ID: R-2408B

CONTRACT: C202240

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2408B	1	102

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34427.1.1	STP-28 (1)	P.E.
34427.2.3	STP-0028 (4)	R/W, UTIL
34427.3.2	STP-0028 (5)	CONST.

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

ROADWAY SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. R-2408B F.A. PROJ. STP-28 (1)

COUNTY MACON

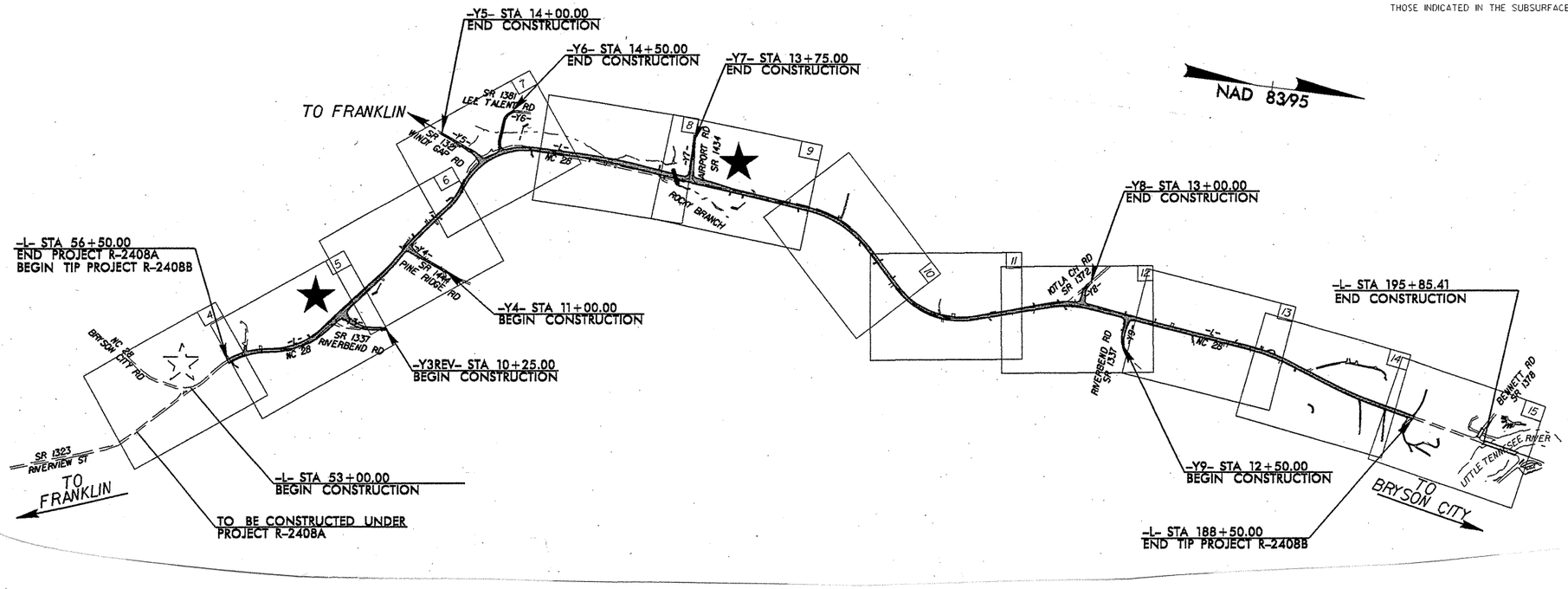
PROJECT DESCRIPTION NC 28 FROM NORTH OF SR 1323 (RIVERVIEW ST.) TO SOUTH OF SR 1378 (BENNETT RD.)

CONTENTS

LINE	STATION	PLAN	PROFILE	XSECT
-L-	60+00 - 188+50	4 - 15	N/A	16 - 91
-Y3-	10+50 - 13+86	5		
-Y4-	11+00 - 15+64	6		92 - 93
-Y5-	10+00 - 14+00	7		
-Y6-	10+00 - 15+64	7		94
-Y7-	10+00 - 13+75	9		95 - 97
-Y8-	10+00 - 14+50	12		
-Y9-	12+50 - 15+27	12		

SUBJECT	SHEET NUMBER
ROADWAY TITLE SHEET	1A
LEGEND	2
INVENTORY REPORT	2A - 2C
EARTHWORK BALANCE SHEET	3
SAMPLE RESULTS	98 - 102

INVENTORY



CAUTION NOTICE

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

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

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

PERSONNEL

T.B. DANIEL

C.J. COFFEY

R.D. CHILDERS

INVESTIGATED BY P.Q. LOCKAMY

CHECKED BY W.D. FRYE

SUBMITTED BY W.D. FRYE

DATE 8/07/06

NORTH CAROLINA LICENSED SEAL 1907 GEOLOGIST PATRICK Q. LOCKAMY

P. Lockamy 8-7-06

SIGNATURE DATE

DRAWN BY: J.T. WILLIAMS

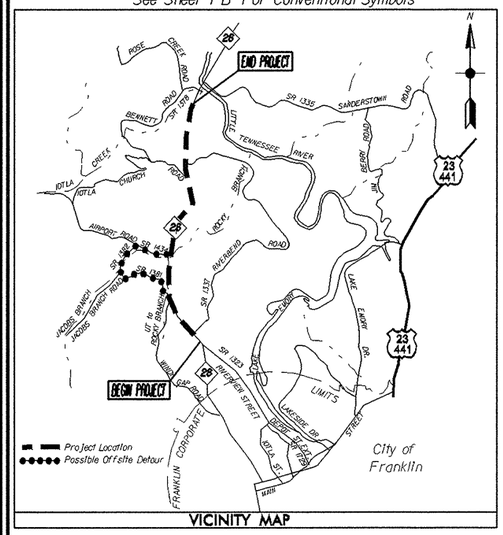
NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IT IS CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

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.

09/08/99

TIP PROJECT: R-2408B

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



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

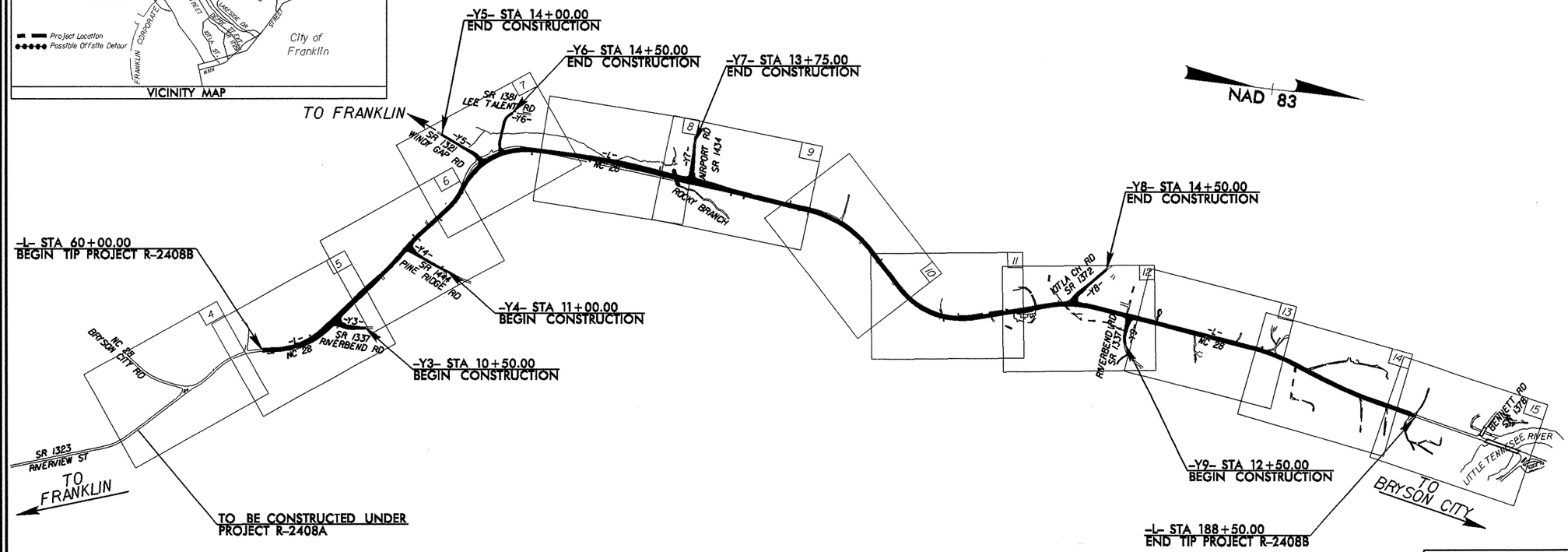
MACON COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2408B	1A	102

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34427.1.1	STP-28 (1)	P.E.
		R/W
		CONST.

LOCATION: NC 28 FROM NORTH OF SR 1323 (RIVERVIEW ST.) TO SOUTH OF SR 1378 (BENNETT RD.)

TYPE OF WORK: GRADING, DRAINAGE, CULVERT, WIDENING, AND PAVING



INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

** DESIGN EXCEPTION NEEDED FOR THIS PROJECT DOES NOT FALL WITHIN THE MUNICIPAL BOUNDARIES OF THE CITY OF FRANKLIN.

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

CONTRACT:

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 2005 = 9,600
ADT 2025 = 15,300
DHV = 9%
D = 65%
T = 6% *
V_D = 50 TO 60 MPH

* TTST 2% DUAL 4%

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2408B =
LENGTH STRUCTURE TIP PROJECT R-2408B =
TOTAL LENGTH TIP PROJECT R-2408B = 2.43 MI

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

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: NOVEMBER 17, 2006

LETTING DATE: NOVEMBER 18, 2008

JASON MOORE, PE
PROJECT ENGINEER

JEANIE TYSON
PROJECT DESIGN ENGINEER

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

25-SEP-2006 09:50
d:\projects\r2408b_geo_rdwy_final\cadd_original\proj\r2408b_rdy_tsh.dgn
jtwilliams
AT GEA22140

PROJECT REFERENCE NO.	SHEET NO.
R-2408B	2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:

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

SOIL LEGEND AND AASHTO CLASSIFICATION

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

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

CONSISTENCY OR DENSENESS

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

TEXTURE OR GRAIN SIZE

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

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

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

SOIL MOISTURE - CORRELATION OF TERMS

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

PLASTICITY

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

COLOR

DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY), MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.

GRADATION

WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.
UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED)
GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.

ANGULARITY OF GRAINS

THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.

MINERALOGICAL COMPOSITION

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

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LIQUID LIMIT LESS THAN 31
MODERATELY COMPRESSIBLE	LIQUID LIMIT EQUAL TO 31-50
HIGHLY COMPRESSIBLE	LIQUID LIMIT GREATER THAN 50

PERCENTAGE OF MATERIAL

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

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

GROUND WATER

- WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING
- STATIC WATER LEVEL AFTER 24 HOURS
- PW — PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA
- SPRING OR SEEP

MISCELLANEOUS SYMBOLS

- ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION
- SOIL SYMBOL
- ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT
- INFERRED SOIL BOUNDARY
- INFERRED ROCK LINE
- ALLUVIAL SOIL BOUNDARY
- 25/025 — DIP & DIP DIRECTION OF ROCK STRUCTURES
- SOUNDING ROD
- SPT CPT DPT DMT VST PMT — TEST BORING
- AUGER BORING
- CORE BORING
- MW — MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- SPT N-VALUE
- REF — SPT REFUSAL

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

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
- [ ] _____
- [ ] _____

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

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

CORE SIZE:
- [ ] -B__
- [ ] -N__
- [ ] -H__

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

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK.
ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:

WEATHERED ROCK (WR)	NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.
CRYSTALLINE ROCK (CR)	FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.
NON-CRYSTALLINE ROCK (NCR)	FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.
COASTAL PLAIN SEDIMENTARY ROCK (CP)	COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.

WEATHERING

FRESH	ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.
VERY SLIGHT (V SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.
SLIGHT (SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.
MODERATE (MOD.)	SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.
MODERATELY SEVERE (MOD. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES 'CLUNK' SOUND WHEN STRUCK. *IF TESTED, YIELDS SPT REFUSAL*
SEVERE (SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. *IF TESTED, YIELDS SPT N VALUES > 100 BPF*
VERY SEVERE (V SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, YIELDS SPT N VALUES < 100 BPF*
COMPLETE	ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.

ROCK HARDNESS

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

FRACTURE SPACING

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

BEDDING

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

INDURATION

FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.

FRIABLE	RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.
MODERATELY INDURATED	GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.
INDURATED	GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.
EXTREMELY INDURATED	SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.

TERMS AND DEFINITIONS

ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.

AQUIFER - A WATER BEARING FORMATION OR STRATA.

ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.

ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.

ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.

CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.

COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.

CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.

DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.

DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.

FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.

FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.

FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.

FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.

FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.

JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.

LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.

LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.

MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.

PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.

RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.

SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.

SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.

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

STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.

STRATA ROCK QUALITY DESIGNATION (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.

TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK: _____

ELEVATION: _____ FT.

NOTES:
-

REVISED 02/23/06

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

DAVID MCCOY
SECRETARY

August 7, 2006

STATE PROJECT: 34427.1.1 (R-2408B)
FEDERAL PROJECT: STP-28 (1)
COUNTY: Macon

DESCRIPTION: NC 28 from North of SR-1323 to South of SR-1378

SUBJECT: Geotechnical Report – Inventory

Project Description

This project consists of widening and improvements to NC 28 designated -L- and adjoining side roads designated -Y3- through -Y9-.

The subsurface investigation was conducted in the spring of 2006 using a CME-550 ATV mounted drill and a hand auger was used in inaccessible areas. Standard Penetration Tests were performed at 5 foot intervals using an automatic hammer. Solid auger borings were also made. Soil samples were taken and submitted for quality testing. No rock was cored along this project.

The following alignments were investigated:

Line	Station Interval
-L-	60+00 – 188+50
-Y3-	10+50 – 13+86.66
-Y4-	11+00 – 15+64.37
-Y5-	10+00 – 14+00
-Y6-	10+00 – 15+64.82
-Y7-	10+00 – 13+75
-Y8-	10+00 – 14+50
-Y9-	12+50 – 15+27.22

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT
1589 MAIL SERVICE CENTER
RALEIGH NC 27699-1589

TELEPHONE: 919-250-4088
FAX: 919-250-4237

WEBSITE: WWW.DOH.DOT.STATE.NC.US

LOCATION:
CENTURY CENTER COMPLEX
BUILDING B
1020 BIRCH RIDGE DRIVE
RALEIGH NC 27610

Areas of Special Geotechnical Interest

(1) Floodplain Deposits: Floodplain deposits are located in the following areas.

Line	Station Interval
-L-	98+50 – 110+20
-L-	11+50 – 12+50

(2) Crystalline Rock: Crystalline rock occurs above or within 6 feet of proposed grade at the following locations.

Line	Station Interval
-L-	78+80 – 79+30, RT
-Y4-	14+75 – 15+25 RT
-Y7-	11+20 – 12+20 RT

(3) Springs: A spring is located in the following area.

Line	Station
-L-	118+65 135 RT (Approx.)

(4) Unsuitable Fill: Areas of unsuitable fill.

Line	Station Interval
-L-	83+30 – 83+95

Physiography and Geology

The project follows existing alignment of NC 28 north of Franklin traversing a deeply weathered, partially incised peneplain in the broad valley of the Little Tennessee River. Just one creek is crossed in 2.4 miles. The area is suburban to bucolic in nature.

Scattered outcrops of gneissic bedrock are exposed at only one locality along the entire project. Encounters with crystalline rock in test borings were unusually sparse. Rock units attributed to the area by the Geologic Map of North Carolina (1985) include Late Proterozoic Age biotite gneiss possibly with abundant aluminosilicates labeled Zybn and amphibolite labeled Zyba. Parent material for the majority of the bedrock is most likely marine sediment derived from a volcanic landscape along with a lesser amount of intrusive and extrusive mafic igneous rock. All of which has been metamorphosed more than once. Intruded into the country rock are Devonian to Silurian age pegmatite swarms.

Numerous small mines in the pegmatites, now obscured, produced mica during the 1930s and 1940s are located along the project corridor. The largest mica mine in Macon County still can be seen along the banks of the river a few hundred feet beyond the end of the project.

Soil Properties

Most of the soils encountered along this project will be saprolitic and frequently straddle the boundary between sand and silt. Saprolitic soils on the project are predominately medium dense silty sand and medium stiff to stiff sandy silt. Typical of saprolites here is layering with weathered rock. This is noticeable in one of the larger cuts on the project right of -L- Stations 84+50 to 94+00.

Widespread residual soils are represented by immature A-5 silts on steeper slopes to intensely weathered A-7-5 clay caps. These soils reflect their volcanic heritage by having somewhat elevated liquid limits. Weathered bedrock clasts are common in residuum.

River terrace soils occupy high flat ground and where protected from erosion, can be 12 feet deep. Terrace clays are typically bright red in color and underlain by rounded basal quartz gravel and cobbles. Generally, these soils are classified as A-7-5 and A-5 and are nearly void of silt. These ancient alluvial soils are so intensely weathered that some are even classified as residual soils on soil surveys.

Incipient colluvial soils observed along the project include residual soils piled up at the toe of one steep slope (-L- Station 74+00, LT) and some clayey residuum in the head of a drainage at -L- Stations 67+50 to 74+00, RT and 184+50, RT. Small clasts of weathered bedrock incorporated in the residuum indicate some creeping movement has occurred in the past. Although these soils have some characteristics of colluvium (they have migrated downhill some) they have a greater resemblance to residuum and were classified so.

Alluvial soils are found mostly to the left of –L- Station 99+00 to 110+20 and on both sides of -Y6- from Station 11+50 to 12+50. Alluvium is typically 3 to 4 feet deep and dominated by very soft silts which tend to have just enough organic material to smell sulphurous and possess a dark brown color but have no peaty layers or wood debris. These very soft silts are labeled as organic on cross sections. Basal sand and gravel are intermittent. Alluvium is typically underlain by a soft clay plugged silty saprolite. Near the culvert by -L-Station 108+95, alluvium is underlain by crystalline rock.

Embankments are found along the roadway throughout the project. Some embankments have a moderate percentage of weathered rock mixed with the saprolitic borrow material used in their construction. Existing embankments appear to be in good condition.

Uncontrolled fill soil is noted in several areas. One is found right of -L- Station 83+50±. The fill was placed in a small intermittent drainage to allow for a parking area in the front yard of a residence. Patches of shallow fill soil (disturbed alluvial silts) were encountered along the creek left of -L- Station 101+00 to 107+00. Also, very soft silty fill was encountered in the low ground left of -L- Station 110+00.

Note: Areas denoted cross sections as saprolite with weathered rock layers or zones, or weathered rock interlayered with saprolite or crystalline rock may require select ripping or blasting to excavate.

Crystalline Rock Properties

Crystalline rock is exposed in only one area along the length of this project. Near the creek at -L- Station 109+00± and on the right side of -Y7-. Crystalline rock is only classified as having a metamorphic origin, i.e. gneiss.

Bulk Samples

A bulk sample was taken at the following cut location for tests to determine engineering properties of the soil.

Sample No.	Location	Depth
BS-1	87+50, 33 RT	13.1 – 23.1

Vane Shear Results

A Geonor Vane Tester H-60 with a 1-inch vane (25.4 x 50.8 mm) was used. Gauge readings are multiplied by 0.5, values given are adjusted.

-L- Station	Offset	Depth	Adjusted Reading (Kpa)
99+50	70 LT	1.5	27
		2.0	6
100+00	70 LT	1.5	13
		2.0	18
		2.5	21
		3.0	36
100+50	35 LT	1.0	34
		1.5	20
		2.0	15
		2.5	24
		3.0	46

Geotechnical Descriptive Analysis

For descriptive purposes, the project has been divided into segments.

Segment 1: -L- Station 60+00 to 110+62

Small cuts and embankments are proposed from -L- Station 60+00 to 84+00. In this area, medium stiff to stiff fine grained residual soils (A-4, A-5, A-7-5) are underlain by medium stiff to very stiff clayey silts (A-5) to sandy silts (A-4) or medium dense silty sands (A-2-4). A small area of crystalline rock will be encountered in the cut right of -L- Stations 78+50 to 79+50 and right of Station -Y4- Station 15+00. There, crystalline rock and weathered rock are layered with dense saprolite.

Soils both left and right of -L- Station 67+50 to 76+00 have clasts of weathered rock in the argillic horizon. It is suspected that these soils have sagged slightly down-slope during past cold climates.

Uncontrolled fill with some wood and trash is present in a filled in drainage right of -L- Station 83+30 to 83+95. The fill may extend slightly under the proposed northbound lane.

Two drainfields were reported to be in the area of the proposed cut left of -Y6- Station 14+00± to 15+64± by the owner of the property, Gary Wayne Crisp.

One of the larger cuts along the project is to the right of -L- Station 86+00± to 98+00±. There, an immature residual horizon of stiff clayey sandy silt or sandy clay (A-5, A-6) typically less than 5 feet thick overlies loose to very dense saprolitic sands (A-2-4, A-2-5). Saprolitic soils are layered with weathered rock of gneiss.

The longest embankment proposed is from -L- Station 98+00± to 110+60±. It will be placed over existing embankment and saprolitic soil with some weathered rock of gneiss and spill out over floodplain soils. Alluvial soils encountered include very soft silts with organic characteristics. Vane shear tests were performed in these weak soils. Also, the top few feet of underlying saprolitic soils are plugged with clay and grey. Some of the area had standing water at the time of this investigation and the ground would sink under foot, particularly from -L- Station 99+00 to 101+00 near the toe of proposed embankment.

The stone culvert where NC 28 crosses Rocky Branch is in an area of shallow crystalline rock overlain by thin silty alluvium. Crystalline rock is exposed along portions of the creek bed there.

From -L- Station 104+00± to 110+20±, multiple generations of embankments serving numerous alignments of NC 28 are present.

Segment 2: -L- Station 110+62 to 188+50

A moderate cut extends on the left of -L- Station 111+00± to 117+00± where less than 5 feet of residual stiff sandy clay overlie fairly deep saprolitic medium dense to very dense silty sand and medium stiff to hard sandy silts layered with weathered rock of gneiss.

Crystalline rock was encountered in three borings left of -L- Station 112+00 to 115+00 at a depth of 31± to 39± feet.

Right of -L- Station 117+50 to 120+00 is a proposed embankment up to approximately 40 feet tall. Foundation materials include existing embankment and some recent alluvium. The embankment toes out in the head of a drainage where about 2 feet of washed in clayey silt overlies 5 feet of very soft recent alluvial sandy silt underlain by hard saprolitic silt. A spring box located approximately 100 feet right of -L- Station 118+65 is outside of construction limits.

Small cuts and embankments are typical for the majority of this section. Fairly deep medium stiff to very stiff residual clays and silty and/or terrace clays and silts (A-7-5, A-5) underlain by medium dense to very dense saprolitic sands and medium stiff to hard silts (A-4, A-2-4, A-2-5) are found in this section from -L- Station 120+00 to 185+50.

The very end of the project has a tall cut on the left from -L- Station 185+00± 188+20±. Surprisingly, no crystalline rock and very little weathered rock of gneiss was encountered in test borings there. The tall cut is composed predominantly of medium stiff to hard saprolitic silt (A-4) with a patchy residual cap of clayey silt (A-5).

A water well and pump house are reported to be to the right of -L- Station 184+00± – 185+00± on the property of Martha C. Donaldson.

-Y7-

Crystalline rock of gneiss is present in the proposed cut right of -Y7- Stations 11+25 to 12+40.

Respectfully Submitted,

P. Q. Lockamy

P. Q. Lockamy, LG

EARTHWORK BALANCE SHEET

PROJECT: R-2408B COUNTY: MACON DONE BY: JBM DATE: 11/3/2009 CHKD BY: SEC DATE: 2/8/2010

ROCK SWELL 25%

LOCATION	EXCAVATION (CUBIC YARDS)					EMBANKMENT (CUBIC YARDS)					WASTE (CUBIC YARDS)			
	TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUITABLE UNCLASS.	SUITABLE EARTH EXCAV.	TOTAL EMBANKMENT	ROCK EMBANKMENT	EARTH EMBANKMENT	EMBANKMENT PLUS 15%	BORROW	ROCK	SUITABLE EARTH	UNSUITABLE	TOTAL
DET1REV (L STA 70+85.00 TO 86+11.17)	4,784	384	642		4,400	1,668	384	1,188	1,750			2,650	642	3,292
L (RT WIDENING) 59+50.00 TO 67+57.45	4,558				4,558	67		67	77			4,481		4,481
L (LT WIDENING) 75+32.00 TO 78+18.00	1,525				1,525	17		17	20			1,505		1,505
Y4DET 12+23.80 TO 15+00.00	437	103			334	421	103	292	439	2				
TOTAL SUMMARY 1	11,304	487	642		10,817	2,173	487	1,564	2,286	2		8,636	642	9,278
LTEMP (PRO) 87+00.00 TO 101+70.40	31,636	822			30,814	10,426	822	9,604	11,867			19,769		19,769
TOTAL SUMMARY 2	31,636	822			30,814	10,426	822	9,604	11,867			19,769		19,769
DET2REV (L 101+70.40 TO 113+61.00)	1,090				1,090	16,990		16,990	19,539	18,449				
Y7TIE 10+77.75 TO 11+75.00	2				2	110		110	127	125				
TOTAL SUMMARY 3	1,092				1,092	17,100		17,100	19,666	18,574				
DET3REV (L 112+40.71 TO 142+00.00)	5,274				5,274	13,830		13,830	15,905	10,631				
DR4REV 10+28.00 TO 11+50	201				201							201		201
TOTAL SUMMARY 4	5,475				5,475	13,830		13,830	15,905	10,631		201		201
DET3REV (L 142+00.00 TO 161+73.32)	6,061				6,061	1,767		1,767	2,032			4,029		4,029
TOTAL SUMMARY 5	6,061				6,061	1,767		1,767	2,032			4,029		4,029
DET6 165+26.80 TO 179+31.02	4,039				4,039	372		372	427			3,612		3,612
TOTAL SUMMARY 6	4,039				4,039	372		372	427			3,612		3,612
L(LEFT) 56+50.00 TO 86+50.00	5,797				5,797	2,569		2,569	2,954			2,843		2,843
TOTAL SUMMARY 7	5,797				5,797	2,569		2,569	2,954			2,843		2,843
L(RIGHT) 56+50.00 TO 86+50.00	4,939				4,939	4,157		4,157	4,776			163		163
Y3REV 10+25.00 TO 14+50.00	1,882				1,882	408		408	469			1,413		1,413
Y4 11+00.00 TO 15+00.00	273				273	208		208	239			34		34
TOTAL SUMMARY 8	7,094				7,094	4,773		4,773	5,484			1,610		1,610
L(LEFT) 86+50.00 TO 110+00.00	1,125				1,125	4,115		4,115	4,732	3,607				
Y5 10+34.00 TO 13+50.00	47				47	1,516		1,516	1,743	1,696				
Y6 10+31.00 TO 14+50.00	98				98	5,059		5,059	5,818	5,720				
TOTAL SUMMARY 9	1,270				1,270	10,690		10,690	12,293	11,023				
L(RIGHT) 86+50.00 TO 116+50.00	5,015				5,015	4,072		4,072	4,683			332		332
TOTAL SUMMARY 10	5,015				5,015	4,072		4,072	4,683			332		332
L(LEFT) 110+00.00 TO 140+00.00	25,601	1,036			24,565	2,547	1,036	1,252	2,476			23,125		23,125
Y7 10+50.00 TO 13+75.00	3,192	888			2,304	1,399	888	289	1,220			1,972		1,972
TOTAL SUMMARY 11	28,793	1,924			26,869	3,946	1,924	1,541	3,696			25,097		25,097
PAGE TOTAL	107,576	3,233	642		104,343	71,718	3,233	67,882	81,293	40,230		66,129	642	66,771

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

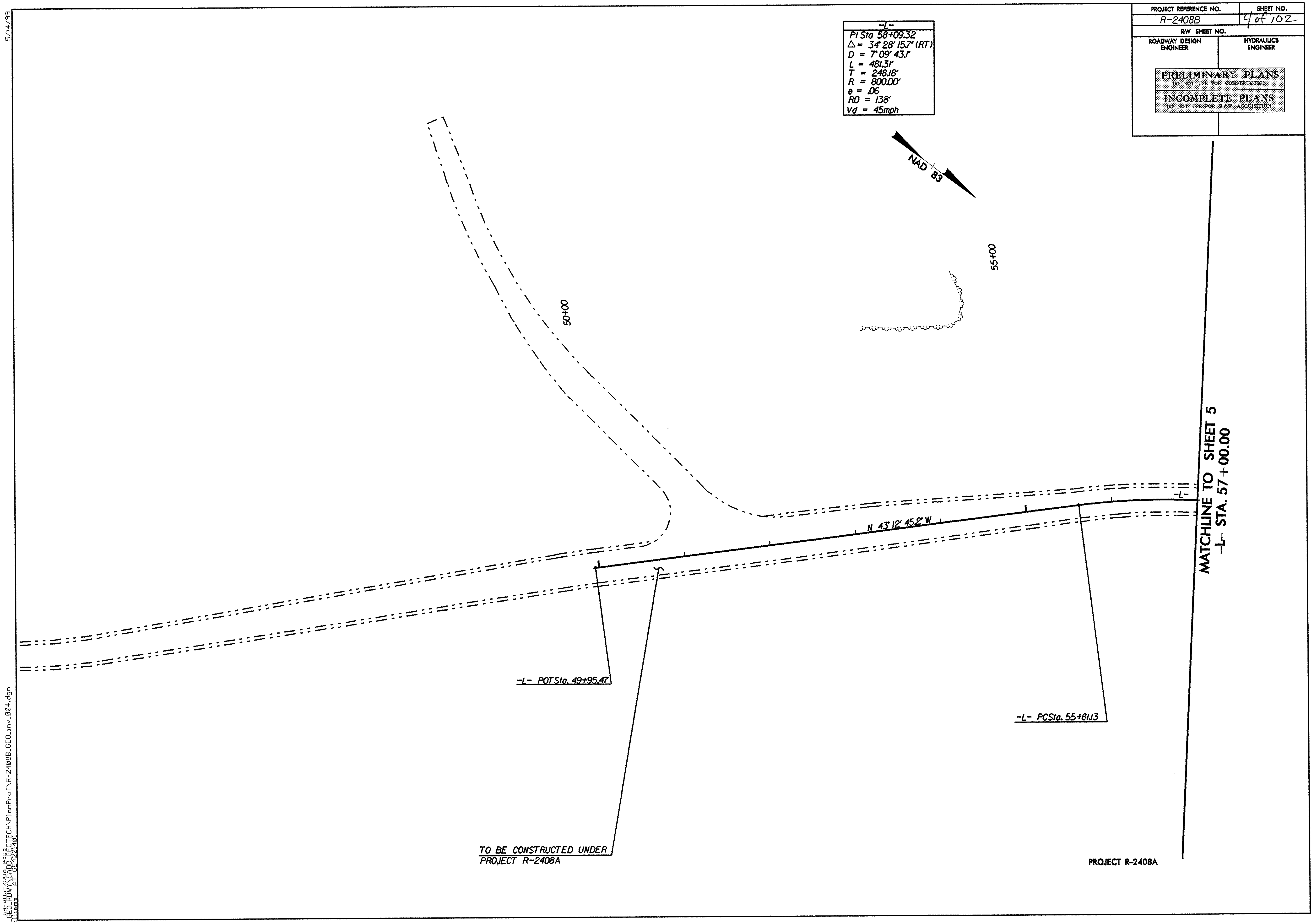
PROJECT: R-2408B COUNTY: MACON DONE BY: JBM DATE: 11/3/2009 CHKD BY: SEC DATE: 2/8/2010

ROCK SWELL 25%

LOCATION	EXCAVATION (CUBIC YARDS)					EMBANKMENT (CUBIC YARDS)					WASTE (CUBIC YARDS)			
	TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUITABLE UNCLASS.	SUITABLE EARTH EXCAV.	TOTAL EMBANKMENT	ROCK EMBANKMENT	EARTH EMBANKMENT	EMBANKMENT PLUS 15%	BORROW	ROCK	SUITABLE EARTH	UNSUITABLE	TOTAL
PAGE 1 TOTAL	107,576	3,233	642		104,343	71,718	3,233	67,882	81,293	40,230		66,129	642	66,771
L (RIGHT) 116+50.00 TO 146+50.00	10,732				10,732	5,155		5,155	5,928			4,804		4,804
TOTAL SUMMARY 12	10,732				10,732	5,155		5,155	5,928			4,804		4,804
L (LEFT) 140+00.00 TO 170+00.00	4,230				4,230	6,996		6,996	8,046	3,816				
Y8 10+50.00 TO 13+00.00	17				17	4,468		4,468	5,138	5,121				
TOTAL SUMMARY 13	4,247				4,247	11,464		11,464	13,184	8,937				
L (RIGHT) 146+50.00 TO 176+50.00	226				226	9,182		9,182	10,559	10,333				
Y9 12+50.00 TO 15+00.00	194				194	593		593	682	488				
TOTAL SUMMARY 14	420				420	9,775		9,775	11,241	10,821				
L (LEFT) 170+00.00 TO 188+50.00	682				682	3,748		3,748	4,310	3,628				
TOTAL SUMMARY 15	682				682	3,748		3,748	4,310	3,628				
L (RIGHT) 176+50.00 TO 188+50.00	2,643				2,643	1,599		1,599	1,839			804		804
TOTAL SUMMARY 16	2,643				2,643	1,599		1,599	1,839			804		804
PAGE 2 TOTAL	18,724				18,724	31,741		31,741	36,503	23,387		5,608		5,608
TOTAL	126,300	3,233	642		123,067	103,459	3,233	99,623	117,796	63,616		71,737	642	72,379
LOSS DUE TO CLEARING & GRUBBING	-2,100				-2,100							-2,100		-2,100
ADDITIONAL UNDERCUT			4,200			4,200		4,200	4,830	4,830			4,200	4,200
EXCAVATION FOR EROSION CONTROL	60													60
EARTH WASTE TO REPL. BOR.										-68,446		-68,446		-68,446
GRAND TOTALS	124,260	3,233	4,842		120,967	107,659	3,233	103,823	122,626			1,191	4,842	6,093
SAY	125,400		4,900											

EST. SHOULDER BORROW	6,500 CY
CLASS IV SUBGRADE STAB. MAT.	3,035 TONS
SELECT GRAN. MAT. CLASS II OR III	2,500 TONS
DRAINAGE DITCH EXCAVATION	740 CY
UNDERDRAIN	1,000 FT
FABRIC FOR SOIL STABILIZATION	4,000 SY
PAVEMENT STRUCTURE VOLUME	54 CY

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



PROJECT REFERENCE NO.
R-2408B
SHEET NO.
4 of 102
RW SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
-L-
PI Sta 58+09.32
△ = 34° 28' 15.7" (RT)
D = 7° 09' 43.5"
L = 481.31'
T = 248.18'
R = 800.00'
e = .06
RO = 138'
Vd = 45mph
NAD 83
50+00
55+00
N 43° 12' 45.2" W
-L-
MATCHLINE TO SHEET 5
-L- STA. 57+00.00
-L- POT Sta. 49+95.47
-L- PC Sta. 55+61.13
TO BE CONSTRUCTED UNDER PROJECT R-2408A
PROJECT R-2408A

5/14/99
GEO_RDWY\CADD_GEOTECH\PlanProf\R-2408B_GEO_inv_004.dgn
AT GEA221401

PROJECT REFERENCE NO.	SHEET NO.
R-2408B	5/102

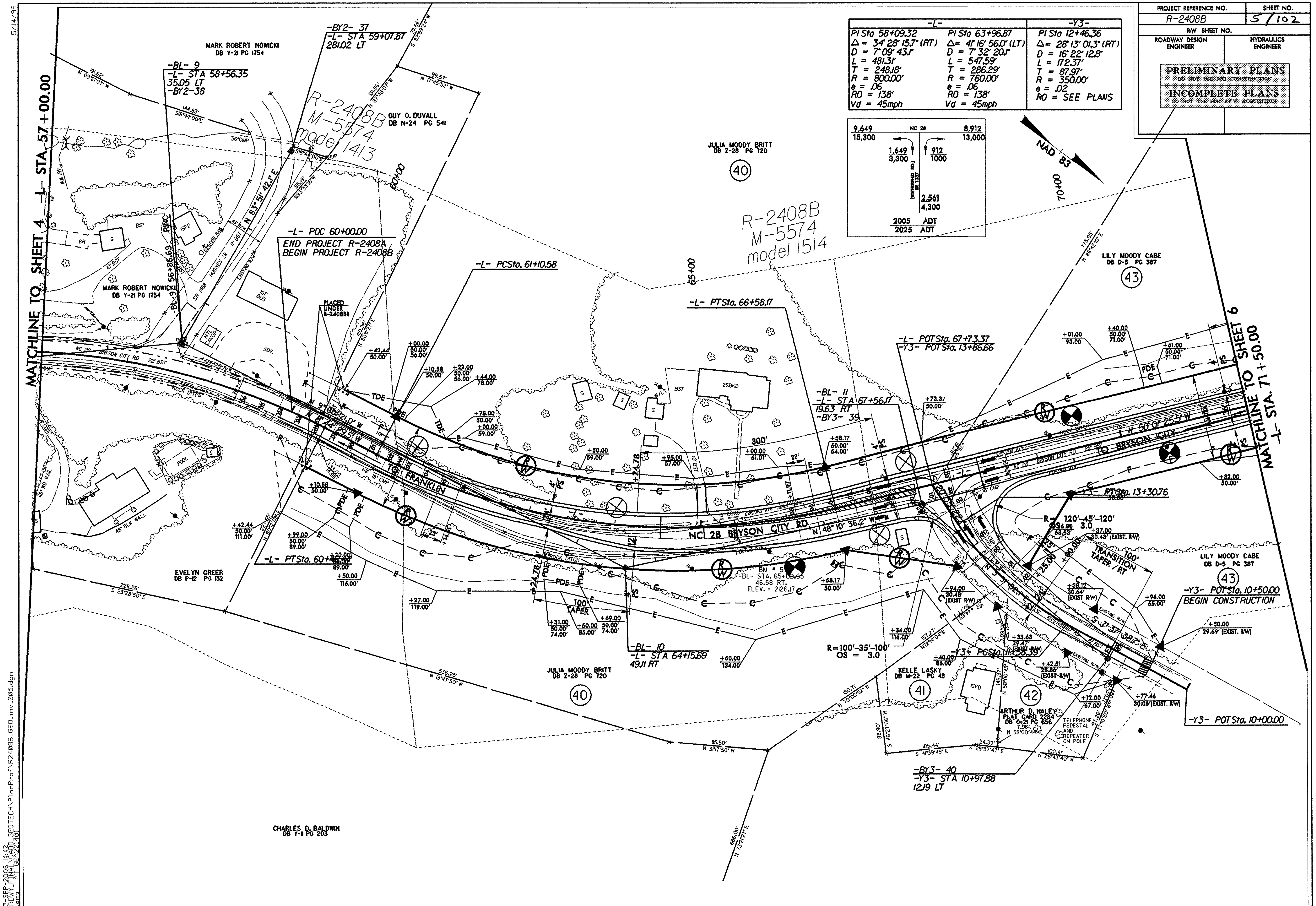
R/W SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-L-	-L-	-Y3-
PI Sta 58+09.32	PI Sta 63+96.87	PI Sta 12+46.36
Δ = 34° 28′ 15.7″ (RT)	Δ = 41° 16′ 56.0″ (LT)	Δ = 28° 13′ 01.3″ (RT)
D = 7° 09′ 43.1″	D = 7° 32′ 20.1″	D = 16° 22′ 12.8″
L = 481.31′	L = 547.59′	L = 172.37′
T = 248.18′	T = 286.29′	T = 87.97′
R = 800.00′	R = 760.00′	R = 350.00′
e = .06	e = .06	e = .02
RO = 138′	RO = 138′	RO = SEE PLANS
Vd = 45mph	Vd = 45mph	



9,649 NC 28 8,912
15,300 13,000
1,649
3,300
912
1000
2,561
4,300
2005 ADT
2025 ADT
NAD 83
MATCHLINE TO SHEET 4 -L- STA. 57+00.00
MATCHLINE TO SHEET 6 -L- STA. 71+50.00
MARK ROBERT NOWICKI DB Y-21 PG 1754
GUY O. DUVALL DB N-24 PG 541
JULIA MOODY BRITT DB Z-28 PG 720
LILY MOODY CABE DB D-5 PG 387
EVELYN GREER DB P-12 PG 132
KELLE LASKY DB M-22 PG 48
ARTHUR D. HALEY PLAT CARD 2284 DB Q-21 PG 656
CHARLES D. BALDWIN DB Y-11 PG 203
R-2408B M-5574 model 1413
R-2408B M-5574 model 1514
-L- POC 60+00.00
END PROJECT R-2408A
BEGIN PROJECT R-2408B
-BY2- 37
-L- STA 59+07.87
281.02 LT
-BL- 9
-L- STA 58+56.35
35.05 LT
-BY2-38
-L- PCSta. 61+10.58
-L- PTSta. 66+58.17
-L- POTSta. 67+73.37
-Y3- POTSta. 13+86.66
-BL- 11
-L- STA 67+56.17
19.63 RT
-BY3- 39
-L- PTSta. 60+
-BL- 10
-L- STA 64+15.69
49.11 RT
-Y3- PTSta. 13+30.76
-Y3- PCSta.
-Y3- POTSta. 10+50.00
BEGIN CONSTRUCTION
-Y3- POTSta. 10+00.00
-BY3- 40
-Y3- STA 10+97.88
12.19 LT
NC 28 BRYSON CITY RD
TO BRYSON CITY
FRANKLIN
TRANSITION TAPER / RT
100′ TAPER
R=100′-35′-100′ OS = 3.0
R= 120′-45′-120′
TELEPHONE PEDESTAL AND REPEATER ON POLE

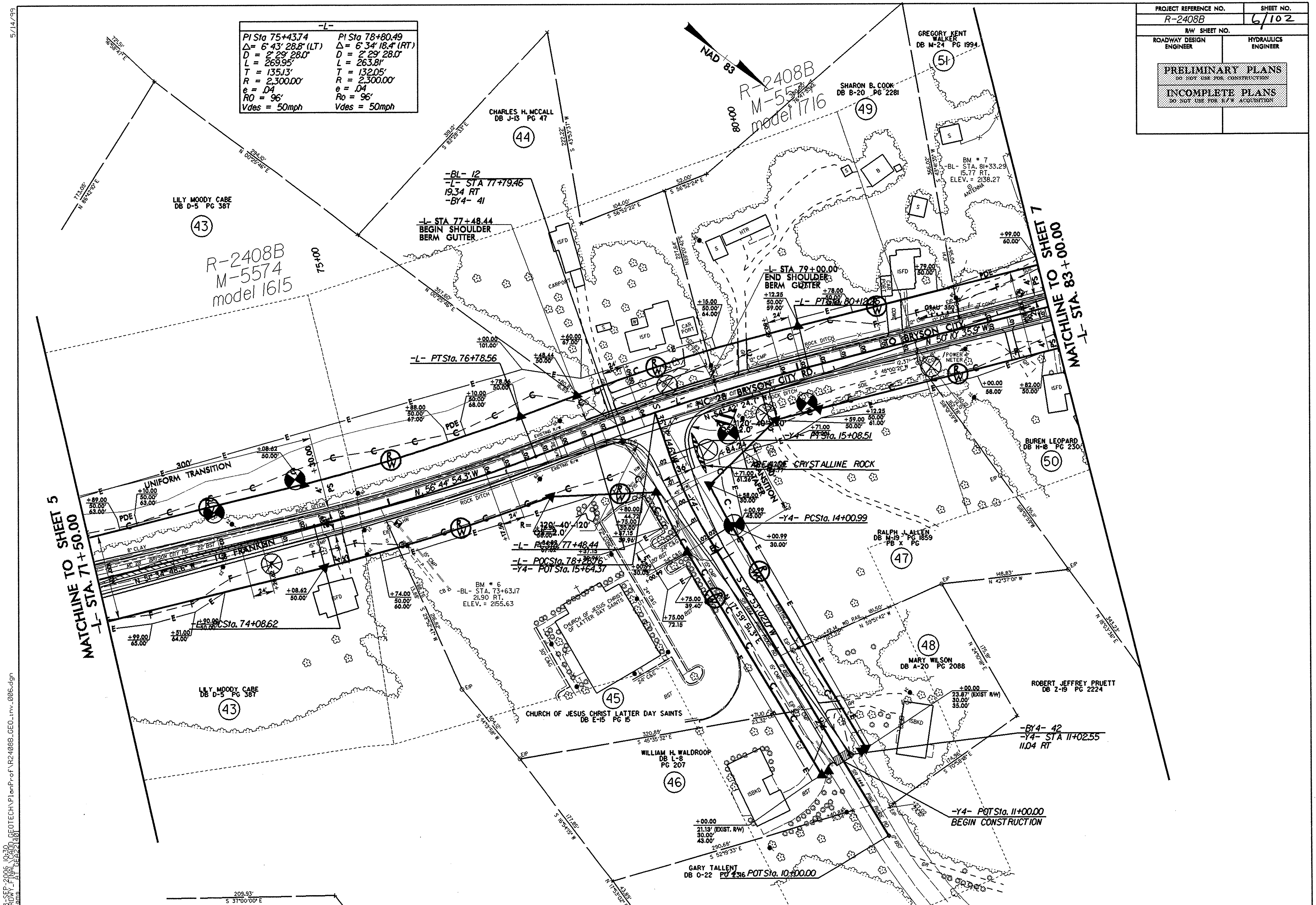
13-SEP-2006 14:42
5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-2408B	6/102
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-L-	
PI Sta 75+43.74	PI Sta 78+80.49
Δ = 6° 43' 28.8" (LT)	Δ = 6° 34' 18.4" (RT)
D = 2° 29' 28.0"	D = 2° 29' 28.0"
L = 269.95'	L = 263.81'
T = 135.13'	T = 132.05'
R = 2,300.00'	R = 2,300.00'
e = .04	e = .04
RO = 96'	Ro = 96'
Vdes = 50mph	Vdes = 50mph

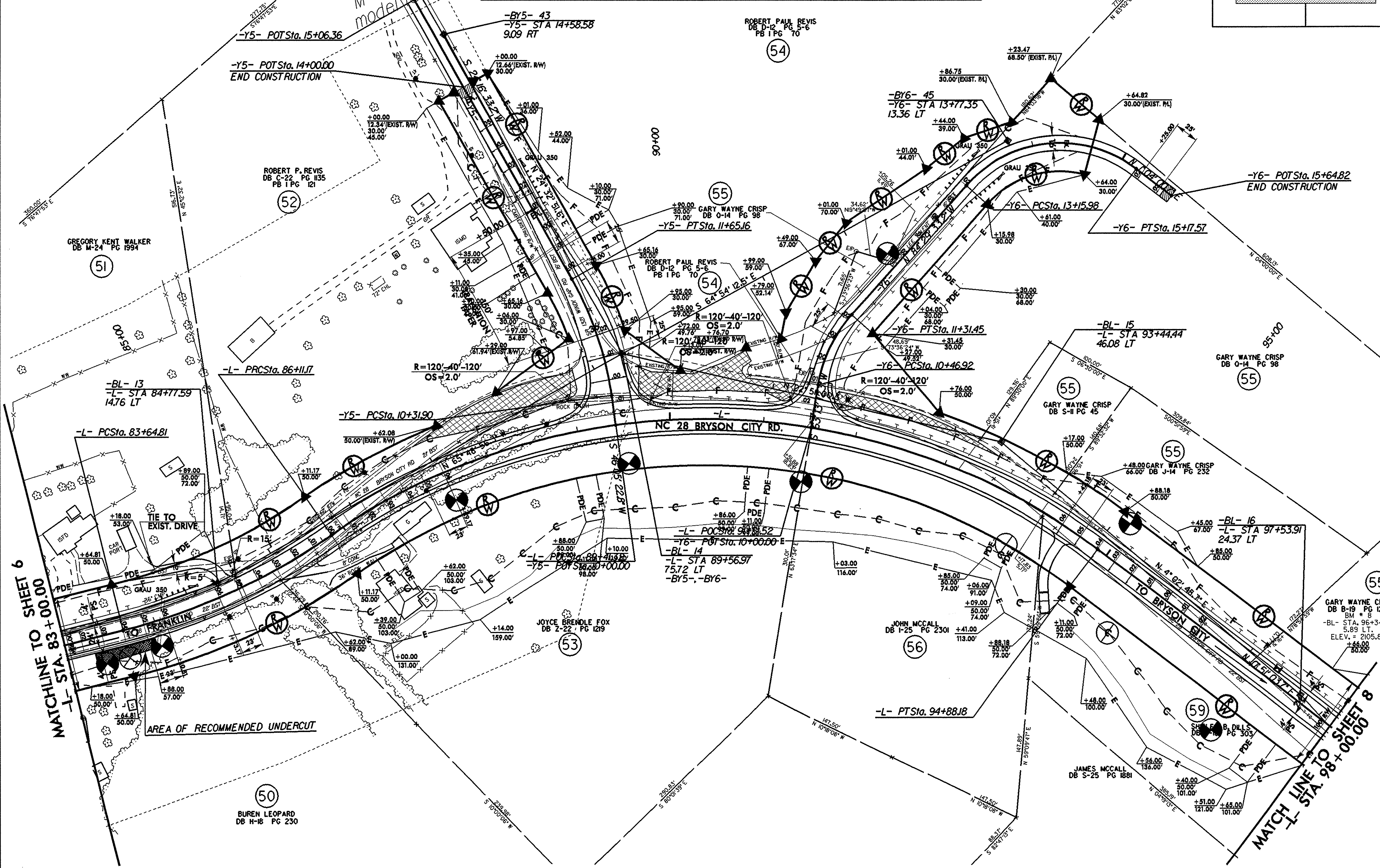


PROJECT REFERENCE NO.	SHEET NO.
R-2408B	7/102
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-L-		-Y5-	-Y6-	
PI Sta 84+89.36	PI Sta 91+17.74	PI Sta 10+99.35	PI Sta 10+90.34	PI Sta 14+40.90
Δ = 20° 45′ 26.1″ (LT)	Δ = 71° 47′ 05.6″ (RT)	Δ = 21° 48′ 49.6″ (LT)	Δ = 32° 17′ 14.5″ (RT)	Δ = 85° 33′ 33.8″ (RT)
D = 8° 25′ 33.1″	D = 8° 11′ 06.4″	D = 16° 22′ 12.8″	D = 38° 11′ 49.9″	D = 42° 26′ 28.7″
L = 246.35′	L = 877.02′	L = 133.25′	L = 84.53′	L = 201.59′
T = 124.54′	T = 506.57′	T = 67.44′	T = 43.42′	T = 124.92′
R = 680.00′	R = 700.00′	R = 350.00′	R = 150.00′	R = 135.00′
e = .06	e = .06	e = .02	e = .02	e = .02
RO = 138′	RO = 138′	RO = SEE PLANS	RO = SEE PLANS	RO = SEE PLANS
Vdes = 45mph	Vdes = 45mph			

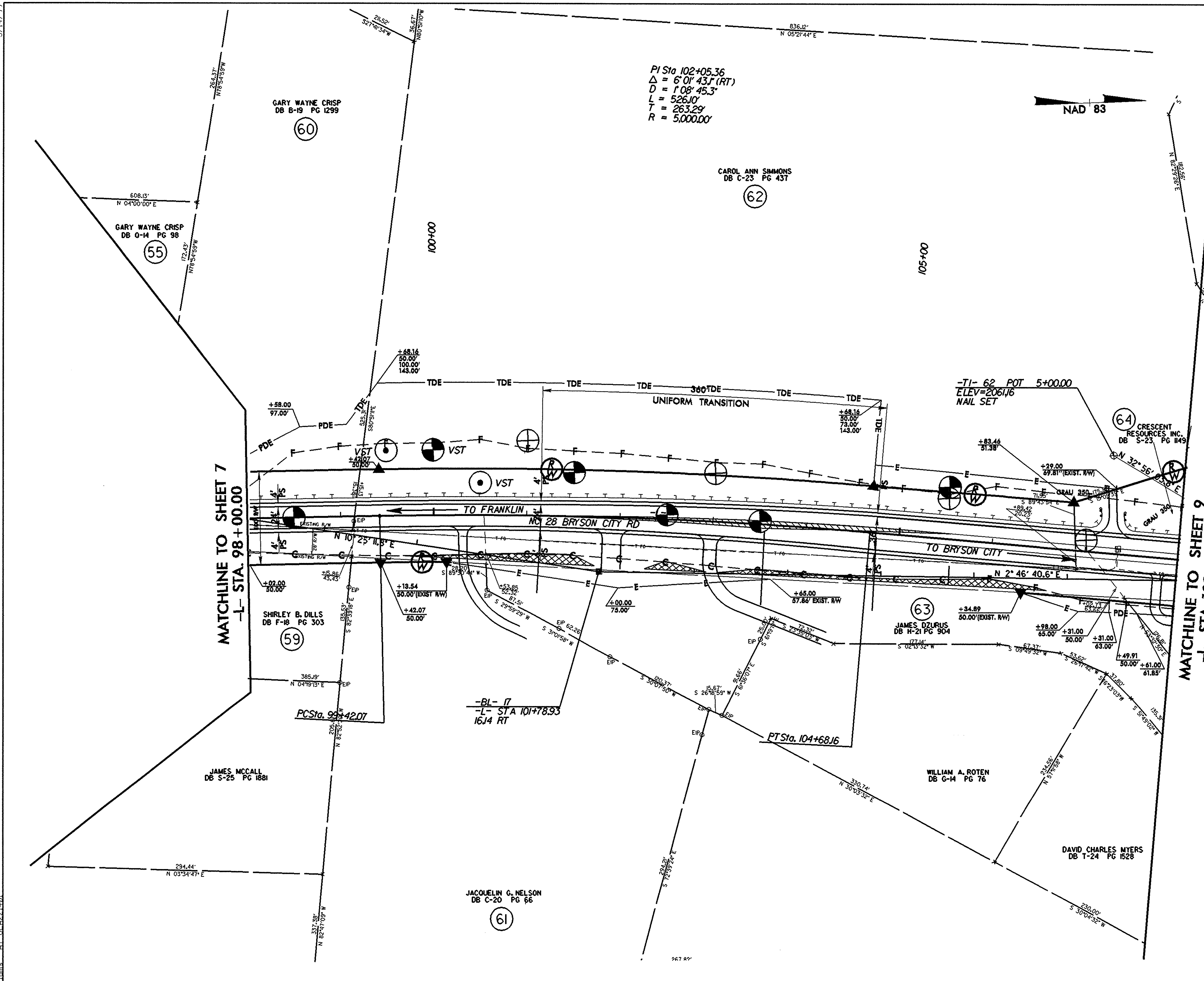


NAD 83
R-2408B
M-5574
-Y5- POT Sta. 15+06.36
-BY5- 43
-Y5- STA 14+58.58
9.09 RT
-Y5- POT Sta. 14+00.00
END CONSTRUCTION
ROBERT PAUL REVIS
DB D-12 PG 5-6
PB 1 PG 70
54
ROBERT P. REVIS
DB C-22 PG 1135
PB 1 PG 121
52
GREGORY KENT WALKER
DB M-24 PG 1994
51
GARY WAYNE CRISP
DB 0-14 PG 98
55
-Y5- PT Sta. 11+65.16
-BY6- 45
-Y6- STA 13+77.35
13.36 LT
-Y6- POT Sta. 15+64.82
END CONSTRUCTION
-Y6- PC Sta. 13+15.98
-Y6- PT Sta. 15+17.57
-Y6- PT Sta. 11+31.45
-Y6- PC Sta. 10+46.92
R=120′-40′-120′
OS=2.0′
-BL- 15
-L- STA 93+44.44
46.08 LT
-L- PRC Sta. 86+11.17
-BL- 13
-L- STA 84+77.59
14.76 LT
-Y5- PC Sta. 10+31.90
-L- PC Sta. 83+64.81
NC 28 BRYSON CITY RD.
GARY WAYNE CRISP
DB S-11 PG 45
GARY WAYNE CRISP
DB J-14 PG 232
-BL- 16
-L- STA 97+53.91
24.37 LT
TIE TO EXIST. DRIVE
-L- POC Sta. 94+81.52
-Y6- POT Sta. 10+00.00
-BL- 14
-L- STA 89+56.97
75.72 LT
-BY5-, -BY6-
JOYCE BRENDLE FOX
DB 2-22 PG 1219
53
JOHN MCCALL
DB 1-25 PG 2301
56
GARY WAYNE CRISP
DB B-19 PG 1299
BM # 8
-BL- STA. 96+34.67
5.89 LT.
ELEV. = 2105.84
TO FRANKLIN
TO BRYSON CITY
MATCHLINE TO SHEET 6
-L- STA. 83+00.00
AREA OF RECOMMENDED UNDERCUT
-L- PT Sta. 94+88.18
JAMES MCCALL
DB S-25 PG 1881
59
BUREN LEOPARD
DB H-18 PG 230
50
MATCH LINE TO SHEET 8
-L- STA. 98+00.00

PROJECT REFERENCE NO.	SHEET NO.
R-2408B	8/102
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



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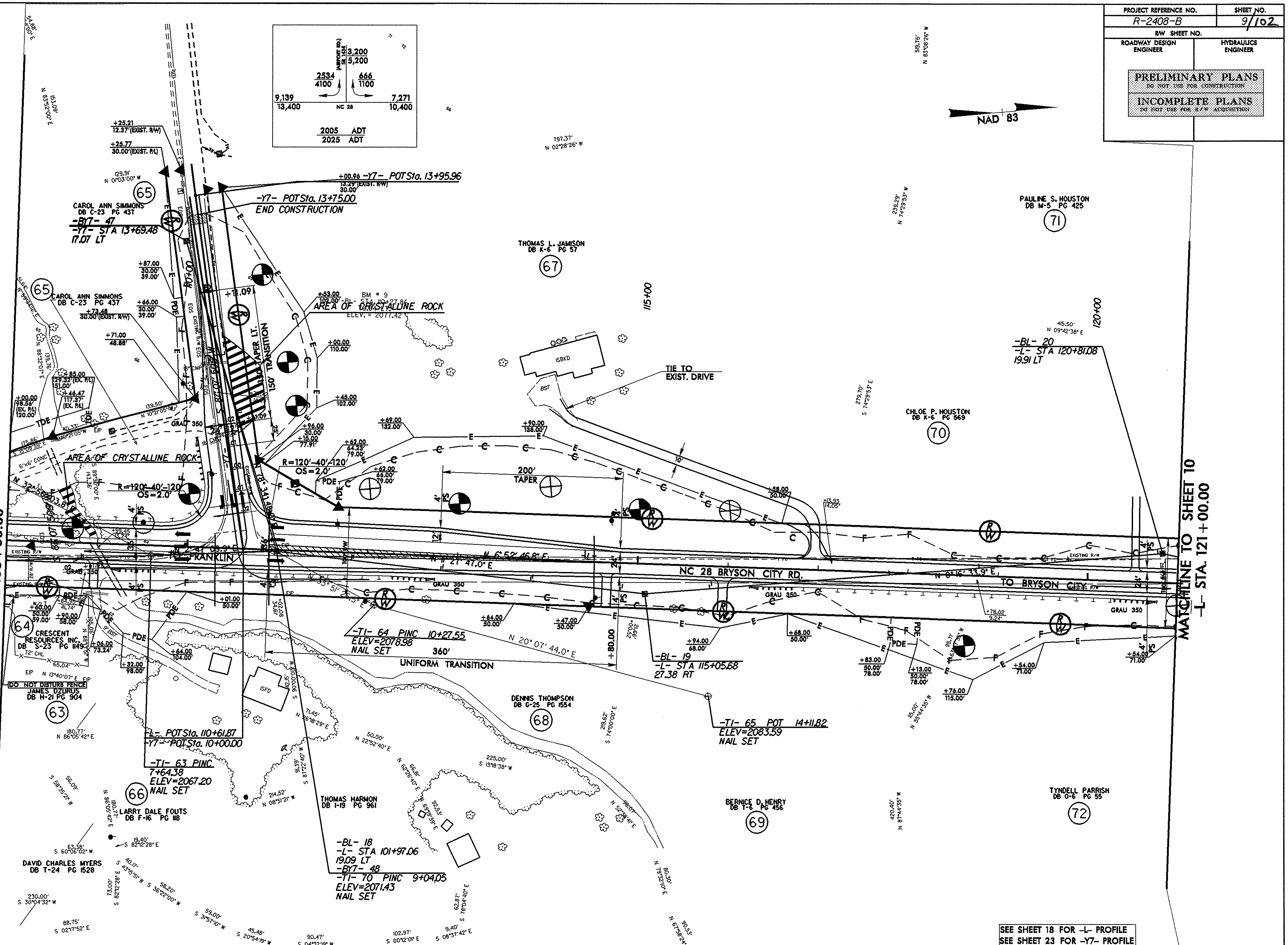
PROJECT REFERENCE NO.	SHEET NO.
R-2408-B	9/102

RW SHEET NO.

ROADWAY DESIGN ENGINEER — HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



NAD 83
2005 ADT
2025 ADT
NC 28
-Y7- POT Sta. 13+95.96
-Y7- POT Sta. 13+75.00
END CONSTRUCTION
CAROL ANN SIMMONS
DB C-23 PG 437
-BY7- 47
-Y7- STA 13+69.48
17.07 LT
AREA OF CRYSTALLINE ROCK
BM # 9
150' TRANSITION
R=120'-40'-120'
OS=2.0'
200' TAPER
TIE TO EXIST. DRIVE
THOMAS L. JAMISON
DB K-6 PG 57
PAULINE S. HOUSTON
DB M-5 PG 425
CHLOE P. HOUSTON
DB K-6 PG 569
-BL- 20
-L- STA 120+81.08
19.91 LT
NC 28 BRYSON CITY RD.
TO BRYSON CITY
FRANKLIN
-T1- 64 PINC 10+27.55
ELEV=2078.98
NAIL SET
360'
UNIFORM TRANSITION
-BL- 19
-L- STA 115+05.68
27.38 RT
-T1- 65 POT 14+11.82
ELEV=2083.59
NAIL SET
CRESCENT RESOURCES INC.
DB S-23 PG 1149
DO NOT DISTURB FENCE
JAMES DZURUS
DB H-21 PG 904
-L- POT Sta. 110+61.87
-Y7- POT Sta. 10+00.00
-T1- 63 PINC
7+64.38
ELEV=2067.20
NAIL SET
LARRY DALE FOUTS
DB F-16 PG 118
DAVID CHARLES MYERS
DB T-24 PG 1528
THOMAS HARMON
DB I-19 PG 961
-BL- 18
-L- STA 101+97.06
19.09 LT
-BY7- 48
-T1- 70 PINC 9+04.05
ELEV=2071.43
NAIL SET
DENNIS THOMPSON
DB G-25 PG 1554
BERNICE D. HENRY
DB T-6 PG 456
TYNDELL PARRISH
DB O-6 PG 55
MATCHLINE TO SHEET 8
-L- STA. 108+00.00
MATCHLINE TO SHEET 10
-L- STA. 121+00.00

SEE SHEET 18 FOR -L- PROFILE
SEE SHEET 23 FOR -Y7- PROFILE

5/14/99

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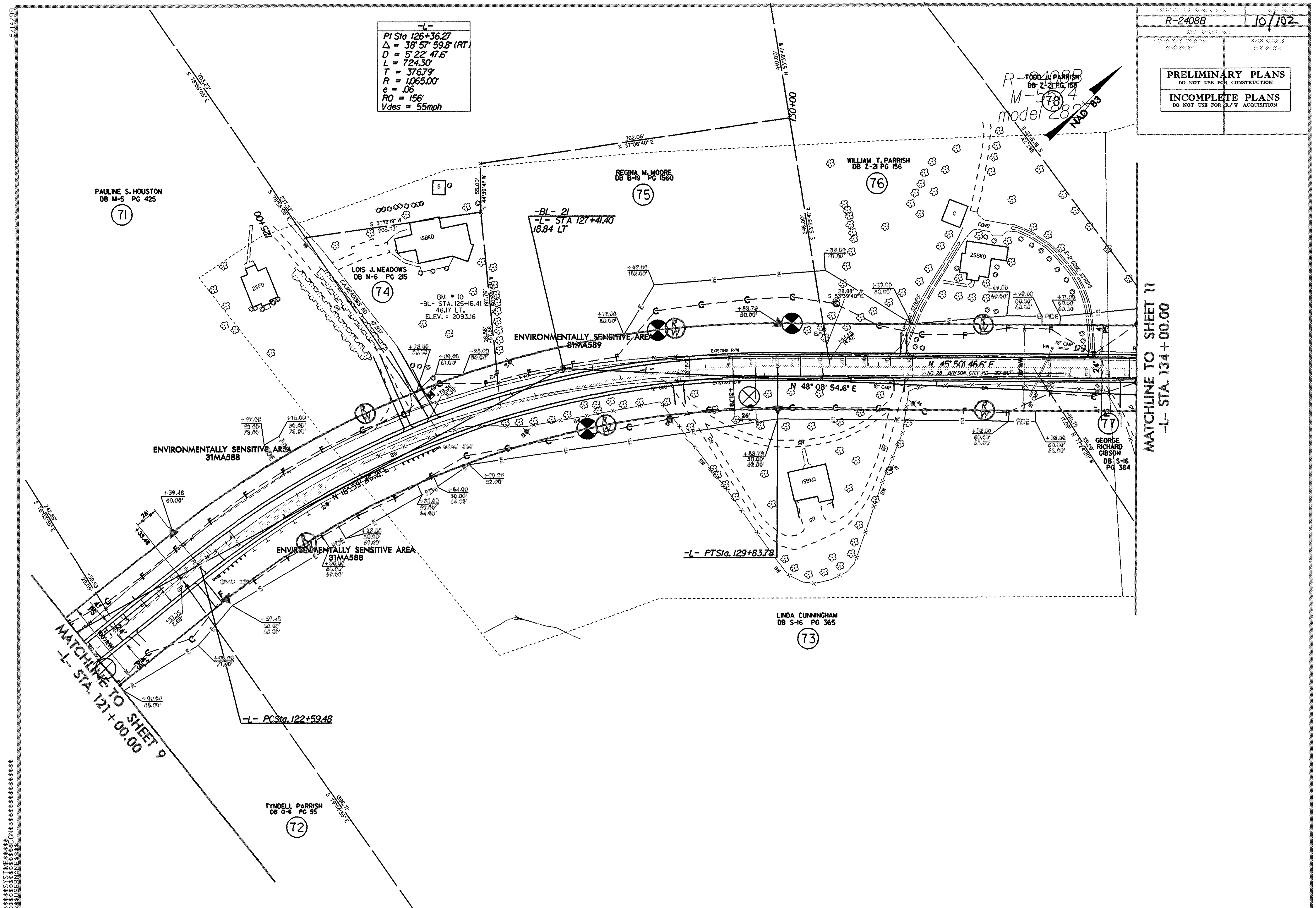
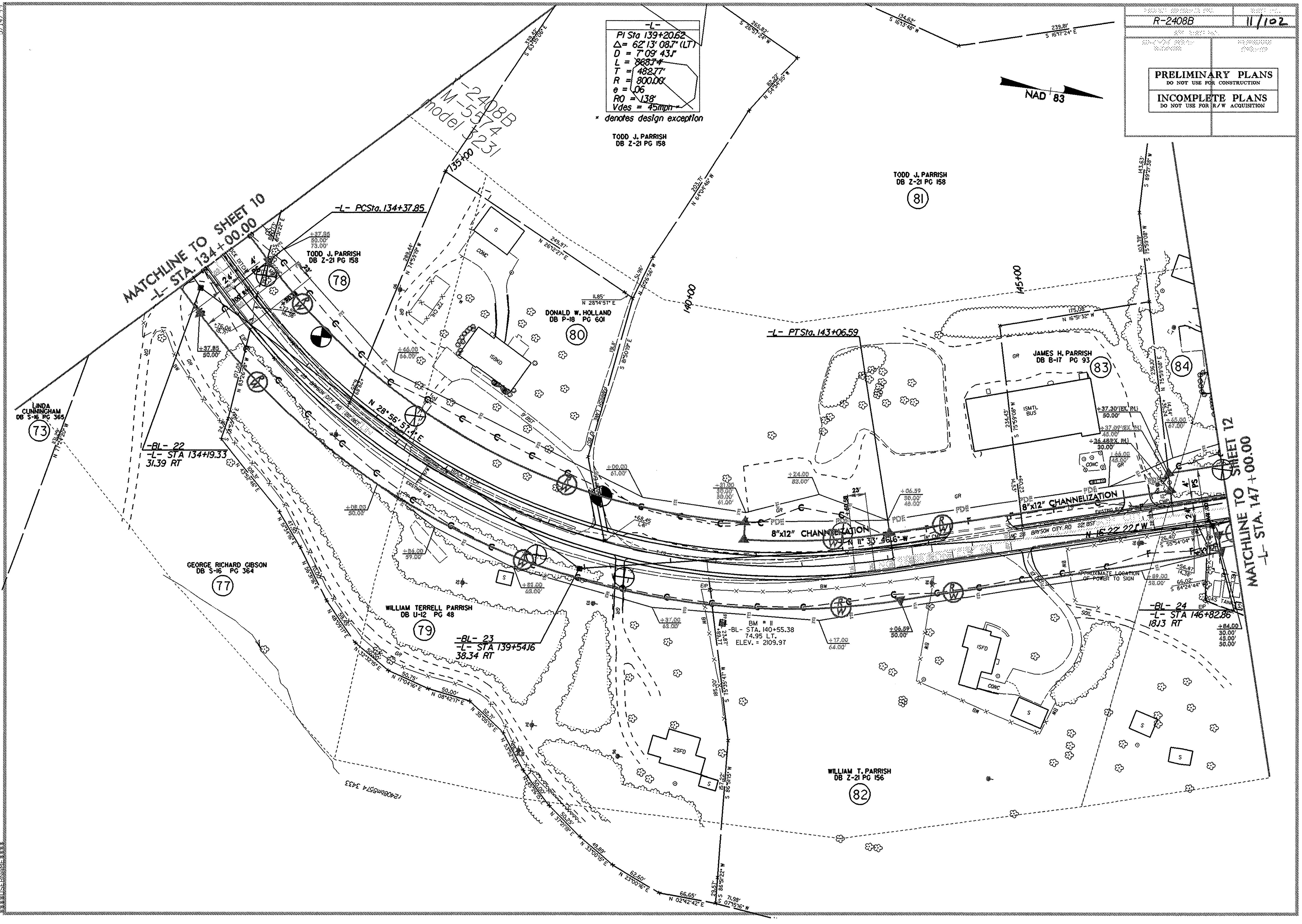


R-2408B
10/102
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
-L-
PI Sta 126+36.27
Δ = 38° 57' 59.8" (RT)
D = 5° 22' 47.6"
L = 724.30'
T = 376.79'
R = 1,065.00'
e = .06
RO = 156'
Vdes = 55mph
NAD 83
PAULINE S. HOUSTON
DB M-5 PG 425
71
LOIS J. MEADOWS
DB N-6 PG 215
74
REGINA M. MOORE
DB B-19 PG 1560
75
WILLIAM T. PARRISH
DB Z-21 PG 156
76
TODD J. PARRISH
DB Z-21 PG 158
78
GEORGE RICHARD GIBSON
DB S-16 PG 384
77
LINDA CUNNINGHAM
DB S-16 PG 365
73
TYNDELL PARRISH
DB Q-6 PG 55
72
BM # 10
-BL- STA. 125+16.41
46.17 LT.
ELEV. = 2093.16
-BL- 21
-L- STA 127+41.40
18.84 LT
ENVIRONMENTALLY SENSITIVE AREA
31MA589
ENVIRONMENTALLY SENSITIVE AREA
31MA588
ENVIRONMENTALLY SENSITIVE AREA
31MA588
N 45° 50' 46.6" E
N 48° 08' 54.6" E
N 16° 59' 46.2" E
NC 28 BRYSON CITY RD
-L- PTSta. 129+83.78
-L- PCSta. 122+59.48
125+00
130+00
MATCHLINE TO SHEET 11
-L- STA. 134+00.00
MATCHLINE TO SHEET 9
-L- STA. 121+00.00

5/14/99


R-2408B
11/102
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
NAD 83
-L-
PI Sta 139+20.62
Δ = 62° 13' 08.7" (LT)
D = 7° 09' 43.1"
L = 868.74'
T = 482.77'
R = 800.00'
e = .06
RO = 138'
Vdes = 45mph
* denotes design exception
TODD J. PARRISH
DB Z-21 PG 158
MATCHLINE TO SHEET 10
-L- STA. 134+00.00
MATCHLINE TO SHEET 12
-L- STA. 147+00.00
-L- PCSta. 134+37.85
-L- PTSta. 143+06.59
DONALD W. HOLLAND
DB P-18 PG 601
JAMES H. PARRISH
DB B-17 PG 93
LINDA CUNNINGHAM
DB S-16 PG 365
GEORGE RICHARD GIBSON
DB S-16 PG 364
WILLIAM TERRELL PARRISH
DB U-12 PG 48
WILLIAM T. PARRISH
DB Z-21 PG 156
-BL- 22
-L- STA 134+19.33
31.39 RT
-BL- 23
-L- STA 139+54.16
38.34 RT
-BL- 24
-L- STA 146+82.86
18.13 RT
BM # 11
-BL- STA. 140+55.38
74.95 LT.
ELEV. = 2109.97
8"x12" CHANNELIZATION
APPROXIMATE LOCATION OF POWER TO SIGN
135+00
140+00
145+00
73
77
78
79
80
81
82
83
84

PROJECT REFERENCE NO.	SHEET NO.
R-2408B	12/102

R/W SHEET NO.

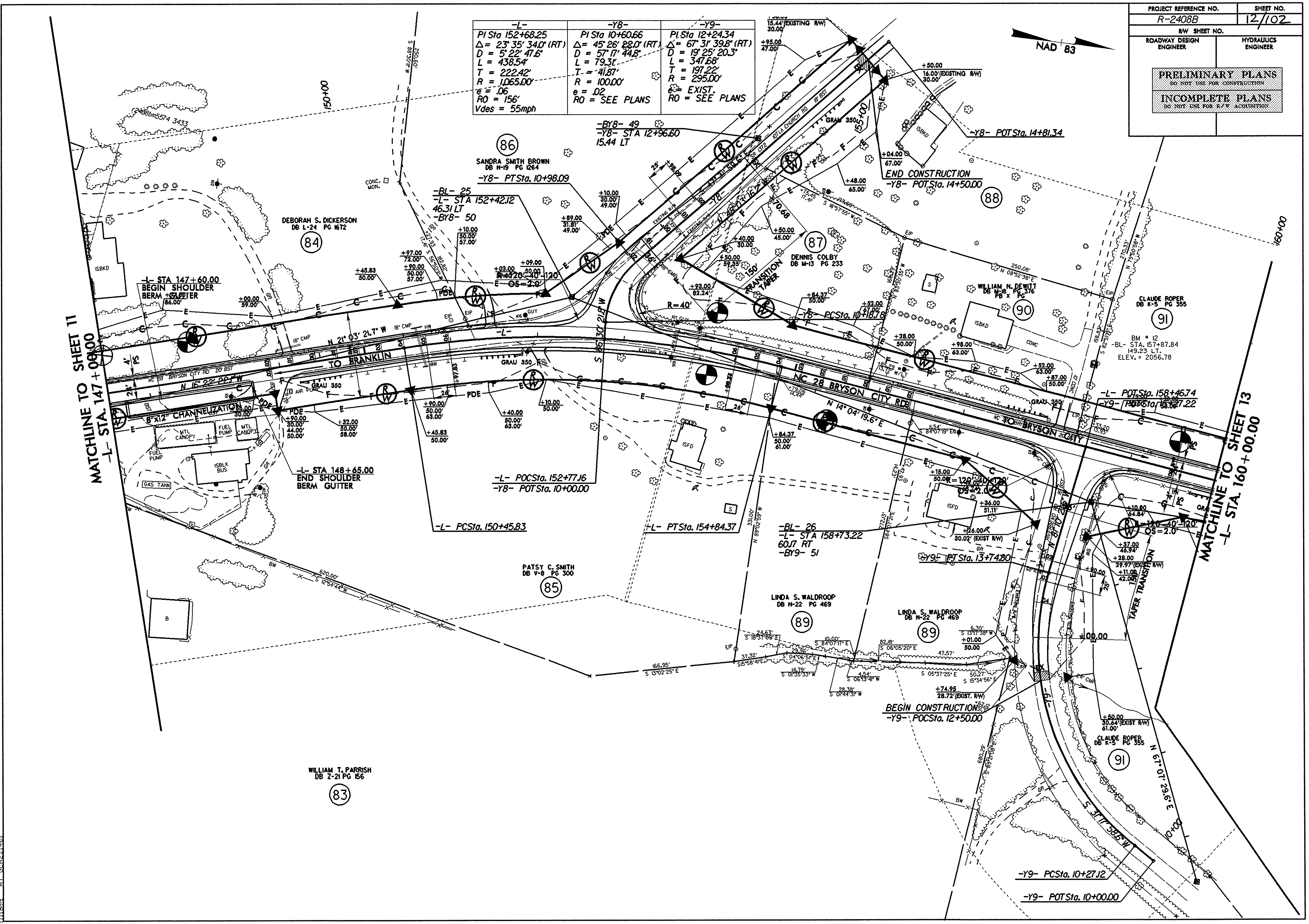
ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

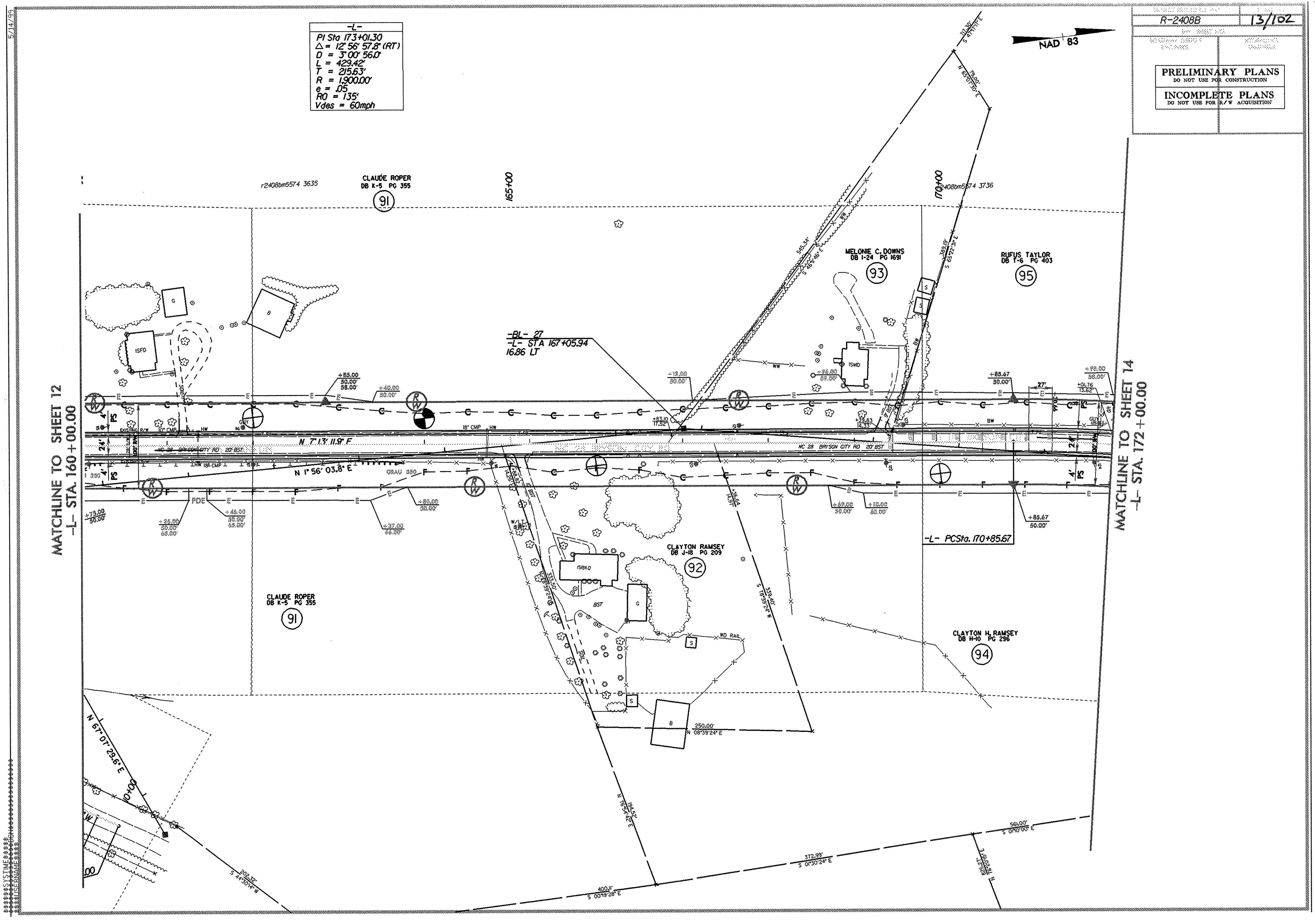
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

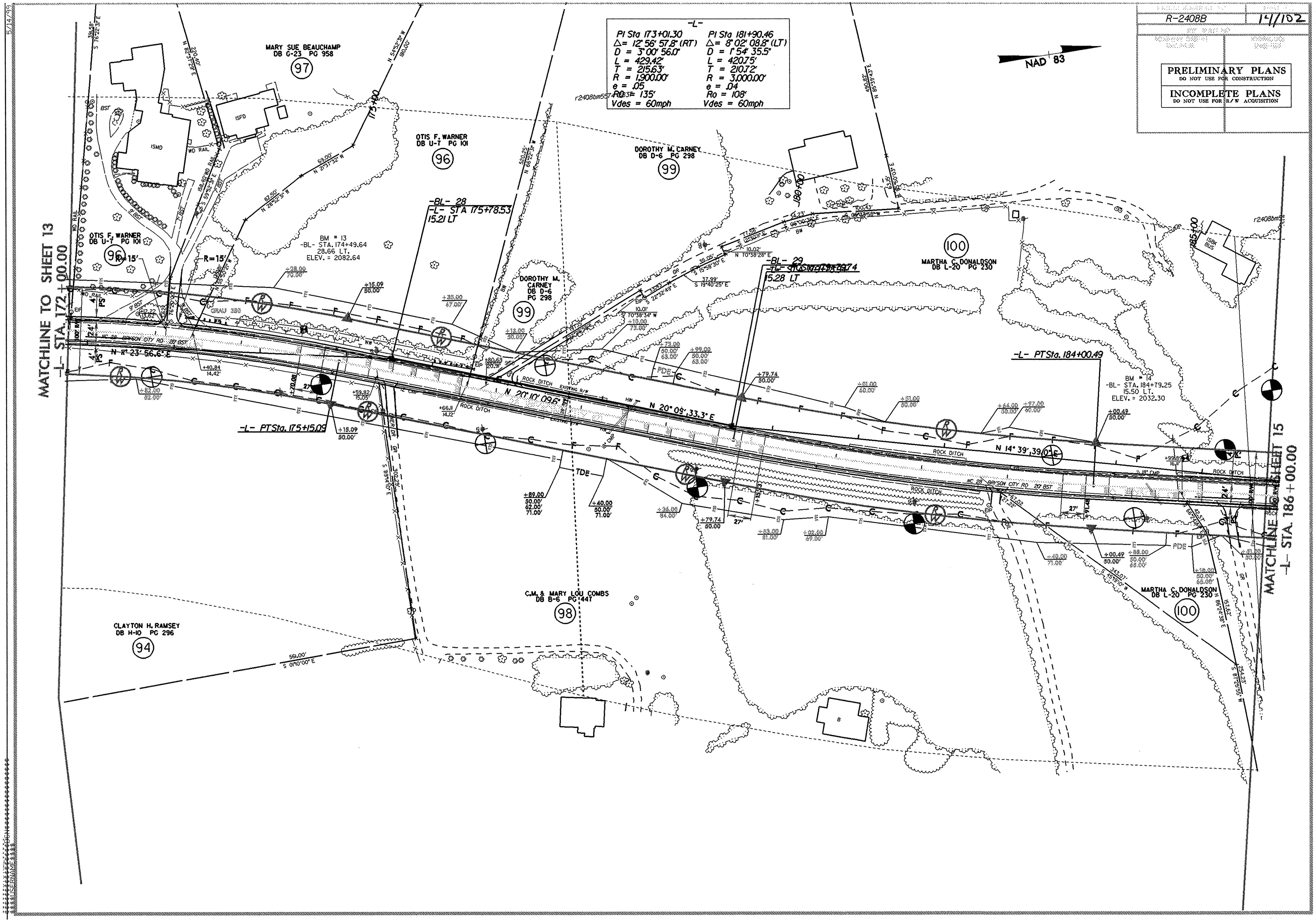
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-L-	-Y8-	-Y9-
PI Sta 152+68.25	PI Sta 10+60.66	PI Sta 12+24.34
Δ = 23° 35' 34.0" (RT)	Δ = 45° 26' 28.0" (RT)	Δ = 67° 31' 39.8" (RT)
D = 5° 22' 47.6"	D = 57° 17' 44.8"	D = 19° 25' 20.3"
L = 438.54'	L = 79.31'	L = 347.68'
T = 222.42'	T = 41.87'	T = 197.22'
R = 1,065.00'	R = 100.00'	R = 295.00'
e = .06	e = .02	e = EXIST.
RO = 156'	RO = SEE PLANS	RO = SEE PLANS
Vdes = 55mph		



NAD 83
MATCHLINE TO SHEET 11
-L- STA. 147+00.00
MATCHLINE TO SHEET 13
-L- STA. 160+00.00
NC 28 BRYSON CITY RD
TO FRANKLIN
TO BRYSON CITY
SANDRA SMITH BROWN DB N-19 PG 1264
DEBORAH S. DICKERSON DB L-24 PG 1672
DENNIS COLBY DB M-13 PG 233
WILLIAM N. DEWITT
CLAUDE ROPER DB K-5 PG 355
PATSY C. SMITH DB V-8 PG 300
LINDA S. WALDROOP DB N-22 PG 469
WILLIAM T. PARRISH DB Z-21 PG 156
-L- STA 147+60.00 BEGIN SHOULDER BERM GUTTER
-L- STA 148+65.00 END SHOULDER BERM GUTTER
-L- PCSta. 150+45.83
-L- POCSta. 152+77.16
-Y8- POTSta. 10+00.00
-Y8- PTSta. 10+98.09
-BL- 25 -L- STA 152+42.12 46.31 LT -BY8- 50
-BY8- 49 -Y8- STA 12+96.60 15.44 LT
-L- PTSta. 154+84.37
-Y8- PCSta. 10+18.78
END CONSTRUCTION -Y8- POTSta. 14+50.00
-Y8- POTSta. 14+81.34
-BL- 26 -L- STA 158+73.22 60.17 RT -BY9- 51
-Y9- PTSta. 13+74.80
BEGIN CONSTRUCTION -Y9- POCSta. 12+50.00
-Y9- PCSta. 10+27.12
-Y9- POTSta. 10+00.00
BM = 12 -BL- STA. 157+87.84 149.23 LT. ELEV. = 2056.78
8"x12" CHANNELIZATION
TRANSITION TAPER
GAS TANK


R-2408B
13/102
NAD 83
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
-L-
PI Sta 173+01.30
△ = 12° 56' 57.8" (RT)
D = 3° 00' 56.0"
L = 429.42'
T = 215.63'
R = 1,900.00'
e = .05
RO = 135'
Vdes = 60mph
CLAUDE ROPER
DB K-5 PG 355
91
MELONIE C. DOWNS
DB I-24 PG 1691
93
RUFUS TAYLOR
DB T-6 PG 403
95
CLAYTON RAMSEY
DB J-18 PG 209
92
CLAYTON H. RAMSEY
DB H-10 PG 296
94
-BL- 27
-L- STA 167+05.94
16.86 LT
-L- PCSta. 170+85.67
N 7° 13' 11.9" E
N 1° 56' 03.8" E
NC 28 BRYSON CITY RD 20' BST
MATCHLINE TO SHEET 12
-L- STA. 160+00.00
MATCHLINE TO SHEET 14
-L- STA. 172+00.00
165+00
170+00
N 67° 07' 29.6" E
250.00'
N 08°39'24" E
372.99'
S 01°30'24" E
400.11'
S 00°19'28" E
202.32'
S 44°30'14" W
5/14/99


R-2408B
14/102
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
-L-
PI Sta 173+01.30
△= 12° 56' 57.8" (RT)
D = 3° 00' 56.0"
L = 429.42'
T = 215.63'
R = 1,900.00'
e = .05
RO = 135'
Vdes = 60mph
PI Sta 181+90.46
△= 8° 02' 08.8" (LT)
D = 1° 54' 35.5"
L = 420.75'
T = 210.72'
R = 3,000.00'
e = .04
Ro = 108'
Vdes = 60mph
NAD 83
MATCHLINE TO SHEET 13
-L- STA. 172+00.00
MATCHLINE TO SHEET 15
-L- STA. 186+00.00
MARY SUE BEAUCHAMP
DB G-23 PG 958
97
OTIS F. WARNER
DB U-7 PG 101
96
DOROTHY M. CARNEY
DB D-6 PG 298
99
-BL- 28
-L- STA 175+78.53
15.21 LT
BM # 13
-BL- STA. 174+49.64
28.66 LT.
ELEV. = 2082.64
-BL- 29
15.28 LT
100
MARTHA C. DONALDSON
DB L-20 PG 230
-L- PT Sta. 175+15.09
-L- PT Sta. 184+00.49
BM # 14
-BL- STA. 184+79.25
15.50 LT.
ELEV. = 2032.30
N 11° 23' 56.6" E
N 20° 10' 09.6" E
N 20° 09' 33.3" E
N 14° 39' 39.0" E
ROCK DITCH
NC 28 BRYSON CITY RD 20' BST
TDE
PDE
C.M. & MARY LOU COMBS
DB B-6 PG 441
98
CLAYTON H. RAMSEY
DB H-10 PG 296
94

5/14/99

R-2408B 15/102

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

$$$$SYSTIME$$$$
$$$$DGN$$$$
$$$$USERNAME$$$$

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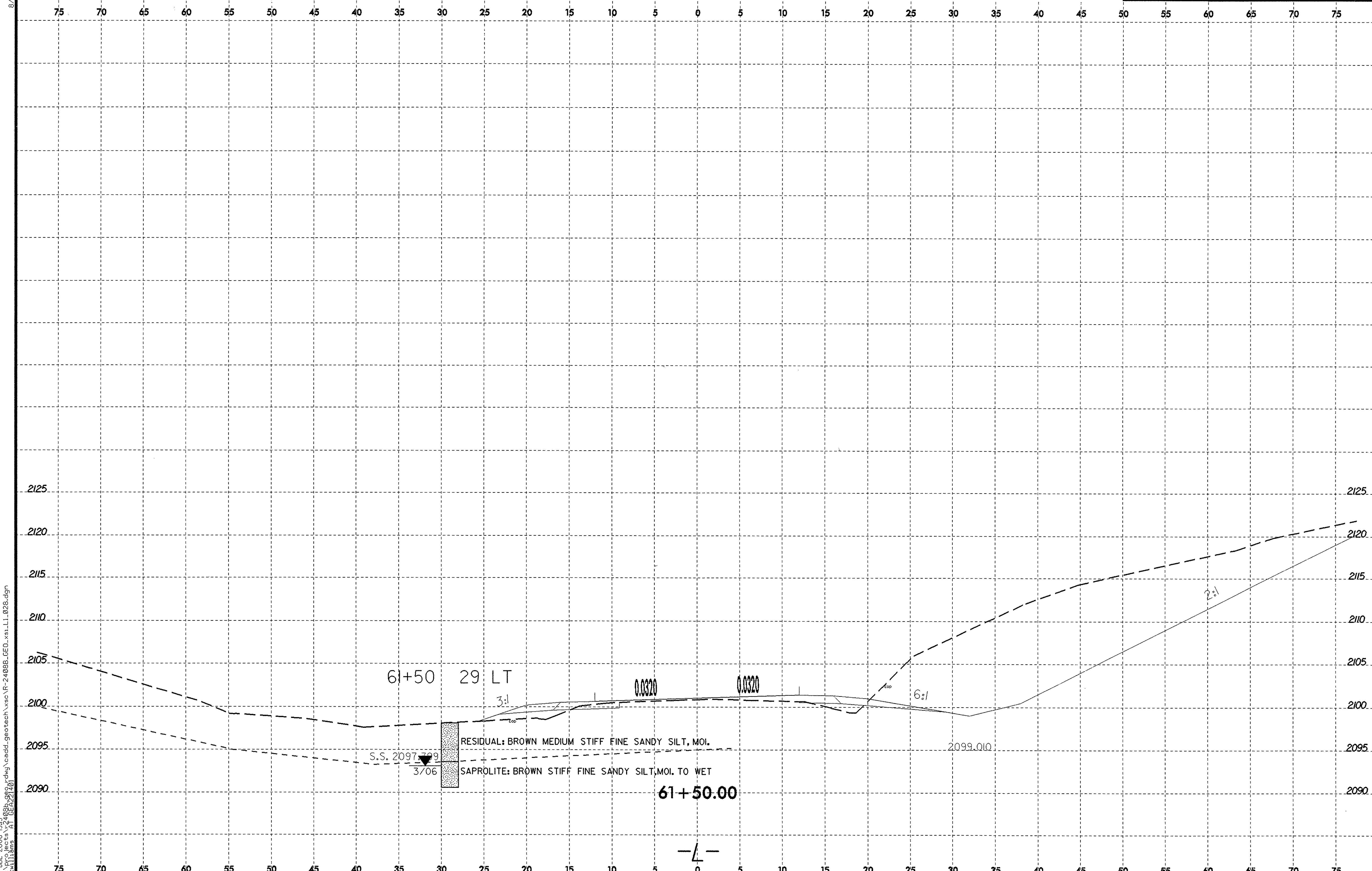
PROJ. REFERENCE NO.	SHEET NO.
R-2408B	16 of 102



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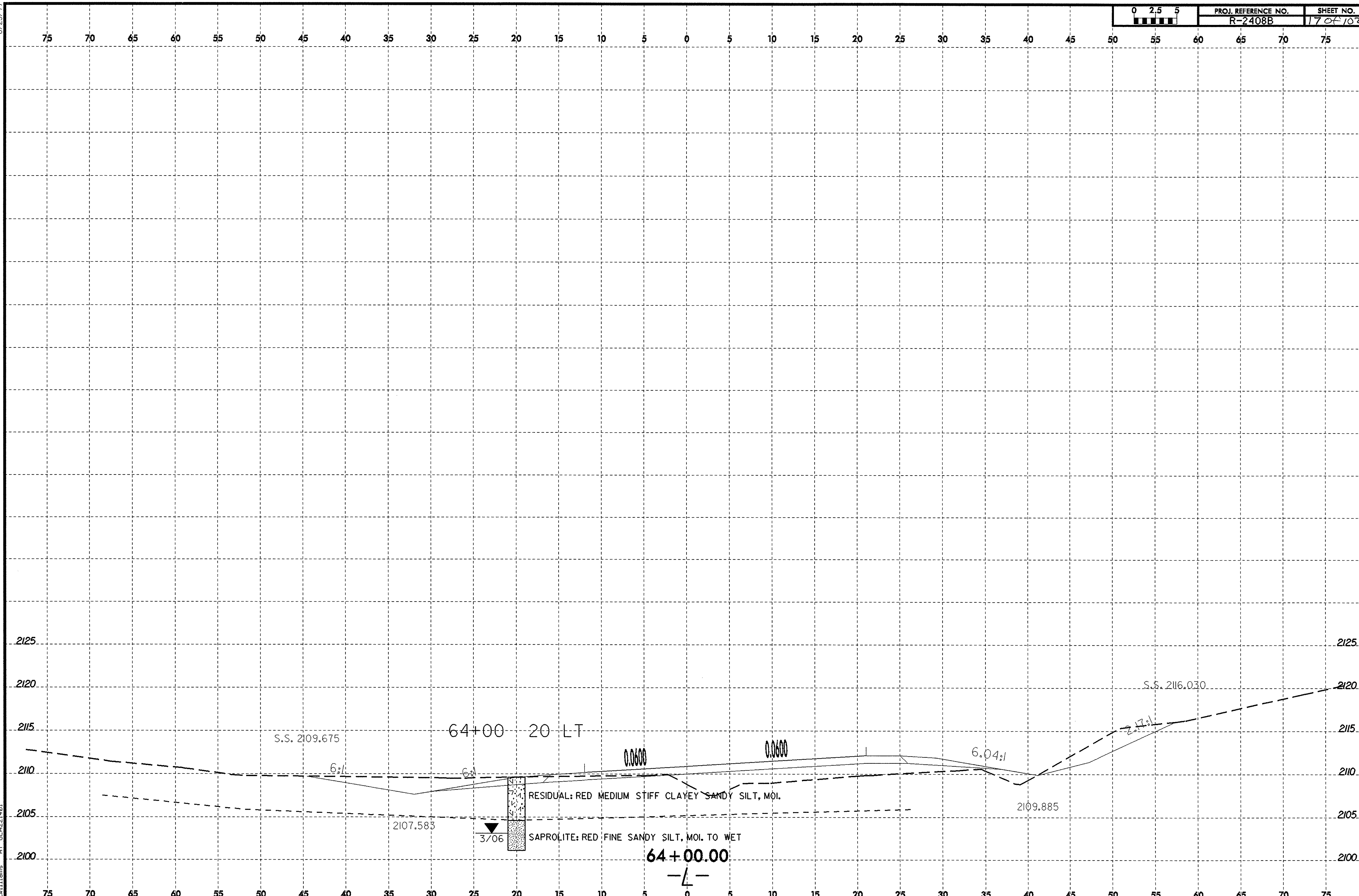
PROJ. REFERENCE NO.	SHEET NO.
R-2408B	17 of 102



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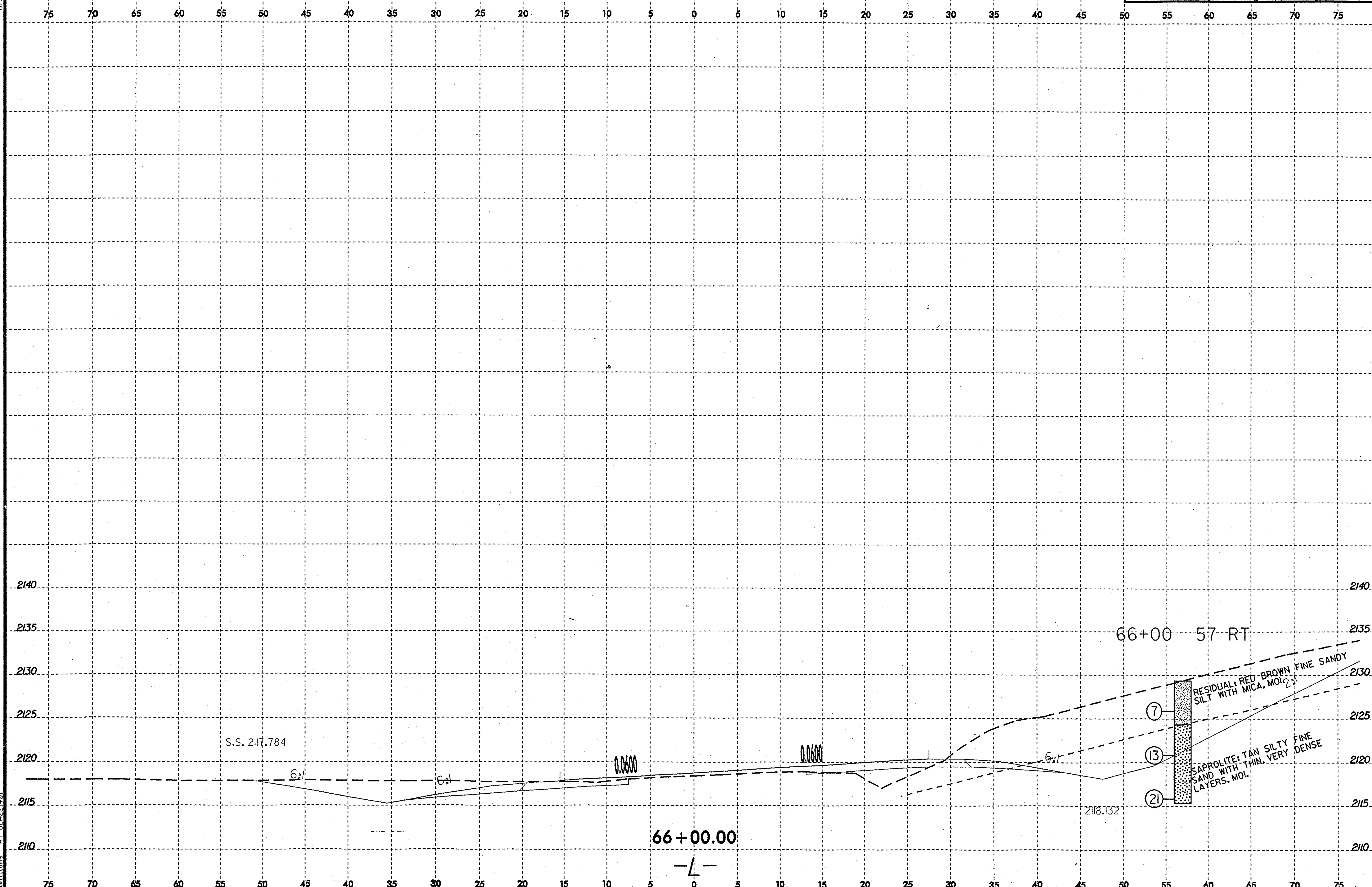
PROJ. REFERENCE NO.	SHEET NO.
R-2408B	18 of 102



66+00.00

-L-

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0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-2408B	19 OF 102

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

2140
2135
2130
2125
2120
2115

Ditch Depth

S.S. 2119.804

6:1

0.0218

0.0218

67+00 42 RT

2:1

2:1

SAPROLITE: RED TO BROWN, LOOSE TO MEDIUM DENSE, SILTY FINE SAND, MOI.

2120.620

67+00.00

—L—

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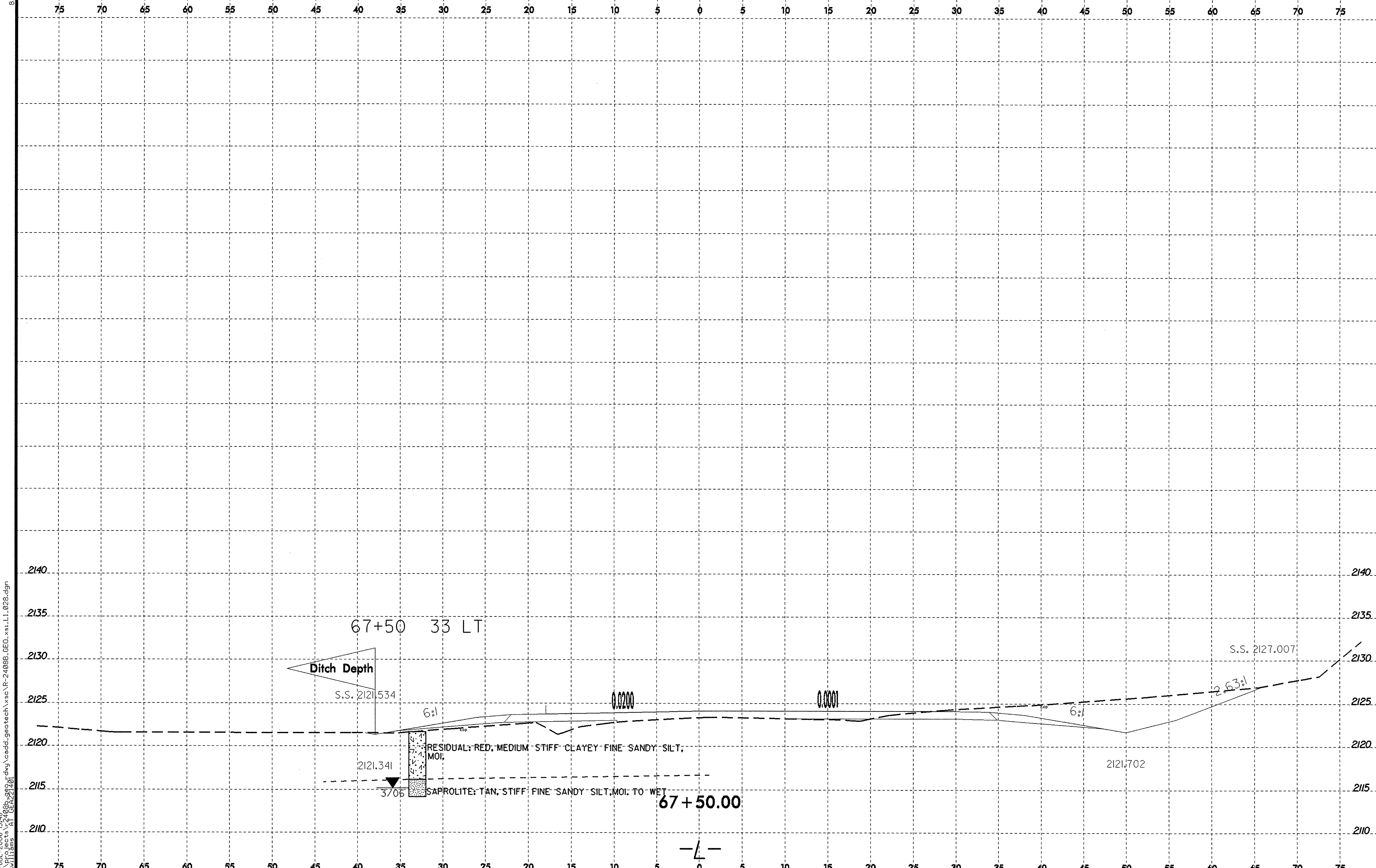
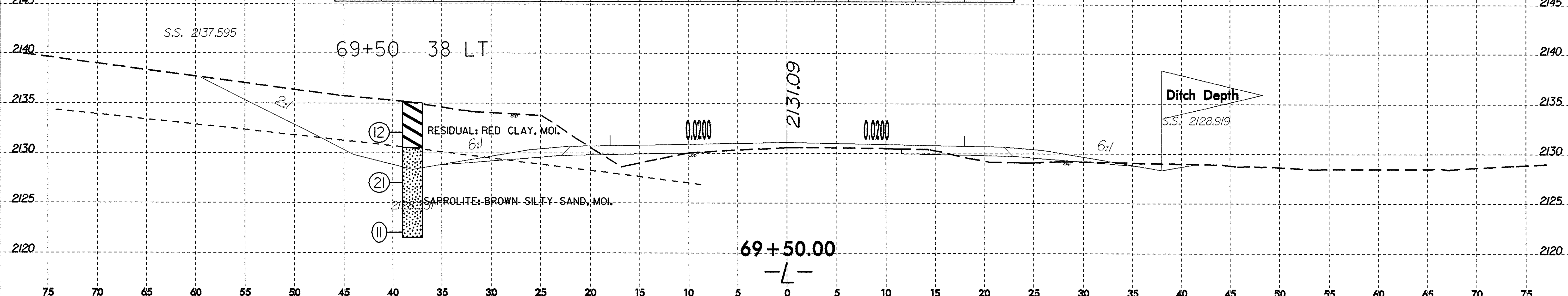
8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-2408B	20 of 102

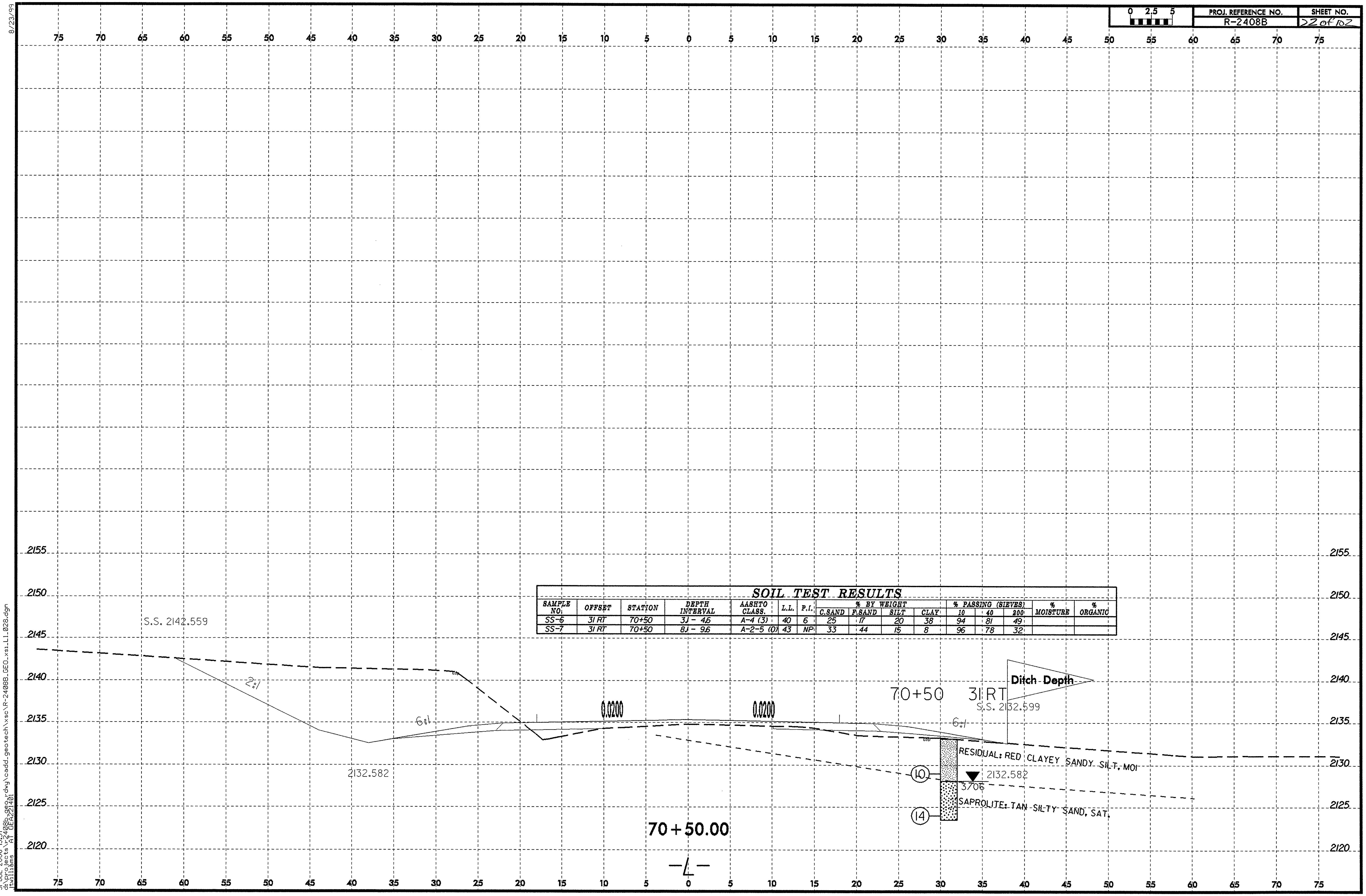


SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-8	38 LT	69+50	2.0 - 3.5	A-7-5 (10)	48	11	13	17	11	59	96	91	69		
SS-9	38 LT	69+50	7.0 - 8.5	A-2-5 (0)	47	NP	30	45	17	8	98	83	33		
SS-10	38 LT	69+50	12.0 - 13.5	A-2-5 (0)	43	NP	36	43	15	6	99	80	30		



PROJ. REFERENCE NO.	SHEET NO.
R-2408B	22 of 102



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-6	31 RT	70+50	3.1 - 4.6	A-4 (3)	40	6	25	17	20	38	94	81	49		
SS-7	31 RT	70+50	8.1 - 9.6	A-2-5 (0)	43	NP	33	44	15	8	96	78	32		

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-2408B	23 of 102

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

2165 2160 2155 2150 2145 2140 2135 2130

S.S. 2150.609

73+00 43 LT

2:1

16 RESIDUAL: RED CLAYEY SILT, MOI.

6:1

20 SAPROLITE: RED TO TAN SANDY SILT, MOI.

2145.212

17

SAPROLITE: TAN SILTY SAND, MOI.

28

0.0200 0.0186

4:1

S.S. 2143.675

73+00.00

—L—

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

2165 2160 2155 2150 2145 2140 2135 2130

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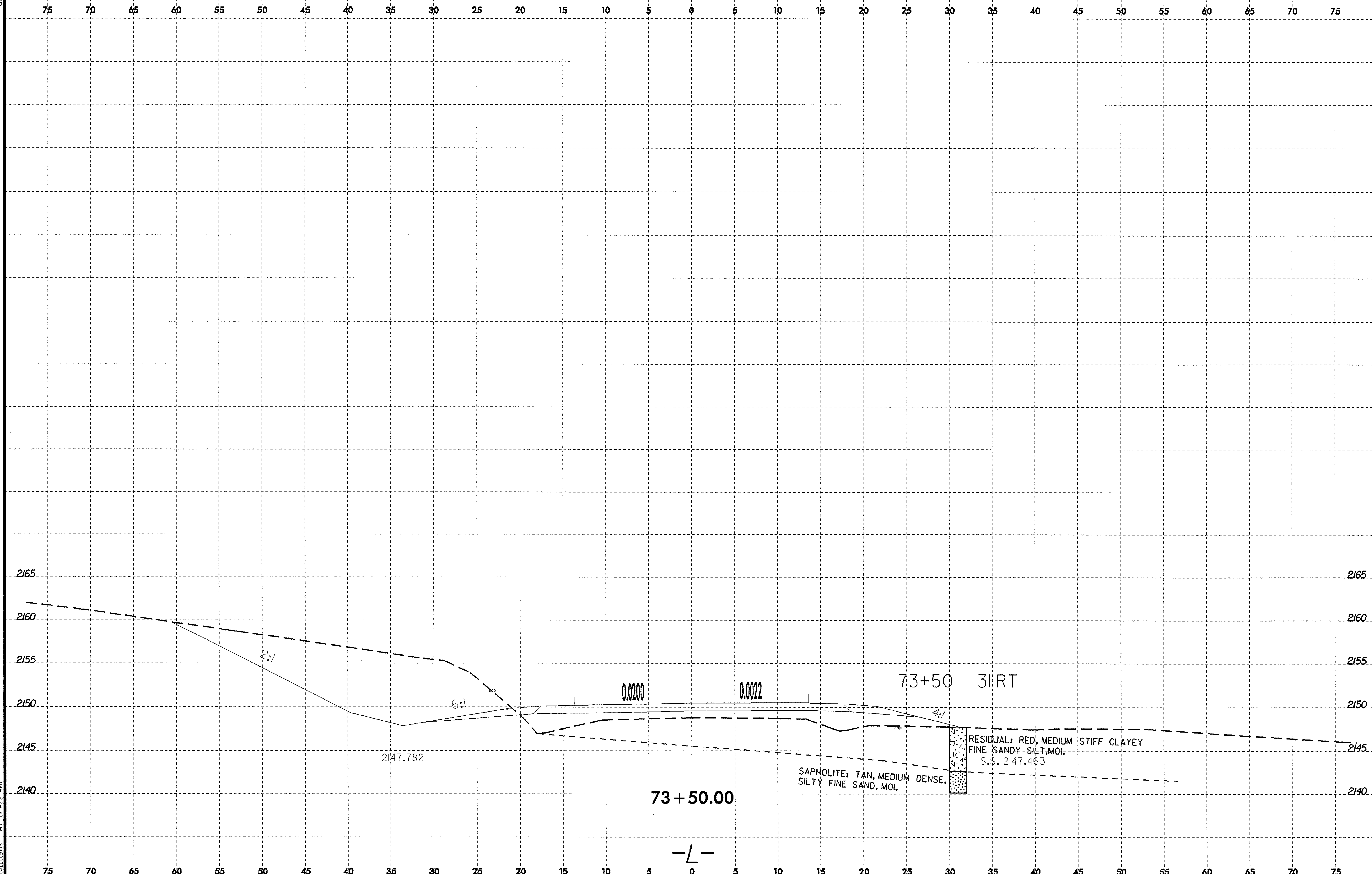
bwilliams
AT GEA21401

PROJ. REFERENCE NO.	SHEET NO.
R-2408B	24 of 102



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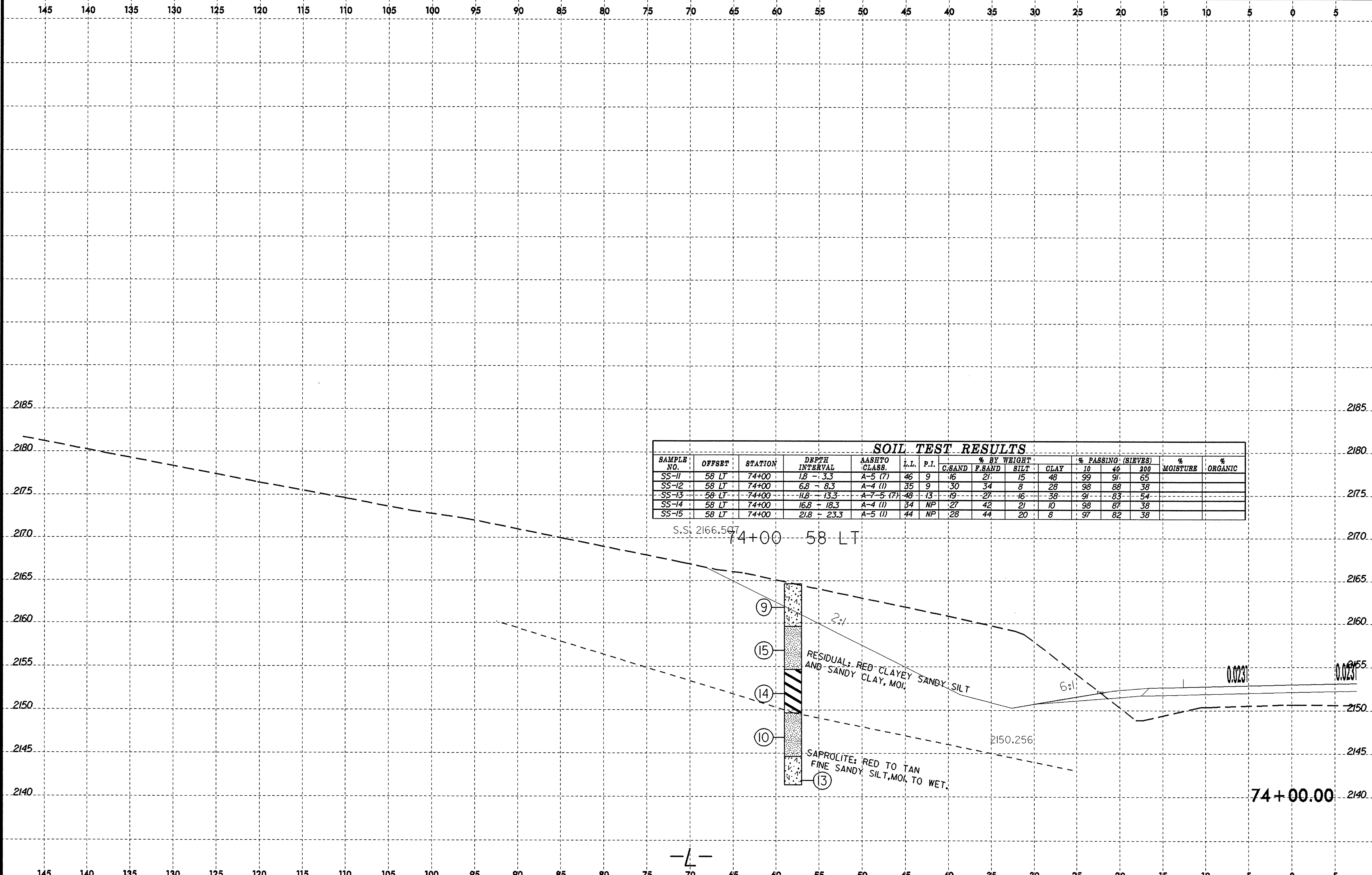
jtwilliams AT GEA221401

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-11	58 LT	74+00	1.8 - 3.3	A-5 (7)	46	9	16	21	15	48	99	91	65		
SS-12	58 LT	74+00	6.8 - 8.3	A-4 (1)	35	9	30	34	8	28	98	88	38		
SS-13	58 LT	74+00	11.8 - 13.3	A-7-5 (7)	48	13	19	27	16	38	91	83	54		
SS-14	58 LT	74+00	16.8 - 18.3	A-4 (1)	34	NP	27	42	21	10	98	87	38		
SS-15	58 LT	74+00	21.8 - 23.3	A-5 (1)	44	NP	28	44	20	8	97	82	38		



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jtwilliams AT GEA2214Ø1
8/23/99

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R2408B	26 of 102

78+50 26 LT

DRIVE

2:1

2:1

6:1

2160.09

RESIDUAL: RED, STIFF CLAYEY FINE SANDY SILT, MOI.

SAPROLITE: TAN, MEDIUM DENSE MICACEOUS SILTY SAND, MOI

WEATHERED ROCK OF GNEISS WITH MANY LAYERS OF DENSE SAPROLITE

CRYSTALLINE ROCK

0.0400

0.0400

78+50.00

—℄—

2175
2170
2165
2160
2155
2150

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

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tswilliams AT GEA21401

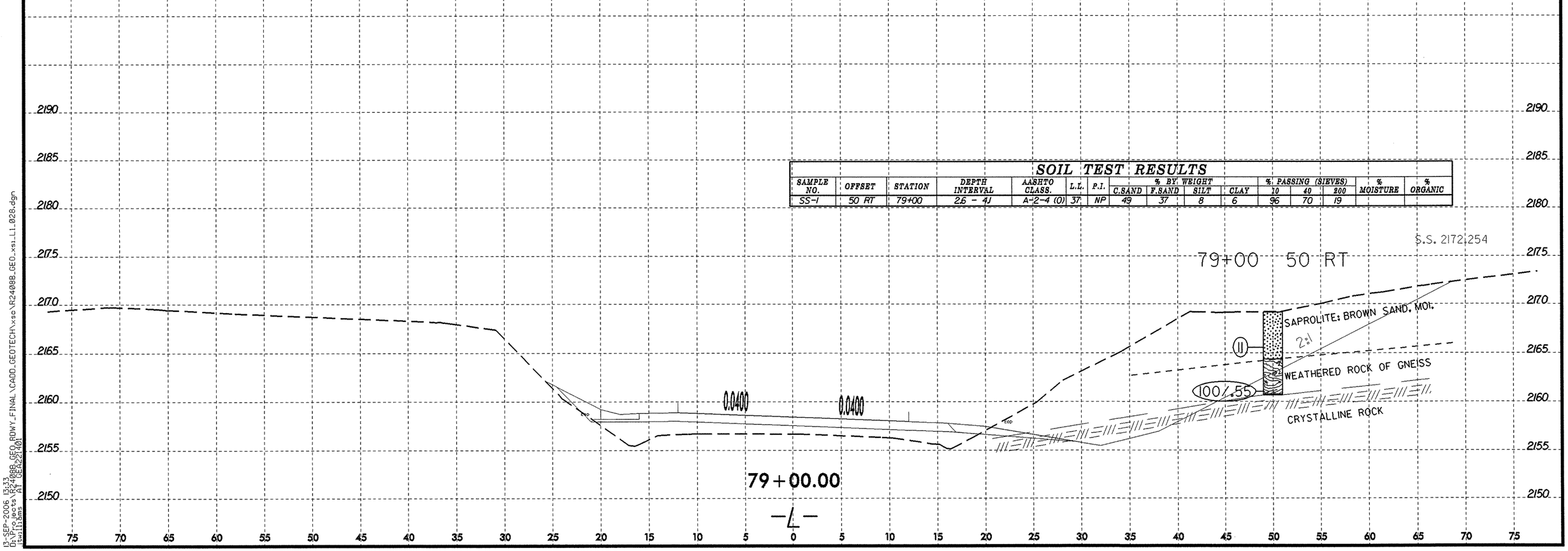
8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-2408B	27/102

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-1	50 RT	79+00	2.6 - 4.1	A-2-4 (0)	37	NP	49	37	8	6	96	70	19		



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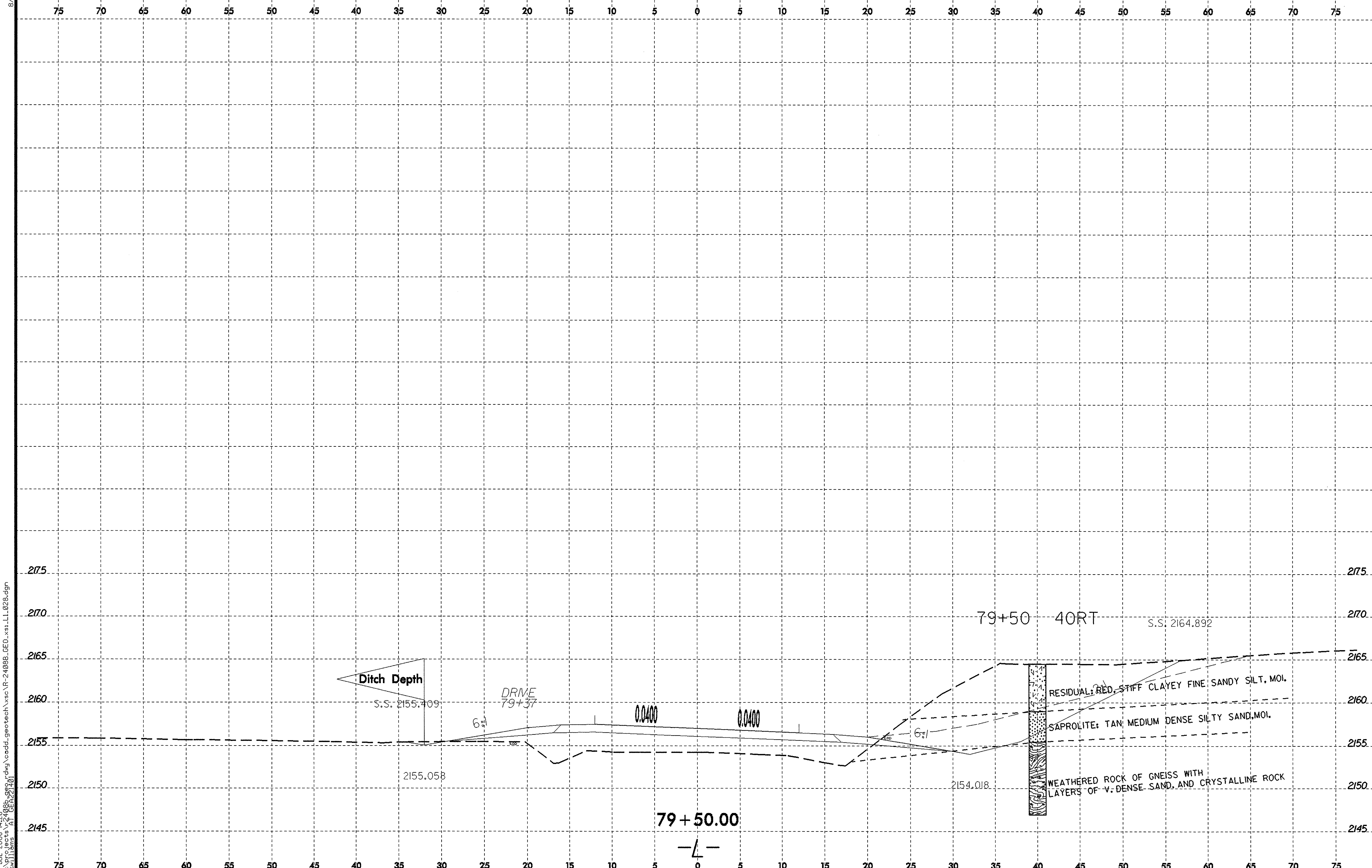
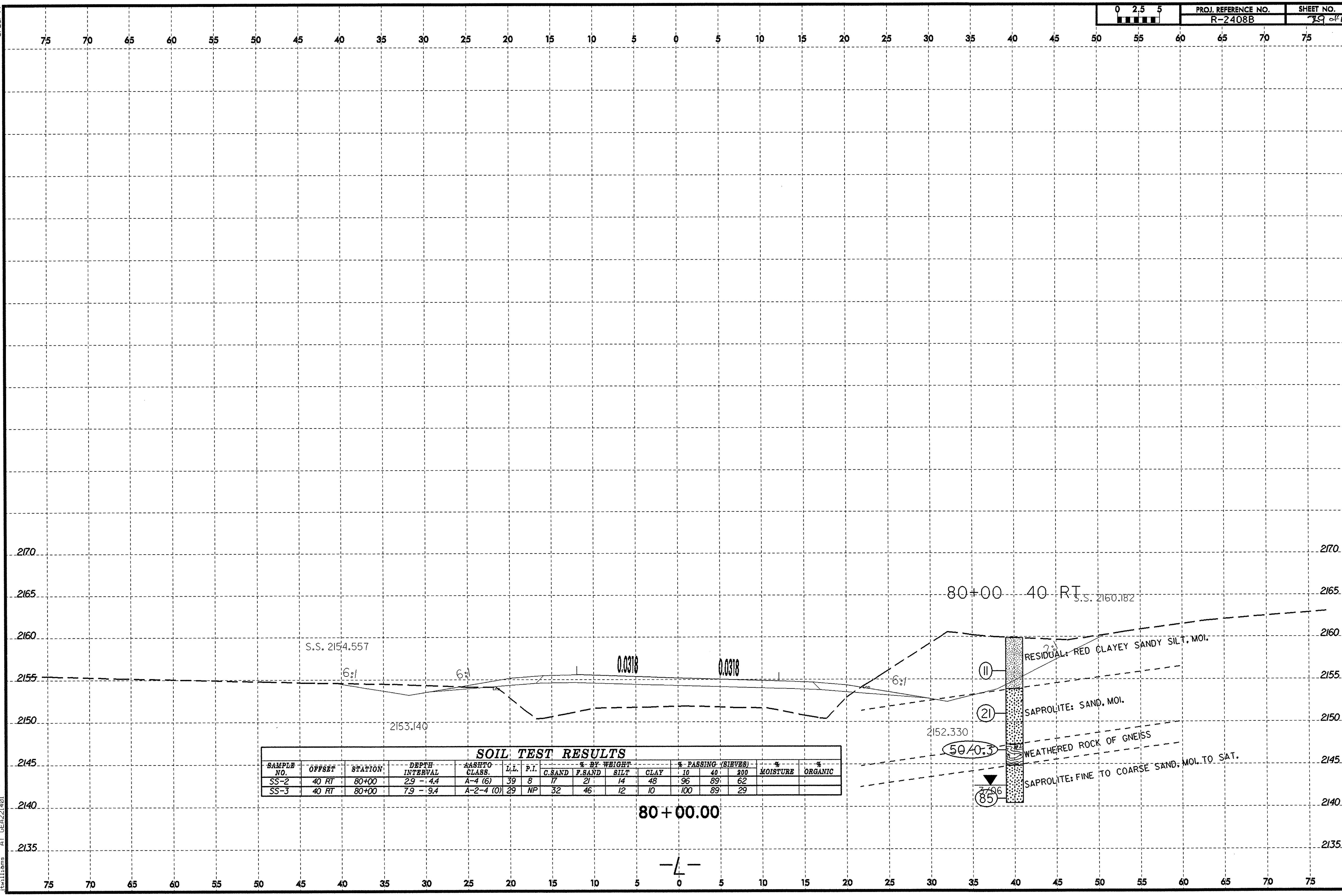
tsullins AT GEA221401

PROJ. REFERENCE NO.	SHEET NO.
R-2408B	28 of 102



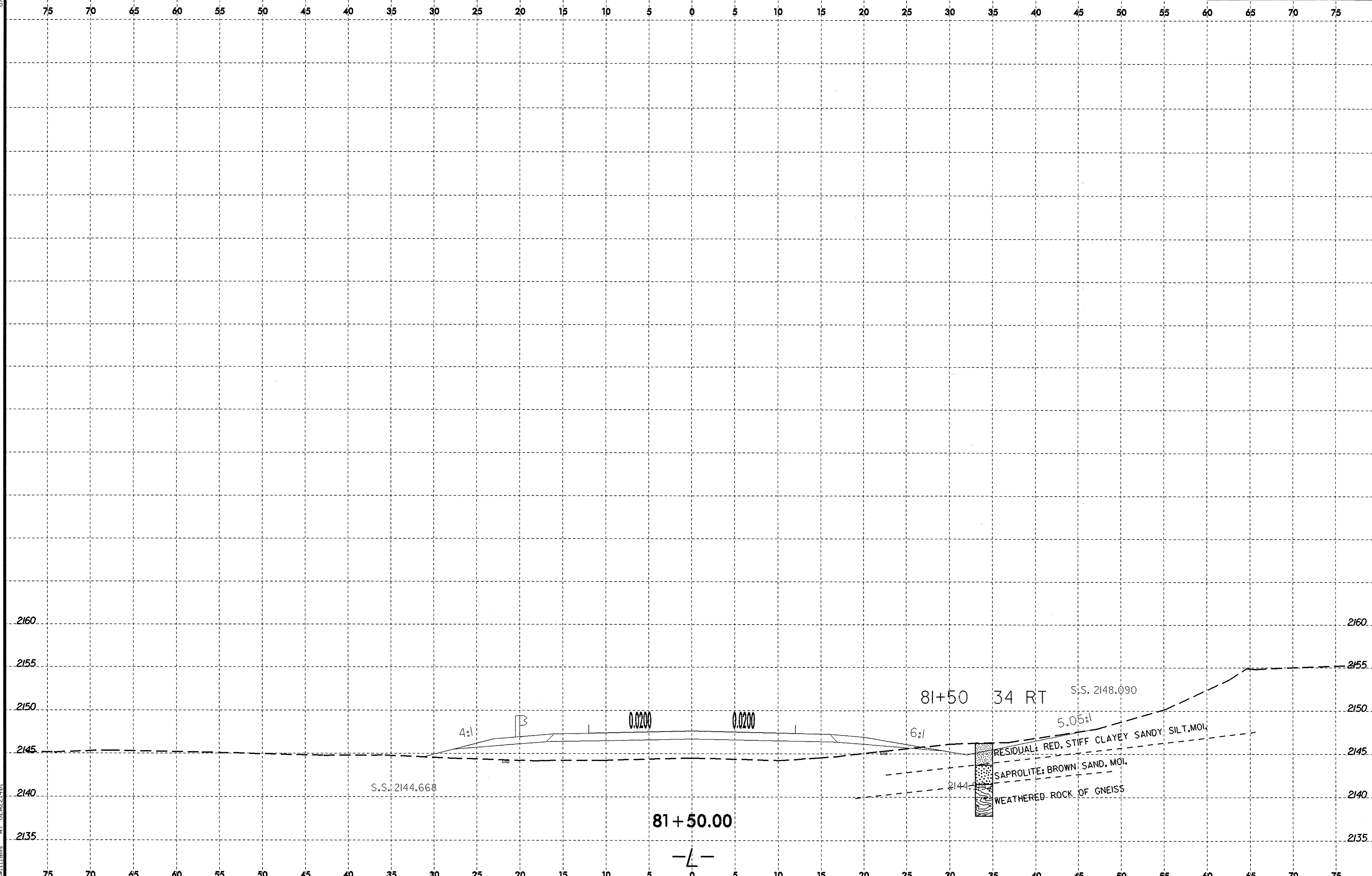
0 2.5 5
Ditch Depth
S.S. 2155.409
DRIVE 79+37
6:1
0.0400
0.0400
6:1
79+50 40RT
S.S. 2164.892
RESIDUAL: RED, STIFF CLAYEY FINE SANDY SILT, MOI.
SAPROLITE: TAN MEDIUM DENSE SILTY SAND, MOI.
WEATHERED ROCK OF GNEISS WITH LAYERS OF V. DENSE SAND, AND CRYSTALLINE ROCK
2155.058
2154.018
2175
2170
2165
2160
2155
2150
2145
75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75
79+50.00
-L-



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-2	40 RT	80+00	2.9 - 4.4	A-4 (6)	39	8	17	21	14	48	96	89	62		
SS-3	40 RT	80+00	7.9 - 9.4	A-2-4 (0)	29	NP	32	46	12	10	100	89	29		

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-2408B	30 of 102



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0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-2408B	31 OF 102

83+65 30 RT

0.0336 0.0336

6:1

2:1

FILL: BROWN, SOFT CLAYEY SILT WITH WOOD, MOI

SAPROLITE: GREY TO TAN, MEDIUM STIFF SANDY SILT, WET.
TOP FEW FEET PLUGGED UP WITH CLAY, MOI. TO WET

WEATHERED ROCK OF GNEISS

83+50.00

83+40 30 RT

0.0200 0.0118

4:1

2:1

FILL: BROWN, SOFT CLAYEY SILT WITH WOOD, MOI

SAPROLITE: TAN, SILTY SAND, MOI.

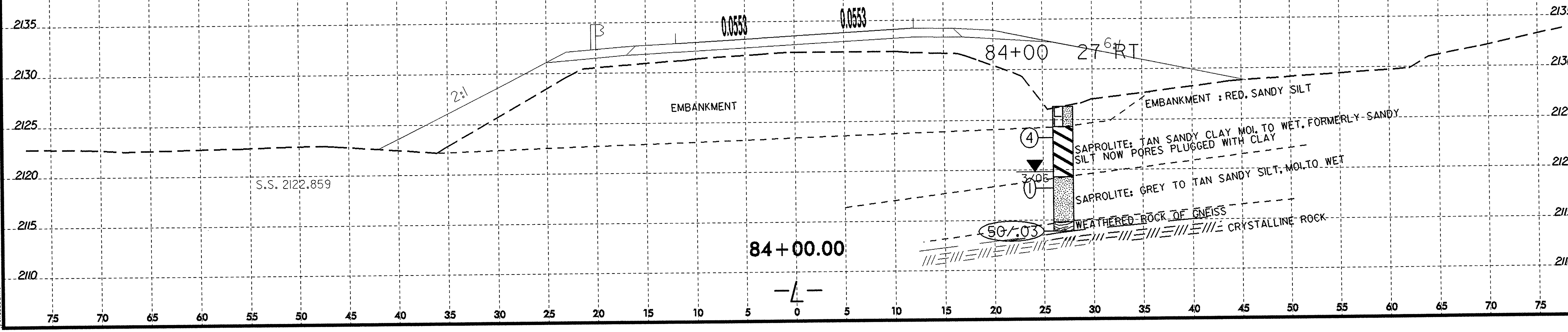
S.S. 2126.255

83+00.00

PROJ. REFERENCE NO.	SHEET NO.
R-2408B	32 of 102

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-16	27 RT	84+00	2.1 - 3.6	A-7-5 (7)	44	11	21	22	13	44	100	91	59		
SS-17	27 RT	84+00	7.1 - 8.6	A-4 (0)	25	NP	30	35	13	22	94	81	38		



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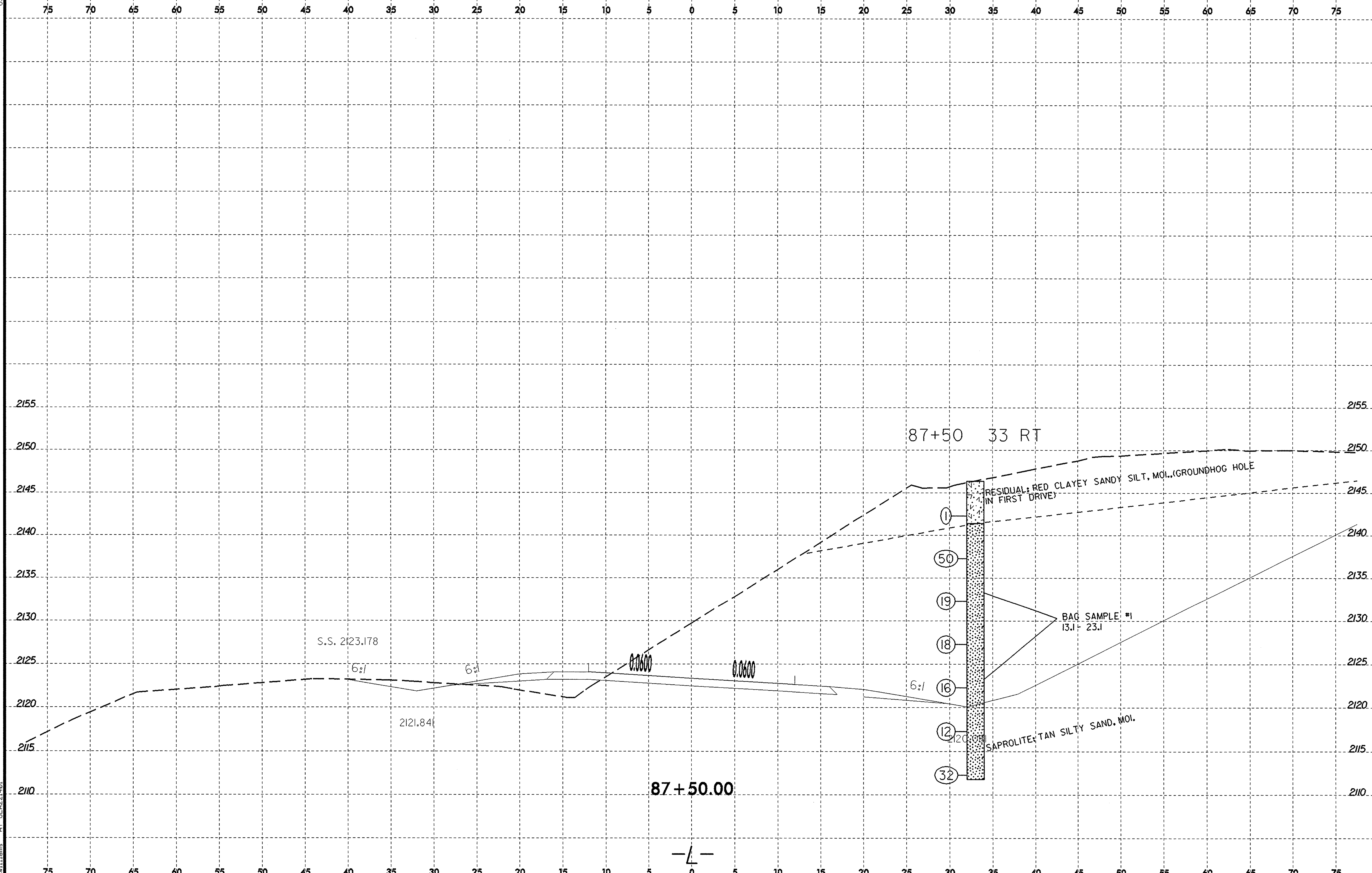
itwilliams AT GEA221401

PROJ. REFERENCE NO.	SHEET NO.
R2408B	33 of 102



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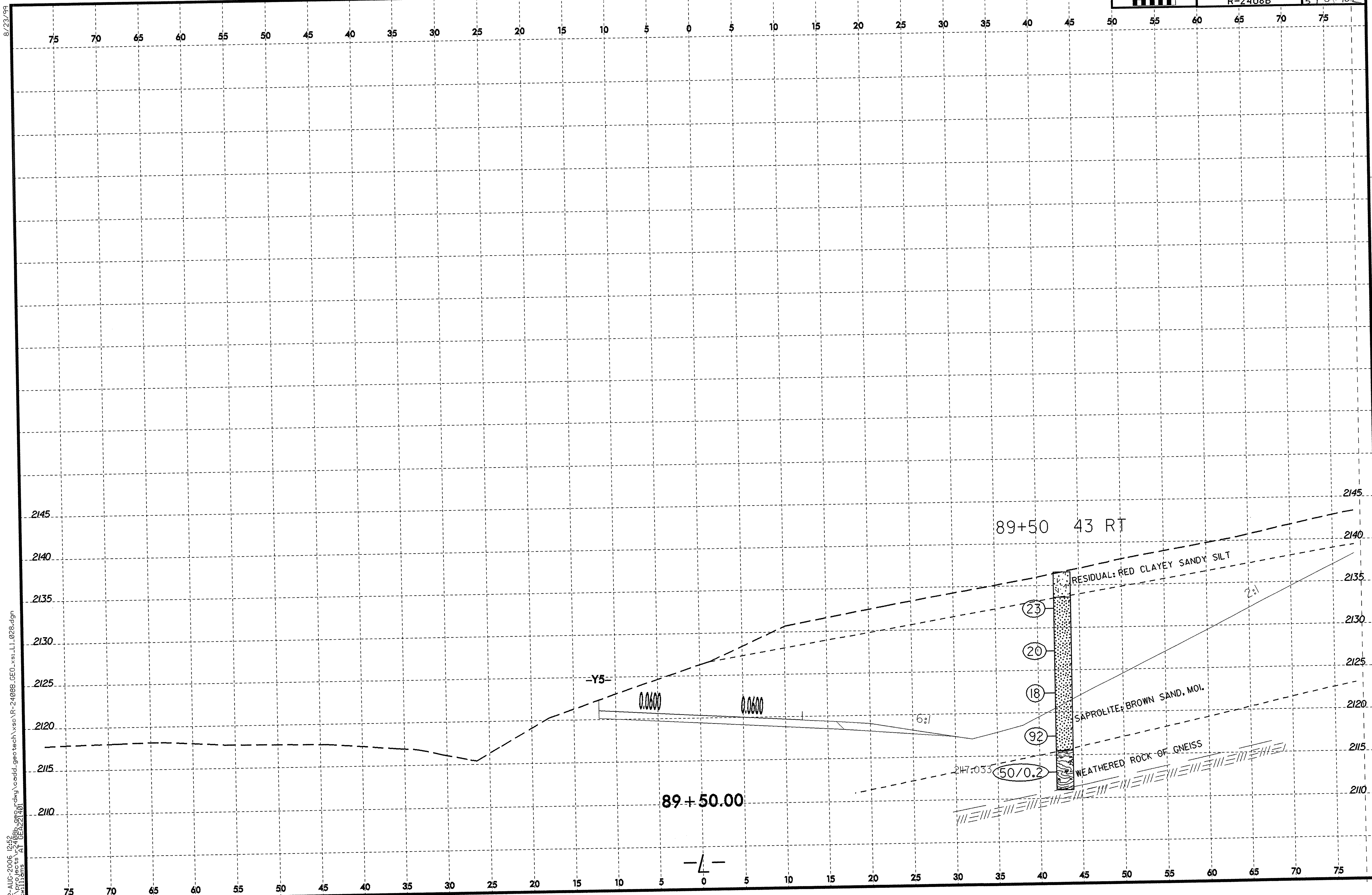

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PROJ. REFERENCE NO.	SHEET NO.
R-2408B	35 OF 102

0 2.5 5

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-18	60 RT	91+50	2.2 - 3.7	A-5 (2)	43	10	27	22	11	40	78	65	42		
SS-19	60 RT	91+50	7.2 - 8.7	A-2-4 (0)	33	NP	34	44	14	8	94	81	28		
SS-20	60 RT	91+50	12.2 - 13.7	A-2-4 (0)	37	NP	27	45	16	12	96	85	35		
SS-21	60 RT	91+50	17.2 - 18.7	A-2-5 (0)	43	NP	29	50	13	8	100	90	30		

91+50 60 RT

RESIDUAL: RED CLAYEY SANDY SILT. MOI.

SAPROLITE: BROWN FINE TO COARSE SAND. MOI.

11 12 9 9 22 63

2:1

-Y6-

0.0600 0.0600

6:1

S.S. 2113.185

2113.986

91+50.00

-L-

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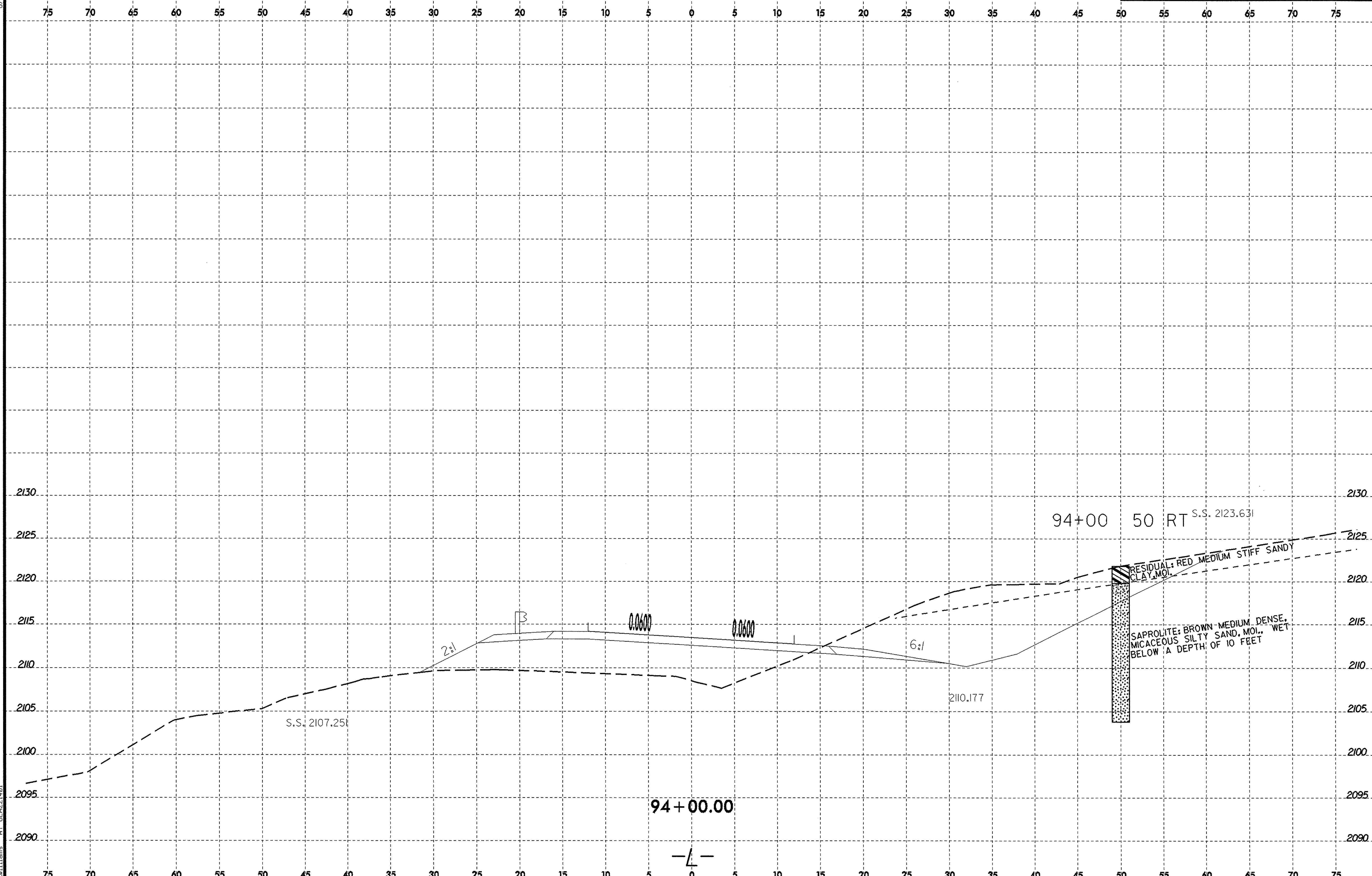

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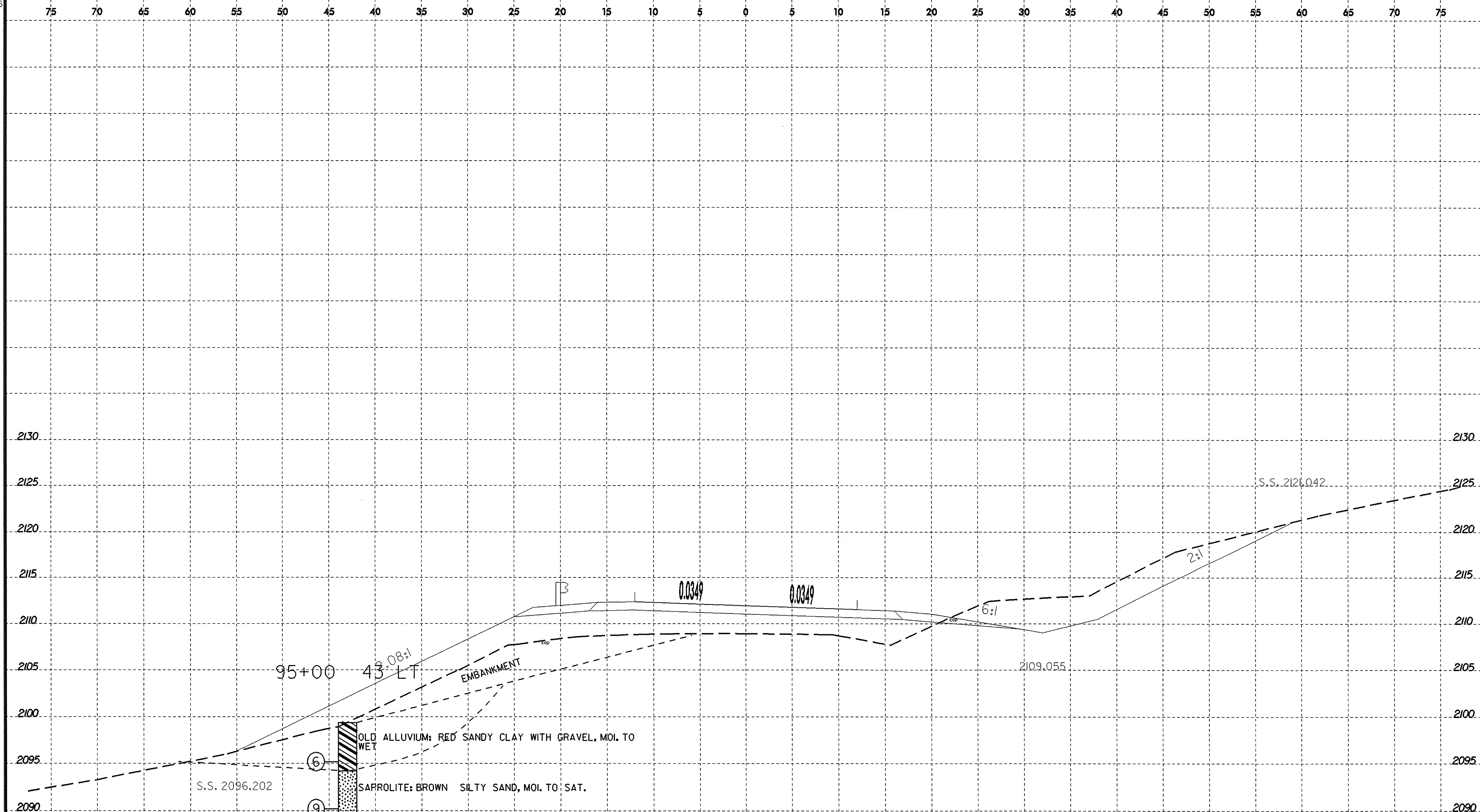


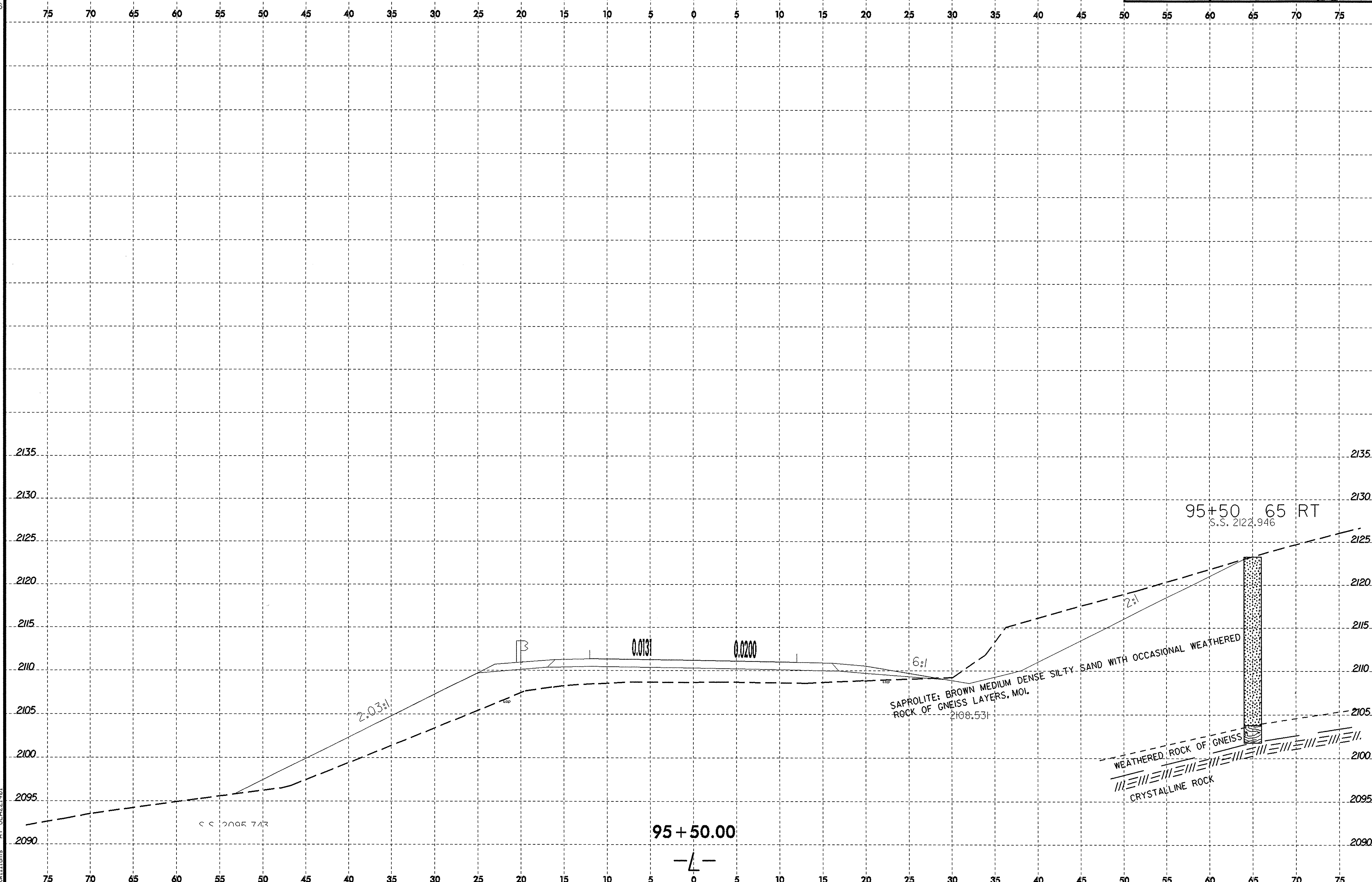
SOIL TEST RESULTS

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-25	43 LT	95+00	3.2 - 4.7	A-6 (2)	40	17	23	25	17	35	67	64	37		

95+00.00

-L-

PROJ. REFERENCE NO.	SHEET NO.
R-2408B	38 of 102



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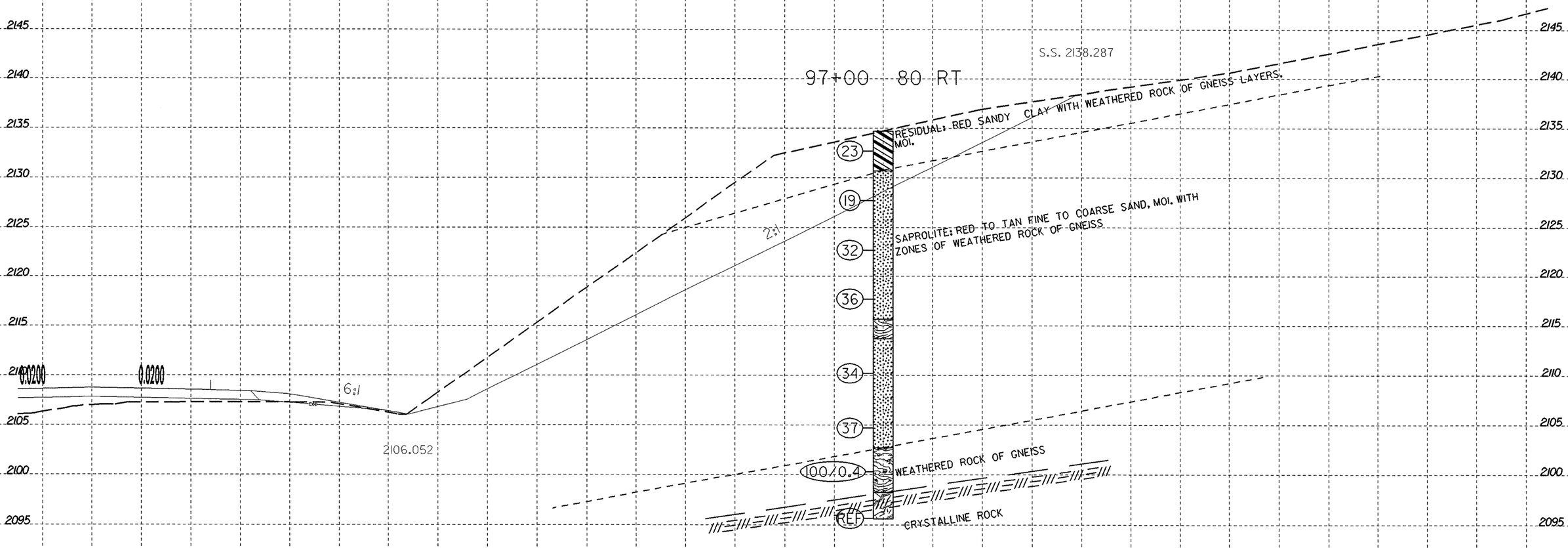
0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-2408B	39 of 102

5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 135 140 145

2145 2140 2135 2130 2125 2120 2115 2110 2105 2100 2095 2090

97+00 80 RT

S.S. 2138.287



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-23	80 RT	97+00	11.0 - 12.5	A-2-4 (0)	38	NP	33	46	13	8	81	68	23		
SS-24	80 RT	97+00	29.0 - 30.5	A-2-4 (0)	40	NP	25	55	16	4	95	87	28		

97+00.00

—L—

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0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-2408B	40 of 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-28	CL	98+50	3.2 - 4.7	A-4 (1)	37	7	27	32	19	22	89	76	42		

98+50 CL

0.0200 0.0200

S.S. 2103.401

2102.218

2:1 6:1 6:1

(2) EMBANKMENT: RED AND BROWN SANDY SILT, MOI

SAPROLITE: BROWN MICACEOUS SANDY SILT, MOI.

(41) WEATHERED ROCK OF GNEISS

98+50.00

—L—

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(twilliams)
AT GEA221401

8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-2408B	41 of 102

99+50 70 LT

2:1

ALLUVIUM: VERY SOFT BROWN SILT TOP SOIL, ORGANIC, WET

ALLUVIUM: VERY SOFT CLAYEY FINE SANDY SILT, ORGANIC, WET

ALLUVIUM: SAND AND GRAVEL, SAT.

99+50.00

01-AUG-2006 14:18
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tkwilliams AT GEA221401

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-2408B	42 of 102

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

2110
2105
2100
2095
2090
2085
2080
2075
2070
2065

DRIVE
100+31

S.S. 2096.260

0.0200 0.0200

6:1 6:1

2094.696

EMBANKMENT

2:1

100+50 35 LT

ALLUVIAL: VERY SOFT SILT, ORGANIC, WET

ALLUVIUM: VERY SOFT CLAYEY SANDY SILT, ORGANIC WET

ALLUVIUM: SAND AND GRAVEL, SAT.

100+50.00

—L—

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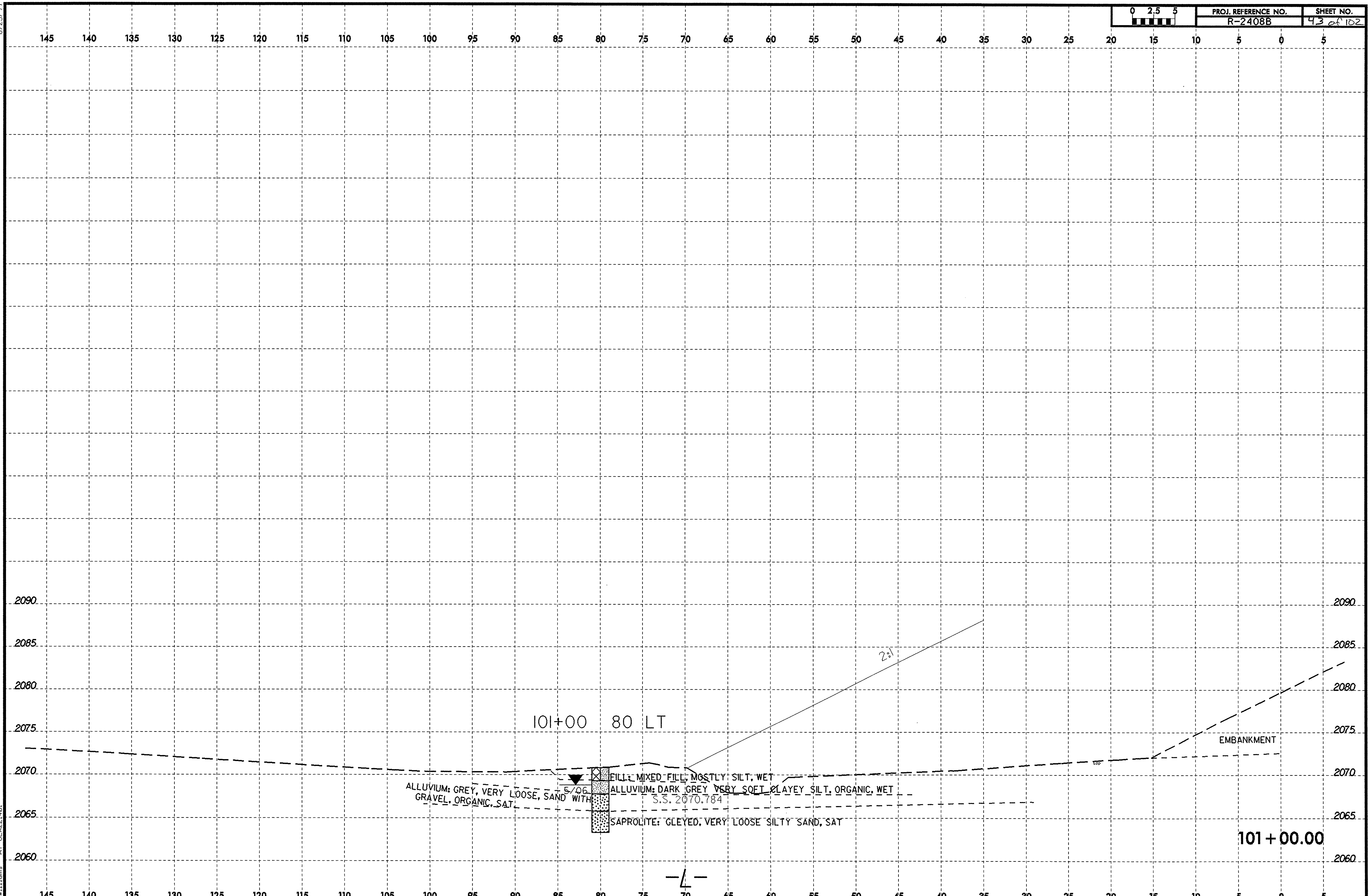
PROJ. REFERENCE NO.	SHEET NO.
R-2408B	43 of 102



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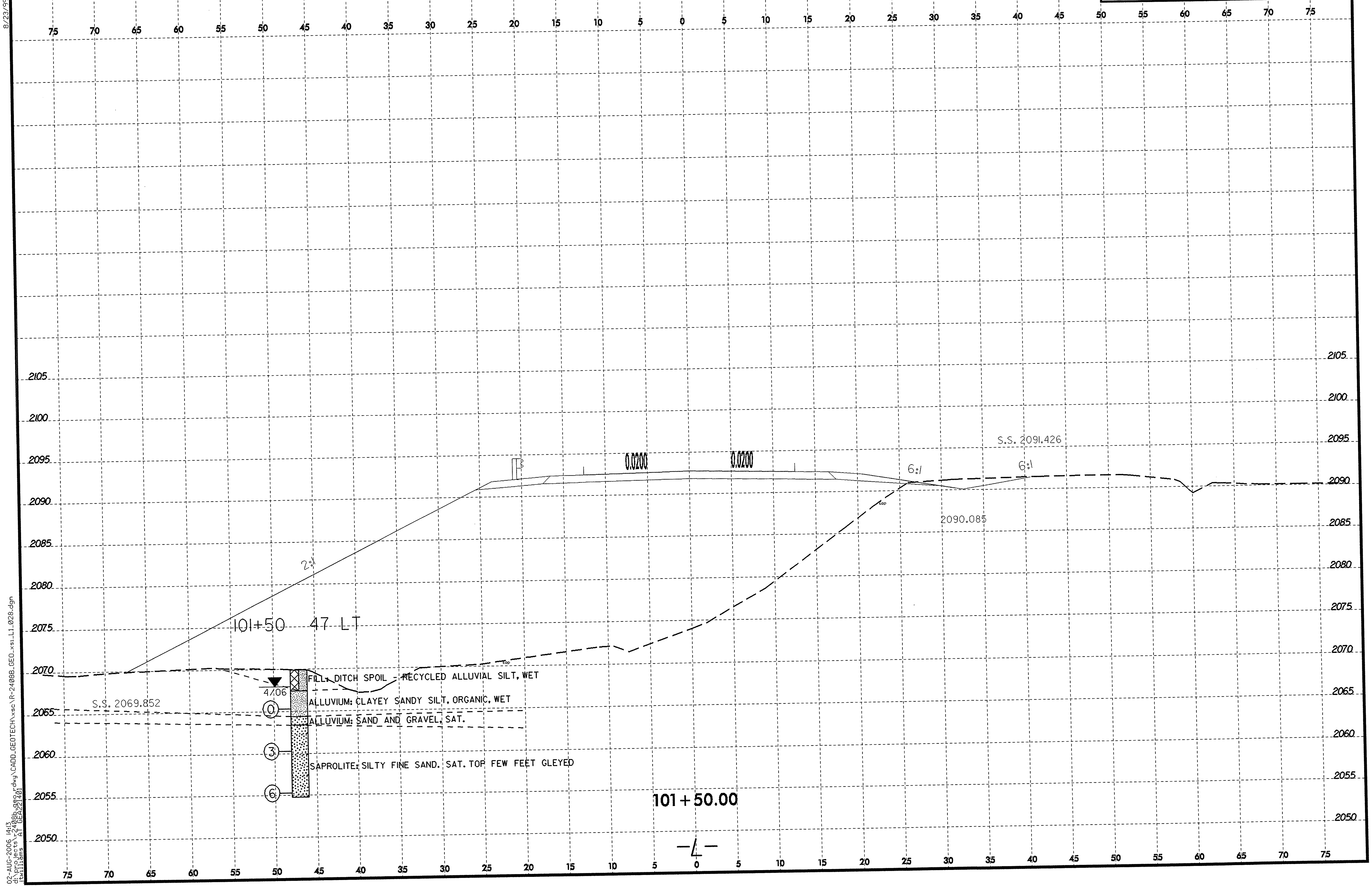
0 2.5 5
S.S. 2091.426
0.0200
0.0200
6:1
6:1
2090.085
2:1
101+50 47 LT
S.S. 2069.852
4/06
FILL: DITCH SPOIL - RECYCLED ALLUVIAL SILT, WET
ALLUVIUM: CLAYEY SANDY SILT, ORGANIC, WET
ALLUVIUM: SAND AND GRAVEL, SAT.
SAPROLITE: SILTY FINE SAND. SAT. TOP FEW FEET GLEYED
0
3
6
101+50.00
-L-
2105
2100
2095
2090
2085
2080
2075
2070
2065
2060
2055
2050
75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

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jtwilliams AT GEA2221401

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-2408B	45 of 102

S.S. 2087.168

0.0200 0.0200

6:1 6:1

2:1

EMBANKMENT

2085.431

102+50 5 LT

S.S. 2068.025

ALLUVIUM: GREY FINE SANDY SILT WITH BASAL SAND AND GRAVEL, ORGANIC, MOI. TO WET AND SAT.

(7) FILL: BROWN CLAYEY SANDY SILT, MOI.

(4) 4/06

(2) SAPROLITE: GREY CLAY FILLED FINE SANDY SILT, WET

(2)

(12) SAPROLITE: BROWN SILTY SAND, SAT.

102+50.00

-L-

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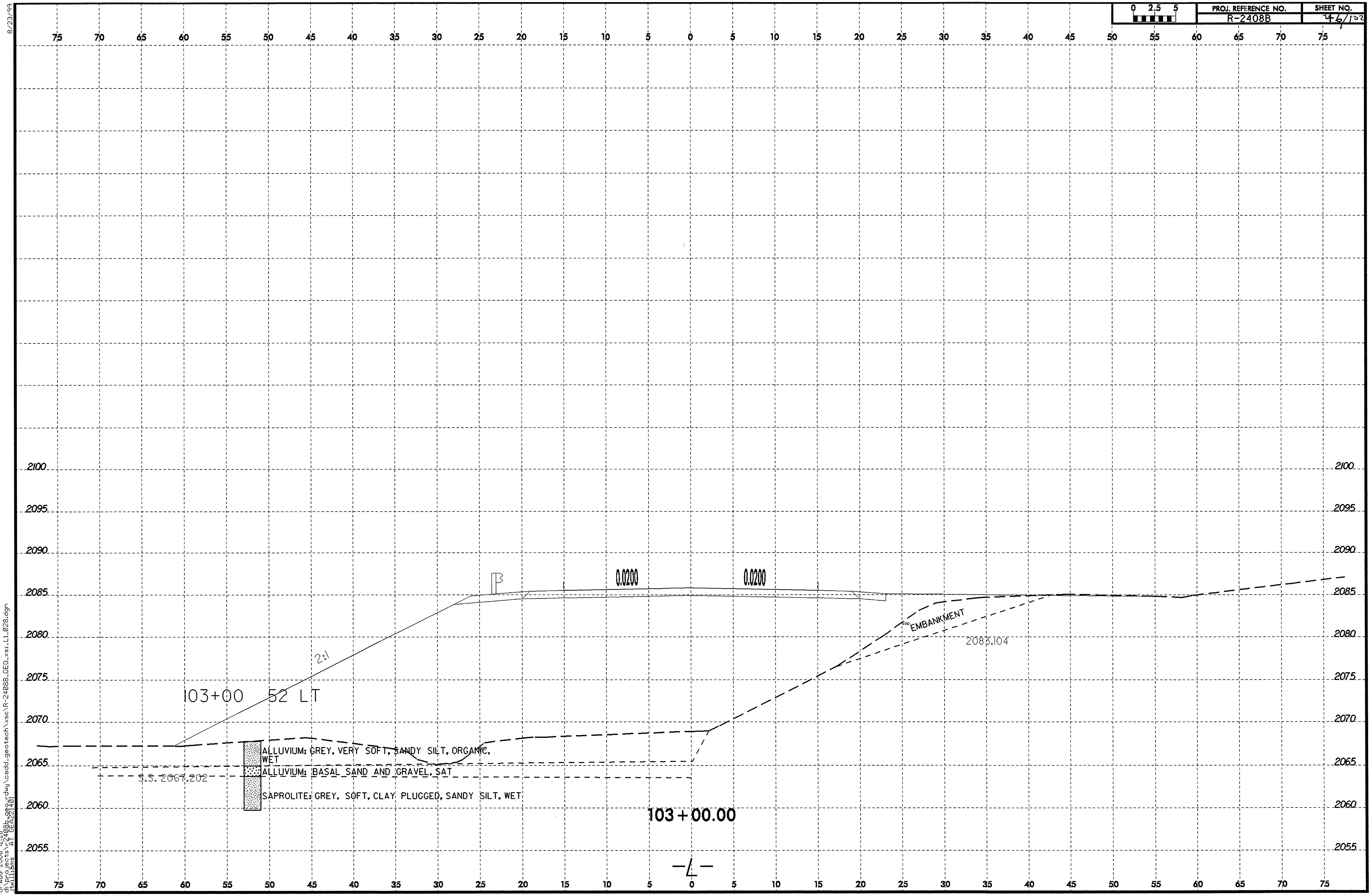
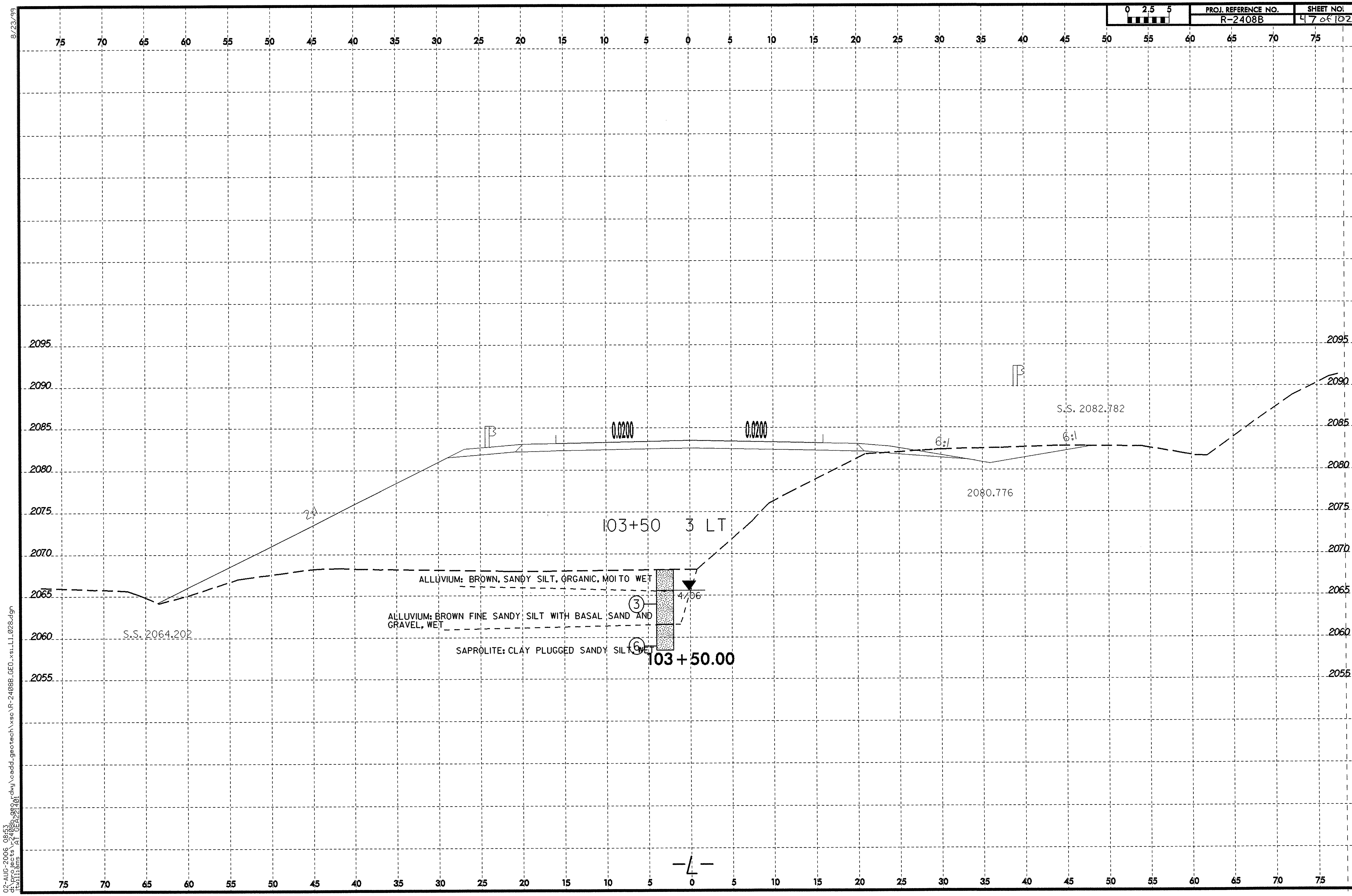
twilliams
AT GEA22140



PROJ. REFERENCE NO.
R-2408B
SHEET NO.
46/102
0 2.5 5
0.0200
0.0200
2:1
103+00 52 LT
EMBANKMENT
2083.104
ALLUVIUM: GREY, VERY SOFT, SANDY SILT, ORGANIC, WET
ALLUVIUM: BASAL SAND AND GRAVEL, SAT
S.S. 2067.202
SAPROLITE: GREY, SOFT, CLAY PLUGGED, SANDY SILT, WET
103+00.00
-L-



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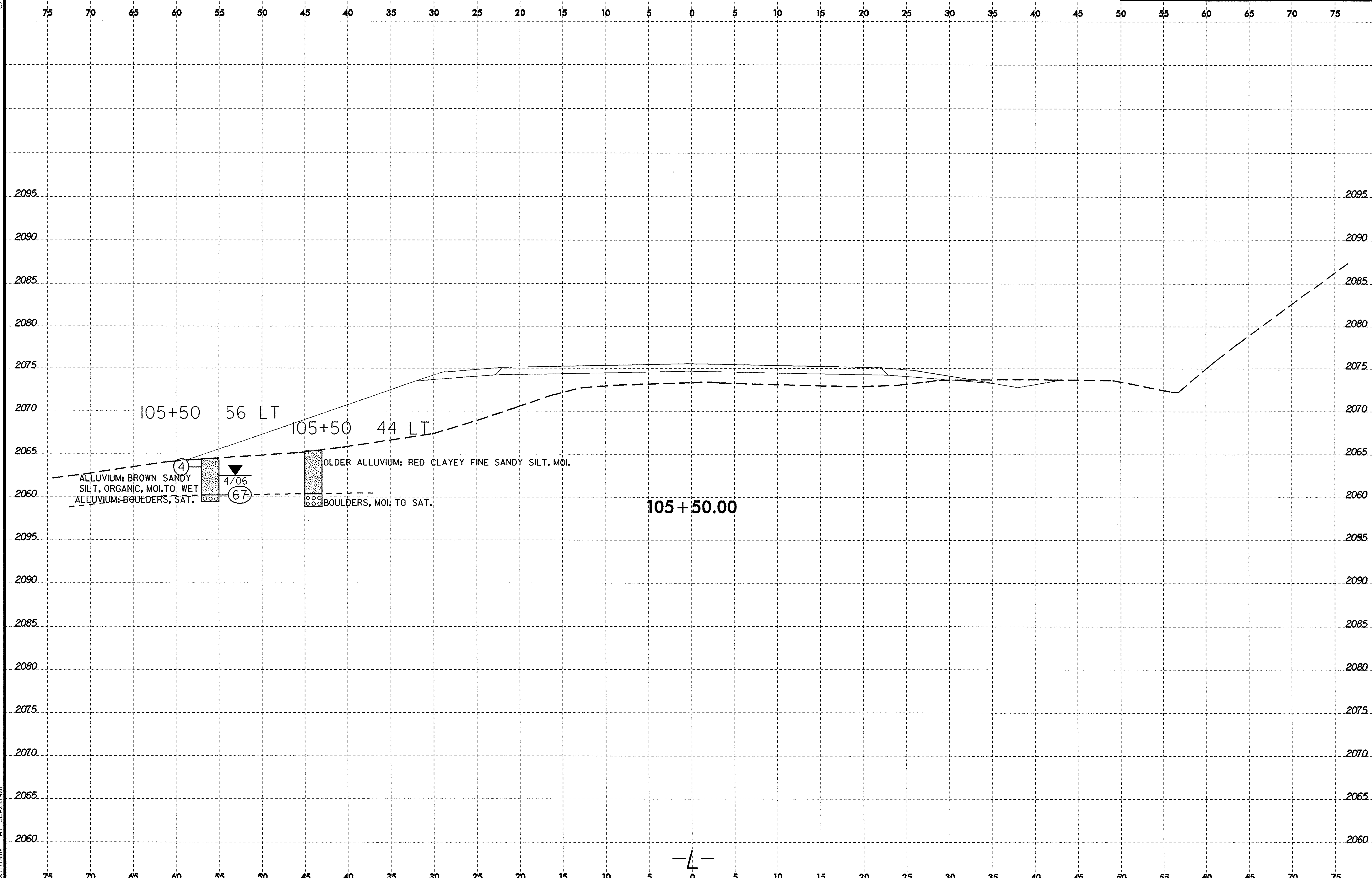
jtwilliams AT GEA22140l

PROJ. REFERENCE NO.	SHEET NO.
R-2408B	48 of 102



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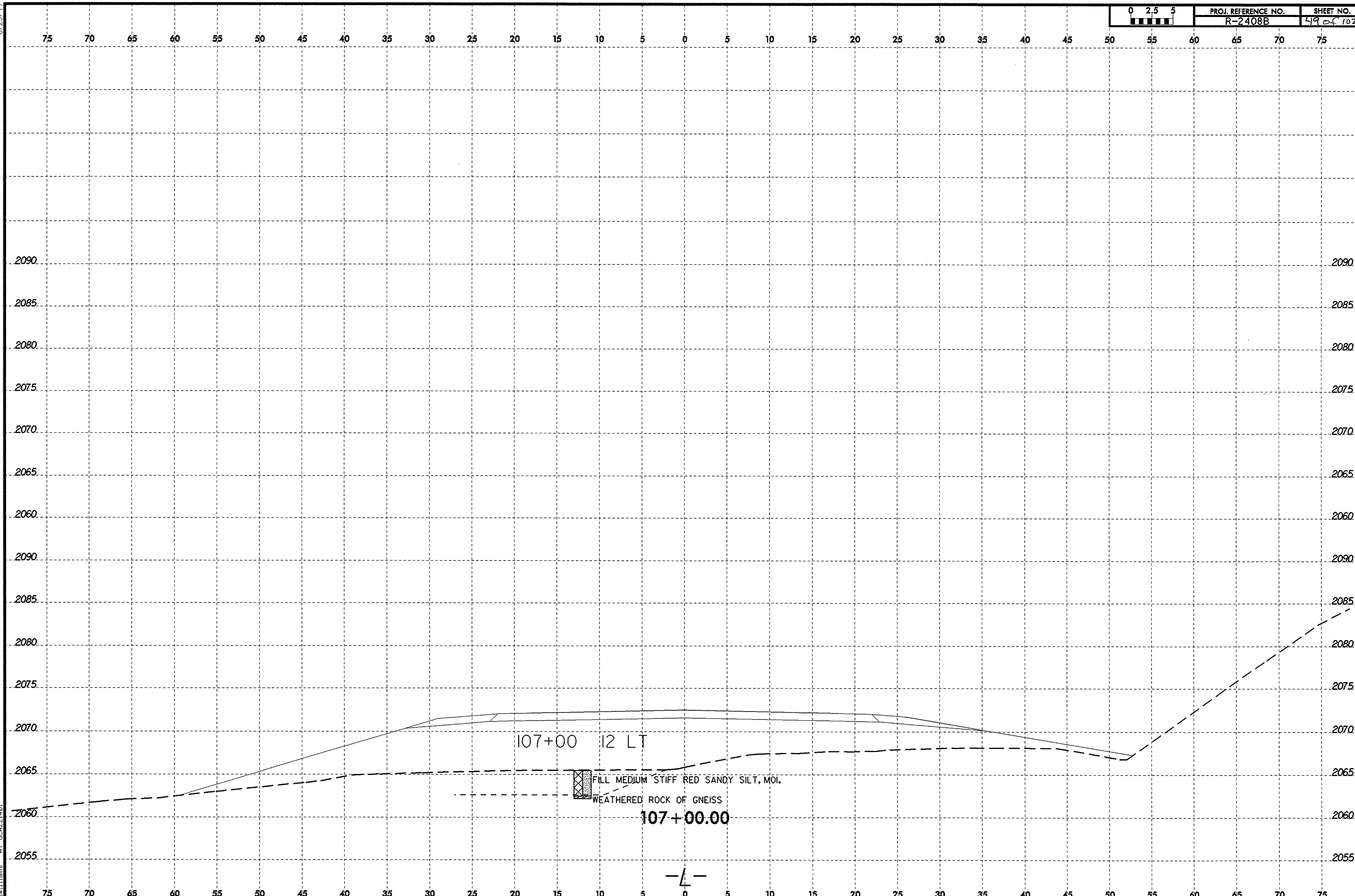

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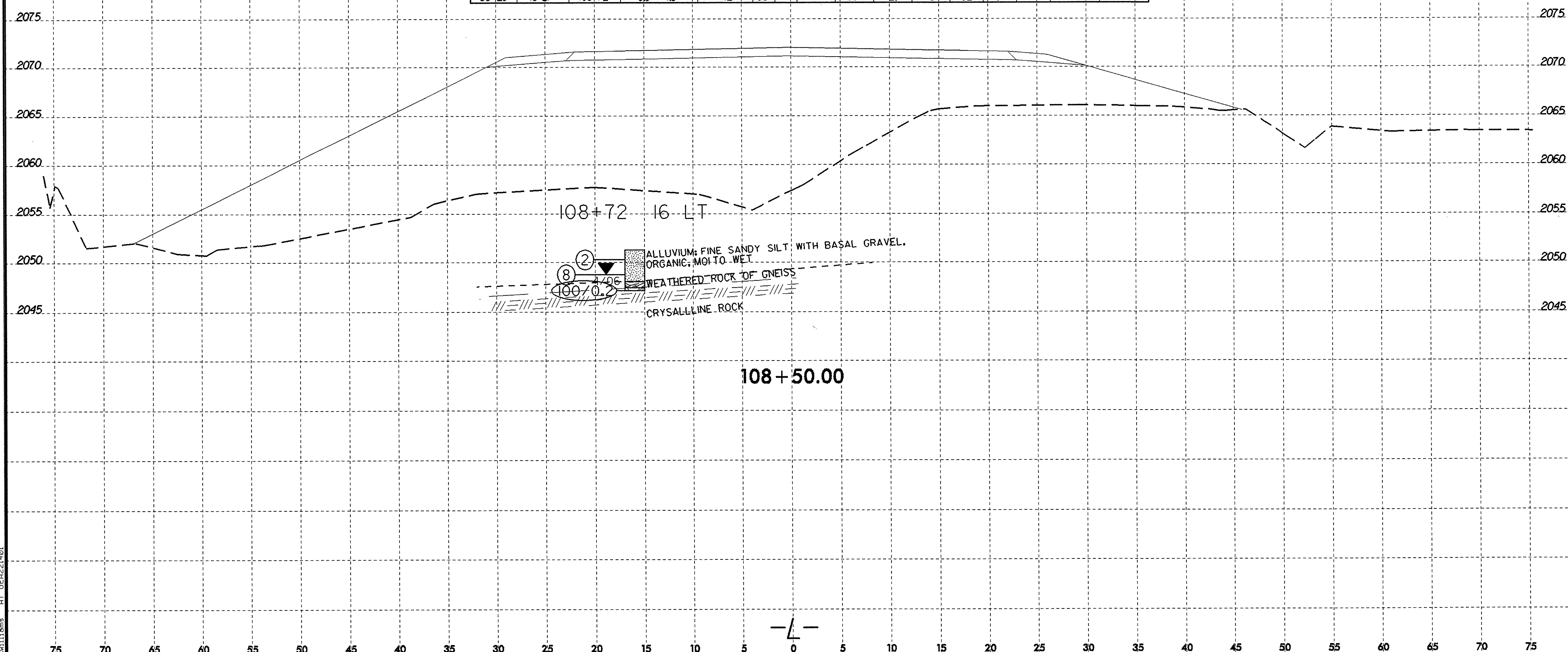
itwilliams AT GEA2214Ø1

PROJ. REFERENCE NO.	SHEET NO.
R-2408B	50 of 102

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-29	16 LT	108+72	0.0 - 1.5	A-4 (2)	33	NP	17	38	29	16	92	84	47		



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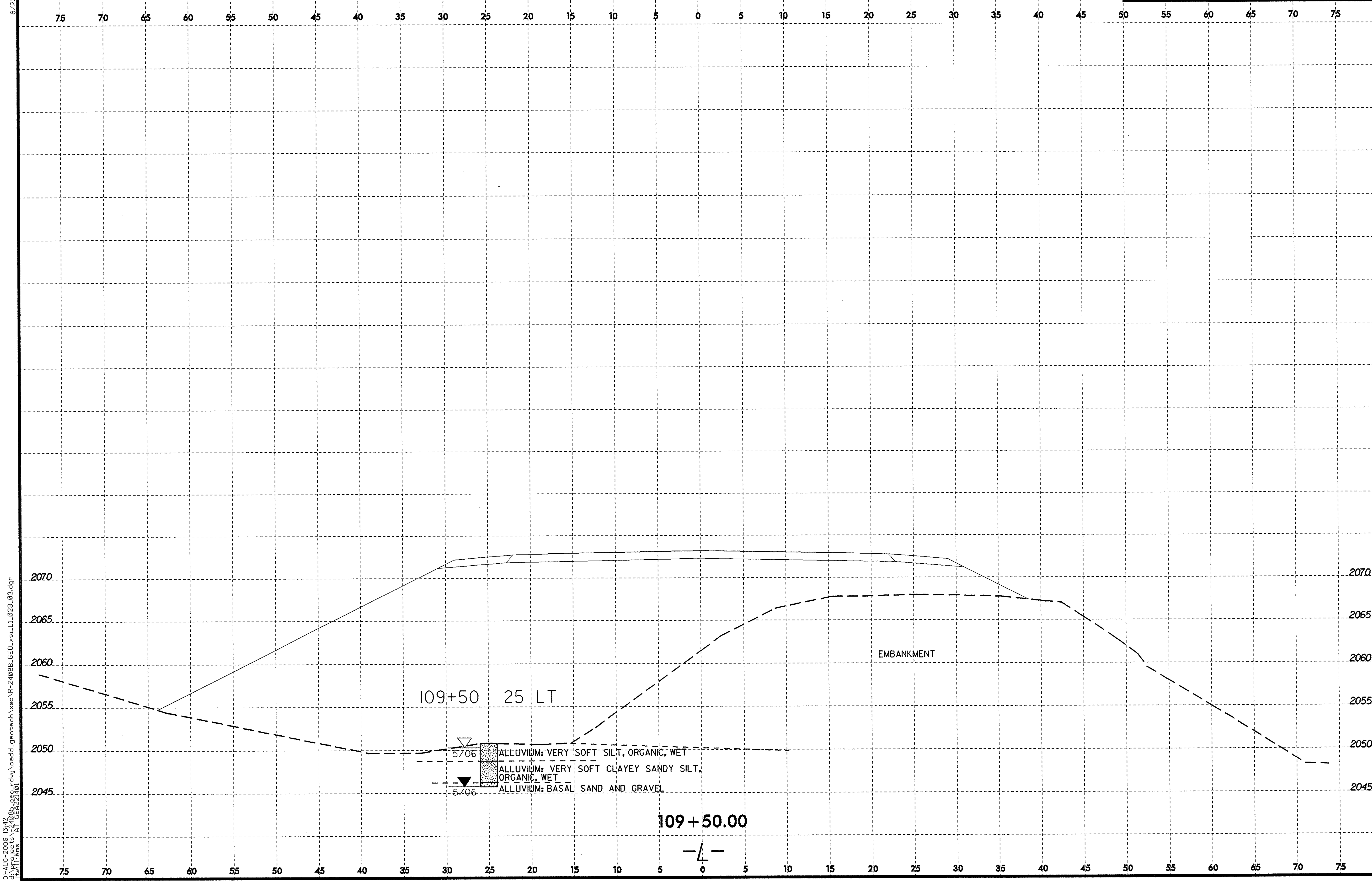
twilliams AT GEA221401
8/23/99

PROJ. REFERENCE NO.	SHEET NO.
R-2408B	51 of 102



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itwilliams AT GEA221401

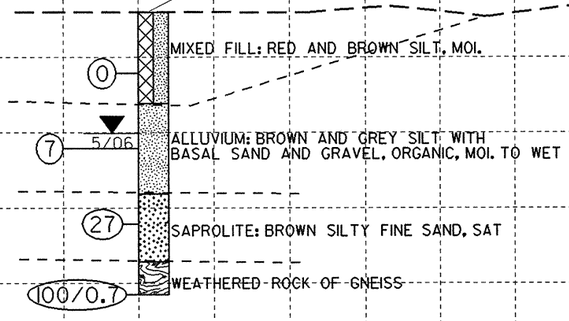
8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-2408B	52 of 102

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

2080 2075 2070 2065 2060 2055 2050 2045 2040 2035 2030

110+00 59 LT



110+00.00

—L—

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

2080 2075 2070 2065 2060 2055 2050 2045 2040 2035 2030

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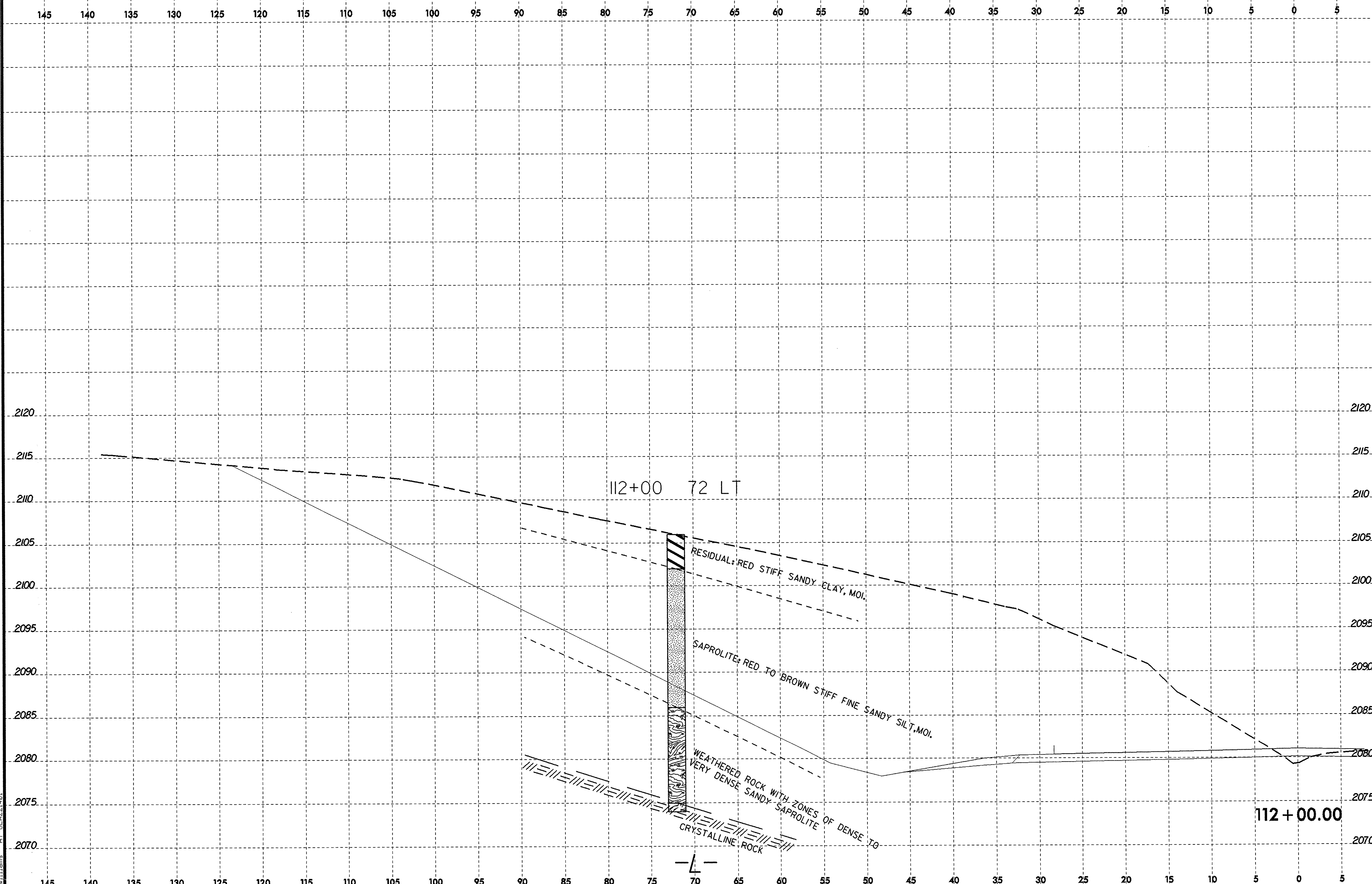
twilliams A1 GEA221401

PROJ. REFERENCE NO.	SHEET NO.
R-2408B	S3 of 102



113+00 59 LT
RESIDUAL: RED SANDY CLAY, MOI.
SAPROLITE: BROWN SANDY SILT, MOI.
WEATHERED ROCK OF GNEISS
SAPROLITE: BROWN SILTY SAND, MOI.
WEATHERED ROCK OF GNEISS
12
37
8
100/1.0
72
24
100/0.9
100/0.9
2082.483
6:1
0.0200
0.0200
6:1
Ditch Depth
S.S. 2083.219
2082.699
113+00.00
2125
2120
2115
2110
2105
2100
2095
2090
2085
2080
2075
2070
2065
2060
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
$$$$$SYSTIME$$$$
$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-2408B	55 of 102

114+00 82 LT

RESIDUAL: RED STIFF SANDY CLAY, MOI.

SAPROLITE: BROWN STIFF SANDY SILT, MOI.

SAPROLITE: BROWN SILTY SAND WITH ZONES OF WEATHERED ROCK, MOI.

WEATHERED ROCK OF GNEISS

CRYSTALLINE ROCK

114+00.00

02-AUG-2006 08:43
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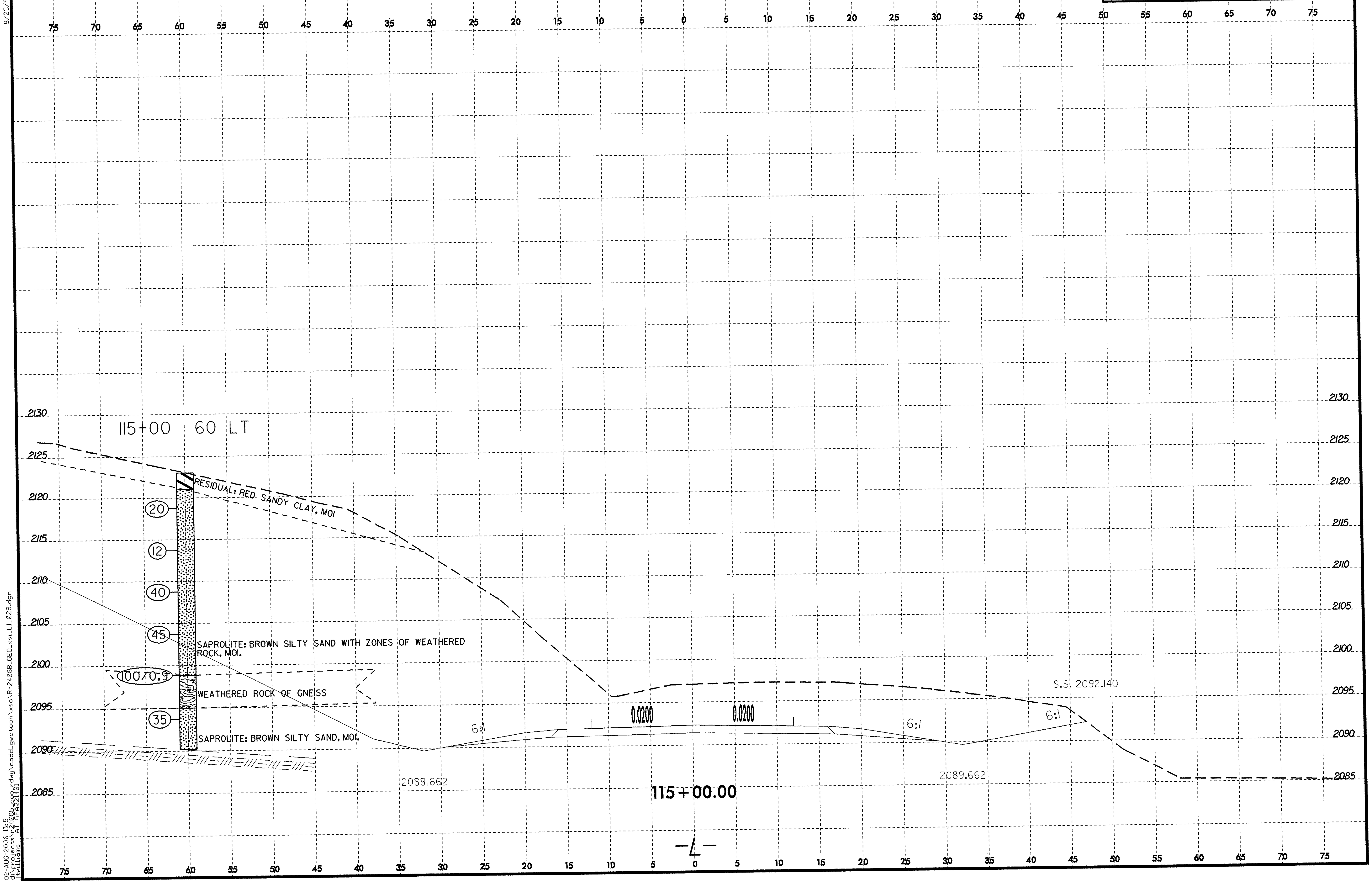
twilliams AT GEA22401

PROJ. REFERENCE NO.	SHEET NO.
R-2408B	56 of 102

8/23/99



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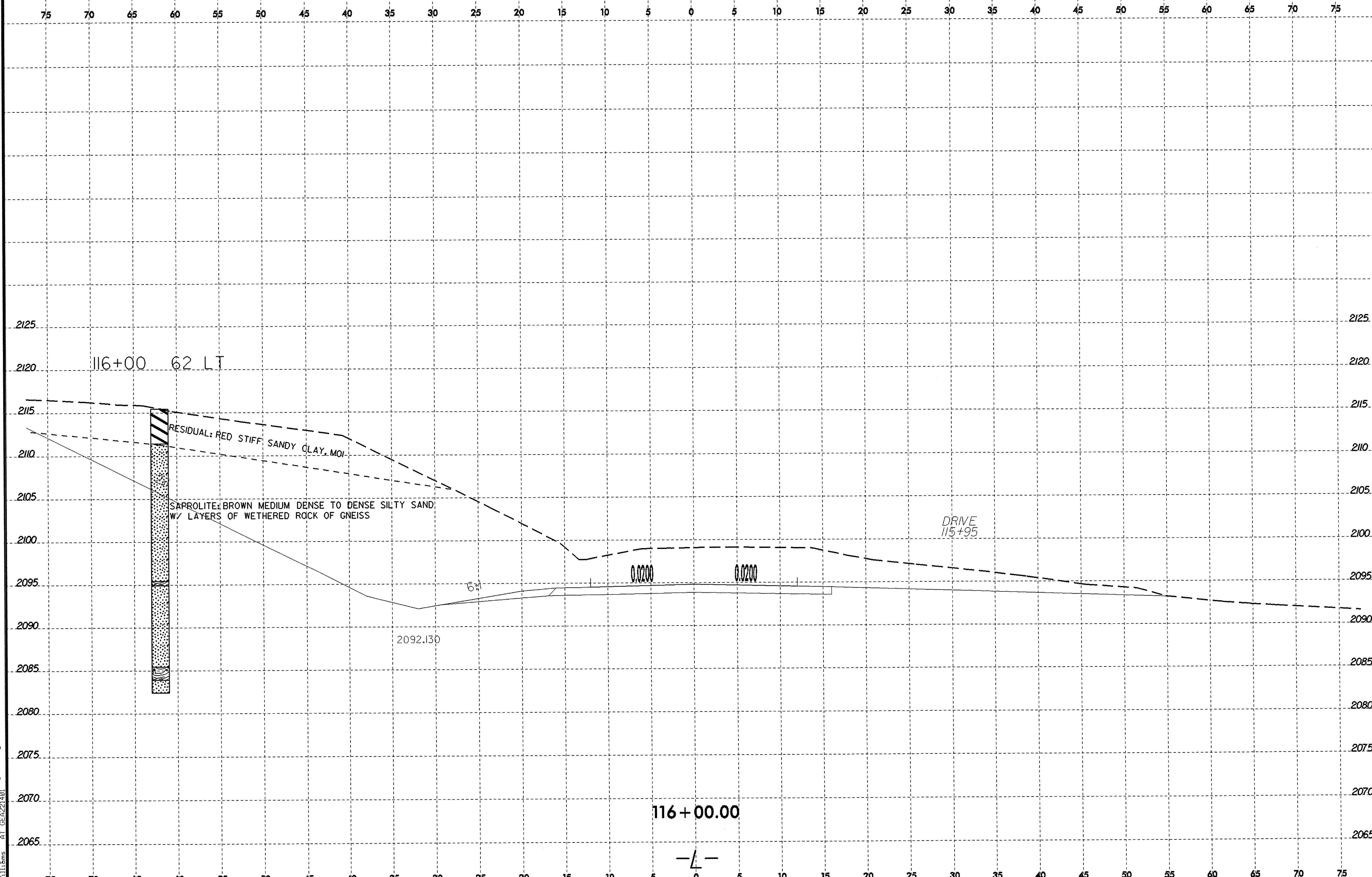
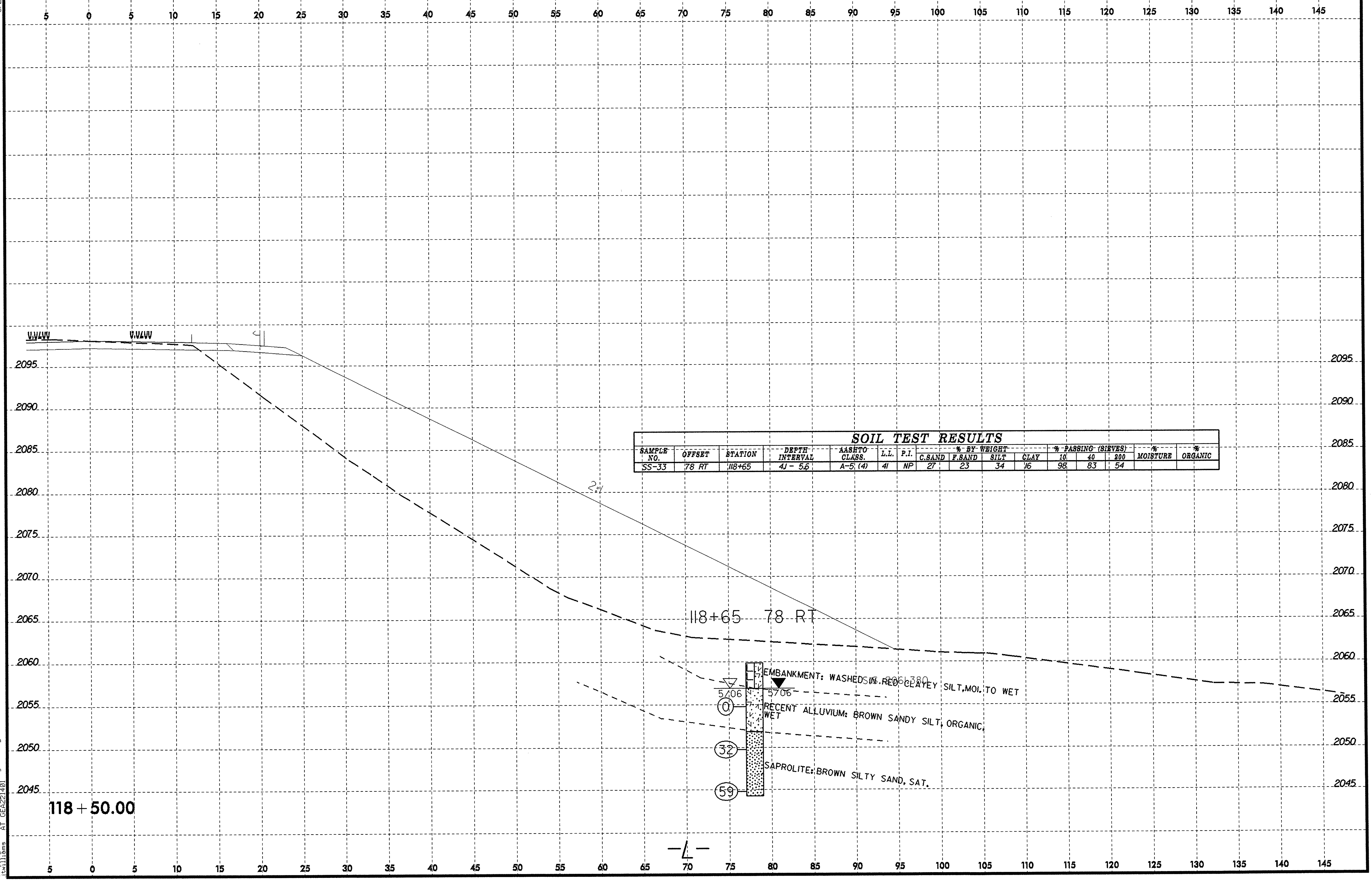
AT GEA221401
twilliams

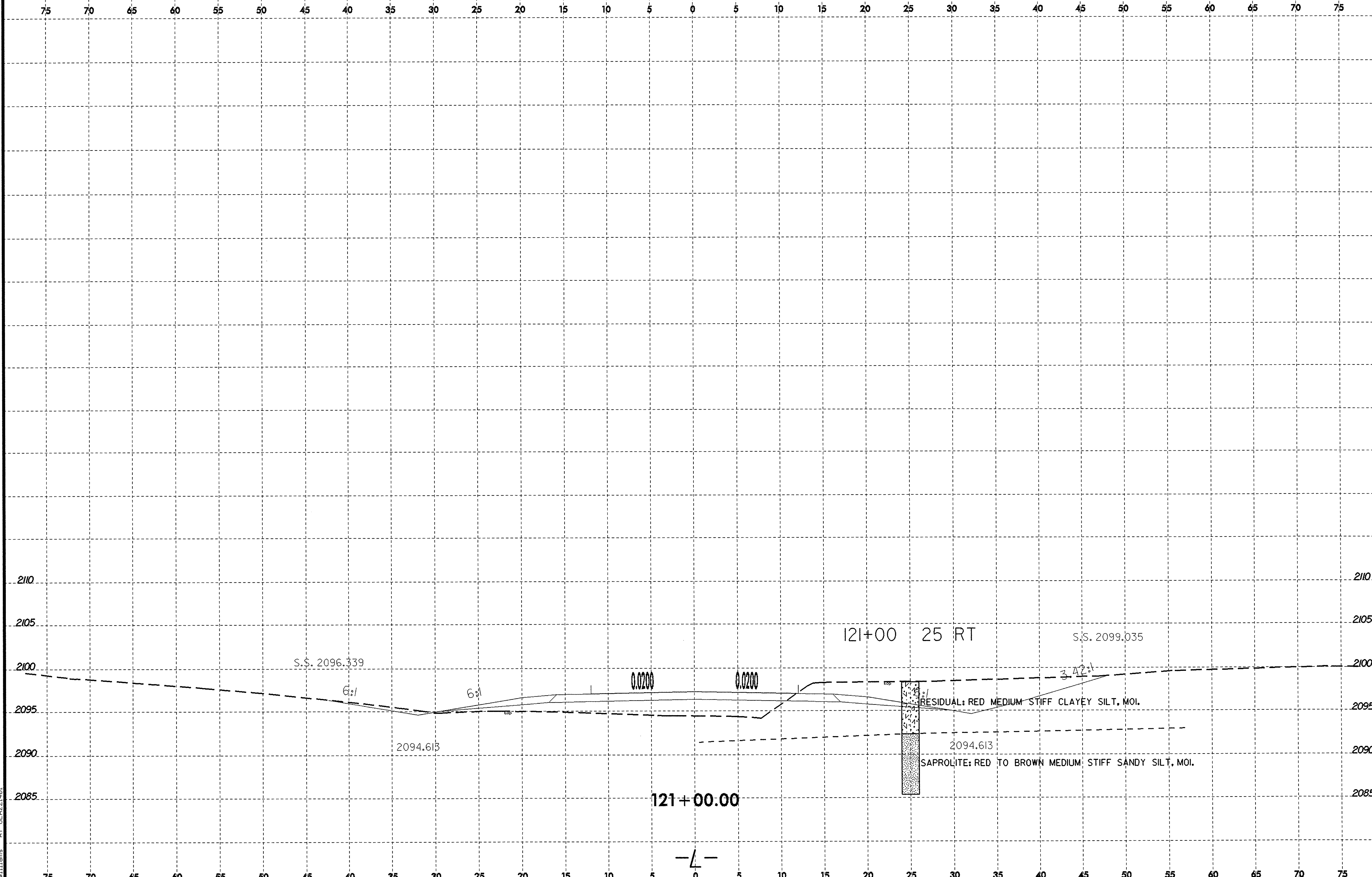

116+00 62 LT
RESIDUAL: RED STIFF SANDY CLAY, MOI
SAPROLITE: BROWN MEDIUM DENSE TO DENSE SILTY SAND W/ LAYERS OF WETHERED ROCK OF GNEISS
DRIVE 115+95
0.0200
0.0200
6:1
2092.130
116+00.00
2125
2120
2115
2110
2105
2100
2095
2090
2085
2080
2075
2070
2065

PROJ. REFERENCE NO.	SHEET NO.
R-2408B	58 of 102



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-33	78 RT	118+65	4.1 - 5.6	A-5 (4)	41	NP	27	23	34	16	98	83	54		



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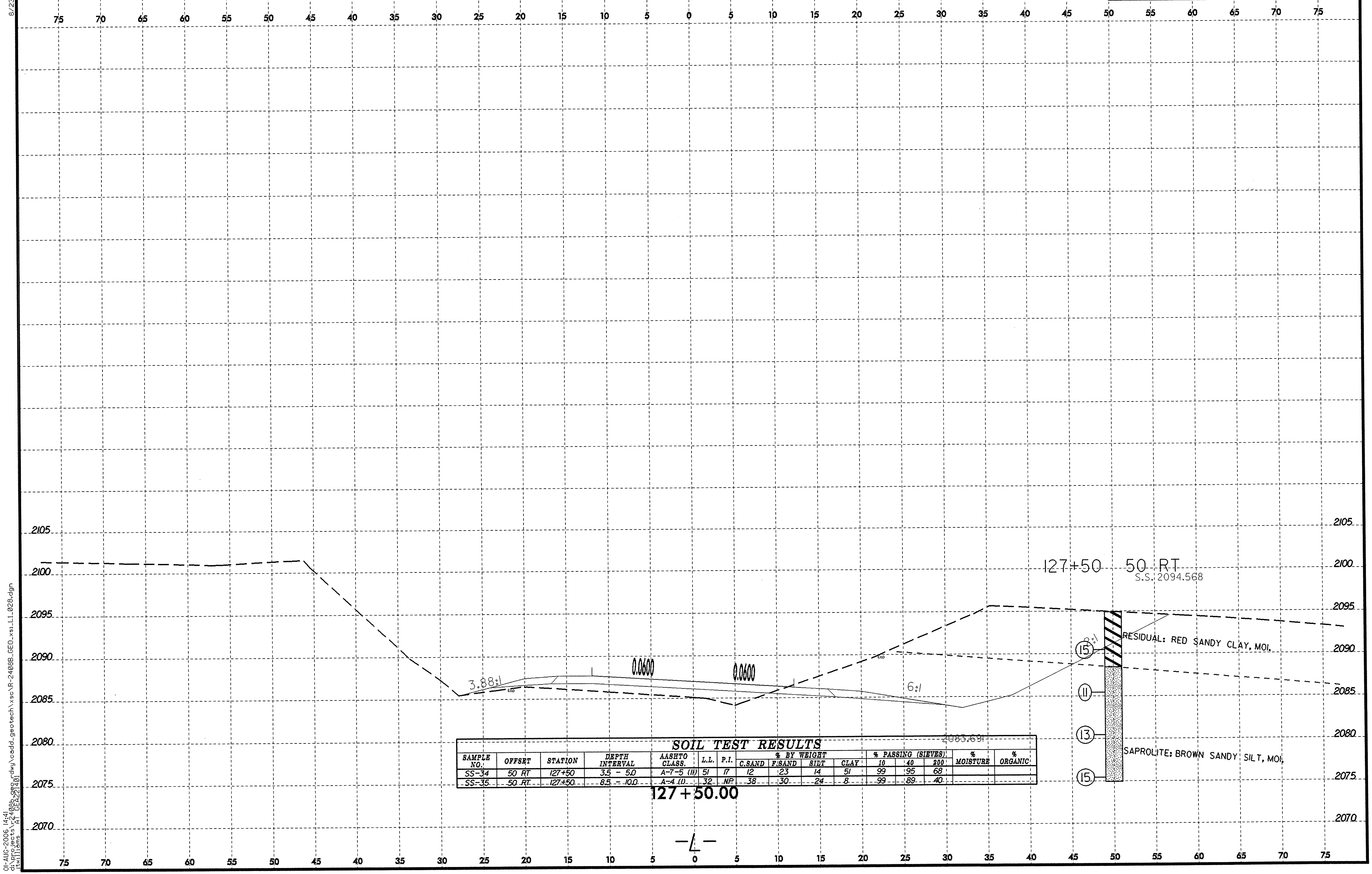

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-34	50 RT	127+50	3.5 - 5.0	A-7-5 (11)	51	17	12	23	14	51	99	95	68		
SS-35	50 RT	127+50	8.5 - 10.0	A-4 (1)	32	NP	38	30	24	8	99	89	40		

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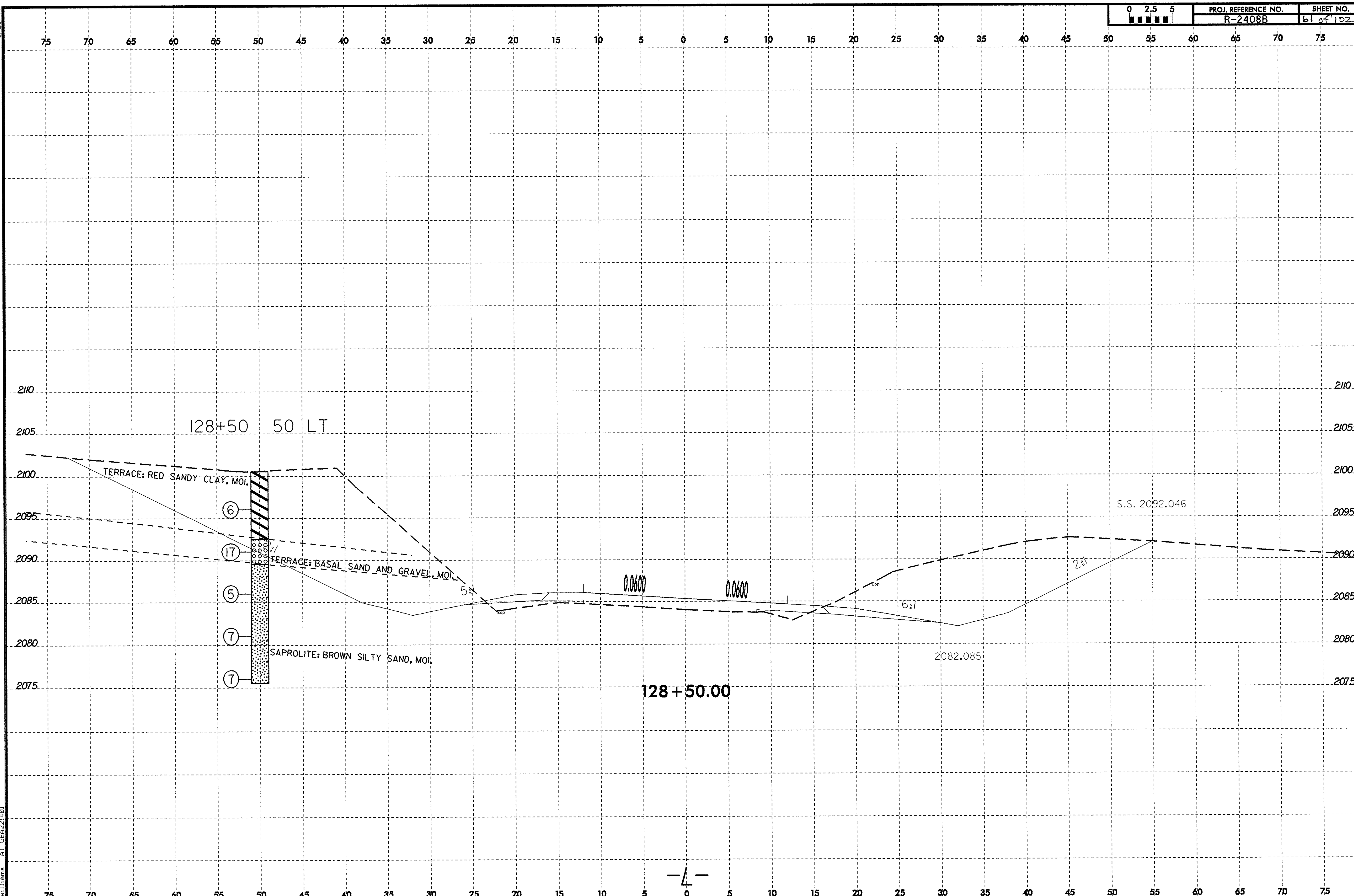
r.williams AT DEA21401

PROJ. REFERENCE NO.	SHEET NO.
R-2408B	61 of 102

8/23/99



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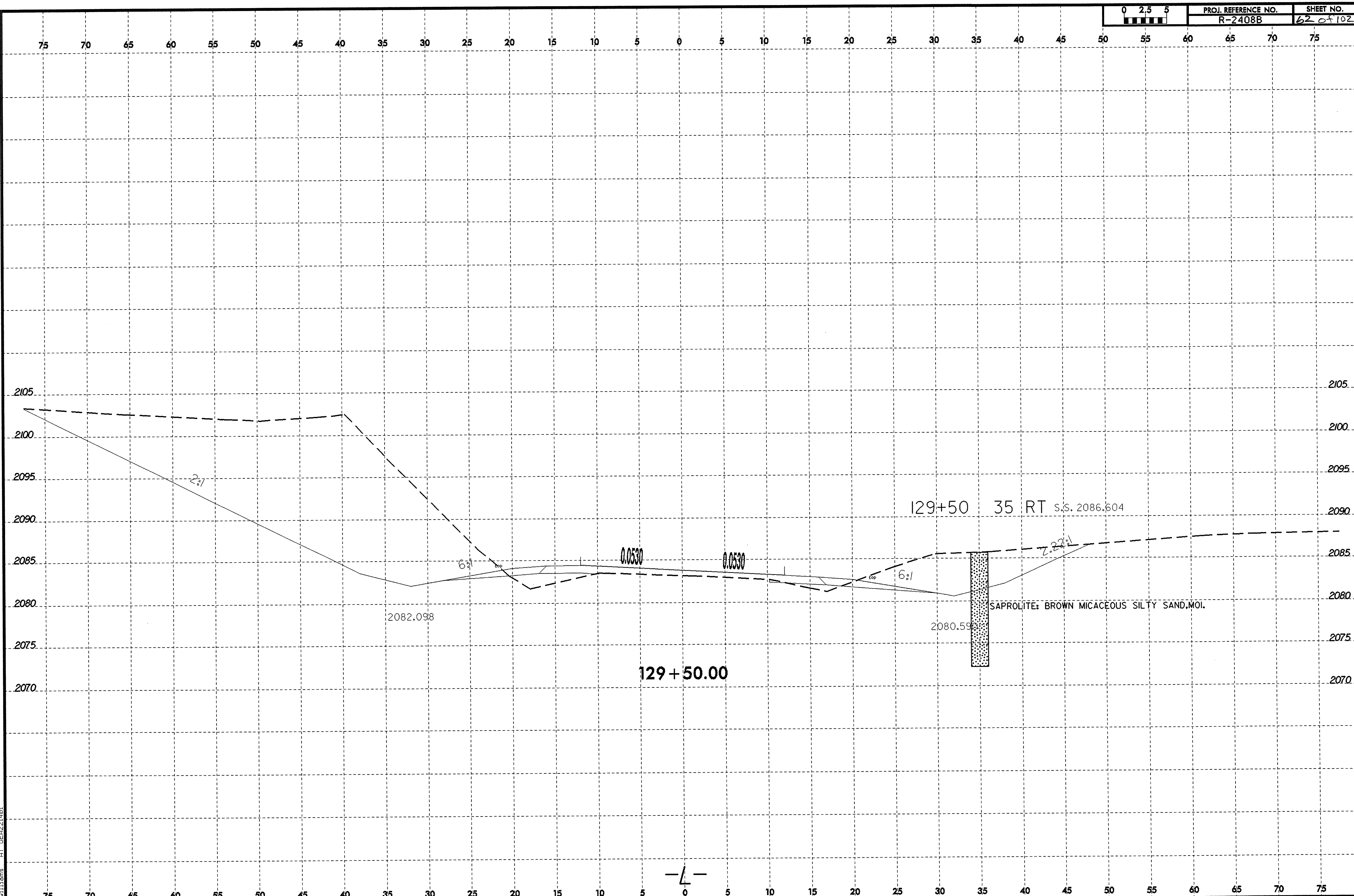
itwilliams AT GEA221401



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8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-2408B	63 OF 102

130+00 50 LT

TERRACE: RED SANDY CLAY, MOI.

SAPROLITE: RED TO TAN SANDY SILT, MOI.

2080.985

2080.120

S.S. 2086.246

DRIVE 131+30

2:1

6:1

6:1

2:1

0.0338

0.0338

(22)

(11)

(12)

(17)

(8)

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-39	50 LT	130+00	3.5 - 5.0	A-7-5 (13)	53	15	7	19	15	59	99	96	78		
SS-40	50 LT	130+00	8.5 - 10.0	A-4 (3)	39	NP	22	34	26	18	99	81	51		
SS-41	50 LT	130+00	13.5 - 15.0	A-4 (1)	36	NP	21	49	26	4	98	91	40		
SS-42	50 LT	130+00	18.5 - 20.5	A-4 (1)	33	NP	25	41	26	8	98	87	42		
SS-43	50 LT	130+00	23.5 - 25.0	A-4 (3)	38	NP	21	38	31	10	100	88	52		

130+00.00

02-AUG-2006 10:23
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tw11sms AT GEA22140

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-2408B	64 of 102

S.S. 2100.728

134+50 38 LT

TERRACE: RED VERY STIFF SANDY CLAY

TERRACE: RED FINE SANDY CLAYEY STIFF SILT, MOI.

SAPROLITE: BROWN SANDY SILT, MOI.

2086.477

0.0453

0.0453

Subgrade warped to Slopestake

134+50.00

-L-

02-AUG-2006 14:15
dtwilliams
R-2408b_geo.dwg \CADD_GEOTECH\xso\R-2408B_GEO_xs1_LL1_028.dgn
A1 GER221401

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-2408B	65 of 102

135+50 40 LT

S.S. 2104.341

11 RESIDUAL: RED SANDY CLAY, MOI.

4

10 2090.731

12 SAPROLITE: BROWN SILTY SAND, MOI.

6:1

4.04:1

S.S. 2087.061

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-36	40 LT	135+50	2.9 - 4.4	A-7-5 (8)	46	13	21	19	15	45	97	86	63		
SS-37	40 LT	135+50	7.9 - 9.4	A-2-4 (0)	31	NP	40	34	20	6	99	72	34		
SS-38	40 LT	135+50	12.9 - 14.4	A-2-4 (0)	33	NP	36	38	20	6	99	77	33		

135+50.00

-L-

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-2408B	66 of 102

137+00 40 LT

2:1

RESIDUAL: RED STIFF CLAYEY SANDY SILT, MOI.

SAPROLITE: BROWN STIFF SANDY SILT, MOI.

6:1

0.0600

0.0600

6:1

6:1

S.S. 2099.652

2098.376

2096.616

137+00.00

2115
2110
2105
2100
2095
2090
2085
2080

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

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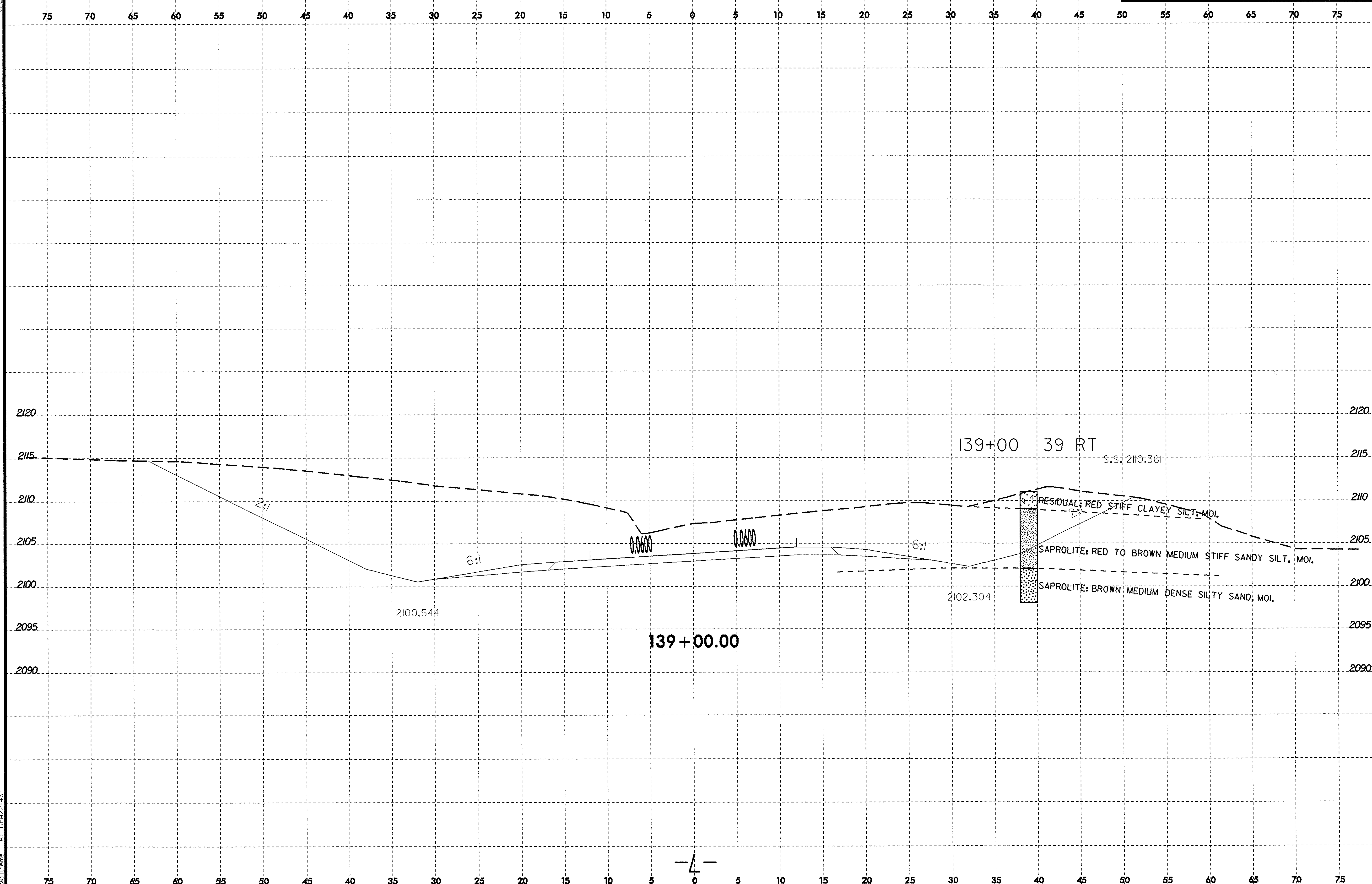

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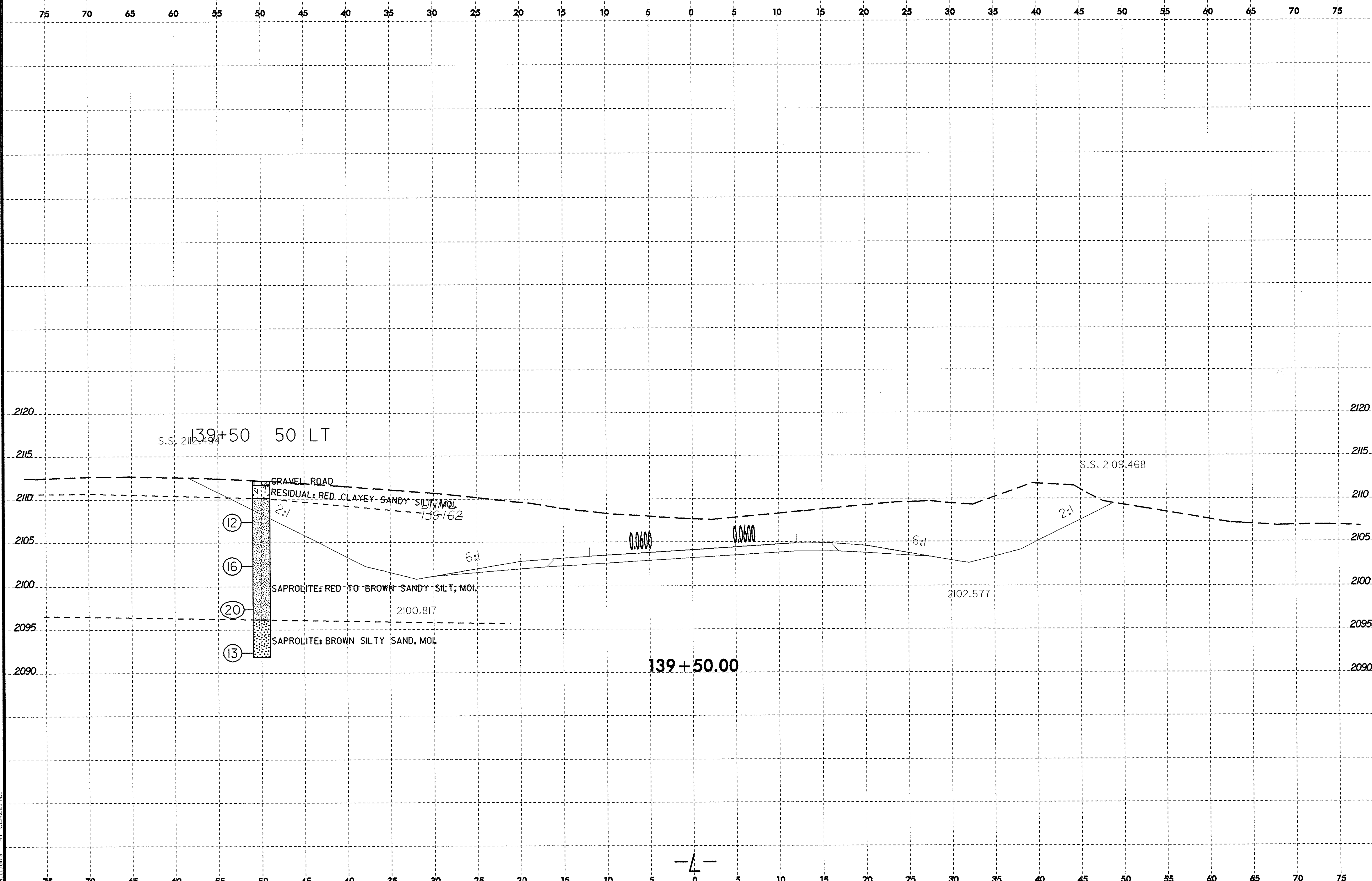
PROJ. REFERENCE NO.	SHEET NO.
R-2408B	68 of 102



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itwilliams AT GEA221401

8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-2408B	69 of 102

S.S. 2108.359

2:1

6:1

0.0600

0.0600

2100.807

140+00.00

DRIVE 139+94

6:1

140+00 35 RT S.S. 2108.874

2.08:1

2102.56 SAPROLITE : RED TO BROWN SANDY SILT, MOI

02-AUG-2006 10:35
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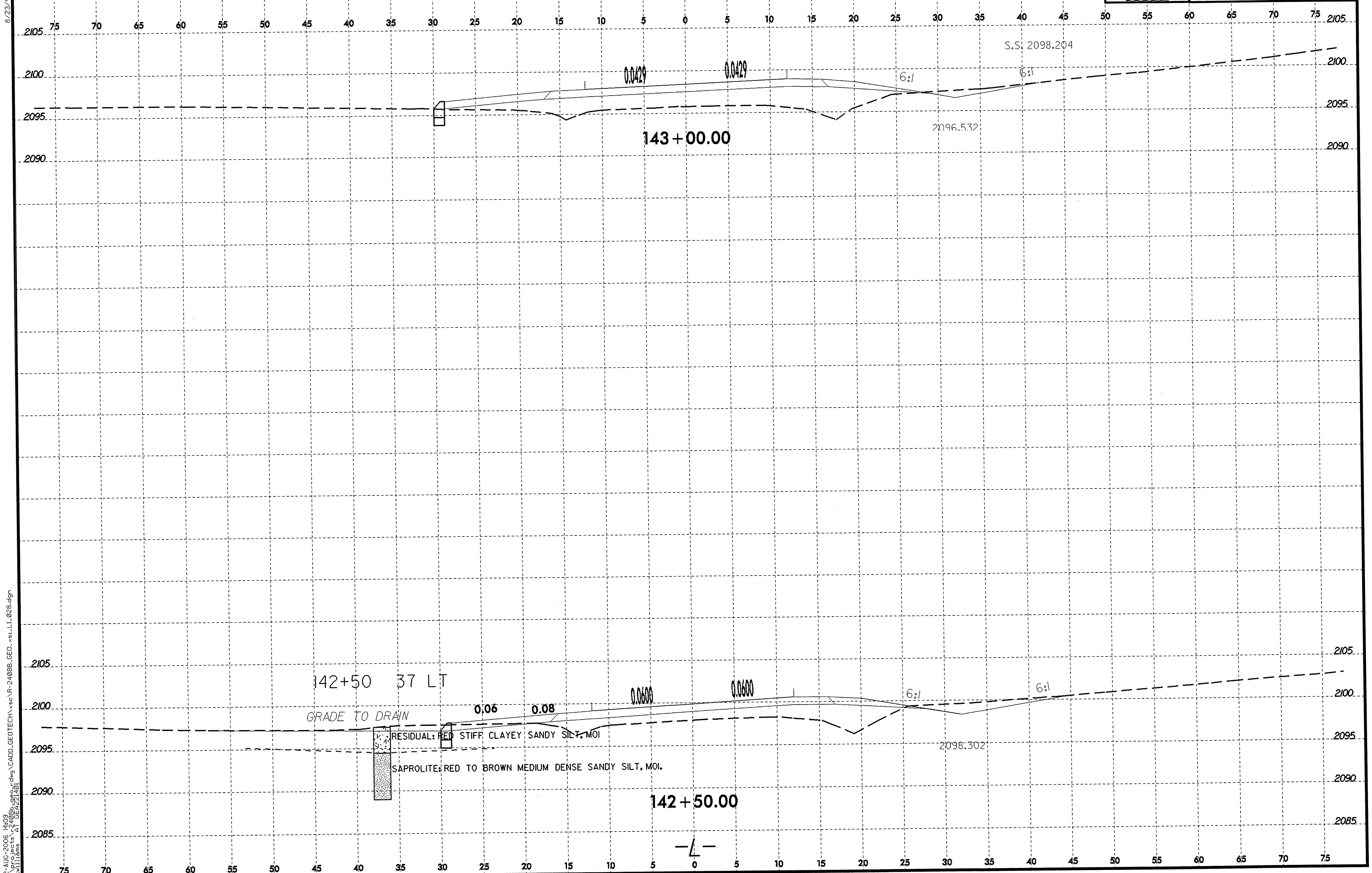
twilliams AT GEA21401

PROJ. REFERENCE NO.	SHEET NO.
R-2408B	70 of 102



8/23/99

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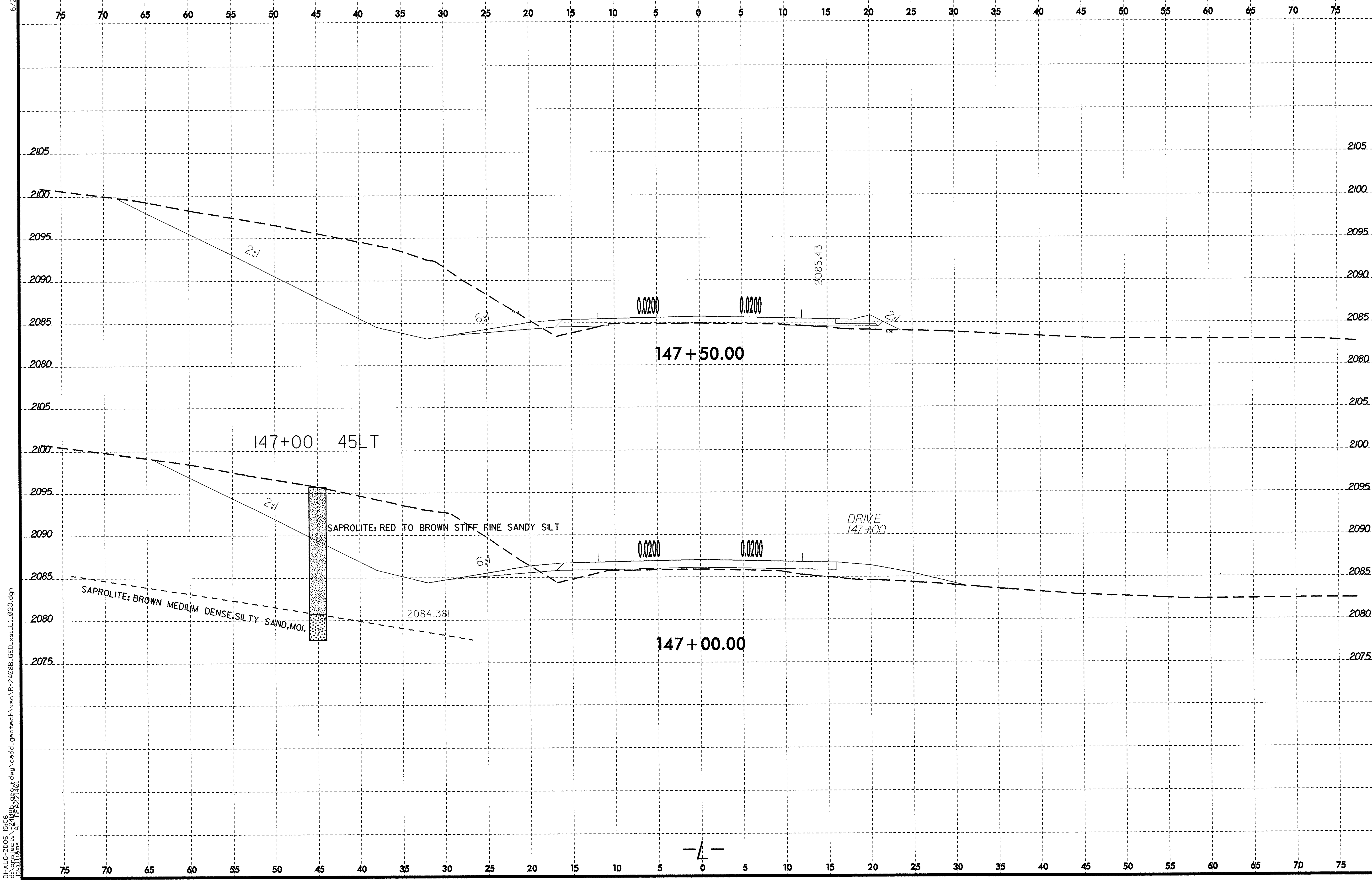
jtwilliams AT GEA2214O1

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
R-2408B	71 of 102



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8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-2408B	72 of 102

148+00 45 LT

RESIDUAL: RED MEDIUM STIFF CLAYEY FINE SANDY SILT

SAPROLITE: RED TO BROWN, FINE SANDY SILT

2081.848

2084.21

S.S. 2084.304

0.0200

0.0200

6:1

2:1

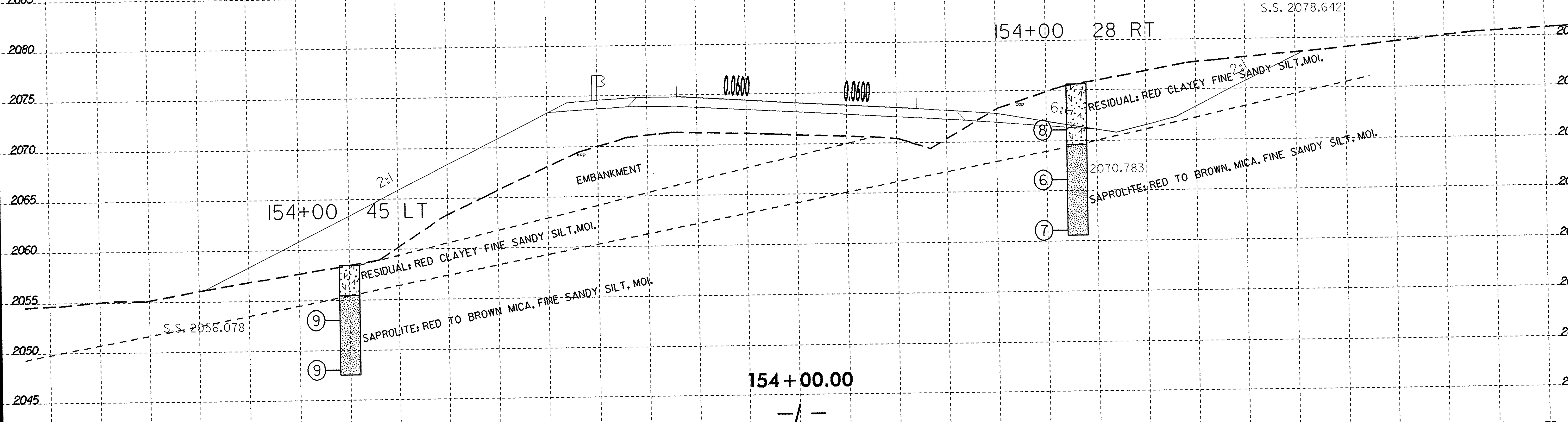
2:1

148+00.00

PROJ. REFERENCE NO.	SHEET NO.
R-2408B	73 of 102

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-44	28 RT	154+00	3.5 - 5.0	A-5 (8)	43	9	9	23	28	40	98	93	73		
SS-45	28 RT	154+00	8.5 - 10.0	A-4 (2)	40	NP	17	45	22	16	99	91	47		
SS-46	28 RT	154+00	13.5 - 15.5	A-4 (8)	37	NP	1	40	49	10	100	99	80		



154+00.00

-L-

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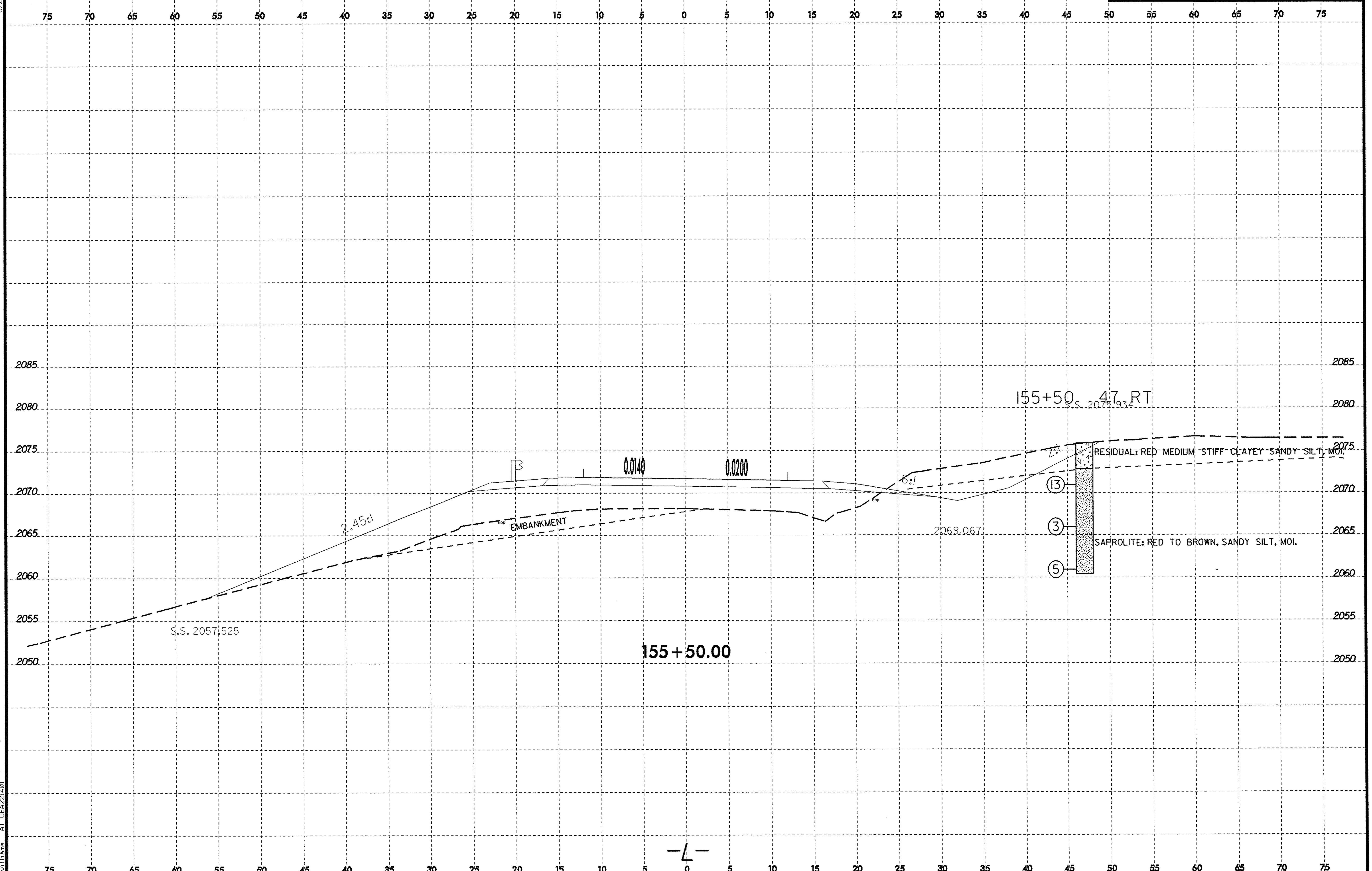
8/23/99

PROJ. REFERENCE NO.	SHEET NO.
R-2408B	74 of 102

8/23/99



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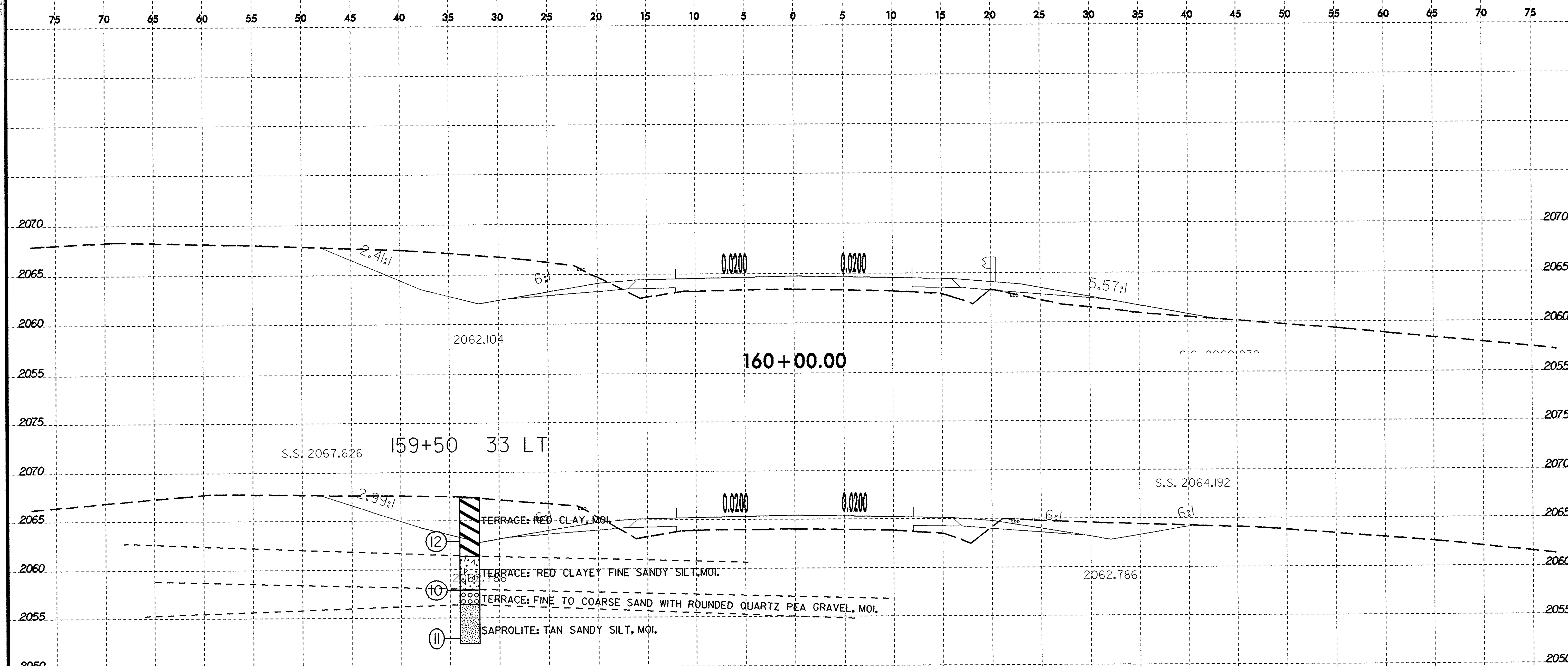
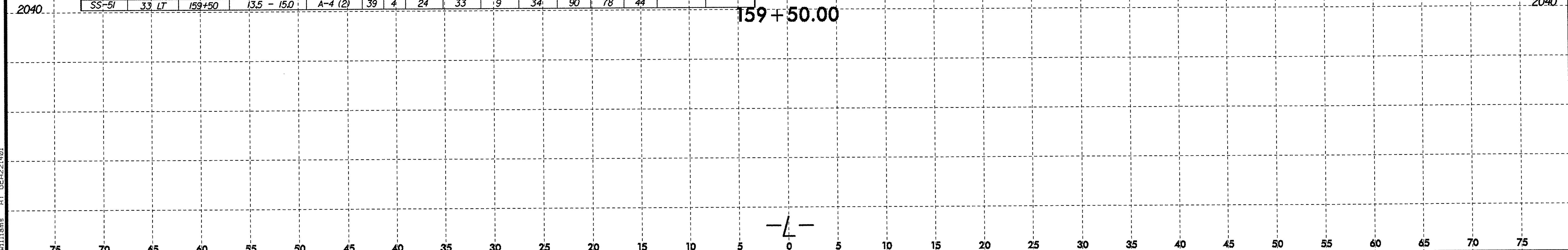
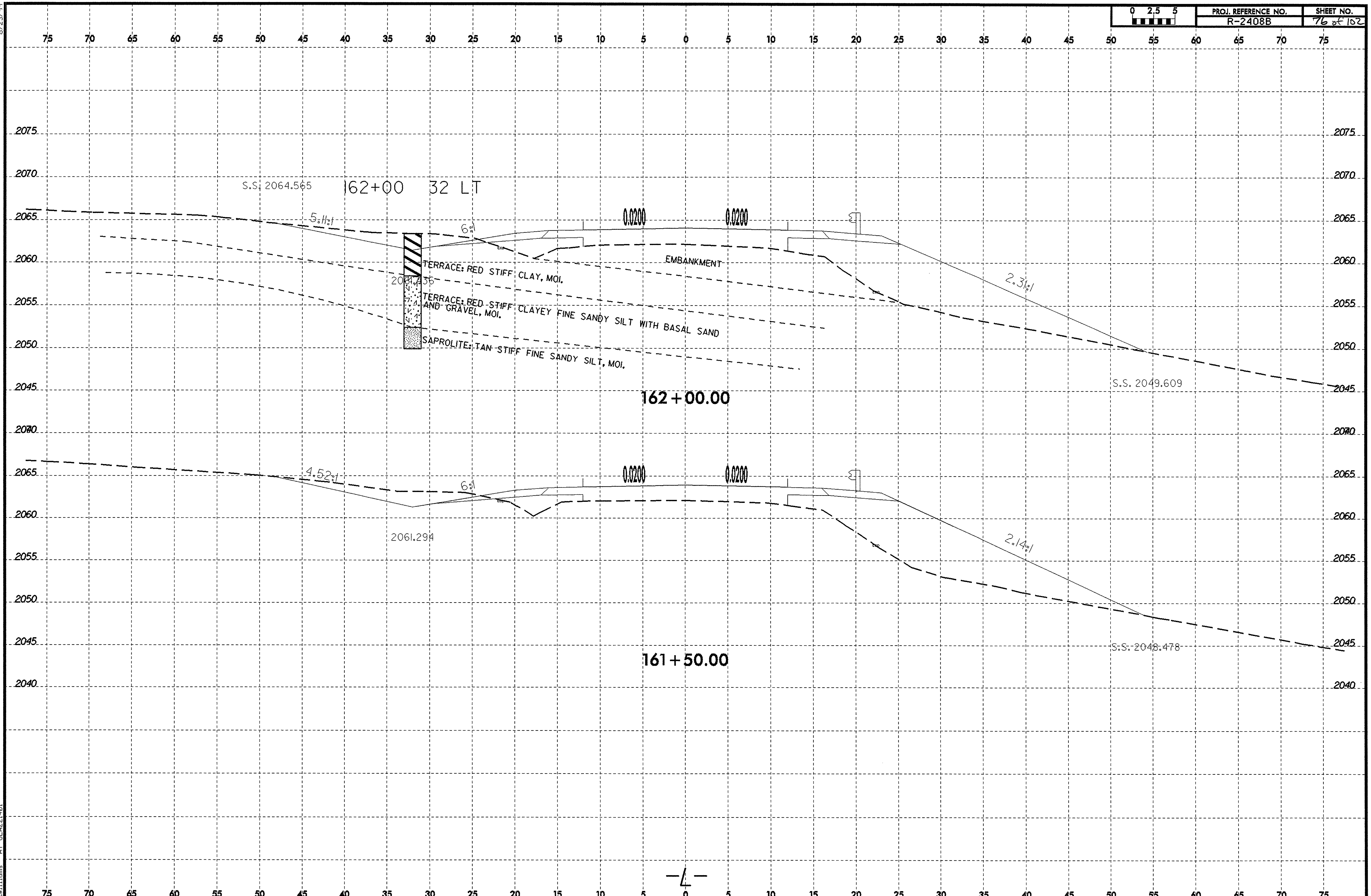
itwilliams AT GEA221401



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-47	33 LT	159+50	0.0 - 3.5	A-7-5 (16)	62	19	15	10	4	71	97	89	74		
SS-48	33 LT	159+50	3.5 - 5.0	A-7-5 (12)	58	16	19	13	5	63	99	91	69		
SS-49	33 LT	159+50	8.5 - 9.5	A-5 (3)	48	10	10	52	2	36	97	94	46		
SS-50	33 LT	159+50	9.5 - 10.0	A-1-b (0)	41	NP	44	34	4	18	56	41	14		
SS-51	33 LT	159+50	13.5 - 15.0	A-4 (2)	39	4	24	33	9	34	90	78	44		





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8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-2408B	77 of 102

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

2070 2065 2060 2055 2050 2045

2066.514

4:1

165+00.00

2065.239

S.S. 2063.562

164+50.00

164+00 30.0 LT

0.02/00 0.02/00

TERRACE: RED SANDY CLAY WITH ROCK FRAGMENTS, MOI.

(18)

(4)

BROWN SANDY SILT, MOI.

(4)

164+00.00

01-AUG-2006 15:12
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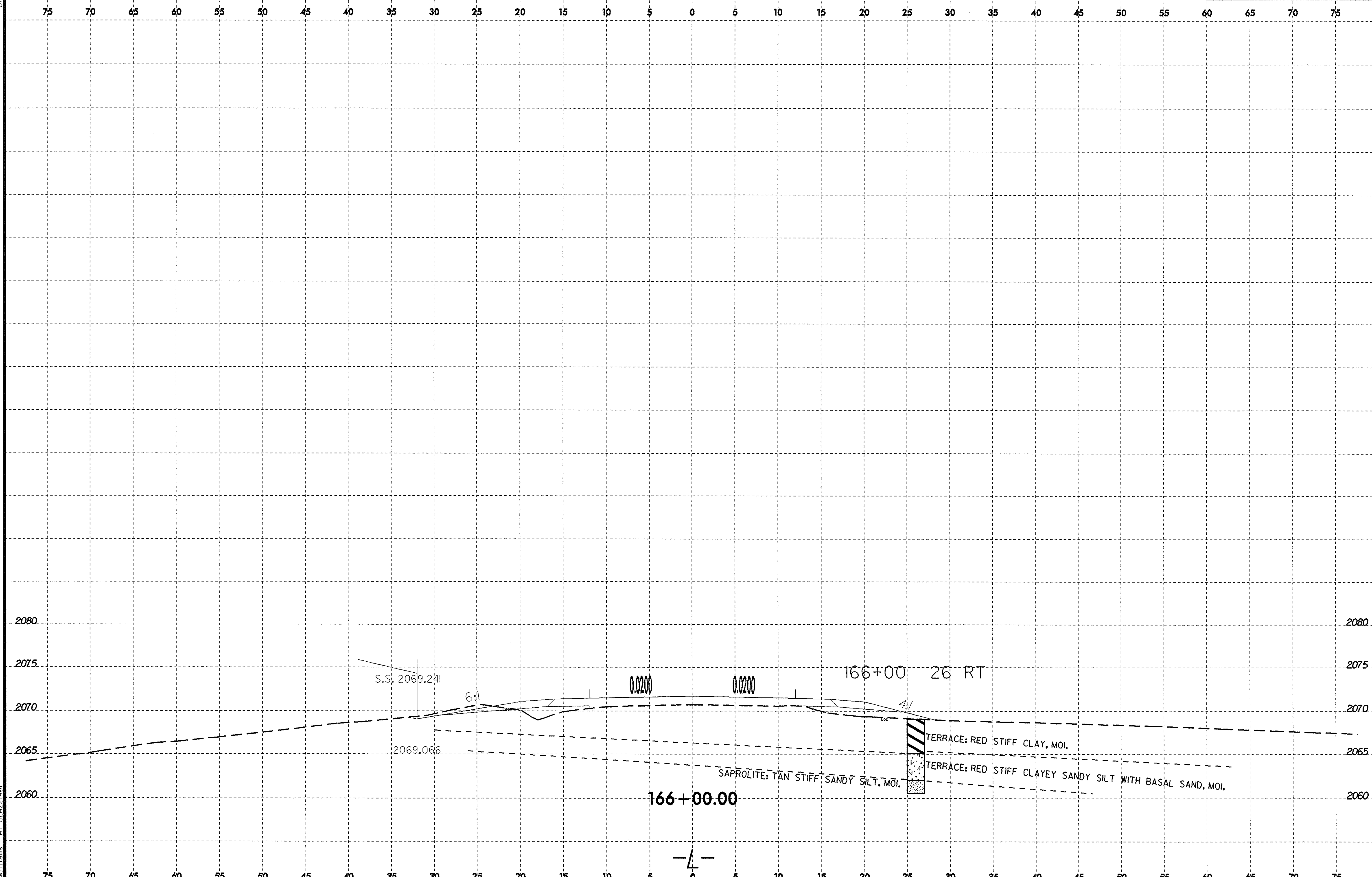
tuttlesms
AT GEA21401

PROJ. REFERENCE NO.	SHEET NO.
R-2408B	78 of 102



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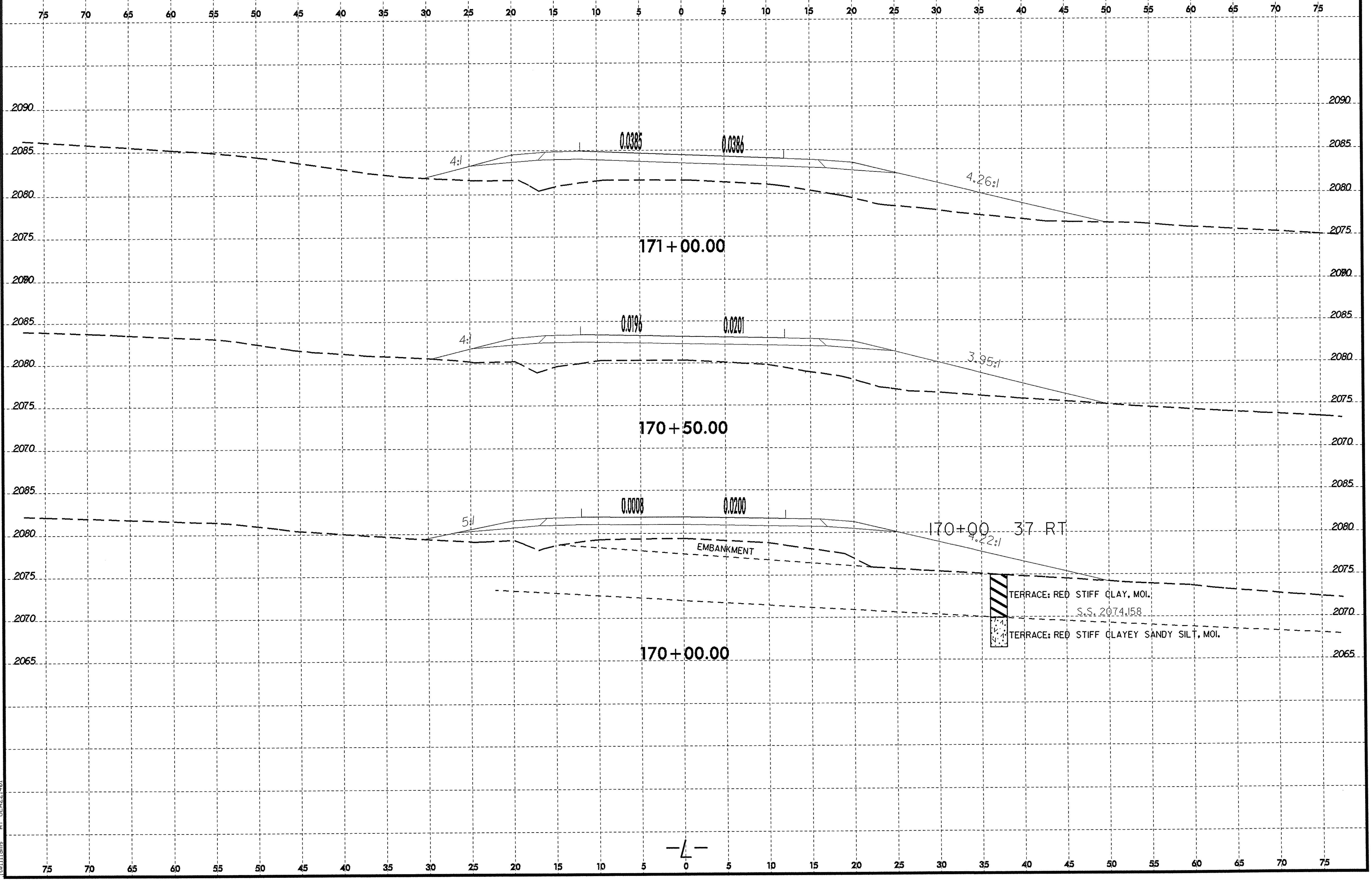
ltwilliams AT GEA2221401



8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-2408B	20 of 102

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2095 2090 2085 2080

3.07:1 0.0500 0.0500 6:1 4.35:1

2086.870

174+00.00

2085 2090 2085 2080

6:1 6:1 0.0500 6:1 5.21:1

2086.636

173+50.00

2100 2095 2090 2085 2080 2075

3.21:1 6:1 0.0500 0.0500 6:1 6:1

2087.455 2086.055

S.S. 2087.225

173+00 48 RT

TERRACE: RED STIFF CLAY, MOI.

TERRACE: RED STIFF CLAYEY SANDY SILT, MOI.

173+00.00

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

01-AUG-2006 15:16
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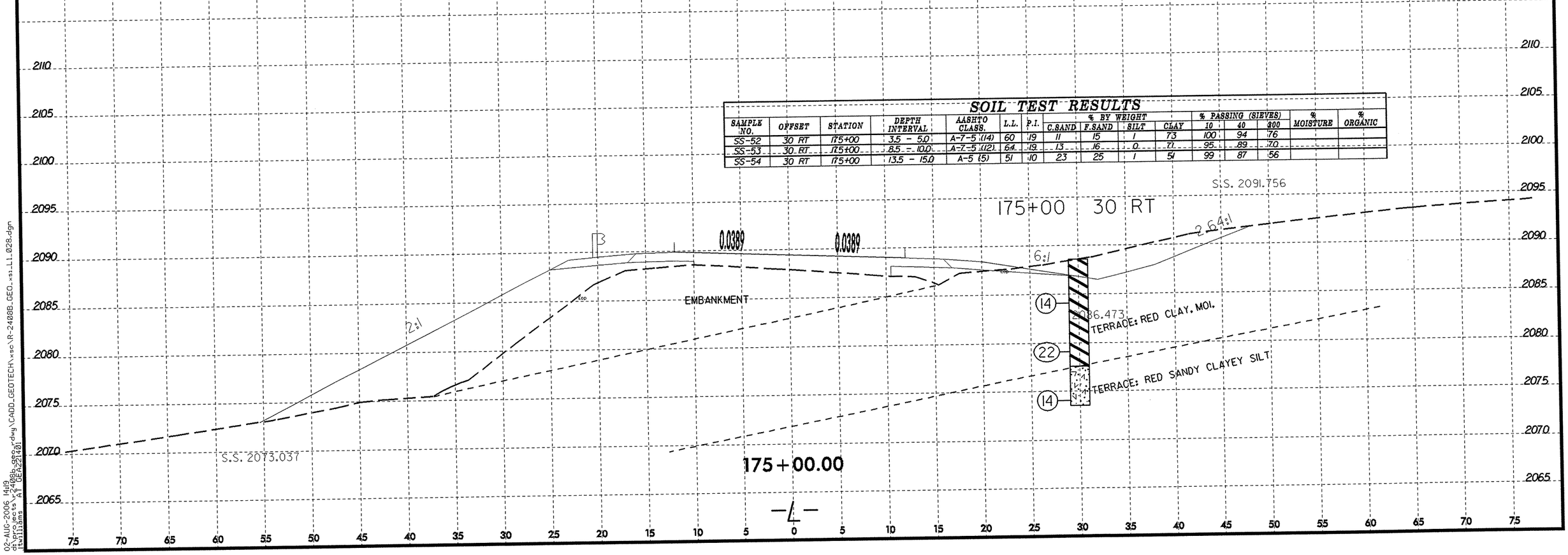
twilliams
AT GEA221401

8/23/96

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-52	30 RT	175+00	3.5 - 5.0	A-7-5 (14)	60	19	11	15	1	73	100	94	76		
SS-53	30 RT	175+00	8.5 - 10.0	A-7-5 (12)	64	19	13	16	0	71	95	89	70		
SS-54	30 RT	175+00	13.5 - 15.0	A-5 (5)	51	10	23	25	1	51	99	87	56		



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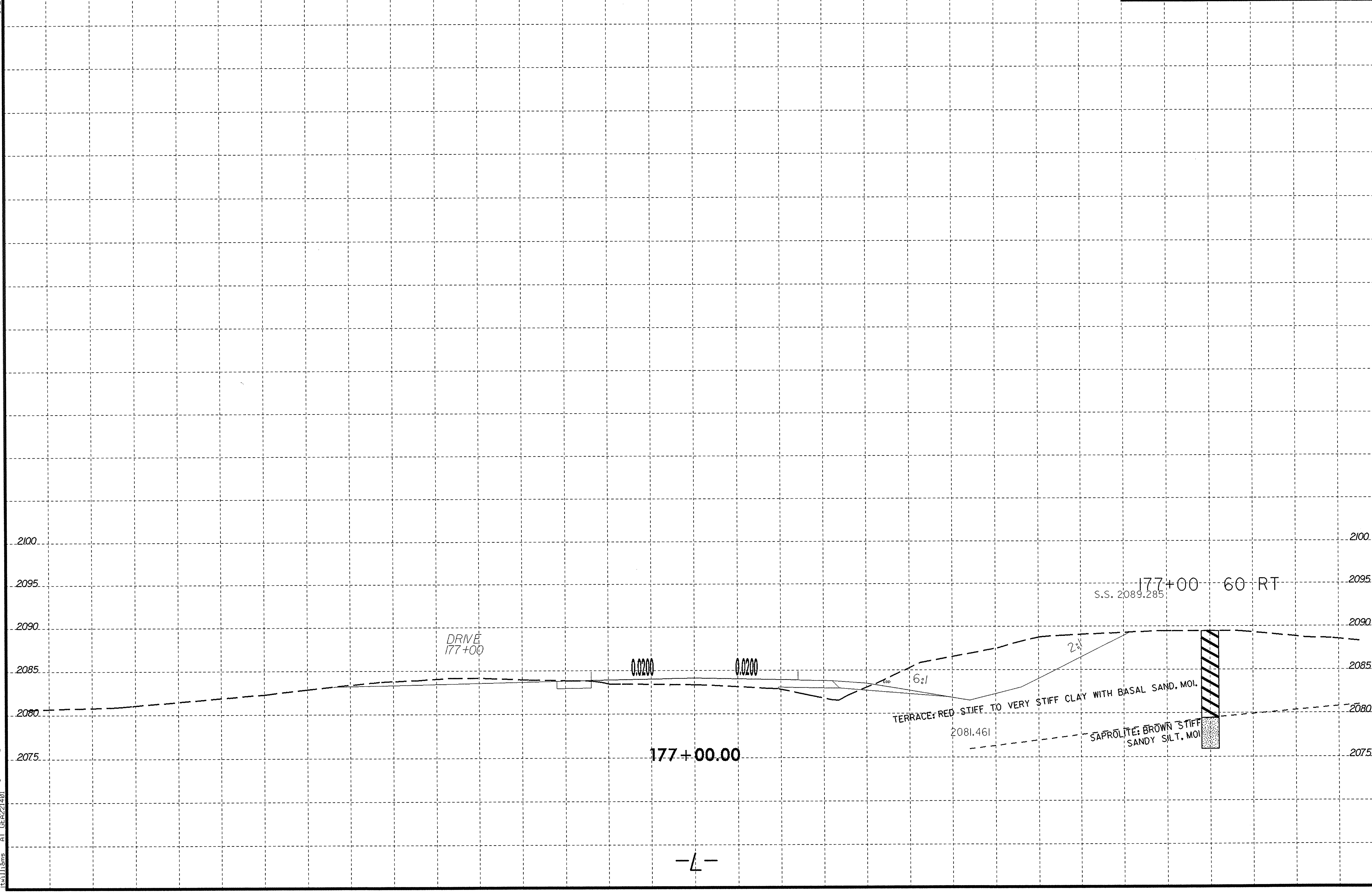
AT GEA221401


0 2.5 5
2100
2095
2090
2085
2080
2075
DRIVE
177+00
0.0200
0.0200
6:1
2:1
177+00 60 RT
S.S. 2089.285
TERRACE: RED STIFF TO VERY STIFF CLAY WITH BASAL SAND, MOI.
2081.461
SAPROLITE: BROWN STIFF SANDY SILT, MOI
177+00.00
-L-

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-2408B	83 of 102

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

2085 2080 2075 2090 2085 2080 2075

6:1 0.0200 0.0200 6:1

Ditch Ditch

178+50.00

2:1 6:1 0.0200 0.0200 6:1

Ditch Ditch

178+00.00

177+50 42 LT

S.S. 2085.485

S.S. 2081.473

2:1 6:1 0.0200 0.0200 6:1 6:1

TERRACE: RED STIFF SANDY CLAYEY SILT, MOI.

2079.264 2079.264

SAPROLITE: RED TO BROWN STIFF SANDY SILT, MOI.

177+50.00

2085 2080 2075 2090 2085 2080 2075 2070

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

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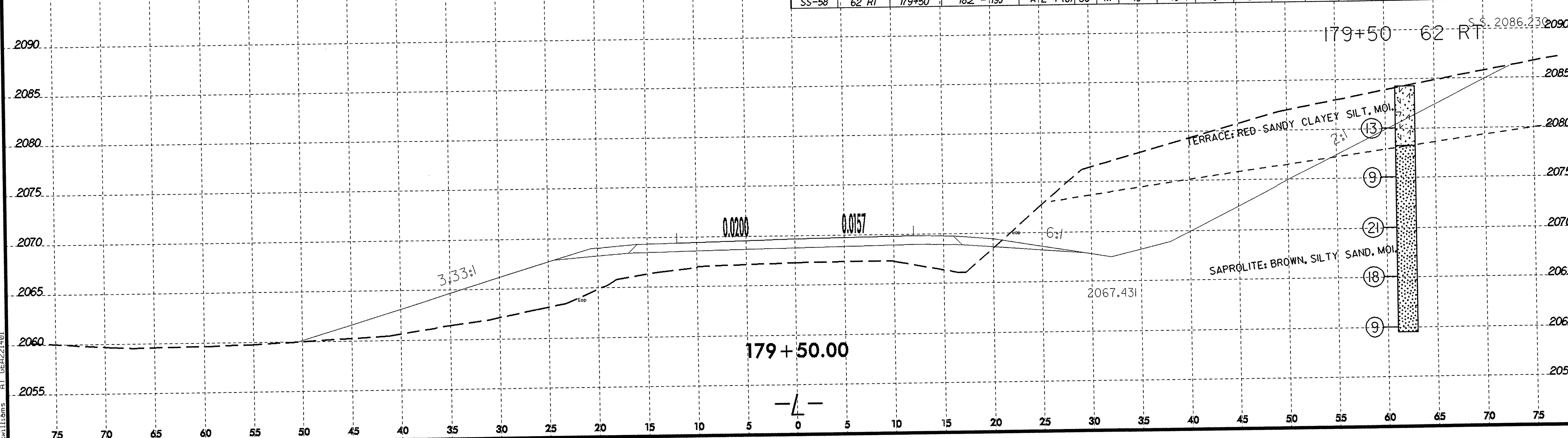
tswilliams
AT GEA22401

PROJ. REFERENCE NO.	SHEET NO.
R-2408B	84 of 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-55	62 RT	179+50	3.2 - 4.7	A-5 (1)	43	4	30	37	3	30	98	79	39		
SS-56	62 RT	179+50	8.2 - 9.7	A-2-4 (0)	40	NP	40	32	14	14	93	66	31		
SS-57	62 RT	179+50	13.2 - 14.7	A-2-4 (0)	37	NP	39	39	12	10	97	74	29		
SS-58	62 RT	179+50	18.2 - 19.7	A-2-4 (0)	38	NP	40	40	10	10	95	73	26		



8/23/99

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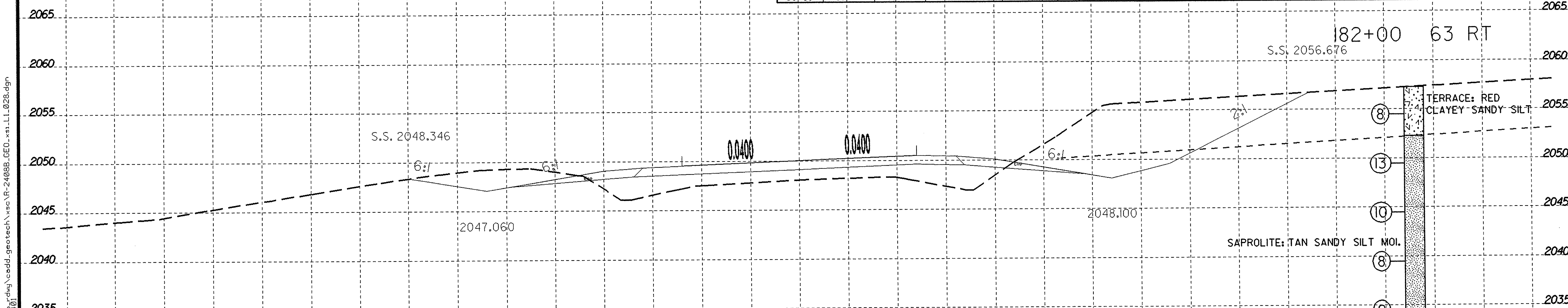
twilliams AT GEA221401

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-59	63 RT	182+00	6.8 - 8.3	A-4 (5)	40	4	21	25	14	40	98	86	58		

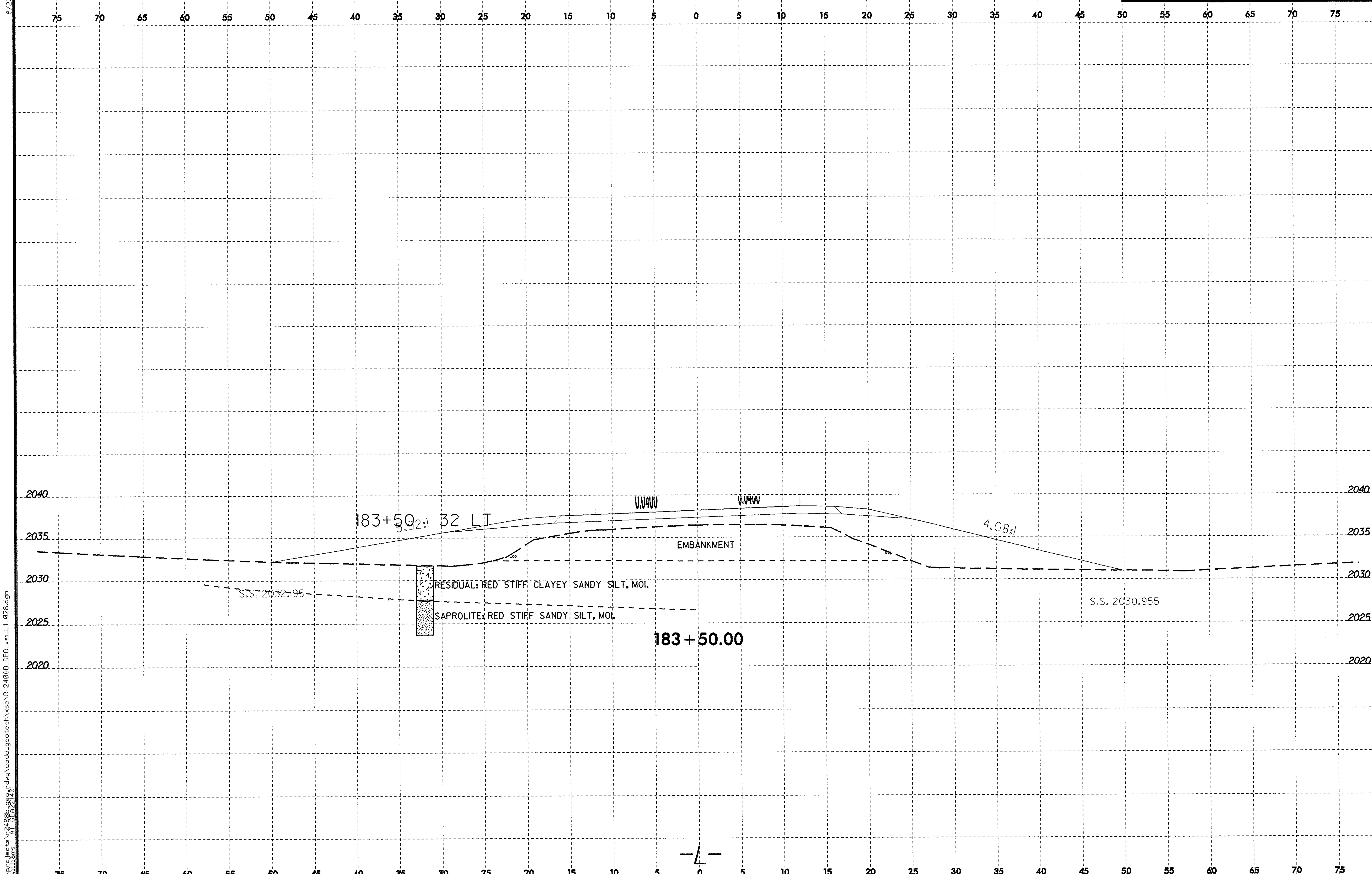


182+00.00

-L-

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
R-2408B	86 of 102



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twilliams
AT GEA221401

8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-2408B	87 of 102

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

2040
2035
2030
2025
2020
2015

6:1

0.0200

0.0083

EMBANKMENT

S.S. 2027.39I

184+503.70 35 RT

RESIDUAL: RED STIFF CLAYEY SILT, MOI.
S.S. 2021.92I

184+50.00

02-AUG-2006 09:25
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twilliams
AT GEN221401

8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-2408B	88 of 102

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

2055
2050
2045
2040
2035
2030
2025
2020
2015
2010

185+50 50 LT

(19)
(10)
(24)
(15)
(48)

SAPROLITE: SANDY SILT, MOI.

6:1

0.0200

0.0200

DRIVE
185+57

6:1

Ditch Depth

S.S. 2020.152

2019.847

2019.847

185+50.00

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

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twilliams
AT GEA22101

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-2408B	89 of 102

186+00 122 LT

11 — RESIDUAL: RED CLAYEY SANDY SILTY, MOI.

17

18

13

25

14 — SAPROLITE: RED TO BROWN SANDY SILT, MOI.

30

5 — SAPROLITE: SILTY SAND, MOI.

100/0.8 — WEATHERED ROCK OF GNEISS

2:1

6:1

0.020

0.020

2015.913

186+00.00

-L-

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-61	122 LT	186+00	2.5 - 4.0	A-5 (10)	47	10	3	24	20	53	98	97	78		
SS-62	122 LT	186+00	7.5 - 9.0	A-4 (5)	39	NP	12	34	34	20	100	95	63		
SS-63	122 LT	186+00	12.5 - 14.0	A-4 (8)	36	NP	5	33	44	18	100	98	74		
SS-65	122 LT	186+00	22.5 - 24.0	A-4 (4)	34	NP	9	47	32	12	98	95	54		
SS-67	122 LT	186+00	32.5 - 34.0	A-4 (2)	36	NP	17	41	28	14	86	78	45		

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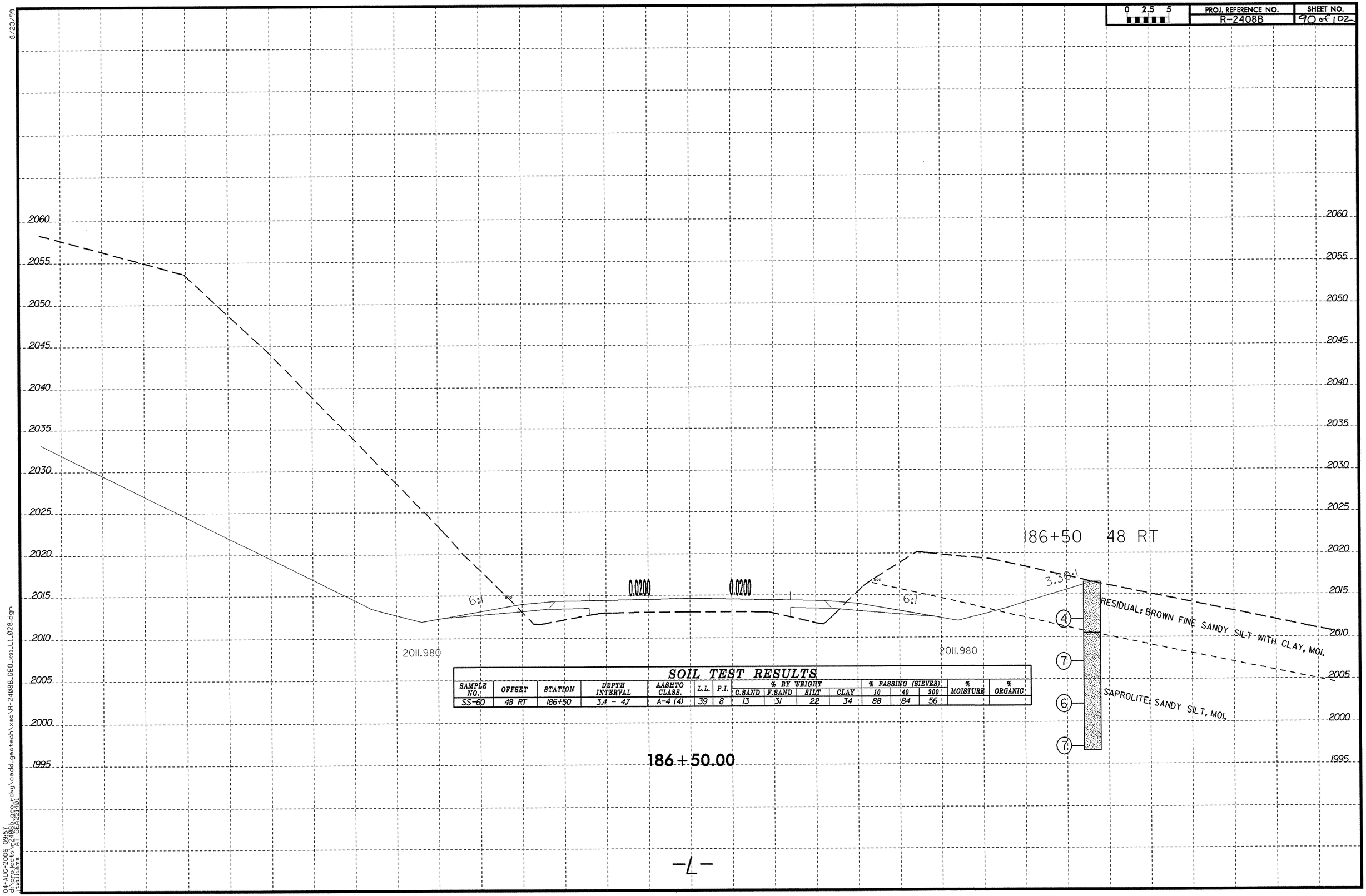
tswilliams AT GEA22140

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-2408B	90 OF 102



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-60	48 RT	186+50	3.4 - 4.7	A-4 (4)	39	8	13	31	22	34	88	84	56		

186+50.00

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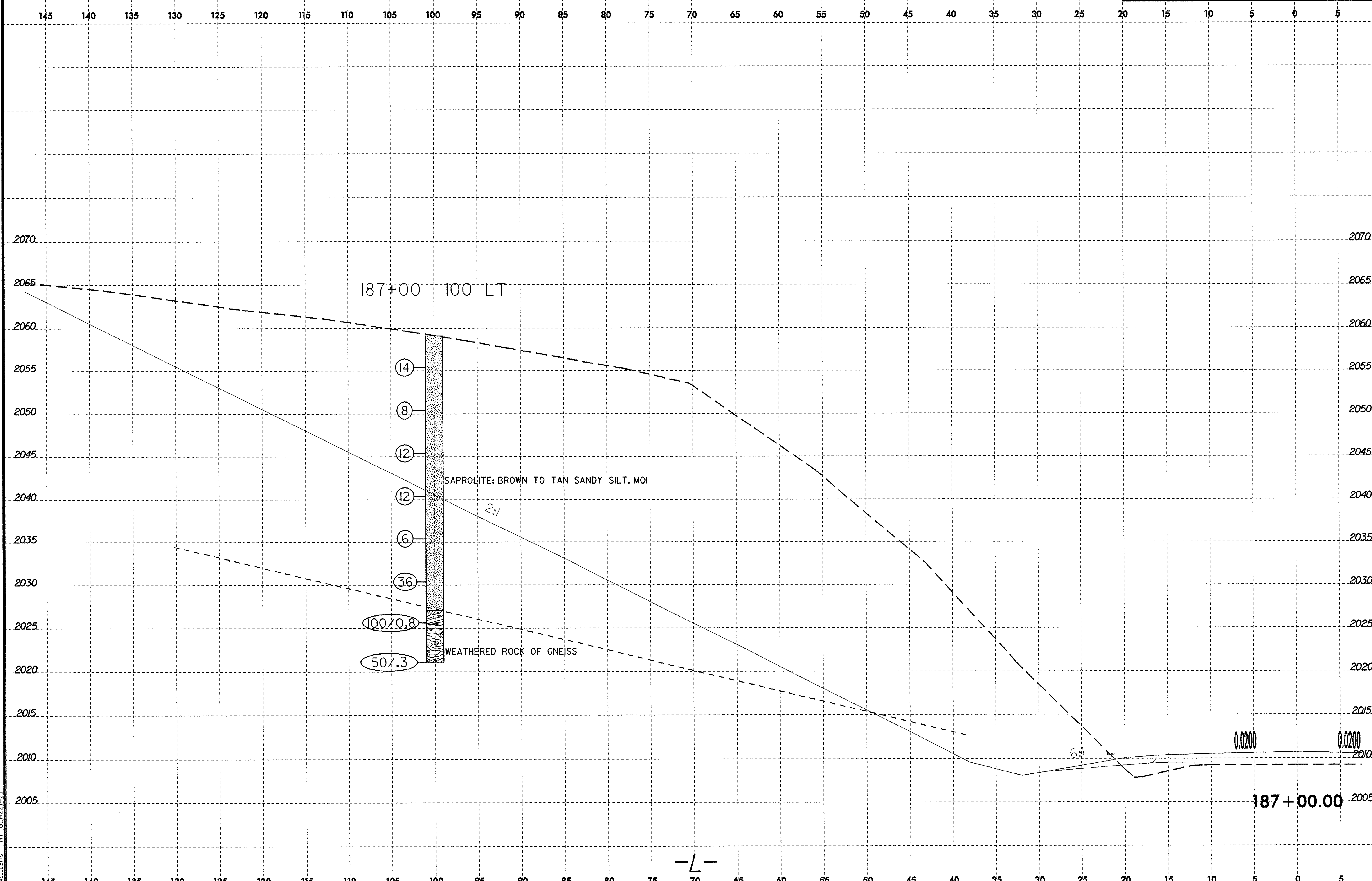
twilliams
AT GEA22140

PROJ. REFERENCE NO.	SHEET NO.
R-2408B	91 of 102



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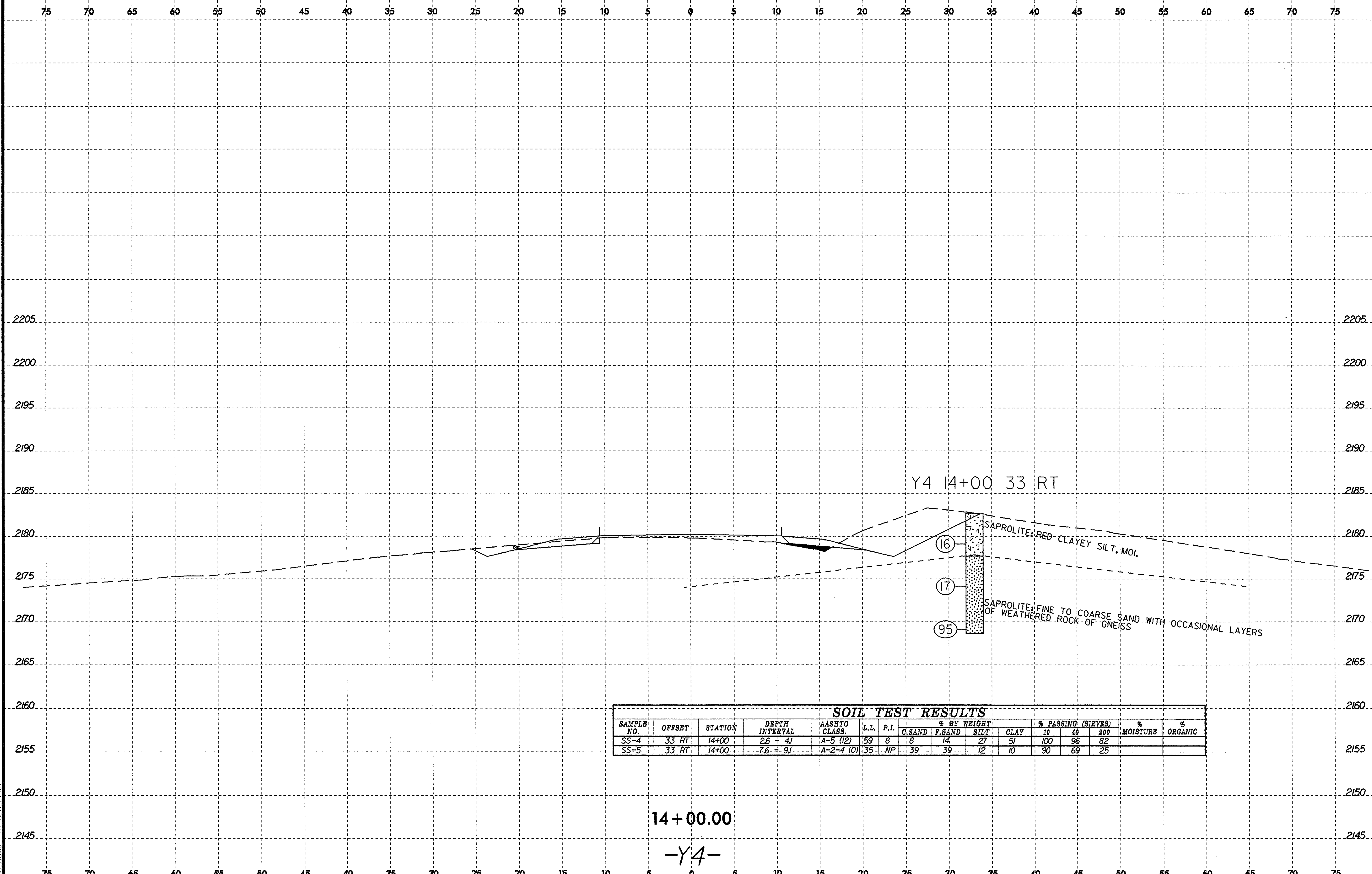
twilliams AT GEA22140I

PROJ. REFERENCE NO.	SHEET NO.
R-2408B	92 of 102



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-4	33 RT	14+00	2.6 - 4.1	A-5 (12)	59	8	8	14	27	51	100	96	82		
SS-5	33 RT	14+00	7.6 - 9.1	A-2-4 (0)	35	NP	39	39	12	10	90	69	25		

14+00.00

-Y4-

8/23/99
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itwilliams AT GEA221401

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-2408B	93/102

Y4 15+00 43 RT

RESIDUAL: RED CLAYEY SILT, MOI.

SAPROLITE: SILTY SAND W/ WEATHERED ROCK OF GNEISS LAYERS, MOI.

WEATHERED ROCK OF GNEISS

CRYSTALLINE ROCK

15+00.00

-Y4-

13-SEP-2006 13:50
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tswilliams AT GEA21401

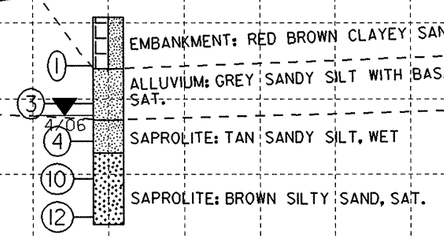
8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-2408B	C4 of C102

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

2110 2105 2100 2095 2090 2085 2080 2075 2070 2065 2060 2055 2050 2045

Y6 12+06 15 LT



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	15 LT	12+06	2.2 - 3.7	A-4 (3)	39	8	23	25	21	31	92	86	51		
SS-27	15 LT	12+06	4.7 - 6.2	A-4 (0)	35	NP	26	35	21	18	84	72	37		

12+00.00

-Y6-

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Williams AT GEA2140

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
R-2408B	95/102

0 2.5 5

Y7 11+50 80 RT

RESIDUAL: RED SANDY CLAY, MOI.

SAPROLITE: TAN SANDY SILT, MOI

CRYSTALLINE ROCK

(23) (11) (8) (8) (21)

11+50.00

-Y7-

2120 2115 2110 2105 2100 2095 2090 2085 2080 2075 2070 2065 2060 2055 2050 2045

5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 135 140 145

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ltwilliams AT GEA22401

8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-2408B	96 / 102

5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 135 140 145

2120 2115 2110 2105 2100 2095 2090 2085 2080 2075 2070 2065 2060 2055 2050 2045

Y7 12+00 77 RT

RESIDUAL: RED SANDY CLAY, MOI.

9

4

SAPROLITE: TAN SANDY SILT, MOI.

WEATHERED ROCK OF GNEISS.

50/0.3

CRYSTALLINE ROCK

12 + 00.00

-Y7-

13-SEP-2006 14:15
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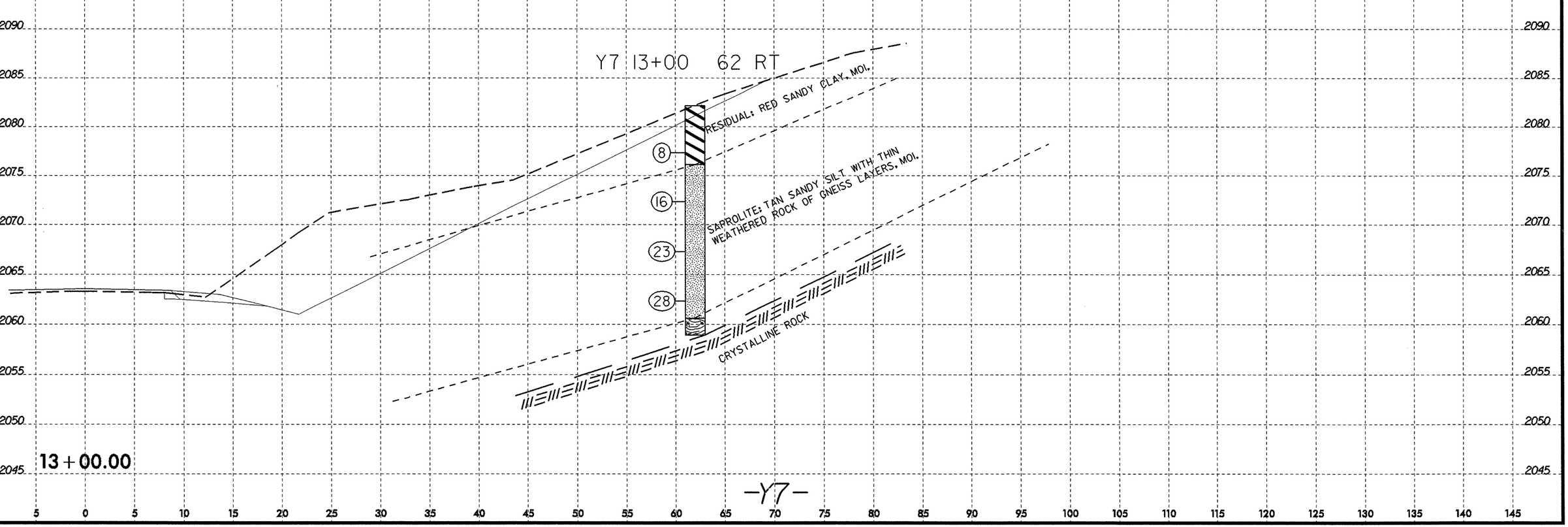
tswilliams AT DEA221401

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-2408B	97 of 102

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-32	62 RT	13+00	3.8 - 5.3	A-7-5 (12)	52	17	13	20	16	51	97	92	69		



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ltwilliams
AT GEA221401

M&T 503E

JCS

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS-MATERIALS AND TESTS UNIT
SOILS TEST REPORT-SOILS LABORATORY

T.I.P. ID #:	--

REPORT ON SAMPLES OF:	Soils for Classification

PROJECT:	R-2408B	COUNTY:	Macon	Owner:	--
DATE SAMPLED:	4.06	DATE RECEIVED:	4.24.06	DATE REPORTED:	5.1.06
SAMPLED FROM:	-L-	SAMPLED BY:	P. Q. Lockamy		
SUBMITTED BY:	W. D. Frye		2002	STANDARD SPECIFICATION	
LABORATORY:	Asheville				

TEST RESULTS

Project Sample No.	SS-1	SS-2	SS-3	SS-4	SS-5	SS-6	SS-7	SS-8
Lab Sample No. A	152423	152424	152425	152426	152427	152428	152429	152430
HiCAMS Sample #	--	--	--	--	--	--	--	--
Retained #4 Sieve %	--	--	--	--	--	--	--	--
Passing #10 Sieve %	96	96	100	100	90	94	96	96
Passing #40 Sieve %	70	89	89	96	69	81	78	91
Passing #200 Sieve %	19	62	29	82	25	49	32	69

MINUS #10 FRACTION

Soil Mortar - 100%								
Coarse Sand -Ret. #60	49	17	32	8	39	25	33	13
Fine Sand - Ret. #270	37	21	46	14	39	17	44	17
Silt 0.05-0.005 mm %	8	14	12	27	12	20	15	11
Clay < 0.005 mm %	6	48	10	51	10	38	8	59
Passing # 40 Sieve %	--	--	--	--	--	--	--	--
Passing # 200 Sieve %	--	--	--	--	--	--	--	--

Liquid Limit	37	39	29	59	35	40	43	48
Plastic Index	NP	8	NP	8	NP	6	NP	11
AASHTO Classification	A-2-4 (0)	A-4 (6)	A-2-4 (0)	A-5 (12)	A-2-4 (0)	A-4 (3)	A-2-5 (0)	A-7-5 (10)
Quantity								
Texture								
Station	79+00	80+00	80+00	14+00	14+00	70+50	70+50	69+50
Hole No.								
Depth (ft) From:	2.6	2.9	7.9	2.6	7.6	3.1	8.1	2.0
To:	4.1	4.4	9.4	4.1	9.1	4.6	9.6	3.5

Remarks:

A-152423 - 152430

CC:

P. Q. Lockamy	
File	

SOILS ENGINEER:	

M&T 503E

JCS

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS-MATERIALS AND TESTS UNIT
SOILS TEST REPORT-SOILS LABORATORY

T.I.P. ID #:	--

REPORT ON SAMPLES OF:	Soils for Classification

PROJECT:	R-2408B	COUNTY:	Macon	Owner:	--
DATE SAMPLED:	4.06	DATE RECEIVED:	4.24.06	DATE REPORTED:	5.1.06
SAMPLED FROM:	-L-	SAMPLED BY:	P. Q. Lockamy		
SUBMITTED BY:	W. D. Frye		2002	STANDARD SPECIFICATION	
LABORATORY:	Asheville				

TEST RESULTS

Project Sample No.	SS-9	SS-10	SS-11	SS-12	SS-13	SS-14	SS-15	SS-16
Lab Sample No. A	152431	152432	152433	152434	152435	152436	152437	152438
HiCAMS Sample #	--	--	--	--	--	--	--	--
Retained #4 Sieve %	--	--	--	--	--	--	--	--
Passing #10 Sieve %	98	99	99	98	91	98	97	100
Passing #40 Sieve %	83	80	91	88	83	87	82	91
Passing #200 Sieve %	33	30	65	38	54	38	38	59

MINUS #10 FRACTION

Soil Mortar - 100%								
Coarse Sand -Ret. #60	30	36	16	30	19	27	28	21
Fine Sand - Ret. #270	45	43	21	34	27	42	44	22
Silt 0.05-0.005 mm %	17	15	15	8	16	21	20	13
Clay < 0.005 mm %	8	6	48	28	38	10	8	44
Passing # 40 Sieve %	--	--	--	--	--	--	--	--
Passing # 200 Sieve %	--	--	--	--	--	--	--	--

Liquid Limit	47	43	46	35	48	34	44	44
Plastic Index	NP	NP	9	9	13	NP	NP	11
AASHTO Classification	A-2-5 (0)	A-2-5 (0)	A-5 (7)	A-4 (1)	A-7-5 (7)	A-4 (1)	A-5 (1)	A-7-5 (7)
Quantity								
Texture								
Station	69+50	69+50	74+00	74+00	74+00	74+00	74+00	84+00
Hole No.								
Depth (ft) From:	7.0	12.0	1.8	6.8	11.8	16.8	21.8	2.1
To:	8.5	13.5	3.3	8.3	13.3	18.3	23.3	3.6

Remarks:

A-152431 - 152438

CC:

P. Q. Lockamy	
File	

SOILS ENGINEER:	

G:/Everyone. . . /M&T Forms/Regional Lab Statesville/Soils Test Report M&T 503E 8-19-2000

JCS

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS-MATERIALS AND TESTS UNIT
SOILS TEST REPORT-SOILS LABORATORY

T.I.P. ID #:	--

REPORT ON SAMPLES OF:	Soils for Classification

PROJECT:	R-2408B	COUNTY:	Macon	Owner:	--
DATE SAMPLED:	4.06	DATE RECEIVED:	4.24.06	DATE REPORTED:	5.1.06
SAMPLED FROM:	-L-	SAMPLED BY:	P. Q. Lockamy		
SUBMITTED BY:	W. D. Frye	2002	STANDARD SPECIFICATION		
LABORATORY:	Asheville				

TEST RESULTS

Project Sample No.	SS-17	SS-18	SS-19	SS-20	SS-21			
Lab Sample No. A	152439	152440	152441	152442	152443			
HiCAMS Sample #	--	--	--	--	--			
Retained #4 Sieve %	--	--	--	--	--			
Passing #10 Sieve %	94	78	94	96	100			
Passing #40 Sieve %	81	65	81	85	90			
Passing #200 Sieve %	38	42	28	35	30			

MINUS #10 FRACTION

Soil Mortar - 100%								
Coarse Sand -Ret. #60	30	27	34	27	29			
Fine Sand - Ret. #270	35	22	44	45	50			
Silt 0.05-0.005 mm %	13	11	14	16	13			
Clay < 0.005 mm %	22	40	8	12	8			
Passing # 40 Sieve %	--	--	--	--	--			
Passing # 200 Sieve %	--	--	--	--	--			
Liquid Limit	25	43	33	37	43			
Plastic Index	NP	10	NP	NP	NP			
AASHTO Classification	A-4 (0)	A-5 (2)	A-2-4 (0)	A-2-4 (0)	A-2-5 (0)			
Quantity								
Texture								
Station	84+00	91+50	91+50	91+50	91+50			
Hole No.								
Depth (ft) From:	7.1	2.2	7.2	12.2	17.2			
To:	8.6	3.7	8.7	13.7	18.7			

Remarks:

A-152439 - 152443

CC:

P. Q. Lockamy	
File	

SOILS ENGINEER:	

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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS-MATERIALS AND TESTS UNIT
SOILS TEST REPORT-SOILS LABORATORY

T.I.P. ID #:	--

REPORT ON SAMPLES OF:	Soils for Quality

PROJECT:	R-2408B	COUNTY:	Macon	Owner:	--
DATE SAMPLED:	5.06	DATE RECEIVED:	5.11.06	DATE REPORTED:	5.19.06
SAMPLED FROM:	- L -	SAMPLED BY:	P. Q. Lockamy		
SUBMITTED BY:	W. D. Frye	2002	STANDARD SPECIFICATION		
LABORATORY:	Asheville				

TEST RESULTS

Project Sample No.	SS-23	SS-24	SS-25	SS-26	SS-27	SS-28	SS-29	SS-30
Lab Sample No. A	152614	152615	152616	152617	152618	152619	152620	152621
HiCAMS Sample #	--	--	--	--	--	--	--	--
Retained #4 Sieve %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Passing #10 Sieve %	81	95	67	92	84	89	92	99
Passing #40 Sieve %	68	87	64	86	72	76	84	96
Passing #200 Sieve %	23	28	37	51	37	42	47	58

MINUS #10 FRACTION

Soil Mortar - 100%								
Coarse Sand -Ret. #60	33	25	23	23	26	27	17	11
Fine Sand - Ret. #270	46	55	25	25	35	32	38	41
Silt 0.05-0.005 mm %	13	16	17	21	21	19	29	22
Clay < 0.005 mm %	8	4	35	31	18	22	16	26
Passing # 40 Sieve %	--	--	--	--	--	--	--	--
Passing # 200 Sieve %	--	--	--	--	--	--	--	--
Liquid Limit	38	40	40	39	35	37	33	40
Plastic Index	NP	NP	17	8	NP	7	NP	8
AASHTO Classification	A-2-4 (0)	A-2-4 (0)	A-6 (2)	A-4 (3)	A-4 (0)	A-4 (1)	A-4 (2)	A-4 (5)
Quantity								
Texture								
Station	97+00	97+00	95+00	12+06	12+06	98+50	108+72	12+00
Hole No.								
Depth (ft) From:	11.0	29.0	3.2	2.2	4.7	3.2	0.0	3.3
To:	12.5	30.5	4.7	3.4	6.2	4.7	1.5	4.8

Remarks:

A-152614 - 152621

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Soils File	

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DIVISION OF HIGHWAYS-MATERIALS AND TESTS UNIT
SOILS TEST REPORT-SOILS LABORATORY

T.I.P. ID #:	--

REPORT ON SAMPLES OF:	Soils for Quality

PROJECT:	R-2408B	COUNTY:	Macon	Owner:	--
DATE SAMPLED:	5.06	DATE RECEIVED:	5.11.06	DATE REPORTED:	5.19.06
SAMPLED FROM:	- Y7 -	SAMPLED BY:	P. Q. Lockamy		
SUBMITTED BY:	W. D. Frye	2002	STANDARD SPECIFICATION		
LABORATORY:	Asheville				

TEST RESULTS

Project Sample No.	SS-31	SS-32	SS-33	SS-34	SS-35	SS-36	SS-37	SS-38
Lab Sample No. A	152622	152623	152624	152625	152626	152627	152628	152629
HiCAMS Sample #	--	--	--	--	--	--	--	--
Retained #4 Sieve %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Passing #10 Sieve %	99	97	98	99	99	97	99	99
Passing #40 Sieve %	94	92	83	95	73	86	72	77
Passing #200 Sieve %	43	69	54	68	40	63	34	33

MINUS #10 FRACTION

Soil Mortar - 100%								
Coarse Sand -Ret. #60	18	13	27	12	38	21	40	36
Fine Sand - Ret. #270	49	20	23	23	30	19	34	38
Silt 0.05-0.005 mm %	21	16	34	14	24	15	20	20
Clay < 0.005 mm %	12	51	16	51	8	45	6	6
Passing # 40 Sieve %	--	--	--	--	--	--	--	--
Passing # 200 Sieve %	--	--	--	--	--	--	--	--

Liquid Limit	39	52	41	51	32	46	31	33
Plastic Index	NP	17	NP	17	NP	13	NP	NP
AASHTO Classification	A-4 (2)	A-7-5 (12)	A-5 (4)	A-7-5 (11)	A-4 (1)	A-7-5 (8)	A-2-4 (0)	A-2-4 (0)
Quantity								
Texture								
Station	12+00	13+00	118+65	127+50	127+50	135+50	135+50	135+50
Hole No.								
Depth (ft) From:	8.3	3.8	4.1	3.5	8.5	2.9	7.9	12.9
To:	9.8	5.3	5.6	5.0	10.0	4.4	9.4	14.4

Remarks:

A-152622 - 152629

CC:

P. Q. Lockamy	
Soils File	

SOILS ENGINEER:	

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DIVISION OF HIGHWAYS-MATERIALS AND TESTS UNIT
SOILS TEST REPORT-SOILS LABORATORY

T.I.P. ID #:	--

REPORT ON SAMPLES OF:	Soils for Quality

PROJECT:	R-2408B	COUNTY:	Macon	Owner:	--
DATE SAMPLED:	5.06	DATE RECEIVED:	5.17.06	DATE REPORTED:	6.8.06
SAMPLED FROM:	Roadway	SAMPLED BY:	P. Q. Lockamy		
SUBMITTED BY:	W. D. Frye	2002	STANDARD SPECIFICATION		
LABORATORY:	Asheville				

TEST RESULTS

Project Sample No.	SS-39	SS-40	SS-41	SS-42	SS-43	SS-44	SS-45	SS-46
Lab Sample No. A	152654	152655	152656	152657	152658	152659	152660	152661
HiCAMS Sample #	--	--	--	--	--	--	--	--
Retained #4 Sieve %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Passing #10 Sieve %	99	99	98	98	100	98	99	100
Passing #40 Sieve %	96	91	91	87	88	93	91	99
Passing #200 Sieve %	78	51	40	42	52	73	47	80

MINUS #10 FRACTION

Soil Mortar - 100%								
Coarse Sand -Ret. #60	7	22	21	25	21	9	17	1
Fine Sand - Ret. #270	19	34	49	41	38	23	45	40
Silt 0.05-0.005 mm %	15	26	26	26	31	28	22	49
Clay < 0.005 mm %	59	18	4	8	10	40	16	10
Passing # 40 Sieve %	--	--	--	--	--	--	--	--
Passing # 200 Sieve %	--	--	--	--	--	--	--	--

Liquid Limit	53	39	36	33	38	43	40	37
Plastic Index	15	NP	NP	NP	NP	9	NP	NP
AASHTO Classification	A-7-5 (13)	A-4 (3)	A-4 (1)	A-4 (1)	A-4 (3)	A-5 (8)	A-4 (2)	A-4 (8)
Quantity								
Texture								
Station	130+00	130+00	130+00	130+00	130+00	154+00	154+00	154+00
Hole No.								
Depth (ft) From:	3.5	8.5	13.5	18.5	23.5	3.5	8.5	13.5
To:	5.0	10.0	15.0	20.5	25.0	5.0	10.0	15.5

Remarks:

A-152654 - 152661

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P. Q. Lockamy	
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SOILS ENGINEER:	

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DIVISION OF HIGHWAYS-MATERIALS AND TESTS UNIT
SOILS TEST REPORT-SOILS LABORATORY

T.I.P. ID #:	--

REPORT ON SAMPLES OF:	Soils for Quality

PROJECT:	R-2408B	COUNTY:	Macon	Owner:	--		
DATE SAMPLED:	5.06	DATE RECEIVED:	5.17.06	DATE REPORTED:	6.8.06		
SAMPLED FROM:	Roadway	SAMPLED BY:	P. Q. Lockamy				
SUBMITTED BY:	W. D. Frye	2002	STANDARD SPECIFICATION				
LABORATORY:	Asheville						

TEST RESULTS

Project Sample No.	SS-47	SS-48	SS-49	SS-50	SS-51	SS-52	SS-53	SS-54
Lab Sample No. A	152662	152663	152664	152665	152666	152667	152668	152669
HiCAMS Sample #	--	--	--	--	--	--	--	--
Retained #4 Sieve %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Passing #10 Sieve %	97	99	97	56	90	100	95	99
Passing #40 Sieve %	89	91	94	41	78	94	89	87
Passing #200 Sieve %	74	69	46	14	44	76	70	56

MINUS #10 FRACTION

Soil Mortar - 100%								
Coarse Sand -Ret. #60	15	19	10	44	24	11	13	23
Fine Sand - Ret. #270	10	13	52	34	33	15	16	25
Silt 0.05-0.005 mm %	4	5	2	4	9	1	0	1
Clay < 0.005 mm %	71	63	36	18	34	73	71	51
Passing # 40 Sieve %	--	--	--	--	--	--	--	--
Passing # 200 Sieve %	--	--	--	--	--	--	--	--

Liquid Limit	62	58	48	41	39	60	64	51
Plastic Index	19	16	10	NP	4	19	19	10
AASHTO Classification	A-7-5 (16)	A-7-5 (12)	A-5 (3)	A-1-b (0)	A-4 (2)	A-7-5 (16)	A-7-5 (14)	A-5 (5)
Quantity								
Texture								
Station	159+50	159+50	159+50	159+50	159+50	175+00	175+00	175+00
Hole No.								
Depth (ft) From:	0.0	3.5	8.5	9.5	13.5	3.5	8.5	13.5
To:	3.5	5.0	9.5	10.0	15.0	5.0	10.0	15.0

Remarks:

A-152662 - 152669

CC:

P. Q. Lockamy	
File	

SOILS ENGINEER:	

M&T 503E

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DIVISION OF HIGHWAYS-MATERIALS AND TESTS UNIT
SOILS TEST REPORT-SOILS LABORATORY

T.I.P. ID #:	--

REPORT ON SAMPLES OF:	Soils for Quality

PROJECT:	R-2408B	COUNTY:	Macon	Owner:	--		
DATE SAMPLED:	5.06	DATE RECEIVED:	5.17.06	DATE REPORTED:	6.8.06		
SAMPLED FROM:	-L-	SAMPLED BY:	P. Q. Lockamy				
SUBMITTED BY:	W. D. Frye	2002	STANDARD SPECIFICATION				
LABORATORY:	Asheville						

TEST RESULTS

Project Sample No.	SS-55	SS-56	SS-57	SS-58	SS-59	SS-60	SS-61	SS-62
Lab Sample No. A	152670	152671	152672	152673	152674	152675	152754	152755
HiCAMS Sample #	--	--	--	--	--	--	--	--
Retained #4 Sieve %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Passing #10 Sieve %	98	93	97	95	98	88	98	100
Passing #40 Sieve %	79	66	74	73	86	84	97	95
Passing #200 Sieve %	39	31	29	26	58	56	78	63

MINUS #10 FRACTION

Soil Mortar - 100%								
Coarse Sand -Ret. #60	30	40	39	40	21	13	3	12
Fine Sand - Ret. #270	37	32	39	40	25	31	24	34
Silt 0.05-0.005 mm %	3	14	12	10	14	22	20	34
Clay < 0.005 mm %	30	14	10	10	40	34	53	20
Passing # 40 Sieve %	--	--	--	--	--	--	--	--
Passing # 200 Sieve %	--	--	--	--	--	--	--	--

Liquid Limit	43	40	37	38	40	39	47	39
Plastic Index	4	NP	NP	NP	4	8	10	NP
AASHTO Classification	A-5 (1)	A-2-4 (0)	A-2-4 (0)	A-2-4 (0)	A-4 (5)	A-4 (4)A-5 (10)		A-4 (5)
Quantity								
Texture								
Station	179+50	179+50	179+50	179+50	182+00	186+50	186+00	186+00
Hole No.								
Depth (ft) From:	3.2	8.2	13.2	18.2	6.8	3.4	2.5	7.5
To:	4.7	9.7	14.7	19.7	8.3	4.7	4.0	9.0

Remarks:

A-152670 – 152675 & 152754 - 152755

CC:

P. Q. Lockamy	
File	

SOILS ENGINEER:	

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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS-MATERIALS AND TESTS UNIT
SOILS TEST REPORT-SOILS LABORATORY

T.I.P. ID #:	--

REPORT ON SAMPLES OF:	Soils for Quality

PROJECT:	R-2408B	**COUNTY:**	Macon	**Owner:**	--
DATE SAMPLED:	5.06	**DATE RECEIVED:**	5.17.06	**DATE REPORTED:**	6.8.06
SAMPLED FROM:	-L-	**SAMPLED BY:**	P. Q. Lockamy		
SUBMITTED BY:	W. D. Frye		2002	STANDARD SPECIFICATION	
LABORATORY:	Asheville				

TEST RESULTS

Project Sample No.	SS-63	SS-65	SS-67					
Lab Sample No. A	152756	152757	152758					
HiCAMS Sample #	--	--	--					
Retained #4 Sieve %	0.0	0.0	0.0					
Passing #10 Sieve %	100	98	86					
Passing #40 Sieve %	98	95	78					
Passing #200 Sieve %	74	54	45					

MINUS #10 FRACTION

Soil Mortar - 100%								
Coarse Sand -Ret. #60	5	9	17					
Fine Sand - Ret. #270	33	47	41					
Silt 0.05-0.005 mm %	44	32	28					
Clay < 0.005 mm %	18	12	14					
Passing # 40 Sieve %	--	--	--					
Passing # 200 Sieve %	--	--	--					
Liquid Limit	36	34	36					
Plastic Index	NP	NP	NP					
AASHTO Classification	A-4 (8)	A-4 (4)	A-4 (2)					
Quantity								
Texture								
Station	186+00	186+00	186+00					
Hole No.								
Depth (ft) From:	12.5	22.5	32.5					
To:	14.0	24.0	34.0					

Remarks:

A-152756 - 152758

CC:

P. Q. Lockamy
File

SOILS ENGINEER:	