CONTRACT: C202331 ID: R-2417AA

NOTE: SEE SHEET 1A FOR PLAN SHEET LAYOUT AT TIME OF INVESTIGATION

CONTENTS

LINE	STATION			SHEET NUMBERS PLAN	PROFILE	XSECT
-L-	12+50	to	208+33.78	4-19	22-36	47-134
-Y-	11+50	to	51+25	6,20,21	37-39	147-153
LOOP B	10+00	to	19+68.71	6	40	51-54,135-137
RAMP B	10+00	to	27+72.03	6	41-42	-
LOOP C	10+00	to	22+54.69	6	43	53-55,138-141
RAMP C	10+00	to	32+66.31	6	44-45	142-146
RAMP CA	10+00	to	18+07.07	6,20,21	46	-
ROCK CORE PHOTOS	PAGES 57-60, 70-71, 80-81, 86-87, 96-97, 100-101					

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

ROADWAY SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 34431.1.1 (R-2417AA) F.A. PROJ. STP-NHF-42(2)

COUNTY LEE

PROJECT DESCRIPTION US 421 - NC 87 SANFORD BYPASS FROM WEST OF SR 1400 TO WEST OF US-1-15-501

INVENTORY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2417AA	1	153

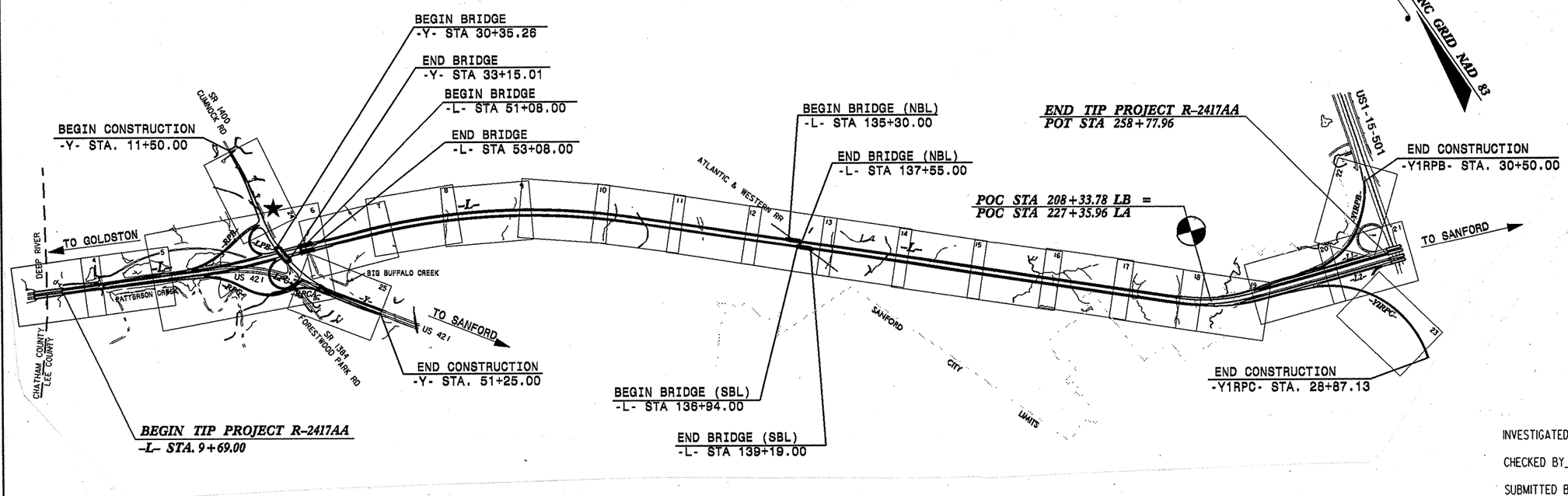
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34431.1.2	STP-NHF-421(2)	P.E.
34431.2.2	STP-NHF-421(15)	RW & UTIL.
34431.3.7	STP-NHF-421(15)	CONST.

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING, AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

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

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



PERSONNEL
CC MURRAY
J ESTEP
J VANDERBURG
L HARPER
C BURRIS
T MECHUM
C LITTLE

INVESTIGATED BY LITTLE /MURRAY
CHECKED BY MURRAY
SUBMITTED BY C LITTLE
DATE JANUARY 2006

NORTH CAROLINA LICENSED SEAL 1104 GEOLOGIST CLINTON B. LITTLE 9-27-06

DRAWN BY: C. LITTLE

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.

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2417AA	1A	150

WBS NO.	F.A. PROJ. NO.	DESCRIPTION
34431.1.2	STP-NHF-421(2)	P.E.

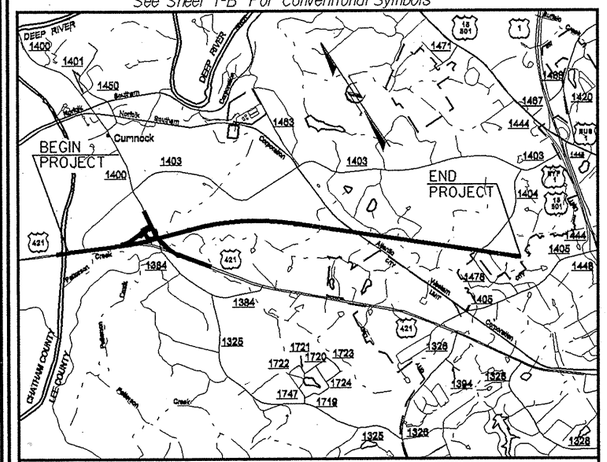
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

LEE COUNTY

LOCATION: US 421- NC 87 SANFORD BYPASS FROM WEST OF SR 1400 TO WEST OF US 1-15-501

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES AND SIGNALS.

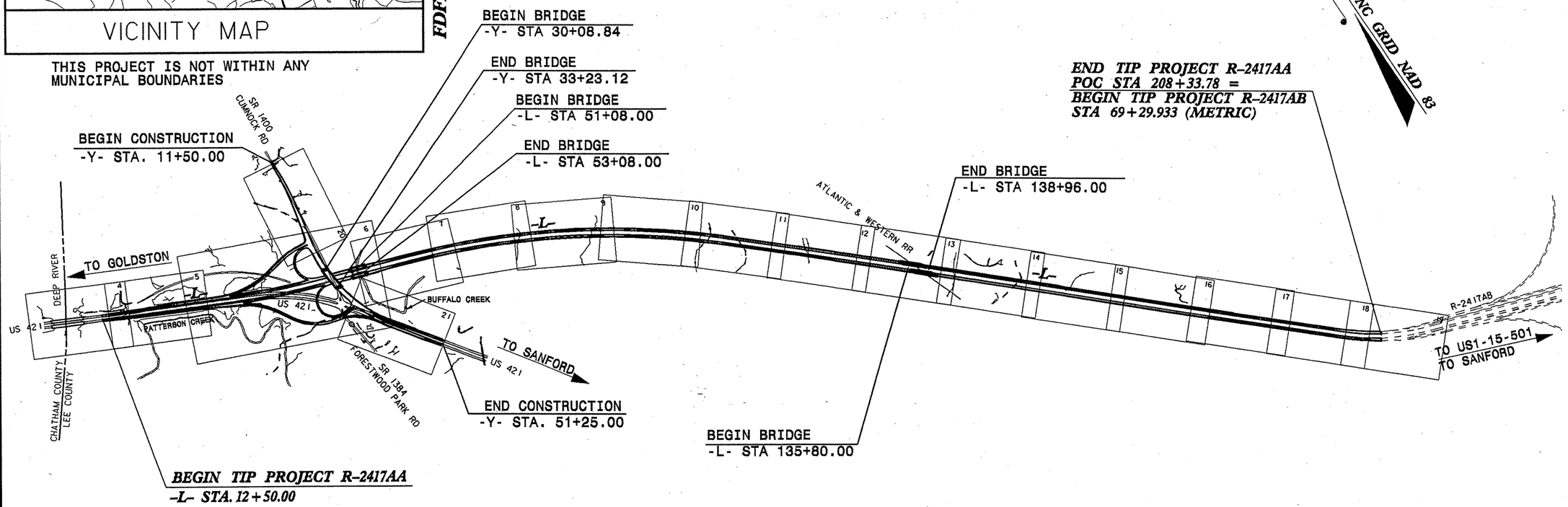
See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional Symbols



VICINITY MAP

FDFI PLANS

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES



THIS IS A CONTROLLED - ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III

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

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONTRACT: TIP PROJECT: R-2417AA

29-DEC-2005 08:18
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clittle AT GEH2214D9

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT (2008) = 13300
ADT (2028) = 20800
DHV = 10 %
D = 60 %
T = 9 %
V = 70 MPH
(TTST = 5% + DUALS = 4%)

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2417AA	=	3.611 MI.
LENGTH STRUCTURES TIP PROJECT R-2417AA	=	0.098 MI.
TOTAL LENGTH OF TIP PROJECT R-2417AA	=	3.709 MI.

2002 STANDARD SPECIFICATIONS

R/W DATE : February 17, 2006
LETTING DATE : May 20, 2008

Stephen R. Whitley, P.E.
PROJECT ENGINEER

David C. Waller, P.E.
PROJECT DESIGN ENGINEER

Prepared In the Office of:

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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 REFERENCE NO.	SHEET NO.
R-2417AA	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, SETTY 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/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
GRAIN SIZE 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) PL — PLASTIC LIMIT	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
OM — OPTIMUM MOISTURE SL — SHRINKAGE LIMIT	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
	- 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 VST PMT TEST BORING
- AUGER BORING
- CORE BORING
- MW MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- SPT N-VALUE
- REP SPT REFUSAL

SAMPLE DESIGNATIONS
S - BULK SAMPLE
SS - SPLIT SPOON SAMPLE
ST - SHELBY TUBE SAMPLE
RM - RESILIENT MODULUS 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-___
- [ ] BK-51
- [ ] CME-45C
- [X] CME-550
- [ ] PORTABLE HOIST
- [ ] OTHER _____
- [ ] OTHER _____

ADVANCING TOOLS:
- [ ] CLAY BITS
- [X] 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
- [ ] OTHER _____

HAMMER TYPE:
- [X] AUTOMATIC
- [ ] MANUAL

CORE SIZE:
- [ ] -B_____
- [X] -N XWL
- [ ] -H_____

HAND TOOLS:
- [ ] POST HOLE DIGGER
- [X] HAND AUGER
- [ ] SOUNDING ROD
- [ ] VANE SHEAR TEST
- [ ] OTHER _____

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 03/07/05

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

January 1, 2006

STATE PROJECT:	34431.1.1 (R-2417AA)
FEDERAL PROJECT:	STP-NHF-42(2)
COUNTY:	Lee
DESCRIPTION:	US 421 – NC 87 Sanford Bypass From West of SR 1400 to West of US 1-15-501
SUBJECT:	Geotechnical Report - Inventory

PROJECT DESCRIPTION

The project begins near the Lee-Chatham county line on an existing 4-lane section of US 421, just east of the Deep River. It then trends northward of the existing US 421 roadway on new location for the remainder of the project. Typical sections call for a four lane roadway with median for the –L- alignment. There is an interchange proposed that will connect the –L- alignment with existing US 421 and Cumnock Road. Three bridges will be required: a grade separation for –Y- (Cumnock Road/existing US 421) over –L-, a stream crossing (-L- over Buffalo Creek), and a railroad separation (-L- over –Y2-, Atlantic & Western RR). The –L- alignment runs generally east-southeast. The following alignments were investigated:

–L- Station 12+50 to 208+33.78
-Y- Station 11+50 to 51+25
Loop B Station 10+00 to 19+68.71
Ramp B Station 10+00 to 27+72.03
Loop C Station 10+00 to 22+54.69
Ramp C Station 10+00 to 32+66.31
Ramp CA Station 10+00 to 18+07.07.

The total length of lines investigated is 5.8 miles.

The initial field investigation was conducted during May through July of 2005. Borings were conducted with a CME-550 drill machine with an automatic hammer. Standard Penetration Tests were conducted at selected locations utilizing hollow stem augers and additional borings were advanced with 6" continuous flight augers. Rock core borings were later performed at selected locations using NXWL "wireline" coring tools. The core borings were performed in October, 2005 in areas of proposed cut where the initial borings indicated significant quantities of rock were present. Numerous soil samples were submitted to the Materials and Tests Unit for laboratory analysis. The rock core samples will be retained at the Geotechnical Engineering Unit Western Regional Office. Photographs of the rock core are included in this report.

AREAS OF SPECIAL GEOTECHNICAL INTEREST

Hard Rock: There is a considerable amount of hard rock on the project. It is more prevalent on the first half of the project. Rock was encountered above the proposed grade from Station 40+00 to 98+50 –L-, 162+50 to 188+50 –L-, most of Loops B and C, a small portion of Ramp C, and along line –Y- in the interchange area. The rock lines depicted on the attached cross-sections are interpolated between borings and based on both SPT refusal and auger refusal. There also significant zones of weathered rock and/or layers with alternating very hard residual soils and weathered rock that occur above the depicted rock lines.

The rock is Triassic sedimentary rock. It is described on the cross-sections as *Noncrystalline rock – Triassic mudstone*. More detailed descriptions are present with the core borings along with core photos. Based on the core obtained, descriptions of cuttings from auger borings, and limited surface outcrop data, I estimate that about 80% of the rock is actually mudstone with varying sand content. The mudstone grades to argillaceous (clay bearing) sandstone in relatively thin layers, and there are also thin stringers of limestone that also tend to contain considerable clay and some sand. Generally, the mudstone is the softest of the rocks, sandstone the hardest, and limestone intermediate.
The rock is thinly laminated; within the project area it appears to be relatively flat lying. Foliation in the core shows dip angles of 15° or less. Very limited surface data indicates a dip direction to the south-east.

Triassic sedimentary rocks in the area are known for degradation when exposed to water. Mudstones and claystones are probably the most prone to this effect. I performed some in-house slaking tests on six rock core samples by placing samples in water and observing the degradation over a period of several weeks. Several of the mudstone samples showed immediate but relatively minor degradation in the form of silt/clay particles flaking off the samples.. Two of the samples broke into pieces along the foliation or on joint planes within one day. A limestone sample showed the same effect after about one week. All of the samples showed moderate degradation but none showed total degradation to soil as has been observed in Triassic rock samples from other projects.

We are currently performing seismic refraction testing to obtain seismic velocity data on the rock. The data will be submitted as an addendum to this report at a later time.

Alluvial Soils: Areas with significant alluvial deposits are discussed below.

Station 12+50 to 36+00 –L-: The alignment through this interval follows the existing US 421 four lane section. Alluvial deposits associated with the Deep River and local tributaries are present on both

sides of the existing roadway. The roadway is on embankment through the section; the fill heights are 20' to 25'. The alluvium appears to be persistent through the interval on the left side, and intermittent on the right. Some of the test borings were conducted through an old roadway embankment (presumably the original US 421 2-lane roadway), most of the others were conducted with hand augers. The ground surface was too soft and wet to support the drill rig in many places. The borings indicate an alluvial layer averaging five feet in thickness containing soft to medium stiff soils described as coarse sandy clay, sandy clay, and sandy clayey silt (A-7, A-4). Water level readings were not obtained in the borings, but water was observed on the surface in December 2005, and the roadway plans indicate that much of the area was flooded on the aerial photography dated March 2003. The area may dry out during the summer months but can be expected to be wet at other times.

Station 52 to 54 –L-; 63 to 67 –L-(Right): These intervals are associated with Big Buffalo Creek. The stream is crossed near Station 52; the stream bends sharply upstream from the crossing and runs parallel to the –L- alignment in the interval from 63 to 67 –L- where proposed fills on the right will encroach on the floodplain. Borings conducted in the floodplain found medium stiff clayey silt (A-4) and medium stiff to stiff fine sandy silty clay (A-6). The thickness of sediment is six to eight feet. Groundwater was not present in the borings, but the soils were wet. Shallow groundwater would likely occur during a wetter season.

Station 104 to 106 –L-: Alluvial soils present are associated with a small stream that intersects the –L- alignment near Station 105+50. The deposit is five feet thick and contains soft to medium stiff, sandy, silty clay and clayey silt (A-4,A-7).

Station 120 to 135±: This is a large flat-lying area that contains some intermittent recent alluvium plus some Coastal Plain type clayey sands. Groundwater was shallow even during the dry period when our field work was done. It is likely that the area floods occasionally. The sediments were shallow and sandy.

Station 151+50 to 161+50 –L-: This area is another large flat area. It was dry in the summer season, but there was surface water throughout in December. Similarly, the surface was firm during the summer; we were able to drive our drilling equipment over it. In December the surface was soft and would not have supported equipment. The test borings found two feet of soft sandy silt (recent alluvium) over four feet of Coastal Plain clayey sand and sandy clay, over Triassic soils.

Groundwater: Groundwater can occur at or very near the ground surface in floodplain areas. It seems to be highly seasonal in the project area. This is discussed above in the section on alluvial soils. Groundwater will also be present in many of the cut sections. The profiles and cross-sections are misleading because most of the auger borings did not penetrate deep enough to reach proposed grade. Water was measured in the core borings, which did generally reach grade. Further, the borings were conducted during a dry season; water levels could be higher during a wet season. The rock is relatively impermeable, so the water will flow through joints/cracks or undetected fault zones. This could lead to very localized areas of groundwater influence. We anticipate that groundwater could occur above proposed grade in the following intervals:

-L- 43+00 to 51+00
-L- 62+00 to 69+00
-L- 72+00 to 75+00
-L- 77+00 to 86+50
-L- 89+00 to 98+00

-L- 189+00 to 202+00
Loop B 10+00 to 16+00
Loop C 10+00 to 18+00.

Artificial Fill/Roadway Fill: Two significant areas of fill soils were encountered.

The existing section of US 421 from the beginning of the project (Station 12+50 -L-) to about Station 38+00 -L- is on an embankment averaging 25 feet in height, crossing the Deep River Floodplain.

In the same general area, an older two lane roadway (abandoned) is still present (including some of the asphalt pavement). It will be within construction limits left of Stations 15 to 20 -L-, and within the "B" quadrant of the interchange affecting Ramp B. Most of the roadway was on embankment, but was in a cut where it hits the –L- section left of about Station 43. Some of the material in what appears to be a cut slope for the existing US 421 was apparently filled and reshaped to match the cut slopes on either side of the old roadbed.

We did not note any areas of significant slope failures, etc. in these embankment slopes; there are some minor erosion problems. None of the fill materials encountered (in limited borings) appeared to be unsuitable.

Ponds: A pond is present on the proposed centerline in the vicinity of Station 195 –L-. It is shown on the roadway plans. We investigated the pond with hand probing tools. Water depths were 1½ to 3 feet. Thickness of silt/clay deposits in the pond was ½ to 3 feet. The pond is formed by an earthen dam located right of –L- centerline and fed by surface drainage from the left. A spring house was noted left of –L- Station 193+50, so the pond may be partially spring fed as well.

PHYSIOGRAPHY AND GEOLOGY

The project is located in the central piedmont region of North Carolina. There are two distinct terrains. From the beginning of the project to about Station 100 –L-, the terrain is rolling hills and valleys, rocky with steep slopes. From Station 100 to the end of the project, the terrain is much flatter with areas of Coastal Plain overlap. The majority of the project is open land; there are few homes or businesses. Much of the land has been logged.

The geology along the project coincides with the terrain. All of the project is within the Deep River Basin, Sanford Sub-Basin, but on the southern/eastern half some of the Triassic rocks are covered by a thin veneer of coastal plain sediments. The basins are downdropped fault blocks that formed topographic lows, then filled with sediments. The rocks appear to be part of the Sanford Formation which consists of red and brown fanglomerate, conglomerate, sandstone and mudstone. As previously discussed, and based on limited data, the prevalent rock type within the corridor is red mudstone,

with lesser amounts of red to brown sandstone and gray limestone or calcareous mudstone. Most of the deposits appear to be lacustrine in origin. We did not observe any of the fanglomerates or conglomerates. All observed structure within the corridor appears to be dipping between 0 and 15° to the southeast. Geologic mapping of the areas shows a series of northeast trending diabase dikes that intrude the basin sediments. We did not note any of the dikes, but they will likely be encountered during construction. Intrusion of the dikes formed zones of altered and fractured rocks at the contacts. These zones have been known to form hydraulic conduits for groundwater, creating localized areas of water seepage and instability in cut slopes. Faults bounding and within the sub-basins can also create fractured rock zones serving as conduits for water with similar results.

SOIL PROPERTIES

Residual Soils

All residual soils on the project are derived from the Triassic rocks previously discussed. The dominant soil type is sandy clay (A-6, A-7) with lesser clayey sand (A-2). The residual soil is commonly just a thin veneer over weathered or hard rock. In many areas the soil veneer is 10' or less in thickness. Soil thicknesses are greater in the second half of the project. Soil mantle thickness of greater than 20 feet is rare.

Artificial/Roadway Fill Soils

These soils occur in significant quantities only at the beginning of the project and in the –Y- interchange area. See the section under "Items of Special Interest" for locations. The fills appear to have been constructed with local residual soils as described above. The bulk of the soils are red sandy clays (A-7).

Alluvial Soils

These soils are widespread in several areas as discussed above. They are generally very thin, however. In the Deep River floodplain, the average thickness is five feet. At Buffalo Creek, the maximum thickness is about ten feet. In the large flat areas toward the end of the project, the thickness is only about two feet. Several small floodplains associated with local drainages are crossed. These are typically 200 feet or less wide with sediment thickness on the order of five feet. The sediment classifications tend toward sandy silt (A-4) and sandy clay (A-6).

Weathered Rock

Toward the end of the project especially, there are significant layers of weathered rock. This is transitional material with SPT counts greater than 100 but less than SPT (or auger) refusal. Often, it is interlayered with hard/very dense soils.

Coastal Plain Soils

Coastal Plains soils are first encountered near Station 105 –L-. They occur intermittently from there to approximate Station 177 -L-, most commonly in low-lying areas. Several soil types are present including sandy clay (A-6), clayey sand (A-2), and sandy silt (A-4). In many places they are only one or two feet thick; the deepest deposit is in the vicinity of Station 129-135 where our borings were terminated in Coastal Plain soils at ten feet. Coastal Plain soils will occur near proposed grade at Stations 115 to 118 –L-, and 169 to 175 –L-. Elsewhere, they are in fill sections.

GEOTECHNICAL DESCRIPTIVE ANALYSIS

For descriptive purposes, the project is divided into segments discussed below.

Station 12+50 to 37+00

Proposed construction through this segment consists of widening an existing fill section (US 421 existing). The current embankment averages 20 feet in height. The fill will be widened by about twenty feet on either side; increasingly more ahead of Station 29+50 – 30+00 where Ramps "B" and "C" begin. The embankment rests largely on alluvial soils consisting of about five feet of stiff sandy clay or soft sandy silt. The area appears to flood frequently.

Station 37+00 to 50+00

This segment includes the interchange with Cumnock Road (-Y-). The -L- alignment is mostly in cut, as are the alignments for Loop B and Loop C. Noncrystalline rock (Triassic mudstone) occurs above proposed grade on these alignments. Ramps B and C are on fill that will be founded mainly on hard residual soils. There also some existing roadway fill soils present in the area, associated with the old two-lane US 421 roadbed and existing Cumnock Road.

Station 50+00 to 98+00

Buffalo Creek and its associated floodplain are crossed from Station 52 to 54. This floodplain is also involved right of Stations 63 to 67 –L- as previously discussed. The remainder of the segment is ridge cuts and valley fills. Triassic rock is present above grade in all of the cuts. Groundwater is present above grade in all of the cuts, generally within the rock mass. The valleys are narrow with little or no alluvial deposits.

Station 98+00 to 216+00

At about Station 98, the regional topography becomes much more subdued. There are two large floodplains, and there are fingers of Coastal Plain overlap. Both the recent alluvium and the Coastal Plain alluvium is shallow. From Station 98 to 118, proposed grade requires shallow fills. A much larger fill will be required from Station 98 to 161. The maximum fill height of about 40 feet occurs near the railroad crossing at Station 137+50. From about Station 179 ahead to the end of the project, the topography becomes more hilly, similar to the earlier project segments. Several cuts of 20 to 25 feet will be required. The area is still underlain by Triassic rock, but the rock is more deeply weathered.

CULVERTS

Station 105+20 -L-
The proposed structure is a 1 @ 9' x 6" RCBC, Overall length = 199'. Three test borings conducted in the vicinity indicate that residual soils from Triassic mudstone are present near the proposed floor elevation (±236). Weathered rock was encountered at elevations 228, 229, and 235 in the borings. The site is located within a small floodplain containing an alluvial deposit of sandy silt and sandy clay five feet or less in thickness.

Station 120+57 -L-
The proposed structure is a 1 @ 8' x 6' RCBC, Overall length = 203'. Two borings conducted in the vicinity indicate the top of residual soil at elevation 242. The proposed culvert has inlet elevation = 243.7 and outlet = 241.7, indicating the culvert will be founded on stiff to hard residual soil (sandy clay from Triassic mudstone). Weathered rock was encountered in one boring (Elev. 239) but not in the other (advanced to Elev. 228). Floodplain soils present were clayey silt and silty clay, soft and wet, 3' to 4' in thickness.

Station 142+67 -L-
The proposed structure is a 1 @ 8' x 6' RCBC, Overall length = 267'. One boring conducted indicates that the excavation and foundation will be in medium to very stiff, residual (Triassic) red-brown sandy clay w/ gravel.

Station 177+29 -L-
The proposed structure is a 2 @ 9' x 7' RCBC, Overall length = 189'. Three borings were conducted along the approximate alignment, located in a narrow floodplain. The borings encountered 6' to 10' of alluvial, very soft, sandy silt over very stiff to hard clayey silt residual (Triassic) soil. Hard rock was encountered at depths between 12' and 16'. The proposed culvert has inlet elevation = 245.9', outlet = 245.5'. This places the culvert floor elevation within the alluvial layer, up to five feet above firm residual materials.

Respectfully submitted,

Clint Little
Regional Geologist

EARTHWORK BALANCE SHEET

Volumes in Cubic Yards

PROJECT TIP # R-2417AA COUNTY Lee DATE 1/11/2011 SHEET 3 OF 153 SHEETS

LINE	STATION	STATION	TOTAL EXCAV. (UNCL.)	ROCK EXCAV.	UNDERCUT EXCAV.	UNSUIT. EXCAV.	SUITABLE EXCAV.	TOTAL EMB.	ROCK EMB.	EARTH EMB.	EMBANK. 15%	BORROW	ROCK WASTE	SUITABLE WASTE	UNSUIT. WASTE	TOTAL WASTE
SUMMARY NO. 1																
-L-	12+50.00	30+00.00	5,478				5,478	31,562	0	31,562	36,296	30,818				
TOTAL SUMMARY NO. 1			5,478	0	0	0	5,478	31,562	0	31,562	36,296	30,818	0	0	0	0
SUMMARY NO. 2																
-L-	30+00.00	51+08.00	319,948	231,373			88,575	56,140	0	56,140	64,561		231,373	24,014		255,387
-Y-	11+50.00	30+08.84	42,004	13,712			28,292	3,791	0	3,791	4,360		13,712	23,932		37,644
-Y-	33+23.12	51+00.00	784				784	21,735	0	21,735	24,995	24,211				
-RPB-	17+25.83	27+00.00	2,656				2,656	33,169	0	33,169	38,144	35,488				
-LPB-	13+00.00	17+11.33	33,770	15,606			18,164	735	0	735	845		15,606	17,319		32,925
-RPC-	17+00.00	32+00.00	7,954				7,954	21,783	0	21,783	25,050	17,096				
-RPCA-	12+25.16	15+31.14	107				107	2,366	0	2,366	2,721	2,614				
-LPC-	12+84.33	17+69.09	32,287	11,238			21,049	0	0	0	0		11,238	21,049		32,287
TOTAL SUMMARY NO. 2			439,510	271,929	0	0	167,581	139,719	0	139,719	160,677	79,410	271,929	86,314	0	358,243
SUMMARY NO. 3																
-L-	53+08.00	60+00.00	17,181				17,181	20,178		20,178	23,205	6,024				
TOTAL SUMMARY NO. 3			17,181	0	0	0	17,181	20,178	0	20,178	23,205	6,024	0	0	0	0
SUMMARY NO. 4																
-L-	60+00.00	90+00.00	338,340	145,446			192,894	30,880	0	30,880	35,512		145,446	157,382		302,828
TOTAL SUMMARY NO. 4			338,340	145,446	0	0	192,894	30,880	0	30,880	35,512	0	145,446	157,382	0	302,828
SUMMARY NO. 5																
-L-	90+00.00	120+00.00	148,082	41,784			106,298	59,783	0	59,783	68,750		41,784	37,548		79,332
TOTAL SUMMARY NO. 5			148,082	41,784	0	0	106,298	59,783	0	59,783	68,750	0	41,784	37,548	0	79,332
SUMMARY NO. 6																
-L-	120+00.00	135+80.00	0				0	347,336		347,336	399,436	399,436				
TOTAL SUMMARY NO. 6			0	0	0	0	0	347,336	0	347,336	399,436	399,436	0	0	0	0
SUMMARY NO. 7																
-L-	138+96.00	150+00.00	0				0	207,768		207,768	238,933	238,933				
TOTAL SUMMARY NO. 7			0	0	0	0	0	207,768	0	207,768	238,933	238,933	0	0	0	0
SUMMARY NO. 8																
-L-	150+00.00	180+00.00	106,166	6,159			100,007	103,843	0	103,843	119,419	19,412	6,159			6,159
TOTAL SUMMARY NO. 8			106,166	6,159	0	0	100,007	103,843	0	103,843	119,419	19,412	6,159	0	0	6,159
SUMMARY NO. 9																
-L-	180+00.00	208+33.78	239,830	473			239,357	35,371	0	35,371	40,677		473	198,680		199,153
TOTAL SUMMARY NO. 9			239,830	473	0	0	239,357	35,371	0	35,371	40,677	0	473	198,680	0	199,153
SUMMARY NO. 10																
-L-	227+35.96	258+77.96	2,029				2,029	1,694		1,694	1,948			81		81
-Y1RPB-	10+00.00	30+50.00	1,664				1,664	10,392		10,392	11,951	10,287				
TOTAL SUMMARY NO. 10			3,693	0	0	0	3,693	12,086	0	12,086	13,899	10,287	0	81	0	81
CONSTRUCT DETOUR SUMMARY																
NB DET	13+09.27	37+93.32	15,270				15,270	1,490		1,490	1,714	0	0	13,557		13,557
REMOVE DETOUR SUMMARY																
NB DET	13+09.27	37+93.32	1,490				1,490	15,270		15,270	17,561	16,071	0	0		0
PROJECT SUBTOTAL			1,315,040	465,791			849,249	1,005,286		1,005,286	1,156,079	800,391	465,791	493,561		959,353
ADJUSTMENT FOR DRY DENTENTION BASIN			17,600				17,600	217		217	250		0	17,350		17,350
SHOULDER MATERIAL								29,100		29,100	33,465	33,465				
LOSS DUE TO CLEARING & GRUBBING			-45,000				-45,000							-45,000		-45,000
ROCK WASTE TO REPLACE BORROW												-367,944	-367,944			-367,944
WASTE IN LIEU OF BORROW												-465,912		-465,912		-465,912
PROJECT TOTAL			1,287,640	465,791	0	0	821,849	1,034,603	0	1,034,603	1,189,794	0	97,847	0	0	97,847
EST 5% TO REPLACE TOP SOIL ON BORROW PIT												0				
GRAND TOTAL			1,287,640	465,791	0	0	821,849	1,034,603	0	1,034,603	1,189,794	0	97,847	0	0	97,847
SAY			**1,287,700**									**0**				
ADDITIONAL UNDERCUT			**10,000**													
SHALLOW UNDERCUT			**3,500**													
SHOULDER BORROW			**29,100**													

*** EARTHWORK QUANTITIES ARE CALCULATED BY THE ROADWAY DESIGN UNIT. THESE EARTHWORK QUANTITIES ARE BASED IN PART ON SUBSURFACE DATA PROVIDED BY THE GEOTECHNICAL ENGINEERING UNIT.**

KO & ASSOCIATES, P.C.
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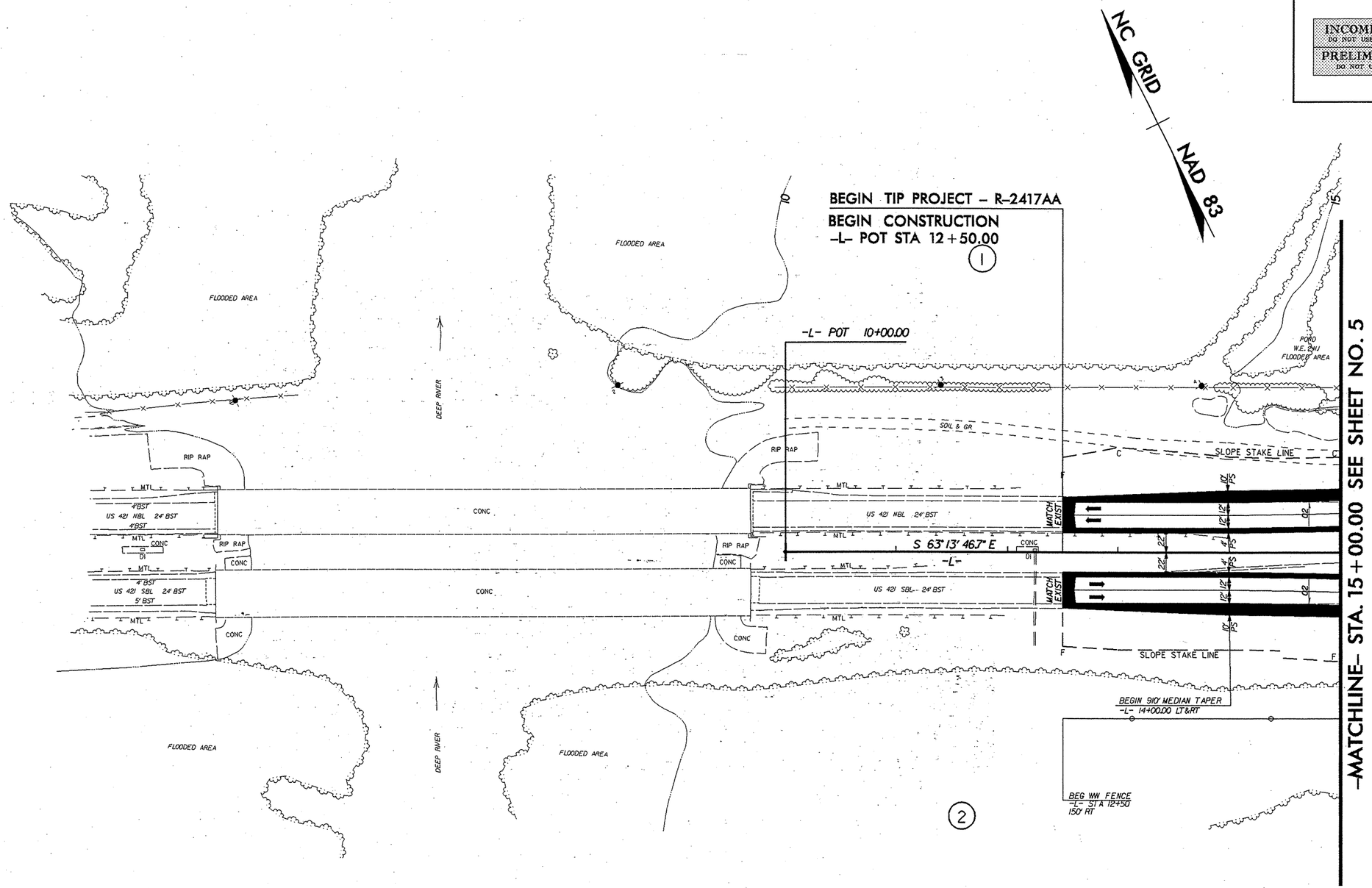
PROJECT REFERENCE NO.	SHEET NO.
R-2417AA	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



LEGEND
PAVED SHOULDER

FOR -L- PROFILE, SEE SHEET NO. 22
FOR DITCH DETAILS, SEE SHEET NOS. 2-E & 2-F

8/17/99
02-DEC-2005 13:38
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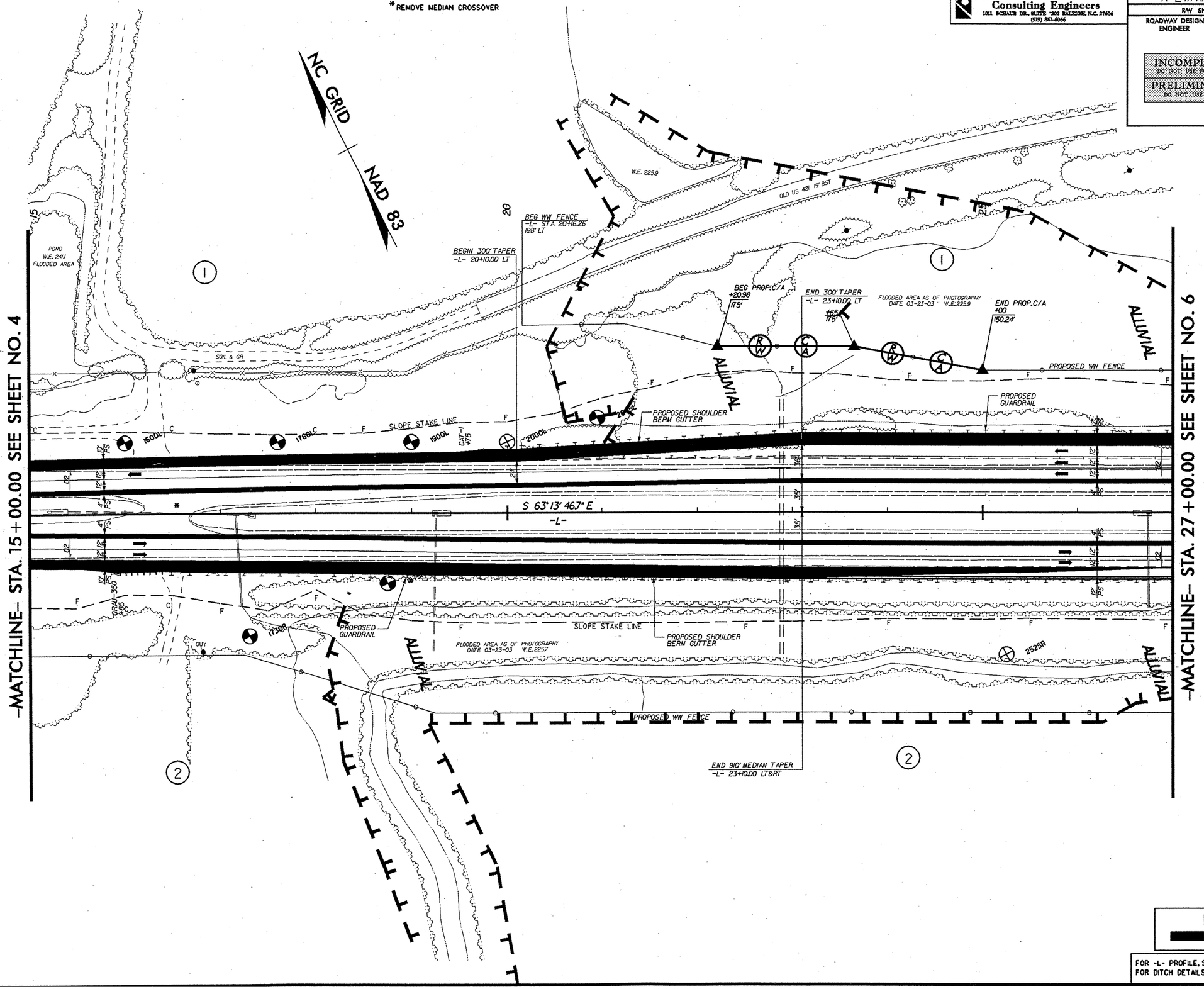
little AT GFH221409

KO & ASSOCIATES, P.C. Consulting Engineers 1011 SCHAUB DR., SUITE 202 RALEIGH, N.C. 27606 (919) 851-6066	PROJECT REFERENCE NO. R-2417AA	SHEET NO. 5
	R/W SHEET NO.	
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



LEGEND
PAVED SHOULDER

FOR -L- PROFILE, SEE SHEET NO. 22
FOR DITCH DETAILS, SEE SHEET NOS. 2-E & 2-F

8/17/99

28-DEC-2005 14:39
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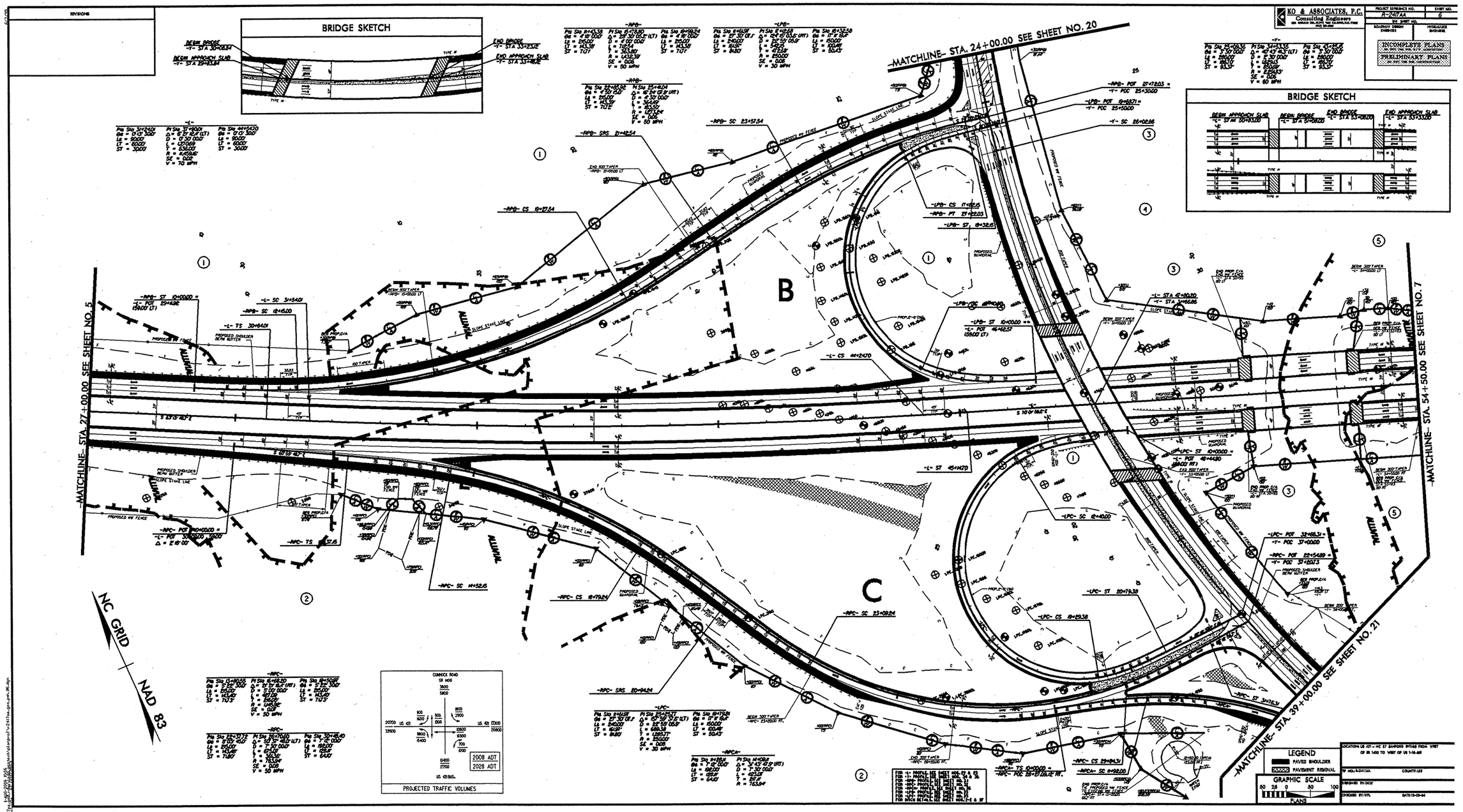


KO & ASSOCIATES, P.C.
Consulting Engineers
PROJECT REFERENCE NO.
R-2417AA
SHEET NO.
6
INCOMPLETE PLANS
PRELIMINARY PLANS
BRIDGE SKETCH
BRIDGE SKETCH
-MATCHLINE- STA. 24+00.00 SEE SHEET NO. 20
-MATCHLINE- STA. 27+00.00 SEE SHEET NO. 5
-MATCHLINE- STA. 54+50.00 SEE SHEET NO. 7
-MATCHLINE- STA. 39+00.00 SEE SHEET NO. 21
B
C
NC GRID
NAD 83
PROJECTED TRAFFIC VOLUMES
2008 ADT
2028 ADT
LEGEND
PAVED SHOULDER
PAVEMENT REMOVAL
GRAPHIC SCALE
PLANS

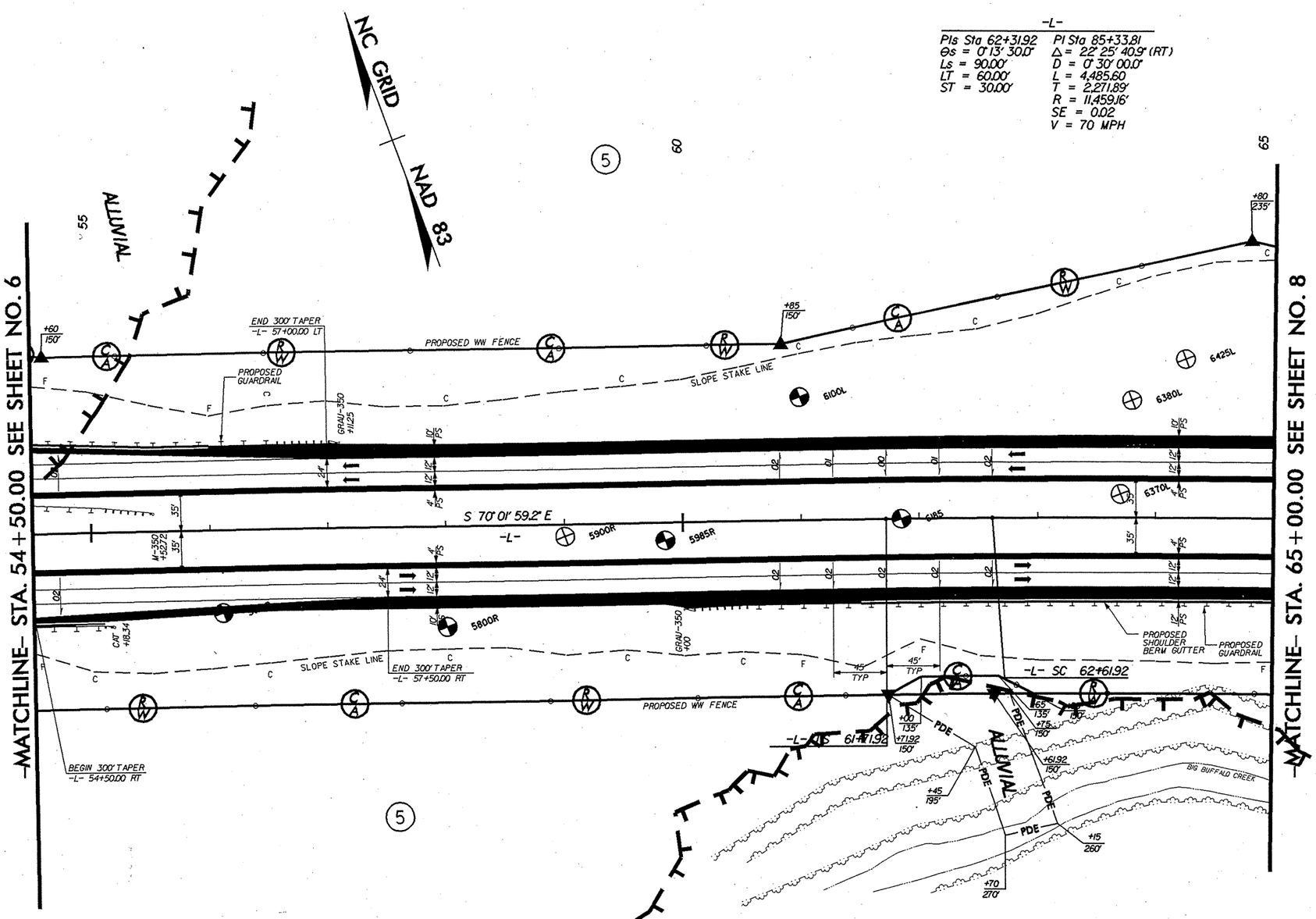
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE 202 RALEIGH, N.C. 27606
(919) 851-6066

PROJECT REFERENCE NO.	SHEET NO.
R-2417AA	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L-

PIs Sta 62+31.92	PI Sta 85+33.81
Θs = 0°13' 30.0"	Δ = 22° 25' 40.9" (RT)
Ls = 90.00'	D = 0° 30' 00.0"
LT = 60.00'	L = 4,485.60
ST = 30.00'	T = 2,271.89'
	R = 11,459.16'
	SE = 0.02
	V = 70 MPH



LEGEND
PAVED SHOULDER

FOR -L- PROFILE, SEE SHEET NOS. 23 & 24
FOR DITCH DETAILS, SEE SHEET NOS. 2-E & 2-F

8/17/99

28-DEC-2005 14:15
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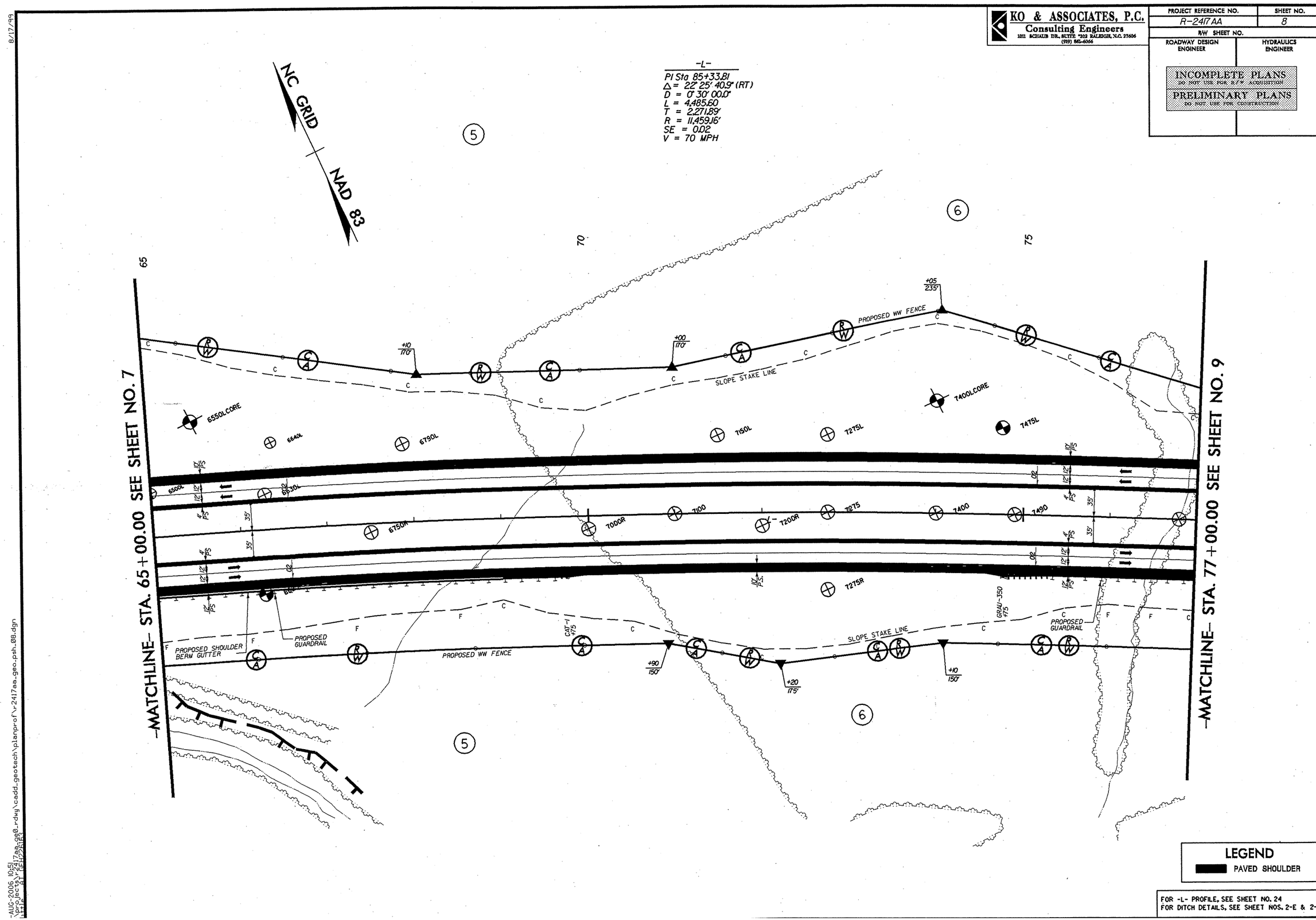
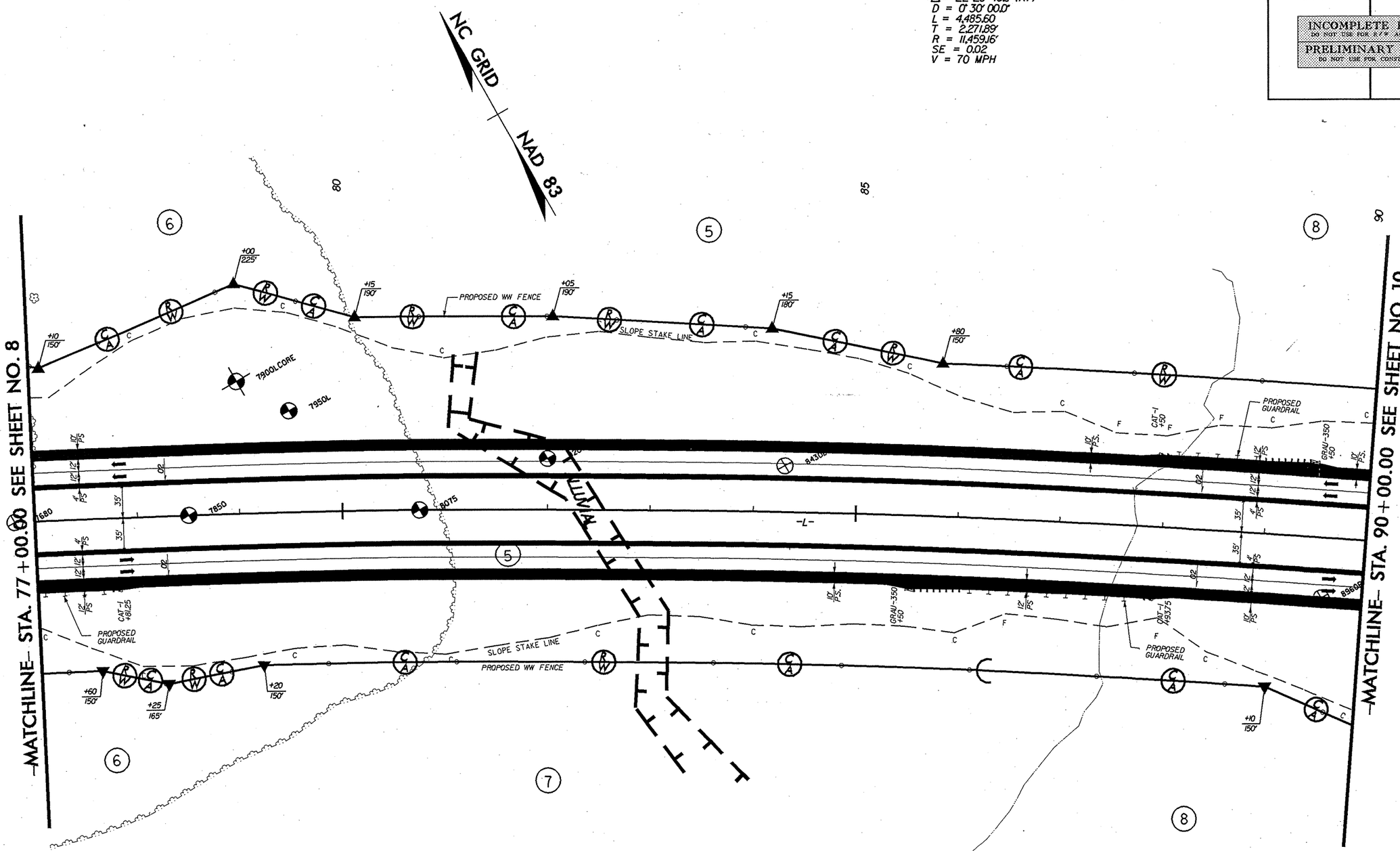

KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE 202 RALEIGH, N.C. 27606
(919) 851-6066
PROJECT REFERENCE NO.
R-2417AA
SHEET NO.
8
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
-L-
PI Sta 85+33.81
Δ = 22° 25' 40.9" (RT)
D = 0° 30' 00.0"
L = 4,485.60
T = 2,271.89'
R = 11,459.16'
SE = 0.02
V = 70 MPH
NC GRID
NAD 83
-MATCHLINE- STA. 65+00.00 SEE SHEET NO. 7
-MATCHLINE- STA. 77+00.00 SEE SHEET NO. 9
PROPOSED WW FENCE
SLOPE STAKE LINE
PROPOSED SHOULDER BERM GUTTER
PROPOSED GUARDRAIL
6550LCORE
6640L
6790L
7150L
7275L
7400LCORE
7475L
6500L
6630L
6750R
7000R
7100
7200R
7275
7400
7490
7275R
LEGEND
PAVED SHOULDER
FOR -L- PROFILE, SEE SHEET NO. 24
FOR DITCH DETAILS, SEE SHEET NOS. 2-E & 2-F

8/17/99

KO & ASSOCIATES, P.C. Consulting Engineers 1011 SCHAUB DR., SUITE 202 RALEIGH, N.C. 27606 (919) 851-6066	PROJECT REFERENCE NO. R-2417AA	SHEET NO. 9
	R/W SHEET NO.	
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L-
PI Sta 85+33.81
Δ = 22° 25' 40.9" (RT)
D = 0° 30' 00.0"
L = 4,485.60
T = 2,271.89'
R = 11,459.16'
SE = 0.02
V = 70 MPH



LEGEND
PAVED SHOULDER

FOR -L- PROFILE, SEE SHEET NOS. 24 & 25
FOR DITCH DETAILS, SEE SHEET NOS. 2-E & 2-F

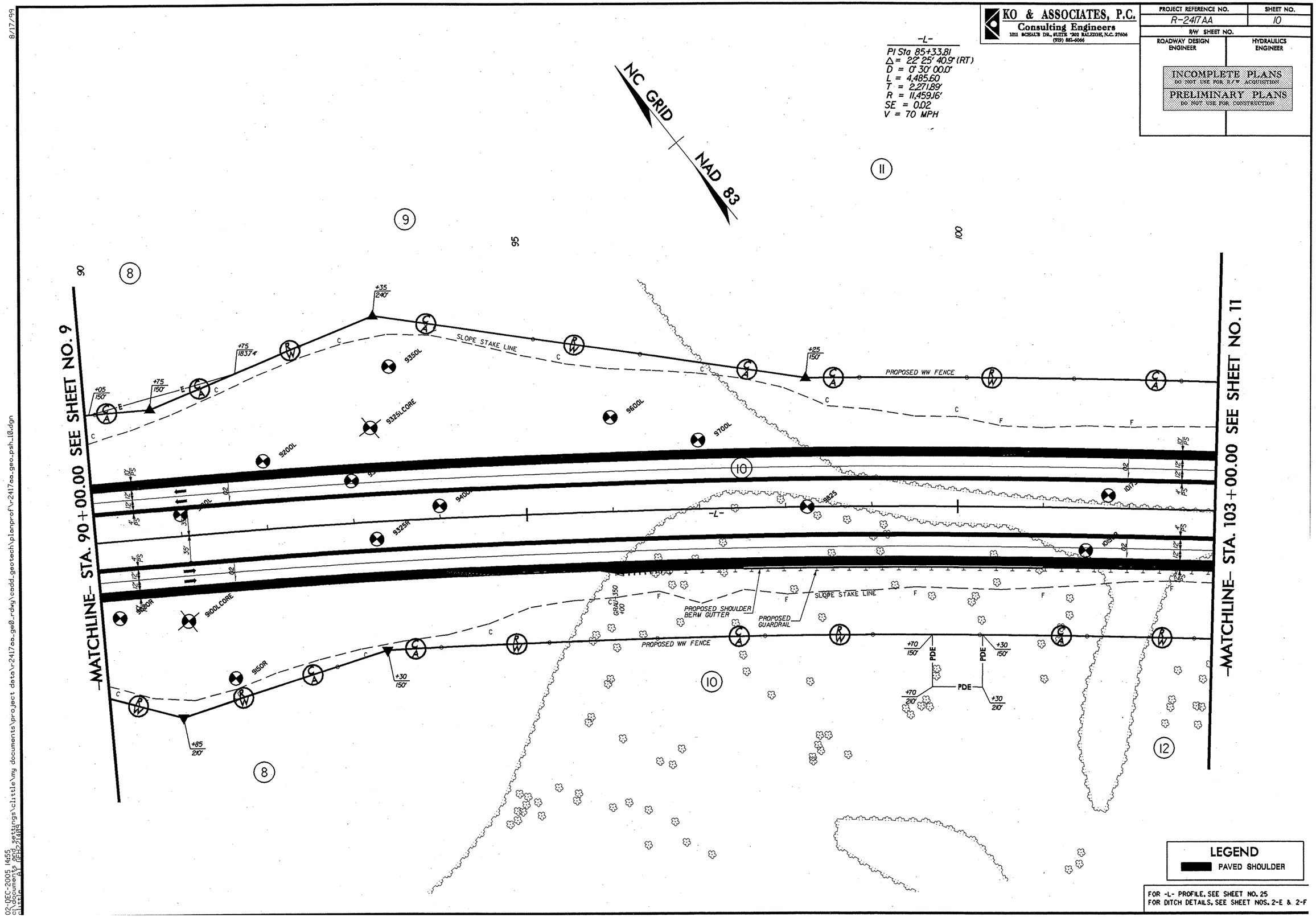
11-AUG-2006 11:21
d:\projects\r2417aa\geo_rdwy\cadd_geotech\planprof\r2417aa_geo_psh_09.dgn

KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE 202 RALEIGH, N.C. 27606
(919) 851-6066

PROJECT REFERENCE NO.	SHEET NO.
R-2417AA	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L-
PI Sta 85+33.81
Δ = 22° 25' 40.9" (RT)
D = 0° 30' 00.0"
L = 4,485.60
T = 2,271.89'
R = 11,459.16'
SE = 0.02
V = 70 MPH



FOR -L- PROFILE, SEE SHEET NO. 25
FOR DITCH DETAILS, SEE SHEET NOS. 2-E & 2-F

8/17/99
02-DEC-2005 14:55
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clittle
at (R)R-2417AA

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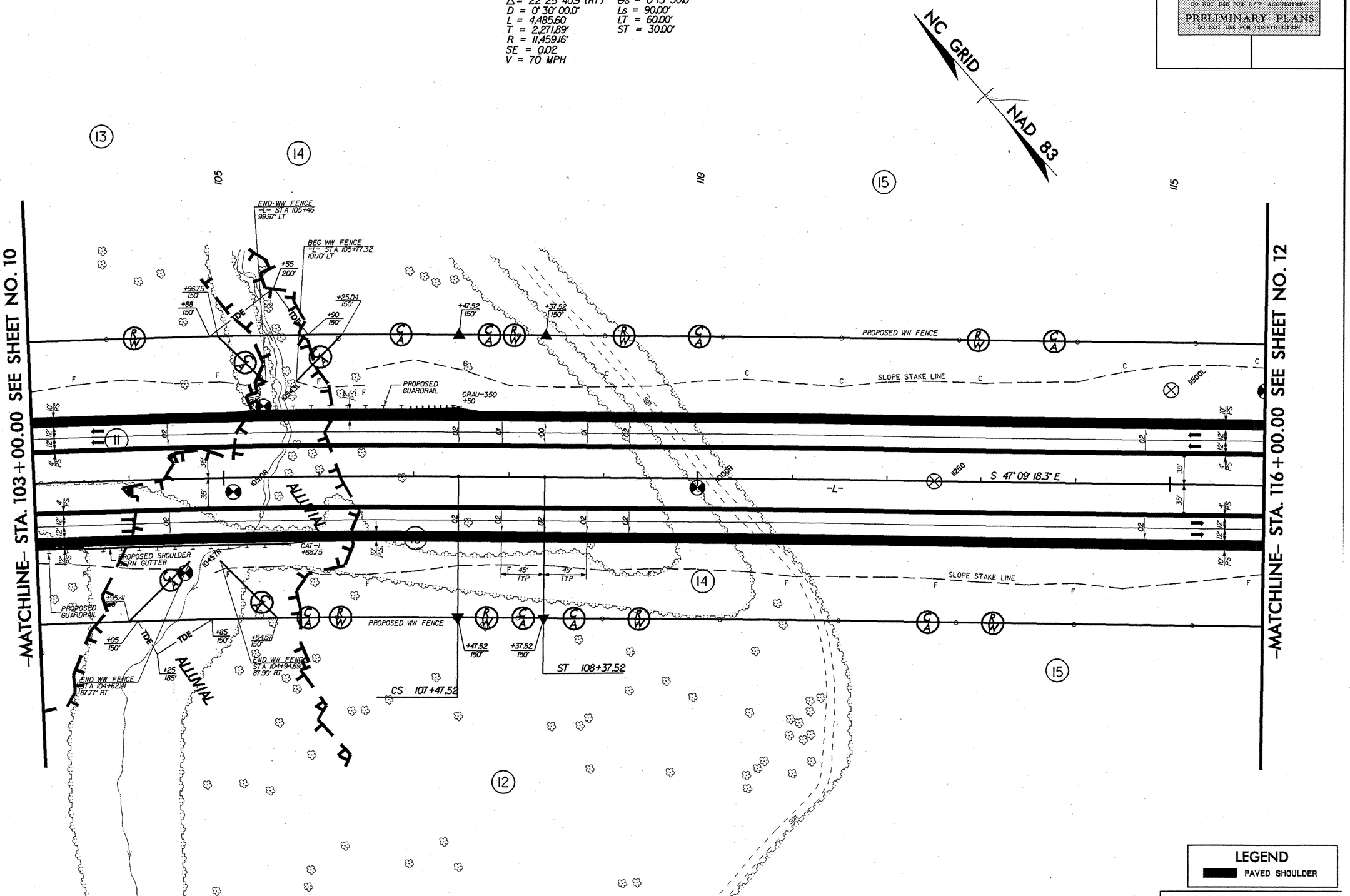
Consulting Engineers
1011 SCHAUB DR., SUITE 202 RALEIGH, N.C. 27606
(919) 851-6066

PROJECT REFERENCE NO.	SHEET NO.
R-2417AA	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L-

PI Sta 85+33.81	PIs Sta 107+77.52
Δ = 22° 25' 40.9" (RT)	Θs = 0° 13' 30.0"
D = 0° 30' 00.0"	Ls = 90.00'
L = 4,485.60	LT = 60.00'
T = 2,271.89'	ST = 30.00'
R = 11,459.16'	
SE = 0.02	
V = 70 MPH	



LEGEND
PAVED SHOULDER

FOR -L- PROFILE, SEE SHEET NOS. 25 & 26
FOR DITCH DETAILS, SEE SHEET NOS. 2-E & 2-F

8/17/99

28-DEC-2005 14:53
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clittle AT GFH22140

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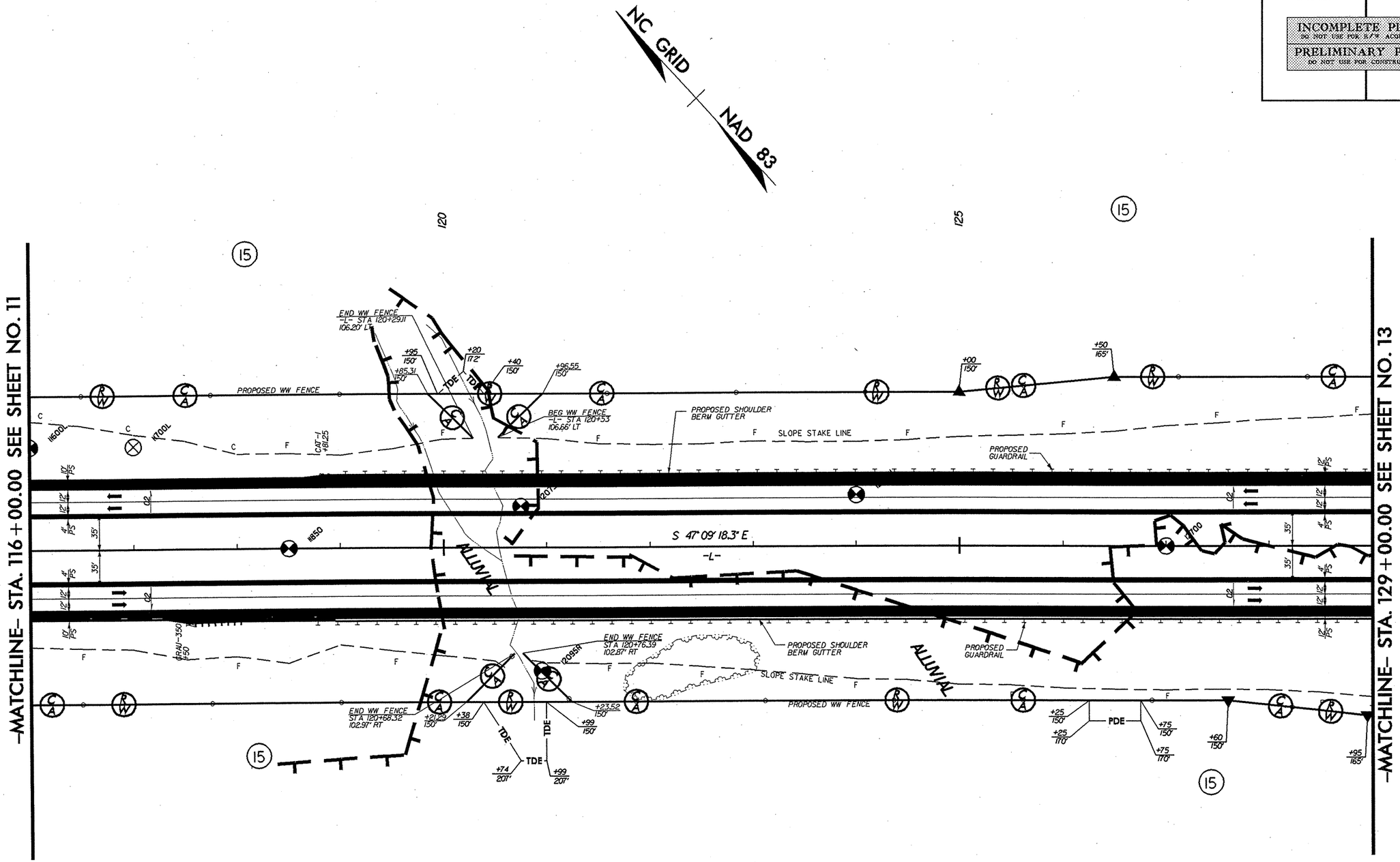
Consulting Engineers
1011 SCHAUB DR., SUITE 202 RALEIGH, N.C. 27606
(919) 851-6066

PROJECT REFERENCE NO.	SHEET NO.
R-2417AA	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



LEGEND
PAVED SHOULDER

FOR -L- PROFILE, SEE SHEET NO. 26
FOR DITCH DETAILS, SEE SHEET NOS. 2-E & 2-F

8/17/99

11-AUG-2006 13:38
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28-DEC-2005 14:56
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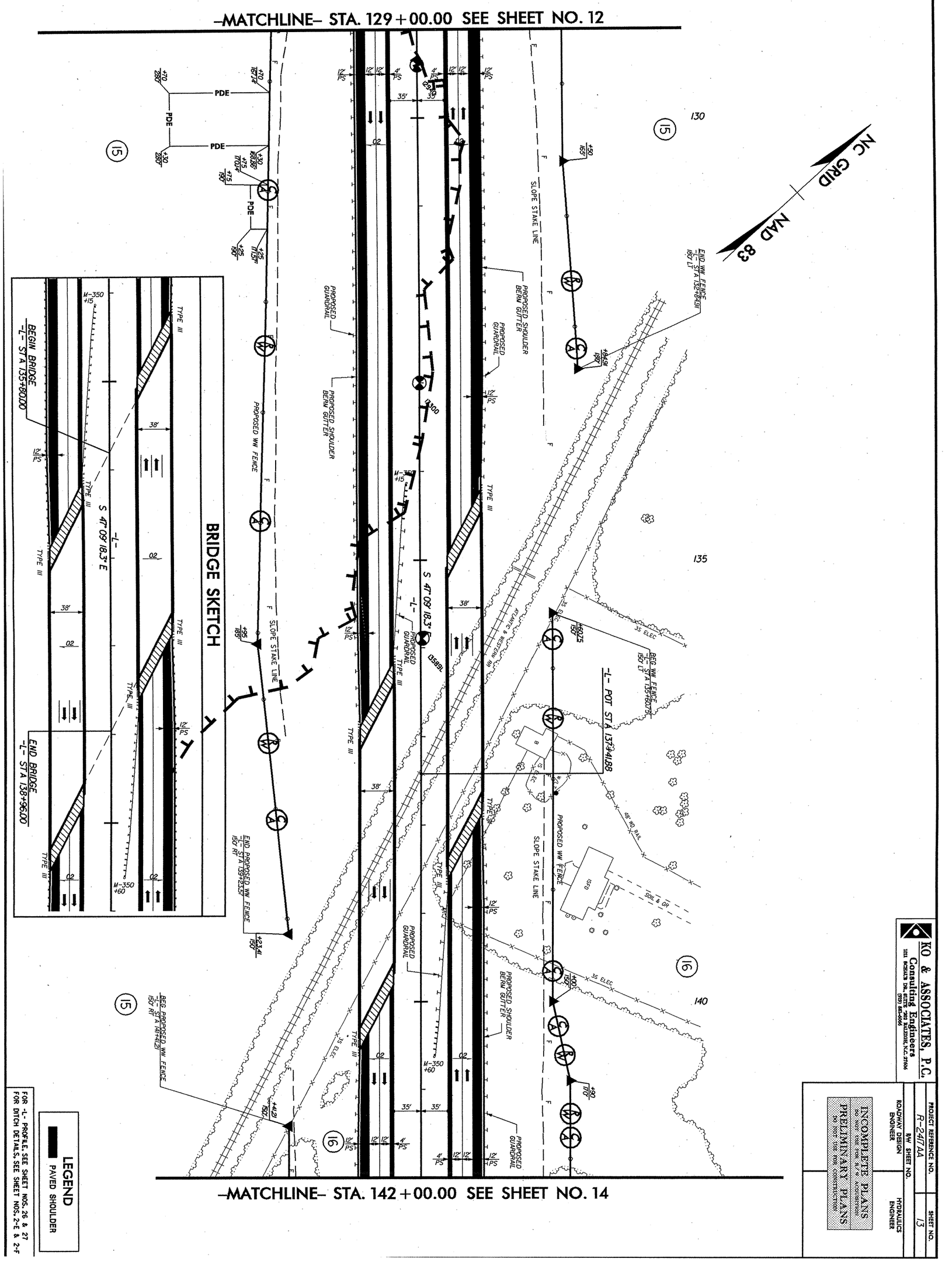
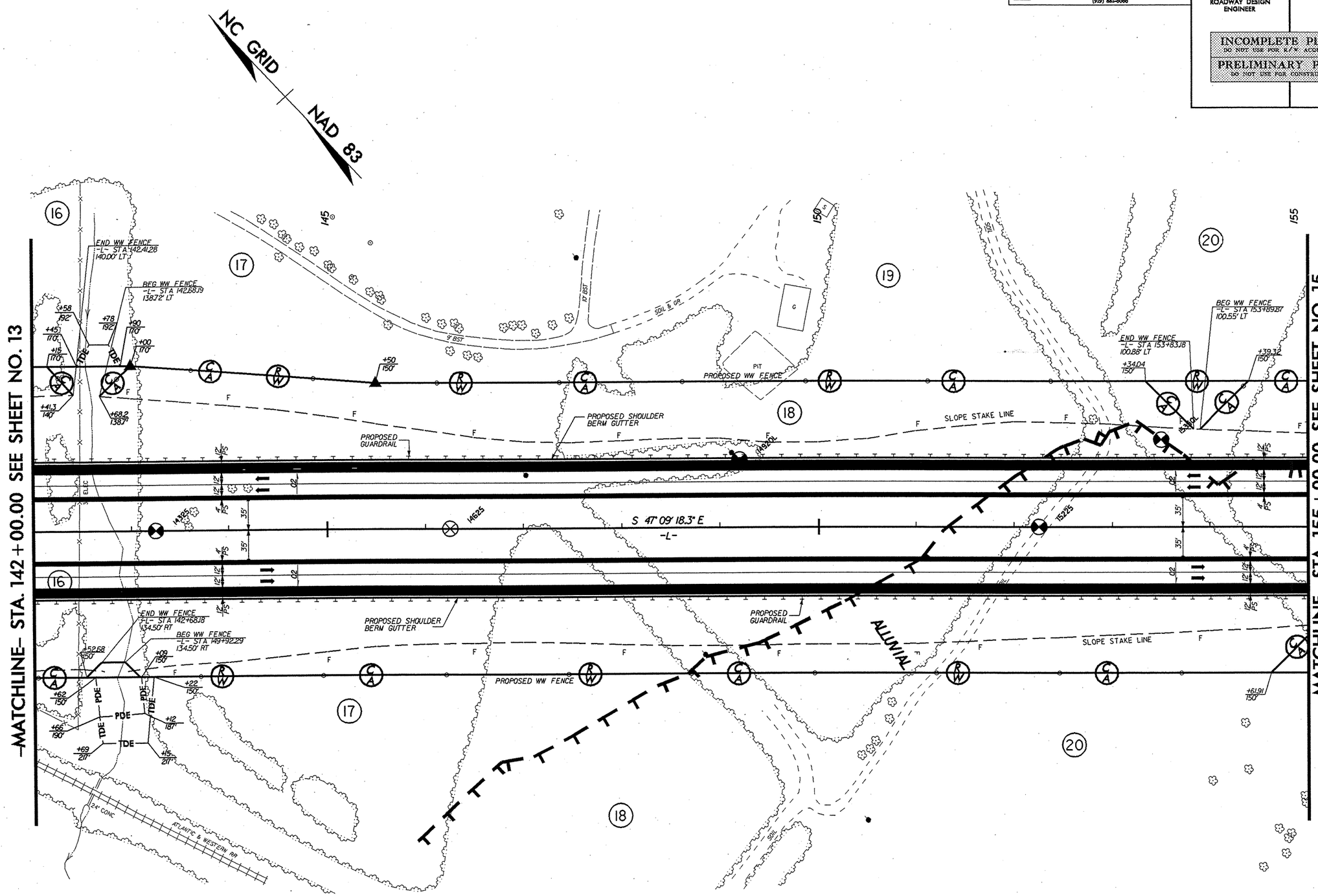
clittle AT GEH221409
8/17/99



KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE 202 RALEIGH, N.C. 27606
(919) 851-6066

PROJECT REFERENCE NO.	SHEET NO.
R-2417AA	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



LEGEND
PAVED SHOULDER

FOR -L- PROFILE, SEE SHEET NO. 27
FOR DITCH DETAILS, SEE SHEET NOS. 2-E & 2-F

8/17/99
28-DEC-2005 14:57
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clittle AT GEH221409

0-AUG-2006 11:24
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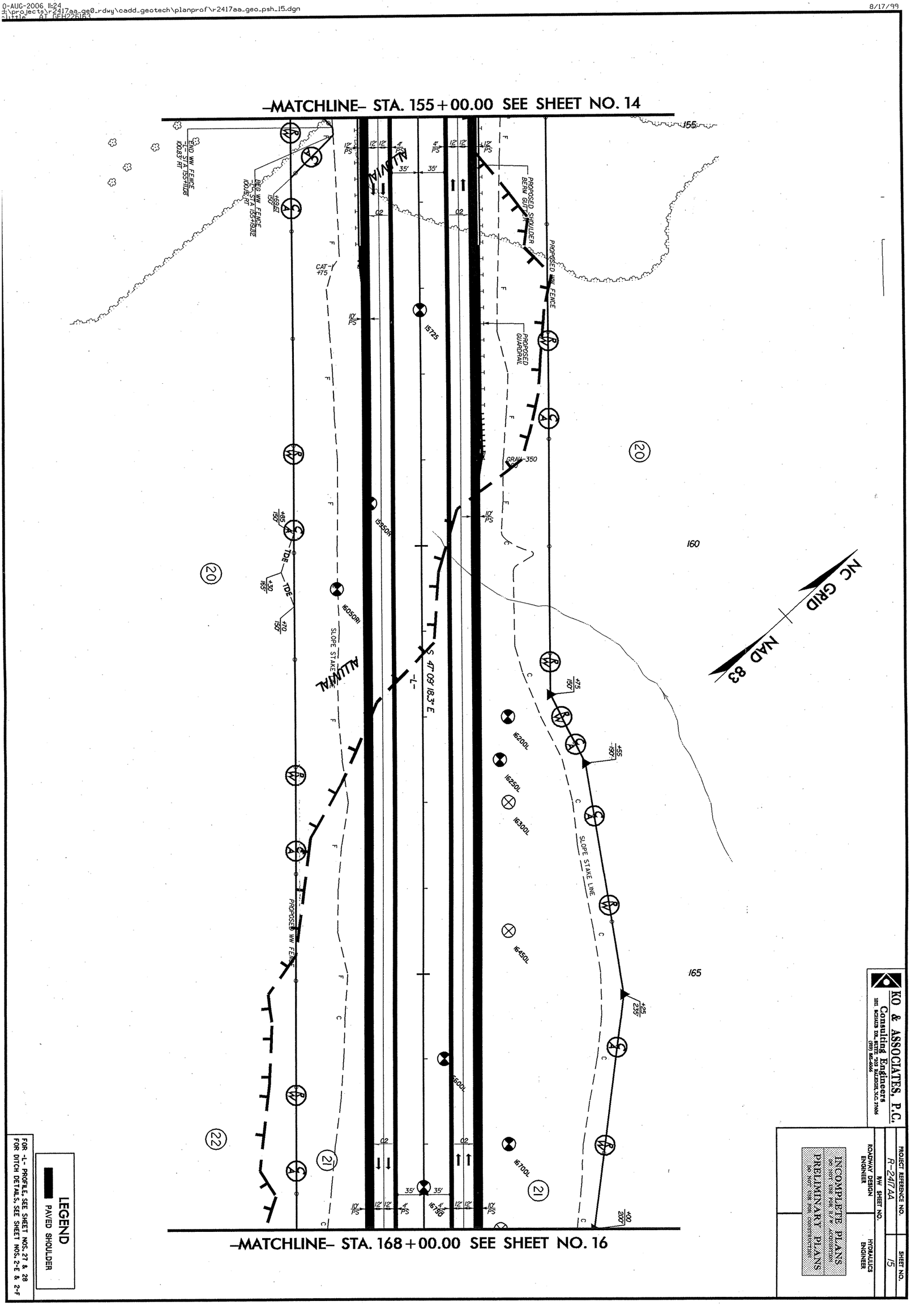
8/17/99



8/17/99

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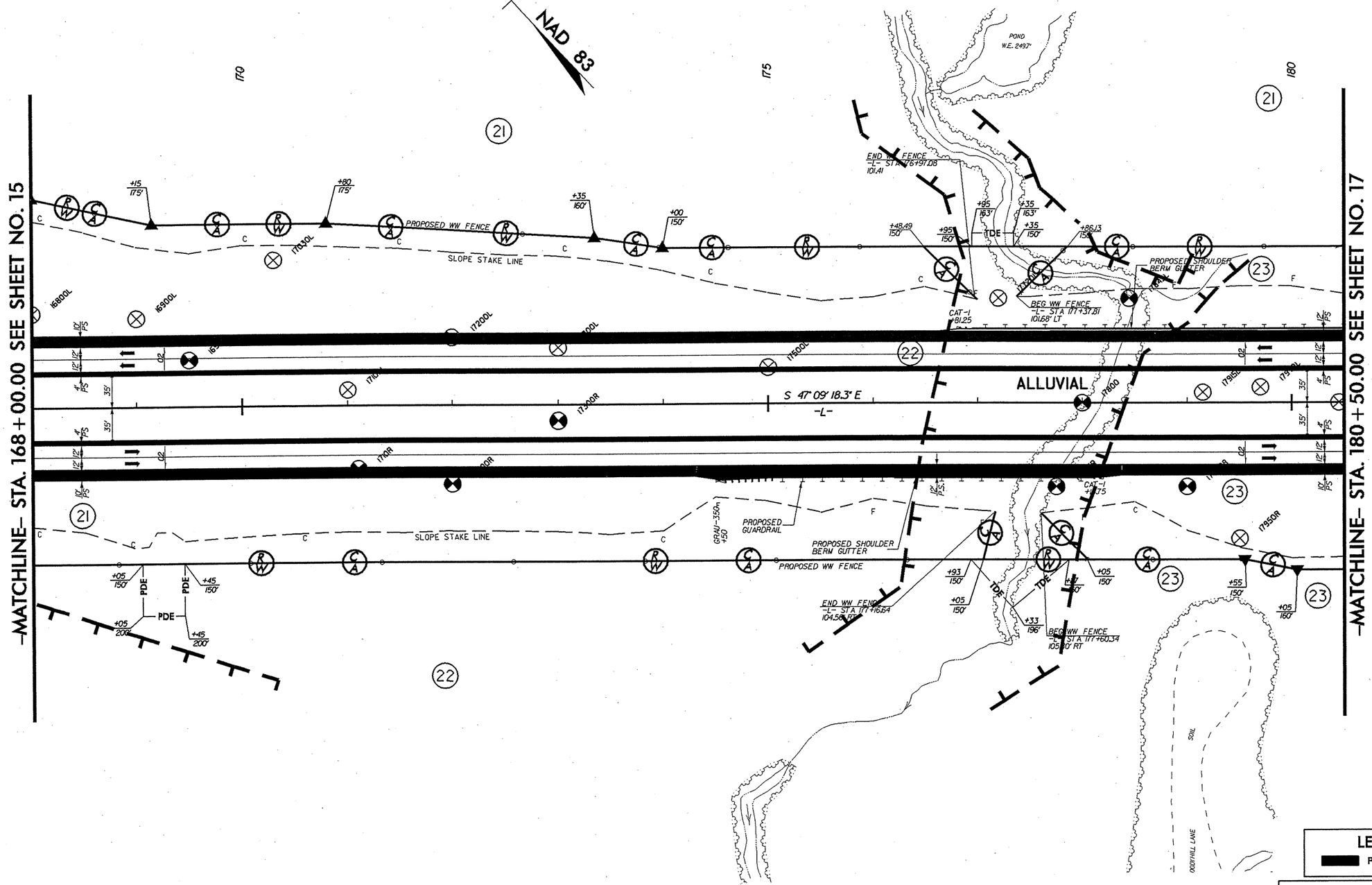
Consulting Engineers
1011 SCHAUB DR., SUITE 202 RALEIGH, N.C. 27606
(919) 851-6066

PROJECT REFERENCE NO.	SHEET NO.
R-2417AA	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



FOR -L- PROFILE, SEE SHEET NO. 28
FOR DITCH DETAILS, SEE SHEET NOS. 2-E & 2-F

14-AUG-2006 08:48
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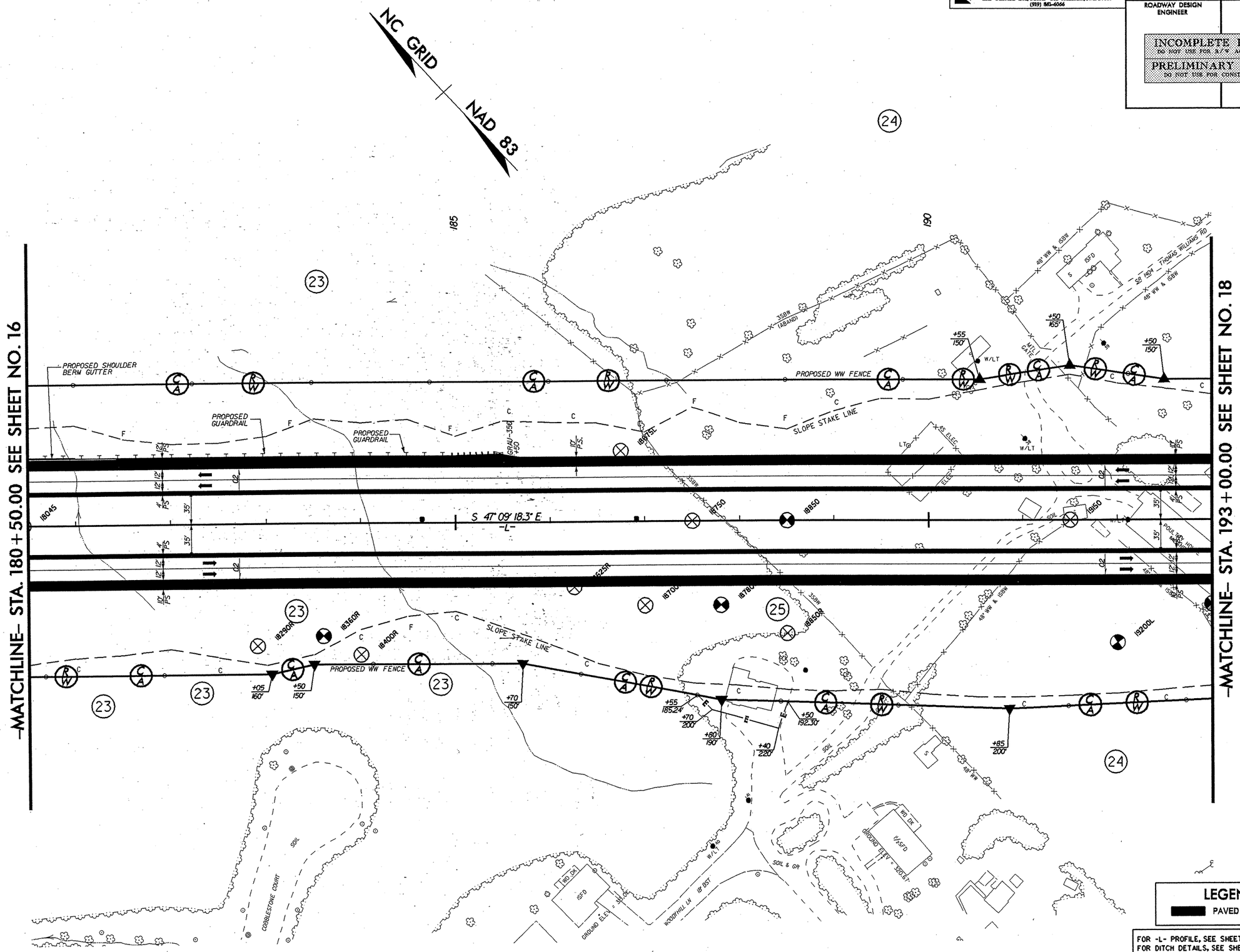
plotter: AT GEH22A1B3

KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE 202 RALEIGH, N.C. 27606
(919) 851-6066

PROJECT REFERENCE NO.	SHEET NO.
R-2417AA	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



LEGEND
PAVED SHOULDER

FOR -L- PROFILE, SEE SHEET NO. 29
FOR DITCH DETAILS, SEE SHEET NOS. 2-E & 2-F

8/17/99

14-AUG-2006 11:34
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KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE 202 RALEIGH, N.C. 27606
(919) 851-6066

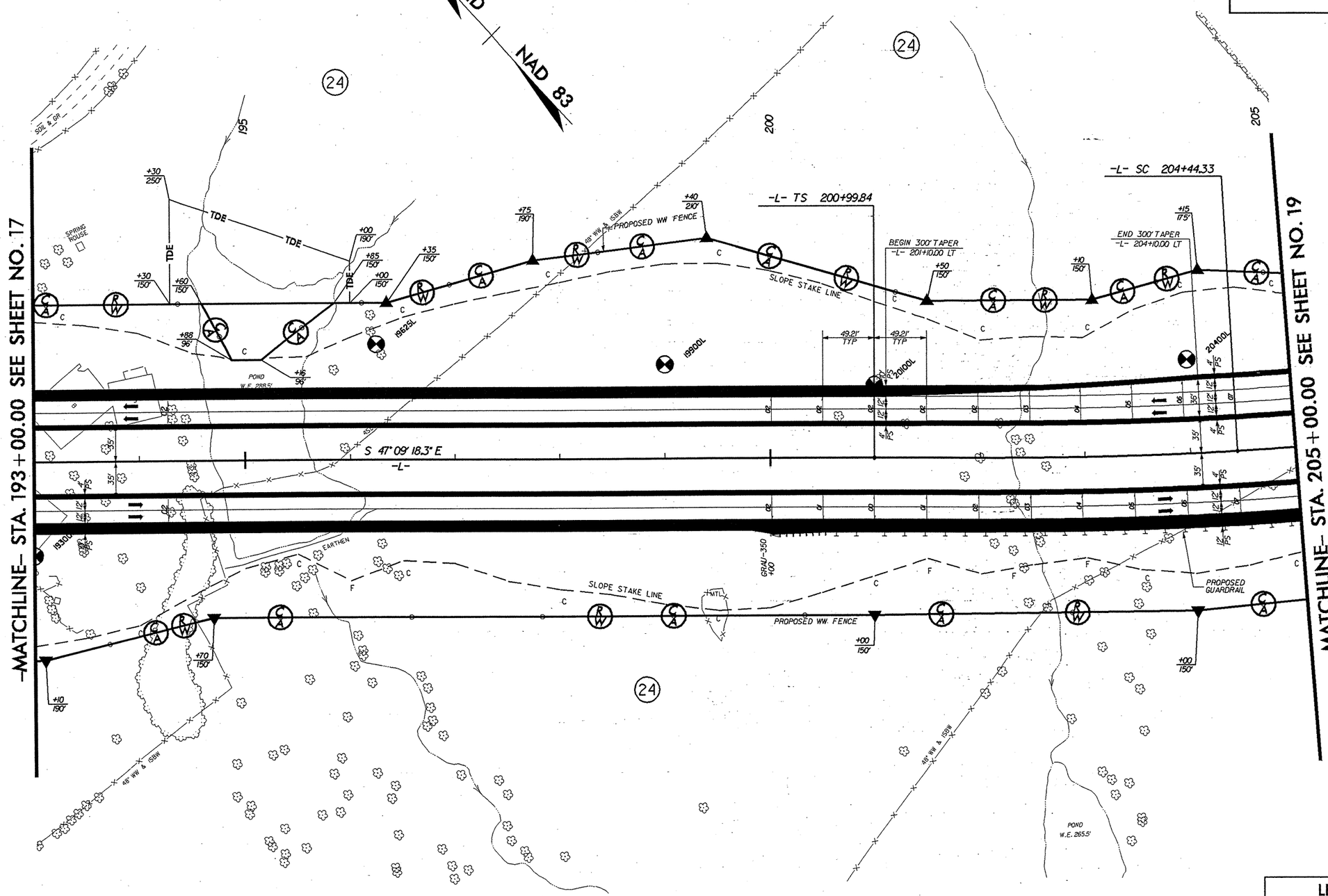
PROJECT REFERENCE NO.	SHEET NO.
R-2417AA	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L-

PIs Sta 203+29.54	PI Sta 208+93.14
Θs = 3° 20' 32.1"	Δ = 17° 17' 07.7" (LT)
Ls = 344.49'	D = 1° 56' 25.5"
LT = 229.70'	L = 890.81
ST = 114.87'	T = 448.81'
	R = 2,952.75'



LEGEND
PAVED SHOULDER

FOR -L- PROFILE, SEE SHEET NOS. 29 & 30
FOR DITCH DETAILS, SEE SHEET NOS. 2-E & 2-F

8/17/99

10-AUG-2006 11:25
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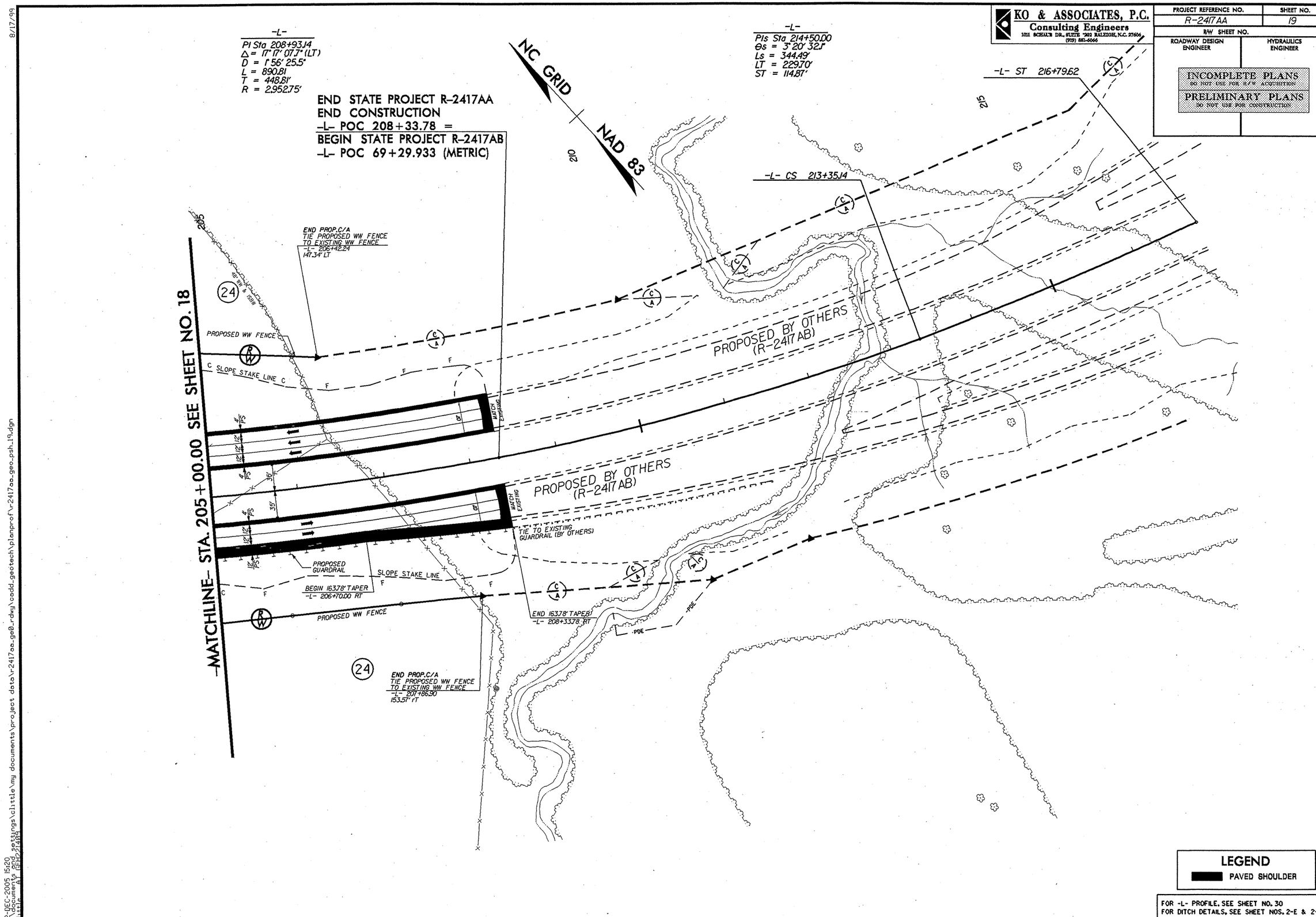

8/17/99

02-DEC-2005 15:20
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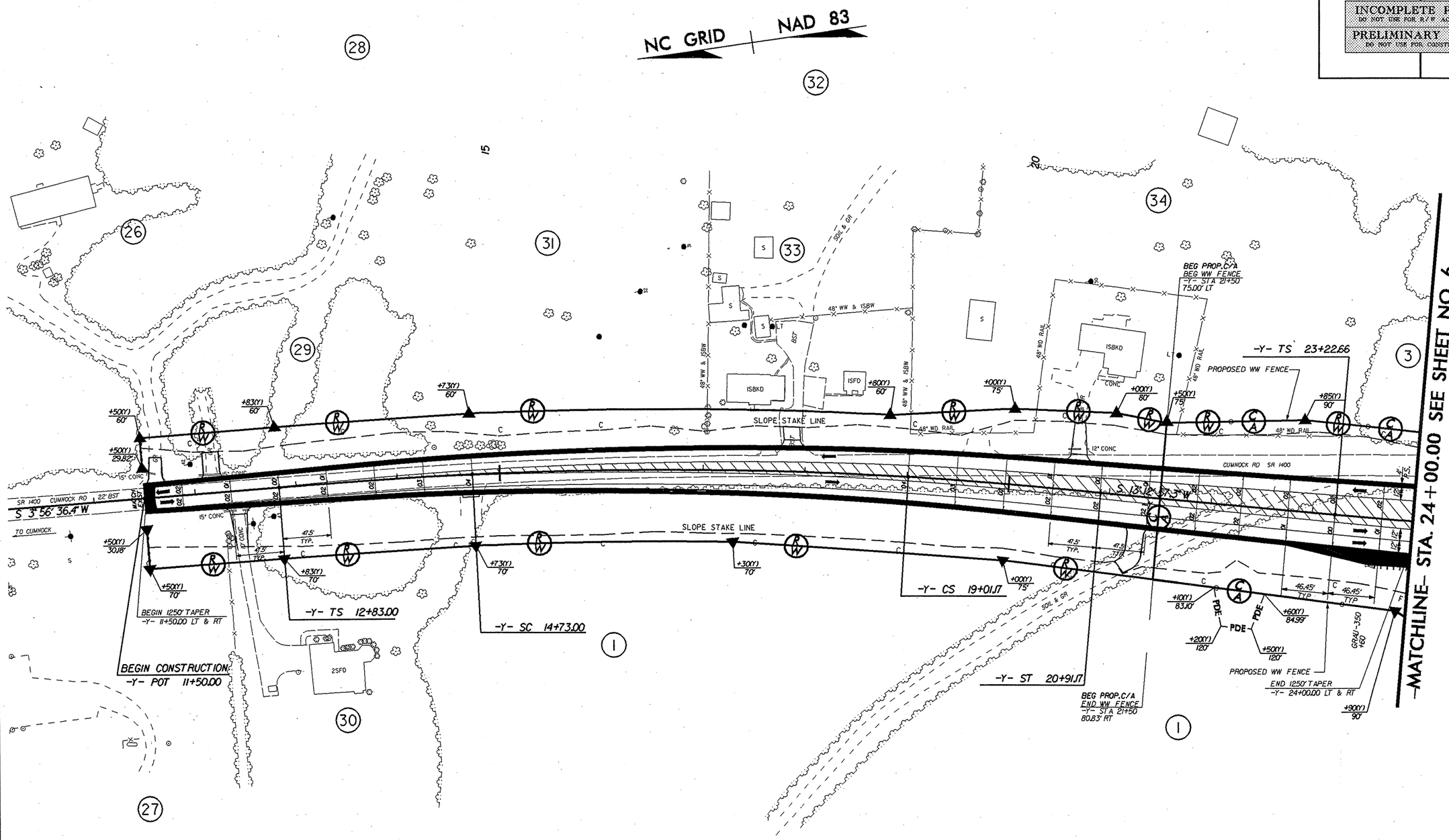
clittle AT GFH221409

KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE 202 RALEIGH, N.C. 27606
(919) 851-6066

PROJECT REFERENCE NO.	SHEET NO.
R-2417AA	20
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



-Y-

PIs Sta 14+09.67	PI Sta 16+87.31	PIs Sta 19+64.50
θs = 1° 25' 30.0"	Δ = 6° 25' 20.8" (RT)	θs = 1° 25' 30.0"
Ls = 190.00'	D = 1° 30' 00.0"	Ls = 190.00'
LT = 126.67'	L = 428.16	LT = 126.67'
ST = 63.34'	T = 214.31'	ST = 63.34'
	R = 3,819.72'	
	SE = 0.04	

NOTE:
ALL DRIVEWAY ENTRANCE RETURNS HAVE A RADIS OF 6' UNLESS OTHERWISE SHOWN.

LEGEND
PAVED SHOULDER

FOR -Y- PROFILE, SEE SHEET NO. 34
FOR DITCH DETAILS, SEE SHEET NOS. 2-E & 2-F

8/17/99
02-DEC-2005 15:22
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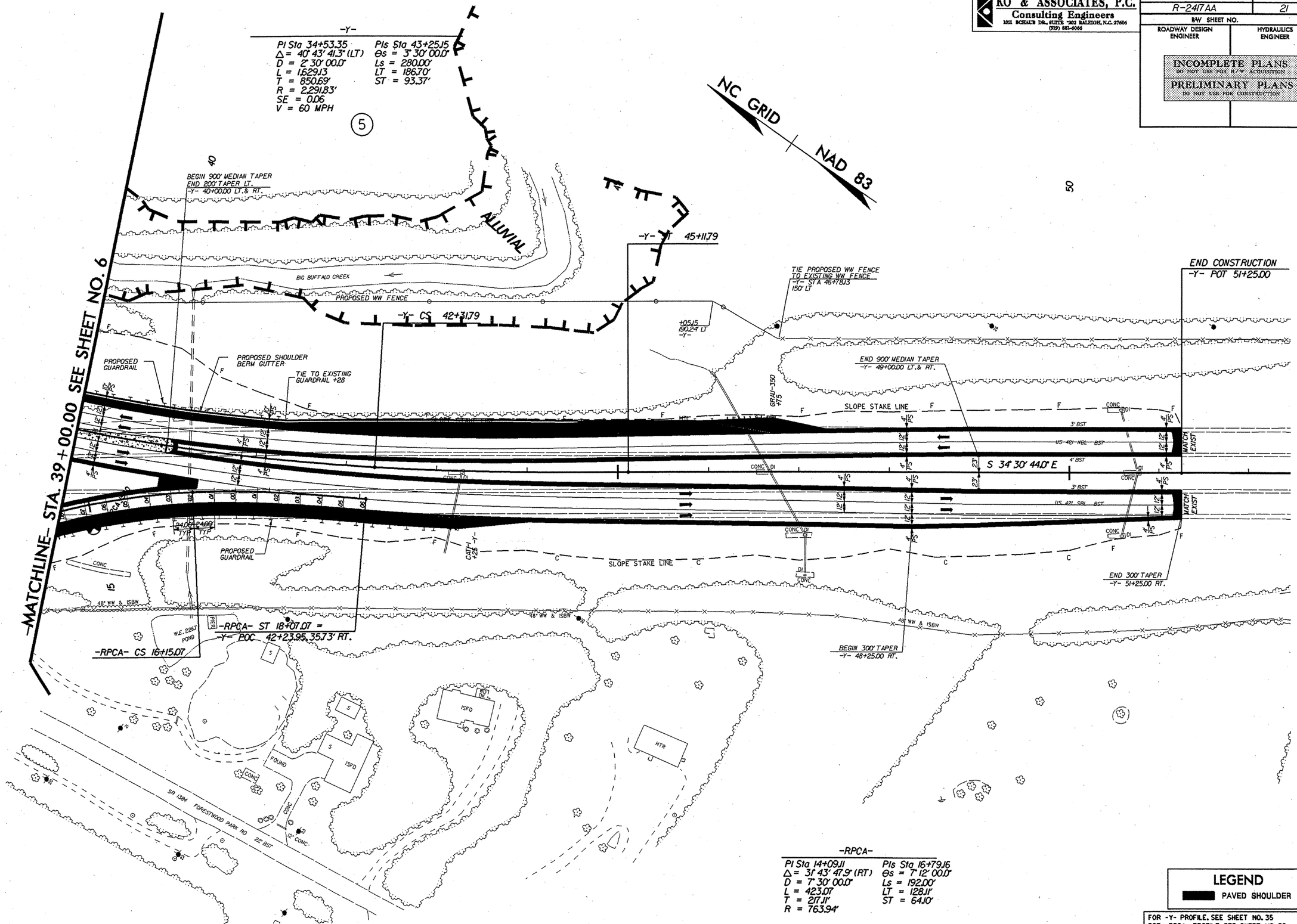
little AT RPHD214109

KO & ASSOCIATES, P.C.
Consulting Engineers
1011 BCHEALT DR., SUITE 202 RALEIGH, N.C. 27606
(919) 851-6066

PROJECT REFERENCE NO.	SHEET NO.
R-2417AA	21
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



-RPCA-

PI Sta 14+09.11	PIs Sta 16+79.16
Δ = 31° 43' 47.9" (RT)	θs = 7° 12' 00.0"
D = 7° 30' 00.0"	Ls = 192.00'
L = 423.07'	LT = 128.11'
T = 217.11'	ST = 64.10'
R = 763.94'	

LEGEND
PAVED SHOULDER

FOR -Y- PROFILE, SEE SHEET NO. 35
FOR -RPCA- PROFILE, SEE SHEET NO. 22
FOR DITCH DETAILS, SEE SHEET NOS. 2-E & 2-F

8/17/99
28-DEC-2005 15:12
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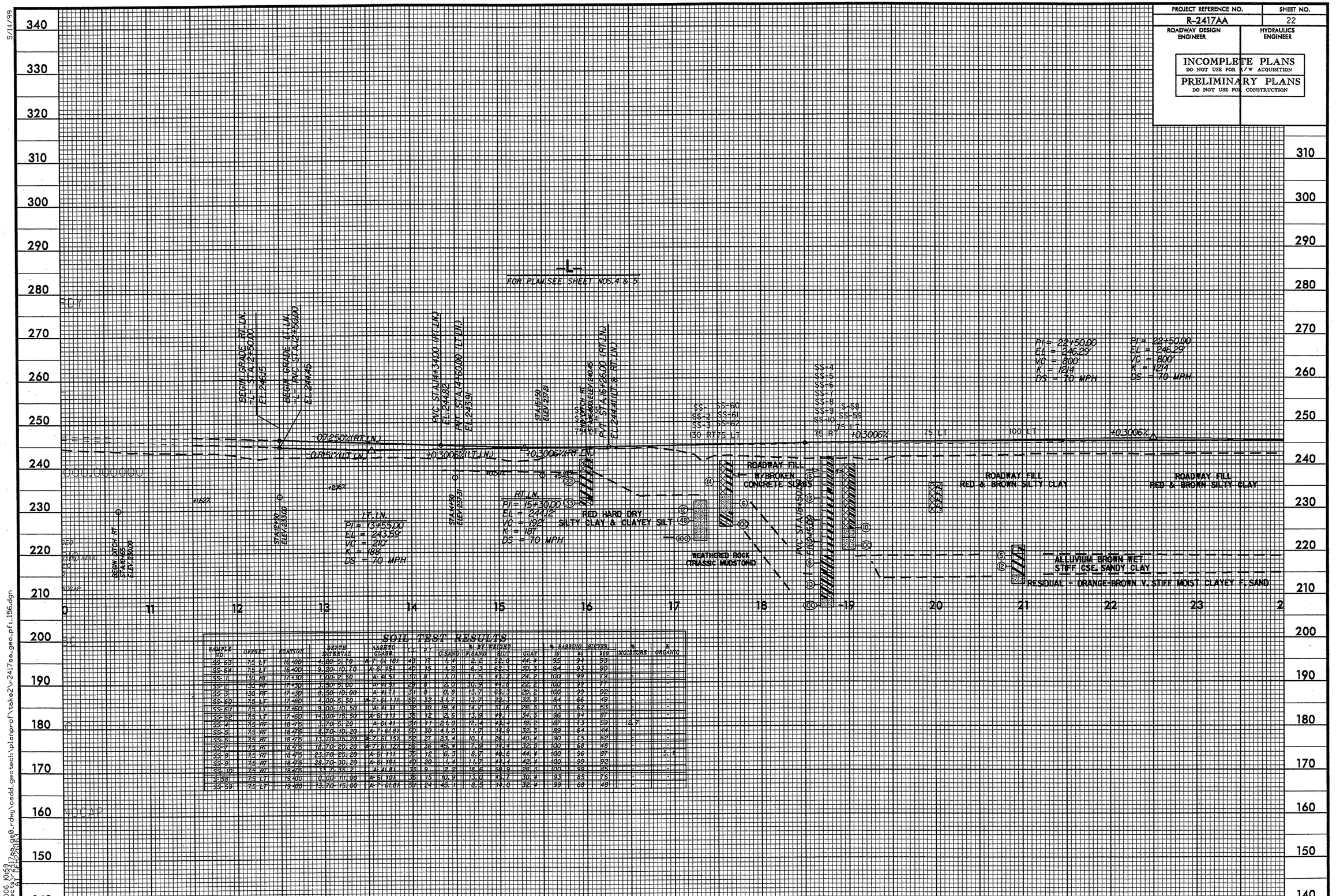
clittle AT RPH221409

PROJECT REFERENCE NO.	SHEET NO.
R-2417AA	22
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING 10	40	SIEVES 200	% MOISTURE	% ORGANIC
SS-63	75 LT	16+00	4.00-5.70	A-7-6(18)	48	17	1.4	2.2	52.0	44.4	95	94	93		
SS-64	75 LT	16+00	9.30-10.70	A-6(15)	40	15	1.2	6.3	52.3	30.9	94	93	90		
SS-1	30 RT	17+30	1.00-2.50	A-4(5)	30	8	1.0	37.5	43.2	24.2	100	99	79		
SS-2	30 RT	17+30	3.50-5.00	A-4(3)	29	8	2.0	30.9	47.8	22.2	100	99	77		
SS-3	30 RT	17+30	8.50-10.00	A-4(7)	30	8	0.9	13.7	63.3	20.2	100	99	92		
SS-60	75 LT	17+60	1.00-2.50	A-7-6(11)	50	32	3.7	13.7	22.3	32.3	84	66	49		
SS-61	75 LT	17+60	9.00-10.50	A-4(1)	30	10	18.4	14.7	41.6	28.3	73	62	51		
SS-62	75 LT	17+60	14.00-15.50	A-6(11)	36	12	2.5	13.9	48.1	34.3	96	94	87		
SS-4	75 RT	18+75	3.70-5.20	A-6(4)	30	11	21.0	11.4	48.4	18.2	87	73	59	18.7	
SS-5	75 RT	18+75	8.70-10.20	A-7-6(8)	50	30	44.0	11.7	11.9	32.3	89	64	44		
SS-6	75 RT	18+75	13.70-15.20	A-7-6(15)	50	27	23.4	10.1	26.1	40.4	90	75	62		
SS-7	75 RT	18+75	18.70-20.20	A-7-6(12)	55	36	45.4	7.5	17.4	32.3	100	68	48		
SS-8	75 RT	18+75	23.70-25.20	A-6(11)	36	12	61.3	8.7	18.8	11.4	100	96	87		5.1
SS-9	75 RT	18+75	28.70-30.20	A-6(19)	40	20	1.4	11.7	41.1	42.4	100	99	92		
SS-10	75 RT	18+75	33.70-35.2	A-6(8)	30	9	2.2	18.6	50.9	28.4	100	99	85		
SS-58	75 LT	13+00	0.00-1.70	A-6(10)	36	15	10.9	13.0	45.7	30.4	93	85	76		
SS-59	75 LT	13+00	13.70-15.00	A-7-6(8)	51	24	45.1	8.5	14.0	32.4	99	68	48		

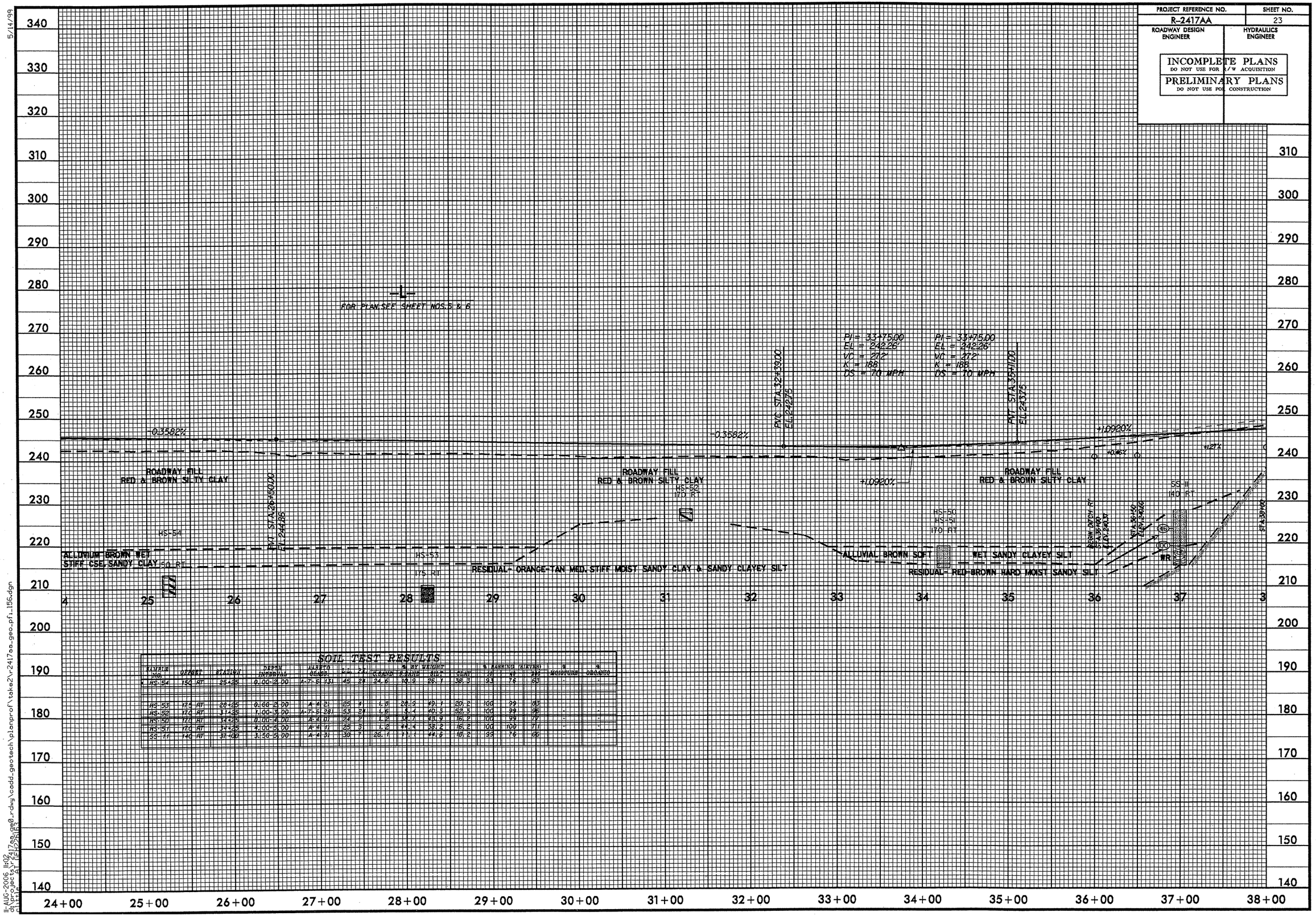
5/14/99

11-AUG-2006 10:59
d:\projects\r-2417aa_ga0_rdwy\cadd_geotech\planprof\tske2\r2417aa_geo_pfl_156.dgn
dlt\proj\ga1 r2417aa

PROJECT REFERENCE NO.	SHEET NO.
R-2417AA	23
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% 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
HS-54	150 RT	25+25	0.00-2.00	A-7-6 131	45	24	24.6	10.9	26.1	38.3	93	76	63	-	-
HS-53	175 RT	28+25	0.00-2.00	A-4 21	25	4	1.8	28.9	49.1	20.2	100	99	83		
HS-52	170 RT	31+25	1.00-3.00	A-7-6 281	53	24	1.6	5.4	40.5	52.5	100	99	96	-	-
HS-50	170 RT	34+25	0.00-4.00	A-4 01	24	2	1.2	38.7	43.9	16.2	100	99	77	-	-
HS-51	170 RT	34+25	4.00-5.00	A-4 11	25	3	1.2	44.4	38.2	16.2	100	100	71	-	-
SS-11	140 RT	37+00	3.50-5.00	A-4 31	30	7	26.1	11.1	44.6	18.2	99	76	66	-	-

5/14/99
11-AUG-2006 11:02
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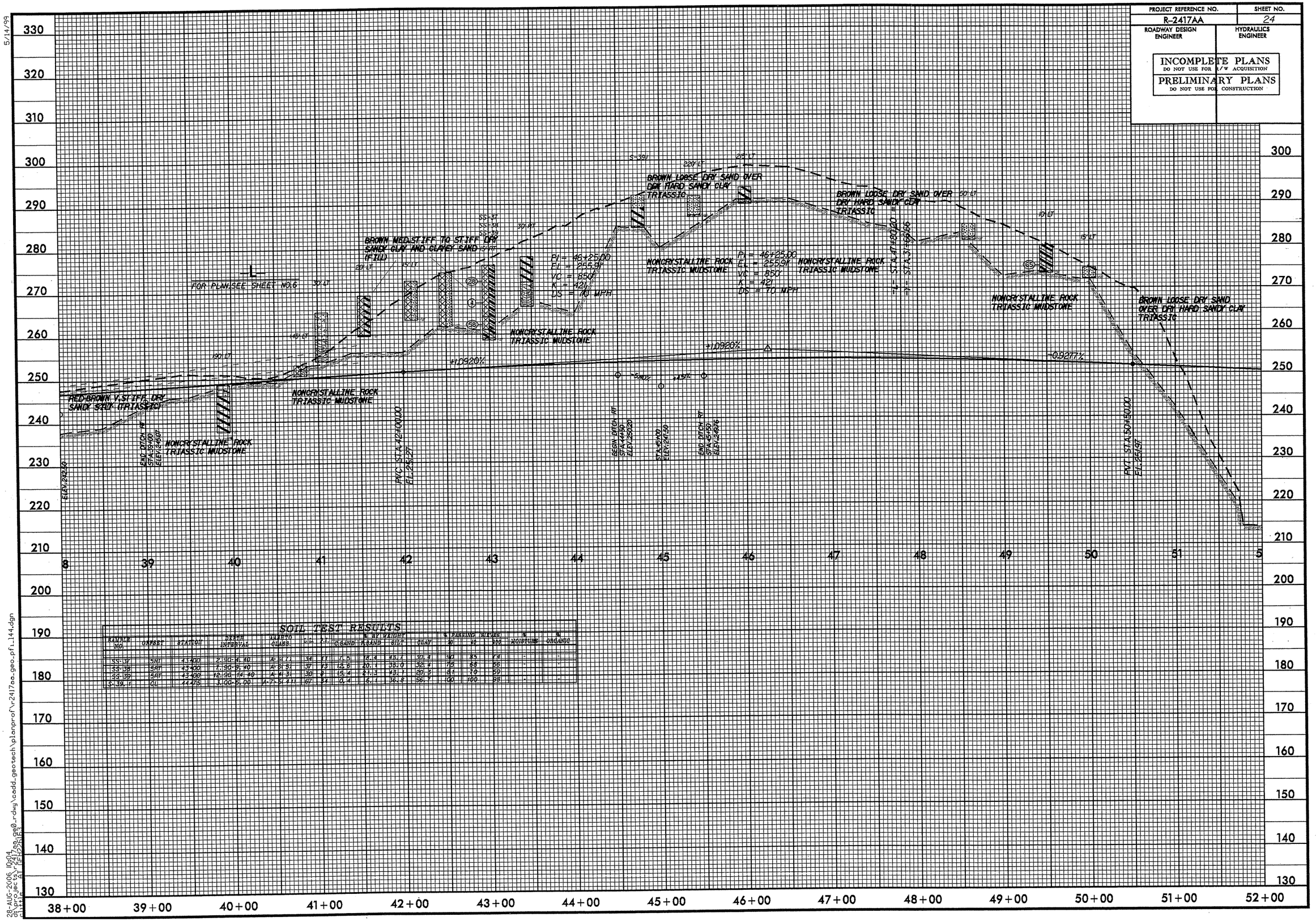
clittle AT GEH226163

PROJECT REFERENCE NO.	SHEET NO.
R-2417AA	24
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT GRAVEL	SAND	SILT	CLAY	% PASSING #10	#40	#200	% MOISTURE	% ORGANIC
SS-37	5RT	43+00	2.50-4.40	A-6(7)	34	13	17.5	16.4	33.7	30.4	90	85	71	-	-
SS-38	5RT	43+00	7.50-9.40	A-6(9)	37	13	12.5	20.1	38.0	32.4	79	68	56	-	-
SS-39	5RT	43+00	12.50-14.40	A-4(4)	30	8	15.4	21.3	43.1	20.5	81	70	59	-	-
S-39	CL	44+75	3.00-5.00	A-7-5(41)	62	34	0.4	6.1	36.8	56.7	100	100	98	-	-

5/14/99
28-AUG-2006 10:04
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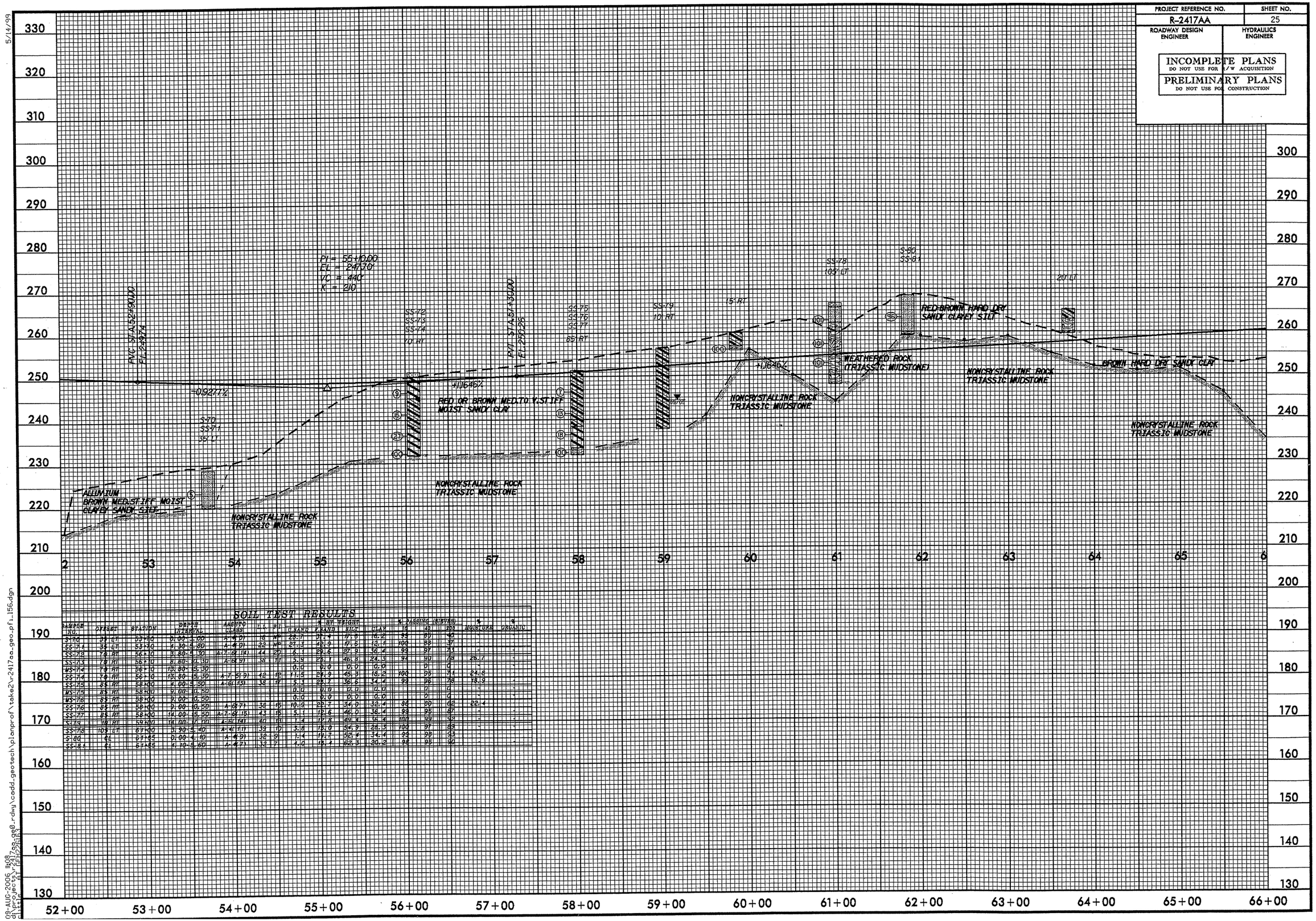
PROJECT REFERENCE NO.	SHEET NO.
R-2417AA	25
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS	L.L.	P.I.	% BY WEIGHT G.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-70	35' LT	53+70	0.00-3.00	A-4(0)	18	NP	28.7	51.4	7.8	12.2	99	95	69		
SS-71	35' LT	53+70	4.30-5.80	A-4(0)	22	NP	27.3	52.9	7.8	12.1	100	98	77		
SS-72	70' RT	56+10	3.80-5.30	A-7-6(14)	44	20	6.1	29.6	27.9	36.4	99	97	93	-	-
SS-73	70' RT	56+10	8.80-10.30	A-6(9)	38	17	3.9	29.1	46.8	24.3	99	90	78	26.7	-
MS-74	70' RT	56+10	13.80-15.30				0.0	0.0	0.0	0.0		0	0		-
SS-74	70' RT	56+10	13.80-15.30	A-7-5(9)	42	18	11.0	24.9	45.3	18.2	100	95	71	24.8	-
SS-75	85' RT	58+00	4.00-5.50	A-6(13)	38	17	5.1	28.7	36.6	34.4	99	96	78	18.9	-
MS-75	85' RT	58+00	9.00-10.50				0.0	0.0	0.0	0.0		0	0		-
MS-76	85' RT	58+00	9.00-10.50				0.0	0.0	0.0	0.0		0	0		-
SS-76	85' RT	58+00	9.00-10.50	A-6(7)	38	15	10.9	22.7	34.0	32.4	86	80	62	22.4	-
SS-77	85' RT	58+00	14.00-15.50	A-7-6(15)	43	16	5.1	18.6	46.0	30.4	99	95	87	-	-
SS-78	105' LT	57+00	3.90-5.40	A-4(11)	33	10	3.8	13.0	54.9	28.3	100	97	89	-	-
SS-80	20' LT	61+65	0.00-1.10	A-4(9)	32	9	1.4	14.7	52.4	31.4	99	99	93	-	-
SS-81	20' LT	61+65	4.10-5.60	A-4(7)	32	7	1.0	15.1	62.3	20.3	98	95	90	-	-

5/14/99
09-AUG-2006 14:08
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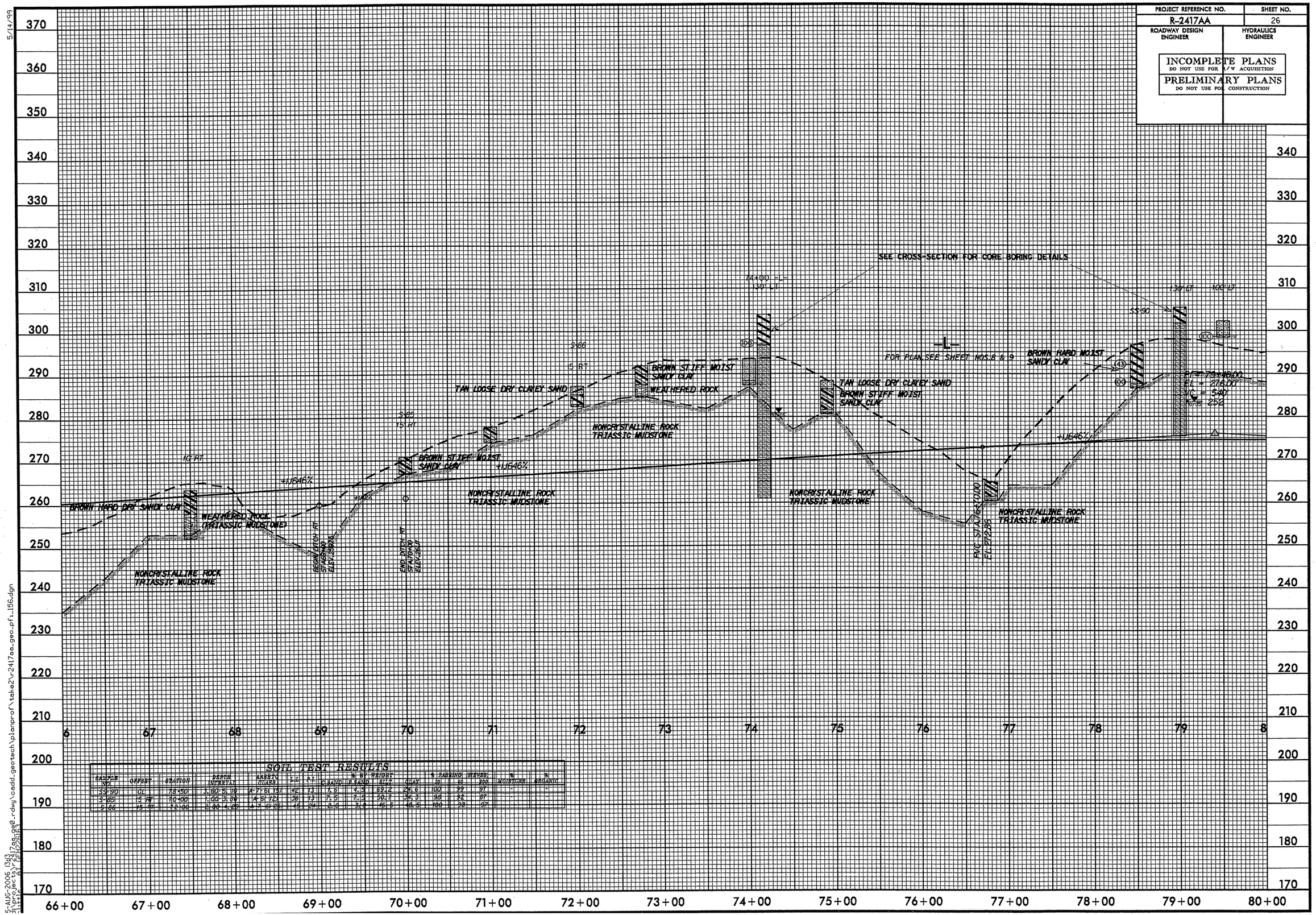
PROJECT REFERENCE NO.	SHEET NO.
R-2417AA	26
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



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-90	CL	78+50	3.60-5.10	A-7-6(15)	42	13	1.6	4.5	69.2	24.6	100	99	97	-	-
S-85	15' RT	70+00	1.00-3.80	A-6(12)	36	13	7.5	7.5	50.7	34.3	98	92	87	-	-
S-86	15' RT	72+00	2.00-4.20	A-7-6(25)	45	24	2.0	3.0	46.5	48.5	100	98	97	-	-

5/14/99

5-AUG-2006 13:13
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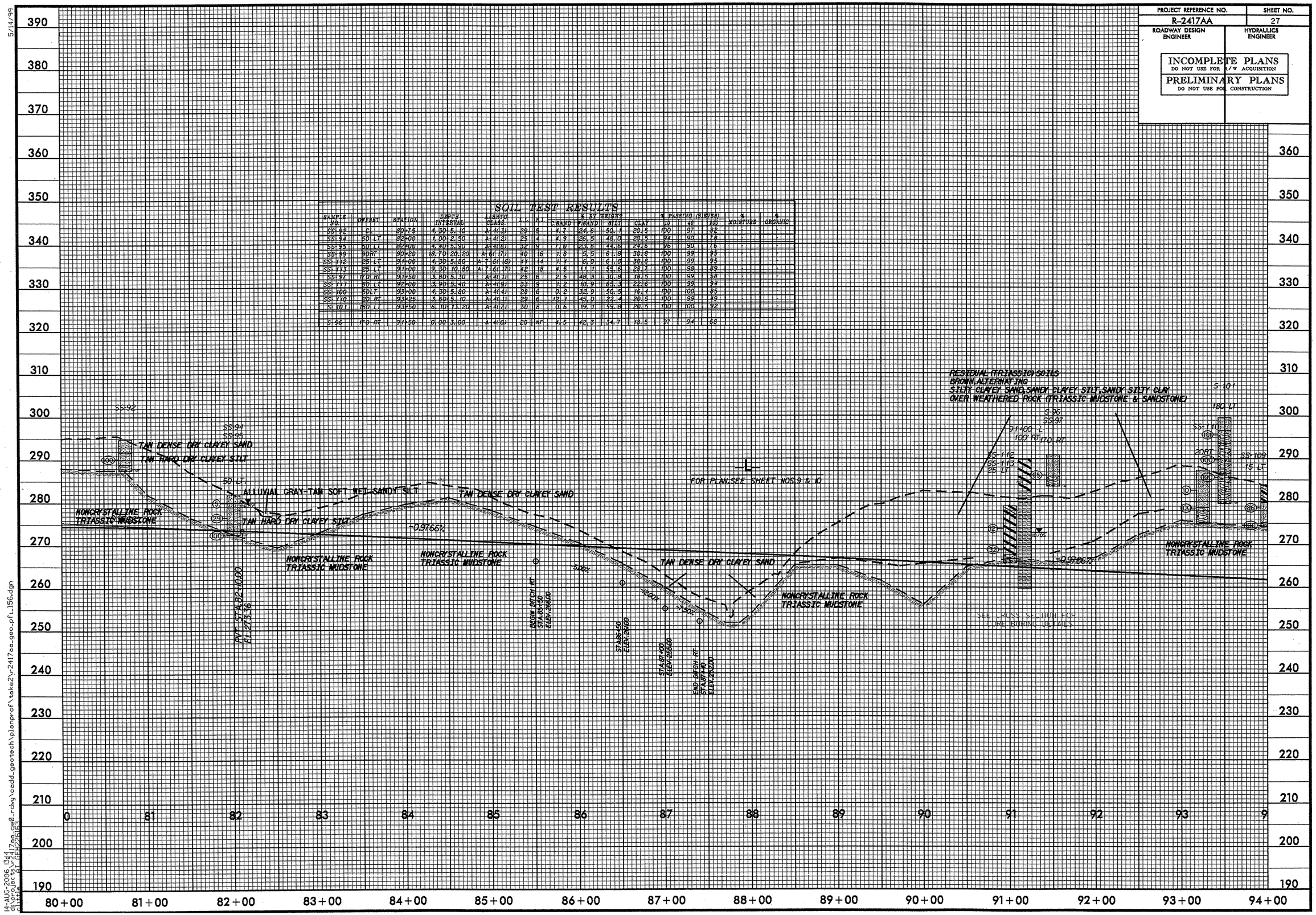
PROJECT REFERENCE NO.	SHEET NO.
R-2417AA	27
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



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) 60	40	200	% MOISTURE	% ORGANIC
SS-92	CL	80+75	4.30-5.10	A-4(3)	29	5	4.7	24.5	50.7	20.5	100	97	92	-	-
SS-94	50 LT	82+00	1.00-2.50	A-4(2)	25	4	4.9	26.5	48.0	20.5	94	90	78	-	-
SS-95	50 LT	82+00	4.40-5.90	A-4(8)	32	9	7.0	23.8	44.6	24.6	96	90	76	-	-
SS-99	90 RT	90+20	18.70-20.20	A-6(7)	40	16	11.8	5.5	61.8	30.8	100	99	95	-	-
SS-112	25 LT	91+00	4.30-5.80	A-7-6(6)	41	14	11.7	6.0	61.8	30.8	100	99	95	-	-
SS-113	25 LT	91+00	9.30-10.80	A-7-6(7)	42	18	11.5	11.0	55.8	28.7	100	98	89	-	-
SS-97	170 RT	91+50	3.80-5.30	A-3(1)	25	6	21.5	48.0	30.5	18.5	100	99	54	-	-
SS-111	20 LT	92+00	3.90-5.40	A-4(8)	33	8	11.2	10.9	62.3	22.6	100	99	94	-	-
SS-100	50 LT	93+00	4.30-5.80	A-4(4)	28	6	21.2	33.9	50.5	16.4	100	100	85	-	-
SS-110	20 RT	93+25	3.80-5.10	A-4(1)	29	6	12.7	45.0	32.4	20.5	100	99	49	-	-
S-101	180 LT	93+50	6.10-13.20	A-4(7)	30	8	11.6	19.0	59.8	20.5	100	100	92	-	-
S-96	170 RT	91+50	0.00-3.00	A-4(0)	20	NP	4.5	42.3	34.7	18.5	97	94	68		

14-AUG-2006 13:41
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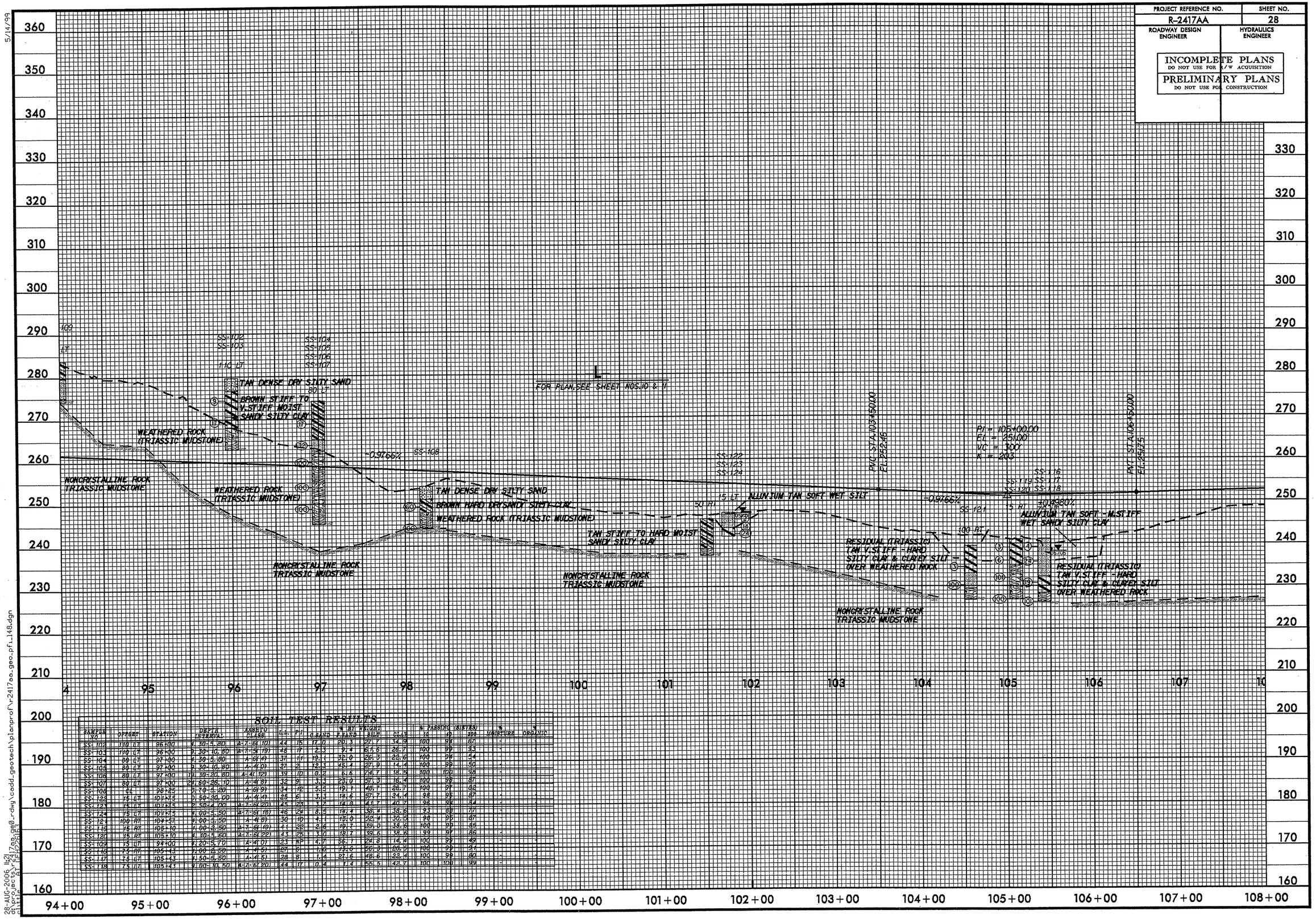
dlynch,jec,ay,rf,fh
5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-2417AA	28
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	G. BAND	% BY WEIGHT S. BAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-102	110 LT	96+00	9.30-5.80	A-7-6(10)	44	15	17.0	20.3	27.7	34.9	100	99	87	-	-
SS-103	110 LT	96+00	9.30-10.80	A-7-5(19)	48	17	2.3	9.4	61.6	26.7	100	99	93	-	-
SS-104	80 LT	97+00	9.30-5.80	A-6(4)	37	11	19.1	32.0	26.9	22.6	100	99	84	-	-
SS-105	80 LT	97+00	9.30-10.80	A-4(0)	27	2	12.3	45.1	27.9	14.4	100	99	50	-	-
SS-106	80 LT	97+00	19.30-20.80	A-4(12)	39	10	0.2	61.6	24.7	13.5	100	100	94	-	-
SS-107	80 LT	97+00	24.60-26.10	A-4(8)	32	9	3.3	53.0	27.9	16.4	100	99	87	-	-
SS-108	64	98+25	9.70-5.20	A-6(9)	34	12	5.5	19.1	49.7	26.7	100	97	92	-	-
SS-122	15 LT	101+75	9.50-30.00	A-4(4)	25	6	3.3	14.6	57.7	24.4	99	95	87	-	-
SS-123	15 LT	101+75	9.50-4.00	A-7-6(20)	46	28	1.2	10.0	41.7	40.7	99	99	94	-	-
SS-124	15 LT	101+75	9.00-5.50	A-7-6(18)	46	24	3.5	19.4	39.4	38.6	99	99	92	-	-
SS-121	100 RT	104+57	9.00-13.50	A-4(8)	30	10	4.1	15.0	52.4	30.5	99	99	87	-	-
SS-116	15 RT	105+10	9.00-12.50	A-7-6(19)	41	22	2.6	19.7	39.0	38.6	100	99	85	-	-
SS-120	15 RT	105+10	9.70-15.50	A-7-6(22)	43	25	1.0	18.7	39.6	38.6	99	99	86	-	-
SS-119	15 RT	24+00	9.20-5.70	A-4(0)	23	NP	4.7	56.1	24.8	14.4	100	99	49	-	-
SS-118	15 RT	105+43	9.00-12.50	A-4(5)	27	5	1.6	15.6	56.3	26.5	100	99	91	-	-
SS-117	15 RT	105+43	9.50-15.50	A-4(6)	28	8	1.4	27.6	48.6	22.4	100	99	80	-	-
SS-118	15 RT	105+43	9.00-10.50	A-7-6(20)	44	17	0.4	1.4	55.5	42.7	100	100	99	-	-

5/14/99

28-AUG-2006 11:21
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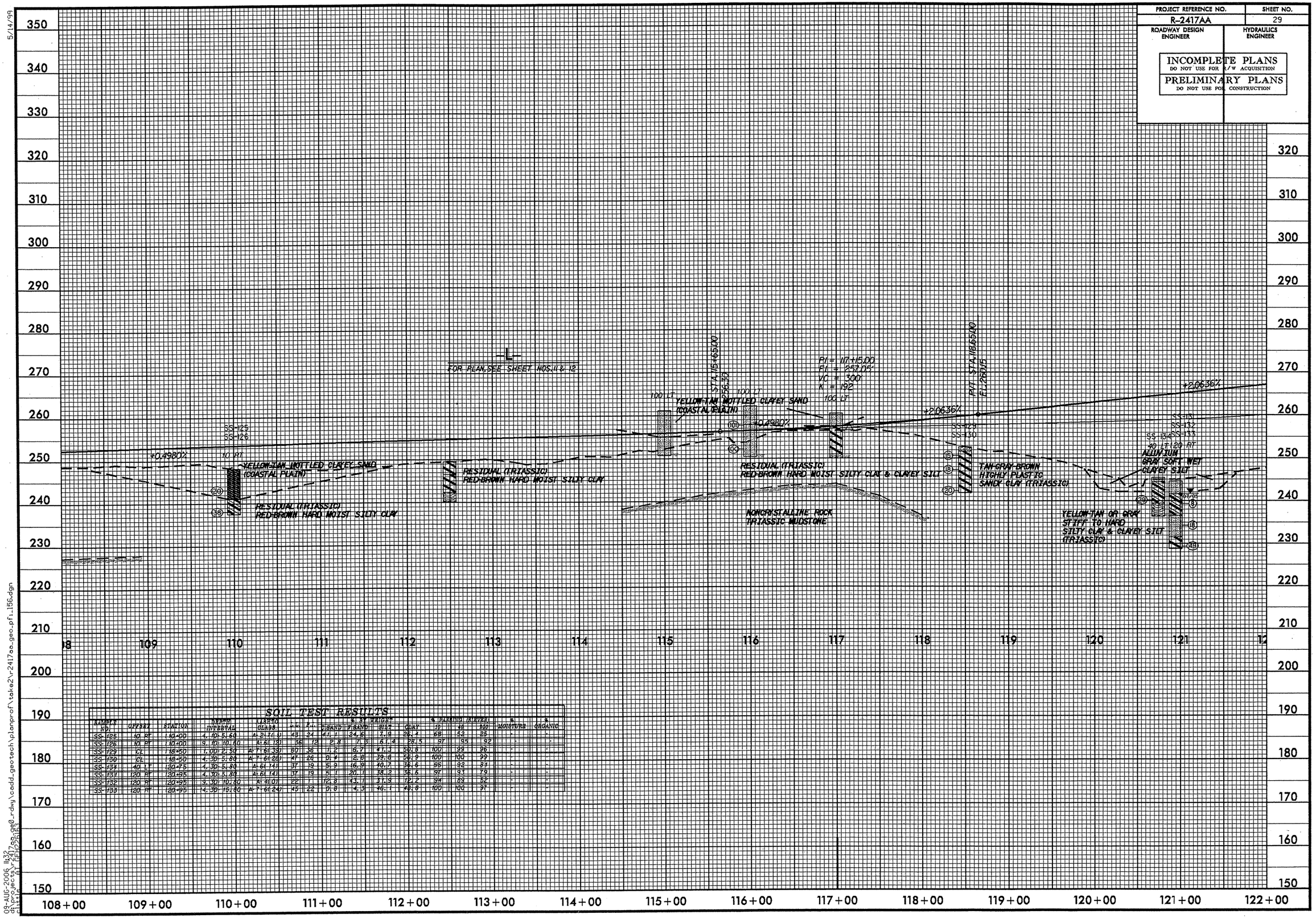
PROJECT REFERENCE NO.	SHEET NO.
R-2417AA	29
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% GRAVEL	% SAND	% SILT	% CLAY	% PASSING SIEVES 10	40	100	% MOISTURE	% ORGANIC
SS-125	10 RT	110+00	4.00-5.60	A-2-7(0)	43	24	41.1	34.6	7.9	26.1	68	63	26	-	-
SS-126	10 RT	110+00	9.00-10.80	A-6(12)	36	12	2.8	17.3	61.4	28.5	97	95	92	-	-
SS-129	CL	118+50	1.00-2.50	A-7-6(39)	80	38	11.2	6.7	47.3	50.3	100	99	96	-	-
SS-130	CL	118+50	4.50-5.80	A-7-6(28)	47	26	0.4	2.8	39.6	56.9	100	100	99	-	-
SS-131	40 LT	120+75	4.50-5.80	A-6(14)	37	19	51.9	16.9	40.7	36.6	96	93	84	-	-
SS-132	120 RT	120+95	4.50-5.80	A-6(14)	37	19	51.1	20.1	38.2	36.6	97	93	79	-	-
SS-133	120 RT	120+95	9.50-10.80	A-4(07)	22	7	12.8	43.1	37.9	19.2	94	89	62	-	-
SS-134	120 RT	120+95	14.50-15.80	A-7-6(24)	45	22	0.8	4.3	46.1	48.8	100	100	97	-	-

5/14/99

09-AUG-2006 11:32
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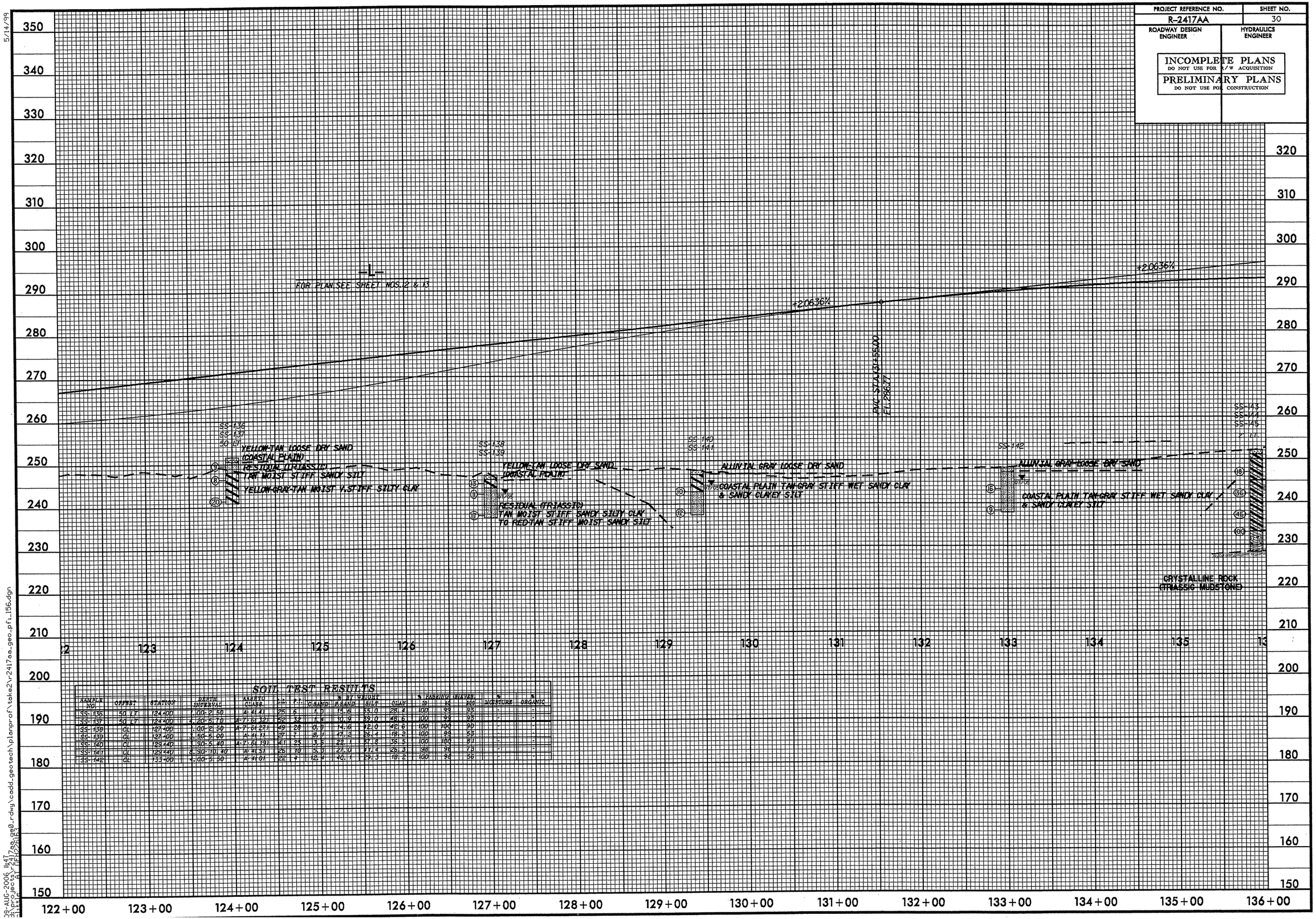
PROJECT REFERENCE NO.	SHEET NO.
R-2417AA	30
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% BY WEIGHT G.SAND	C.SAND	F.SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-136	50 LT	124+00	1.00-2.50	A-4(0)	25	6	1.0	15.6	55.0	28.4		100	99	95	-	-
SS-137	50 LT	124+00	4.20-5.70	A-7-6(32)	52	32	1.6	10.9	59.0	28.5		100	99	95	-	-
SS-138	CL	127+00	1.00-2.50	A-7-6(27)	49	28	0.9	14.6	42.0	42.6		100	100	90	-	-
SS-139	CL	127+00	3.50-5.00	A-4(1)	27	7	8.1	47.2	26.7	18.2		100	99	55	-	-
SS-140	CL	129+40	1.90-3.40	A-7-6(19)	41	25	3.5	29.1	37.8	36.5		100	100	81	-	-
SS-141	CL	129+40	8.90-10.40	A-4(5)	26	10	5.8	27.0	41.4	26.3		98	96	70	-	-
SS-142	CL	133+00	4.00-5.50	A-4(0)	22	7	12.4	40.1	29.3	18.2		100	98	56	-	-

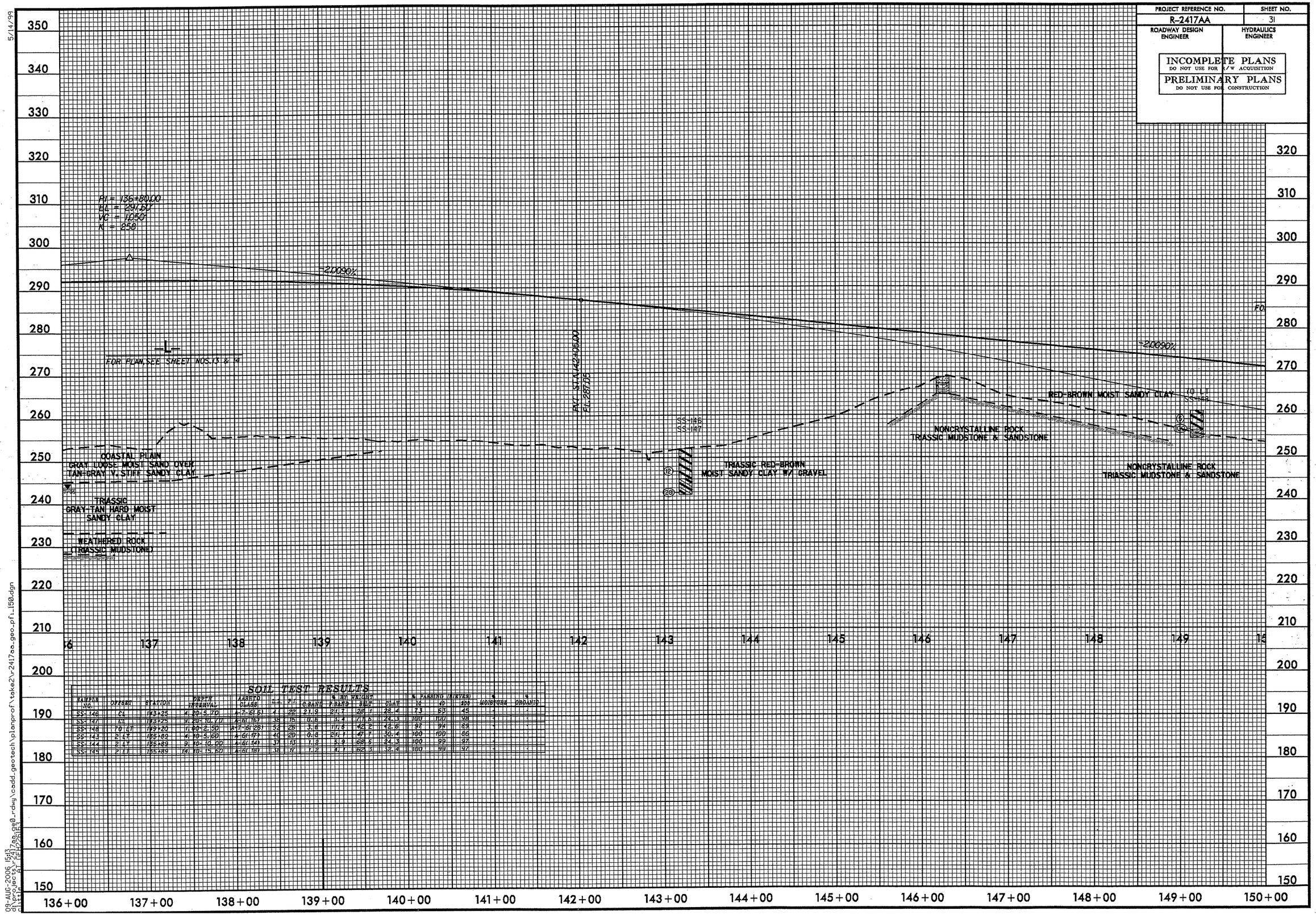
5/14/99

09-AUG-2006 11:47
31:projects\r2417aa\geo0_r.dwg\cadd_geotech\planprof\take2\r2417aa_geo_pf1_156.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2417AA	31
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS	LL	PI	% BY WEIGHT GRAVEL	SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-146	CL	143+25	6.20-8.70	A-7-6(51)	41	22	21.9	21.7	28.1	28.4	73	53	45	-	
SS-147	CL	140+25	9.80-10.70	A-6(16)	38	16	10.6	31.4	41.5	24.3	100	100	98	-	
SS-148	70 LT	149+20	11.00-12.50	A-7-6(29)	52	28	3.6	11.6	42.2	42.6	97	94	89	-	
SS-143	21 LT	135+83	4.10-5.60	A-6(17)	40	20	6.8	21.1	41.7	30.4	100	100	86	-	
SS-144	21 LT	135+83	9.10-10.00	A-6(14)	37	13	7.2	5.9	58.5	24.3	100	99	97	-	
SS-145	21 LT	135+83	14.10-15.60	A-6(16)	38	17	7.2	4.1	62.3	32.4	100	99	97	-	

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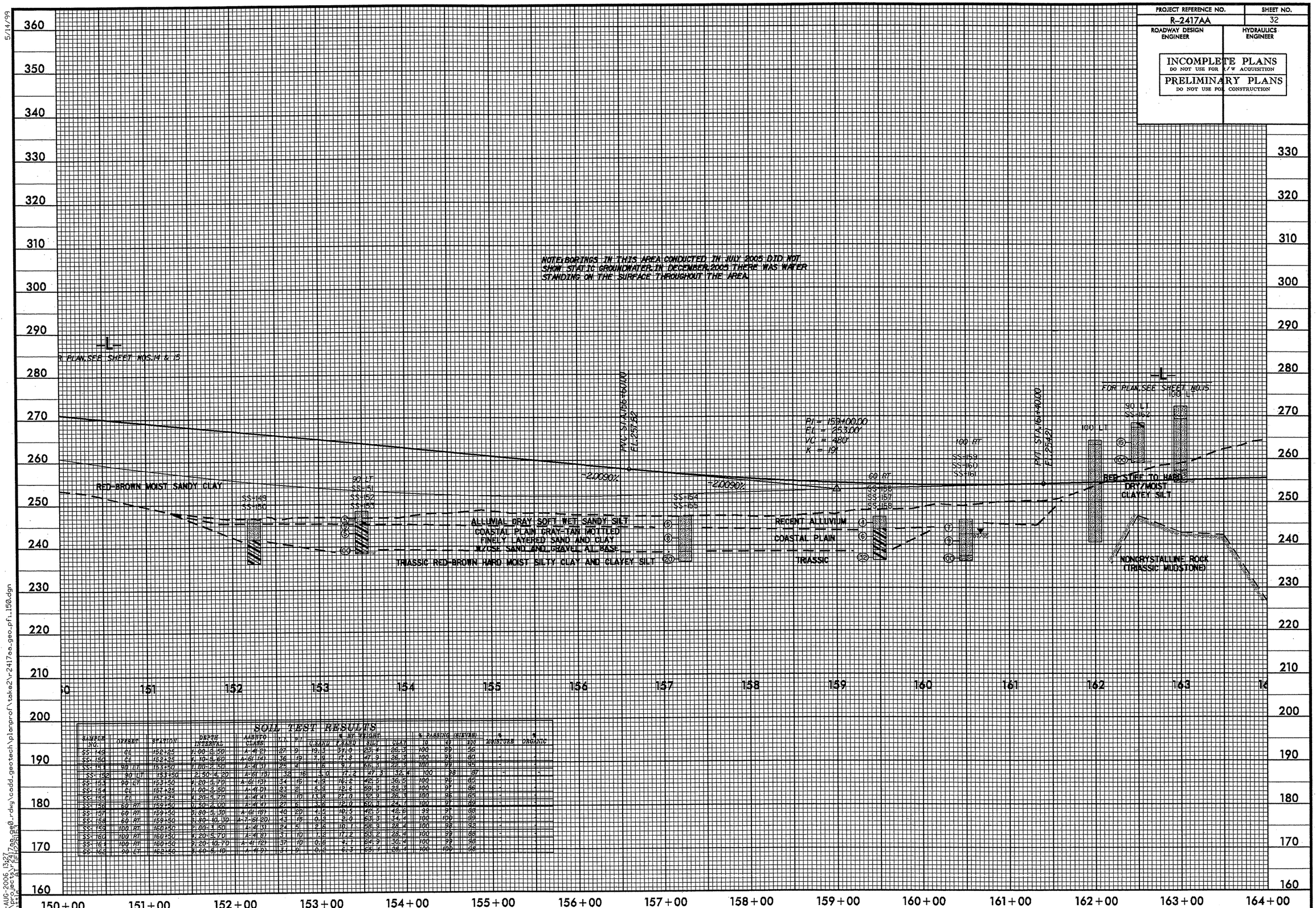
PROJECT REFERENCE NO.	SHEET NO.
R-2417AA	32
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	P.I.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-149	CL	152+25	1.00-2.50	A-4(2)	27	9	19.3	51.0	23.4	26.3	100	99	56	-	
SS-150	CL	152+25	4.10-5.60	A-6(14)	36	19	7.9	17.8	47.9	26.3	100	95	80	-	
SS-151	90 LT	153+50	1.00-2.50	A-4(3)	25	4	1.6	9.7	66.3	22.3	100	99	95	-	
SS-152	90 LT	153+50	2.50-4.20	A-6(13)	32	16	3.0	17.2	47.3	32.4	100	98	87	-	
SS-153	90 LT	153+50	4.20-5.70	A-6(13)	34	16	4.9	16.2	42.5	36.5	100	96	65	-	
SS-154	CL	157+25	1.00-2.50	A-4(9)	23	2	5.9	18.6	59.3	23.3	100	97	86	-	
SS-155	CL	157+25	4.20-5.70	A-4(4)	26	10	13.8	27.0	32.9	26.3	100	96	65	-	
SS-156	60 RT	159+50	0.50-2.00	A-4(4)	20	5	3.6	12.0	60.5	24.1	100	97	89	-	
SS-157	60 RT	159+50	3.30-5.30	A-6(18)	40	20	4.5	10.5	42.5	42.6	99	97	88	-	
SS-158	60 RT	159+50	8.30-10.30	A-7-6(20)	43	18	0.2	2.0	63.3	34.4	100	100	99	-	
SS-159	100 RT	160+50	2.00-3.50	A-4(5)	24	5	2.8	10.1	58.3	28.4	100	98	92	-	
SS-160	100 RT	160+50	3.20-5.70	A-4(8)	31	10	1.2	11.2	53.2	34.4	100	99	88	-	
SS-161	100 RT	160+50	8.20-10.70	A-4(12)	37	10	0.6	7.7	54.9	36.9	100	99	98	-	
SS-162	90 LT	162+50	3.50-5.19	A-4(9)	31	9	0.6	5.7	55.1	38.6	100	100	98	-	

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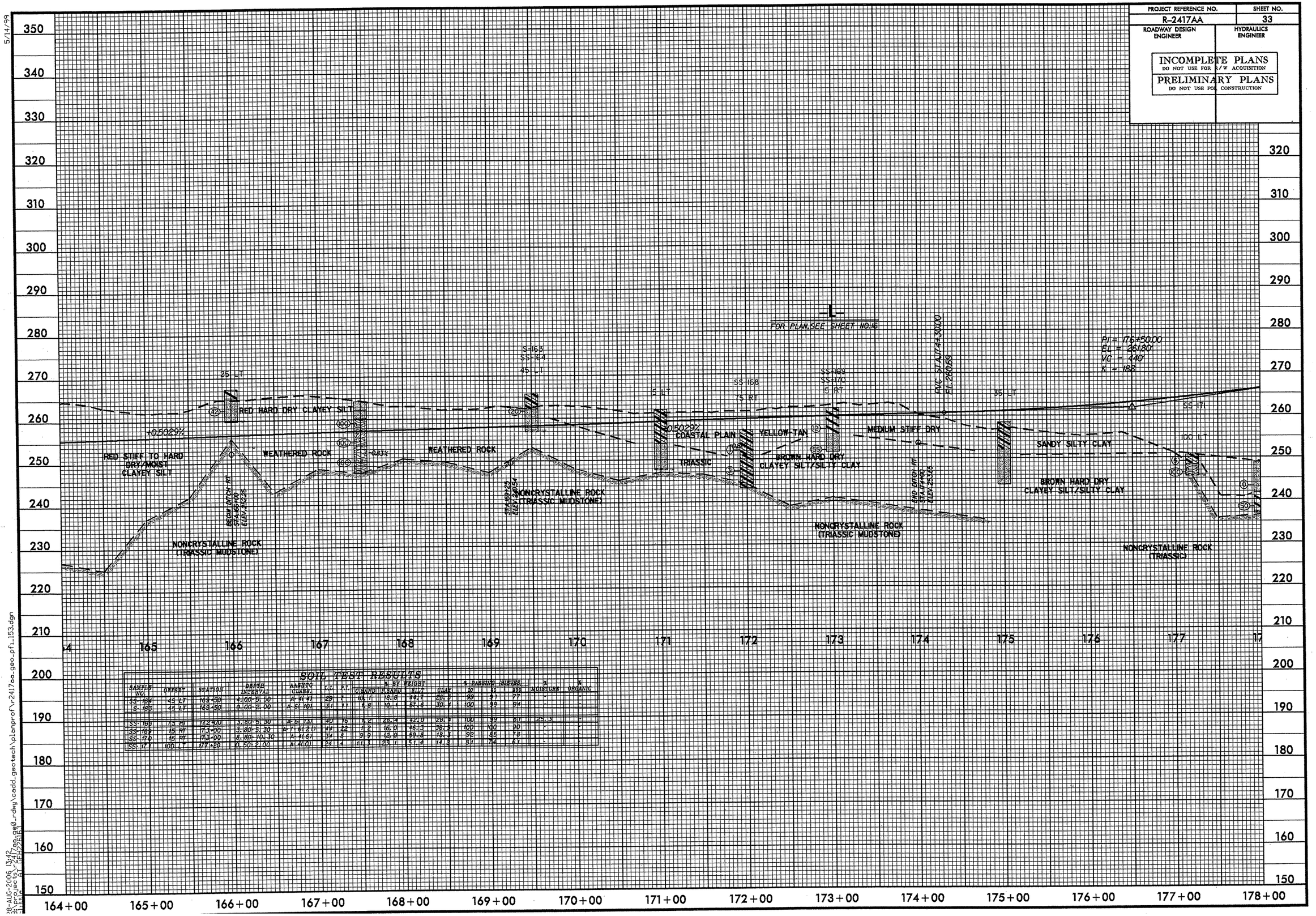
PROJECT REFERENCE NO.	SHEET NO.
R-2417AA	33
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



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) 20	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-164	45 LT	169+50	4.00-5.50	A-4(4)	29	7	10.1	18.8	44.7	26.3	99	91	77	-	-
S-163	45 LT	169+50	0.00-2.00	A-6(10)	31	11	4.8	10.1	57.6	30.4	100	99	94	-	-
SS-168	75 RT	172+00	3.80-5.30	A-6(13)	40	16	1.2	28.4	42.0	28.4	100	99	81	25.3	-
SS-169	15 RT	173+00	3.80-5.30	A-7-6(21)	44	22	1.2	16.0	46.3	36.5	100	100	90	-	-
SS-170	15 RT	173+00	8.80-10.30	A-4(6)	34	8	9.9	12.0	59.8	18.3	92	85	78	-	-
SS-171	100 LT	177+20	0.50-2.00	A-4(0)	24	4	11.3	23.1	51.4	14.2	81	74	61	-	-

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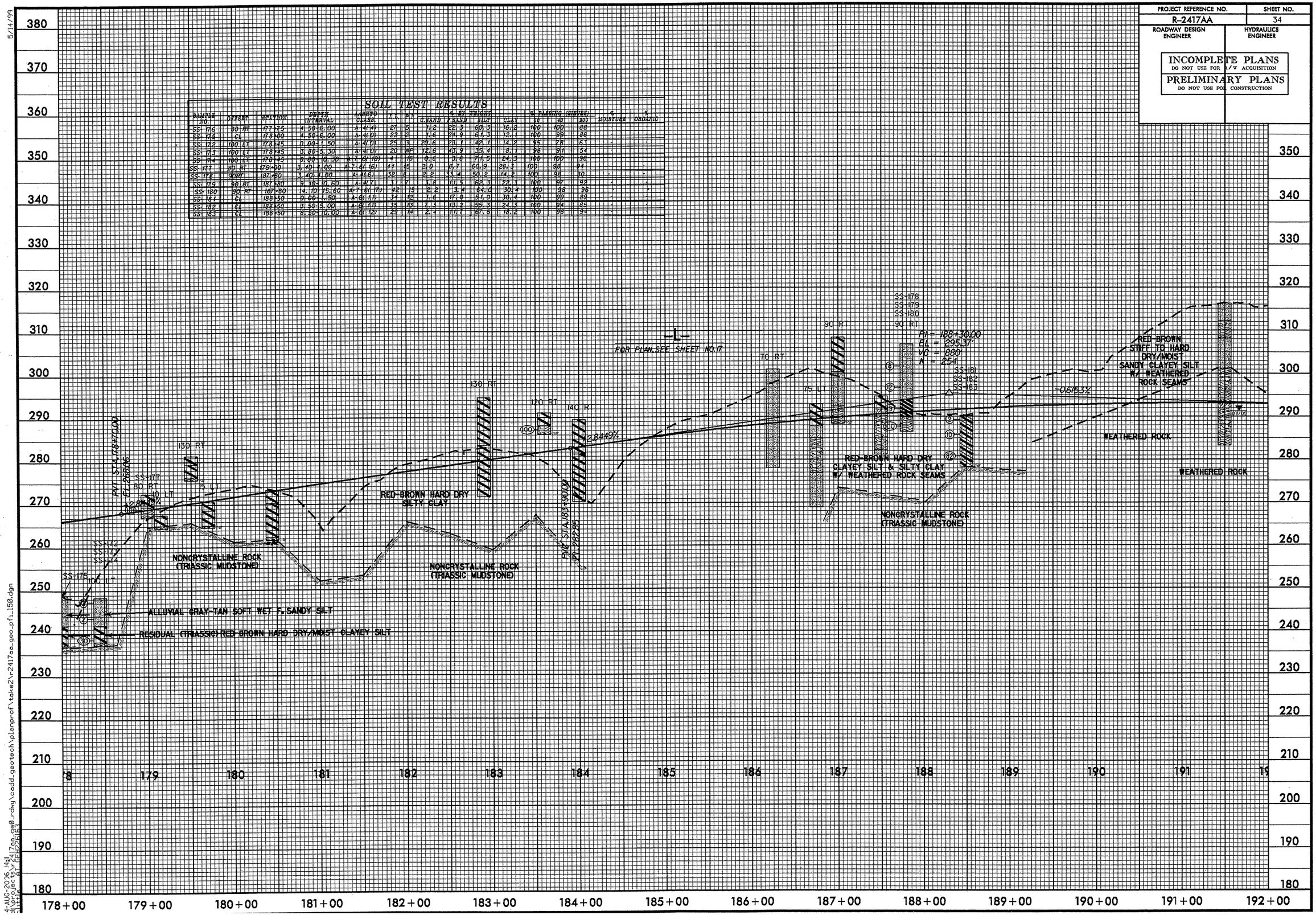
PROJECT REFERENCE NO.	SHEET NO.
R-2417AA	34
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT G.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-176	80 RT	177+75	4.50-6.00	A-4(4)	27	5	1.2	22.3	60.3	16.2	100	100	86	-	-
SS-175	CL	178+00	4.50-6.00	A-4(0)	22	2	1.6	24.9	61.3	12.1	100	99	86	-	-
SS-172	100 LT	178+45	0.00-1.50	A-4(0)	25	3	20.6	23.1	42.1	14.2	95	78	63	-	-
SS-173	100 LT	178+45	3.80-5.30	A-4(0)	20	WP	12.6	43.9	35.4	8.1	98	91	54	-	-
SS-174	100 LT	178+45	8.80-10.30	A-7-6(10)	41	16	0.6	3.6	71.5	24.3	100	100	96	-	-
SS-177	80 RT	179+00	3.40-4.00	A-7-6(16)	41	15	2.0	8.7	60.9	28.3	100	98	94	-	-
SS-178	90RT	187+80	3.40-4.00	A-4(6)	32	8	2.2	33.4	50.2	14.2	100	98	80	-	-
SS-179	90 RT	187+80	9.10-10.60	A-4(7)	31	7	3.8	11.5	62.3	22.3	100	97	92	-	-
SS-180	90 RT	187+80	14.10-15.60	A-7-6(17)	42	15	2.2	3.4	64.0	30.4	100	98	96	-	-
SS-181	CL	188+50	0.00-1.50	A-6(11)	34	12	1.6	17.0	51.0	30.4	100	99	89	-	-
SS-182	CL	188+50	3.50-5.00	A-6(11)	35	13	7.3	13.2	55.3	24.3	100	94	85	-	-
SS-183	CL	188+50	8.50-10.00	A-6(12)	29	14	2.4	11.7	67.6	18.2	100	98	94	-	-



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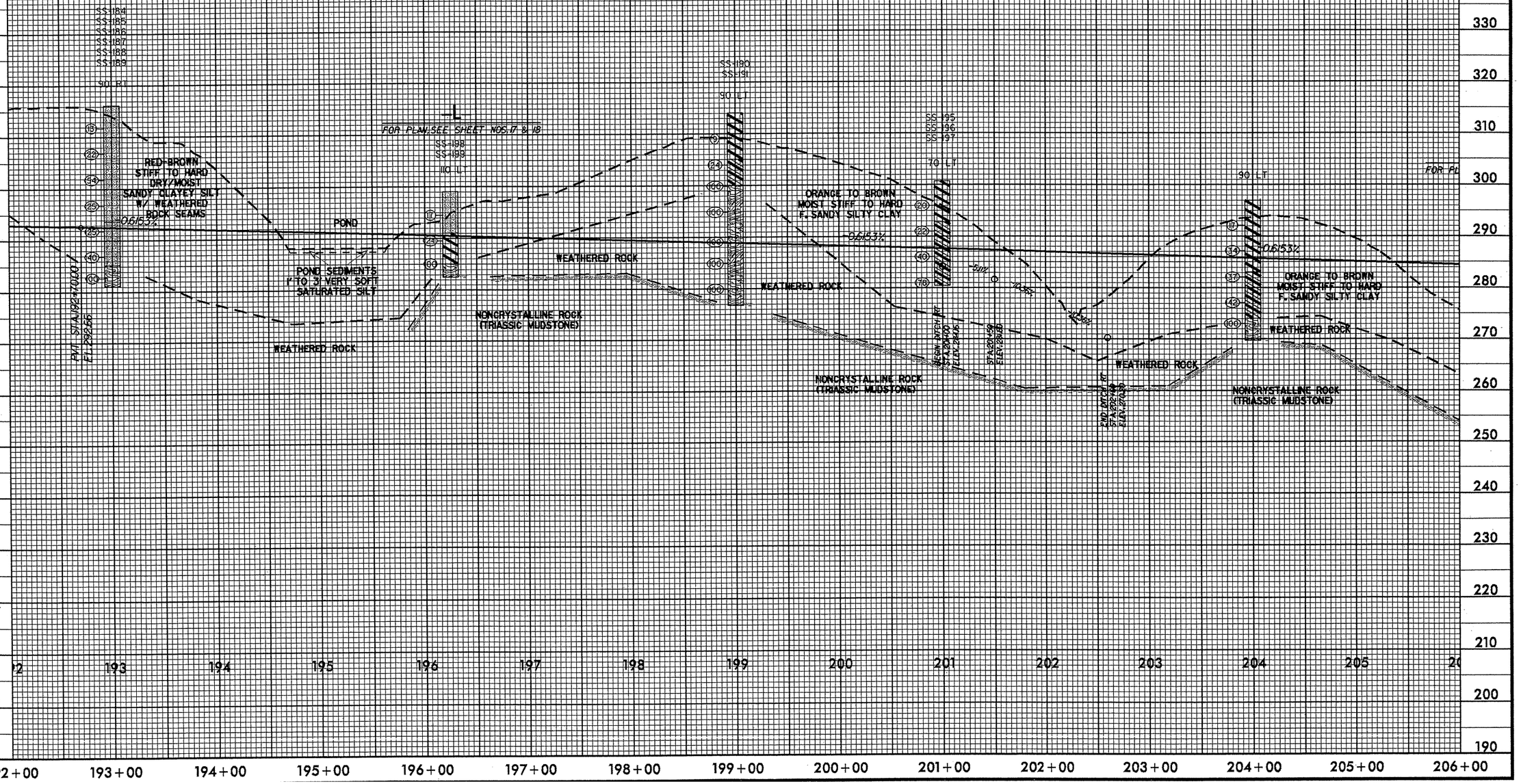
PROJECT REFERENCE NO.	SHEET NO.
R-2417AA	35
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT GRAVEL	SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-184	90 RT	193+00	3.90-5.90	A-4(7)	35	8	0.2	28.3	53.2	18.2	100	100	84	-	-
SS-185	90 RT	193+00	8.90-9.90	A-4(3)	33	5	1.4	35.6	50.8	12.1	100	100	87	-	-
SS-186	90 RT	193+00	13.40-14.90	A-4(9)	35	9	0.2	27.9	55.8	13.1	100	100	92	-	-
SS-187	90 RT	193+00	18.40-19.90	A-4(4)	33	7	1.4	43.5	38.3	16.2	100	100	68	-	-
SS-188	90 RT	193+00	23.40-24.90	A-5(15)	39	13	0.2	7.3	72.3	20.2	100	100	97	-	-
SS-189	90 RT	193+00	28.40-29.90	A-5(13)	36	13	0.9	15.8	70.6	14.2	100	100	92	-	-
SS-190	110 LT	194+25	3.50-5.30	A-4(9)	32	10	3.6	11.1	69.0	16.2	100	97	91	-	-
SS-191	110 LT	194+25	7.50-10.00	A-7-5(16)	41	14	0.8	2.0	66.8	30.4	100	99	98	-	-
SS-192	90 LT	193+00	3.10-5.60	A-7-5(34)	61	32	0.4	15.2	39.9	44.5	100	100	92	-	-
SS-193	90 LT	193+00	9.10-10.60	A-5(16)	39	14	0.2	1.6	69.6	28.3	100	100	99	-	-
SS-195	70 LT	201+00	3.80-5.30	A-7-5(33)	60	37	0.6	13.4	41.5	44.5	100	100	92	-	-
SS-196	70 LT	201+00	8.80-10.30	A-5(4)	39	14	23.5	22.9	33.4	30.2	62	58	48	-	-
SS-197	70 LT	201+00	13.80-15.30	A-5(19)	40	18	0.4	2.8	68.4	28.3	100	100	99	-	-



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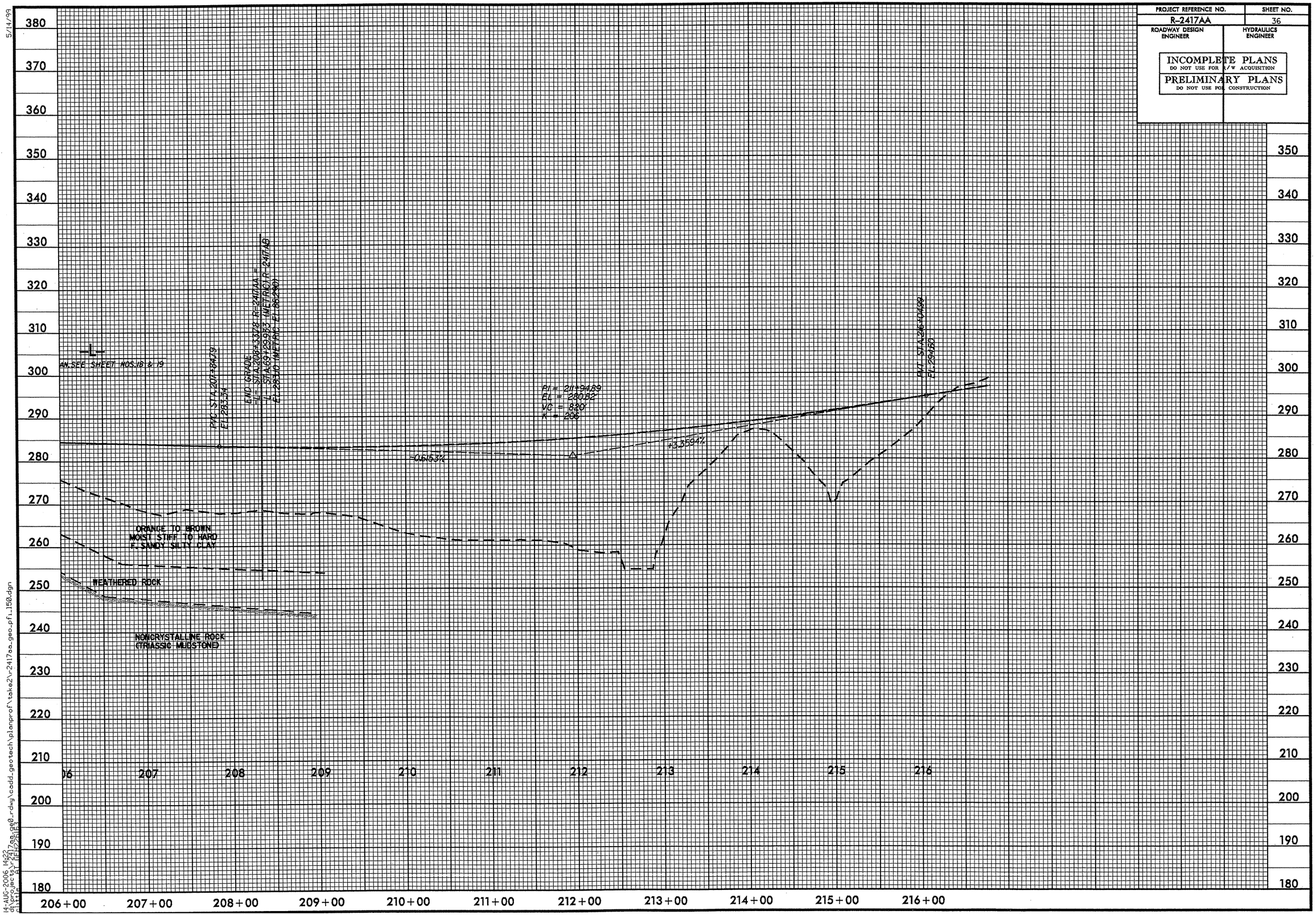

PROJECT REFERENCE NO.
R-2417AA
SHEET NO.
36
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
5/14/99
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270
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210
200
190
180
-L-
AN.SEE SHEET NOS.18 & 19
PVC STA.201+84.79
EL.283.34
END GRADE
-L- STA.208+33.78 R-2417AA =
-L- STA.69+29.933 (METRIC) R-2417AB
EL.283.10 (METRIC EL.85.290)
PI = 211+94.89
EL = 280.82
VC = 820
K = 206
-0.6153%
+3.3594%
PVT STA.216+04.99
EL.294.60
ORANGE TO BROWN
MOIST STIFF TO HARD
F. SANDY SILTY CLAY
WEATHERED ROCK
NONCRYSTALLINE ROCK
(TRIASSIC MUDSTONE)
206
207
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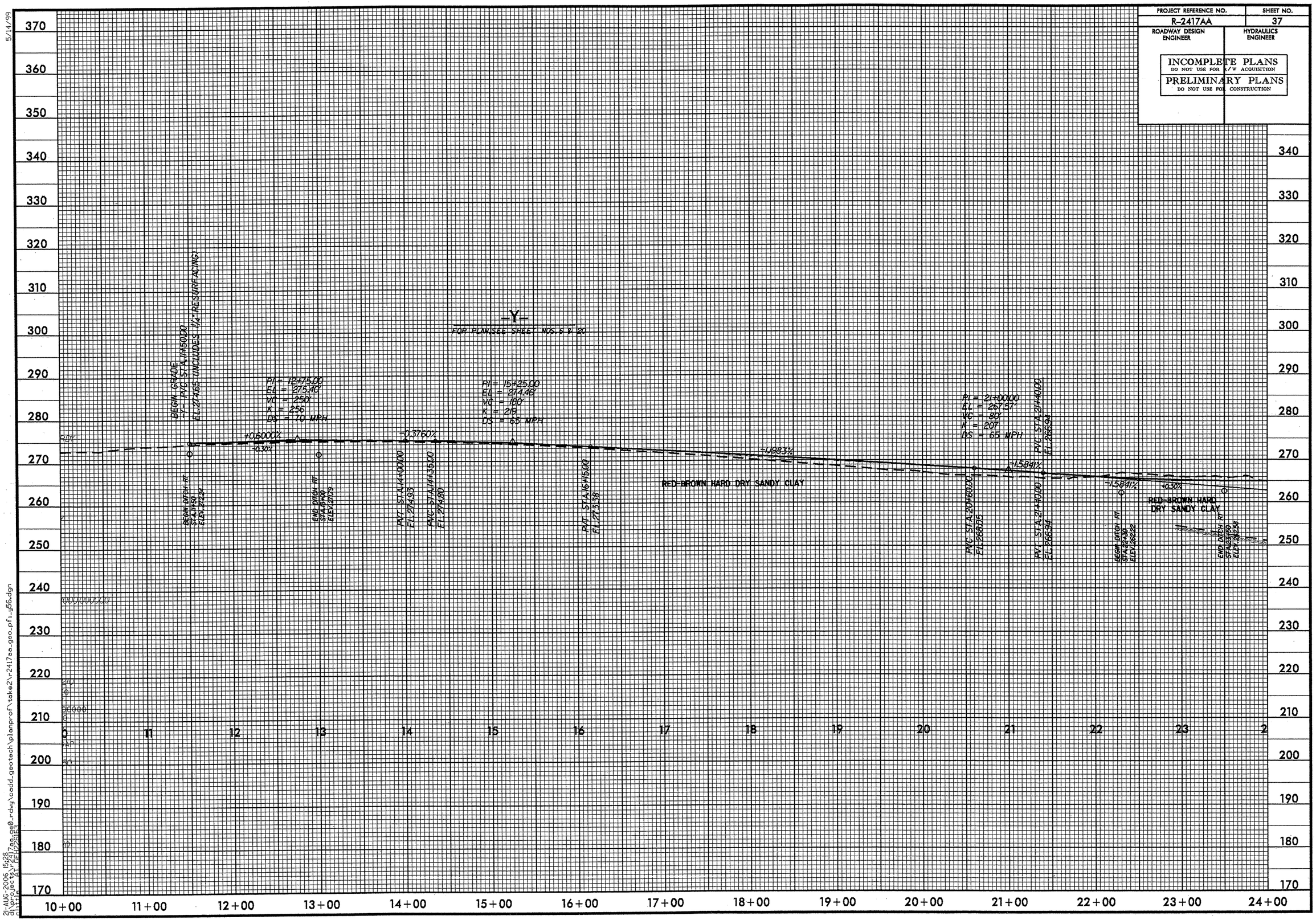

5/14/99

21-AUG-2006 15:28
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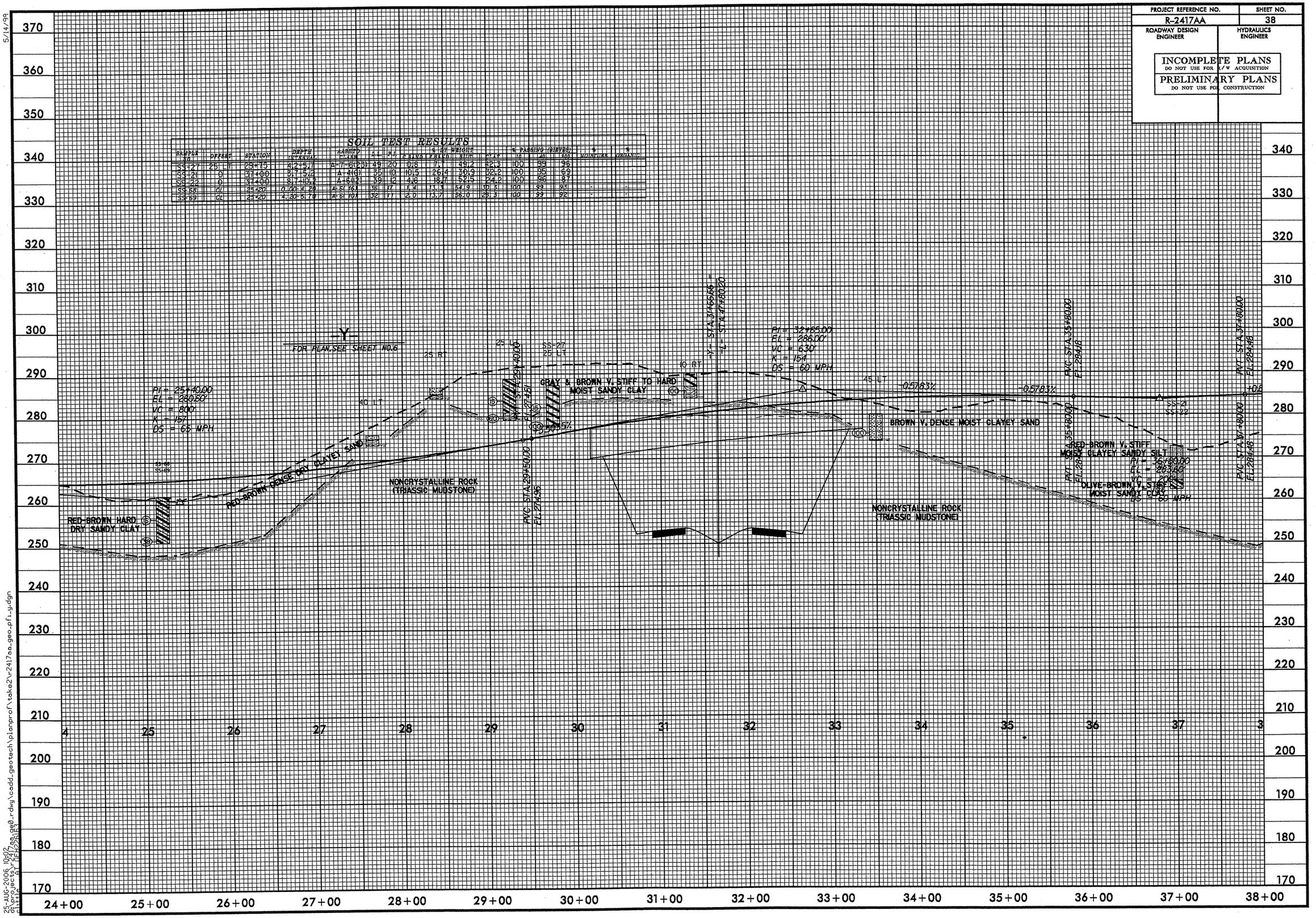
PROJECT REFERENCE NO.	SHEET NO.
R-2417AA	38
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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-27	25 LT	28+75	4.2-5.7	A-7-6(23)	49	20	0.8	7.7	49.2	42.3	100	99	96		
SS-21	0	37+00	3.7-5.2	A-4(6)	35	10	10.5	26.4	30.9	32.2	100	95	69		
SS-22	0	37+00	8.7-10.2	A-6(12)	39	12	4.6	18.7	52.5	24.2	100	96	87		
SS-68	CL	25+20	0.00-4.20	A-6(16)	36	17	1.4	13.3	54.9	30.3	100	99	93	-	-
SS-69	CL	25+20	4.20-5.70	A-6(10)	32	11	2.0	13.7	56.0	28.3	100	99	92	-	-



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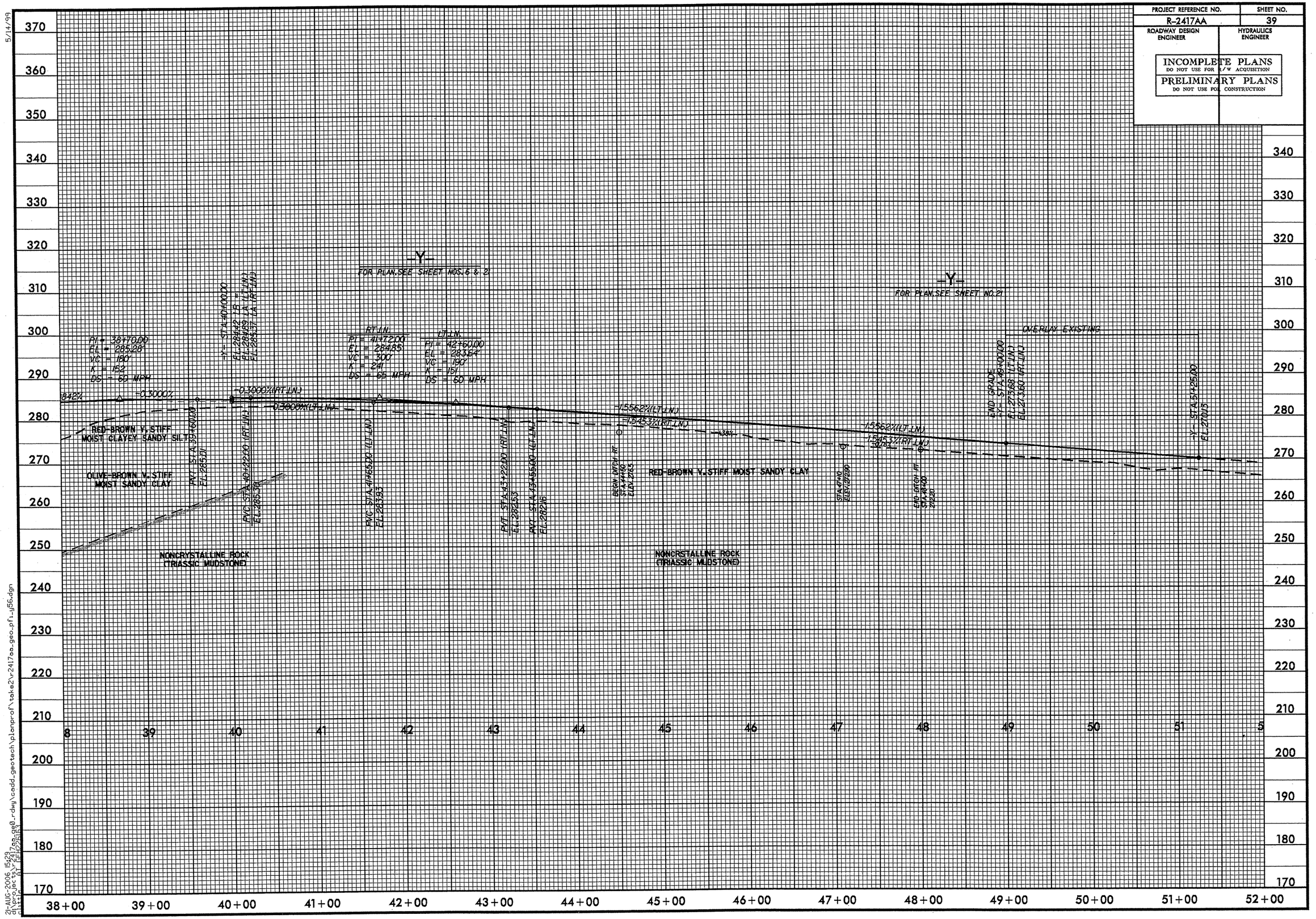
PROJECT REFERENCE NO.	SHEET NO.
R-2417AA	39
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



5/14/99

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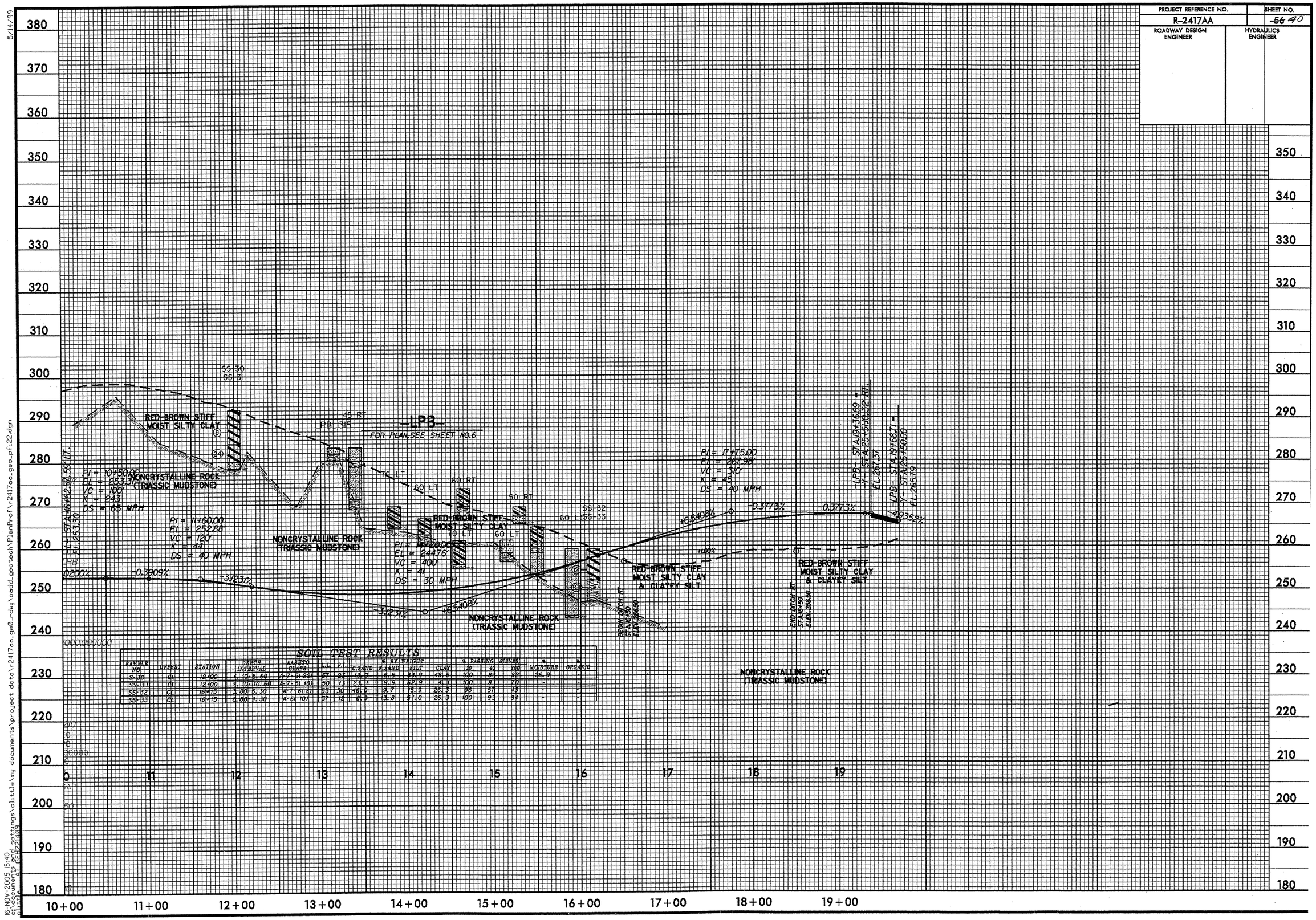
PROJECT REFERENCE NO.	SHEET NO.
R-2417AA	~~56~~ 40
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-30	CL	13+00	3.10-5.50	A-7-6(37)	67	23	13.0	6.9	31.3	48.8	100	99	98	36.9	
SS-31	CL	12+00	3.10-10.60	A-7-5(70)	60	23	23.0	9.9	32.9	34.2	100	97	70		
SS-32	CL	16+15	3.80-5.30	A-7-6(37)	58	30	48.0	9.7	15.5	26.3	99	97	43		
SS-33	CL	16+15	6.80-9.30	A-6(10)	37	12	9.9	3.8	37.0	28.3	100	93	84		

5/14/99

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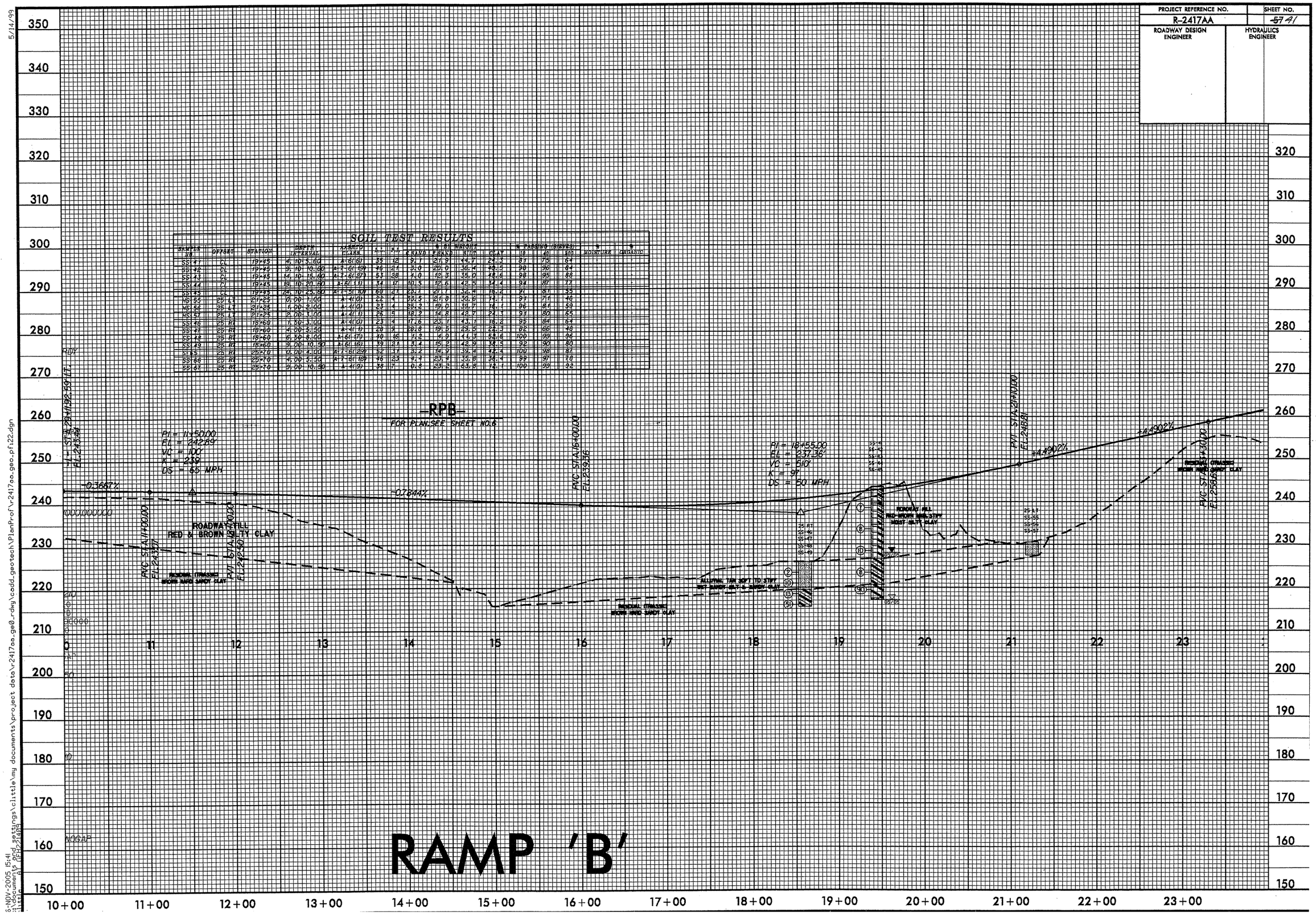
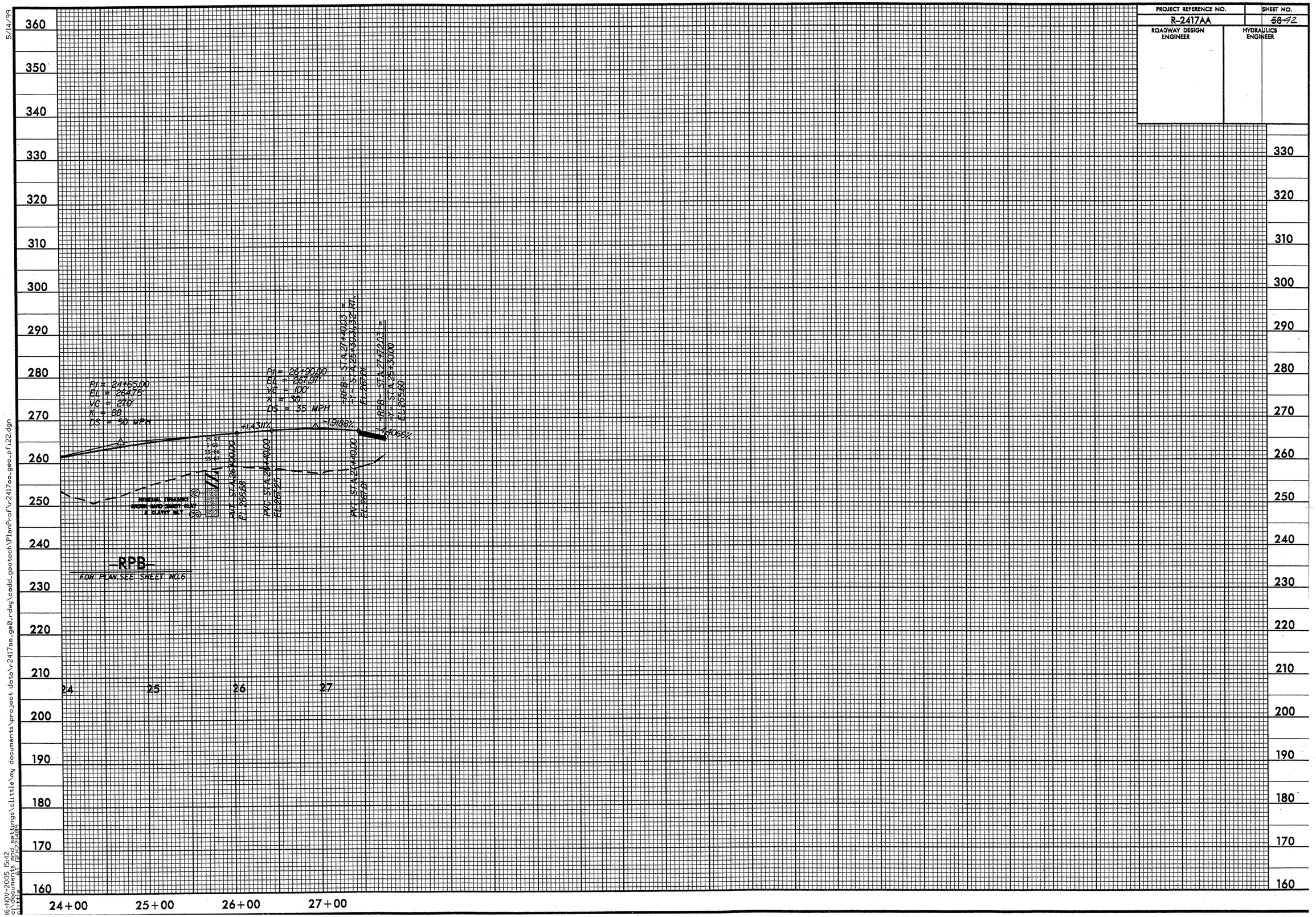
PROJECT REFERENCE NO.	SHEET NO.
R-2417AA	~~57~~ 41
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT: % SAND	% BY WEIGHT: % SILT	% BY WEIGHT: CLAY	% PASSING (SIEVES): 10	% PASSING (SIEVES): 40	% PASSING (SIEVES): 200	% MOISTURE	% ORGANIC
SS-41	CL	19+45	4.10-5.60	A-6(6)	35	12	9.1	21.9	44.7	24.3	81	75	64	
SS-42	CL	19+45	9.10-10.60	A-7-6(19)	46	21	3.0	20.0	36.4	40.5	98	96	64	
SS-43	CL	19+45	14.10-15.60	A-7-6(27)	53	28	4.0	12.3	35.0	48.6	98	95	88	
SS-44	CL	19+45	19.10-20.60	A-6(11)	34	17	10.5	12.6	42.5	34.4	94	87	77	
SS-45	CL	19+45	24.10-25.60	A-7-5(10)	60	21	23.7	27.7	32.4	16.2	97	81	55	
HS-55	25 LT	21+25	0.00-1.00	A-4(0)	22	4	33.5	21.8	30.6	14.1	91	71	46	
HS-56	25 LT	21+25	1.00-2.00	A-4(0)	23	4	25.2	19.0	39.7	16.1	96	81	59	
HS-57	25 LT	21+25	2.00-3.00	A-4(1)	26	5	18.2	14.8	42.7	24.3	91	80	65	
SS-46	25 RT	18+60	1.50-3.00	A-4(0)	23	4	17.6	23.1	43.1	16.2	95	84	64	
SS-47	25 RT	18+60	4.00-5.50	A-4(1)	28	9	28.8	19.5	29.5	22.3	82	66	48	
SS-48	25 RT	18+60	6.50-8.00	A-6(17)	40	16	1.2	4.9	44.3	52.6	100	99	96	
SS-49	25 RT	18+60	9.00-10.50	A-6(16)	39	21	3.4	15.2	42.9	38.5	92	90	80	
SS-65	25 RT	25+70	0.00-4.00	A-7-6(29)	52	31	3.2	14.9	39.4	42.4	100	98	87	
SS-66	25 RT	25+70	4.00-5.50	A-7-6(18)	46	23	4.4	23.4	35.8	36.4	99	97	78	
SS-67	25 RT	25+70	9.00-10.50	A-4(9)	38	7	0.8	23.2	63.8	12.1	100	99	92	

PROJECT REFERENCE NO.	SHEET NO.
R-2417AA	~~58~~ 42
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



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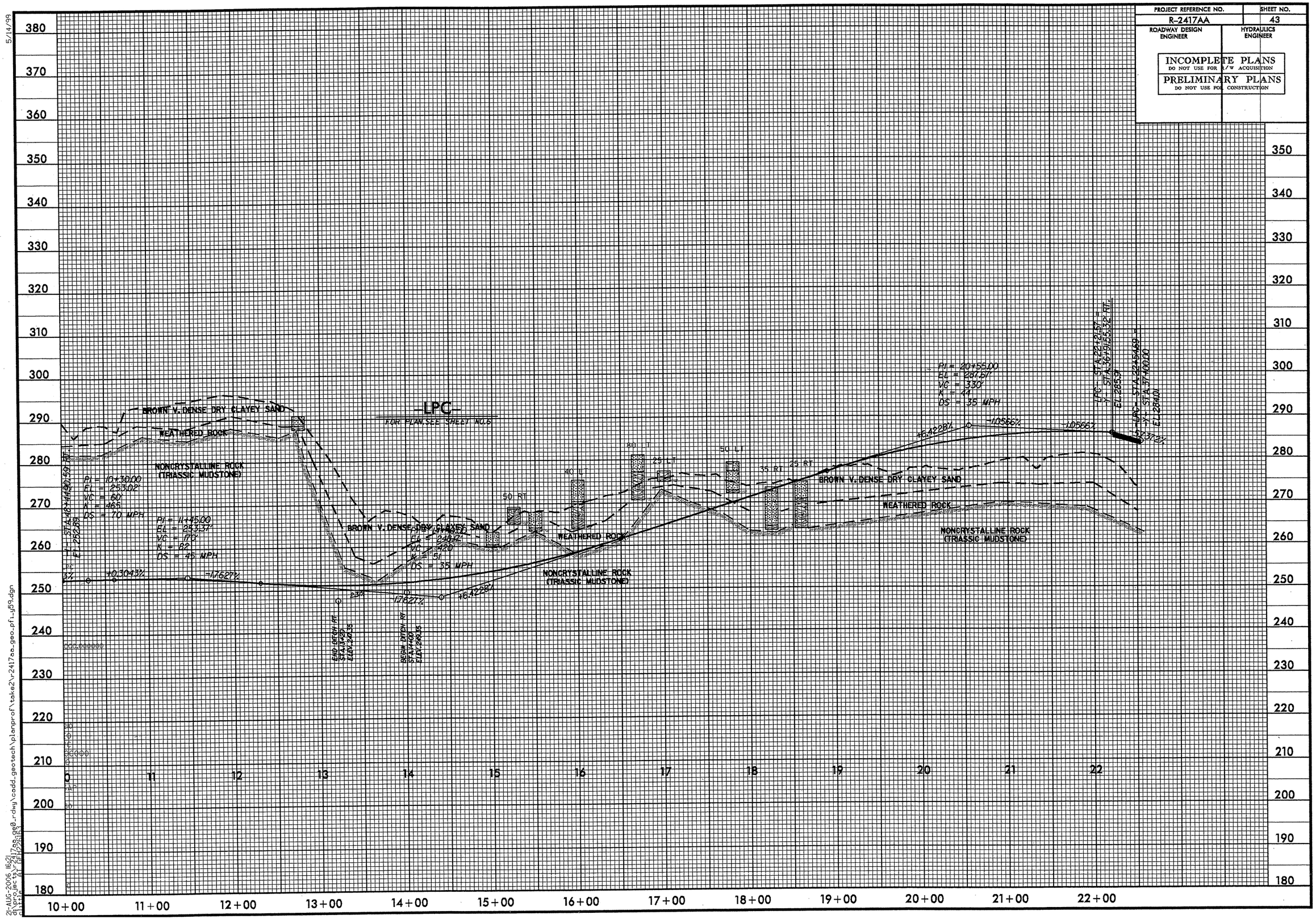
PROJECT REFERENCE NO.	SHEET NO.
R-2417AA	43
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

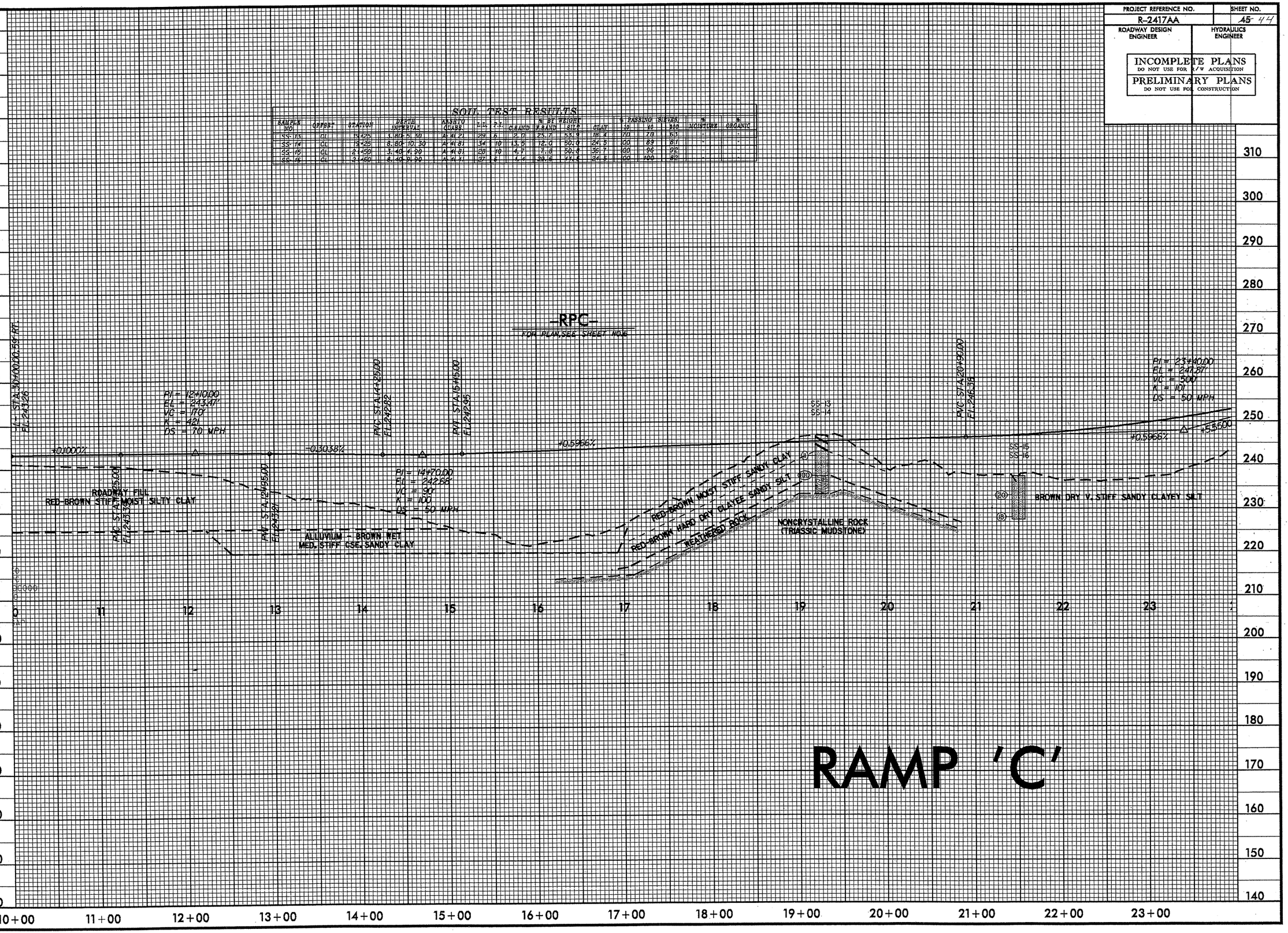


PROJECT REFERENCE NO.	SHEET NO.
R-2417AA	45-44
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	C.BAND	% BY WEIGHT V.BAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-13	CL	13+25	1.80-5.30	A-4(2)	29	6	2.0	25.7	53.9	18.4	70	70	63	-	-
SS-14	CL	13+25	8.80-10.30	A-4(8)	34	10	13.5	12.0	50.0	24.5	60	89	81	-	-
SS-15	CL	21+50	3.40-4.90	A-4(8)	28	10	4.7	7.8	50.6	36.7	60	98	92		
SS-16	CL	21+50	8.40-9.90	A-4(4)	27	5	1.4	29.6	44.5	24.5	60	100	82		



5/14/99

22-AUG-2006 11:23
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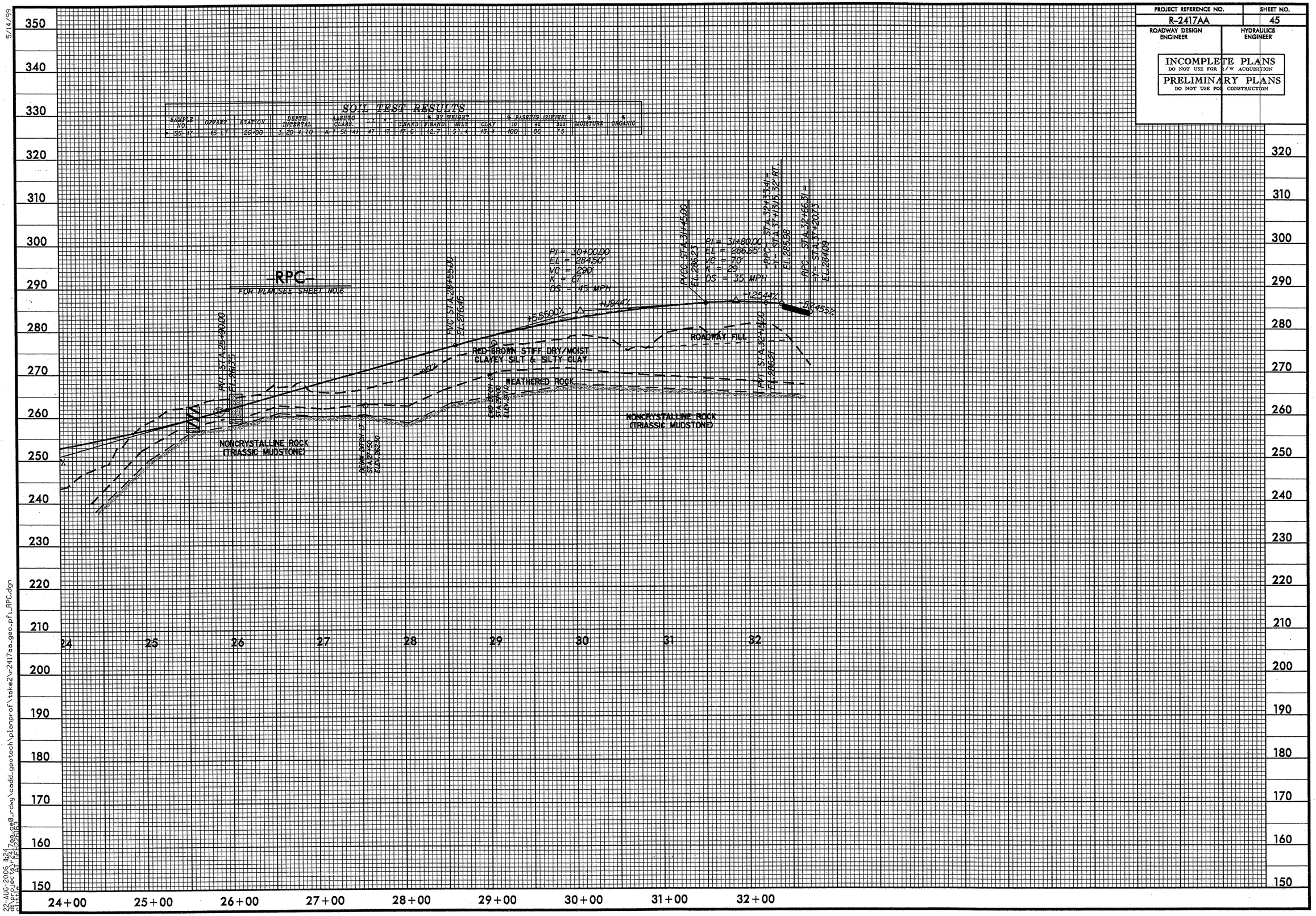
PROJECT REFERENCE NO.	SHEET NO.
R-2417AA	45
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



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
55-17	15 LT	26+00	3.20-4.70	A-7-5(14)	47	17	17.6	12.7	51.4	18.4	100	86	75		

5/14/99

22-AUG-2006 11:24
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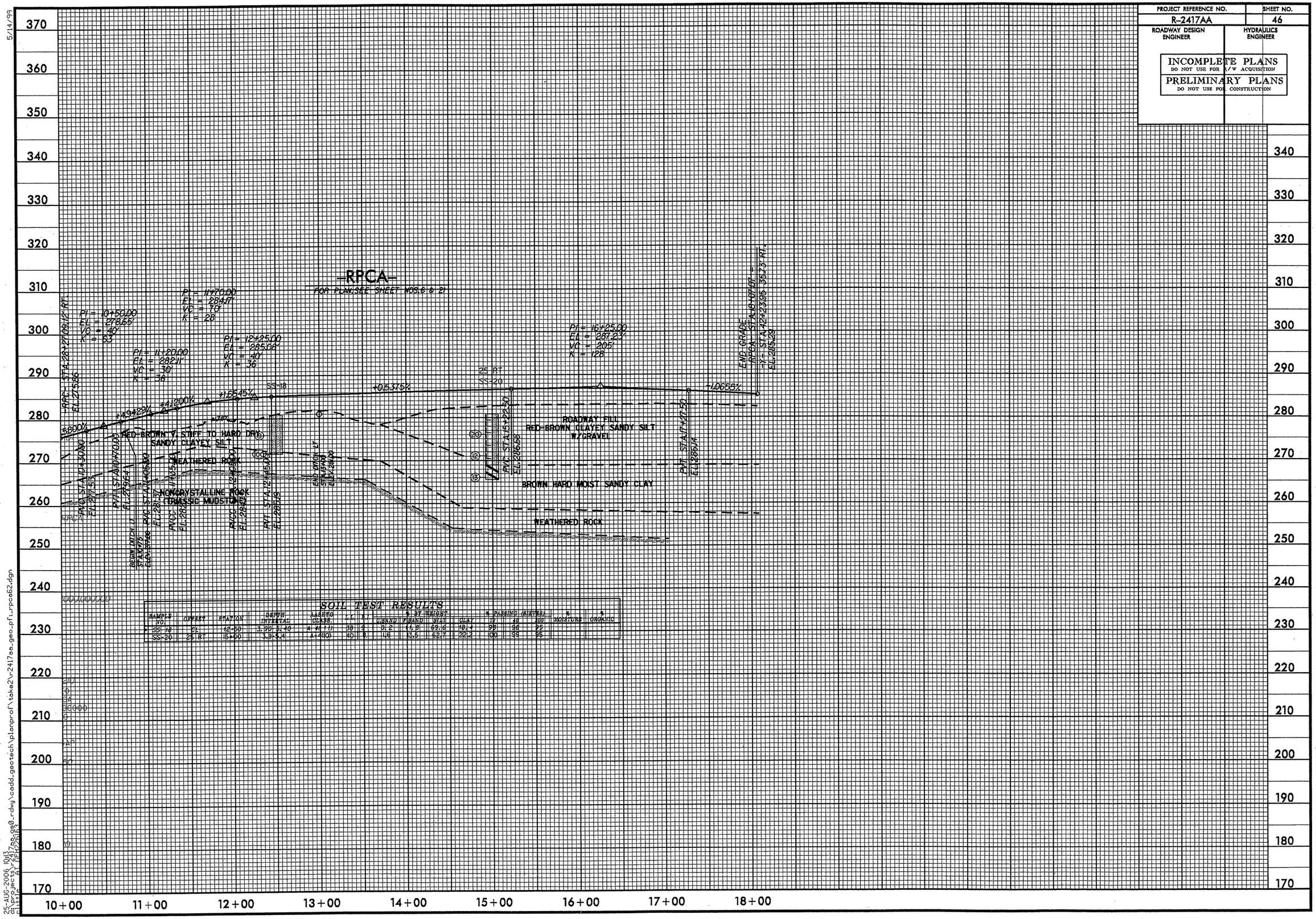
PROJECT REFERENCE NO.	SHEET NO.
R-2417AA	46
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



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) 100	% MOISTURE	% ORGANIC
SS-18	CL	12+50	3.99-5.40	A-4(1)	38	9	9.2	11.8	69.6	18.4	98	98	95		
SS-20	25 RT	15+00	3.9-5.4	A-4(0)	40	8	1.6	13.5	62.7	22.2	100	99	95		

5/14/99

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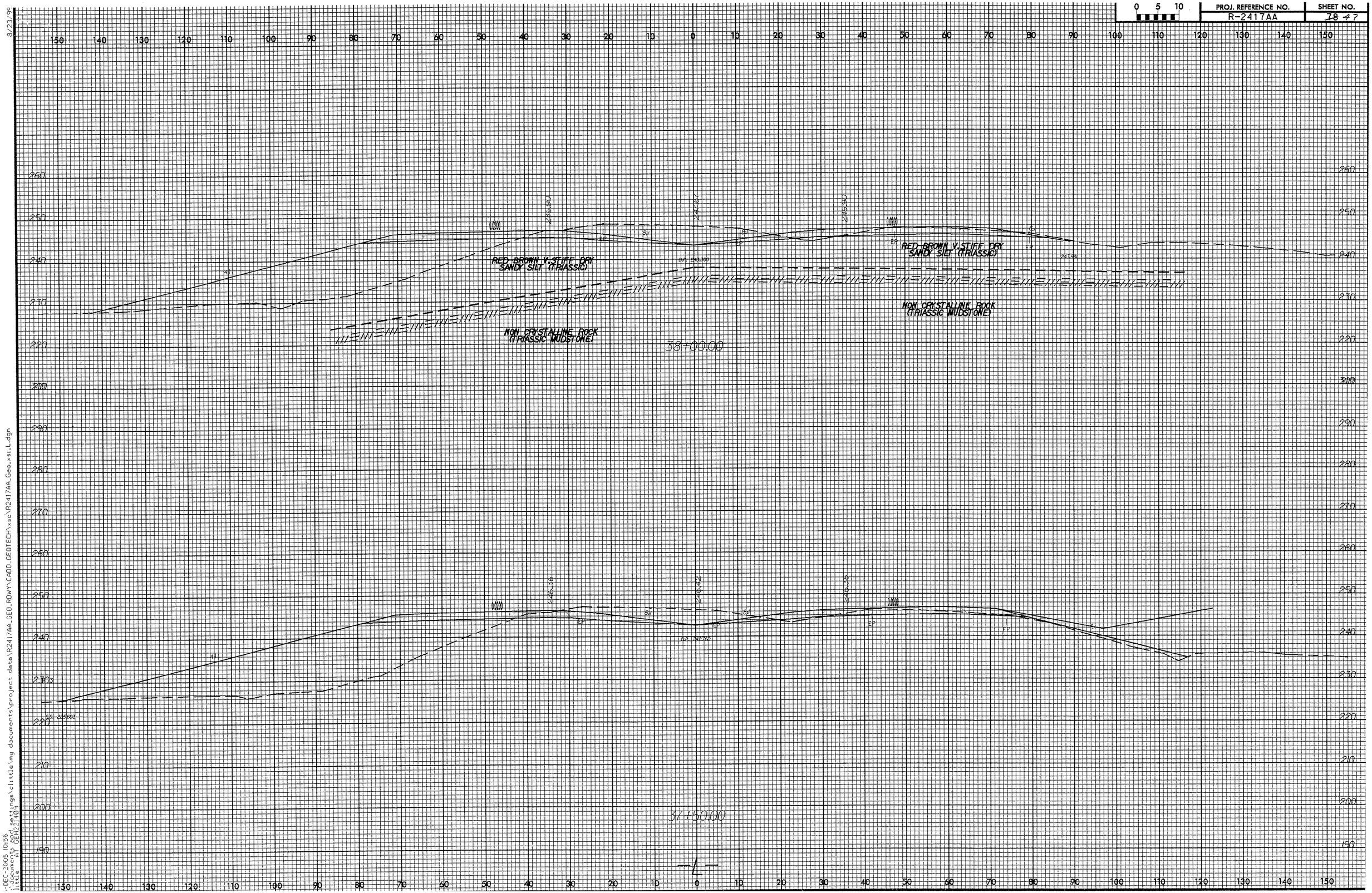
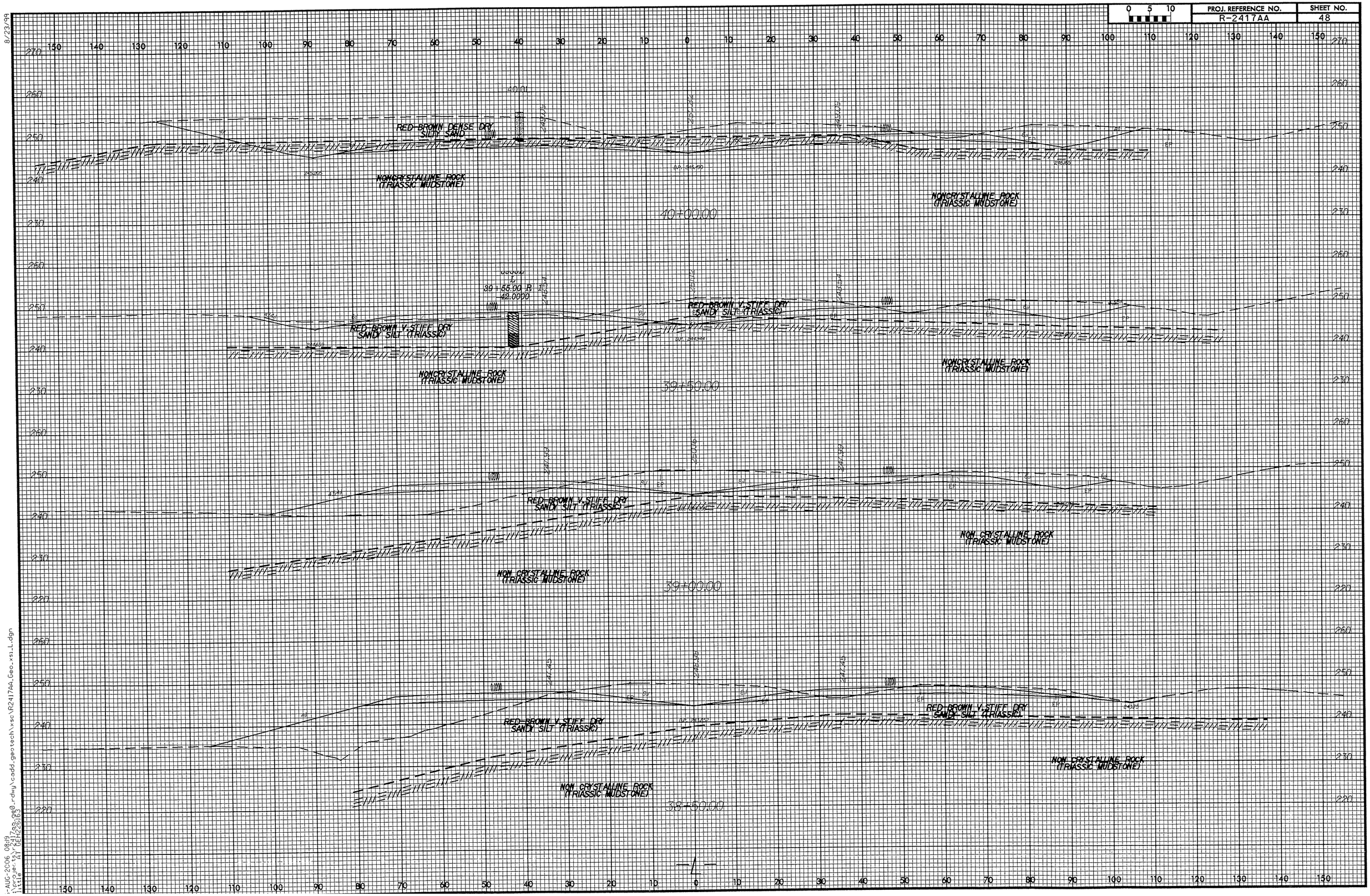


0 5 10
PROJ. REFERENCE NO.
R-2417AA
SHEET NO.
38 47
RED BROWN V.STIFF DRY SANDY SILT (TRIASSIC)
NON CRYSTALLINE ROCK (TRIASSIC MUDSTONE)
38+00.00
37+50.00
-L-

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2417AA	48



8/23/99

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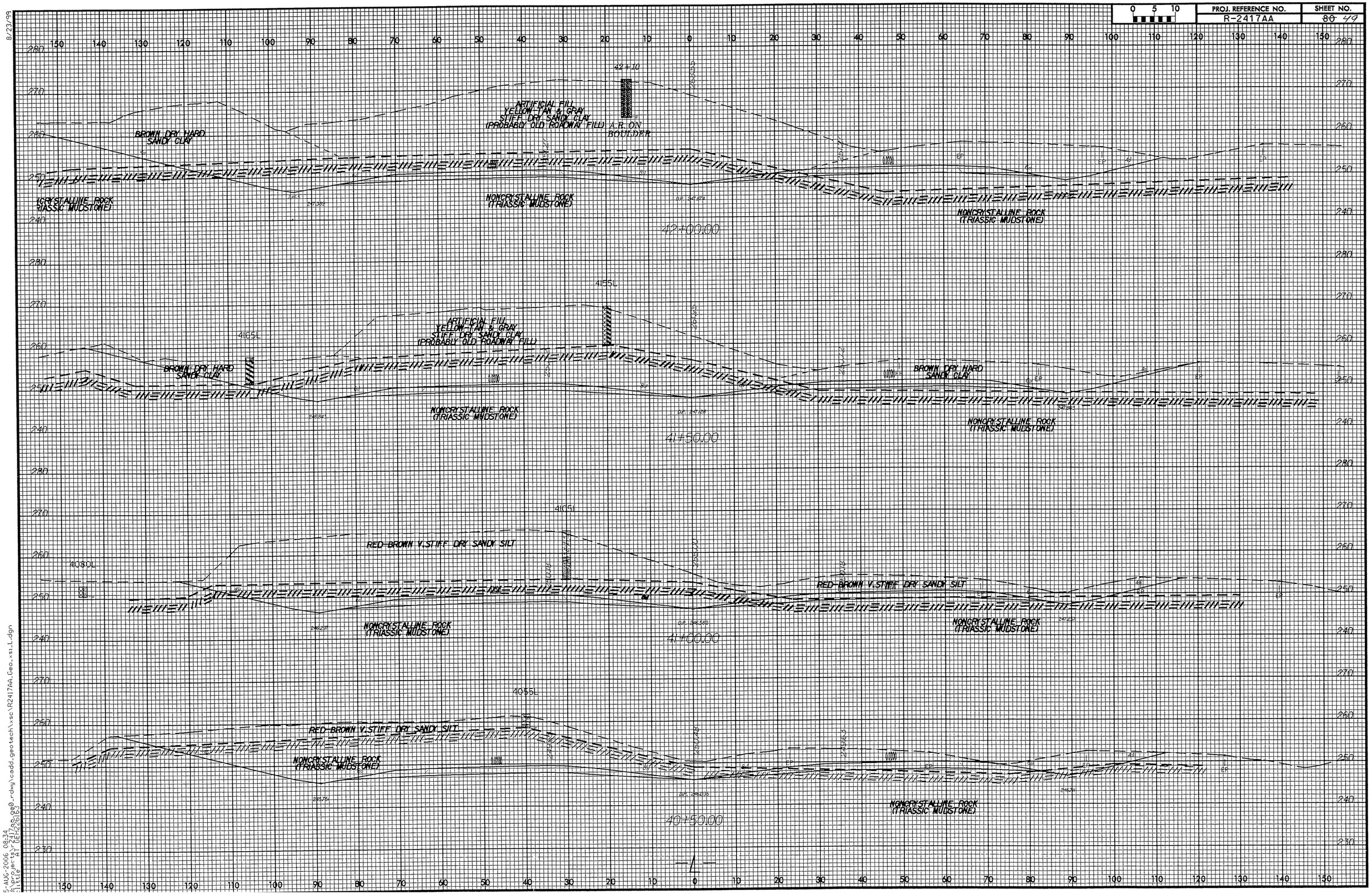
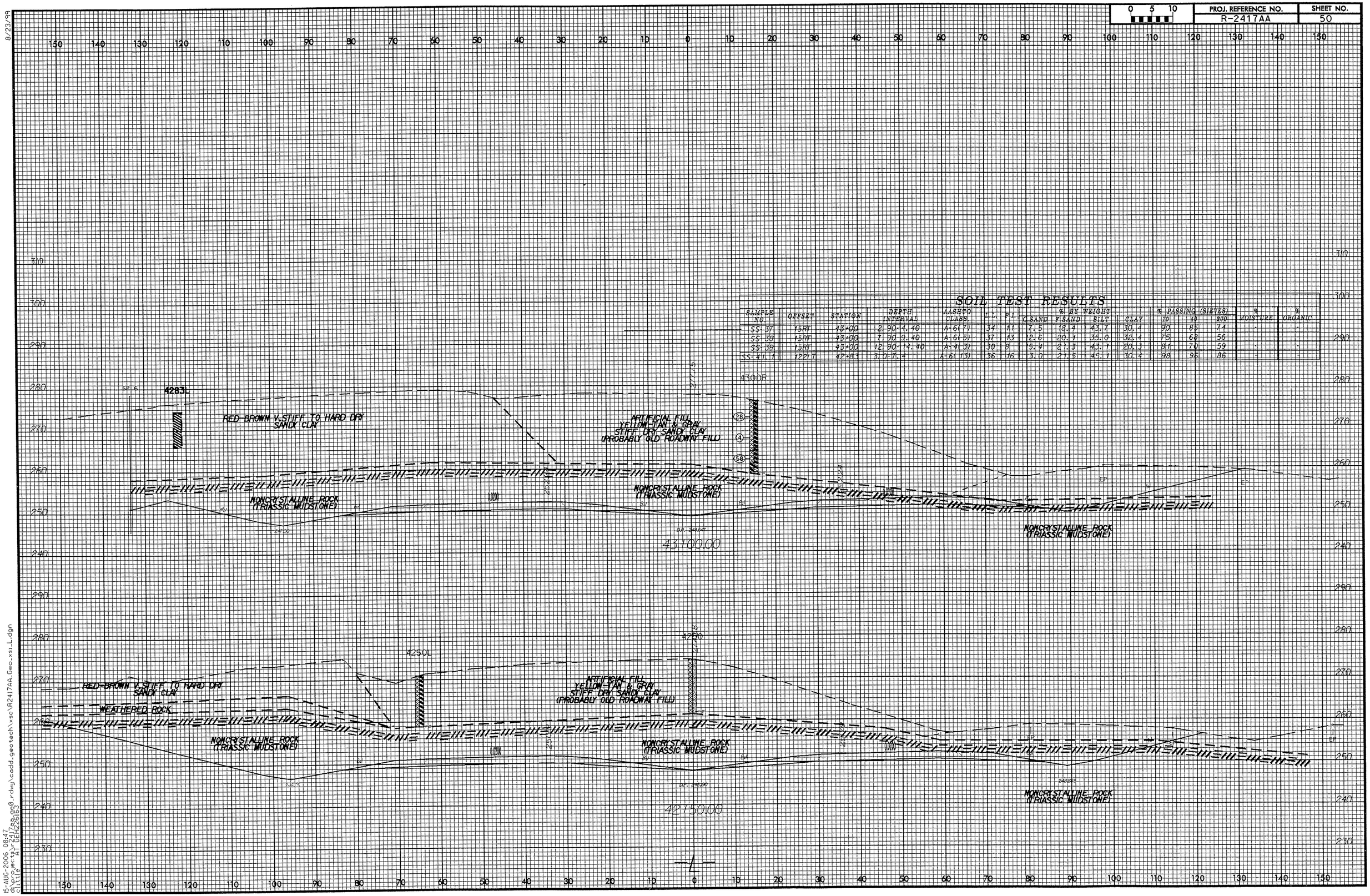


PROJ. REFERENCE NO.
R-2417AA
SHEET NO.
80 49
0 5 10
42+10
ARTIFICIAL FILL
YELLOW-TAN & GRAY
STIFF DRY SANDY CLAY
(PROBABLY OLD ROADWAY FILL)
A.R. ON
BOULDER
BROWN DRY HARD
SANDY CLAY
NONCRYSTALLINE ROCK
(TRIASSIC MUDSTONE)
42+00.00
4155L
4165L
41+50.00
4105L
4080L
RED-BROWN V.STIFF DRY SANDY SILT
41+00.00
4055L
40+50.00

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2417AA	50



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-37	15RT	43+00	2.90-4.40	A-6(7)	34	11	7.5	18.4	43.7	30.4	90	85	71	-	-
SS-38	15RT	43+00	7.90-9.40	A-6(5)	37	13	2.6	20.1	35.0	32.4	75	68	56	-	-
SS-39	15RT	43+00	12.90-14.40	A-4(3)	30	8	5.4	21.3	43.1	20.3	81	70	59	-	-
SS-41.1	12RT	42+83	3.0-7.4	A-6(13)	36	16	3.0	21.5	45.1	30.4	98	96	86	-	-

8/23/99

15-AUG-2006 08:47
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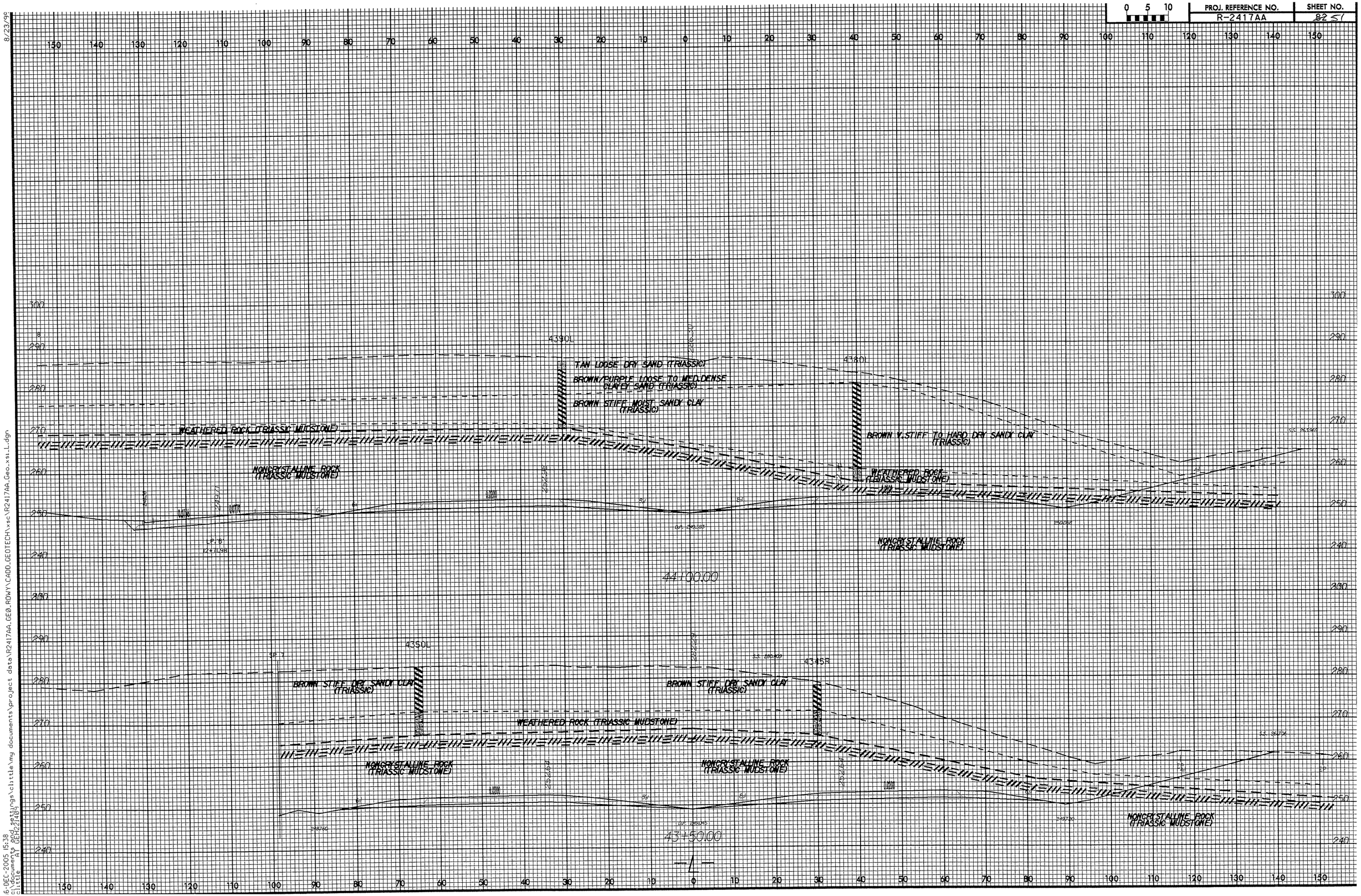
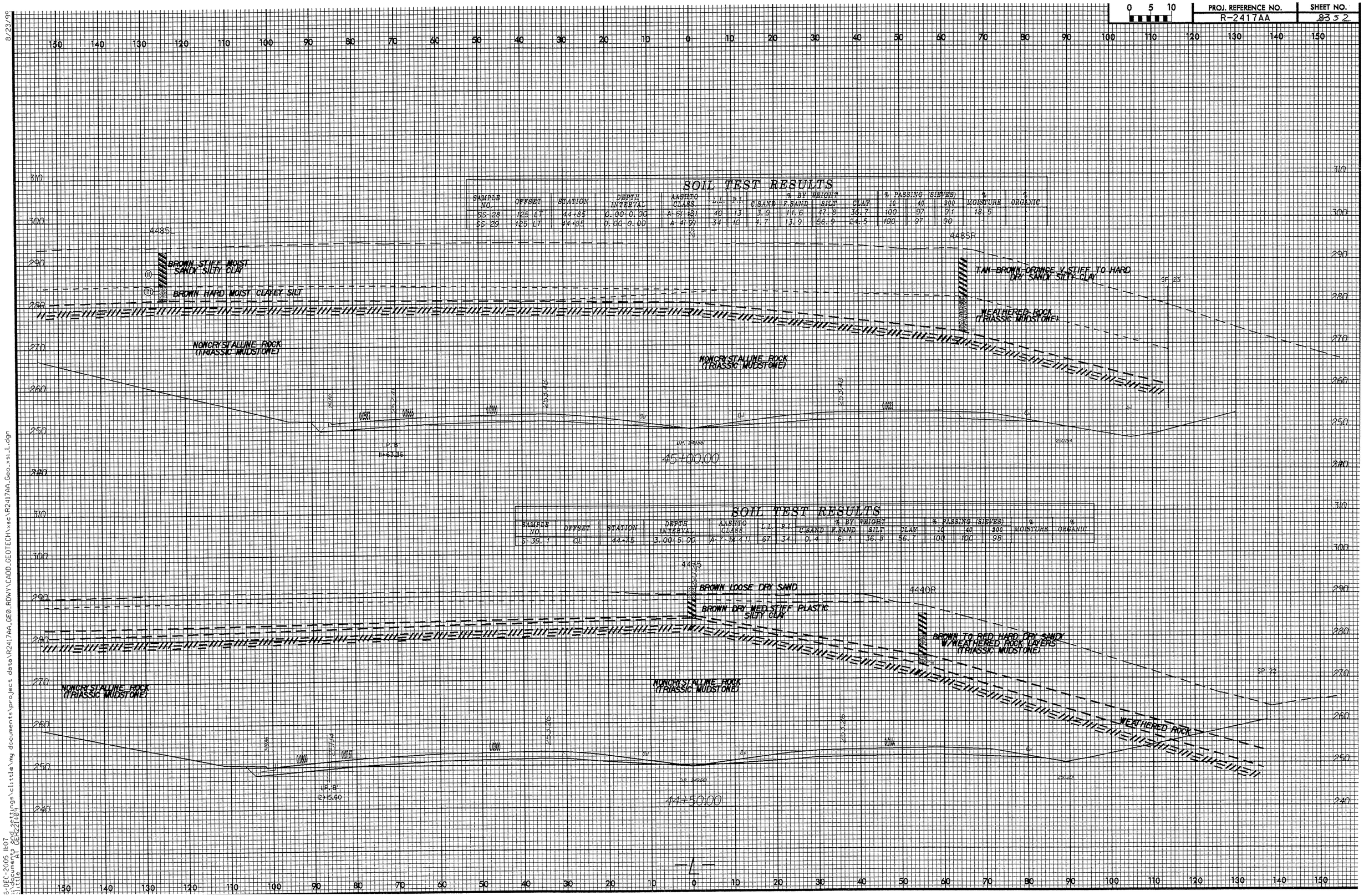


0 5 10
PROJ. REFERENCE NO.
R-2417AA
SHEET NO.
82 51
4390L
4380L
TAN LOOSE DRY SAND (TRIASSIC)
BROWN/PURPLE LOOSE TO MED.DENSE CLAYEY SAND (TRIASSIC)
BROWN STIFF MOIST SANDY CLAY (TRIASSIC)
WEATHERED ROCK (TRIASSIC MUDSTONE)
BROWN V.STIFF TO HARD DRY SANDY CLAY (TRIASSIC)
NONCRYSTALLINE ROCK (TRIASSIC MUDSTONE)
44+00.00
4350L
4345R
BROWN STIFF DRY SANDY CLAY (TRIASSIC)
43+50.00



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-28	125 LT	44+85	0.00-0.00	A-6(8)	40	13	3.9	11.6	47.8	36.7	100	97	91	18.5	
SS-29	125 LT	44+85	0.00-0.00	A-4(9)	34	10	4.7	13.9	56.9	24.5	100	97	90		

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-39.1	CL	44+45	3.00-5.00	A-7-5(41)	67	34	0.4	6.1	36.8	56.7	100	100	98		

8/23/99
6-DEC-2005 11:07
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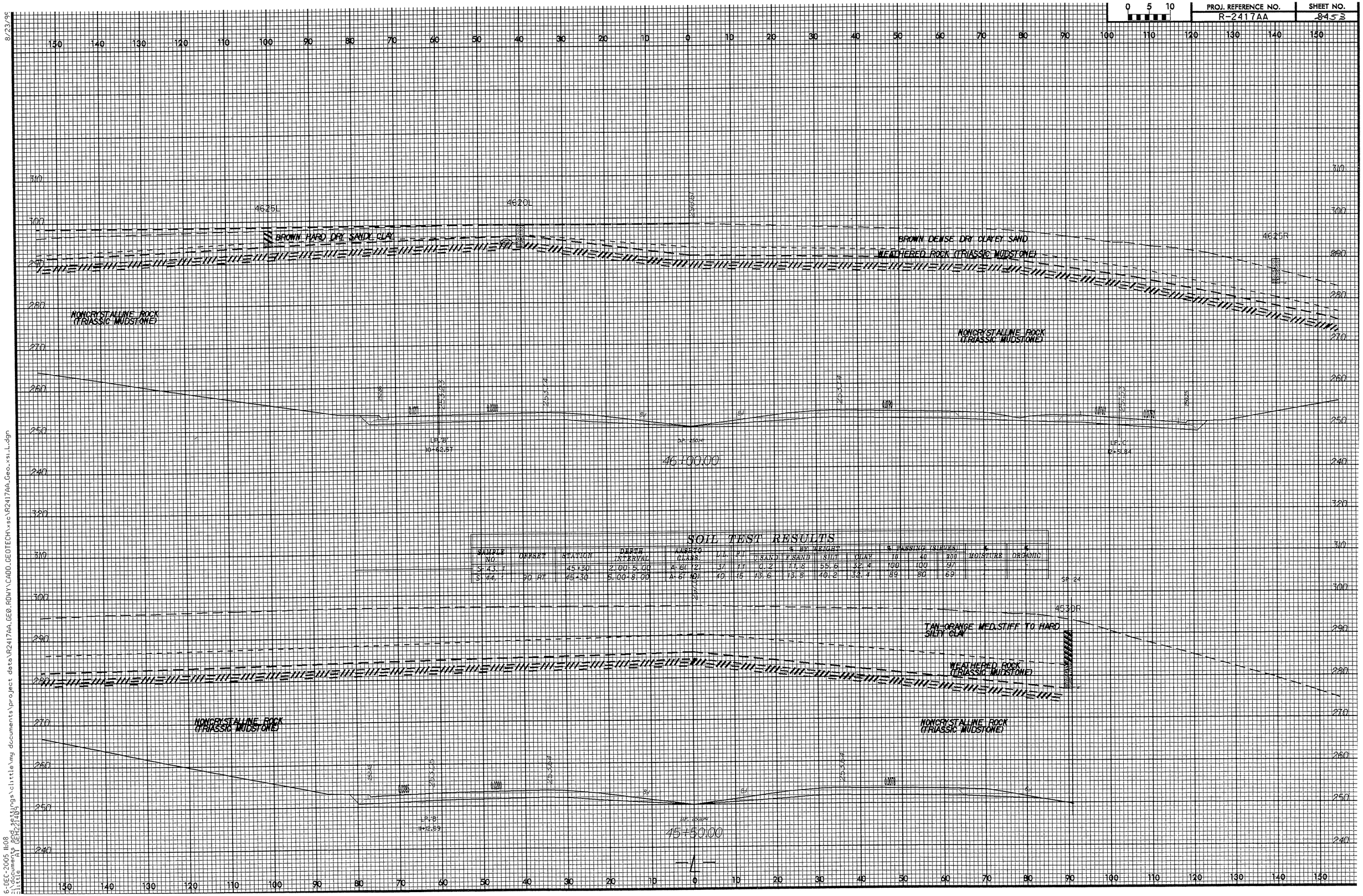

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% BY WEIGHT CSAND	FSAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-43.1		45+30	2.00-5.00	A-6(12)	37	11	0.2	11.8	55.6	32.4	100	100	97		
S-44.1	90 RT	45+30	5.00-8.00	A-6(10)	40	15	13.6	13.8	40.2	32.4	89	80	69		

8/23/99
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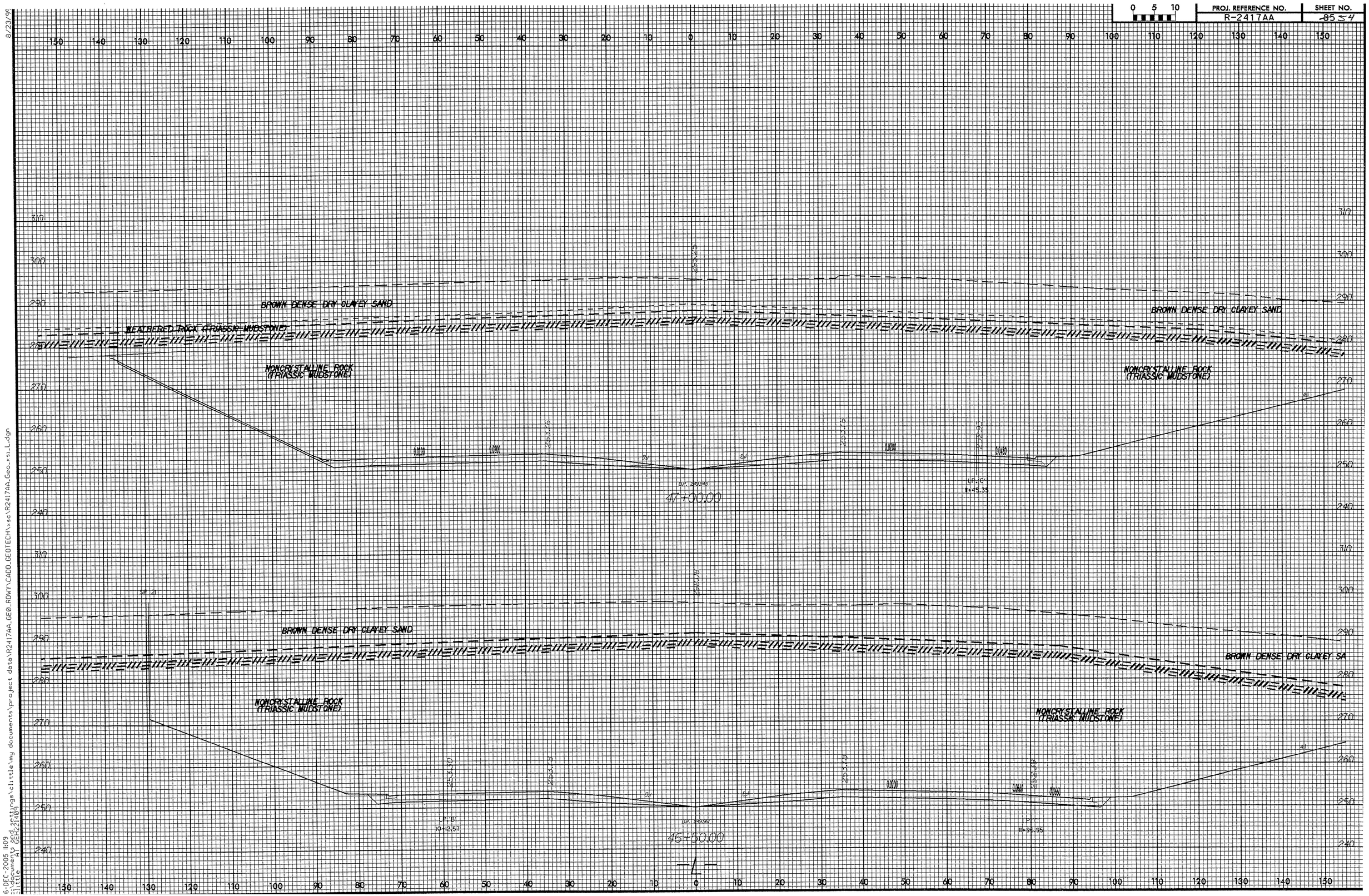
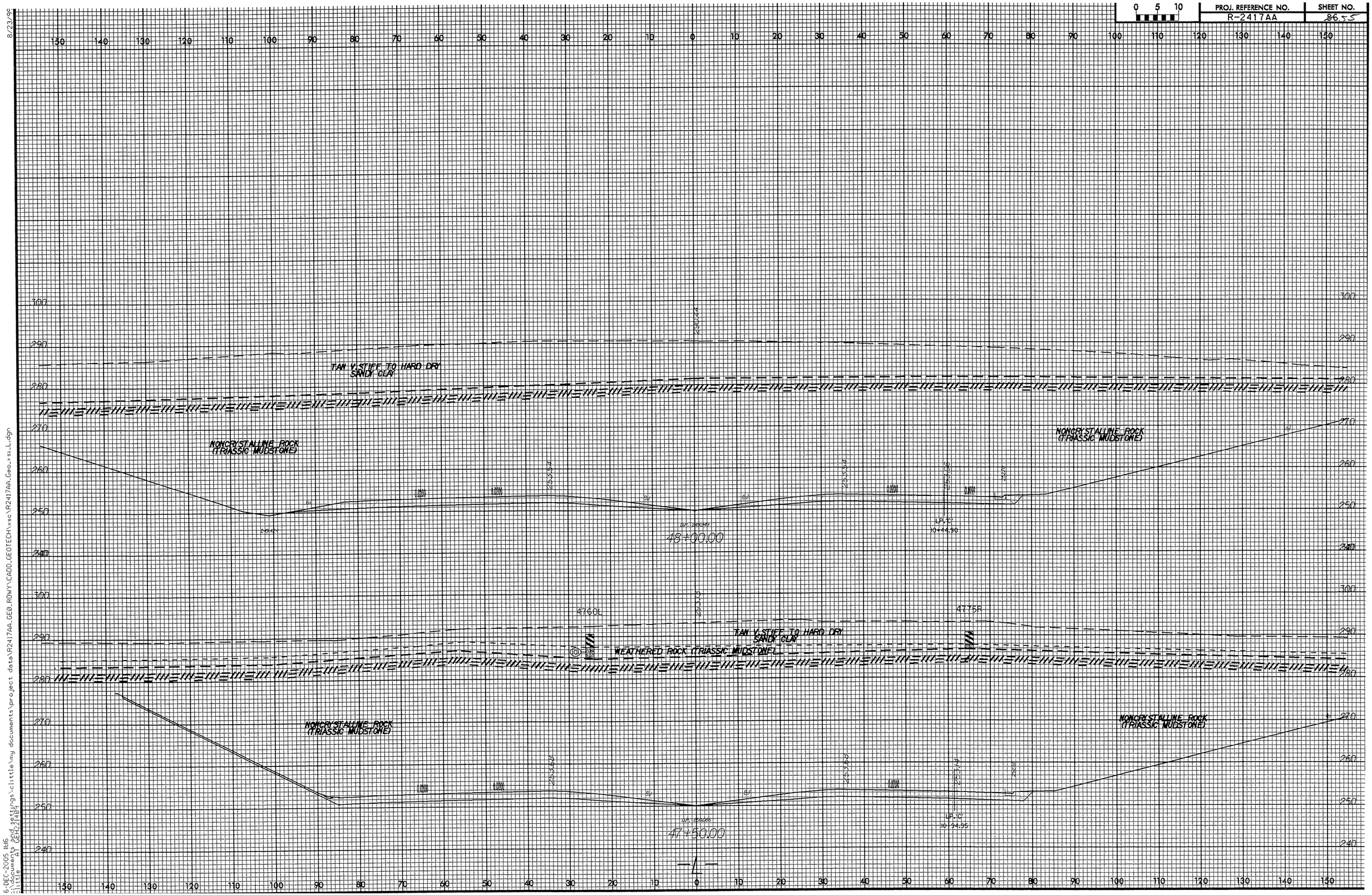


PROJ. REFERENCE NO.
R-2417AA
SHEET NO.
85 54
BROWN DENSE DRY CLAYEY SAND
WEATHERED ROCK (TRIASSIC MUDSTONE)
NONCRYSTALLINE ROCK (TRIASSIC MUDSTONE)
47+00.00
BROWN DENSE DRY CLAYEY SAND
BROWN DENSE DRY CLAYEY SA
NONCRYSTALLINE ROCK (TRIASSIC MUDSTONE)
46+50.00



8/23/99

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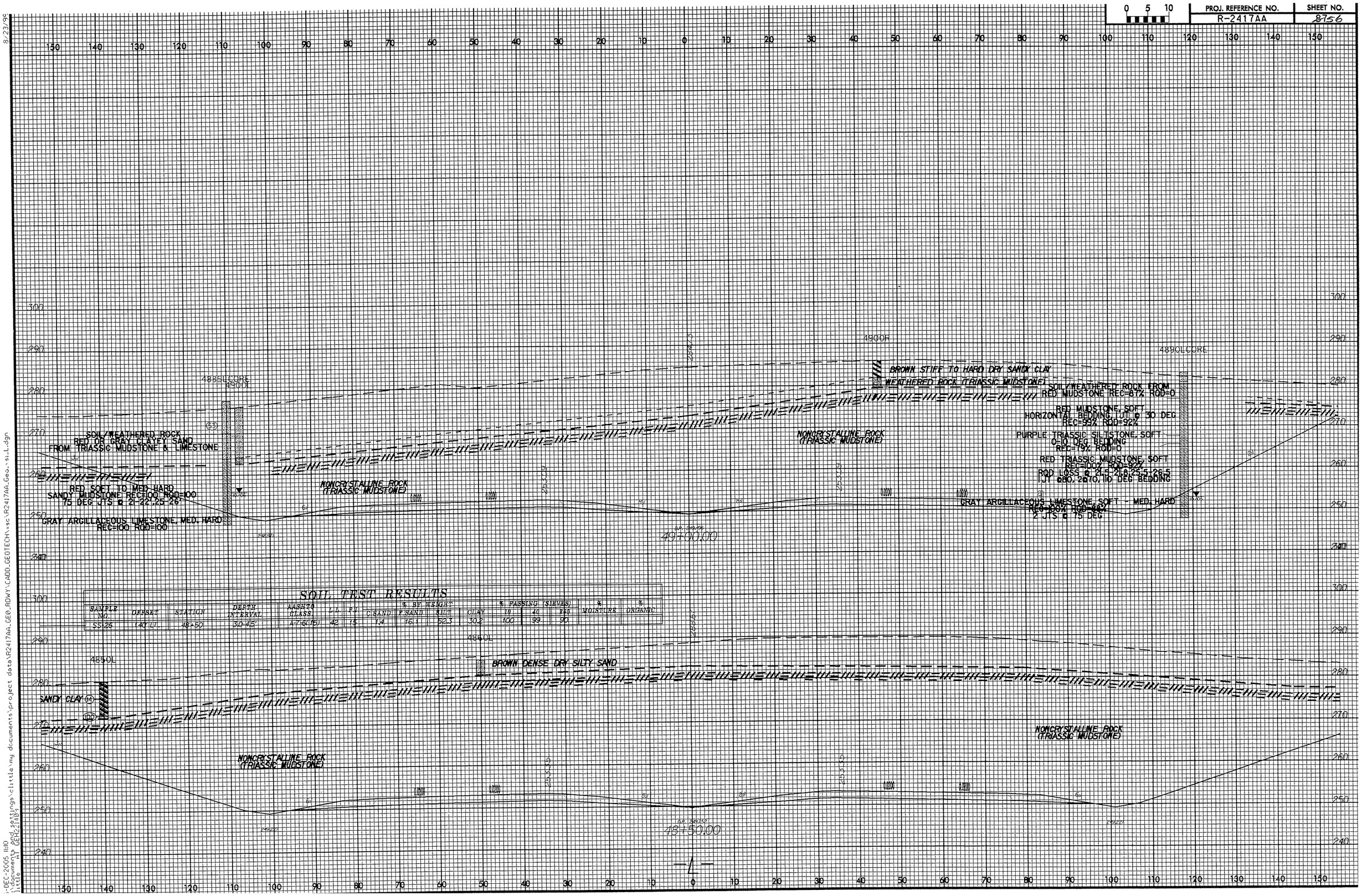
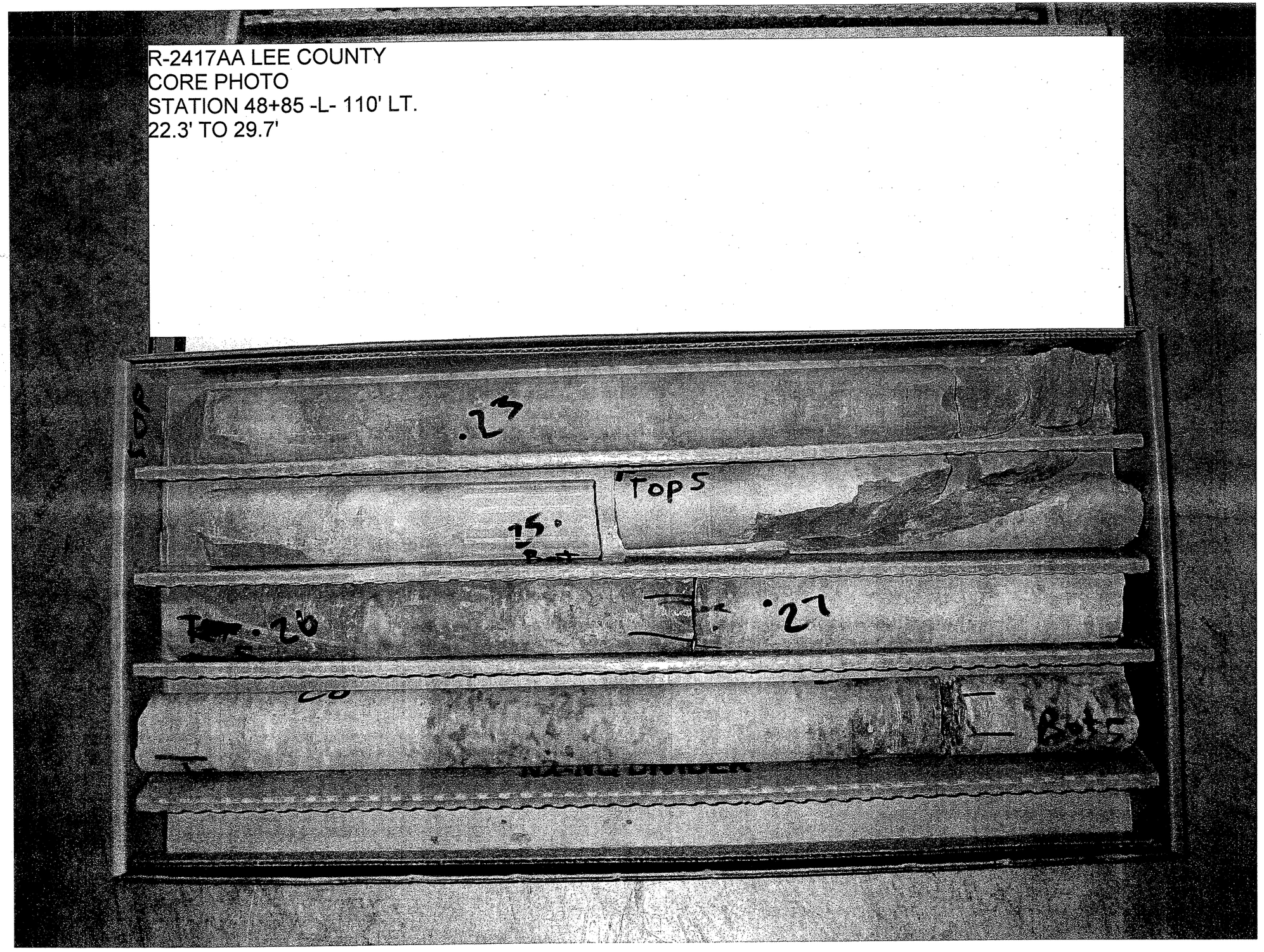


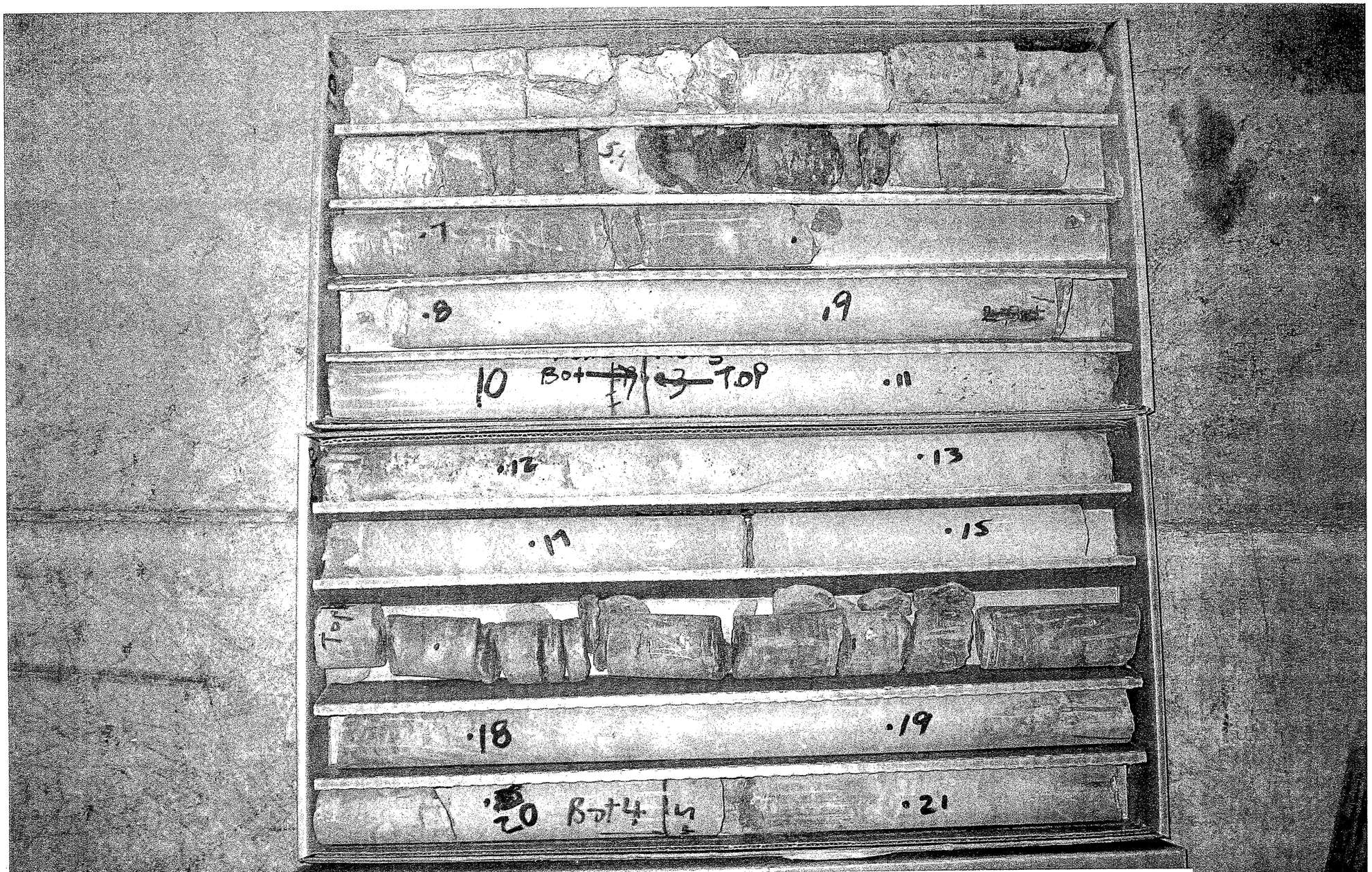
SOIL TEST RESULTS

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-26	140' LT.	48+50	3.0-4.5'	A-7-6(15)	42	15	1.4	16.1	52.3	30.2	100	99	90		

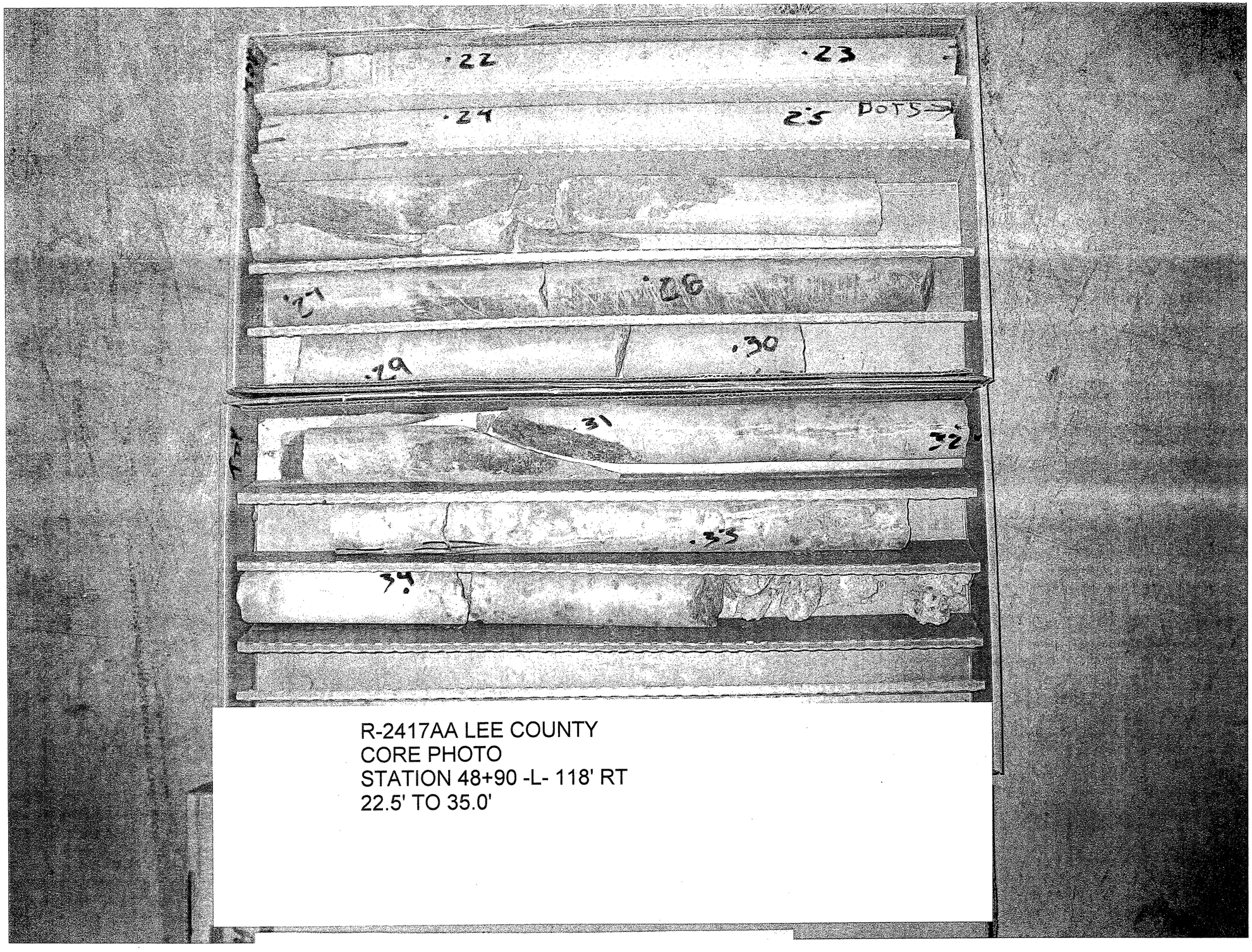
R-2417AA LEE COUNTY
CORE PHOTO
STATION 48+85 -L- 110' LT
6.6' TO 22.3'

R-2417AA LEE COUNTY
CORE PHOTO
STATION 48+85 -L- 110' LT.
22.3' TO 29.7'



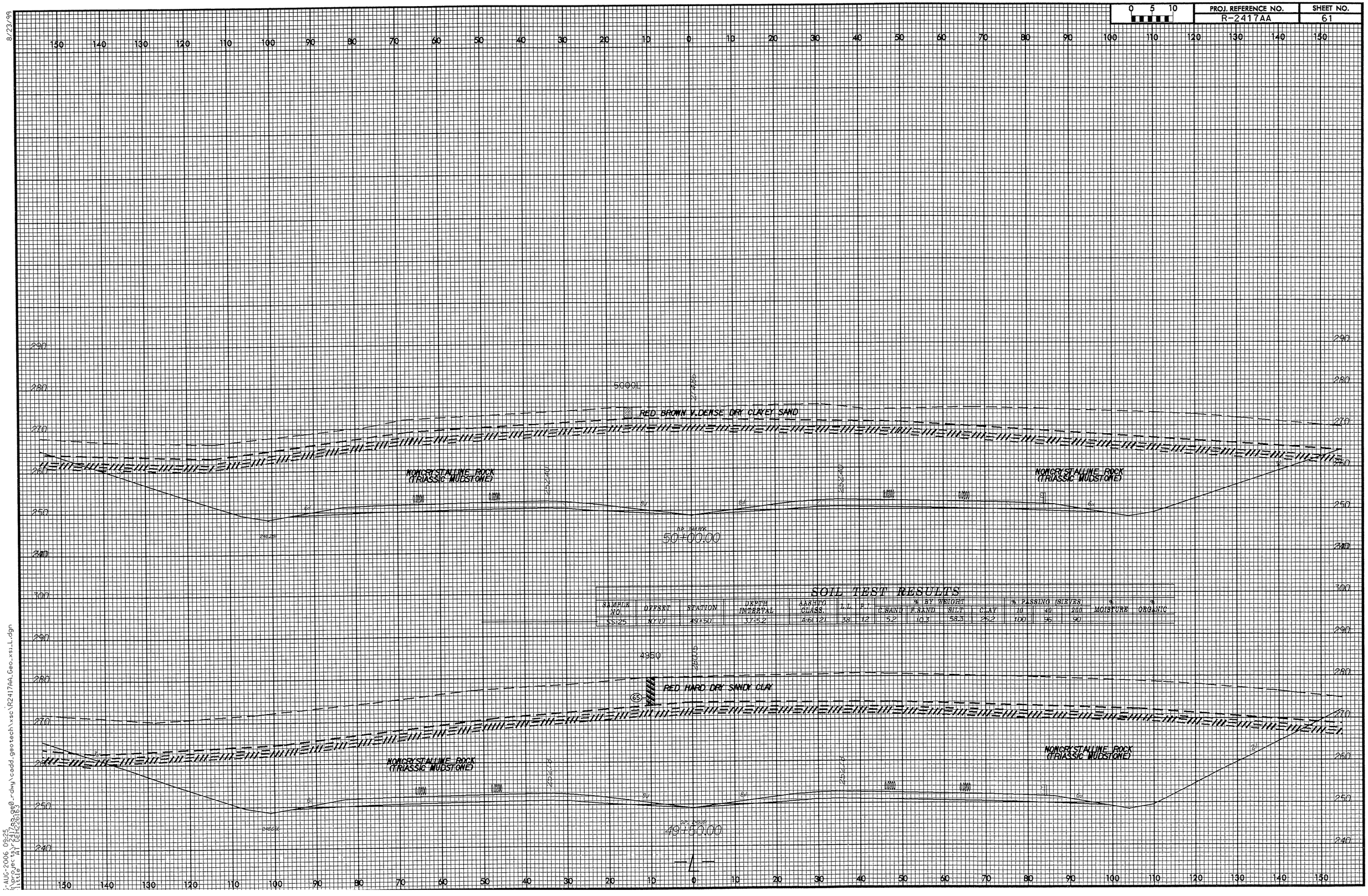


R-2417AA LEE COUNTY
CORE PHOTO
STATION 48+90 -L- 118' RT
2.4' TO 21.5'



R-2417AA LEE COUNTY
CORE PHOTO
STATION 48+90 -L- 118' RT
22.5' TO 35.0'

PROJ. REFERENCE NO.	SHEET NO.
R-2417AA	61

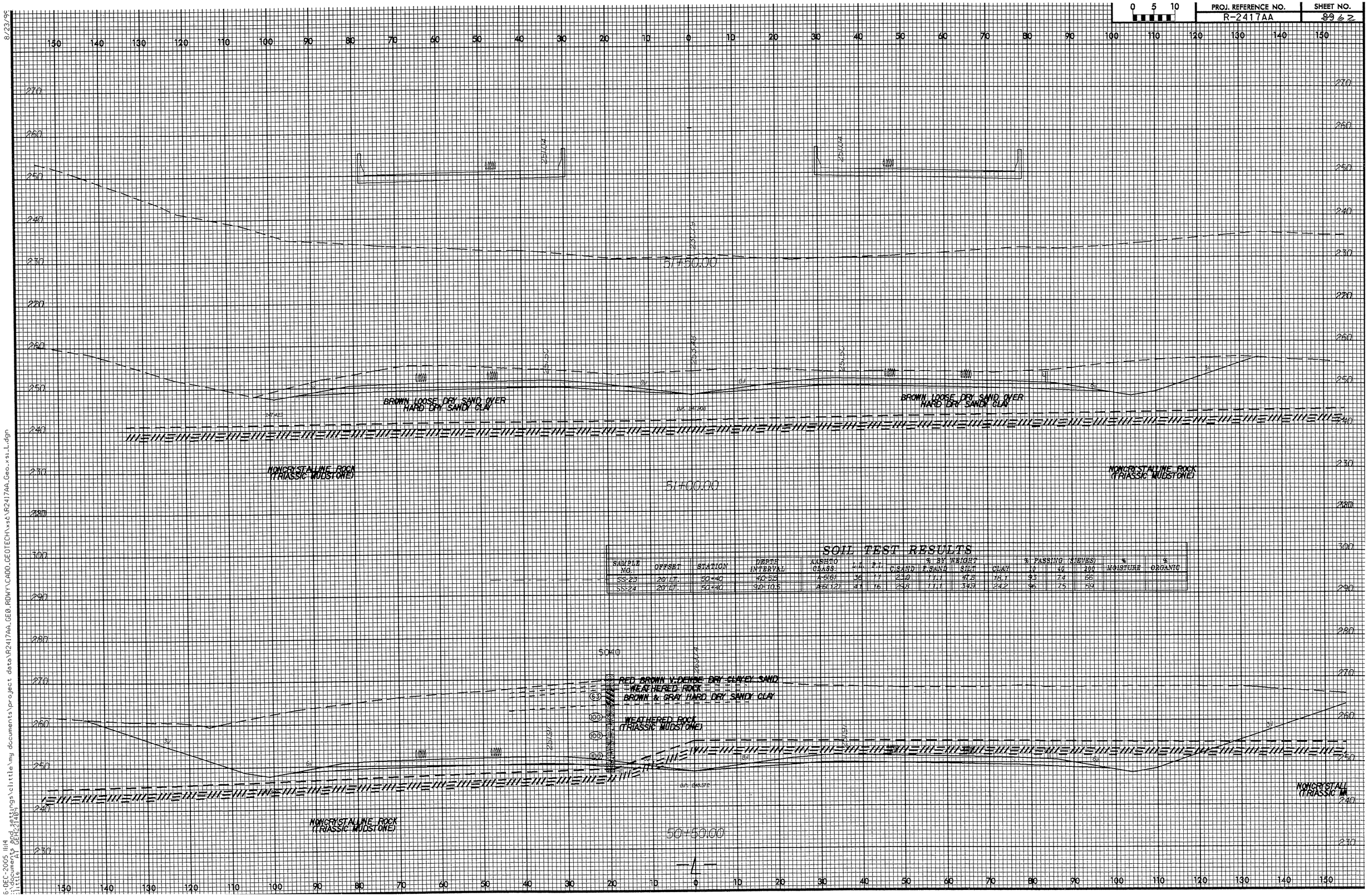


SOIL TEST RESULTS

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-25	10'LT	49+50	3.7-5.2	A-6(12)	38	12	5.2	10.3	58.3	26.2	100	96	90		

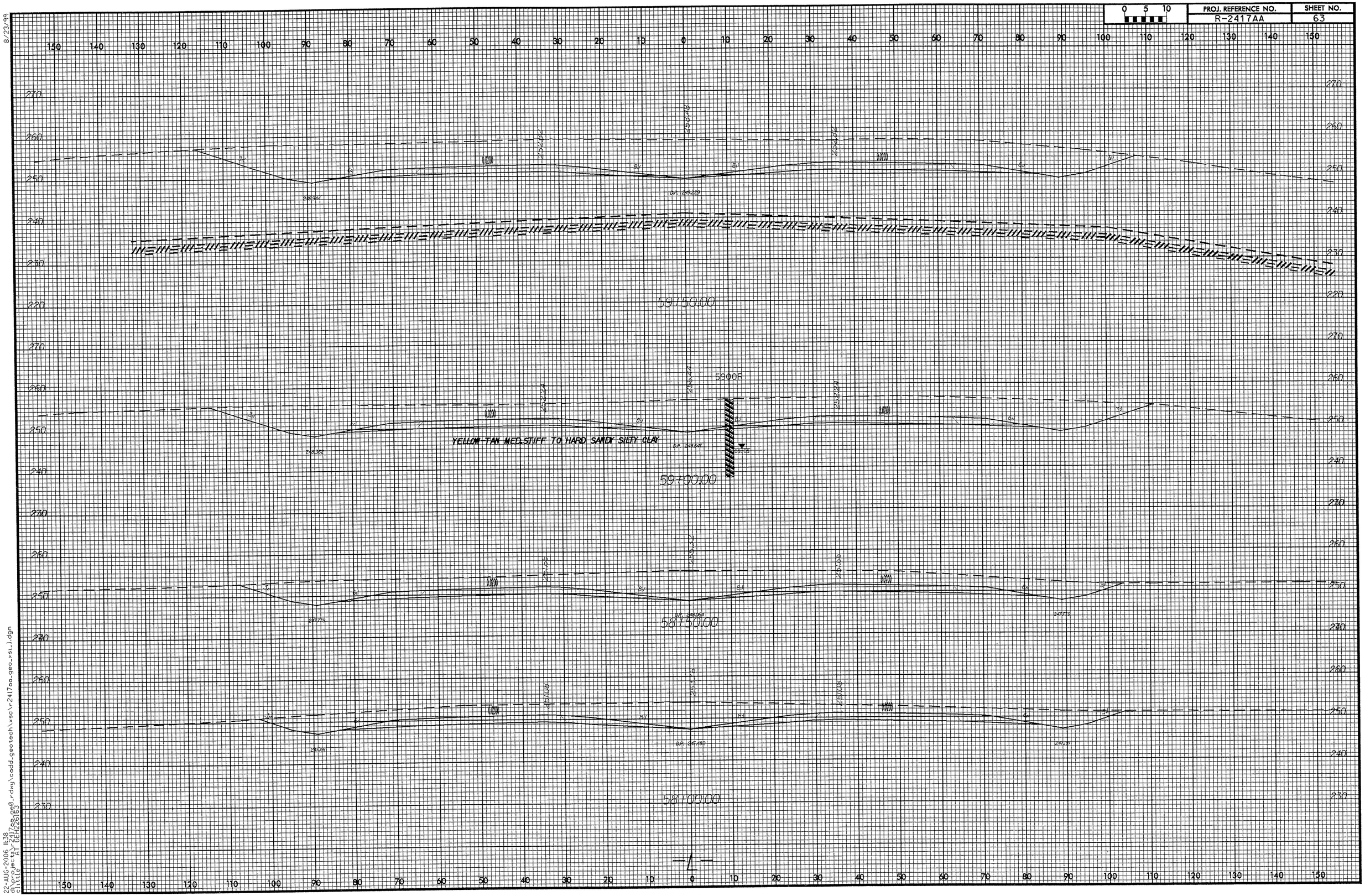
PROJ. REFERENCE NO.	SHEET NO.
R-2417AA	89 62

0 5 10



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-23	20'LT.	50+40	40-55	A-6(6)	38	17	23.0	17.1	41.8	18.1	95	84	66		
SS-24	20'LT.	50+40	90-105	A-6(12)	41	16	29.5	17.1	34.9	24.2	96	75	59		



8/23/99

22-AUG-2006 11:38
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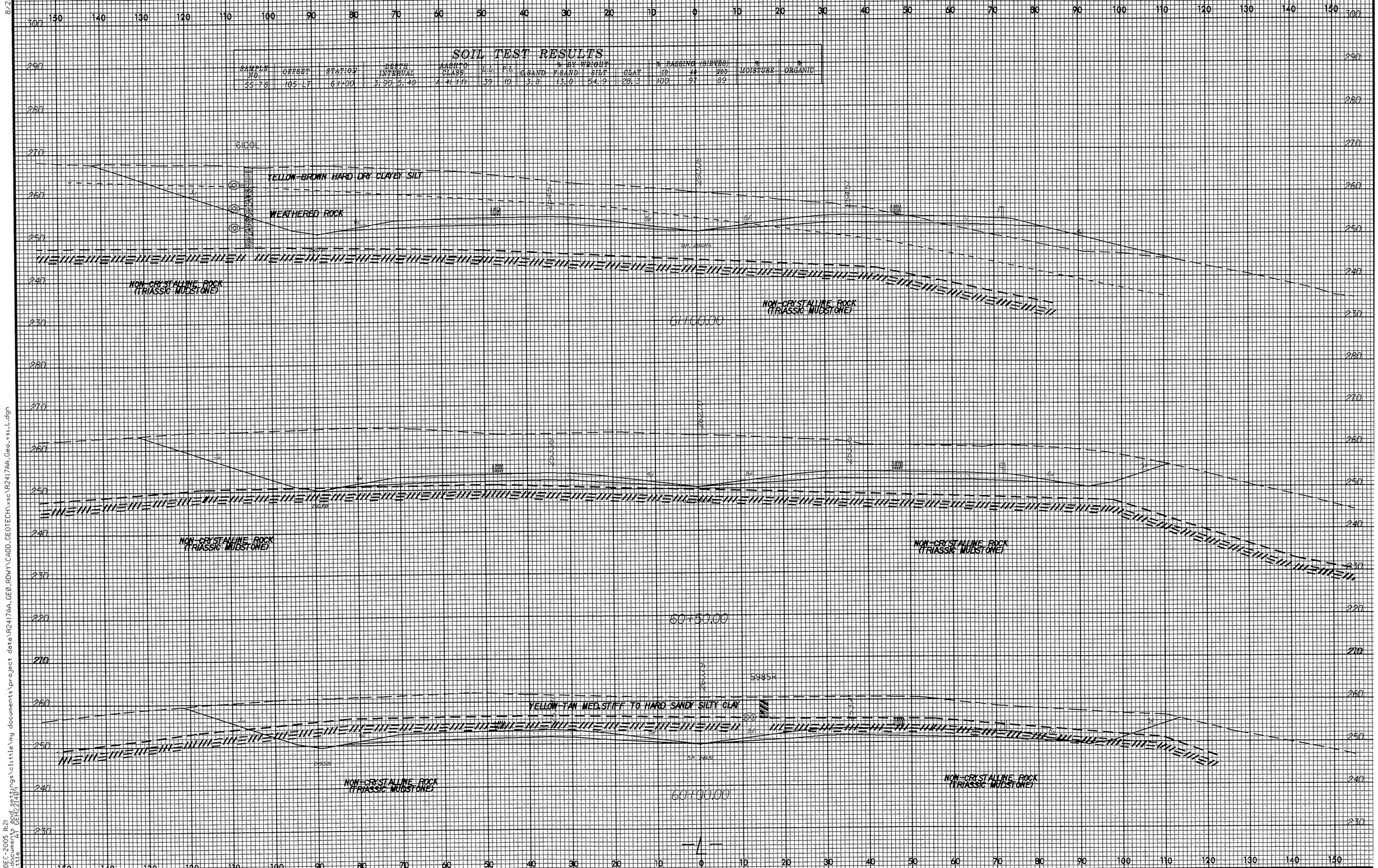
PROJ. REFERENCE NO.	SHEET NO.
R-2417AA	9464

0 5 10

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT G.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS 78	105 LT	61+00	3.90-5.40	A-4(11)	39	10	3.8	13.0	54.9	28.3	100	97	89		



8/23/99

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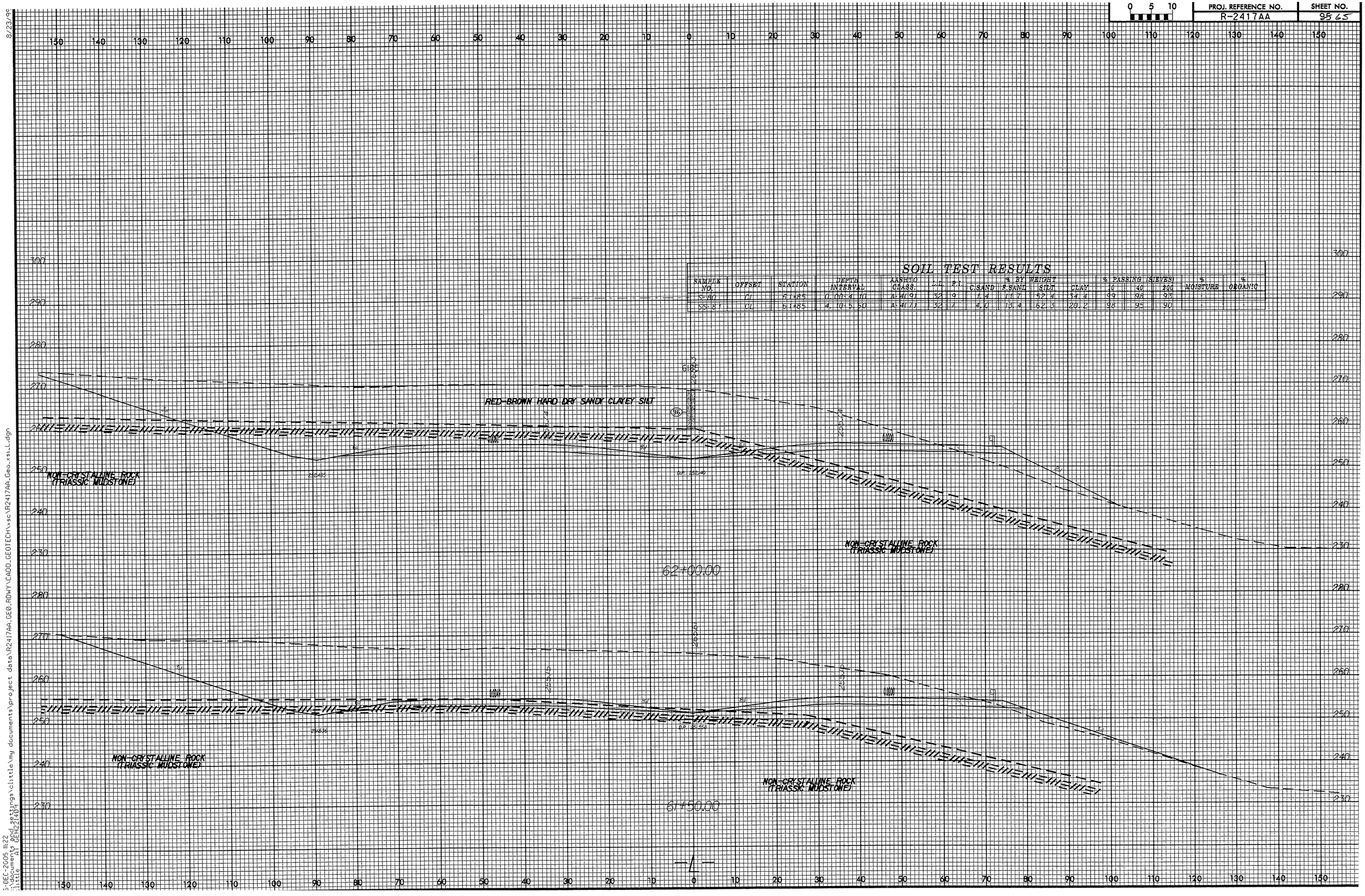
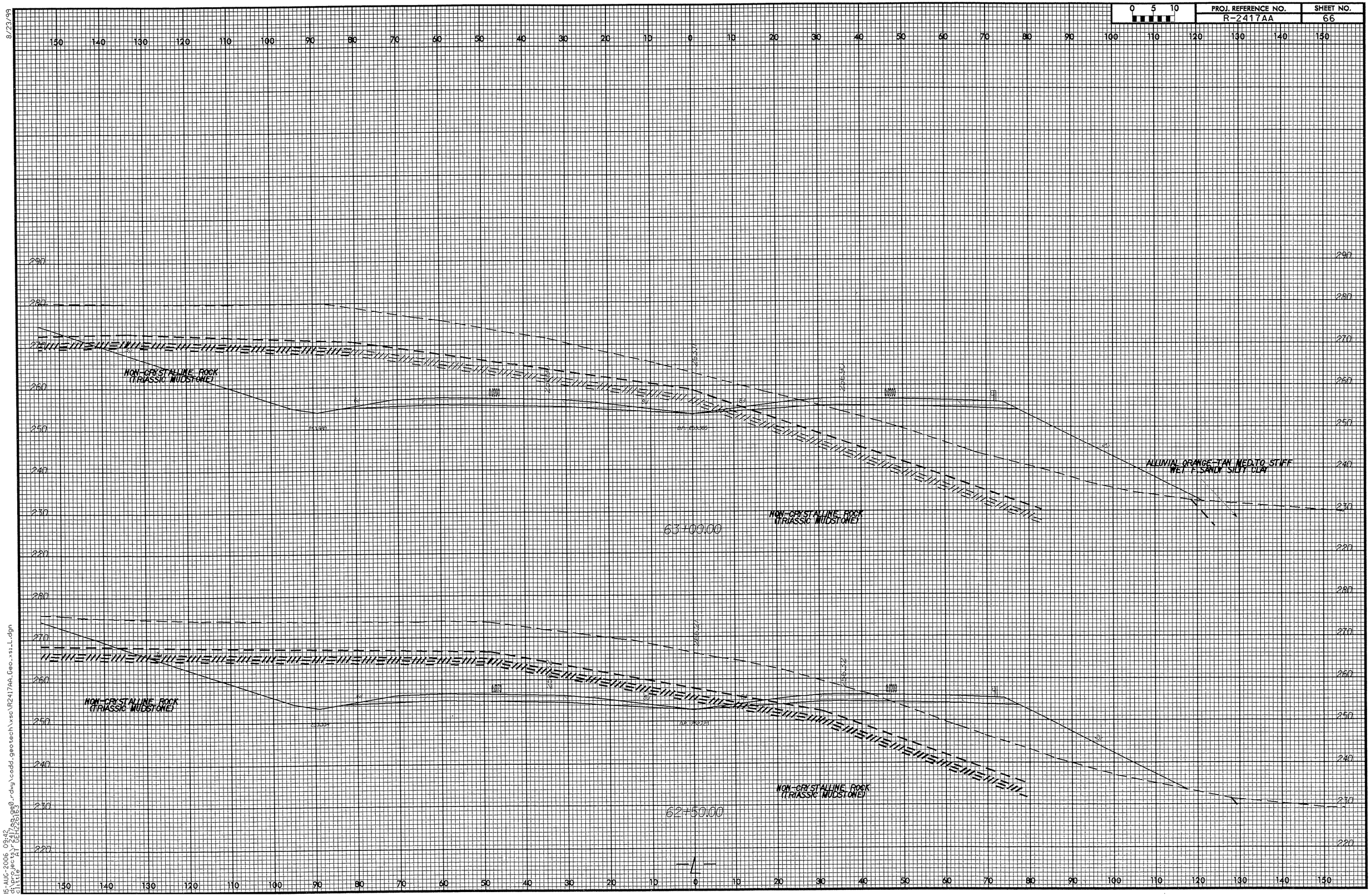
PROJ. REFERENCE NO.	SHEET NO.
R-2417AA	9565



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-80	CL	61+85	0.00-4.10	A-4(9)	32	9	1.4	11.7	52.4	34.4	99	98	93	-	-
SS-81	CL	61+85	4.10-5.60	A-4(7)	32	7	4.0	13.4	62.3	20.2	98	95	90	-	-



8/23/99

15-AUG-2006 09:42
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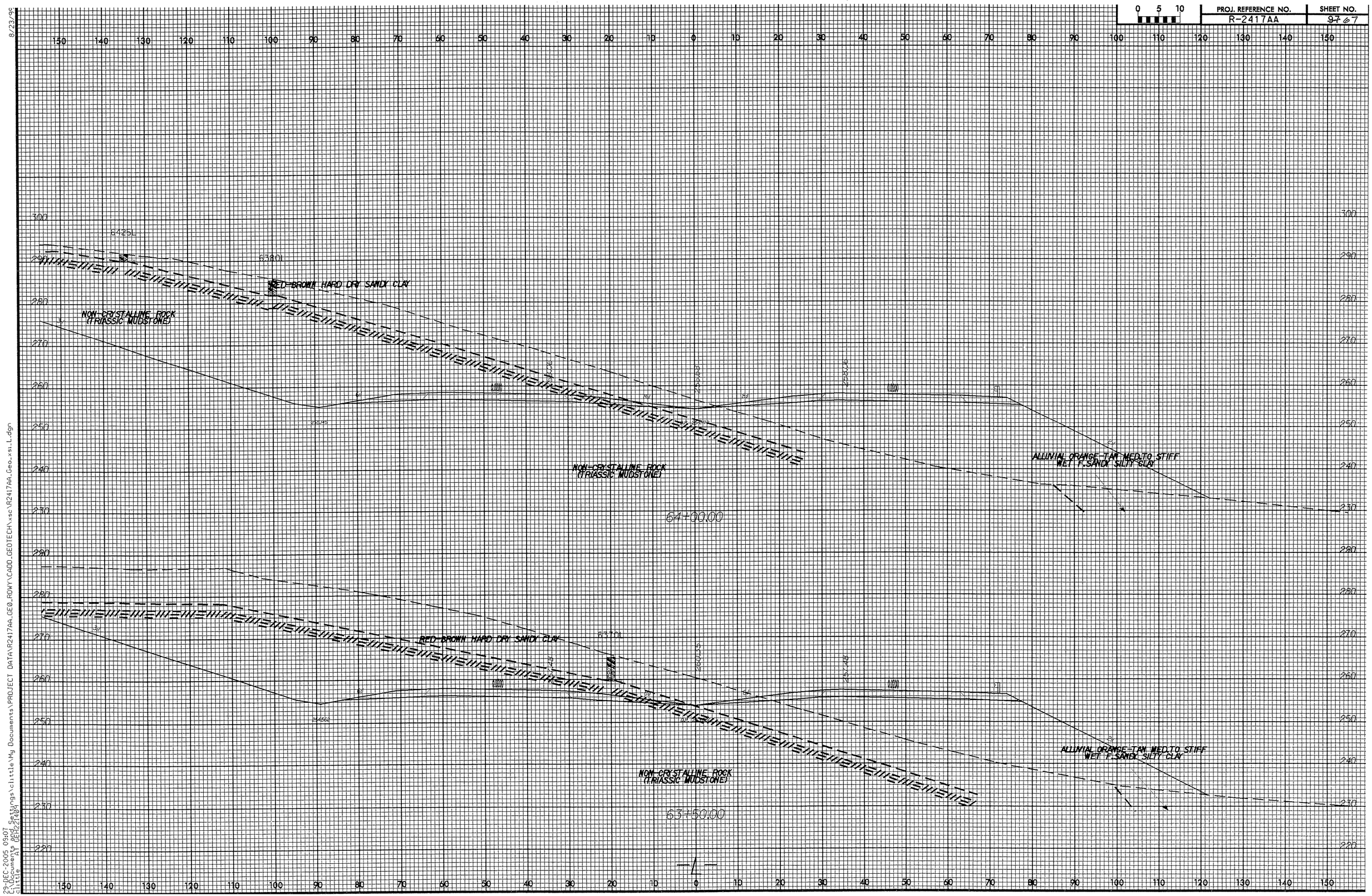
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2417AA	9 of 7



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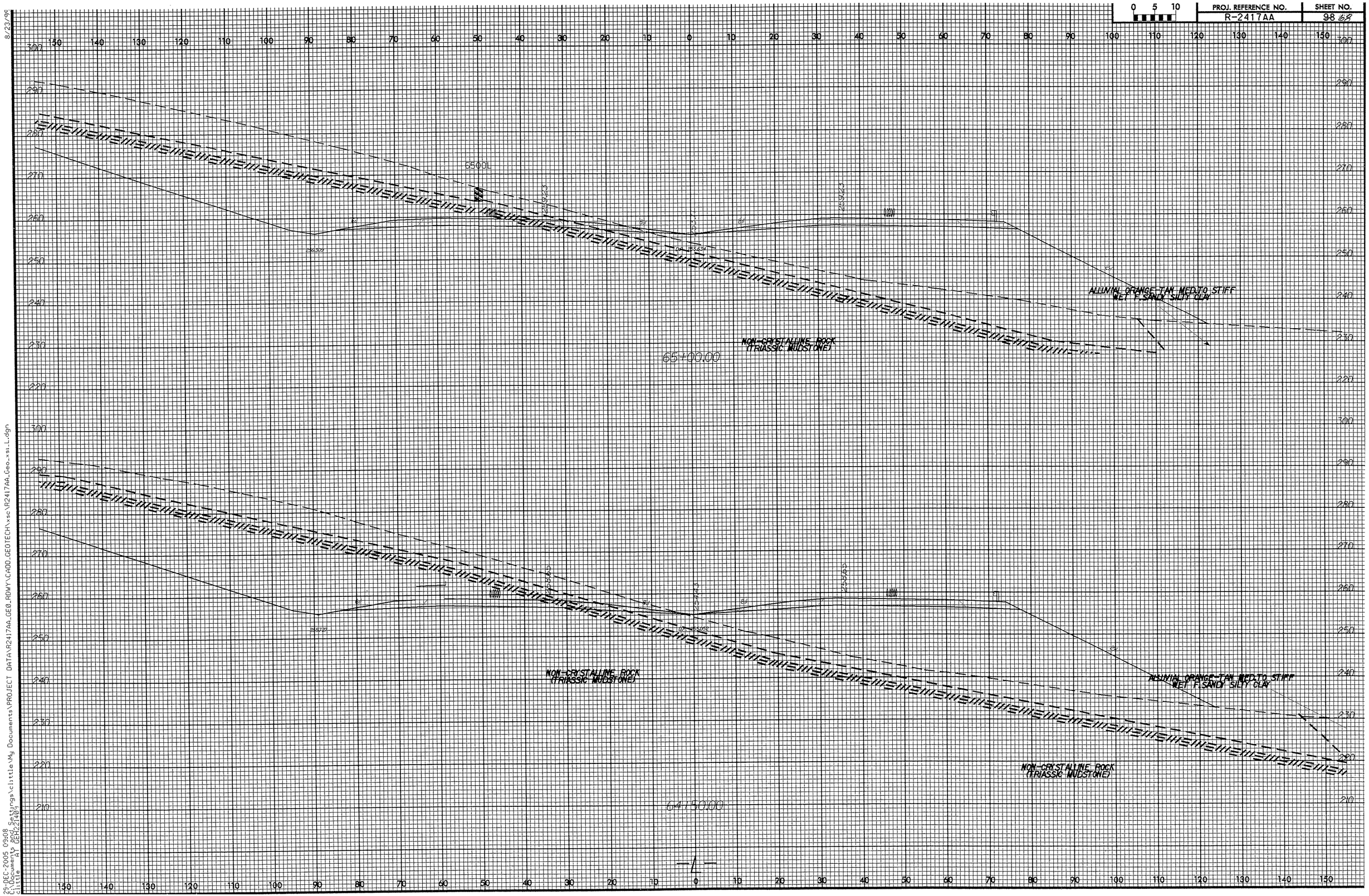

8/23/99

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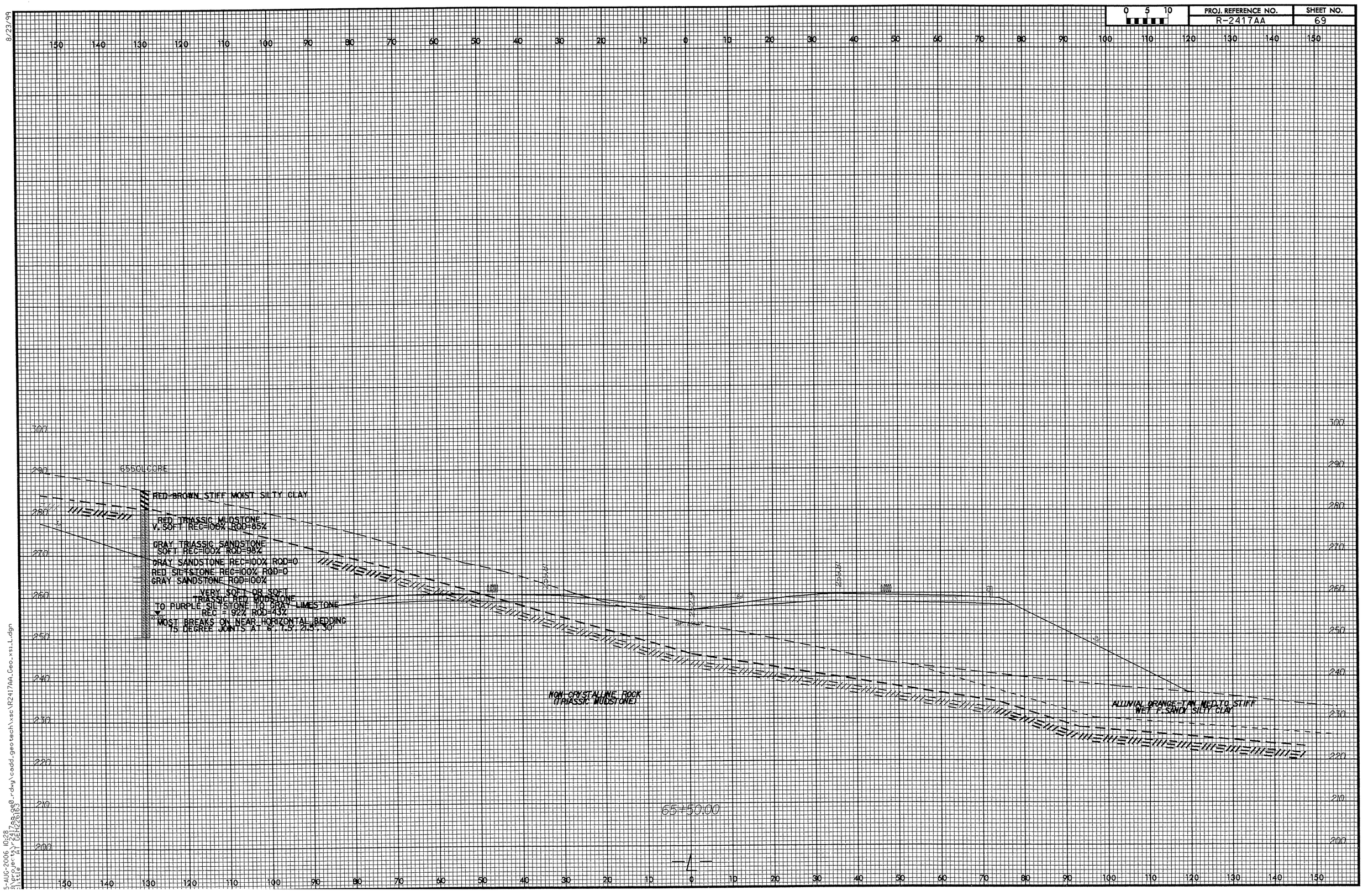
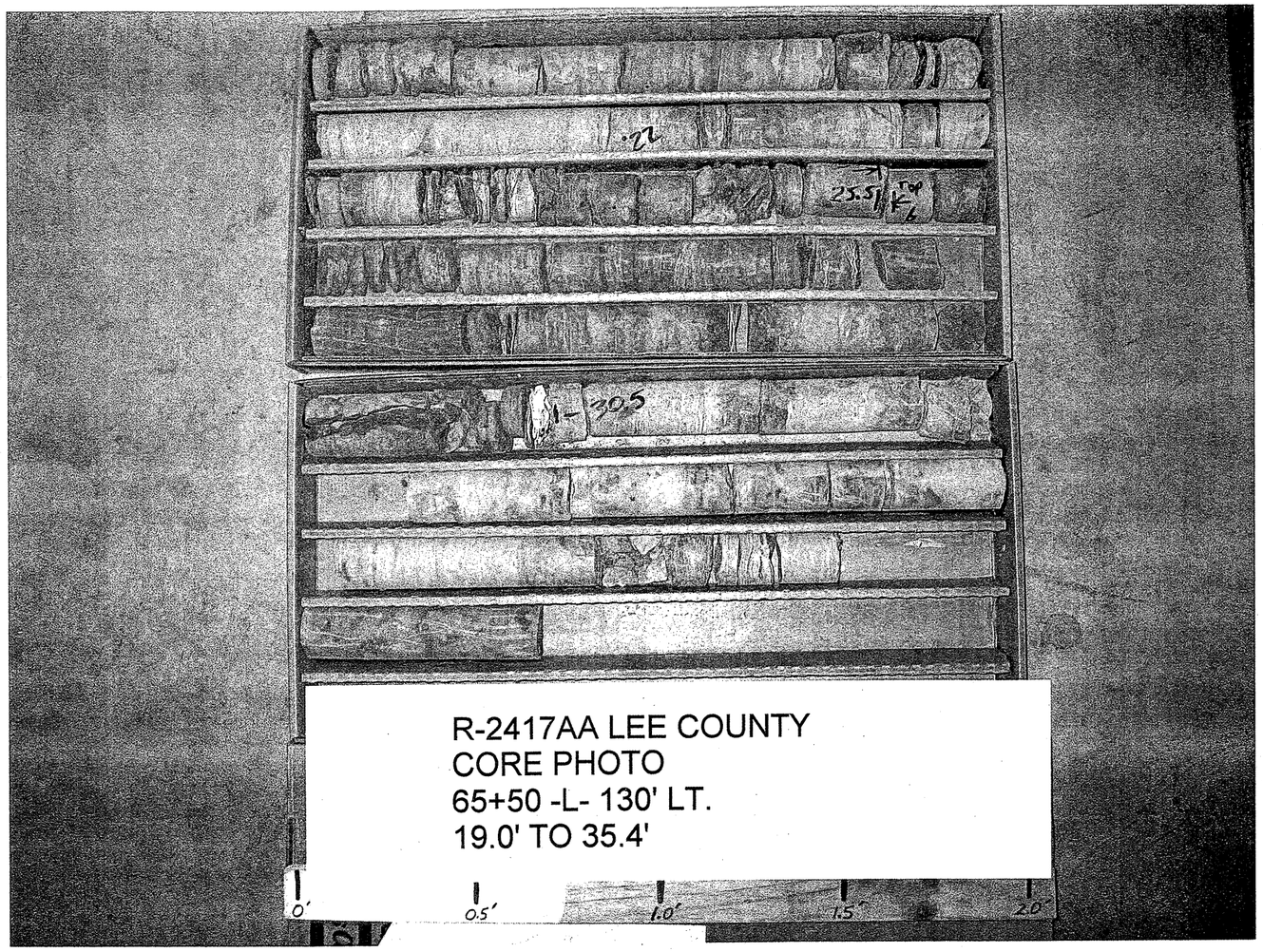


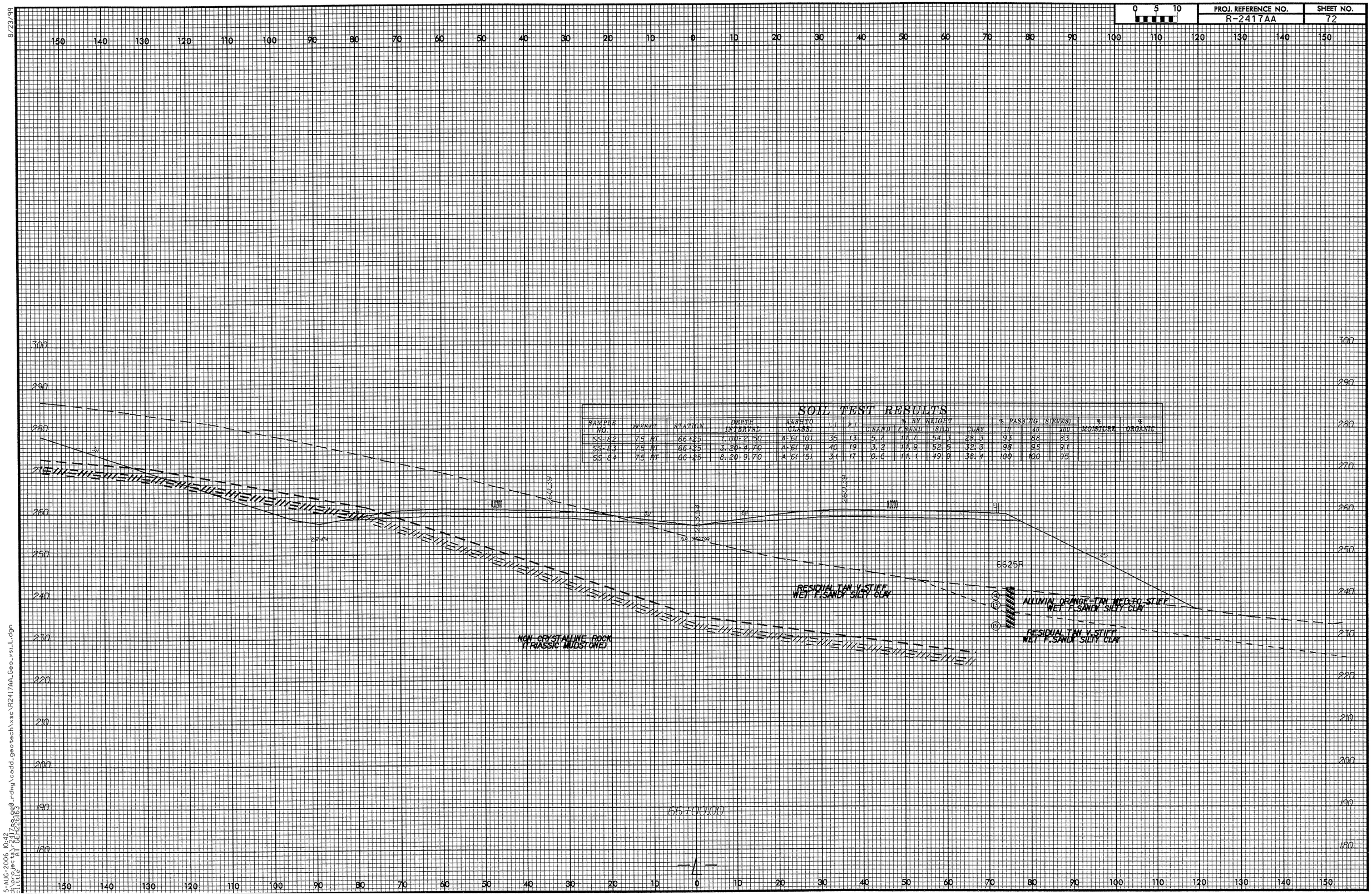
0 5 10
PROJ. REFERENCE NO.
R-2417AA
SHEET NO.
69
8/23/99
6550LCORE
RED-BROWN STIFF MOIST SILTY CLAY
RED TRIASSIC MUDSTONE
V. SOFT REC=100% RQD=85%
GRAY TRIASSIC SANDSTONE
SOFT REC=100% RQD=98%
GRAY SANDSTONE REC=100% RQD=0
RED SILTSTONE REC=100% RQD=0
GRAY SANDSTONE RQD=100%
VERY SOFT OR SOFT
TRIASSIC RED MUDSTONE
TO PURPLE SILTSTONE TO GRAY LIMESTONE
REC = 92% RQD=43%
MOST BREAKS ON NEAR HORIZONTAL BEDDING
75 DEGREE JOINTS AT 6', 7.5', 21.5', 30'
NON-CRYSTALLINE ROCK
(TRIASSIC MUDSTONE)
ALLUVIAL ORANGE-TAN MED.TO STIFF
WET F.SANDY SILTY CLAY
65+50.00

R-2417AA LEE COUNTY
CORE PHOTO
65+50 -L- 130' LT
1.7' TO 19.0'



R-2417AA LEE COUNTY
CORE PHOTO
65+50 -L- 130' LT.
19.0' TO 35.4'

PROJ. REFERENCE NO.	SHEET NO.
R-2417AA	72



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-82	75 RT	66+25	1.00-2.50	A-6(10)	35	13	5.7	11.7	54.3	28.3	93	88	83		
SS-83	75 RT	66+25	3.20-4.70	A-6(8)	40	19	3.2	11.9	52.5	32.3	98	95	91		
SS-84	75 RT	66+25	8.20-9.70	A-6(5)	31	17	0.6	11.1	49.9	38.4	100	100	95		

8/23/99

5-AUG-2006 10:42
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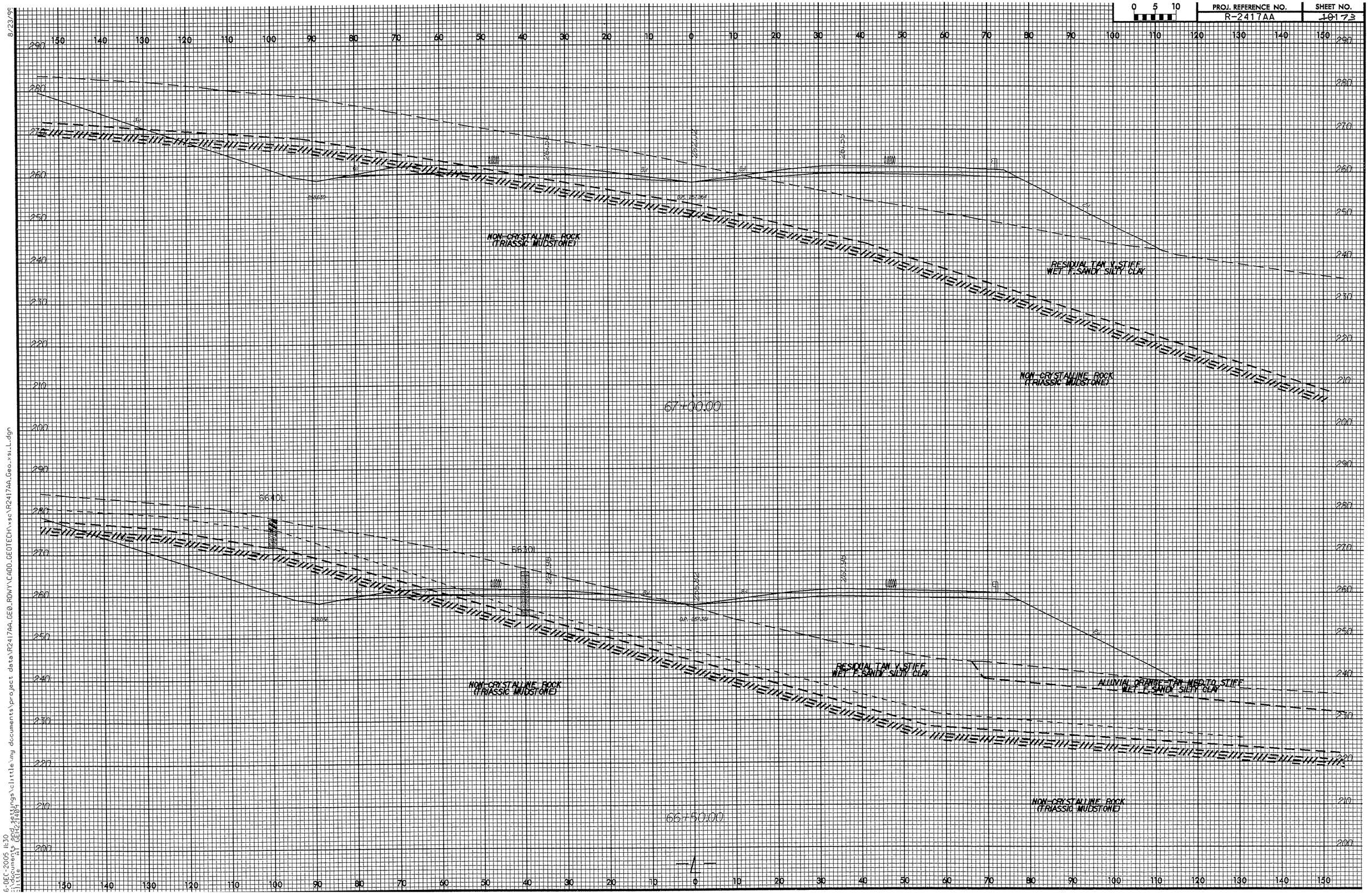
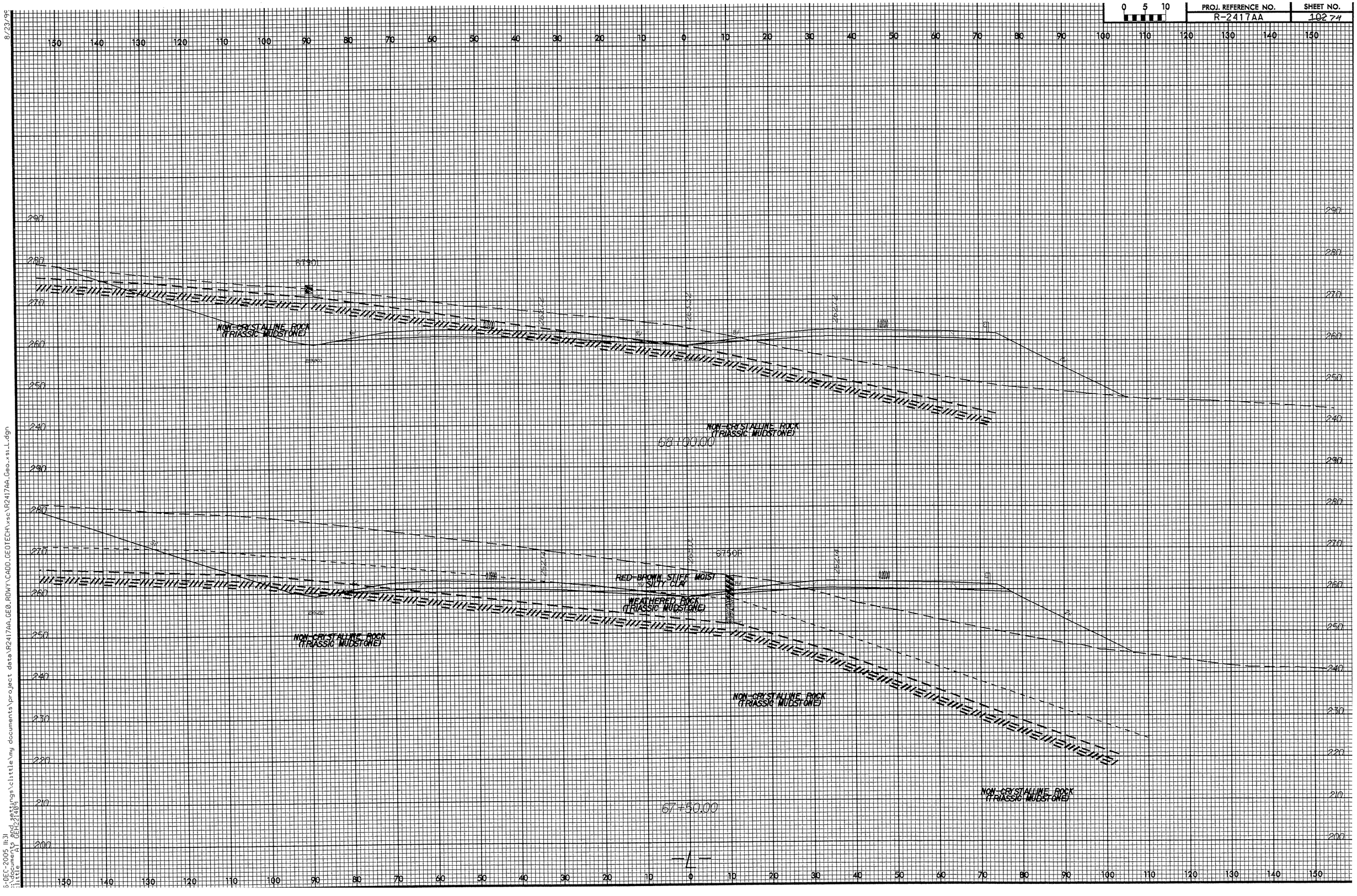
Cliffie AT GEH226163



PROJ. REFERENCE NO.
R-2417AA
SHEET NO.
10173
NON-CRYSTALLINE ROCK
(TRIASSIC MUDSTONE)
RESIDUAL TAN V. STIFF
WET F. SANDY SILTY CLAY
NON-CRYSTALLINE ROCK
(TRIASSIC MUDSTONE)
67+00.00
66+40L
66+30L
RESIDUAL TAN V. STIFF
WET F. SANDY SILTY CLAY
ALLUVIAL ORANGE-TAN MED. TO STIFF
WET F. SANDY SILTY CLAY
NON-CRYSTALLINE ROCK
(TRIASSIC MUDSTONE)
66+50.00



8/23/99

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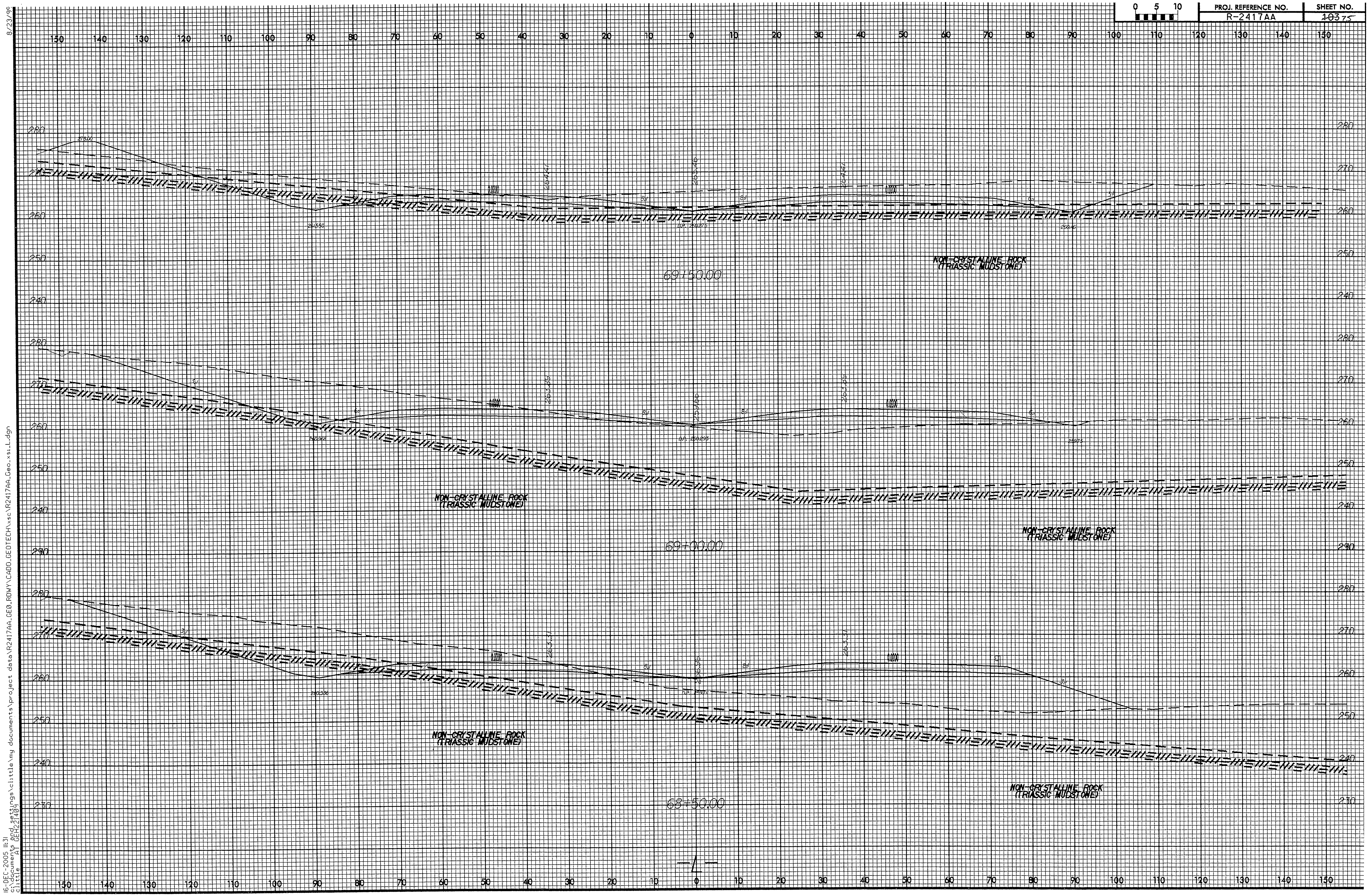
clittle AT GEH221409

PROJ. REFERENCE NO.	SHEET NO.
R-2417AA	~~103~~ 75



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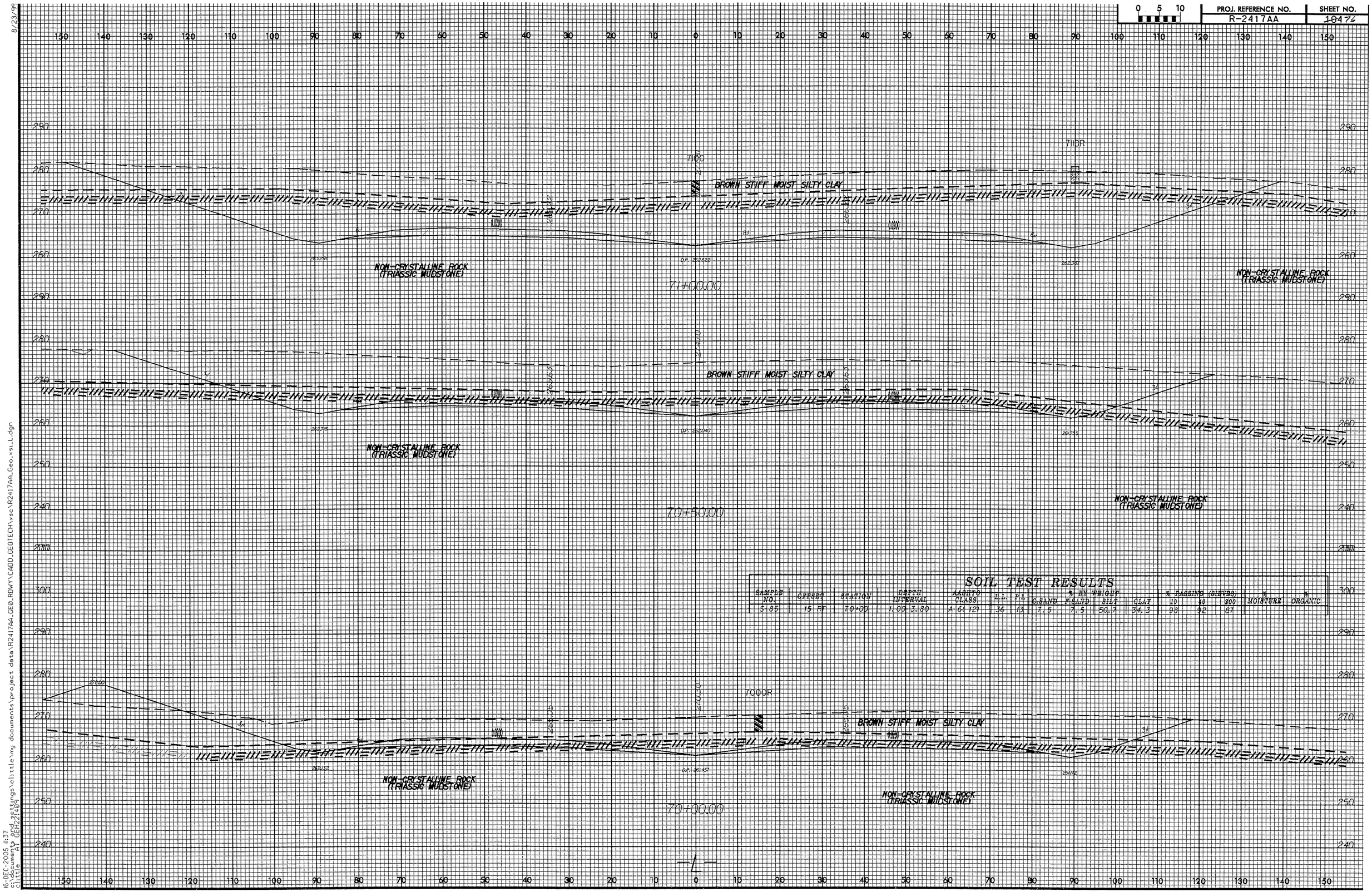
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2417AA	1047L



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVE) #10	#40	#200	% MOISTURE	% ORGANIC
S-85	15 RT	70+00	1.00 3.80	A-6(12)	36	13	7.5	7.5	50.7	34.3	98	92	87		

8/23/99
16-DEC-2005 11:37
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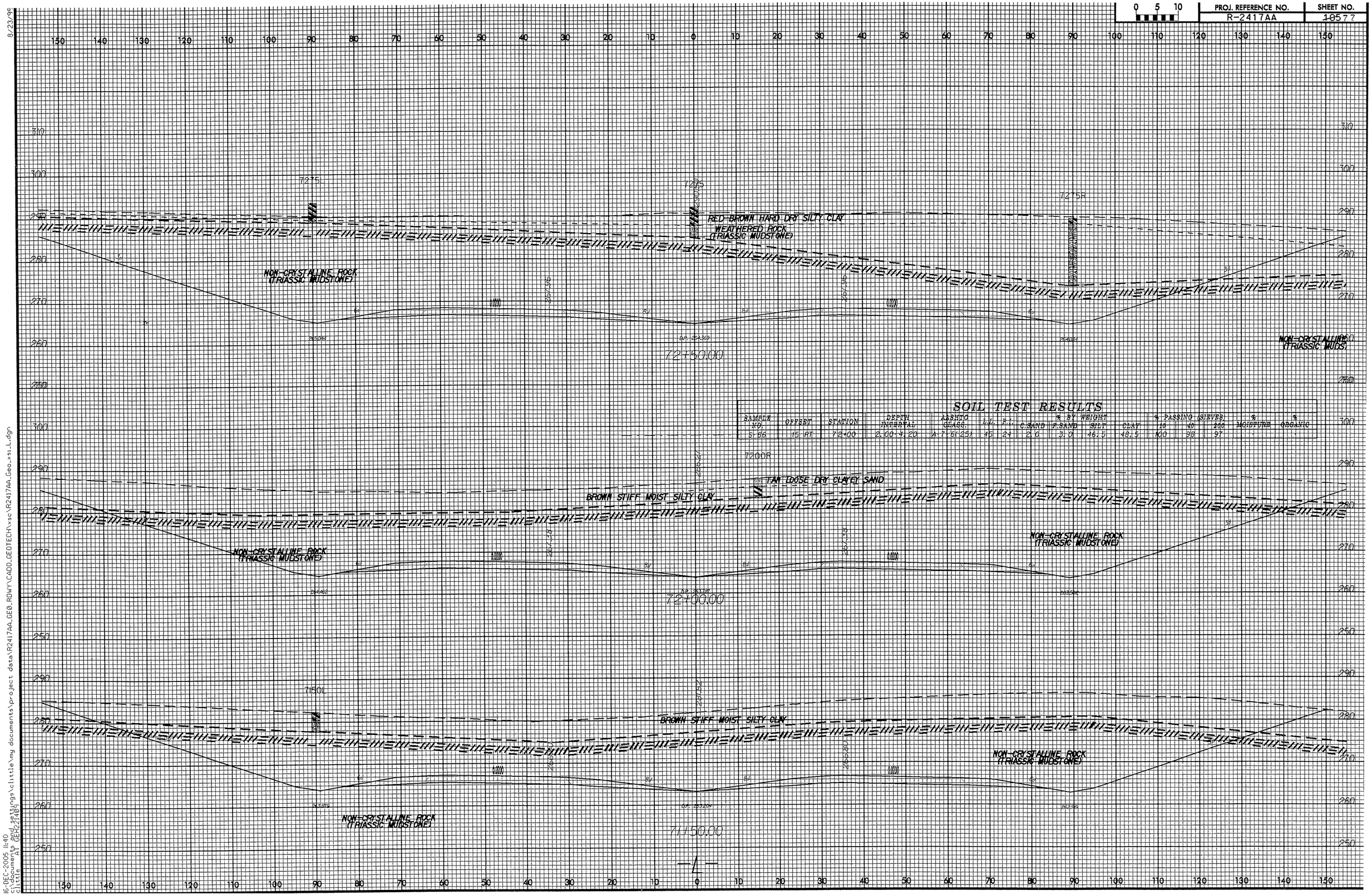
little AT GEH22400

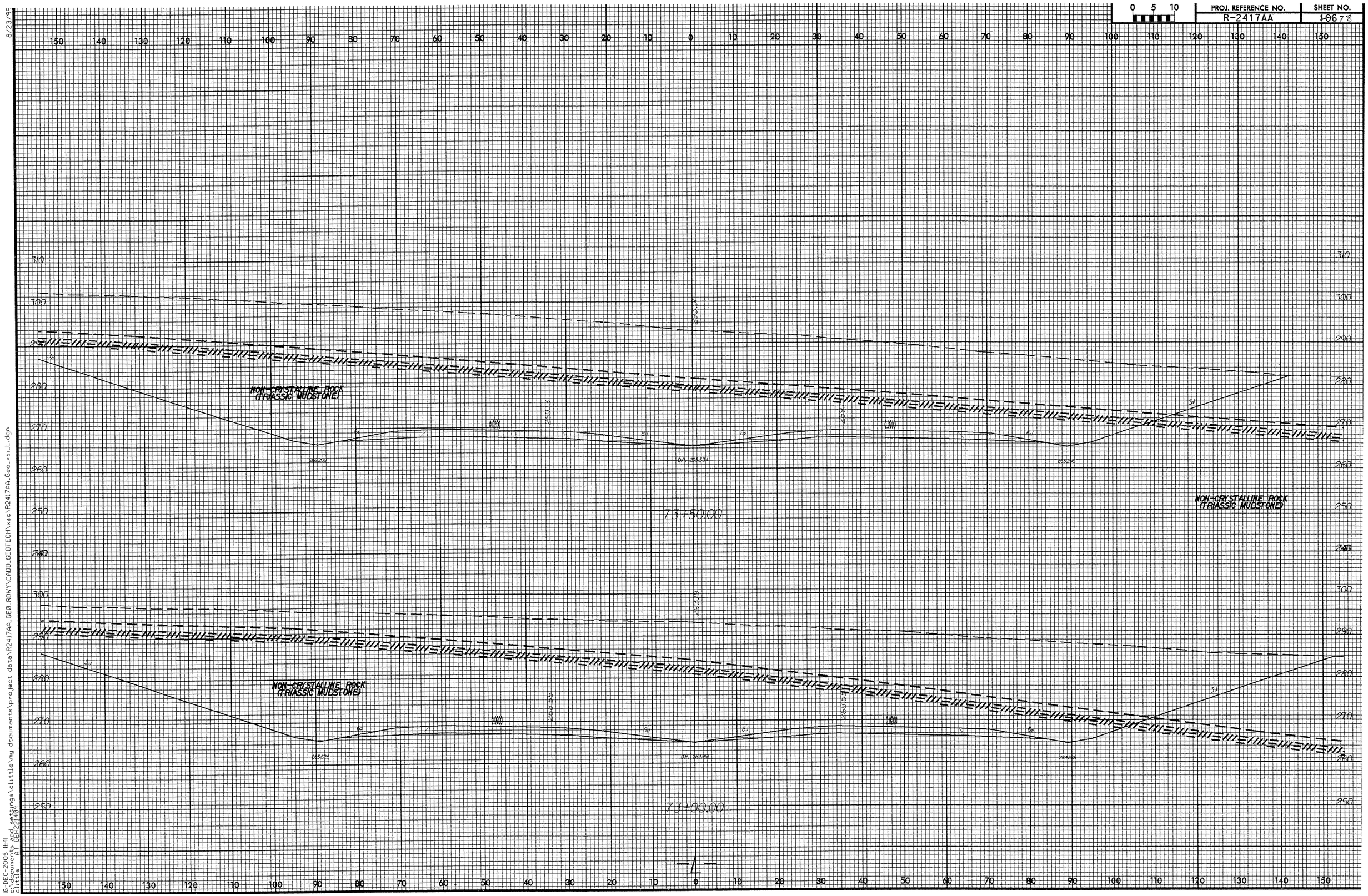
PROJ. REFERENCE NO.	SHEET NO.
R-2417AA	10577

0 5 10



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-66	15 RT	72+00	2.00-4.20	A-7-6(25)	45	24	2.0	3.0	46.5	48.5	100	98	97		



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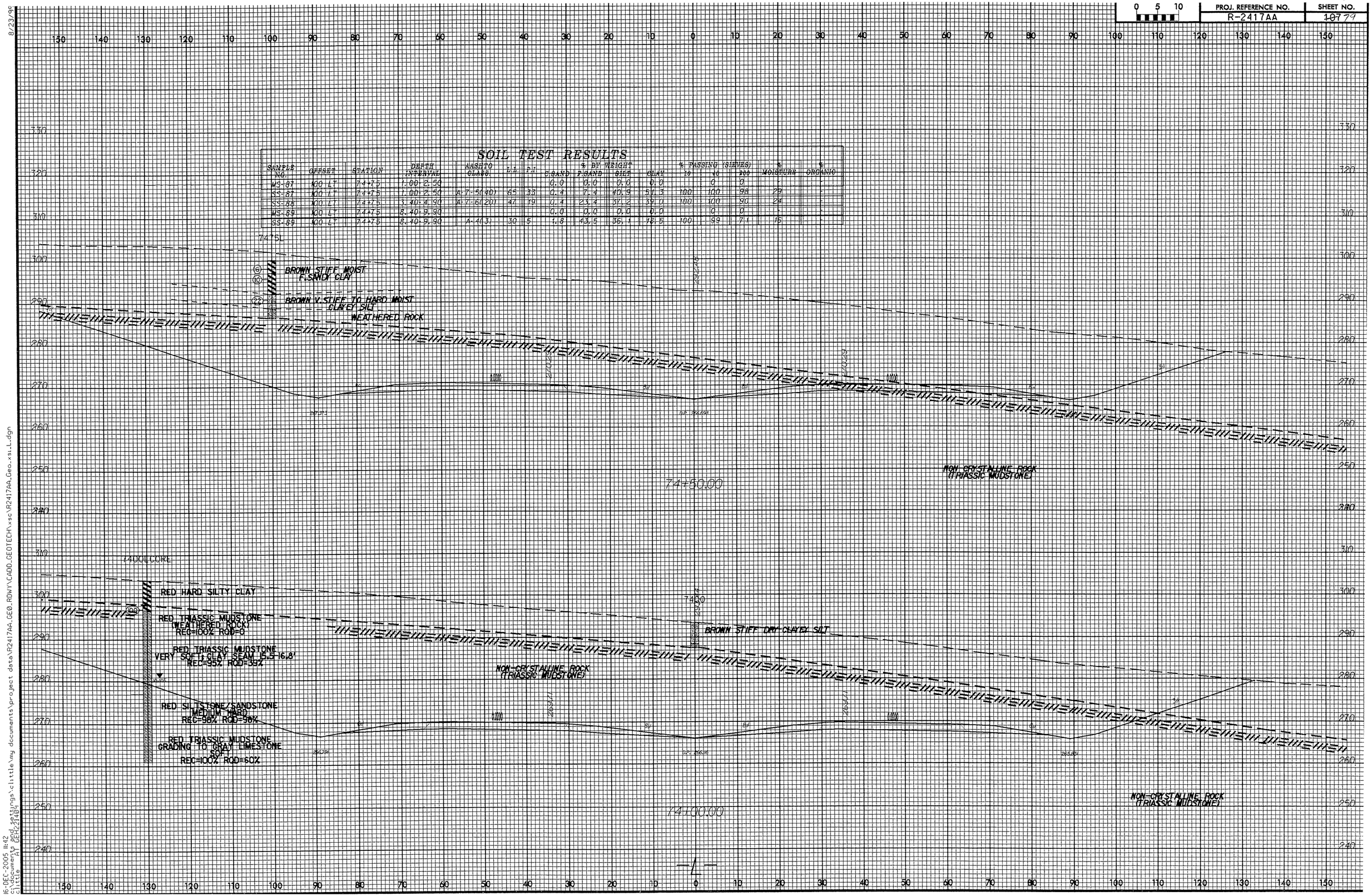
clittle AT GEH221409

PROJ. REFERENCE NO.	SHEET NO.
R-2417AA	10779

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
WS-87	100 LT	74+75	1.00-2.50				0.0	0.0	0.0	0.0		0	0		
SS-87	100 LT	74+75	1.00-2.50	A-7-5(40)	65	33	0.4	7.4	40.9	51.3	100	100	98	29	
SS-88	100 LT	74+75	3.40-4.90	A-7-6(20)	47	19	0.4	23.4	37.2	39.0	100	100	90	24	
WS-89	100 LT	74+75	8.40-9.90				0.0	0.0	0.0	0.0		0	0		
SS-89	100 LT	74+75	8.40-9.90	A-4(3)	30	5	1.8	43.5	36.1	18.5	100	99	71	16	



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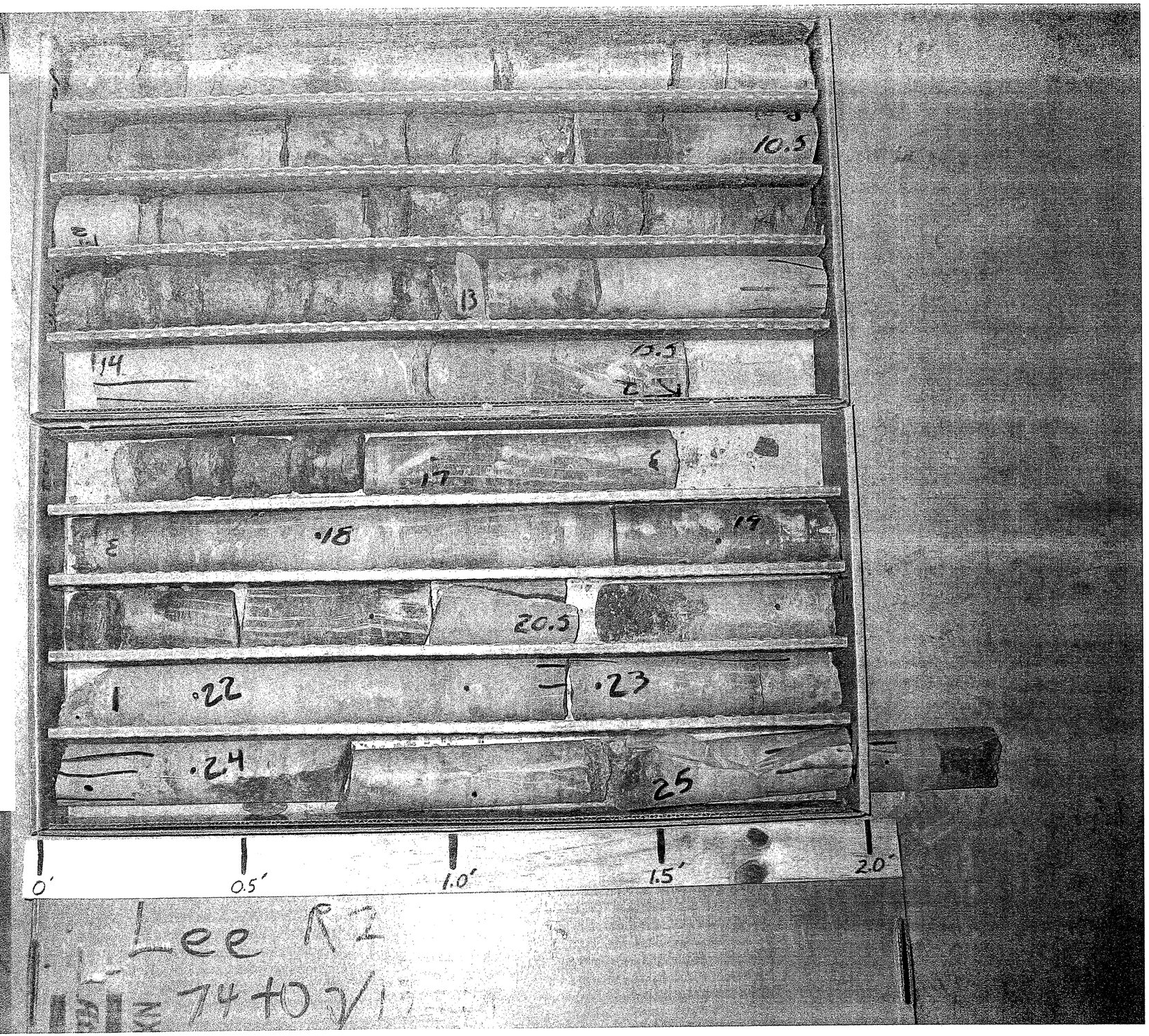
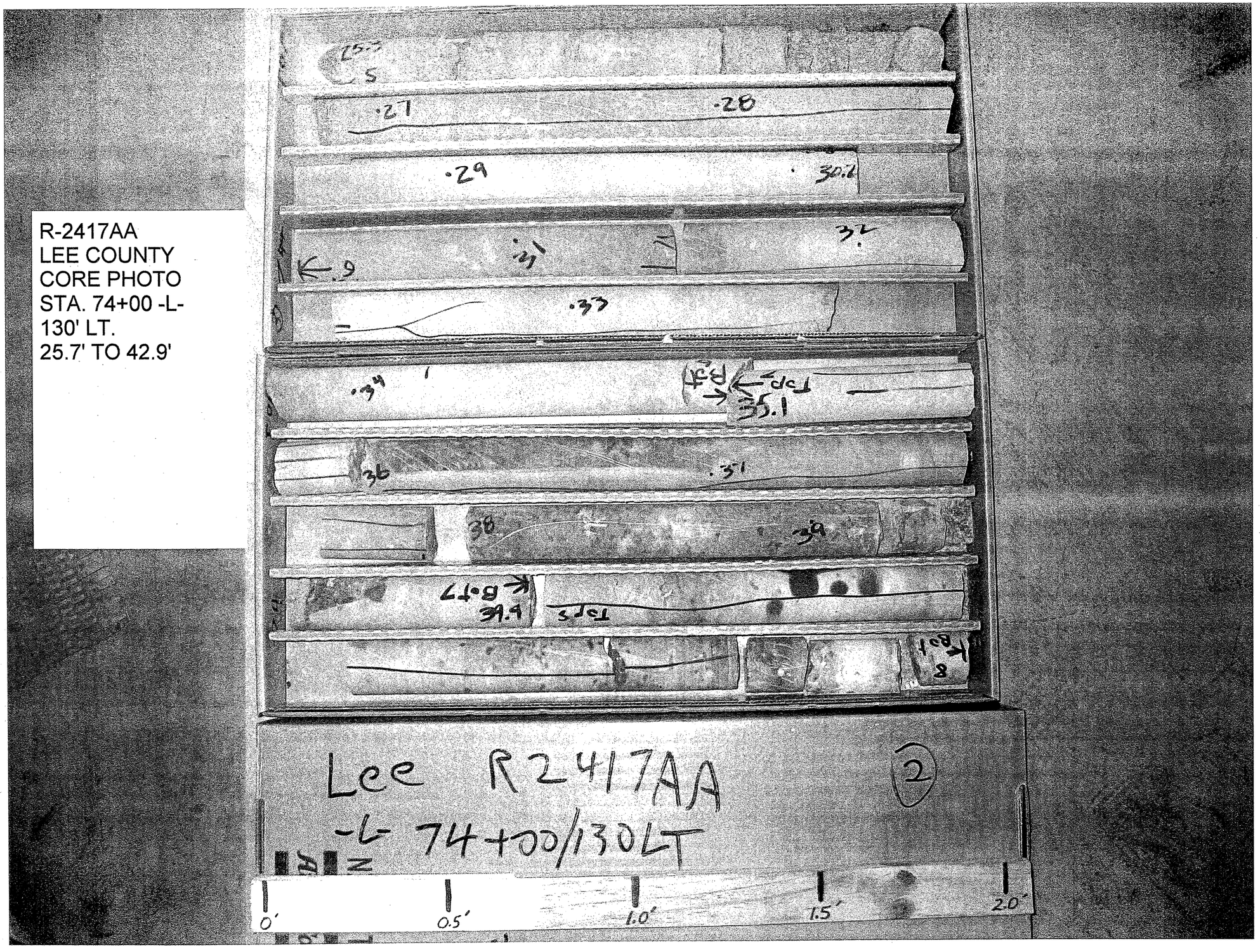
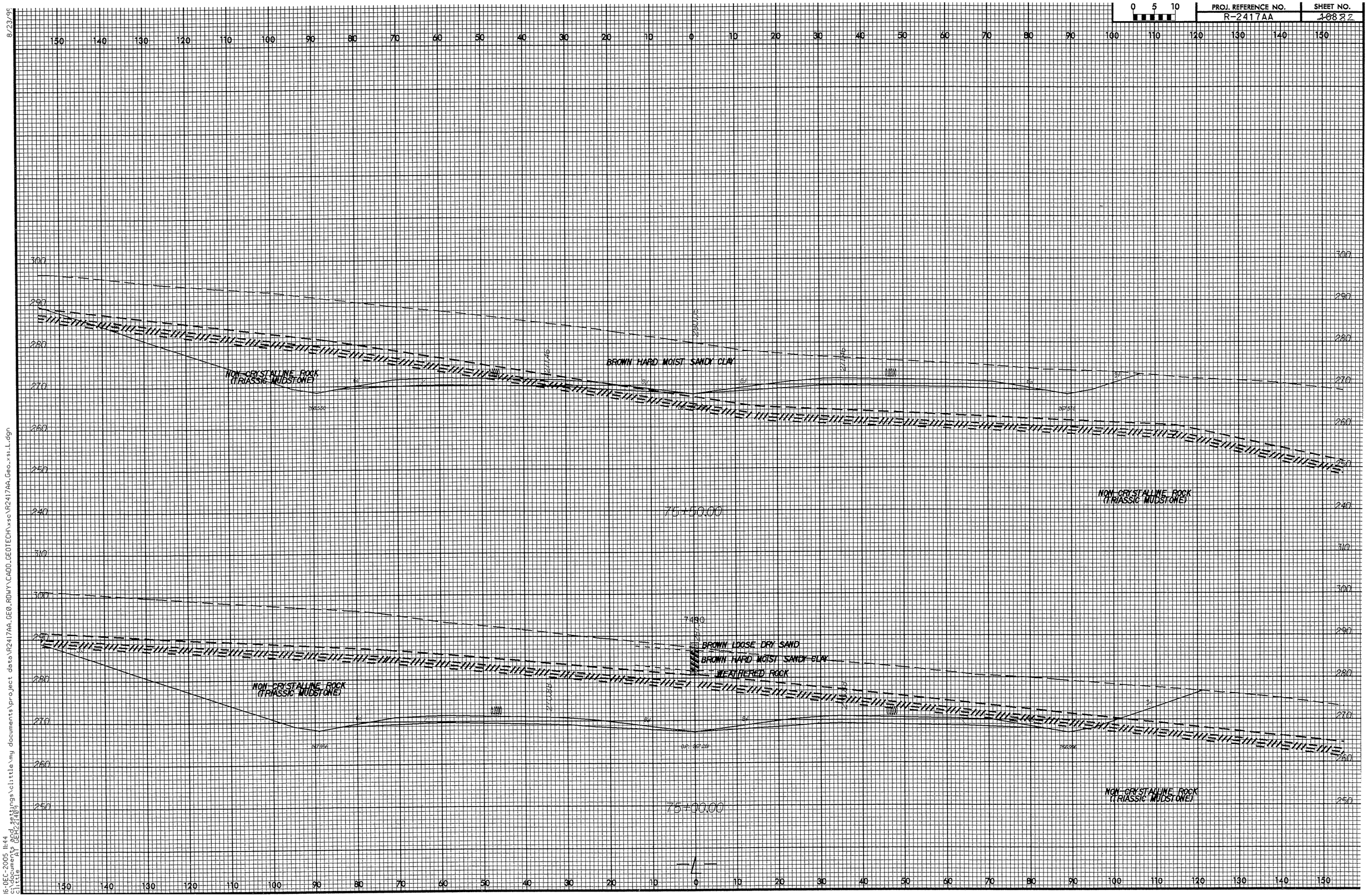
clittle AT CEHQ21404

R-2417AA
LEE COUNTY
CORE PHOTO
STA. 74+00 -L-
130' LT.
7.2' TO 25.7'



R-2417AA
LEE COUNTY
CORE PHOTO
STA. 74+00 -L-
130' LT.
25.7' TO 42.9'





8/23/99

16-DEC-2005 11:44
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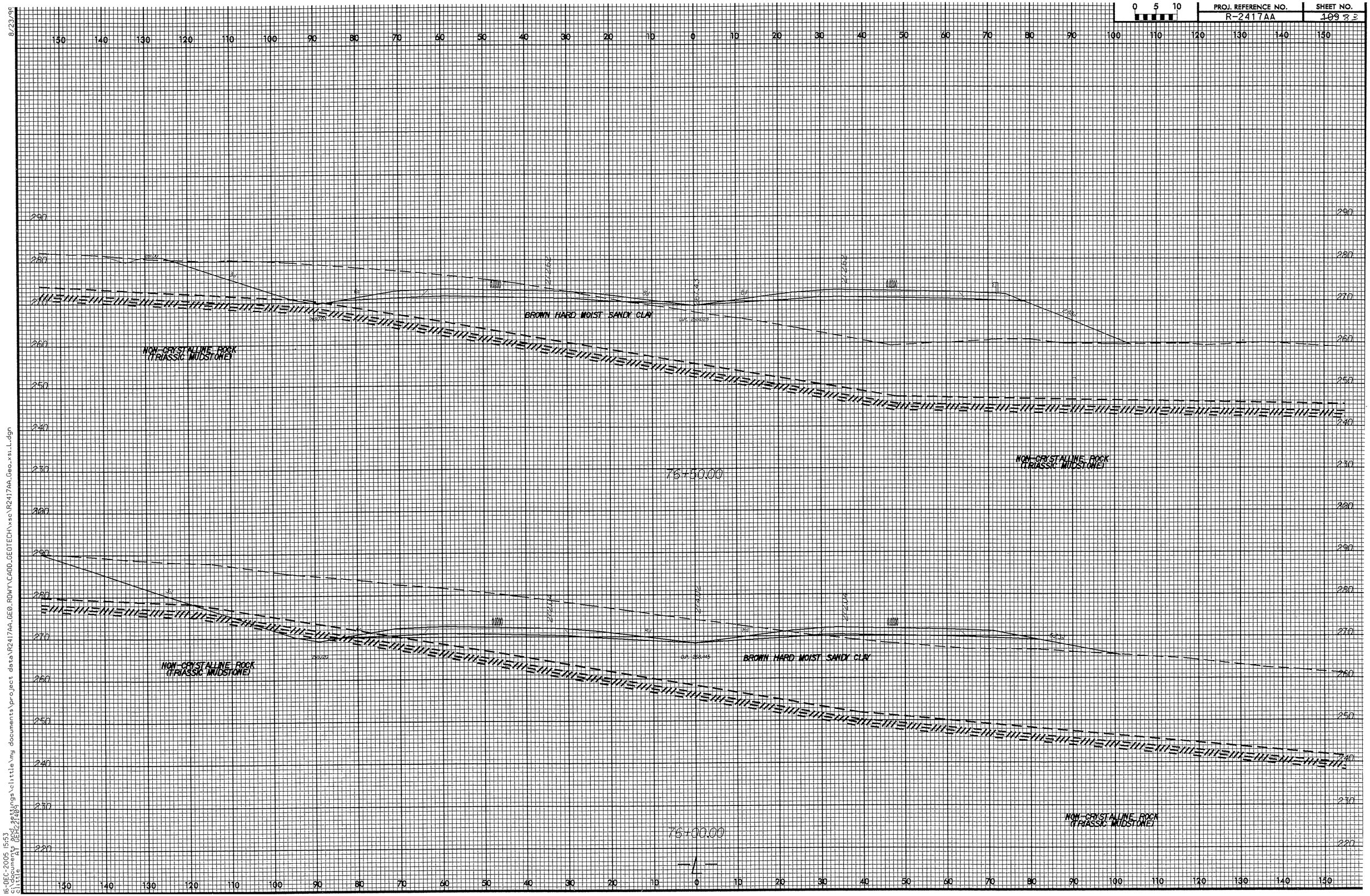

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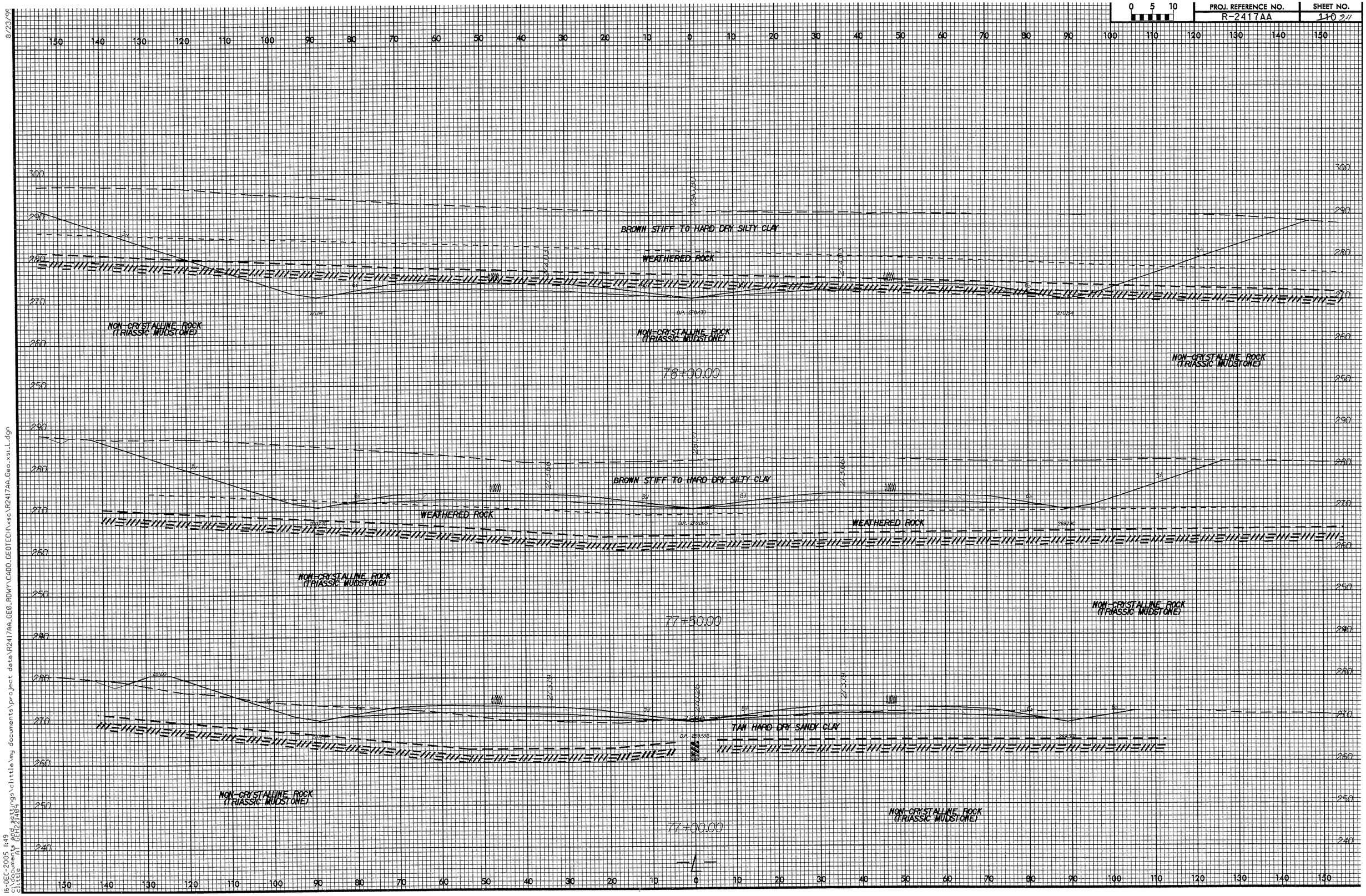
clittle AT GEH221409



8/23/99

16-DEC-2005 11:49
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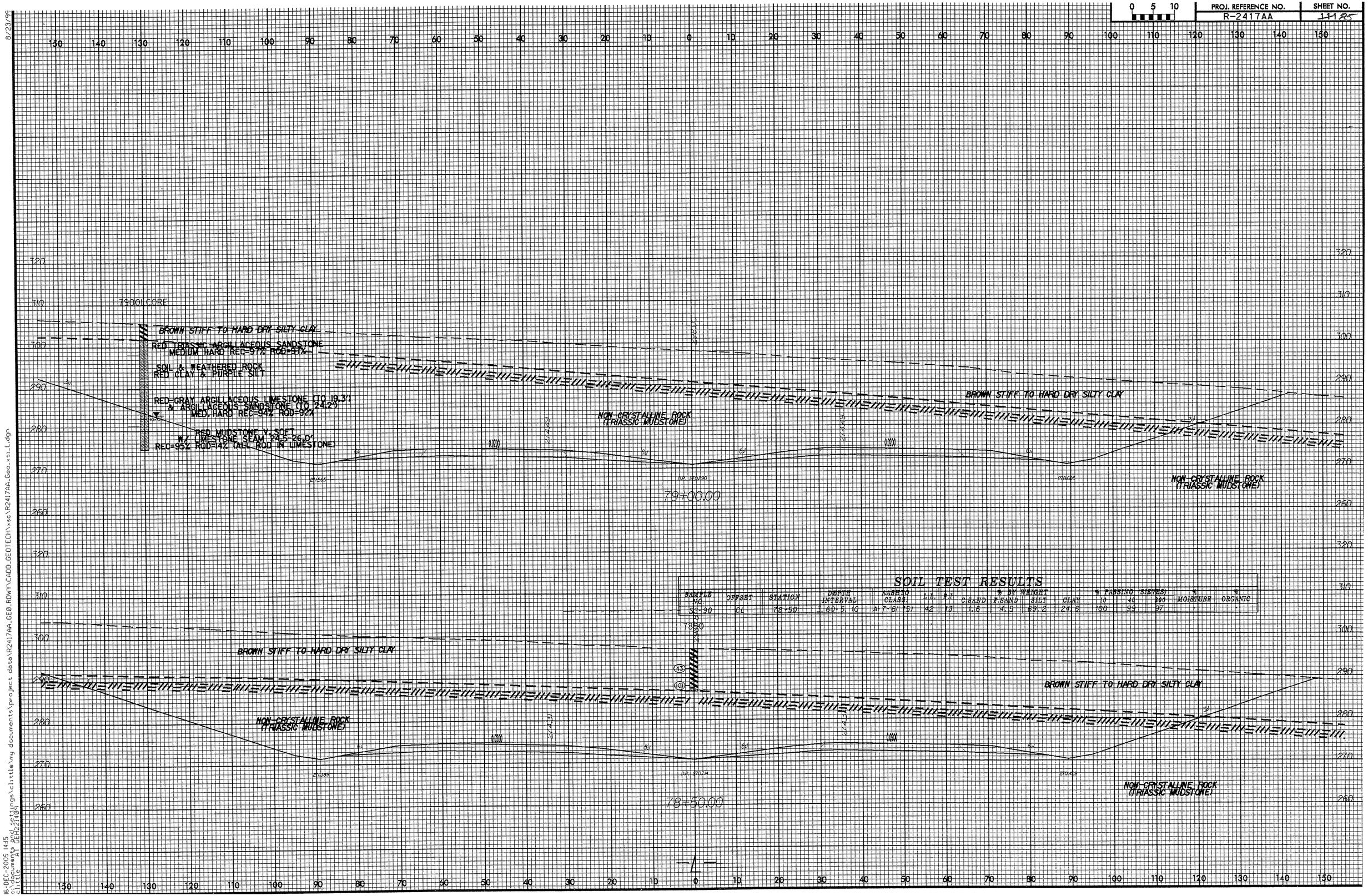
PROJ. REFERENCE NO.	SHEET NO.
R-2417AA	111 25



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-90	CL	78+50	3.60-5.10	A-7-6(15)	42	13	1.6	4.5	69.2	24.6	100	99	97	-	-

8/23/99
16-DEC-2005 14:15
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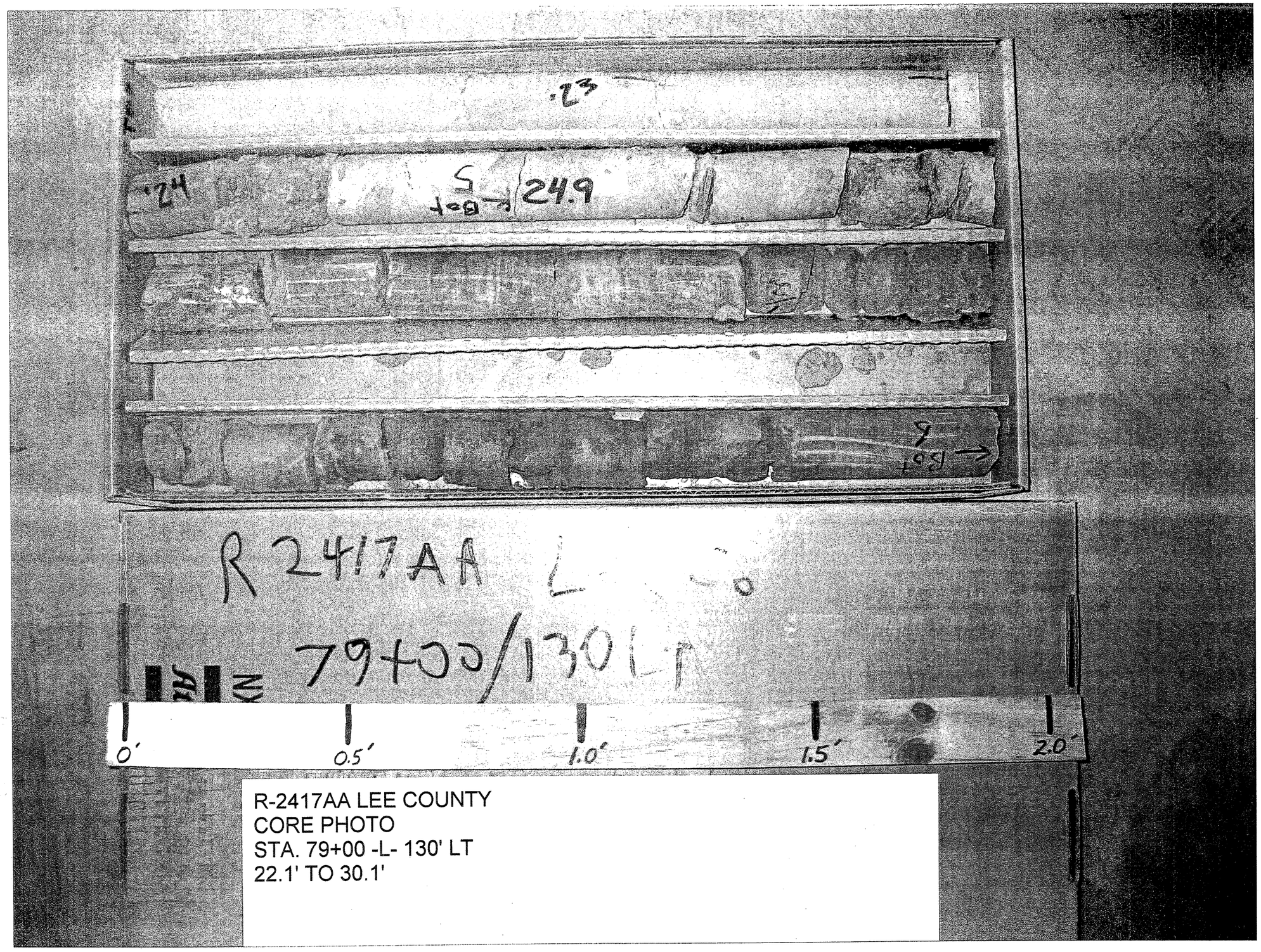
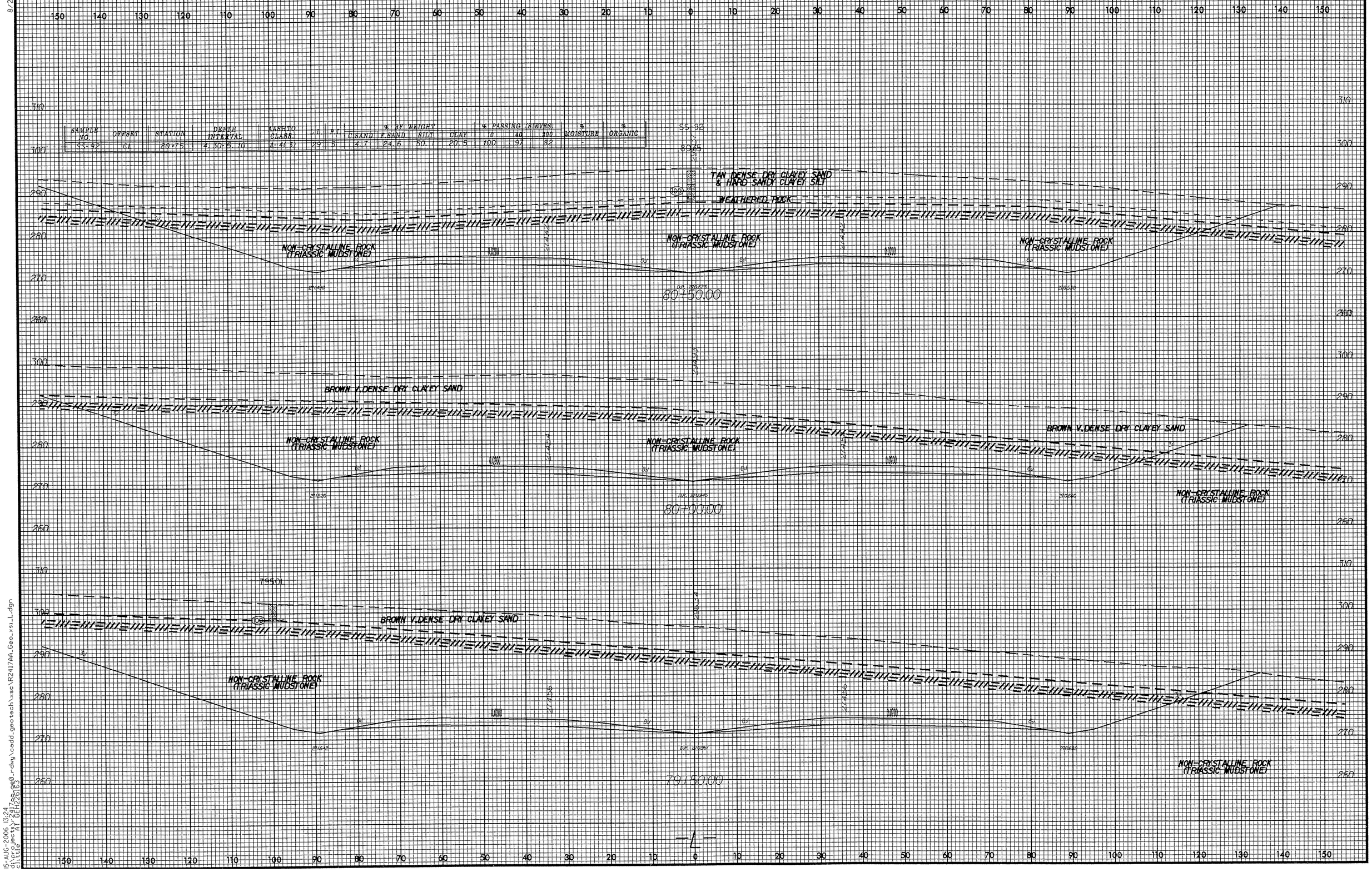
clittle AT GEH221409

R-2417AA
LEE COUNTY
CORE PHOTO
STA. 79+00 -L-
130' LT
3.7-22.1'



R-2417AA LEE COUNTY
CORE PHOTO
STA. 79+00 -L- 130' LT
22.1' TO 30.1'

PROJ. REFERENCE NO.	SHEET NO.
R-2417AA	88



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-92	CL	80+75	4.30-6.10	A-4(3)	29	5	4.7	24.6	50.1	20.5	100	97	82	-	-

8/23/99

15-AUG-2006 13:24
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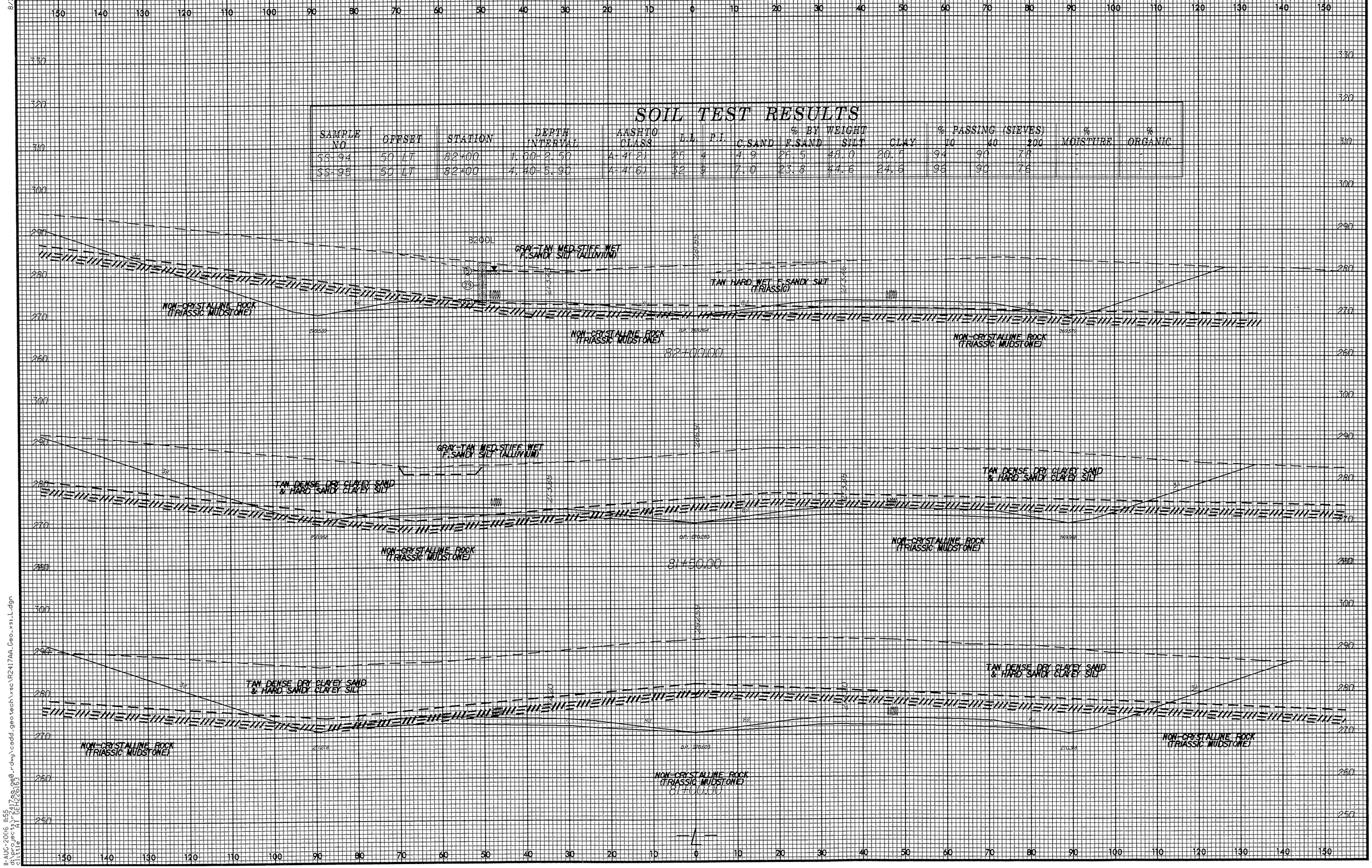
clittle AT GEH226163

PROJ. REFERENCE NO.	SHEET NO.
R-2417AA	~~113~~ 89

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-94	50 LT	82+00	1.00-2.50	A-4(2)	25	4	4.9	26.5	48.0	20.5	94	90	78	-	-
SS-95	50 LT	82+00	4.40-5.90	A-4(6)	32	9	7.0	23.8	44.6	24.6	96	90	76	-	-



8/23/99

11-AUG-2006 11:55
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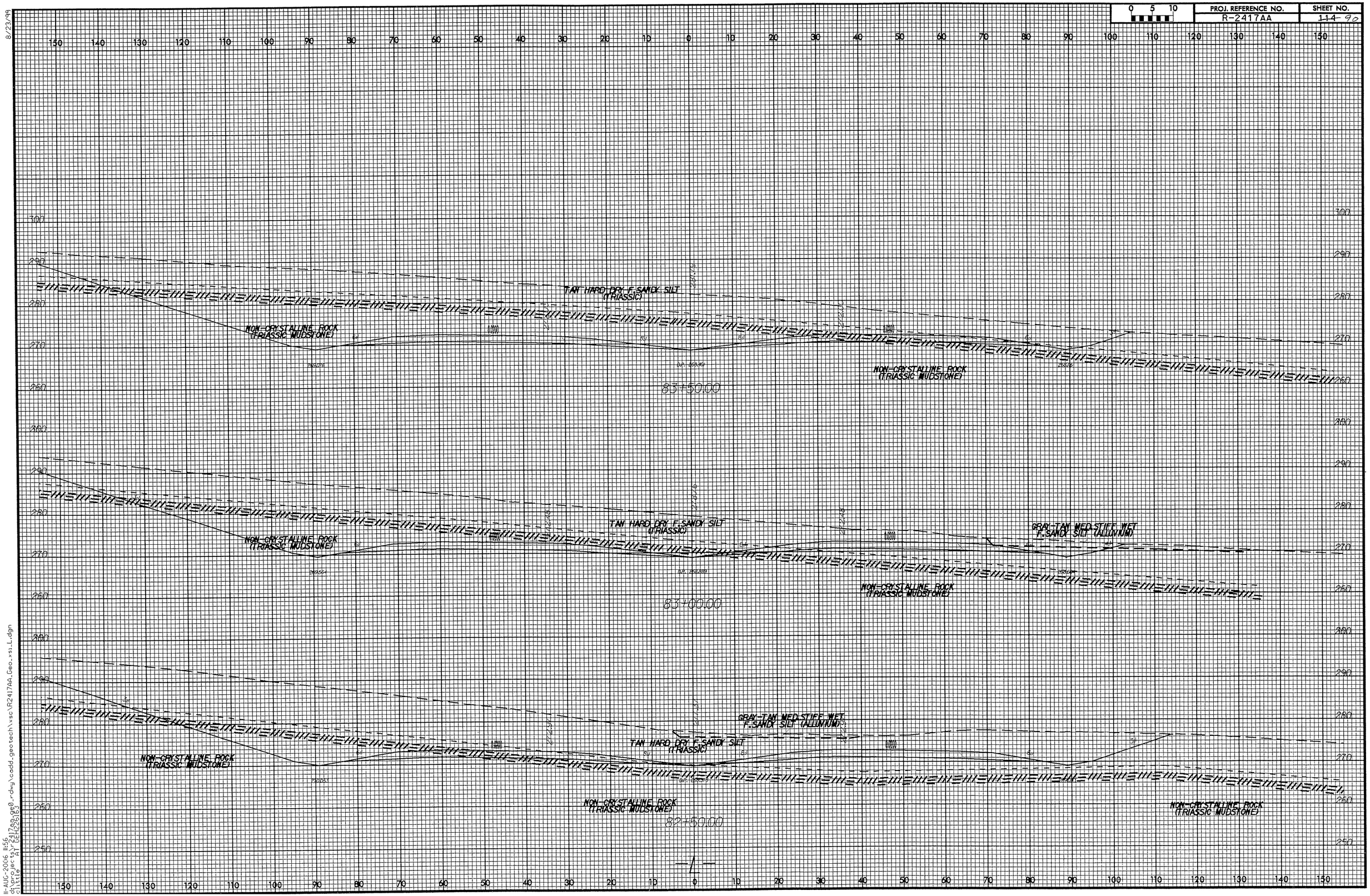
cliffie AT GEH226163



8/23/99

11-AUG-2006 11:56
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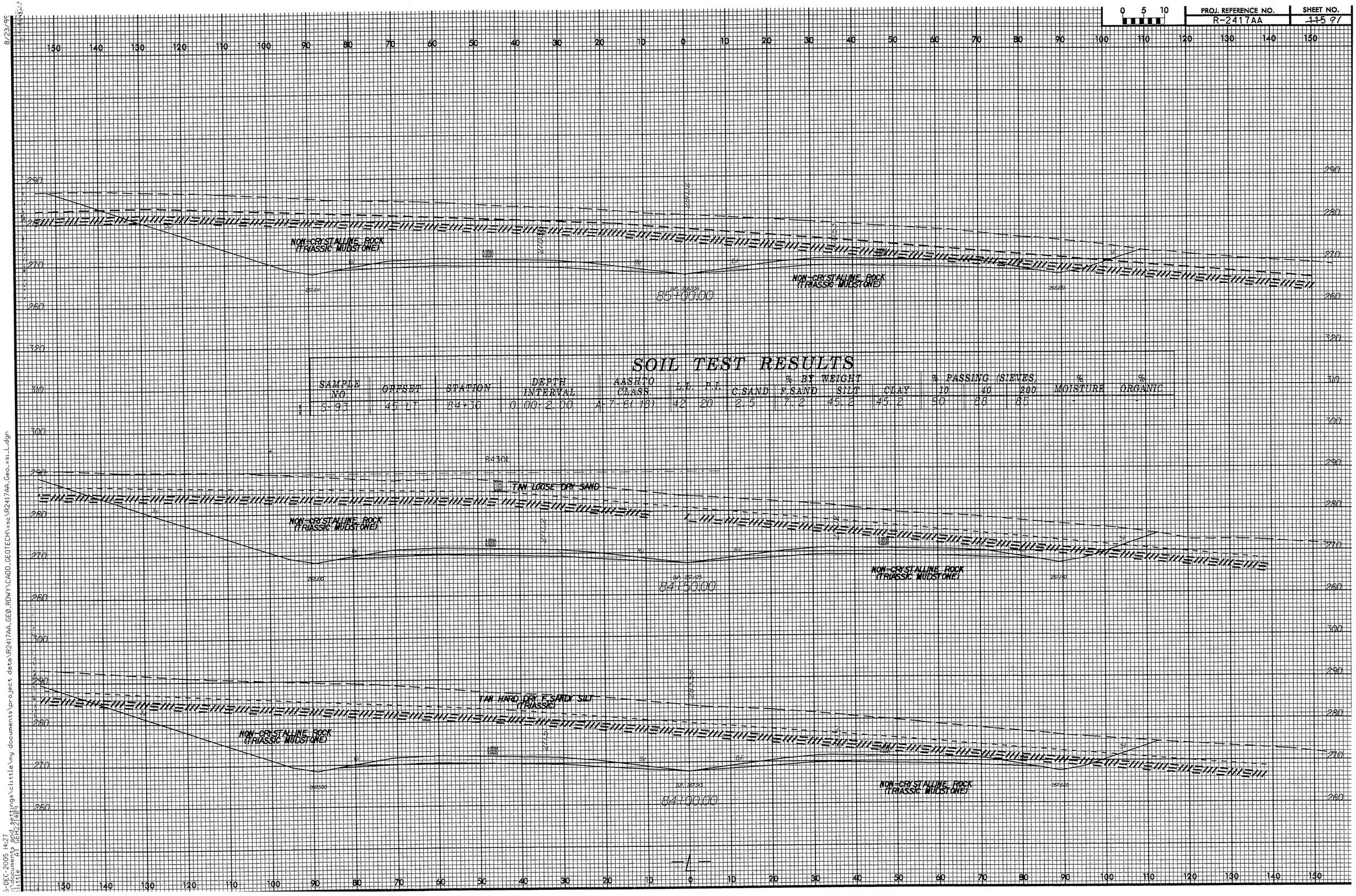
clittle AT GEH226163

PROJ. REFERENCE NO.	SHEET NO.
R-2417AA	~~115~~ 91



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-93	45 LT	84+30	0.00-2.00	A-7-6(18)	42	20	2.5	7.2	45.2	45.2	90	88	85	-	-

8/23/99

5-DEC-2005 14:27
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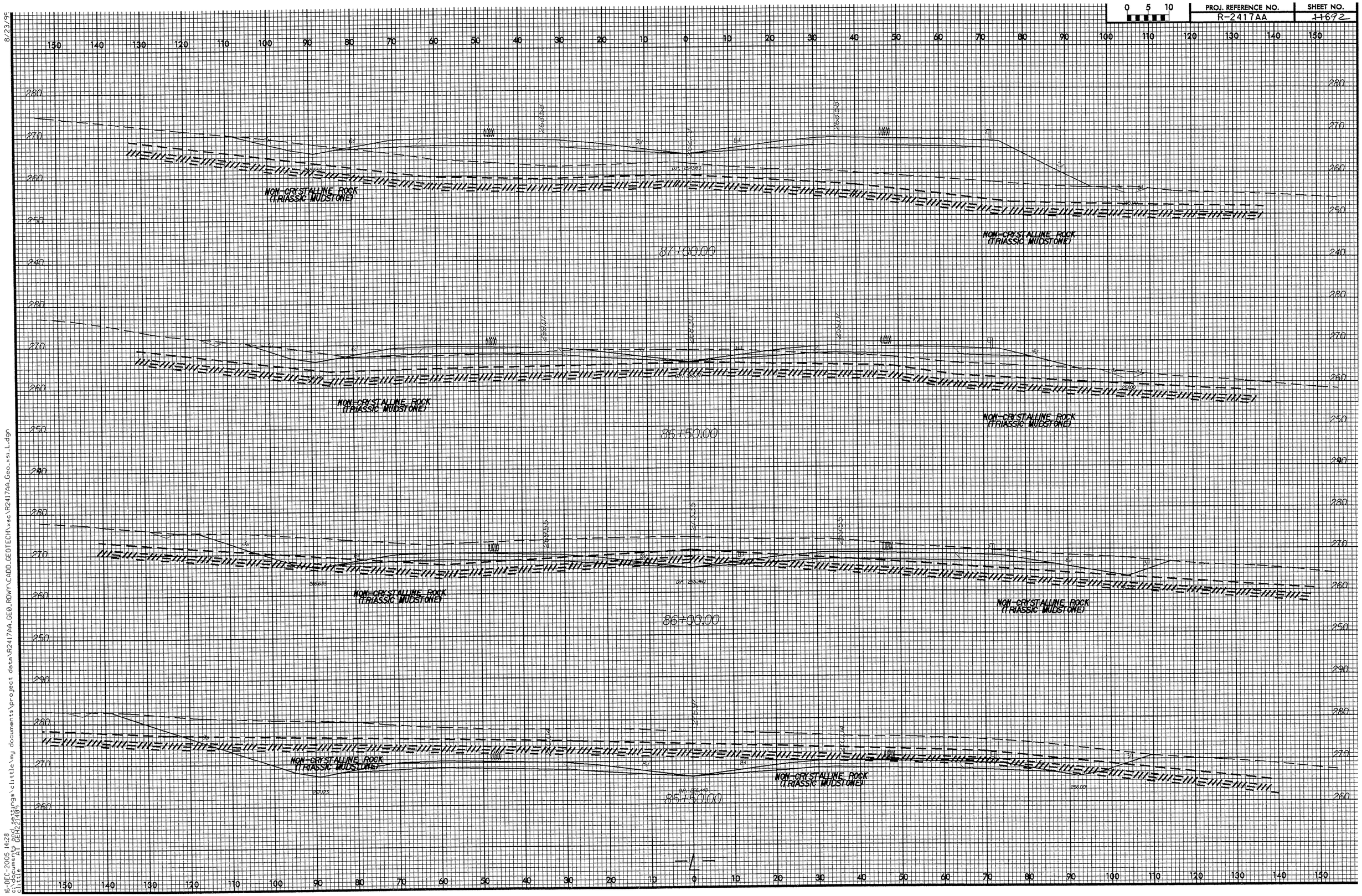
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2417AA	11692



8/23/99
16-DEC-2005 14:28
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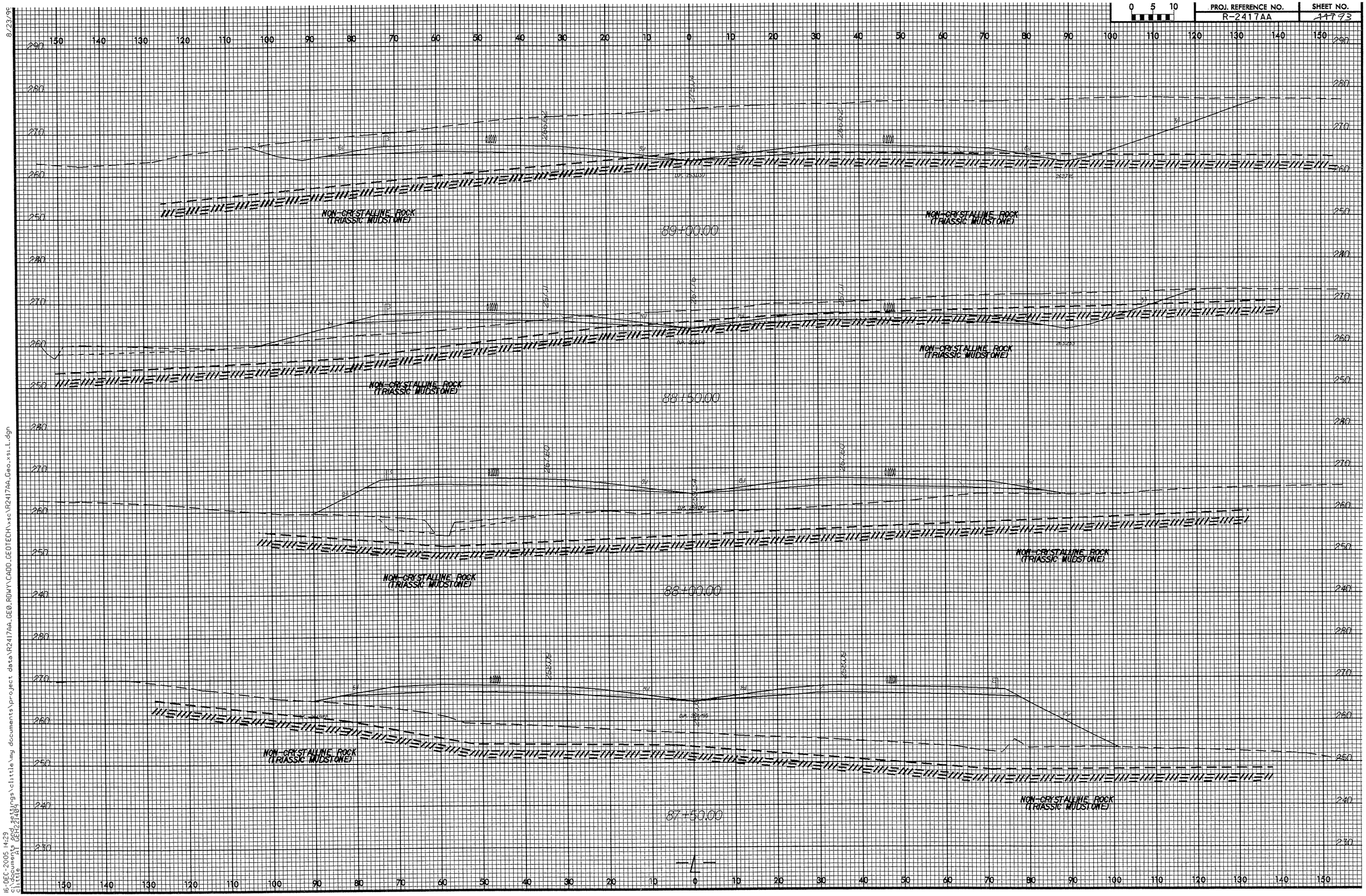
little AT GEH221403



8/23/99
16-DEC-2005 14:29
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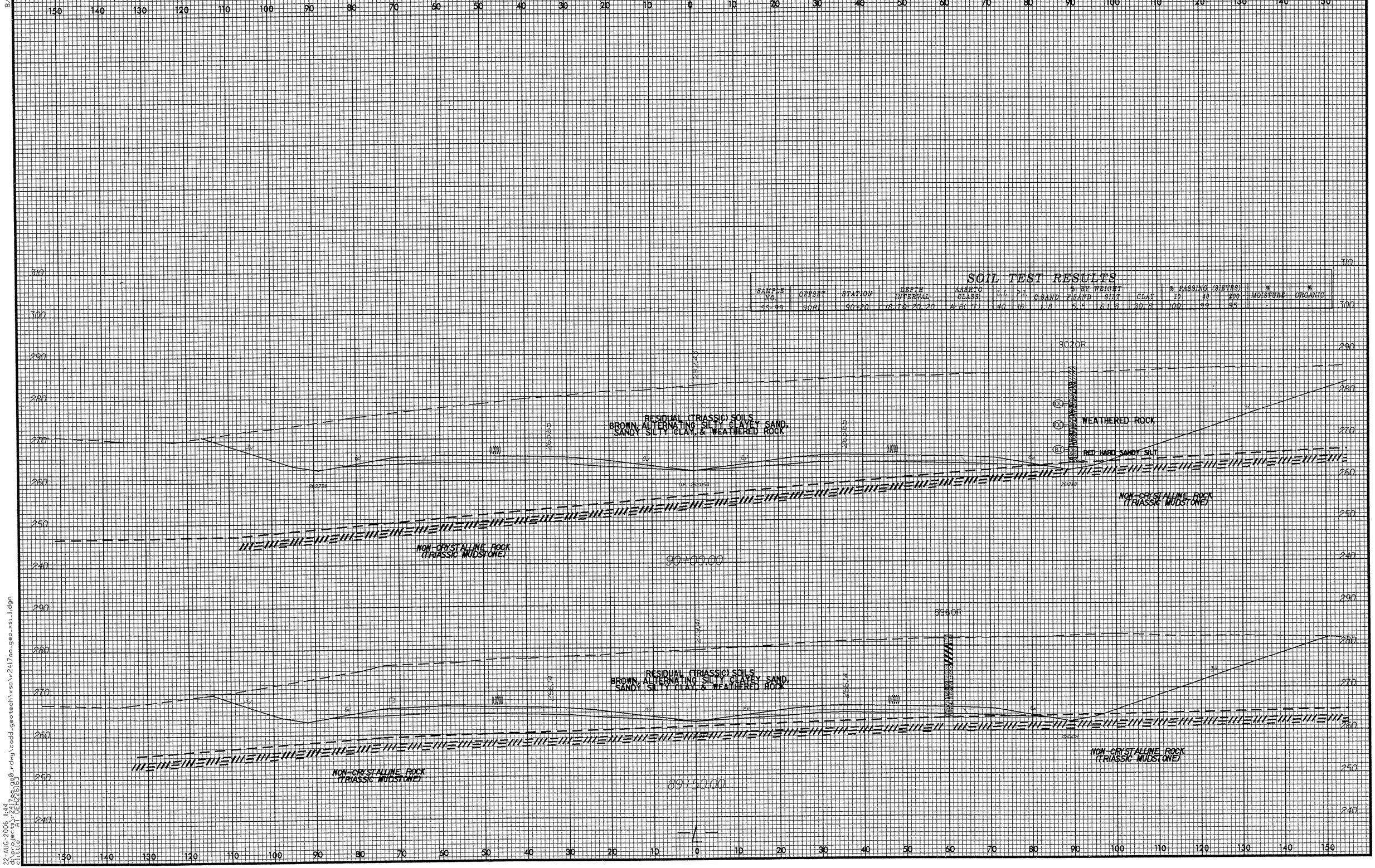
PROJ. REFERENCE NO.	SHEET NO.
R-2417AA	~~118~~ 94



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-99	90RT	90+20	18.70-20.20	A-6(17)	40	16	1.8	6.5	61.8	30.8	100	99	95	-	-

8/23/99

22-AUG-2006 11:44
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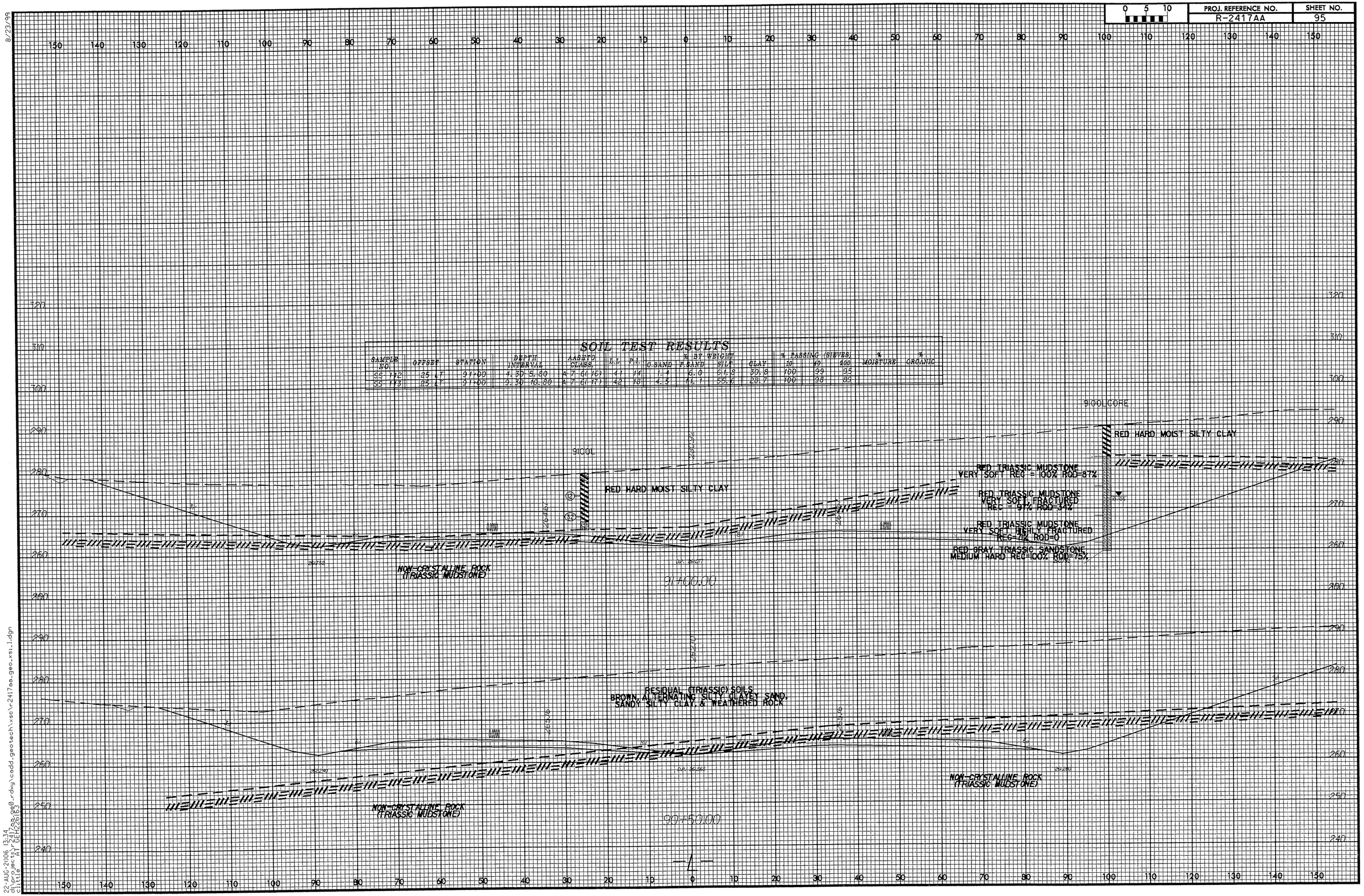
cittle AT GEH226163

PROJ. REFERENCE NO.	SHEET NO.
R-2417AA	95



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT G.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS 112	25 LT	91+00	4.30-5.80	A-7-6(16)	41	14	1.1	8.0	61.8	30.8	100	99	93		
SS 113	25 LT	91+00	9.30-10.80	A-7-6(17)	42	18	4.5	11.7	55.6	28.7	100	98	89		

8/23/99

22-AUG-2006 13:34
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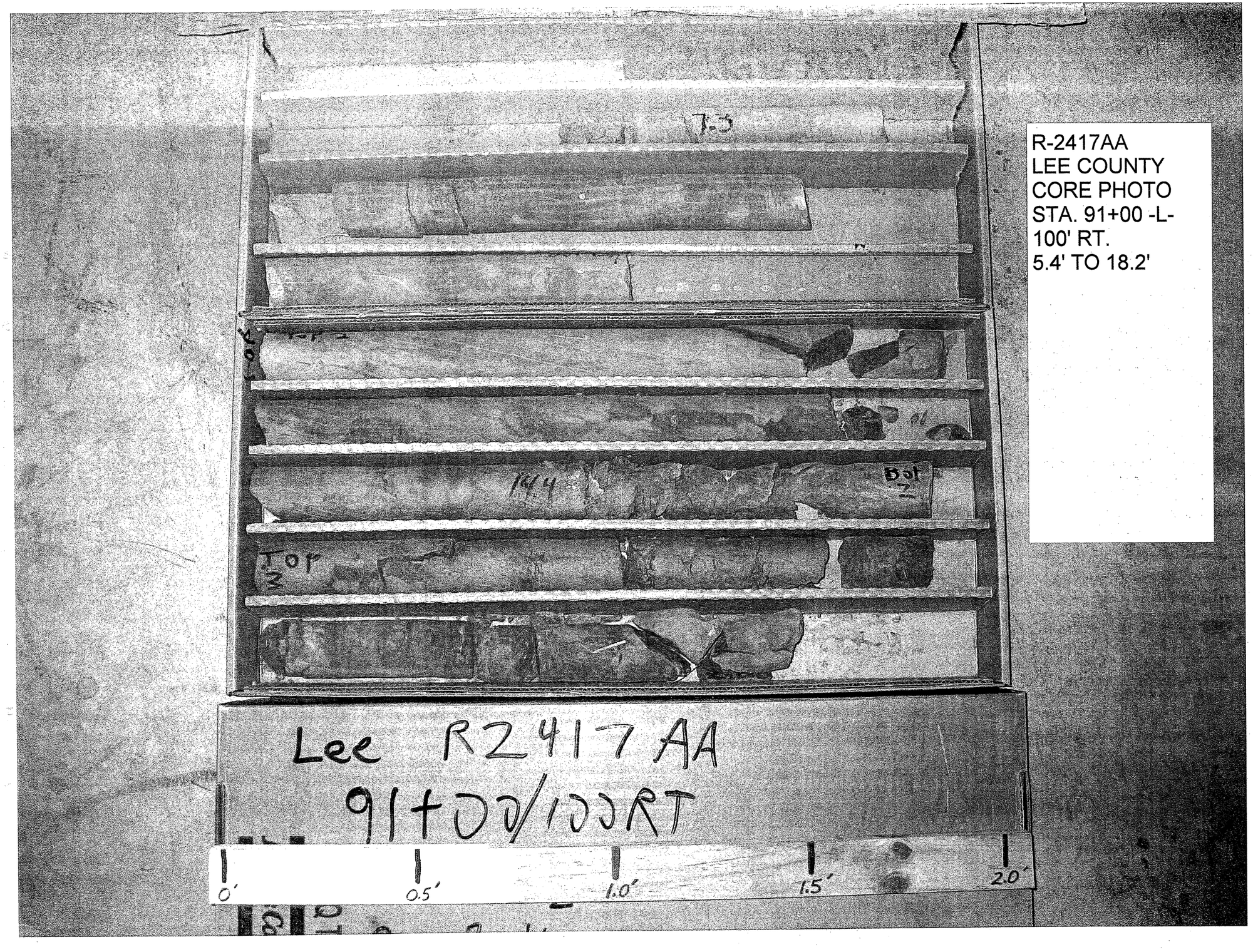
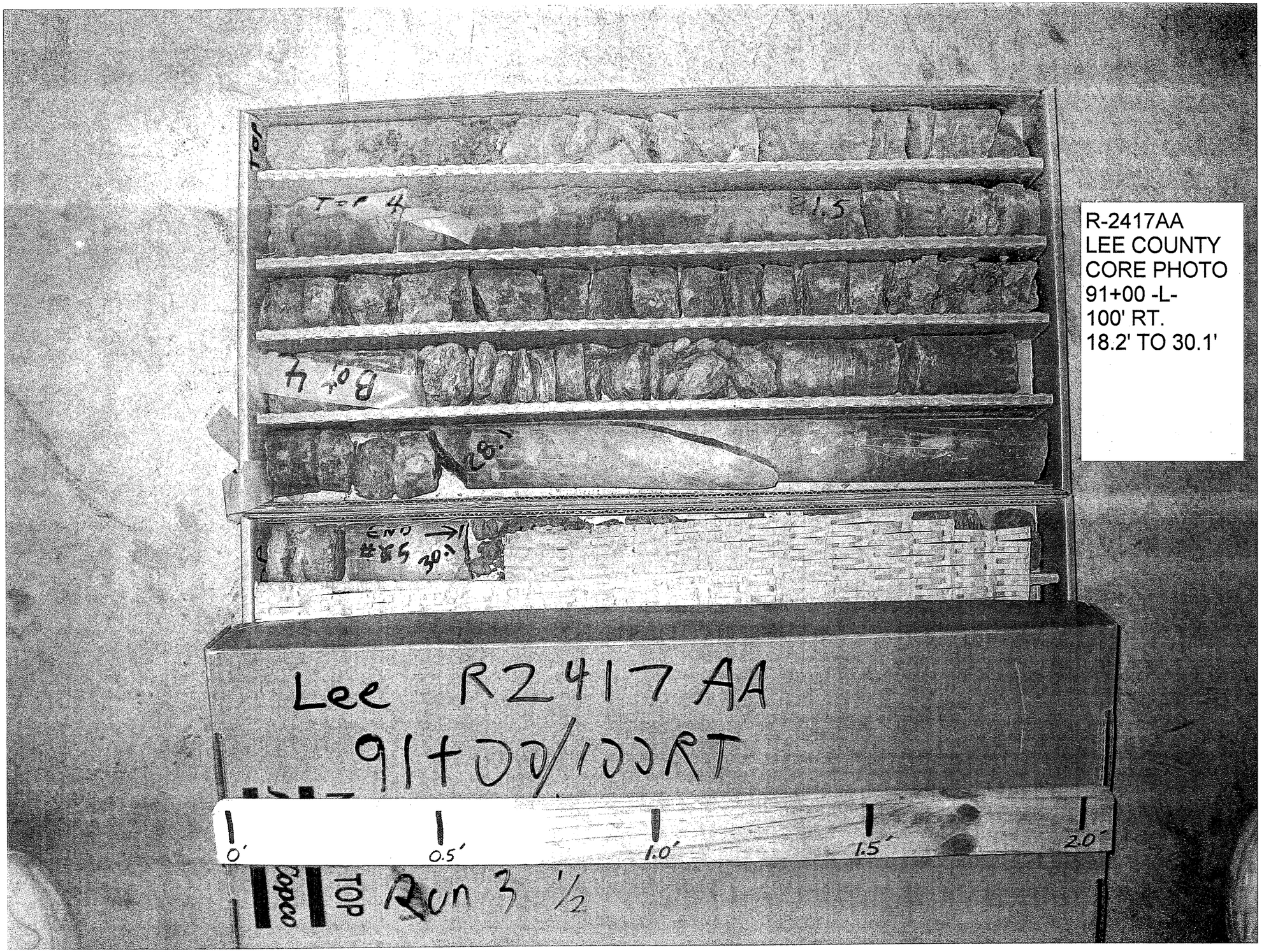
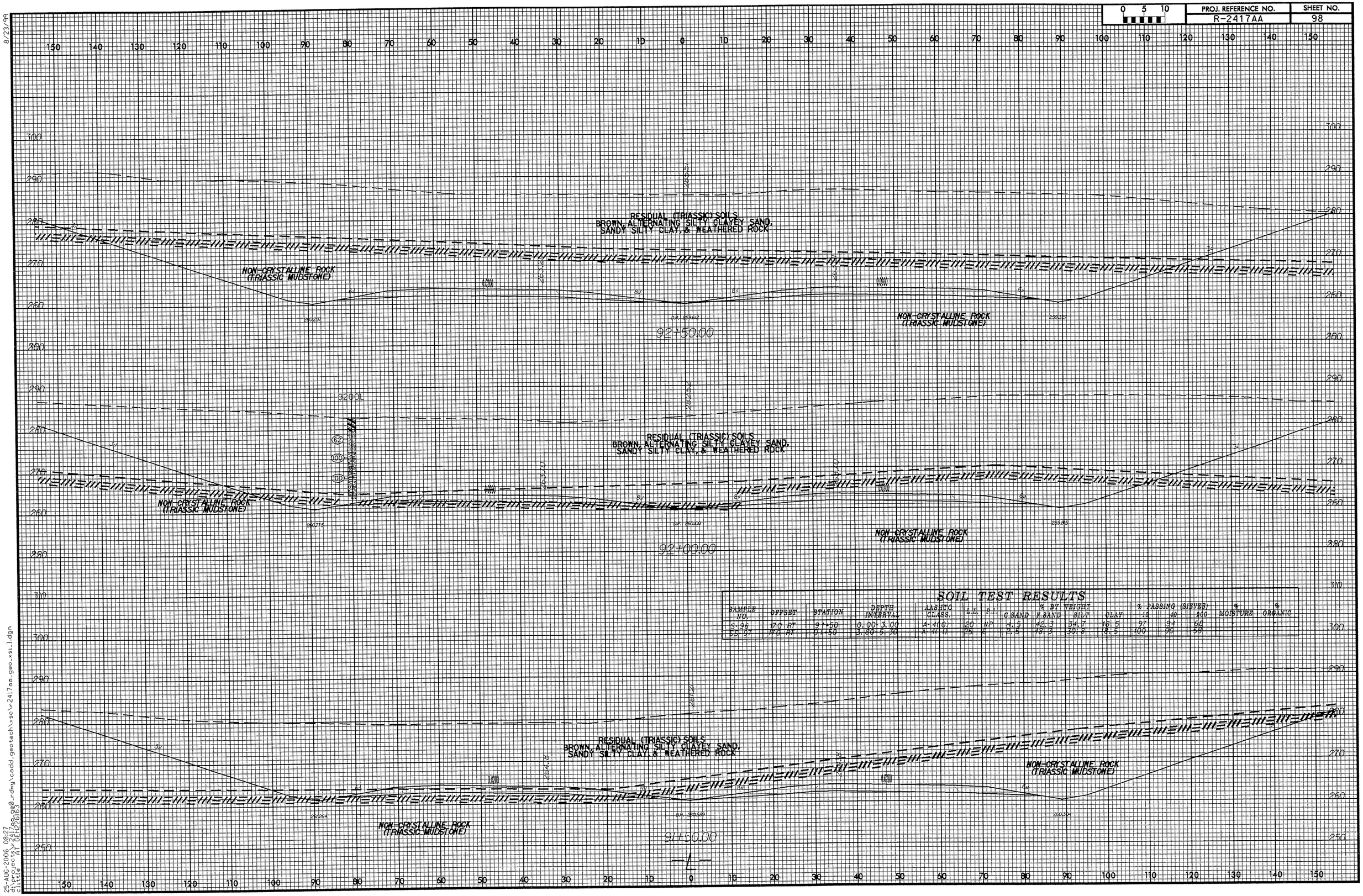

R-2417AA
LEE COUNTY
CORE PHOTO
STA. 91+00 -L-
100' RT.
5.4' TO 18.2'
Lee R2417 AA
91+00/100RT
0'
0.5'
1.0'
1.5'
2.0'


R-2417AA
LEE COUNTY
CORE PHOTO
91+00 -L-
100' RT.
18.2' TO 30.1'
Lee R2417 AA
91+00/100RT
0'
0.5'
1.0'
1.5'
2.0'
TOP Run 3 1/2

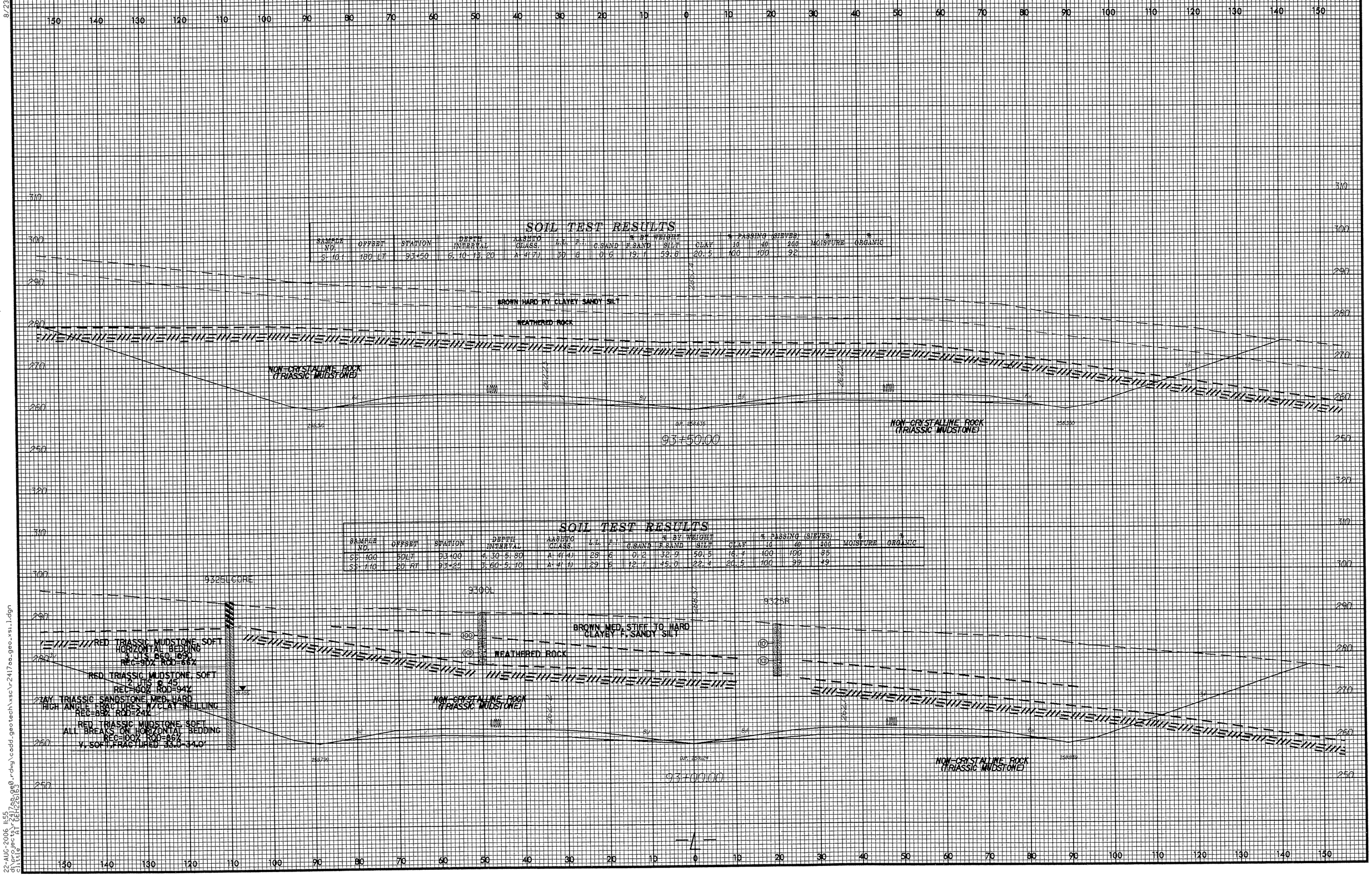


SOIL TEST RESULTS

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-96	170 RT	91+50	0.00-3.00	A-4(0)	20	NP	4.5	42.3	34.7	18.5	97	94	68		
SS-97	170 RT	91+50	3.00-5.30	A-4(0)	25	6	2.5	49.3	30.8	18.5	100	99	58		

PROJ. REFERENCE NO.	SHEET NO.
R-2417AA	99

0 5 10



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-101	180 LT	93+50	5.10-13.20	A-4(7)	30	6	0.6	19.1	59.8	20.5	100	100	92		

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-100	50LT	93+00	4.30-5.80	A-4(4)	29	6	0.2	32.9	50.5	16.4	100	100	85		
S-110	20 RT	93+25	5.60-5.10	A-4(0)	29	6	12.1	45.0	22.4	20.5	100	99	49		

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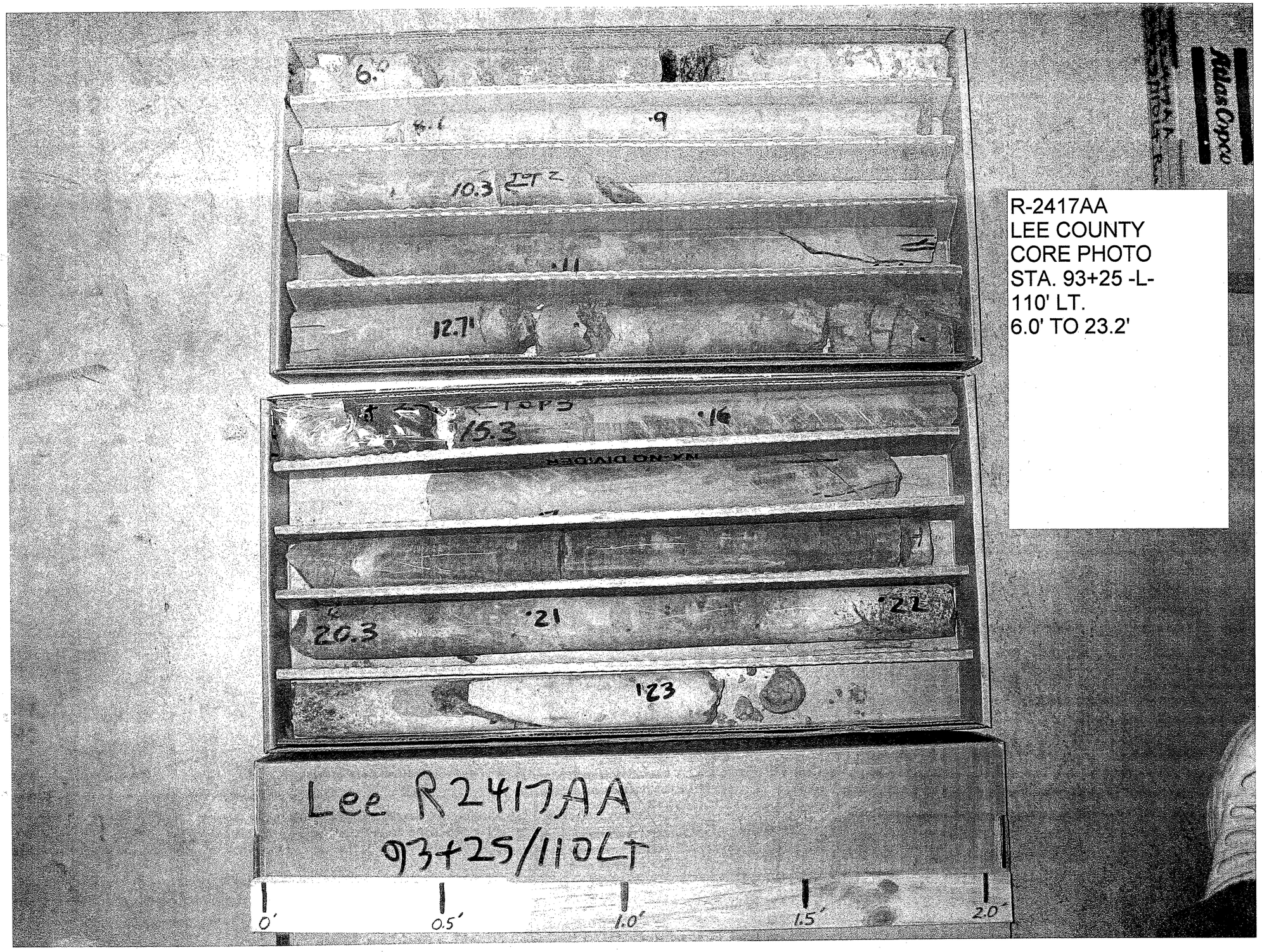
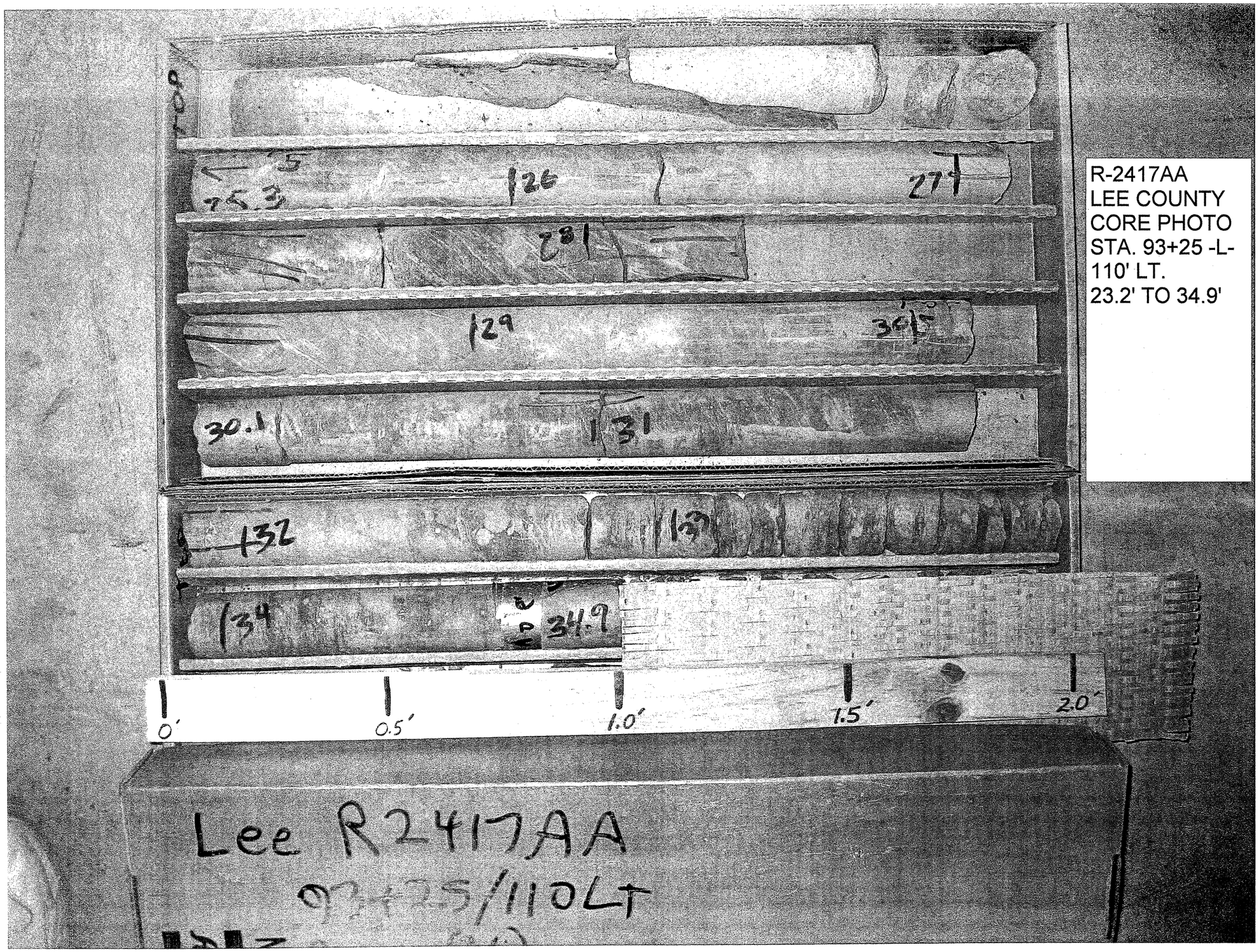
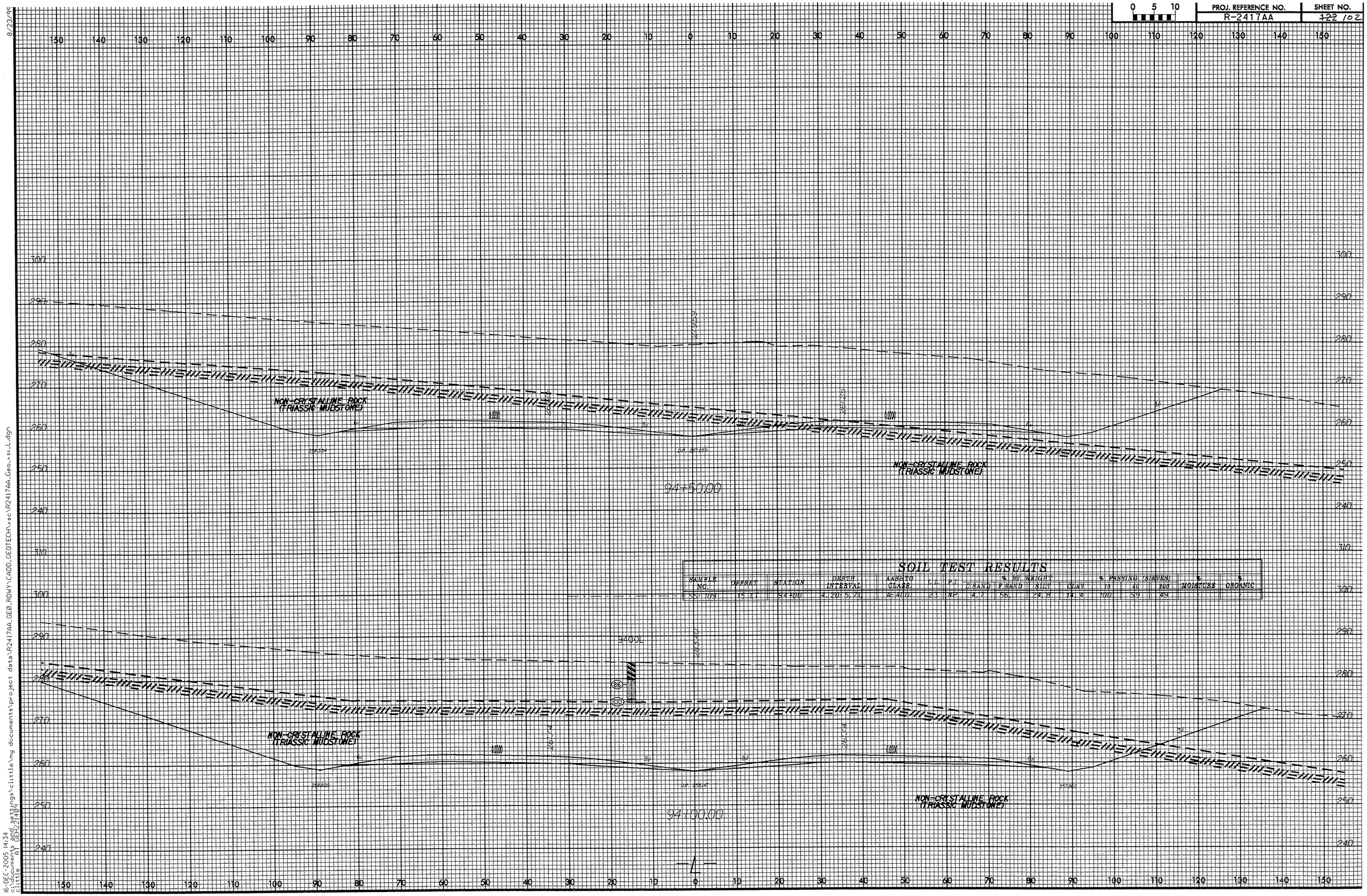


R-2417AA
LEE COUNTY
CORE PHOTO
STA. 93+25 -L-
110' LT.
6.0' TO 23.2'



R-2417AA
LEE COUNTY
CORE PHOTO
STA. 93+25 -L-
110' LT.
23.2' TO 34.9'

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2417AA	122 102



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-109	15.0 L	94+00	4.20-5.70	A-4(0)	23	NP	4.7	56.1	24.8	14.4	100	99	89		

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16-DEC-2005 14:34
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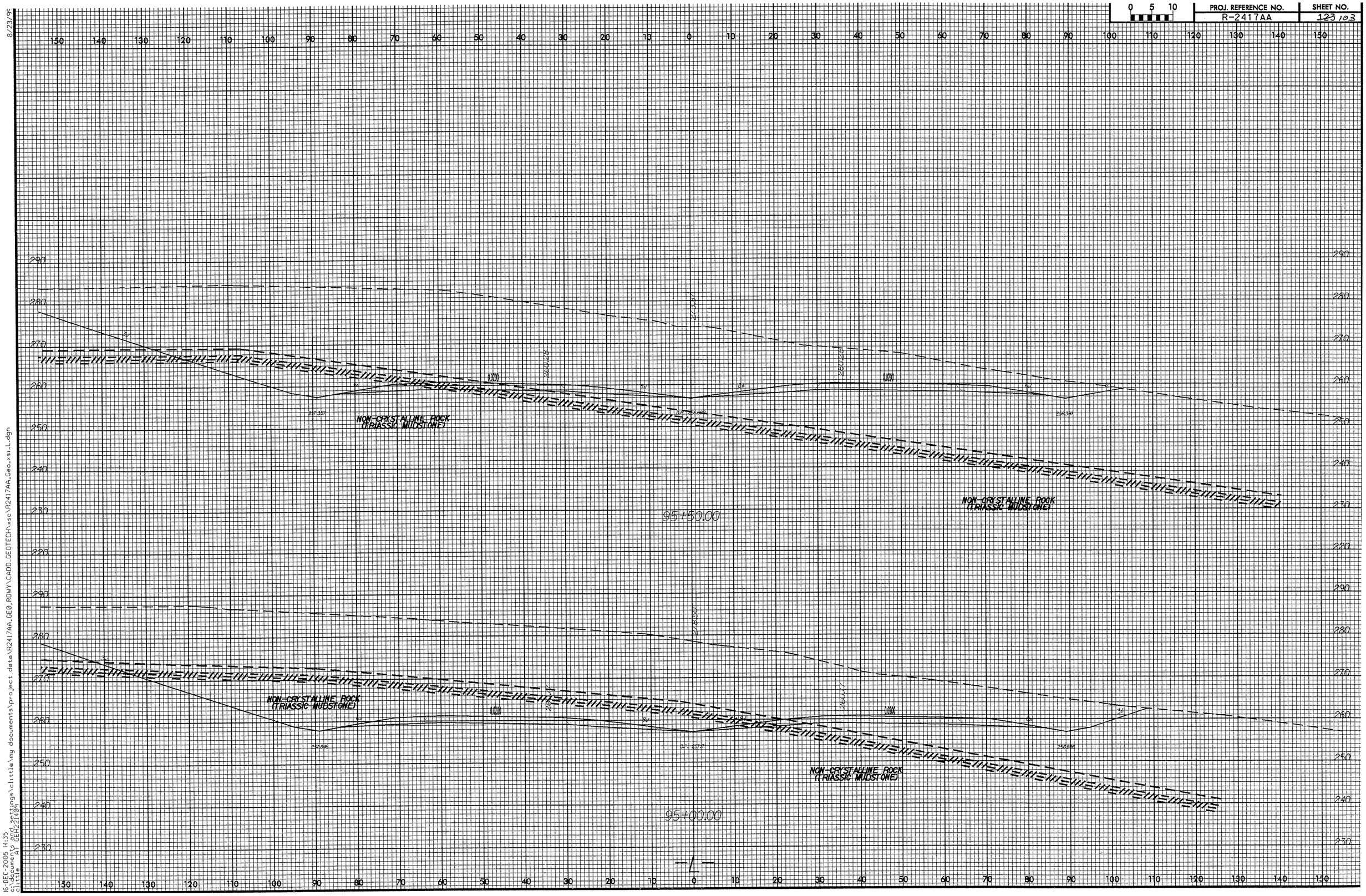

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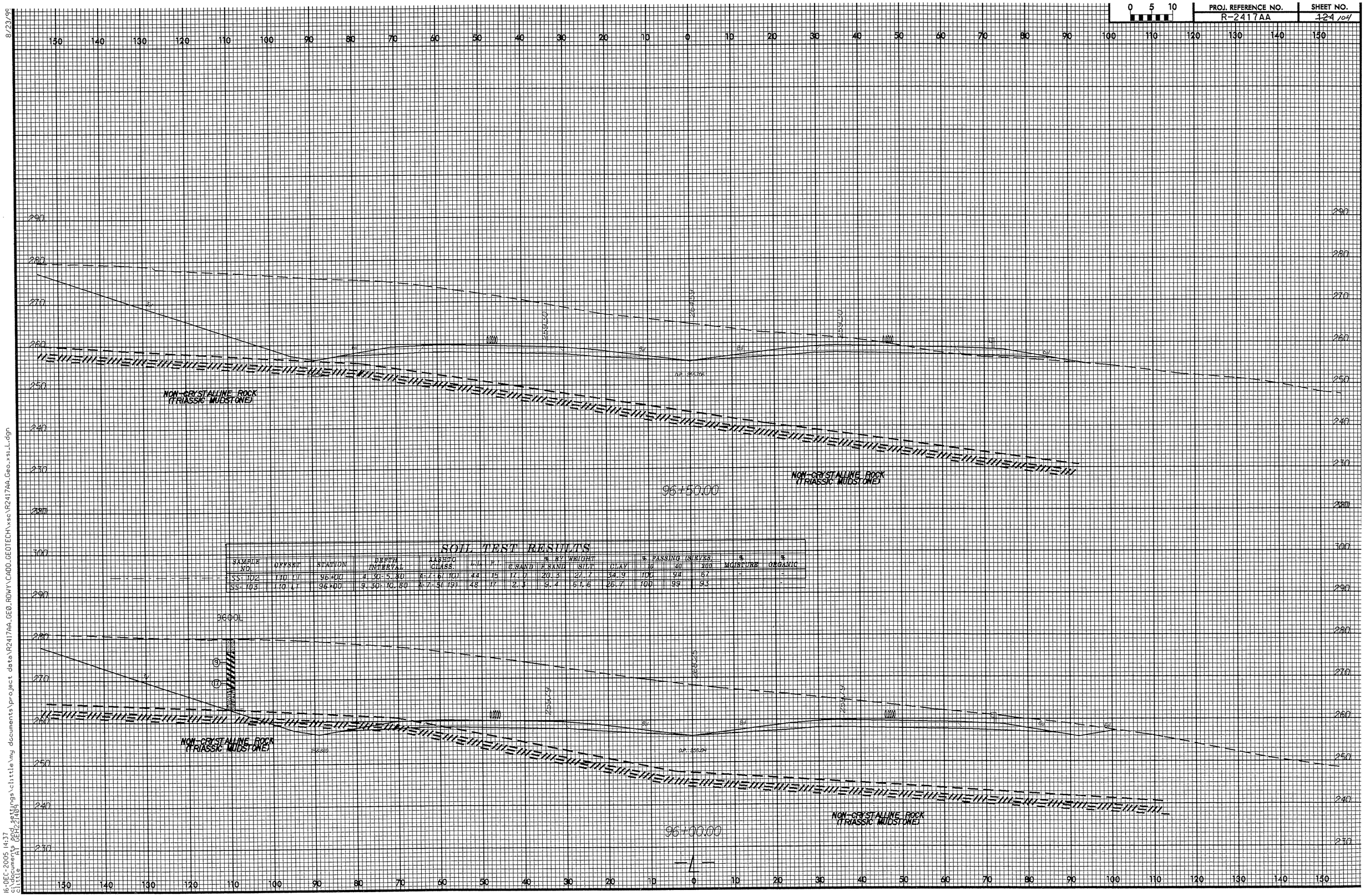

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT G.SAND	F.SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-102	110 LT	96+00	4.30-5.30	A-7-6 (10)	44	15	17.0	20.8	27.7	34.9	100	99	67	-	-
SS-103	110 LT	96+00	9.30-10.30	A-7-5 (19)	48	17	2.3	9.4	61.6	26.7	100	99	93	-	-

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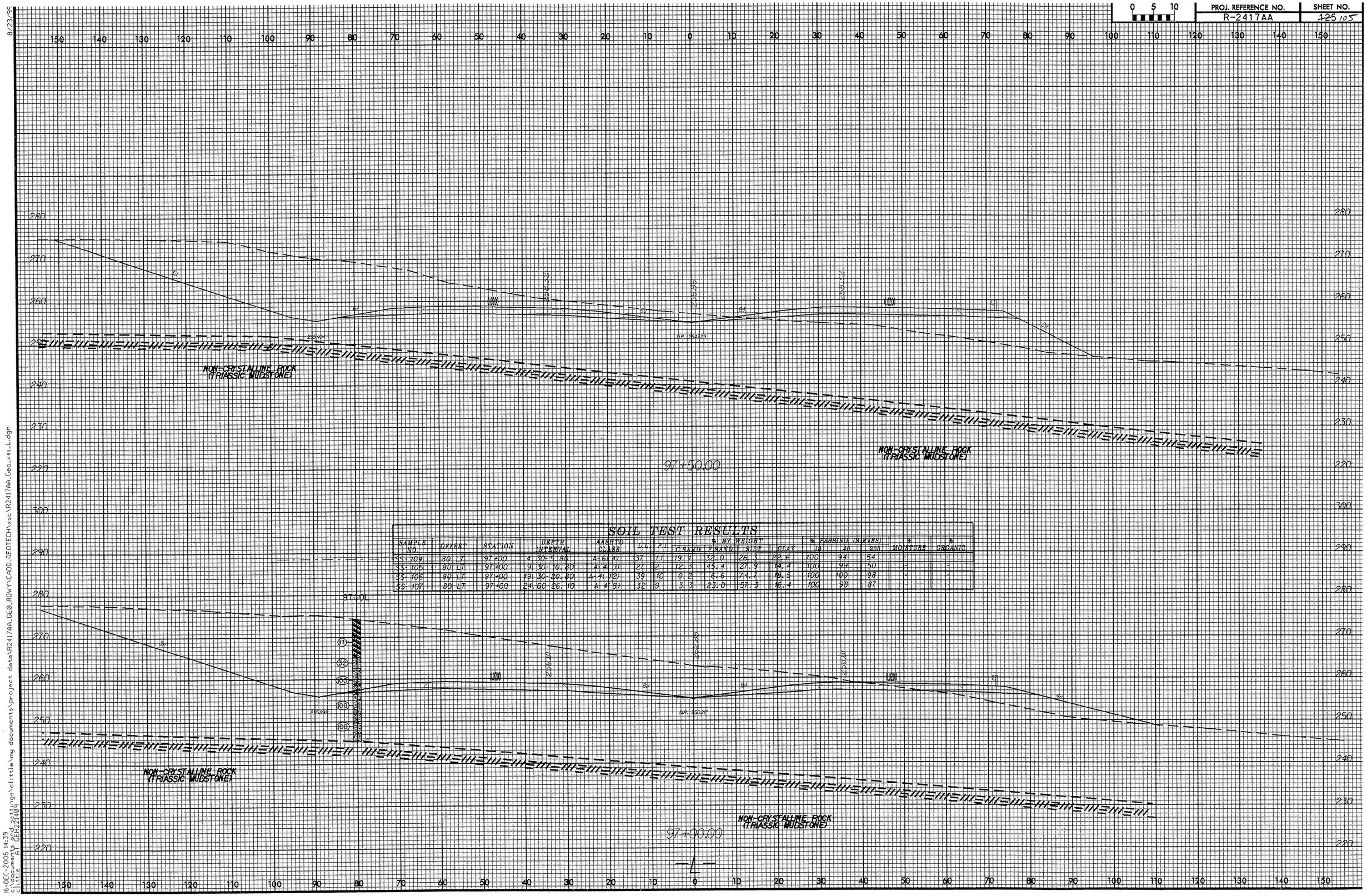
PROJ. REFERENCE NO.	SHEET NO.
R-2417AA	125 105



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	80 LT	97+00	4.30-5.80	A-6(4)	37	11	19.1	32.0	26.3	22.6	100	94	54	-	-
SS-105	80 LT	97+00	9.30-10.80	A-4(0)	27	2	12.3	45.4	27.9	14.4	100	99	50	-	-
SS-106	80 LT	97+00	19.30-20.80	A-4(12)	39	10	0.2	6.6	74.7	18.5	100	100	98	-	-
SS-107	80 LT	97+00	24.60-26.10	A-4(8)	32	9	3.3	23.0	57.3	16.4	100	98	87	-	-

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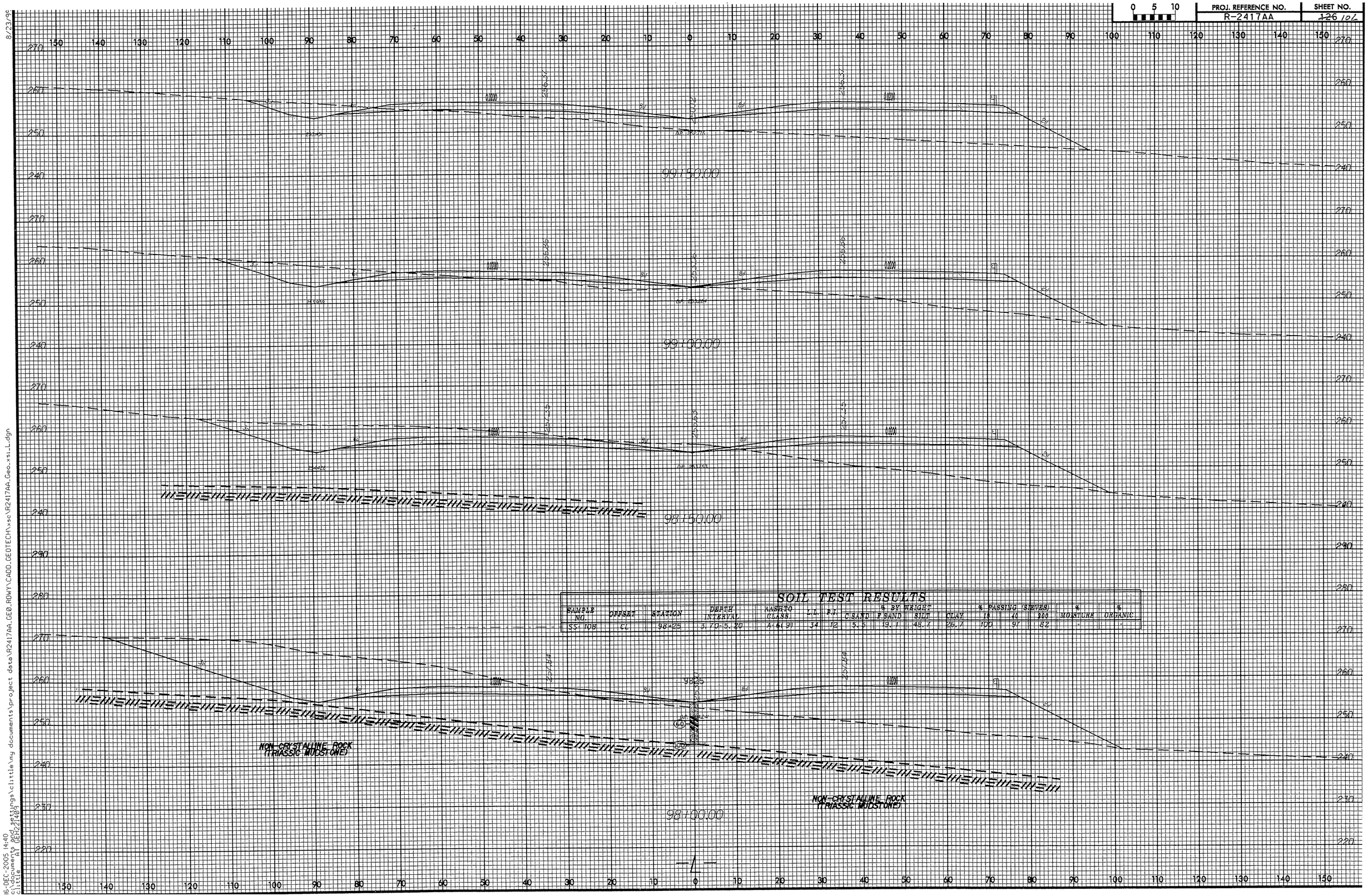

SOIL TEST RESULTS

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-108	CL	98+25	3.70-5.20	A-6(9)	34	12	5.5	19.1	48.7	26.7	100	97	82	-	-

8/23/99

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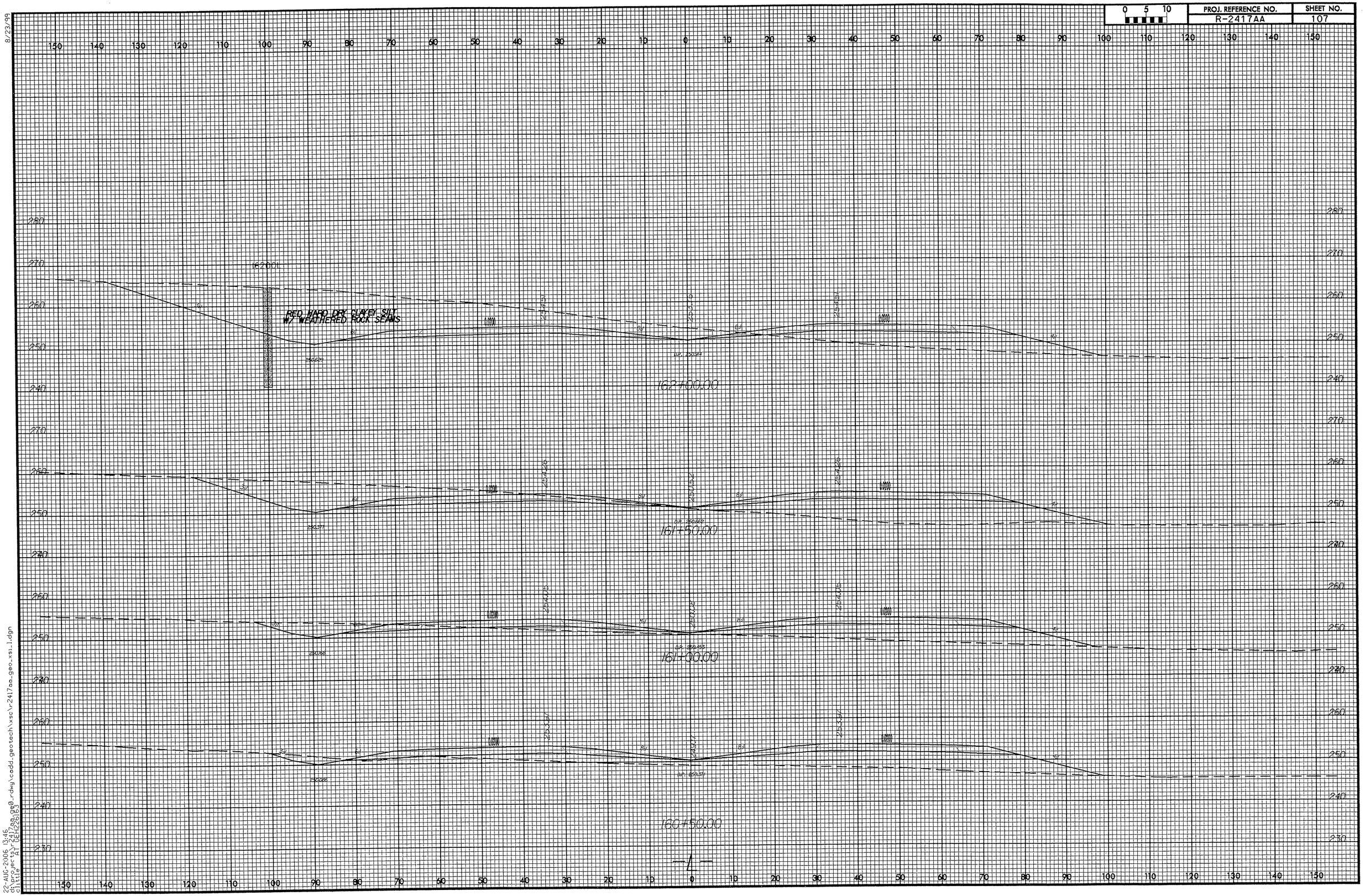

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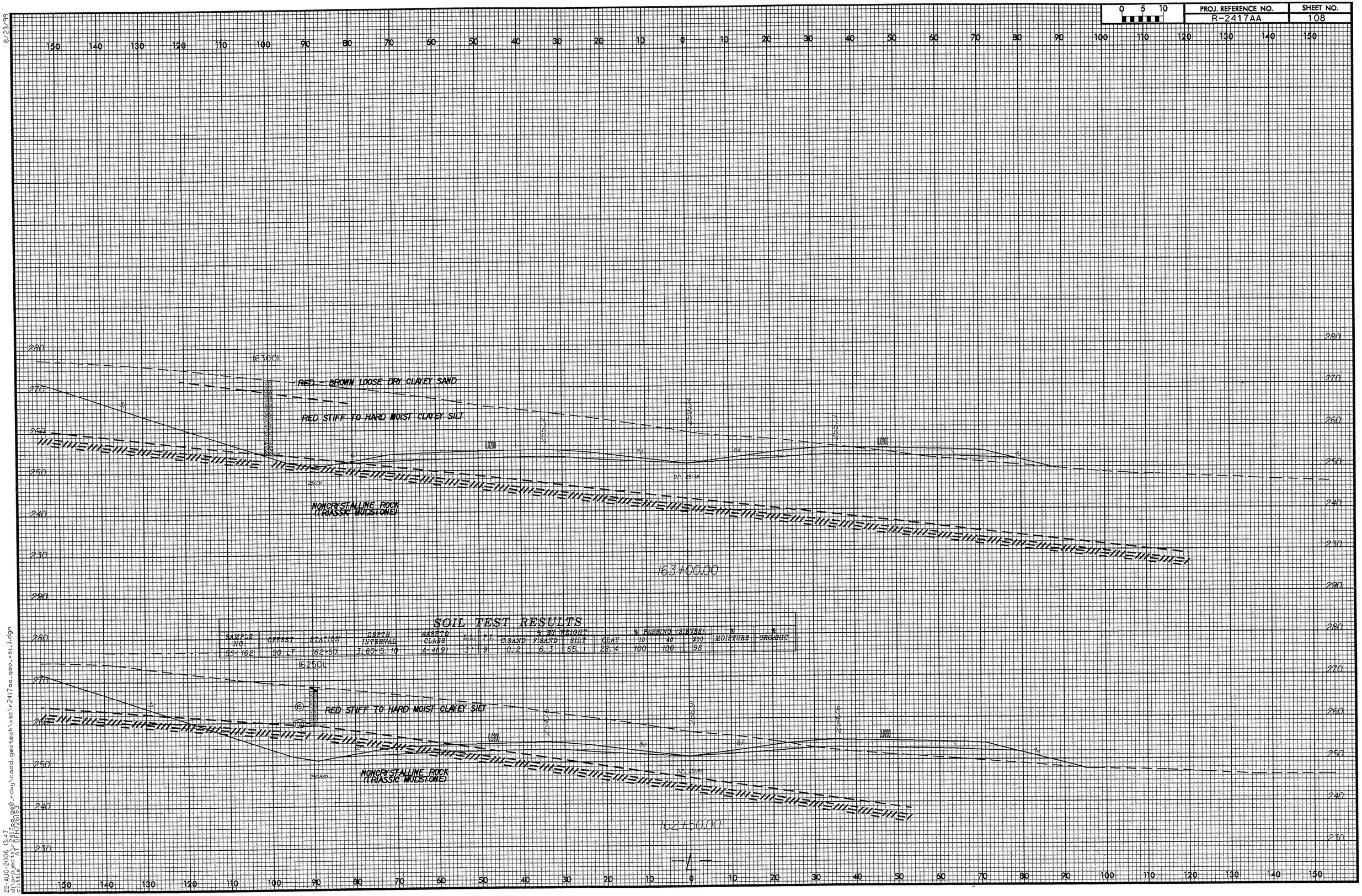
PROJ. REFERENCE NO.	SHEET NO.
R-2417AA	108



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-162	90 LT	162+50	3.80-5.10	A-4(9)	31	9	0.2	6.3	65.1	28.4	100	100	98		

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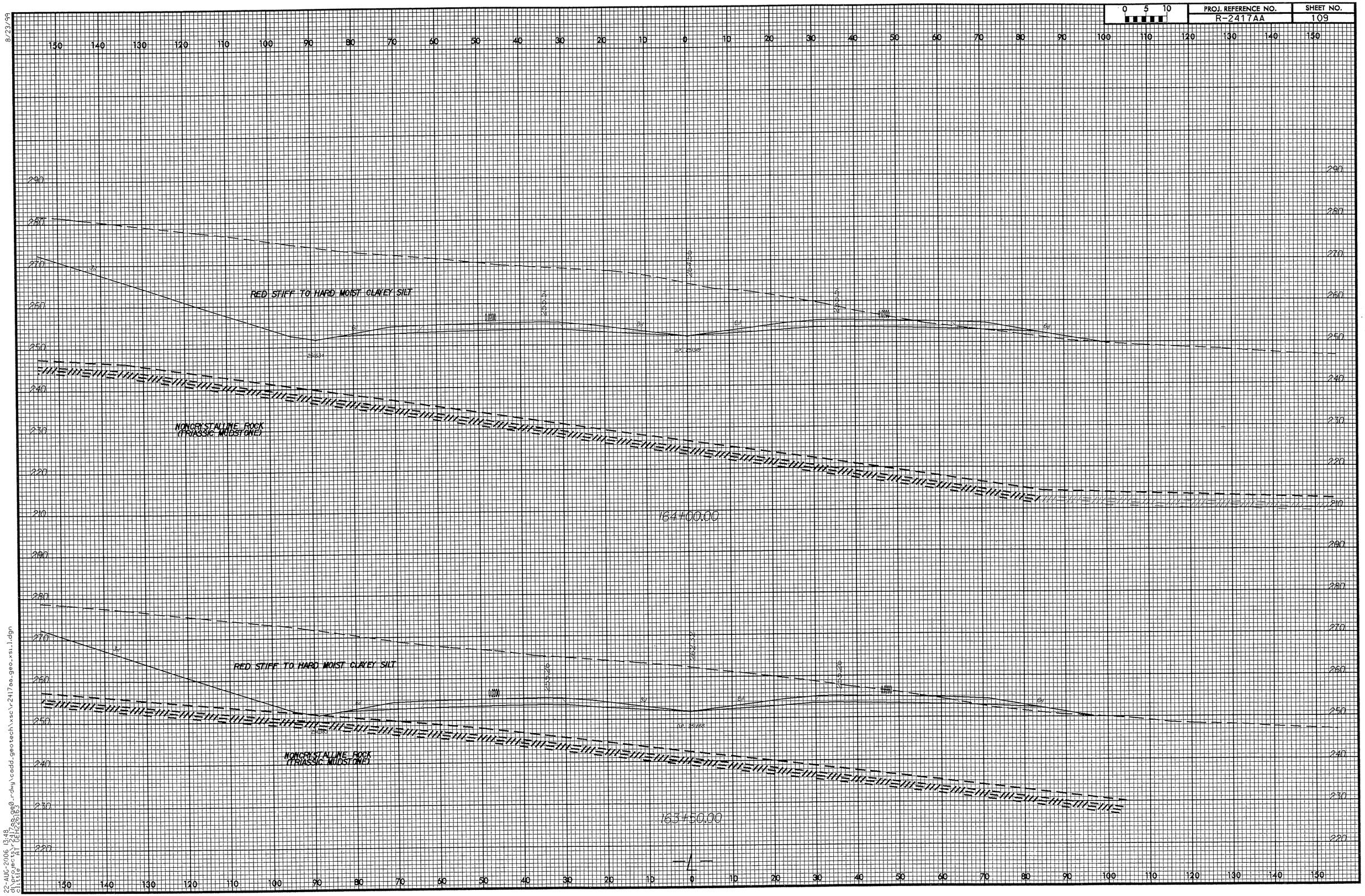

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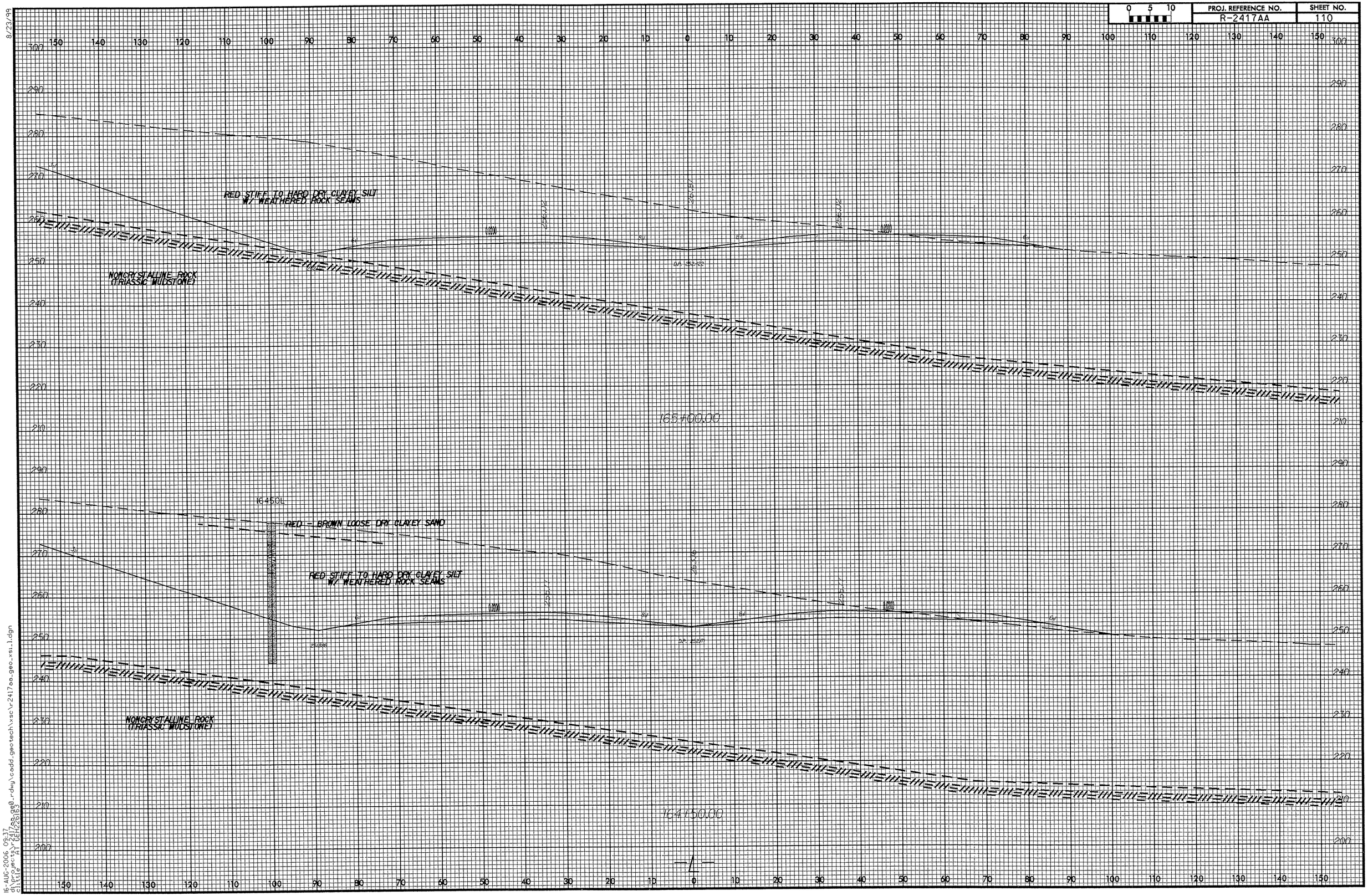

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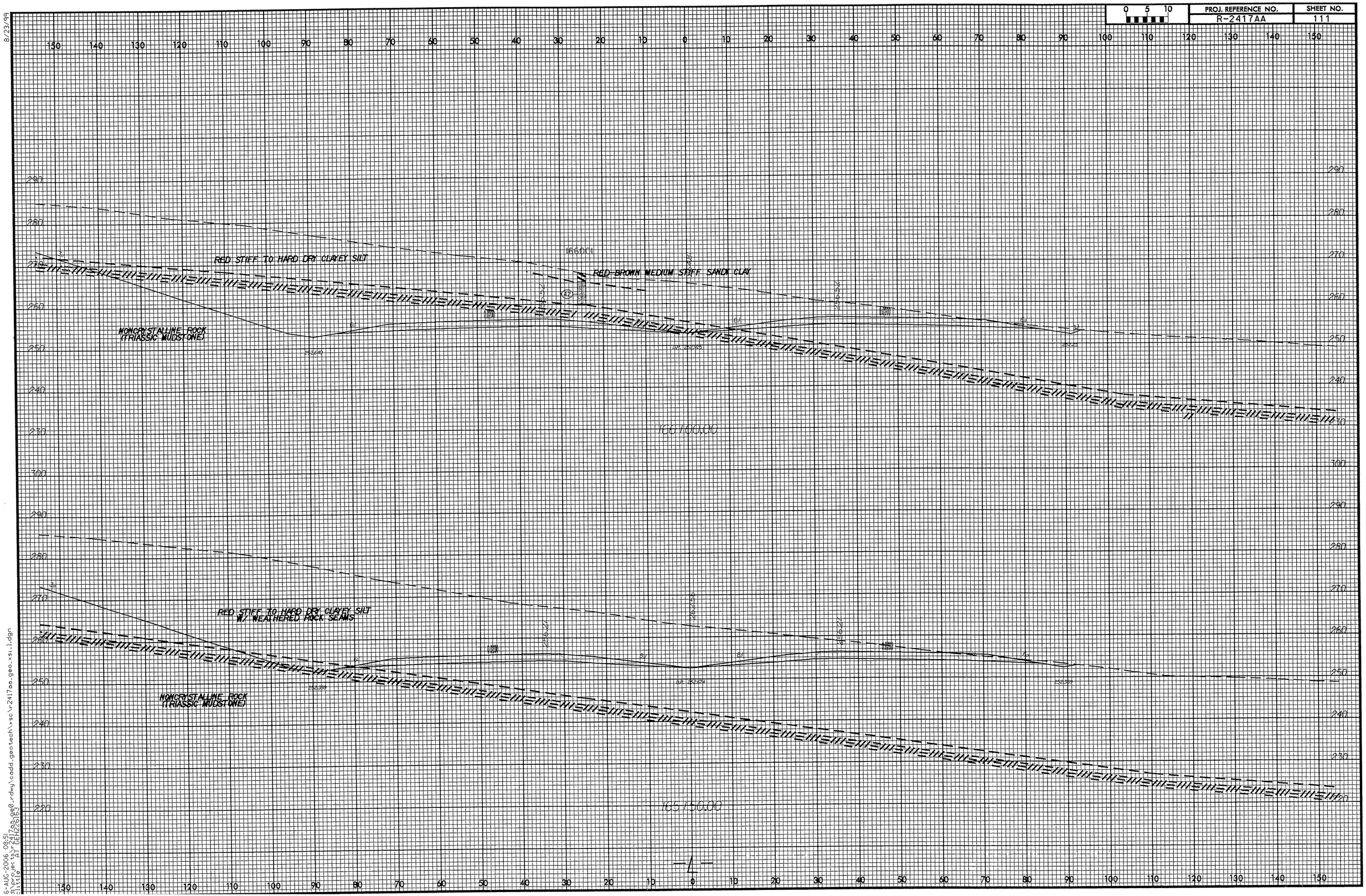
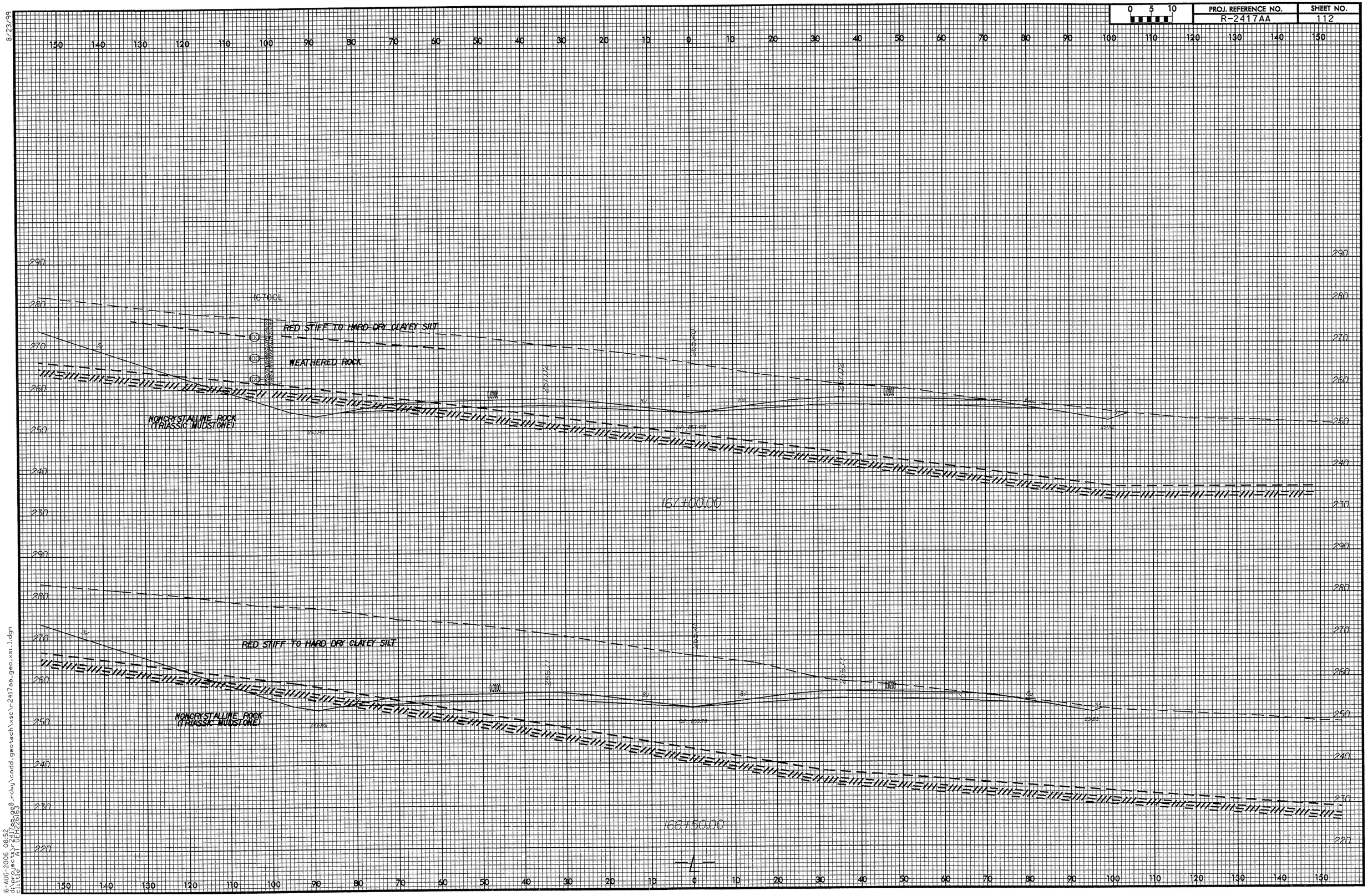


0 5 10
PROJ. REFERENCE NO.
R-2417AA
SHEET NO.
111
RED STIFF TO HARD DRY CLAYEY SILT
RED-BROWN MEDIUM STIFF SANDY CLAY
NONCRYSTALLINE ROCK
(TRIASSIC MUDSTONE)
166+00.00
RED STIFF TO HARD DRY CLAYEY SILT
W/ WEATHERED ROCK SEAMS
NONCRYSTALLINE ROCK
(TRIASSIC MUDSTONE)
165+50.00



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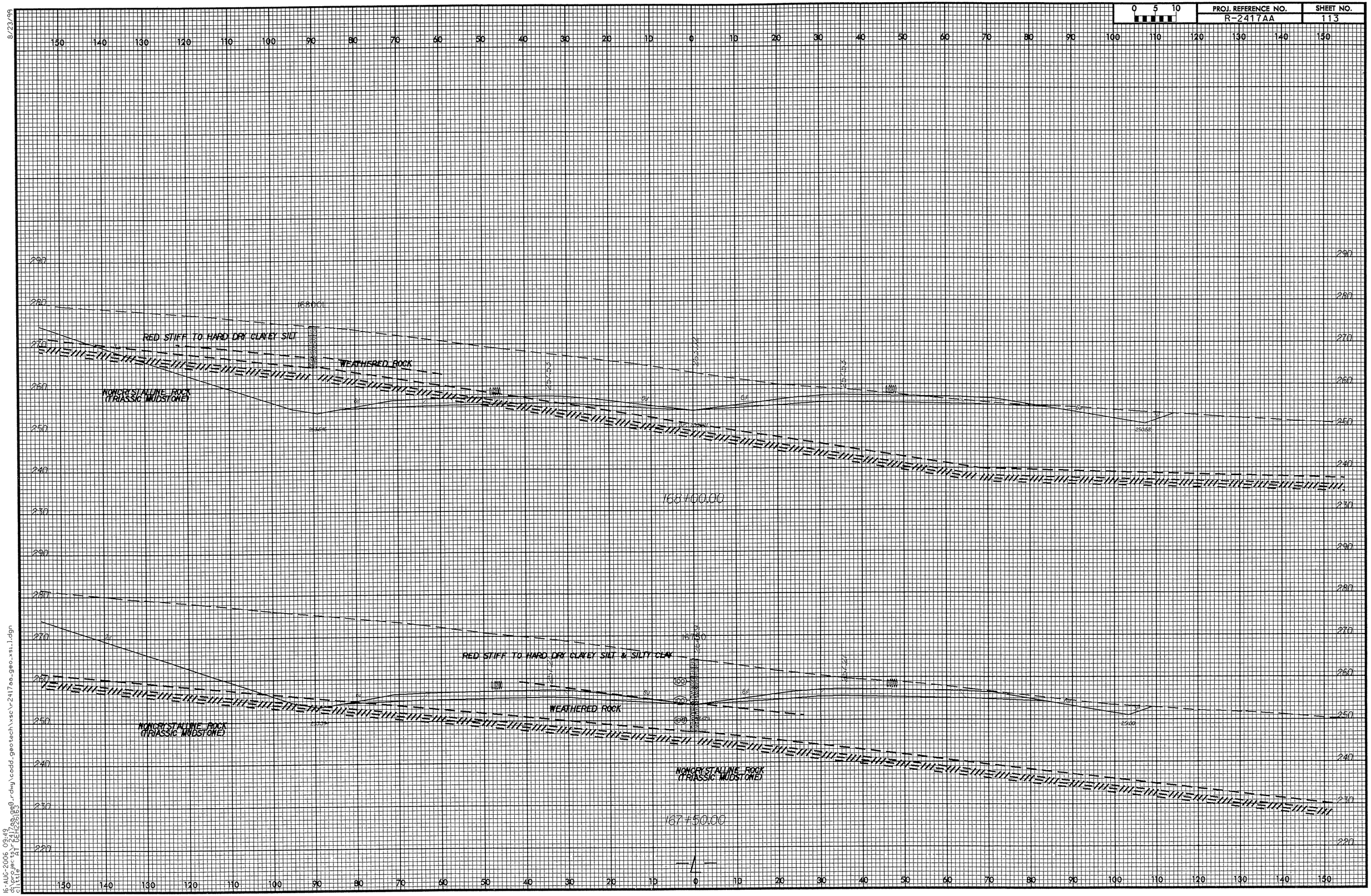

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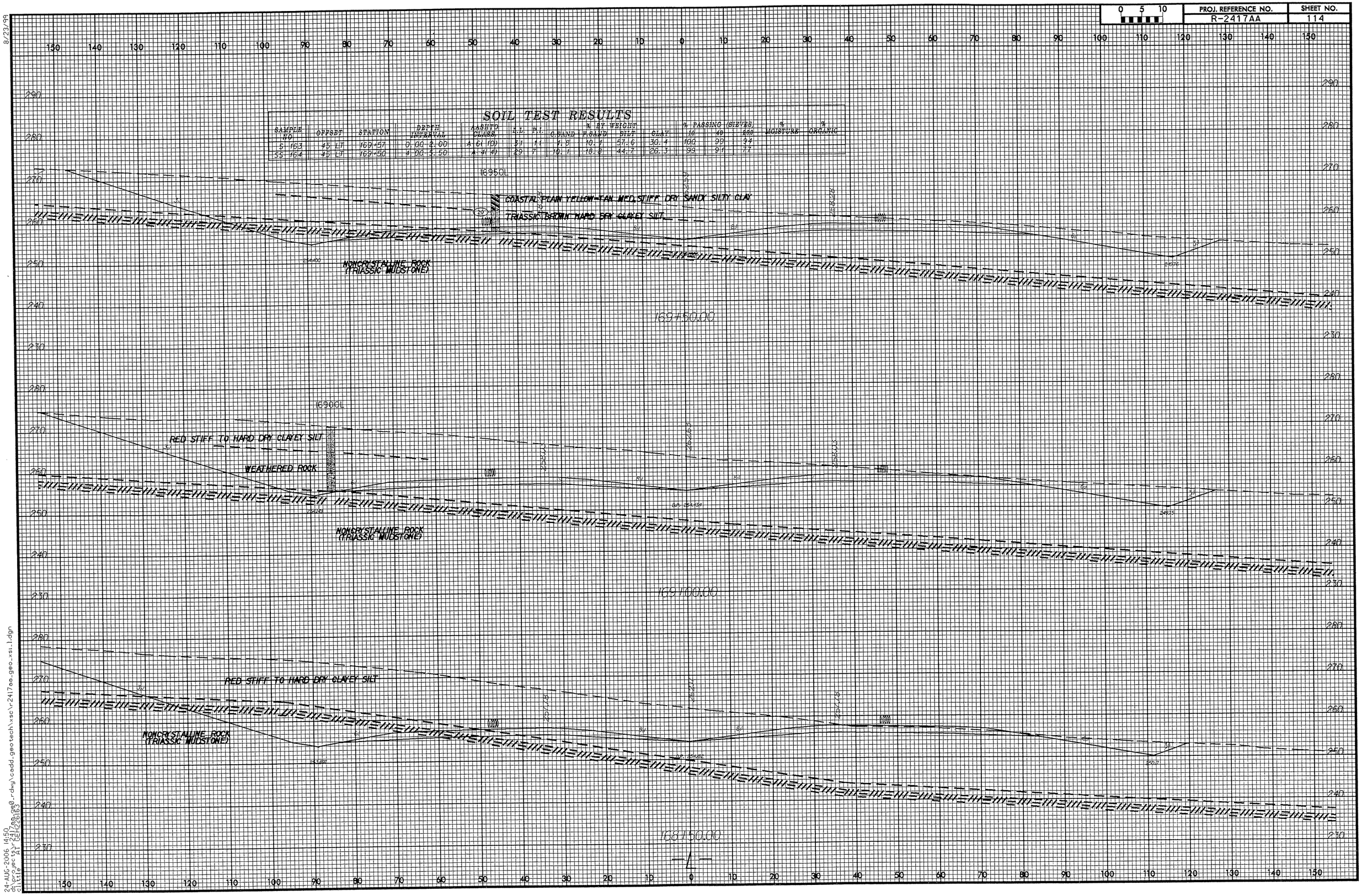
PROJ. REFERENCE NO.	SHEET NO.
R-2417AA	114

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 163	45 LT	169+57	0.00-2.00	A 6(10)	31	11	1.8	10.1	57.6	30.4	100	99	94		
SS 164	45 LT	169+50	4.00-5.50	A 4(4)	29	7	10.1	18.8	44.7	26.3	99	91	77		



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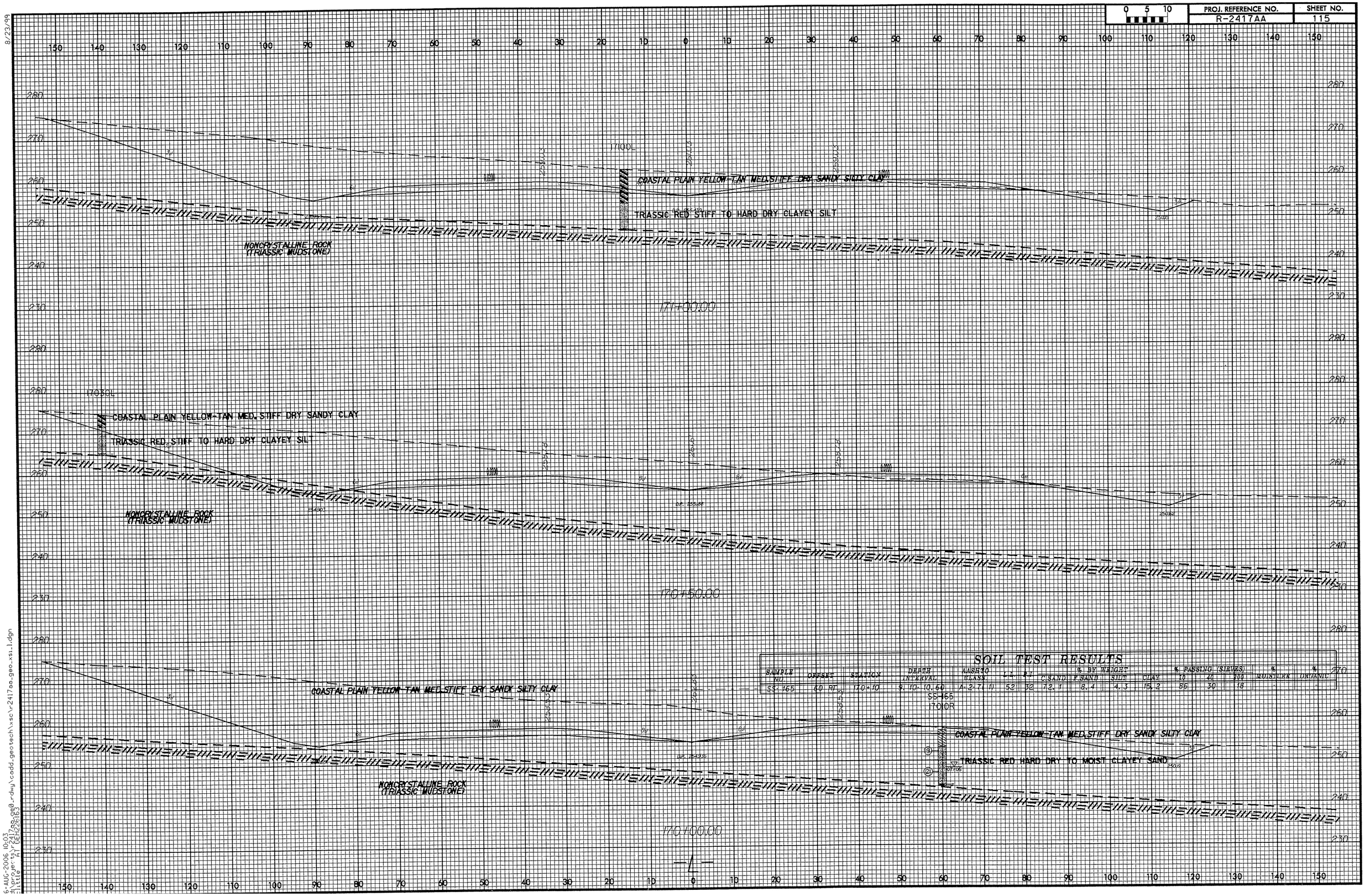
PROJ. REFERENCE NO.	SHEET NO.
R-2417AA	115



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-165	60 RT	170+10	9.10-10.60	A-2-7(1)	52	32	72.1	8.4	4.3	15.2	86	30	18		

8/23/99

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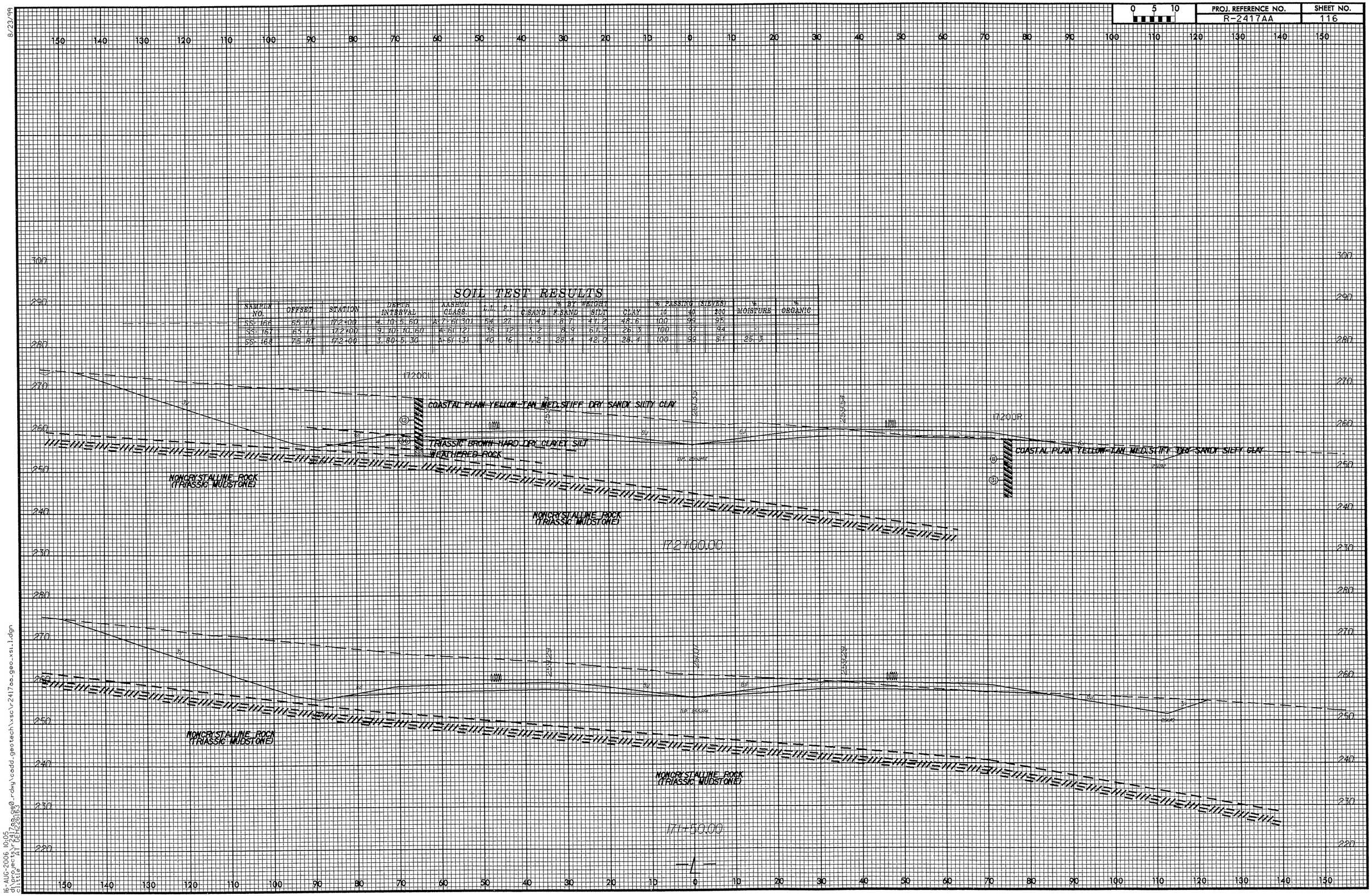
PROJ. REFERENCE NO.	SHEET NO.
R-2417AA	116



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-166	65 LT	172+00	4.10-5.60	A-7-6(30)	54	27	1.4	8.7	41.2	48.6	100	99	95	-	-
SS-167	65 LT	172+00	9.10-10.60	A-6(12)	36	12	3.2	8.9	61.5	26.3	100	97	94	-	-
SS-168	75 RT	172+00	3.80-5.30	A-6(13)	40	16	1.2	28.4	42.0	28.4	100	99	81	25.3	-

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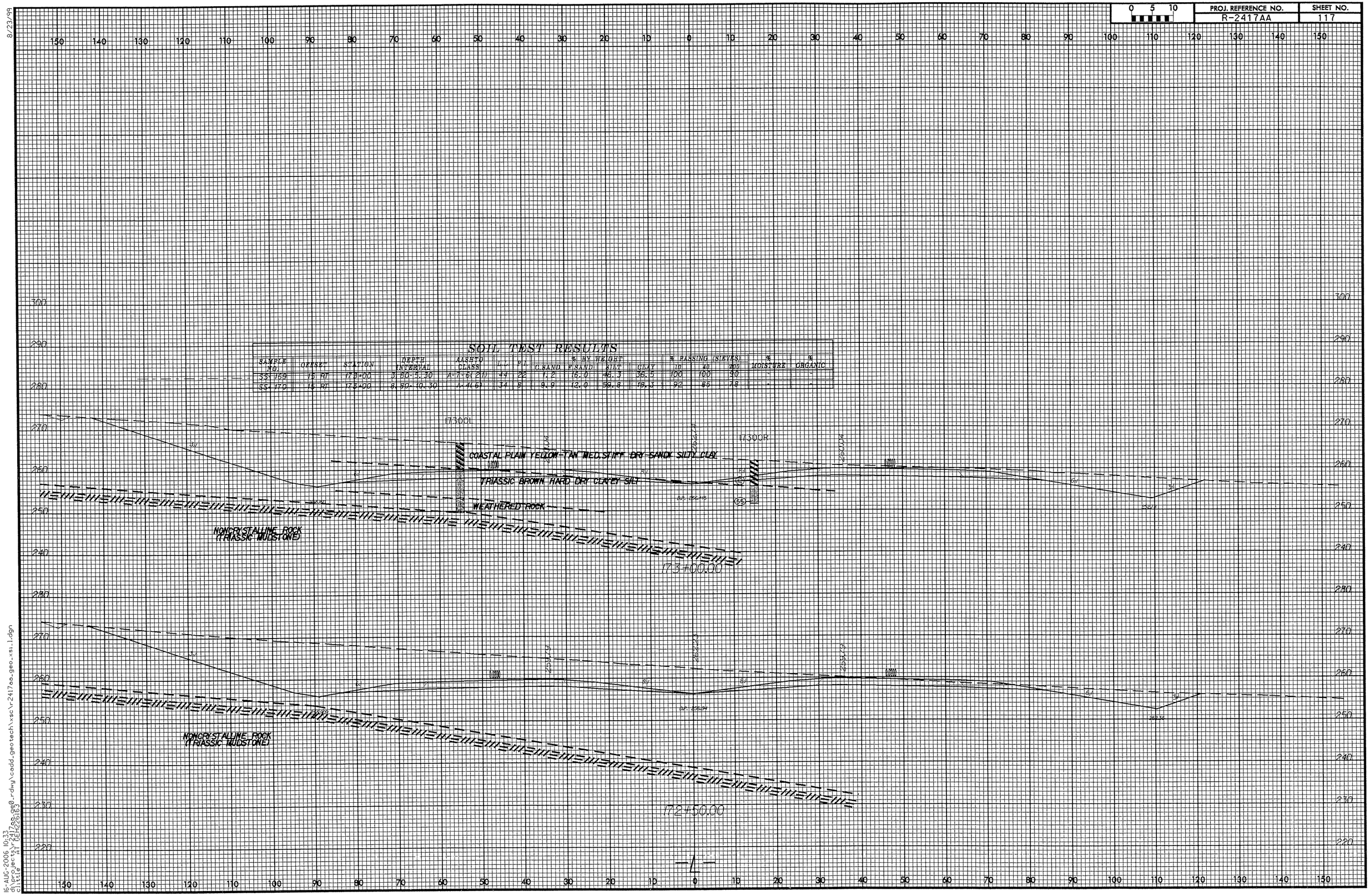
R-2417AA	117



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-169	15 RT	173+00	3.80-5.30	A-7-6(21)	44	22	1.2	16.0	46.3	36.5	100	100	90	-	-
SS-170	15 RT	173+00	8.80-10.30	A-4(6)	34	8	9.9	12.0	59.8	18.3	92	85	78	-	-

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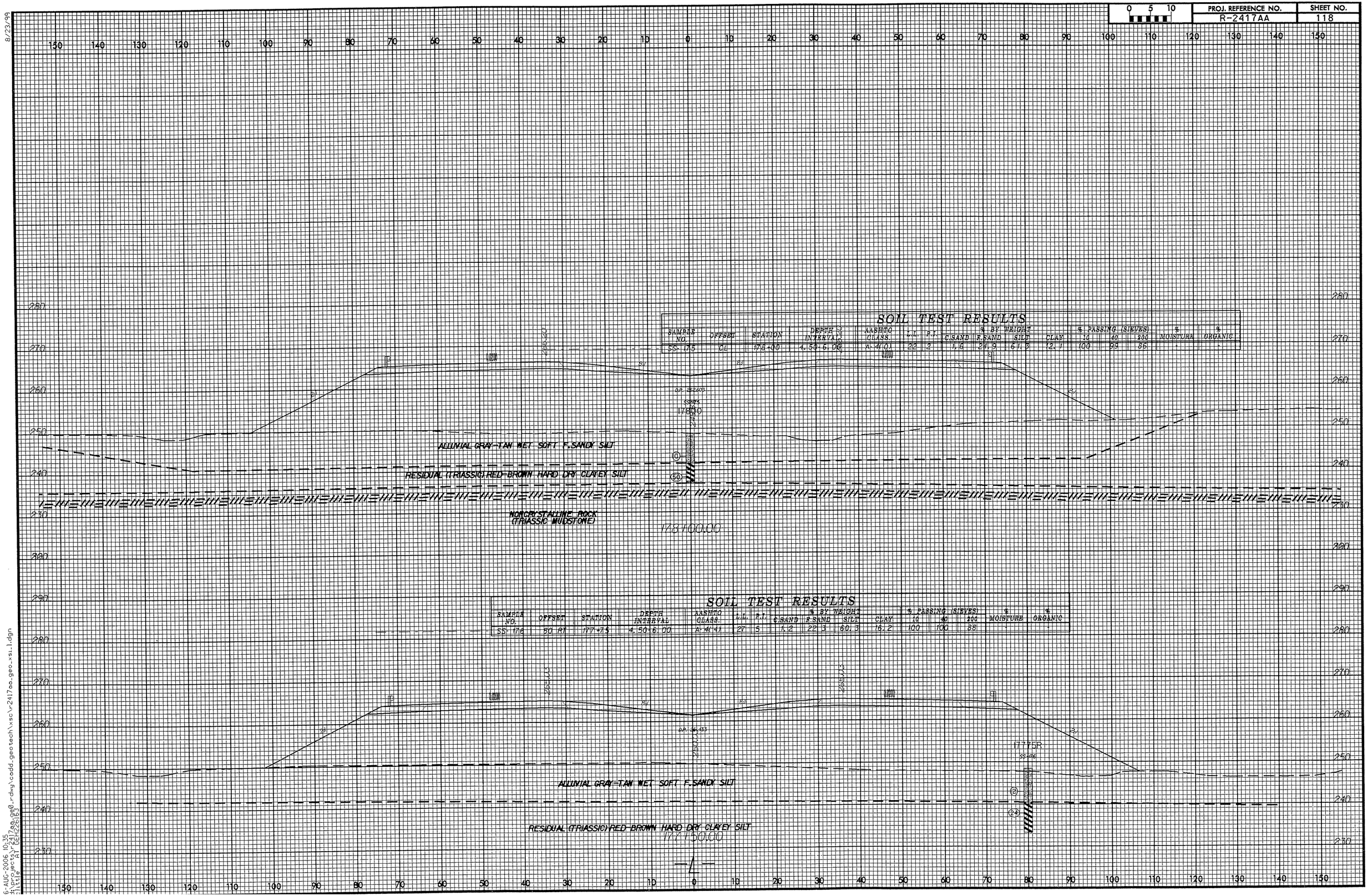
PROJ. REFERENCE NO.	SHEET NO.
R-2417AA	118



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	CL	178+00	4.50-6.00	A-4(0)	22	2	1.6	24.9	61.3	12.1	100	99	86	-	-

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-176	80 RT	177+75	4.50-6.00	A-4(4)	27	5	1.2	22.3	60.3	16.2	100	100	88	-	-

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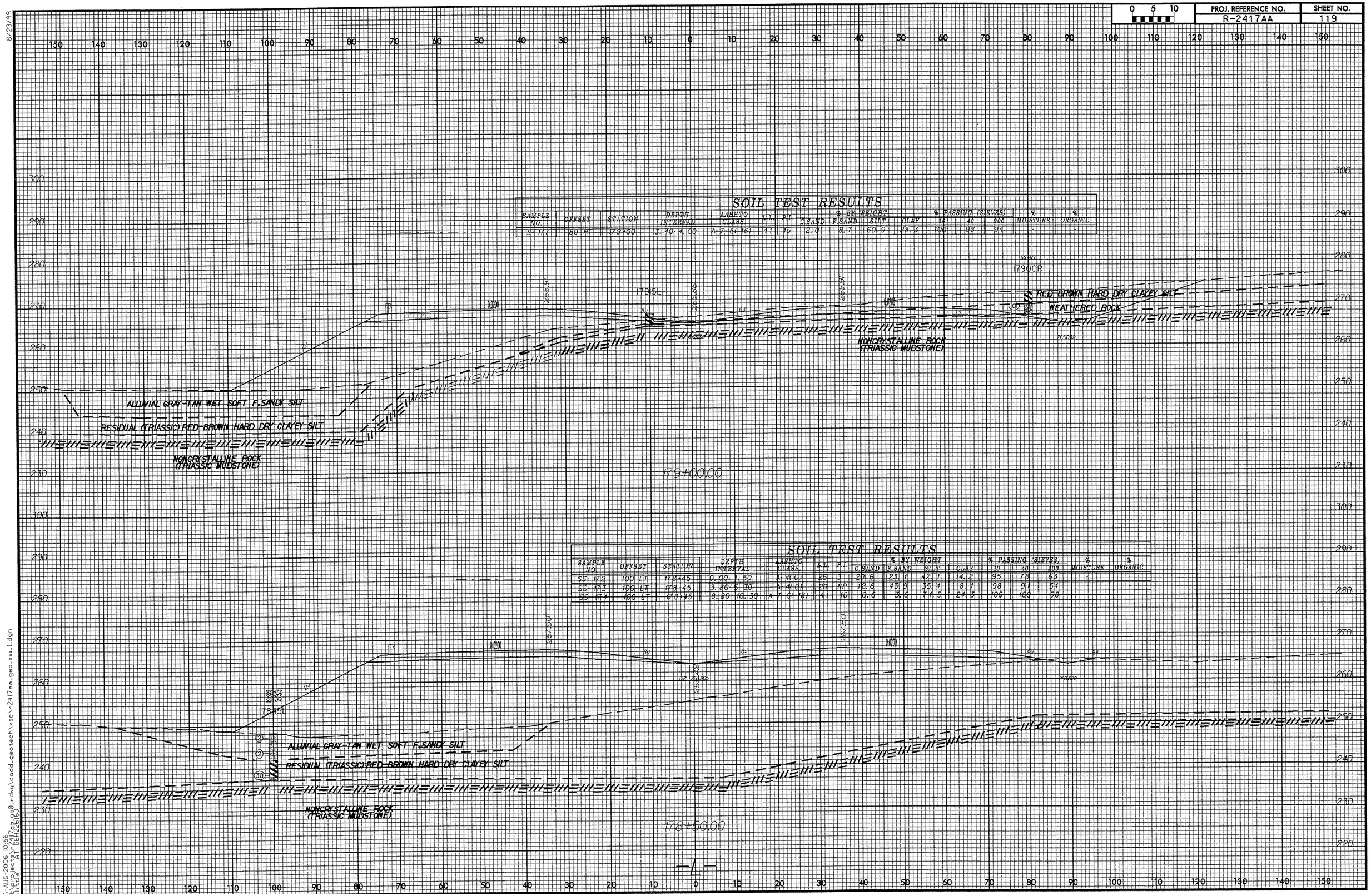

SOIL TEST RESULTS

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-117	80 RT	179+00	3.10-4.00	A-7-6(16)	41	15	2.0	8.7	60.9	28.3	100	98	94	-	-

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-172	100 LT	178+45	0.00-1.50	A-4(0)	25	3	20.6	23.1	42.1	14.2	95	78	63	-	-
SS-173	100 LT	178+45	3.80-5.30	A-4(0)	20	NP	12.6	43.9	35.4	8.1	98	94	54		
SS-174	100 LT	178+45	8.80-10.30	A-7-6(10)	41	10	6.6	3.6	44.5	24.3	100	100	98		

8/23/99
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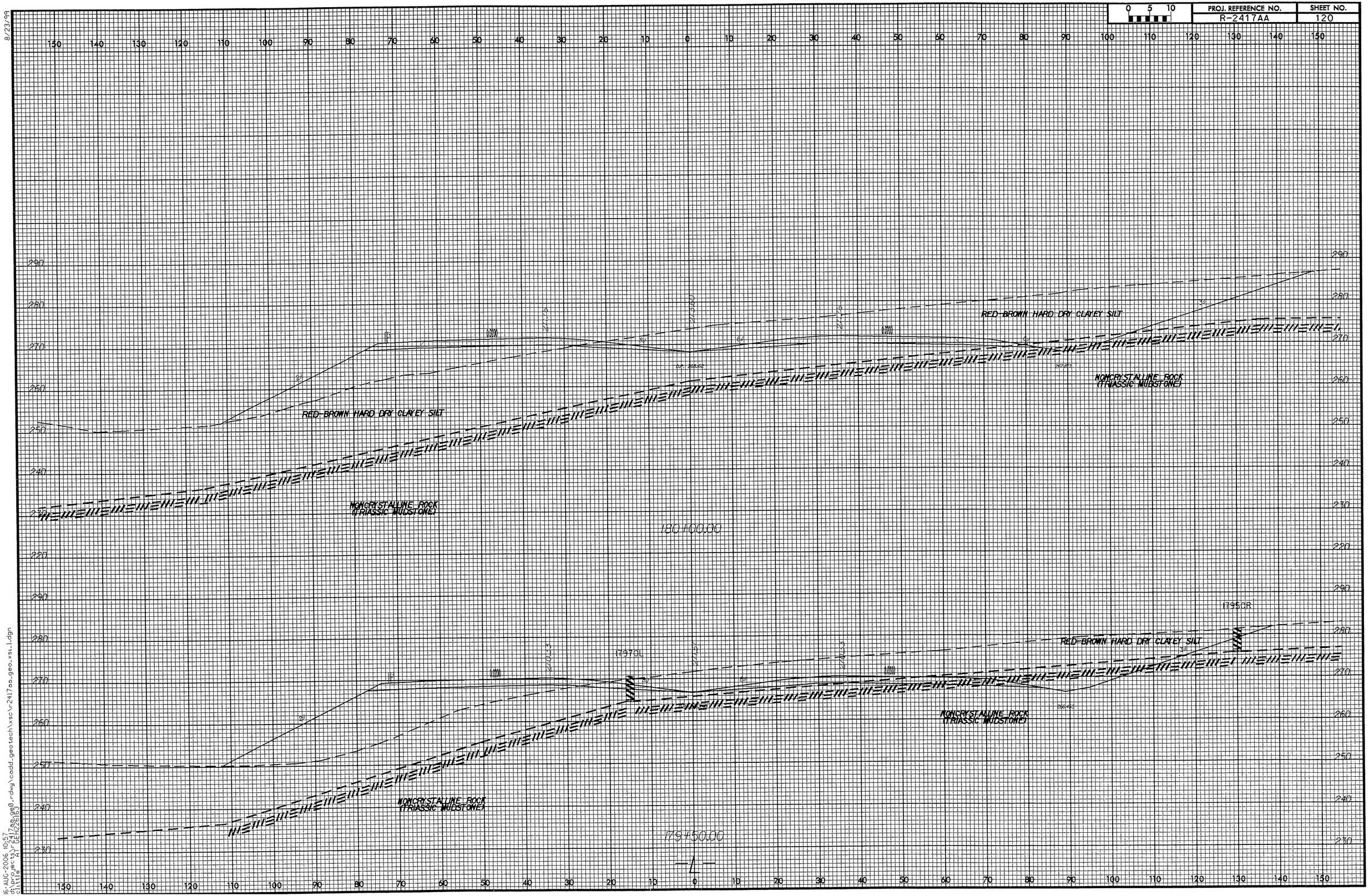

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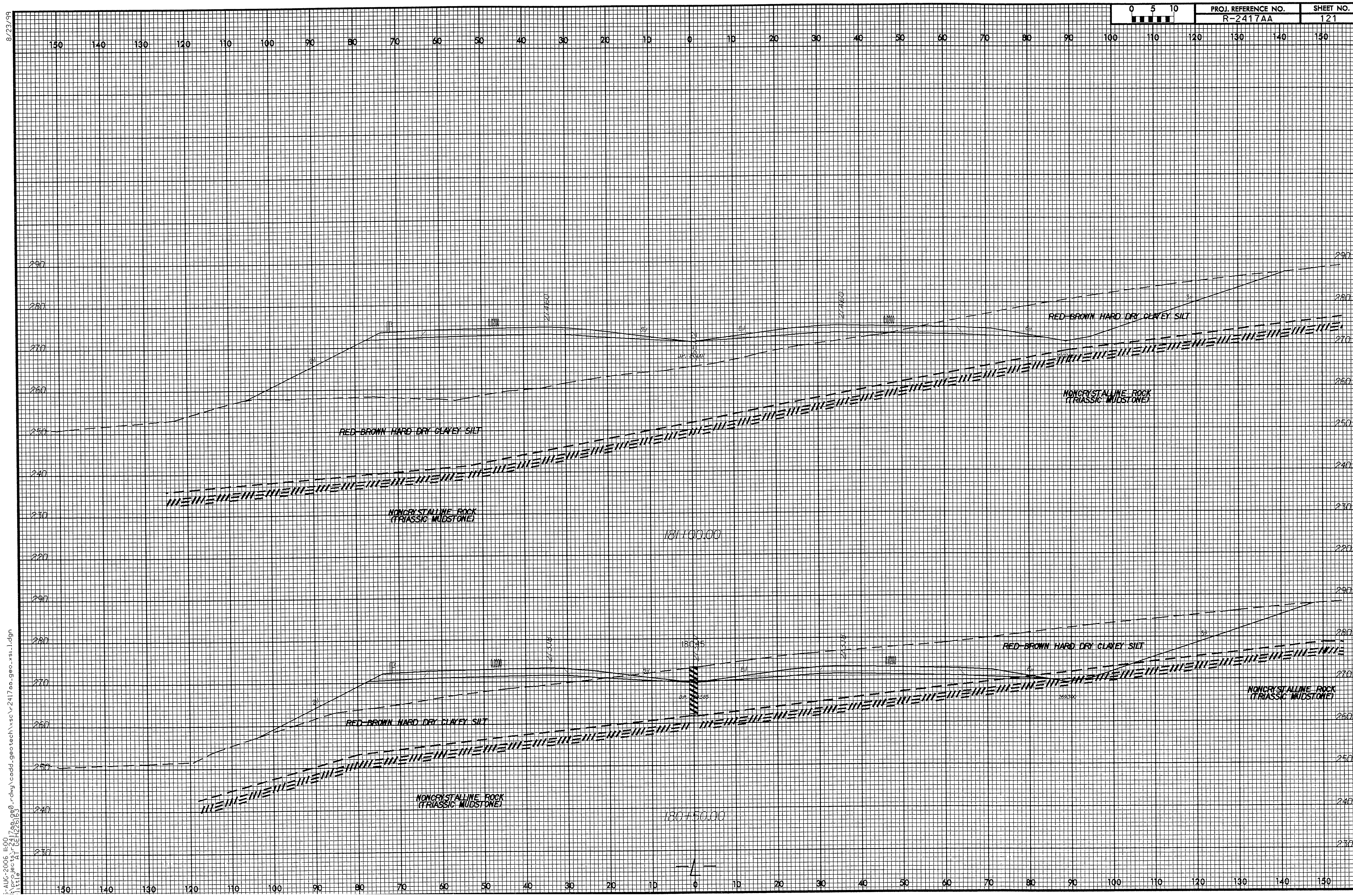
R-2417AA	121

8/23/99



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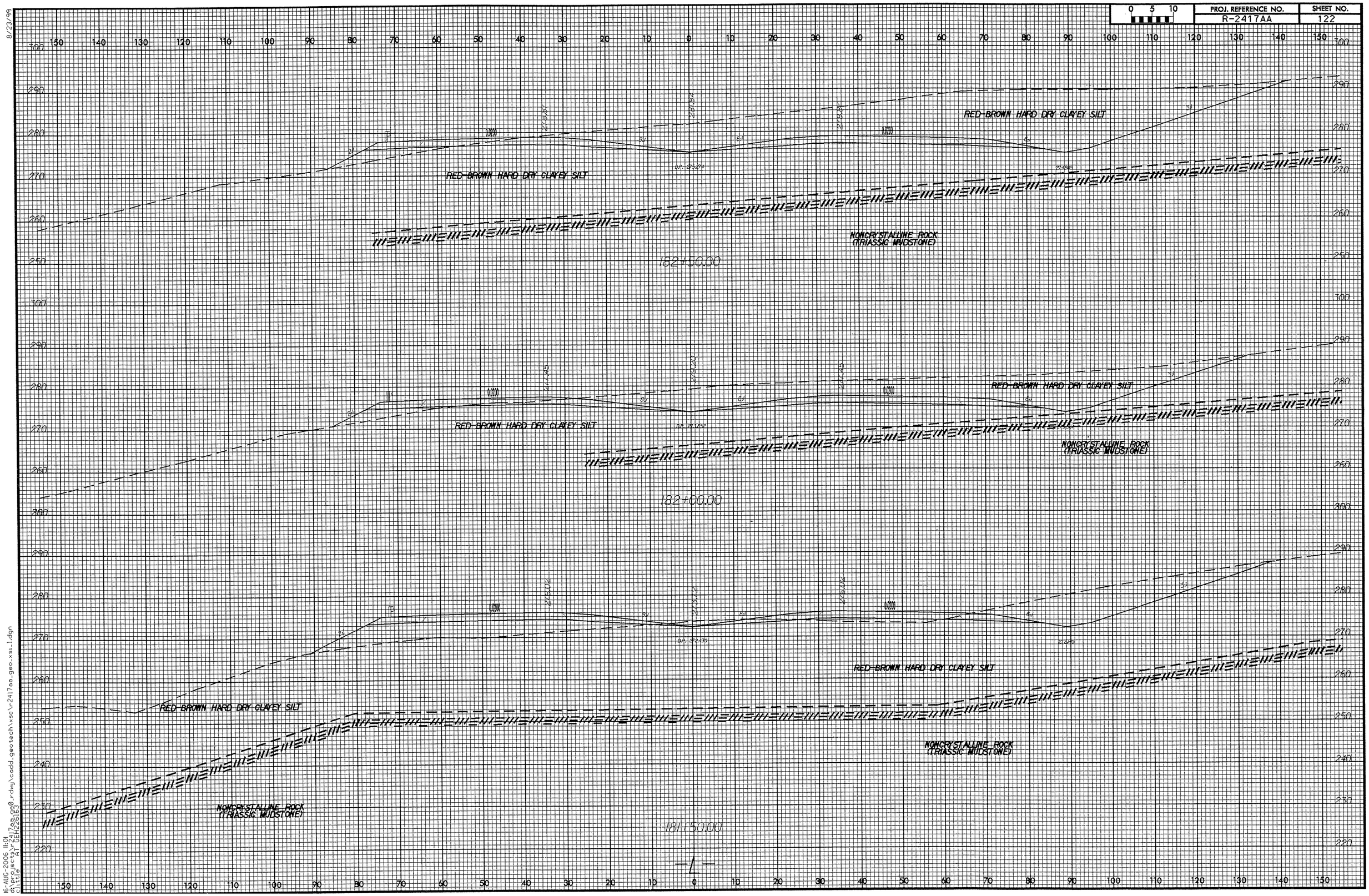

8/23/99

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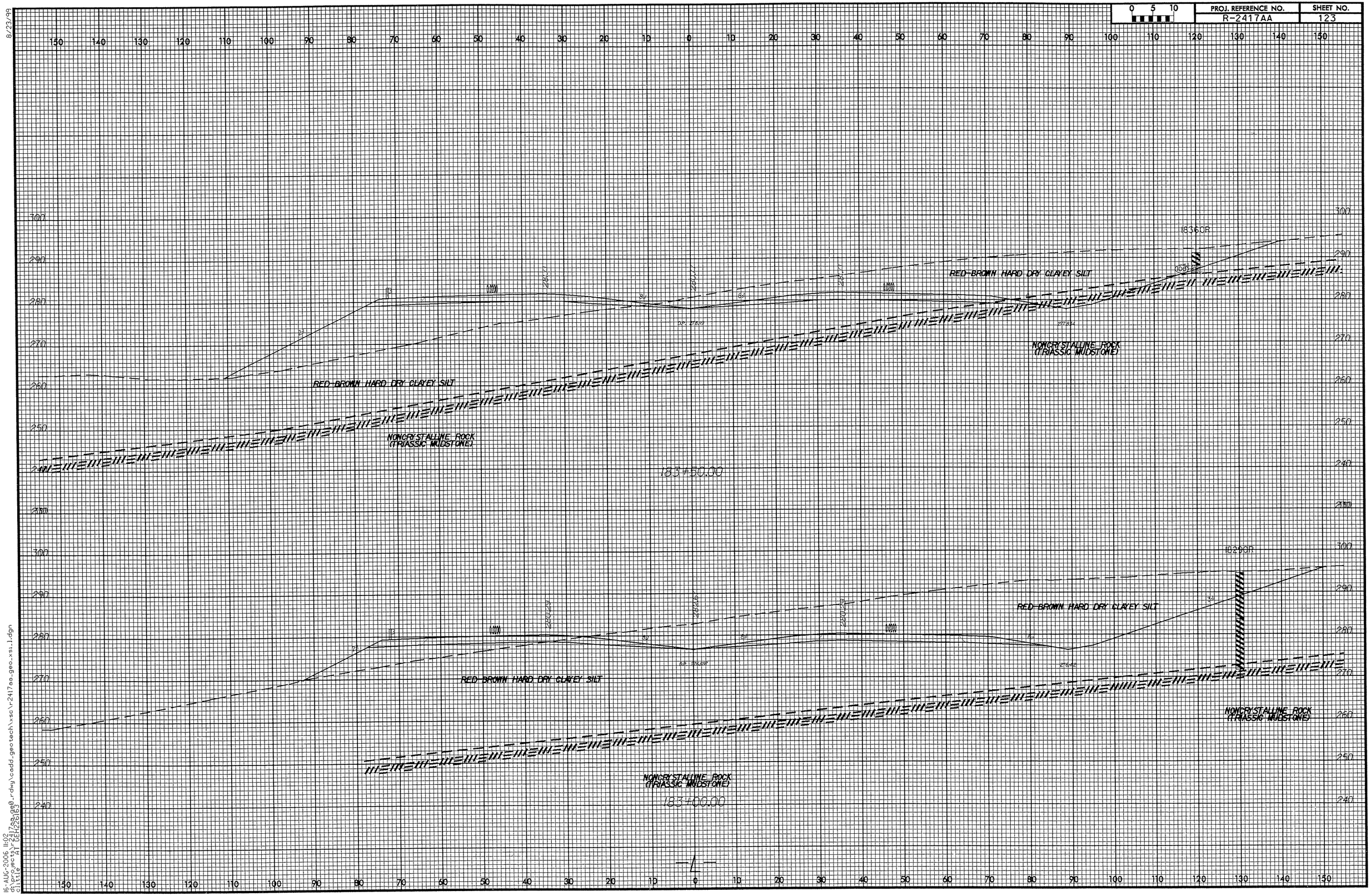

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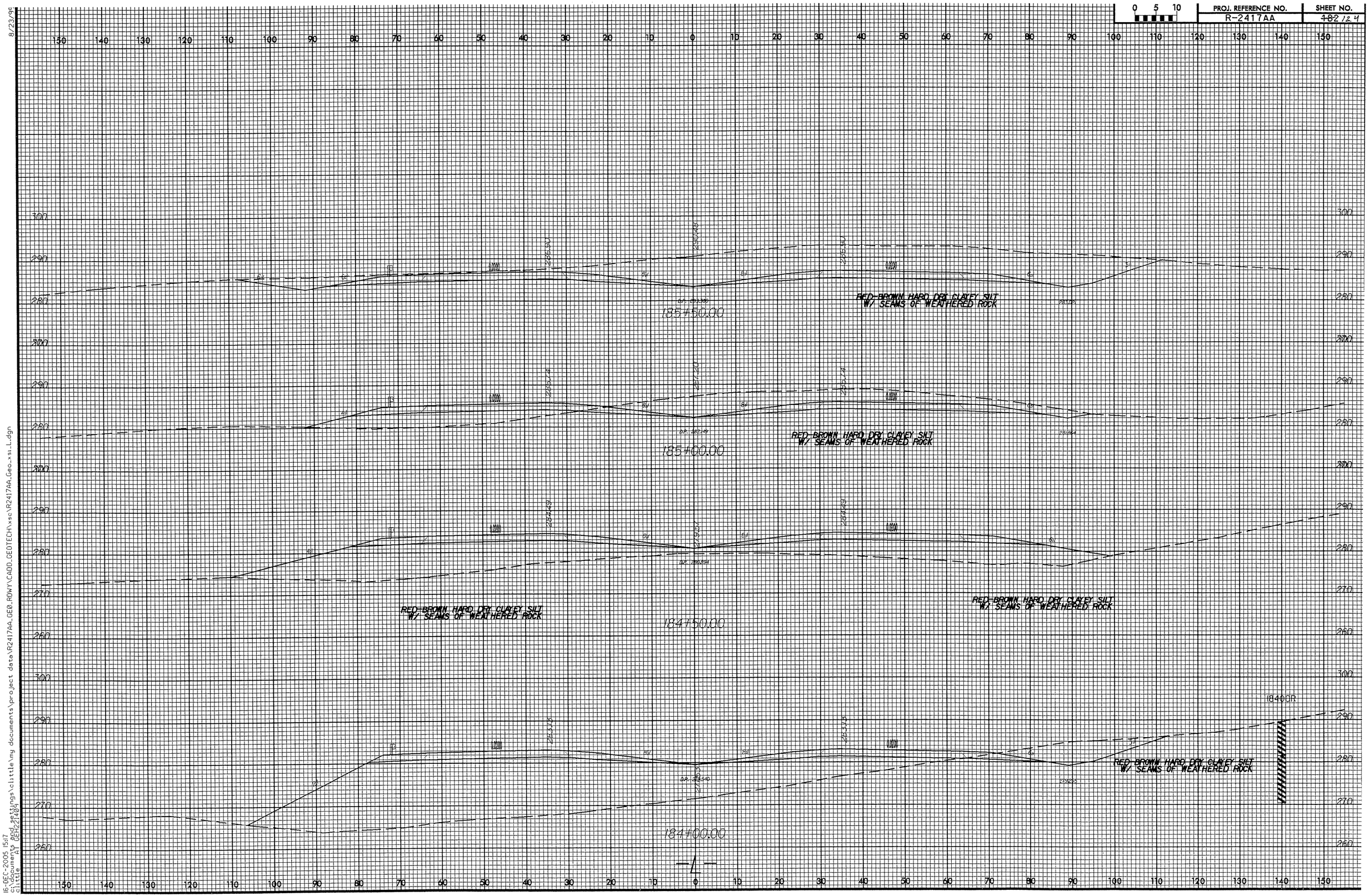

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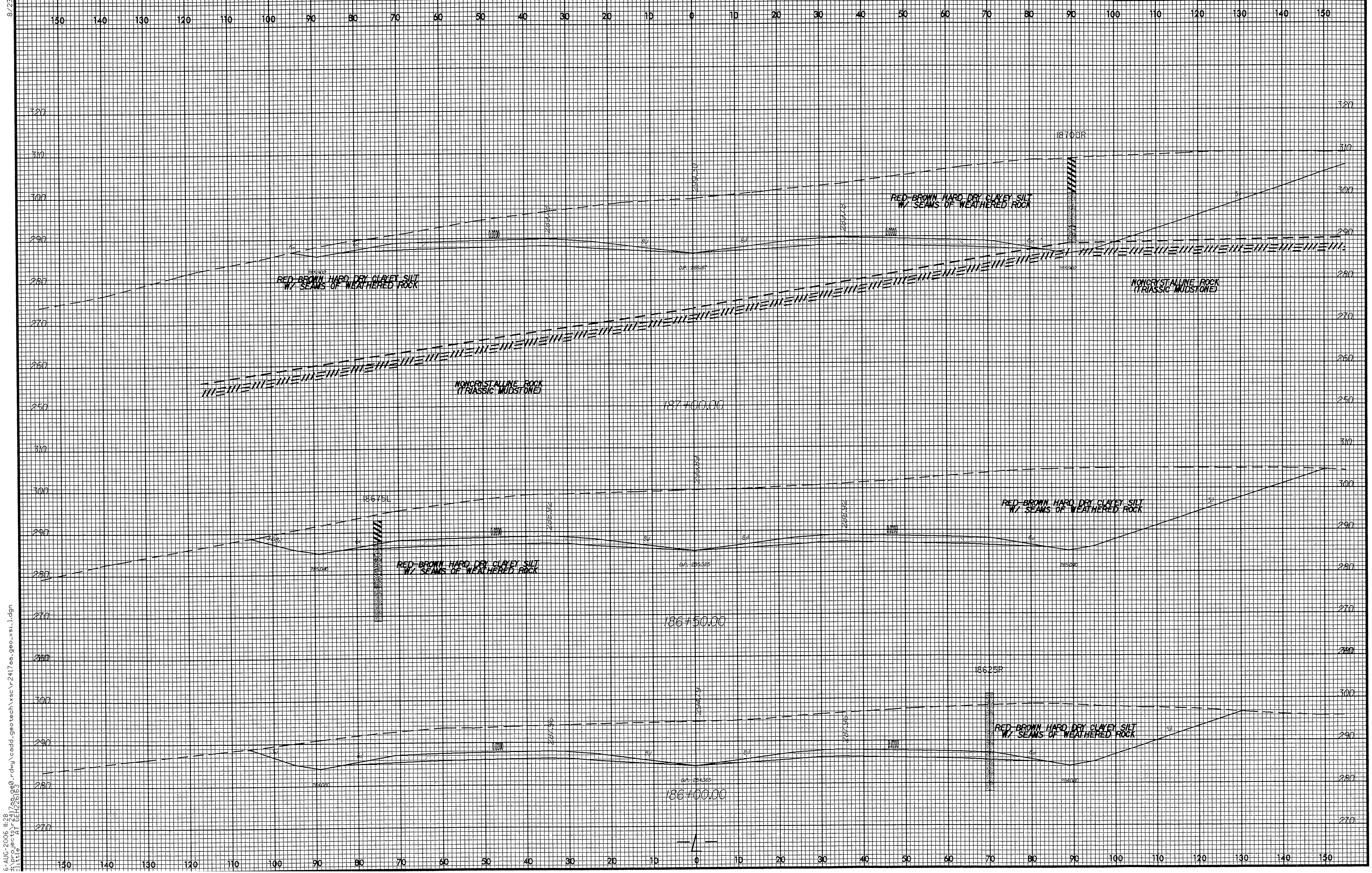
R-2417AA	125



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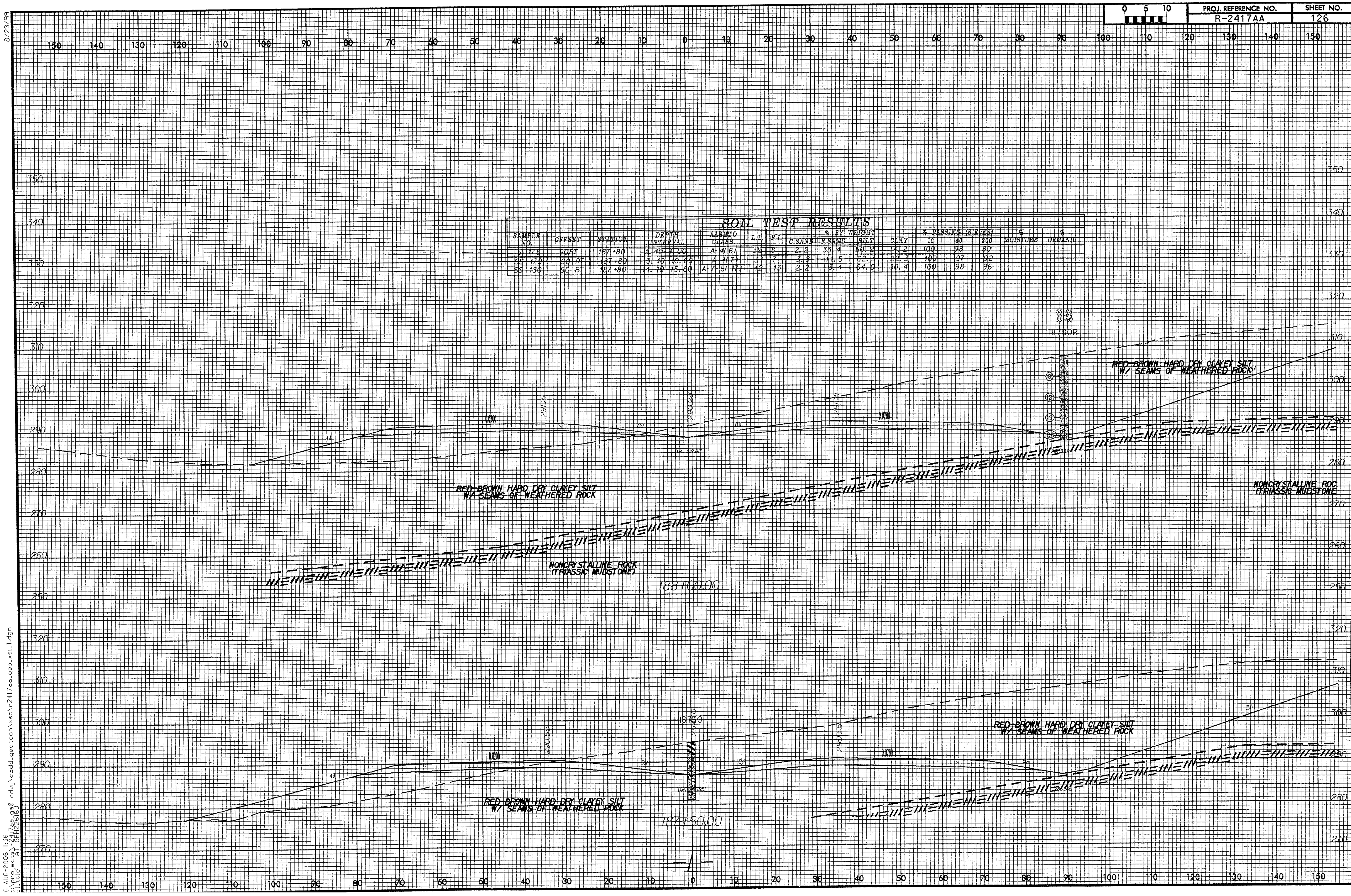
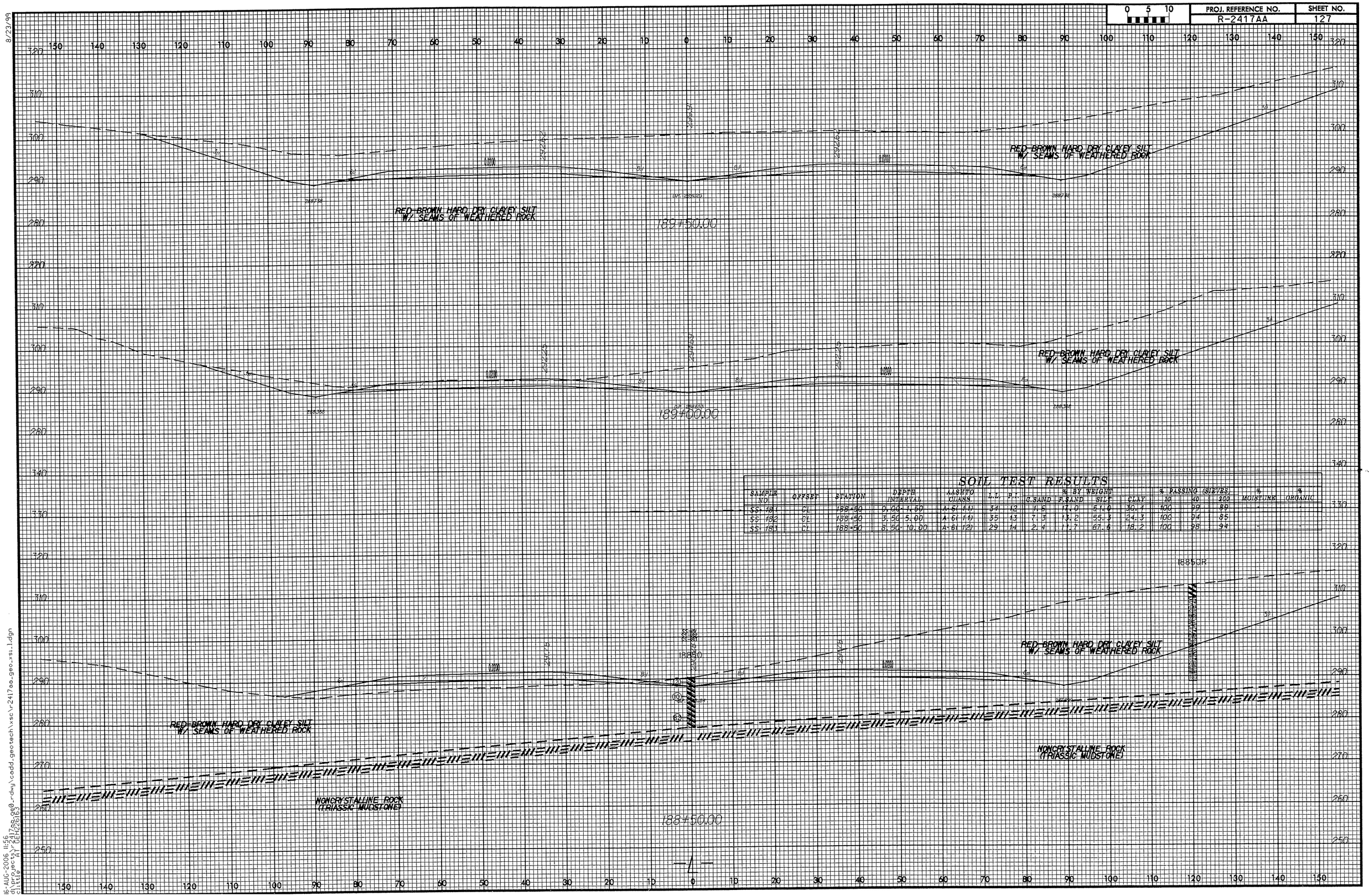
clittle AT GEH226163

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-178	90RT	187+80	3.40-4.00	A-4(6)	32	8	2.2	33.4	50.2	14.2	100	98	80		
SS-179	90 RT	187+80	9.10-10.60	A-4(7)	31	7	3.8	11.5	62.3	22.3	100	97	92		
SS-180	90 RT	187+80	14.10-15.60	A-7-6(17)	42	15	2.2	3.4	64.0	30.4	100	98	96		



PROJ. REFERENCE NO.	SHEET NO.
R-2417AA	127



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-181	CL	188+50	0.00-1.50	A-6(11)	34	12	1.6	17.0	51.0	30.4	100	99	89	-	-
SS-182	CL	188+50	3.50-5.00	A-6(11)	35	13	7.3	13.2	55.3	24.3	100	94	85	-	-
SS-183	CL	188+50	8.50-10.00	A-6(12)	29	14	2.4	11.7	67.6	18.2	100	98	94	-	-

8/23/99

16-AUG-2006 11:56
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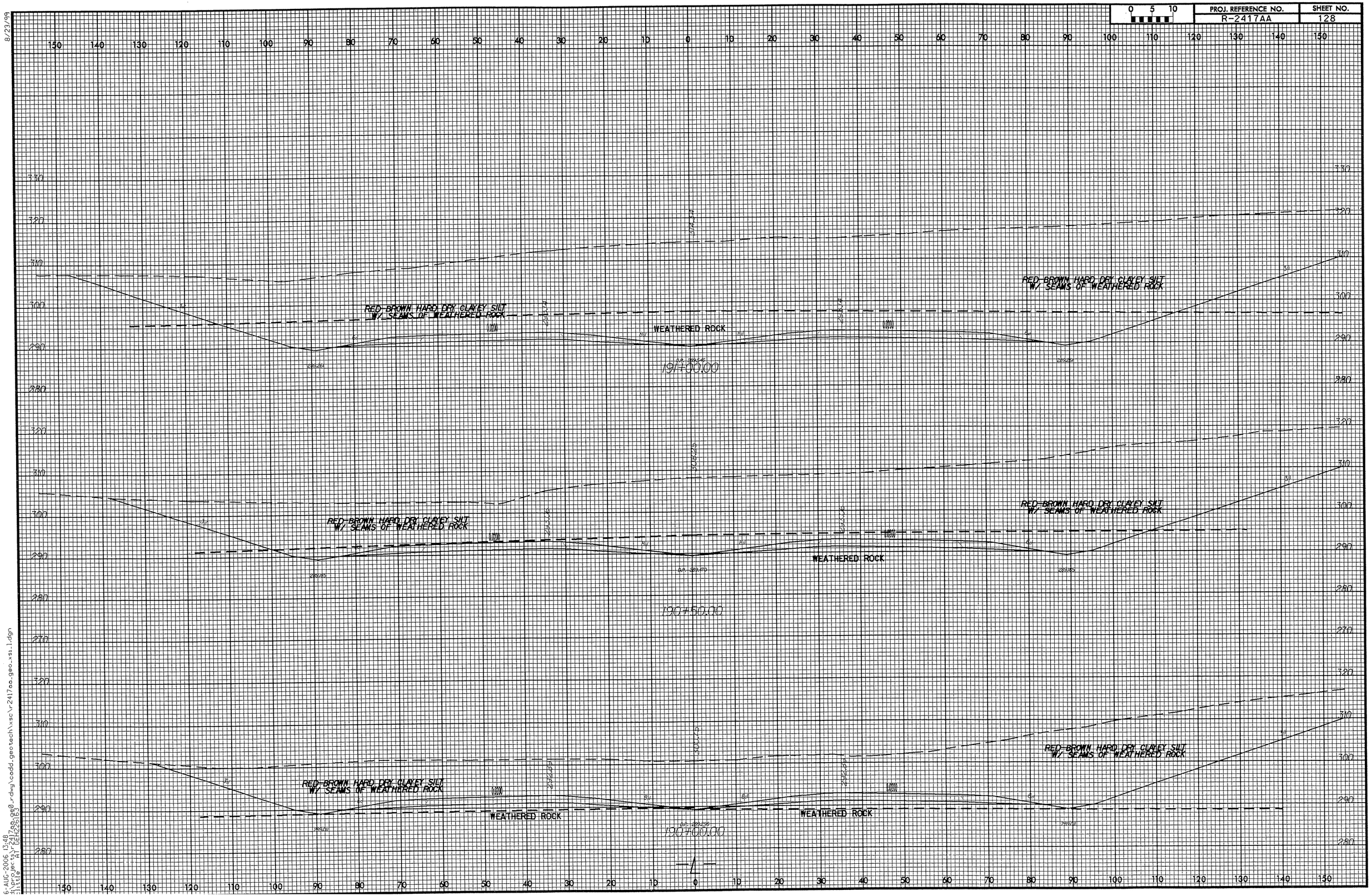

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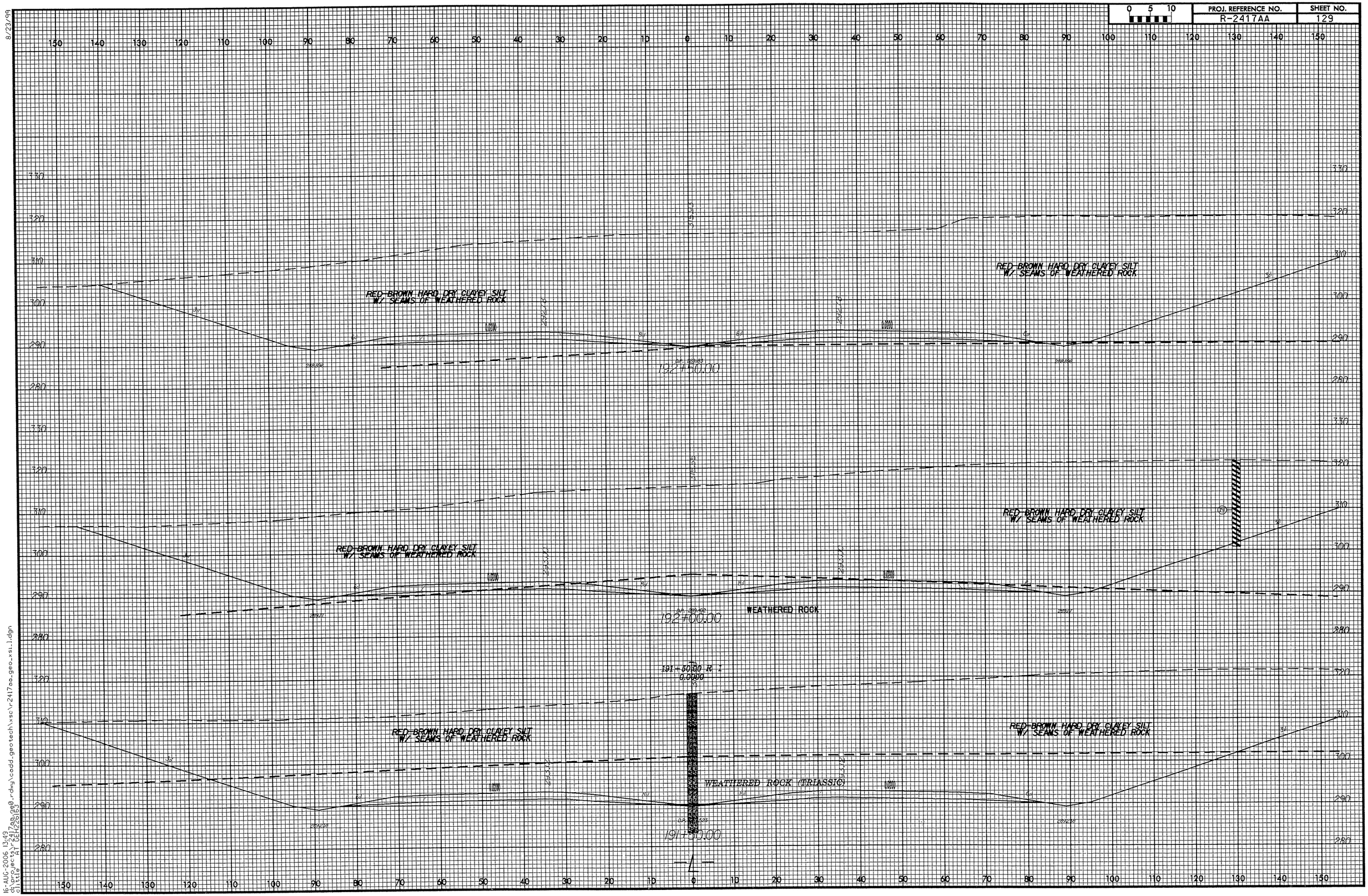

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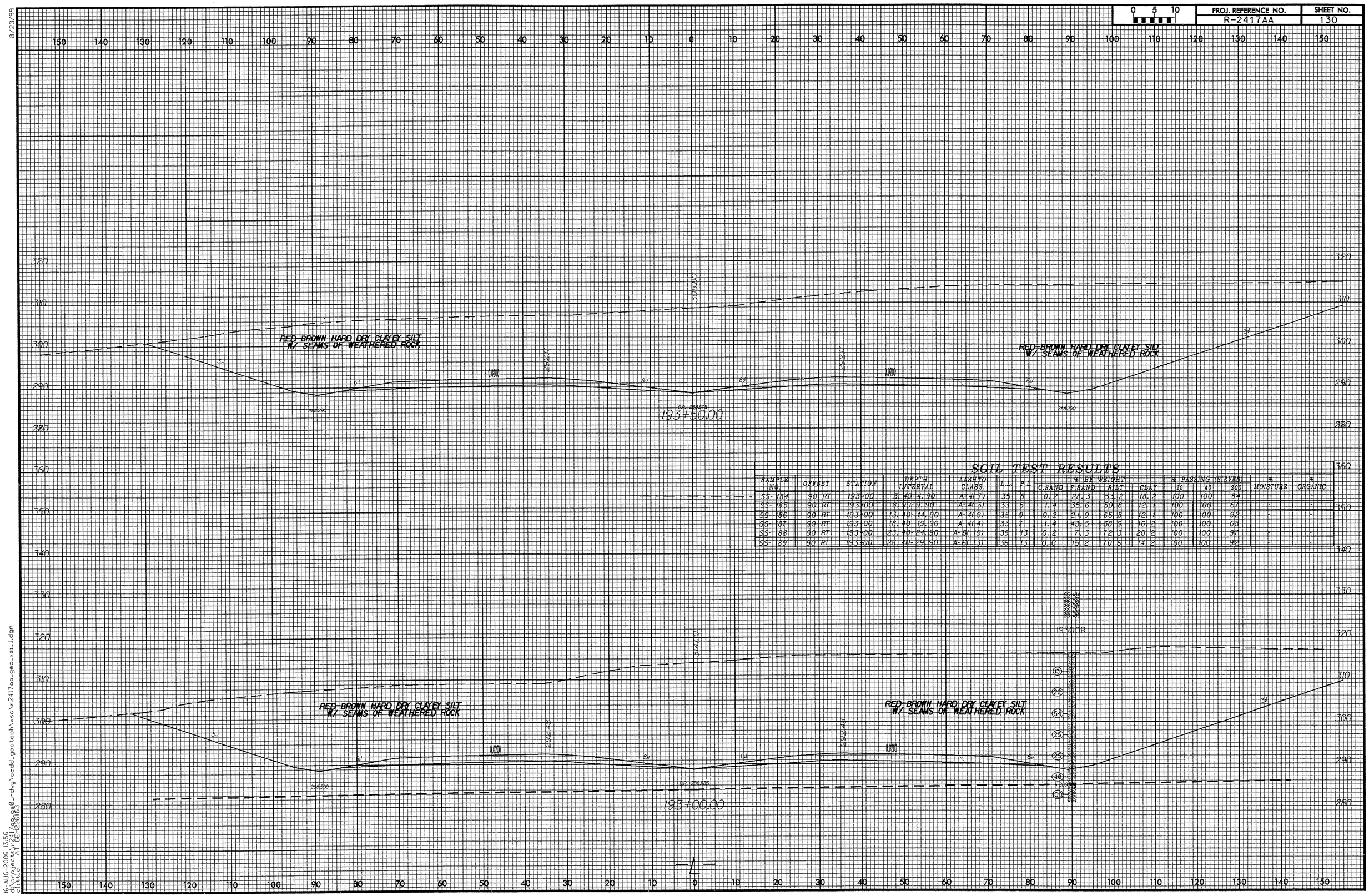

SOIL TEST RESULTS

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
SS-184	90 RT	193+00	3.40-4.90	A-4(7)	35	6	0.2	28.3	53.2	18.2	100	100	84	-	-
SS-185	90 RT	193+00	8.90-9.90	A-4(3)	33	5	1.4	35.6	50.8	12.1	100	100	67	-	-
SS-186	90 RT	193+00	13.40-14.90	A-4(9)	35	9	0.2	21.9	65.8	12.1	100	100	92	-	-
SS-87	90 RT	193+00	18.40-19.90	A-4(4)	33	7	1.4	43.5	38.9	16.2	100	100	68	-	-
SS-88	90 RT	193+00	23.40-24.90	A-6(15)	39	13	0.2	7.3	72.3	20.2	100	100	97	-	-
SS-89	90 RT	193+00	28.40-29.90	A-6(13)	36	13	0.0	15.2	70.6	14.2	100	100	92	-	-

16-AUG-2006 13:56
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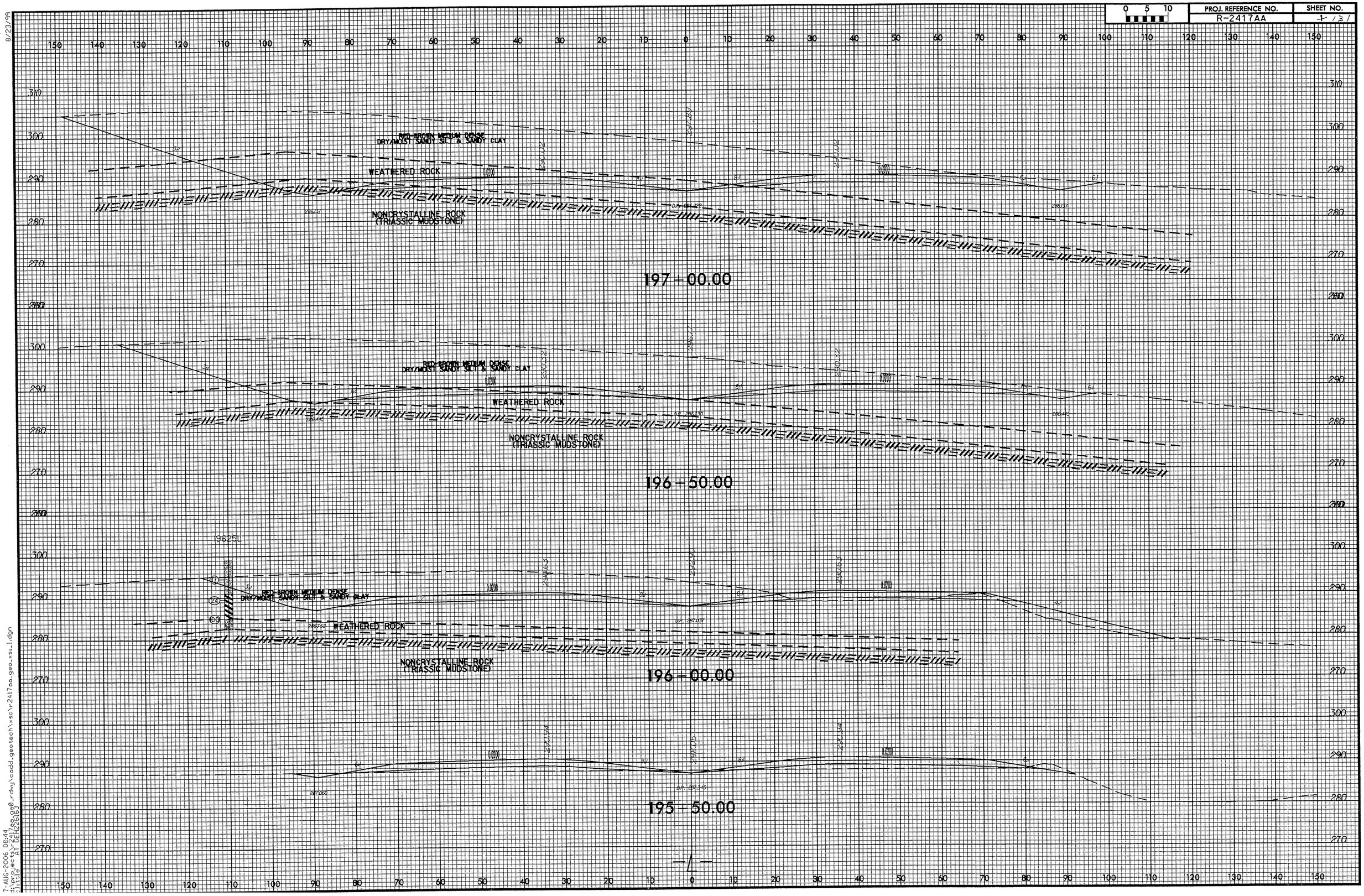

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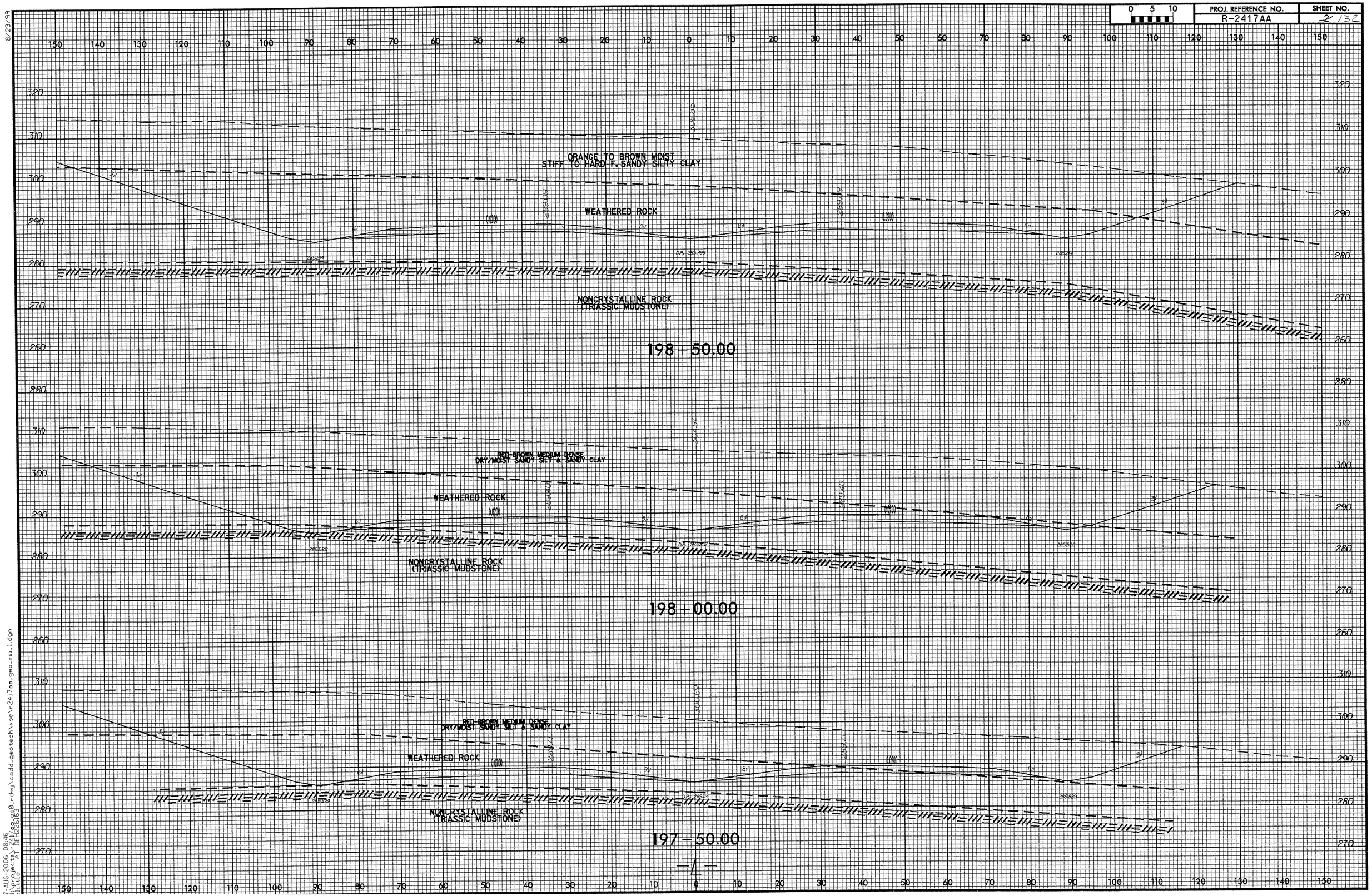
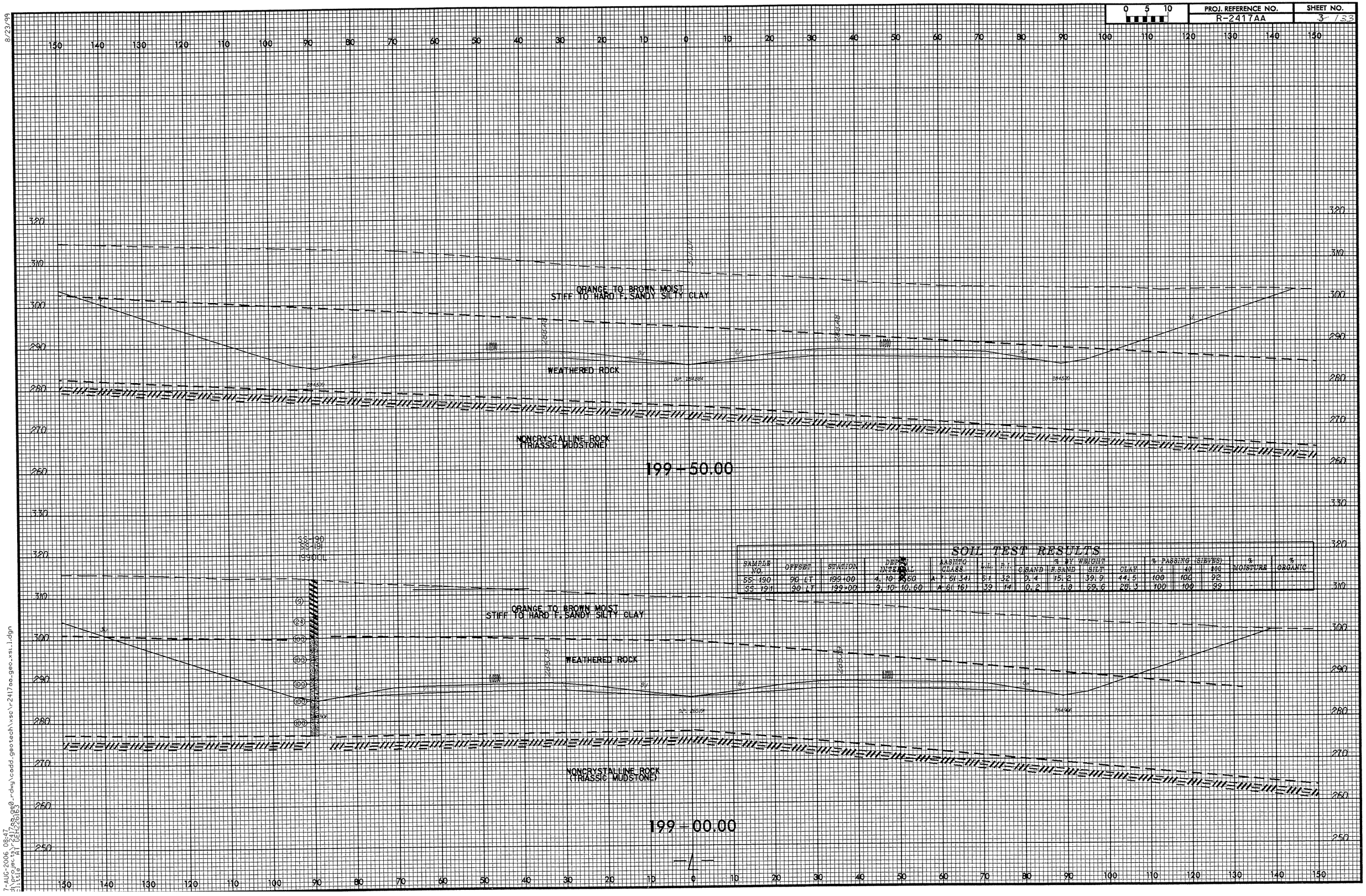


PROJ. REFERENCE NO.
R-2417AA
SHEET NO.
2 / 32
ORANGE TO BROWN MOIST
STIFF TO HARD F. SANDY SILTY CLAY
WEATHERED ROCK
NONCRYSTALLINE ROCK
(TRIASSIC MUDSTONE)
198 + 50.00
RED-BROWN MEDIUM DENSE
DRY/MOIST SANDY SILT & SANDY CLAY
WEATHERED ROCK
NONCRYSTALLINE ROCK
(TRIASSIC MUDSTONE)
198 + 00.00
RED-BROWN MEDIUM DENSE
DRY/MOIST SANDY SILT & SANDY CLAY
WEATHERED ROCK
NONCRYSTALLINE ROCK
(TRIASSIC MUDSTONE)
197 + 50.00

PROJ. REFERENCE NO. R-2417AA
SHEET NO. 3 / 33



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-190	90 LT	199+00	4.10-[illegible].60	A-7-6(34)	51	32	0.4	15.2	39.9	44.5	100	100	92		
SS-191	90 LT	199+00	9.10-10.60	A-6(16)	39	14	0.2	1.8	69.6	28.3	100	100	99		

8/23/99
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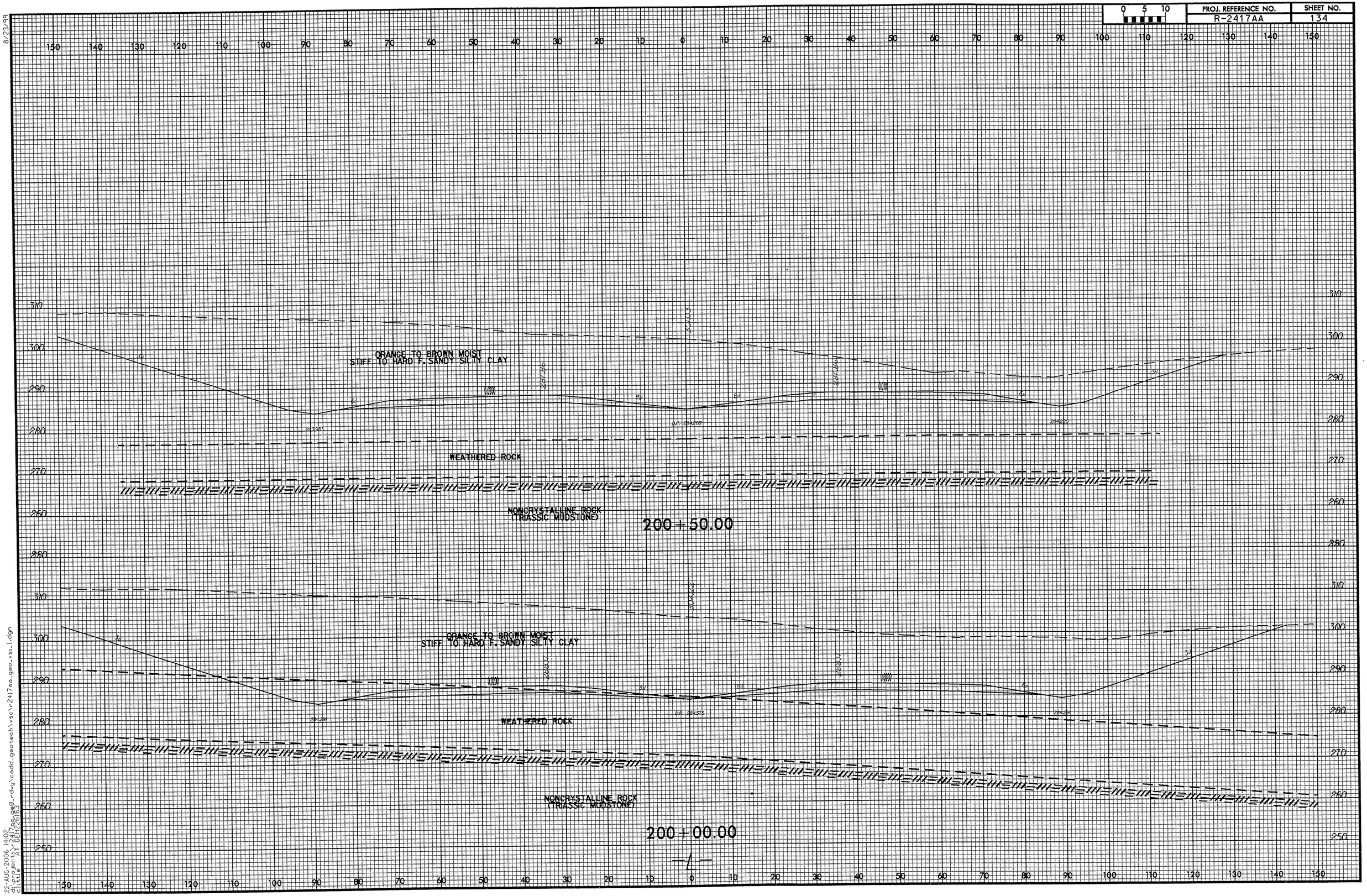

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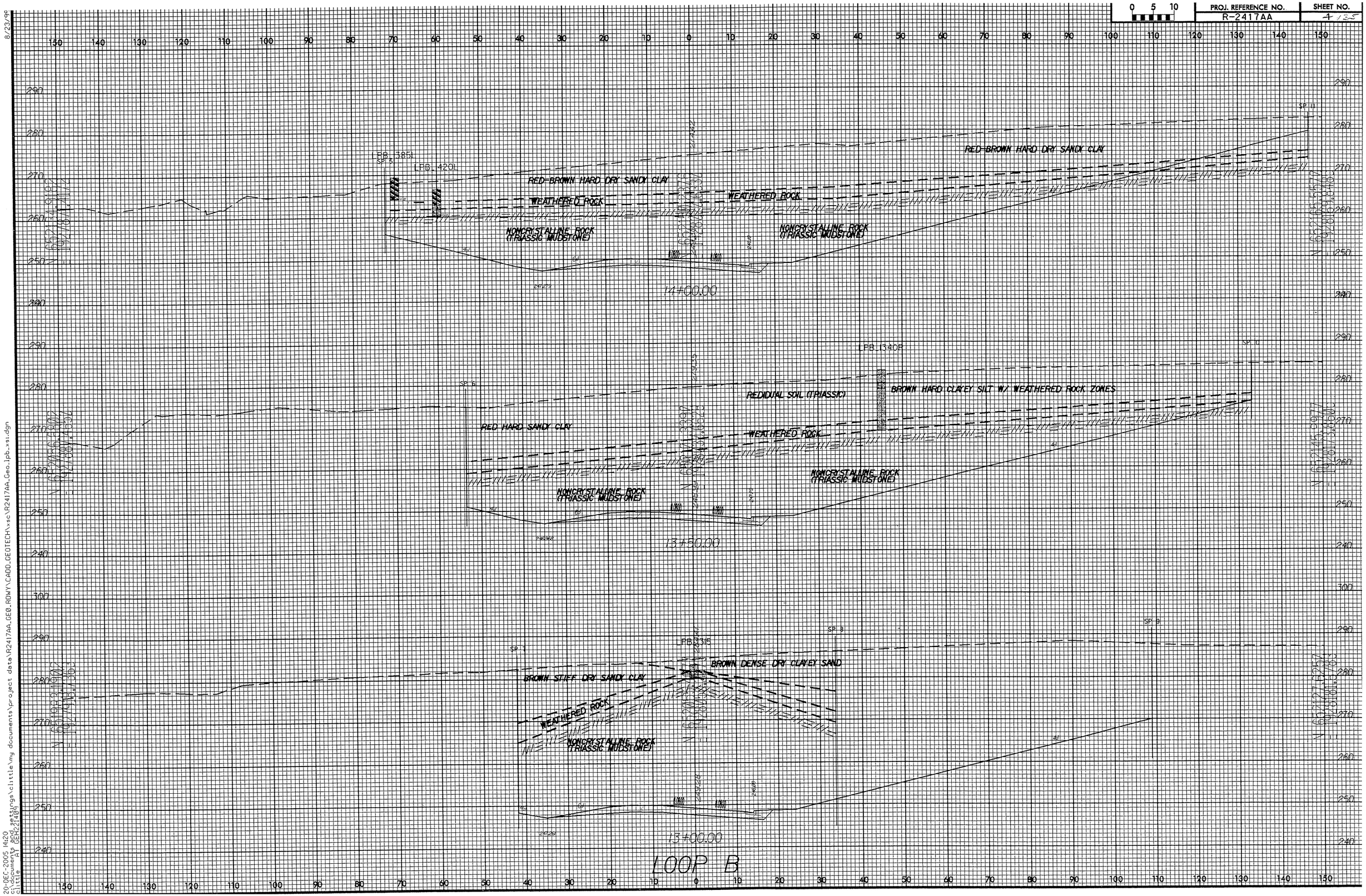

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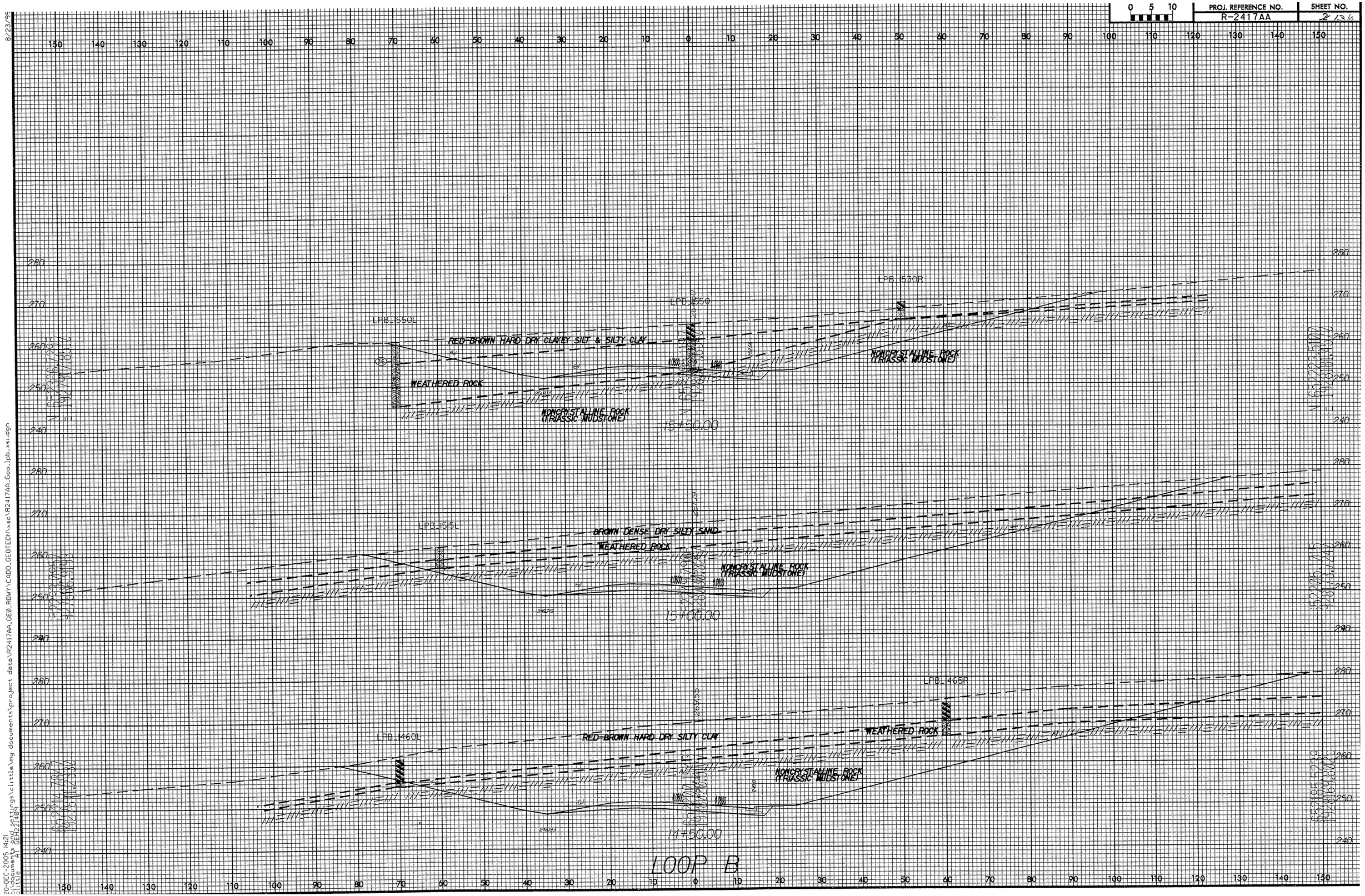

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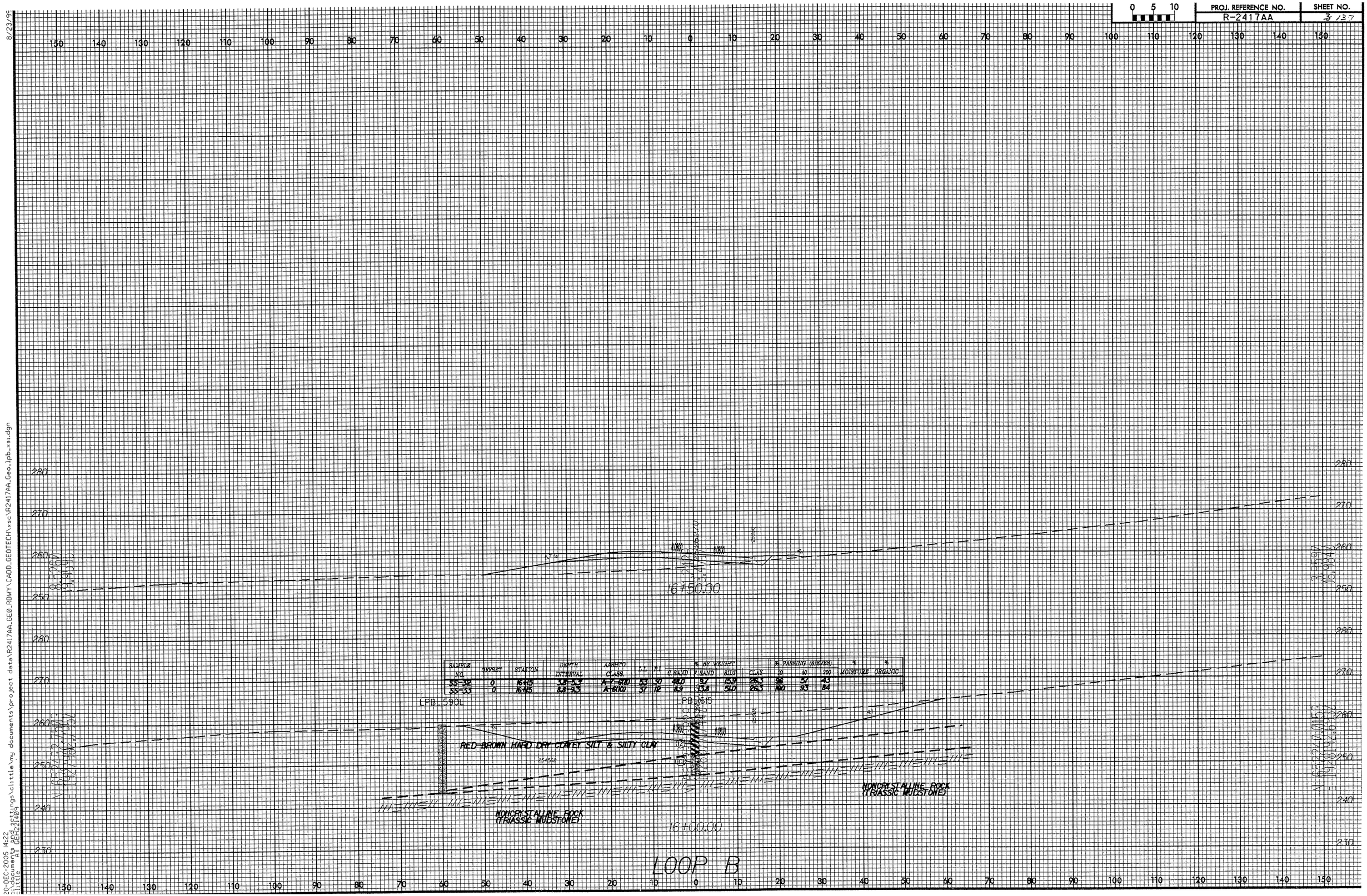
PROJ. REFERENCE NO.
R-2417AA
SHEET NO.
2 136
LPB_1550L
LPB_1550
LPB_1530R
RED-BROWN HARD DRY CLAYEY SILT & SILTY CLAY
WEATHERED ROCK
NONCRYSTALLINE ROCK (TRIASSIC MUDSTONE)
15+50.00
LPB_1515L
BROWN DENSE DRY SILTY SAND
WEATHERED ROCK
NONCRYSTALLINE ROCK (TRIASSIC MUDSTONE)
15+00.00
LPB_1460L
LPB_1465R
RED-BROWN HARD DRY SILTY CLAY
WEATHERED ROCK
NONCRYSTALLINE ROCK (TRIASSIC MUDSTONE)
14+50.00
LOOP B



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-32	0	16+15	3.8-5.3	A-7-6(8)	53	30	48.0	9.7	15.9	26.3	96	57	43		
SS-33	0	16+15	8.8-9.3	A-6(10)	37	12	8.9	13.8	51.0	26.3	100	93	84		

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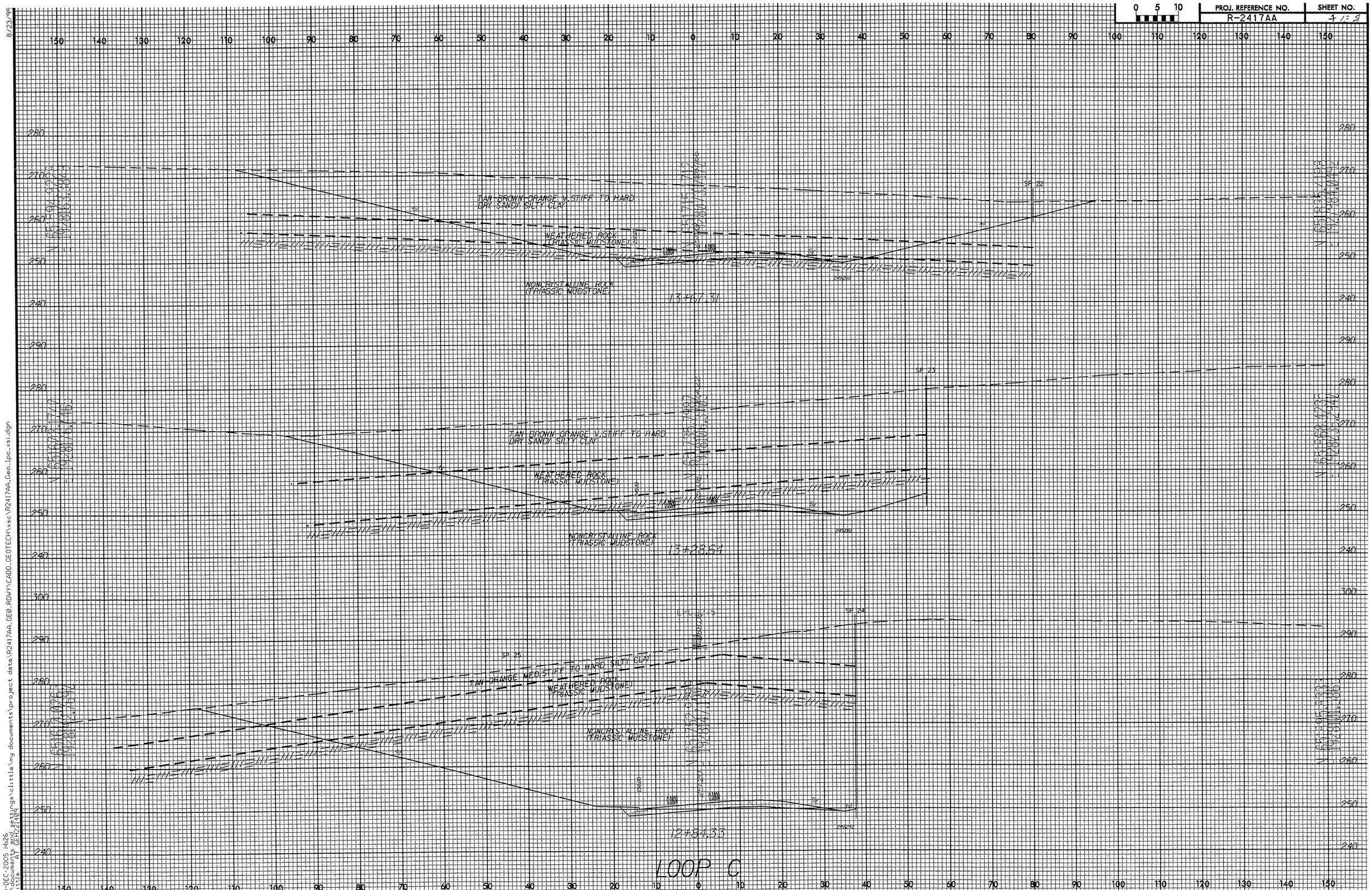

8/23/99

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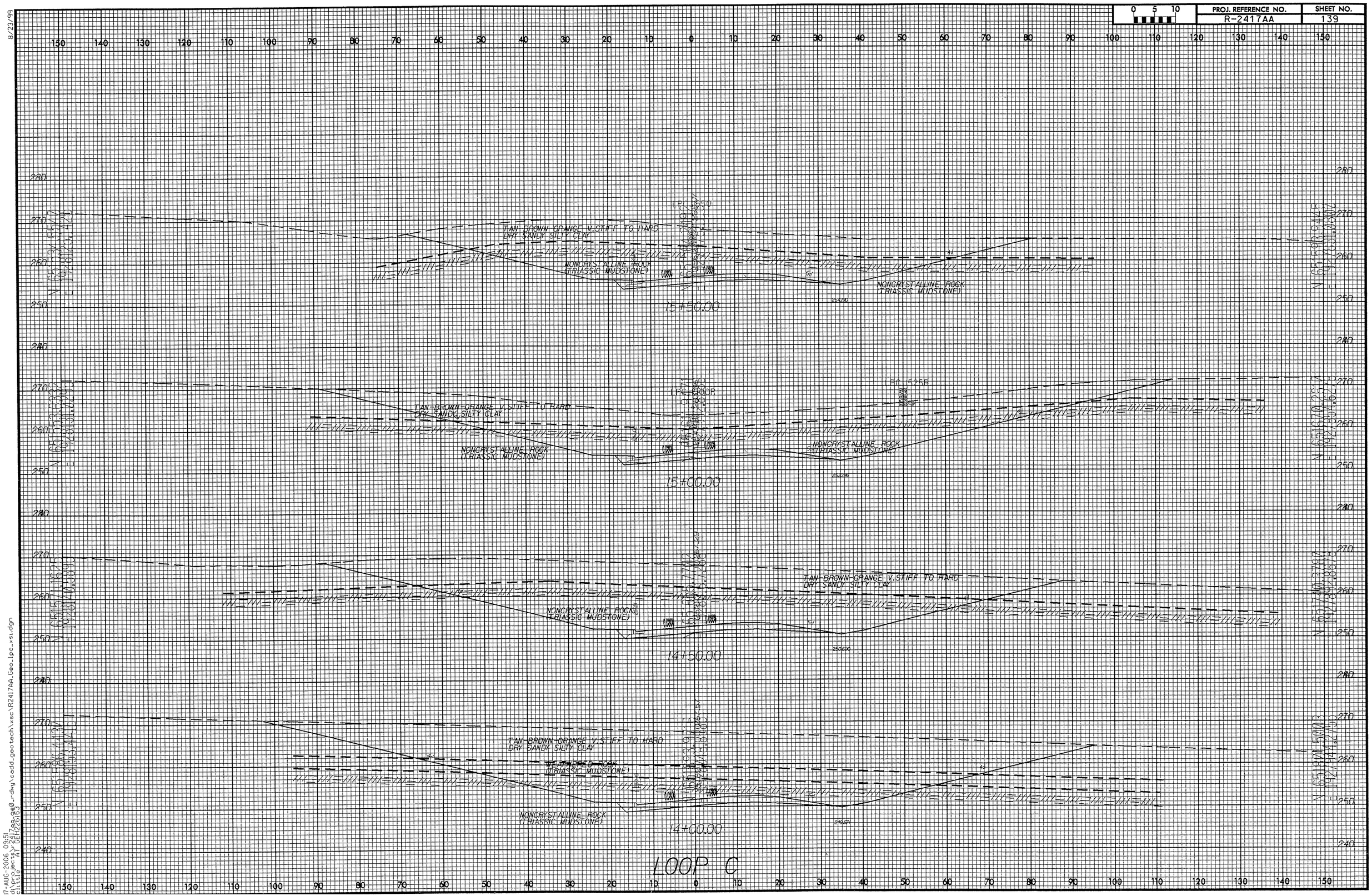

8/23/99

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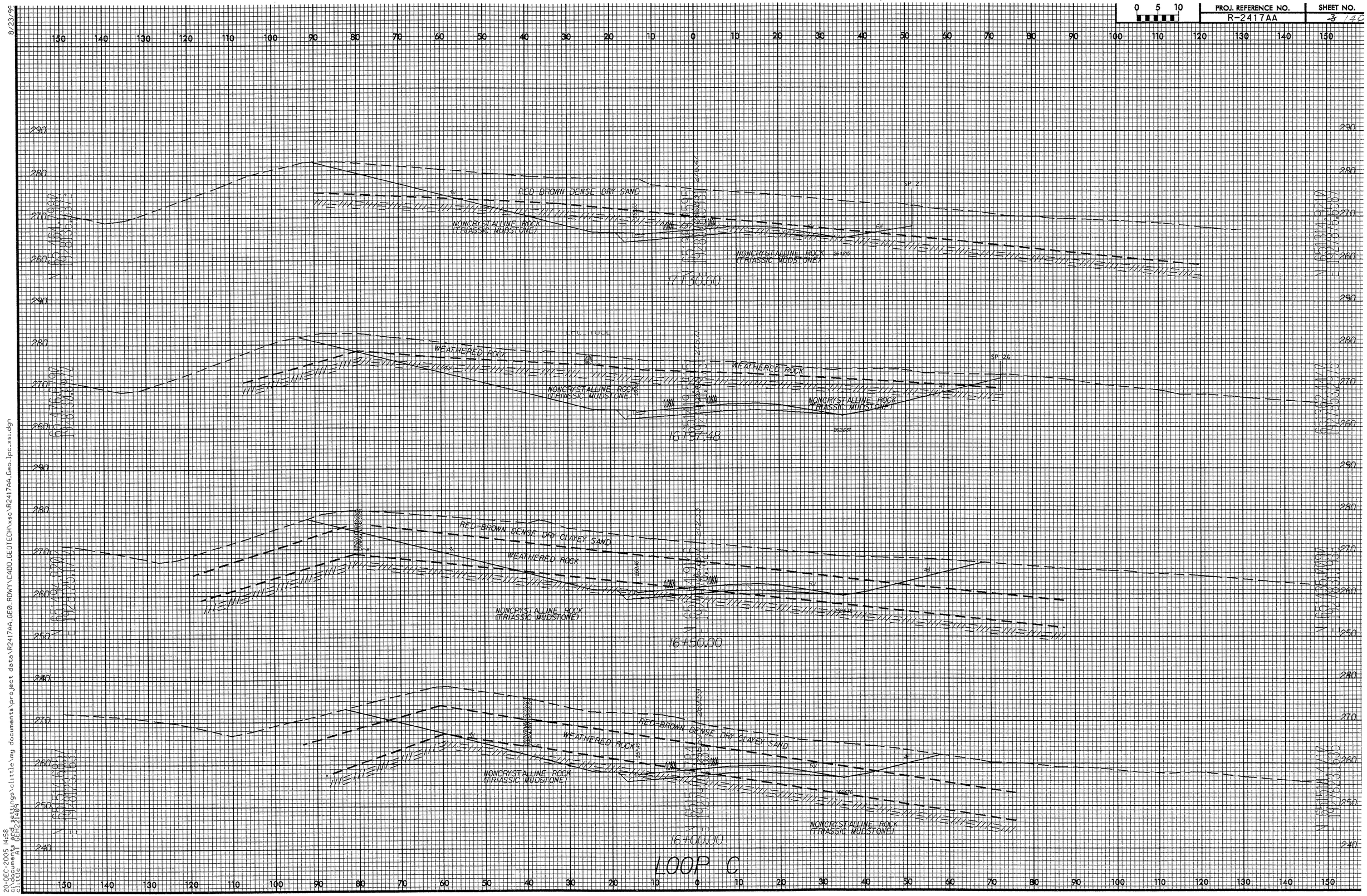

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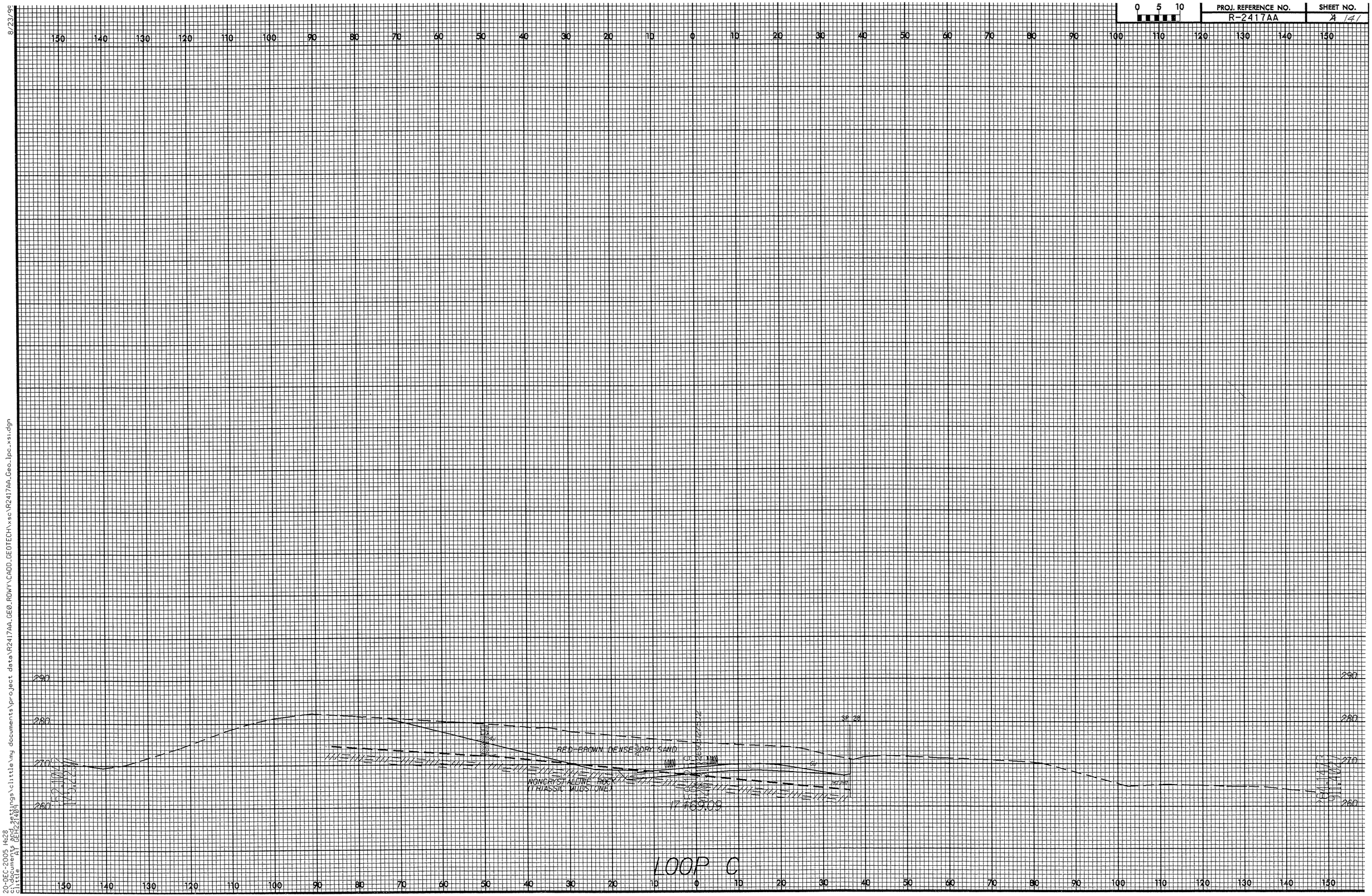
Little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R-2417AA
SHEET NO.
A 141
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290
280
270
260
RED-BROWN DENSE DRY SAND
NONCRYSTALLINE ROCK
(TRIASSIC MUDSTONE)
SR 28
17+89.09
LOOP C
8/23/99
20-DEC-2005 14:28
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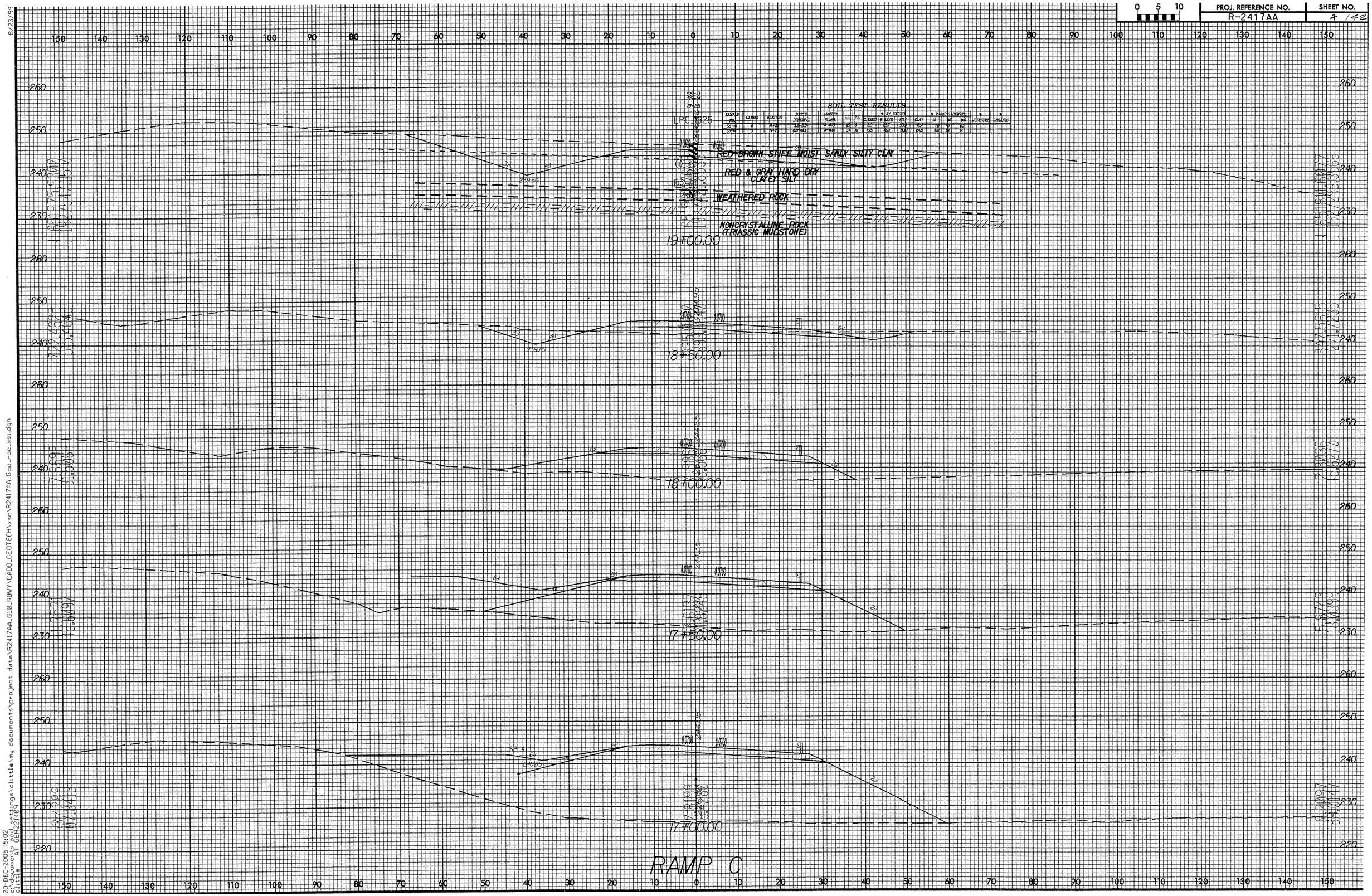

8/23/99

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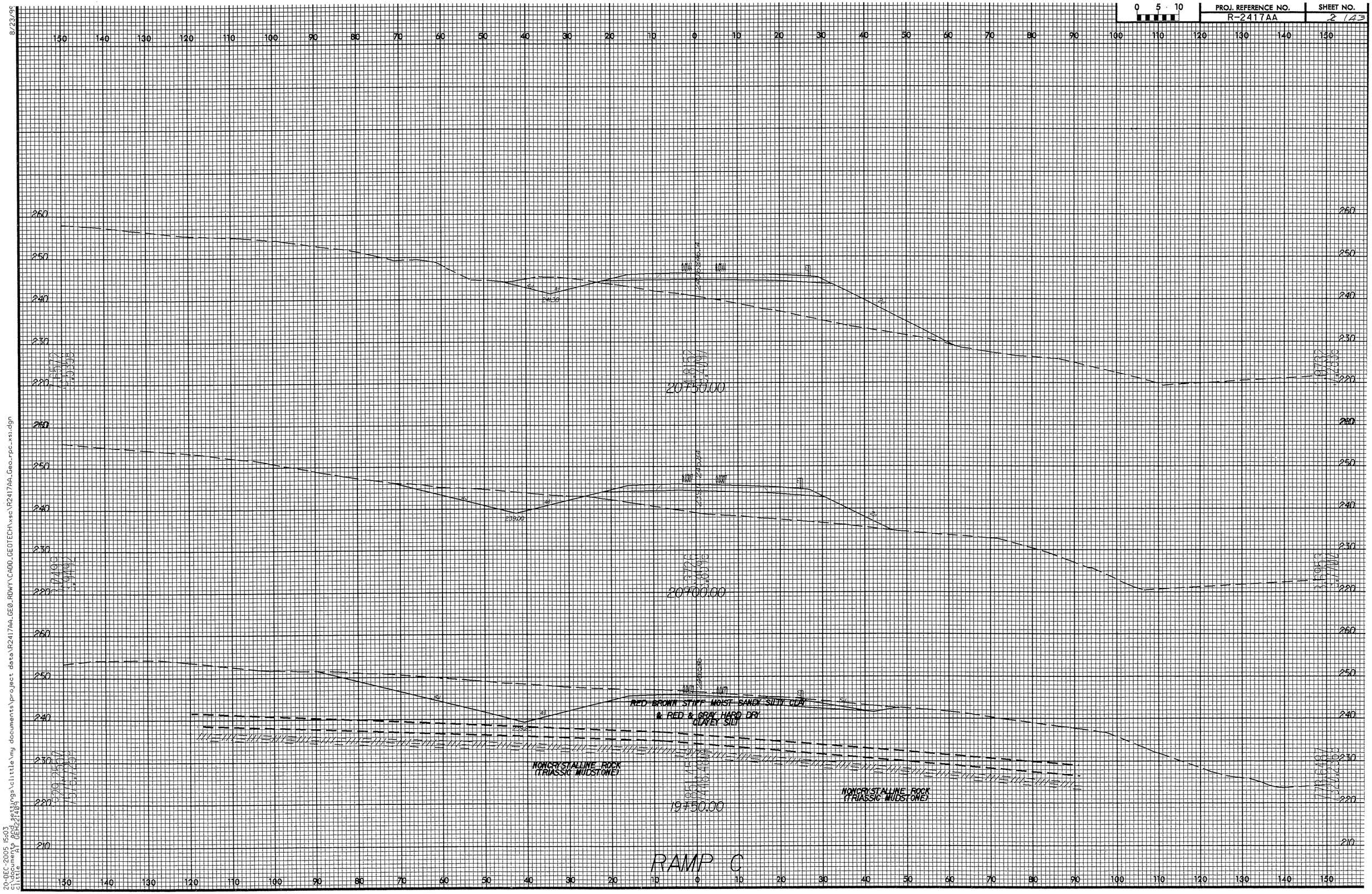
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R-2417AA
SHEET NO.
2 143
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20+00.00
19+50.00
RED BROWN STIFF MOIST SANDY SILTY CLAY
& RED & GRAY HARD DRY
CLAYEY SILT
NONCRYSTALLINE ROCK
(TRIASSIC MUDSTONE)
NONCRYSTALLINE ROCK
(TRIASSIC MUDSTONE)
RAMP C
8/23/99
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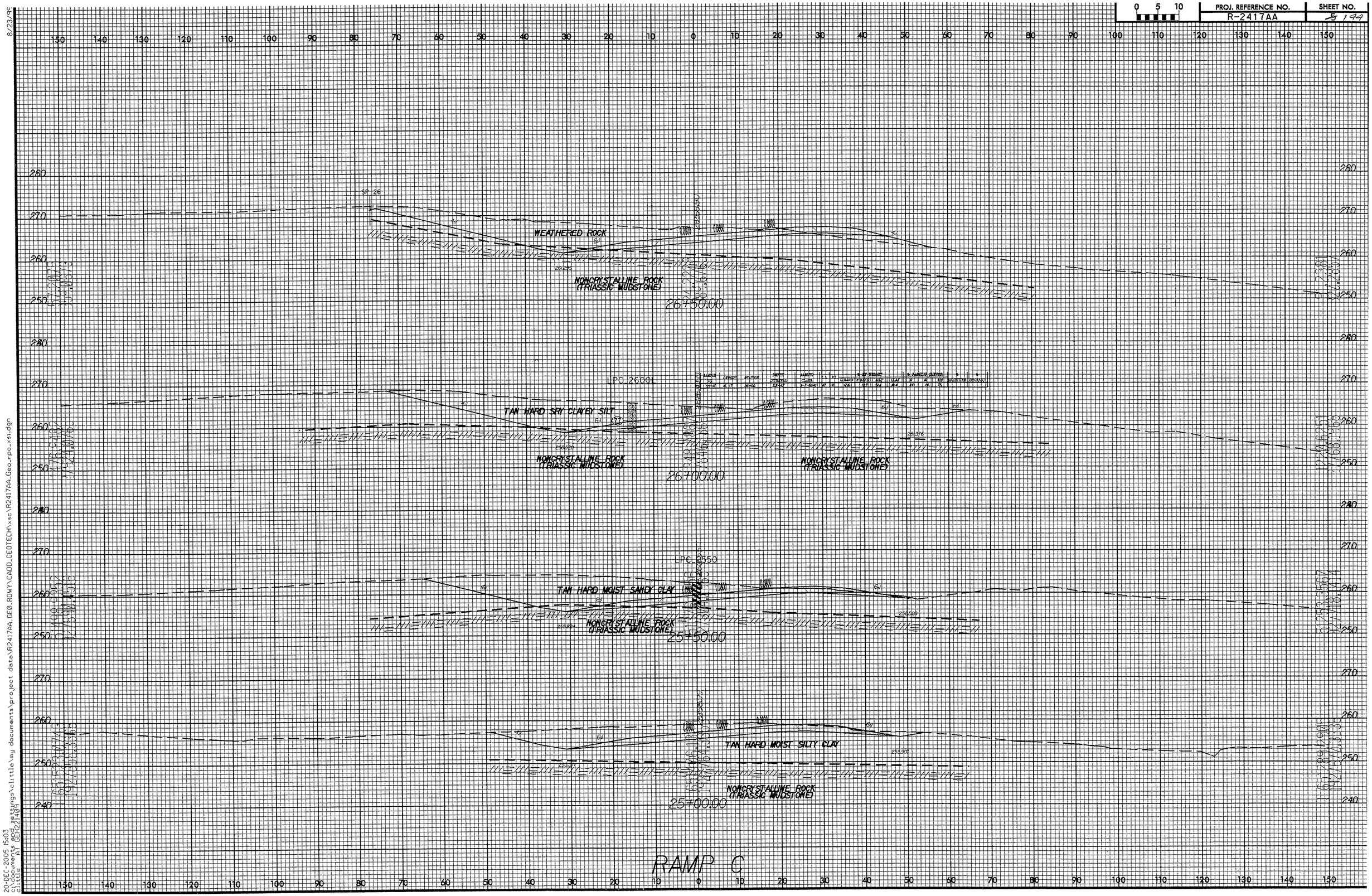

8/23/99

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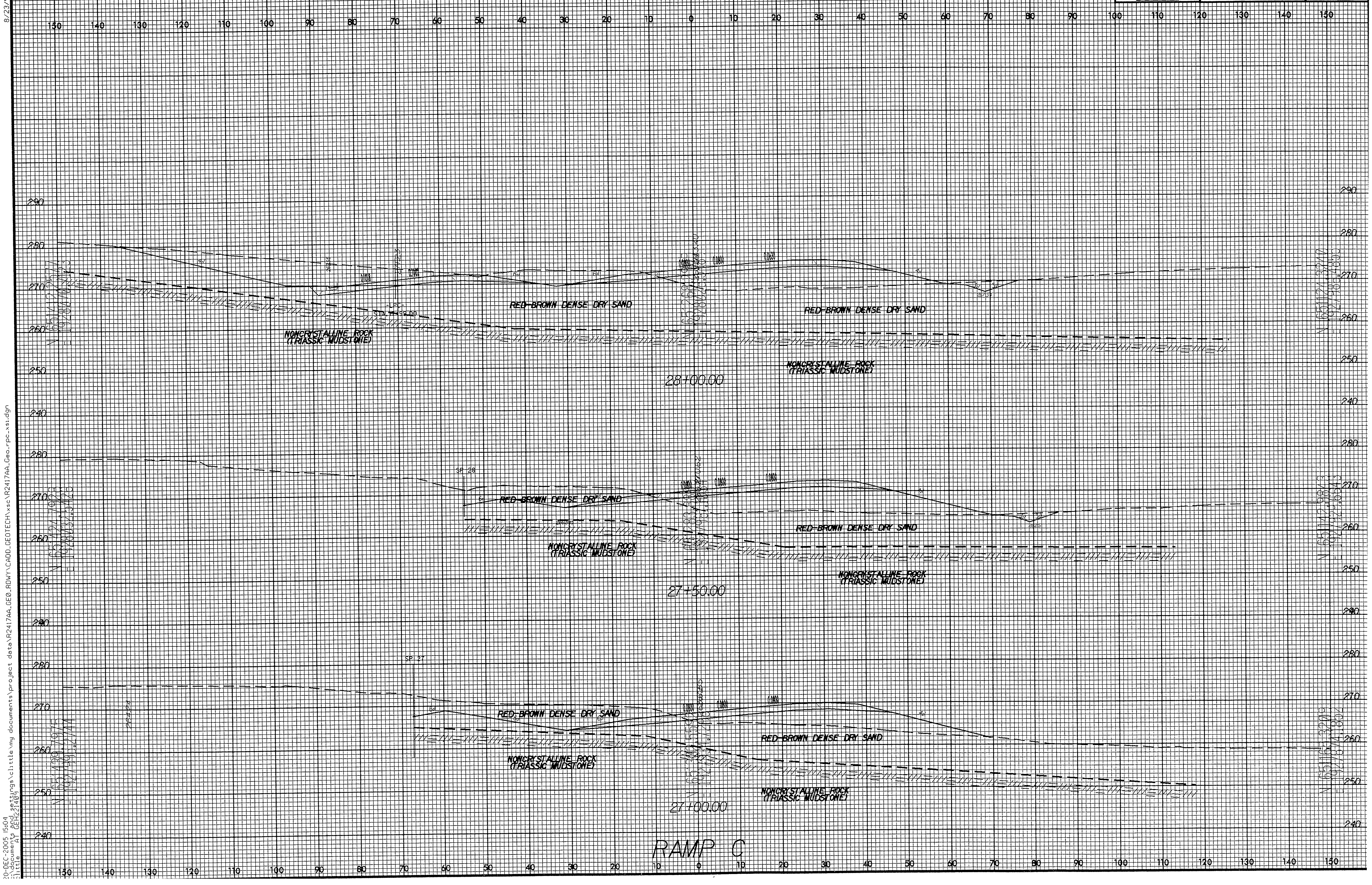
	R-2417AA	6145



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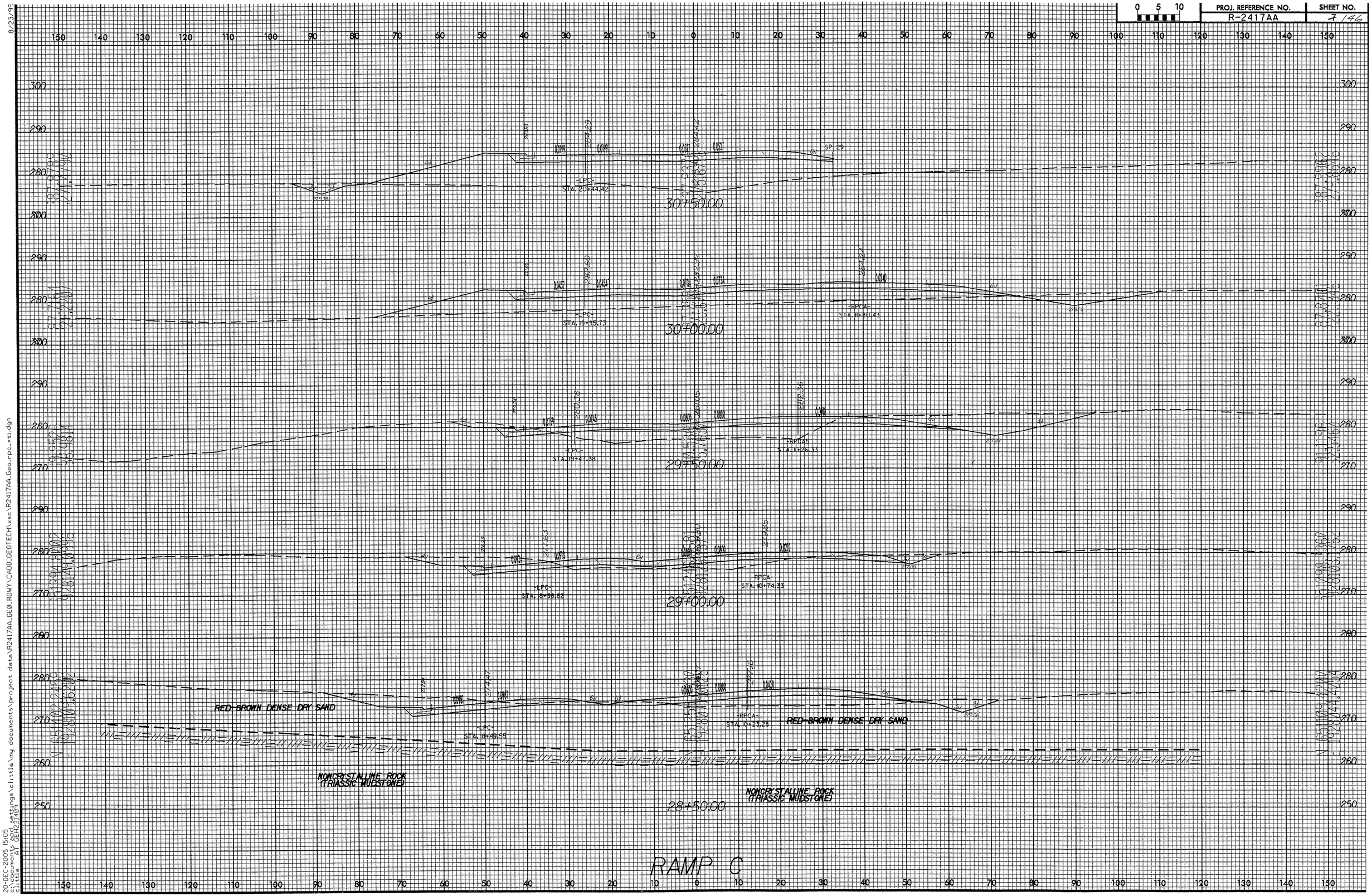
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R-2417AA
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STA. 19+95.73
30+00.00
-RPCA-
STA. 11+30.45
-LPC-
STA. 19+47.58
29+50.00
-RPCAS
STA. 11+26.33
-LPC-
STA. 18+98.62
29+00.00
-RPCA-
STA. 10+74.35
-LPC-
STA. 18+49.55
28+50.00
-RPCA-
STA. 10+23.28
RED-BROWN DENSE DRY SAND
RED-BROWN DENSE DRY SAND
NONCRYSTALLINE ROCK
(TRIASSIC MUDSTONE)
NONCRYSTALLINE ROCK
(TRIASSIC MUDSTONE)
RAMP C
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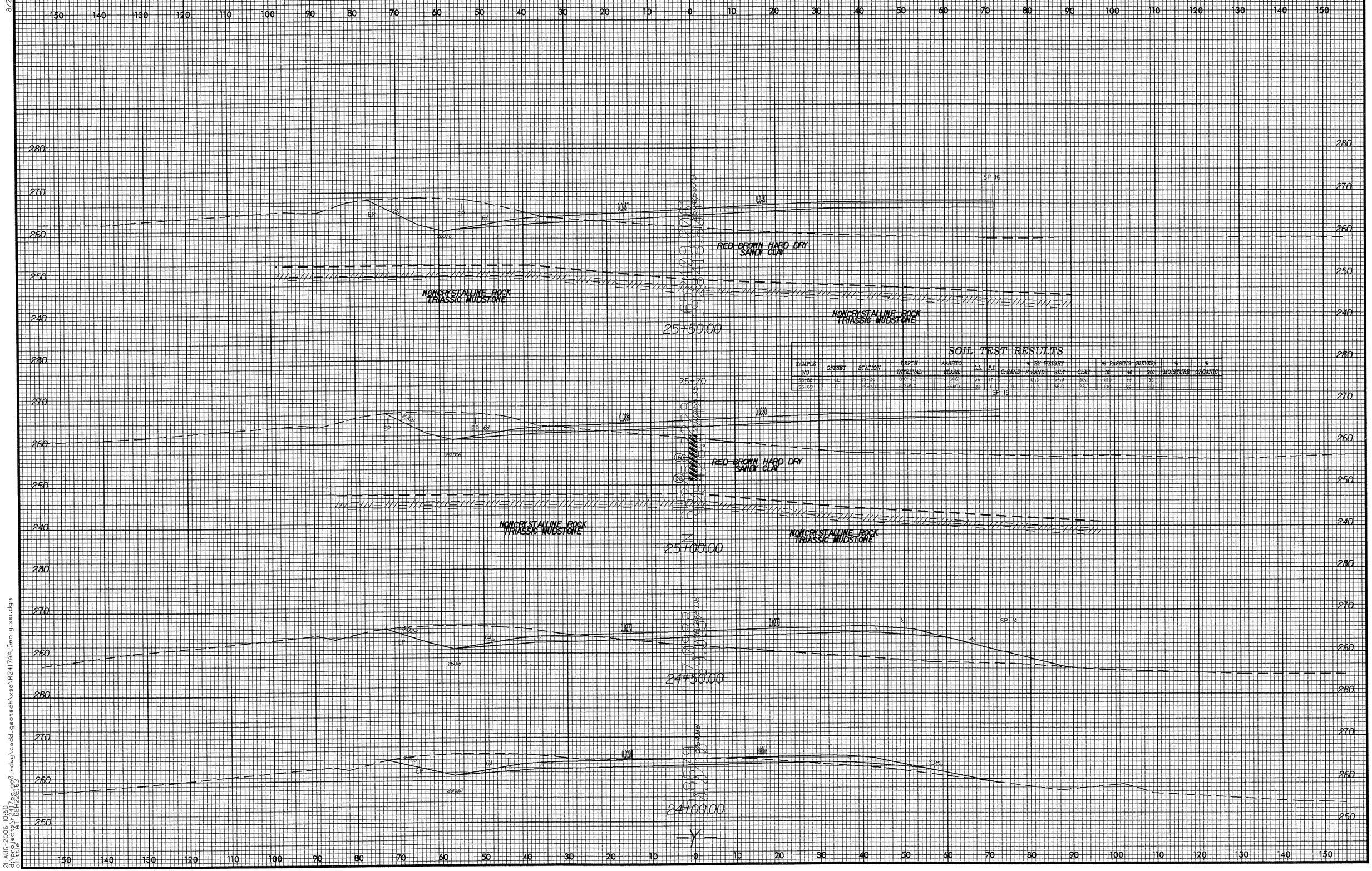
PROJ. REFERENCE NO.	SHEET NO.
R-2417AA	6 / 147



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-68	CL	25+20	10.0-12	A-6(6)	36	17	1.4	13.3	54.9	30.3	100	99	95		
SS-69	CL	25+20	42.5-7	A-6(6)	38	17	2.0	13.7	56.0	28.3	100	99	92		

8/23/99
21-AUG-2006 10:50
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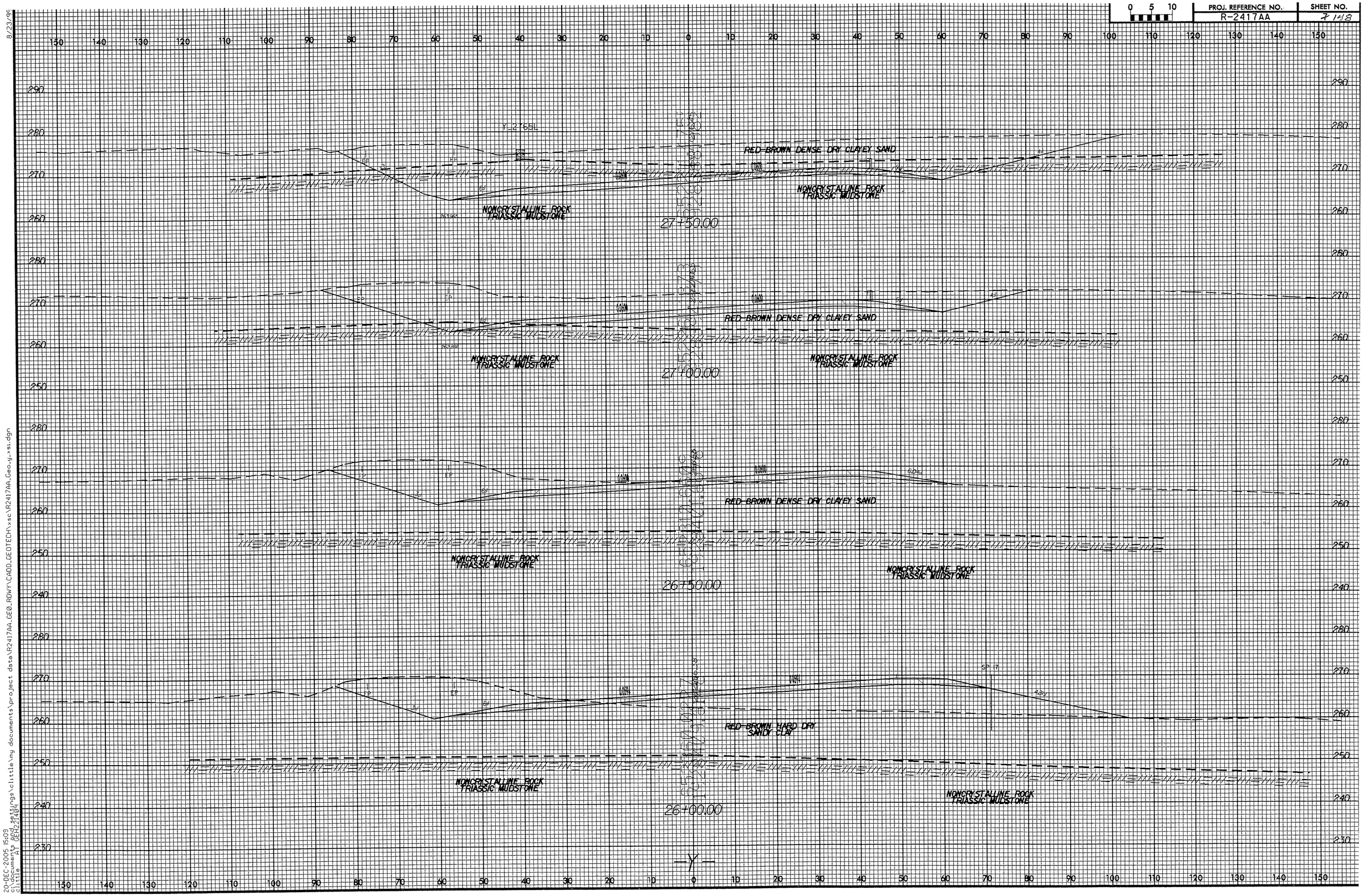

8/23/99

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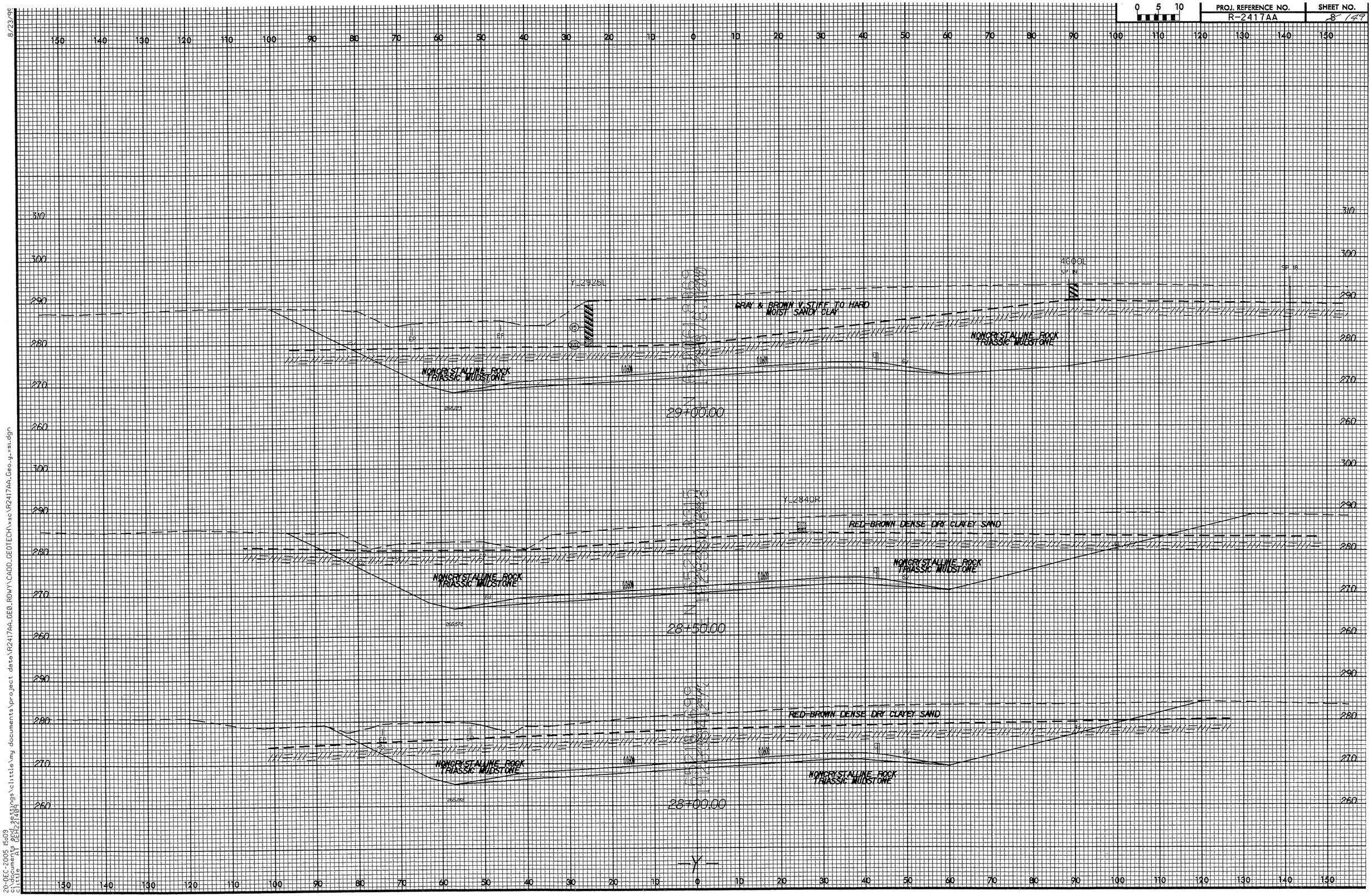

8/23/99

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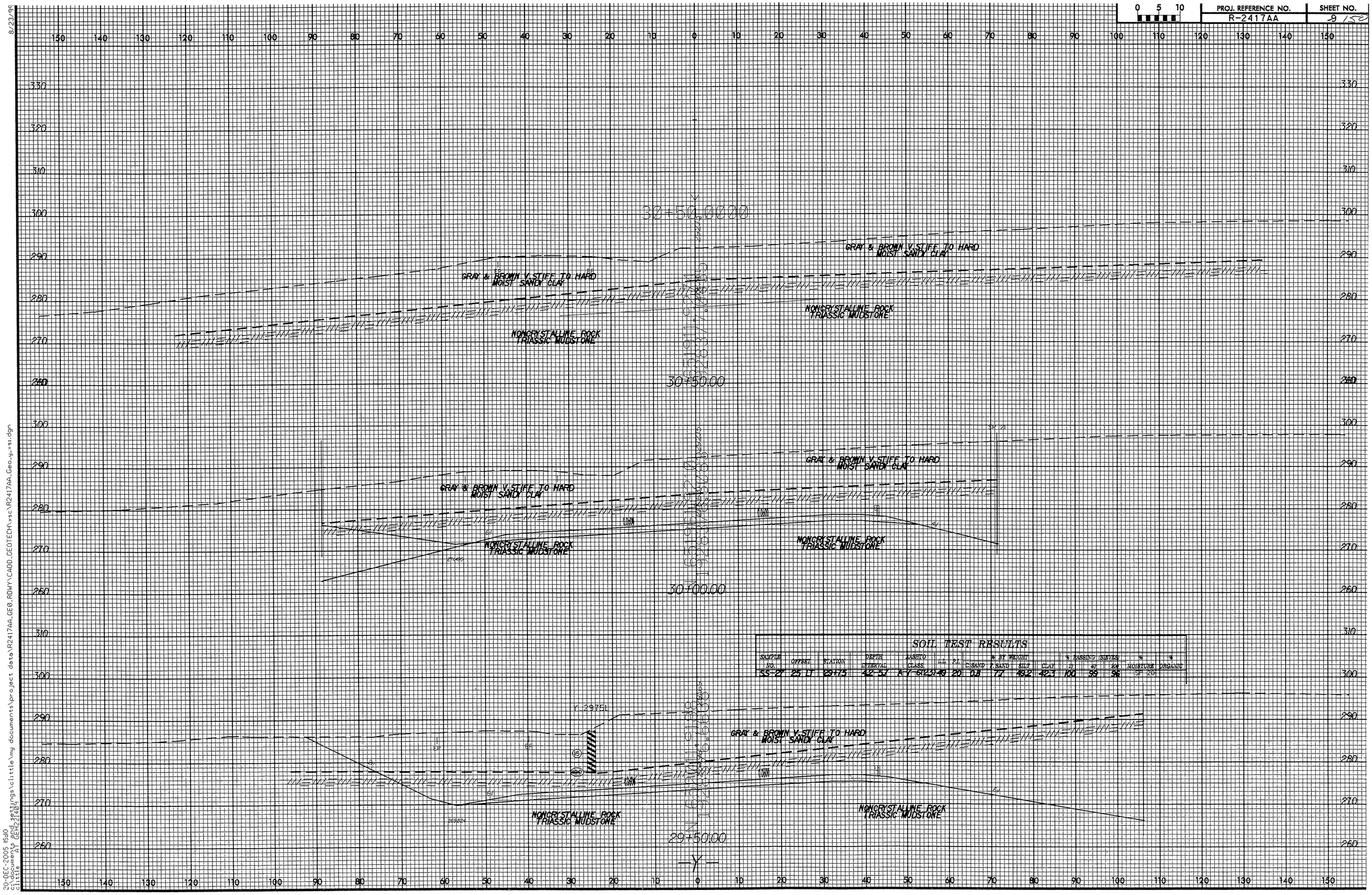
clittle AT GEH221409

PROJ. REFERENCE NO. R-2417AA
SHEET NO. 9 150



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) 100	% MOISTURE	% ORGANIC
SS-27	25 LT	29+75	42-57	A-7-6(23)	49	20	0.8	7.7	49.2	42.3	100	99	96	SP 20	

8/23/99
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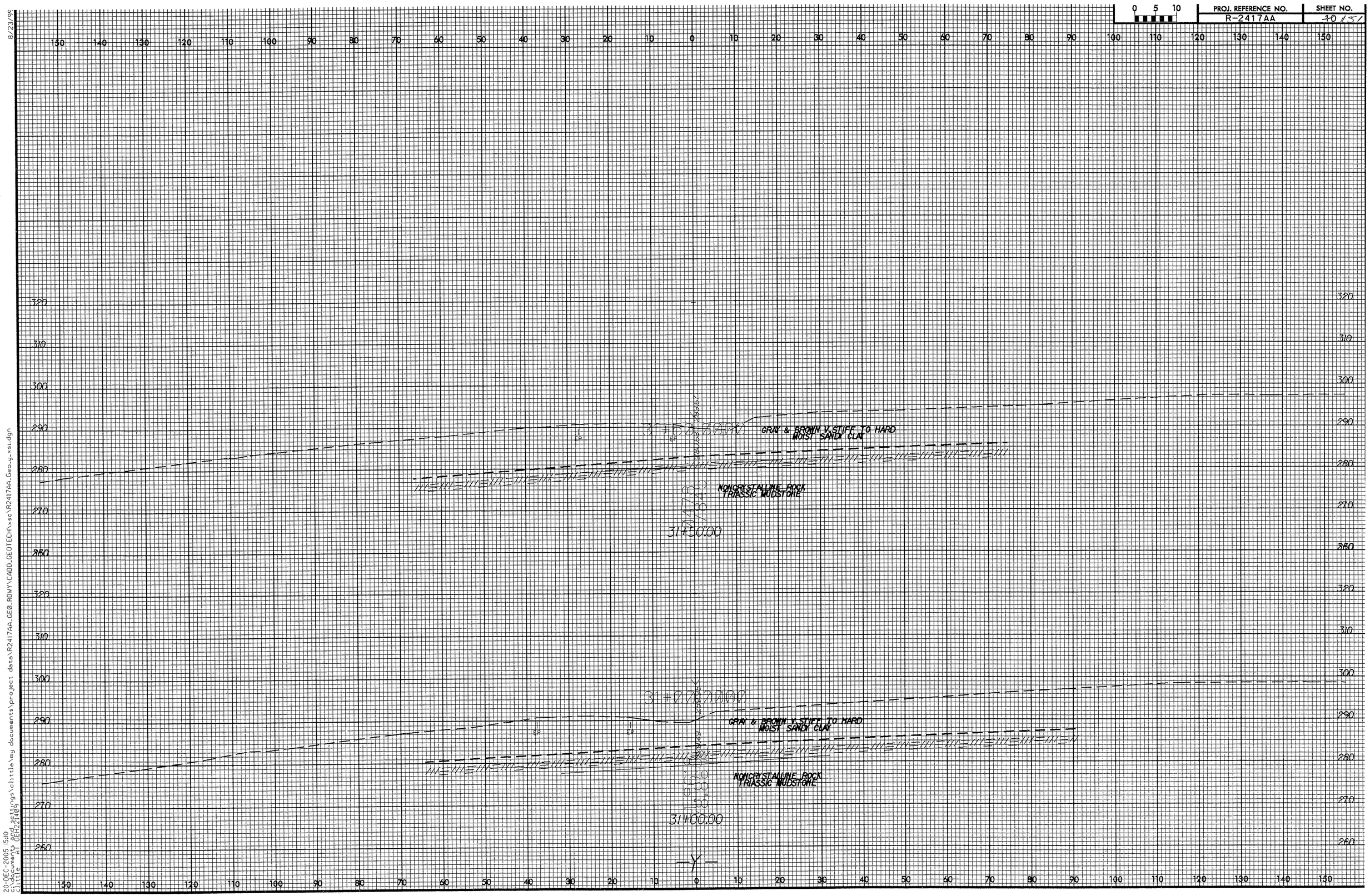

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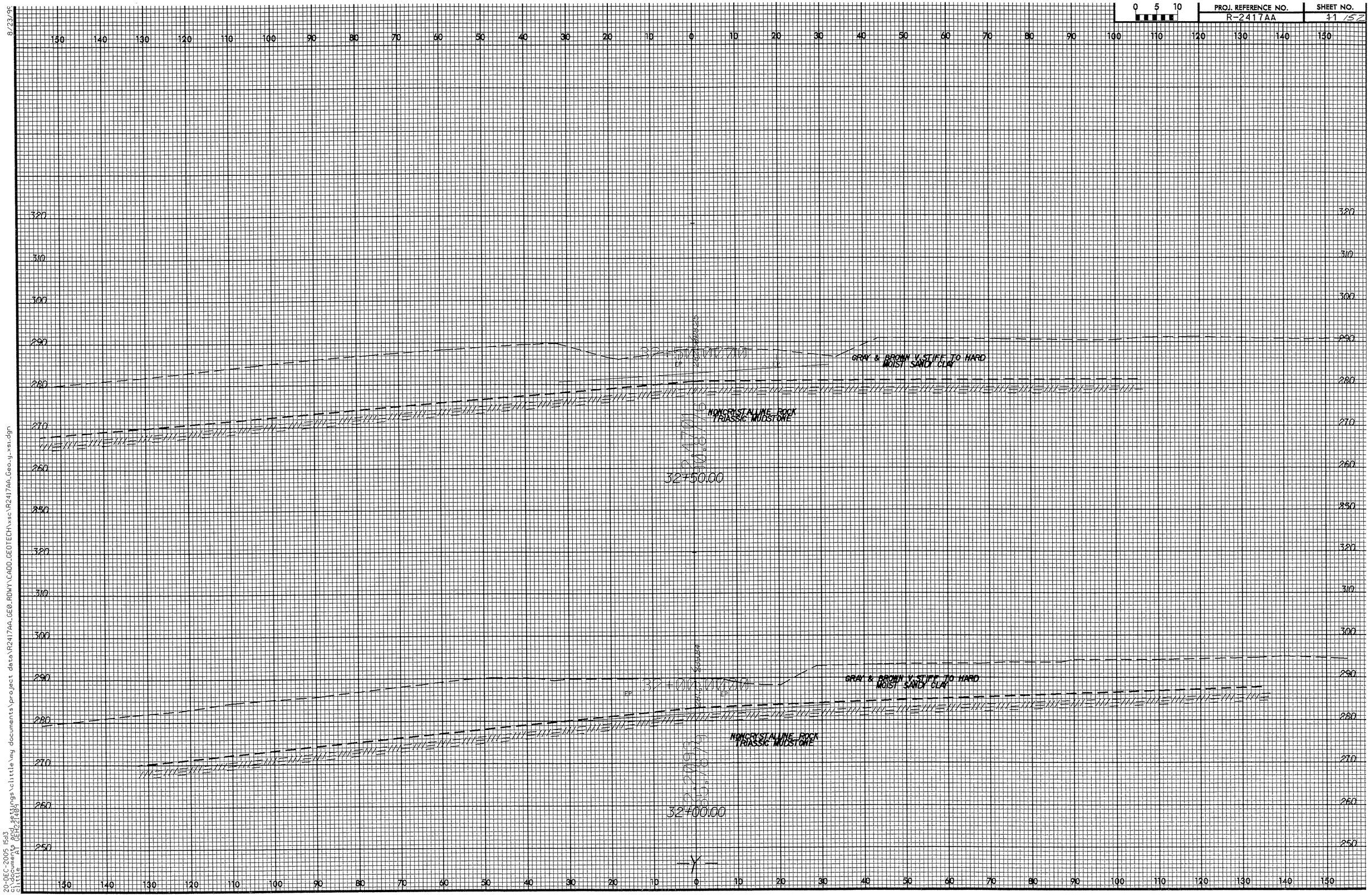

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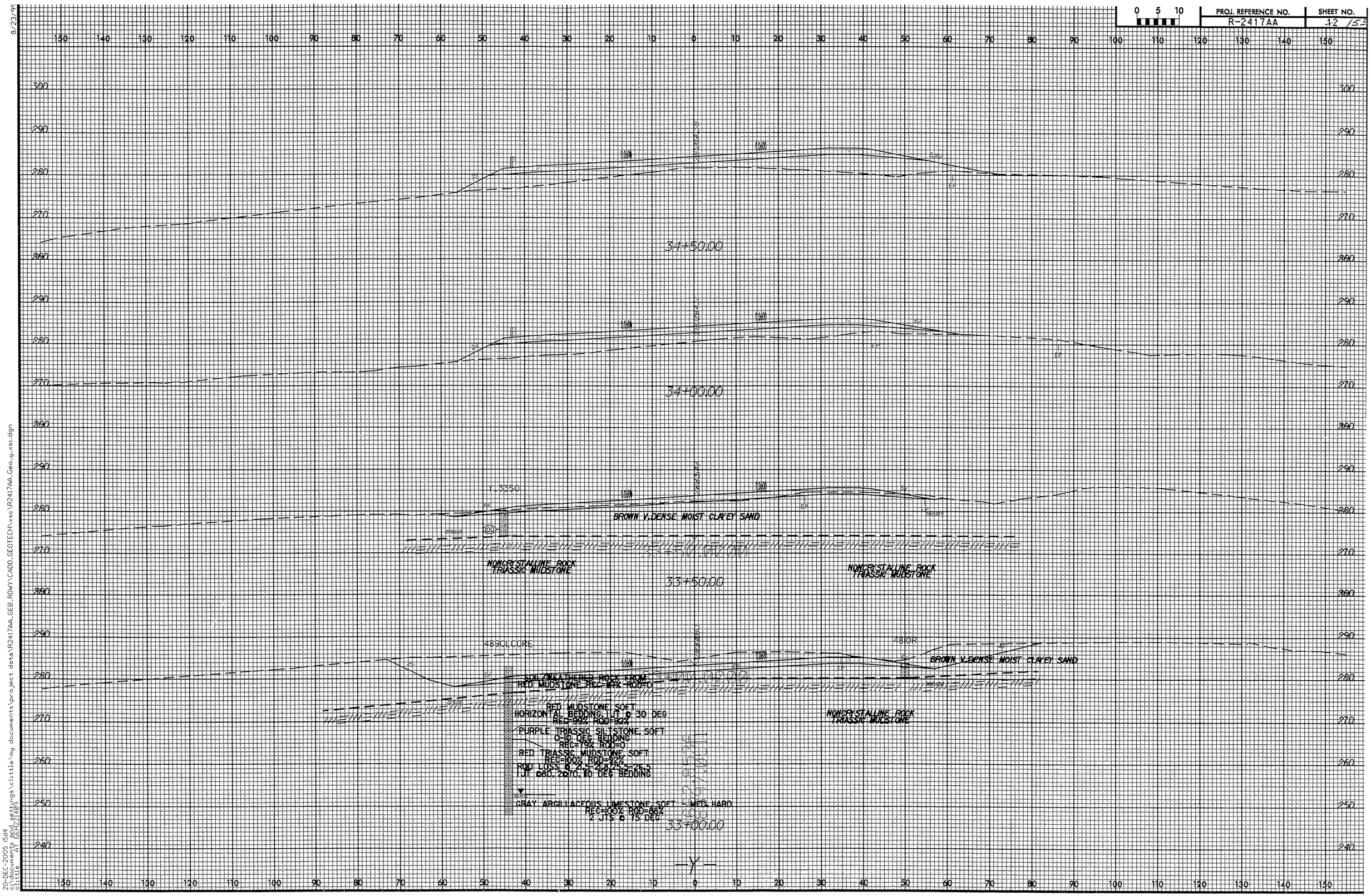

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