

PROJECT: C201368 ID. R-2320G

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL UNIT

SUBSURFACE INVESTIGATION

(34422.1.1)

STATE PROJECT 8.1680401 I.D. NO. R-2320G

F.A. PROJECT NHF-52(10)

COUNTY STANLY

DESCRIPTION US 52 EXTENSION NC 24-27 TO SR 1785

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2320G	1	126
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34422.1.1	NHF-52(10)	P.E.	
34422.2.2	NHF-52(10)	RW & UTIL	
34422.3.5	NHF-52(23)	CONST.	

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WAS 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 UNIT # (919) 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA IS PART OF THE CONTRACT.

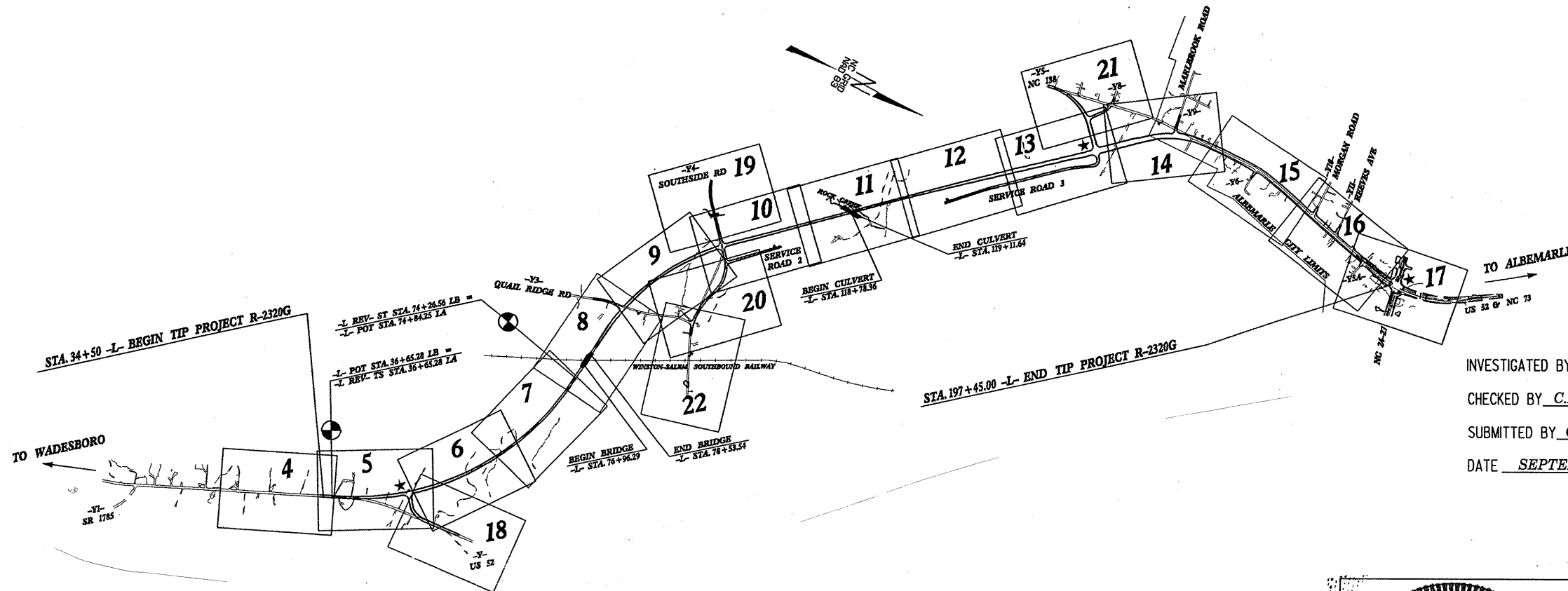
GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND 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.

CONTENTS:

LINE	STATION	SHEET NUMBERS		
		PLAN	PROFILE	X-SECTS.
-L-	35+50.00 to 192+74.00	4-16	22-32	40-112
-Y-	10+00.00 to 18+50.00	5, 18	33	
-Y2-	10+00.00 to 17+55.23	8	33	
-Y3-	13+00.00 to 17+59.34	8	34	
-Y4-	5+50.00 to 26+50.00	10, 19-20	35	101, 113-119
-Y5-	10+00.00 to 21+74.22	13, 21	36	120-125
-Y5A-	10+00.00 to 10+82.00	16	36	
-Y6-	10+00.00 to 11+50.00	15	36	
-Y8-	10+00.00 to 16+69.41	21	37	126
-Y9-	15+10.00 to 17+94.10	14	37	109
-Y10-	10+00.00 to 12+16.41	16	38	
-Y11-	10+00.00 to 12+19.28	16	38	
-SR2-	10+00.00 to 17+55.00	10	38	69-71, 101-104
-SR3-	10+00.00 to 32+25.00	12-13	39	90-100, 105-106

"Refer to Sheet 2A for plan sheet layout at the time of investigation"



INVESTIGATED BY R.Q. CALLAWAY PERSONNEL C.C. MURRAY

CHECKED BY C.B. LITTLE J.E. ESTEP

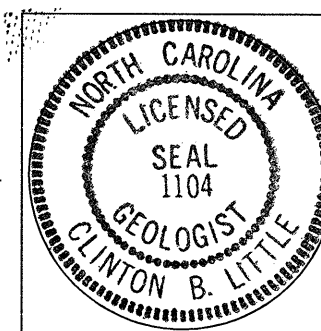
SUBMITTED BY C.B. LITTLE D.K. BRATTON

DATE SEPTEMBER 2003

DRAWN BY: J.K. McCLURE

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.



REVISED 11-01-05 CBL

9-25-03

SEAL

 SIGNATURE

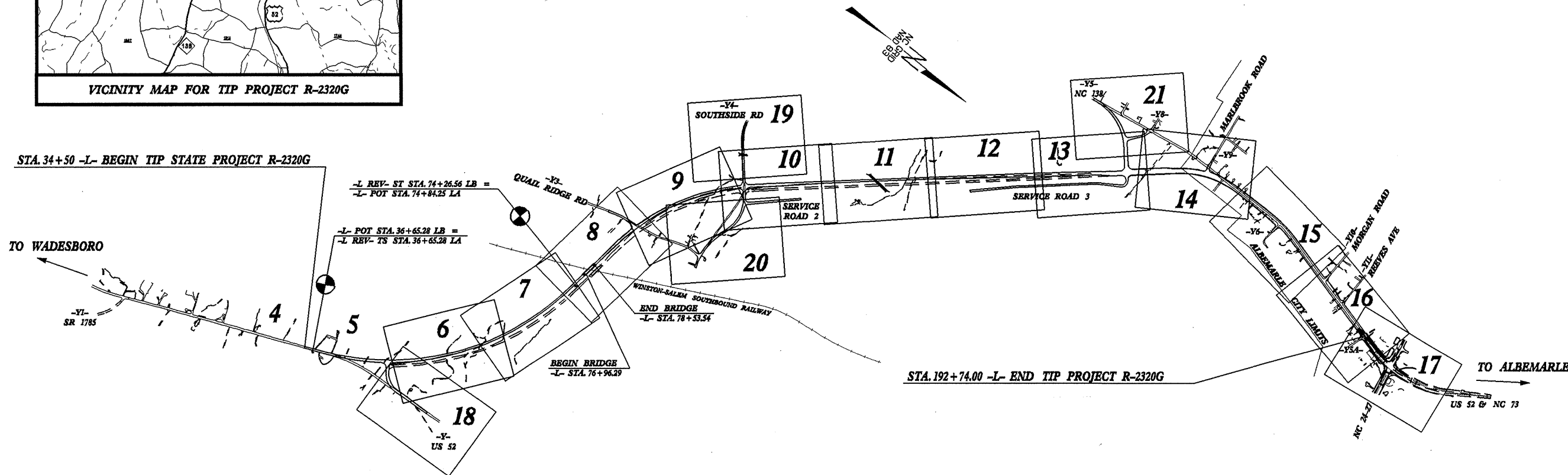
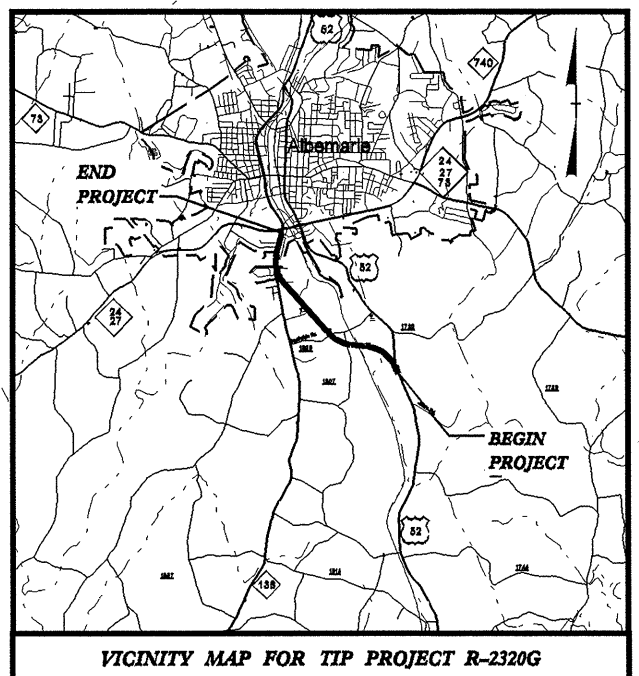
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2320G	1A	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34422.1.1	NHF-52(10)	P.E.	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STANLY COUNTY

LOCATION: Albemarle - US 52 Extension from the Intersection of US 52, NC 73, NC 24-27 & NC 138 to Intersect of US 52 and SR 1785 (Johns Road)
TYPE OF WORK: Grading, Drainage, Paving, Structures and Signals

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



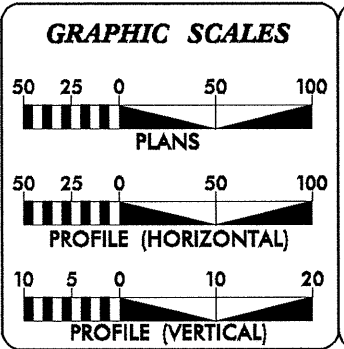
A PORTION (0.6 MILES) OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF ALBEMARLE.

THIS IS A PARTIAL CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON THE PLANS.

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

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



DESIGN DATA

ADT 2005 = 8,400/16,100
ADT 2025 = 11,300/21,500
DHV = 10 %
D = 60 %
T = 9 % *
V = 60/50 MPH
* TTST 5% DUAL 4%

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT R-2320G	=	2.948 mi.
LENGTH OF STRUCTURE TIP PROJECT R-2320G	=	0.030 mi.
TOTAL LENGTH OF TIP PROJECT R-2320G	=	2.978 mi.

Prepared in the Office of:
KO & ASSOCIATES, P.C.
1011 Scheub Dr. Suite 202, Raleigh, NC 27606 919-851-6066
for
North Carolina Department of Transportation
2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: Brian A. Wiles, P.E.
PROJECT ENGINEER

LETTING DATE:
November 15, 2005

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.

**DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA**

SIGNATURE: _____ P.E.

STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR





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09/08/05
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 jmclore AT 08/24/05

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION		GRADATION		ROCK DESCRIPTION		TERMS AND DEFINITIONS											
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE: <i>VERY STIFF, GRANULAR CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HARD PLASTIC, A-7-6</i>		WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED) GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.		HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:  WEATHERED ROCK (WR)  CRYSTALLINE ROCK (CR)  NON-CRYSTALLINE ROCK (NCR)  COASTAL PLAIN SEDIMENTARY ROCK (CP)		ALUVIUM (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 (MT) - 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 SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (ROQ) - 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 INTRODUCED 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 (SCRC) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.											
SOIL LEGEND AND AASHTO CLASSIFICATION		MINERALOGICAL COMPOSITION		WEATHERING		ROCK HARDNESS											
GENERAL CLASS. GRANULAR MATERIALS (< 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS		MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.		FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE. VERY SLIGHT (V SLI.) ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY, ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE. SLIGHT (SLI.) ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS. MODERATE (MOD.) SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK. MODERATELY SEVERE (MOD. SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION, ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. IF TESTED, WOULD YIELD SPT REFUSAL. SEVERE (SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. IF TESTED, YIELDS SPT N VALUES > 100 BPF. VERY SEVERE (V SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. IF TESTED, YIELDS SPT N VALUES < 100 BPF. COMPLETE ROCK REDUCED TO SOIL, ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.		SLIGHTLY COMPRESSIBLE MODERATELY COMPRESSIBLE HIGHLY COMPRESSIBLE		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 GROUDED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. SOFT CAN BE GROUDED 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 FINGER NAIL.		PERCENTAGE OF MATERIAL ORGANIC MATERIAL GRANULAR SOILS SILT-CLAY SOILS OTHER MATERIAL TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10% LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20% MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35% HIGHLY ORGANIC >10% >20% HIGHLY 35% AND ABOVE		GROUND WATER WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING STATIC WATER LEVEL AFTER 24 HOURS PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA SPRING OR SEEP		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 0.009 - 0.03 FEET THINLY LAMINATED < 0.009 FEET			
CONSISTENCY OR DENSENESS		MISCELLANEOUS SYMBOLS		ROCK HARDNESS		ROCK HARDNESS											
PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/F ²)		ROADWAY EMBANKMENT WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL OTHER THAN ROADWAY EMBANKMENT INFERRED SOIL BOUNDARY INFERRED ROCK LINE ALLUVIAL SOIL BOUNDARY DIP & DIP DIRECTION OF ROCK STRUCTURES SOUNDING ROD		TEST BORING AUGER BORING CORE BORING MONITORING WELL PIEZOMETER INSTALLATION SLOPE INDICATOR INSTALLATION SPT N-VALUE SPT REFUSAL		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 GROUDED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. SOFT CAN BE GROUDED 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 FINGER NAIL.		TEXTURE OR GRAIN SIZE U.S. STD. SIEVE SIZE OPENING (MM) 4 10 40 60 200 270 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		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 FRAGS. - FRAGMENTS HI. - HIGHLY MED. - MEDIUM MICA. - MICA MOD. - MODERATELY NP - NON PLASTIC 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 UNIT WEIGHT DRY UNIT WEIGHT		EQUIPMENT USED ON SUBJECT PROJECT DRILL UNITS: MOBILE B- BK-51 CME-45C CME-550 PORTABLE HOIST OTHER OTHER ADVANCING TOOLS: CLAY BITS 6" CONTINUOUS FLIGHT AUGER 6" HOLLOW AUGERS HARD FACED FINGER BITS TUNG-CARBIDE INSERTS CASING W/ ADVANCER TRICONE * STEEL TEETH TRICONE * TUNG-CARB. CORE BIT OTHER HAMMER TYPE: AUTOMATIC MANUAL CORE SIZE: B N H HAND TOOLS: POST HOLE DIGGER HAND AUGER SOUNDING ROD VANE SHEAR TEST OTHER		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 GROUDED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. SOFT CAN BE GROUDED 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 FINGER NAIL.		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 GROUDED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. SOFT CAN BE GROUDED 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 FINGER NAIL.	
TEXTURE OR GRAIN SIZE		MISCELLANEOUS SYMBOLS		ROCK HARDNESS		ROCK HARDNESS											
CONSISTENCY OR DENSENESS		MISCELLANEOUS SYMBOLS		ROCK HARDNESS		ROCK HARDNESS											
TEXTURE OR GRAIN SIZE		MISCELLANEOUS SYMBOLS		ROCK HARDNESS		ROCK HARDNESS											
SOIL MOISTURE - CORRELATION OF TERMS		MISCELLANEOUS SYMBOLS		ROCK HARDNESS		ROCK HARDNESS											
SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION		MISCELLANEOUS SYMBOLS		ROCK HARDNESS		ROCK HARDNESS											
SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION		MISCELLANEOUS SYMBOLS		ROCK HARDNESS		ROCK HARDNESS											
PLASTICITY		MISCELLANEOUS SYMBOLS		ROCK HARDNESS		ROCK HARDNESS											
COLOR		MISCELLANEOUS SYMBOLS		ROCK HARDNESS		ROCK HARDNESS											

EARTHWORK BALANCE SHEET

PROJECT R-2320G

COUNTY STANLY

DATE JANUARY 10, 2008

COMPILED BY BRIAN A WILES

LINE	STATION	STATION	EXCAVATION					EMBANKMENT				BORROW	WASTE				
			TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUIT. UNCLASS.	SUITABLE UNCLASS.	TOTAL	ROCK	EARTH	EMBANK + 20 %		ROCK	SUITABLE	UNSUIT.	TOTAL	
L- & -LREV-	34+50.00	48+00.00	2,564				2,564	5,743		5,743	6,892	4,328			0		0
-Y-	9+41.69	18+50.00	222				222	3,094		3,094	3,713	3,491			0		0
SUBTOTAL SUMMARY NO. 1			2,786	0	0	0	2,786	8,837	0	8,837	10,605	7,819	0	0	0	0	0
-LREV-	48+00.00	74+26.56 L.B.	36,550	6,949			29,601	22,182	6,949	15,233	25,229	0			11,321		11,321
-L-	74+84.25 L.A.	76+98.29	0				0	8,656		8,656	10,387	10,387			0		0
SUBTOTAL SUMMARY NO. 2			36,550	6,949	0	0	29,601	30,838	6,949	23,889	35,616	10,387	0	11,321	0	11,321	0
-L-	78+53.54	108+00.00	54,213	412			53,801	23,922	412	23,510	28,624	0			25,589		25,589
-Y3-	13+00.00	17+11.63	578				578	11		11	13	0			565		565
-Y4-	4+61.38	26+50.00	35,198	5,296			29,902	21,516	5,296	16,220	24,760	0			10,438		10,438
-SR2-	10+12.35	17+55.00	14,547	313			14,234	216	0	216	259	0	313		13,662		13,975
SUBTOTAL SUMMARY NO. 3			104,536	6,021	0	0	98,515	45,665	5,708	39,957	53,656	0	313	50,254	0	50,567	0
-L-	108+00.00	126+00.00	25,935	148			25,787	72,809	148	72,661	87,341	61,406			0		0
SUBTOTAL SUMMARY NO. 4			25,935	148	0	0	25,787	72,809	148	72,661	87,341	61,406	0	0	0	0	0
-L-	126+00.00	153+00.00	75,154	4,245			70,909	33,698	4,245	29,453	39,589	0			35,565		35,565
-Y5-	10+35.00	21+42.22	15,369	1,441			13,928	1,652	1,441	211	1,694	0			13,675		13,675
-Y8-	12+00.00	16+48.83	450				450	738		738	886	436			0		0
-SR3-	10+32.00	32+25.00	3,215				3,215	37,288		37,288	44,746	41,531			0		0
SUBTOTAL SUMMARY NO. 5			94,188	5,686	0	0	88,502	73,376	5,686	67,690	86,915	41,967	0	49,240	0	49,240	0
-L-	153+00.00	162+00.00	7,086				7,086	1,707		1,707	2,048	0			5,038		5,038
SUBTOTAL SUMMARY NO. 6			7,086	0	0	0	7,086	1,707	0	1,707	2,048	0	0	5,038	0	5,038	0
-L-	164+50.00	187+50.00	5,935				5,935	1,225		1,225	1,470	0			4,465		4,465
TEMP PAVMT			5,935	0	0	0	5,935	1,225	0	1,225	1,470	0	0	4,465	0	4,465	0
SUBTOTAL SUMMARY NO. 7			5,935	0	0	0	5,935	1,225	0	1,225	1,470	0	0	4,465	0	4,465	0
-L- RT SIDE	162+00.00	195+62.00	6,648				6,648	14,357		14,357	17,228	10,580			0		0
-Y6-	10+32.00	11+50.00	475				475	0		0	0	0			475		475
-Y5A-	10+26.40	10+70.00	12				12	2		2	2	0			10		10
SUBTOTAL SUMMARY NO. 8			7,135	0	0	0	7,135	14,359	0	14,359	17,230	10,580	0	485	0	485	0
-L- LEFT SIDE	162+00.00	195+62.00	919				919	15,665		15,665	18,798	17,879			0		0
-Y9-	15+10.00	17+62.09	64				64	840		840	1,008	944			0		0
-Y10-	11+00.00	11+83.47	64				64	26		26	31	0			33		33
-Y11-	11+70.00	11+86.31	133				133	6		6	7	0			126		126
SUBTOTAL SUMMARY NO. 9			1,180	0	0	0	1,180	16,537	0	16,537	19,844	18,823	0	159	0	159	0
SUBTOTAL SUMMARIES NO. 1-9			285,331	18,804	0	0	266,527	265,353	18,491	246,862	314,725	150,982	313	120,962	0	121,275	0
EST. SHOULDER MATERIAL							9,650		9,650	11,580	11,580	0			0		0
EST. LOSS DUE TO C & G			-13,000				-13,000					13,000					
SUBTOTAL			272,331	18,804	0	0	253,527	275,003	18,491	256,512	326,305	175,562	313	120,962	0	121,275	0
WASTE USED IN LIEU OF BORROW												-121,275	-313	-120,962	0	-121,275	0
PROJECT TOTAL			272,331	18,804	0	0	253,527	275,003	18,491	256,512	326,305	54,287	0	0	0	0	0
EST 5% FOR REPLACING TOPSOIL ON BORROW PITS												2,714					
GRAND TOTAL			272,331	18,804	0	0	253,527	275,003	18,491	256,512	326,305	57,001	0	0	0	0	0
SAY			272,500									57,500					0

ESTIMATE DRAINAGE DITCH EXCAVATION = 4,350 CY
 ESTIMATE UNDERCUT = 7,250 CY (2,250 CY FROM GEOT. & 5,000 CY FROM DIVISION)
 PAVEMENT STRUCTURE VOLUME = 24,388 CY

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



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
P.O. BOX 25201, RALEIGH, N.C. 27611-5201

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

September 10, 2003

State Project: 8.1680401 (R-2320G)
Federal Project: NHF - 52(10)
County: Stanly
Description: U.S. 52 Extension, NC 24-27 to SR 1785
Subject: Geotechnical Report - Inventory

Project Description

This is the report of an English-units geotechnical investigation for a roadway relocation project of a section of US 52 in Stanly County, just south of Albemarle. The project begins at the south end, on existing U.S. 52 about one half mile north of Johns Road, travels northerly along existing US 52 for 700', then diverges to the west as a 4 lane divided new alignment. After about 2 miles, the planned roadway converges with existing NC-138 at the Brevard Drive intersection. From this point to just beyond the intersection with NC 24-27 a planned 4 lane divided alignment widens the existing NC-138 alignment. The following lines were investigated:

-L- Line:	35+50 to 192+74	15,724ft
-Y-:	10+00 to 18+50	850ft
-Y2-	10+00 to 17+55	755ft
-Y3-:	13+00 to 17+59	459ft
-Y4-:	5+50 to 13+58	808ft
-Y5-:	10+00 to 21+74	1174ft
-Y5A-:	10+00 to 10+82	82ft
-Y6-:	10+00 to 11+50	150ft
-Y8-:	10+00 to 16+50	650ft
-Y9-:	15+10 to 17+94	284ft
-Y10-:	11+00 to 12+16	116ft
-Y11-:	10+50 to 12+19	169ft
-SR2-:	10+00 to 17+55	755ft
-SR3-:	10+00 to 32+25	2225ft

Areas of Special Geotechnical Interest

Hard Rock

The following areas have hard rock within 10 feet of finished grade. Most occurrences plot below grade, and some are below fill sections. (see table, this page and following)

Alignment	From (Sta. & Offset)	To (Sta. & Offset)	Comment.
-L-	45+00	46+50	Below Grade
-L-	53+50	75+00	Nearly All Above Grade
-L-	80+50	85+00	Below Grade

Alignment	From (Sta. & Offset)	To (Sta. & Offset)	Comment.
-L-	90+00	93+00	Mostly At or Below Grade
-L-	96+00	116+50	Mostly At or Below Grade
-L-	126+00	135+50	Mostly At or Below Grade
-L-	140+50	144+50	Mostly At or Below Grade
-L-	147+00	152+00	Mostly At or Below Grade
Y-4	15+00		Within Cut
SR-2	10+44	13+84	Mostly At or Below Grade
SR-3	32+23	30+72	Mostly At or Below Grade
-L-	158+50	166+50	Mostly At or Below Grade

Weathered Rock

In most cases weathered rock occurs as a thin transition between soil and hard rock. The reader is referred to the cross-sections in this report for illustration.

Highly Plastic Soil

There are intermittent occurrences of clay with P.I. values from 20 to 30 in the upper 5' of the residual surface "cap clay". There was also one occurrence of clay from a weathered dike in the sub-grade at 119+00.

Groundwater Near Existing or Finished Grade

The intervals below were found to have groundwater at or near grade during this very wet year, (2003). In most cases water was found in hard residual soil, weathered rock or rock.

Alignment	From (Sta. & Offset)	To (Sta. & Offset)	Comment.
-L-	51+75		At surface, below fill
-L-	69+00	72+00	At and Above Finished Grade
-L-	80+00	85+00	Within 10' of Finished Grade
-L-	102+00	108+00	At and Above Finished Grade
SR-2	10+00	15+00	At Grade, Parallel to -L- 102+00
-Y-4-	13+00	17+00	At Grade, Connects -L- & SR-2
-L-	118+00	121+00	Floodplain, Under Fill
-L-	129+50	131+50	At and Above Finished Grade

Springs and Wells

Wells were not noted but there is a spring at -L-118+00, right side and it is indicated on the plans. An embankment is planned in this area.

Physiography and Geology

The project is within the Piedmont physiographic province in the Carolina Slate Belt litho-tectonic belt. It is underlain by residual soil from weathered slate. The project is stationed from south to north, so in this case, the beginning of the project is farthest away from Albemarle.

Topographic Setting

NC 138, the railroad, and U.S. 52 travel in parallel lines along north-northwest trending topographic features. The project roadway begins at existing NC 52 on a broad-topped ridge east of the north-south rail line, veers northwest dropping into a broad swale where the rail-line is crossed, then turns north along existing NC 138 to travel to the end. The ridge tops are at elevations from 500 to 600', and the intervening valleys are at elevations 50 feet lower, varying from 450 to 550'.

Surface Drainage and Geomorphology

The ridges and valleys with a northwest topographic "grain" probably express a regional direction of jointing that is occupied by diabase dikes in places. This trend crosses an east-northeast trend of stratigraphy, that is also expressed topographically. The major topographic depression is a north-northwest valley, exploited by the northwest flowing Rock Creek to the north, and the southeast flowing Little Jacobs Creek to the southeast. The railroad also follows this valley. On a larger scale the project area is at a divide between streams flowing directly east into the Uwharrie River, and streams that flow north or west, then south and into the Rocky River and eventually into the Uwharrie River. The east flowing streams that run directly to the Uwharrie are "Protected status" water supply streams.

Geology

The project area is in the Carolina Slate belt litho-tectonic belt which is underlain by slate. The high hill at the beginning of the project may have a volcanic component resulting in a more durable rock. The slate is hard, almost flinty when it is unweathered. Joints and fractures intersecting the bedding planes and slaty cleavage often result in blocky fracture patterns.

Soils Properties

Most of the soil on the project is residual soil, though alluvial soil is found in the two major stream crossings. A general description follows immediately below, and a detailed description of the subsurface may be found under the segment descriptions in the *Geotechnical Descriptive Analysis* section, farther along in the report.

Residual Soil

Clayey Soil

Most of the residual soil is either A-6 or A-7, very stiff to hard, with a plasticity index, (P.I.), value from 15 to 20. Occasional surface samples will return a P.I. value of 20 to 30.

Silt Soil

There is sometimes a transition zone to weathered rock that returns an A-4 soil classification.

Alluvial Soil

Alluvial soil was found in the headwater tributaries to Rock Creek at -L- 120 and 136. Soft, A-7 and A-4 soil was less than 5' thick, laying on slate which also was exposed in the creeks. Alluvial soil not associated with a stream may actually be colluvium or possibly plowed soil.

Fill Soil

Fill, associated with existing roads, is built of local residual source soil. It is thin and will probably be reworked during construction activities.

Rock Properties

The original rock was a sedimentary unit with monotonously laminar fining upward thin-bedded fine-grained beds. After metamorphism, the bedding is preserved with a slaty cleavage overprint. This rock is usually hard to flinty, blue gray when un-weathered, slightly pyritic with a blocky fracture pattern.

Groundwater Properties

This area seems to have typical piedmont groundwater properties with an unconfined crystalline aquifer. The high ground is probably a groundwater recharge area, and the low ground is a groundwater discharge area. The railroad appears to drain the areas immediately adjacent to it, possibly resulting in depressed groundwater levels there. The proposed roadway will probably intersect the normal water table in the cuts for SR-2, -Y4-, and -L- near the at grade intersection with SR-1906 at -L- 102+00. A spring was found at -L-118+00, right side, and is indicated on the plans. An embankment is planned in this area.

Geotechnical Descriptive Analysis of the Project

The project was divided into 3 segments, for discussion. **Segment 1** is the -L- line from the beginning of the project up to the intersection with SR-1907, Quail Ridge Road and includes any associated lines. **Segment 2** is the -L- line from Quail Ridge Road to the end of the fill section at -L- 141+00, and any associated lines. **Segment 3** is the -L- line from -L- 141+00 to the end of the project at -L-192+74 and includes any associated lines.

1. Station -L-35+50+00 to Station -L-86+00, Including Y, Y2, and Y3.

Physical Description

The project begins at -L- 35+50, elevation 530'. Up to station -L-42+00 at elevation 535', the US 52 alignment is improved at the present location. At -L-42+00 and elevation 535', a corridor for a four lane divided roadway on a new alignment diverges left to a northwest travel direction. (Y is the new intersection with "old 52" is planned at -L-46+80.) The finished grade will rise to 555' at 58+00, then drop to 545' at -L- 74+00, at the railroad. The highway grade is shown at 545' elevation over the railroad, (Y2), elevation 510. Across the railroad, the grade continues at 540' to the end of this segment at -L-86+00. The majority of this segment is on cut section, up to 30' deep. The segment ends at an at-grade-crossing of SR 1907, Quail Ridge Road, (Y3).

Soil

Most of the soil drilled in this segment was residual, but a little transported soil was noted.

Residual Soil

Most of the soil from the beginning to the railroad is very stiff to hard A-6 with some sections of A-7. After the railroad crossing, all of the soil is very stiff to hard A-7.

Transported Soil

Intervals of alluvial soil are mapped at 62+00 and 68+00. These areas are topographic dips in the landscape and are probably colluvium, soil transported down-slope a short distance.

Rock and Weathered Rock

As illustrated in the section of this report *Areas of Geotechnical Interest*, this segment had the largest occurrence of above grade rock on the project. This rock outcrops as narrow "ribs", rising up to 6' above the ground. The actual rock line in this area is probably very uneven, and excavation may produce some large unwieldy rocks from the first cuts.

Groundwater

Areas of shallow groundwater are presented in a table in the *Areas of Geotechnical Interest*, section of this report. Additional groundwater may be encountered in the large cut centered around 58+00. (Hard rock prevented drilling to depths where water could occur.)

2. Segment 2 is the -L- line from Quail Ridge Road to the end of the fill section at -L-141+00, Y4, SR-2 and SR-3.

Physical Description

At -L- 86+00 on existing grade at elevation 540, the roadway generally follows topography in a gradual decline to the intersection with SR1906, (Y4) at -L- 103+00, elevation 502. SR 1906 is shifted to the north and provides access to SR-2 that runs parallel to -L- for 700', all in cut. The roadway then climbs to about 510, which is maintained to the end of the segment at 141. From 102+00 115+50, the roadway is in cut up to 20' deep. From 115+50 to 126+00 fill, up to 35' thick, bridges a small stream valley. From 126+00 to 134+00 cut up to 15' is required, followed by fill up to 25' thick from 134+00 to the end at 141+00. SR-3 is parallel to and north of -L- from -L- 131+00 to 151+00. SR-3 is on 30' of fill where it crosses the un-named creek, otherwise on the part parallel to Segment 3, below, SR-3 is mostly close to natural grade.

Soil

A floodplain with alluvial soil was found from 118+00 to 120+50; otherwise, all soil was residual clayey or silty soil.

Clayey Residual Soil

A consistent pattern of weathering was noted in the residual soil: At the surface the soil was brown or gray with a trace amount of organic humus. This is followed by no more than 8' of weathered, very stiff to hard, clayey soil with red-orange-yellow oxidized iron colors. Below this the hard clayey soil continues for up to another 8', but with reduced iron colors such as light olive green. Below this, rocky soil is quickly followed by auger refusal on hard rock.

Other Residual Soil

One boring at 119+00 was completed in material interpreted to be weathered diabase.

Alluvial Soil

Three borings were completed in the alluvial soil near -L-119+00. The alluvial soil was wet, very soft to medium dense silt or clay soil.

Rock and Weathered Rock

In this segment, rock or weathered rock, was commonly found, but mostly occurred below planned finished grade. Limited rock cut occurs on Y4, while some weathered rock will be encountered on SR-2

Groundwater

Groundwater was found in the upland recharge areas as noted in the *Areas of Geotechnical Interest*, section of this report. Water is indicated within the cut section of Y-4 SR-2 and -L- where they come together at SR 1906. A spring that was found at -L-118+00, right side is indicated on the plans. An embankment is planned in this area.

Segment 3 is the -L- line from -L- 141+00 to the end of the project at -L-192+74 and Y5, Y9, Y6, Y10, Y11, Y5A,

Physical Description

Most of this segment is built on grade, including the "Y" lines. The proposed grade begins at 510' elevation, and gradually rises to 538' at 159+50' with minor, balanced, cuts and fills. From 159+50', the road follows grade down to 162+00 where the alignment merges with existing NC138, and continues to descend to the end at 192+74 and elevation 496'.

Soil

Residual Soil

In this segment with few cuts or fills, drilling was sparse but indicates a thin residual clayey soil of less than 10' thickness over rock.

Alluvial Soil

No alluvial soil was found on this segment.

Rock and Weathered Rock

Rock is in the subgrade at about 10' below existing surface.

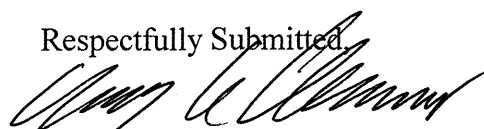
Groundwater

No groundwater was found, though it is assumed to exist in fractures of the rock below grade.

CLOSING STATEMENT

If any significant changes are made in the design or location of the proposed roadway, the subsurface information and interpretations will have to be reviewed and modified as necessary.

Respectfully Submitted,



R.Q. Callaway, L.G.

Project Geologist

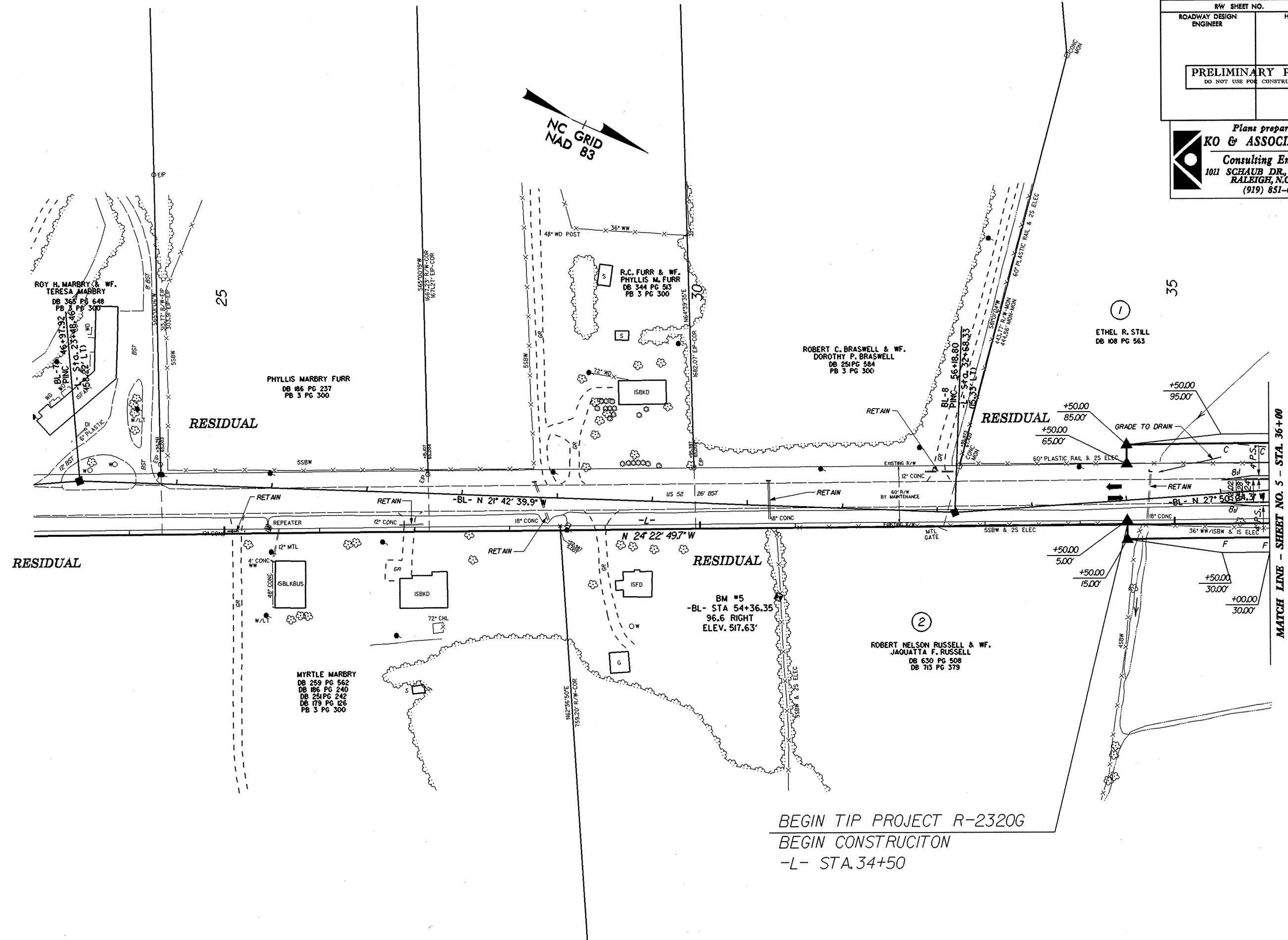
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RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			

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REVISIONS

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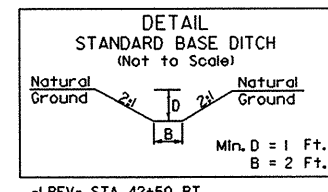
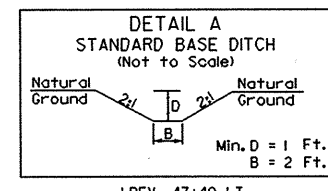
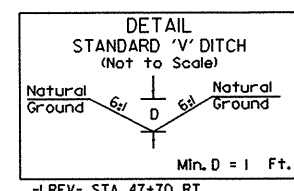
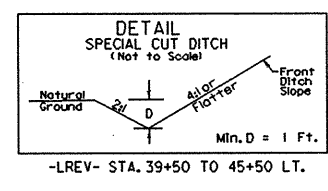


BEGIN TIP PROJECT R-2320G
 BEGIN CONSTRUCTION
 -L- STA. 34+50

SEE SHEET NO. 22 FOR -L- LEFT PROFILE

MATCH LINE - SHEET NO. 5 - STA. 36+00

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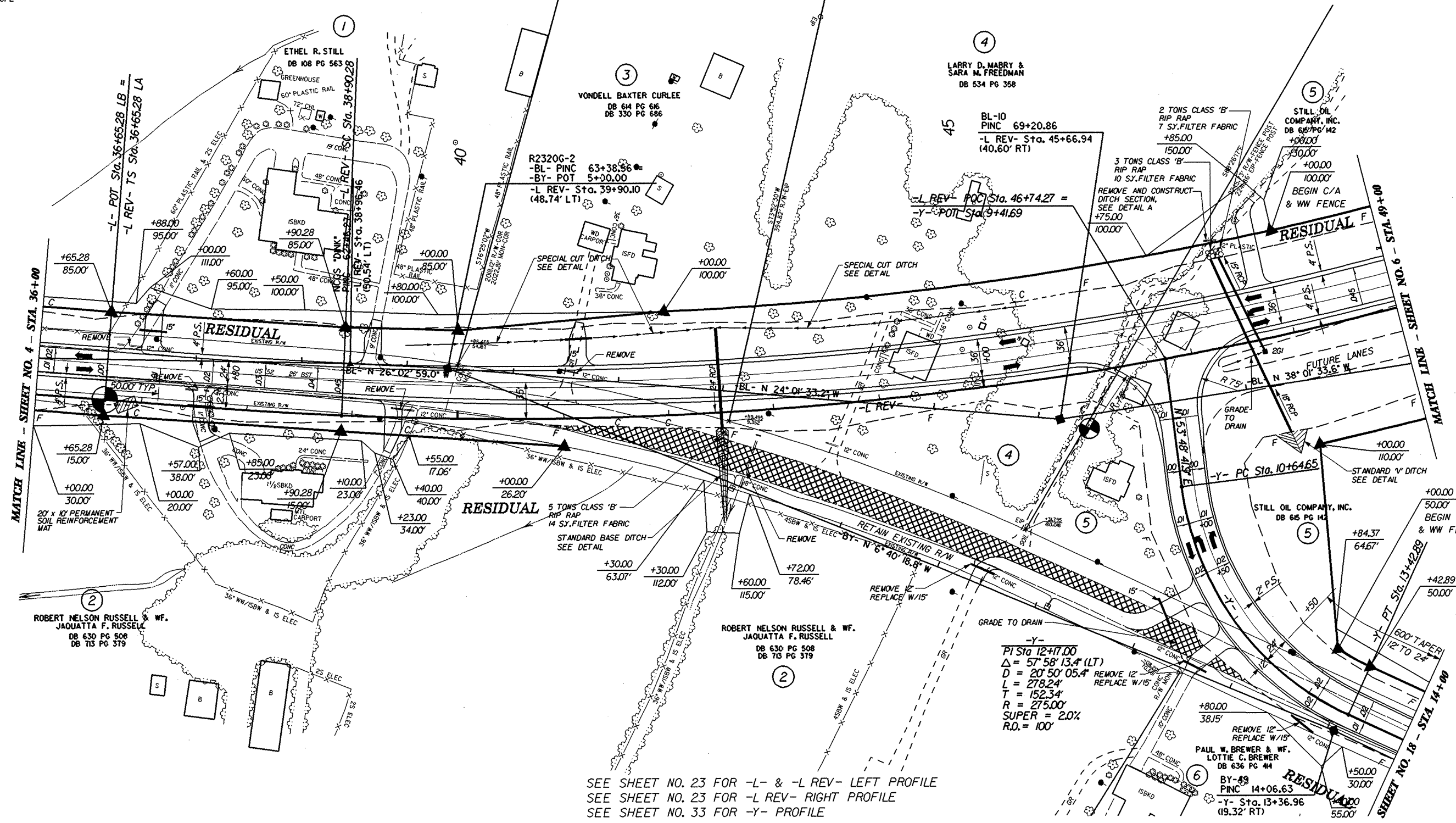


-L REV-
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 Ls = 225.00'
 LT = 150.01'
 ST = 75.01'

-L REV-
 PI Sta 56+90.51
 $\Delta = 55' 48' 02.2''$ (LT)
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 T = 1,800.23'
 R = 3,400.00'
 SUPER = 45%



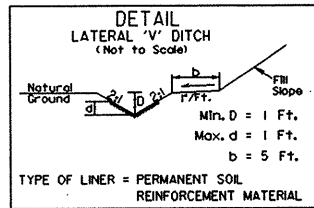
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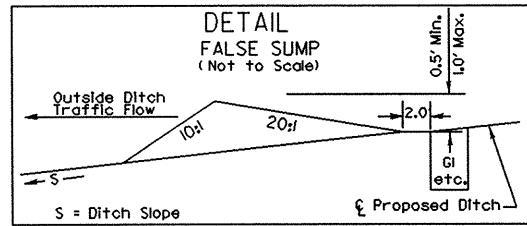
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 SEE SHEET NO. 23 FOR -L REV- RIGHT PROFILE
 SEE SHEET NO. 33 FOR -Y- PROFILE

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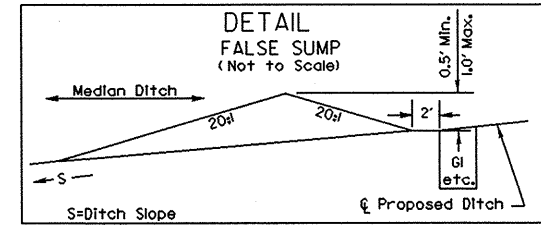
LARRY D. MABRY &
SARA M. FREEDMAN
DB 534 PG 358



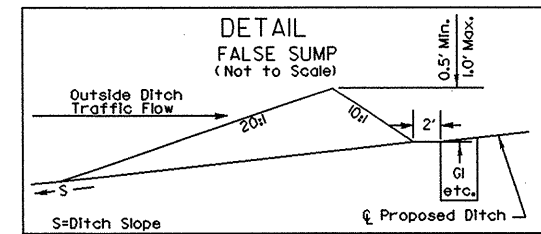
-LREV- 51+60 TO 52+50 RT.
-LREV- 50+00 TO 50+65 LT.



-LREV- 53+25 LT.



-LREV- 52+25 MED.
-LREV- 53+25 MED.



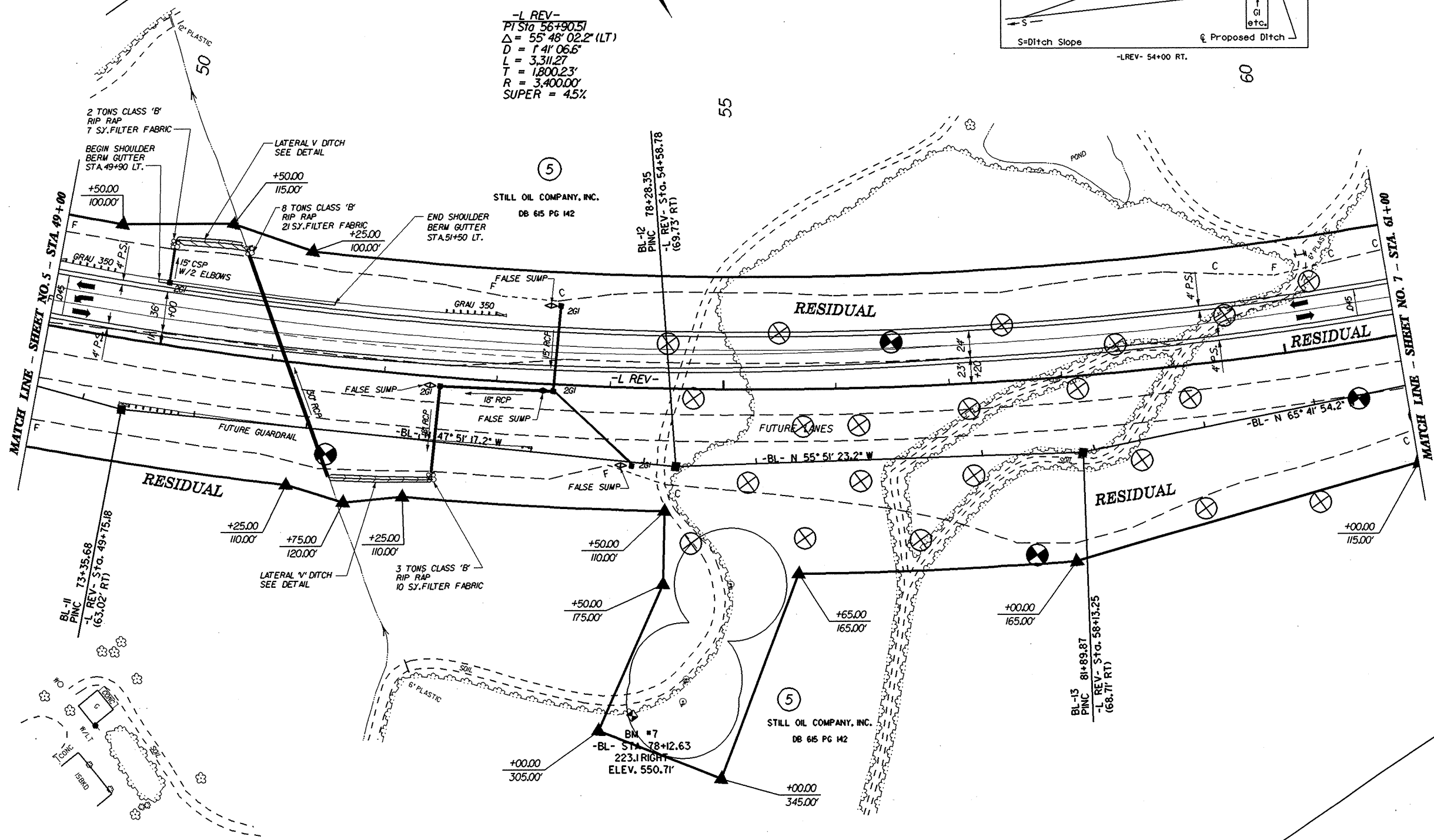
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-L REV-
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R = 3,400.00'
SUPER = 4.5%



REVISIONS
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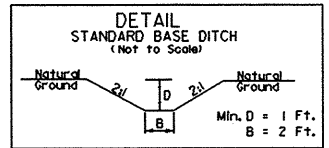
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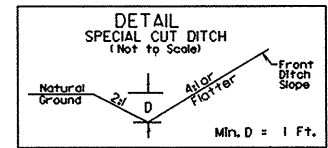
SEE SHEET NO. 24 FOR -L REV- LEFT PROFILE
SEE SHEET NO. 24 FOR -L REV- RIGHT PROFILE

PROJECT REFERENCE NO. R-2320G	SHEET NO. 7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

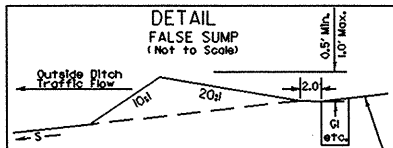
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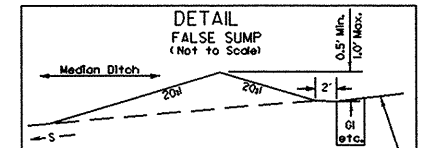
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35' @ 0.25%, DDE = 15 CY



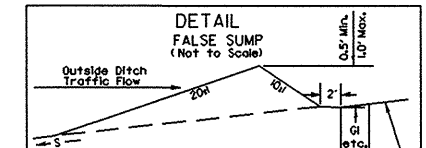
-LREV- 62+70 TO 65+50 LT.
-LREV- 63+20 TO 65+00 RT.



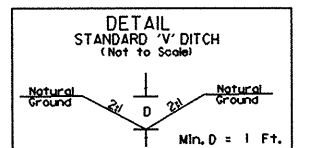
-LREV- 72+20 LT.



-LREV- 62+50 MED., 65+75 MED., 69+25 MED., 72+45 MED.



-LREV- 72+20 RT.

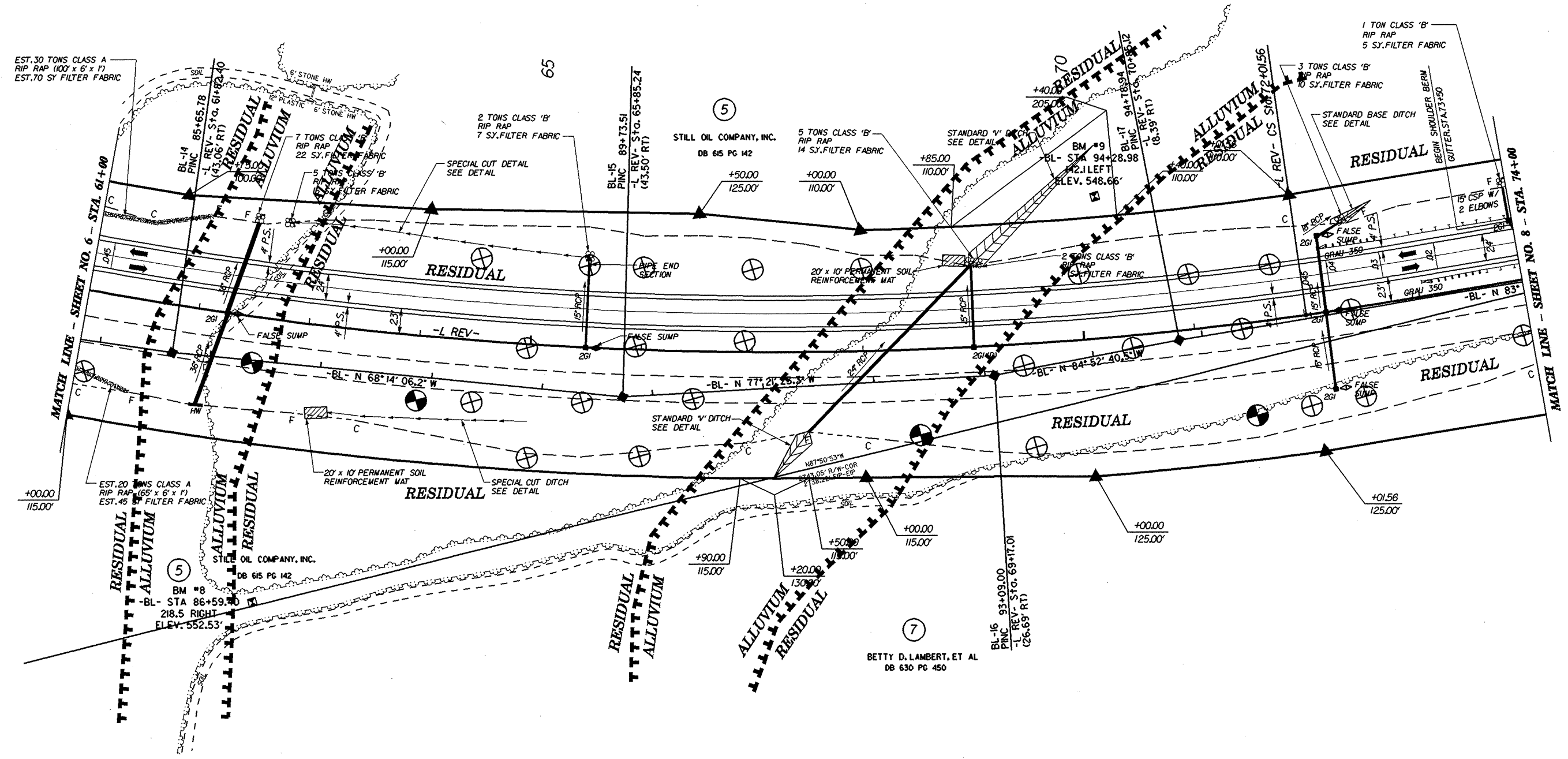


-LREV- 67+30 RT., 50' @ 4.6%, DDE = 10 CY
-LREV- 69+50 LT., 160' @ 0.2%, DDE = 25 CY

NC GRID
MAD 83

-L REV-
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L = 3,311.27'
T = 1,800.23'
R = 3,400.00'
SUPER = 4.5%

-L REV-
PIs Sta 72+76.56
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Ls = 225.00'
LT = 150.00'
ST = 75.00'



SEE SHEET NO. 25 FOR -L REV- LEFT PROFILE
SEE SHEET NO. 25 FOR -L REV- RIGHT PROFILE

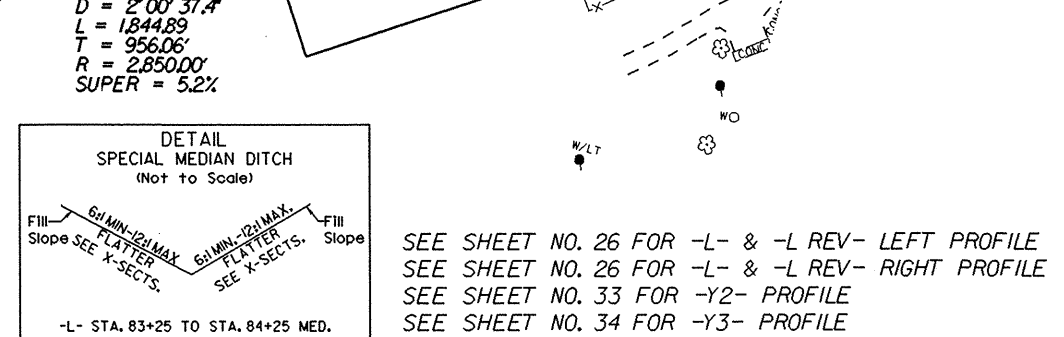
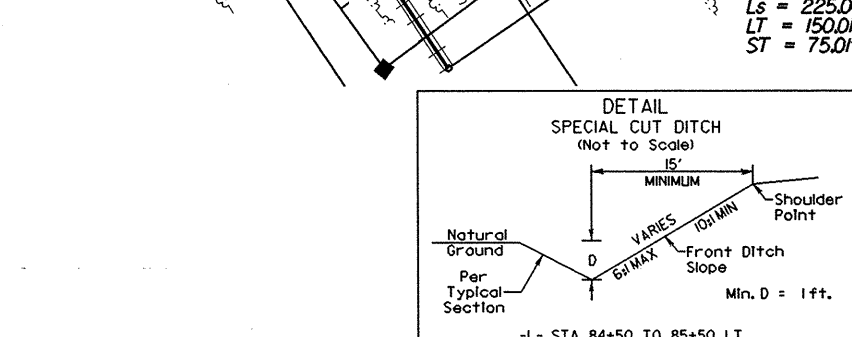
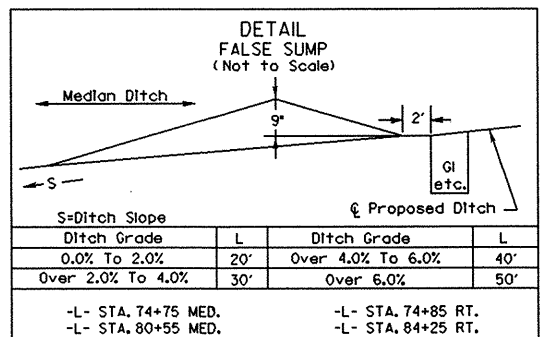
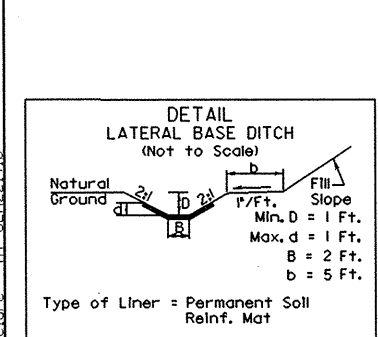
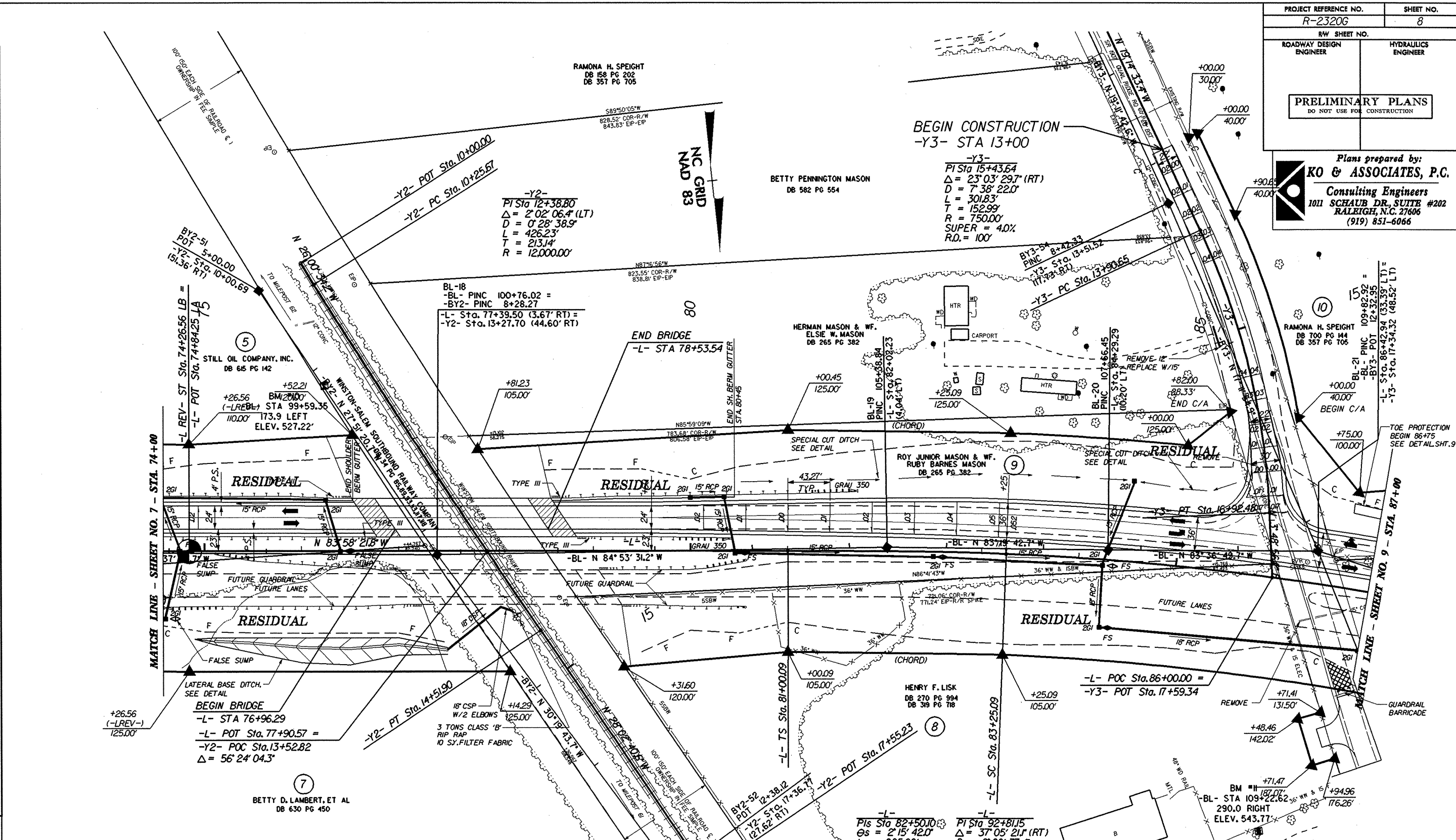
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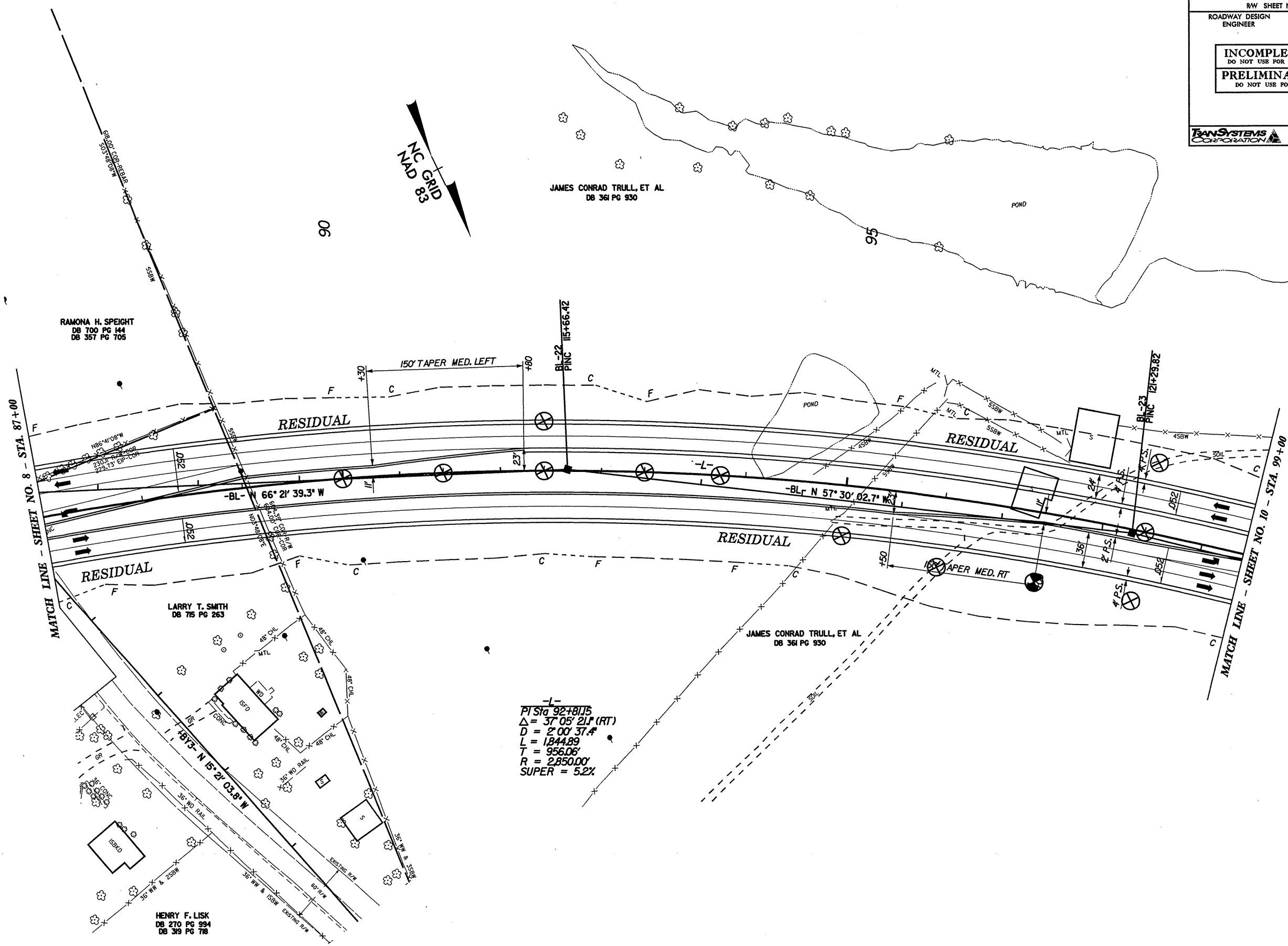
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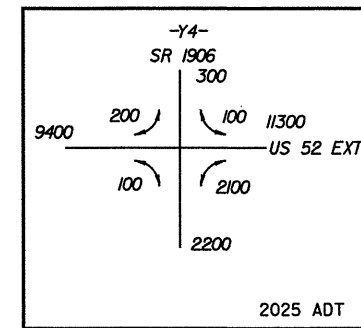
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 SEE SHEET NO. 33 FOR -Y2- PROFILE
 SEE SHEET NO. 34 FOR -Y3- PROFILE

PROJECT REFERENCE NO. R-2320G	SHEET NO. 9
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INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
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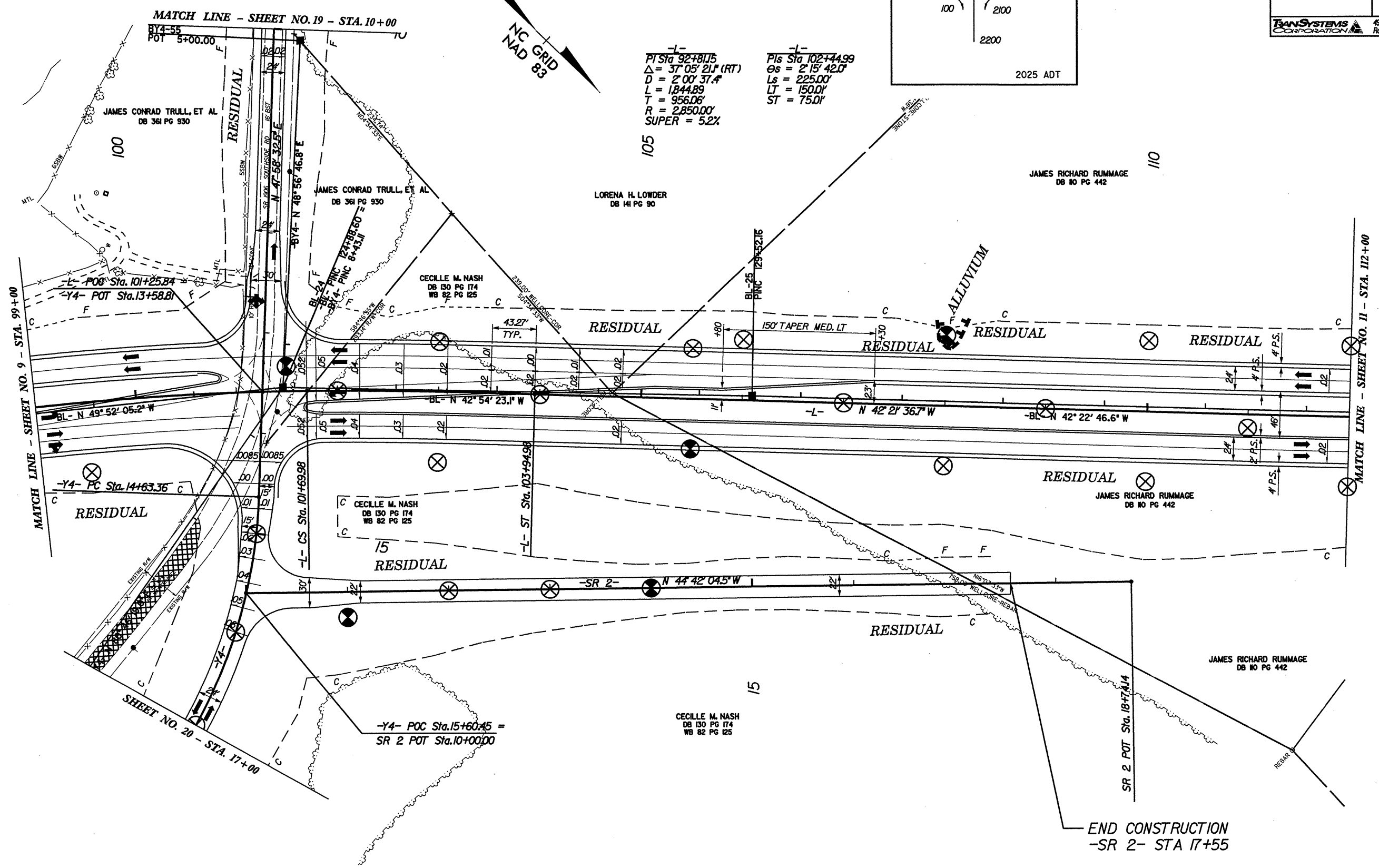
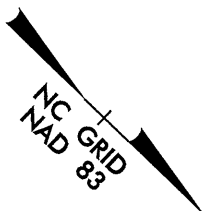


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INCOMPLETE PLANS		PRELIMINARY PLANS	
DO NOT USE FOR S/W ACQUISITION		DO NOT USE FOR CONSTRUCTION	
TRANSYSTEMS CORPORATION		497 Waters Edge Drive, Suite 235 Raleigh, NC 27606 (919) 233-8125	



-L-
 PI Sta 92+81.5
 $\Delta = 37^{\circ} 05' 21.1''$ (RT)
 $D = 2^{\circ} 00' 37.4''$
 $L = 1,844.89$
 $T = 956.06'$
 $R = 2,850.00'$
 SUPER = 5.2%

-L-
 PI Sta 102+44.99
 $\Delta s = 2^{\circ} 15' 42.0''$
 $Ls = 2,225.00'$
 $LT = 150.01'$
 $ST = 75.01'$



REVISIONS

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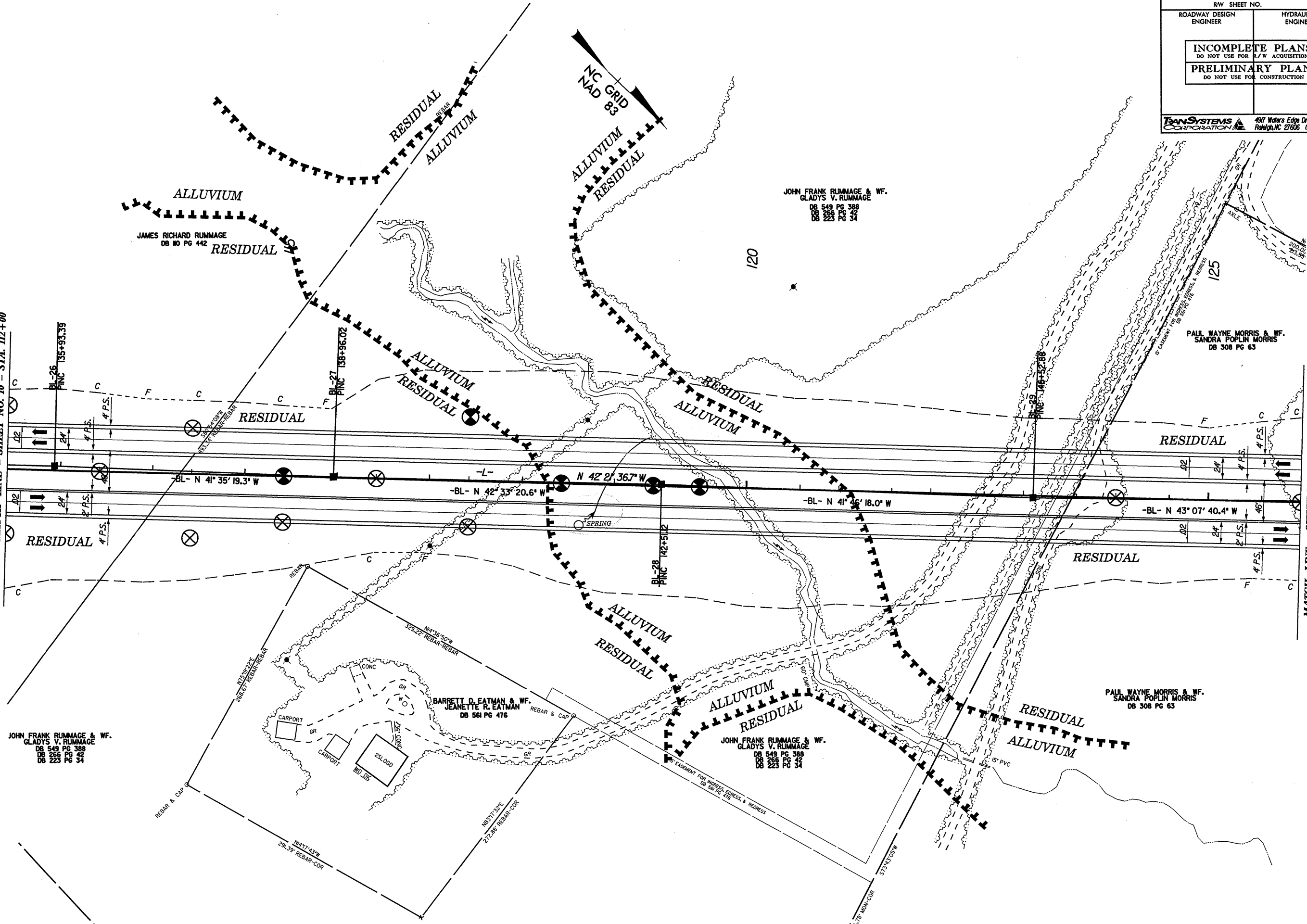
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INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
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REVISIONS

MATCH LINE - SHEET NO. 10 - STA. 112+00

MATCH LINE - SHEET NO. 12 - STA. 126+00



JAMES RICHARD RUMMAGE
DB 10 PG 442
RESIDUAL

JOHN FRANK RUMMAGE & WF.
GLADYS V. RUMMAGE
DB 549 PG 388
DB 226 PG 42
DB 223 PG 34

PAUL WAYNE MORRIS & WF.
SANDRA POPLIN MORRIS
DB 308 PG 63

BARRETT D. EATMAN & WF.
JEANETTE R. EATMAN
DB 561 PG 476

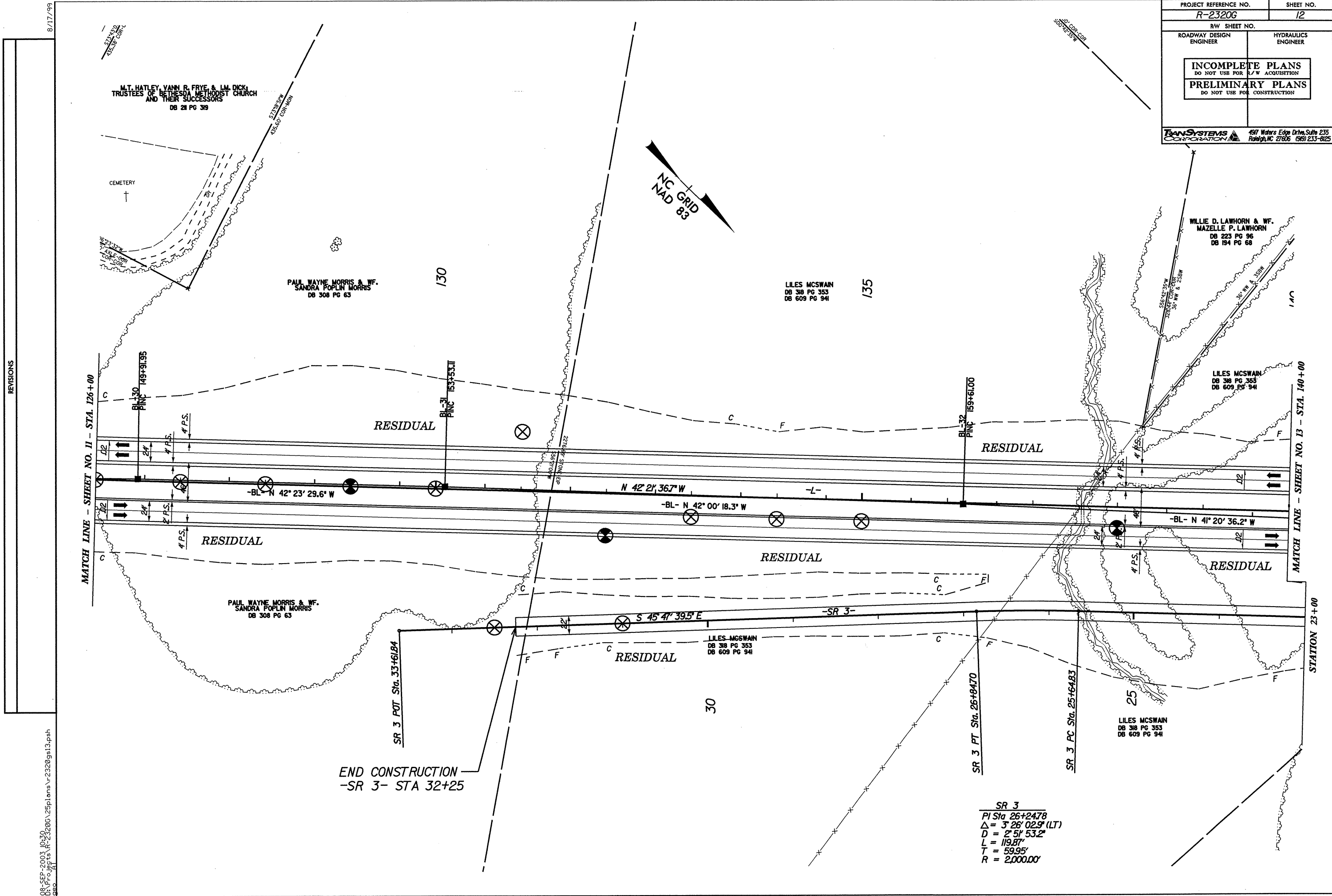
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PAUL WAYNE MORRIS & WF.
SANDRA POPLIN MORRIS
DB 308 PG 63

JOHN FRANK RUMMAGE & WF.
GLADYS V. RUMMAGE
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PROJECT REFERENCE NO. R-2320G	SHEET NO. 12
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR P/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
TRANSYSTEMS CORPORATION 497 Waters Edge Drive, Suite 235 Raleigh, NC 27606 (919) 233-8125	



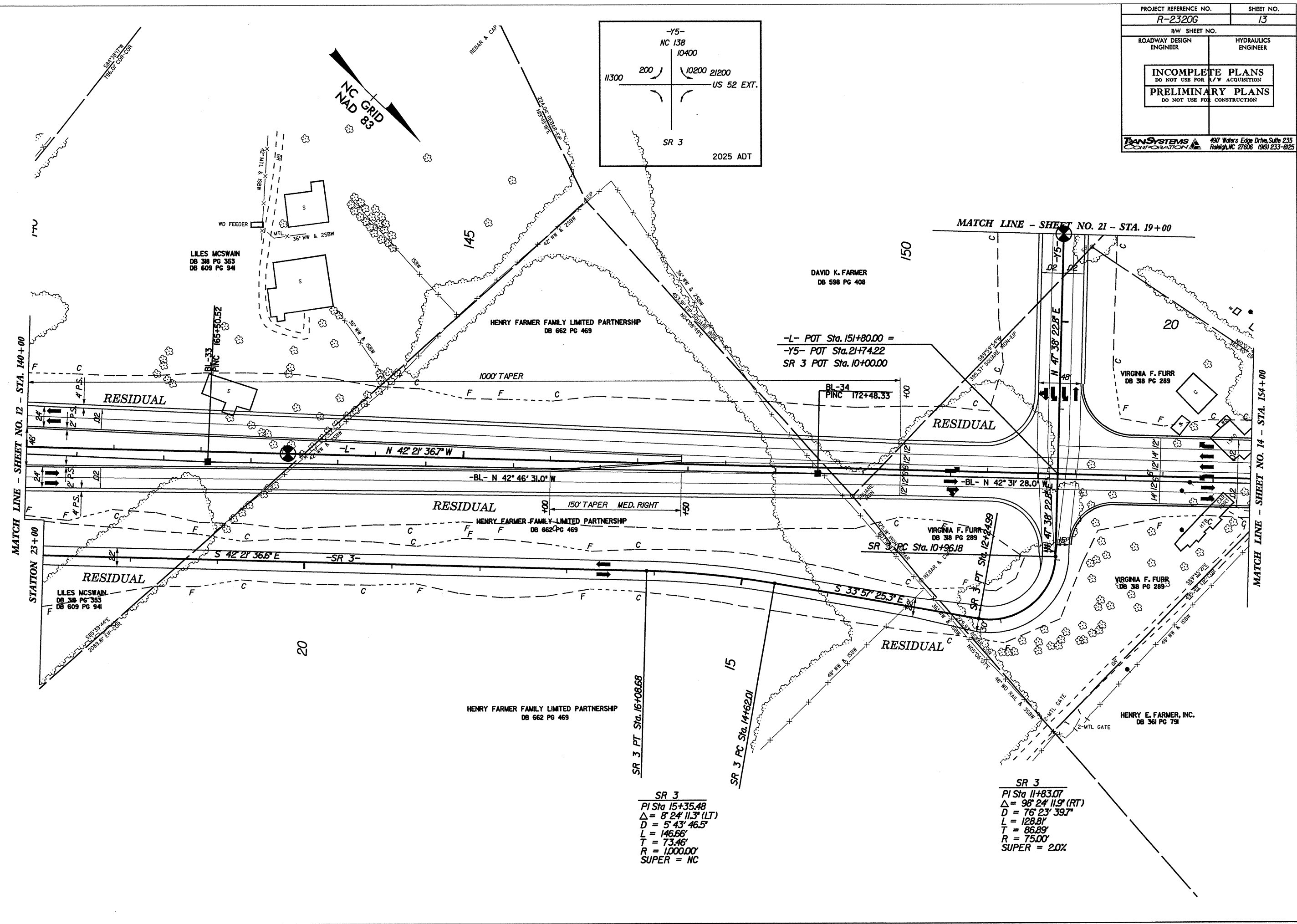
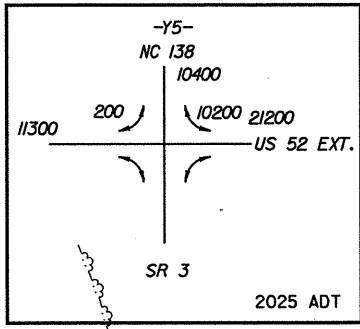
REVISIONS

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END CONSTRUCTION
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 D = 2° 51' 53.2"
 L = 119.87'
 T = 59.95'
 R = 2000.00'



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MATCH LINE - SHEET NO. 21 - STA. 19+00

MATCH LINE - SHEET NO. 14 - STA. 154+00

STATION 23+00

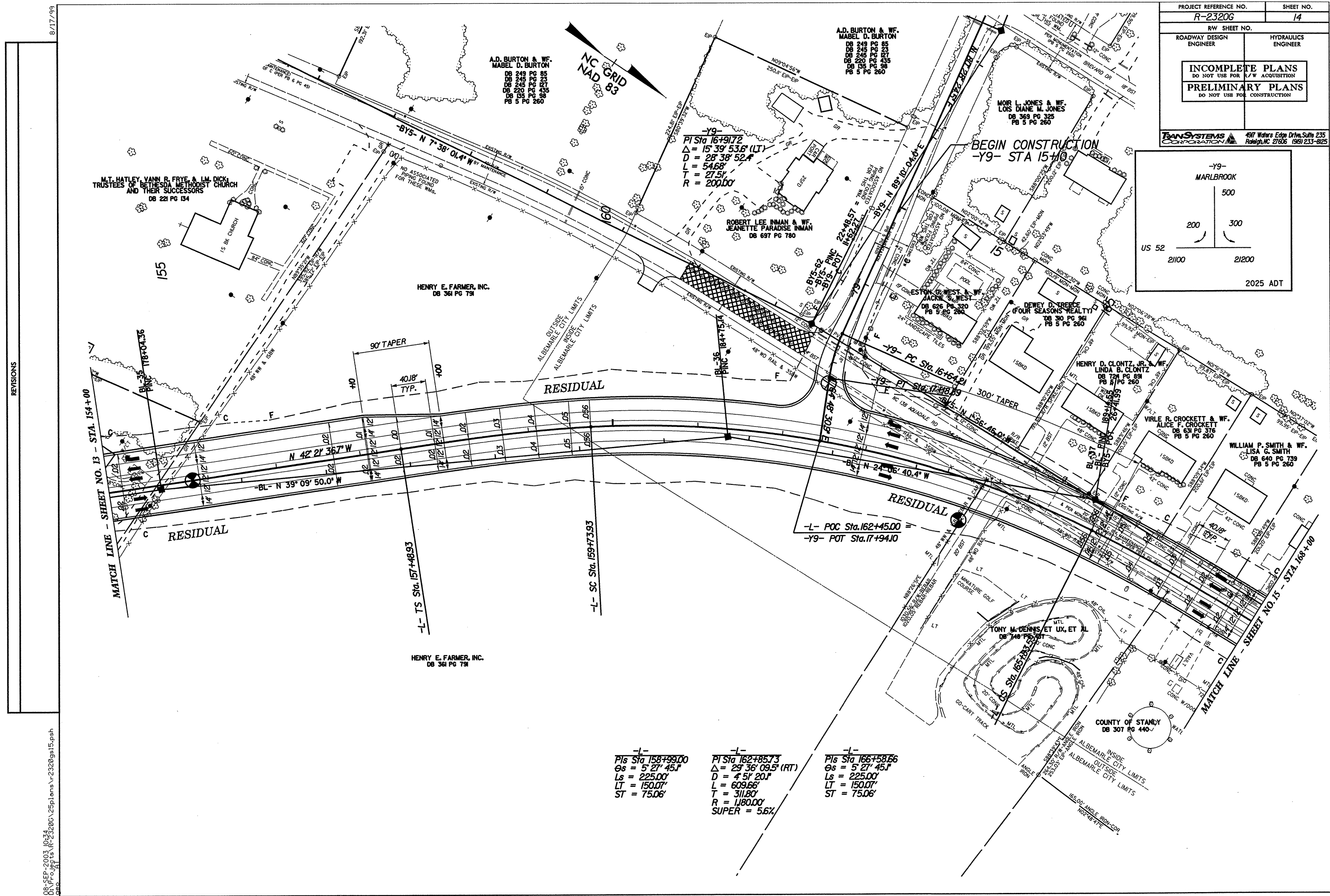
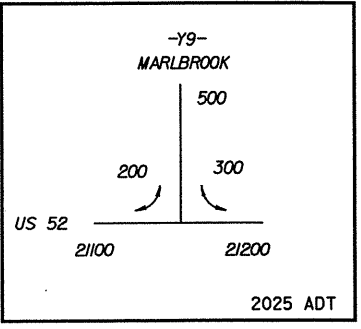
REVISIONS

NC GRID
NAD 83

SR 3
 PI Sta 15+35.48
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 $D = 5' 43' 46.5''$
 $L = 146.66'$
 $T = 73.46'$
 $R = 1000.00'$
 SUPER = NC

SR 3
 PI Sta 11+83.07
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 $T = 86.89'$
 $R = 75.00'$
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8/17/99
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A.D. BURTON & WF.
 MABEL D. BURTON
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 DB 220 PG 435
 DB 135 PG 98
 PB 5 PG 260

A.D. BURTON & WF.
 MABEL D. BURTON
 DB 249 PG 85
 DB 245 PG 83
 DB 220 PG 435
 DB 135 PG 98
 PB 5 PG 260

MOIR L. JONES & WF.
 LOIS DIANE M. JONES
 DB 369 PG 325
 PB 5 PG 260

ROBERT LEE INMAN & WF.
 JEANETTE PARADISE INMAN
 DB 697 PG 780

M.T. HATLEY, YANN R. FRYE, & LM. DICK
 TRUSTEES OF BETHESDA METHODIST CHURCH
 AND THEIR SUCCESSORS
 DB 221 PG 134

HENRY E. FARMER, INC.
 DB 361 PG 791

HENRY D. CLONTZ, JR. & WF.
 LINDA B. CLONTZ
 DB 724 PG 891
 PB 7 PG 260

VIRLE R. CROCKETT & WF.
 ALICE F. CROCKETT
 DB 631 PG 376
 PB 5 PG 260

WILLIAM P. SMITH & WF.
 LISA G. SMITH
 DB 640 PG 739
 PB 5 PG 260

TONY M. DENNIS ET UX, ET AL
 DB 748 PG 801

COUNTY OF STANLEY
 DB 307 PG 440

-L-
 PIs Sta 158+99.00
 Δs = 5' 27" 45.1"
 Ls = 225.00'
 LT = 150.07'
 ST = 75.06'

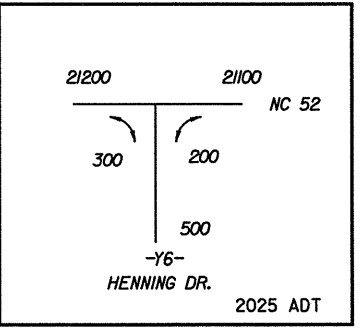
-L-
 PI Sta 162+85.73
 Δ = 29' 36" 09.5" (RT)
 D = 4' 51" 20.1"
 L = 609.66'
 T = 311.80'
 R = 1180.00'
 SUPER = 5.6%

-L-
 PIs Sta 166+58.66
 Δs = 5' 27" 45.1"
 Ls = 225.00'
 LT = 150.07'
 ST = 75.06'

REVISIONS

8/17/99

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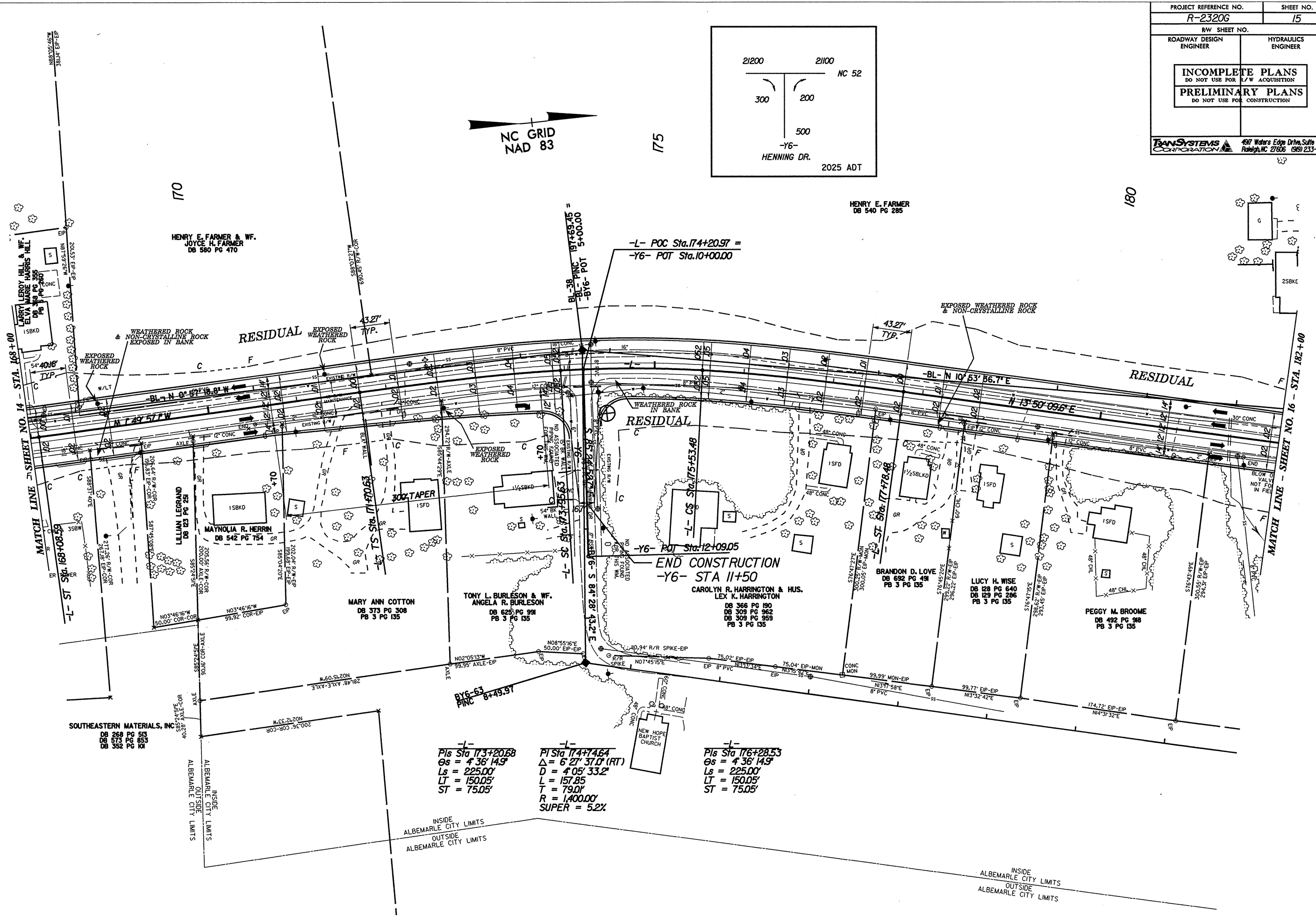
NC GRID
NAD 83

175

180

HENRY E. FARMER
DB 540 PG 285

HENRY E. FARMER & WF.
JOYCE H. FARMER
DB 580 PG 470



REVISIONS

$Pis Sta 173+20.68$
 $Os = 4' 36' 14.9"$
 $Ls = 225.00'$
 $LT = 150.05'$
 $ST = 75.05'$

$Pis Sta 174+74.64$
 $\Delta = 6' 27' 37.0" (RT)$
 $D = 4' 05' 33.2"$
 $L = 157.85$
 $T = 79.01'$
 $R = 1,400.00'$
 $SUPER = 5.2\%$

$Pis Sta 176+28.53$
 $Os = 4' 36' 14.9"$
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 $LT = 150.05'$
 $ST = 75.05'$

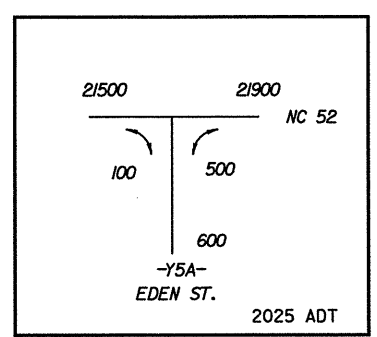
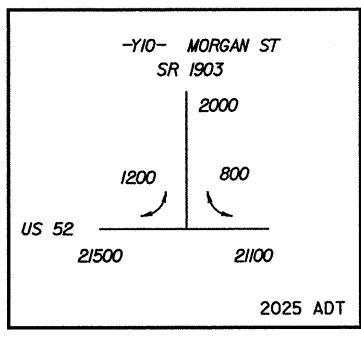
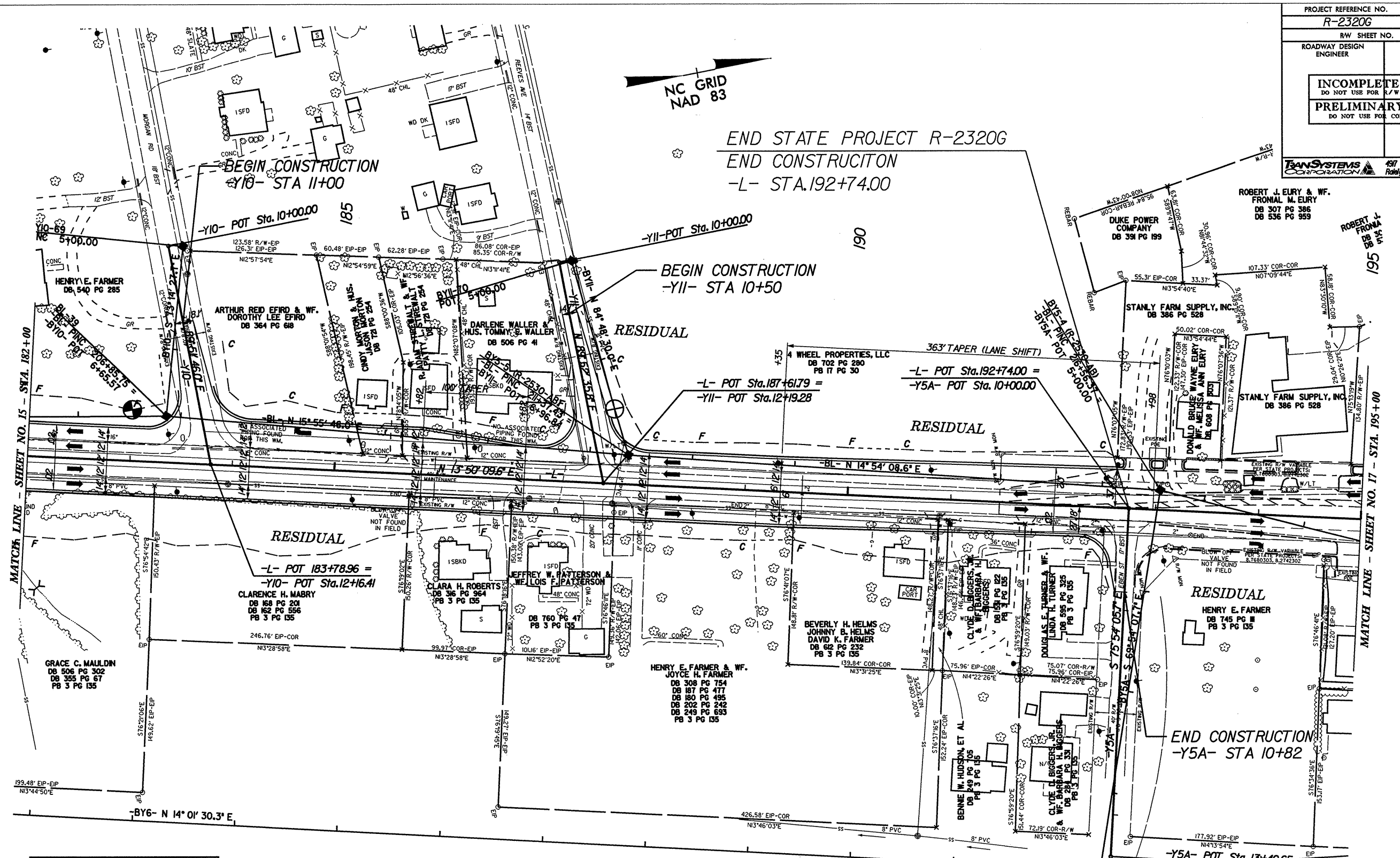
INSIDE
 ALBEMARLE CITY LIMITS
 OUTSIDE
 ALBEMARLE CITY LIMITS

INSIDE
 ALBEMARLE CITY LIMITS
 OUTSIDE
 ALBEMARLE CITY LIMITS

8/17/99
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NC GRID
NAD 83

END STATE PROJECT R-2320G
 END CONSTRUCTION
 -L- STA. 192+74.00



REVISIONS

8/17/99

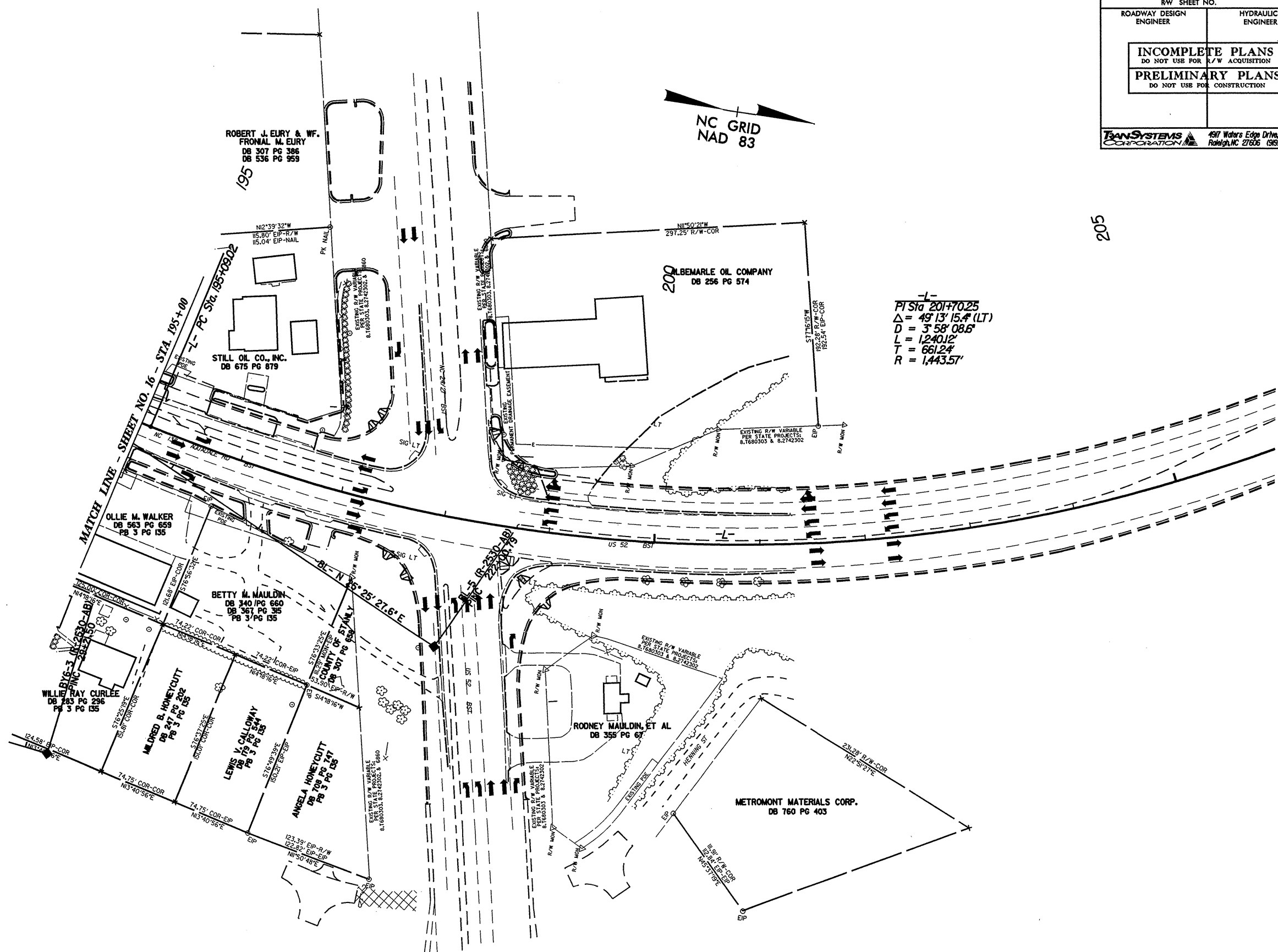
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PROJECT REFERENCE NO. R-2320G	SHEET NO. 17
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
TRANSYSTEMS CORPORATION 4917 Waters Edge Drive, Suite 235 Raleigh, NC 27606 (919) 233-8125	

8/17/99

REVISIONS

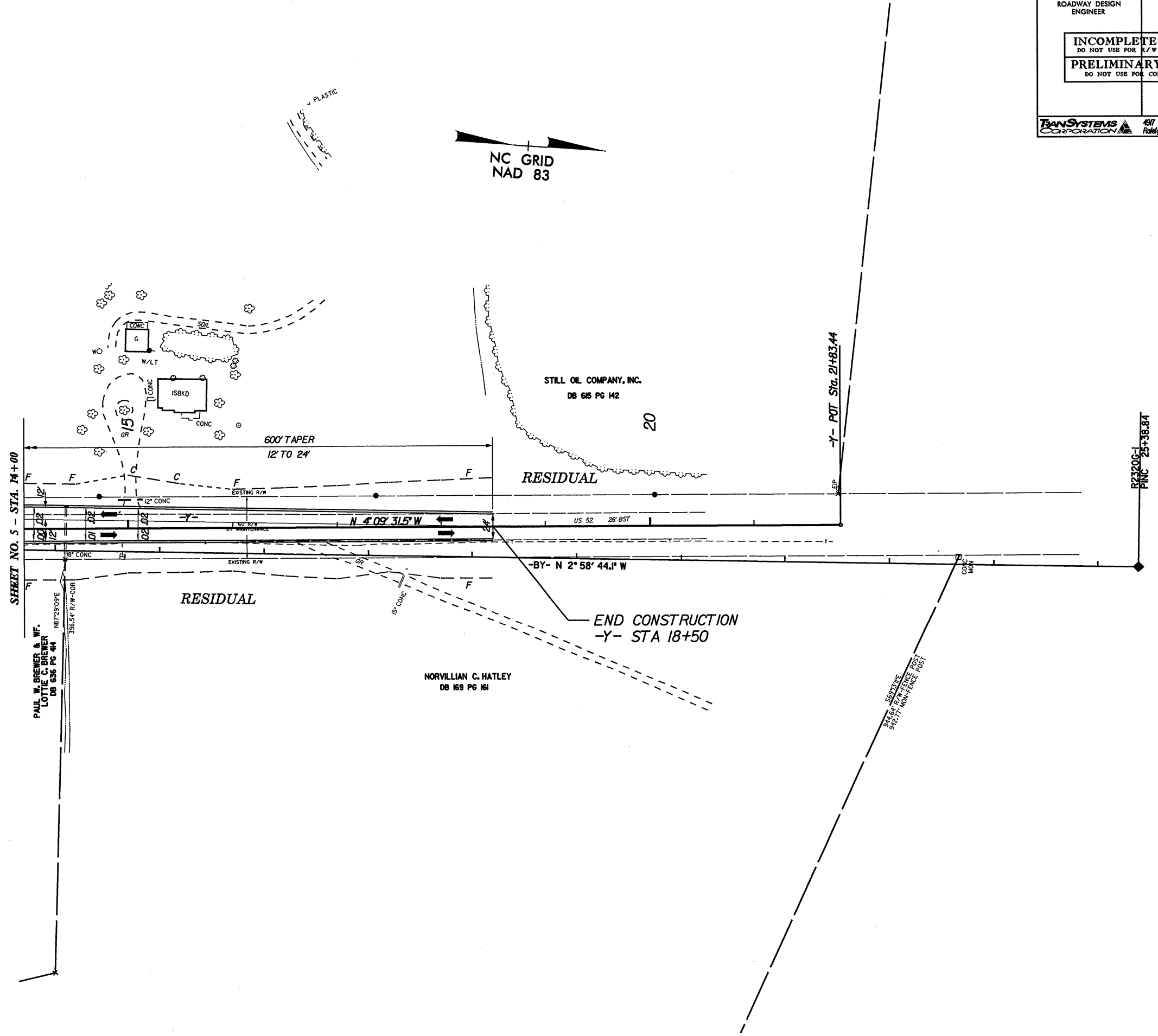
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205

PROJECT REFERENCE NO. <i>R-2320G</i>		SHEET NO. <i>18</i>	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER		
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
TRANSYSTEMS CORPORATION		4917 Waters Edge Drive, Suite 235 Raleigh, NC 27606 (919) 233-8125	

REVISIONS

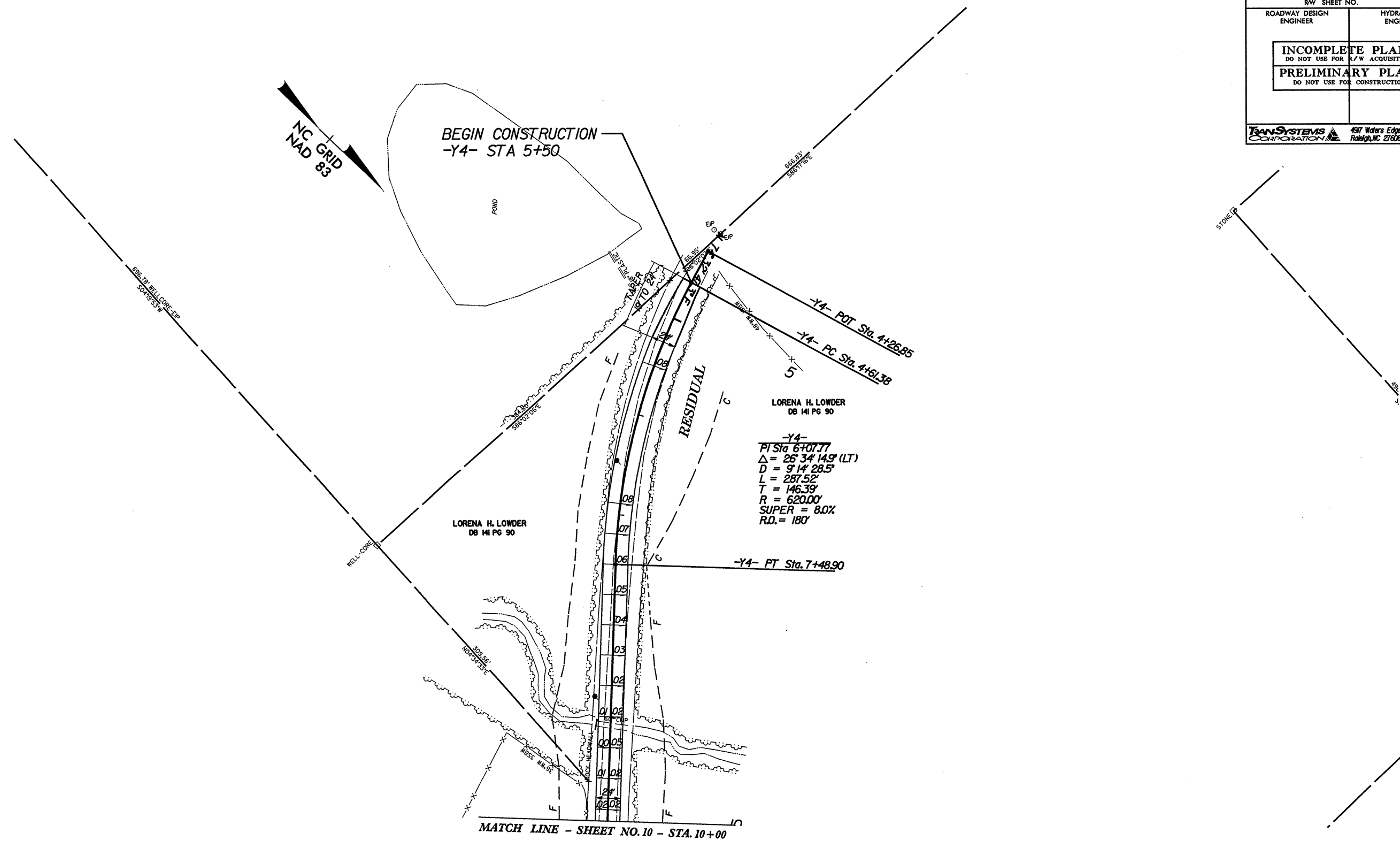


PROJECT REFERENCE NO. R-2320G	SHEET NO. 19
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
TRANSYSTEMS CORPORATION <small>4917 Waters Edge Drive, Suite 235 Raleigh, NC 27606 (919) 233-8125</small>	

8/17/99

REVISIONS

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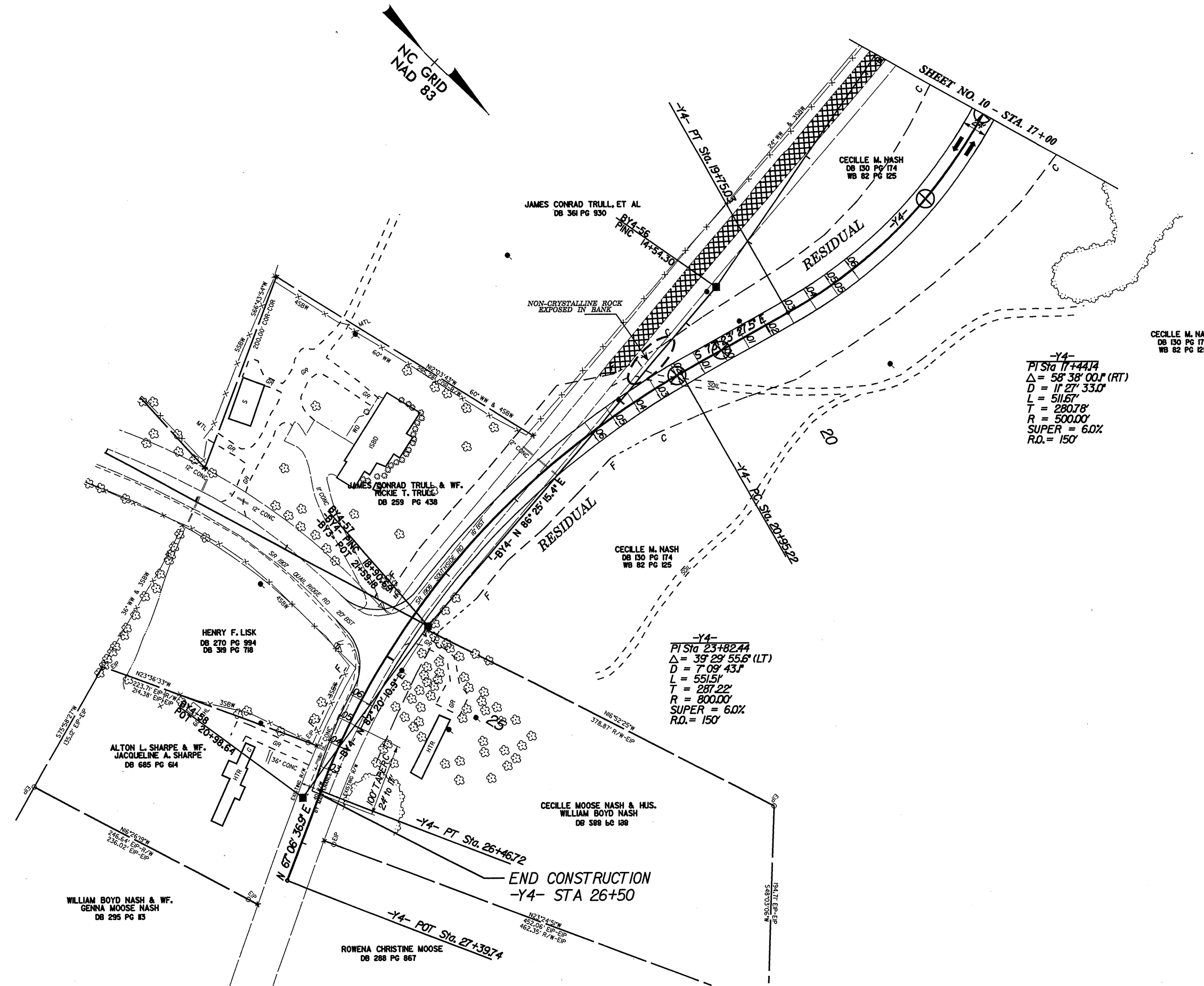
MATCH LINE - SHEET NO. 10 - STA. 10+00

PROJECT REFERENCE NO. R-2320G	SHEET NO. 20
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
TRANSYSTEMS CORPORATION <small>497 Waters Edge Drive, Suite 235 Raleigh, NC 27606 (919) 233-8125</small>	

8/17/99

REVISIONS

08-SEP-2003 10:44
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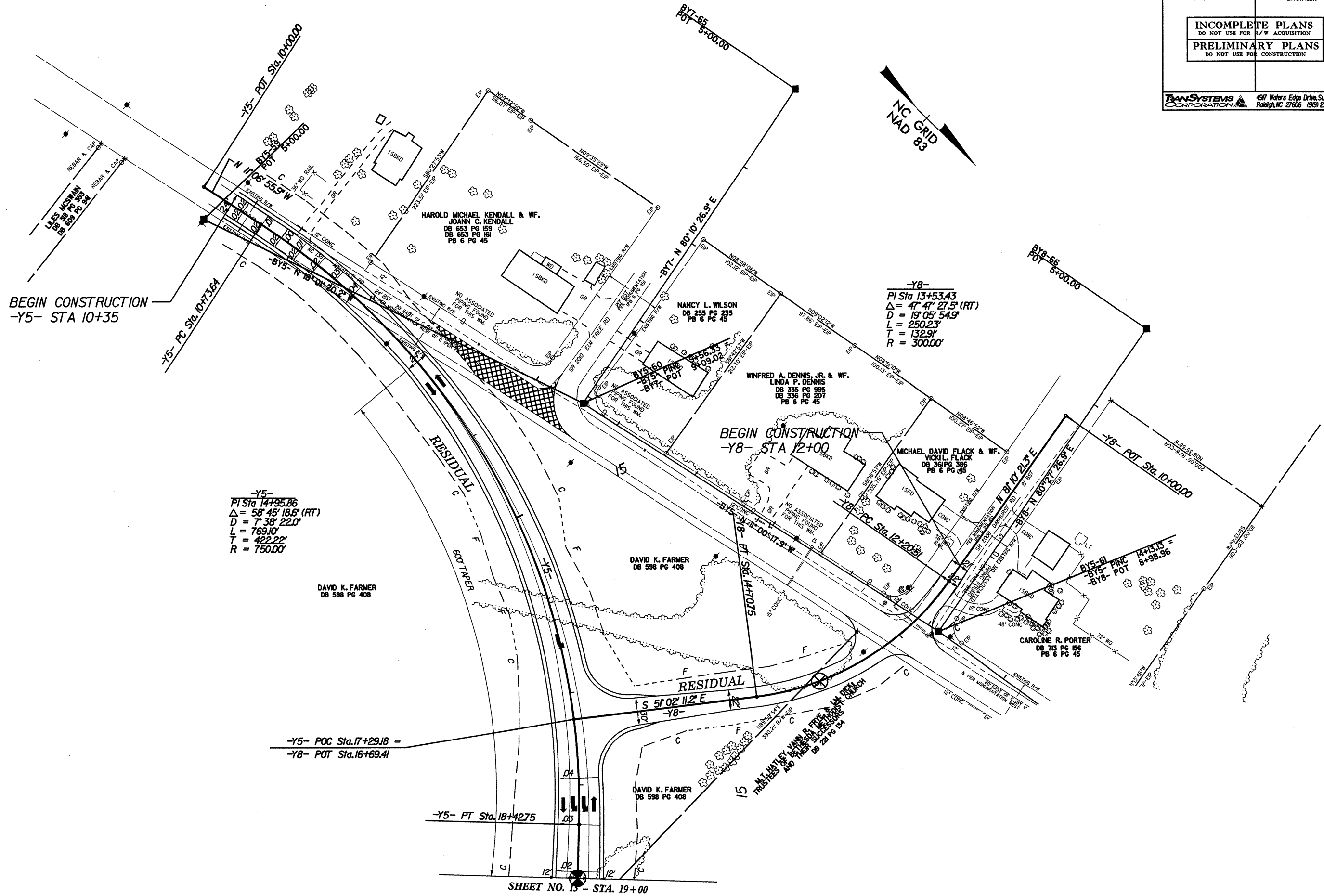


-Y4-
 PI Sta 17+44.74
 Δ = 58° 38' 00.1\"/>

-Y4-
 PI Sta 23+82.44
 Δ = 39° 29' 55.6\"/>

END CONSTRUCTION
 -Y4- STA 26+50

PROJECT REFERENCE NO. R-2320G	SHEET NO. 21
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
TRANSYSTEMS CORPORATION <small>497 Waters Edge Drive, Suite 235 Raleigh, NC 27606 (919) 233-8125</small>	



BEGIN CONSTRUCTION
-Y5- STA 10+35

BEGIN CONSTRUCTION
-Y8- STA 12+00

-Y5-
PI Sta 14+95.86
Δ = 58° 45' 18.6" (RT)
D = 7' 38" 22.0"
L = 769.10'
T = 422.22'
R = 750.00'

-Y8-
PI Sta 13+53.43
Δ = 47° 47' 27.5" (RT)
D = 19' 05" 54.9"
L = 250.23'
T = 132.91'
R = 300.00'

-Y5- POC Sta. 17+29.18 =
-Y8- POT Sta. 16+69.41

-Y5- PT Sta. 18+42.75

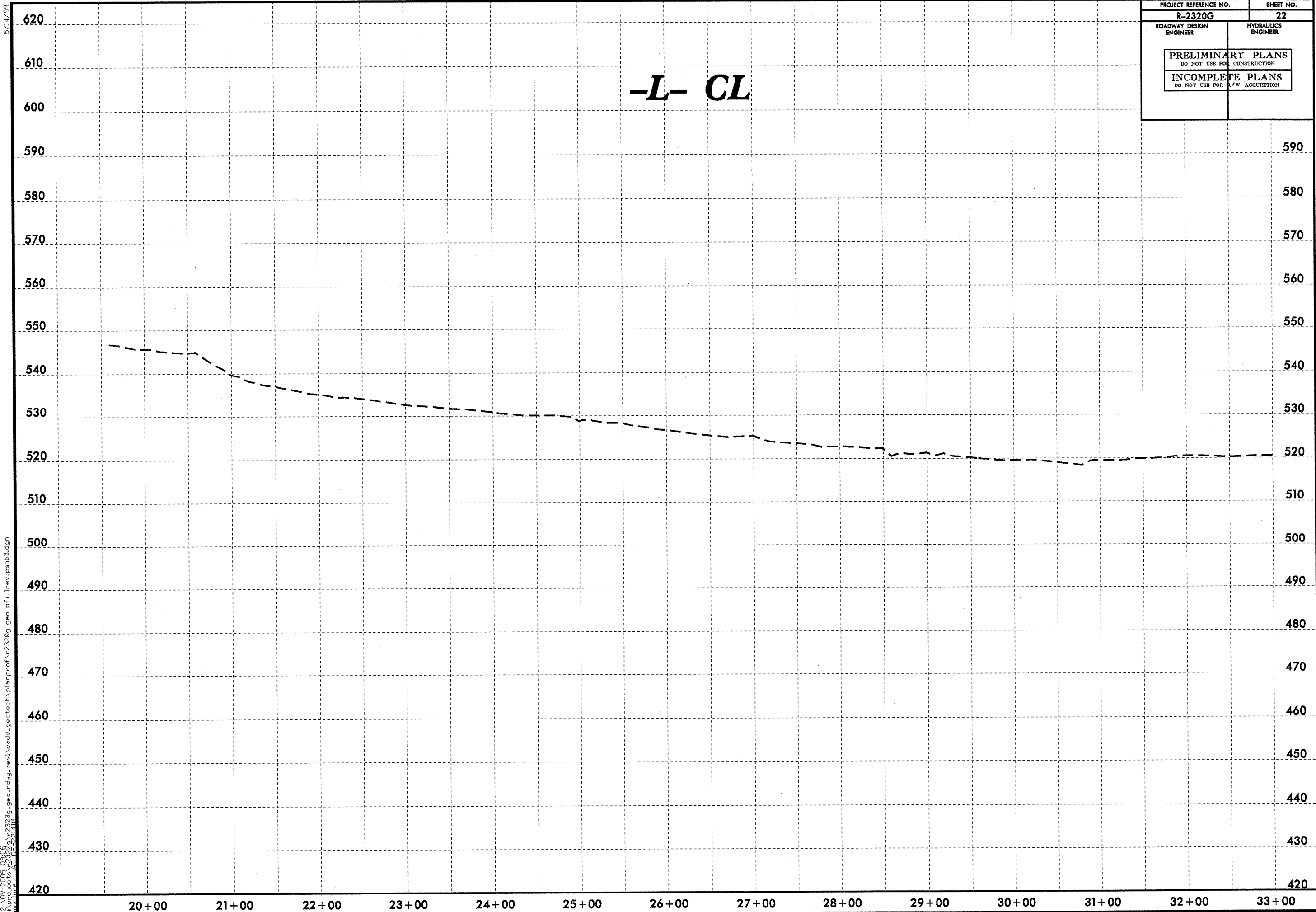
SHEET NO. 15 - STA. 19+00

REVISIONS

8/17/99
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 geo

PROJECT REFERENCE NO.	SHEET NO.
R-2320G	22
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR ACQUISITION	

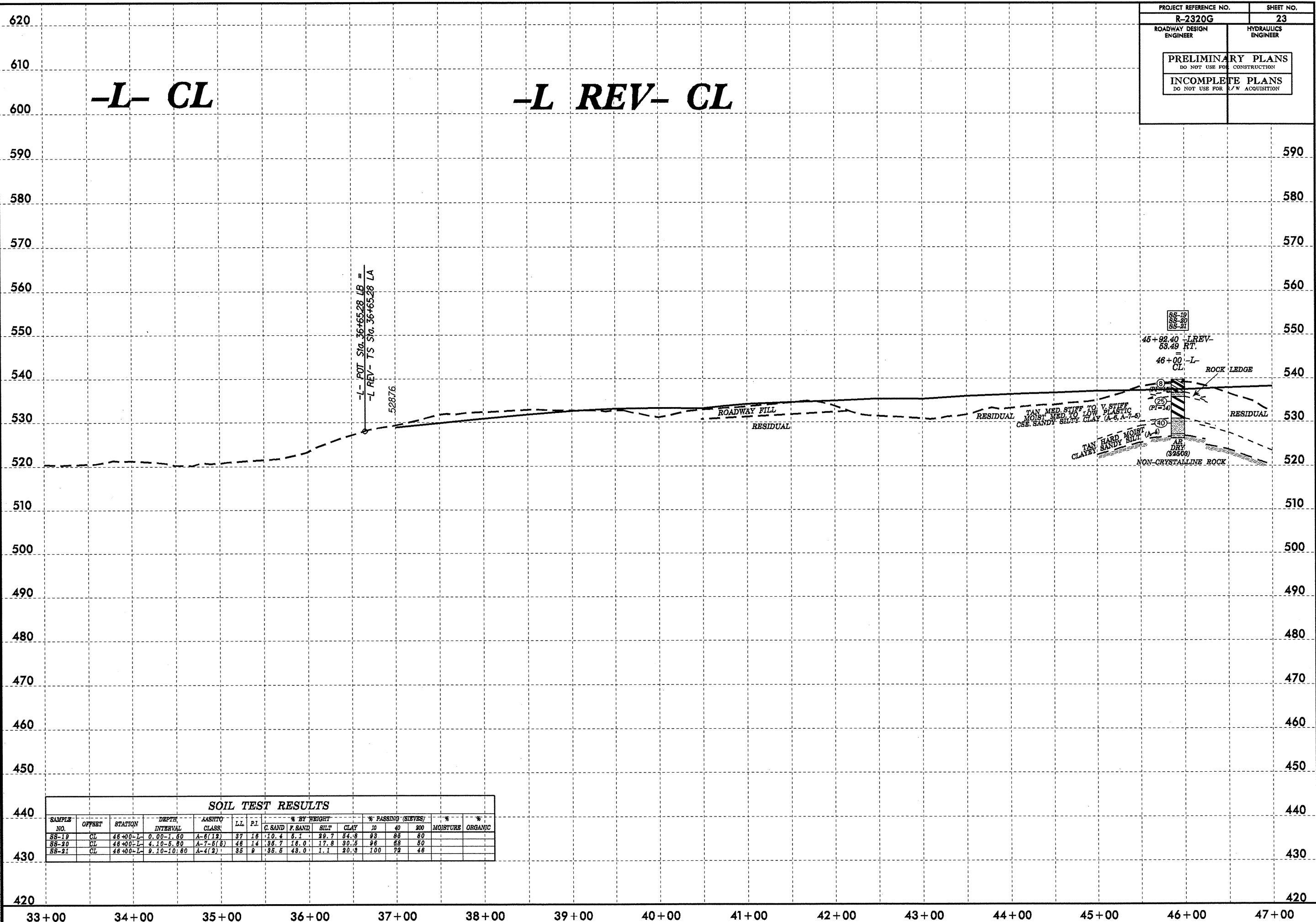
-L- CL



5/14/99
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PROJECT REFERENCE NO. R-2320G	SHEET NO. 23
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	



-L- CL

-L REV- CL

-L- POT Sta. 36+65.28 LB =
 -L REV- TS Sta. 36+65.28 LA
 52876

SS-19
 SS-20
 SS-21

45+92.40 -L REV-
53.49 RT.

46+00 -L-
CL

ROCK LEDGE

(25)
(PI-14)

(40)
AR DRY
(32808)

NON-CRYSTALLINE ROCK

ROADWAY FILL
RESIDUAL

RESIDUAL
TAN MED. STIFF TO V. STIFF
MOIST MED. TO LOW PLASTIC
CLAYEY SANDY SILTY CLAY (A-6, A-7-8)

TAN HARD MOIST
CLAYEY SANDY SILTY
CLAY (A-4)

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS	LL	PL	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-19	CL	46+00-L	0.00-1.50	A-6(12)	37	16	10.4	6.1	29.7	54.8	98	85	80		
SS-20	CL	46+00-L	4.10-5.80	A-7-8(6)	46	14	36.7	16.0	17.8	30.5	96	68	50		
SS-21	CL	46+00-L	9.10-10.80	A-4(2)	36	9	35.5	48.0	1.1	20.8	100	72	48		

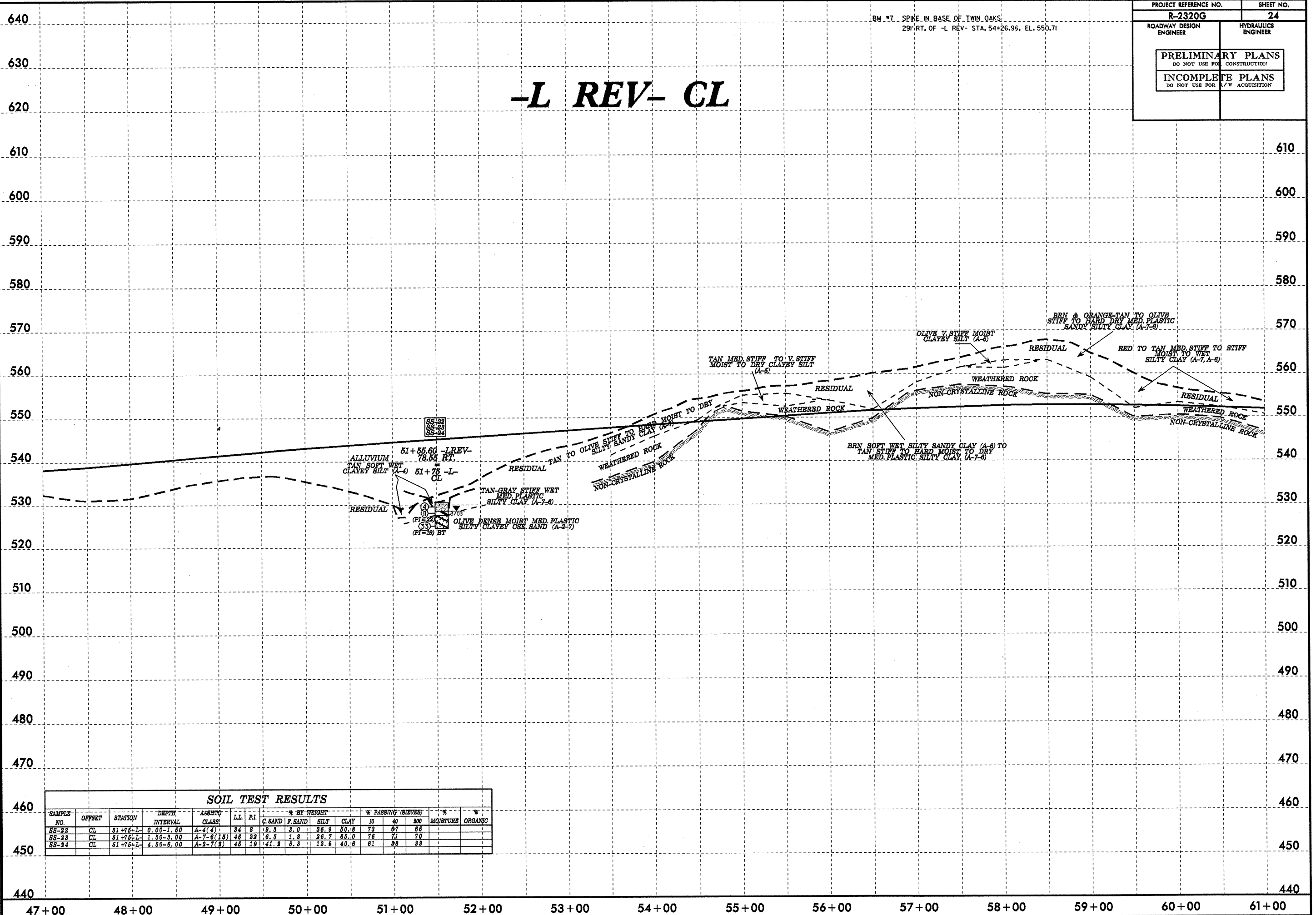
33+00 34+00 35+00 36+00 37+00 38+00 39+00 40+00 41+00 42+00 43+00 44+00 45+00 46+00 47+00

5/14/99
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 AT: (P)

BM #7 SPIKE IN BASE OF TWIN OAKS
 29' RT. OF -L REV- STA. 54+26.96, EL. 550.71

PROJECT REFERENCE NO.		SHEET NO.	
R-2320G		24	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER		
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			

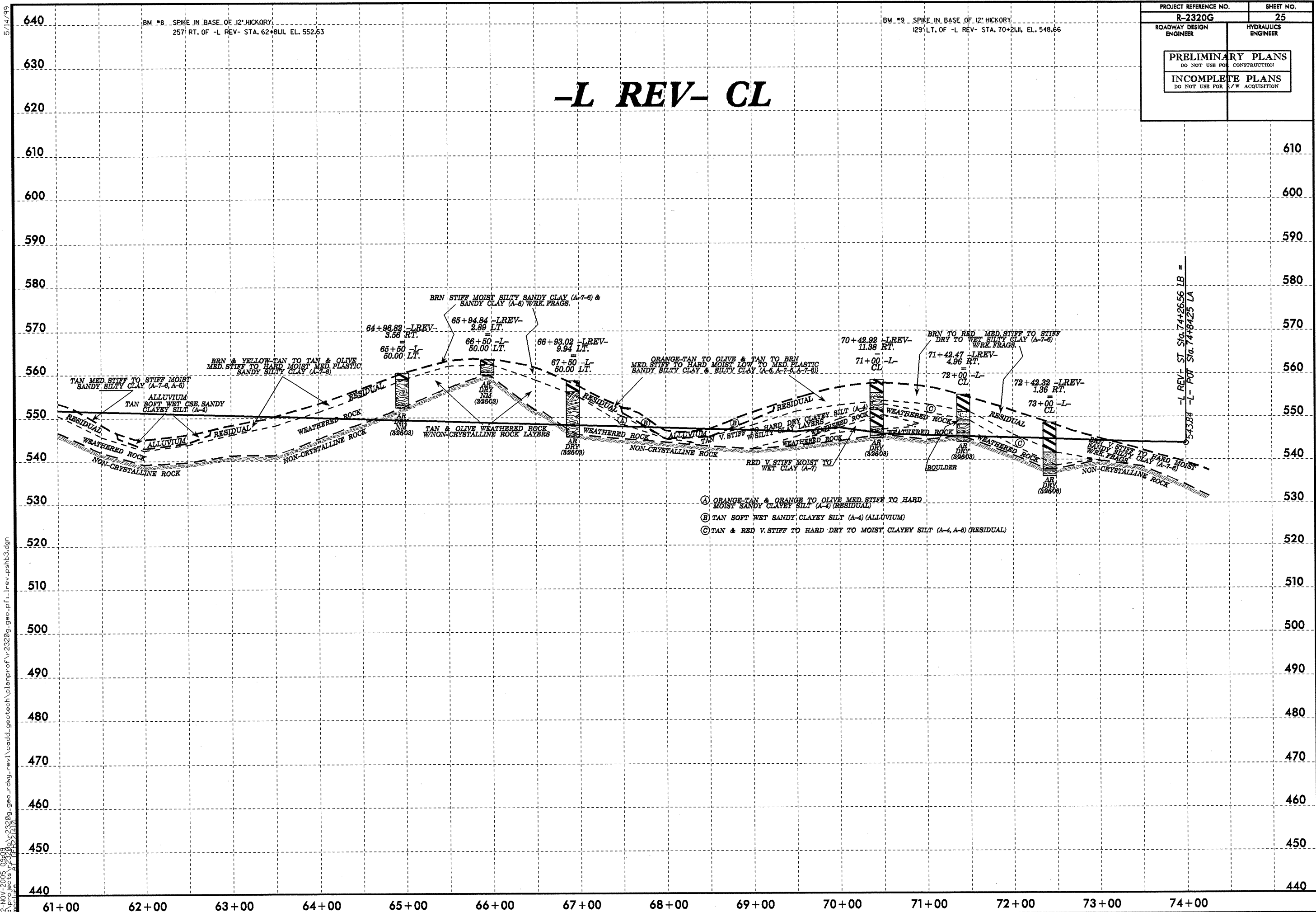
-L REV- CL



SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-22	CL	51+76-L	0.00-1.50	A-4(4)	34	8	9.3	3.0	36.9	50.8	73	67	66		
SS-23	CL	51+76-L	1.50-3.00	A-7-6(16)	48	22	6.5	1.8	26.7	65.0	76	71	70		
SS-24	CL	51+76-L	4.50-6.00	A-2-7(2)	45	19	41.2	5.3	12.9	40.6	61	38	33		

PROJECT REFERENCE NO.	SHEET NO.
R-2320G	25
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR ACQUISITION	

-L REV- CL



BM #8 SPIKE IN BASE OF 12" HICKORY
257' RT. OF -L REV- STA. 62+81.11, EL. 552.53

BM #9 SPIKE IN BASE OF 12" HICKORY
129' LT. OF -L REV- STA. 70+21.11, EL. 548.66

- Ⓐ ORANGE-TAN & ORANGE TO OLIVE MED STIFF TO HARD MOIST SANDY CLAYEY SILT (A-4) (RESIDUAL)
- Ⓑ TAN SOFT WET SANDY CLAYEY SILT (A-4) (ALLUVIUM)
- Ⓒ TAN & RED V. STIFF TO HARD DRY TO MOIST CLAYEY SILT (A-4, A-5) (RESIDUAL)

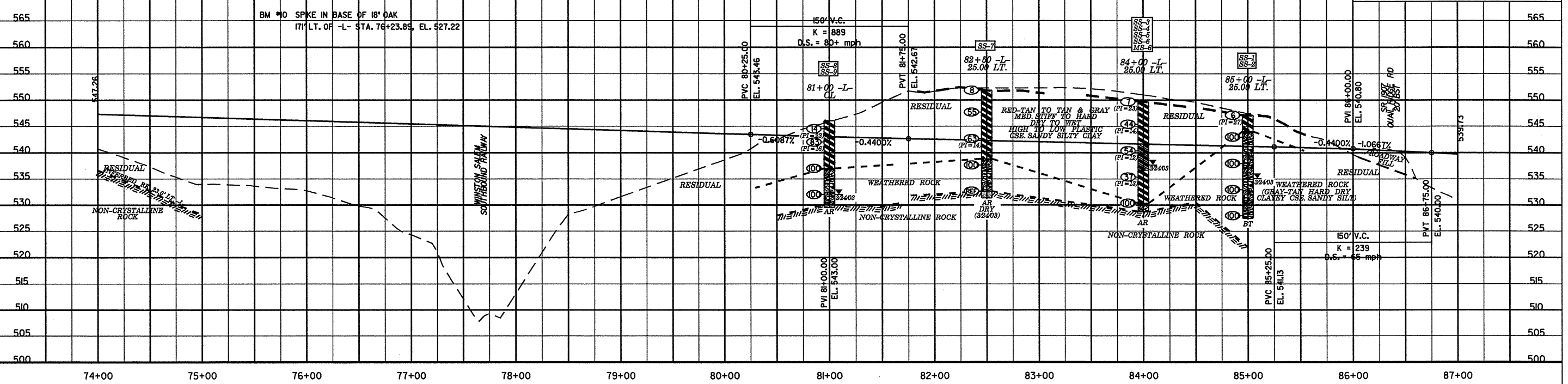
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5/28/99

TRANS SYSTEMS CORPORATION 497 Waters Edge Drive, Suite 235 Raleigh, NC 27606 (919) 233-8125

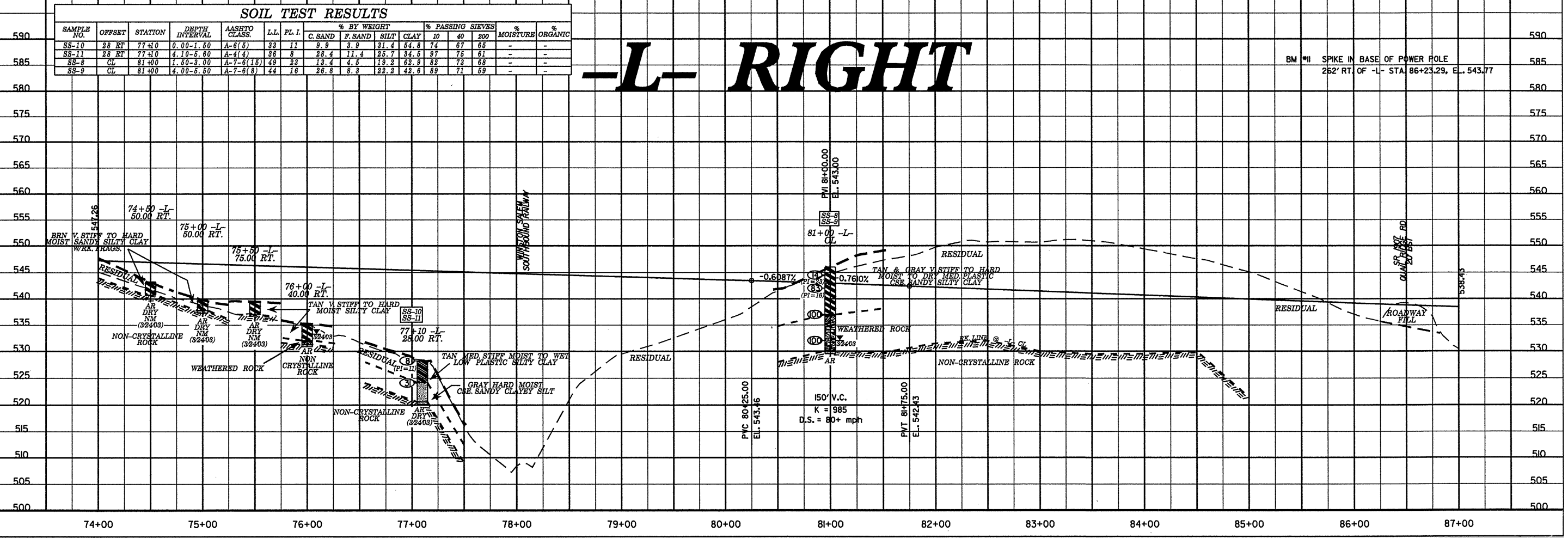
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.L.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-3	CL	81+00	1.50-3.00	A-7-6(15)	49	23	13.4	4.5	19.2	62.9	82	73	68	-	-
SS-9	CL	81+00	4.00-5.50	A-7-6(8)	44	18	26.8	8.3	22.2	42.6	89	71	59	-	-
SS-7	25 LT	82+50	9.20-10.70	A-7-6(12)	44	14	15.6	6.3	35.4	44.7	96	84	77	-	-
SS-3	25 LT	84+00	0.00-1.50	A-7-6(2)	53	23	6.1	2.2	19.6	73.1	98	84	82	-	-
SS-4	25 LT	84+00	4.30-5.80	A-7-6(12)	42	14	16.9	4.7	21.6	56.9	99	85	79	-	-
SS-5	25 LT	84+00	9.30-10.80	A-6(4)	40	12	37.6	7.5	20.4	34.5	89	60	60	-	-
MS-6	25 LT	84+00	14.30-15.80				0.0	0.0	0.0	0.0	0	0	0	28.6	-
SS-6	25 LT	84+00	14.30-15.80	A-7-6(10)	46	18	17.7	7.5	28.1	46.7	95	81	73	-	-
SS-1	25 LT	85+00	0.00-1.50	A-7-6(14)	56	27	14.2	4.9	11.9	69.0	72	64	69	-	-
SS-2	25 LT	85+00	4.10-5.50	A-4(3)	38	10	37.0	9.9	20.6	32.6	95	66	52	-	-

-L- LEFT



SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.L.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-10	28 RT	77+10	0.00-1.50	A-6(5)	33	11	9.9	3.9	31.4	54.8	74	67	65	-	-
SS-11	28 RT	77+10	4.10-6.60	A-4(4)	36	8	28.4	11.4	26.7	34.5	97	75	61	-	-
SS-8	CL	81+00	1.50-3.00	A-7-6(15)	49	23	13.4	4.5	19.2	62.9	82	73	68	-	-
SS-9	CL	81+00	4.00-5.50	A-7-6(8)	44	16	26.8	8.3	22.2	42.6	89	71	59	-	-

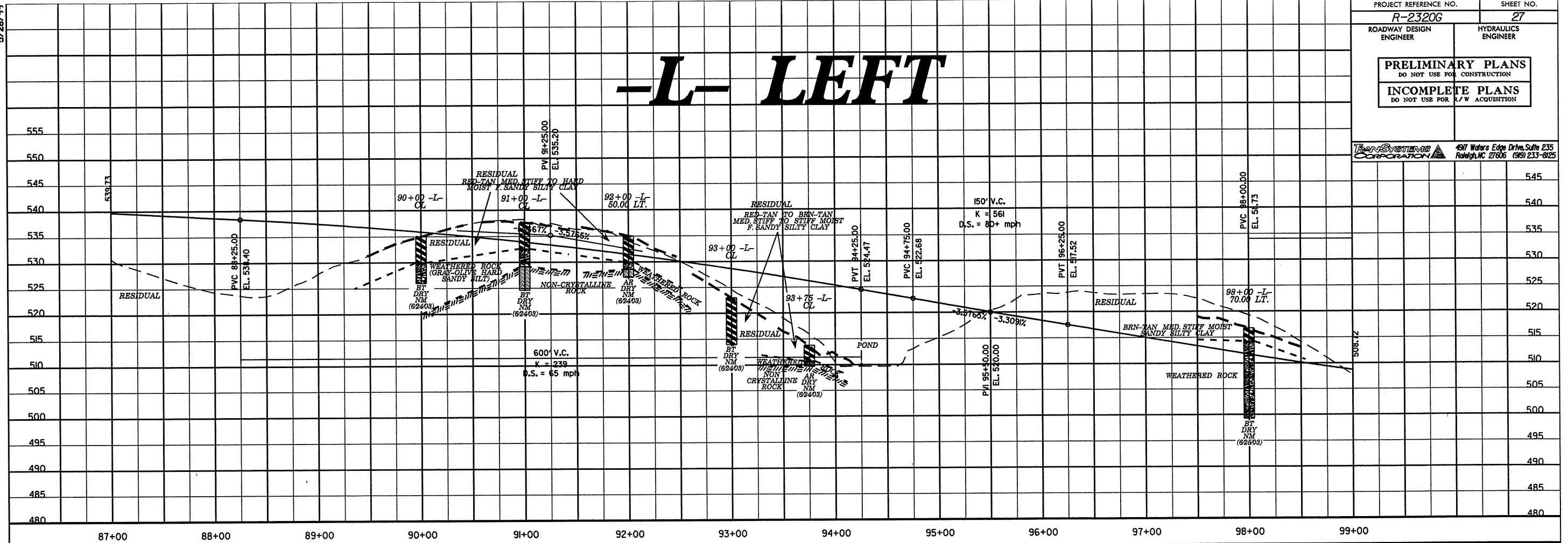
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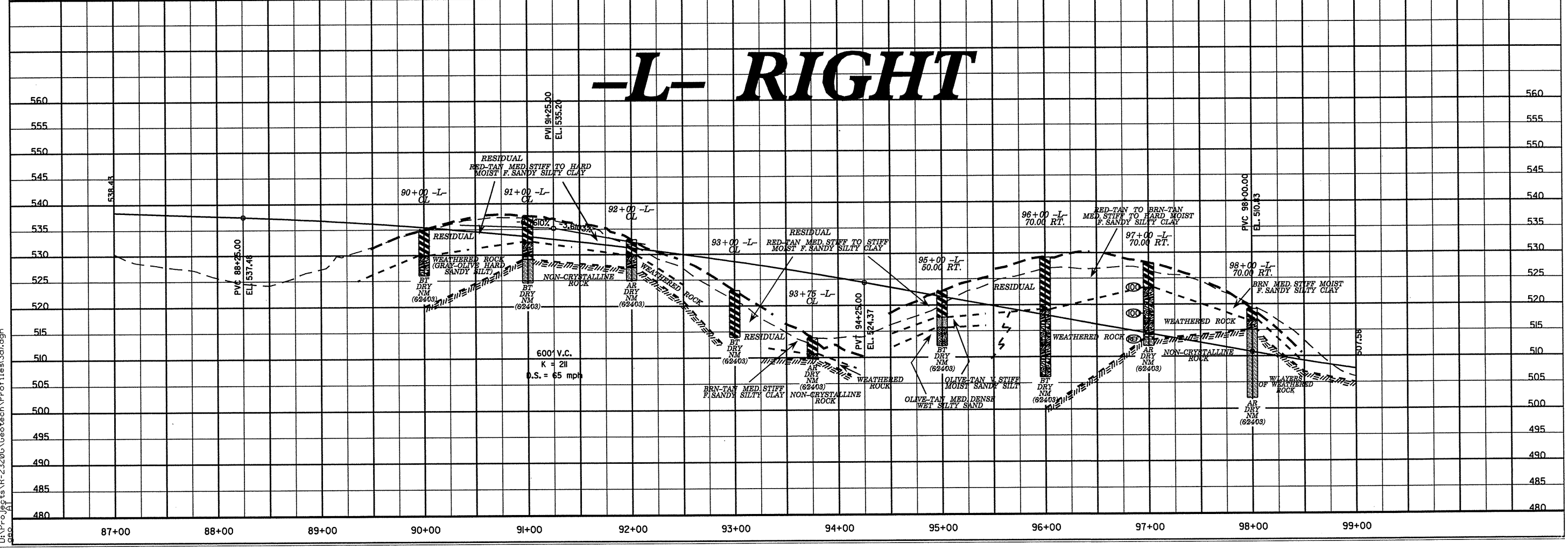
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TRANSYSTEMS CORPORATION 4917 Waters Edge Drive, Suite 235 Raleigh, NC 27606 (919) 233-8125

-L- LEFT



-L- RIGHT



5/28/99

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5/28/99

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.L.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-35	25 LT	101+50	0.00-1.50	A-6(3)	38	13	24.6	5.7	25.3	44.4	65	52	46	-	-
SS-36	25 LT	101+50	8.50-10.00	A-7-5(17)	48	18	7.1	5.1	29.3	58.6	93	88	83	-	-
SS-109	50 LT	103+00	0.00-1.50	A-6(10)	38	12	6.3	4.8	38.4	50.5	88	83	80	-	-
SS-110	50 LT	103+00	3.80-5.30	A-6(2)	37	12	42.4	6.9	14.8	36.4	79	49	41	-	-

PROJECT REFERENCE NO. **R-2320G** SHEET NO. **28**

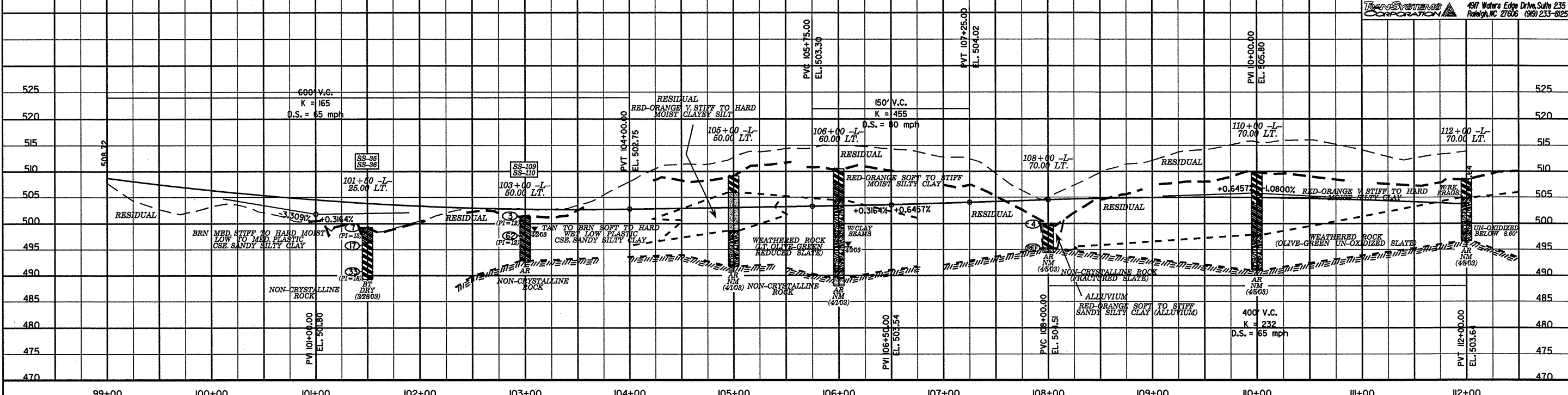
ROADWAY DESIGN ENGINEER HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

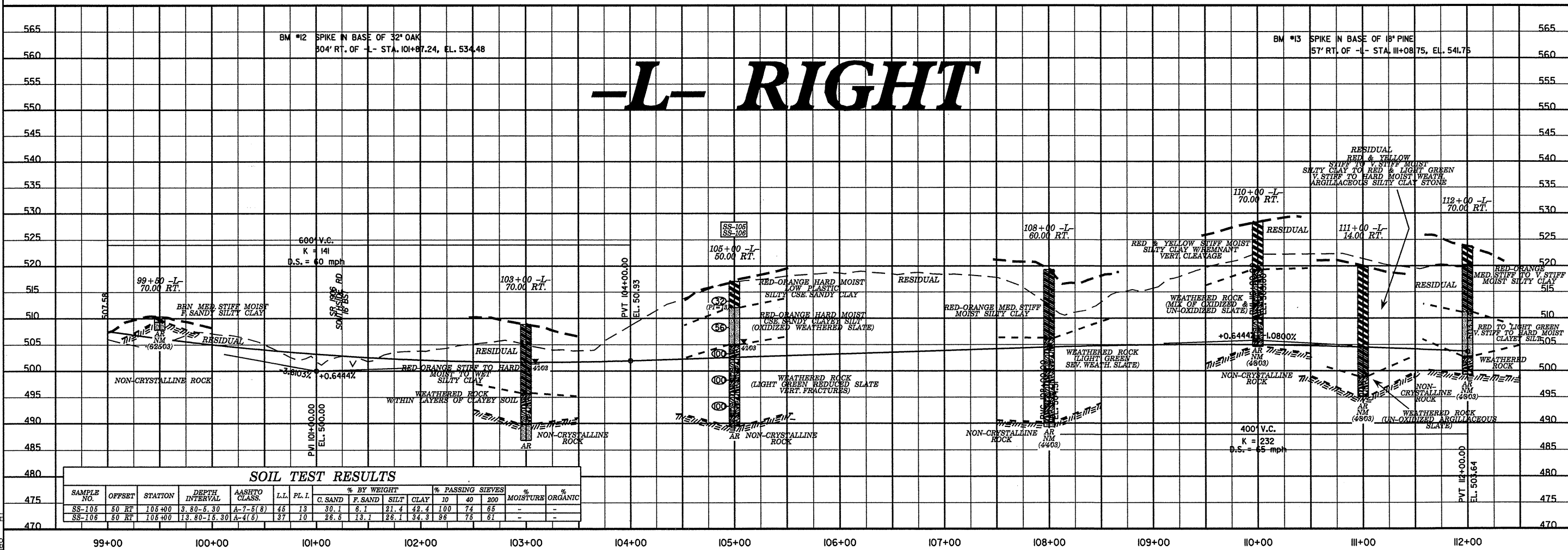
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

TRANS SYSTEMS CORPORATION 4517 Waters Edge Drive, Suite 235 Raleigh, NC 27606 (919) 233-8125

-L- LEFT



-L- RIGHT



SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.L.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-105	50 RT	105+00	3.80-5.30	A-7-5(8)	45	13	30.1	6.1	21.4	42.4	100	74	65	-	-
SS-106	50 RT	105+00	13.80-15.30	A-4(6)	37	10	26.5	13.1	26.1	34.3	98	75	61	-	-

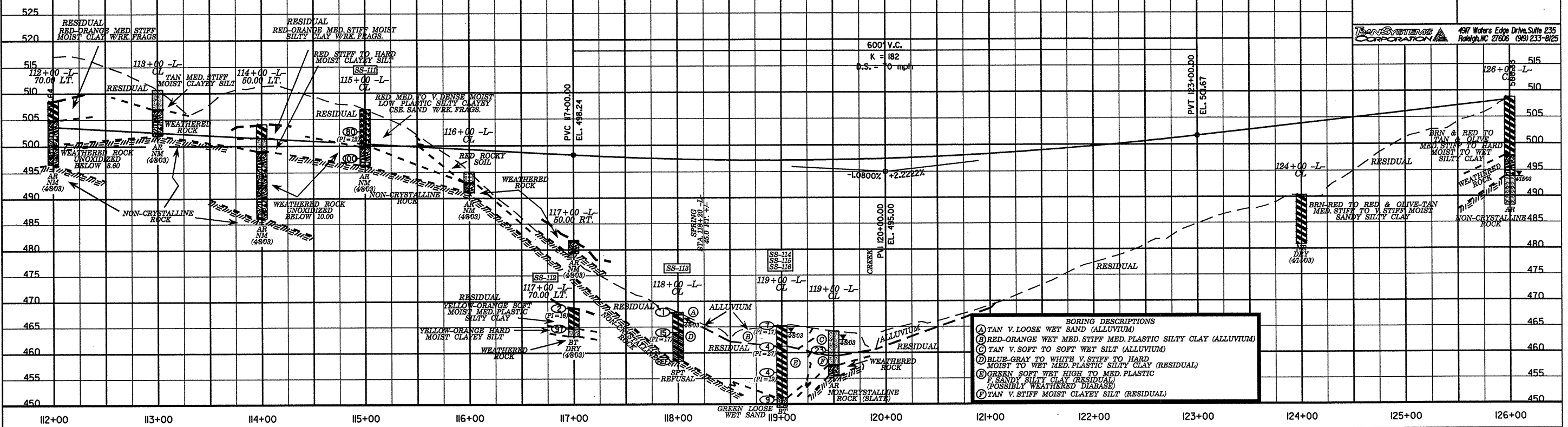
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5/28/99

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.L.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-111	CL	115+00	4.20-5.70	A-2-6(0)	37	12	40.6	14.3	14.7	30.3	43	28	20	-	-
SS-112	70 LT	117+00	0.00-1.60	A-7-6(10)	41	16	8.7	4.4	30.3	66.6	77	72	68	-	-
SS-113	70 LT	118+00	4.00-5.60	A-6(16)	39	17	6.5	6.3	32.7	66.6	95	91	87	-	-
SS-114	CL	119+00	0.00-1.60	A-7-6(12)	41	17	15.8	6.3	30.7	48.6	91	79	74	-	-
SS-115	CL	119+00	4.00-5.60	A-7-6(29)	65	27	4.2	13.9	35.4	46.5	100	98	86	-	-
SS-116	CL	119+00	8.00-10.60	A-7-6(8)	51	19	20.4	32.5	37.0	10.1	100	89	64	-	-

BM #14 SPIKE IN BASE OF 12' SWEETGUM
151' RT. OF -L- STA. 122+30.39 EL. 470.38

TRANS SYSTEMS CORPORATION
497 Waters Edge Drive, Suite 235
Raleigh, NC 27606 (919) 233-8125



SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.L.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-50	CL	128+00	1.00-8.00	A-7-6(36)	63	30	1.4	4.5	21.3	72.9	100	99	95	-	-
SS-57	CL	129+00	1.00-2.60	A-7-6(17)	48	19	7.3	7.6	26.6	48.6	100	95	88	-	-
SS-58	CL	129+00	3.90-5.10	A-7-6(16)	49	19	3.0	3.4	26.7	66.8	100	98	94	-	-
SS-59	CL	129+00	8.30-11.10	A-7-6(14)	43	14	7.9	6.7	40.9	44.5	100	94	88	-	-
SS-60	50 RT	132+00	0.00-1.60	A-7-6(19)	48	19	7.9	4.9	26.5	60.7	98	92	87	-	-
SS-61	50 RT	132+00	4.40-5.90	A-7-6(9)	41	11	15.4	10.1	38.1	36.4	100	90	77	-	-
S-62	25 RT	138+00	0.00-1.00	A-6(8)	37	11	9.9	4.0	33.4	52.6	84	77	73	-	-

08-SEP-2003 11:43 C:\Pro\Projects\R-2320G\Geotech\Pr\Files\Gcd.dgn

5/28/99

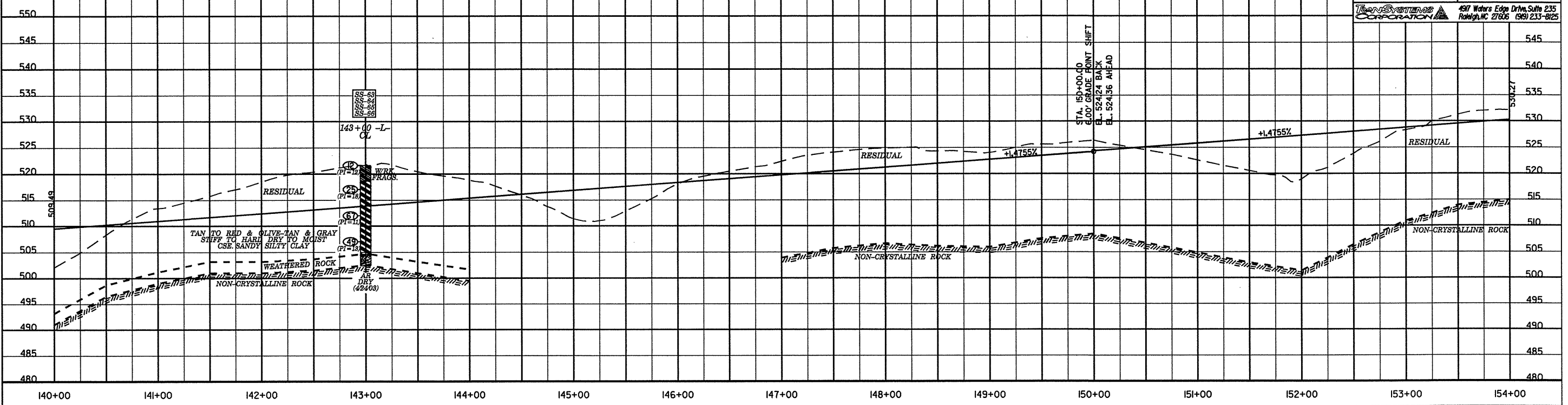
PROJECT REFERENCE NO.	SHEET NO.
R-23206	30
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS	
DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS	
DO NOT USE FOR R/W ACQUISITION	

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.L.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-63	CL	143+00	0.00-1.50	A-6(6)	37	12	38.6	7.7	14.2	44.5	100	71	60	-	-
SS-64	CL	143+00	4.60-6.10	A-7-6(16)	49	18	13.2	9.5	30.8	46.6	100	90	80	-	-
SS-65	CL	143+00	9.60-11.10	A-7-6(9)	41	11	12.8	8.5	36.2	42.6	95	86	78	-	-
SS-66	CL	143+00	14.60-16.10	A-7-6(9)	43	13	21.6	9.1	28.9	40.5	95	80	68	-	-

-L-

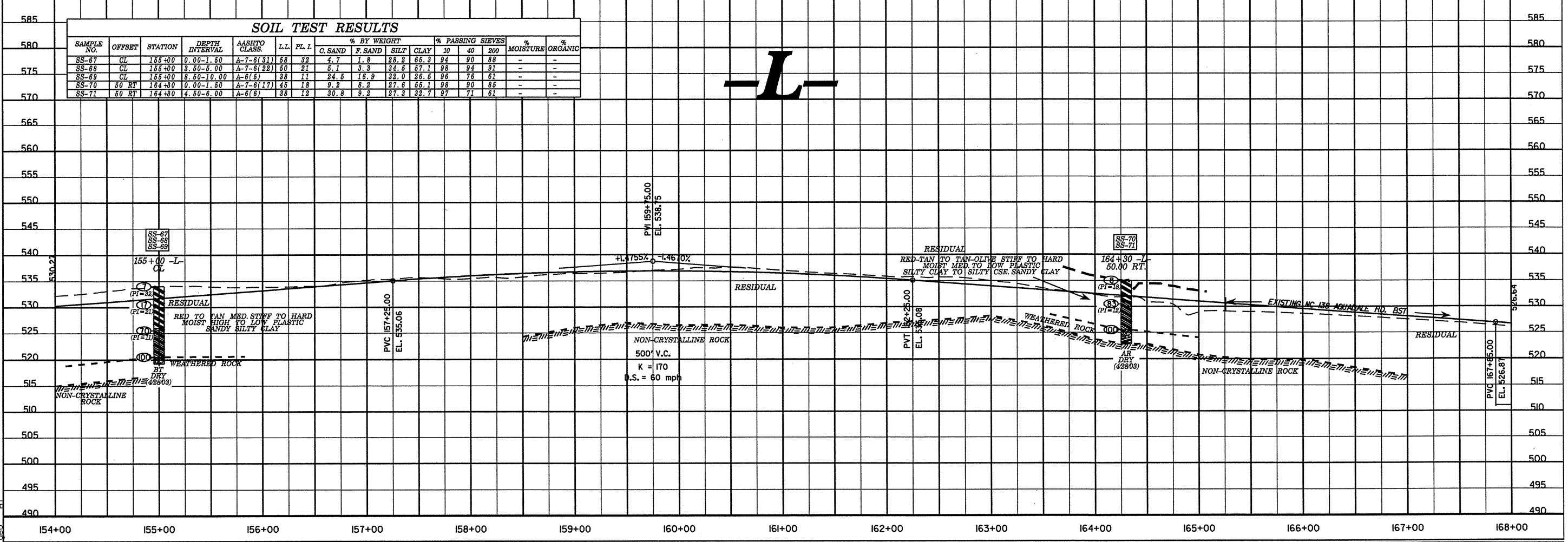
BM #17 SPIKE N BASE OF 18" OAK
204' LT. OF -L- STA. 146+81.92, EL. 522.22

TRANS SYSTEMS CORPORATION
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Raleigh, NC 27606 (919) 233-8125



SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.L.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-67	CL	155+00	0.00-1.50	A-7-6(31)	68	32	4.7	1.8	28.2	55.3	94	90	88	-	-
SS-68	CL	155+00	3.50-6.00	A-7-6(22)	60	21	6.1	3.3	34.6	57.1	98	94	91	-	-
SS-69	CL	155+00	8.50-10.00	A-6(5)	38	11	24.6	16.9	32.0	26.5	96	76	61	-	-
SS-70	60 RT	164+30	0.00-1.50	A-7-6(17)	46	18	9.2	8.2	27.6	55.1	98	90	85	-	-
SS-71	60 RT	164+30	4.50-6.00	A-6(6)	38	12	30.8	9.2	27.3	32.7	97	71	61	-	-

-L-

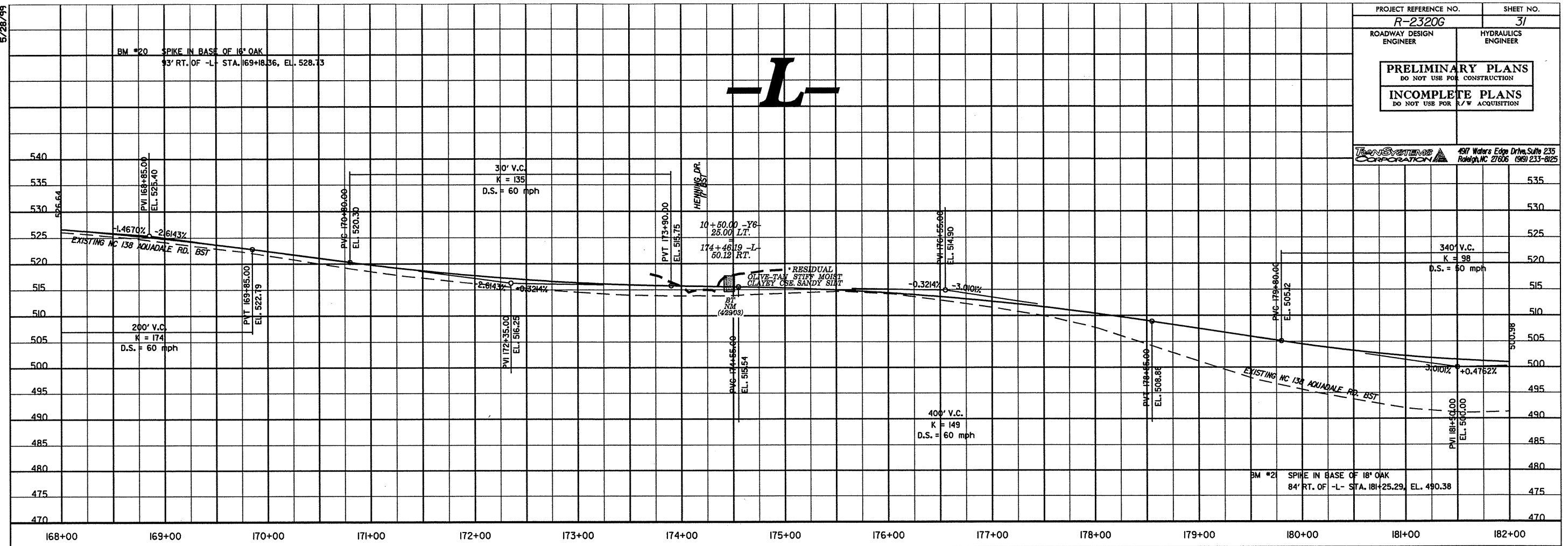


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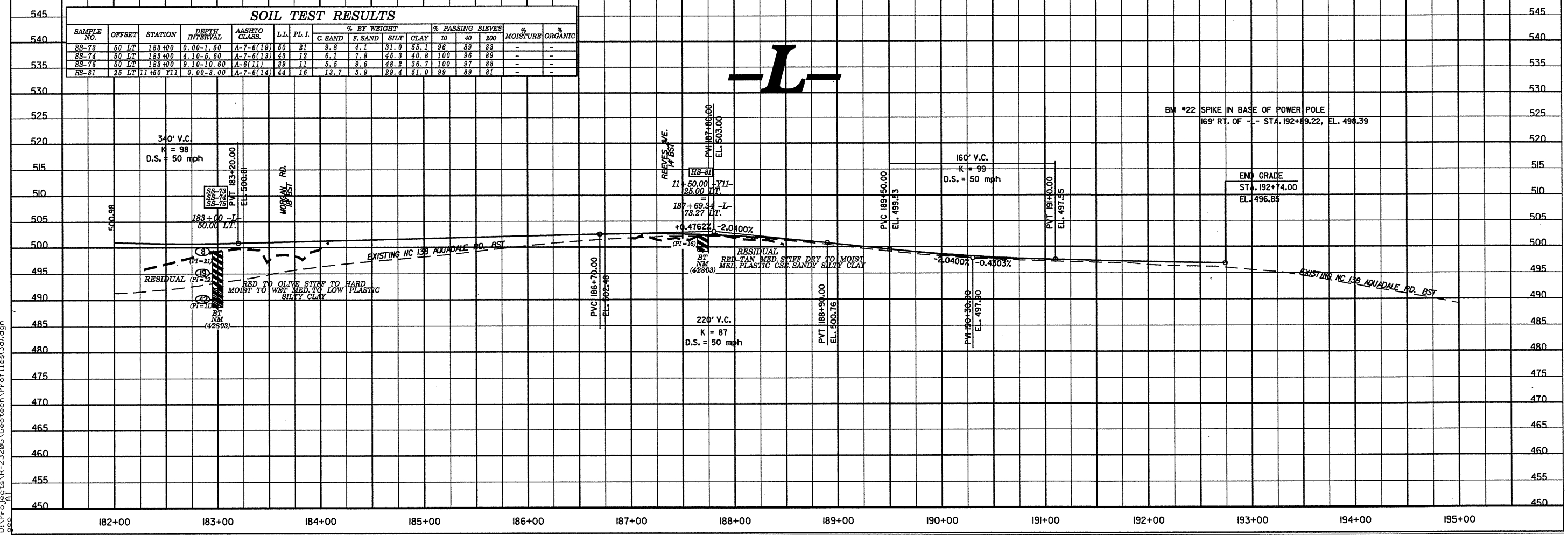
5/28/99

PROJECT REFERENCE NO. R-2320G	SHEET NO. 31
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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SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.L.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-73	50 LT	183+00	0.00-1.50	A-7-6(19)	60	21	9.8	4.1	31.0	55.1	96	89	83	-	-
SS-74	50 LT	183+00	4.10-5.50	A-7-6(13)	43	12	6.1	7.8	45.3	40.8	100	96	89	-	-
SS-75	50 LT	183+00	9.10-10.50	A-6(11)	39	11	5.5	9.6	48.2	36.7	100	97	88	-	-
HS-81	25 LT	181+60 Y11	0.00-3.00	A-7-6(14)	44	16	13.7	6.9	29.4	61.0	99	89	81	-	-



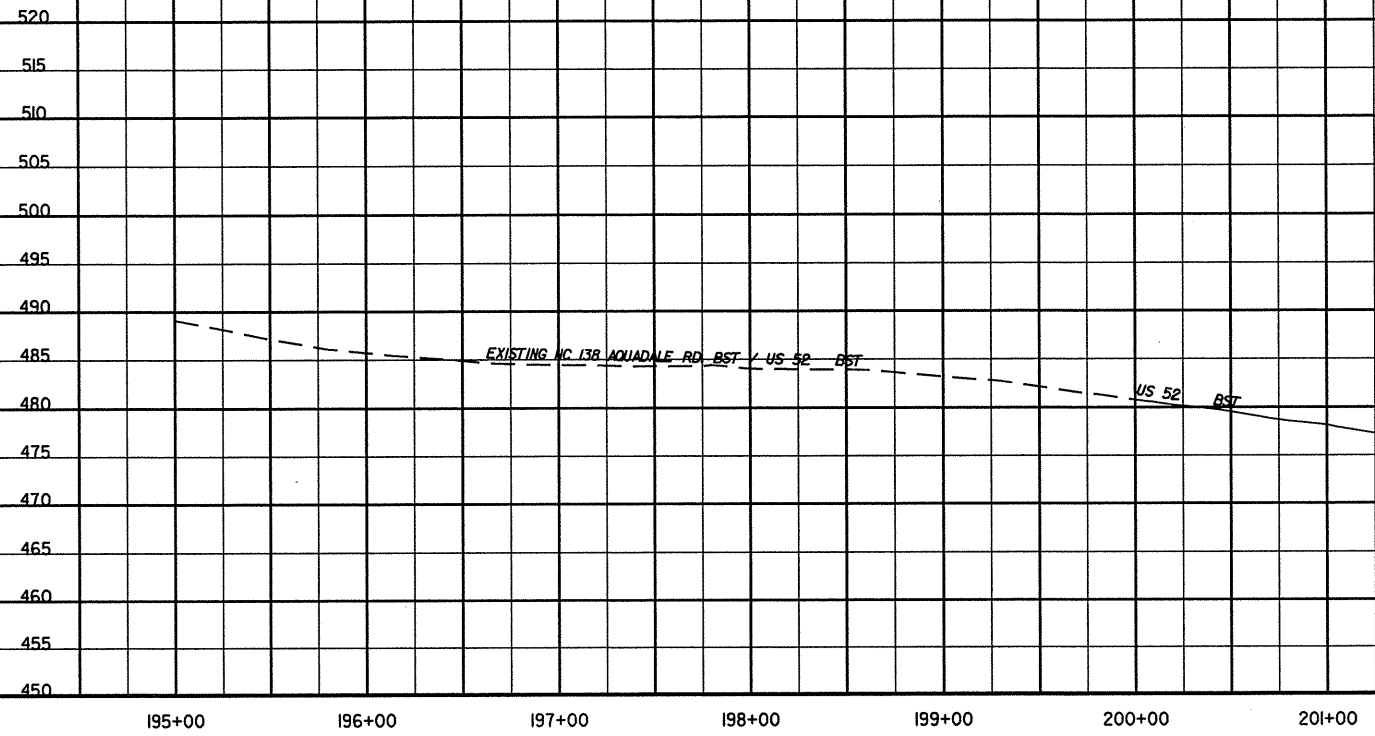
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5/28/99

PROJECT REFERENCE NO. R-2320G	SHEET NO. 32
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
 4917 Waters Edge Drive, Suite 235 Raleigh, NC 27606 (919) 233-8125	

BM #23 SPIKE IN BASE OF 8" PINE
 334' LT. OF -L- STA. 199+5.87, EL. 484.78

-L-



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 Leo

5/28/99

PROJECT REFERENCE NO. R-2320G	SHEET NO. 33
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	

TRANSYSTEMS CORPORATION
4917 Waters Edge Drive, Suite 235
Raleigh, NC 27606 (919) 233-8125

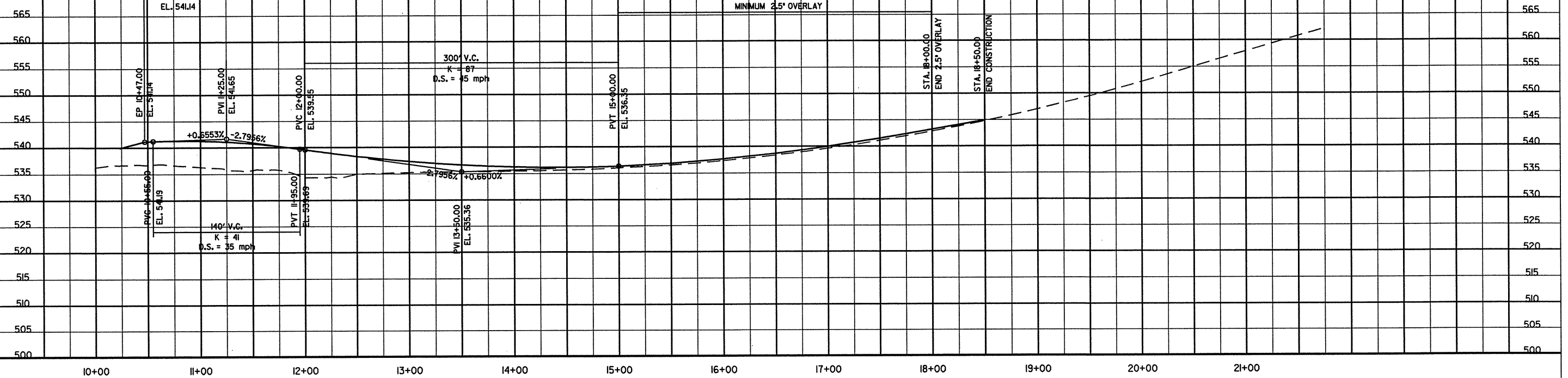
BM #6 SPIKE IN BASE OF POWER POLE
3/4 LT. OF Y STA. 14+72.43, EL. 533.39

-Y-

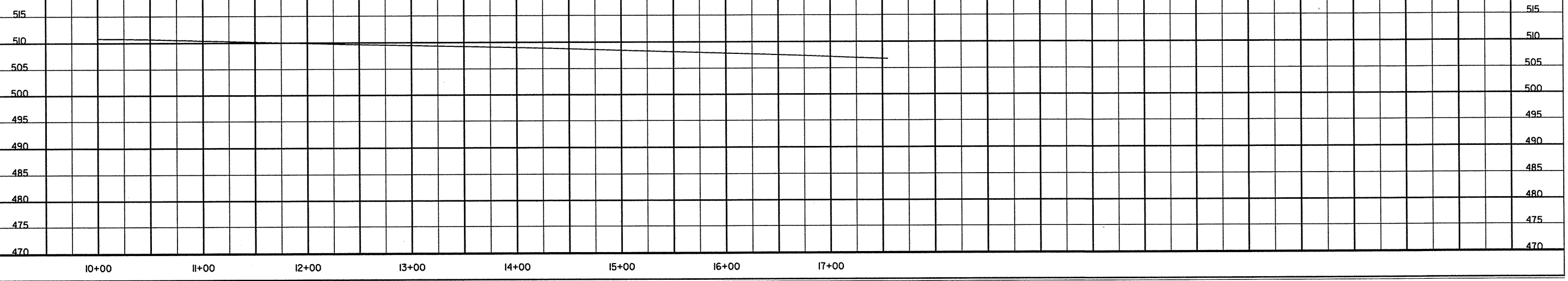
END GRADE
STA. 15+00.00
EL. 535.90

BEGIN GRADE
-Y- STA. 0+47.00
-L- STA. 16+80.00, 47 RT.
EL. 541.14

MINIMUM 2.5' OVERLAY




-Y2-

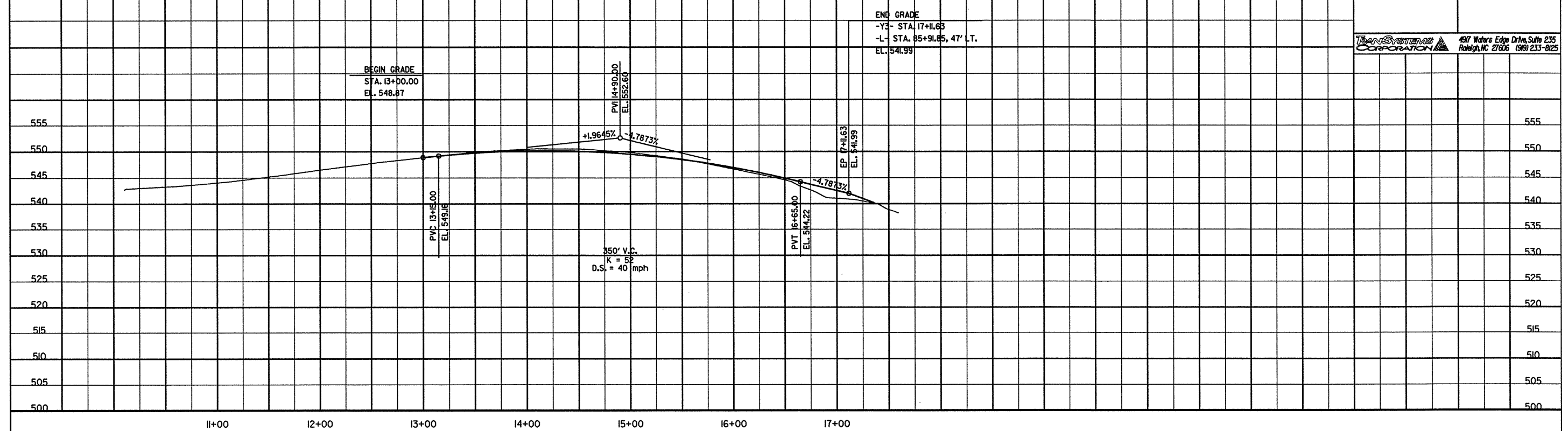


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5/28/99

PROJECT REFERENCE NO. <i>R-23206</i>	SHEET NO. <i>34</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
 497 Waters Edge Drive, Suite 235 Raleigh, NC 27606 (919) 233-8125	

-Y3-

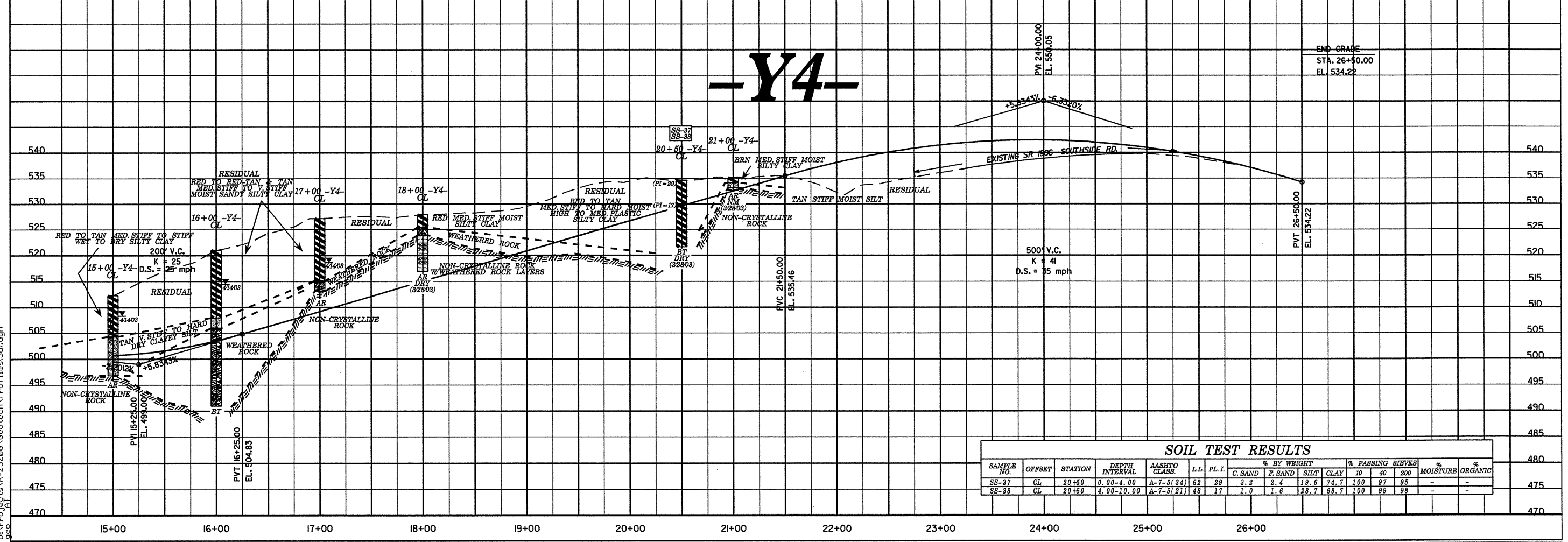
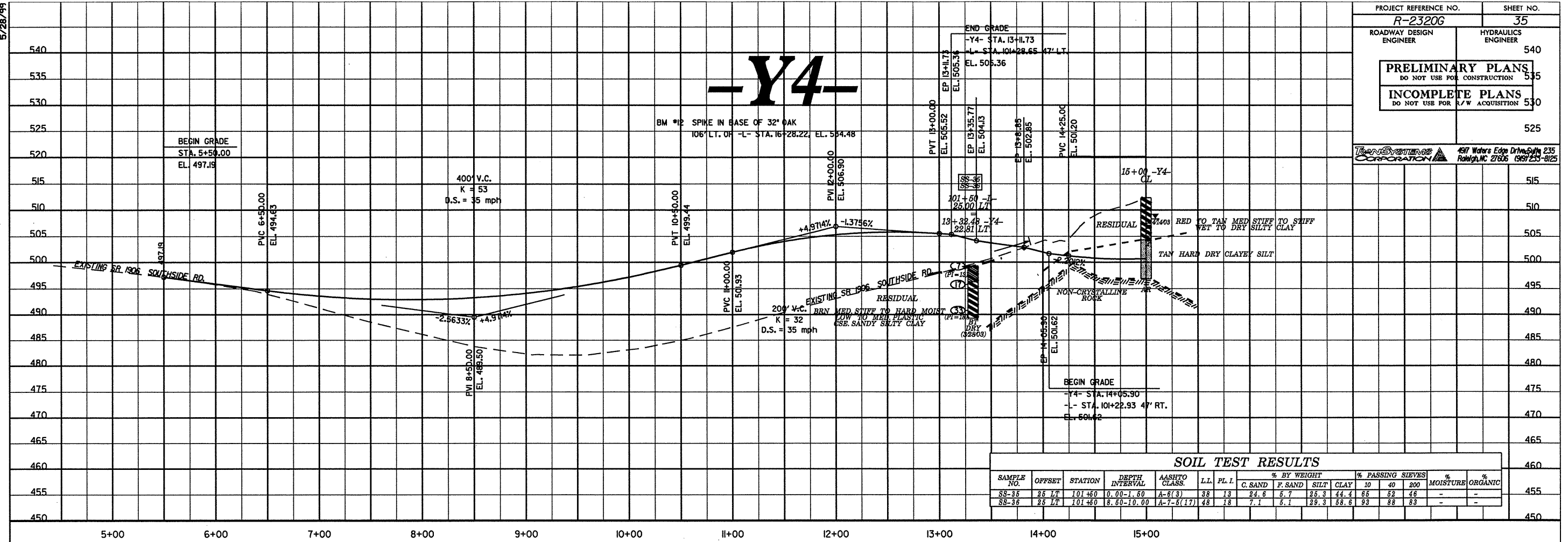


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geo

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PROJECT REFERENCE NO. R-2320G	SHEET NO. 35
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	

TRANS SYSTEMS CORPORATION 497 Waters Edge Drive, Suite 235 Raleigh, NC 27606 (919) 233-9125



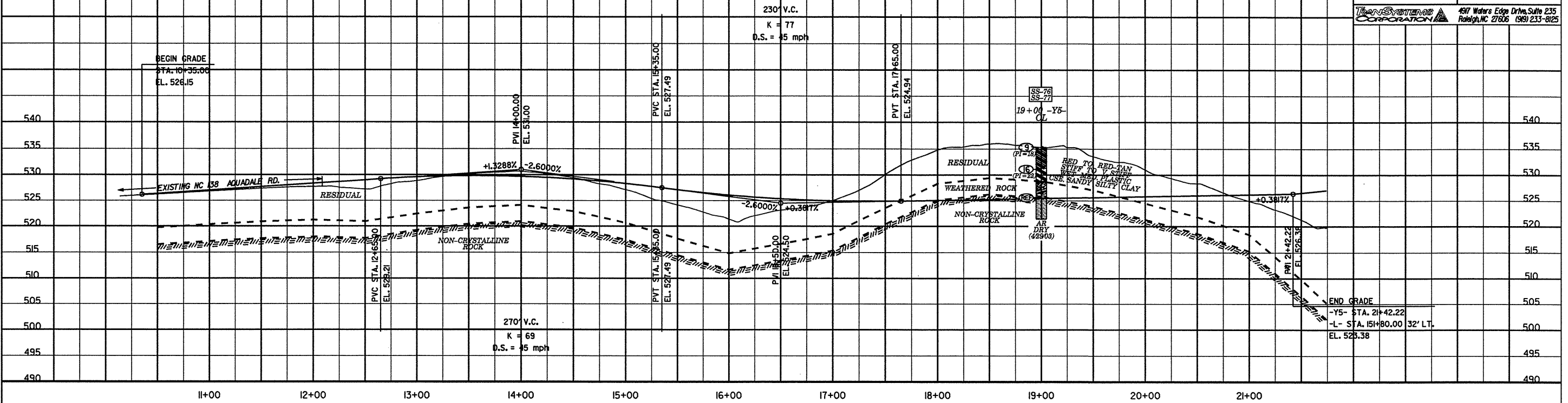
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5/28/99

PROJECT REFERENCE NO. R-2320G	SHEET NO. 36
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
4917 Waters Edge Drive, Suite 235 Raleigh, NC 27606 (919) 233-8125	

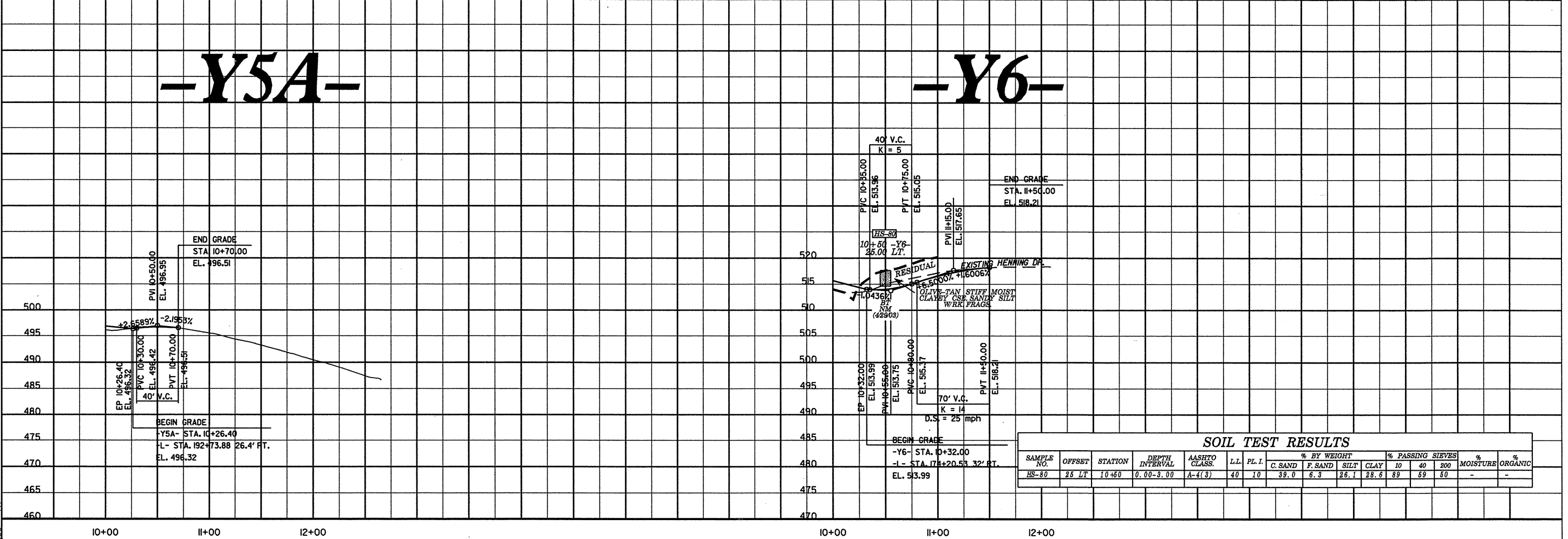
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.L.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-76	CL	19+00	0.00-1.50	A-6(11)	40	18	16.3	3.3	27.3	53.1	83	71	68	-	-
SS-77	CL	19+00	4.20-5.70	A-7-6(18)	60	23	16.3	4.9	23.7	55.1	95	83	76	-	-

-Y5-



-Y5A-

-Y6-




SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.L.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
HS-80	25 LT	10+50	0.00-3.00	A-4(3)	40	10	39.0	6.3	26.1	28.6	89	59	50	-	-

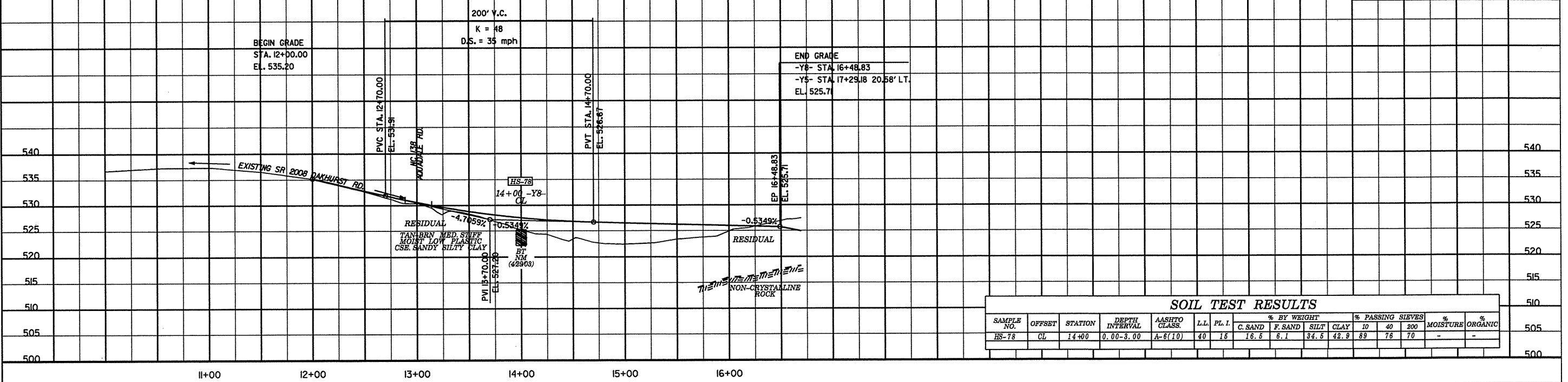
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5/28/99

BM #18 SPIKE IN BASE OF 18" SWBETGUM
48' RT. OF -Y8- STA. 13+44.85, EL. 525.64

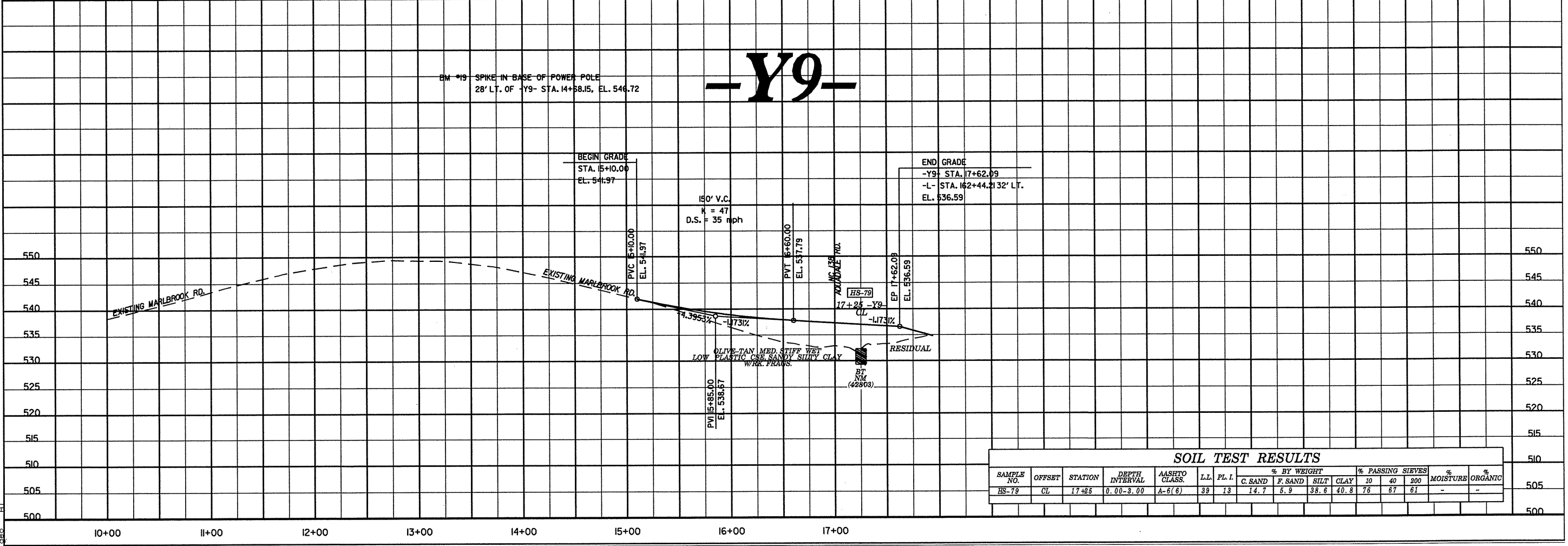
-Y8-

PROJECT REFERENCE NO. R-2320G	SHEET NO. 37
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
 4917 Waters Edge Drive, Suite 235 Raleigh, NC 27606 (919) 233-8125	



BM #19 SPIKE IN BASE OF POWER POLE
28' LT. OF -Y9- STA. 14+58.15, EL. 546.72

-Y9-



04-AUG-2003 13:05
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-Y10-

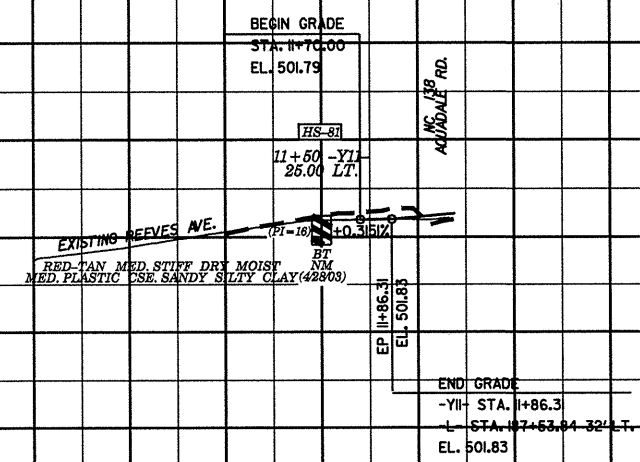
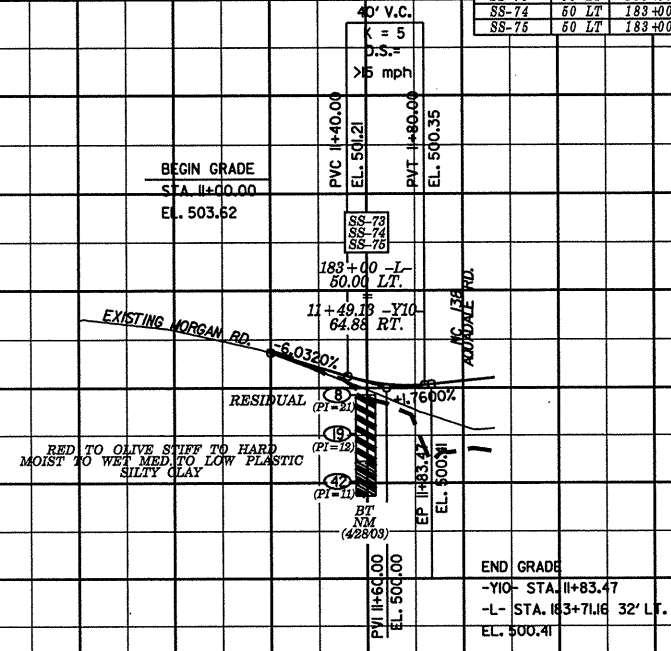
-Y11-

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	PL. I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-73	60 LT	183+00	0.00-1.50	A-7-6(19)	60	31	9.8	4.1	31.0	55.1	96	89	83	-	-
SS-74	60 LT	183+00	4.10-5.60	A-7-6(13)	43	12	6.1	7.8	45.3	40.8	100	96	89	-	-
SS-75	60 LT	183+00	9.10-10.60	A-6(11)	39	11	5.5	9.6	48.2	36.7	100	97	88	-	-

SOIL TEST RESULTS

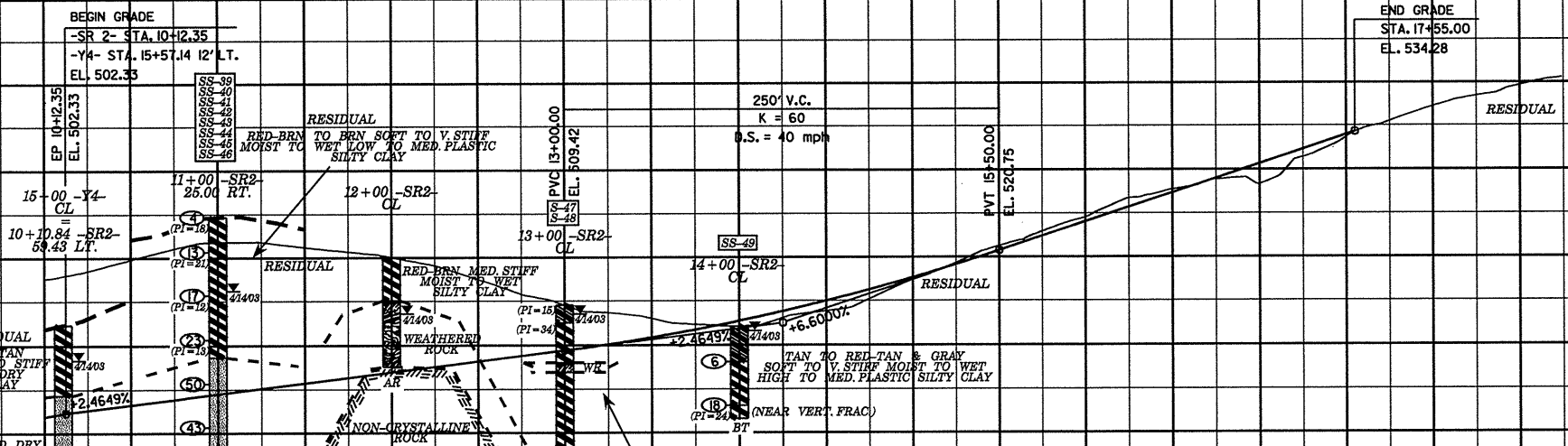
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	PL. I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
HS-81	25 LT	11+50	0.00-3.00	A-7-6(14)	44	16	13.7	6.9	29.4	61.0	99	89	81	-	-



10+00 11+00 12+00

10+00 11+00 12+00

-SR 2-



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	PL. I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-39	25 RT	11+00	0.00-1.50	A-7-6(14)	42	18	7.1	3.6	22.5	68.8	85	80	77	-	-
SS-40	25 RT	11+00	4.00-5.60	A-7-6(24)	48	21	1.8	3.8	31.6	68.8	100	99	96	-	-
SS-41	25 RT	11+00	9.00-10.60	A-7-6(16)	45	12	2.6	6.7	41.1	50.8	100	99	94	-	-
SS-42	25 RT	11+00	14.00-15.60	A-7-6(14)	45	13	8.9	6.7	37.9	48.8	100	94	86	-	-
SS-43	25 RT	11+00	19.00-20.60	A-4(9)	40	8	7.1	11.3	39.1	42.5	100	95	86	-	-
SS-44	25 RT	11+00	24.00-25.60	A-4(9)	39	10	8.7	9.9	40.9	40.5	96	89	81	-	-
SS-45	25 RT	11+00	29.00-30.60	A-4(10)	40	8	4.5	6.1	42.9	46.6	100	96	92	-	-
SS-46	25 RT	11+00	34.00-34.90	A-4(7)	36	6	3.6	7.7	44.1	44.5	98	95	90	-	-
S-47	CL	13+00	0.00-2.00	A-6(11)	38	15	5.3	8.8	32.2	58.7	82	79	76	-	-
S-48	CL	13+00	2.00-6.50	A-7-6(38)	71	34	2.2	7.1	23.9	66.8	98	97	91	-	-
SS-49	CL	14+00	9.00-10.50	A-7-6(23)	53	24	5.9	4.5	24.9	64.8	94	90	86	-	-

10+00 11+00 12+00

13+00 14+00 15+00

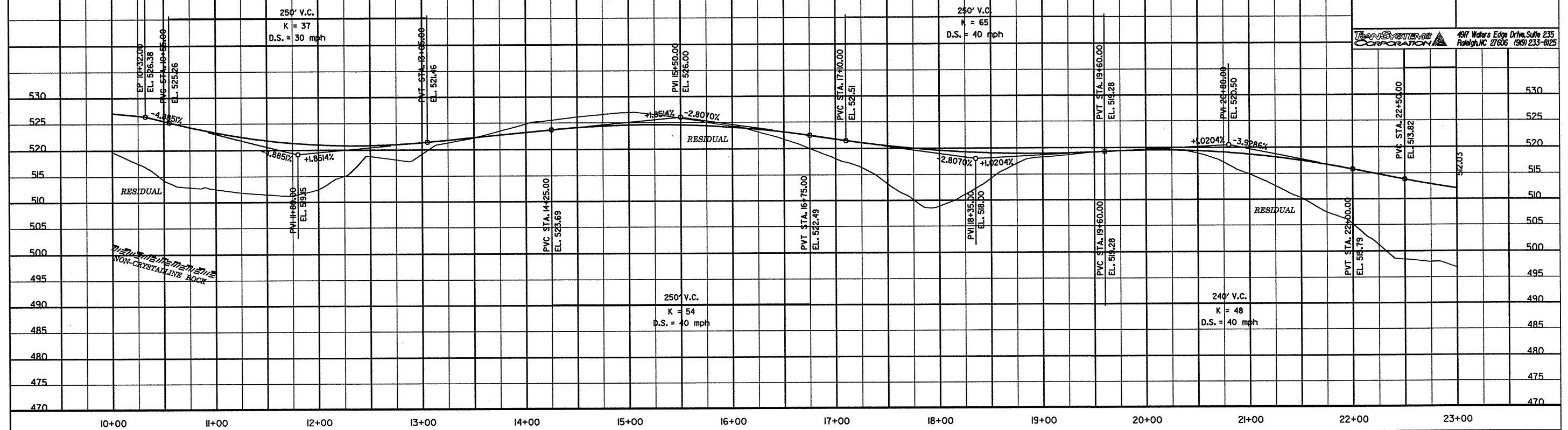
16+00 17+00 18+00

5/28/99

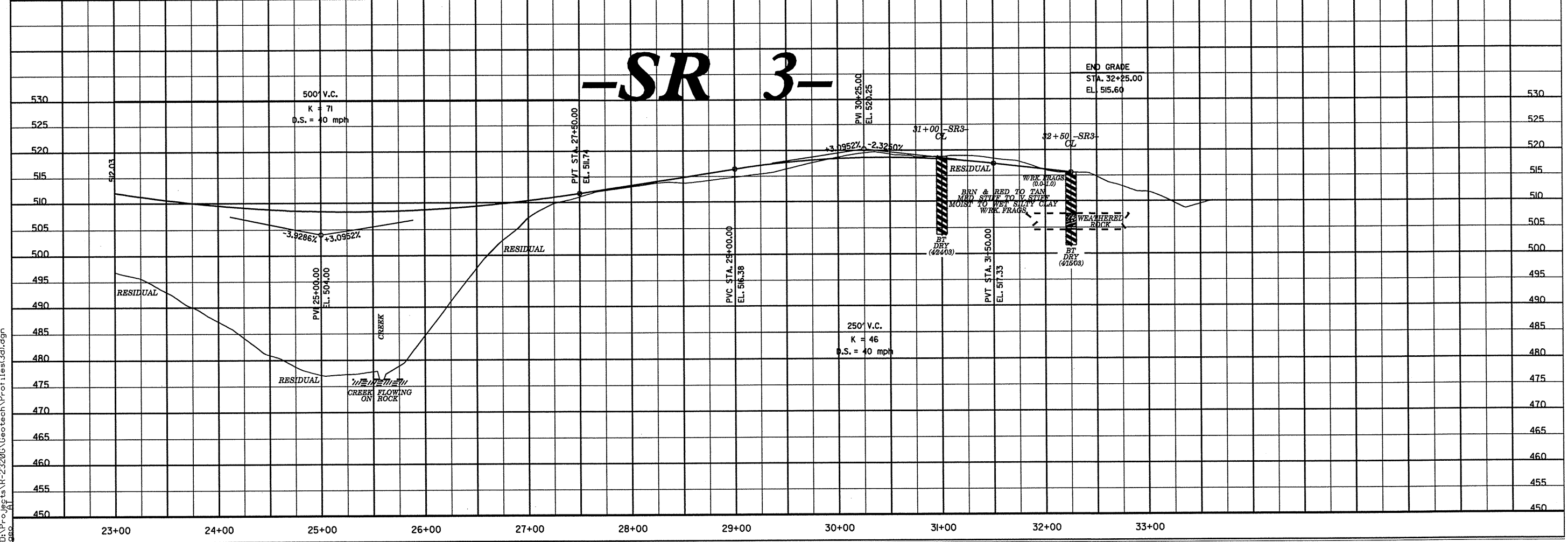
PROJECT REFERENCE NO. R-2320G	SHEET NO. 39
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	

TRANS SYSTEMS CORPORATION
4917 Waters Edge Drive, Suite 235
Raleigh, NC 27606 (919) 233-8125

-SR 3-

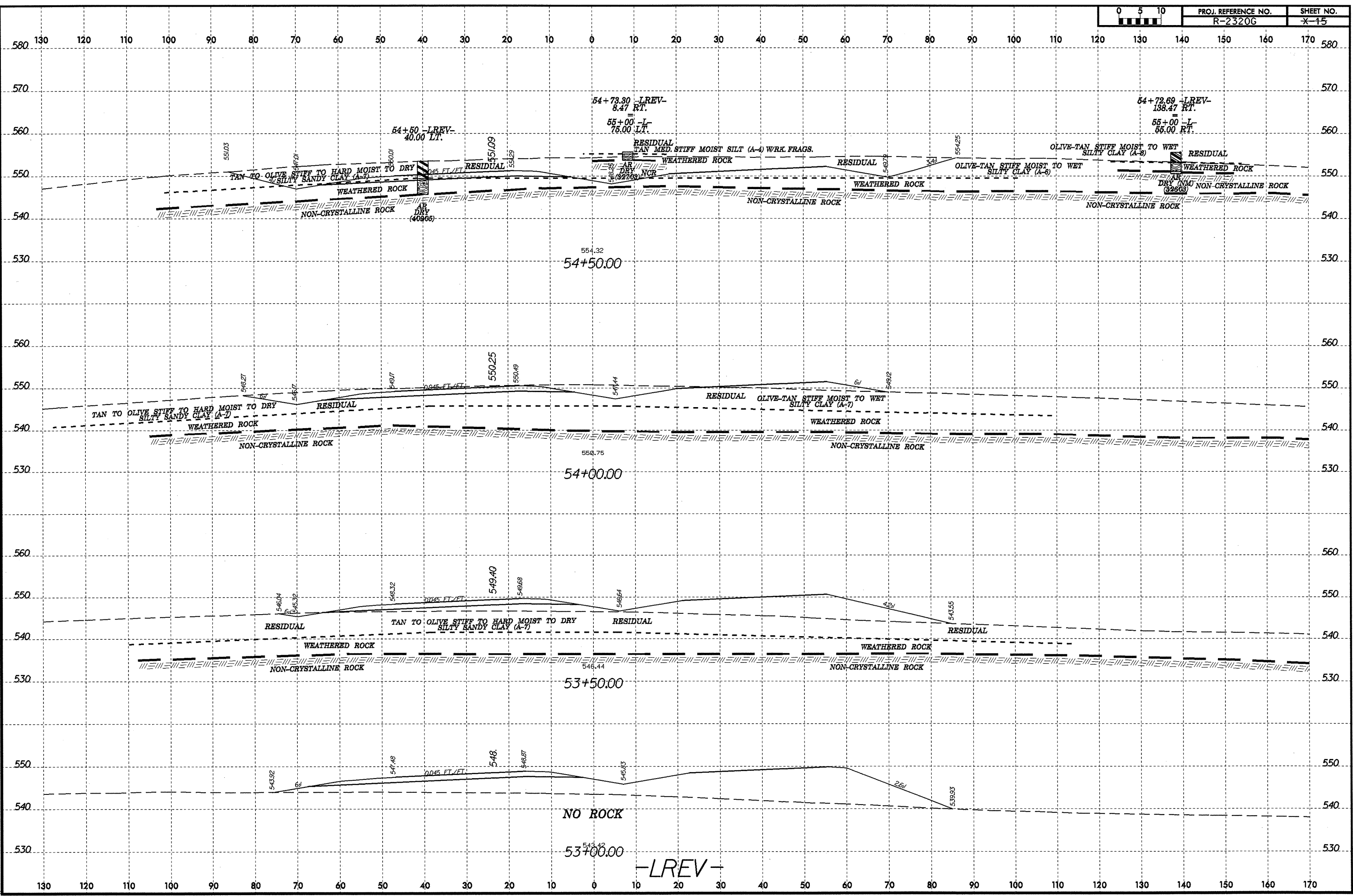


-SR 3-



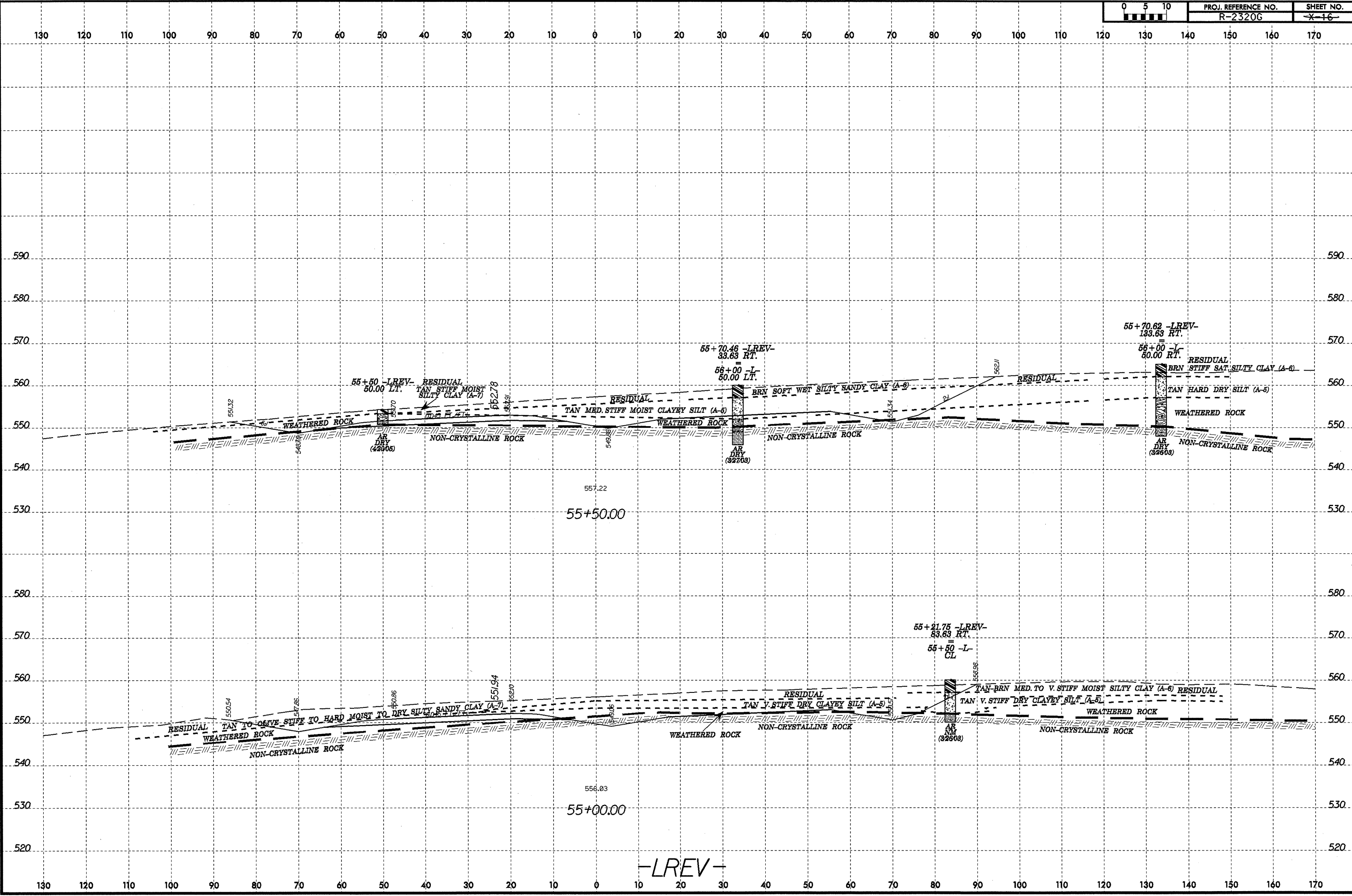
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8/23/99



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8/23/99



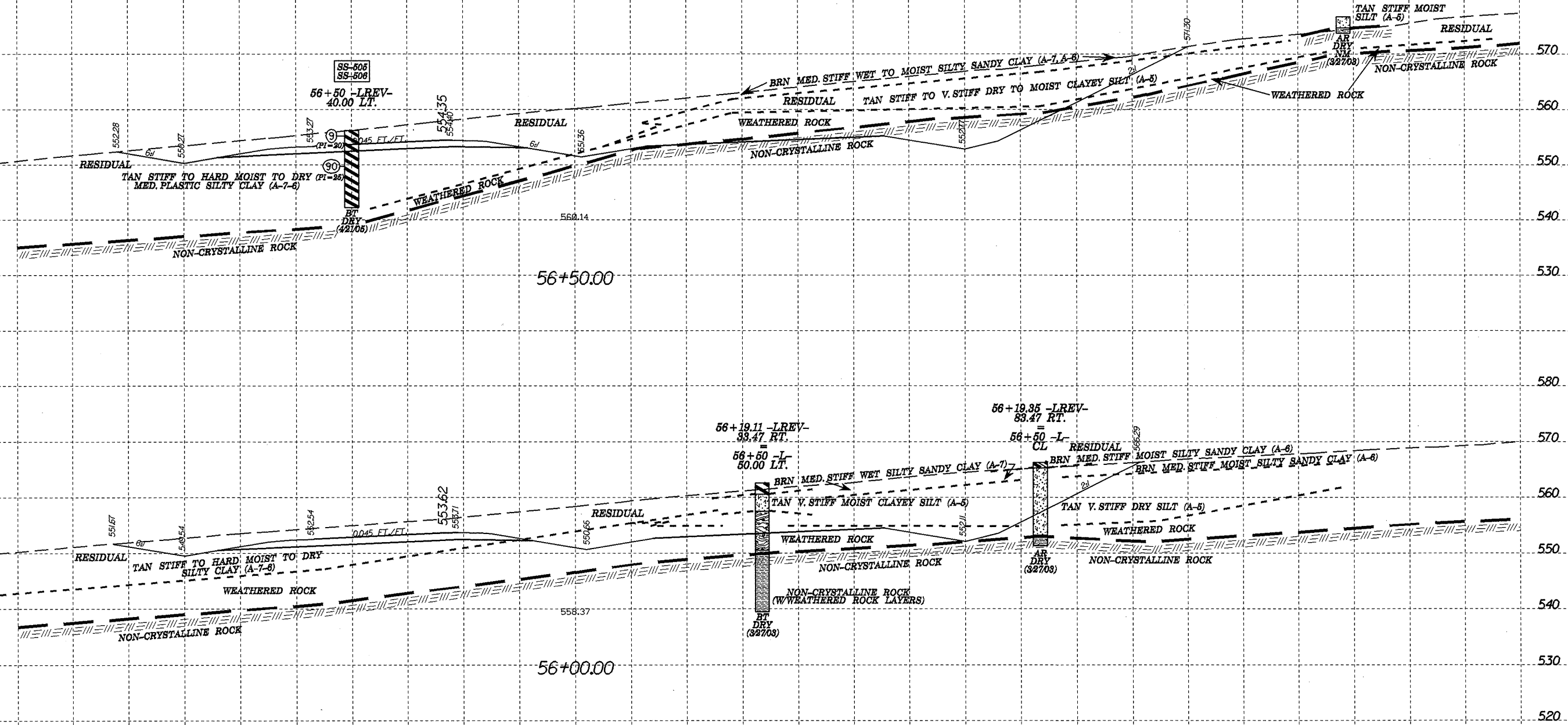
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600 590 580 570 560 550 540 530 520

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-506	40 LT	56+50	0.00-2.00	A-7-6(17)	49	20	6.5	3.8	37.0	52.6	87	83	79		
SS-506	40 LT	56+50	5.50-7.00	A-7-6(22)	53	26	6.7	2.6	25.9	64.8	88	83	80		

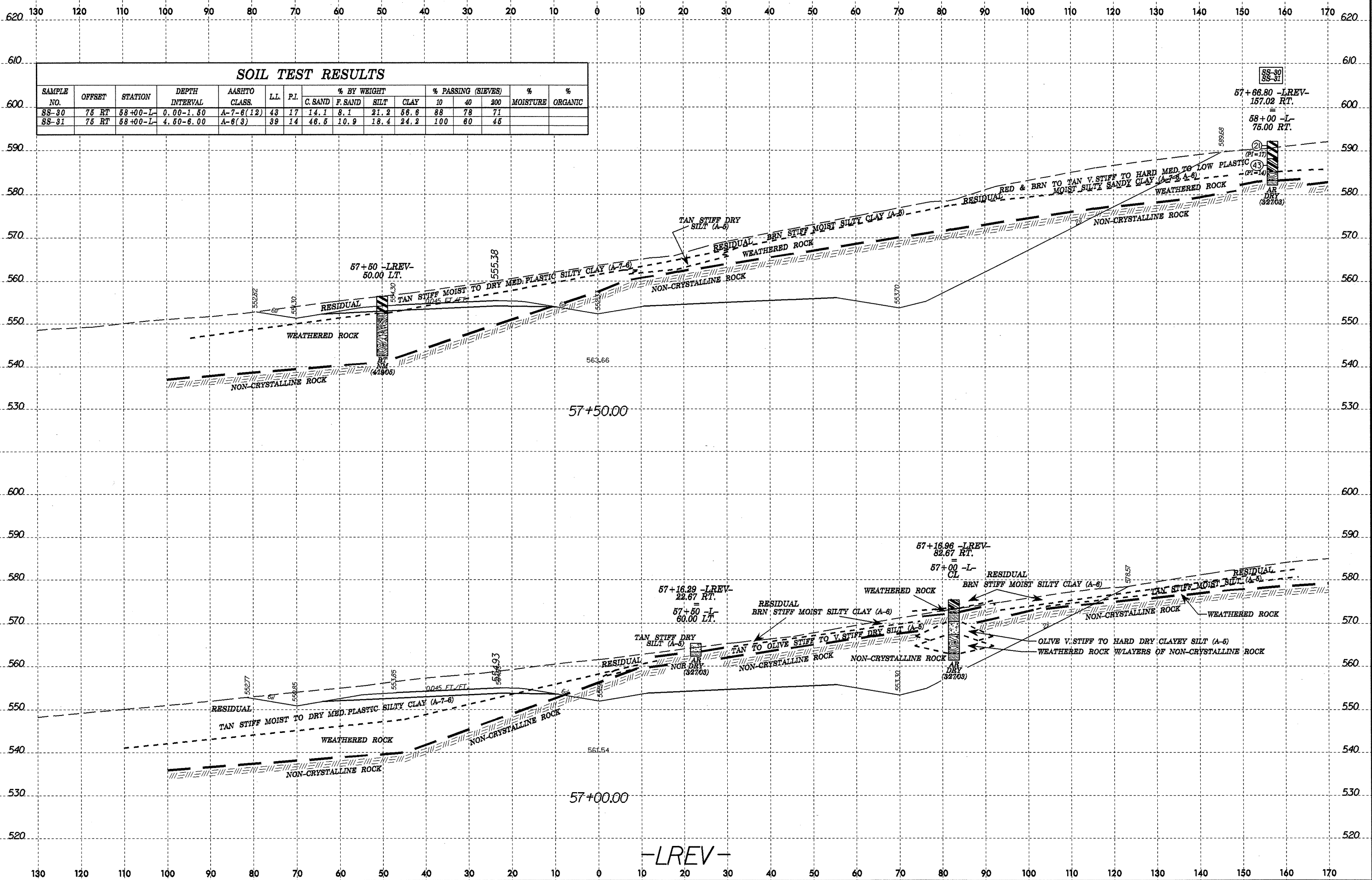


-LREV-

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SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-30	76 RT	58+00-L	0.00-1.50	A-7-6(12)	43	17	14.1	8.1	21.2	56.6	88	78	71		
SS-31	76 RT	58+00-L	4.50-6.00	A-6(3)	39	14	46.6	10.9	18.4	24.2	100	60	45		



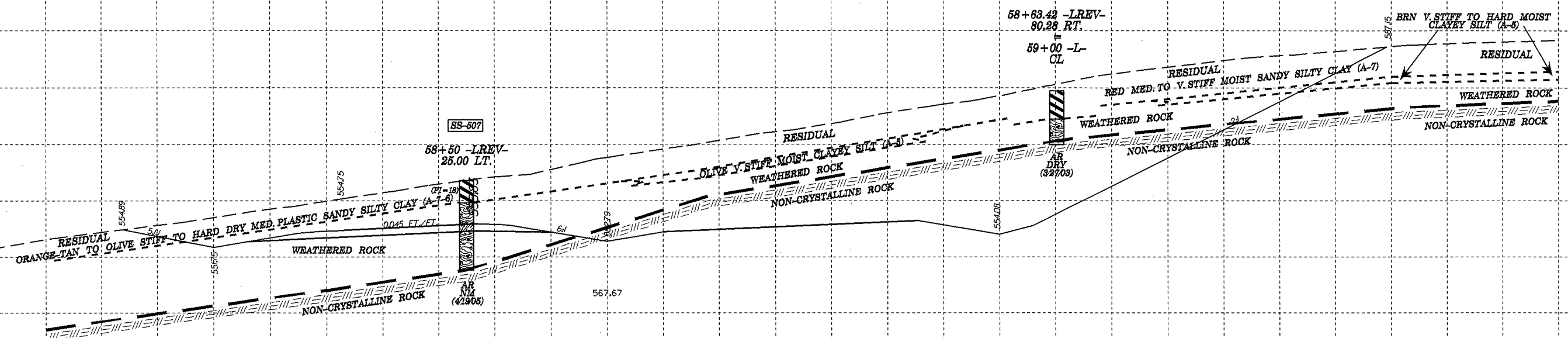
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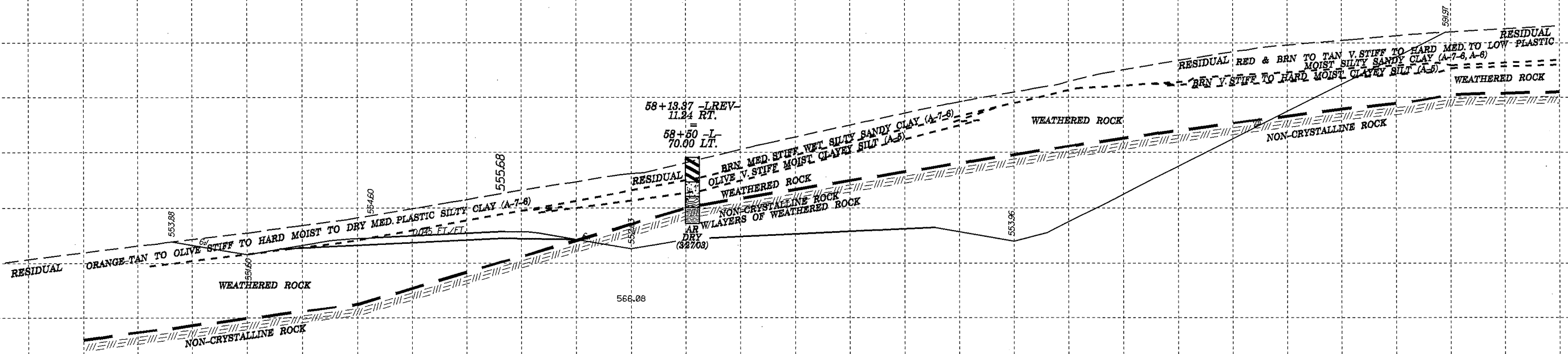
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SOIL TEST RESULTS

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							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-507	25 LT	58+50	0.00-2.50	A-7-8(11)	44	18	20.4	19.4	41.9	24.0	100	87	66		



58+50.00

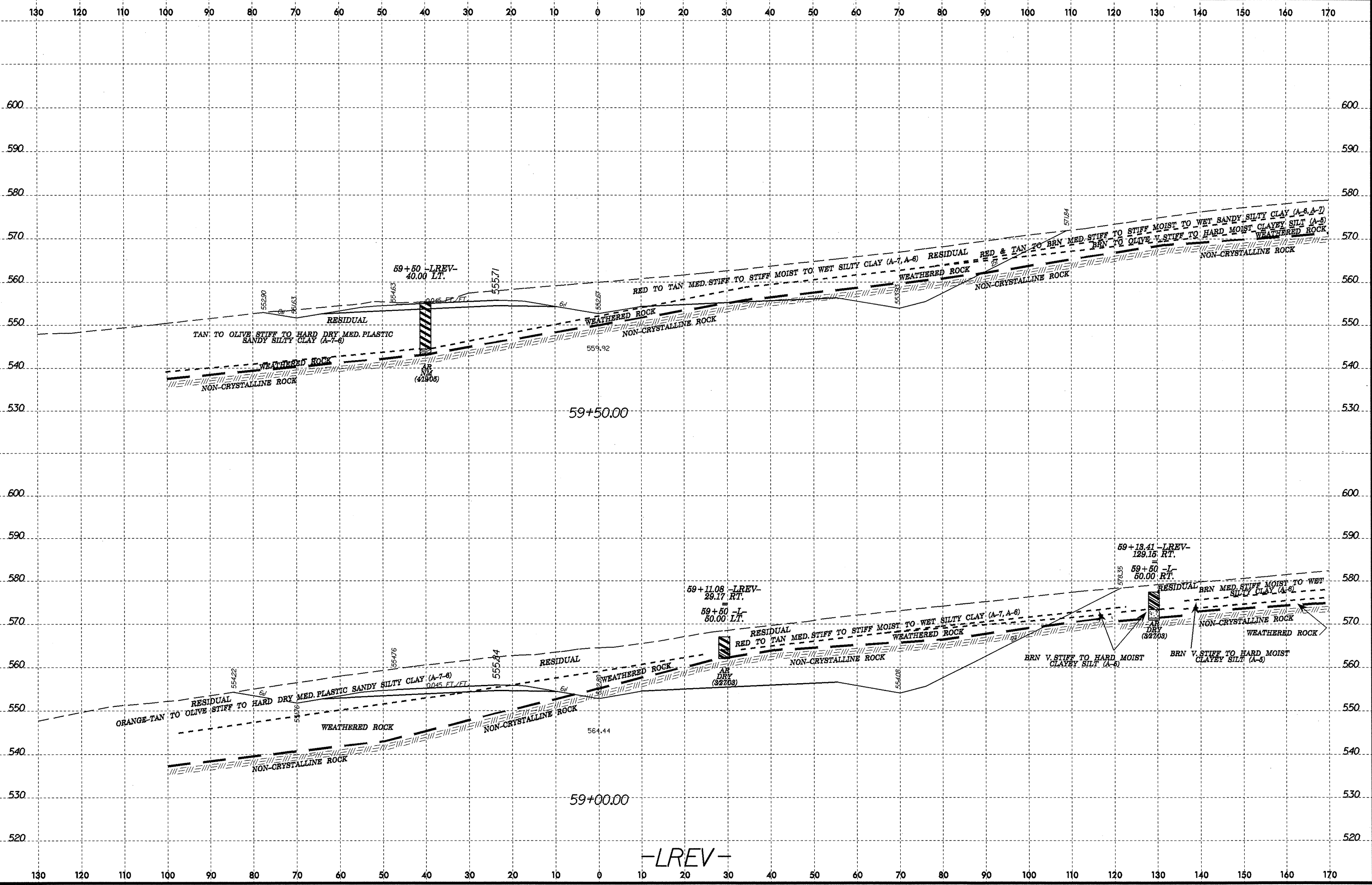


58+00.00

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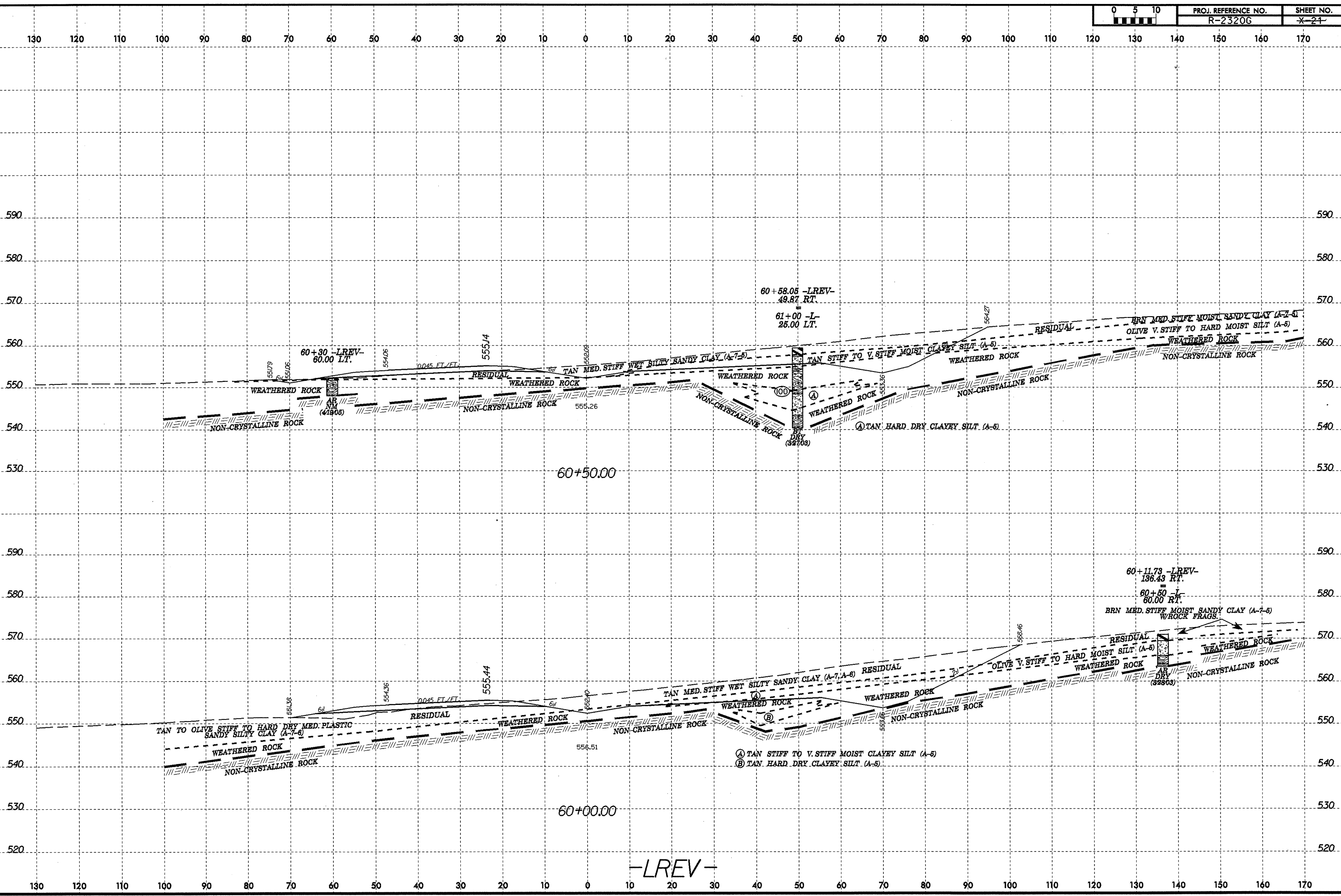
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21-OCT-2005 15:09
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-LREV-

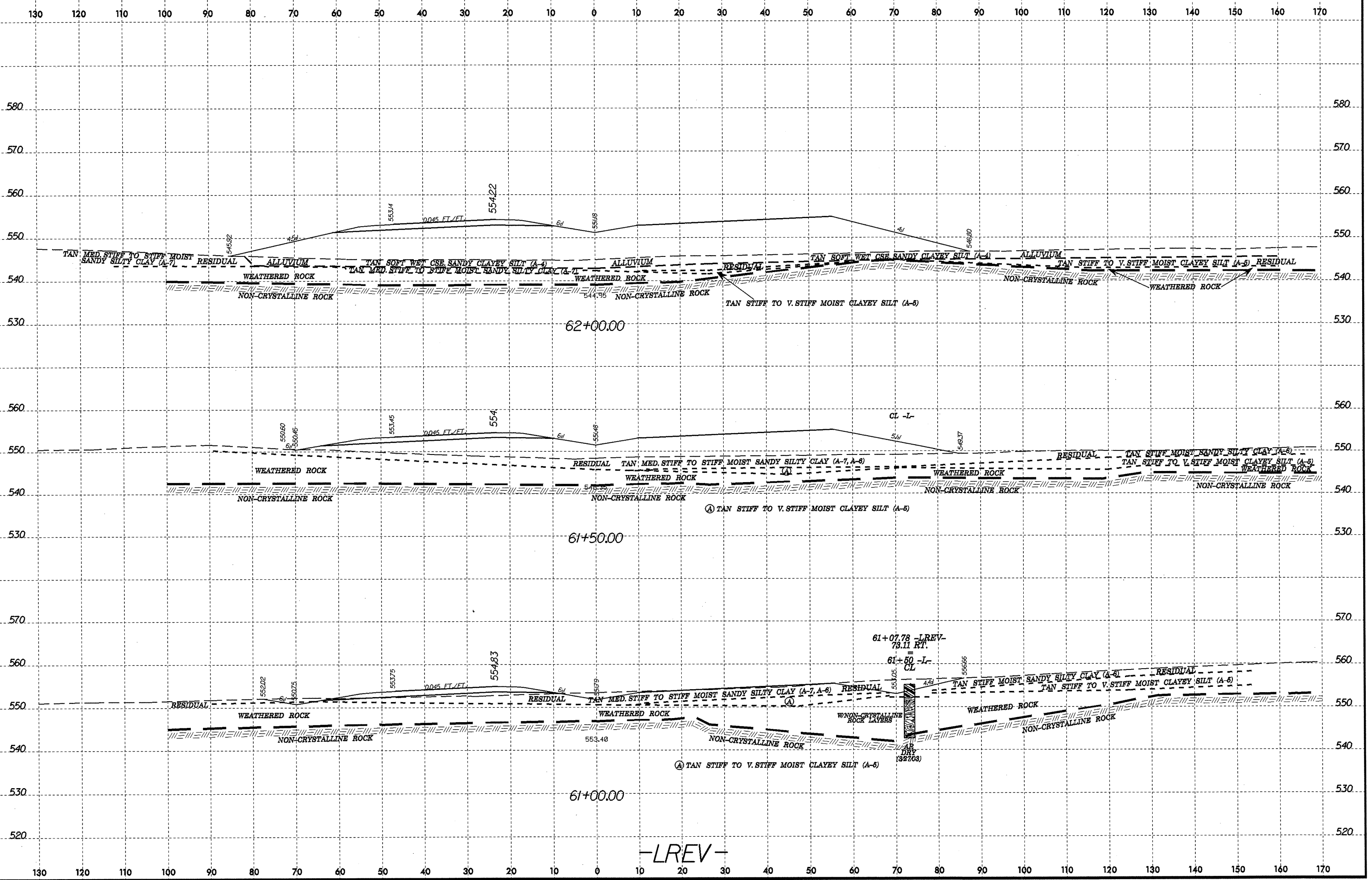
8/23/99



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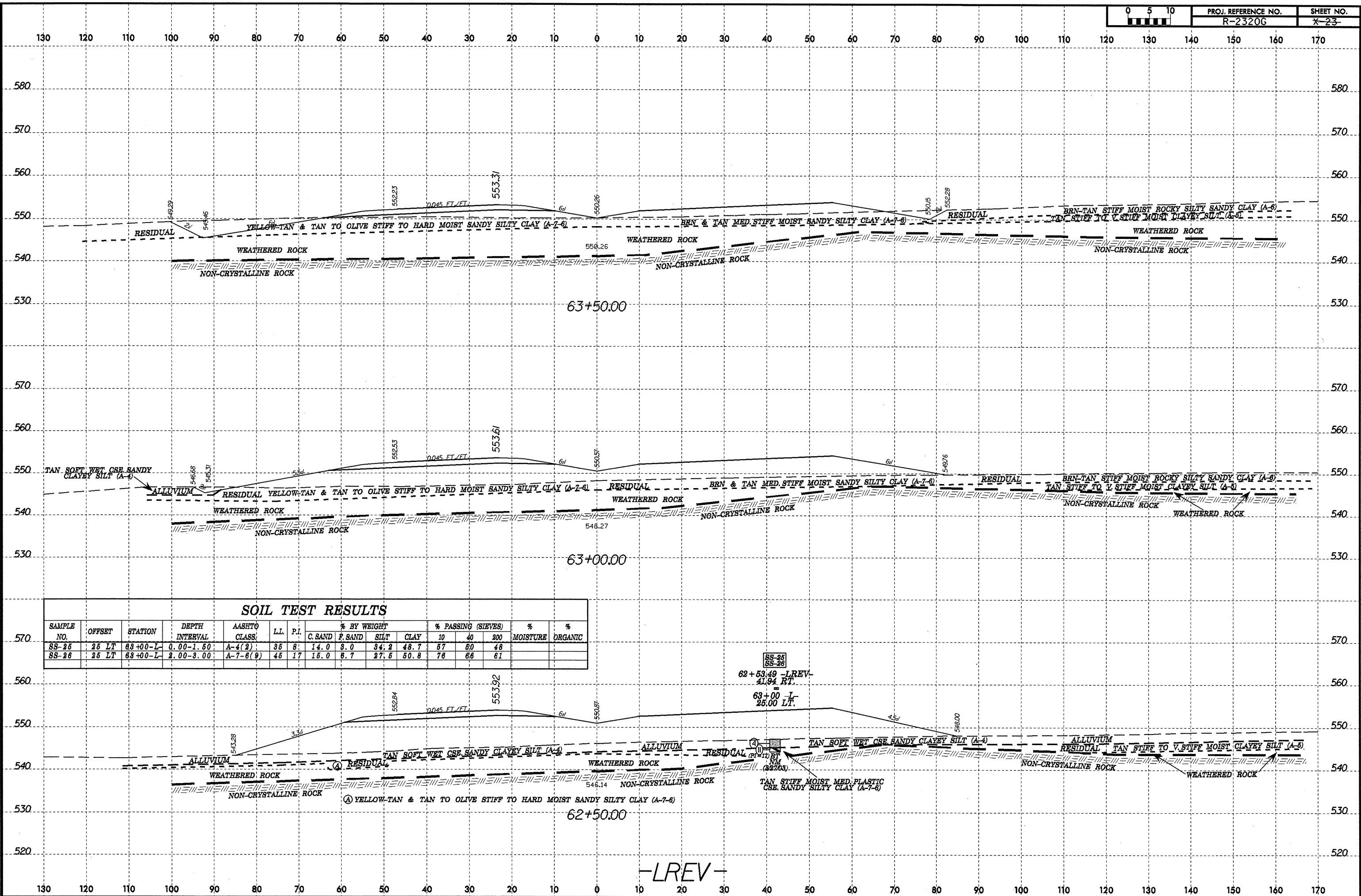
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8/23/99



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8/23/99
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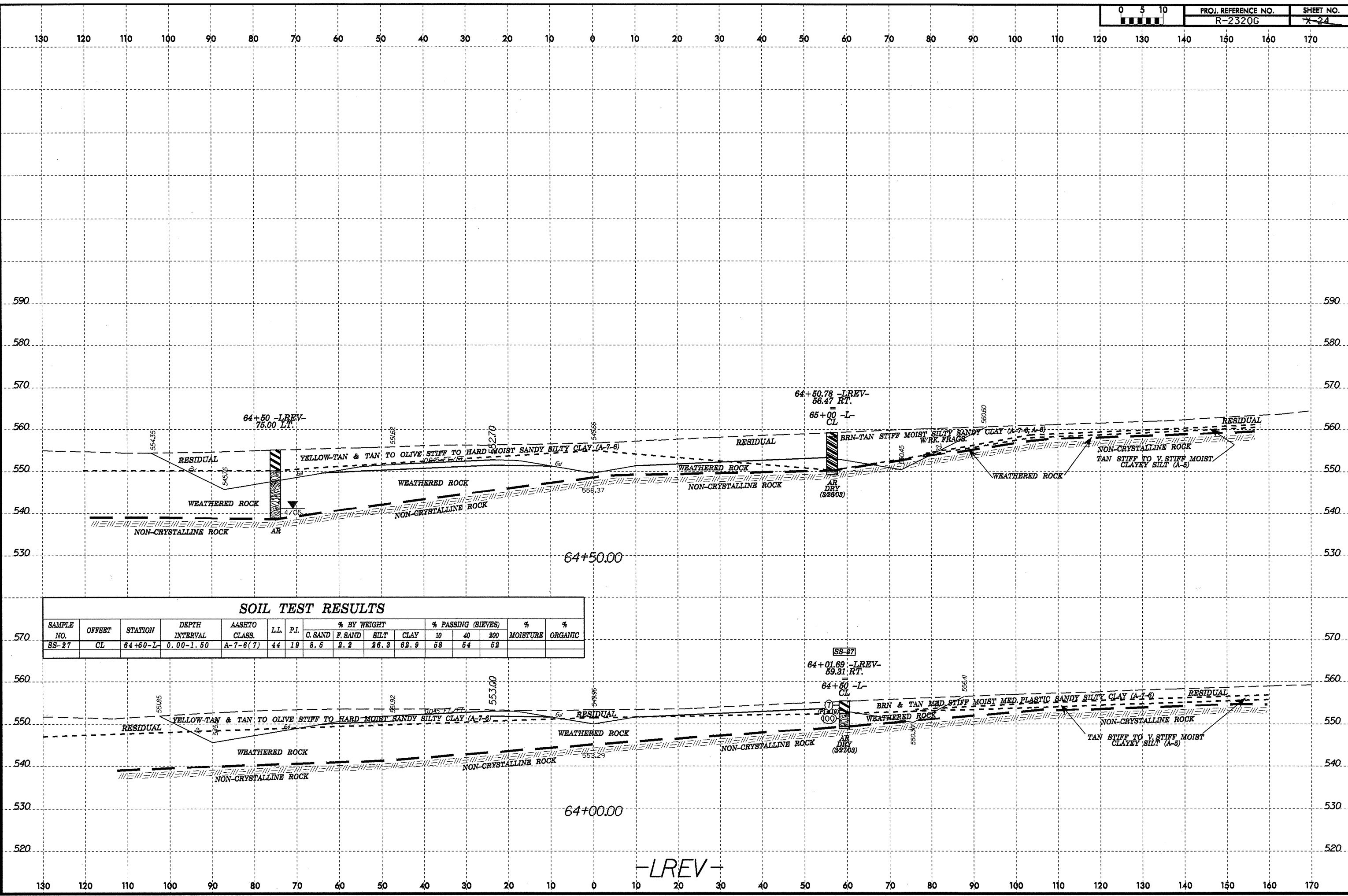


SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-25	25 LT	63+00-L	0.00-1.50	A-4(2)	95	8	14.0	9.0	34.2	48.7	57	50	48		
SS-26	25 LT	63+00-L	2.00-3.00	A-7-6(9)	46	17	16.0	8.7	27.6	50.8	76	66	61		

SS-25
 SS-26
 62+53.49 -LREV-
 41.94 RT.
 63+00 -L-
 25.00 LT.

-LREV-



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)		% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40		
SS-27	CL	64+50-L	0.00-1.50	A-7-6(7)	44	19	8.6	2.2	26.8	62.9	58	64	62	

8/23/99
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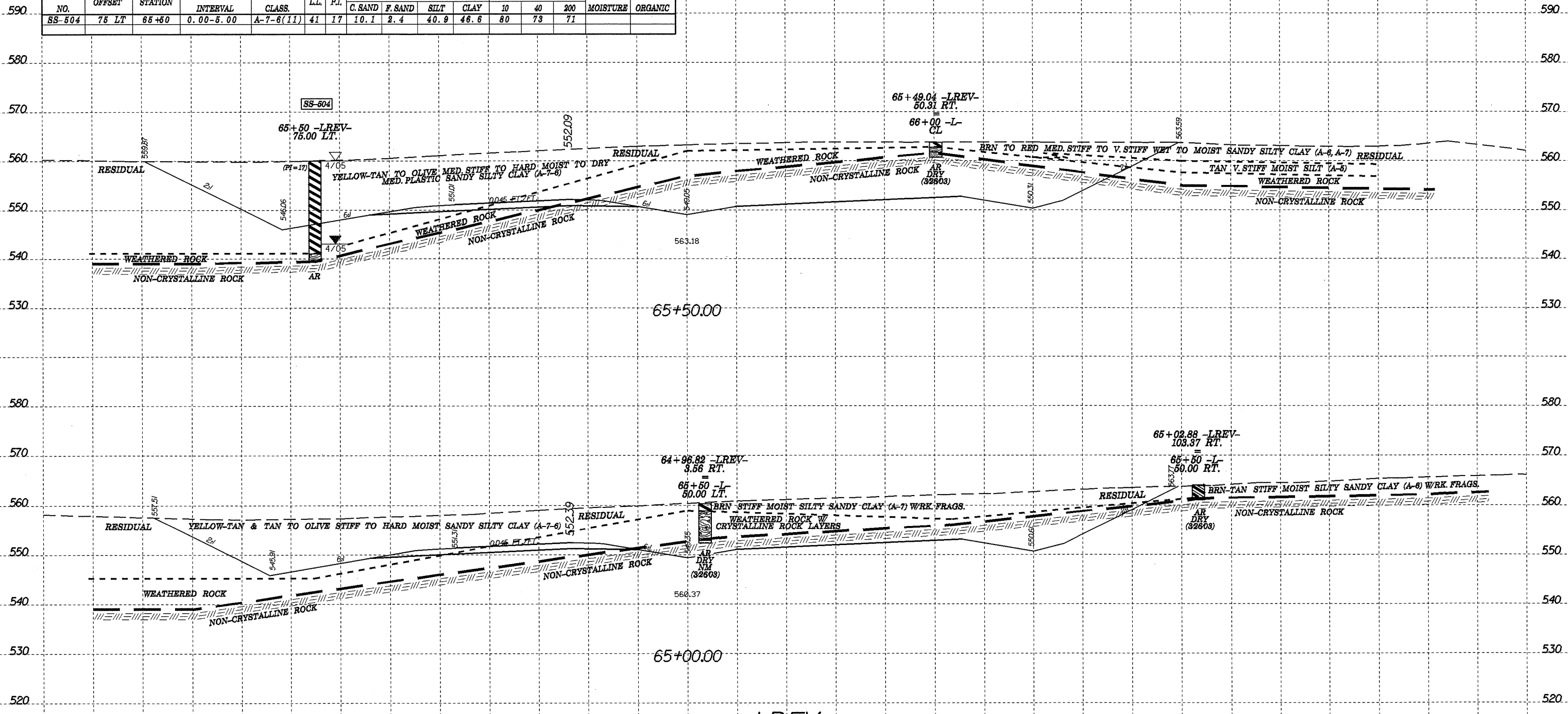
-LREV-

8/23/99

130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-504	75 LT	65+60	0.00-5.00	A-7-6(11)	41	17	10.1	2.4	40.9	46.6	80	73	71		

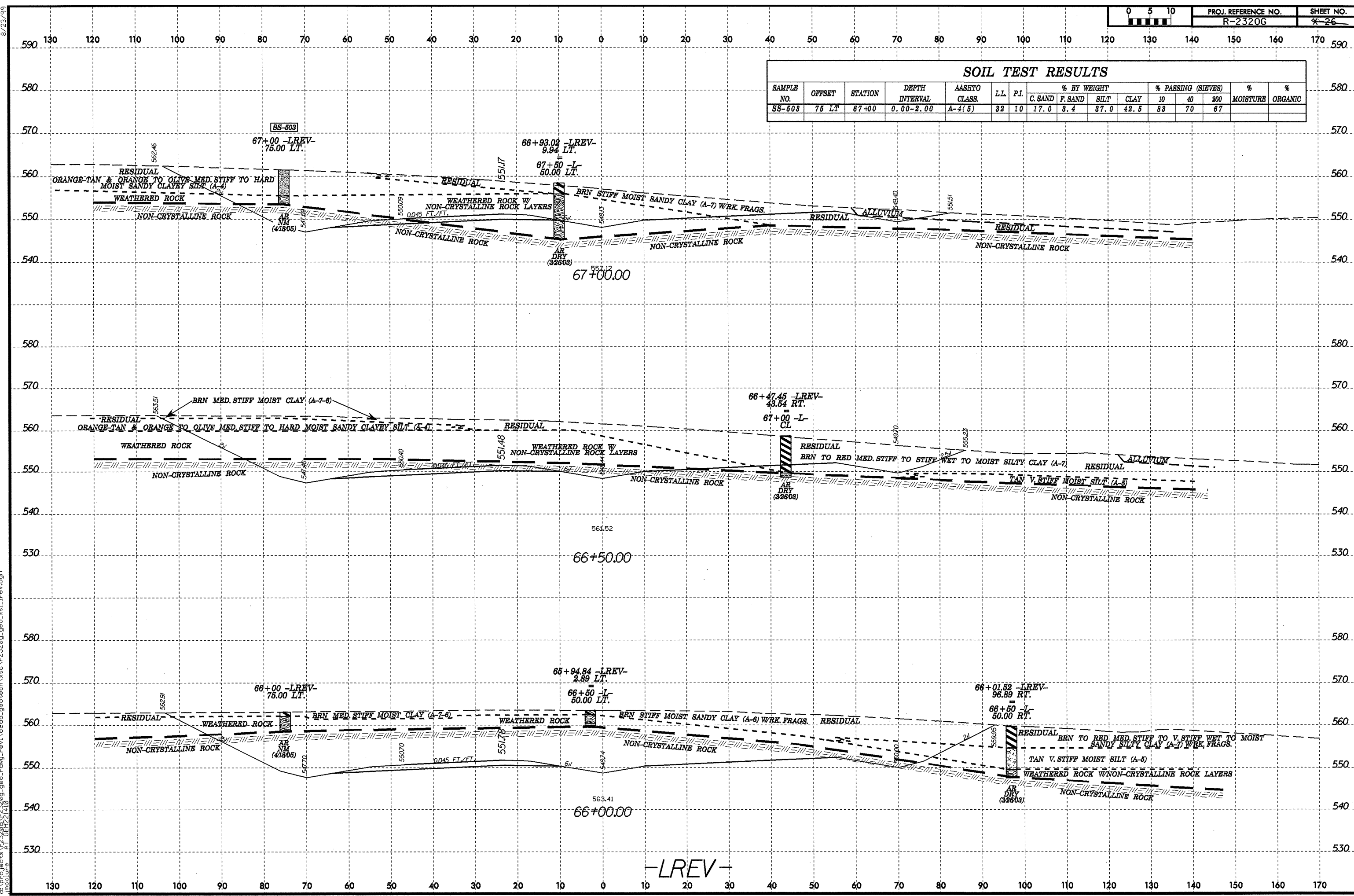


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-LREV-

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-608	75 LT	67+00	0.00-2.00	A-4(5)	32	10	17.0	3.4	37.0	42.6	83	70	67		



8/23/99
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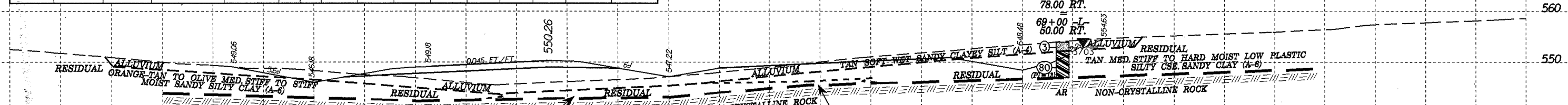
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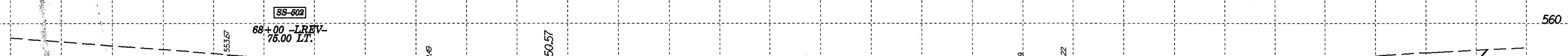
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SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-502	75 LT	68+00	0.00-2.50	A-6(8)	40	13	20.4	4.3	28.7	46.8	89	73	68		
SS-28	50 LT	69+00-L	0.00-1.50	A-4(6)	34	8	9.6	1.8	33.8	64.8	76	70	68		
SS-29	50 LT	69+00-L	4.00-6.50	A-6(4)	32	13	33.6	6.1	20.0	40.4	86	59	62		



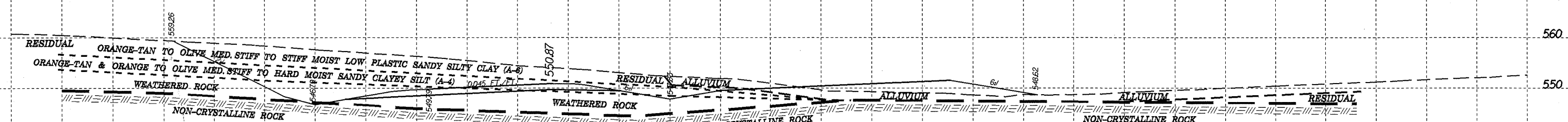
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530 530
68+50.00

570 570



540 540
530 530
68+00.00

570 570



540 540
530 530
67+50.00

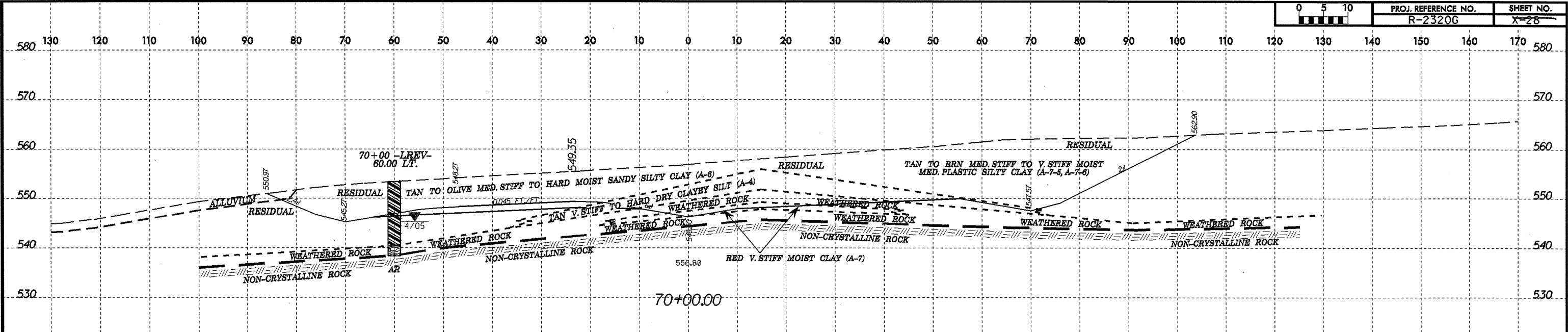
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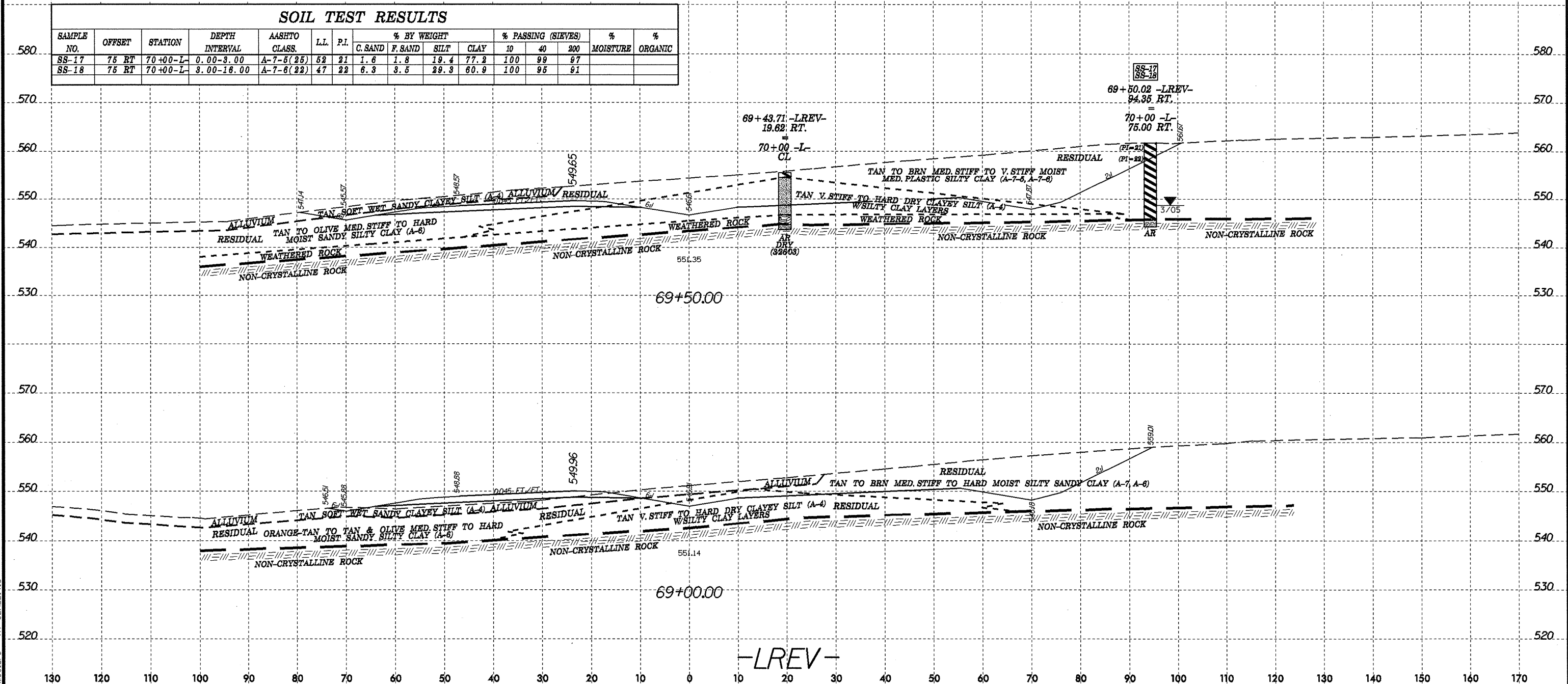


PROJ. REFERENCE NO.	SHEET NO.
R-2320G	X-28

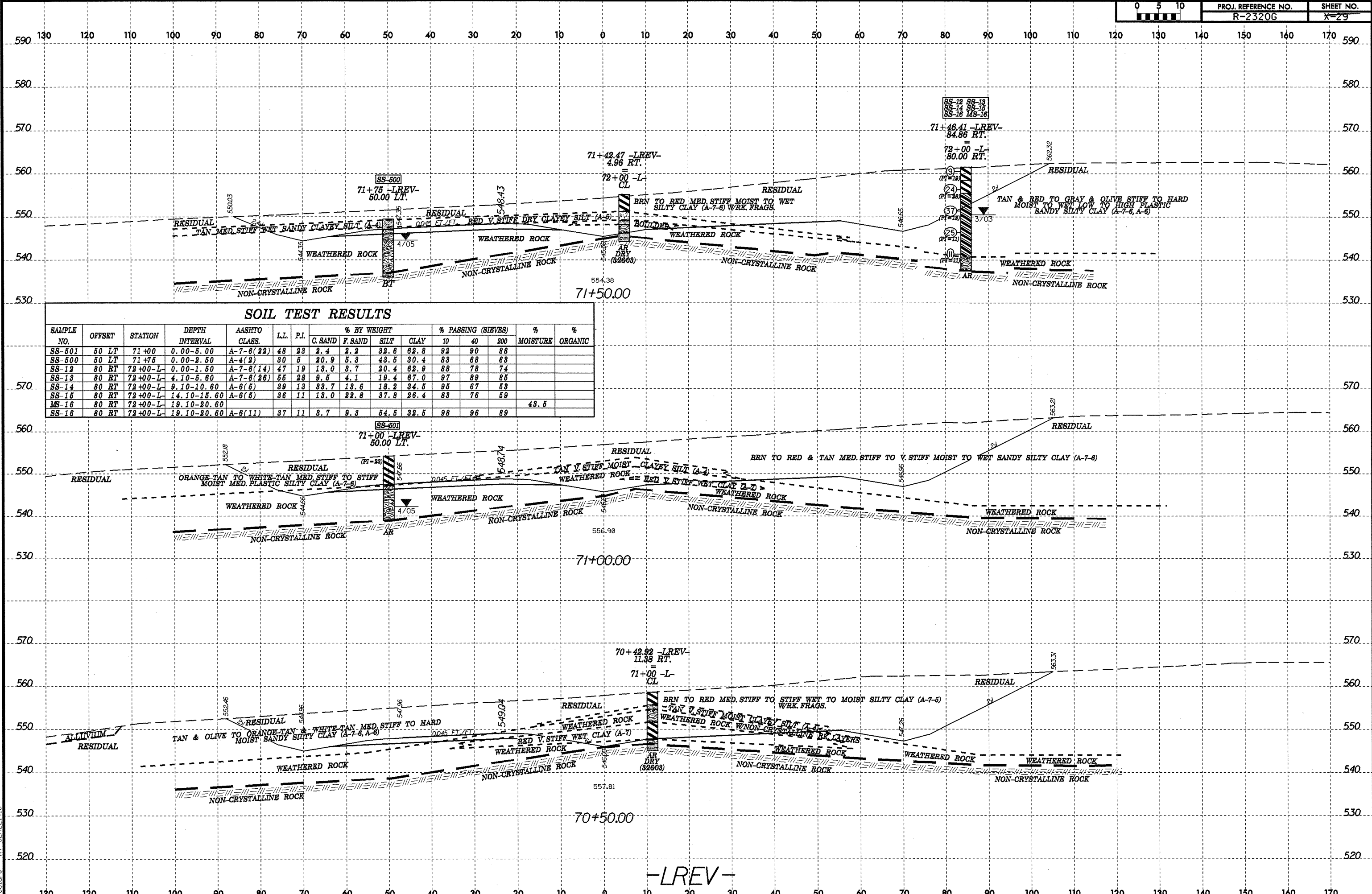


SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-17	75 RT	70+00-L	0.00-3.00	A-7-5(26)	62	21	1.6	1.8	19.4	77.2	100	99	97		
SS-18	75 RT	70+00-L	3.00-16.00	A-7-6(22)	47	22	6.3	8.5	28.9	60.9	100	96	91		



8/23/99
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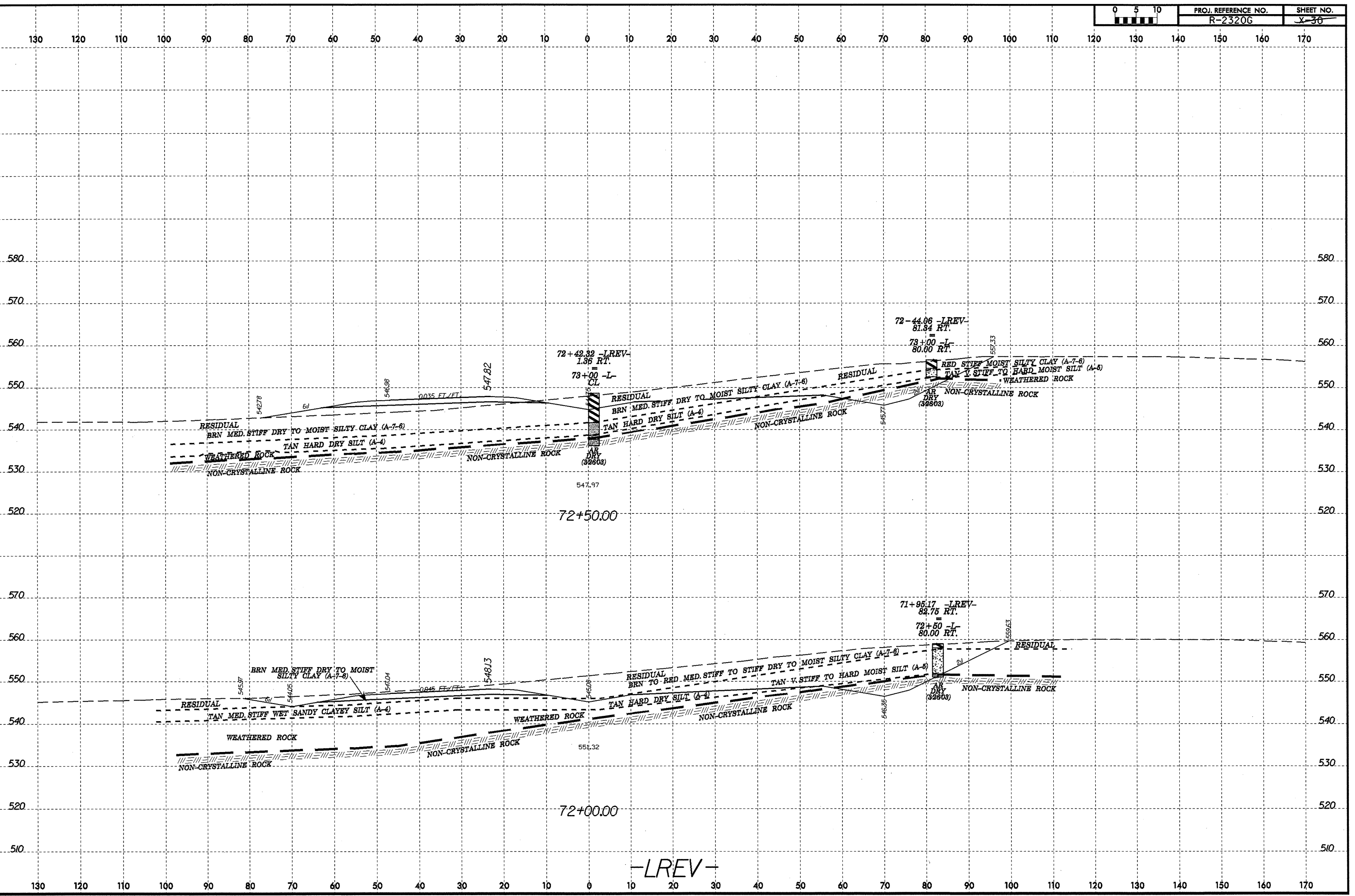


SOIL TEST RESULTS

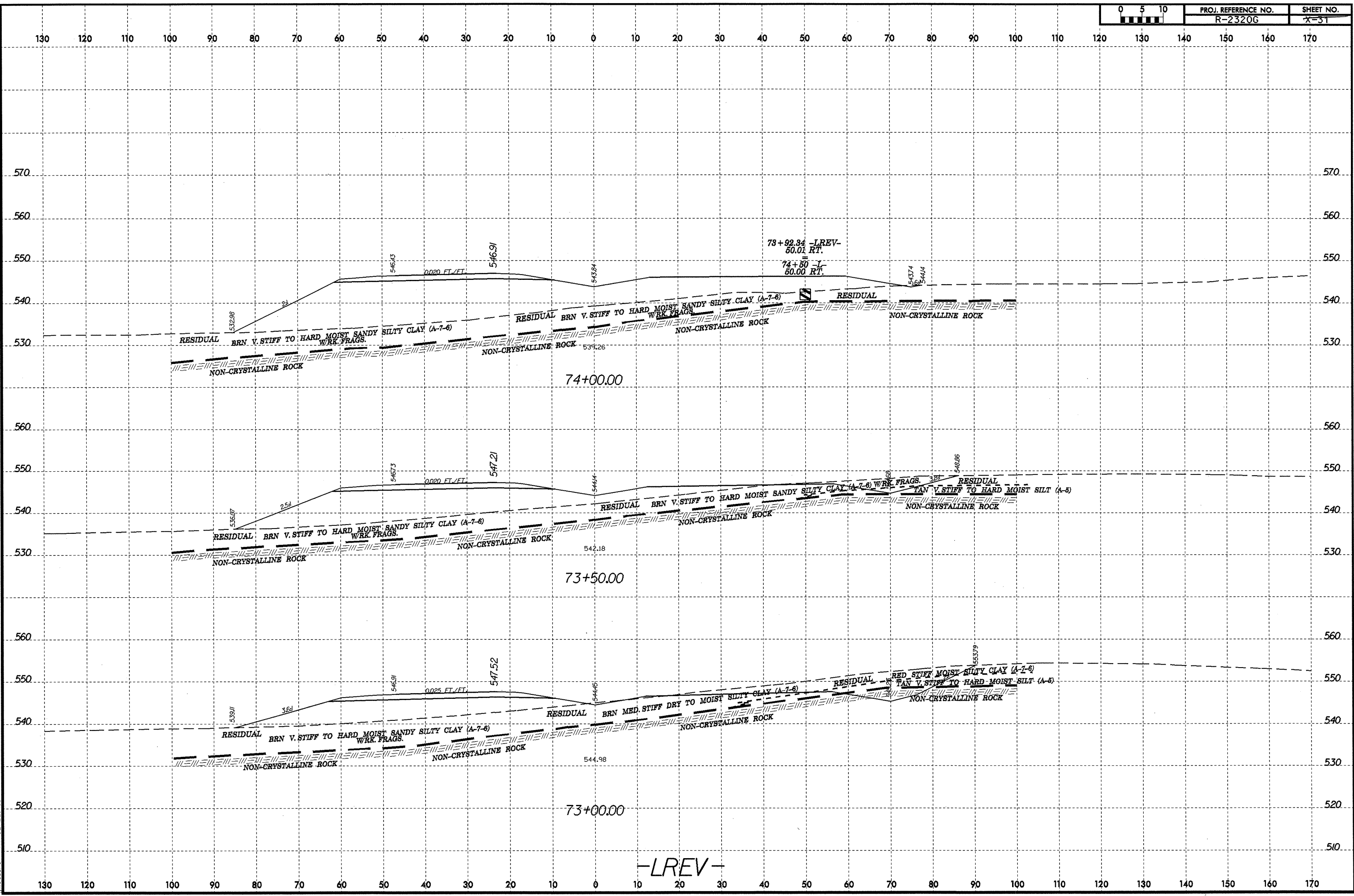
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							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-501	50 LT	71+00	0.00-5.00	A-7-6(22)	48	23	2.4	2.2	32.6	62.8	92	90	88		
SS-500	50 LT	71+75	0.00-2.50	A-4(2)	30	5	20.9	5.3	49.5	30.4	83	68	63		
SS-12	80 RT	72+00-L	0.00-1.50	A-7-6(14)	47	19	13.0	3.7	20.4	62.9	88	78	74		
SS-13	80 RT	72+00-L	4.10-5.60	A-7-6(26)	55	28	9.5	4.1	19.4	67.0	97	89	85		
SS-14	80 RT	72+00-L	9.10-10.60	A-6(5)	39	13	33.7	18.6	18.2	34.5	95	67	53		
SS-15	80 RT	72+00-L	14.10-15.60	A-6(5)	36	11	13.0	22.8	37.8	26.4	83	78	59		
MS-16	80 RT	72+00-L	19.10-20.60										43.5		
SS-16	80 RT	72+00-L	19.10-20.60	A-6(11)	37	11	3.7	9.3	54.5	32.5	98	98	89		

8/23/99
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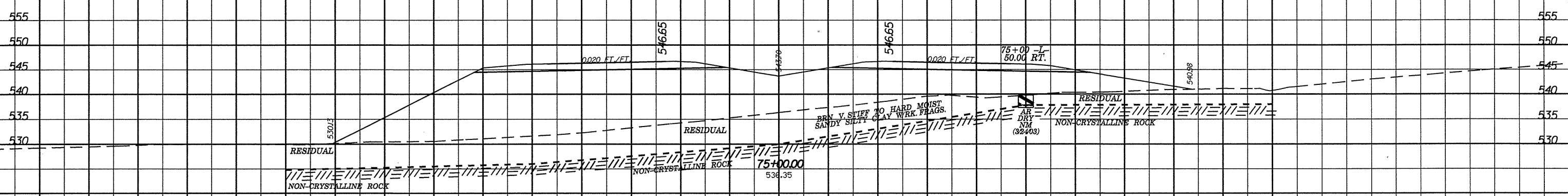
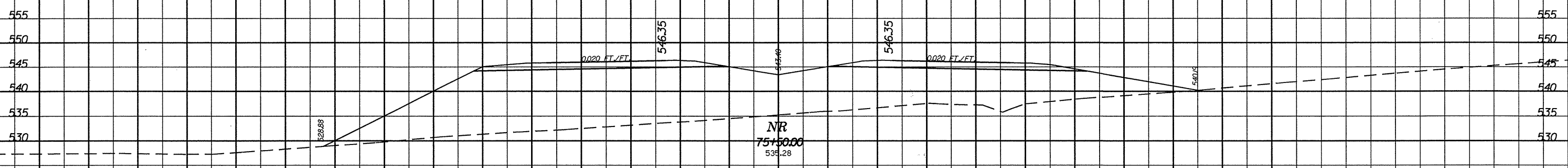
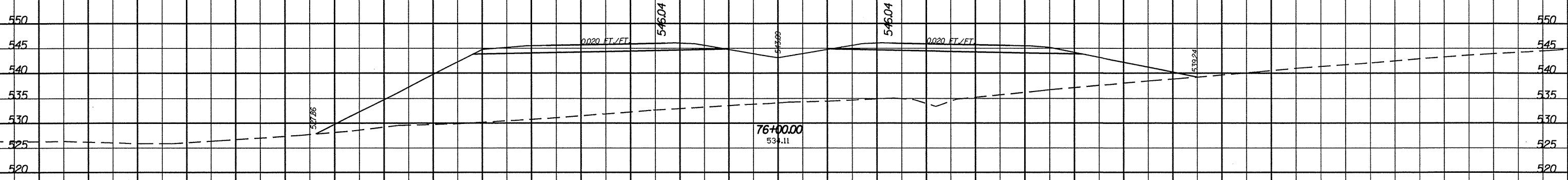
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8/23/99
 21-OCT-2005 15:21
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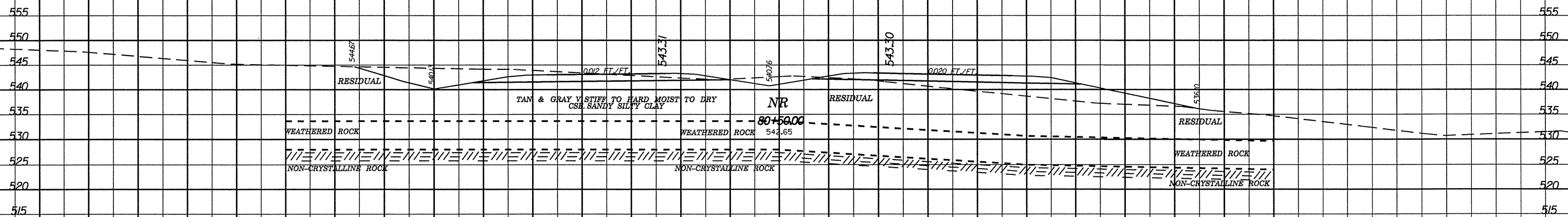
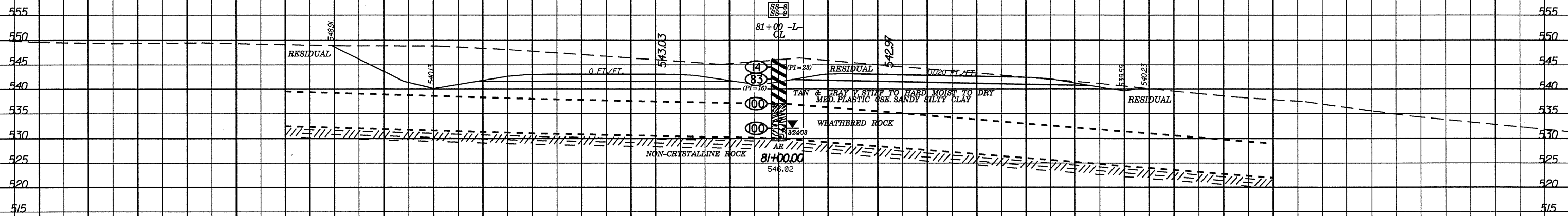


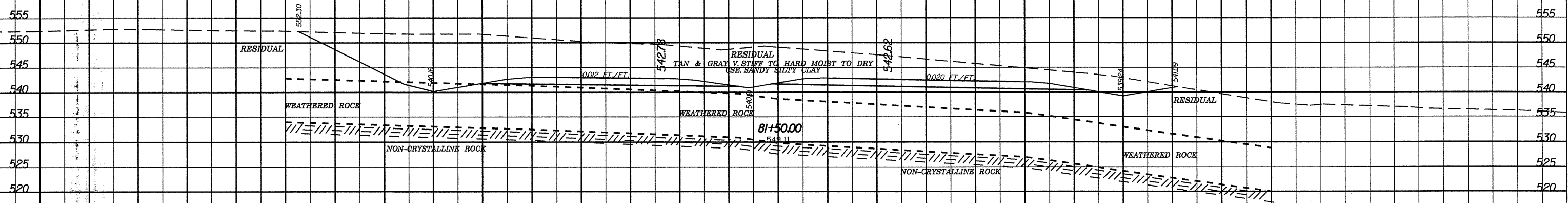
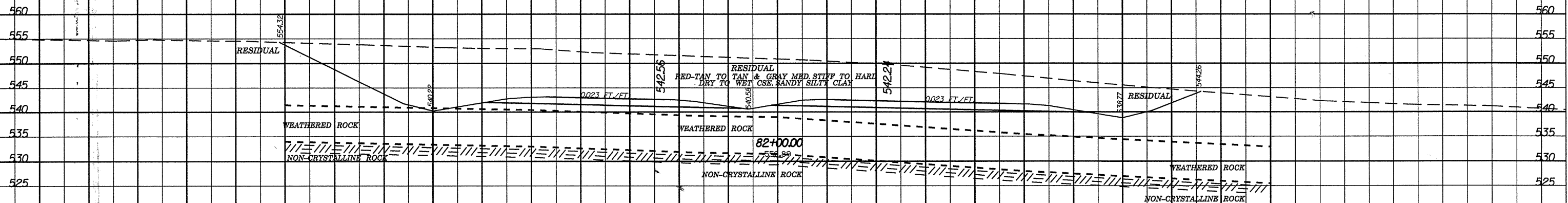
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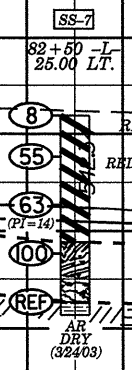
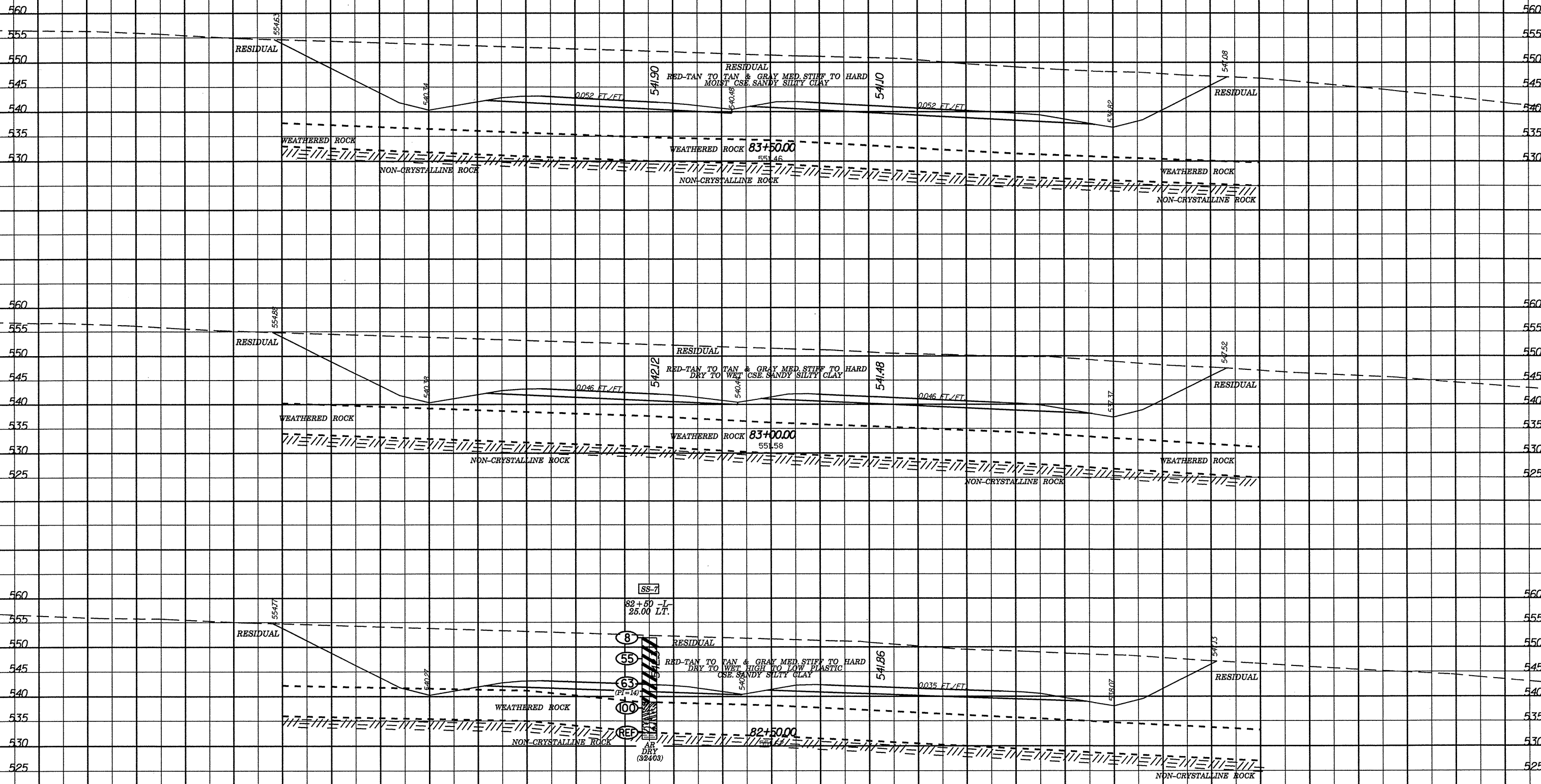


SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.L.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-8	CL	81+00	1.50-3.00	A-7-6(15)	49	23	13.4	4.5	19.2	62.9	82	73	68	-	-
SS-9	CL	81+00	4.00-5.50	A-7-6(8)	44	16	26.8	8.3	22.2	42.6	89	71	59	-	-





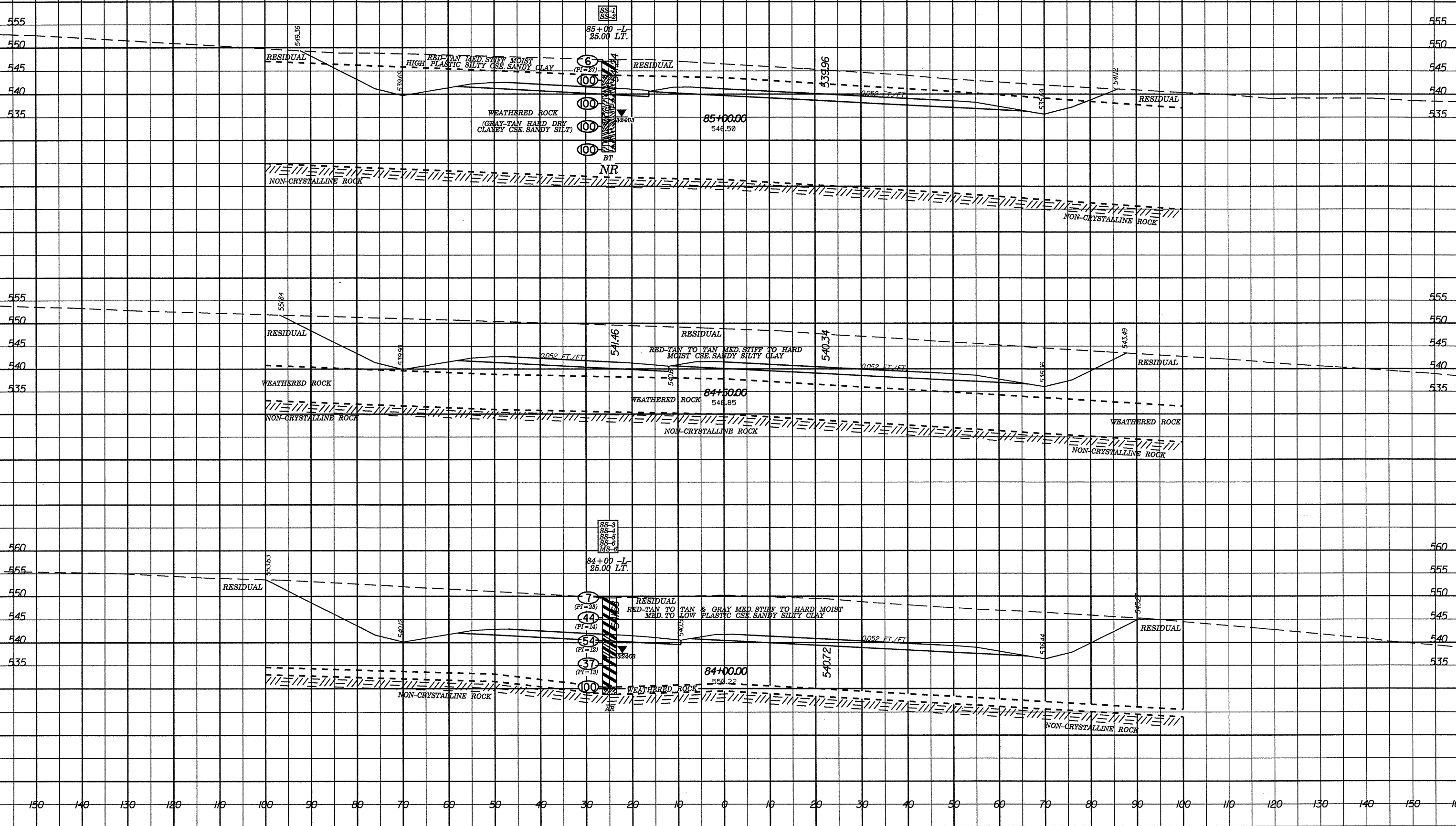


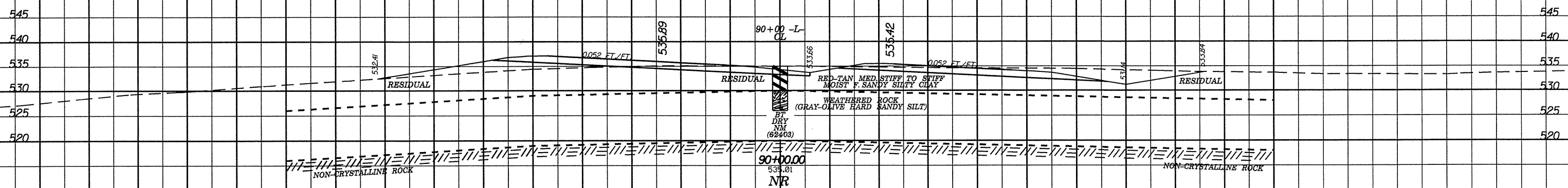
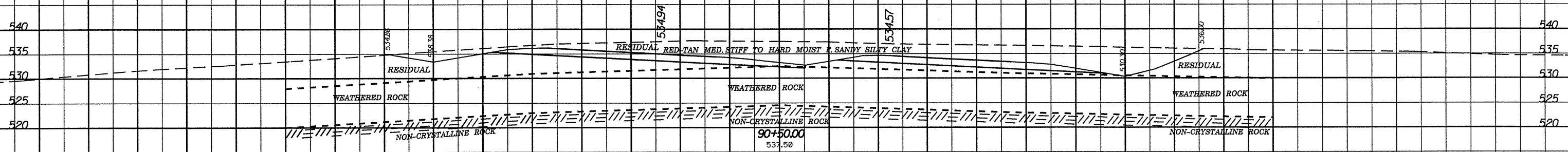
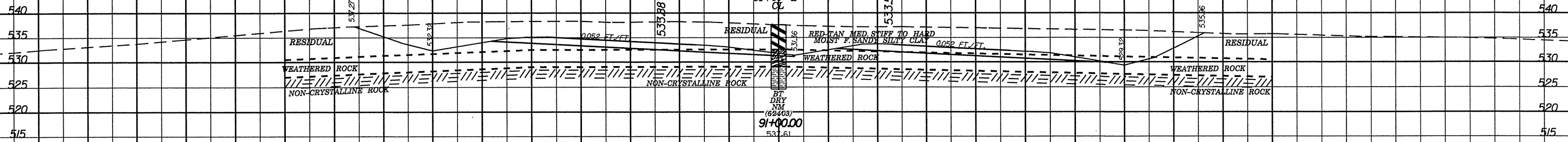
SOIL TEST RESULTS

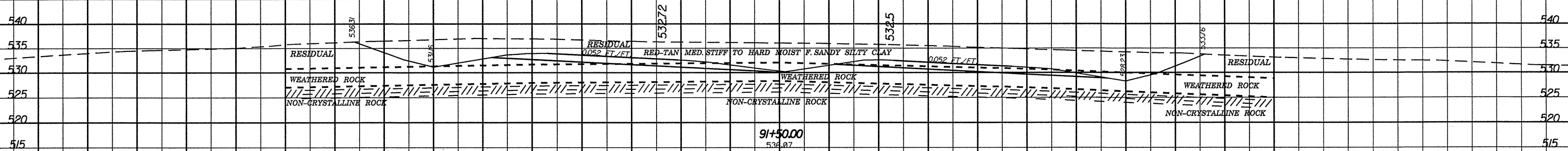
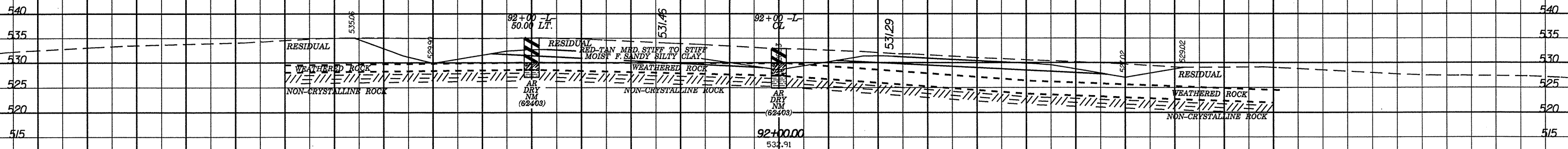
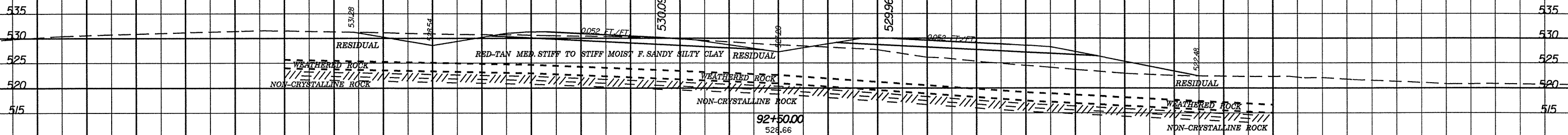
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	PL I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-7	25 LT	82+50	9.20-10.70	A-7-5(12)	44	14	15.6	6.3	33.4	44.7	96	84	77	-	-

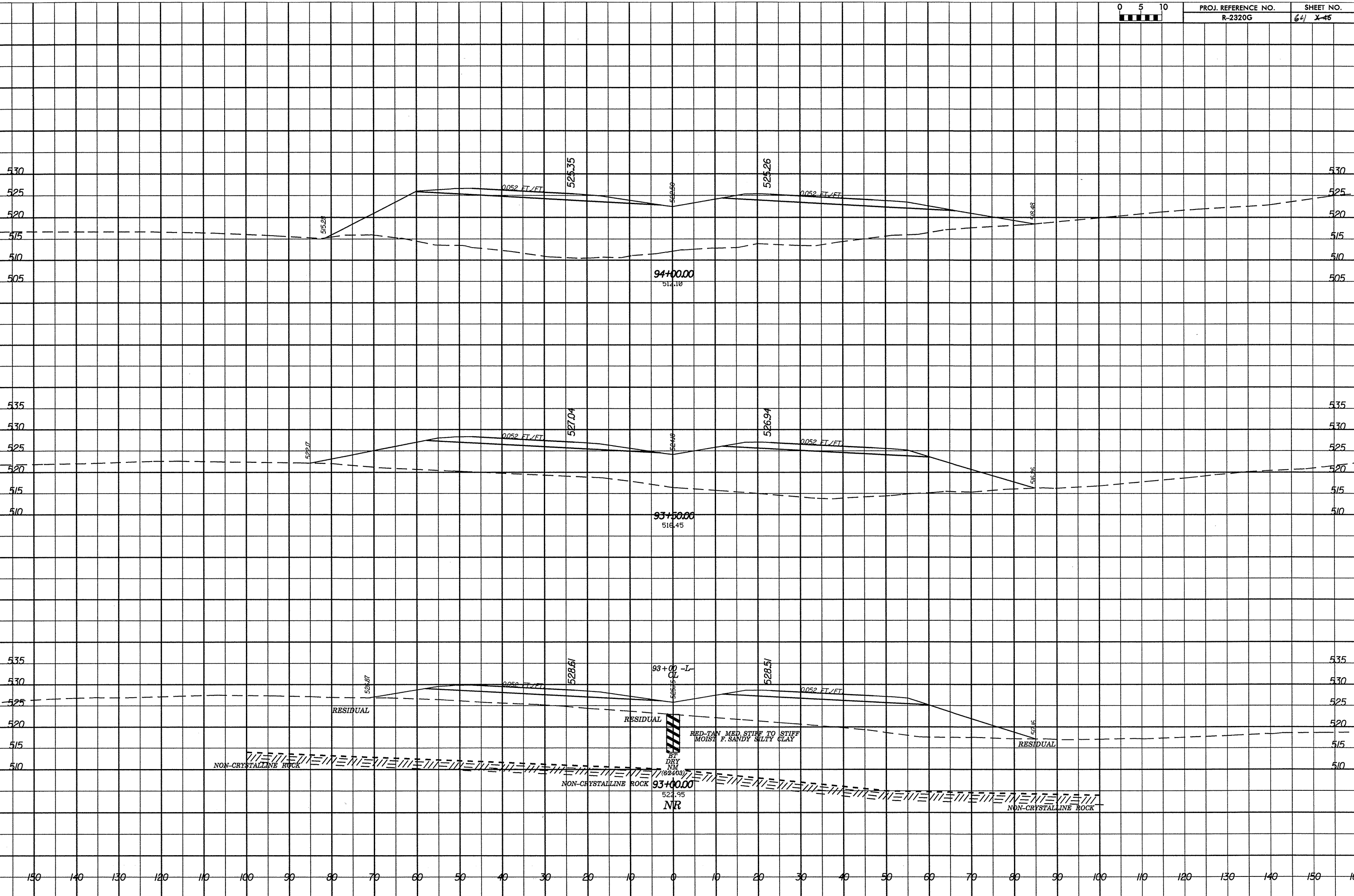
SOIL TEST RESULTS

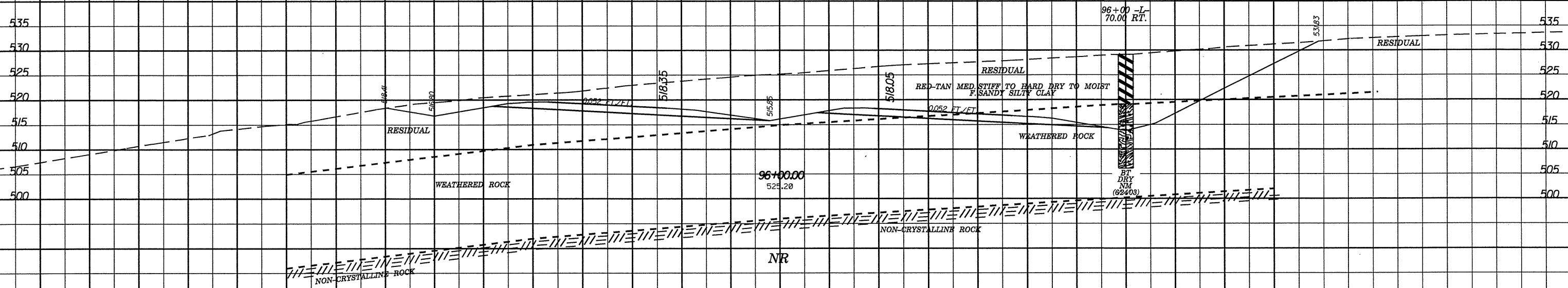
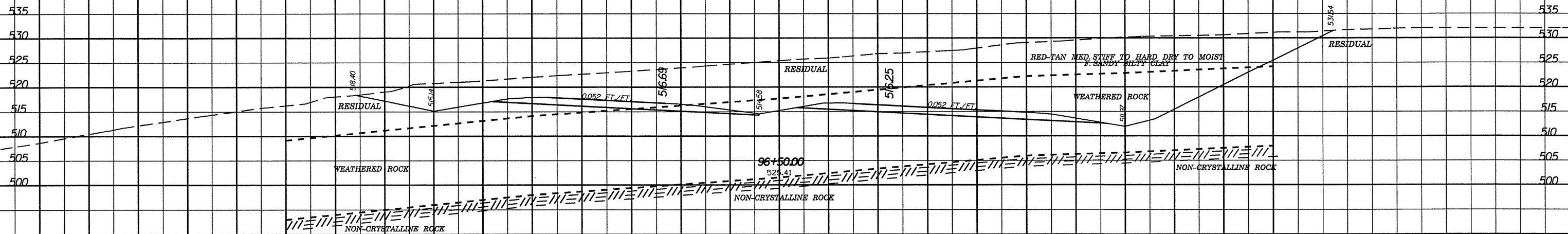
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS	L.L.	P.L.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-3	25 LT	84+00	0.00-1.50	A-7-5(21)	53	23	5.1	2.2	19.6	73.1	88	84	82	-	-
SS-4	25 LT	84+00	4.30-5.80	A-7-6(12)	42	14	16.9	4.7	21.6	66.9	89	85	79	-	-
SS-5	25 LT	84+00	9.30-10.80	A-6(4)	40	12	37.6	7.5	20.4	34.5	89	60	50	-	-
MS-6	25 LT	84+00	14.30-15.80				0.0	0.0	0.0	0.0	0	0	0	28.5	-
SS-6	25 LT	84+00	14.30-15.80	A-7-5(10)	46	13	17.7	7.5	28.1	46.7	95	81	73	-	-
SS-1	25 LT	85+00	0.00-1.50	A-7-6(14)	56	27	14.2	4.9	11.9	69.0	72	64	59	-	-
SS-2	25 LT	85+00	4.10-5.60	A-4(3)	36	10	37.0	9.9	20.6	32.5	95	65	52	-	-

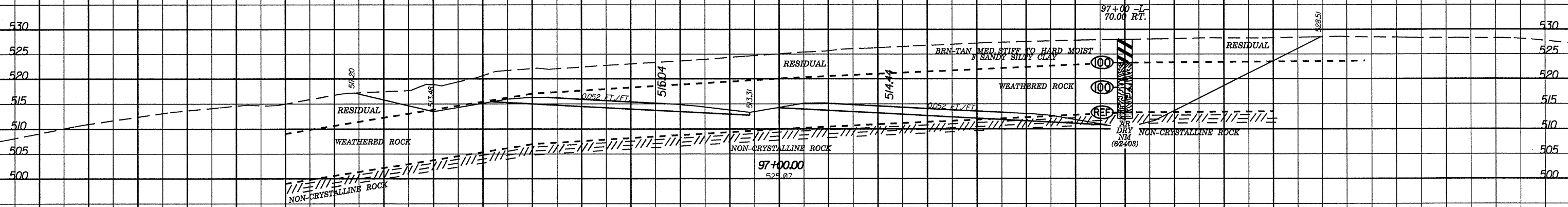
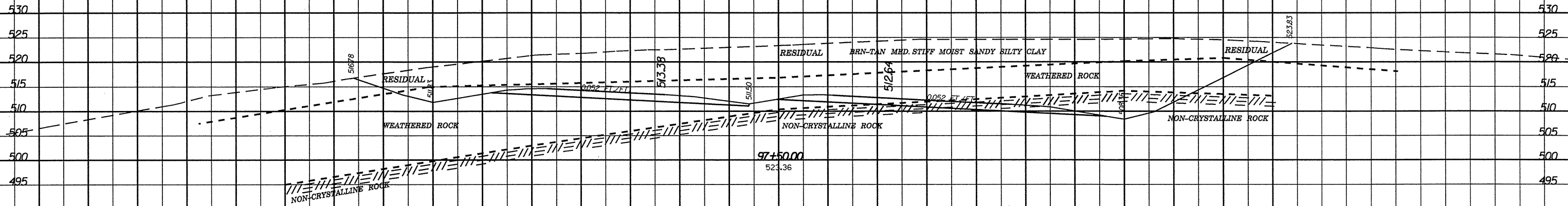


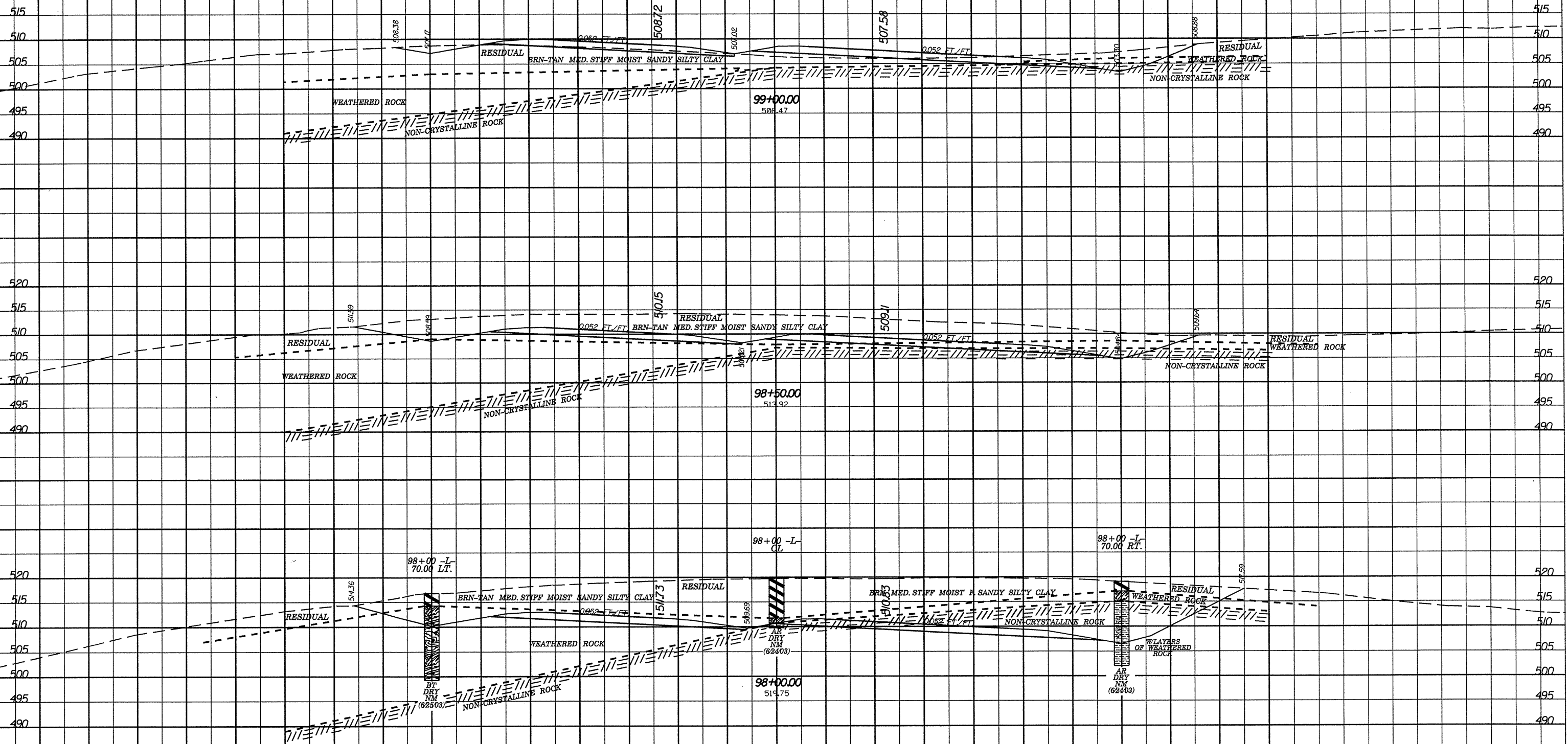


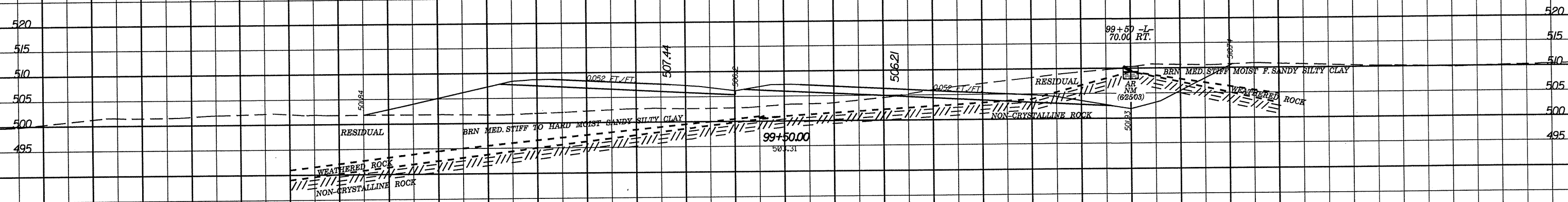
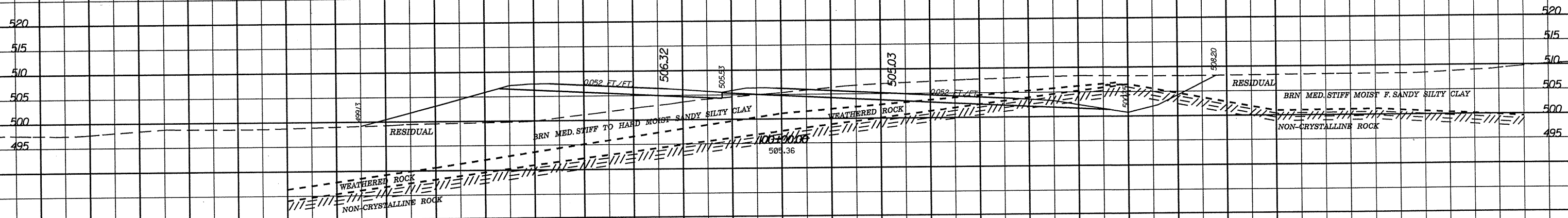
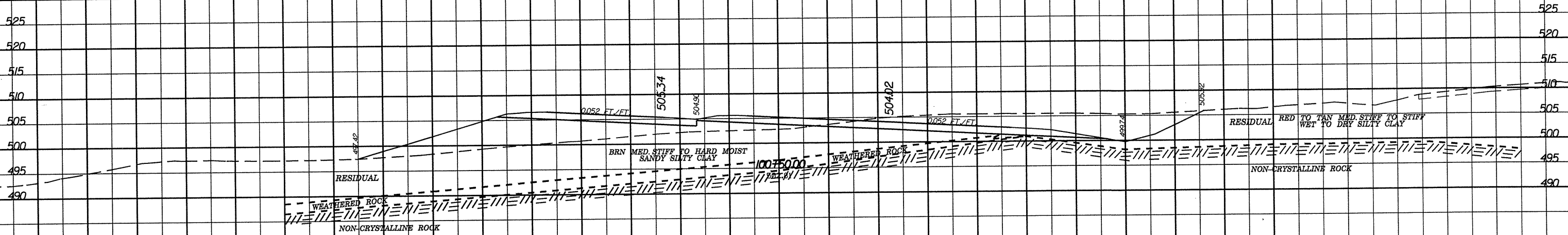






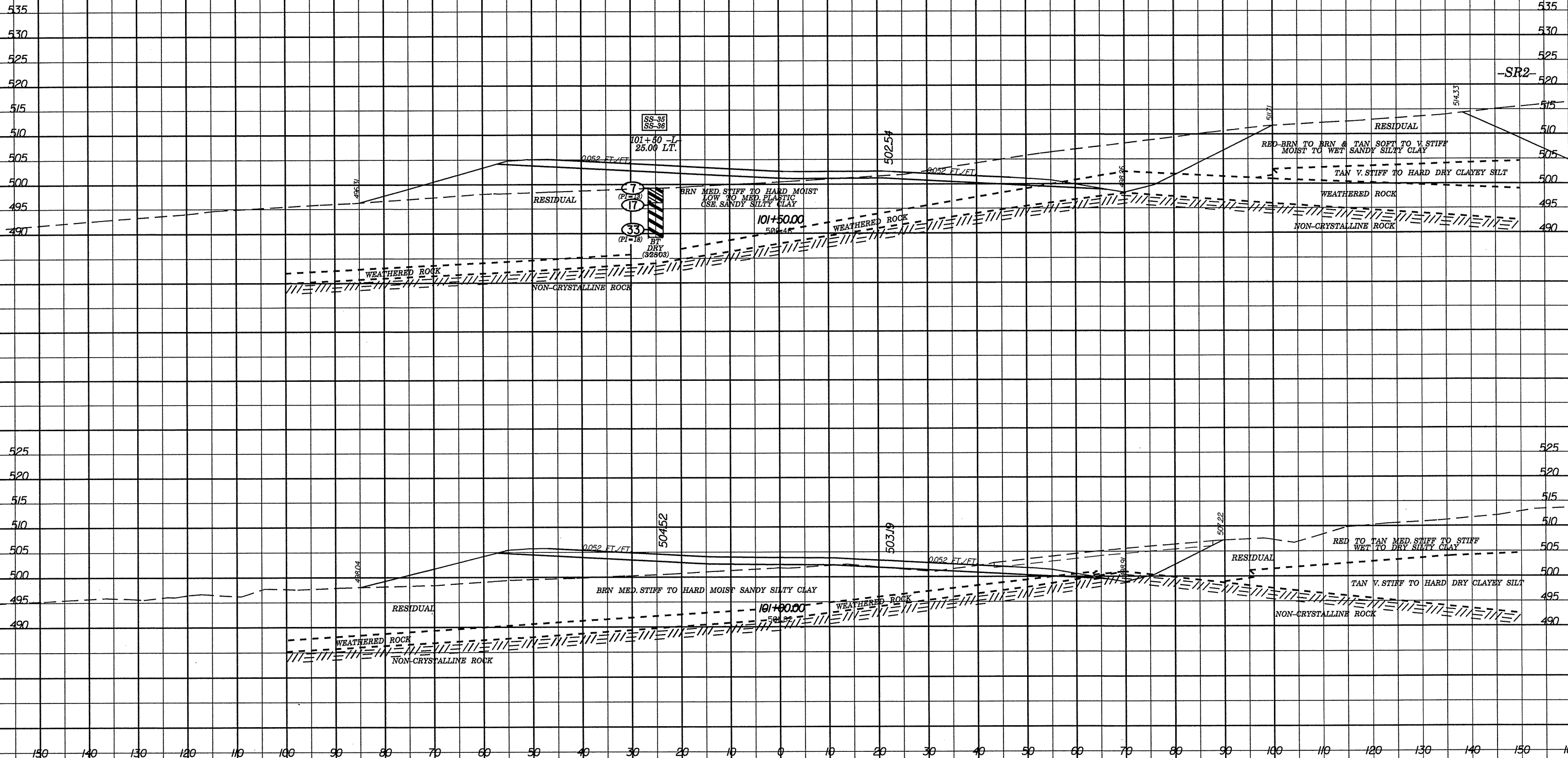


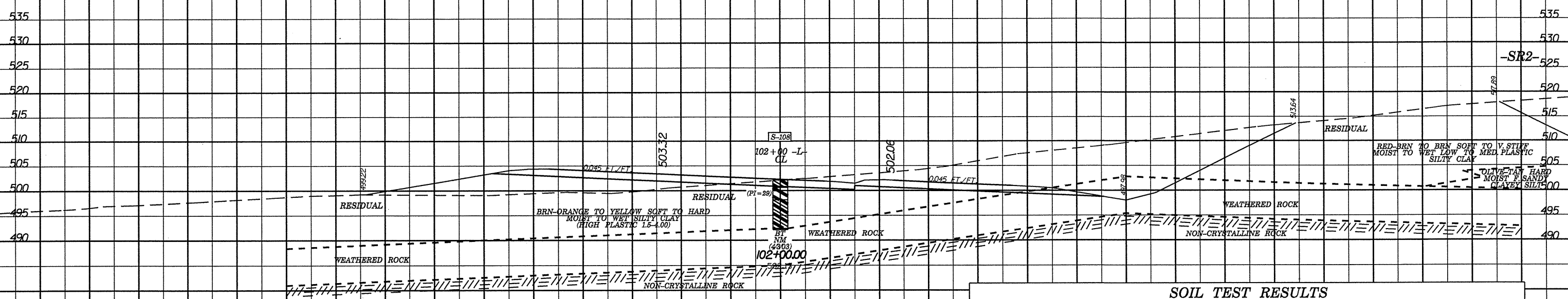
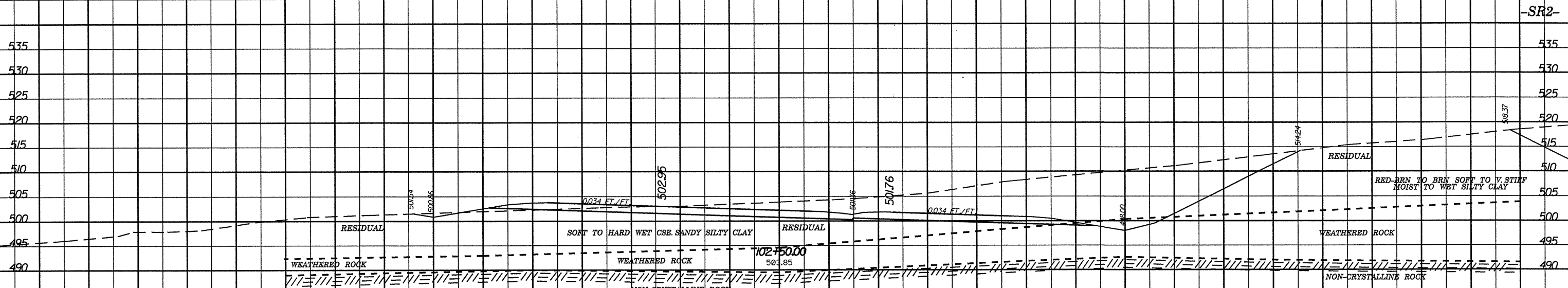




SOIL TEST RESULTS

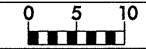
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							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-35	25 LT	101+50	0.00-1.50	A-6(3)	38	13	24.6	5.7	25.3	44.4	65	52	46	-	-
SS-38	25 LT	101+50	8.50-10.00	A-7-6(17)	48	18	7.1	5.1	29.3	58.6	93	88	83	-	-





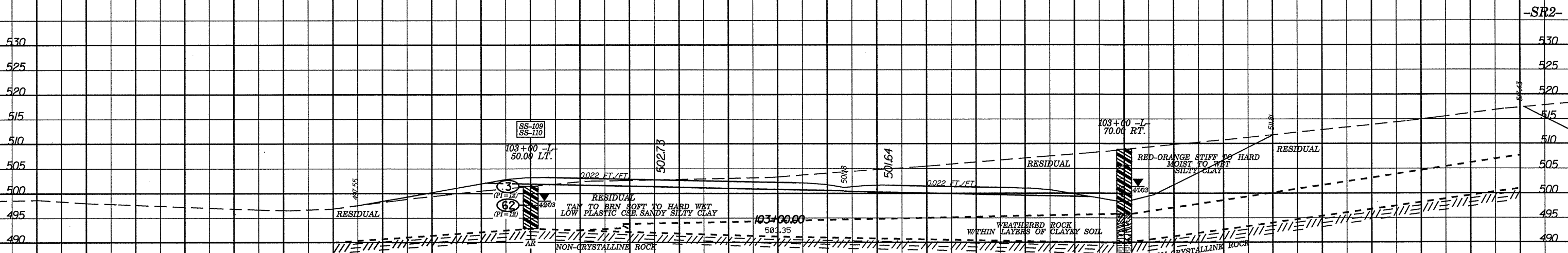
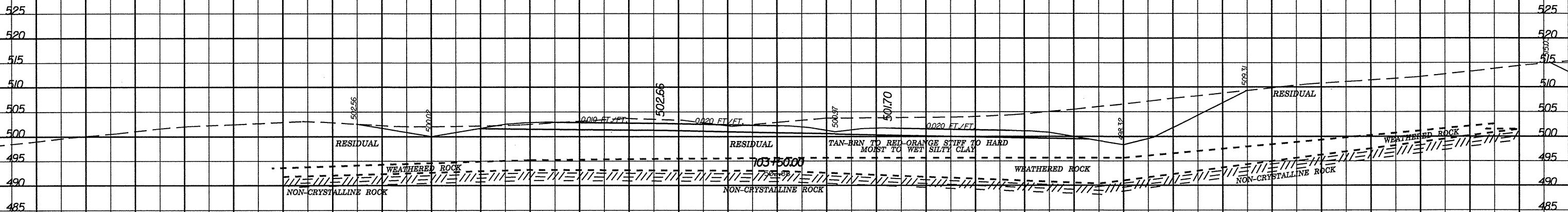
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.L.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-108	CL	102+00	1.60-4.00	A-7-6(28)	55	29	6.9	4.4	28.1	60.6	91	86	82	-	-

8/23/99



PROJ. REFERENCE NO. R-2320G

SHEET NO. 7/ 4-34



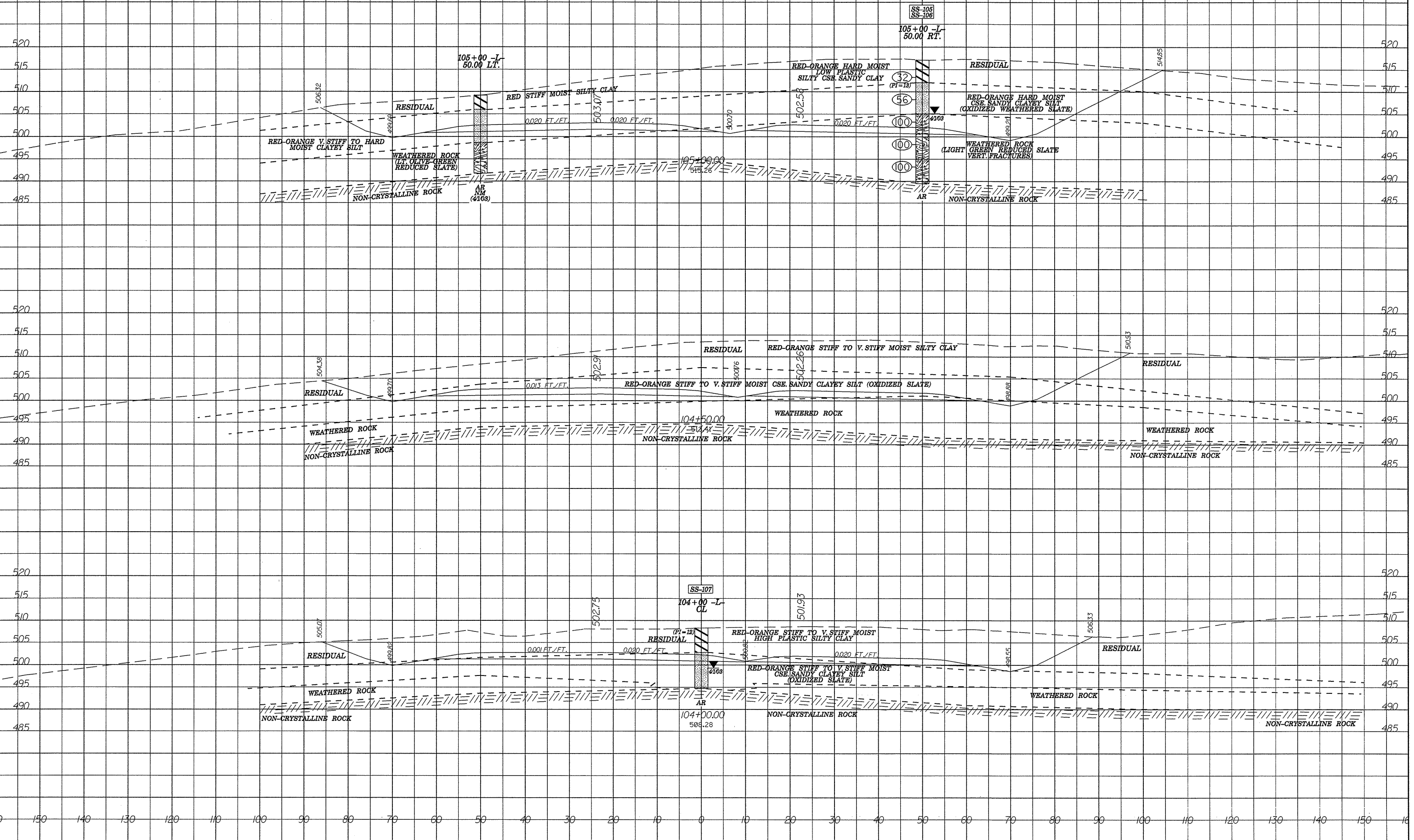
SOIL TEST RESULTS

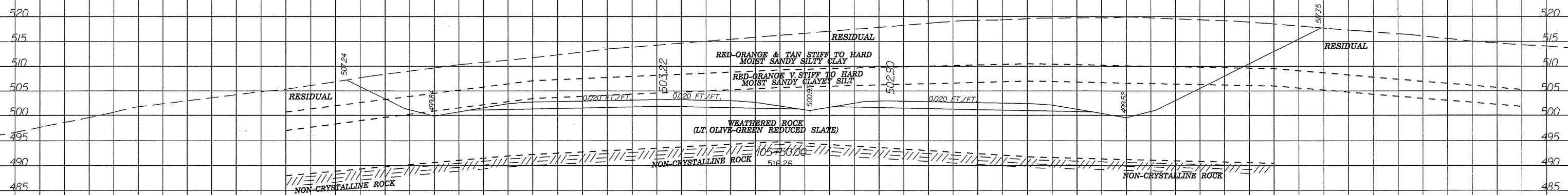
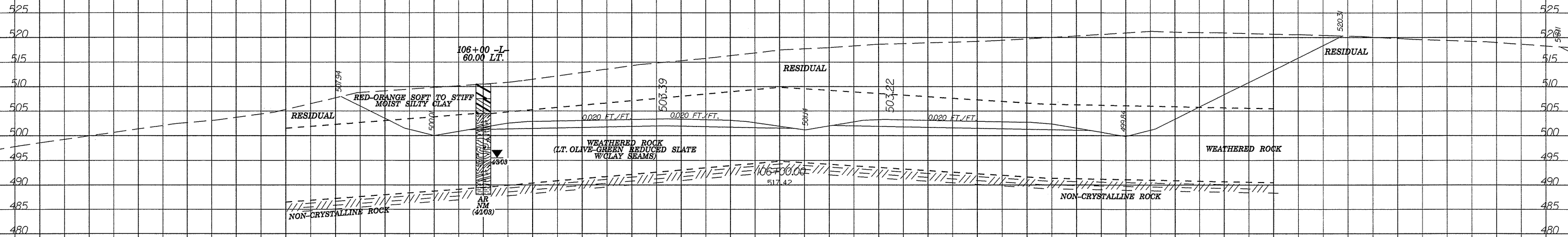
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.L.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-109	50 LT	103+00	0.00-1.50	A-6(10)	38	12	6.3	4.8	38.4	50.5	88	83	80	-	-
SS-110	50 LT	103+00	3.80-5.30	A-6(2)	37	12	42.4	6.9	14.3	38.4	79	49	41	-	-

05-SEP-2003 14:18
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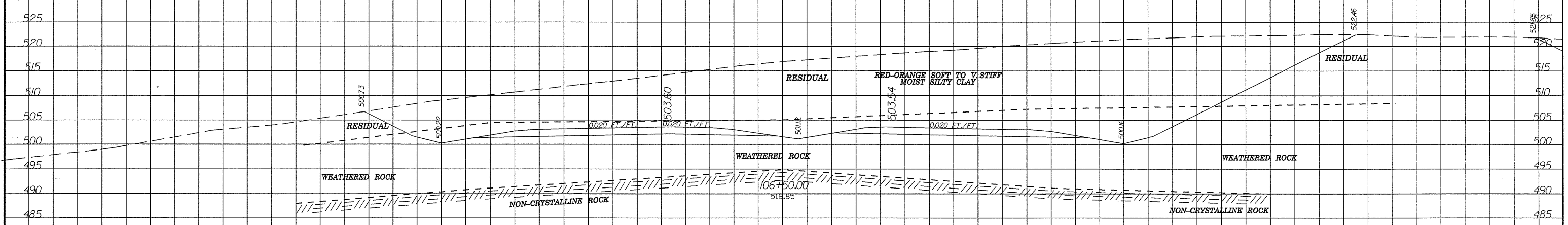
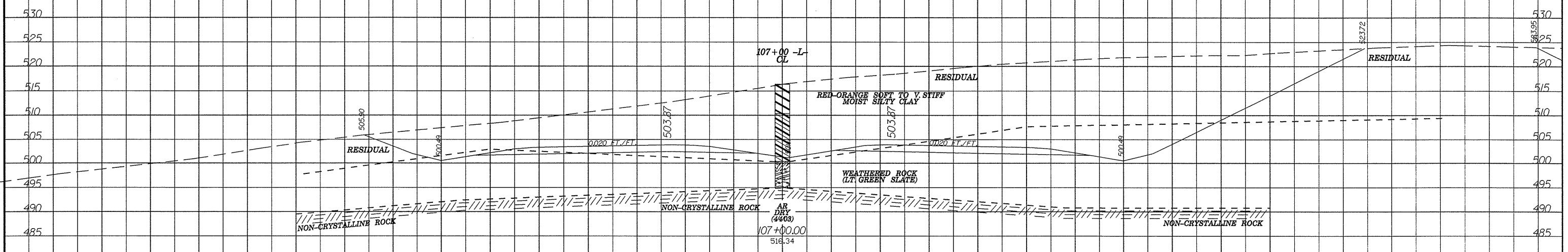
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.L. I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-107	CL	104+00	0.00-3.60	A-7-6(36)	65	31	2.8	2.6	13.7	80.8	100	98	95	-	-
SS-105	50 RT	105+00	3.80-5.30	A-7-6(8)	45	13	30.1	6.1	21.4	42.4	100	74	65	-	-
SS-106	50 RT	105+00	13.80-15.30	A-4(6)	37	10	26.5	13.1	26.1	34.3	96	75	61	-	-

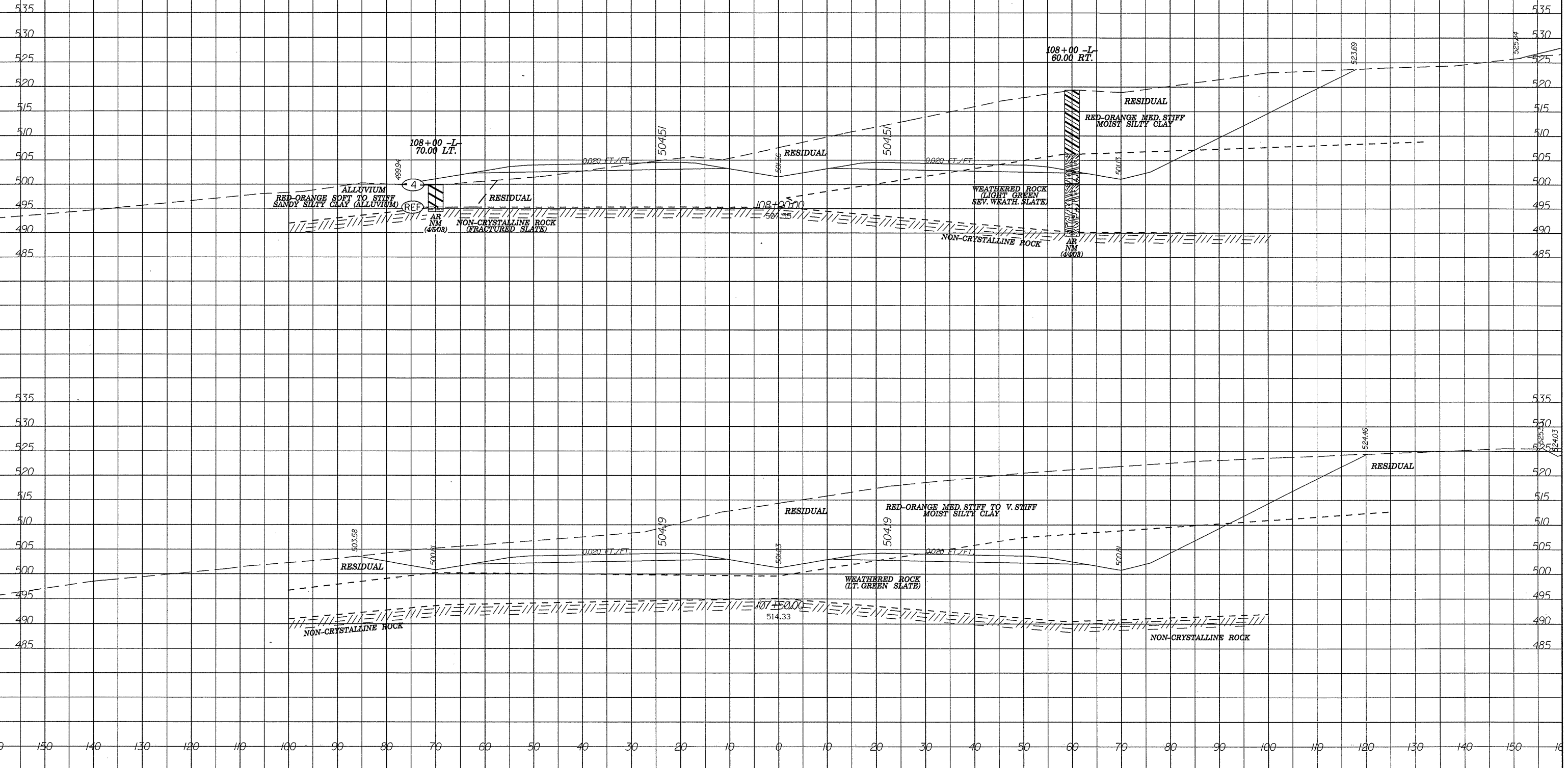




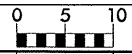
8/23/77



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 SECTION CUT DATE 08/23/11
 SECTION CUT BY J. PERNAME

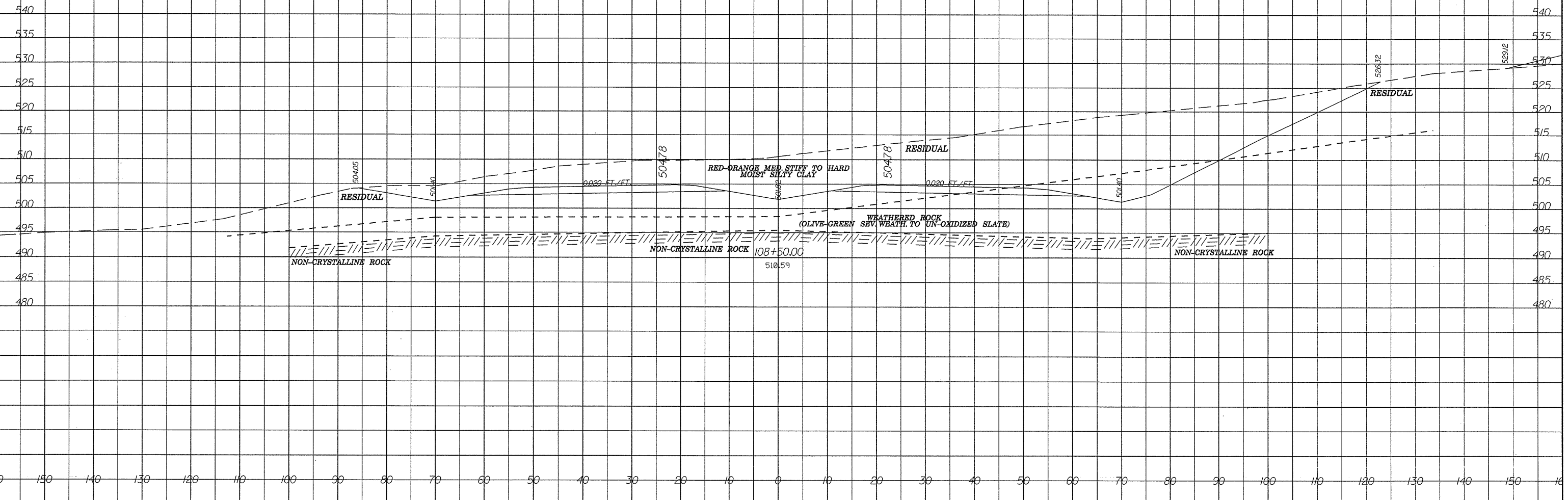


8/23/12

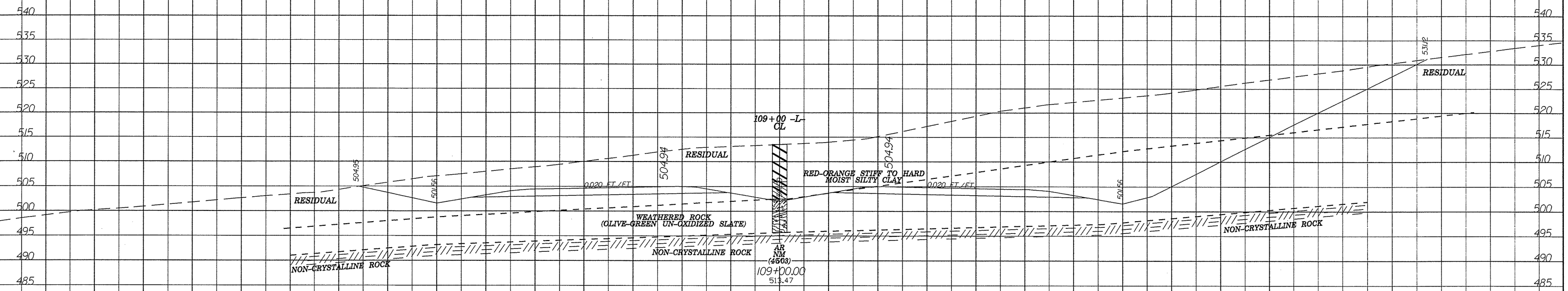
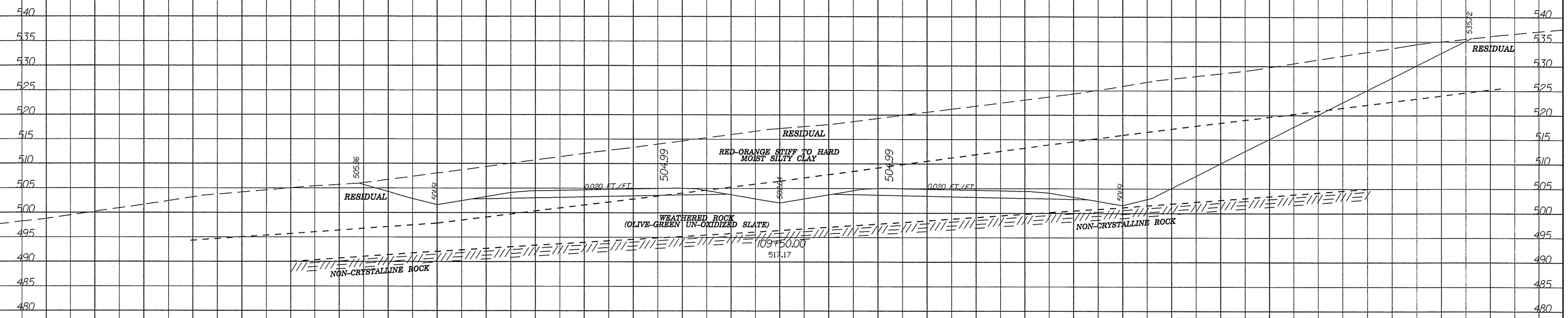


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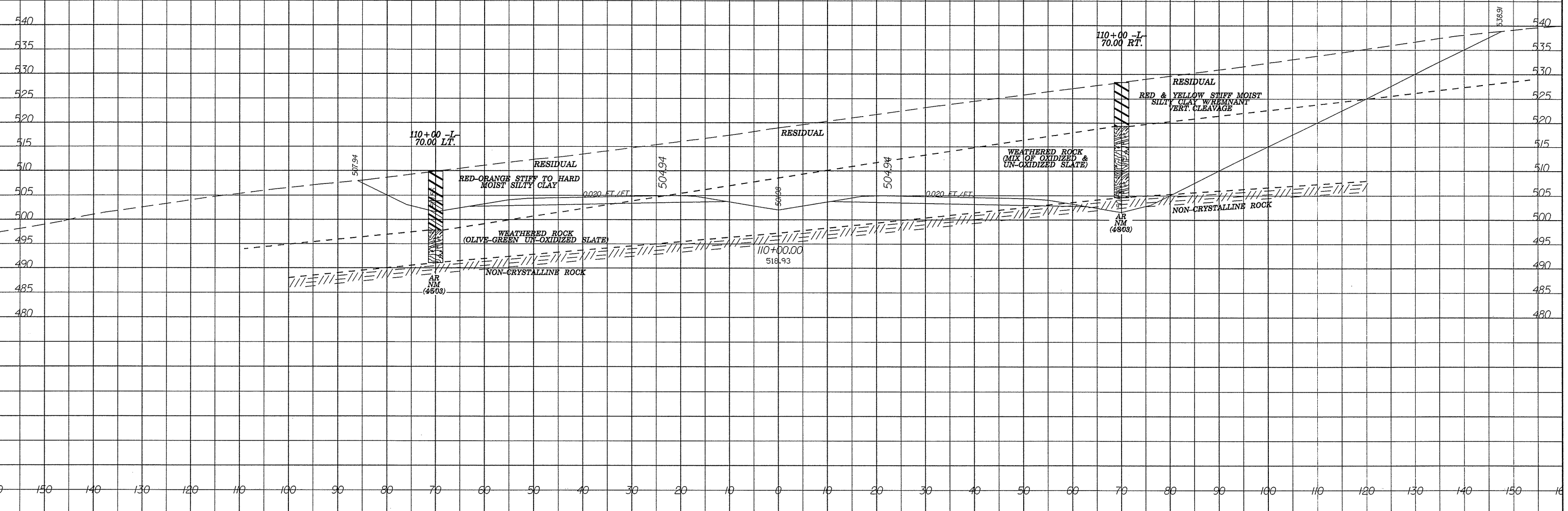
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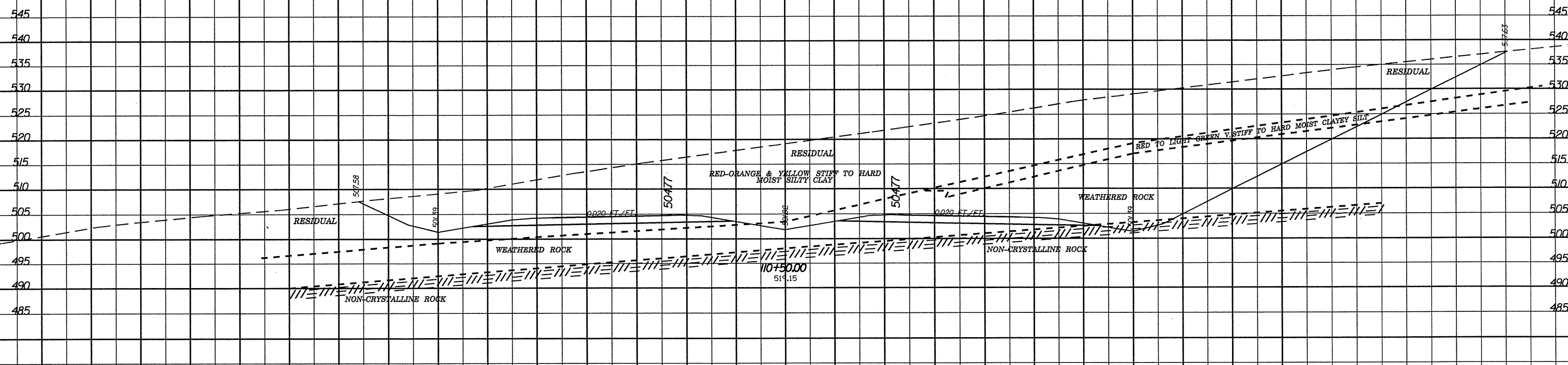
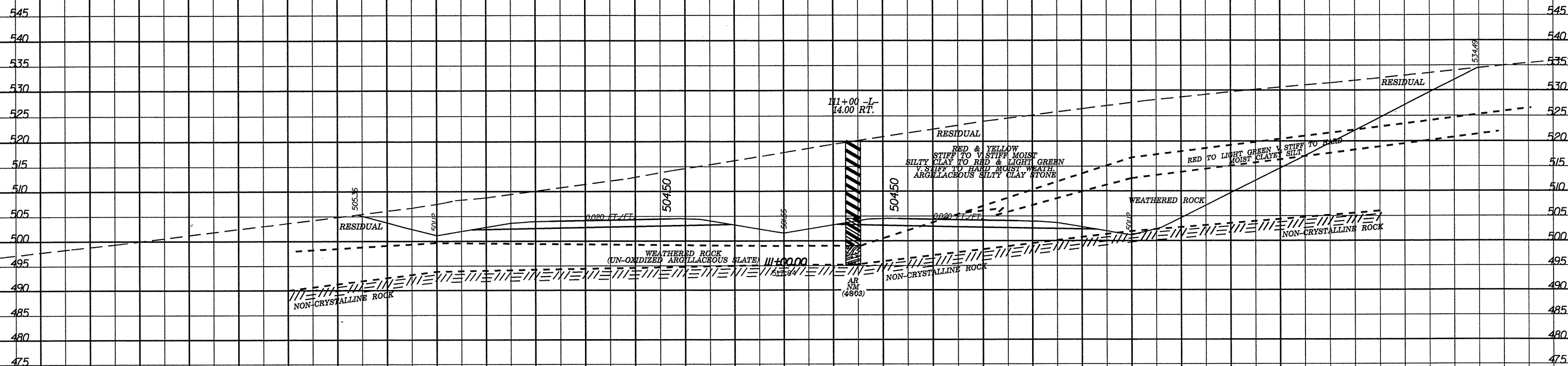
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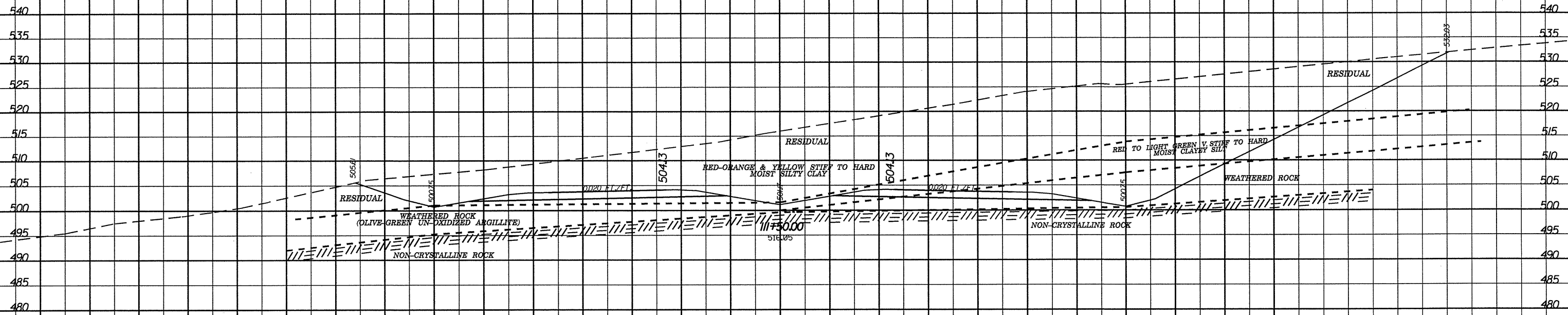


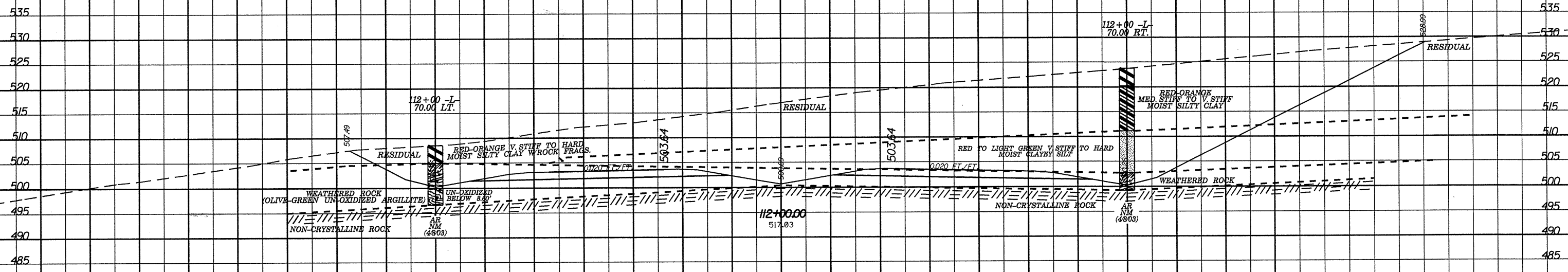
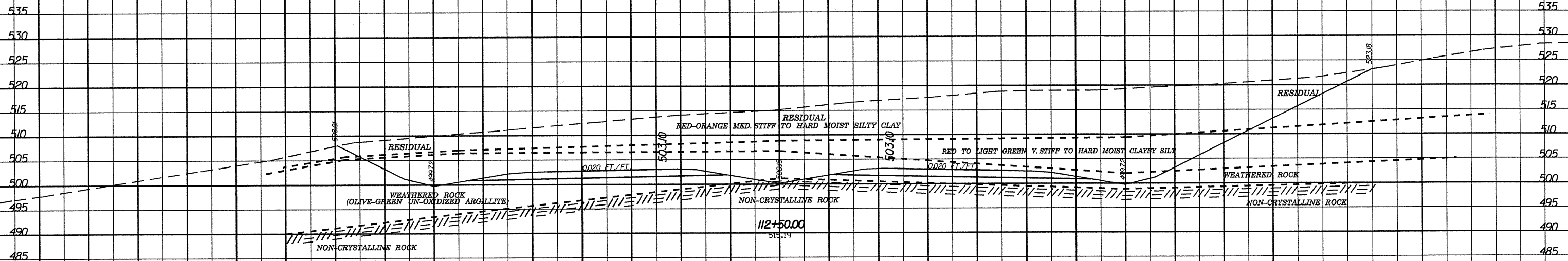
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DATE 08/23/11
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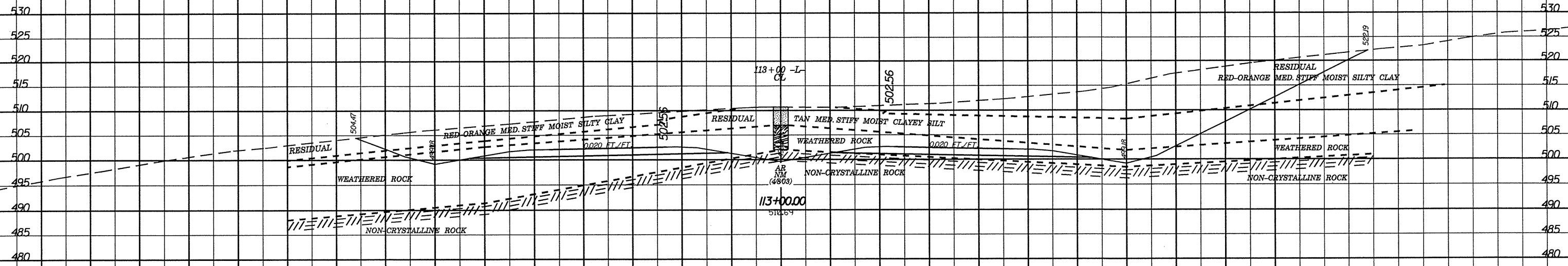
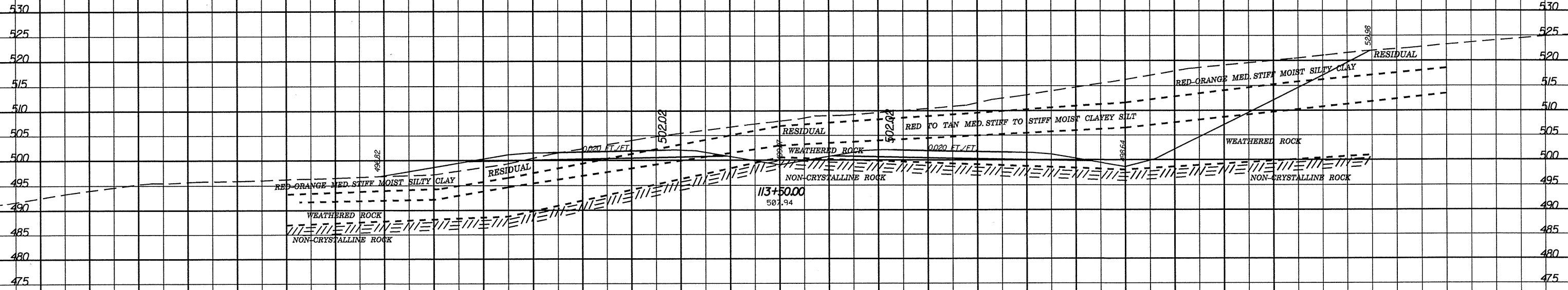


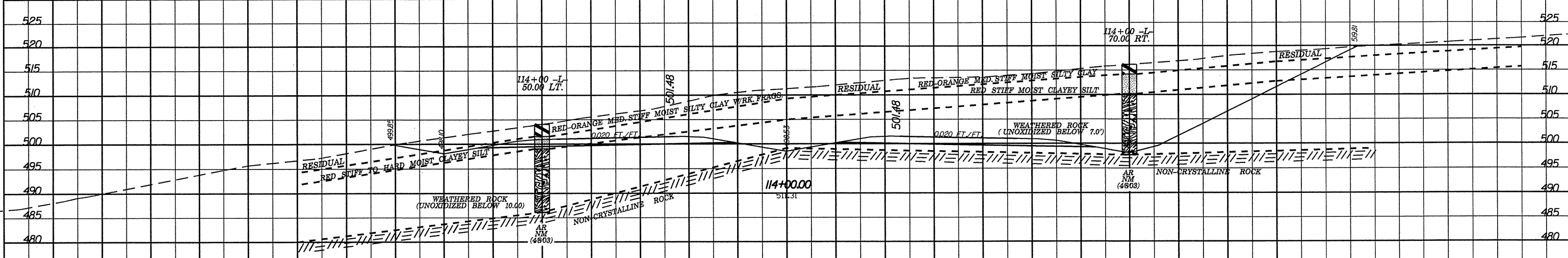
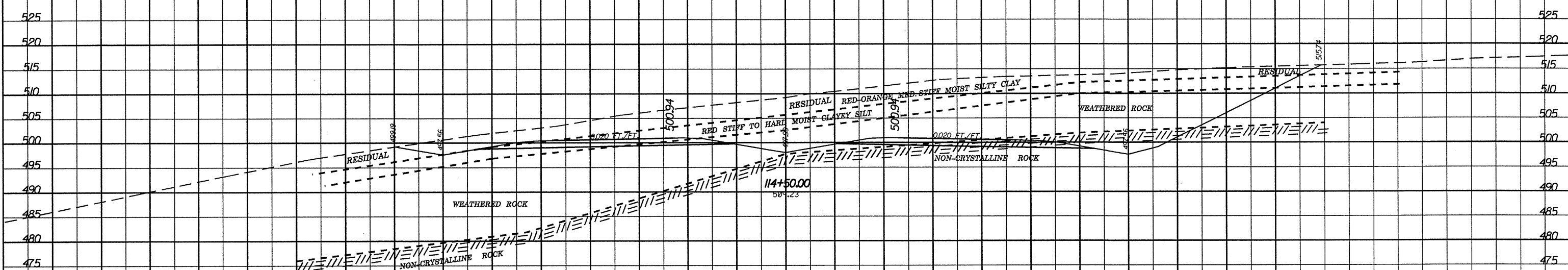
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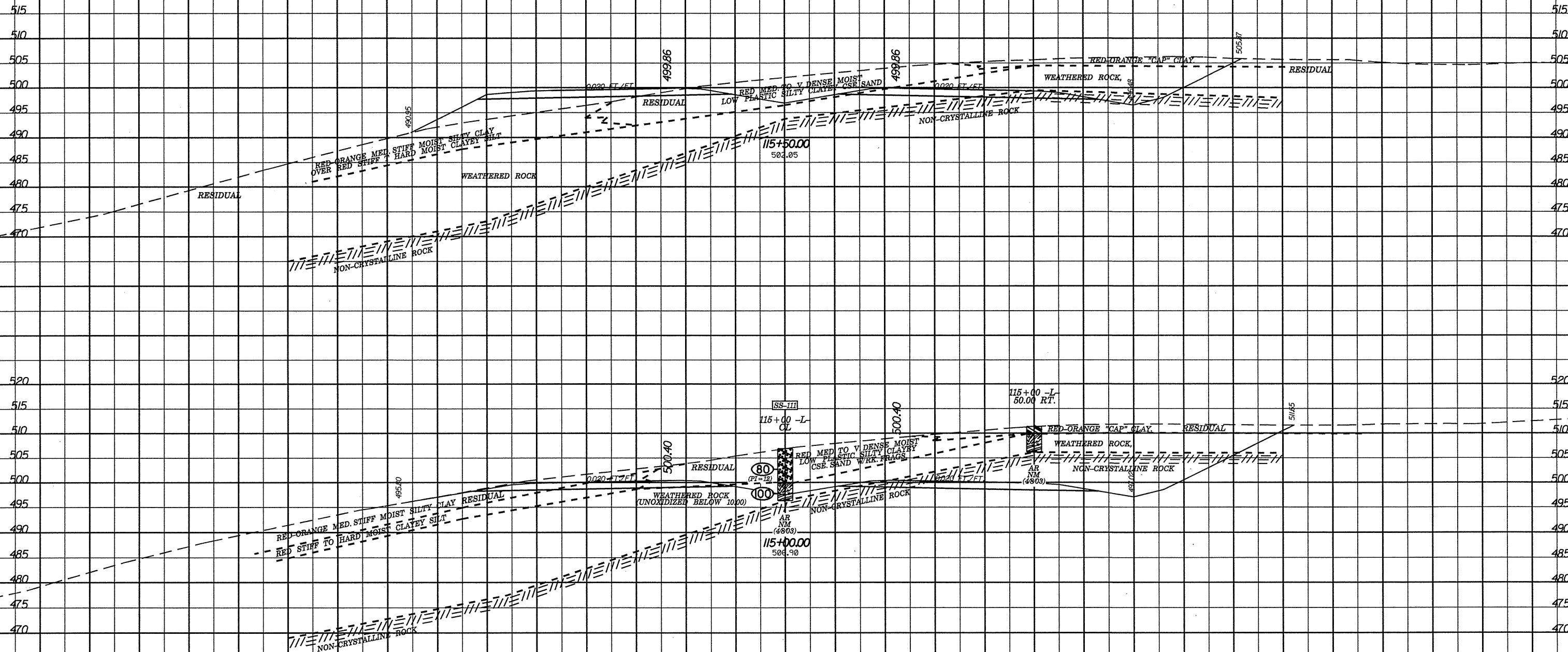






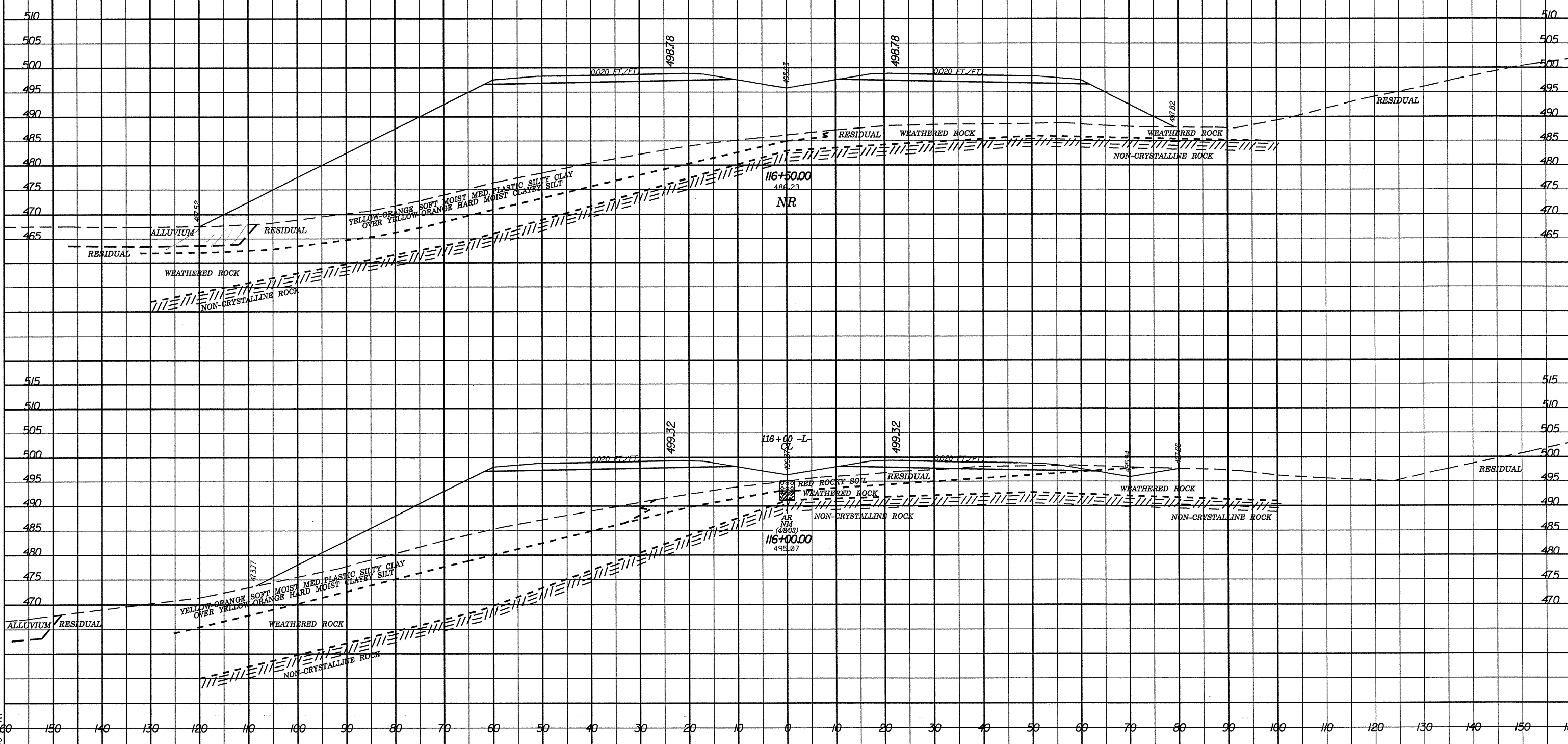


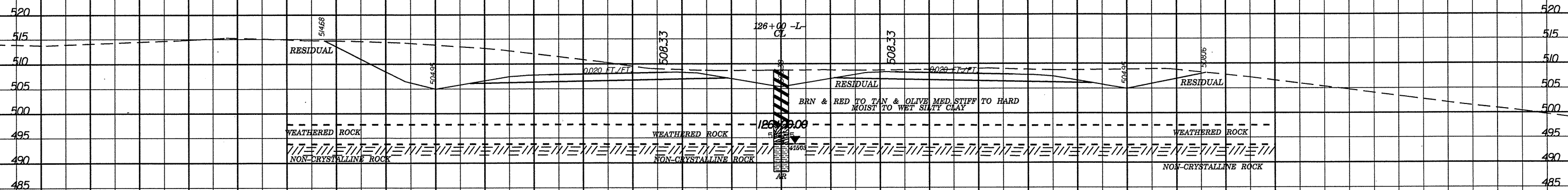
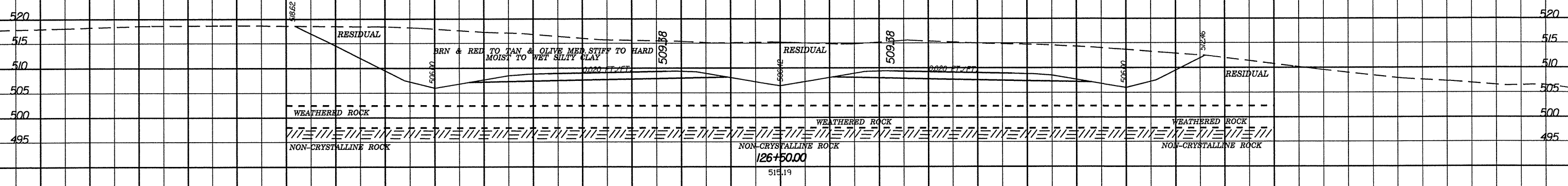
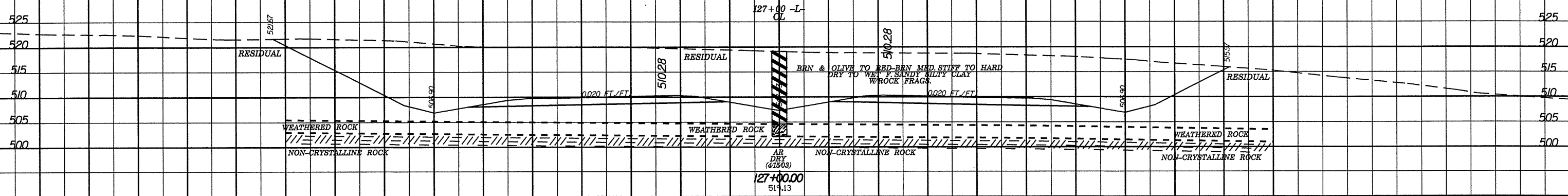




SOIL TEST RESULTS

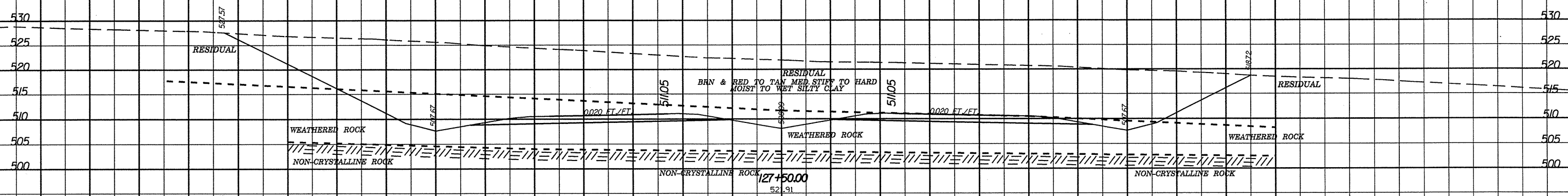
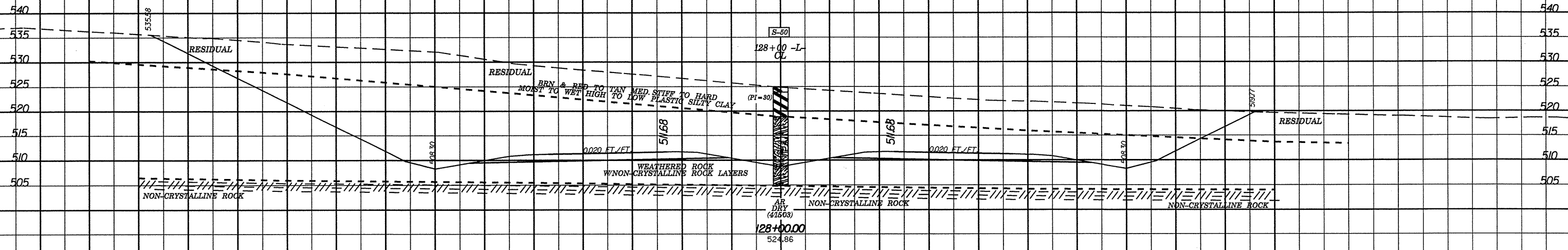
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.L.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-111	CL	115+00	4.20-5.70	A-2-6(0)	37	12	40.6	14.3	14.7	30.3	43	28	20	-	-





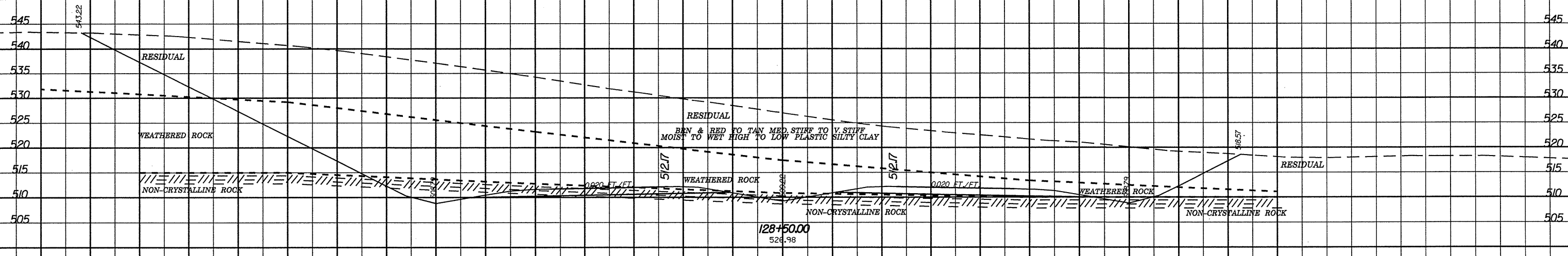
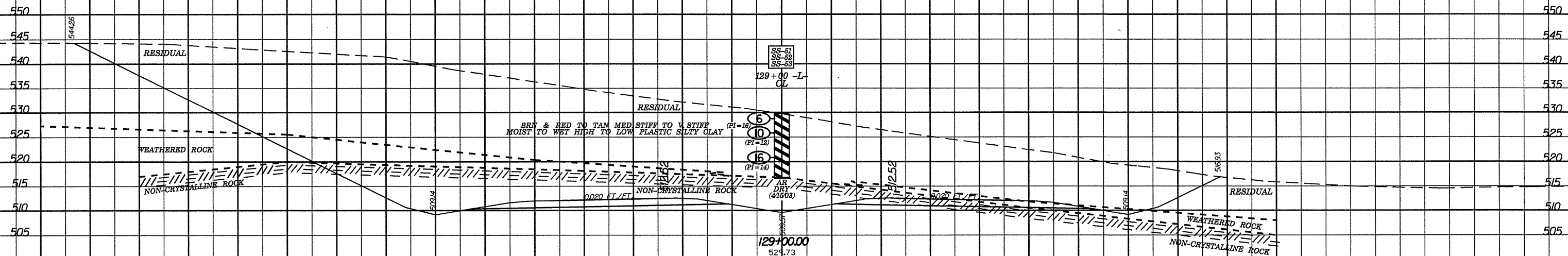
SOIL TEST RESULTS

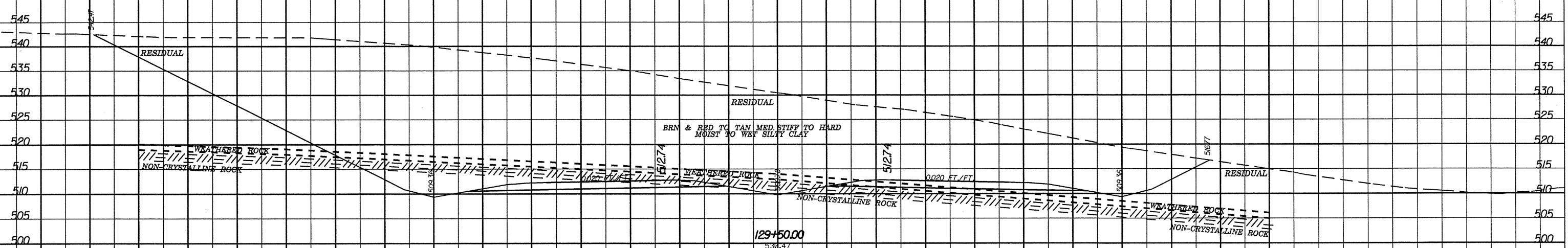
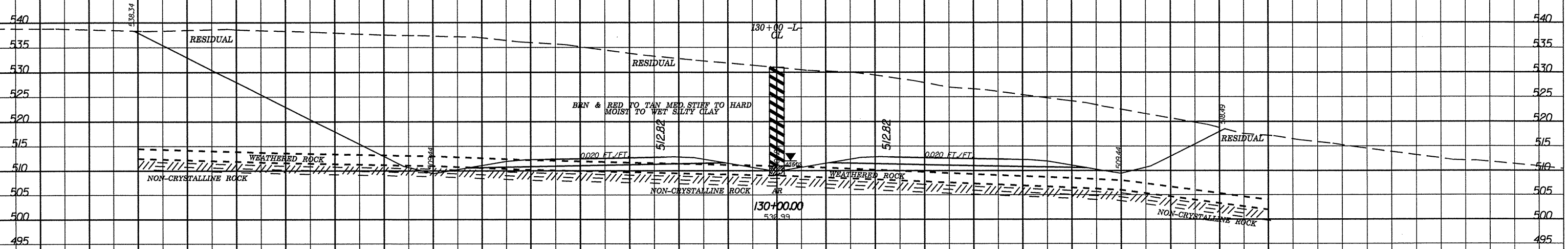
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.L.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-50	CL	128+00	1.00-6.00	A-7-6(35)	63	30	1.4	4.6	21.3	72.9	100	99	95	-	-

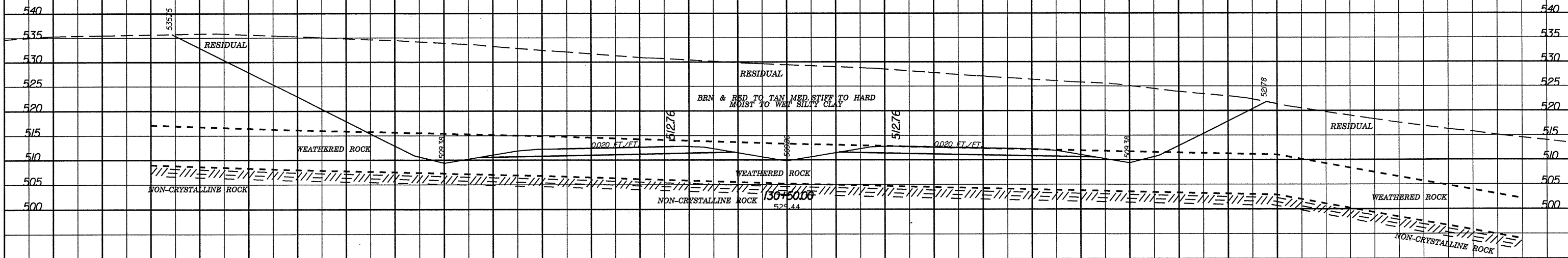
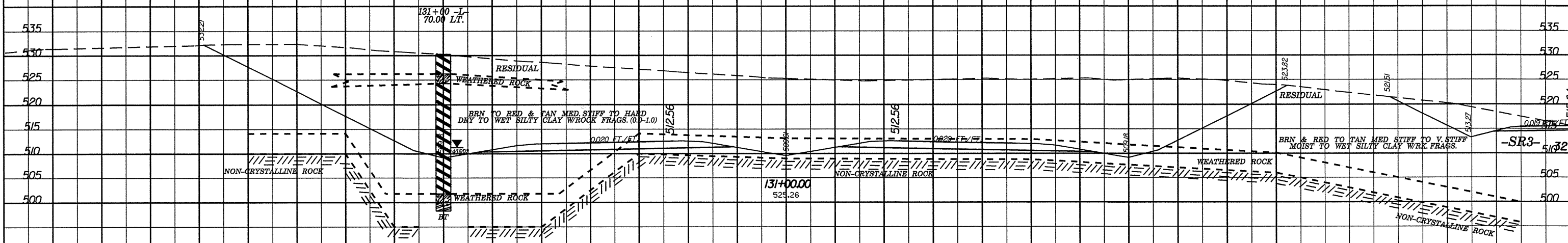


SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.L.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-51	CL	129+00	1.00-2.50	A-7-5(17)	48	16	7.3	7.5	36.6	48.6	100	95	88	-	-
SS-52	CL	129+00	3.90-5.10	A-7-6(16)	49	12	3.0	3.4	26.7	66.8	100	98	94	-	-
SS-53	CL	129+00	8.90-11.10	A-7-6(14)	43	14	7.9	6.7	40.9	44.5	100	94	88	-	-

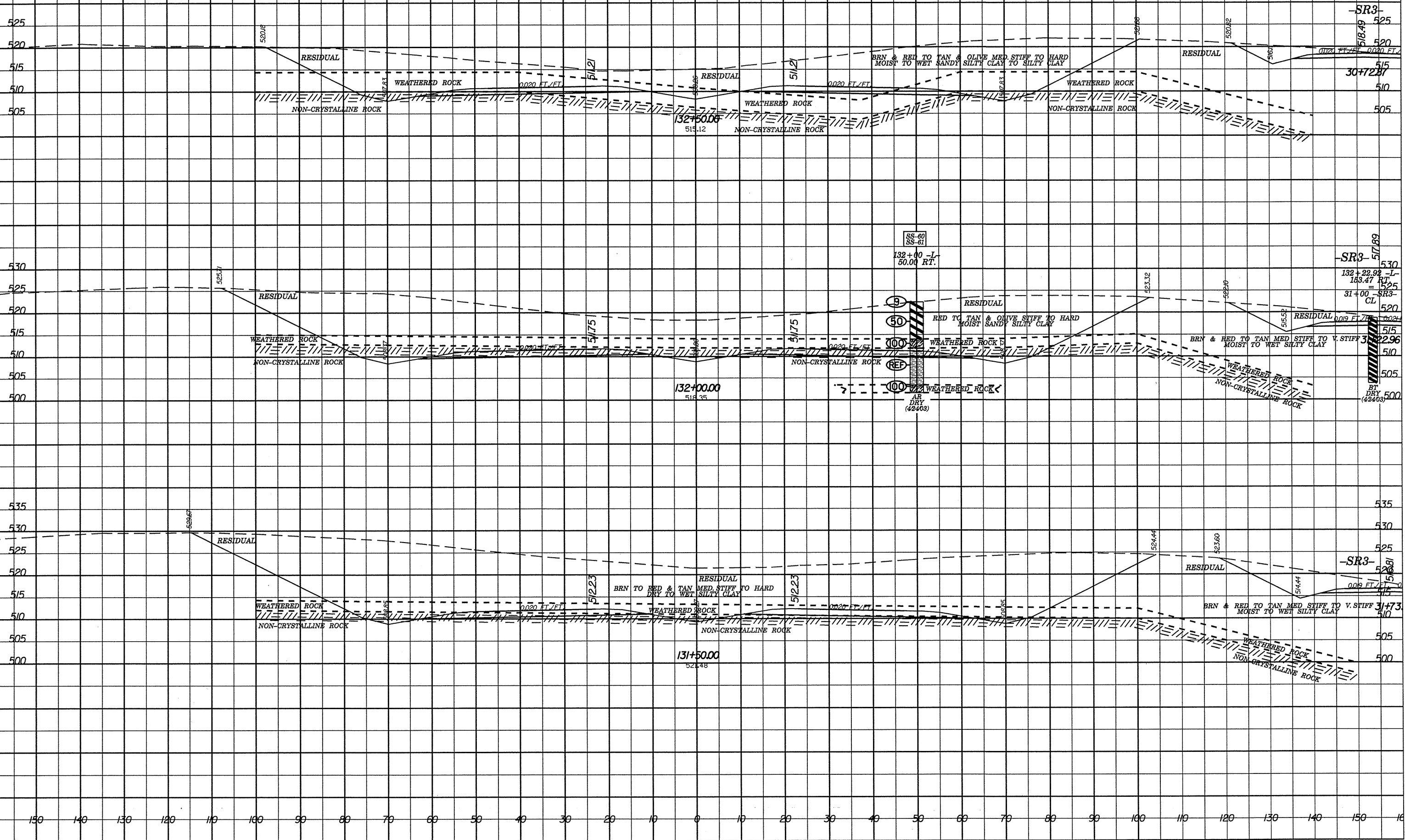


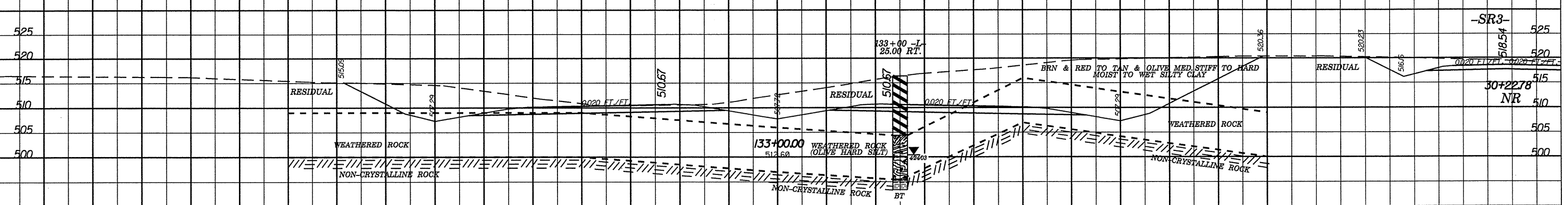
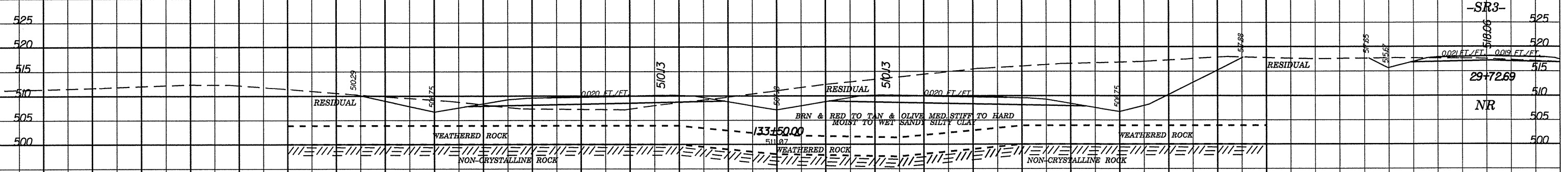
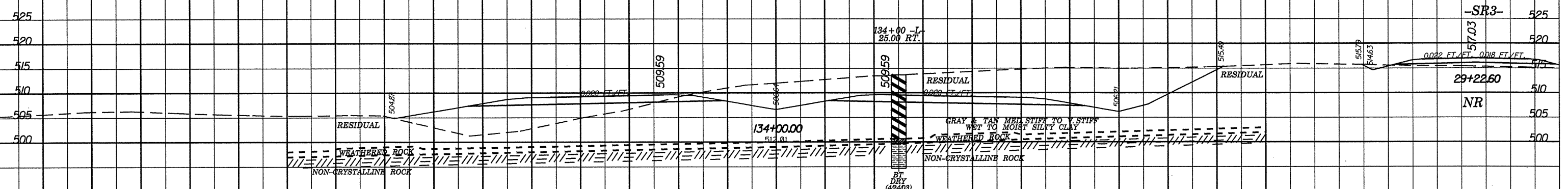


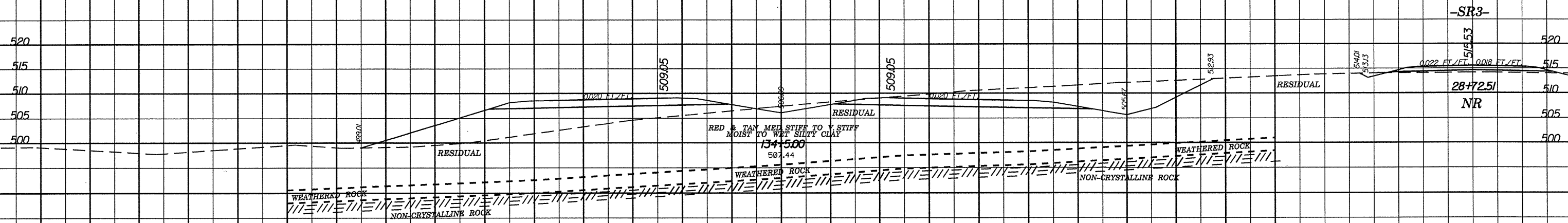
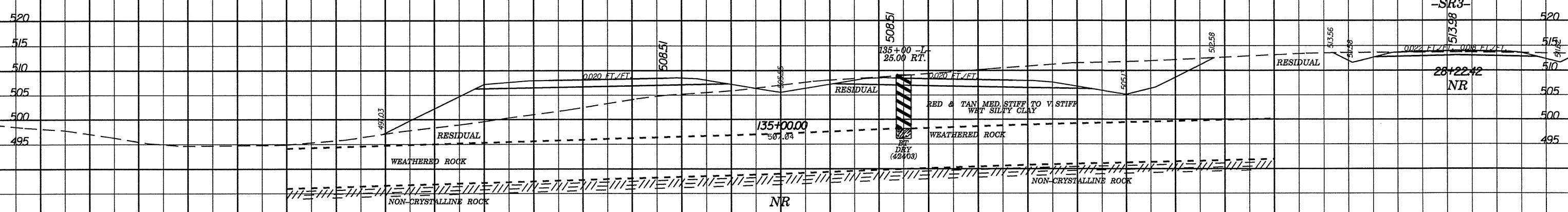
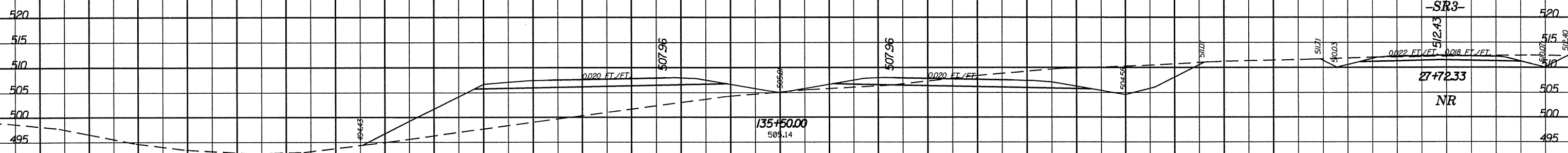


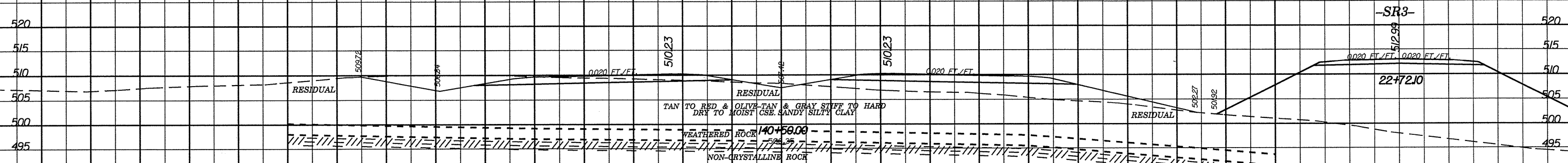
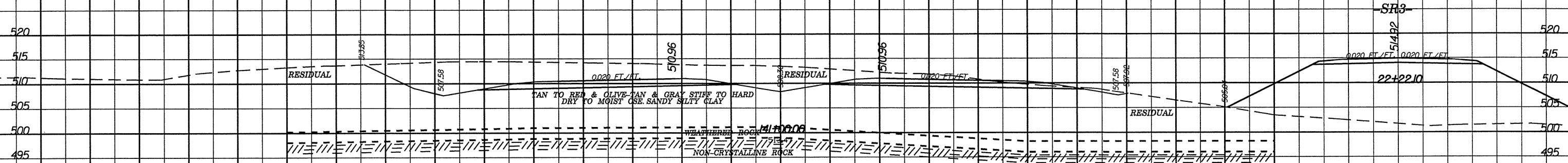
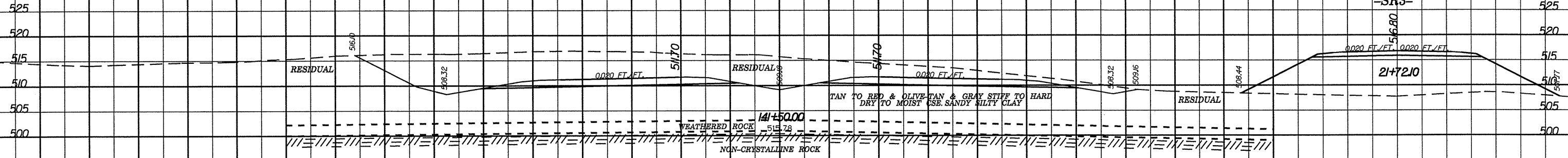
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.L.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-60	50 RT	132+00	0.00-1.50	A-7-6(19)	48	19	7.9	4.9	26.5	60.7	98	92	87	-	-
SS-61	50 RT	132+00	4.40-5.90	A-7-5(9)	41	11	15.4	10.1	38.1	36.4	100	90	77	-	-





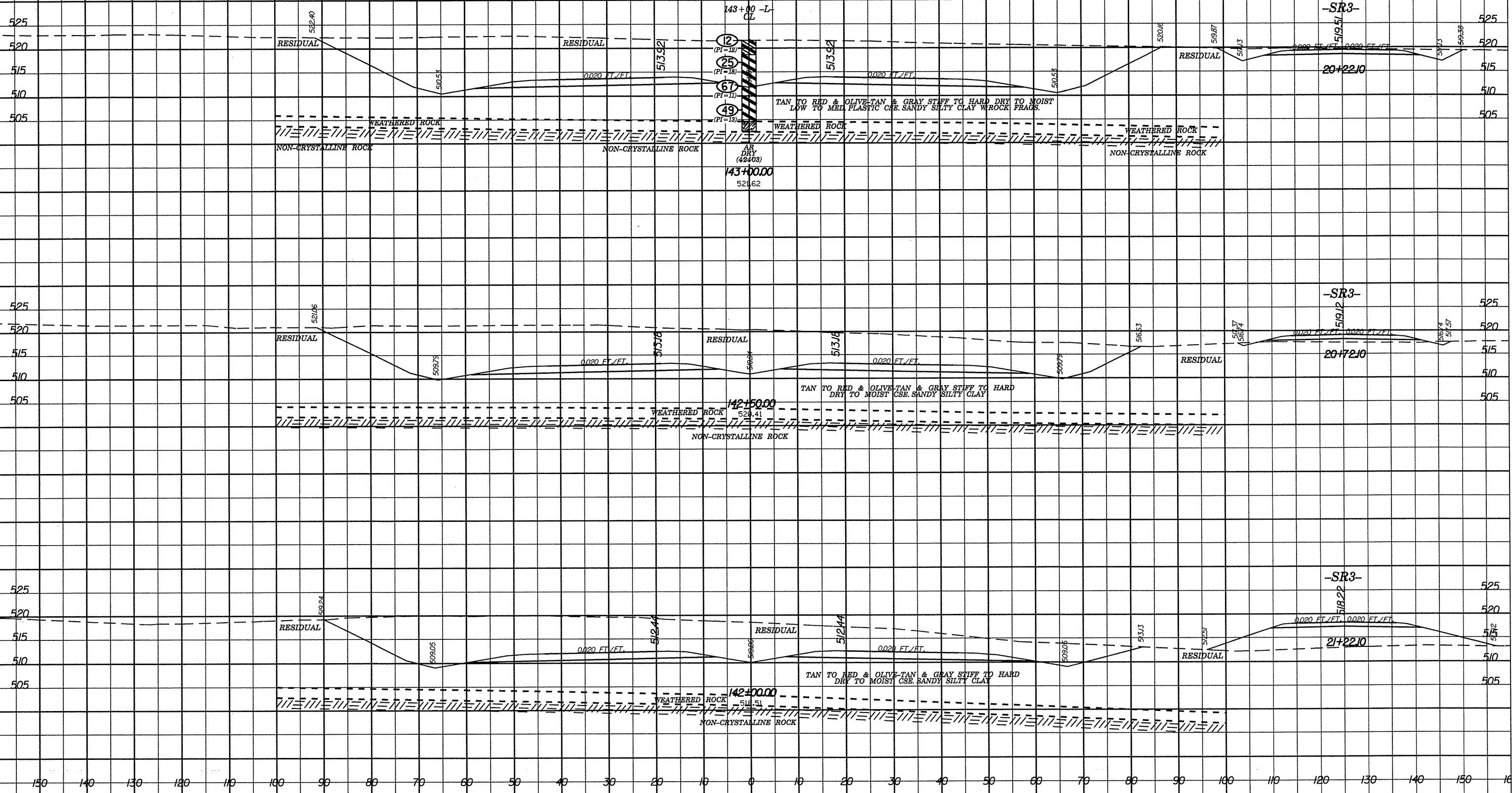


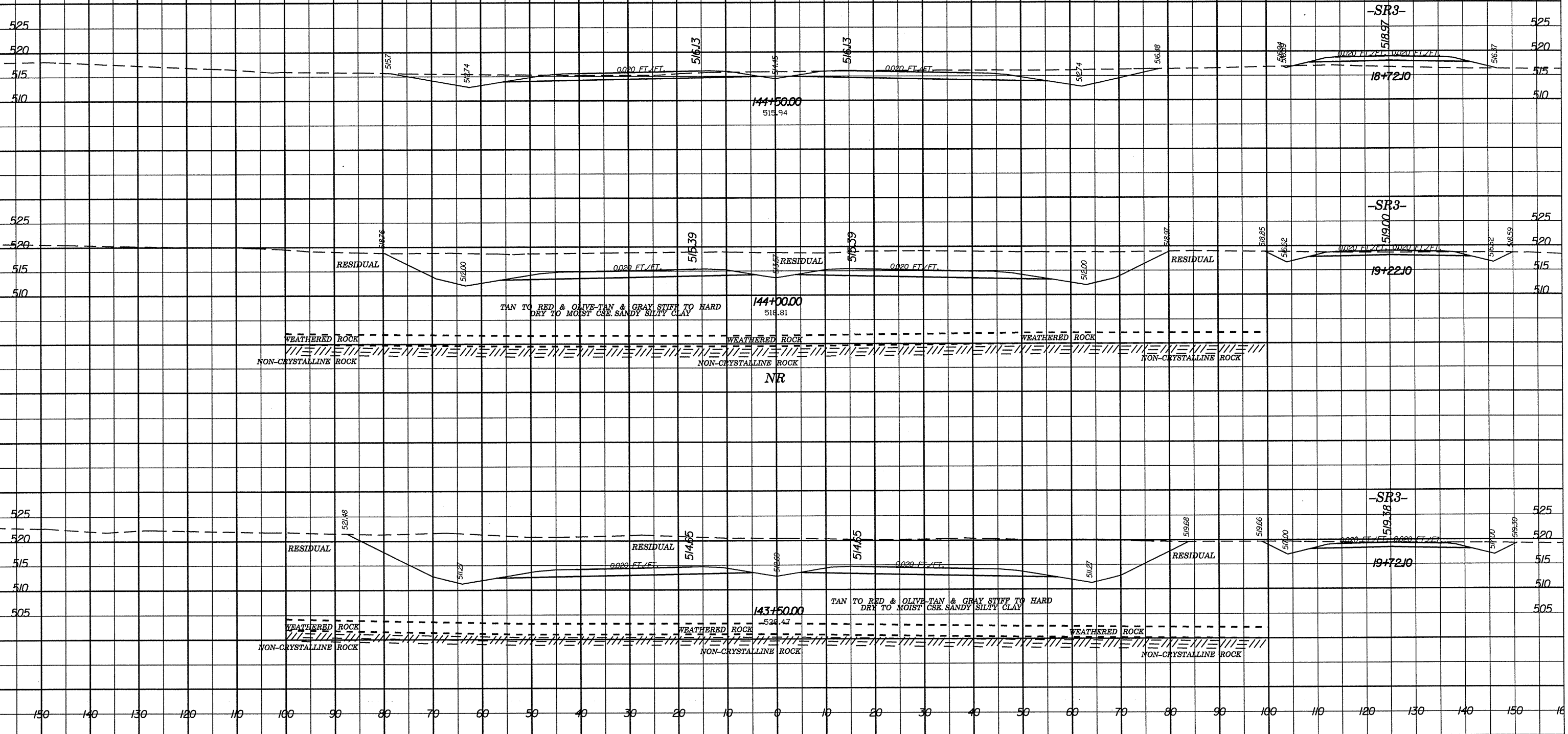


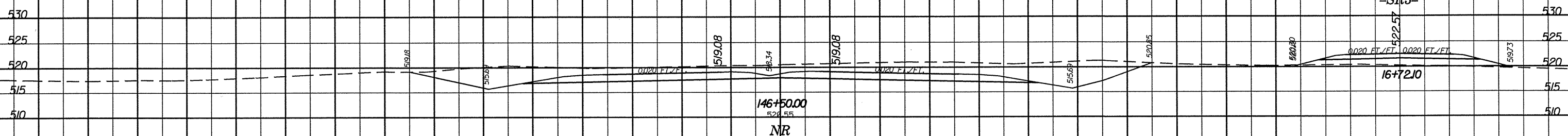
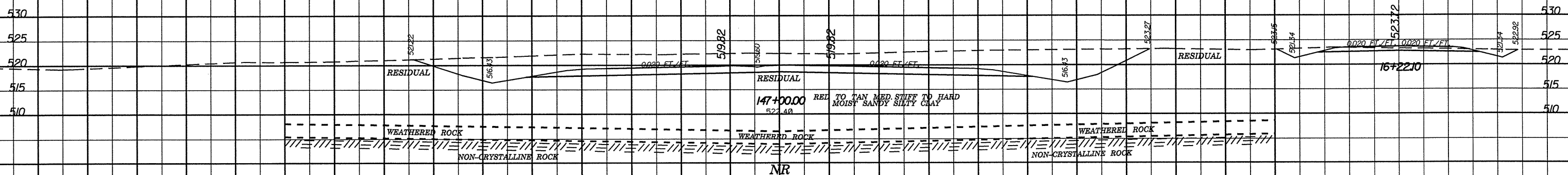
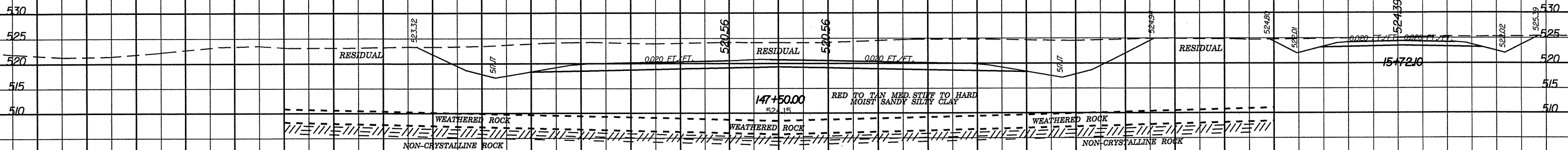
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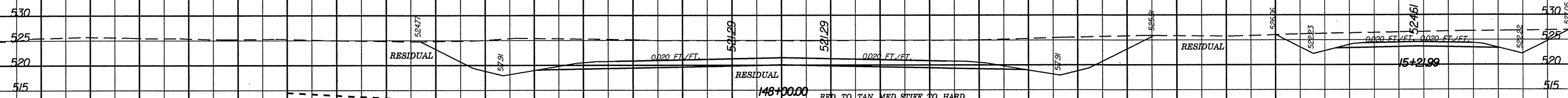
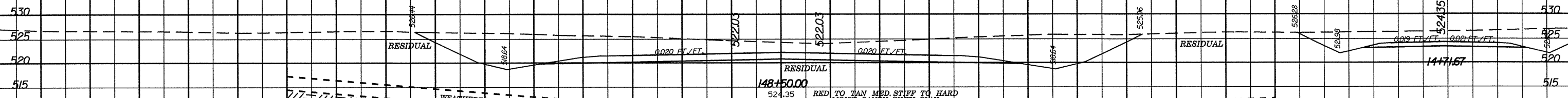
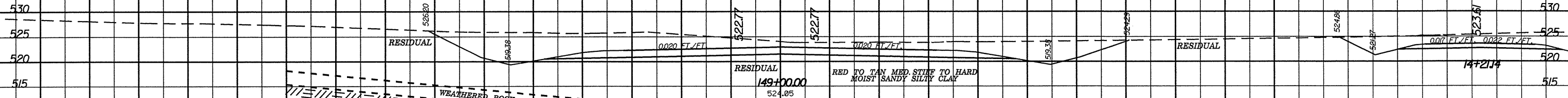
SOIL TEST RESULTS

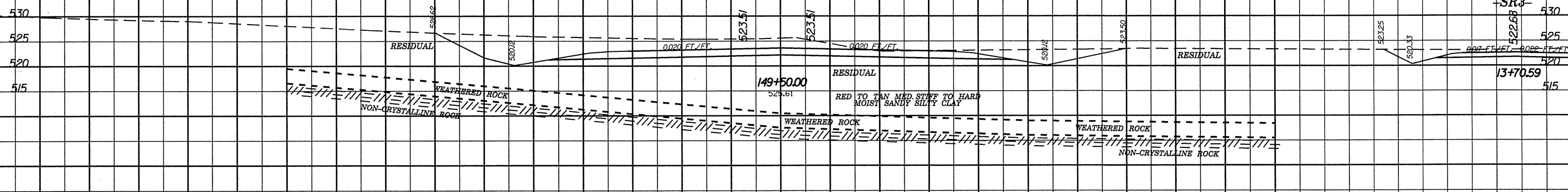
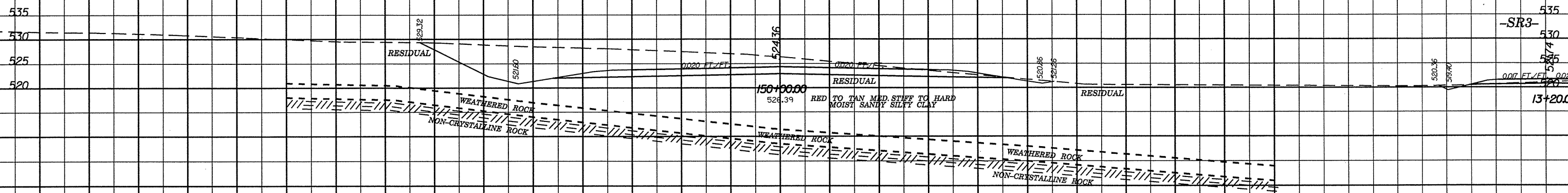
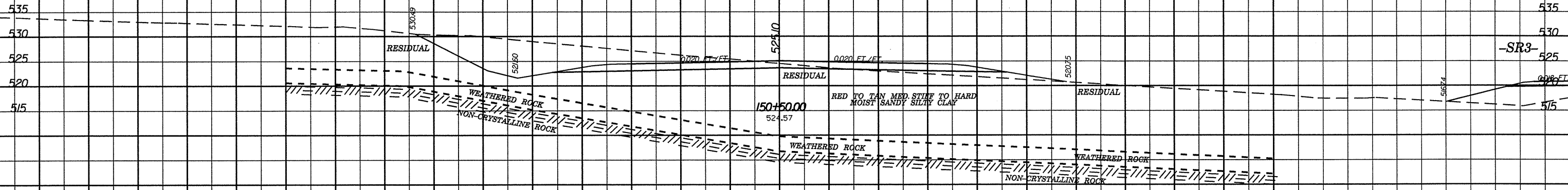
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	PL. I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-63	CL	143+00	0.00-1.50	A-6(6)	37	12	33.6	7.7	14.2	44.6	100	71	60	-	-
SS-64	CL	143+00	4.60-6.10	A-7-5(16)	49	18	13.2	9.5	30.8	46.6	100	90	80	-	-
SS-65	CL	143+00	9.60-11.10	A-7-5(9)	41	11	12.8	8.5	36.2	42.5	95	86	78	-	-
SS-66	CL	143+00	14.60-16.10	A-7-5(9)	43	13	21.5	9.1	28.9	40.5	95	80	68	-	-

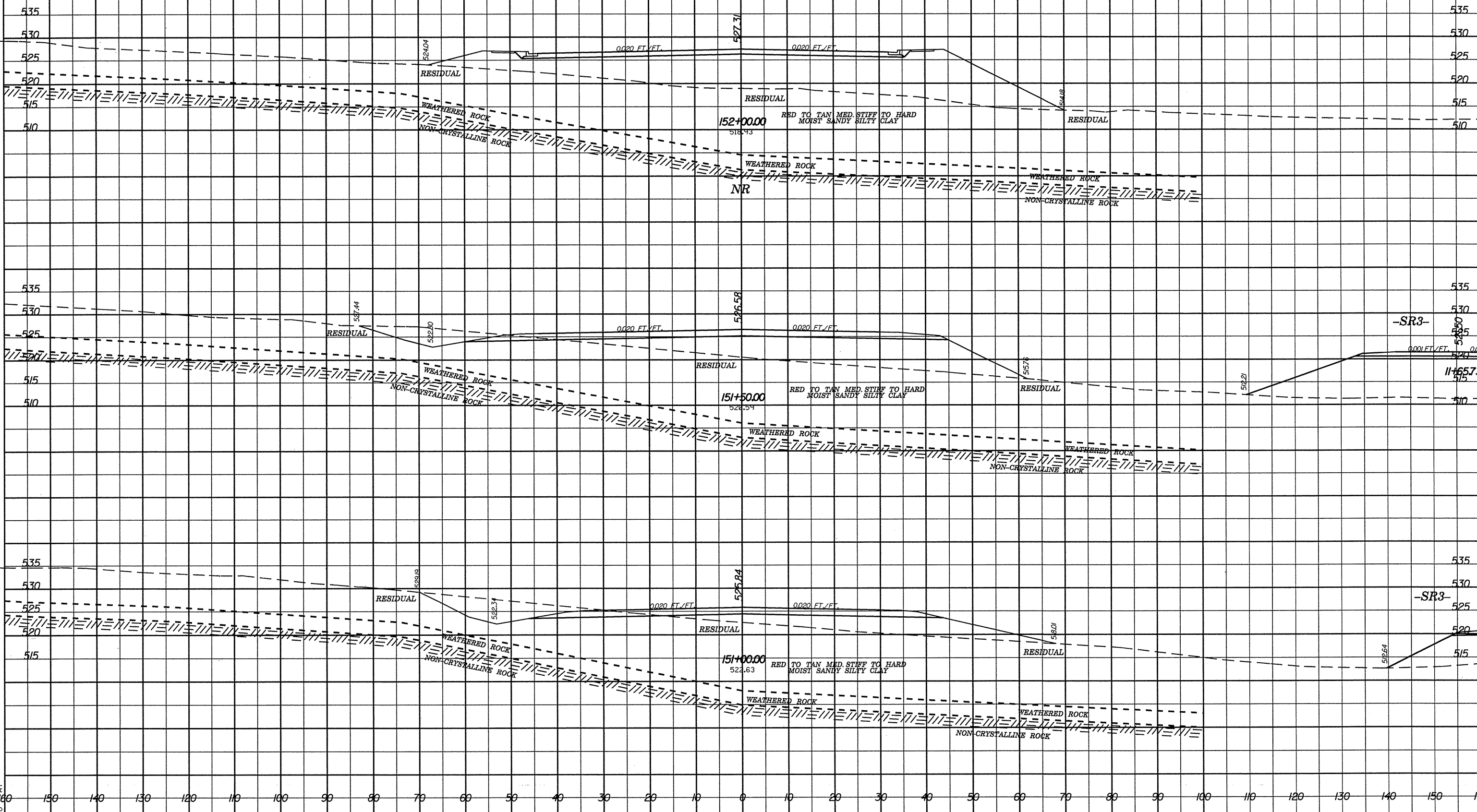












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-SP2-

RESIDUAL

RED-BRN TO BRN & TAN SOFT TO V. STIFF
MOIST TO WET SANDY SILTY CLAY

TAN V. STIFF TO HARD DRY CLAYEY SILT

RESIDUAL
BRN MED. STIFF TO HARD MOIST LOW TO
CSE. SANDY SILTY CLAY

MED. PLASTIC
ROCK

101+50.00

WEATHERED
ROCK

WEATHERED
ROCK

NON-CRYSTALLINE
ROCK

10+44.06

504.52

503.19

525

520

515

510

505

500

495

100+89.76 -L-
237.72 RT.

16+00 -Y4-
CL

RESIDUAL

RED TO RED-TAN & TAN
MED STIFF TO V. STIFF
WET SANDY SILTY CLAY

RESIDUAL
RED TO TAN MED STIFF TO STIFF
WET TO DRY SILTY CLAY

TAN HARD DRY CLAYEY SILT

TAN V. STIFF TO HARD DRY CLAYEY SILT

WEATHERED
ROCK

RESIDUAL
BRN MED. STIFF TO HARD MOIST
SANDY SILTY CLAY

101+00.00

NON-CRYSTALLINE
ROCK

NON-CRYSTALLINE
ROCK

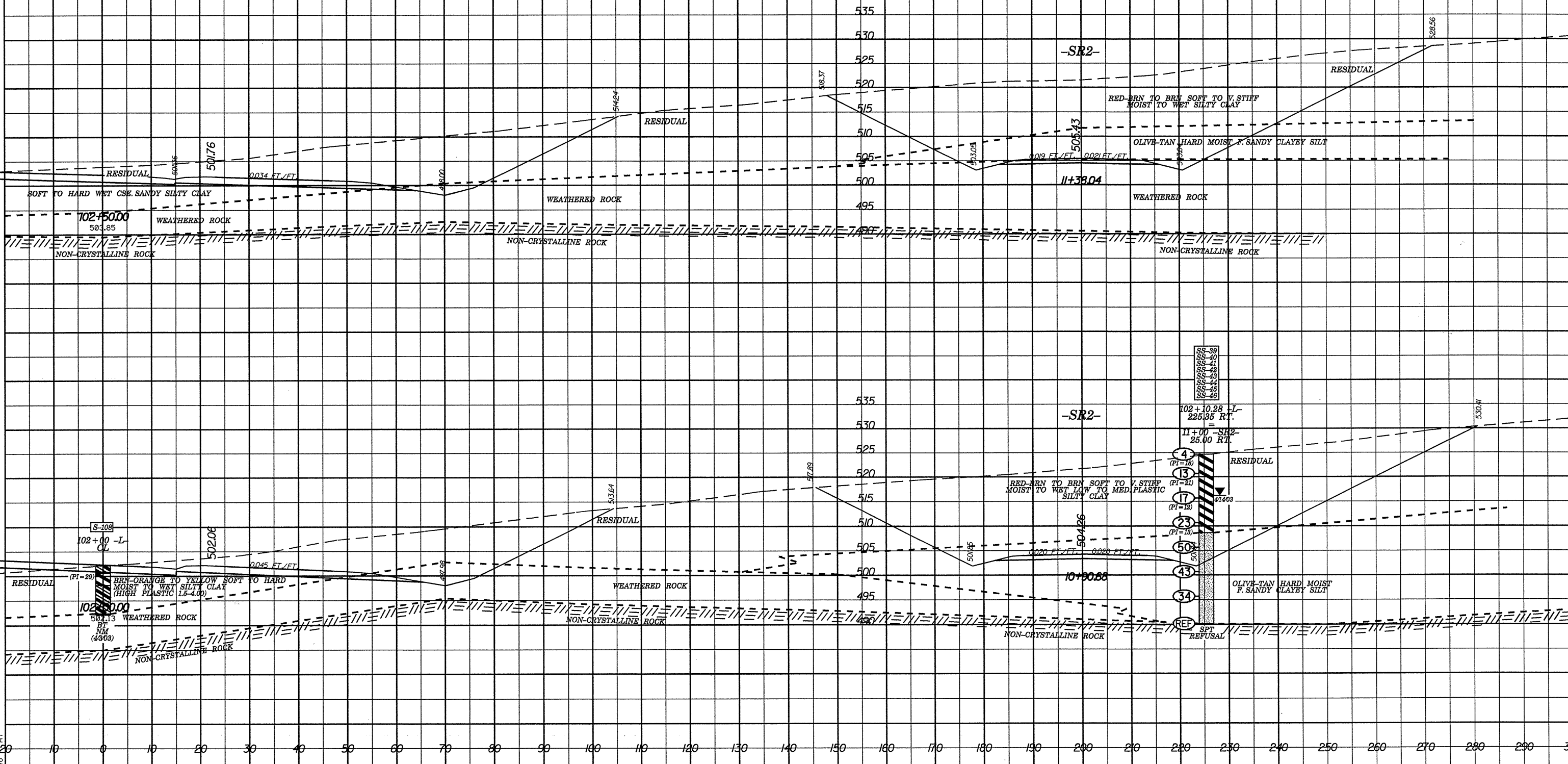
NON-CRYSTALLINE
ROCK

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.L.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-108	CL	102+00	1.50-4.00	A-7-6(26)	55	29	6.9	4.4	28.1	60.6	91	86	82	-	-
SS-39	25 RT	11+00	0.00-1.50	A-7-6(14)	42	18	7.1	3.6	22.6	66.8	85	80	77	-	-
SS-40	25 RT	11+00	4.00-5.50	A-7-6(24)	48	21	1.8	3.8	31.6	62.8	100	99	96	-	-
SS-41	25 RT	11+00	9.00-10.50	A-7-5(15)	45	12	2.6	5.7	41.1	60.6	100	99	94	-	-
SS-42	25 RT	11+00	14.00-15.50	A-7-5(14)	46	13	8.9	6.7	37.9	46.6	100	94	86	-	-
SS-43	25 RT	11+00	19.00-20.50	A-4(9)	40	8	7.1	11.3	39.1	42.5	100	95	86	-	-
SS-44	25 RT	11+00	24.00-25.50	A-4(9)	39	10	8.7	9.9	40.9	40.5	96	89	81	-	-
SS-45	25 RT	11+00	29.00-30.50	A-4(10)	40	8	4.5	6.1	42.9	46.6	100	96	92	-	-
SS-46	25 RT	11+00	34.00-34.90	A-4(7)	36	6	3.6	7.7	44.1	44.5	98	95	90	-	-

502.95

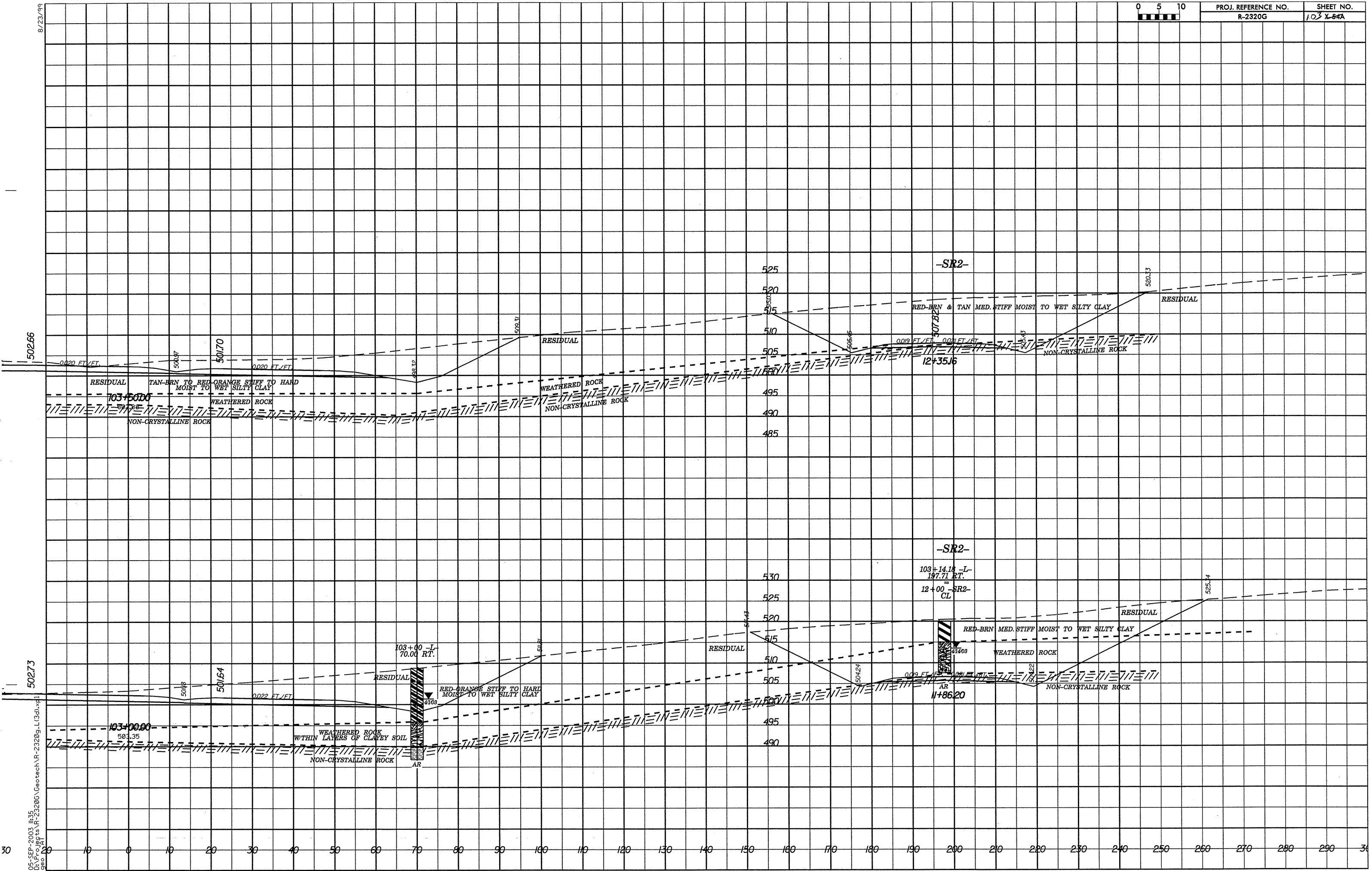
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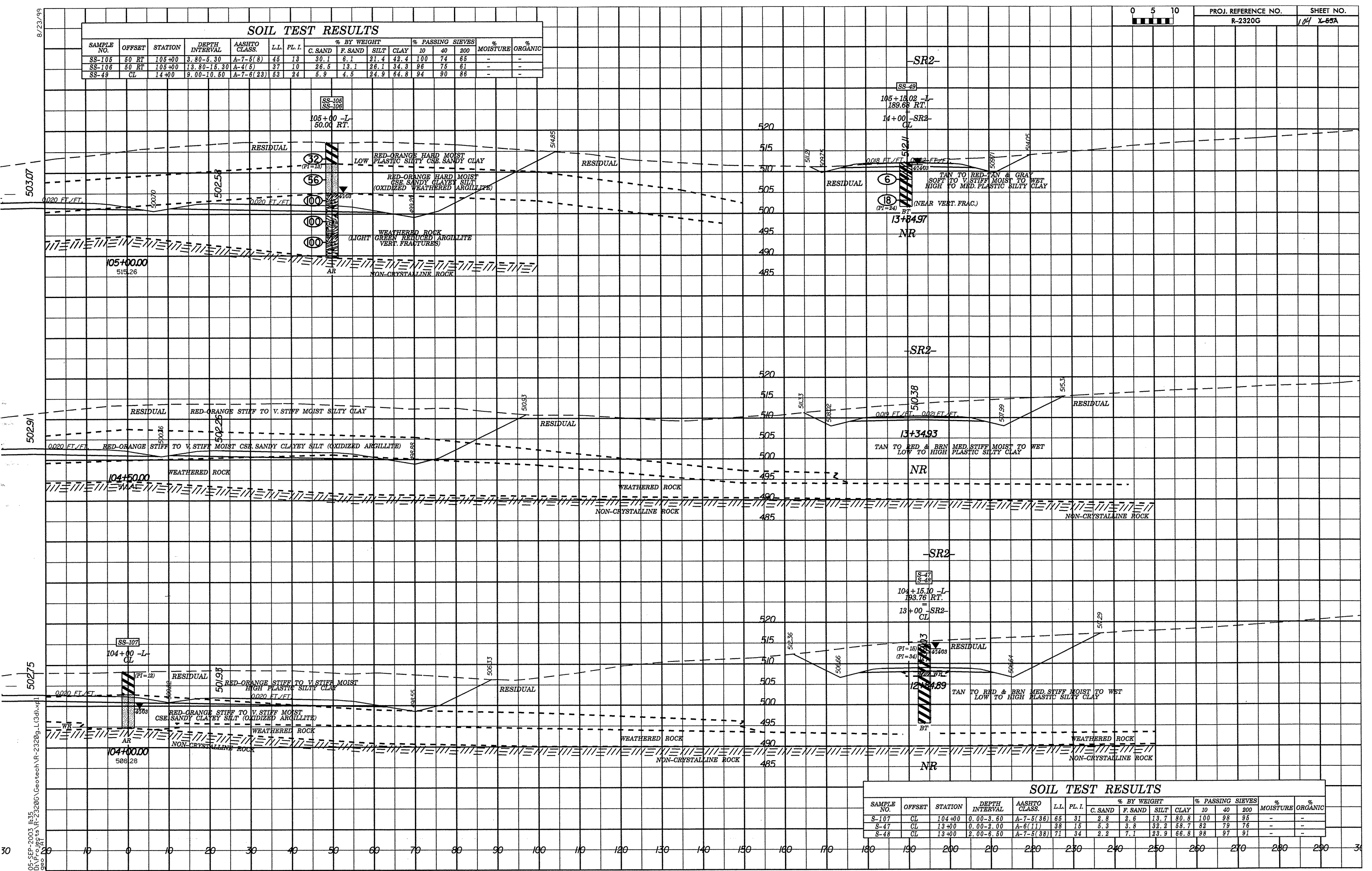
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SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.L.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-105	50 RT	105+00	3.80-5.30	A-7-5(8)	45	13	30.1	6.1	21.4	42.4	100	74	65	-	-
SS-106	50 RT	105+00	13.80-15.30	A-4(5)	37	10	26.5	13.1	26.1	34.3	96	75	61	-	-
SS-49	CL	14+00	9.00-10.50	A-7-6(23)	53	24	6.9	4.5	24.9	64.8	94	90	86	-	-



SOIL TEST RESULTS

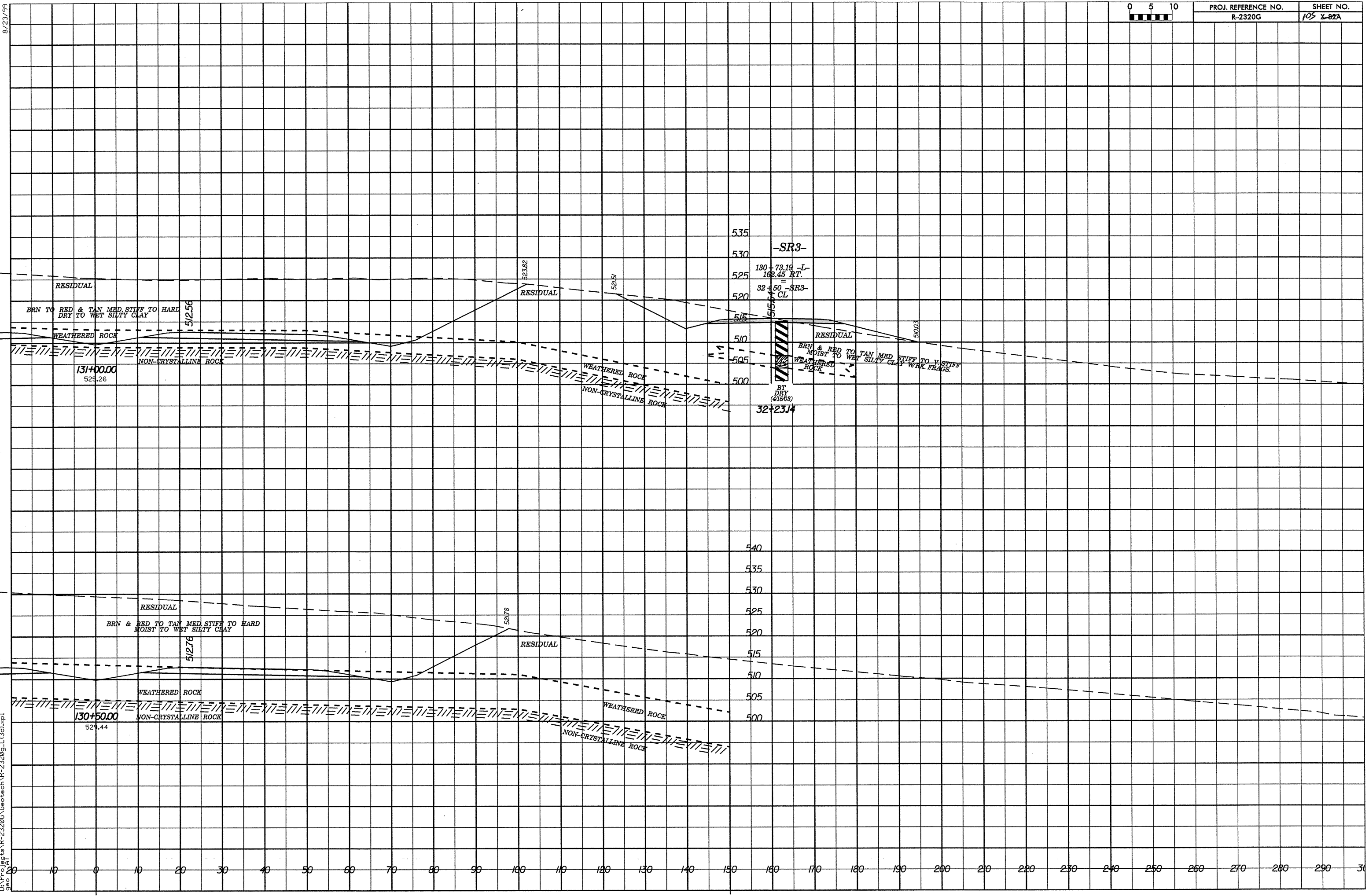
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.L.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-107	CL	104+00	0.00-3.60	A-7-5(36)	65	31	2.8	2.6	13.7	80.8	100	98	95	-	-
S-47	CL	13+00	0.00-2.00	A-6(11)	38	15	5.3	3.8	32.2	58.7	82	79	76	-	-
S-48	CL	13+00	2.00-6.50	A-7-5(38)	71	34	2.2	7.1	23.9	66.8	98	97	91	-	-

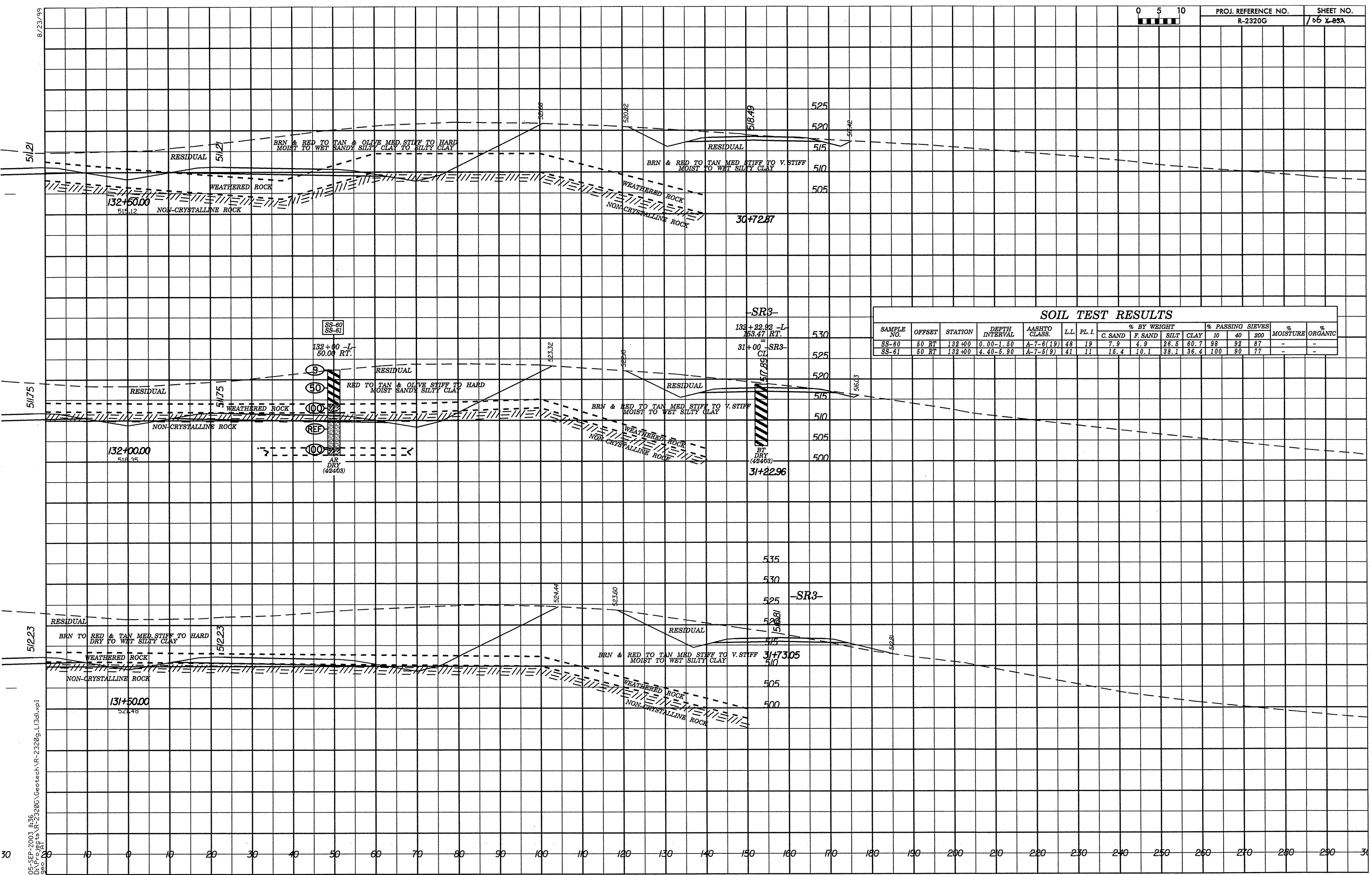
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512.56

512.76

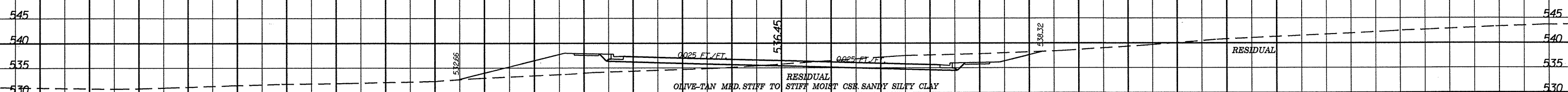
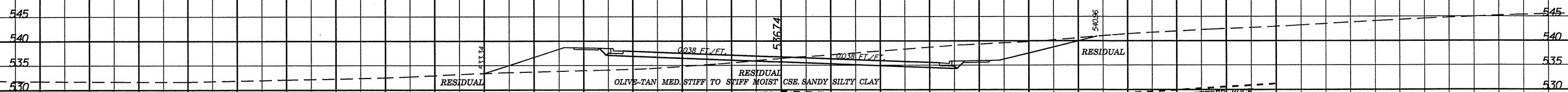
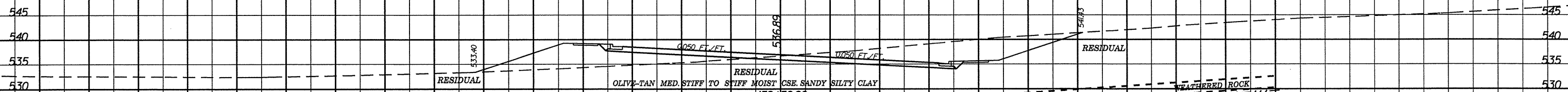




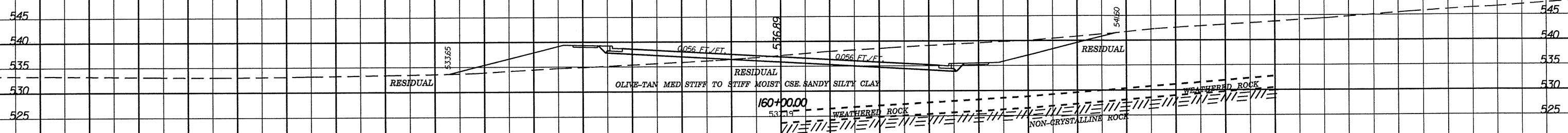
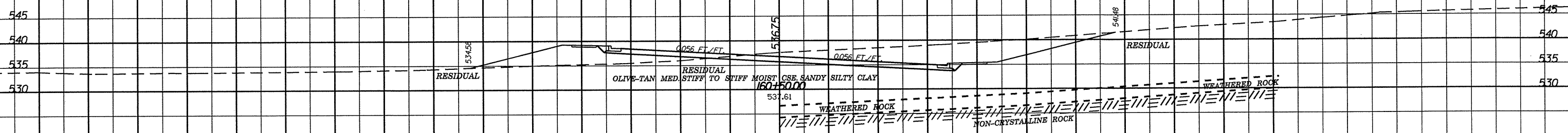
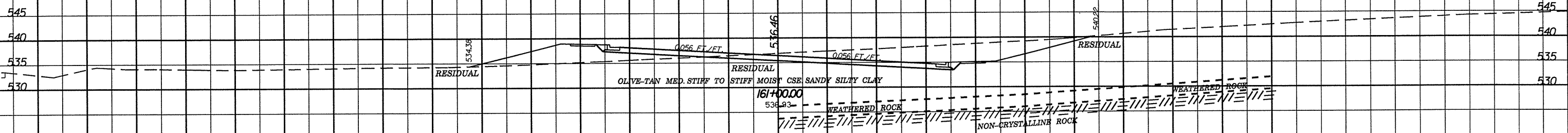
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.L.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-60	50 RT	132+00	0.00-1.50	A-7-6(19)	48	19	7.9	4.9	28.5	60.7	98	92	87	-	-
SS-61	50 RT	132+00	4.40-5.90	A-7-6(9)	41	11	15.4	10.1	38.1	36.4	100	90	77	-	-

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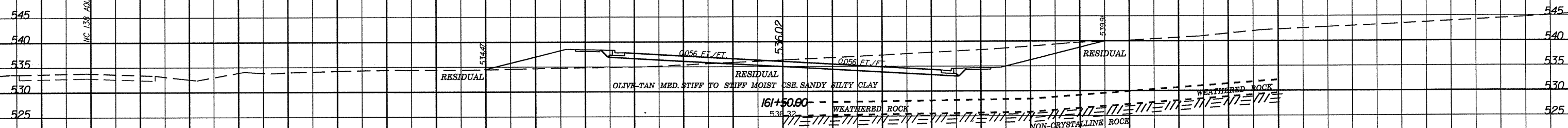
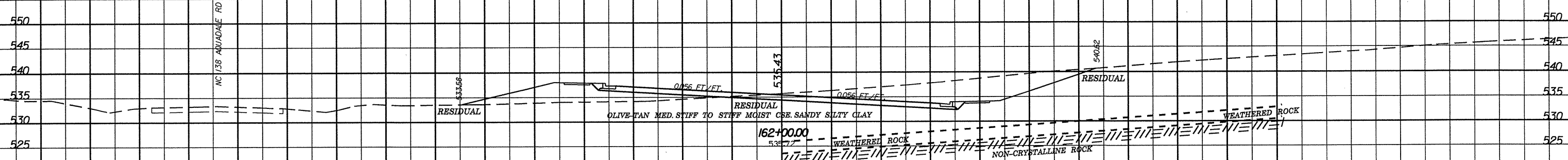
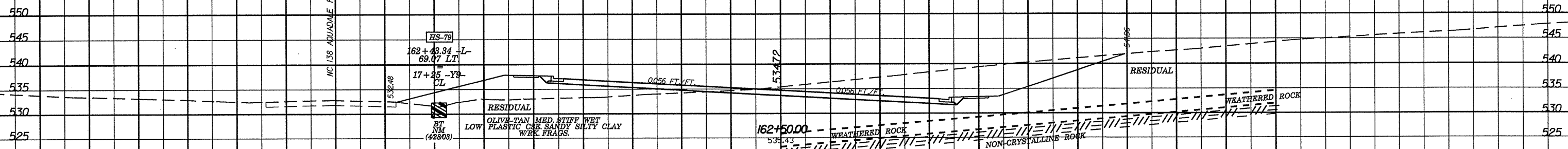


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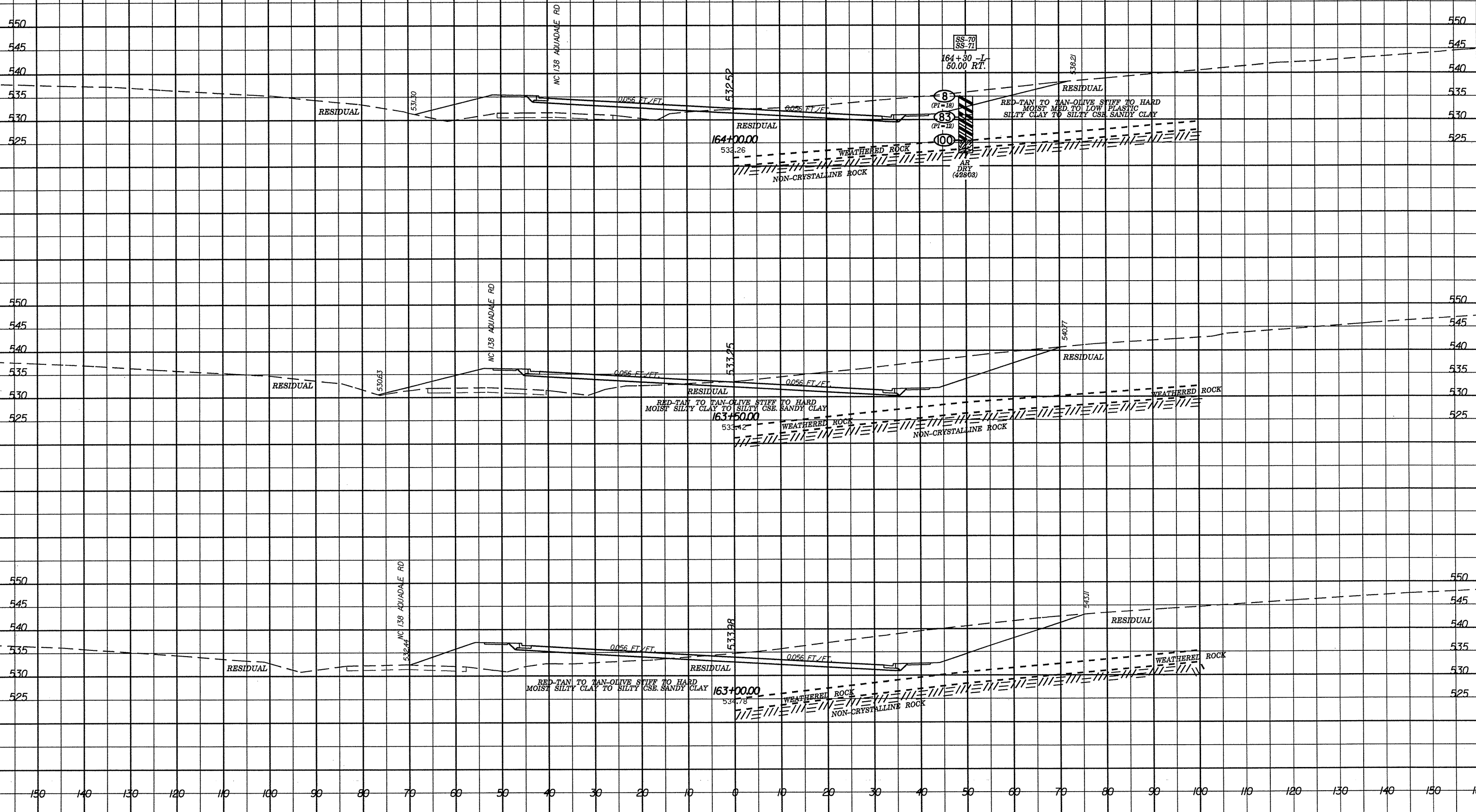
SOIL TEST RESULTS

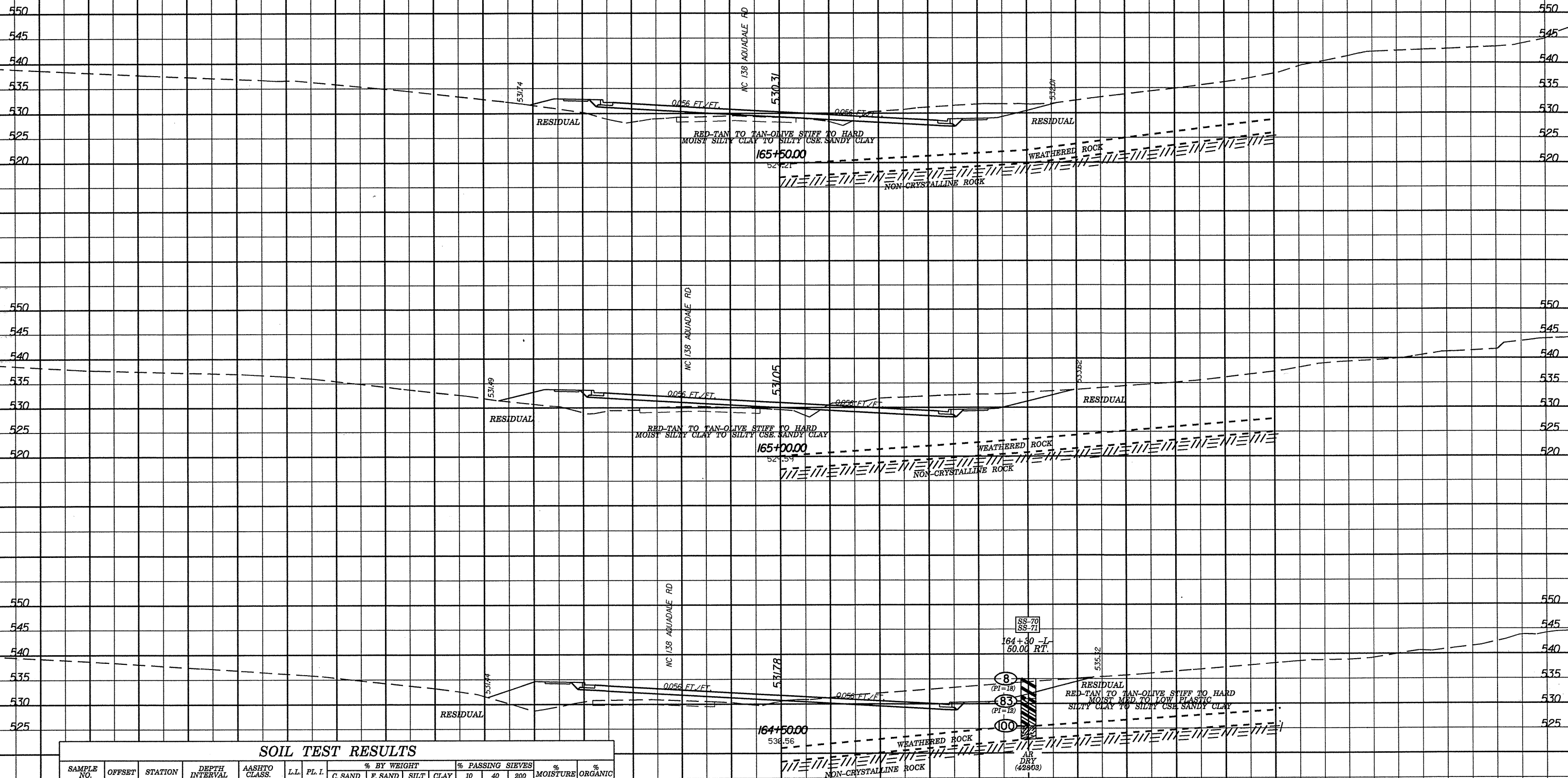
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.L.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
HS-79	CL	17+25	0.00-3.00	A-6(6)	39	13	14.7	6.9	38.6	40.8	76	67	61	-	-



SOIL TEST RESULTS

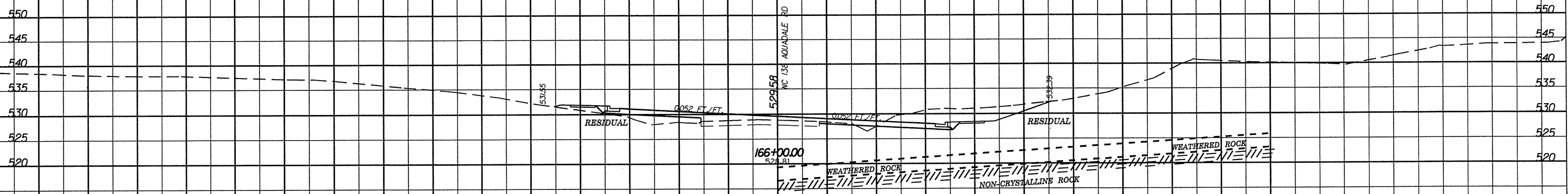
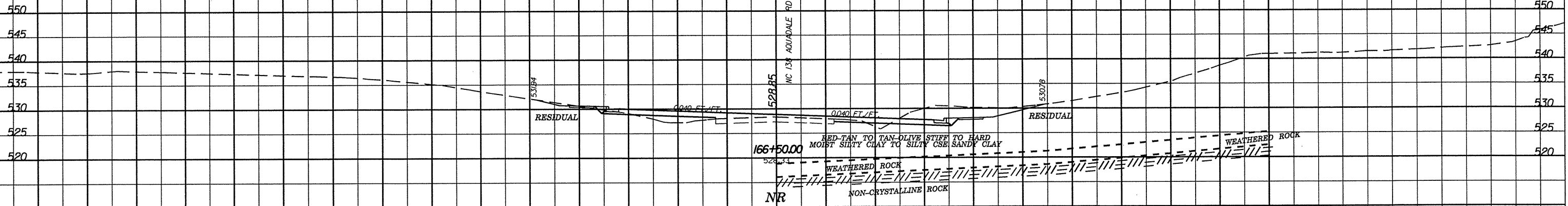
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.L.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-70	50 RT	164+30	0.00-1.50	A-7-6(17)	45	18	9.2	8.2	27.6	55.1	98	90	85	-	-
SS-71	50 RT	164+30	4.50-6.00	A-6(6)	38	12	30.8	9.2	27.3	32.7	97	71	61	-	-





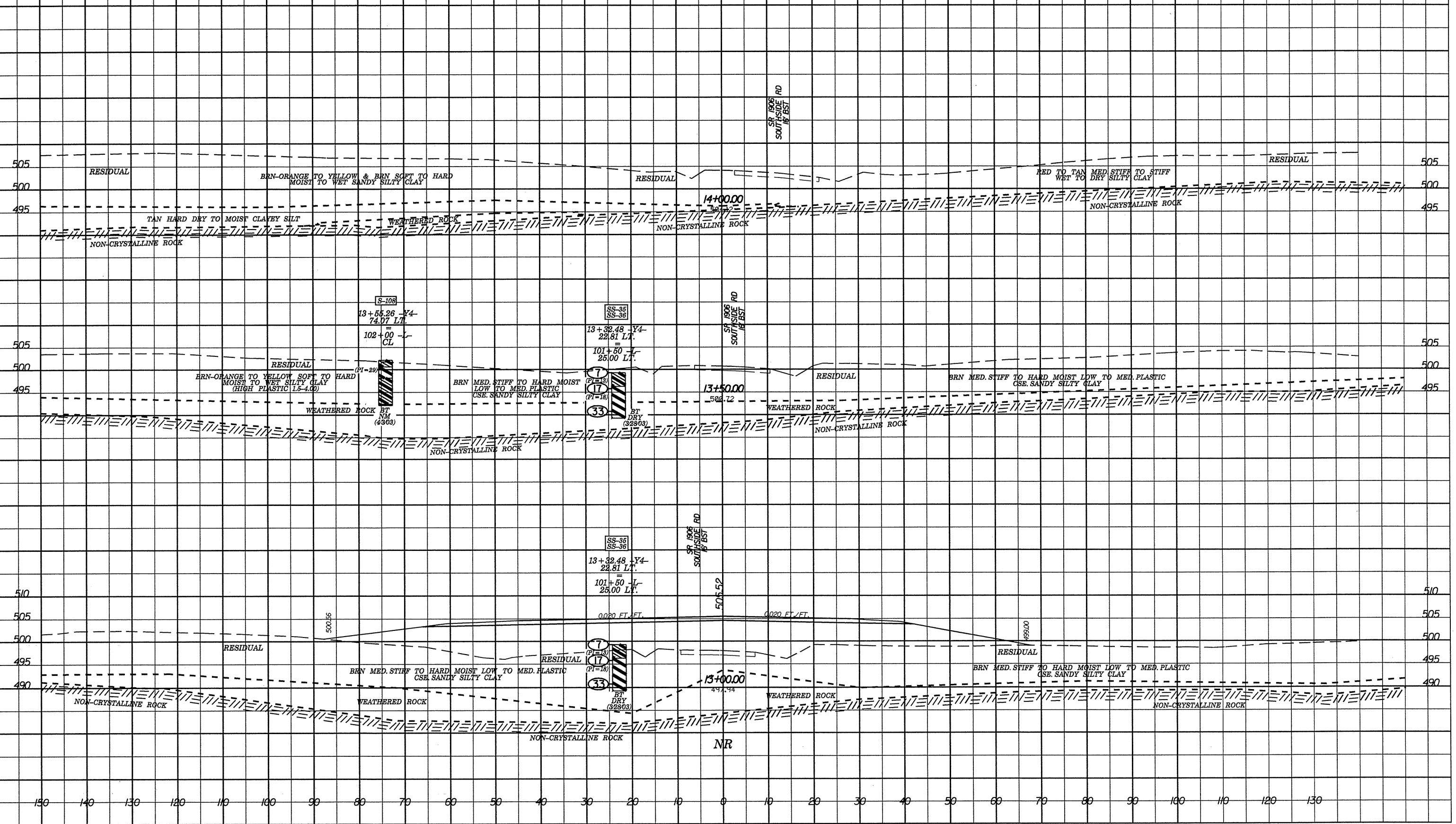
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	PL. I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-70	50 RT	164+30	0.00-1.50	A-7-6(17)	45	18	9.2	8.2	27.6	55.1	98	90	85	-	-
SS-71	50 RT	164+30	4.50-6.00	A-6(6)	38	12	30.8	9.2	27.3	32.7	97	71	61	-	-



SOIL TEST RESULTS

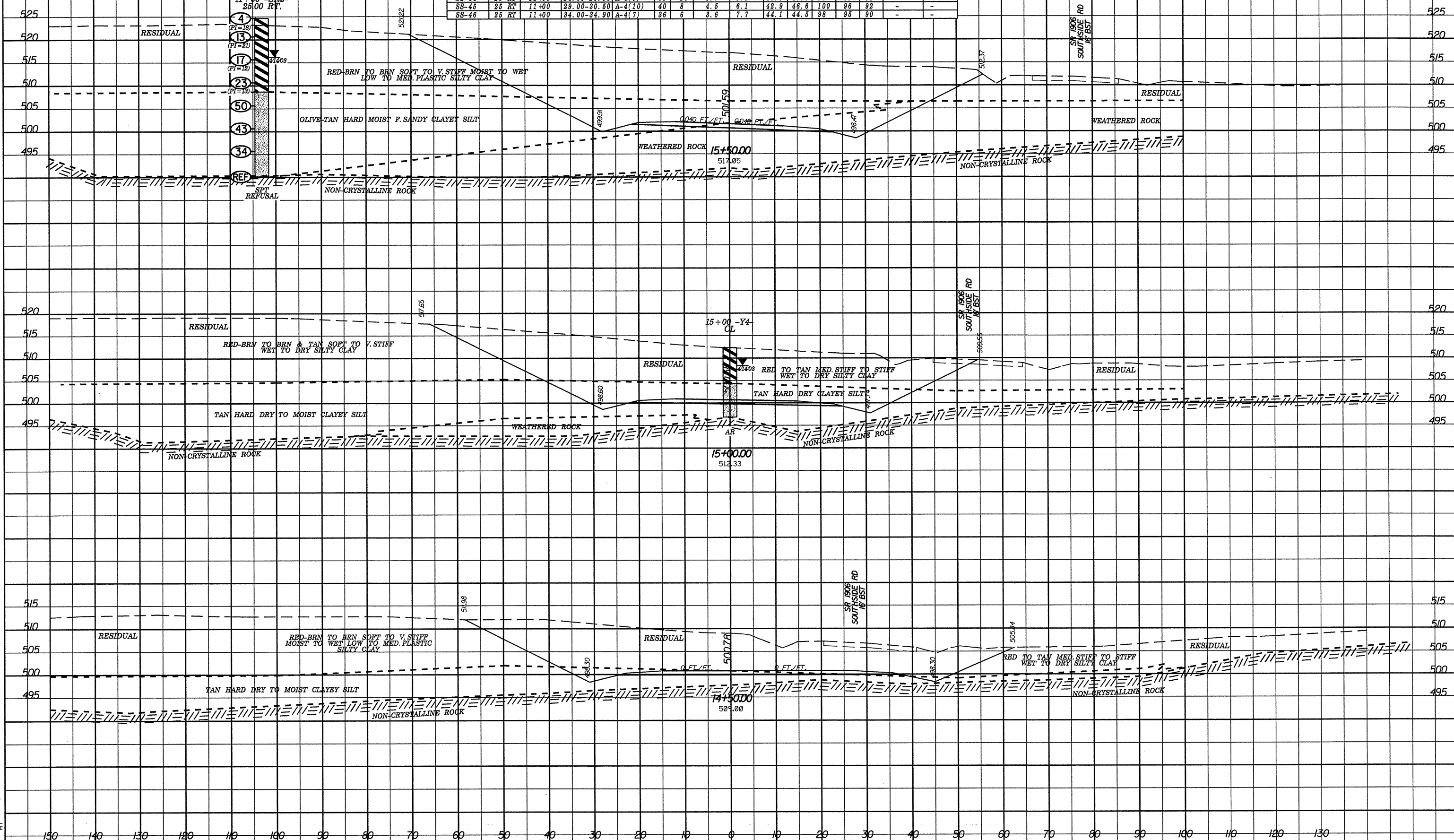
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	PL I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-35	25 LT	101+60	0.00-1.50	A-6(3)	38	13	24.6	6.7	25.3	44.4	65	52	46	-	-
SS-36	25 LT	101+60	8.50-10.00	A-7-5(17)	48	18	7.1	6.1	29.3	58.6	93	88	83	-	-
S-108	CL	102+00	1.50-4.00	A-7-6(26)	56	29	6.9	4.4	28.1	60.6	91	86	82	-	-

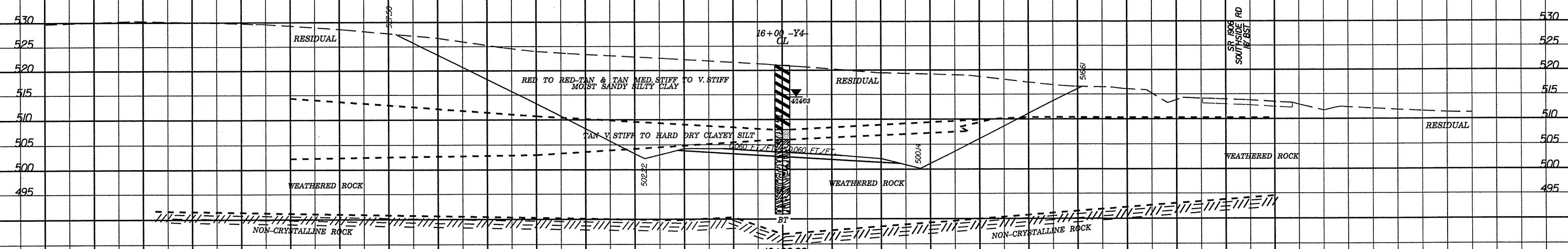
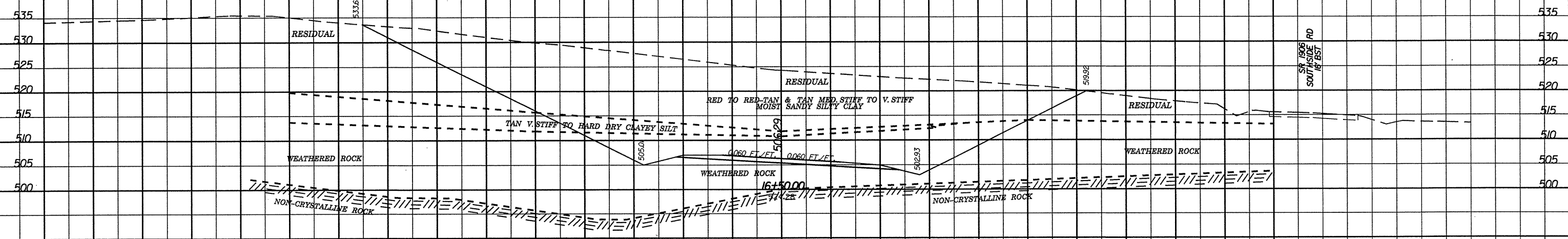


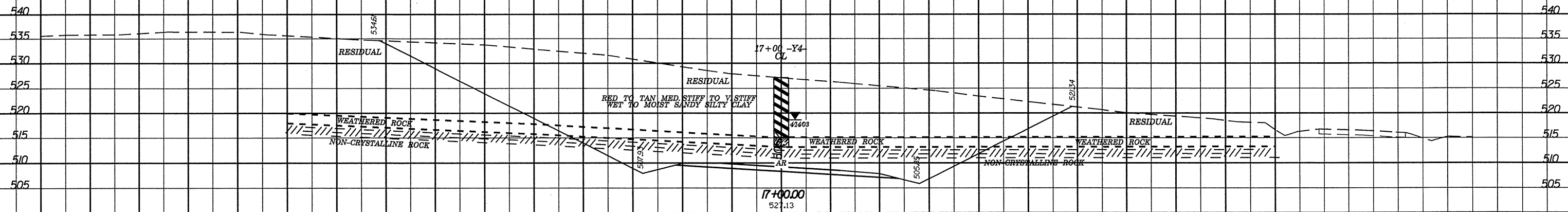
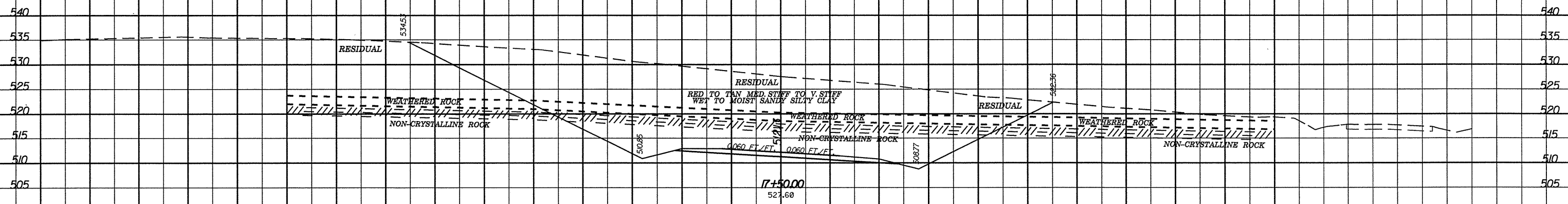
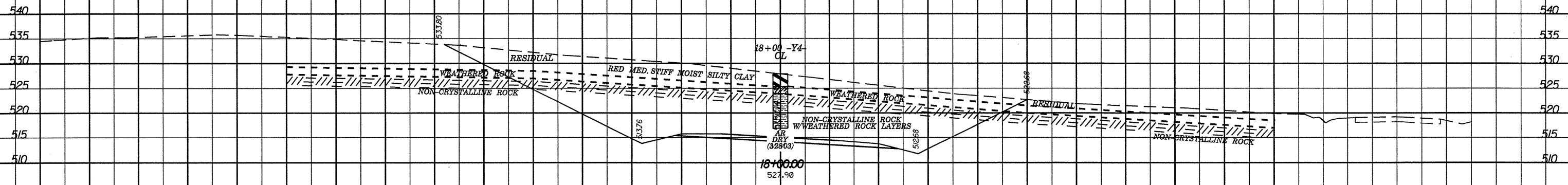
SOIL TEST RESULTS

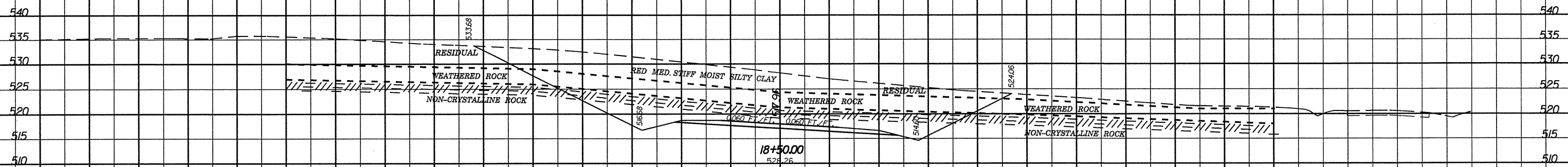
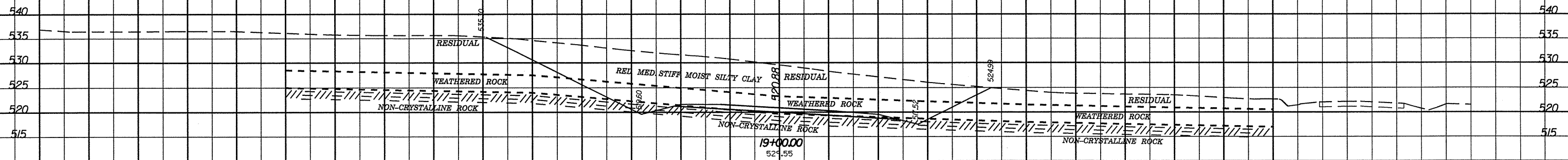
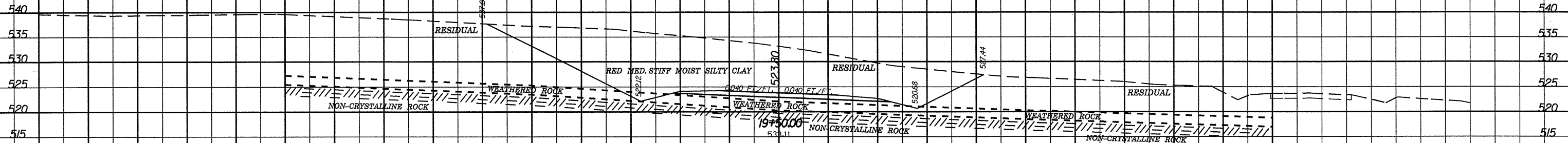
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.L.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-39	25 RT	11+00	0.00-1.50	A-7-6(14)	42	18	7.1	3.6	22.5	66.8	85	80	77	-	-
SS-40	25 RT	11+00	4.00-5.50	A-7-6(24)	48	21	1.8	3.8	31.6	62.8	100	99	96	-	-
SS-41	25 RT	11+00	9.00-10.50	A-7-6(15)	46	12	2.6	5.7	41.1	50.6	100	99	94	-	-
SS-42	25 RT	11+00	14.00-15.50	A-7-6(14)	46	13	8.9	6.7	37.9	46.6	100	94	86	-	-
SS-43	25 RT	11+00	19.00-20.50	A-4(9)	40	8	7.1	11.3	39.1	42.5	100	95	86	-	-
SS-44	25 RT	11+00	24.00-25.50	A-4(9)	39	10	8.7	9.9	40.9	40.5	96	89	81	-	-
SS-45	25 RT	11+00	29.00-30.50	A-4(10)	40	8	4.5	6.1	42.9	46.6	100	96	92	-	-
SS-46	25 RT	11+00	34.00-34.90	A-4(7)	36	6	3.6	7.7	44.1	44.5	98	95	90	-	-

-Y4-





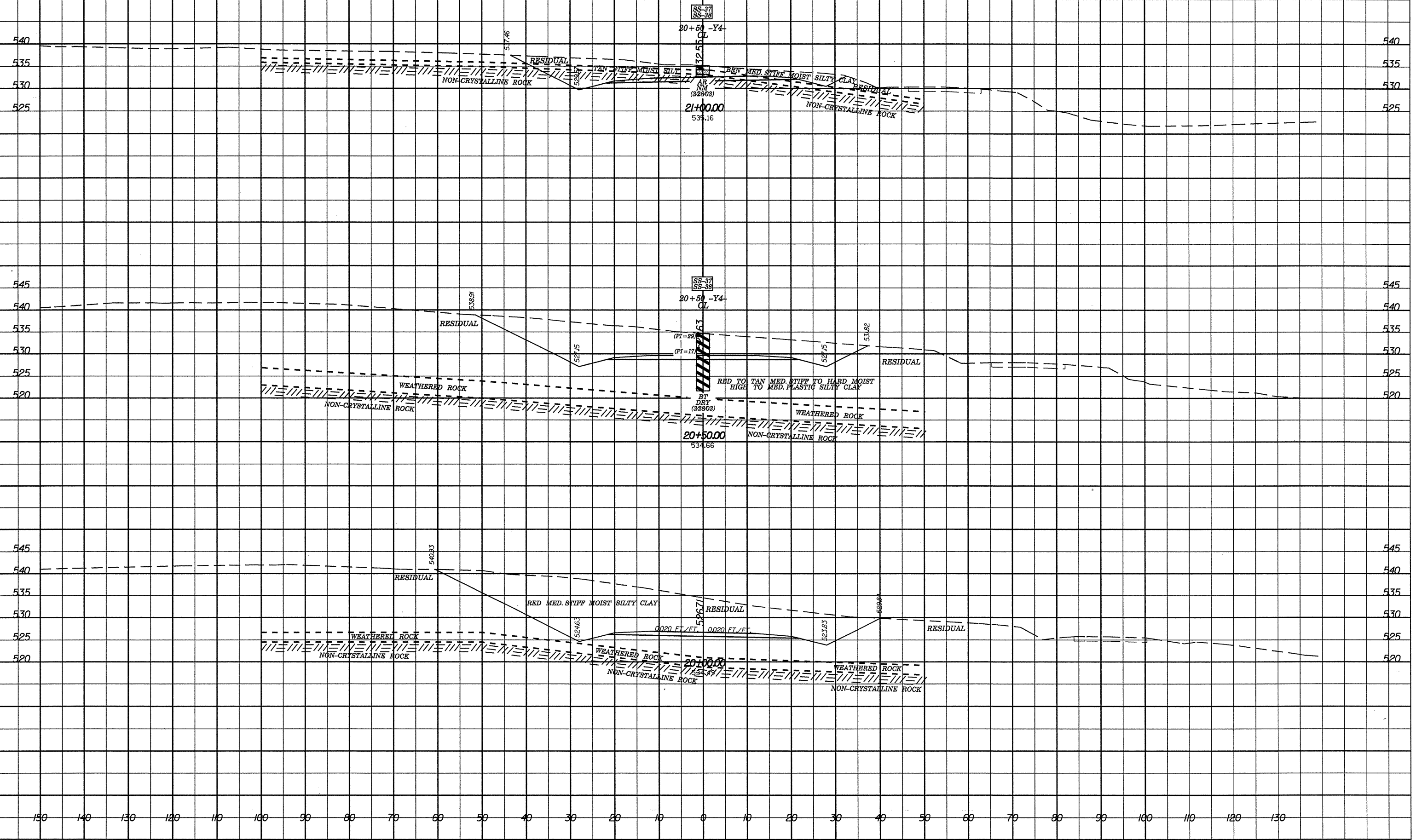




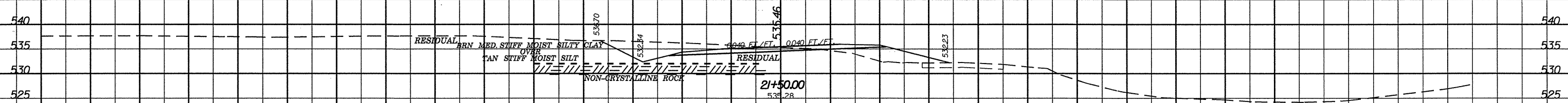
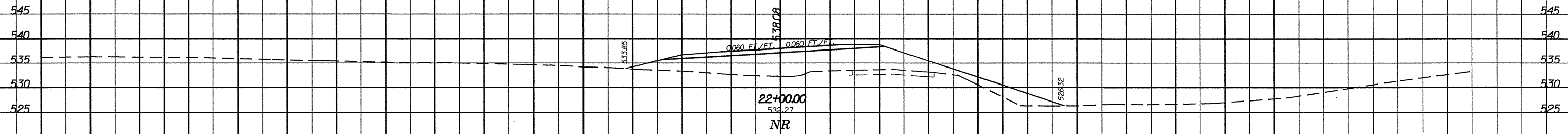
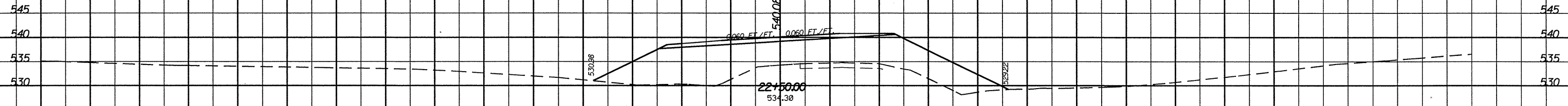
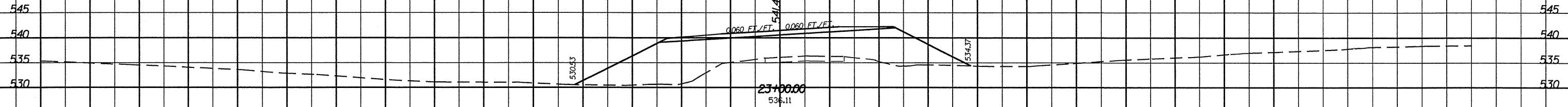
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.L.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-37	CL	20+50	0.00-4.00	A-7-5(34)	62	29	3.2	2.4	19.6	74.7	100	97	95	-	-
SS-38	CL	20+50	4.00-10.00	A-7-6(21)	48	17	1.0	1.6	28.7	68.7	100	99	98	-	-

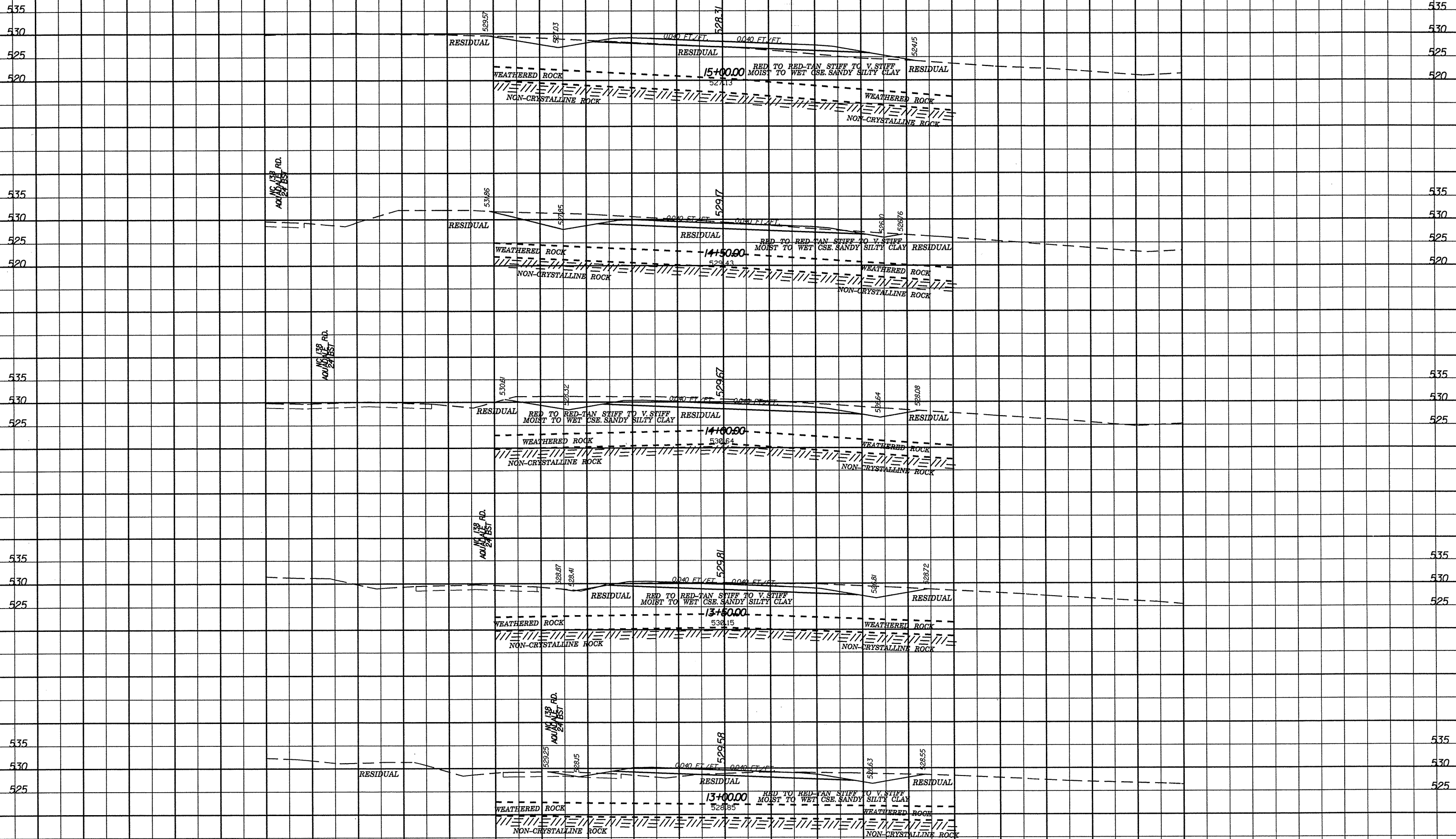
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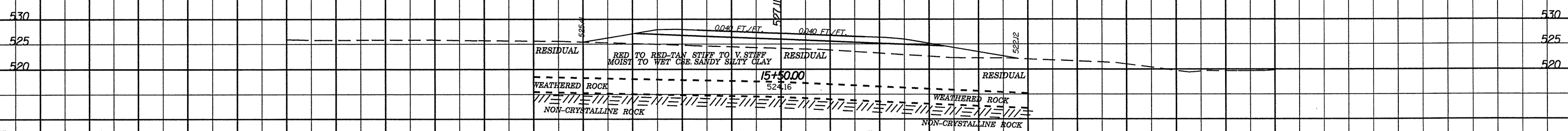
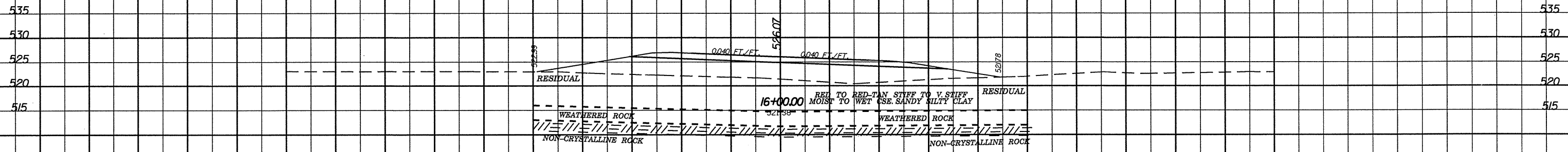
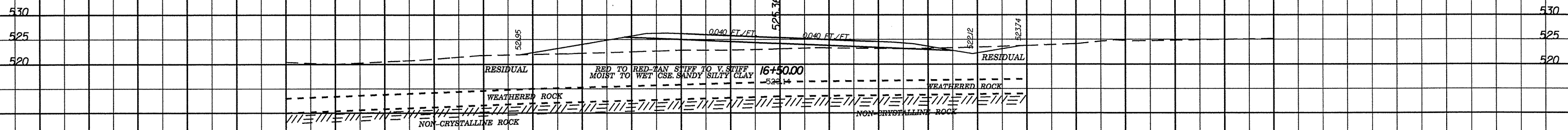
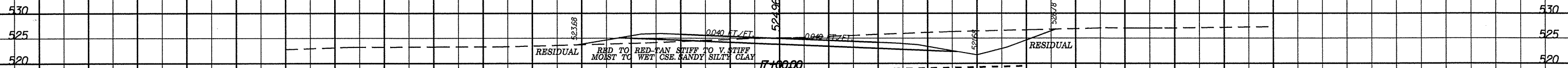
Y4



Y5



Y5



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