0	A-2-4(0)	26	NP	49.2	28.1	12.7	10.0	89	59	24	-	-
SS-63	CL	290+50	3.6-5.1	A-5(11)	42	8	22.9	40.7	20.2	16.2	98	84	43	-	-
SS-64	CL	290+50	8.6-10.1	A-4(0)	40	8	36.0	33.2	16.6	14.2	97	76	36	-	-
SS-65	CL	290+50	13.6-15.1	A-2-4(0)	23	NP	38.3	39.5	14.2	8.1	93	71	27	-	-
SS-107	90' LT	293+00	4.0-5.5	A-2-6(11)	40	13	42.9	25.7	13.2	18.2	89	61	32	-	-
SS-108	90' LT	293+00	9.0-10.5	A-2-4(0)	27	NP	52.6	28.3	13.0	6.1	89	54	21	-	-



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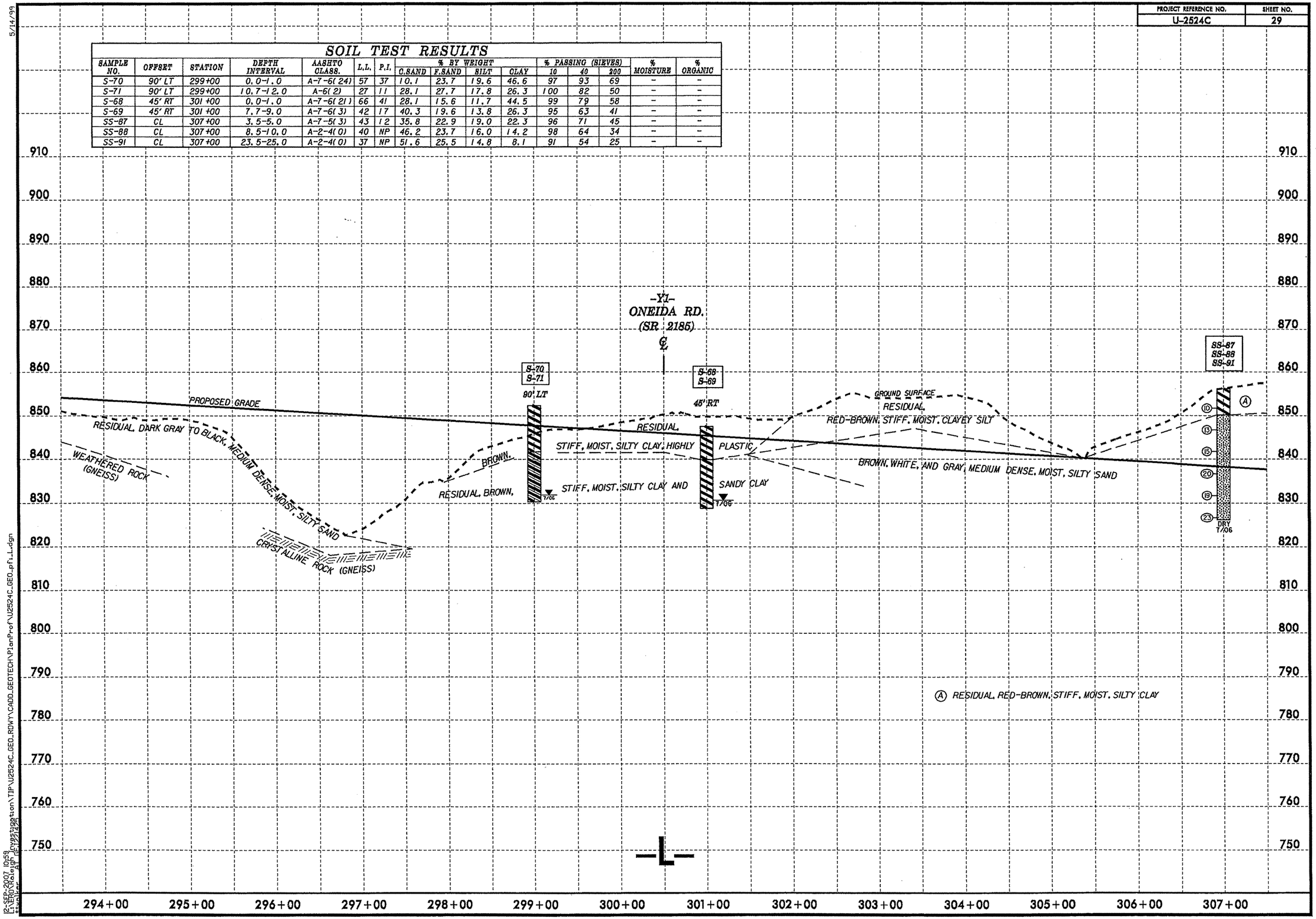
tmoore

PROJECT REFERENCE NO.	SHEET NO.
U-2524C	29

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-70	90' LT	299+00	0.0-1.0	A-7-6(24)	57	37	10.1	23.7	19.6	46.6	97	93	69	-	-
S-71	90' LT	299+00	10.7-12.0	A-6(2)	27	11	28.1	27.7	17.8	26.3	100	82	50	-	-
S-68	45' RT	301+00	0.0-1.0	A-7-6(21)	66	41	28.1	15.6	11.7	44.5	99	79	58	-	-
S-69	45' RT	301+00	7.7-9.0	A-7-6(3)	42	17	40.3	19.6	13.8	26.3	95	63	41	-	-
SS-87	CL	307+00	3.5-5.0	A-7-5(3)	43	12	35.8	22.9	19.0	22.3	96	71	45	-	-
SS-88	CL	307+00	8.5-10.0	A-2-4(0)	40	NP	46.2	23.7	16.0	14.2	98	64	34	-	-
SS-91	CL	307+00	23.5-25.0	A-2-4(0)	37	NP	51.6	25.5	14.8	8.1	91	54	25	-	-



5/14/99

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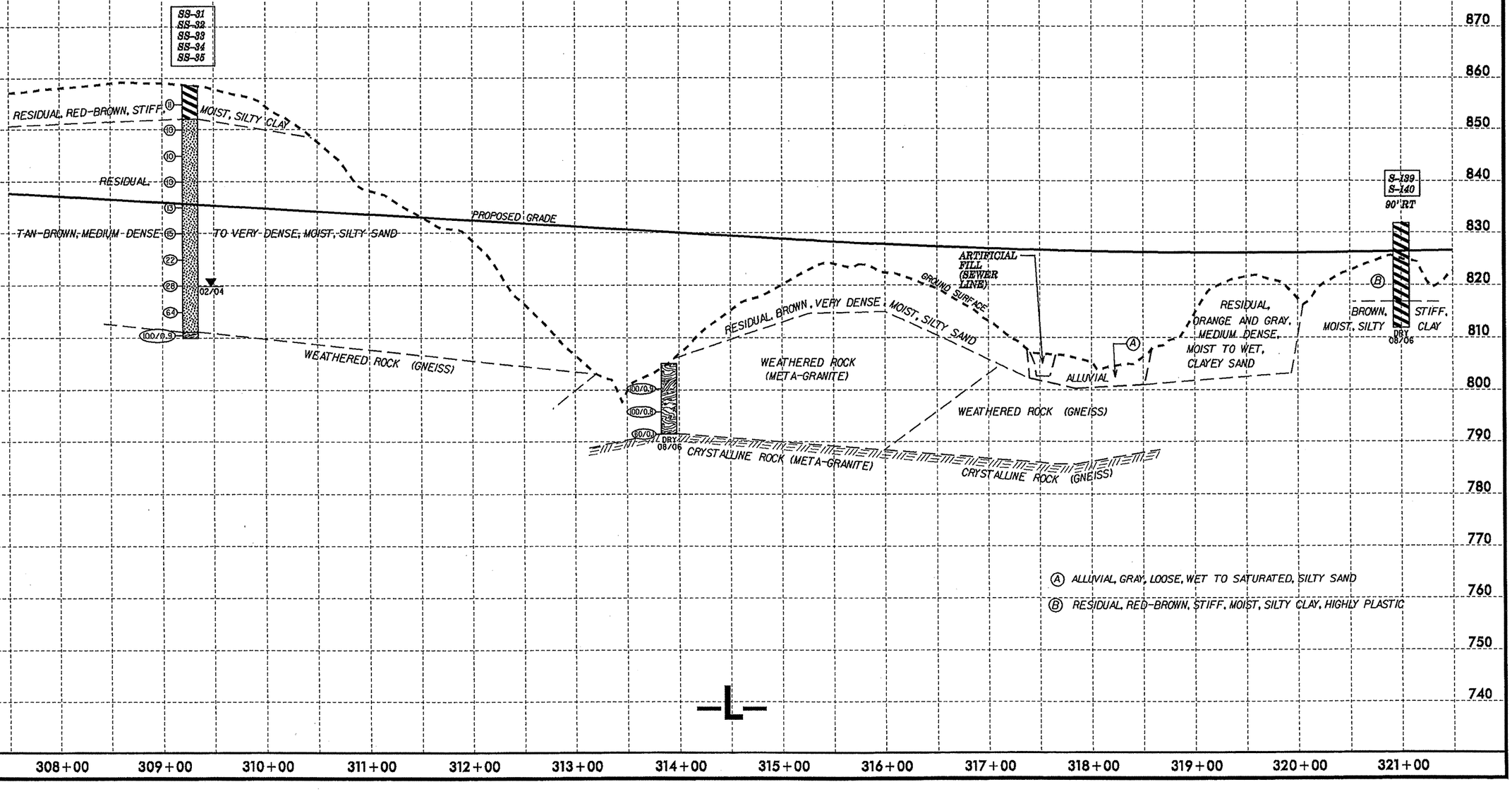
tswalker AM DF 12/12/2001

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
U-2524C	30

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-31	CL	309+27	2.7-4.2	A-7-5(4)	50	12	34.2	23.5	16.1	26.2	100	76	47	-	-
SS-32	CL	309+27	7.7-9.2	A-2-4(0)	37	NP	44.7	24.1	17.1	14.1	92	61	33	-	-
SS-33	CL	309+27	12.7-14.2	A-2-4(0)	33	NP	49.7	23.9	16.3	10.1	93	58	29	-	-
SS-34	CL	309+27	22.7-24.2	A-2-5(0)	41	NP	49.3	26.6	18.1	6.0	90	57	25	-	-
SS-35	CL	309+27	37.7-39.2	A-2-4(0)	32	NP	50.5	28.8	12.7	8.0	90	57	23	-	-
S-139	90' RT	321+00	3.0-4.5	A-7-5(16)	56	26	22.5	16.6	16.3	44.6	100	85	64	-	-
S-140	90' RT	321+00	15.0-16.0	A-7-5(8)	46	15	13.2	33.2	27.3	26.3	100	93	61	-	-



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tmoller
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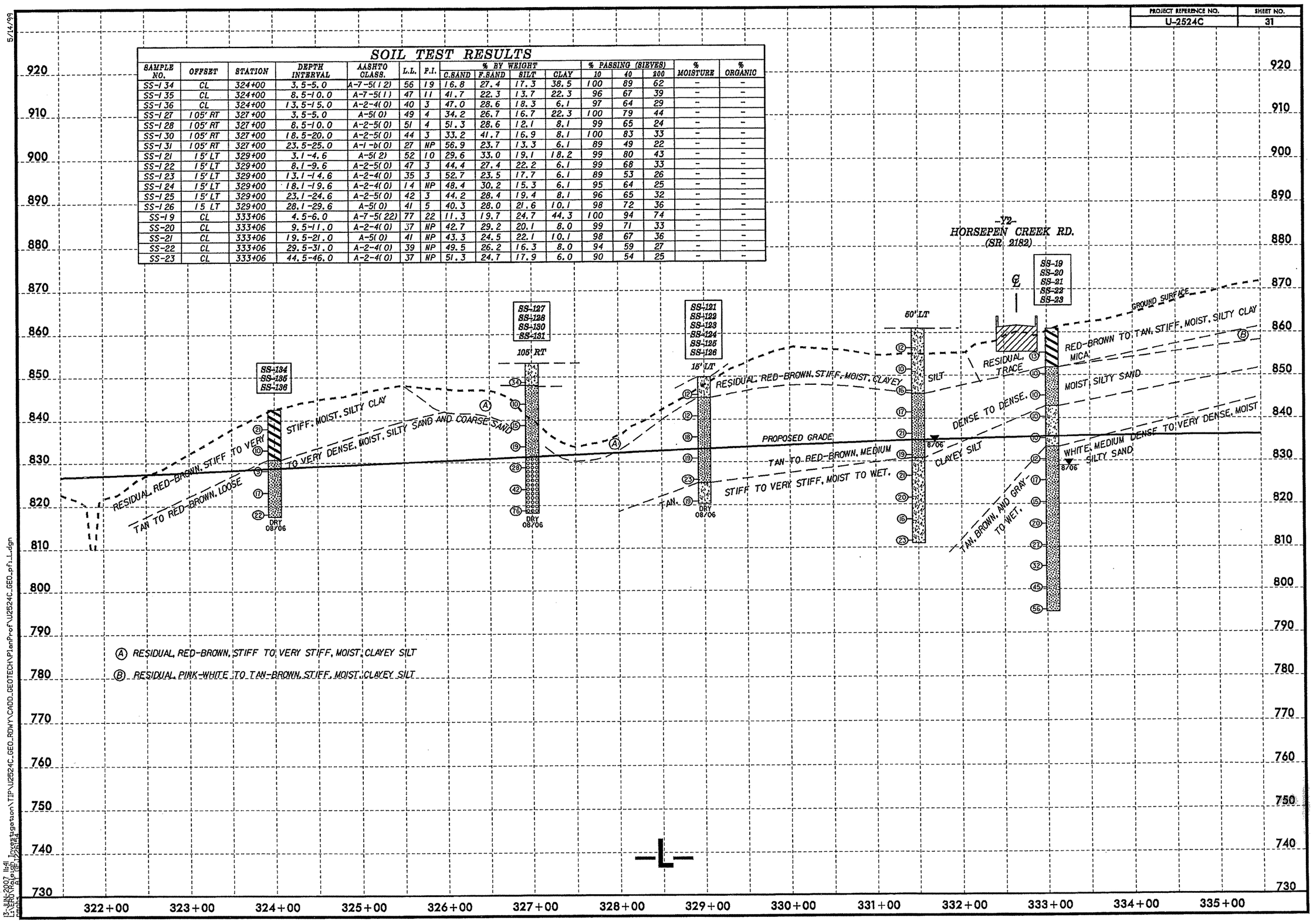
PROJECT REFERENCE NO.	SHEET NO.
U-2524C	31

5/14/99

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-I 34	CL	324+00	3.5-5.0	A-7-5(12)	56	19	16.8	27.4	17.3	38.5	100	89	62	-	-
SS-I 35	CL	324+00	8.5-10.0	A-7-5(11)	47	11	41.7	22.3	13.7	22.3	96	67	39	-	-
SS-I 36	CL	324+00	13.5-15.0	A-2-4(0)	40	3	47.0	28.6	18.3	6.1	97	64	29	-	-
SS-I 27	105' RT	327+00	3.5-5.0	A-5(0)	49	4	34.2	26.7	16.7	22.3	100	79	44	-	-
SS-I 28	105' RT	327+00	8.5-10.0	A-2-5(0)	51	4	51.3	28.6	12.1	8.1	99	65	24	-	-
SS-I 30	105' RT	327+00	18.5-20.0	A-2-5(0)	44	3	33.2	41.7	16.9	8.1	100	83	33	-	-
SS-I 31	105' RT	327+00	23.5-25.0	A-1-b(0)	27	NP	56.9	23.7	13.3	6.1	89	49	22	-	-
SS-I 21	15' LT	329+00	3.1-4.6	A-5(2)	52	10	29.6	33.0	19.1	18.2	99	80	43	-	-
SS-I 22	15' LT	329+00	8.1-9.6	A-2-5(0)	47	3	44.4	27.4	22.2	6.1	99	68	33	-	-
SS-I 23	15' LT	329+00	13.1-14.6	A-2-4(0)	35	3	52.7	23.5	17.7	6.1	89	53	26	-	-
SS-I 24	15' LT	329+00	18.1-19.6	A-2-4(0)	14	NP	48.4	30.2	15.3	6.1	95	64	25	-	-
SS-I 25	15' LT	329+00	23.1-24.6	A-2-5(0)	42	3	44.2	28.4	19.4	8.1	96	65	32	-	-
SS-I 26	15 LT	329+00	28.1-29.6	A-5(0)	41	5	40.3	28.0	21.6	10.1	98	72	36	-	-
SS-I 9	CL	333+06	4.5-6.0	A-7-5(22)	77	22	11.3	19.7	24.7	44.3	100	94	74	-	-
SS-20	CL	333+06	9.5-11.0	A-2-4(0)	37	NP	42.7	29.2	20.1	8.0	99	71	33	-	-
SS-21	CL	333+06	19.5-21.0	A-5(0)	41	NP	43.3	24.5	22.1	10.1	98	67	36	-	-
SS-22	CL	333+06	29.5-31.0	A-2-4(0)	39	NP	49.5	26.2	16.3	8.0	94	59	27	-	-
SS-23	CL	333+06	44.5-46.0	A-2-4(0)	37	NP	51.3	24.7	17.9	6.0	90	54	25	-	-



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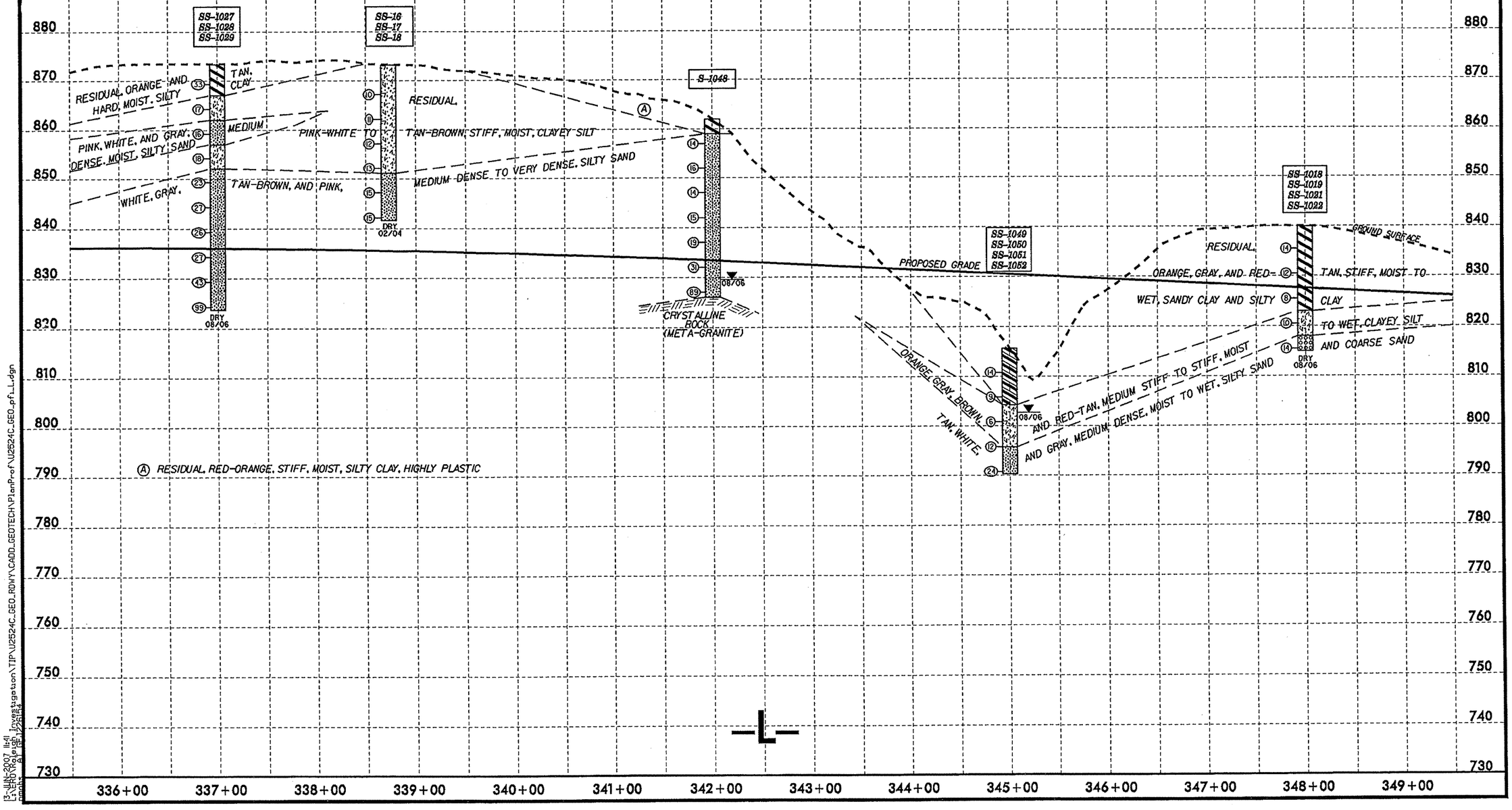
PROJECT REFERENCE NO.	SHEET NO.
U-2524C	32

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-1027	CL	337+00	3.0-4.5	A-7-5(10)	57	20	28.1	18.3	15.0	38.7	97	75	57	-	-
SS-1028	CL	337+00	8.0-9.5	A-5(0)	41	5	38.1	27.2	16.5	18.2	97	68	39	-	-
SS-1029	CL	337+00	13.0-14.5	A-2-4(0)	38	NP	45.4	27.6	14.9	12.2	99	67	33	-	-
SS-16	CL	338+73	5.0-6.5	A-5(2)	46	7	33.4	25.2	21.3	20.1	97	73	46	-	-
SS-17	CL	338+73	15.0-16.5	A-5(0)	41	NP	42.1	23.7	18.1	16.1	96	66	38	-	-
SS-18	CL	338+73	25.0-26.5	A-2-4(0)	35	NP	45.5	22.1	20.3	12.1	92	60	34	-	-
SS-1048	CL	342+00	1.0-2.0	A-7-5(22)	61	30	18.4	13.2	19.8	48.6	100	87	71	-	-
SS-1049	CL	345+00	3.9-5.4	A-6(2)	37	13	41.7	21.7	14.3	22.3	98	68	40	-	-
SS-1050	CL	345+00	8.9-10.4	A-6(1)	32	12	45.8	22.1	13.9	18.2	100	65	36	-	-
SS-1051	CL	345+00	13.9-15.4	A-5(0)	58	NP	20.9	47.0	24.0	8.1	100	93	41	-	-
SS-1052	CL	345+00	23.9-25.4	A-2-4(0)	35	NP	53.9	30.2	11.9	4.1	90	53	19	-	-
SS-1018	CL	348+00	3.5-5.0	A-7-5(8)	50	14	21.1	25.5	25.3	28.1	100	87	60	-	-
SS-1019	CL	348+00	8.5-10.0	A-7-5(5)	48	13	29.3	23.1	23.5	24.1	99	75	53	-	-
SS-1021	CL	348+00	18.5-20.0	A-5(0)	55	NP	23.7	35.7	26.5	14.1	99	86	49	-	-
SS-1022	CL	348+00	23.5-25.0	A-1-b(0)	35	NP	57.1	22.3	14.6	6.0	91	50	23	-	-



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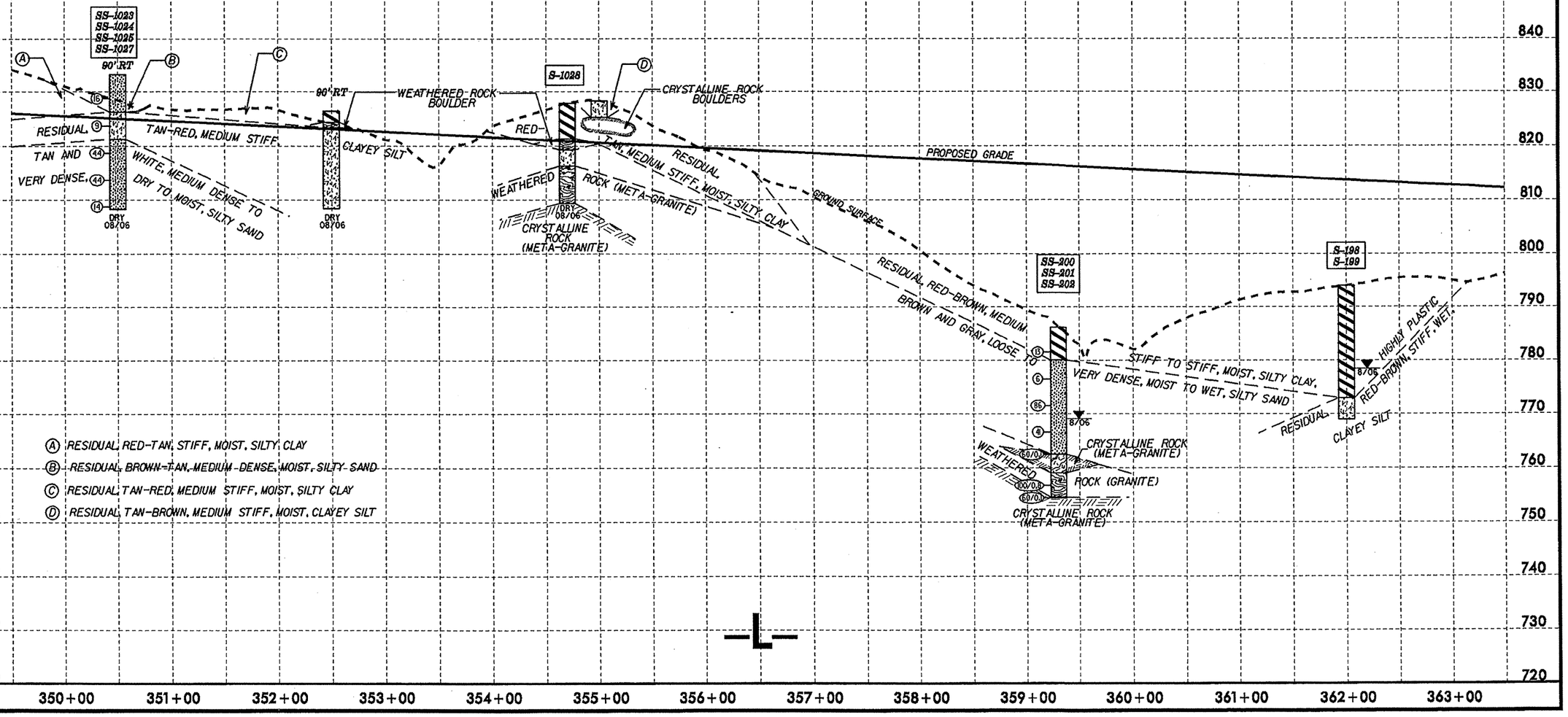
PROJECT REFERENCE NO.	SHEET NO.
U-2524C	33

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-1023	90' RT	350+50	3.5-5.0	A-2-5(0)	46	NP	56.8	27.3	9.8	6.0	99	65	18	-	-
SS-1024	90' RT	350+50	8.5-10.0	A-5(0)	52	NP	32.9	32.3	20.7	14.1	100	81	40	-	-
SS-1025	90' RT	350+50	13.5-15.0	A-2-4(0)	39	NP	50.5	32.0	11.4	6.0	96	65	22	-	-
SS-1027	90' RT	350+50	23.5-25.0	A-2-5(0)	43	NP	51.6	27.8	12.6	8.0	95	59	24	-	-
SS-1028	CL	354+70	0.0-6.0	A-7-5(13)	55	20	20.5	21.1	18.3	40.2	100	86	63	-	-
SS-200	CL	359+30	3.5-5.0	A-7-6(19	52	30	20.4	15.9	15.2	48.4	100	87	68	-	-
SS-201	CL	359+30	8.5-10.0	A-2-4(0)	29	8	40.4	30.5	9.0	20.2	97	72	32	-	-
SS-202	CL	359+30	13.5-15.0	A-2-4(0)	29	NP	46.6	34.9	10.4	8.1	97	69	23	-	-
S-198	CL	362+00	3.5-4.5	A-7-6(14)	53	28	26.2	17.6	11.8	44.4	100	81	59	-	-
S-199	CL	362+00	21.0-22.0	A-5(0)	41	4	39.0	22.2	18.7	20.2	97	70	42	-	-



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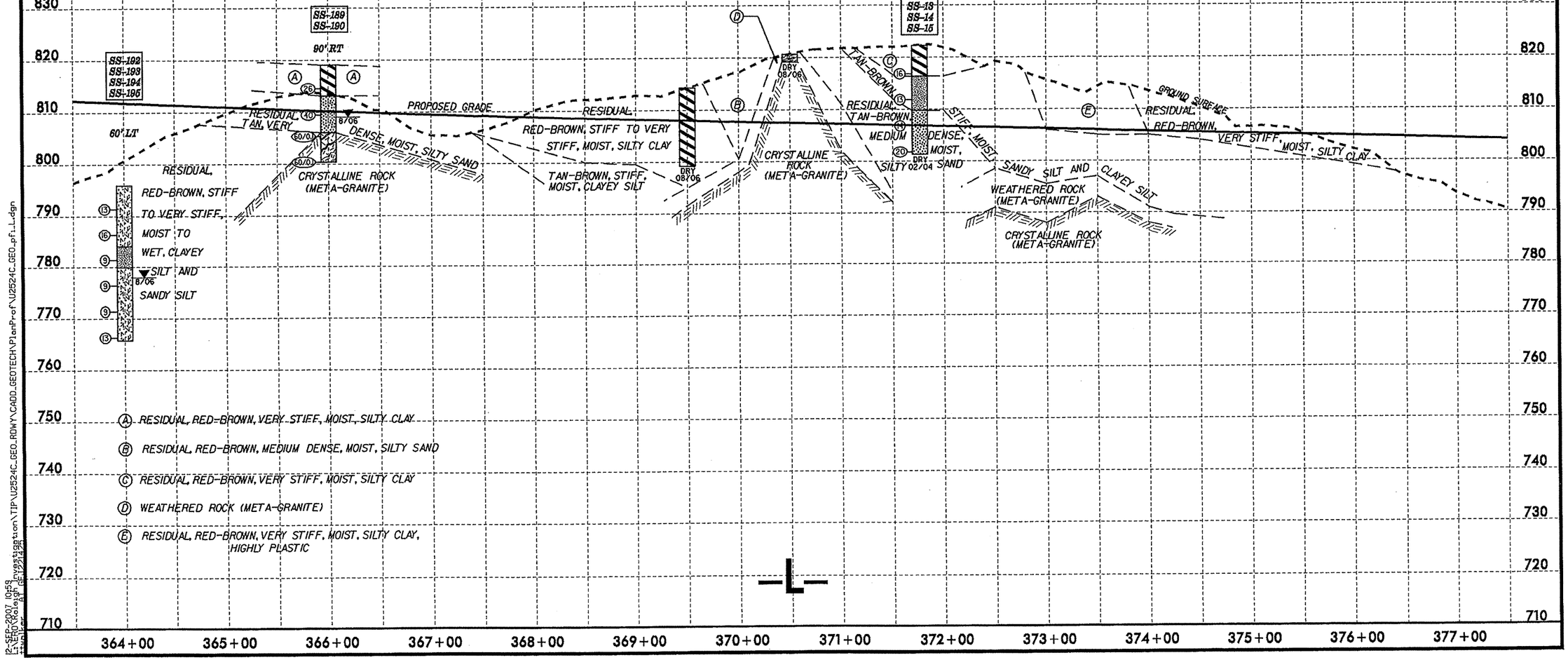
PROJECT REFERENCE NO.	SHEET NO.
U-2524C	34

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-192	60' LT	364+00	3.6-5.1	A-5(2)	43	9	38.1	21.0	18.7	22.2	100	71	46	-	-
SS-193	60' LT	364+00	8.6-10.1	A-5(1)	41	8	32.7	28.3	20.9	18.2	97	75	45	-	-
SS-194	60' LT	364+00	13.6-15.1	A-4(0)	39	4	37.9	27.2	22.7	12.1	95	69	41	-	-
SS-195	60' LT	364+00	18.6-20.1	A-5(0)	45	4	36.3	30.3	25.3	8.1	96	69	40	-	-
SS-189	90' RT	366+00	3.6-5.1	A-7-5(9)	53	19	30.0	18.2	11.2	40.5	100	79	54	-	-
SS-190	90' RT	366+00	9.6-10.1	A-2-4(0)	33	NP	44.4	28.4	11.0	16.2	100	72	32	-	-
SS-13	CL	371+77	4.5-6.0	A-7-5(10)	53	21	25.8	20.9	17.1	36.2	97	81	56	-	-
SS-14	CL	371+77	9.5-11.0	A-4(0)	38	NP	33.2	32.2	20.5	14.1	100	78	41	-	-
SS-15	CL	371+77	14.5-16.0	A-2-4(0)	26	NP	40.6	32.0	19.3	8.0	99	74	33	-	-



Ⓐ RESIDUAL, RED-BROWN, VERY STIFF, MOIST, SILTY CLAY

Ⓑ RESIDUAL, RED-BROWN, MEDIUM DENSE, MOIST, SILTY SAND

Ⓒ RESIDUAL, RED-BROWN, VERY STIFF, MOIST, SILTY CLAY

Ⓓ WEATHERED ROCK (META-GRANITE)

Ⓔ RESIDUAL, RED-BROWN, VERY STIFF, MOIST, SILTY CLAY, HIGHLY PLASTIC

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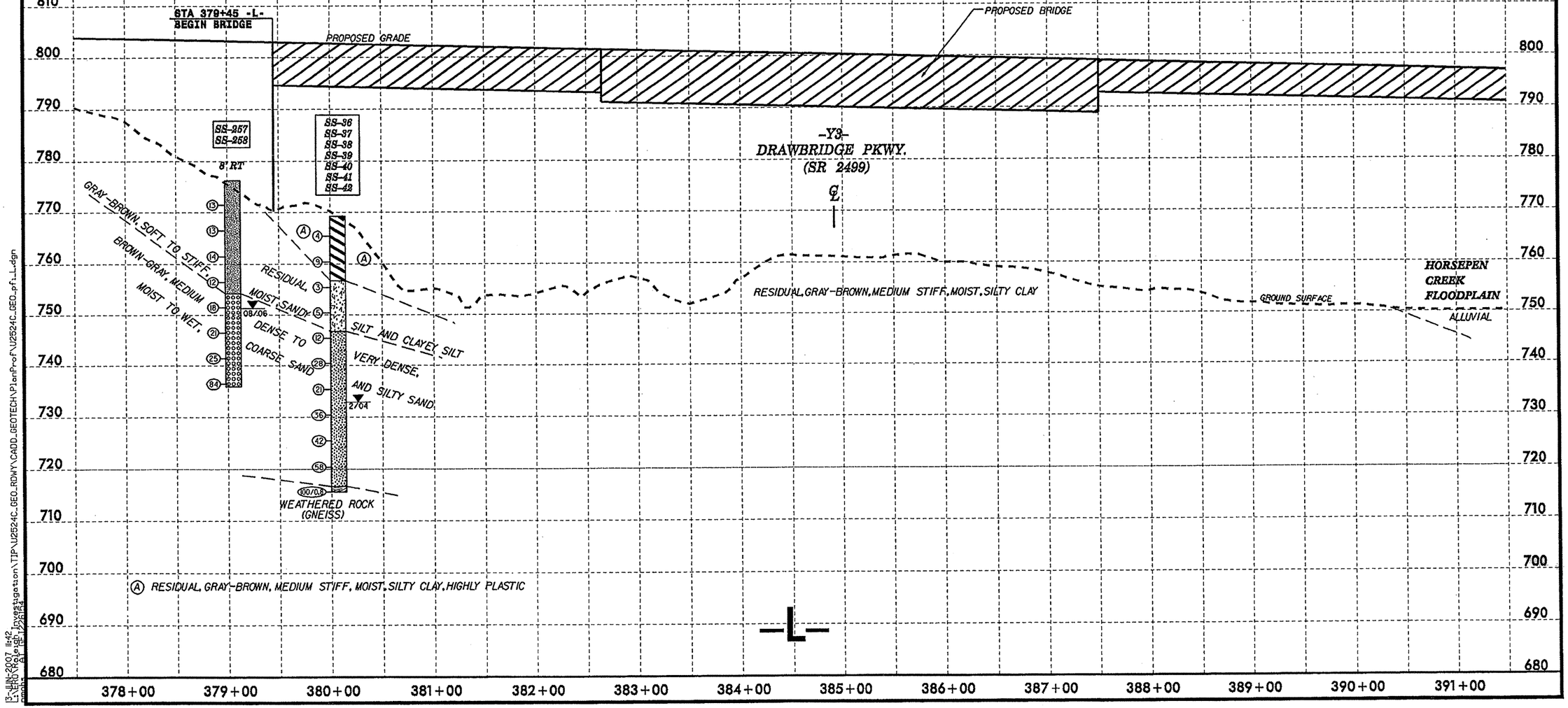
PROJECT REFERENCE NO.	SHEET NO.
U-2524C	35

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-257	8' RT	379+50	3.8-5.3	A-4(0)	37	NP	18.0	48.1	13.7	20.2	100	94	41	-	-
SS-258	8' RT	379+50	23.8-25.3	A-1-b(0)	32	NP	52.7	25.9	11.3	10.1	82	50	22	-	-
SS-36	CL	380+07	2.8-4.3	A-7-5(30)	63	33	6.4	17.9	27.4	48.3	100	96	81	-	-
SS-37	CL	380+07	7.8-9.3	A-7-6(8)	42	21	13.1	38.2	12.5	36.2	99	93	53	-	-
SS-38	CL	380+07	12.8-14.3	A-5(0)	51	NP	18.9	45.7	25.4	10.1	100	93	47	-	-
SS-39	CL	380+07	22.8-24.3	A-2-5(0)	41	NP	30.2	47.7	14.1	8.0	100	88	31	-	-
SS-40	CL	380+07	32.8-34.3	A-2-5(0)	41	NP	29.2	48.3	14.5	8.0	100	86	32	-	-
SS-41	CL	380+07	42.8-44.3	A-2-4(0)	33	NP	23.1	51.3	15.5	10.1	100	89	34	-	-
SS-42	CL	380+07	47.8-49.3	A-2-4(0)	30	NP	42.7	39.8	11.5	6.0	95	73	22	-	-



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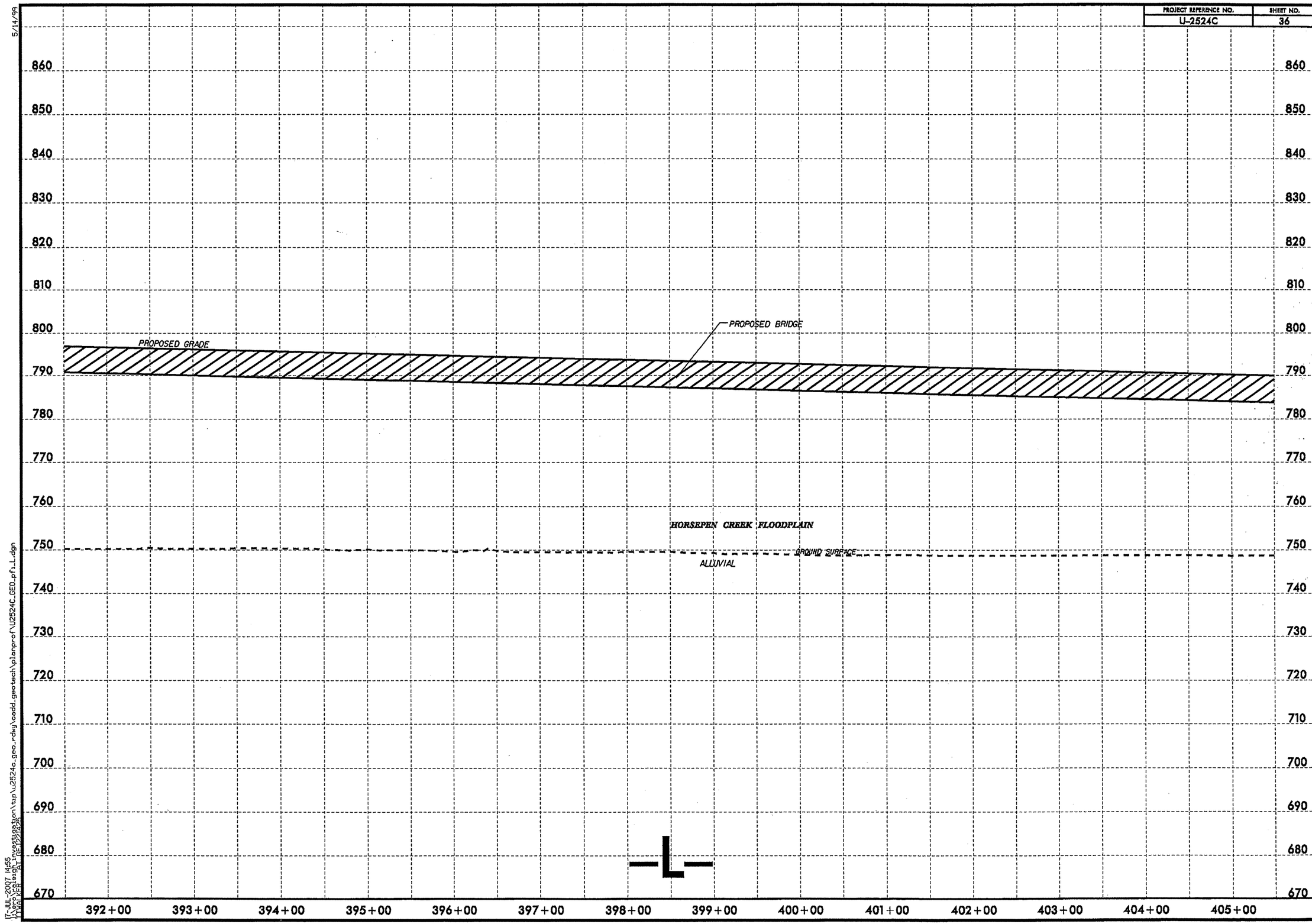
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PROPOSED GRADE
PROPOSED BRIDGE
HORSEPEN CREEK FLOODPLAIN
GROUND SURFACE
ALLUVIAL
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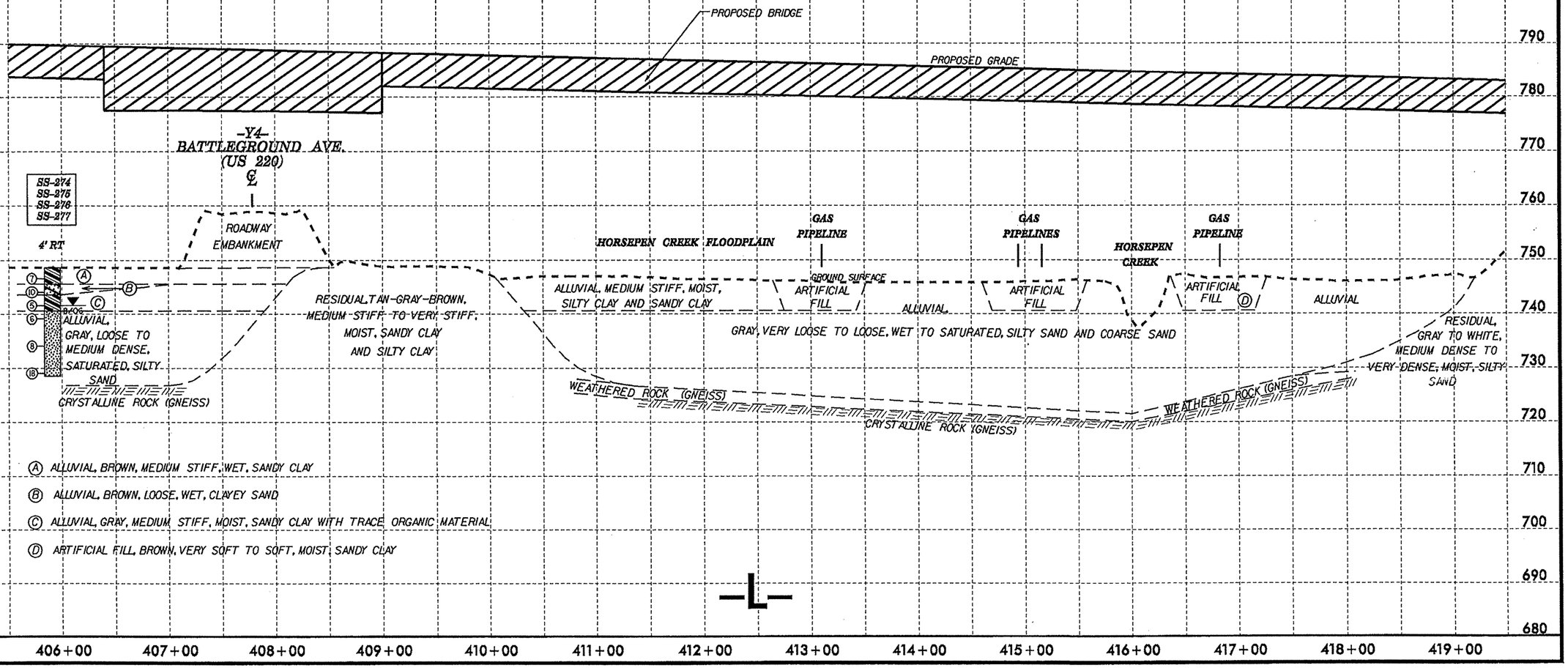
PROJECT REFERENCE NO.	SHEET NO.
U-2524C	37

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-274	4' RT	405+91	1.0-2.5	A-6(9)	38	19	6.5	41.2	16.0	36.4	100	99	61	-	-
SS-275	4' RT	405+91	3.5-5.0	A-2-6(11)	32	15	51.5	19.2	5.1	24.2	95	65	29	-	-
SS-276	4' RT	405+91	6.0-7.5	A-6(8)	37	16	15.2	29.9	18.6	36.4	99	91	61	-	-
SS-277	4' RT	405+91	8.5-10.0	A-2-4(0)	26	NP	49.5	34.7	5.7	10.1	100	74	20	-	-

NOTE: THE LOCATIONS OF GAS PIPELINES AND BOUNDARIES OF ASSOCIATED ARTIFICIAL FILL AREAS ARE APPROXIMATED.



Ⓐ ALLUVIAL, BROWN, MEDIUM STIFF, WET, SANDY CLAY

Ⓑ ALLUVIAL, BROWN, LOOSE, WET, CLAYEY SAND

Ⓒ ALLUVIAL, GRAY, MEDIUM STIFF, MOIST, SANDY CLAY WITH TRACE ORGANIC MATERIAL

Ⓓ ARTIFICIAL FILL, BROWN, VERY SOFT TO SOFT, MOIST, SANDY CLAY

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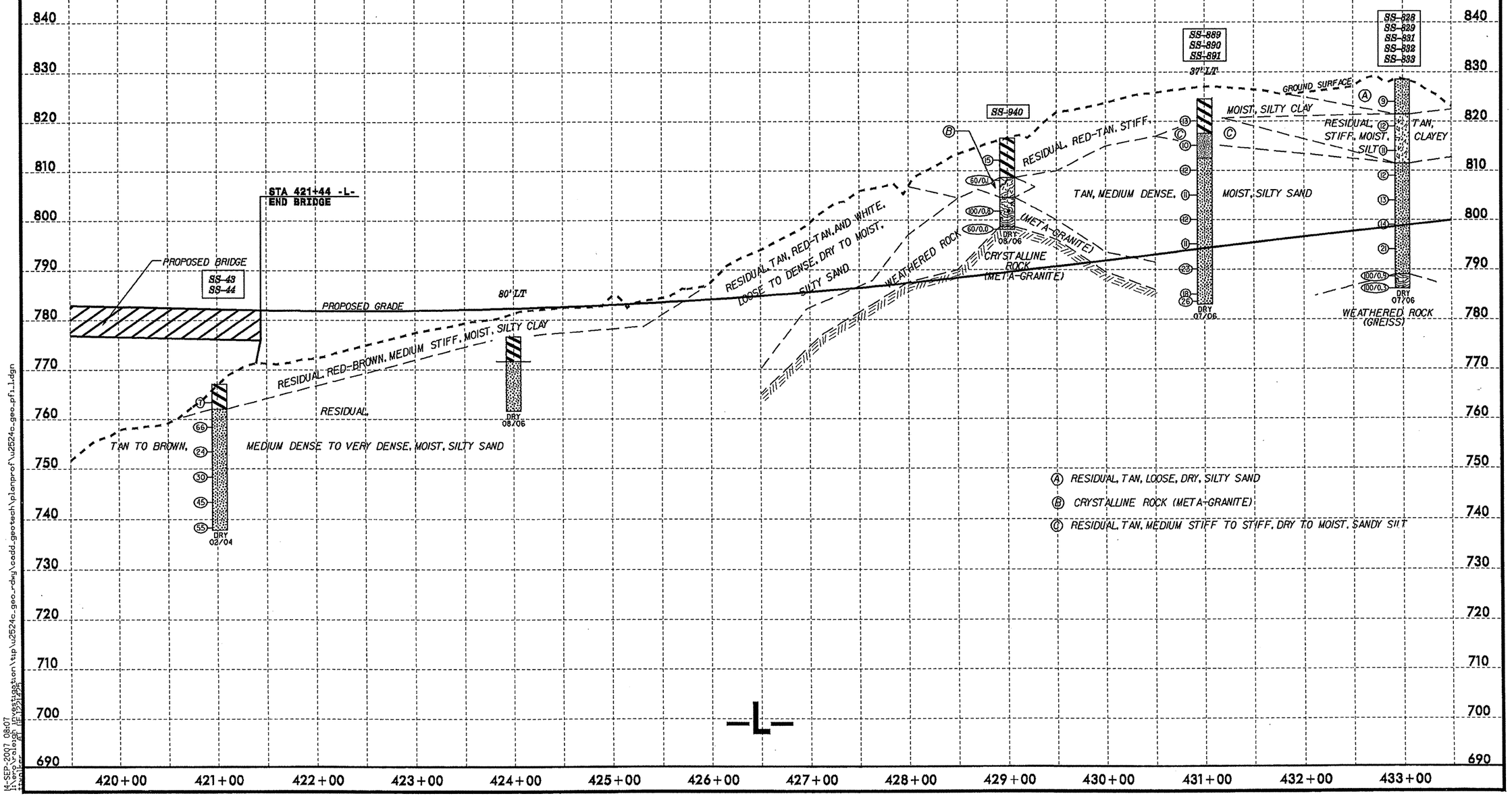
PROJECT REFERENCE NO.	SHEET NO.
U-2524C	38

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-43	CL	421+02	2.7-4.2	A-7-5(7)	62	12	17.9	34.4	17.5	30.2	100	95	54	-	-
SS-44	CL	421+02	7.7-9.2	A-2-4(0)	34	NP	39.2	41.6	11.1	8.0	98	79	25	-	-
SS-940	CL	429+00	3.5-5.0	A-7-5(11)	56	23	23.1	26.1	14.5	36.4	100	84	56	-	-
SS-889	37' LT	431+00	3.5-5.0	A-7-5(5)	50	12	25.7	28.1	21.9	24.3	100	84	53	-	-
SS-890	37' LT	431+00	8.5-10.0	A-4(0)	32	NP	27.7	37.4	24.8	10.1	100	84	43	-	-
SS-891	37' LT	431+00	13.5-15.0	A-2-4(0)	39	NP	40.8	34.8	18.3	6.1	100	75	31	-	-
SS-828	CL	433+00	3.5-5.0	A-2-5(0)	41	NP	21.9	52.0	11.9	14.2	100	94	33	-	-
SS-829	CL	433+00	8.5-10.0	A-5(0)	48	NP	23.3	46.8	19.8	10.1	98	85	37	-	-
SS-831	CL	433+00	18.5-20.0	A-2-5(0)	43	NP	14.6	66.4	13.0	6.1	100	97	28	-	-
SS-832	CL	433+00	23.5-25.0	A-2-5(0)	45	NP	16.4	62.1	13.4	8.1	100	96	30	-	-
SS-833	CL	433+00	28.5-30.0	A-2-4(0)	40	NP	34.3	39.4	18.2	8.1	98	79	32	-	-



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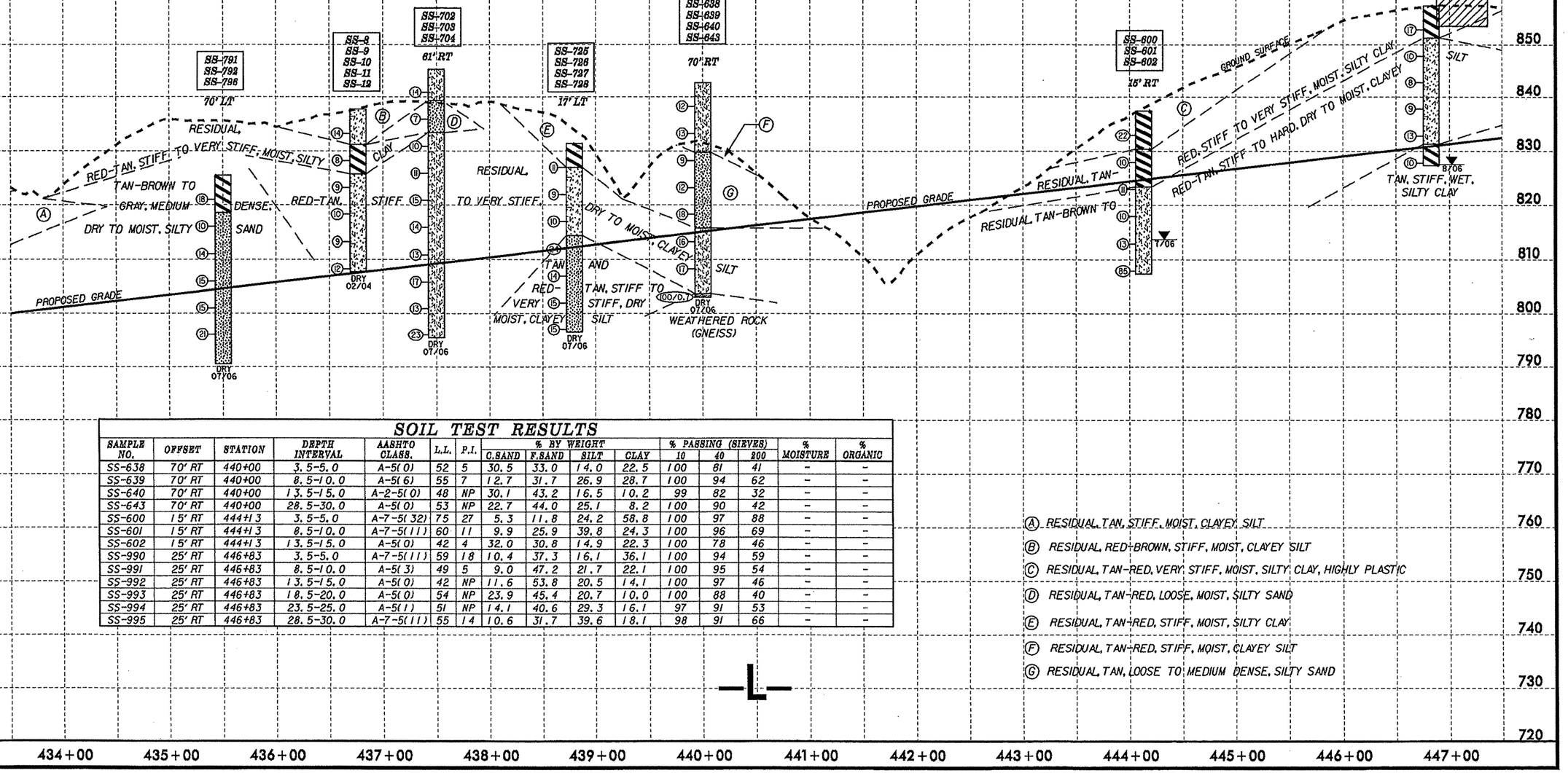
PROJECT REFERENCE NO.	SHEET NO.
U-2524C	39

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-791	70' LT	435+50	3.5-5.0	A-7-5(3)	45	15	25.3	37.4	10.9	26.3	100	87	44	-	-
SS-792	70' LT	435+50	8.5-10.0	A-2-5(0)	45	NP	39.7	40.7	9.5	10.1	100	80	26	-	-
SS-796	70' LT	435+50	28.5-30.0	A-2-5(0)	42	NP	40.6	37.3	15.0	7.1	100	74	29	-	-
SS-8	CL	436+77	3.5-5.0	A-5(0)	45	NP	20.3	41.4	20.1	18.1	100	93	44	-	-
SS-9	CL	436+77	8.5-10.0	A-7-5(14)	58	14	7.4	27.6	42.9	22.1	100	96	75	28.1	-
SS-10	CL	436+77	13.5-15.0	A-5(11)	54	NP	13.1	41.0	31.8	14.1	100	95	54	28.3	-
SS-11	CL	436+77	18.5-20.0	A-5(11)	50	NP	14.5	42.9	32.6	10.1	100	97	54	32.5	-
SS-12	CL	436+77	28.5-30.6	A-5(0)	50	NP	15.5	40.0	34.4	10.1	93	86	50	-	-
SS-702	61' RT	437+50	3.5-5.0	A-5(5)	57	6	17.0	30.9	19.3	32.8	100	91	57	-	-
SS-703	61' RT	437+50	8.5-10.0	A-2-5(0)	55	NP	45.9	21.3	16.5	16.4	100	90	35	-	-
SS-704	61' RT	437+50	13.5-15.0	A-5(0)	56	NP	22.1	42.2	23.4	12.3	100	90	43	-	-
SS-725	17' LT	438+80	3.5-5.0	A-7-5(12)	60	15	7.7	33.0	30.9	28.4	100	96	67	-	-
SS-726	17' LT	438+80	8.5-10.0	A-5(0)	46	NP	18.2	42.8	26.8	12.2	99	89	48	-	-
SS-727	17' LT	438+80	13.5-15.0	A-5(11)	51	NP	18.4	35.1	34.3	12.2	100	88	56	-	-
SS-728	17' LT	438+80	18.5-20.0	A-2-4(0)	33	NP	44.2	36.7	14.1	5.1	100	75	25	-	-



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-638	70' RT	440+00	3.5-5.0	A-5(0)	52	5	30.5	33.0	14.0	22.5	100	81	41	-	-
SS-639	70' RT	440+00	8.5-10.0	A-5(6)	55	7	12.7	31.7	26.9	28.7	100	94	62	-	-
SS-640	70' RT	440+00	13.5-15.0	A-2-5(0)	48	NP	30.1	43.2	16.5	10.2	99	82	32	-	-
SS-643	70' RT	440+00	28.5-30.0	A-5(0)	53	NP	22.7	44.0	25.1	8.2	100	90	42	-	-
SS-600	15' RT	444+13	3.5-5.0	A-7-5(32)	75	27	5.3	11.8	24.2	58.8	100	97	88	-	-
SS-601	15' RT	444+13	8.5-10.0	A-7-5(11)	60	11	9.9	25.9	39.8	24.3	100	96	69	-	-
SS-602	15' RT	444+13	13.5-15.0	A-5(0)	42	4	32.0	30.8	14.9	22.3	100	78	46	-	-
SS-990	25' RT	446+83	3.5-5.0	A-7-5(11)	59	18	10.4	37.3	16.1	36.1	100	94	59	-	-
SS-991	25' RT	446+83	8.5-10.0	A-5(3)	49	5	9.0	47.2	21.7	22.1	100	95	54	-	-
SS-992	25' RT	446+83	13.5-15.0	A-5(0)	42	NP	11.6	53.8	20.5	14.1	100	97	46	-	-
SS-993	25' RT	446+83	18.5-20.0	A-5(0)	54	NP	23.9	45.4	20.7	10.0	100	88	40	-	-
SS-994	25' RT	446+83	23.5-25.0	A-5(1)	51	NP	14.1	40.6	29.3	16.1	97	91	53	-	-
SS-995	25' RT	446+83	28.5-30.0	A-7-5(11)	55	14	10.6	31.7	39.6	18.1	98	91	66	-	-

Ⓐ RESIDUAL, TAN, STIFF, MOIST, CLAYEY SILT

Ⓑ RESIDUAL, RED-BROWN, STIFF, MOIST, CLAYEY SILT

Ⓒ RESIDUAL, TAN-RED, VERY STIFF, MOIST, SILTY CLAY, HIGHLY PLASTIC

Ⓓ RESIDUAL, TAN-RED, LOOSE, MOIST, SILTY SAND

Ⓔ RESIDUAL, TAN-RED, STIFF, MOIST, SILTY CLAY

Ⓕ RESIDUAL, TAN-RED, STIFF, MOIST, CLAYEY SILT

Ⓖ RESIDUAL, TAN, LOOSE TO MEDIUM DENSE, SILTY SAND

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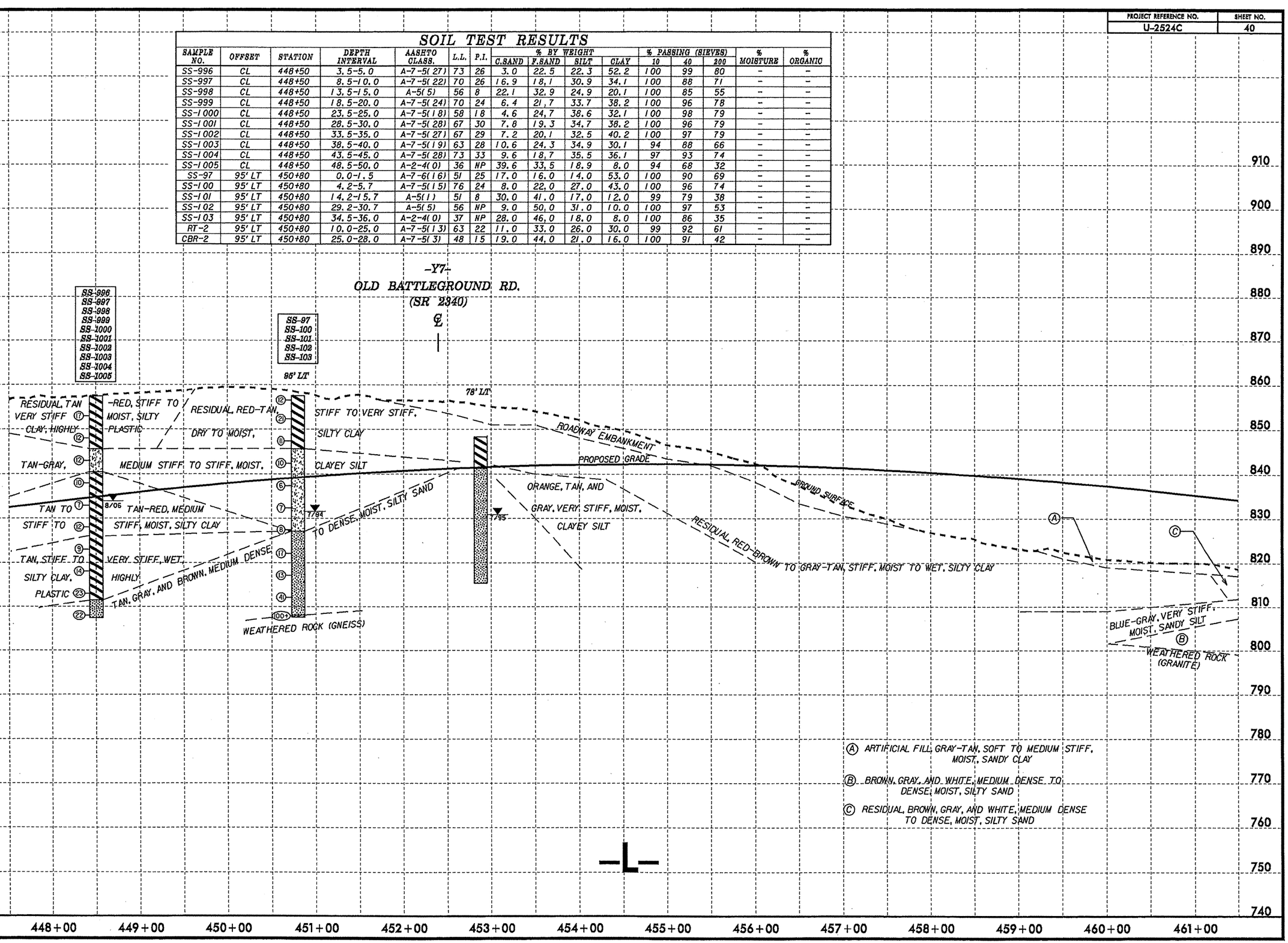
5/14/99

PROJECT REFERENCE NO.	SHEET NO.
U-2524C	40

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-996	CL	448+50	3.5-5.0	A-7-5(27)	73	26	3.0	22.5	22.3	52.2	100	99	80	-	-
SS-997	CL	448+50	8.5-10.0	A-7-5(22)	70	26	16.9	18.1	30.9	34.1	100	88	71	-	-
SS-998	CL	448+50	13.5-15.0	A-5(5)	56	8	22.1	32.9	24.9	20.1	100	85	55	-	-
SS-999	CL	448+50	18.5-20.0	A-7-5(24)	70	24	6.4	21.7	33.7	38.2	100	96	78	-	-
SS-1000	CL	448+50	23.5-25.0	A-7-5(18)	58	18	4.6	24.7	38.6	32.1	100	98	79	-	-
SS-1001	CL	448+50	28.5-30.0	A-7-5(28)	67	30	7.8	19.3	34.7	38.2	100	96	79	-	-
SS-1002	CL	448+50	33.5-35.0	A-7-5(27)	67	29	7.2	20.1	32.5	40.2	100	97	79	-	-
SS-1003	CL	448+50	38.5-40.0	A-7-5(19)	63	28	10.6	24.3	34.9	30.1	94	88	66	-	-
SS-1004	CL	448+50	43.5-45.0	A-7-5(28)	73	33	9.6	18.7	35.5	36.1	97	93	74	-	-
SS-1005	CL	448+50	48.5-50.0	A-2-4(0)	36	NP	39.6	33.5	18.9	8.0	94	68	32	-	-
SS-97	95' LT	450+80	0.0-1.5	A-7-6(16)	51	25	17.0	16.0	14.0	53.0	100	90	69	-	-
SS-100	95' LT	450+80	4.2-5.7	A-7-5(15)	76	24	8.0	22.0	27.0	43.0	100	96	74	-	-
SS-101	95' LT	450+80	14.2-15.7	A-5(11)	51	8	30.0	41.0	17.0	12.0	99	79	38	-	-
SS-102	95' LT	450+80	29.2-30.7	A-5(5)	56	NP	9.0	50.0	31.0	10.0	100	97	53	-	-
SS-103	95' LT	450+80	34.5-36.0	A-2-4(0)	37	NP	28.0	46.0	18.0	8.0	100	86	35	-	-
RT-2	95' LT	450+80	10.0-25.0	A-7-5(13)	63	22	11.0	33.0	26.0	30.0	99	92	61	-	-
CBR-2	95' LT	450+80	25.0-28.0	A-7-5(3)	48	15	19.0	44.0	21.0	16.0	100	91	42	-	-



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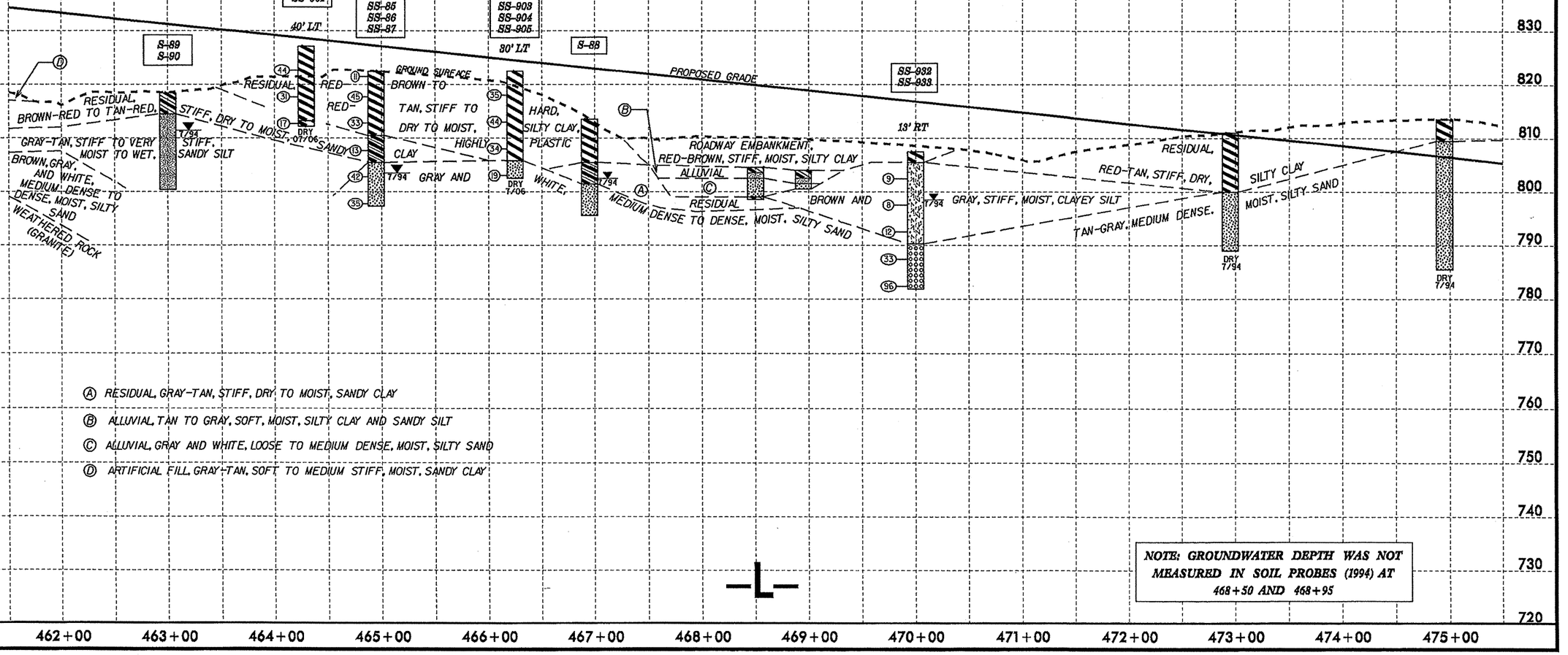
PROJECT REFERENCE NO.	SHEET NO.
U-2524C	41

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-89	CL	463+00	0.0-4.0	A-6(6)	33	16	22.0	25.0	14.0	39.0	98	87	55	-	-
S-90	CL	463+00	4.0-18.0	A-4(0)	36	9	26.0	40.0	18.0	16.0	86	73	36	-	-
SS-900	40' LT	464+30	3.5-5.0	A-7-5(31)	75	36	12.0	13.8	15.2	59.0	98	90	76	-	-
SS-901	40' LT	464+30	13.5-15.0	A-7-6(11)	54	25	21.2	25.6	18.6	34.6	96	84	55	-	-
SS-84	CL	464+95	0.0-1.5	A-7-5(18)	60	26	11.0	11.0	9.0	69.0	100	95	79	-	-
SS-85	CL	464+95	8.7-10.2	A-7-6(18)	58	29	18.0	16.0	13.0	53.0	100	90	68	-	-
SS-86	CL	464+95	13.8-15.3	A-6(3)	34	18	37.0	26.0	13.0	24.0	95	73	38	-	-
SS-87	CL	464+95	18.7-20.2	A-2-4(0)	35	8	47.0	28.0	17.0	8.0	72	47	22	-	-
SS-902	30' LT	466+25	3.5-5.0	A-7-5(35)	77	39	12.8	11.0	5.0	71.2	100	93	78	-	-
SS-903	30' LT	466+25	8.5-10.0	A-7-5(41)	93	55	17.1	10.4	11.5	61.0	93	81	70	-	-
SS-904	30' LT	466+25	13.5-15.0	A-7-5(37)	80	47	12.6	16.1	8.2	63.1	100	93	74	-	-
SS-905	30' LT	466+25	18.5-20.0	A-2-4(0)	37	2	31.3	42.7	15.8	10.2	99	85	33	-	-
SS-88	CL	466+95	12.0-18.0	A-2-5(0)	41	10	32.0	30.0	20.0	18.0	82	66	35	-	-
SS-932	13' RT	470+00	4.0-5.5	A-5(0)	50	9	40.7	25.8	23.4	10.2	93	66	36	-	-
SS-933	13' RT	470+00	19.0-20.5	A-1-b(0)	35	5	47.0	24.2	20.7	8.1	68	41	24	-	-



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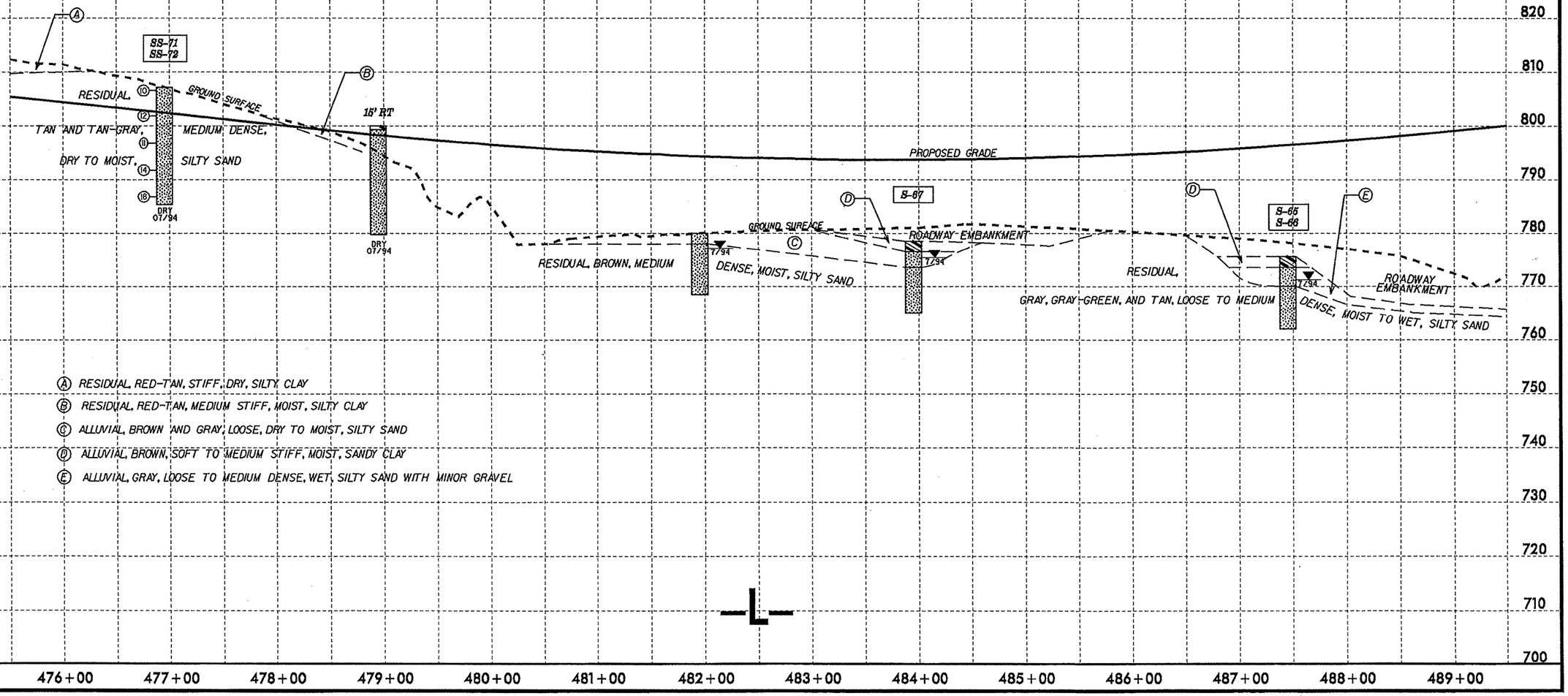
PROJECT REFERENCE NO.	SHEET NO.
U-2524C	42

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-71	CL	476+95	13.2-14.7	A-2-4(0)	40	NP	40.0	36.0	18.0	6.0	81	61	25	-	-
SS-72	CL	476+95	28.2-29.7	A-2-4(0)	39	NP	37.0	42.0	17.0	4.0	89	70	25	-	-
RT-1	CL	476+95	2.0-20.0	A-6(1)	40	11	33.0	23.0	26.0	18.0	87	68	41	-	-
CBR-1	CL	476+95	20.0-29.7	A-7-5(2)	42	12	32.0	25.0	25.0	18.0	85	66	40	-	-
S-67	CL	483+95	5.0-13.5	A-2-4(0)	34	NP	38.0	31.0	21.0	10.0	77	58	24	-	-
S-65	CL	487+45	0.0-2.0	A-6(4)	32	13	29.0	25.0	20.0	26.0	100	82	50	-	-
S-66	CL	487+45	2.0-5.5	A-2-4(0)	17	NP	47.0	36.0	9.0	8.0	85	63	17	-	-



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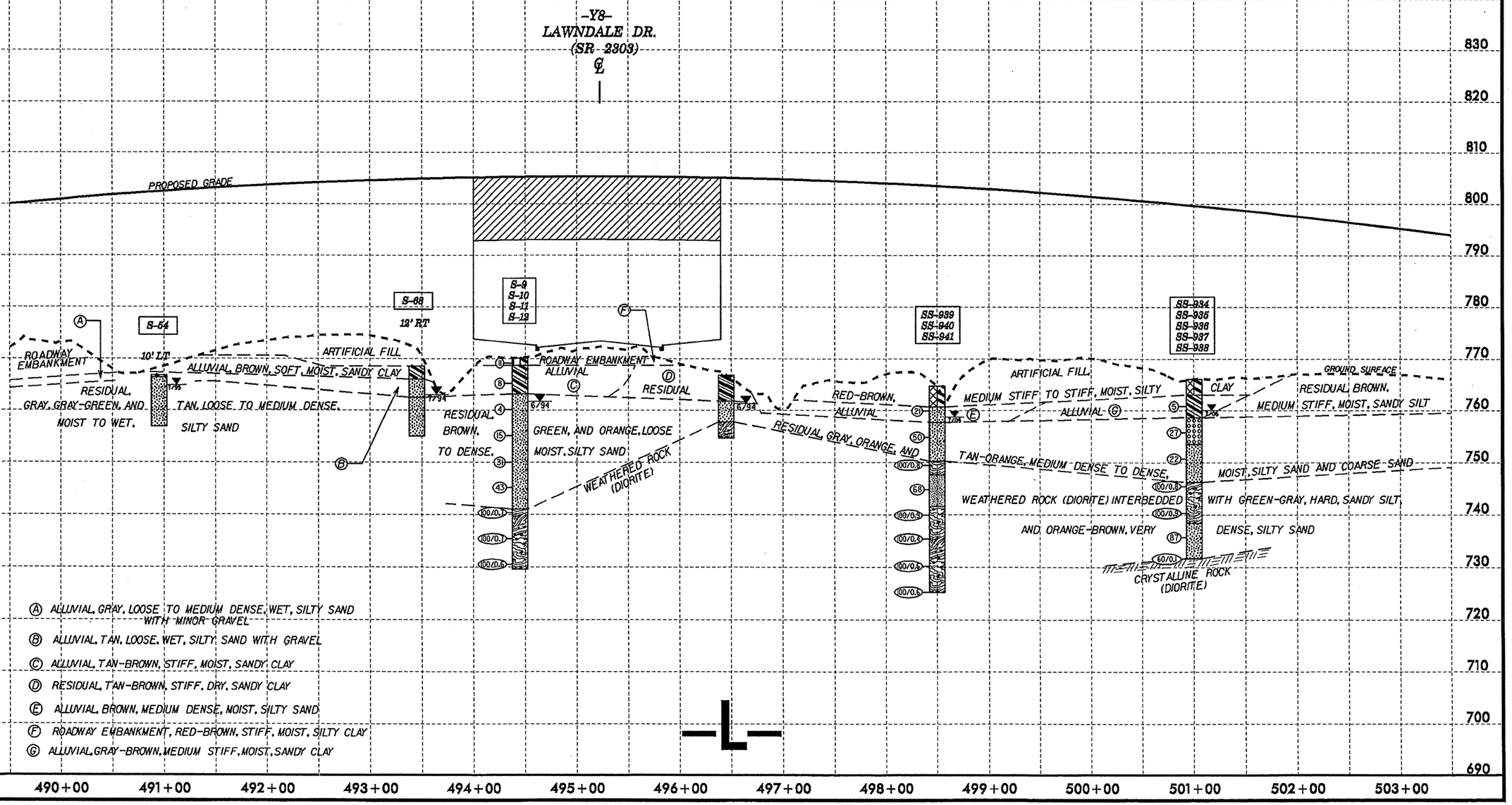
PROJECT REFERENCE NO.	SHEET NO.
U-2524C	43

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-54	10' LT	490+95	2.0-4.0	A-6(5)	32	11	19.0	25.0	27.0	29.0	97	87	58	-	-
S-68	12' RT	493+45	0.0-2.5	A-6(9)	34	14	5.0	33.0	29.0	33.0	100	98	70	-	-
SS-9	CL	494+45	0.0-1.5	A-7-6(8)	42	21	17.0	22.0	24.0	37.0	96	86	62	-	-
SS-10	CL	494+45	4.0-5.5	A-6(10)	37	14	3.0	15.0	48.0	34.0	100	99	86	-	-
SS-11	CL	494+45	9.0-10.5	A-2-5(0)	41	NP	38.0	36.0	20.0	6.0	83	64	27	-	-
SS-12	CL	494+45	24.0-25.5	A-2-4(0)	26	NP	48.0	33.0	15.0	4.0	79	54	18	-	-
SS-939	CL	498+50	3.8-5.3	A-2-4(0)	30	5	38.8	36.8	20.3	4.1	96	71	31	-	-
SS-940	CL	498+50	8.8-10.3	A-2-4(0)	29	3	43.7	34.6	17.7	4.1	83	58	24	-	-
SS-941	CL	498+50	18.8-20.3	A-4(0)	23	3	23.8	42.9	19.1	14.2	99	89	41	-	-
SS-934	CL	501+00	1.0-2.0	A-7-6(9)	43	19	19.3	22.8	19.3	38.6	93	81	59	-	-
SS-935	CL	501+00	4.2-5.7	A-6(6)	31	11	13.4	26.4	29.7	30.5	99	92	68	-	-
SS-936	CL	501+00	9.2-10.7	A-1-a(0)	21	NP	55.9	26.2	11.8	6.1	48	28	11	-	-
SS-937	CL	501+00	14.2-15.7	A-2-4(0)	31	4	40.7	37.2	16.1	6.1	99	71	30	-	-
SS-938	CL	501+00	29.2-30.7	A-2-4(0)	26	NP	45.1	31.9	16.9	6.1	100	70	29	-	-



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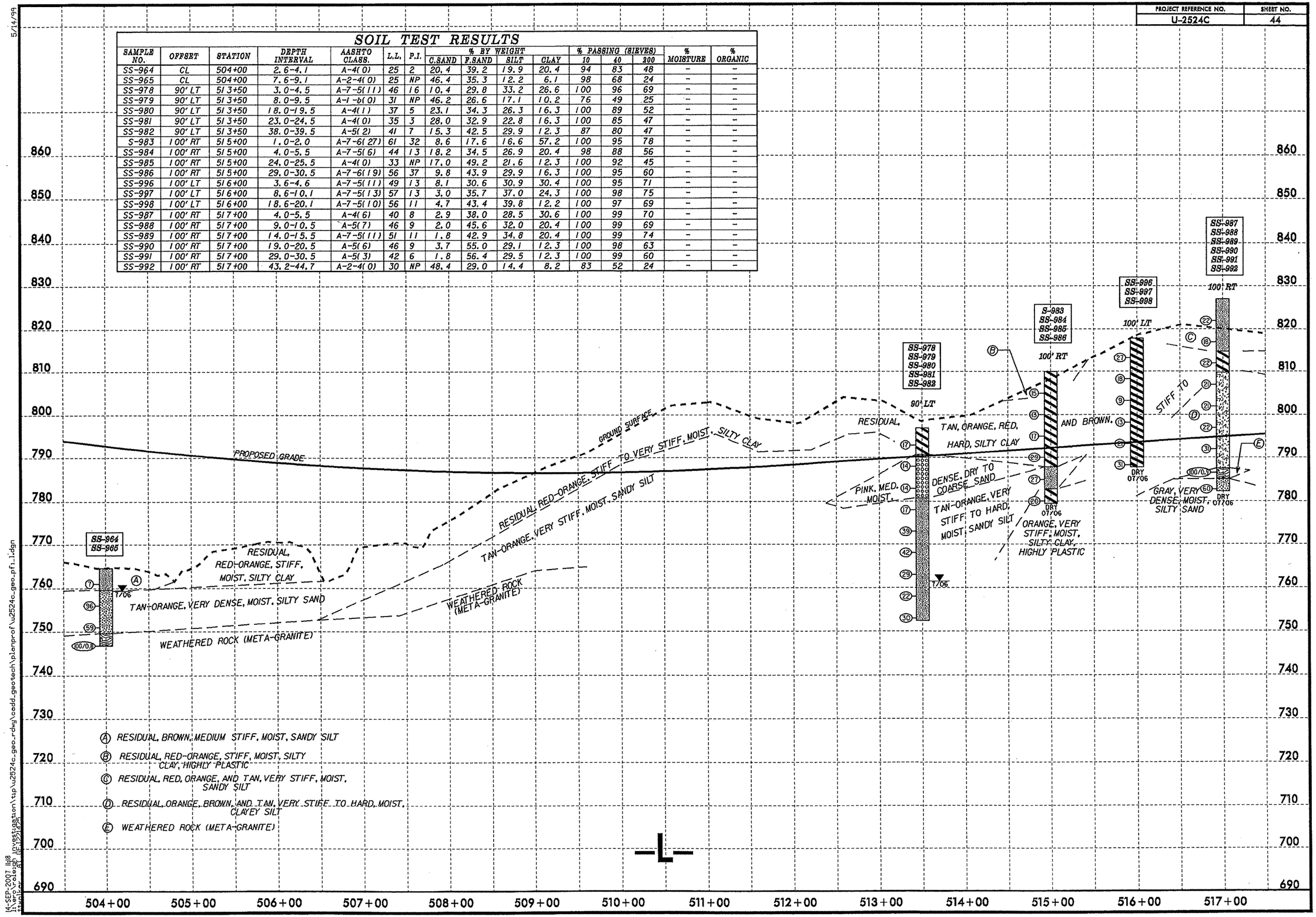
PROJECT REFERENCE NO.	SHEET NO.
U-2524C	44

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-964	CL	504+00	2.6-4.1	A-4(0)	25	2	20.4	39.2	19.9	20.4	94	83	48	-	-
SS-965	CL	504+00	7.6-9.1	A-2-4(0)	25	NP	46.4	35.3	12.2	6.1	98	68	24	-	-
SS-978	90' LT	513+50	3.0-4.5	A-7-5(11)	46	16	10.4	29.8	33.2	26.6	100	96	69	-	-
SS-979	90' LT	513+50	8.0-9.5	A-1-b(0)	31	NP	46.2	26.6	17.1	10.2	76	49	25	-	-
SS-980	90' LT	513+50	18.0-19.5	A-4(11)	37	5	23.1	34.3	26.3	16.3	100	89	52	-	-
SS-981	90' LT	513+50	23.0-24.5	A-4(0)	35	3	28.0	32.9	22.8	16.3	100	85	47	-	-
SS-982	90' LT	513+50	38.0-39.5	A-5(2)	41	7	15.3	42.5	29.9	12.3	87	80	47	-	-
S-983	100' RT	515+00	1.0-2.0	A-7-6(27)	61	32	8.6	17.6	16.6	57.2	100	95	78	-	-
SS-984	100' RT	515+00	4.0-5.5	A-7-5(6)	44	13	18.2	34.5	26.9	20.4	98	88	56	-	-
SS-985	100' RT	515+00	24.0-25.5	A-4(0)	33	NP	17.0	49.2	21.6	12.3	100	92	45	-	-
SS-986	100' RT	515+00	29.0-30.5	A-7-6(19)	56	37	9.8	43.9	29.9	16.3	100	95	60	-	-
SS-996	100' LT	516+00	3.6-4.6	A-7-5(11)	49	13	8.1	30.6	30.9	30.4	100	95	71	-	-
SS-997	100' LT	516+00	8.6-10.1	A-7-5(13)	57	13	3.0	35.7	37.0	24.3	100	98	75	-	-
SS-998	100' LT	516+00	18.6-20.1	A-7-5(10)	56	11	4.7	43.4	39.8	12.2	100	97	69	-	-
SS-987	100' RT	517+00	4.0-5.5	A-4(6)	40	8	2.9	38.0	28.5	30.6	100	99	70	-	-
SS-988	100' RT	517+00	9.0-10.5	A-5(7)	46	9	2.0	45.6	32.0	20.4	100	99	69	-	-
SS-989	100' RT	517+00	14.0-15.5	A-7-5(11)	51	11	1.8	42.9	34.8	20.4	100	99	74	-	-
SS-990	100' RT	517+00	19.0-20.5	A-5(6)	46	9	3.7	55.0	29.1	12.3	100	98	63	-	-
SS-991	100' RT	517+00	29.0-30.5	A-5(3)	42	6	1.8	56.4	29.5	12.3	100	99	60	-	-
SS-992	100' RT	517+00	43.2-44.7	A-2-4(0)	30	NP	48.4	29.0	14.4	8.2	83	52	24	-	-



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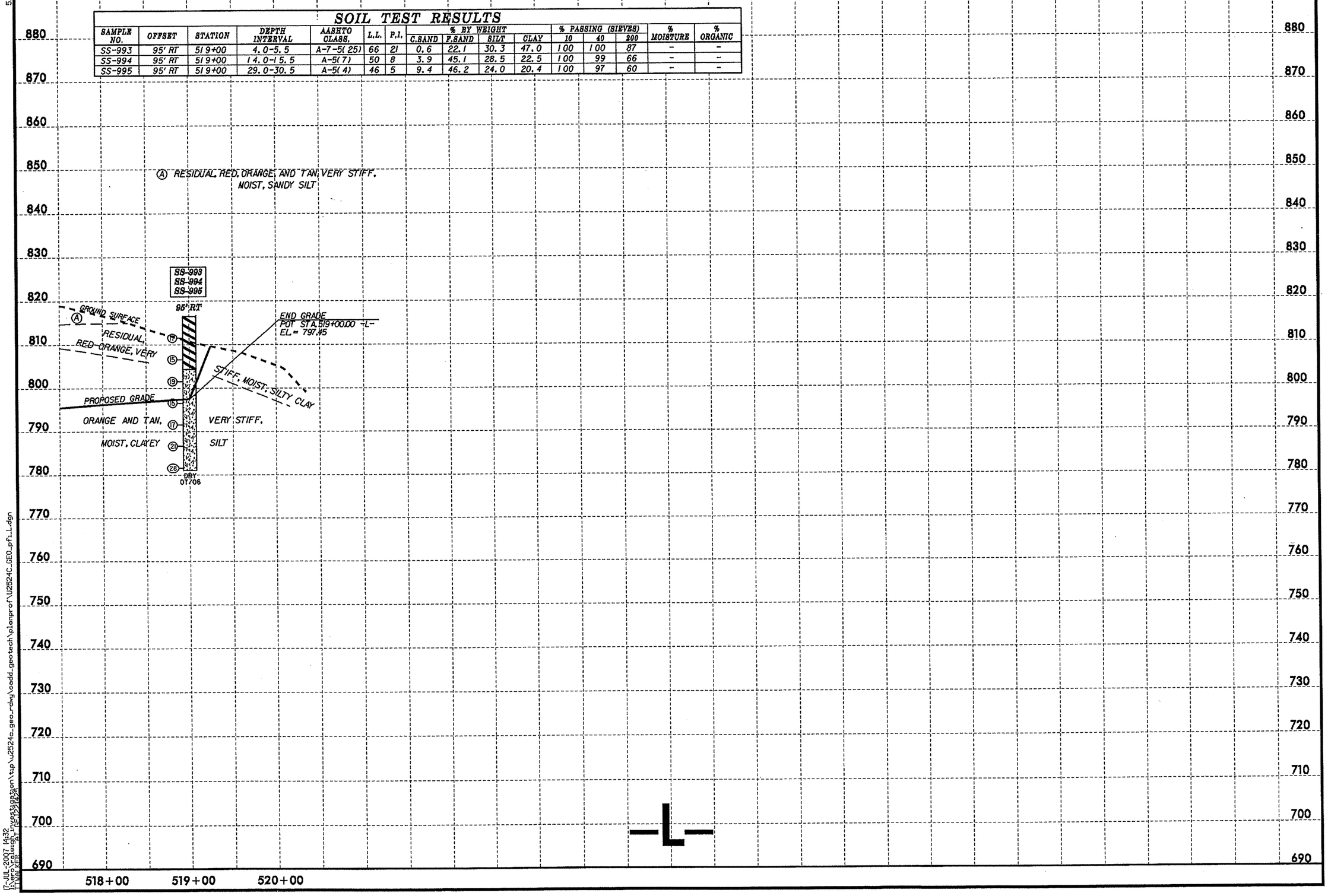
PROJECT REFERENCE NO.	SHEET NO.
U-2524C	45

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-993	95' RT	519+00	4.0-5.5	A-7-5(25)	66	21	0.6	22.1	30.3	47.0	100	100	87	-	-
SS-994	95' RT	519+00	14.0-15.5	A-5(7)	50	8	3.9	45.1	28.5	22.5	100	99	66	-	-
SS-995	95' RT	519+00	29.0-30.5	A-5(4)	46	5	9.4	46.2	24.0	20.4	100	97	60	-	-



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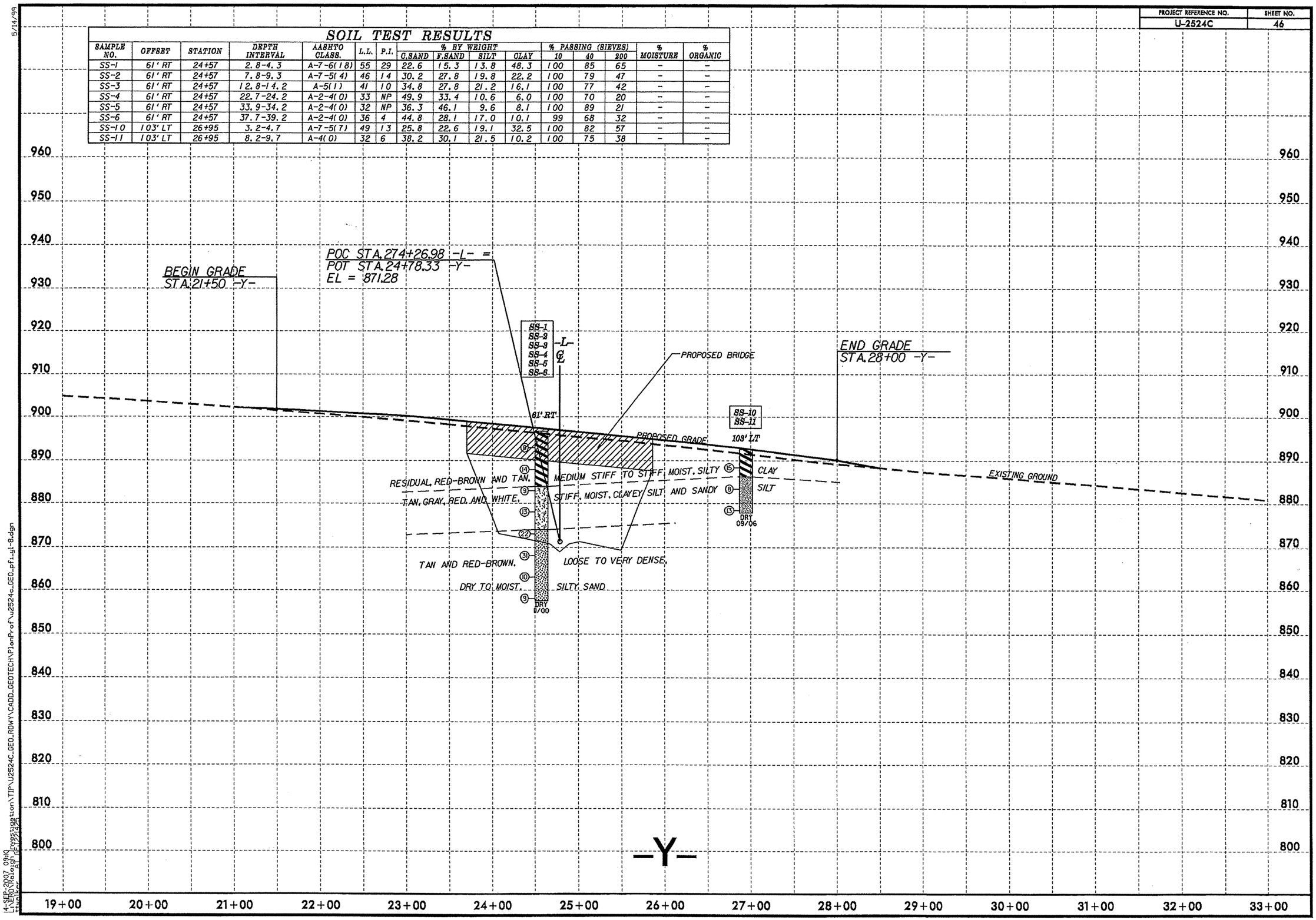
PROJECT REFERENCE NO.	SHEET NO.
U-2524C	46

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-1	61' RT	24+57	2.8-4.3	A-7-6(18)	55	29	22.6	15.3	13.8	48.3	100	85	65	-	-
SS-2	61' RT	24+57	7.8-9.3	A-7-5(4)	46	14	30.2	27.8	19.8	22.2	100	79	47	-	-
SS-3	61' RT	24+57	12.8-14.2	A-5(1)	41	10	34.8	27.8	21.2	16.1	100	77	42	-	-
SS-4	61' RT	24+57	22.7-24.2	A-2-4(0)	33	NP	49.9	33.4	10.6	6.0	100	70	20	-	-
SS-5	61' RT	24+57	33.9-34.2	A-2-4(0)	32	NP	36.3	46.1	9.6	8.1	100	89	21	-	-
SS-6	61' RT	24+57	37.7-39.2	A-2-4(0)	36	4	44.8	28.1	17.0	10.1	99	68	32	-	-
SS-10	103' LT	26+95	3.2-4.7	A-7-5(7)	49	13	25.8	22.6	19.1	32.5	100	82	57	-	-
SS-11	103' LT	26+95	8.2-9.7	A-4(0)	32	6	38.2	30.1	21.5	10.2	100	75	38	-	-



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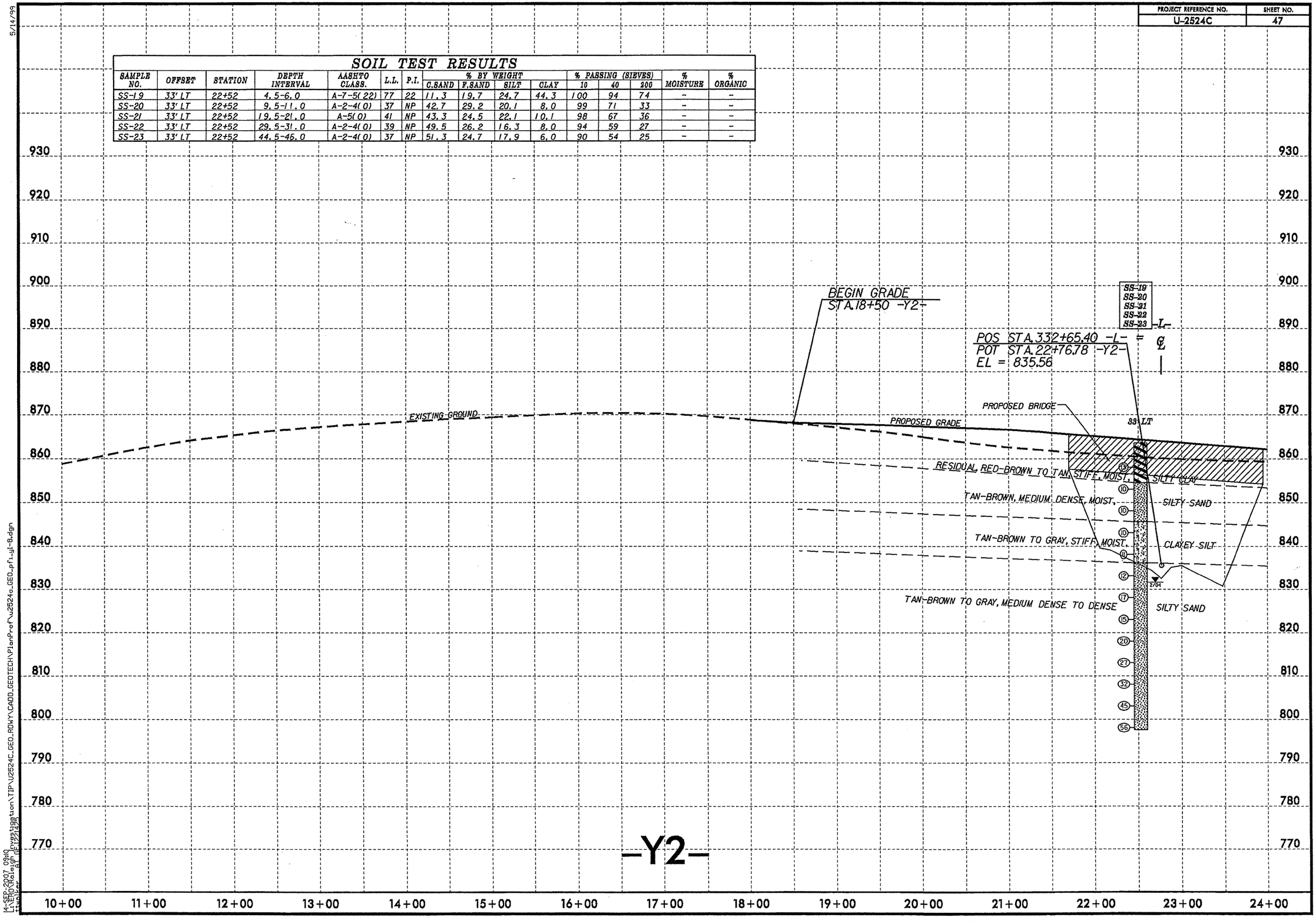
PROJECT REFERENCE NO.	SHEET NO.
U-2524C	47

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-19	33' LT	22+52	4.5-6.0	A-7-5(22)	77	22	11.3	19.7	24.7	44.3	100	94	74	-	-
SS-20	33' LT	22+52	9.5-11.0	A-2-4(0)	37	NP	42.7	29.2	20.1	8.0	99	71	33	-	-
SS-21	33' LT	22+52	19.5-21.0	A-5(0)	41	NP	43.3	24.5	22.1	10.1	98	67	36	-	-
SS-22	33' LT	22+52	29.5-31.0	A-2-4(0)	39	NP	49.5	26.2	16.3	8.0	94	59	27	-	-
SS-23	33' LT	22+52	44.5-46.0	A-2-4(0)	37	NP	51.3	24.7	17.9	6.0	90	54	25	-	-



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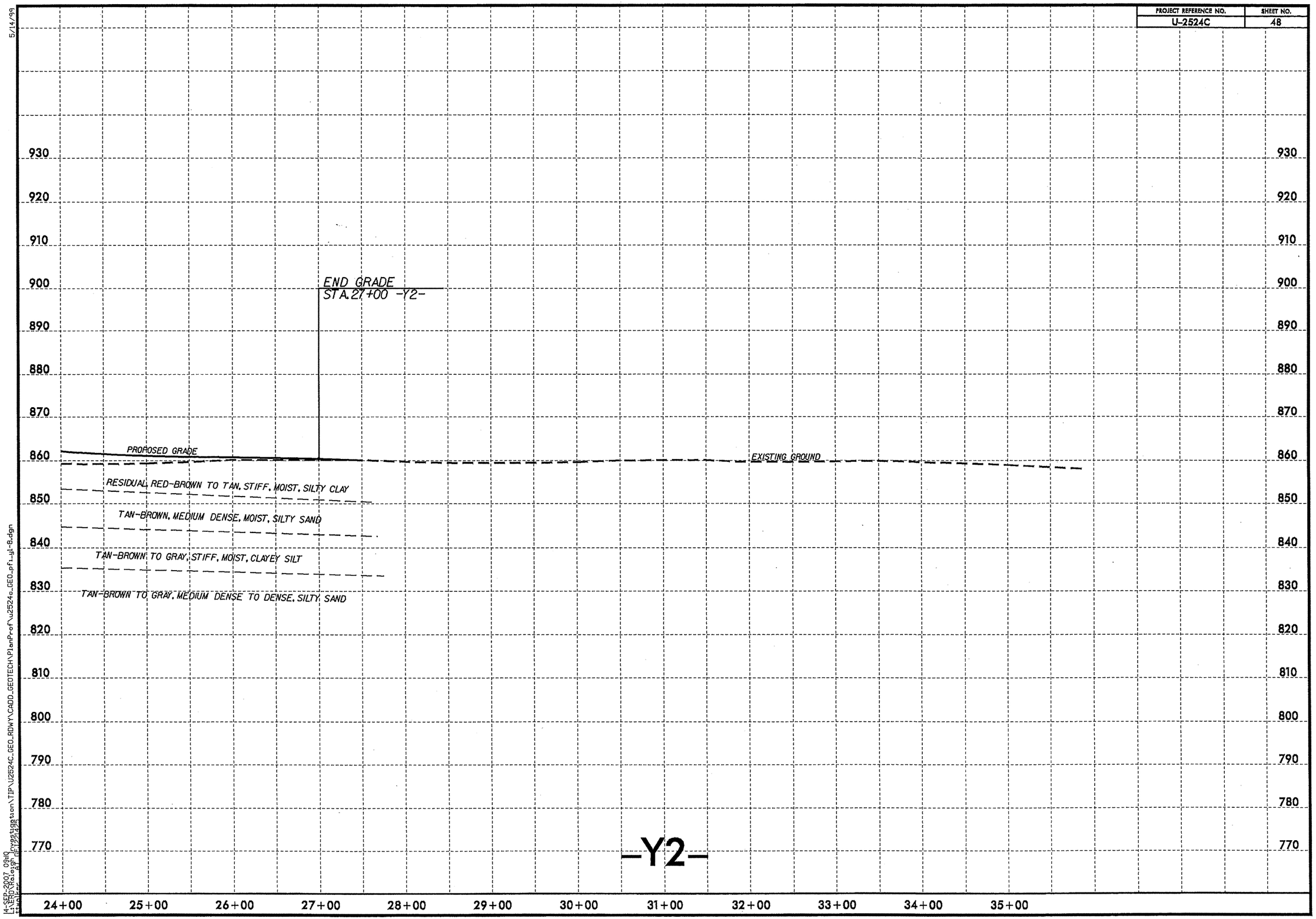
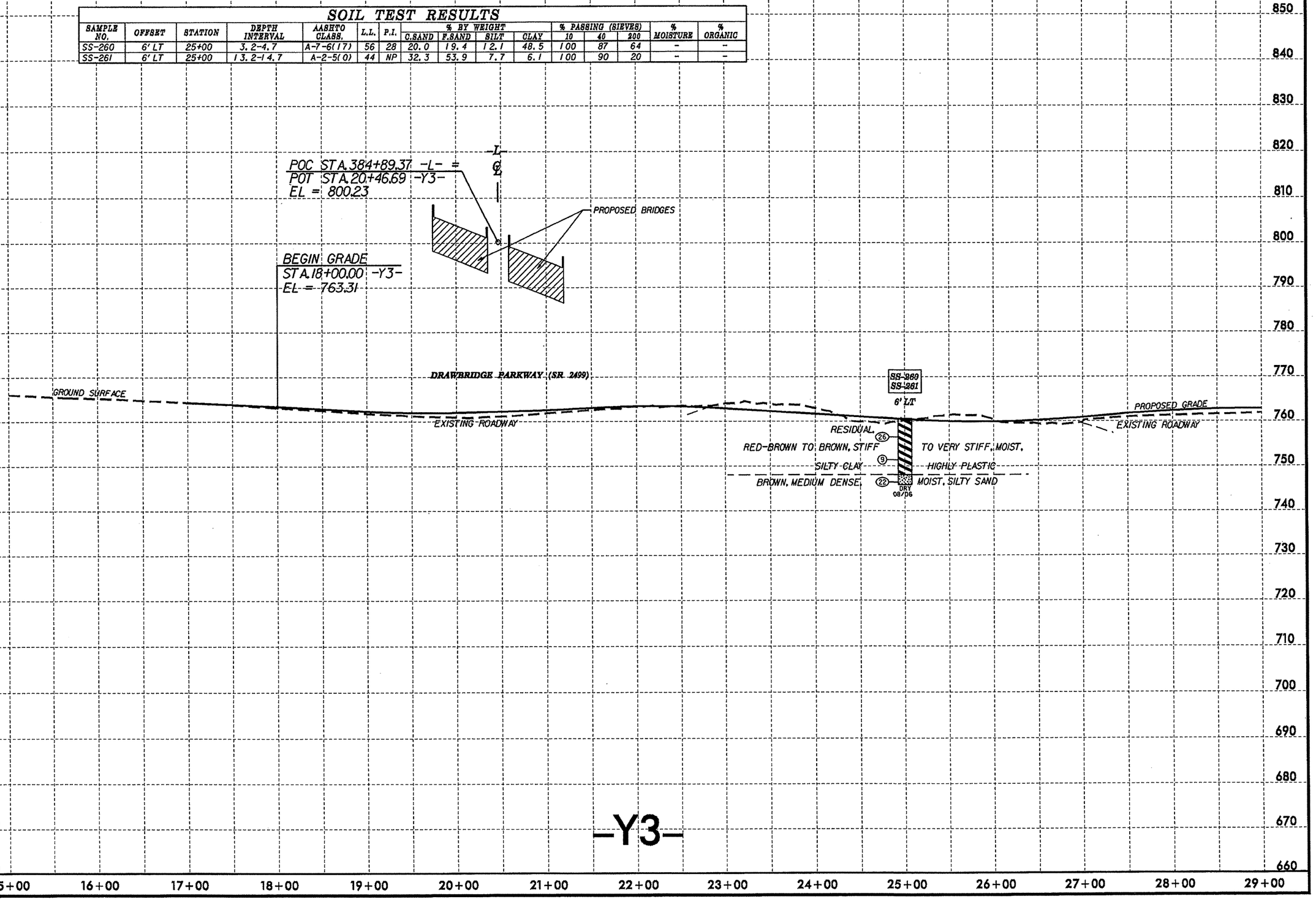


PROJECT REFERENCE NO.
U-2524C
SHEET NO.
48
5/14/99
930
920
910
900
890
880
870
860
850
840
830
820
810
800
790
780
770
END GRADE
STA. 27+00 -Y2-
PROPOSED GRADE
EXISTING GROUND
RESIDUAL RED-BROWN TO TAN, STIFF, MOIST, SILTY CLAY
TAN-BROWN, MEDIUM DENSE, MOIST, SILTY SAND
TAN-BROWN TO GRAY, STIFF, MOIST, CLAYEY SILT
TAN-BROWN TO GRAY, MEDIUM DENSE TO DENSE, SILTY SAND
-Y2-
24+00
25+00
26+00
27+00
28+00
29+00
30+00
31+00
32+00
33+00
34+00
35+00

PROJECT REFERENCE NO.	SHEET NO.
U-2524C	49

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-260	6' LT	25+00	3.2-4.7	A-7-6(17)	56	28	20.0	19.4	12.1	48.5	100	87	64	-	-
SS-261	6' LT	25+00	13.2-14.7	A-2-5(0)	44	NP	32.3	53.9	7.7	6.1	100	90	20	-	-



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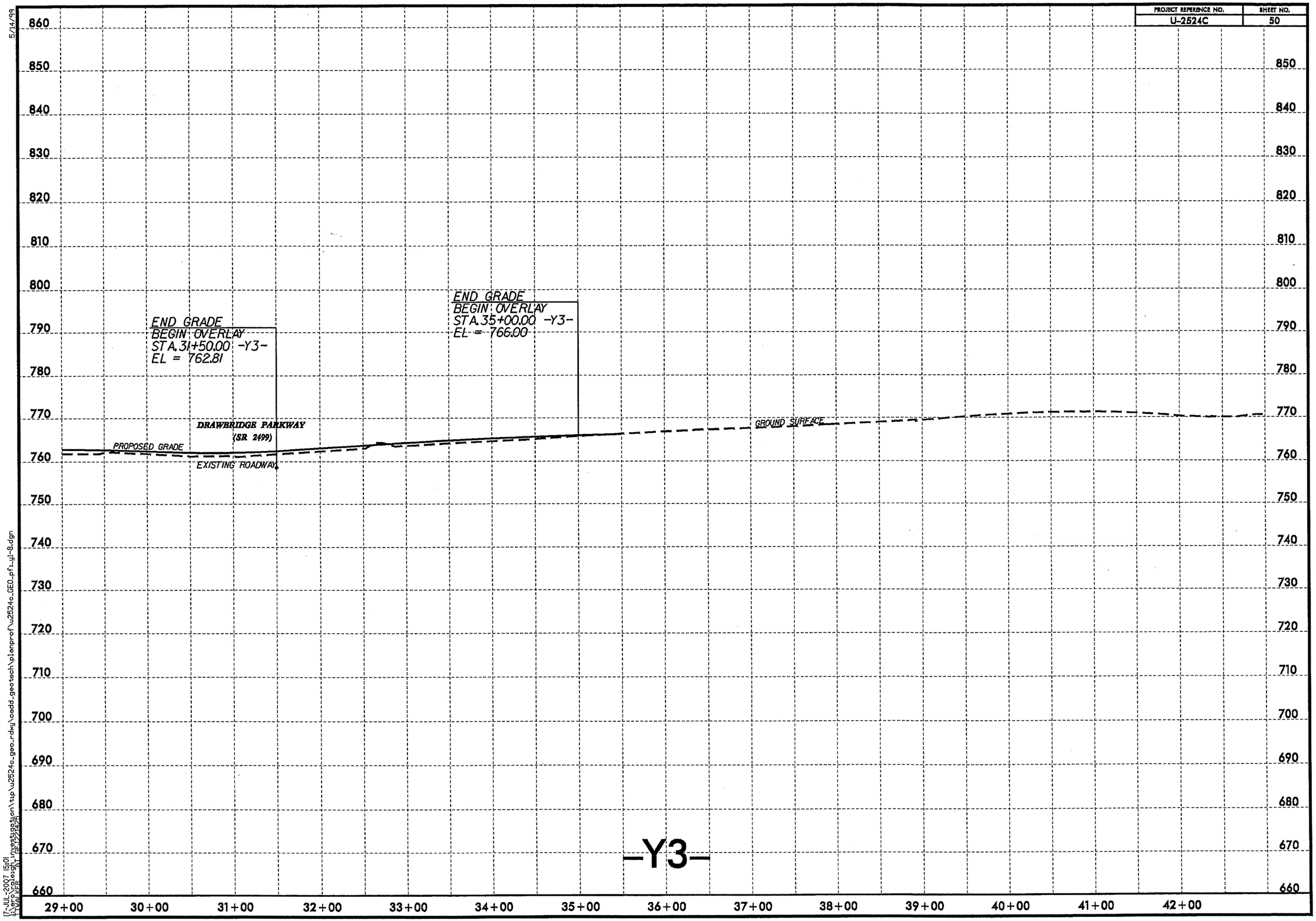
PROJECT REFERENCE NO.
U-2524C
SHEET NO.
50
5/14/99
860
850
840
830
820
810
800
790
780
770
760
750
740
730
720
710
700
690
680
670
660
END GRADE
BEGIN OVERLAY
STA. 31+50.00 -Y3-
EL = 762.81
END GRADE
BEGIN OVERLAY
STA. 35+00.00 -Y3-
EL = 766.00
DRAWBRIDGE PARKWAY
(SR 2499)
PROPOSED GRADE
EXISTING ROADWAY
GROUND SURFACE
-Y3-
29+00
30+00
31+00
32+00
33+00
34+00
35+00
36+00
37+00
38+00
39+00
40+00
41+00
42+00
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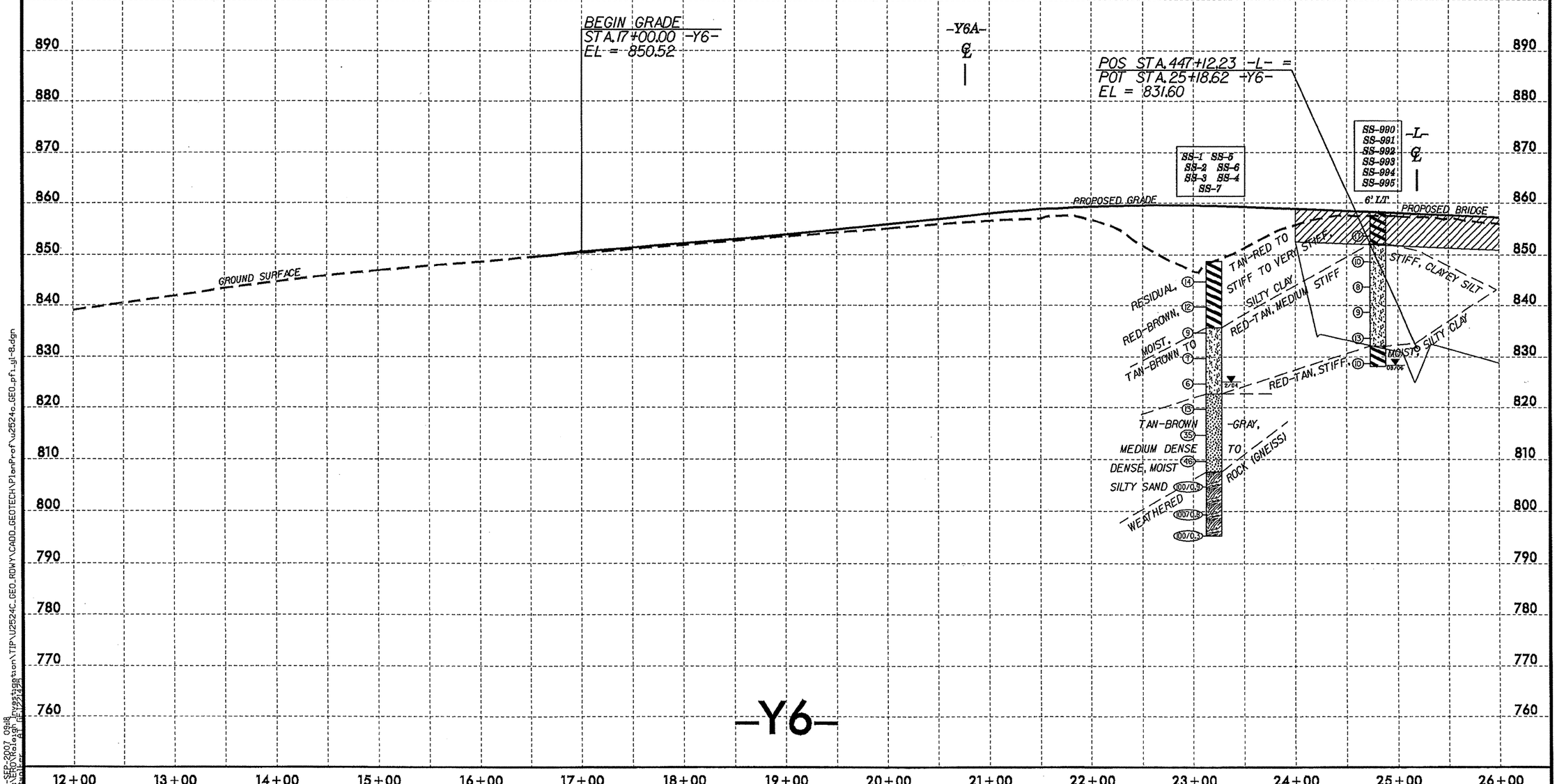
PROJECT REFERENCE NO.	SHEET NO.
U-2524C	51

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-1	CL	23+20	3.0-4.5	A-7-5(12)	63	20	17.5	26.8	17.5	38.2	100	91	60	-	-
SS-2	CL	23+20	8.0-9.5	A-7-5(8)	63	11	18.1	27.0	26.8	28.2	100	89	60	34.8	-
SS-3	CL	23+20	13.0-14.5	A-5(0)	50	NP	15.7	51.5	18.7	14.1	97	92	44	41.6	-
SS-4	CL	23+20	18.0-19.5	A-5(0)	44	NP	25.6	32.2	34.2	8.0	100	86	50	-	-
SS-5	CL	23+20	23.0-24.5	A-5(0)	54	NP	16.5	40.0	31.4	12.1	82	73	46	58.7	-
SS-6	CL	23+20	28.0-29.5	A-2-4(0)	38	NP	28.2	43.3	22.5	6.0	100	84	35	-	-
SS-7	CL	23+20	33.0-34.5	A-2-4(0)	34	NP	34.4	43.5	14.1	8.0	94	79	27	-	-
SS-990	6' LT	24+81	3.5-5.0	A-7-5(11)	59	18	10.4	37.3	16.1	36.1	100	94	59	-	-
SS-991	6' LT	24+81	8.5-10.0	A-5(3)	49	5	9.0	47.2	21.7	22.1	100	95	54	-	-
SS-992	6' LT	24+81	13.5-15.0	A-5(0)	42	NP	11.6	53.8	20.5	14.1	100	97	46	-	-
SS-993	6' LT	24+81	18.5-20.0	A-5(0)	54	NP	23.9	45.4	20.7	10.0	100	88	40	-	-
SS-994	6' LT	24+81	23.5-25.0	A-5(1)	51	NP	14.1	40.6	29.3	16.1	97	91	53	-	-
SS-995	6' LT	24+81	28.5-30.0	A-7-5(11)	55	14	10.6	31.7	39.6	18.1	98	91	66	-	-



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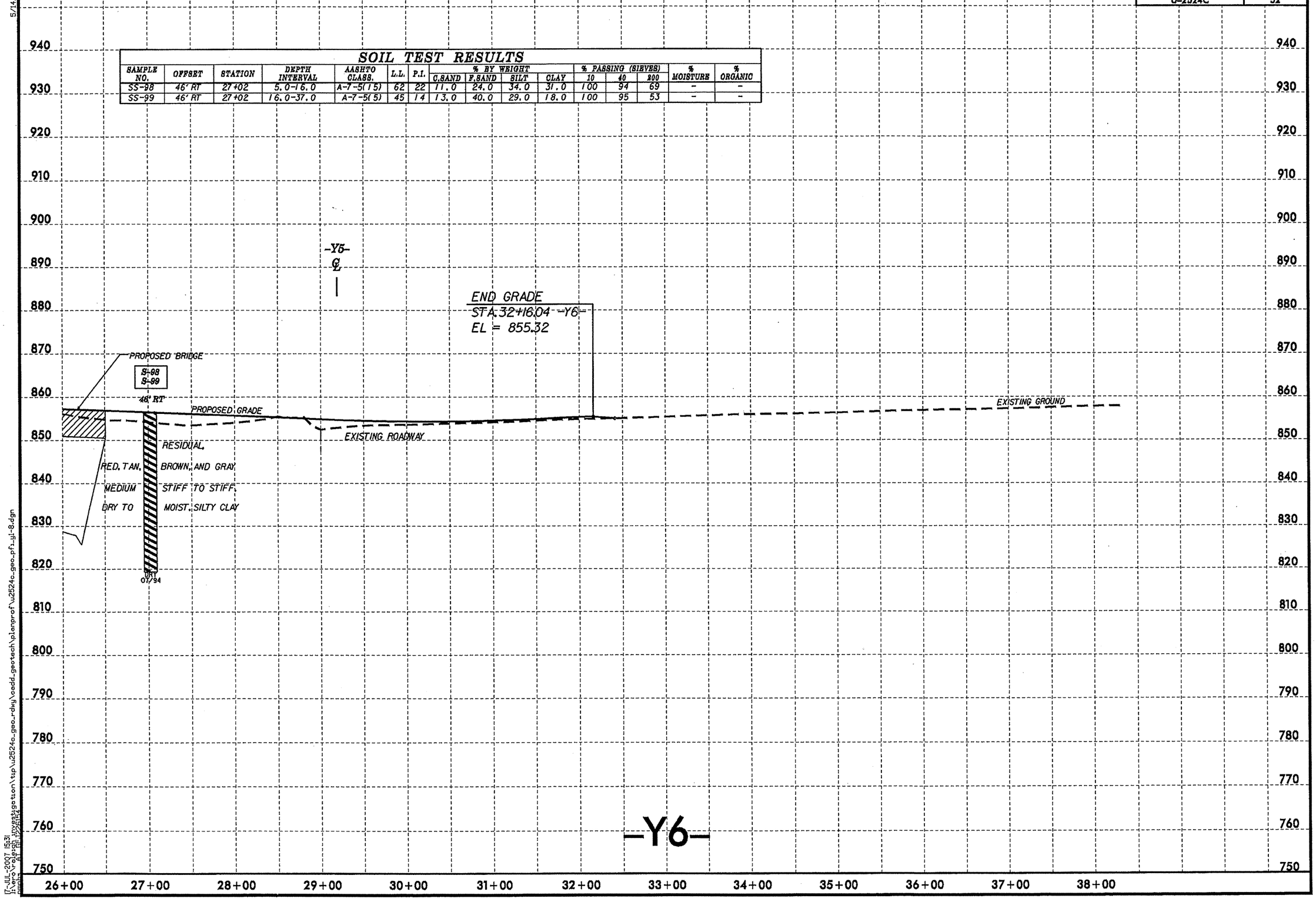
PROJECT REFERENCE NO.	SHEET NO.
U-2524C	52

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-98	46' RT	27+02	5.0-16.0	A-7-5(15)	62	22	11.0	24.0	34.0	31.0	100	94	69	-	-
SS-99	46' RT	27+02	16.0-37.0	A-7-5(5)	45	14	13.0	40.0	29.0	18.0	100	95	53	-	-



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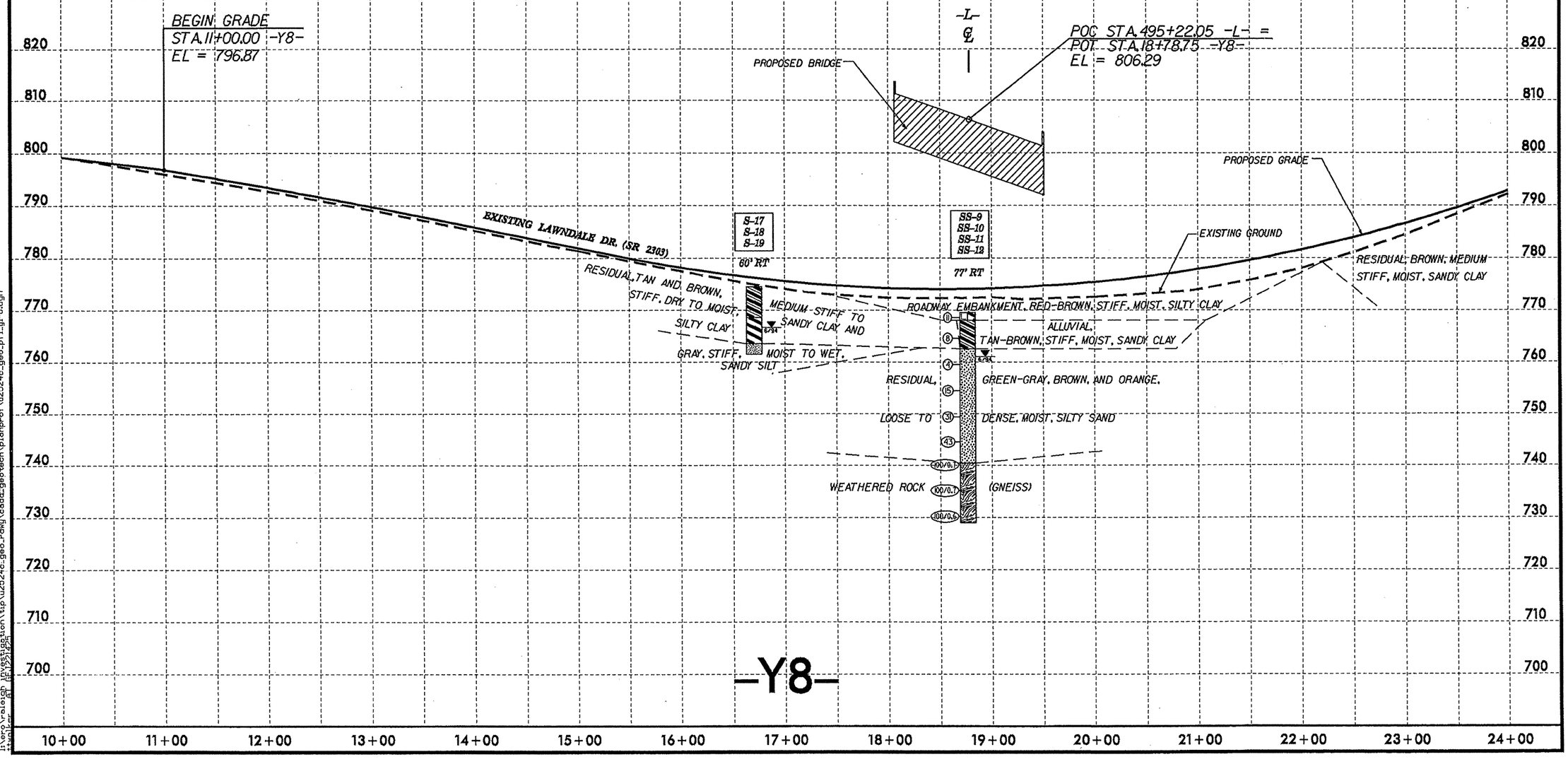
PROJECT REFERENCE NO.	SHEET NO.
U-2524C	53

5/14/99

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-17	60' RT	16+70	0.5-6.0	A-6(9)	40	23	25.0	24.0	14.0	37.0	100	86	55	-	-
S-18	60' RT	16+70	6.0-11.0	A-7-6(9)	42	25	18.0	23.0	18.0	41.0	98	88	61	-	-
S-19	60' RT	16+70	11.0-13.0	A-4(1)	39	9	32.0	34.0	22.0	12.0	98	78	38	-	-
SS-9	77' RT	18+77	0.0-1.5	A-7-6(8)	42	21	17.0	22.0	24.0	37.0	96	86	62	-	-
SS-10	77' RT	18+77	4.0-5.5	A-6(10)	37	14	3.0	15.0	48.0	34.0	100	99	86	-	-
SS-11	77' RT	18+77	9.0-10.5	A-2-5(0)	41	NP	38.0	36.0	20.0	6.0	83	64	27	-	-
SS-12	77' RT	18+77	24.0-25.5	A-2-4(0)	26	NP	48.0	33.0	15.0	4.0	79	54	18	-	-



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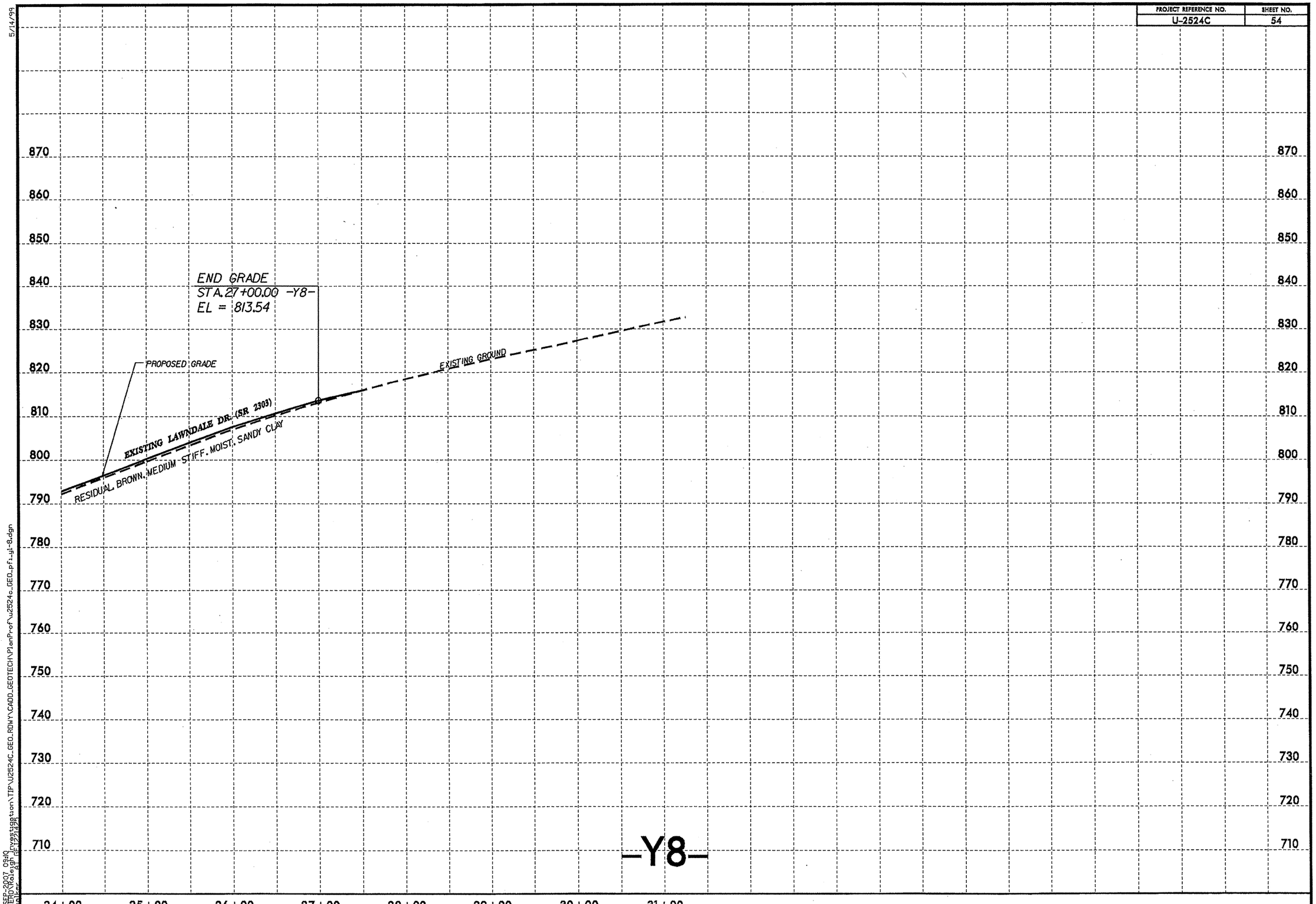
PROJECT REFERENCE NO.
U-2524C
SHEET NO.
54
5/14/99
END GRADE
STA. 27+00.00 -Y8-
EL = 813.54
PROPOSED GRADE
EXISTING GROUND
EXISTING LAWNDALE DR. (SR 2303)
RESIDUAL, BROWN, MEDIUM STIFF, MOIST, SANDY CLAY
-Y8-
870
860
850
840
830
820
810
800
790
780
770
760
750
740
730
720
710
24+00
25+00
26+00
27+00
28+00
29+00
30+00
31+00
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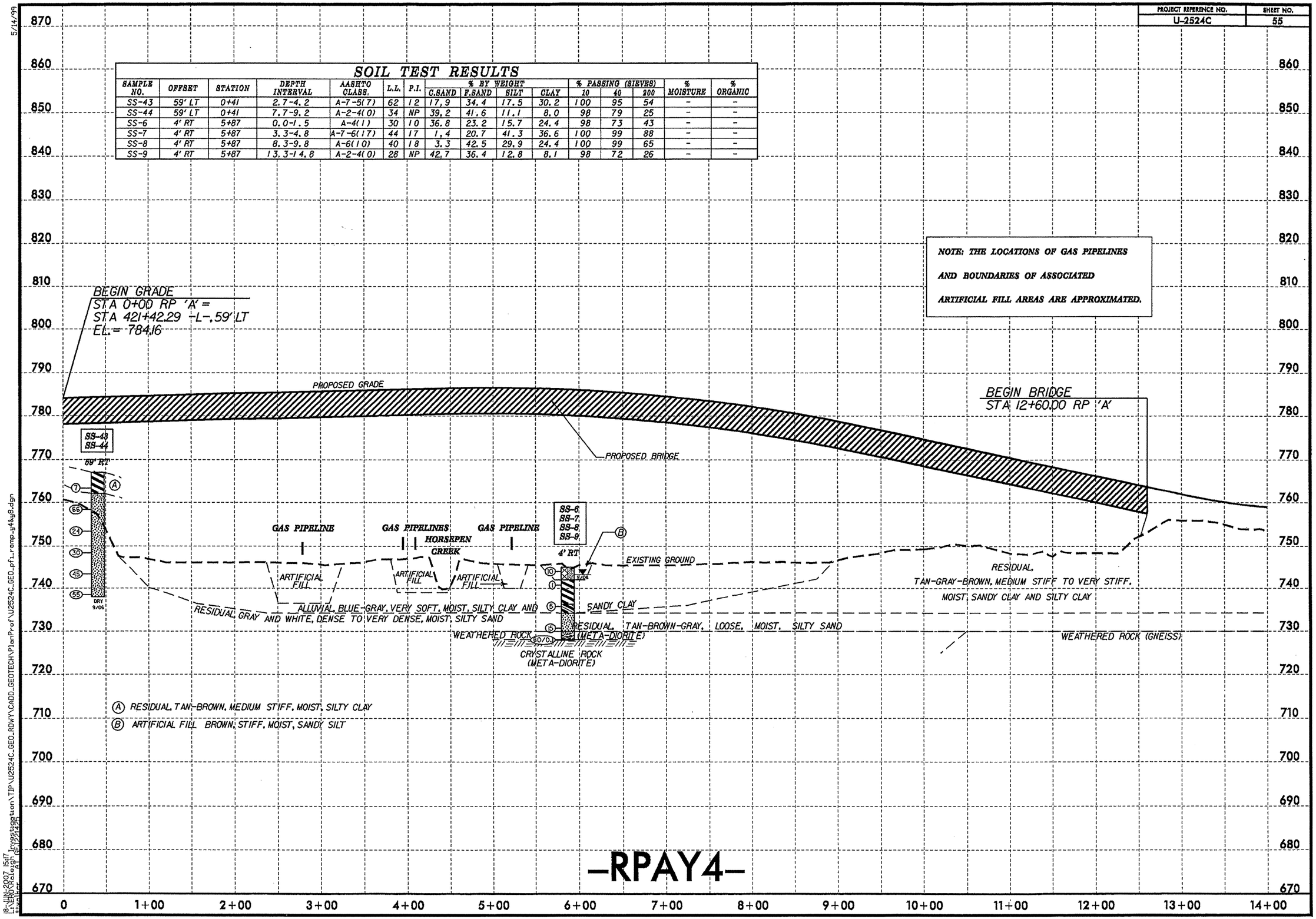
PROJECT REFERENCE NO.	SHEET NO.
U-2524C	55

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-43	59' LT	0+41	2.7-4.2	A-7-5(7)	62	12	17.9	34.4	17.5	30.2	100	95	54	-	-
SS-44	59' LT	0+41	7.7-9.2	A-2-4(0)	34	NP	39.2	41.6	11.1	8.0	98	79	25	-	-
SS-6	4' RT	5+87	0.0-1.5	A-4(1)	30	10	36.8	23.2	15.7	24.4	98	73	43	-	-
SS-7	4' RT	5+87	3.3-4.8	A-7-6(17)	44	17	1.4	20.7	41.3	36.6	100	99	88	-	-
SS-8	4' RT	5+87	8.3-9.8	A-6(10)	40	18	3.3	42.5	29.9	24.4	100	99	65	-	-
SS-9	4' RT	5+87	13.3-14.8	A-2-4(0)	28	NP	42.7	36.4	12.8	8.1	98	72	26	-	-

NOTE: THE LOCATIONS OF GAS PIPELINES AND BOUNDARIES OF ASSOCIATED ARTIFICIAL FILL AREAS ARE APPROXIMATED.



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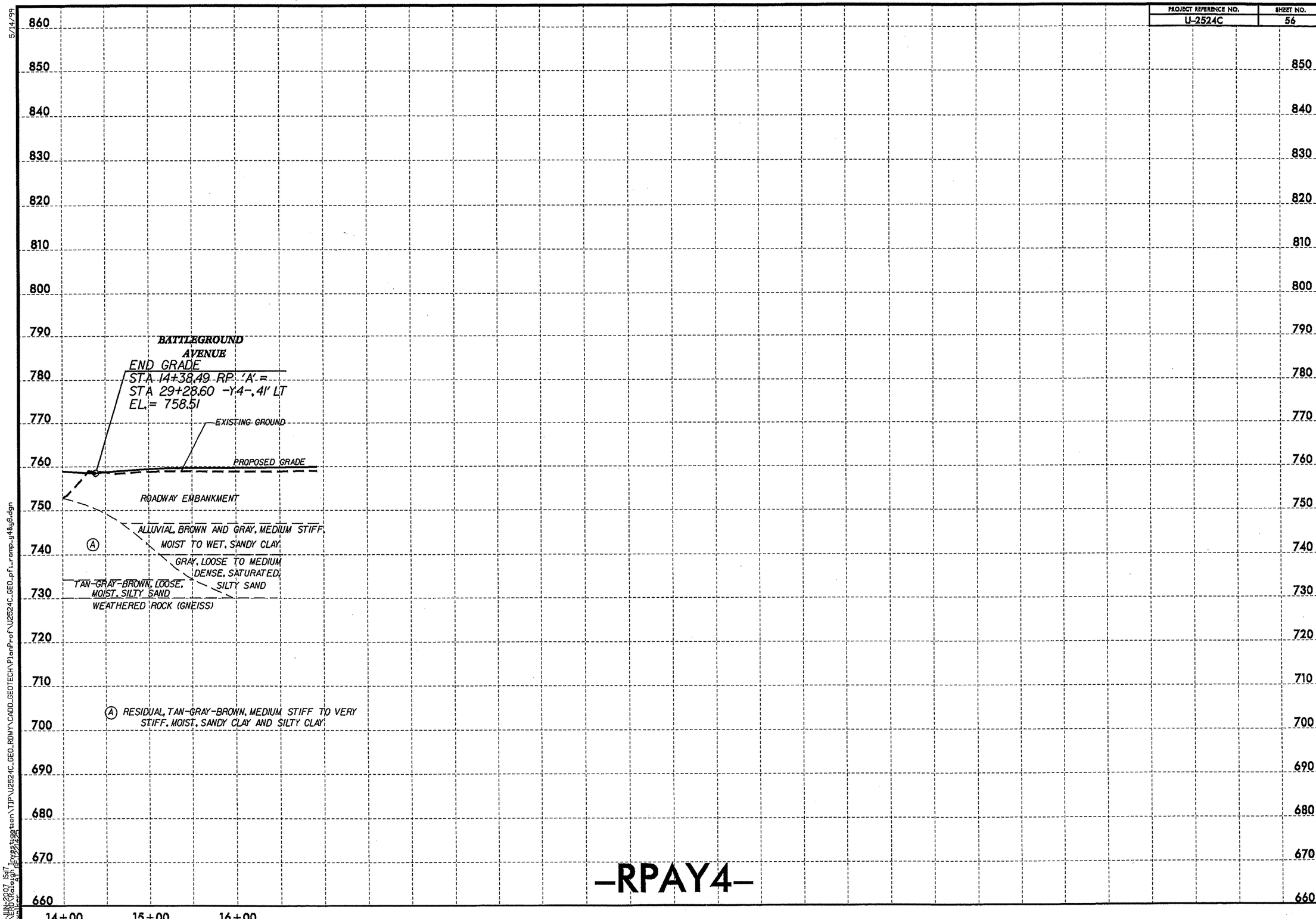
PROJECT REFERENCE NO.	SHEET NO.
U-2524C	56



-RPAY4-

5/14/99

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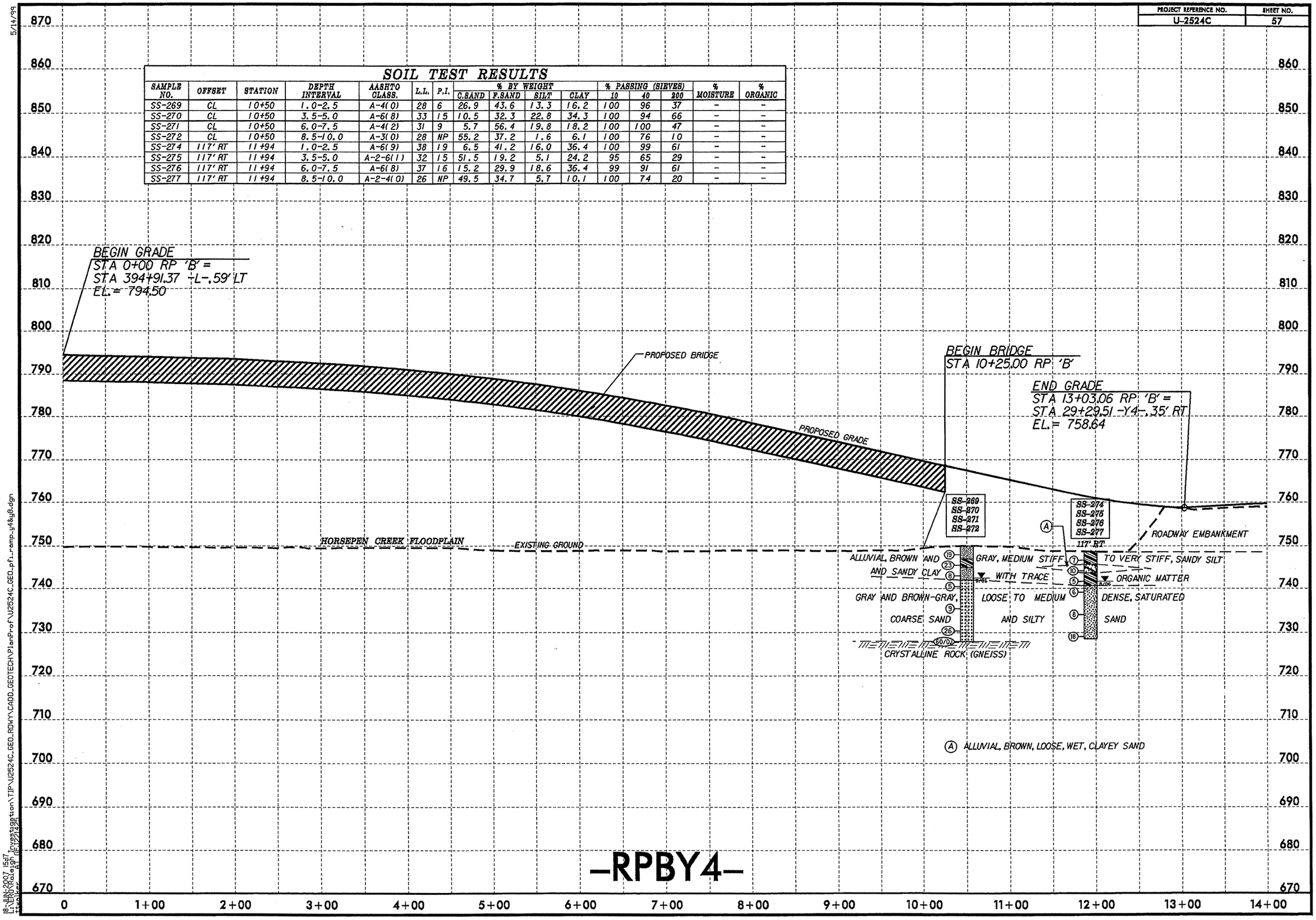
PROJECT REFERENCE NO.	SHEET NO.
U-2524C	57

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-269	CL	10+50	1.0-2.5	A-4(0)	28	6	26.9	43.6	13.3	16.2	100	96	37	-	-
SS-270	CL	10+50	3.5-5.0	A-6(8)	33	15	10.5	32.3	22.8	34.3	100	94	66	-	-
SS-271	CL	10+50	6.0-7.5	A-4(2)	31	9	5.7	56.4	19.8	18.2	100	100	47	-	-
SS-272	CL	10+50	8.5-10.0	A-3(0)	28	NP	55.2	37.2	1.6	6.1	100	76	10	-	-
SS-274	117' RT	11+94	1.0-2.5	A-6(9)	38	19	6.5	41.2	16.0	36.4	100	99	61	-	-
SS-275	117' RT	11+94	3.5-5.0	A-2-6(1)	32	15	51.5	19.2	5.1	24.2	95	65	29	-	-
SS-276	117' RT	11+94	6.0-7.5	A-6(8)	37	16	15.2	29.9	18.6	36.4	99	91	61	-	-
SS-277	117' RT	11+94	8.5-10.0	A-2-4(0)	26	NP	49.5	34.7	5.7	10.1	100	74	20	-	-



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PROJECT REFERENCE NO.	SHEET NO.
U-2524C	58

860 850 840 830 820 810 800 790 780 770 760 750 740 730 720 710 700 690 680 670 660

EXISTING GROUND

BATTLEGROUND AVENUE

PROPOSED GRADE

ROADWAY EMBANKMENT

ALLUVIAL, BROWN, MEDIUM STIFF TO VERY STIFF, MOIST TO WET, SANDY SILT AND SANDY CLAY

14+00 15+00

-RPBY4-

5/14/99

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PROJECT REFERENCE NO.	SHEET NO.
U-2524C	59

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-274	149' LT	12+46	1.0-2.5	A-6(9)	38	19	6.5	41.2	16.0	36.4	100	99	61	-	-
SS-275	149' LT	12+46	3.5-5.0	A-2-6(1)	32	15	51.5	19.2	5.1	24.2	95	65	29	-	-
SS-276	149' LT	12+46	6.0-7.5	A-6(8)	37	16	15.2	29.9	18.6	36.4	99	91	61	-	-
SS-277	149' LT	12+46	8.5-10.0	A-2-4(0)	26	NP	49.5	34.7	5.7	10.1	100	74	20	-	-

BEGIN GRADE
STA 0+00 RP 'C' =
STA 395+09.81 -L-, 59' RT
EL. = 794.99

PROPOSED GRADE

PROPOSED BRIDGE

END GRADE
STA 13+30.23 RP 'C' =
STA 29+72.32 -Y4-, 35' RT
EL. = 758.85

END BRIDGE
STA 12+00.00 RP 'C'

BATTLEGROUND AVE.

ROADWAY EMBANKMENT

HORSEPEN CREEK FLOODPLAIN

EXISTING GROUND

SS-274
SS-275
SS-276
SS-277
149' LT

ALLUVIAL, BROWN, MEDIUM STIFF

WET, CLAYEY SAND

GRAY, LOOSE TO SATURATED

MEDIUM DENSE, SILTY SAND

CRYSTALLINE (GNEISS)

ROCK

(A) ALLUVIAL, BROWN, LOOSE, WET, CLAYEY SAND

(B) ALLUVIAL, GRAY, MEDIUM STIFF, MOIST, SANDY CLAY WITH TRACE ORGANIC MATERIAL

(C) RESIDUAL, TAN-GRAY-BROWN, MEDIUM STIFF TO VERY VERY STIFF, MOIST, SANDY CLAY AND SILTY CLAY

870 860 850 840 830 820 810 800 790 780 770 760 750 740 730 720 710 700 690 680 670

0 1+00 2+00 3+00 4+00 5+00 6+00 7+00 8+00 9+00 10+00 11+00 12+00 13+00 14+00

-RPCY4-

5/14/99

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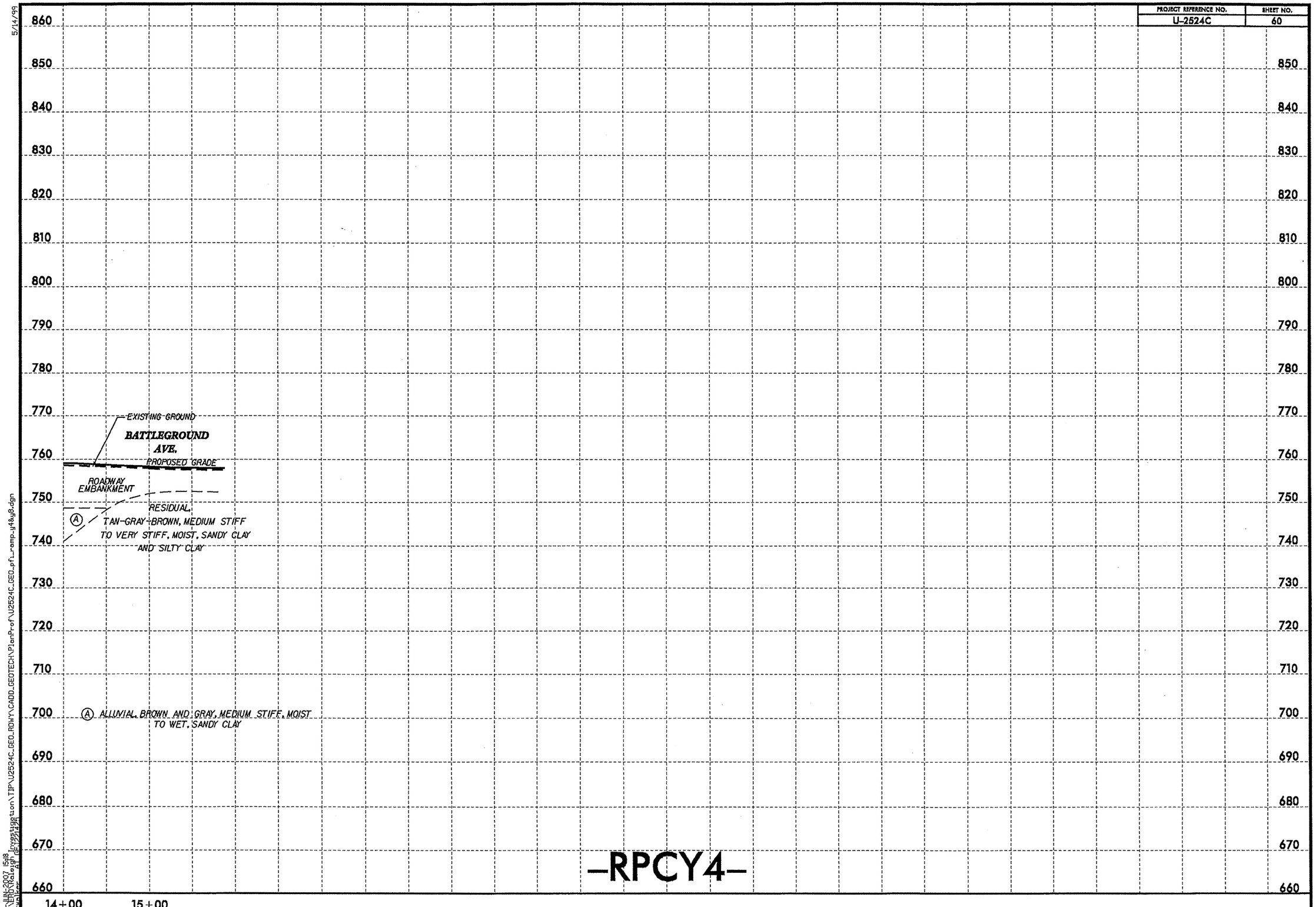
$$$$ser ACTIVE GEOPAK



PROJECT REFERENCE NO.
U-2524C
SHEET NO.
60
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860
850
840
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800
790
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770
760
750
740
730
720
710
700
690
680
670
660
EXISTING GROUND
BATTLEGROUND AVE.
PROPOSED GRADE
ROADWAY EMBANKMENT
RESIDUAL, TAN-GRAY-BROWN, MEDIUM STIFF TO VERY STIFF, MOIST, SANDY CLAY AND SILTY CLAY
A
A ALLUVIAL, BROWN AND GRAY, MEDIUM STIFF, MOIST TO WET, SANDY CLAY
-RPCY4-
14+00
15+00
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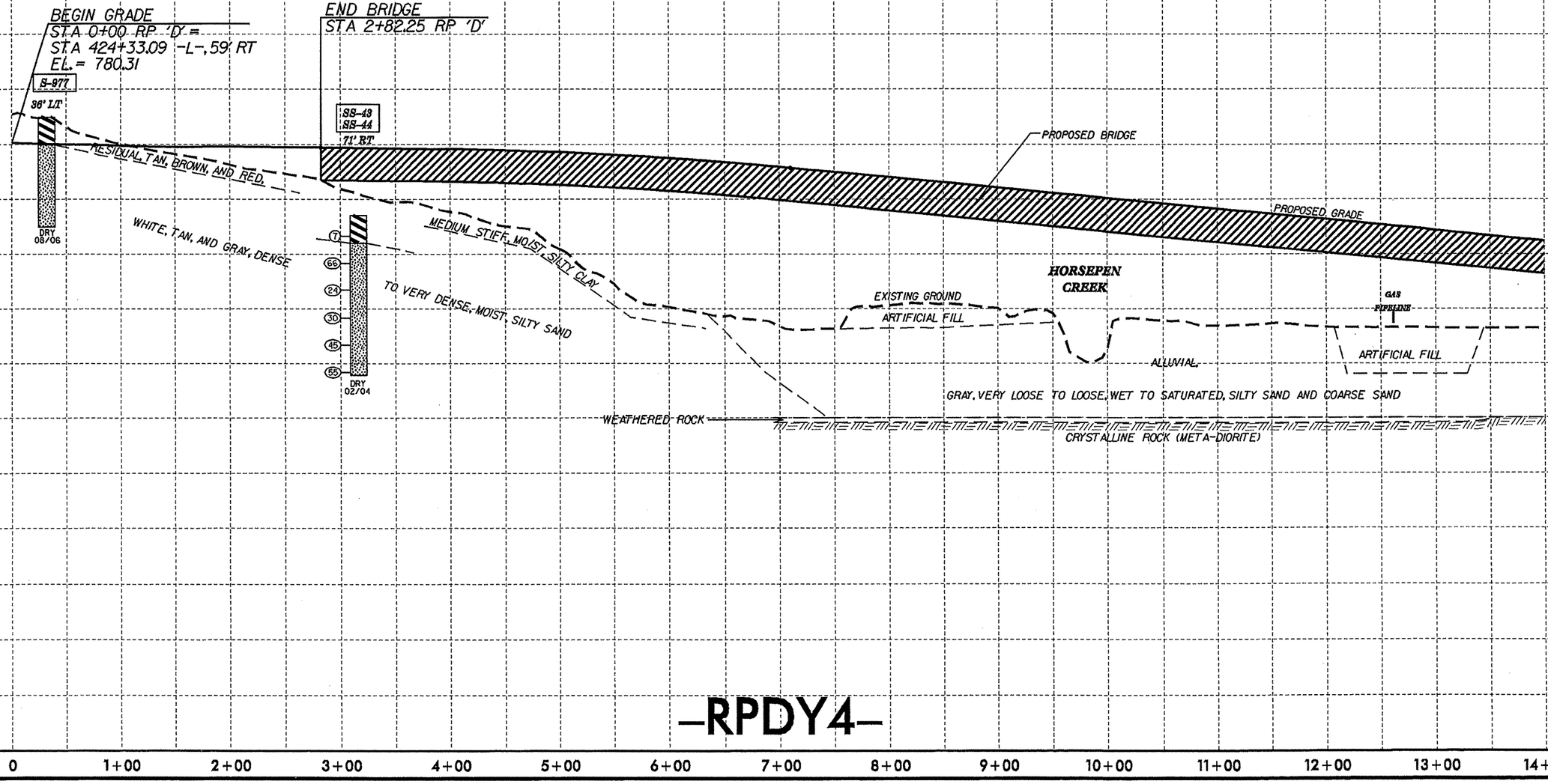
PROJECT REFERENCE NO.	SHEET NO.
U-2524C	61

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-977	36' LT	0+32	5.0-6.0	A-2-4(0)	33	NP	42.2	32.7	13.1	12.0	95	69	29	-	-
SS-43	71' RT	3+16	2.7-4.2	A-7-5(7)	62	12	17.9	34.4	17.5	30.2	100	95	54	-	-
SS-44	71' RT	3+16	7.7-9.2	A-2-4(0)	34	NP	39.2	41.6	11.1	8.0	98	79	25	-	-

NOTE: THE LOCATIONS OF GAS PIPELINES AND BOUNDARIES OF ASSOCIATED ARTIFICIAL FILL AREAS ARE APPROXIMATED.



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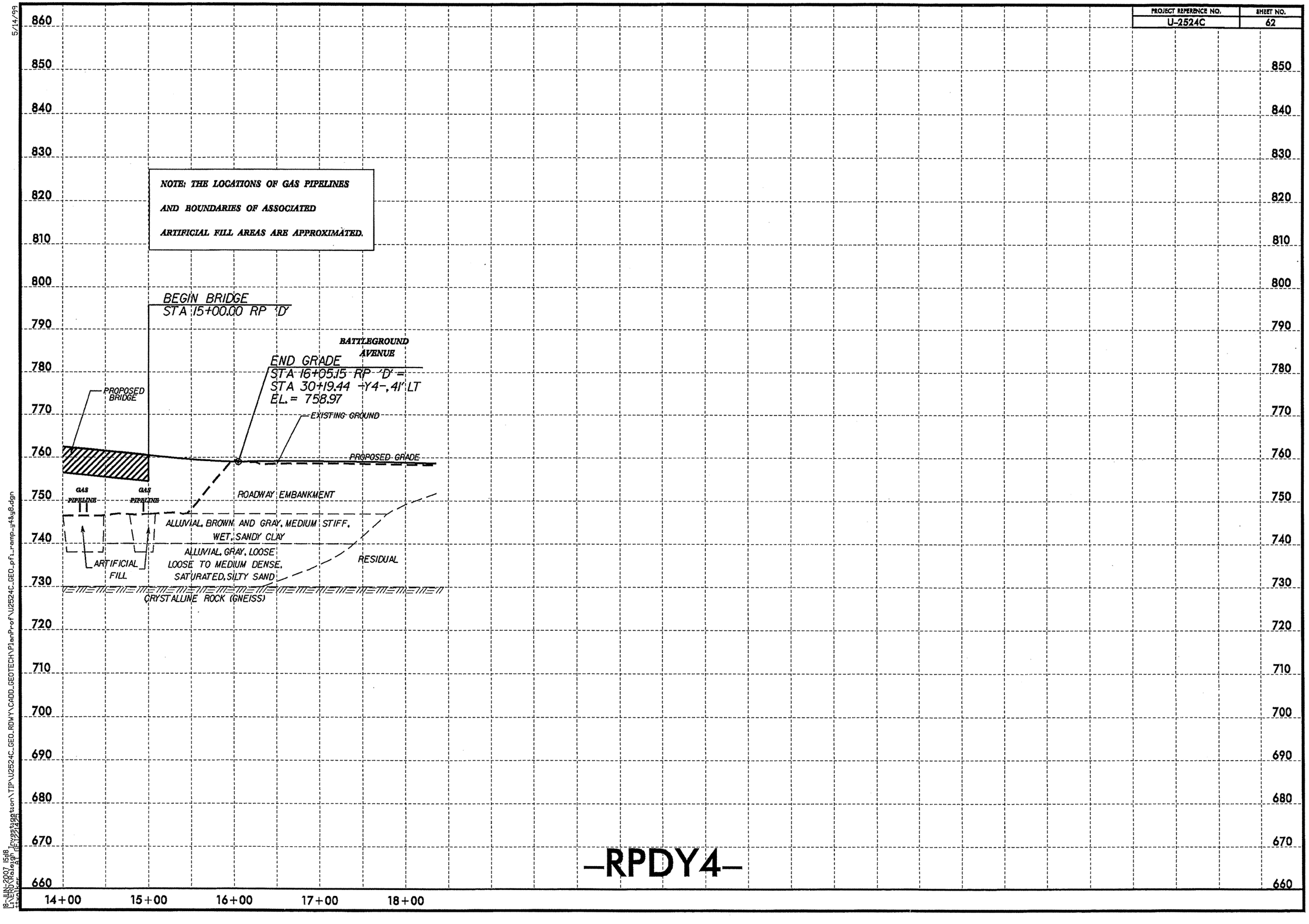
PROJECT REFERENCE NO.	SHEET NO.
U-2524C	62



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PROJECT REFERENCE NO.	SHEET NO.
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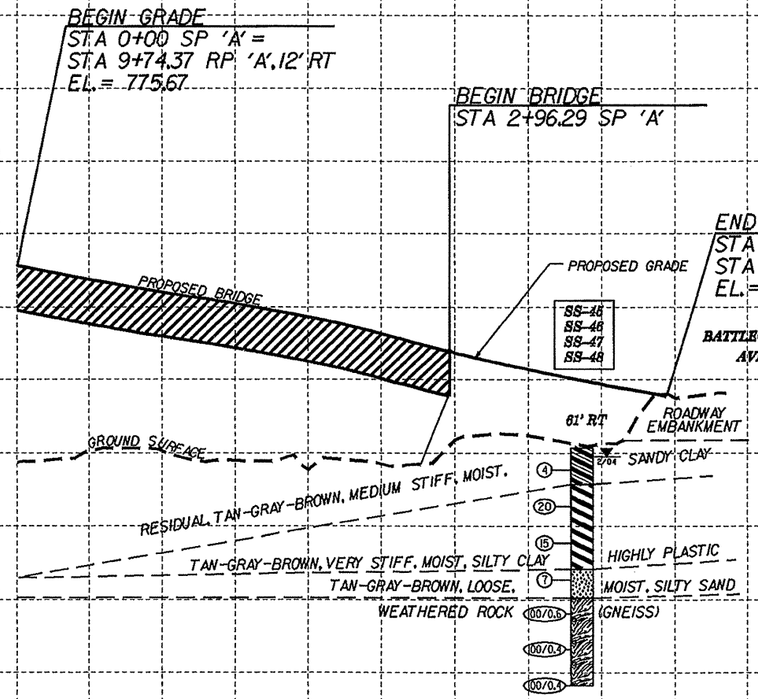

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-45	38' RT	3+86	2.0-3.5	A-6(6)	39	21	33.4	22.3	12.1	32.2	96	74	46	-	-
SS-46	38' RT	3+86	7.0-8.5	A-7-6(22)	51	29	14.9	10.1	24.7	50.3	100	90	77	25.7	-
SS-47	38' RT	3+86	12.0-13.5	A-7-6(27)	51	28	7.0	7.8	32.8	52.3	100	96	88	-	-
SS-48	38' RT	3+86	17.0-18.5	A-2-4(0)	26	NP	18.3	52.7	16.9	12.1	100	95	35	-	-

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PROJECT REFERENCE NO.	SHEET NO.
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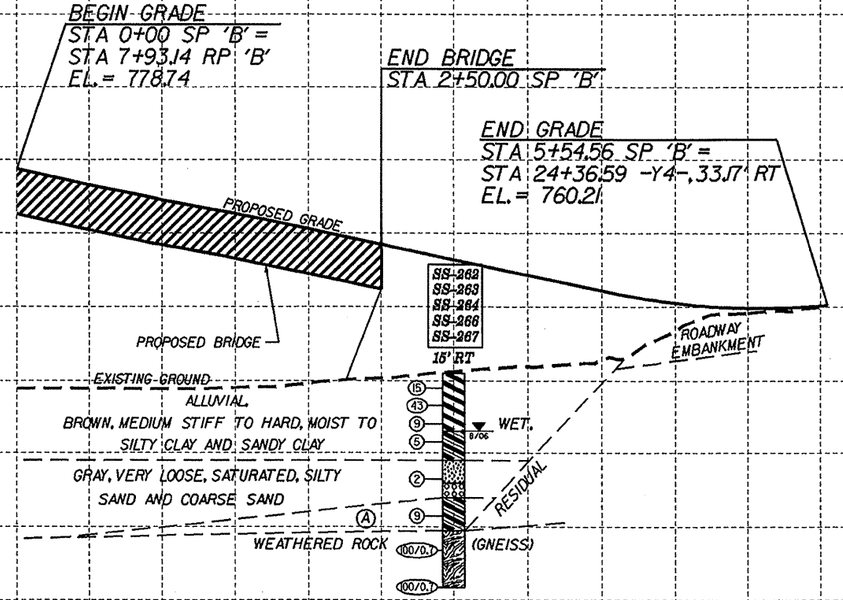

SOIL TEST RESULTS

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-262	15' RT	3+00	1.0-2.5	A-7-6(19)	41	24	10.3	8.3	57.2	24.2	100	93	83	-	-
SS-263	15' RT	3+00	3.5-5.0	A-7-6(19)	48	23	12.3	11.3	29.9	46.5	100	92	79	-	-
SS-264	15' RT	3+00	6.0-7.5	A-6(7)	37	15	4.6	45.1	24.0	26.3	100	99	62	-	-
SS-266	15' RT	3+00	13.5-15.0	A-1-b(0)	26	NP	78.9	16.8	0.3	4.0	92	28	6	-	-
SS-267	15' RT	3+00	18.5-20.0	A-6(12)	35	19	9.3	24.2	26.1	40.4	100	95	74	-	-

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PROJECT REFERENCE NO.	SHEET NO.
U-2524C	65

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PROJECT REFERENCE NO.	SHEET NO.
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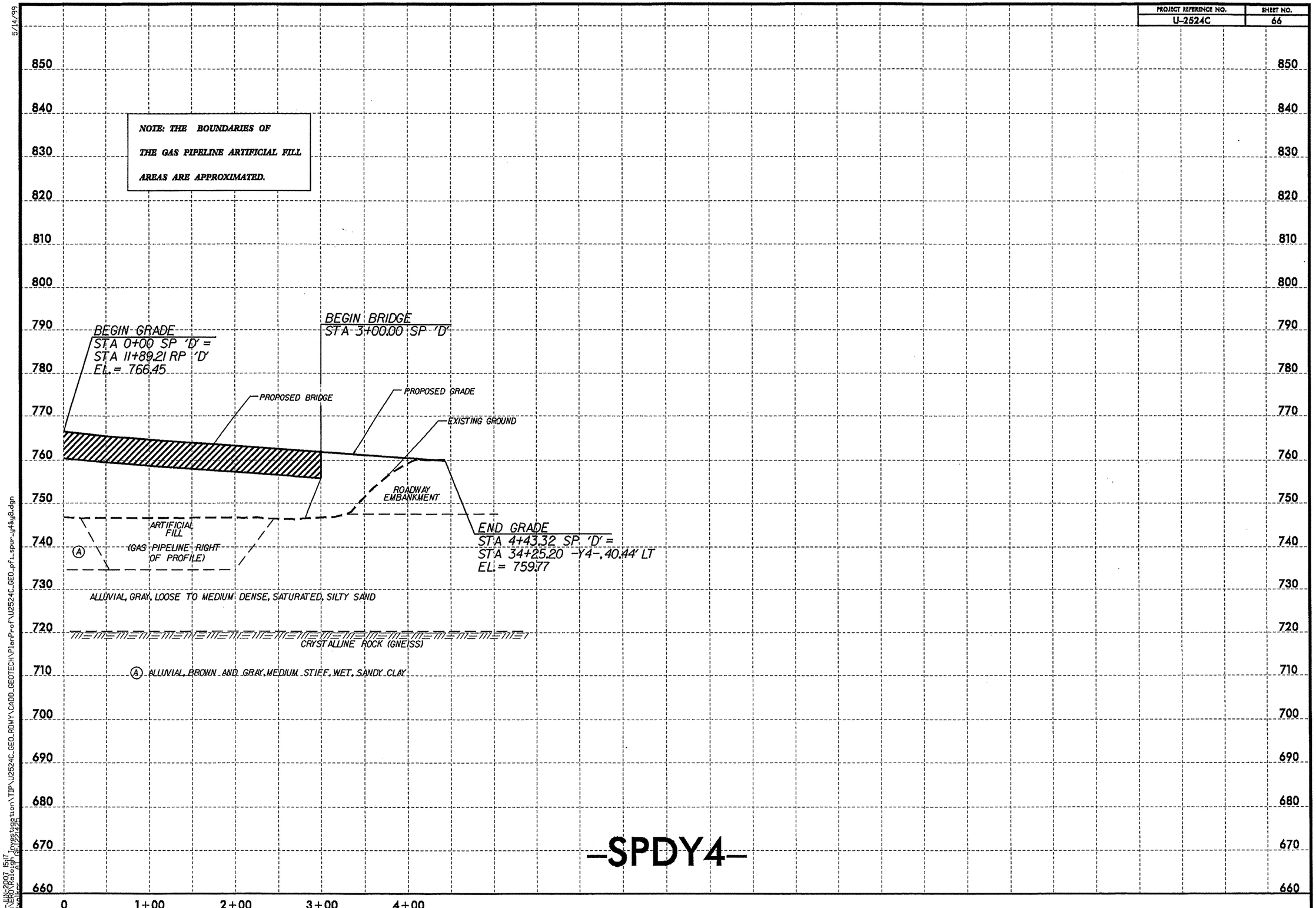

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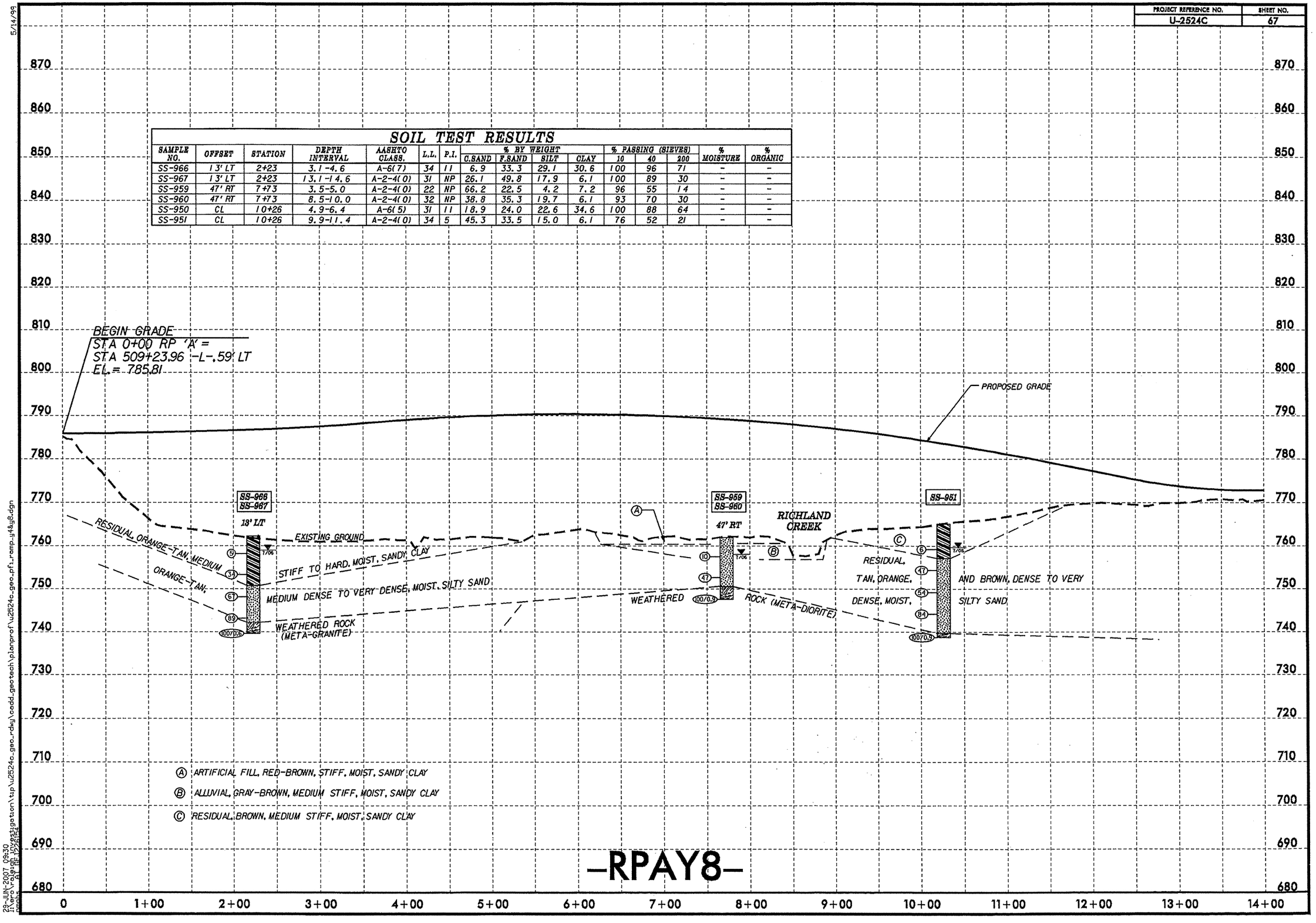
PROJECT REFERENCE NO.	SHEET NO.
U-2524C	67

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-966	13' LT	2+23	3.1-4.6	A-6(7)	34	11	6.9	33.3	29.1	30.6	100	96	71	-	-
SS-967	13' LT	2+23	13.1-14.6	A-2-4(0)	31	NP	26.1	49.8	17.9	6.1	100	89	30	-	-
SS-959	47' RT	7+73	3.5-5.0	A-2-4(0)	22	NP	66.2	22.5	4.2	7.2	96	55	14	-	-
SS-960	47' RT	7+73	8.5-10.0	A-2-4(0)	32	NP	38.8	35.3	19.7	6.1	93	70	30	-	-
SS-950	CL	10+26	4.9-6.4	A-6(5)	31	11	18.9	24.0	22.6	34.6	100	88	64	-	-
SS-951	CL	10+26	9.9-11.4	A-2-4(0)	34	5	45.3	33.5	15.0	6.1	76	52	21	-	-



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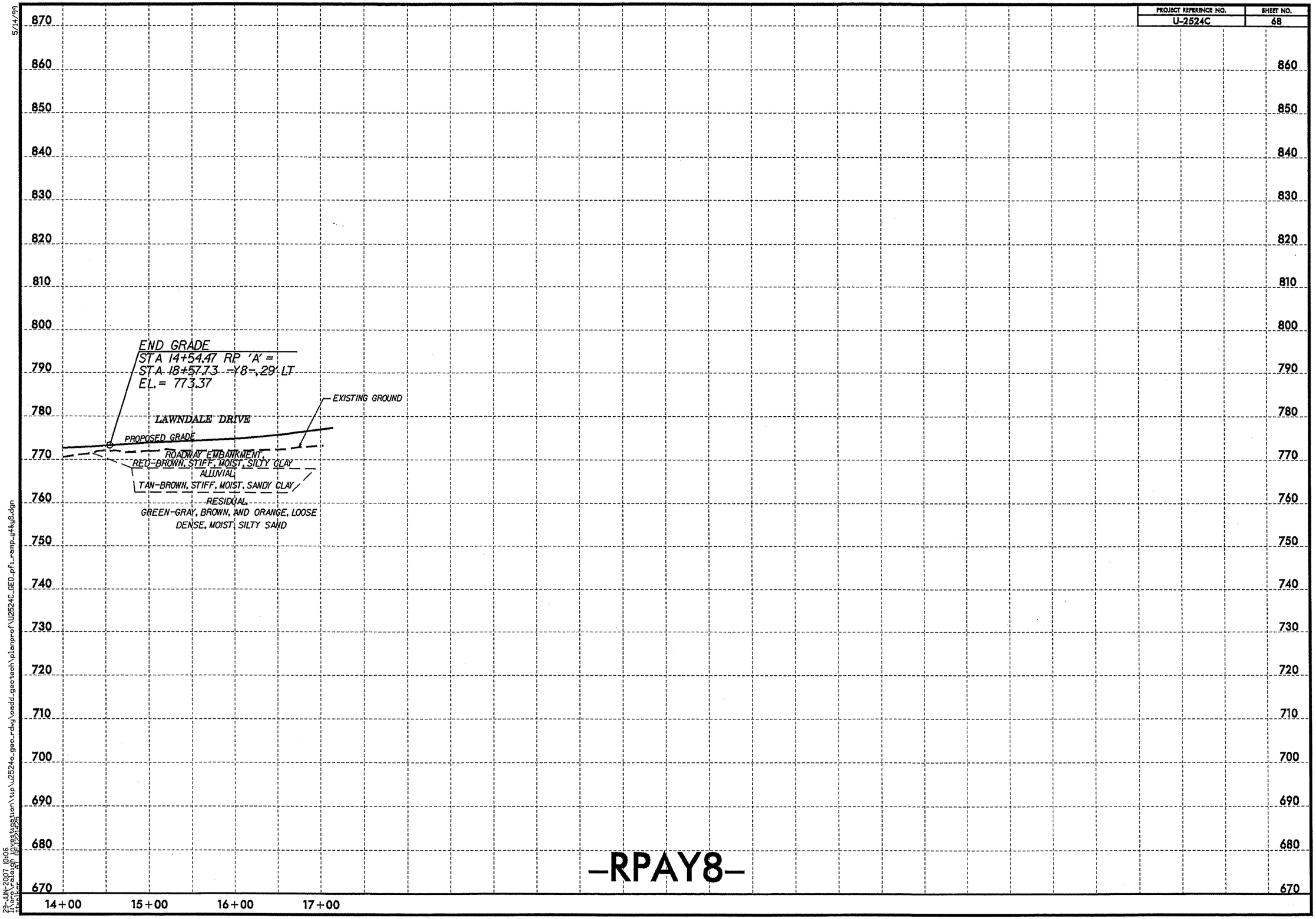

PROJECT REFERENCE NO.
U-2524C
SHEET NO.
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END GRADE
STA 14+54.47 RP 'A' =
STA 18+57.73 -Y8-,29' LT
EL.= 773.37
EXISTING GROUND
LAWNDALE DRIVE
PROPOSED GRADE
ROADWAY EMBANKMENT,
RED-BROWN, STIFF, MOIST, SILTY CLAY
ALLUVIAL
TAN-BROWN, STIFF, MOIST, SANDY CLAY
RESIDUAL,
GREEN-GRAY, BROWN, AND ORANGE, LOOSE
DENSE, MOIST, SILTY SAND
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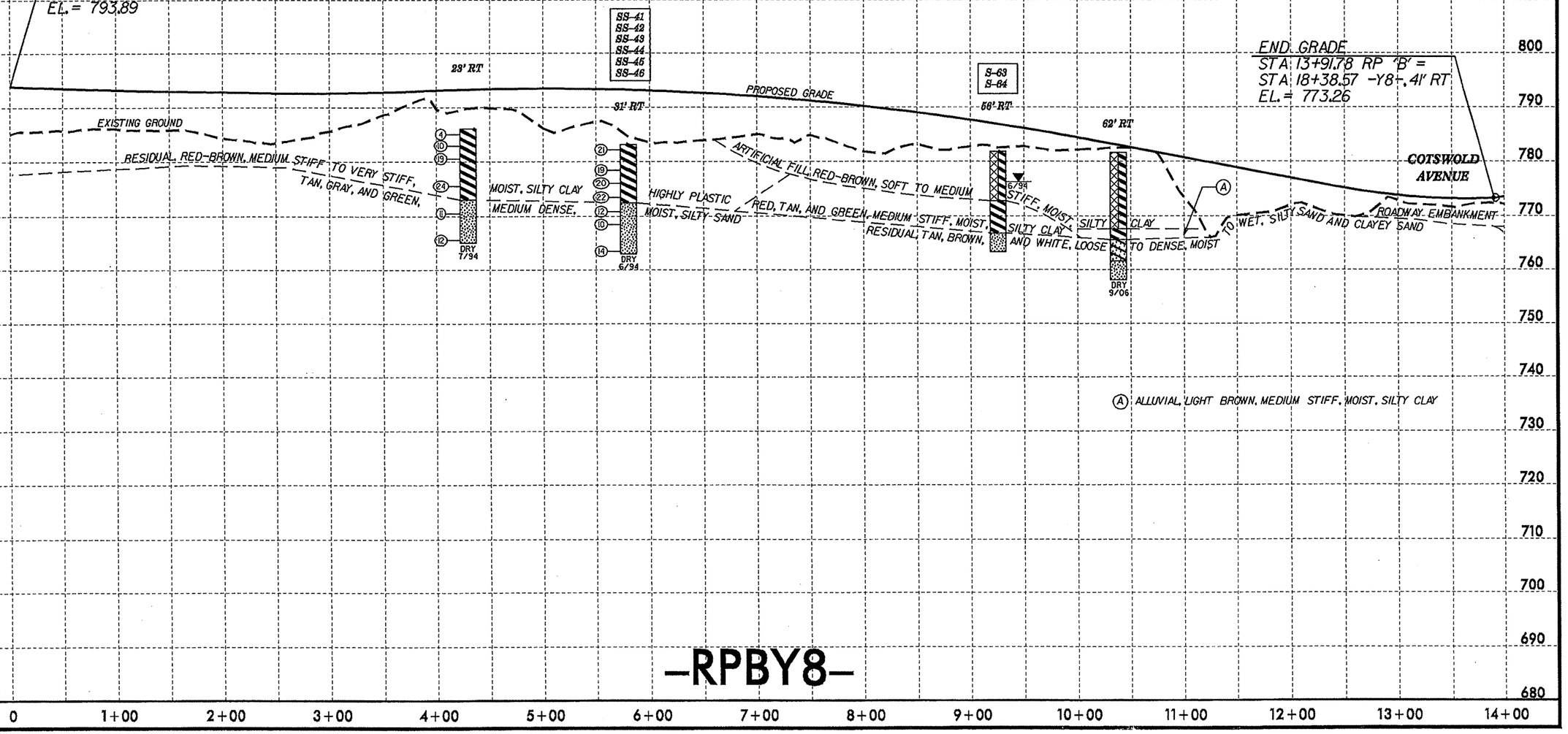
PROJECT REFERENCE NO.	SHEET NO.
U-2524C	69

5/14/99

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-41	31' RT	5+80	0.0-1.5	A-7-6(16)	51	29	15.0	19.0	15.0	51.0	100	92	69	-	-
SS-42	31' RT	5+80	6.4-7.6	A-7-6(17)	63	29	18.0	17.0	16.0	49.0	100	89	67	-	-
SS-43	31' RT	5+80	8.7-10.2	A-7-6(6)	43	26	31.0	19.0	15.0	35.0	78	61	41	-	-
SS-44	31' RT	5+80	11.3-12.0	A-2-5(0)	42	9	35.0	27.0	26.0	12.0	69	52	30	-	-
SS-45	31' RT	5+80	13.7-15.2	A-2-4(0)	40	NP	39.0	36.0	21.0	4.0	78	59	24	-	-
SS-46	31' RT	5+80	18.7-20.2	A-2-4(0)	38	NP	39.0	35.0	22.0	4.0	72	55	22	-	-
S-63	56' RT	9+26	0.0-4.5	A-7-6(12)	49	24	22.0	21.0	22.0	35.0	99	86	59	-	-
S-64	56' RT	9+26	4.5-9.0	A-7-6(12)	51	25	23.0	22.0	20.0	35.0	100	85	60	-	-



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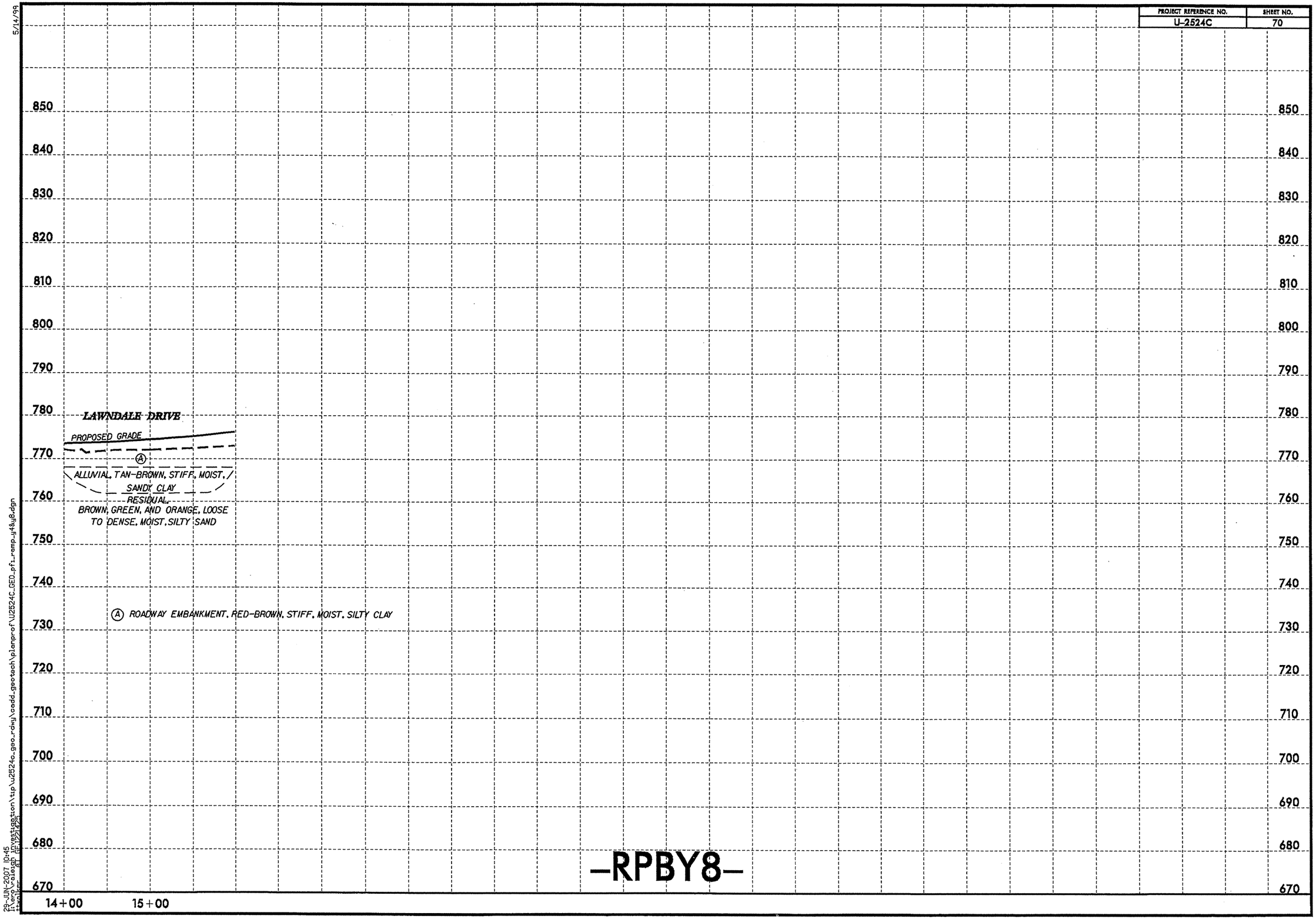
PROJECT REFERENCE NO.
U-2524C
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LAWNDALE DRIVE
PROPOSED GRADE
A
ALLUVIAL, TAN-BROWN, STIFF, MOIST, SANDY CLAY
RESIDUAL, BROWN, GREEN, AND ORANGE, LOOSE TO DENSE, MOIST, SILTY SAND
A ROADWAY EMBANKMENT, RED-BROWN, STIFF, MOIST, SILTY CLAY
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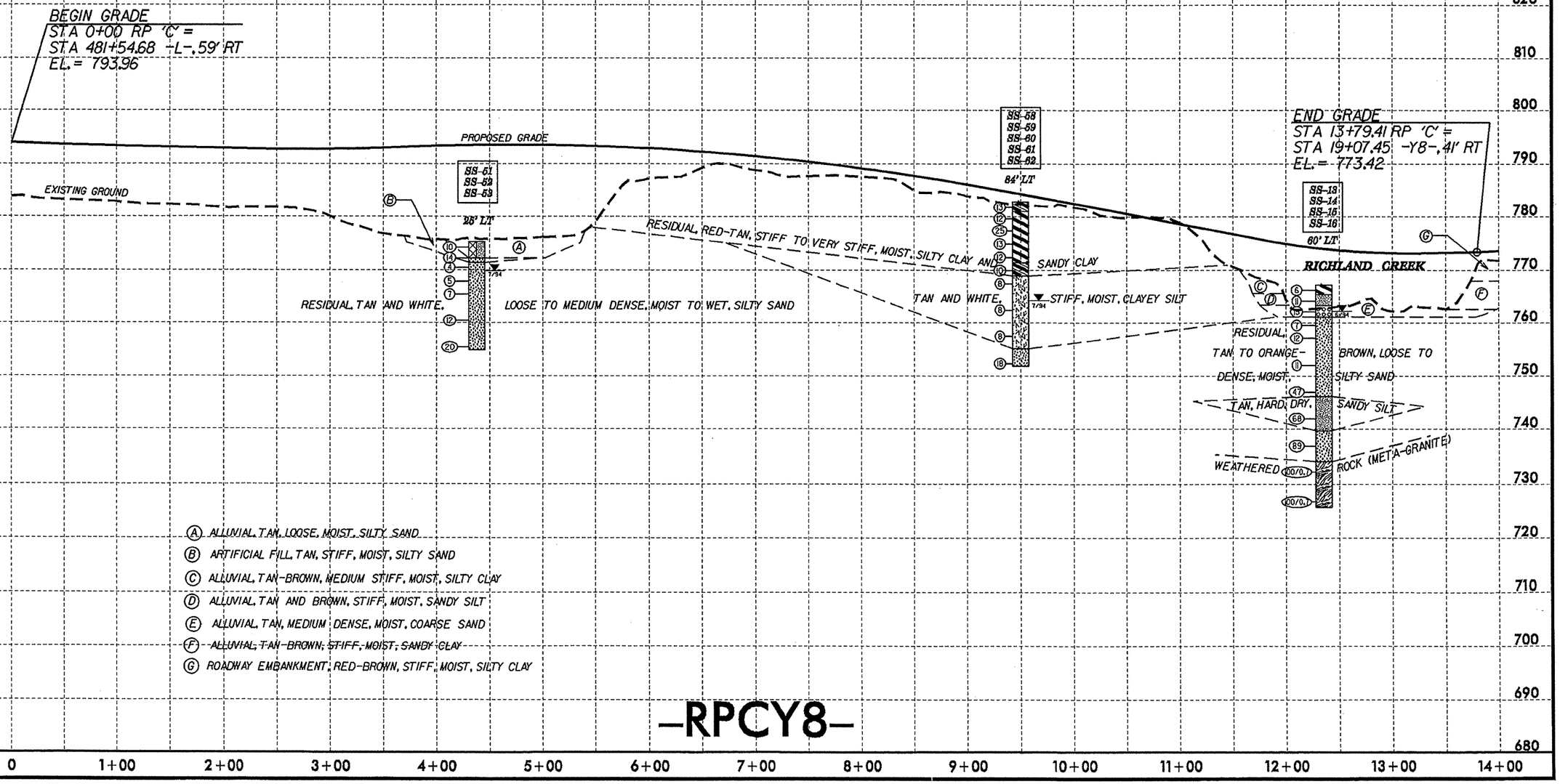
PROJECT REFERENCE NO.	SHEET NO.
U-2524C	71

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-51	25' LT	4+38	0.0-1.5	A-4(0)	22	3	24.0	44.0	14.0	18.0	100	91	37	-	-
SS-52	25' LT	4+38	3.8-5.3	A-2-5(0)	45	5	36.0	33.0	25.0	6.0	78	60	29	-	-
SS-53	25' LT	4+38	13.9-15.4	A-2-5(0)	44	8	35.0	34.0	25.0	6.0	78	61	28	-	-
SS-58	84' LT	9+50	0.0-1.5	A-6(10)	39	19	15.0	25.0	21.0	39.0	100	92	66	-	-
SS-59	84' LT	9+50	2.1-3.6	A-7-6(11)	42	21	13.0	25.0	19.0	43.0	100	93	68	21.3	-
SS-60	84' LT	9+50	4.3-5.8	A-7-6(9)	44	18	9.0	38.0	20.0	33.0	100	98	62	-	-
SS-61	84' LT	9+50	6.8-8.3	A-7-5(5)	46	11	28.0	26.0	30.0	16.0	99	81	52	-	-
SS-62	84' LT	9+50	14.3-15.8	A-5(2)	47	7	31.0	30.0	33.0	6.0	93	72	45	30.5	-
SS-13	60' LT	12+35	2.1-3.6	A-4(8)	31	10	7.0	26.0	39.0	28.0	100	97	75	-	-
SS-14	60' LT	12+35	4.6-5.6	A-1-b(0)	23	5	58.0	22.0	8.0	12.0	68	38	16	-	-
SS-15	60' LT	12+35	14.2-15.7	A-2-4(0)	36	8	41.0	28.0	25.0	6.0	89	62	33	-	-
SS-16	60' LT	12+35	24.2-25.7	A-4(1)	34	6	29.0	39.0	26.0	6.0	100	84	39	-	-



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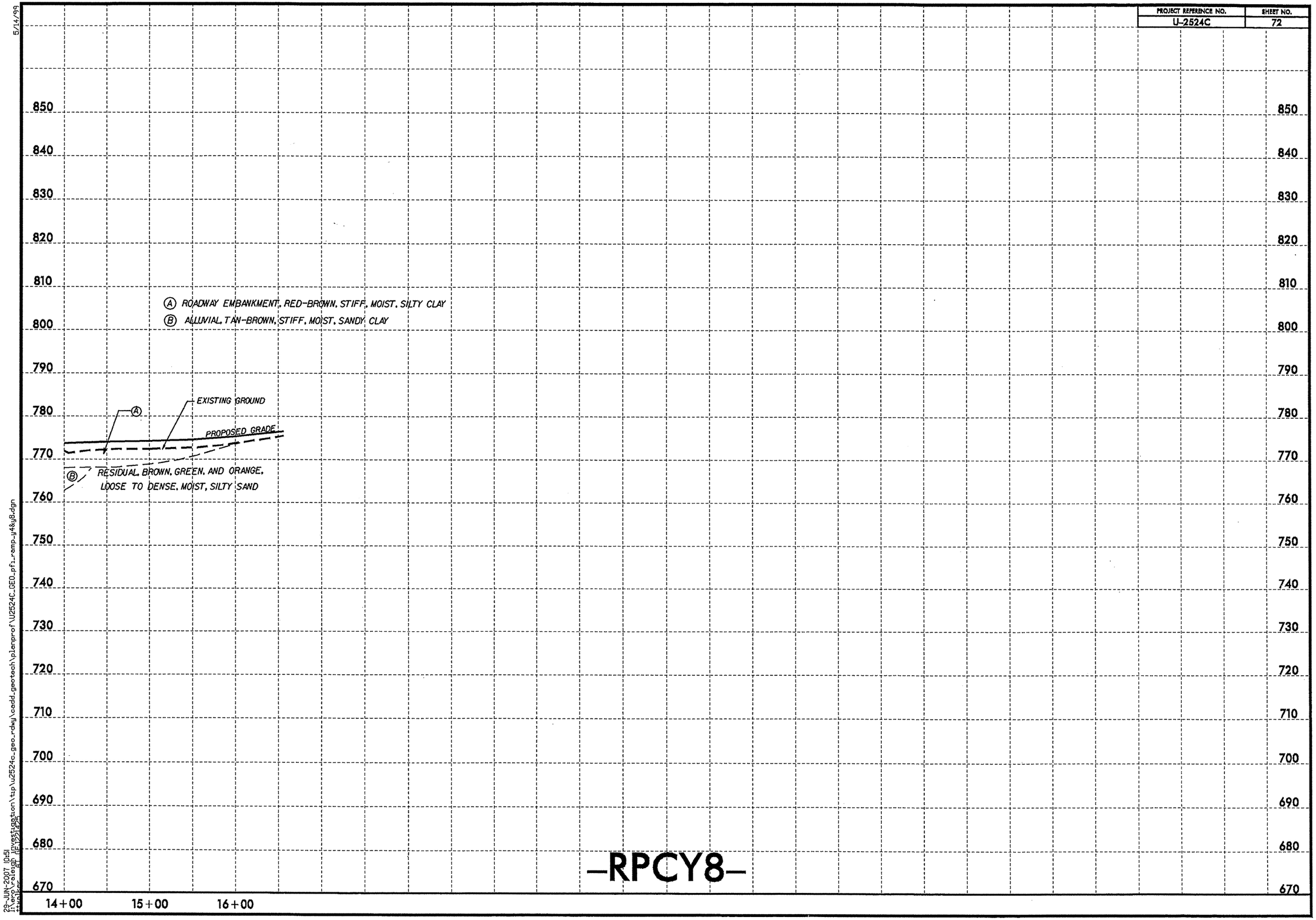
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U-2524C
SHEET NO.
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Ⓐ ROADWAY EMBANKMENT, RED-BROWN, STIFF, MOIST, SILTY CLAY
Ⓑ ALLUVIAL, TAN-BROWN, STIFF, MOIST, SANDY CLAY
EXISTING GROUND
PROPOSED GRADE
RESIDUAL, BROWN, GREEN, AND ORANGE, LOOSE TO DENSE, MOIST, SILTY SAND
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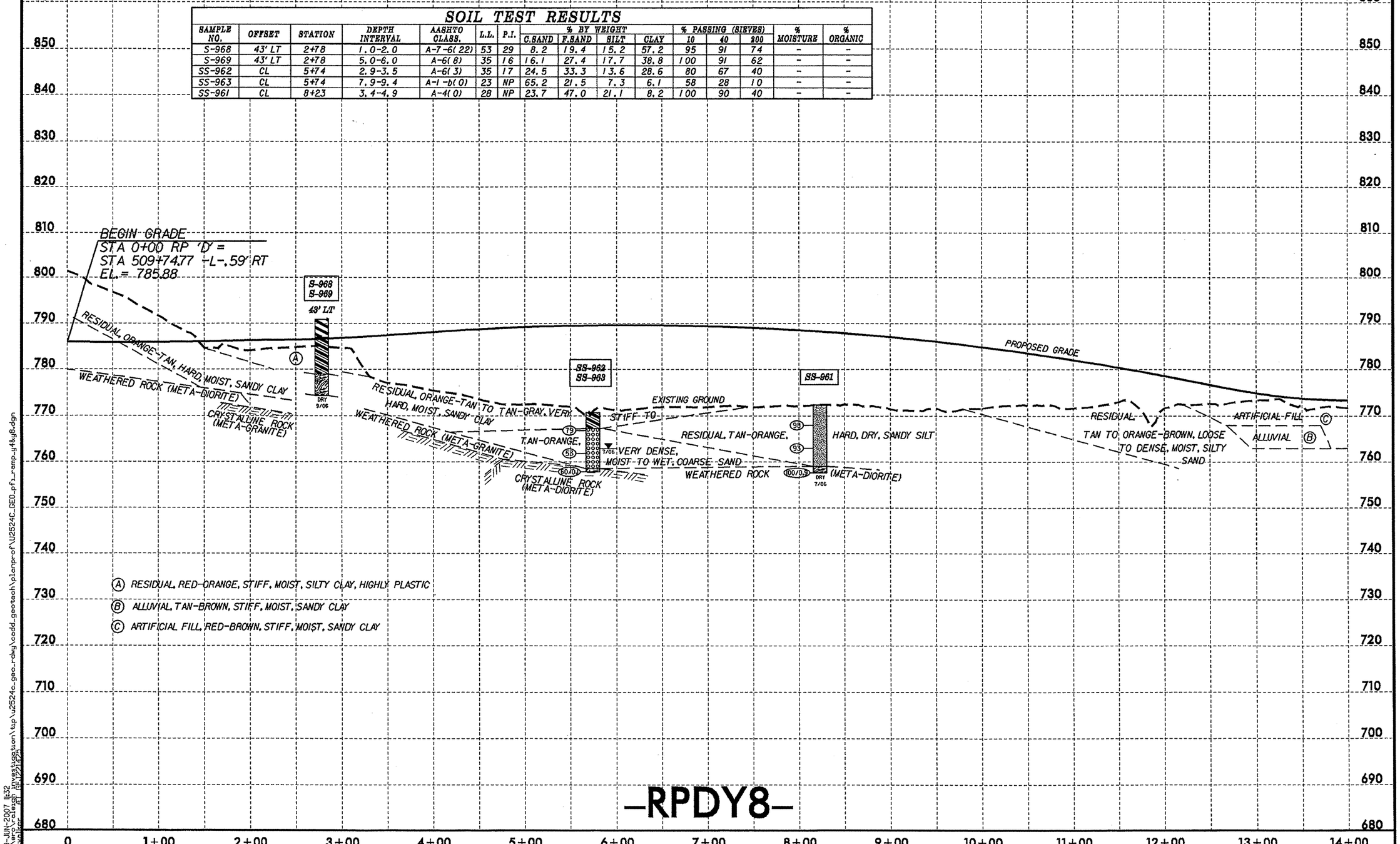
PROJECT REFERENCE NO. U-2524C | SHEET NO. 73

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-968	43' LT	2+78	1.0-2.0	A-7-6(22)	53	29	8.2	19.4	15.2	57.2	95	91	74	-	-
S-969	43' LT	2+78	5.0-6.0	A-6(8)	35	16	16.1	27.4	17.7	38.8	100	91	62	-	-
SS-962	CL	5+74	2.9-3.5	A-6(3)	35	17	24.5	33.3	13.6	28.6	80	67	40	-	-
SS-963	CL	5+74	7.9-9.4	A-1-b(0)	23	NP	65.2	21.5	7.3	6.1	58	28	10	-	-
SS-961	CL	8+23	3.4-4.9	A-4(0)	28	NP	23.7	47.0	21.1	8.2	100	90	40	-	-



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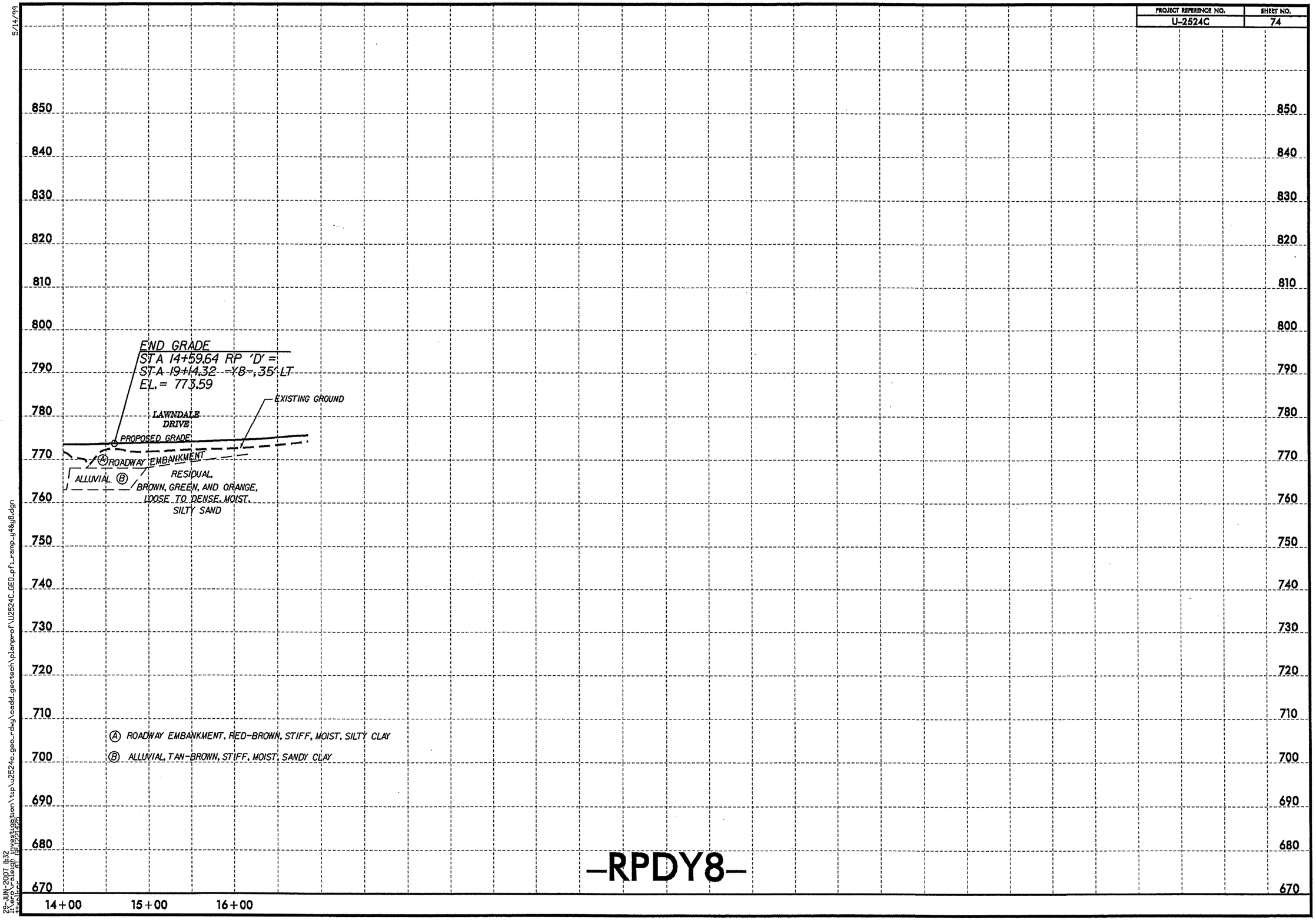

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PROJECT REFERENCE NO.	SHEET NO.
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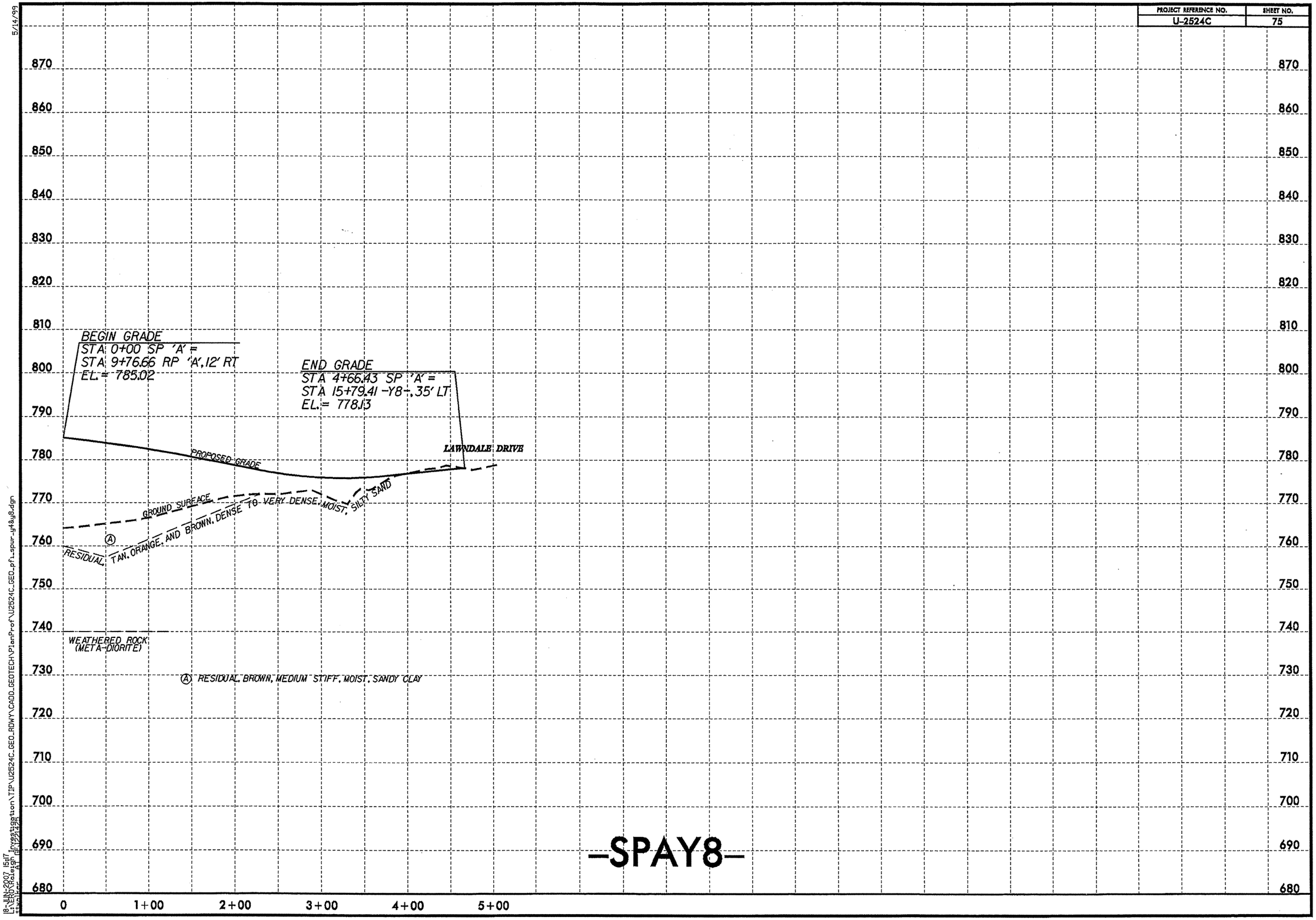

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PROJECT REFERENCE NO.	SHEET NO.
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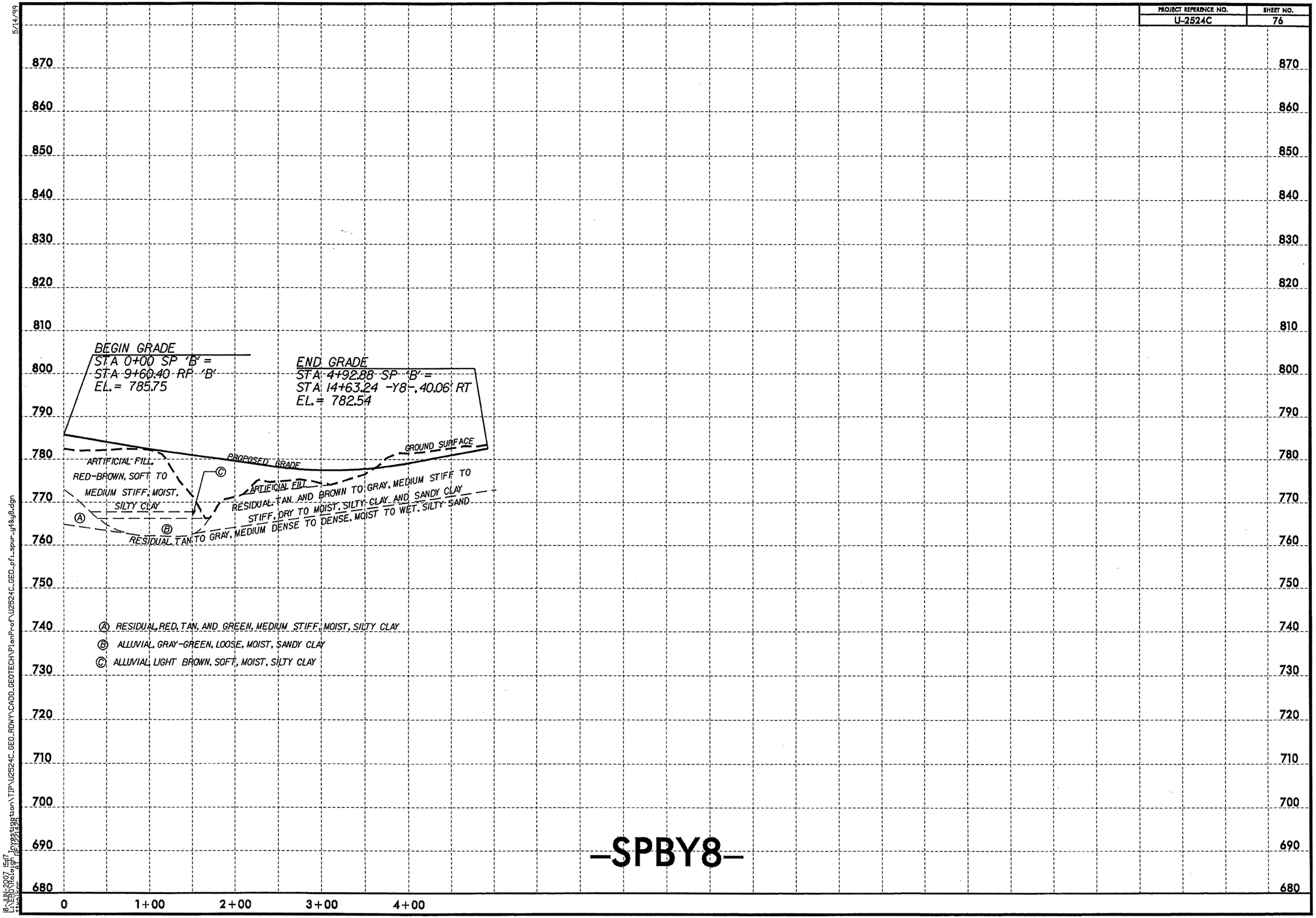

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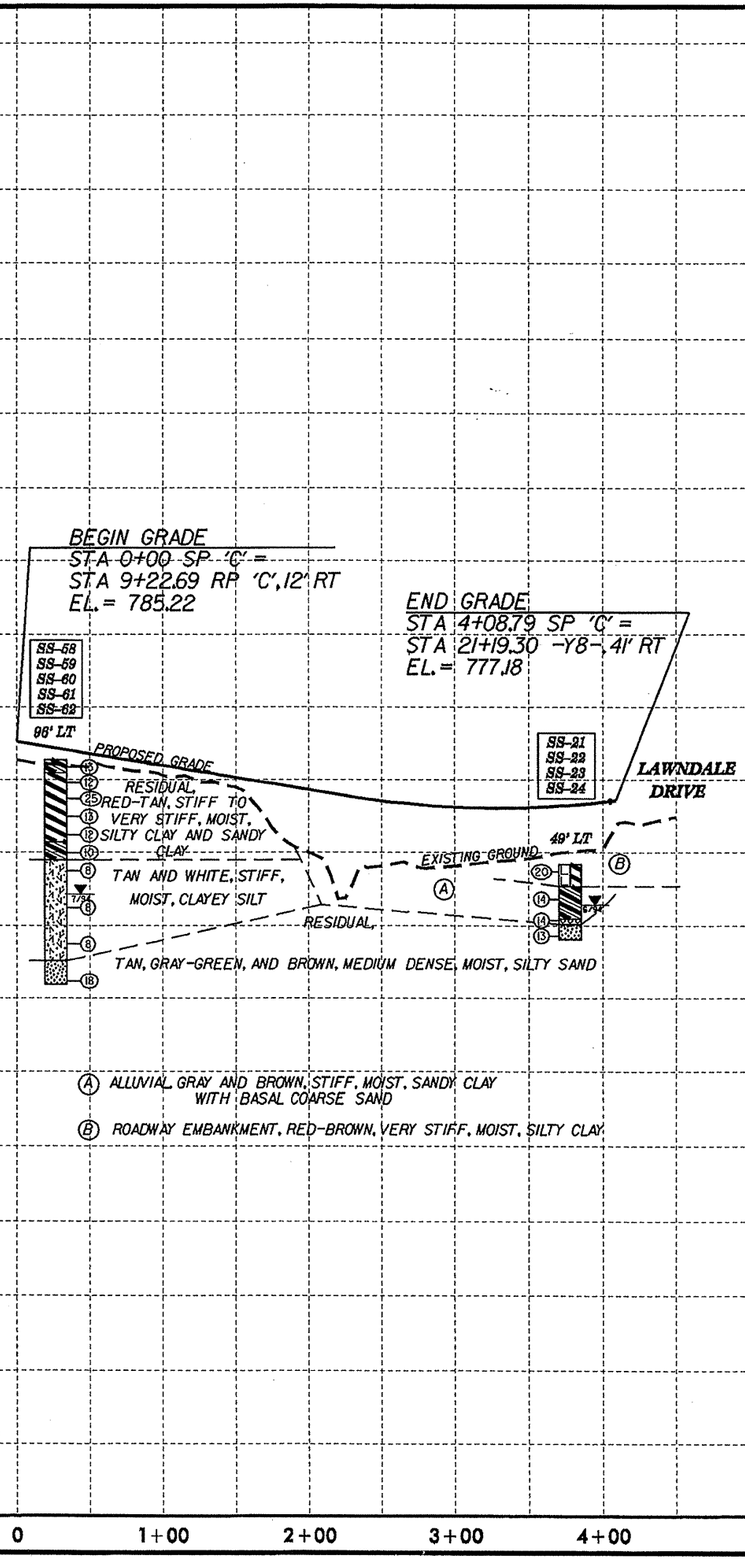

SOIL TEST RESULTS

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		
SS-58	96' LT	0+27	0.0-1.5	A-6(10)	39	19	15.0	25.0	21.0	39.0	100	92	66	-	-
SS-59	96' LT	0+27	2.1-3.6	A-7-6(11)	42	21	13.0	25.0	19.0	43.0	100	93	68	21.3	-
SS-60	96' LT	0+27	4.3-5.8	A-7-6(9)	44	18	9.0	38.0	20.0	33.0	100	98	62	-	-
SS-61	96' LT	0+27	6.8-8.3	A-7-5(5)	46	11	28.0	26.0	30.0	16.0	99	81	52		-
SS-62	96' LT	0+27	14.3-15.8	A-5(2)	47	7	31.0	30.0	33.0	6.0	93	72	45	30.5	-
SS-21	49' LT	3+78	0.5-1.5	A-7-6(12)	41	19	7.0	21.0	37.0	35.0	100	96	79	-	-
SS-22	49' LT	3+78	4.2-5.2	A-6(9)	33	13	7.0	28.0	37.0	28.0	100	96	73	-	-
SS-23	49' LT	3+78	2.4-8.1	A-1-b(0)	19	NP	67.0	21.0	8.0	4.0	54	26	8	-	-
SS-24	49' LT	3+78	9.2-10.2	A-2-4(0)	33	6	42.0	31.0	21.0	6.0	96	67	32	-	-

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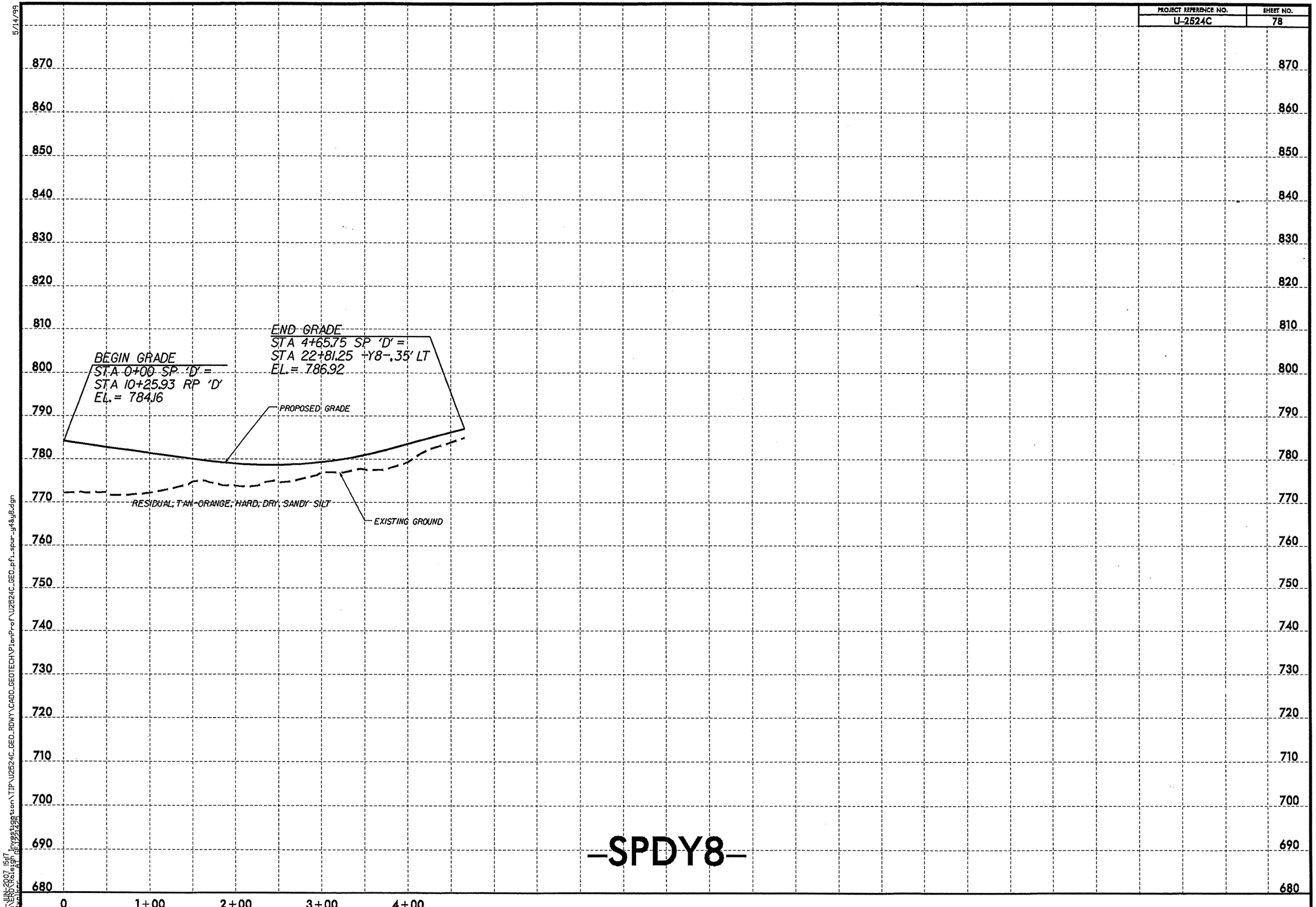
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690
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BEGIN GRADE
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STA 10+25.93 RP 'D'
EL.= 784.16
END GRADE
STA 4+65.75 SP 'D' =
STA 22+81.25 -Y8-.35' LT
EL.= 786.92
PROPOSED GRADE
RESIDUAL, TAN-ORANGE, HARD, DRY, SANDY SILT
EXISTING GROUND
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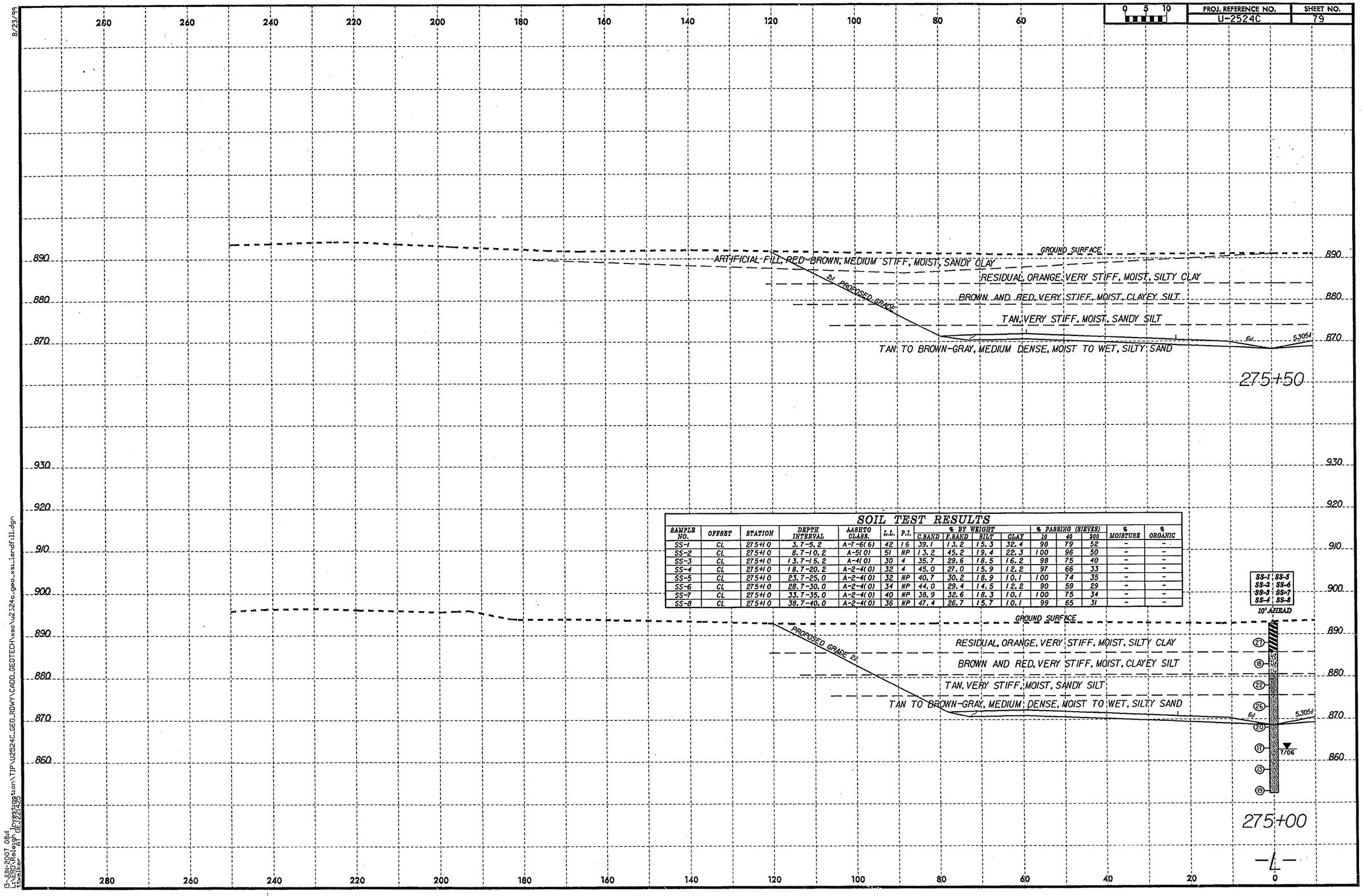

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-1	CL	275+10	3.7-5.2	A-7-6(6)	42	16	39.1	13.2	15.3	32.4	98	79	52	-	-
SS-2	CL	275+10	8.7-10.2	A-5(0)	51	NP	13.2	45.2	19.4	22.3	100	96	50	-	-
SS-3	CL	275+10	13.7-15.2	A-4(0)	30	4	35.7	29.6	18.5	16.2	98	75	40	-	-
SS-4	CL	275+10	18.7-20.2	A-2-4(0)	32	4	45.0	27.0	15.9	12.2	97	66	33	-	-
SS-5	CL	275+10	23.7-25.0	A-2-4(0)	32	NP	40.7	30.2	18.9	10.1	100	74	35	-	-
SS-6	CL	275+10	28.7-30.0	A-2-4(0)	34	NP	44.0	29.4	14.5	12.2	90	59	29	-	-
SS-7	CL	275+10	33.7-35.0	A-2-4(0)	40	NP	38.9	32.6	18.3	10.1	100	75	34	-	-
SS-8	CL	275+10	38.7-40.0	A-2-4(0)	36	NP	47.4	26.7	15.7	10.1	99	65	31	-	-

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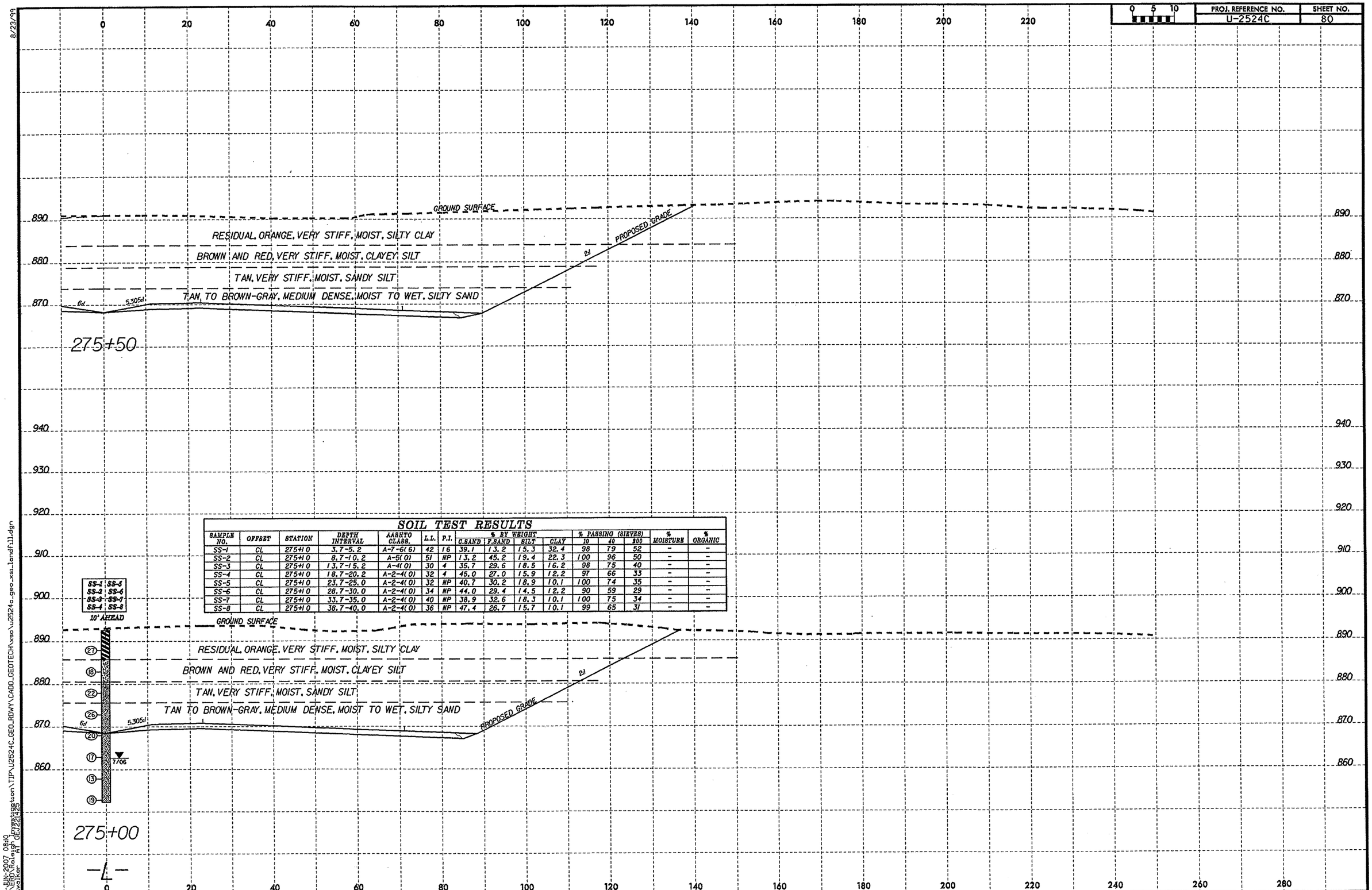
ttwalker AT GEJ221425

PROJ. REFERENCE NO.	SHEET NO.
U-2524C	80



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-1	CL	275+10	3.7-5.2	A-7-6(6)	42	16	39.1	13.2	15.3	32.4	98	79	52	-	-
SS-2	CL	275+10	8.7-10.2	A-5(0)	51	NP	13.2	45.2	19.4	22.3	100	96	50	-	-
SS-3	CL	275+10	13.7-15.2	A-4(0)	30	4	35.7	29.6	18.5	16.2	98	75	40	-	-
SS-4	CL	275+10	18.7-20.2	A-2-4(0)	32	4	45.0	27.0	15.9	12.2	97	66	33	-	-
SS-5	CL	275+10	23.7-25.0	A-2-4(0)	32	NP	40.7	30.2	18.9	10.1	100	74	35	-	-
SS-6	CL	275+10	28.7-30.0	A-2-4(0)	34	NP	44.0	29.4	14.5	12.2	90	59	29	-	-
SS-7	CL	275+10	33.7-35.0	A-2-4(0)	40	NP	38.9	32.6	18.3	10.1	100	75	34	-	-
SS-8	CL	275+10	38.7-40.0	A-2-4(0)	36	NP	47.4	26.7	15.7	10.1	99	65	31	-	-

8/23/99

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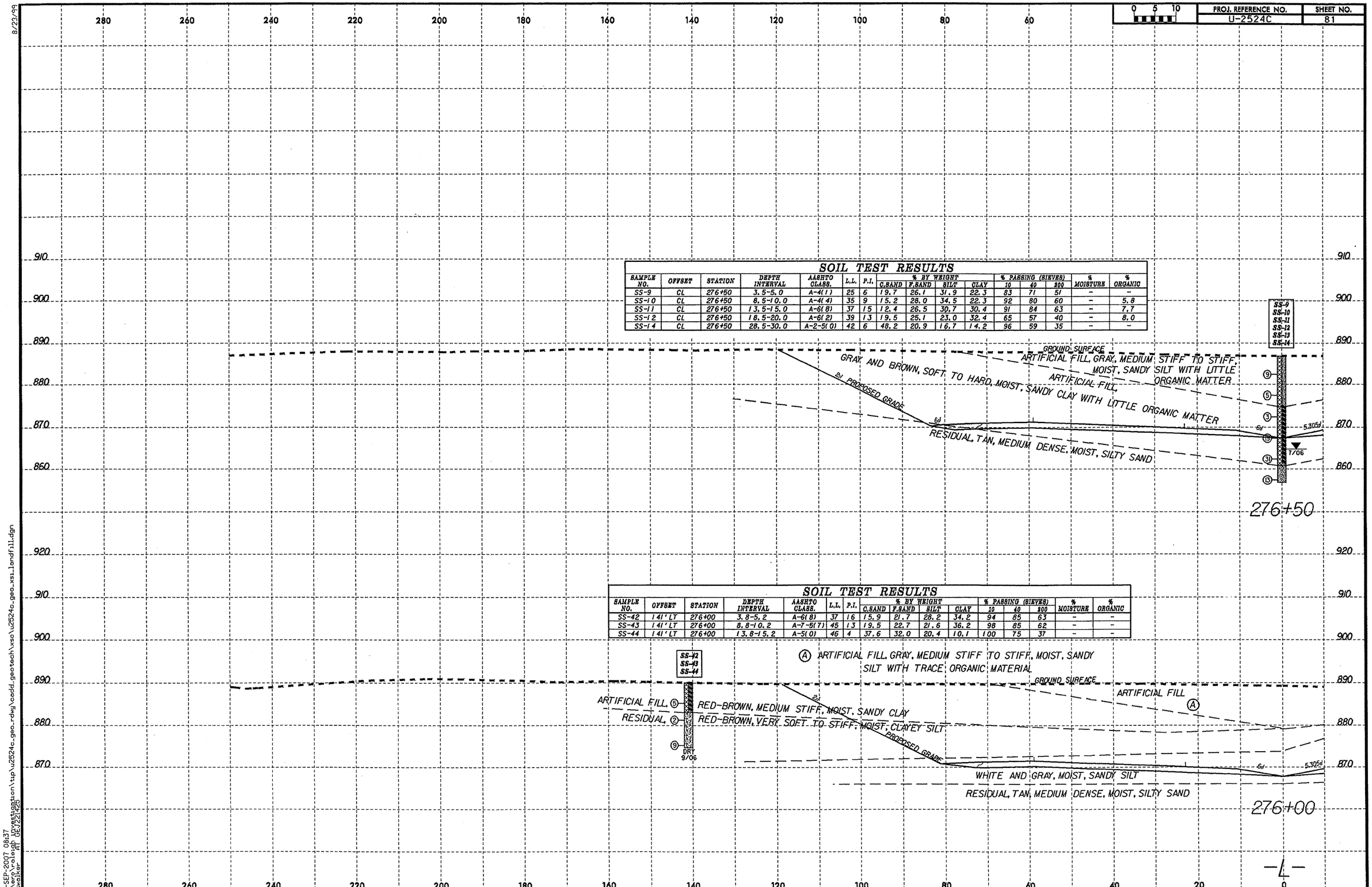
PROJ. REFERENCE NO. U-2524C | SHEET NO. 81



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-9	CL	276+50	3.5-5.0	A-4(1)	25	6	19.7	26.1	31.9	22.3	83	71	51	-	-
SS-10	CL	276+50	8.5-10.0	A-4(4)	35	9	15.2	28.0	34.5	22.3	92	80	60	-	5.8
SS-11	CL	276+50	13.5-15.0	A-6(8)	37	15	12.4	26.5	30.7	30.4	91	84	63	-	7.7
SS-12	CL	276+50	18.5-20.0	A-6(2)	39	13	19.5	25.1	23.0	32.4	65	57	40	-	8.0
SS-14	CL	276+50	28.5-30.0	A-2-5(0)	42	6	48.2	20.9	16.7	14.2	96	59	35	-	-

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-42	141' LT	276+00	3.8-5.2	A-6(8)	37	16	15.9	21.7	28.2	34.2	94	85	63	-	-
SS-43	141' LT	276+00	8.8-10.2	A-7-5(7)	45	13	19.5	22.7	21.6	36.2	98	85	62	-	-
SS-44	141' LT	276+00	13.8-15.2	A-5(0)	46	4	37.6	32.0	20.4	10.1	100	75	37	-	-

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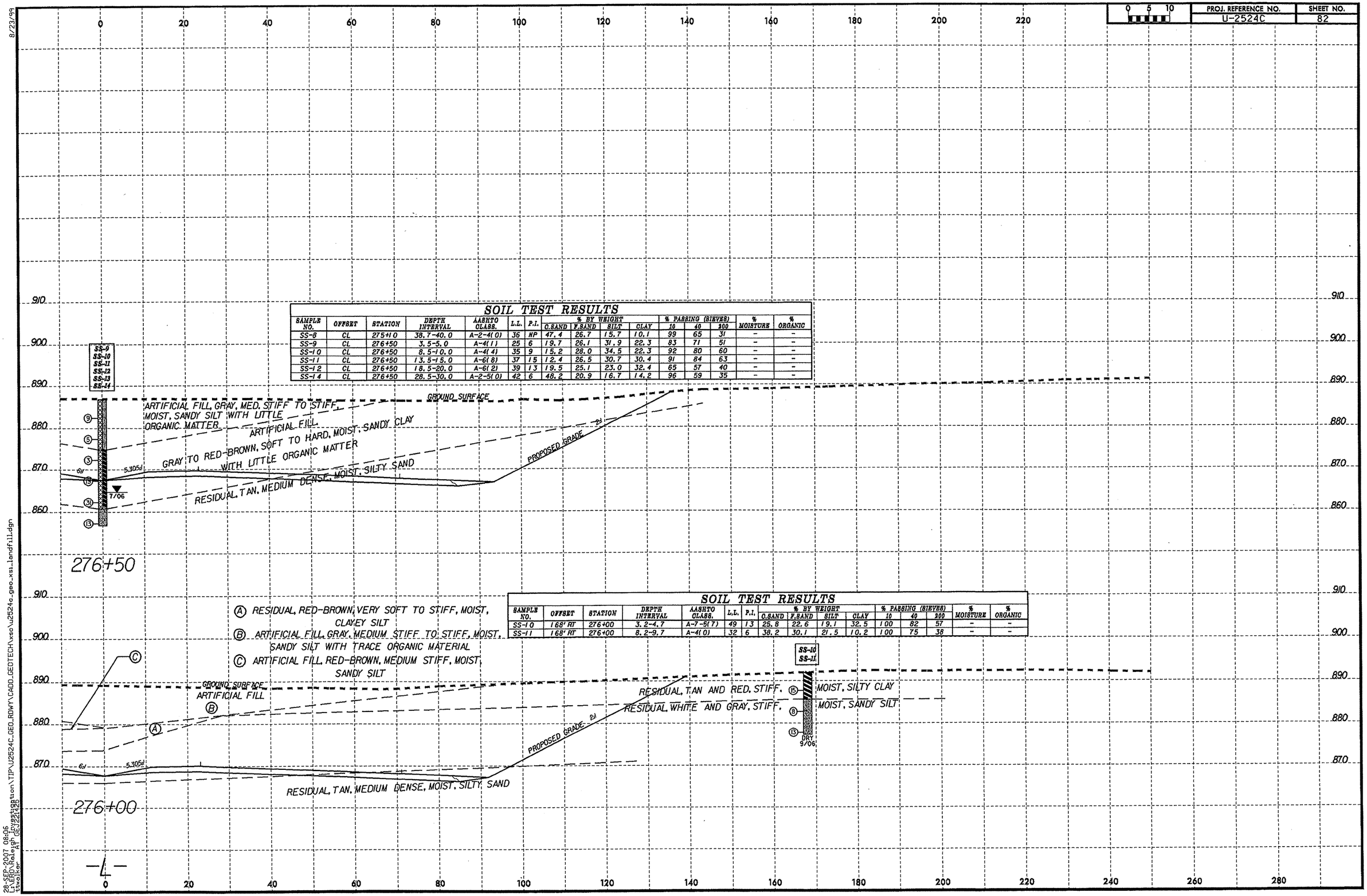
PROJ. REFERENCE NO.	SHEET NO.
U-2524C	82



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-8	CL	275+10	38.7-40.0	A-2-4(0)	36	NP	47.4	26.7	15.7	10.1	99	65	31	-	-
SS-9	CL	276+50	3.5-5.0	A-4(1)	25	6	19.7	26.1	31.9	22.3	83	71	51	-	-
SS-10	CL	276+50	8.5-10.0	A-4(4)	35	9	15.2	28.0	34.5	22.3	92	80	60	-	-
SS-11	CL	276+50	13.5-15.0	A-6(8)	37	15	12.4	26.5	30.7	30.4	91	84	63	-	-
SS-12	CL	276+50	18.5-20.0	A-6(2)	39	13	19.5	25.1	23.0	32.4	65	57	40	-	-
SS-14	CL	276+50	28.5-30.0	A-2-5(0)	42	6	48.2	20.9	16.7	14.2	96	59	35	-	-

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-10	168' RT	276+00	3.2-4.7	A-7-5(7)	49	13	25.8	22.6	19.1	32.5	100	82	57	-	-
SS-11	168' RT	276+00	8.2-9.7	A-4(0)	32	6	38.2	30.1	21.5	10.2	100	75	38	-	-

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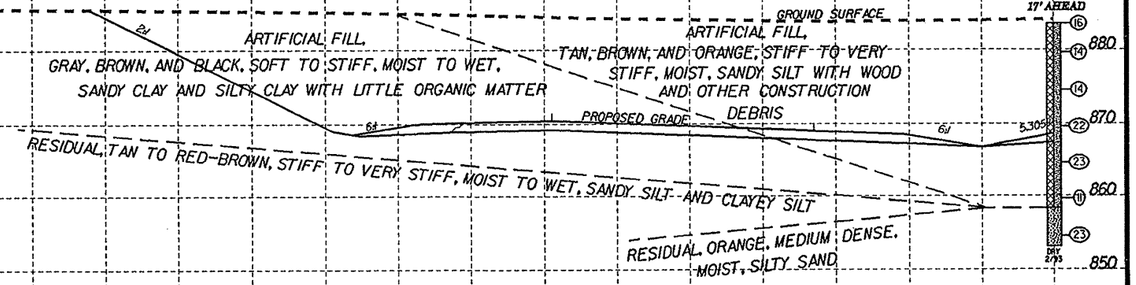
ttwalker AT GEJ221425

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-2524C	83

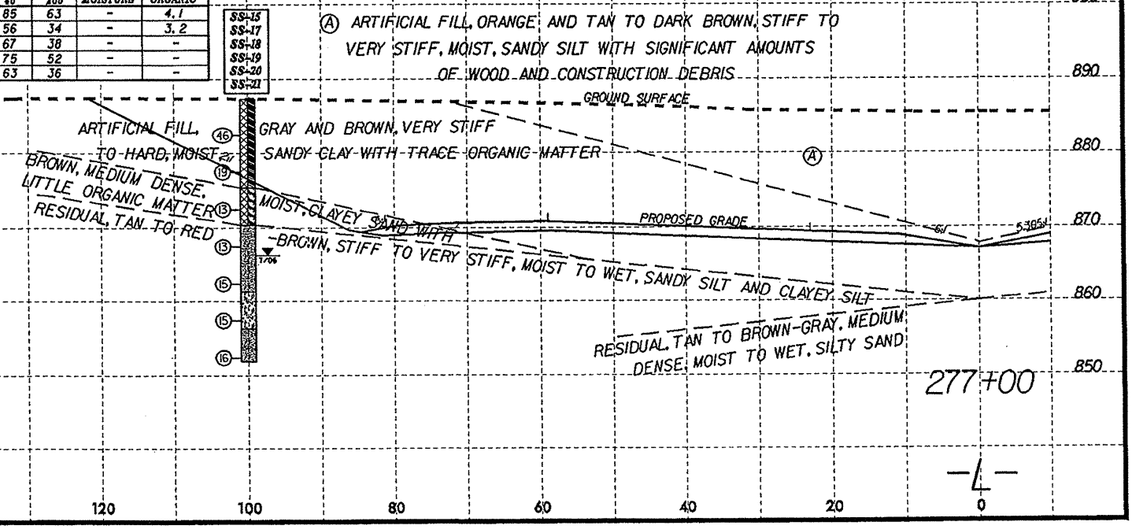
280 260 240 220 200 180 160 140 120 100 80 60

890 880 870 860 850



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-15	100' LT	277+00	3.9-5.4	A-6(7)	35	14	13.8	25.7	28.1	32.4	95	85	63	-	4.1
SS-17	100' LT	277+00	13.9-15.4	A-2-6(0)	36	12	37.3	21.7	14.7	26.3	75	56	34	-	3.2
SS-19	100' LT	277+00	23.9-25.4	A-4(0)	38	7	43.2	24.9	21.8	10.1	98	67	38	-	-
SS-20	100' LT	277+00	28.9-30.4	A-5(2)	42	5	26.7	26.7	24.2	22.3	96	75	52	-	-
SS-21	100' LT	277+00	33.9-35.4	A-4(0)	39	8	39.3	26.1	24.4	10.1	87	63	36	-	-



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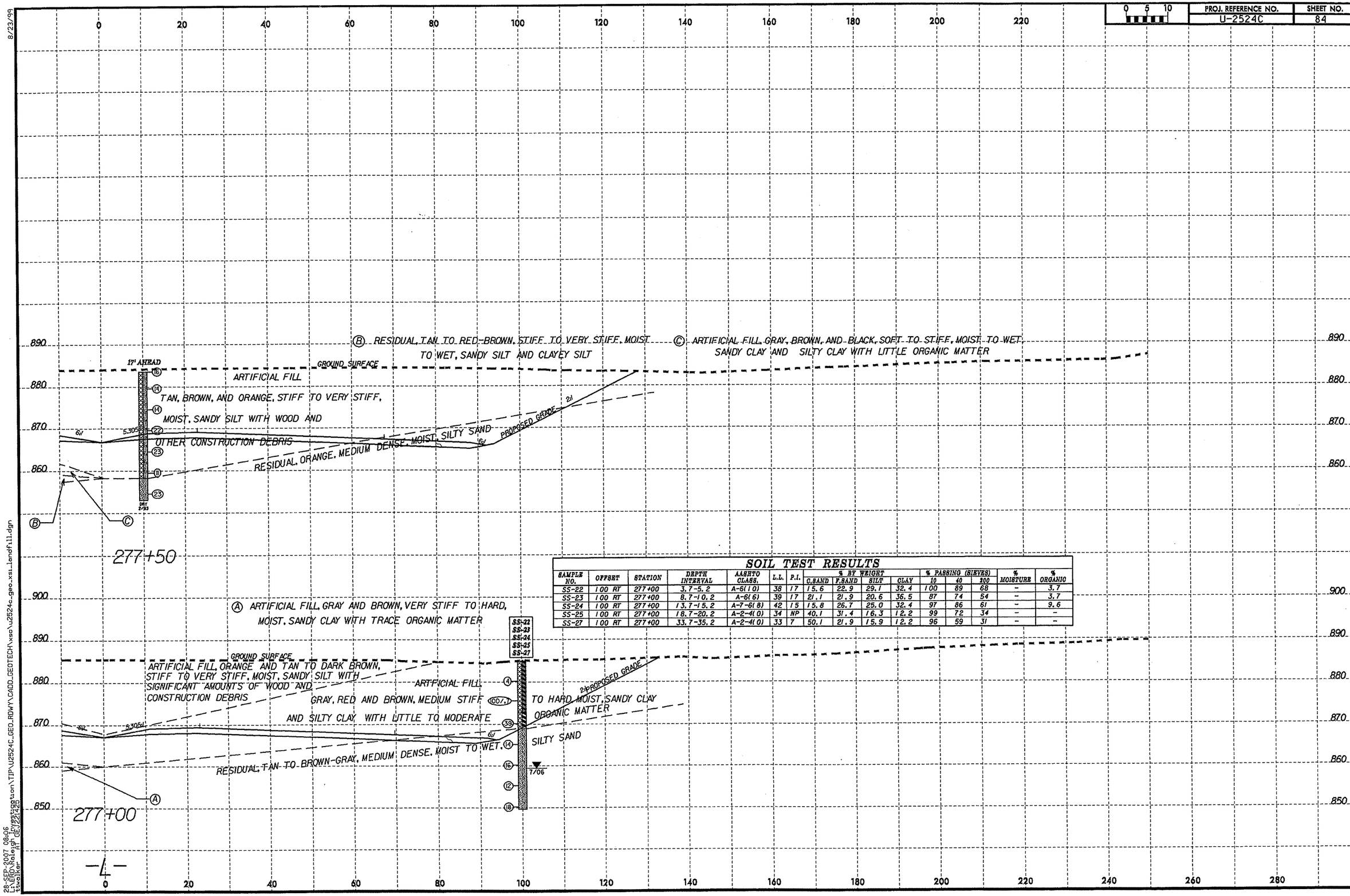

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-22	100 RT	277+00	3.7-5.2	A-6(10)	38	17	15.6	22.9	29.1	32.4	100	89	68	-	3.7
SS-23	100 RT	277+00	8.7-10.2	A-6(6)	39	17	21.1	21.9	20.6	36.5	87	74	54	-	3.7
SS-24	100 RT	277+00	13.7-15.2	A-7-6(8)	42	15	15.8	26.7	25.0	32.4	97	86	61	-	9.6
SS-25	100 RT	277+00	18.7-20.2	A-2-4(0)	34	NP	40.1	31.4	16.3	12.2	99	72	34	-	-
SS-27	100 RT	277+00	33.7-35.2	A-2-4(0)	33	7	50.1	21.9	15.9	12.2	96	59	31	-	-

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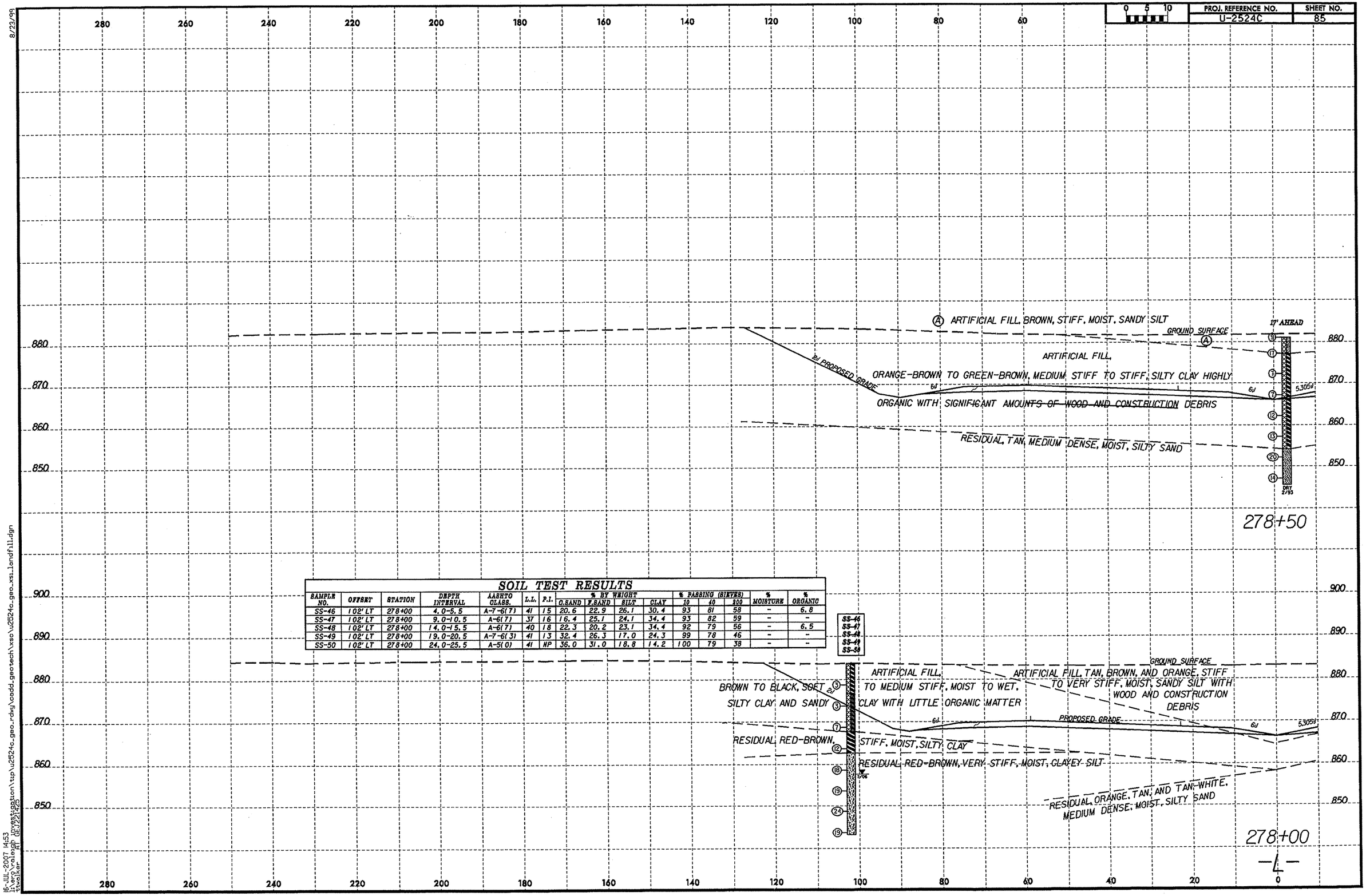

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							O.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-46	102' LT	278+00	4.0-5.5	A-7-6(7)	41	15	20.6	22.9	26.1	30.4	93	81	58	-	6.8
SS-47	102' LT	278+00	9.0-10.5	A-6(7)	37	16	16.4	25.1	24.1	34.4	93	82	59	-	-
SS-48	102' LT	278+00	14.0-15.5	A-6(7)	40	18	22.3	20.2	23.1	34.4	92	79	56	-	6.5
SS-49	102' LT	278+00	19.0-20.5	A-7-6(3)	41	13	32.4	26.3	17.0	24.3	99	78	46	-	-
SS-50	102' LT	278+00	24.0-25.5	A-5(0)	41	NP	36.0	31.0	18.8	14.2	100	79	38	-	-

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8/23/99

PROJ. REFERENCE NO.	SHEET NO.
U-2524C	86

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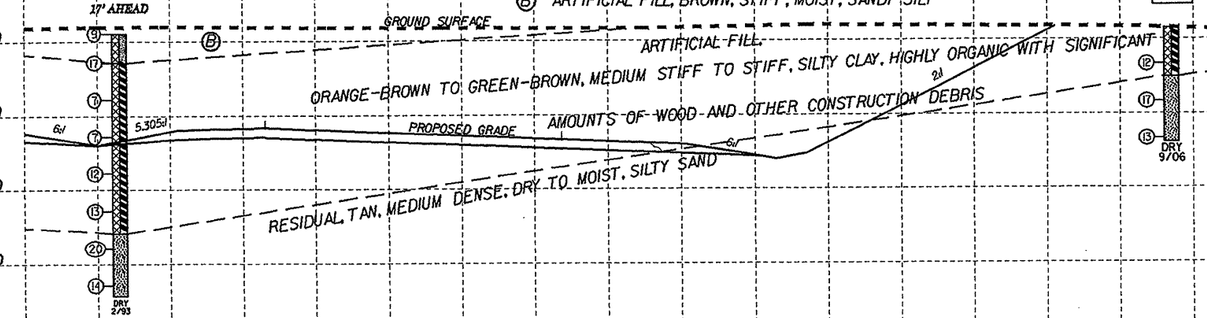
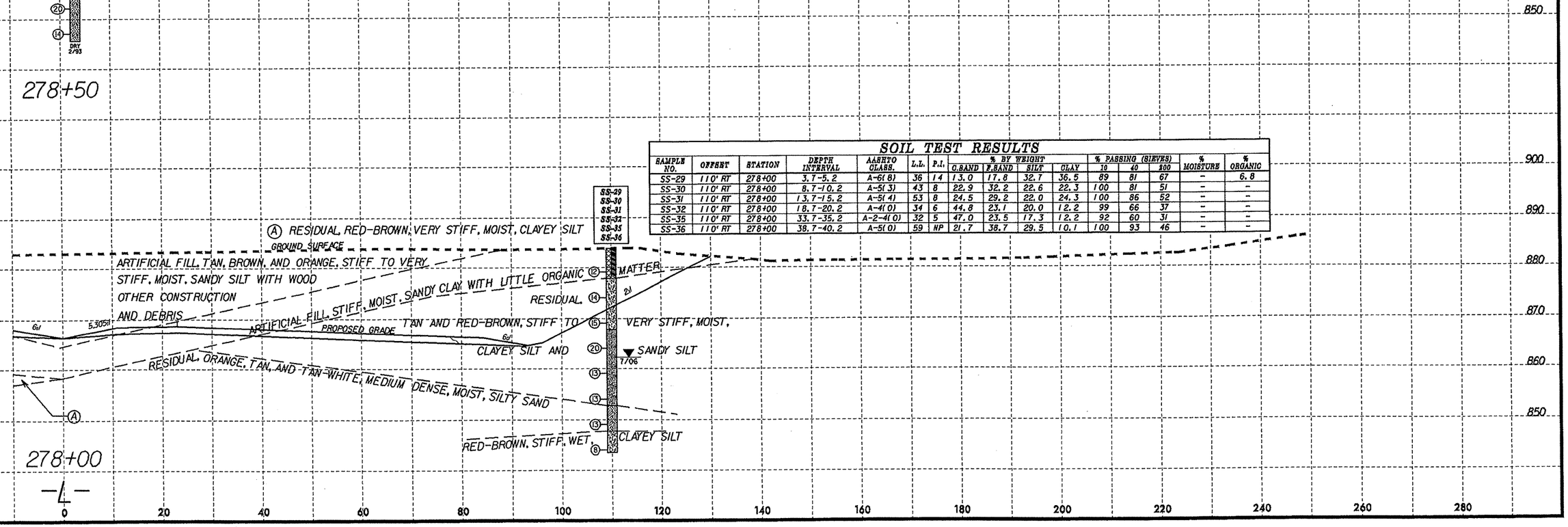
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							G.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-12	147' RT	278+50	3.8-5.3	A-7-6(5)	41	15	25.6	19.9	17.9	36.6	89	74	52	–	–
SS-13	147' RT	278+50	8.8-10.3	A-2-4(0)	31	6	50.6	23.0	10.2	16.3	94	58	28	–	–



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		
SS-29	110' RT	278+00	3.7-5.2	A-6(8)	36	14	13.0	17.8	32.7	36.5	89	81	67	–	6.8
SS-30	110' RT	278+00	8.7-10.2	A-5(3)	43	8	22.9	32.2	22.6	22.3	100	81	51	–	–
SS-31	110' RT	278+00	13.7-15.2	A-5(4)	53	8	24.5	29.2	22.0	24.3	100	86	52	–	–
SS-32	110' RT	278+00	18.7-20.2	A-4(0)	34	6	44.8	23.1	20.0	12.2	99	66	37	–	–
SS-35	110' RT	278+00	33.7-35.2	A-2-4(0)	32	5	47.0	23.5	17.3	12.2	92	60	31	–	–
SS-36	110' RT	278+00	38.7-40.2	A-5(0)	59	NP	21.7	38.7	29.5	10.1	100	93	46	–	–



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	U-2524C	87

280 260 240 220 200 180 160 140 120 100 80 60

880 870 860 850

GROUND SURFACE

ARTIFICIAL FILL, ORANGE, BROWN, BLACK, AND DARK GREEN, MEDIUM STIFF TO STIFF, MOIST, SANDY SILT INTERMIXED WITH WOOD DEBRIS

2% PROPOSED GRADE

6% 6% 5.523%

ARTIFICIAL FILL, BLACK, STIFF, MOIST, SILTY CLAY INTERMIXED WITH WOOD DEBRIS

11" AHEAD

6 14 7 7 6 7 10 14 8 10 12

RESIDUAL, TAN, WHITE, AND BLACK, MEDIUM DENSE, MOIST, SILTY SAND

279+50

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-54	110' LT	279+00	3.7-5.2	A-6(5)	39	16	19.2	30.0	22.5	28.3	91	78	51	-	5.7
SS-56	110' LT	279+00	13.7-15.2	A-7-6(17)	41	19	20.9	21.3	21.5	36.4	81	70	51	-	5.3
SS-57	110' LT	279+00	18.7-20.2	A-7-6(10)	43	21	20.9	19.8	22.9	36.4	92	79	58	-	5.6
SS-60	110' LT	279+00	33.7-35.2	A-2-5(0)	42	NP	44.9	29.6	13.4	12.1	95	66	29	-	-

SS-54 SS-56 SS-57 SS-60

890 880 870 860 850 840

GROUND SURFACE

ARTIFICIAL FILL, ORANGE, BROWN, AND BLACK, MEDIUM STIFF TO STIFF, MOIST, SANDY SILT

26 100/0.5 10 12 29 13 12 9 11

2% 6% PROPOSED GRADE 6% 5.366%

ARTIFICIAL FILL, STIFF, MOIST, SANDY CLAY AND SILTY CLAY WITH LITTLE ORGANIC MATTER, INTERMIXED WITH WOOD DEBRIS

(NOTE: SPT AT 8.7' REFUSED ON WOOD)

GRAY TO RED-GRAY, STIFF TO VERY STIFF, MOIST, SANDY CLAY AND SILTY CLAY

RESIDUAL, BLACK, BROWN, AND WHITE, LOOSE TO MEDIUM DENSE, SILTY SAND

11/06

279+00

—L—

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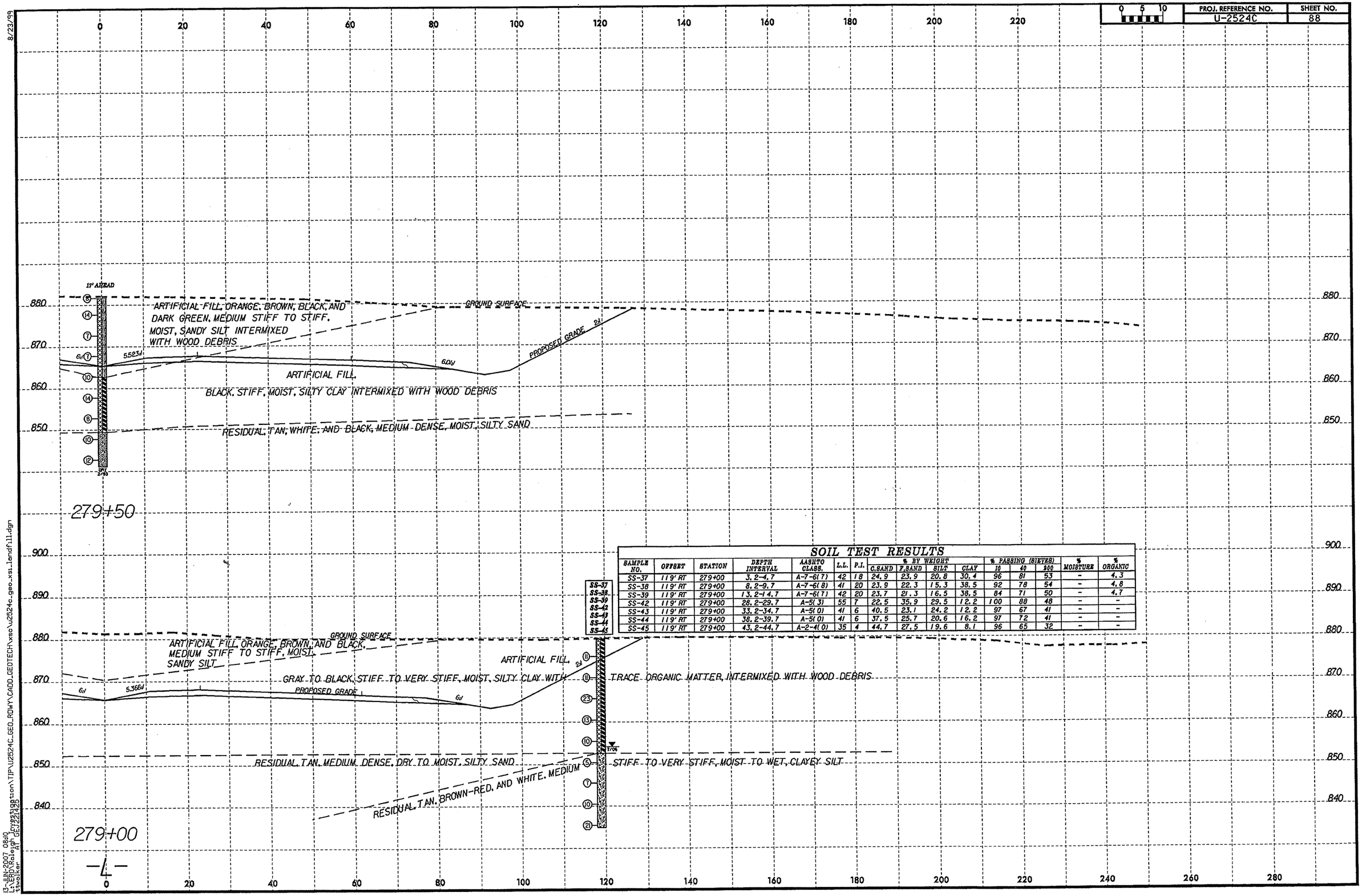
	U-2524C	88



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) #10	#40	#200	% MOISTURE	% ORGANIC
SS-37	119' RT	279+00	3.2-4.7	A-7-6(17)	42	18	24.9	23.9	20.8	30.4	96	81	53	-	4.3
SS-38	119' RT	279+00	8.2-9.7	A-7-6(18)	41	20	23.9	22.3	15.3	38.5	92	78	54	-	4.8
SS-39	119' RT	279+00	13.2-14.7	A-7-6(17)	42	20	23.7	21.3	16.5	38.5	84	71	50	-	4.7
SS-42	119' RT	279+00	28.2-29.7	A-5(3)	55	7	22.5	35.9	29.5	12.2	100	88	48	-	-
SS-43	119' RT	279+00	33.2-34.7	A-5(0)	41	6	40.5	23.1	24.2	12.2	97	67	41	-	-
SS-44	119' RT	279+00	38.2-39.7	A-5(0)	41	6	37.5	25.7	20.6	16.2	97	72	41	-	-
SS-45	119' RT	279+00	43.2-44.7	A-2-4(0)	35	4	44.7	27.5	19.6	8.1	96	65	32	-	-

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tswicker AT GEU221425

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-2524C	89

280 260 240 220 200 180 160 140 120 100 80 60

880 870 860 850 840

17' AHEAD

(19) (19) (11) (8) (6) (5) (10) (25) (7)

PROPOSED GRADE 2d

GROUND SURFACE

ARTIFICIAL FILL, ORANGE AND BROWN, MEDIUM STIFF TO VERY STIFF, MOIST, SANDY SILT WITH GRAVEL, INTERMIXED WITH WOOD DEBRIS

6d 6d 5.869d

BROWN, MEDIUM STIFF TO VERY STIFF, MOIST TO WET, SILTY CLAY, INTERMIXED WITH WOOD DEBRIS

2.93

RESIDUAL, GRAY, LOOSE, WET, SILTY SAND

280+50

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-18	185' LT	279+93	3.9-5.4	A-2-6(1)	38	15	30.6	19.7	29.6	20.1	59	45	32	-	5.1
SS-19	185' LT	279+93	8.9-10.4	A-7-6(6)	41	18	20.9	19.5	31.5	28.1	81	70	52	-	4.9
SS-20	185' LT	279+93	13.9-15.4	A-6(7)	40	16	18.1	20.1	23.6	32.2	86	76	57	-	6.4
SS-21	185' LT	279+93	18.9-20.4	A-7-6(7)	42	17	21.3	20.9	27.6	30.2	85	73	54	-	6.4
SS-22	185' LT	279+93	23.9-25.4	A-6(6)	38	15	23.1	22.5	26.2	28.1	93	79	55	-	4.9
SS-23	185' LT	279+93	28.9-30.4	A-2-7(0)	42	11	29.3	22.5	24.0	24.1	62	50	33	-	9.4
SS-24	185' LT	279+93	33.9-40.4	A-2-7(0)	44	12	29.1	21.3	27.4	22.1	51	41	27	-	15.9
SS-25	185' LT	279+93	38.9-39.9	A-2-7(0)	47	15	40.2	15.7	28.0	16.1	33	23	15	-	21.0
SS-26	185' LT	279+93	39.9-40.4	A-6(4)	36	15	37.2	19.9	14.8	28.1	100	74	46	-	-
SS-27	185' LT	279+93	43.9-45.4	A-2-5(0)	48	NP	39.8	36.2	18.0	6.0	97	76	28	-	-
SS-28	185' LT	279+93	48.9-50.4	A-2-4(0)	35	NP	45.8	32.2	14.0	8.0	88	65	23	-	-

920 910 900 890 880 870 860 850 840

SS-18 SS-23
SS-19 SS-24
SS-20 SS-25
SS-21 SS-26
SS-22 SS-27
SS-28

7' BACK

(A) ARTIFICIAL FILL, BROWN, BLACK, AND RED, VERY STIFF, MOIST, CLAYEY SAND, MODERATELY ORGANIC INTERMIXED WITH WOOD DEBRIS

(A) (22) (A)

ARTIFICIAL FILL AND SANDY CLAY (17) (9) (9) (10)

BROWN, VERY SOFT TO VERY STIFF, MOIST, SILTY CLAY WITH TRACE ORGANIC MATTER WITH WOOD DEBRIS AND GRAVEL

BROWN, VERY LOOSE TO HIGHLY ORGANIC, (3) (23) (9)

TO MEDIUM DENSE, MOIST, CLAYEY SAND, MODERATELY INTERMIXED WITH WOOD DEBRIS

0.706

RESIDUAL, (7) (17)

BROWN AND GRAY, LOOSE TO MEDIUM DENSE, WET, SILTY SAND

2d PROPOSED GRADE

GROUND SURFACE

ARTIFICIAL FILL, ORANGE, BROWN, BLACK, AND DARK GREEN, MEDIUM STIFF TO STIFF, MOIST, SANDY SILT WITH INTERMIXED WOOD DEBRIS

6d 6d 5.89d

280+00

-4-

280 260 240 220 200 180 160 140 120 100 80 60 40 20 0

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	U-2524C	90

0 20 40 60 80 100 120 140 160 180 200 220

880 870 860 850 840 830

GROUND SURFACE

17' AHEAD

ARTIFICIAL FILL.

BROWN AND ORANGE, MEDIUM STIFF TO STIFF, MOIST, SANDY SILT WITH GRAVEL INTERMIXED WITH WOOD DEBRIS

6d 5.869d PROPOSED GRADE 6d 2d

BROWN, SOFT TO MEDIUM STIFF, MOIST, SILTY CLAY WITH GRAVEL. INTERMIXED WITH WOOD DEBRIS

RESIDUAL, GREEN AND WHITE, LOOSE TO MEDIUM DENSE, WET, SILTY SAND

11 6 2 7 5 7 8 2 7 13

2/13

280+50

900 890 880 870 860 850 840

SS-14
SS-15
SS-16
SS-17

GROUND SURFACE

ARTIFICIAL FILL, ORANGE, BROWN, BLACK, AND DARK GREEN, MEDIUM STIFF TO STIFF, MOIST, SANDY SILT INTERMIXED WITH WOOD DEBRIS

6d 5.691d 6d PROPOSED GRADE 2d

ARTIFICIAL FILL.

BROWN, GRAY, AND RED, VERY SOFT TO STIFF, MOIST, SILTY CLAY

4 2 4 1 11 50/4

RESIDUAL, TAN, WHITE, AND BLACK, MEDIUM DENSE, MOIST, SILTY SAND

WEATHERED ROCK

CRYSTALLINE ROCK

280+00

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) #10	#40	#200	% MOISTURE	% ORGANIC
SS-14	139' RT	280+00	3.2-4.7	A-7-6(9)	47	20	21.3	24.0	22.2	32.5	94	82	55	-	5.4
SS-15	139' RT	280+00	8.2-9.7	A-7-6(8)	42	16	18.1	22.2	23.2	36.6	97	87	62	-	7.4
SS-16	139' RT	280+00	18.2-19.7	A-7-6(8)	43	16	19.3	21.1	23.0	36.6	96	84	61	-	7.2
SS-17	139' RT	280+00	23.2-24.7	A-7-6(6)	42	14	17.3	19.3	26.8	36.6	80	71	54	-	11.4

0 20 40 60 80 100 120 140 160 180 200 220 240 260 280

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nmohs AT GEOPAK 7.2.8154

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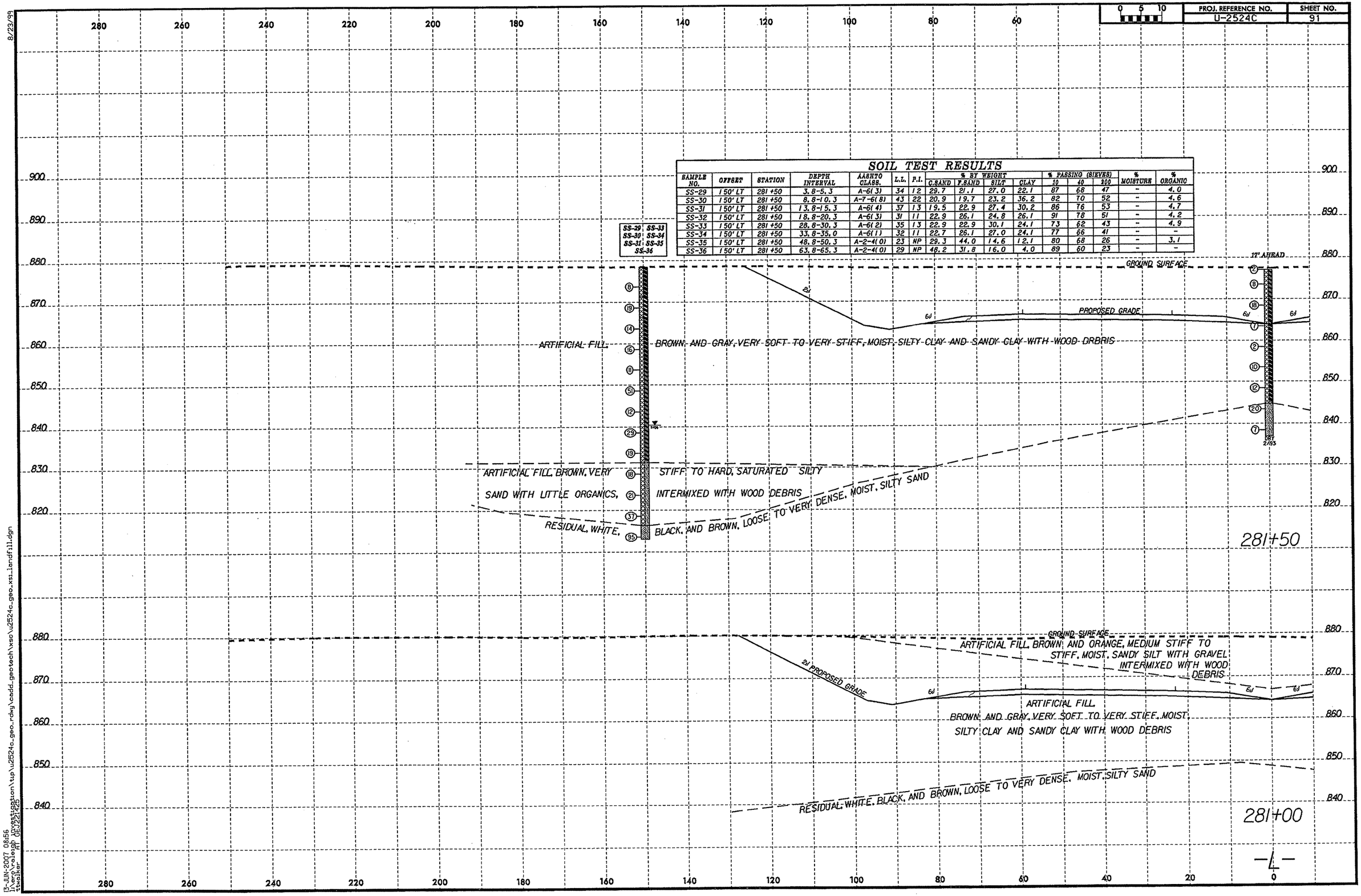

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-29	150' LT	281+50	3.8-5.3	A-6(3)	34	12	29.7	21.1	27.0	22.1	87	68	47	-	4.0
SS-30	150' LT	281+50	8.8-10.3	A-7-6(8)	43	22	20.9	19.7	23.2	36.2	82	70	52	-	4.6
SS-31	150' LT	281+50	13.8-15.3	A-6(4)	37	13	19.5	22.9	27.4	30.2	86	76	53	-	4.7
SS-32	150' LT	281+50	18.8-20.3	A-6(3)	31	11	22.9	26.1	24.8	26.1	91	78	51	-	4.2
SS-33	150' LT	281+50	28.8-30.3	A-6(2)	35	13	22.9	22.9	30.1	24.1	73	62	43	-	4.9
SS-34	150' LT	281+50	33.8-35.0	A-6(1)	32	11	22.7	26.1	27.0	24.1	77	66	41	-	-
SS-35	150' LT	281+50	48.8-50.3	A-2-4(0)	23	NP	29.3	44.0	14.6	12.1	80	68	26	-	3.1
SS-36	150' LT	281+50	63.8-65.3	A-2-4(0)	29	NP	48.2	31.8	16.0	4.0	89	60	23	-	-

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ttwalker AT GEV221425

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U-2524C	92

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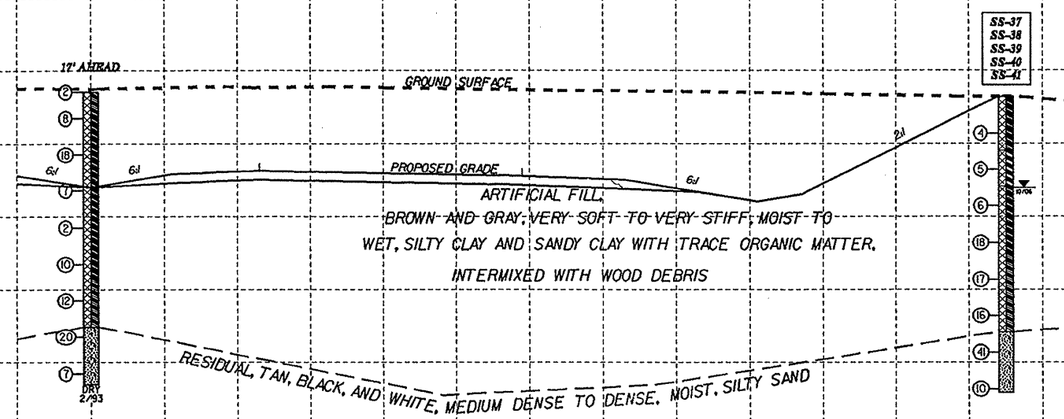
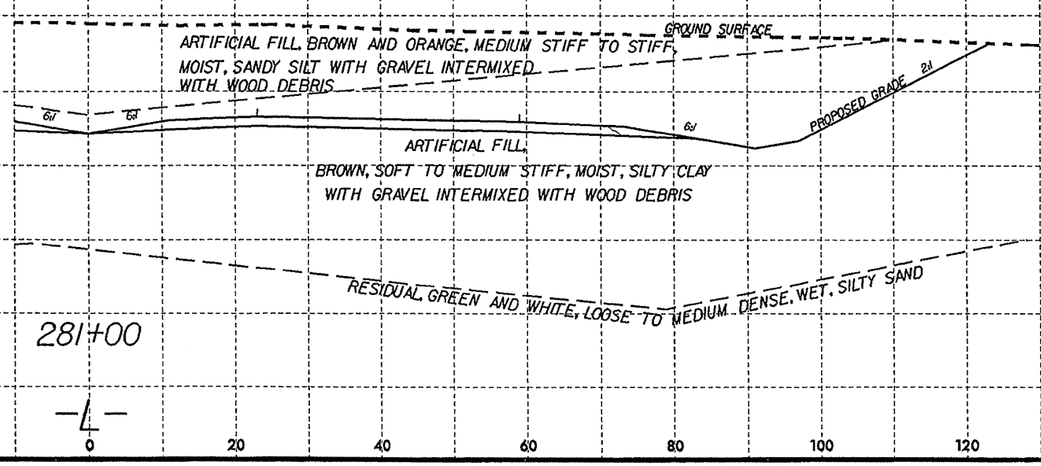
SOIL TEST RESULTS

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-37	125' RT	281+50	4.0-5.5	A-6(2)	37	12	26.3	24.1	23.4	26.1	82	67	44	-	4.3
SS-38	125' RT	281+50	9.0-10.5	A-7-6(4)	43	17	27.5	18.5	27.8	26.1	77	62	44	-	4.8
SS-39	125' RT	281+50	14.0-15.5	A-6(5)	36	12	18.5	21.5	29.8	30.2	88	77	58	-	4.7
SS-40	125' RT	281+50	34.0-35.5	A-2-4(0)	20	NP	42.4	29.3	18.2	10.1	98	70	33	-	--
SS-41	125' RT	281+50	39.0-40.5	A-2-4(0)	37	6	43.4	28.3	22.2	6.0	99	68	35	-	--





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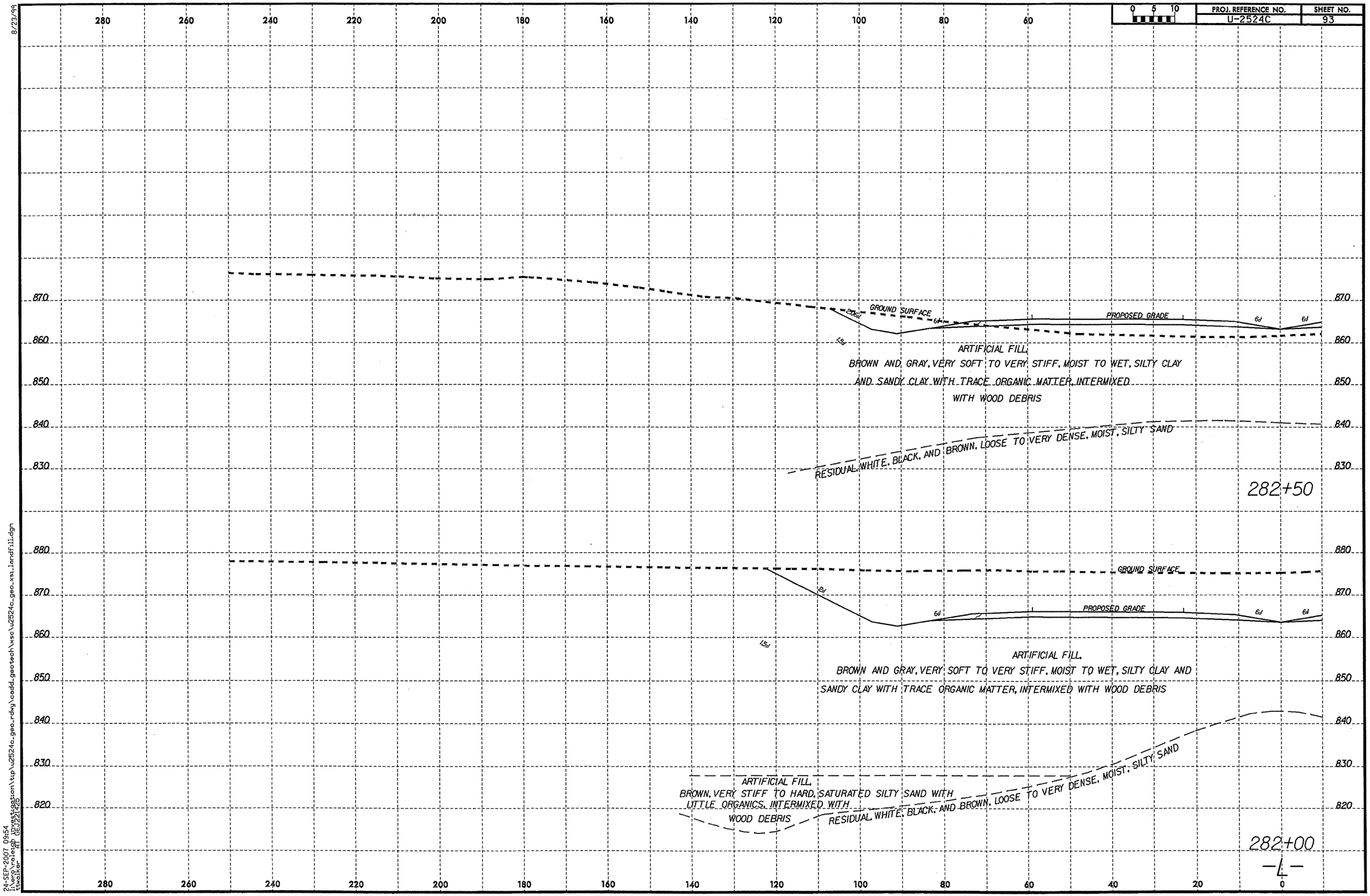

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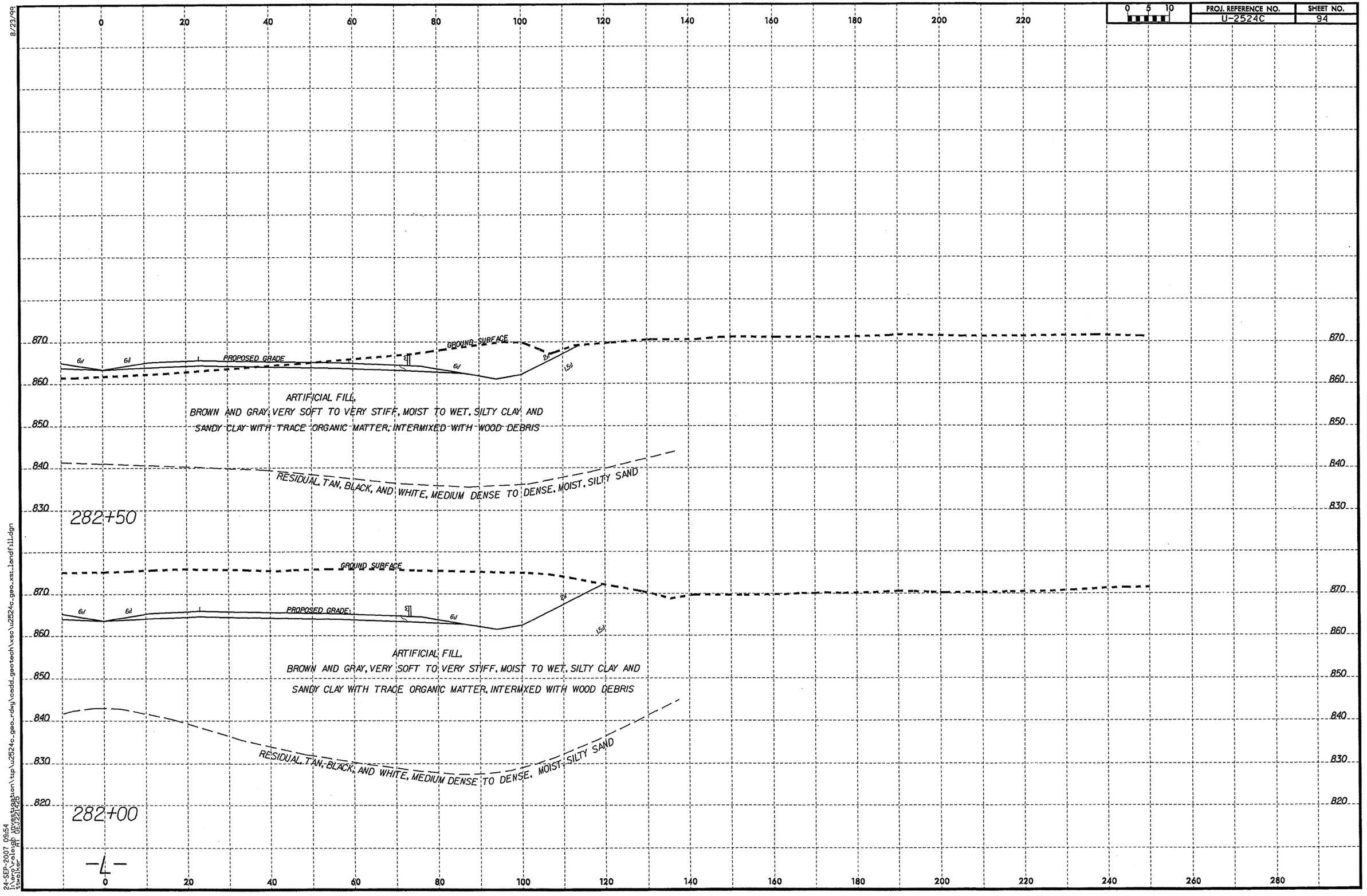

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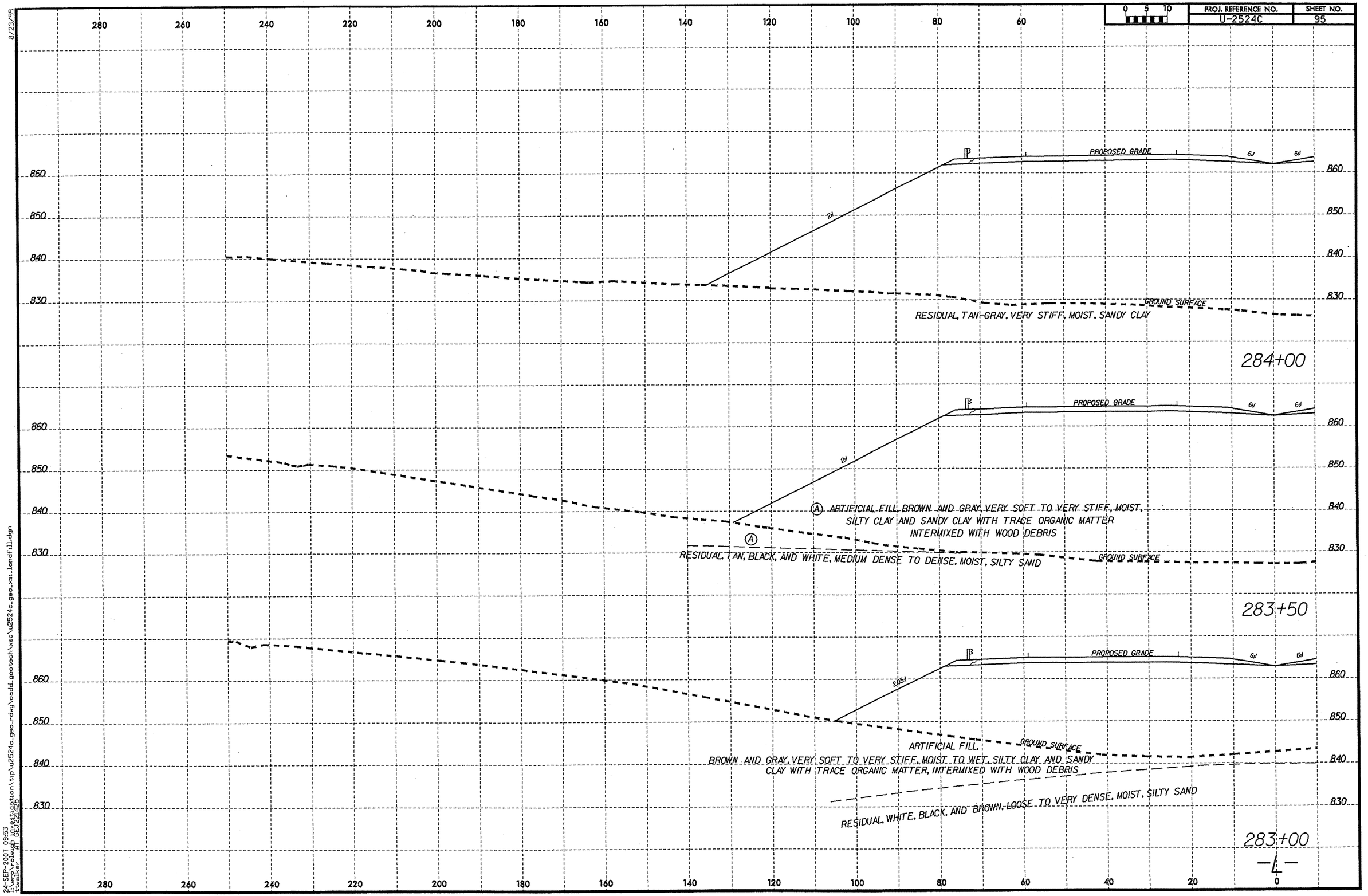

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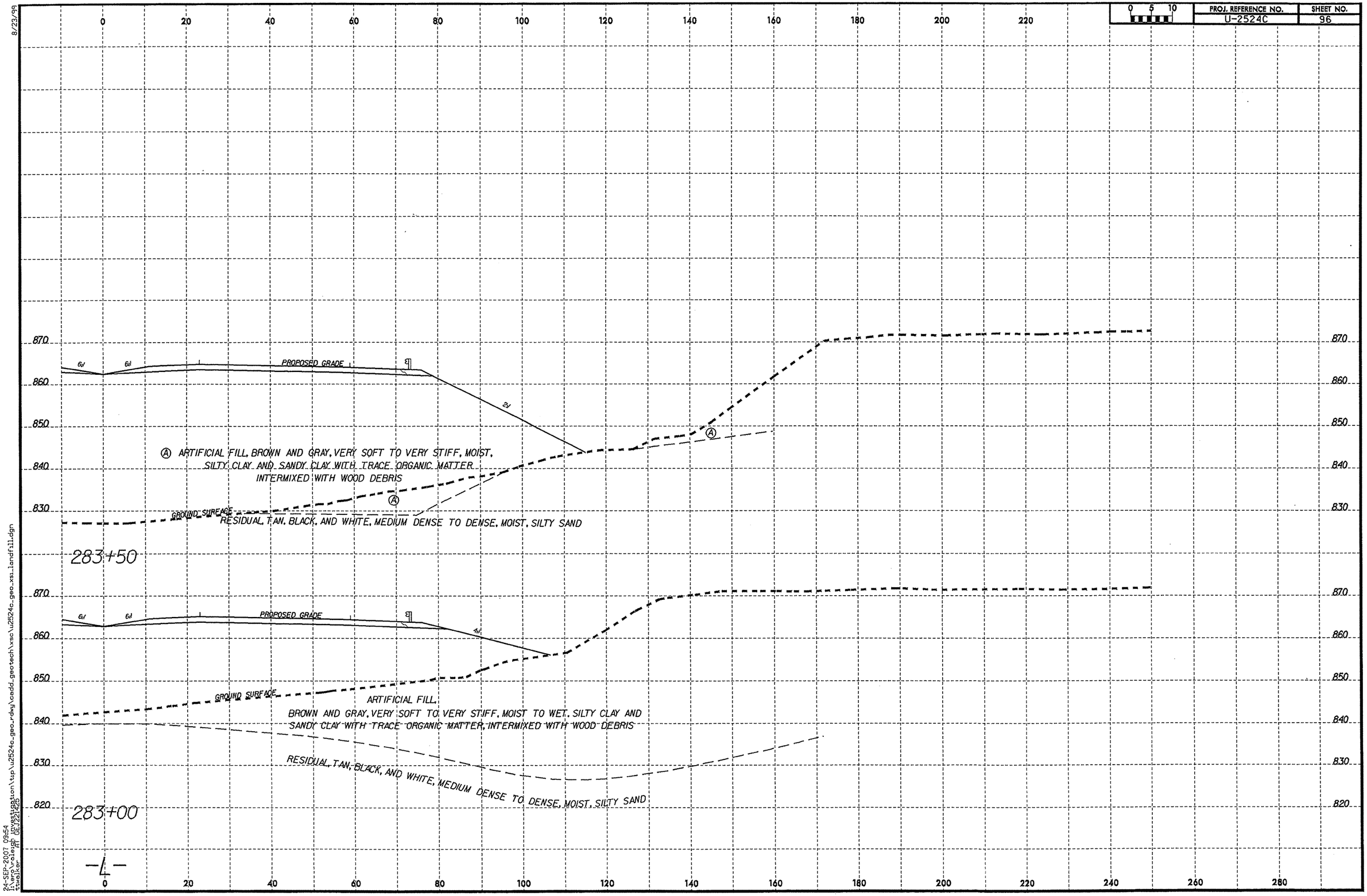

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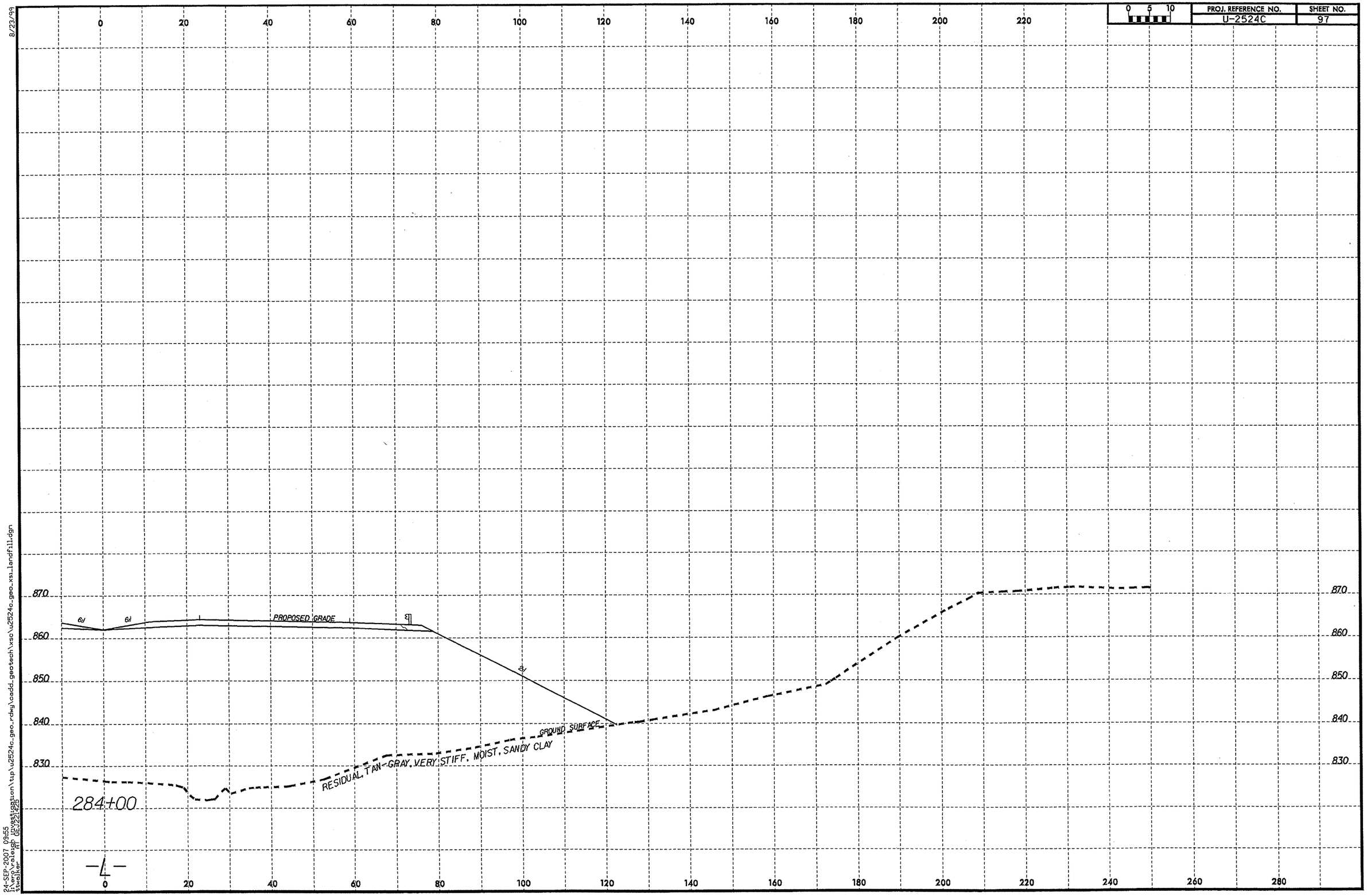

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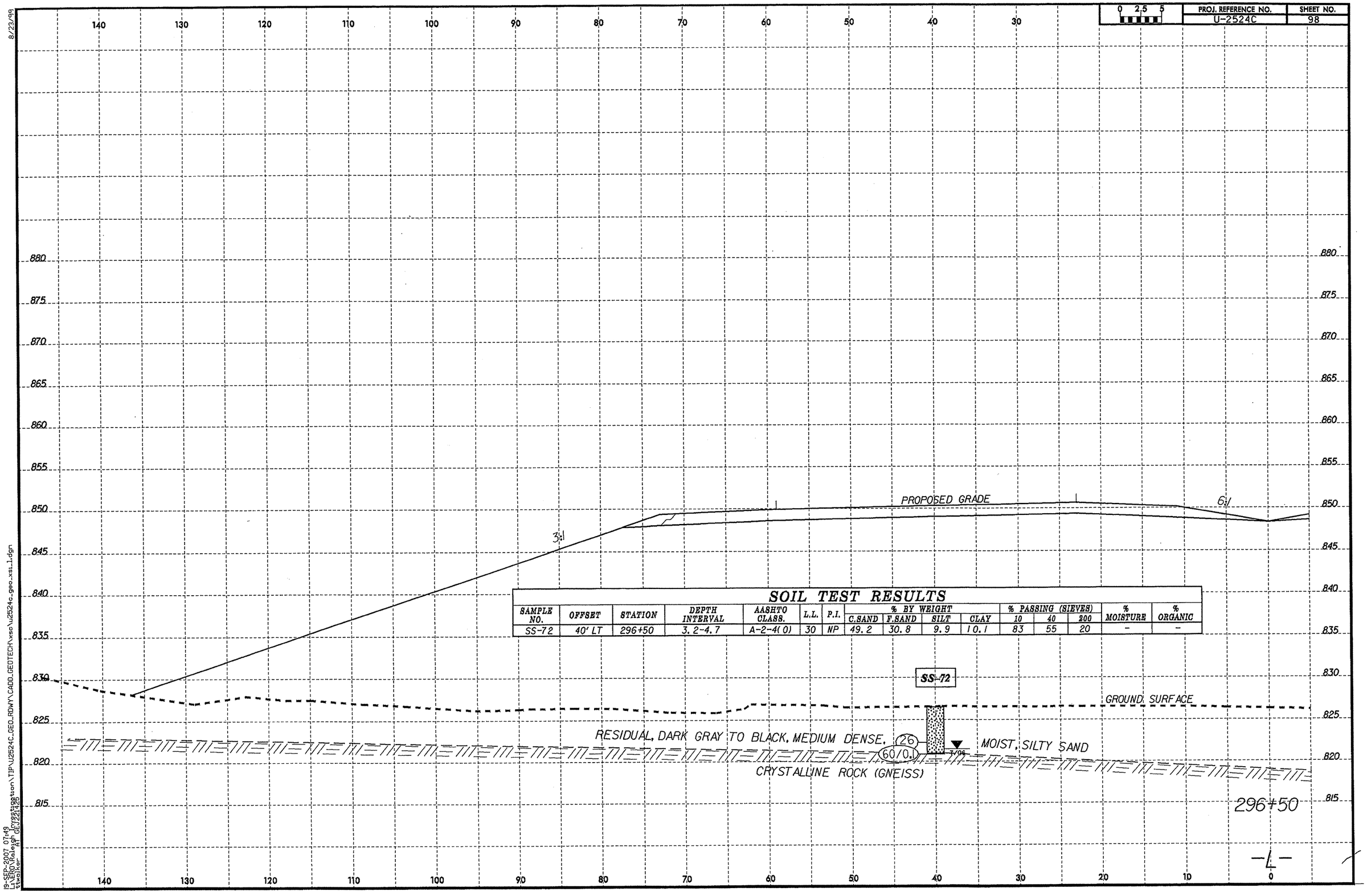

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-72	40' LT	296+50	3.2-4.7	A-2-4(0)	30	NP	49.2	30.8	9.9	10.1	83	55	20	-	-

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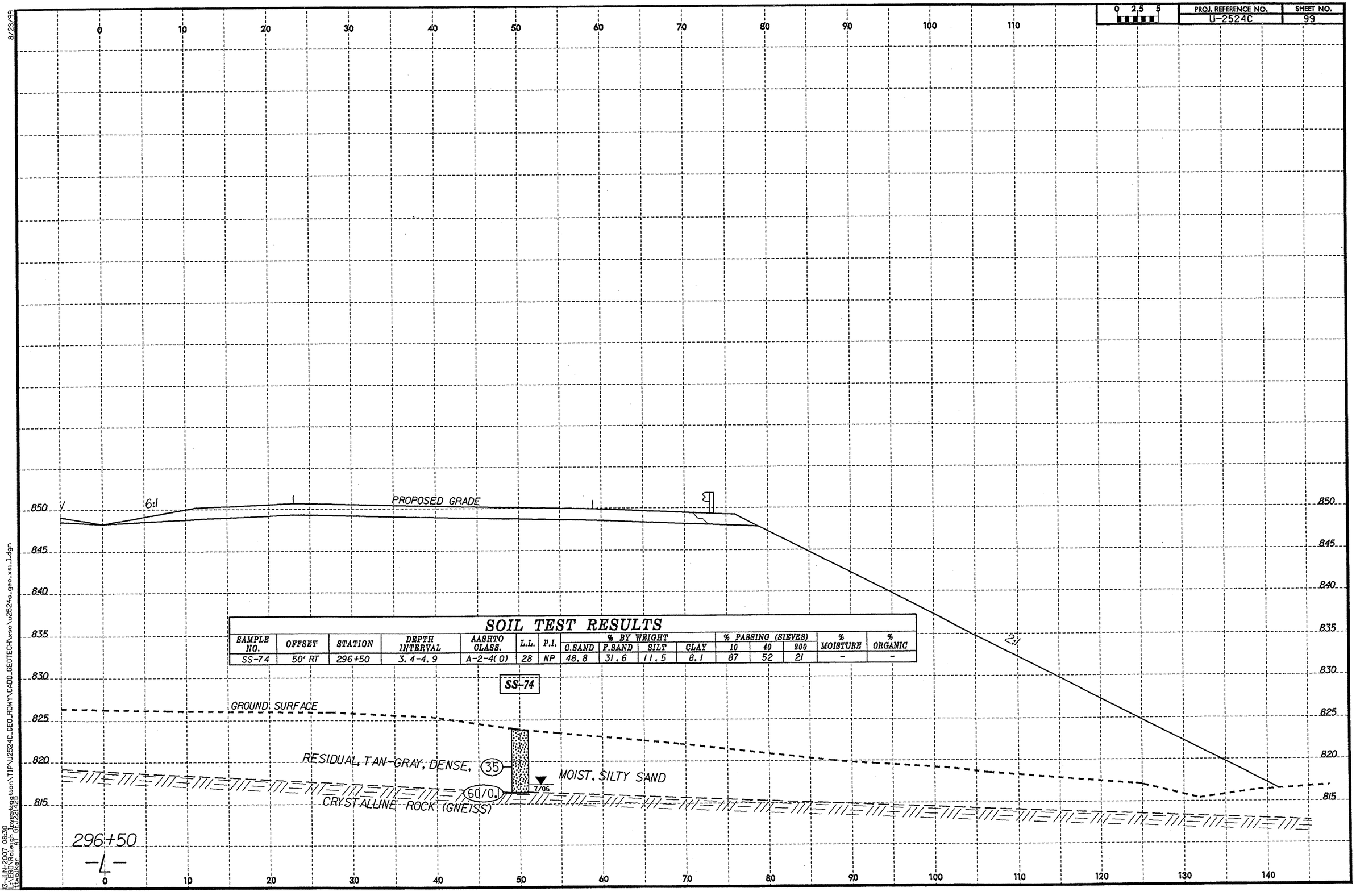
SHEET NO. 99



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-74	50' RT	296+50	3.4-4.9	A-2-4(0)	28	NP	48.8	31.6	11.5	8.1	87	52	21	-	-

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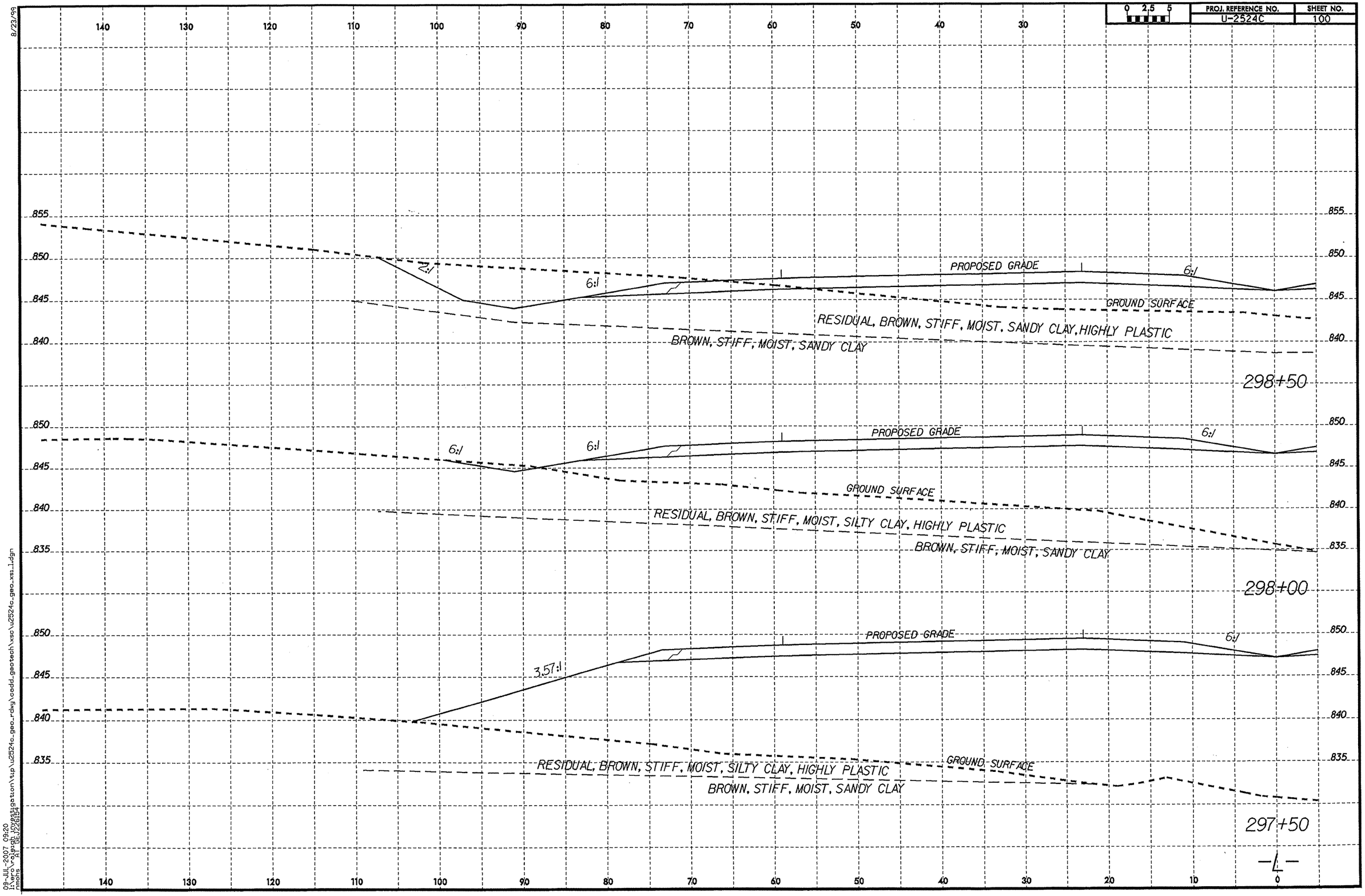

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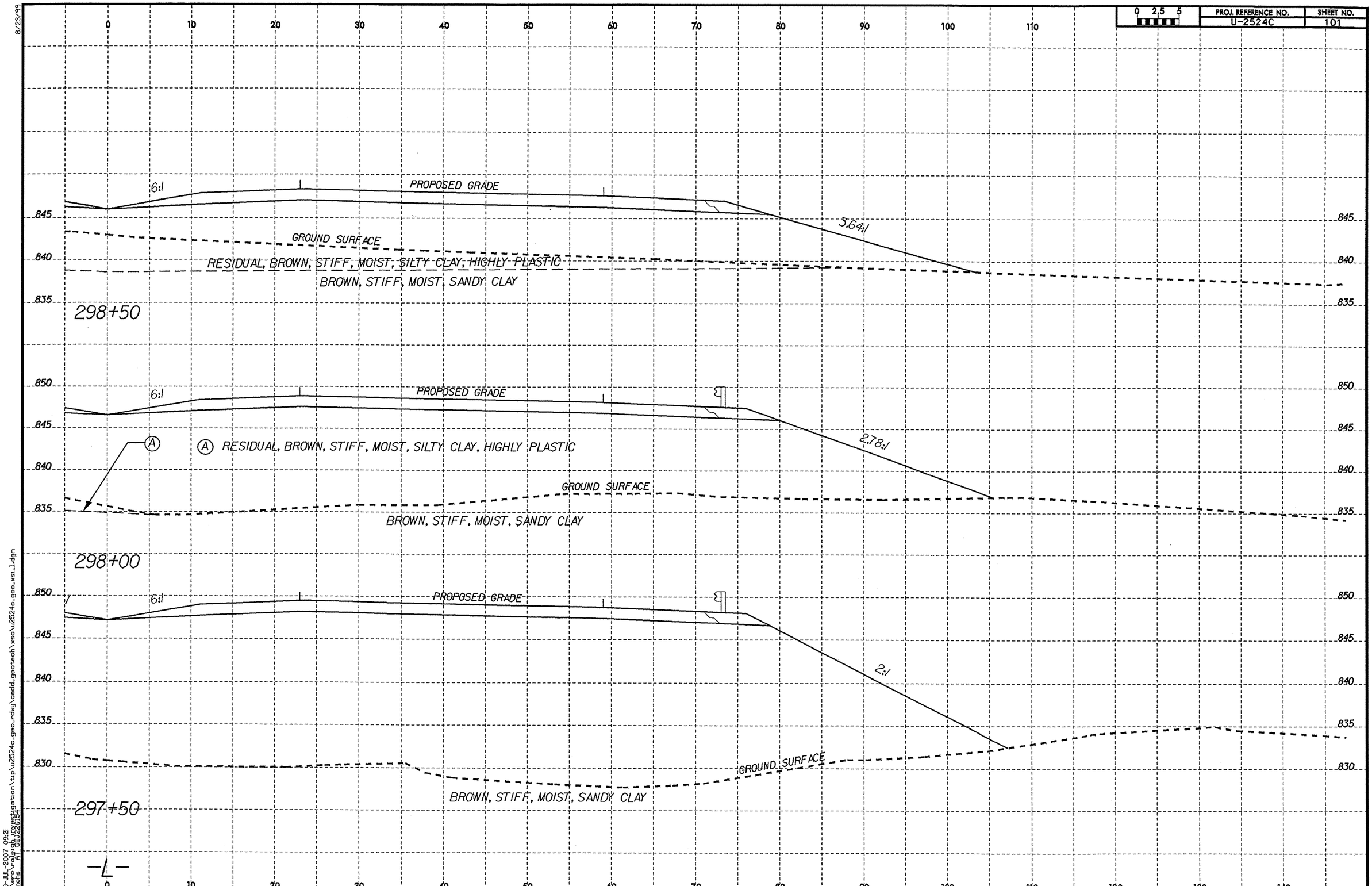

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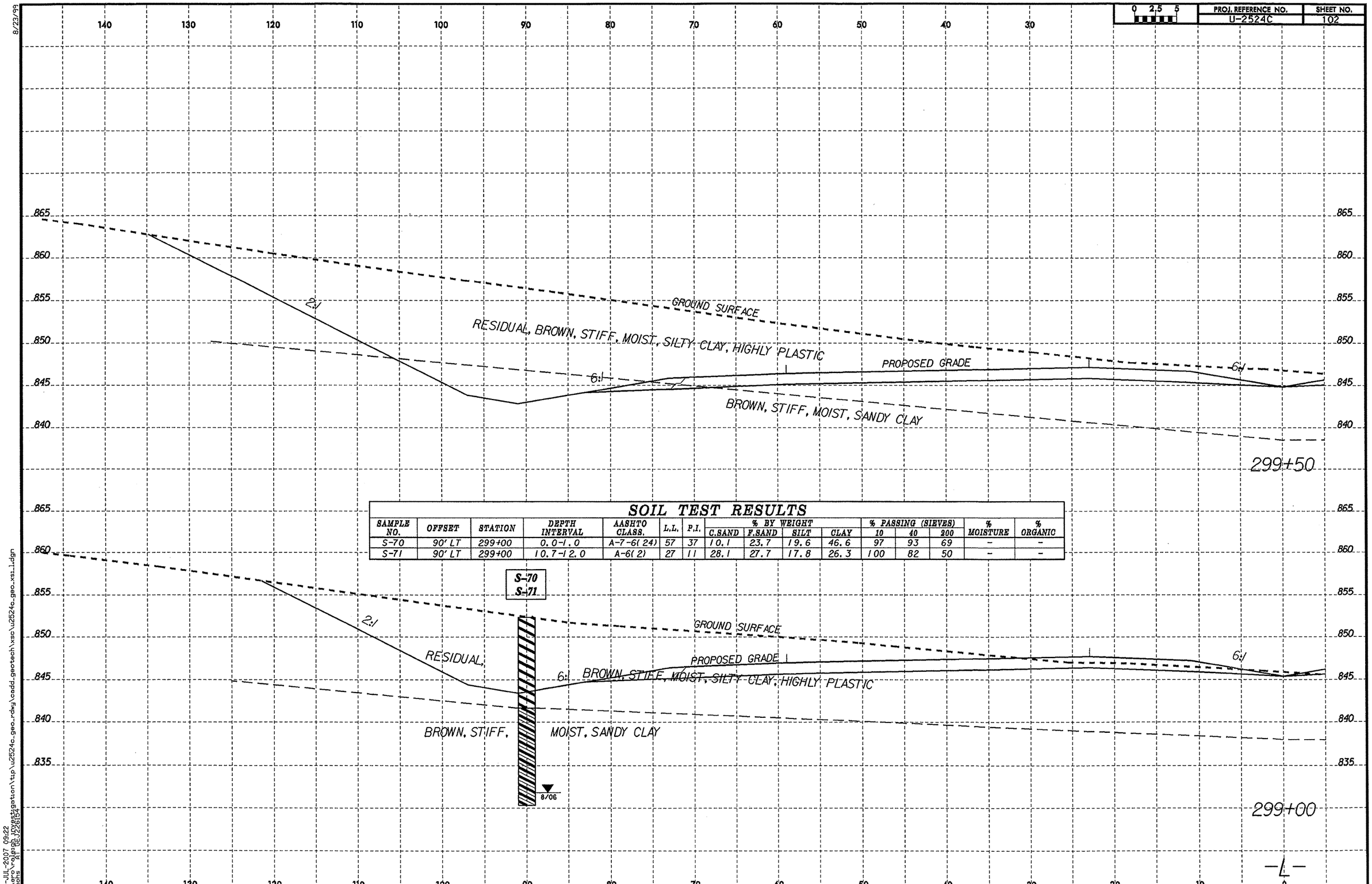

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-70	90' LT	299+00	0.0-1.0	A-7-6(24)	57	37	10.1	23.7	19.6	46.6	97	93	69	-	-
S-71	90' LT	299+00	10.7-12.0	A-6(2)	27	11	28.1	27.7	17.8	26.3	100	82	50	-	-

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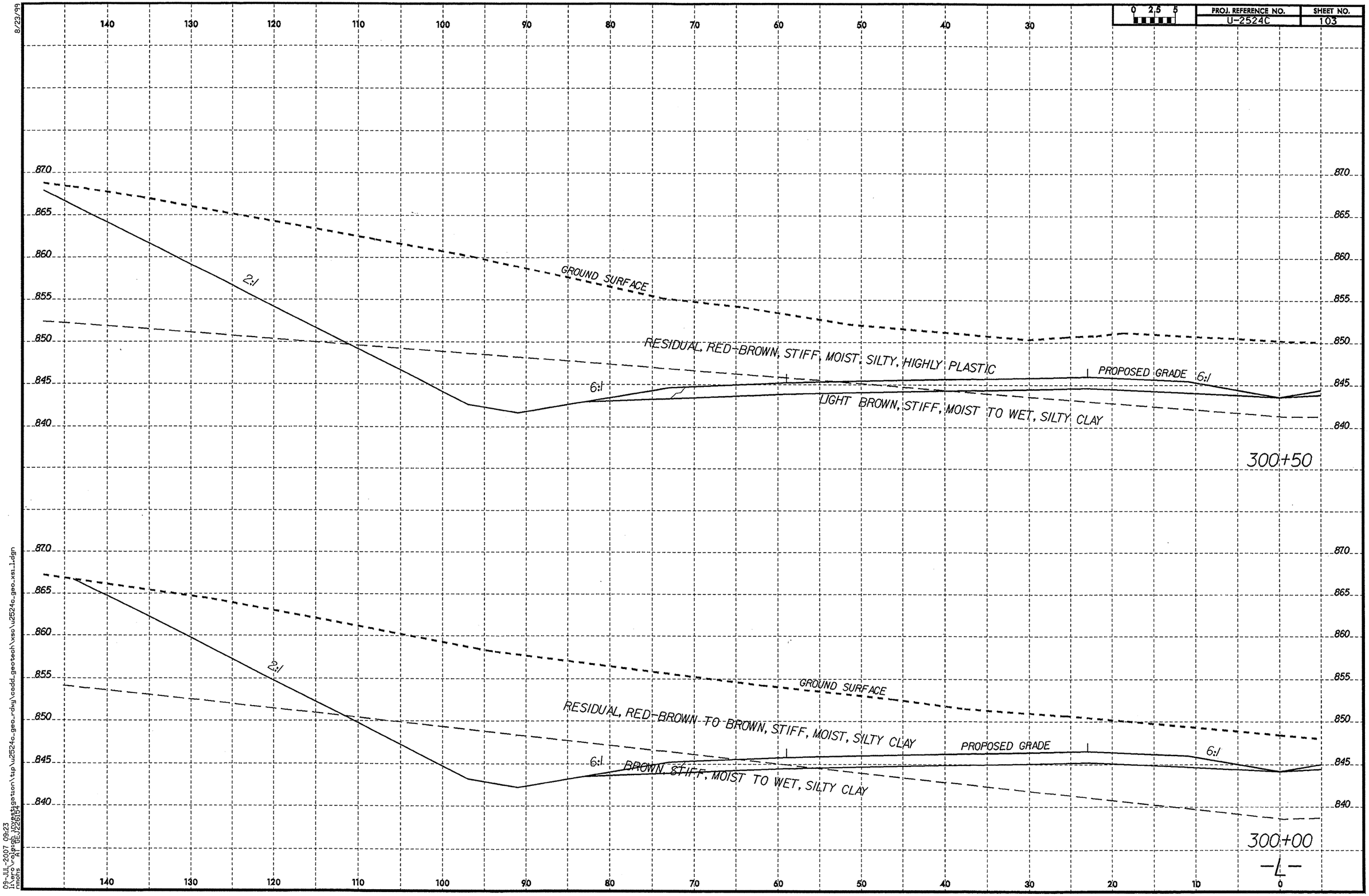

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nmohs AT GEJ226154

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	U-2524C	104

0 10 20 30 40 50 60 70 80 90 100 110

850
845
840

GROUND SURFACE
PROPOSED GRADE
6:1
6:1
3.92:1
RESIDUAL, RED-BROWN, STIFF, MOIST, SILTY CLAY, HIGHLY PLASTIC
LIGHT BROWN, STIFF, MOIST TO WET, SILTY CLAY

300+50

PROPOSED GRADE
GROUND SURFACE
6:1
6:1
2.83:1
RESIDUAL, RED-BROWN TO BROWN, STIFF, MOIST, SILTY CLAY, HIGHLY PLASTIC
BROWN, STIFF, MOIST TO WET, SILTY CLAY

300+00

PROPOSED GRADE
6:1
6:1
GROUND SURFACE
6:1
RESIDUAL, BROWN, STIFF, MOIST, SILTY CLAY, HIGHLY PLASTIC
BROWN, STIFF, MOIST, SANDY CLAY

299+50

PROPOSED GRADE
6:1
5:1
GROUND SURFACE
RESIDUAL, BROWN, STIFF, MOIST, SILTY CLAY, HIGHLY PLASTIC
BROWN, STIFF, MOIST, SANDY CLAY

299+00

-L-

850
845
840
835

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

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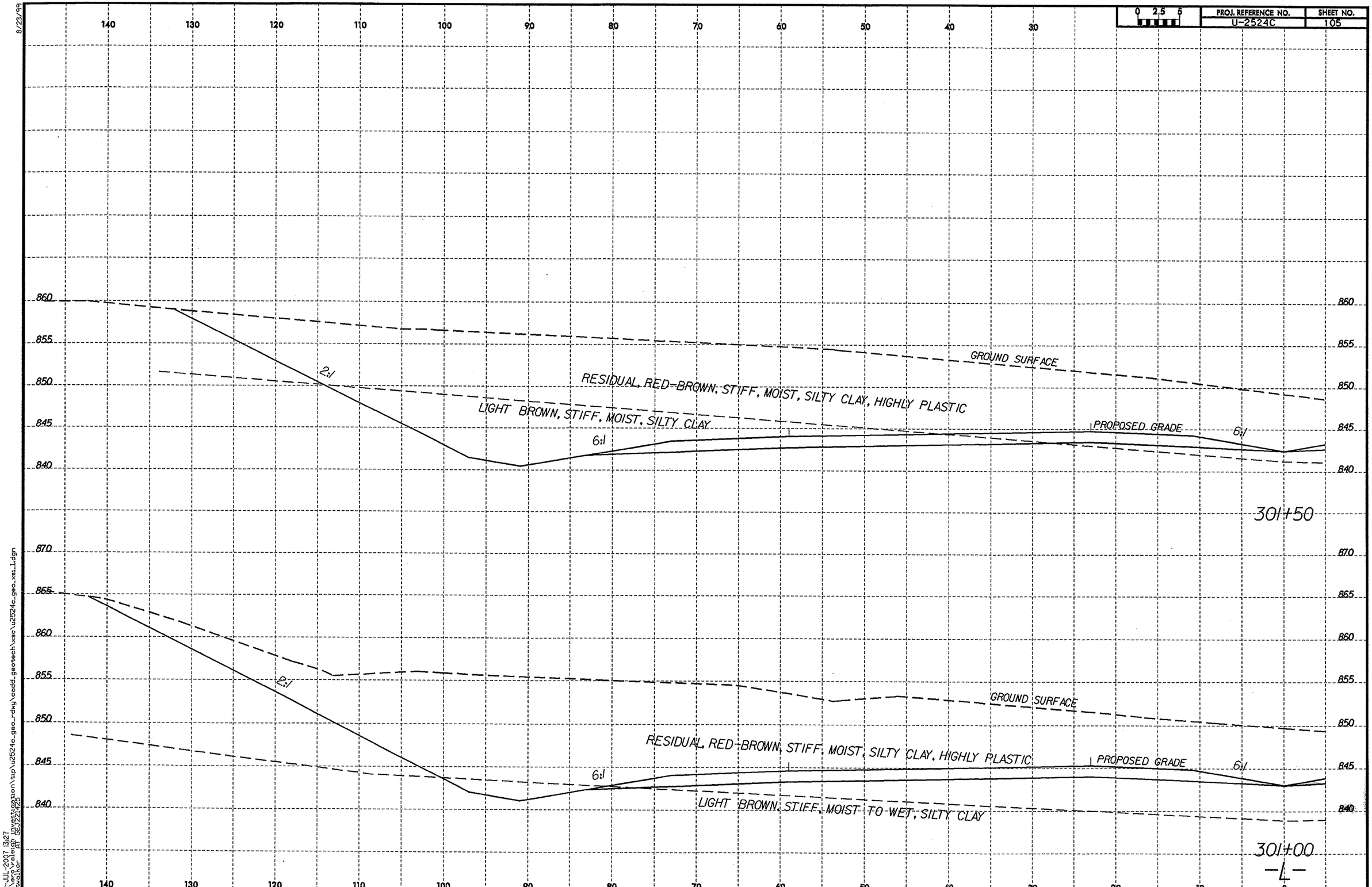
tlwalker
AT GEOPAK



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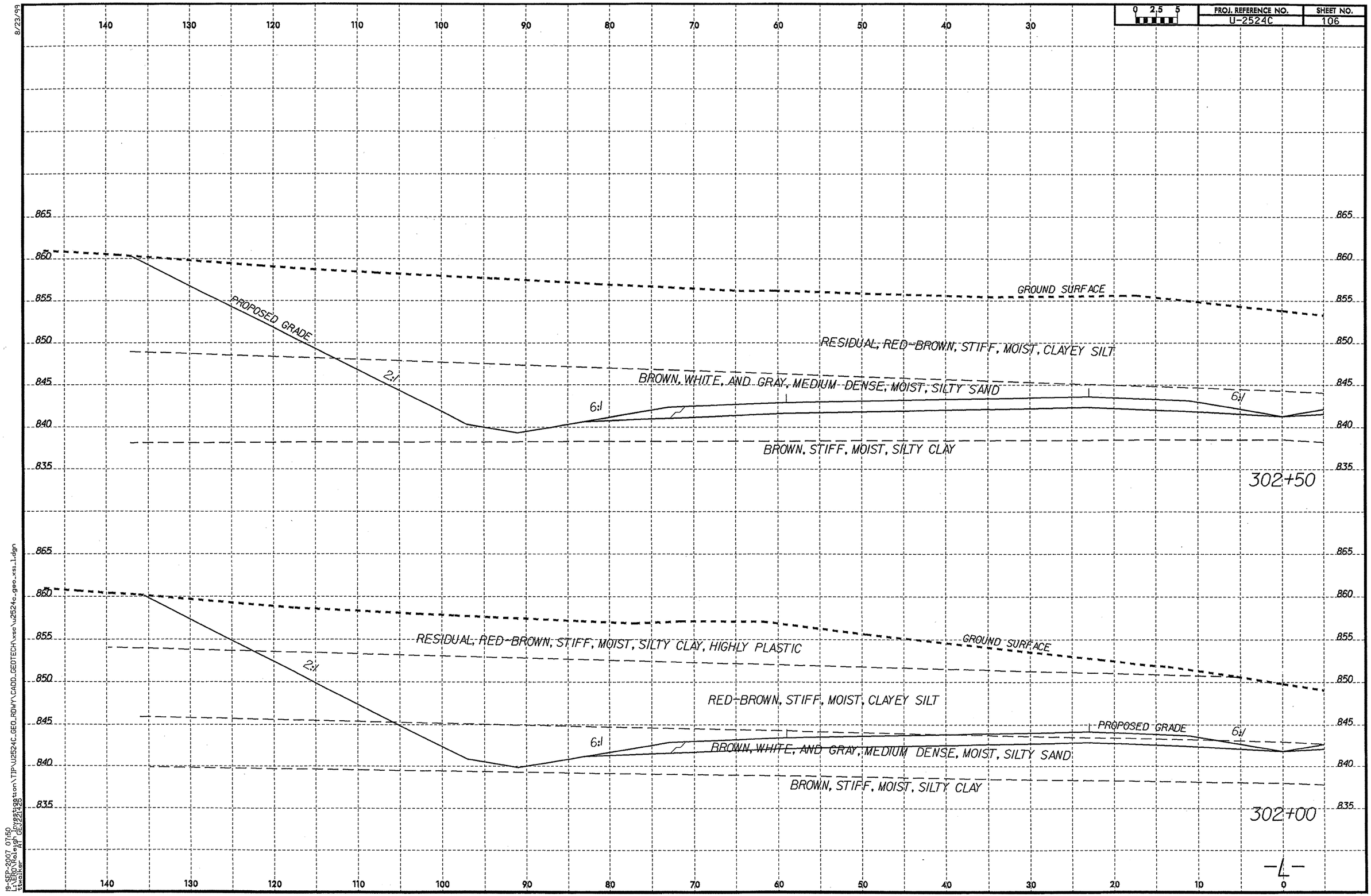

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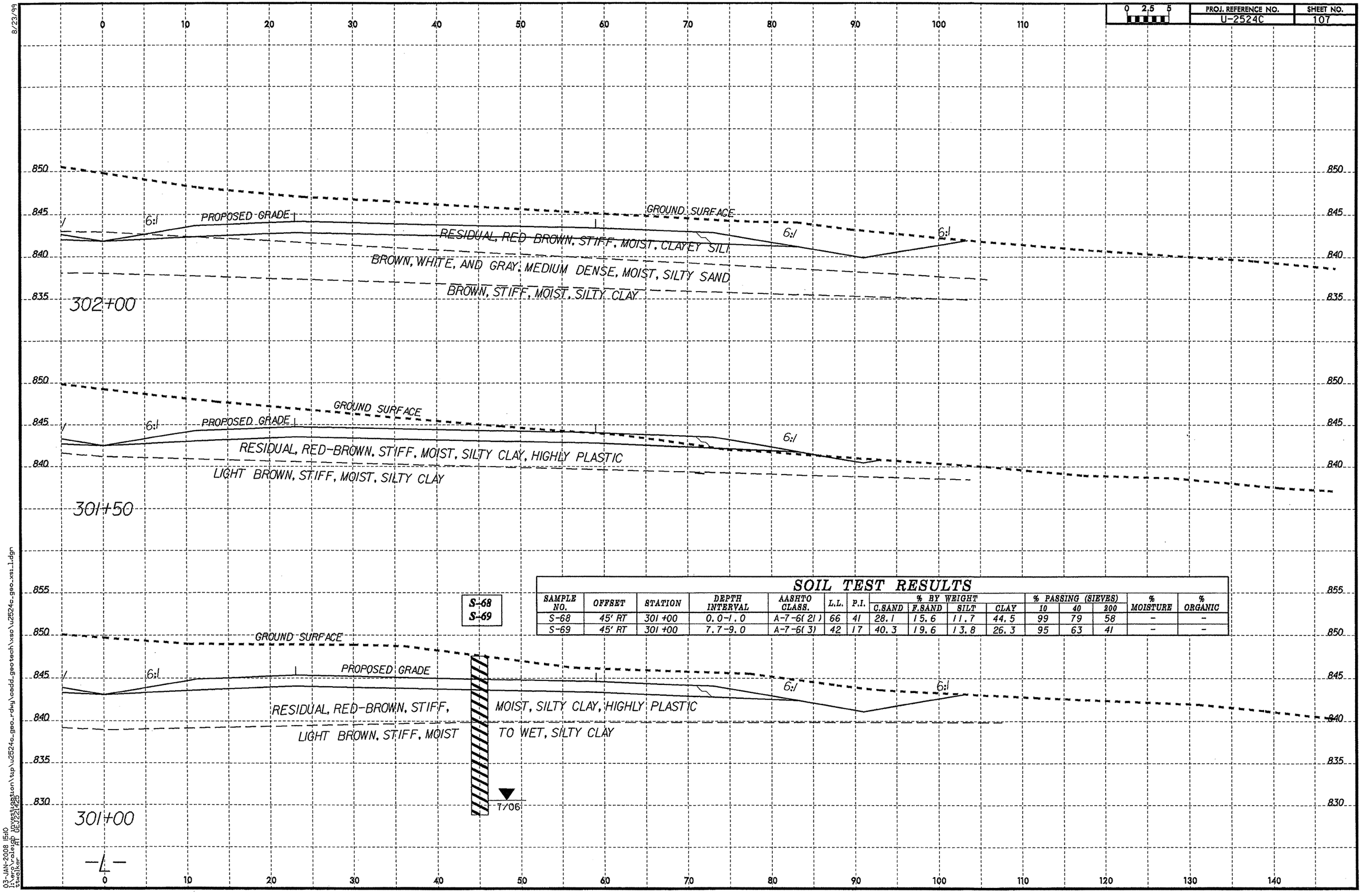

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
S-68	45' RT	301+00	0.0-1.0	A-7-6(21)	66	41	28.1	15.6	11.7	44.5	99	79	58	-	-
S-69	45' RT	301+00	7.7-9.0	A-7-6(3)	42	17	40.3	19.6	13.8	26.3	95	63	41	-	-

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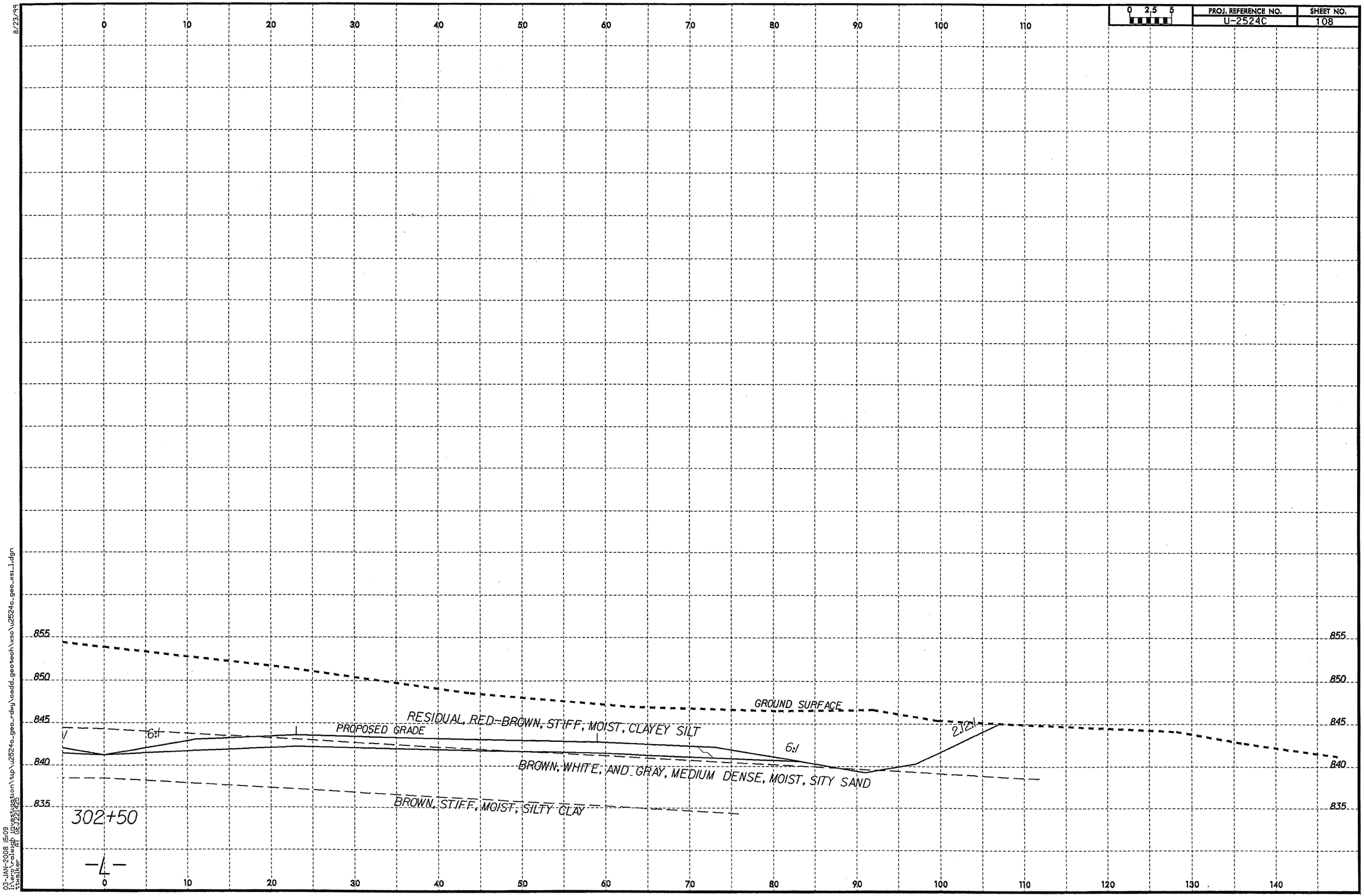

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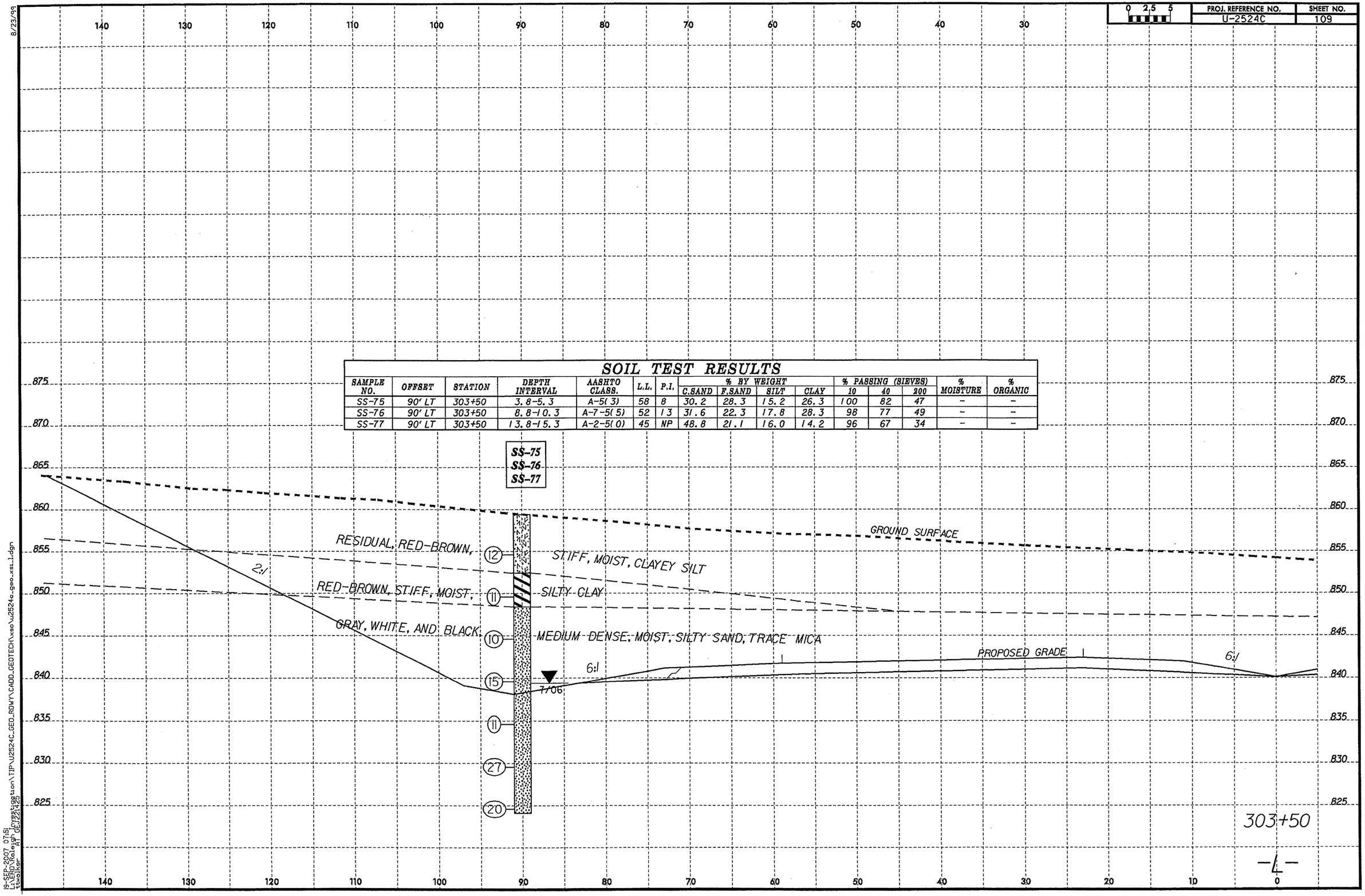
U-2524C	109



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-75	90' LT	303+50	3.8-5.3	A-5(3)	58	8	30.2	28.3	15.2	26.3	100	82	47	-	-
SS-76	90' LT	303+50	8.8-10.3	A-7-5(5)	52	13	31.6	22.3	17.8	28.3	98	77	49	-	-
SS-77	90' LT	303+50	13.8-15.3	A-2-5(0)	45	NP	48.8	21.1	16.0	14.2	96	67	34	-	-

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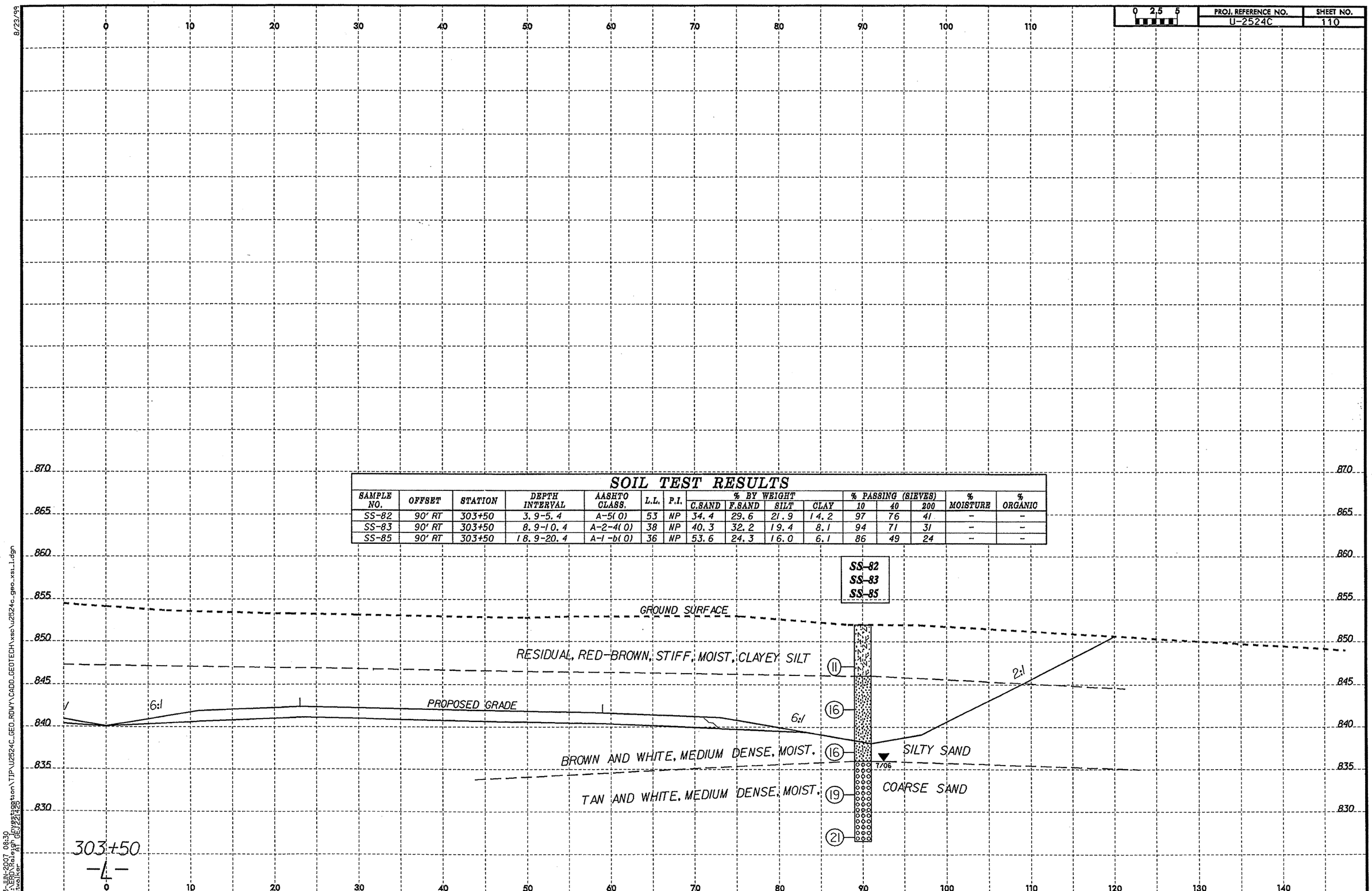
SHEET NO. 110



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-82	90' RT	303+50	3.9-5.4	A-5(0)	53	NP	34.4	29.6	21.9	14.2	97	76	41	-	-
SS-83	90' RT	303+50	8.9-10.4	A-2-4(0)	38	NP	40.3	32.2	19.4	8.1	94	71	31	-	-
SS-85	90' RT	303+50	18.9-20.4	A-1-b(0)	36	NP	53.6	24.3	16.0	6.1	86	49	24	-	-

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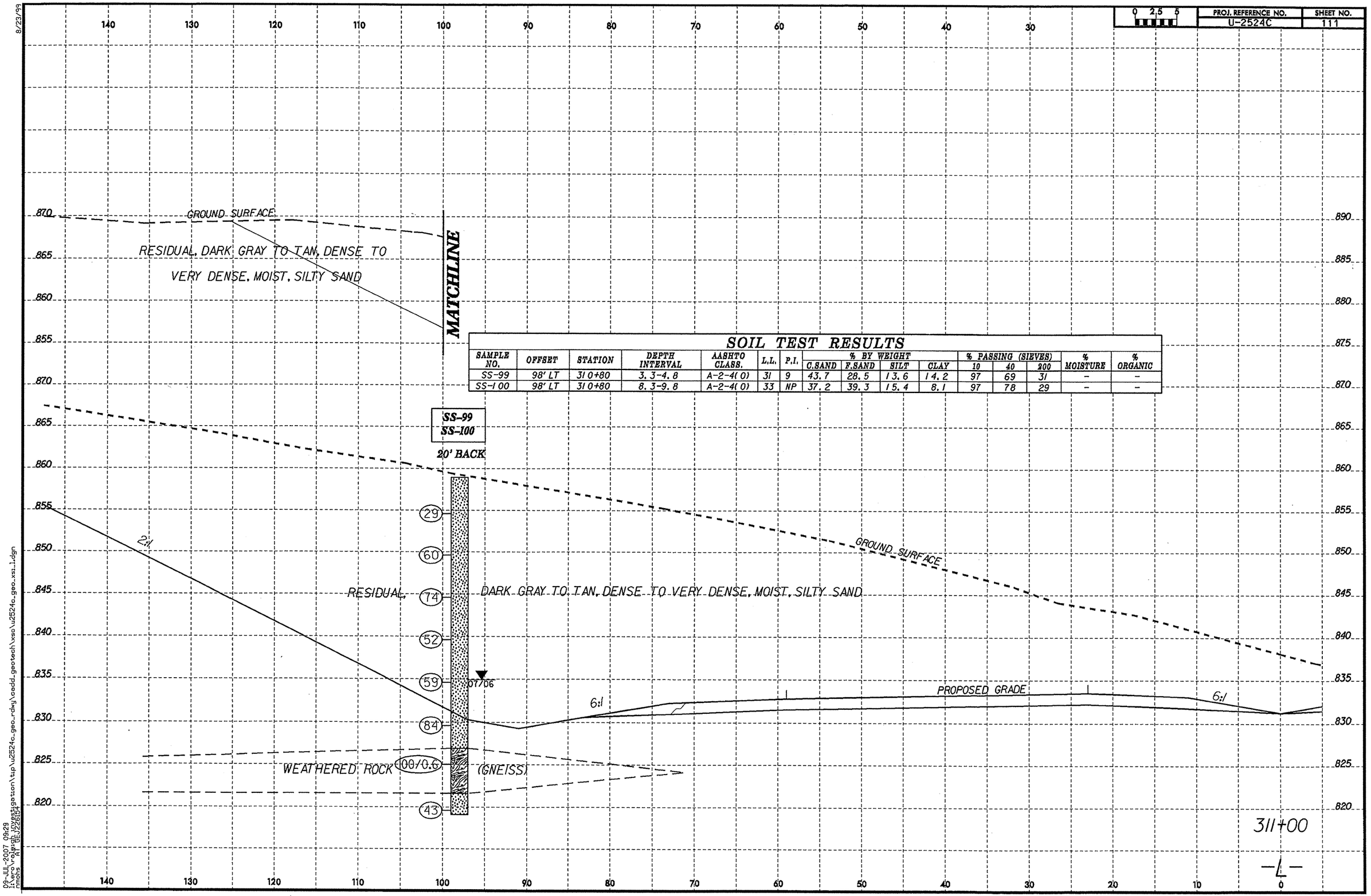
ttwalker AT GEJ221425

PROJ. REFERENCE NO.	SHEET NO.
U-2524C	111



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-99	98' LT	310+80	3.3-4.8	A-2-4(0)	31	9	43.7	28.5	13.6	14.2	97	69	31	-	-
SS-100	98' LT	310+80	8.3-9.8	A-2-4(0)	33	NP	37.2	39.3	15.4	8.1	97	78	29	-	-

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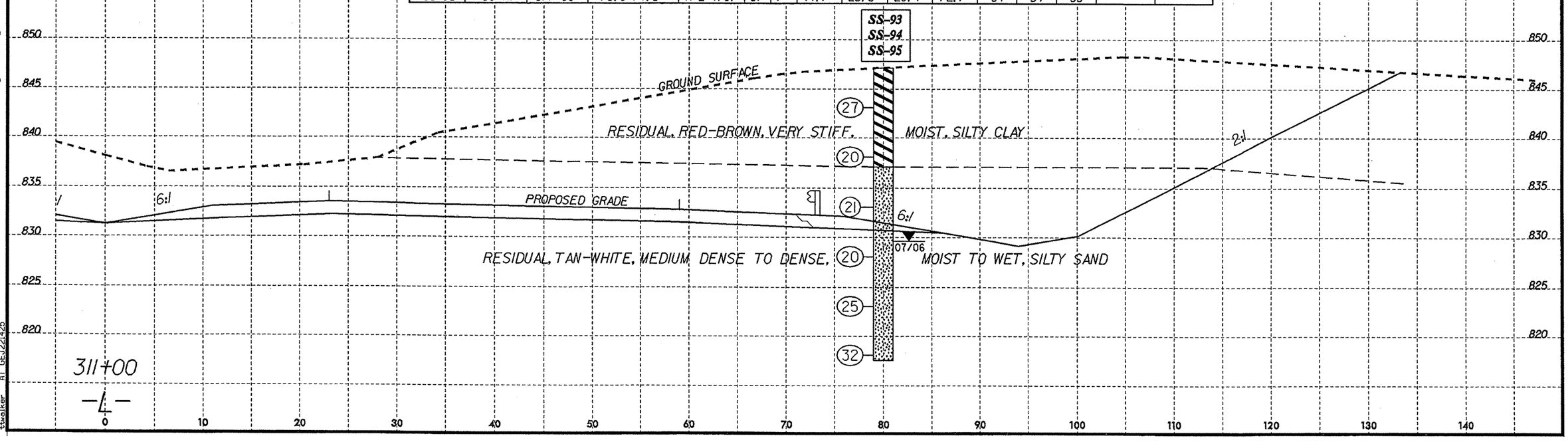
PROJ. REFERENCE NO.	SHEET NO.
U-2524C	112

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-93	80' RT	311+00	3.0-4.5	A-7-5(5)	56	15	31.8	26.5	13.4	28.3	99	78	46	-	-
SS-94	80' RT	311+00	8.0-9.5	A-7-5(9)	56	14	22.7	20.9	24.1	32.4	100	85	61	-	-
SS-95	80' RT	311+00	13.0-14.5	A-2-4(0)	37	7	44.1	23.3	20.4	12.1	84	54	33	-	-



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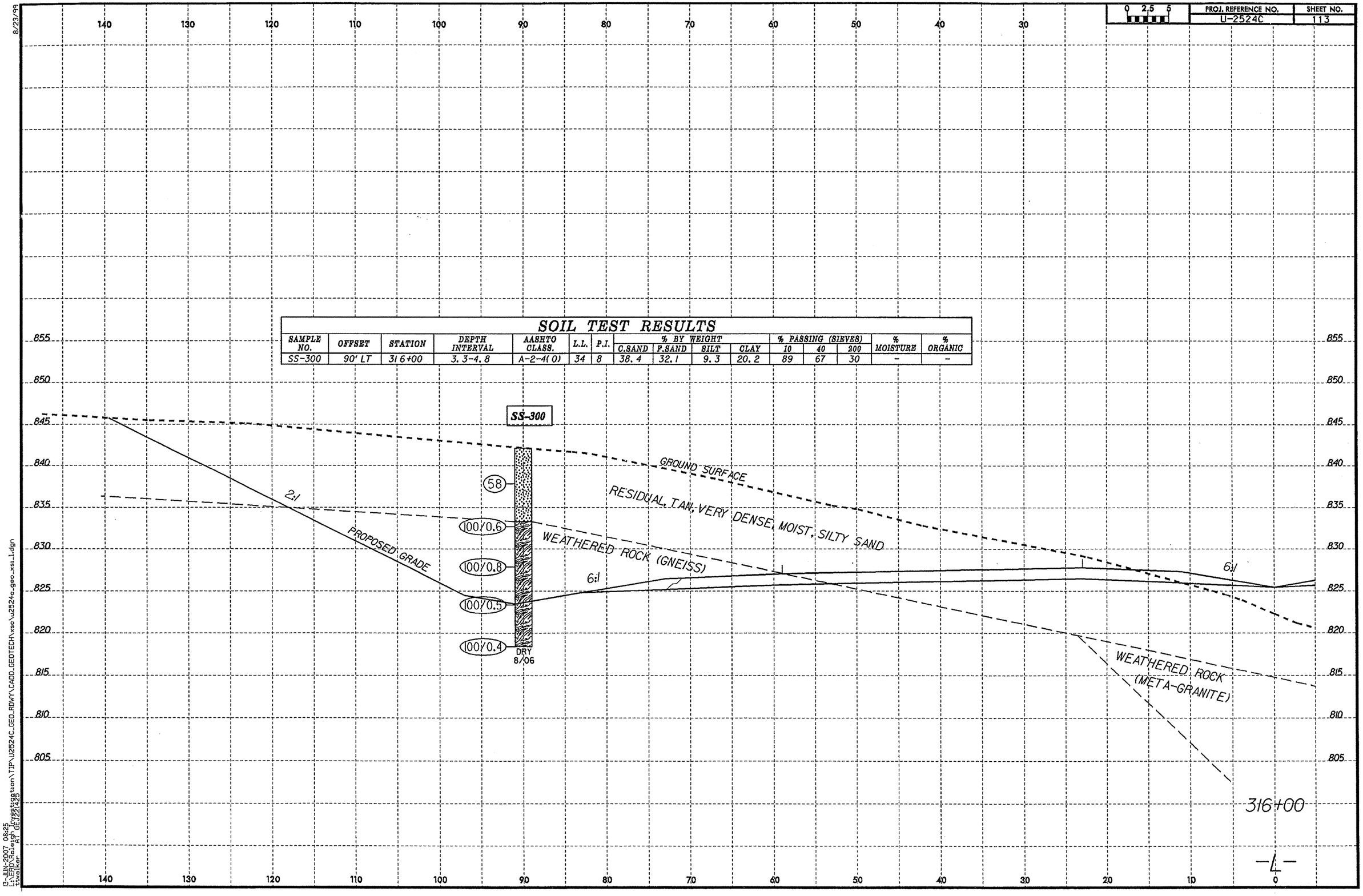
PROJ. REFERENCE NO.	SHEET NO.
U-2524C	113



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-300	90' LT	316+00	3.3-4.8	A-2-4(0)	34	8	38.4	32.1	9.3	20.2	89	67	30	-	-

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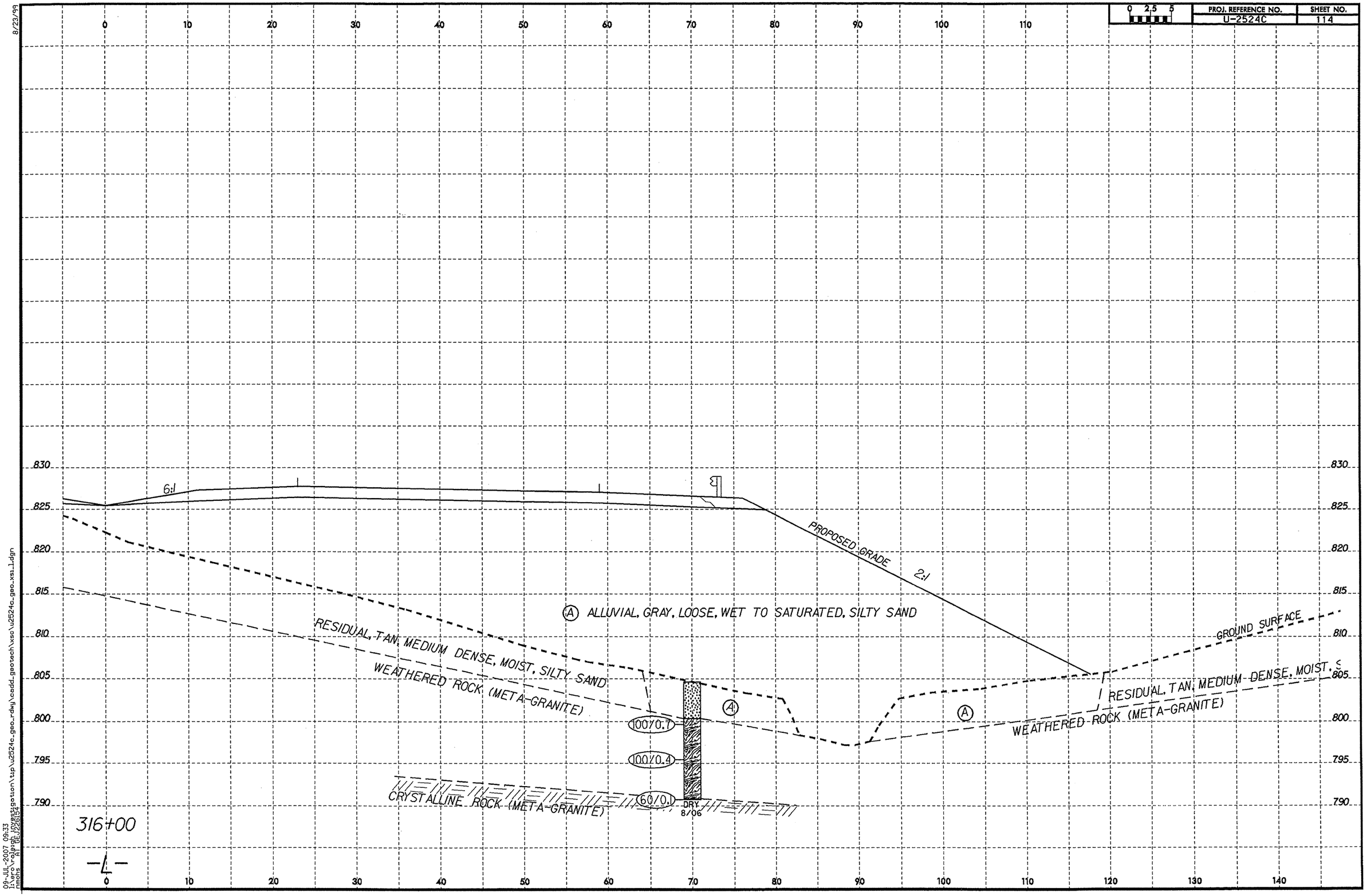

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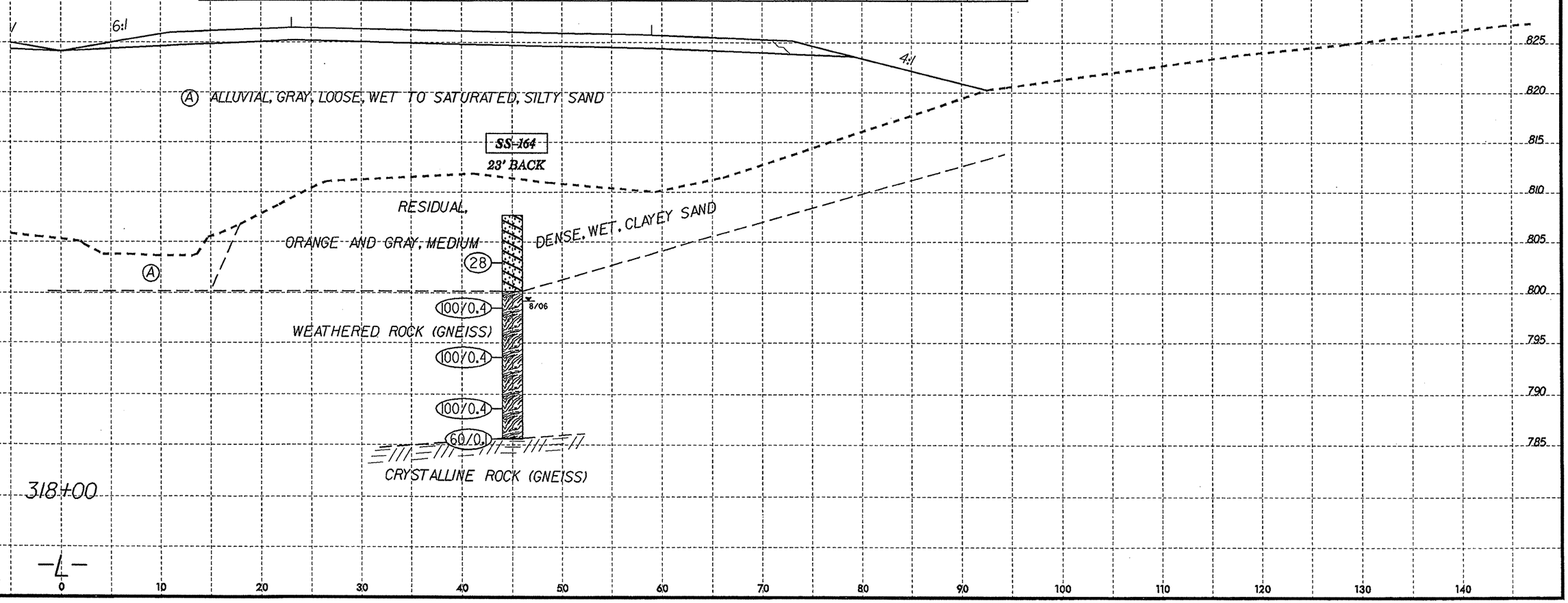
0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	U-2524C	115

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-164	43' RT	317+77	3.7-5.2	A-2-6(0)	32	12	66.0	15.5	2.3	16.1	90	45	18	-	-



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tswalker AT GEV221425

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PROJ. REFERENCE NO.	SHEET NO.
U-2524C	116

0 2.5 5

0 10 20 30 40 50 60 70 80 90 100 110

825 820 815 810 805 800 795

GROUND SURFACE

RESIDUAL, RED-BROWN, STIFF TO VERY STIFF, MOIST, SILTY CLAY

4.282:1

6:1

2:1

PROPOSED GRADE

TAN-BROWN, STIFF, MOIST, CLAYEY SILT

CRYSTALLINE ROCK (META-GRANITE)

369+00

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-183	90' RT	368+50	3.6-5.1	A-7-6(11)	48	21	26.7	16.0	12.7	44.6	100	82	60	-	-
SS-184	90' RT	368+50	8.6-10.1	A-6(3)	40	14	37.5	24.7	11.4	26.3	100	74	43	-	-
SS-185	90' RT	368+50	13.6-15.1	A-5(0)	42	NP	39.9	26.7	21.2	12.2	100	75	37	-	-

SS-183
SS-184
SS-185

835 830 825 820 815 810 805 800 795 790

GROUND SURFACE

29 AND SANDY CLAY

RESIDUAL, RED-BROWN, VERY STIFF, MOIST, SILTY CLAY

27

2:1 PROPOSED GRADE

2:1 4:1 PROPOSED GRADE

6:1

15 8/06

TAN-BROWN, STIFF, MOIST, CLAYEY SILT

100/0.9 WEATHERED ROCK (LEDGE)

13 TAN, MEDIUM DENSE, MOIST, SILTY SAND

100/0.6 WEATHERED ROCK (META-GRANITE)

368+50

-L-

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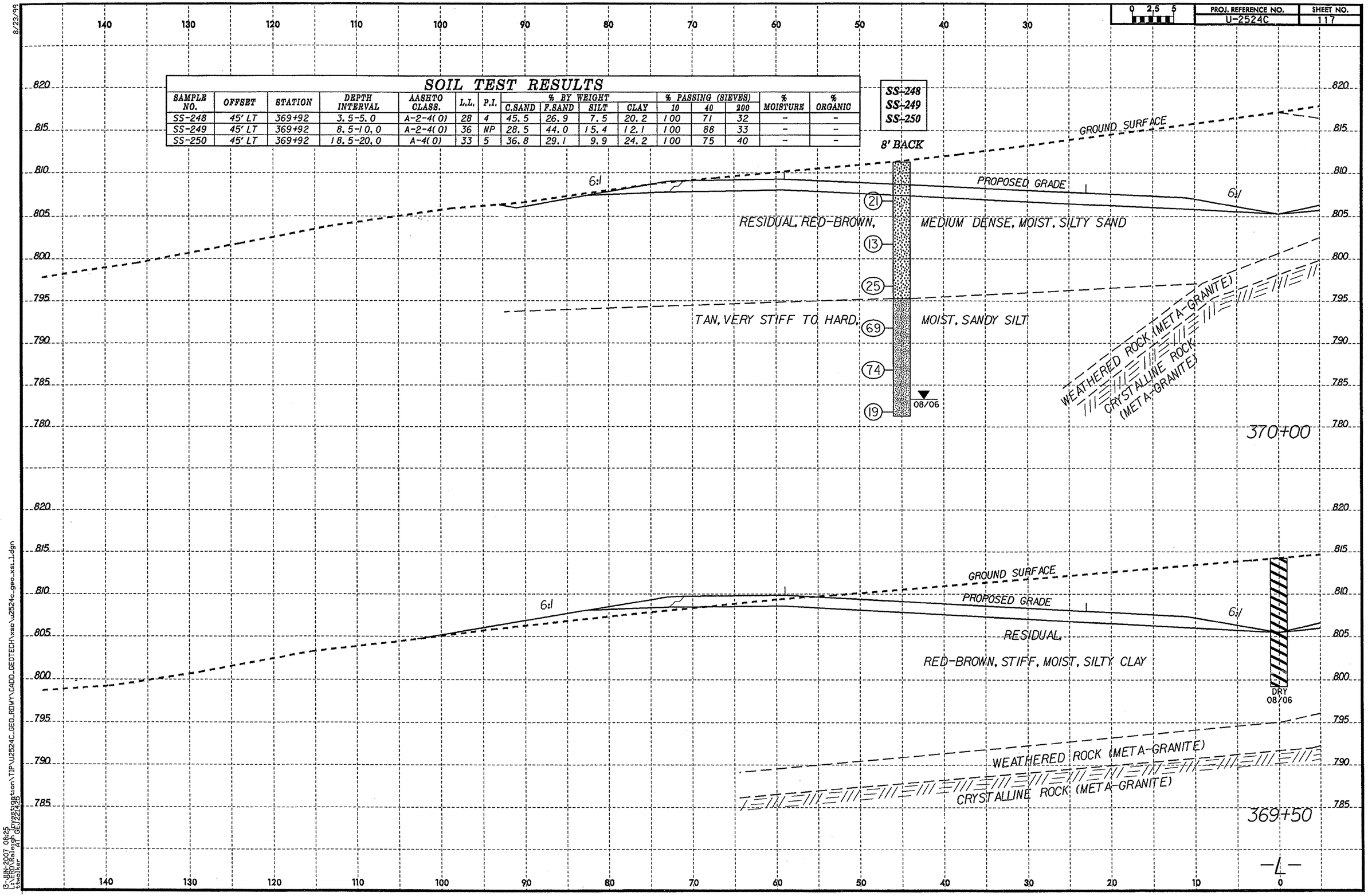
PROJ. REFERENCE NO.	SHEET NO.
U-2524C	117

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-248	45' LT	369+92	3.5-5.0	A-2-4(0)	28	4	45.5	26.9	7.5	20.2	100	71	32	-	-
SS-249	45' LT	369+92	8.5-10.0	A-2-4(0)	36	NP	28.5	44.0	15.4	12.1	100	88	33	-	-
SS-250	45' LT	369+92	18.5-20.0	A-4(0)	33	5	36.8	29.1	9.9	24.2	100	75	40	-	-



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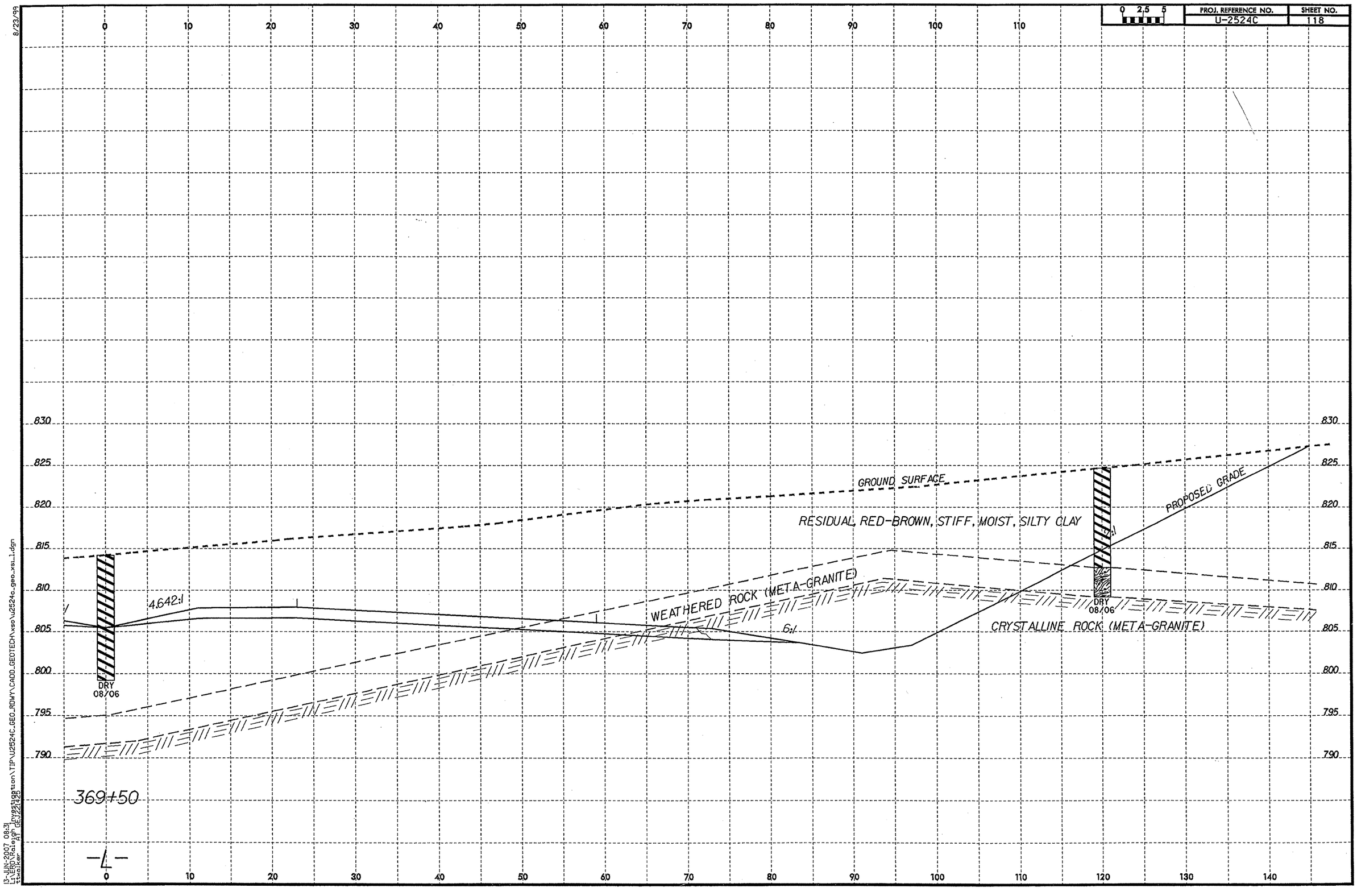

PROJ. REFERENCE NO.
U-2524C
SHEET NO.
118
0 2.5 5
GROUND SURFACE
PROPOSED GRADE
RESIDUAL, RED-BROWN, STIFF, MOIST, SILTY CLAY
WEATHERED ROCK (META-GRANITE)
CRYSTALLINE ROCK (META-GRANITE)
4.642:1
6:1
DRY 08/06
DRY 08/06
369+50
-L-
830
825
820
815
810
805
800
795
790
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
8/23/99
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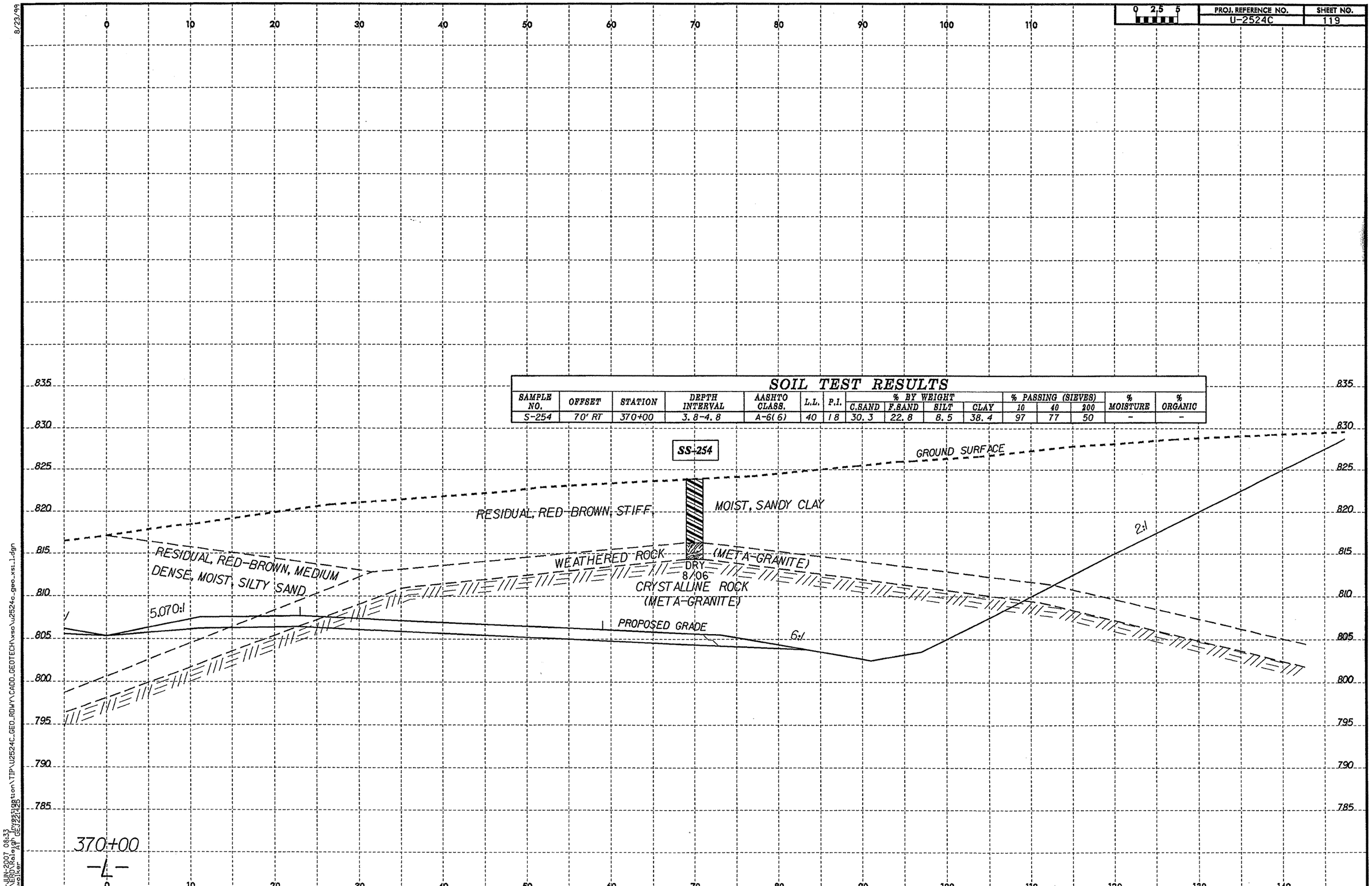
ttwalker AT GEJ221425

PROJ. REFERENCE NO. U-2524C
SHEET NO. 119



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-254	70' RT	370+00	3.8-4.8	A-6(6)	40	18	30.3	22.8	8.5	38.4	97	77	50	-	-

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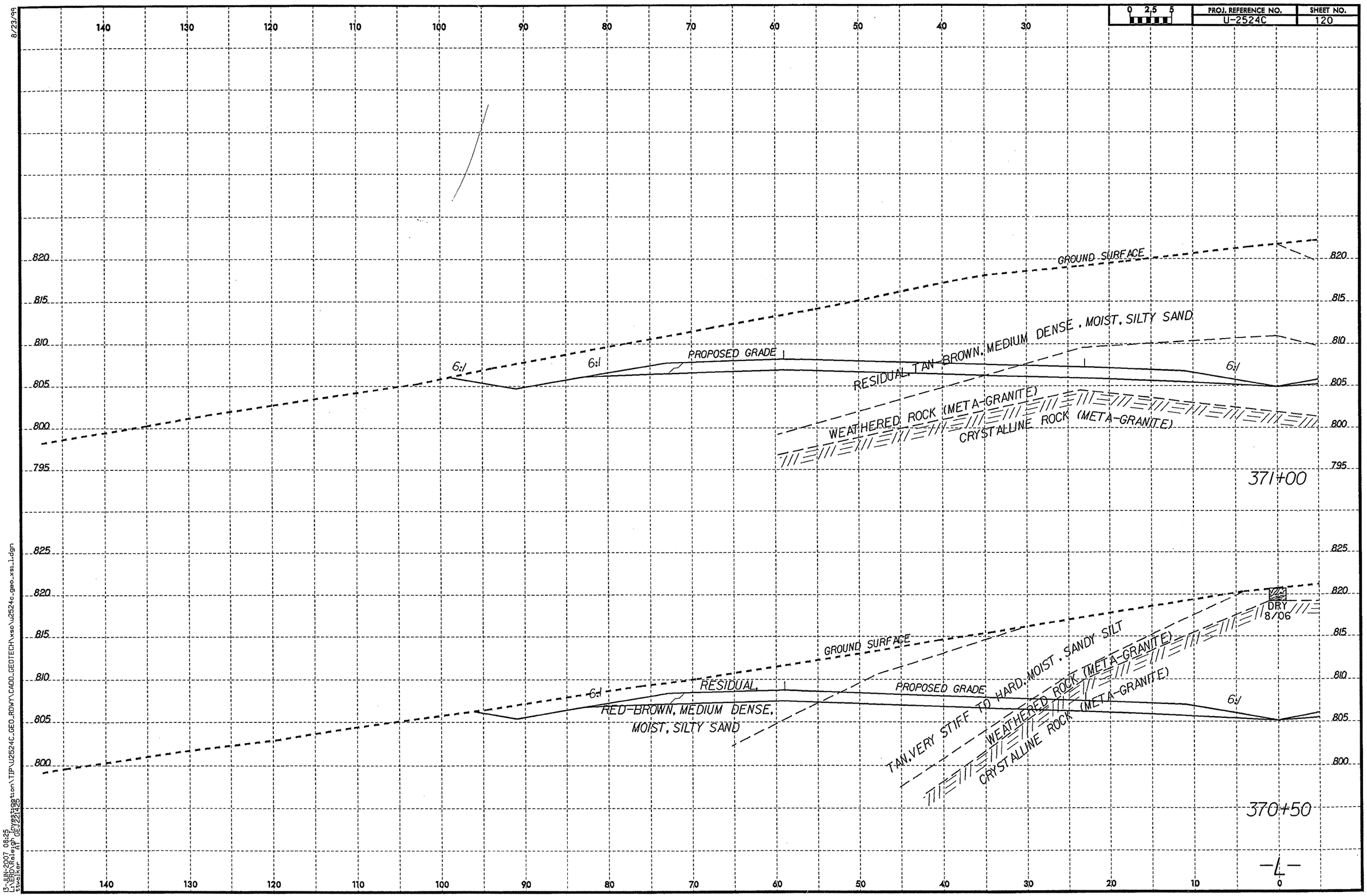

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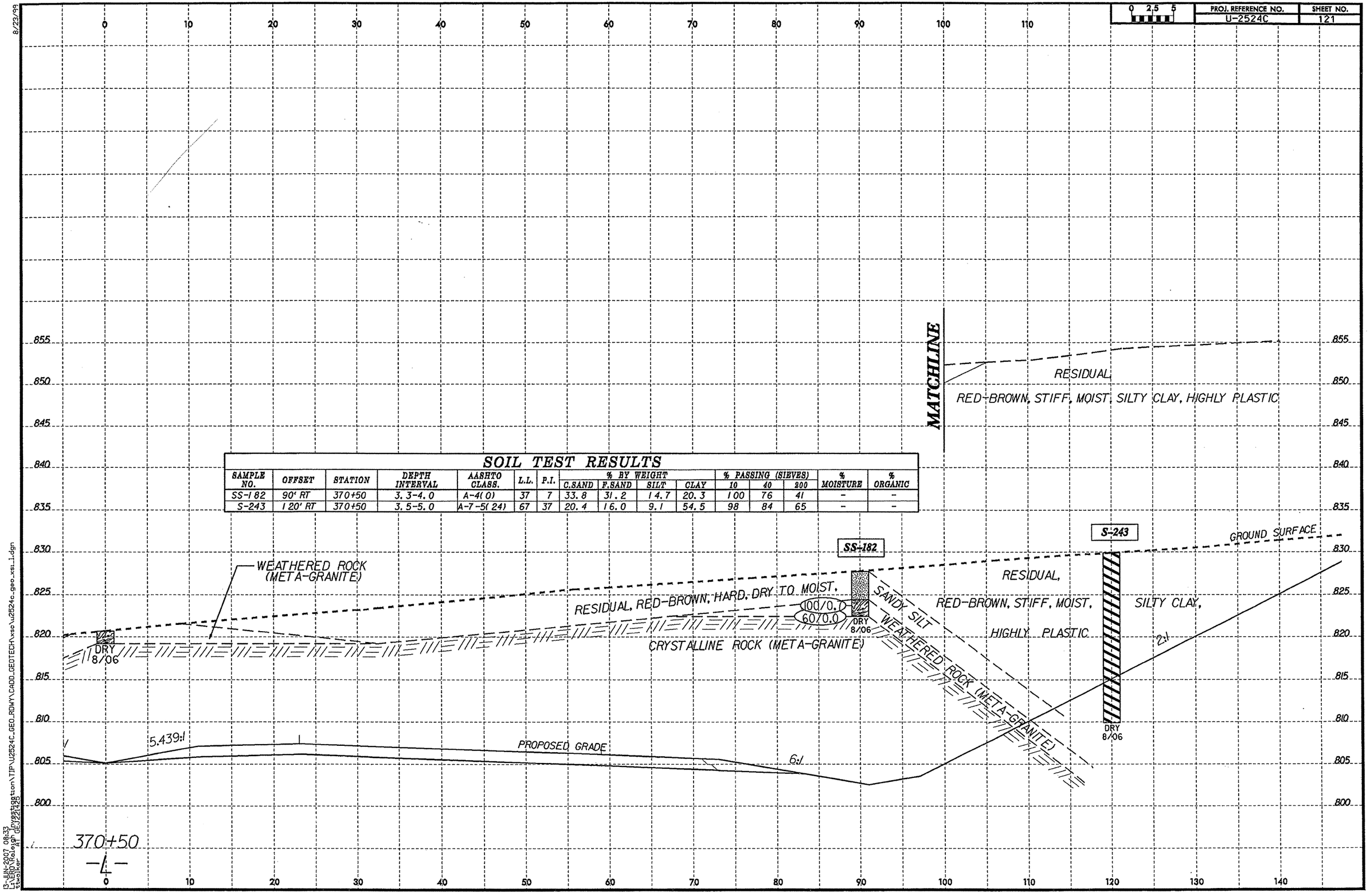

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-182	90' RT	370+50	3.3-4.0	A-4(0)	37	7	33.8	31.2	14.7	20.3	100	76	41	-	-
S-243	120' RT	370+50	3.5-5.0	A-7-5(24)	67	37	20.4	16.0	9.1	54.5	98	84	65	-	-

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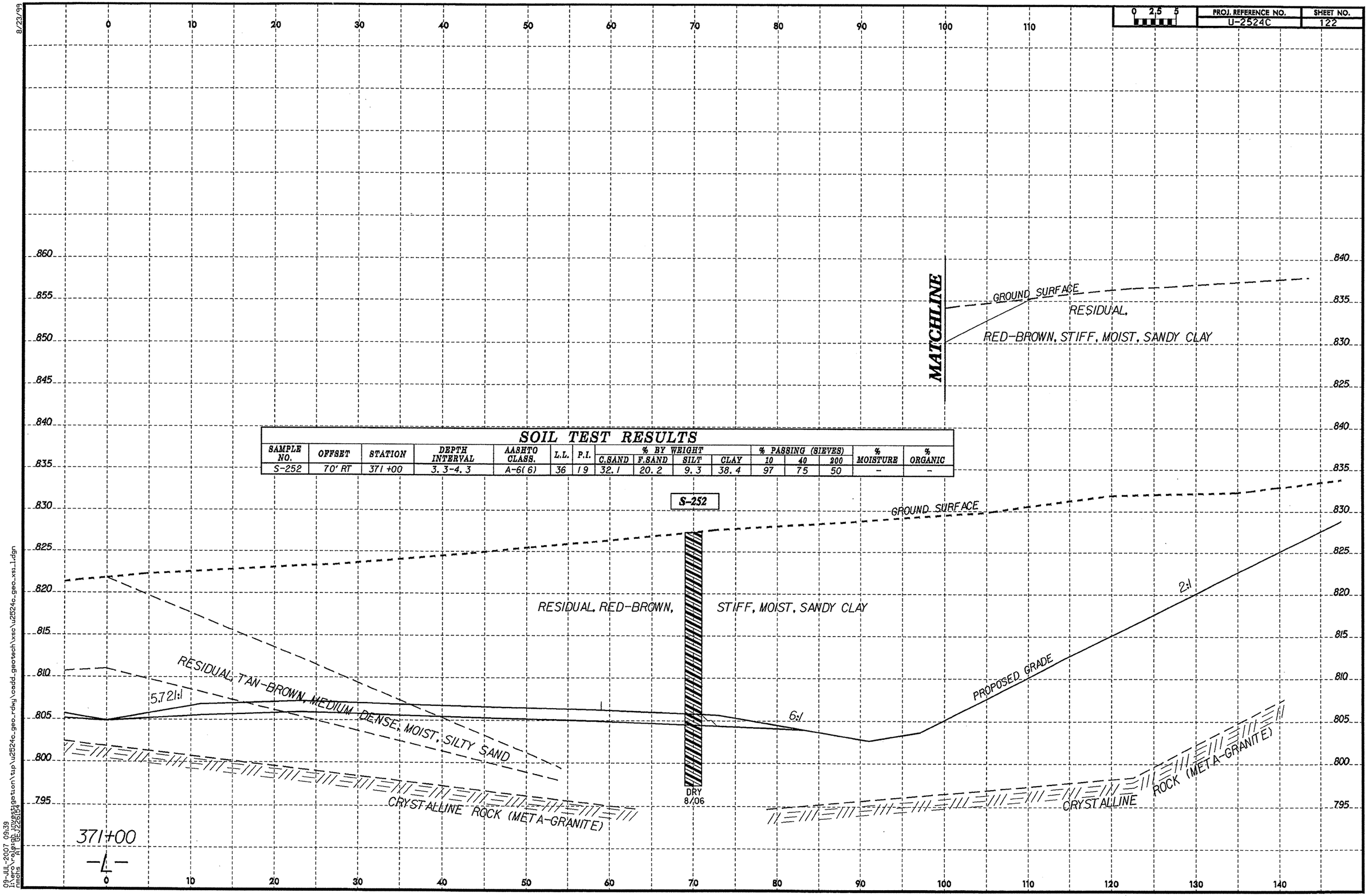
SHEET NO. 122



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
S-252	70' RT	371+00	3.3-4.3	A-6(6)	36	19	32.1	20.2	9.3	38.4	97	75	50	-	-

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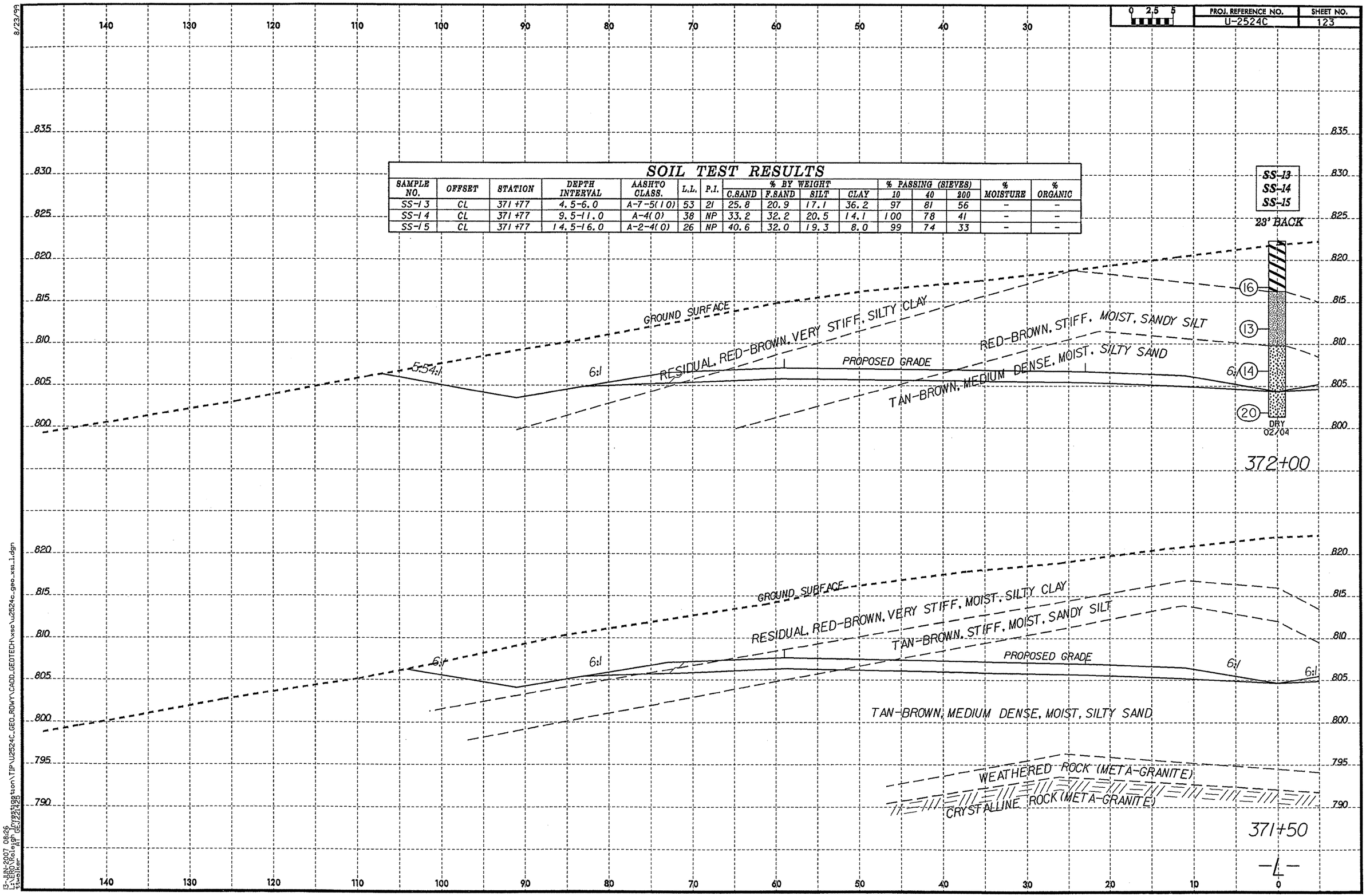
nmohs AT GEJ226154

PROJ. REFERENCE NO.	SHEET NO.
U-2524C	123

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-13	CL	371+77	4.5-6.0	A-7-5(10)	53	21	25.8	20.9	17.1	36.2	97	81	56	-	-
SS-14	CL	371+77	9.5-11.0	A-4(0)	38	NP	33.2	32.2	20.5	14.1	100	78	41	-	-
SS-15	CL	371+77	14.5-16.0	A-2-4(0)	26	NP	40.6	32.0	19.3	8.0	99	74	33	-	-



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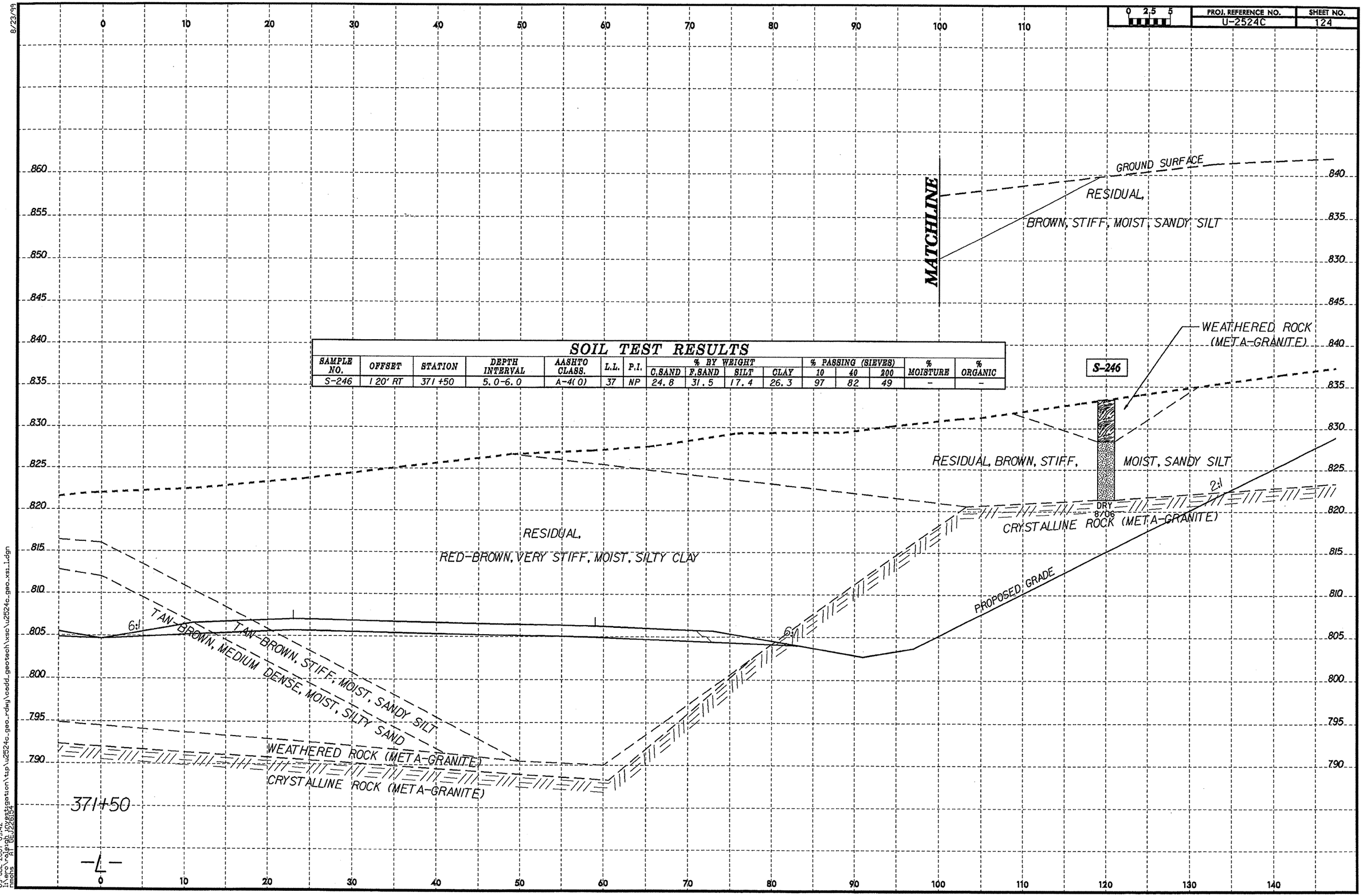

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-246	120' RT	371+50	5.0-6.0	A-4(0)	37	NP	24.8	31.5	17.4	26.3	97	82	49	-	-

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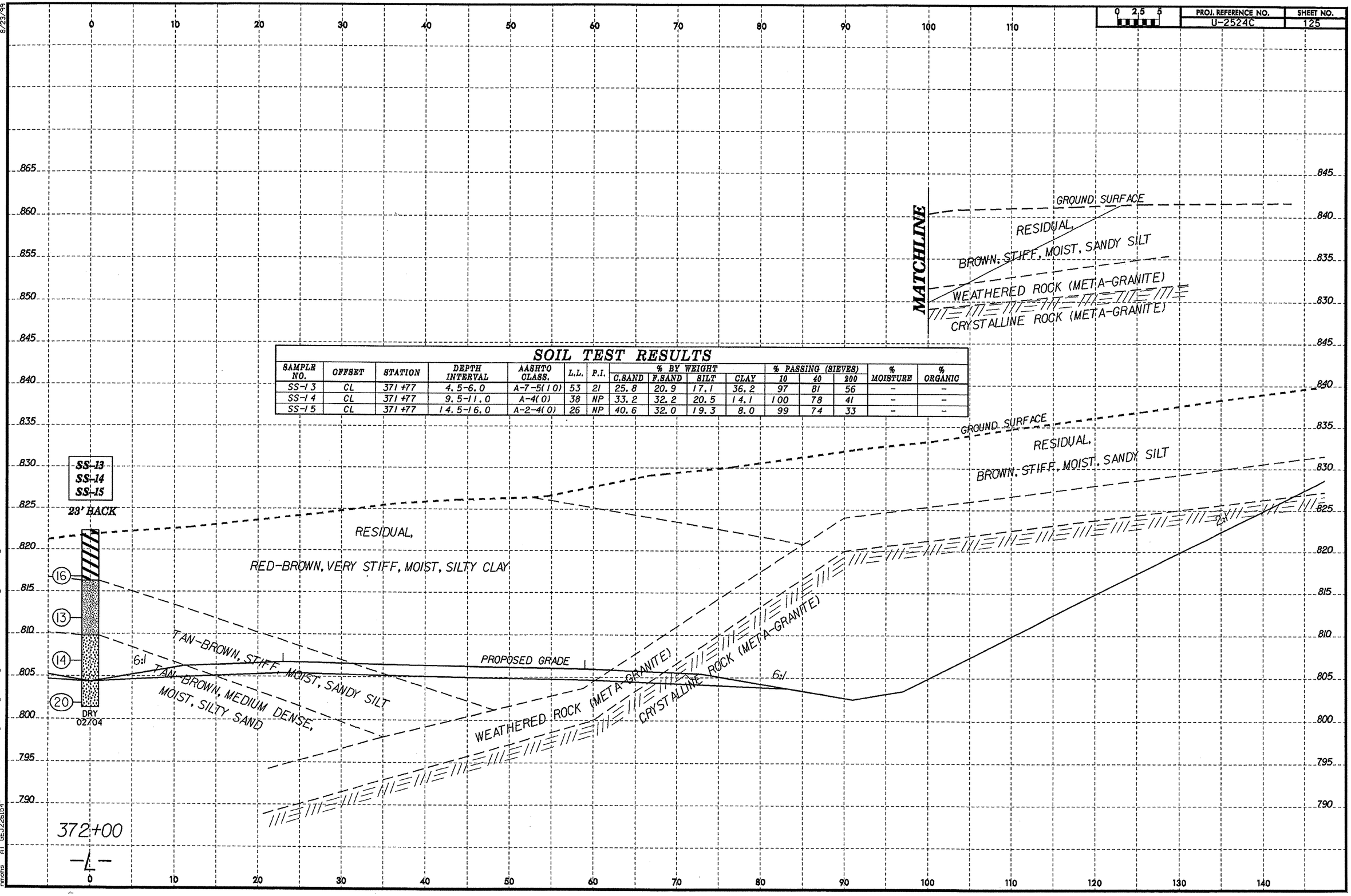

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-13	CL	371+77	4.5-6.0	A-7-5(10)	53	21	25.8	20.9	17.1	36.2	97	81	56	-	-
SS-14	CL	371+77	9.5-11.0	A-4(0)	38	NP	33.2	32.2	20.5	14.1	100	78	41	-	-
SS-15	CL	371+77	14.5-16.0	A-2-4(0)	26	NP	40.6	32.0	19.3	8.0	99	74	33	-	-

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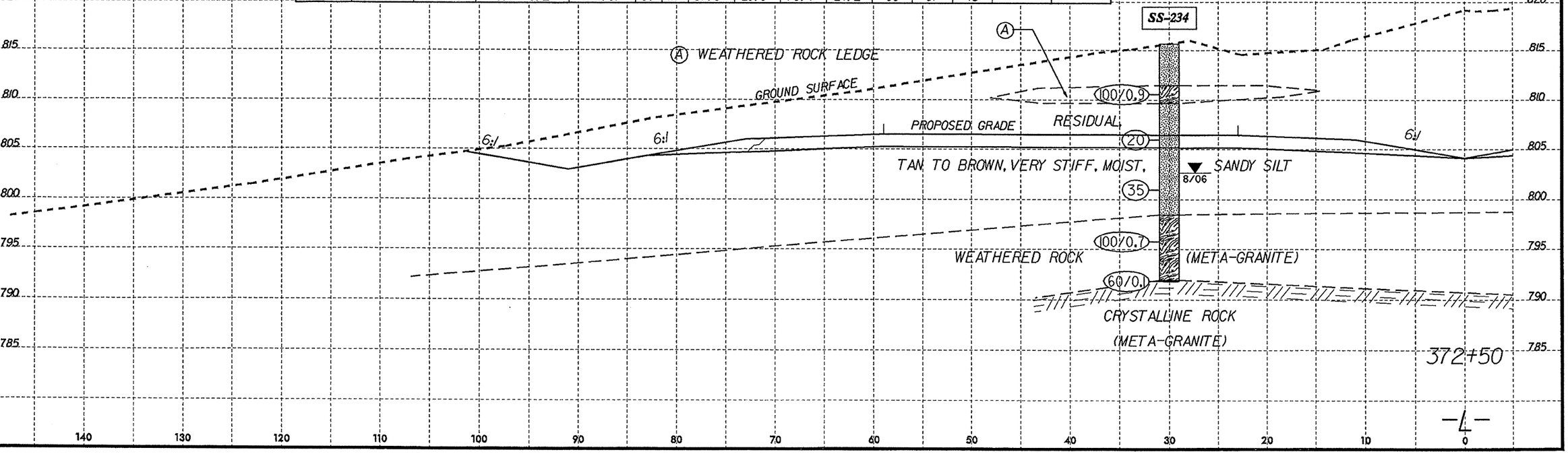
PROJ. REFERENCE NO.	SHEET NO.
U-2524C	126

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-234	30' LT	372+50	8.7-10.2	A-4(0)	38	NP	31.5	28.9	15.4	24.2	99	81	43	-	-



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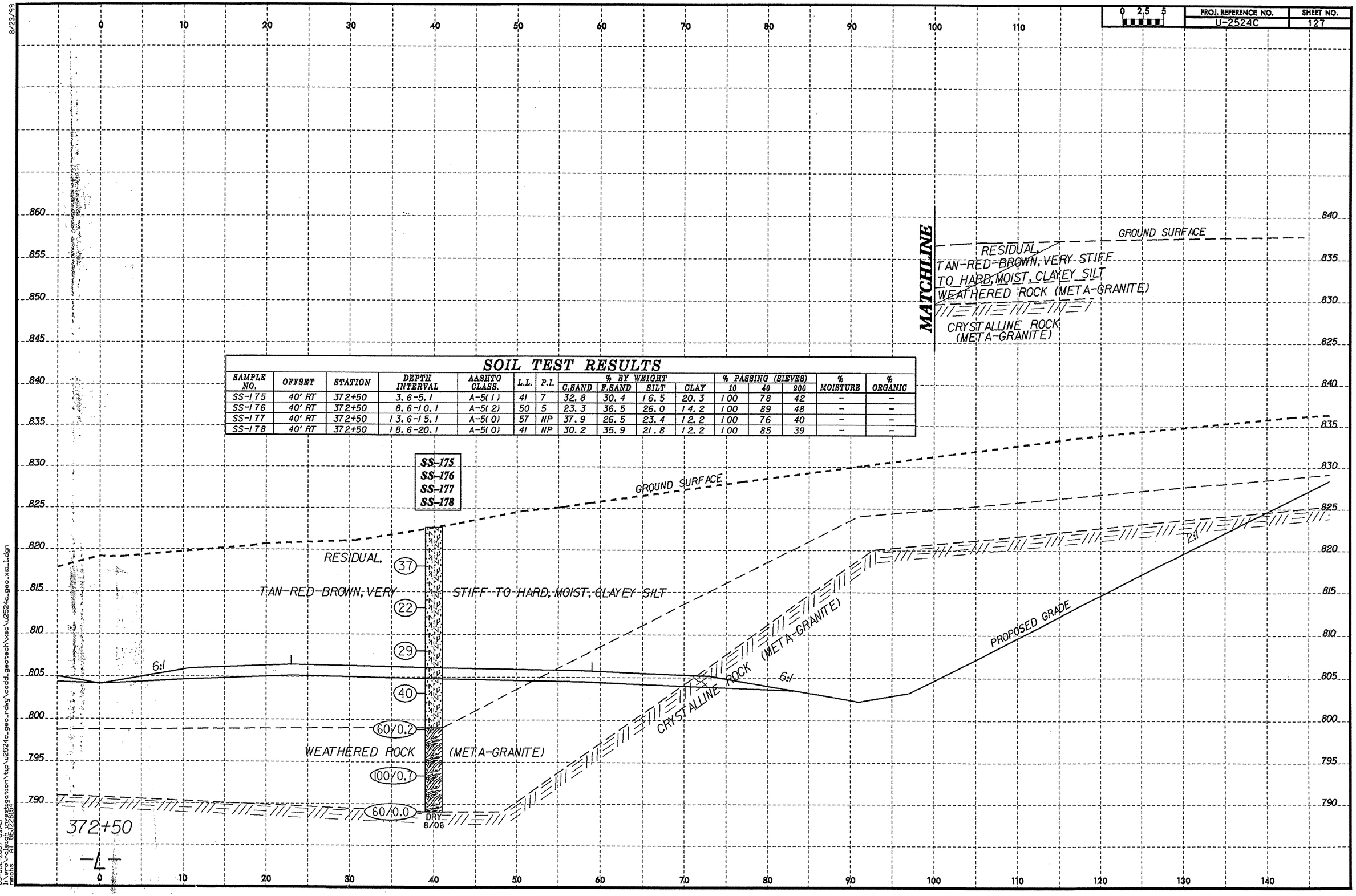

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-175	40' RT	372+50	3.6-5.1	A-5(1)	41	7	32.8	30.4	16.5	20.3	100	78	42	-	-
SS-176	40' RT	372+50	8.6-10.1	A-5(2)	50	5	23.3	36.5	26.0	14.2	100	89	48	-	-
SS-177	40' RT	372+50	13.6-15.1	A-5(0)	57	NP	37.9	26.5	23.4	12.2	100	76	40	-	-
SS-178	40' RT	372+50	18.6-20.1	A-5(0)	41	NP	30.2	35.9	21.8	12.2	100	85	39	-	-

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PROJ. REFERENCE NO.	SHEET NO.
U-2524C	128

0 2.5 5

140 130 120 110 100 90 80 70 60 50 40 30

820 815 810 805 800 795 790 785

GROUND SURFACE

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

6:1

PROPOSED GRADE

6:1

RED-BROWN, VERY STIFF TO HARD, MOIST, SANDY SILT

WEATHERED ROCK (META-GRANITE)

CRYSTALLINE ROCK (META-GRANITE)

373+50

373+00

20 10 0

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PROJ. REFERENCE NO.	SHEET NO.
U-2524C	129

0 2.5 5

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-256	100' RT	373+00	3.5-4.5	A-7-5(22)	66	34	21.6	16.4	9.5	52.5	100	86	65	-	-

MATCHLINE

GROUND SURFACE

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

WEATHERED ROCK (META-GRANITE)

S-256

GROUND SURFACE

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

WEATHERED ROCK (META-GRANITE)

CRYSTALLINE ROCK (META-GRANITE)

PROPOSED GRADE

6:1

6:1

2:1

373+00

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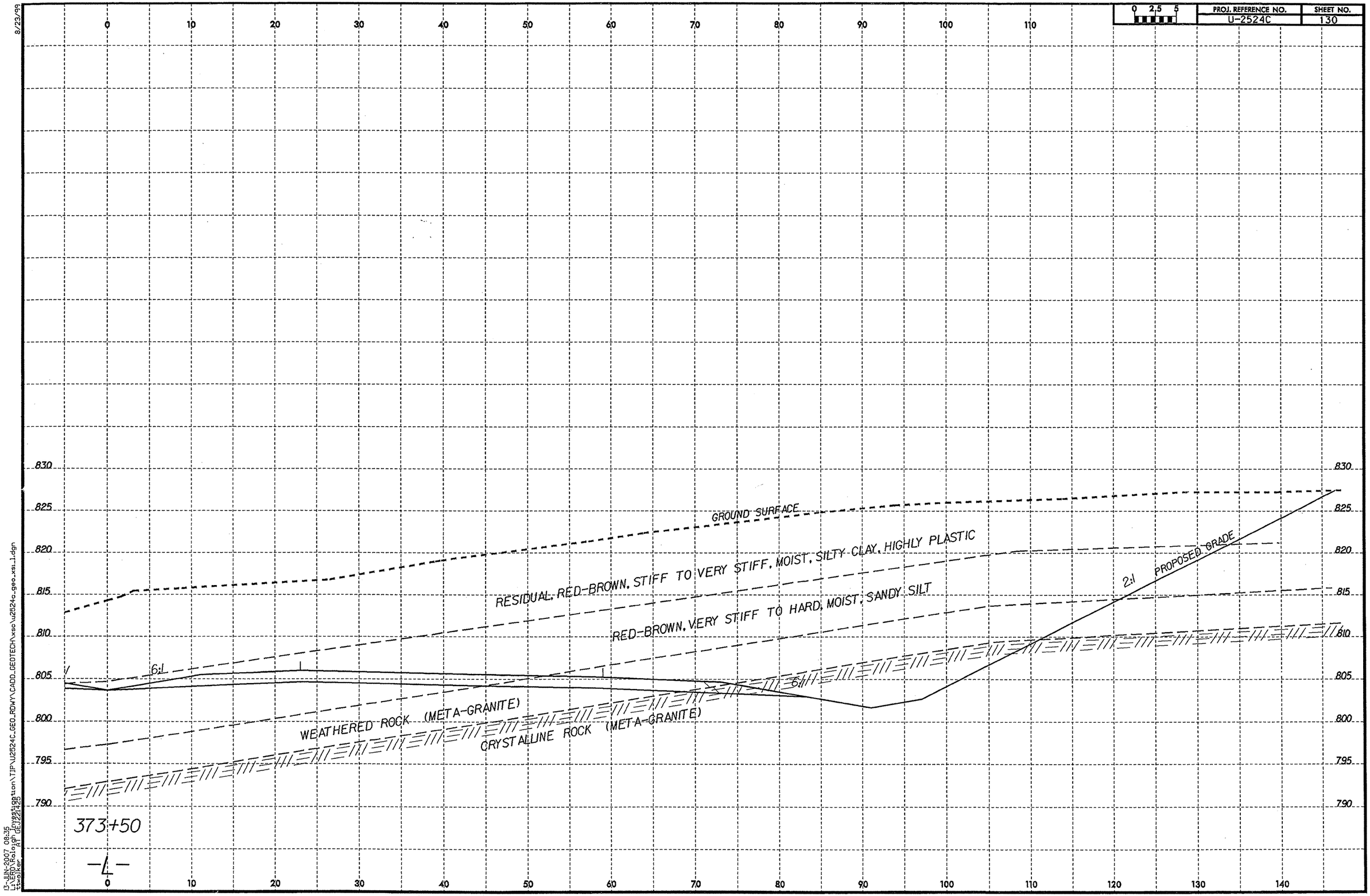

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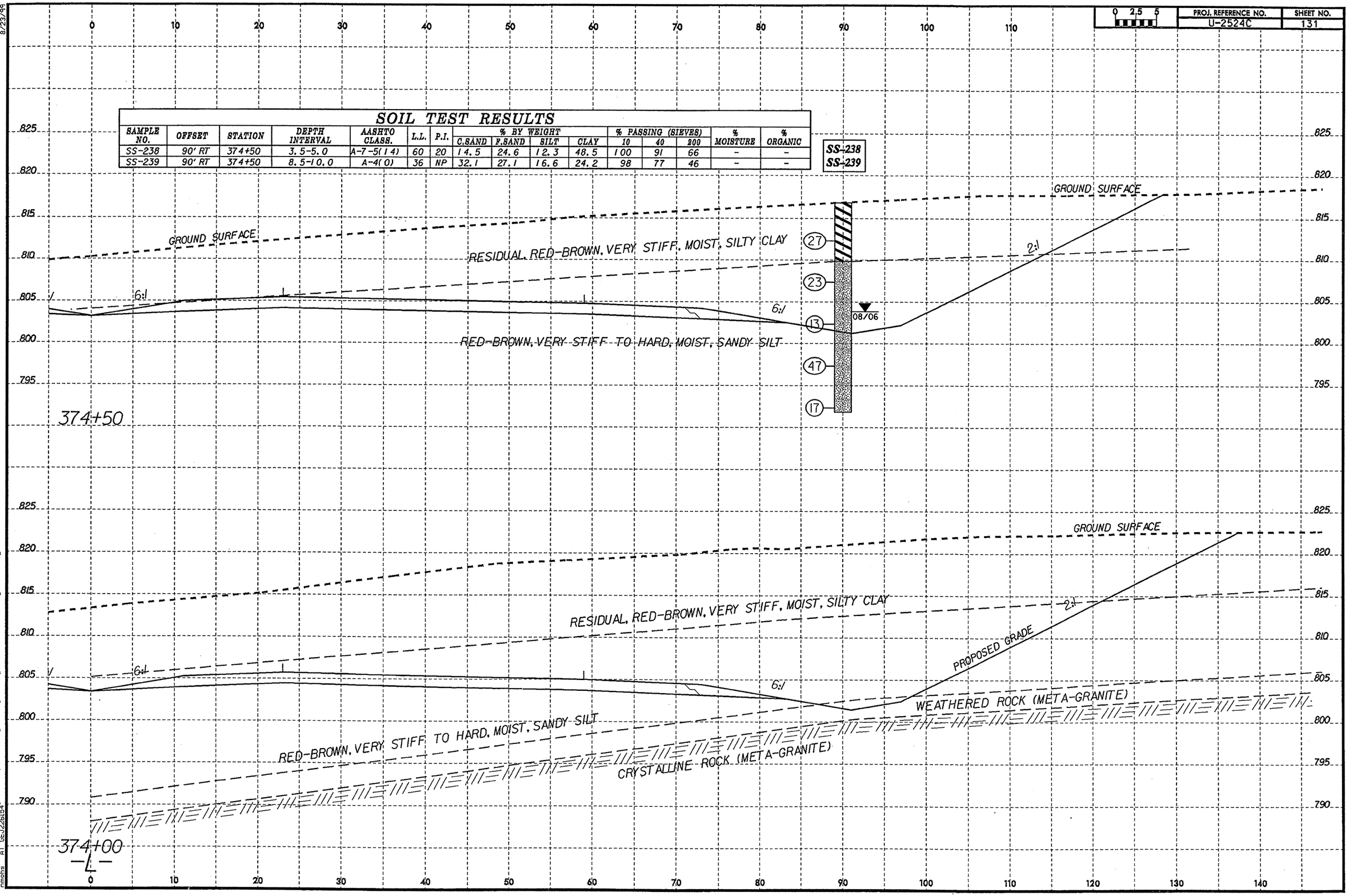
ttwalker AT GEJ221425

PROJ. REFERENCE NO.	SHEET NO.
U-2524C	131

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-238	90' RT	374+50	3.5-5.0	A-7-5(14)	60	20	14.5	24.6	12.3	48.5	100	91	66	-	-
SS-239	90' RT	374+50	8.5-10.0	A-4(0)	36	NP	32.1	27.1	16.6	24.2	98	77	46	-	-



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nmohs AT GEU226154

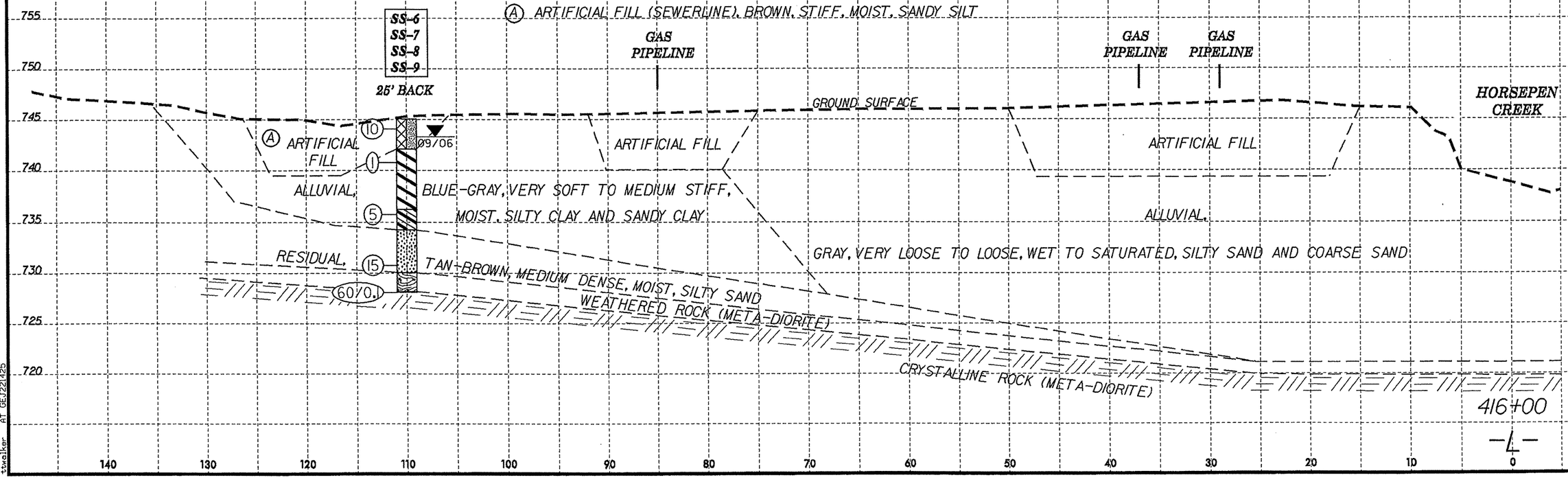
8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	U-2524C	132

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-6	110' LT	415+75	0.0-1.5	A-4(1)	30	10	36.8	23.2	15.7	24.4	98	73	43	-	-
SS-7	110' LT	415+75	3.3-4.8	A-7-6(17)	44	17	1.4	20.7	41.3	36.6	100	99	88	-	-
SS-8	110' LT	415+75	8.3-9.8	A-6(10)	40	18	3.3	42.5	29.9	24.4	100	99	65	-	-
SS-9	110' LT	415+75	13.3-14.8	A-2-4(0)	28	NP	42.7	36.4	12.8	8.1	98	72	26	-	-

NOTE: THE LOCATIONS OF GAS PIPELINES AND BOUNDARIES OF ASSOCIATED ARTIFICIAL FILL AREAS ARE APPROXIMATED



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tswalker

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
U-2524C	133

0 2.5 5

NOTE: THE LOCATIONS OF GAS PIPELINES AND BOUNDARIES OF ASSOCIATED ARTIFICIAL FILL AREAS ARE APPROXIMATED

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-1	57' RT	416+08	0.0-1.5	A-6(6)	38	13	18.5	30.1	23.0	28.5	100	90	58	-	-
SS-2	57' RT	416+08	8.5-10.0	A-2-4(0)	23	NP	24.0	56.9	6.9	12.2	100	98	25	-	-
SS-3	57' RT	416+08	13.5-15.0	A-2-4(0)	31	NP	60.0	26.4	3.5	10.2	95	62	15	-	-
SS-4	57' RT	416+08	18.5-20.0	A-1-b(0)	23	NP	63.2	25.6	3.0	8.1	88	49	13	-	-
SS-5	57' RT	416+08	23.5-25.0	A-1-b(0)	22	NP	83.2	11.2	0.5	5.1	90	26	6	-	-

SS-1
SS-2
SS-3
SS-4
SS-5

8' AHEAD

GAS PIPELINE

HORSEPEN CREEK

ARTIFICIAL FILL

ARTIFICIAL FILL, BROWN, VERY SOFT TO SOFT, MOIST, SANDY CLAY

09/06

ALLUVIAL, GRAY, VERY LOOSE TO LOOSE, WET TO SATURATED, SILTY SAND AND COARSE SAND

WEATHERED ROCK (META-DIORITE)

60/0.1

CRYSTALLINE ROCK (META-DIORITE)

416+00

-L-

770 765 760 755 750 745 740 735 730 725 720

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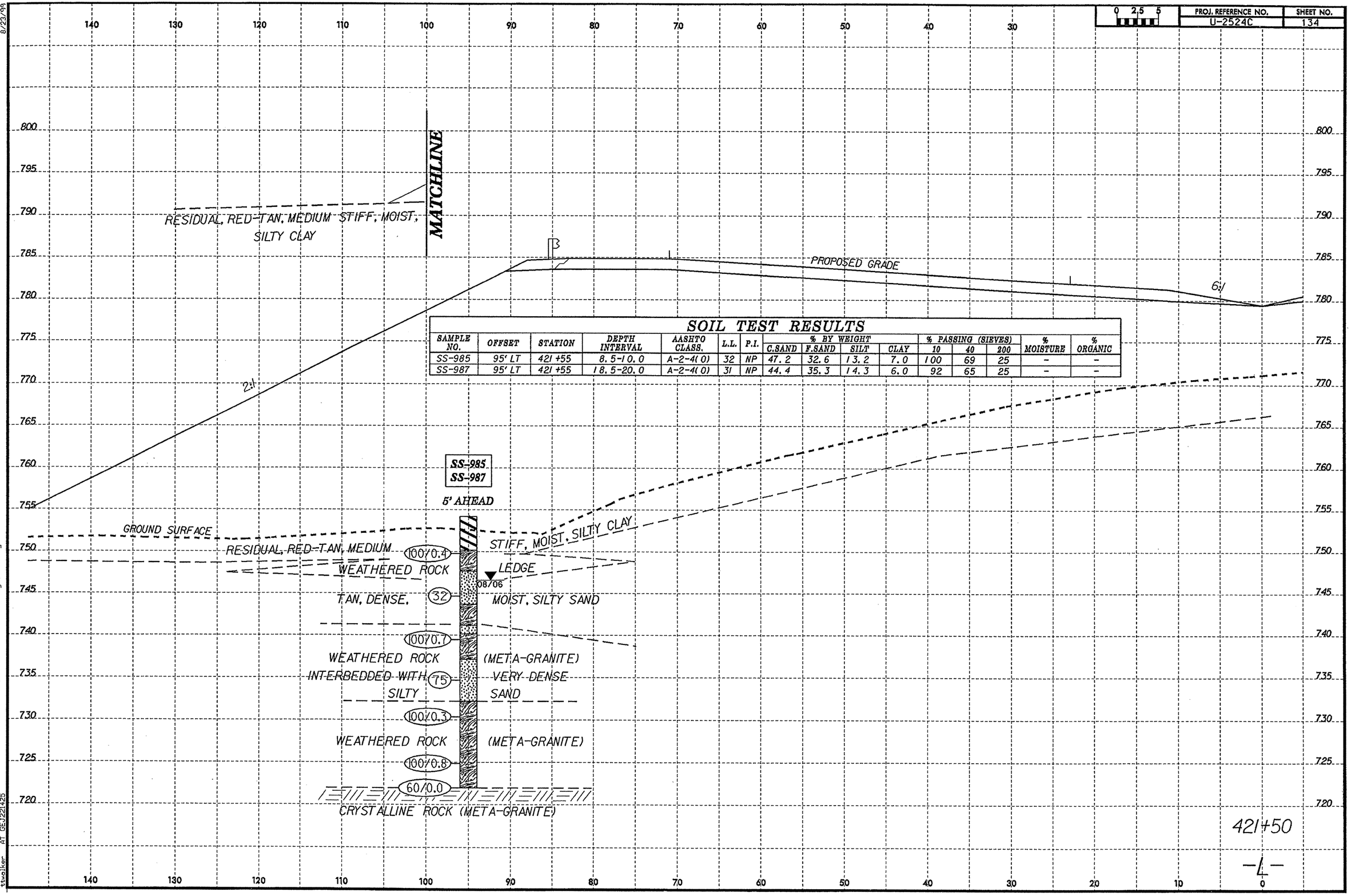
TTWALKER
AT GEOPAK



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-985	95' LT	421+55	8.5-10.0	A-2-4(0)	32	NP	47.2	32.6	13.2	7.0	100	69	25	-	-
SS-987	95' LT	421+55	18.5-20.0	A-2-4(0)	31	NP	44.4	35.3	14.3	6.0	92	65	25	-	-

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ttwalker AT GEJ221425

8/23/99

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	U-2524C	135

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-977	95' RT	424+00	5.0-6.0	A-2-4(0)	33	NP	42.2	32.7	13.1	12.0	95	69	29	-	-

RPDY4
0+32.31

SS-977

GROUND SURFACE

4.308:1

RESIDUAL, TAN-RED, STIFF, MOIST, SILTY

CLAY, HIGHLY PLASTIC

2:1

SILTY SAND

TAN, MEDIUM DENSE TO VERY DENSE, MOIST, &

DRY
8/06

424+00

800 795 790 785 780 775 770 765 760

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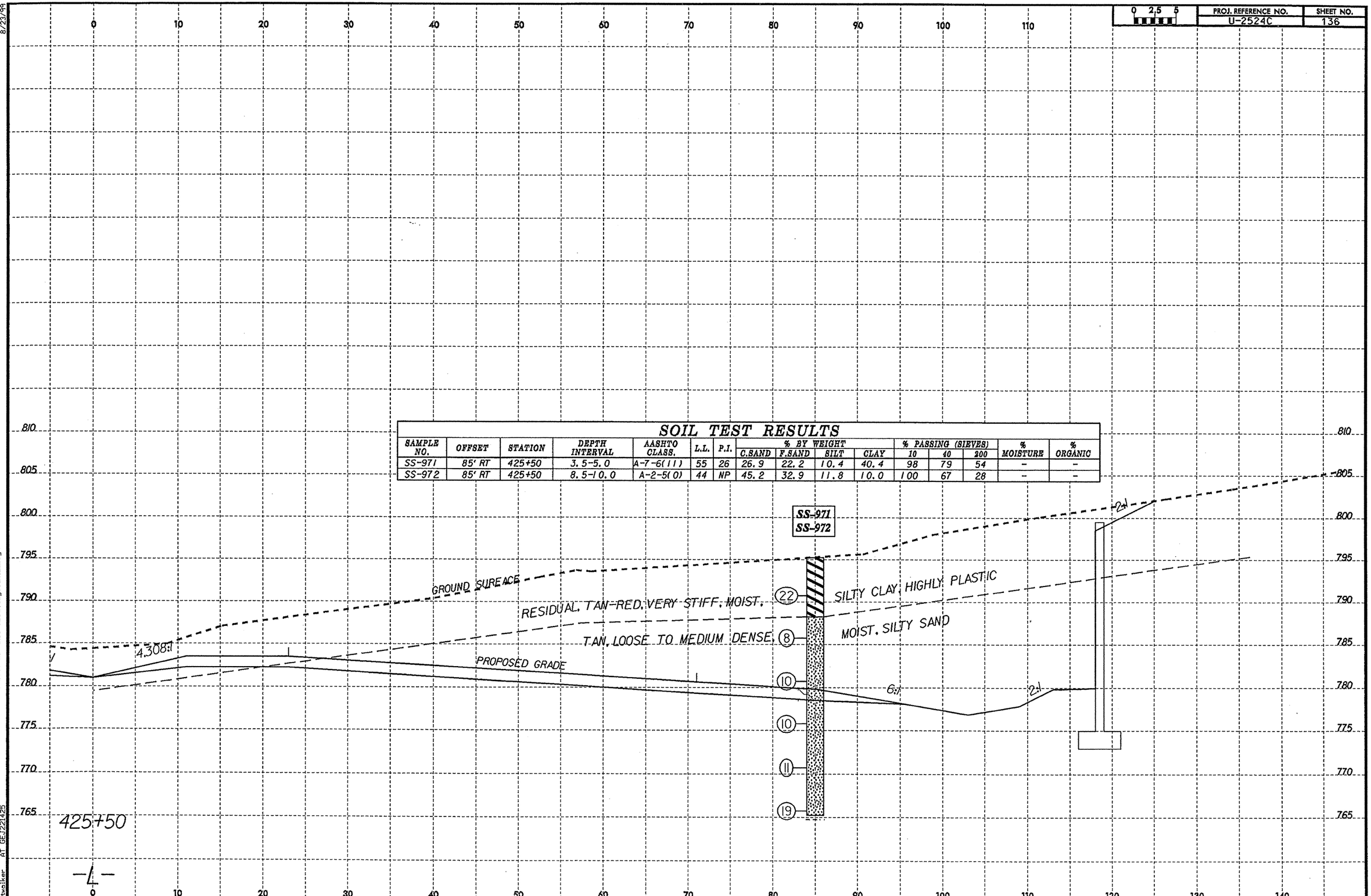
AT GEJ221425

PROJ. REFERENCE NO.	SHEET NO.
U-2524C	136



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-971	85' RT	425+50	3.5-5.0	A-7-6(11)	55	26	26.9	22.2	10.4	40.4	98	79	54	-	-
SS-972	85' RT	425+50	8.5-10.0	A-2-5(0)	44	NP	45.2	32.9	11.8	10.0	100	67	28	-	-

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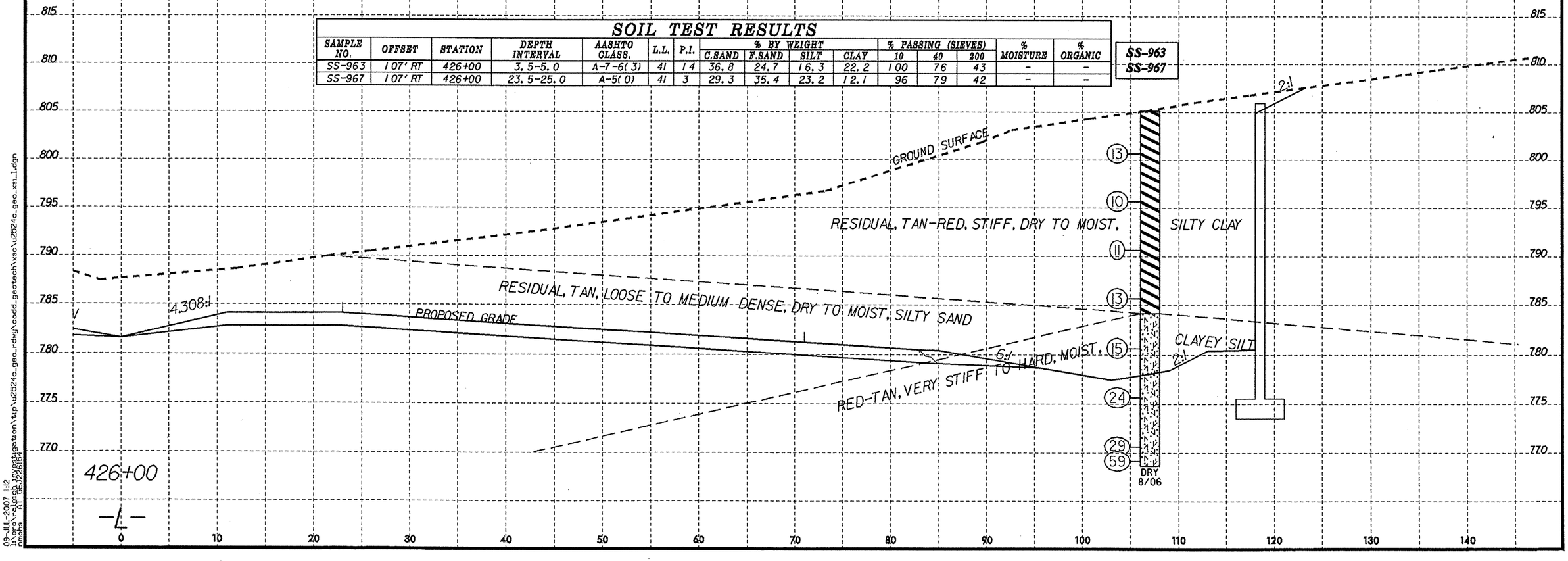
ttwalker AT GEJ221425

PROJ. REFERENCE NO. U-2524C
SHEET NO. 137

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-963	107' RT	426+00	3.5-5.0	A-7-6(3)	41	14	36.8	24.7	16.3	22.2	100	76	43	-	-
SS-967	107' RT	426+00	23.5-25.0	A-5(0)	41	3	29.3	35.4	23.2	12.1	96	79	42	-	-



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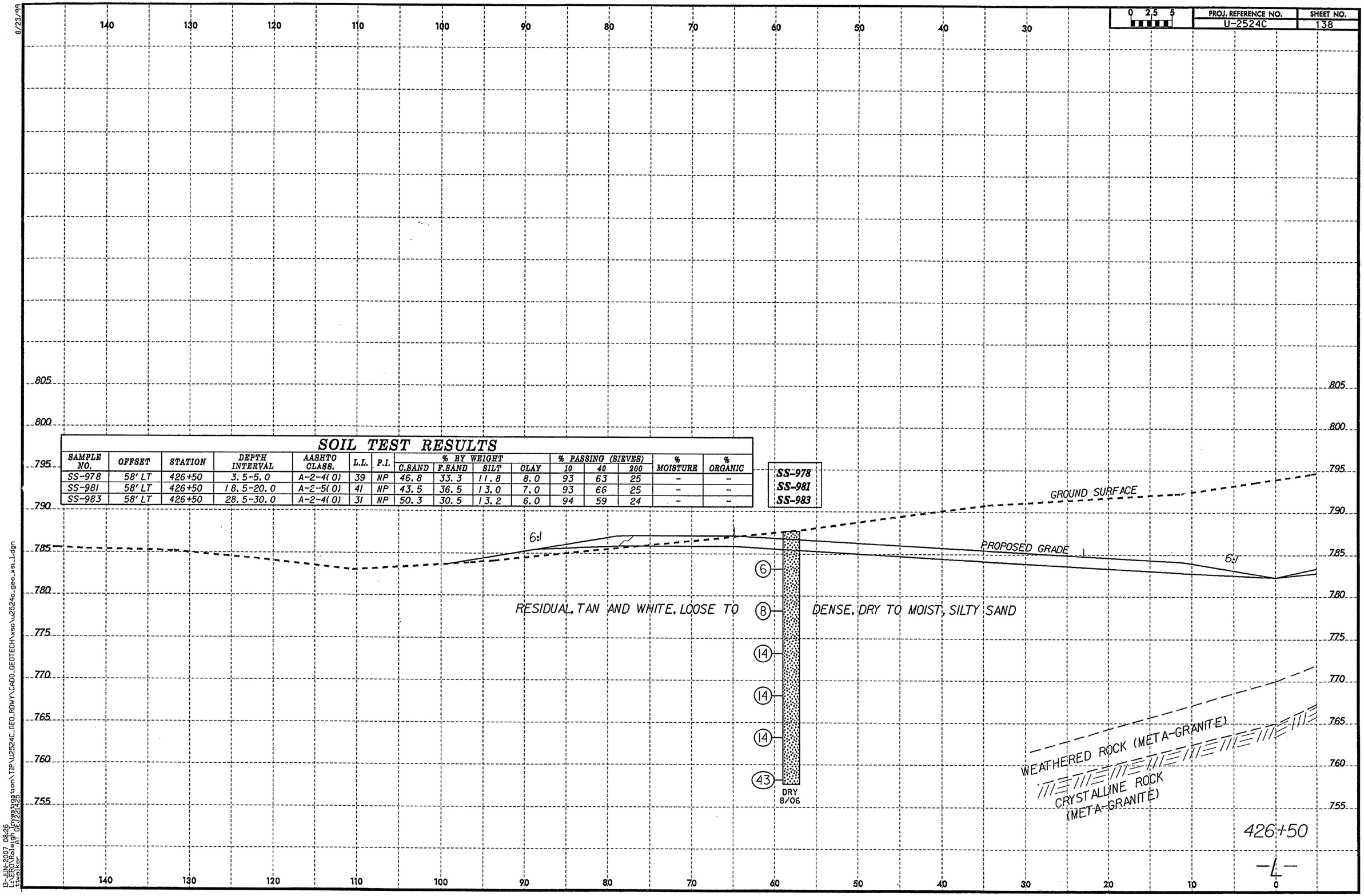
nmohs AT GEJ226154

PROJ. REFERENCE NO.	SHEET NO.
U-2524C	138



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-978	58' LT	426+50	3.5-5.0	A-2-4(0)	39	NP	46.8	33.3	11.8	8.0	93	63	25	-	-
SS-981	58' LT	426+50	18.5-20.0	A-2-5(0)	41	NP	43.5	36.5	13.0	7.0	93	66	25	-	-
SS-983	58' LT	426+50	28.5-30.0	A-2-4(0)	31	NP	50.3	30.5	13.2	6.0	94	59	24	-	-

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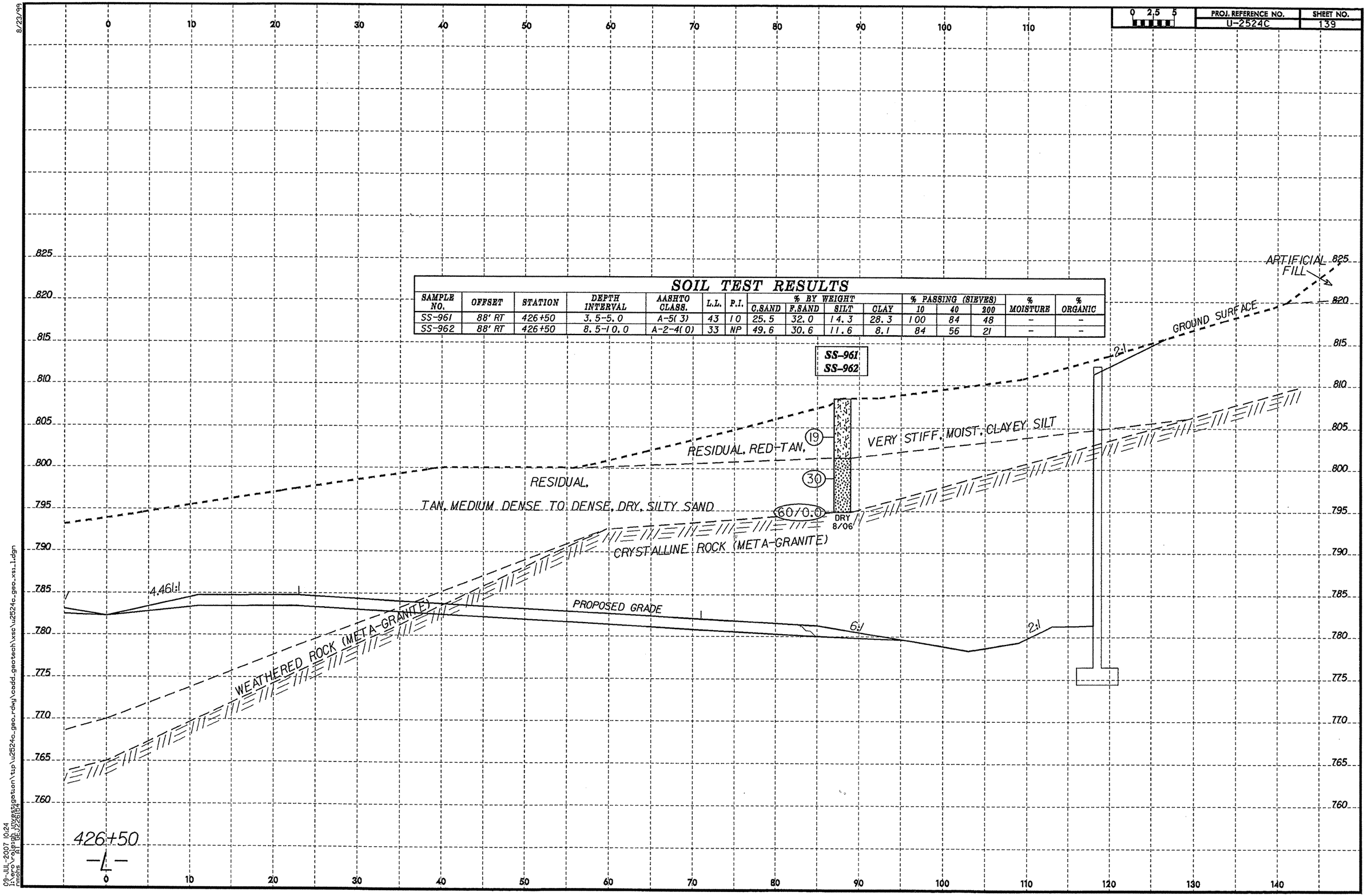
U-2524C	139



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-961	88' RT	426+50	3.5-5.0	A-5(3)	43	10	25.5	32.0	14.3	28.3	100	84	48	-	-
SS-962	88' RT	426+50	8.5-10.0	A-2-4(0)	33	NP	49.6	30.6	11.6	8.1	84	56	21	-	-

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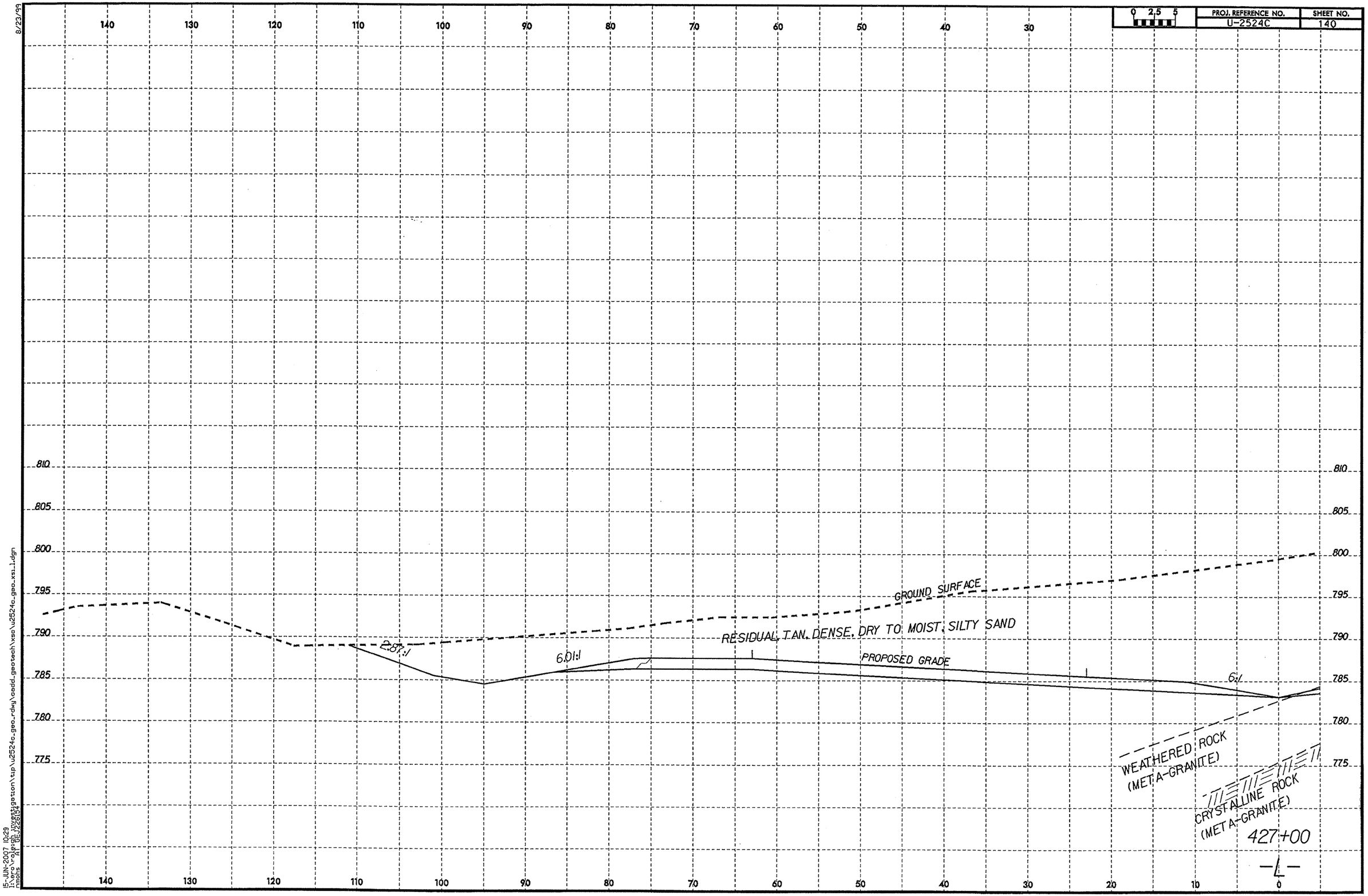

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8/23/99

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	U-2524C	141

ARTIFICIAL FILL, TAN-RED, VERY STIFF, MOIST, SILTY CLAY

8' AHEAD

GROUND SURFACE

RESIDUAL, TAN, DENSE, DRY TO MOIST, SILTY SAND

WEATHERED ROCK (META-GRANITE)

CRYSTALLINE ROCK (META-GRANITE)

60/0.1

60/0.0

DRY
8/06

4.749:1

PROPOSED GRADE

6:1

2:1

427+00

-L-

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AT GEJ22425

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0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	U-2524C	142

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

810
805
800
795
790
785
780
775
770

GROUND SURFACE

RESIDUAL, RED-TAN, DENSE TO VERY DENSE, DRY TO MOIST, SILTY SAND

2:1

6.01:1

PROPOSED GRADE

6:1

WEATHERED ROCK (META-GRANITE)

CRYSTALLINE ROCK (META-GRANITE)

427+50

—L—

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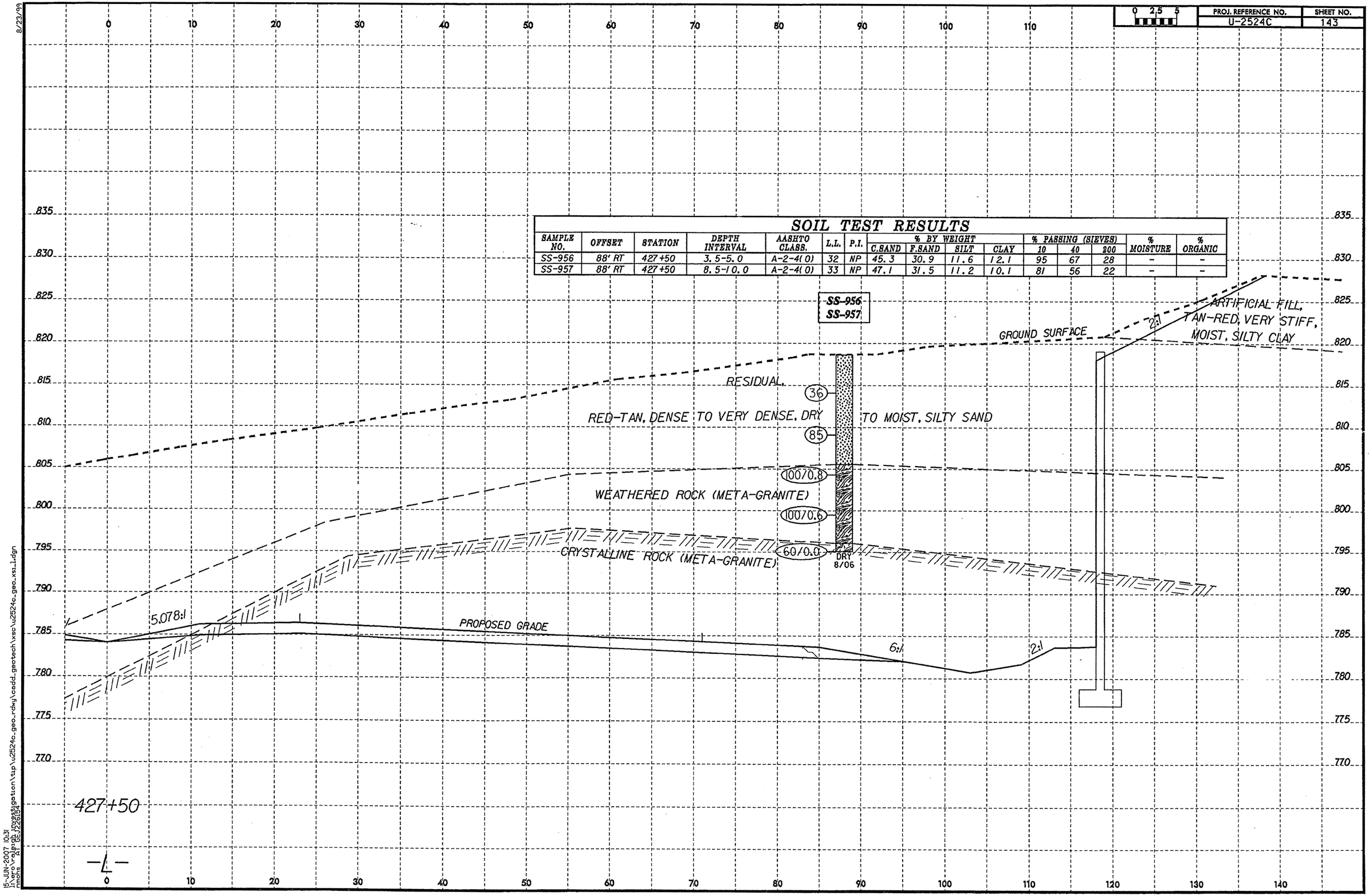
U-2524C	143



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-956	88' RT	427+50	3.5-5.0	A-2-4(0)	32	NP	45.3	30.9	11.6	12.1	95	67	28	-	-
SS-957	88' RT	427+50	8.5-10.0	A-2-4(0)	33	NP	47.1	31.5	11.2	10.1	81	56	22	-	-

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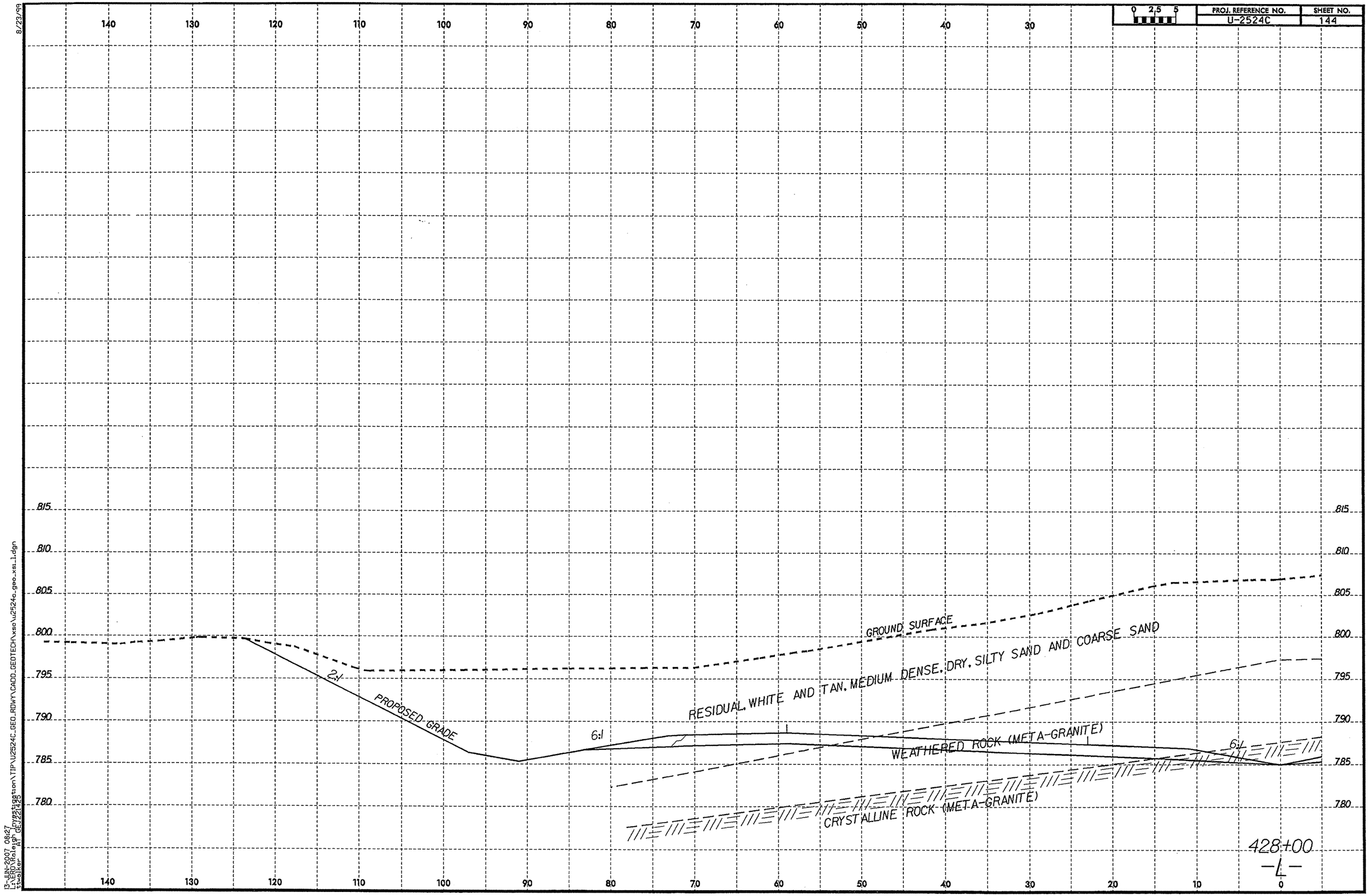

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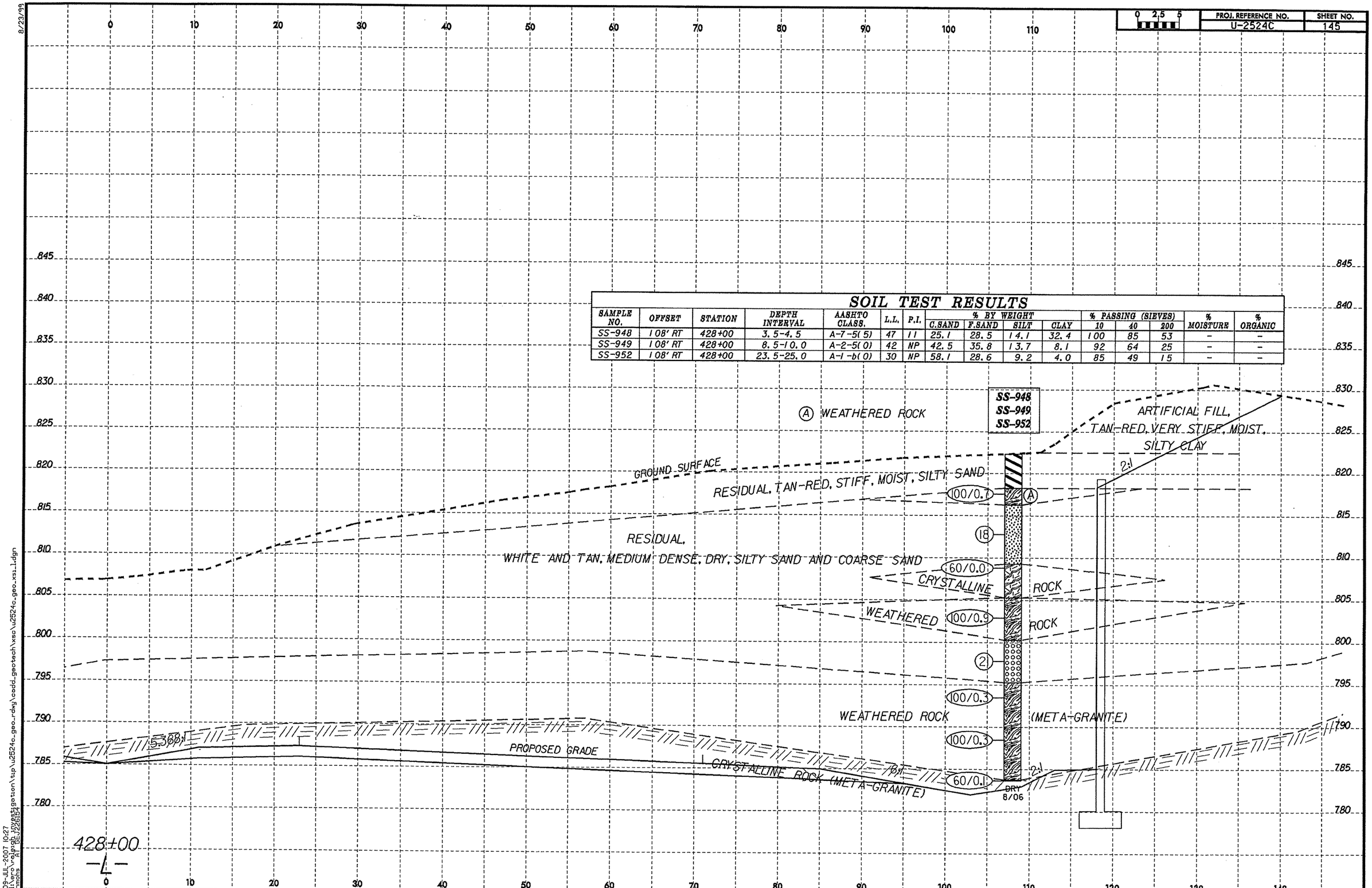
PROJ. REFERENCE NO. U-2524C
SHEET NO. 145



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-948	108' RT	428+00	3.5-4.5	A-7-5(5)	47	11	25.1	28.5	14.1	32.4	100	85	53	-	-
SS-949	108' RT	428+00	8.5-10.0	A-2-5(0)	42	NP	42.5	35.8	13.7	8.1	92	64	25	-	-
SS-952	108' RT	428+00	23.5-25.0	A-1-b(0)	30	NP	58.1	28.6	9.2	4.0	85	49	15	-	-

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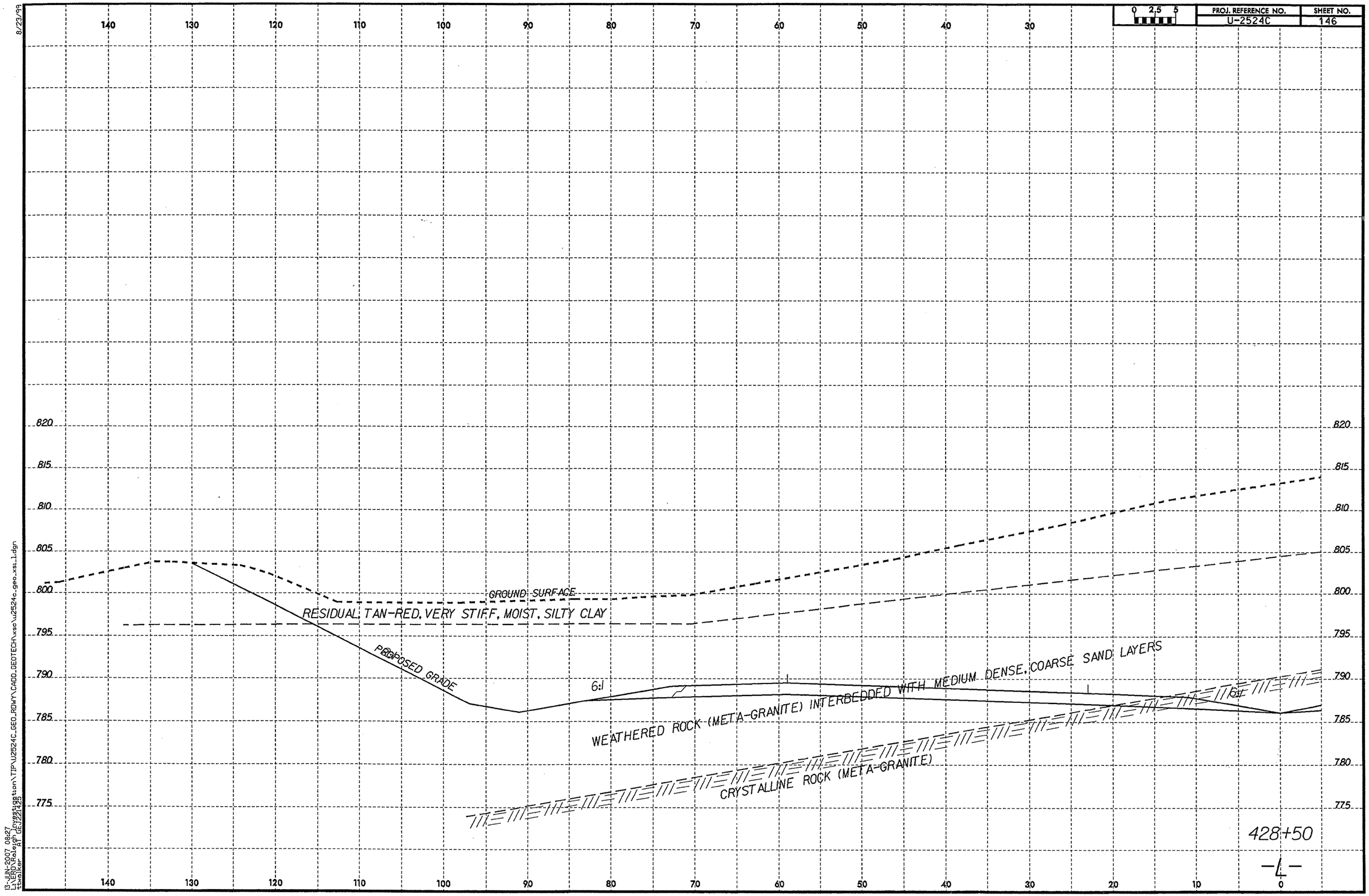

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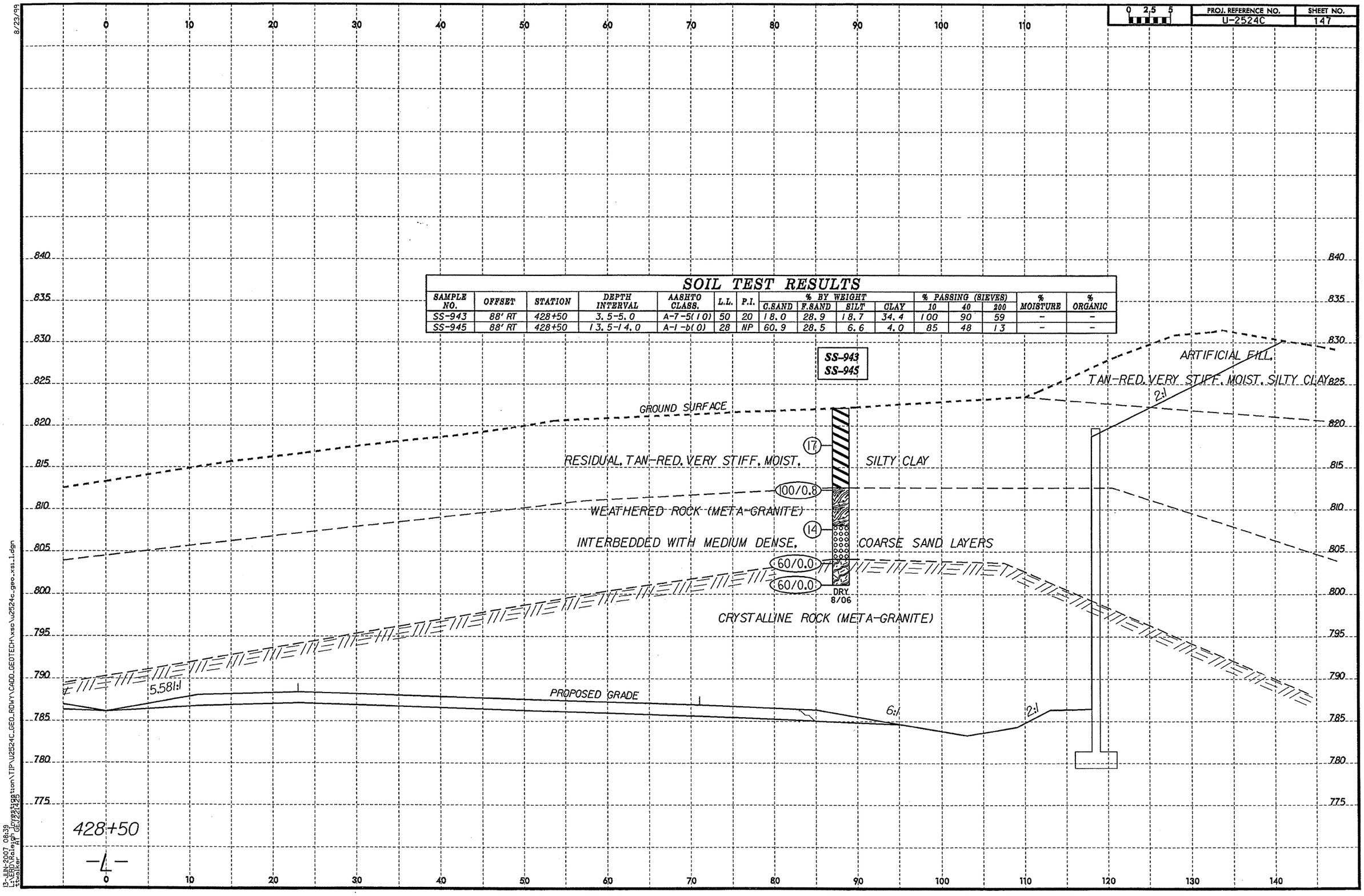
PROJ. REFERENCE NO.	SHEET NO.
U-2524C	147



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-943	88' RT	428+50	3.5-5.0	A-7-5(10)	50	20	18.0	28.9	18.7	34.4	100	90	59	-	-
SS-945	88' RT	428+50	13.5-14.0	A-1-b(0)	28	NP	60.9	28.5	6.6	4.0	85	48	13	-	-

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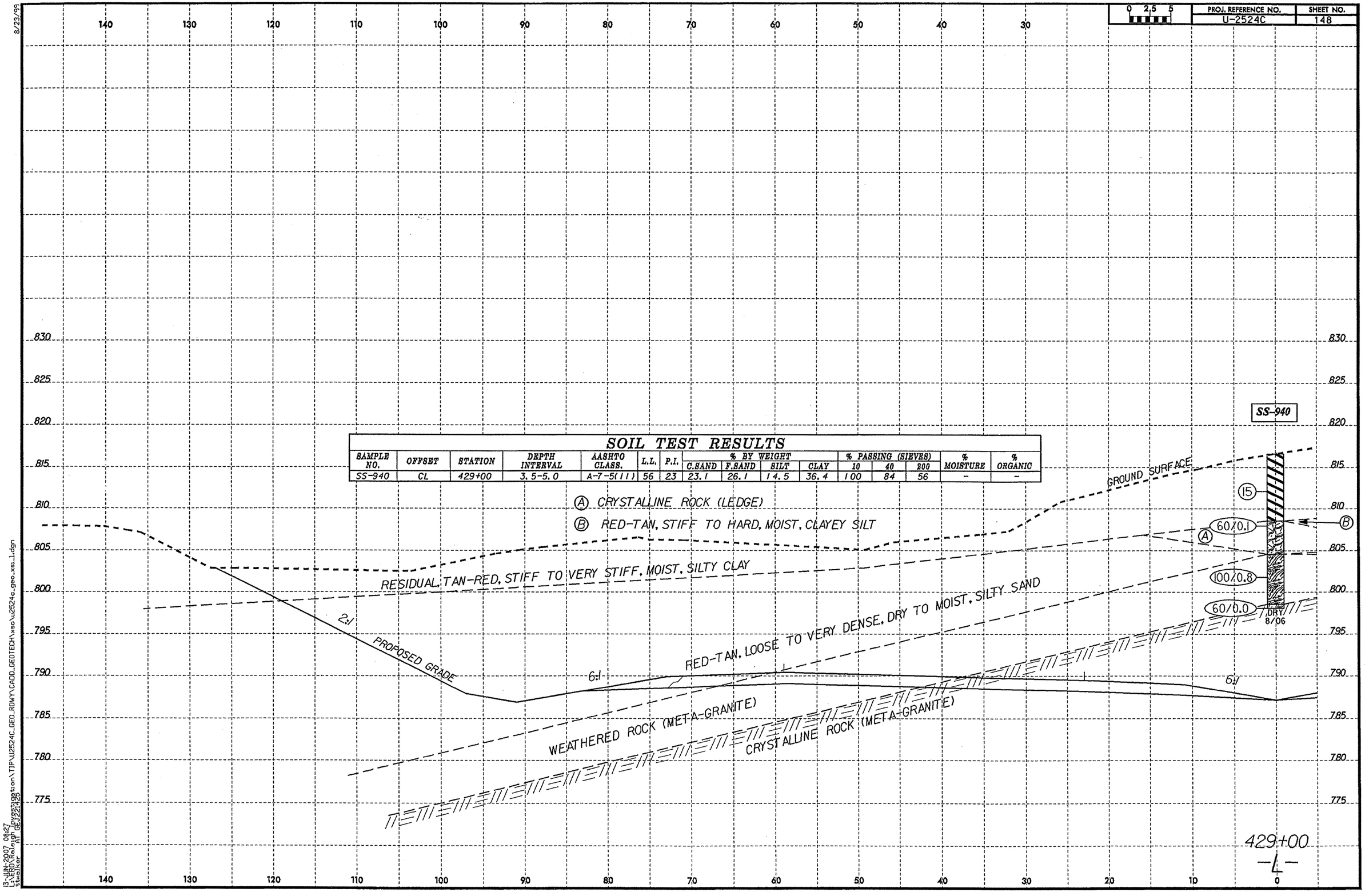

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-940	CL	429+00	3.5-5.0	A-7-5(11)	56	23	23.1	26.1	14.5	36.4	100	84	56	-	-

8/23/99

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ttwalker AT GEJ221425

8/23/99

0 2,5 5	PROJ. REFERENCE NO.	SHEET NO.
	U-2524C	149

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-940	CL	429+00	3.5-5.0	A-7-5(11)	56	23	23.1	26.1	14.5	36.4	100	84	56	-	-
SS-918	133' RT	429+00	3.5-5.0	A-7-5(12)	57	20	15.2	27.3	19.1	38.4	97	89	61	-	-
SS-919	133' RT	429+00	8.5-10.0	A-7-5(15)	59	28	21.4	23.5	14.7	40.4	100	87	60	-	-
SS-920	133' RT	429+00	13.5-15.0	A-5(11)	48	6	24.7	37.2	17.9	20.2	100	87	45	-	-
SS-923	133' RT	429+00	28.5-30.0	A-4(0)	38	NP	32.4	38.6	18.9	10.1	99	76	37	-	-

(A) CRYSTALLINE ROCK (LEDGE)

(B) ARTIFICIAL FILL, TAN-RED, VERY STIFF, MOIST, SILTY CLAY, HIGHLY PLASTIC

SS-940

SS-918
SS-919
SS-920
SS-923

GROUND SURFACE

ARTIFICIAL FILL, TAN-RED, MEDIUM STIFF, MOIST, SILTY CLAY

RESIDUAL, TAN-RED, STIFF TO VERY STIFF, MOIST, SILTY CLAY

RED-TAN, STIFF TO HARD, MOIST, CLAYEY SILT

TAN, VERY STIFF, DRY TO MOIST, SANDY SILT

WEATHERED ROCK (META-GRANITE)

CRYSTALLINE ROCK (META-GRANITE)

TAN, VERY DENSE, MOIST, COARSE SAND

PROPOSED GRADE

5.80:1

6:1

2:1

15 | 60/0.1 | 100/0.8 | 60/0.0 DRY 8/06

7 | 21 | 10 | 6.9 | 15 | 16 | 19 | 16 | 21 | 24 | 84 | 100/0.8 DRY 8/06

429+00

-L-

835 830 825 820 815 810 805 800 795 790 785 780 775 770 765 760

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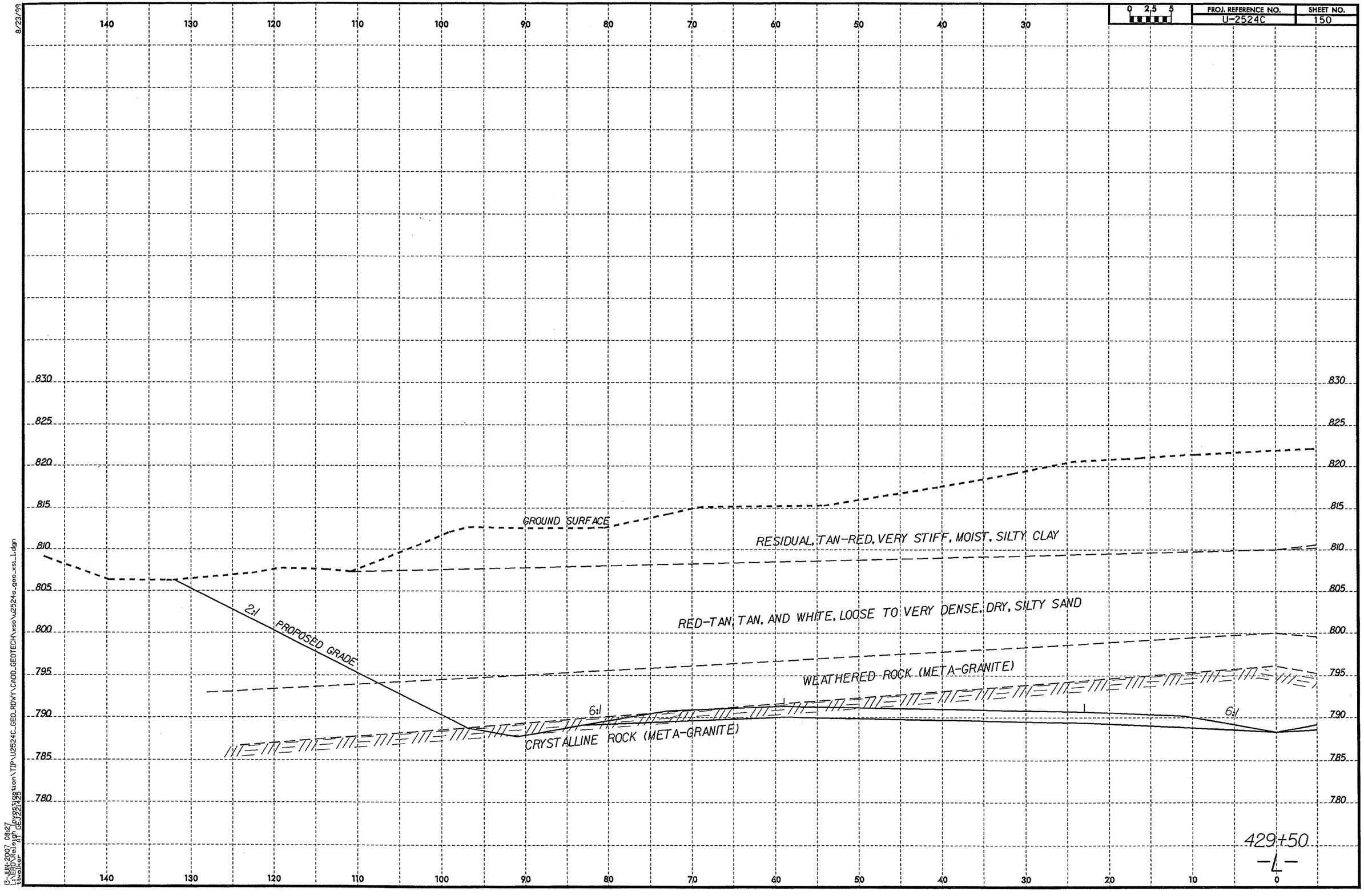
AT GEJ221425



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ttwalker AT GEJ221425

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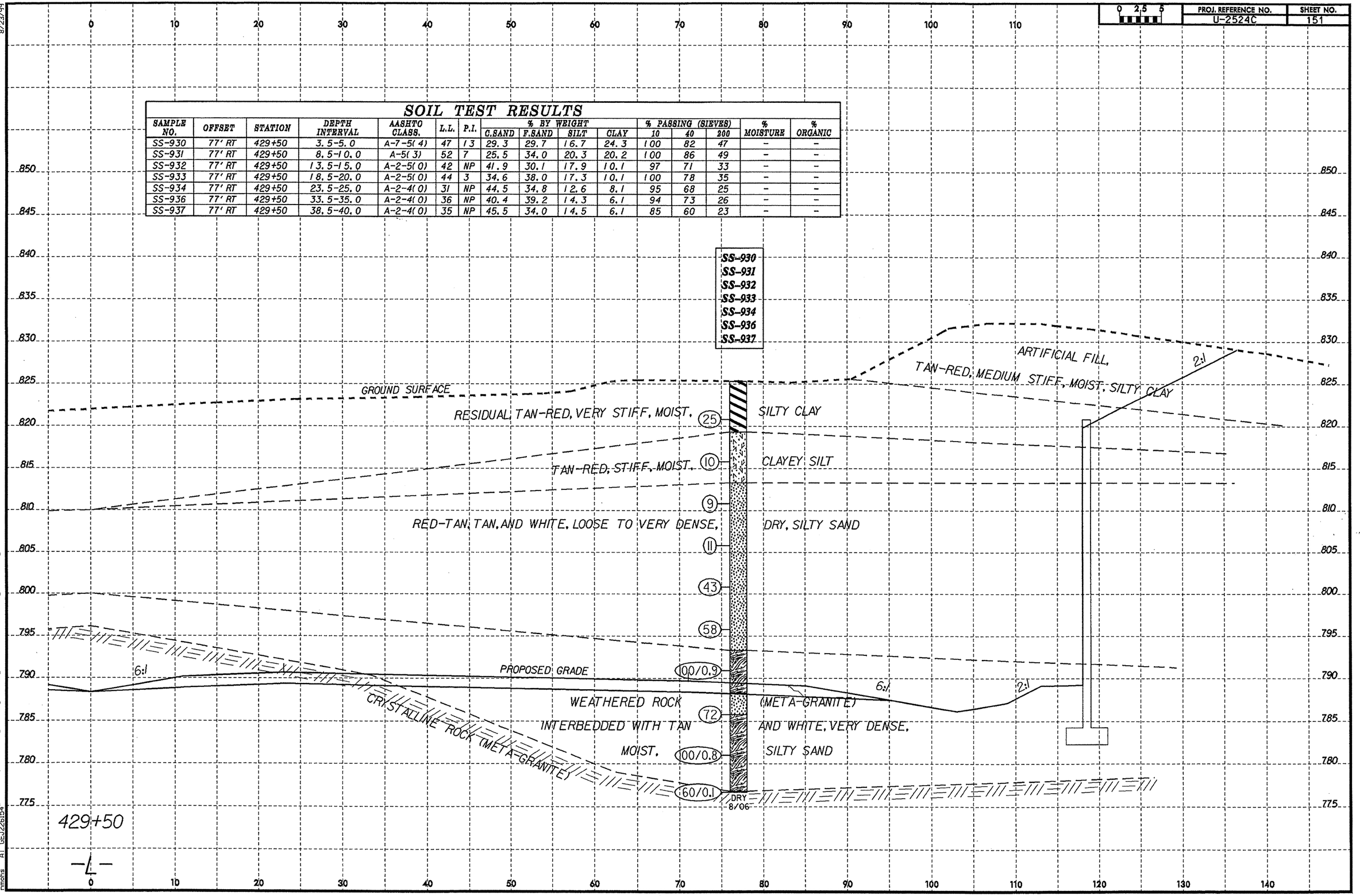
	U-2524C	151

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-930	77' RT	429+50	3.5-5.0	A-7-5(4)	47	13	29.3	29.7	16.7	24.3	100	82	47	-	-
SS-931	77' RT	429+50	8.5-10.0	A-5(3)	52	7	25.5	34.0	20.3	20.2	100	86	49	-	-
SS-932	77' RT	429+50	13.5-15.0	A-2-5(0)	42	NP	41.9	30.1	17.9	10.1	97	71	33	-	-
SS-933	77' RT	429+50	18.5-20.0	A-2-5(0)	44	3	34.6	38.0	17.3	10.1	100	78	35	-	-
SS-934	77' RT	429+50	23.5-25.0	A-2-4(0)	31	NP	44.5	34.8	12.6	8.1	95	68	25	-	-
SS-936	77' RT	429+50	33.5-35.0	A-2-4(0)	36	NP	40.4	39.2	14.3	6.1	94	73	26	-	-
SS-937	77' RT	429+50	38.5-40.0	A-2-4(0)	35	NP	45.5	34.0	14.5	6.1	85	60	23	-	-



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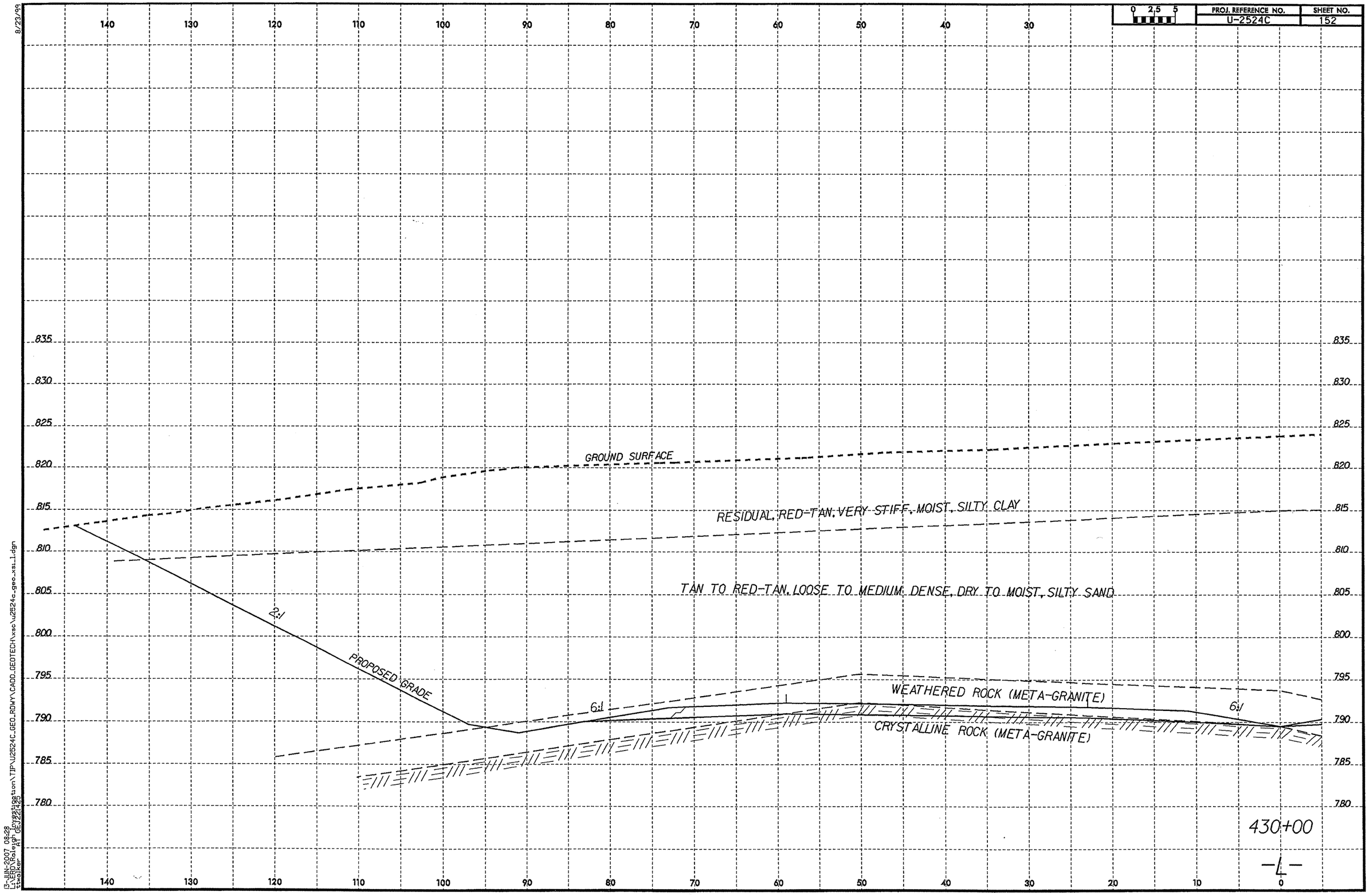

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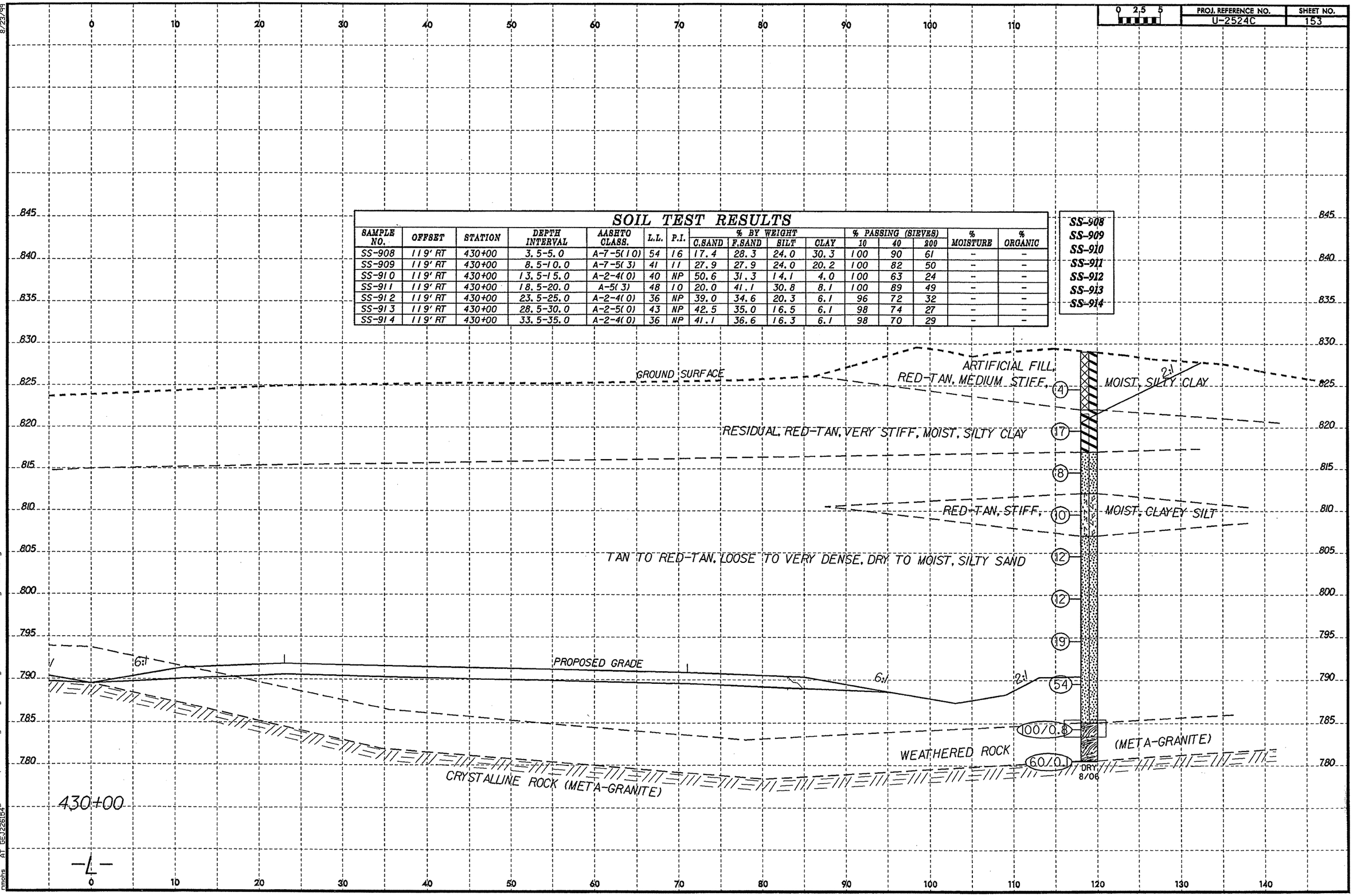
ttwalker AT GEJ221425

PROJ. REFERENCE NO. U-2524C | SHEET NO. 153

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-908	119' RT	430+00	3.5-5.0	A-7-5(10)	54	16	17.4	28.3	24.0	30.3	100	90	61	-	-
SS-909	119' RT	430+00	8.5-10.0	A-7-5(3)	41	11	27.9	27.9	24.0	20.2	100	82	50	-	-
SS-910	119' RT	430+00	13.5-15.0	A-2-4(0)	40	NP	50.6	31.3	14.1	4.0	100	63	24	-	-
SS-911	119' RT	430+00	18.5-20.0	A-5(3)	48	10	20.0	41.1	30.8	8.1	100	89	49	-	-
SS-912	119' RT	430+00	23.5-25.0	A-2-4(0)	36	NP	39.0	34.6	20.3	6.1	96	72	32	-	-
SS-913	119' RT	430+00	28.5-30.0	A-2-5(0)	43	NP	42.5	35.0	16.5	6.1	98	74	27	-	-
SS-914	119' RT	430+00	33.5-35.0	A-2-4(0)	36	NP	41.1	36.6	16.3	6.1	98	70	29	-	-



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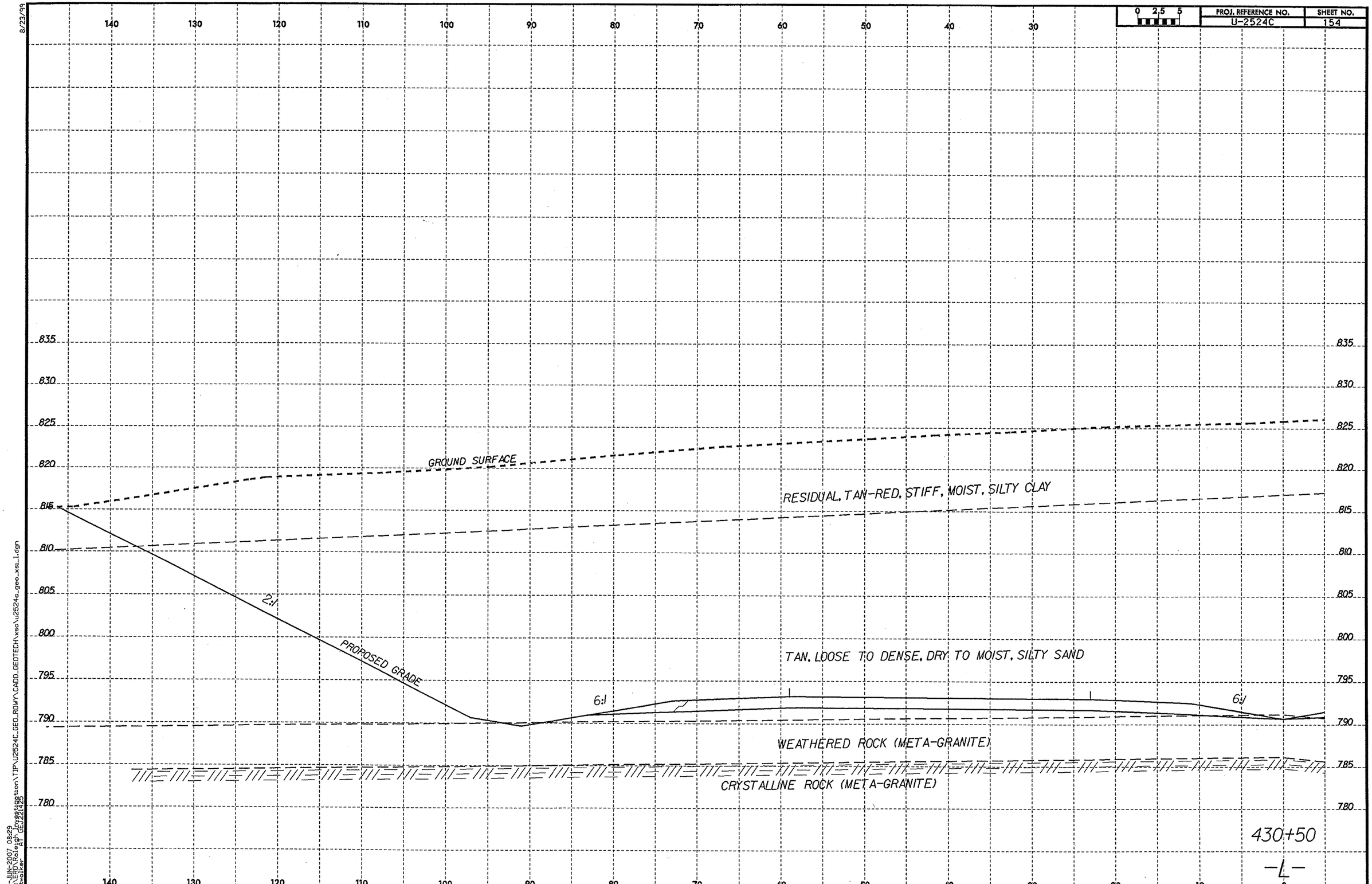
nmohs AT GEJ226154



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ttwalker AT GEJ221425

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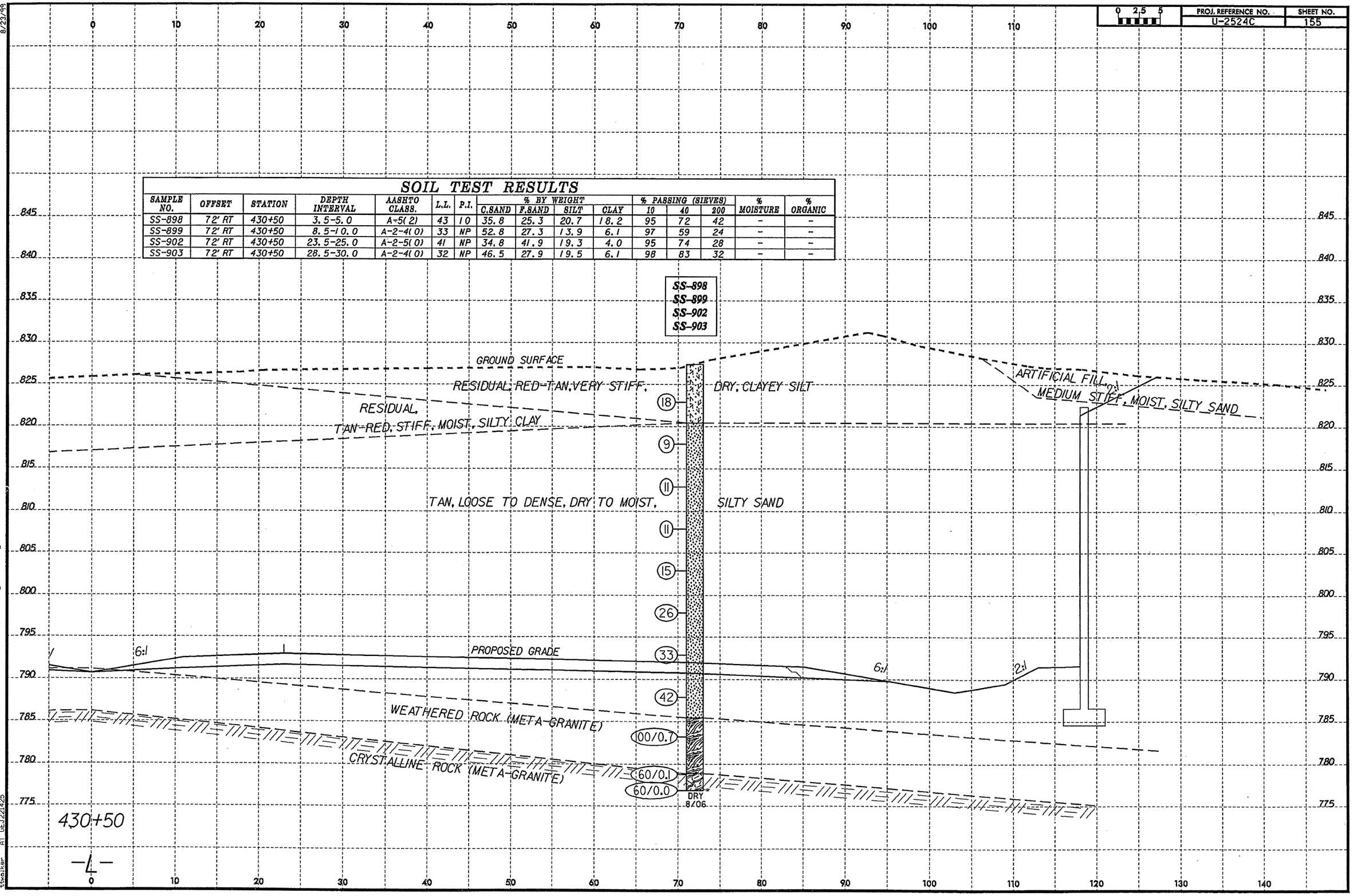
PROJ. REFERENCE NO.	SHEET NO.
U-2524C	155

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-898	72' RT	430+50	3.5-5.0	A-5(2)	43	10	35.8	25.3	20.7	18.2	95	72	42	-	-
SS-899	72' RT	430+50	8.5-10.0	A-2-4(0)	33	NP	52.8	27.3	13.9	6.1	97	59	24	-	-
SS-902	72' RT	430+50	23.5-25.0	A-2-5(0)	41	NP	34.8	41.9	19.3	4.0	95	74	28	-	-
SS-903	72' RT	430+50	28.5-30.0	A-2-4(0)	32	NP	46.5	27.9	19.5	6.1	98	83	32	-	-



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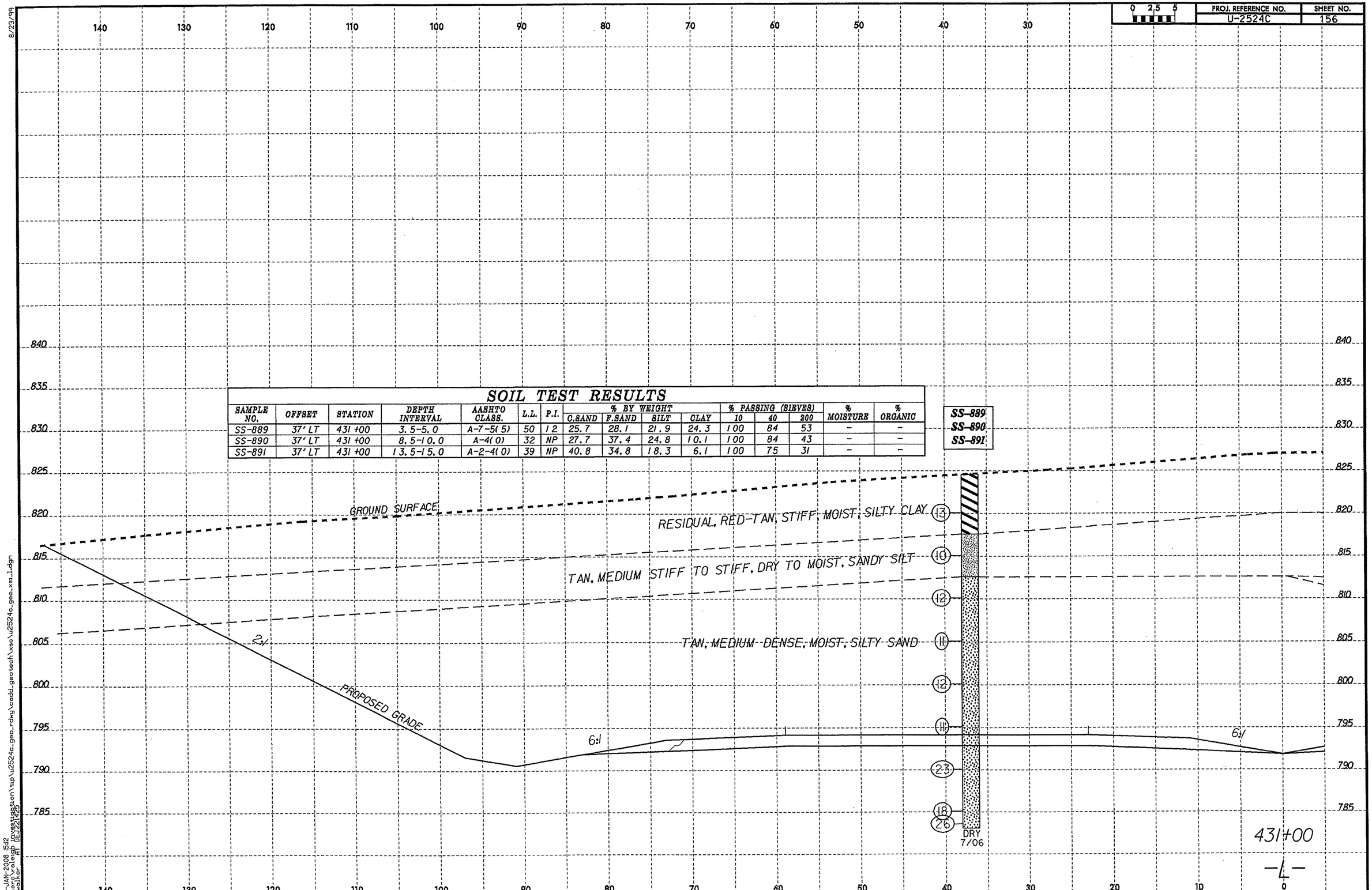
PROJ. REFERENCE NO.	SHEET NO.
U-2524C	156



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-889	37' LT	431+00	3.5-5.0	A-7-5(5)	50	12	25.7	28.1	21.9	24.3	100	84	53	-	-
SS-890	37' LT	431+00	8.5-10.0	A-4(0)	32	NP	27.7	37.4	24.8	10.1	100	84	43	-	-
SS-891	37' LT	431+00	13.5-15.0	A-2-4(0)	39	NP	40.8	34.8	18.3	6.1	100	75	31	-	-

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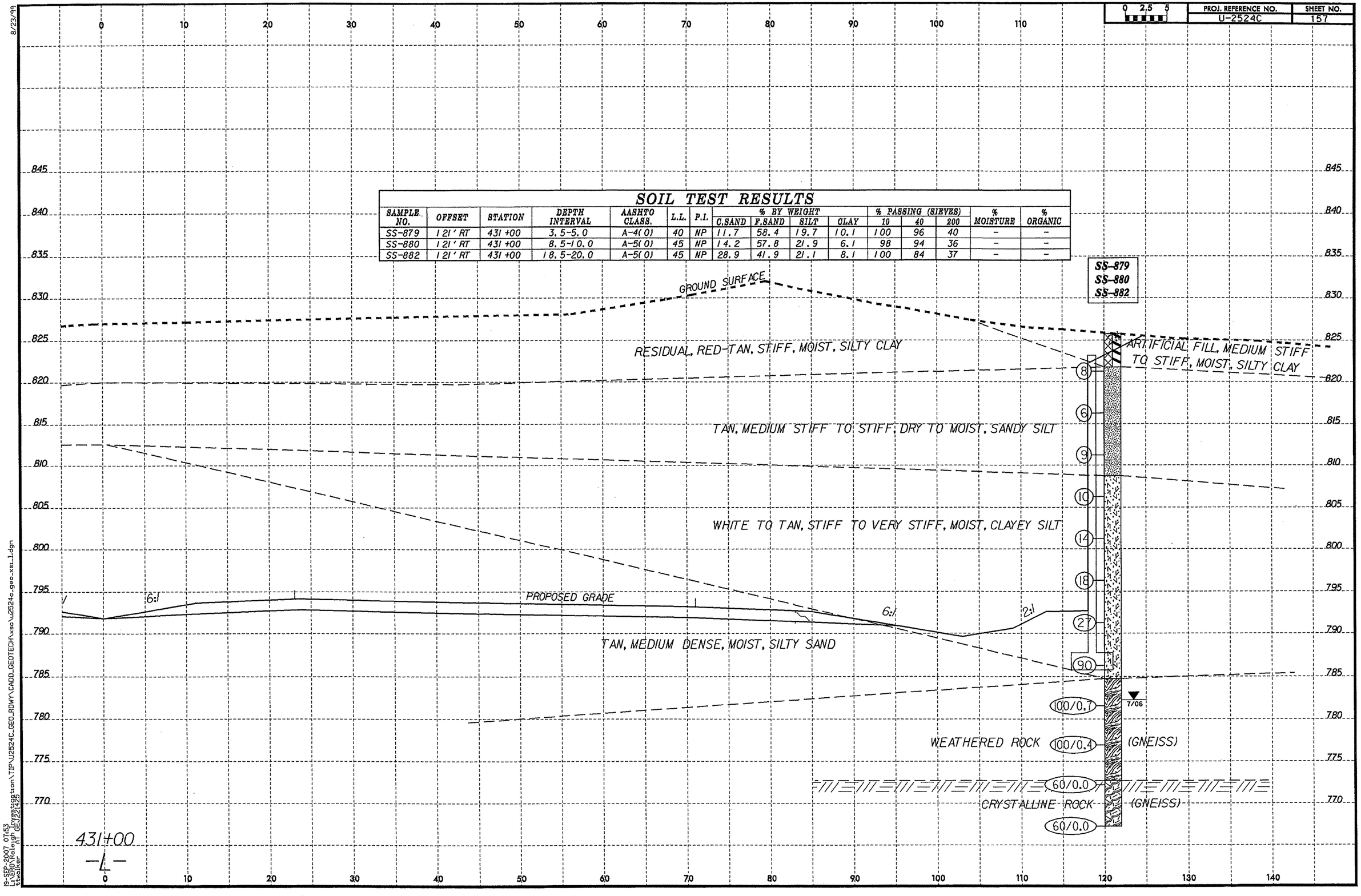
8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	U-2524C	157

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-879	121' RT	431+00	3.5-5.0	A-4(0)	40	NP	11.7	58.4	19.7	10.1	100	96	40	-	-
SS-880	121' RT	431+00	8.5-10.0	A-5(0)	45	NP	14.2	57.8	21.9	6.1	98	94	36	-	-
SS-882	121' RT	431+00	18.5-20.0	A-5(0)	45	NP	28.9	41.9	21.1	8.1	100	84	37	-	-



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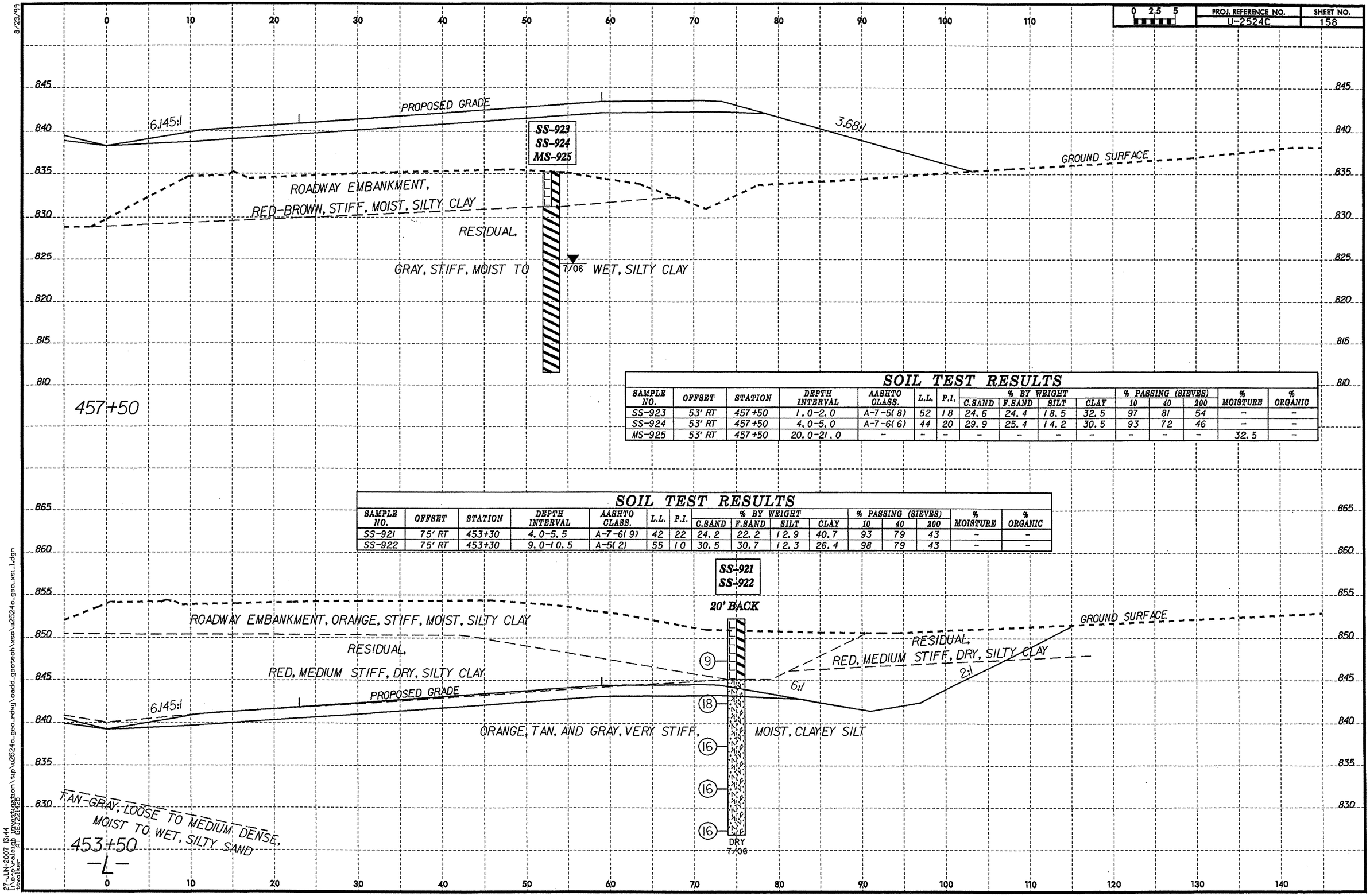

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-923	53' RT	457+50	1.0-2.0	A-7-5(8)	52	18	24.6	24.4	18.5	32.5	97	81	54	-	-
SS-924	53' RT	457+50	4.0-5.0	A-7-6(6)	44	20	29.9	25.4	14.2	30.5	93	72	46	-	-
MS-925	53' RT	457+50	20.0-21.0	-	-	-	-	-	-	-	-	-	-	32.5	-

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-921	75' RT	453+30	4.0-5.5	A-7-6(9)	42	22	24.2	22.2	12.9	40.7	93	79	43	-	-
SS-922	75' RT	453+30	9.0-10.5	A-5(2)	55	10	30.5	30.7	12.3	26.4	98	79	43	-	-

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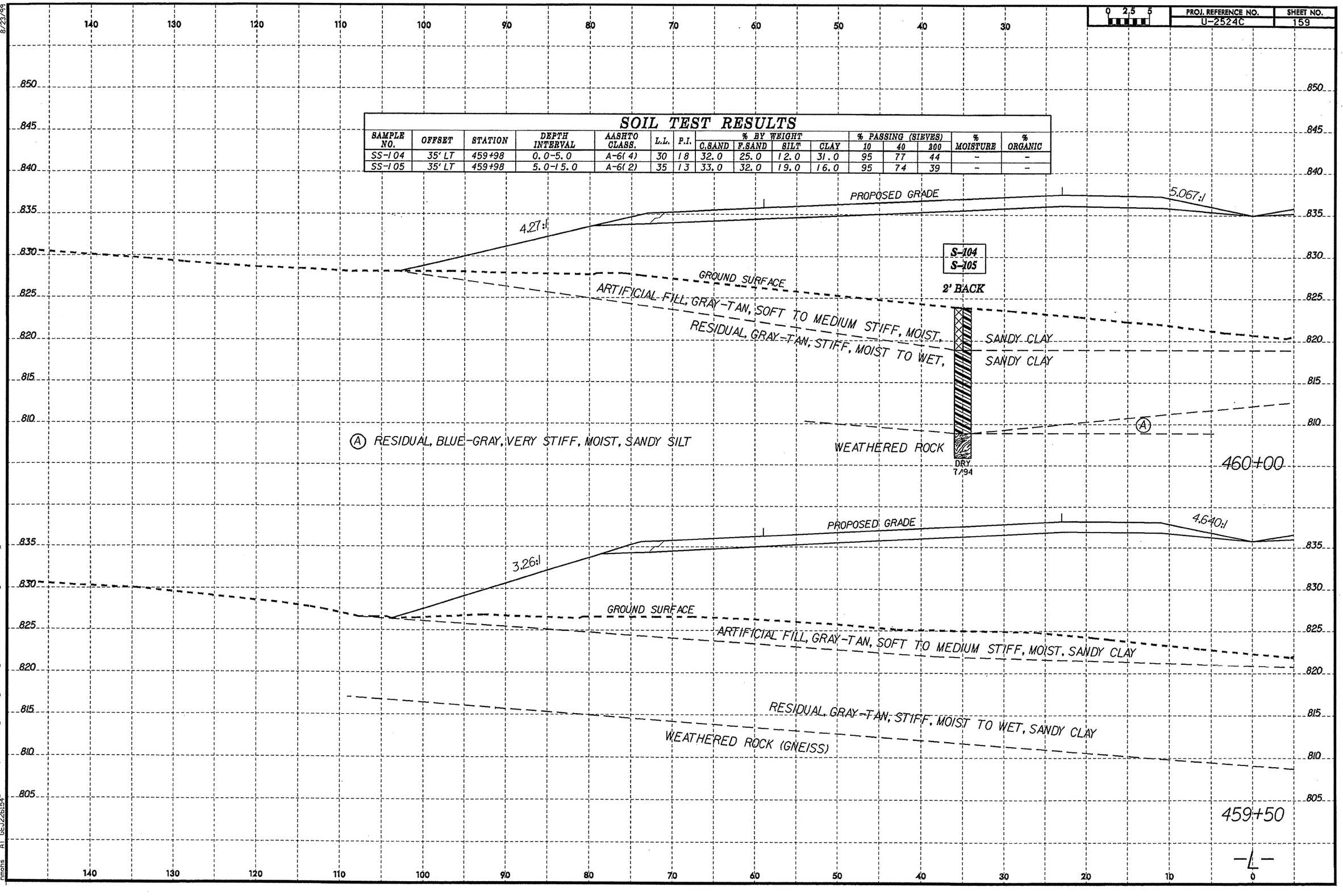
PROJ. REFERENCE NO.	SHEET NO.
U-2524C	159

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-104	35' LT	459+98	0.0-5.0	A-6(4)	30	18	32.0	25.0	12.0	31.0	95	77	44	-	-
SS-105	35' LT	459+98	5.0-15.0	A-6(2)	35	13	33.0	32.0	19.0	16.0	95	74	39	-	-



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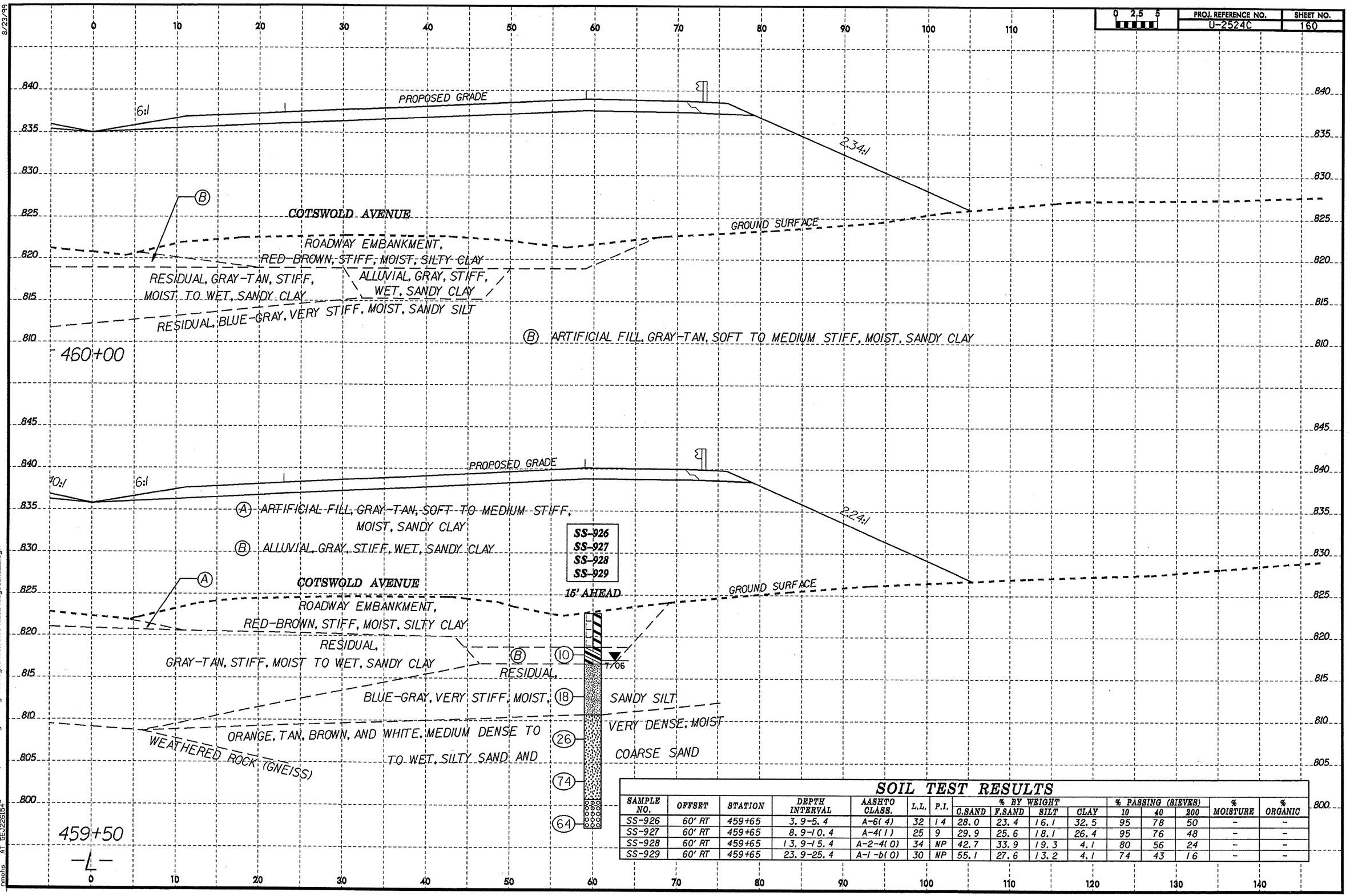

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-926	60' RT	459+65	3.9-5.4	A-6(4)	32	14	28.0	23.4	16.1	32.5	95	78	50	-	-
SS-927	60' RT	459+65	8.9-10.4	A-4(1)	25	9	29.9	25.6	18.1	26.4	95	76	48	-	-
SS-928	60' RT	459+65	13.9-15.4	A-2-4(0)	34	NP	42.7	33.9	19.3	4.1	80	56	24	-	-
SS-929	60' RT	459+65	23.9-25.4	A-1-b(0)	30	NP	55.1	27.6	13.2	4.1	74	43	16	-	-

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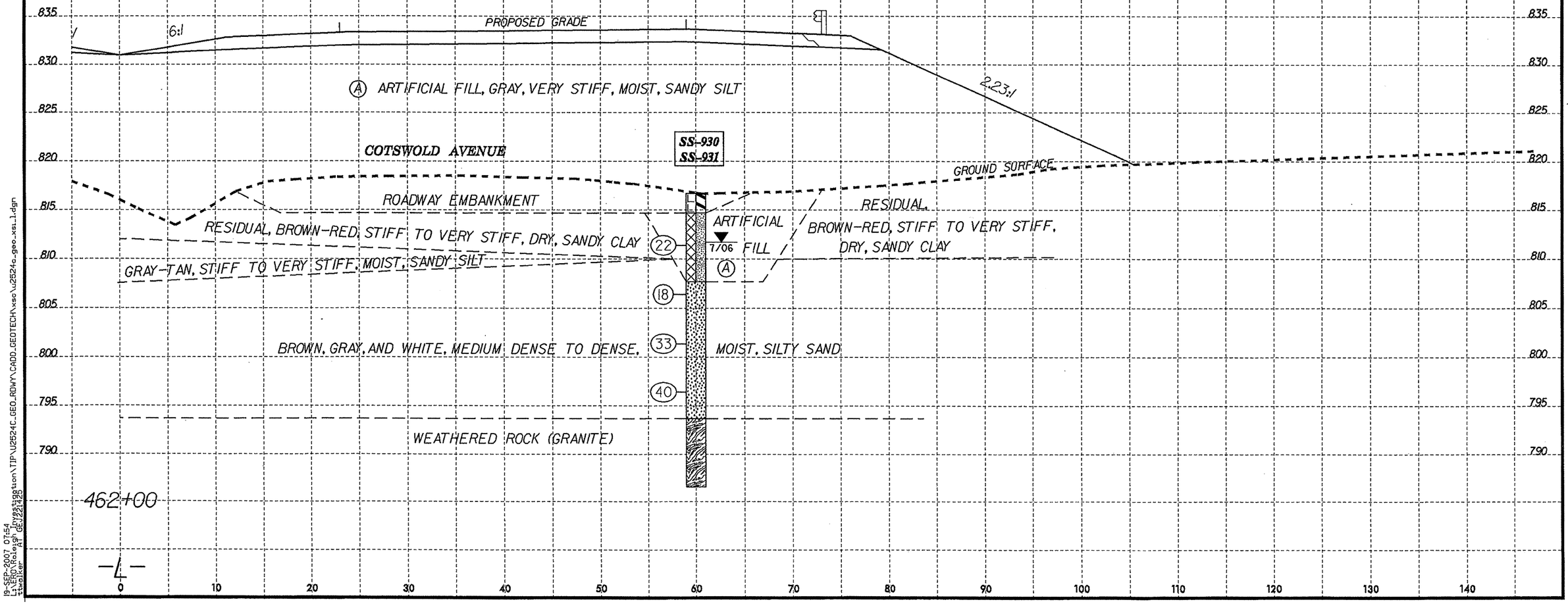
PROJ. REFERENCE NO.	SHEET NO.
U-2524C	161

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-930	60' RT	462+00	4.3-5.8	A-4(1)	26	10	32.5	30.5	14.6	22.4	95	76	40	-	-
SS-931	60' RT	462+00	9.3-10.8	A-2-4(0)	38	9	40.9	29.5	15.4	14.2	83	61	29	-	-



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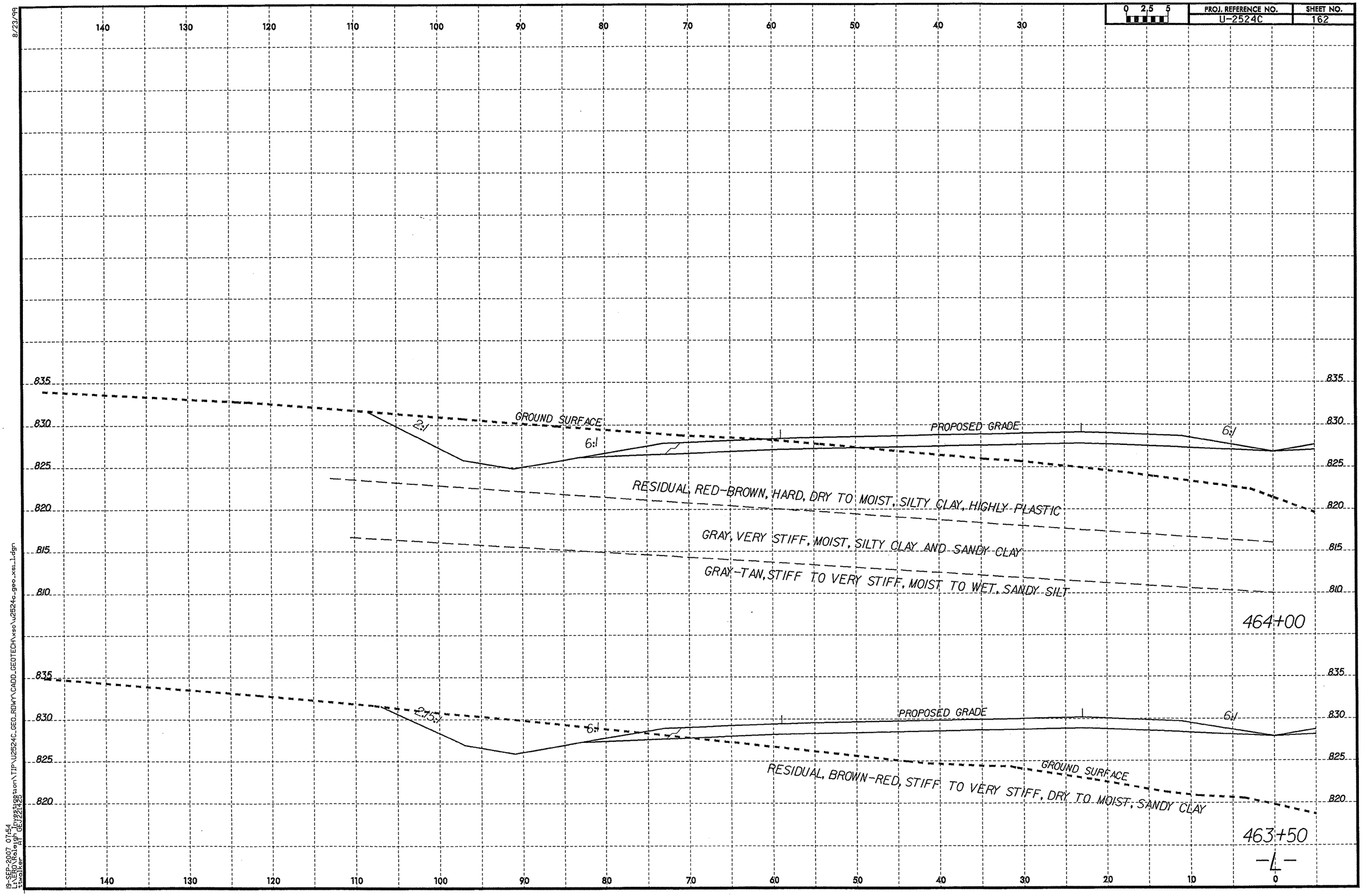

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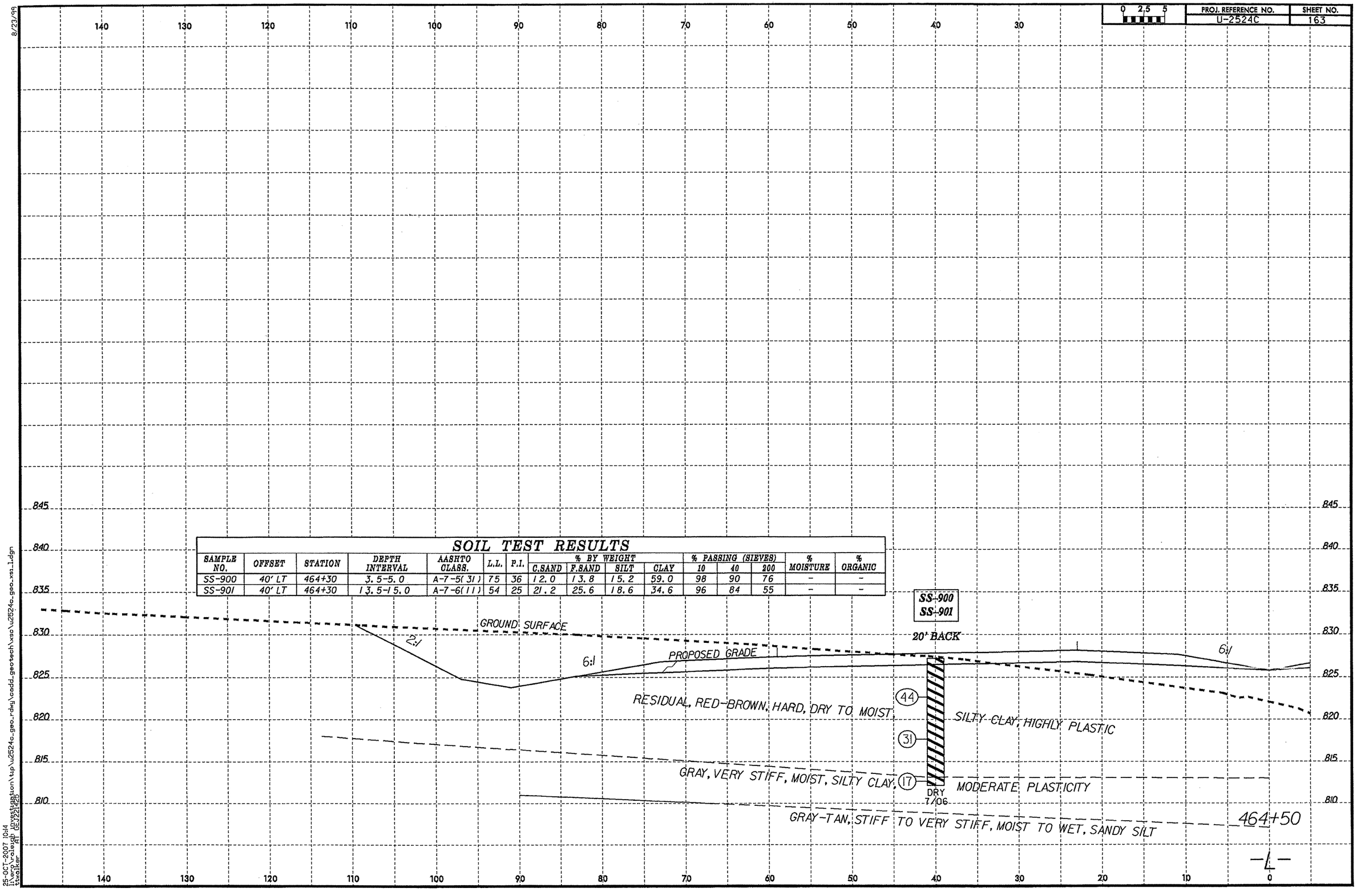
PROJ. REFERENCE NO.	SHEET NO.
U-2524C	163



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-900	40' LT	464+30	3.5-5.0	A-7-5(31)	75	36	12.0	13.8	15.2	59.0	98	90	76	-	-
SS-901	40' LT	464+30	13.5-15.0	A-7-6(11)	54	25	21.2	25.6	18.6	34.6	96	84	55	-	-

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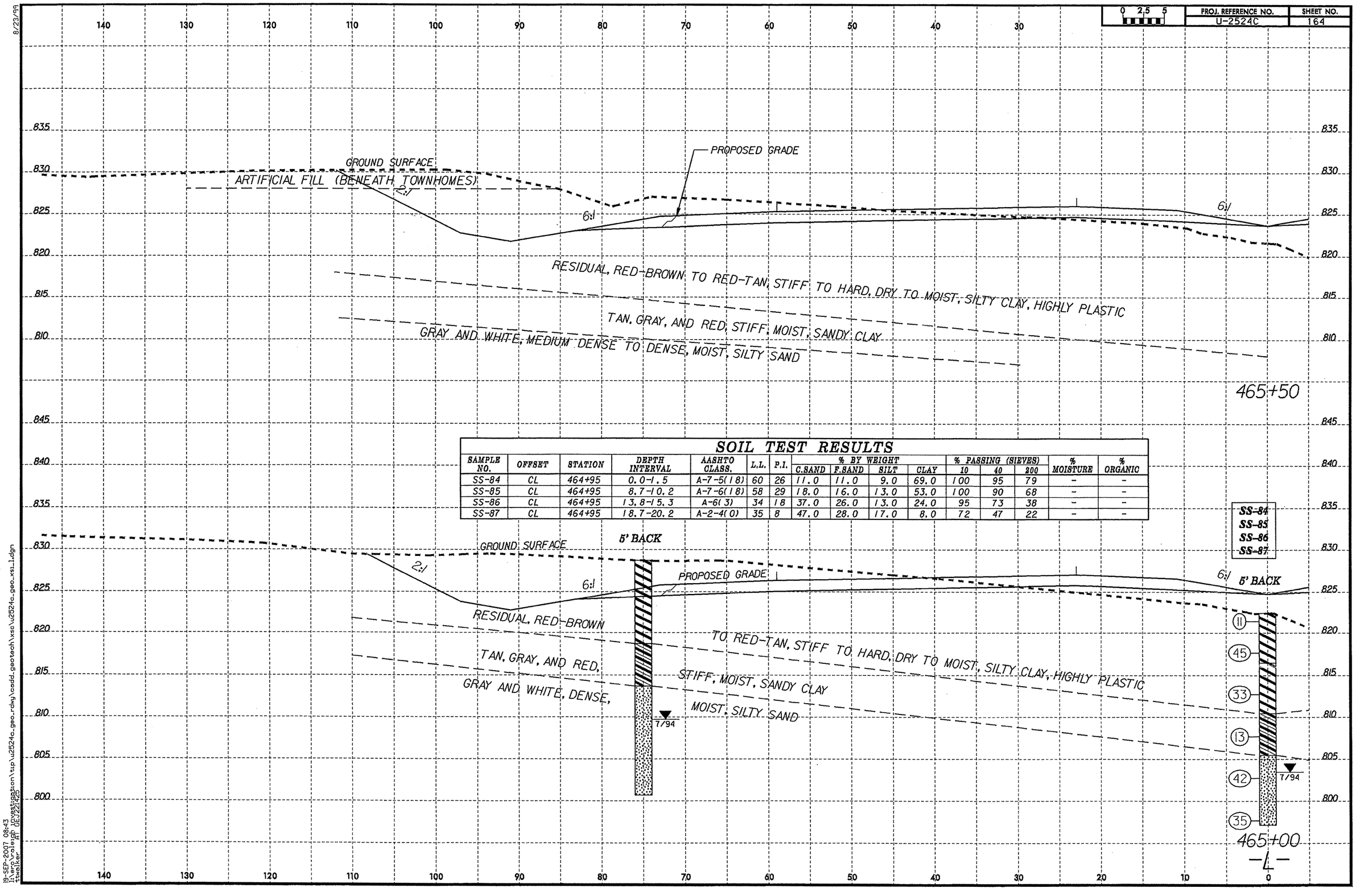

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-84	CL	464+95	0.0-1.5	A-7-5(18)	60	26	11.0	11.0	9.0	69.0	100	95	79	-	-
SS-85	CL	464+95	8.7-10.2	A-7-6(18)	58	29	18.0	16.0	13.0	53.0	100	90	68	-	-
SS-86	CL	464+95	13.8-15.3	A-6(3)	34	18	37.0	26.0	13.0	24.0	95	73	38	-	-
SS-87	CL	464+95	18.7-20.2	A-2-4(0)	35	8	47.0	28.0	17.0	8.0	72	47	22	-	-

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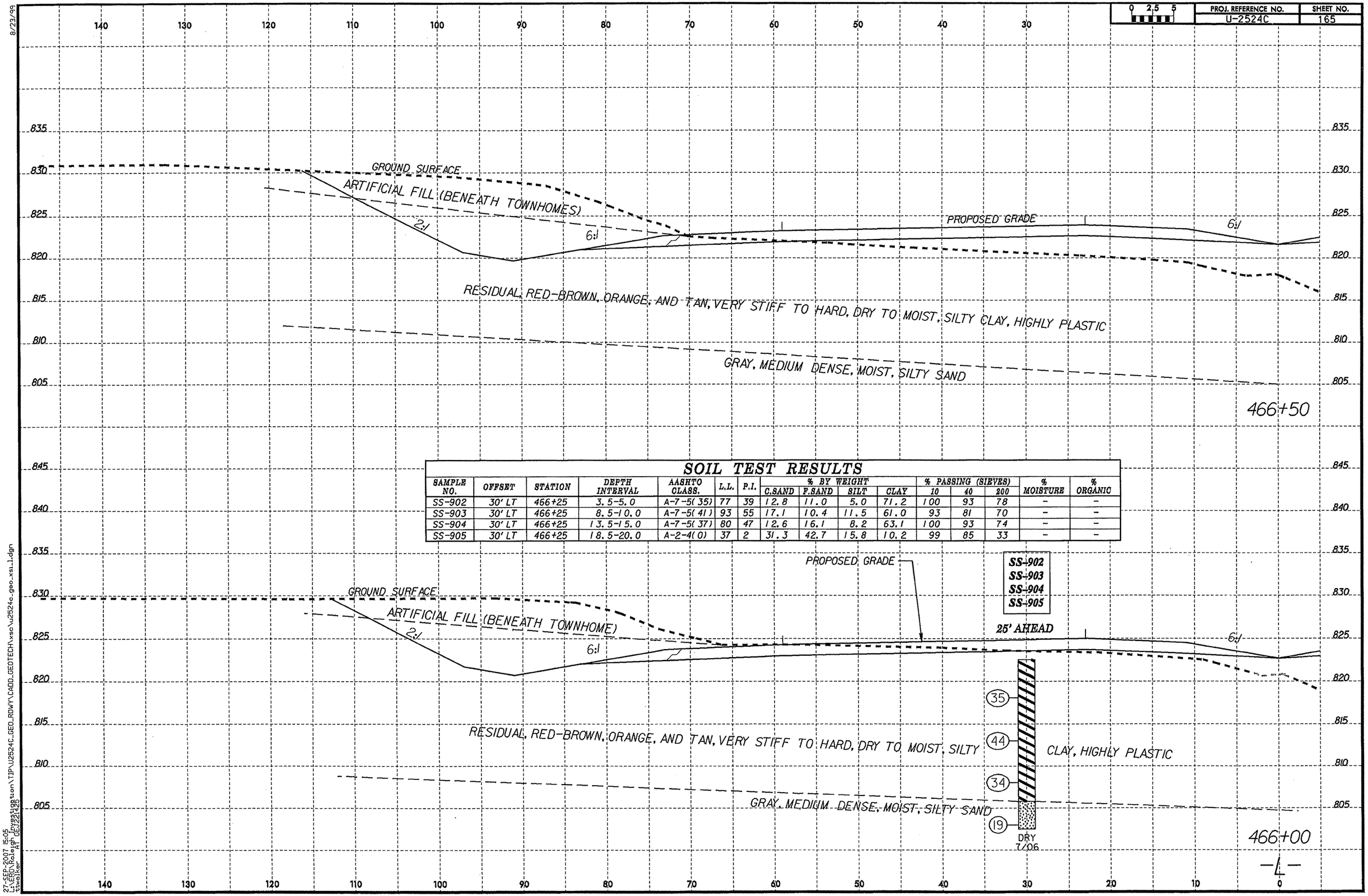
PROJ. REFERENCE NO.	SHEET NO.
U-2524C	165



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-902	30' LT	466+25	3.5-5.0	A-7-5(35)	77	39	12.8	11.0	5.0	71.2	100	93	78	-	-
SS-903	30' LT	466+25	8.5-10.0	A-7-5(41)	93	55	17.1	10.4	11.5	61.0	93	81	70	-	-
SS-904	30' LT	466+25	13.5-15.0	A-7-5(37)	80	47	12.6	16.1	8.2	63.1	100	93	74	-	-
SS-905	30' LT	466+25	18.5-20.0	A-2-4(0)	37	2	31.3	42.7	15.8	10.2	99	85	33	-	-

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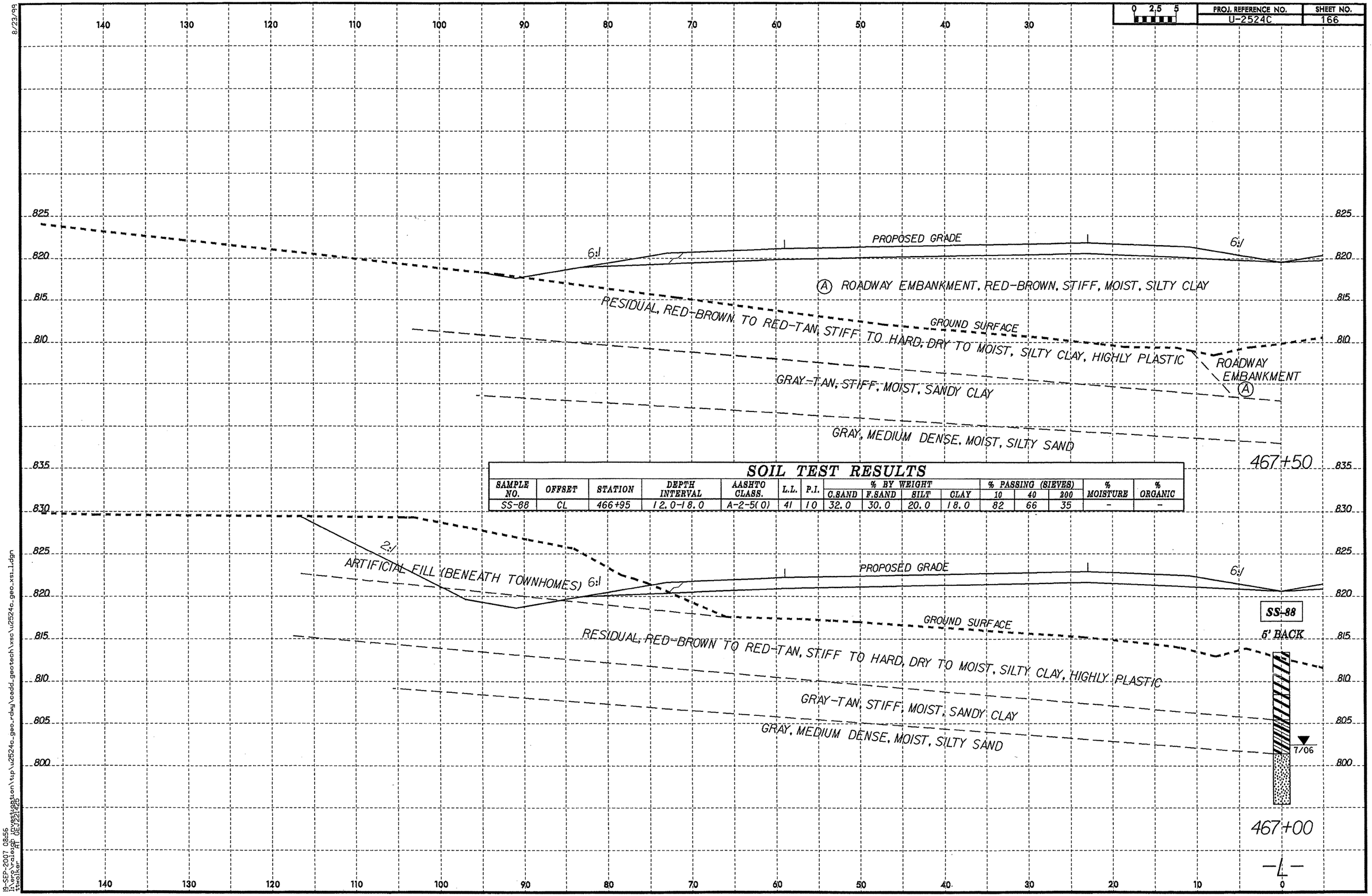

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-88	CL	466+95	12.0-18.0	A-2-5(0)	41	10	32.0	30.0	20.0	18.0	82	66	35	-	-

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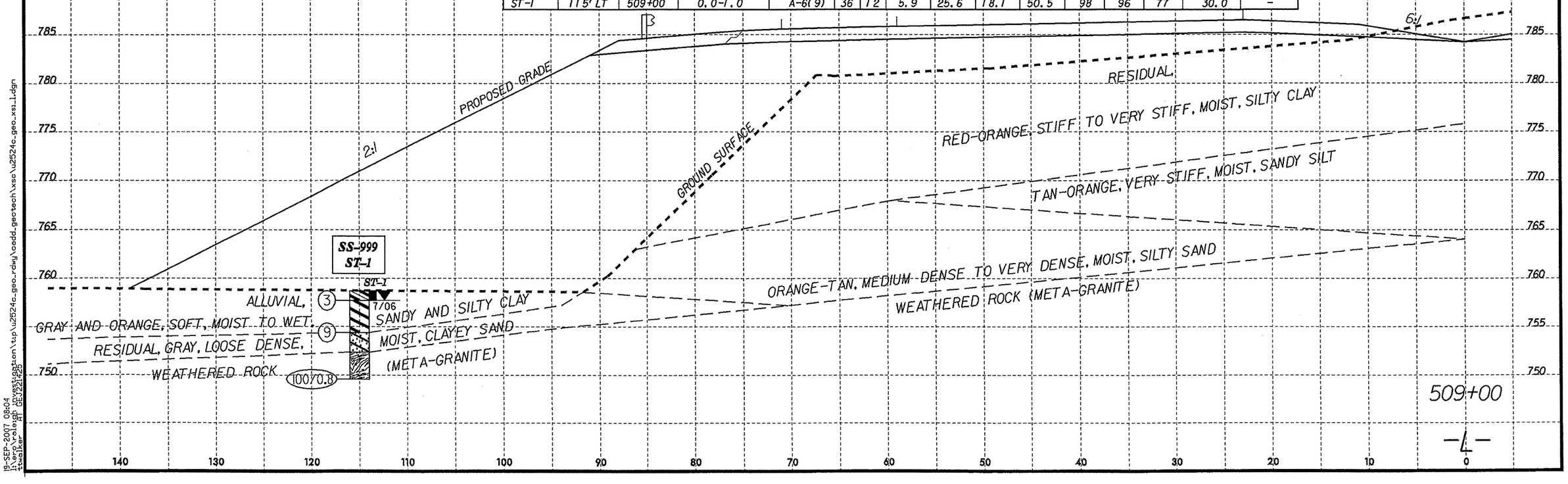
ttwalker AT GEJ221425

PROJ. REFERENCE NO.	SHEET NO.
U-2524C	167

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-999	115' LT	509+00	0.0-1.5	A-7-6(13)	43	15	5.3	21.5	40.8	32.4	100	98	82	-	-
ST-1	115' LT	509+00	0.0-1.0	A-6(9)	36	12	5.9	25.6	18.1	50.5	98	96	77	30.0	-



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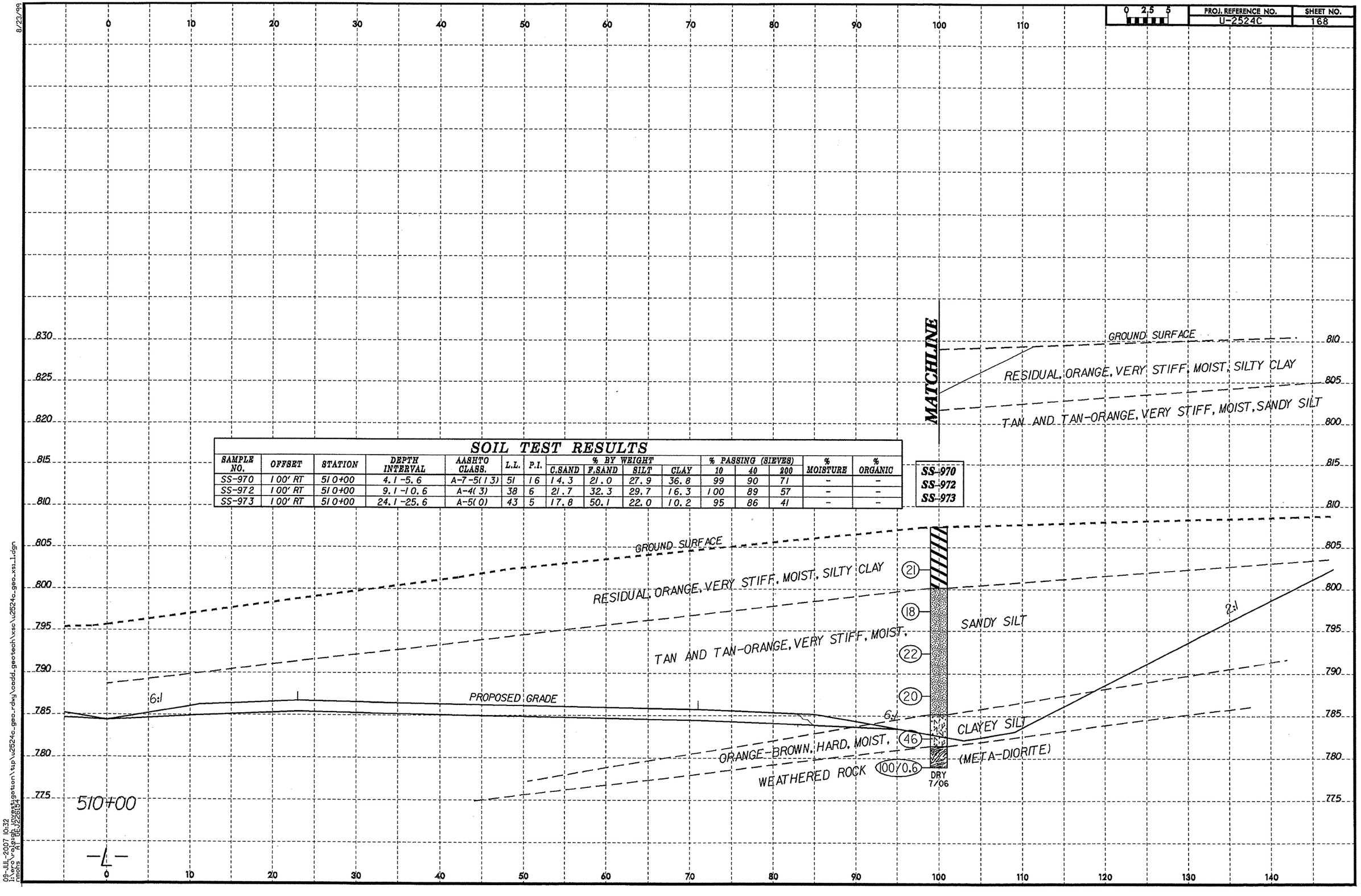
ttwalker AT GEJ221425

PROJ. REFERENCE NO.	SHEET NO.
U-2524C	168



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-970	100' RT	510+00	4.1-5.6	A-7-5(13)	51	16	14.3	21.0	27.9	36.8	99	90	71	-	-
SS-972	100' RT	510+00	9.1-10.6	A-4(3)	38	6	21.7	32.3	29.7	16.3	100	89	57	-	-
SS-973	100' RT	510+00	24.1-25.6	A-5(0)	43	5	17.8	50.1	22.0	10.2	95	86	41	-	-

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nmohs AT GEJ226154

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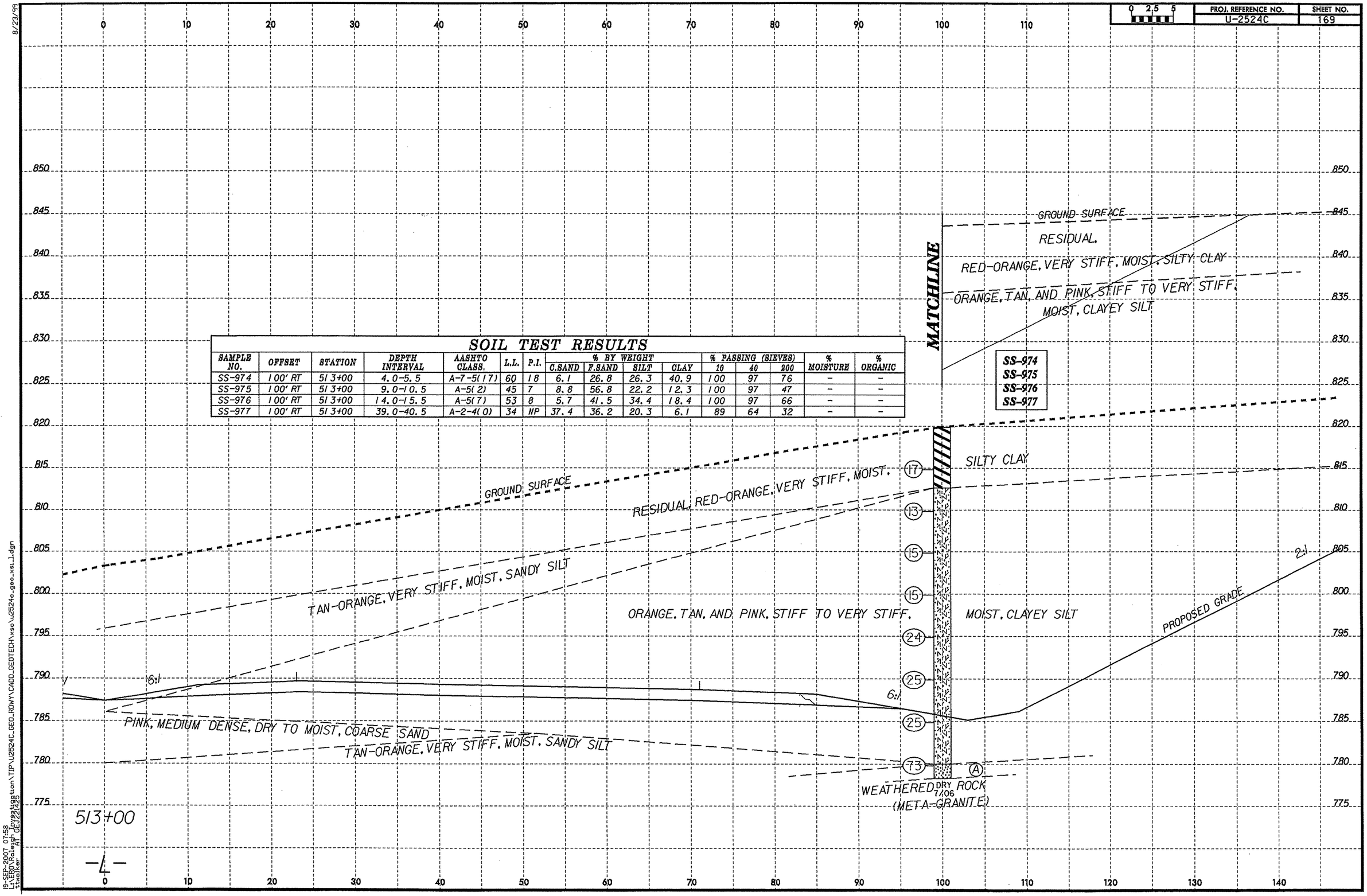
0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	U-2524C	169

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-974	100' RT	513+00	4.0-5.5	A-7-5(17)	60	18	6.1	26.8	26.3	40.9	100	97	76	-	-
SS-975	100' RT	513+00	9.0-10.5	A-5(2)	45	7	8.8	56.8	22.2	12.3	100	97	47	-	-
SS-976	100' RT	513+00	14.0-15.5	A-5(7)	53	8	5.7	41.5	34.4	18.4	100	97	66	-	-
SS-977	100' RT	513+00	39.0-40.5	A-2-4(0)	34	NP	37.4	36.2	20.3	6.1	89	64	32	-	-



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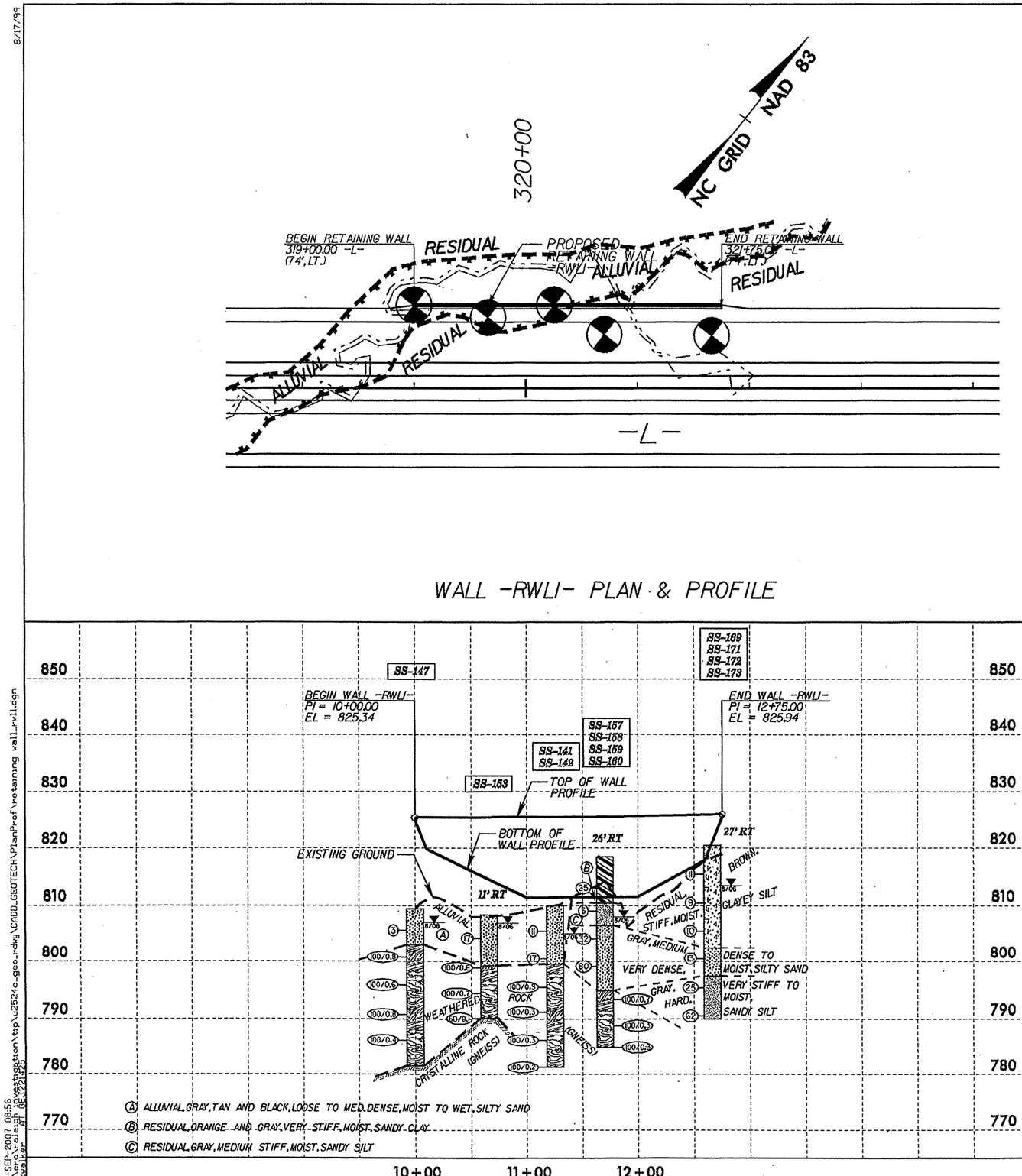
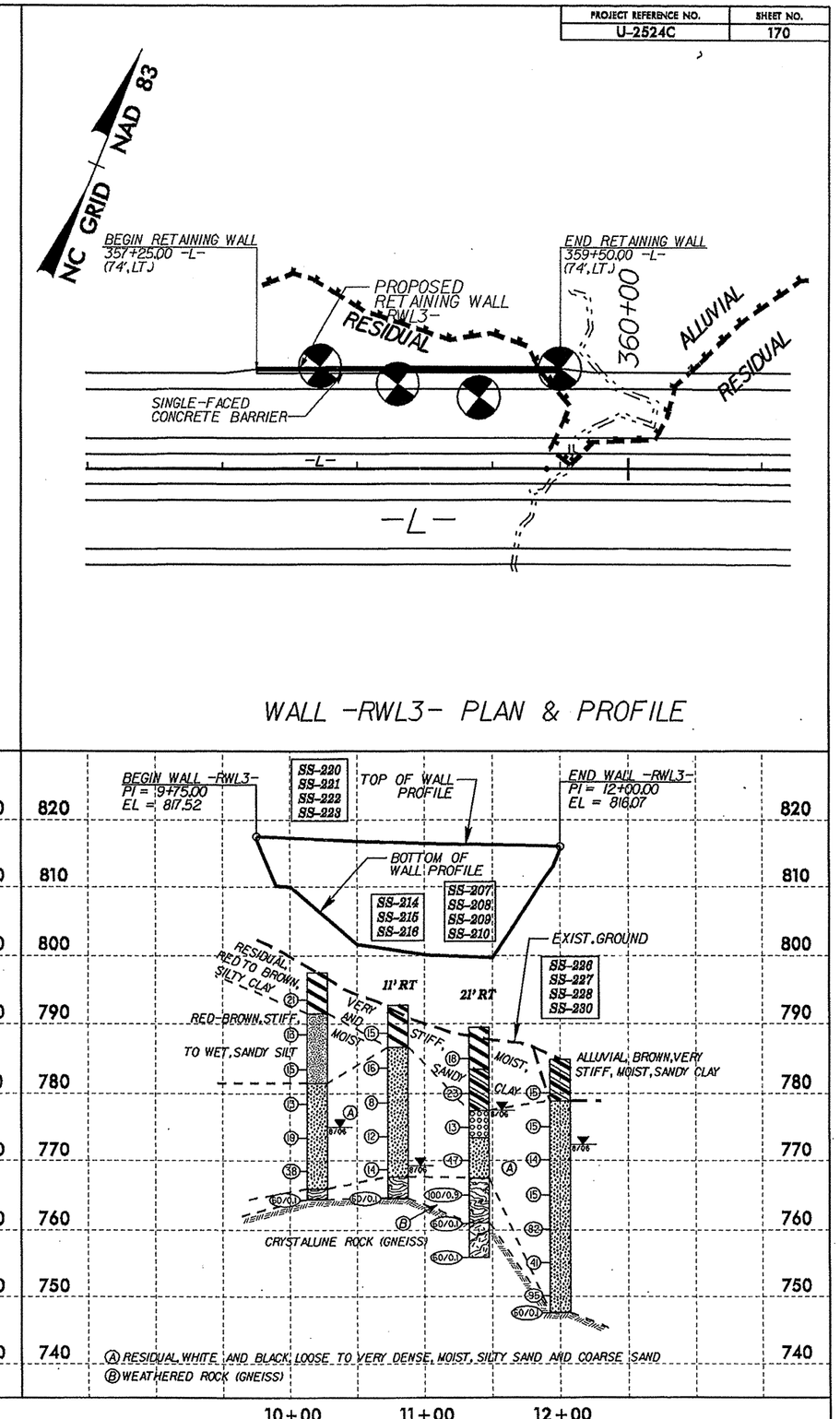
PROJECT REFERENCE NO.	SHEET NO.
U-2524C	170





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ttwalker AT GE1221425

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RETAINING WALL 1

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-147	CL	10+00	2.9-4.4	A-2-4(0)	32	NP	66.7	19.9	7.4	6.1	100	51	16	-	-
SS-153	11' RT	10+66	3.2-4.7	A-2-4(0)	36	NP	60.0	23.3	8.6	8.1	96	55	19	-	-
SS-141	CL	11+25	3.5-5.0	A-2-4(0)	31	NP	46.2	30.2	13.5	10.1	81	57	23	-	-
SS-142	CL	11+25	8.5-10.0	A-2-4(0)	34	NP	54.7	31.0	8.2	6.1	89	57	16	-	-
SS-157	26' RT	11+70	4.4-5.9	A-6(1)	30	11	38.7	26.1	14.9	20.3	98	73	39	-	-
SS-158	26' RT	11+70	9.4-10.9	A-4(0)	30	NP	38.7	35.5	15.7	10.1	94	71	48	-	-
SS-159	26' RT	11+70	14.4-15.9	A-2-4(0)	36	NP	51.9	29.4	14.7	4.1	90	54	22	-	-
SS-160	26' RT	11+70	19.4-20.9	A-2-4(0)	36	NP	38.7	33.2	20.0	8.1	91	68	32	-	-
SS-169	27' RT	12+66	4.0-5.5	A-5(1)	54	NP	19.0	36.9	27.9	16.2	99	91	50	-	-
SS-171	27' RT	12+66	14.0-15.5	A-5(0)	48	NP	23.1	40.7	28.1	8.1	100	90	46	-	-
SS-172	27' RT	12+66	19.0-20.5	A-2-4(0)	38	NP	50.1	30.2	13.7	6.1	92	58	24	-	-
SS-173	27' RT	12+66	24.0-25.5	A-4(0)	37	NP	30.8	41.3	19.8	8.1	100	84	36	-	-

RETAINING WALL 3

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-220	CL	10+20	3.0-4.5	A-7-5(16)	64	30	26.2	18.6	8.8	46.4	100	83	59	-	-
SS-221	CL	10+20	8.0-9.5	A-4(1)	39	9	35.5	25.0	13.2	26.2	99	76	43	-	-
SS-222	CL	10+20	13.0-14.5	A-4(0)	32	NP	37.3	29.1	17.5	16.1	98	73	39	-	-
SS-223	CL	10+20	18.0-19.5	A-2-4(0)	34	NP	42.2	32.9	14.8	10.1	95	70	29	-	-
SS-214	11' RT	10+80	3.0-4.5	A-7-6(12)	53	27	30.9	17.6	13.1	38.4	100	78	55	-	-
SS-215	11' RT	10+80	8.0-9.5	A-2-4(0)	30	NP	52.1	24.8	9.0	14.1	93	58	25	-	-
SS-216	11' RT	10+80	13.0-14.5	A-2-5(0)	50	NP	40.0	35.5	16.4	8.1	94	70	29	-	-
SS-207	21' RT	11+40	3.5-5.0	A-7-6(5)	41	22	39.6	18.8	9.4	32.3	99	70	44	-	-
SS-208	21' RT	11+40	8.5-10.0	A-6(1)	36	11	40.2	22.8	12.8	24.2	90	64	38	-	-
SS-209	21' RT	11+40	13.5-15.0	A-1-b(0)	33	NP	54.9	23.8	13.2	8.1	83	46	22	-	-
SS-210	21' RT	11+40	0.0-0.0	A-2-4(0)	28	NP	46.4	31.5	14.0	8.1	86	59	24	-	-
SS-226	CL	12+00	3.8-5.3	A-6(3)	40	19	45.8	18.0	8.0	28.3	100	67	39	-	-
SS-227	CL	12+00	8.8-11.1	A-2-6(0)	30	11	39.2	27.2	11.4	22.2	87	63	33	-	-
SS-228	CL	12+00	13.8-15.3	A-2-4(0)	36	NP	40.2	33.7	7.9	18.2	95	73	30	-	-
SS-230	CL	12+00	23.8-25.3	A-2-4(0)	25	NP	47.9	31.3	8.7	12.1	90	61	24	-	-

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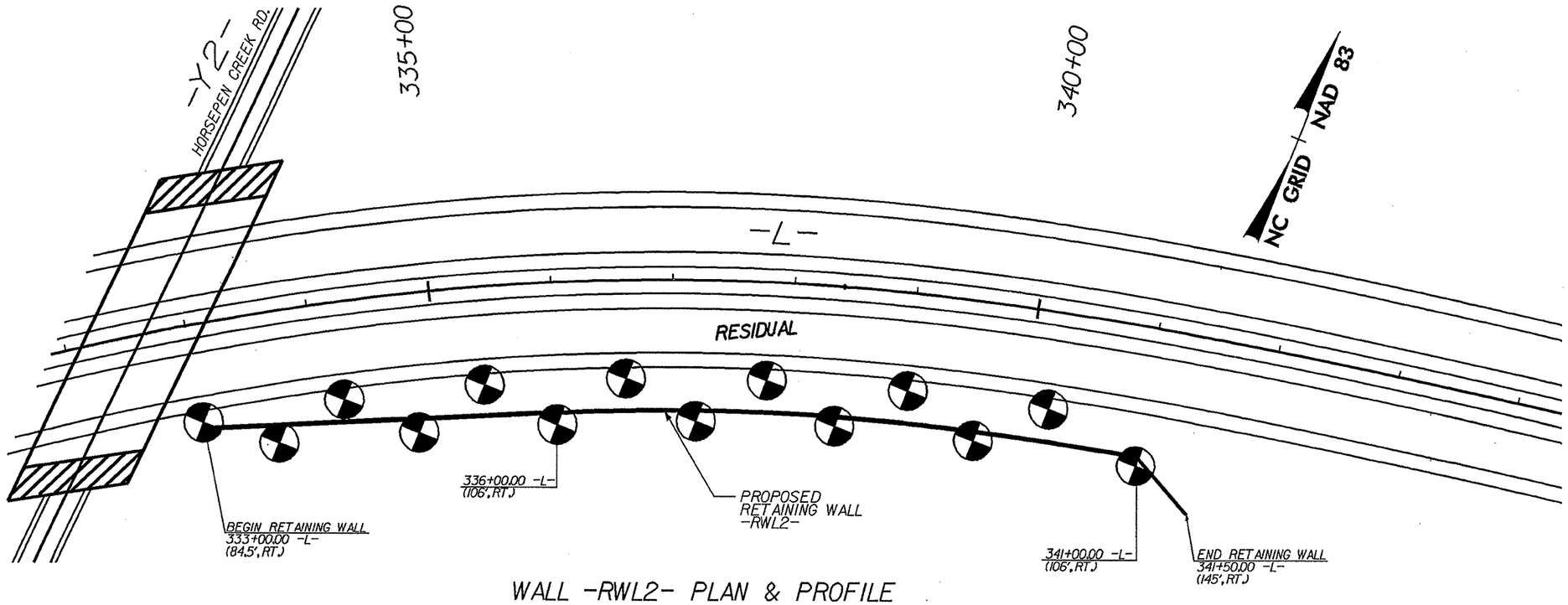
PROJECT REFERENCE NO.	SHEET NO.
U-2524C	172



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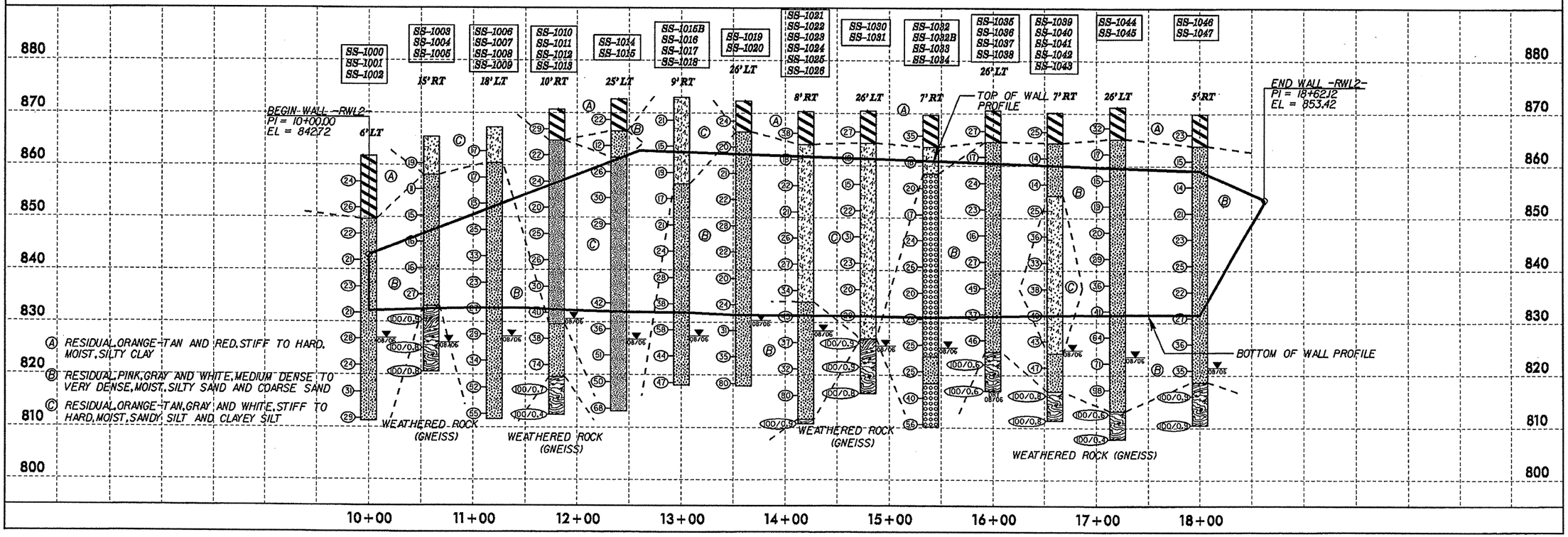


(A) RESIDUAL, ORANGE-TAN AND RED, STIFF TO HARD, MOIST, SILTY CLAY

(B) RESIDUAL, PINK, GRAY AND WHITE, MEDIUM DENSE TO VERY DENSE, MOIST, SILTY SAND AND COARSE SAND

(C) RESIDUAL, ORANGE-TAN, GRAY AND WHITE, STIFF TO HARD, MOIST, SANDY SILT AND CLAYEY SILT

8/17/99

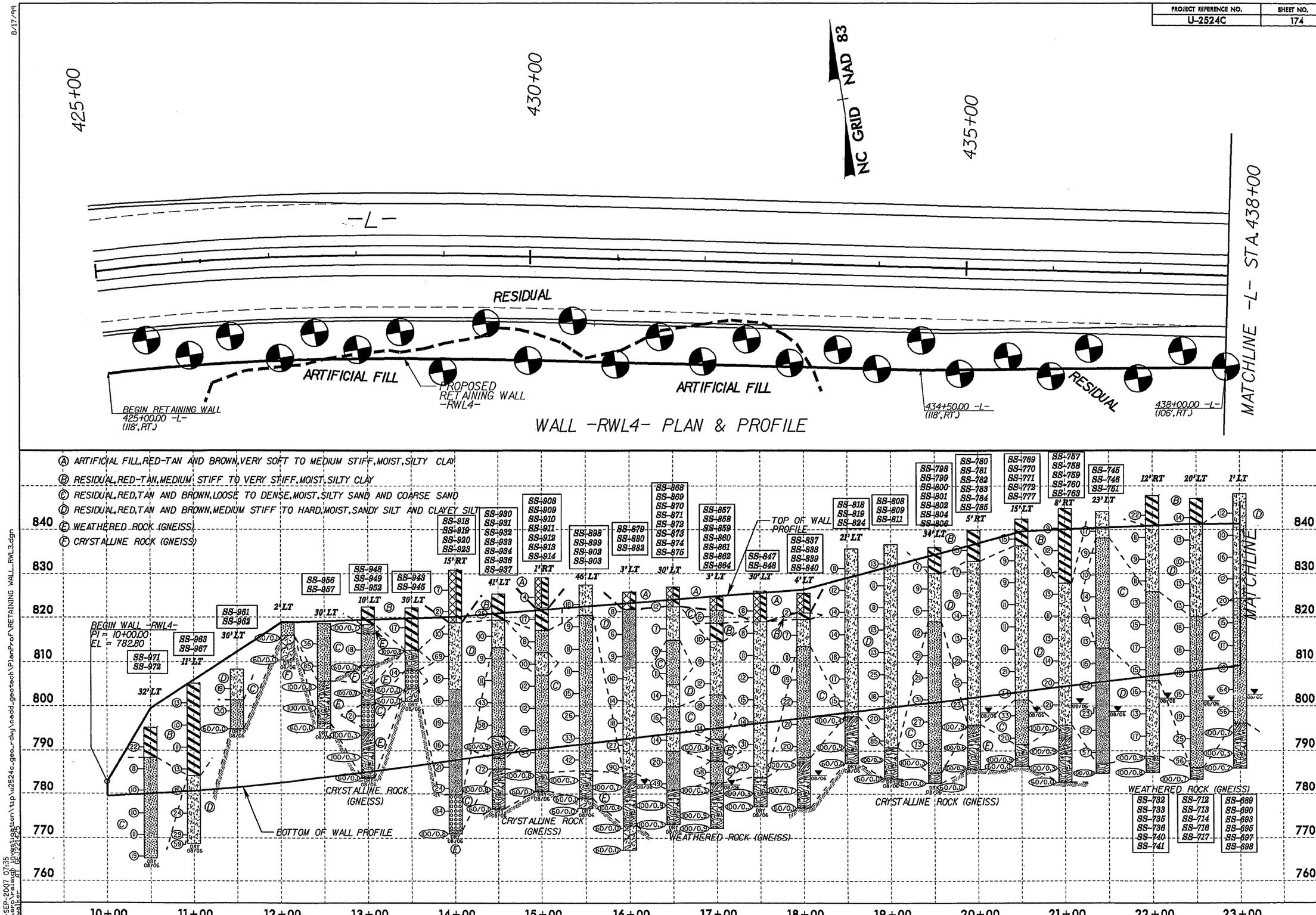
PROJECT REFERENCE NO.	SHEET NO.
U-2524C	173

RETAINING WALL 2

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-1000	6 LT	10+00	3.9-5.4	A-7-5(2)	49	15	41.7	23.1	12.9	22.3	99	69	39	-	-
SS-1001	6 LT	10+00	13.9-15.4	A-2-4(0)	39	9	49.8	20.6	18.4	11.1	96	58	33	-	-
SS-1002	6 LT	10+00	33.9-35.4	A-2-4(0)	36	8	52.3	18.0	17.5	12.2	87	49	30	-	-
SS-1003	15 RT	10+60	4.0-5.5	A-5(1)	49	9	36.5	29.2	16.1	18.2	99	76	40	-	-
SS-1004	15 RT	10+60	9.0-10.5	A-2-5(0)	45	NP	51.0	28.8	15.2	5.1	96	61	25	-	-
SS-1005	15 RT	10+60	29.0-30.5	A-2-4(0)	37	NP	52.9	29.7	12.4	5.1	92	57	21	-	-
SS-1006	18 LT	11+20	3.6-5.1	A-5(0)	44	NP	22.1	41.9	15.7	20.3	100	91	43	-	-
SS-1007	18 LT	11+20	8.6-10.1	A-2-5(0)	41	NP	37.1	40.1	16.7	6.1	100	81	28	-	-
SS-1008	18 LT	11+20	13.6-15.1	A-2-4(0)	37	NP	48.6	33.0	14.3	4.1	97	62	23	-	-
SS-1009	18 LT	11+20	43.6-45.1	A-2-4(0)	36	NP	44.2	35.9	12.9	7.1	94	68	24	-	-
SS-1010	10 RT	11+80	2.8-4.3	A-7-5(7)	54	16	30.2	21.1	16.3	32.4	99	78	52	-	-
SS-1011	10 RT	11+80	7.8-9.3	A-4(0)	39	7	47.6	19.7	14.5	18.2	97	60	36	-	-
SS-1012	10 RT	11+80	42.8-49.8	A-2-5(0)	43	NP	40.9	39.5	13.5	6.1	96	77	24	-	-
SS-1013	10 RT	11+80	47.8-49.3	A-2-4(0)	37	NP	55.3	28.2	12.5	4.1	91	51	20	-	-
SS-1014	25 RT	12+40	3.0-4.5	A-7-5(3)	46	12	35.3	24.1	16.3	24.3	97	73	45	-	-
SS-1015	25 RT	12+40	8.0-9.5	A-2-5(0)	45	NP	45.2	28.8	11.9	14.2	96	68	30	-	-
SS-1015B	9 RT	13+00	3.4-4.9	A-5(2)	46	10	38.5	21.5	17.7	22.3	99	71	44	-	-
SS-1016	9 RT	13+00	13.4-14.9	A-5(0)	44	7	35.3	30.4	14.1	20.3	100	78	39	-	-
SS-1017	9 RT	13+00	18.4-19.4	A-2-4(0)	36	NP	53.5	24.7	11.7	10.1	98	61	26	-	-
SS-1018	9 RT	13+00	23.4-24.9	A-2-4(0)	35	7	56.9	17.4	15.5	10.1	94	50	27	-	-
SS-1019	26 LT	13+60	2.9-4.4	A-7-5(10)	58	27	29.0	15.2	13.3	42.6	83	64	50	-	-
SS-1020	26 LT	13+60	7.9-9.4	A-2-5(0)	42	8	41.1	29.0	15.7	14.2	95	65	35	-	-
SS-1021	8 RT	14+20	3.2-4.7	A-7-5(17)	68	25	23.1	15.8	22.6	38.5	100	83	64	-	-
SS-1022	8 RT	14+20	8.2-9.7	A-5(9)	61	10	14.2	28.6	22.8	34.4	100	93	64	-	-
SS-1023	8 RT	14+20	14.0-14.7	A-5(1)	43	10	38.7	28.0	19.1	14.2	100	72	40	-	-
SS-1024	8 RT	14+20	23.2-24.7	A-5(0)	51	5	33.0	32.4	16.3	18.2	98	76	41	-	-
SS-1025	8 RT	14+20	38.2-39.7	A-2-4(0)	40	NP	51.1	32.6	10.2	6.1	100	70	21	-	-
SS-1026	8 RT	14+20	53.2-54.7	A-2-4(0)	32	NP	48.8	34.2	10.8	6.1	92	60	21	-	-
SS-1030	26 LT	14+80	3.1-4.6	A-7-5(12)	63	21	24.9	19.0	13.5	42.6	99	82	59	-	-
SS-1031	26 LT	14+80	8.1-9.6	A-5(0)	43	3	30.0	40.1	13.7	16.2	100	84	38	-	-
SS-1032	7 RT	15+40	3.0-4.5	A-7-5(9)	54	19	30.8	18.2	10.4	40.5	100	78	55	-	-
SS-1032B	7 RT	15+40	8.0-9.5	A-5(2)	47	10	40.3	21.6	13.7	24.4	99	70	42	-	-
SS-1033	7 RT	15+40	13.0-14.5	A-1-b(0)	31	NP	58.4	22.7	10.8	8.1	92	49	22	-	-
SS-1034	7 RT	15+40	48.0-49.5	A-2-5(0)	44	NP	27.6	46.8	19.6	6.1	100	88	35	-	-
SS-1035	26 LT	16+00	3.0-4.5	A-7-5(11)	60	23	18.4	32.6	8.4	40.5	100	93	55	-	-
SS-1036	26 LT	16+00	8.0-9.5	A-2-5(0)	41	NP	35.5	45.8	10.6	8.1	100	88	25	-	-
SS-1037	26 LT	16+00	18.0-19.5	A-2-5(0)	42	NP	54.3	28.4	9.2	8.1	97	64	20	-	-
SS-1038	26 LT	16+00	33.0-34.5	A-2-5(0)	41	NP	51.9	30.2	9.8	8.1	93	62	21	-	-
SS-1039	7 RT	16+60	2.7-4.2	A-7-5(11)	64	17	23.7	21.9	13.9	40.5	100	84	59	-	-
SS-1040	7 RT	16+60	7.7-9.2	A-2-5(0)	50	NP	42.8	31.8	15.3	10.1	98	69	32	-	-
SS-1041	7 RT	16+60	17.7-19.2	A-5(0)	48	NP	36.7	28.0	19.1	16.2	100	73	41	-	-
SS-1042	7 RT	16+60	42.7-44.2	A-5(0)	42	NP	27.2	41.5	17.1	14.2	100	86	40	-	-
SS-1043	7 RT	16+60	47.7-49.2	A-2-4(0)	39	NP	46.6	33.6	13.7	6.1	92	63	23	-	-
SS-1044	26 LT	17+20	3.0-4.5	A-7-5(25)	63	25	10.7	12.6	26.0	50.7	100	92	82	-	-
SS-1045	26 LT	17+20	13.0-14.5	A-2-5(0)	57	NP	41.7	37.1	17.1	4.1	97	71	27	-	-
SS-1046	5 RT	18+00	3.0-4.5	A-7-5(3)	47	12	34.9	24.5	18.3	22.3	100	72	46	-	-
SS-1047	5 RT	18+00	8.0-9.5	A-2-4(0)	33	NP	51.5	25.7	14.7	8.1	100	62	28	-	-

PROJECT REFERENCE NO.	SHEET NO.
U-2524C	174



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ttwalker AT GE1221425

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RETAINING WALL 4

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-971	32 LT	10+50	3.5-5.0	A-7-6(11)	55	26	26.9	22.2	10.4	40.4	98	79	54	-	-
SS-972	32 LT	10+50	8.5-10.0	A-2-5(0)	44	NP	45.2	32.9	11.8	10.0	100	67	28	-	-
SS-963	11 LT	11+00	3.5-5.0	A-7-6(3)	41	14	36.8	24.7	16.3	22.2	100	76	43	-	-
SS-967	11 LT	11+00	23.5-25.0	A-5(0)	41	3	29.3	35.4	23.2	12.1	96	79	42	-	-
SS-961	30 LT	11+50	3.5-5.0	A-5(3)	43	10	25.5	32.0	14.3	28.3	100	84	48	-	-
SS-962	30 LT	11+50	8.5-10.0	A-2-4(0)	33	NP	49.6	30.6	11.6	8.1	84	56	21	-	-
SS-956	30 LT	12+50	3.5-5.0	A-2-4(0)	32	NP	45.3	30.9	11.6	12.1	95	67	28	-	-
SS-957	30 LT	12+50	8.5-10.0	A-2-4(0)	33	NP	47.1	31.5	11.2	10.1	81	56	22	-	-
SS-948	10 LT	13+00	3.5-4.5	A-7-5(5)	47	11	25.1	28.5	14.1	32.4	100	85	53	-	-
SS-949	10 LT	13+00	8.5-10.0	A-2-5(0)	42	NP	42.5	35.8	13.7	8.1	92	64	25	-	-
SS-952	10 LT	13+00	23.5-25.0	A-1-b(0)	30	NP	58.1	28.6	9.2	4.0	85	49	15	-	-
SS-943	30 LT	13+50	3.5-5.0	A-7-5(10)	50	20	18.0	28.9	18.7	34.4	100	90	59	-	-
SS-945	30 LT	13+50	13.5-14.0	A-1-b(0)	28	NP	60.9	28.5	6.6	4.0	85	48	13	-	-
SS-918	15 RT	14+00	3.5-5.0	A-7-5(12)	57	20	15.2	27.3	19.1	38.4	97	89	61	-	-
SS-919	15 RT	14+00	8.5-10.0	A-7-5(15)	59	28	21.4	23.5	14.7	40.4	100	87	60	-	-
SS-920	15 RT	14+00	13.5-15.0	A-5(1)	48	6	24.7	37.2	17.9	20.2	100	87	45	-	-
SS-923	15 RT	14+00	28.5-30.0	A-4(0)	38	NP	32.4	38.6	18.9	10.1	99	76	37	-	-
SS-930	41 LT	14+50	3.5-5.0	A-7-5(4)	47	13	29.3	29.7	16.7	24.3	100	82	47	-	-
SS-931	41 LT	14+50	8.5-10.0	A-5(3)	52	7	25.5	34.0	20.3	20.2	100	86	49	-	-
SS-932	41 LT	14+50	13.5-15.0	A-2-5(0)	42	NP	41.9	30.1	17.9	10.1	97	71	33	-	-
SS-933	41 LT	14+50	18.5-20.0	A-2-5(0)	44	3	34.6	38.0	17.3	10.1	100	78	35	-	-
SS-934	41 LT	14+50	23.5-25.0	A-2-4(0)	31	NP	44.5	34.8	12.6	8.1	95	68	25	-	-
SS-936	41 LT	14+50	33.5-35.0	A-2-4(0)	36	NP	40.4	39.2	14.3	6.1	94	73	26	-	-
SS-937	41 LT	14+50	38.5-40.0	A-2-4(0)	35	NP	45.5	34.0	14.5	6.1	85	60	23	-	-
SS-908	1 RT	15+00	3.5-5.0	A-7-5(10)	54	16	17.4	28.3	24.0	30.3	100	90	61	-	-
SS-909	1 RT	15+00	8.5-10.0	A-7-5(3)	41	11	27.9	27.9	24.0	20.2	100	82	50	-	-
SS-910	1 RT	15+00	13.5-15.0	A-2-4(0)	40	NP	50.6	31.3	14.1	4.0	100	63	24	-	-
SS-911	1 RT	15+00	18.5-20.0	A-5(3)	48	10	20.0	41.1	30.8	8.1	100	89	49	-	-
SS-912	1 RT	15+00	23.5-25.0	A-2-4(0)	36	NP	39.0	34.6	20.3	6.1	96	72	32	-	-
SS-913	1 RT	15+00	28.5-30.0	A-2-5(0)	43	NP	42.5	35.0	16.5	6.1	98	74	27	-	-
SS-914	1 RT	15+00	33.5-35.0	A-2-4(0)	36	NP	41.1	36.6	16.3	6.1	98	70	29	-	-
SS-898	46 LT	15+50	3.5-5.0	A-5(2)	43	10	35.8	25.3	20.7	18.2	95	72	42	-	-
SS-899	46 LT	15+50	8.5-10.0	A-2-4(0)	33	NP	52.8	27.3	13.9	6.1	97	59	24	-	-
SS-902	46 LT	15+50	23.5-25.0	A-2-5(0)	41	NP	34.8	41.9	19.3	4.0	95	74	28	-	-
SS-903	46 LT	15+50	28.5-30.0	A-2-4(0)	32	NP	46.5	27.9	19.5	6.1	98	83	32	-	-
SS-879	3 LT	16+00	3.5-5.0	A-4(0)	40	NP	11.7	58.4	19.7	10.1	100	96	40	-	-
SS-880	3 LT	16+00	8.5-10.0	A-5(0)	45	NP	14.2	57.8	21.9	6.1	98	94	36	-	-
SS-882	3 LT	16+00	18.5-20.0	A-5(0)	45	NP	28.9	41.9	21.1	8.1	100	84	37	-	-
SS-868	30 LT	16+50	3.5-5.0	A-7-5(8)	55	14	14.8	30.5	28.4	26.3	95	88	58	-	-
SS-869	30 LT	16+50	8.5-10.0	A-5(0)	57	NP	14.2	49.9	27.8	8.1	100	96	45	-	-
SS-870	30 LT	16+50	13.5-15.0	A-2-5(0)	46	NP	26.5	45.9	19.5	8.1	100	88	35	-	-
SS-871	30 LT	16+50	18.5-20.0	A-2-5(0)	54	NP	29.1	47.7	17.1	6.1	100	89	30	-	-
SS-872	30 LT	16+50	23.5-25.0	A-5(0)	52	NP	12.1	55.6	22.1	10.1	99	92	44	-	-
SS-873	30 LT	16+50	28.5-30.0	A-2-5(0)	47	NP	25.1	47.7	21.1	6.1	100	92	33	-	-
SS-874	30 LT	16+50	33.5-35.0	A-5(0)	61	NP	17.0	52.0	27.0	4.0	100	97	40	-	-
SS-875	30 LT	16+50	38.5-40.0	A-4(0)	38	NP	22.2	51.0	20.7	6.1	100	92	37	-	-
SS-857	3 LT	17+00	3.5-5.0	A-2-5(0)	53	NP	24.5	50.6	18.9	6.1	100	90	31	-	-
SS-858	3 LT	17+00	8.5-10.0	A-7-5(5)	59	11	13.8	42.9	31.2	12.1	100	98	51	-	-
SS-859	3 LT	17+00	12.5-15.0	A-5(0)	55	NP	18.8	41.1	30.0	10.1	99	92	48	-	-
SS-860	3 LT	17+00	18.5-20.0	A-5(0)	55	NP	17.6	47.9	26.4	8.1	100	90	45	-	-
SS-861	3 LT	17+00	23.5-25.0	A-2-4(0)	40	NP	43.9	35.4	12.6	8.1	97	69	26	-	-
SS-862	3 LT	17+00	28.5-30.0	A-2-5(0)	44	NP	26.7	49.5	17.7	6.1	99	88	31	-	-
SS-864	3 LT	17+00	38.5-40.0	A-2-4(0)	29	NP	38.8	40.0	15.1	6.1	98	77	27	-	-
SS-847	30 LT	17+50	3.5-5.0	A-7-5(5)	52	12	20.8	34.4	24.6	20.2	100	88	52	-	-

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-848	30 LT	17+50	8.5-10.0	A-5(0)	49	NP	21.4	53.0	19.5	6.1	100	89	36	-	-
SS-837	4 LT	18+00	3.5-5.0	A-7-5(5)	51	12	20.2	35.4	20.0	24.3	100	90	51	-	-
SS-838	4 LT	18+00	8.5-10.0	A-5(0)	54	NP	21.1	40.3	24.5	14.2	100	89	46	-	-
SS-839	4 LT	18+00	13.5-15.0	A-2-5(0)	41	NP	30.7	46.1	15.1	8.1	99	87	29	-	-
SS-840	4 LT	18+00	18.5-20.0	A-2-5(0)	45	NP	33.0	42.7	16.3	8.1	92	78	30	-	-
SS-818	21 LT	18+55	3.5-5.0	A-5(0)	52	NP	22.3	44.1	17.4	16.2	100	90	41	-	-
SS-819	21 LT	18+55	8.5-10.0	A-5(0)	41	NP	22.5	46.0	19.4	12.1	100	91	39	-	-
SS-824	21 LT	18+55	33.5-35.0	A-5(0)	44	NP	15.4	48.8	25.7	10.1	97	90	45	-	-
SS-808	CL	19+00	3.5-5.0	A-5(3)	53	10	28.5	27.9	17.2	26.3	99	81	47	-	-
SS-809	CL	19+00	8.5-10.0	A-5(5)	59	8	11.1	41.1	29.6	18.2	100	94	56	-	-
SS-811	CL	19+00	18.5-20.0	A-5(0)	53	NP	28.5	40.9	22.5	8.1	100	86	40	-	-
SS-798	34 LT	19+50	3.5-5.0	A-7-5(11)	54	14	13.6	27.3	26.7	32.4	100	91	67	-	-
SS-799	34 LT	19+50	8.5-10.0	A-5(8)	51	9	7.9	35.0	32.8	24.3	100	97	68	-	-
SS-800	34 LT	19+50	13.5-15.0	A-5(3)	52	5	12.6	39.3	23.9	24.3	100	96	54	-	-
SS-801	34 LT	19+50	18.5-20.0	A-2-5(0)	49	NP	31.2	41.9	16.8	10.1	100	88	33	-	-
SS-802	34 LT	19+50	23.5-25.0	A-2-5(0)	45	NP	16.8	59.3	15.8	8.1	100	95	33	-	-
SS-804	34 LT	19+50	33.5-35.0	A-2-4(0)	38	NP	30.5	47.0	15.5	7.1	100	86	31	-	-
SS-806	34 LT	19+50	43.5-45.0	A-2-4(0)	30	NP	32.2	44.1	16.6	7.1	100	84	32	-	-
SS-780	5 RT	19+95	3.5-5.0	A-7-5(15)	59	18	8.5	28.9	24.1	38.5	100	96	71	-	-
SS-781	5 RT	19+95	8.5-10.0	A-5(1)	45	5	22.7	38.5	22.7	16.2	98	86	45	-	-
SS-782	5 RT	19+95	13.5-15.0	A-5(0)	53	NP	26.1	42.1	19.6	12.1	90	74	36	-	-
SS-783	5 RT	19+95	18.5-20.0	A-5(0)	50	NP	19.4	51.6	18.8	10.1	99	90	37	-	-
SS-784	5 RT	19+95	23.5-25.0	A-5(0)	51	NP	10.5	57.1	20.2	12.1	100	96	42	-	-
SS-785	5 RT	19+95	28.5-30.0	A-5(0)	41	NP	13.4	46.4	28.1	12.1	100	93	52	-	-
SS-769	15 LT	20+50	3.5-5.0	A-7-5(21)	71	25	8.3	26.9	16.2	48.6	100	97	71	-	-
SS-770	15 LT	20+50	8.5-10.0	A-5(5)	55	9	9.1	44.9	21.7	24.3	100	97	55	-	-
SS-771	15 LT	20+50	13.5-15.0	A-5(3)	52	5	13.4	42.7	29.8	14.2	100	95	54	-	-
SS-772	15 LT	20+50	18.5-20.0	A-5(0)	49	NP	17.6	46.4	23.9	12.1	99	91	46	-	-
SS-777	15 LT	20+50	43.5-45.0	A-2-4(0)	35	NP	38.5	41.4	13.1	7.1	98	77	26	-	-
SS-757	8 RT	21+00	3.5-5.0	A-7-5(14)	68	15	12.2	22.9	20.4	44.6	100	94	69	-	-
SS-758	8 RT	21+00	8.5-10.0	A-7-5(13)	70	19	8.7	35.9	27.1	28.4	100	99	61	-	-
SS-759	8 RT	21+00	13.5-15.0	A-7-5(9)	56	12	6.5	40.7	36.6	16.2	100	98	63	-	-
SS-760	8 RT	21+00	18.5-20.0	A-5(2)	57	NP	6.3	51.0	28.5	14.2	100	98	54	-	-
SS-763	8 RT	21+00	33.5-35.0	A-5(0)	48	NP	14.8	55.3	21.9	8.1	100	96	41	-	-
SS-745	23 LT	21+43	3.5-5.0	A-5(5)	62	9	19.9	33.8	15.9	30.4	99	90	51	-	-
SS-746	23 LT	21+43	8.5-10.0	A-2-4(0)	40	NP	40.5	38.9	12.5	8.1	100	79	25	-	-
SS-751	23 LT	21+43	33.5-35.0	A-4(0)	37	NP	18.4	46.8	28.7	6.1	100	94	45	-	-
SS-732	12 RT	22+00	3.5-5.0	A-7-5(25)	79	25	8.9	21.3	25.2	44.6	100	94	75	-	-
SS-733	12 RT	22+00	8.5-10.0	A-5(0)	52	NP	18.4	45.6	21.8	14.2	100	92	44	-	-
SS-735	12 RT	22+00	18.5-20.0	A-5(0)	52	NP	15.2	49.4	27.3	8.1	92	86	41	-	-
SS-736	12 RT	22+00	23.5-25.0	A-2-5(0)	47	NP	28.6	48.0	17.3	6.1	100	88	31	-	-
SS-740	12 RT	22+00	43.5-45.0	A-5(0)	43	NP	24.5	45.8	25.6	4.1	98	84	36	-	-
SS-741	12 RT	22+00	48.5-50.0	A-5(0)	43	NP	22.3	45.8	25.8	6.1	97	87	40	-	-
SS-712	20 LT	22+50	3.5-5.0	A-7-5(22)	69	23	6.9	21.7	26.8	44.6	100	97	76	-	-
SS-713	20 LT	22+50	8.5-10.0	A-5(6)	54	9	13.6	34.9	27.3	24.3	97	90	57	-	-
SS-714	20 LT	22+50	13.5-15.0	A-5(0)	58	NP	23.3	42.6	22.0	12.2	100	90	40	-	-
SS-716	20 LT	22+50	0.0-0.0	A-5(3)	49	2	12.0	33.6	40.2	14.2	98	93	64	-	-
SS-717	20 LT	22+50	28.5-30.0	A-2-5(0)	44	NP	38.9	42.1	14.9	4.1	100	81	24	-	-
SS-689	1 LT	23+00	3.5-5.0	A-5(0)	46	NP	14.5	42.4	18.5	24.6	100	96	50	-	-
SS-690	1 LT	23+00	8.5-10.0	A-5(0)	51	NP	13.1	55.5	21.2	10.2	100	97	40	-	-
SS-693	1 LT	23+00	23.5-25.0	A-2-4(0)	35	NP	44.6	32.8	12.4	10.2	87	61	24	-	-
SS-695	1 LT	23+00	33.5-35.0	A-2-5(0)	52	NP	31.7	42.8	19.3	6.1	100	86	32	-	-
SS-697	1 LT	23+00	43.5-45.0	A-2-4(0)	30	NP	41.8	39.7	10.3	8.2	96	72	25	-	-
SS-698	1 LT	23+00	48.5-50.0	A-2-4(0)	35	NP	26.8	58.8	8.3	6.1	100	90	22	-	-

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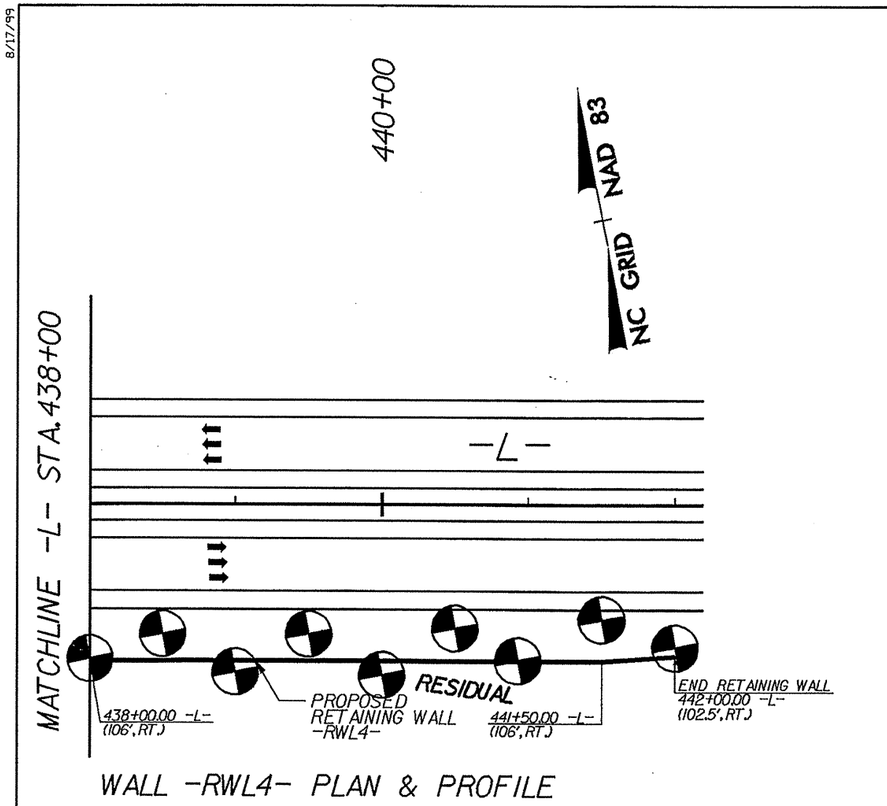
PROJECT REFERENCE NO.	SHEET NO.
U-2524C	176



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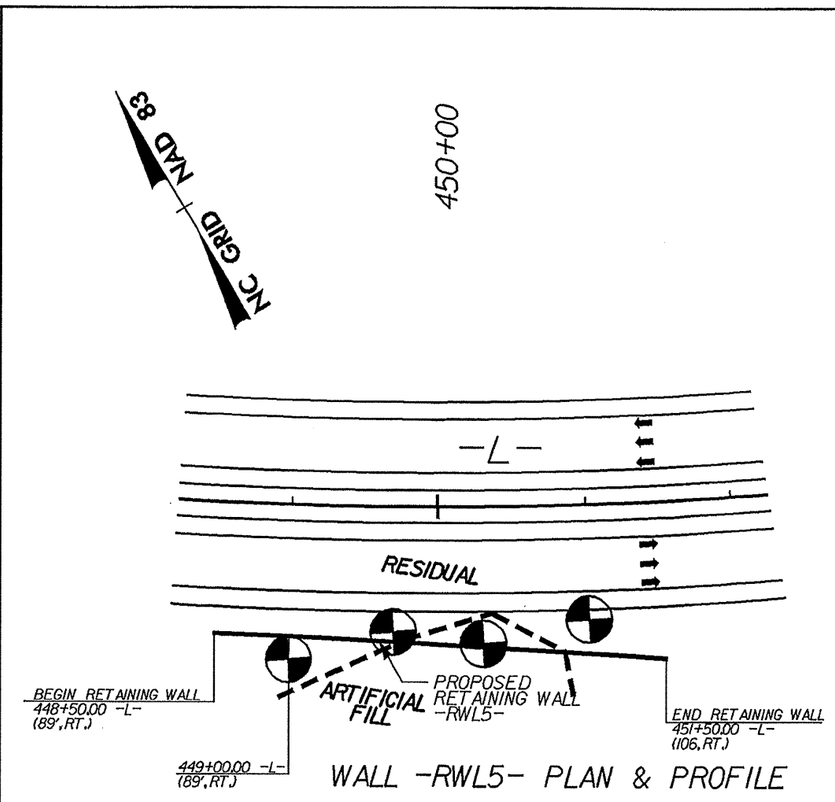

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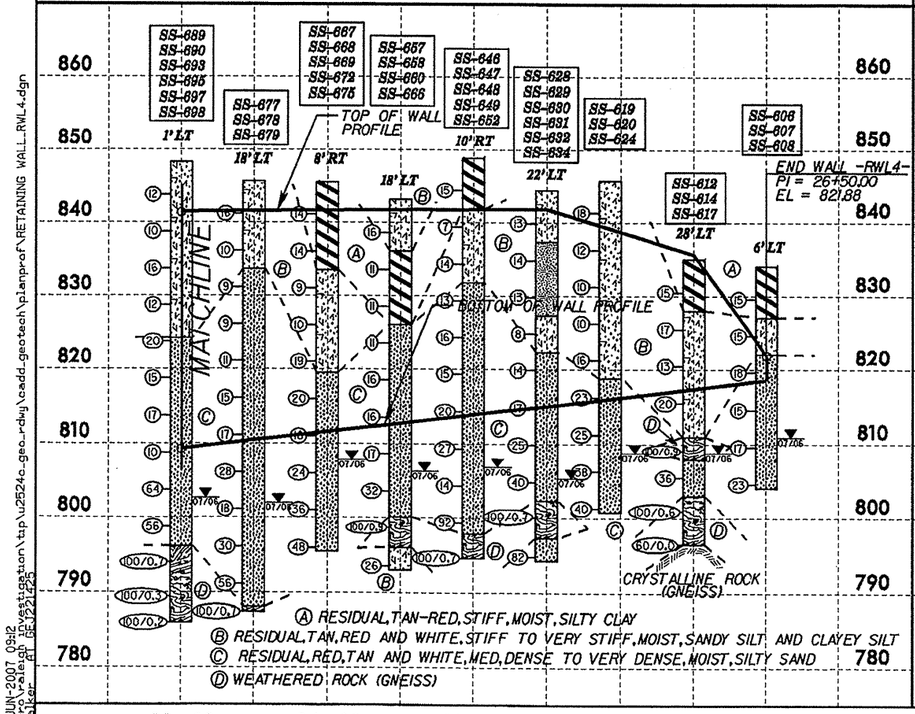

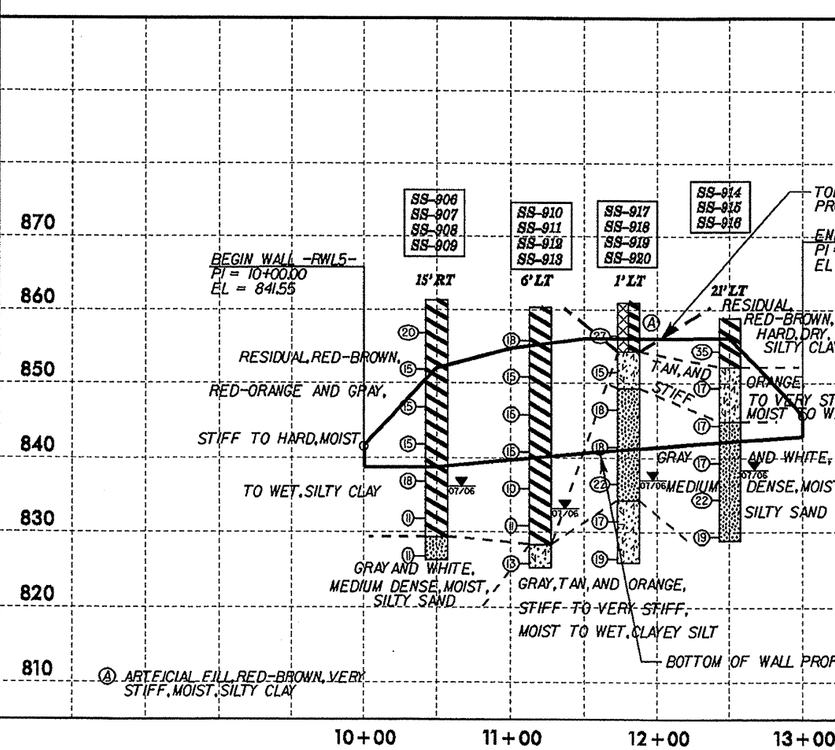

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PROJECT REFERENCE NO.	SHEET NO.
U-2524C	177

RETAINING WALL 4

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-689	1 LT	23+00	3.5-5.0	A-5(0)	46	NP	14.5	42.4	18.5	24.6	100	96	50	-	-
SS-690	1 LT	23+00	8.5-10.0	A-5(0)	51	NP	13.1	55.5	21.2	10.2	100	97	40	-	-
SS-693	1 LT	23+00	23.5-25.0	A-2-4(0)	35	NP	44.6	32.8	12.4	10.2	87	61	24	-	-
SS-695	1 LT	23+00	33.5-35.0	A-2-5(0)	52	NP	31.7	42.8	19.3	6.1	100	86	32	-	-
SS-697	1 LT	23+00	43.5-45.0	A-2-4(0)	30	NP	41.8	39.7	10.3	8.2	96	72	25	-	-
SS-698	1 LT	23+00	48.5-50.0	A-2-4(0)	35	NP	26.8	58.8	8.3	6.1	100	90	22	-	-
SS-677	18 LT	23+50	3.5-5.0	A-5(0)	46	NP	25.0	36.0	12.4	26.6	100	86	46	-	-
SS-678	18 LT	23+50	8.5-10.0	A-5(0)	44	NP	18.0	47.9	19.8	14.3	100	93	43	-	-
SS-679	18 LT	23+50	13.5-15.0	A-2-5(0)	46	NP	30.7	46.7	14.4	8.2	99	86	28	-	-
SS-667	8 RT	24+00	3.5-5.0	A-7-5(15)	64	21	5.9	37.5	19.8	36.8	100	98	64	-	-
SS-668	8 RT	24+00	8.5-10.0	A-7-5(6)	59	11	12.9	41.1	23.4	22.5	100	94	54	-	-
SS-669	8 RT	24+00	13.5-15.0	A-5(0)	58	NP	19.9	48.9	21.0	10.2	100	93	38	-	-
SS-672	8 RT	24+00	28.5-30.0	A-2-4(0)	39	NP	37.5	43.6	10.7	8.2	99	78	26	-	-
SS-675	8 RT	24+00	43.5-45.0	A-2-4(0)	35	NP	33.2	48.1	12.6	6.1	96	82	25	-	-
SS-657	18 LT	24+50	3.5-5.0	A-5(5)	58	9	19.0	32.5	17.7	30.7	100	91	53	-	-
SS-658	18 LT	24+50	8.5-10.0	A-7-5(9)	64	19	17.2	35.8	20.4	26.6	100	89	53	-	-
SS-660	18 LT	24+50	18.5-20.0	A-2-5(0)	55	NP	59.6	14.5	17.7	8.2	100	68	27	-	-
SS-666	18 LT	24+50	48.5-50.0	A-5(11)	45	8	18.8	47.7	25.3	8.2	100	92	44	-	-
SS-646	10 RT	25+00	3.5-5.0	A-7-5(6)	55	15	17.4	38.5	15.5	28.7	100	92	50	-	-
SS-647	10 RT	25+00	8.5-10.0	A-5(5)	57	8	10.0	42.8	26.7	20.5	100	97	56	-	-
SS-648	10 RT	25+00	12.5-15.0	A-5(9)	54	10	9.0	33.6	34.9	22.5	100	97	67	-	-
SS-649	10 RT	25+00	18.5-20.0	A-2-5(0)	51	NP	25.6	48.3	20.0	6.1	100	88	34	-	-
SS-652	10 RT	25+00	33.5-35.0	A-2-4(0)	34	NP	36.6	37.9	17.3	8.2	99	80	33	-	-
SS-628	22 LT	25+50	3.5-5.0	A-5(4)	55	9	27.2	25.9	18.5	28.4	100	86	51	-	-
SS-629	22 LT	25+50	8.5-10.0	A-4(0)	39	3	18.8	45.6	25.3	10.2	100	92	46	-	-
SS-630	22 LT	25+50	13.5-15.0	A-4(0)	39	6	27.4	34.4	24.0	14.2	93	77	42	-	-
SS-631	22 LT	25+50	18.5-20.0	A-5(0)	51	7	26.8	42.0	23.0	8.2	93	80	37	-	-
SS-632	22 LT	25+50	23.5-25.0	A-2-5(0)	45	NP	31.9	45.0	16.9	6.1	100	81	31	-	-
SS-634	22 LT	25+50	33.5-35.0	A-2-4(0)	40	NP	38.7	42.0	13.2	6.1	100	78	26	-	-
SS-619	CL	25+93	3.5-5.0	A-5(7)	53	8	12.4	28.6	28.7	30.4	100	94	64	-	-
SS-620	CL	25+93	8.5-10.0	A-5(2)	52	8	25.3	36.1	20.4	18.2	100	87	44	-	-
SS-624	CL	25+93	28.5-30.0	A-2-5(0)	42	NP	32.2	48.2	13.5	6.1	100	85	27	-	-
SS-612	28 LT	26+50	3.5-5.0	A-7-5(11)	41	11	25.9	41.1	8.6	24.3	100	88	39	-	-
SS-614	28 LT	26+50	13.5-15.0	A-5(0)	59	NP	15.2	49.8	28.9	6.1	100	94	45	-	-
SS-617	28 LT	26+50	28.5-30.0	A-2-4(0)	35	NP	33.4	53.1	9.4	4.1	99	85	21	-	-
SS-606	6 LT	27+00	3.5-5.0	A-7-5(26)	68	31	9.1	19.7	22.6	48.6	100	95	75	-	-
SS-607	6 LT	27+00	8.5-10.0	A-5(11)	49	5	27.6	34.2	17.9	20.3	100	87	43	-	-
SS-608	6 LT	27+00	13.5-15.0	A-2-5(0)	41	NP	45.6	41.5	8.8	4.1	100	77	18	-	-

RETAINING WALL 5

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-906	15 RT	10+50	3.5-5.0	A-7-5(8)	61	17	12.8	40.1	12.5	34.6	100	96	53	-	-
SS-907	15 RT	10+50	13.5-15.0	A-7-5(8)	59	16	14.0	40.5	21.1	24.4	100	94	54	-	-
SS-908	15 RT	10+50	18.5-20.0	A-7-5(11)	50	12	33.2	34.0	18.6	14.2	96	74	38	-	-
SS-909	15 RT	10+50	33.5-35.0	A-2-5(0)	51	4	29.7	41.3	16.8	12.2	96	81	35	-	-
SS-910	6 LT	11+20	3.5-5.0	A-7-5(17)	64	23	18.5	19.1	23.7	38.7	100	88	67	-	-
SS-911	6 LT	11+20	13.5-15.0	A-7-5(8)	59	15	14.2	37.6	23.7	24.4	100	97	55	-	-
SS-912	6 LT	11+20	23.5-25.0	A-7-5(7)	59	12	20.8	32.3	28.6	18.3	100	87	55	-	-
SS-913	6 LT	11+20	33.5-35.0	A-5(3)	50	6	22.6	29.9	33.3	14.2	99	86	54	-	-
SS-917	1 LT	11+80	3.5-5.0	A-7-5(8)	60	14	22.2	26.4	14.8	36.6	100	86	56	-	-
SS-918	1 LT	11+80	8.5-10.0	A-5(11)	48	7	31.7	29.7	18.2	20.3	98	77	44	-	-
SS-919	1 LT	11+80	13.5-15.0	A-2-5(0)	42	NP	33.4	38.3	12.1	16.3	96	78	34	-	-
SS-920	1 LT	11+80	28.5-30.0	A-5(2)	44	10	34.4	25.0	26.3	14.2	90	65	43	-	-
SS-914	21 LT	12+50	3.5-5.0	A-7-5(8)	56	16	23.2	24.2	16.0	36.6	98	83	56	-	-
SS-915	21 LT	12+50	8.5-10.0	A-5(2)	53	7	29.5	29.5	22.7	18.3	98	79	46	-	-
SS-916	21 LT	12+50	13.5-15.0	A-2-5(0)	43	NP	43.5	26.7	15.6	14.2	95	64	34	-	-

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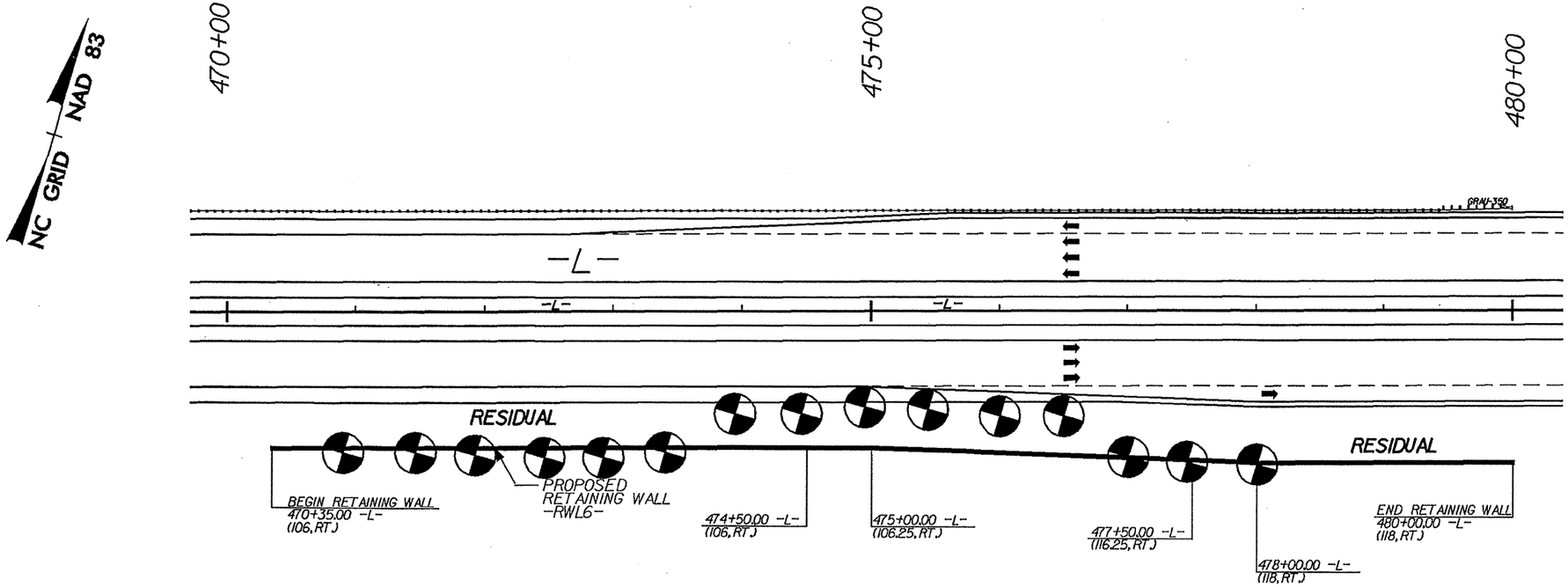
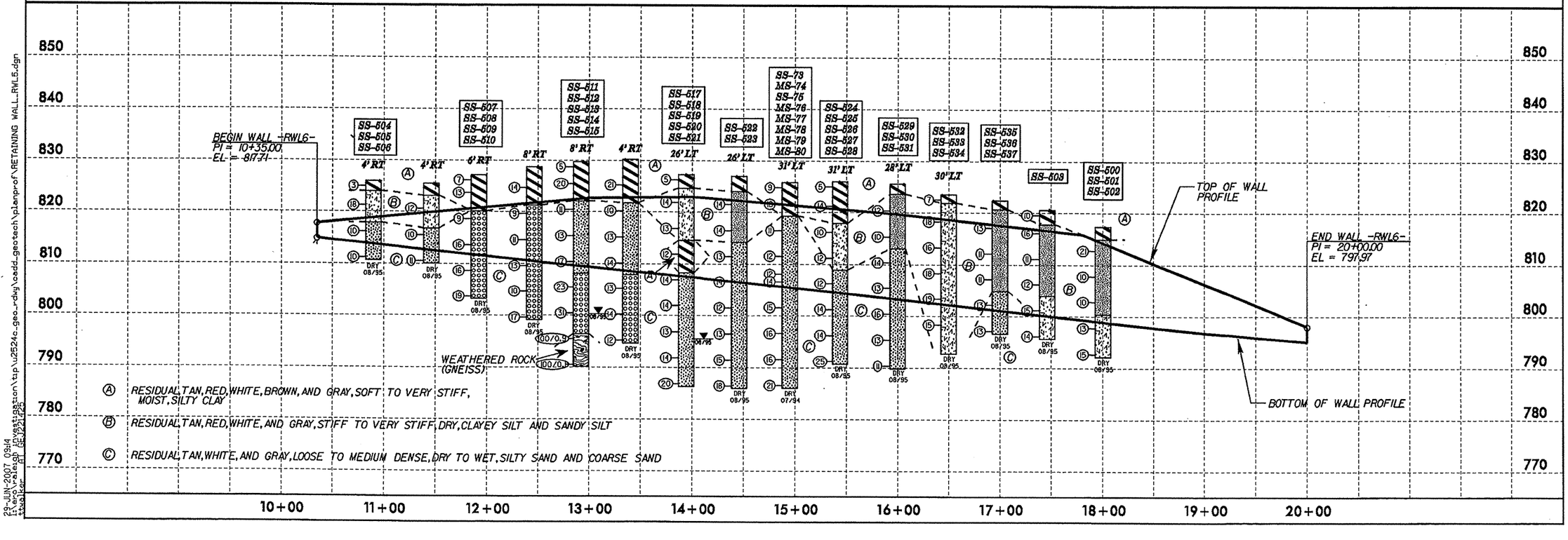
PROJECT REFERENCE NO.	SHEET NO.
U-2524C	178



WALL -RWL6- PLAN & PROFILE



Ⓐ RESIDUAL, TAN, RED, WHITE, BROWN, AND GRAY, SOFT TO VERY STIFF, MOIST, SILTY CLAY

Ⓑ RESIDUAL, TAN, RED, WHITE, AND GRAY, STIFF TO VERY STIFF, DRY, CLAYEY SILT AND SANDY SILT

Ⓒ RESIDUAL, TAN, WHITE, AND GRAY, LOOSE TO MEDIUM DENSE, DRY TO WET, SILTY SAND AND COARSE SAND

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RETAINING WALL 6

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-504	4 RT	10+90	0.0-1.5	A-7-6(9)	45	18	22.2	20.0	19.4	38.4	96	80	58	-	-
SS-505	4 RT	10+90	3.7-5.2	A-5(0)	42	NP	34.7	28.1	19.0	18.2	97	74	40	-	-
SS-506	4 RT	10+90	8.7-10.2	A-2-5(0)	41	NP	41.8	30.7	21.4	6.1	81	58	26	-	-
SS-507	6 RT	11+92	0.0-1.5	A-7-5(15)	54	21	17.8	15.8	18.0	48.5	100	88	69	-	-
SS-508	6 RT	11+92	2.5-4.0	A-7-5(4)	51	13	29.1	26.7	22.0	22.2	97	77	47	-	-
SS-509	6 RT	11+92	7.5-9.0	A-1-b(0)	43	NP	48.9	25.5	21.6	4.0	77	48	23	-	-
SS-510	6 RT	11+92	17.5-19.0	A-1-b(0)	37	NP	50.3	23.8	19.8	6.1	73	45	22	-	-
SS-511	8 RT	12+92	0.0-1.5	A-7-6(11)	42	18	19.8	16.0	17.8	46.5	100	86	67	-	-
SS-512	8 RT	12+92	3.3-4.8	A-7-5(14)	56	21	17.8	22.6	29.3	30.3	100	87	64	-	-
SS-513	8 RT	12+92	8.3-9.8	A-2-5(0)	44	NP	40.8	28.1	23.0	8.1	96	68	33	-	-
SS-514	8 RT	12+92	18.3-19.8	A-2-4(0)	29	NP	40.4	33.5	22.0	4.0	77	58	24	-	-
SS-515	8 RT	12+92	23.3-24.8	A-1-b(0)	32	NP	44.2	28.9	22.8	4.0	73	49	23	-	-
SS-517	26 LT	13+94	0.0-1.5	A-7-6(15)	49	25	18.4	17.0	18.2	46.5	97	84	65	-	-
SS-518	26 LT	13+94	4.4-5.9	A-5(0)	42	NP	34.5	31.1	22.2	12.1	97	76	38	-	-
SS-519	26 LT	13+94	14.4-15.9	A-7-5(5)	48	14	28.5	25.1	32.3	14.1	98	79	50	-	-
SS-520	26 LT	13+94	19.4-20.9	A-2-5(0)	41	NP	38.6	29.5	23.8	8.1	89	66	31	-	-
SS-521	26 LT	13+94	24.4-25.9	A-4(0)	38	NP	41.4	28.7	23.8	6.1	81	55	28	-	-
SS-522	26 LT	14+46	4.5-6.0	A-4(0)	36	NP	36.8	25.5	29.7	8.1	95	70	40	-	-
SS-523	26 LT	14+46	14.5-16.0	A-2-5(0)	44	NP	38.0	28.5	25.5	8.1	92	69	35	-	-
SS-73	31 LT	14+96	3.2-4.7	A-7-5(7)	54	18	31.0	23.0	20.0	26.0	100	80	50	-	-
MS-74	31 LT	14+96	8.2-9.7											20.2	-
SS-75	31 LT	14+96	13.2-14.7	A-2-5(0)	41	NP	46.0	28.0	18.0	8.0	90	61	21	-	-
MS-76	31 LT	14+96	18.2-19.7											20.6	-
MS-77	31 LT	14+96	23.2-24.7											23.9	-
MS-78	31 LT	14+96	28.2-29.7											24.9	-
MS-79	31 LT	14+96	33.2-34.7											26.4	-
MS-80	31 LT	14+96	38.2-39.7											22.9	-
SS-524	31 LT	15+44	0.0-1.5	A-7-6(11)	43	19	20.4	15.8	19.4	44.4	100	86	66	-	-
SS-525	31 LT	15+44	3.7-5.2	A-7-5(5)	51	21	27.1	24.8	29.9	18.2	100	82	51	-	-
SS-526	31 LT	15+44	8.7-10.2	A-5(0)	42	NP	34.5	24.4	30.9	10.1	96	72	42	-	-
SS-527	31 LT	15+44	18.7-20.2	A-2-5(0)	41	NP	38.8	25.9	27.3	8.1	84	61	33	-	-
SS-528	31 LT	15+44	28.7-30.2	A-2-4(0)	40	NP	37.0	31.1	25.9	6.1	82	62	30	-	-
SS-529	28 LT	16+00	4.2-5.7	A-4(0)	38	NP	38.2	27.3	24.4	10.1	100	73	39	-	-
SS-530	28 LT	16+00	14.2-15.7	A-2-5(0)	45	NP	39.0	26.1	26.9	8.1	89	64	34	-	-
SS-531	28 LT	16+00	24.2-25.7	A-2-4(0)	38	NP	39.4	27.3	25.3	8.1	79	57	30	-	-
SS-532	30 LT	16+50	0.0-1.5	A-7-5(22)	61	28	16.0	13.1	16.4	54.5	100	90	73	-	-
SS-533	30 LT	16+50	4.2-5.7	A-5(0)	41	NP	34.9	25.9	25.1	14.1	100	74	43	-	-
SS-534	30 LT	16+50	14.2-15.7	A-5(0)	43	NP	35.4	27.1	27.5	10.1	90	68	38	-	-
SS-535	CL	17+00	4.2-5.7	A-4(0)	40	NP	31.1	25.3	31.5	12.1	100	80	48	-	-
SS-536	CL	17+00	9.2-10.2	A-5(0)	45	NP	33.9	30.9	27.1	8.1	98	77	39	-	-
SS-537	CL	17+00	19.2-20.7	A-2-4(0)	37	NP	40.8	28.9	24.2	6.1	96	68	33	-	-
SS-503	CL	17+46	0.0-1.5	A-7-5(31)	75	36	13.3	13.9	16.2	56.6	100	92	75	-	-
SS-500	CL	18+00	3.7-5.2	A-4(0)	39	4	28.9	33.1	25.9	12.1	100	80	43	-	-
SS-501	CL	18+00	8.7-10.2	A-4(0)	39	7	34.3	32.9	26.7	6.1	100	79	38	-	-
SS-502	CL	18+00	18.7-20.2	A-5(0)	41	NP	36.0	29.1	28.9	6.1	96	73	38	-	-

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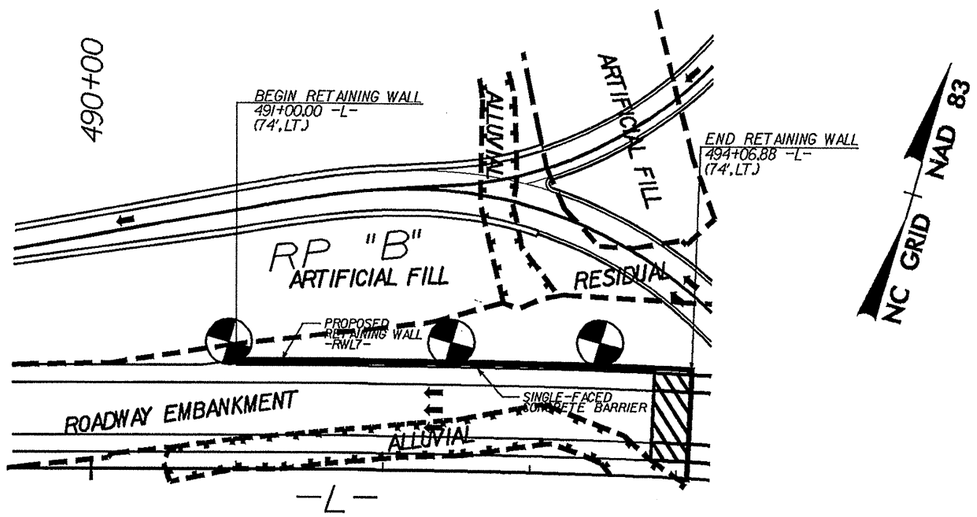
PROJECT REFERENCE NO.	SHEET NO.
U-2524C	180



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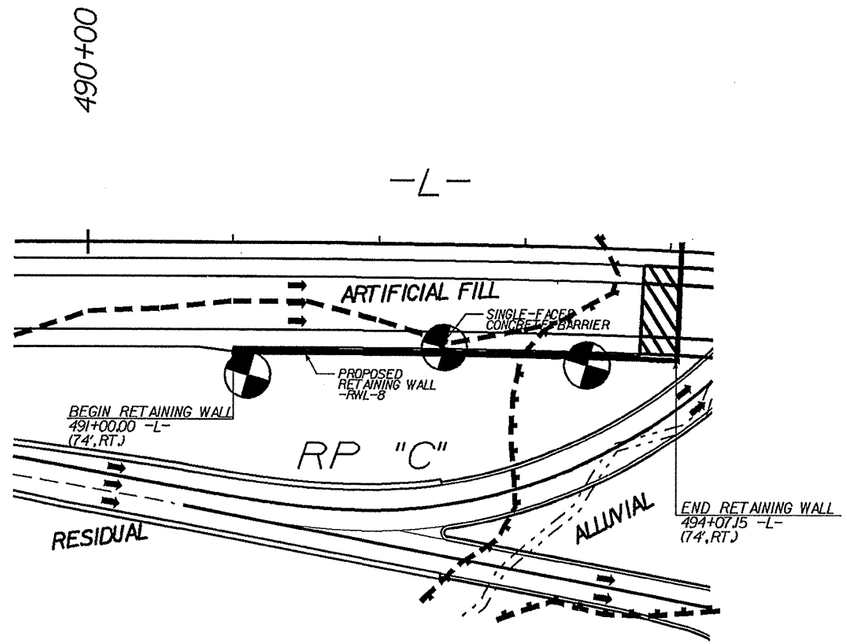

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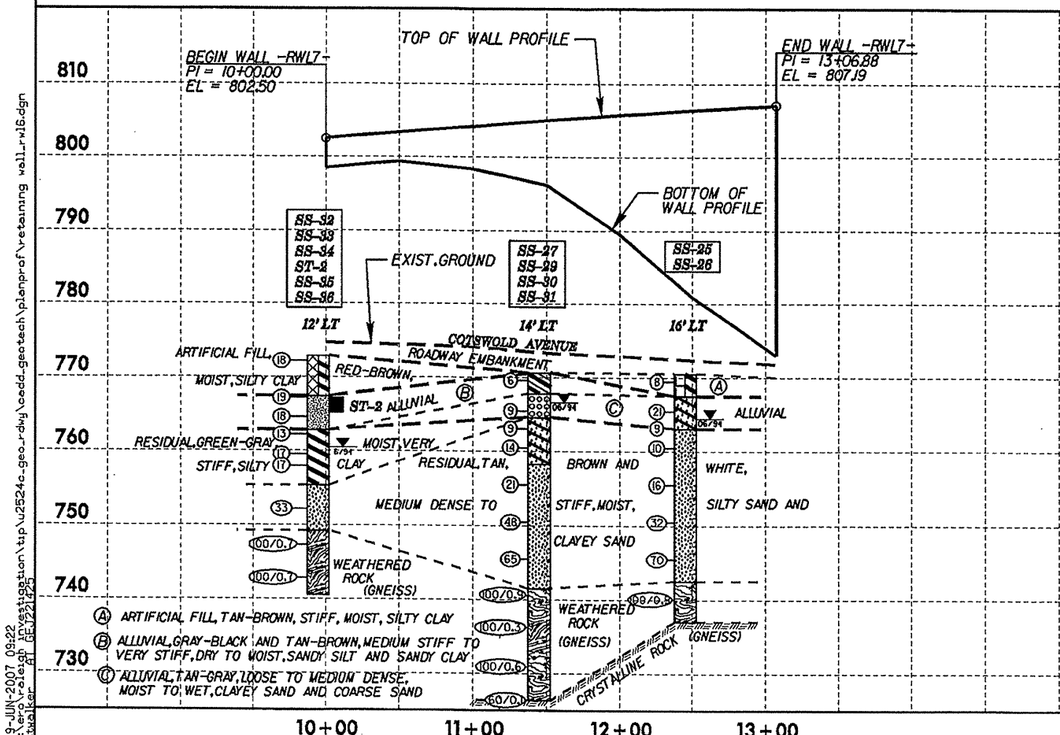

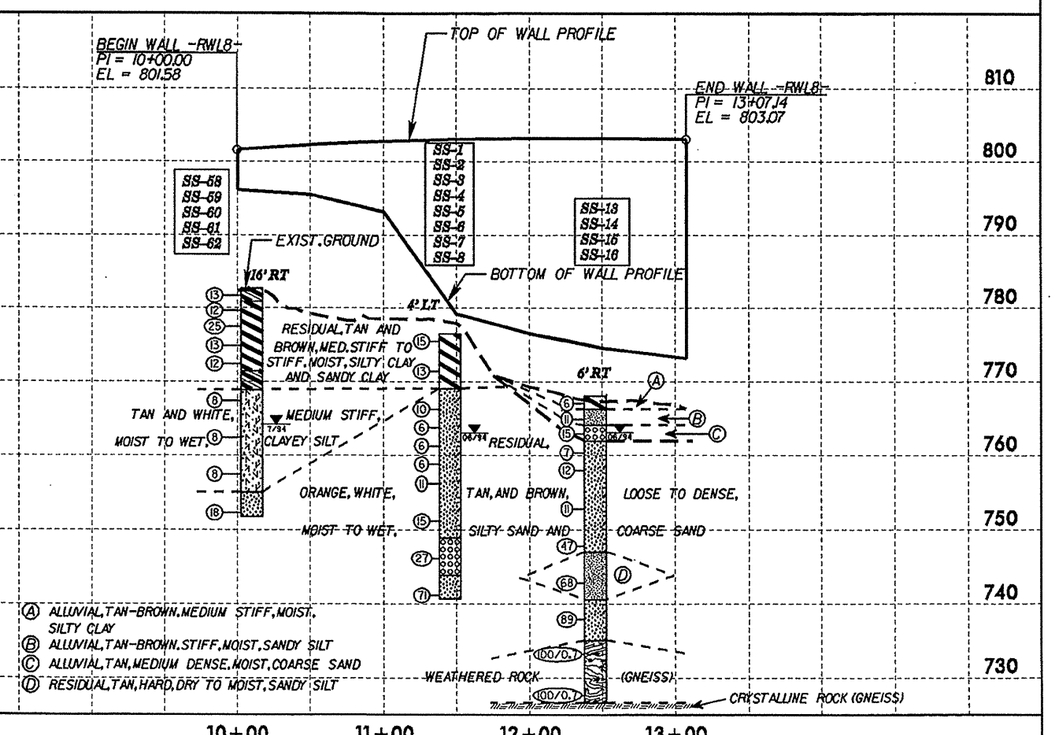

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RETAINING WALL 7

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-32	12 LT	9+95	0.1-1.5	A-7-6(14)	51	29	20.0	23.0	14.0	43.0	100	89	60		-
SS-33	12 LT	9+95	4.0-5.5	A-7-5(16)	60	27	19.0	20.0	22.0	39.0	100	88	65		-
SS-34	12 LT	9+95	9.0-10.5	A-4(2)	25	10	27.0	30.0	19.0	24.0	97	82	46		-
ST-2	12 LT	9+95	10.0-12.0	A-4(2)	24	9	26.0	30.0	15.0	29.0	91	78	44	22.6	-
SS-35	12 LT	9+95	14.0-15.5	A-7-6(5)	44	16	24.0	26.0	28.0	22.0	88	73	50		-
SS-36	12 LT	9+95	24.0-25.5	A-2-4(0)	31	NP	43.0	36.0	19.0	2.0	82	60	21		-
SS-27	14 LT	11+45	0.4-1.5	A-6(4)	31	11	23.0	28.0	27.0	22.0	100	87	54		-
SS-29	14 LT	11+45	4.1-5.6	A-1-b(0)	21	NP	56.0	32.0	5.0	7.0	79	50	11		-
SS-30	14 LT	11+45	6.5-8.0	A-2-6(0)	39	11	41.0	31.0	22.0	6.0	74	52	25		-
SS-31	14 LT	11+45	14.1-15.6	A-2-4(0)	37	5	43.0	31.0	22.0	4.0	71	47	26		-
SS-25	16 LT	12+45	4.0-5.5	A-2-6(0)	27	11	35.0	31.0	16.0	18.0	93	75	35		-
SS-26	16 LT	12+45	9.0-10.5	A-2-4(0)	38	8	40.0	35.0	21.0	4.0	78	58	24	-	-

RETAINING WALL 8

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-58	16 RT	10+10	0.0-1.5	A-6(10)	39	19	15.0	25.0	21.0	39.0	100	92	66	-	-
SS-59	16 RT	10+10	2.1-3.6	A-7-6(11)	42	21	13.0	25.0	19.0	43.0	100	93	68	21.3	-
SS-60	16 RT	10+10	4.3-5.8	A-7-6(9)	44	18	9.0	38.0	20.0	33.0	100	98	62	-	-
SS-61	16 RT	10+10	6.8-8.3	A-7-5(5)	46	11	28.0	26.0	30.0	16.0	99	81	52		-
SS-62	16 RT	10+10	14.3-15.8	A-5(2)	47	7	31.0	30.0	33.0	6.0	93	72	45	30.5	-
SS-1	4 LT	11+45	0.0-1.5	A-7-6(5)	47	24	26.0	20.0	17.0	37.0	95	78	55	-	-
SS-2	4 LT	11+45	4.1-5.6	A-7-5(4)	49	14	35.0	24.0	23.0	18.0	98	75	44	-	-
SS-3	4 LT	11+45	9.2-10.7	A-2-5(0)	48	10	34.0	26.0	26.0	14.0	78	60	35	25.1	-
SS-4	4 LT	11+45	11.7-13.2	A-2-5(0)	44	4	37.0	33.0	24.0	6.0	90	68	33	34.3	-
SS-5	4 LT	11+45	14.2-15.7											37.0	
SS-6	4 LT	11+45	16.7-18.2	A-2-5(0)	41	NP	40.0	31.0	23.0	6.0	92	66	33	37.3	-
SS-7	4 LT	11+45	29.3-30.8	A-1-b(0)	30	NP	45.0	33.0	16.0	6.0	71	49	20	-	-
SS-8	4 LT	11+45	34.3-35.8	A-1-b(0)	30	NP	38.0	36.0	22.0	4.0	78	58	26		-
SS-13	6 RT	12+45	2.1-3.6	A-4(8)	31	10	7.0	26.0	39.0	28.0	100	97	75	-	-
SS-14	6 RT	12+45	4.6-5.6	A-1-b(0)	23	5	58.0	22.0	8.0	12.0	68	38	16	-	-
SS-15	6 RT	12+45	14.2-15.7	A-2-4(0)	36	8	41.0	28.0	25.0	6.0	89	62	33	-	-
SS-16	6 RT	12+45	24.2-25.7	A-4(1)	34	6	29.0	39.0	26.0	6.0	100	84	39	-	-

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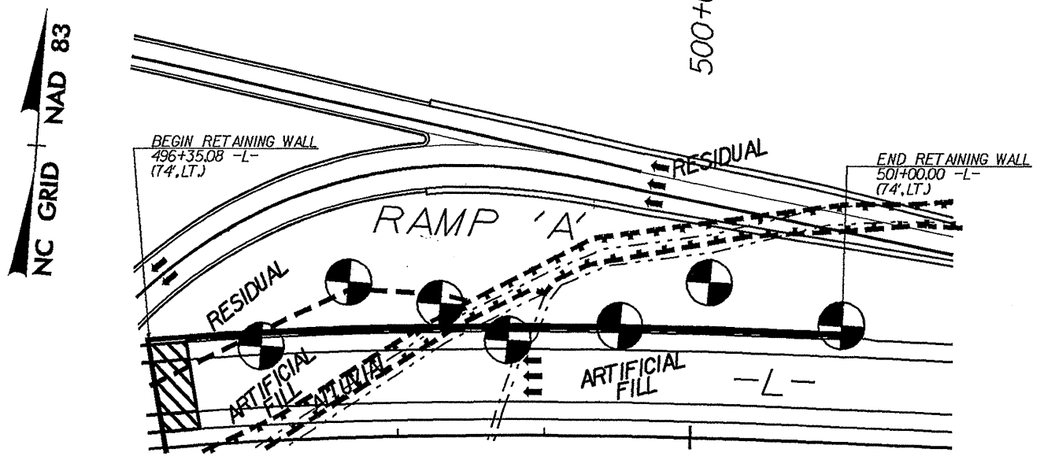
PROJECT REFERENCE NO.	SHEET NO.
U-2524C	182



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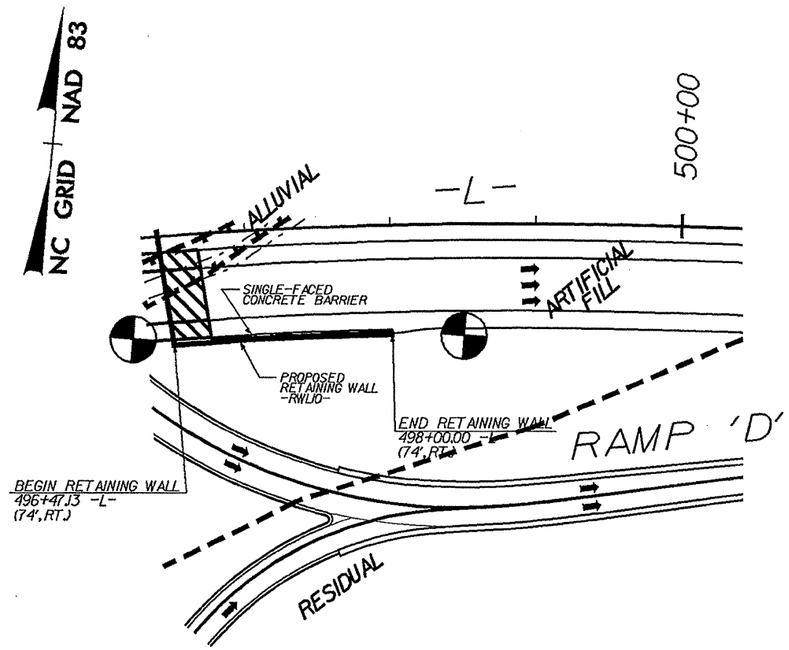

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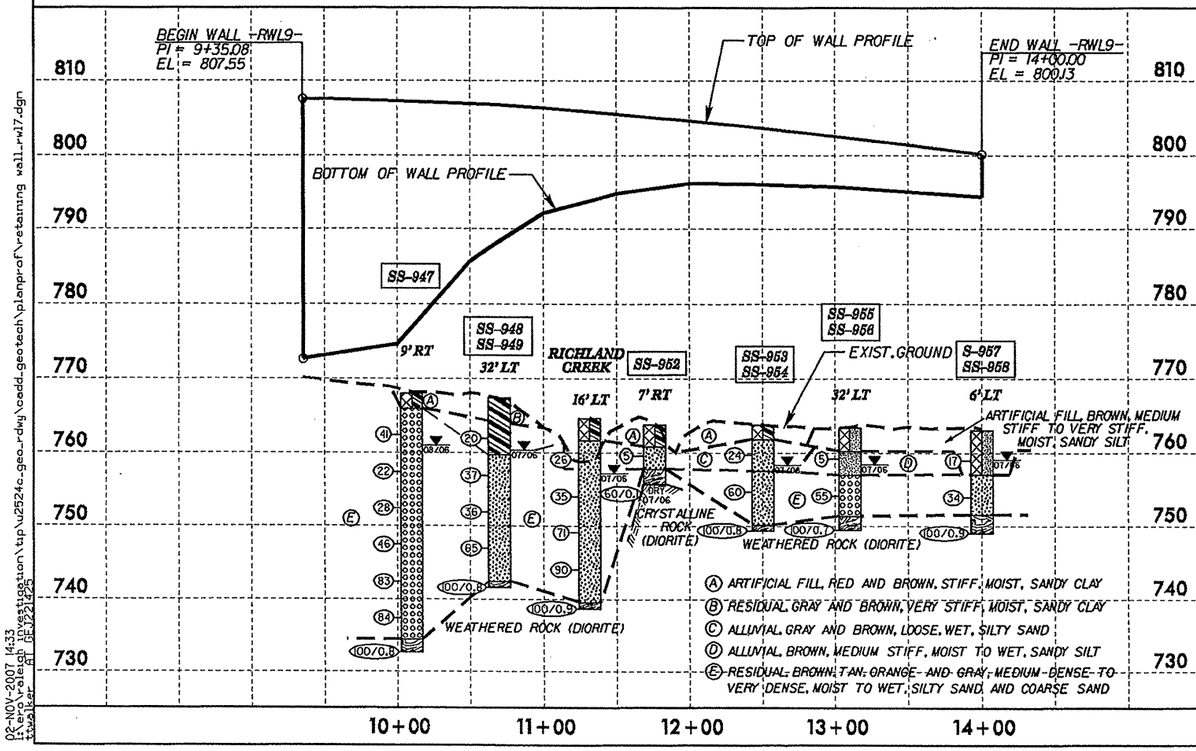

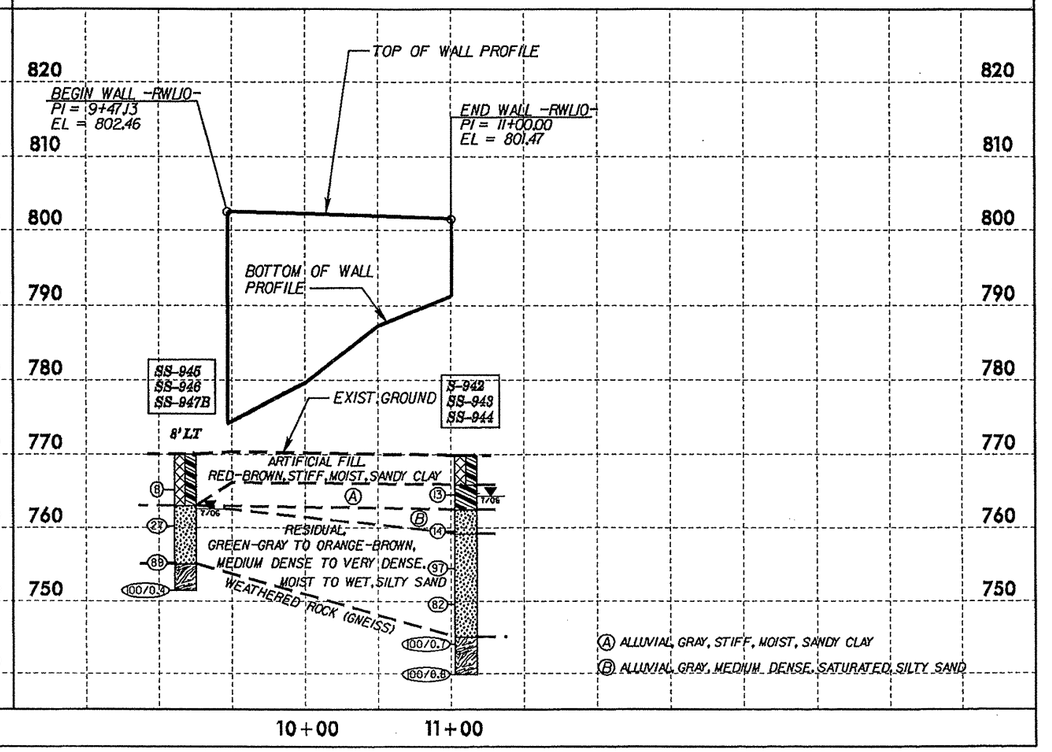

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RETAINING WALL 9

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-947	9' RT	10+10	4.5-6.0	A-1-b(0)	25	6	43.3	28.3	10.2	18.3	65	47	22		-
SS-948	32' LT	10+70	4.4-5.9	A-6(5)	31	13	13.2	36.0	26.4	24.4	93	86	57		-
SS-949	32' LT	10+70	9.4-10.9	A-2-4(0)	36	7	46.3	30.1	17.5	6.1	75	50	22		-
SS-952	7' RT	11+75	3.2-4.7	A-2-4(0)	22	NP	59.1	23.4	7.3	10.2	96	57	20		-
SS-953	CL	12+50	3.1-4.6	A-2-4(0)	20	NP	55.7	28.5	7.7	8.1	80	52	16		-
SS-954	CL	12+50	8.1-9.6	A-2-4(0)	28	NP	50.4	32.5	11.0	6.1	82	53	19		-
SS-955	32' LT	13+10	3.2-4.7	A-4(4)	31	10	17.7	31.7	26.2	24.4	98	88	58		-
SS-956	32' LT	13+10	8.2-9.7	A-1-b(0)	29	5	49.0	31.7	13.2	6.1	78	48	20		-
S-957	6' LT	14+00	2.0-3.0	A-4(3)	30	10	15.0	38.4	22.2	24.4	100	95	55		-
SS-958	6' LT	14+00	8.1-9.6	A-2-4(0)	30	5	38.4	35.8	17.7	8.1	93	69	30		-

RETAINING WALL 10

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-945	8' LT	9+18	3.8-5.0	A-6(5)	40	16	22.4	27.6	21.5	28.5	86	73	48		-
SS-946	8' LT	9+18	8.8-10.3	A-2-4(0)	39	3	29.7	39.6	24.6	6.1	76	61	30		-
SS-947B	8' LT	9+18	13.8-15.3	A-2-5(0)	44	7	43.5	30.7	21.7	4.1	79	56	25		-
S-942	2' RT	11+50	1.0-2.0	A-6(8)	39	18	20.1	22.0	23.4	34.6	93	80	59		-
SS-943	2' RT	11+50	9.3-10.7	A-2-4(0)	28	5	54.9	27.0	12.0	6.1	88	53	20		-
SS-944	2' RT	11+50	14.3-15.8	A-2-4(0)	28	2	44.1	30.9	18.9	6.1	97	66	31		-

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STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	34820.1.2 (U-2524C)	1	5

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

ROADWAY SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. ***34820.1.2 (U-2524C)*** F.A. PROJ. ***NHF-0708(52)***

COUNTY ***GUILFORD***

PROJECT DESCRIPTION ***GREENSBORO WESTERN LOOP FROM NORTH OF SR 2176 (BRYAN BOULEVARD) TO US 220***

SITE DESCRIPTION ***ADDENDUM TO SUBSURFACE INVENTORY- REINFORCED STEEPENED SLOPE LEFT OF -L- STATION 360+00***

CONTENTS

SHEET	DESCRIPTION
1	TITLE SHEET
2, 2A	LEGEND
3	GEOTECHNICAL MEMO
4, 5	BORELOGS

PERSONNEL

N.D. MOHS

AMEC

INVESTIGATED BY ***N.D. MOHS***

CHECKED BY ***N.T. ROBERSON***

SUBMITTED BY ***N.T. ROBERSON***

DATE ***NOVEMBER, 2012***

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) 707-6850. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

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

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

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

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

NORTH CAROLINA LICENSED GEOLOGIST SEAL 2124 NATHAN DANIEL MOHS

11/19/12

DRAWN BY: ***W.D. FIELDS***

PROJECT REFERENCE NO.	SHEET NO.
37820.1.2 (U-2524C)	2

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

SOIL DESCRIPTION

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:

VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5 A-7-6			
SYMBOL														
% PASSING # 10	50 MX											GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
# 40	30 MX	50 MX	51 MN											
# 200	15 MX	25 MX	10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN			
LIQUID LIMIT	6 MX		NP	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
PLASTIC INDEX				10 MX	10 MX	11 MN	11 MN	10 MX	10 MX	11 MN	11 MN			
GROUP INDEX	0		0	0		4 MX		8 MX	12 MX	16 MX	No MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND		FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS				
GEN. RATING AS A SUBGRADE	EXCELLENT TO GOOD							FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE

PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTENCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT²)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE	<4 4 TO 10 10 TO 30 30 TO 50 >50	N/A
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD	<2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 >30	<0.25 0.25 TO 0.50 0.5 TO 1.0 1 TO 2 2 TO 4 >4

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE	4	10	40	60	200	270
OPENING (MM)	4.76	2.00	0.42	0.25	0.075	0.053

BOULDER (BLDR.)	COBBLE (COB.)	GRAVEL (GR.)	COARSE SAND (CSE. SD.)	FINE SAND (F SD.)	SILT (SL.)	CLAY (CL.)

GRAIN SIZE MM: 305, 75, 2.0, 0.25, 0.05, 0.005
IN.: 12, 3

SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
LL - LIQUID LIMIT		
PLASTIC RANGE (PI)	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
PL - PLASTIC LIMIT		
OM - OPTIMUM MOISTURE	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
SL - SHRINKAGE LIMIT		
	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
NONPLASTIC	0-5	VERY LOW
LOW PLASTICITY	6-15	SLIGHT
MED. PLASTICITY	16-25	MEDIUM
HIGH PLASTICITY	26 OR MORE	HIGH

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.

GRADATION

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.

MINERALOGICAL COMPOSITION

MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

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

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

GROUND WATER

WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING

STATIC WATER LEVEL AFTER 24 HOURS

PW - 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
25/025 DIP & DIP DIRECTION OF ROCK STRUCTURES
SPT DPT DMT VST PMT TEST BORING
AUGER BORING
CORE BORING
MW MONITORING WELL
PIEZOMETER INSTALLATION
SLOPE INDICATOR INSTALLATION
CONE PENETROMETER TEST
SOUNDING ROD
TEST BORING W/ CORE
SPT N-VALUE
REF SPT REFUSAL

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
HI. - HIGHLY
MED. - MEDIUM
MICA. - MICACEOUS
MOD. - MODERATELY
NP - NON PLASTIC
ORG. - ORGANIC
PMT - PRESSUREMETER TEST
SAP. - SAPROLITIC
SD. - SAND, SANDY
SL. - SILT, SILTY
SLI. - SLIGHTLY
TCR - TRICONE REFUSAL
w - MOISTURE CONTENT
V - VERY
VST - VANE SHEAR TEST
WEA. - WEATHERED
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT

SAMPLE ABBREVIATIONS

S - BULK
SS - SPLIT SPOON
ST - SHELBY TUBE
RS - ROCK
RT - RECOMPACTED TRIAXIAL
CBR - CALIFORNIA BEARING RATIO

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] MOBILE B-__
- [ ] BK-51
- [ ] CME-45C
- [ ] CME-550
- [ ] PORTABLE HOIST
- [X] CME-55C
- [ ] ____

ADVANCING TOOLS:
- [ ] CLAY BITS
- [ ] 6" CONTINUOUS FLIGHT AUGER
- [X] 8" HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [ ] TUNG.-CARBIDE INSERTS
- [ ] CASING [ ] W/ ADVANCER
- [ ] TRICONE ____" STEEL TEETH
- [ ] TRICONE ____" TUNG.-CARB.
- [ ] CORE BIT
- [ ] ____

HAMMER TYPE: [X] AUTOMATIC [ ] MANUAL

CORE SIZE:
- [ ] -B____
- [ ] -N____
- [ ] -H____

HAND TOOLS:
- [ ] POST HOLE DIGGER
- [ ] HAND AUGER
- [ ] SOUNDING ROD
- [ ] VANE SHEAR TEST
- [ ] ____

REVISED 09/23/09

PROJECT REFERENCE NO.	SHEET NO.
37820.1.2 (U-2524C)	2A

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

ROCK DESCRIPTION

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)	NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.
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.
NON-CRYSTALLINE ROCK (NCR)	FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.
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.

WEATHERING

FRESH	ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.
VERY SLIGHT (V SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.
SLIGHT (SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.
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. *IF TESTED, WOULD YIELD SPT REFUSAL*
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. *IF TESTED, YIELDS SPT N VALUES > 100 BPF*
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. *IF TESTED, YIELDS SPT N VALUES < 100 BPF*
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.

ROCK HARDNESS

VERY HARD	CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.
HARD	CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.
MODERATELY HARD	CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.
MEDIUM HARD	CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.
SOFT	CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.
VERY SOFT	CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.

FRACTURE SPACING

TERM	SPACING
VERY WIDE	MORE THAN 10 FEET
WIDE	3 TO 10 FEET
MODERATELY CLOSE	1 TO 3 FEET
CLOSE	0.16 TO 1 FEET
VERY CLOSE	LESS THAN 0.16 FEET

BEDDING

TERM	THICKNESS
VERY THICKLY BEDDED	> 4 FEET
THICKLY BEDDED	1.5 - 4 FEET
THINLY BEDDED	0.16 - 1.5 FEET
VERY THINLY BEDDED	0.03 - 0.16 FEET
THICKLY LAMINATED	0.008 - 0.03 FEET
THINLY LAMINATED	< 0.008 FEET

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.

TERMS AND DEFINITIONS

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.

BENCH MARK:

ELEVATION: FT.

NOTES:

REVISED 09/23/09

SHEET 4

NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

WBS 34820.1.2	TIP U-2524C	COUNTY GUILFORD	GEOLOGIST Contract Geologist
SITE DESCRIPTION GREENSBORO WESTERN LOOP FROM NORTH OF SR 2176 (BRYAN BLVD.) TO US 220			GROUND WTR (ft)
BORING NO. 36000	STATION 360+00	OFFSET 120 ft LT	ALIGNMENT -L-
			0 HR. 5.0
COLLAR ELEV. 779.6 ft	TOTAL DEPTH 25.0 ft	NORTHING 869,867	EASTING 1,740,766
			24 HR. FIAD
DRILL RIG/HAMMER EFF./DATE MAC9354 CME-45C 87% 05/30/2012		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER Contract Driller	START DATE 11/08/12	COMP. DATE 11/08/12	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	SAMP. NO.	MOI
780							
	779.6	0.0	WOH	WOH	1		M
775	776.1	3.5	1	2	2		W (water level)
770	771.1	8.5	4	4	4		M
765	766.1	13.5	3	8	10		M
760	761.1	18.5	8	7	7		M
755	756.1	23.5	7	9	22		M

SOIL AND ROCK DESCRIPTION

ELEV. (ft)		DEPTH (ft)
779.6	GROUND SURFACE	0.0
	ALLUVIAL RED-BROWN TO GRAY, SILTY SAND WITH SOME ORGANICS	
770.6		9.0
	RESIDUAL WHITE AND GRAY, SAPROLITIC, SILTY SAND WITH SOME MICA	
754.6		25.0
	Boring Terminated at Elevation 754.6 ft IN SILTY SAND	

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34820.1.2	TIP U-2524C	COUNTY GUILFORD	GEOLOGIST Contract Geologist
SITE DESCRIPTION GREENSBORO WESTERN LOOP FROM NORTH OF SR 2176 (BRYAN BLVD.) TO US 220			GROUND WTR (ft)
BORING NO. 36150	STATION 361+50	OFFSET 120 ft LT	ALIGNMENT -L-	0 HR. 10.0
COLLAR ELEV. 780.3 ft	TOTAL DEPTH 25.0 ft	NORTHING 869,888	EASTING 1,740,917	24 HR. FIAD
DRILL RIG/HAMMER EFF./DATE MAC9354 CME-45C 87% 05/30/2012		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER Contract Driller	START DATE 01/10/00	COMP. DATE 11/08/12	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
785										
780	780.3	0.0								780.3 GROUND SURFACE 0.0
			1	2	3	5		M		RESIDUAL RED-BROWN, SANDY CLAY WITH SOME ORGANICS AND FINE SAND
	776.8	3.5	4	4	4	8		M		774.2 5.1
775										GRAY AND WHITE, SAPROLITIC, SILTY SAND WITH SOME MICA
	771.8	8.6	5	7	9	16		W		
770										
	766.8	13.5	8	8	16	24		M		
765										
	761.8	18.5	10	15	21	36		M		
760										
	756.8	23.5	17	14	12	26		M		755.3 25.0
										Boring Terminated at Elevation 755.3 ft IN SILTY SAND

NCDOT BORE SINGLE U2524C_GEO_BH_SLOPE.GPJ NC_DOT.GDT 11/19/12

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	34820.1.2	1	15

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

INFILTRATION BASIN SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. *34820.1.2 (U-2524C)* F.A. PROJ. *STP-NHF-124(1)*

COUNTY *GUILFORD*

PROJECT DESCRIPTION *GREENSBORO WESTERN LOOP FROM NORTH OF SR 2176 (BRYAN BOULEVARD) TO US 220 (BATTLEGROUND AVE)*

ID: U-2524C

PROJECT: 34820.1.2

CONTENTS

SHEET	DESCRIPTION
1	TITLE SHEET
2	LEGEND
3-4	GEOTECHNICAL REPORT
5-6	BORING LOCATION PLAN
7-9	CONSTANT HEAD PERMEAMETER TEST RESULTS
10-12	HAND AUGER LOG REPORTS
13-15	LABORATORY TEST REPORT SUMMARY AND GRAIN SIZE CURVES

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) 707-6850. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

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

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

PERSONNEL

J. GAY

B. DEOBALD

R. RAHIE

INVESTIGATED BY *AMEC E&I, INC.*

CHECKED BY *B. DEOBALD*

SUBMITTED BY *AMEC E&I, INC.*

DATE *MAY 29, 2012*

NORTH CAROLINA LICENSED 5-29-12 SEAL 1730 GEOLOGIST WILLIAM BRIAN DEOBALD

amec

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SIGNATURE

NC Engineering F-1253 NC Geology C-247

DRAWN BY: *R. RAHIE*

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

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

PROJECT REFERENCE NO.	SHEET NO.
34820.1.2	2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

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:

VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5 A-7-6			
SYMBOL														
% PASSING # 10 # 40 # 200	50 MX 30 MX 15 MX		50 MX 25 MX	51 MN 10 MX	35 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
LIQUID LIMIT PLASTIC INDEX	6 MX		NP	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
GROUP INDEX	0		0	0		4 MX		8 MX	12 MX	16 MX	No MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND		FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS				
GEN. RATING AS A SUBGRADE	EXCELLENT TO GOOD							FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE

PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTENCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH ($TONS/FT^2$)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE	<4 4 TO 10 10 TO 30 30 TO 50 >50	N/A
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD	<2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 >30	<0.25 0.25 TO 0.50 0.5 TO 1.0 1 TO 2 2 TO 4 >4

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE	4	10	40	60	200	270
OPENING (MM)	4.76	2.00	0.42	0.25	0.075	0.053

BOULDER (BLDR.)	COBBLE (COB.)	GRAVEL (GR.)	COARSE SAND (CSE. SD.)	FINE SAND (F SD.)	SILT (SL.)	CLAY (CL.)

GRAIN SIZE	MM	305	75	2.0	0.25	0.05	0.005
	IN.	12	3				

SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
LL — LIQUID LIMIT		
PLASTIC RANGE (PI)	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
PL — PLASTIC LIMIT		
OM — OPTIMUM MOISTURE	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
SL — SHRINKAGE LIMIT		
	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
NONPLASTIC	0-5	VERY LOW
LOW PLASTICITY	6-15	SLIGHT
MED. PLASTICITY	16-25	MEDIUM
HIGH PLASTICITY	26 OR MORE	HIGH

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.

GRADATION

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.

MINERALOGICAL COMPOSITION

MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

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

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

GROUND WATER

- WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING
- STATIC WATER LEVEL AFTER 24 HOURS
- PW — 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
- 25/025 — DIP & DIP DIRECTION OF ROCK STRUCTURES
- SPT / DPT DMT VST PMT — TEST BORING
- AUGER BORING
- CORE BORING
- MW — MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- CONE PENETROMETER TEST
- SOUNDING ROD
- TEST BORING W/ CORE
- SPT N-VALUE
- REF — SPT REFUSAL

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
HI. - HIGHLY
MED. - MEDIUM
MICA. - MICACEOUS
MOD. - MODERATELY
NP - NON PLASTIC
ORG. - ORGANIC
PMT - PRESSUREMETER TEST
SAP. - SAPROLITIC
SD. - SAND, SANDY
SL. - SILT, SILTY
SLI. - SLIGHTLY
TCR - TRICONE REFUSAL
w - MOISTURE CONTENT
V - VERY
VST - VANE SHEAR TEST
WEA. - WEATHERED
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT

SAMPLE ABBREVIATIONS
S - BULK
SS - SPLIT SPOON
ST - SHELBY TUBE
RS - ROCK
RT - RECOMPACTED TRIAXIAL
CBR - CALIFORNIA BEARING RATIO

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
- [ ] 6" 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
- [X] HAND AUGER
- [ ] SOUNDING ROD
- [ ] VANE SHEAR TEST
- [ ] _____

ROCK DESCRIPTION

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)	NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.
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.
NON-CRYSTALLINE ROCK (NCR)	FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.
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.

WEATHERING

FRESH	ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.
VERY SLIGHT (V SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.
SLIGHT (SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.
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. *IF TESTED, WOULD YIELD SPT REFUSAL*
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. *IF TESTED, YIELDS SPT N VALUES > 100 BPF*
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. *IF TESTED, YIELDS SPT N VALUES < 100 BPF*
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.

ROCK HARDNESS

VERY HARD	CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.
HARD	CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.
MODERATELY HARD	CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.
MEDIUM HARD	CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.
SOFT	CAN BE GROVED OR DOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.
VERY SOFT	CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.

FRACTURE SPACING

TERM	SPACING
VERY WIDE	MORE THAN 10 FEET
WIDE	3 TO 10 FEET
MODERATELY CLOSE	1 TO 3 FEET
CLOSE	0.16 TO 1 FEET
VERY CLOSE	LESS THAN 0.16 FEET

BEDDING

TERM	THICKNESS
VERY THICKLY BEDDED	> 4 FEET
THICKLY BEDDED	1.5 - 4 FEET
THINLY BEDDED	0.16 - 1.5 FEET
VERY THINLY BEDDED	0.03 - 0.16 FEET
THICKLY LAMINATED	0.008 - 0.03 FEET
THINLY LAMINATED	< 0.008 FEET

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.

TERMS AND DEFINITIONS

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 IN OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.

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.

BENCH MARK:

ELEVATION: _____ FT.

NOTES:

BENCH MARKS:

BY3-513	N. 869490	E. 1743056	ELEV. 762.82 FT
BY3-510	N. 870370	E. 1744523	ELEV. 766.51 FT
-BL-36	N. 870592	E. 1746154	ELEV. 747.12 FT
-BL-37	N. 870730	E. 1746725	ELEV. 769.28 FT

REVISED 09/23/09

NCDOT PROJECT NO.: 34820.1.2
TIP NO.: U-2524C
FEDERAL AID NO.: STP-NHF-124(1)
COUNTY: GUILFORD
DESCRIPTION: Greensboro Western Loop from North of SR 2176 (Bryan Boulevard) to US 220 (Battleground Avenue)
SUBJECT: Infiltration Pond Testing

Project Description

The purpose of this subsurface investigation was to evaluate five locations, identified by the NCDOT, at the project site for infiltration basins associated with the Greensboro Western Loop from north of SR 2176 (Bryan Boulevard) to US 220 (Battleground Avenue). Our understanding of this project comes from conversations with NCDOT Geotechnical Engineering Unit personnel; and from documents and drawings provided by the Geotechnical Engineering Unit including a Request for Proposal (RFP) dated April 17, 2012 and electronic files on the NCDOT ftp site.

The five project sites are located adjacent to the proposed Western Loop alignment. The project sites include four forested areas in close proximity to stream channels, and one ruderal area adjacent to an assisted living facility.

Methodology

AMEC conducted a subsurface investigation to determine depth to seasonal high water table (SHWT), apparent water table (if present), and *in-situ* saturated hydraulic conductivity. An AMEC soil scientist advanced five hand auger borings to depths of 6.0 feet below ground surface (BGS). Representative soil samples were collected at approximately 2-foot intervals or where significant changes in soil texture were observed. The soil samples were described in the field and placed in sealed containers for transportation to and testing in AMEC's laboratory. Infiltration testing with a constant head permeameter was conducted adjacent to the hand-auger boring locations. The infiltration tests were conducted at the most limiting horizon noted between 1.0 and 1.5 feet BGS in general accordance with the scope of work outlined in the April 17, 2012 RFP. Additional tests were run if an apparent significant change in permeability was noted below 1.5 feet BGS but above the seasonal high water table (SHWT)

AMEC identified the boring/test locations in the field utilizing non-survey grade sub-meter Global Positioning System (GPS) using northing/easting coordinates determined from project drawing files provided by NCDOT. Ground surface elevations at the boring/test locations were determined by AMEC using conventional survey methods and referencing NCDOT baseline markers as tie-in points. The boring locations are shown on the Boring Location Plan (Drawing 1) and listed in the following table.

Table 1: Hand Auger and Permeameter Test Locations

Location	Northing	Easting	Elevation (ft)	Alignment, Station, Offset
Site 1	869455	1742756	773.5	-L- STA. 380+08, 136 RT
Site 2	869569	1743488	752.7	-L- STA. 387+20, 41 RT
Site 3	869818	1744622	751.4	-L- STA. 398+62, 167 RT
Site 4	870090	1745854	747.1	-L- STA. 411+07, 366 RT
Site 5	870487	1746435	752.3	-L- STA.418+22, 180 RT

Representative soil samples were tested to determine the soil index properties and to verify field classifications. Five soil samples were tested for grain size distribution (including hydrometer) and classified in general accordance with the AASHTO classification. Laboratory testing was performed in general accordance with applicable ASTM/AASHTO/NCDOT specifications. The results of the laboratory testing are included with this report.

Physiography and Geology

The project sites range from lightly rolling to relatively flat, low lying areas located within the Charlotte and Milton Belts within the Piedmont Physiographic Province, in Guilford County, North Carolina. The 1985 Geologic Map of North Carolina, compiled by the N.C. Geological Survey, indicates the presence of metamorphosed granitic rock (megacrystic, well foliated, locally containing horneblend) is present at the project locations.

Soils encountered in the five hand-auger borings include a thin surficial layer of topsoil consisting of very dark grayish brown, to dark brown loam. The topsoil extends from the ground surface to approximately 0.2 feet BGS. The top soil is underlain by pale brown to strong brown sandy silt and fine sandy clay (A-4, A-7-5, A-7-6). The silt and/or clay extends to the termination depths of the borings with the exception of Site 5. The boring at Site 5 terminated in a saprolitic, silty sand (A-2-4).

Infiltration Rates

Infiltration rates were measured at four locations. K_{sat} measurements were conducted with a Guelph Permeameter (GP). Test locations evaluated were at sites 1, 2, 3, and 5, and are shown on Drawing 1. Site 1 was measured at two depths. The SHWT at site 4 was determined to be at 13 inches BGS, and did not have the necessary separation to conduct the test.

The K_{sat} tests were conducted in the unsaturated material above the apparent water table (if observed) on April 20, 21, and 25, 2012. These tests were conducted at soil depths ranging from 15 inches to 31 inches BGS. A detailed soil profile description was completed at each test location and is included with this report.

The *in-situ* K_{sat} values were calculated based on field measurements using the Glover Equation. K_{sat} measurements for boring Site 1 ranged from 0.019 to 0.191 inches/hour (in/hr) or 0.28 to 2.84 gallons per day per square-foot (gpd/ft^2). The soils present at the test depths at this site ranged from sandy clay loam to silt. K_{sat} measurements for Sites 3 and 5 ranged from 0.00028 to 0.0011 inches/hour (in/hr) or 0.004 to 0.016 gallons per day per square-foot (gpd/ft^2). The soils present at the test depths at this site ranged from sandy clay loam to silt.

Infiltration was not observed at boring location Site 2 within five hours of commencing the infiltration tests. Soils present at the test depths at these locations are a heavy clay loam to clay texture. These soils were beyond the capability of the GP to measure the K_{sat}.

K_{sat} measurement was not conducted at site 4. The SHWT was noted at 13 inches BGS.

Table 2 summarizes the *in-situ* K_{sat} measurements for each location and includes: location; depth and horizon; hydraulic conductivity test method used; and conductivity measurement at each location.

Table 2: *In-situ* Saturated Hydraulic Conductivity Measurements

Location	Depth/Horizon (inches BGS)	Method	Result	
			gpd/ft^2	in/hr
Site 1 shallow	**15/Bt1**	***In-Situ* (GP)**	**0.28**	**0.019**
Site 1 deep	**31/Bt2**	***In-Situ* (GP)**	**2.84**	**0.191**
Site 2	**15/Bt1**	***In-Situ* (GP)**	**NIO**	**NIO**
Site 3	**15/Bt1**	***In-Situ* (GP)**	**0.004**	**0.00028**
Site 4	**NT**			
Site 5	**16/E**	***In-Situ* (GP)**	**0.016**	**0.0011**

Note: NIO = No Infiltration Observed, NT = No Testing conducted

Groundwater

The hand-auger borings were terminated at 72 inches BGS. Apparent water tables were not observed within 72 inches BGS at Sites 1 and 5, but was noted within 72 inches BGS at the other three sites. SHWT depths were estimated based on soil characteristics through identification of low chroma redoximorphic features (mottles). The low chroma mottles suggest past conditions of saturation and reducing soil conditions. Evidence of a SHWT was observed at depths ranging from 13 to >72 inches BGS as indicated in Table 3.

Table 3: SHWT Estimates on 21-25 April 2012.

Location	Elevation of Ground Surface (feet)	SHWT Depth (inches BGS)	Apparent Water Table Depth (inches BGS)
Site 1	773.5	>72	>72
Site 2	752.7	28	49
Site 3	751.4	24	43
Site 4	747.1	13	22
Site 5	752.3	26	>72

Closure

AMEC provided these services in accordance with our Proposal No. PROP12RAIL154 dated April 25, 2012. Our services were performed under the Terms of the Agreement made and entered into on June 6, 2011 by and between the NCDOT and MACTEC.

We are available to discuss our findings with you and to provide additional studies or services necessary to complete the project. We appreciate the opportunity to assist you on this project and look forward to serving as your geotechnical consultant on future projects.

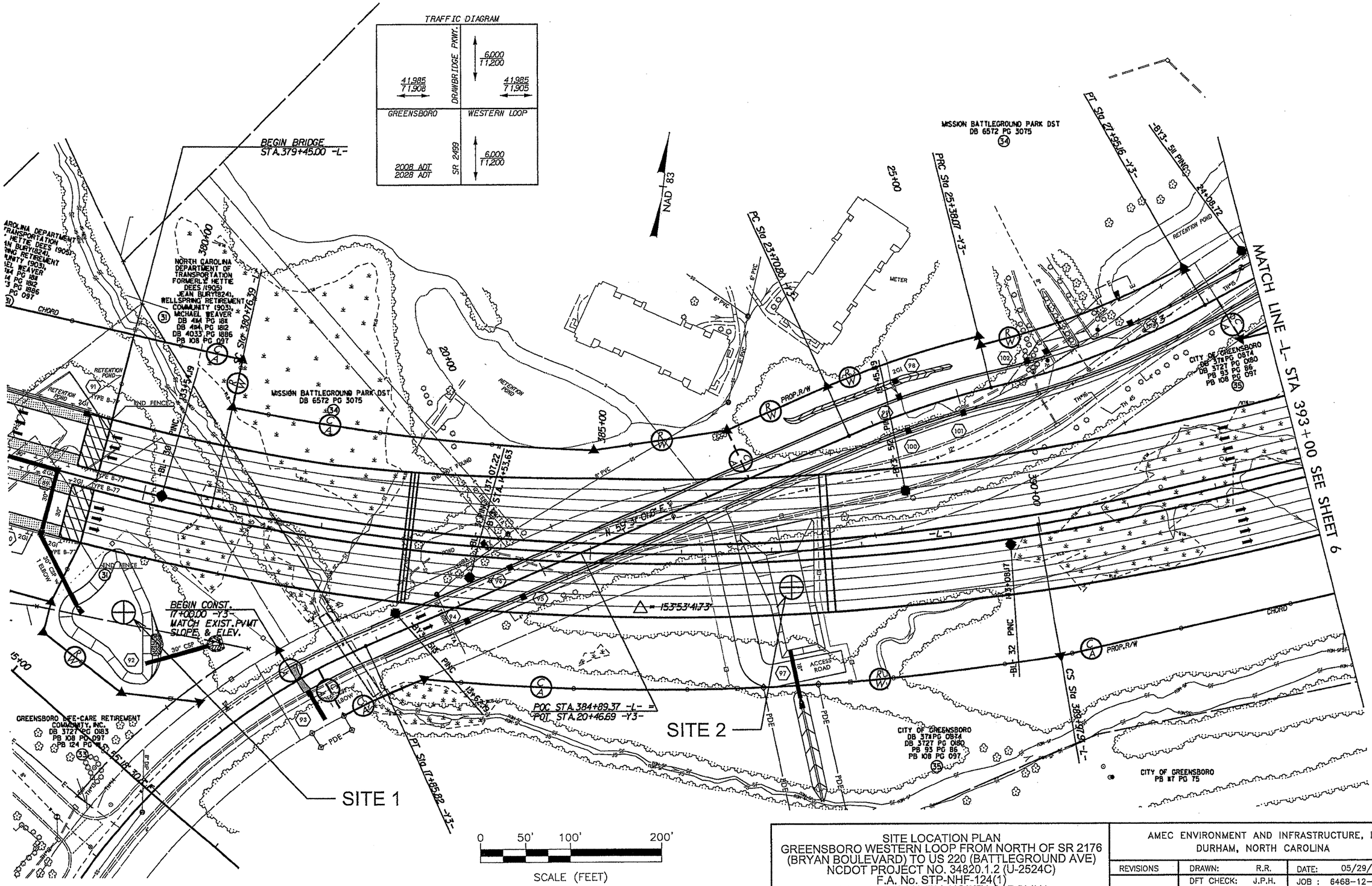
Very truly yours,

AMEC Environment & Infrastructure, Inc.

Jan Gay, LSS
Senior Scientist
Licensed, North Carolina 1158

29 May 2012

William B. Deobald, L.G.
Senior Geologist
Licensed, North Carolina 1730



SITE LOCATION PLAN
GREENSBORO WESTERN LOOP FROM NORTH OF SR 2176 (BRYAN BOULEVARD) TO US 220 (BATTLEGROUND AVE)
NCDOT PROJECT NO. 34820.1.2 (U-2524C)
F.A. No. STP-NHF-124(1)
GUILFORD COUNTY, NORTH CAROLINA

AMEC ENVIRONMENT AND INFRASTRUCTURE, INC.
DURHAM, NORTH CAROLINA

REVISIONS	DRAWN: R.R.	DATE: 05/29/12
	DFT CHECK: J.P.H.	JOB : 6468-12-1100
	ENG CHECK: W.B.D.	DWG: 1

MATCH LINE -L- STA 393+00 SEE SHEET 5

SITE 3

SITE 4

SITE 5

0 100' 200' 400'

SCALE (FEET)
1" : 200'

SITE LOCATION MAP
GREENSBORO WESTERN LOOP FROM NORTH OF SR 2176
(BRYAN BOULEVARD) TO US 220 (BATTLEGROUND AVE)
NCDOT PROJECT NO. 34820.1.2 (U-2524C)
F.A. No. STP-NHF-124(1)
GUILFORD COUNTY, NORTH CAROLINA

AMEC ENVIRONMENT AND INFRASTRUCTURE, INC.
DURHAM, NORTH CAROLINA

REVISIONS	DRAWN: R.R.	DATE: 05/29/12
	DFT CHECK: J.P.H.	JOB : 6468-12-1100
	ENG CHECK: W.B.D.	DWG: 2

Guelph Permeameter Field Data Sheet

Standard Procedure for Permeameter Readings and Calculations

Job Name: Greensboro Western Loop from North of SR 2176 to US 220
NCDOT Project Number: 34820.1.2 (U-2524C)
Location ID: Site 1
Date: 04/20/12
Field Personnel: J. Gay
Well Hole Depth, (inches): 15
Field Notes:
Combined Reservoirs X, (cm^2): 35.22 Horizon: Bt1
Inner Reservoir Y, (cm^2): 2.15 SHWT: >72"
Reservoir Constant: 2.15 cm^2
Note: In standardized procedure the radius of the well hole is always 3.0 cm.

1st set of readings with height of water in well (H_1) set at 5 cm.

Reading Number	Time	Time Interval (min)	Water Level in Reservoir (cm)	Water Level Change (cm)	Rate of Water Level Change R_1 (cm/min)
0	Recorded by	0.0	45.0	0.0	0.0000
1	stop watch	3.0	45.0	0.0	0.0000
2		3.0	45.1	0.1	0.0333
3		3.0	45.1	0.0	0.0000
4		3.0	45.2	0.1	0.0333
5		3.0	45.2	0.0	0.0000
6		3.0	45.2	0.0	0.0000
7		3.0	45.3	0.1	0.0333
8		3.0	45.3	0.0	0.0000
9		3.0	45.3	0.0	0.0000
10		3.0	45.4	0.1	0.0333
11		3.0	45.4	0.0	0.0000
12		3.0	45.4	0.0	0.0000
13		3.0	45.5	0.1	0.0333
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					

2nd set of readings with height of water in well (H_2) set at 10 cm.

Reading Number	Time	Time Interval (min)	Water Level in Reservoir (cm)	Water Level Change (cm)	Rate of Water Level Change R_2 (cm/min)
0	Recorded by	0.0	47.8		
1	stop watch	3.0	47.8	0.0	0.0000
2		3.0	47.8	0.0	0.0000
3		3.0	47.9	0.1	0.0333
4		3.0	47.9	0.0	0.0000
5		3.0	48.0	0.1	0.0333
6		3.0	48.0	0.0	0.0000
7		3.0	48.1	0.1	0.0333
8		3.0	48.1	0.0	0.0000
9		3.0	48.2	0.1	0.0333
10		3.0	48.2	0.0	0.0000
11		3.0	48.3	0.1	0.0333
12		3.0	48.3	0.0	0.0000
13		3.0	48.4	0.1	0.0333
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					

For the first set of readings $R_{1\text{-bar}}$ = $R_{1\text{-bar}}$ / 60 = 1.4E-04 cm/sec
For the second set of readings $R_{2\text{-bar}}$ = $R_{2\text{-bar}}$ / 60 = 2.8E-04 cm/sec

K_{fs} = [(0.0041)*(Res. Const)*($R_{2\text{-bar}}$)] - [(0.0054)*(Res. Const)*($R_{1\text{-bar}}$)] ***cm/sec***
where,
K_{fs} = field saturated hydraulic conductivity

Calculated K_{fs}:		
K_{fs} =	1.4E-05	*cm/sec*
K_{fs} =	0.019412599	in/hr
K_{fs} =	0.28	gpd/ft2

Prepared By: JG
Checked By: WBd

Guelph Permeameter Field Data Sheet

Standard Procedure for Permeameter Readings and Calculations

SHEET 7

Job Name: Greensboro Western Loop from North of SR 2176 to US 220
NCDOT Project Number: 34820.1.2 (U-2524C)
Location ID: Site 1
Date: 04/20/12
Field Personnel: J. Gay
Well Hole Depth, (inches): 31
Field Notes:
Combined Reservoirs X, (cm^2): 35.22 Horizon: B1
Inner Reservoir Y, (cm^2): 2.15 SHWT: >72"
Reservoir Constant: 2.15 cm^2
Note: In standardized procedure the radius of the well hole is always 3.0 cm.

1st set of readings with height of water in well (H_1) set at 5 cm.

Reading Number	Time	Time Interval (min)	Water Level in Reservoir (cm)	Water Level Change (cm)	Rate of Water Level Change R_1 (cm/min)
0	Recorded by	0.0	59.9	0.0	0.0000
1	stop watch	3.0	60.0	0.1	0.0333
2		3.0	60.1	0.1	0.0333
3		3.0	60.2	0.1	0.0333
4		3.0	60.3	0.1	0.0333
5		3.0	60.4	0.1	0.0333
6		3.0	60.6	0.2	0.0667
7		3.0	60.7	0.1	0.0333
8		3.0	60.8	0.1	0.0333
9		3.0	61.0	0.2	0.0667
10		3.0	61.1	0.1	0.0333
11		3.0	61.2	0.1	0.0333
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					

2nd set of readings with height of water in well (H_2) set at 10 cm.

Reading Number	Time	Time Interval (min)	Water Level in Reservoir (cm)	Water Level Change (cm)	Rate of Water Level Change R_1 (cm/min)
0	Recorded by	0.0	65.0		
1	stop watch	3.0	65.2	0.2	0.0667
2		3.0	65.4	0.1	0.0667
3		3.0	65.6	0.2	0.0667
4		3.0	65.8	0.2	0.0667
5		3.0	65.9	0.1	0.0333
6		3.0	66.2	0.3	0.1000
7		3.0	66.4	0.2	0.0667
8		3.0	66.7	0.3	0.1000
9		3.0	67.0	0.3	0.1000
10		3.0	67.3	0.3	0.1000
11		3.0	67.6	0.3	0.1000
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					

For the first set of readings $R_{1\text{-bar}}$ = $R_{1\text{-bar}}$ / 60 = 5.6E-04 cm/sec
For the second set of readings $R_{2\text{-bar}}$ = $R_{2\text{-bar}}$ / 60 = 1.7E-03 cm/sec

K_{fs} = [(0.0041)*(Res. Const)*($R_{2\text{-bar}}$)] - [(0.0054)*(Res. Const)*($R_{1\text{-bar}}$)] ***cm/sec***
where,
K_{fs} = field saturated hydraulic conductivity

Calculated K_{fs}:		
K_{fs} =	1.4E-04	*cm/sec*
K_{fs} =	0.191	in/hr
K_{fs} =	2.84	gpd/ft2

Prepared By: JG
Checked By: WBd

Guelph Permeameter Field Data Sheet

Standard Procedure for Permeameter Readings and Calculations

Job Name: Greensboro Western Loop from North of SR 2176 to US 220
NCDOT Project Number: 34820.1.2 (U-2524C)
Location ID: Site 2
Date: 04/21/12
Field Personnel: J. Gay
Well Hole Depth, (inches): 15
Field Notes:
Combined Reservoirs X, (cm^2): 35.22 Horizon: Bt1
Inner Reservoir Y, (cm^2): 2.15 SHWT: 28"
Reservoir Constant: 2.15 cm^2
Note: In standardized procedure the radius of the well hole is always 3.0 cm.

1st set of readings with height of water in well (H_1) set at 5 cm.

Reading Number	Time	Time Interval (min)	Water Level in Reservoir (cm)	Water Level Change (cm)	Rate of Water Level Change R_{fs} (cm/min)
0					
No Infiltration recorded in 5 hour period					

2nd set of readings with height of water in well (H_2) set at 10 cm.

Reading Number	Time	Time Interval (min)	Water Level in Reservoir (cm)	Water Level Change (cm)	Rate of Water Level Change R_{fs} (cm/min)
0					
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					

For the first set of readings $R_{1\text{-bar}}$ = $R_{1\text{-bar}}$ / 60 = 0.0E+00 cm/sec
For the second set of readings $R_{2\text{-bar}}$ = $R_{2\text{-bar}}$ / 60 = 0.0E+00 cm/sec

K_{fs} = [(0.0041)*(Res. Const)*($R_{2\text{-bar}}$)] - [(0.0054)*(Res. Const)*($R_{1\text{-bar}}$)] *cm/sec*
where,
K_{fs} = field saturated hydraulic conductivity

Calculated K_{fs}:		
K_{fs} =	0.0E+00	*cm/sec*
K_{fs} =	0	in/hr
K_{fs} =	0	gpd/ft2

Prepared By: JG
Checked By: WED

Guelph Permeameter Field Data Sheet

Standard Procedure for Permeameter Readings and Calculations

SHEET 8

Job Name: Greensboro Western Loop from North of SR 2176 to US 220
NCDOT Project Number: 34820.1.2 (U-2524C)
Location ID: Site 3
Date: 04/21/12
Field Personnel: J. Gay
Well Hole Depth, (inches): 15
Field Notes:
Combined Reservoirs X, (cm^2): 35.22 Horizon: Bt1
Inner Reservoir Y, (cm^2): 2.15 SHWT: 24"
Reservoir Constant: 2.15 cm^2
Note: In standardized procedure the radius of the well hole is always 3.0 cm.

1st set of readings with height of water in well (H_1) set at 5 cm.

Reading Number	Time	Time Interval (min)	Water Level in Reservoir (cm)	Water Level Change (cm)	Rate of Water Level Change R_{fs} (cm/min)
0	Recorded by		12.8		
1	stop watch	20.0	12.9	0.1	0.0050
2		20.0	13.0	0.1	0.0050
3		20.0	13.1	0.1	0.0050
4		20.0	13.2	0.1	0.0050
5		20.0	13.3	0.1	0.0050
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					

2nd set of readings with height of water in well (H_2) set at 10 cm.

Reading Number	Time	Time Interval (min)	Water Level in Reservoir (cm)	Water Level Change (cm)	Rate of Water Level Change R_{fs} (cm/min)
0	Recorded by		16.0		
1	stop watch	10.0	16.0	0.0	0.00
2		10.0	16.1	0.1	0.01
3		10.0	16.2	0.1	0.01
4		10.0	16.3	0.1	0.01
5		10.0	16.3	0.0	0.00
6		10.0	16.4	0.1	0.01
7		10.0	16.4	0.0	0.00
8		10.0	16.5	0.1	0.01
9		10.0	16.6	0.1	0.01
10		10.0	16.7	0.1	0.01
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					

For the first set of readings $R_{1\text{-bar}}$ = $R_{1\text{-bar}}$ / 60 = 1.1E-04 cm/sec
For the second set of readings $R_{2\text{-bar}}$ = $R_{2\text{-bar}}$ / 60 = 8.3E-05 cm/sec

K_{fs} = [(0.0041)*(Res. Const)*($R_{2\text{-bar}}$)] - [(0.0054)*(Res. Const)*($R_{1\text{-bar}}$)] *cm/sec*
where,
K_{fs} = field saturated hydraulic conductivity

Calculated K_{fs}:		
K_{fs} =	2.0E-07	*cm/sec*
K_{fs} =	0.000277323	in/hr
K_{fs} =	0.004	gpd/ft2

Prepared By: JG
Checked By: WED

Guelph Permeameter Field Data Sheet

Standard Procedure for Permeameter Readings and Calculations

Job Name: Greensboro Western Loop from North of SR 2176 to US 220
NCDOT Project Number: 34820.1.2 (U-2524C)
Location ID: Site 5
Date: 04/25/12
Field Personnel: J. Gay
Well Hole Depth, (inches): 16
Field Notes:
Combined Reservoirs X, (cm^2): 35.22 Horizon: Bt1
Inner Reservoir Y, (cm^2): 2.15 SHWT: 26"
Reservoir Constant: 2.15 cm^2
Note: In standardized procedure the radius of the well hole is always 3.0 cm.

1st set of readings with height of water in well (H_1) set at 5 cm.

Reading Number	Time	Time Interval (min)	Water Level in Reservoir (cm)	Water Level Change (cm)	Rate of Water Level Change R_1 (cm/min)
0	Recorded by	0.0	22.5		
1	stop watch	5.0	22.6	0.1	0.0200
2		5.0	22.7	0.1	0.0200
3		5.0	22.8	0.1	0.0200
4		5.0	22.9	0.1	0.0200
5		5.0	23.0	0.1	0.0200
6		5.0	23.1	0.1	0.0200
7		3.0	23.2	0.1	0.0200
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					

2nd set of readings with height of water in well (H_2) set at 10 cm.

Reading Number	Time	Time Interval (min)	Water Level in Reservoir (cm)	Water Level Change (cm)	Rate of Water Level Change R_2 (cm/min)
0	Recorded by	0.0	25.7		
1	stop watch	5.0	25.8	0.2	0.0400
2		5.0	25.9	0.1	0.0200
3		5.0	26.1	0.2	0.0400
4		5.0	26.2	0.1	0.0200
5		5.0	26.3	0.1	0.0200
6		5.0	26.4	0.1	0.0200
7		5.0	26.6	0.2	0.0400
8		5.0	26.7	0.1	0.0200
9		5.0	26.8	0.1	0.0200
10		5.0	26.9	0.1	0.0200
11		5.0	27.1	0.2	0.0400
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					

For the first set of readings $R_{1\text{-bar}}$ = $R_{1\text{-bar}}$ / 60 = 3.3E-04 cm/sec
For the second set of readings $R_{2\text{-bar}}$ = $R_{2\text{-bar}}$ / 60 = 4.1E-04 cm/sec

K_{fs} = [(0.0041)*(Res. Const)*($R_{2\text{-bar}}$)] - [(0.0054)*(Res. Const)*($R_{1\text{-bar}}$)] *cm/sec*

where,
K_{fs} = field saturated hydraulic conductivity

Calculated K_{fs}:		
K_{fs} =	7.8E-07	*cm/sec*
K_{fs} =	0.0011	in/hr
K_{fs} =	0.016	gpd/ft2

Prepared By: JG
Checked By:

Hand Auger Log Report

Client: NCDOT
Project Name: Greensboro Western Loop from North of SR 2176 to US 220
Date: 20 April 2012
Location: -L- STA. 380+08, 136 RT
County: Guilford
Northing: 869455 Easting: 1742756
Elevation: 773.5 feet above MSL

Site/Boring Location #: 1
Vegetation: Ruderal Field
Seasonal High Water Table: >72 inches BGS
Apparent High Water Table: >72 inches BGS
Slope: 3-5%
Boring Termination Depth: 72 inches BGS

Profile Description based on Field Description

Horizon	Depth (in)	Matrix color	Mottle(s)	Texture	Structure	Consistence (moist)	Notes
A	0-3	7.5yr 5/6		SL	1fsbk	Friable	
Bt1	3-17	7.5YR 5/6		SCL/CL	1msbk	Firm	
B1	17-35	5YR 5/6		SiL	2msbk	Friable	
B2	35-43	5YR 5/6		SiL	1fsbk	Friable	Mica
B3	43-51	7.5YR 4/6	7.5YR 5/2	SiL	1fsbk	Friable	Mica
C1	51-55	7.5YR 4/6		SL (SAP)	1fsbk	Friable	Mica
C2	55-72	7.5YR 4/6	7.5YR 7/2	SL (SAP)	1fsbk	Friable	Mica

Notes: -Soil Texture: SL – Sandy Loam; Si – Silt; SCL –Clay Loam; CL –Clay Loam ; Si – Silt Loam; SAP - Saprolite

-Soil Structure: 1fsbk – weak, fine, subangular, blocky; 1msbk – weak, medium, subangular, blocky; 2msbk - moderate, medium, subangular, blocky

-Matrix and mottle colors reference the Munsell Book of Color

-Gleyed Soil: Soils of blue, green and gray-scale color which is generally an indication of long-term saturation

-BGS – Below Ground Surface

-Sample S-1 taken between 0.0-2.0 feet BGS is 7.5YR 5/6 (color), silty fine sandy clay (A-7-5)(9) based on lab analysis

-Sample S-2 taken between 2.0-4.0 feet BGS is 5YR 5/6 (color), silty fine sandy clay (A-7-5)(2) based on lab analysis

Hand Auger Log Report

Client: NCDOT
Project Name: Greensboro Western Loop North of SR 2176 to US 220
Date: 21 April 2012
Location: -L- STA. 387+20, 41 RT
County: Guilford
Northing: 869569 Easting: 1743488
Elevation: 752.7 feet above MSL

Site/Boring Location #: 2
Vegetation: Forested
Seasonal High Water Table: 28 inches BGS
Apparent High Water Table: 49 inches BGS
Slope: 15-25%
Boring Termination Depth: 72 inches BGS

Profile Description based on Field Description

Horizon	Depth (in)	Matrix color	Mottle(s)	Texture	Structure	Consistence (moist)	Notes
A	0-2	10YR 3/3		L	1mgr	Friable	
E	2-8	5YR 5/6		SiL	1fsbk	Friable	
Bt1	8-30	5YR 5/5	10YR 4/6	SCL/SC	2msbk	Very firm	SHWT 28”
Bt2	30-49	10YR 5/6	10YR 7/1	SCL/SC	1msbk	Firm	
			5YR 5/6				
Bt3	49-72	10YR 4/4	10YR 7/1	SCL	1msbk	Firm	Free water at 66”
			Gley 2 7/5B				

Notes: -Soil Texture:S L – Loam; SiLi – Silty Loam; SCL – Sandy Clay Loam; SC – Sandy Clay ;

-Soil Structure: 1mgr – weak, medium, granular; 1msbk – weak, medium, subangular, blocky; 2msbk - moderate, medium, subangular, blocky

-Matrix and mottle colors reference the Munsell Book of Color

-Gleyed Soil: Soils of blue, green and gray-scale color which is generally an indication of long-term saturation

-BGS - Below Ground Surface

-Sample S-3 at 0.0-2.0 feet BGS is 10YR4/6 (color), silty fine sandy clay (A-7-6)(15) based on lab analysis

Hand Auger Log Report

Client: NCDOT
Project Name: Greensboro Western Loop
North of SR 2176 to US 220
Date: 21 April 2012
Location: -L- STA. 398+62, 167 RT
County: Guilford
Northing: 869818 Easting: 1744622
Elevation: 751.4 feet above MSL

Site/Boring Location #: 3
Vegetation: Forested
Seasonal High Water Table: 24 inches BGS
Apparent High Water Table: 43 inches BGS
Slope: 5-15%
Boring Termination Depth: 72 inches BGS

Profile Description based on Field Description

Horizon	Depth (in)	Matrix color	Mottle(s)	Texture	Structure	Consistence (moist)	Notes
A	0-2	10YR 3/3		SiL	1fgr	Friable	
Bt1	2-17	5YR 5/6		SCL/SC	2msbk	Firm	
Bt2	17-34	5YR 5/6	10YR 4/2	SCL/SC	1msbk	Firm	SHWT 24"
BT3	34-43	5YR 5/6	10YR 6/2	SCL/SC	2msbk	Firm	
			10YR 7/2				
Bt4	43-54	10YR 5/6	Gley 2 7/5B	SCL	1msbk	Firm	
Bt5	54-66	10YR 5/6	Gley 2 7/5B	SCL/gravel	1msbk	Very Firm	
Bt6	66-72	7.5YR 5/6	Gley 2 7/5B	SCL	massive	Very Firm	
			10YR 6/6				

Notes: -Soil Texture: Si – Silt; Fine S – Fine Sand; SCL – Sandy Clay Loam; SiL – Silty Loam; C – clay

-Soil Structure: 1fgr – weak, fine, granular; 1msbk – weak, medium, subangular, blocky; 2msbk - moderate, medium, subangular, blocky

-Matrix and mottle colors reference the Munsell Book of Color

-Gleyed Soil: Soils of blue, green and gray-scale color which is generally an indication of long-term saturation

-BGS - Below Ground Surface

-Sample S-4 at 0.0-2.0 feet BGS is 7.5YR5/6 (color) silty fine sandy clay (A-7-6)(14) based on lab analysis

Hand Auger Log Report

Client: NCDOT
Project Name: Greensboro Western Loop
North of SR 2176 to US 220
Date: 21 April 2012
Location: -L- STA. 411+07, 366 RT
County: Guilford
Northing: 870090 Easting: 1745854
Elevation: 747.1 feet above MSL

Site/Boring Location #: 4
Vegetation: Forested
Seasonal High Water Table: 13 inches BGS
Apparent High Water Table: 22 inches BGS
Slope: 5-15%
Boring Termination Depth: 72 inches BGS

Profile Description based on Field Description

Horizon	Depth (in)	Matrix color	Mottle(s)	Texture	Structure	Consistence (moist)	Notes
A	0-2	10YR 3/2		L	1fgr	Friable	
E1	2-9	10YR 4/6		SL	1fsbk	Friable	
E2	9-14	10YR 4/6	10YR 5/2	S	1fgr	Friable	SHWT 13"
Bt1	14-22	10YR 5/6	10YR 4/3	SCL/CL	2msbk	Friable	
Bt2	22-40	10YR 5/6	10YR 4/2	SCL/CL	2msbk	Firm	Free Water 34"
			10YR 5/2				
Bt3	40-53	10YR 4/3	10YR 5/6	SCL/CL	2msbk	Firm	
Bt4	53-72	10YR 4/2	10YR 5/3	SCL/CL	2msbk	Firm	
		10YR5/6	10YR 4/3				

Notes: -Soil Texture: S – Sand; SL – Sandy Loam; SCL – Sandy Clay Loam;; SC – Sandy Clay

Soil Structure: 1fgr – weak, fine, granular; 1fsbk – weak, fine, subangular, blocky; 2msbk - moderate, medium, subangular, blocky

-Matrix and mottle colors reference the Munsell Book of Color

-Gleyed Soil: Soils of blue, green and gray-scale color which is generally an indication of long-term saturation

-BGS - Below Ground Surface

-No sample tested from this location

Hand Auger Log Report

Client: NCDOT
Project Name: Greensboro Western Loop
North of SR 2176 to US 220
Date: 23 April 2012
Location: -L- STA. 418+22, 180 RT
County: Guilford
Northing: 870487 Easting: 1746435
Elevation: 752.3 feet above MSL

Site/Boring Location #: 5
Vegetation: Forested
Seasonal High Water Table: 26 inches BGS
Apparent High Water Table: >72 inches BGS
Slope: 5-15%
Boring Termination Depth: 72 inches BGS

Profile Description based on Field Description

Horizon	Depth (in)	Matrix color	Mottle(s)	Texture	Structure	Consistence (moist)	Notes
A	0-2	10YR 3/3		L	1fgr	Friable	
Bt1	2-18	10YR 6/3		SiL	1fsbk	Friable	
Bt2	18-27	7.5YR 5/6		SiL	1fsbk	Friable	SHWT 26"
BT3	27-44	10YR 5/6	10YR 3/1	SCL	2msbk	Firm	
			10YR 6/8				
Bt4	44-60	Polychromatic		SAP	1fgr		
Bt5	60-72	polychromatic		SAP	1fgr		
Bt6							

Notes: -Soil Texture: L– Loam; Fine SAP – Saprolite; SCL – Sandy Clay Loam; SiL – Silty Loam;

-Soil Structure: 1fgr – weak, fine, granular; 1fsbk – weak, fine, subangular, blocky; 2msbk - moderate, medium, subangular, blocky

-Matrix and mottle colors reference the Munsell Book of Color

-Gleyed Soil: Soils of blue, green and gray-scale color which is generally an indication of long-term saturation

-BGS - Below Ground Surface

-Sample S-5 at 0.0-2.0 feet BGS is 10YR 6/3 (color) silty fine sandy clay (A-4)(0) based on lab analysis

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.
4021 STIRRUP CREEK DRIVE, SUITE 100
DURHAM, NORTH CAROLINA 27703

N.C.D.O.T./AASHTO CLASSIFICATIONS

REPORT ON SAMPLES OF: SOILS FOR QUALITY

MACTEC PROJECT NAME/ NUMBER: Greensboro Western Loop from North of SR 2176 to US 220 (6468-12-1100)

AMEC Job No.: 6468-12-1100

NCDOT PROJ. NO.: 34820.1.2 (U-2524C) COUNTY: Guilford OWNER: N.C.D.O.T.

DATES SAMPLED: 4/19/12 - 4/21/12 RECEIVED: 4/25/2012 REPORTED BY: AMEC

SAMPLED FROM: Site 1, Site 2, Site 3 and Site 5

SUBMITTED BY: MACTEC ENGINEERING AND CONSULTING, INC.

1992 STANDARD SPECIFICATIONS

TEST RESULTS

Lab Sample No.		S-1	S-2	S-3	S-4	S-5	
Retained No. 4 Sieve	(%)	2.8	0.1	0.0	0.0	0.1	
Passing No. 10 Sieve	(%)	96.8	98.1	100.0	100.0	99.2	
Passing No. 40 Sieve	(%)	86.3	75.3	91.0	99.3	77.9	
Passing No. 200 Sieve	(%)	58.6	37.1	67.3	63.0	37.0	

MINUS 2.00mm FRACTION

SOIL MORTAR - 100%							
Coarse Sand	(%)	18.7	37.4	15.2	4.3	36.6	
Fine Sand	(%)	25.2	29.7	21.4	38.0	31.1	
Silt	(%)	18.9	15.3	17.0	11.6	12.0	
Clay	(%)	37.2	17.6	46.4	46.1	20.3	

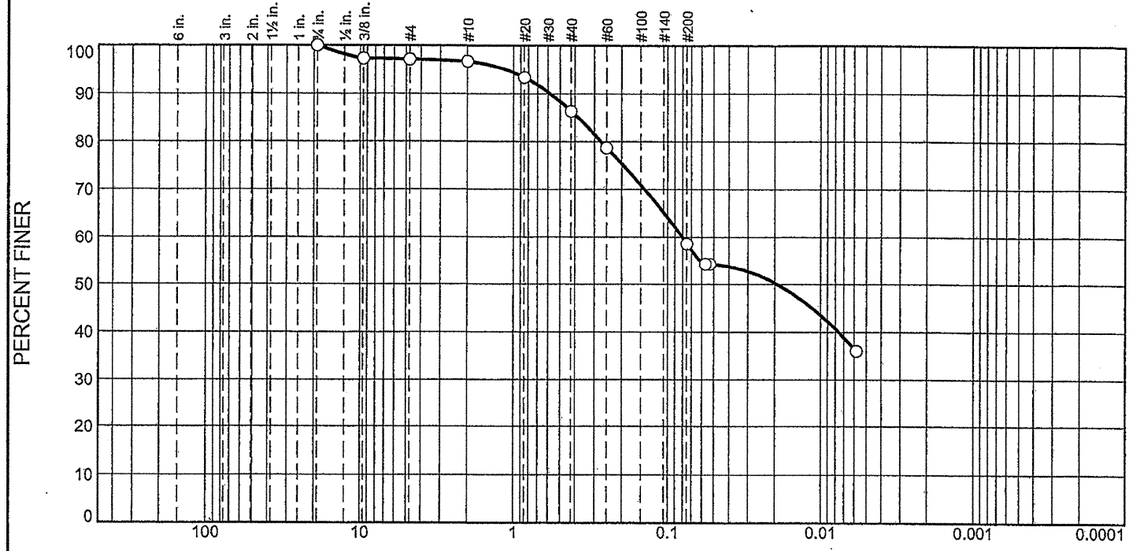
Moisture Content	(%)	24.0	23.2	22.5	25.6	14.8	
Liquid Limit, L.L.		47	46	48	48	26	
Plasticity Index, P.I.		17	16	25	26	8	
AASHTO Classification		A-7-5(9)	A-7-5(2)	A-7-6(15)	A-7-6(14)	A-4(0)	

Site No.		Site 1	Site 1	Site 2	Site 3	Site 5	
Station		380+08	380+08	387+20	398+62	481+22	
Offset (FT)		136 RT	136 RT	41 RT	167 RT	180 RT	
Alignment		-L-	-L-	-L-	-L-	-L-	
Depth (FT)	From	0.0	2.0	0.0	0.0	0.0	
	to	2.0	4.0	2.0	2.0	2.0	

REMARKS: ND=Not Determined, NP=Non-Plastic, NV=No Value

Tested By Chana Savanapridi; Cert. No. 104-04-0504 Chana Savanapridi
Signature

Particle Size Distribution Report AASHTO T-88



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/4	100.0		
3/8	97.3		
#4	97.2		
#10	96.8		
#20	93.4		
#40	86.3		
#60	78.7		
#200	58.6		
0.0568 mm.	54.3		
#270	54.3		
0.0058 mm.	36.0		

* (no specification provided)

Material Description

Dark Red Silty Sandy CLAY with mica

Atterberg Limits (ASTM D 4318)

PL= 30 LL= 47 PI= 17

Classification

USCS (D 2487)= ML AASHTO (M 145)= A-7-5(9)

Coefficients

D_{90}= 0.5792 D_{85}= 0.3851 D_{60}= 0.0805
D_{50}= 0.0192 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Specific Gravity is Assumed

Date Received: 4/24/2012 **Date Tested:** 5/7/2012
Tested By: CS (CERT No. 104-04-0504)
Checked By: IAM
Title: Laboratory Manager

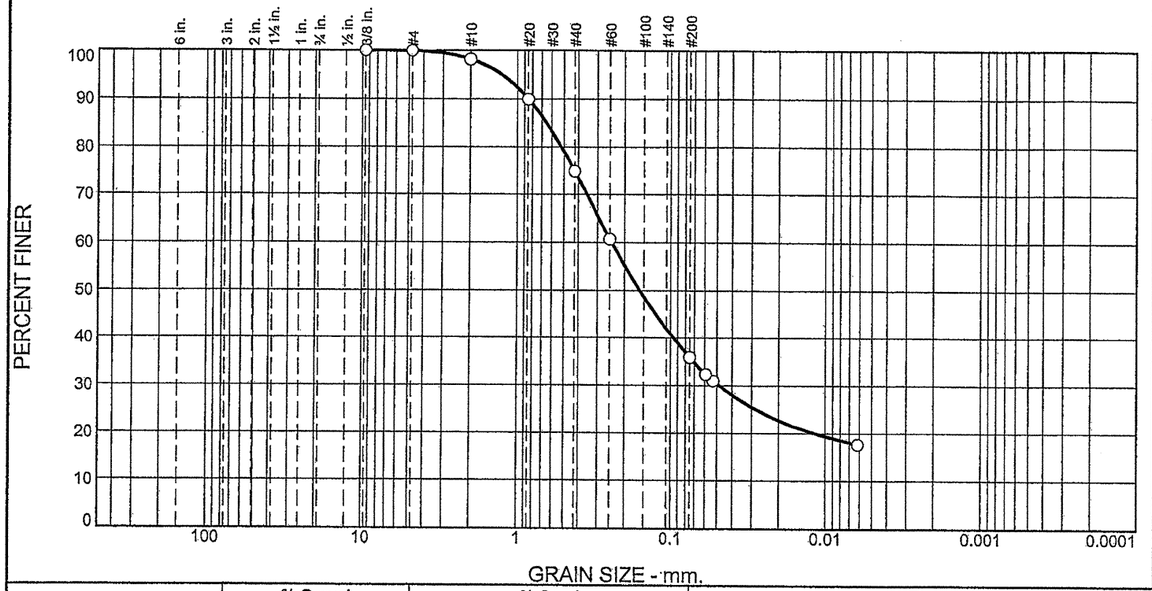
Source of Sample: Site 1 **Depth:** 0.0-2.0'
Sample Number: S-1

Date Sampled: 4/20/2012

Client: NCDOT
Project: Greensboro Western Loop From North Of SR2176 To US220

Project No: 6468-12-1100 **Figure**

Particle Size Distribution Report AASHTO T-88



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/8	100.0		
#4	99.9		
#10	98.1		
#20	90.0		
#40	74.9		
#60	60.7		
#200	35.8		
0.0592 mm.	32.3		
#270	31.0		
0.0062 mm.	17.6		

* (no specification provided)

Material Description

Dark Red Silty Sandy CLAY with mica

Atterberg Limits (ASTM D 4318)

PL= 30 LL= 46 PI= 16

Classification

USCS (D 2487)= SM AASHTO (M 145)= A-7-5(1)

Coefficients

D_{90}= 0.8507 D_{85}= 0.6509 D_{60}= 0.2434
D_{50}= 0.1594 D_{30}= 0.0486 D_{15}=
D_{10}= C_u= C_c=

Remarks

Specific Gravity is Assumed

Date Received: 4/24/2012 **Date Tested:** 5/7/2012
Tested By: CS (CERT No. 104-04-0504)
Checked By: IAM IAM
Title: Laboratory Manager

Source of Sample: Site 1 **Depth:** 2.0-4.0'
Sample Number: S-2

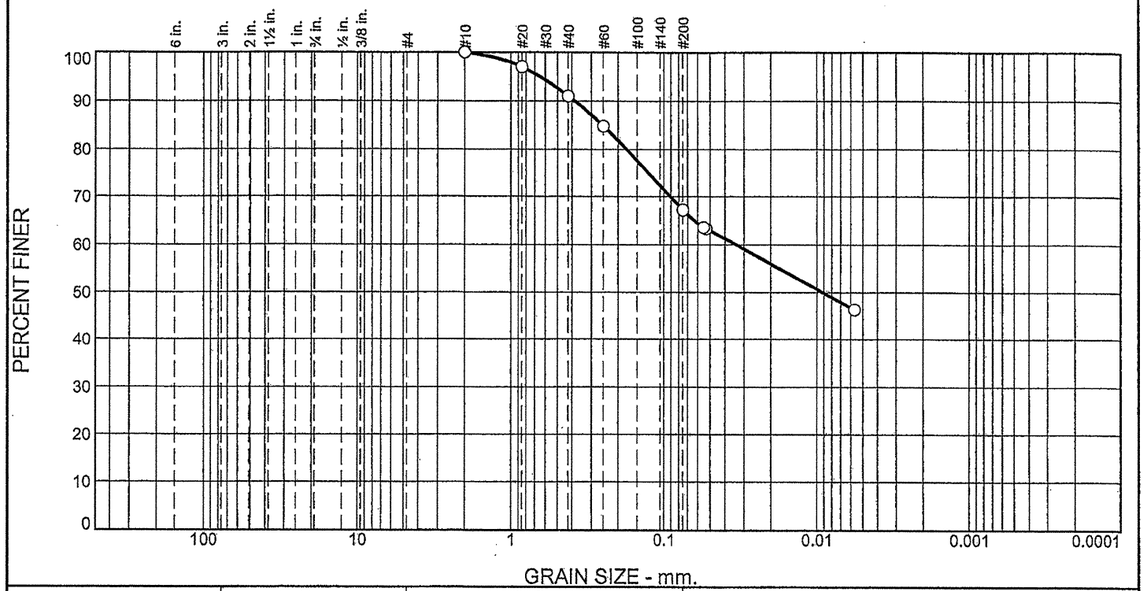
Date Sampled: 4/20/2012

amec

Client: NCDOT
Project: Greensboro Western Loop From North Of SR2176 To US220

Project No: 6468-12-1100 **Figure**

Particle Size Distribution Report AASHTO T-88



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#10	100.0		
#20	97.0		
#40	91.0		
#60	84.8		
#200	67.3		
0.0550 mm.	63.7		
#270	63.4		
0.0057 mm.	46.4		

* (no specification provided)

Material Description

Light Red Silty Sandy CLAY

Atterberg Limits (ASTM D 4318)

PL= 23 LL= 47 PI= 24

Classification

USCS (D 2487)= CL AASHTO (M 145)= A-7-6(15)

Coefficients

D_{90}= 0.3863 D_{85}= 0.2530 D_{60}= 0.0338
D_{50}= 0.0091 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Specific Gravity is Assumed

Date Received: 4/24/2012 **Date Tested:** 5/7/2012
Tested By: CS (CERT No. 104-04-0504)
Checked By: IAM IAM
Title: Laboratory Manager

Source of Sample: Site 2 **Depth:** 0.0-2.0'
Sample Number: S-3

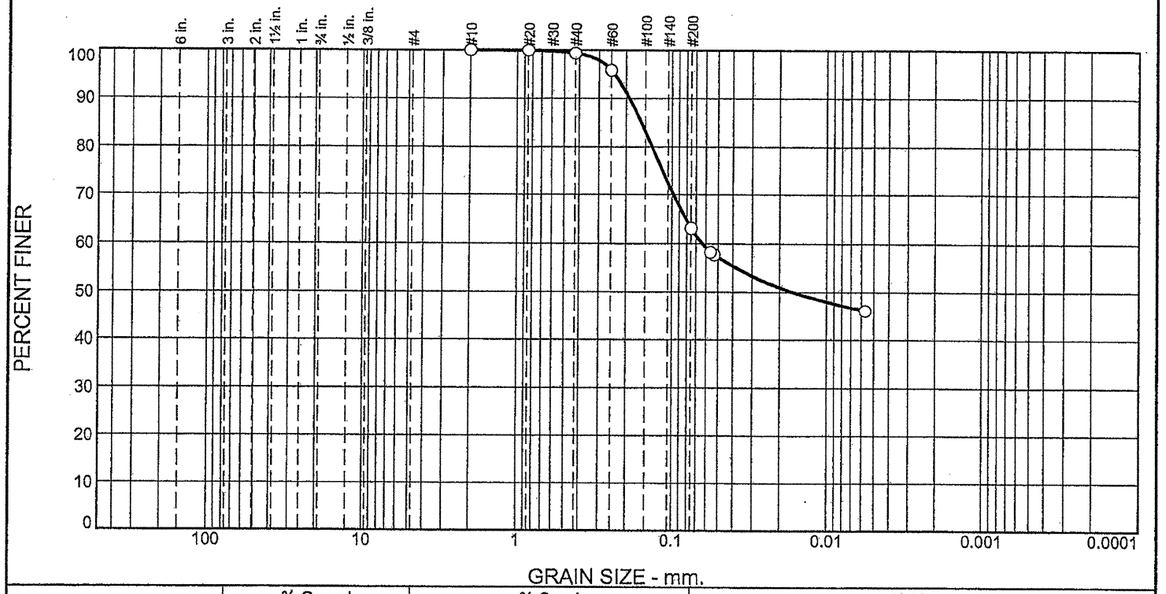
Date Sampled: 4/21/2012

amec

Client: NCDOT
Project: Greensboro Western Loop From North Of SR2176 To US220

Project No: 6468-12-1100 **Figure**

Particle Size Distribution Report AASHTO T-88



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#10	100.0		
#20	99.9		
#40	99.3		
#60	95.7		
#200	63.0		
0.0560 mm.	58.3		
#270	57.7		
0.0057 mm.	46.1		

* (no specification provided)

Material Description

Reddish Yellow Silty Sandy CLAY

Atterberg Limits (ASTM D 4318)

PL= 22 LL= 48 PI= 26

Classification

USCS (D 2487)= CL AASHTO (M 145)= A-7-6(14)

Coefficients

D_{90}= 0.1910 D_{85}= 0.1596 D_{60}= 0.0639
D_{50}= 0.0163 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Specific Gravity is Assumed

Date Received: 4/24/2012 **Date Tested:** 5/7/2012

Tested By: CS (CERT No. 104-04-0504)

Checked By: IAM

Title: Laboratory Manager

Source of Sample: Site 3 **Depth:** 0.0-2.0'

Sample Number: S-4

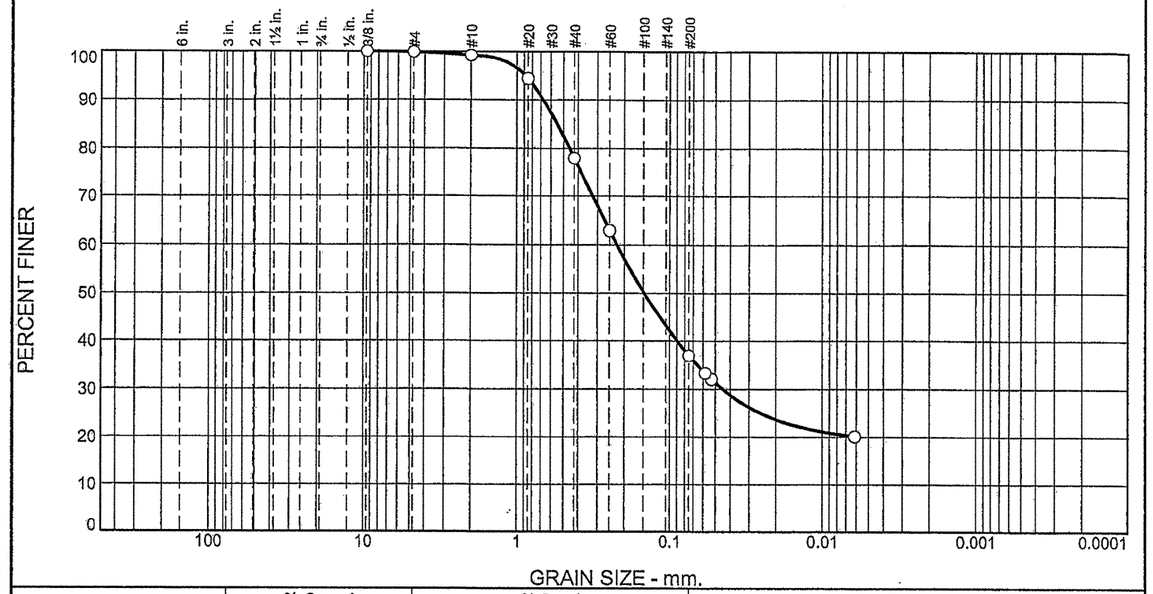
Date Sampled: 4/20/2012

Client: NCDOT

Project: Greensboro Western Loop From North Of SR2176 To US220

Project No: 6468-12-1100 **Figure**

Particle Size Distribution Report AASHTO T-88



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/8	100.0		
#4	99.9		
#10	99.2		
#20	94.3		
#40	77.9		
#60	62.9		
#200	37.0		
0.0582 mm.	33.2		
#270	32.0		
0.0061 mm.	20.1		

* (no specification provided)

Material Description

Reddish Brown Clayey Sandy SILT

Atterberg Limits (ASTM D 4318)

PL= 19 LL= 26 PI= 7

Classification

USCS (D 2487)= SC-SM AASHTO (M 145)= A-4(0)

Coefficients

D_{90}= 0.6757 D_{85}= 0.5495 D_{60}= 0.2245
D_{50}= 0.1483 D_{30}= 0.0448 D_{15}=
D_{10}= C_u= C_c=

Remarks

Specific Gravity is Assumed

Date Received: 4/24/2012 **Date Tested:** 5/7/2012

Tested By: CS (CERT No. 104-04-0504)

Checked By: IAM

Title: Laboratory Manager

Source of Sample: Site 5 **Depth:** 0.0-2.0'

Sample Number: S-5

Date Sampled: 4/21/2012

Client: NCDOT

Project: Greensboro Western Loop From North Of SR2176 To US220

Project No: 6468-12-1100 **Figure**