CONTRACT: C201976

ID: R-2301A

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

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

ROADWAY SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 34414.1.1 I.D. NO. R-2301A

F.A. PROJECT N/A COUNTY JONES / CRAVEN

PROJECT DESCRIPTION US 17 NEW BERN BYPASS FROM US 17 SOUTH OF NEWBERN TO US 70 (REVISED INVENTORY)

METRIC

ALL DIMENSIONS IN THESE PLANS ARE IN METERS OR MILLIMETERS UNLESS OTHERWISE NOTED

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2301A	1	93

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34414.1.1		P.E.
34414.2.3		R/W, UTIL
34414.3.4		CONSTR.

CONTENTS

LINE	STATION	SHEET NO.
-L-	9+68 TO 104+97	4-33, 43-57
-Y1-	16+97 TO 21+51	4, 36,37,70
-Y1LT-	10+09 TO 13+64	35,36,69
-Y1A-	5+60 TO 7+32	38
-Y4-	3+99 TO 21+79	39-42
-Y6-	10+20 TO 10+65	36,70
-RAMP A-	0+00 TO 8+07	30,32,40,61,62
-RAMP B-	0+00 TO 8+49	29,30,40,63,64
-RAMP C-	0+00 TO 9+23	28,31,41,65,66
-RAMP D-	0+00 TO 9+46	31,32,41,42,67,68
-LOOP A-	0+00 TO 5+21	30,31,60
-LOOP B-	0+00 TO 5+33	30,31,62
-LOOP C-	0+00 TO 5+21	30,31,64
-LOOP D-	0+00 TO 5+33	30,31,66,67
-DR1-	5+01 TO 17+05	22-25,71,72

CROSS SECTIONS

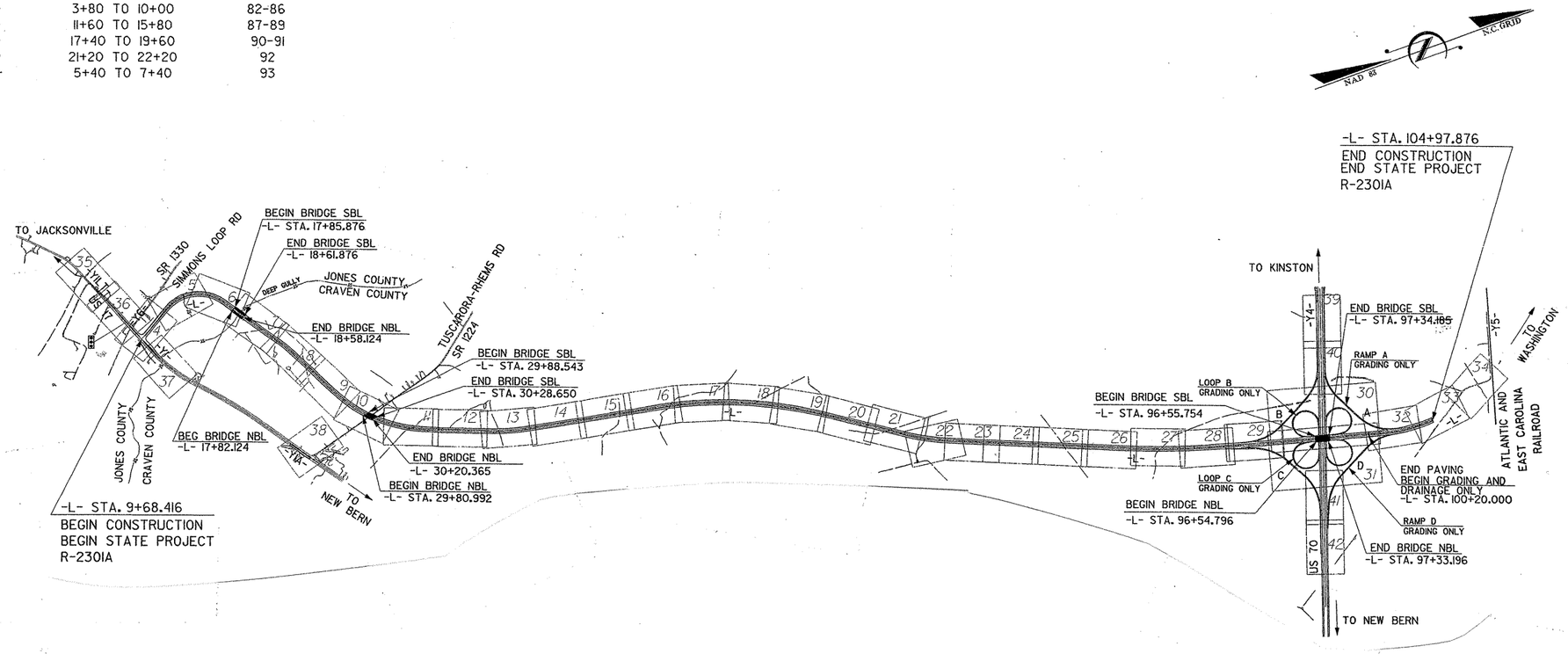
LINE	STATION	SHEET NO.
-L-	31+80 TO 33+20	73,74
-L-	34+40 TO 35+00	75
-L-	69+20 TO 72+00	76-78
-L-	73+20 TO 76+20	79-81
-Y4-	3+80 TO 10+00	82-86
-Y4-	11+60 TO 15+80	87-89
-Y4-	17+40 TO 19+60	90-91
-Y4-	21+20 TO 22+20	92
-Y1A-	5+40 TO 7+40	93

CAUTION NOTICE

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

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

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



PERSONNEL

FMW

LWD

WNC

INVESTIGATED BY D.N. ARGENBRIGHT

CHECKED BY D.N. ARGENBRIGHT

SUBMITTED BY D.N. ARGENBRIGHT

DATE FEBRUARY, 2008

NORTH CAROLINA LICENSED SEAL 1050 GEOLOGIST D. N. ARGENBRIGHT

2-1-08

DRAWN BY: DNA, CMK

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.

EARTHWORK BALANCE SHEET

Volumes in Cubic Meters

PROJECT **TIP #** 6.179001T (R-2301A) COUNTY JONES AND CRAVEN DATE 2/23/2009 SHEET_1_ OF _1_ SHEETS

LINE	STATION	STATION	TOTAL EXCAV. (UNCL.)	ROCK EXCAV.	UNDERCUT EXCAV.	UNSUIT. EXCAV.	SUITABLE EXCAV.	TOTAL EMB.	ROCK EMB.	UNDERCUT EMB.	EARTH EMB.	EMBANK. 30%	BORROW	SUITABLE WASTE	UNSUIT. WASTE	TOTAL WASTE
SUMMARY #1																
Y1XOVER	10+00.000	13+37.307	245				245	101		0	101	131	0	114		114
Y1LT	10+20.000	13+64.625	1581		3267	1581		3546		3267	279	4610	4610	0	4848	4848
Y1	16+97.996	21+51.307	9218		5356	9218		7004		5356	1648	9105	9105	0	14574	14574
Y6	10+20.000	10+53.173	620			620		30		0	30	39	39	0	620	620
		TOTAL SUMMARY #1	**11664**		**8623**	**11419**	**245**	**10681**		**8623**	**2058**	**13885**	**13754**	**114**	**20042**	**20156**
SUMMARY #2																
L	10+00.000	17+84.000	3842		4339	3842		163405		4339	159066	212427	212427	0	8181	8181
		BEG BRIDGE														
		TOTAL SUMMARY #2	**3842**		**4339**	**3842**	**0**	**163405**		**4339**	**159066**	**212427**	**212427**		**8181**	**8181**
SUMMARY #3																
L	18+60.000	29+84.110						147731		0	147731	192050	192050	0		
	END BRIDGE	BEG BRIDGE														
		TOTAL SUMMARY #3						**147731**			**147731**	**192050**	**192050**			
SUMMARY #4																
L	30+24.956	40+20.000						162257		0	162257	210934	210934	0		
	END BRIDGE															
Y1A	5+68.342	7+32.342	121		254		121	265		254	11	345	224	0	254	254
		TOTAL SUMMARY #4	**121**		**254**		**121**	**162522**		**254**	**162268**	**211279**	**211158**		**254**	**254**
SUMMARY #5																
L	40+20.000	50+20.000						72955		0	72955	94842	94842	0		
		TOTAL SUMMARY #5						**72955**			**72955**	**94842**	**94842**			
SUMMARY #6																
L	50+20.000	60+20.000						64447		0	64447	83781	83781	0		
		TOTAL SUMMARY #6						**64447**			**64447**	**83781**	**83781**			
SUMMARY #7																
L	60+20.000	70+20.000						88222		0	88222	114689	114689	0		
		TOTAL SUMMARY #7						**88222**			**88222**	**114689**	**114689**			
SUMMARY #8																
L	70+20.000	80+20.000						70835		0	70835	92086	92086	0		
		TOTAL SUMMARY #8						**70835**			**70835**	**92086**	**92086**			
SUMMARY #9																
L	80+20.000	90+20.000						55541		0	55541	72203	72203	0		
		TOTAL SUMMARY #9						**55541**			**55541**	**72203**	**72203**			
SUMMARY #10																
L	90+20.000	96+55.275						156622		0	156622	203609	203609	0		
		BEG BRIDGE														
LPB	0+00.000	4+47.000	160		318	160		33891		318	33573	44058	44058	0	478	478
RPB	0+00.000	7+23.000	599		167	599		16131		167	15964	20970	20970	0	766	766
LPC	0+00.000	4+26.000	307		194	307		34609		194	34415	44992	44992	0	501	501
RPC	0+00.000	7+94.290	286		133	286		14060		133	13927	18278	18278	0	419	419
		TOTAL SUMMARY #10	**1352**		**812**	**1352**	**0**	**255313**		**812**	**254501**	**331907**	**331907**		**2164**	**2164**
SUMMARY #11																
L	97+33.691	99+40.000						105935		0	105935	137716	137716	0		
	END BRIDGE															
LPA	0+00.000	4+30.000	466		355	466		35748		355	35393	46472	46472	0	821	821
RPA	3+58.610	6+95.263	604		201	604		8740		201	8539	11362	11362	0	805	805
LPD	0+00.000	4+61.000	62		118	62		38563		118	38445	50132	50132	0	180	180
RPD	3+60	7+87.180	64			64		11763		0	11763	15292	15292	0	64	64
Y4	3+99.427	14+00.000	1959		2343		1959	3028		2343	685	3936	1977	0	2343	2343
		TOTAL SUMMARY #11	**3155**		**3017**	**1196**	**1959**	**203777**		**3017**	**200760**	**264910**	**262951**		**4213**	**4213**
SUMMARY #12																
Y4	14+00.000	23+42.787	1827		2040		1827	3004		2040	964	3905	2078	0	2040	2040
		TOTAL SUMMARY #12	**1827**		**2040**		**1827**	**3004**		**2040**	**964**	**3905**	**2078**		**2040**	**2040**
SUMMARY #13																
REMOVE -Y1XOVER- TEMP US 17 DETOUR			101				101	245		0	245	319	218	0		
		TOTAL SUMMARY #13	**101**				**101**	**245**			**245**	**319**	**218**			
PROJECT SUBTOTAL (SUMMARIES 1-13)			**22062**	**0**	**19085**	**17809**	**4253**	**1298678**	**0**	**19085**	**1279593**	**1688283**	**1684144**	**114**	**36894**	**37008**
ADDITIONAL UNDERCUT					18615			18615		18615		24200	24200		18615	18615
SHOULDER MATERIAL											36500	47450	47450			
WASTE IN LIEU OF BORROW													-114	-114		-114
LOSS DUE TO CLEARING & GRUBBING			-100				-100						100			
SEL. GRANULAR IN LIEU OF BORROW												-69700	-69700			
PROJECT TOTAL			**21962**	**0**	**37700**	**17809**	**4153**	**1317293**	**0**	**37700**	**1316093**	**1690233**	**1686080**	**0**	**55509**	**55509**
EST 5% TO REPLACE TOP SOIL ON BORROW PIT													84304			
GRAND TOTAL			**21962**	**0**	**37700**	**17809**	**4153**	**1317293**	**0**	**37700**	**1316093**	**1690233**	**1770384**	**0**	**55509**	**55509**
SAY			**22,050**		**37,700**	**17,850**	**4,200**	**1,317,300**		**37,700**			**1,770,400**			

EARTHWORK TOTALS FOR ALTERNATE 1 PAVEMENT DESIGN

PROJECT SUBTOTAL (SUMMARIES 1-13)	**22062**	**0**	**19085**	**17809**	**4253**	**1298678**	**0**	**19085**	**1279593**	**1688283**	**1684144**	**114**	**36894**	**37008**
ADJ. FOR ALT 1 PAVEMENT DESIGN	-2050				-2050	38073			38073	49494	51544			
ADDITIONAL UNDERCUT			18615			18615		18615		24200	24200		18615	18615
SHOULDER MATERIAL									58350	75855	75855			
WASTE IN LIEU OF BORROW											-114	-114		-114
LOSS DUE TO CLEARING & GRUBBING	-100				-100						100			
SEL. GRANULAR IN LIEU OF BORROW										-69700	-69700			
PROJECT TOTAL	**19912**	**0**	**37700**	**17809**	**2103**	**1355366**	**0**	**37700**	**1376016**	**1768132**	**1766029**	**0**	**55509**	**55509**
EST 5% TO REPLACE TOP SOIL ON BORROW PIT											88301			
GRAND TOTAL	**19912**	**0**	**37700**	**17809**	**2103**	**1355366**	**0**	**37700**	**1376016**	**1768132**	**1854330**	**0**	**55509**	**55509**
SAY	**20,000**		**37,700**	**17,850**	**2,150**	**1,355,400**		**37,700**			**1,854,400**			

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

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER 30 CM ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:

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

SOIL LEGEND AND AASHTO CLASSIFICATION

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

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

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTENCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH (kN/m^2)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE	<4 4 TO 10 10 TO 30 30 TO 50 >50	N/A
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD	<2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 >30	<25 25 TO 50 50 TO 100 100 TO 200 200 TO 400 >400

TEXTURE OR GRAIN SIZE

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

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

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

SOIL MOISTURE - CORRELATION OF TERMS

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

PLASTICITY

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

COLOR

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

GRADATION

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

ANGULARITY OF GRAINS

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

MINERALOGICAL COMPOSITION

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

COMPRESSIBILITY

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

PERCENTAGE OF MATERIAL

ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL	
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE	1 - 10%
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE	10 - 20%
MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME	20 - 35%
HIGHLY ORGANIC	>10%	>20%	HIGHLY	35% AND ABOVE

GROUND WATER

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

MISCELLANEOUS SYMBOLS

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

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

ABBREVIATIONS

AR - AUGER REFUSAL
BT - BORING TERMINATED
CL. - CLAY
CPT - CONE PENETRATION TEST
CSE. - COARSE
DMT - DILATOMETER TEST
DPT - DYNAMIC PENETRATION TEST
e - VOID RATIO
F - FINE
FOSS. - FOSSILIFEROUS
FRAC. - FRACTURED, FRACTURES
FRAGS. - FRAGMENTS
HI. - HIGHLY
MED. - MEDIUM
MICA. - MICACEOUS
MOD. - MODERATELY
NP - NON PLASTIC
ORG. - ORGANIC
PMT - PRESSUREMETER TEST
SAP. - SAPROLITIC
SD. - SAND, SANDY
SL. - SILT, SILTY
SLI. - SLIGHTLY
TCR - TRICONE REFUSAL
w - MOISTURE CONTENT
V - VERY
VST - VANE SHEAR TEST
WEA. - WEATHERED
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] MOBILE B-___
- [ ] BK-51
- [X] CME-45
- [ ] CME-550
- [ ] PORTABLE HOIST
- [ ] _____
- [ ] _____

ADVANCING TOOLS:
- [X] CLAY BITS
- [X] 152mm CONTINUOUS FLIGHT AUGER
- [ ] 203mm HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [ ] TUNG.-CARBIDE INSERTS
- [X] CASING [ ] W/ ADVANCER
- [X] TRICONE 2 15/16 mm STEEL TEETH
- [ ] TRICONE _____ mm TUNG.-CARB.
- [ ] CORE BIT
- [ ] _____

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

CORE SIZE:
- [ ] -B_____
- [ ] -N_____
- [ ] -H_____

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

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 3 CM PER 60 BLOWS. IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK.
ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:

WEATHERED ROCK (WR)	NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER 30 CM IF TESTED.
CRYSTALLINE ROCK (CR)	FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.
NON-CRYSTALLINE ROCK (NCR)	FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.
COASTAL PLAIN SEDIMENTARY ROCK (CP)	COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.

WEATHERING

FRESH	ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.
VERY SLIGHT (V SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.
SLIGHT (SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.
MODERATE (MOD.)	SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.
MODERATELY SEVERE (MOD. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. *IF TESTED, WOULD YIELD SPT REFUSAL*
SEVERE (SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. *IF TESTED, YIELDS SPT N VALUES > 100 BLOWS PER 30 CM*
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 BLOWS PER 30 CM*
COMPLETE	ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.

ROCK HARDNESS

VERY HARD	CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.
HARD	CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.
MODERATELY HARD	CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 6 MM DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.
MEDIUM HARD	CAN BE GROOVED OR GOUGED 13 MM DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 25 MM MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.
SOFT	CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.
VERY SOFT	CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 25 MM OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.

FRACTURE SPACING

TERM	SPACING
VERY WIDE	MORE THAN 3 M
WIDE	3 TO 10 M
MODERATELY CLOSE	30 TO 100 CM
CLOSE	5 TO 30 CM
VERY CLOSE	LESS THAN 5 CM

BEDDING

TERM	THICKNESS
VERY THICKLY BEDDED	> 1 M
THICKLY BEDDED	0.5 - 1 M
THINLY BEDDED	0.05 - 0.5 M
VERY THINLY BEDDED	10 - 50 MM
THICKLY LAMINATED	2.5 - 10 MM
THINLY LAMINATED	< 2.5 MM

INDURATION

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

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

TERMS AND DEFINITIONS

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

AQUIFER - A WATER BEARING FORMATION OR STRATA.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 10 CM DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

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

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

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

STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N) OF A 63.5 KG HAMMER FALLING 0.76 M REQUIRED TO PRODUCE A PENETRATION OF 30 CM INTO SOIL WITH A 5 CM OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 3 CM PER 60 BLOWS.

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

STRATA ROCK QUALITY DESIGNATION (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 10 CM DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.

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

BENCH MARK:

ELEVATION: M

NOTES:
FILL = ROADWAY EMBANKMENT
FM. = FORMATION
MOI. = MOIST
SAT. = SATURATED

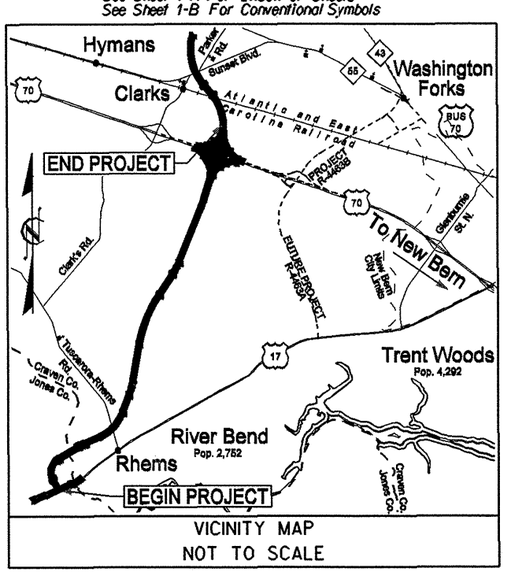
APPROXIMATE LIMITS OF ORGANIC SOILS

9/09/99

TIP PROJECT: R-2301A

CONTRACT:

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



VICINITY MAP
NOT TO SCALE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

JONES & CRAVEN COUNTIES

LOCATION: US 17 NEW BERN BYPASS FROM US 17 SOUTH OF NEW BERN TO US 70

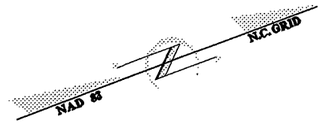
TYPE OF WORK: DRAINAGE, GRADING, PAVING, STRUCTURES, SIGNALS, AND SIGNING

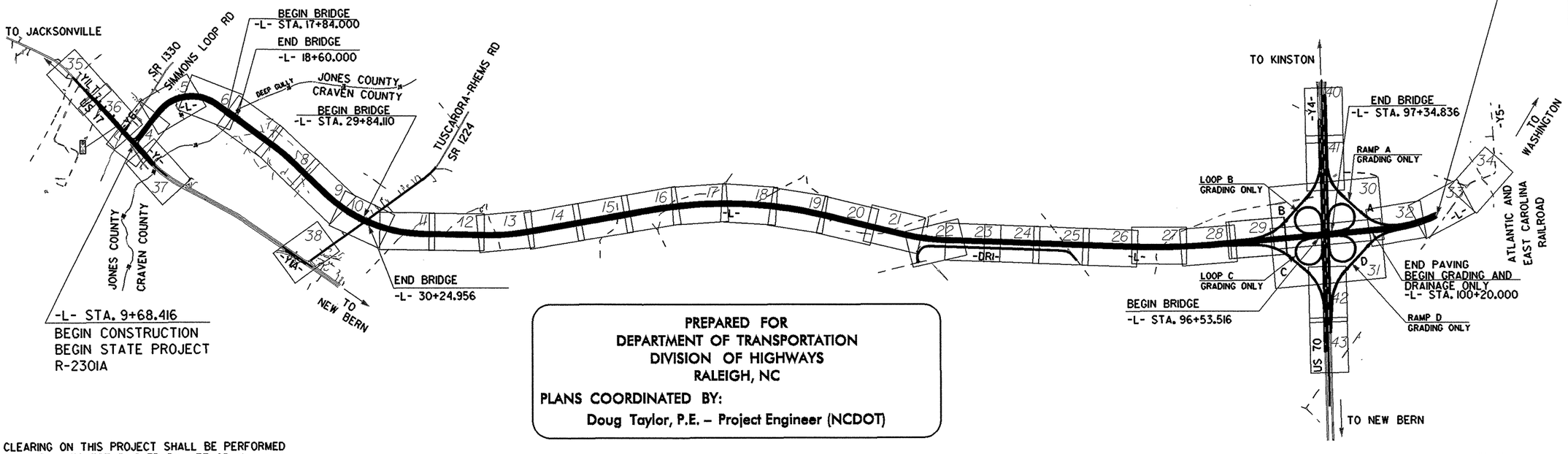
METRIC

ALL DIMENSIONS IN THESE PLANS ARE IN METERS OR MILLIMETERS UNLESS OTHERWISE NOTED

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2301A	2A	93

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34414.1.1		P.E.
34414.2.3		R/W, UTIL





PREPARED FOR
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, NC

PLANS COORDINATED BY:
Doug Taylor, P.E. – Project Engineer (NCDOT)

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

PRELIMINARY PLANS

SEPTEMBER 14, 2007 REVISED BYPASS-US 17 INTERSECTION PRELIMINARY 25% PLAN SHEETS

GRAPHIC SCALES

5 0 10
PLANS

5 0 10
PROFILE (HORIZONTAL)

0.5 0 1
PROFILE (VERTICAL)

DESIGN DATA

ADT 2008 = 23,300
ADT 2028 = 40,300
DHV = 10 %
D = 60 %
T = 12 %
(6% TTST + 6% DUAL)
V = 110 km/h
FUNCTIONAL CLASSIFICATION: FREEWAY

PROJECT LENGTH

LENGTH ROADWAY STATE PROJECT 34414.2.3 = 9.331 KILOMETERS
LENGTH STRUCTURE STATE PROJECT 34414.2.3 = 0.198 KILOMETERS
TOTAL LENGTH STATE PROJECT 34414.2.3 = 9.529 KILOMETERS

THIS IS A CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO THE INTERCHANGES

Prepared in the Office of:
URS Corporation – North Carolina
1600 Perimeter Park Drive, Suite 400
Morrisville, North Carolina 27560
TELEPHONE (919) 461-1100 FAX (919) 461-1415

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JUNE 30, 2006

LETTING DATE:
NOVEMBER 18, 2008

TIMOTHY H. KEENER, P.E.
PROJECT ENGINEER

JEFFREY A. KOONTZ, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE HIGHWAY DESIGN ENGINEER

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

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

LYNDO TIPPETT
SECRETARY

February 1, 2008

STATE PROJECT: 34414.1.1 R-2301A
F.A. PROJECT:
COUNTY: Jones/Craven
DESCRIPTION: US 17 New Bern Bypass From US 17 South of New Bern to US 70

SUBJECT: Geotechnical Report – Revised Inventory

Project Description

The proposed US 64 project generally consists of constructing a relocated four lane divided facility with a 10.4± meter median. The project begins in just south of the intersection of SR 1330 and US 17 in Jones County and proceeds 9.5± kilometers north to just north of US 70 in Craven County. The southern terminus of the project ties in with existing US 17 and the northern terminus ties in with R-2301B. The investigation of subsurface conditions was confined to the corridor of proposed new construction.

The following base lines were investigated for this project:

Line	Station
-L-	9+68 to 104+97
-Y1-	16+97 to 21+51
-Y1LT-	10+09 to 13+64
-Y1A-	5+60 to 7+32
-Y4 -	3+99 to 21+79
-Y6-	10+20 to 10+65
-Ramp A-	0+00 to 8+07
-Ramp B-	0+00 to 8+49
-Ramp C-	0+00 to 9+23
-Ramp D-	0+00 to 9+46
-Loop A-	0+00 to 5+21
-Loop B-	0+00 to 5+33
-Loop C-	0+00 to 5+21
-Loop D-	0+00 to 5+33
-DR1-	5+01 to 17+05

Areas of Special Geotechnical Interest

1) The entire project contains silt-clay soils which typically have medium to high plasticity indices, 50% or more passing the 75μm sieve and/or high moisture contents.

2) Moderately to highly organic soils occur through the following sections:

Line	Station (±)
-L-	18+04 to 18+46
-L-	32+35 to 33+13
-L-	34+30 to 35+07
-L-	69+85 to 70+43
-L-	71+25 to 71+59
-L-	73+47 to 73+67
-L-	73+85 to 75+45
-DR1-	6+80 to 7+30
-DR1-	7+60 to 8+66
-DR1-	9+13 to 10+73
-DR1-	11+05 to 12+15

The approximate limits of surficial organic soils are shown on the accompanying plan view sheets.

3) The following sections have the potential for embankment stability and/or long term settlement problems:

Location	Station (±)
-L-	12+00 to 20+00
-L-	28+00 to 33+00
-L-	92+80 to 101+20
-Loop A-	0+00 to 3+00
-Loop B-	0+00 to 3+00
-Loop C-	0+00 to 3+00
-Loop D-	0+00 to 3+00

4) The entire project was found to exhibit a high water table, seasonal high ground water or the potential for ground water related construction problems.

5) Existing sinkholes were encountered along the project in the areas listed below

Location	Station (±)
-L-	32+35 to 33+20
-L-	34+25 to 35+10
-L-	36+50 to 41+40
-L-	69+70 to 70+50
-L-	73+60 to 75+40
-L-	80+70 to 80+90
-Ramp A-	5+80 to 6+20
-DR1-	6+70 to 8+70
-DR1-	9+10 to 12+15

6) Several sites were identified as potentially hazardous waste sites by the GeoEnvironmental Section in their report dated May, 1996.

Physiography and Geology

The project corridor is located in northern Jones County and southern Craven County and generally lies southwest of New Bern. Topography is typical of the Lower Coastal Plain and is generally flat. Karst topography, specifically sinkholes, were noted along the project corridor. The roadway typically crosses upland terrain where natural ground elevations along the project generally range from 8.5 to 11.5 meters above sea level. Sinkhole elevations are from 1.0 to 1.5 meters lower than the surrounding upland area.

The geology of this region primarily consists of a veneer (2 to 4 meters) of surficial Quaternary silt and clay sediments capping the majority of the project. These soils are primarily underlain by sandy soils probably belonging to the Duplin Formation. The granular soils are underlain by limestone of the Oligocene age River Bend Formation along the southern end of the project and the Eocene age Castle Hayne Formation at the northern terminus near US 70.

Man-made canals and ditches that eventually flow into the Trent River drain the project area. Surface drainage is poor throughout the proposed corridor.

Ground Water

Ground water data was collected primarily from December 2000 to April 2001 as well as December 2007 and January 2008 during average rainfall conditions. During our investigation, the water table was generally within 1 meter of the natural ground surface along the project. Ground water levels may rise 1± meter during the wet season and fall 1± meter during a dry summer. In some of the sinkhole areas, water is at or above the natural ground surface.

Soils

Soils encountered during this investigation are separated into five major categories based on origin and published data. These categories are alluvial soils, surficial soils, Duplin Formation soils, rootmat and embankment soils.

Alluvial soils were encountered in the sinkhole areas and generally consist of 0.2 to 0.8 meters of muck, organic silt and organic sand underlain by 0.5 to 1.5± meters of soft to stiff sandy and silty clay (A-6, A-7-6). Organic contents range from 6 to 69 percent and moisture contents of tested samples range from 143 to 178 percent. Vane shear tests performed in the organic alluvial sediments range from 27 to 62 kPa. Typically, the alluvial sediments exhibit poor engineering properties and undercutting or other methods of stabilizing the subgrade may be required.

The surficial Quaternary soils along this project generally consist of a veneer (1 to 4 meters) of very soft to stiff clayey sandy silt (A-4) and silty sandy clay (A-6, A-7-6) which have fair to poor engineering properties. These soils are typically found slightly above but generally below the water table, have a low to high plasticity index (5 to 56 PI) and relatively high moisture contents. The majority of these deposits generally have more than 70 percent passing the 75μm sieve and have the potential to cause subgrade problems. In areas where high embankments are to be constructed, the cohesive soils have the potential to cause settlement and stability problems.

The Duplin Formation generally underlies the surficial soils at an elevation of 4.5 to 9± meters. Soils within this formation consist of 7 to 11 meters of very loose to loose fine to coarse sand (A-2-4, A-3) and sandy silt (A-4) with some clay (A-7-6) layers. The granular deposits of the Yorktown Formation have good to excellent engineering properties. However, the clay deposits have poor engineering properties due to the soft consistency, high moisture contents and more than 70 percent passing the 75μm sieve. In areas where high embankments are to be constructed, the cohesive soils have the potential to cause settlement and stability problems.

The soft fossiliferous limestone of the River Bend and Castle Hayne Formation underlies the Duplin Formation at an elevation of sea level to 2 meters above sea level. The limestone along the southern end of the project is 1.5± meters thick and underlain by loose to dense fine sand (A-2-4, A-3). A boring was advanced 6.5± meters in the limestone at the northern end of the project and terminated.

Rootmat is surficial organic debris derived from the decomposition of plant material. Rootmat along the project is primarily confined to wooded areas of the project and is approximately 0.05 (±) meters thick. The engineering properties of this material is generally poor. The majority of this material shall be removed during clearing and grubbing operations.

Embankments are man-made fills built during construction of existing roadways. The fill material generally consists of loose to medium dense fine to coarse sand (A-2-4). Thickness of

the fill material ranges from 0.1 to 1.6± meters and has good to excellent engineering properties. This material was primarily encountered along existing US 17, US 70 and associated -Y- lines.

Undisturbed Samples

Undisturbed (Shelby Tube) samples were taken at the following locations and submitted for Triaxial CU and Consolidation testing:

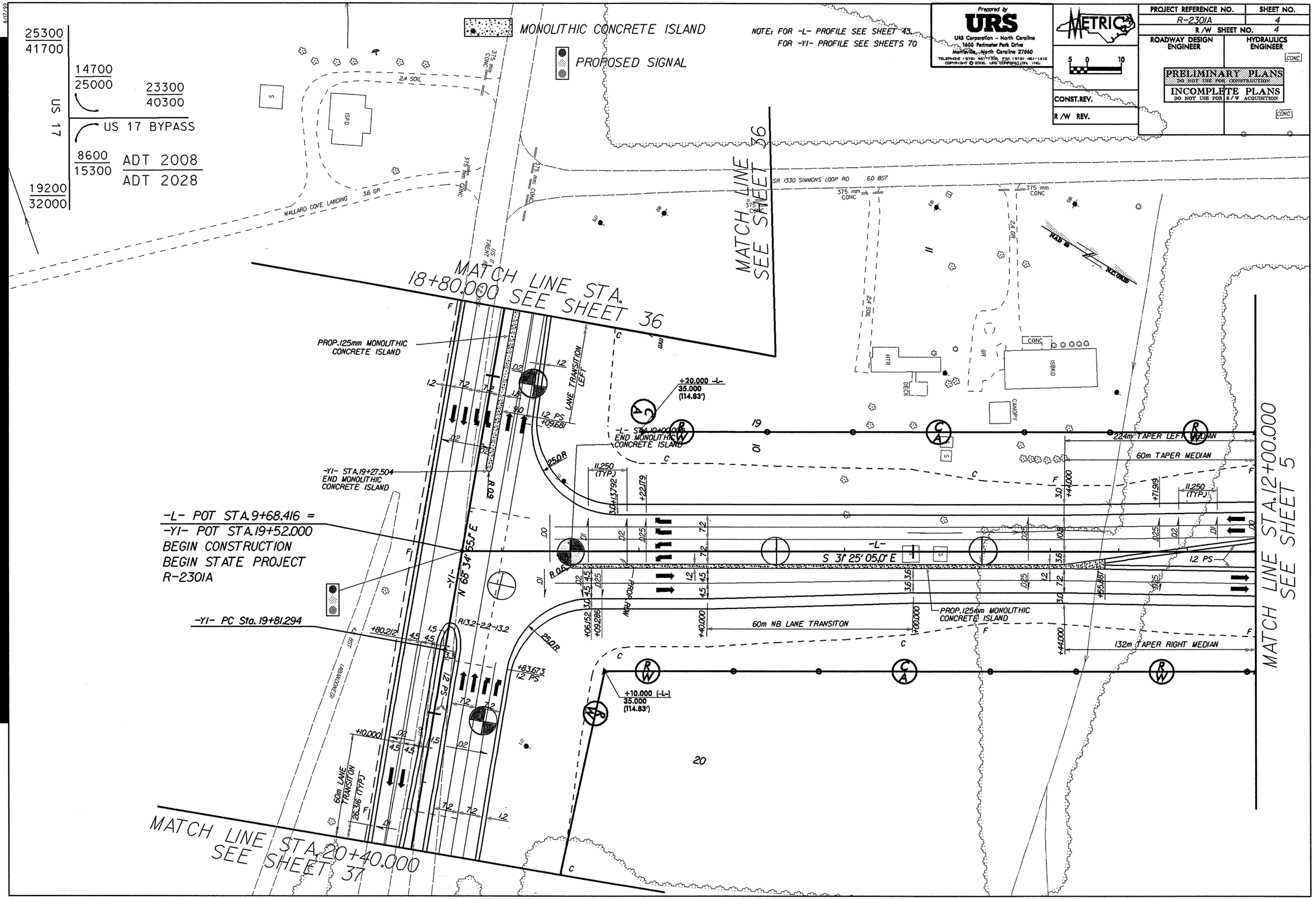
Sample No.	Station	Depth (m)
ST-1*	13+50, 68mRT of -L-	0.61 – 1.22
ST-2*	13+50, 68mRT of -L-	2.00 – 2.60
ST-3*	30+67.5, Centerline -L-	0.40 – 1.00
ST-4*	30+67.5, Centerline -L-	1.20 – 1.80
ST-5	57+01, Centerline -L-	0.61 – 1.22
ST-6	57+01, Centerline -L-	1.52 – 2.13
ST-7	13+48, Centerline -Y4-	0.61 – 1.22
ST-8	13+48, Centerline -Y4-	1.92 – 2.53

* Restationed based on revised alignment.

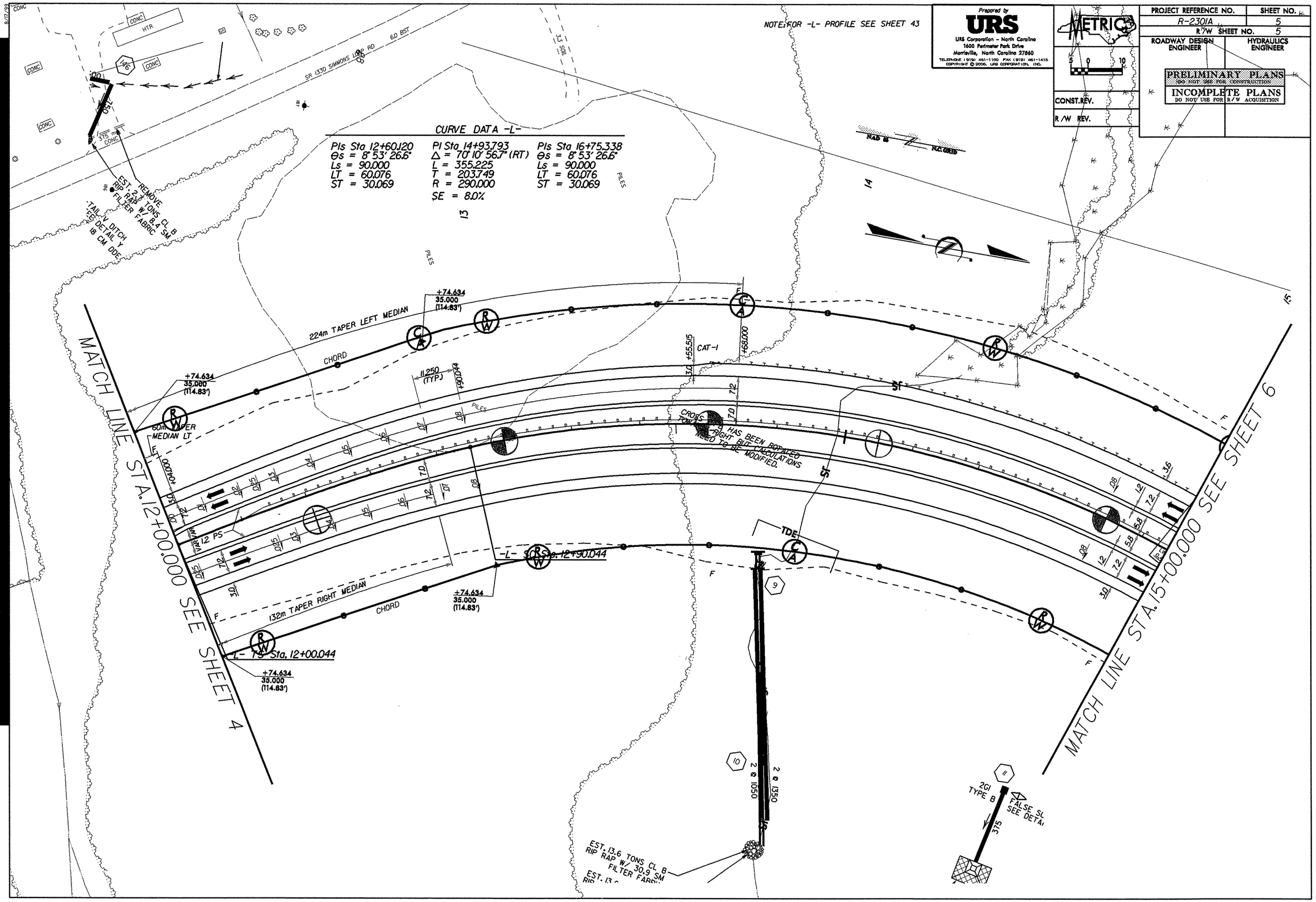
Prepared by,

Dean N. Argenbright, L.G.
Regional Geological Engineer

DNA



MONOLITHIC CONCRETE ISLAND
PROPOSED SIGNAL
NOTE: FOR -L- PROFILE SEE SHEET 43.
FOR -Y1- PROFILE SEE SHEETS 70
Prepared by
URS
URS Corporation - North Carolina
1600 Perimeter Park Drive
Morrisville, North Carolina 27560
METRIC
PROJECT REFERENCE NO.
R-2301A
SHEET NO.
4
R/W SHEET NO.
4
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
CONST.REV.
R/W REV.
25300
41700
14700
25000
23300
40300
US 17
US 17 BYPASS
8600
15300
ADT 2008
ADT 2028
19200
32000
MATCH LINE STA. 18+80.000 SEE SHEET 36
MATCH LINE SEE SHEET 36
MATCH LINE STA. 12+00.000 SEE SHEET 5
MATCH LINE STA. 20+40.000 SEE SHEET 37
PROP. 125mm MONOLITHIC CONCRETE ISLAND
-Y1- STA. 19+27.504 END MONOLITHIC CONCRETE ISLAND
-L- POT STA. 9+68.416 = -Y1- POT STA. 19+52.000 BEGIN CONSTRUCTION BEGIN STATE PROJECT R-2301A
-Y1- PC Sta. 19+81.294
-L- STA. 10+00.000 END MONOLITHIC CONCRETE ISLAND
+20.000 -L- 35.000 (114.83')
+10.000 (-L-) 35.000 (114.83')
224m TAPER LEFT MEDIAN
60m TAPER MEDIAN
60m NB LANE TRANSITON
132m TAPER RIGHT MEDIAN
60m LANE TRANSITON 26.316 (TYP.)
LANE TRANSITION LEFT
S 31° 25' 05.0" E
N 68° 34' 55.1" E
MALLARD COVE LANDING
SR 1330 SIMMONS LOOP RD



NOTE: FOR -L- PROFILE SEE SHEET 43
Prepared by
URS
URS Corporation - North Carolina
1600 Perimeter Park Drive
Morrisville, North Carolina 27560
TELEPHONE (919) 461-1100 FAX (919) 461-1415
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METRIC
PROJECT REFERENCE NO.
R-2301A
SHEET NO.
5
R/W SHEET NO.
5
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
CONST.REV.
R/W REV.
CURVE DATA -L-
PIs Sta 12+60.120
Θs = 8° 53' 26.6"
Ls = 90.000
LT = 60.076
ST = 30.069
PI Sta 14+93.793
Δ = 70° 10' 56.7" (RT)
L = 355.225
T = 203.749
R = 290.000
SE = 8.0%
PIs Sta 16+75.338
Θs = 8° 53' 26.6"
Ls = 90.000
LT = 60.076
ST = 30.069
SR 1330 SIMMONS LOOP RD
6.0 BST
3.3 SOIL
REMOVE
EST. 2.7 TONS CL B
RIP RAP W/ 8.4 SM
FILTER FABRIC
TAIL V DITCH
SEE DETAIL Y
18 CM DDE
224m TAPER LEFT MEDIAN
CHORD
+74.634
35.000
(114.83')
60m TAPER
MEDIAN LT
11.250
(TYP.)
CAT-1
CROSS SLOPE HAS BEEN ROTATED
TOWARD RIGHT BUT CALCULATIONS
NEED TO BE MODIFIED.
132m TAPER RIGHT MEDIAN
-L- SC Sta. 12+90.044
-L- TS Sta. 12+00.044
MATCH LINE STA. 12+00.000 SEE SHEET 4
MATCH LINE STA. 15+00.000 SEE SHEET 6
2 @ 1050
2 @ 1350
EST. 13.6 TONS CL B
RIP RAP W/ 30.9 SM
FILTER FABRIC
2GI
TYPE B
FALSE SL
SEE DETAIL

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NOTE: FOR -L- PROFILE SEE SHEET 43-44

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5 0 10

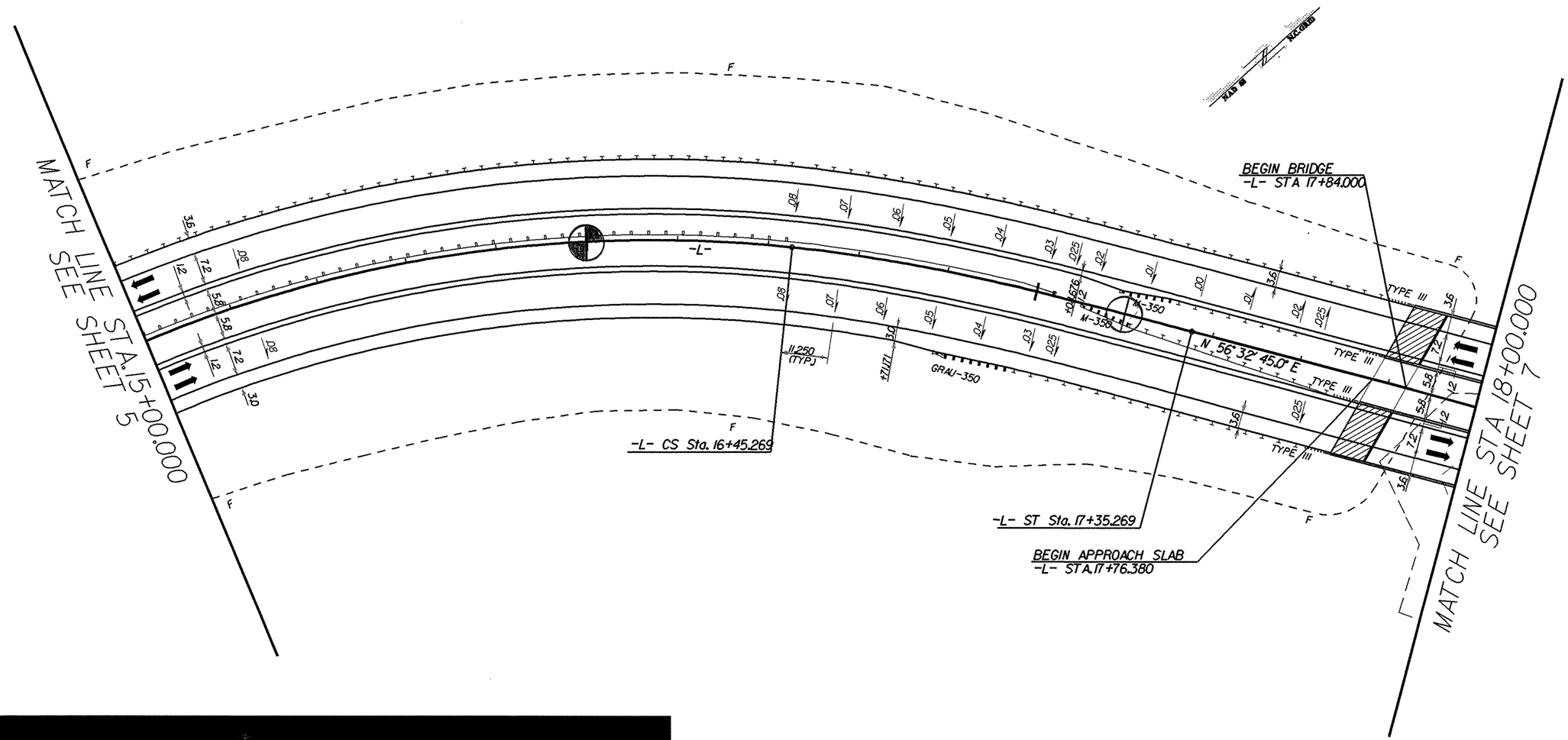
CONST. REV.
R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	6
R/W SHEET NO.	6
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

CURVE DATA -L-

PIs Sta 12+60.120	PI Sta 14+93.793	PIs Sta 16+75.338
Θs = 8° 53' 26.6"	Δ = 70° 10' 56.7" (RT)	Θs = 8° 53' 26.6"
Ls = 90.000	L = 355.225	Ls = 90.000
LT = 60.076	T = 203.749	LT = 60.076
ST = 30.069	R = 290.000	ST = 30.069
	SE = 8.0%	



[redacted]

NOTE: FOR -L- PROFILE SEE SHEET 44
FOR BRIDGE SKETCH, SEE SHEET 6

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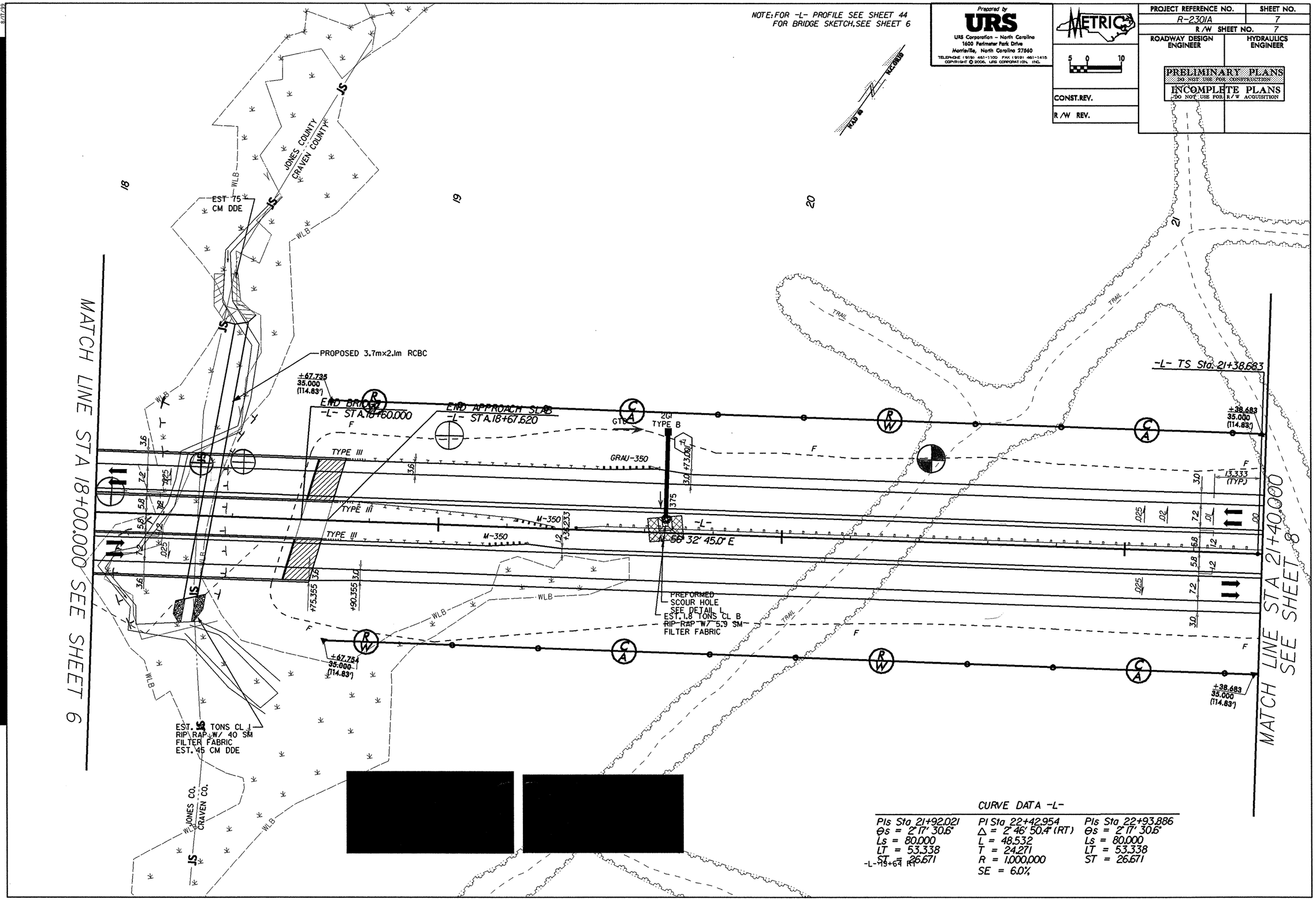
CONST. REV.

R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	7
R/W SHEET NO.	7
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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



CURVE DATA -L-

PIs Sta 21+92.021	PI Sta 22+42.954	PIs Sta 22+93.886
θs = 2°17' 30.6"	Δ = 2°46' 50.4" (RT)	θs = 2°17' 30.6"
Ls = 80.000	L = 48.532	Ls = 80.000
LT = 53.338	T = 24.271	LT = 53.338
ST = 26.671	R = 1,000.000	ST = 26.671
-L- 119+64 RT	SE = 6.0%	

8/17/99

NOTE: FOR -L- PROFILE SEE SHEET 44-45

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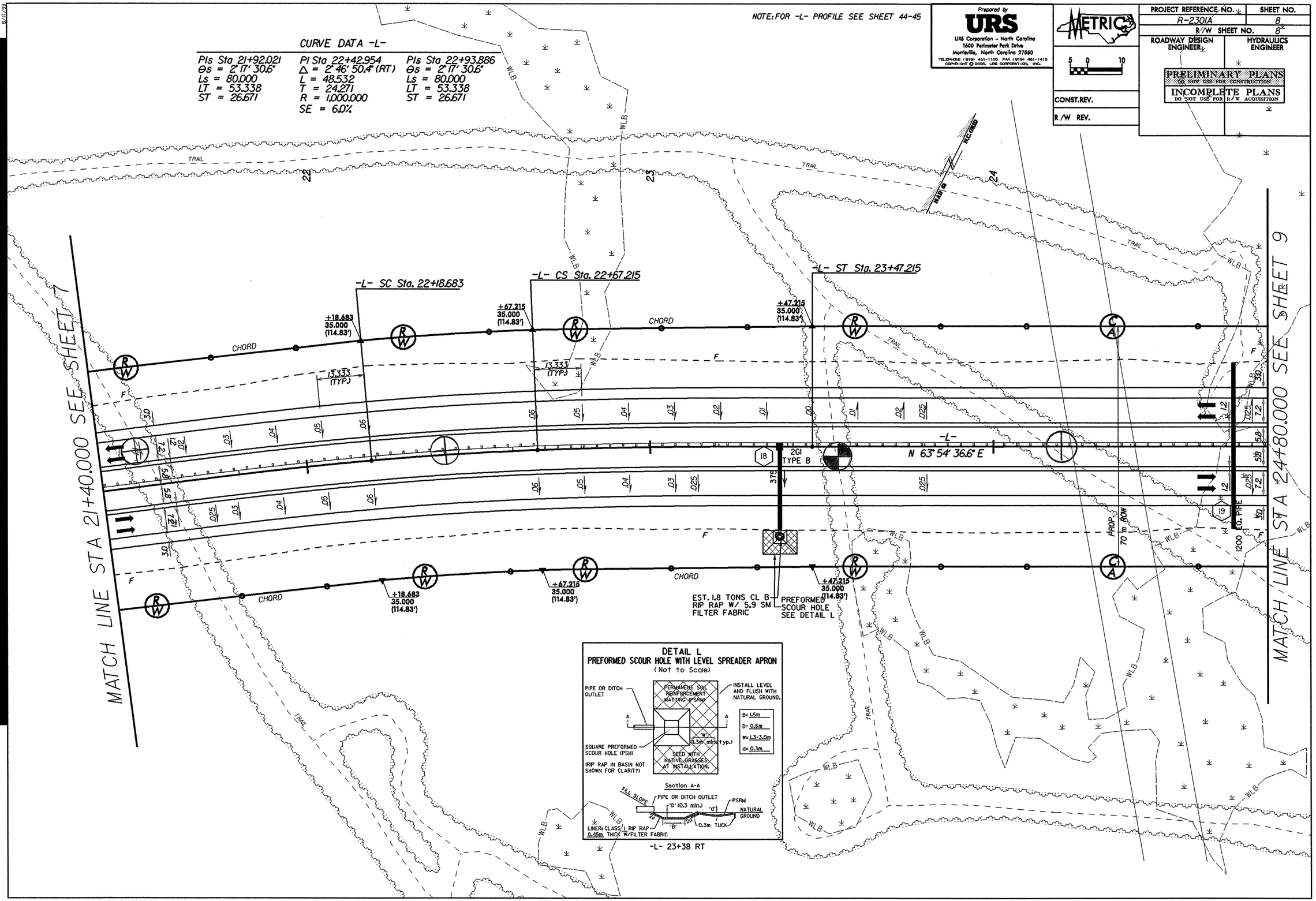
CONST. REV.
R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	8
R/W SHEET NO.	8
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

CURVE DATA -L-

PIs Sta 21+92.021	PI Sta 22+42.954	PIs Sta 22+93.886
Θs = 2° 17' 30.6"	Δ = 2° 46' 50.4" (RT)	Θs = 2° 17' 30.6"
Ls = 80.000	L = 48.532	Ls = 80.000
LT = 53.338	T = 24.271	LT = 53.338
ST = 26.671	R = 1,000.000	ST = 26.671
	SE = 6.0%	



8/17/99

NOTE: FOR -L- PROFILE SEE SHEETS 45

CURVE DATA -L-	
PIs Sta 26+89.162	PI Sta 30+56.607
Θs = 2° 34' 41.9"	Δ = 37° 17' 38.6" (LT)
Ls = 90.000	L = 650.904
LT = 60.006	T = 337.451
ST = 30.006	R = 1,000.000
	SE = 5.9%

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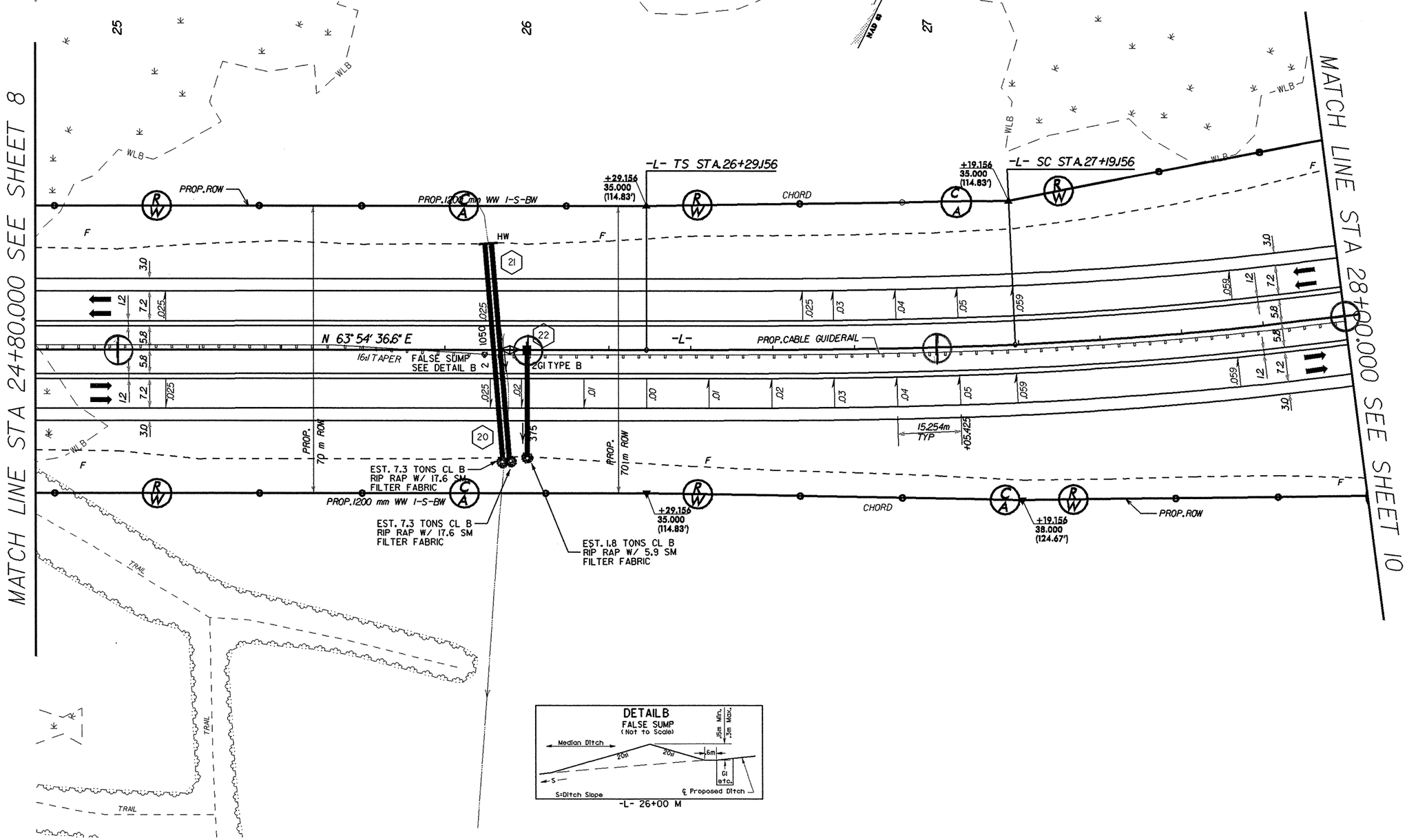
CONST. REV.

R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	9
R/W SHEET NO.	9
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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METRIC 5 0 10

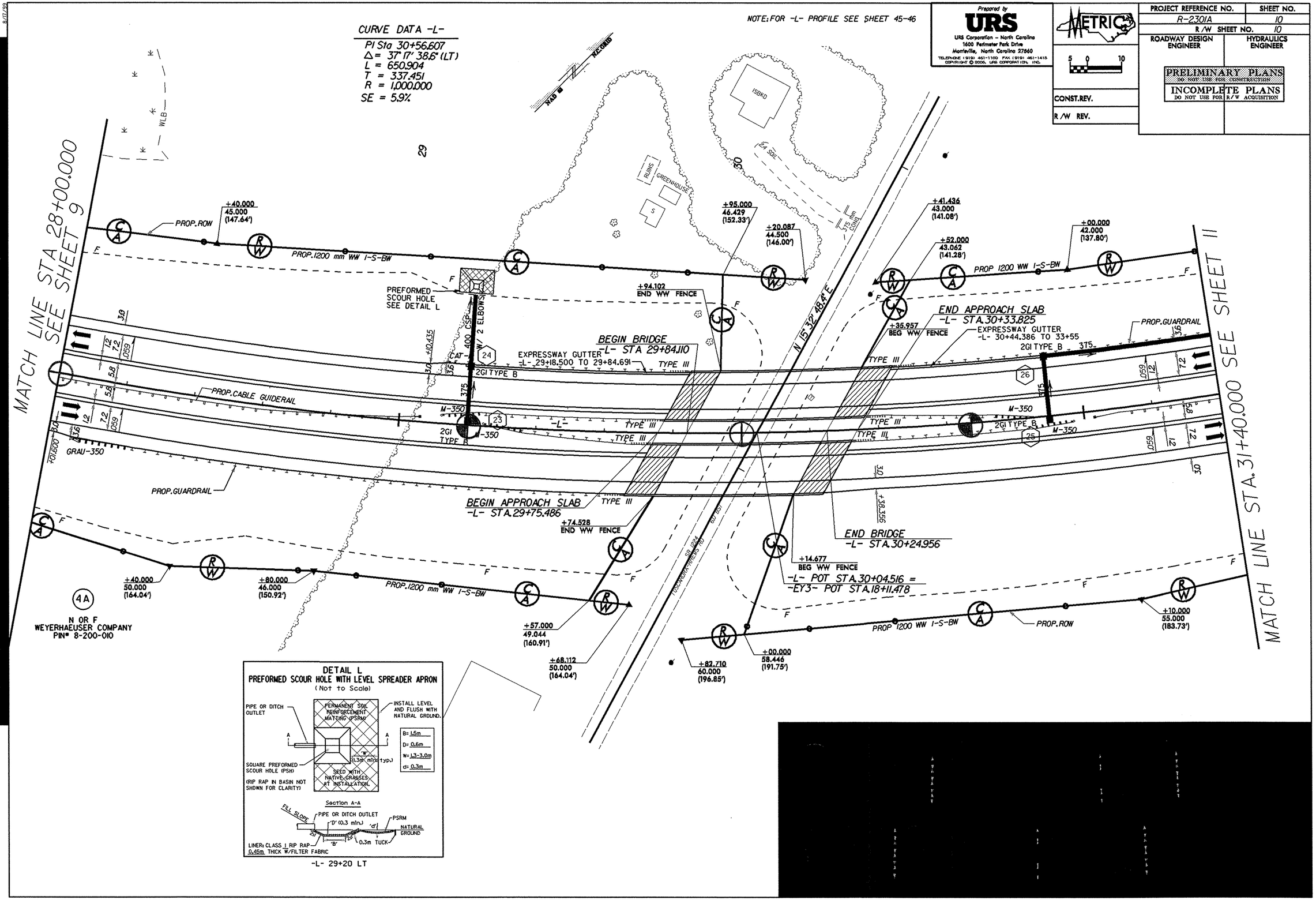
PROJECT REFERENCE NO.	SHEET NO.
R-2301A	10
R/W SHEET NO.	10
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

CONST.REV.
R/W REV.

NOTE: FOR -L- PROFILE SEE SHEET 45-46

CURVE DATA -L-
PI Sta 30+56.607
Δ = 37° 17' 38.6" (LT)
L = 650.904
T = 337.451
R = 1,000.000
SE = 5.9%



DETAIL L
PREFORMED SCOUR HOLE WITH LEVEL SPREADER APRON
(Not to Scale)

-L- 29+20 LT

NOTE: FOR -L- PROFILE SEE SHEET 46

CURVE DATA -L-

PI Sta 30+56.607	PIs Sta 34+00.066
Δ = 37° 17' 38.6" (LT)	Θs = 2° 34' 41.9"
L = 650.904	Ls = 90.000
T = 337.451	LT = 60.006
R = 1,000.000	ST = 30.006
SE = 5.9%	

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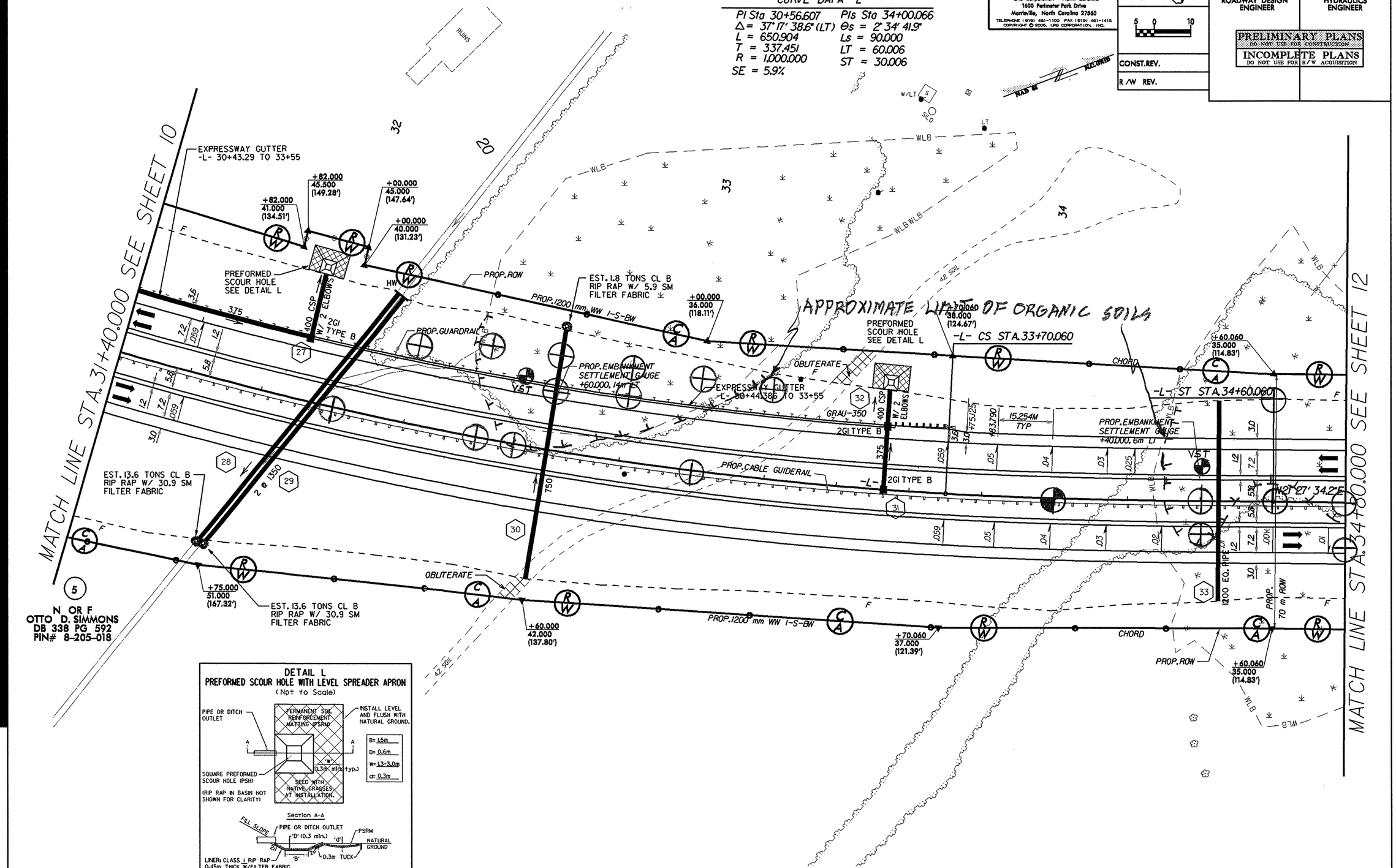
CONST. REV.

R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	11
R/W SHEET NO.	11
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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



8/17/99

CURVE DATA -L-

PIs Sta 38+55.747
Θs = 1° 20' 12.8"
Ls = 70.000
LT = 46.668
ST = 23.335
SE = 4.1%

NOTE: FOR -L- PROFILE SEE SHEETS 46-47

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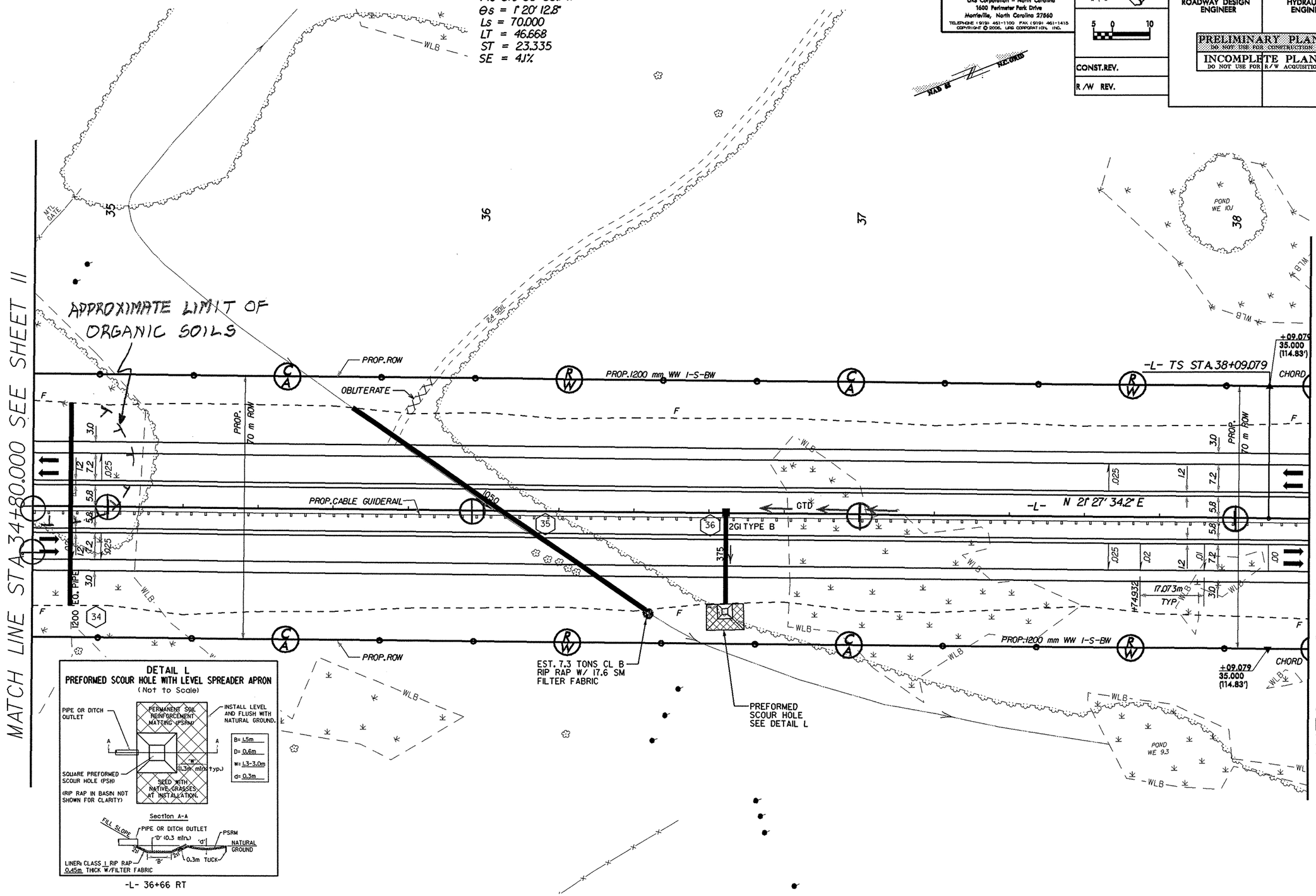
CONST. REV.

R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	12
R/W SHEET NO.	12
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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NOTE: FOR -L- PROFILE SEE SHEET 47

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CONST.REV.
R/W REV.

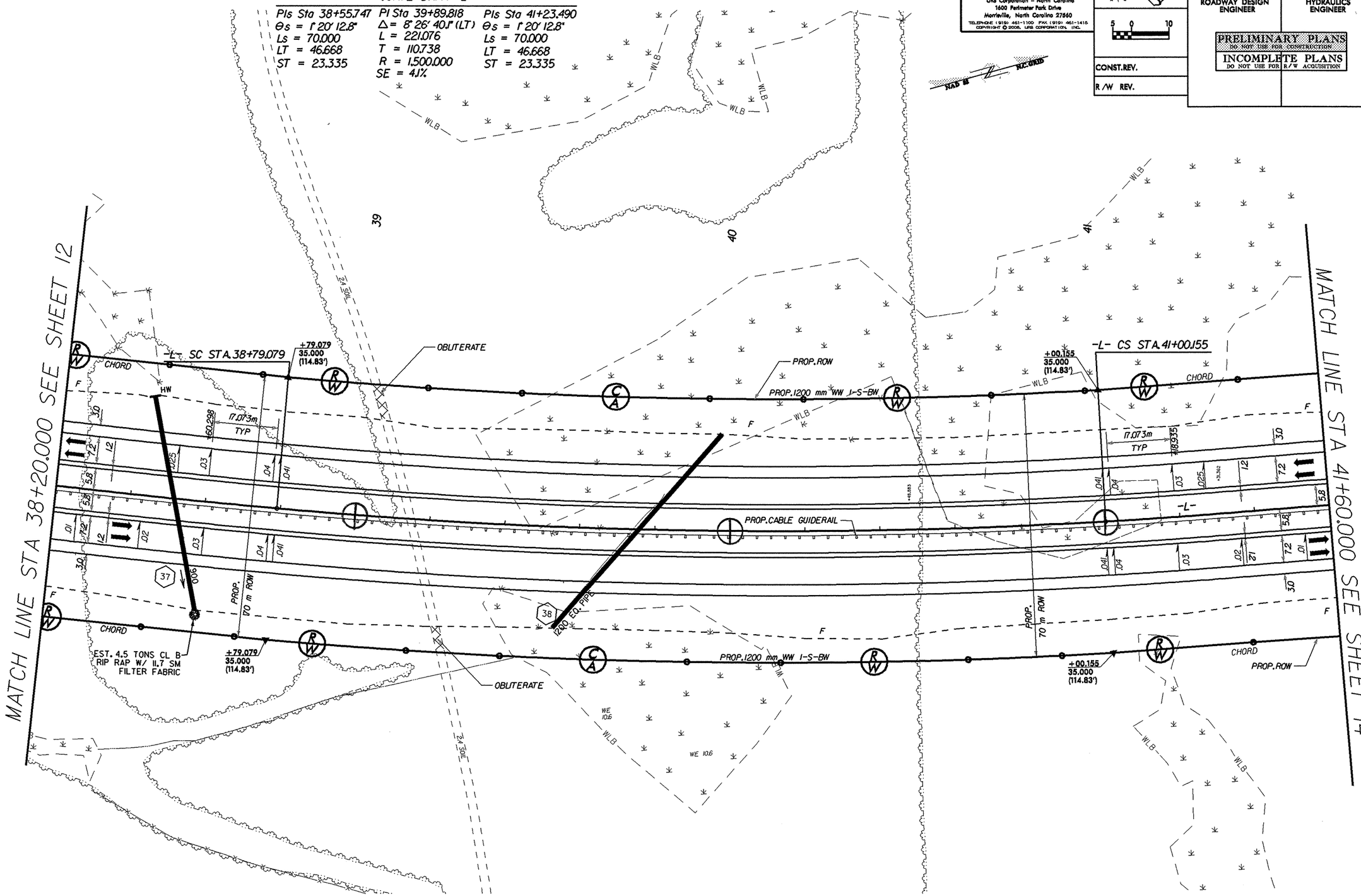
PROJECT REFERENCE NO.	SHEET NO.
R-2301A	13
R/W SHEET NO.	13
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

NAD 83 N.C. GRID

CURVE DATA -L-

PIs Sta 38+55.747	PI Sta 39+89.818	PIs Sta 41+23.490
θs = 1° 20' 12.8"	Δ = 8° 26' 40.1" (LT)	θs = 1° 20' 12.8"
Ls = 70.000	L = 221.076	Ls = 70.000
LT = 46.668	T = 110.738	LT = 46.668
ST = 23.335	R = 1,500.000	ST = 23.335
	SE = 4.1%	



NOTE: FOR -L- PROFILE SEE SHEETS 46-47

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CONST. REV.

R/W REV.

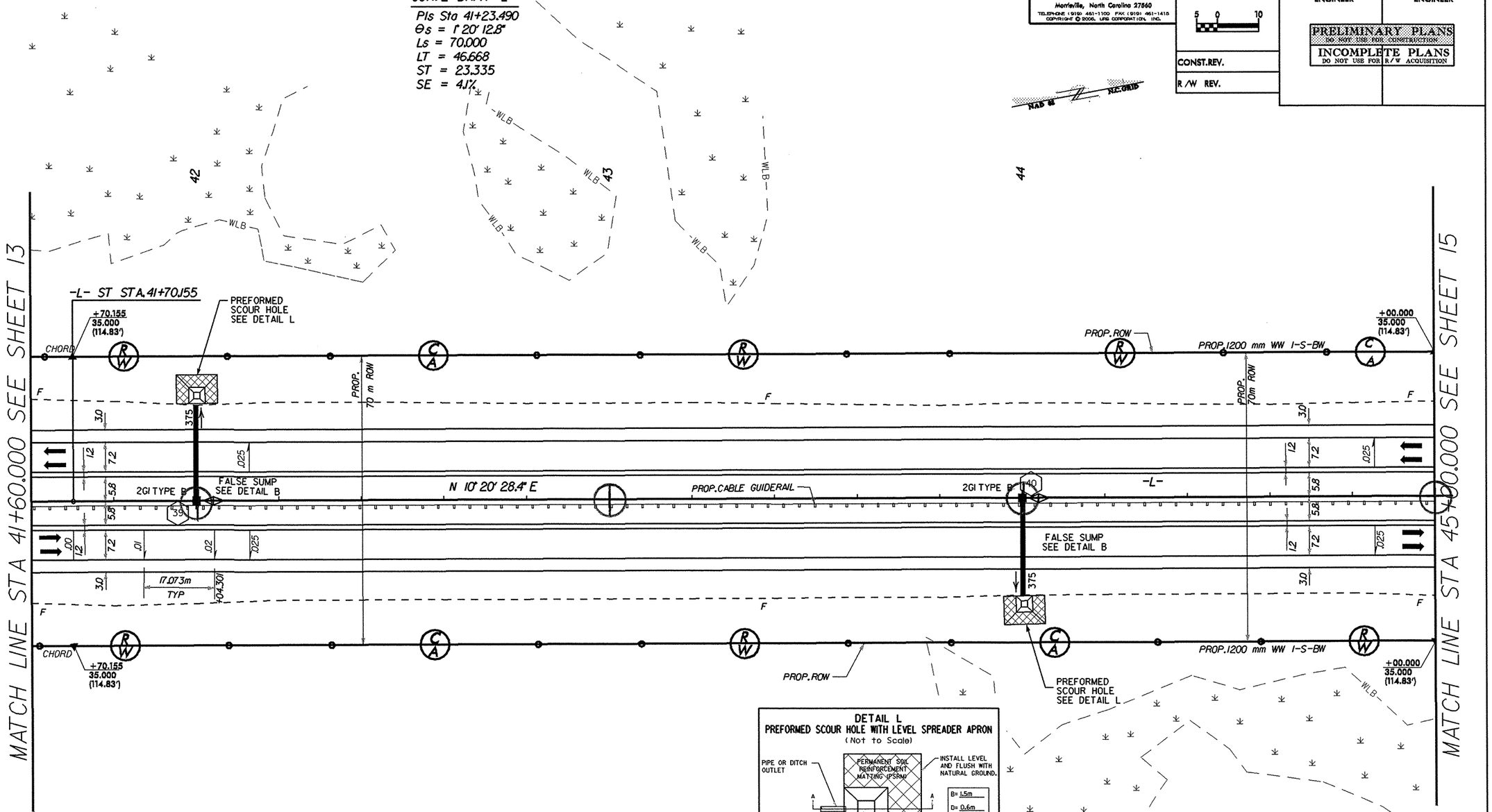
PROJECT REFERENCE NO.	SHEET NO.
R-2301A	14
R/W SHEET NO.	14
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

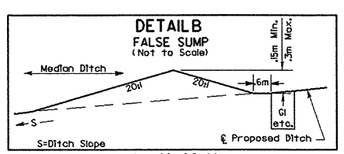
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

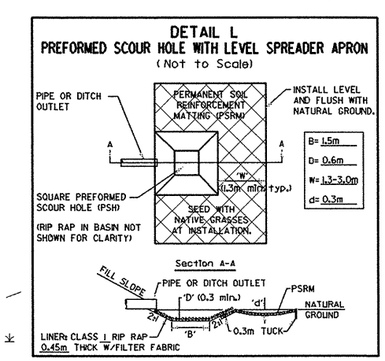
NAD 83 N.C. GRID

CURVE DATA -L-
Pls Sta 41+23.490
Θs = 1° 20' 12.8"
Ls = 70.000
LT = 46.668
ST = 23.335
SE = 4.1%





-L- 42+00 M
-L- 44+00 M



-L- 42+00 LT
-L- 44+00 RT

NOTE: FOR -L- PROFILE SEE SHEET 48

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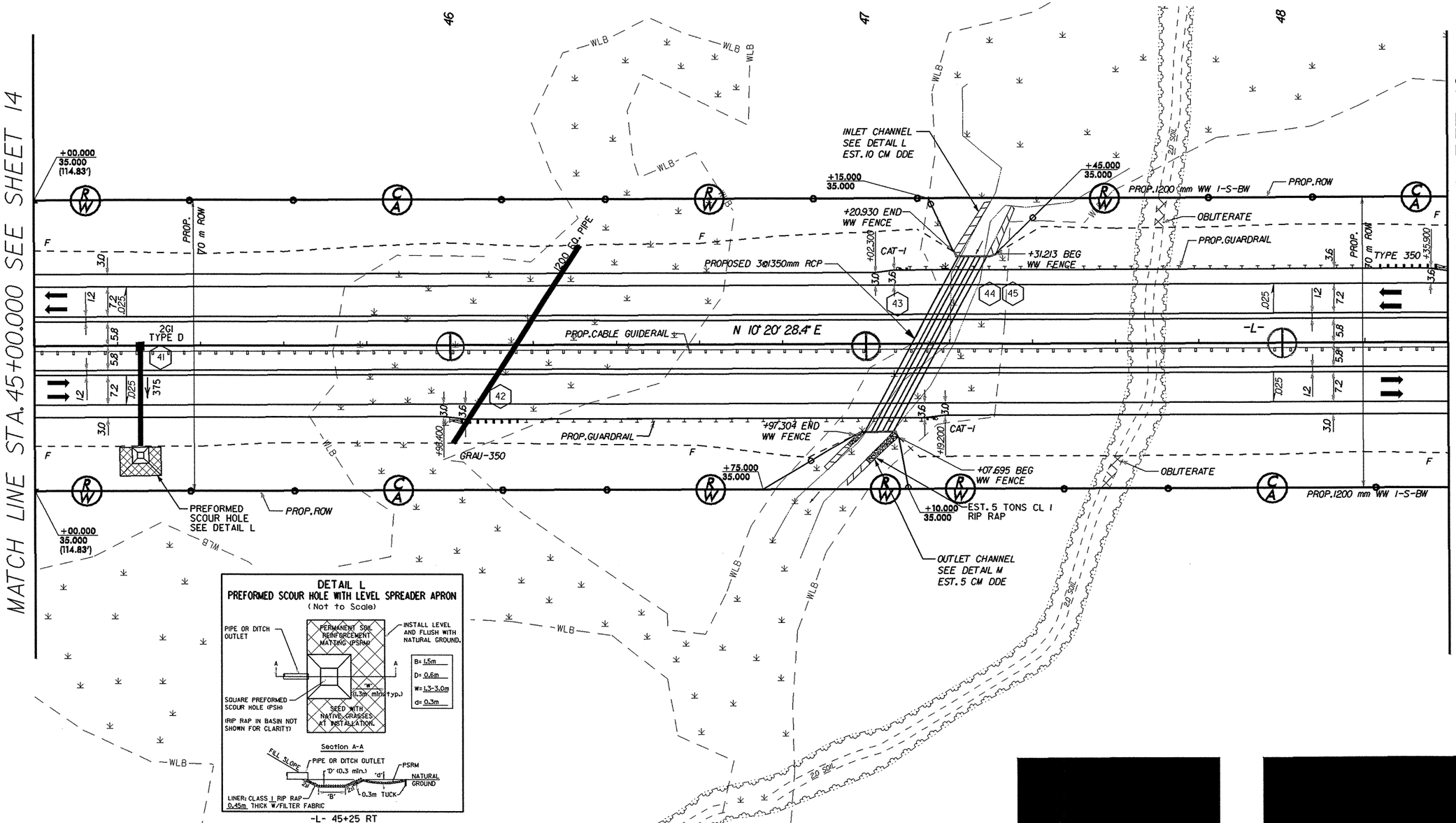
CONST. REV.
R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	15
R/W SHEET NO.	15
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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CONST.REV.
R/W REV.

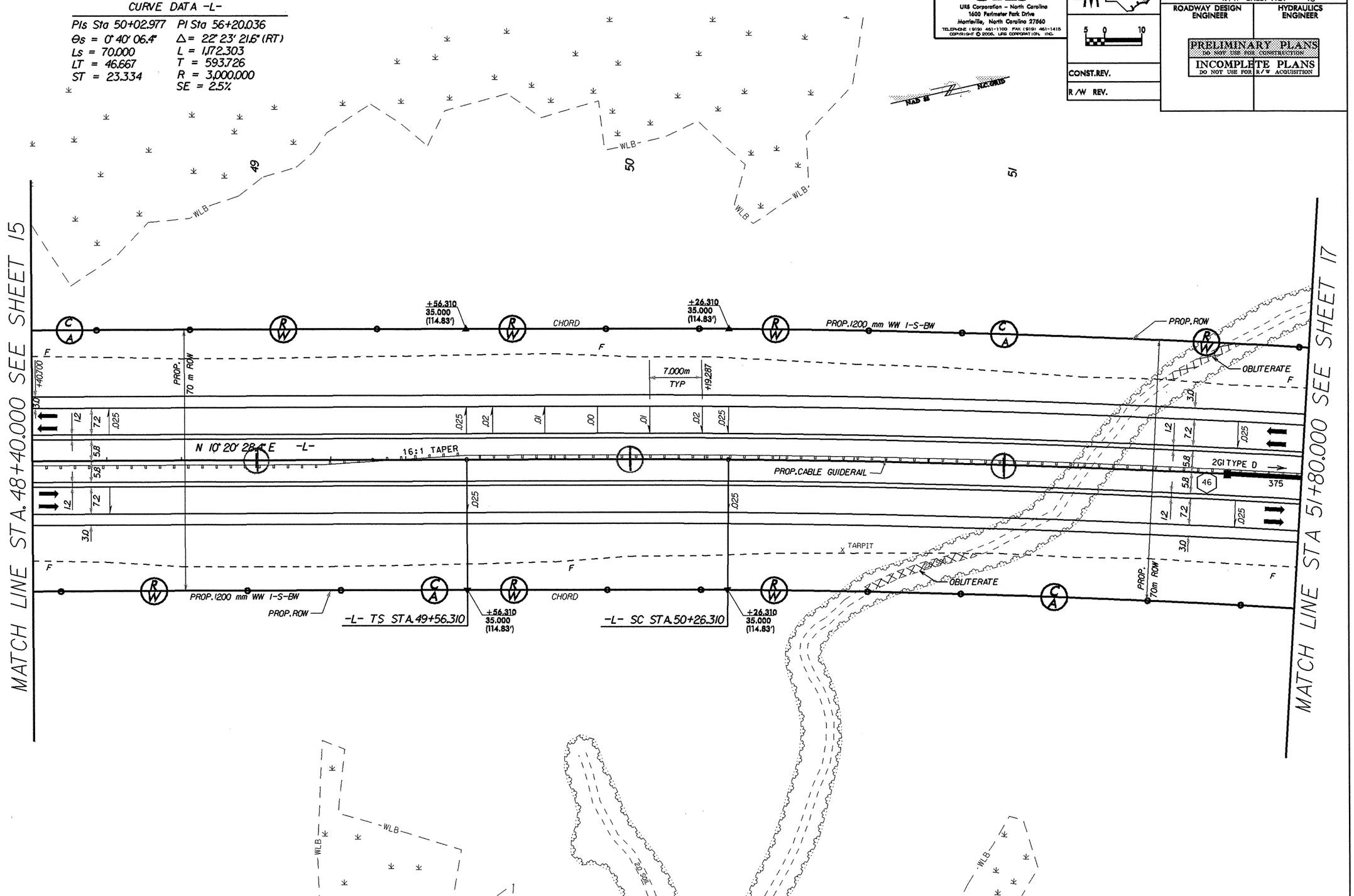
PROJECT REFERENCE NO.	SHEET NO.
R-2301A	16
R/W SHEET NO.	16
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

NOTE: FOR -L- PROFILE SEE SHEETS 48-49

CURVE DATA -L-

PIs Sta 50+02.977	PI Sta 56+20.036
θs = 0° 40' 06.4"	Δ = 22° 23' 21.6" (RT)
Ls = 70.000	L = 1,172.303
LT = 46.667	T = 593.726
ST = 23.334	R = 3,000.000
	SE = 2.5%



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NOTE: FOR -L- PROFILE SEE SHEETS 49

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CONST. REV.

R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	17
R/W SHEET NO.	17
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

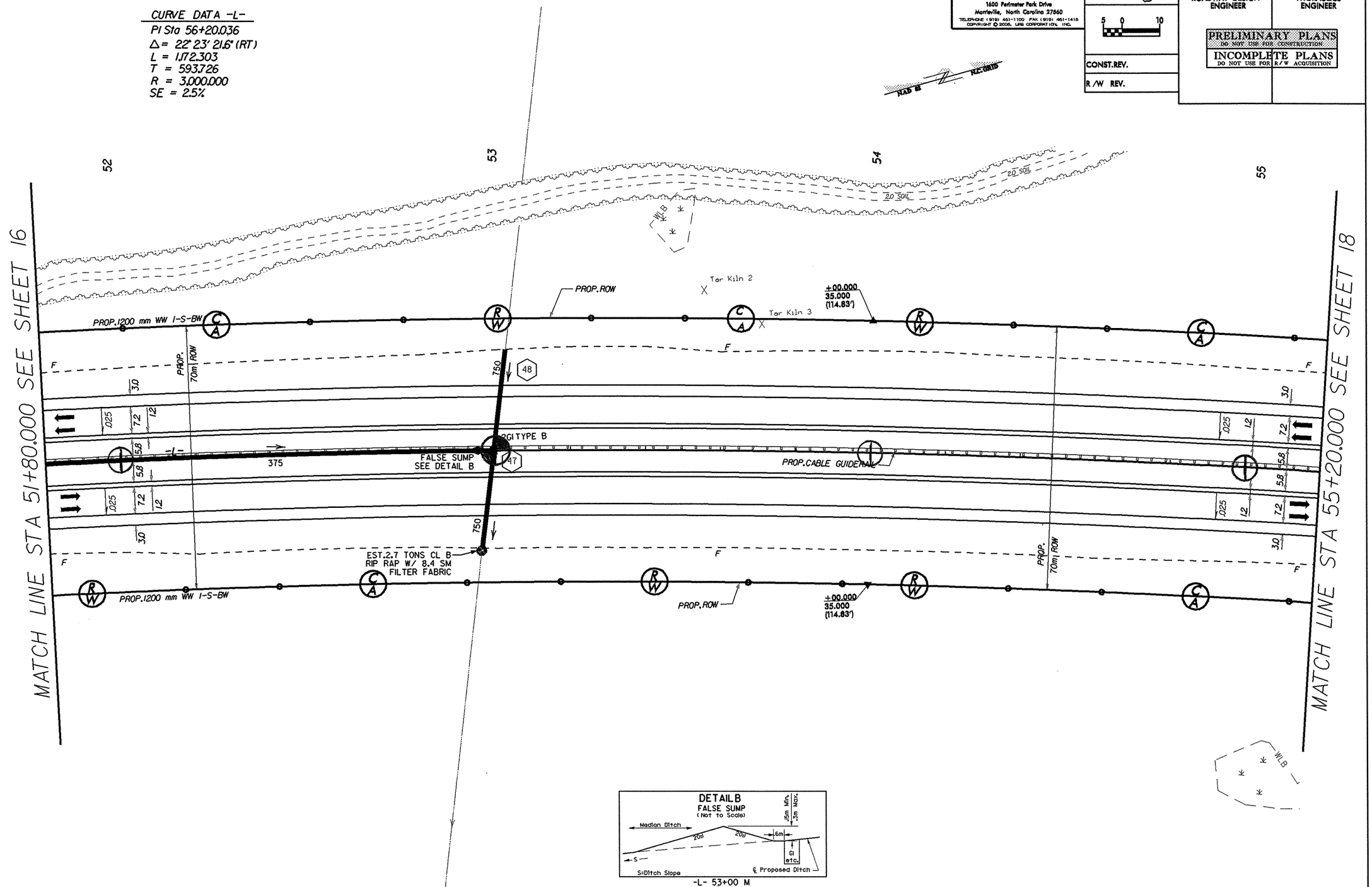
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

CURVE DATA -L-

PI Sta 56+20.036
Δ = 22° 23' 21.6" (RT)
L = 1,172.303
T = 593.726
R = 3,000.000
SE = 2.5%

NAD 83 N.C. GRID



NOTE: FOR -L- PROFILE SEE SHEET 49-50

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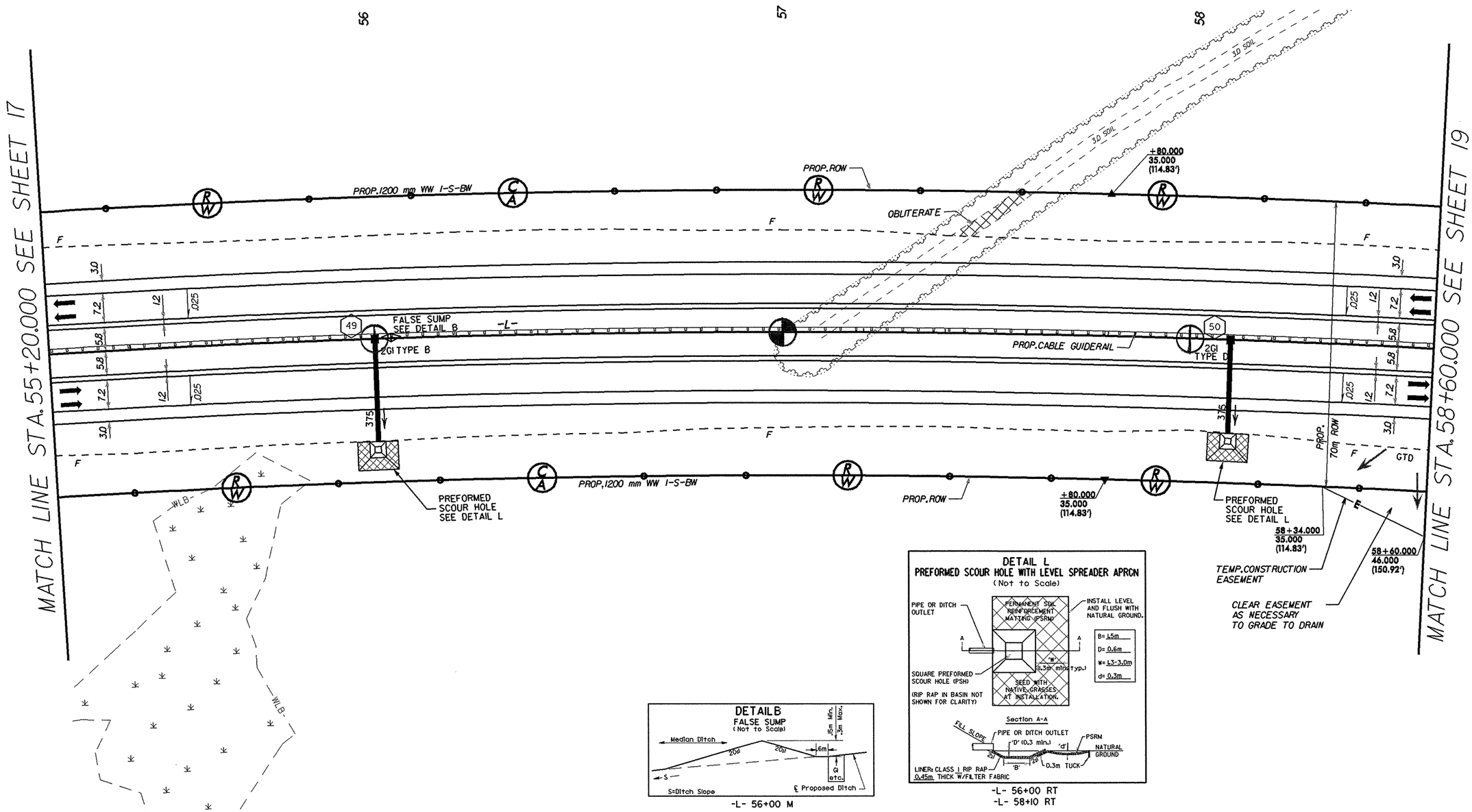
CONST. REV.
R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	18
R/W SHEET NO.	18
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

CURVE DATA -L-
PI Sta 56+20.036
Δ = 22° 23' 21.6" (RT)
L = 1,172.303
T = 593.726
R = 3,000.000
SE = 2.5%

NAD 83 N.C. GRID



-L- 56+00 M

-L- 56+00 RT
-L- 58+10 RT

NOTE: FOR -L- PROFILE SEE SHEET 50

CURVE DATA -L-	
PI Sta 56+20.036	PIs Sta 62+21.946
Δ = 22° 23' 21.6" (RT)	θs = 0° 40' 06.4"
L = 1,172.303	Ls = 70.000
T = 593.726	LT = 46.667
R = 3,000.000	ST = 23.334
SE = 2.5%	

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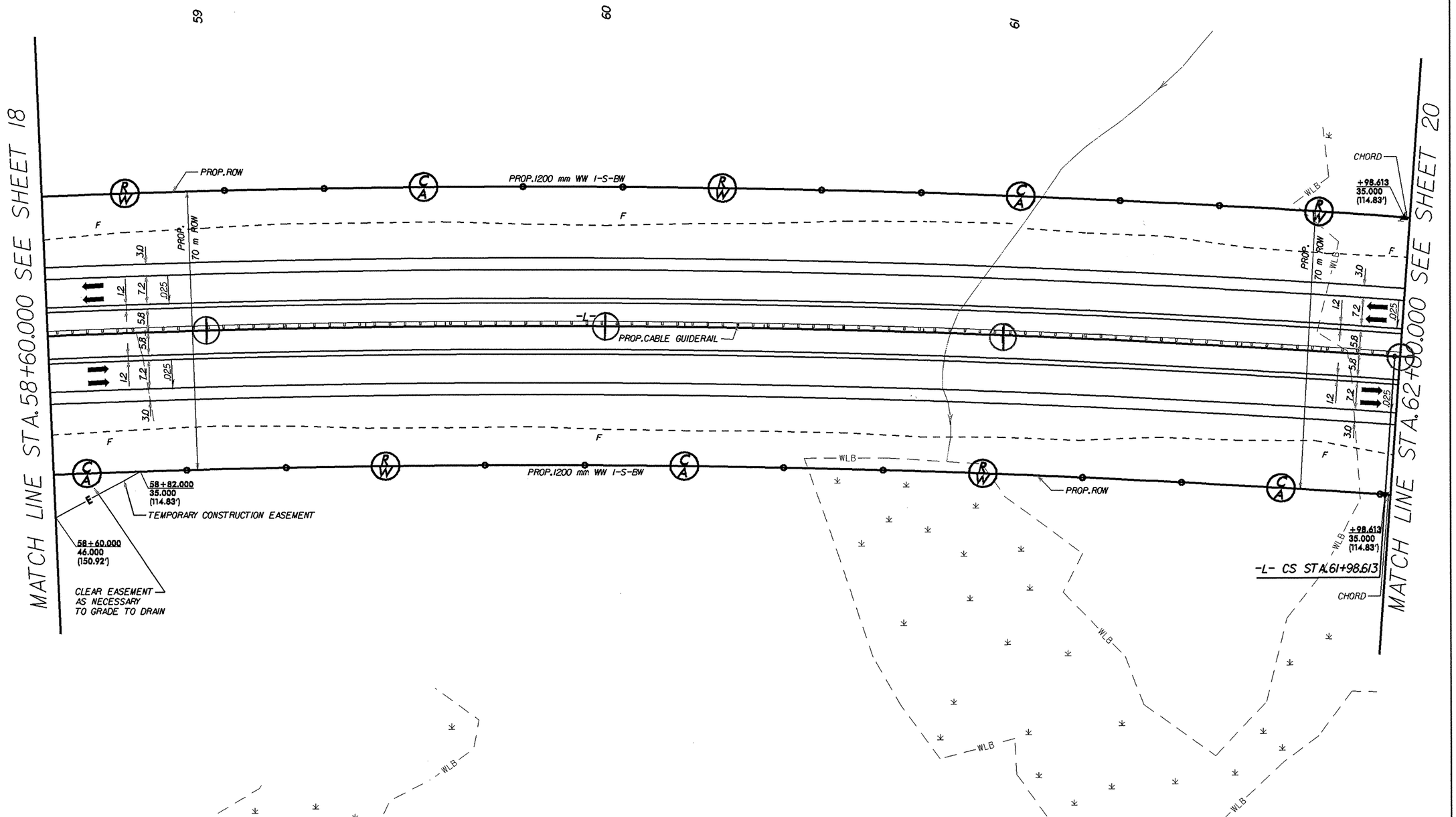
CONST. REV.

R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	19
R/W SHEET NO.	19
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



8/17/99

NOTE: FOR -L- PROFILE SEE SHEETS 50-51

CURVE DATA -L-
PIs Sta 62+21.946
Θs = 0° 40' 06.4"
Ls = 70.000
LT = 46.667
ST = 23.334
SE = 2.5%

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METRIC
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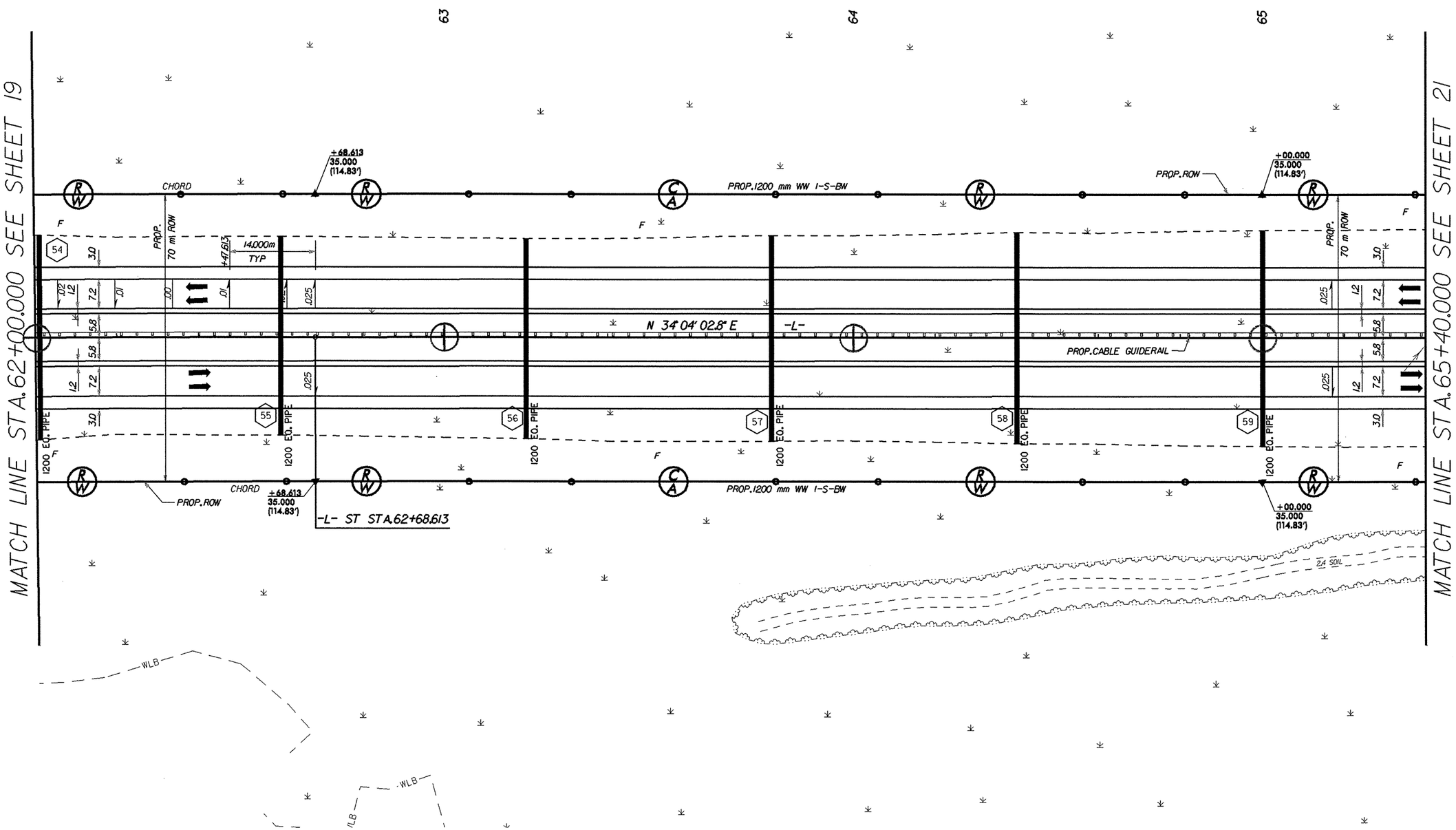
CONST.REV.
R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	20
R/W SHEET NO.	20
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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NOTE: FOR -L- PROFILE SEE SHEET 51

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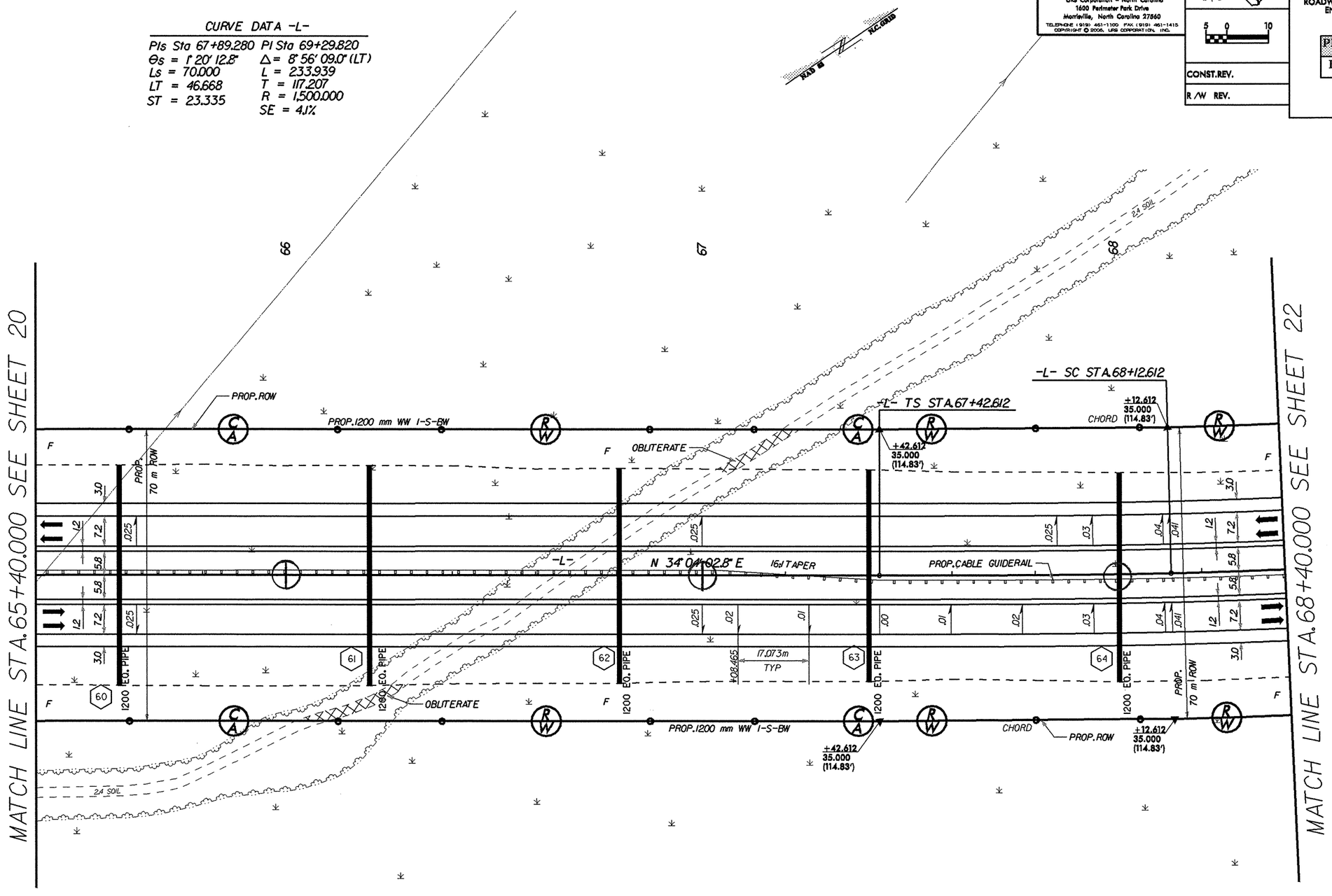
CONST. REV.
R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	21
R/W SHEET NO.	21
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

CURVE DATA -L-

PIs Sta 67+89.280 PI Sta 69+29.820
Θs = 1° 20' 12.8" Δ = 8° 56' 09.0" (LT)
Ls = 70.000 L = 233.939
LT = 46.668 T = 117.207
ST = 23.335 R = 1,500.000
SE = 4.1%



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NOTE: FOR -L- PROFILE SEE SHEET 51-52
FOR -DRI- PROFILE SEE SHEET 74

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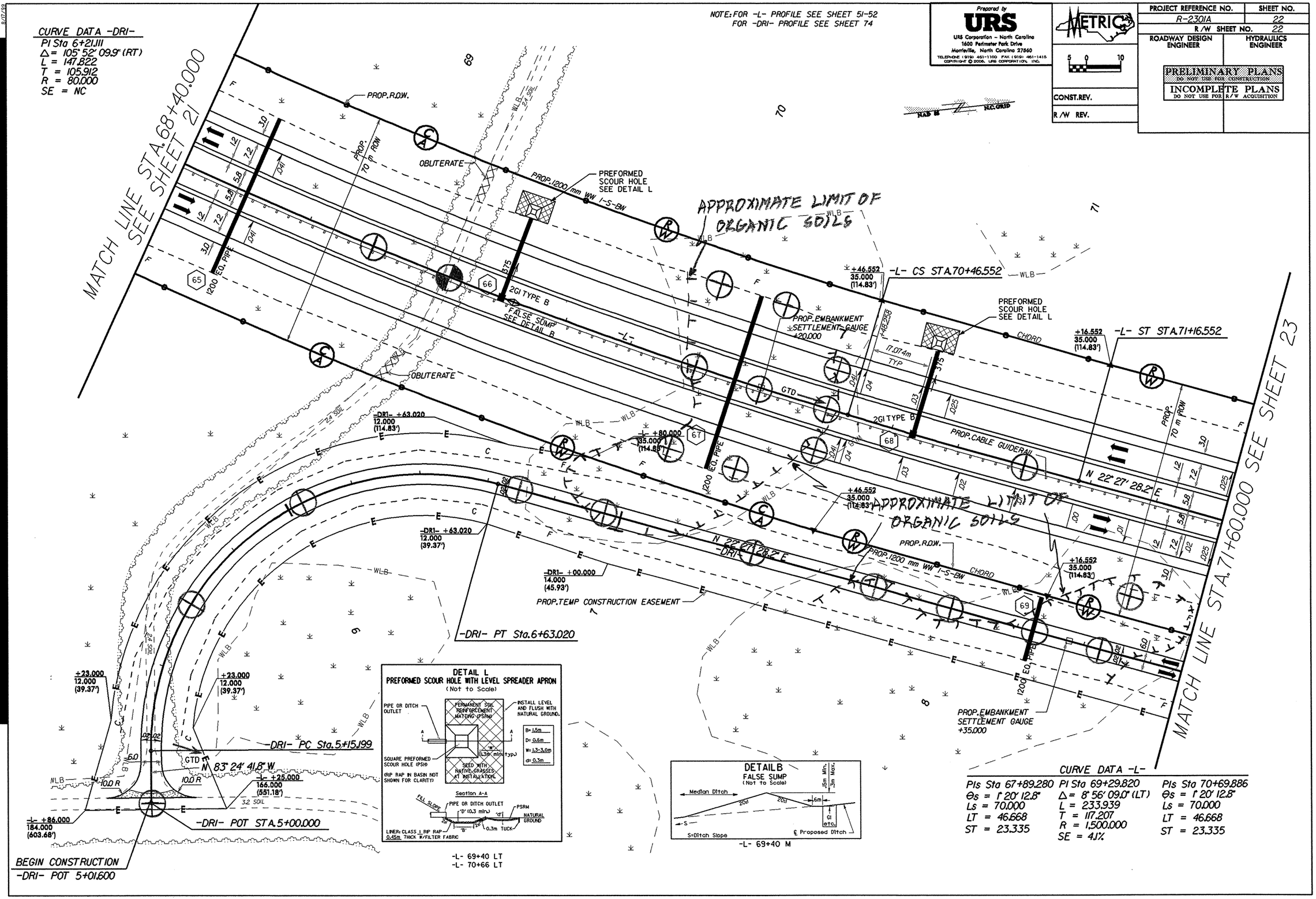
METRIC 5 0 10

CONST. REV.

R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	22
R/W SHEET NO.	22
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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



DETAIL L
PREFORMED SCOUR HOLE WITH LEVEL SPREADER APRON
(Not to Scale)

-L- 69+40 LT
-L- 70+66 LT

DETAIL B
FALSE SUMP
(Not to Scale)

-L- 69+40 M

CURVE DATA -L-

PIs Sta 67+89.280	PI Sta 69+29.820	PIs Sta 70+69.886
θs = 1° 20' 12.8"	Δ = 8° 56' 09.0" (LT)	θs = 1° 20' 12.8"
Ls = 70.000	L = 233.939	Ls = 70.000
LT = 46.668	T = 117.207	LT = 46.668
ST = 23.335	R = 1,500.000	ST = 23.335
	SE = 4.1%	

NOTE: FOR -L- PROFILE SEE SHEET 52
FOR -DRI- PROFILE SEE SHEET 74

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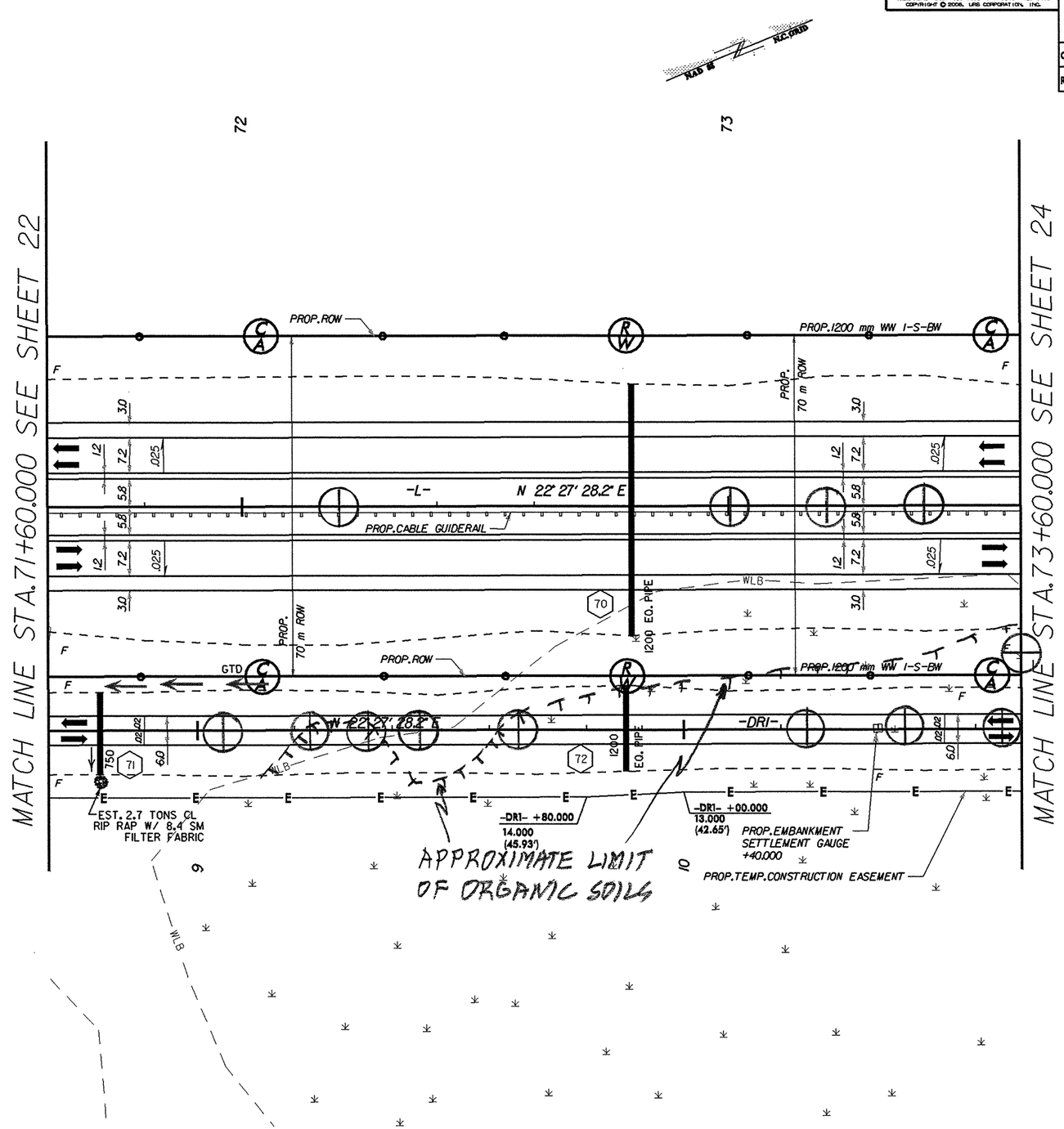
METRIC
5 0 10

CONST.REV.
R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	23
R/W SHEET NO.	23
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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



NOTE: FOR -L- PROFILE SEE SHEET 52
FOR -DRI- PROFILE SEE SHEET 74

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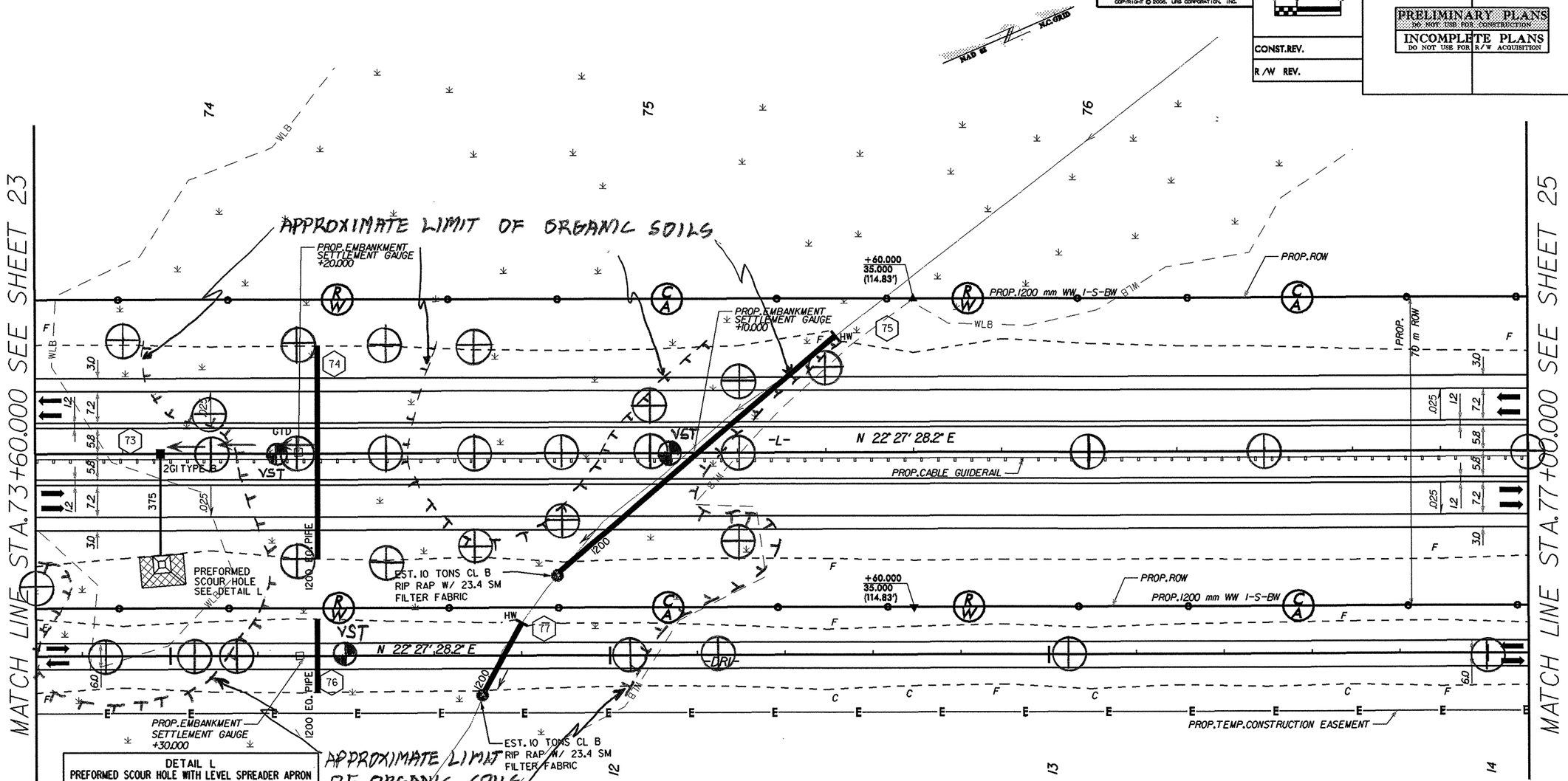
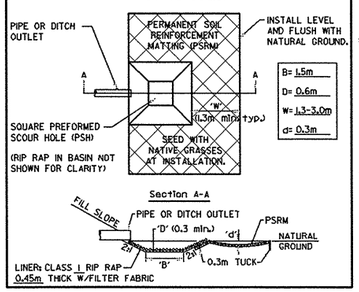
CONST.REV.
R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	24
R/W SHEET NO.	24
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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



DETAIL L
PREFORMED SCOUR HOLE WITH LEVEL SPREADER APRON
(Not to Scale)



-L- 73+88 RT

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NOTE: FOR -L- PROFILE SEE SHEETS 52-53
FOR -DRI- PROFILE SEE SHEET 74

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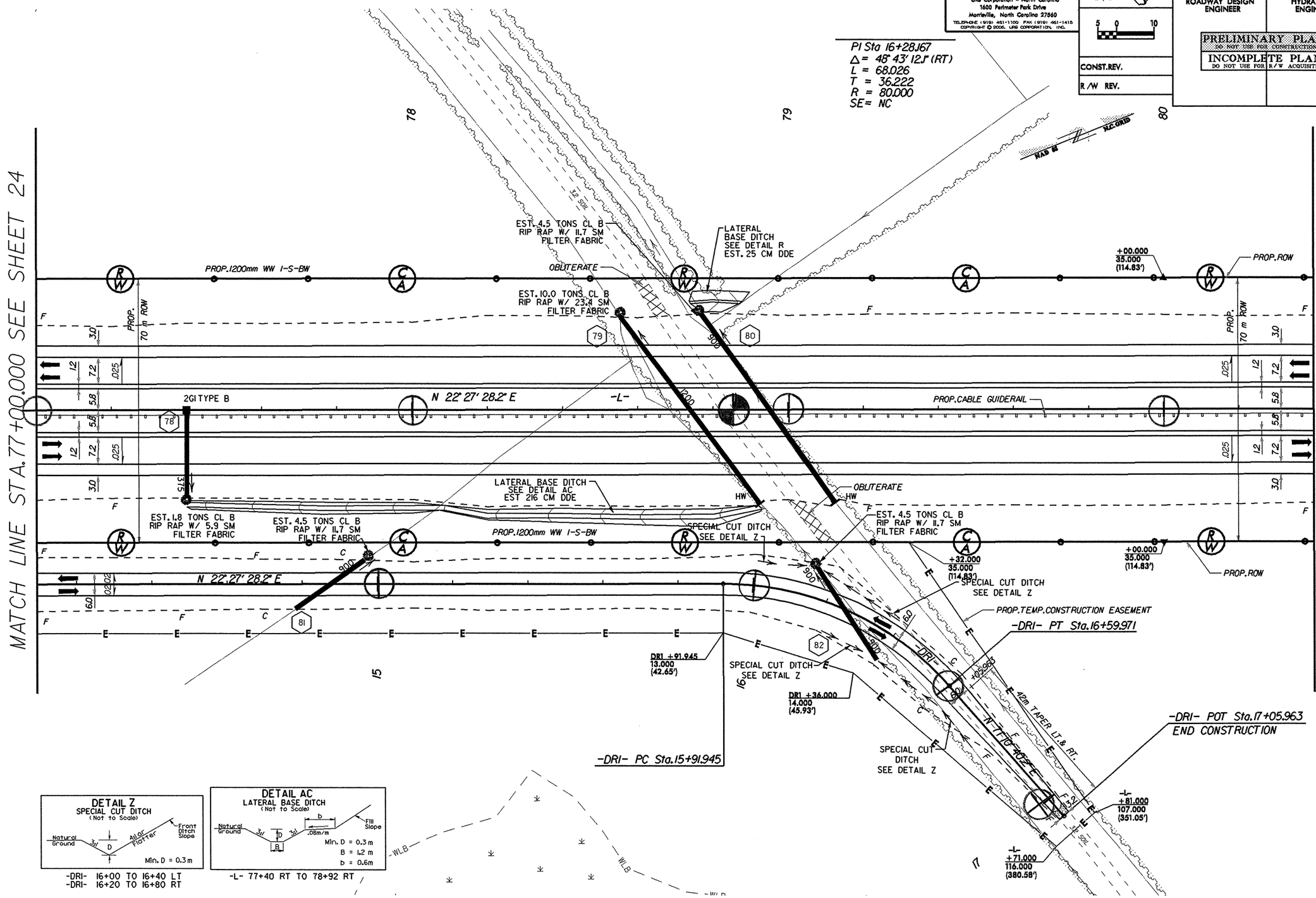
CONST. REV.

R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	25
R/W SHEET NO.	25
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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NOTE: FOR -L- PROFILE SEE SHEETS 53

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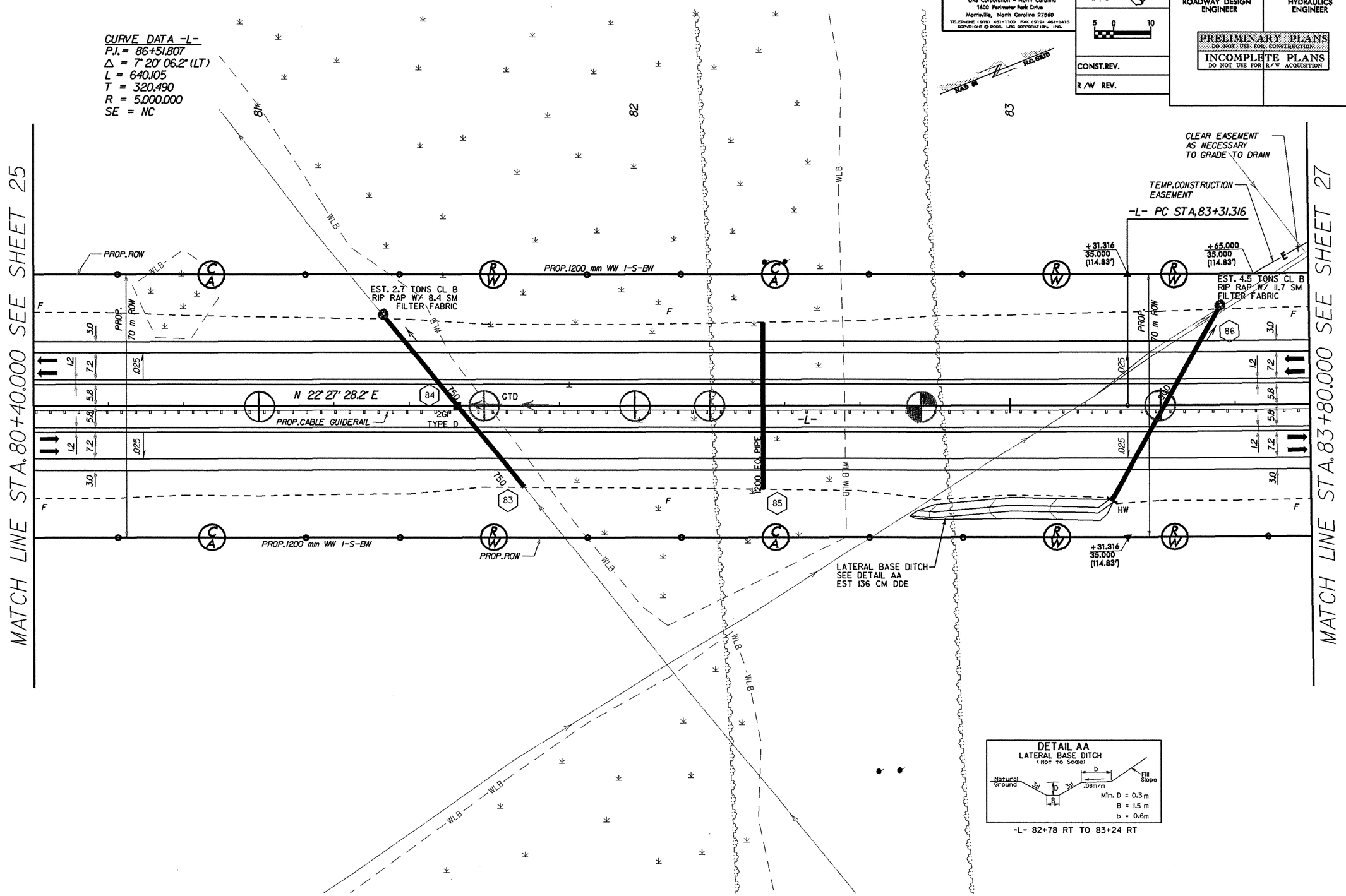
CONST. REV.

R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	26
R/W SHEET NO.	26
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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NOTE: FOR -L- PROFILE SEE SHEET 53-54

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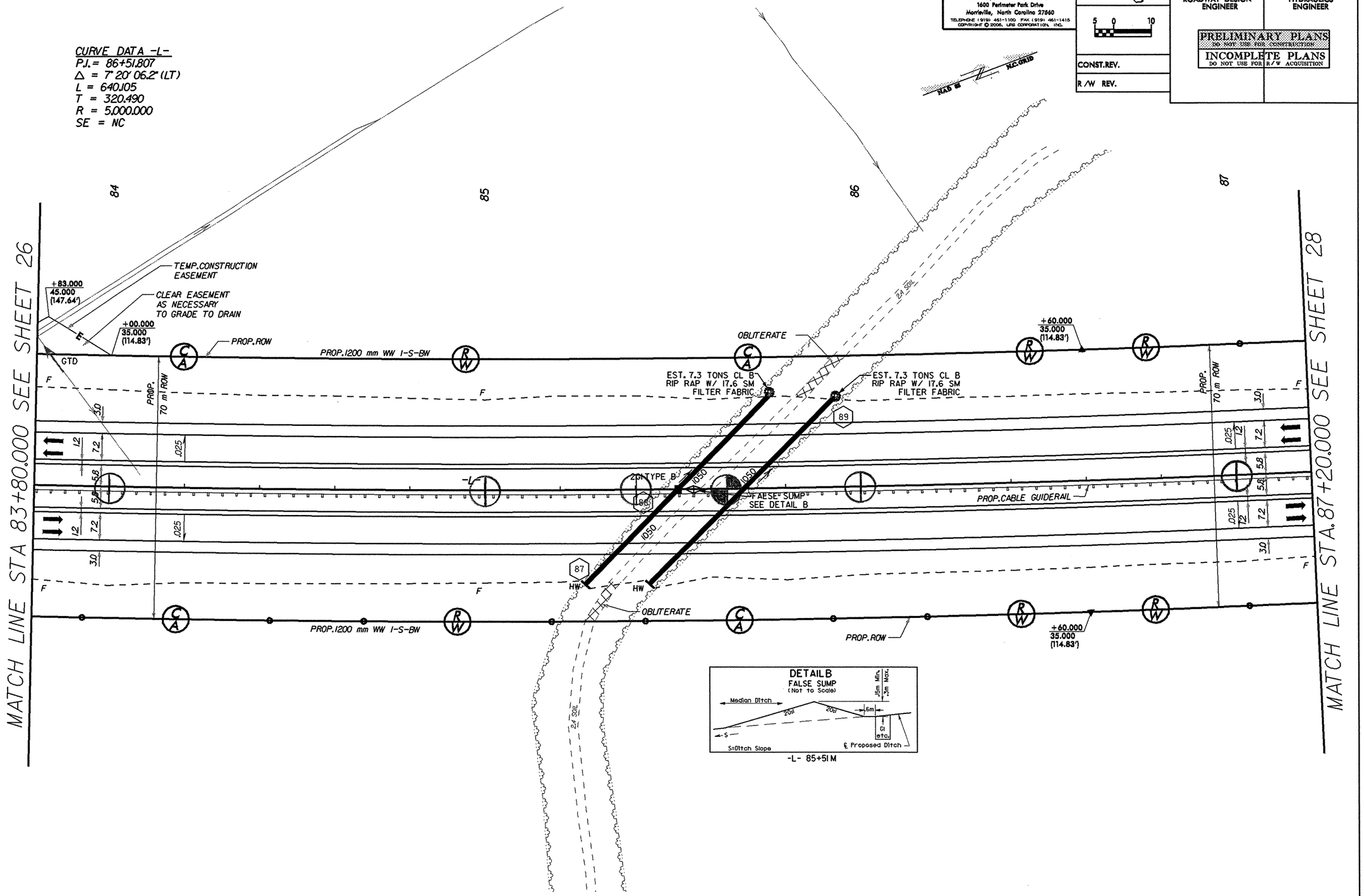
CONST. REV.
R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	27
R/W SHEET NO.	27
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

CURVE DATA -L-
P.I. = 86+51.807
Δ = 7° 20' 06.2" (LT)
L = 640.105
T = 320.490
R = 5,000.000
SE = NC



8/17/99

NOTE: FOR -L- PROFILE SEE SHEETS 54
FOR -RPC- PROFILE SEE SHEETS 65-66

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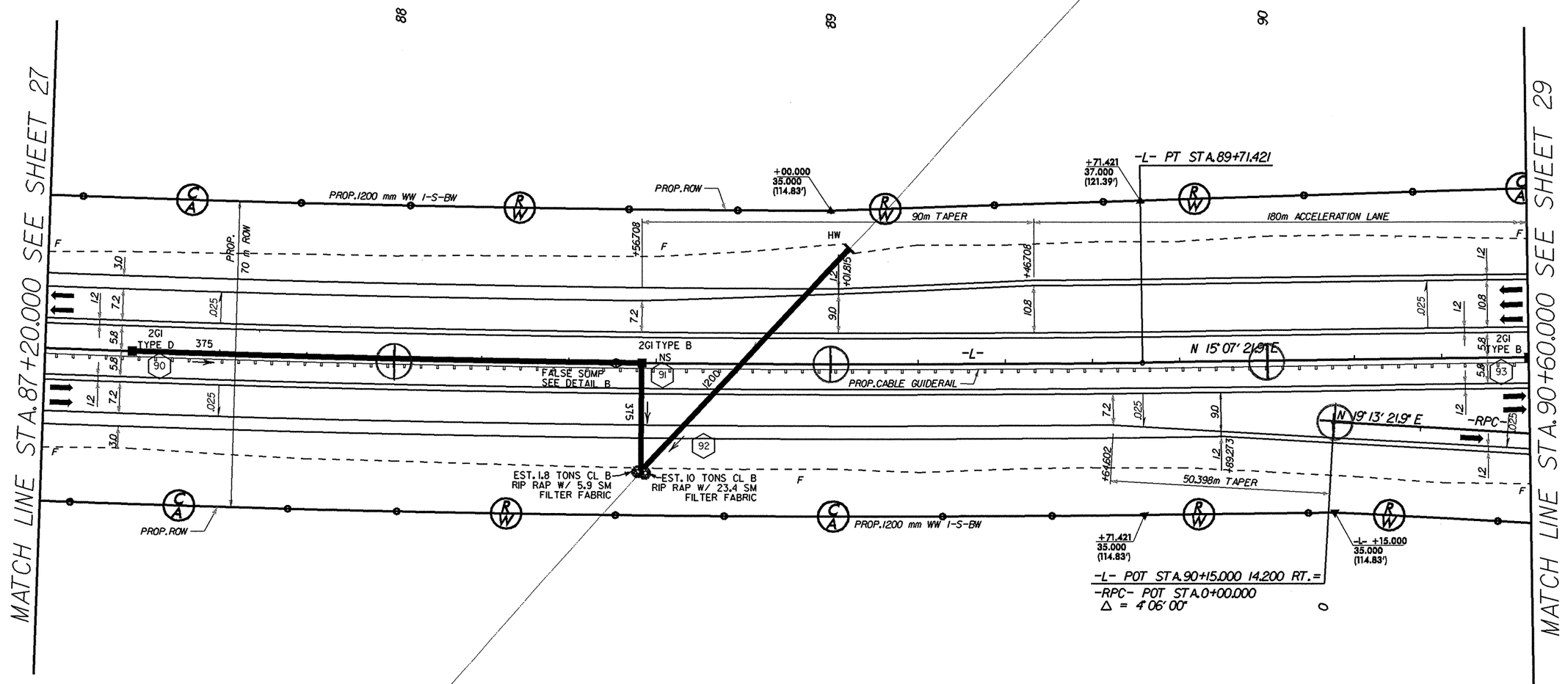
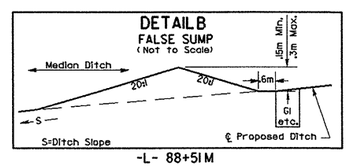
CONST. REV.
R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	28
R/W SHEET NO.	28
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

CURVE DATA -L-
P.I. = 86+51.807
Δ = 7° 20' 06.2" (LT)
L = 640.105
T = 320.490
R = 5,000.000
SE = NC





-L- 88+51 M

8/17/93

NOTE: FOR -L- PROFILE SEE SHEET 54-55
FOR -RPB- PROFILE SEE SHEET 63
FOR -RPC- PROFILE SEE SHEET 65-66

INTERCHANGE AND RIGHT-OF-WAY SET UP FOR FUTURE "POOR MAN'S" COLLECTOR-DISTRIBUTOR WITH OUTSIDE AUX. LANES ON US 17 BYPASS

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1600 Perimeter Park Drive
Morrisville, North Carolina 27560
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METRIC

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CONST.REV.

R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	29
R/W SHEET NO.	29
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

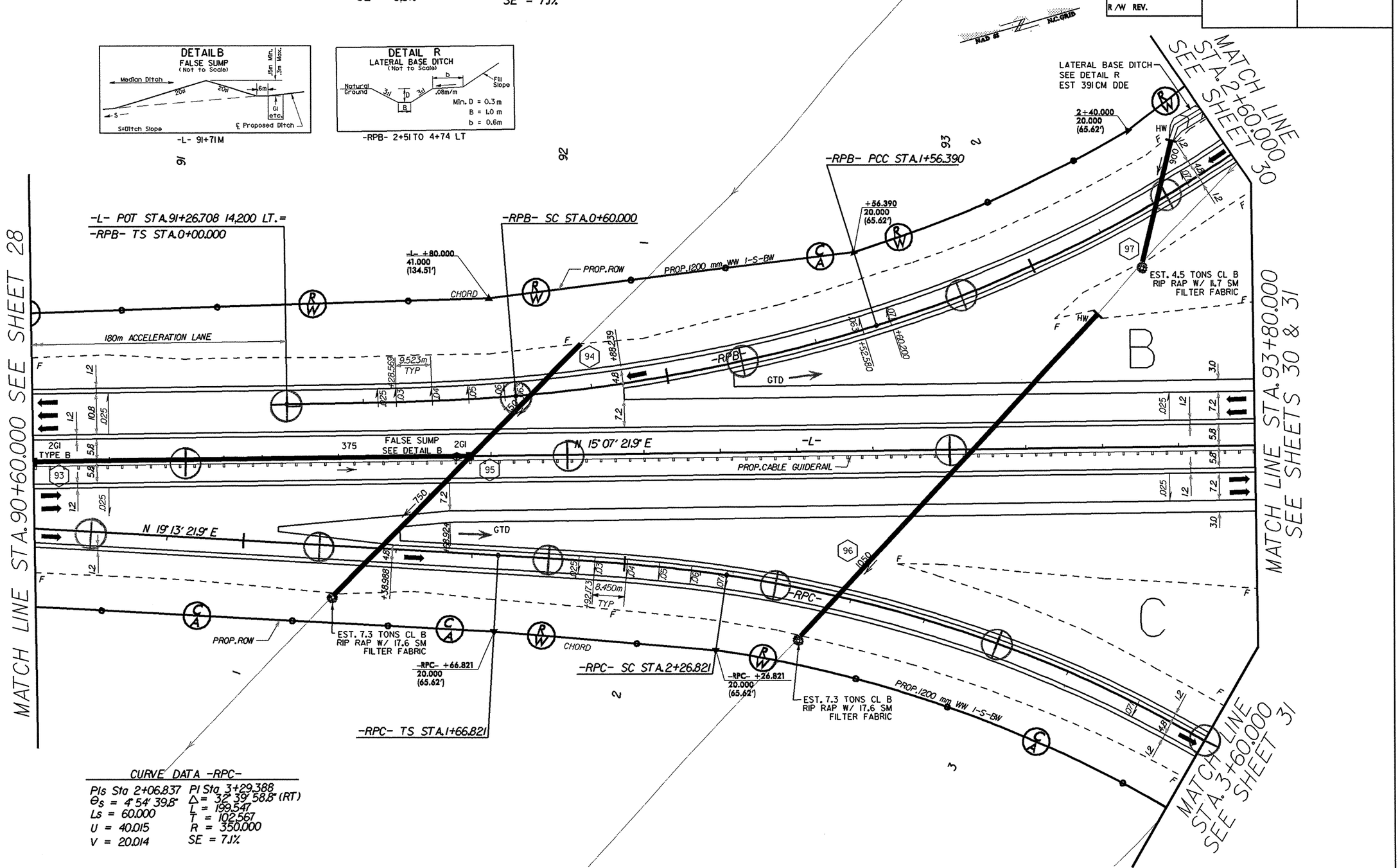
CURVE DATA -RPB-
PJ.S, Sta 0+40.010
θ_s = 3° 54' 23.5"
Ls = 60.000
LT = 40.010
ST = 20.009

CURVE DATA -RPB-
PI Sta 1+08.389
Δ = 12° 33' 06.1" (LT)
L = 96.390
T = 48.389
R = 440.000
SE = 6.3%

CURVE DATA -RPB-
PI Sta 2+22.033
Δ = 21° 14' 42.2" (LT)
L = 129.779
T = 65.643
R = 350.000
SE = 7.1%

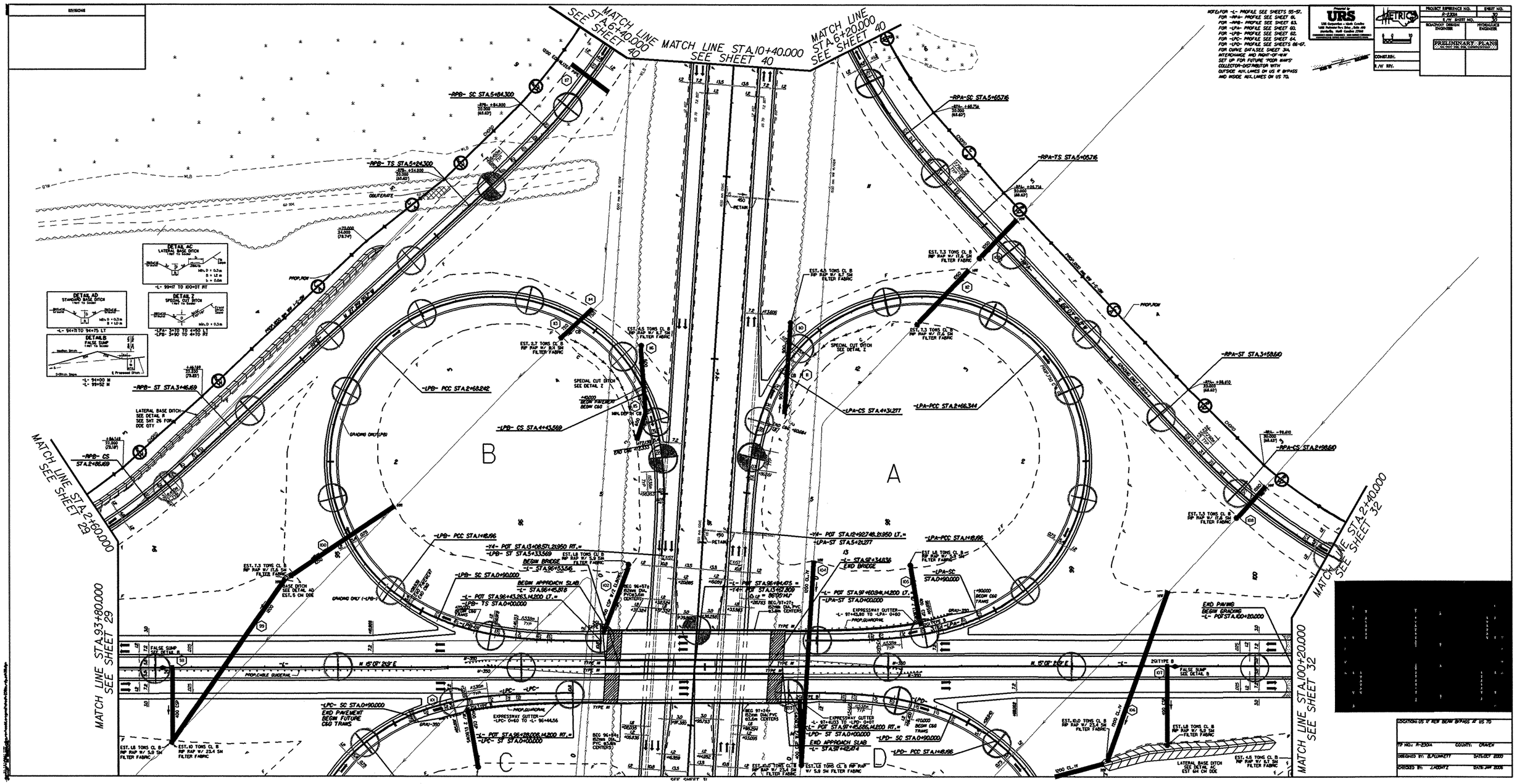
-L- 91+71M

-RPB- 2+51 TO 4+74 LT



CURVE DATA -RPC-

PIs Sta 2+06.837	PI Sta 3+29.388
θ_s = 4° 54' 39.8"	Δ = 32° 39' 58.8" (RT)
Ls = 60.000	L = 199.547
U = 40.015	T = 102.567
V = 20.014	R = 350.000
	SE = 7.1%



NOTE: FOR -L- PROFILE SEE SHEETS 55-57.
FOR -RPA- PROFILE SEE SHEET 61.
FOR -RPB- PROFILE SEE SHEET 63.
FOR -LPA- PROFILE SEE SHEET 60.
FOR -LPB- PROFILE SEE SHEET 62.
FOR -LPC- PROFILE SEE SHEET 64.
FOR -LPD- PROFILE SEE SHEETS 66-67.
FOR CURVE DATA SEE SHEET 31A.
INTERCHANGE AND RIGHT-OF-WAY SET UP FOR FUTURE "POOR MAN'S" COLLECTOR-DISTRIBUTOR WITH OUTSIDE AUX. LANES ON US 17 BYPASS AND INSIDE AUX. LANES ON US 70.

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URS Corporation • North Carolina
1400 Pulaski Pkwy • Suite 200
Huntsville, North Carolina 27540
CONSULTING ENGINEERS • LAND SURVEYORS • ENVIRONMENTAL SCIENTISTS
PROJECT REFERENCE NO. R-2301A
SHEET NO. 30
R/W SHEET NO. 30
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
CONST.REV.
R/W REV.

REVISIONS

SEE SHEET 30

MATCH LINE STA.93+80.000 SEE SHEET 29

MATCH LINE STA.31+60.000 SEE SHEET 29

MATCH LINE STA.100+20.000 SEE SHEET 32

MATCH LINE STA.2+40.000 SEE SHEET 32

SEE SHEET 31

MATCH LINE STA.16+40.000 SEE SHEET 41

MATCH LINE STA.6+60.000 SEE SHEET 41

MATCH LINE STA.6+00.000 SEE SHEET 41

A

B

C

D

-LPB- PCC STA.1+18.96

-Y4- POT STA.13+08.57, 21.950 RT.=
-LPB- ST STA.5+33.569

EST. 7.3 TONS CL B RIP RAP W/ 11.6 SM FILTER FABRIC

BASE DITCH SEE DETAIL AD EST. 5 CM DOE

-LPB- SC STA.0+90.000

BEGIN BRIDGE
BEGIN APPROACH SLAB
-L- STA.96+45.876

-L- POT STA.96+43.263, 14.200 LT.=

-LPB- TS STA.0+00.000

GRADING ONLY (-LPB-)

EST. 1.8 TONS CL B RIP RAP W/ 5.5 SM FILTER FABRIC

EST. 1.0 TONS CL B RIP RAP W/ 5.9 SM FILTER FABRIC

FALSE SUMP SEE DETAIL B

PROP. CABLE GUIDERAIL

N 15°02' 21.9" E

-LPC- SC STA.0+90.000

END PAVEMENT BEGIN FUTURE C&G TRANS

EXPRESSWAY GUTTER
-LPC- 0+60 TO -L- 98+44.56

-L- POT STA.96+28.006, 14.200 RT.=
-LPC- ST STA.0+00.000

END PAVEMENT BEGIN FUTURE C&G TRANS

EST. 1.8 TONS CL B RIP RAP W/ 5.5 SM FILTER FABRIC

-LPC- PCC STA.1+18.96

-Y4- POT STA.14+42.870, 21.950 RT.=
-LPC- ST STA.5+21.277

EST. 1.0 TONS CL B RIP RAP W/ 2.3.4 SM FILTER FABRIC

-LPC- CS STA.4+31.277

-LPC- PCC STA.2+66.344

SPECIAL CUT DITCH SEE DETAIL Z

EST. 2.7 TONS CL B RIP RAP W/ 8.4 SM FILTER FABRIC

EST. 1.3 TONS CL B RIP RAP W/ 17.2 SM FILTER FABRIC

-RPC- CS STA.4+26.368

-RPC- ST STA.4+86.368

-RPC- TS STA.5+74.473

-RPC- SC STA.6+34.473

-Y4- POT STA.12+92.748, 21.950 LT.=
-LPA- ST STA.5+21.277

-LPA-PCC STA.1+18.96

-L- STA.97+34.836
END BRIDGE

EST. 1.8 TONS CL B RIP RAP W/ 5.5 SM FILTER FABRIC

-LPA-SC STA.0+90.000

-L- POT STA.97+14.475 =
-Y4- POT STA.13+07.309

-L- POT STA.97+60.94, 14.200 LT.=

-LPA-ST STA.0+00.000

EXPRESSWAY GUTTER
-L- 97+43.00 TO -LPA- 0+60

PROP. GUARDRAIL

END PAVING BEGIN GRADING
-L- POT STA.1.00+20.000

NOTE: FOR -L- PROFILE SEE SHEETS 55-57.
FOR -RPC- PROFILE SEE SHEET 65-66.
FOR -RPD- PROFILE SEE SHEETS 67-68.
FOR -LPA- PROFILE SEE SHEET 63.
FOR -LPB- PROFILE SEE SHEET 62.
FOR -LPC- PROFILE SEE SHEET 64.
FOR -LPD- PROFILE SEE SHEETS 66-67.
FOR CURVE DATA SEE SHEET 34.

NOTE: INTERCHANGE AND RIGHT-OF-WAY SET UP FOR FUTURE "FOUR WAYS" COLLECTOR-DISTRIBUTOR WITH OUTSIDE RDWAYLINES ON US 17 BYPASS AND INSIDE RDWAYLINES ON US 70.

-L- 97+24 TO -L- 97+43.33
-L- POT STA.97+45.686, 14.200 RT.=
-LPD- ST STA.0+00.000

END APPROACH SLAB
-L- STA.97+42.814

-LPD- SC STA.0+90.000

-LPD- PCC STA.1+18.96

-Y4- POT STA.14+27.048, 21.950 LT.=
-LPD- ST STA.5+33.569

-L- POT STA.96+94.475 =
-Y4- POT STA.13+07.309

EST. 1.0 TONS CL B RIP RAP W/ 2.3.4 SM FILTER FABRIC

EST. 1.8 TONS CL B RIP RAP W/ 5.9 SM FILTER FABRIC

EST. 1.0 TONS CL B RIP RAP W/ 2.3.4 SM FILTER FABRIC

EST. 1.0 TONS CL B RIP RAP W/ 2.3.4 SM FILTER FABRIC

LATERAL BASE DITCH SEE DETAIL AC EST. 6.4 CM DOE

EST. 4.6 TONS CL B RIP RAP W/ 8.7 SM FILTER FABRIC

-LPD- CS STA.4+43.569

-LPD- PCC STA.2+68.242

EST. 1.3 TONS CL B RIP RAP W/ 17.2 SM FILTER FABRIC

EST. 4.5 TONS CL B RIP RAP W/ 8.7 SM FILTER FABRIC

EST. 88.6 TONS CL B RIP RAP W/ 46.2 SM FILTER FABRIC

EST. 63.5 TONS CL B RIP RAP W/ 46.2 SM FILTER FABRIC

TAL BASE DITCH SEE DETAIL AD EST. 5 CM DOE

-RPD-CS STA.2+63.390

-RPD-ST STA.3+23.390

-RPD-TS STA.5+20.401

-RPD-SC STA.5+80.401

DETAIL B
FALSE SUMP
1 MIN TO SLOPE

DETAIL AC
LATERAL BASE DITCH
1 MIN TO SLOPE
Min. D = 0.3 m
B = 1.2 m
b = 0.6 m

-LPD- 4+06 RT TO 4+20 RT
-L- 99+17 RT TO 100+07 RT

DETAIL Z
SPECIAL CUT DITCH
1 MIN TO SLOPE
Min. D = 0.3 m

-LPC- 3+20 TO 4+30 RT
-LPC- 4+20 TO 4+48 RT

DETAIL AD
STANDARD BASE DITCH
1 MIN TO SLOPE
Min. D = 0.3 m
B = 1.0 m

-Y4- 15+62 TO 15+68 LT

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ENGINEERING & TECHNOLOGY SOLUTIONS FOR A BETTER TOMORROW

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	31
R.W. SHEET NO.	TOTAL SHEETS
37	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST. STA.
R.W. STA.

LOCATION: US 17 NEW BERN BYPASS AT US 70

TIP NO.: R-2301A COUNTY: CRAVEN

DESIGNED BY: B.PLUMMETT DATE: OCT 2000

CHECKED BY: J.KOPITZ DATE: JAN 2006

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	32
R/W SHEET NO.	32
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

CONST. REV.

R/W REV.

METRIC 5 0 10

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NOTE: FOR -L- PROFILE SEE SHEET 57
FOR -RPA- PROFILE SEE SHEETS 61
FOR -RPD- PROFILE SEE SHEET 67-68

INTERCHANGE AND RIGHT-OF-WAY SET UP FOR FUTURE "POOR MAN'S" COLLECTOR-DISTRIBUTOR WITH OUTSIDE AUX. LANES ON US 17 BYPASS

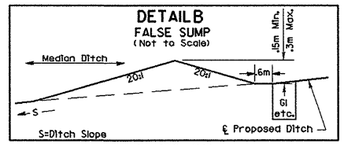
CURVE DATA -L-

PIs Sta 101+31.971	PI Sta 106+53.464	PIs Sta 111+11.348
Θs = 2° 27' 19.9"	Δ = 50° 10' 04.9" (LT)	Θs = 2° 27' 19.9"
Ls = 90.000	L = 919.377	Ls = 90.000
LT = 60.006	T = 491.499	LT = 60.006
ST = 30.005	R = 1,050.000	ST = 30.005
	SE = 5.9%	

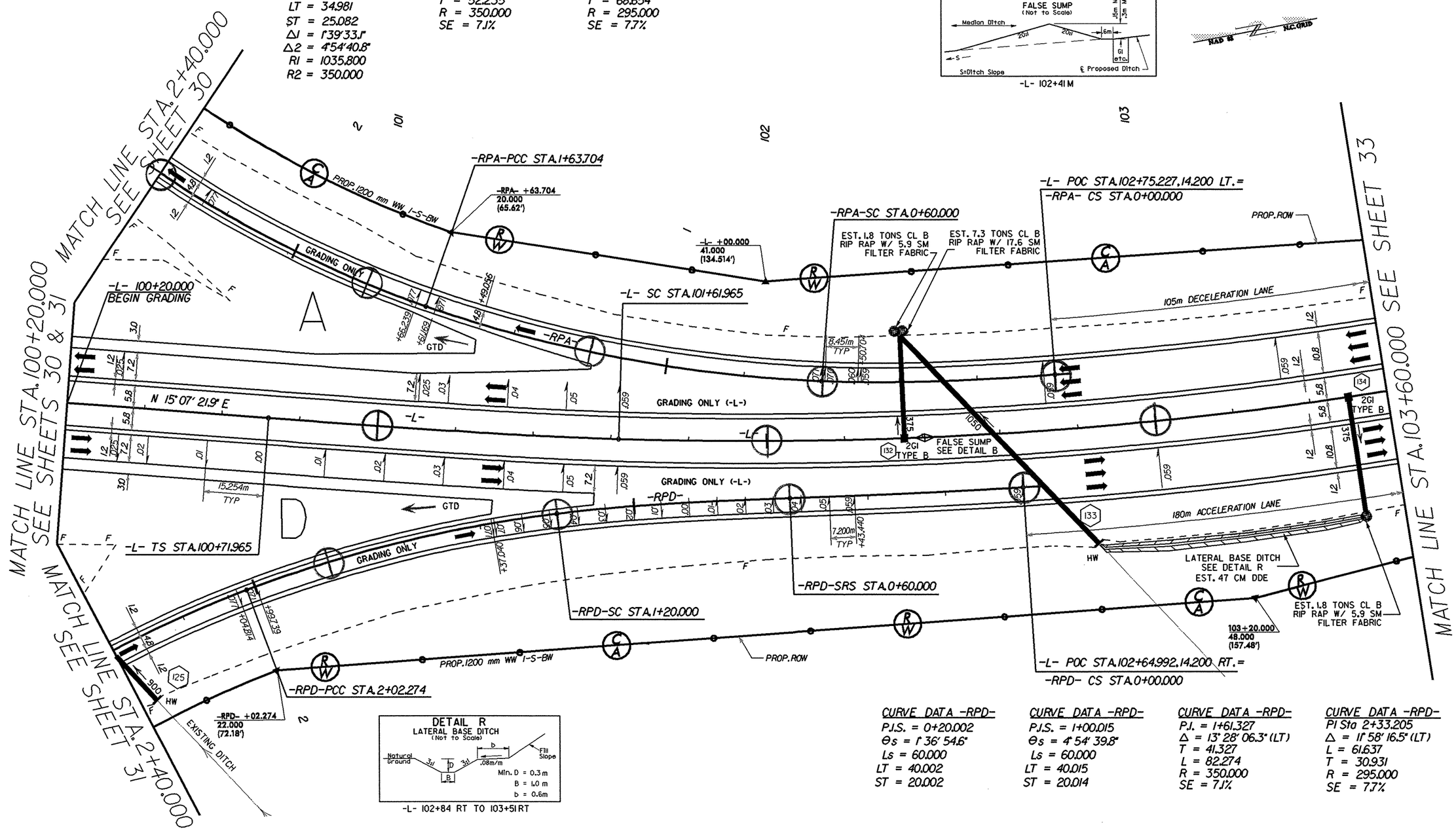
CURVE DATA -RPA-
P.I.S. = 0+34.981
Θs = 6°34'13.9"
Ls = 60.000
LT = 34.981
ST = 25.082
Δ1 = 1°39'33.1"
Δ2 = 4°54'40.8"
R1 = 1035.800
R2 = 350.000

CURVE DATA -RPA-
PI Sta 1+12.235
Δ = 16° 58' 35.6" (RT)
L = 103.704
T = 52.235
R = 350.000
SE = 7.1%

CURVE DATA -RPA-
PI Sta 2+32.358
Δ = 26° 12' 07.1" (RT)
L = 134.907
T = 68.654
R = 295.000
SE = 7.7%



-L- 102+41 M



-L- 102+84 RT TO 103+51 RT

CURVE DATA -RPD-
P.I.S. = 0+20.002
Θs = 1° 36' 54.6"
Ls = 60.000
LT = 40.002
ST = 20.002

CURVE DATA -RPD-
P.I.S. = 1+00.015
Θs = 4° 54' 39.8"
Ls = 60.000
LT = 40.015
ST = 20.014

CURVE DATA -RPD-
P.I. = 1+61.327
Δ = 13° 28' 06.3" (LT)
T = 41.327
L = 82.274
R = 350.000
SE = 7.1%

CURVE DATA -RPD-
PI Sta 2+33.205
Δ = 11° 58' 16.5" (LT)
L = 61.637
T = 30.931
R = 295.000
SE = 7.7%

8/17/99

NOTE: FOR -L- PROFILE SEE SHEETS 57-58

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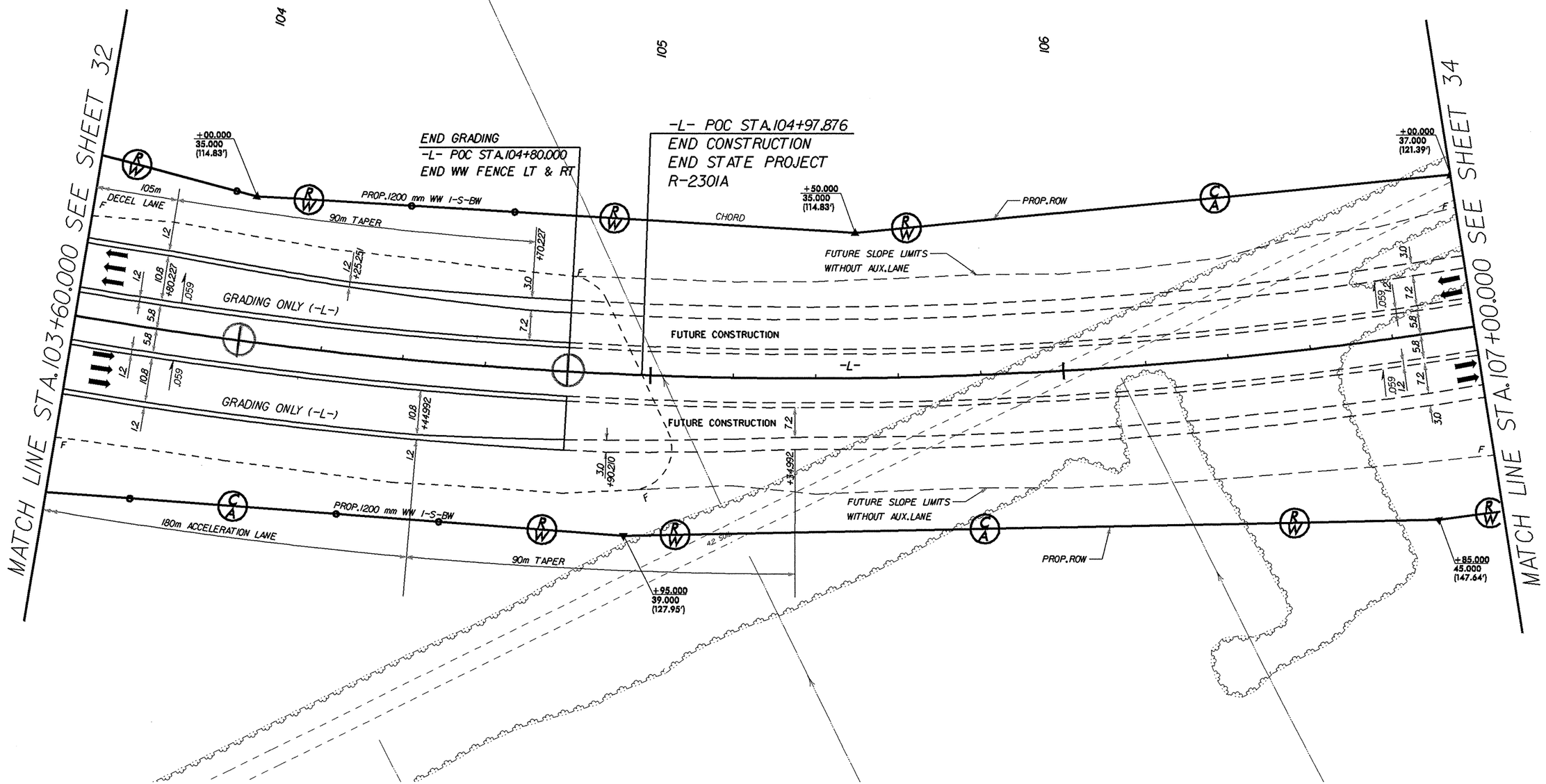
CONST. REV.
R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	33
R/W SHEET NO.	33
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

NAD 83 N.C. GRID



NOTE: THIS SHEET FOR RIGHT-OF-WAY ONLY
FOR -L- PROFILE SEE SHEET SEE SHEETS 58-59

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METRIC
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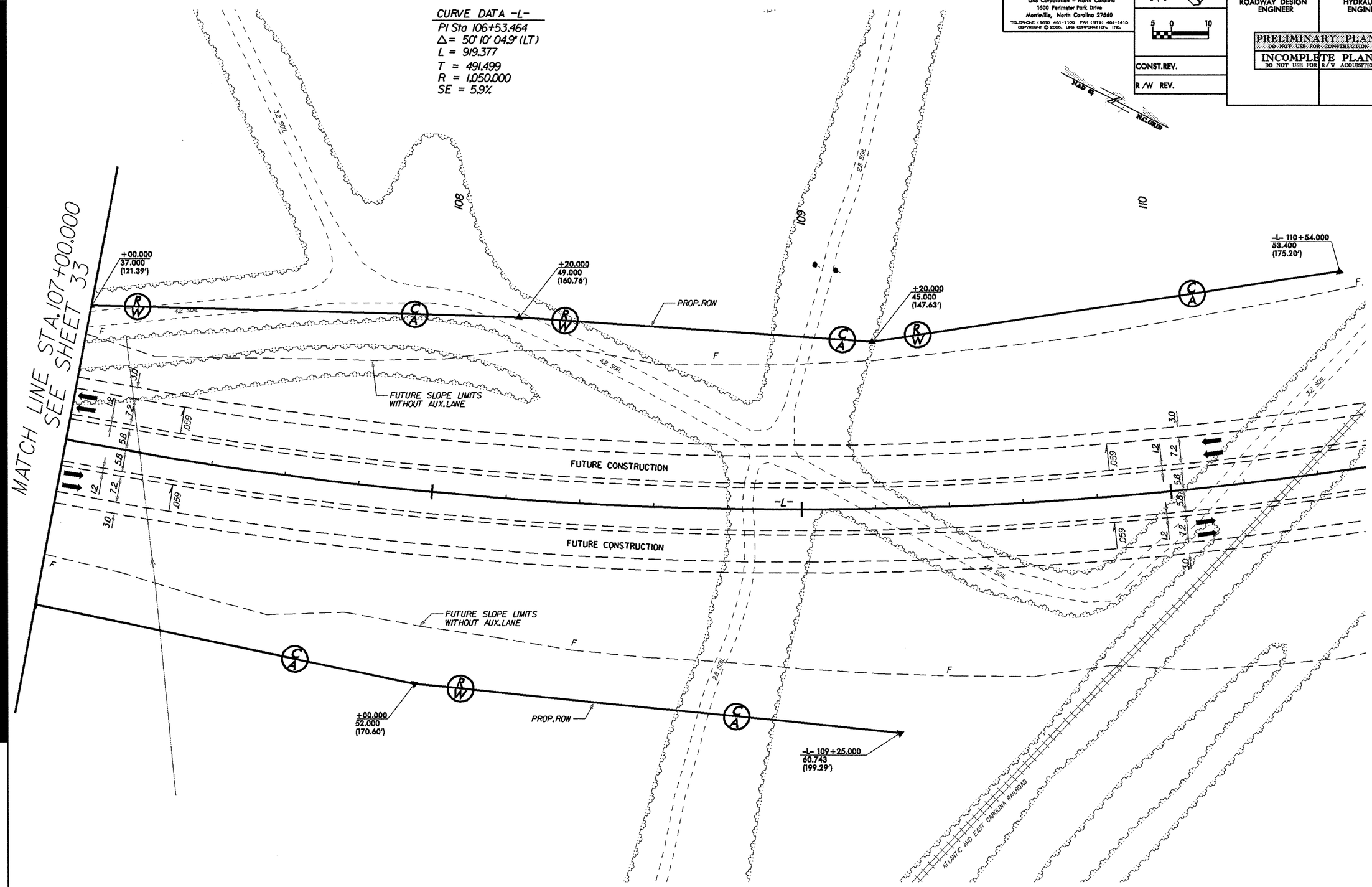
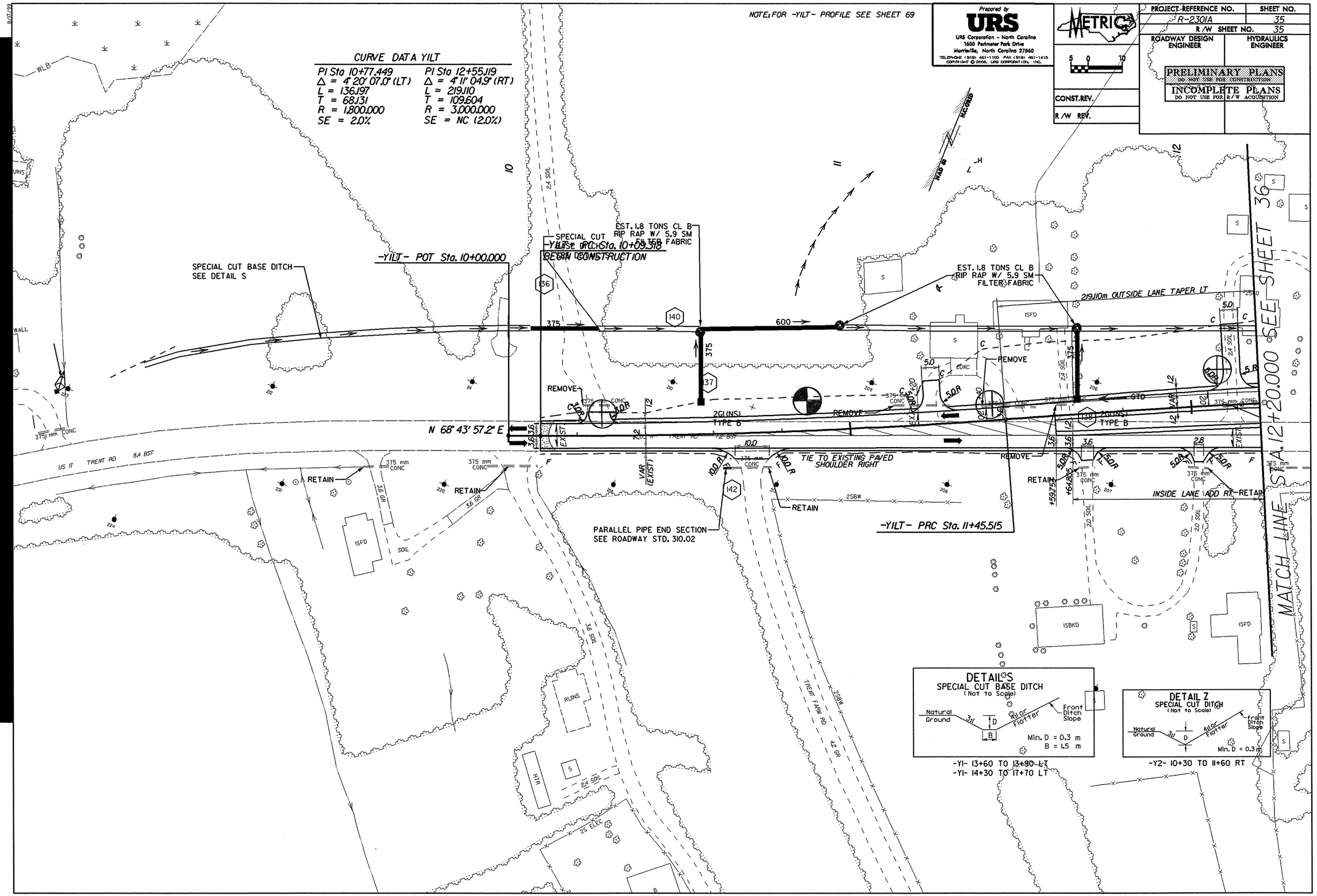
PROJECT REFERENCE NO.	SHEET NO.
R-2301A	34
R/W SHEET NO.	34
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

CONST.REV.
R/W REV.

CURVE DATA -L-
PI Sta 106+53.464
Δ = 50° 10' 04.9" (LT)
L = 919.377
T = 491.499
R = 1,050.000
SE = 5.9%




NOTE: FOR -YILT- PROFILE SEE SHEET 69
Prepared by
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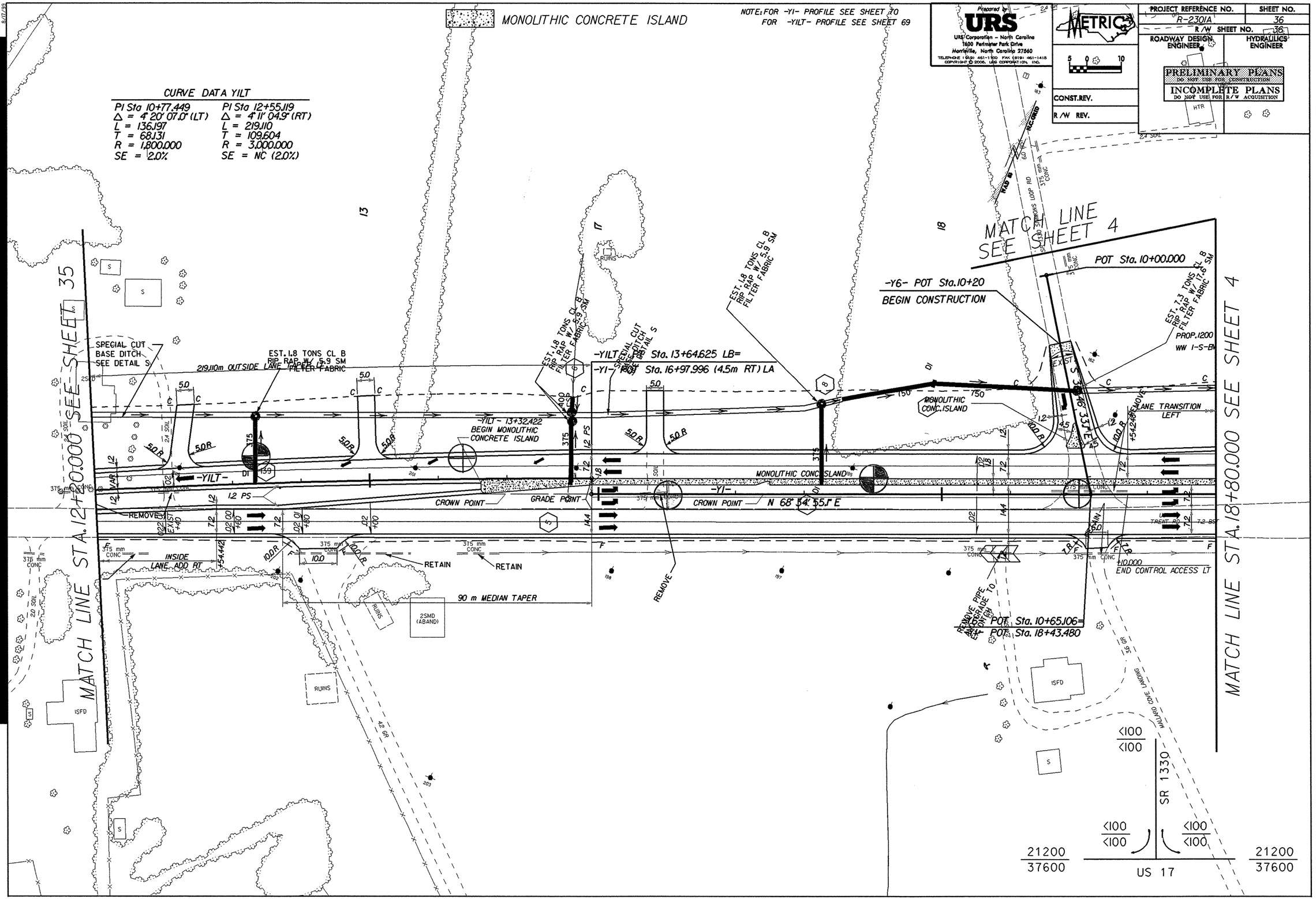
METRIC
5 0 10
CONST. REV.
R/W REV.
PROJECT REFERENCE NO.
R-2301A
SHEET NO.
35
R/W SHEET NO.
35
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
CURVE DATA YILT
PI Sta 10+77.449
Δ = 4° 20' 07.0" (LT)
L = 136.197
T = 68.131
R = 1,800.000
SE = 2.0%
PI Sta 12+55.119
Δ = 4° 11' 04.9" (RT)
L = 219.110
T = 109.604
R = 3,000.000
SE = NC (2.0%)
-YILT- POT Sta. 10+00.000
SPECIAL CUT BASE DITCH
SEE DETAIL S
SPECIAL CUT
-YILT- PRC Sta. 10+09.518
BEGIN CONSTRUCTION
EST. 1.8 TONS CL B
RIP RAP W/ 5.9 SM
FILTER FABRIC
EST. 1.8 TONS CL B
RIP RAP W/ 5.9 SM
FILTER FABRIC
219.110m OUTSIDE LANE TAPER LT
REMOVE
N 68° 43' 57.2" E
2GI(NS)
TYPE B
TIE TO EXISTING PAVED
SHOULDER RIGHT
RETAIN
PARALLEL PIPE END SECTION
SEE ROADWAY STD. 310.02
-YILT- PRC Sta. 11+45.515
INSIDE LANE ADD RT
MATCH LINE STA. 12+20.000 SEE SHEET 36
US 17 TRENT RD
TRENT FARM RD
DETAIL S
SPECIAL CUT BASE DITCH
(Not to Scale)
Natural Ground
3:1
D
B
Front Ditch Slope
Min. D = 0.3 m
B = 1.5 m
-Y1- 13+60 TO 13+80 LT
-Y1- 14+30 TO 17+70 LT
DETAIL Z
SPECIAL CUT DITCH
(Not to Scale)
Min. D = 0.3 m
-Y2- 10+30 TO 11+60 RT


MONOLITHIC CONCRETE ISLAND
NOTE: FOR -Y1- PROFILE SEE SHEET 70
FOR -YILT- PROFILE SEE SHEET 69
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CONST. REV.
R/W REV.
PROJECT REFERENCE NO.
R-2301A
SHEET NO.
36
R/W SHEET NO.
36
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
CURVE DATA YILT
PI Sta 10+77.449
Δ = 4° 20' 07.0" (LT)
L = 136.197
T = 68.131
R = 1,800.000
SE = 2.0%
PI Sta 12+55.119
Δ = 4° 11' 04.9" (RT)
L = 219.110
T = 109.604
R = 3,000.000
SE = NC (2.0%)
MATCH LINE SEE SHEET 4
POT Sta. 10+00.000
-Y6- POT Sta.10+20
BEGIN CONSTRUCTION
EST. 7.3 TONS CL B RIP RAP W/ 17.6 SM FILTER FABRIC
PROP. 1200 WW 1-S-BM
EXIST. 3 46.33" E
LANE TRANSITION LEFT
MONOLITHIC CONC. ISLAND
EST. 1.8 TONS CL B RIP RAP W/ 5.9 SM FILTER FABRIC
-YILT- Sta. 13+64.625 LB=
-Y1- POT Sta. 16+97.996 (4.5m RT) LA
SPECIAL CUT BASE DITCH SEE DETAIL S
219.110m OUTSIDE LANE TAPER
-YILT- 13+32.422
BEGIN MONOLITHIC CONCRETE ISLAND
MONOLITHIC CONC. ISLAND
-YILT-
-Y1-
CROWN POINT
GRADE POINT
N 68° 54' 55.1" E
REMOVE
RETAIN
INSIDE LANE ADD RT
90 m MEDIAN TAPER
REMOVE PIPE & REGRADE TO EXIST. DITCH
-Y1- POT Sta. 10+65.106=
-YILT- POT Sta. 18+43.480
+10.000
END CONTROL ACCESS LT
MATCH LINE STA. 12+50.000 SEE SHEET 35
MATCH LINE STA. 18+80.000 SEE SHEET 4
RUINS
ISFD
2SMD (ABAND)
MULLAND COVE LANDING
SR 1330
US 17
<100
21200
37600

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NOTE: FOR -Y1- PROFILE SEE SHEET 70

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CONST. REV.
R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	37
R/W SHEET NO.	37
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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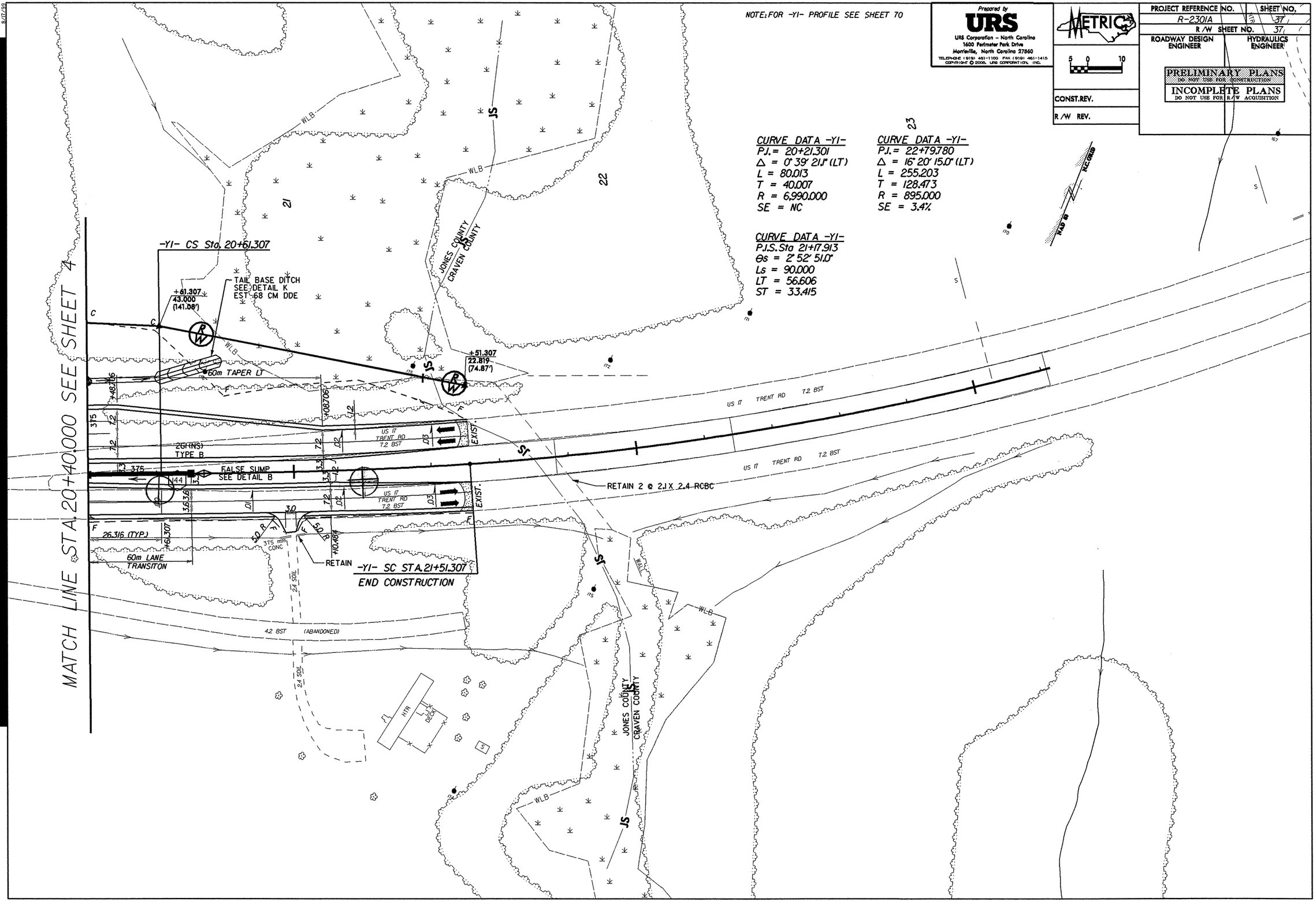
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



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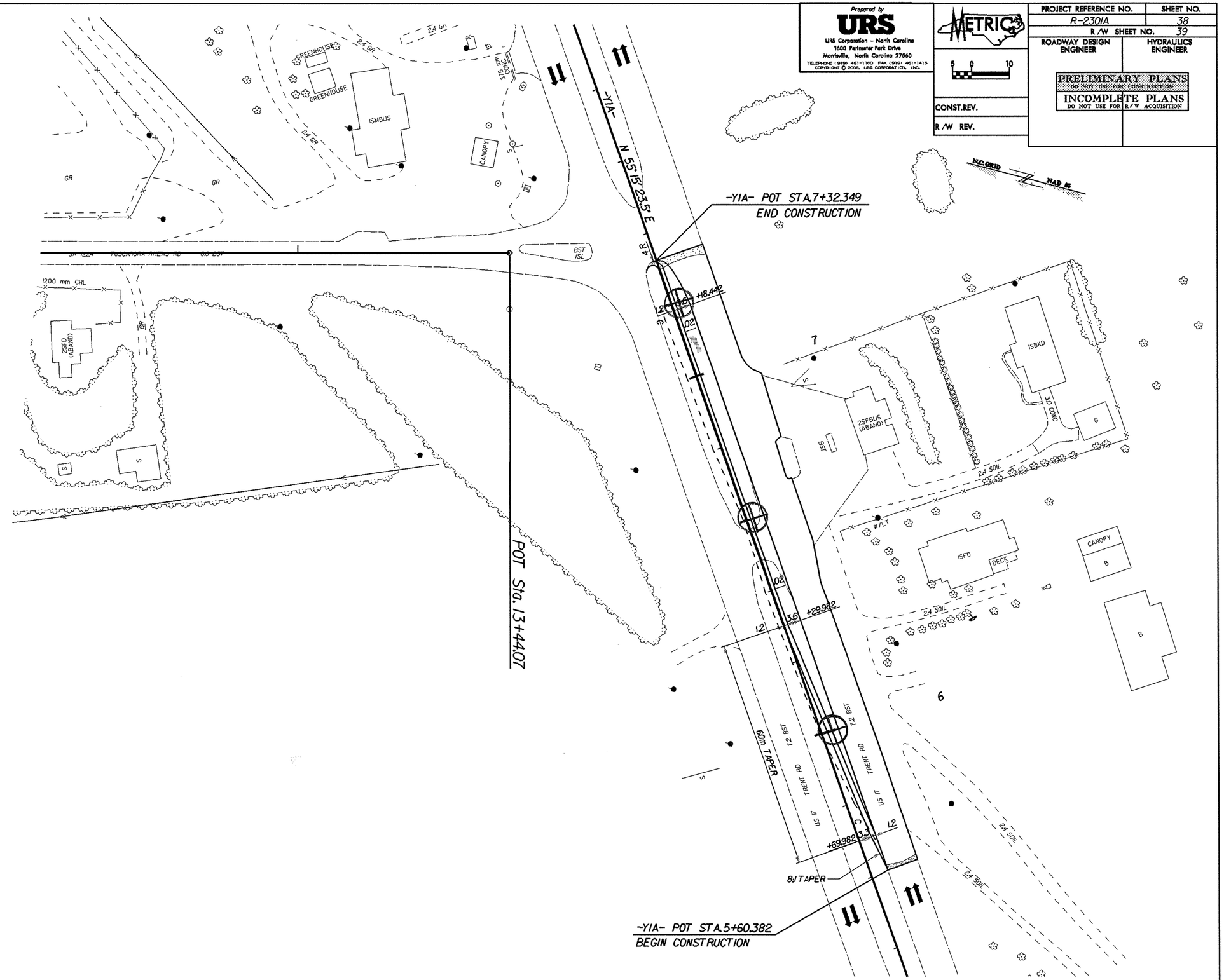
PROJECT REFERENCE NO.	SHEET NO.
R-2301A	38
R/W SHEET NO.	39
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

CONST.REV.
R/W REV.



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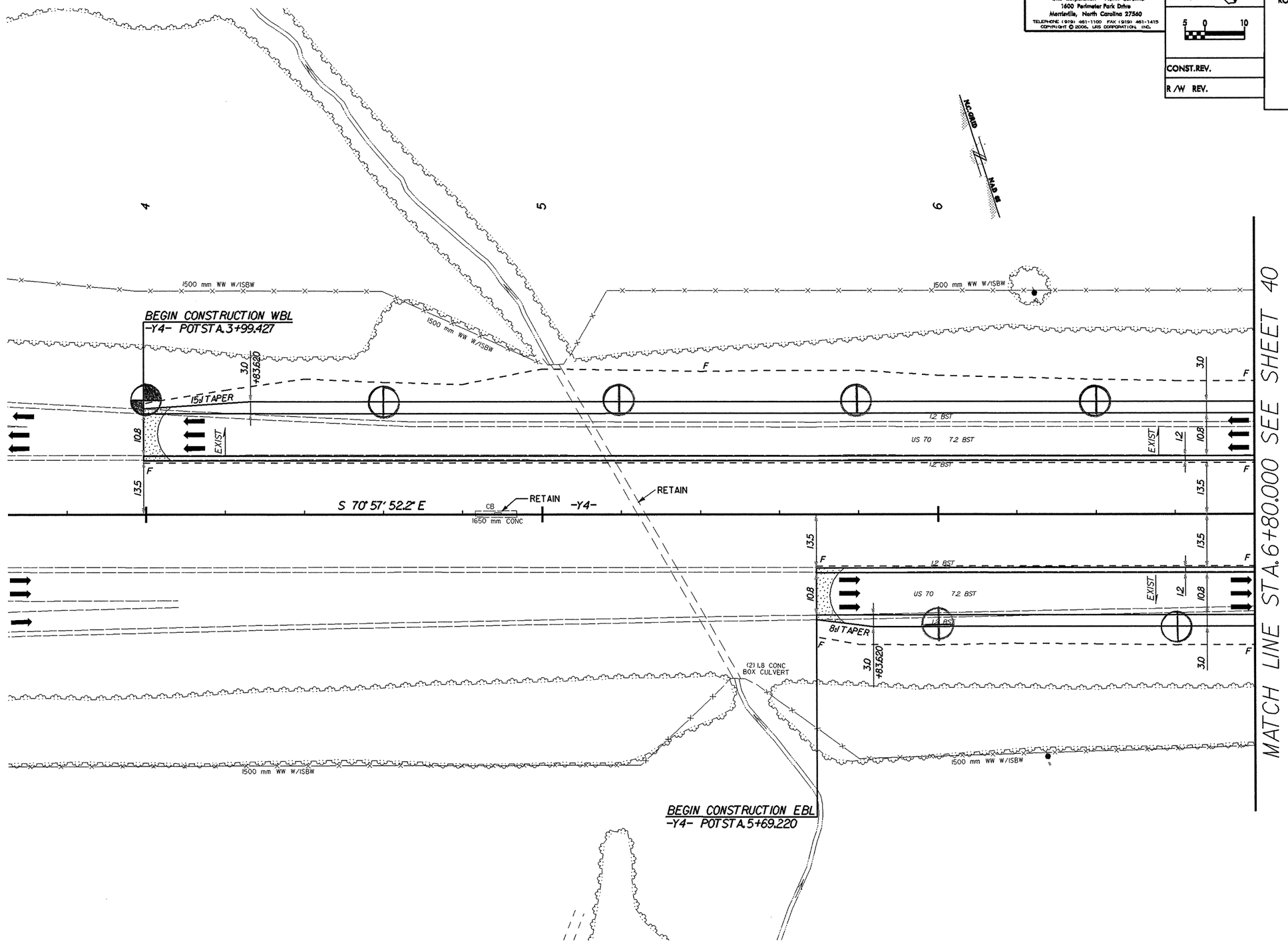
CONST.REV.
R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	39
R/W SHEET NO.	40
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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NOTE: FOR -RPA- PROFILE SEE SHEET 61
FOR -RPB- PROFILE SEE SHEETS 63-64

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R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	40
R/W SHEET NO.	41
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

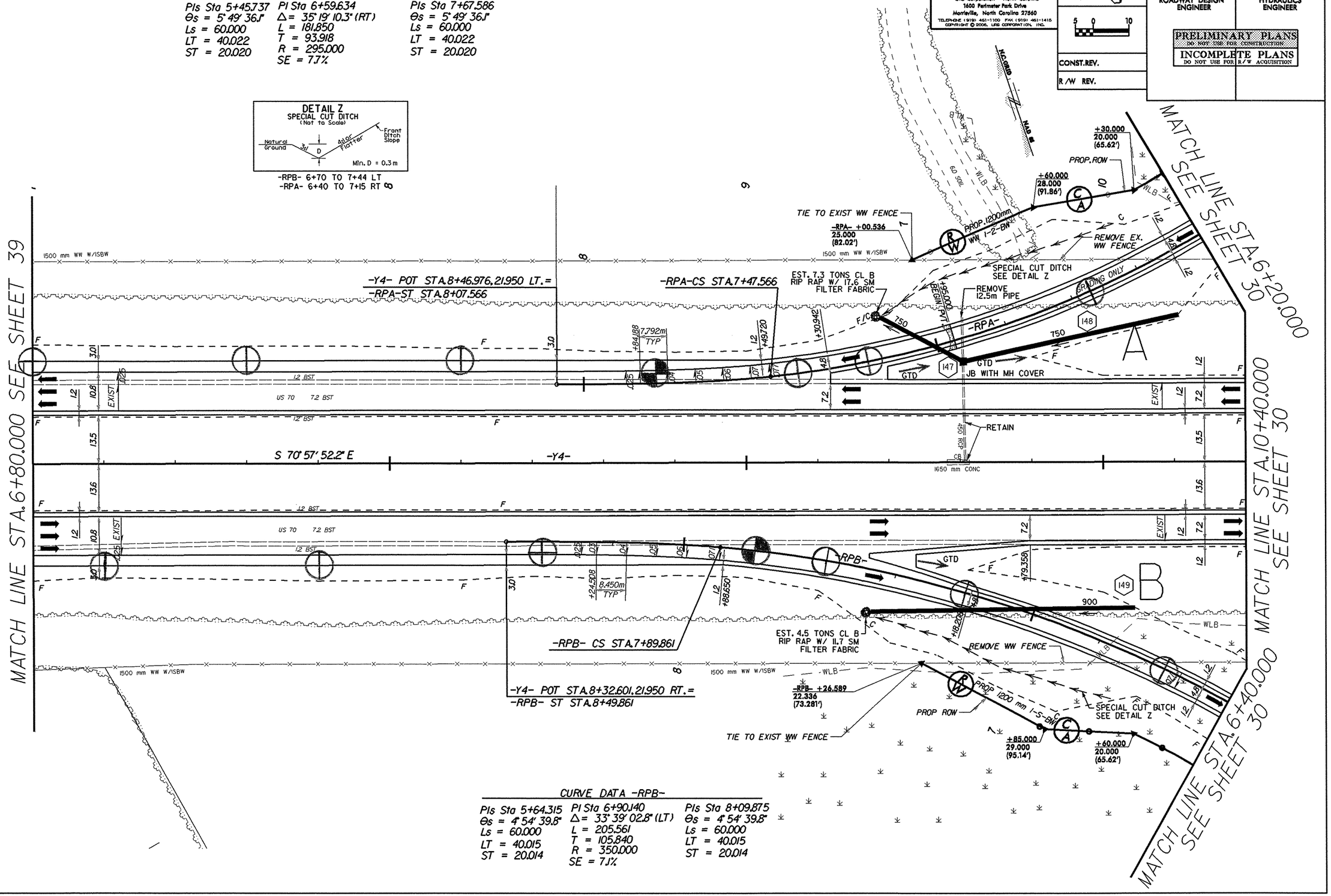
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

CURVE DATA -RPA-

PIs Sta 5+45.737	PI Sta 6+59.634	PIs Sta 7+67.586
Θs = 5° 49' 36.1"	Δ = 35° 19' 10.3" (RT)	Θs = 5° 49' 36.1"
Ls = 60.000	L = 181.850	Ls = 60.000
LT = 40.022	T = 93.918	LT = 40.022
ST = 20.020	R = 295.000	ST = 20.020
	SE = 7.7%	

DETAIL Z
SPECIAL CUT DITCH
(Not to Scale)

-RPB- 6+70 TO 7+44 LT
-RPA- 6+40 TO 7+15 RT



CURVE DATA -RPB-

PIs Sta 5+64.315	PI Sta 6+90.140	PIs Sta 8+09.875
Θs = 4° 54' 39.8"	Δ = 33° 39' 02.8" (LT)	Θs = 4° 54' 39.8"
Ls = 60.000	L = 205.561	Ls = 60.000
LT = 40.015	T = 105.840	LT = 40.015
ST = 20.014	R = 350.000	ST = 20.014
	SE = 7.1%	

NOTE: FOR -RPC- PROFILE SEE SHEETS 65-66
FOR -RPD- PROFILE SEE SHEET 67-68

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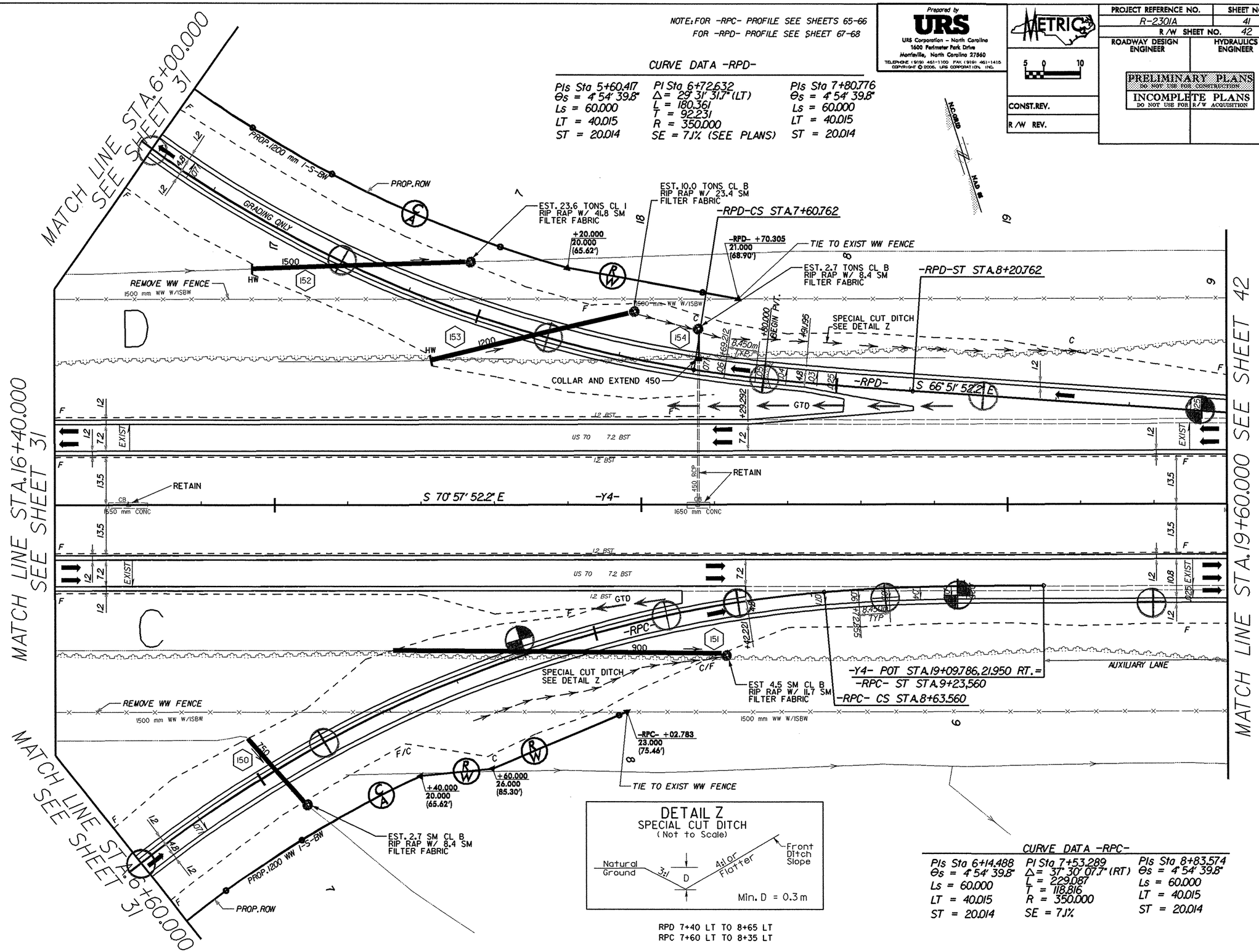
PROJECT REFERENCE NO.	SHEET NO.
R-2301A	41
R/W SHEET NO.	42
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

CONST. REV.
R/W REV.



CURVE DATA -RPD-

PIs Sta 5+60.417	PI Sta 6+72.632	PIs Sta 7+80.776
Θs = 4° 54' 39.8"	Δ = 29° 31' 31.7" (LT)	Θs = 4° 54' 39.8"
Ls = 60.000	L = 180.361	Ls = 60.000
LT = 40.015	T = 92.231	LT = 40.015
ST = 20.014	R = 350.000	ST = 20.014
	SE = 7.1% (SEE PLANS)	

DETAIL Z
SPECIAL CUT DITCH
(Not to Scale)

RPD 7+40 LT TO 8+65 LT
RPC 7+60 LT TO 8+35 LT

CURVE DATA -RPC-

PIs Sta 6+14.488	PI Sta 7+53.289	PIs Sta 8+83.574
Θs = 4° 54' 39.8"	Δ = 37° 30' 07.7" (RT)	Θs = 4° 54' 39.8"
Ls = 60.000	L = 229.087	Ls = 60.000
LT = 40.015	T = 118.816	LT = 40.015
ST = 20.014	R = 350.000	ST = 20.014
	SE = 7.1%	

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NOTE: FOR -RPD- PROFILE SEE SHEET 67

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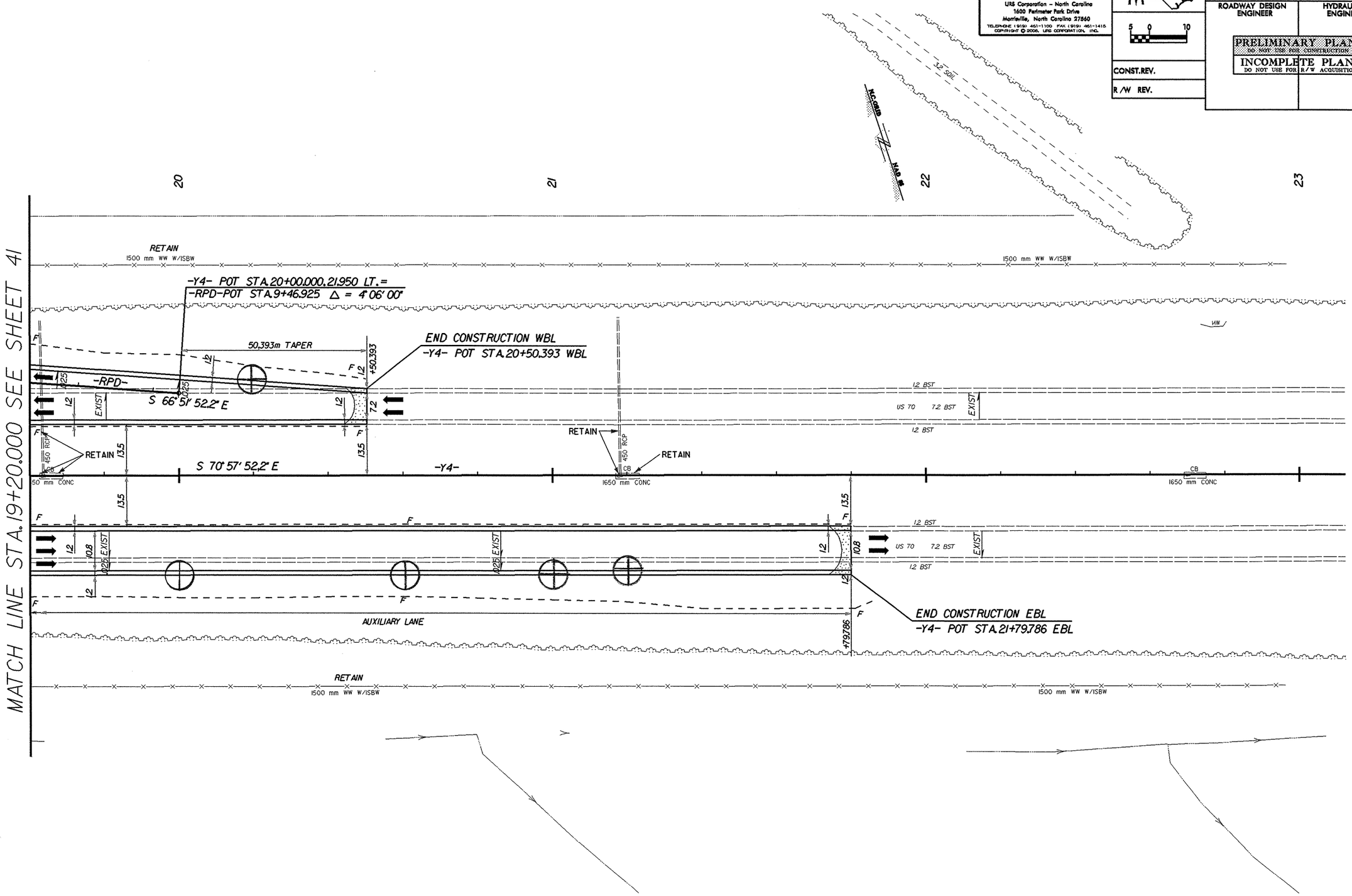
R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	42
R/W SHEET NO.	43
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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



6/09/99

TBM-21 ELEV. 10.108
RR SPIKE IN POWER POLE NUMBER RS840
-L- 10+08.806, 95.782 (LT)

TBM-20 ELEV. 10.913
RR SPIKE IN POWER POLE NUMBER RS849
-L- 12+70.673, 108.249 (LT)

FOR DETAILS SEE PLAN SHEETS 4-6

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0.5 0 1
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R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	43
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

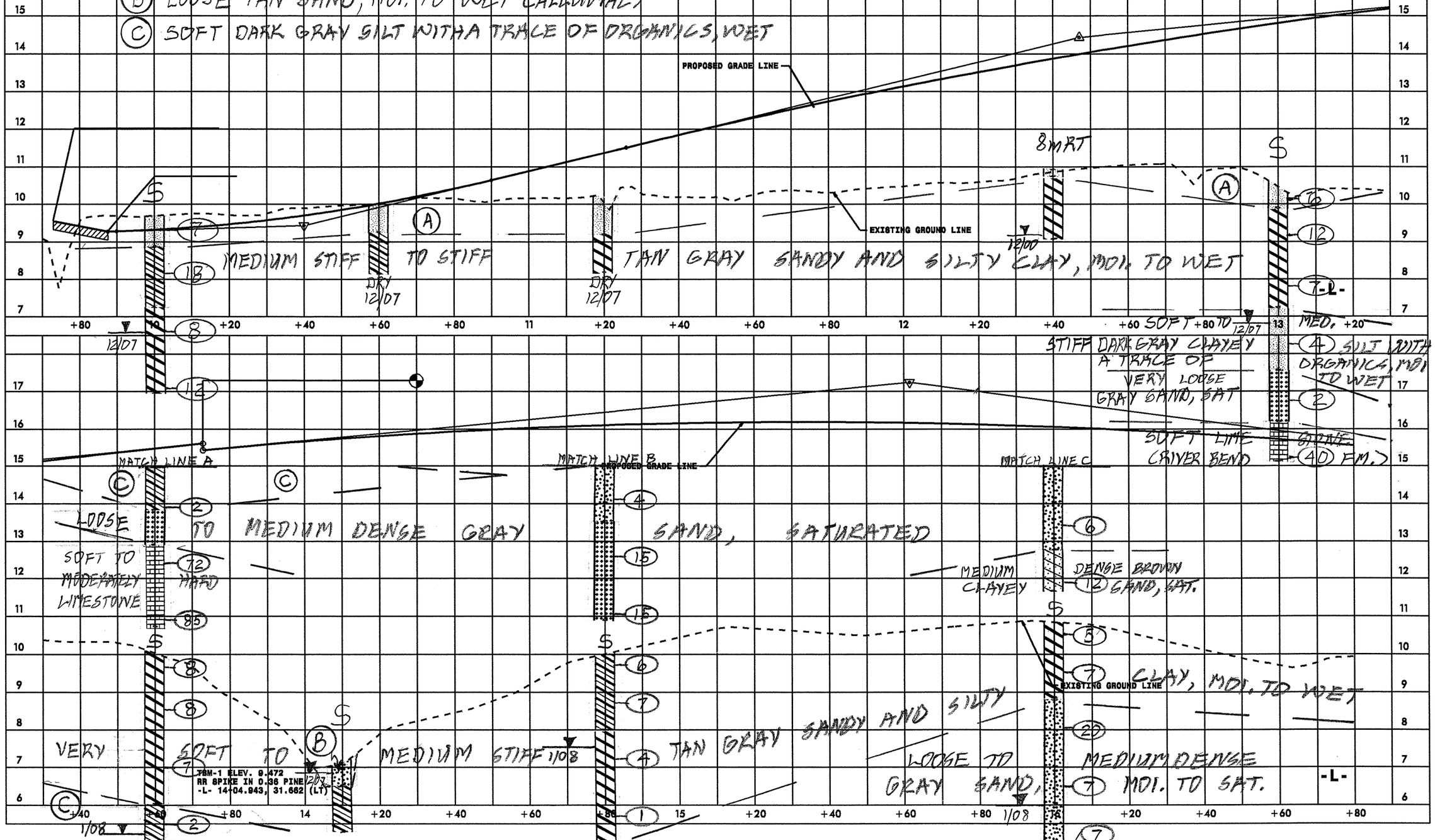
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

NOTE: SEE SHEET A3A FOR SOIL TEST RESULTS

(A) MEDIUM STIFF TAN BROWN CLAYEY SANDY SILT, MOI.

(B) LOOSE TAN SAND, MOI. TO WET (ALLUVIAL)

(C) SOFT DARK GRAY SILT WITH A TRACE OF ORGANICS, WET



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R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	43A
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

Soil Sample Test Results

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
S-501	10+00	CL	0.00-0.43	A-4(2)	21	6	3.2	28.1	44.3	24.3	100	99	79		
S-502	10+00	CL	1.16-1.61	A-6(6)	29	13	13.0	27.3	31.4	28.3	92	83	63		
S-503	10+00	CL	2.69-3.14	A-7-6(20)	42	23	2.6	14.8	46.2	36.4	100	98	85	27.4	
S-504	13+00	CL	0.00-0.45	A-4(4)	27	10	15.4	28.7	29.6	26.3	98	91	62		
S-505	13+00	CL	0.95-1.40	A-7-6(21)	46	21	3.8	9.1	34.4	52.6	100	99	91		
S-506	13+00	CL	3.86-4.31	A-4(7)	32	7	3.8	5.5	62.3	28.3	100	98	91	54.2	
S-507	13+00	CL	5.39-5.84	A-3(0)	21	NP	22.6	74.8	0.6	2.0	100	95	3		
S-508	13+00	CL	6.92-7.37	A-1-a(0)	16	NP	59.3	27.1	9.5	4.0	36	20	5		

Soil Sample Test Results

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
SS-510	13+60	CL	1.16-1.62	A-7-6(34)	54	32	1.4	5.3	28.3	65.0	100	100	95		
SS-511	13+60	CL	4.21-4.67	A-6(1)	26	12	35.4	26.4	13.8	24.4	97	88	37		5.2
SS-512	13+60	CL	7.25-7.71				59.8	27.0	7.1	6.1	24	13	4		
S-500	14+10	CL	0.60-1.83	A-6(10)	34	17	17.2	14.3	36.2	32.3	100	92	71	25.3	
SS-513	14+80	CL	0.31-0.46	A-6(17)	37	16	0.0	3.3	39.8	56.9	100	100	98		
SS-514	14+80	CL	4.05-4.51	A-7-6(43)	62	38	0.0	3.5	23.4	73.2	100	100	98		
SS-515	14+80	CL	5.58-6.04	A-2-4(0)	24	5	46.2	36.9	1.6	15.2	96	74	17		
SS-516	14+80	CL	7.10-7.56	A-3(0)	23	NP	25.0	71.8	0.2	3.0	100	98	4		
SS-517	16+00	CL	0.31-0.46	A-7-6(30)	49	28	0.0	4.9	32.1	63.0	100	100	98		
SS-518	16+00	CL	2.53-2.99	A-2-4(0)	18	NP	56.2	33.7	0.9	9.1	100	93	11		
SS-519	16+00	CL	5.58-6.04	A-2-4(0)	23	7	41.5	34.1	7.1	17.3	99	79	26		
SS-520	16+00	CL	8.63-9.09	A-2-6(0)	26	11	38.1	31.9	7.6	22.4	100	81	32		

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FOR DETAILS SEE PLAN SHEETS 6-8

TBM-2 ELEV. 11.019
RR SPIKE IN 0.43 OAK
-L- 17+89.097, 45.225 (LT)

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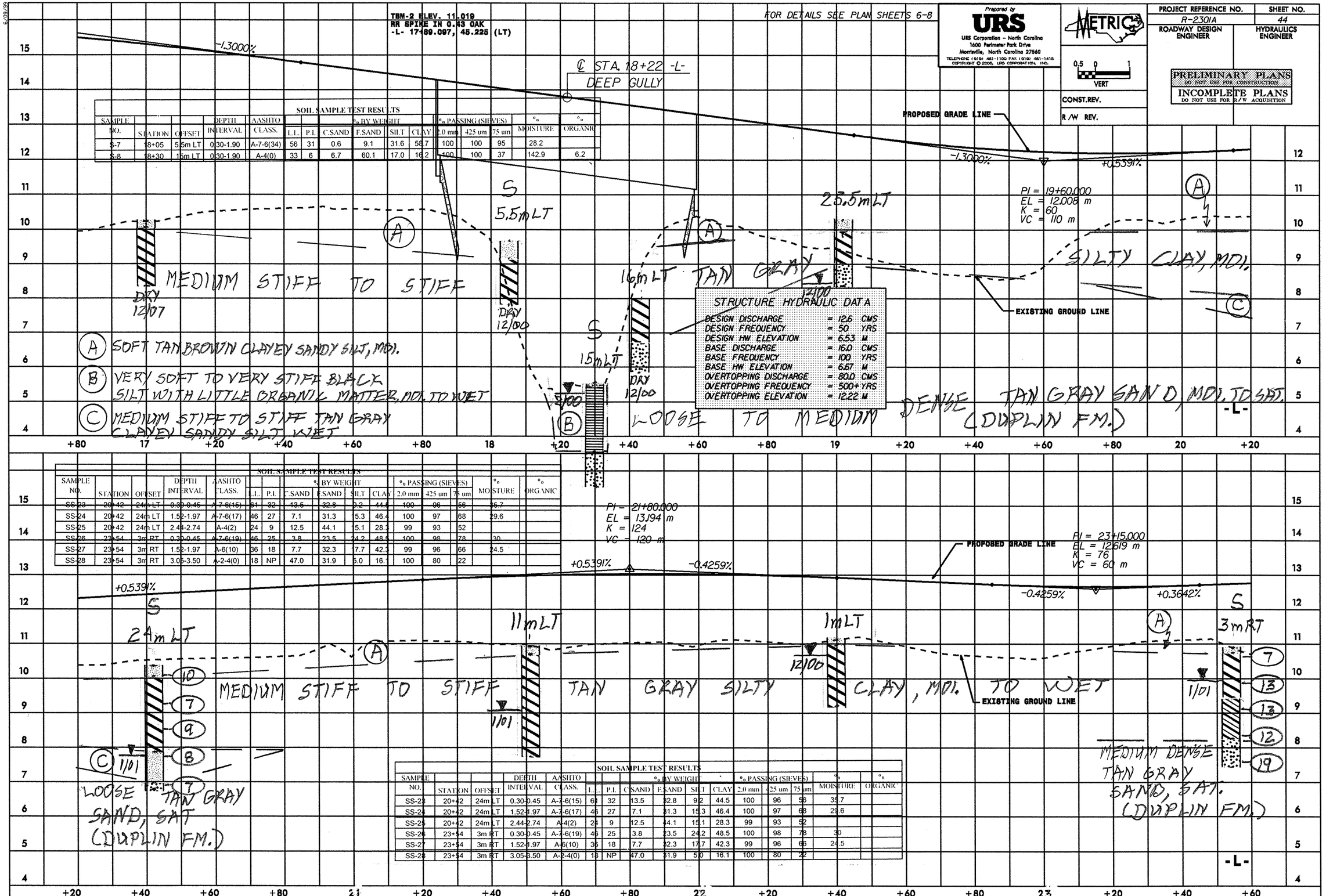
CONST.REV.
R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	44
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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



STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	= 12.6	CMS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 6.53	M
BASE DISCHARGE	= 16.0	CMS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 6.67	M
OVERTOPPING DISCHARGE	= 80.0	CMS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 12.22	M

SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	% BY WEIGHT L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
S-7	18+05	5.5m LT	0.30-1.90	A-7-6(34)	56	31	0.6	9.1	31.6	58.7	100	100	95	28.2	
S-8	18+30	15m LT	0.30-1.90	A-4(0)	33	6	6.7	60.1	17.0	16.2	100	100	37	142.9	6.2

SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	% BY WEIGHT L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
SS-23	20+42	24m LT	0.30-0.45	A-7-6(15)	61	32	13.6	32.8	9.2	44.4	100	96	66	35.7	
SS-24	20+42	24m LT	1.52-1.97	A-7-6(17)	46	27	7.1	31.3	15.3	46.4	100	97	68	29.6	
SS-25	20+42	24m LT	2.44-2.74	A-4(2)	24	9	12.5	44.1	15.1	28.3	99	93	52		
SS-26	23+54	3m RT	0.30-0.45	A-7-6(19)	46	25	3.8	23.5	24.2	48.5	100	98	78	30	
SS-27	23+54	3m RT	1.52-1.97	A-6(10)	36	18	7.7	32.3	17.7	42.3	99	96	66	24.5	
SS-28	23+54	3m RT	3.05-3.50	A-2-4(0)	18	NP	47.0	31.9	5.0	16.1	100	80	22		

SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	% BY WEIGHT L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
SS-23	20+42	24m LT	0.30-0.45	A-7-6(15)	61	32	13.5	32.8	9.2	44.5	100	96	56	35.7	
SS-24	20+42	24m LT	1.52-1.97	A-7-6(17)	46	27	7.1	31.3	15.3	46.4	100	97	68	29.6	
SS-25	20+42	24m LT	2.44-2.74	A-4(2)	24	9	12.5	44.1	15.1	28.3	99	93	52		
SS-26	23+54	3m RT	0.30-0.45	A-7-6(19)	46	25	3.8	23.5	24.2	48.5	100	98	78	30	
SS-27	23+54	3m RT	1.52-1.97	A-6(10)	36	18	7.7	32.3	17.7	42.3	99	96	66	24.5	
SS-28	23+54	3m RT	3.05-3.50	A-2-4(0)	18	NP	47.0	31.9	5.0	16.1	100	80	22		

6/09/99

TBM-3 ELEV. 11.062
RR SPIKE IN 0.18 MAPLE
-L- 24+90.520, 42.755 (LT)

FOR DETAILS SEE PLAN SHEETS 8-10

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METRIC
0.5 0 1
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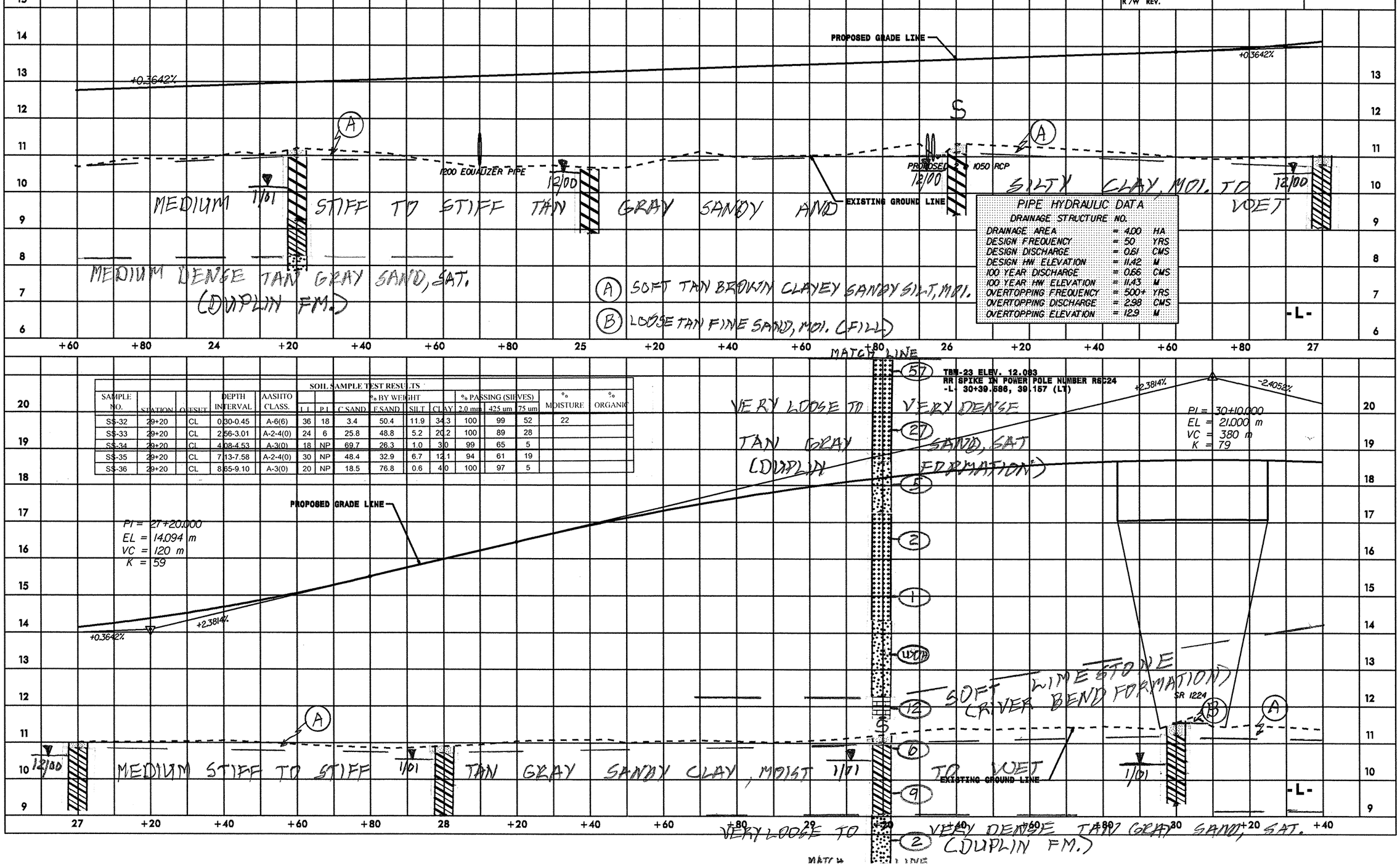
CONST.REV.
R /W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	45
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
S-9	26+00	CL	0.30-1.90	A-7-6(20)	49	25	1.4	25.3	18.6	54.7	100	100	78	26.9	



PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 4.00	HA
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 0.61	CMS
DESIGN HW ELEVATION	= 11.42	M
100 YEAR DISCHARGE	= 0.66	CMS
100 YEAR HW ELEVATION	= 11.43	M
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 2.98	CMS
OVERTOPPING ELEVATION	= 12.9	M

SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
SS-32	29+20	CL	0.30-0.45	A-6(6)	36	18	3.4	50.4	11.9	34.3	100	99	52	22	
SS-33	29+20	CL	2.56-3.01	A-2-4(0)	24	6	25.8	48.8	5.2	20.2	100	89	28		
SS-34	29+20	CL	4.08-4.53	A-3(0)	18	NP	69.7	26.3	1.0	3.0	99	65	5		
SS-35	29+20	CL	7.13-7.58	A-2-4(0)	30	NP	48.4	32.9	6.7	12.1	94	61	19		
SS-36	29+20	CL	8.65-9.10	A-3(0)	20	NP	18.5	76.8	0.6	4.0	100	97	5		

6/09/99

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	46
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

CONST. REV.

R/W REV.

Prepared by
URS
URS Corporation - North Carolina
1600 Perimeter Park Drive
Morrisville, North Carolina 27560
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METRIC
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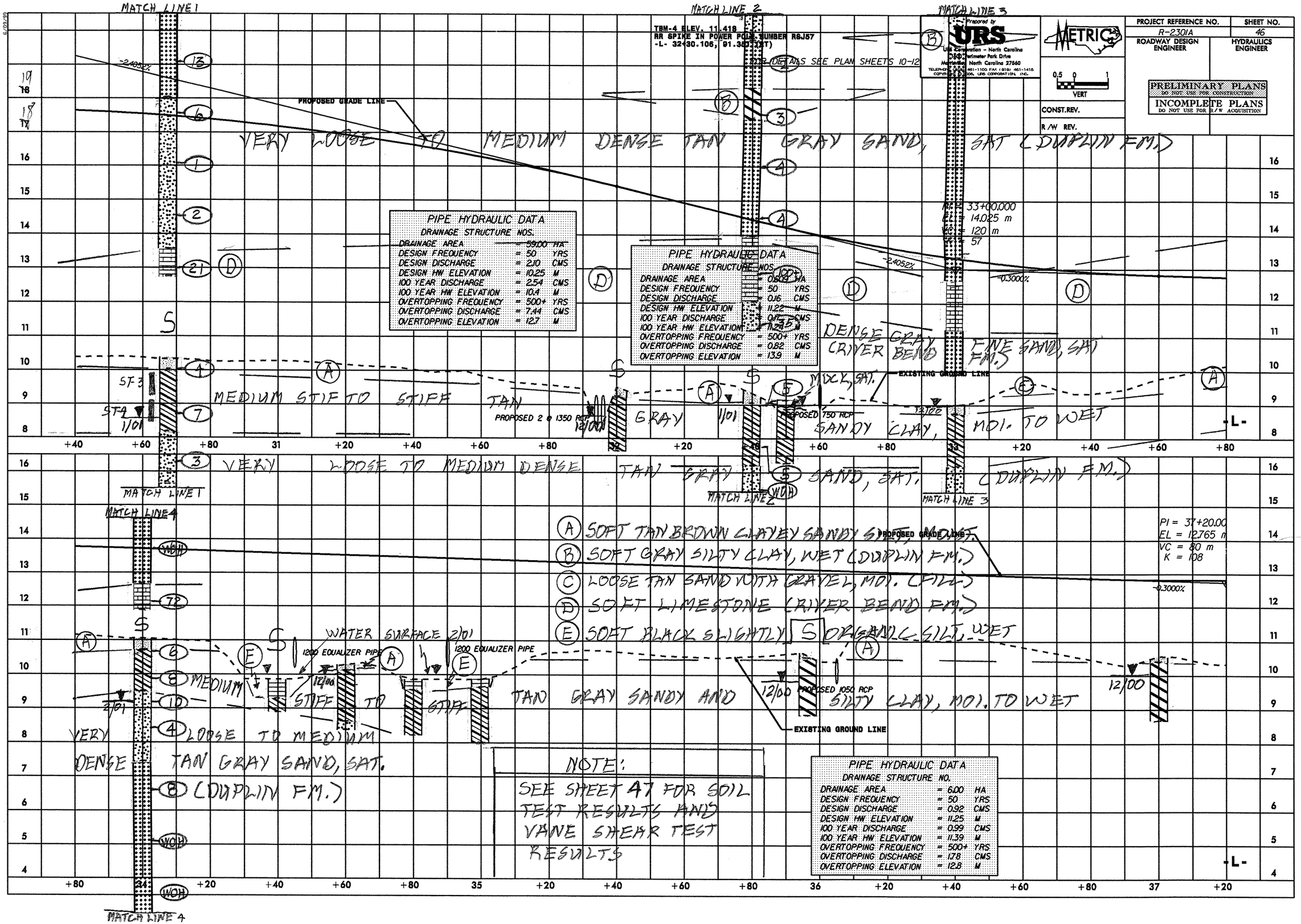

6/09/99

FOR DETAILS SEE PLAN SHEETS 13-14

TBM-5 ELEV. 11.767
NAIL IN 0.5 PINE
-L- 39+69.861, 66.935 (LT)

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URS
URS Corporation – North Carolina
1600 Perimeter Park Drive
Morrisville, North Carolina 27560
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METRIC
0.5 0 1
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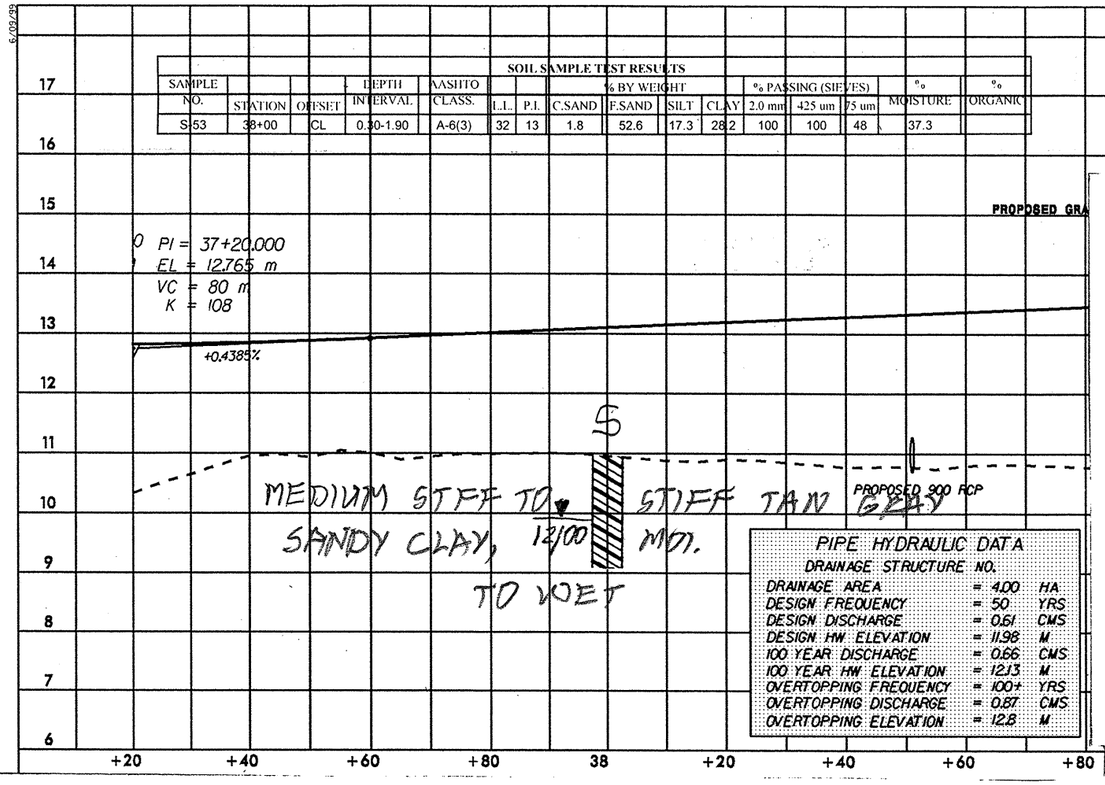
R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	47
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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



SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
S-53	38+00	CL	0.30-1.90	A-6(3)	32	13	1.8	52.6	17.3	28.2	100	100	48	37.3	

See Sheet 46 for sample locations

VANE SHEAR TESTS

STATION	OFFSET	DEPTH (m)	S(kPa)	SR(kPa)
34+40	10m LT	0.20	26	
34+40	10m LT	0.40	52	
34+40	10m LT	0.80	58	
34+40	10m LT	0.80	74	
34+40	10m LT	1.00	88	
34+40	10m LT	1.20	120	
34+40	10m LT	1.40	130	

VANE SHEAR TESTS

STATION	OFFSET	DEPTH (m)	S(kPa)	SR(kPa)
32+50	20m LT	0.20	10	
32+50	20m LT	0.40	14	
32+50	20m LT	0.60	28	
32+50	20m LT	0.80	18	
32+50	20m LT	1.00	42	
32+50	20m LT	1.20	20	

SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
SS-1	30+67.5	CL	0.00-0.45	A-6(5)	34	17	5.1	50.5	10.0	34.4	100	98	50	18.3	
SS-2	30+67.5	CL	2.56-3.10	A-2-4(0)	20	NP	18.8	65.8	3.2	12.2	100	92	18		
SS-3	30+67.5	CL	4.08-4.53	A-3(0)	20	NP	68.4	26.8	0.7	4.1	99	62	8		
SS-4	30+67.5	CL	7.13-7.58	A-2-4(0)	20	NP	71.0	18.2	1.6	9.1	94	51	11		
SS-5	30+67.5	CL	10.18-10.63	A-2-4(0)	29	NP	7.8	75.6	5.0	12.2	99	96	18		
SS-6	30+67.5	CL	11.70-12.15	A-3(0)	21	NP	12.2	79.7	2.0	6.1	99	93	9		

SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
S-10	32+00	CL	0.30-1.90	A-6(10)	40	17	5.7	31.6	14.2	48.6	100	98	66	28.1	
SS-44	32+40	CL	0.30-0.45	A-6(7)	38	18	5.3	43.5	14.9	36.4	100	99	55	23.1	
SS-45	32+40	CL	2.52-2.98	A-2-4(0)	18	NP	38.6	45.2	3.0	13.1	100	80	18		
SS-46	32+40	CL	4.05-4.50	A-3(0)	18	NP	29.5	63.5	0.9	6.1	100	92	8		
SS-47	32+40	CL	5.58-5.88	A-7-6(10)	45	28	15.6	35.0	9.0	40.4	100	92	52	45.6	
SS-48	32+40	CL	7.10-7.55	A-3(0)	23	NP	17.5	78.6	0.9	3.0	100	99	4		
SS-49	32+40	CL	10.32-10.47	A-1-a(0)	16	NP	62.9	24.9	8.2	4.0	44	22	6		
SS-50	32+40	CL	11.67-12.12	A-2-4(0)	23	NP	3.7	88.9	3.3	4.0	100	99	11		

SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
SS-51	34+00	CL	0.30-0.45	A-6(11)	40	24	5.5	37.8	12.2	44.5	100	99	59	17.4	
SS-52	34+00	CL	1.52-1.97	A-2-4(0)	28	9	1.2	66.9	7.6	24.3	100	99	35		
SS-57	34+00	CL	4.05-4.50	A-3(0)	18	NP	75.1	11.4	7.4	6.1	100	58	4		
SS-58	34+00	CL	7.10-7.55	A-3(0)	26	NP	22.7	73.9	1.3	2.0	99	96	4		
SS-59	34+00	CL	10.15-10.60	A-1-b(0)	17	NP	54.6	29.6	7.6	8.1	56	31	10		
S-91	34+40	CL	0.30-0.50	A-4(0)	38	NP	10.9	42.1	22.8	24.2	100	97	51		10.6
S-11	35+97	CL	0.30-1.90	A-7-6(11)	45	20	2	37.9	11.5	48.6	100	100	62	29.6	

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URS
URS Corporation – Maryland
3109 Poplarwood Court, Suite 301
Raleigh, North Carolina 27604
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METRIC

10 0 20

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	48
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

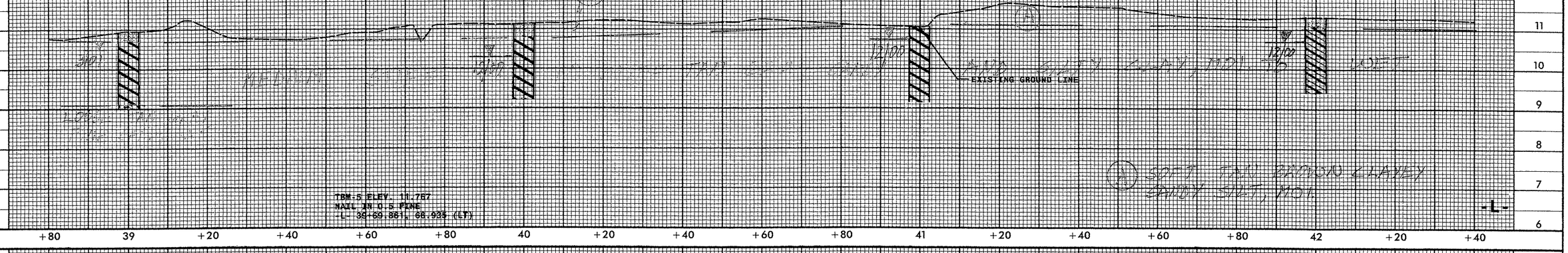
CONST.REV.

R /W REV.

PT = 39+80.000
EL = 13.905 m
VC = 120 m
K = 162
DS = 110+ km/h

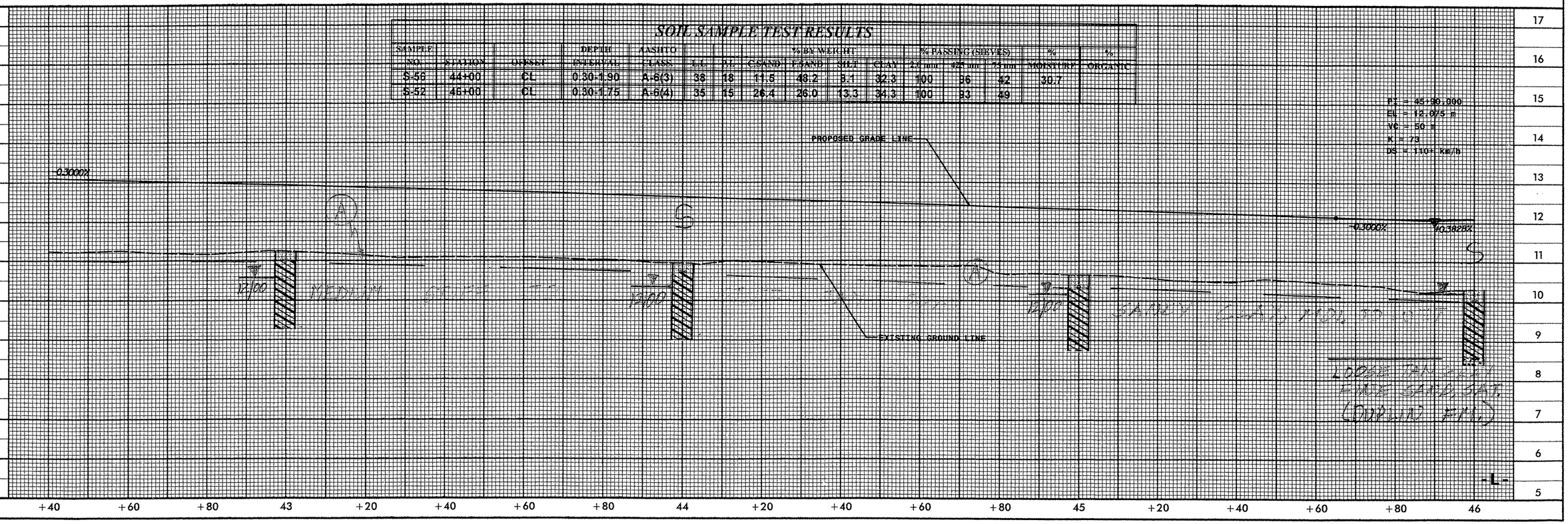
SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 µm	75 µm	% MOISTURE	% ORGANIC
S-54	40+00	CL	0.30-1.90	A-7-6(10)	43	22	[illegible]	48.7	15.1	40.3	100	99	57	29.7	
S-55	42+00	CL	0.30-1.90	A-6(8)	39	19	8.3	38.1	13.3	40.3	100	97	55		



SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 µm	75 µm	% MOISTURE	% ORGANIC
S-56	44+00	CL	0.30-1.90	A-6(3)	38	18	11.5	48.2	9.1	32.3	100	96	42	30.7	
S-52	46+00	CL	0.30-1.75	A-6(4)	35	15	26.4	26.0	13.3	34.3	100	93	49		



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PI = 48+60.000
EL = 13.185 m
VC = 120 m
K = 176
DS = 110+ km/h

METRIC
10 0 20

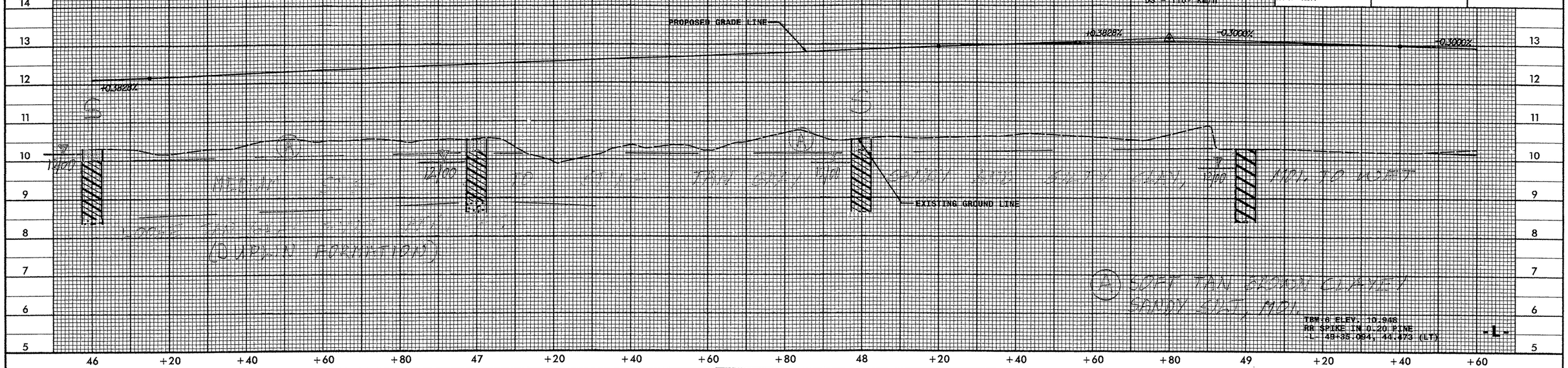
CONST.REV.
R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	49
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

SOIL SAMPLE TEST RESULTS

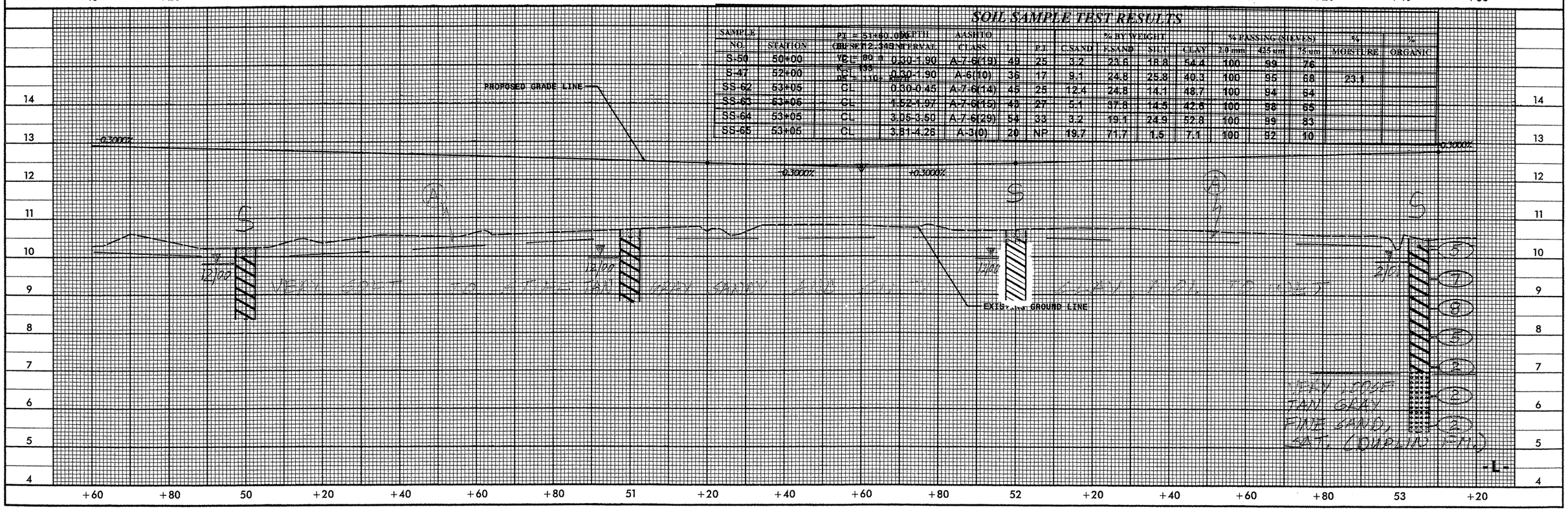
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
S-62	46+00	CL	0.30-1.75	A-6(4)	35	15	26.4	26.0	13.3	34.3	100	93	49		
S-51	48+00	CL	0.30-1.90	A-6(9)	40	21	11.7	32.5	15.5	40.3	100	98	58	26.5	



SOIL SAMPLE TEST RESULTS

PI = 51+60.000
EL = 12.343
VC = 80 m
K = 133
DS = 110+ km/h

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
S-50	50+00	CL	0.30-1.90	A-7-6(19)	49	25	3.2	23.6	18.8	54.4	100	99	76		
S-47	52+00	CL	0.30-1.90	A-6(10)	36	17	9.1	24.8	25.8	40.3	100	95	68	23.1	
SS-62	53+05	CL	0.00-0.45	A-7-6(14)	45	25	12.4	24.8	14.1	48.7	100	94	64		
SS-63	53+05	CL	1.52-1.97	A-7-6(15)	49	27	5.1	37.8	14.5	42.6	100	88	55		
SS-64	53+05	CL	3.05-3.50	A-7-6(29)	54	33	3.2	19.1	24.9	52.8	100	99	83		
SS-65	53+05	CL	3.81-4.26	A-3(0)	20	NP	19.7	71.7	1.5	7.1	100	52	10		



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METRIC

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CONST.REV.

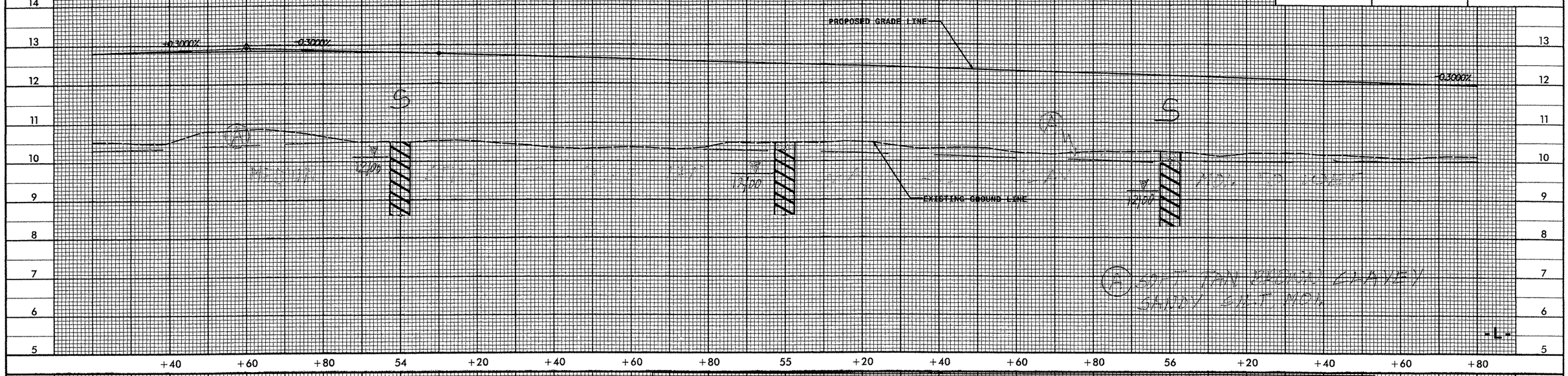
R /W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	50
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

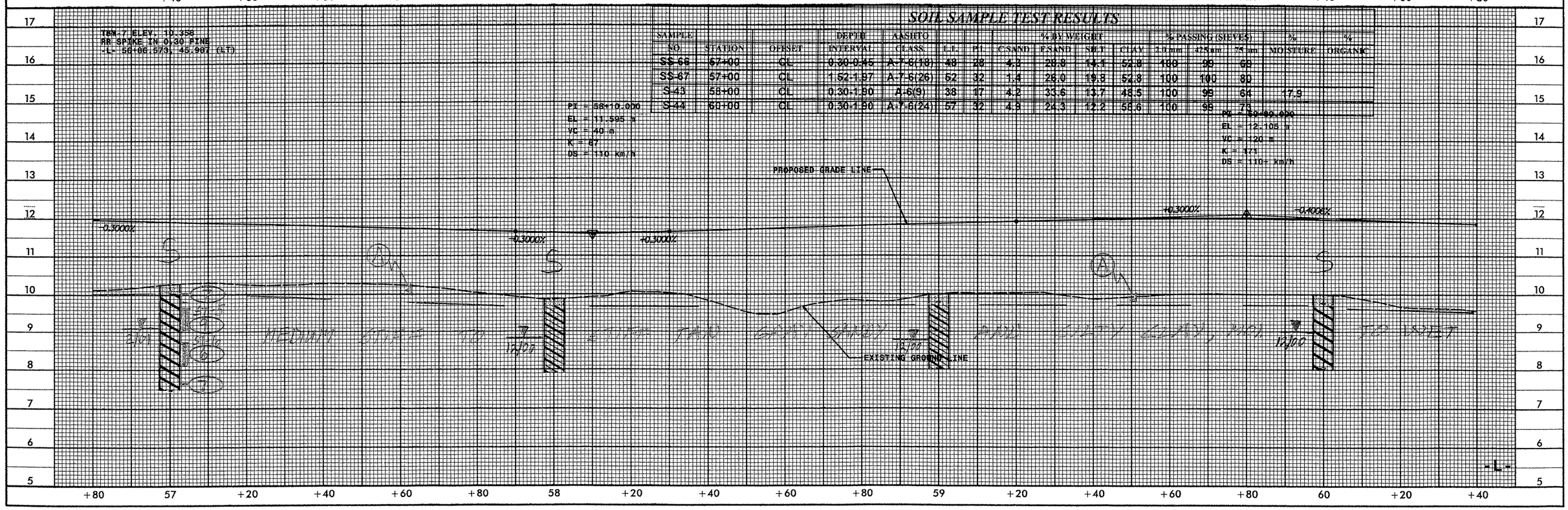
SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 µm	75 µm	% MOISTURE	% ORGANIC
S-48	54+00	CL	0.30-1.90	A-7-6(15)	44	23	5.4	25.0	19.2	50.4	100	99	71		
S-49	56+00	CL	0.30-1.90	A-7-6(20)	48	26	1.8	23.2	20.6	54.4	100	100	76	29.4	



SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 µm	75 µm	% MOISTURE	% ORGANIC
SS-66	57+00	CL	0.30-0.45	A-7-6(18)	49	28	4.3	28.9	14.1	52.9	100	99	69		
SS-67	57+00	CL	1.52-1.97	A-7-6(26)	62	32	1.4	26.0	19.8	52.8	100	100	80		
S-43	58+00	CL	0.30-1.90	A-6(9)	38	17	4.2	33.6	13.7	48.5	100	99	64	17.9	
S-44	60+00	CL	0.30-1.90	A-7-6(24)	57	32	4.9	24.3	12.2	56.6	100	98	78		



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3109 Poplarwood Court, Suite 301
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METRIC

10 0 20

CONST.REV.

R /W REV.

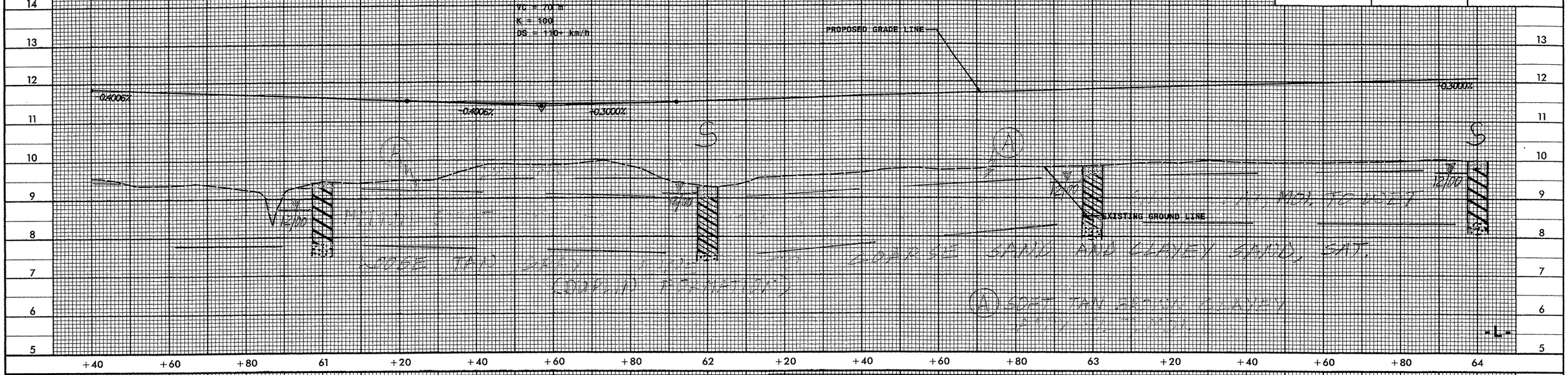
PROJECT REFERENCE NO.	SHEET NO.
R-2301A	51
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
S-17	62+00	CL	0.30-1.70	A-6(8)	38	19	13.2	38.6	15.8	40.5	100	95	58	39.3	
S-14	64+00	CL	0.20-1.60	A-7-6(18)	53	25	13.0	18.6	13.8	54.7	100	95	70	38.5	
S-15	64+00	CL	1.60-1.70	A-2-6(1)	30	14	34.8	34.6	2.2	28.3	99	83	31		
S-16	64+00	CL	1.70-1.90	A-2-4(0)	22	5	38.9	44.5	2.4	14.2	99	82	17		

PI = 61+57.000
EL = 11.396 m
VC = 70 m
K = 100
DS = 110+ km/h

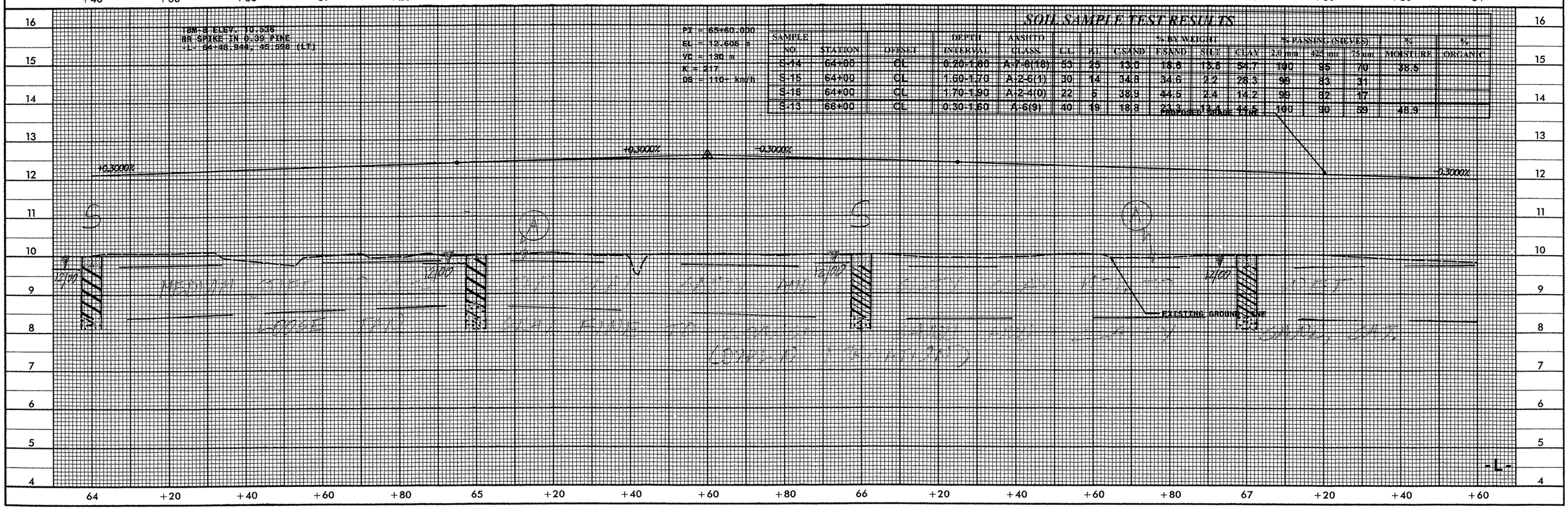


SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 mm	75 mm	% MOISTURE	% ORGANIC
S-14	64+00	CL	0.20-1.60	A-7-6(18)	53	25	13.0	18.6	13.8	54.7	100	95	70	38.5	
S-15	64+00	CL	1.60-1.70	A-2-6(1)	30	14	34.8	34.6	2.2	28.3	99	83	31		
S-16	64+00	CL	1.70-1.90	A-2-4(0)	22	5	38.9	44.5	2.4	14.2	99	82	17		
S-13	66+00	CL	0.30-1.60	A-6(9)	40	19	18.8	23.3	13.4	44.5	100	90	59	48.9	

BM-8 ELEV. 10.536
RR SPIKE IN 0.39 PINE
-L- 64+48.944, 45.596 (LT)

PI = 65+60.000
EL = 12.608 m
VC = 130 m
K = 217
DS = 110+ km/h



10/25/98

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METRIC 10 0 20

CONST.REV.

R /W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	52
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

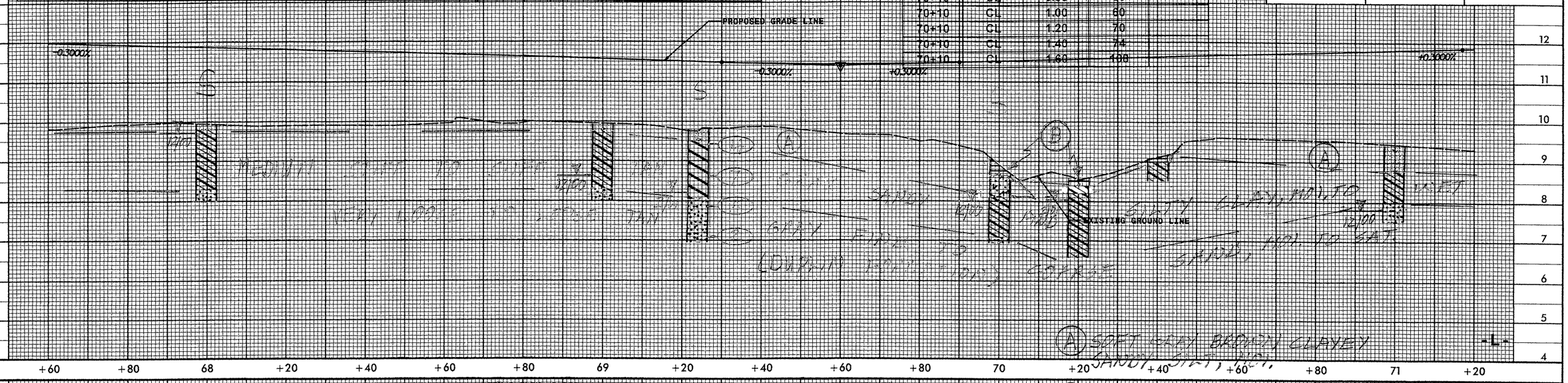
SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
S-12	68+00	CL	0.30-1.60	A-6(6)	38	18	19.6	28.9	13.0	38.5	100	91	53	28.4	
SS-60	69+24	CL	0.30-0.46	A-7-6(16)	48	26	13.4	20.1	13.7	52.8	100	94	68		
SS-61	69+24	CL	1.67-1.87	A-2-4(0)	16	NP	61.1	28.3	0.4	10.2	100	66	12		
S-18	70+00	CL	0.30-0.80	A-5(5)	77	NP	19.2	24.1	28.3	28.3	100	94	59	53.1	
S-19	70+00	CL	0.80-1.80	A-6(8)	40	16	17.4	23.7	10.3	48.6	100	96	60	29	

PI = 69+60.000
EL = 11.405 m
VC = 60 m
K = 100
DS = 110 km/h

VANE SHEAR TESTS

STATION	OFFSET	DEPTH (m)	S(kPa)
70+10	CL	0.20	10
70+10	CL	0.40	76
70+10	CL	0.60	42
70+10	CL	0.80	56
70+10	CL	1.00	60
70+10	CL	1.20	70
70+10	CL	1.40	74
70+10	CL	1.60	100



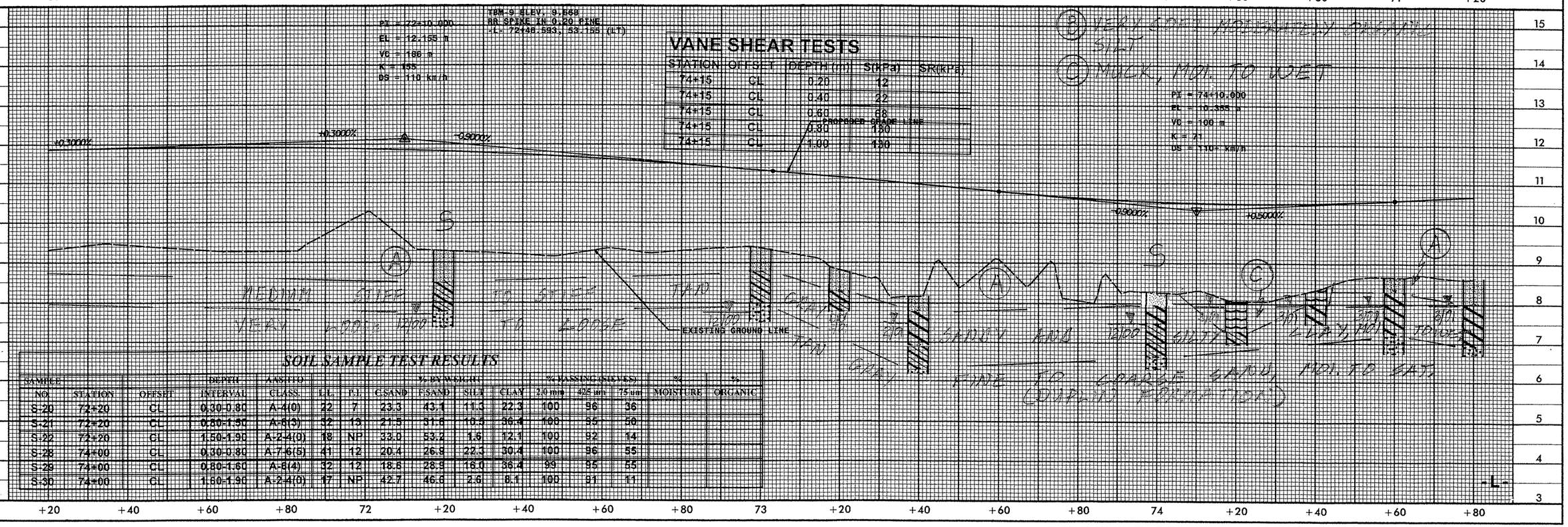
TBM-9 ELEV. 9.669
RR SPIKE IN 0.20 PINE
-L- 72+48.593, 53.155 (LT)

PI = 72+10.000
EL = 12.155 m
VC = 186 m
K = 155
DS = 110 km/h

VANE SHEAR TESTS

STATION	OFFSET	DEPTH (m)	S(kPa)	SR(kPa)
74+15	CL	0.20	12	
74+15	CL	0.40	22	
74+15	CL	0.60	68	
74+15	CL	0.80	150	
74+15	CL	1.00	130	

PI = 74+10.000
EL = 10.355 m
VC = 100 m
K = 71
DS = 110 km/h



SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
S-20	72+20	CL	0.30-0.80	A-4(0)	22	7	23.3	43.1	11.3	22.3	100	96	36		
S-21	72+20	CL	0.80-1.50	A-6(3)	32	13	21.5	31.6	10.5	36.4	100	95	50		
S-22	72+20	CL	1.50-1.90	A-2-4(0)	18	NP	33.0	53.2	1.6	12.1	100	92	14		
S-28	74+00	CL	0.30-0.80	A-7-6(5)	41	12	20.4	26.9	22.3	30.4	100	96	55		
S-29	74+00	CL	0.80-1.60	A-6(4)	32	12	18.8	28.9	16.0	36.4	99	95	55		
S-30	74+00	CL	1.60-1.90	A-2-4(0)	17	NP	42.7	46.6	2.6	8.1	100	91	11		

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METRIC

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CONST.REV.

R /W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	53
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

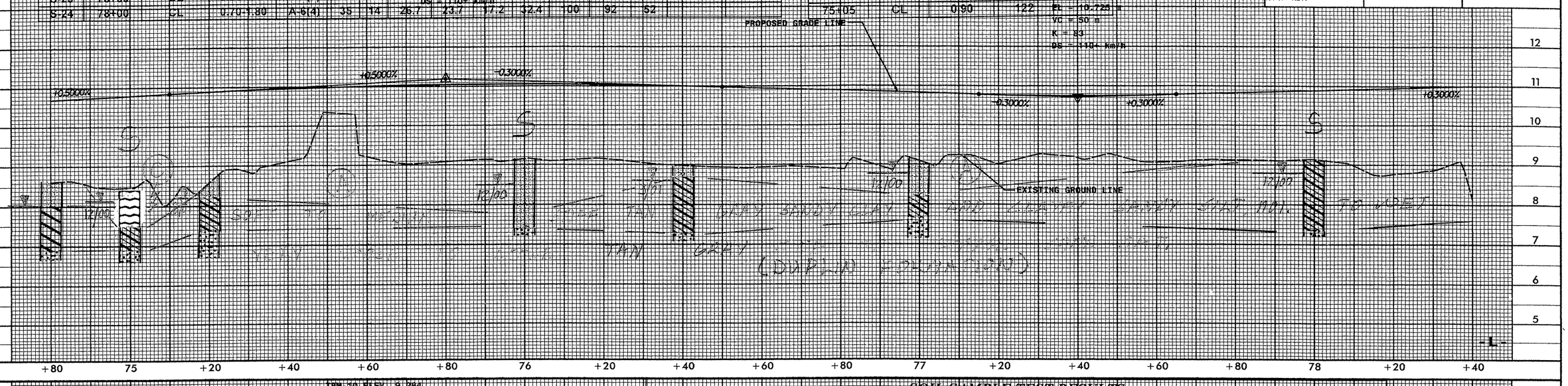
SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT CSAND	FSAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
S-97	75+00	CL	0.30-1.00	A-5(4)	134	NP	31	28.2	36.8	4.0	100	83	46		68.7
S-25	76+00	CL	0.30-1.40	A-4(0)	23	4	22.9	44.3	12.6	20.2	100	94	37		
S-26	76+00	CL	1.40-1.70	A-4(0)	22	9	25.3	42.5	11.9	20.2	100	93	37		
S-27	76+00	CL	1.70-1.90	A-2-4(0)	18	NP	33.6	53.4	0.8	12.1	100	89	14		
S-23	78+00	CL	0.30-0.70	A-6(4)	36	11	24.9	25.1	21.7	28.3	100	92	53		
S-24	78+00	CL	0.70-1.80	A-6(4)	35	14	26.7	23.7	17.2	32.4	100	92	52		

VANE SHEAR TESTS

STATION	OFFSET	DEPTH (m)	S(kPa)	SR(kPa)
75+05	CL	0.30	27	
75+05	CL	0.45	14	
75+05	CL	0.60	38	
75+05	CL	0.75	62	
75+05	CL	0.90	122	

PI = 77+40.000
EL = 10.725 m
VC = 50 m
K = 83
DS = 110+ Km/h



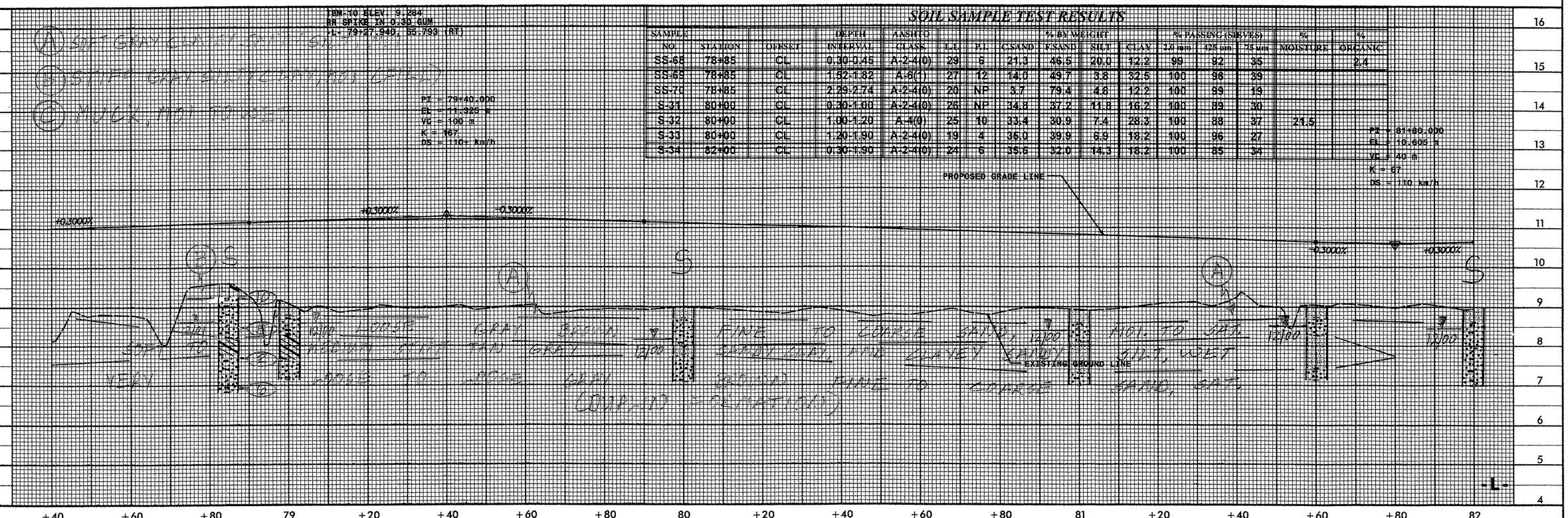
SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT CSAND	FSAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
SS-68	78+85	CL	0.30-0.45	A-2-4(0)	29	6	21.3	46.5	20.0	12.2	99	92	36		2.4
SS-69	78+85	CL	1.52-1.82	A-6(1)	27	12	14.0	49.7	3.8	32.5	100	96	39		
SS-70	78+85	CL	2.29-2.74	A-2-4(0)	20	NP	3.7	79.4	4.6	12.2	100	99	19		
S-31	80+00	CL	0.30-1.00	A-2-4(0)	26	NP	34.8	37.2	11.8	16.2	100	89	30		
S-32	80+00	CL	1.00-1.20	A-4(0)	25	10	33.4	30.9	7.4	28.3	100	88	37	21.5	
S-33	80+00	CL	1.20-1.90	A-2-4(0)	19	4	36.0	39.9	6.9	18.2	100	96	27		
S-34	82+00	CL	0.30-1.90	A-2-4(0)	24	6	35.6	32.0	14.3	18.2	100	85	34		

TBM-10 ELEV. 9.284
RR SPIKE IN 0.30 GUM
+L+ 79+27.940, 55.793 (RT)

PI = 79+40.000
EL = 11.925 m
VC = 100 m
K = 167
DS = 110+ Km/h

PI = 81+80.000
EL = 10.605 m
VC = 40 m
K = 67
DS = 110 Km/h



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URS Corporation – Maryland
3109 Poplarwood Court, Suite 301
Raleigh, North Carolina 27604
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R /W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	54
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

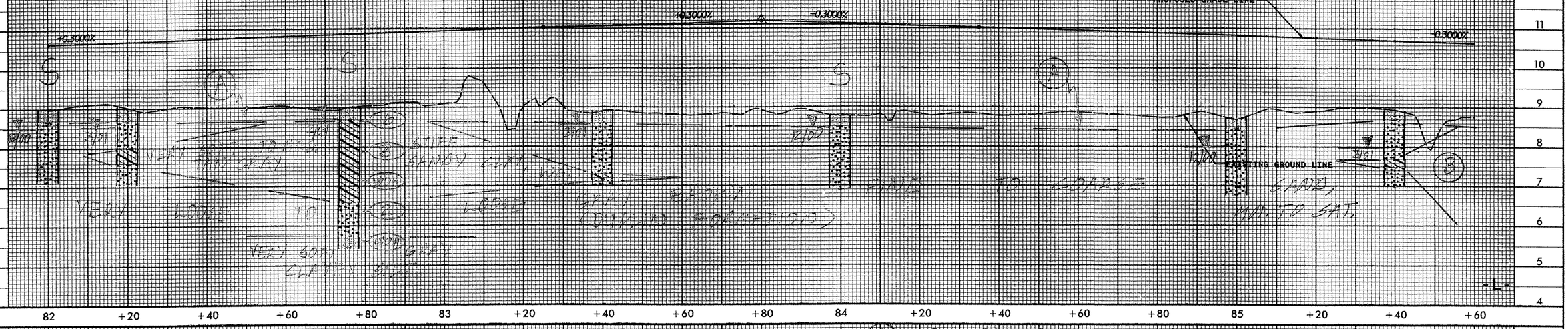
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
S-34	82+00	CL	0.30-1.98	A-2-4(0)	24	6	35.6	32.8	14.5	16.2	100	85	34		
SS-71	82+76	CL	0.30-0.45	A-6(1)	28	13	31.3	34.3	12.1	22.3	100	85	36		
SS-72	82+76	CL	1.52-1.97	A-6(2)	28	12	2.2	58.3	21.2	18.3	100	99	45		
SS-73	82+76	CL	2.44-2.74	A-2-4(0)	23	NP	52.2	35.5	4.2	8.1	100	74	14		
SS-74	82+76	CL	3.20-3.50	A-4(3)	24	6	7.7	12.2	47.6	32.5	100	96	85		
S-35	84+00	CL	0.30-1.90	A-2-4(0)	22	7	46.3	28.1	5.4	20.2	100	77	28		

PI = 83+80.000
EL = 11.205 m
VC = 110 m
K = 183
DS = 110+ km/h

TBM 11 ELEV. 9.204
RR SPIKE IN 0.23 PINE
-L- 85+15.831, 44.989 (LT)

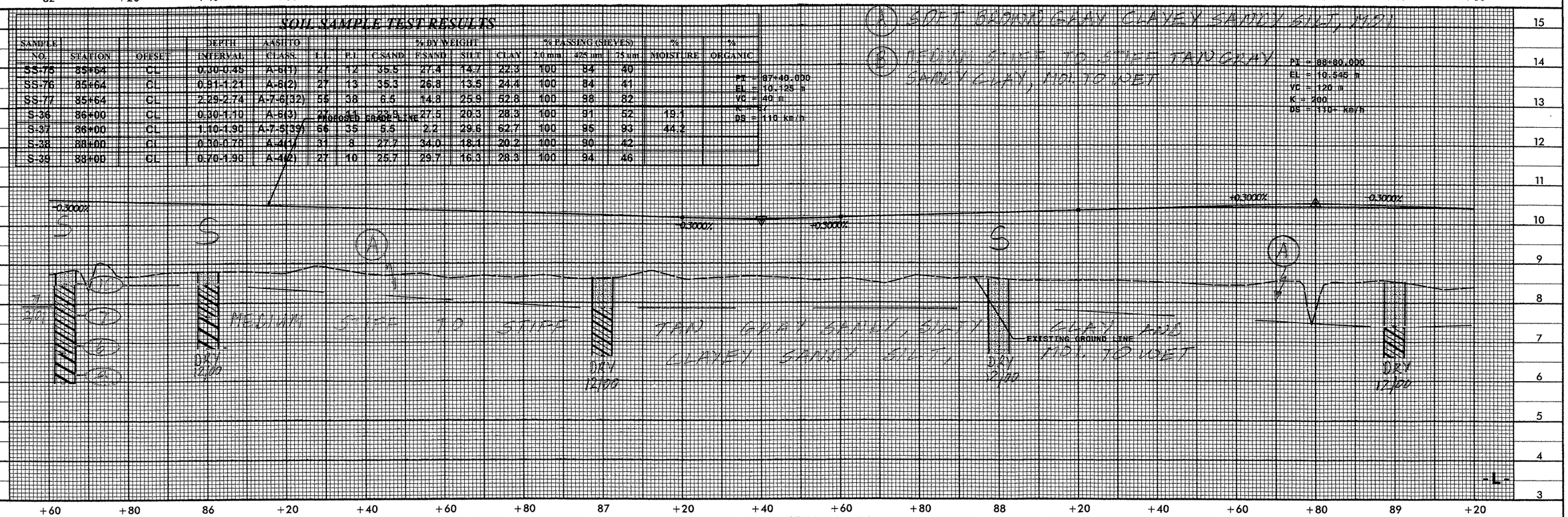


SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
SS-75	85+64	CL	0.30-0.45	A-6(1)	27	12	35.5	27.4	14.7	22.3	100	94	40		
SS-76	85+64	CL	0.91-1.21	A-6(2)	27	13	35.3	26.8	13.5	24.4	100	84	41		
SS-77	85+64	CL	2.29-2.74	A-7-6(32)	55	38	6.5	14.8	25.9	52.8	100	98	82		
S-36	86+00	CL	0.30-1.10	A-6(3)	27	14	33.1	27.5	20.3	28.3	100	91	52	19.1	
S-37	86+00	CL	1.10-1.90	A-7-5(39)	56	35	5.5	2.2	29.6	62.7	100	95	93	44.2	
S-38	88+00	CL	0.30-0.70	A-4(1)	31	8	27.7	34.0	18.1	20.2	100	90	42		
S-39	88+00	CL	0.70-1.90	A-4(2)	27	10	25.7	29.7	16.3	28.3	100	94	46		

PI = 87+40.000
EL = 10.125 m
VC = 40 m
K = 67
DS = 110 km/h

PI = 88+80.000
EL = 10.545 m
VC = 120 m
K = 200
DS = 110+ km/h



TBM-12 ELEV. 8.813
RR SPIKE IN 0.25 POPLAR
-L- 91+59.823, 50.318 (LT)

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CONST.REV.

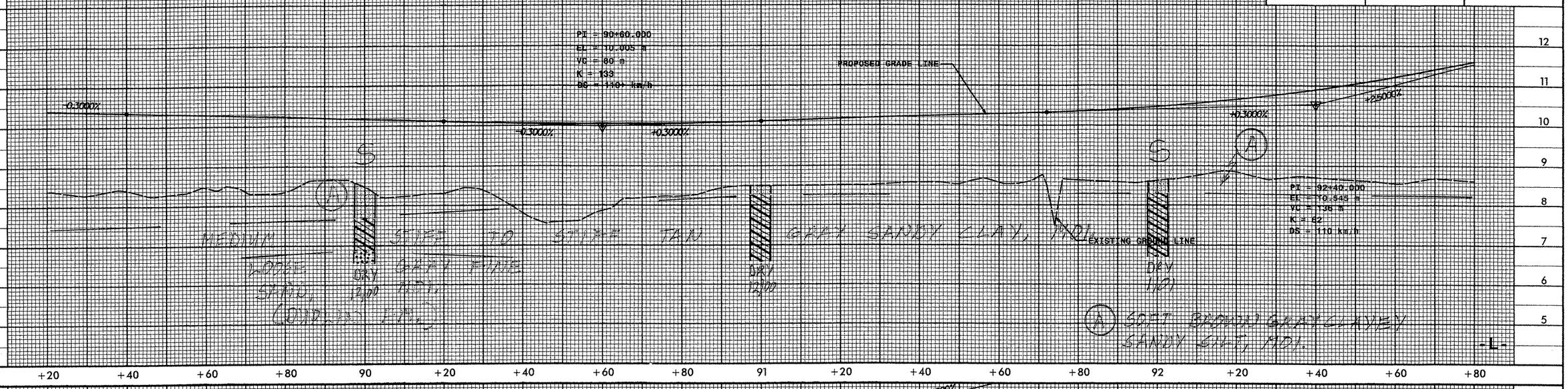
R /W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	55
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

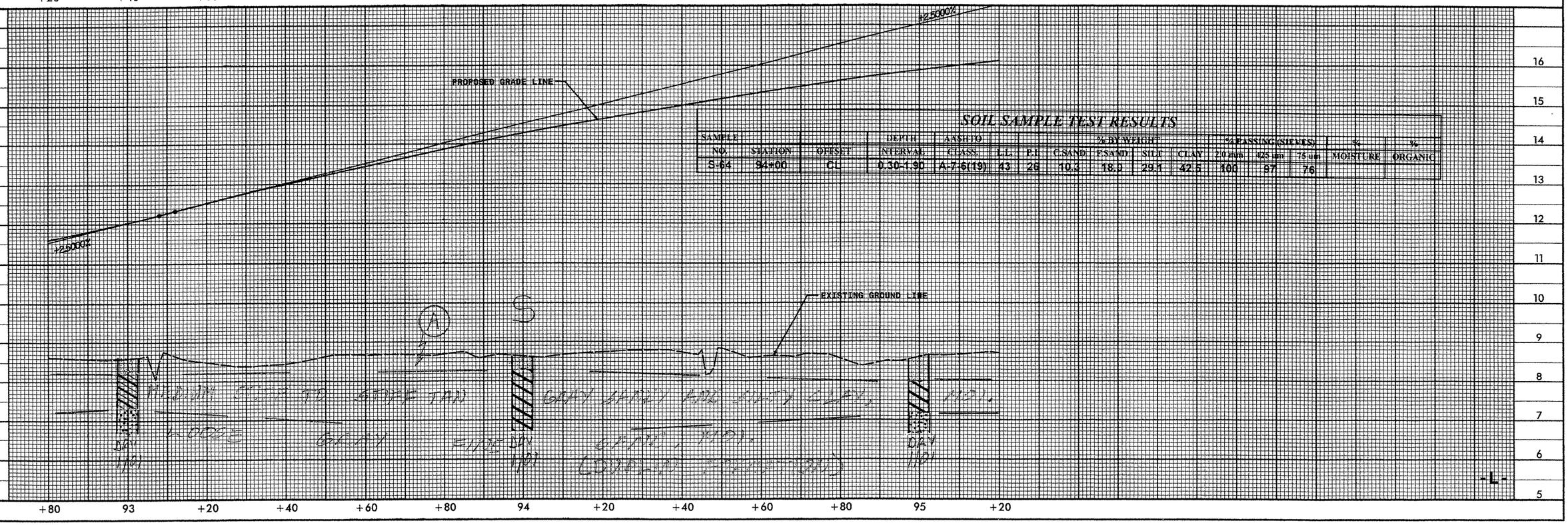
SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
S-40	90+00	CL	0.20-0.80	A-4(1)	25	8	19.0	39.2	14.5	28.3	100	94	46		
S-41	90+00	CL	0.80-1.60	A-6(5)	31	12	17.2	24.5	21.9	36.4	100	94	63	32.8	
S-42	90+00	CL	1.60-1.90	A-2-4(0)	21	NP	3.5	85.2	1.1	10.1	100	100	12		
S-65	92+00	CL	0.30-1.90	A-6(4)	32	16	26.5	28.1	15.0	30.4	100	87	49	20.8	



SOIL SAMPLE TEST RESULTS

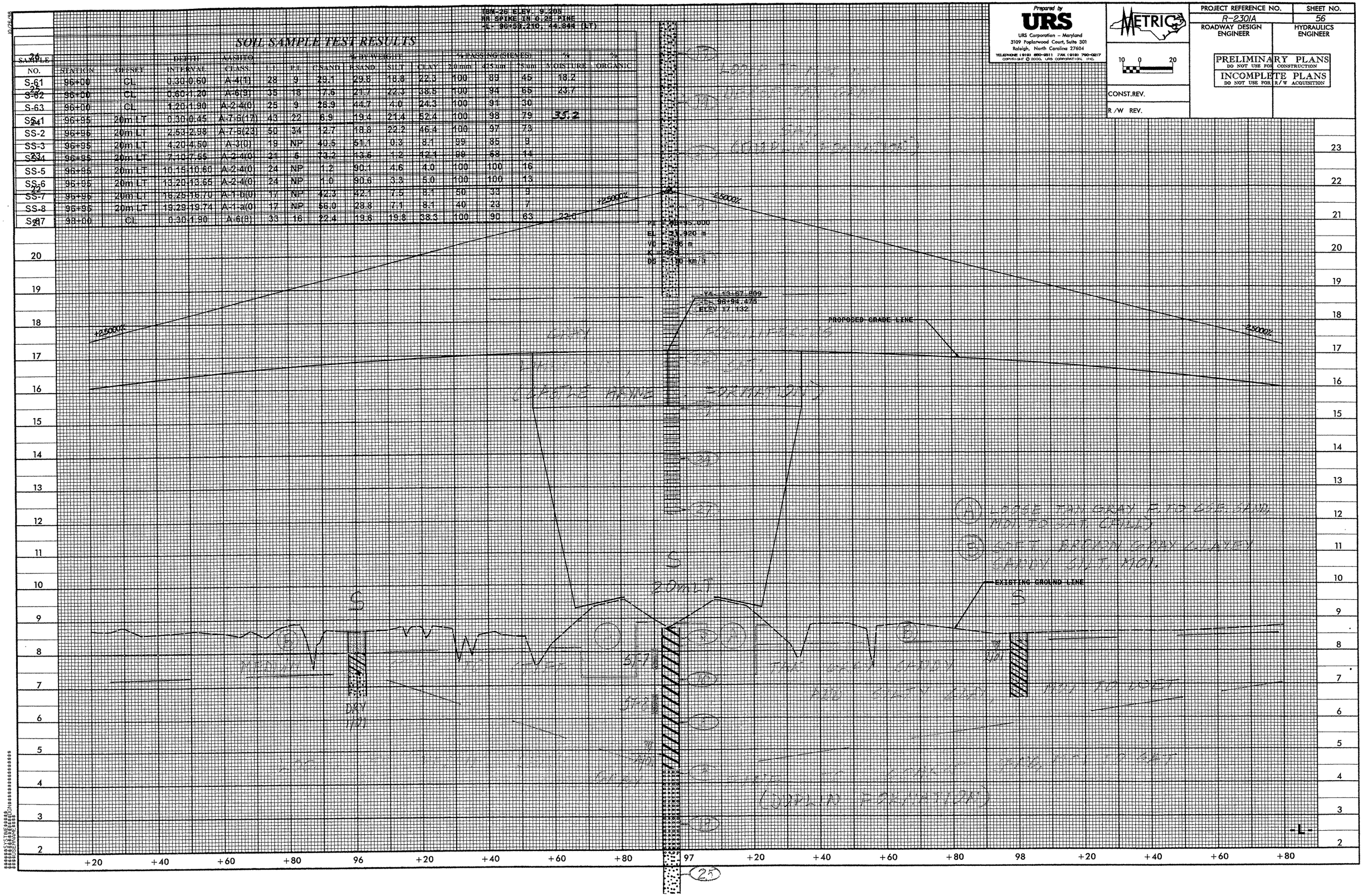
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
S-64	94+00	CL	0.30-1.90	A-7-6(19)	43	26	10.3	18.0	29.1	42.5	100	97	76		



BM-26 ELEV. 9.205
RR SPIKE IN 0.25 PINE
-L- 96+58.210, 44.845 (LT)

SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT GRAVEL	SAND	SILT	CLAY	% PASSING SIEVES 2.0mm	425um	75um	% MOISTURE	% ORGANIC
S-61	96+00	CL	0.30-0.60	A-4(1)	28	9	29.1	29.8	18.8	22.3	100	89	45	18.2	
S-62	96+00	CL	0.60-1.20	A-6(9)	35	18	17.6	21.7	22.3	38.5	100	94	65	23.7	
S-63	96+00	CL	1.20-1.90	A-2-4(0)	25	9	28.9	44.7	4.0	24.3	100	91	30		
SS-1	96+95	20m LT	0.30-0.45	A-7-5(17)	43	22	6.9	19.4	21.4	52.4	100	98	79	35.2	
SS-2	96+95	20m LT	2.53-2.98	A-7-5(23)	50	34	12.7	18.8	22.2	46.4	100	97	73		
SS-3	96+95	20m LT	4.20-4.60	A-3(0)	19	NP	40.5	51.1	0.3	8.1	99	85	9		
SS-4	96+95	20m LT	7.10-7.55	A-2-4(0)	21	5	73.2	13.6	1.2	12.1	99	69	14		
SS-5	96+95	20m LT	10.15-10.60	A-2-4(0)	24	NP	1.2	90.1	4.6	4.0	100	100	16		
SS-6	96+95	20m LT	13.20-13.65	A-2-4(0)	24	NP	1.0	90.6	3.3	5.0	100	100	13		
SS-7	96+95	20m LT	16.25-16.70	A-1-b(0)	17	NP	42.3	42.1	7.5	8.1	50	33	9		
SS-8	96+95	20m LT	19.29-19.74	A-1-a(0)	17	NP	56.0	28.8	7.1	8.1	40	23	7		
S-67	98+00	CL	0.30-1.90	A-6(8)	33	16	22.4	19.6	19.8	38.3	100	90	63	22.0	



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METRIC
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CONST.REV.
R /W REV.

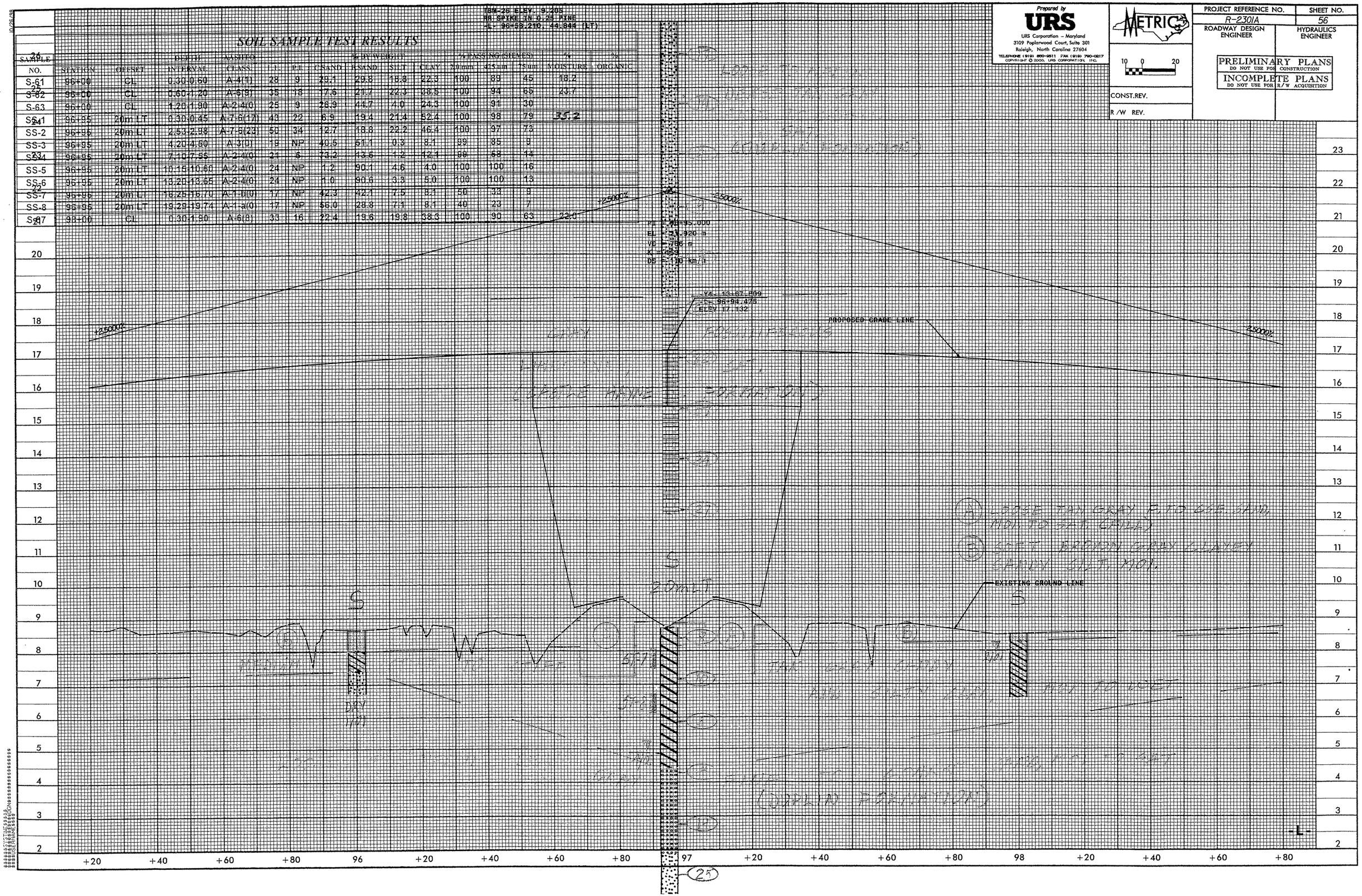
PROJECT REFERENCE NO.	SHEET NO.
R-2301A	56
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

TBM-26 ELEV. 9.205
RR SPIKE IN 0.25 PINE
-L- 96+58.210, 44.846 (LT)

SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	% BY WEIGHT LL	PI	CSAND	FSAND	SILT	CLAY	% PASSING SIEVES 2.00mm	.425mm	.075mm	% MOISTURE	% ORGANIC
S-61	96+00	CL	0.30-0.60	A-4(1)	28	9	29.1	29.8	18.8	22.3	100	89	45	18.2	
S-62	96+00	CL	0.60-1.20	A-6(9)	35	18	17.6	21.7	22.3	38.5	100	94	65	23.7	
S-63	96+00	CL	1.20-1.90	A-2-4(0)	25	9	28.9	44.7	4.0	24.3	100	91	30		
S-64	96+95	20m LT	0.30-0.45	A-7-6(17)	48	22	6.9	19.4	21.4	52.4	100	98	79	35.2	
SS-2	96+95	20m LT	2.53-2.98	A-7-6(23)	50	34	12.7	18.8	22.2	46.4	100	97	73		
SS-3	96+95	20m LT	4.20-4.60	A-3(0)	19	NP	40.5	51.1	0.3	8.1	99	85	9		
SS-4	96+95	20m LT	7.10-7.55	A-2-4(0)	21	6	73.2	13.6	1.2	12.1	99	68	14		
SS-5	96+95	20m LT	10.15-10.60	A-2-4(0)	24	NP	1.2	90.1	4.6	4.0	100	100	16		
SS-6	96+95	20m LT	13.20-13.65	A-2-4(0)	24	NP	1.0	90.6	3.3	5.0	100	100	13		
SS-7	96+95	20m LT	16.25-16.70	A-1-b(0)	17	NP	42.3	42.1	7.5	8.1	50	33	9		
SS-8	96+95	20m LT	19.29-19.74	A-1-a(0)	17	NP	56.0	28.8	7.1	8.1	40	23	7		
S-67	98+00	CL	0.30-1.90	A-6(8)	33	16	22.4	19.6	19.8	38.3	100	90	63	22.0	



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URS
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3109 Poplarwood Court, Suite 301
Raleigh, North Carolina 27604
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PROJECT REFERENCE NO.	SHEET NO.
R-2301A	56
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

CONST.REV.
R/W REV.

10/26/98

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CONST.REV.

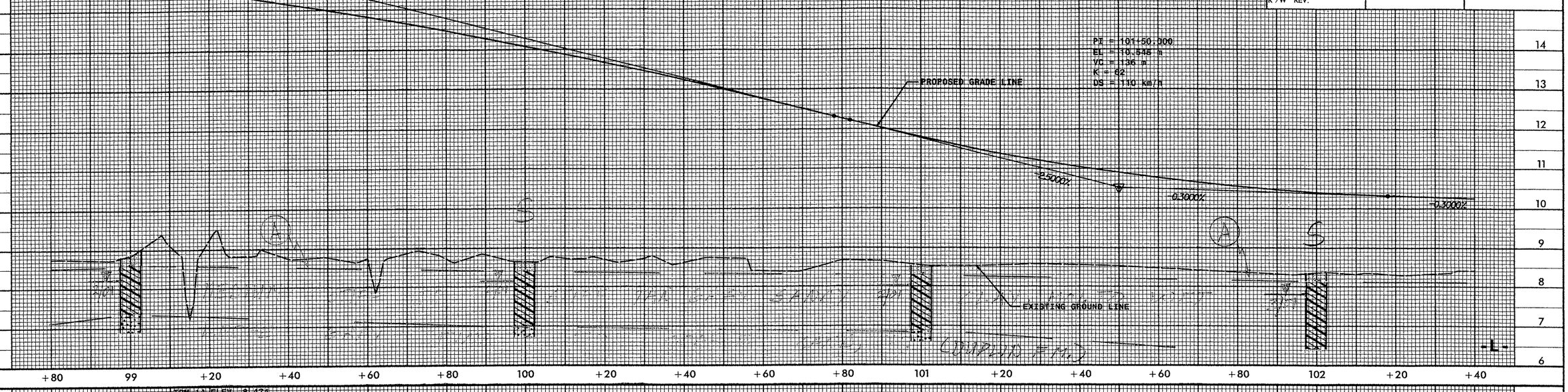
R /W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	57
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

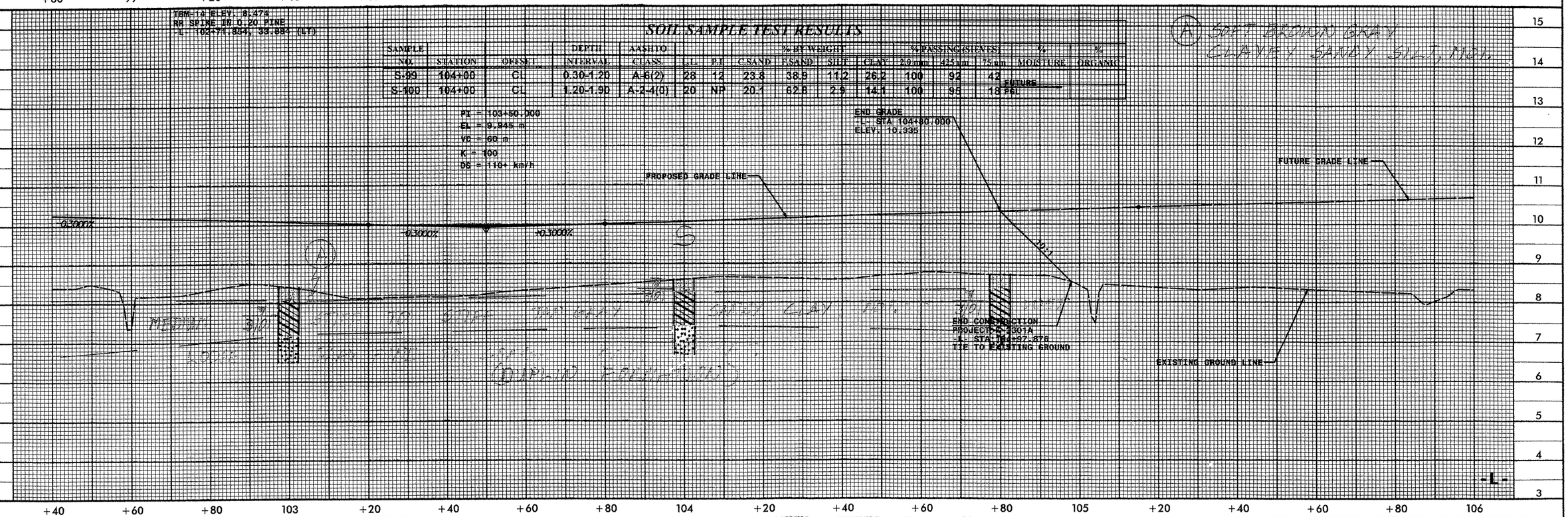
SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 mm	75 mm	% MOISTURE	% ORGANIC
S-88	100+00	CL	0.30-1.80	A-6(4)	31	13	26.9	25.8	13.9	34.3	100	89	53		
S-89	100+00	CL	1.60-1.90	A-2-4(0)	18	NP	27.6	51.0	3.2	18.1	100	94	25		
S-98	102+00	CL	0.30-1.90	A-6(4)	31	13	23.2	28.6	18	30.2	100	92	53	21.8	



SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 mm	75 mm	% MOISTURE	% ORGANIC
S-99	104+00	CL	0.30-1.20	A-6(2)	28	12	23.8	38.9	11.2	26.2	100	92	42		
S-100	104+00	CL	1.20-1.90	A-2-4(0)	20	NP	20.1	62.8	2.9	14.1	100	95	18		



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METRIC

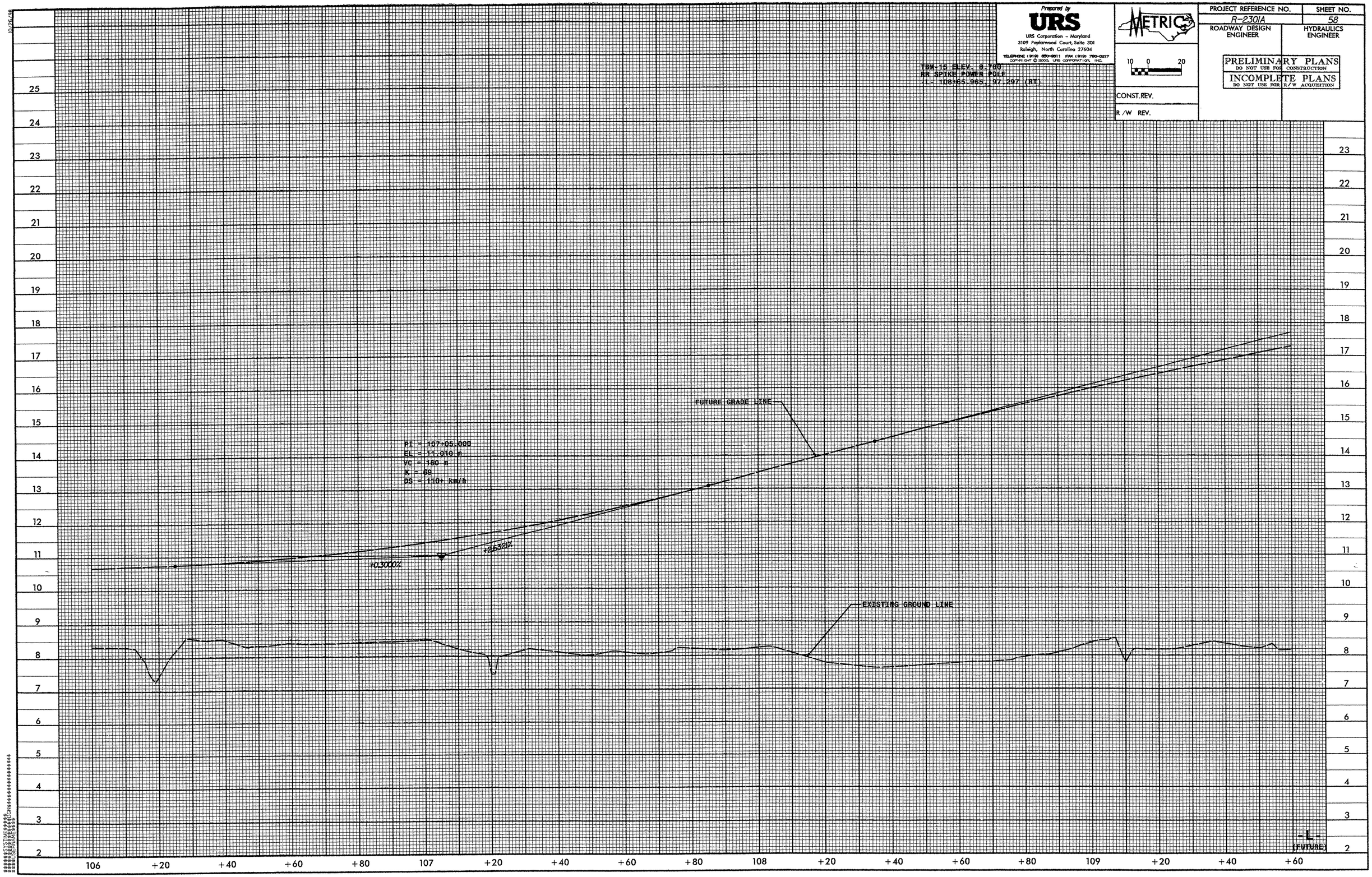
10 0 20

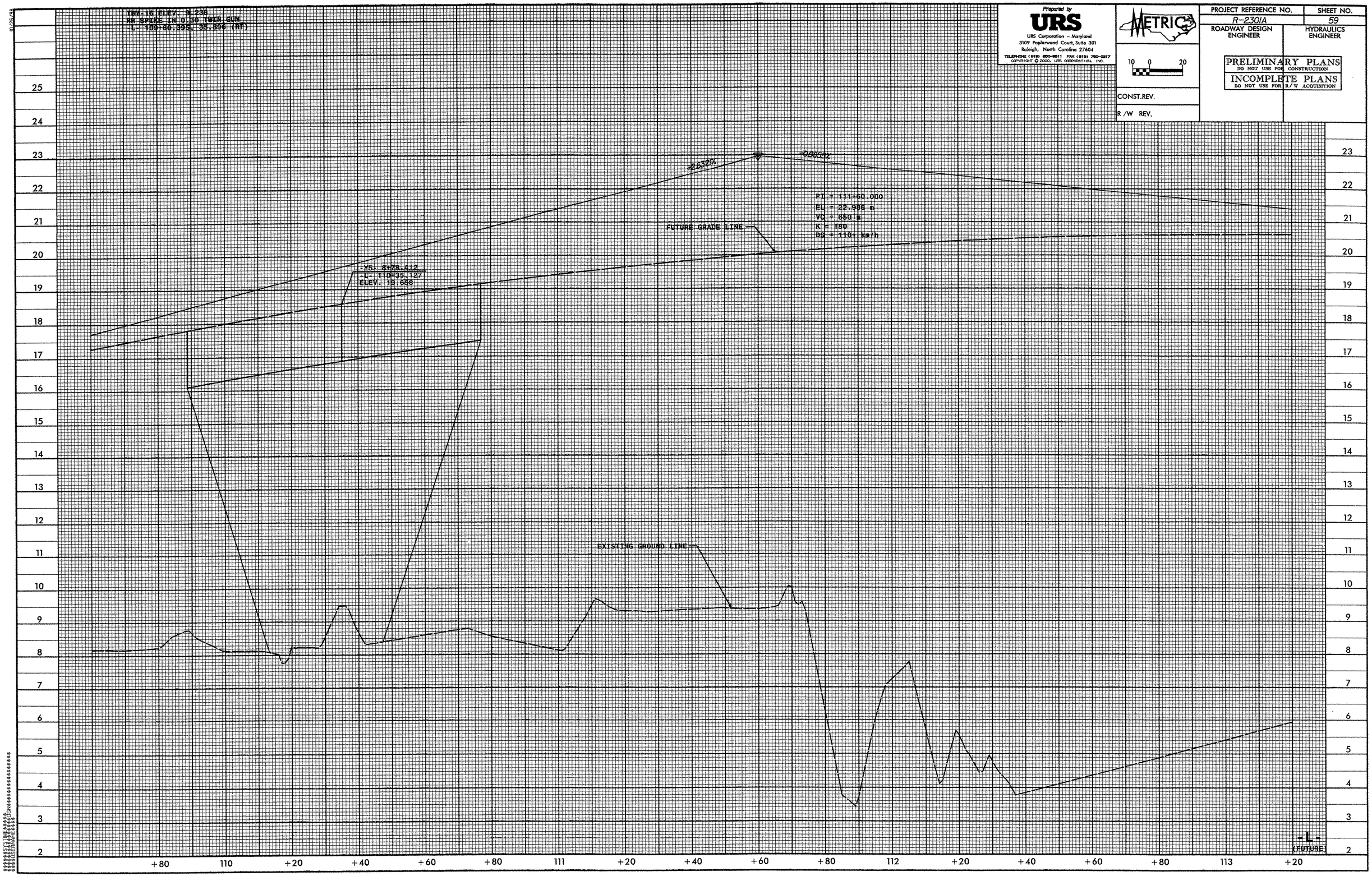
CONST.REV.

R /W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	58
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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CONST.REV.

R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	59
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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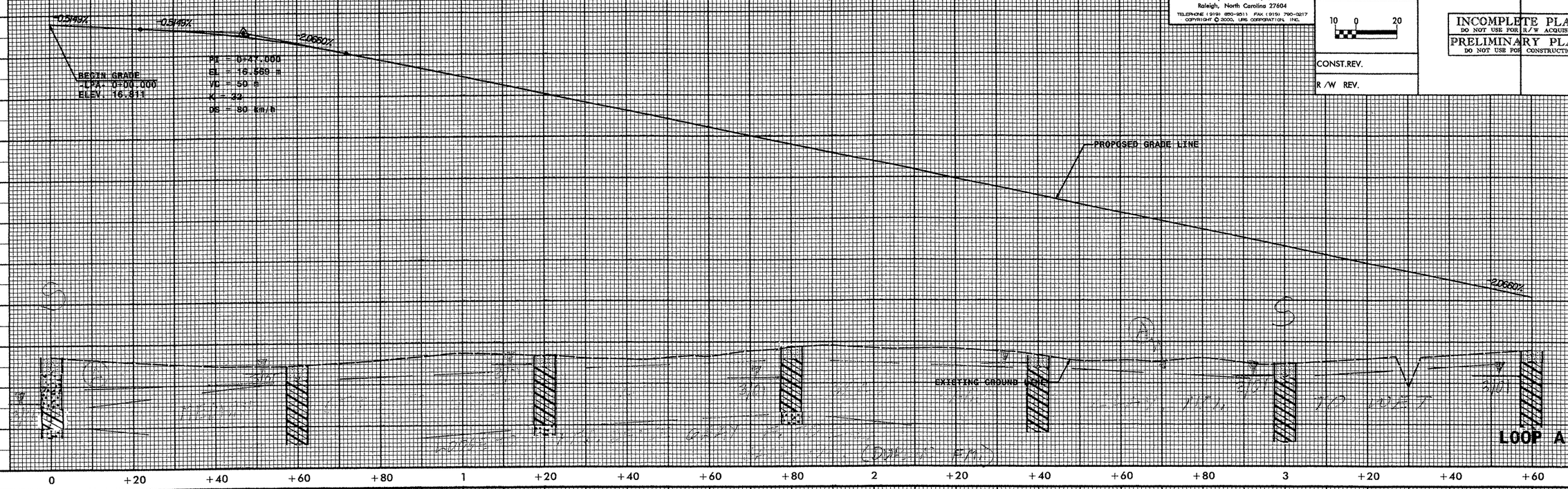
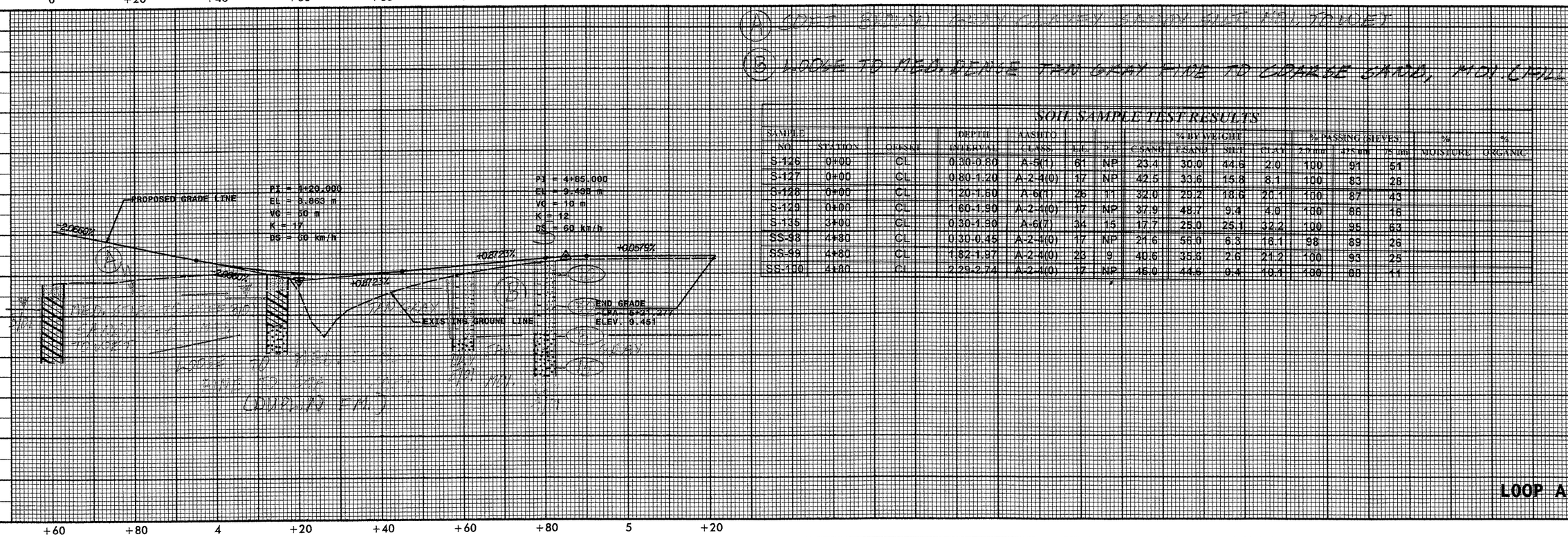
CONST.REV.

R /W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	60
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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





(A) CUT SLOPE TO BE VERY STABLE WHEN THE PROJECT IS COMPLETED

(B) LOOSE TO MEDIUM DENSE TAN CLAY FINE TO COARSE SAND, MOISTURE

SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% BY WEIGHT GRAVEL	SAND	SILT	CLAY	% PASSING SIEVES 2.0 mm	425 μm	75 μm	% MOISTURE	% ORGANIC
S-126	0+00	CL	0.30-0.80	A-3(1)	61	NP	23.4	30.0	44.6	2.0	100	91	51		
S-127	0+00	CL	0.80-1.20	A-2-4(0)	17	NP	42.5	33.6	15.8	8.1	100	83	28		
S-128	0+00	CL	1.20-1.50	A-6(1)	26	11	32.0	29.2	18.6	20.1	100	87	43		
S-129	0+00	CL	1.60-1.90	A-2-4(0)	17	NP	37.9	48.7	9.4	4.0	100	86	16		
S-135	3+00	CL	0.30-1.90	A-6(7)	34	15	17.7	25.0	25.1	32.2	100	95	63		
SS-98	4+80	CL	0.30-0.45	A-2-4(0)	17	NP	21.6	56.0	6.3	16.1	98	89	26		
SS-99	4+80	CL	1.82-1.97	A-2-4(0)	23	9	40.6	35.6	2.6	21.2	100	93	25		
SS-100	4+80	CL	2.29-2.74	A-2-4(0)	17	NP	46.0	44.6	0.4	10.4	100	88	11		

LOOP A

10/25/98

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URS
URS Corporation – Maryland
3109 Poplarwood Court, Suite 301
Raleigh, North Carolina 27604
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METRIC

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CONST.REV.

R /W REV.

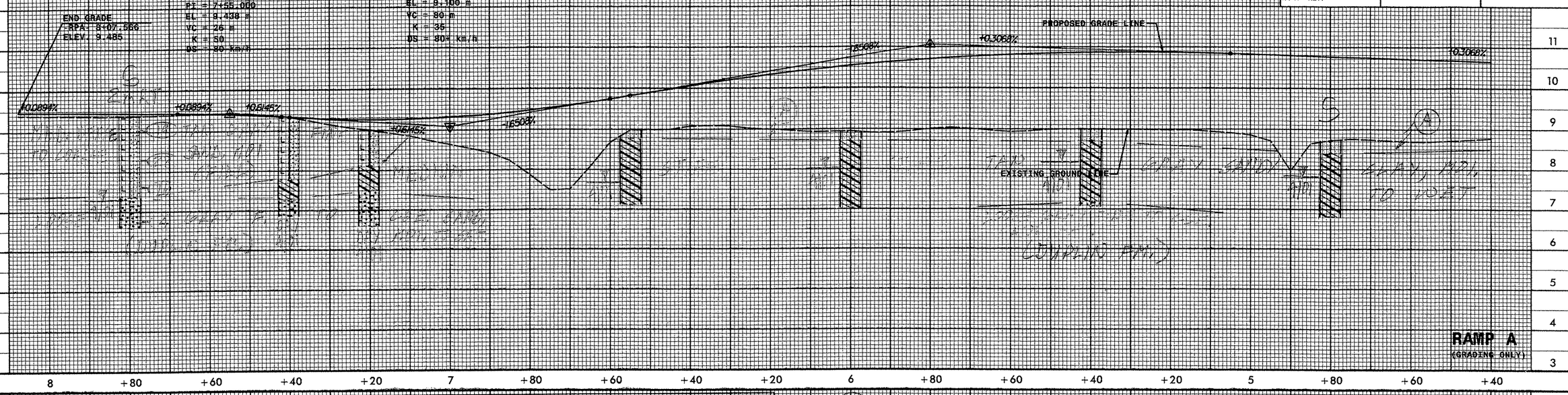
PROJECT REFERENCE NO.	SHEET NO.
R-2301A	61
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

SOIL SAMPLE TEST RESULTS

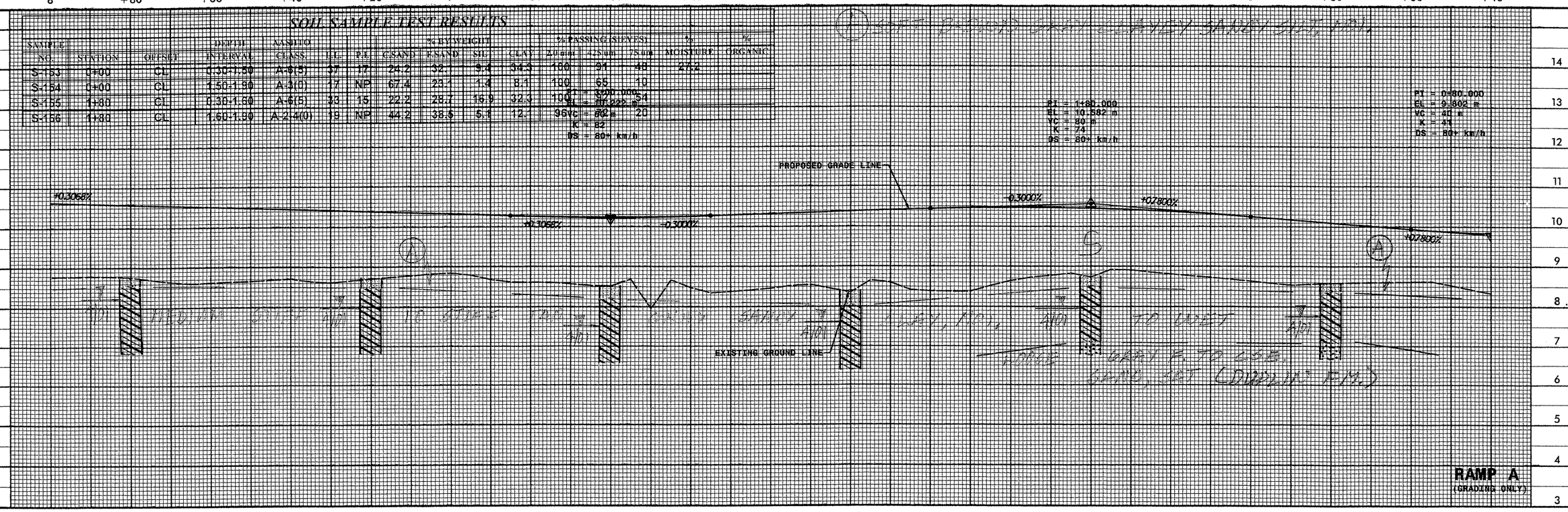
TBM-25 ELEV. 10.043
IRON SPIKE IN 0.30 PINE
DEPTH W.L. 8.00@10/10, 44.125 (RT)

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% BY WEIGHT C SAND	F SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
S-157	4+80	CL	0.30-1.90	A-6(3)	27	12	26.0	27.0	22.7	24.2	100	91	53		
SS-96	7+80	2M RT	0.30-0.45	A-2-4(0)	18	NP	20.6	56.3	5.0	18.1	89	80	25		
SS-97	7+80	2M RT	1.52-1.97	A-2-4(0)	16	NP	30.2	33.9	8.7	12.1	99	88	16		



SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% BY WEIGHT C SAND	F SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
S-153	0+00	CL	0.30-1.50	A-6(5)	37	17	24.2	32.1	9.4	34.3	100	91	48	27.2	
S-154	0+00	CL	1.50-1.90	A-3(0)	17	NP	67.4	23.1	1.4	8.1	100	65	10		
S-155	1+80	CL	0.30-1.60	A-6(5)	33	15	22.2	28.7	16.9	32.3	100	94	54		
S-156	1+80	CL	1.60-1.90	A-2-4(0)	19	NP	44.2	38.5	5.1	12.1	96	80	20		



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3109 Poplarwood Court, Suite 301
Raleigh, North Carolina 27604
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METRIC

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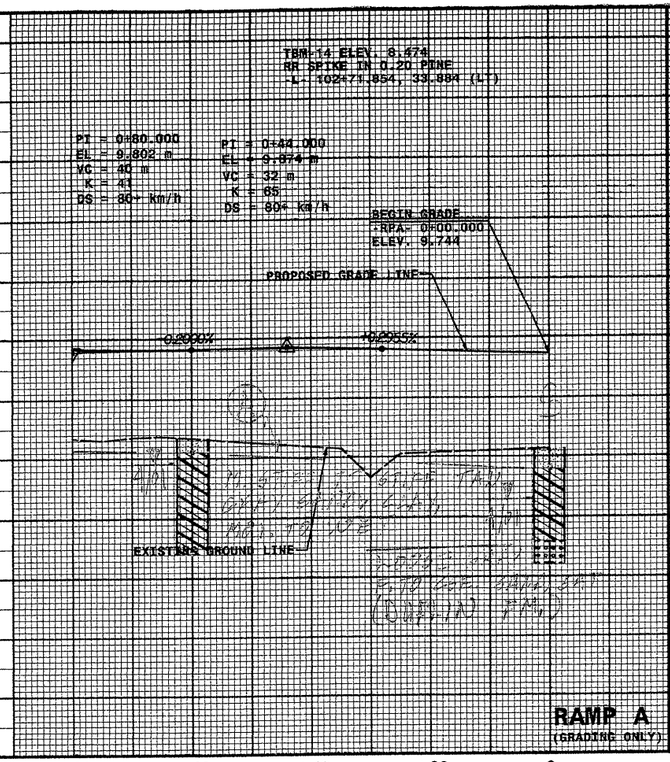
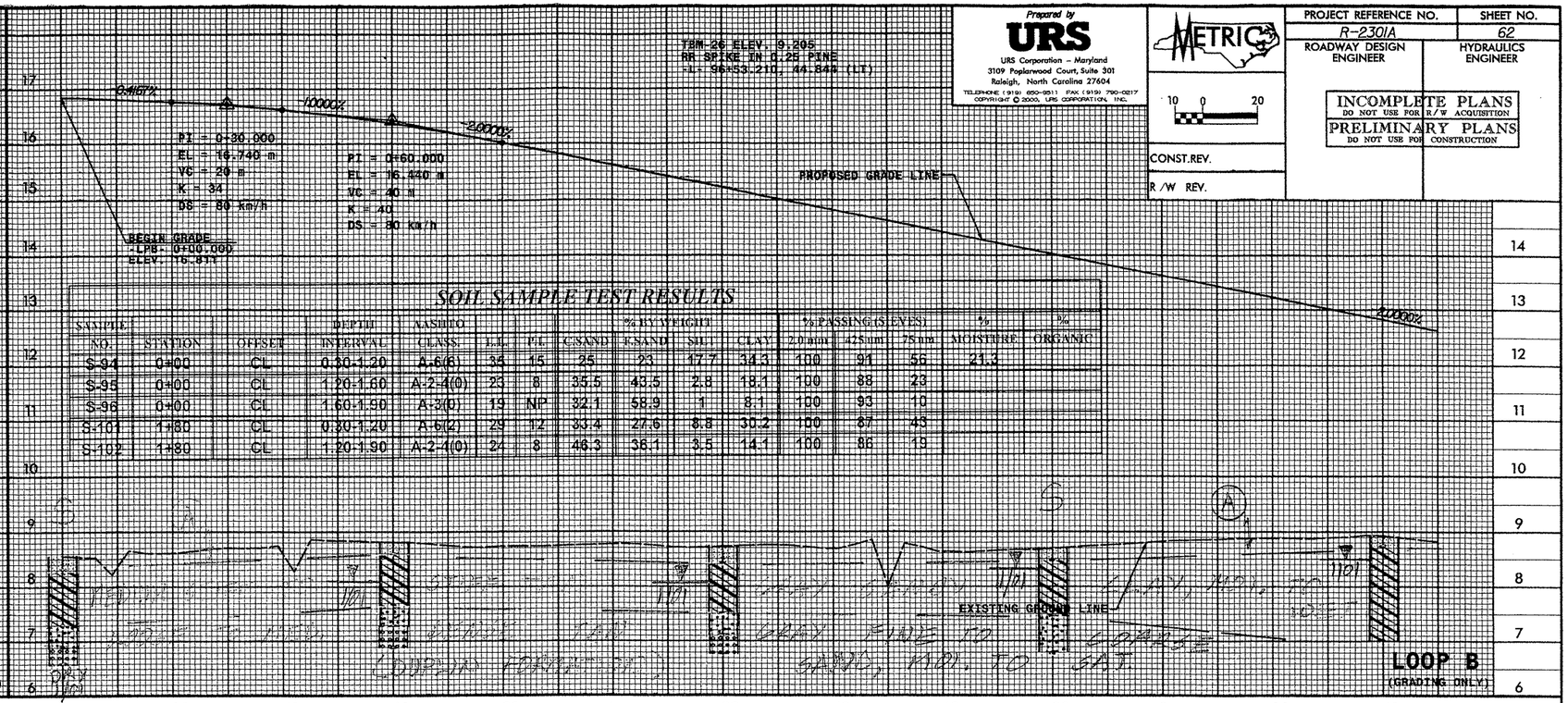
CONST.REV.

R /W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	62
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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



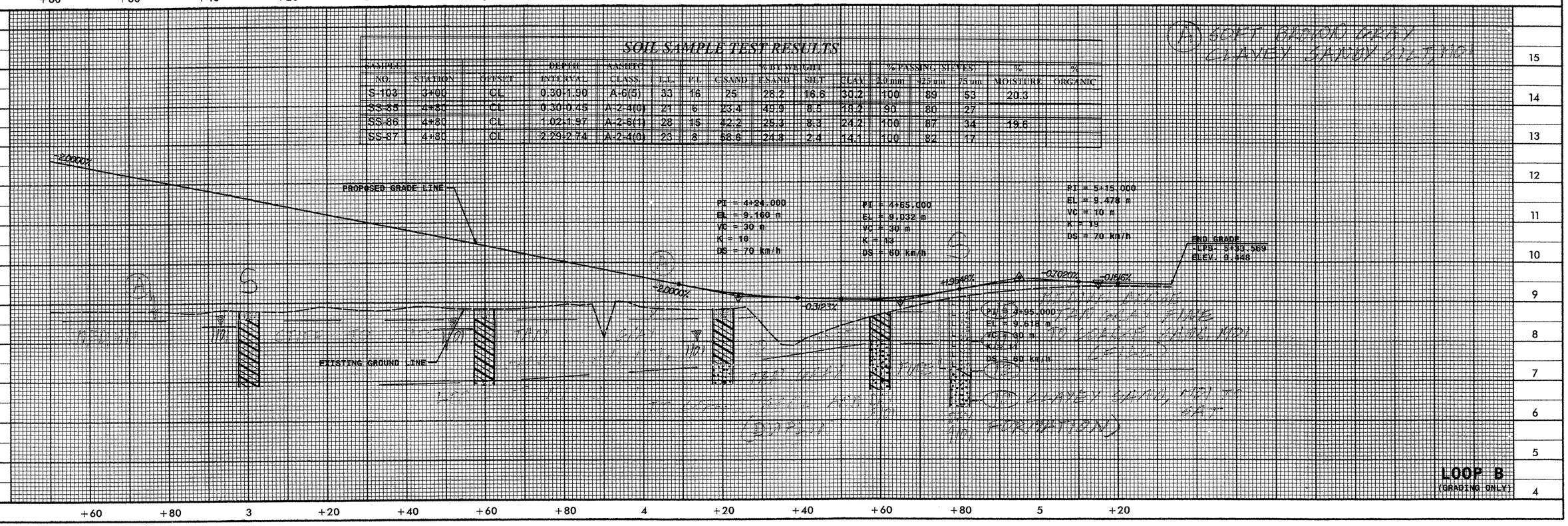


SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 mm	75 mm	% MOISTURE	% ORGANIC
S-94	0+00	CL	0.30-1.20	A-6(6)	35	15	25	23	17.7	34.3	100	91	56	21.3	
S-95	0+00	CL	1.20-1.60	A-2-4(0)	23	8	35.5	43.5	2.8	18.1	100	88	23		
S-96	0+00	CL	1.60-1.90	A-3(0)	19	NP	32.1	58.9	1	8.1	100	93	10		
S-101	1+80	CL	0.30-1.20	A-6(2)	29	12	33.4	27.6	8.8	30.2	100	87	43		
S-102	1+80	CL	1.20-1.90	A-2-4(0)	24	8	46.3	36.1	3.5	14.1	100	86	19		

SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 mm	75 mm	% MOISTURE	% ORGANIC
S-103	3+00	CL	0.30-1.90	A-6(5)	33	16	25	28.2	16.6	30.2	100	89	53	20.3	
SS-85	4+80	CL	0.30-0.45	A-2-4(0)	21	6	23.4	49.9	8.5	18.2	90	80	27		
SS-86	4+80	CL	1.02-1.97	A-2-6(1)	28	15	42.2	25.3	8.3	24.2	100	87	34	19.6	
SS-87	4+80	CL	2.29-2.74	A-2-4(0)	23	8	58.6	24.8	2.4	14.1	100	82	17		



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METRIC

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PROJECT REFERENCE NO.	SHEET NO.
R-2301A	63
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

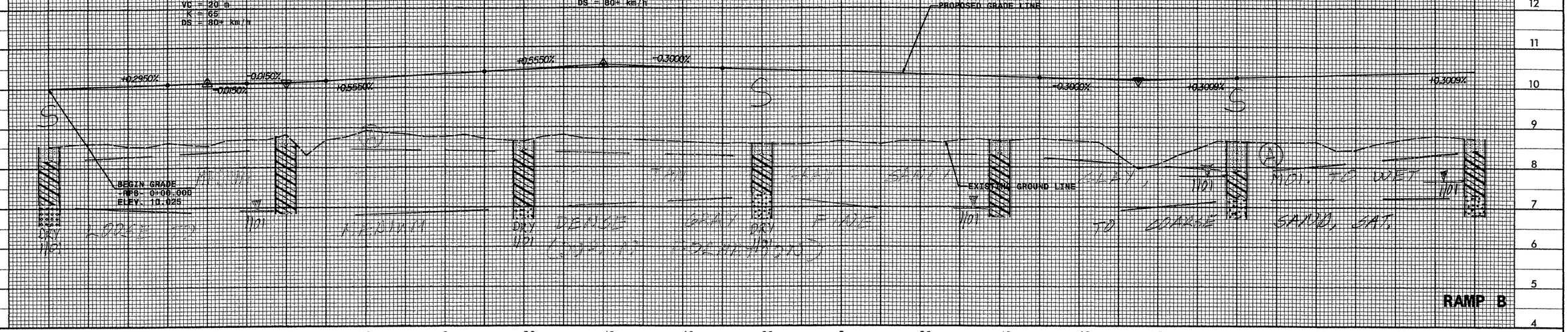
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.

R /W REV.

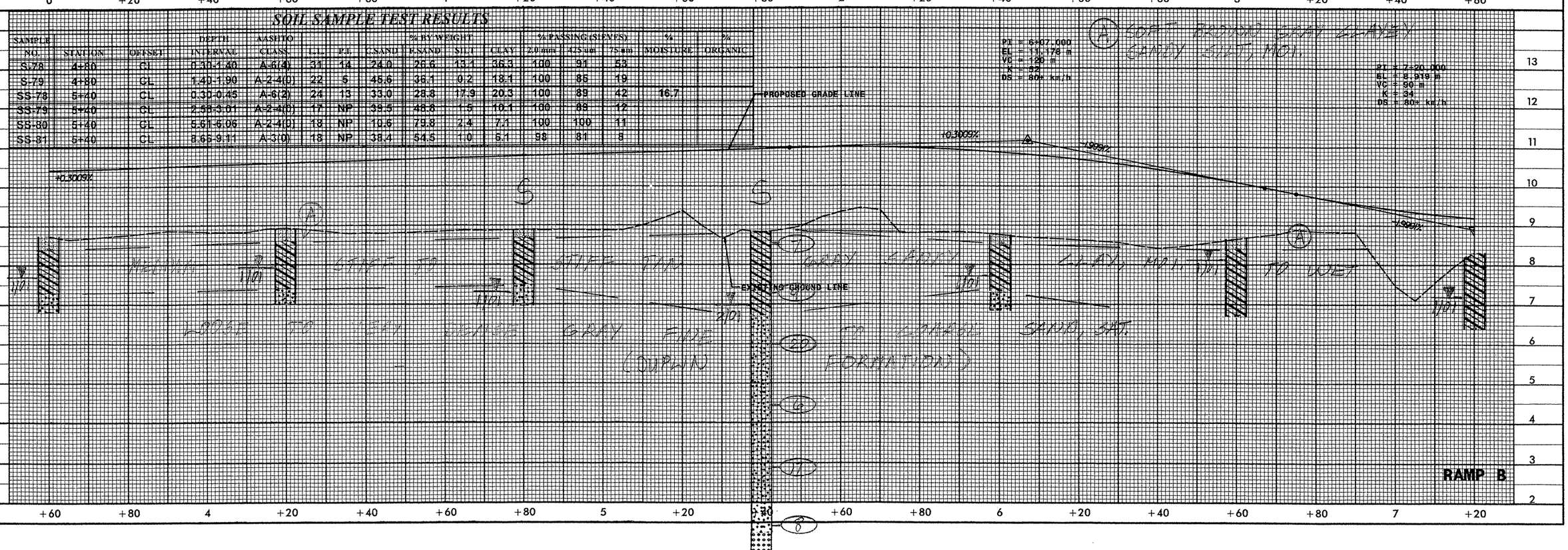
SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
S-71	0+00	CL	0.30-1.40	A-6(8)	37	17	21.8	22.8	15.4	40.3	100	91	59	24	
S-72	0+00	CL	1.40-1.90	A-3(0)	18	NP	59.6	32.2	1.0	7.1	100	87	8		
S-73	1+80	CL	0.30-1.20	A-6(2)	27	11	29.0	30.8	7.9	32.3	100	88	44		
S-74	1+80	CL	1.20-1.90	A-2-4(0)	25	9	26.0	48.0	1.8	24.2	100	92	28		
S-75	3+00	CL	0.30-0.70	A-4(0)	27	8	34.3	32.1	11.5	22.2	100	87	38	25.2	
S-76	3+00	CL	0.70-1.40	A-6(2)	26	13	31.9	28.2	7.7	32.3	100	86	44	19	
S-77	3+00	CL	1.40-1.90	A-4(0)	21	NP	43.3	35.7	0.8	20.2	100	81	23		



SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
S-78	4+80	CL	0.30-1.40	A-6(4)	31	14	24.0	26.6	13.4	36.3	100	91	53		
S-79	4+80	CL	1.40-1.90	A-2-4(0)	22	5	45.6	36.1	0.2	18.1	100	85	19		
SS-78	5+40	CL	0.30-0.45	A-6(2)	24	13	33.0	28.8	17.9	20.3	100	89	42	16.7	
SS-79	5+40	CL	2.58-3.01	A-2-4(0)	17	NP	39.5	48.8	1.5	10.1	100	88	12		
SS-80	5+40	CL	5.61-6.06	A-2-4(0)	18	NP	10.6	79.8	2.4	7.1	100	100	11		
SS-81	5+40	CL	8.65-9.11	A-3(0)	18	NP	38.4	54.5	1.0	6.1	98	81	8		



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METRIC

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CONST.REV.

R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	64
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

TBM-25 ELEV. 8.043
RR SPIKE IN 0.30 PINE
Y3: 8+31.116, 44.123 (RT)

TBM-25 ELEV. 9.205
RR SPIKE IN 0.25 PINE
-L-: 96+53.210, 44.844 (LT)

SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	% BY WEIGHT LL	PI	C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
SS-83	7+80	CL	0.30-0.45	A-2-4(0)	18	NP	34.5	50.1	5.3	10.1	98	34	17		
SS-84	7+80	CL	1.52-1.97	A-2-4(0)	18	NP	38	46.3	5.7	8.1	97	30	15		

PI = 7+20.000
EL = 8.919 m
VC = 50 m
K = 34
DS = 80+ km/h

PI = 0+17.000
EL = 9.519 m
VC = 28 m
K = 48
DS = 80 km/h

-0.5152%
-0.5152%
2.0590%
2.0590%

BEGIN GRADE
-LPC: 0+00.000
ELEV. 16.805

PI = 0+46.000
EL = 16.569 m
VC = 50 m
K = 32
DS = 80 km/h

PROPOSED GRADE LINE

SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	% BY WEIGHT LL	PI	C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
S-152	0+00	CL	0.30-1.90	A-4(1)	24	8	27.6	26.2	17.9	28.3	100	90	51		
S-109	0+65	CL	0.20-1.60	A-7-6(11)	41	22	23.1	19.9	18.8	38.2	100	90	61	27.9	
S-110	0+65	CL	1.60-1.90	A-6(12)	34	13	0.8	27.3	41.7	30.2	100	100	94		
S-111	1+80	CL	0.20-1.20	A-4(0)	23	8	34	29.1	14.8	22.1	100	88	42		
S-112	1+80	CL	1.20-1.90	A-2-8(0)	27	14	41.3	34.4	7.2	17.1	100	83	25		

PROPOSED GRADE LINE

-0.5188%
-0.5188%
-0.0396%

END GRADE
-RPC: 8+49.861
ELEV. 9.532

EXISTING GROUND LINE

TO STIFF TAN CLAY SAND SILT

MOD. TO SOFT

LOOSE TO FIRM

RAMP B

MEDIUM STIFF SILTY CLAY

TO STIFF CLAY AND SAND

EXISTING GROUND LINE

TAN GRAY CLAYEY SILT

TAN GRAY SANDY SILT, MOD. TO SOFT

LOOP C
(GRADING ONLY)

+20 +40 +60 +80 8 +20 +40 0 +20 +40 +60 +80 1 +20 +40 +60 +80 2

SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	% BY WEIGHT LL	PI	C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
S-116	3+00	CL	0.50-1.00	A-6(11)	40	19	19.1	18.3	22.4	40.2	100	93	68	22.7	
S-117	3+00	CL	1.00-1.20	A-6(1)	27	14	34	31.4	13.6	21.1	100	87	38		
S-118	3+00	CL	1.20-1.50	A-2-4(0)	23	8	33.5	39.3	11.2	16.1	100	90	31		
S-119	4+20	CL	0.30-1.90	A-5(2)	45	NP	14.9	21.9	45.1	18.1	100	94	69	58.2	11.5
SS-88	4+80	CL	0.30-0.45	A-2-4(0)	16	NP	31.1	48.9	9.9	10.1	75	51	18		
SS-89	4+80	CL	1.67-1.97	A-4(1)	22	10	17.2	44.4	14.1	24.2	100	94	41		
SS-90	4+80	CL	2.44-2.74	A-2-4(0)	21	6	17.4	60.8	3.6	18.2	100	91	24		

(A) SOFT BROWN GRAY CLAYEY SANDY SILT, MOI.

(B) LOOSE GRAY FINE TO COARSE SAND, MOI. TO SAT. (DRAIN FILL)

(C) SOFT TO MEDIUM STIFF BROWN MODERATELY ORGANIC SILT, MOI. TO SAT.

-2.0590%

PROPOSED GRADE LINE

PI = 4+20.000
EL = 8.831 m
VC = 60 m
K = 16
DS = 60 km/h

+0.5141%
-0.0262%
+0.5141%

PI = 4+49.000
EL = 9.150 m
VC = 20 m
K = 19
DS = 70 km/h

END GRADE
-LPC: 5+21.277
ELEV: 9.503

EXISTING GROUND LINE

MEDIUM STIFF TO STIFF MOI.

TAN GRAY SANDY SILT

GRAY MOI.

TO STIFF TAN FINE SANDY SILT, MOI. TO SAT.

TO STIFF GRAY SANDY SILT

TO STIFF GRAY CLAYEY SILT, MOI. TO SAT.

LOOP C
(GRADING ONLY)

+20 +40 +60 +80 3 +20 +40 +60 +80 4 +20 +40 +60 +80 5 +20

10/26/98

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METRIC 10 0 20

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	65
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

CONST.REV.

R /W REV.

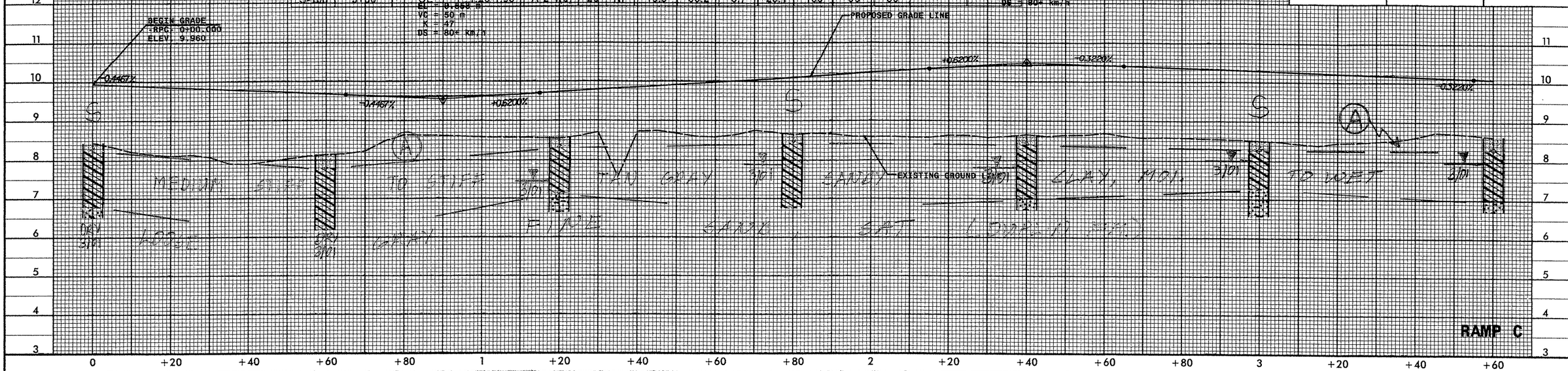
TBM-12 ELEV. 9.813
RR SPIKE IN 0.25 POPLAR
EL = 9+59.825, 50.318 (RT)

SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	% BY WEIGHT L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
S-104	0+00	CL	0.30-1.60	A-6(4)	28	12	20.5	28.6	20.6	30.2	100	92	55	15.3	
S-105	0+00	CL	1.60-1.90	A-2-4(0)	19	NP	1.2	76.9	9.8	12.1	100	100	24		
S-106	1+80	CL	0.30-1.90	A-6(5)	32	15	28.6	27.2	13.0	30.2	100	88	46		
S-107	3+00	CL	0.30-1.20	A-6(2)	26	12	26.0	33.4	14.4	26.2	100	89	43	19	
S-108	3+00	CL	1.20-1.90	A-2-4(0)	20	NP	10.9	63.2	5.7	20.1	100	96	30		

PI = 0+90.000
EL = 9.859 m
VC = 50 m
K = 47
DS = 80+ KM/H

PI = 2+40.000
EL = 10.488 m
VC = 50 m
K = 83
DS = 80+ KM/H



RAMP C

SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	% BY WEIGHT L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
S-113	5+40	CL	0.20-0.80	A-6(6)	33	14	24.2	20.7	20.9	34.2	100	91	60	22.2	
S-114	5+40	CL	0.80-1.10	A-2-6(1)	35	19	33.5	39.3	11.2	16.1	100	90	31		
S-115	5+40	CL	1.10-1.90	A-7-6(28)	53	38	8.6	14.1	28.0	48.2	100	98	82		
S-120	7+20	CL	0.10-1.00	A-6(7)	31	12	15.1	21.1	25.6	38.2	100	94	71	19	
S-121	7+20	CL	1.00-1.30	A-2-6(0)	30	12	40.2	40.9	4.8	14.1	100	84	22		
S-122	7+20	CL	1.30-1.60	A-7-6(33)	61	38	1.9	5.2	18.4	72.4	100	97	88		

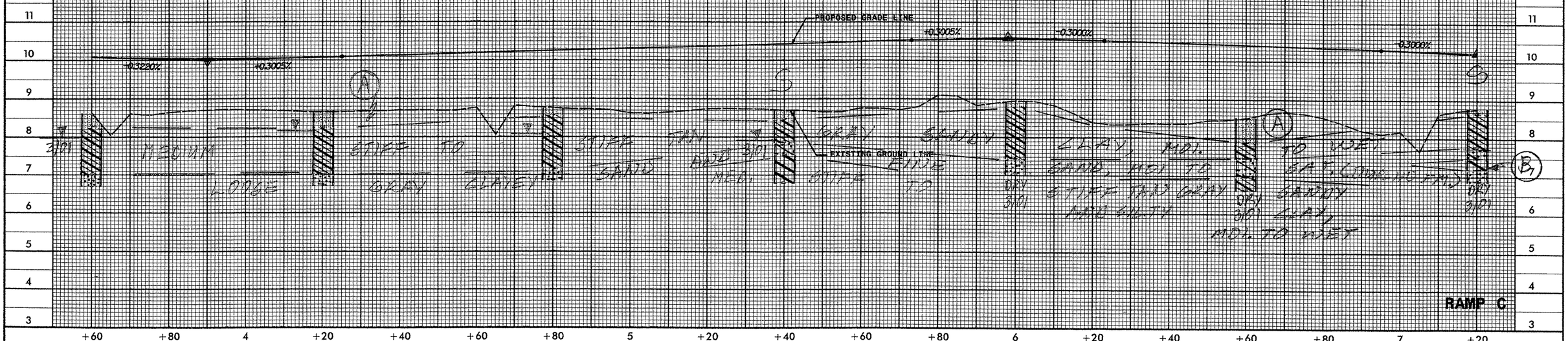
PI = 3+90.000
EL = 10.005 m
VC = 70 m
K = 112
DS = 80+ KM/H

PI = 5+98.000
EL = 10.630 m
VC = 50 m
K = 88
DS = 80+ KM/H

(A) SOFT BROWN CLAYEY SANDY SILT, MOI.

(B) MEDIUM STIFF GRAY SILTY CLAY, WET

PI = 7+20.000
EL = 10.264 m
VC = 50 m
K = 71
DS = 80+ KM/H



RAMP C

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	66
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

CONST.REV.

R/W REV.

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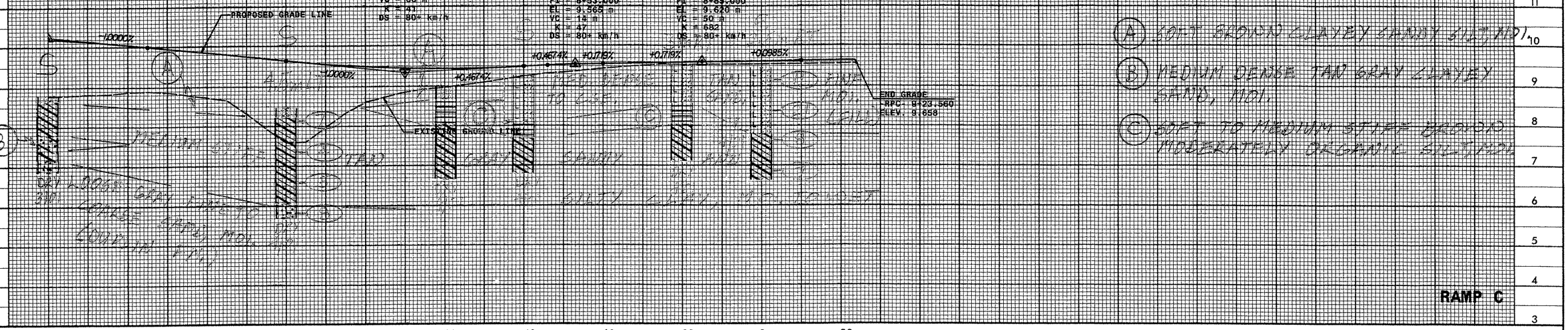
METRIC 10 0 20

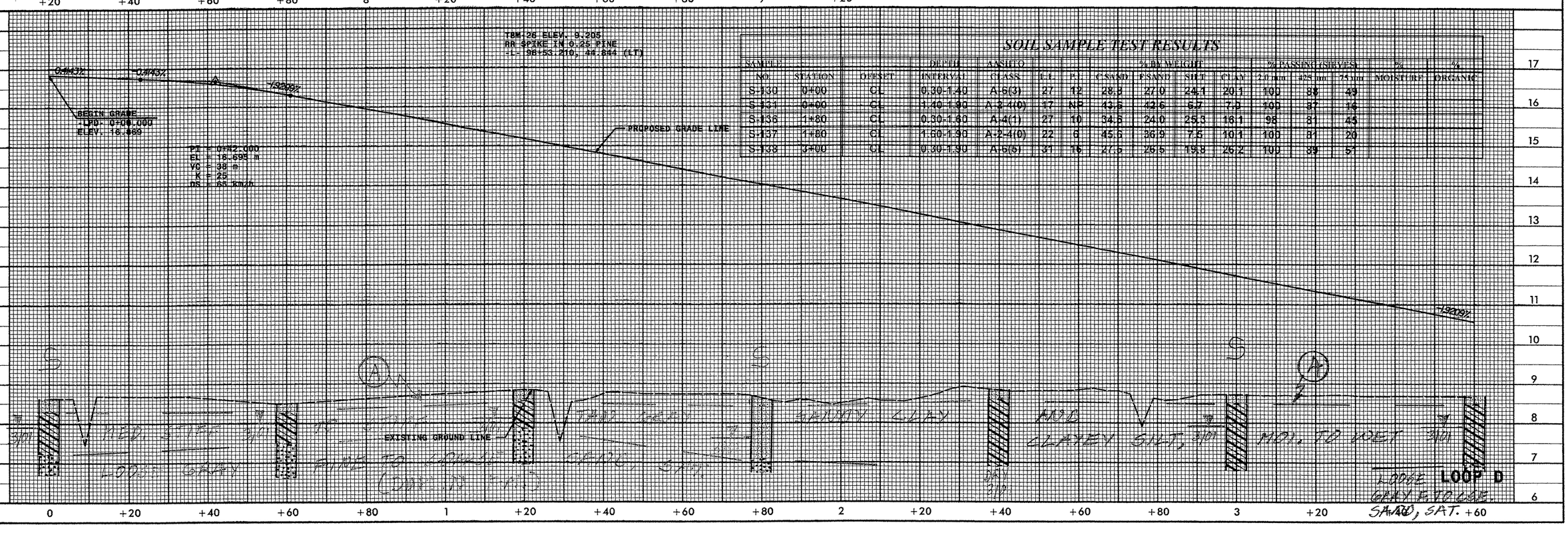
SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
S-120	7+20	GL	0.10-1.00	A-6(7)	31	12	18.1	21.1	25.6	35.2	100	94	71	19	
S-121	7+20	GL	1.00-1.30	A-2-6(0)	30	12	49.2	29.9	4.9	16.1	100	84	22		
S-122	7+20	GL	1.30-1.60	A-7-6(33)	61	33	7.0	5.2	15.4	72.4	100	97	88		
SS-91	7+80	4.5M LT	0.30-0.45	A-6(7)	30	12	11.7	19.2	34.7	34.3	100	96	76	22.8	
SS-92	7+80	4.5M LT	1.52-1.97	A-6(4)	31	15	17.2	38.0	16.6	28.3	100	93	51		
SS-93	7+80	4.5M LT	2.44-2.74	A-2-4(0)	16	NP	38.5	52.0	4.4	6.1	100	90	12		
S-139	8+40	GL	1.10-1.50	A-4(0)	33	NP	17.0	24.3	33.9	24.2	99	93	63	36.0	9.5
SS-94	9+00	2.5M LT	0.30-0.45	A-2-4(0)	15	NP	32.9	48.3	8.7	10.1	91	74	19		
SS-95	9+00	2.5M LT	1.62-1.97	A-6(3)	27	12	22.4	29.9	19.4	28.3	100	92	53		



SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
S-130	0+00	CL	0.30-1.40	A-6(3)	27	12	28.3	27.9	24.1	20.1	100	88	49		
S-131	0+00	CL	1.40-1.90	A-2-4(0)	17	NP	43.5	42.6	5.7	7.9	100	87	16		
S-136	1+80	CL	0.30-1.60	A-4(1)	27	10	34.3	24.0	25.3	16.1	98	81	45		
S-137	1+80	CL	1.60-1.90	A-2-4(0)	22	6	45.5	36.9	7.5	10.1	100	81	20		
S-138	3+00	CL	0.30-1.30	A-6(5)	31	16	27.5	25.5	19.8	26.2	100	89	51		



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R /W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	67
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

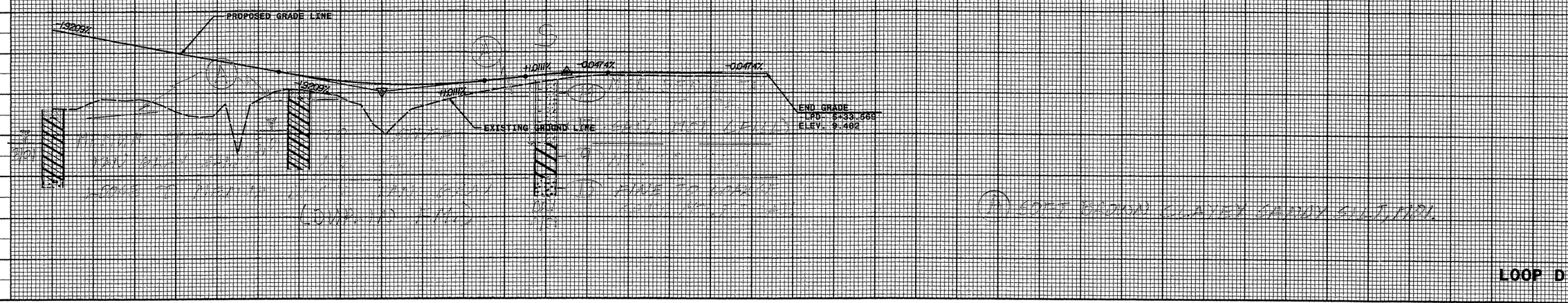
SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING SIEVES 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
SS-103	4+80	CL	0.30-0.45	A-2-4(0)	18	NP	21.4	58.0	7.5	16.1	99	92	25		
SS-104	4+80	CL	1.52-1.97	A-7-5(15)	44	26	16.7	19.2	12.7	52.4	100	95	67		
SS-105	4+80	CL	2.29-2.74	A-2-4(0)	18	NP	45.7	41.7	1.5	11.1	100	71	14		

TBM-26 ELEV. 9.205
RR SPIKE IN 0.25 PINE
-L- 96+53.210, 44.844 (LT)

PI = 4+40.000
EL = 9.050 m
VC = 50 m
K = 17
DS = 59 Km/h

PI = 4+85.000
EL = 9.505 m
VC = 20 m
K = 19
DS = 61 Km/h



LOOP D

+60 +80 4 +20 +40 +60 +80 5 +20

SOIL SAMPLE TEST RESULTS

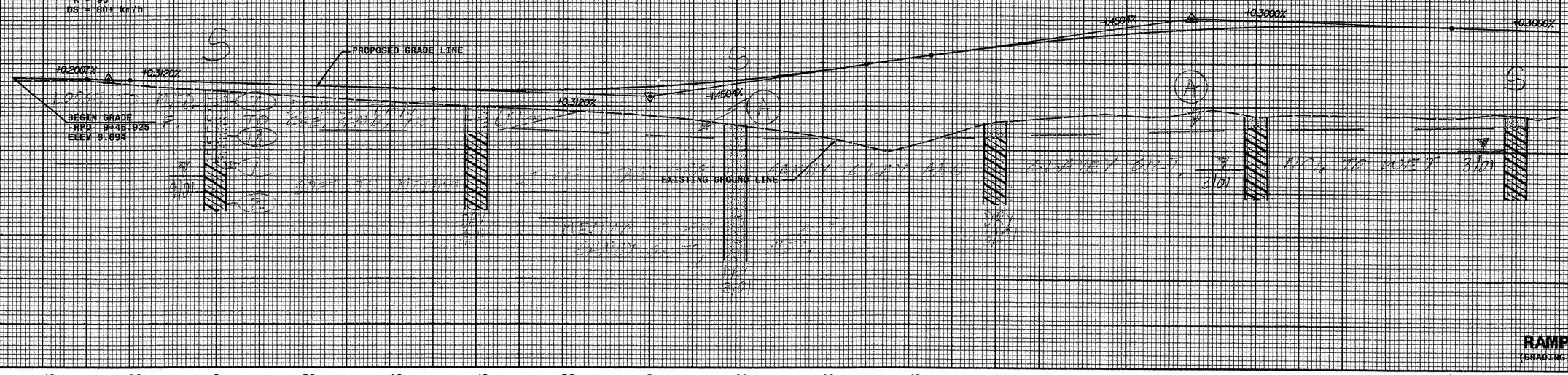
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING SIEVES 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
S-144	6+00	CL	0.30-1.00	A-6(3)	25	11	26.4	24.4	27.1	22.2	100	90	55		
S-149	7+80	CL	0.30-2.13	A-4(4)	30	10	18.4	27.4	25.9	28.3	100	93	60	22.7	
S-150	7+80	CL	2.13-3.05	A-4(0)	22	6	11.1	56.3	12.4	20.2	100	97	39		
SS-101	9+00	CL	0.30-0.45	A-2-4(0)	21	5	22.0	51.6	8.3	18.1	98	90	30		
SS-102	9+00	CL	1.52-1.97	A-7-6(20)	33	14	7.5	20.2	34.1	38.3	100	97	80		

TBM-27 ELEV. 7.853
RR SPIKE IN 0.30 PINE
-Y4- 17+73.490, 42.242 (RT)

PT = 9+25.000
EL = 9.850 m
VC = 10 m
K = 90
DS = 80+ Km/h

PI = 8+00.000
EL = 9.600 m
VC = 100 m
K = 57
DS = 80+ Km/h

PI = 8+75.000
EL = 11.073 m
VC = 120 m
K = 89
DS = 80+ Km/h



RAMP D
(GRADING ONLY)

+40 +20 9 +80 +60 +40 +20 8 +80 +60 +40 +20 7 +80 +60 +40 +20 6

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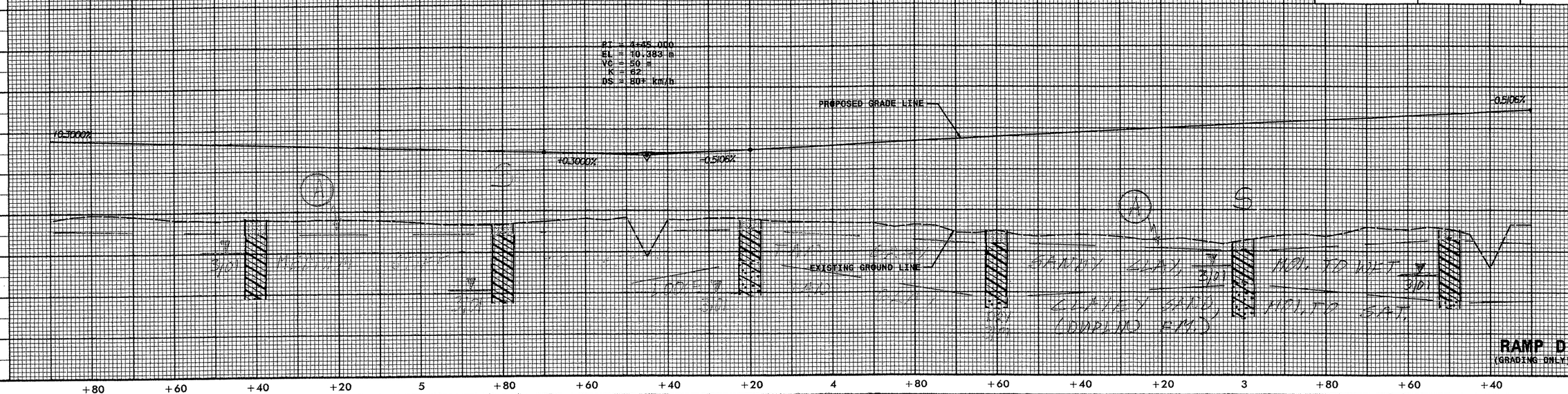
R /W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	68
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

SOIL SAMPLE TEST RESULTS

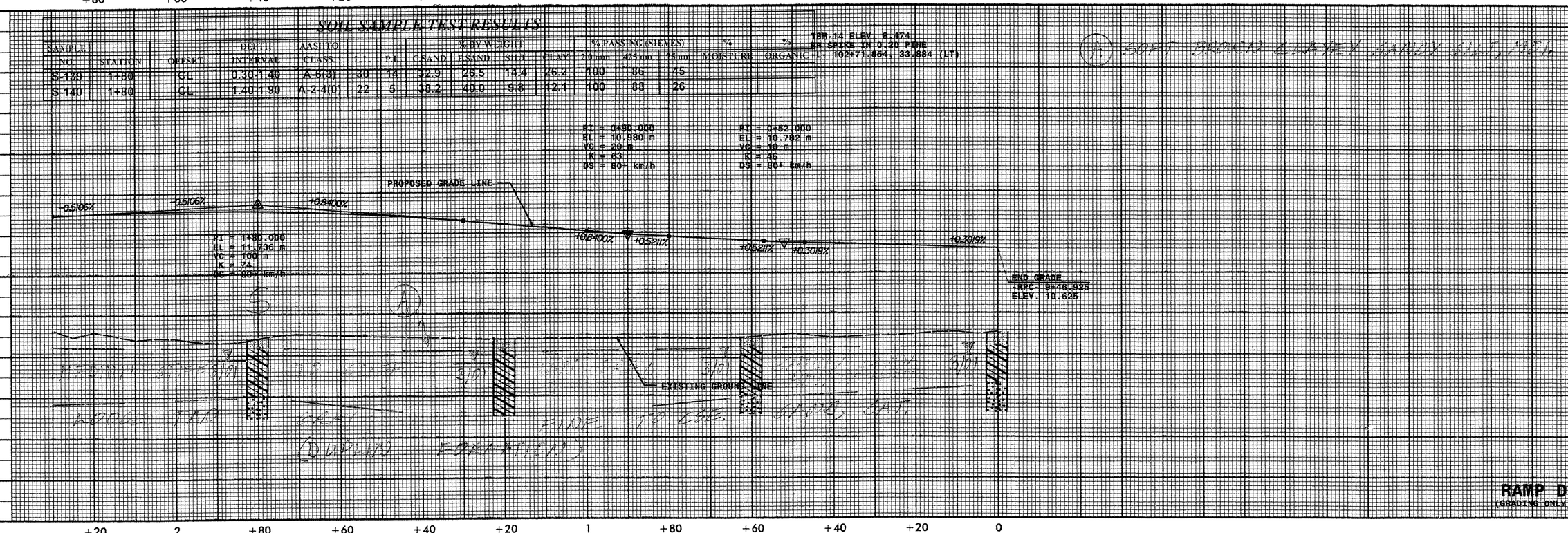
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
S-141	3+00	CL	0.30-1.00	A-6(13)	40	18	13.7	17.3	24.7	44.3	100	95	74		
S-142	3+00	CL	1.00-1.90	A-2-6(0)	25	11	44.7	30.7	7.5	17.1	97	79	27		
S-143	4+80	CL	0.30-1.90	A-6(3)	29	12	30.4	26.8	20.6	22.2	100	87	48		



SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
S-139	1+80	CL	0.30-1.40	A-6(3)	30	14	32.9	26.5	14.4	26.2	100	86	45		
S-140	1+80	CL	1.40-1.90	A-2-4(0)	22	5	38.2	40.0	9.8	12.1	100	88	26		

TBM 14 ELEV. 6.474
RR SPIKE IN 0.20 PINE
L 102+71.854, 33.884 (LT)



6/09/09

FOR -Y1- DETAILS SEE PLAN SHEETS 35-36

NOTE: SEE -Y1- TYPICAL SECTION FOR PGL LOCATIONS OF -Y1-LT

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Morrisville, North Carolina 27560
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METRIC

0.5 0 1
VERT

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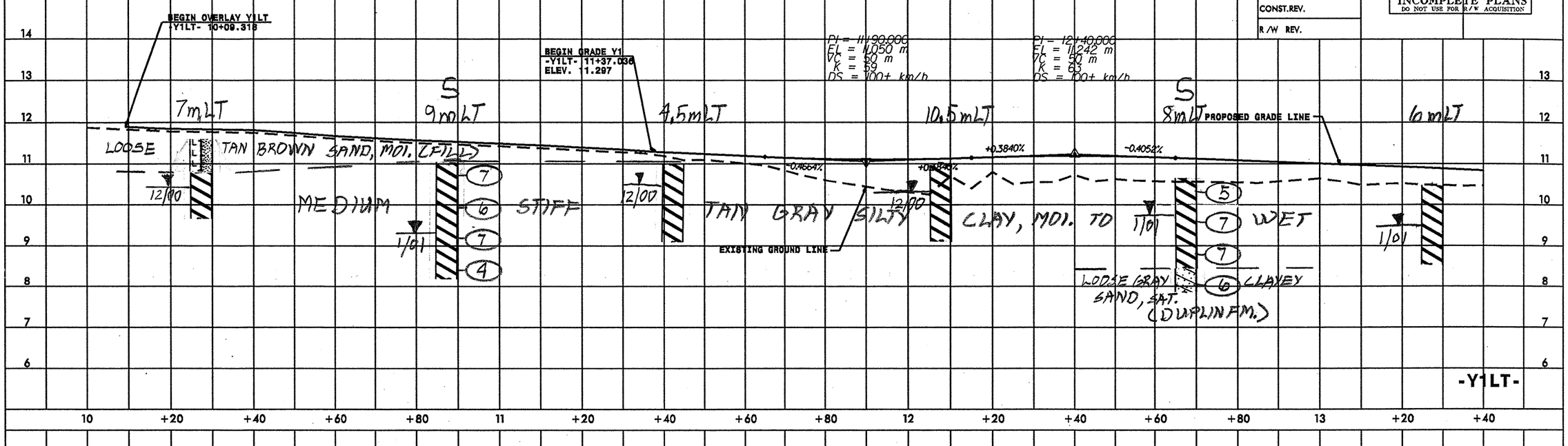
R/W REV.

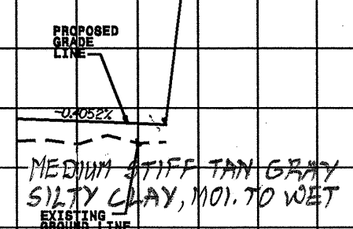
PROJECT REFERENCE NO.	SHEET NO.
R-2301A	69
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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



TBM-18 ELEV. 11.354
RR SPIKE IN POWER POLE NUMBER R8A67
-Y1LT- 12+34.239, 11.945 LT

END GRADE Y1LT
-Y1LT- 13+64.625=
-Y1- 17+00.000
ELEV. 10.737



Soil Sample Test Results

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
SS-3	11+88	9M LT	0.30-0.45	A-7-6(63)	81	56	1.0	4.0	26.2	68.8	100	100	97	20.3%	
SS-4	11+88	9M LT	1.52-1.97	A-7-6(18)	45	25	6.1	25.5	15.9	52.6	100	97	75	24.2%	
SS-5	12+67	6M LT	0.30-0.45	A-7-6(35)	56	33	2.0	6.1	31.2	60.7	100	99	95	28.8%	
SS-6	12+67	6M LT	1.52-1.97	A-7-5(32)	69	33	2.4	19.4	19.5	58.6	100	99	83	28.6%	
SS-7	12+67	6M LT	2.29-2.74	A-2-6(0)	25	12	28.5	42.9	4.3	24.3	99	88	30		

6/09/99

TBM-18 ELEV. 11.354
RR SPIKE IN POWER POLE NUMBER RGA87
-Y1- 15+67.132, 13.601 LT

FOR -Y1- DETAILS SEE PLAN SHEETS 4 & 37

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0.5 0 1
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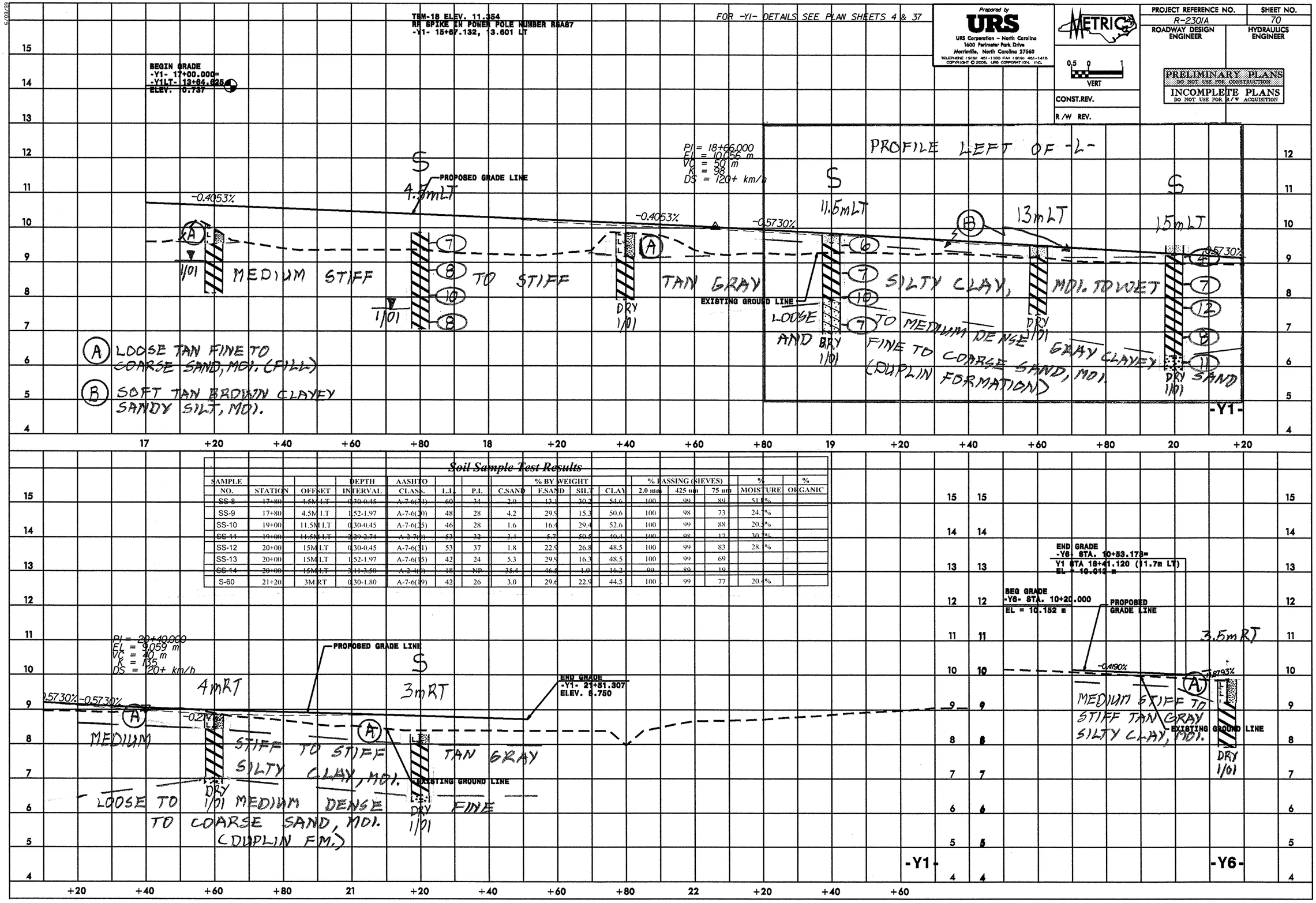
R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	70
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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



Soil Sample Test Results

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
~~SS-8~~	~~17+80~~	~~4.5M LT~~	~~0.30-0.45~~	~~A-7-6(21)~~	~~60~~	~~34~~	~~2.0~~	~~13.1~~	~~30.2~~	~~54.6~~	~~100~~	~~99~~	~~89~~	~~51.1%~~	
SS-9	17+80	4.5M LT	1.52-1.97	A-7-6(30)	48	28	4.2	29.9	15.3	50.6	100	99	98	73	24.7%
SS-10	19+00	11.5M LT	0.30-0.45	A-7-6(35)	46	28	1.6	16.4	29.4	52.6	100	99	88	20.5%	
~~SS-11~~	~~19+00~~	~~11.5M LT~~	~~2.29-2.74~~	~~A-2-7(0)~~	~~53~~	~~32~~	~~3.4~~	~~5.7~~	~~50.5~~	~~40.4~~	~~100~~	~~98~~	~~17~~	~~30.7%~~	
SS-12	20+00	15M LT	0.30-0.45	A-7-6(31)	53	37	1.8	22.9	26.8	48.5	100	99	83	28.[illegible]%	
SS-13	20+00	15M LT	1.52-1.97	A-7-6(35)	42	24	5.3	29.9	16.3	48.5	100	99	69		
~~SS-14~~	~~20+00~~	~~15M LT~~	~~3.11-3.50~~	~~A-2-4(0)~~	~~18~~	~~NP~~	~~35.4~~	~~46.8~~	~~1.0~~	~~16.2~~	~~99~~	~~89~~	~~19~~		
S-60	21+20	3M RT	0.30-1.80	A-7-6(39)	42	26	3.0	29.6	22.9	44.5	100	99	77	20.[illegible]%	

TBM-9 ELEV. 9.668
RR SPIKE IN 0.20 PINE
-DR1- 9+52.027 102.154 (LT)

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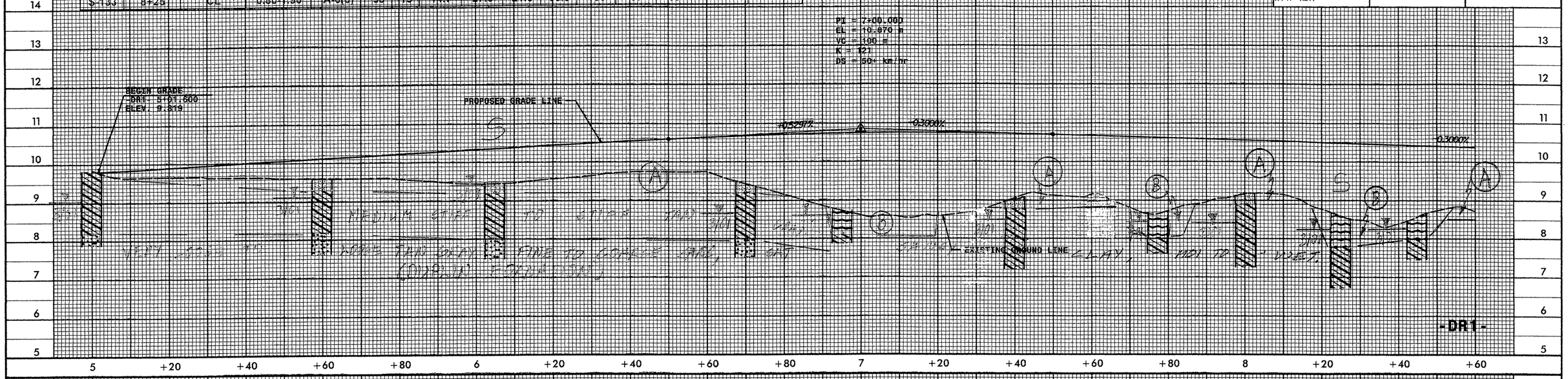
R /W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2301A	71
ROADWAY DESIGN ENGINEER	HYDRAU ENGINEER

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

SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 mm	75 mm	% MOISTURE	% ORGANIC
S-134	6+05	CL	0.30-1.40	A-6(3)	30	14	28.4	29.2	18.2	24.2	100	88	45		
S-132	8+25	CL	0.30-0.80	A-5(8)	110	NP	23.0	16.1	56.9	4.0	94	82	58	177.7	49.1
S-133	8+25	CL	0.80-1.90	A-6(6)	33	15	14.7	27.6	21.5	36.3	100	97	60		



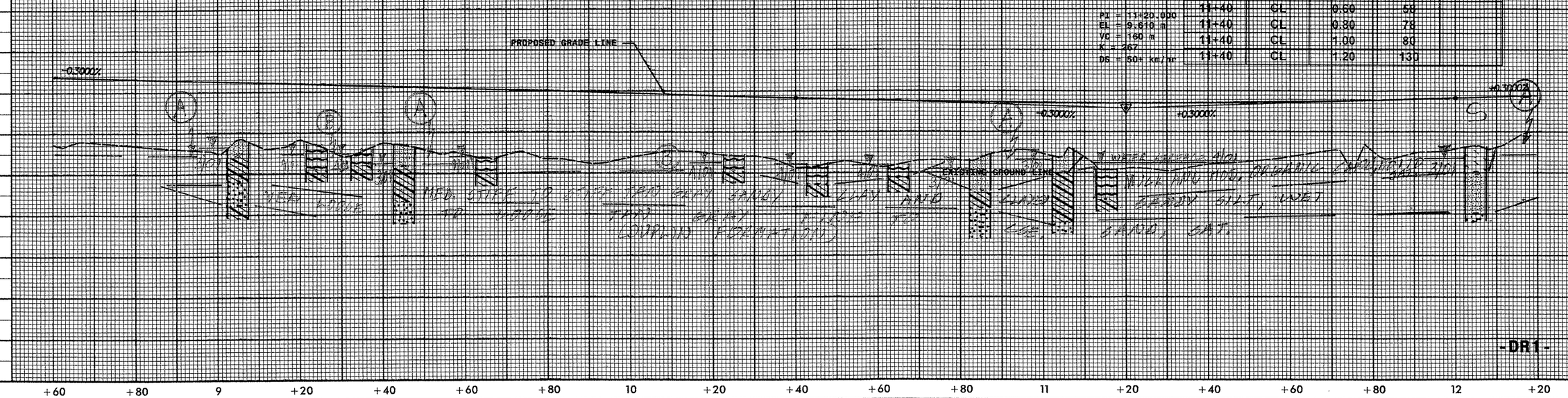
SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 mm	75 mm	% MOISTURE	% ORGANIC
S-120	12+05	CL	0.30-0.70	A-2-4(0)	26	NP	27.0	42.5	20.4	10.1	100	93	33		5.9
S-121	12+05	CL	0.70-1.70	A-4(1)	27	10	25.4	38.7	15.8	20.1	100	93	39		

(A) SOFT GRAY BROWN CLAYEY SANDY SILT, MOI TO WET
(B) MUCK, MOI TO SAT

VANE SHEAR TESTS

STATION	OFFSET	DEPTH (m)	S(kPa)	SR(kPa)
11+40	CL	0.20	12	
11+40	CL	0.40	32	
11+40	CL	0.60	58	
11+40	CL	0.80	78	
11+40	CL	1.00	80	
11+40	CL	1.20	130	



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CONST.REV.

R /W REV.

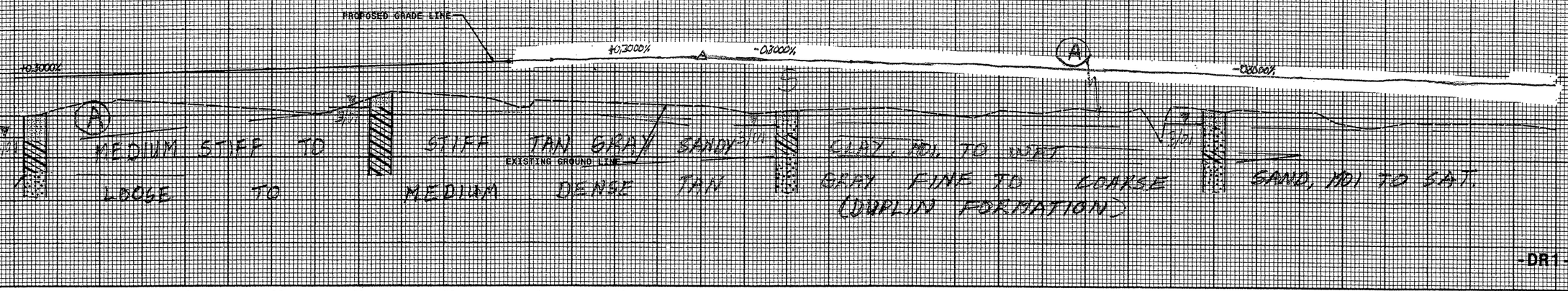
PROJECT REFERENCE NO.	SHEET NO.
R-2301A	72
ROADWAY DESIGN ENGINEER	HYDRA. ENGINEER

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

SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
S-124	14+00	CL	0.50-1.00	A-6(1)	26	13	25.0	40.3	12.6	22.2	100	93	37		
S-125	14+00	CL	1.00-1.90	A-2-4(0)	18	NP	38.2	49.7	4.0	8.1	100	85	13		

PI = ~~13+80.000~~ 13+80.000
EL = ~~10.300 m~~ 10.300 m
VC = 70 m
K = 117
DS = 50+ km/hr

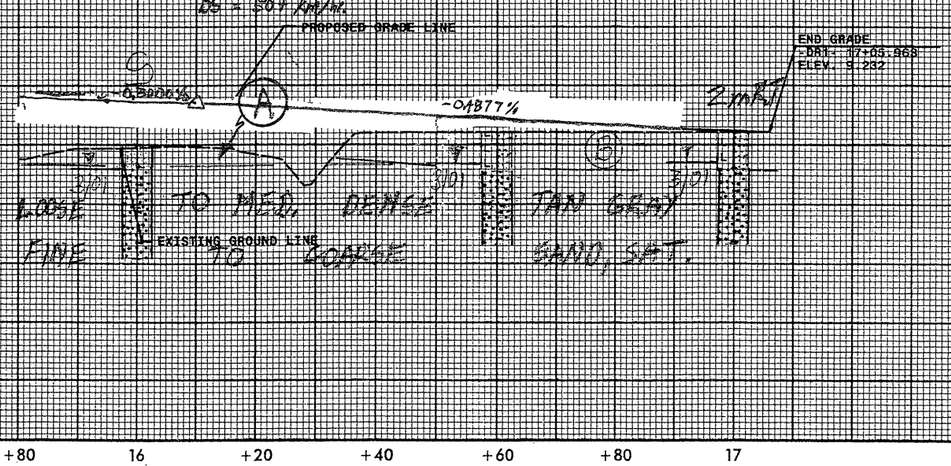


TBM-10 ELEV. 9.284
RR SPIKE IN 0.30 GUM
-DR1- 16+38.197, 3.684 (RT)

SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
S-122	16+00	CL	0.30-1.00	A-2-4(0)	22	NP	27.8	45.3	17.0	10.1	100	90	30		
S-123	16+00	CL	1.00-1.60	A-2-4(0)	22	8	21.3	47.7	14.8	16.1	100	94	34		

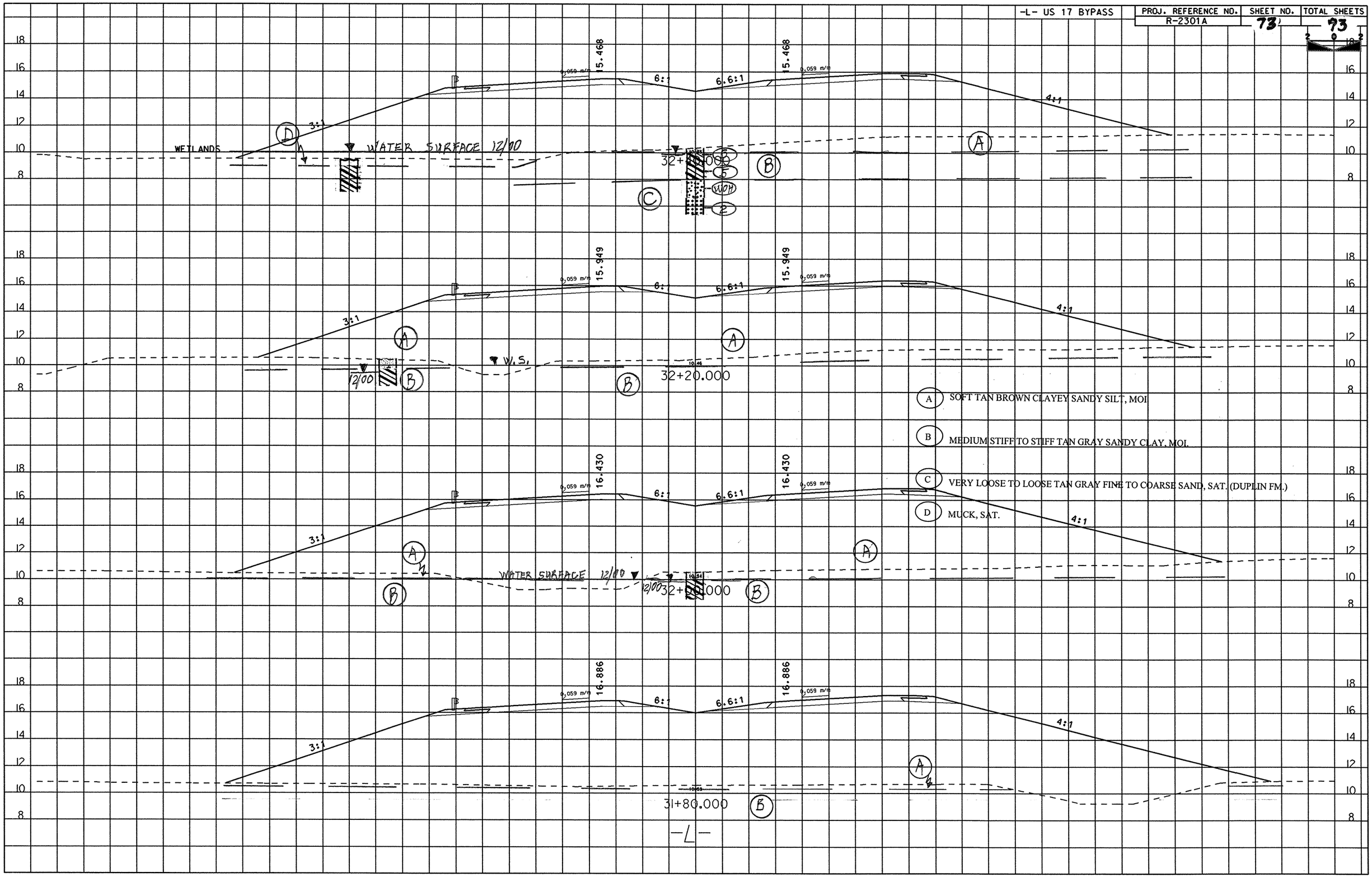
PI = 16+00.000
EL = 9.700 m
K = 160
VC = 30 m
DS = 50+ km/hr



(A) SOFT BROWN CLAYEY SANDY SILT, MOI.

(B) LOOSE TAN GRAY F. TO C. SAND WITH GRAVEL, MOI. TO SAT. (FILL)

-DR1-

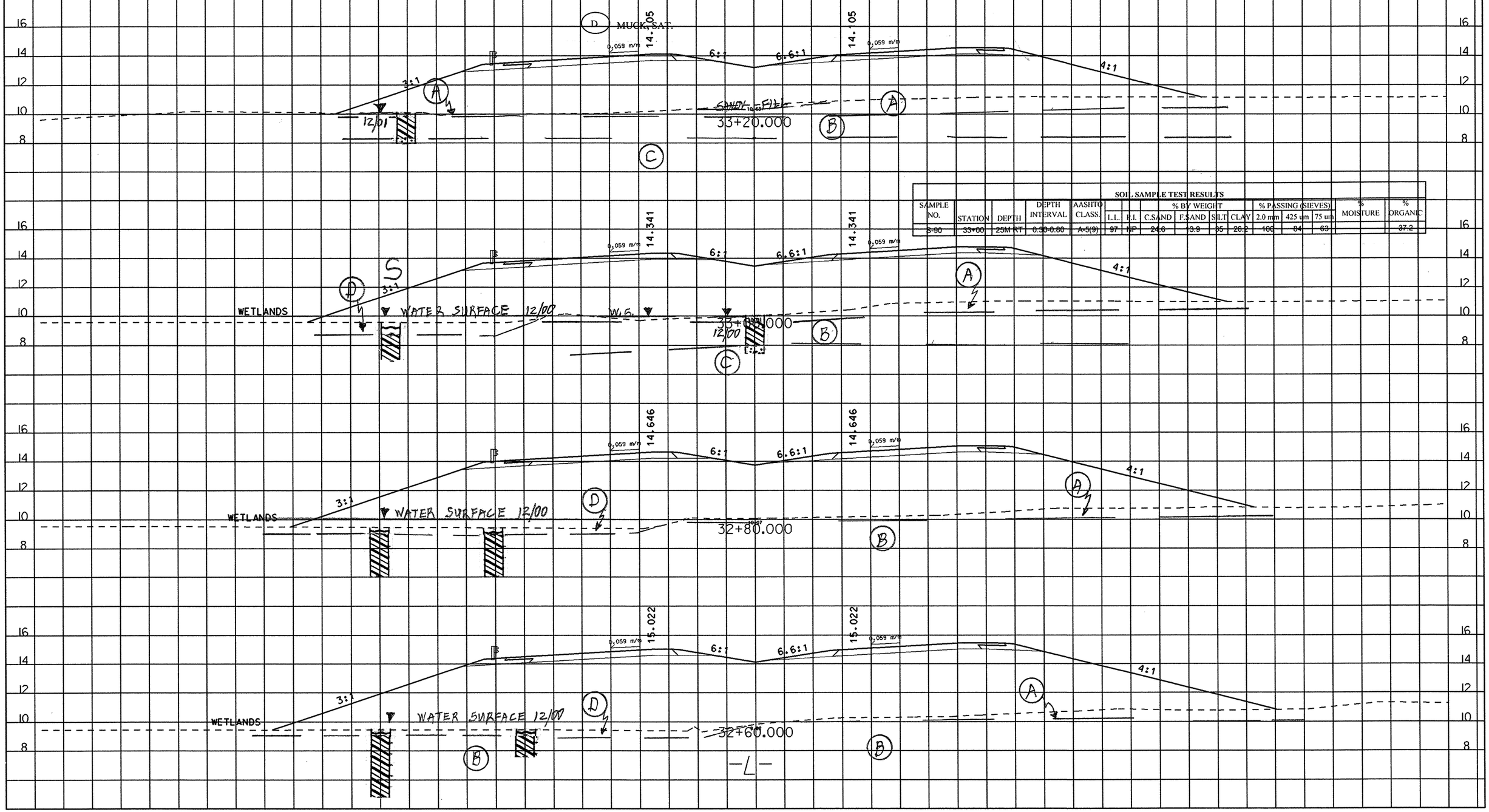

15.468
0.059 m/m
6:1
6.6:1
4:1
3:1
WETLANDS
WATER SURFACE 12/00
32+00.000
15.949
W.S.
12/00
32+20.000
16.430
16.886
31+80.000
-L-
A SOFT TAN BROWN CLAYEY SANDY SILT, MOI.
B MEDIUM STIFF TO STIFF TAN GRAY SANDY CLAY, MOI.
C VERY LOOSE TO LOOSE TAN GRAY FINE TO COARSE SAND, SAT. (DUPLIN FM.)
D MUCK, SAT.

(A) SOFT TAN BROWN CLAYEY SANDY SILT, MOI.

(B) MEDIUM STIFF TO STIFF TAN GRAY SANDY CLAY, MOI.

(C) VERY LOOSE TO LOOSE TAN GRAY FINE TO COARSE SAND, SAT. (DUPLIN FM.)

(D) MUCK, SAT.



SOIL SAMPLE TEST RESULTS

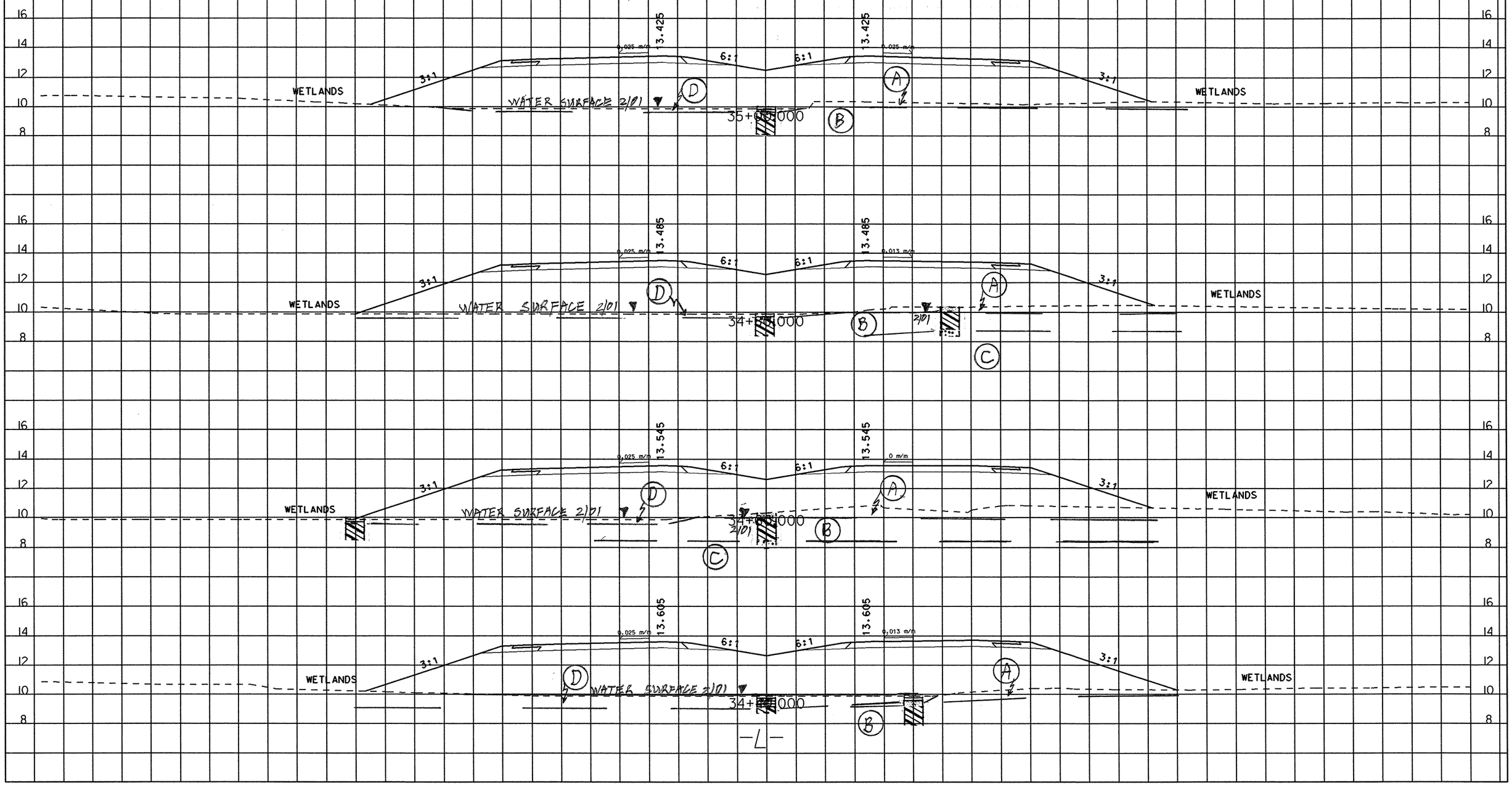
SAMPLE NO.	STATION	DEPTH	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
S-90	33+00	25M RT	0.30-0.80	A-5(9)	97	NP	24.6	13.9	35	26.2	100	84	63		37.2

(A) SOFT TAN BROWN CLAYEY SANDY SILT, MOI.

(B) MEDIUM STIFF TO STIFF TAN GRAY SANDY CLAY, MOI.

(C) VERY LOOSE TO LOOSE TAN GRAY FINE TO COARSE SAND, SAT. (DUPLIN FM.)

(D) SOFT BLACK SLIGHTLY ORGANIC SILT, WET



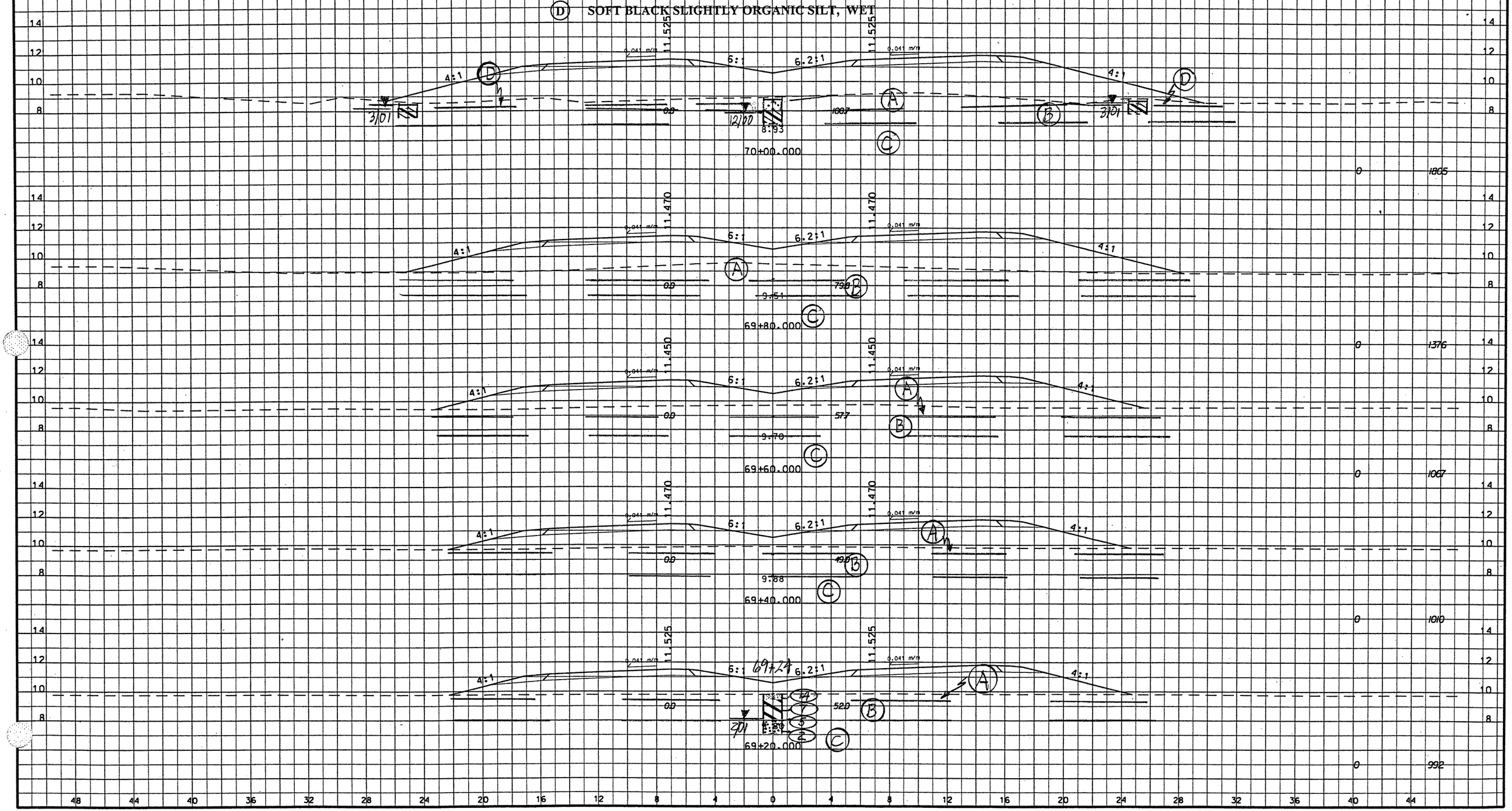
-L- US 17 BYPASS | PROJ. REFERENCE NO. R-2301A | SHEET NO. 76 | TOTAL SHEETS 93

(A) SOFT TAN BROWN CLAYEY SANDY SILT, MOI.

(B) MEDIUM STIFF TO STIFF TAN GRAY SANDY CLAY, MOI.

(C) VERY LOOSE TO LOOSE TAN GRAY FINE TO COARSE SAND, SAT. (DUPLIN FM.)

(D) SOFT BLACK SLIGHTLY ORGANIC SILT, WET

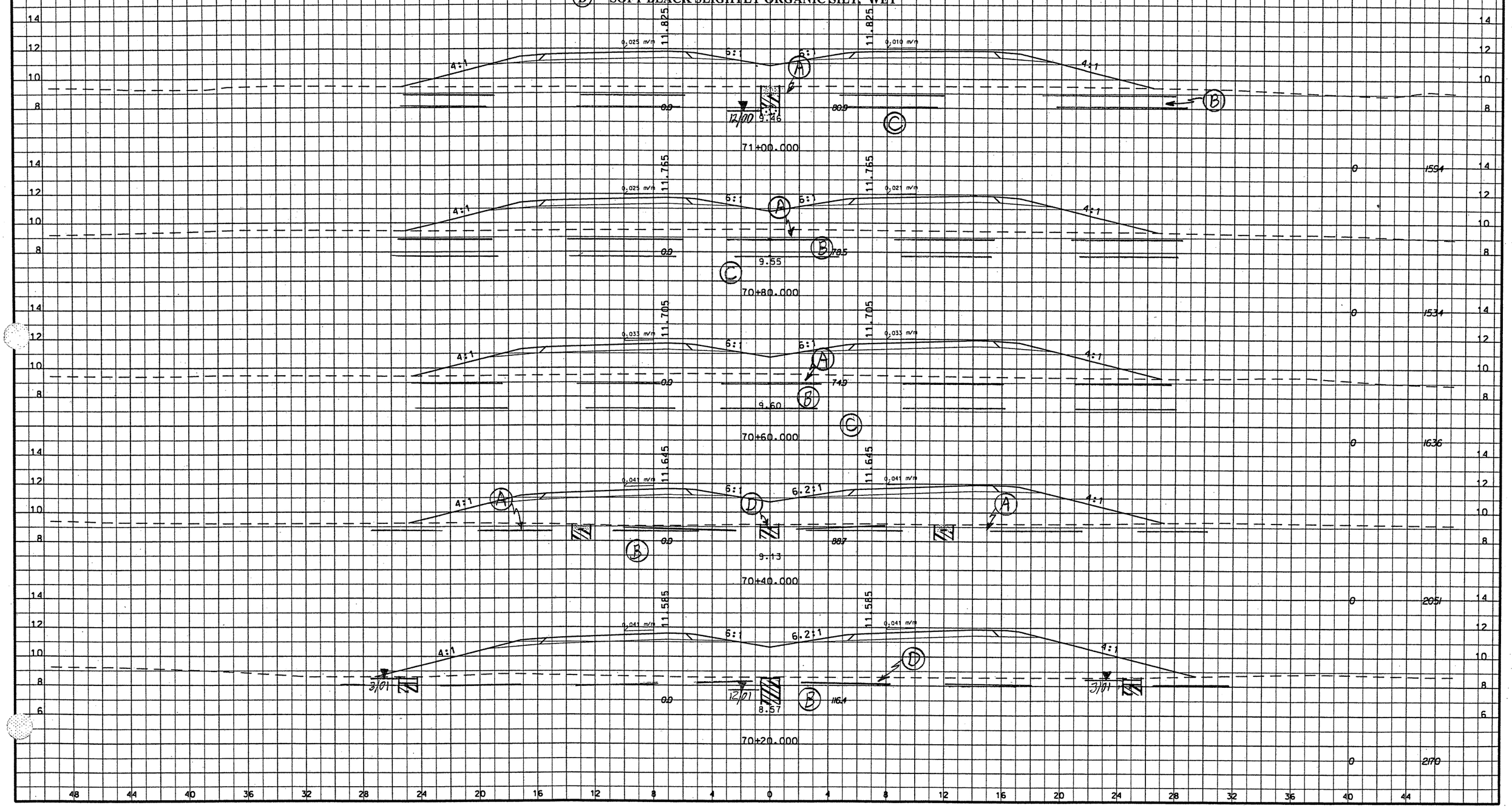


(A) SOFT TAN BROWN CLAYEY SANDY SILT, MOI.

(B) MEDIUM STIFF TO STIFF TAN GRAY SANDY CLAY, MOI.

(C) VERY LOOSE TO LOOSE TAN GRAY FINE TO COARSE SAND, SAT. (DUPLIN FM.)

(D) SOFT BLACK SLIGHTLY ORGANIC SILT, WET



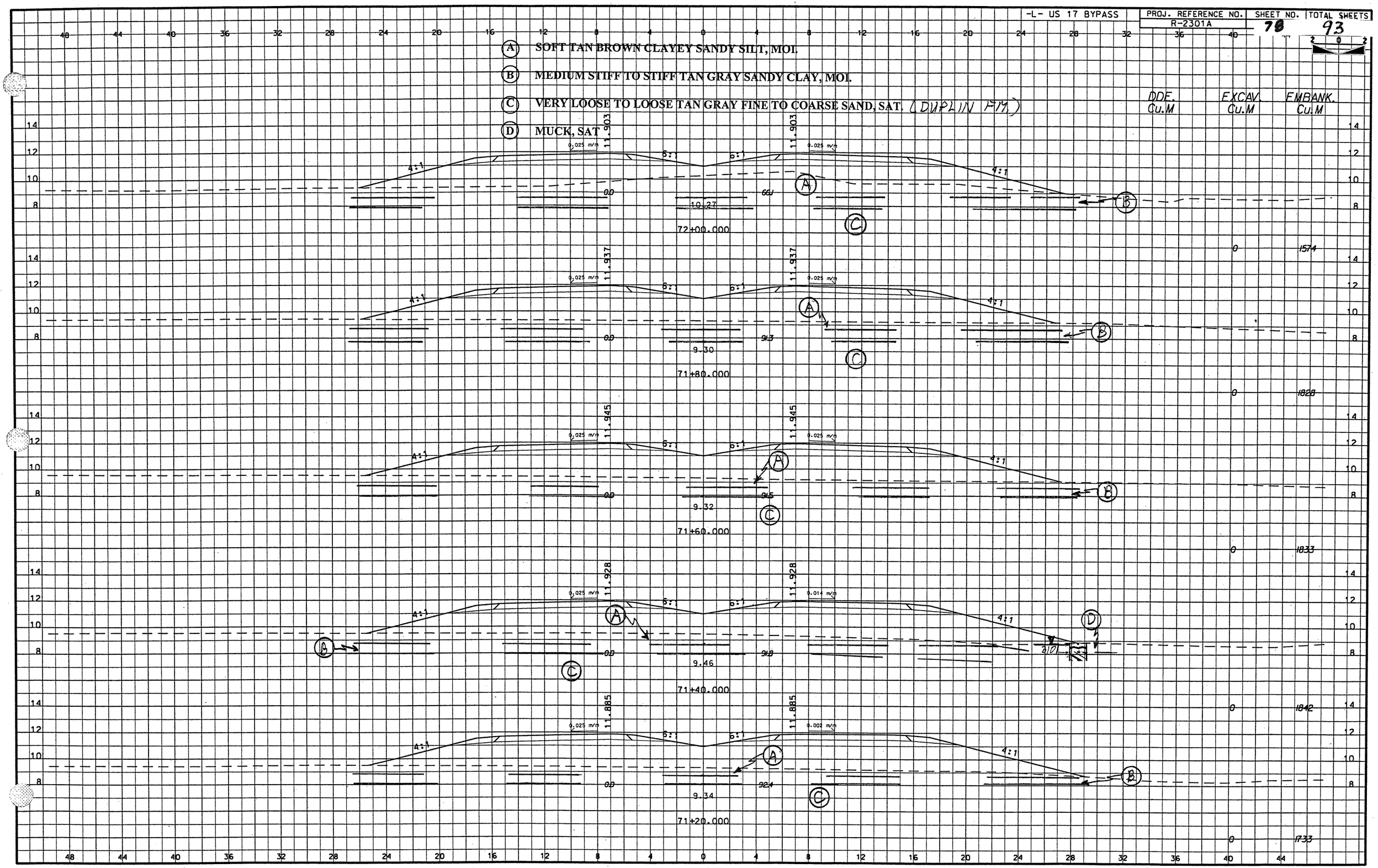
(A) SOFT TAN BROWN CLAYEY SANDY SILT, MOI.

(B) MEDIUM STIFF TO STIFF TAN GRAY SANDY CLAY, MOI.

(C) VERY LOOSE TO LOOSE TAN GRAY FINE TO COARSE SAND, SAT. (DUPLIN FM.)

(D) MUCK, SAT

	DDF. Cu.M	EXCAV. Cu.M	EMBANK. Cu.M
72+00.000		0	1574
71+80.000		0	1828
71+60.000		0	1833
71+40.000		0	1842
71+20.000		0	1733



-L- US 17 BYPASS

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
R-2301A	79	93

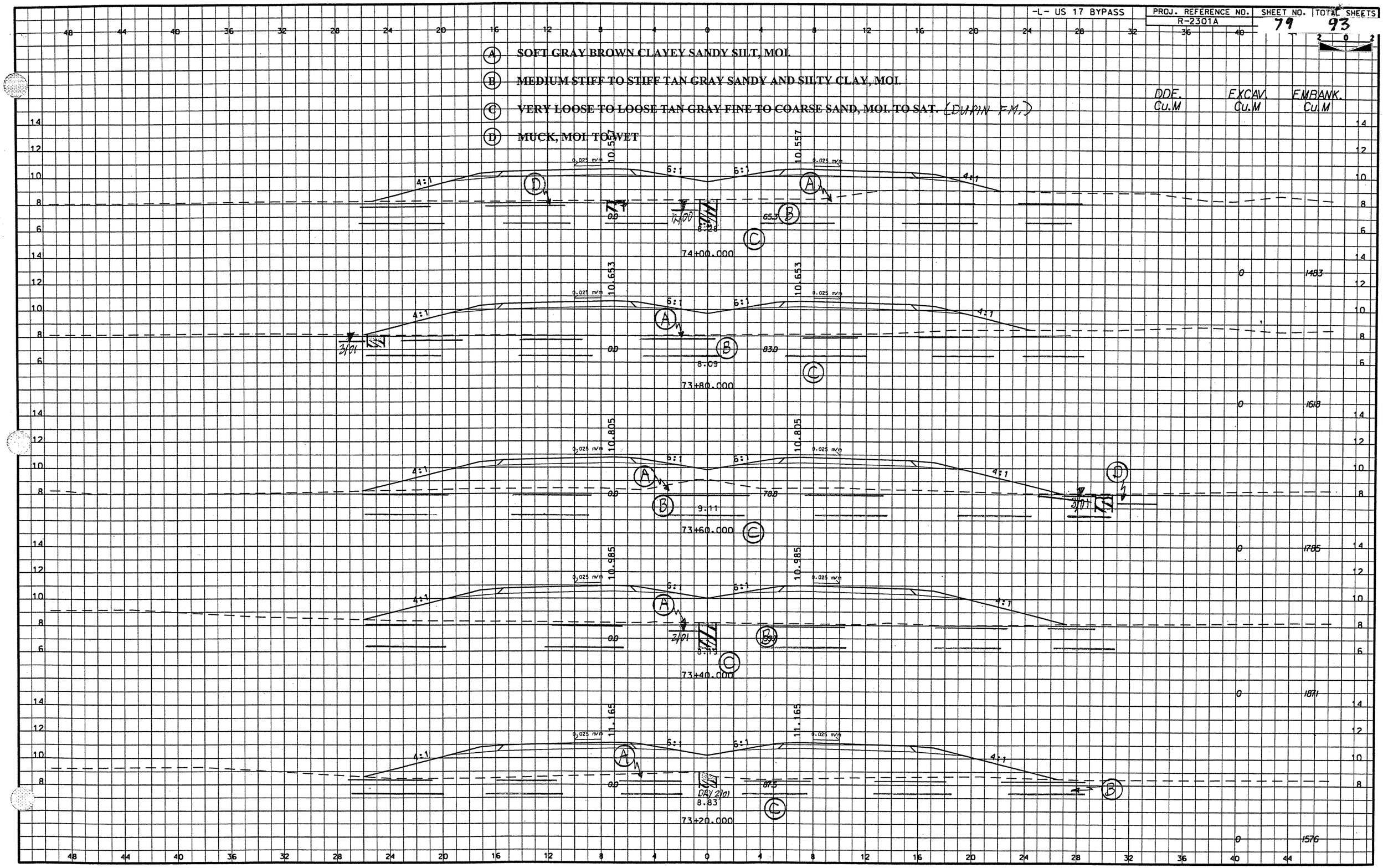
(A) SOFT GRAY BROWN CLAYEY SANDY SILT, MOI.

(B) MEDIUM STIFF TO STIFF TAN GRAY SANDY AND SILTY CLAY, MOI.

(C) VERY LOOSE TO LOOSE TAN GRAY FINE TO COARSE SAND, MOI. TO SAT. (DUPIN FM.)

(D) MUCK, MOI. TO WET

	DDE. CU.M	EXCAV. CU.M	EMBANK. CU.M
74+00.000		0	1483
73+80.000		0	1618
73+60.000		0	1785
73+40.000		0	1871
73+20.000		0	1576

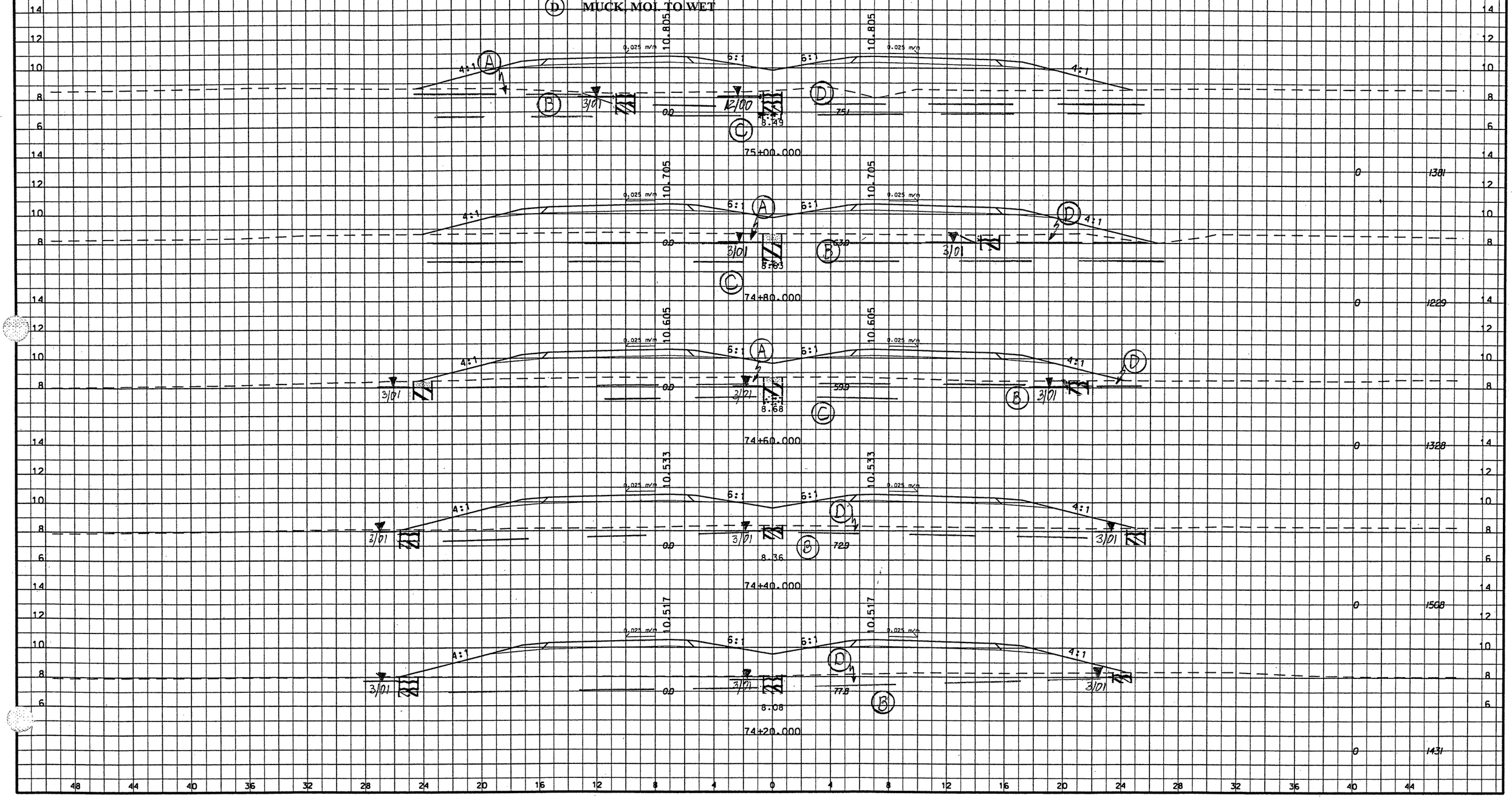


(A) SOFT GRAY BROWN CLAYEY SANDY SILT, MOI.

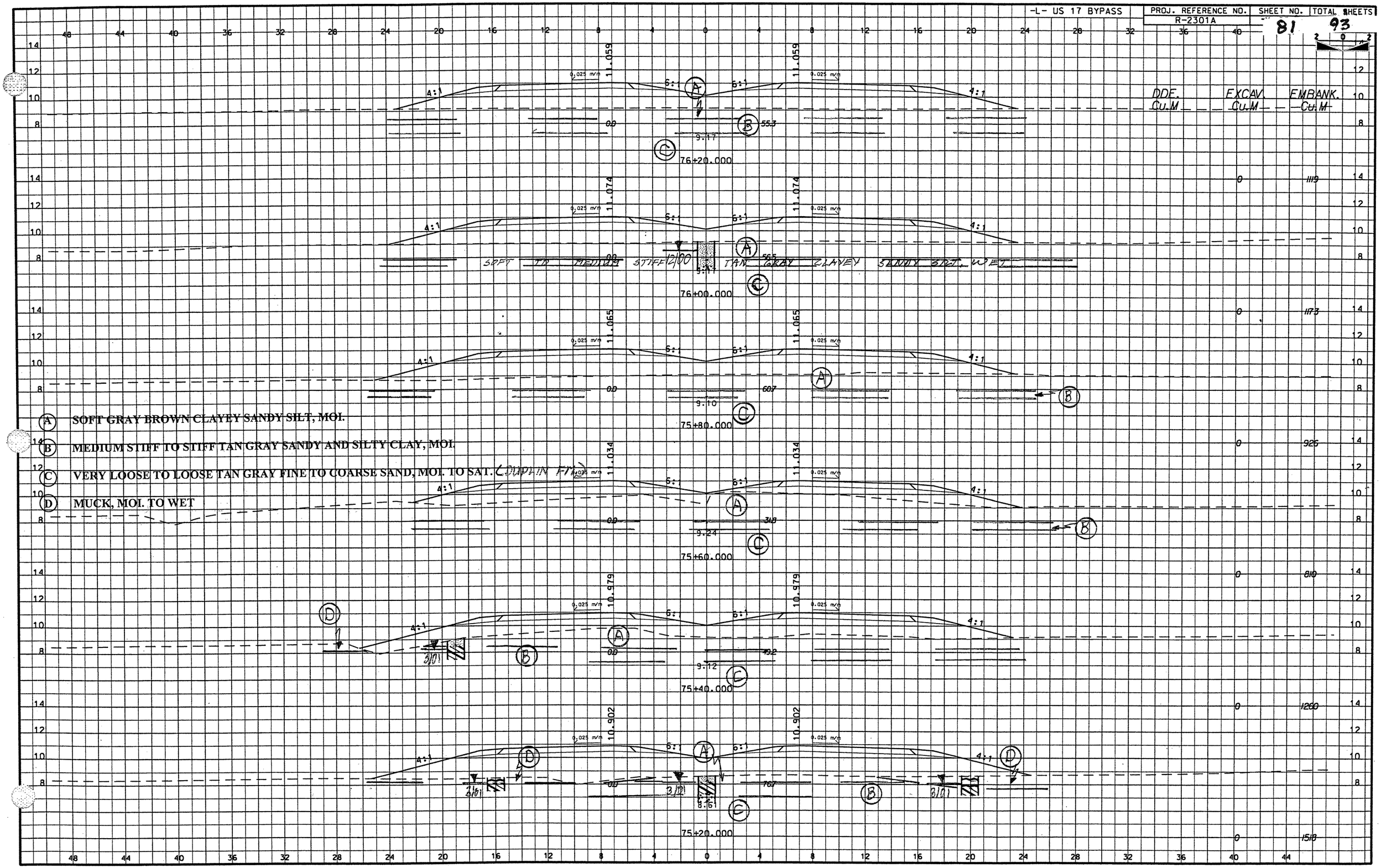
(B) MEDIUM STIFF TO STIFF TAN GRAY SANDY AND SILTY CLAY, MOI.

(C) VERY LOOSE TO LOOSE TAN GRAY FINE TO COARSE SAND, MOI. TO SAT. (DIPLIN FM.)

(D) MUCK, MOI. TO WET



	DDE. Cu.M	EXCAV. Cu.M	EMBANK. Cu.M
75+00.000		0	1381
74+80.000		0	1229
74+60.000		0	1328
74+40.000		0	1508
74+20.000		0	1431



(A) SOFT GRAY BROWN CLAYEY SANDY SILT, MOI.

(B) MEDIUM STIFF TO STIFF TAN GRAY SANDY AND SILTY CLAY, MOI.

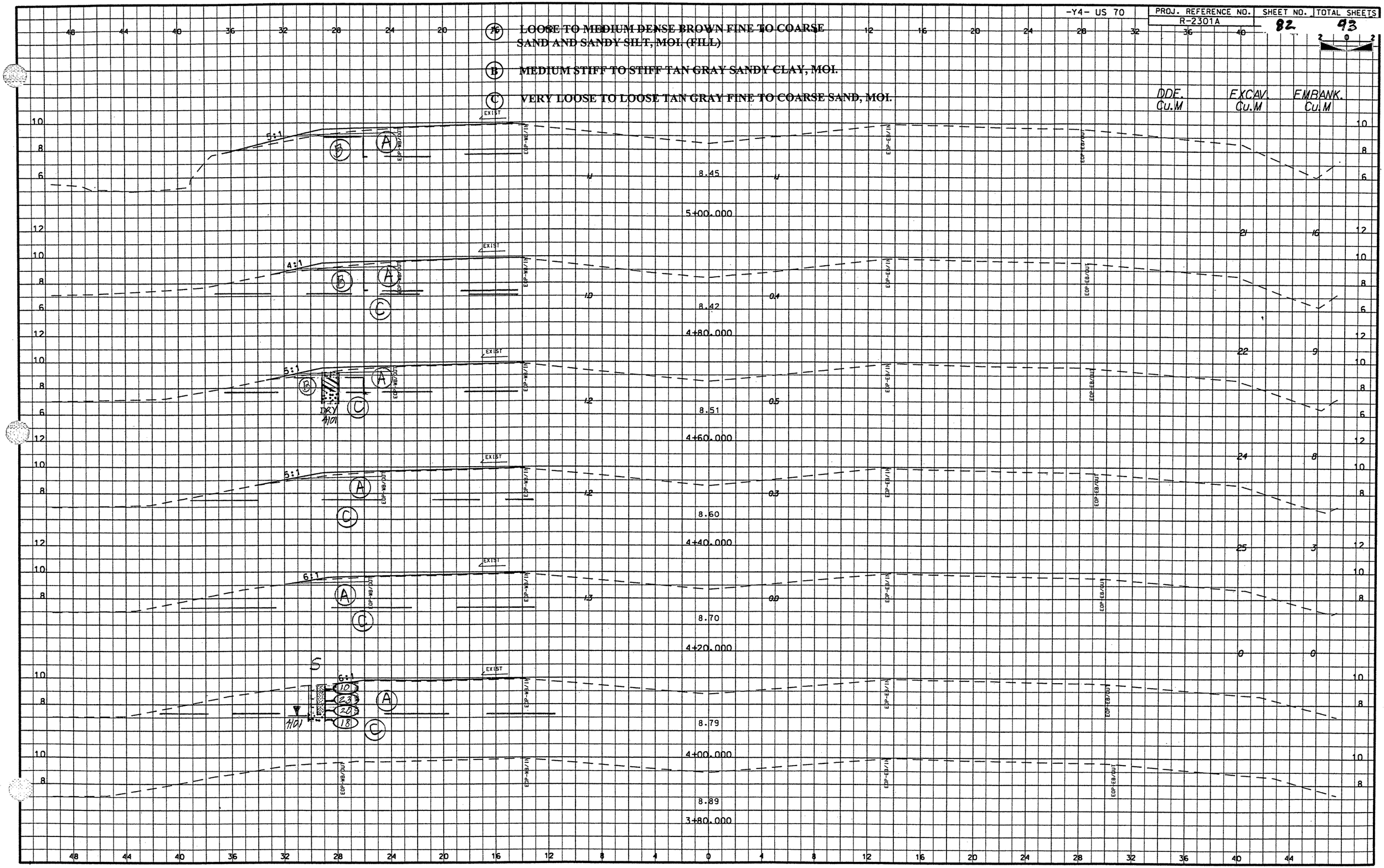
(C) VERY LOOSE TO LOOSE TAN GRAY FINE TO COARSE SAND, MOI. TO SAT. (SUPPLIN FILL)

(D) MUCK, MOI. TO WET

(A) LOOSE TO MEDIUM DENSE BROWN FINE TO COARSE SAND AND SANDY SILT, MOI. (FILL)

(B) MEDIUM STIFF TO STIFF TAN GRAY SANDY CLAY, MOI.

(C) VERY LOOSE TO LOOSE TAN GRAY FINE TO COARSE SAND, MOI.

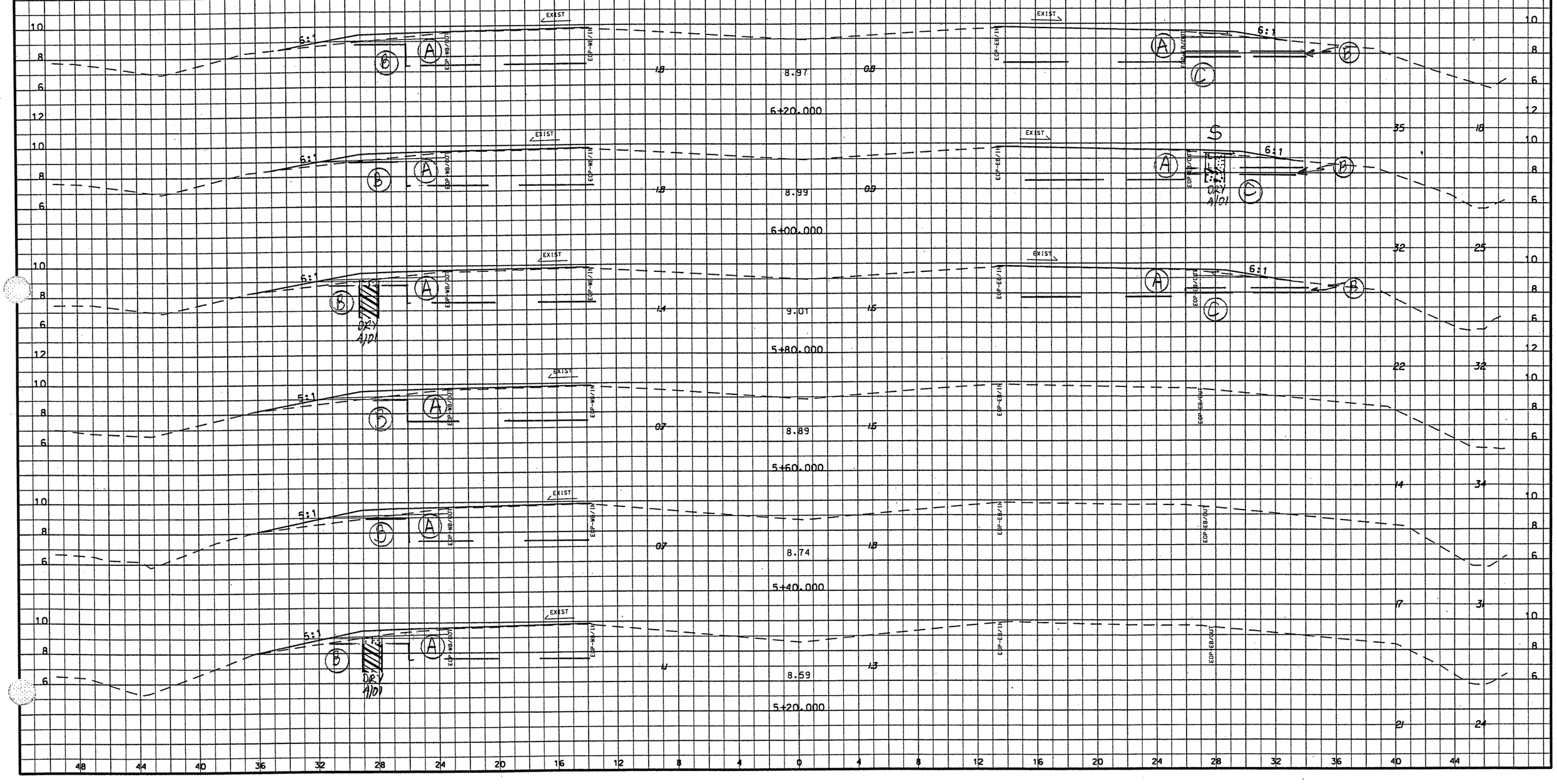


(A) LOOSE TO MEDIUM DENSE BROWN FINE TO COARSE SAND, MOI. (FILL)

(B) MEDIUM STIFF TO STIFF TAN GRAY SANDY CLAY, MOI.

(C) VERY LOOSE TO LOOSE TAN GRAY FINE TO COARSE SAND, MOI.

DDF. Cu.M	EXCAV. Cu.M	EMBANK. Cu.M



(A) LOOSE TO MEDIUM DENSE BROWN FINE TO COARSE SAND, MOI. (FILL)

(B) MEDIUM STIFF TO STIFF TAN GRAY SANDY CLAY AND SILT, MOI.

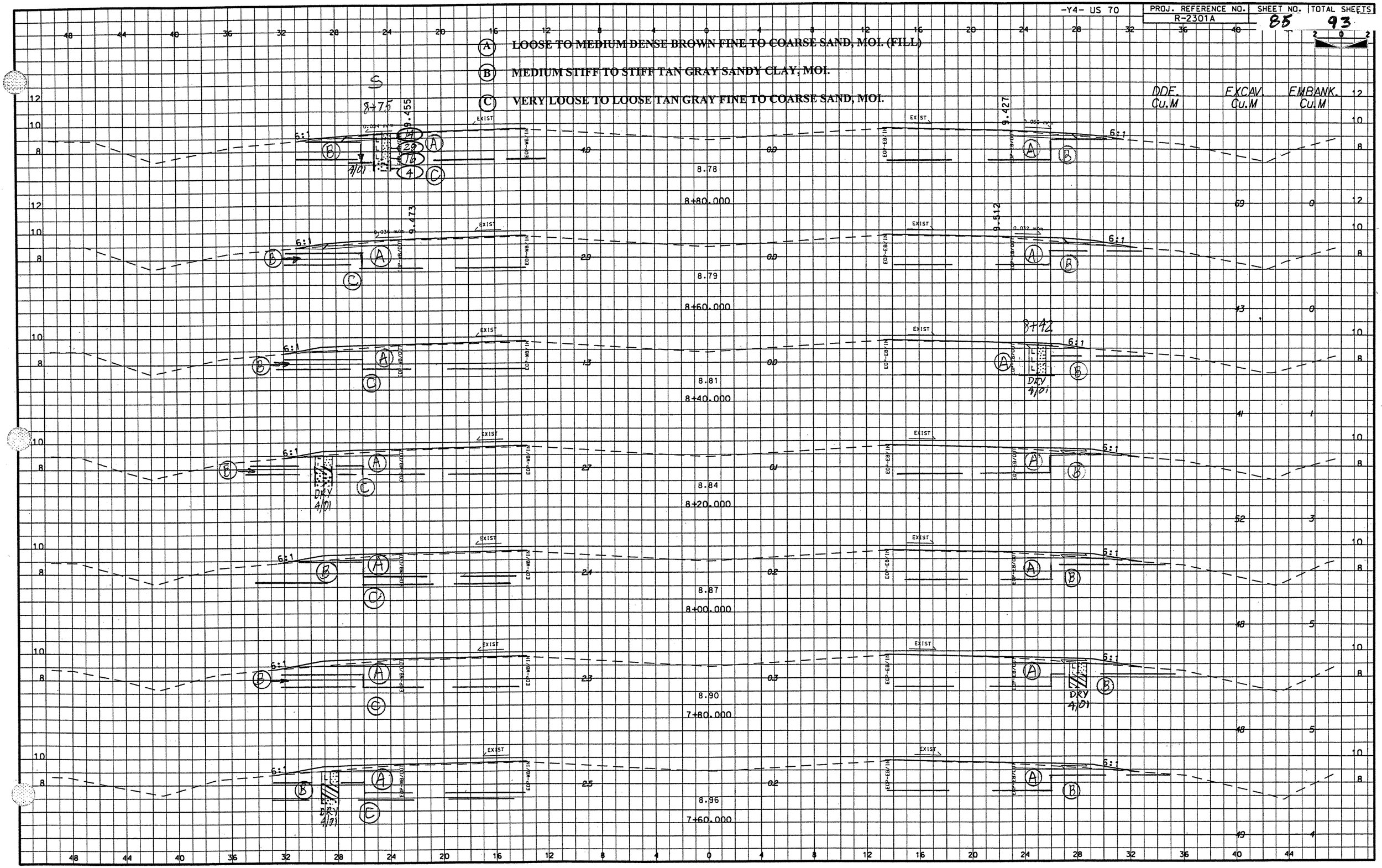
(C) VERY LOOSE TO LOOSE TAN GRAY FINE TO COARSE SAND, MOI.

DDE. Cu.M	EXCAV. Cu.M	EMBANK. Cu.M
49	4	
48	6	
42	10	
38	13	
37	13	
35	15	

(A) LOOSE TO MEDIUM DENSE BROWN FINE TO COARSE SAND, MOI. (FILL)

(B) MEDIUM STIFF TO STIFF TAN GRAY SANDY CLAY, MOI.

(C) VERY LOOSE TO LOOSE TAN GRAY FINE TO COARSE SAND, MOI.

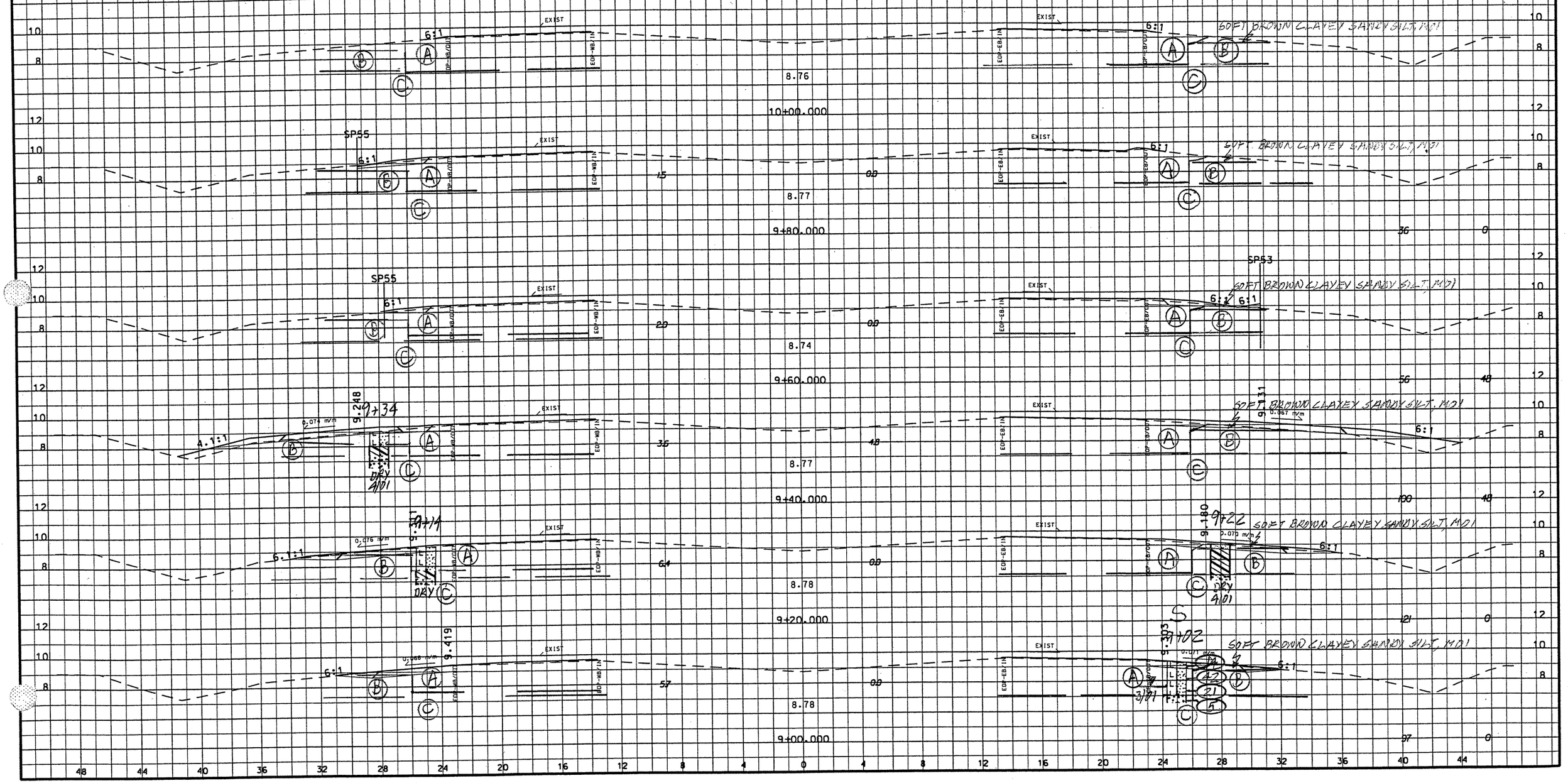


(A) LOOSE TO MEDIUM DENSE BROWN FINE TO COARSE SAND, MOI. (FILL)

(B) MEDIUM STIFF TO STIFF TAN GRAY SANDY CLAY, MOI.

(C) VERY LOOSE TO LOOSE TAN GRAY FINE TO COARSE SAND, MOI.

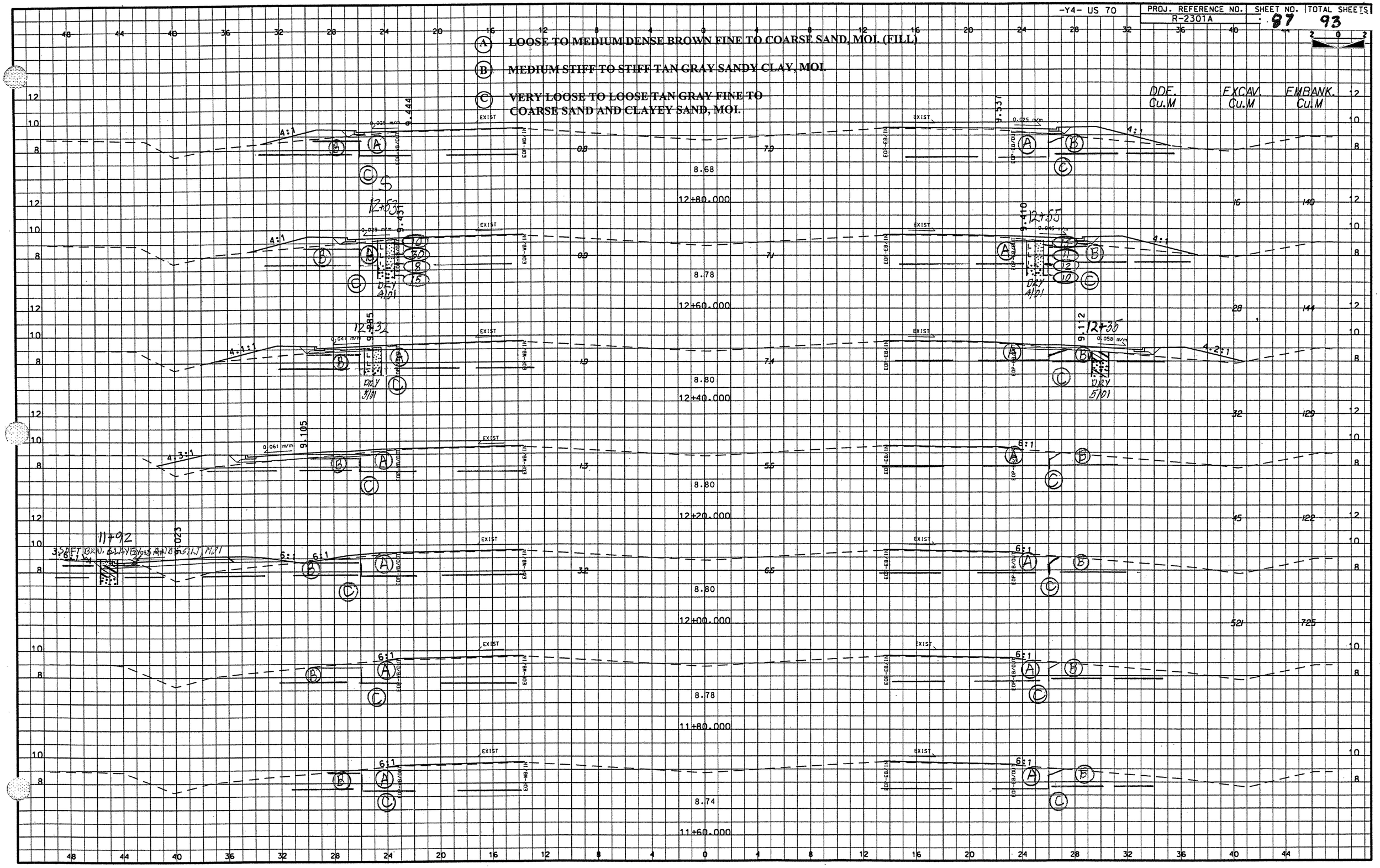
DDE. Cu.M	EXCAV. Cu.M	EMBANK. Cu.M



(A) LOOSE TO MEDIUM DENSE BROWN FINE TO COARSE SAND, MOI. (FILL)

(B) MEDIUM STIFF TO STIFF TAN GRAY SANDY CLAY, MOI.

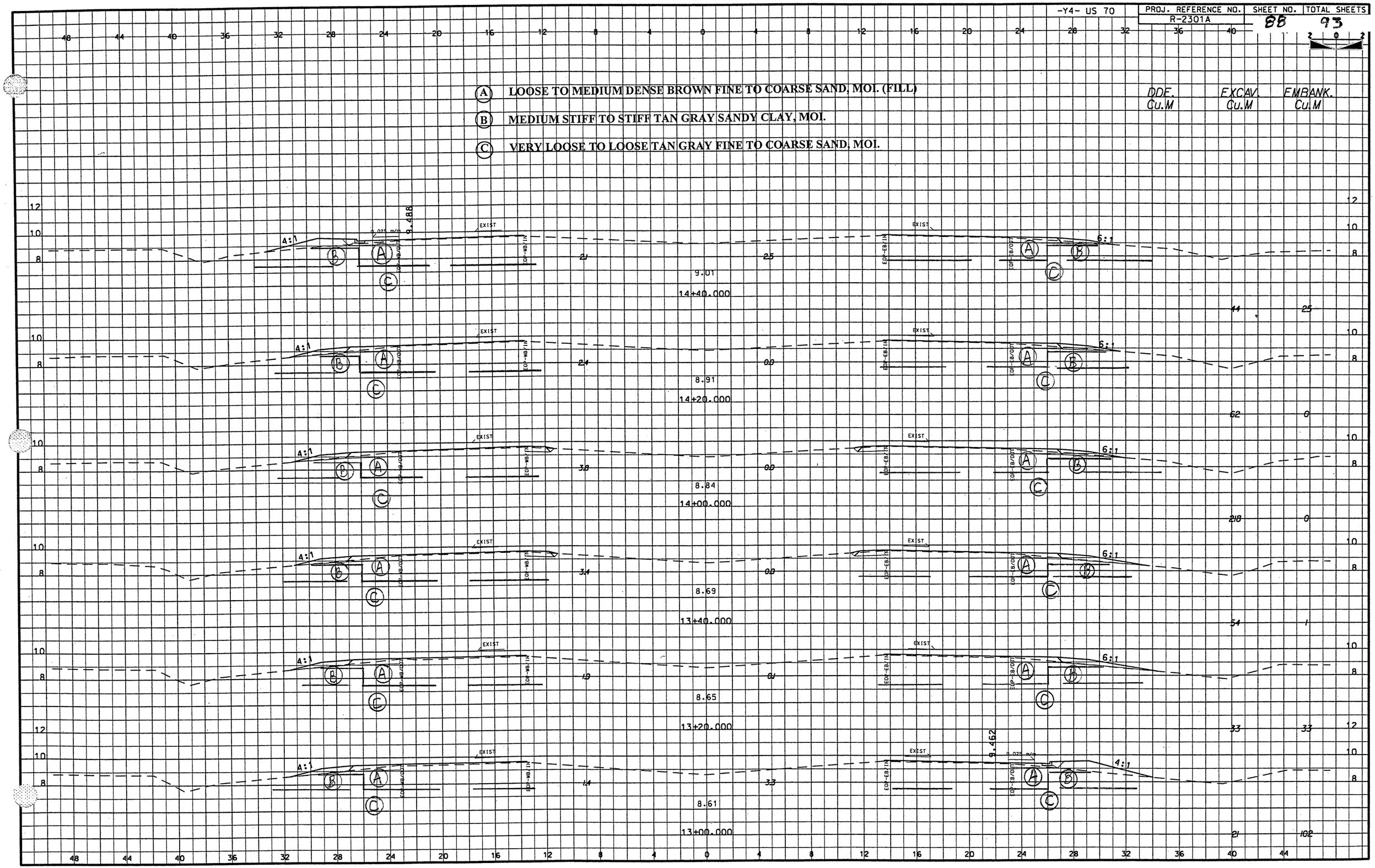
(C) VERY LOOSE TO LOOSE TAN GRAY FINE TO COARSE SAND AND CLAYEY SAND, MOI.



(A) LOOSE TO MEDIUM DENSE BROWN FINE TO COARSE SAND, MOI. (FILL)

(B) MEDIUM STIFF TO STIFF TAN GRAY SANDY CLAY, MOI.

(C) VERY LOOSE TO LOOSE TAN GRAY FINE TO COARSE SAND, MOI.



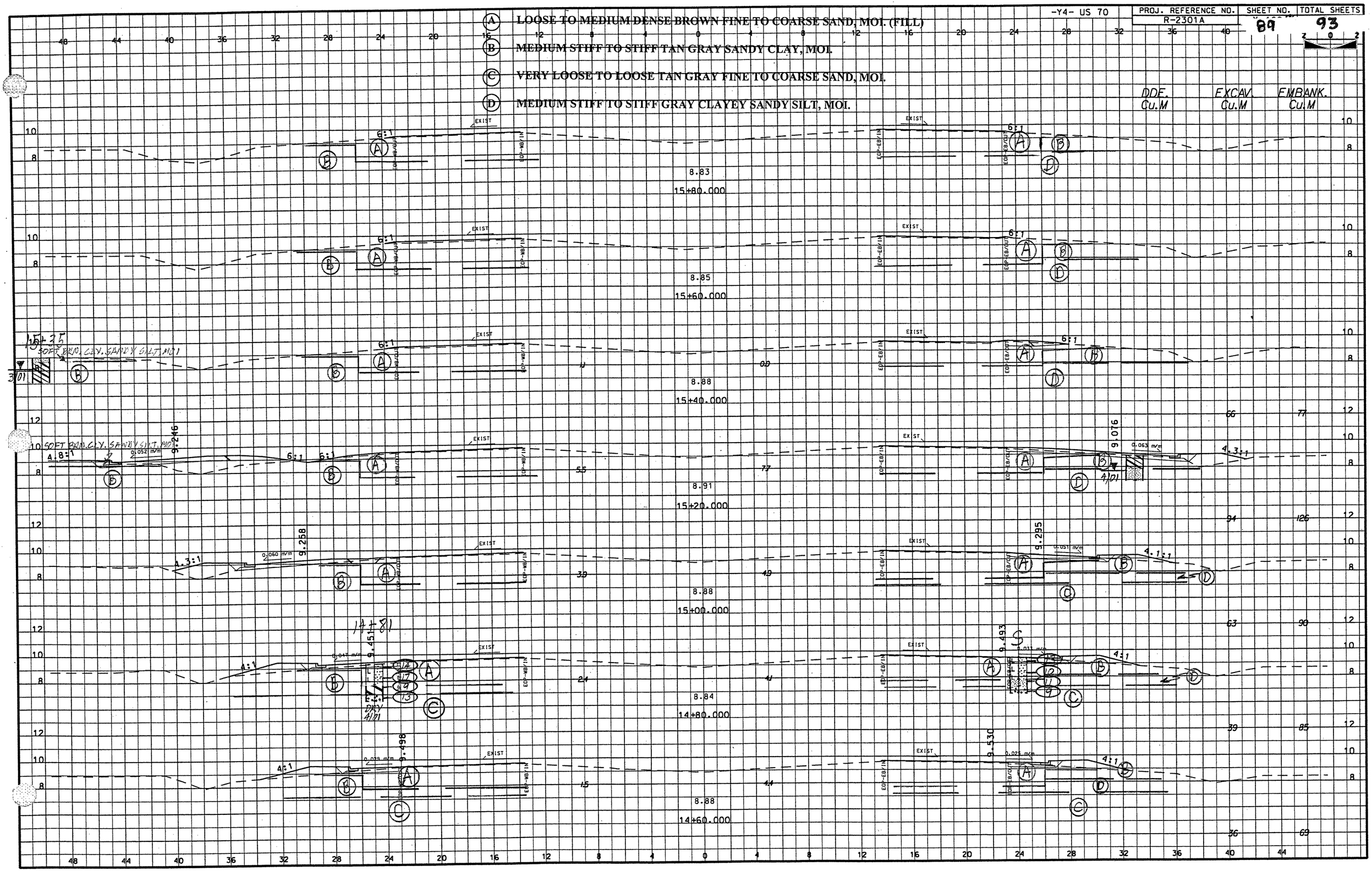
(A) LOOSE TO MEDIUM DENSE BROWN FINE TO COARSE SAND, MOI. (FILL)

(B) MEDIUM STIFF TO STIFF TAN GRAY SANDY CLAY, MOI.

(C) VERY LOOSE TO LOOSE TAN GRAY FINE TO COARSE SAND, MOI.

(D) MEDIUM STIFF TO STIFF GRAY CLAYEY SANDY SILT, MOI.

DDE. Cu.M	EXCAV. Cu.M	EMBANK. Cu.M

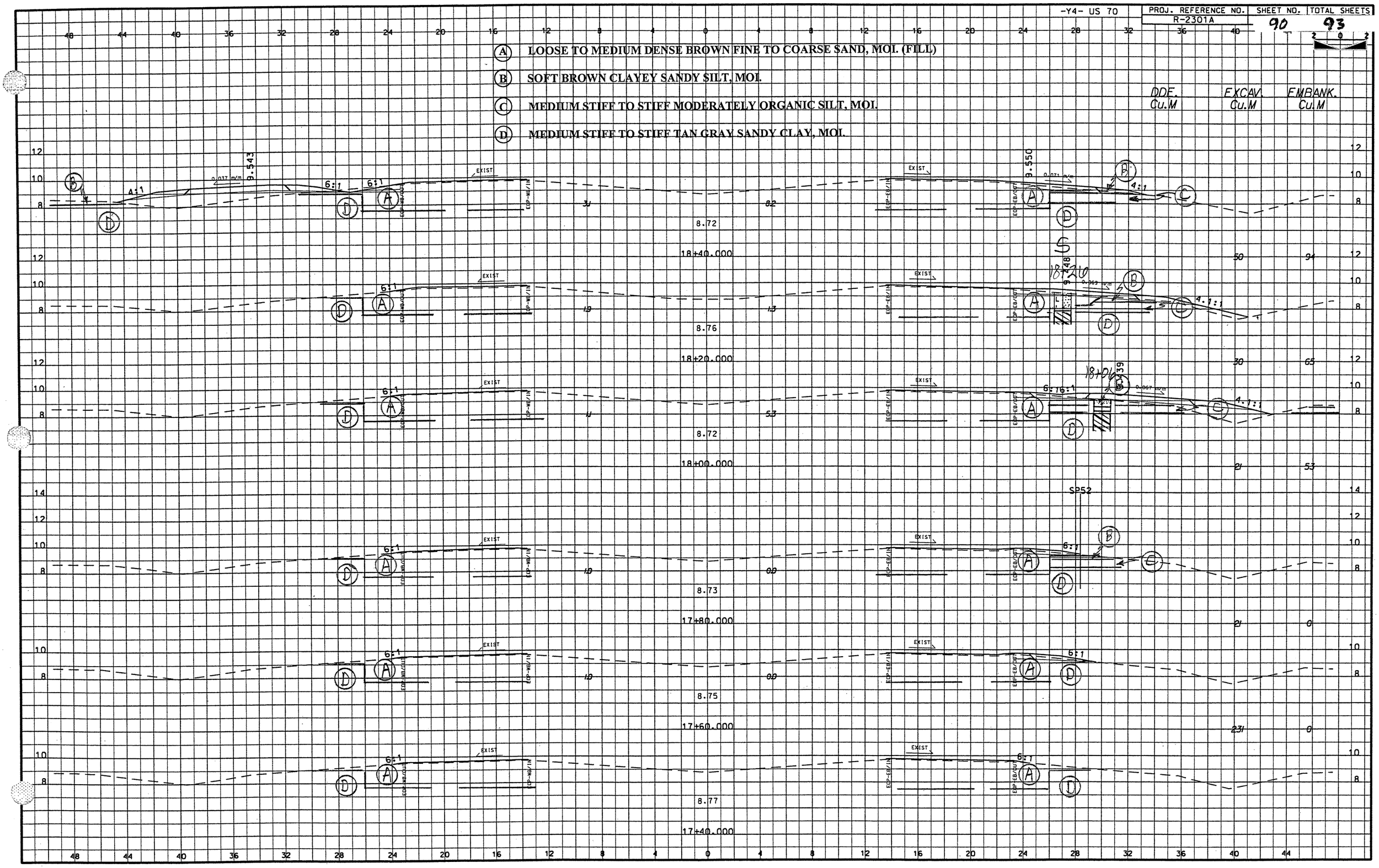


(A) LOOSE TO MEDIUM DENSE BROWN FINE TO COARSE SAND, MOI. (FILL)

(B) SOFT BROWN CLAYEY SANDY SILT, MOI.

(C) MEDIUM STIFF TO STIFF MODERATELY ORGANIC SILT, MOI.

(D) MEDIUM STIFF TO STIFF TAN GRAY SANDY CLAY, MOI.

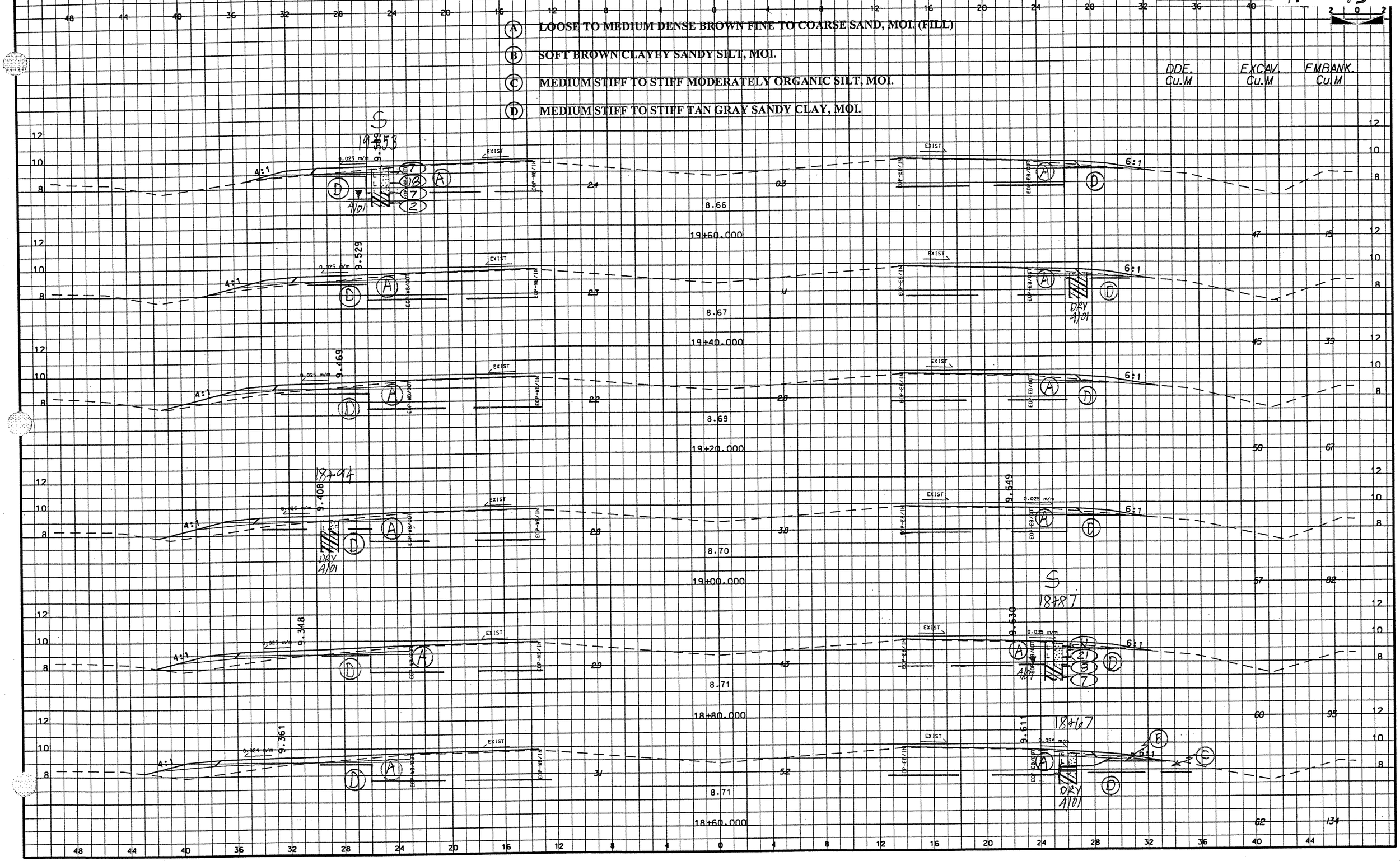


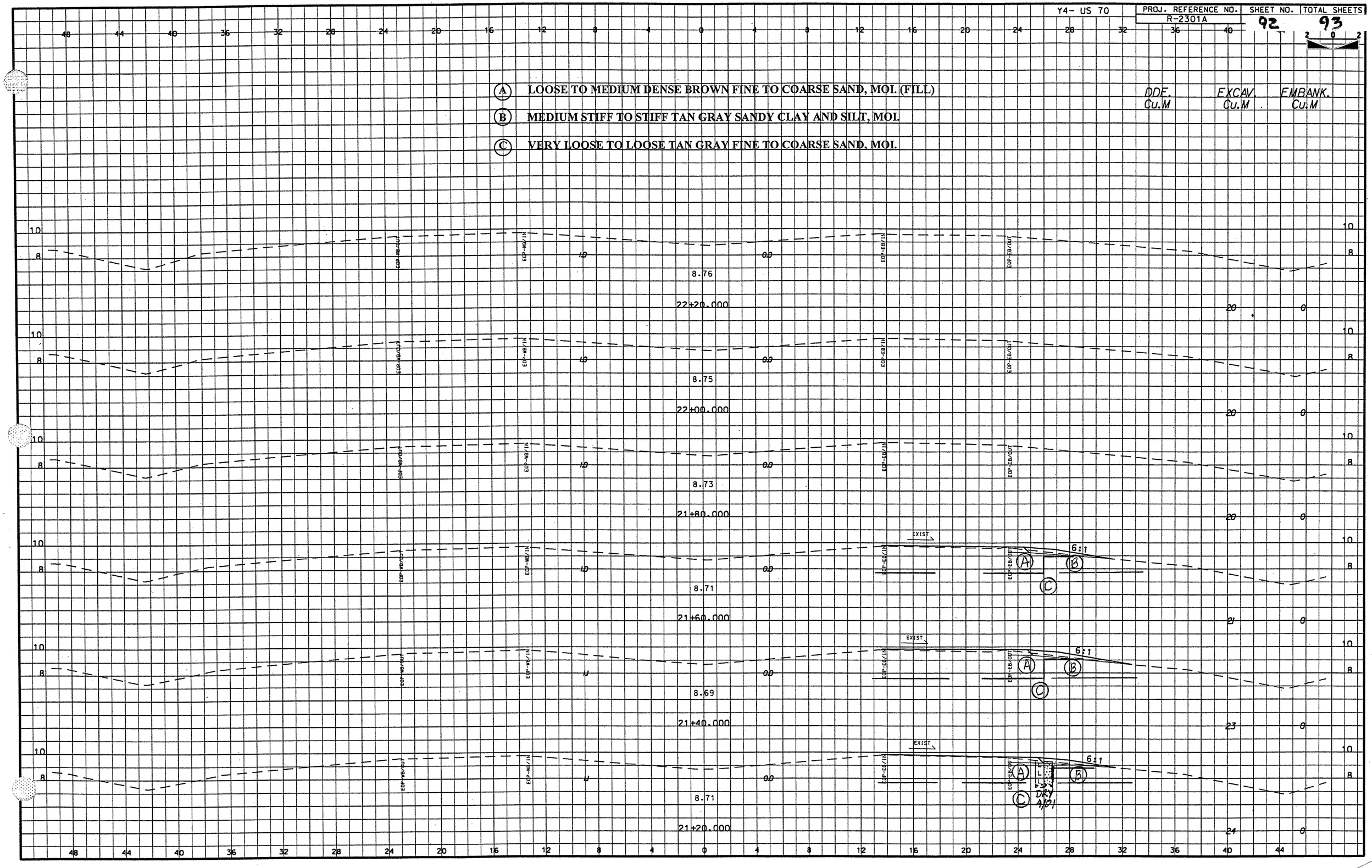
(A) LOOSE TO MEDIUM DENSE BROWN FINE TO COARSE SAND, MOI. (FILL)

(B) SOFT BROWN CLAYEY SANDY SILT, MOI.

(C) MEDIUM STIFF TO STIFF MODERATELY ORGANIC SILT, MOI.

(D) MEDIUM STIFF TO STIFF TAN GRAY SANDY CLAY, MOI.




Y4- US 70
PROJ. REFERENCE NO.
R-2301A
SHEET NO.
92
TOTAL SHEETS
93
(A) LOOSE TO MEDIUM DENSE BROWN FINE TO COARSE SAND, MOI. (FILL)
(B) MEDIUM STIFF TO STIFF TAN GRAY SANDY CLAY AND SILT, MOI.
(C) VERY LOOSE TO LOOSE TAN GRAY FINE TO COARSE SAND, MOI.
DDE. Cu.M
EXCAV. Cu.M
EMBANK. Cu.M
EOP-WB/OUT
EOP-WB/IN
EOP-EB/IN
EOP-EB/OUT
8.76
22+20.000
8.75
22+00.000
8.73
21+80.000
8.71
21+60.000
8.69
21+40.000
8.71
21+20.000
EXIST
6:1
DRY
A/01

EXCAV. Cu.M | EMBANK. Cu.M

S

6+60.000 — 23 — 0

6+40.000 — 23 — 0

6+20.000 — 26 — 0

6+00.000 — 20 — 0

5+80.000 — 0 — 0

5+60.000

5+40.000

11.72

7+40.000

7+20.000 — 22 — 1

7+00.000 — 15 — 2

6+80.000 — 23 — 1

EXCAV. Cu.M | EMBANK. Cu.M

SOIL SAMPLE TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 2.0 mm	425 um	75 um	% MOISTURE	% ORGANIC
S-45	6+60	1.5M RT	0.30-0.70	A-2-4(0)	16	NP	36.2	43.9	5.8	14.2	80	69	18		
S-46	6+60	1.5M RT	0.80-1.80	A-6(3)	36	14	26.3	29.9	3.3	40.4	100	93	45	20.7	

(A) LOOSE BROWN FINE TO COARSE SAND WITH GRAVEL, MOI. (FILL)

(B) MEDIUM STIFF TO STIFF TAN GRAY SANDY CLAY, MOI.

(C) VERY LOOSE TO LOOSE TAN GRAY FINE TO COARSE SAND, MOI.

(D) VERY LOOSE TO LOOSE TAN GRAY CLAYEY SAND, MOI.