ID: U-4026A

CONTRACT: C200840

CONTENTS

LINE	STATION	PLAN	PROFILE	XSECTS
-L-	13+64-77+00	4-9		12-34
-YS-	19+35-36+65	8, 10, 11		35-41

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

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

ROADWAY SUBSURFACE INVESTIGATION

STATE PROJ. 35018.3.1 I.D. U-4026A F.A. PROJ. N/A

COUNTY WAKE

PROJECT DESCRIPTION DAVIS DRIVE (SR 1613/1999) FROM 390' NORTH OF MORRISVILLE-CARPENTER ROAD (SR 3014) TO NORTH OF KOPPERS RD./McCRIMMONS PKWY (SR 1635)

INVENTORY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-4026	1	41

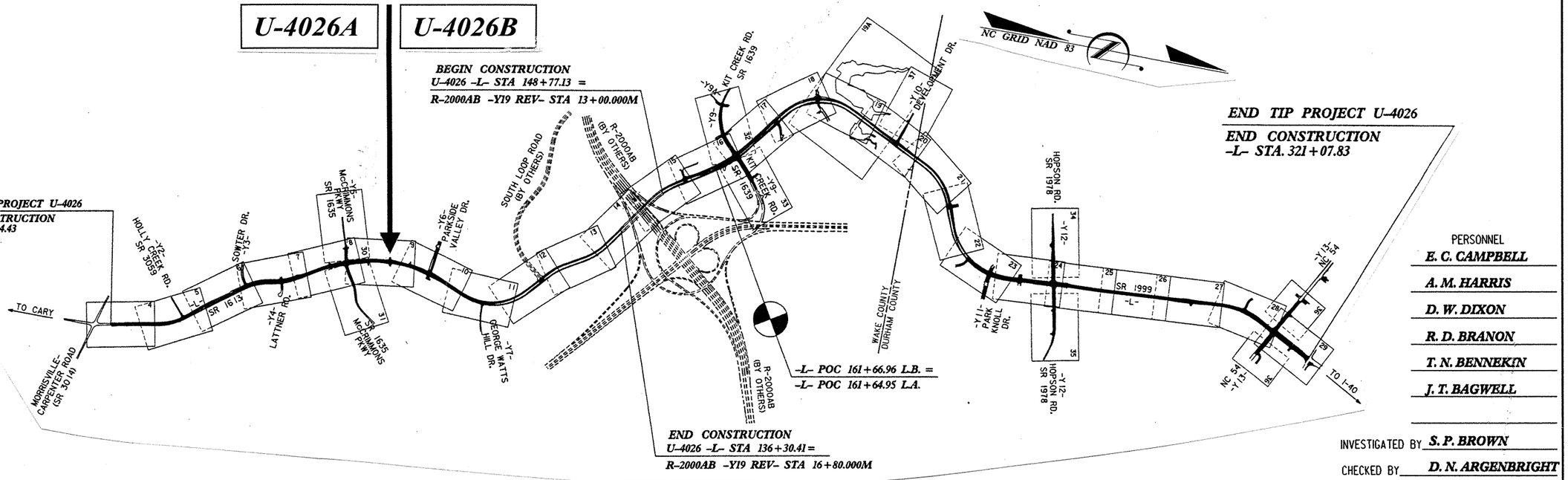
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
35018.1.1		P.E.
35018.2.1		R/W
35018.3.1		CONST

CAUTION NOTICE

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

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

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



PERSONNEL

E. C. CAMPBELL

A. M. HARRIS

D. W. DIXON

R. D. BRANON

T. N. BENNEKIN

J. T. BAGWELL

INVESTIGATED BY S. P. BROWN

CHECKED BY D. N. ARGENBRIGHT

SUBMITTED BY D. N. ARGENBRIGHT

DATE AUGUST 2003

NORTH CAROLINA LICENSED SEAL 1873 GEOLOGIST STEVE P. BROWN SEAL

SIGNATURE

DRAWN BY: A. N. KARPA

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.

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
U-4026A	9.8051713	2	41

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL 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 WHICH CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND WHICH YIELDS LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM AND BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:

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

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤35% PASSING #200)							SILT-CLAY MATERIALS (>35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5 A-7-6			
SYMBOL														
% PASSING #10 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX	51 MN 10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
LIQUID LIMIT	6 MX		N.P.	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

P.I. OF A-7-5 ≤ L.L. - 30 ; P.I. OF A-7-6 > L.L. - 30

CONSISTENCY OR DENSENESS

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

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE	4	10	40	60	200	270
OPENING (MM)	4.76	2.0	0.42	0.25	0.075	0.053

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

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

SOIL MOISTURE - CORRELATION OF TERMS

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

PLASTICITY

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

COLOR

DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YEL-BRN, 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 ARE 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 30
MODERATELY COMPRESSIBLE	LIQUID LIMIT 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 SEEPAGE

MISCELLANEOUS SYMBOLS

- ROADWAY EMBANKMENT WITH SOIL DESCRIPTION
- SOIL SYMBOL
- ARTIFICIAL FILL OTHER THAN ROADWAY EMBANKMENTS
- INFERRED SOIL BOUNDARIES
- 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
- 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 - CBR 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
FRAGS. - FRAGMENTS
MED. - MEDIUM
PMT - PRESSUREMETER TEST
SD. - SAND, SANDY
SL. - SILT, SILTY
SLI. - SLIGHTLY
TCR - TRICONE REFUSAL
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT
W - MOISTURE CONTENT
V. - VERY
VST - VANE SHEAR TEST

EQUIPMENT USED ON SUBJECT PROJECT

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

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

HAMMER TYPE:
- [X] AUTOMATIC [ ] MANUAL

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

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

ROCK DESCRIPTION

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

WEATHERED ROCK (WR)	NON-COASTAL PLAIN MATERIAL THAT YIELDS SPT N VALUES > 100 BLOWS PER FOOT.
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 ROCKS EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. *IF TESTED, YIELDS SPT N VALUES > 100 BPF*
VERY SEVERE (V. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, YIELDS SPT N VALUES < 100 BPF*
COMPLETE	ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.

ROCK HARDNESS

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

FRACTURE SPACING

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

BEDDING

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

INDURATION

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

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

TERMS AND DEFINITIONS

ALLUVIUM (ALLUV.) - SOILS WHICH 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 IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.

CALCAREOUS (CALC.) - SOILS WHICH 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 (F.P.) - 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 SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

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

SAPROLITE (SAP.) - RESIDUAL SOIL WHICH 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, WHICH HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS

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

STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR B.P.F.) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS LESS THAN 0.1 FOOT PENETRATION WITH 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 (S.R.Q.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY: TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 10 CENTIMETERS DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.

TOPSOIL (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK:

ELEVATION:

NOTES:

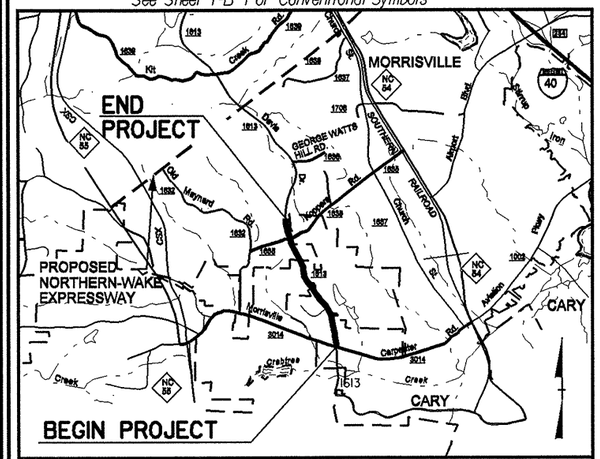
REVISED 09/15/00

9/09/99

U-4026A

PROJECT: 9.8051713

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



VICINITY MAP

R/W PLANS

NOTE: THIS PROJECT IS WITHIN THE MUNICIPAL CITY LIMITS OF CARY AND MORRISVILLE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-4026A	2A	41

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
9.8051713		P.E., R/W

LOCATION: *DAVIS DRIVE (SR 1613/1999) FROM 390' NORTH OF MORRISVILLE-CARPENTER ROAD (SR 3014) TO NORTH OF KOPPERS RD./McCRIMMONS PKWY (SR 1635)*

TYPE OF WORK: *GRADING, DRAINAGE, PAVING, CULVERTS AND SIGNALS.*

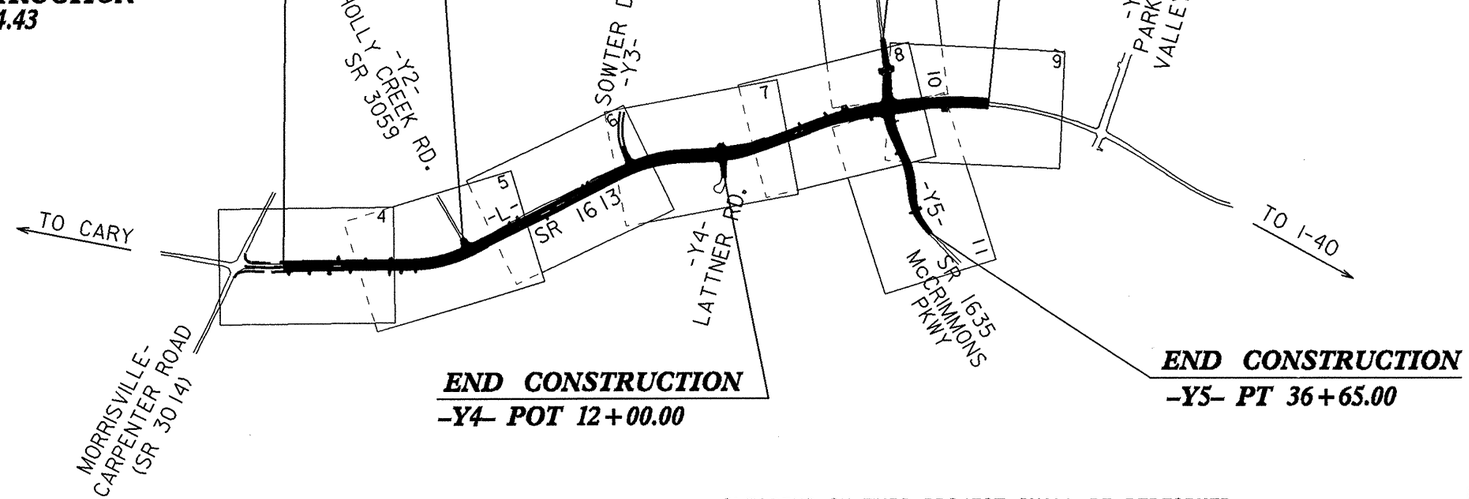
NC GRID NAD 83

BEGIN STATE PROJECT 9.8051713
BEGIN CONSTRUCTION
-L- STA. 13+64.43

BEGIN CONSTRUCTION
-Y5- POC 19+35.00

BEGIN CONSTRUCTION
-Y2 STA. 14+00.00

END STATE PROJECT 9.8051713
END CONSTRUCTION
-L- STA. 77+00.00



END CONSTRUCTION
-Y4- POT 12+00.00

END CONSTRUCTION
-Y5- PT 36+65.00

NCDOT CONTACT: TERESA BRUTON, P.E.
DESIGN SERVICES - ENGINEERING COORDINATION

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT (2004)= 24155
ADT (2024)= 45055
DHV = 12 %
D = 65 %
T = 4 % *
V = 55 MPH

* TTST 1 % DUAL 3 %

PROJECT LENGTH

LENGTH ROADWAY STATE PROJECT 9.8051713 = 1.200 MI.

TOTAL LENGTH OF STATE PROJECT 9.8051713 = 1.200 MI.

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

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:

LETTING DATE:
APRIL 20, 2004

Warren F. Lamb, P.E.
PROJECT ENGINEER

Stephen R. Whitley, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: *P.E.*

ROADWAY DESIGN ENGINEER

SIGNATURE: *P.E.*

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER *P.E.*

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR *DATE*

$$$$SYSTIME$$$$ $$$$CONS$$$$ $$$$USERNAME$$$$

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

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

LYNDO TIPPETT
SECRETARY

August 5, 2003

STATE PROJECT:	9.8051713 (U-4026A)
FEDERAL PROJECT:	N/A
COUNTY:	Wake
DESCRIPTION:	Davis Drive (SR 1613/1999) from 390' north of Morrisville - Carpenter Road (SR 3014) to north of Koppers Road/McCrimmons Parkway (SR 1635)
SUBJECT:	Geotechnical Report - Inventory

PROJECT DESCRIPTION

The project consists of widening with partial horizontal and vertical realignment of -L- (Davis Drive) and -Y5- (Koppers Road/McCrimmons Parkway). Minor reconstruction of three additional Y lines is required to retie them with -L-.

A geotechnical investigation was conducted from February to May 2003, using a CME-45C ATV-mounted drill machine with an automatic hammer. Standard Penetration Tests were performed at selected locations and additional borings were advanced using continuous flight augers. Representative soil samples were collected for visual classification in the field and for laboratory analysis by the Materials and Tests Unit. ~~Bulk samples are itemized in Appendix A.~~

The following alignments, totaling 1.4 miles, were investigated. Subsurface soil cross sections of these lines are included in this report.

Line	Station		
-L-	13+64	to	77+00
-Y5-	19+35	to	32+00

AREAS OF SPECIAL GEOTECHNICAL INTEREST

1) Soft Foundation Soil: Artificial fill in the form of an abandoned, breached dam was encountered on the project as noted below.

Line	Station			Material
-L-	41+80	to	45+55	Sandy Silt and Sandy Clay

2) Highly Plastic Soils: Highly plastic clays, with plasticity indices greater than 35, were found in the following areas.

Line	Station		
-L-	34+25	to	37+75
-L-	60+25	to	74+25
-L-	76+25	to	77+00
-Y5-	19+35	to	31+50

3) Groundwater: The following sections were found to exhibit a high water table, seasonal high groundwater, or the potential for groundwater related construction problems.

Line	Station		
-L-	15+00	to	39+00
-L-	43+50	to	59+00
-L-	64+50	to	67+00
-Y5-	27+50	to	28+50

4) Wells: Water wells within proposed right of way were found at the following locations.

Line	Station	Offset
-L-	14+60	55 Rt
-L-	16+40	55 Rt
-L-	16+47	58 Lt
-L-	18+07	63 Rt
-L-	18+50	45 Rt
-L-	21+20	43 Lt
-L-	22+60	61 Lt
-L-	66+60	75 Rt

PHYSIOGRAPHY AND GEOLOGY

The project is in very gently rolling terrain of the Piedmont Physiographic Province. Surface drainage, both natural and man-made, is generally poor to fair. This drainage condition results in common wet areas and broad areas of shallow groundwater. Land use is rural residential, commercial, and agricultural. Triassic age, sedimentary rocks of the Durham Sub-basin underlie the area. Most soils are residual, and have been derived by weathering of the underlying rocks.

SOIL PROPERTIES

Residual soils are the dominant soils on the project. They are derived from in-place weathering of the underlying Triassic sedimentary rocks. The majority of these soils are medium stiff to hard, moist to wet, silty clay (A-7-5, A-7-6), sandy clay (A-6), and sandy silt (A-4). The sandy and silty clays range from slightly to highly plastic, with the highly plastic material being concentrated near the ground surface. Plasticity typically decreases with depth, grading to moderately to slightly plastic within 3 to 5 feet of the surface. Residual, very loose to very dense, moist to wet, silty sand (A-2-4) and clayey sand (A-2-6) are also present, but far less common than the clays. They usually occur at depth, below the more clayey soils.

Existing roadway embankment soils are the next most abundant soils on the project. Existing embankments are less than 10 feet high and are stable. Consequently, they were not investigated.

Artificial fill, in the form of an abandoned, breached dam, is present right of -L-, Stations 41+80 to 45+55. The dam consists of soft, moist, sandy silt (A-4) and slightly plastic, sandy clay (A-6). These soils, if adequately compacted, are suitable for roadway construction.

ROCK PROPERTIES

Non-crystalline rock was not encountered in the drilling of this project. However, weathered rock (sandstone and siltstone) was encountered at -L-, Station 30+00, 50' Rt, more than 20 feet below proposed grade. The project is within the Durham Sub-basin, which contains Triassic age sandstones, siltstones, and mudstones. These rocks have been encountered on the adjoining project to the north (U-4026B).

GROUNDWATER

Frequent rain during the investigation, combined with generally poor to fair drainage on the project, resulted in saturated ground conditions and an elevated groundwater table. Ground water elevations determined during the investigation are probably maximums. Depth to the ground water table is generally less than 5 feet, from the beginning of the project to -L- Station 59+00. Ahead of Station 59+00, the ground water table was encountered at depths usually greater than 5 feet.

BULK SAMPLES

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

Sample No.	Location	Depth (m)	Test
RT-4	-L- 77+00, 70 Rt	0.0 - 3.0	Recompacted Triaxial CU
RT-5	-L- 77+00, 70 Rt	3.0 - 7.0	Recompacted Triaxial CU
RT-6	-L- 77+00, 70 Rt	7.0 - 15.0	Recompacted Triaxial CU
CBR-2	-L- 77+00, 70 Rt	0.0 - 3.0	California Bearing Ratio
CBR-3	-L- 77+00, 70 Rt	3.0 - 7.0	California Bearing Ratio
CBR-4	-L- 77+00, 70 Rt	7.0 - 15.0	California Bearing Ratio

Respectfully submitted,

Steve P. Brown

Steve P. Brown, LG
Project Engineering Geologist

Volumes in Cubic **YARDS**

PROJECT **U-4026** COUNTY **WAKE/DURHAM** DATE **5/1/2006** COMPILIED BY: **DCW** CHECKED BY: **SRW** SHEET OF 4

STATION	STATION	EXCAVATION					EMBANKMENT				BORROW	WASTE			
		TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUIT. UNCLASS.	SUITABLE UNCLASS.	TOTAL	ROCK	EARTH	EMBANK. (+) 20 %		ROCK	SUITABLE	UNSUIT.	TOTAL
SUMMARY NO. 1 (LEFT)															
-L- LT 13+64.43	40+00.00	4047		985		4047	1936		1936	2323			1724	985	2709
-Y2- 14+00.00	14+50.00	17				17	5		5	6			11		11
TOTAL SUMMARY NO. 1 (LEFT)		4064		985		4064	1941		1941	2329			1735	985	2720
SUMMARY NO. 2 (LEFT)															
-L- LT 40+00.00	68+50.00	2899				2899	1453		1453	1744			1155		1155
-Y3- 13+00.00	14+50.00	121				121	17		17	20			101		101
-Y5- 19+35.00	24+00.00	742		1324	551	191	1865		1865	2238	2047			1875	1875
TOTAL SUMMARY NO. 2 (LEFT)		3762		1324	551	3211	3335		3335	4002	2047		1256	1875	3131
SUMMARY NO. 3 (LEFT)															
-L- LT 68+50.00	90+00.00	1539		1824	495	1044	5821		5821	6985	5941			2319	2319
TOTAL SUMMARY NO. 3 (LEFT)		1539		1824	495	1044	5821		5821	6985	5941			2319	2319
SUMMARY NO. 4 (LEFT)															
-L- LT 90+00.00	120+00.00	492				492	92		92	110			382		382
TOTAL SUMMARY NO. 4 (LEFT)		492				492	92		92	110			382		382
SUMMARY NO. 5 (LEFT)															
-L- LT 120+00.00	136+30.41	327				327	331		331	397	70				
TOTAL SUMMARY NO. 5 (LEFT)		327				327	331		331	397	70				
SUMMARY NO. 6 (LEFT)															
-L- LT 148+77.13	161+66.96	566				566	233		233	280			286		286
TOTAL SUMMARY NO. 6 (LEFT)		566				566	233		233	280			286		286
SUMMARY NO. 7 (LEFT)															
-L- LT 161+64.95	167+00.00	17				17	235		235	282	265				
-Y9- 10+00.00	25+00.00	5879			129	5750	11501		11501	13801	8051			129	129
-Y9A- 10+00.00	13+00.00	14				14	2545		2545	3054	3040				
TOTAL SUMMARY NO. 7 (LEFT)		5910			129	5781	14281		14281	17137	11356			129	129
SUMMARY NO. 8 (LEFT)															
-L- LT 167+00.00	198+00.00	4036				4036	216		216	259			3777		3777
TOTAL SUMMARY NO. 8 (LEFT)		4036				4036	216		216	259			3777		3777
SUMMARY NO. 9 (LEFT)															
-L- LT 198+00.00	229+00.00	15857	26		64	15767	178		178	214		26	15553	64	15643
-Y10- 8+00.00	14+50.00	1226				1226	145		145	174			1052		1052
TOTAL SUMMARY NO. 9 (LEFT)		17083	26		64	16993	323		323	388		26	16605	64	16695
SUMMARY NO. 10 (LEFT)															
-L- LT 229+00.00	260+50.00	7401				7401	2426		2426	2911			4490		4490
-Y12- 10+00.00	24+50.00	3641			113	3528	2354		2354	2825			703	113	816
TOTAL SUMMARY NO. 10 (LEFT)		11042			113	10929	4780		4780	5736			5193	113	5306
SUMMARY NO. 11 (LEFT)															
-L- LT 260+50.00	290+00.00	765				765	4386		4386	5263	4498				

Volumes in Cubic **YARDS**

PROJECT **U-4026** COUNTY **WAKE/DURHAM** DATE **5/1/2006** COMPILIED BY: **DCW** CHECKED BY: **SRW** SHEET OF 4

3C

STATION	STATION	EXCAVATION					EMBANKMENT				BORROW	WASTE			
		TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUIT. UNCLASS.	SUITABLE UNCLASS.	TOTAL	ROCK	EARTH	EMBANK. (+) 20 %		ROCK	SUITABLE	UNSUIT.	TOTAL
TOTAL SUMMARY NO. 11 (LEFT)		765				765	4386		4386	5263	4498				
SUMMARY NO. 12 (LEFT)															
-L- LT 290+00.00	311+23.33	371				371	3179		3179	3815	3444				
-Y13- 11+50.00	19+50.00	1920			511	1409	1938		1938	2326	917			511	511
TOTAL SUMMARY NO. 12 (LEFT)		2291			511	1780	5117		5117	6140	4360			511	511
SUMMARY NO. 13 (LEFT)															
-L- LT 311+23.33	321+07.83	217				217	1960		1960	2352	2135				
TOTAL SUMMARY NO. 13 (LEFT)		217				217	1960		1960	2352	2135				
SUB-TOTAL LEFT (SUMMARY 1 THRU 13)		52094	26	4133	1863	50205	42816		42816	51379	30408	26	29234	5996	35256

Volumes in Cubic **YARDS**

PROJECT **U-4026** COUNTY **WAKE/DURHAM** DATE **5/1/2006** COMPILIED BY: **DCW** CHECKED BY: **SRW** SHEET OF 4

3D

STATION	STATION	EXCAVATION					EMBANKMENT				BORROW	WASTE			
		TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUIT. UNCLASS.	SUITABLE UNCLASS.	TOTAL	ROCK	EARTH	EMBANK. (+) 20 %		ROCK	SUITABLE	UNSUIT.	TOTAL
SUMMARY NO. 1 (RIGHT)															
-L- RT 13+64.43	40+00.00	2135		1323	1317	818	10318		10318	12382	11564			2640	2640
TOTAL SUMMARY NO. 1 (RIGHT)		2135		1323	1317	818	10318		10318	12382	11564			2640	2640
SUMMARY NO. 2 (RIGHT)															
-L- RT 40+00.00	68+50.00	4704		2945	2062	2642	8663		8663	10396	7754			5007	5007
-Y4- 11+00.00	12+00.00	40				40	54		54	65	25				
-Y5- 26+00.00	36+65.00	1197		1358	955	242	4777		4777	5732	5490			2313	2313
TOTAL SUMMARY NO. 2 (RIGHT)		5941		4303	3017	2924	13494		13494	16193	13269			7320	7320
SUMMARY NO. 3 (RIGHT)															
-L- RT 68+50.00	90+00.00	14093		194	582	13511	862		862	1034			12477	776	13253
TOTAL SUMMARY NO. 3 (RIGHT)		14093		194	582	13511	862		862	1034			12477	776	13253
SUMMARY NO. 4 (RIGHT)															
-L- RT 90+00.00	120+00.00	58373		29	9531	48842	19245		19245	23094			25748	9560	35308
-Y7- 10+50.00	12+00.00	103				103	76		76	91			12		12
TOTAL SUMMARY NO. 4 (RIGHT)		58476		29	9531	48945	19321		19321	23185			25760	9560	35320
SUMMARY NO. 5 (RIGHT)															
-L- RT 120+00.00	136+30.41	49630		175	3951	45679	5836		5836	7003			38676	4126	42802
TOTAL SUMMARY NO. 5 (RIGHT)		49630		175	3951	45679	5836		5836	7003			38676	4126	42802
SUMMARY NO. 6 (RIGHT)															
-L- RT 148+77.13	161+66.96	10424	17	118	1221	9186	7624		7624	9149		17	37	1339	1393
TOTAL SUMMARY NO. 6 (RIGHT)		10424	17	118	1221	9186	7624		7624	9149		17	37	1339	1393
SUMMARY NO. 7 (RIGHT)															
-L- RT 161+64.95	167+00.00	1561			86	1475	1481		1481	1777	302			86	86
-Y9- 27+00.00	34+63.35	176				176	4348		4348	5218	5042				
TOTAL SUMMARY NO. 7 (RIGHT)		1737			86	1651	5829		5829	6995	5344			86	86
SUMMARY NO. 8 (RIGHT)															
-L- RT 167+00.00	198+00.00	64067	6742	186	9494	47831	27558		27558	33070		6742	14761	9680	31183
TOTAL SUMMARY NO. 8 (RIGHT)		64067	6742	186	9494	47831	27558		27558	33070		6742	14761	9680	31183
SUMMARY NO. 9 (RIGHT)															
-L- RT 198+00.00	229+00.00	24631		438	1484	23147	22885		22885	27462	4315			1922	1922
TOTAL SUMMARY NO. 9 (RIGHT)		24631		438	1484	23147	22885		22885	27462	4315			1922	1922

Volumes in Cubic **YARDS**

PROJECT **U-4026** COUNTY **WAKE/DURHAM** DATE **5/1/2006** COMPILIED BY: **DCW** CHECKED BY: **SRW** SHEET OF 4

3E

STATION	STATION	EXCAVATION					EMBANKMENT				BORROW	WASTE			
		TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUIT. UNCLASS.	SUITABLE UNCLASS.	TOTAL	ROCK	EARTH	EMBANK. (+) 20 %		ROCK	SUITABLE	UNSUIT.	TOTAL
SUMMARY NO. 10 (RIGHT)															
-L- RT 229+00.00	260+50.00	17074			1011	16063	17388		17388	20866	4803			1011	1011
-Y12- 26+00.00	40+60.00	2656			50	2606	2468		2468	2962	356			50	50
TOTAL SUMMARY NO. 10 (RIGHT)		19730			1061	18669	19856		19856	23827	5158			1061	1061
SUMMARY NO. 11 (RIGHT)															
-L- RT 260+50.00	290+00.00	518				518	27411		27411	32893	32375				
TOTAL SUMMARY NO. 11 (RIGHT)		518				518	27411		27411	32893	32375				
SUMMARY NO. 12 (RIGHT)															
-L- RT 290+00.00	311+23.33	18874			525	18349	9473		9473	11368			6981	525	7506
-Y13- 21+50.00	26+50.00	2026				2026	1395		1395	1674			352		352
TOTAL SUMMARY NO. 12 (RIGHT)		20900			525	20375	10868		10868	13042			7333	525	7858
SUMMARY NO. 13 (RIGHT)															
-L- RT 311+23.33	321+07.83	766				766	999		999	1199	433				
TOTAL SUMMARY NO. 13 (RIGHT)		766				766	999		999	1199	433				
SUB-TOTAL RIGHT (SUMMARY 1 THRU 13)		273048	6759	6766	32269	234020	172861		172861	207433	72457	6759	99044	39035	144838
SUB-TOTAL LEFT (SUMMARY 1 THRU 13)		52094	26	4133	1863	50205	42816		42816	51379	30408	26	29234	5996	35256
SUB-TOTAL RIGHT (SUMMARY 1 THRU 13)		273048	6759	6766	32269	234020	172861		172861	207433	72457	6759	99044	39035	144838
ADDITIONAL UNDERCUT				1450			1450		1450	1740	1740			1450	1450
EST. LOSS DUE TO CLEAR. & GRUB.		-9350				-9350							-9350		-9350
SUB-TOTAL		315792	6785	12349	34132	274875	217127		217127	260552	104606	6785	118928	46481	172194
WASTE IN LIEU OF BORROW											-104606		-104606		-104606
GRAND TOTALS		315792	6785	12349	34132	274875	217127		217127	260552		6785	14323	46481	67589
SAY		315800		12400											

PAVEMENT STRUCTURE VOLUME 46,750 CY

DDE 10,650 CY

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-4026A	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83 / NC GRID

KAMAL ALIMANSOUR
DB 3241 PG 525

GROVER O. & PEGGY H. LEWTER
DB 251 PG 206

WILLIAM M. & GALE D. YEAGER
DB 2545 PG 30

J. T. HOBBY & SON INC.
DB 1230 PG 354

LEE MOORE OIL COMPANY
DB 4088 PG 495

CLARENCE B. & PEGGY C. RIDOUT
DB 3005 PG 926

LEE-MOORE OIL COMPANY
DB 4160 PG 409

IDA WILLIAMS MILLS
DB 2577 PG 346

DANNY E. & PATRICIA R. BLACKBURN
DB 5190 PG 302

BILLY H. & WILMA
DB 2818 PG 466

JAMES L. MICHAEL, ET UX
DB 2926 PG 604

JOHN W. HOPKINS
DB 2659 PG 259

BY-202 PINC 8+60.76
-L- STA. 11+52.19
(304.900' LT.)

BL-1 PINC 18+93.38
BY-203 PINC 12+39.58
GPS U-4026-1
-L- STA. 10+25.26
(53.532' RT.)

BY-204 PINC 16+85.75

BL-2 PINC 28+17.37
GPS U-4026-2
-L- STA. 20+04.74
(18.185' RT.)

FUTURE PROJECT
BY OTHERS

BEGIN STATE PROJECT U-4026A
-L- PT STA. 13+64.43 =
PROJECT TOC 99-040
-L- PT STA. 220+71.66

-L- STA. 13+64.43
BEGIN 200' TAPER
LT. TURN LANE, SB

-L- STA. 15+64.43
END 200' TAPER
LT. TURN LANE, SB

SR 1613 DAVIS DR BST

SR 3014 MORRISVILLE-CARPENTER RD BST

SR 3014 MORRISVILLE-CARPENTER RD

SLOPE STAKE LINE

2' BASE TAIL DITCH
EST 16 CY DDE
SEE DITCH DETAIL

CLASS "B" RIP RAP
EST 2 TONS
EST 7 SY FF

SPECIAL DITCH GRADE
(SEE PROFILES)

PROP. 1'-6" C&G

-L-
PI Sta 11+80.85
Δ = 5° 25' 17.3" (LT)
D = 1° 30' 00.0"
L = 361.43'
T = 180.85'
R = 3,819.72'
SE = 0.024 FT/FT

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "R2000-26" WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 765 141.40 (ift) EASTING: 2040233.344(ift) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9999 1540 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "R2000-26" TO -L- STATION 13+64.43 IS S 23°06'48.7"E ; 12,371.50' ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NGVD 29

Plans prepared by:
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE #202
RALEIGH, N.C. 27606
For Division of Highways

-MATCHLINE- STA. 22+00.00 SEE SHEET NO. 5

$$$$$$$USERNAME$$$$$
$$$$$$$SYSTIME$$$$$

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-4026A	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

7/2/99

-L-
PI Sta 25+34.91
Es = 7° 30' 00.0"
Ls = 300.00'
LT = 200.18'
ST = 100.16'

PI Sta 27+48.07
Δ = 11° 17' 49.6" (LT)
D = 5° 00' 00.0"
L = 225.94
T = 113.34'
R = 1145.92'
SE = 0.06 FT/FT
RUNOFF = 300.0 FT

PI Sta 29+60.83
Es = 7° 30' 00.0"
Ls = 300.00'
LT = 200.18'
ST = 100.16'

-Y2- POT 10+00.00
BYI-206 POT 5+00.00
12" BSF
373.38'
S22°48'22"E
150'
S38°05'51"W
125.22'
N38°05'51"E
260.00'
N51°54'09"E
180.00'
N64°58'51"E
POND
4 MELVIN D. NANCY T. BARNES DB 3189 PG 250
5 WILLIAM L. EDITH A. WRIGHT DB 4468 PG 426
3 BILLY H. & WILMA SAULS DB 2878 PG 466
12" CMP
2SFD
G
S
GR
BEGIN CONSTRUCTION
-Y2- STA.14+00.00
-L- TS 23+34.73
-L- SC 26+34.73
-L- CS 28+60.67
-L- ST 31+60.67
-L- POS 30+07.20
-Y2- POT 15+19.10
-L- STA.32+20.00
BEGIN 200' TAPER
LT. TURN LANE, SB
9 HERMAN & BERTHA S. YATES
+00 -Y2- 29.60'
+64.12 -L- 102.85'
+50 -Y2- 93.38'
+00 -Y2- 30.40'
+34.73 -L- 70'
+60.67 -L- 79.85'
50' (TYP.)
SPECIAL DITCH GRADE (SEE PROFILES)
EXISTING R/W
SR 1003 DAVIS DR (SR 1003)
N 36° 44' 50.7" W
PROP. 1'-6" C&G
PROP. 6' MONO. CONC. ISLAND
CHORD SLOPE STAKE LINE
TECC CAROLINA AND EXISTING R/W TANGENT
(AATUP)
W/LT
-L-
N 49° 47' 40.8" E
-MATCHLINE- STA. 22+00.00 SEE SHEET NO. 4
-MATCHLINE- STA. 34+00.00 SEE SHEET NO. 6
NAD 83 / NC GRID
+84 -L- 85'
+84 -L- 102'
+34.73 -L- 85'
+10.56 -L- 85'
+06.07 -L- 105'
+34.73 -L- 90'
+60.67 -L- 85'
+30 -L- 90.77'
+00 -L- 100'
+60.67 -L- 95'
+65 -L- 95.03'
+30 -L- 145'
+65 -L- 145'
+60.67 -L- 95'
2 JOHN W. HOPKINS DB 2659 PG 259
6 FERRELL LAND COMPANY LLC DB 7271 PG 126
7 JOHN J. MITCHELL DB 6074 PG 474
8 WILLIAM T. HATCH, ET AL DB 5482 PG 107
CLASS "B" RIP RAP EST 3 TONS EST 10 SY FF
CLASS "B" RIP RAP EST 1 TONS EST 5 SY FF
SPECIAL LAT. "V" DITCH SEE DITCH DETAIL
LAT. "V" DITCH W/ CLASS "B" RIP RAP EST. 59.8 TONS EST. 168 SY FF EST. 27 CY DDE SEE DITCH DETAIL
2' BASE TAIL DITCH W/ CLASS "B" RIP RAP EST. 30.8 TONS EST. 83.4 SY FF EST. 8 CY DDE SEE DITCH DETAIL
BL-103 PINC 33+59.82
-L- STA. 24+86.51
(20.486' RT.)
BL-104 PINC 38+58.53
BYI-207 POT 10+35.17
-L- STA. 29+84.14
(2.211' RT.)
-L- STA.25+90.00
BEGIN 200' TAPER
LT. TURN LANE, NB
-L- STA.27+90.00
END 200' TAPER
LT. TURN LANE, NB
S23°51'19"E
132.43'
GRAU-350
+75
PROP. GUARDRAIL
SLOPE STAKE LINE
MORRISVILLE CARY CITY LIMIT
CARY CITY LIMIT
SERVICE ROAD
OK COVERED CONC.
25BKO
CAT-I
+72.99
PDE
REMOVE
EXISTING R/W REMOVE
PROP. 1'-6" C&G
EXISTING R/W
16' W/LT
2@1.20%
2@2%
-2%
-4%
-6%
-8%
-10%
-12%
-14%
-16%
-18%
-20%
-22%
-24%
-25%
-26%
-28%
-30%
-32%
-34%
-36%
-38%
-40%
-42%
-44%
-46%
-48%
-50%
-52%
-54%
-56%
-58%
-60%
-62%
-64%
-66%
-68%
-70%
-72%
-74%
-76%
-78%
-80%
-82%
-84%
-86%
-88%
-90%
-92%
-94%
-96%
-98%
-100%

Plans prepared by:
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE #202
RALEIGH, N.C. 27606
For Division of Highways

$$$$SYSTIME$$$$
$$$$SYSNAME$$$$
$$$$USERNAME$$$$

7/2/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-4026A	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83 / NC GRID

-Y3-
PI Sta 12+07.09
Δ = 39° 44' 38.3" (LT)
D = 10° 00' 00.0"
L = 397.44'
T = 207.09'
R = 572.96'
SE = 0.02 FT/FT
RUNOFF = 30.0 FT

BEGIN CONSTRUCTION
-Y3- POC 13+00.00

-Y3- PT 13+97.44

-L- STA. 34+20.00
END 200' TAPER
LT. TURN LANE, SB

BL-105 PINC 48+55.64
-L- STA. 39+80.94
(22.928' LT.)

BL-106 PINC 54+22.31
BT2-209 ROT 9+92.09
-L- STA. 45+47.01
(1.895' LT.)

-MATCHLINE STA. 34+00.00 SEE SHEET NO. 5

-MATCHLINE STA. 46+00.00 SEE SHEET NO. 7

2' BASE TAIL DITCH W/ CLASS "B" RIP RAP
EST. 22.4 TONS
EST. 60.6 SY FF
EST. 6 CY DDE
SEE DITCH DETAIL

2' BASE TAIL DITCH W/ CLASS "B" RIP RAP
EST. 11.2 TONS
EST. 30.3 SY FF
EST. 3 CY DDE
SEE DITCH DETAIL

9 HERMAN & BERTHA S. YATES

10 JAMES RAY SEAGROVES
DB 931 PG 217

11 CARPENTER ASSOCIATES
DB 3756 PG 444

8 WILLIAM T. HATCH, ET AL
DB 5482 PG 107

CARY CITY LIMIT
MORRISVILLE CITY LIMIT

SPECIAL DITCH GRADE (SEE PROFILES)

SLOPE STAKE LINE

ARTIFICIAL FILL

SPECIAL LAT. "V" DITCH SEE DITCH DETAIL

-L- POS 45+77.62
-Y3- POT 15+02.12

-L- TS 43+42.62

-L-
PIs Sta 45+42.80
θs = 7° 30' 00.0"
Ls = 300.00'
LT = 200.18'
ST = 100.16'

Plans prepared by:
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE #202
RALEIGH, N.C. 27606
For Division of Highways

$$$$$$$$SYSTIME$$$$$
$$$$$$$$

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-4026A	7
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83 / NC GRID

-MATCHLINE- STA. 46+00.00 SEE SHEET NO. 6

-MATCHLINE- STA. 58+00.00 SEE SHEET NO. 8

-L-
PI Sta 54+31.89
Θs = 7° 30' 00.0"
Ls = 300.00'
LT = 200.18'
ST = 100.16'

PI Sta 55+47.04
Δ = 1° 32' 00.0" (LT)
D = 5° 00' 00.0"
L = 30.67'
T = 15.33'
R = 1145.92'
SE = 0.06 FT/FT
RUNOFF = 300.0 FT

PI Sta 56+62.54
Θs = 7° 30' 00.0"
Ls = 300.00'
LT = 200.18'
ST = 100.16'

-Y3-
PI Sta 12+07.09
Δ = 39° 44' 38.3" (LT)
D = 10° 00' 00.0"
L = 397.44'
T = 207.09'
R = 572.96'
SE = 0.02 FT/FT
RUNOFF = 30.0 FT

BL-107 PINC 61+80.24
BY3-210 POT 5+00.00
-L- STA. 53+10.76
(25.652' RT.)

-L- STA. 57+60.00
END 200' TAPER
LT. TURN LANE, SB

-L- STA. 56+60.00
END 150' TAPER
RT. TURN LANE, SB

-L- CS 55+62.38

-L- STA. 55+60.00
BEGIN 200' TAPER
LT. TURN LANE, SB

-L- SC 55+31.71

-L- STA. 55+10.00
BEGIN 150' TAPER
RT. TURN LANE, SB

-L- TS 52+31.71

-L- CS 47+96.71

-L- SC 46+42.62

-L- ST 50+96.71

-L- STA. 51+50.00
END 200' TAPER
LT. TURN LANE, NB

-L- STA. 51+90.00
RT. TURN LANE, NB

-L- STA. 49+50.00
BEGIN 200' TAPER
LT. TURN LANE, NB

-L- STA. 49+90.00
BEGIN 200' TAPER
RT. TURN LANE, NB

-L- POS 53+58.34
-Y4- POT 10+00.00

-Y4- PC 11+65.84

-Y4- PT 12+35.73

-Y4- PC 12+45.59

-Y4- PT 13+14.59

-L- STA. 54+60.00
BEGIN 210' TAPER
BUS LANE, NB

-L- STA. 56+70.00
END 210' TAPER
BUS LANE, NB

END CONSTRUCTION
-Y4- POT 12+00.00

BY3-211 POT 7+16.81
-L- STA. 53+22.04
(242.145' RT.)

-Y4-
PI Sta 12+01.05
Δ = 17° 17' 49.2" (RT)
D = 24° 45' 00.0"
L = 69.89'
T = 35.21'
R = 231.50'
SE = MATCH EXIST.

PI Sta 12+81.70
Δ = 41° 44' 29.7" (RT)
D = 60° 30' 00.0"
L = 68.99'
T = 36.11'
R = 94.70'

PI Sta 45+42.80
Θs = 7° 30' 00.0"
Ls = 300.00'
LT = 200.18'
ST = 100.16'

PI Sta 47+19.78
Δ = 7° 42' 15.5" (RT)
D = 5° 00' 00.0"
L = 154.09
T = 77.16'
R = 1145.92'
SE = 0.06 FT/FT
RUNOFF = 300.0 FT

PI Sta 48+96.87
Θs = 7° 30' 00.0"
Ls = 300.00'
LT = 200.18'
ST = 100.16'

11 CARPENTER ASSOCIATES DB 3756 PG 444

12 KAT PARTNERS LLC DB 8339 PG 1365

13 DAVIS RECREATIONAL FACILITIES LLC BK 8339 PG 1361

14 PAUL J. & PATTIE H. CARTRETTE BK 4083 PG 359

15 HAZEL T. MAYNARD BK 1299 PG 562

16 GID BK 4253 PG 259

17 DANIEL O & INA P RHEW DB 2538 PG 523

BILLY W. & MAGARET S. MAYNARD BK 2408 PG 623

EVA R. MAYNARD, ET AL BK 6268 PG 208

2' BASE TAIL DITCH EST. 9 CY DDE SEE DITCH DETAIL

SPECIAL DITCH GRADE (SEE PROFILES)

REMOVE EXISTING SIDEWALK

PROP. 1'-6" C&G

PROP. 6" MONO. CONC. ISLAND

CLASS "B" RIP RAP EST 2 TONS EST 7 SY FF

SPECIAL LAT. "V" DITCH SEE DITCH DETAIL

RETAIN

REMOVE

CHORD

SLOPE STAKE LINE

N 14° 02' 35.2" W

N 75° 43' 02" E

S 86° 59' 08" E

327.07' N10° 45' 09" W

191.40' S10° 43' 48" E

353.80' N68° 28' 19" W

CARY CITY LIMIT

MORRISVILLE CITY LIMIT

Plans prepared by:
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE #202
RALEIGH, N.C. 27606
For Division of Highways

$$SYSTIME$$
$$USERNAME$$

REVISIONS

7/2/99

PROJECT REFERENCE NO.	SHEET NO.
U-4026A	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83 / NC GRID

-Y5-
SR 1635
KOPPERS RD.

2004 ADT
2024 ADT

925 / 2325

385/688 (NW) 385/685 (NE)

20480 -L- 15670
36880 DAVIS DRIVE 28270

5195/9295 (SW) 385/685 (SE)

5735 / 11035

McCRIMMONS PKWY
SR 1635
-Y5-

PROJECTED TRAFFIC VOLUMES

-Y5-
PI Sta 22+49.68
Δ = 9° 31' 59.3" (RT)
D = 3° 00' 00.0"
L = 317.77'
T = 159.25'
R = 1,909.86'
SE = 0.05 FT/FT
RUNOFF = 100.0 FT

-Y5- STA. 23+35.00
END 200' TAPER
RT TURN LANE, EB

-MATCHLINE- STA. 22+00.00
SEE SHEET NO. 10

-Y5- STA. 23+35.00
END 400' TAPER
LT & RT TURN LANES, EB

-MATCHLINE- STA. 58+00.00
SEE SHEET NO. 7

-MATCHLINE- STA. 70+00.00
SEE SHEET NO. 9

-MATCHLINE- STA. 28+00.00
SEE SHEET NO. 11

DO NOT DISTURB.
CONTROLLED ENVIRONMENT
VAULT AND FIBER OPTIC.
CONTRACTOR TO USE EXTREME
CAUTION WHEN WORKING IN
THIS AREA.

-L- ST 58+62.38

-L- STA. 64+95.00
BEGIN 210' TAPER
BUS LANE, SB

-L- STA. 67+05.00
END 210' TAPER
BUS LANE, SB

-Y5- PT 24+08.20

-Y5- PC 24+67.54

-L- POT 68+32.65 =
-Y5- POC 25+13.17

-L- ST 68+00.47

-L- TS 69+76.

-L- STA. 69+70.00
BEGIN 210' TAPER
BUS LANE, NB

-Y5- STA. 26+90.00
BEGIN 200' TAPER
RT TURN LANE, WB

-L- STA. 63+36.09
BEGIN 200' TAPER
RT. TURN LANE, NB

-L- SC 63+63.15

-L- STA. 64+86.16
BEGIN 200' TAPER
LT. TURN LANE, NB

-L- CS 65+75.47

-L- STA. 65+36.09
END 200' TAPER
RT. TURN LANE, NB

-L- STA. 66+86.16
END 200' TAPER
LT. TURN LANE, NB

-L- TS 61+38.15

BL-109 PINC 69+74.91
-L- STA. 61+04.03
(0.783' LT.)

BL-110 PINC 76+43.53
BY4-213 PINC 21+07.00
-L- STA. 67+78.96
(47.752' RT.)

-L-
PIs Sta 62+88.18
Θs = 3° 22' 30.0"
Ls = 225.00'
LT = 150.03'
ST = 75.02'

PIs Sta 64+69.42
Δ = 6° 22' 10.6" (RT)
D = 3° 00' 00.0"
L = 212.32
T = 106.27'
R = 1,909.86'
SE = 0.05 FT/FT
RUNOFF = 225.0 FT

PIs Sta 66+50.49
Θs = 3° 22' 30.0"
Ls = 225.00'
LT = 150.03'
ST = 75.02'

-L-
PIs Sta 70+60.27
Θs = 2° 00' 00.0"
Ls = 200.00'
LT = 133.34'
ST = 66.67'

-Y5-
PI Sta 26+13.61
Δ = 25° 50' 43.9" (LT)
D = 9° 00' 00.0"
L = 287.17'
T = 146.07'
R = 636.62'
SE = 0.02 FT/FT
RUNOFF = 68.0 FT

SPECIAL LAT. "V" DITCH W/CLASS "B" RIP RAP
EST. 110 TONS
EST. 311 SY FF
SEE DITCH DETAIL

CLASS "B" RIP RAP
EST. 11 TONS
EST. 28 SY FF

CLASS "B" RIP RAP
EST. 1 TONS
EST. 5 SY FF

CLASS "B" RIP RAP
EST. 2 TONS
EST. 7 SY FF

SPECIAL DITCH GRADE (SEE PROFILES)

PROP. 6" MONO. CONC. ISLAND

PROP. GUARDRAIL

CONTROLLED ENVIRONMENT VAULT AND FIBER OPTIC

17 DANIEL O. & INA P. RHEW
DB 2538 PG 523

18 BETTY F. HAMILTON
DB 1850 PG 619

16 CID
BK 4253 PG 259

19 PHILIP ALLEN RICHARD & SUSAN AUSTIN RICHARD
DB 3062 PG 347
BM 1982 PG 923

20 WILLIAM H. RICHARD & JANET M. RICHARD
DB 3045 PG 864
BM 1982 PG 107
BM 1972 PG 174

14 PAUL J. & PATTIE H. CARTRETTE
DB 4085 PG 359
MB 1972 PG 174

MORRISVILLE CITY LIMIT / CARY CITY LIMIT

Plans prepared by:
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE #202
RALEIGH, N.C. 27606
For Division of Highways

$$$$$$SYSTIME$$$$$$
$$$$$$USERNAME$$$$$$

7/2/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-4026A	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

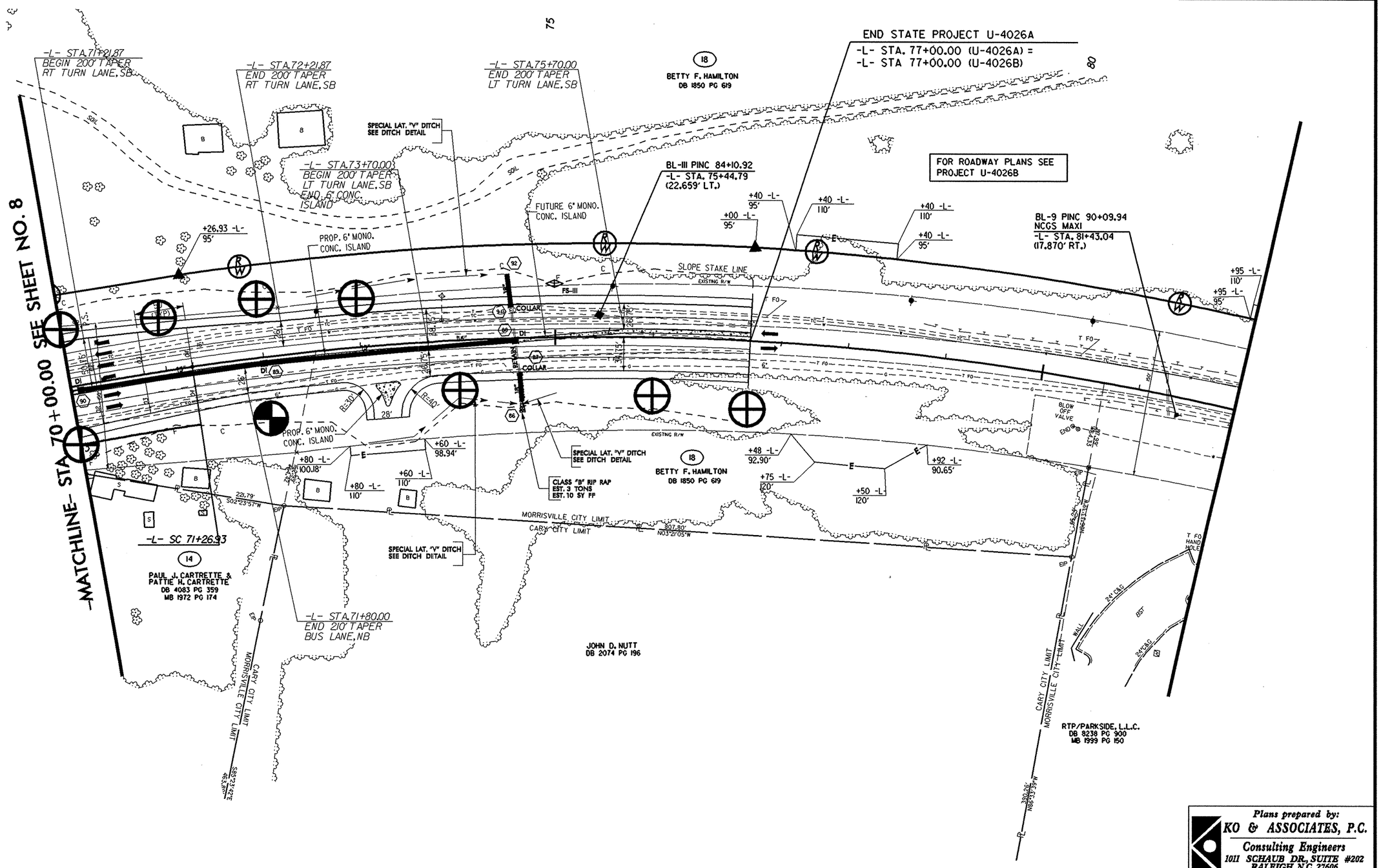
-L-

PI's Sta 70+60.27
Θs = 2°00'00.0"
Ls = 200.00'
LT = 133.34'
ST = 66.67'

PI Sta 80+83.70
Δ = 36°56'10.4" (RT)
D = 2°00'00.0"
L = 1,846.81'
T = 956.77'
R = 2,864.79'
SE = 0.04 FT/FT
RUNOFF = 200.0 FT

PI's Sta 90+40.41
Θs = 2°00'00.0"
Ls = 200.00'
LT = 133.34'
ST = 66.67'

NAD 83 / NC GRID



Plans prepared by:
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE #202
RALEIGH, N.C. 27606
For Division of Highways

$$$$$$$$SYSTIME$$$$$$
$$$$$$$$

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-4026A	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

7/2/9

NAD 83 NC GRID

496.01'
N86°26'14"E

STEVEN D. BLEDSOE
D.B. 6807 PG. 195
M.B. 1981 PG. 489

H Tr

T&S

S00°20'43"W
1.78'

EIP

EXISTING R/W

MAILBOX

N 67° 01' 54.2" E

SR 1635 KOPPERS RD 20.0' BST

EIP

N00°21'36"E
1.11'

-Y5- PC 11+62.04

-Y5- PT 11+36.83

HAZEL T. MAYNARD
D.B. 805 PG. 194

EIP

S89°56'00"E
403.85'

259.93'
S00°19'21"W

-BY4-261 PINC 9+98.97
-Y5- STA. 14+56.01
(15.805 RT.)

15

WOODS

-Y5- PCC 14+15.61

-Y5- PRC 16+15.81

18
BETTY F. HAMILTON
DB 1850 PG 619

S89°56'00"E
548.19'

-BY4-212 PINC 14+99.33
-Y5- STA. 19+55.90
(12.928 RT.)

BEGIN CONSTRUCTION
-Y5- POC 19+35.00

-Y5- PT 19+27.56

+27.56 -Y5-
55'

+27.56 -Y5-
30'

+27.56 -Y5-
30'

+27.56 -Y5-
45'

-Y5- STA. 19+35.00
BEGIN 400' TAPER
LT & RT TURN LANE, EB

20

SLOPE STAKE LINE

SPECIAL LAT. "V" DITCH
SEE DITCH DETAIL

PROP. 6' MONO. CONC. ISLAND

+50 -Y5-
60.70'

+50 -Y5-
100'

+90.43 -Y5-
60'

+90.43 -Y5-
55'

R=40'

25' (TYP)

N 72° 01' 17.7" E

EXISTING R/W

REMOVE

SLOPE STAKE LINE

SPECIAL DITCH GRADE
(SEE PROFILES)

+55 -Y5-
67.43'

+55 -Y5-
100'

-Y5- PC 20+90.43

PROP. 6" MONO. CONC. ISLAND

-Y5- STA. 21+35.00
BEGIN 200' TAPER
RT TURN LANE, EB

-MATCHLINE- STA. 22+00.00 SEE SHEET NO. 8

-Y5-

PI Sta 10+68.42	PI Sta 12+88.98	PI Sta 15+15.71	PI Sta 17+71.71	PI Sta 22+49.68
Δ = 0° 45' 05.2" (RT)	Δ = 6° 47' 36.3" (RT)	Δ = 0° 33' 57.3" (RT)	Δ = 2° 36' 25.6" (LT)	Δ = 9° 31' 59.3" (RT)
D = 0° 32' 57.0"	D = 2° 40' 44.6"	D = 0° 16' 57.7"	D = 0° 50' 10.6"	D = 3° 00' 00.0"
L = 136.83'	L = 253.57'	L = 200.19'	L = 311.75'	L = 311.77'
T = 68.42'	T = 126.94'	T = 100.10'	T = 155.90'	T = 159.25'
R = 10,433.18'	R = 2,138.65'	R = 20,268.54'	R = 6,851.31'	R = 1,909.86'
				SE = 0.05 FT/FT
				RUNOFF = 100.0 FT

Plans prepared by:
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE #202
RALEIGH, N.C. 27606
For Division of Highways

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

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-4026A	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83 / NC GRID

-MATCHLINE- STA. 28+00.00 SEE SHEET NO. 8

-Y5- STA. 28+90.00
END 200' TAPER
RT TURN LANE, WB

CARY CITY LIMIT
MORRISVILLE CITY LIMIT

SPECIAL DITCH GRADE (SEE PROFILES)

(14) PAUL J. CARTRETTE & PATTIE H. CARTRETTE
DB 4083 PG 359
MB 1972 PG 174

PROP. 6' MONO. CONC. ISLAND

2' BASE TAIL DITCH
EST. 6 CY DDE
SEE DITCH DETAIL

-BY4-214 PINC 26+05.13
-Y5- STA. 30+49.55
(16.00' RT.)

SPECIAL DITCH GRADE (SEE PROFILES)

-Y5- STA. 32+65.00
BEGIN 400' TAPER
LT & RT TURN LANE, WB
END 6" CONC. ISLAND

(22) JOHN D. NUTT
DB 2074 PG 196

-Y5- PC 33+22.69

SPECIAL DITCH GRADE (SEE PROFILES)

CLASS "B" RIP RAP
EST. 3 TONS
EST. 10 SY FF

-Y5- PT 35+39.13

-Y5- PC 35+63.49

SPECIAL DITCH GRADE (SEE PROFILES)

-Y5- PT 37+24.72

-Y5- POT 40+28.60

-Y5- PC 29+71.76

-Y5- PT 31+71.98

SPECIAL LATERAL DITCH (SEE PROFILES)

LAT. "V" TAIL DITCH
EST 1 CY DDE
SEE DITCH DETAIL

CLASS "B" RIP RAP
EST. 2 TONS
EST. 7 SQ YD FF

(20) WILLIAM H. RICHARD & JANET M. RICHARD
DB 3045 PG 844
BM 1982 PG 717
BM 1972 PG 174

(21) JULIA R. DEAN
DB 5210 PG 314
MB 1982 PG 717

(19) PHILIP ALLEN RICHARD & SUSAN AUSTIN RICHARD
DB 3062 PG 347
BM 1982 PG 923

N 55° 48' 33" E

N 74° 21' 59" E

N 45° 09' 05.8" E

N 35° 51' 49.5" E

END CONSTRUCTION
-Y5- POC 36+65.00

-Y5- STA. 36+65.00
END 400' TAPER
LT & RT TURN LANES, WB

-BY4-262 PINC 31+66.79
-Y5- STA. 36+12.65
(24.28' RT.)

-Y5-

PI Sta 26+13.61	PI Sta 30+72.76
Δ = 25° 50' 43.9" (LT)	Δ = 18° 33' 26.6" (RT)
D = 9° 00' 00.0"	D = 9° 16' 05.7"
L = 287.17'	L = 200.23'
T = 146.07'	T = 101.00'
R = 636.62'	R = 618.19'
SE = 0.02 FT/FT	SE = 0.06 FT/FT
RUNOFF = 68.0 FT	RUNOFF = 150.0 FT
PI Sta 34+33.21	PI Sta 36+44.26
Δ = 28° 33' 45.2" (LT)	Δ = 8° 38' 07.8" (LT)
D = 13° 11' 49.4"	D = 5° 21' 21.0"
L = 216.43'	L = 161.24'
T = 110.51'	T = 80.77'
R = 434.16'	R = 1,069.79'
SE = 0.06 FT/FT	SE = MATCH EXIST.
RUNOFF = 150.0 FT	

Plans prepared by:
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE #202
RALEIGH, N.C. 27606
For Division of Highways

$$$$$$SYSTIME$$$$$
$$$$$$

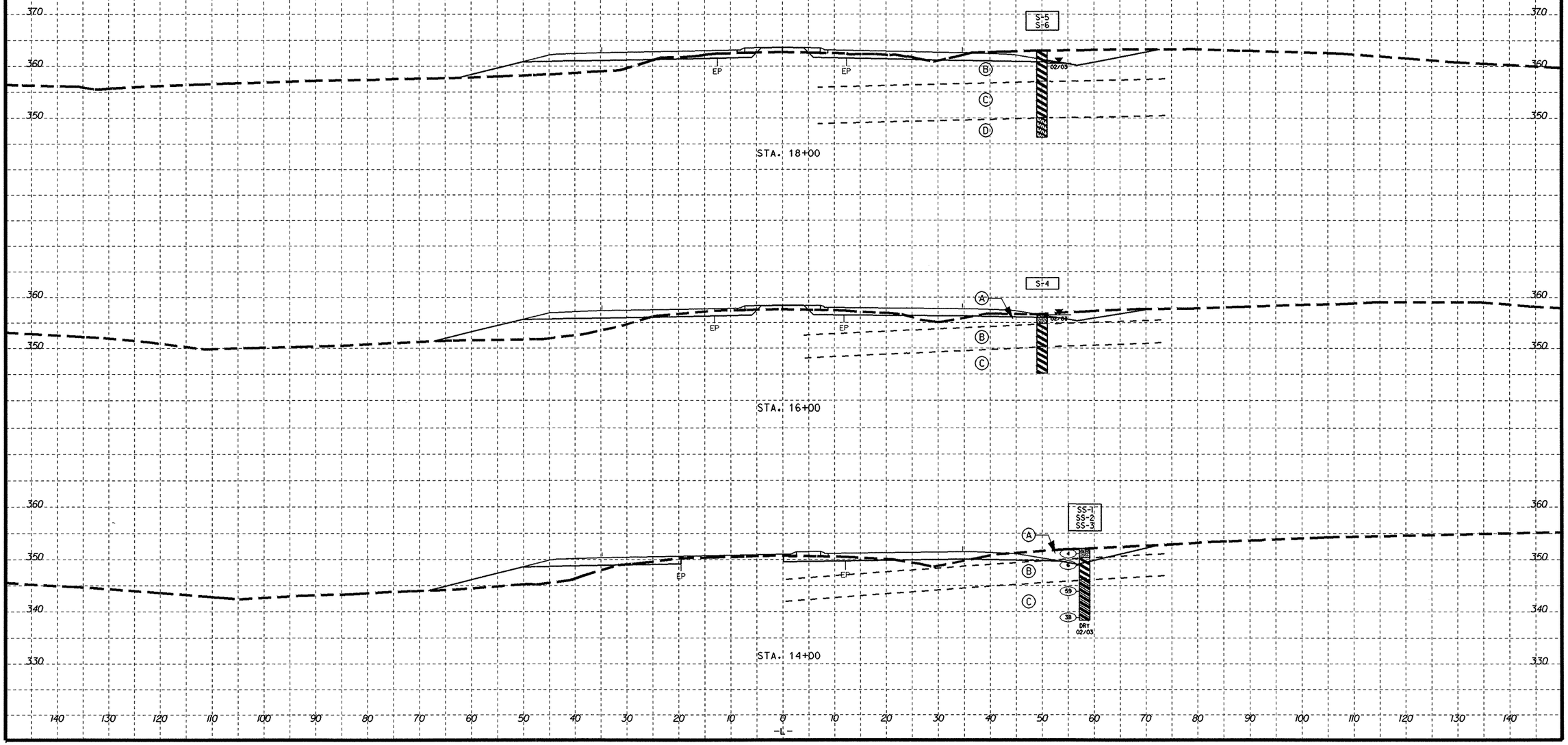
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026A	12

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-1	58' RT	14+00	0.0-1.5	A-4(0)	26	5	34.9	19.4	33.5	12.1	97	71	49	11	-
SS-2	58' RT	14+00	2.2-3.7	A-7-6(21)	52	30	15.2	10.7	27.7	46.5	94	83	73	27	-
SS-3	58' RT	14+00	7.2-8.7	A-6(17)	39	16	1.0	4.0	52.5	42.4	100	100	97	11	-
S-4	50' RT	16+00	6.5-8.0	A-7-6(20)	43	19	2.4	4.4	40.6	52.5	100	99	95	-	-
S-5	50' RT	18+00	0.0-4.0	A-7-5(17)	62	32	25.9	15.6	12.1	46.5	97	81	59	-	-
S-6	50' RT	18+00	13.0-16.8	A-2-6(1)	39	13	50.1	16.2	19.6	14.1	98	62	35	-	-

LEGEND

A: RESIDUAL, BROWN, SOFT, MOIST TO WET, SANDY SILT
B: RESIDUAL, BROWN, YELLOW-BROWN, AND GRAY, SOFT TO MEDIUM STIFF, HIGHLY PLASTIC, MOIST TO WET, SILTY CLAY
C: RESIDUAL, RED-BROWN, MEDIUM STIFF TO HARD, MODERATELY PLASTIC, MOIST TO WET, SANDY CLAY AND SILTY CLAY
D: RESIDUAL, RED-BROWN, LOOSE, WET, CLAYEY SAND



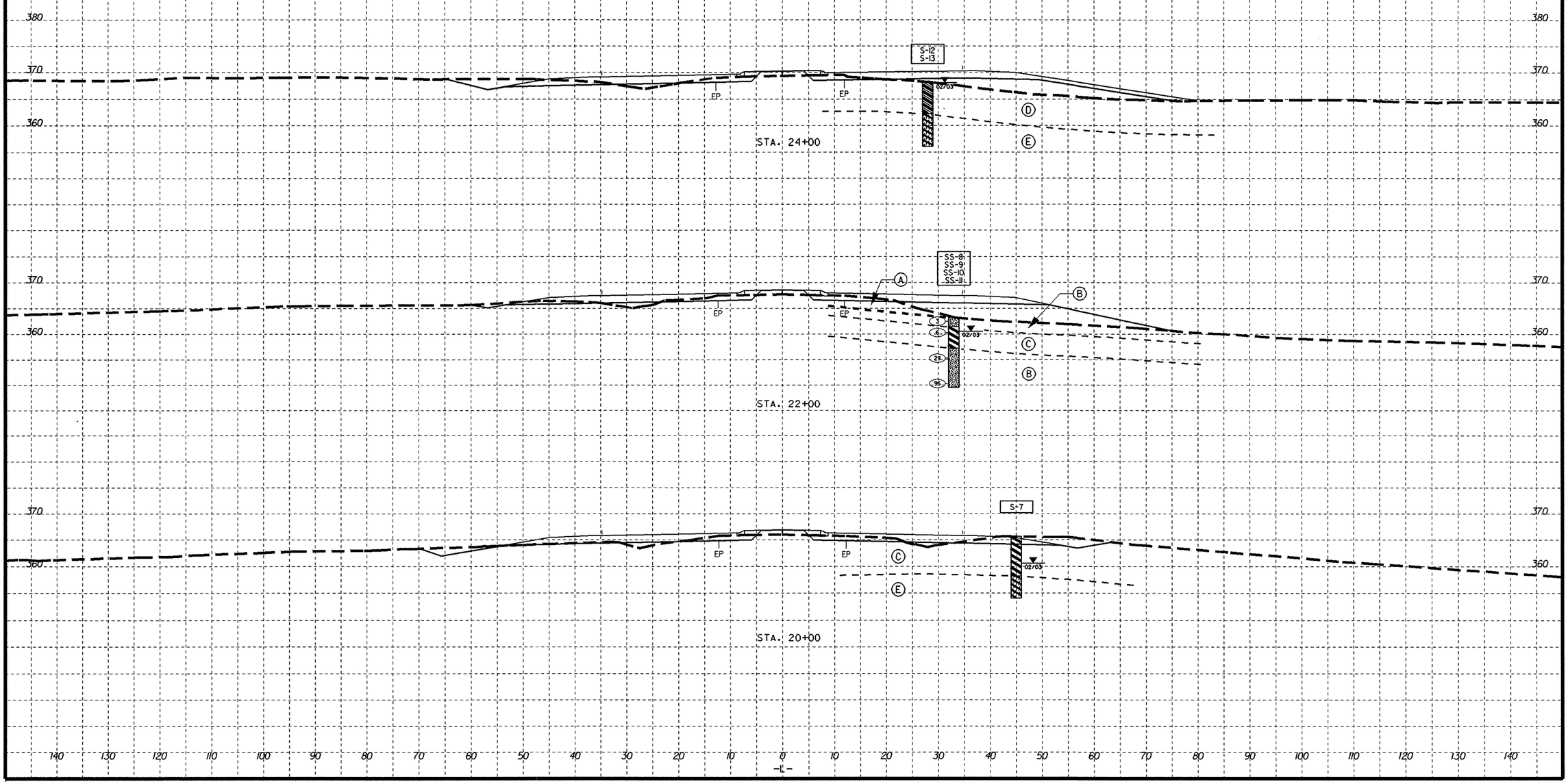
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026A	13

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-7	45' RT	20+00	7.5-11.6	A-2-6(0)	37	11	46.7	20.0	17.2	16.2	90	57	34	-	-
SS-8	33' RT	22+00	0.0-1.5	A-2-4(0)	21	4	45.1	26.1	16.8	12.1	96	66	33	15	-
SS-9	33' RT	22+00	2.2-3.7	A-7-6(21)	62	34	18.4	21.4	17.8	42.4	100	90	64	29	-
SS-10	33' RT	22+00	7.2-8.7	A-2-4(0)	34	8	57.8	19.8	12.3	10.1	92	48	24	-	-
SS-11	33' RT	22+00	12.2-13.7	A-2-4(0)	30	8	51.5	22.8	15.6	10.1	83	50	25	-	-
S-12	28' RT	24+00	1.0-4.0	A-6(5)	32	14	23.6	24.8	23.2	28.3	97	82	56	-	-
S-13	28' RT	24+00	7.0-11.0	A-2-6(0)	33	12	48.9	20.6	16.4	14.1	97	61	33	-	-

LEGEND

A: ROADWAY EMBANKMENT
B: RESIDUAL, BROWN AND GRAY, VERY LOOSE TO DENSE, MOIST TO WET, SILTY SAND
C: RESIDUAL, BROWN AND YELLOW-BROWN, SOFT TO MEDIUM STIFF, HIGHLY PLASTIC, MOIST TO WET, SILTY CLAY
D: RESIDUAL, RED-BROWN, SOFT, SLIGHTLY PLASTIC, WET, SANDY CLAY
E: RESIDUAL, RED-BROWN AND RED-GRAY, WET, CLAYEY SAND

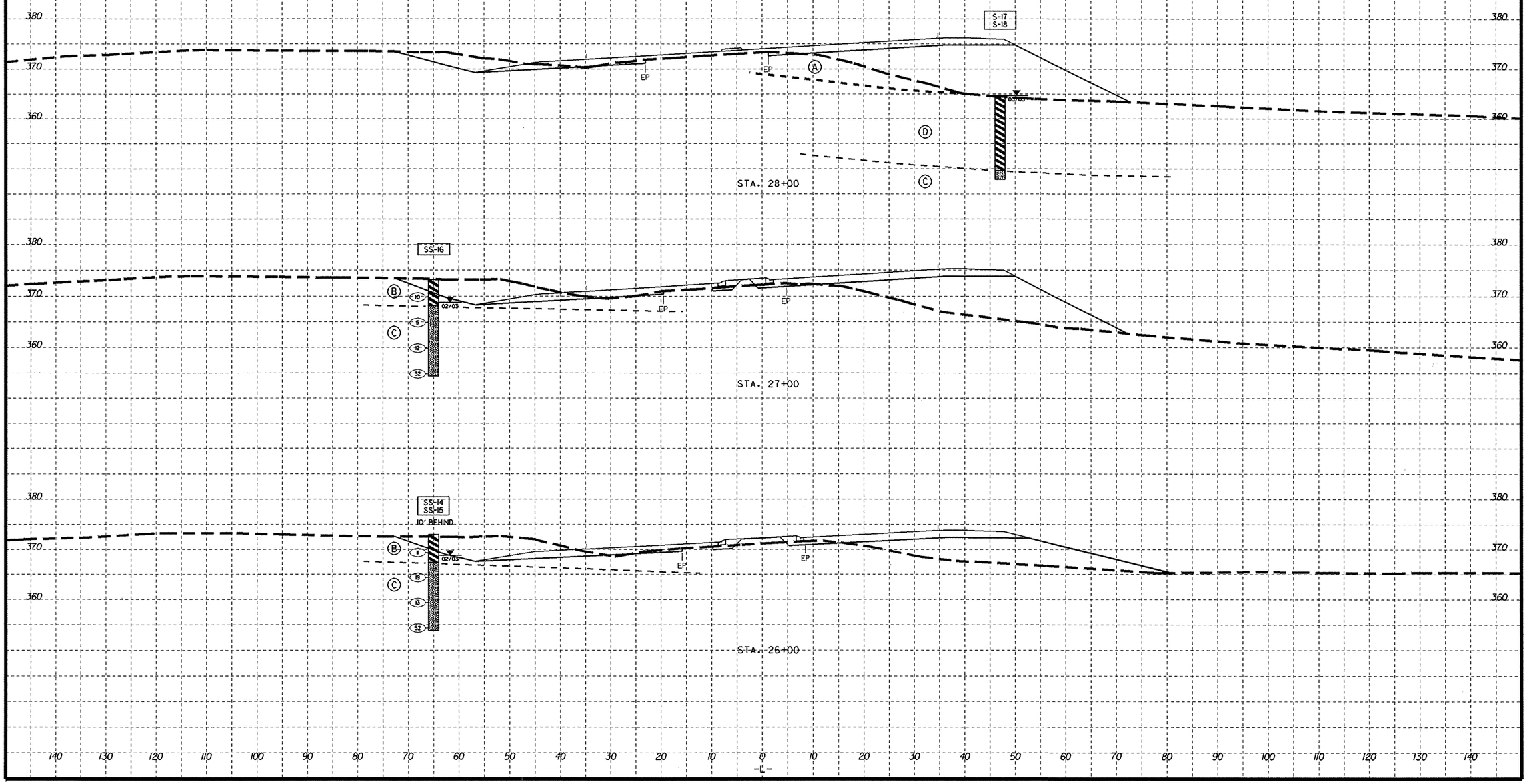


SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-14	65' LT	25+90	2.6-4.1	A-7-6(12)	55	29	35.2	16.0	14.5	34.3	99	75	52	21	-
SS-15	65' LT	25+90	7.6-9.1	A-2-4(0)	37	9	52.7	23.2	16.0	8.1	92	53	26	-	-
SS-16	65' LT	27+00	7.3-8.8	A-2-4(0)	39	8	49.7	21.8	16.4	12.1	94	56	32	-	-
S-17	47' RT	28+00	0.0-3.5	A-7-6(13)	43	22	12.5	26.1	23.0	38.4	98	90	68	-	-
S-18	47' RT	28+00	6.0-12.0	A-7-6(22)	48	25	4.6	16.6	30.3	48.5	100	97	84	-	-

LEGEND

A: ROADWAY EMBANKMENT
B: RESIDUAL, ORANGE-BROWN AND GRAY, STIFF, HIGHLY PLASTIC, MOIST TO WET, SILTY CLAY
C: RESIDUAL, GRAY AND PURPLE, LOOSE TO VERY DENSE, WET, SILTY SAND
D: RESIDUAL, YELLOW-BROWN AND RED-BROWN, SOFT TO MEDIUM STIFF, MODERATELY PLASTIC, WET, SILTY CLAY

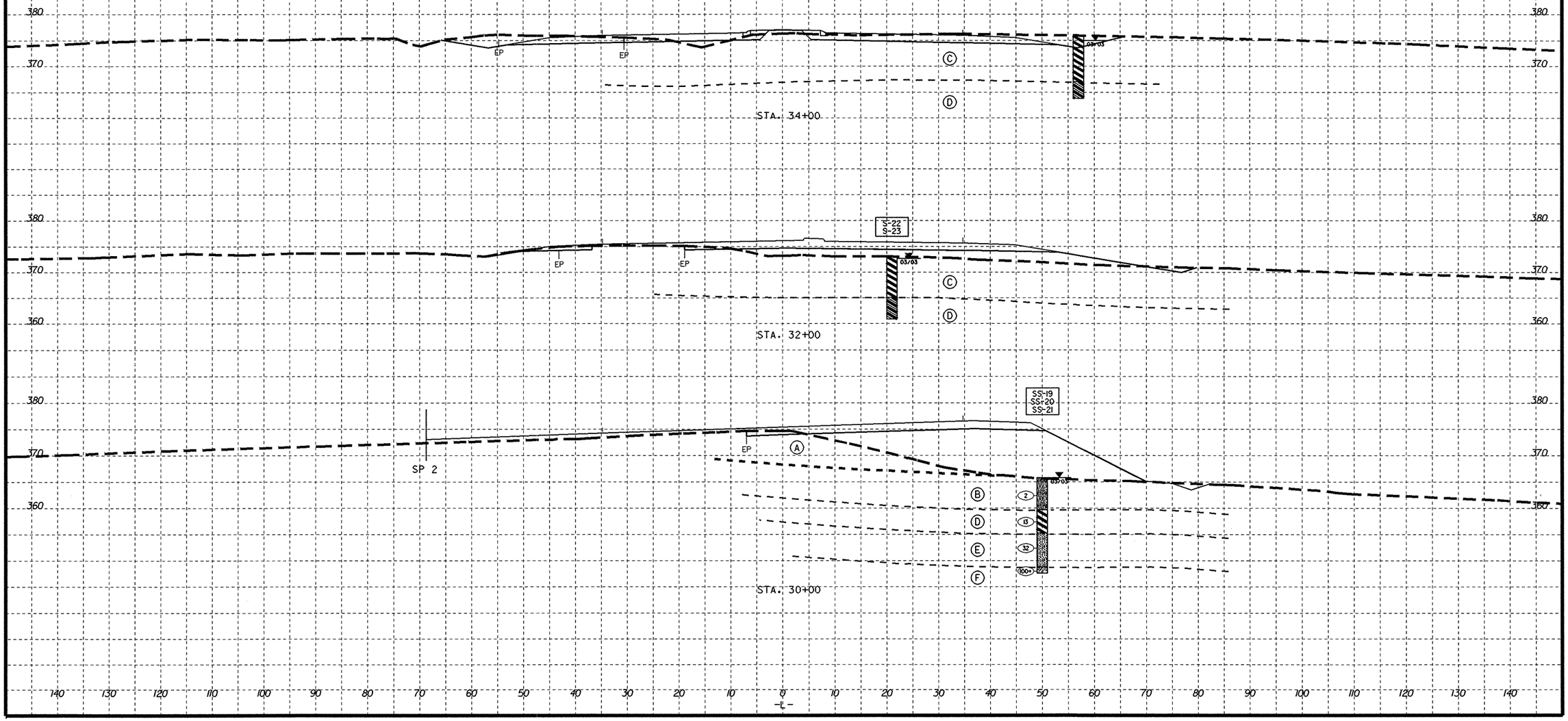


SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-19	50' RT	30+00	2.4-3.9	A-4(2)	28	10	34.5	23.0	22.2	20.2	97	73	46	28	-
SS-20	50' RT	30+00	7.4-8.9	A-7-6(9)	42	17	20.6	24.2	28.9	26.3	100	85	63	20	-
SS-21	50' RT	30+00	12.4-13.9	A-2-4(0)	34	8	54.5	21.4	13.9	10.1	78	44	22	-	-
S-22	21' RT	32+00	0.2-2.2	A-7-6(8)	48	27	39.2	16.0	10.5	34.3	97	71	46	-	-
S-23	21' RT	32+00	9.0-12.2	A-6(1)	39	12	47.1	19.4	19.4	14.1	95	60	36	-	-

LEGEND

A: ROADWAY EMBANKMENT
B: RESIDUAL, RED-BROWN AND GRAY, WET, SANDY SILT
C: RESIDUAL, ORANGE-BROWN AND BROWN, SOFT TO MEDIUM STIFF, HIGHLY PLASTIC, MOIST TO WET, SILTY CLAY
D: RESIDUAL, YELLOW-BROWN, RED-BROWN, AND GRAY, SOFT TO STIFF, SLIGHTLY TO MODERATELY PLASTIC, WET, SILTY CLAY AND SANDY CLAY
E: RESIDUAL, GRAY AND PINK, DENSE, WET, SILTY SAND
F: WEATHERED ROCK (SANDSTONE AND SILTSTONE)



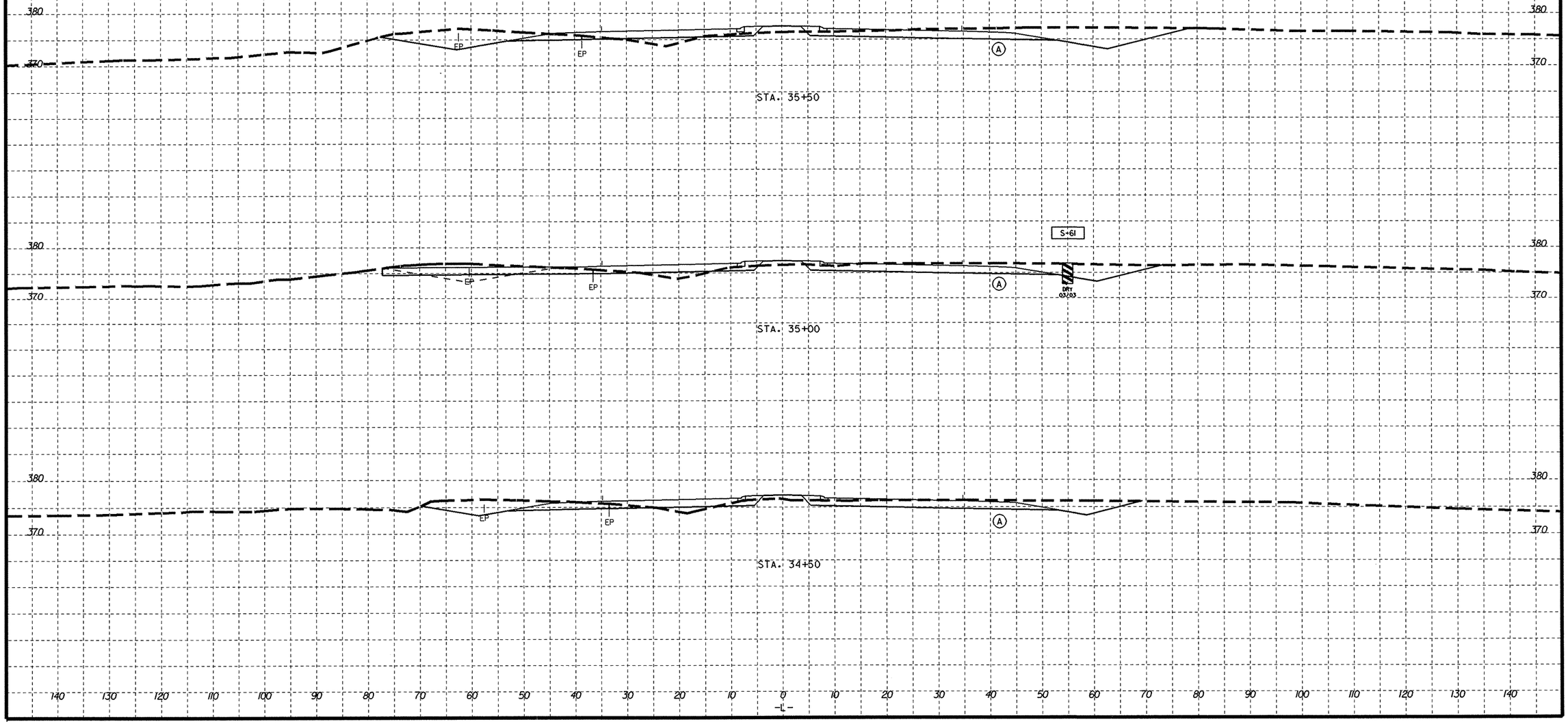
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026A	16

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			%	%
							C. SAND	F. SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
S-61	55' RT	35+00	0.5-3.5	A-7-5(43)	87	56	16.8	11.1	9.4	62.7	98	87	73	-	-

LEGEND

A: RESIDUAL, ORANGE-BROWN, STIFF, HIGHLY PLASTIC, MOIST TO WET, SILTY CLAY



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026A	17

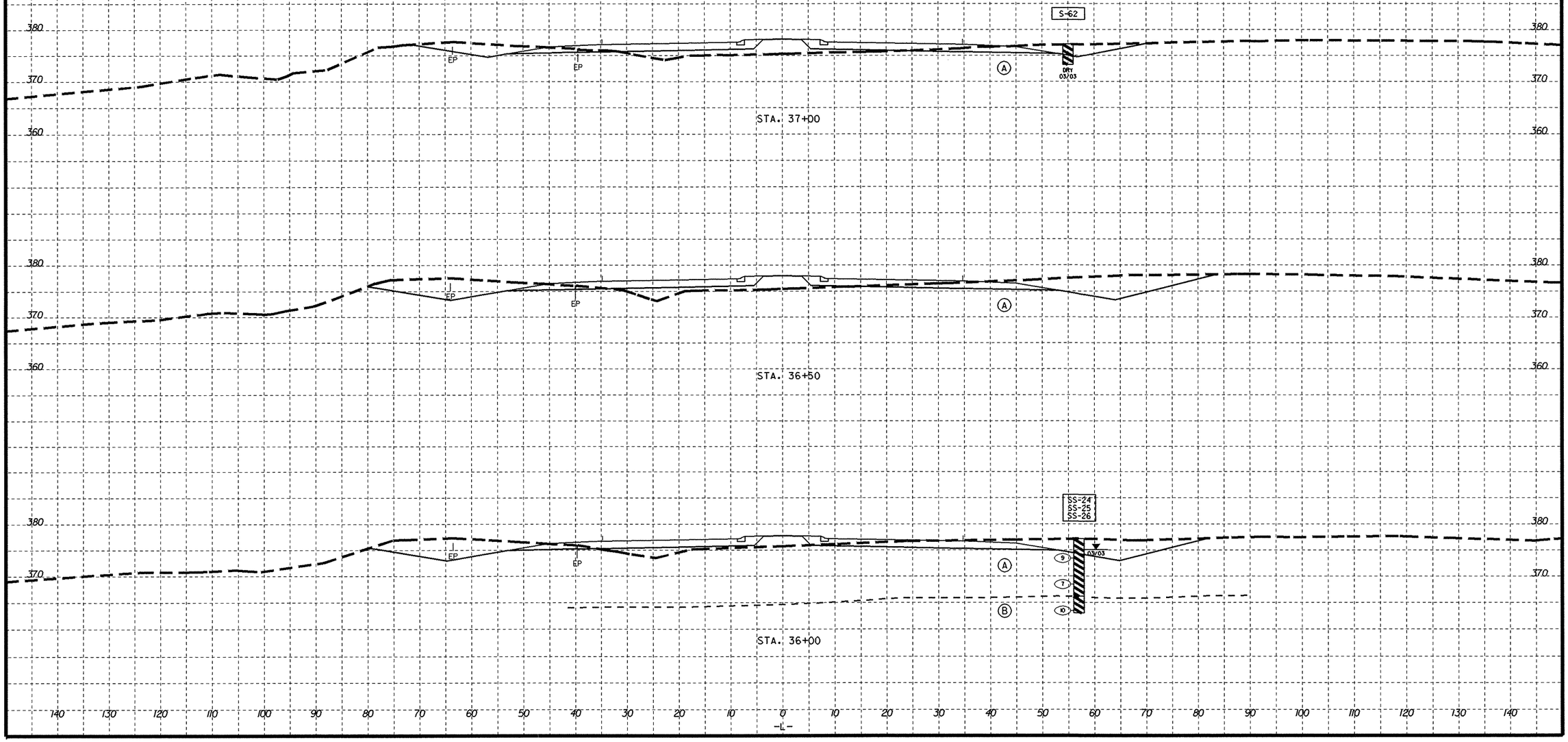
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-24	57' RT	36+00	2.7-4.2	A-7-6(27)	73	49	26.3	12.1	15.1	46.5	95	76	61	30	-
SS-25	57' RT	36+00	7.7-9.2	A-7-6(8)	51	26	38.6	17.2	15.9	28.3	98	69	47	29	-
SS-26	57' RT	36+00	12.7-14.2	A-7-6(4)	45	20	38.2	17.8	19.7	24.3	84	58	41	31	-
S-62	55' RT	37+00	0.5-3.5	A-7-5(35)	95	60	28.5	6.7	8.2	56.6	93	71	61	-	-

LEGEND

A: RESIDUAL, ORANGE-BROWN, RED-BROWN, AND GRAY, MEDIUM STIFF TO STIFF, HIGHLY PLASTIC, MOIST TO WET, SILTY CLAY

B: RESIDUAL, GRAY, STIFF, MODERATELY PLASTIC, WET, SILTY CLAY



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026A	18

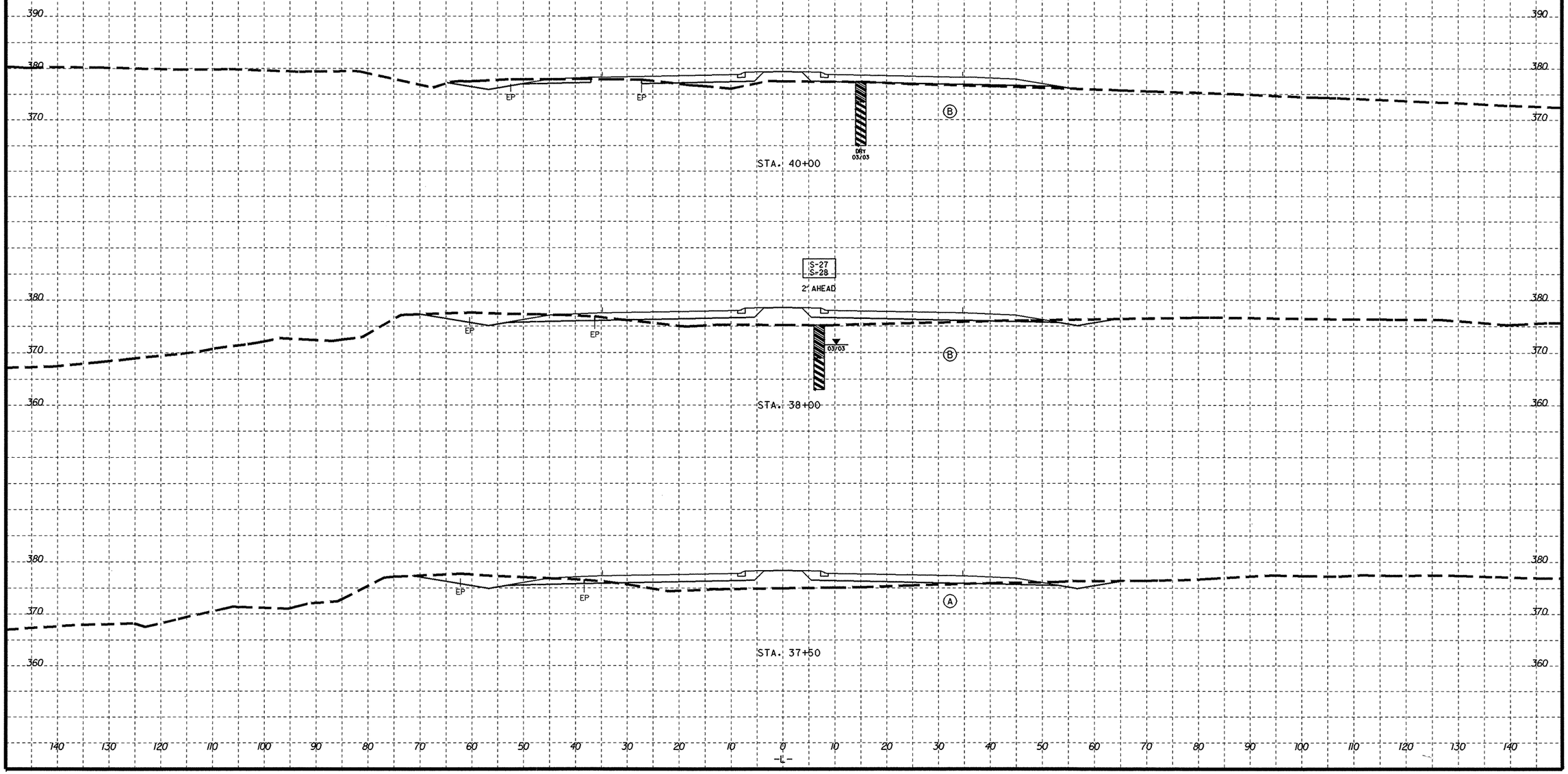
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			%	%
							C. SAND	F. SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
S-27	7' RT	38+02	0.0-3.0	A-6(5)	32	16	30.3	19.8	23.6	26.3	96	74	52	-	-
S-28	7' RT	38+02	10.0-12.2	A-7-6(22)	43	22	2.4	5.9	35.1	56.6	100	99	93	-	-

LEGEND

A: RESIDUAL, ORANGE-BROWN, MEDIUM STIFF TO STIFF, HIGHLY PLASTIC, MOIST TO WET, SILTY CLAY

B: RESIDUAL, YELLOW-BROWN, RED-BROWN, AND GRAY, SOFT TO MEDIUM STIFF, MODERATELY PLASTIC, MOIST TO WET, SANDY AND SILTY CLAY



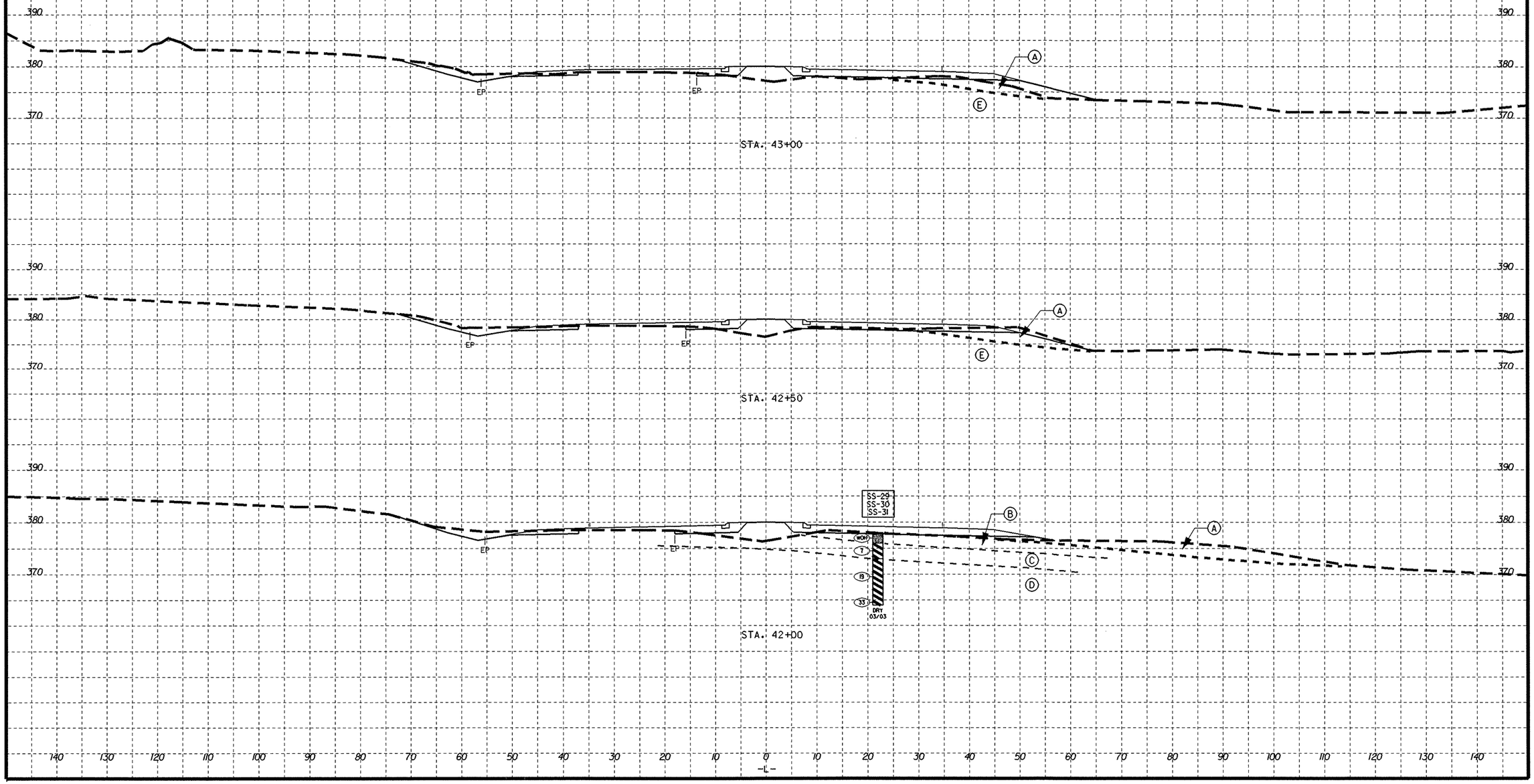
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026A	19

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-29	22' RT	42+00	0.0-1.5	A-4(0)	20	4	30.5	22.6	30.6	16.2	97	77	51	16	-
SS-30	22' RT	42+00	2.5-4.0	A-7-6(34)	59	37	9.9	7.7	29.8	52.6	100	93	85	-	-
SS-31	22' RT	42+00	7.5-9.0	A-7-6(22)	43	21	0.8	5.5	49.2	44.5	100	100	96	19	-

LEGEND

A: ARTIFICIAL FILL, BROWN AND GREEN-GRAY, SOFT, MOIST, SANDY SILT AND SLIGHTLY PLASTIC, SANDY CLAY
B: RESIDUAL, BROWN AND YELLOW-GRAY, VERY SOFT, MOIST, SANDY SILT
C: RESIDUAL, ORANGE-BROWN AND GRAY, MEDIUM STIFF, HIGHLY PLASTIC, SILTY CLAY
D: RESIDUAL, RED-BROWN, VERY STIFF TO HARD, MODERATELY PLASTIC, MOIST, SILTY CLAY
E: RESIDUAL, YELLOW-BROWN, RED-BROWN, AND GRAY, MEDIUM STIFF TO STIFF, MODERATELY TO HIGHLY PLASTIC, MOIST, SILTY CLAY



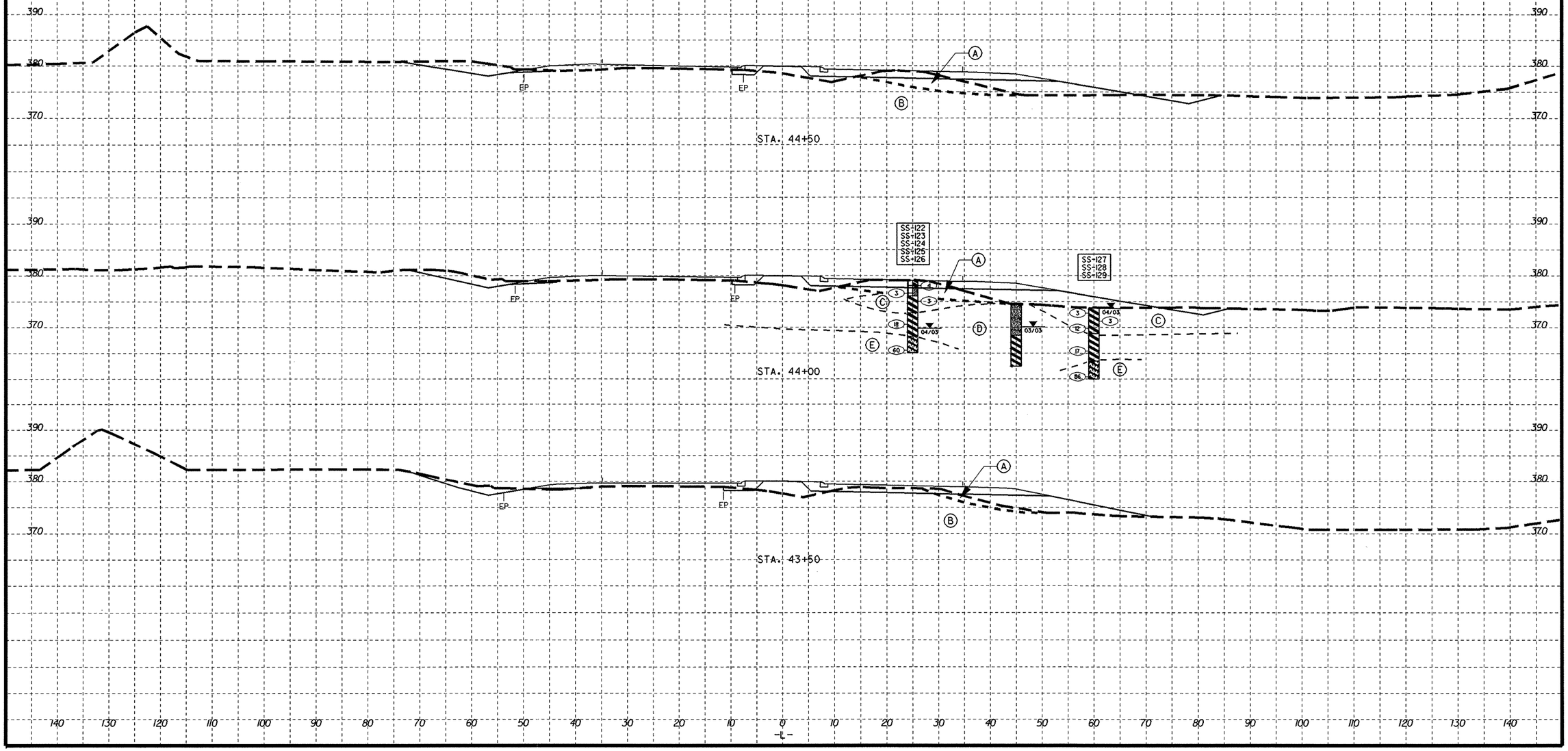
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026A	20

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-122	25' RT	44+00	0.0-1.5	A-6(4)	29	12	27.7	20.6	23.1	28.5	100	81	56	-	-
SS-123	25' RT	44+00	1.5-3.0	A-4(0)	20	3	38.9	23.6	23.1	14.3	99	71	43	17	-
SS-124	25' RT	44+00	3.0-4.5	A-7-6(26)	62	43	22.8	16.3	16.0	44.9	100	83	65	-	-
SS-125	25' RT	44+00	7.5-9.0	A-7-6(19)	44	19	2.0	13.3	35.8	48.9	100	99	89	-	-
SS-126	25' RT	44+00	12.5-14.0	A-2-6(0)	35	12	47.7	27.3	14.8	10.2	99	66	29	-	-
SS-127	60' RT	44+00	0.0-1.5	A-7-6(25)	56	29	9.6	13.0	20.3	57.1	100	94	81	-	-
SS-128	60' RT	44+00	1.5-3.0	A-7-6(31)	56	30	2.0	11.8	25.0	61.2	100	99	91	-	-
SS-129	60' RT	44+00	3.0-4.5	A-7-6(42)	62	42	3.5	7.1	20.1	69.3	100	98	91	-	-

LEGEND

A: ARTIFICIAL FILL, BROWN AND GREEN-GRAY, SOFT, MOIST, SANDY SILT AND SLIGHTLY PLASTIC, SANDY CLAY
B: RESIDUAL, YELLOW-BROWN, RED-BROWN, AND GRAY, MED. TO V. STIFF, MOIST TO WET, SANDY SILT AND MOD. TO HIGHLY PLASTIC, SILTY CLAY
C: RESIDUAL, YELLOW-BROWN AND YELLOW-GREEN, SOFT TO STIFF, HIGHLY PLASTIC, MOIST TO WET, SILTY CLAY
D: RESIDUAL, YELLOW-BROWN AND RED-BROWN, MEDIUM TO VERY STIFF, MOIST TO WET, SANDY SILT AND MODERATELY PLASTIC, SILTY CLAY
E: RESIDUAL, PINK-WHITE-BLACK, VERY DENSE, WET, CLAYEY SAND



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026A	21

SOIL TEST RESULTS

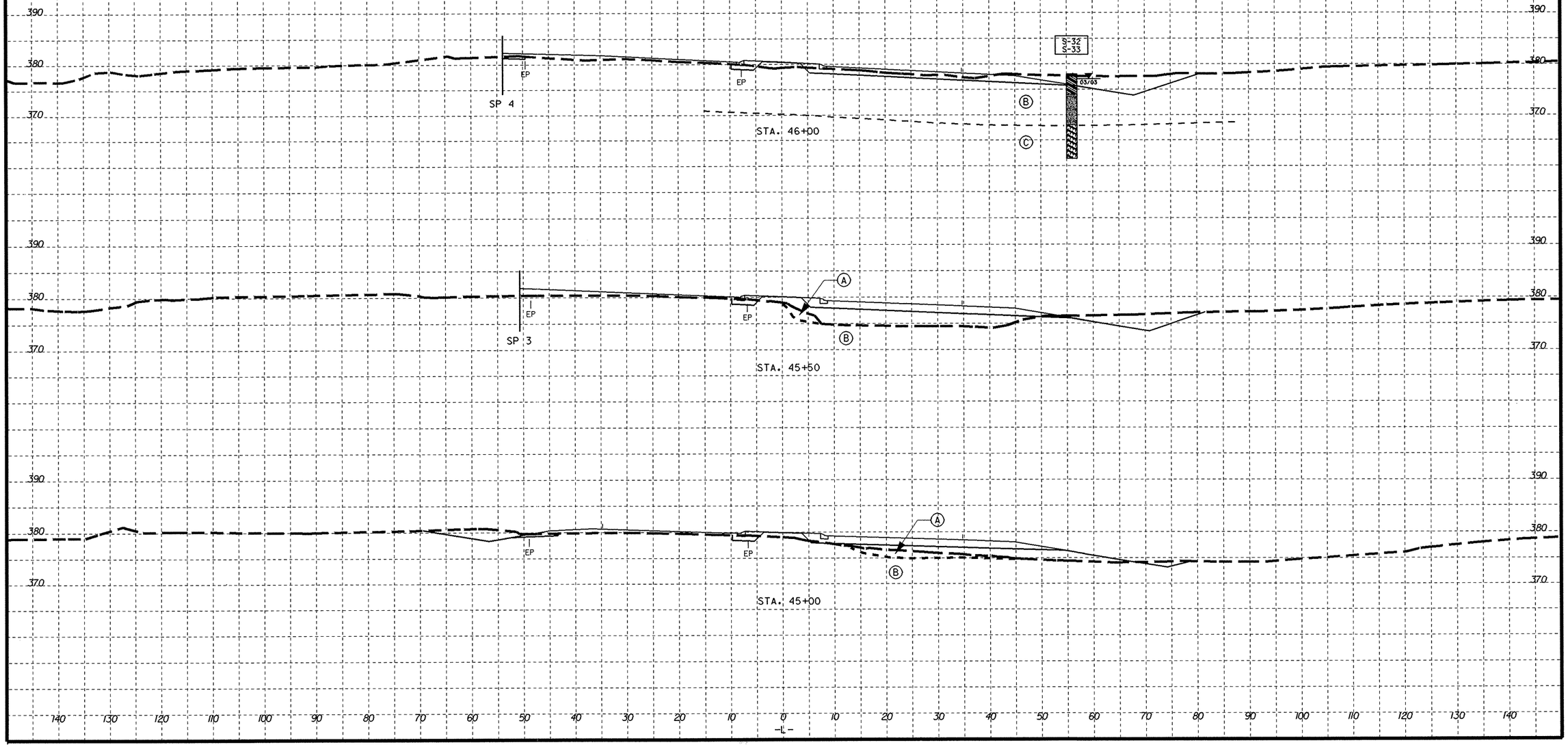
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			%	%
							C. SAND	F. SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
S-32	56' RT	46+00	0.0-3.0	A-6(4)	29	12	22.4	20.4	30.8	26.3	95	80	59	-	-
S-33	56' RT	46+00	11.0-15.0	A-2-6(1)	36	16	45.1	21.8	16.9	16.2	87	57	32	-	-

LEGEND

A: ARTIFICIAL FILL, BROWN AND GREEN-GRAY, SOFT, MOIST, SANDY SILT AND SLIGHTLY PLASTIC, SANDY CLAY

B: RESIDUAL, YELLOW-BROWN, BROWN, AND GRAY, SOFT TO STIFF, MOIST TO WET, SD. SILT AND MOD. TO HIGHLY PLASTIC, SANDY AND SILTY CLAY

C: RESIDUAL, GREEN-GRAY, MEDIUM DENSE, WET, CLAYEY SAND



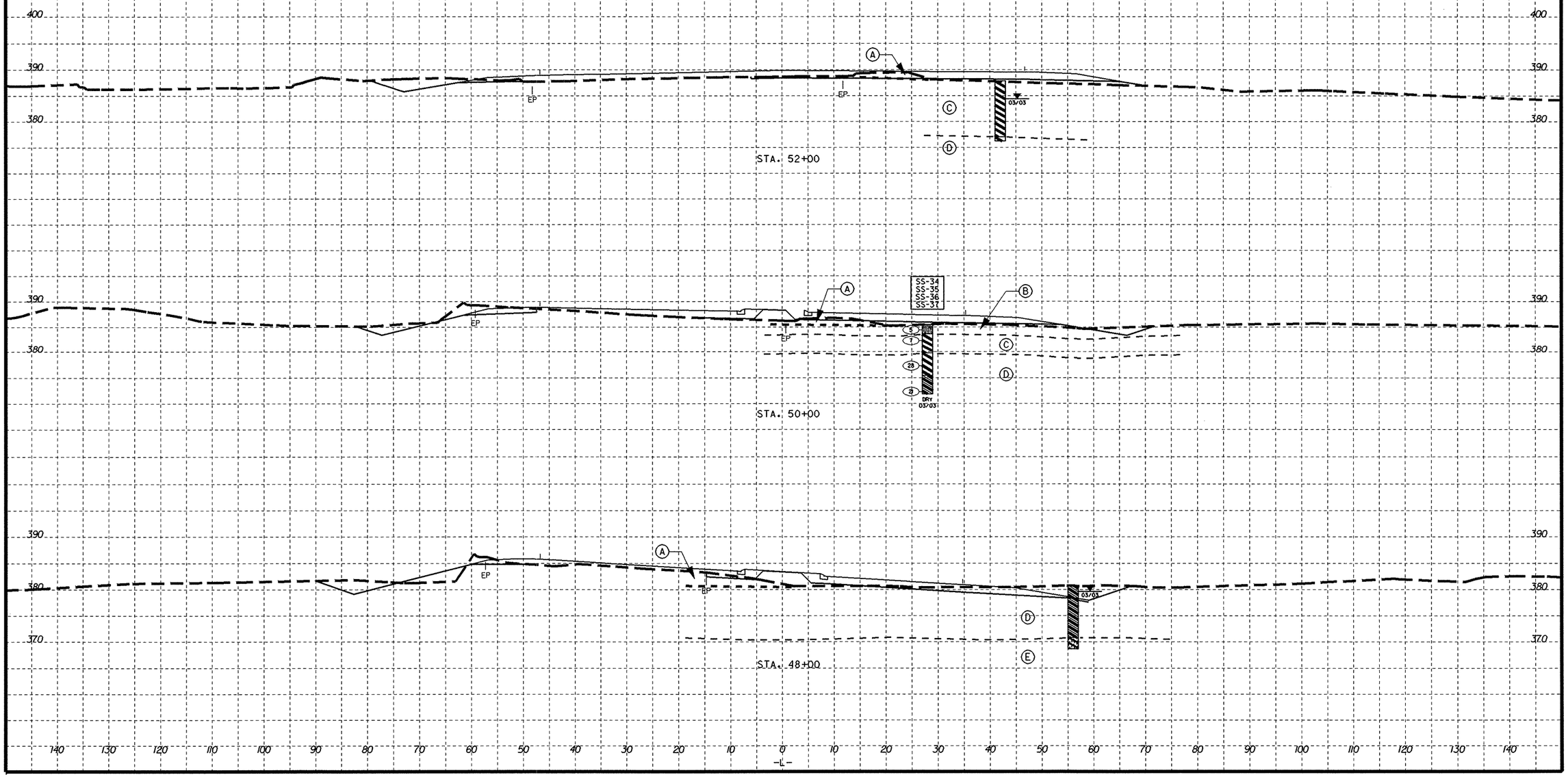
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026A	22

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-34	28' RT	50+00	0.0-1.5	A-4(0)	17	3	34.0	28.5	21.3	16.2	97	76	43	15	-
SS-35	28' RT	50+00	2.1-3.6	A-7-6(18)	49	33	21.8	18.2	19.5	40.4	100	86	64	-	-
SS-36	28' RT	50+00	7.1-8.6	A-7-6(17)	41	15	1.2	5.5	48.8	44.5	100	99	96	-	-
SS-37	28' RT	50+00	12.1-13.6	A-6(10)	39	17	7.9	34.4	31.4	26.3	100	95	68	19	-

LEGEND

A: ROADWAY EMBANKMENT
B: RESIDUAL, BROWN AND YELLOW-GRAY, MEDIUM STIFF, MOIST, SANDY SILT
C: RESIDUAL, YELLOW-BROWN AND GRAY, MEDIUM STIFF, HIGHLY PLASTIC, MOIST TO WET, SILTY CLAY
D: RESIDUAL, YELLOW-BROWN, RED-BROWN, BROWN, AND GRAY, SOFT TO V. STIFF, SLI. TO MOD. PLASTIC, MOIST TO WET, SANDY AND SILTY CLAY
E: RESIDUAL, YELLOW-BROWN, MEDIUM DENSE, WET, CLAYEY SAND



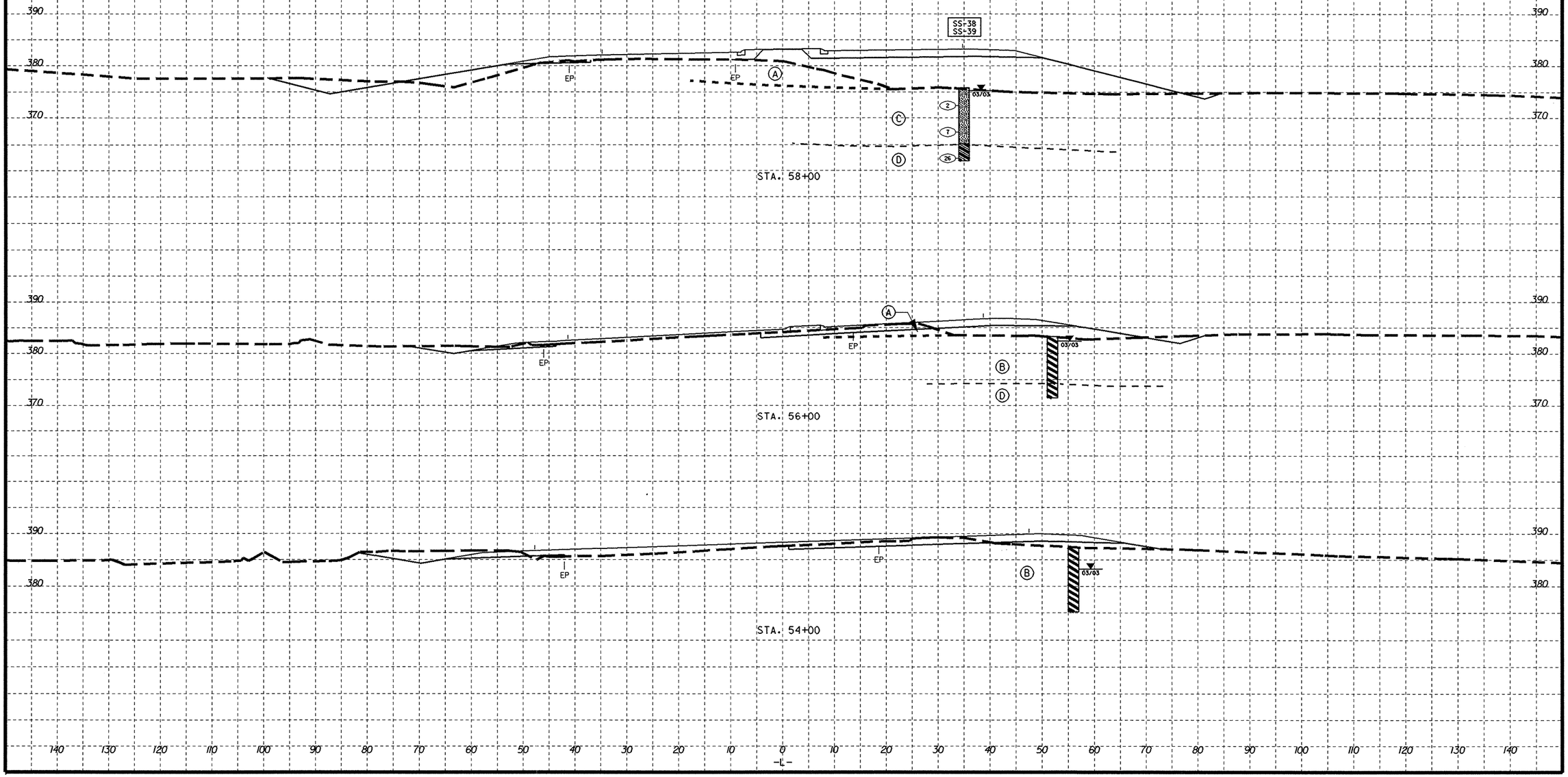
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026A	23

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-38	35' RT	58+00	2.4-3.9	A-2-4(0)	23	9	47.1	19.8	16.7	16.3	92	60	34	-	-
SS-39	35' RT	58+00	12.4-13.9	A-6(7)	32	15	13.5	28.0	30.0	28.6	100	93	65	-	-

LEGEND

A: ROADWAY EMBANKMENT
B: RESIDUAL, ORANGE-BROWN, YELLOW-BROWN, AND BROWN, MEDIUM STIFF, HIGHLY PLASTIC, MOIST TO WET, SILTY CLAY
C: RESIDUAL, GRAY, VERY LOOSE TO LOOSE, WET, SILTY SAND
D: RESIDUAL, RED-BROWN, MEDIUM TO VERY STIFF, SLIGHTLY PLASTIC, WET, SANDY AND SILTY CLAY



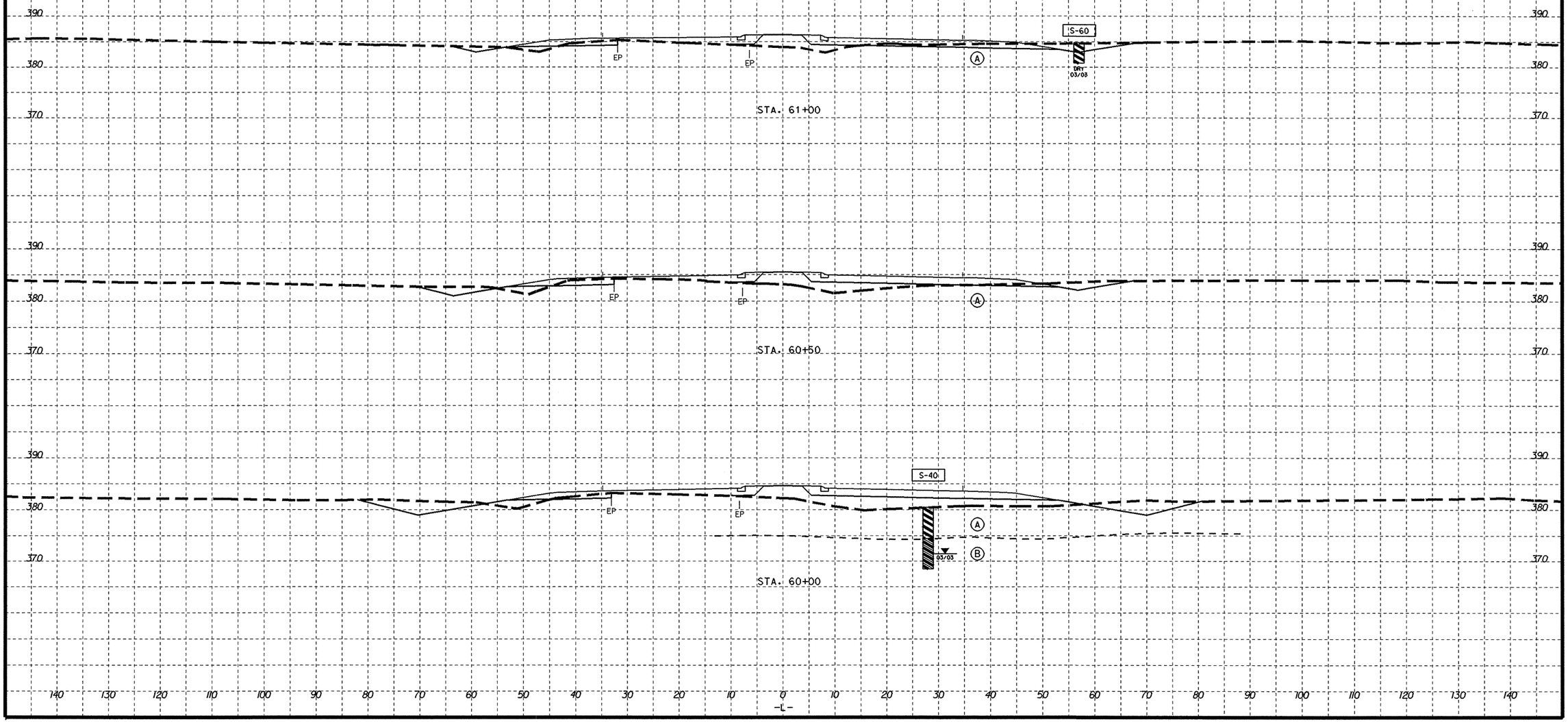
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-40	28' RT	60+00	3.0-5.0	A-7-6(25)	57	30	10.8	15.9	26.3	46.9	100	93	79	-	-
S-60	57' RT	61+00	1.5-3.5	A-7-6(13)	62	36	40.2	11.7	9.6	38.4	96	65	48	-	-

LEGEND

A: RESIDUAL, GREEN-GRAY, ORANGE-BROWN, AND BROWN, SOFT, HIGHLY PLASTIC, MOIST, SILTY CLAY

B: RESIDUAL, RED-BROWN, STIFF TO VERY STIFF, SLIGHTLY PLASTIC, MOIST TO WET, SANDY CLAY



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026A	25

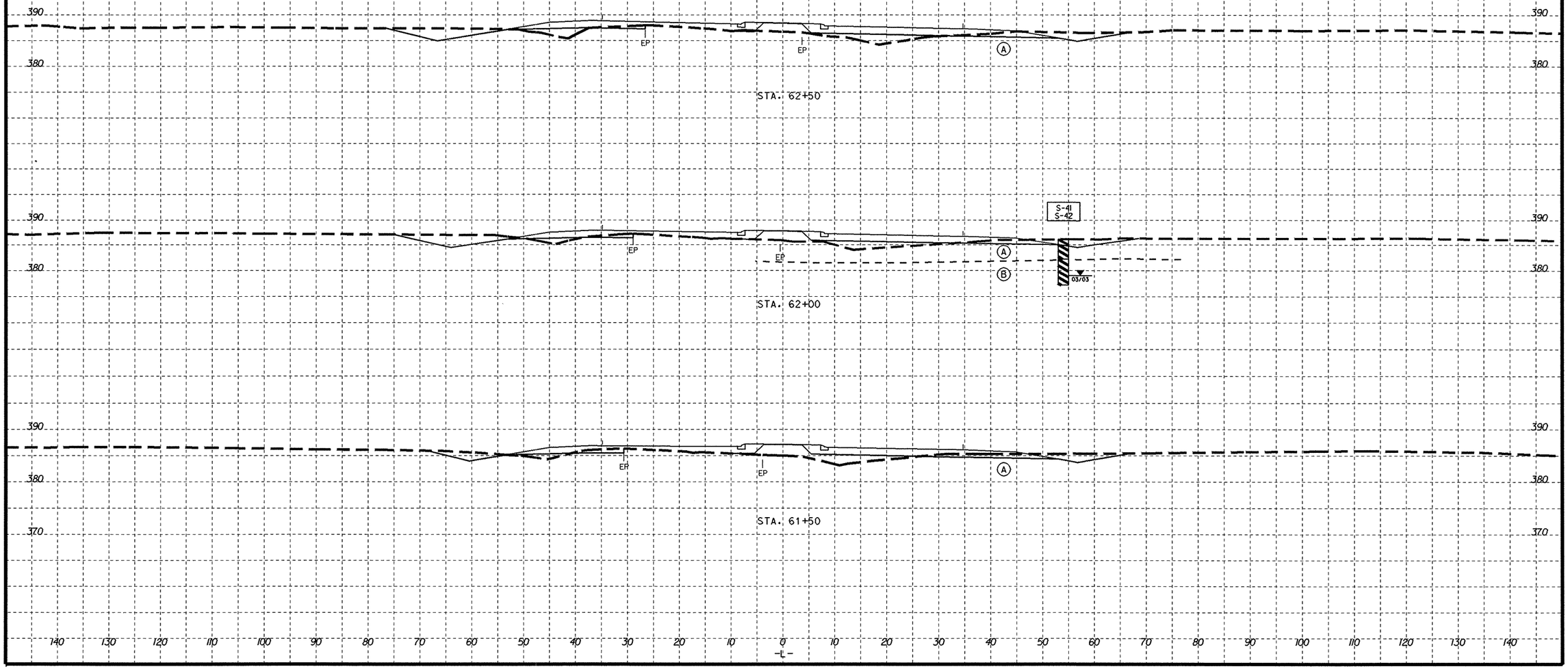
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-41	54' RT	62+00	1.0-3.0	A-7-6(19)	75	47	40.2	10.6	10.4	38.8	96	65	50	-	-
S-42	54' RT	62+00	5.0-8.0	A-7-6(4)	45	20	46.7	15.7	15.1	22.4	99	64	41	-	-

LEGEND

A: RESIDUAL, ORANGE-BROWN, SOFT, HIGHLY PLASTIC, MOIST, SILTY CLAY

B: RESIDUAL, BROWN AND PURPLE, STIFF, MODERATELY PLASTIC, MOIST TO WET, SILTY CLAY



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026A	26

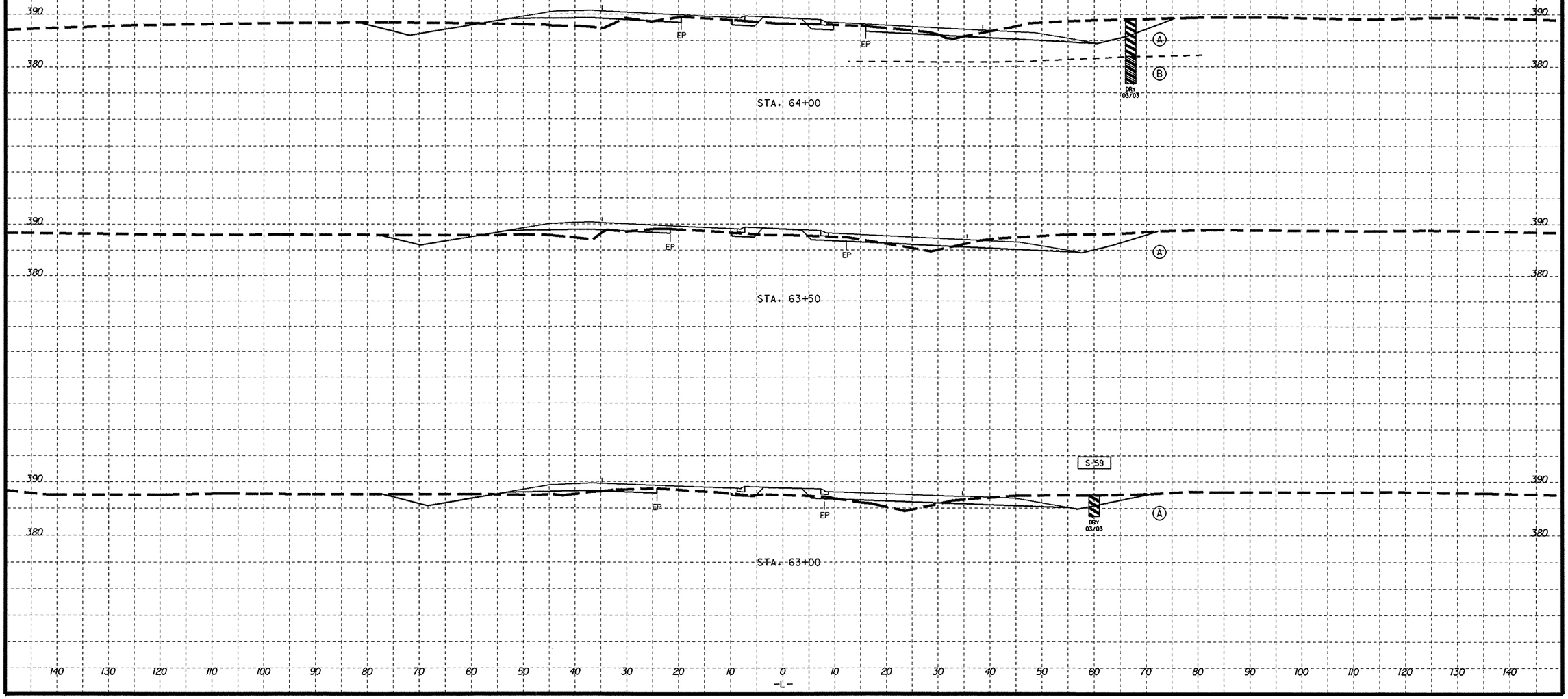
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-59	60' RT	63+00	0.5-3.5	A-7-6(22)	70	42	28.5	13.3	11.6	46.5	97	77	59	-	-

LEGEND

A: RESIDUAL, ORANGE-BROWN, SOFT TO STIFF, HIGHLY PLASTIC, MOIST, SILTY CLAY

B: RESIDUAL, YELLOW-ORANGE AND RED-BROWN, STIFF TO VERY STIFF, SLIGHTLY PLASTIC, MOIST, SANDY CLAY



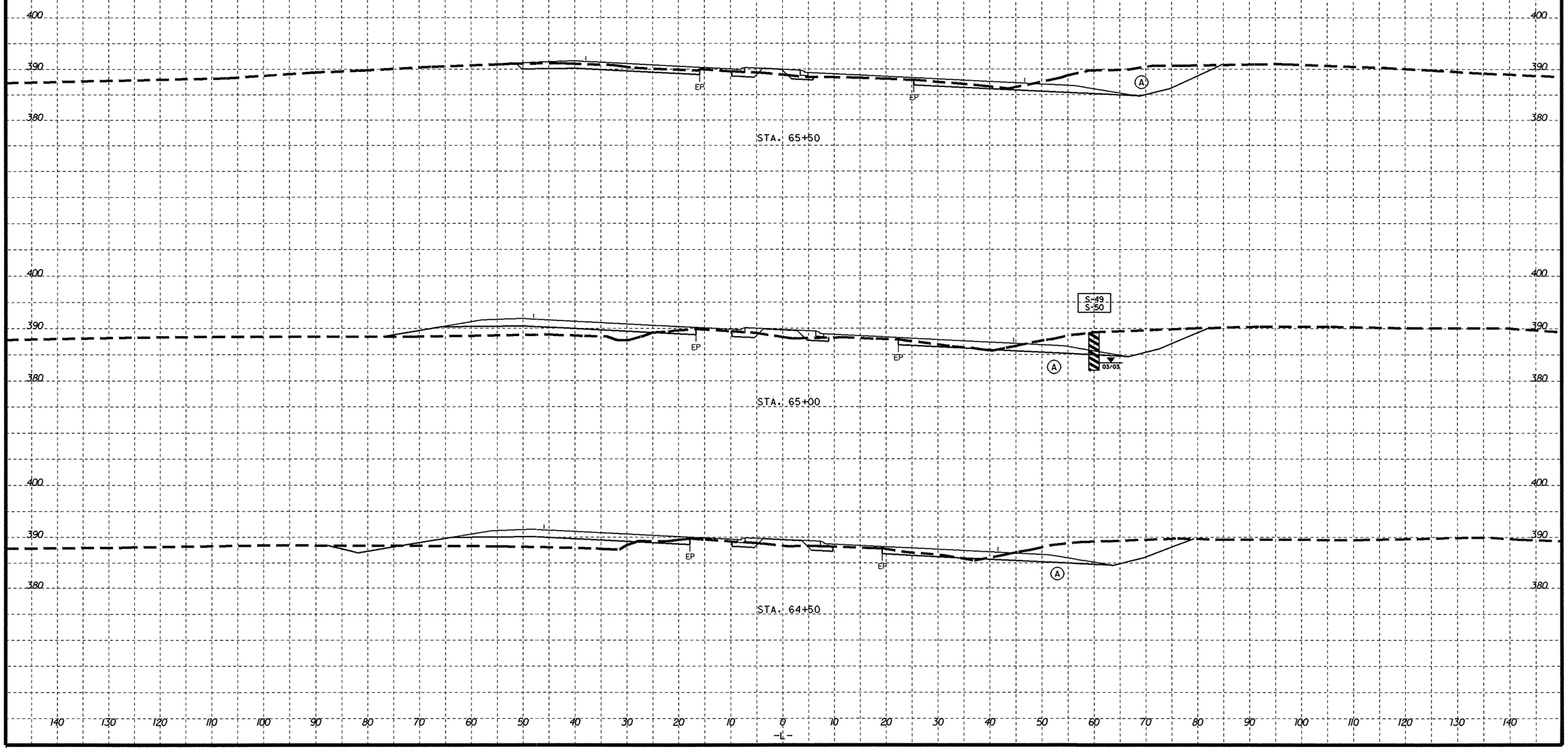
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026A	27

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-49	60' RT	65+00	0.0-3.0	A-7-6(7)	52	31	57.1	0.4	14.0	28.5	92	56	42	-	-
S-50	60' RT	65+00	3.0-6.0	A-7-6(25)	64	37	15.7	21.1	20.5	42.7	100	90	68	-	-

LEGEND

A: RESIDUAL, ORANGE-BROWN AND YELLOW-BROWN, SOFT TO STIFF, HIGHLY PLASTIC, MOIST TO WET, SILTY CLAY



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026A	28

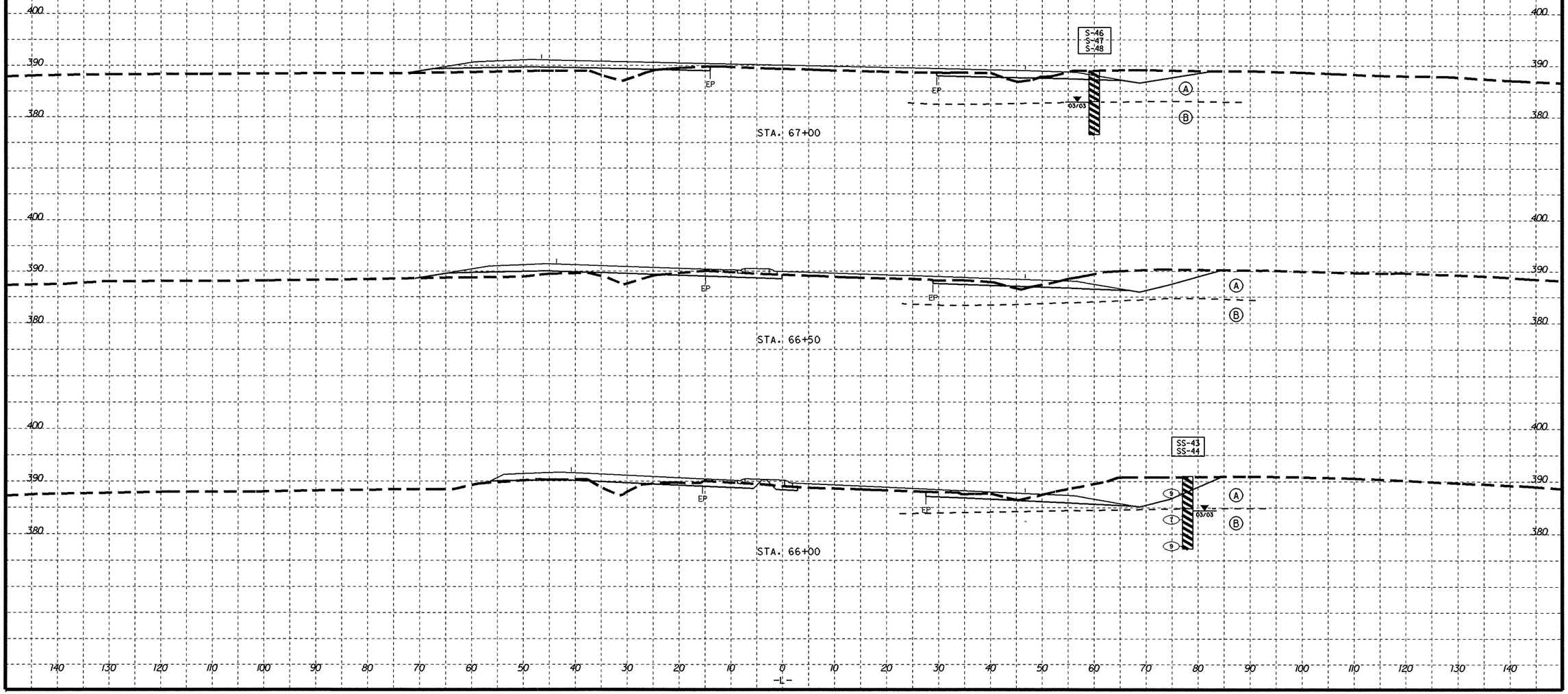
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-43	78' RT	66+00	2.2-3.7	A-7-5(43)	104	70	28.0	6.7	6.1	59.2	95	71	63	-	-
SS-44	78' RT	66+00	7.2-8.7	A-7-6(5)	44	15	26.9	27.1	19.4	26.5	100	87	51	-	-
S-46	60' RT	67+00	0.0-3.0	A-7-6(22)	75	47	26.4	16.5	32.7	24.4	91	73	55	-	-
S-47	60' RT	67+00	3.0-6.0	A-7-6(24)	55	26	10.2	17.1	32.1	40.7	100	93	82	-	-
S-48	60' RT	67+00	6.0-9.0	A-7-6(4)	43	18	40.2	20.1	19.3	20.3	97	73	43	-	-

LEGEND

A: RESIDUAL, ORANGE-BROWN, YELLOW-BROWN, AND BROWN, SOFT TO STIFF, HIGHLY PLASTIC, MOIST, SILTY CLAY

B: RESIDUAL, RED-BROWN AND BROWN, MEDIUM STIFF TO STIFF, SLIGHTLY TO MODERATELY PLASTIC, WET, SILTY CLAY



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026A	29

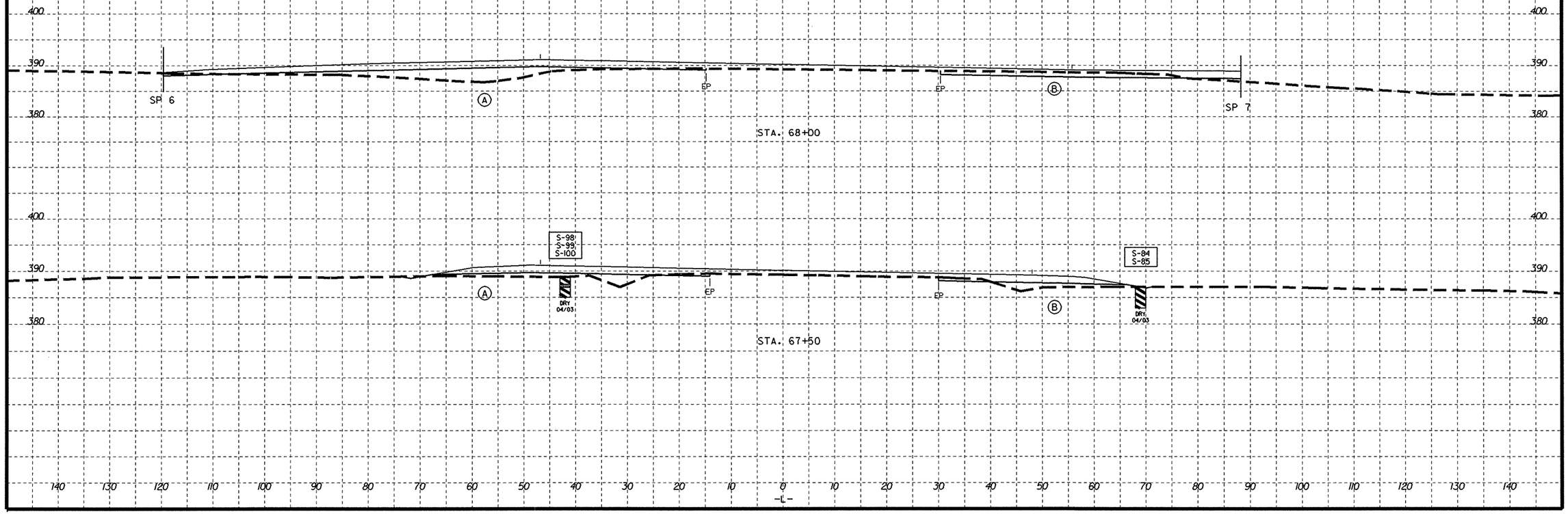
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-98	42' LT	67+50	0.0-1.5	A-7-6(12)	43	23	20.7	19.1	21.9	38.2	98	84	63	-	-
S-99	42' LT	67+50	1.5-2.1	A-4(0)	20	4	31.4	27.8	28.8	12.1	97	77	46	-	-
S-100	42' LT	67+50	2.1-4.0	A-7-6(12)	44	24	24.1	19.7	21.9	34.2	99	83	61	-	-
S-84	69' RT	67+50	0.5-2.0	A-7-5(33)	81	51	23.9	11.9	14.3	49.9	97	81	65	-	-
S-85	69' RT	67+50	2.0-4.0	A-7-5(27)	69	35	19.3	11.0	19.8	49.9	98	84	72	-	-

LEGEND

A: RESIDUAL, YELLOW-GRAY AND GREEN-GRAY, MEDIUM TO VERY STIFF, MOIST, SANDY SILT AND MODERATELY PLASTIC, SILTY CLAY

B: RESIDUAL, YELLOW-BROWN, SOFT TO STIFF, HIGHLY PLASTIC, MOIST, SILTY CLAY



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026A	30

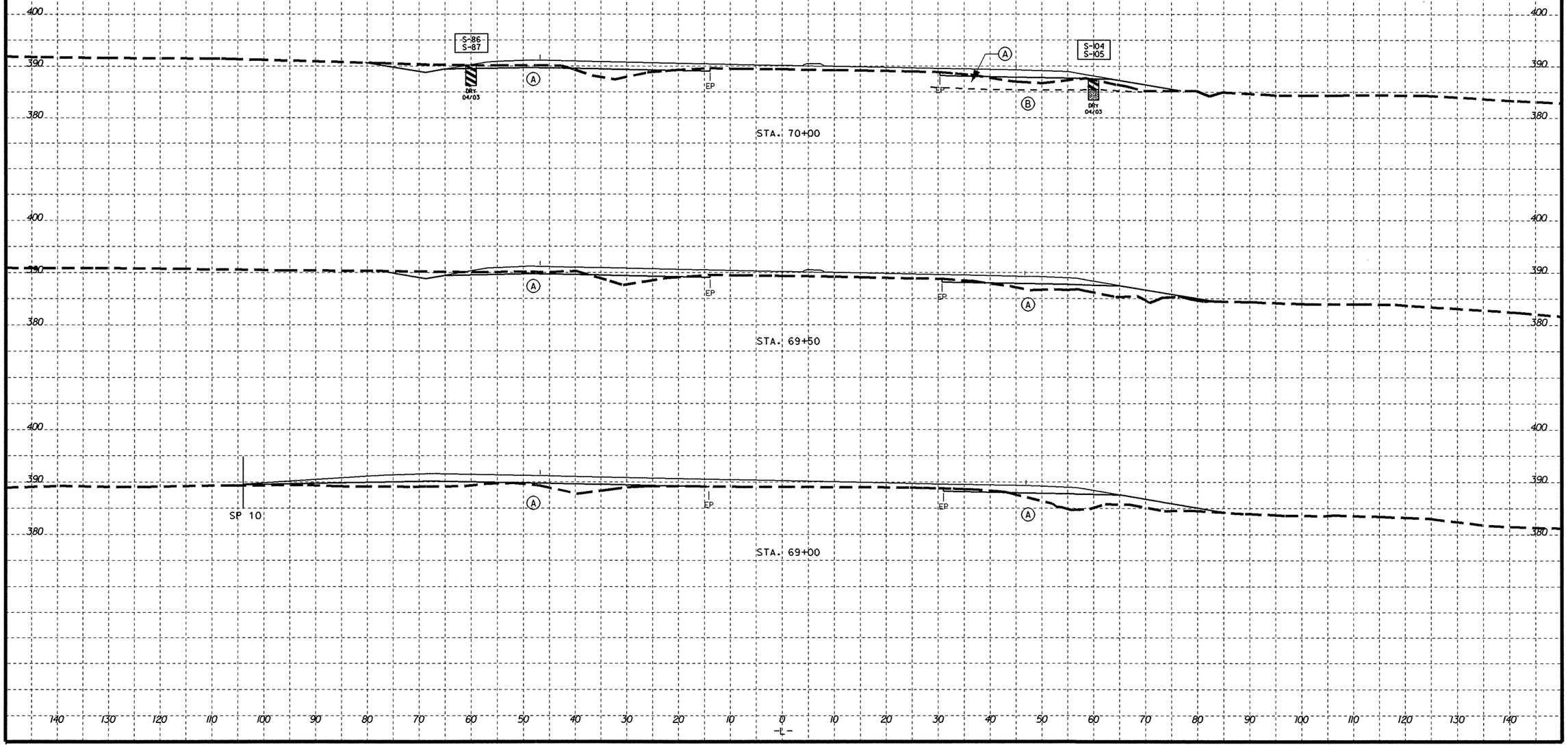
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-86	60' LT	70+00	0.5-2.0	A-7-6(13)	64	38	38.7	11.9	12.1	37.4	91	61	47	-	-
S-87	60' LT	70+00	2.0-4.0	A-7-6(12)	65	40	43.2	12.8	12.8	31.2	94	59	44	-	-
S-104	60' RT	70+00	0.0-2.0	A-7-6(9)	46	26	31.8	18.8	18.9	30.4	94	71	50	-	-
S-105	60' RT	70+00	2.0-4.0	A-2-4(0)	17	2	43.8	26.7	19.4	10.1	99	70	35	-	-

LEGEND

A: RESIDUAL, BROWN, GRAY, YELLOW-BROWN AND YELLOW-GRAY, SOFT TO STIFF, HIGHLY PLASTIC, MOIST, SILTY CLAY

B: RESIDUAL, GREEN-GRAY AND GRAY, MEDIUM DENSE, MOIST, SILTY SAND



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026A	31

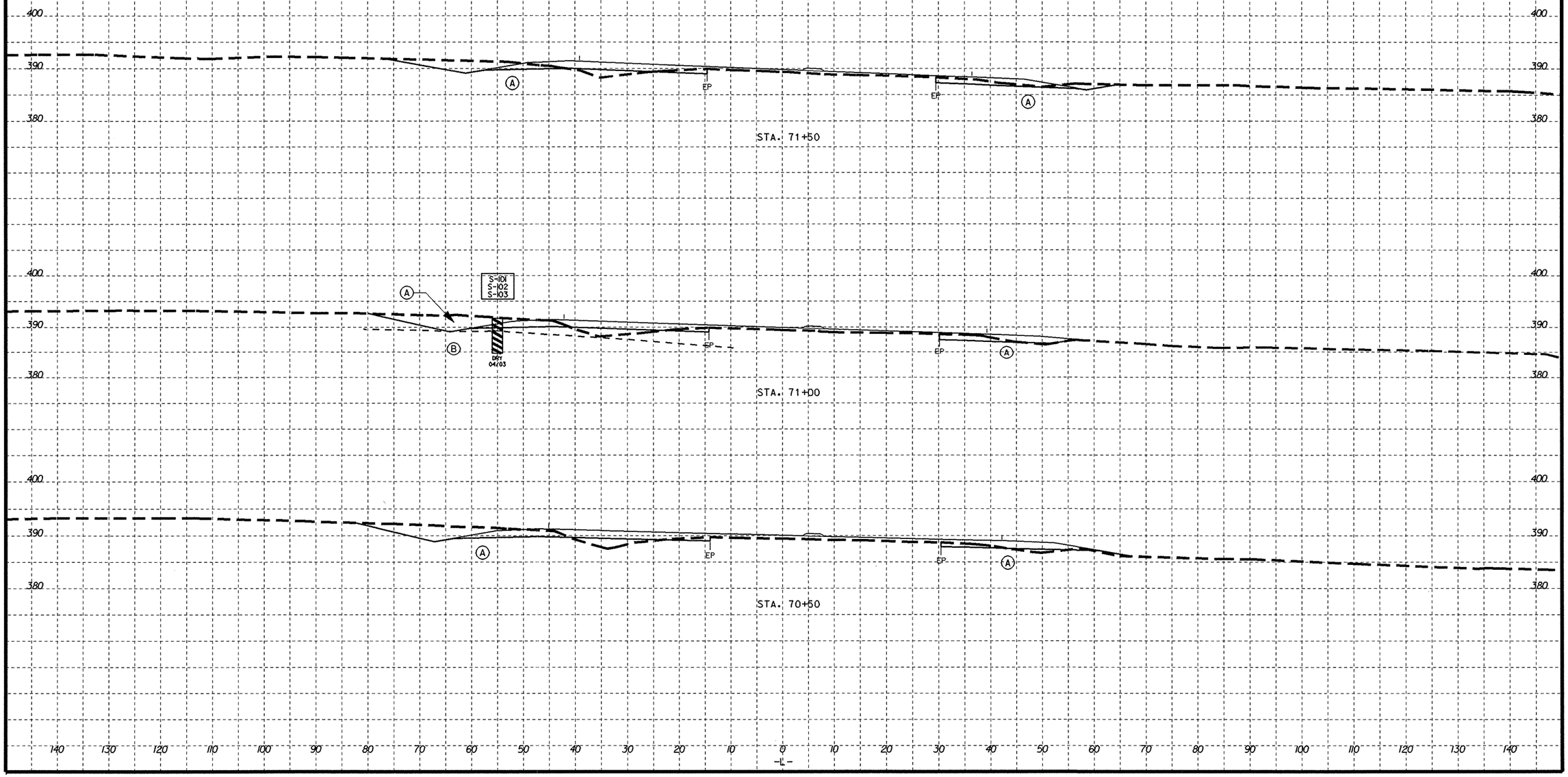
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-101	55' LT	71+00	0.5-2.5	A-7-6(45)	84	56	11.5	15.5	12.7	60.4	100	92	76	-	-
S-102	55' LT	71+00	2.5-5.0	A-7-6(5)	41	17	32.4	24.5	18.9	24.1	98	75	47	-	-
S-103	55' LT	71+00	5.0-7.0	A-7-6(13)	43	19	7.2	26.6	32.0	34.2	100	95	71	-	-

LEGEND

A: RESIDUAL, YELLOW-BROWN AND BROWN, SOFT TO STIFF, HIGHLY PLASTIC, MOIST, SILTY CLAY

B: RESIDUAL, YELLOW-BROWN AND RED-BROWN, MEDIUM STIFF, MODERATELY PLASTIC, MOIST, SILTY CLAY



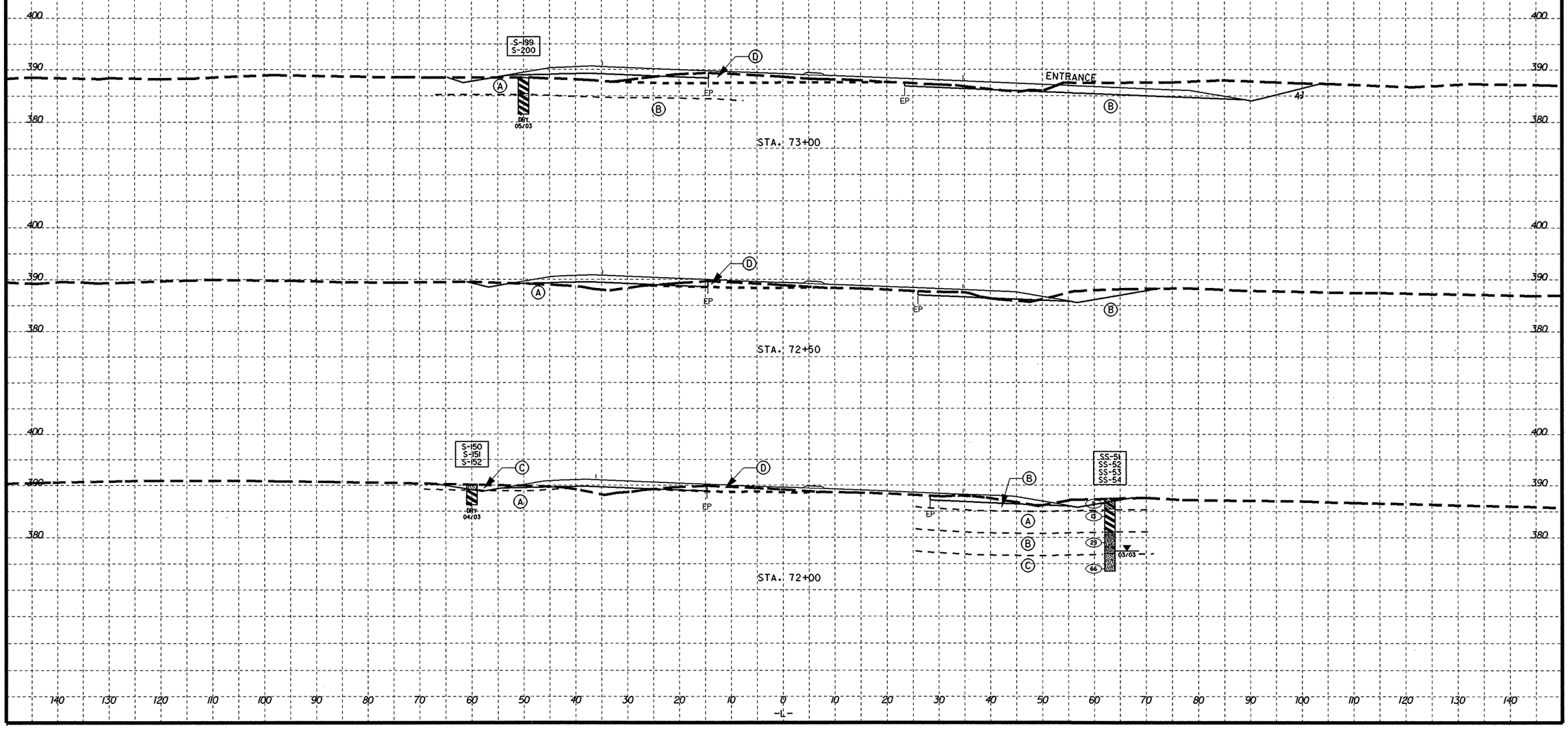
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026A	32

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-51	63' RT	72+00	0.0-1.5	A-6(2)	29	15	39.2	24.2	16.3	20.3	97	69	42	-	-
SS-52	63' RT	72+00	2.4-3.9	A-7-6(12)	50	34	35.0	18.5	16.1	30.5	98	73	50	17	-
SS-53	63' RT	72+00	7.4-8.9	A-4(7)	35	8	2.2	35.2	40.2	22.4	100	99	80	-	-
SS-54	63' RT	72+00	12.4-13.9	A-2-4(0)	31	6	48.4	28.5	15.0	8.1	95	66	26	12	-
S-150	60' LT	72+00	0.0-1.1	A-2-4(0)	25	9	44.9	25.3	15.5	14.3	95	64	33	-	-
S-151	60' LT	72+00	1.1-2.5	A-7-6(24)	66	44	24.9	16.9	17.3	40.8	100	83	61	-	-
S-152	60' LT	72+00	2.5-4.0	A-7-6(6)	45	26	42.2	19.0	18.4	20.4	96	66	42	-	-
S-199	50' LT	73+00	0.0-3.0	A-7-6(14)	60	40	40.4	13.2	15.5	30.9	96	67	48	-	-
S-200	50' LT	73+00	3.0-6.9	A-7-6(18)	42	21	4.1	18.1	44.7	33.0	100	98	84	-	-

LEGEND

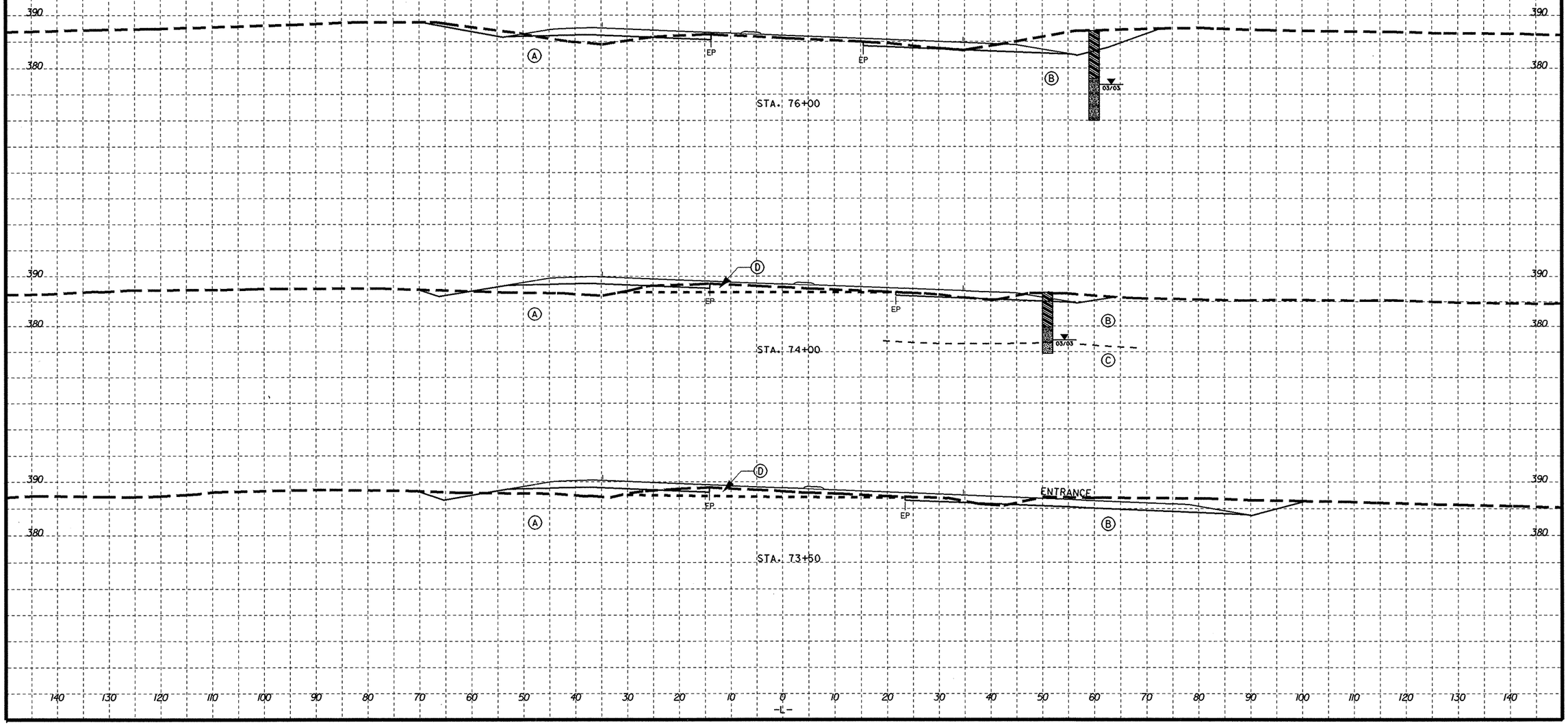
A: RESIDUAL, YELLOW-BROWN, GRAY, AND BROWN, SOFT TO STIFF, HIGHLY PLASTIC, MOIST, SILTY CLAY
B: RESIDUAL, YELLOW-BROWN AND RED-BROWN, MED. TO V. STIFF, MOIST TO WET, SANDY SILT AND SLI. TO MOD. PLASTIC, SANDY AND SILTY CLAY
C: RESIDUAL, YELLOW-BROWN AND GRAY, LOOSE TO VERY DENSE, MOIST TO WET, SILTY SAND
D: ROADWAY EMBANKMENT



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026A	33

LEGEND

A: RESIDUAL, YELLOW-BROWN, GRAY, AND BROWN, SOFT TO STIFF, HIGHLY PLASTIC, MOIST, SILTY CLAY
B: RESIDUAL, YELLOW-BROWN, RED-BROWN, AND GREEN-GRAY, SOFT TO VERY STIFF, MOIST TO WET, SANDY SILT AND SLI. PLASTIC, SANDY CLAY
C: RESIDUAL, GRAY, VERY DENSE, WET, SILTY SAND
D: ROADWAY EMBANKMENT



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026A	34

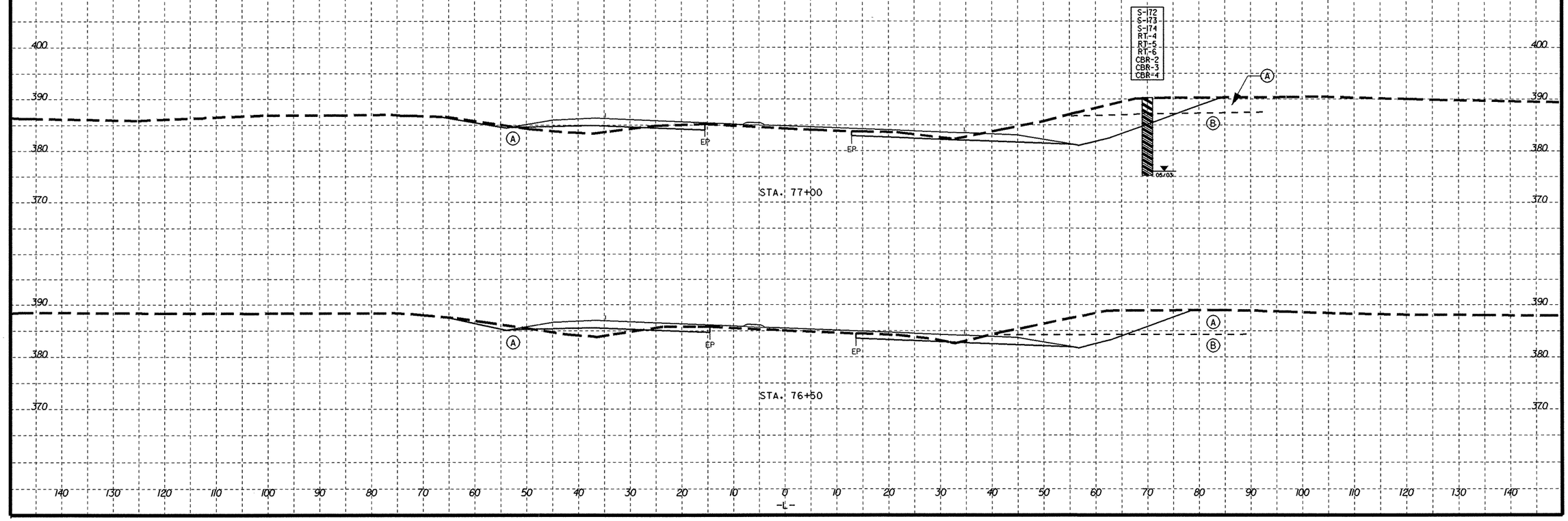
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-172	70' RT	77+00	0.0-3.0	A-7-6(28)	70	46	21.9	17.0	16.6	44.5	99	85	64	-	-
S-173	70' RT	77+00	3.0-7.0	A-6(6)	39	18	31.0	20.9	19.8	28.3	99	83	52	-	-
S-174	70' RT	77+00	7.0-15.0	A-6(1)	32	13	41.7	21.9	20.2	16.2	98	70	39	-	-
RT-4	70' RT	77+00	0.0-3.0	A-7-6(18)	60	39	25.8	21.1	16.4	36.8	96	79	55	-	-
RT-5	70' RT	77+00	3.0-7.0	A-7-6(7)	42	22	28.4	25.2	17.8	28.6	98	80	50	-	-
RT-4	70' RT	77+00	7.0-15.0	A-6(3)	36	18	42.1	22.1	19.4	16.4	96	68	39	-	-
CBR-2	70' RT	77+00	0.0-3.0	A-7-6(24)	69	48	26.4	17.3	15.9	40.7	97	79	57	-	-
CBR-3	70' RT	77+00	3.0-7.0	A-6(7)	39	19	25.6	23.8	22.2	28.5	99	83	54	-	-
CBR-4	70' RT	77+00	7.0-15.0	A-6(2)	37	18	43.9	20.5	19.3	16.3	97	67	38	-	-

LEGEND

A: RESIDUAL, YELLOW-BROWN, GRAY, AND BROWN, SOFT TO STIFF, HIGHLY PLASTIC, MOIST, SILTY CLAY

B: RESIDUAL, YELLOW-BROWN, RED-BROWN, AND GREEN-GRAY, SOFT TO VERY STIFF, MOIST TO WET, SANDY SILT AND SLI. PLASTIC, SANDY CLAY



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026A	35

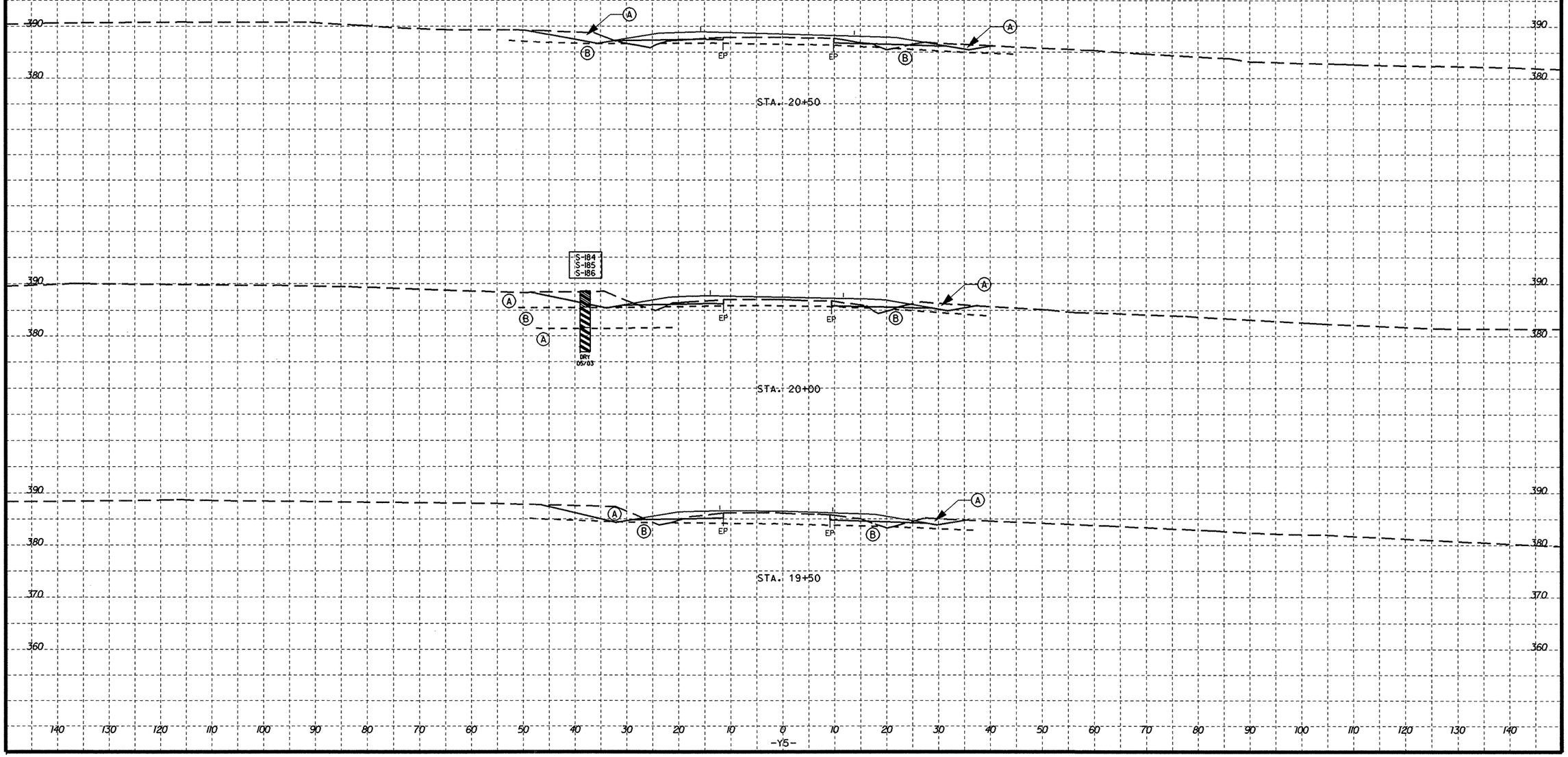
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-184	38' LT	20+00	0.5-3.0	A-6(7)	32	12	15.9	18.4	24.5	41.2	99	90	69	-	-
S-185	38' LT	20+00	3.0-6.5	A-7-6(31)	61	42	12.6	15.7	26.4	45.4	100	93	75	-	-
S-186	38' LT	20+00	7.0-11.0	A-7-6(22)	45	22	4.3	3.7	44.5	47.4	100	97	93	-	-

LEGEND

A: RESIDUAL, YELLOW-BROWN AND RED-BROWN, SOFT TO MEDIUM STIFF, SLIGHTLY TO MODERATELY PLASTIC, MOIST, SANDY AND SILTY CLAY

B: RESIDUAL, GRAY-BROWN, SOFT, HIGHLY PLASTIC, MOIST, SILTY CLAY



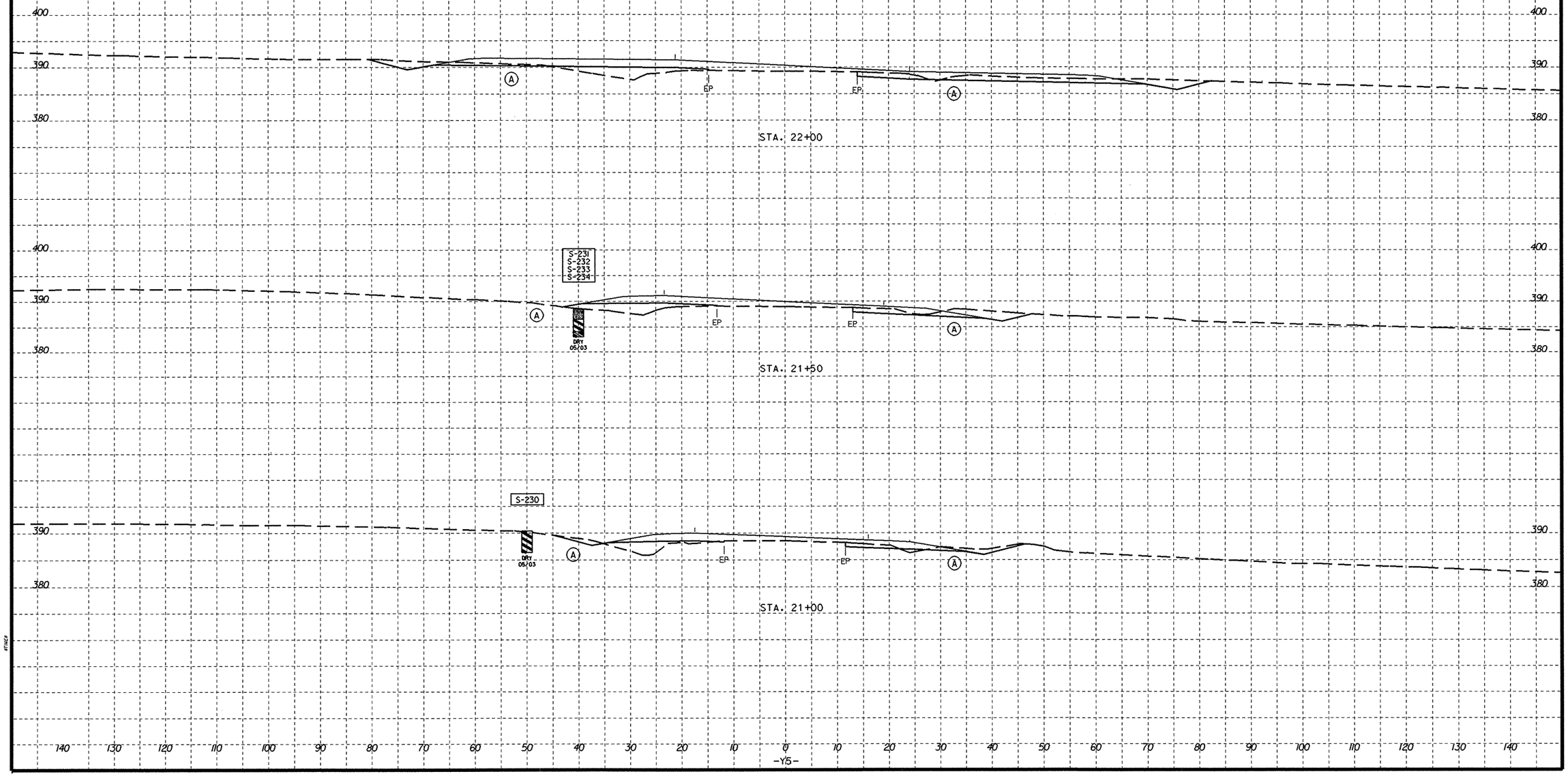
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026A	36

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-230	50' LT	21+00	0.5-2.5	A-7-6(46)	80	58	11.9	15.6	18.9	53.5	100	93	76	-	-
S-231	40' RT	21+50	0.5-1.5	A-4(1)	23	7	28.0	28.6	24.9	18.5	98	80	48	-	-
S-232	40' RT	21+50	2.5-3.5	A-7-6(51)	89	62	11.5	14.4	16.5	57.6	100	93	77	-	-
S-233	40' RT	21+50	4.0-4.5	A-7-6(4)	45	29	44.4	20.0	13.0	22.6	95	65	36	-	-
S-234	40' RT	21+50	4.5-5.5	A-6(10)	40	17	16.3	17.1	35.8	30.9	96	85	67	-	-

LEGEND

A: RESIDUAL, ORANGE-BROWN, RED-BROWN, YELLOW-BROWN, AND GRAY, SOFT TO VERY STIFF, MOIST, SANDY SILT AND MODERATELY TO HIGHLY PLASTIC, SANDY AND SILTY CLAY



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026A	37

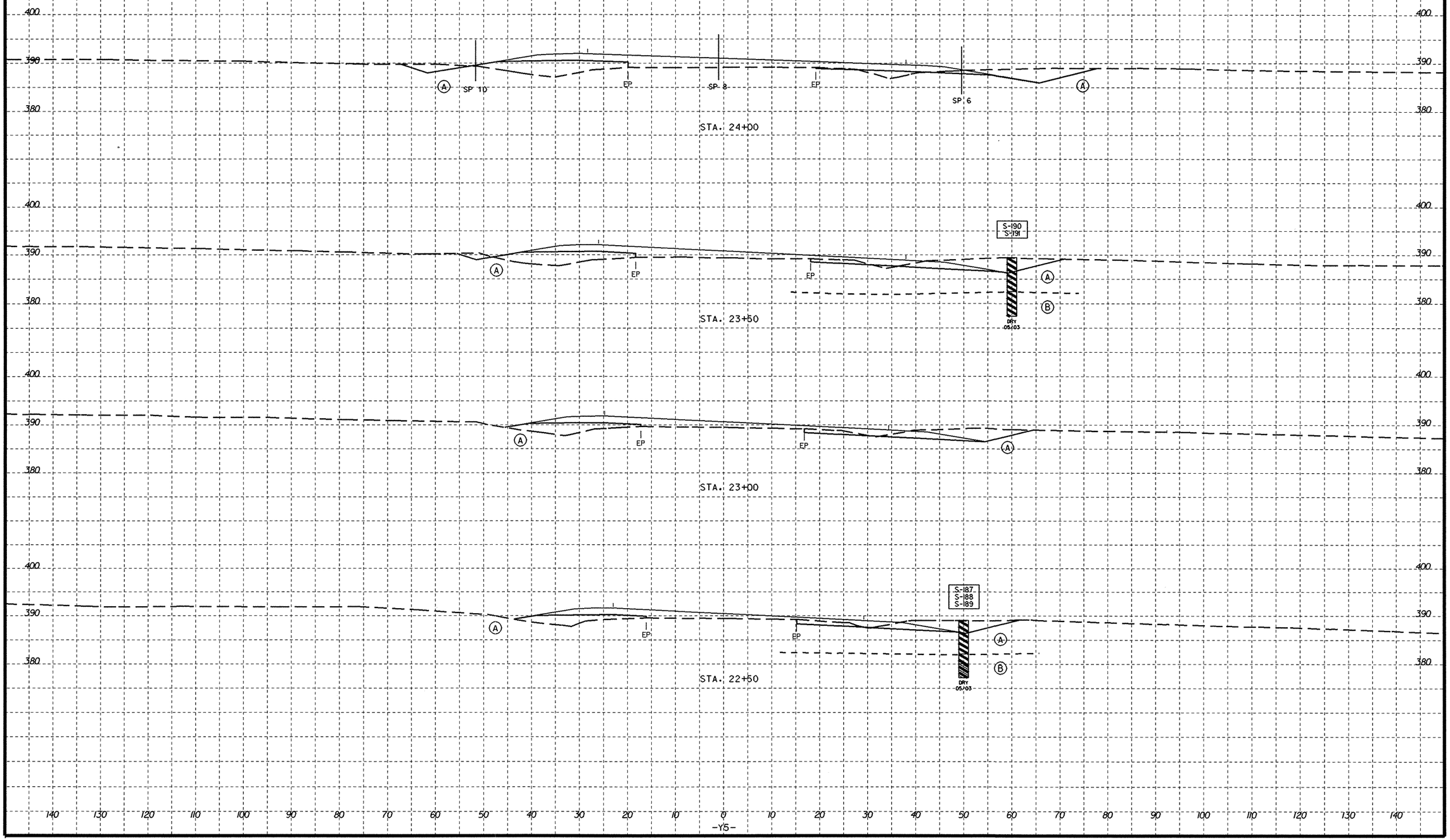
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-187	50' RT	22+50	0.5-3.0	A-7-6(30)	65	46	18.1	19.6	19.0	43.3	100	88	68	-	-
S-188	50' RT	22+50	3.0-6.0	A-7-6(21)	51	35	13.8	24.3	22.7	39.2	100	93	67	-	-
S-189	50' RT	22+50	9.0-11.9	A-6(6)	36	19	13.4	43.5	22.5	20.6	100	95	51	-	-
S-190	60' RT	23+50	0.0-3.0	A-7-6(22)	59	41	25.2	16.1	17.5	41.2	97	79	61	-	-
S-191	60' RT	23+50	4.0-7.0	A-7-6(18)	46	27	6.2	31.1	29.7	33.0	100	97	72	-	-

LEGEND

A: RESIDUAL, YELLOW-BROWN AND GRAY, SOFT TO STIFF, HIGHLY PLASTIC, MOIST, SILTY CLAY

B: RESIDUAL, RED-BROWN AND GRAY, MEDIUM STIFF, MOIST, MODERATELY PLASTIC, SANDY AND SILTY CLAY



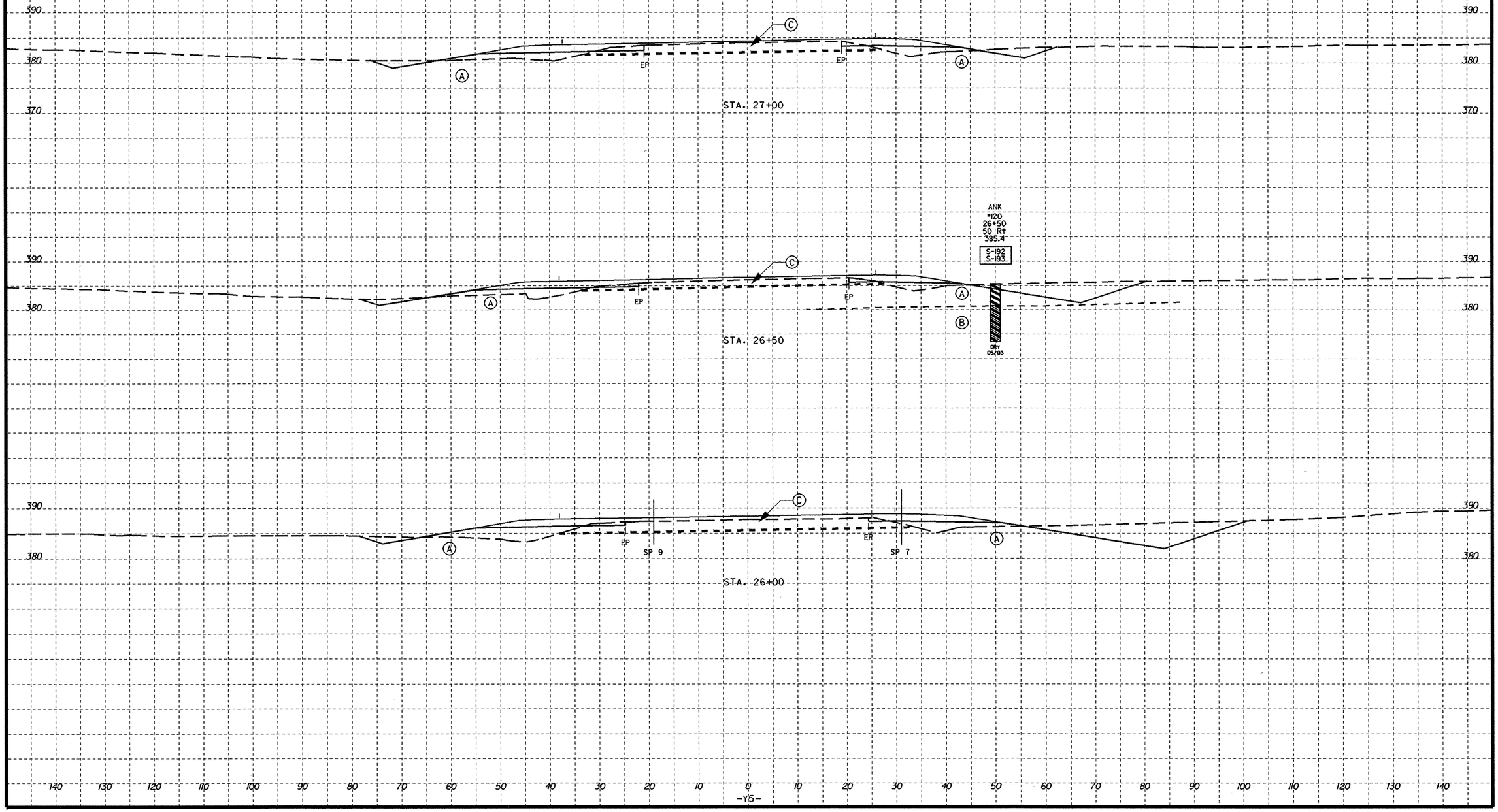
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026A	38

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-192	50' RT	26+50	0.5-3.5	A-7-6(41)	80	52	16.7	8.5	15.1	59.8	98	85	75	-	-
S-193	50' RT	26+50	4.5-7.0	A-6(9)	35	13	5.4	31.8	36.1	26.8	100	97	75	-	-

LEGEND

A: RESIDUAL, YELLOW-BROWN, SOFT, HIGHLY PLASTIC, MOIST, SILTY CLAY
B: RESIDUAL, RED-BROWN, MEDIUM STIFF, SLIGHTLY PLASTIC, MOIST, SANDY CLAY
C: ROADWAY EMBANKMENT



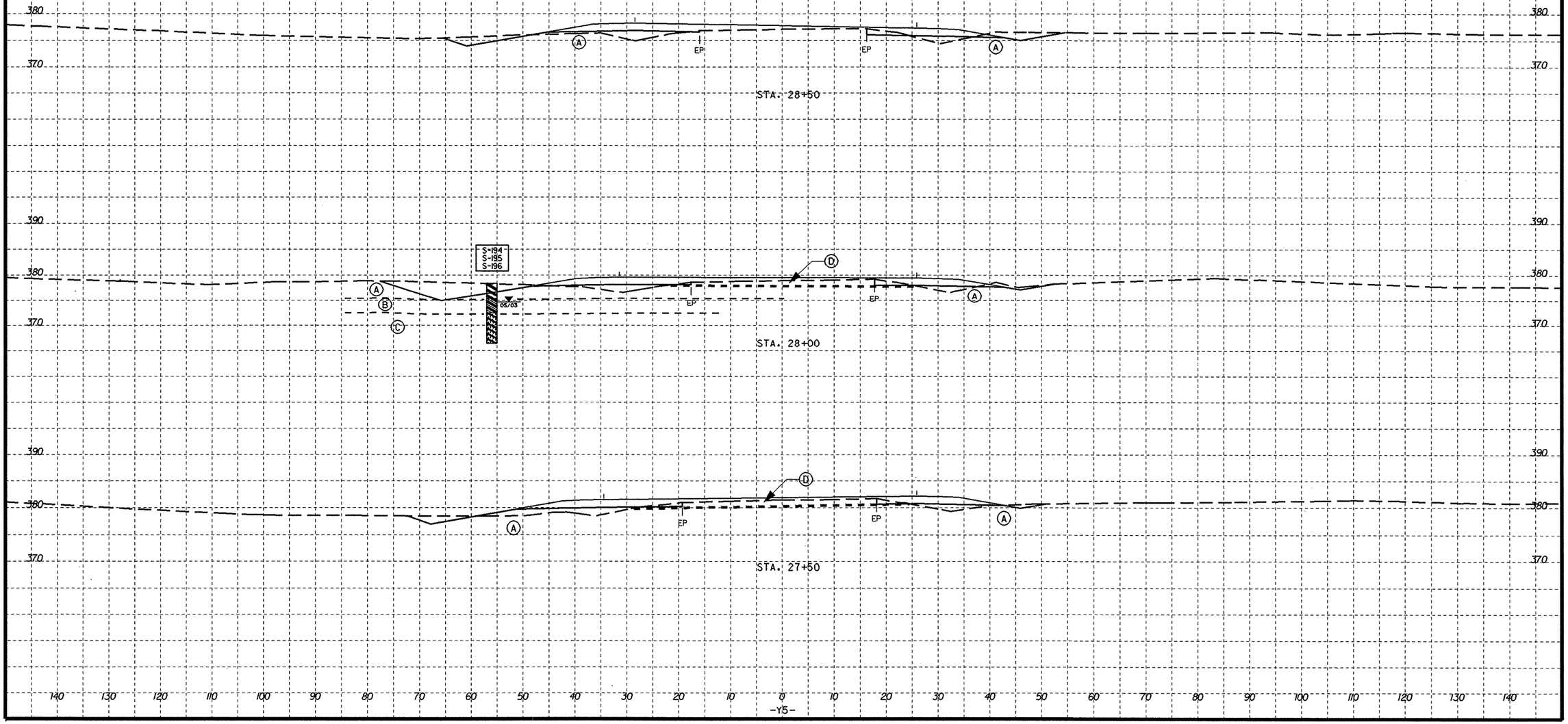
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026A	39

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			%	%
							C. SAND	F. SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
S-194	56' LT	28+00	0.5-3.0	A-7-6(22)	60	39	20.8	18.8	17.1	43.3	98	84	63	-	-
S-195	56' LT	28+00	3.0-6.0	A-6(3)	38	18	39.6	24.7	17.1	18.6	98	70	39	-	-
S-196	56' LT	28+00	6.0-10.0	A-2-6(0)	33	12	52.0	22.5	15.3	10.3	90	55	26	-	-

LEGEND

A: RESIDUAL, YELLOW-BROWN, SOFT, HIGHLY PLASTIC, MOIST, SILTY CLAY
B: RESIDUAL, GRAY, SOFT, MODERATELY PLASTIC, WET, SILTY CLAY
C: RESIDUAL, BROWN-GRAY, MEDIUM DENSE, WET, CLAYEY SAND
D: ROADWAY EMBANKMENT



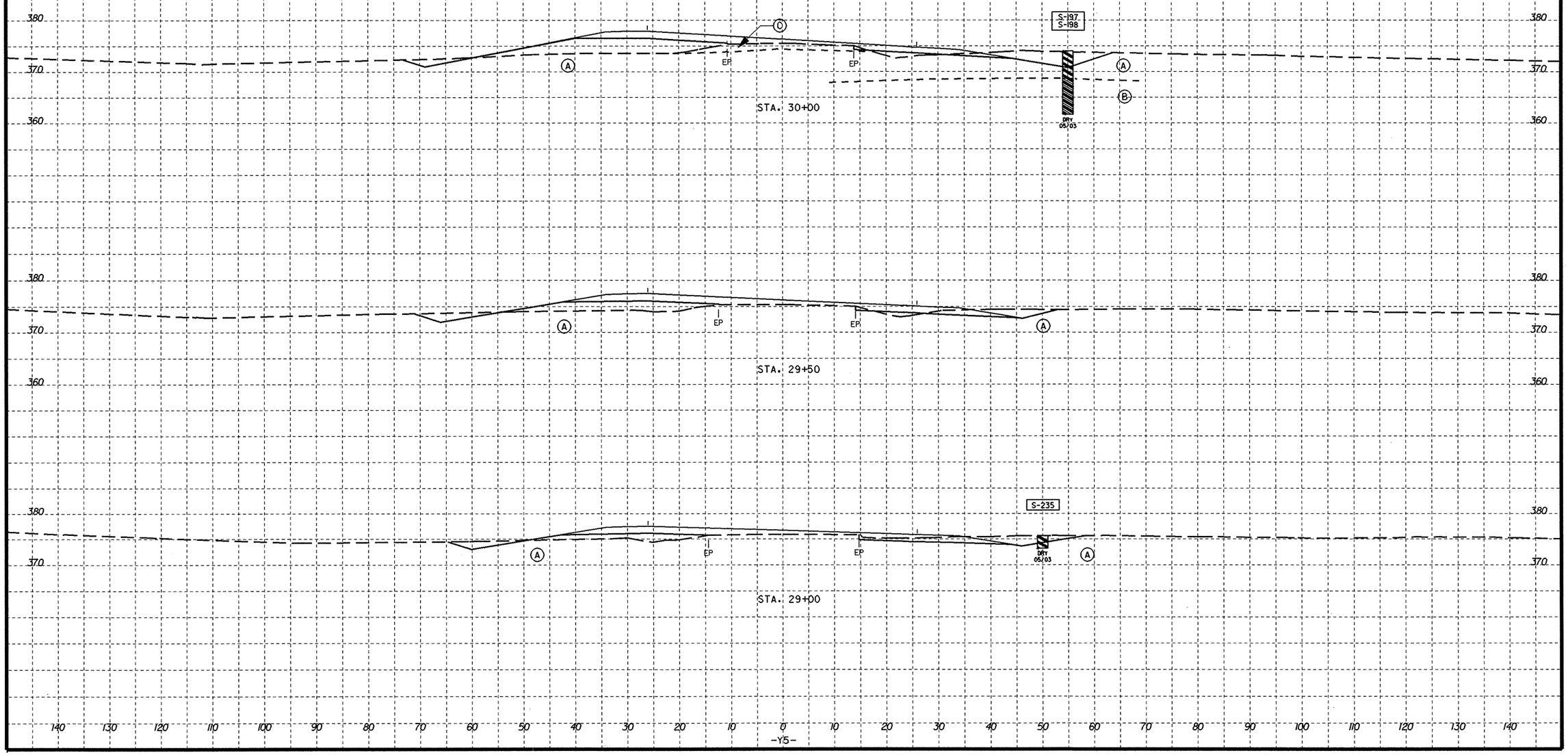
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026A	40

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-197	55' RT	30+00	1.0-4.0	A-7-6(28)	65	43	17.3	15.5	17.7	49.5	98	86	68	-	-
S-198	55' RT	30+00	7.0-12.3	A-6(10)	37	16	3.5	37.9	31.8	26.8	100	99	69	-	-
S-235	50' RT	29+00	0.5-1.5	A-7-6(39)	70	48	12.1	8.0	26.3	53.5	95	86	78	-	-

LEGEND

A: RESIDUAL, YELLOW-BROWN, ORANGE-BROWN, AND RED-BROWN, SOFT TO STIFF, HIGHLY PLASTIC, MOIST, SILTY CLAY
B: RESIDUAL, RED-BROWN, MEDIUM STIFF TO STIFF, MODERATELY PLASTIC, MOIST, SANDY CLAY
C: ROADWAY EMBANKMENT



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026A	41

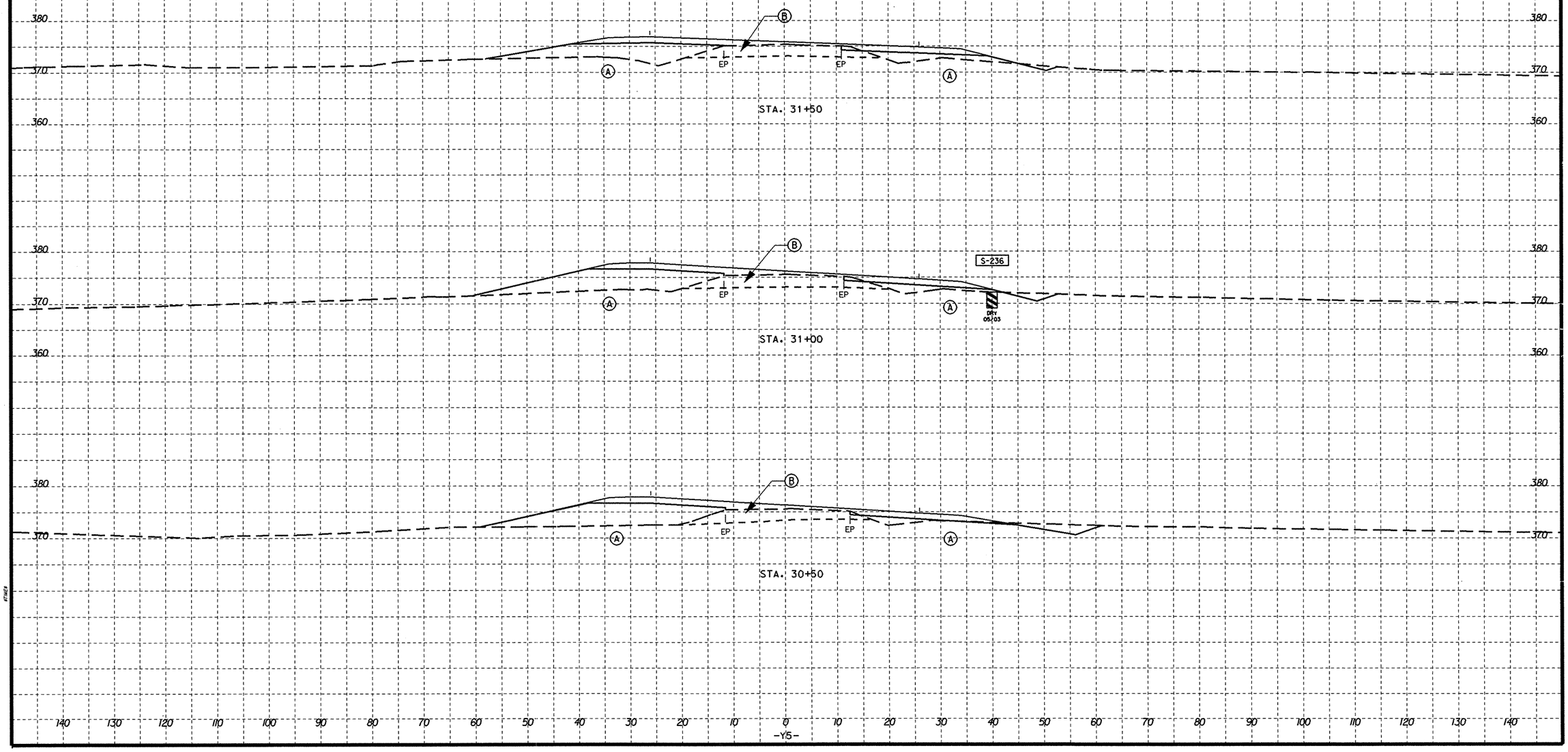
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-236	40' RT	31+00	1.5-3.0	A-7-6(26)	59	40	19.3	15.6	21.8	43.2	100	88	68	-	-

LEGEND

A: RESIDUAL, ORANGE-BROWN AND YELLOW-BROWN, SOFT TO STIFF, HIGHLY PLASTIC, MOIST, SILTY CLAY

B: ROADWAY EMBANKMENT



CONTRACT: C200840

ID: U-4026B

CONTENTS

LINE	STATION	PLAN	PROFILE	XSECTS
-L-	230+50	4		10
-L-	287+50	5		11
-L-	308+50 – 321+08	6, 7		12, 13
-Y9-	10+00 – 14+25	8		14
-Y13-	11+50 – 26+50	7, 9		15, 16

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

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

ROADWAY SUBSURFACE INVESTIGATION

STATE PROJ. 35018.3.1 I.D. U-4026B F.A. PROJ. N/A

COUNTY WAKE & DURHAM

PROJECT DESCRIPTION DAVIS DRIVE (SR 1613/1999) FROM NORTH OF KOPPERS ROAD/McCRIMMONS PARKWAY (SR 1635) TO NORTH OF NC 54

INVENTORY – ADDENDUM

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-4026	1	16

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
35018.1.1	-	P.E.
35018.2.1		R/W
35018.3.1		CONST

CAUTION NOTICE

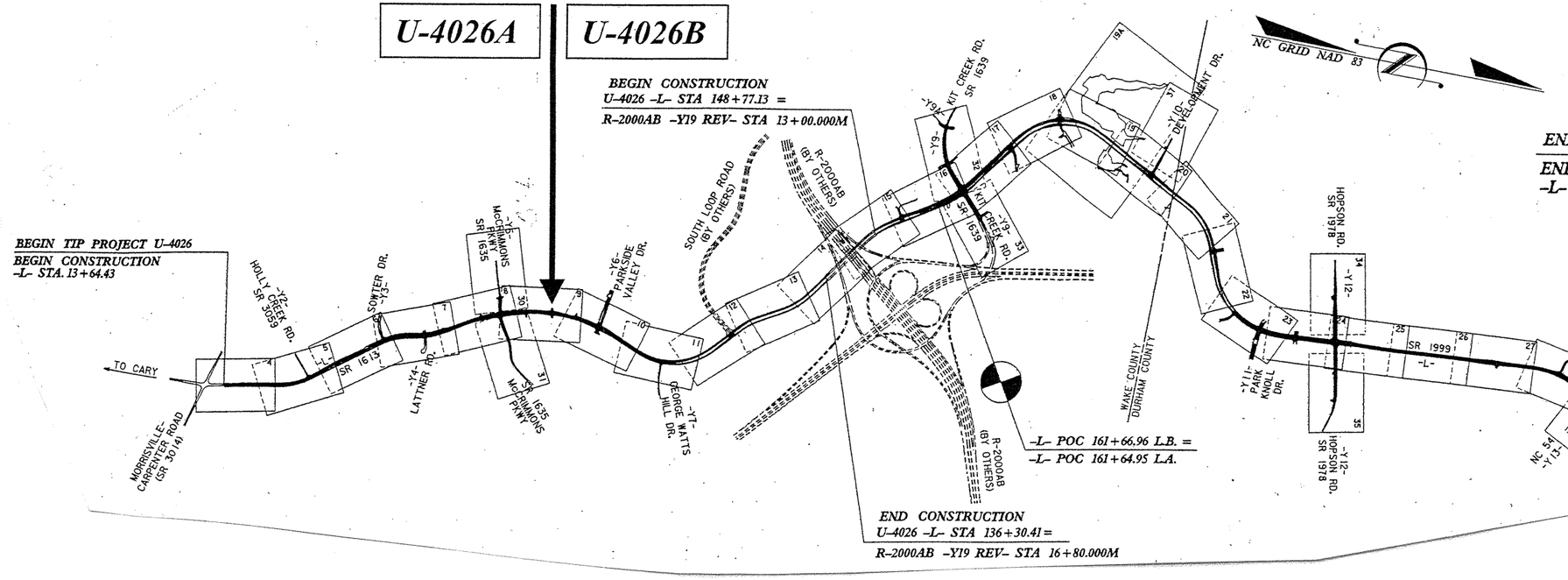
THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WAS MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING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

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

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

U-4026A

U-4026B



PERSONNEL

O. B. OTI

D. W. DIXON

W. T. DUGGINS

C. E. POPE

INVESTIGATED BY S. P. BROWN

CHECKED BY D. N. ARGENBRIGHT

SUBMITTED BY D. N. ARGENBRIGHT

DATE MAY 2004

NORTH CAROLINA LICENSED SEAL 1873 GEOLOGIST STEVE P. BROWN

Steve P. Brown 5/14/04

DRAWN BY: A. N. KARPA, S. P. BROWN

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.

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
U-4026B	35018.1.1	2	16

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL 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 WHICH CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND WHICH YIELDS LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM AND 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		N.P.	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

P.I. OF A-7-5 ≤ L.L. - 30 ; P.I. OF A-7-6 > L.L. - 30

CONSISTENCY OR DENSENESS

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

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE	4	10	40	60	200	270
OPENING (MM)	4.76	2.0	0.42	0.25	0.075	0.053

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

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

SOIL MOISTURE - CORRELATION OF TERMS

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

PLASTICITY

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

COLOR

DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YEL-BRN, 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 ARE 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 30
MODERATELY COMPRESSIBLE	LIQUID LIMIT 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 SEEPAGE

MISCELLANEOUS SYMBOLS

- ROADWAY EMBANKMENT WITH SOIL DESCRIPTION
- SOIL SYMBOL
- ARTIFICIAL FILL OTHER THAN ROADWAY EMBANKMENTS
- INFERRED SOIL BOUNDARIES
- 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 - CBR 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
FRAGS. - FRAGMENTS
MED. - MEDIUM
PMT - PRESSUREMETER TEST
SD. - SAND, SANDY
SL. - SILT, SILTY
SLI. - SLIGHTLY
TCR - TRICONE REFUSAL
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT
W - MOISTURE CONTENT
V. - VERY
VST - VANE SHEAR TEST

EQUIPMENT USED ON SUBJECT PROJECT

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

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

HAMMER TYPE:
- [X] AUTOMATIC [ ] MANUAL

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

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

ROCK DESCRIPTION

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

WEATHERED ROCK (WR)		NON-COASTAL PLAIN MATERIAL THAT YIELDS SPT N VALUES > 100 BLOWS PER FOOT.
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 ROCKS EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. *IF TESTED, YIELDS SPT N VALUES > 100 BPF*
VERY SEVERE (V. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, YIELDS SPT N VALUES < 100 BPF*
COMPLETE	ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.

ROCK HARDNESS

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

FRACTURE SPACING

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

BEDDING

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

INDURATION

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

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

TERMS AND DEFINITIONS

ALLUVIUM (ALLUV.) - SOILS WHICH 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 IS IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.

CALCAREOUS (CALC.) - SOILS WHICH 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 (F.P.) - 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 SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

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

SAPROLITE (SAP.) - RESIDUAL SOIL WHICH 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, WHICH HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS

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

STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR B.P.F.) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS LESS THAN 0.1 FOOT PENETRATION WITH 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 (S.R.Q.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY: TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 10 CENTIMETERS DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.

TOPSOIL (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK:

ELEVATION:

NOTES:

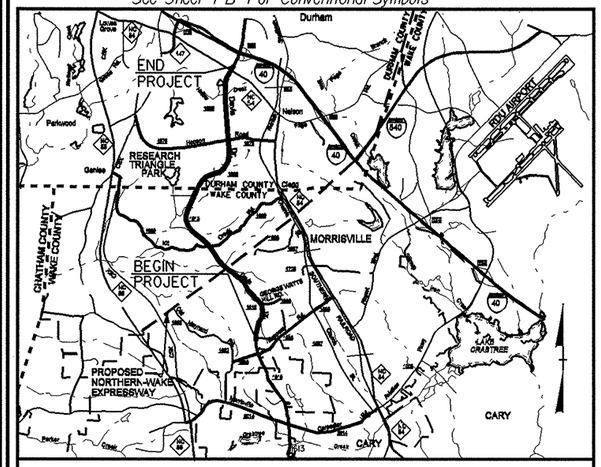
REVISED 09/15/00

10/17/03 ADDED SHEETS
10/02/03 REVISED SHEET LAYOUT
7/18/03 NEW TITLE SHEET

TIP PROJECT: U-4026B

CONTRACT: C200868

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



VICINITY MAP

NOTE: THIS PROJECT IS WITHIN THE MUNICIPAL CITY LIMITS OF CARY AND MORRISVILLE

RW PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE–DURHAM COUNTIES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U–4026B	2A	16

WBS NO.	F.A. PROJ. NO.	DESCRIPTION
35018.1.1		P.E., R/W
		CONST

LOCATION: DAVIS DRIVE (SR 1613/1999) FROM NORTH OF KOPPERS RD./McCRIMMONS PKWY (SR 1635) TO NORTH OF NC 54

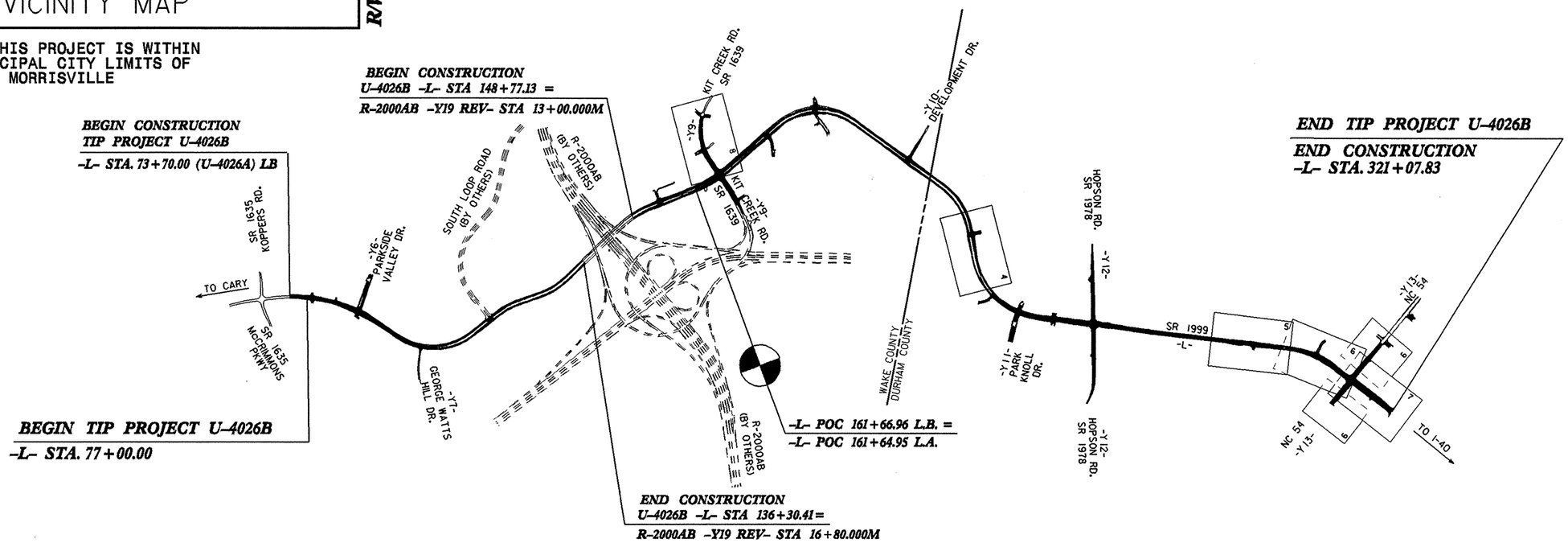
TYPE OF WORK: GRADING, DRAINAGE, PAVING, CULVERTS AND SIGNALS.

NC GRID NAD 83

BEGIN CONSTRUCTION
U–4026B –L– STA 148+77.13 =
R–2000AB –Y19 REV– STA 13+00.000M

BEGIN CONSTRUCTION
TIP PROJECT U–4026B
–L– STA. 73+70.00 (U–4026A) LB

END TIP PROJECT U–4026B
END CONSTRUCTION
–L– STA. 321+07.83



–L– POC 161+66.96 L.B. =
–L– POC 161+64.95 L.A.

BEGIN TIP PROJECT U–4026B
–L– STA. 77+00.00

END CONSTRUCTION
U–4026B –L– STA 136+30.41=
R–2000AB –Y19 REV– STA 16+80.000M

NCDOT CONTACT: TERESA BRUTON, P.E.
DESIGN SERVICES - ENGINEERING COORDINATION

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT (2004) = 24155
ADT (2024) = 45055
DHV = 12 %
D = 65 %
T = 4 % *
V = 55 MPH (SHLD)
= 50 MPH (C&G)
* TTST 1 % DUAL 3 %

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U–4026B = 4.387 MI.

TOTAL LENGTH OF TIP PROJECT U–4026B = 4.387 MI.

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

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: JUNE 30, 2003

LETTING DATE: JUNE 15, 2004

Warren F. Lamb, P.E.
PROJECT ENGINEER

Stephen R. Whitley, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER P.E.

DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR *DATE*

$$$$$$$SYSTIME$$$$$$
$$$$$$$USER$$$$$$$$$$
$$$$$$$DGN$$$$$$$$$$

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

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

LYNDO TIPPETT
SECRETARY

May 19, 2004

STATE PROJECT: 35018.1.1 (U-4026B)
FEDERAL PROJECT: N/A
COUNTY: Wake and Durham
DESCRIPTION: Davis Drive (SR 1613/1999) from north of Koppers Road / McCrimmons Parkway (SR 1635) to north of NC 54
SUBJECT: Geotechnical Report - Inventory (Addendum)

PROJECT DESCRIPTION

The project consists of widening with partial horizontal and vertical realignment of -L- (Davis Drive), -Y9- (Kit Creek Road), -Y12- (Hopson Road), and -Y13- (NC 54). Minor reconstruction of four additional Y lines is required to retie them with -L-. Construction will include one new culvert, three culvert extensions, and six bore and jack pipes.

This report is an addendum to the Inventory Report for U-4026B submitted in October 2003. The addendum addresses design changes that occurred after our original investigation. Changes addressed in this report include an extension of -L- at the end of the project, an extension at the beginning of -Y9-, and extensions at both the beginning and the end of -Y13-. -Y12- is not included in the addendum, as the revisions to -Y12- did not require additional borings. Additional borings were drilled in the vicinities of two pipes that were identified as bore and jack after our original investigation. These pipes are located at approximately -L- Stations 230+15 and 286+70.

A geotechnical investigation was conducted from October to December 2003, using a CME-45C ATV-mounted drill machine with an automatic hammer. Standard Penetration Tests were performed at selected locations and additional borings were advanced using continuous flight augers. Representative soil samples were collected for visual classification in the field and for laboratory analysis by the Materials and Tests Unit.

The following alignments, totaling 0.6 miles, were investigated.

Line	Station
-L-	308+50 to 321+08
-Y9-	10+00 to 14+25
-Y13-	11+50 to 26+50

AREAS OF SPECIAL GEOTECHNICAL INTEREST

1) Highly Plastic Soils: Clays with plasticity indices equal to or greater than 26 were found in the following areas.

Line	Station
-Y13-	16+75 to 18+75
-Y13-	22+00 to 23+00

2) Groundwater: The following sections exhibit a high water table, seasonal high groundwater, or the potential for groundwater related construction problems.

Line	Station
-L-	308+25 to 310+25
-Y13-	17+25 to 20+00

3) Degradable Rock: Degradable rock is defined as rock material (including both weathered rock and non-crystalline rock) that exhibits high slaking characteristics when exposed to air and water. Degradable rock was encountered at or between the following stations.

Line	Station
-L-	230+50
-L-	287+50
-L-	308+60 to 309+75
-L-	312+75 to 319+75
-Y13-	17+75 to 18+75
-Y13-	22+50

4) Non-Crystalline Rock: Non-crystalline rock on this project is primarily Triassic sandstone, siltstone, and mudstone. Non-crystalline rock was encountered at the following stations.

Line	Station
-L-	230+50
-L-	287+50
-L-	309+00
-L-	315+00
-L-	317+00
-Y13-	18+50
-Y13-	22+50

PHYSIOGRAPHY AND GEOLOGY

The project is in gently rolling terrain of the Piedmont Physiographic Province. Surface drainage is generally good. Most of the project is wooded or in commercial land use. Triassic age, sedimentary rocks of the Durham Sub-basin underlie the area. They are mostly interbedded sandstone, mudstone, and siltstone. Scattered diabase dikes are present. Most soils are residual, and have been derived by in-place weathering of the underlying sedimentary rocks.

SOIL PROPERTIES

Soil properties described here are with respect to the addendum investigation.

Residual soils are derived from in-place weathering of the underlying Triassic sedimentary rocks. Most of these soils are stiff to hard, moist to wet, silty clay (A-7-6), sandy clay (A-6), and sandy silt (A-4). The sandy clays are slightly to moderately plastic. Silty clays are moderately to highly plastic, with the highly plastic material being concentrated near the ground surface. Plasticity typically decreases with depth, grading to moderately to slightly plastic within 3 to 5 feet of the surface.

Existing roadway embankment soils were not investigated for the addendum. Where drilled elsewhere on the project, these soils are soft to stiff, slightly to moderately plastic, moist, sandy clay (A-6).

Alluvial soils are present where the two bore and jack pipes are proposed, at -L- Stations 230+15 and 286+70. These soils are very soft to stiff, moist to wet, sand silt (A-4) and sandy clay (A-6).

ROCK PROPERTIES

Triassic sedimentary rocks underlie the project area. Bedrock consists of interbedded sandstone, siltstone, and mudstone. Jar slake and slake durability tests were completed on representative samples of rock core recovered from the intersecting R-2000AB project. These test results indicate that the Triassic mudstones and siltstones are degradable. Core samples of mudstone and siltstone exhibited significant slaking when exposed to air and water, as well as very low to low durability values. Sandstone, as well as the more indurated siltstone samples, did not slake and had medium to high durability values. However, sandstone and siltstone have been included in this report as "degradable rock" because these rock types are commonly interbedded with degradable mudstone and siltstone layers.

With respect to the addendum investigation, degradable rock is present on the project as noted above, in "Areas of Special Geotechnical Interest, Degradable Rock". Occurrences of Non-crystalline rock are also noted above, in "Areas of Special Geotechnical Interest, Non-Crystalline Rock".

GROUNDWATER

The areas noted above, in "Areas of Special Geotechnical Interest, Groundwater", exhibit a high water table, seasonal high groundwater, or the potential for groundwater related construction problems. Groundwater occurred well below grade over the remainder of the project area covered by this addendum.

BORE & JACK PIPE AT -L- STATION 230+15

Natural ground elevations typically range from 288 feet in the stream bed to 292 feet in the floodplain. An existing, 20 foot high embankment rests on 4 to 5 feet of alluvial, very soft to soft, moist to wet, sandy silt (A-4). The alluvial soils overlie weathered rock, at an elevation of approximately 286 feet. Groundwater, as determined from borings near the ends of the proposed pipe, is at elevations ranging between 281 and 287 feet.

BORE & JACK PIPE AT -L- STATION 286+70

Natural ground elevations typically range from a low of 279 feet in the stream bed, near the outlet of the proposed pipe, to a high of 286 feet near the inlet of the proposed pipe. An existing, 20 foot high embankment rests on 6 to 9 feet of alluvial, soft to stiff, moist to wet, sandy silt (A-4) and sandy clay (A-6). These deposits overlie residual, sandy clay and weathered rock, at an approximate elevation of 275 feet. Groundwater, as determined from borings near the ends of the proposed pipe, is at elevations ranging between 267 and 278 feet.

Respectfully submitted,

Steve P. Brown

Steve P. Brown, LG
Project Engineering Geologist

7/2/99

REVISIONS
10/17/03 COMPLETED R/W DESIGN PARCELS 6, 14 & 15

PROJECT REFERENCE NO.	SHEET NO.
U-4026B	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83 / NC GRID

-L-
Pls Sta 232+89.30
Θs = 5° 37' 30.0"
Ls = 270.00'
LT = 180.09'
ST = 90.08'

Pl Sta 241+99.29
Δ = 61° 37' 18.9" (LT)
D = 4° 10' 00.0"
L = 1,478.93
T = 820.08'
R = 1,375.10'
SE = 0.07 FT/FT
RUNOFF = 270.0 FT

(14) EISAI PHARMATECHNOLOGY, INC
DB 2177 PG 936
MB 135 PG 96

(6) RESEARCH TRIANGLE FOUNDATION
DB 148 PG 331
DB 315 PG 537

RESIDUAL
ALLUVIAL
RESIDUAL
ROADWAY EMBANKMENT
RESIDUAL
ALLUVIAL
RESIDUAL

-L- TS 231+09.21
-L- ST 228+47.93
-L- SC 233+79.21

PROP. MULTI USE TRAIL
SLOPE STAKE LINE
PROPOSED SHLD BERM GUTTER
SHLD. BERM GUTTER
EXISTING R/W
SR 1999 DAVIS DR
N 69° 30' 59.8" E
S 86° 48' 43" W 989.18'
N 19° 05' 02" W 1185.82'

2' LAT. BASE DITCH W/ CLASS "B" RIP RAP
EST. 45 TONS
EST. 127 SY FF
EST. 434 CY DDE
SEE DITCH DETAIL F

INLET CHANNEL
EST. CY DDE
SEE DITCH DETAIL X

2' LAT BASE DITCH W/ CLASS "B" RIP RAP
EST. TONS
EST. SY FF
SEE DITCH DETAIL F

CLASS "B" RIP RAP
EST. 2 TONS
EST. 7 SY FF

LAT. "V" DITCH W/ CLASS "B" RIP RAP
EST. 87 TONS
EST. 262 SY FF
EST. 80 CY DDE
SEE DITCH DETAIL G

OUTLET CHANNEL W/ CLASS "I" RIP RAP
EST. 160 TONS
EST. 325 SY FF
EST. 315 CY DDE
SEE DITCH DETAIL Y

LAT. "V" DITCH W/ CLASS "B" RIP RAP
EST. 80 TONS
EST. 240 SY FF
EST. 25 CY DDE
SEE DITCH DETAIL G

-L-
Pls Sta 226+48.06
Θs = 6° 45' 00.0"
Ls = 300.00'
LT = 200.15'
ST = 100.13'

(6) RESEARCH TRIANGLE FOUNDATION
DB 2754 PG 733
MB 138 PG 157

(6) RESEARCH TRIANGLE FOUNDATION
DB 148 PG 331
DB 315 PG 537

(15) DAVIS DRIVE ASSOCIATES LIMITED PARTNERSHIP
DB 1880 PG 43

LEGEND
PAVED SHOULDER

Plans prepared by:
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE #202
RALEIGH, N.C. 27606
For Division of Highways

$$$$$SYSTIME$$$$$
$$$$$USERNAME$$$$$

7/2/99

REVISIONS
9/23/03 REVISED TDE & PDE ON PARCEL 23
10/17/03 COMPLETED R/W DESIGN PARCELS 6 & 22

PROJECT REFERENCE NO.	SHEET NO.
U-4026B	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83 NC GRID

-MATCHLINE- STA. 298+00.00 SEE SHEET NO. 6

RESEARCH TRIANGLE FOUNDATION DB 980 PG 395

RESEARCH TRIANGLE FOUNDATION DB 345 PG 537

BASF CORPORATION DB 2327 PG 535 MB 138 PG 72

NORTHERN TELECOM, INC DB 2289 PG 349 MB 110 PG 193

BL-131 PINC 304+90.47 -L- STA. 295+71.34 (1,239' RT.)

BL-130 PINC 298+98.61 -L- STA. 289+80.73 (39.674' RT.)

-L- TS 296+37.68

ALLUVIAL

RESIDUAL

ROADWAY EMBANKMENT

SR 1999 DAVIS DR BST

PROP. 2'-6" C&G

PROP. 1'-6" C&G

PROP. MULTIUSE TRAIL

PROP. 6" MONO. CONC. ISLAND

PROP. GUARDRAIL

EXISTING GUARDRAIL

REMOVE EXISTING BRIDGE

SLOPE STAKE LINE F

OUTLET CHANNEL W/ CLASS "I" RIP RAP
EST. 86 TONS
EST. 115 SY FF
EST. 60 CY DDE
SEE DITCH DETAIL BB

TOE PROTECTION W/ CLASS "B" RIPRAP
EST. TONS
EST. SY FF
SEE DITCH DETAIL N

OUTLET CHANNEL W/ CLASS "I" RIP RAP
EST. 60 TONS
EST. 115 SY FF
EST. 65 CY DDE
SEE DITCH DETAIL Z

CLASS "B" RIP RAP
EST. 1 TONS
EST. 5 SY FF

CLASS "B" RIP RAP
EST. 2 TONS
EST. 7 SY FF

CLASS "B" RIP RAP
EST. 2 TONS
EST. 7 SY FF

LAT. 6' BASE DITCH W/ CLASS "B" RIP RAP
EST. TONS
EST. YD FF
SEE DITCH DETAIL F

LAT. 2' BASE DITCH W/ CLASS "I" RIP RAP
EST. TONS
EST. YD FF
SEE DITCH DETAIL F

3' LAT. BASE DITCH W/ CLASS "B" RIP RAP
EST. 92 TONS
EST. 244 SY FF
EST. 103 CY DDE
SEE DITCH DETAIL F

LAT. "V" DITCH
EST. 62 CY DDE
SEE DITCH DETAIL H

SPECIAL LAT. "V" DITCH
EST. CY DDE
SEE DITCH DETAIL D

INLET CHANNEL W/ CLASS "I" RIP RAP
EST. 110 TONS
EST. 104 SY FF
EST. 150 CY DDE
SEE DITCH DETAIL AA

5' X 5' BASE PREFORMED SCOUR HOLE
SEE DETAIL CC

8' X 6' R.C.B.C. W/ TAPERED INLET

6' X 6' CONC. BOX CULVERT

2GI W/ URBAN GRATE

15"CS W/ ELBOW

COLLAR

ENDWALL

-L-
Pls Sta 297+92.48
Θs = 3°22'30.0"
Ls = 225.00'
LT = 150.03'
ST = 75.02'

LEGEND
PAVED SHOULDER

Plans prepared by:
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR. SUITE #202
RALEIGH, N.C. 27606
For Division of Highways

$$$$$$SYSTIME$$$$$$
$$$$$$USERNAME$$$$$$

7/2/99

REVISIONS
9/23/03 REVISED TDE & PDE ON PARCEL 23 10/17/03 COMPLETED R/W DESIGN PARCELS 6, 22, & 24

PROJECT REFERENCE NO.	SHEET NO.
U-4026B	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83 | NC GRID

-MATCHLINE- STA. 298+00.00 SEE SHEET NO. 5

-MATCHLINE- STA. 310+00.00 SEE SHEET NO. 6

-L- SC 298+62.68

-L- CS 306+67.00

-L- ST 308+92.00

BL-133 PINC 315+56.99
-L- STA. 306+42.94
(14.864' RT.)

BL-132 PINC 311+16.67
-L- STA. 301+99.83
(12.233' RT.)

SR 1999 DAVIS DR BST

PROP. 2'-6" C&G

PROP. 1'-6" C&G

PROP. MULTIUSE TRAIL

PROP. 6' MONO. CONC. ISLAND

TOE PROTECTION W/ PERMANENT EROSION CONTROL MATTING EST SY SEE DITCH DETAIL O

TIE TO EXIST C&G

RETAIN

REMOVE

EXISTING R/W

POND

22' BST

24' BST

96' BST

BASF WYANDOTTE CORPORATION
DB 859 PG 624
MB 105 PG 98

BASF CORPORATION
DB 2371 PG 535
DB 2358 PG 72

NORTHERN TELECOM, INC.
DB 2450 PG 794
MB 130 PG 109

NORTHERN TELECOM, INC
DB 2289 PG 349
MB 110 PG 193

RESEARCH TRIANGLE FOUNDATION
DB 229 PG 376
MB 130 PG 109

LEGEND

PAVED SHOULDER

Plans prepared by:
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE #202
RALEIGH, N.C. 27606
For Division of Highways

$$SYSTIME$$
$$USERNAME$$

7/2/99

REVISIONS
10/17/03 COMPLETED R/W DESIGN PARCELS 6, 22, 24, 33 & 34

PROJECT REFERENCE NO.	SHEET NO.
U-4026B	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-MATCHLINE- STA. 17+50.00 -Y13-
SEE SHEET NO. 9

-MATCHLINE- STA. 310+00.00 SEE SHEET NO. 6

-MATCHLINE- STA. 25+00.00 -Y13-
SEE SHEET NO. 9

NAD 83 NC GRID

TRIANGLE SERVICE CENTER, INC.
DB 317 PG 184
PB 83 PG 22
DB 3666 PG 165

ONE PARK DRIVE, LLC
GRAHAM ASSOCIATES
DB 2579 PG 382
PB 141 PG 38

RESEARCH TRIANGLE FOUNDATION
DB 229 PG 376
MB 130 PG 109

NORTHERN TELECOM, INC
DB 2450 PG 794
MB 13 PG 109

BECTON, DICKINSON AND COMPANY
DB 355 PG 138
PB 60 PG 77
DB 374 PG 339
DB 374 PG 341
DB 374 PG 343

-L- PT 320+67.64

END TIP PROJECT U-4026B
-L- STA. 321+07.83

-L- POT 321+53.91

-L- POT 311+23.33

-Y13- POC 20+56.13
SPECIAL DITCH GRADE TO TYPICAL DITCH (SEE PROFILES)

-Y13- PT 21+03.20

-Y13- PC 20+15.50

-L- PC 319+39.92

BL-7 PINC 327+58.61
GPS U-4026-7

BL-134 PINC 319+68.99
BYII-228 PINC 10+09.69

-L- STA. 310+55.76
(38.029' RT.)

N 27° 47' 22.6" E

N 25° 14' 06.7" E

S 59° 36' 00.4" E

S 59° 53' 32.8" E

PROP MULTI USE TRAIL

PROP 5' SIDEWALK

PROP. 6" MONO. CONC. ISLAND

PROP. 2'-6" C&G

FLUSH SLOPES TO DRAIN LINE BACK

SPECIAL LAT "V" DITCH W/CLASS "B" RIP RAP
EST. TONS
EST. SQ. YD FF
SEE DITCH DETAIL C

CLASS "B" RIP RAP
EST. 2 TONS
EST. 7.39 FF

REMOVE PVD DITCH

SIAMESE CONNECTION

STA 5' BASE PREFORMED SCOUR HOLE SEE DETAIL CC

GAS RELEASE VALVE

4.0' WW FENCE

2.0' CURB & GUTTER

30' C&G

48" WD WALL

SR 1999 DAVIS DRIVE 24' BST

SR 1999 DAVIS DRIVE 48' BST

SR 1999 DAVIS DRIVE 30' BST

SR 1999 DAVIS DR BST

40' CONC MEDIAN

30' CONC MEDIAN

WOODS

LEGEND

PAVED SHOULDER

Plans prepared by:
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE #202
RALEIGH, N.C. 27606
For Division of Highways

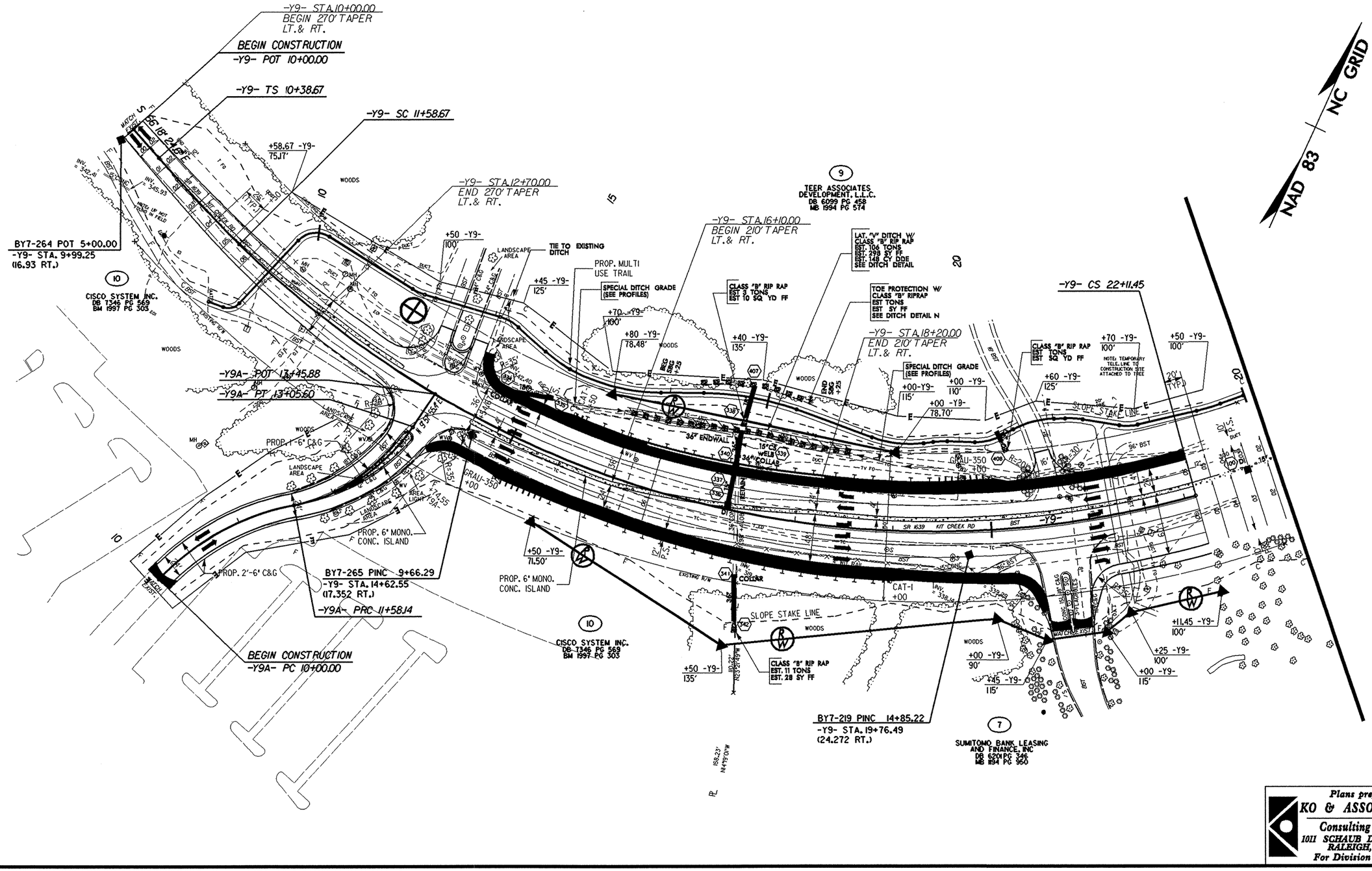
$$$$$$$$USERNAME$$$$$$$$

7/2/99

REVISIONS
10/17/03 COMPLETED R/W DESIGN PARCEL 9 3/18/04 REVISED CE PARCEL NO. 9

PROJECT REFERENCE NO.	SHEET NO.
U-4026B	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



Plans prepared by:
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE #202
RALEIGH, N.C. 27606
For Division of Highways

$$$$SYSTIME$$$$ $$$$SYSDATE$$$$

7/2/99

REVISIONS
10/03/03 REVISED SHEET LAYOUT
10/17/03 COMPLETED R/W DESIGN ON PARCELS 22, 24 & 33

PROJECT REFERENCE NO.	SHEET NO.
U-4026B	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83 NC GRID

SE

TRIANGLE SERVICE CENTER, INC.
DB 317 PG 184
PB 83 PG 22
DB 3666 PG 165

33

BEGIN CONSTRUCTION
POT 11+50.00 -Y13-

POT 10+00.00 -Y13-

NTL CANOPY

ISLS U/CANOPY

IS BLK D BUS

ISFBUS

LANDSCAPE AREA

AREA LIGHT

CLEASE VALVE

OPEN THROAT CB

+30 -Y13- 75'

+50 -Y13- 80'

+45 -Y13- 85'

+85 -Y13- 74.31'

+50 -Y13- 73.68'

PROP. 6' MONO. CONC. ISLAND

SLOPE STAKE LINE

-Y13-

S 59°53'32.8" E

+30 -Y13- 73.64'

PROP MULTIUSE TRAIL

+00 -Y13- 110'

+00 -Y13- 120'

+00 -Y13- 115'

WOODS

24

ASF WYANDOTTE CORPORATION
DB 1159 PG 624
MB 105 PG 98

BASF WYANDOTTE CORPORATION
DB 1159 PG 624
MB 105 PG 98

BYII-272 POT 0+37.94
-Y13- STA. 11+26.32
(47.163' RT.)

BYII-227 PINC 5+00.00
-Y13- STA. 15+88.19
(33.856' RT.)

-MATCHLINE- STA. 17+50.00 -Y13-
SEE SHEET NO. 7

NAD 83 NC GRID

END CONSTRUCTION
POT 26+50.00 -Y13-

SPECIAL LAT "V" DITCH W/CLASS "B" RIP RAP
EST. TONS
EST. SQ YD FF
SEE DITCH DETAIL C

+00 -Y13- 125'

+00 -Y13- 75.29'

+00 -Y13- 75.55'

PROP MULTIUSE TRAIL

ENDWALL

SLOPE STAKE -INV=302.86

REMOVE T FO FES

T FO HAND HOLE

25' BST

30' C&G

48" CONC

96" BST

INV=302.34

PROP. 6' MONO. CONC. ISLAND

BYII-229 POT 15+24.83
Y13 POT 26+11.60
(38.094' RT)

N08°34'27"W
462.57'

22

NORTHERN TELECOM, INC
DB 2450 PG 784
MB 130 PG 109

-MATCHLINE- STA. 25+00.00 -Y13-
SEE SHEET NO. 7

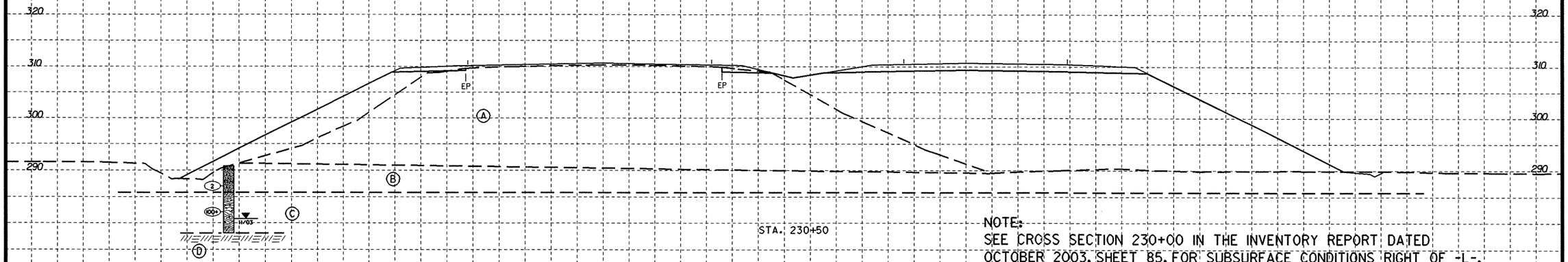
Plans prepared by:
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE #202
RALEIGH, N.C. 27606
For Division of Highways

$$$$$$SYSTIME$$$$$$
$$$$$$

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	10

LEGEND

A: ROADWAY EMBANKMENT
B: ALLUVIAL, BROWN AND GRAY-BROWN, VERY SOFT TO SOFT, MOIST TO WET, SANDY SILT
C: WEATHERED ROCK (CLAYSTONE AND SILTSTONE)
D: NON-CRYSTALLINE ROCK (SILTSTONE)



NOTE:
SEE CROSS SECTION 230+00 IN THE INVENTORY REPORT DATED OCTOBER 2003, SHEET B5, FOR SUBSURFACE CONDITIONS RIGHT OF -L-.

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

-L-

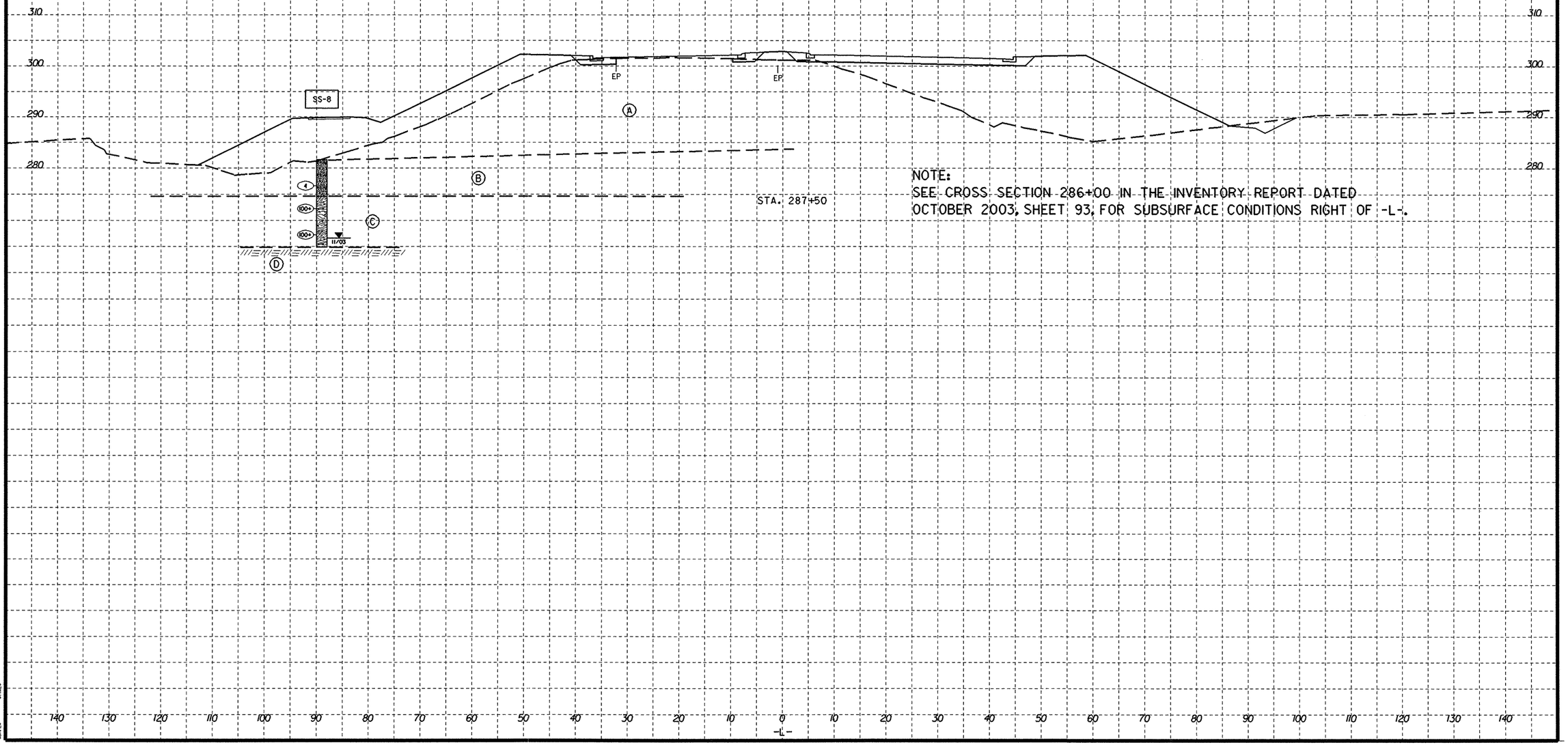
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	11

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-8	89 LT	287+50	4.0-5.5	A-4(2)	22	6	6.4	32.7	40.8	20.1	100	99	68	-	-

LEGEND

A: ROADWAY EMBANKMENT
B: ALLUVIAL, GRAY, SOFT TO MEDIUM STIFF, MOIST TO WET, SANDY SILT
C: WEATHERED ROCK (SILTSTONE)
D: NON-CRYSTALLINE ROCK (SILTSTONE)

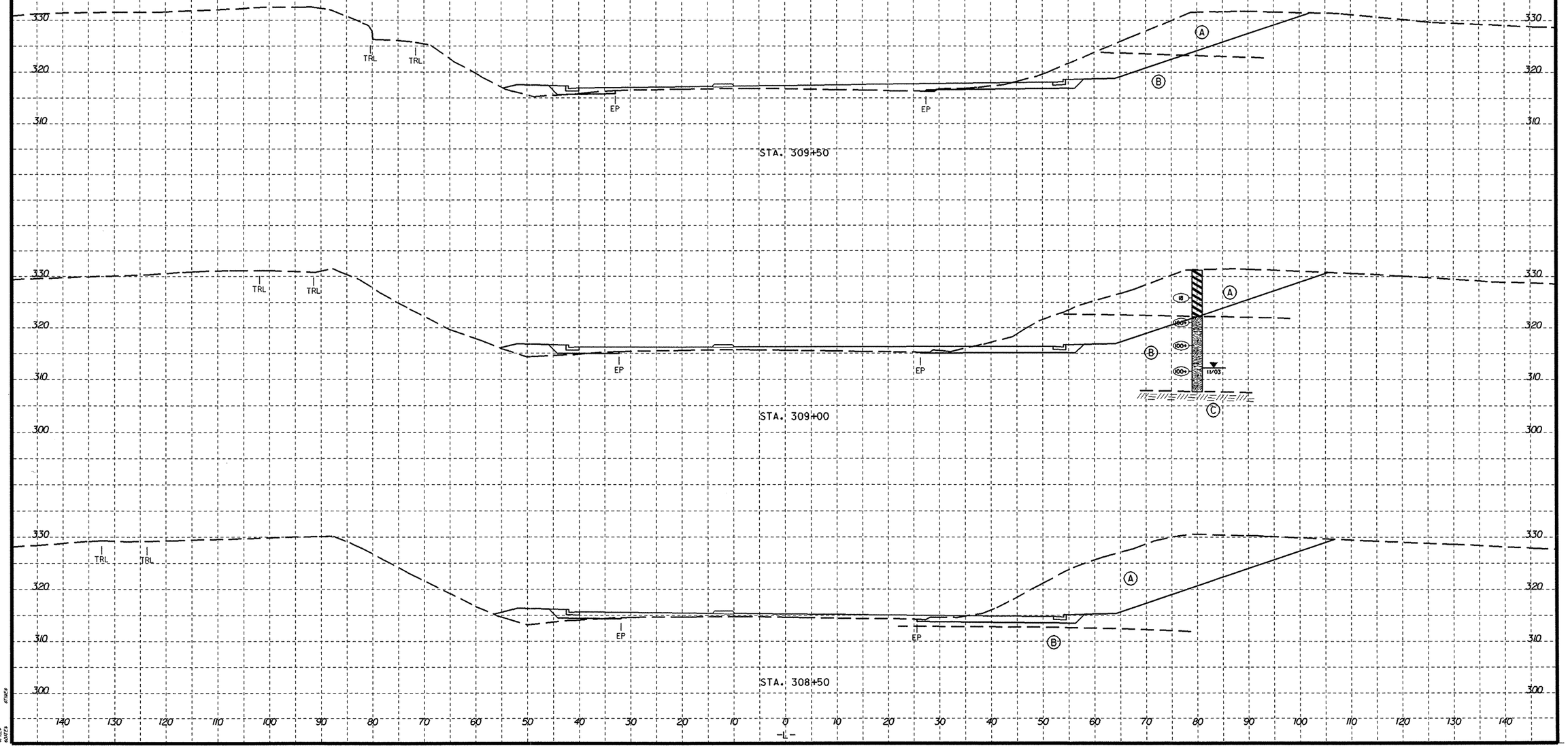


NOTE:
SEE CROSS SECTION 286+00 IN THE INVENTORY REPORT DATED OCTOBER 2003, SHEET 93, FOR SUBSURFACE CONDITIONS RIGHT OF -L-.

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	12

LEGEND

A: RESIDUAL, RED-BROWN, VERY STIFF, MODERATELY PLASTIC, MOIST, SILTY CLAY
B: WEATHERED ROCK (SILTSTONE)
C: NON-CRYSTALLINE ROCK (SILTSTONE)



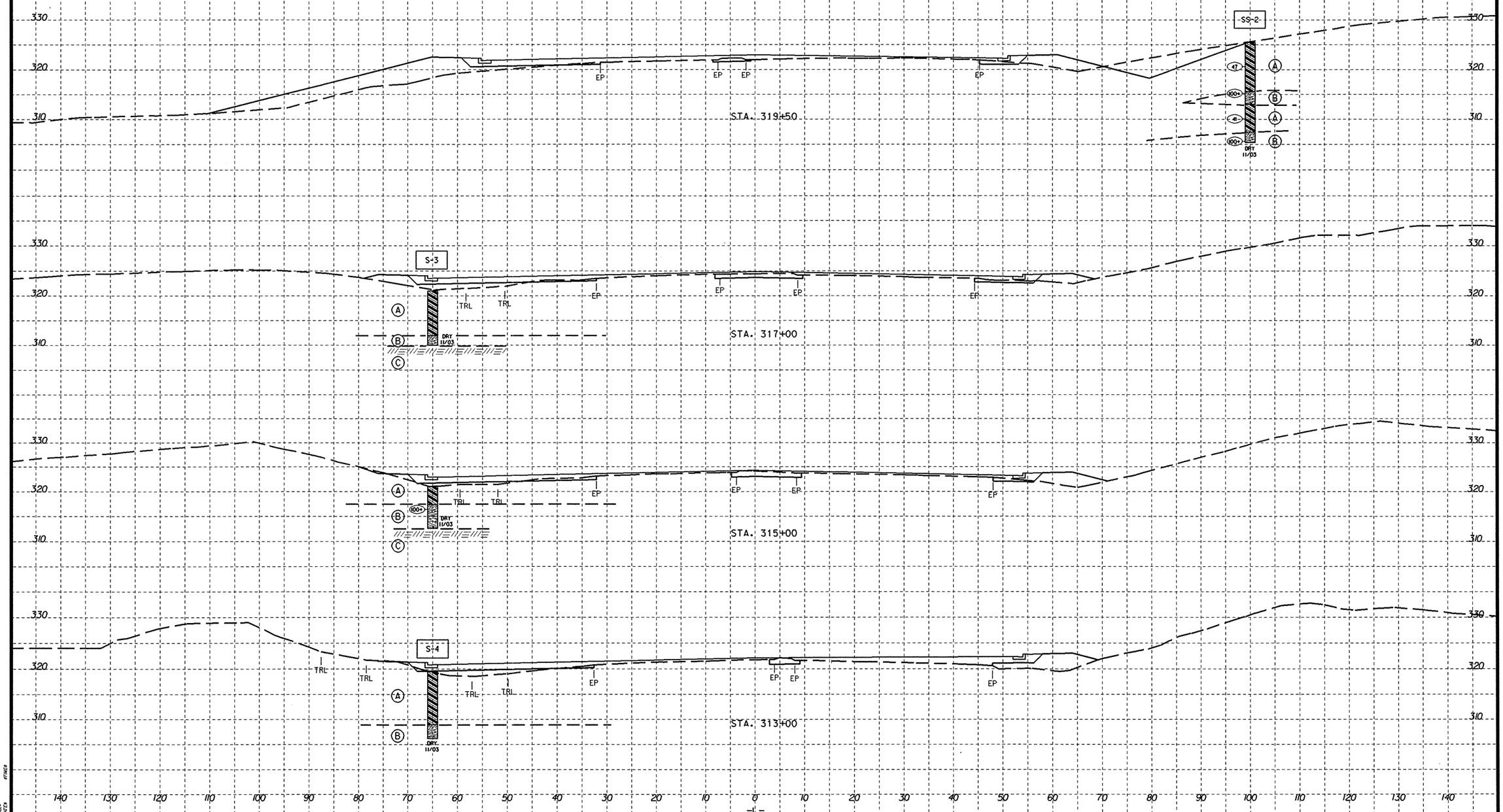
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	13

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-2	100 RT	319+50	3.9-5.4	A-6(16)	40	15	1.4	4.6	61.9	32.1	97	96	93	-	-
S-3	65 LT	317+00	0.0-9.0	A-6(5)	34	13	19.3	15.8	40.8	24.1	81	71	56	-	-
S-4	65 LT	313+00	0.0-10.5	A-6(12)	37	17	3.0	7.6	55.3	34.1	84	83	77	-	-

LEGEND

A: RESIDUAL, RED-BROWN, VERY STIFF TO HARD, SLIGHTLY TO MODERATELY PLASTIC, MOIST, SANDY CLAY
B: WEATHERED ROCK (SILTSTONE)
C: NON-CRYSTALLINE ROCK (SILTSTONE)



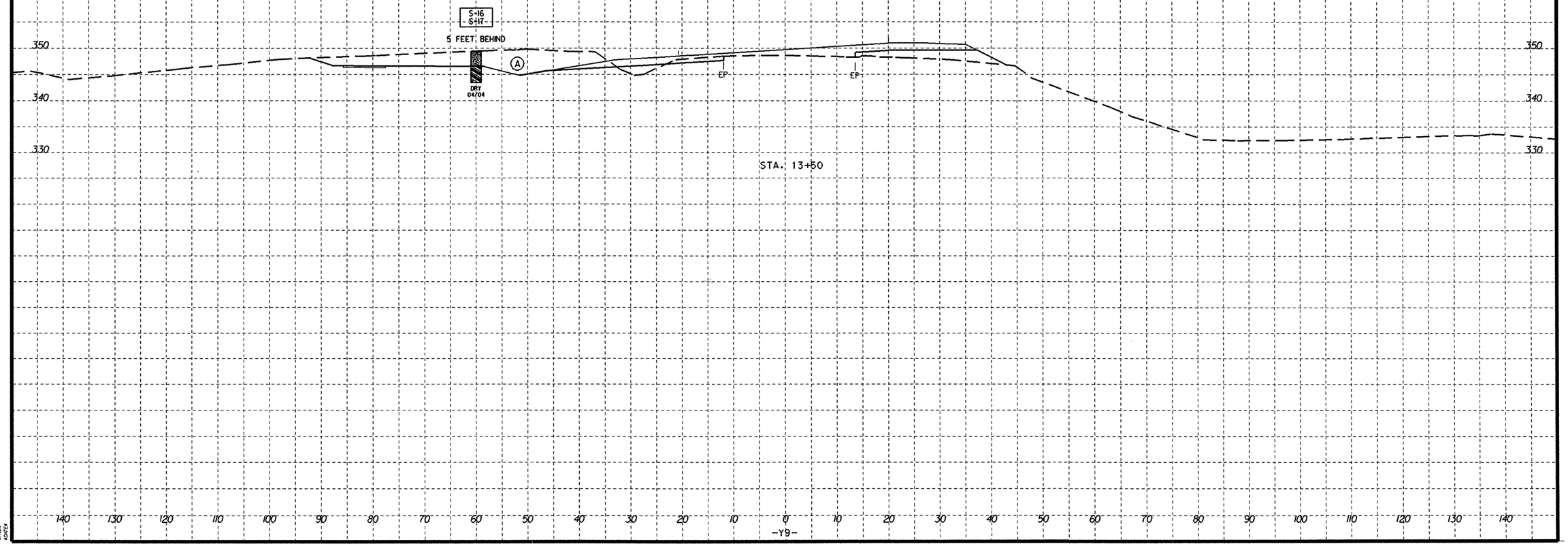
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	14

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-16	60 LT	13+45	1.0-2.5	A-4(6)	29	10	2.4	31.3	37.9	28.4	100	99	75	-	-
S-17	60 LT	13+45	3.0-5.0	A-6(7)	33	12	2.2	32.5	51.1	14.2	88	87	71	-	-

LEGEND

A: RESIDUAL, RED-BROWN, SOFT TO STIFF, DRY, SANDY SILT AND SLIGHTLY PLASTIC, SANDY CLAY



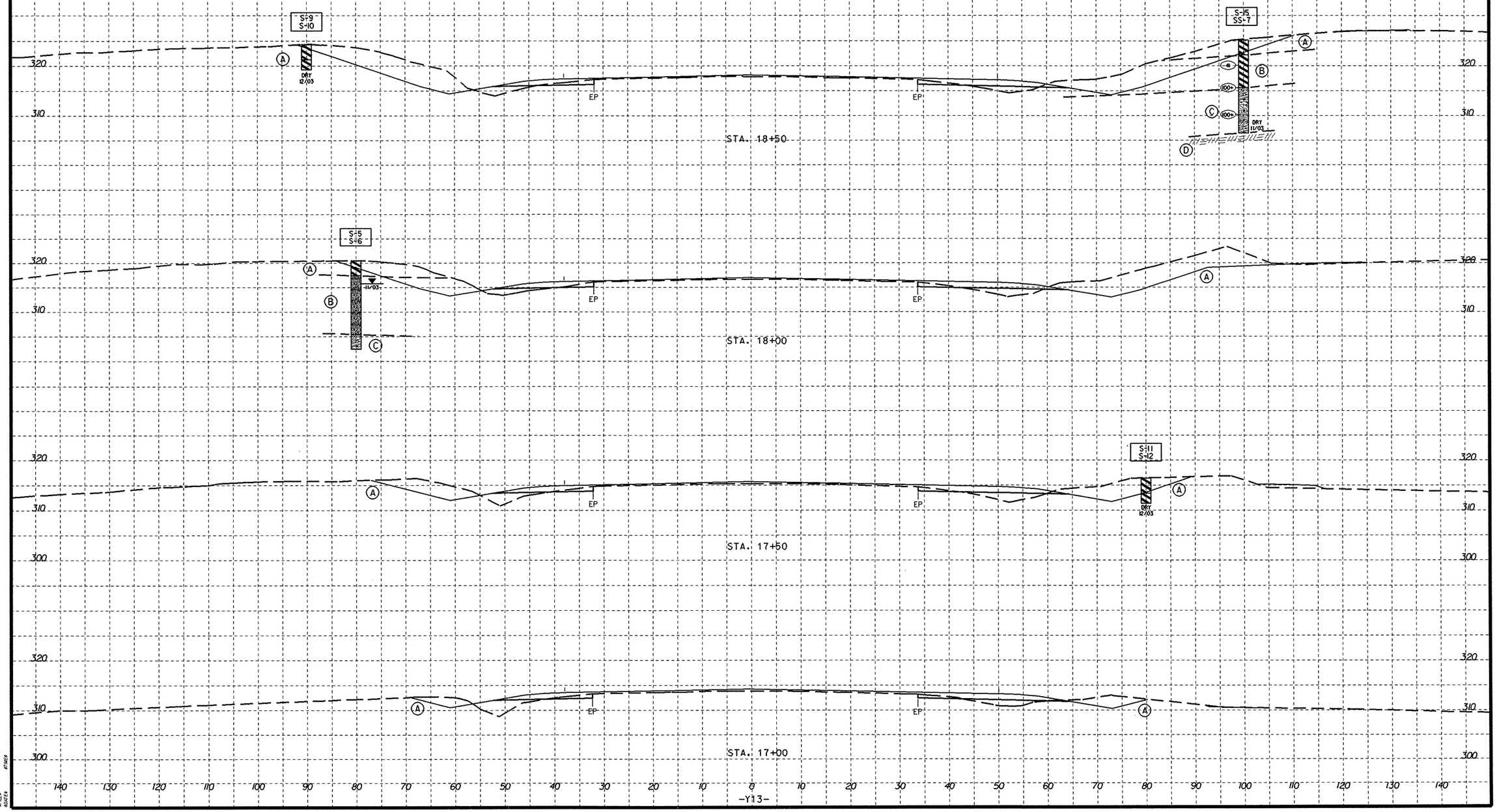
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	15

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-5	80 LT	18+00	0.0-3.0	A-7-6(41)	70	46	3.0	7.0	27.8	62.2	89	87	82	-	-
S-6	80 LT	18+00	3.0-15.0	A-4(0)	26	5	20.3	40.1	25.6	14.0	95	92	44	-	-
SS-7	100 RT	18+50	4.1-5.6	A-7-6(19)	42	20	0.8	14.2	54.9	30.1	100	100	91	-	-
S-9	90 LT	18+50	0.0-3.0	A-7-6(54)	74	51	0.8	9.0	22.4	67.8	100	99	94	-	-
S-10	90 LT	18+50	3.0-5.0	A-7-6(29)	51	32	1.6	6.0	45.2	47.2	91	90	86	-	-
S-11	80 RT	17+50	0.0-3.0	A-7-6(54)	84	63	0.8	8.2	21.1	69.8	86	85	81	-	-
S-12	80 RT	17+50	3.0-5.0	A-7-6(26)	48	28	0.2	19.5	41.3	39.0	100	100	89	-	-
S-15	100 RT	18+50	0.0-3.0	A-7-6(24)	45	32	2.3	25.9	34.9	37.0	100	100	80	-	-

LEGEND

A: RESIDUAL, RED-BROWN AND BROWN, STIFF, HIGHLY PLASTIC, MOIST, SANDY CLAY
B: RESIDUAL, RED-BROWN, VERY STIFF TO HARD, MOIST TO WET, SANDY SILT AND MODERATELY PLASTIC, SILTY CLAY
C: WEATHERED ROCK (SILTSTONE)
D: NON-CRYSTALLINE ROCK (SILTSTONE)

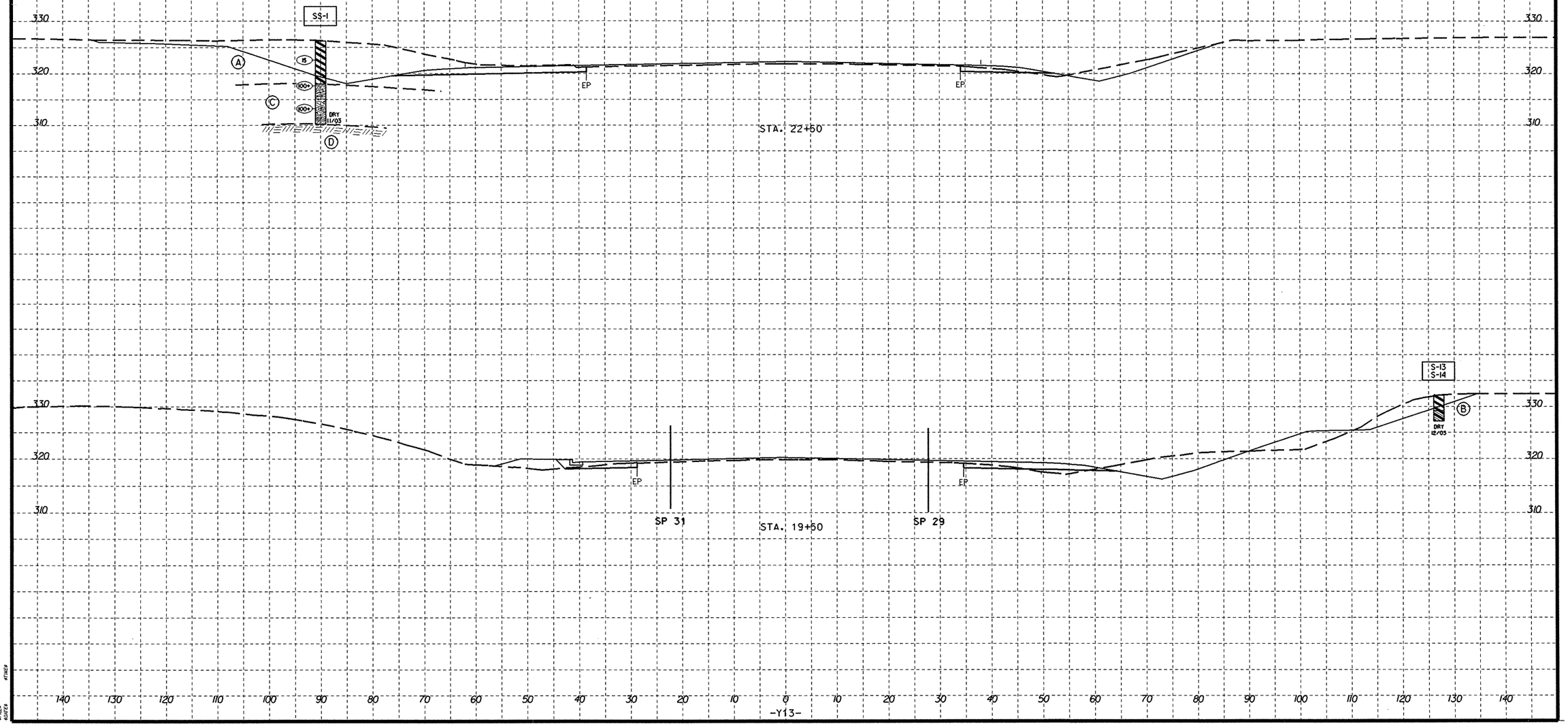


SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-1	90 LT	22+50	2.7-4.2	A-7-6(31)	52	28	0.6	3.8	49.4	46.1	100	100	97	-	-
S-13	127 RT	19+50	0.0-3.0	A-7-6(18)	43	21	4.1	7.6	41.1	47.2	93	92	84	-	-
S-14	127 RT	19+50	3.0-5.0	A-6(13)	40	21	8.8	17.7	38.6	34.9	89	85	69	-	-

LEGEND

A: RESIDUAL, RED-BROWN, VERY STIFF, HIGHLY PLASTIC, MOIST, SILTY CLAY
B: RESIDUAL, RED-BROWN, STIFF, MODERATELY PLASTIC, MOIST, SILTY CLAY AND SANDY CLAY
C: WEATHERED ROCK (CLAYSTONE)
D: NON-CRYSTALLINE ROCK (CLAYSTONE)



CONTRACT: C200840 ID: U-4026B

CONTENTS

LINE	STATION	PLAN	PROFILE	XSECTS
-L-	77+00 – 320+19	4 – 30		31 – 97
-Y9-	14+25 – 34+63	12, 25, 26		98 – 101
-Y12-	10+30 – 40+60	19, 27, 28		102 – 107

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

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

ROADWAY SUBSURFACE INVESTIGATION

STATE PROJ. 35018.3.1 I.D. U-4026B F.A. PROJ. N/A

COUNTY WAKE & DURHAM

PROJECT DESCRIPTION DAVIS DRIVE (SR 1613/1999) FROM NORTH OF KOPPERS ROAD/McCRIMMONS PARKWAY (SR 1635) TO NORTH OF NC 54

INVENTORY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-4026	1	107

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
35018.1.1	-	P.E.
35018.2.1		R/W
35018.3.1		CONST

CAUTION NOTICE

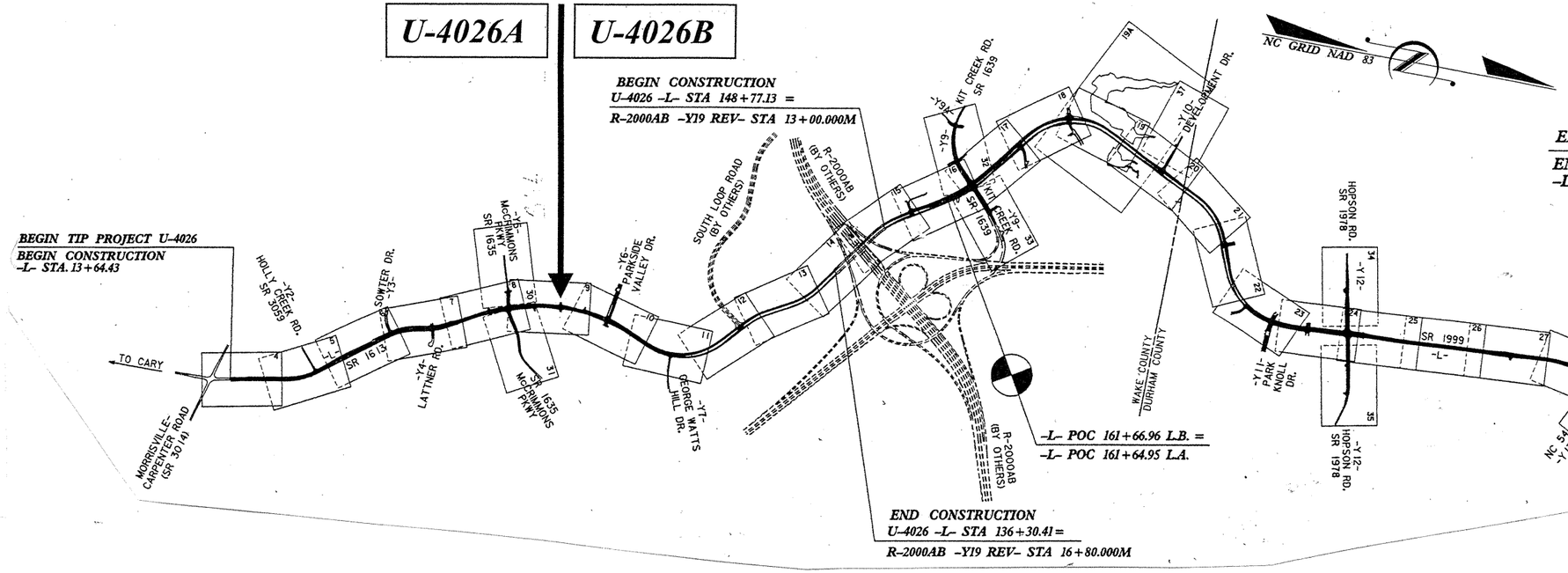
THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WAS MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING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

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

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

U-4026A | U-4026B

BEGIN CONSTRUCTION
U-4026 -L- STA 148+77.13 =
R-2000AB -Y19 REV- STA 13+00.000M



PERSONNEL
E. C. CAMPBELL
A. M. HARRIS
D. W. DIXON
R. D. BRANON
T. N. BENNEKIN
J. T. BAGWELL
M. L. REEDER

INVESTIGATED BY S. P. BROWN
CHECKED BY D. N. ARGENBRIGHT
SUBMITTED BY D. N. ARGENBRIGHT
DATE OCTOBER 2003

NORTH CAROLINA LICENSED GEOLOGIST SEAL 1373 STEVE P. BROWN

10/3/03 Steve P. Brown
SIGNATURE

DRAWN BY: A. N. KARPA

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.

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
U-4026B	9.8051713	2	107

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL 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 WHICH CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND WHICH YIELDS LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM AND 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	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2	A-4, A-5	
CLASS.	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5, A-7-6	A-3	A-6, A-7	
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		N.P.	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

P.I. OF A-7-5 ≤ L.L. - 30 ; P.I. OF A-7-6 > L.L. - 30

CONSISTENCY OR DENSENESS

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

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE	4	10	40	60	200	270
OPENING (MM)	4.76	2.0	0.42	0.25	0.075	0.053

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

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

SOIL MOISTURE - CORRELATION OF TERMS

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

PLASTICITY

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

COLOR

DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YEL-BRN, 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 ARE 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 30
MODERATELY COMPRESSIBLE	LIQUID LIMIT 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 SEEPAGE

MISCELLANEOUS SYMBOLS

- ROADWAY EMBANKMENT WITH SOIL DESCRIPTION
- SOIL SYMBOL
- ARTIFICIAL FILL OTHER THAN ROADWAY EMBANKMENTS
- INFERRED SOIL BOUNDARIES
- 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 - CBR 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
FRAGS. - FRAGMENTS
MED. - MEDIUM
PMT - PRESSUREMETER TEST
SD. - SAND, SANDY
SL. - SILT, SILTY
SLI. - SLIGHTLY
TCR - TRICONE REFUSAL
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT
W - MOISTURE CONTENT
V. - VERY
VST - VANE SHEAR TEST

EQUIPMENT USED ON SUBJECT PROJECT

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

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

HAMMER TYPE:
- [X] AUTOMATIC [ ] MANUAL

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

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

ROCK DESCRIPTION

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

WEATHERED ROCK (WR)	NON-COASTAL PLAIN MATERIAL THAT YIELDS SPT N VALUES > 100 BLOWS PER FOOT.
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 ROCKS EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. *IF TESTED, YIELDS SPT N VALUES > 100 BPF*
VERY SEVERE (V. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, YIELDS SPT N VALUES < 100 BPF*
COMPLETE	ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.

ROCK HARDNESS

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

FRACTURE SPACING

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

BEDDING

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

INDURATION

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

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

TERMS AND DEFINITIONS

ALLUVIUM (ALLUV.) - SOILS WHICH 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 IS IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.

CALCAREOUS (CALC.) - SOILS WHICH 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 (F.P.) - 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 SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

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

SAPROLITE (SAP.) - RESIDUAL SOIL WHICH 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, WHICH HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS

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

STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR B.P.F.) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS LESS THAN 0.1 FOOT PENETRATION WITH 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 (S.R.Q.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY: TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 10 CENTIMETERS DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.

TOPSOIL (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK: _____

ELEVATION: _____

NOTES:

REVISED 09/15/00

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE–DURHAM COUNTIES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U–4026B	2A	107

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
9.8051713		P.E., R/W

LOCATION: DAVIS DRIVE (SR 1613/1999) FROM NORTH OF KOPPERS RD./McCRIMMONS PKWY (SR 1635) TO NORTH OF NC 54

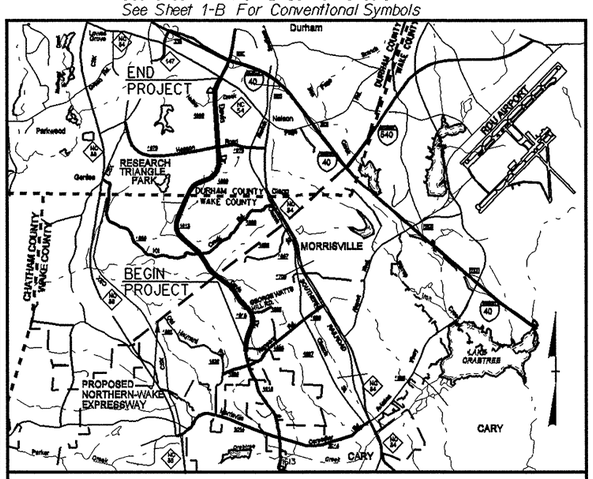
TYPE OF WORK: GRADING, DRAINAGE, PAVING, CULVERTS AND SIGNALS.

NC GRID NAD 83

U–4026B

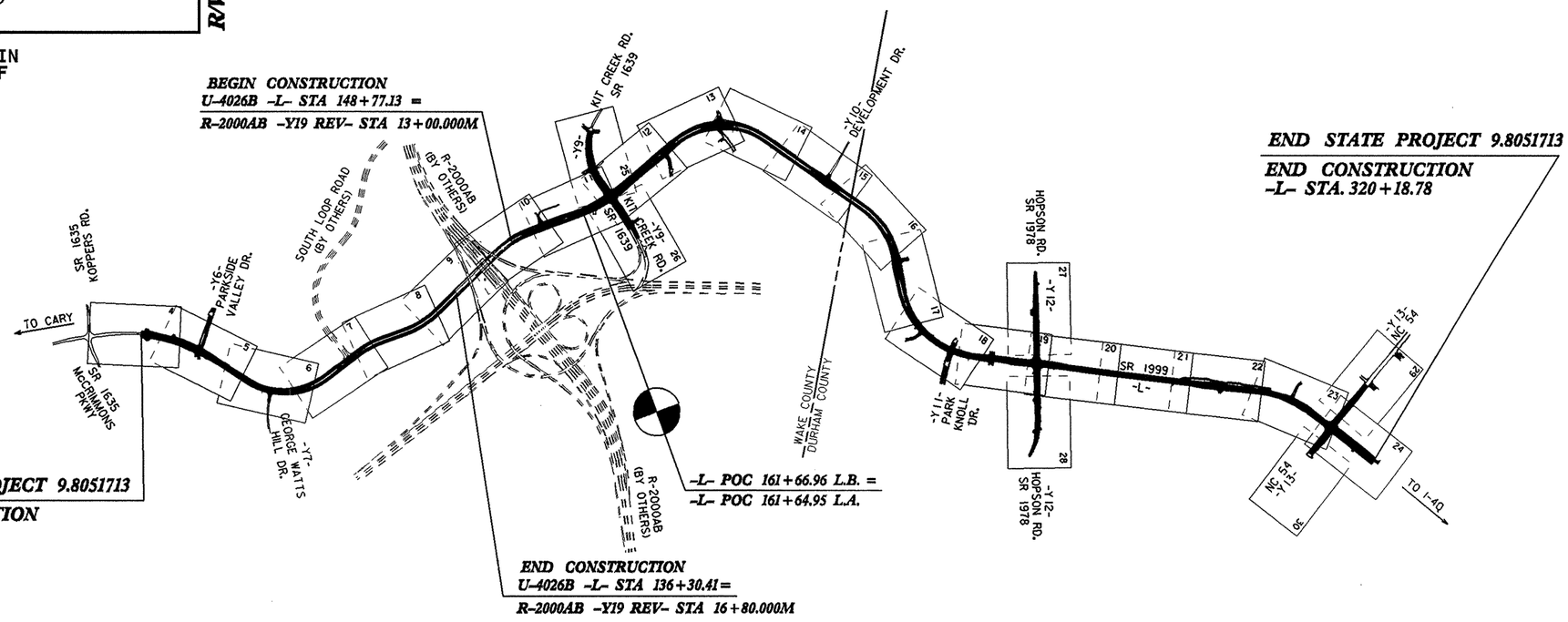
PROJECT: 9.8051713

R/W PLANS



VICINITY MAP

NOTE: THIS PROJECT IS WITHIN THE MUNICIPAL CITY LIMITS OF CARY AND MORRISVILLE



NCDOT CONTACT: TERESA BRUTON, P.E.
DESIGN SERVICES - ENGINEERING COORDINATION

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

PLANS: 50 25 0 50 100
PROFILE (HORIZONTAL): 50 25 0 50 100
PROFILE (VERTICAL): 10 5 0 10 20

DESIGN DATA

ADT (2004) = 24155
ADT (2024) = 45055
DHV = 12 %
D = 65 %
T = 4 % *
V = 55 MPH (SHLD)
= 50 MPH (C&G)
* TTST 1 % DUAL 3 %

PROJECT LENGTH

LENGTH ROADWAY STATE PROJECT 9.8051713 = 4.370 MI.
TOTAL LENGTH OF STATE PROJECT 9.8051713 = 4.370 MI.

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

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: JUNE , 2003

LETTING DATE: JUNE , 2004

Warren F. Lamb, P.E.
PROJECT ENGINEER

Stephen R. Whitley, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER
SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
STATE DESIGN ENGINEER P.E.

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
APPROVED
DIVISION ADMINISTRATOR DATE

25-SEP-2003 13:26
S:\PROJECTS\u4026b\CADD_Geotech\Maps&More\u4026b_geo.tsh
Brown, Al

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

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

LYNDO TIPPETT
SECRETARY

October 3, 2003

STATE PROJECT: 9.8051713 (U-4026B)
FEDERAL PROJECT: N/A
COUNTY: Wake and Durham
DESCRIPTION: Davis Drive (SR 1613/1999) from north of Koppers Road / McCrimmons Parkway (SR 1635) to north of NC 55

SUBJECT: Geotechnical Report - Inventory

PROJECT DESCRIPTION

The project consists of widening with partial horizontal and vertical realignment of -L- (Davis Drive), -Y9- (Kit Creek Road), -Y12- (Hopson Road), and -Y13- (NC 54). Minor reconstruction of four additional Y lines is required to retie them with -L-. Construction will include one new culvert, three culvert extensions, and four bore and jack pipes.

A geotechnical investigation was conducted from February to August 2003, using a CME-45C ATV-mounted drill machine with an automatic hammer. Standard Penetration Tests were performed at selected locations and additional borings were advanced using continuous flight augers. Representative soil samples were collected for visual classification in the field and for laboratory analysis by the Materials and Tests Unit.

The following alignments, totaling 5.3 miles, were investigated.

Line	Station		
-L-	77+00	to	136+30
-L-	148+77	to	311+23
-Y6-	14+00	to	15+01
-Y7-	10+00	to	12+00
-Y9-	14+25	to	34+63
-Y10-	14+00	to	15+31
-Y11-	10+00	to	10+70
-Y12-	10+30	to	40+60

At the time of our investigation, preliminary design drawings were not complete for -L- Stations 311+23 to 320+19 and -Y13- Stations 11+50 to 26+50. These alignments will be investigated and an addendum report prepared after we receive the related design drawings.

AREAS OF SPECIAL GEOTECHNICAL INTEREST

1) Artificial Fill: Three areas of artificial fill were encountered on the project. Listed below are the locations and types of material.

Line	Station			Material
-L-	80+50	to	91+00	Low to Medium PI, Sandy Clay
-L-	167+00	to	169+00	Low to Medium PI, Sandy Clay
-L-	296+00	to	298+00	Low to Medium PI, Sandy Clay

2) Highly Plastic Soils: Clays with plasticity indices equal to or greater than 26 were found in the following areas.

Line	Station		
-L-	77+00	to	81+00
-L-	92+75	to	93+25
-L-	112+75	to	120+75
-L-	121+75	to	127+00
-L-	148+77	to	150+50
-L-	151+25	to	151+75
-L-	153+75	to	154+25
-L-	169+75	to	171+50
-L-	189+75	to	193+25
-L-	194+75	to	198+75
-L-	202+75	to	204+25
-L-	222+75	to	223+25
-L-	261+75	to	269+00
-L-	289+00	to	293+00
-Y9-	17+75	to	18+25
-Y12-	12+00	to	15+75

3) Groundwater: The following sections were found to exhibit a high water table, seasonal high groundwater, or the potential for groundwater related construction problems.

Line	Station		
-L-	77+50	to	82+50
-L-	111+50	to	120+50
-L-	132+50	to	134+50
-L-	150+50	to	151+50
-L-	155+00	to	159+00
-L-	177+00	to	178+00
-L-	186+75	to	194+25
-L-	199+25	to	203+75

Line	Station		
-L-	214+50	to	217+50
-L-	220+75	to	221+25
-L-	223+25	to	223+75
-L-	227+50	to	231+00
-L-	267+00	to	272+25
-L-	293+00	to	294+25
-L-	297+75	to	298+25
-L-	302+75	to	305+25
-Y9-	19+00	to	22+00
-Y9-	23+75	to	25+25

A boring at -Y12- Station 39+00, 57 LT encountered groundwater at a shallow depth of 1.3 feet. Odor from the boring suggested that this high groundwater is related to a residential, septic system drain field.

4) Pond: A pond falls within proposed right of way are at the following location.

Line	Station	Offset
-L-	200+00	RT

5) Degradable Rock: Degradable rock is defined as rock material (including both weathered rock and non-crystalline rock) that exhibits high slaking characteristics when exposed to air and water. Degradable rock occurs as unclassified excavation in the following cut areas.

Line	Station		
-L-	96+75	to	99+75
-L-	109+25	to	112+75
-L-	115+25	to	117+75
-L-	121+25	to	123+75
-L-	129+25	to	129+75
-L-	151+75	to	152+25
-L-	154+25	to	154+75
-L-	155+25	to	157+25
-L-	160+25	to	160+75
-L-	164+25	to	164+75
-L-	189+75	to	193+75
-L-	195+25	to	197+75
-L-	212+75	to	213+25
-L-	223+25	to	225+25
-L-	235+25	to	237+25
-L-	299+75	to	300+25
-Y9-	23+25	to	24+75
-Y12-	14+25	to	15+25
-Y12-	36+25	to	37+25

6) Non-Crystalline Rock: Non-crystalline rock occurs above or within 6 feet below proposed grade at the following locations. Hard rock delineated on this project includes non-crystalline rock (primarily Triassic sandstone, siltstone, and mudstone).

Line	Station		
-L-	129+25	to	129+75
-L-	151+75	to	152+25
-L-	154+25	to	154+75
-L-	160+25	to	162+25
-L-	163+75	to	165+25
-L-	189+75	to	190+25
-L-	190+75	to	193+75
-L-	195+25	to	198+25
-L-	203+75	to	204+25
-L-	210+25	to	210+75
-L-	212+75	to	213+25
-L-	213+75	to	214+25
-L-	221+25	to	222+25
-L-	223+25	to	224+25

7) Wells: One water well was found within proposed right of way at the following location.

Line	Station	Offset
-Y12-	31+00	55 LT

PHYSIOGRAPHY AND GEOLOGY

The project is in gently rolling terrain of the Piedmont Physiographic Province. Surface drainage is generally good. Most of the project is wooded or in commercial land use. Some land along -Y12- (Hopson Road) is rural residential. Triassic age, sedimentary rocks of the Durham Sub-basin underlie the area. They are mostly interbedded sandstone, mudstone, and siltstone. Scattered diabase dikes are present. Most soils are residual, and have been derived by weathering of the underlying rocks sedimentary rocks.

SOIL PROPERTIES

Residual soils are the dominant soils on the project. They are derived from in-place weathering of the underlying Triassic sedimentary rocks. Most of these soils are medium stiff to hard, moist to wet, silty clay (A-7-5, A-7-6), sandy clay (A-6), and sandy silt (A-4). The sandy clays are slightly to moderately plastic. Silty clays are moderately to highly plastic, with the highly plastic material being concentrated near the ground surface. Plasticity typically decreases with depth, grading to moderately to slightly plastic within 3 to 5 feet of the surface. Residual, loose to very dense, moist to wet, silty sands (A-2-4) are also present, but far less common than the clays. They usually occur at depth, below the more clayey soils.

Existing roadway embankment soils are the next most abundant soils on the project. These soils were not investigated in detail, as existing embankments are stable. Where drilled, these soils are soft to stiff, slightly to moderately plastic, moist, sandy clay (A-6).

Alluvial soils are present in the floodplains of the creeks that cross the project. Maximum drilled thickness is 16 feet. These soils are moist to wet, sand (A-1-b), silty sand (A-2-4), sandy silt (A-4), and sandy clay (A-6). The sands are very loose to loose. The silts and clays are very soft to stiff. Plasticity indices for the clays range from 11 to 21.

Artificial fill, in the form of a noise and privacy berm, is present right of -L-, Stations 80+50 to 91+00. The berm consists of soft to stiff, slightly to moderately plastic, moist, sandy clay (A-6). These soils, if adequately compacted, are suitable for roadway construction.

Artificial fill is present right of -L-, Stations 167+00 to 169+00, and 296+00 to 298+00. This material appears to have been stockpiled and/or placed in anticipation of widening of Davis Drive. The soils are soft to medium stiff, slightly to moderately plastic, dry to moist, sandy clay (A-6). If adequately compacted, they are suitable for roadway construction.

ROCK PROPERTIES

Triassic sedimentary rocks underlie the project area. Bedrock consists of interbedded sandstone, siltstone, and mudstone. Jar slake and slake durability tests were completed on representative samples of rock core recovered from the intersecting R-2000AB project. These test results indicate that the Triassic mudstones and siltstones are degradable. Core samples of mudstone and siltstone exhibited significant slaking when exposed to air and water, as well as very low to low durability values. Sandstone, as well as the more indurated siltstone samples, did not slake and had medium to high durability values. However, sandstone and siltstone have been included in this report as "degradable rock" because these rock types are commonly interbedded with degradable mudstone and siltstone layers.

Degradable rock is present in the unclassified excavation as noted above, in "Areas of Special Geotechnical Interest, Degradable Rock". Non-crystalline rock occurs above or within 6 feet below grade as noted above, in "Areas of Special Geotechnical Interest, Non-Crystalline Rock".

GROUNDWATER

The areas noted above, in "Areas of Special Geotechnical Interest, Groundwater", were found to exhibit a high water table, seasonal high groundwater, or the potential for groundwater related construction problems. Groundwater occurred well below grade over the remainder of the project area.

UNDISTURBED SAMPLES

Undisturbed "Shelby" tube samples were taken at the following locations to provide data regarding in situ soil strength.

Sample No.	Location	Depth (ft)	Test
ST-1	-L- 92+00, 56 RT	2.0 - 4.0	Consolidation
ST-2	-L- 194+00, 73 RT	12.0 - 14.0	Compressive Strength
ST-3	-L- 282+00, 40 RT	2.7 - 4.7	Consolidation

BULK SAMPLES

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

Sample No.	Location	Depth (ft)	Test
RT-1	-L- 98+00, 80 RT	2.0 - 10.0	Recompacted Triaxial CU
RT-2	-L- 114+00, 75 RT	0.0 - 6.0	Recompacted Triaxial CU
RT-3	-L- 114+00, 75 RT	7.0 - 14.0	Recompacted Triaxial CU
RT-4	-L- 77+00, 70 RT	0.0 - 3.0	Recompacted Triaxial CU
RT-5	-L- 77+00, 70 RT	3.0 - 7.0	Recompacted Triaxial CU
RT-6	-L- 77+00, 70 RT	7.0 - 15.0	Recompacted Triaxial CU
RT-7	-L- 191+50, 90 RT	3.0 -10.0	Recompacted Triaxial CU
RT-8	-L- 222+00, 73 RT	0.0 - 4.0	Recompacted Triaxial CU
RT-9	-L- 222+00, 73 RT	4.0 - 9.0	Recompacted Triaxial CU
RT-10	-L- 304+00, 50 RT	5.0 - 8.0	Recompacted Triaxial CU
CBR-1	-L- 114+00, 75 RT	15.0 - 19.0	California Bearing Ratio
CBR-2	-L- 77+00, 70 RT	0.0 - 3.0	California Bearing Ratio
CBR-3	-L- 77+00, 70 RT	3.0 - 7.0	California Bearing Ratio
CBR-4	-L- 77+00, 70 RT	7.0 - 15.0	California Bearing Ratio
CBR-5	-L- 191+50, 90 RT	20.0 - 30.0	California Bearing Ratio
CBR-6	-L- 222+00, 73 RT	9.0 - 14.0	California Bearing Ratio
CBR-7	-L- 304+00, 50 RT	10.0 - 13.0	California Bearing Ratio

BORE & JACK PIPE AT -L- STATION 92+40

Natural ground elevations typically range from 321 feet in the stream bed to 325 feet in the floodplain. An existing, 15 foot high embankment rests on floodplain deposits and residual soils. The embankment consists of sandy clay. Borings in the vicinity of the proposed pipe indicate the floodplain deposits are alluvial, sandy silt and slightly plastic, sandy clay. Residual soils are highly plastic, silty clay and slightly to moderately plastic, sandy clay. Groundwater, as determined from borings near the toes of the embankments, is at elevation 314 feet or lower.

BORE & JACK PIPE AT -L- STATION 104+50

Natural ground elevations typically range from 307 feet in the stream bed to 313 feet in the floodplain. An existing, 10 foot high embankment rests on floodplain deposits and residual soils. The embankment consists of sandy clay. Borings in the vicinity of the proposed pipe indicate the floodplain deposits are alluvial, sandy silt. Residual soils are also sandy silt. The top of weathered rock is at approximately elevation 306 feet. Groundwater, as determined from borings near the toes of the embankments, is at elevation 308 feet or lower.

BORE & JACK PIPE AT -L- STATION 108+45

Natural ground elevations typically range from a low of 304 feet in the stream bed, near the outlet of the proposed pipe, to a high of 314 feet near the inlet of the proposed pipe. The floodplain near the pipe's outlet has an elevation of 308 feet. An existing, 8 foot high embankment rests on floodplain deposits and residual soils. The embankment consists of sandy clay. Borings in the vicinity of the proposed pipe indicate the floodplain deposits are alluvial, silty sand and sandy silt. Residual soils are slightly to moderately plastic, sandy clay. Groundwater, as determined from borings near the toes of the embankments, is at elevations ranging between 304 and 307 feet.

CULVERT AT -L- STATION 133+25

Natural ground elevations typically range from 284 feet in the stream bed to 290 feet in the floodplain. An existing, 13 foot high embankment rests on floodplain deposits and residual soils. The embankment consists of sandy clay. Borings in the vicinity of the proposed culvert indicate the floodplain deposits are alluvial, sand, silty sand, and sandy silt. Residual soils are slightly plastic, sandy clay. Groundwater was measured in the borings at elevations ranging between 283 to 288 feet.

BORE & JACK PIPE AT -L- STATION 178+50

Natural ground elevations typically range from 278 feet in the stream bed to 282 feet in the floodplain. An existing, 20 foot high embankment rests on floodplain deposits and residual soils. The embankment consists of moderately plastic, sandy clay. Borings in the vicinity of the proposed pipe indicate the floodplain deposits are alluvial, silty sand. Residual soils are sandy silt and moderately plastic, silty clay. A boring near the outlet of the proposed pipe encountered weathered rock at elevation 276 feet. Borings indicate groundwater is at elevation 280 feet or lower.

CULVERT EXTENSION FOR EXISTING CULVERT AT -L- STATION 200+00

The inlet for the existing culvert at -L- Station 200+00 is located in a pond whose surface water elevation is approximately 276 feet. Elevation of the bottom of the pond, within the construction area, varies between 267 and 272 feet. Up to 3 feet of alluvial, soft, moderately plastic, sandy clay rests directly on non-crystalline rock. Elevation of the rock surface varies between 267 and 269 feet. These elevations place rock above the proposed culvert's floor elevation at some locations.

CULVERT EXTENSIONS FOR EXISTING CULVERT AT -L- STATION 293+80

Culvert extensions are proposed for both ends of the existing culvert at -L- Station 293+80. Natural ground elevations typically range from 275 feet in the stream bed to 281 feet in the floodplain. An existing, 15 foot high embankment rests on floodplain deposits. The embankment consists of sandy clay. Borings in the vicinity of the proposed culvert extensions indicate the floodplain deposits are alluvial, sandy silt. Residual sandy silt and weathered rock underlie the alluvial soils. Elevation of the top of weathered rock varies between 270 and 274 feet. Borings in the floodplain indicate groundwater elevations of 276 to 277 feet.

Respectfully submitted,

Steve P. Brown

Steve P. Brown, LG
Project Engineering Geologist

3D

Volumes in Cubic **YARDS**

PROJECT **U-4026** COUNTY **WAKE/DURHAM** DATE **5/1/2006** COMPILIED BY: **DCW** CHECKED BY: **SRW** SHEET OF 4

STATION	STATION	EXCAVATION					EMBANKMENT				BORROW	WASTE			
		TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUIT. UNCLASS.	SUITABLE UNCLASS.	TOTAL	ROCK	EARTH	EMBANK. (+) 20 %		ROCK	SUITABLE	UNSUIT.	TOTAL
SUMMARY NO. 1 (LEFT)															
-L- LT 13+64.43	40+00.00	4047		985		4047	1936		1936	2323			1724	985	2709
-Y2- 14+00.00	14+50.00	17				17	5		5	6			11		11
TOTAL SUMMARY NO. 1 (LEFT)		4064		985		4064	1941		1941	2329			1735	985	2720
SUMMARY NO. 2 (LEFT)															
-L- LT 40+00.00	68+50.00	2899				2899	1453		1453	1744			1155		1155
-Y3- 13+00.00	14+50.00	121				121	17		17	20			101		101
-Y5- 19+35.00	24+00.00	742		1324	551	191	1865		1865	2238	2047			1875	1875
TOTAL SUMMARY NO. 2 (LEFT)		3762		1324	551	3211	3335		3335	4002	2047		1256	1875	3131
SUMMARY NO. 3 (LEFT)															
-L- LT 68+50.00	90+00.00	1539		1824	495	1044	5821		5821	6985	5941			2319	2319
TOTAL SUMMARY NO. 3 (LEFT)		1539		1824	495	1044	5821		5821	6985	5941			2319	2319
SUMMARY NO. 4 (LEFT)															
-L- LT 90+00.00	120+00.00	492				492	92		92	110			382		382
TOTAL SUMMARY NO. 4 (LEFT)		492				492	92		92	110			382		382
SUMMARY NO. 5 (LEFT)															
-L- LT 120+00.00	136+30.41	327				327	331		331	397	70				
TOTAL SUMMARY NO. 5 (LEFT)		327				327	331		331	397	70				
SUMMARY NO. 6 (LEFT)															
-L- LT 148+77.13	161+66.96	566				566	233		233	280			286		286
TOTAL SUMMARY NO. 6 (LEFT)		566				566	233		233	280			286		286
SUMMARY NO. 7 (LEFT)															
-L- LT 161+64.95	167+00.00	17				17	235		235	282	265				
-Y9- 10+00.00	25+00.00	5879			129	5750	11501		11501	13801	8051			129	129
-Y9A- 10+00.00	13+00.00	14				14	2545		2545	3054	3040				
TOTAL SUMMARY NO. 7 (LEFT)		5910			129	5781	14281		14281	17137	11356			129	129
SUMMARY NO. 8 (LEFT)															
-L- LT 167+00.00	198+00.00	4036				4036	216		216	259			3777		3777
TOTAL SUMMARY NO. 8 (LEFT)		4036				4036	216		216	259			3777		3777
SUMMARY NO. 9 (LEFT)															
-L- LT 198+00.00	229+00.00	15857	26		64	15767	178		178	214		26	15553	64	15643
-Y10- 8+00.00	14+50.00	1226				1226	145		145	174			1052		1052
TOTAL SUMMARY NO. 9 (LEFT)		17083	26		64	16993	323		323	388		26	16605	64	16695
SUMMARY NO. 10 (LEFT)															
-L- LT 229+00.00	260+50.00	7401				7401	2426		2426	2911			4490		4490
-Y12- 10+00.00	24+50.00	3641			113	3528	2354		2354	2825			703	113	816
TOTAL SUMMARY NO. 10 (LEFT)		11042			113	10929	4780		4780	5736			5193	113	5306
SUMMARY NO. 11 (LEFT)															
-L- LT 260+50.00	290+00.00	765				765	4386		4386	5263	4498				
TOTAL SUMMARY NO. 11 (LEFT)		765				765	4386		4386	5263	4498				
SUMMARY NO. 12 (LEFT)															

3E

Volumes in Cubic **YARDS**

PROJECT **U-4026** COUNTY **WAKE/DURHAM** DATE **5/1/2006** COMPILIED BY: **DCW** CHECKED BY: **SRW** SHEET OF 4

STATION	STATION	EXCAVATION					EMBANKMENT				BORROW	WASTE			
		TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUIT. UNCLASS.	SUITABLE UNCLASS.	TOTAL	ROCK	EARTH	EMBANK. (+) 20 %		ROCK	SUITABLE	UNSUIT.	TOTAL
-L- LT 290+00.00	311+23.33	371				371	3179		3179	3815	3444				
-Y13- 11+50.00	19+50.00	1920			511	1409	1938		1938	2326	917			511	511
TOTAL SUMMARY NO. 12 (LEFT)		2291			511	1780	5117		5117	6140	4360			511	511
SUMMARY NO. 13 (LEFT)															
-L- LT 311+23.33	321+07.83	217				217	1960		1960	2352	2135				
TOTAL SUMMARY NO. 13 (LEFT)		217				217	1960		1960	2352	2135				
SUB-TOTAL LEFT (SUMMARY 1 THRU 13)		52094	26	4133	1863	50205	42816		42816	51379	30408	26	29234	5996	35256

Volumes in Cubic **YARDS**

PROJECT **U-4026** COUNTY **WAKE/DURHAM** DATE **5/1/2006** COMPILIED BY: **DCW** CHECKED BY: **SRW** SHEET OF 4

3F

STATION	STATION	EXCAVATION					EMBANKMENT				BORROW	WASTE			
		TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUIT. UNCLASS.	SUITABLE UNCLASS.	TOTAL	ROCK	EARTH	EMBANK. (+) 20 %		ROCK	SUITABLE	UNSUIT.	TOTAL
SUMMARY NO. 1 (RIGHT)															
-L- RT 13+64.43	40+00.00	2135		1323	1317	818	10318		10318	12382	11564			2640	2640
TOTAL SUMMARY NO. 1 (RIGHT)		2135		1323	1317	818	10318		10318	12382	11564			2640	2640
SUMMARY NO. 2 (RIGHT)															
-L- RT 40+00.00	68+50.00	4704		2945	2062	2642	8663		8663	10396	7754			5007	5007
-Y4- 11+00.00	12+00.00	40				40	54		54	65	25				
-Y5- 26+00.00	36+65.00	1197		1358	955	242	4777		4777	5732	5490			2313	2313
TOTAL SUMMARY NO. 2 (RIGHT)		5941		4303	3017	2924	13494		13494	16193	13269			7320	7320
SUMMARY NO. 3 (RIGHT)															
-L- RT 68+50.00	90+00.00	14093		194	582	13511	862		862	1034			12477	776	13253
TOTAL SUMMARY NO. 3 (RIGHT)		14093		194	582	13511	862		862	1034			12477	776	13253
SUMMARY NO. 4 (RIGHT)															
-L- RT 90+00.00	120+00.00	58373		29	9531	48842	19245		19245	23094			25748	9560	35308
-Y7- 10+50.00	12+00.00	103				103	76		76	91			12		12
TOTAL SUMMARY NO. 4 (RIGHT)		58476		29	9531	48945	19321		19321	23185			25760	9560	35320
SUMMARY NO. 5 (RIGHT)															
-L- RT 120+00.00	136+30.41	49630		175	3951	45679	5836		5836	7003			38676	4126	42802
TOTAL SUMMARY NO. 5 (RIGHT)		49630		175	3951	45679	5836		5836	7003			38676	4126	42802
SUMMARY NO. 6 (RIGHT)															
-L- RT 148+77.13	161+66.96	10424	17	118	1221	9186	7624		7624	9149		17	37	1339	1393
TOTAL SUMMARY NO. 6 (RIGHT)		10424	17	118	1221	9186	7624		7624	9149		17	37	1339	1393
SUMMARY NO. 7 (RIGHT)															
-L- RT 161+64.95	167+00.00	1561			86	1475	1481		1481	1777	302			86	86
-Y9- 27+00.00	34+63.35	176				176	4348		4348	5218	5042				
TOTAL SUMMARY NO. 7 (RIGHT)		1737			86	1651	5829		5829	6995	5344			86	86
SUMMARY NO. 8 (RIGHT)															
-L- RT 167+00.00	198+00.00	64067	6742	186	9494	47831	27558		27558	33070		6742	14761	9680	31183
TOTAL SUMMARY NO. 8 (RIGHT)		64067	6742	186	9494	47831	27558		27558	33070		6742	14761	9680	31183
SUMMARY NO. 9 (RIGHT)															
-L- RT 198+00.00	229+00.00	24631		438	1484	23147	22885		22885	27462	4315			1922	1922
TOTAL SUMMARY NO. 9 (RIGHT)		24631		438	1484	23147	22885		22885	27462	4315			1922	1922

Volumes in Cubic **YARDS**

PROJECT **U-4026** COUNTY **WAKE/DURHAM** DATE **5/1/2006** COMPILIED BY: **DCW** CHECKED BY: **SRW** SHEET OF 4

STATION	STATION	EXCAVATION					EMBANKMENT				BORROW	WASTE			
		TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUIT. UNCLASS.	SUITABLE UNCLASS.	TOTAL	ROCK	EARTH	EMBANK. (+) 20 %		ROCK	SUITABLE	UNSUIT.	TOTAL
SUMMARY NO. 10 (RIGHT)															
-L- RT 229+00.00	260+50.00	17074			1011	16063	17388		17388	20866	4803			1011	1011
-Y12- 26+00.00	40+60.00	2656			50	2606	2468		2468	2962	356			50	50
TOTAL SUMMARY NO. 10 (RIGHT)		19730			1061	18669	19856		19856	23827	5158			1061	1061
SUMMARY NO. 11 (RIGHT)															
-L- RT 260+50.00	290+00.00	518				518	27411		27411	32893	32375				
TOTAL SUMMARY NO. 11 (RIGHT)		518				518	27411		27411	32893	32375				
SUMMARY NO. 12 (RIGHT)															
-L- RT 290+00.00	311+23.33	18874			525	18349	9473		9473	11368			6981	525	7506
-Y13- 21+50.00	26+50.00	2026				2026	1395		1395	1674			352		352
TOTAL SUMMARY NO. 12 (RIGHT)		20900			525	20375	10868		10868	13042			7333	525	7858
SUMMARY NO. 13 (RIGHT)															
-L- RT 311+23.33	321+07.83	766				766	999		999	1199	433				
TOTAL SUMMARY NO. 13 (RIGHT)		766				766	999		999	1199	433				
SUB-TOTAL RIGHT (SUMMARY 1 THRU 13)		273048	6759	6766	32269	234020	172861		172861	207433	72457	6759	99044	39035	144838
SUB-TOTAL LEFT (SUMMARY 1 THRU 13)		52094	26	4133	1863	50205	42816		42816	51379	30408	26	29234	5996	35256
SUB-TOTAL RIGHT (SUMMARY 1 THRU 13)		273048	6759	6766	32269	234020	172861		172861	207433	72457	6759	99044	39035	144838
ADDITIONAL UNDERCUT				1450			1450		1450	1740	1740			1450	1450
EST. LOSS DUE TO CLEAR. & GRUB.		-9350				-9350							-9350		-9350
SUB-TOTAL		315792	6785	12349	34132	274875	217127		217127	260552	104606	6785	118928	46481	172194
WASTE IN LIEU OF BORROW											-104606		-104606		-104606
GRAND TOTALS		315792	6785	12349	34132	274875	217127		217127	260552		6785	14323	46481	67589
SAY		315800		12400											

PAVEMENT STRUCTURE VOLUME 46,750 CY
DDE 10,600 CY

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-4026B	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L-

Pls Sta 70+60.27
Θs = 2°00'00.0"
Ls = 200.00'
LT = 133.34'
ST = 66.67'

Pl Sta 80+83.70
Δ = 36°56'10.4" (RT)
D = 2°00'00.0"
L = 1,846.81'
T = 956.77'
R = 2,864.79'
SE = 0.04 FT/FT
RUNOFF = 200.0 FT

Pls Sta 90+40.41
Θs = 2°00'00.0"
Ls = 200.00'
LT = 133.34'
ST = 66.67'

NAD 83 / NC GRID

FOR ROADWAY PLANS SEE PROJECT U-4026A

BEGIN STATE PROJECT U-4026B
-L- STA. 77+00.00 (U-4026A) LB=
-L- STA 77+00.00 (U-4026B) LA

75

80

BETTY F. HAMILTON
DB 1850 PG 619

-L- STA.80+42.69
END 200' TAPER
RT.TURN LANE,SB

-L- STA.78+42.69
BEGIN 200' TAPER
RT.TURN LANE,SB

BL-III PINC 84+10.92
-L- STA. 75+44.79
(22.659' LT.)

BL-9 PINC 90+09.94
NCGS MAXI
-L- STA. 81+43.04
(17.870' RT.)

CLASS "B" RIP RAP
EST 1 TONS
EST 5 SQ. YD FF

"M" TAIL DITCH
EST 1 CY DIE
SEE DITCH DETAIL

+26.93 -L-
95'

+00 -L-
95'

+40 -L-
95'

+40 -L-
110'

+40 -L-
110'

+40 -L-
95'

+95 -L-
110'

+95 -L-
95'

SLOPE STAKE LINE

FUTURE 6' MONO. CONC. ISLAND

PROP. GUARDRAIL

GRAU-350

ROADWAY EMBANKMENT

RESIDUAL

ARTIFICIAL FILL

SLOPE STAKE LINE

FUTURE 6' MONO. CONC. ISLAND

FUTURE 6' MONO. CONC. ISLAND

+48 -L-
92.90'

+75 -L-
120'

+92 -L-
90.65'

+50 -L-
120'

+00 -L-
87.43'

+50 -L-
105'

SPECIAL DITCH GRADE
(SEE PROFILES)

SPECIAL DITCH GRADE
(SEE PROFILES)

EXISTING R/W

BETTY F. HAMILTON
DB 1850 PG 619

MORRISVILLE CITY LIMIT
CARY CITY LIMIT

807.80'
N03°21'05"W

221.79'
S02°23'57"W

3

-L- SC 71+26.93

PAUL J. CARTRETTE &
PATTIE H. CARTRETTE
DB 4083 PG 359
MB 1972 PG 174

JOHN D. NUTT
DB 2074 PG 196

-L- STA.77+52.81
END 200' TAPER
RT.TURN LANE,NB

-L- STA.81+75.00
BEGIN 200' TAPER
LT.TURN LANE,SB

-MATCHLINE- STA. 82+00.00 SEE SHEET NO. 5

24" CMP

BST

WALL

24" CMP

CARY CITY LIMIT
MORRISVILLE CITY LIMIT

RTP/PARKSIDE, L.L.C.
DB 8238 PG 900
MB 1999 PG 150

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "R2000-26"
WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 765141.40 (ift) EASTING: 2040233.344(ift)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99991540
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "R2000-26" TO -L- STATION 77+00.00 IS
S 23°33'51.2"E : 6,140.72'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NGVD 29

Plans prepared by:
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE #202
RALEIGH, N.C. 27606
For Division of Highways

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-4026B	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L-
PIs Sta 70+60.27
θs = 2° 00' 00.0"
Ls = 200.00'
LT = 133.34'
ST = 66.67'

PI Sta 80+83.70
Δ = 36° 56' 10.4" (RT)
D = 2° 00' 00.0"
L = 1,846.81
T = 956.77'
R = 2,864.79'
SE = 0.04 FT/FT
RUNOFF = 200.0 FT

PIs Sta 90+40.41
θs = 2° 00' 00.0"
Ls = 200.00'
LT = 133.34'
ST = 66.67'

BETTY F. HAMILTON
DB 1850 PG 619

PARKSIDE DEVELOPMENT, L.L.P.
DB 8307 PG 1310
MB 1997 PG 1728

PULTE HOME CORPORATION
DB 8582 PG 1
MB 1999 PG 1953

PULTE HOME CORPORATION
DB 8582 PG 1
MB 1999 PG 1953

PULTE HOME CORPORATION
DB 8582 PG 1
MB 1999 PG 1953

PULTE HOME CORPORATION
DB 8582 PG 1
MB 1999 PG 1953

PUBLIC SERVICE COMPANY
DB 1224 PG 598

MORRISVILLE CITY LIMIT
RTP LIMIT

BEGIN CONSTRUCTION
-Y6- POT 14+00.00

-L- S 80° 37' 41.4" E

-L- STA. 83+75.00
END 200' TAPER
LT TURN LANE, SB

-L- STA. 88+48.95
BEGIN 200' TAPER
RT TURN LANE, SB
LT TURN LANE, SB

-L- STA. 90+48.95
END 200' TAPER
RT TURN LANE, SB
LT TURN LANE, SB

BL-112 PINC 95+20.48
BY5-216 POT 10+52.42
-L- STA. 86+56.04
(4.044' RT.)

BL-3 PINC 98+51.63
GPS U-4026-3
-L- STA. 89+79.65
(53.048' LT.)

-Y6- 60.26' 55.64'

-Y6- 69.24' 38.93'

+75 -L- 100'

+73.74 -L- 90'

+00 -L- 95'

+73.74 -L- 105'

+75 -L- 110'

+75 -L- 95'

+75 -L- 100'

+50 -L- 100'

+00 -L- 82.86'

+75 -L- 84.75'

+50 -L- 95'

+75 -L- 105'

+50 -L- 100'

+40 -L- 74.98'

+75 -L- 90'

+73.74 -L- 85'

+10 -L- 155'

+73.74 -L- 125'

+50 -L- 100'

+73.74 -L- 105'

+50 -L- 100'

PROP. 6" MONO. CONC. ISLAND

PROP. GUARDRAIL

SPECIAL DITCH GRADE (SEE PROFILES)

ENDWALL

REMOVE

MATCH

ROADWAY EMBANKMENT

RESIDUAL

ARTIFICIAL FILL SLOPE STAKE LINE

ARTIFICIAL FILL

RETAIN

RIP RAP

SHLD. BERM GUTTER

PROP. 1'-6" C&G

LAT. "V" DITCH W/ CLASS "B" RIP RAP
EST. 78.2 TONS
EST. 220 SY FF
EST. 36 CY DDE
SEE DITCH DETAIL

TIE EXISTING TO LATERAL

2' LAT. BASE DITCH W/ CLASS "B" RIP RAP
EST. 192 TONS
EST. 828 SY FF
EST. 826 CY DDE
SEE DITCH DETAIL

5' LAT. BASE DITCH W/ CLASS "B" RIP RAP
EST. 55 TONS
EST. 142 SY FF
EST. 131 CY DDE
SEE DITCH DETAIL

-L- STA. 90+50.00
END 210' TAPER
BUS LANE, NB

-L- ST 91+73.74

-L- STA. 88+40.00
BEGIN 210' TAPER
BUS LANE, NB

-L- POC 87+03.10 =
-Y6- POT 15+01.12

-L- STA. 85+48.58
END 200' TAPER
RT. TURN LANE, NB

-L- STA. 83+48.58
BEGIN 200' TAPER
RT. TURN LANE, NB

-L- OS 89+73.74

-MATCHLINE- STA. 82+00.00
SEE SHEET NO. 4

-MATCHLINE- STA. 94+00.00 SEE SHEET NO. 6

NAD 83 / NC GRID

RESEARCH TRIANGLE FOUNDATION
DB 1670 PG 239

MORRISVILLE, L.L.C.
DB 8307 PG 1306
MB 1997 PG 1728

RTP/PARKSIDE, L.L.C.
DB 8238 PG 900
MB 1999 PG 150

TOWN OF MORRISVILLE
MB 1998 PG 104

PUBLIC SERVICE COMPANY
DB 1221 PG 598

RTP/PARKSIDE, L.L.C.
DB 8238 PG 900
MB 1999 PG 150

NATIONS BANK LEASING CORPORATION
DB 6594 PG 159
MB 1995 PG 1044

3SFAPT

1SFBUS

-Y6-
PARKSIDE VALLEY DR.

2004 ADT
2024 ADT

2215 / 3795

1350 / 2350

770 / 1370

15670 -L- 15285
28270 DAVIS DRIVE 27585

190 / 390

385 / 685

670 / 1270

SUMMER SKY DR.

PROJECTED TRAFFIC VOLUMES

Plans prepared by:
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE #202
RALEIGH, N.C. 27606
For Division of Highways

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-4026B	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83 | NC GRID

-L-
PIs Sta 96+79.59
es = 1° 30' 00.0"
Ls = 300.00'
LT = 200.18'
ST = 100.16'

PI Sta 103+87.90
Δ = 55° 56' 12.8" (LT)
D = 5° 00' 00.0"
L = 1,118.74
T = 608.48'
R = 1,145.92'
SE = 0.06 FT/FT
RUNOFF = 300.0 FT

-MATCHLINE- STA. 94+00.00 SEE SHEET NO. 5

-MATCHLINE- STA. 106+00.00 SEE SHEET NO. 7

DESIGNATED ENVIROMENTALLY SENSITIVE AREA. NO CLEARING ADJACENT TO STREAM.

RIP RAP ENERGY DISSIPATOR BASIN #1 W/CLASS I RIP RAP
EST TONS
SY FF
SEE DITCH DETAIL

-L- TS 94+79.41

+79.41 -L-
125'

+00 -L-
140'

4' BASE TAIL DITCH
EST. 20 CY DDE
SEE DITCH DETAIL

ROCK CROSS VANE
SEE DITCH DETAIL

+55 -L-
81.63'

(6) RESEARCH TRIANGLE FOUNDATION
DB 1670 PG 239

-L- STA. 101+70.00
BEGIN 750' TAPER
NB & SB LANES

(6) RESEARCH TRIANGLE FOUNDATION
DB 1670 PG 239

-L- STA. 102+65.00
BEGIN 200' TAPER
LT. TURN LANE, SB

-L- STA. 104+65.00
END 200' TAPER
LT. TURN LANE, SB

CHANNEL IMPROVEMENT
75 LF W/CLASS "I" RIP RAP
EST. 9 TONS
EST. 13 SY FF
EST. 13 CY DDE
SEE DITCH DETAIL

+30 -L-
140'

+30 -L-
93.64'

CLASS "B" RIP RAP
EST. 2 TONS
EST. 7 SY FF

+00 -L-
110'

+00 -L-
91.44'

+50 -L-
110'

+50 -L-
90.78'

-L- SC 97+79.41

-L- POC 100+61.15 =
-Y7- POT 10+00.00

PROP. 1'-6" C&G

PROP. 6" MONO. CONC. ISLAND

SLOPE STAKE LINE

PROP. GUARDRAIL

SHLD. BERM GUTTER

+79.41 -L-
115'

2' LAT. BASE DITCH W/ CLASS "B" RIP RAP FOR QUANTITIES
SEE SHEET 5
SEE DITCH DETAIL

BERM DITCH W/ CLASS "B" RIP RAP
EST. 69 TONS
EST. 194 SY FF
SEE DITCH DETAIL

+50 -L-
115'

STD BERM DITCH
SEE DITCH DETAIL

+05 -L-
155'

STD BERM DITCH
SEE DITCH DETAIL

-L- STA. 96+65.00
BEGIN 200' TAPER
LT. TURN LANE, NB

(2) NATIONS BANK LEASING CORPORATION
DB 6594 PG 169
MB 1995 PG 1044

-L- STA. 98+65.00
END 200' TAPER
LT. TURN LANE, NB

BL-113 PINC 108+83.49
BY6-217 POT 5+00.00
-L- STA. 100+13.33
(11.156' RT.)

+22.34 -Y7-
77.89'

SPECIAL DITCH GRADE
(SEE PROFILES)

END CONSTRUCTION
-Y7- POC 12+00.00

-Y7-
PI Sta 14+34.75
Δ = 18° 47' 30.7" (LT)
D = 4° 45' 00.0"
L = 395.62'
T = 199.60'
R = 1,206.23'
SE = MATCH

-Y7- PC 12+35.15

N 88° 13' 20" E

ROADWAY EMBANKMENT

RESIDUAL

ALLUVIAL

PROP. GUARDRAIL

LAT. "V" DITCH
EST. 92 CY DDE
SEE DITCH DETAIL

25LF OF CHANNEL TRANSITION
EST 30 CY DDE
SEE DITCH DETAIL

LAT. "V" DITCH W/ CLASS "B" RIP RAP
EST. 83 TONS
EST. 233 SY FF
EST. 210 CY DDE
SEE DITCH DETAIL

(6) RESEARCH TRIANGLE FOUNDATION
DB 1670 PG 239

Plans prepared by:
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE #202
RALEIGH, N.C. 27606
For Division of Highways

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-4026B	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L-
PI Sta 103+87.90
Δ = 55° 56' 12.8" (LT)
D = 5° 00' 00.0"
L = 1,118.74'
T = 608.48'
R = 1,145.92'
SE = 0.06 FT/FT
RUNOFF = 300.0 FT

Pls Sta 109+98.31
θs = 7° 30' 00.0"
Ls = 300.00'
LT = 200.18'
ST = 100.16'

NAD 83 / NC GRID

-MATCHLINE- STA. 106+00.00 SEE SHEET NO. 6

-MATCHLINE- STA. 118+00.00 SEE SHEET NO. 8

DESIGNATED ENVIROMENTALLY SENSITIVE AREA. NO CLEARING ADJACENT TO STREAM.

BL-114 PINC 117+86.39
-L- STA. 109+42.43
(14,480' LT.)

-L- STA.117+61.78
BEGIN 200' TAPER
SB LT.TURN LANE

-L- ST 111+98.15

RESEARCH TRIANGLE FOUNDATION
DB 1670 PG 239

SOUTH LOOP RD.BY OTHERS

RESIDUAL

ALLUVIAL

ROADWAY EMBANKMENT

CLASS "I" RIP RAP
EST. 26 TONS
EST. 50 SY FF

CLASS "B" RIP RAP
EST. 8 TONS
EST. 21 SY FF

SHLD. BERM GUTTER

PROP. GUARDRAIL ENDWALL

GRAU-350 SLOPE STAKE LINE

N 41° 27' 26.9" W

DAVIS DR.

SR 1613

ADJUST 2GI

REMOVE

STUB 15"CMP

COLLAR

ENDWALL

BDO

EXISTING R/W

SLOPE STAKE LINE

LAT. "V" DITCH
FOR QUANTITIES
SEE SHEET 6
SEE DITCH DETAIL

LAT. "V" DITCH W/
CLASS "B" RIP RAP
EST. 37 TONS
EST. 104 SY FF
EST. 41 CY DDE
SEE DITCH DETAIL

LAT. "V" DITCH W/
CLASS "B" RIP RAP
EST. 33 TONS
EST. 91 SY FF
EST. 36 CY DDE
SEE DITCH DETAIL

STD BERM DITCH
SEE DITCH DETAIL

BERM DITCH W/
CLASS "B" RIP RAP
EST. 92 TONS
EST. 259 SY FF
SEE DITCH DETAIL

-L- STA.109+20.00
END 750' TAPER
NB & SB LANES

-L- CS 108+98.15

-L- STA.110+91.81
BEGIN 200' TAPER
NB LT.TURN LANE

-L- STA.112+91.81
END 200' TAPER
NB LT.TURN LANE

-L- TS 115+74.22

-L-
Pls Sta 117+74.37
θs = 6° 45' 00.0"
Ls = 300.00'
LT = 200.15'
ST = 100.13'

Plans prepared by:
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE #202
RALEIGH, N.C. 27606
For Division of Highways

REVISIONS

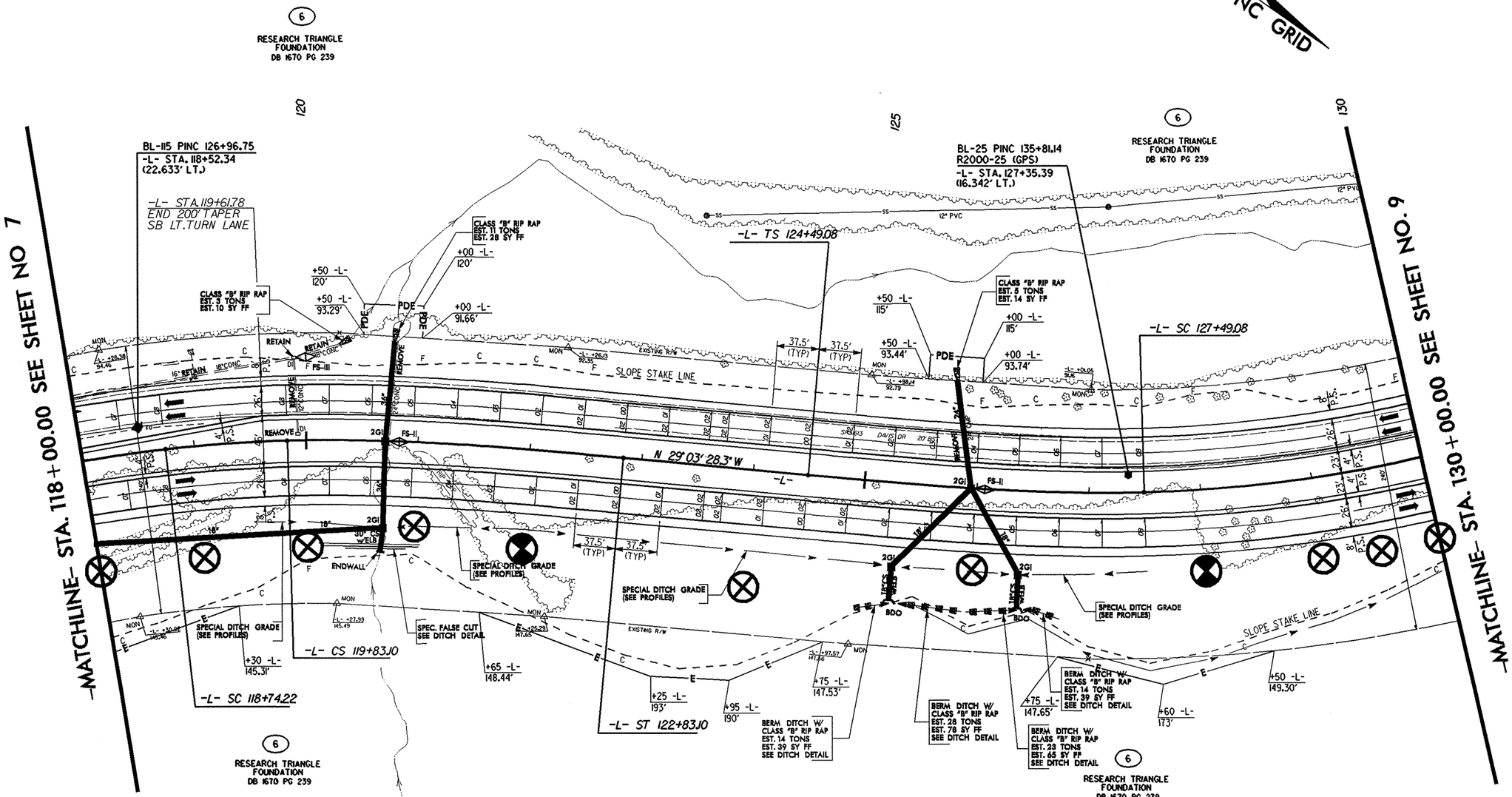
PROJECT REFERENCE NO.	SHEET NO.
U-4026B	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L-
PIs Sta 126+49.22
θs = 6° 45' 00.0"
Ls = 300.00'
LT = 200.15'
ST = 100.13'

PI Sta 128+78.05
Δ = 11° 34' 03.7" (LT)
D = 4° 30' 00.0'
L = 257.06
T = 128.97'
R = 1,273.24'
SE = 0.08 FT/FT
RUNOFF = 300.0 FT

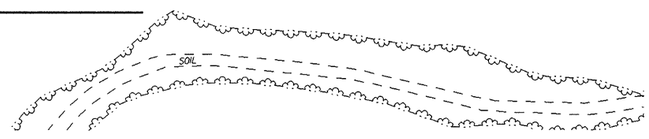
NAD 83 / NC GRID



-L-
PIs Sta 117+74.37
θs = 6° 45' 00.0"
Ls = 300.00'
LT = 200.15'
ST = 100.13'

PI Sta 119+28.69
Δ = 4° 53' 58.6" (RT)
D = 4° 30' 00.0'
L = 108.88
T = 54.47'
R = 1,273.24'
SE = 0.08 FT/FT

PIs Sta 120+83.23
θs = 6° 45' 00.0"
Ls = 300.00'
LT = 200.15'
ST = 100.13'



Plans prepared by:
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE #202
RALEIGH, N.C. 27606
For Division of Highways

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-4026B	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L-
PI Sta 128+78.05
Δ = 11° 34' 03.7" (LT)
D = 4° 30' 00.0"
L = 257.06'
T = 128.97'
R = 1,273.24'
SE = 0.08 FT/FT
RUNOFF = 300.0 FT

Pis Sta 131+06.27
Θs = 6° 45' 00.0"
Ls = 300.00'
LT = 200.15'
ST = 100.13'

END CONSTRUCTION
STATE PROJECT U-4026B
-L- POT STA.136+30.41 =
(R-2000AB) -Y19REV- 16+80.000 (METRIC)

NAD 83
NC GRID

-MATCHLINE- STA. 130+00.00 SEE SHEET NO 8

-MATCHLINE- STA. 142+00.00 SEE SHEET NO. 10

-L- CS 130+06.14

REMOVE EXISTING WINGWALL
TIE PROP. WINGWALL TO EXISTING HEADWALL

RETAIN EXISTING 90"x66" TAPERED INLET

ALLUVIAL

RESIDUAL

25LF OF CHANNEL IMPROVEMENT SEE DITCH DETAIL

STA. 133+24 -L- SKEW = 62°

STA. 134+23.50 -L- SKEW = 38°

+10 -L- 130'

+35 -L- 130'

+00 -L- 115'

+00 -L- 90.19'

+30.41 -L- 90.20'

+10 -L- 90.17'

+35 -L- 90.88'

PDE

TDE

RETAIN

ROADWAY EMBANKMENT

TIE TO CULVERT

COLLAR

PROP. GUARDRAIL

SLOPE STAKE LINE

ALLUVIAL

RESIDUAL

TIE TO EXISTING GUARDRAIL

SPECIAL DITCH GRADE (SEE PROFILES)

RESIDUAL

GRAU-350 +25

37.5' (TYP)

37.5' (TYP)

-L- ST 133+06.14

CLASS "I" RIP RAP
EST. 86 TONS
EST. 70 SY FF

+50 -L- 149.81'

+50 -L- 190'

207 LF OF PROPOSED OUTLET CHANNEL SEE DITCH DETAIL

ROCK CROSS VAIN SEE DITCH DETAIL

100LF OF CHANNEL IMPROVEMENT SEE DITCH DETAIL

+85 -L- 149.80'

+85 -L- 190'

CLASS "I" RIP RAP
EST. 38 TONS
EST. 30 SY FF

CLASS "B" RIP RAP
EST. 1 TONS
EST. 5 SY FF

LAT. "V" DITCH W/ CLASS "B" RIP RAP
EST. 28 TONS
EST. 78 SY FF
EST. 13 CY DDE
SEE DITCH DETAIL

2' BASE TAIL DITCH W/CLASS "B" RIP RAP

2' LATERAL BASE DITCH W/CLASS "B" RIP RAP

(2) 13' x 10' RCBC

(2) 13' x 10' RCBC

15"CS w/ELBS

15"CS w/ELBS

12" PVC

R-2000AB PROJECT BY OTHERS

R-2000AB PROJECT BY OTHERS

N 54°07'32"W

EXISTING R/W

BDO

2GI

FS-II 18"

FS-III

6 RESEARCH TRIANGLE FOUNDATION DB 1670 PG 239

RESEARCH TRIANGLE FOUNDATION DB 1670 PG 239

RESEARCH TRIANGLE FOUNDATION DB 1670 PG 239

Plans prepared by:
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE #202
RALEIGH, N.C. 27606
For Division of Highways

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-4026B	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83 NC GRID

BL-26 PINC 155+50.72
R2000-26 (GPS)
-L- STA. 147+12.81
(58.353' LT.)

BEGIN CONSTRUCTION
STATE PROJECT U-4026B
-L- POC STA.148+77.13 =
(R-2000AB) -Y19REV- STA.13+00.000 (METRIC)

-MATCHLINE- STA. 142+00.00 SEE SHEET NO. 9

-MATCHLINE- STA. 154+00.00 SEE SHEET NO. 11

R-2000AB PROJECT
BY OTHERS

RESEARCH TRIANGLE FOUNDATION
DB 1670 PG 239

SUMITOMO BANK LEASING AND FINANCE, INC
DB 6201 PG 346
MB 194 PG 950

WINGWALLS SUBMERGED (WATER LEVEL TO TOP OF HW)

CABLE GUIDE RAIL

SR 1613 DAVIS DR 19' BST

N 54° 07' 32.1" W

(2) 13' x 10' RCBC

-L- TS 144+35.84

-L- SC 147+14.71

-L- STA.150+40.00
BEGIN 200' TAPER
LT. TURN LANE, NB

-L- STA.152+40.00
END 200' TAPER
LT. TURN LANE, NB

-L- CS 150+90.97

-L- ST 153+70.97

TIE TO EXISTING GUARDRAIL

SLOPE STAKE LINE

PROP. GUARDRAIL

CLASS "B" RIP RAP
EST. 3 TONS
EST. 10 SY FF

CLASS "I" RIP RAP
EST. 20 TONS
EST. 39 SY FF

-L-

PIs Sta 146+21.82	PI Sta 149+03.70	PIs Sta 151+84.37
θs = 4° 58' 10.3"	Δ = 13° 24' 36.7" (RT)	θs = 4° 59' 22.8"
Ls = 278.87'	D = 3° 33' 50.5"	Ls = 280.00'
LT = 185.99'	L = 376.26	LT = 186.74'
ST = 93.02'	T = 189.00'	ST = 93.40'
	R = 1,607.61'	
	SE = 0.06 FT/FT	
	RUNOFF = 280.0 FT	

Plans prepared by:
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE #202
RALEIGH, N.C. 27606
For Division of Highways

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-4026B	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

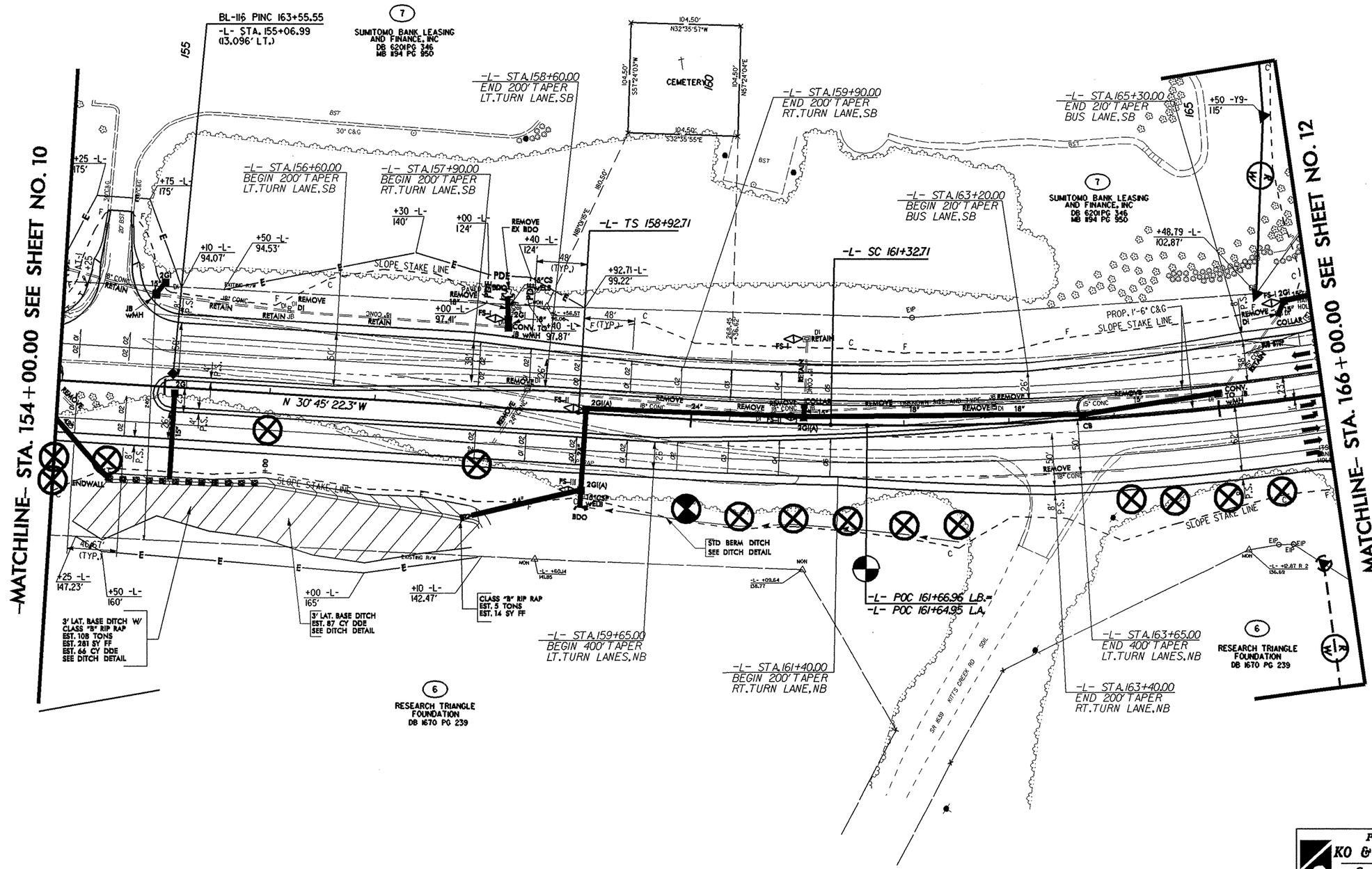
NAD 83 / NC GRID

-L-

PI's Sta 160+52.73
Θs = 2° 24' 00.0"
Ls = 240.00'
LT = 160.01'
ST = 80.01'

PI Sta 161+49.84
Δ = 0° 41' 05.9" (LT)
D = 2° 00' 00.0"
L = 34.25'
T = 17.12'
R = 2,864.79'
SE = 0.05 FT/FT
RUNOFF = 240.0 FT

PI Sta 165+33.95
Δ = 14° 40' 45.7" (LT)
D = 2° 00' 00.0"
L = 733.97'
T = 369.00'
R = 2,864.79'


-MATCHLINE- STA. 154+00.00 SEE SHEET NO. 10
-MATCHLINE- STA. 166+00.00 SEE SHEET NO. 12
BL-116 PINC 163+55.55
-L- STA. 155+06.99
(13.096' LT.)
SUMITOMO BANK LEASING AND FINANCE, INC
DB 6201PG 346
MB 194 PG 950
CEMETERY
-L- STA.158+60.00
END 200' TAPER
LT.TURN LANE,SB
-L- STA.159+90.00
END 200' TAPER
RT.TURN LANE,SB
-L- STA.165+30.00
END 210' TAPER
BUS LANE,SB
-L- STA.156+60.00
BEGIN 200' TAPER
LT.TURN LANE,SB
-L- STA.157+90.00
BEGIN 200' TAPER
RT.TURN LANE,SB
-L- STA.163+20.00
BEGIN 210' TAPER
BUS LANE,SB
-L- TS 158+92.71
-L- SC 161+32.71
SLOPE STAKE LINE
PROP. 1'-6" C&G
SLOPE STAKE LINE
N 30° 45' 22.3" W
STD BERM DITCH
SEE DITCH DETAIL
3' LAT. BASE DITCH W
CLASS "B" RIP RAP
EST. 108 TONS
EST. 281 SY FF
EST. 66 CY DDE
SEE DITCH DETAIL
3' LAT. BASE DITCH
EST. 87 CY DDE
SEE DITCH DETAIL
CLASS "B" RIP RAP
EST. 5 TONS
EST. 14 SY FF
-L- STA.159+65.00
BEGIN 400' TAPER
LT.TURN LANES,NB
-L- STA.161+40.00
BEGIN 200' TAPER
RT.TURN LANE,NB
-L- POC 161+66.96 LB.=
-L- POC 161+64.95 LA.
-L- STA.163+65.00
END 400' TAPER
LT.TURN LANES,NB
-L- STA.163+40.00
END 200' TAPER
RT.TURN LANE,NB
RESEARCH TRIANGLE FOUNDATION
DB 1670 PG 239
KITTS CREEK RD
SR 1639
SHL
REMOVE EX RDO
PROP. CONC. VALLEY GUTTER
CONV. TO JB w/HH
REMOVE 18" CONC
REMOVE 24" CONC
REMOVE 15" CONC
REMOVE 18" CONC COLLAR
REMOVE 18" CONC DI
REMOVE 24" CONC DI
REMOVE 15" CONC DI
REMOVE 18" CONC DI
REMOVE 18" CONC JB
REMOVE 24" CONC JB
REMOVE 15" CONC JB
REMOVE 18" CONC JB
RETAIN DI
RETAIN JB
RETAIN 18" CONC
RETAIN 24" CONC
RETAIN 15" CONC
RETAIN 18" CONC

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-4026B	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83 / NC GRID

-Y9-
SR 1639 KIT CREEK ROAD
19800 / 39800

1530 / 2930 | 4765 / 9465
15285 / 27585 -L- DAVIS DRIVE 21950 / 40950
1335 / 2635 | 4765 / 9465

19605 / 39505

2004 ADT
2024 ADT

PROJECTED TRAFFIC VOLUMES

-MATCHLINE- STA. 23+00.00
SEE SHEET NO. 25

-MATCHLINE- STA. 166+00.00 SEE SHEET 11

-MATCHLINE- STA. 178+00.00 SEE SHEET NO. 13

-MATCHLINE- STA. 29+00.00
SEE SHEET NO. 26

SUMITOMO BANK LEASING AND FINANCE, INC
DB 6201 PG 346
MB 1994 PG 950

RESEARCH TRIANGLE FOUNDATION
DB 1670 PG 239

(9) TEER ASSOCIATES DEVELOPMENT, L.L.C.
DB 6099 PG 458
MB 1994 PG 574

(10) CISCO SYSTEMS, INC.
DB 8119 PG 899
MB 1998 PG 1391

(8) BIOGEN, INC.
DB 8249 PG 340
DB 6317 PG 83
MB 1999 PG 264
MB 1994 PG 1560

-Y9- ST 23+31.45

-L- ST 171+38.92

-L- STA. 173+50.47
BEGIN 400' TAPER
LT. TURN LANES, SB

BL-118 PINC 184+36.81
-L- STA. 175+94.71
(3.453' LT.)

-L- STA. 177+50.47
END 400' TAPER
LT. TURN LANES, SB

BL-117 PINC 174+86.39
BY7-220 PINC 21+20.65
-L- STA. 166+41.95
(15.060' LT.)

-L- CS 168+98.92

PROP. 6" MONO. CONC. ISLAND

SPECIAL DITCH GRADE (SEE PROFILES)

SPECIAL LAT. "V" DITCH SEE DITCH DETAIL

SPEC. FALSE CUT SEE DITCH DETAIL

SPECIAL LAT. "V" DITCH SEE DITCH DETAIL

CLASS "B" RIP RAP
EST. 2 TONS
EST. 7 SY FF

TIE PIPE TO EXISTING DITCH

REMOVE DI

REMOVE 15" CONC

REMOVE 2GI

FS-III

24" CS WELDS

SR 1613 DAVIS DR 47' BST SBL

SR 1613 DAVIS DR 46' BST

PROP. 1'-6" C&G

EXISTING R/W

CABLE

ROADWAY EMBANKMENT

N 50° 55' 13.8" W

PROP. GUARDRAIL

ENDWALL

SHLD. BERM GUTTER

GRAU-350 +25 RIP RAP

TIE TO EXISTING DRAW

SLOPE STAKE LINE

ARTIFICIAL FILL

RESIDUAL

ALLUVIAL

PDE

-L- POC 166+96.91 =
-Y9- POT 26+19.50

-Y9- PC 26+62.65

-Y9- PT 28+49.35

-L- STA. 168+50.00
BEGIN 210' TAPER
BUS LANE, NB

-L- STA. 170+60.00
END 210' TAPER
BUS LANE, NB

SPEC. LAT. "V" DITCH W/ CLASS "B" RIP RAP
EST. 69 TONS
EST. 194 SY FF
SEE DITCH DETAIL

-L- STA. 174+60.00
BEGIN 200' TAPER
LT. TURN LANE, NB

-L- STA. 174+95.00
BEGIN 200' TAPER
RT. TURN LANE, NB

RIP RAP ENERGY DISSIPATOR BASIN # 2 W/CLASS I RIP RAP
EST TONS
SY FF
SEE DITCH DETAIL

-L- STA. 176+60.00
END 200' TAPER
LT. TURN LANE, NB

-L- STA. 176+95.00
END 200' TAPER
RT. TURN LANE, NB

CLASS "B" RIP RAP @ EMBANKMENT
EST. 15 TONS
EST. 35 SY FF
SEE DITCH DETAIL

LAT. "V" DITCH W/ CLASS "B" RIP RAP
EST. 28 TONS
EST. 84 SY FF
EST. 2 CY CDE
SEE DITCH DETAIL

-DRI- PT 12+28.28

-DRI- POT 12+94.55

N 14° 07' 51.8" E

-Y9-
PI Sta 27+56.01
Δ = 1° 52' 01.5" (RT)
D = 1° 00' 00.0"
L = 186.71'
T = 93.36'
R = 5,729.58'
SE = 0.02 FT/FT

-L-
PI Sta 165+33.96
Δ = 14° 40' 45.6" (LT)
D = 2° 00' 00.0"
L = 733.97'
T = 369.00'
R = 2,864.79'
SE = 0.05 FT/FT
RUNOFF = 240.0 FT

PIs Sta 169+78.93
θs = 2° 24' 00.0"
Ls = 240.00'
LT = 160.01'
ST = 80.01'

Plans prepared by:
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE #202
RALEIGH, N.C. 27606
For Division of Highways

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-4026B	13
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-MATCHLINE- STA. 178+00.00 SEE SHEET NO. 12

-MATCHLINE- STA. 190+00.00 SEE SHEET NO. 14

(6) RESEARCH TRIANGLE FOUNDATION DB 1670 PG 239

(10) CISCO SYSTEMS, INC. DB 819 PG 199 MB 1998 PG 1391

(11) DELTA PRODUCTS CORP. DB 734 PG 645 MB 1997 PG 160

(8) BIOGEN, INC. DB 8249 PG 340 DB 6317 PG 83 MB 1999 PG 264 MB 1994 PG 1560

-L- SC 182+45.04

-L- TS 179+45.04

-DRI- POT 10+00.00 = -L- POT 178+55.72

BL-119 PINC 193+06.74 -L- STA. 184+48.08 (22.769' LT.)

PROPOSED RETAINING WALL BOTTOM 3' BELOW BED AND TOP 6' ABOVE BED

CLASS "B" RIP RAP EST. 11 TONS EST. 28 SY FF

SPECIAL DITCH GRADE (SEE PROFILES)

2' LAT. BASE DITCH W/ CLASS "B" RIP RAP EST. 108 TONS EST. 304 SY FF EST. 233 CY DDE SEE DITCH DETAIL

TIE TO EXISTING SWALE

TIE TO EXISTING DITCH

CLASS "B" RIP RAP EST. 2 TONS EST. 7 SY FF

BERM "V" DITCH W/ CLASS "B" RIP RAP EST. 52 TONS EST. 157 SY FF SEE DITCH DETAIL

SPEC. FALSE CUT SEE DITCH DETAIL

STD. BERM DITCH SEE DITCH DETAIL

TIE EXIST. DITCH TO PROP. DITCH

SLOPE STAKE LINE

C SLOPE STAKE LINE

RETAIN. WALL

REMOVE 18" RCP & MH COVER

REMOVE CMP & DRAIN

REMOVE CULVERT

REMOVE CONC. WALL

REMOVE CONC. DRIVE

REMOVE DRIVE

REMOVE CONC. CURB & GUTTER

REMOVE CONC. SIDEWALK

REMOVE CONC. MEDIAN

REMOVE ASPHALT

REMOVE CONC. PAVEMENT

REMOVE CONC. CURB

REMOVE CONC. FLUME

REMOVE CONC. DITCH

REMOVE CONC. HEADWALL

REMOVE CONC. APRON

REMOVE CONC. GUTTER

REMOVE CONC. PAVEMENT & CURB

REMOVE CONC. PAVEMENT & CURB & GUTTER

REMOVE CONC. PAVEMENT & CURB & GUTTER & SIDEWALK

REMOVE CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN

REMOVE CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT

REMOVE CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT

REMOVE CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB

REMOVE CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER

REMOVE CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER & SIDEWALK

REMOVE CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN

REMOVE CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT

REMOVE CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT

REMOVE CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB

REMOVE CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER

REMOVE CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER & SIDEWALK

REMOVE CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN

REMOVE CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT

REMOVE CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT

REMOVE CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB

REMOVE CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER

REMOVE CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER & SIDEWALK

REMOVE CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN

REMOVE CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT

REMOVE CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT

REMOVE CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB

REMOVE CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER

REMOVE CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT & CONC. PAVEMENT & CURB & GUTTER & SIDEWALK

REMOVE CONC. PAVEMENT & CURB & GUTTER & SIDEWALK & MEDIAN & ASPHALT &

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-4026B	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83 / NC GRID

RESEARCH TRIANGLE FOUNDATION
DB 1670 PG 239

DELTA PRODUCTS CORP.
DB 738 PG 615
MB 1997 PG 160

-L- STA. 190+55.71
BEGIN 200' TAPER
LT & RT TURN LANES, SB

-L- STA. 192+55.71
END 200' TAPER
LT & RT. TURN LANES, SB

BL-120 PINC 200+69.51
-L- STA. 191+89.49
(30.442' LT.)

BL-121 PINC 205+87.54
-L- STA. 197+01.59
(16.173' LT.)

-MATCHLINE- STA. 190+00.00 SEE SHEET NO. 13

-MATCHLINE- STA. 202+00.00 SEE SHEET NO. 15

-L- STA. 190+30.00
BEGIN 210' TAPER
BUS LANE, NB

-L- STA. 192+40.00
END 210' TAPER
BUS LANE, NB

-L- CS 195+63.20

-L- ST 198+63.20

BIOGEN, INC.
DB 8249 PG 340
DB 6317 PG 83
MB 1999 PG 264
MB 1994 PG 1560

PI Sta 189+78.62
Δ = 62° 36' 45.7" (RT)
D = 4° 45' 00.0"
L = 1,318.16
T = 733.58'
R = 1,206.23'
SE = 0.08 FT/FT
RUNOFF = 300.0 FT

PIs Sta 196+63.35
θs = 7° 07' 30.0"
Ls = 300.00'
LT = 200.16'
ST = 100.15'

ROADWAY EMBANKMENT

RESIDUAL

ALLUVIAL
CLASS "B" RIP RAP
EST. 1 TONS
EST. 5 SY FF

PROP. GUARDRAIL

DO NOT DISTURB EXISTING TIMBER WALL

SPECIAL DITCH GRADE (SEE PROFILES)

STD. BERM DITCH SEE DITCH DETAIL

LAT. "V" DITCH W/ CLASS "B" RIP RAP
EST. 10 TONS
EST. 31 SY FF
EST. 7 CY DDE
SEE DITCH DETAIL

6' X 6' BASE PREFORMED SCOUR HOLE SEE DETAIL

LAT. 2' BASE DITCH
EST. 246 CY DDE
SEE DITCH DETAIL

INLET CHANNEL
EST. 42 CY DDE
SEE DITCH DETAIL

RESEARCH TRIANGLE FOUNDATION
DB 1670 PG 239

Plans prepared by:
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE #202
RALEIGH, N.C. 27606
For Division of Highways

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-4026B	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y10-
DEVELOPEMENT DRIVE
2215
3915
675
1175
1540
2740
22245 -L-
41345 DAVIS DRIVE
23110
42910
2004 ADT
2024 ADT
PROJECTED TRAFFIC VOLUMES

-MATCHLINE- STA. 202+00.00 SEE SHEET NO. 14

-MATCHLINE- STA. 214+00.00 SEE SHEET NO. 16

-Y10- POT 10+00.00

NAD 83 / NC GRID

6 RESEARCH TRIANGLE FOUNDATION DB 1670 PG 239

12 ERICSSON TRUST DB 7126 PG 64 MB 1996 PG 1253

13 EISAI INC DB 8341 PG 2421 MB 1996 PG 417

DURHAM COUNTY
WAKE COUNTY

-L- STA. 208+10.00
END 210' TAPER
BUS LANE, SB

-L- STA. 206+00.00
BEGIN 210' TAPER
BUS LANE, SB

BEGIN CONSTRUCTION
-Y10- POT 14+00.00

-L- STA. 211+03.15
BEGIN 200' TAPER
RT. TURN LANE, SB

-L- STA. 211+30.00
BEGIN 200' TAPER
LT. TURN LANE, SB

-L- STA. 213+03.15
END 200' TAPER
RT TURN LANE, SB

-L- STA. 213+30.00
END 200' TAPER
LT. TURN LANE, SB

+25 -Y10-
83.3'
PROP. MULTI USE TRAIL

CLASS "B" RIP RAP
EST. 2 TONS
EST. 7 SY FF

STD. BERM DITCH
SEE DITCH DETAIL

SPECIAL DITCH GRADE
(SEE PROFILES)

S 68° 49' 47.5" E

-Y10-

ROADWAY EMBANKMENT

RESIDUAL

ALLUVIAL

EXPOSED AND CUT TMS LOCATION

SLOPE STAKE LINE

SHLD. BERM GUTTER

PROP. GUARDRAIL

EXISTING R/W

CONTROL VALVE

SR 1613 DAVIS DR BST

-L- STA. 204+61.66
BEGIN 200' TAPER
LT. TURN LANE, NB

-L- STA. 206+61.66
END 200' TAPER
LT. TURN LANE, NB

CLASS "B" RIP RAP
EST. 5 TONS
EST. 16 SY FF

CLASS "B" RIP RAP
EST. 10 SY FF

LAT. 2' BASE DITCH
FOR QUANTITIES
SEE SHEET 14
SEE DITCH DETAIL

POND

BL-10 PINC 217+38.41
BY8-231 POT 13+92.30
NCGS DEVELOPMENT
-L- STA. 208+51.24
(24.69' RT.)

-L- POT 209+36.47
-Y10- POT 15+30.83

-L- STA. 207+90.00
BEGIN 200' TAPER
BUS LANE, NB

-L- STA. 209+90.00
END 200' TAPER
BUS LANE, NB

-L- STA. 210+40.00
BEGIN 210' TAPER
BUS LANE, NB

-L- STA. 212+50.00
END 210' TAPER
BUS LANE, NB

CHANNEL CHANGE W/
CLASS "B" RIP RAP
EST. 157 TONS
EST. 444 SY FF
EST. 341 CY DDE
SEE DITCH DETAIL

RESEARCH TRIANGLE FOUNDATION
DB 8483 PG 1841
BM 1997 PG 316 (WAKE)
BM 138 PG 167 (DURHAM)

RTP LIMIT
MORRISVILLE CITY LIMIT

Plans prepared by:
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE #202
RALEIGH, N.C. 27606
For Division of Highways

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-4026B	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83 NC GRID

-MATCHLINE- STA. 214+00.00 SEE SHEET NO. 15

-MATCHLINE- STA. 226+00.00 SEE SHEET NO. 17

13
EISAI INC
DB 2667 PG 583
MB 135 PG 95

14
EISAI PHARMATECHNOLOGY, INC
DB 2177 PG 936
MB 135 PG 96

6
RESEARCH TRIANGLE FOUNDATION
DB 8483 PG 1841
BM 1997 PG 1316 (WAKE)
BM 138 PG 167 (DURHAM)

6
RESEARCH TRIANGLE FOUNDATION
DB 2751 PG 793
MB 138 PG 167

BL-122 PINC 226+91.86
-L- STA. 218+02.82
(18.374' LT.)

BL-123 PINC 232+27.47
-L- STA. 223+36.00
(12.326' LT.)

-L- STA. 224+80.00
BEGIN 210' TAPER
BUS LANE, SB

-L- TS 215+79.61

-L- SC 218+79.61

-L- ST A. 222+55.00
BEGIN 200' TAPER
LT. TURN LANE, NB

-L- ST A. 224+55.00
END 200' TAPER
LT. TURN LANE, NB

-L- CS 225+47.93

SLOPE STAKE LINE

RESIDUAL

ROADWAY EMBANKMENT

ALLUVIAL

EXISTING R/W

96' BST

DUCT

GRADE TO DRAIN

REMOVE 8' EXIST PIPE & EXTEND 24" TO TIE TO PROP. 2GI

REMOVE DI 2GI"A"

REMOVE 24"CONC 30'

REMOVE 24" CONC

24" REMOVE

REMOVE DI 30'

REMOVE DI

ADJUST 2GI

RETAIN EXIST DD

PDE

HEADWALL

RIP RAP, GUARDRAIL

2' LAT BASE DITCH W/ CLASS "B" RIP RAP
EST. 90 TONS
EST. 254 SY FF
EST. 112 CY DDE
SEE DITCH DETAIL

RIP RAP ENERGY DISSIPATOR BASIN 3 W/CLASS I RIP RAP
EST TONS
SY FF
SEE DITCH DETAIL

R/P LIMIT

MORRISVILLE CITY LIMIT

DURHAM COUNTY
WAKE COUNTY

MON

-L-

PIs Sta 217+79.75	PI Sta 222+21.66	PIs Sta 226+48.06
θs = 6° 45' 00.0"	Δ = 30° 04' 28.0" (RT)	θs = 6° 45' 00.0"
Ls = 300.00'	D = 4° 30' 00.0"	Ls = 300.00'
LT = 200.15'	L = 668.32	LT = 200.15'
ST = 100.13'	T = 342.05'	ST = 100.13'
	R = 1,273.24'	
	SE = 0.08 FT/FT	
	RUNOFF = 300.0 FT	

Plans prepared by:
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE #202
RALEIGH, N.C. 27606
For Division of Highways

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-4026B	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83 / NC GRID

-MATCHLINE- STA. 226+00.00 SEE SHEET NO. 16

-MATCHLINE- STA. 238+00.00 SEE SHEET NO. 18

-L-
Pis Sta 226+48.06
Θs = 6° 45' 00.0"
Ls = 300.00'
LT = 200.15'
ST = 100.13'

-L-
Pis Sta 232+89.30
Θs = 5° 37' 30.0"
Ls = 270.00'
LT = 180.09'
ST = 90.08'

-L-
PI Sta 241+99.29
Δ = 61° 37' 18.9" (LT)
D = 4° 10' 00.0"
L = 1,478.93
T = 820.08'
R = 1,375.10'
SE = 0.07 FT/FT
RUNOFF = 270.0 FT

-L- STA. 226+85.00
BEGIN 200' TAPER
BUS LANE, NB

-L- STA. 226+90.00
END 210' TAPER
BUS LANE, SB

-L- STA. 228+85.00
END 200' TAPER
BUS LANE, NB

-L- ST 228+47.93

BL-124 PINC 237+41.93
-L- STA. 228+49.47
(8.076' LT.)

-L- STA. 229+35.00
BEGIN 210' TAPER
BUS LANE, NB

-L- STA. 230+00.00
BEGIN 200' TAPER
LT. TURN LANE, SB

-L- STA. 231+45.00
BEGIN 200' TAPER
RT. TURN LANE, SB

-L- STA. 231+45.00
END 210' TAPER
BUS LANE, NB

-L- TS 231+09.21

-L- STA. 232+00.00
END 200' TAPER
LT. TURN LANE, SB

-L- STA. 233+45.00
END 200' TAPER
RT. TURN LANE, SB

-L- SC 233+79.21

-L- STA. 234+95.00
BEGIN 750' TAPER
NB & SB LANES

14
EISAI PHARMATECHNOLOGY, INC
DB 2177 PG 936
MB 135 PG 96

6
RESEARCH TRIANGLE FOUNDATION
DB 148 PG 331
DB 385 PG 537

6
RESEARCH TRIANGLE FOUNDATION
DB 2761 PG 793
MB 138 PG 167

15
DAVIS DRIVE ASSOCIATES LIMITED PARTNERSHIP
DB 1880 PG 43

ROADWAY EMBANKMENT

ALLUVIAL

RESIDUAL

RESIDUAL

2' LAT. BASE DITCH W/ CLASS "B" RIP RAP
EST. 45 TONS
EST. 127 SY FF
EST. 65 CY DDE
SEE DITCH DETAIL

INLET CHANNEL
EST. 28 CY DDE
SEE DITCH DETAIL

TOE PROTECTION W/ CLASS "B" RIP RAP
EST. 30 TONS
EST. 67 SY FF
SEE DITCH DETAIL

CLASS "B" RIP RAP
EST. 2 TONS
EST. 7 SY FF

LAT. "V" DITCH W/ CLASS "B" RIP RAP
EST. 87 TONS
EST. 262 SY FF
EST. 80 CY DDE
SEE DITCH DETAIL

OUTLET CHANNEL W/ CLASS "I" RIP RAP
EST. 150 TONS
EST. 225 SY FF
EST. 315 CY DDE
SEE DITCH DETAIL

LAT. "V" DITCH W/ CLASS "B" RIP RAP
EST. 80 TONS
EST. 240 SY FF
EST. 25 CY DDE
SEE DITCH DETAIL

PROPOSED SHLD BERM GUTTER

SLOPE STAKE LINE

PROP. MULTI USE TRAIL

EXISTING R/W

TDE

PDE

RIP RAP

REMOVE DI

REMOVE

SHLD. BERM GUTTER

GRAU-350

CABLE

HAND HOLE

MTL POST

IN GROUND LTS

SR 1999 DAVIS DR BST

24" BST

96" BST

S69° 30' 59.8" E

S85° 18' 43" W

N67° 09' 02" W

Plans prepared by:
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE #202
RALEIGH, N.C. 27606
For Division of Highways

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-4026B	18
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

2004 ADT
2024 ADT

480
880

-L- DAVIS DRIVE
23110 / 42910 — 24155 / 45055
190 / 390 — 190 / 390
285 / 585 — 1330 / 2730
1715 / 3415

-YII- PARK KNOLL DRIVE

PROJECTED TRAFFIC VOLUMES

-L-
PI Sta 241+99.29
Δ = 61° 37' 18.9" (LT)
D = 4° 10' 00.0"
L = 1,478.93'
T = 820.08'
R = 1,375.10'
SE = 0.07 FT/FT
RUNOFF = 270.0 FT

PIs Sta 249+48.22
θs = 5° 37' 30.0"
Ls = 270.00'
LT = 180.09'
ST = 90.08'

-MATCHLINE- STA. 238+00.00 SEE SHEET NO. 17

-MATCHLINE- STA. 250+00.00 SEE SHEET NO. 19

NAD 83 / NC GRID

BL-125 PINC 247+17.37
-L- STA. 238+26.70
(27.503' RT.)

BL-126 PINC 254+71.85
BY9-222 POT 5+00.00
-L- STA. 245+68.15
(53.432' RT.)

-L- POC 246+09.29 =
-YII- POT 10+00.00

-L- CS 248+58.13

-L- STA. 242+50.00
BEGIN 200' TAPER
NB & SB LT TURN LANE

-L- STA. 242+45.00
END 750' TAPER
NB & SB LANES

-L- STA. 244+50.00
END 200' TAPER
NB LT TURN LANE
END 200' TAPER
SB LT TURN LANE

-L- STA. 247+75.00
BEGIN 200' TAPER
SB RT TURN LANE

-L- STA. 249+75.00
END 200' TAPER
SB RT TURN LANE

-L- STA. 249+20.00
BEGIN 200' TAPER
NB RT TURN LANE

-L- STA. 248+15.00
BEGIN 400' TAPER
NB LT TURN LANES
SB LT TURN LANE

-YII- PC 11+06.77

-YII- PT 12+12.67

-YII-
PI Sta 11+59.50
Δ = 7° 37' 57.0" (LT)
D = 7° 10' 00.0"
L = 106.50'
T = 53.33'
R = 799.48'
SE = MATCH

(6) RESEARCH TRIANGLE FOUNDATION
DB 148 PG 331
DB 315 PG 537

(15) DAVIS DRIVE ASSOCIATES, LTD
DB 870 PG 88
MB 145 PG 55

(17) KEYSTONE OFFICE 100, LLC
DB 2555 PG 165
MB 142 PG 28

DUKE POWER CO
DB 937 BK 392

(15) DAVIS DRIVE ASSOCIATES, LTD
DB 870 PG 88
MB 142 PG 28

TOWN OF CARY
DB 2253 PG 672
MB 136 PG 62

(15) DAVIS DRIVE ASSOCIATES LIMITED PARTNERSHIP
DB 1880 PG 43

KEYSTONE TECHNOLOGY PARK OWNERS ASSOC., INC
DB 2447 PG 655
MB 140 PG 75
(16)

KEYSTONE WAREHOUSE PARK OWNERS ASSOC., INC
DB 2602 PG 549
MB 142 PG 156

TECHNOLOGY V, LLC
DB 2498 PG 533
MB 140 PG 214

(18) TECHNOLOGY I, LLC
DB 2305 PG 577
BM 137 PG 204

DUKE POWER CO
DB 937 BK 392

2' LAT. BASE DITCH W/ CLASS "B" RIP RAP
EST. 45 TONS
EST. 127 SY FF
EST. 38 CY DDE
SEE DITCH DETAIL

TOE PROTECTION W/ PERMANENT EROSION CONTROL MATTING
EST. 30 TONS
EST. 67 SY FF
SEE DITCH DETAIL

TOE PROTECTION W/ PERMANENT EROSION CONTROL MATTING FOR TOE PROTECTION
EST. TONS
EST. SY FF
SEE DITCH DETAIL

PROP. MULTI USE TRAIL
PROP. GUARDRAIL REMOVE EX HEADWALL
PROP. 6' MONO. CONC. ISLAND
PROP. 5' SIDEWALK
PROP. 2'-6" C&G
PROP. 6" SIDEWALK
CONC. DITCH TO JB W/MH COVER
REMOVE EX. TRAFFIC SIGNAL JB
REMOVE EX. TRAFFIC SIGNAL CONTROL VALVE
REMOVE DI
REMOVE
SLOPE STAKE LINE
TIE TO EXIST C&G
(3) POWER CABLES CUT & EXPOSED AT LOCATION
IRRIGATION CONTROL VALVE
WATER BOOSTER STATION
POND
SR 1929 DAVIS DR
LOPE STAKE LINE -L- E

Plans prepared by:
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE #202
RALEIGH, N.C. 27606
For Division of Highways

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-4026B	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y12-
SR 1978 (HOPSON RD)

2004 ADT	16465
2024 ADT	31165

24155 -L- 21775
45055 DAVIS DRIVE 40275

43 / 81	2780 / 5180
2670 / 5270	1620 / 3220

13865 / 26565

PROJECTED TRAFFIC VOLUMES

NAD 83 NC GRID

-MATCHLINE- STA. 22+00.00
SEE SHEET NO. 27

-MATCHLINE- STA. 250+00.00
SEE SHEET NO. 18

-MATCHLINE- STA. 262+00.00
SEE SHEET NO. 20

-MATCHLINE- STA. 29+00.00
SEE SHEET NO. 28

(15) DAVIS DRIVE ASSOCIATES, LTD
DB 1170 PG 88
MB 145 PG 55

-L- STA 252+15.00
END 200' TAPER
NB & SB -LANES
END 400' TAPER
NB LT TURN LANES
SB LT TURN LANE

-L- STA 250+15.00
BEGIN 200' TAPER
NB & SB LANES

-L- ST 251+28.13

BL-127 PINC 262+54.96
-L- STA. 253+38.72
(52.708' RT.)

-L- POT 260+51.05 =
-Y12- POT 25+31.11

-L- STA 251+20.00
END 200' TAPER
NB RT TURN LANE

-L- STA 254+40.00
BEGIN 200' TAPER
NB RT TURN LANE

-L- STA 256+40.00
END 200' TAPER
NB RT TURN LANE

BL-5 PINC 269+48.15
BY10-225 PINC 24+51.91
GPS U-4026-5
-L- STA. 260+31.68
(71.126' RT.)

(18) TECHNOLOGY I, LLC
DB 2305 PG 577
BM 137 PG 204

(19) TECHNOLOGY IV, LLC
DB 2411 PG 969
BM 139 PG 171

(20) SEARLS FAMILY LIMITED PARTNERSHIP
DB 2712 PG 997

TOE PROTECTION W/ PERMANENT EROSION CONTROL MATTING FOR TOE PROTECTION FOR QUANTITIES SEE SHEET 20 SEE DITCH DETAIL

LAT. "V" TAIL DITCH
EST 7 CU YD DDE
SEE DITCH DETAIL

CLASS "B" RIP RAP
EST. 2 TONS
EST. 7 SY FF

Plans prepared by:
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE #202
RALEIGH, N.C. 27606
For Division of Highways

7/2/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-4026B	20
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83 | NC GRID

-L-
PI Sta 270+12.65
Δ = 2° 18' 20.7" (LT)
D = 0° 30' 00.0"
L = 461.15'
T = 230.61'
R = 11,459.16'
SE = 0.02 FT/FT

-MATCHLINE- STA. 262+00.00 SEE SHEET NO. 19

-MATCHLINE- STA. 274+00.00 SEE SHEET NO. 21

265

270

20
SEARLS FAMILY
LIMITED PARTNERSHIP
DB 2712 PG 997

-L- STA. 263+10.00
BEGIN 200' TAPER
SB LANES

-L- STA. 265+10.00
END 200' TAPER
SB LANES

-L- STA. 265+60.00
BEGIN 200' TAPER
SB LANES

-L- STA. 267+60.00
END 200' TAPER
SB LANES

-L- PT 272+43.20

BL-128 PINC 279+42.60
-L- STA. 270+25.86
(10.644' RT.)

CLASS "B" RIP RAP
EST. 1 TONS
EST. 5 SY FF

LAT. "V" DITCH
EST. 84 CY DDE
SEE DITCH DETAIL

2' LAT BASE DITCH W/
CLASS "B" RIP RAP
EST. 112 TONS
EST. 317 SY FF
EST. 100 CY DDE
SEE DITCH DETAIL

SPECIAL DITCH GRADE
(SEE PROFILES)

SPECIAL DITCH
(SEE PROFILES)

+67.81 -L-
115'

+32.17 -L-
92.81'

+31.81 -L-
85'

+82.04 -L-
85'

+00 -L-
95'

+00 -L-
74.92'

PROP. 5'
SIDEWALK

PROP. 6" MONO.
CONC. ISLAND

PROP. 2'-6" C&G

PROP. 1'-6" C&G

SLOPE STAKE LINE

EXISTING R/W

HEADWALL

SR 1999 DAVIS DR BST

N 3° 05' 23.5" W

ROADWAY EMBANKMENT

PROP. GUARDRAIL

RESIDUAL

ALLUVIAL

+75 -L-
78.16'

+24 -L-
79.48'

+75 -L-
76.24'

+76 -L-
80.92'

+76 -L-
102'

+24 -L-
102'

+75 -L-
115'

+75 -L-
115'

+75 -L-
85'

+50 -L-
85'

PDE

TOE PROTECTION W/
PERMANENT EROSION
CONTROL MATTING
FOR TOE PROTECTION
EST. 45 TONS
EST. 100 SY FF
SEE DITCH DETAIL

5' X 5' BASE
PREFORMED
SCOUR HOLE
SEE DETAIL

3' BASE TAIL DITCH W/
CLASS "I" RIP RAP
EST. 40 TONS
EST. 85 SY FF
EST. 23 CY DDE
SEE DITCH DETAIL

-L- PC 262+67.81

-L- PRC 267+82.04

-L- STA. 265+60.00
END 200' TAPER
NB LANES

-L- STA. 263+60.00
BEGIN 200' TAPER
NB LANES

-L-
PI Sta 265+24.97
Δ = 2° 34' 16.3" (RT)
D = 0° 30' 00.0"
L = 514.24'
T = 257.16'
R = 11,459.16'
SE = 0.02 FT/FT

05-SEP-2013 15:13
R:\PROJECTS\U4026b\CADD_Geotech\Maps&More\u4026bp20_Geo20.psh
akarpo
A1

Plans prepared by:
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE #202
RALEIGH, N.C. 27606
For Division of Highways

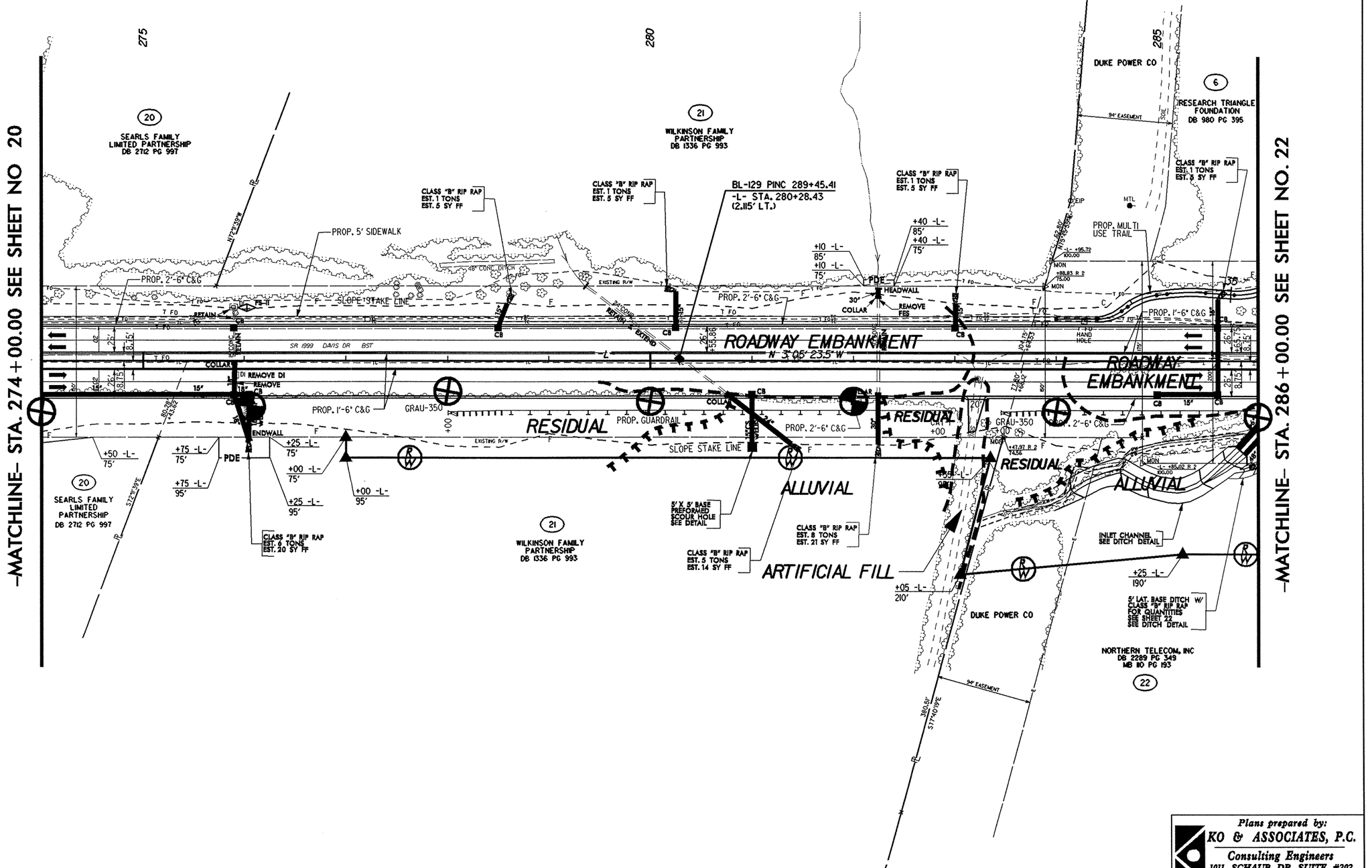
7/2/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-4026B	21
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83 | NC GRID



Plans prepared by:
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE #202
RALEIGH, N.C. 27606
For Division of Highways

05-SEP-2003 15:16
R:\PROJECTS\U4026b\CADD_Geotech\Maps&More\u4026bgp21.Geo21.psh
akarpa AT

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-4026B	22
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83 | NC GRID

-MATCHLINE- STA. 286+00.00 SEE SHEET NO. 21

-MATCHLINE- STA. 298+00.00 SEE SHEET NO. 23

6 RESEARCH TRIANGLE FOUNDATION DB 980 PG 395

6 RESEARCH TRIANGLE FOUNDATION DB 315 PG 537

OUTLET CHANNEL W/ CLASS "I" RIP RAP EST. 80 TONS EST. 113 SY FF EST. 40 CY DDE SEE DITCH DETAIL

-L- STA. 287+90.00 BEGIN 210' TAPER BUS LANE, SB

-L- STA. 290+00.00 END 210' TAPER BUS LANE, SB

-L- STA. 290+50.00 BEGIN 200' TAPER BUS LANE, SB

-L- STA. 292+50.00 END 200' TAPER BUS LANE, SB

CLASS "B" RIP RAP EST. 2 TONS EST. 7 SY FF

PROP. 6" MONO. 90° CONC. ISLAND

PROP. MULTI USE TRAIL

PROP. 6" MONO. CONC. ISLAND

PROP. 2'-6" C&G

PROP. 1'-6" C&G

SLOPE STAKE LINE F

EXISTING R/W

PROP. GUARDRAIL

ROADWAY EMBANKMENT

RESIDUAL

ALLUVIAL

N 3°05'23.5" W

-L-

-L- STA. 289+05.00 END 200' TAPER LT TURN LANE, NB

-L- STA. 288+20.00 END 200' TAPER RT. TURN LANE, NB

-L- STA. 287+05.00 BEGIN 200' TAPER LT. TURN LANE, NB

-L- STA. 286+20.00 BEGIN 200' TAPER RT. TURN LANE, NB

5' LAT. BASE DITCH W/ CLASS "B" RIP RAP EST. 92 TONS EST. 244 SY FF EST. 103 CY DDE SEE DITCH DETAIL

LAT. "V" DITCH EST. 62 CY DDE SEE DITCH DETAIL

CLASS "B" RIP RAP EST. 1 TONS EST. 5 SY FF

SPECIAL DITCH GRADE (SEE PROFILES)

BL-130 PINC 298+98.63 -L- STA. 289+80.73 (39.674' RT.)

22 NORTHERN TELECOM, INC DB 2289 PG 349 MB 110 PG 193

-L- STA. 292+40.00 BEGIN 210' TAPER BUS LANE, NB

INLET CHANNEL W/ CLASS "I" RIP RAP EST. 74 TONS EST. 104 SY FF EST. 350 CY DDE SEE DITCH DETAIL

-L- STA. 294+20.00 BEGIN 200' TAPER LT. TURN LANE, SB

BL-131 PINC 304+90.49 -L- STA. 295+71.34 (1.239' RT.)

BASF CORPORATION DB 2327 PG 535 MB 138 PG 72

23

-L- STA. 296+20.00 END 200' TAPER LT. TURN LANE, SB

RIP RAP ENERGY DISSIPATOR BASIN 4 FOR QUANTITIES SEE SHEET 23 SEE DITCH DETAIL

CLASS "B" RIP RAP EST. 2 TONS EST. 7 SY FF

REMOVE EXISTING BRIDGE

6' CONC. - 8' X 6' RCBC

2 @ 18"D W/ URBAN GRATE

1 @ 8' X 6' RCBC TAPERED INLET

5' X 5' BASE PREFORMED SCOUR HOLE SEE DETAIL

-L- TS 296+37.68

-L- STA. 294+50.00 END 210' TAPER BUS LANE, NB

22 NORTHERN TELECOM, INC DB 2289 PG 349 MB 110 PG 193

ARTIFICIAL FILL

SR 1999 DAVIS DR BST

18" CONC.

-L-
Pls Sta 297+92.48
Θs = 3°22'30.0"
Ls = 225.00'
LT = 150.03'
ST = 75.02'

Plans prepared by:
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE #202
RALEIGH, N.C. 27606
For Division of Highways

7/2/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-4026B	23
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83 | NC GRID

-MATCHLINE- STA. 298+00.00 SEE SHEET NO. 22

-MATCHLINE- STA. 310+00.00 SEE SHEET NO. 24

-L- STA. 299+90.00
BEGIN 210' TAPER
BUS LANE, SB

-L- STA. 302+00.00
END 210' TAPER
BUS LANE, SB

-L- STA. 306+00.00
BEGIN 200' TAPER
RT. TURN LANE, SB

-L- STA. 308+00.00
END 200' TAPER
RT. TURN LANE, SB

BL-133 PINC 315+57.02
-L- STA. 306+43.42
(17.007' RT.)

-L- SC 298+62.68

-L- STA. 298+15.00
BEGIN 200' TAPER
LT. TURN LANE, NB

-L- STA. 300+15.00
END 200' TAPER
LT. TURN LANE, NB

-L- STA. 301+85.00
BEGIN 200' TAPER
BUS LANE, NB

-L- STA. 303+85.00
END 200' TAPER
BUS LANE, NB

-L- STA. 304+30.00
BEGIN 200' TAPER
LT. TURN LANE, NB
LT. TURN LANE, SB

-L- STA. 306+30.00
END 200' TAPER
LT. TURN LANE, NB
LT. TURN LANE, SB

-L- STA. 306+45.00
END 210' TAPER
BUS LANE, NB

-L- CS 306+67.00

-L- ST 308+92.00

BL-132 PINC 311+16.70
-L- STA. 301+99.95
(3.339' RT.)

RIP RAP ENERGY DISSIPATOR BASIN 4 W/CLASS I RIP RAP
EST TONS
SQ YD FF
SEE DITCH DETAIL

TOE PROTECTION W/ PERMANENT EROSION CONTROL MATTING
EST. 33 TONS
EST. 72 SY FF
SEE DITCH DETAIL

TOE PROTECTION W/ PERMANENT EROSION CONTROL MATTING
EST. 30 TONS
EST. 57 SY FF
SEE DITCH DETAIL

TOE PROTECTION W/ PERMANENT EROSION CONTROL MATTING
EST. 18 TONS
EST. 37 SY FF
SEE DITCH DETAIL

(23) BASF CORPORATION DB 2327 PG 215 DB 138 PG 72

(24) BASF WYANDOTTE CORPORATION DB 1159 PG 624 MB 105 PG 98

(22) NORTHERN TELECOM, INC. DB 2450 PG 794 MB 130 PG 109

(22) NORTHERN TELECOM, INC DB 2289 PG 349 MB 110 PG 193

(6) RESEARCH TRIANGLE FOUNDATION DB 229 PG 376 MB 130 PG 109

PROP. MULTIUSE TRAIL

SR 1999 DAVIS DR BST

PROP. 2'-6" C&G

PROP. 1'-6" C&G

PROP. 6" MONO. CONC. ISLAND

EXISTING R/W

POND

+50 -L- 90'

+80 -L- 74.58'

+90 -L- 110'

+50 -L- 72.61'

+40 -L- 110'

+74 -L- 89.21'

+00 -L- 73.44'

+74 -L- 73.50'

+30 -L- 75.56'

+30 -L- 115'

+89.24 -L- 118'

Plans prepared by:
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE #202
RALEIGH, N.C. 27606
For Division of Highways

05-SEP-2003 13:22
C:\PROJECTS\u4026b\CADD_Geotech\Maps&More\u4026bp23_Geo23.psh
sbrown AT

7/2/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-4026B	24
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83 / NC GRID

-MATCHLINE- STA. 12+00.00 -Y13-
SEE SHEET NO. 29

-MATCHLINE- STA. 310+00.00 SEE SHEET NO. 23

-MATCHLINE- STA. 19+00.00 -Y13-
SEE SHEET NO. 30

-Y13- PC 20+15.50

-L- STA. 318+93.93
BEGIN 124.85' TAPER
RT. TURN LANE, SB

-L- STA. 319+59.77
END 160.89' TAPER
LT. TURN LANE, SB

-L- STA. 320+18.78
END 124.85' TAPER
RT. TURN LANE, SB

END STATE PROJECT U-4026
-L- STA. 320+18.78

POT Sta. 320+31.06

-L- POT 311+23.33
-Y13- POC 20+56.13

-Y13- PT 21+03.20

BL-134 PINC 319+69.01
BY11-228 PINC 10+09.69
-L- STA. 310+56.40
(40.773' RT.)

BL-7 PINC 327+58.63
GPS U-4026-7

-L- STA. 320+18.88
END 220' TAPER
RT. TURN LANE, NB

-L- STA. 317+98.88
BEGIN 160.89' TAPER
RT. TURN LANE, NB

-Y13- STA. 17+90.00
END 140' TAPER
LT. TURN LANE, NB
BEGIN 140' TAPER
LT. TURN LANE, SB

2004 ADT	-Y13- NC 54 20055 38955
2024 ADT	

21775 / 40275 -L- DAVIS DRIVE 29535 / 57365

1440 / 2640 | 5750 / 10750 | 860 / 1660 | 4310 / 8110

18305 / 35335

PROJECTED TRAFFIC VOLUMES

RESEARCH TRIANGLE FOUNDATION
DB 229 PG 376
MB 130 PG 109

NORTHERN TELECOM, INC
DB 2450 PG794
MB 13 PG 109

BECTON, DICKINSON AND COMPANY
DB 355 PG 138
MB 60 PG 77

RESEARCH TRIANGLE ASSOCIATES LIMITED PARTNERSHIP
DB1253 PG 791
MB 99 PG 192

BASF WYANDOTTE CORPORATION
DB 1511 PG 524
MB 105 PG 98

PROP. 6" MONO. CONC. ISLAND

SR 1999 DAVIS DR BST

Plans prepared by:
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR. SUITE #202
RALEIGH, N.C. 27606
For Division of Highways

05-SEP-2003 13:20
G:\Projects\U4026b\CADD_Geotech\Maps&More\u4026bp24_Geo24.psh
sbrown

7/2/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-4026B	25
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y9-
PIs Sta 11+18.69 PI Sta 17+40.19 PIs Sta 22+51.46
θs = 3° 27' 00.0" Δ = 60° 32' 05.6" (LT) θs = 3° 27' 00.0"
Ls = 120.00' D = 5° 45' 00.0" Ls = 120.00'
LT = 80.02' L = 1,052.78 LT = 80.02'
ST = 40.01' T = 581.52' ST = 40.01'
R = 996.45'
SE = 0.06 FT/FT
RUNOFF = 120.0 FT

NAD 83 / NC GRID

-MATCHLINE- STA. 23+00.00 SEE SHEET NO. 12

BY7-264 POT 5+00.00
-Y9- POT 10+00.00
-Y9- TS 10+38.67
-Y9- SC 11+58.67
S 65-18-24 E
-Y9- STA.14+25.00 BEGIN 395' TAPER LT.& RT.
BEGIN CONSTRUCTION
-Y9- POC 14+25.00
BY7-265 PINC 9+66.29
-Y9- STA. 14+62.55
(17.352 RT.)
-Y9- STA.18+20.00 END 395' TAPER LT.& RT.
-Y9- CS 22+11.45
SR 1639 KIT CREEK RD
EXISTING R/W
PROP. 6' MONO. CONC. ISLAND
BEGIN CONC. ISLAND +75.08
PROP. MULTI USE TRAIL
SPECIAL DITCH GRADE (SEE PROFILES)
SLOPE STAKE LINE
CAT-1 +00
COLLAR
GRAU-350 +25
GRAU-350 +00
RETAIN
LAT. "V" DITCH W/ CLASS "B" RIP RAP EST. 106 TONS EST. 298 SY FF EST. 148 CY DDE SEE DITCH DETAIL
CLASS "B" RIP RAP EST. 11 TONS EST. 28 SY FF
LONG INLET CAS (SEE PROFILES)
MATCHLINE -Y9-
BY7-219 PINC 14+85.22
-Y9- STA. 19+76.49
(24.272 RT.)
158.23' N47°18'00"W
WOODS
LANDSCAPE AREA
AREA LIGHT
BST
DUCT
TYP.
+20 -Y9- 77.62'
+20 -Y9- 105'
+00 -Y9- 105'
+80 -Y9- 78.48'
+40 -Y9- 135'
+00 -Y9- 71.76'
+50 -Y9- 90'
+50 -Y9- 135'
+00 -Y9- 115'
+00 -Y9- 78.70'
+00 -Y9- 110'
+60 -Y9- 125'
+70 -Y9- 100'
+50 -Y9- 100'
+11.45 -Y9- 100'
+25 -Y9- 100'
+00 -Y9- 115'
+00 -Y9- 90'
+45 -Y9- 115'

(10) CISCO SYSTEM INC. DB 7346 PG 569 BM 1997 PG 303

(9) TEER ASSOCIATES DEVELOPMENT, L.L.C. DB 6099 PG 458 MB 1994 PG 574

(7) SUMITOMO BANK LEASING AND FINANCE, INC DB 6204 PG 345 MB 1994 PG 950

Plans prepared by:
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE #202
RALEIGH, N.C. 27606
For Division of Highways

05-SEP-2003 13:37
SP:\PROJECTS\u4026b\CADD_Geotech\Maps&More\u4026bp25_Geo25.psh
sp:com 11 x 17

7/2/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-4026B	26
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83 / NC GRID

-MATCHLINE- STA. 29+00.00
SEE SHEET NO. 12

-Y9- STA. 31+65.35
BEGIN 300' TAPER
RT. TURN LANE, WB

-Y9- STA. 34+63.35
END 300' TAPER
RT. TURN LANE, WB

END CONSTRUCTION
-Y9- STA. 34+63.35 (WBL)

BY7-221 PINC 25+10.63
-Y9- STA. 29+94.29
(29.163' RT.)

BY7-266 PINC 30+15.18
-Y9- STA. 35+01.73
(22.72 RT.)

BY7-267 POT 34+73.95

8
BIOGEN, INC.
DB 8249 PG 340
DB 6377 PG 83
MB 1999 PG 264
MB 1994 PG 1560

+75 -Y9-
125'

+19.98 -Y9-
115'

+50 -Y9-
110.23'

CLASS "B" RIP RAP
EST TONS
EST SY FF

WOODS

KENNETH MURRAY DR

SR 1639 KIT CREEK RD BST

SLOPE STAKE LINE

39.66'

N 48° 07' 31.3" E

TIE TO EXISTING ISLAND

R-2000 AB (BY OTHERS)

R-2000 AB (BY OTHERS)

EXPOSED ELEC. CONDUIT

EXISTING R/W

PROP. 6' MONO. CONC. ISLAND

-Y9- F SLOPE STAKE LINE

-Y9- TS 29+69.98

-Y9- SC 31+19.98

RESEARCH TRIANGLE FOUNDATION
DB 1670 PG 239

-Y9- STA. 31+63.35
BEGIN 100' TAPER
LT. TURN LANE, EB

-Y9- STA. 32+63.35
END 100' TAPER
LT. TURN LANE, EB

END OVERLAY & WIDENING
-Y9- STA. 32+63.35 (EBL)

-Y9- PT 37+17.48

-Y9-

PIs Sta 30+69.98	PI Sta 34+19.26
θs = 1° 03' 01.7"	Δ = 8° 22' 07.0" (RT)
Ls = 150.00'	D = 1° 24' 02.2"
LT = 100.00'	L = 597.49
ST = 50.00'	T = 299.28'
	R = 4,090.75'
	SE = 0.03 FT/FT
	RUNOFF = 150.0 FT

Plans prepared by:
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE #202
RALEIGH, N.C. 27606
For Division of Highways

05-SEP-2003 13:27
G:\PROJECTS\u4026eb\CADD_Geotech\Maps&More\u4026bp26_Geo26.psh
sbrown

7/2/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-4026B	27
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83 NC GRID

RESEARCH TRIANGLE FOUNDATION OF NORTH CAROLINA
D.B. 980 PG. 395
PB. 94 PG. 48

SEARLS FAMILY LIMITED PARTNERSHIP
DB 2712 PG 997

RODNEY COE & MARIE S. COE
D.B. 1064 PG. 445

BY10-269 PINC 10+00.01
-Y12- STA. 11+52.53
(22.77 LT)

-Y12- STA. 10+30.00
BEGIN 500' TAPER
LT. LANE, WB &
RT. LANE, EB

BEGIN CONSTRUCTION
-Y12- PC 10+30.00

-Y12- STA. 15+30.00
END 500' TAPER
LT. LANE, WB &
RT. LANE, EB

BY10-224 PINC 14+88.38
GPS U-4026-6
-Y12- STA. 16+39.56
(58.31 LT)

-Y12- STA. 17+30.00
BEGIN 200' TAPER
LT. LANE, WB &
RT. LANE, EB

-Y12- STA. 19+30.00
END 200' TAPER
LT. LANE, WB &
RT. LANE, EB

-Y12- PC 10+00.00

-Y12- PT 17+66.67

-Y12-
PI Sta 13+83.34
Δ = 0°05'26.4" (RT)
D = 0°00'42.6"
L = 766.67'
T = 383.34'
R = 484,515.26'
SE = 0.02 FT/FT

-MATCHLINE- STA. 22+00.00 SEE SHEET NO. 19

EISAI INC.
D.B. 2667 PG. 583

DAVIS DRIVE ASSOCIATES, LTD
DB 870 PG 88
MB 145 PG 55

SLOPE STAKE LINE

PROP. 6" MONO. CONC. ISLAND

PROP. 5' SIDEWALK

PROP. 2'-6" C&G

PAVED SWALE TO DITCH

CLASS "B" RIP RAP
EST. 2 TONS
EST. 7 SY FF

2GI w/ URBAN GRATE

BACKFLOW PREVENTER

T FO CABLE CUT AND EXPOSED AT THIS LOCATION

TIE TO EXIST C&G

SR 1978 HOPSON RD 24' BST

5 SMB BUS.

Plans prepared by:
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE #202
RALEIGH, N.C. 27606
For Division of Highways

05-SEP-2003 13:30
G:\PROJECTS\u4026b\CADD_Geotech\Maps&More\u4026bp27_Geo27.psh
sbrown AT

7/2/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-4026B	28
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83 NC GRID

-MATCHLINE- STA. 29+00.00 SEE SHEET NO. 19

-Y12- STA. 31+60.00
BEGIN 200' TAPER
LT. LANE, WB &
RT. LANE, EB

-Y12- STA. 33+60.00
END 200' TAPER
LT. LANE, WB &
RT. LANE, EB

-Y12- STA. 35+60.00
BEGIN 500' TAPER
LT. LANE, WB &
RT. LANE, EB

BY10-270 PINC 34+32.11
-Y12- STA. 35+77.36
(14.42 LT)

BY10-271 POT 38+67.09
-Y12- STA. 40+08.07
(25.59 LT)

-Y12- STA. 40+60.00
END 500' TAPER
LT. LANE, WB &
RT. LANE, EB

20 SEARLS FAMILY LIMITED PARTNERSHIP DB 2712 PG 997

27 ROBERT H. & NANCY C. MALLETT DB 2044 PG 112

28 SUSAN S O'BRIEN & PATRICIA S. O'BRIEN DB 1822 PG 237 PB 190 PG 136

29 AGATHA L. HURST DB 233 PG 085 PB 30 PG 116

30 CHARLES KENNEDY & WIFE JANE W. DB 1275 424 PB 30 PG 116

31 RONALD K. MAYNOR DB 1080 PG 151 PB 100 PG 148

32 GERALD E. SEARLS DB 165 PG 358 PB 61PG 127

19 TECHNOLOGY IV, LLC DB 241PG 969 BM 139 PG 171

25 TECHNOLOGY III, LLC DB 241PG 951 MB 139 PG 171

26 RAYMOND M. PROCTOR &WIFE FAYE B. DB 989 PG 567 PB 95 PG 10

RAYMOND M. PROCTOR & WIFE FAYE B. DB 287 PG 107

-Y12- PC 33+83.66

-Y12- PCC 36+05.51

-Y12- PCC 38+13.43

-Y12- PCC 38+67.51

-Y12- PT 40+56.34

-Y12- POT 41+03.

BY10-226 PINC 30+29.33
-Y12- STA. 31+76.57
(22.94 RT)

END CONSTRUCTION
-Y12- POT 40+60.00

-Y12-			
PI Sta 34+94.63	PI Sta 37+09.84	PI Sta 38+40.50	PI Sta 39+62.00
Δ = 4° 10' 04.6" (RT)	Δ = 11° 54' 47.1" (RT)	Δ = 6° 53' 10.9" (RT)	Δ = 5° 58' 31.2" (RT)
D = 1° 52' 43.5"	D = 5° 43' 46.5"	D = 12° 43' 56.7"	D = 3° 09' 54.1"
L = 221.85'	L = 207.92'	L = 54.09'	L = 188.79'
T = 110.97'	T = 104.34'	T = 27.08'	T = 94.48'
R = 3,049.69'	R = 1,000.00'	R = 450.00'	R = 1,810.28'
SE = 0.04 FT/FT	SE = 0.06 FT/FT	SE = 0.06 FT/FT	SE = 0.06 FT/FT
RUNOFF = 110.0 FT			RUNOFF = 165.0 FT

Plans prepared by:
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR. SUITE #202
RALEIGH, N.C. 27606
For Division of Highways

05-SEP-2003 13:31
N:\PROJECTS\u4026b\CADD_Geotech\Maps&More\u4026bp28_Geo28.psh
storown
41

7/2/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-4026B	29
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83 / NC GRID

-MATCHLINE- STA. 12+00.00 -Y13-
SEE SHEET NO. 24

RESEARCH TRIANGLE ASSOCIATES LIMITED PARTNERSHIP
DB 1253 PG 791
MB 99 PG 192

RESEARCH TRIANGLE FOUNDATION OF NORTH CAROLINA
DB 980 PG 395

(24) BASF WYANDOTTE CORPORATION
DB 1159 PG 624
MB 105 PG 98

(33) RESEARCH TRIANGLE ASSOCIATES LIMITED PARTNERSHIP
DB 1253 PG 791
MB 99 PG 192

BYII-272 POT 0+37.94

-Y13- STA. 8+83.00
BEGIN 100' TAPER
RT. TURN LANE, SB

-Y13- STA. 9+83.00
END 100' TAPER
RT. TURN LANE, SB

BYII-227 PINC 5+00.00
-Y13- STA. 10+19.23
(33.856' RT.)

PROP. 6' MONO. CONC. ISLAND

S 59° 53' 32.8" E

23-SEP-2003 15:18
R:\PROJECTS\u4026b\CADD_Geotech\Maps&More\u4026bp29_GeoInv29.psh
akarpa

Plans prepared by:
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE #202
RALEIGH, N.C. 27606
For Division of Highways

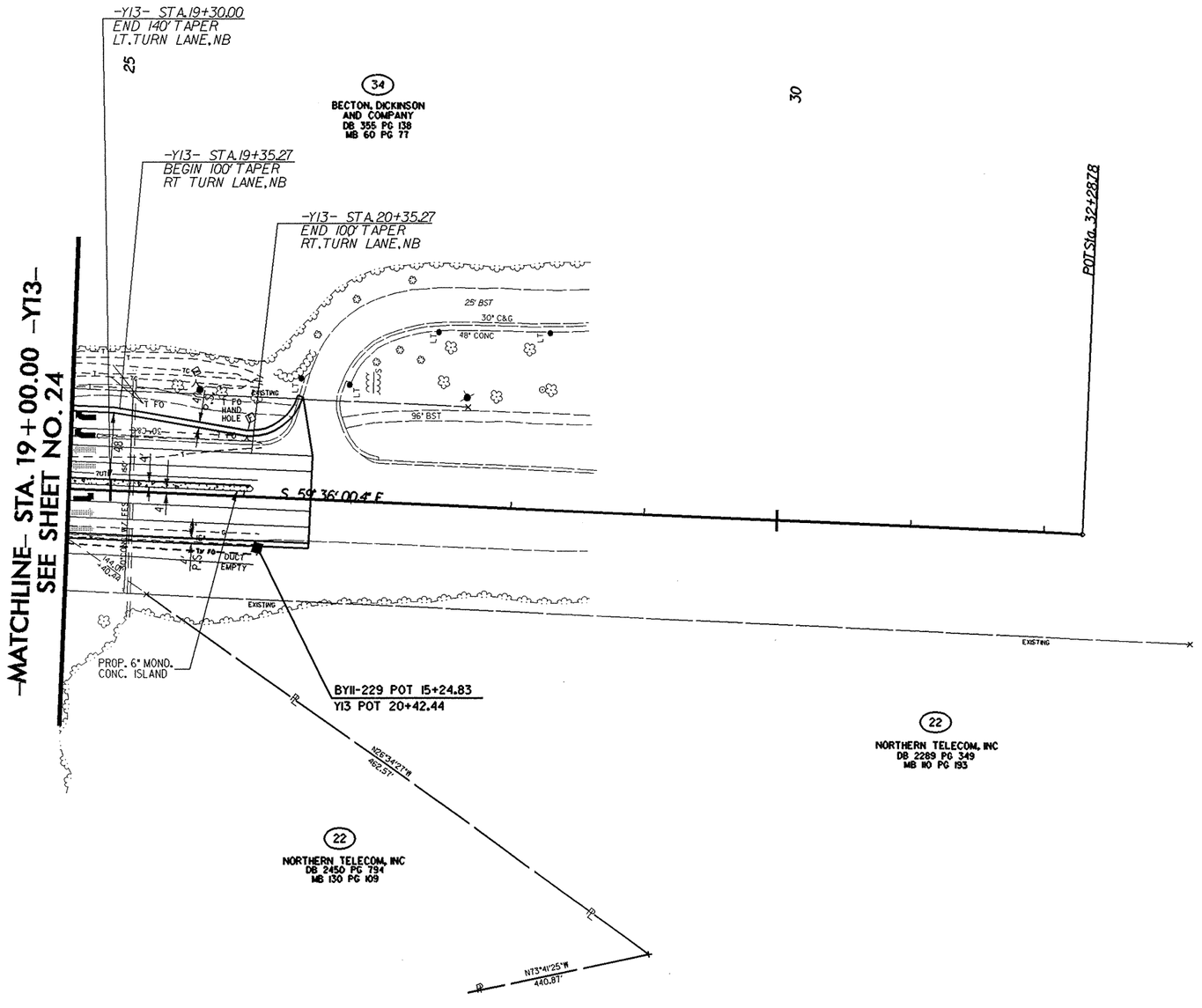
7/2/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-4026B	30
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83 NC GRID



Plans prepared by:
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE #202
RALEIGH, N.C. 27606
For Division of Highways

05-SEP-2003 13:35
G:\PROJECTS\u4026b\CADD_Geotech\Maps&More\u4026bp30_Geo30.psh
Slovum AT

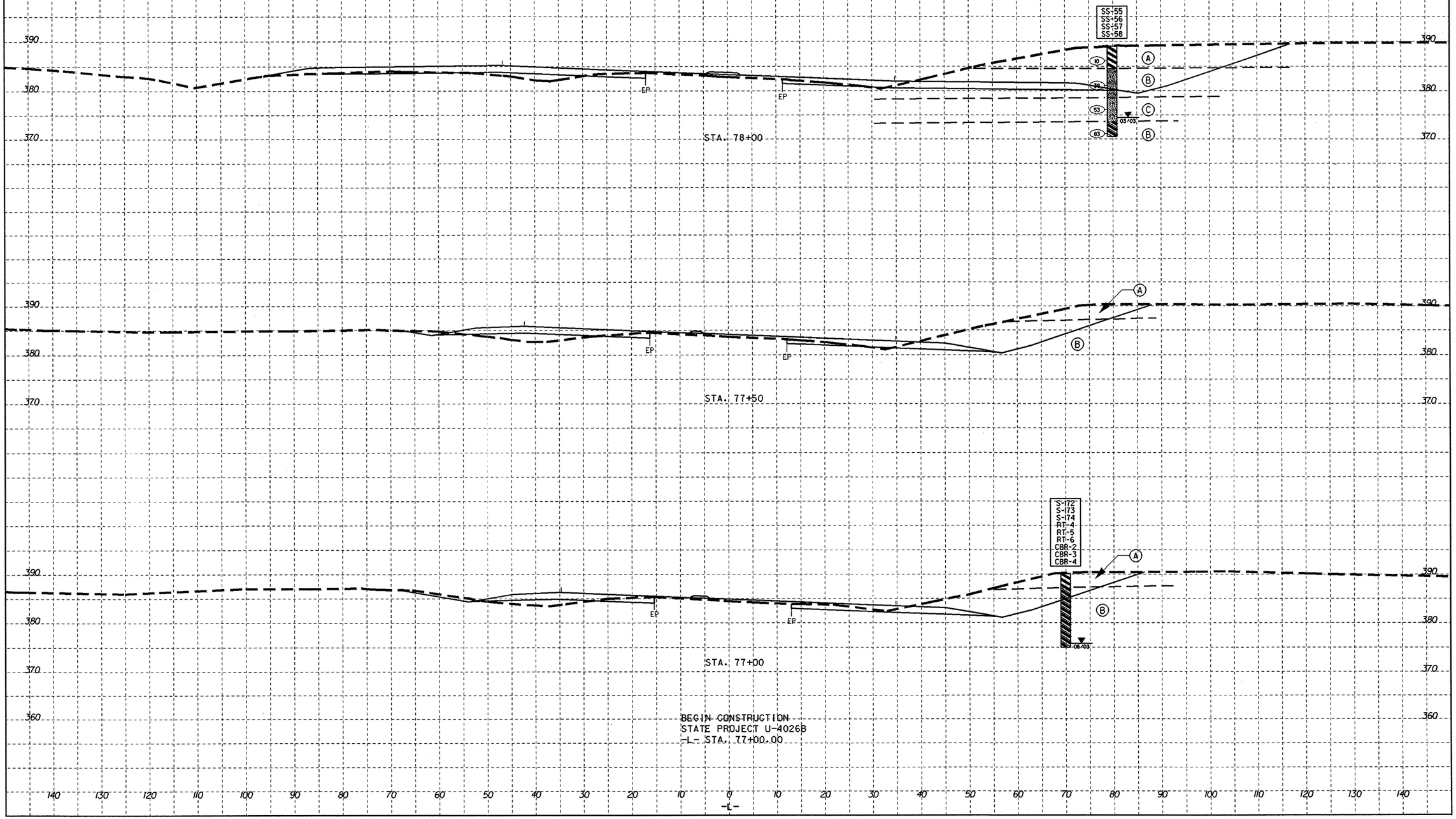
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	31

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
RT-4	70' RT	77+00	0.0-3.0	A-7-6(18)	60	39	25.8	21.1	16.4	36.8	96	79	55	-	-
S-172	70' RT	77+00	0.0-3.0	A-7-6(28)	70	46	21.9	17.0	16.6	44.5	99	85	64	-	-
CBR-2	70' RT	77+00	0.0-3.0	A-7-6(24)	69	48	26.4	17.3	15.7	40.7	97	79	57	-	-
S-173	70' RT	77+00	3.0-7.0	A-6(6)	39	18	31.0	20.9	19.8	28.3	99	83	52	-	-
RT-5	70' RT	77+00	3.0-7.0	A-7-6(7)	42	22	28.4	25.2	17.8	28.6	98	80	50	-	-
CBR-3	70' RT	77+00	3.0-7.0	A-6(7)	39	19	25.6	23.8	22.2	28.5	99	83	54	-	-
S-174	70' RT	77+00	7.0-15.0	A-6(1)	32	13	41.7	21.9	20.2	16.2	98	70	39	-	-
RT-6	70' RT	77+00	7.0-15.0	A-6(3)	36	18	42.1	22.1	19.4	16.4	96	68	39	-	-
CBR-4	70' RT	77+00	7.0-15.0	A-6(2)	37	18	43.9	20.5	19.3	16.3	97	67	38	-	-
SS-55	80' RT	78+00	2.0-3.5	A-7-6(20)	48	28	15.2	11.2	26.8	46.7	96	85	74	-	-
SS-56	80' RT	78+00	7.0-8.5	A-4(0)	28	6	29.7	33.9	22.2	14.2	99	82	42	11.1	-
SS-57	80' RT	78+00	12.0-13.5	A-2-4(0)	28	NP	56.9	22.6	13.4	7.1	96	54	23	-	-
SS-58	80' RT	78+00	17.0-18.5	A-6(6)	28	11	8.7	30.1	38.8	22.4	100	95	72	11.3	-

LEGEND

A: RESIDUAL, YELLOW-BROWN, SOFT TO STIFF, HIGHLY PLASTIC, MOIST, SILTY CLAY
B: RESIDUAL, RED-BROWN, BROWN, AND GRAY, SOFT TO HARD, SLIGHTLY TO MODERATELY PLASTIC, MOIST TO WET, SANDY CLAY AND SANDY SILT
C: RESIDUAL, RED AND GRAY, VERY DENSE, MOIST TO WET, SILTY SAND



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	32

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-63	73' RT	82+00	0.0-6.0	A-6(3)	34	17	17.6	23.7	26.4	32.4	67	60	43	-	-
S-64	73' RT	82+00	6.0-16.0	A-6(7)	34	16	18.6	22.6	24.4	34.4	97	86	62	-	-
S-65	73' RT	82+00	16.0-22.0	A-7-6(8)	41	22	29.5	23.1	19.1	28.3	98	79	51	-	-
S-66	73' RT	82+00	30.0-32.2	A-6(10)	34	17	10.5	24.7	30.4	34.4	97	90	70	-	-
SS-67	50' RT	84+00	2.3-3.8	A-6(4)	28	11	19.6	25.9	28.2	26.3	95	83	58	-	-
SS-68	50' RT	84+00	7.3-8.8	A-6(6)	31	13	15.8	24.5	27.4	32.4	95	86	62	15.9	-
SS-69	50' RT	84+00	17.3-18.8	A-4(2)	26	9	25.5	27.1	25.2	22.2	93	77	51	18.2	-
SS-70	50' RT	84+00	22.3-23.8	A-4(0)	19	4	38.2	26.7	18.9	16.2	96	71	39	-	-
SS-71	50' RT	84+00	27.3-28.8	A-4(0)	23	7	33.0	27.7	19.1	20.2	98	77	44	-	-
SS-72	50' RT	84+00	32.3-33.8	A-6(7)	33	11	2.4	38.6	40.7	18.2	100	99	71	9.7	-

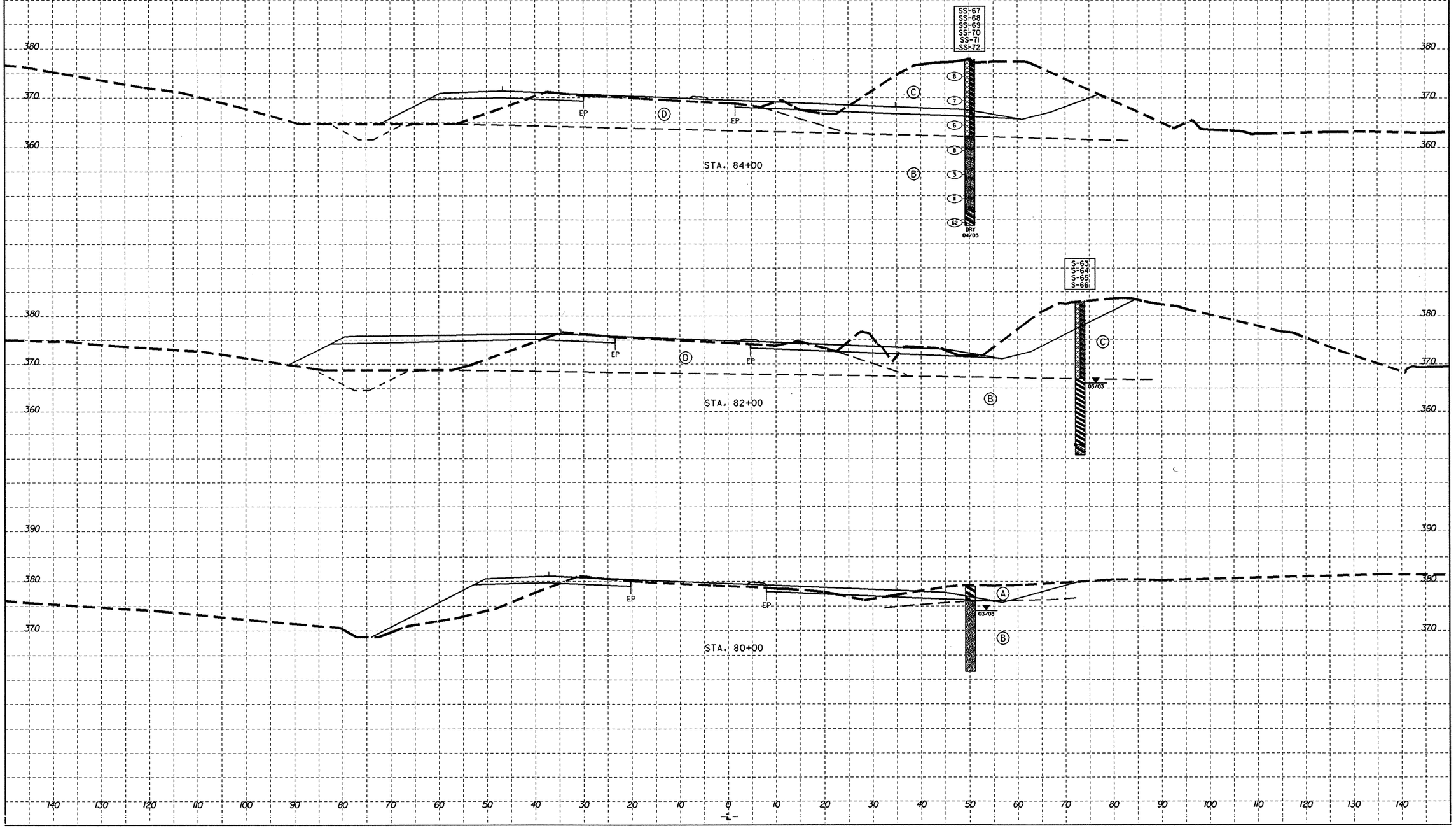
LEGEND

A: RESIDUAL, YELLOW-BROWN, MEDIUM STIFF, HIGHLY PLASTIC, MOIST, SILTY CLAY

B: RESIDUAL, RED-BROWN, YELLOW-BROWN, AND GREEN-GRAY, SOFT TO HARD, MOIST TO WET, SANDY SILT AND SLIGHTLY TO MODERATELY PLASTIC, SANDY, AND SILTY CLAY

C: ARTIFICIAL FILL, RED-BROWN, BROWN, AND GREEN-GRAY, SOFT TO MEDIUM STIFF, SLIGHTLY TO MODERATELY PLASTIC, MOIST, SANDY CLAY

D: ROADWAY EMBANKMENT



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	33

SOIL TEST RESULTS

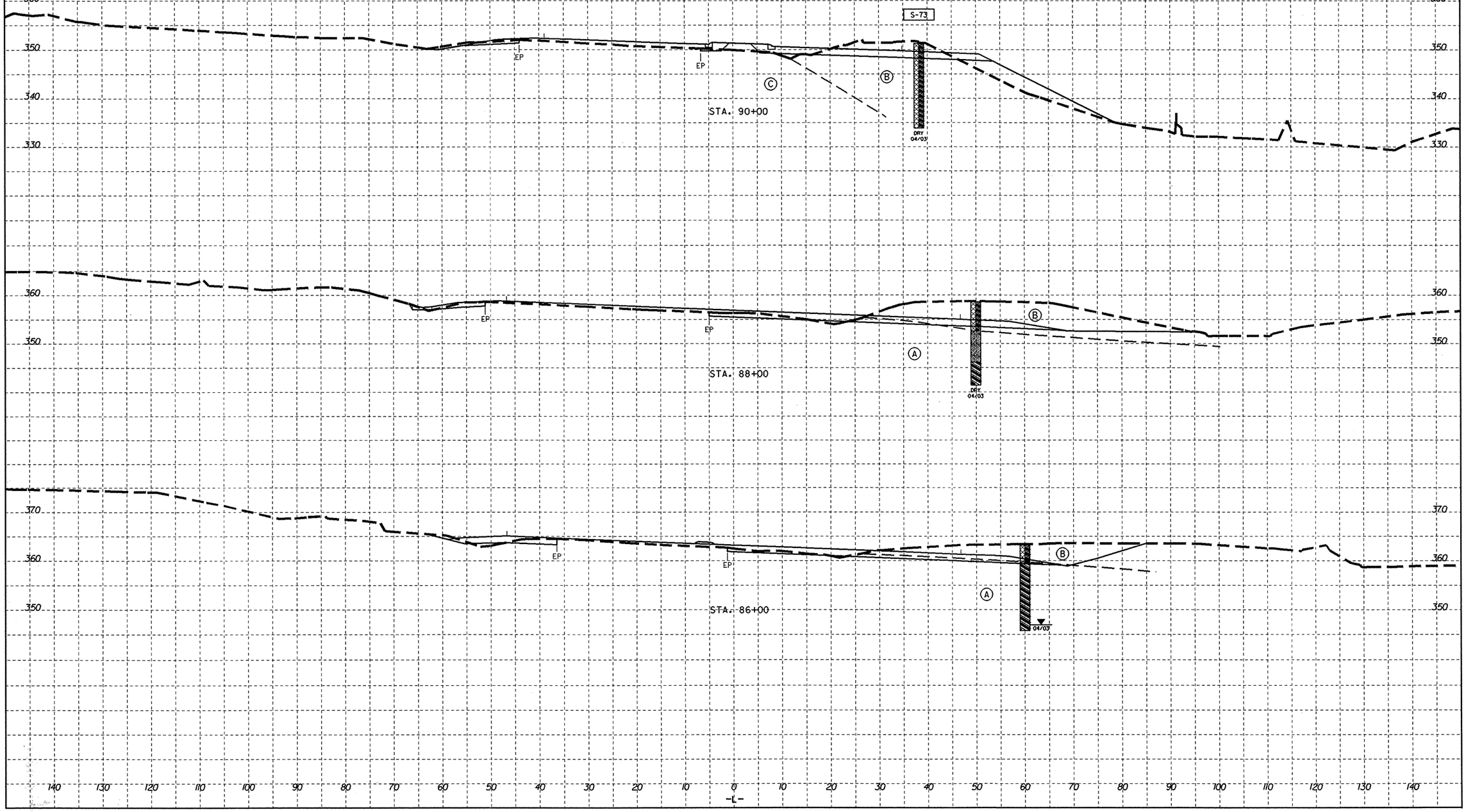
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-73	38' RT	90+00	0.0-7.0	A-6(3)	30	13	18.8	29.5	25.4	26.3	85	75	49	-	-

LEGEND

A: RESIDUAL, RED-BROWN, YELLOW-BROWN, AND GREEN-GRAY, MEDIUM STIFF TO HARD, MOIST TO WET, SANDY SILT AND SLIGHTLY PLASTIC, SANDY CLAY

B: ARTIFICIAL FILL, RED-BROWN AND BROWN, SOFT TO STIFF, SLIGHTLY PLASTIC, MOIST, SANDY CLAY

C: ROADWAY EMBANKMENT



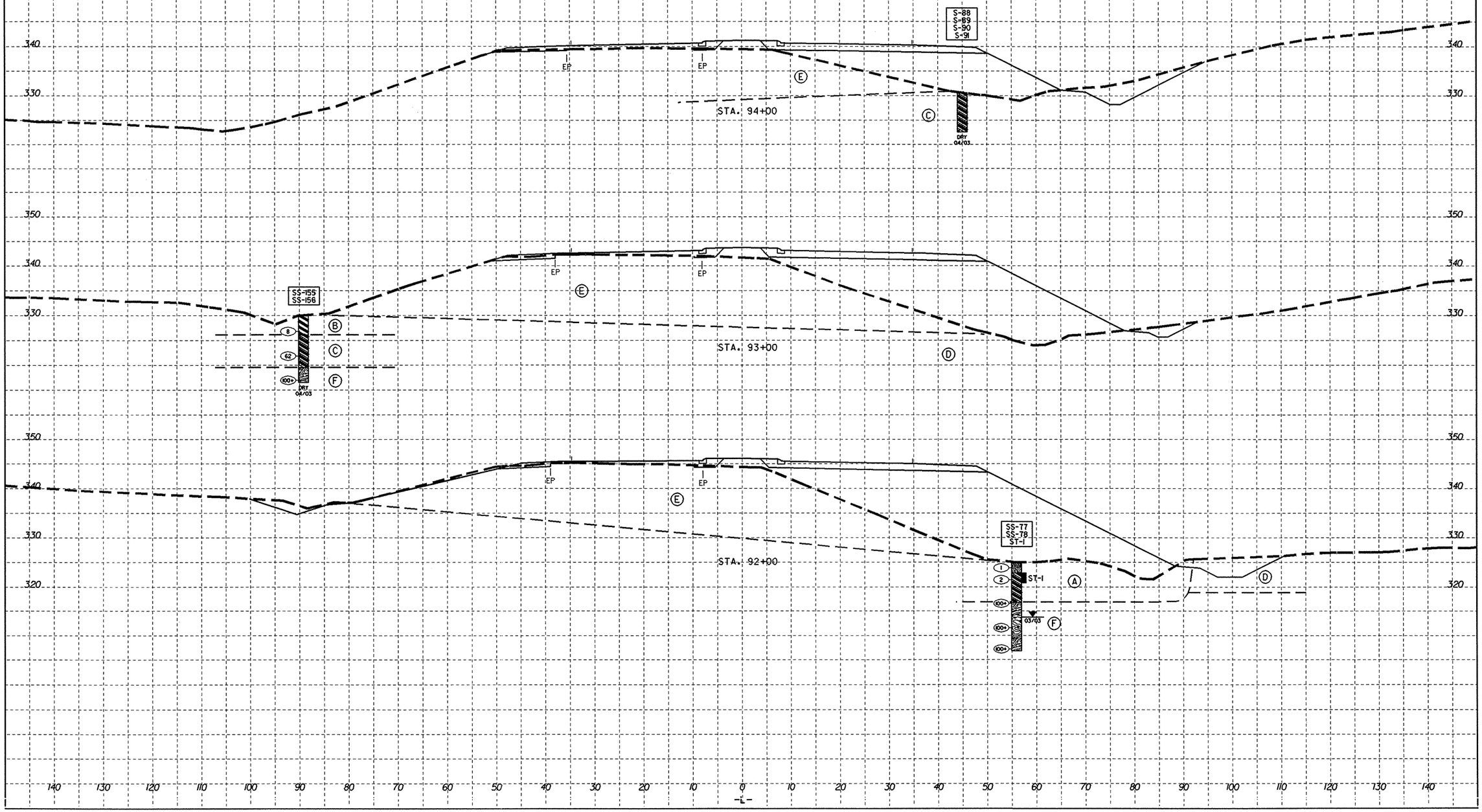
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	34

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-77	56' RT	92+00	0.0-1.5	A-4(1)	26	8	30.4	28.3	20.6	20.8	99	81	48	25.6	-
ST-1	56' RT	92+00	2.0-4.0	A-4(1)	23	6	23.2	28.7	28.0	20.2	99	85	53	18.4	-
SS-78	56' RT	92+00	2.4-3.9	A-6(4)	28	11	22.7	23.5	24.7	29.1	100	86	59	-	-
SS-155	89' LT	93+00	2.3-3.8	A-7-6(15)	48	29	19.0	25.1	23.3	32.7	100	90	62	14.4	-
SS-156	89' LT	93+00	7.3-8.8	A-6(17)	37	16	0.4	2.0	66.9	30.6	100	100	99	-	-
S-88	45' RT	94+00	0.5-2.0	A-6(6)	33	13	17.9	24.3	28.7	29.1	96	85	62	-	-
S-89	45' RT	94+00	2.0-4.0	A-6(7)	32	14	12.1	29.3	29.5	29.1	97	90	65	-	-
S-90	45' RT	94+00	4.0-6.0	A-6(5)	33	14	23.7	23.1	20.0	33.3	97	80	57	-	-
S-91	45' RT	94+00	6.0-8.0	A-6(8)	40	19	32.4	8.3	34.3	24.9	95	71	58	-	-

LEGEND

A: ALLUVIAL, BROWN AND GREEN-GRAY, VERY SOFT TO SOFT, MOIST, SANDY SILT AND SLIGHTLY PLASTIC, SANDY CLAY
B: RESIDUAL, YELLOW-BROWN AND GRAY, MEDIUM STIFF TO STIFF, HIGHLY PLASTIC, MOIST, SILTY CLAY
C: RESIDUAL, RED-BROWN AND GREEN-GRAY, SOFT TO HARD, SLIGHTLY TO MODERATELY PLASTIC, MOIST, SANDY CLAY
D: RESIDUAL
E: ROADWAY EMBANKMENT
F: WEATHERED ROCK (SILTSTONE AND CLAYSTONE)

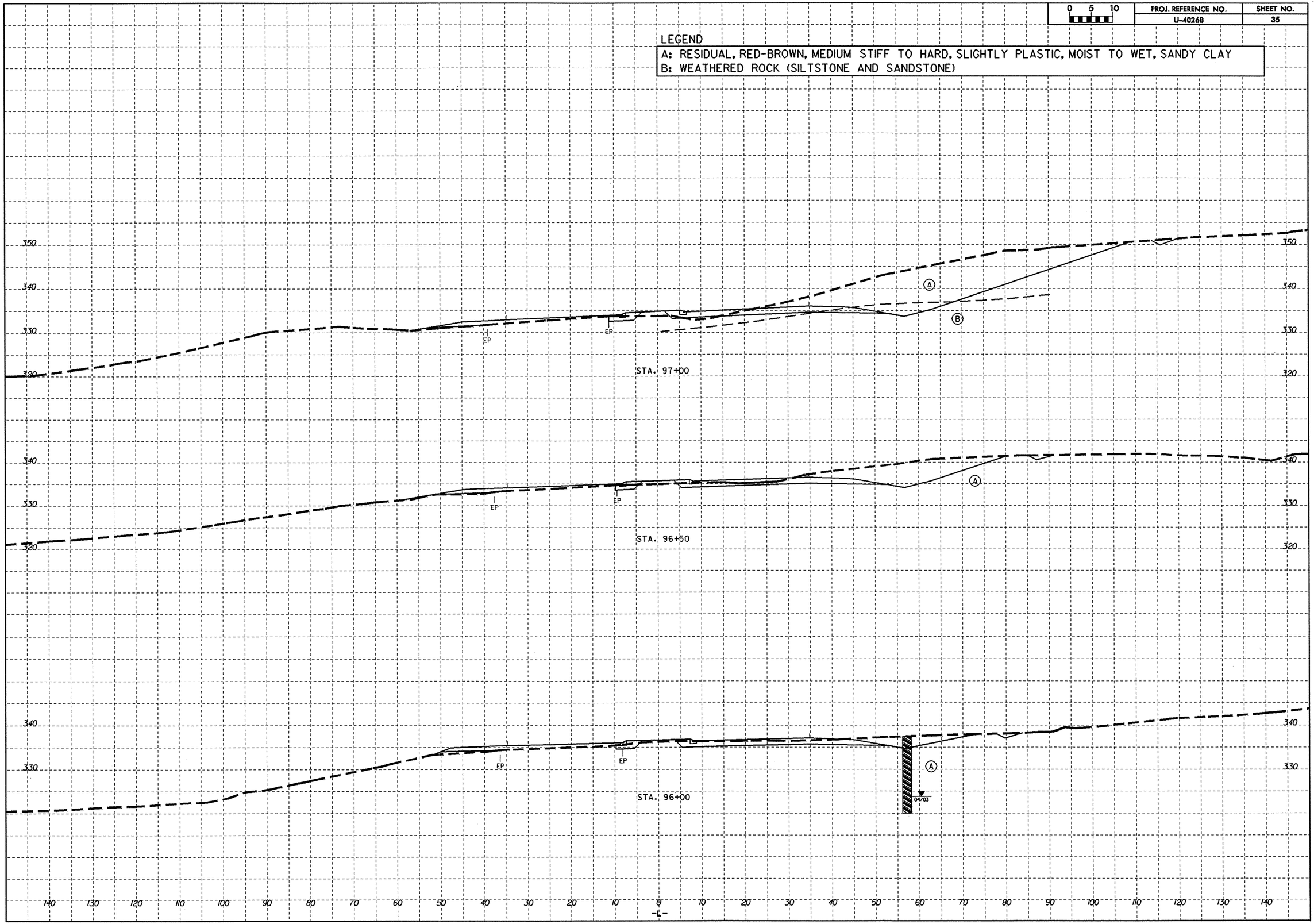


0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	35

LEGEND

A: RESIDUAL, RED-BROWN, MEDIUM STIFF TO HARD, SLIGHTLY PLASTIC, MOIST TO WET, SANDY CLAY

B: WEATHERED ROCK (SILTSTONE AND SANDSTONE)



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	36

SOIL TEST RESULTS

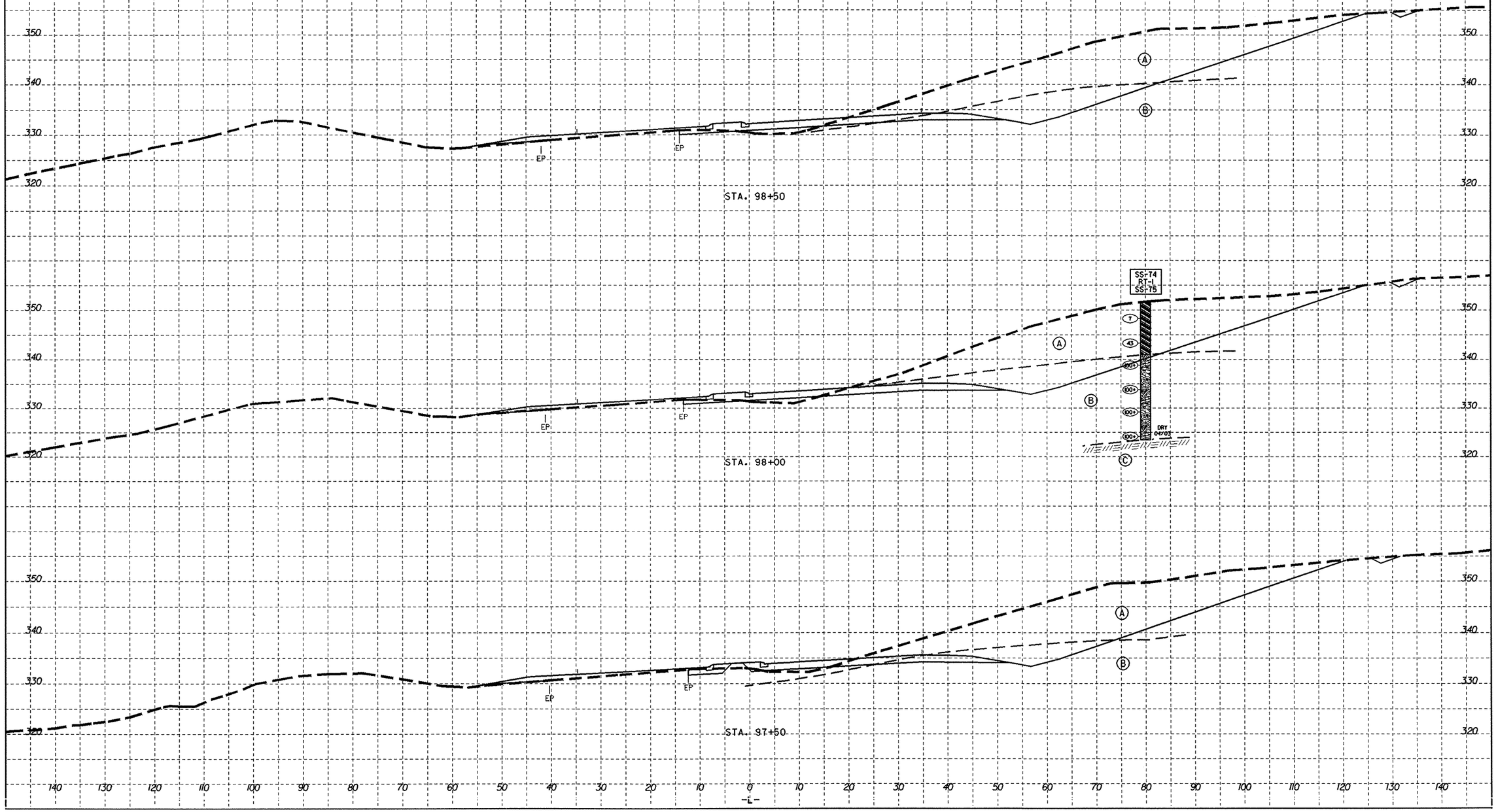
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-74	80' RT	98+00	2.2-3.7	A-6(4)	33	14	29.7	24.7	22.7	22.9	99	80	50	22.2	-
RT-1	80' RT	98+00	2.0-10.0	A-7-6(19)	46	25	8.3	15.2	30.8	45.7	95	91	77	-	-
SS-75	80' RT	98+00	7.2-8.7	A-6(14)	36	14	0.8	8.7	57.2	33.3	100	99	95	-	-

LEGEND

A: RESIDUAL, RED-BROWN AND YELLOW-BROWN, MEDIUM STIFF TO HARD, SLIGHTLY TO MODERATELY PLASTIC, MOIST, SANDY CLAY

B: WEATHERED ROCK (SILTSTONE AND SANDSTONE)

C: NON-CRYSTALLINE ROCK (SILTSTONE)



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	37

SOIL TEST RESULTS

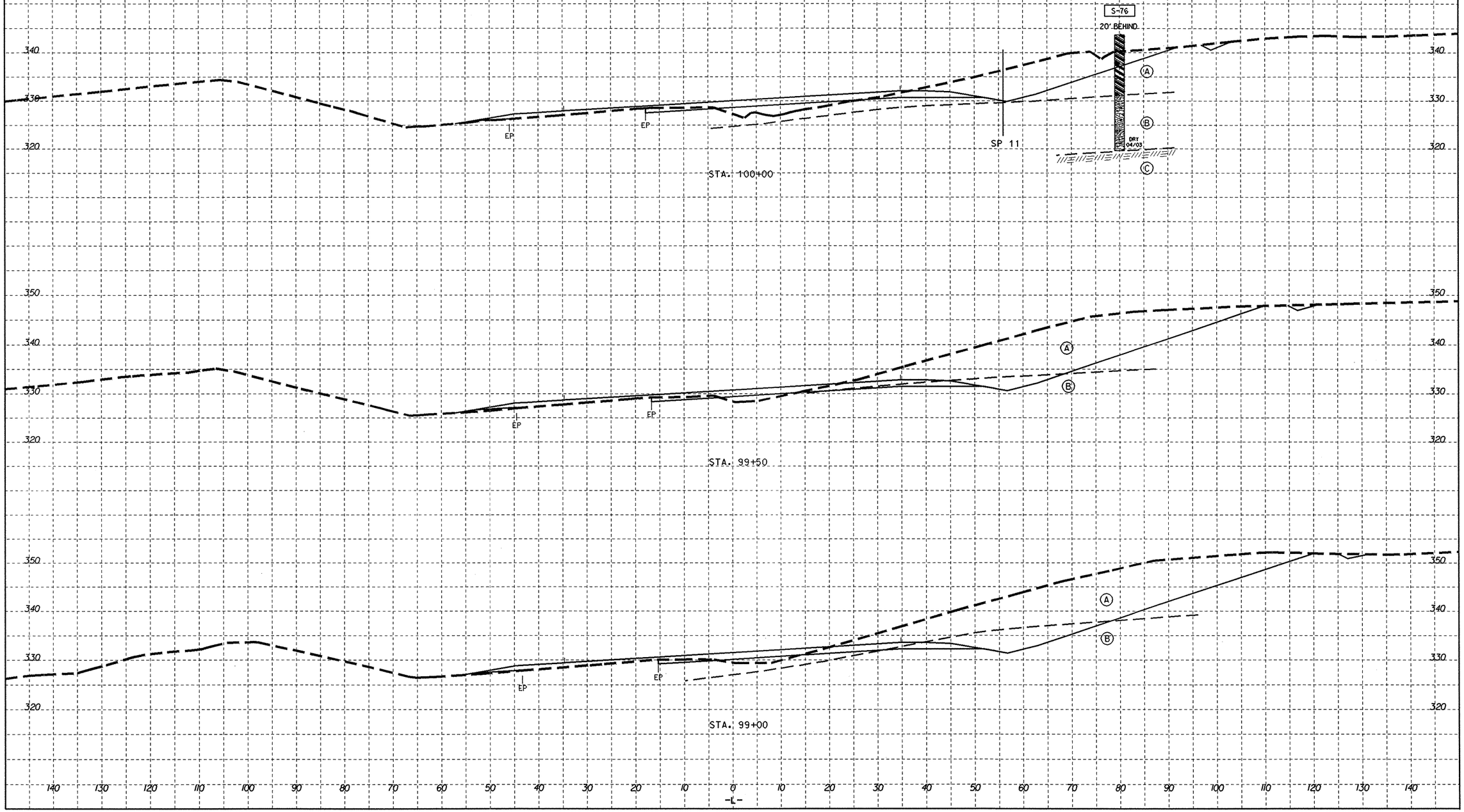
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-76	80' RT	99+80	6.0-9.0	A-7-6(26)	48	24	1.5	6.4	42.2	49.9	100	99	95	-	-

LEGEND

A: RESIDUAL, RED-BROWN, YELLOW-BROWN, AND GREEN-GRAY, SOFT TO HARD, SLIGHTLY TO MODERATELY PLASTIC, MOIST, SANDY AND SILTY CLAY

B: WEATHERED ROCK (SANDSTONE)

C: NON-CRYSTALLINE ROCK (SANDSTONE)



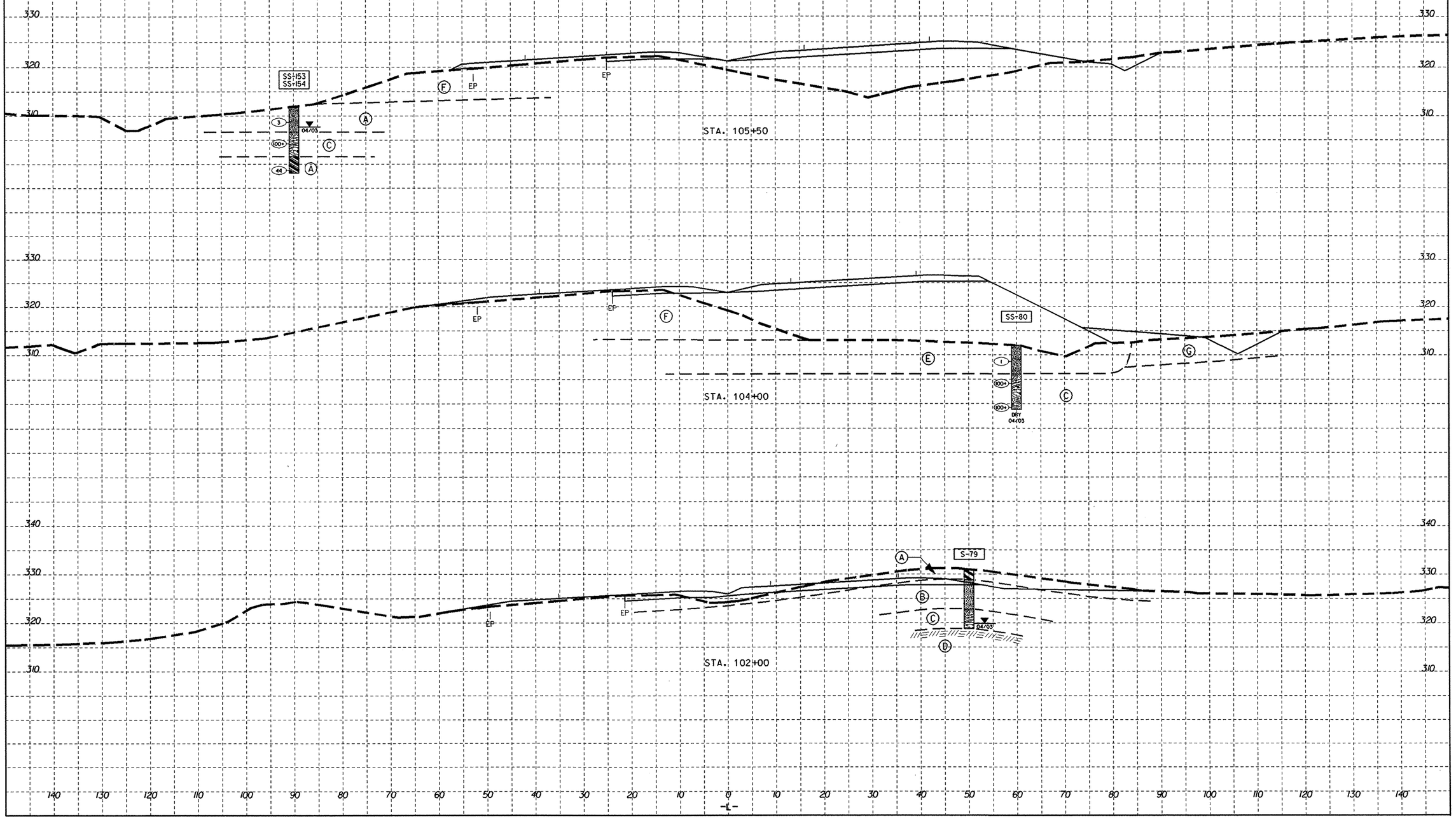
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	38

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-79	50' RT	102+00	2.0-7.0	A-2-4(0)	32	10	53.4	23.0	12.2	11.4	89	52	25	-	-
SS-80	60' RT	104+00	2.4-3.9	A-4(0)	20	5	31.2	34.7	17.5	16.6	96	80	38	-	-
SS-153	90' LT	105+50	2.1-3.6	A-4(2)	27	10	29.0	29.2	25.5	16.3	100	82	47	-	-
SS-154	90' LT	105+50	12.1-13.6	A-6(4)	31	11	19.2	20.4	42.0	18.4	90	78	56	-	-

LEGEND

A: RESIDUAL, RED-BROWN AND BROWN, SOFT TO HARD, MOIST TO WET, SANDY SILT AND SLIGHTLY TO MODERATELY PLASTIC, SANDY AND SILTY CLAY
B: RESIDUAL, RED-BROWN AND BROWN, MEDIUM DENSE, MOIST, SILTY SAND
C: WEATHERED ROCK (SILTSTONE AND SANDSTONE)
D: NON-CRYSTALLINE ROCK (SANDSTONE)
E: ALLUVIAL, BROWN, VERY SOFT, MOIST, SANDY SILT
F: ROADWAY EMBANKMENT
G: RESIDUAL



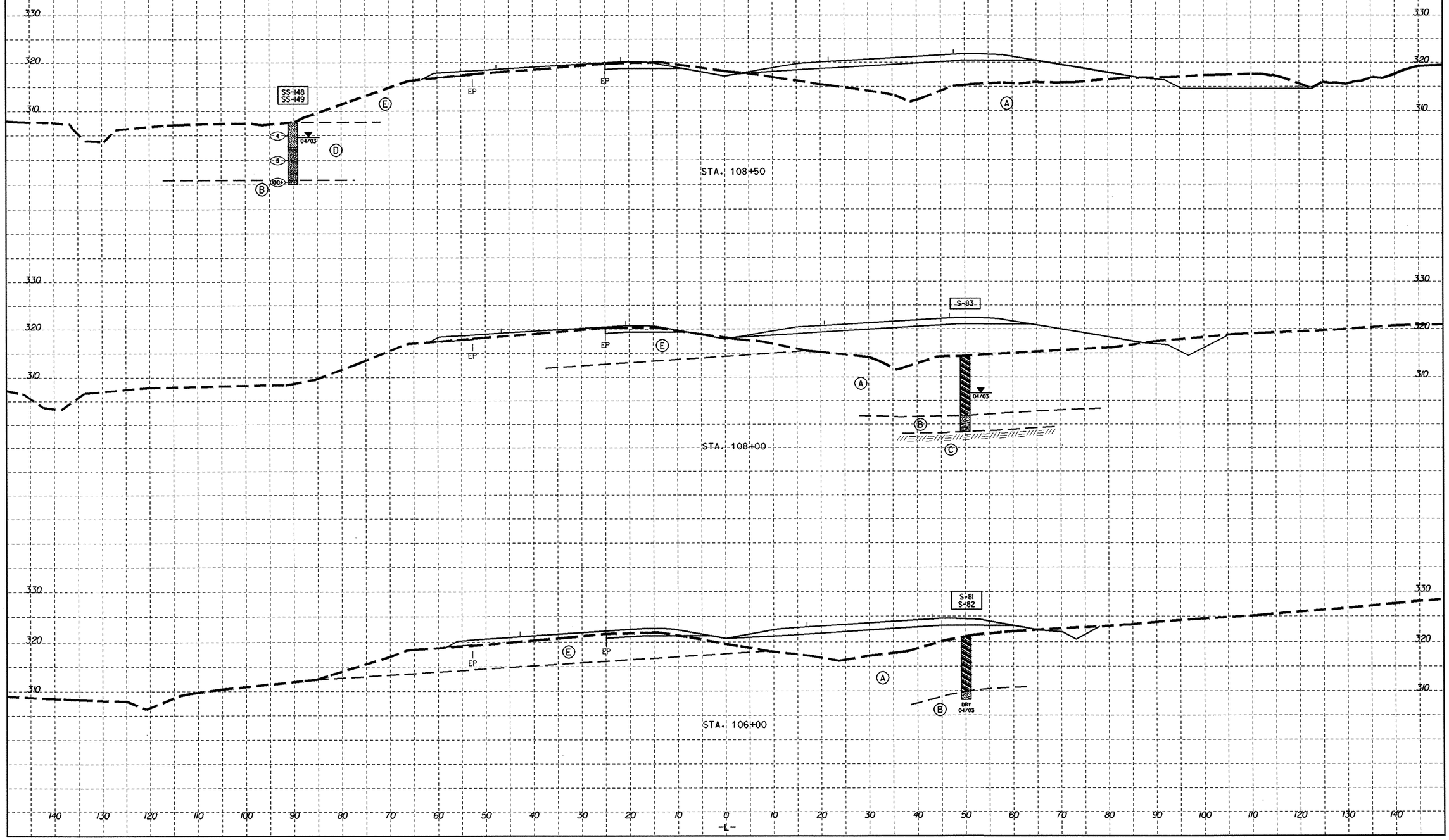
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	39

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-81	50' RT	106+00	0.0-5.0	A-6(7)	35	21	22.7	32.0	16.2	29.1	99	86	51	-	-
S-82	50' RT	106+00	9.0-10.0	A-6(12)	35	16	4.8	15.4	50.7	29.1	98	96	83	-	-
S-83	50' RT	108+00	0.0-5.0	A-6(5)	28	13	13.3	33.3	24.3	29.1	100	94	60	-	-
SS-148	90' LT	108+50	1.7-3.2	A-2-4(0)	20	5	36.3	36.3	19.3	8.2	99	76	34	-	-
SS-149	90' LT	108+50	6.7-8.2	A-4(2)	28	9	16.1	34.7	26.8	22.4	100	93	54	19.1	-

LEGEND

A: RESIDUAL, RED-BROWN AND YELLOW-BROWN, SOFT TO HARD, SLIGHTLY TO MODERATELY PLASTIC, MOIST TO WET, SANDY CLAY
B: WEATHERED ROCK (SILTSTONE AND SANDSTONE)
C: NON-CRYSTALLINE ROCK (SANDSTONE)
D: ALLUVIAL, YELLOW-BROWN, LOOSE, MOIST TO WET, SILTY SAND AND GREEN-GRAY, MEDIUM STIFF, WET, SANDY SILT
E: ROADWAY EMBANKMENT



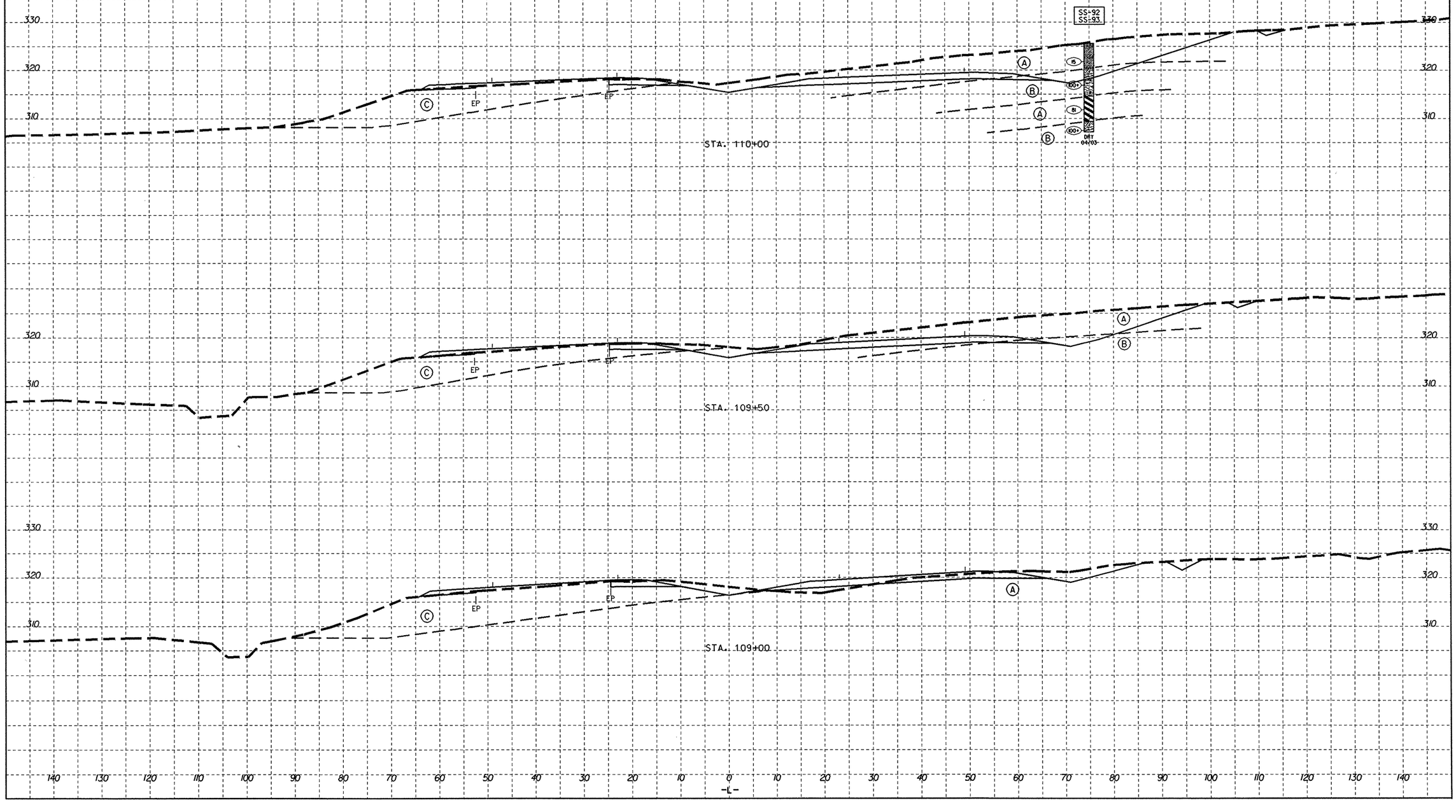
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	40

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-92	75' RT	110+00	2.9-3.4	A-4(0)	32	8	16.2	51.6	17.7	14.6	100	94	40	21.8	-
SS-93	75' RT	110+00	12.9-14.4	A-7-6(21)	48	20	5.2	4.6	40.3	49.9	100	96	92	-	-

LEGEND

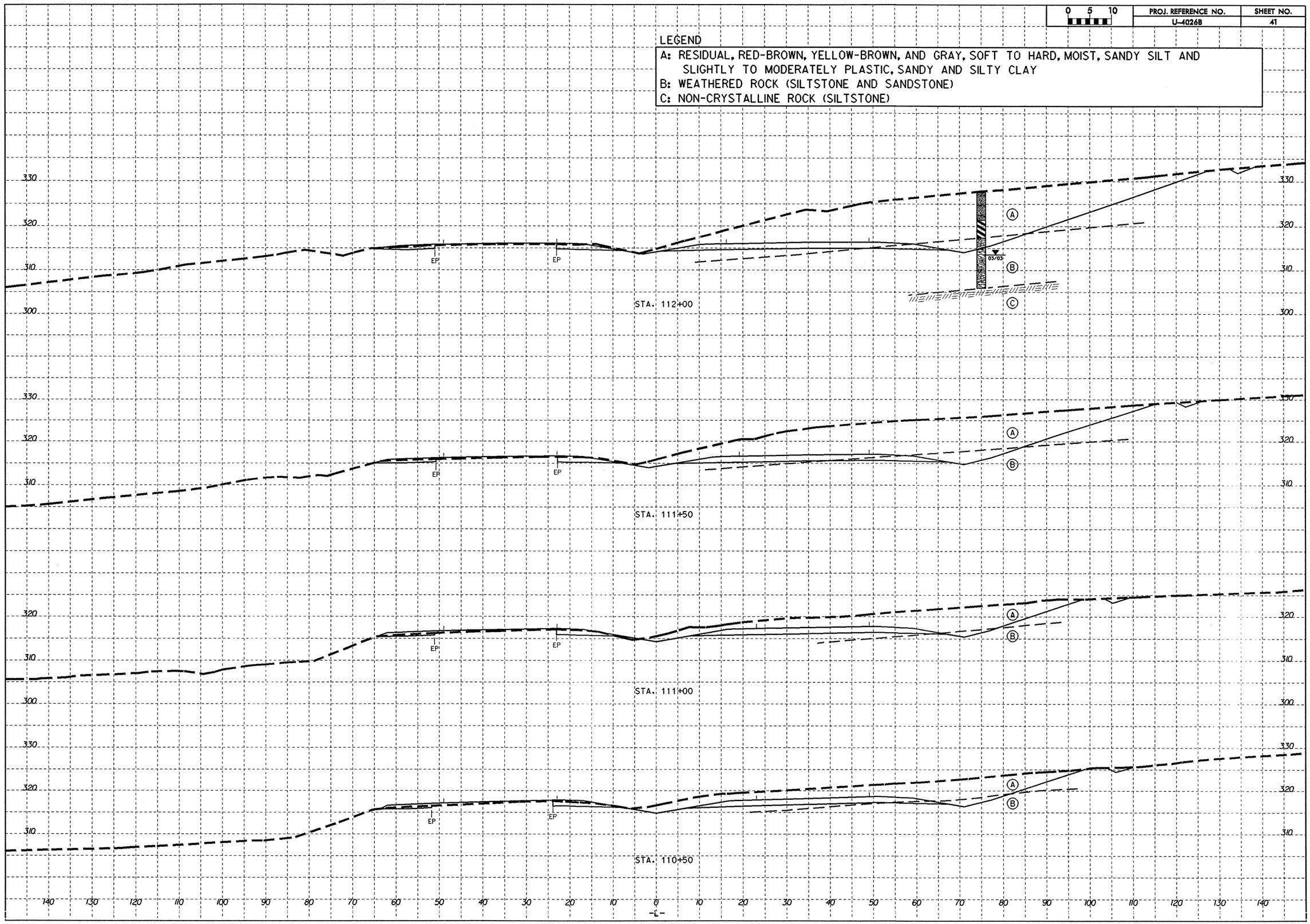
A: RESIDUAL, RED-BROWN AND YELLOW-BROWN, SOFT TO HARD, MOIST, SANDY SILT AND SLIGHTLY TO MODERATELY PLASTIC, SANDY AND SILTY CLAY
B: WEATHERED ROCK (SILTSTONE AND SANDSTONE)
C: ROADWAY EMBANKMENT



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	41

LEGEND

A: RESIDUAL, RED-BROWN, YELLOW-BROWN, AND GRAY, SOFT TO HARD, MOIST, SANDY SILT AND SLIGHTLY TO MODERATELY PLASTIC, SANDY AND SILTY CLAY
B: WEATHERED ROCK (SILTSTONE AND SANDSTONE)
C: NON-CRYSTALLINE ROCK (SILTSTONE)



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	42

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-132	69' RT	113+00	0.0-3.0	A-7-6(16)	48	24	14.9	17.1	25.2	42.8	97	87	71	-	-
S-133	69' RT	113+00	3.0-5.7	A-7-6(26)	53	33	4.3	22.6	32.3	40.8	100	97	79	-	-
S-134	69' RT	113+00	6.5-10.0	A-2-4(0)	26	9	49.3	20.7	17.7	12.2	100	70	34	-	-

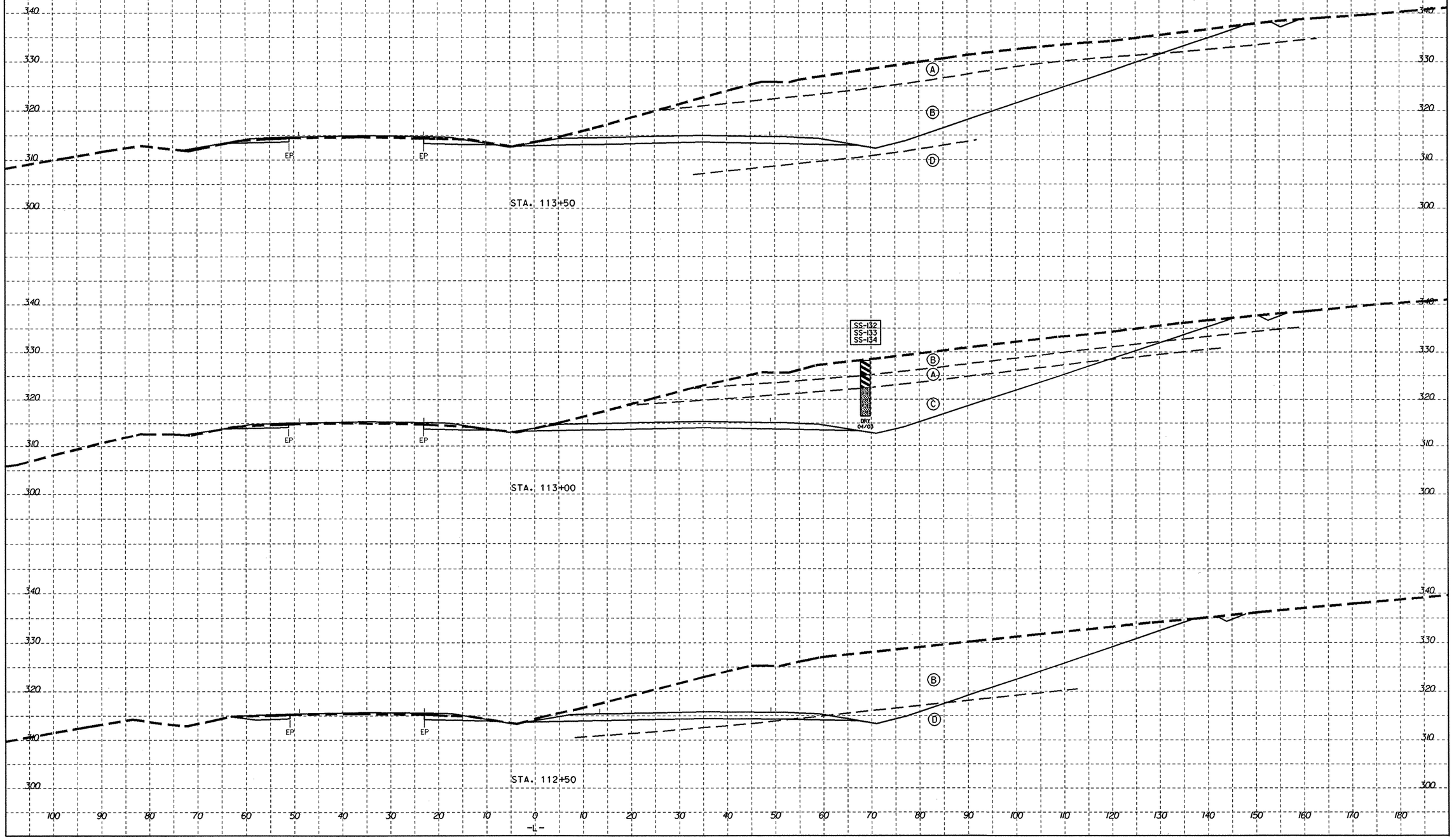
LEGEND

A: RESIDUAL, BROWN, YELLOW-BROWN, AND YELLOW-GRAY, SOFT TO MEDIUM STIFF, HIGHLY PLASTIC, MOIST, SILTY CLAY

B: RESIDUAL, RED-BROWN, YELLOW-BROWN, AND GREEN-GRAY, SOFT TO HARD, MOIST TO WET, SANDY SILT AND SLIGHTLY TO MODERATELY PLASTIC, SANDY, AND SILTY CLAY

C: RESIDUAL, BROWN, LOOSE, MOIST, SILTY SAND

D: WEATHERED ROCK (SILTSTONE)



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	43

SOIL TEST RESULTS

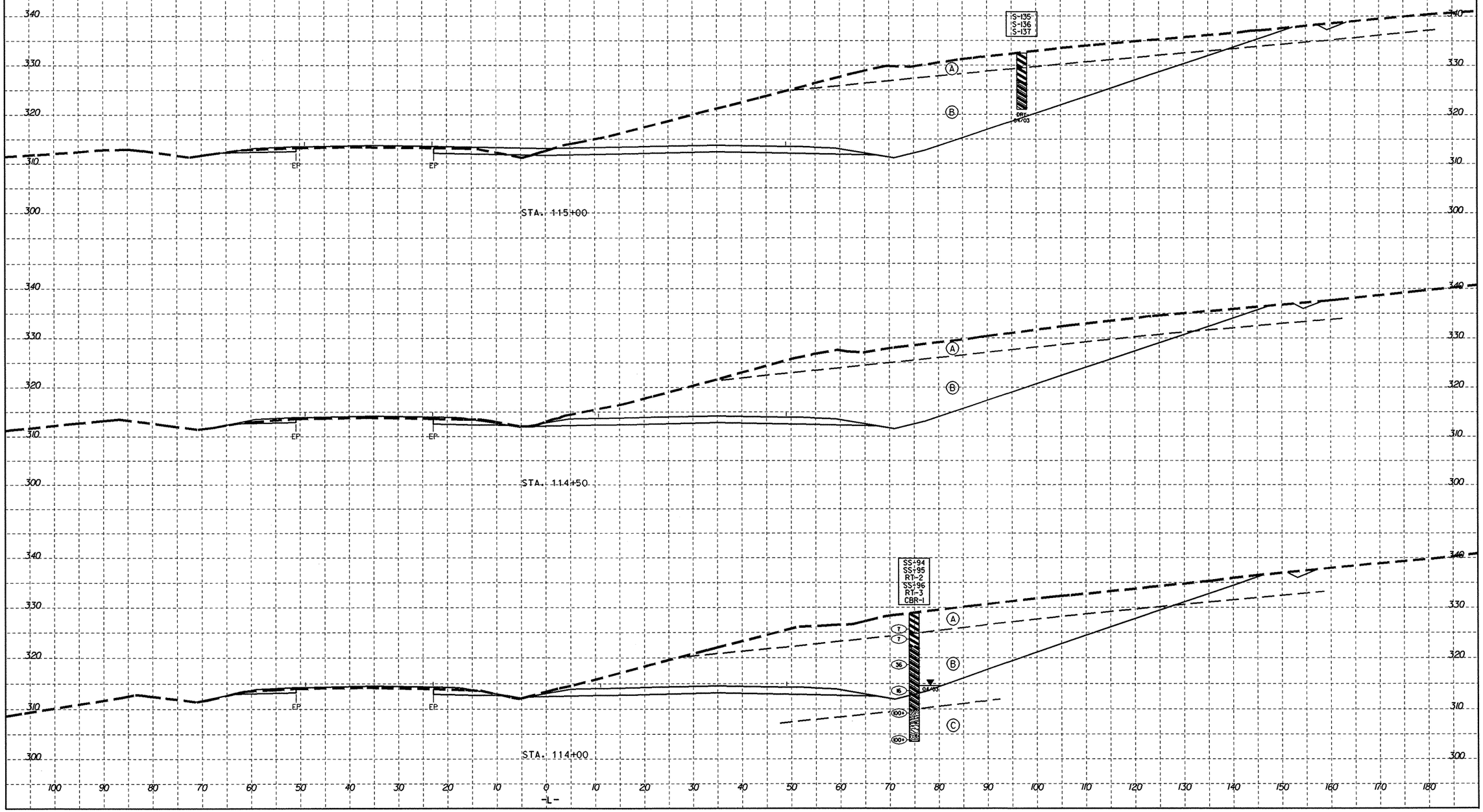
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
RT-2	75' RT	114+00	0.0-6.0	A-7-6(13)	41	25	22.7	16.8	20.0	40.5	97	82	62	-	-
SS-94	75' RT	114+00	2.2-3.7	A-7-6(29)	62	40	14.1	12.7	24.9	48.3	97	88	73	14.9	-
SS-95	75' RT	114+00	4.2-5.7	A-7-6(17)	42	22	3.4	26.0	38.4	32.2	100	99	78	-	-
RT-3	75' RT	114+00	7.0-14.0	A-7-6(18)	42	24	6.9	19.3	35.4	38.5	100	97	79	-	-
SS-96	75' RT	114+00	9.2-10.7	A-6(10)	36	16	7.0	30.0	32.8	30.2	100	98	70	-	-
CBR-1	75' RT	114+00	15.0-19.0	A-7-6(17)	41	21	6.7	13.0	41.6	38.7	96	92	81	-	-
S-135	97' RT	115+00	0.0-3.0	A-7-5(34)	66	36	9.0	6.3	23.5	61.2	96	90	83	-	-
S-136	97' RT	115+00	3.0-6.0	A-7-6(21)	43	22	2.2	12.0	45.0	40.8	100	99	91	-	-
S-137	97' RT	115+00	6.0-10.0	A-6(10)	32	14	4.1	21.4	48.0	26.5	100	99	80	-	-

LEGEND

A: RESIDUAL, YELLOW-BROWN AND YELLOW-GRAY, SOFT TO MEDIUM STIFF, HIGHLY PLASTIC, MOIST, SILTY CLAY

B: RESIDUAL, RED-BROWN, BROWN, AND GREEN-GRAY, MEDIUM STIFF TO HARD, SLIGHTLY TO MODERATELY PLASTIC, MOIST TO WET, SANDY AND SILTY CLAY

C: WEATHERED ROCK (SILTSTONE)



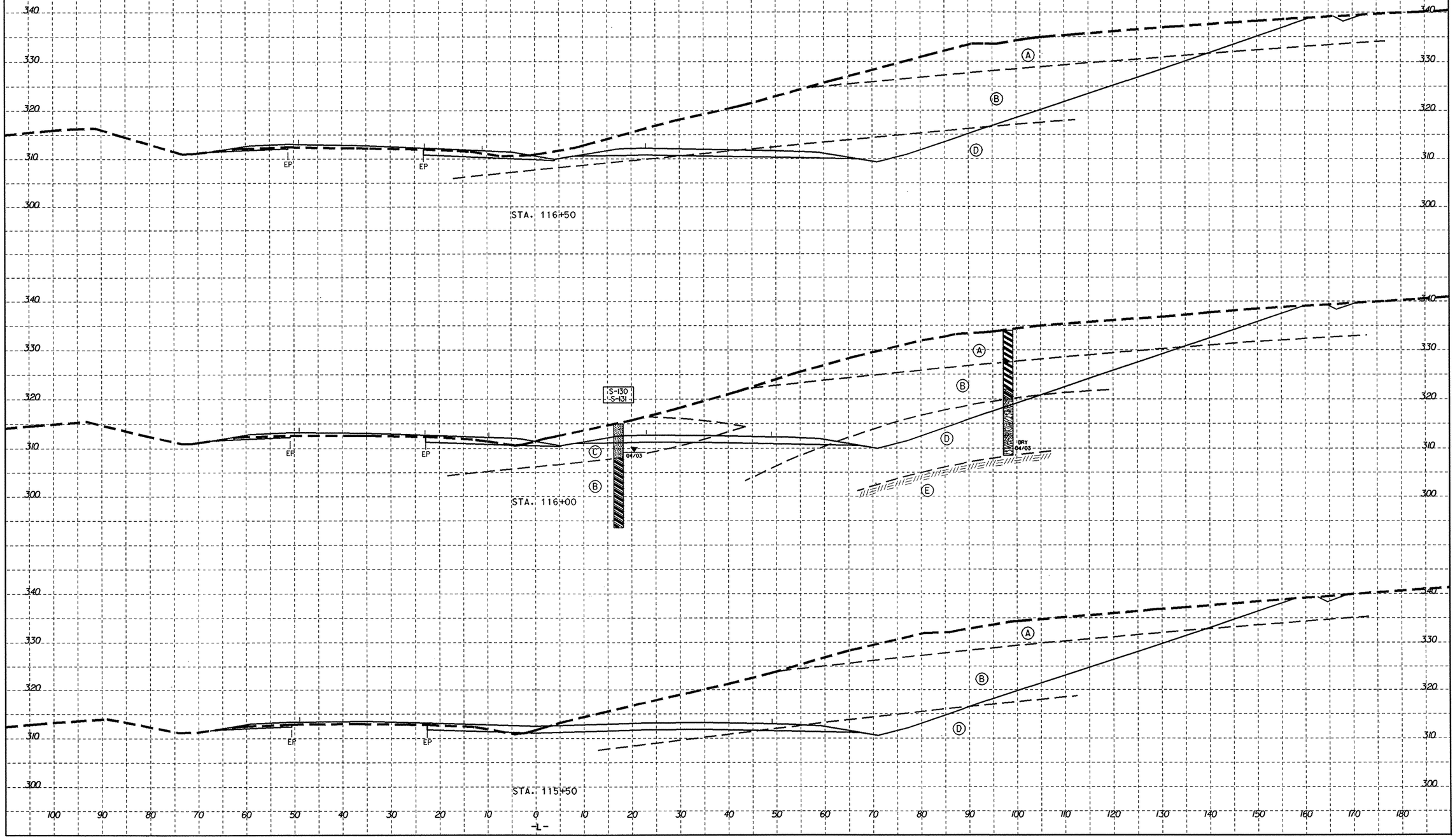
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	44

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-130	17' RT	116+00	0.0-5.0	A-2-4(0)	31	7	50.4	25.8	12.6	11.2	94	62	26	-	-
S-131	17' RT	116+00	7.0-12.0	A-6(4)	29	12	30.0	16.3	33.3	20.4	94	71	55	-	-

LEGEND

A: RESIDUAL, YELLOW-BROWN AND YELLOW-GRAY, SOFT TO MEDIUM STIFF, HIGHLY PLASTIC, MOIST, SILTY CLAY
B: RESIDUAL, RED-BROWN AND BROWN, MEDIUM STIFF TO HARD, SLIGHTLY TO MODERATELY PLASTIC, MOIST TO WET, SANDY AND SILTY CLAY
C: RESIDUAL, BROWN, MEDIUM DENSE, MOIST TO WET, SILTY SAND
D: WEATHERED ROCK (SILTSTONE)
E: NON-CRYSTALLINE ROCK (SILTSTONE)



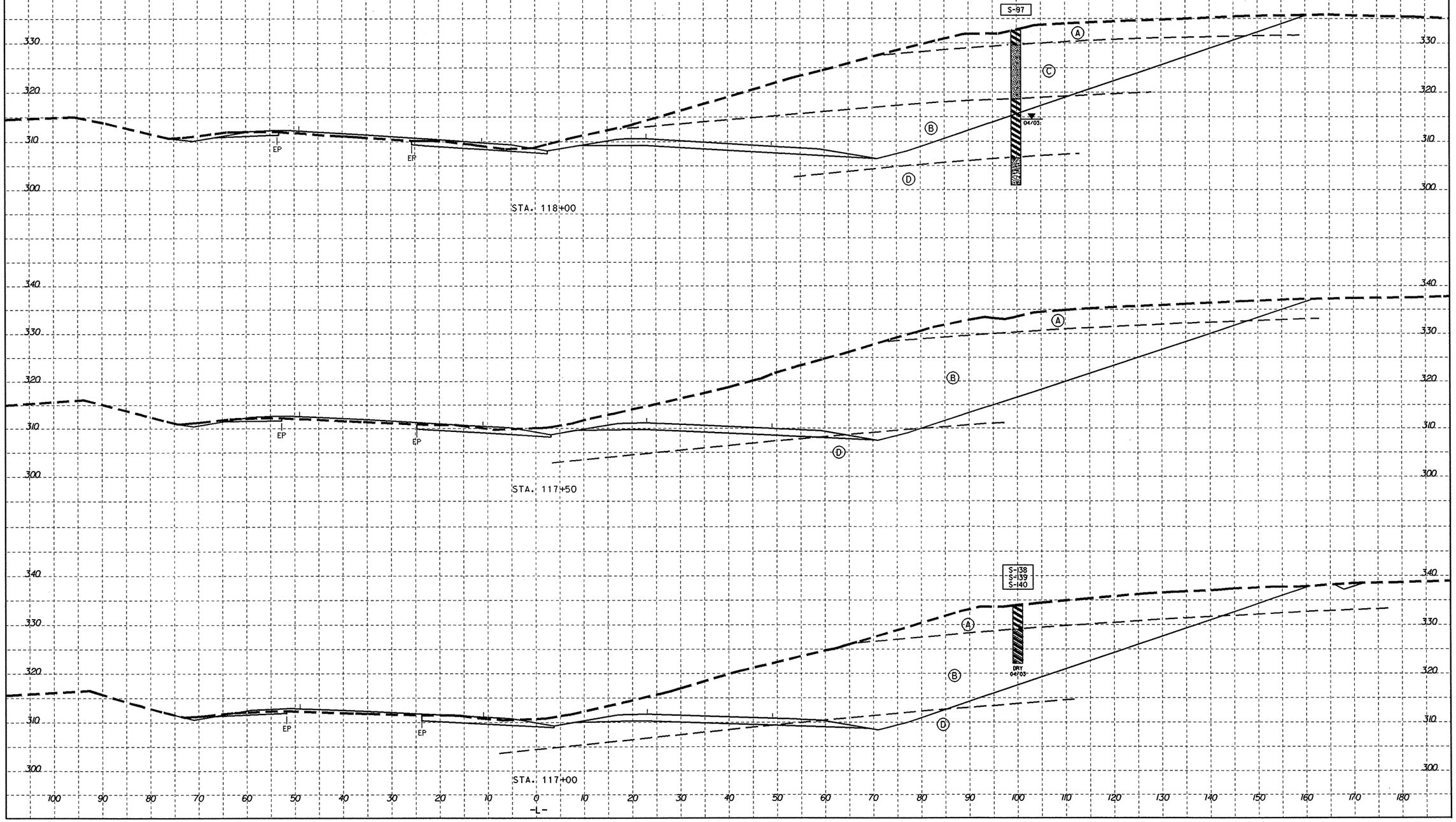
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	45

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-138	100' RT	117+00	0.0-3.0	A-7-6(31)	68	48	16.3	19.8	19.1	44.9	100	91	68	-	-
S-139	100' RT	117+00	4.7-6.7	A-6(8)	35	15	11.0	25.9	30.5	32.6	100	96	67	-	-
S-140	100' RT	117+00	8.0-11.0	A-6(14)	35	17	1.4	20.6	51.5	26.5	100	99	87	-	-
S-97	100' RT	118+00	3.0-10.0	A-2-4(0)	33	10	48.0	22.9	17.0	12.1	94	60	31	-	-

LEGEND

A: RESIDUAL, YELLOW-BROWN, SOFT TO MEDIUM STIFF, HIGHLY PLASTIC, MOIST, SILTY CLAY
B: RESIDUAL, RED-BROWN AND BROWN, MEDIUM STIFF TO HARD, SLIGHTLY TO MODERATELY PLASTIC, MOIST TO WET, SANDY AND SILTY CLAY
C: RESIDUAL, BROWN, MEDIUM DENSE, MOIST, SILTY SAND
D: WEATHERED ROCK (SILTSTONE AND CLAYSTONE)



PROJ. REFERENCE NO.	SHEET NO.
U-4026B	46

0 5 10

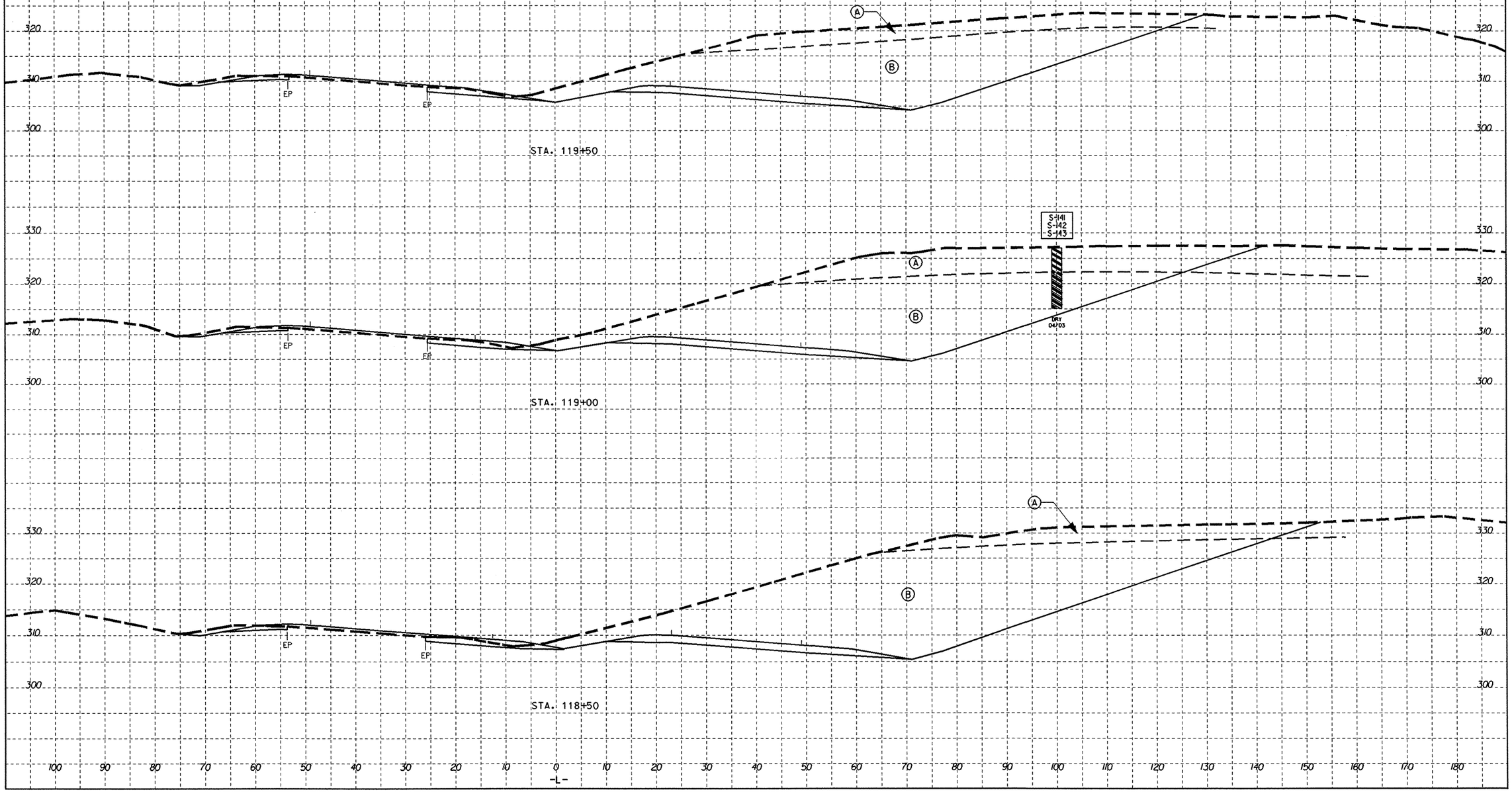
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-141	100' RT	119+00	0.0-3.0	A-7-6(28)	57	29	6.9	7.5	26.4	59.1	99	95	86	-	-
S-142	100' RT	119+00	5.0-7.0	A-6(9)	35	12	12.6	11.4	41.3	34.7	99	91	77	-	-
S-143	100' RT	119+00	7.0-12.0	A-6(1)	28	11	31.8	29.6	24.4	14.3	99	81	43	-	-

LEGEND

A: RESIDUAL, YELLOW-BROWN AND YELLOW-GRAY, SOFT TO MEDIUM STIFF, HIGHLY PLASTIC, MOIST, SILTY CLAY

B: RESIDUAL, RED-BROWN AND GREEN-GRAY, MEDIUM STIFF TO HARD, SLIGHTLY TO MODERATELY PLASTIC, MOIST TO WET, SANDY AND SILTY CLAY

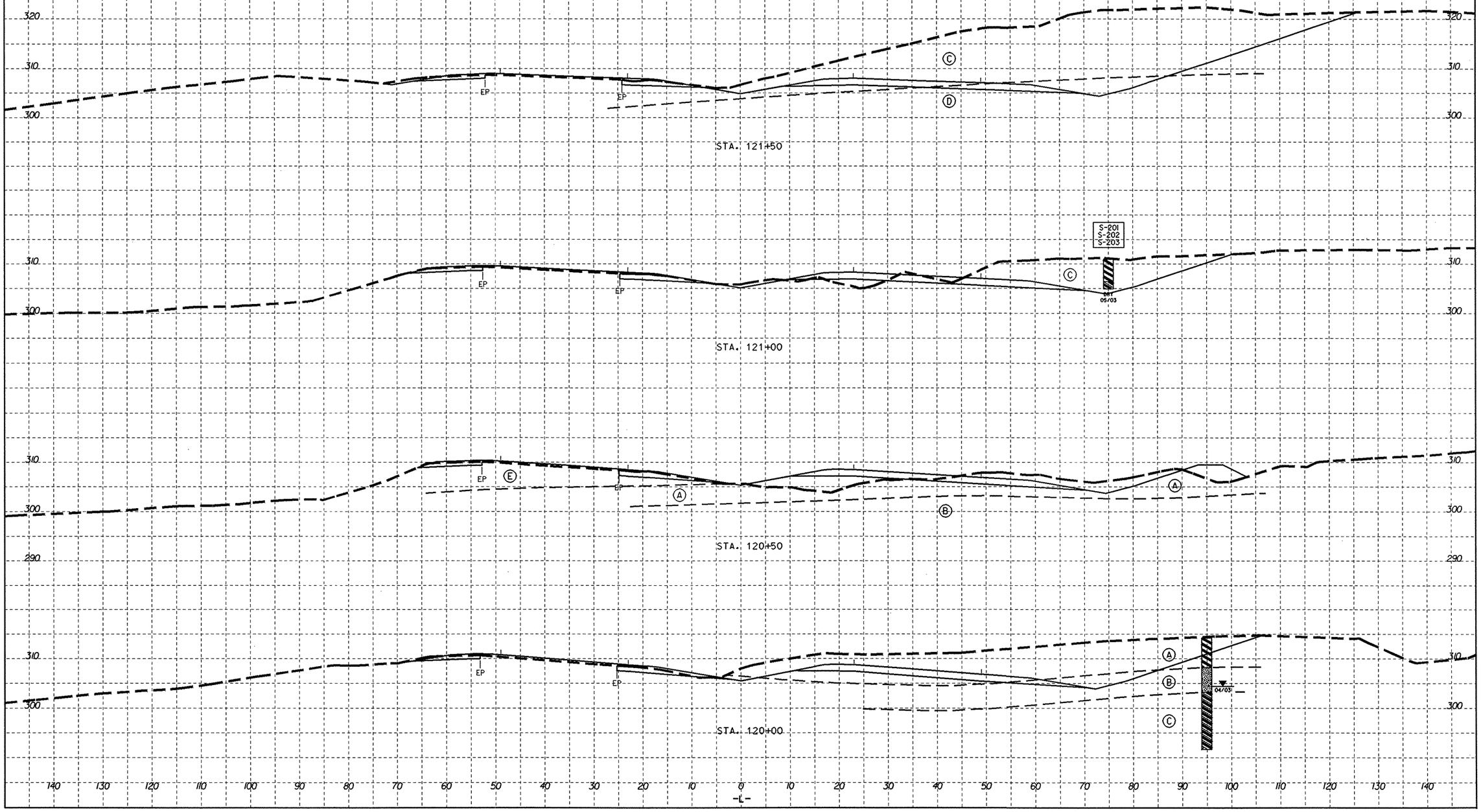


SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-201	75' RT	121+00	0.5-3.0	A-7-6(12)	41	21	4.7	37.2	27.6	30.5	100	98	67	-	-
S-202	75' RT	121+00	3.0-4.5	A-7-6(19)	42	20	1.2	12.8	49.4	36.6	100	99	91	-	-
S-203	75' RT	121+00	4.5-6.0	A-6(16)	39	18	1.8	18.7	51.0	28.5	100	99	88	-	-

LEGEND

A: RESIDUAL, YELLOW-BROWN, SOFT, HIGHLY PLASTIC, MOIST, SILTY CLAY
B: RESIDUAL, BROWN, MEDIUM DENSE, MOIST TO WET, SILTY SAND
C: RESIDUAL, RED-BROWN AND YELLOW-BROWN, SOFT TO HARD, MODERATELY PLASTIC, MOIST TO WET, SANDY AND SILTY CLAY
D: WEATHERED ROCK (SANDSTONE)
E: ROADWAY EMBANKMENT



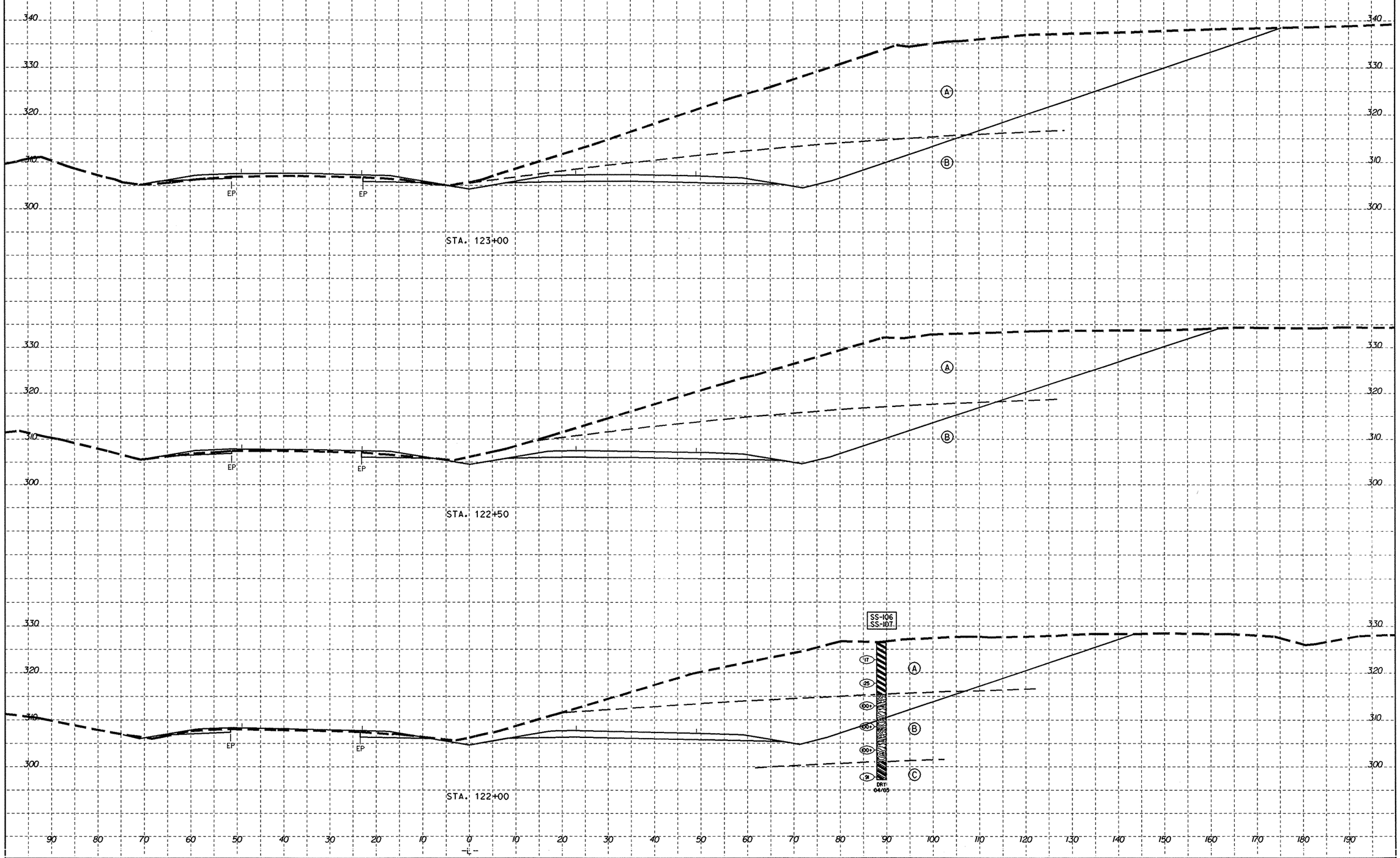
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	48

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-106	89' RT	122+00	2.7-4.2	A-7-6(27)	43	29	2.4	8.0	37.4	52.2	100	99	93	11.9	-
SS-107	89' RT	122+00	27.7-29.2	A-6(11)	36	16	5.4	27.5	47.0	20.1	100	97	74	7.2	-

LEGEND

A: RESIDUAL, RED-BROWN, VERY STIFF, HIGHLY PLASTIC, MOIST, SILTY CLAY
B: WEATHERED ROCK (SANDSTONE AND SILTSTONE)
C: RESIDUAL, RED-BROWN, HARD, MODERATELY PLASTIC, MOIST, SANDY CLAY



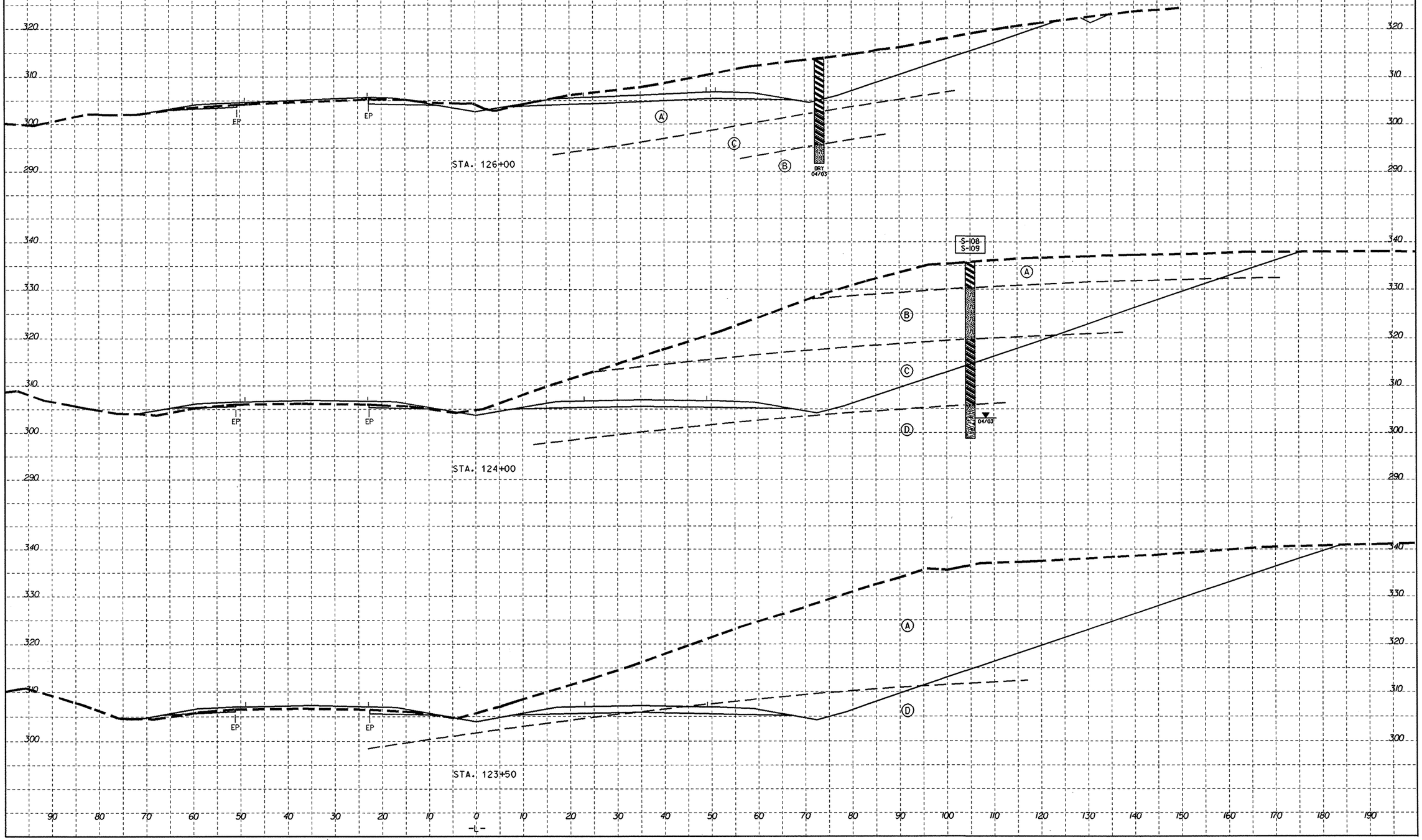
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	49

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-108	105' RT	124+00	5.4-11.5	A-2-4(0)	21	NP	39.1	33.9	19.0	8.0	96	73	32	-	-
S-109	105' RT	124+00	17.0-26.0	A-6(3)	28	11	8.2	49.7	28.0	14.0	100	98	51	-	-

LEGEND

A: RESIDUAL, RED-BROWN AND BROWN, MEDIUM STIFF TO VERY STIFF, HIGHLY PLASTIC, MOIST, SILTY CLAY
B: RESIDUAL, RED-BROWN AND BROWN, MEDIUM DENSE TO DENSE, MOIST, SILTY SAND
C: RESIDUAL, RED-BROWN, MEDIUM STIFF TO HARD, SLIGHTLY TO MODERATELY PLASTIC, MOIST, SANDY CLAY
D: WEATHERED ROCK (SILTSTONE)



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	50

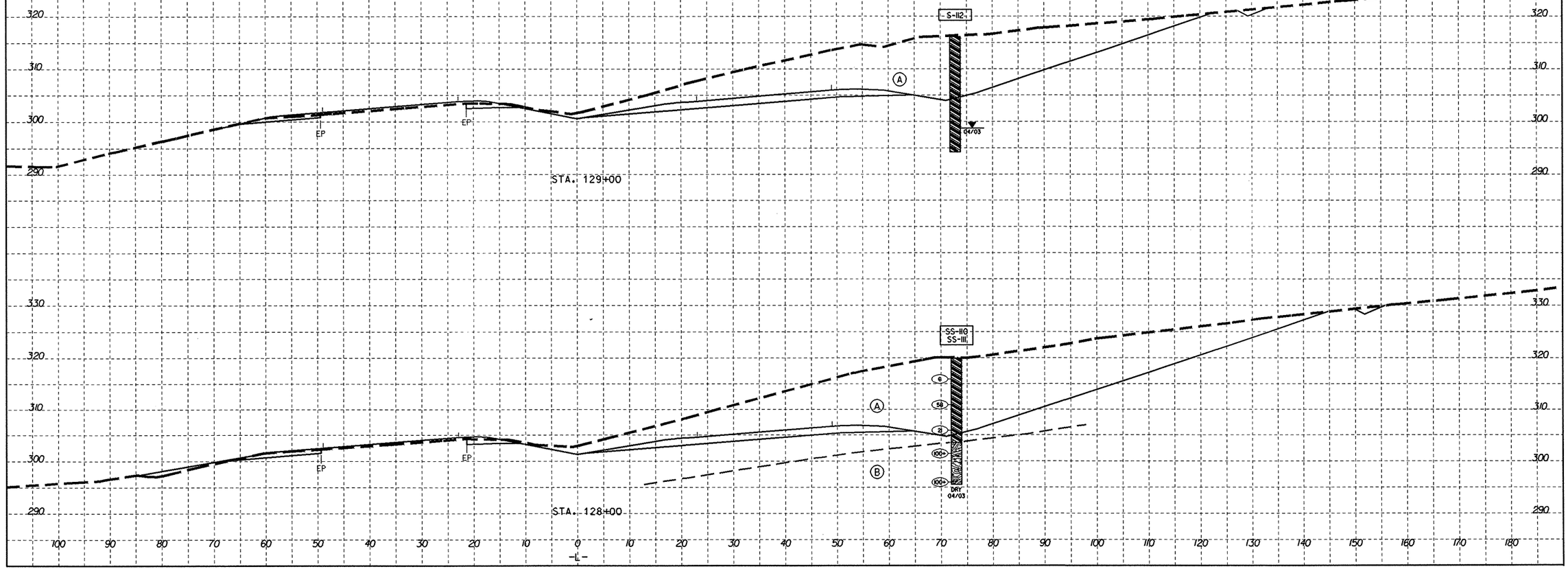
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-110	73' RT	128+00	3.0-4.5	A-6(2)	26	11	15.4	43.5	19.0	22.1	100	96	46	19.1	-
SS-111	73' RT	128+00	13.0-14.5	A-6(10)	33	13	5.6	16.0	50.3	28.1	98	96	82	11.6	-
S-112	73' RT	129+00	12.0-17.0	A-6(12)	33	16	2.2	22.9	50.9	24.1	100	99	85	-	-

LEGEND

A: RESIDUAL, RED-BROWN AND YELLOW-BROWN, SOFT TO HARD, SLIGHTLY TO MODERATELY PLASTIC, MOIST TO WET, SANDY CLAY

B: WEATHERED ROCK (SILTSTONE)



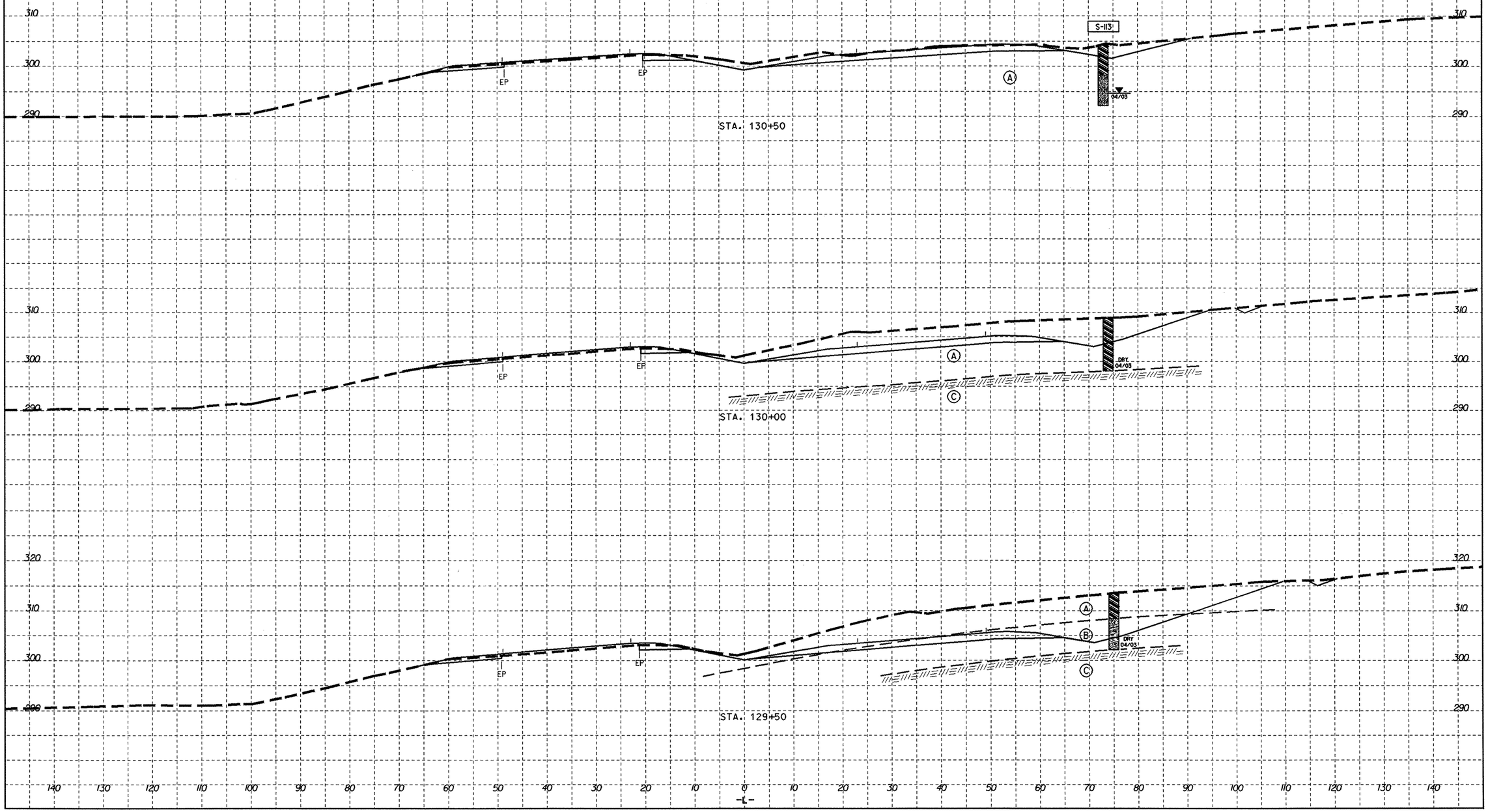
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	51

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-113	73' RT	130+50	6.0-12.1	A-4(0)	21	NP	31.9	38.1	20.0	10.0	98	82	37	-	-

LEGEND

A: RESIDUAL, RED-BROWN AND YELLOW-BROWN, SOFT TO HARD, MOIST TO WET, SANDY SILT AND SLIGHTLY PLASTIC, SANDY CLAY
B: WEATHERED ROCK (SILTSTONE)
C: NON-CRYSTALLINE ROCK (SILTSTONE AND SANDSTONE)



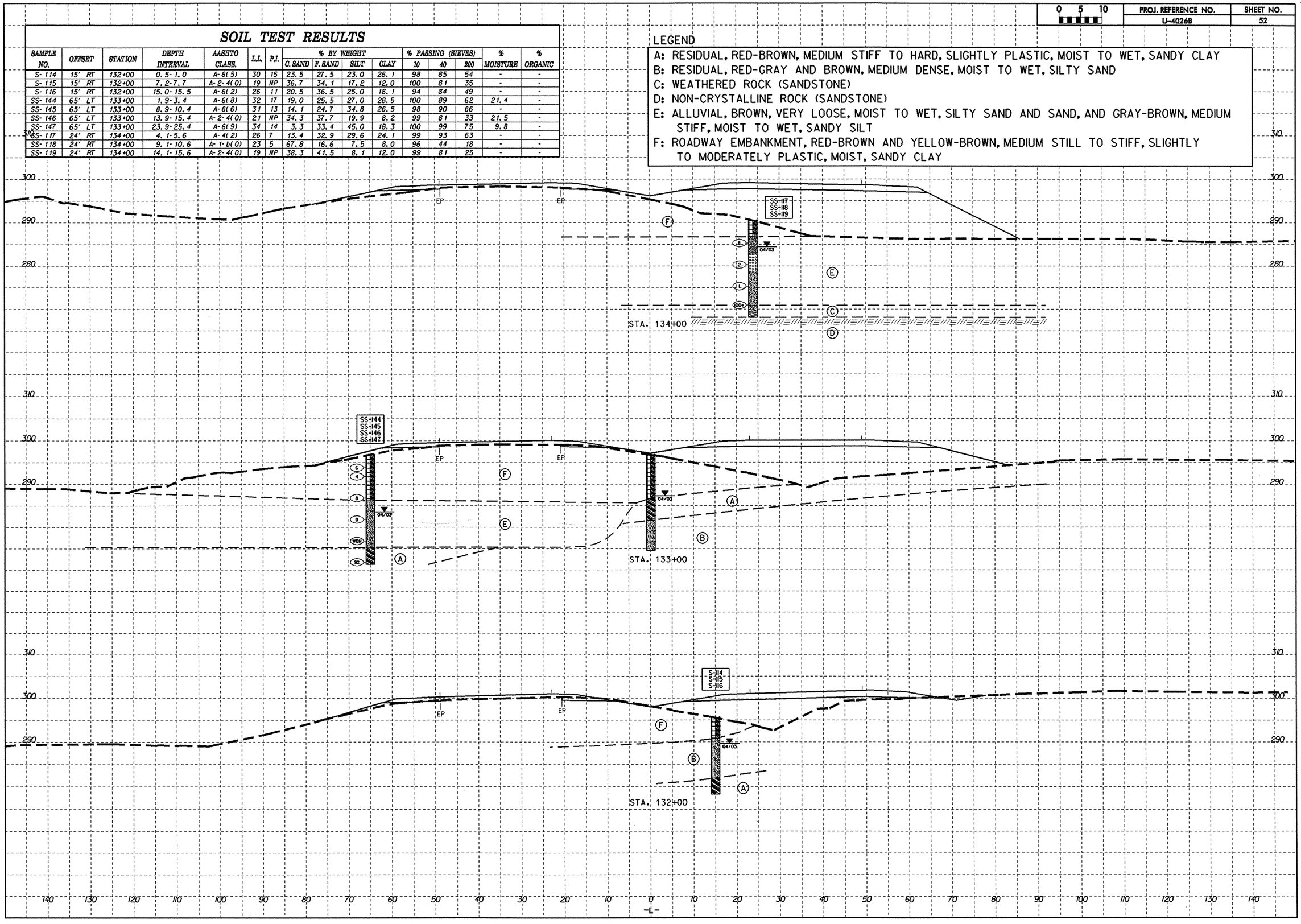
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	52

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-114	15' RT	132+00	0.5-1.0	A-6(5)	30	15	23.5	27.5	23.0	26.1	98	85	54	-	-
S-115	15' RT	132+00	7.2-7.7	A-2-4(0)	19	NP	36.7	34.1	17.2	12.0	100	81	35	-	-
S-116	15' RT	132+00	15.0-15.5	A-6(2)	26	11	20.5	36.5	25.0	18.1	94	84	49	-	-
SS-144	65' LT	133+00	1.9-3.4	A-6(8)	32	17	19.0	25.5	27.0	28.5	100	89	62	21.4	-
SS-145	65' LT	133+00	8.9-10.4	A-6(6)	31	13	14.1	24.7	34.8	26.5	98	90	66	-	-
SS-146	65' LT	133+00	13.9-15.4	A-2-4(0)	21	NP	34.3	37.7	19.9	8.2	99	81	33	21.5	-
SS-147	65' LT	133+00	23.9-25.4	A-6(9)	34	14	3.3	33.4	45.0	18.3	100	99	75	9.8	-
SS-117	24' RT	134+00	4.1-5.6	A-4(2)	26	7	13.4	32.9	29.6	24.1	99	93	63	-	-
SS-118	24' RT	134+00	9.1-10.6	A-1-b(0)	23	5	67.8	16.6	7.5	8.0	96	44	18	-	-
SS-119	24' RT	134+00	14.1-15.6	A-2-4(0)	19	NP	38.3	41.5	8.1	12.0	99	81	25	-	-

LEGEND

A: RESIDUAL, RED-BROWN, MEDIUM STIFF TO HARD, SLIGHTLY PLASTIC, MOIST TO WET, SANDY CLAY
B: RESIDUAL, RED-GRAY AND BROWN, MEDIUM DENSE, MOIST TO WET, SILTY SAND
C: WEATHERED ROCK (SANDSTONE)
D: NON-CRYSTALLINE ROCK (SANDSTONE)
E: ALLUVIAL, BROWN, VERY LOOSE, MOIST TO WET, SILTY SAND AND SAND, AND GRAY-BROWN, MEDIUM STIFF, MOIST TO WET, SANDY SILT
F: ROADWAY EMBANKMENT, RED-BROWN AND YELLOW-BROWN, MEDIUM STILL TO STIFF, SLIGHTLY TO MODERATELY PLASTIC, MOIST, SANDY CLAY



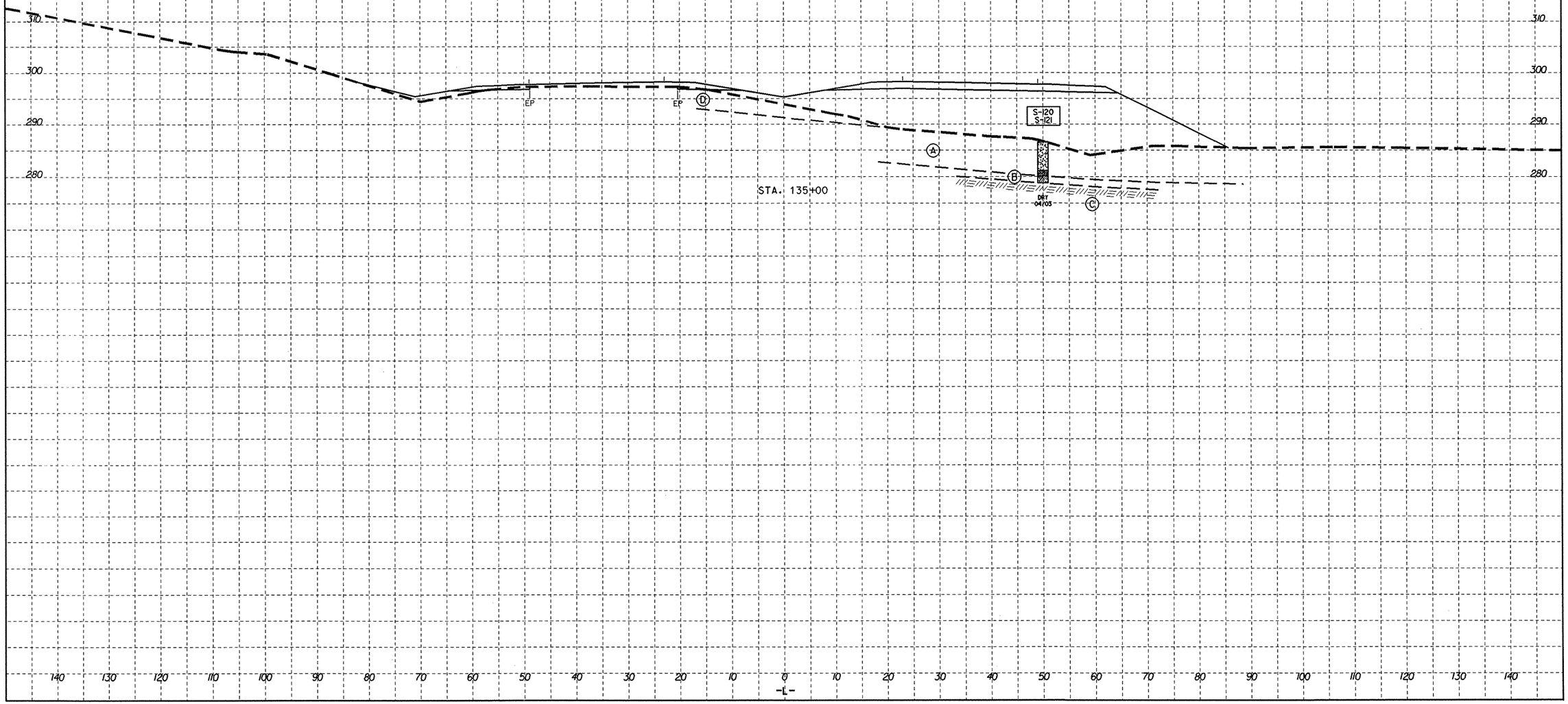
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	53

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-120	50' RT	136+00	1.0-1.5	A-5(6)	48	3	3.4	25.7	30.8	40.1	98	97	80	-	-
S-121	50' RT	136+00	5.5-6.5	A-4(1)	24	8	23.3	39.3	17.4	20.1	100	91	44	-	-

LEGEND

A: RESIDUAL, RED-BROWN AND ORANGE-BROWN, MEDIUM STIFF TO HARD, MOIST, SANDY AND CLAYEY SILT
B: WEATHERED ROCK (SANDSTONE)
C: NON-CRYSTALLINE ROCK (SANDSTONE)
D: ROADWAY EMBANKMENT



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	54

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S- 157	85' RT	150+00	1. 5- 1. 8	A- 4(1)	23	7	18. 4	34. 3	29. 0	18. 4	100	91	55	-	-
S- 158	85' RT	150+00	3. 5- 4. 0	A- 7- 6(15)	45	28	15. 1	26. 7	25. 5	32. 7	100	92	64	-	-
S- 159	85' RT	150+00	5. 0- 5. 3	A- 6(3)	34	20	39. 6	24. 3	15. 7	20. 4	98	74	39	-	-
S- 160	85' RT	150+00	8. 3- 8. 8	A- 4(2)	27	8	8. 2	46. 9	28. 6	16. 3	100	96	54	-	-

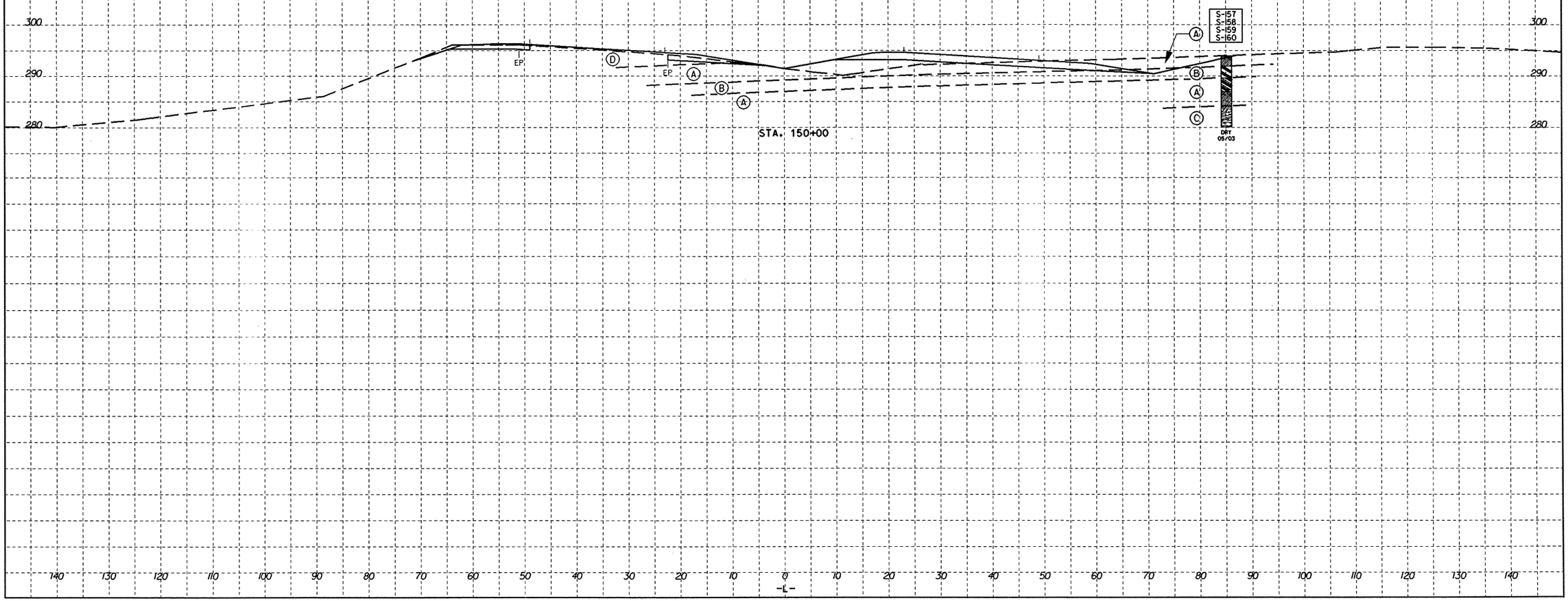
LEGEND

A: RESIDUAL, RED-BROWN AND YELLOW-BROWN, MEDIUM STIFF TO HARD, MOIST, SANDY SILT AND MODERATELY PLASTIC, SANDY CLAY

B: RESIDUAL, RED-BROWN, SOFT, HIGHLY PLASTIC, MOIST, SILTY CLAY

C: WEATHERED ROCK (SILTSTONE)

D: ROADWAY EMBANKMENT



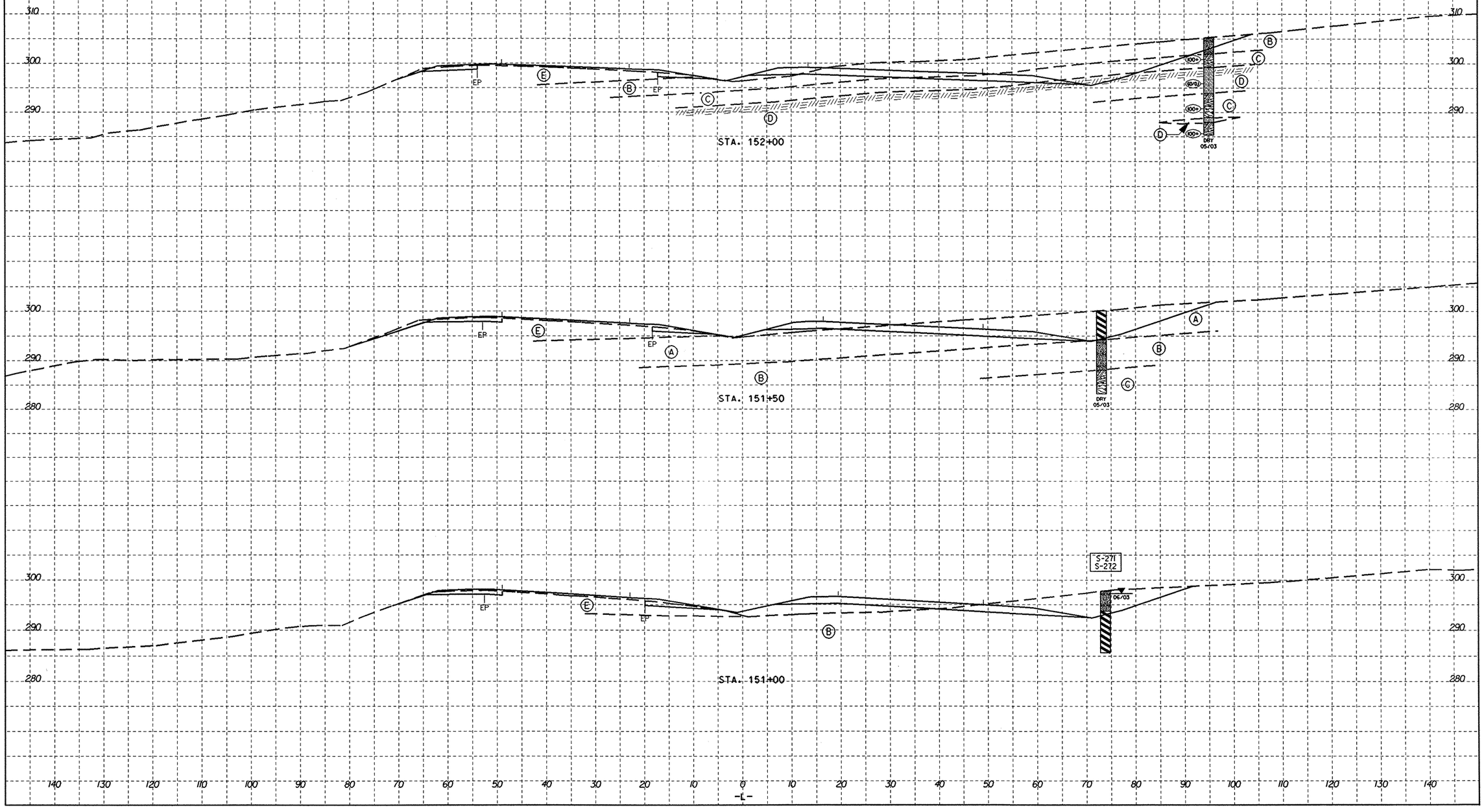
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	55

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-271	73' RT	151+00	0.0-2.0	A-4(0)	19	2	22.0	35.0	24.8	18.3	99	88	49	-	-
S-272	73' RT	151+00	4.0-7.1	A-7-6(14)	41	18	4.7	26.6	30.1	38.6	100	98	77	-	-

LEGEND

A: RESIDUAL, YELLOW-BROWN, SOFT, HIGHLY PLASTIC, MOIST, SILTY CLAY
B: RESIDUAL, RED-BROWN, YELLOW-BROWN, AND BROWN, SOFT TO HARD, MOIST TO WET, SANDY SILT AND MODERATELY PLASTIC, SILTY CLAY
C: WEATHERED ROCK (SILTSTONE)
D: NON-CRYSTALLINE ROCK (SANDSTONE)
E: ROADWAY EMBANKMENT



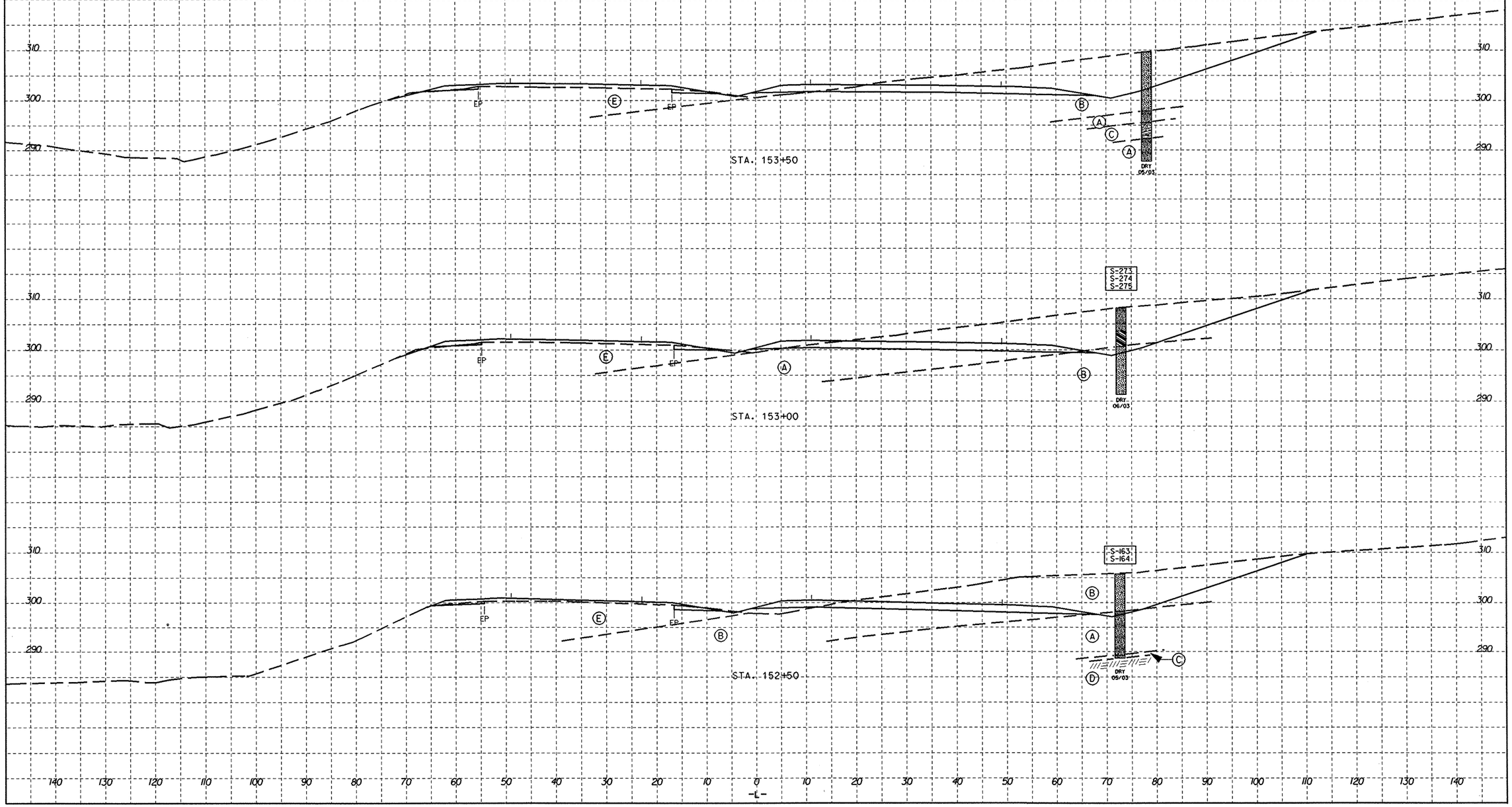
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	56

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-163	73' RT	152+50	1.0-5.0	A-2-4(0)	22	NP	39.9	31.6	18.4	10.1	100	79	33	-	-
S-164	73' RT	152+50	10.0-15.0	A-4(6)	29	10	5.3	32.0	42.5	20.2	100	97	73	-	-
S-273	73' RT	153+00	0.5-1.5	A-4(0)	21	3	11.1	33.7	37.0	18.2	100	95	63	-	-
S-274	73' RT	153+00	4.5-6.8	A-6(7)	30	12	9.9	25.1	42.8	22.2	100	96	73	-	-
S-275	73' RT	153+00	7.5-10.0	A-2-4(0)	21	NP	34.1	36.0	21.8	8.1	100	83	35	-	-

LEGEND

A: RESIDUAL, RED-BROWN AND YELLOW-BROWN, SOFT TO MEDIUM STIFF, MOIST, SANDY SILT AND SLIGHTLY PLASTIC, SANDY CLAY
B: RESIDUAL, BROWN, LOOSE TO DENSE, MOIST, SILTY SAND
C: WEATHERED ROCK (SILTSTONE AND SANDSTONE)
D: NON-CRYSTALLINE ROCK (SILTSTONE)
E: ROADWAY EMBANKMENT



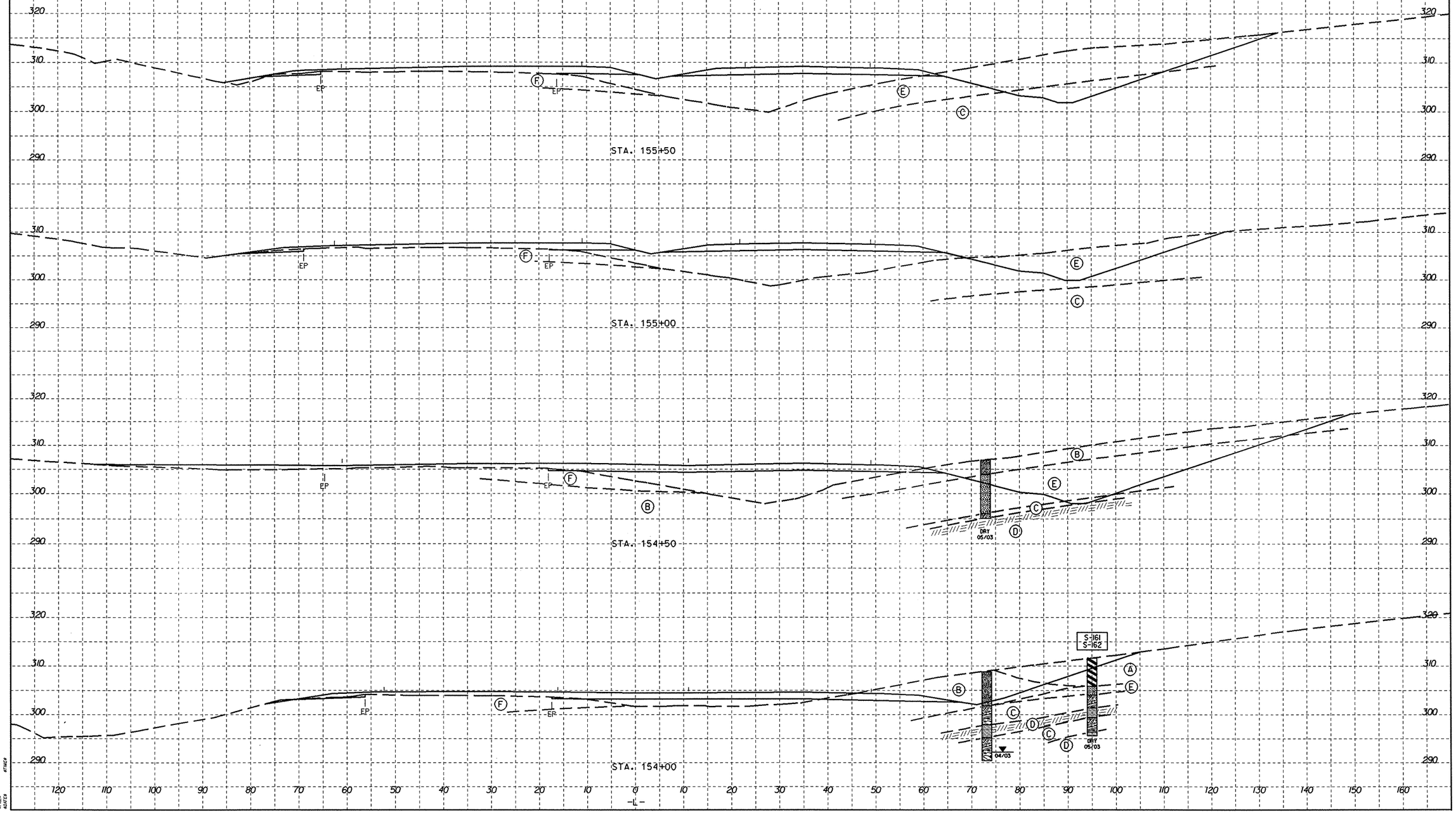
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	57

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-161	95' RT	154+00	1.8-2.2	A-7-6(38)	68	46	12.2	11.8	24.9	51.0	100	92	79	-	-
S-162	95' RT	154+00	6.8-7.2	A-2-4(0)	20	NP	19.4	53.7	18.8	8.2	100	96	33	-	-

LEGEND

A: RESIDUAL, RED-BROWN, SOFT TO MEDIUM STIFF, HIGHLY PLASTIC, MOIST, SILTY CLAY
B: RESIDUAL, RED-BROWN AND YELLOW-BROWN, SOFT TO HARD, MOIST, SANDY SILT
C: WEATHERED ROCK (SILTSTONE AND SANDSTONE)
D: NON-CRYSTALLINE ROCK (SANDSTONE)
E: RESIDUAL, BROWN, MEDIUM DENSE TO VERY DENSE, MOIST, SILTY SAND
F: ROADWAY EMBANKMENT



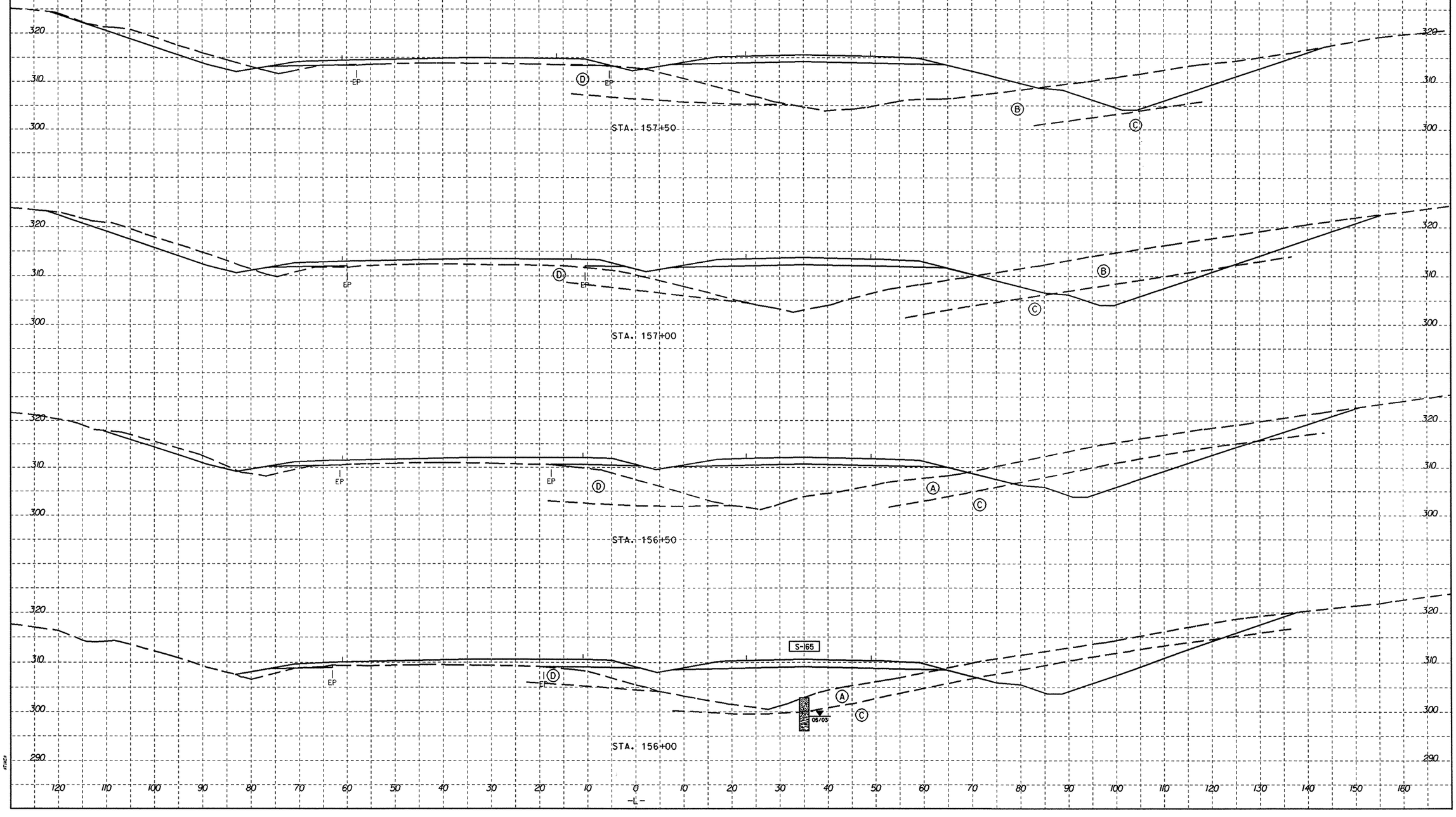
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	58

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-165	35' RT	156+00	1.0-2.8	A-2-4(0)	21	NP	30.2	40.9	20.9	8.1	99	86	35	-	-

LEGEND

A: RESIDUAL, BROWN, MEDIUM DENSE TO VERY DENSE, MOIST, SILTY SAND
B: RESIDUAL, RED-BROWN AND BROWN, SOFT TO MEDIUM STIFF, MOIST, SANDY SILT AND MODERATELY PLASTIC, SANDY CLAY
C: WEATHERED ROCK (SILTSTONE AND SANDSTONE)
D: ROADWAY EMBANKMENT



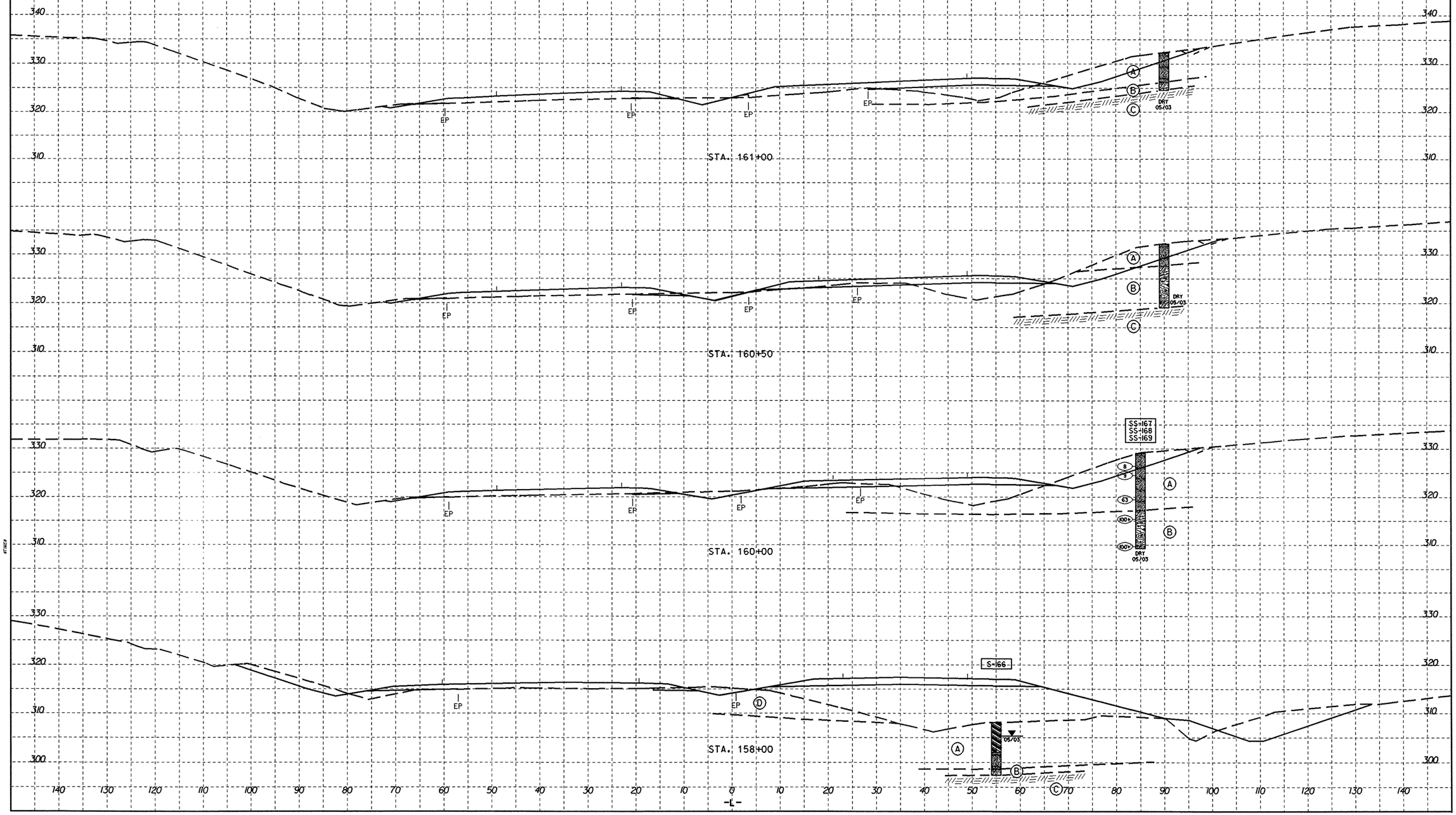
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	59

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-166	55' RT	158+00	0.0-3.0	A-6(12)	37	18	6.7	27.3	31.6	34.4	100	97	73	-	-
SS-167	85' RT	160+00	1.7-3.2	A-4(1)	30	7	32.6	27.5	25.7	14.2	99	78	45	17.3	-
SS-168	85' RT	160+00	3.6-5.1	A-4(0)	25	5	38.3	26.9	22.7	12.1	100	77	41	-	-
SS-169	85' RT	160+00	8.6-10.1	A-4(4)	28	9	5.9	35.4	40.5	18.2	100	98	67	9.2	-

LEGEND

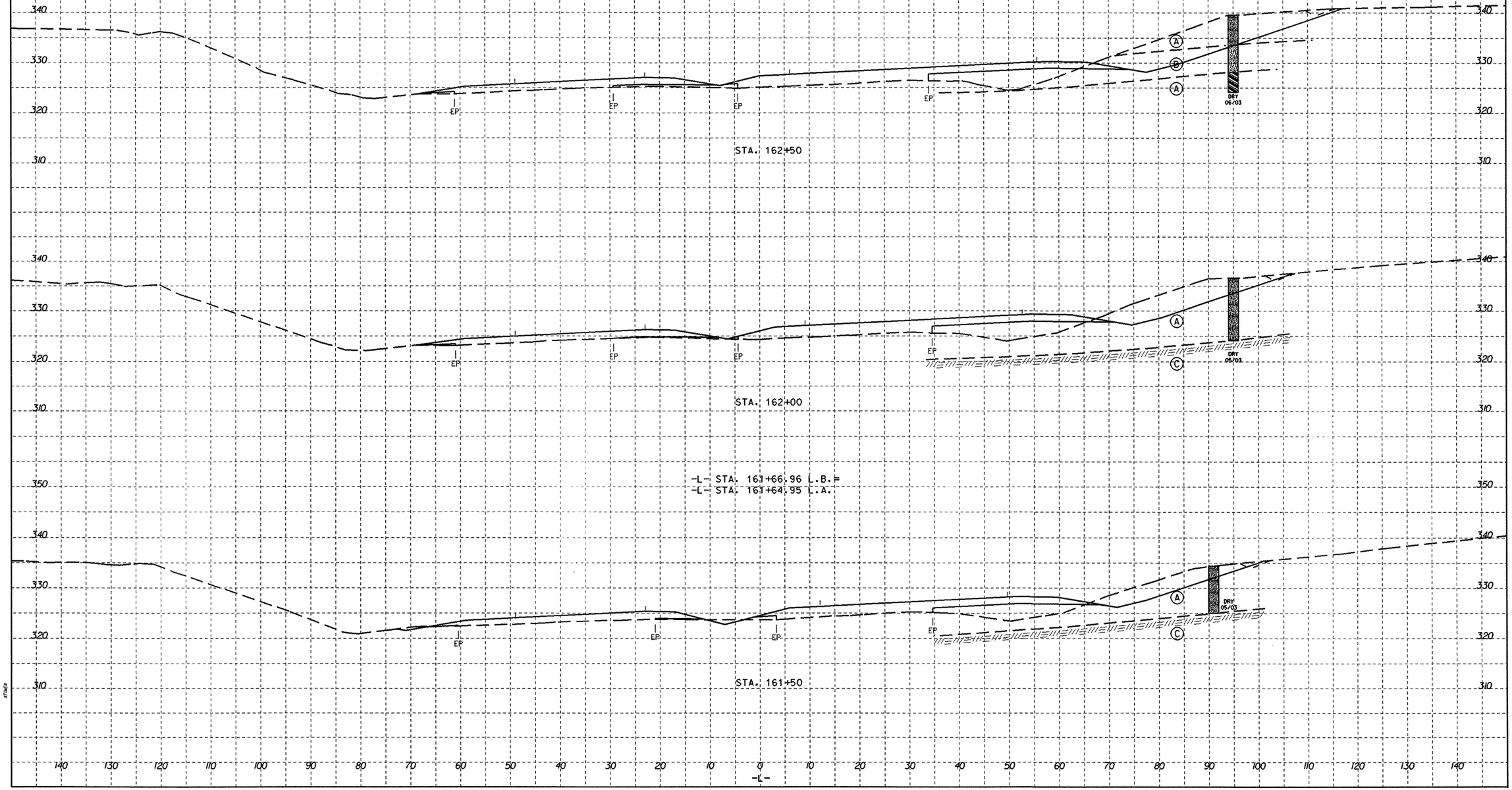
A: RESIDUAL, RED-BROWN AND BROWN, SOFT TO HARD, MOIST TO WET, SANDY SILT AND MODERATELY PLASTIC, SANDY CLAY
B: WEATHERED ROCK (SILTSTONE AND SANDSTONE)
C: NON-CRYSTALLINE ROCK (SILTSTONE AND SANDSTONE)
D: ROADWAY EMBANKMENT



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	60

LEGEND

A: RESIDUAL, RED-BROWN, YELLOW-BROWN, AND BROWN, SOFT TO HARD, MOIST, SANDY SILT AND SLIGHTLY PLASTIC, SANDY CLAY
B: RESIDUAL, BROWN, DENSE, MOIST, SILTY SAND
C: NON-CRYSTALLINE ROCK (SILTSTONE)



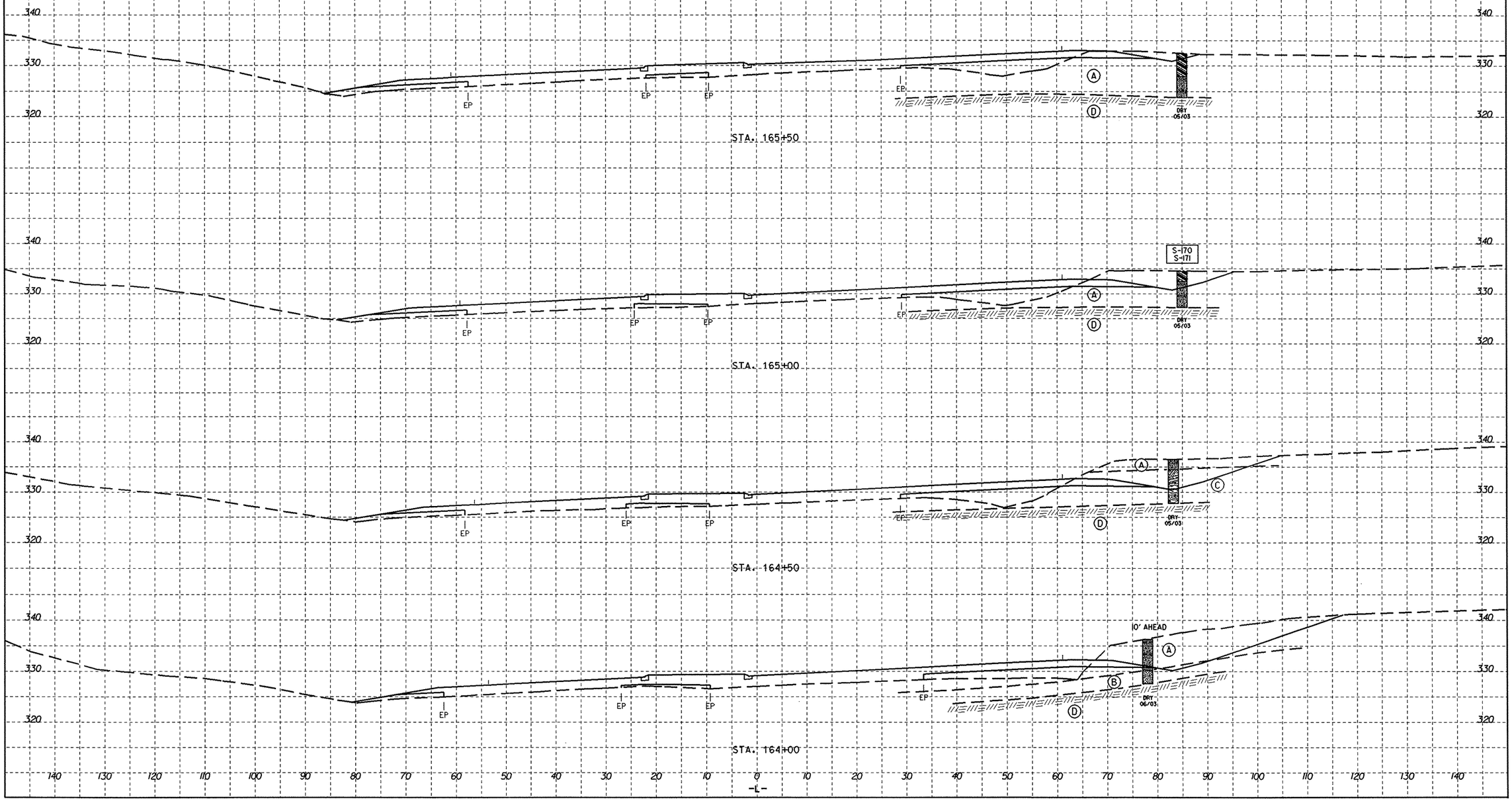
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	61

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-170	85' RT	165+00	0.0-2.0	A-6(8)	36	18	23.1	21.1	25.5	30.4	100	86	60	-	-
S-171	85' RT	165+00	2.0-6.5	A-4(0)	23	6	17.6	46.6	23.7	12.1	100	92	46	-	-

LEGEND

A: RESIDUAL, RED-BROWN, YELLOW-BROWN, AND GRAY, SOFT TO VERY STIFF, MOIST, SANDY SILT AND MODERATELY PLASTIC, SANDY CLAY
B: RESIDUAL, GRAY, DENSE, MOIST, SILTY SAND
C: WEATHERED ROCK (SILTSTONE AND SANDSTONE)
D: NON-CRYSTALLINE ROCK (SILTSTONE AND SANDSTONE)

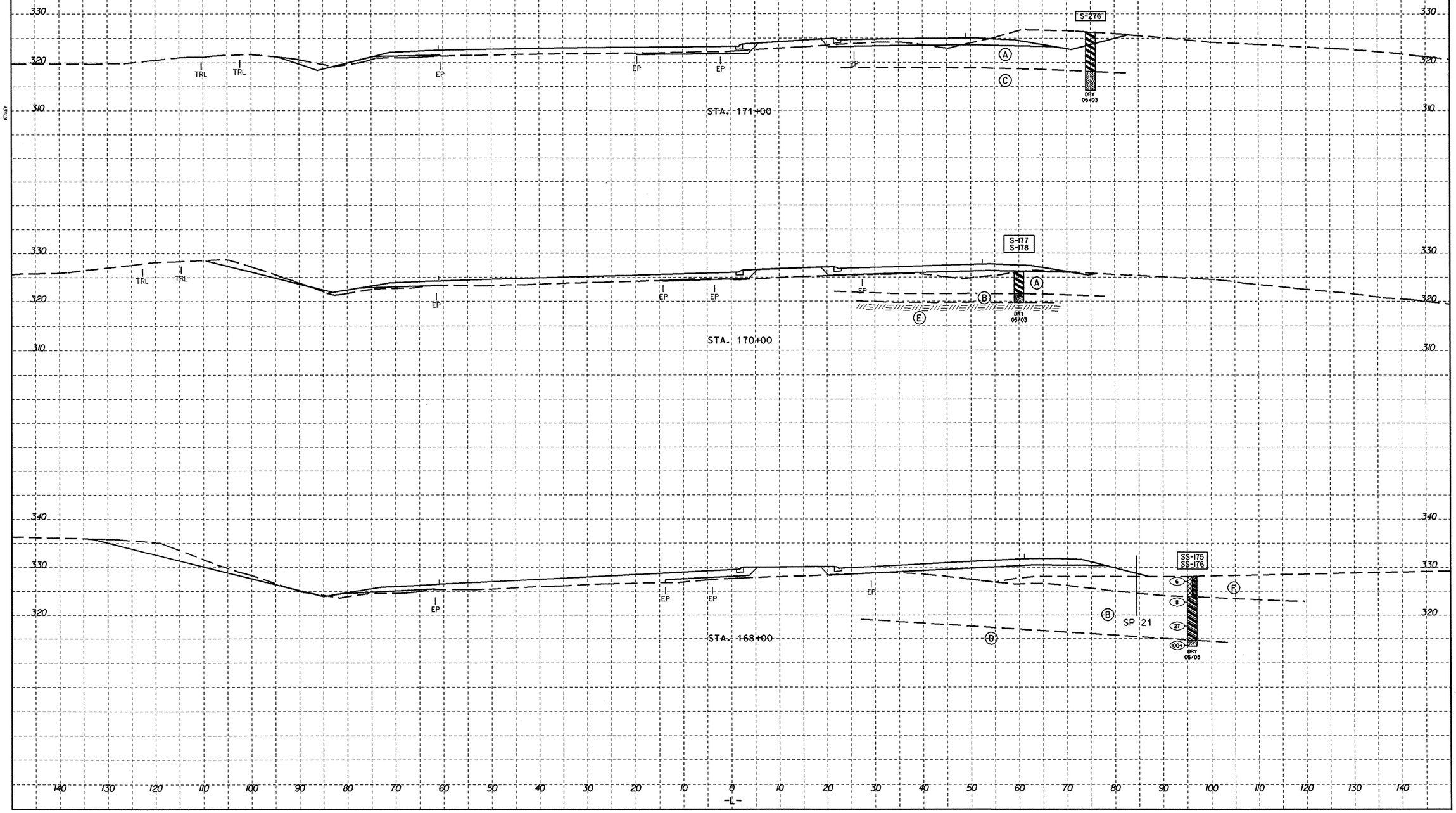


SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-175	70' RT	168+00	0.0-1.5	A-6(5)	32	15	15.0	26.1	34.6	24.3	79	71	53	-	-
SS-176	70' RT	168+00	9.4-10.9	A-6(4)	28	12	18.4	25.9	33.4	22.3	100	94	59	10.8	-
S-177	60' RT	170+00	0.0-3.0	A-7-6(44)	66	42	1.4	11.3	36.6	50.6	100	100	93	-	-
S-178	60' RT	170+00	4.5-6.0	A-4(1)	29	6	1.4	59.9	26.5	12.1	100	100	51	-	-
S-276	75' RT	171+00	0.5-4.0	A-7-6(16)	50	34	25.9	22.0	21.8	30.3	100	86	57	-	-

LEGEND

A: RESIDUAL, RED-BROWN, YELLOW-BROWN, AND BROWN, SOFT, HIGHLY PLASTIC, MOIST, SILTY CLAY
B: RESIDUAL, RED-BROWN AND GRAY-BROWN, MEDIUM STIFF TO VERY STIFF, MOIST, SANDY SILT AND SLIGHTLY PLASTIC, SANDY CLAY
C: RESIDUAL, BROWN AND GRAY, DENSE, MOIST, SILTY SAND
D: WEATHERED ROCK (SANDSTONE)
E: NON-CRYSTALLINE ROCK (SANDSTONE)
F: ARTIFICIAL FILL, RED-BROWN, MEDIUM STIFF, SLIGHTLY PLASTIC, GRAVELLY, MOIST, SANDY CLAY



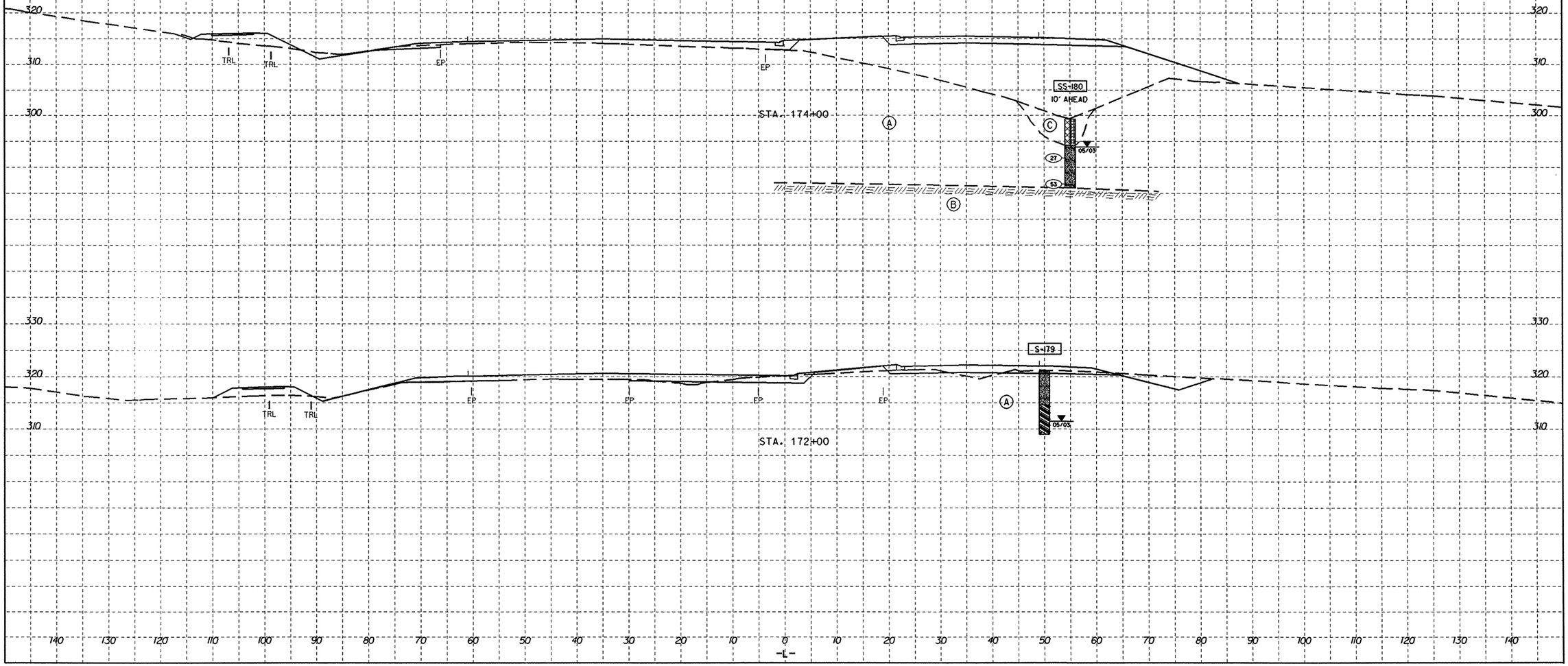
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	63

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-179	50' RT	172+00	0.5-5.0	A-4(2)	28	9	13.6	42.9	21.3	22.3	100	94	52	-	-
SS-180	55' RT	174+10	6.5-8.0	A-4(0)	34	NP	26.5	36.4	31.0	6.1	99	87	44	-	-

LEGEND

A: RESIDUAL, RED-BROWN, BROWN, GREEN-GRAY, AND BLUE-GRAY, SOFT TO HARD, MOIST TO WET, SANDY SILT AND SLIGHTLY PLASTIC, SANDY CLAY
B: NON-CRYSTALLINE ROCK (SANDSTONE)
C: ARTIFICIAL FILL, RIP RAP



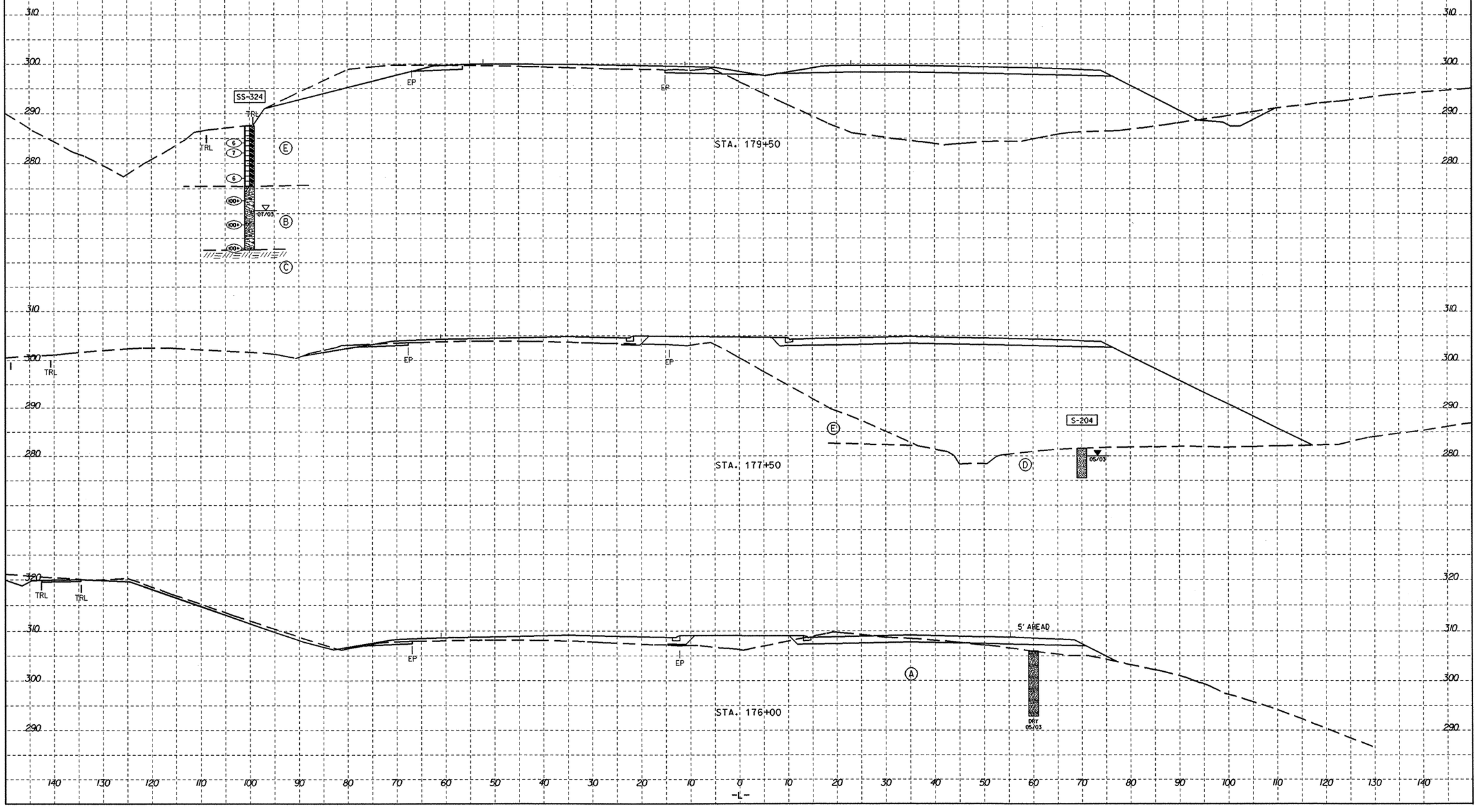
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	64

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-204	70' RT	177+50	0.5-6.0	A-2-4(0)	20	NP	21.1	55.1	15.7	8.1	100	94	31	-	-
SS-324	100' LT	179+50	2.4-3.9	A-6(11)	37	20	8.8	27.5	37.2	26.5	93	88	66	-	-

LEGEND

A: RESIDUAL, RED-BROWN AND BROWN, MEDIUM STIFF TO HARD, MOIST, SANDY SILT
B: WEATHERED ROCK (CLAYSTONE)
C: NON-CRYSTALLINE ROCK (CLAYSTONE)
D: ALLUVIAL, BROWN, VERY LOOSE, MOIST TO WET, SILTY SAND
E: ROADWAY EMBANKMENT, RED-BROWN, MEDIUM STIFF, MODERATELY PLASTIC, MOIST, SANDY CLAY



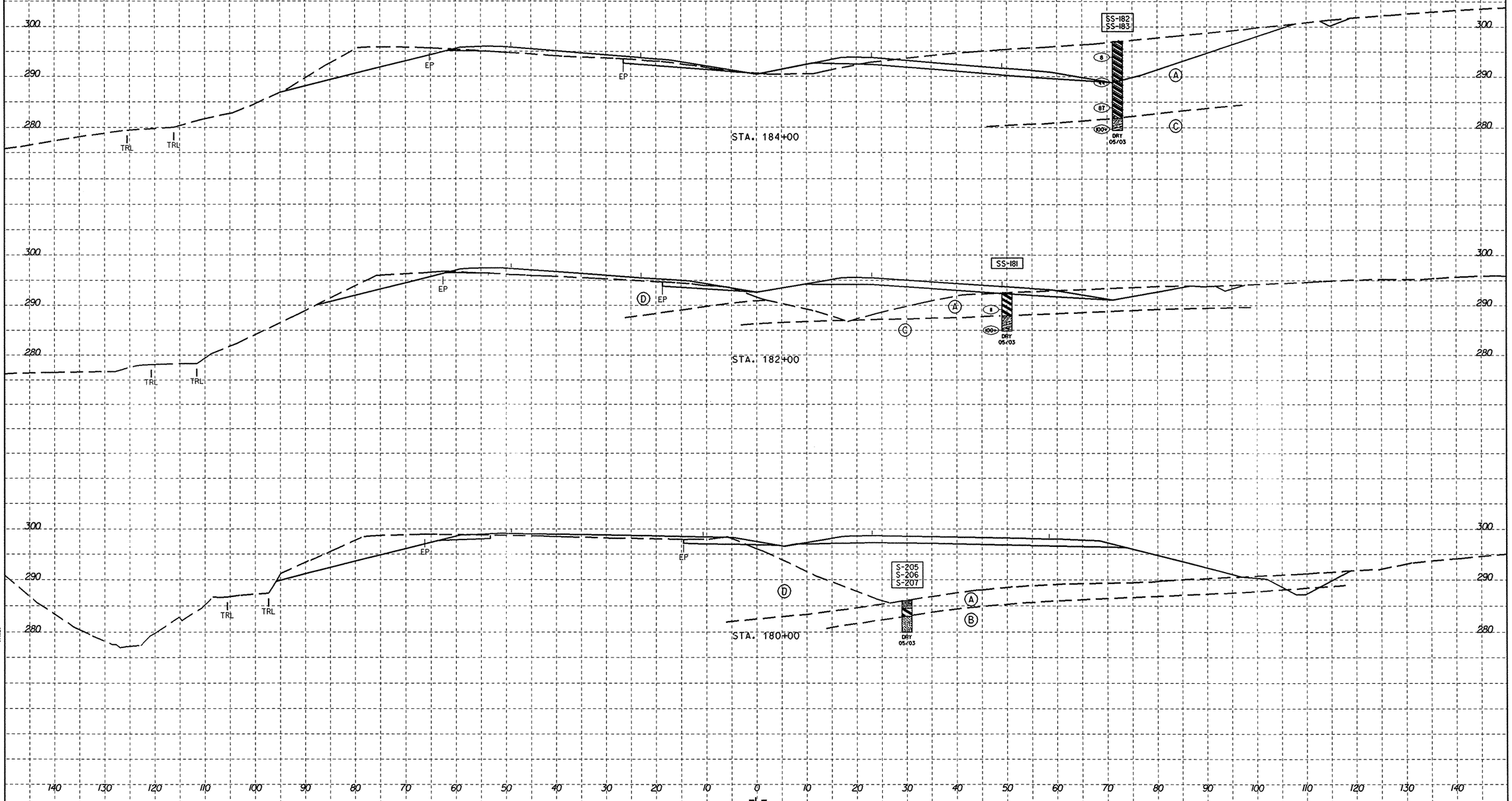
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	65

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-205	30' RT	180+00	0.5-1.5	A-4(0)	16	NP	14.6	45.3	29.9	10.2	100	94	51	-	-
S-206	30' RT	180+00	1.5-3.0	A-7-6(12)	42	24	12.2	34.8	20.5	32.5	100	96	60	-	-
S-207	30' RT	180+00	3.0-6.0	A-2-4(0)	21	4	32.3	38.0	13.4	16.3	96	80	33	-	-
SS-181	50' RT	182+00	2.3-3.8	A-7-6(14)	41	25	8.7	34.2	26.7	30.4	100	97	65	17.1	-
SS-182	72' RT	184+00	2.2-3.7	A-6(5)	34	18	25.6	30.7	21.0	22.7	100	88	48	18.1	-
SS-183	72' RT	184+00	7.2-8.7	A-6(12)	37	15	4.7	19.2	51.3	24.7	100	97	82	-	-

LEGEND

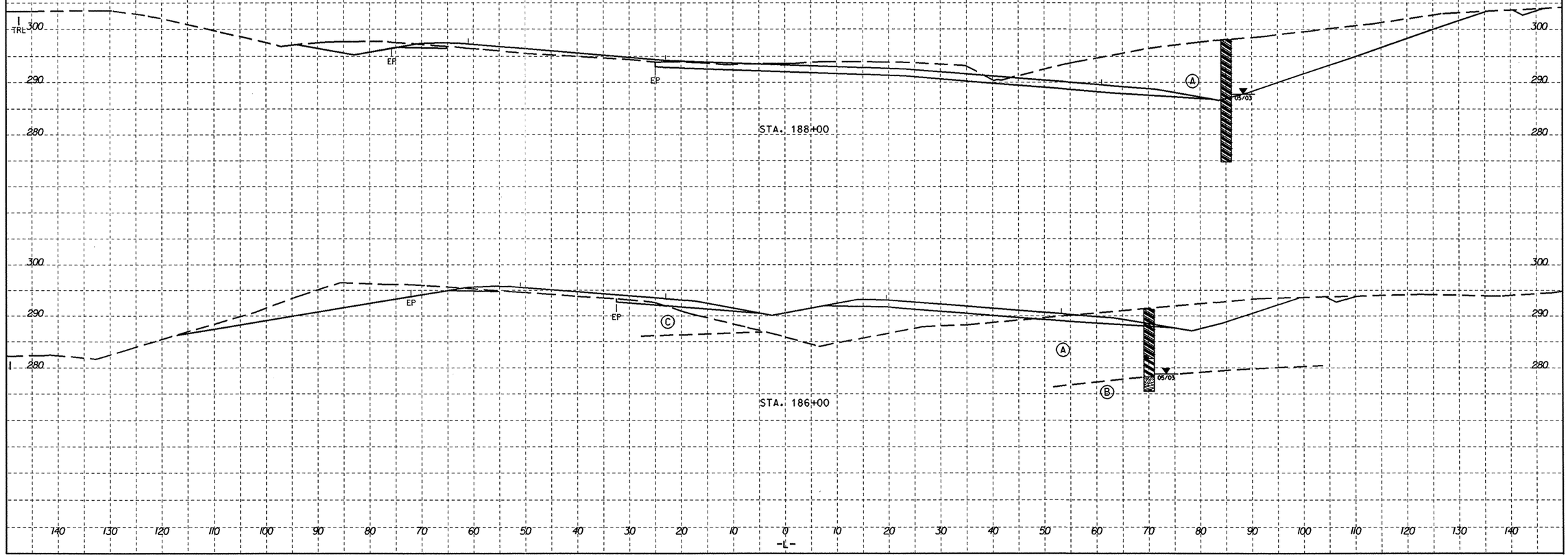
A: RESIDUAL, RED-BROWN, YELLOW-BROWN, AND BROWN, MED. STIFF TO HARD, MOIST, SD. SILT AND SLI. TO MOD. PLASTIC, SANDY AND SILTY CLAY
B: RESIDUAL, ORANGE-BROWN, MEDIUM DENSE, MOIST, SILTY SAND
C: WEATHERED ROCK (SANDSTONE)
D: ROADWAY EMBANKMENT



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	66

LEGEND

A: RESIDUAL, RED-BROWN, ORANGE-BROWN, AND BROWN, SOFT TO HARD, SLIGHTLY TO MODERATELY PLASTIC, MOIST TO WET, SANDY AND SILTY CLAY
B: WEATHERED ROCK (SANDSTONE)
C: ROADWAY EMBANKMENT



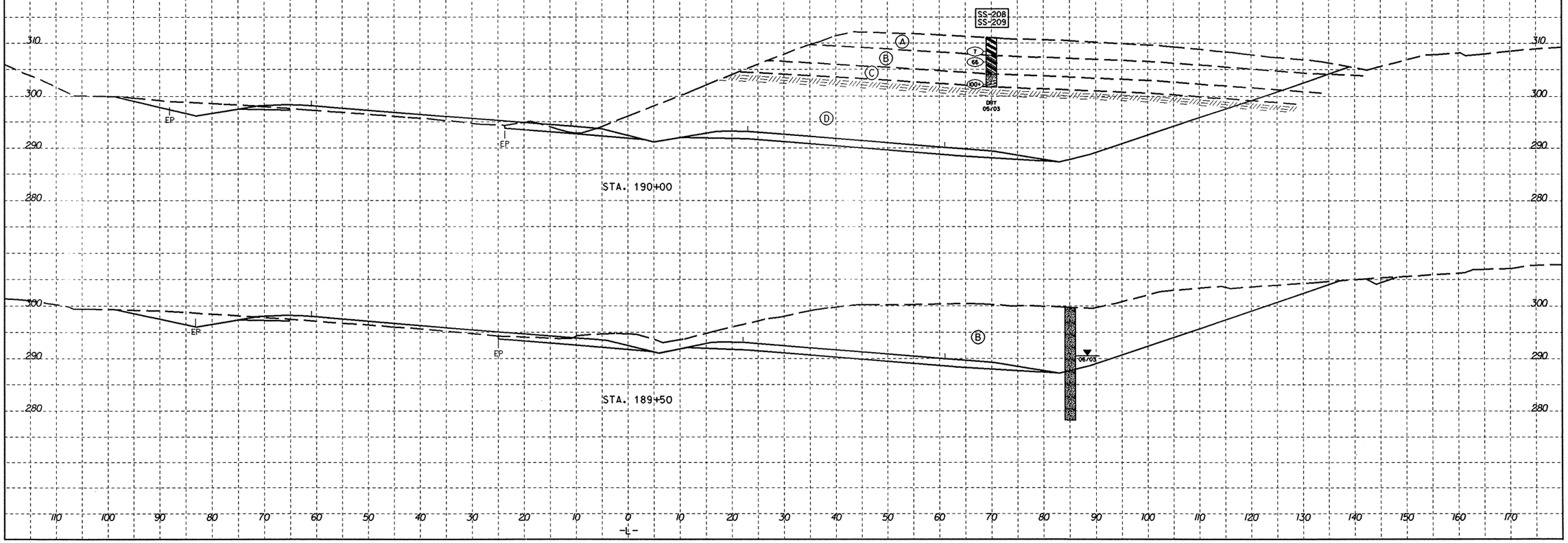
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	67

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			%	%
							C. SAND	F. SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
SS-208	70' RT	190+00	1.7-3.2	A-7-6(41)	63	42	0.8	17.5	35.0	46.7	100	100	90	-	-
SS-209	70' RT	190+00	3.7-5.2	A-6(17)	38	19	2.0	16.5	49.0	32.5	100	99	88	8.9	-

LEGEND

A: RESIDUAL, YELLOW-BROWN, MEDIUM STIFF, HIGHLY PLASTIC, MOIST, SILTY CLAY
B: RESIDUAL, RED-BROWN AND BROWN, SOFT TO HARD, MOIST TO WET, SANDY SILT AND MODERATELY PLASTIC, SANDY CLAY
C: WEATHERED ROCK (SANDSTONE)
D: NON-CRYSTALLINE ROCK (SANDSTONE)

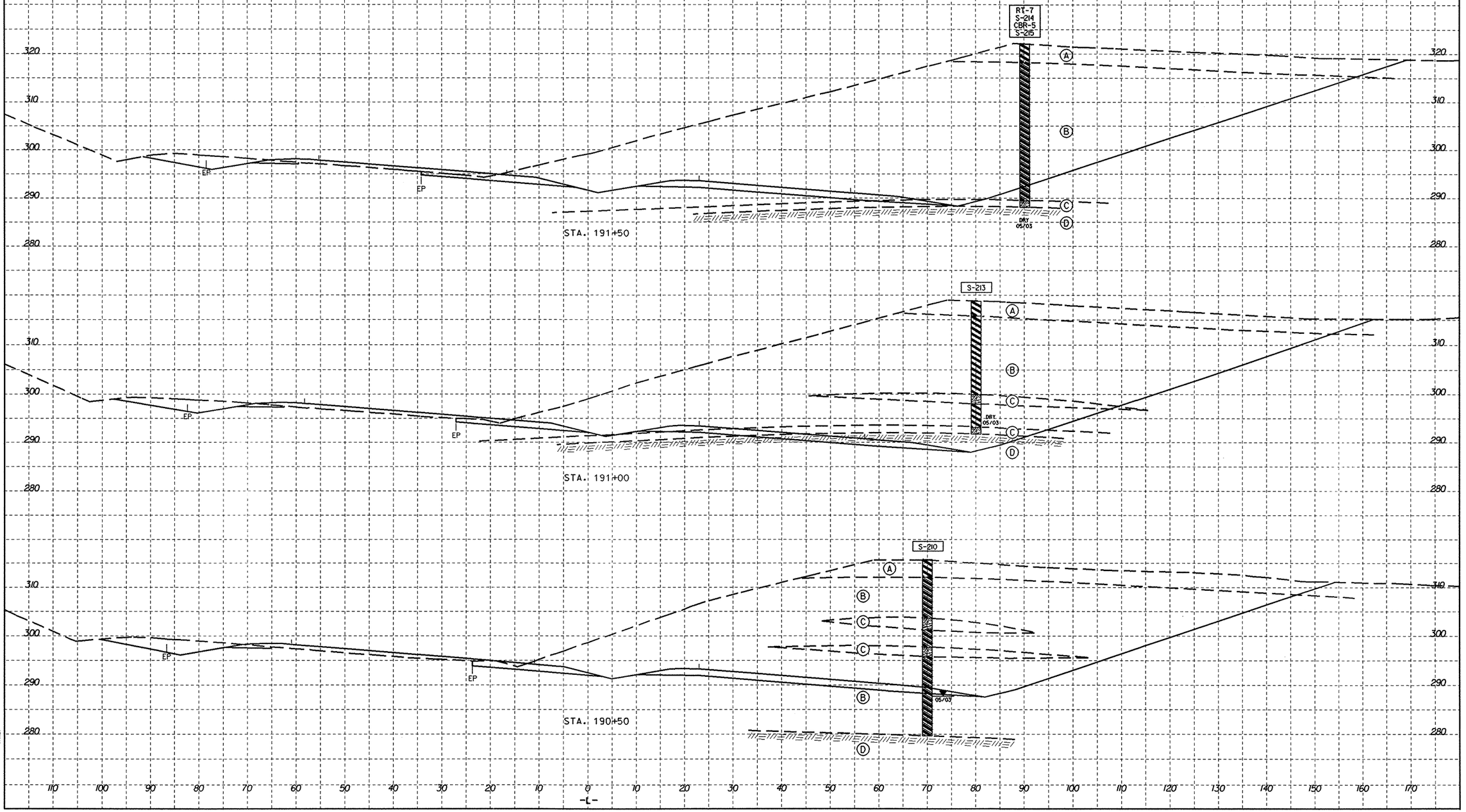


SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-210	70' RT	190+50	14.5-18.0	A-6(10)	36	15	3.3	10.4	66.1	20.3	82	80	75	-	-
S-213	80' RT	191+00	0.0-3.0	A-7-6(56)	79	54	2.0	12.6	32.5	52.8	100	99	91	-	-
S-214	90' RT	191+50	3.0-10.0	A-6(9)	35	15	2.2	22.8	54.7	20.3	87	86	71	-	-
RT-7	90' RT	191+50	3.0-10.0	A-6(8)	32	13	2.5	31.0	47.9	18.6	100	99	76	-	-
S-215	90' RT	191+50	20.0-30.0	A-6(6)	33	13	9.8	27.6	46.3	16.3	89	83	63	-	-
CBR-5	90' RT	191+50	20.0-30.0	A-6(7)	30	11	5.3	26.4	52.0	16.3	99	96	79	-	-

LEGEND

A: RESIDUAL, RED-BROWN AND YELLOW-BROWN, SOFT TO MEDIUM STIFF, HIGHLY PLASTIC, MOIST, SILTY CLAY
B: RESIDUAL, RED-BROWN AND GREEN-BROWN, SOFT TO VERY STIFF, SLIGHTLY TO MODERATELY PLASTIC, MOIST TO WET, SANDY AND SILTY CLAY
C: WEATHERED ROCK (SILTSTONE)
D: NON-CRYSTALLINE ROCK (SILTSTONE)



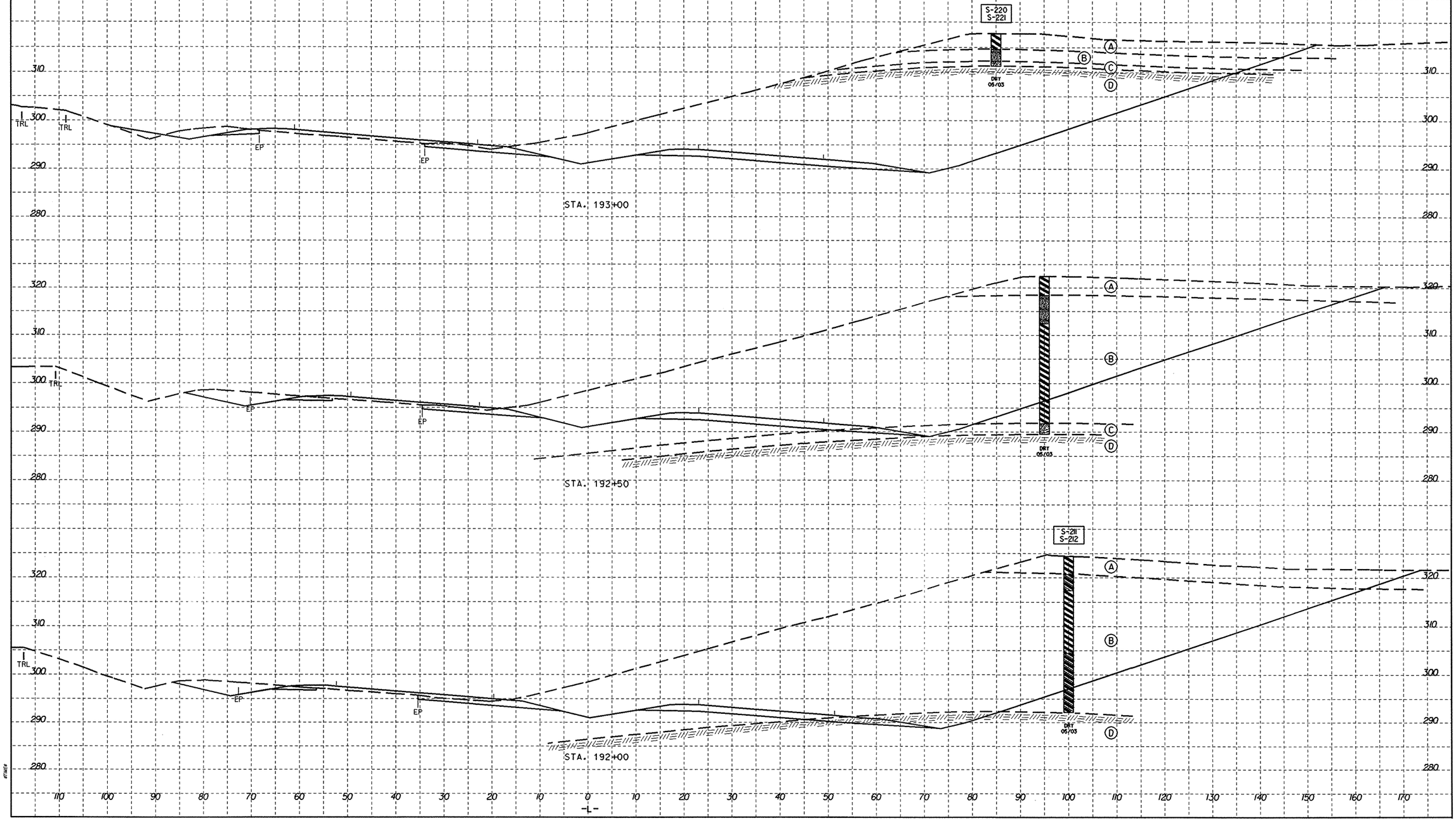
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	69

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-211	100' RT	192+00	7.0-13.0	A-7-6(21)	43	21	1.2	8.3	55.9	34.6	100	99	94	-	-
S-212	100' RT	192+00	24.0-28.0	A-6(5)	32	14	3.5	33.7	44.5	18.3	75	74	54	-	-
S-220	85' RT	193+00	0.0-3.0	A-7-6(34)	53	34	2.0	8.9	42.3	46.7	100	99	93	-	-
S-221	85' RT	193+00	3.0-5.4	A-4(3)	29	10	7.7	47.0	35.2	10.2	90	89	53	-	-

LEGEND

A: RESIDUAL, RED-BROWN AND YELLOW-BROWN, SOFT, HIGHLY PLASTIC, MOIST, SILTY CLAY
B: RESIDUAL, RED-BROWN AND ORANGE-BROWN, MED. STIFF TO HARD, MOIST, SANDY SILT AND SLI. TO MOD. PLASTIC, SANDY AND SILTY CLAY
C: WEATHERED ROCK (SANDSTONE AND SILTSTONE)
D: NON-CRYSTALLINE ROCK (SANDSTONE AND SILTSTONE)

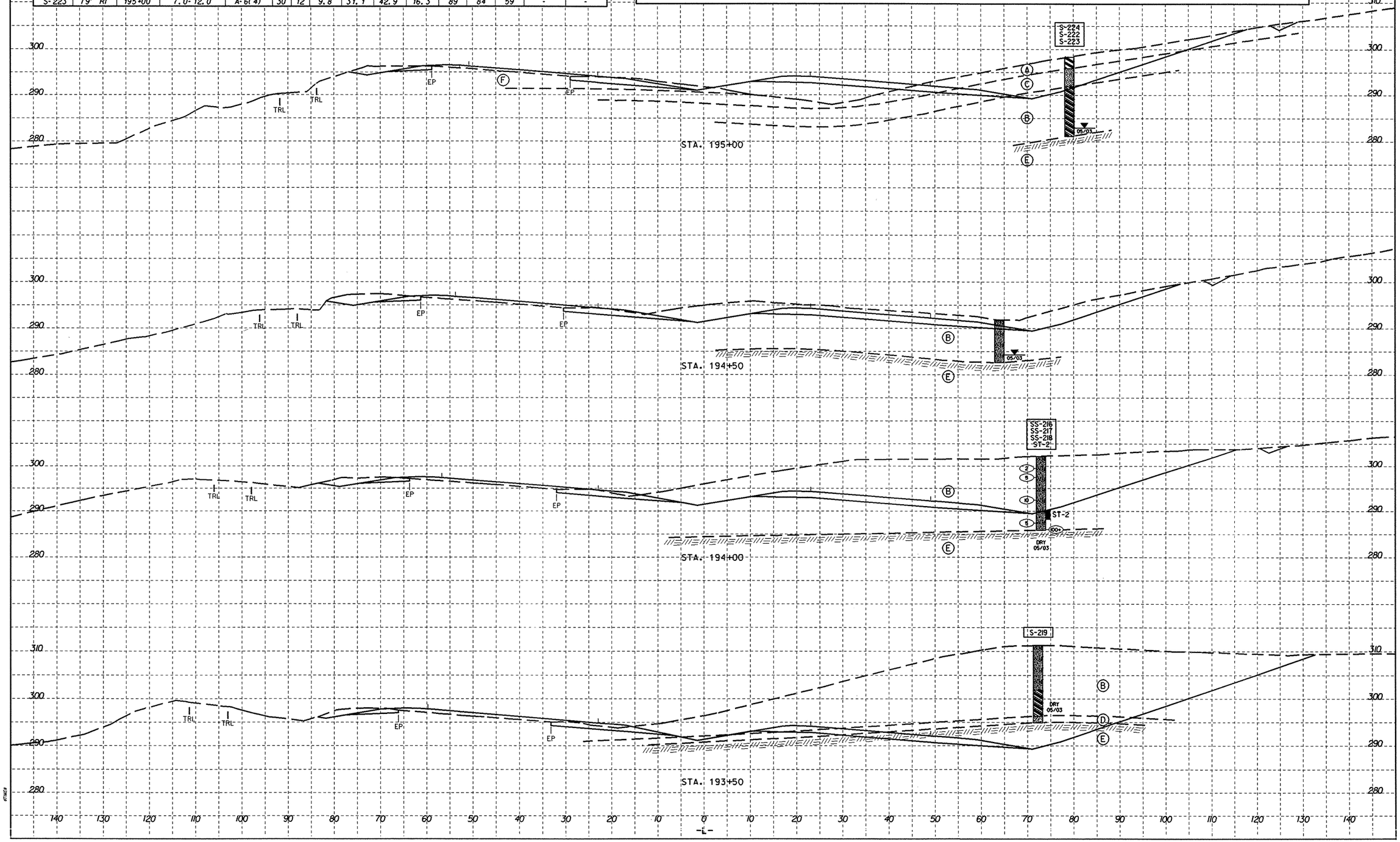


SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-219	73' RT	193+50	9.4- 12.0	A-6(3)	30	11	18.3	28.9	40.7	12.2	86	76	52	-	-
SS-216	73' RT	194+00	1.7- 3.2	A-4(3)	29	9	12.8	33.3	31.5	22.4	100	92	62	15.5	-
SS-217	73' RT	194+00	8.8- 10.3	A-4(0)	24	5	20.5	41.7	27.6	10.2	100	91	47	14.4	-
ST-2	73' RT	194+00	12.0- 14.0	A-4(5)	29	10	17.4	15.6	50.9	16.2	97	84	69	14.7	-
SS-218	73' RT	194+00	13.8- 15.3	A-4(5)	28	10	7.9	26.2	53.7	12.2	100	97	73	-	-
S-224	79' RT	195+00	0.0- 2.5	A-7-6(23)	53	34	5.3	31.7	22.4	40.7	100	98	71	-	-
S-222	79' RT	195+00	2.5- 6.5	A-2-4(0)	24	NP	22.2	52.6	19.1	6.1	100	93	33	-	-
S-223	79' RT	195+00	7.0- 12.0	A-6(4)	30	12	9.8	31.1	42.9	16.3	89	84	59	-	-

LEGEND

A: RESIDUAL, BROWN, MEDIUM STIFF, HIGHLY PLASTIC, MOIST, SILTY CLAY
B: RESIDUAL, RED-BROWN, SOFT TO HARD, MOIST TO WET, SANDY SILT AND SLIGHTLY PLASTIC, SANDY CLAY
C: RESIDUAL, BROWN, DENSE TO VERY DENSE, MOIST, SILTY SAND
D: WEATHERED ROCK (SANDSTONE)
E: NON-CRYSTALLINE ROCK (SANDSTONE AND SILTSTONE)
F: ROADWAY EMBANKMENT



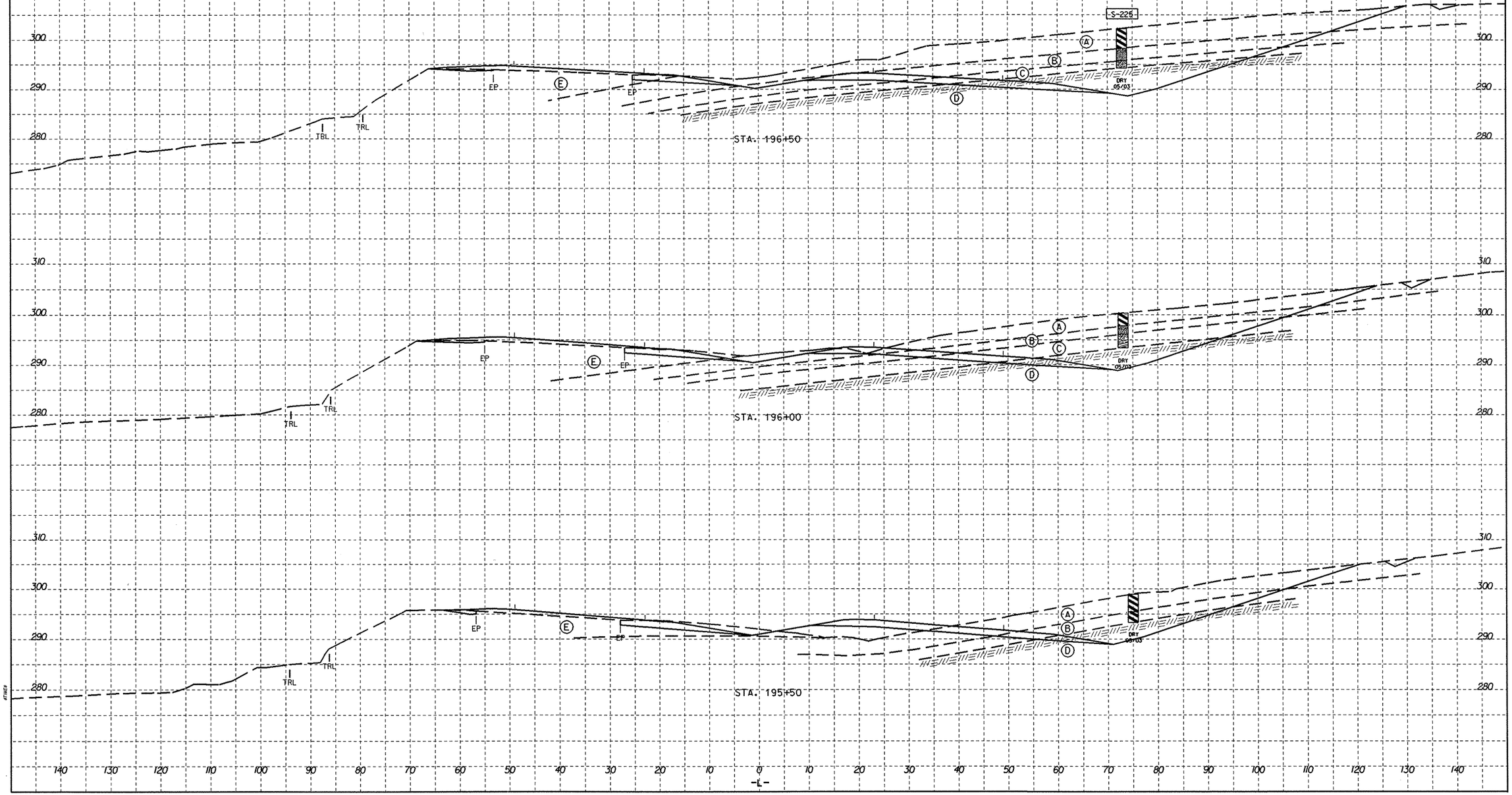
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	71

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-225	73' RT	196+50	0.0-3.5	A-7-6(40)	66	47	2.3	22.0	26.3	49.4	100	99	81	-	-

LEGEND

A: RESIDUAL, RED-BROWN AND BROWN, SOFT TO MEDIUM STIFF, HIGHLY PLASTIC, MOIST, SILTY CLAY
B: RESIDUAL, RED-BROWN AND BROWN, MEDIUM STIFF TO HARD, MOIST, SANDY SILT AND MODERATELY PLASTIC, SILTY CLAY
C: WEATHERED ROCK (SANDSTONE AND SILTSTONE)
D: NON-CRYSTALLINE ROCK (SANDSTONE AND SILTSTONE)
E: ROADWAY EMBANKMENT



PROJ. REFERENCE NO.	SHEET NO.
U-4026B	72

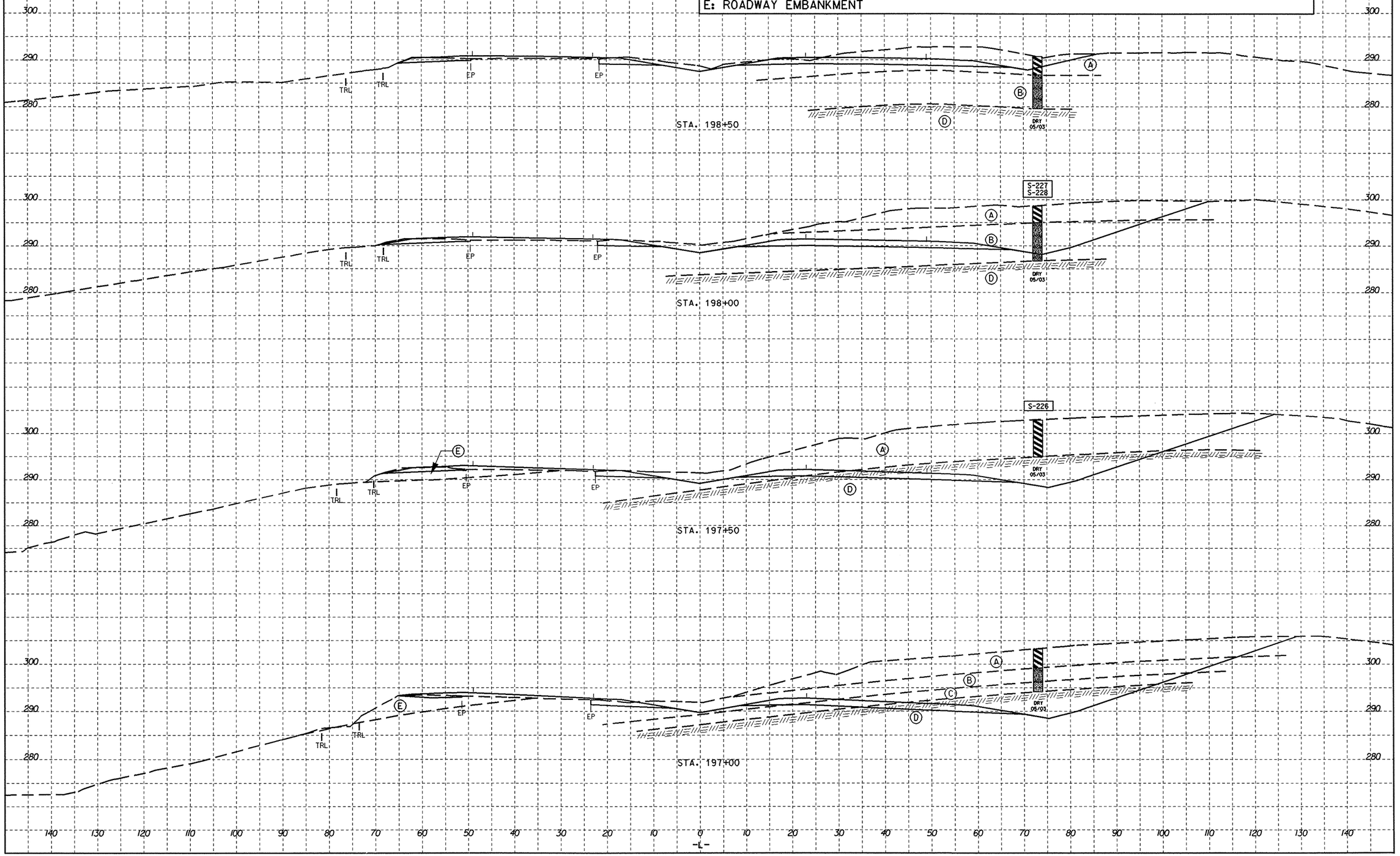
0 5 10

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-226	73' RT	197+50	4.1-7.9	A-7-6(15)	53	27	15.8	23.5	29.8	30.9	94	86	62	-	-
S-227	73' RT	198+00	0.5-3.5	A-7-6(22)	52	33	7.6	28.0	23.3	41.2	100	98	71	-	-
S-228	73' RT	198+00	4.0-8.5	A-4(4)	30	9	1.0	49.8	34.8	14.4	100	100	65	-	-

LEGEND

A: RESIDUAL, RED-BROWN, YELLOW-BROWN, AND BROWN, VERY SOFT TO MEDIUM STIFF, HIGHLY PLASTIC, MOIST, SILTY CLAY
B: RESIDUAL, RED-BROWN, MEDIUM STIFF, MOIST, SANDY SILT
C: RESIDUAL, BROWN, MEDIUM DENSE, MOIST, SILTY SAND
D: NON-CRYSTALLINE ROCK (SANDSTONE AND SILTSTONE)
E: ROADWAY EMBANKMENT



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-229	60' RT	199+50	0.0- 1.5	A-6(10)	38	21	13.4	30.2	25.5	30.9	96	89	60	17.0	-
PS- 1	75' RT	200+00	0.0- 1.5	A-6(19)	40	19	1.4	9.3	59.0	30.3	100	100	95	-	-
SS-237	50' RT	200+50	2.3- 3.8	A-6(10)	35	18	10.1	30.0	31.1	28.8	100	98	67	-	-
SS-238	50' RT	200+50	7.3- 8.8	A-4(1)	25	6	8.4	39.9	33.1	18.5	99	96	59	-	-
SS-239	50' RT	200+50	12.3- 13.8	A-4(2)	25	8	10.7	40.9	27.8	20.6	100	98	55	-	-

LEGEND

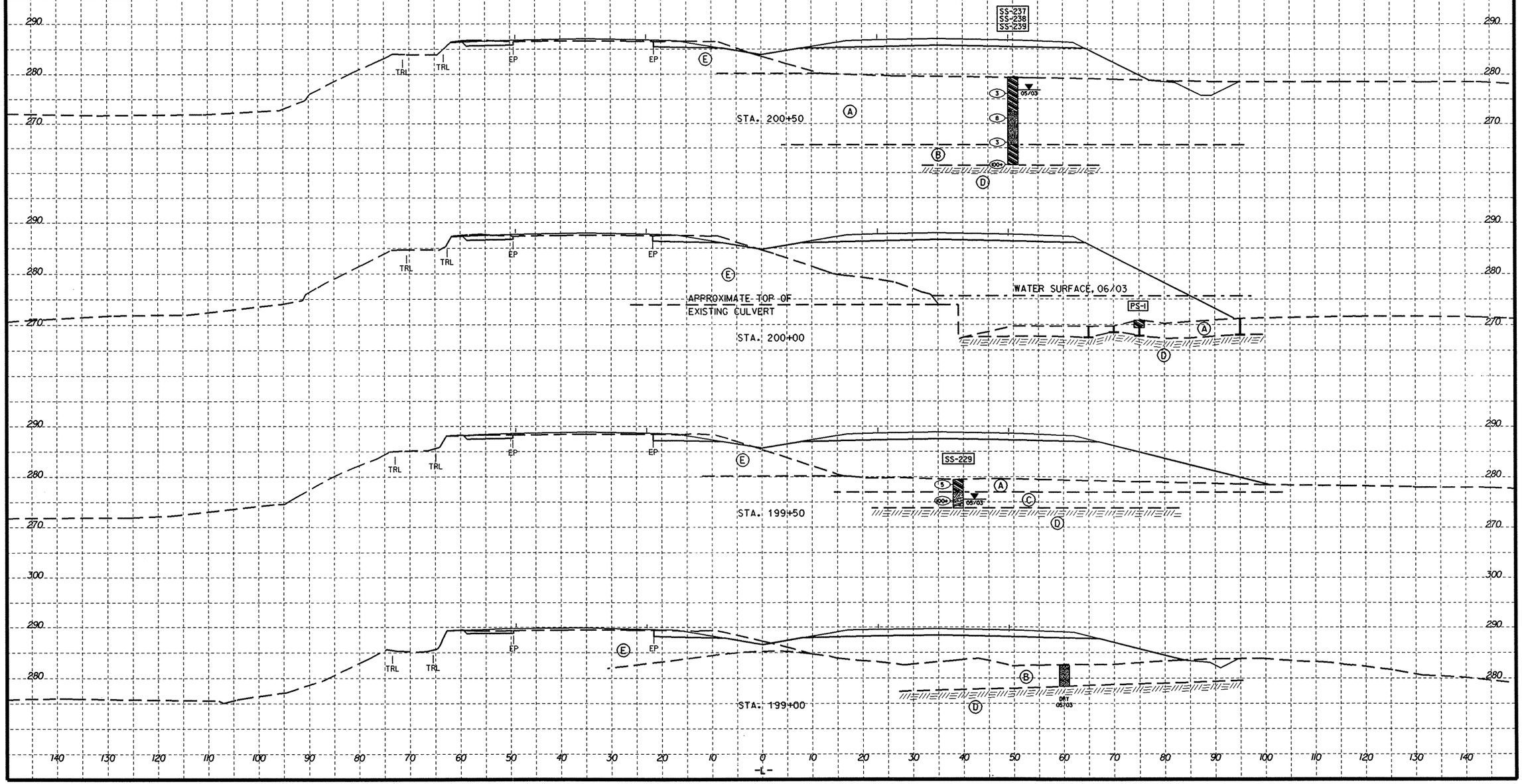
A: ALLUVIAL, BROWN, GRAY, AND BROWN-GRAY, SOFT TO STIFF, DRY TO WET, SANDY SILT AND MODERATELY PLASTIC, SANDY CLAY

B: RESIDUAL, RED-BROWN, BROWN, AND DARK RED, SOFT TO MEDIUM STIFF, MOIST TO WET, SANDY SILT AND MODERATELY PLASTIC, SANDY CLAY

C: WEATHERED ROCK (SANDSTONE)

D: NON-CRYSTALLINE ROCK (SANDSTONE AND SILTSTONE)

E: ROADWAY EMBANKMENT



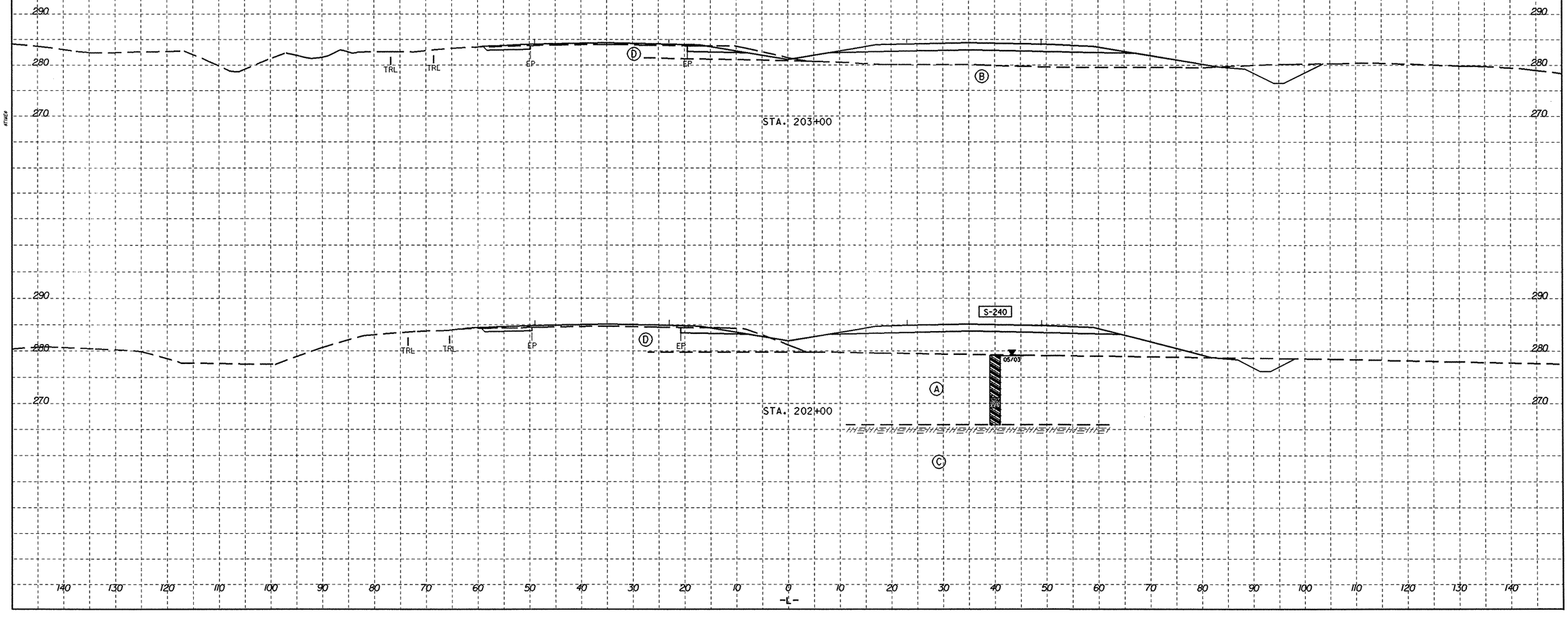
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	74

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-240	40' RT	202+00	10.0-12.0	A-6(11)	33	16	4.9	21.6	44.7	28.8	98	96	79	-	-

LEGEND

A: ALLUVIAL, BROWN, GRAY, AND DARK RED, SOFT TO STIFF, DRY TO WET, SANDY SILT AND MODERATELY PLASTIC, SANDY CLAY
B: RESIDUAL, BROWN, SOFT, HIGHLY PLASTIC, MOIST TO WET, SILTY CLAY
C: NON-CRYSTALLINE ROCK (SILTSTONE)
D: ROADWAY EMBANKMENT



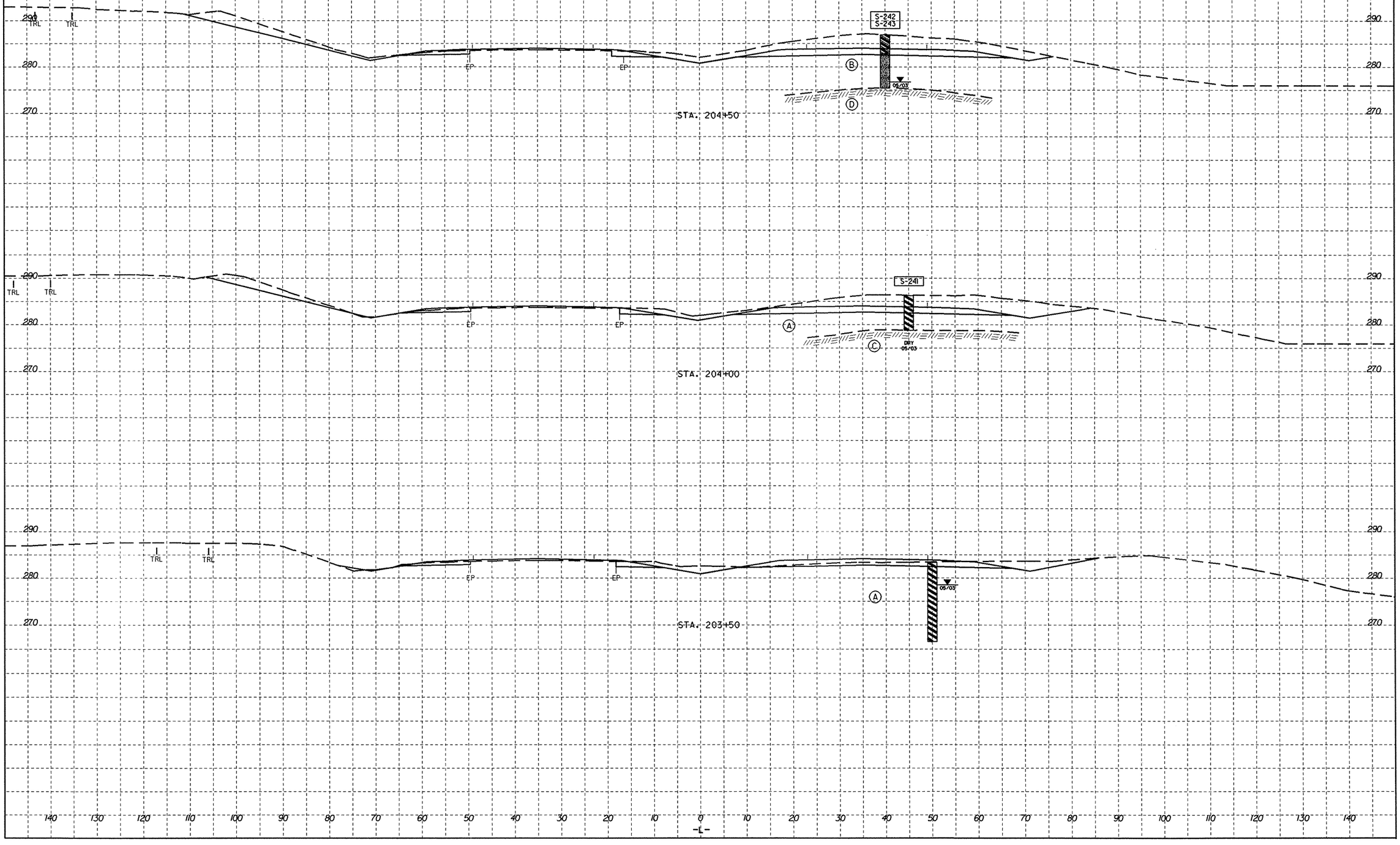
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	75

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-241	45' RT	204+00	1.0-5.0	A-7-5(51)	84	52	2.3	12.6	31.7	53.5	98	97	86	-	-
S-242	40' RT	204+50	0.5-4.0	A-6(9)	39	20	5.5	42.9	23.1	28.6	100	99	59	-	-
S-243	40' RT	204+50	4.0-9.5	A-4(1)	26	9	29.4	30.2	24.1	16.3	100	82	46	-	-

LEGEND

A: RESIDUAL, BROWN, SOFT, HIGHLY PLASTIC, MOIST TO WET, SILTY CLAY
B: RESIDUAL, RED-BROWN AND BROWN, SOFT, MOIST TO WET, SANDY SILT AND MODERATELY PLASTIC, SANDY CLAY
C: NON-CRYSTALLINE ROCK (DIABASE)
D: NON-CRYSTALLINE ROCK (SILTSTONE)



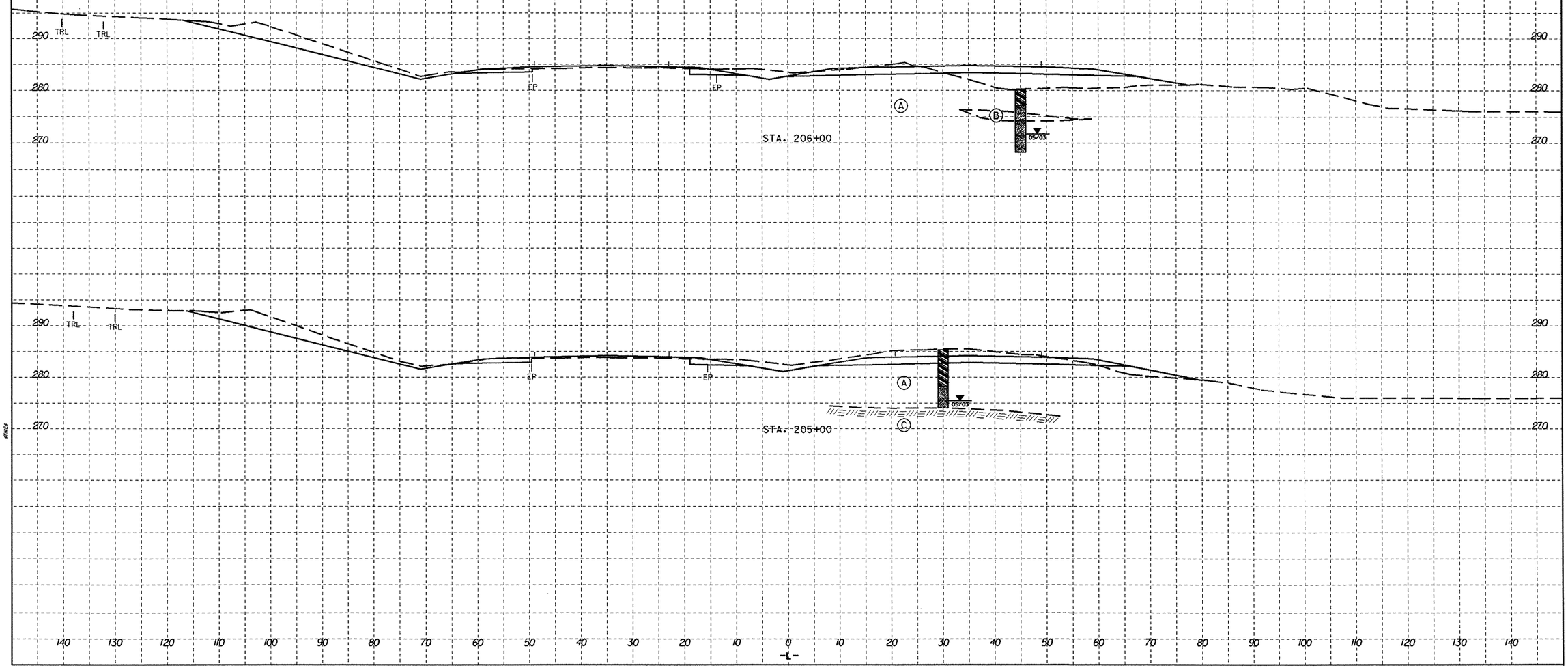
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	76

LEGEND

A: RESIDUAL, RED-BROWN AND BROWN, SOFT TO STIFF, MOIST TO WET, SANDY SILT AND MODERATELY PLASTIC, SANDY CLAY

B: WEATHERED ROCK (SILTSTONE)

C: NON-CRYSTALLINE ROCK (SILTSTONE)



PROJ. REFERENCE NO.	SHEET NO.
U-4026B	77

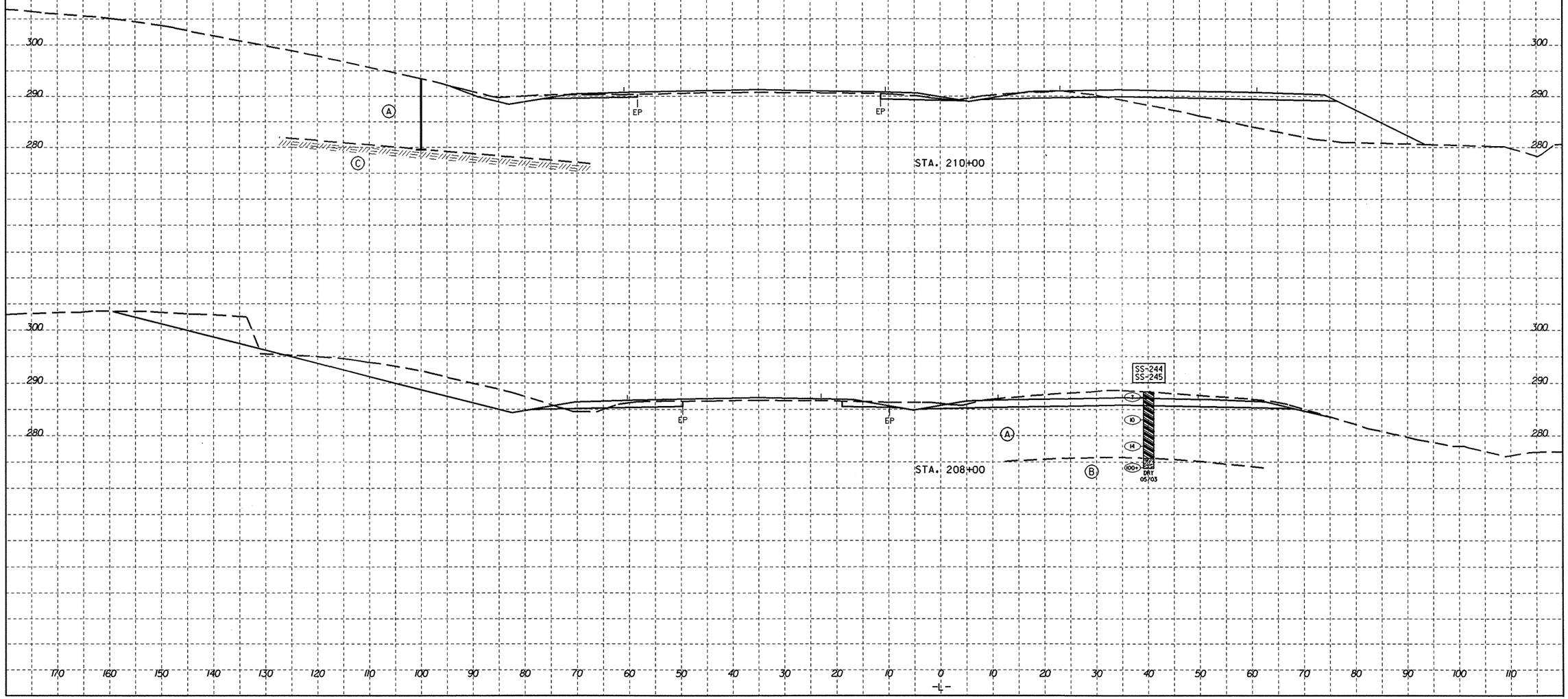
0 5 10

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-244	40' RT	208+00	0.0-1.5	A-6(8)	33	17	12.9	34.1	26.5	26.5	100	94	62	15.4	-
SS-245	40' RT	208+00	4.3-5.8	A-6(10)	36	18	5.3	35.3	34.9	24.5	100	98	69	-	-

LEGEND

A: RESIDUAL, RED-BROWN AND BROWN, SOFT TO HARD, MOIST, SANDY SILT AND MODERATELY PLASTIC, SANDY CLAY
B: WEATHERED ROCK (SILTSTONE)
C: NON-CRYSTALLINE ROCK (SILTSTONE)



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	78

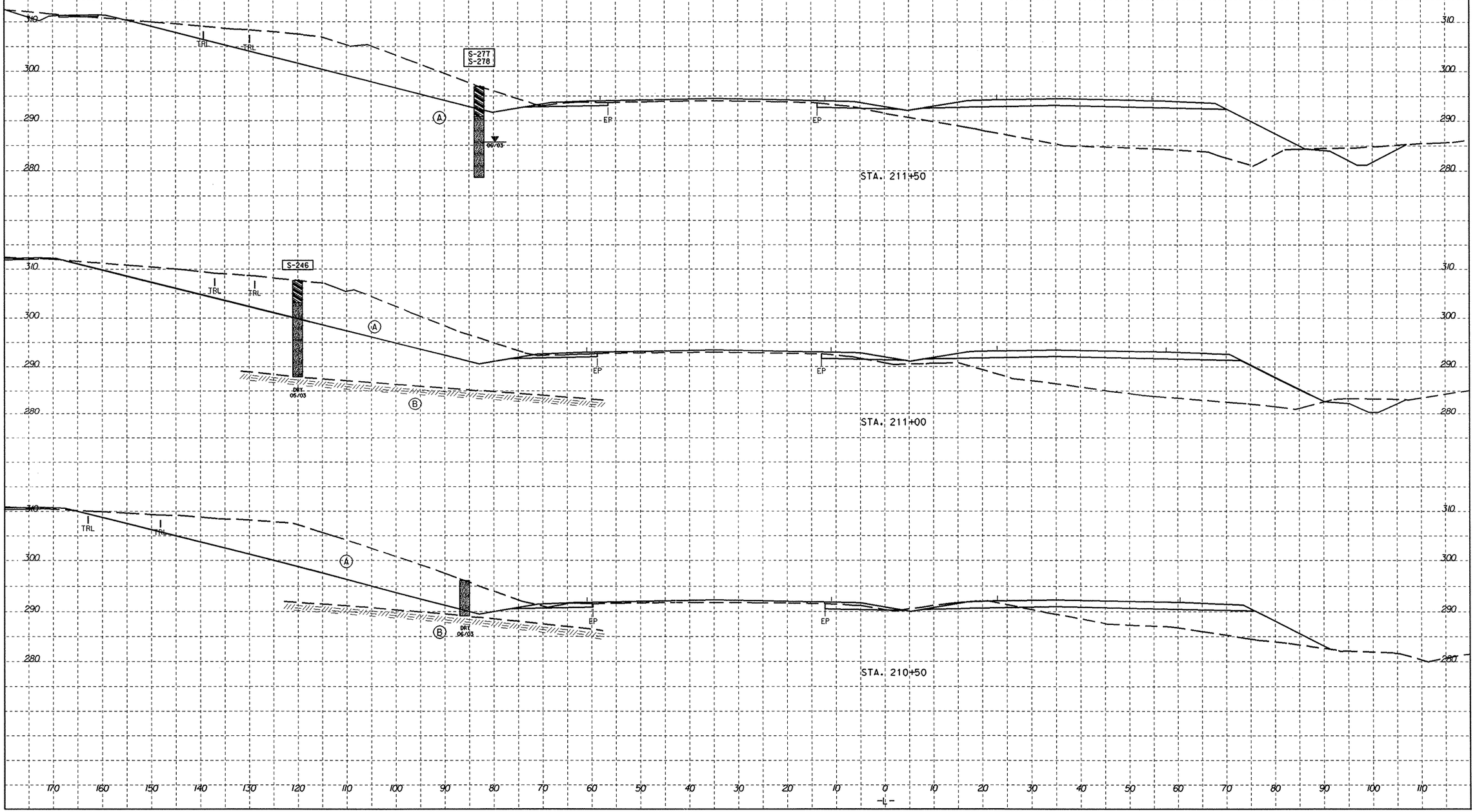
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-246	120' LT	211+00	12.0-17.0	A-4(1)	27	7	9.8	50.0	25.9	14.3	100	98	50	-	-
S-277	83' LT	211+50	0.5-3.2	A-6(7)	31	13	5.7	34.3	41.8	18.2	99	96	69	-	-
S-278	83' LT	211+50	6.0-10.0	A-4(2)	25	8	5.5	48.7	31.7	14.1	100	98	55	-	-

LEGEND

A: RESIDUAL, RED-BROWN AND BROWN, SOFT TO HARD, MOIST TO WET, SANDY SILT AND SLIGHTLY TO MODERATELY PLASTIC, SANDY CLAY

B: NON-CRYSTALLINE ROCK (SILTSTONE)

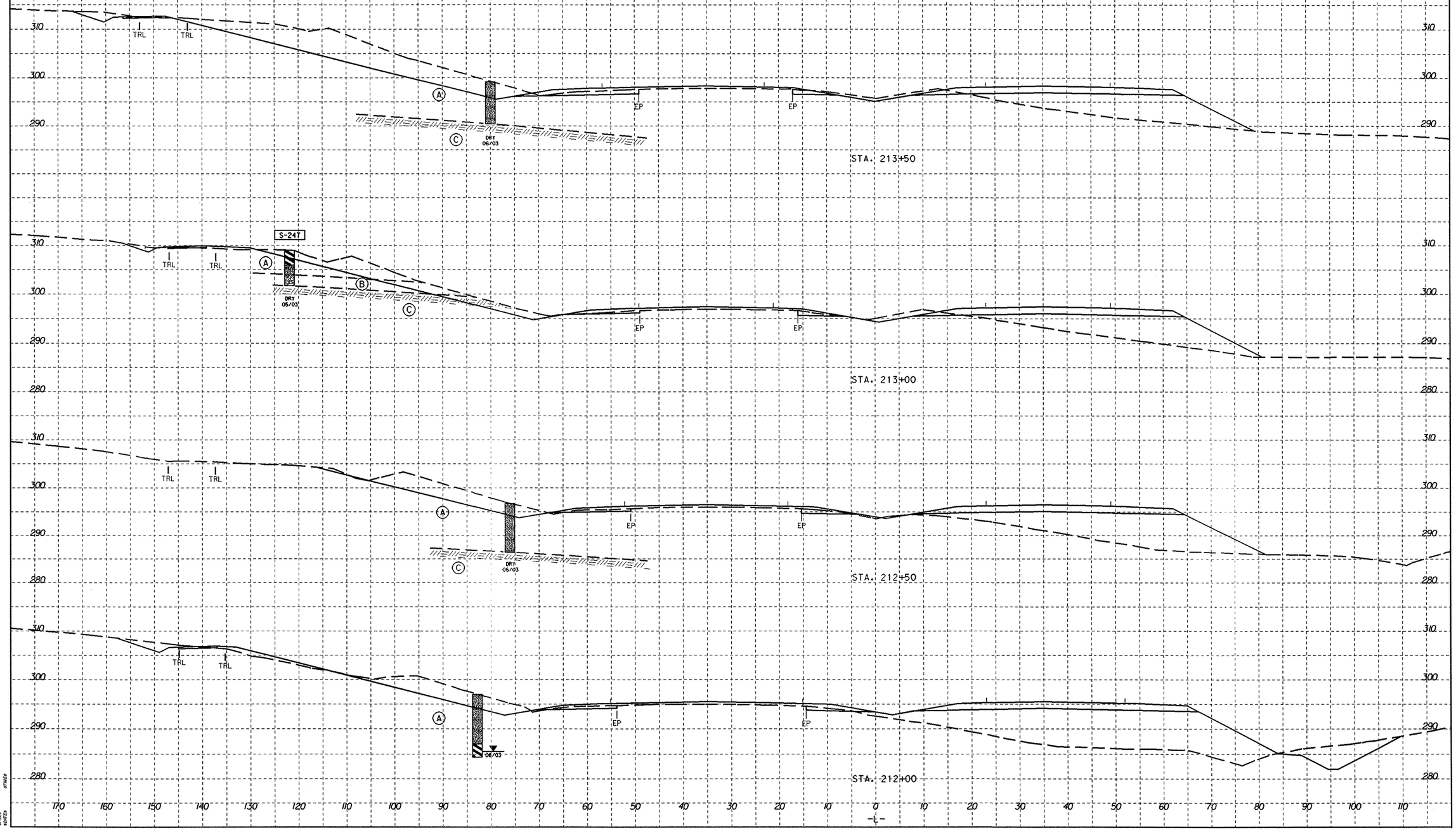


SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-247	122' LT	213+00	0.0-2.0	A-7-6(22)	47	24	1.4	17.8	35.9	44.9	100	100	87	-	-

LEGEND

A: RESIDUAL, RED-BROWN AND BROWN, SOFT TO HARD, MOIST TO WET, SANDY SILT AND MODERATELY PLASTIC, SILTY CLAY
B: WEATHERED ROCK (SILTSTONE)
C: NON-CRYSTALLINE ROCK (SILTSTONE)



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	80

SOIL TEST RESULTS

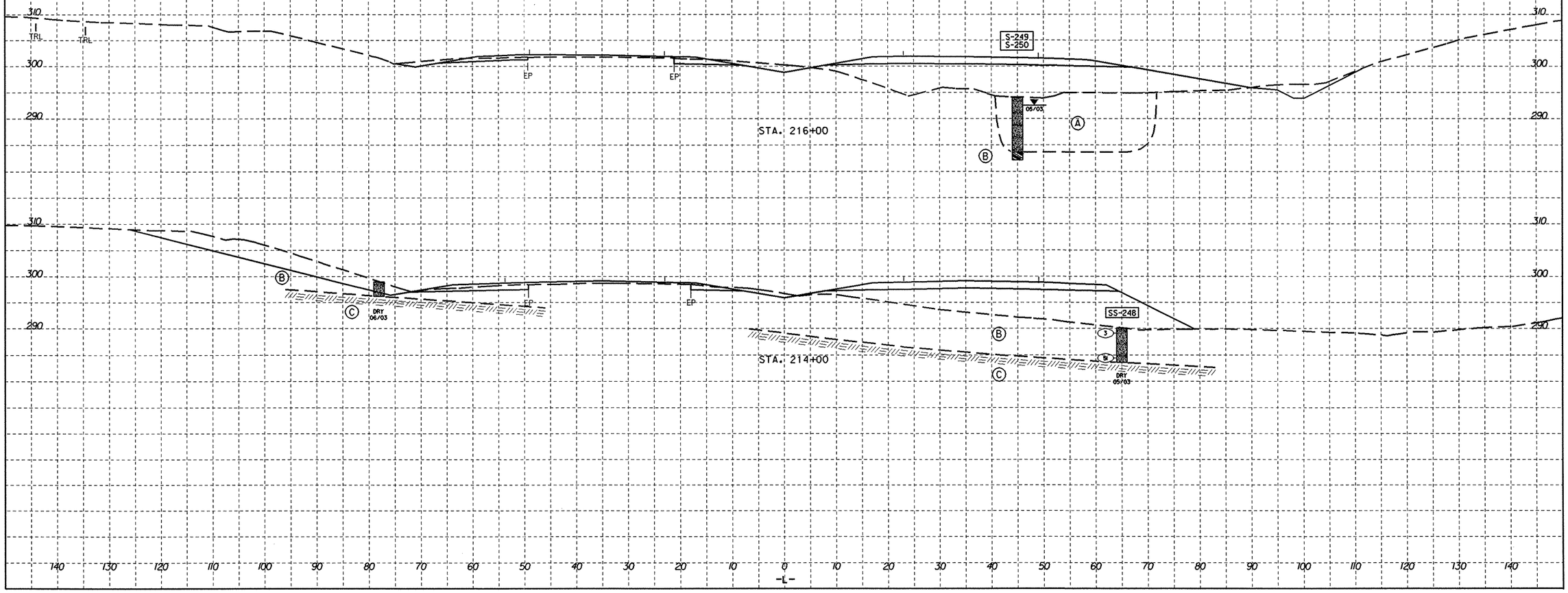
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-248	65' RT	214+00	0.0-1.5	A-4(1)	24	6	13.1	38.4	30.2	18.4	100	94	58	19.5	-
S-249	45' RT	216+00	0.0-2.0	A-4(0)	23	4	6.5	41.0	34.1	18.4	100	98	63	-	-
S-250	45' RT	216+00	10.4-11.9	A-6(10)	31	12	1.4	20.2	51.8	26.5	100	99	89	-	-

LEGEND

A: ALLUVIAL, BROWN, SOFT TO STIFF, MOIST TO WET, SANDY SILT

B: RESIDUAL, RED-BROWN, SOFT TO HARD, MOIST TO WET, SANDY SILT AND SLIGHTLY PLASTIC, SANDY CLAY

C: NON-CRYSTALLINE ROCK (CLAYSTONE)



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	81

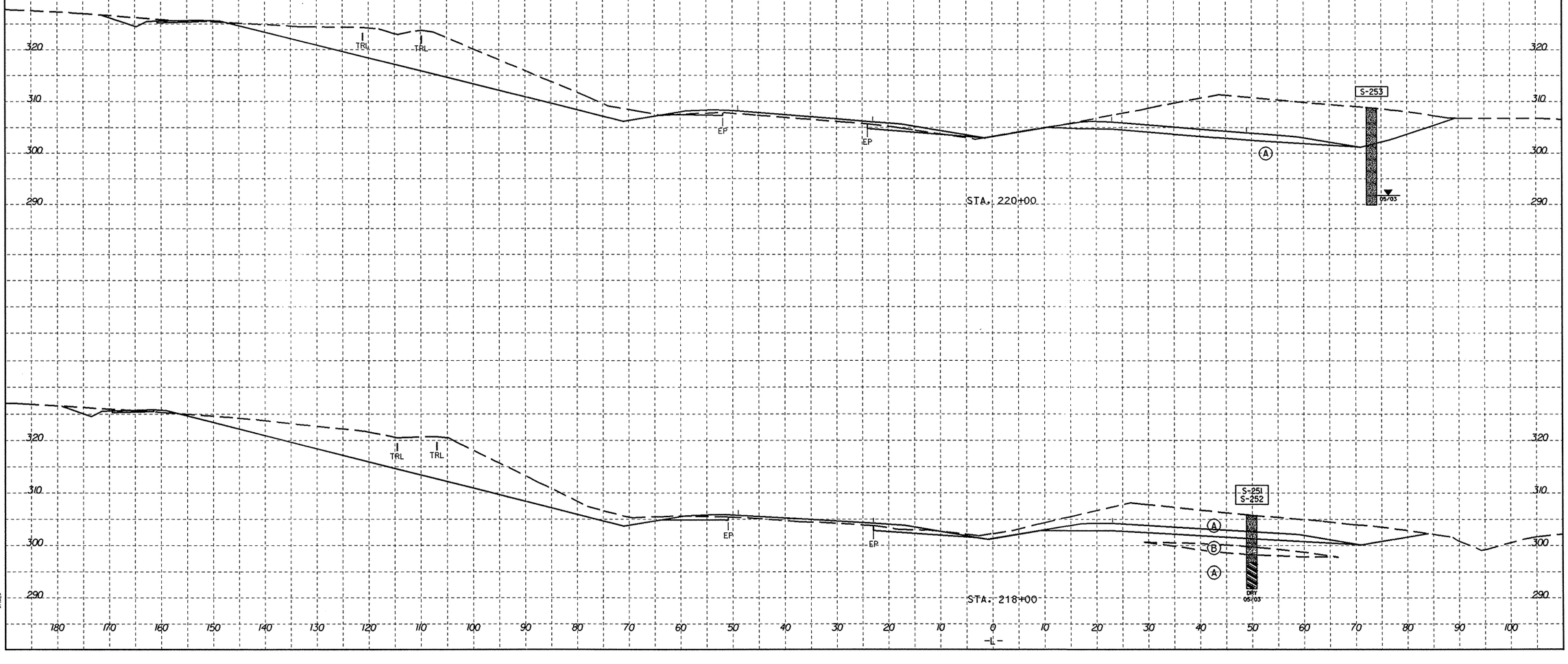
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-251	50' RT	218+00	0.0-4.0	A-4(0)	23	1	20.6	44.7	22.4	12.2	100	93	41	-	-
S-252	50' RT	218+00	7.5-9.0	A-4(0)	25	5	37.8	28.2	21.8	12.2	100	75	41	-	-
S-253	73' RT	220+00	4.0-8.0	A-4(6)	28	10	3.3	27.8	48.6	20.4	100	99	79	-	-

LEGEND

A: RESIDUAL, RED-BROWN AND BROWN, SOFT TO HARD, MOIST TO WET, SANDY SILT AND SLIGHTLY PLASTIC, SANDY CLAY

B: WEATHERED ROCK (SILTSTONE)



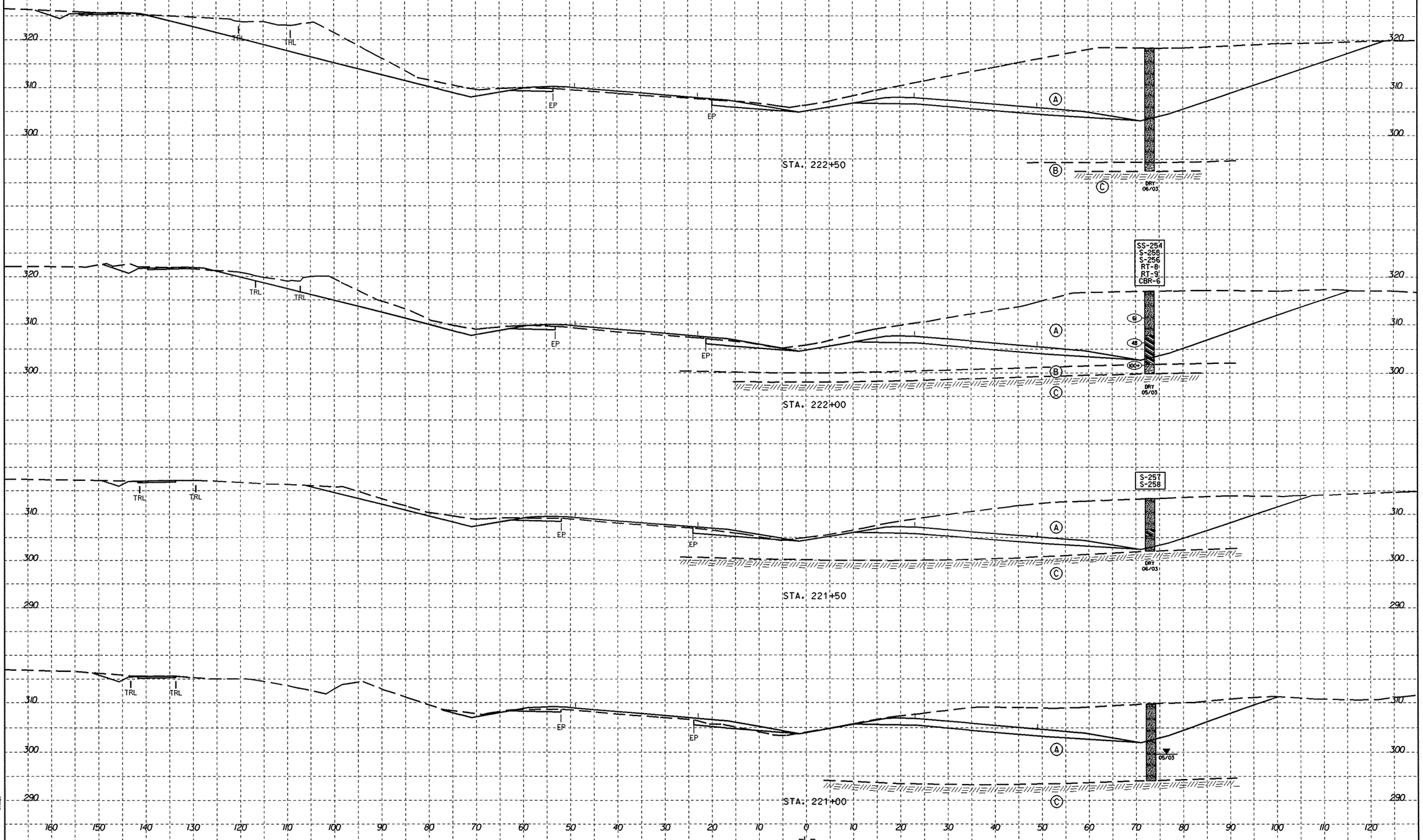
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	82

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-257	73' RT	221+50	0.5-4.0	A-4(2)	26	9	11.0	41.6	24.9	22.4	100	96	56	-	-
S-258	73' RT	221+50	7.0-8.0	A-6(5)	29	12	8.4	36.3	30.8	24.5	100	97	63	-	-
RT-8	73' RT	222+00	0.0-4.0	A-6(5)	30	13	11.2	34.8	27.6	26.4	100	96	61	-	-
S-255	73' RT	222+00	0.0-4.0	A-4(0)	20	2	14.5	46.1	27.1	12.2	100	95	49	-	-
RT-9	73' RT	222+00	4.0-9.0	A-6(11)	33	16	3.3	27.4	36.8	32.5	100	99	77	-	-
SS-254	73' RT	222+00	4.5-6.0	A-4(7)	30	10	0.8	28.0	54.9	16.3	100	100	82	7.0	-
S-256	73' RT	222+00	9.0-14.0	A-6(15)	35	18	3.3	12.0	50.0	34.7	100	98	89	-	-
CBR-6	73' RT	222+00	9.0-14.0	A-6(17)	40	19	1.8	17.3	44.2	36.7	100	99	88	-	-

LEGEND

A: RESIDUAL, RED-BROWN, YELLOW-BROWN, GREEN-GRAY, AND BROWN, SOFT TO HARD, MOIST TO WET, SD SILT AND SLI. TO MOD. PLASTIC, SD CLAY
B: WEATHERED ROCK (CLAYSTONE)
C: NON-CRYSTALLINE ROCK (CLAYSTONE)



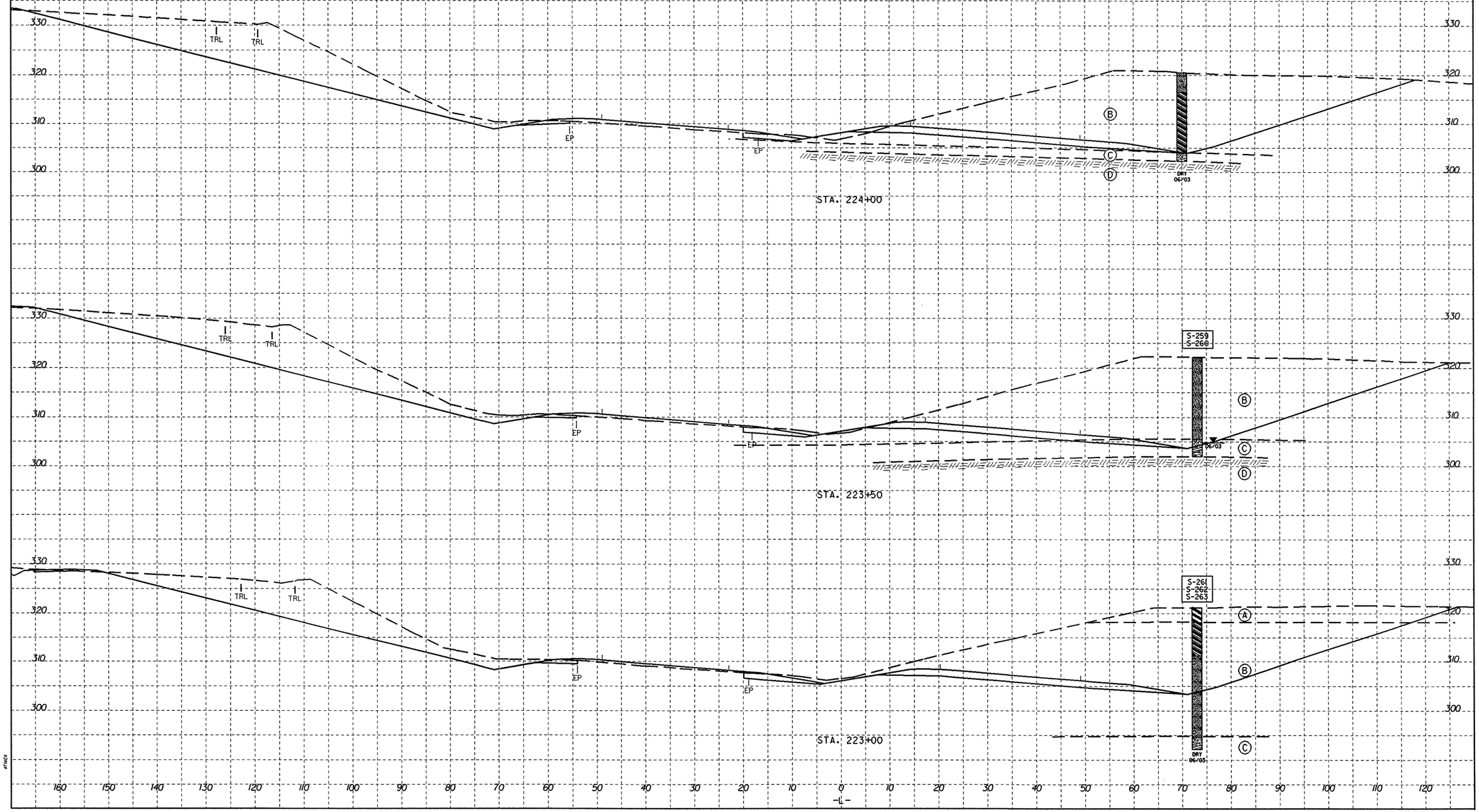
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	83

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-261	73' RT	223+00	0.0-2.5	A-7-6(33)	55	32	0.6	13.8	36.8	48.8	100	100	92	-	-
S-262	73' RT	223+00	4.0-6.5	A-6(11)	35	16	4.5	26.4	46.7	22.4	100	99	76	-	-
S-263	73' RT	223+00	11.5-26.5	A-4(2)	26	7	6.5	41.7	33.5	18.3	100	99	61	-	-
S-259	73' RT	223+50	5.0-9.1	A-4(5)	29	8	0.8	32.7	50.2	16.3	100	100	79	-	-
S-260	73' RT	223+50	11.6-13.6	A-4(4)	26	8	2.4	35.1	46.1	16.3	100	99	79	-	-

LEGEND

A: RESIDUAL, RED-BROWN, SOFT, HIGHLY PLASTIC, MOIST, SILTY CLAY
B: RESIDUAL, RED-BROWN AND BROWN, SOFT TO HARD, MOIST, SANDY SILT AND MODERATELY PLASTIC, SANDY CLAY
C: WEATHERED ROCK (CLAYSTONE AND SILTSTONE)
D: NON-CRYSTALLINE ROCK (CLAYSTONE)



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	84

LEGEND

A: RESIDUAL, RED-BROWN, YELLOW-BROWN, AND BROWN, SOFT TO VERY STIFF, MOIST, SANDY SILT AND SLI. TO MOD. PLASTIC, SANDY CLAY

B: WEATHERED ROCK (SANDSTONE)

STA: 225+50

STA: 225+00

STA: 224+50

TRL

EP

A

B

320

310

300

330

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

—L—

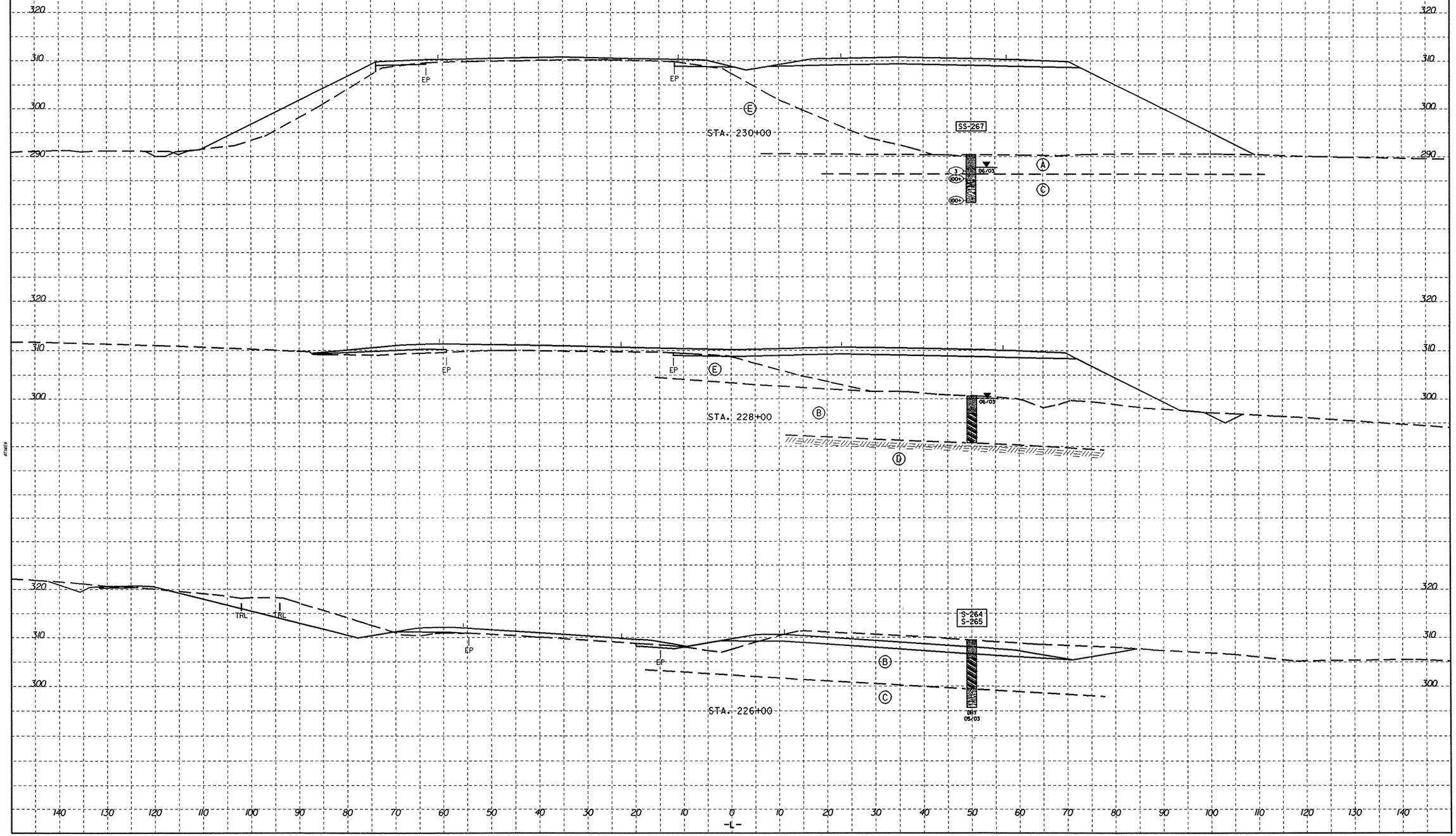
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	85

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-264	50' RT	226+00	0.0-1.7	A-4(0)	22	2	7.3	31.3	43.1	18.3	100	97	71	-	-
S-265	50' RT	226+00	4.0-6.5	A-6(11)	32	15	0.8	24.4	48.4	26.4	100	100	84	-	-
SS-267	50' RT	230+00	2.5-4.0	A-4(3)	27	6	3.7	29.5	42.5	24.4	100	99	75	25.3	-

LEGEND

A: ALLUVIAL, BROWN AND GRAY, SOFT, MOIST TO WET, SANDY SILT
B: RESIDUAL, RED-BROWN AND YELLOW-BROWN, SOFT TO HARD, MOIST TO WET, SANDY SILT AND SLIGHTLY PLASTIC, SANDY CLAY
C: WEATHERED ROCK (CLAYSTONE AND SANDSTONE)
D: NON-CRYSTALLINE ROCK (SANDSTONE



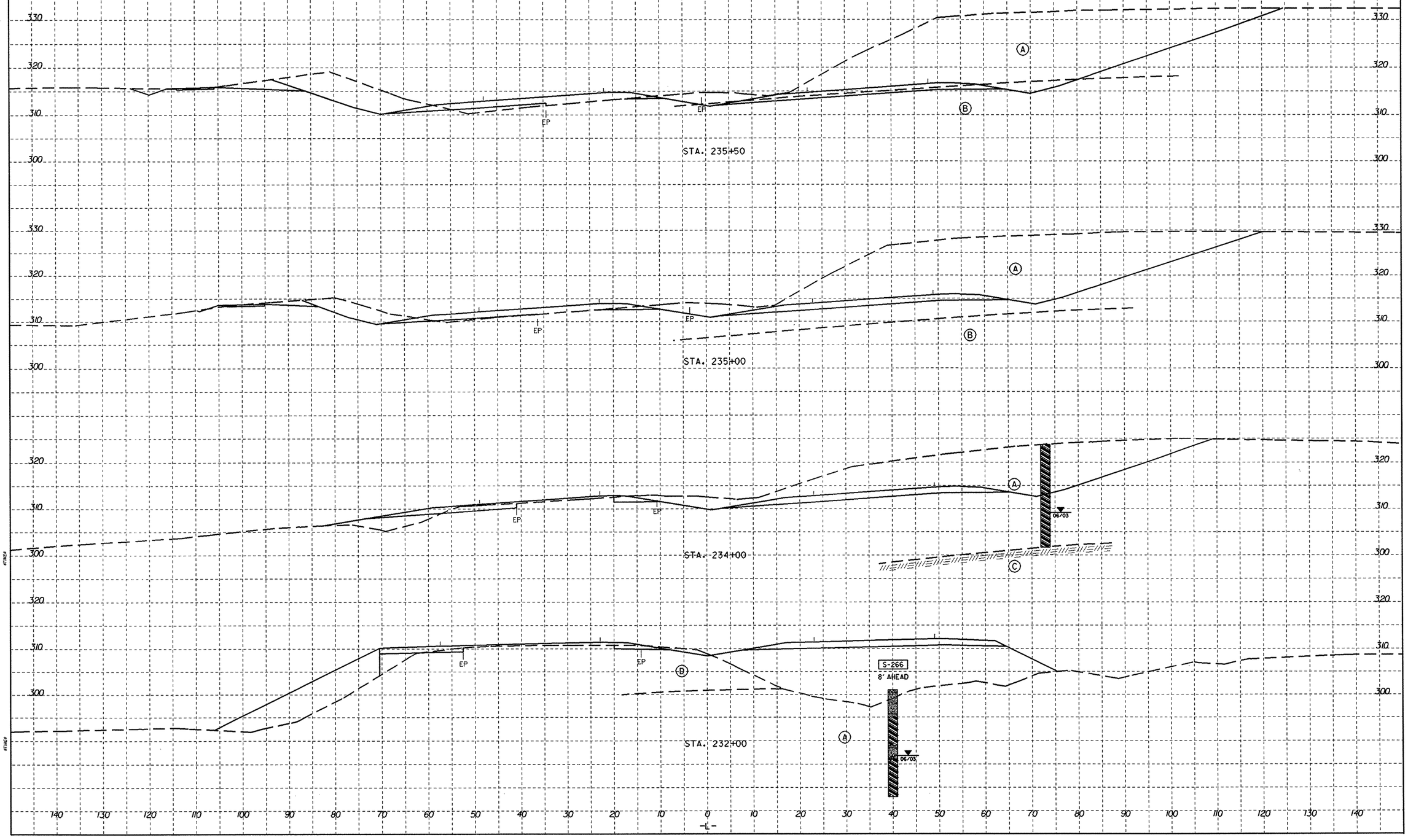
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	86

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-266	40' RT	232+08	1.0-4.0	A-4(1)	25	5	3.5	52.0	28.3	16.3	100	99	55	-	-

LEGEND

A: RESIDUAL, RED-BROWN, YELLOW-BROWN, AND GREEN-GRAY, SOFT TO HARD, MOIST TO WET, SD. SILT AND SLI. TO MOD. PLASTIC, SD. AND SL. CLAY
B: WEATHERED ROCK (CLAYSTONE AND SILTSTONE)
C: NON-CRYSTALLINE ROCK (CLAYSTONE)
D: ROADWAY EMBANKMENT



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	87

SOIL TEST RESULTS

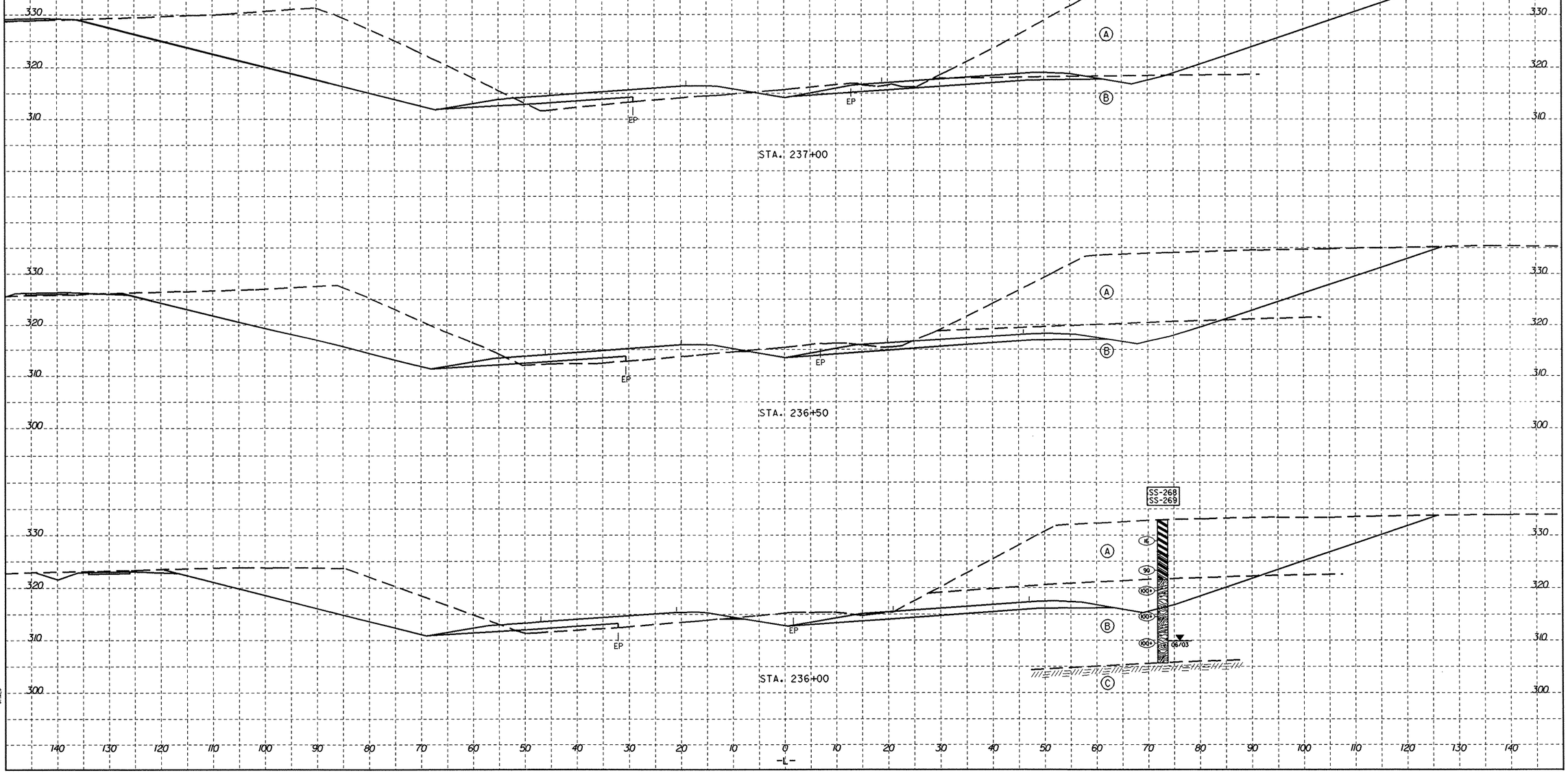
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-268	73' RT	236+00	3.0-4.5	A-7-5(13)	49	17	9.6	27.0	35.0	28.5	100	96	71	28.1	-
SS-269	73' RT	236+00	8.0-9.5	A-6(12)	37	14	7.9	14.8	58.9	18.3	100	96	85	-	-

LEGEND

A: RESIDUAL, RED-BROWN, YELLOW-BROWN, AND GREEN-GRAY, SOFT TO HARD, MOIST TO WET, SD. SILT AND SLI. TO MOD. PLASTIC, SD. AND SL. CLAY

B: WEATHERED ROCK (CLAYSTONE AND SILTSTONE)

C: NON-CRYSTALLINE ROCK (SANDSTONE)



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	8B

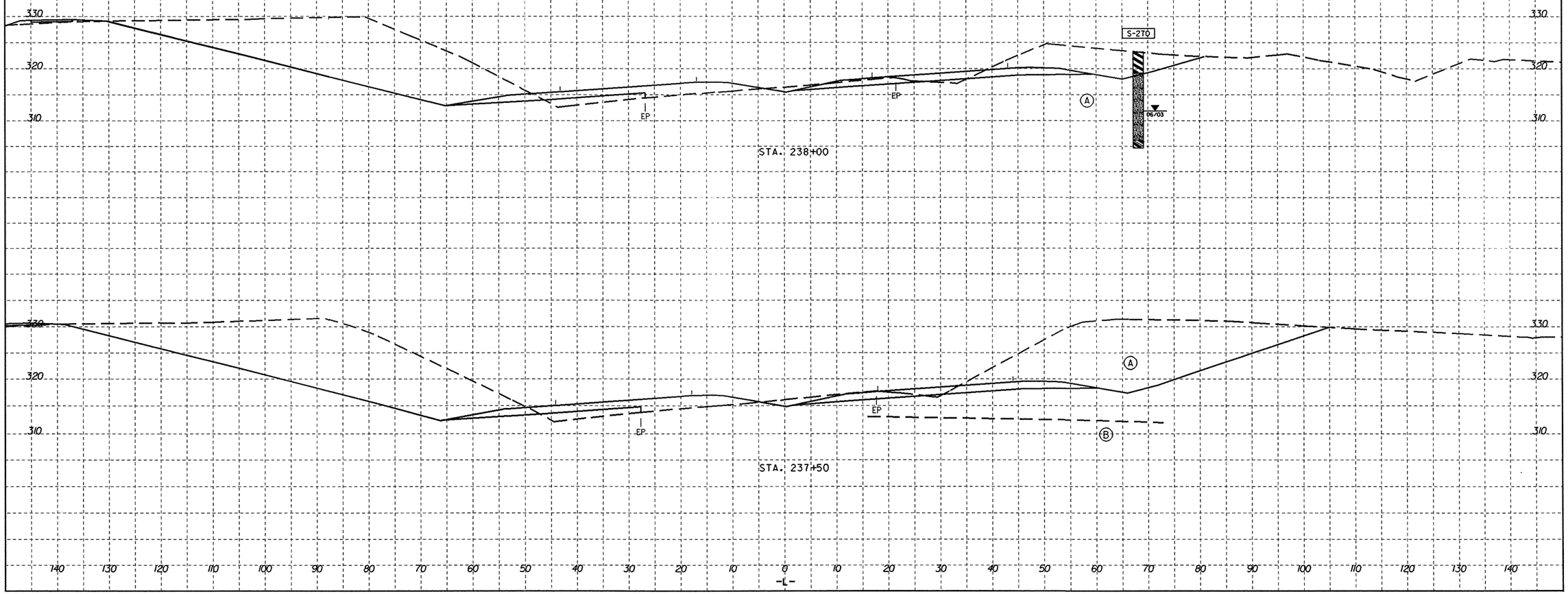
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) #10	#40	#200	% MOISTURE	% ORGANIC
S-270	68' RT	238+00	4.0-8.5	A-4(3)	29	8	4.9	40.4	34.3	20.3	100	100	62	-	-

LEGEND

A: RESIDUAL, RED-BROWN, YELLOW-BROWN, AND GREEN-GRAY, SOFT TO HARD, MOIST TO WET, SD. SILT AND SLI. TO MOD. PLASTIC, SD. AND SL. CLAY

B: WEATHERED ROCK (CLAYSTONE AND SILTSTONE)



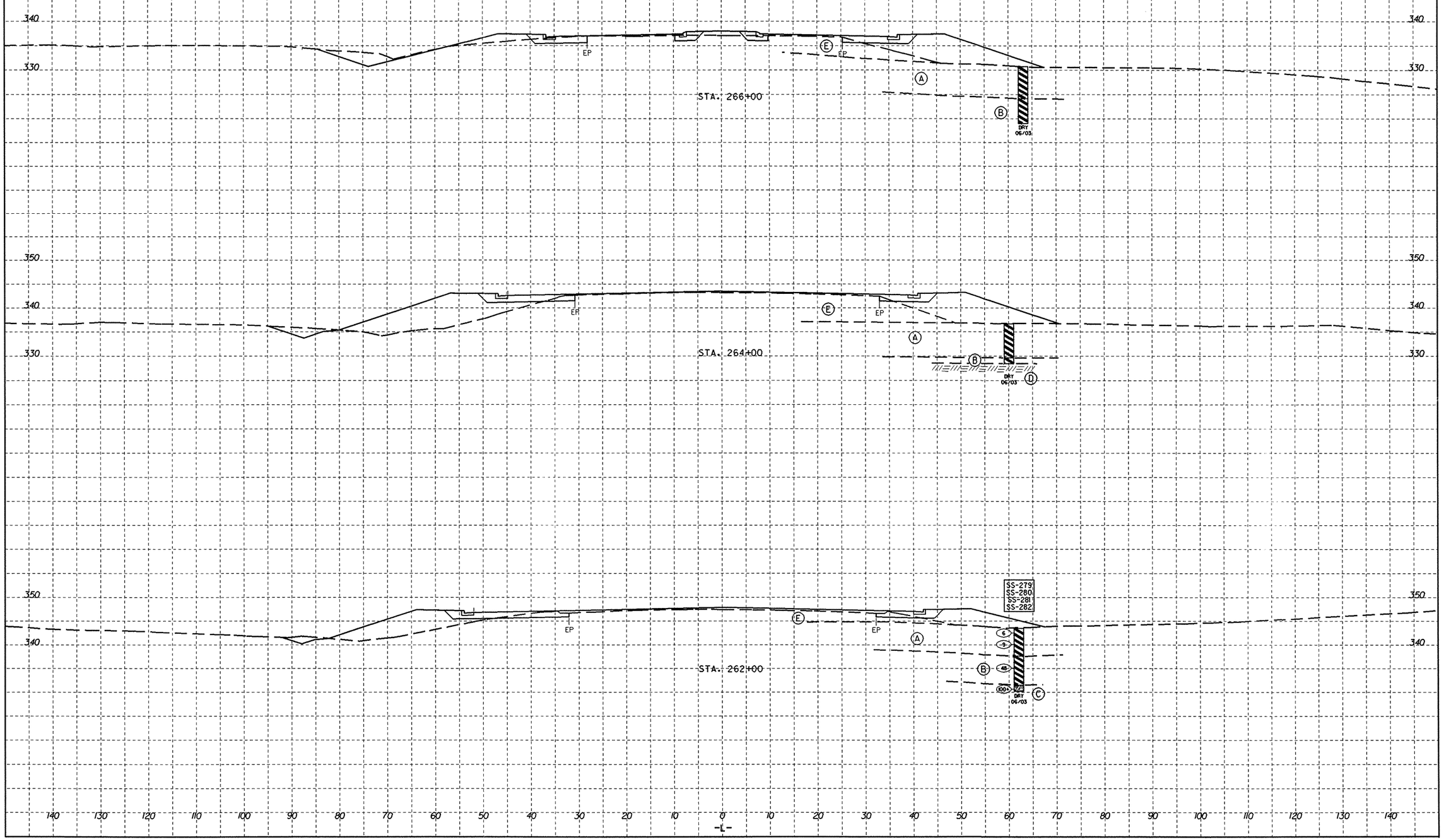
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	89

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-279	62' RT	262+00	0.0-1.5	A-7-6(19)	45	28	9.8	20.1	31.1	39.0	97	91	73	-	-
SS-280	62' RT	262+00	2.4-3.9	A-7-6(30)	55	34	6.6	15.2	29.0	49.2	100	96	83	24.4	-
SS-281	62' RT	262+00	7.4-8.9	A-7-6(22)	45	21	1.8	4.7	58.6	34.9	100	99	95	-	-
SS-282	62' RT	262+00	12.4-13.3	A-6(12)	39	18	15.6	6.2	45.4	32.8	92	80	73	7.8	-

LEGEND

A: RESIDUAL, BROWN, SOFT TO HARD, HIGHLY PLASTIC, MOIST, SILTY CLAY
B: RESIDUAL, GREEN-GRAY AND BROWN, HARD, MODERATELY PLASTIC, MOIST, SILTY CLAY
C: WEATHERED ROCK (CLAYSTONE)
D: NON-CRYSTALLINE ROCK (SILTSTONE)
E: ROADWAY EMBANKMENT



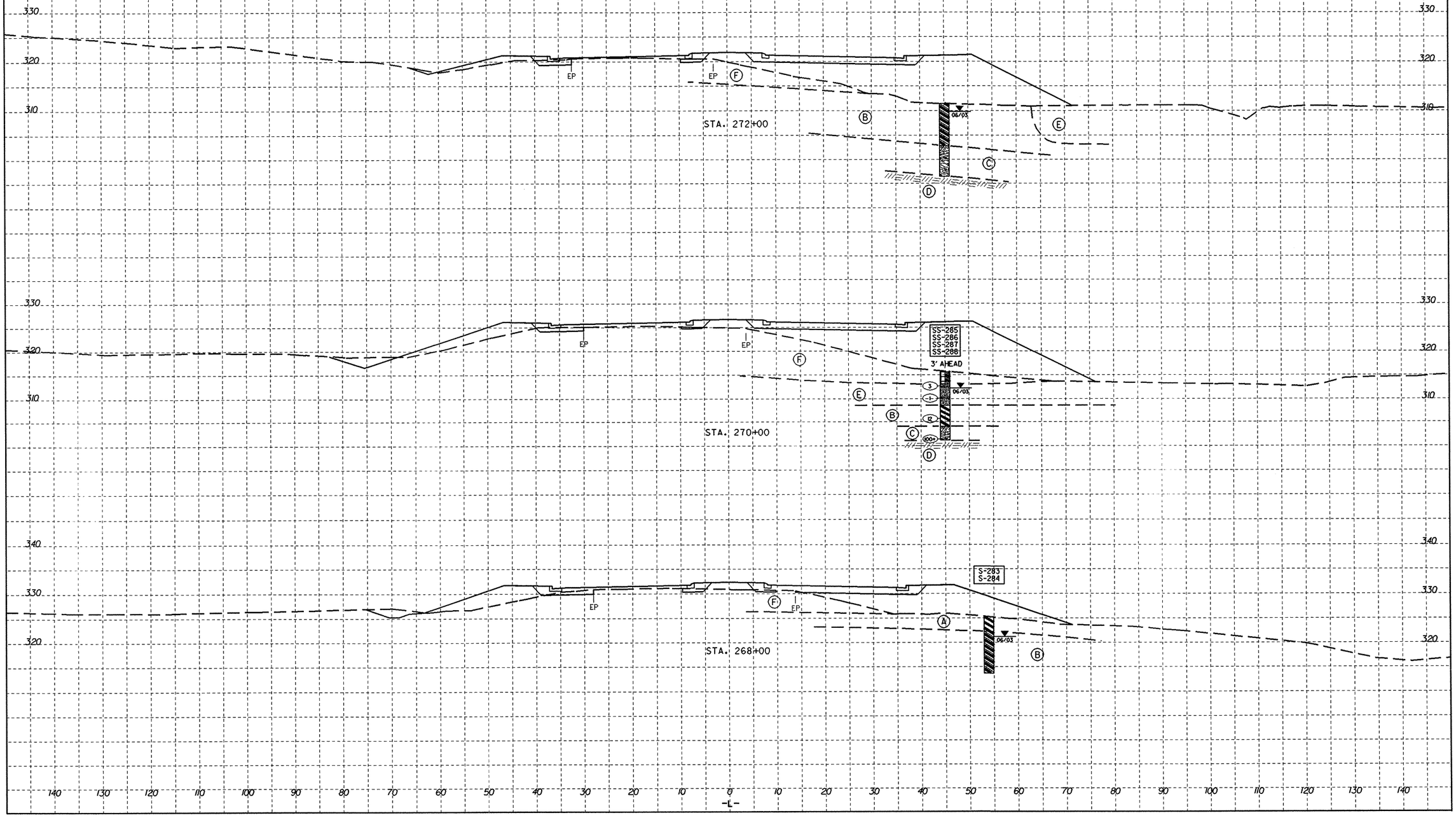
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	90

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-283	54' RT	268+00	0.5-2.0	A-7-6(37)	64	45	1.4	26.3	25.1	47.2	100	100	80	-	-
S-284	54' RT	268+00	4.0-6.0	A-6(15)	38	17	2.3	23.0	50.2	24.6	100	99	86	-	-
SS-286	46' RT	270+03	2.0-2.5	A-6(14)	39	21	7.6	23.4	34.2	34.9	97	93	73	-	-
SS-285	46' RT	270+03	2.5-3.5	A-4(8)	30	10	0.8	19.7	50.8	28.7	100	100	86	-	-
SS-287	46' RT	270+03	4.5-6.0	A-4(3)	23	6	4.3	22.4	44.6	28.7	100	98	80	20.9	-
SS-288	46' RT	270+03	9.0-10.5	A-7-6(25)	48	25	4.3	5.3	45.2	45.1	100	97	92	-	-

LEGEND

A: RESIDUAL, YELLOW-BROWN, SOFT, HIGHLY PLASTIC, MOIST, SILTY CLAY
B: RESIDUAL, GREEN-GRAY AND RED-BROWN, SOFT TO STIFF, MODERATELY PLASTIC, MOIST TO WET, SANDY AND SILTY CLAY
C: WEATHERED ROCK (SANDSTONE)
D: NON-CRYSTALLINE ROCK (SANDSTONE)
E: ALLUVIAL, GREEN-GRAY AND BLUE-GRAY, VERY SOFT, MOIST TO WET, SANDY SILT
F: ROADWAY EMBANKMENT, RED-BROWN, SOFT, MODERATELY PLASTIC, MOIST, SANDY CLAY



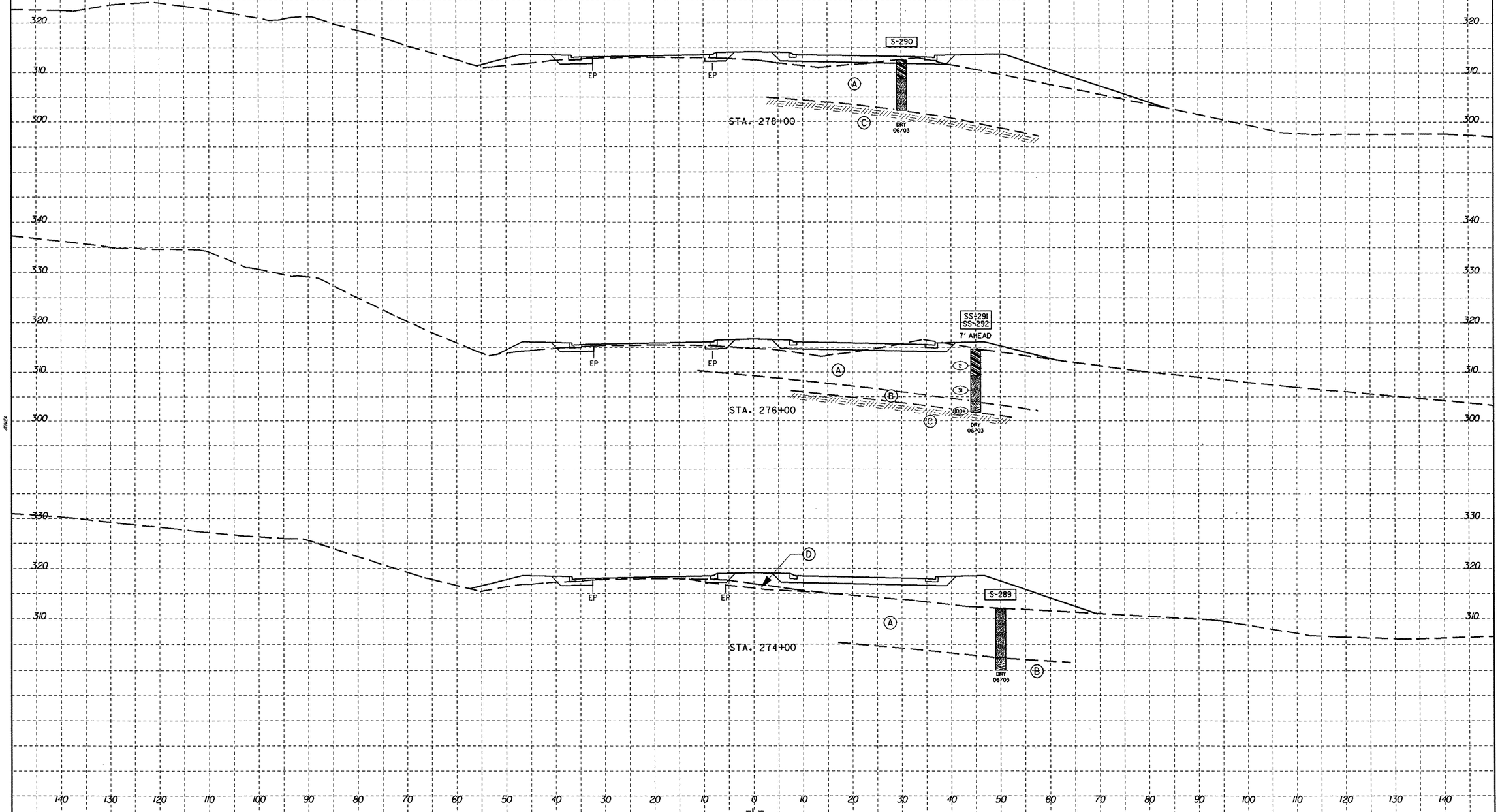
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	91

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-289	50' RT	274+00	1.0-4.0	A-4(2)	27	8	16.2	36.1	27.2	20.5	100	93	54	-	-
SS-291	45' RT	276+07	2.4-3.9	A-6(12)	37	17	10.1	18.7	34.4	36.9	100	94	77	-	-
SS-292	45' RT	276+07	7.4-8.9	A-4(6)	34	10	5.9	32.2	35.2	26.7	100	98	69	21.7	-
S-290	30' RT	278+00	1.9-3.4	A-6(9)	35	14	13.7	19.5	36.0	30.8	100	91	71	-	-

LEGEND

A: RESIDUAL, RED-BROWN AND BROWN, SOFT TO HARD, MOIST, SANDY SILT AND SLIGHTLY TO MODERATELY PLASTIC, SANDY CLAY
B: WEATHERED ROCK (CLAYSTONE AND SILTSTONE)
C: NON-CRYSTALLINE ROCK (CLAYSTONE)
D: ROADWAY EMBANKMENT



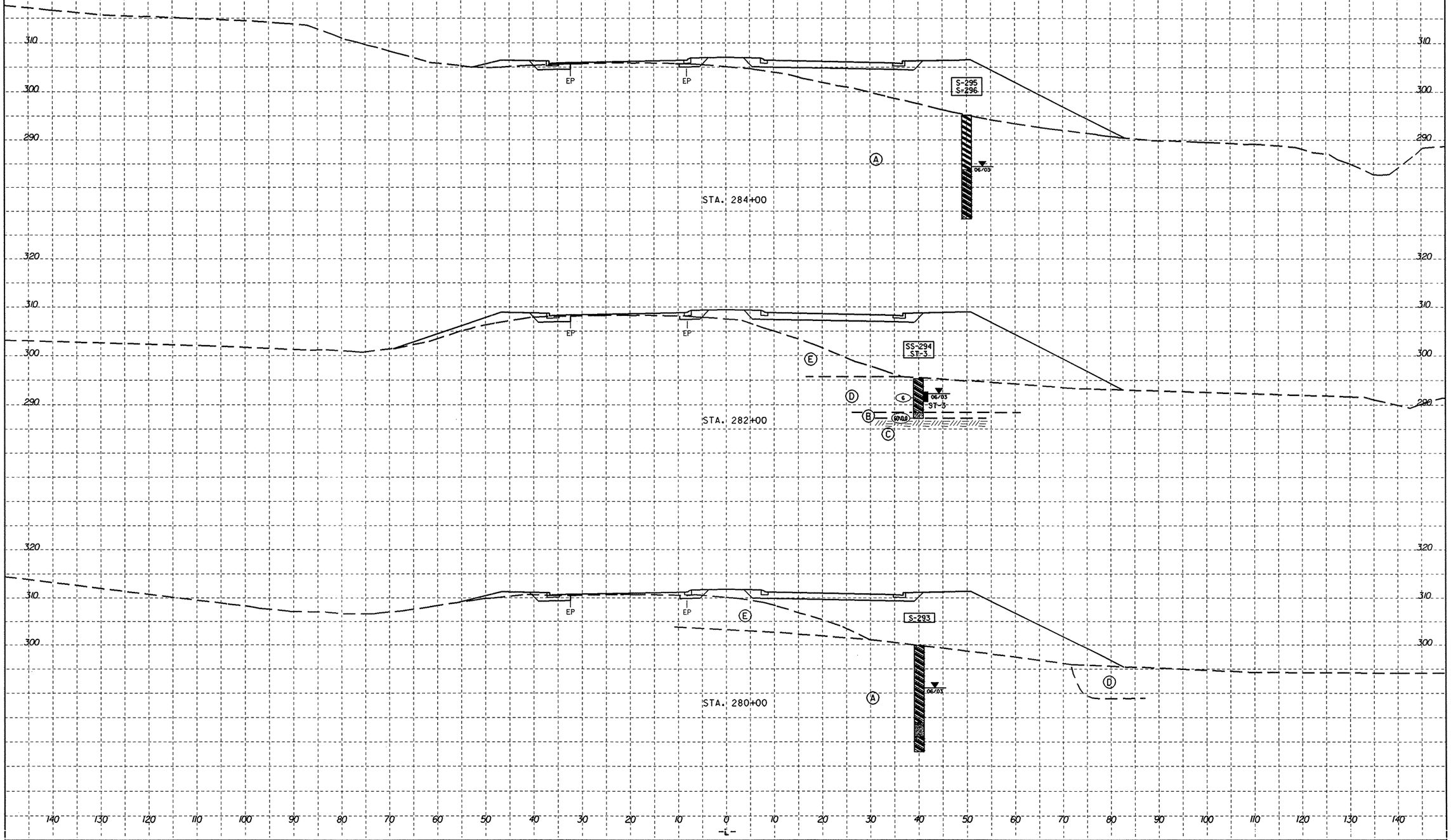
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	92

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-293	40' RT	280+00	19.0-21.0	A-6(11)	38	15	10.9	23.6	47.1	18.5	100	91	77	-	-
ST-3	40' RT	282+00	2.7-4.7	A-6(7)	33	17	5.5	40.4	19.8	34.3	100	99	60	26.4	-
SS-294	40' RT	282+00	2.9-4.4	A-6(8)	31	18	6.6	38.6	22.1	32.8	100	98	61	21.5	-
S-295	50' RT	284+00	0.5-6.0	A-7-6(19)	42	24	6.2	18.9	36.0	39.0	100	98	80	-	-
S-296	50' RT	284+00	11.5-14.0	A-6(9)	34	15	17.0	12.9	41.3	28.7	99	87	73	-	-

LEGEND

A: RESIDUAL, YELLOW-BROWN, GREEN-GRAY, AND RED-BROWN, SOFT TO HARD, MOIST TO WET, SD. SILT AND SLI. TO MOD. PLASTIC, SD. AND SL. CLAY
B: WEATHERED ROCK (CLAYSTONE)
C: NON-CRYSTALLINE ROCK (SANDSTONE)
D: ALLUVIAL, RED-BROWN AND GRAY, VERY SOFT TO MEDIUM STIFF, MODERATELY PLASTIC, MOIST TO WET, SANDY CLAY
E: ROADWAY EMBANKMENT



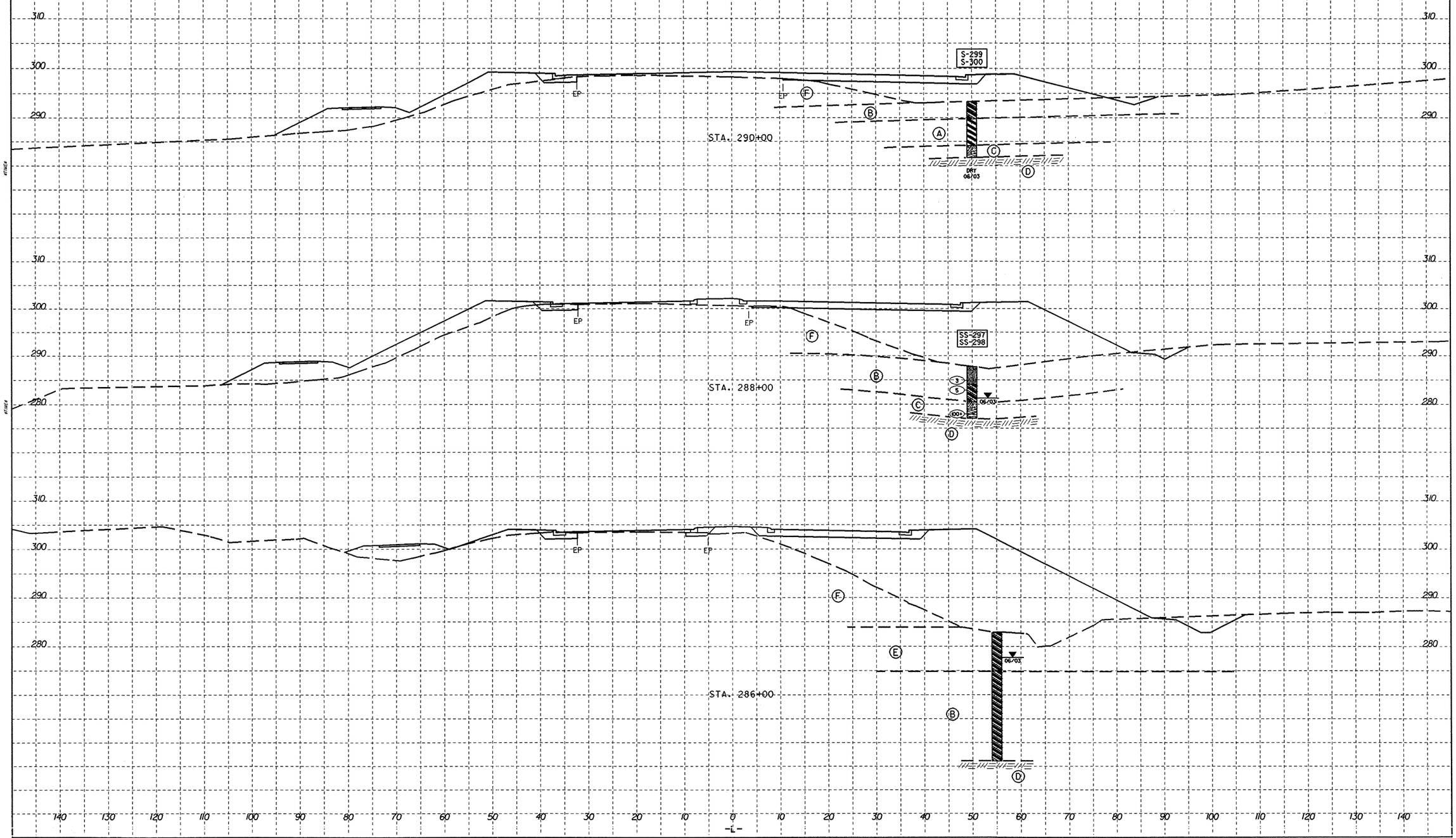
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	93

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-297	50' RT	288+00	1.9-3.4	A-4(3)	26	10	11.7	32.0	31.7	24.6	97	92	61	21.2	-
SS-298	50' RT	288+00	3.9-5.4	A-6(16)	40	24	5.9	26.3	35.0	32.8	98	95	73	-	-
S-299	50' RT	290+00	0.5-2.1	A-6(9)	31	16	7.2	27.9	28.0	36.9	100	97	72	-	-
S-300	50' RT	290+00	4.0-8.0	A-7-5(18)	57	27	15.0	21.9	32.3	30.8	100	91	68	-	-

LEGEND

A: RESIDUAL, RED-BROWN, SOFT TO STIFF, HIGHLY PLASTIC, MOIST, SILTY CLAY
B: RESIDUAL, YELLOW-GRAY, GREEN-GRAY, AND RED-BROWN, SOFT TO HARD, MOIST TO WET, SANDY SILT AND SLI. TO MOD. PLASTIC, SANDY CLAY
C: WEATHERED ROCK (CLAYSTONE AND SANDSTONE)
D: NON-CRYSTALLINE ROCK (CLAYSTONE, SILTSTONE, AND SANDSTONE)
E: ALLUVIAL, GRAY AND RED-BROWN, SOFT TO STIFF, MOIST TO WET, MODERATELY PLASTIC, SANDY CLAY
F: ROADWAY EMBANKMENT



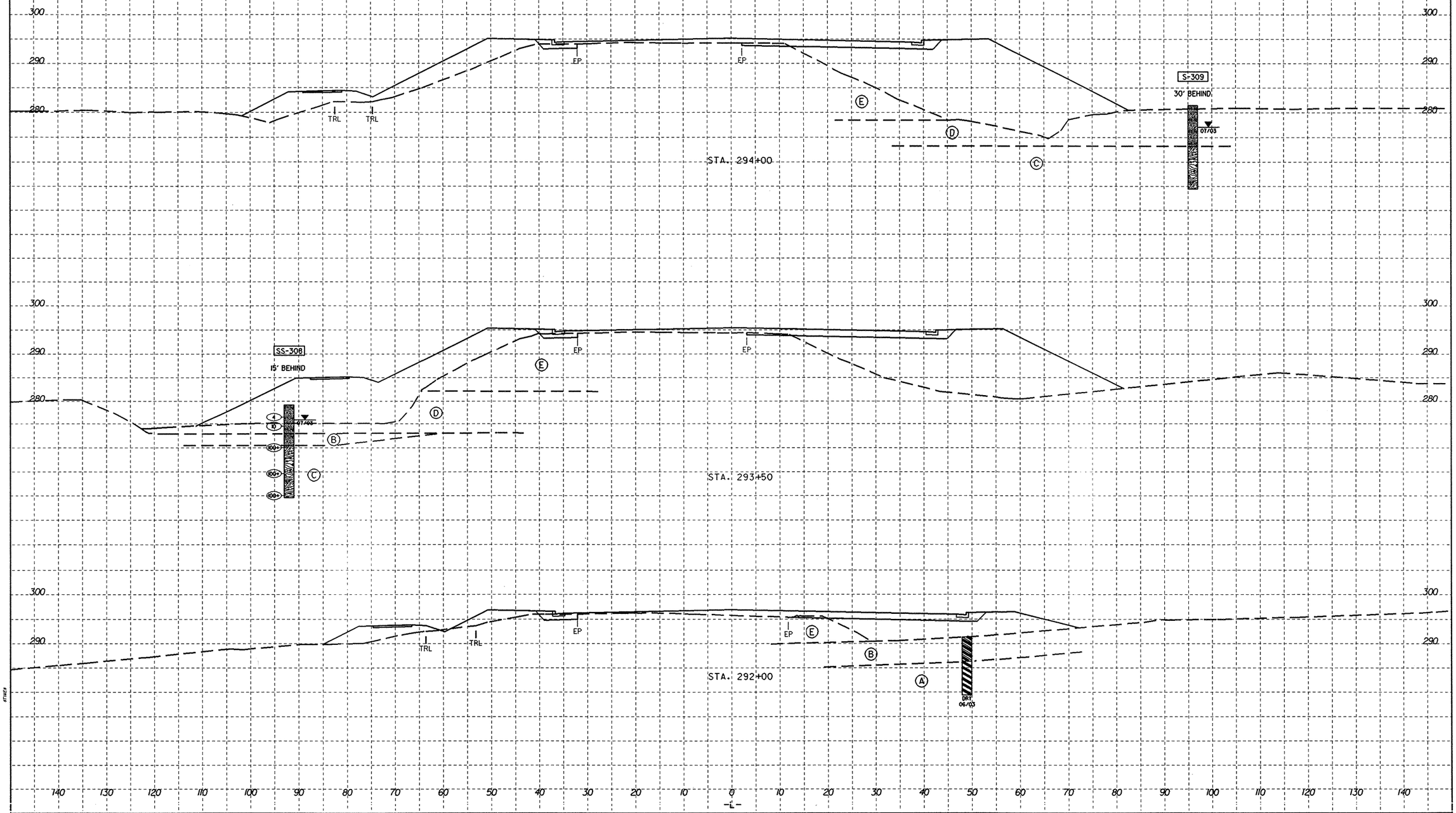
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	94

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			%	%
							C. SAND	F. SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
SS-308	92' LT	293+35	1.7-3.2	A-4(3)	26	7	6.3	29.6	41.8	22.3	100	99	70	21.9	-
S-309	96' RT	293+70	4.0-7.0	A-4(4)	26	9	8.5	30.2	34.9	26.4	100	98	67	-	-

LEGEND

A: RESIDUAL, RED-BROWN, SOFT TO STIFF, HIGHLY PLASTIC, MOIST, SILTY CLAY
B: RESIDUAL, YELLOW-BROWN AND RED-BROWN, SOFT TO MEDIUM STIFF, MOIST TO WET, SANDY SILT AND MODERATELY PLASTIC, SANDY CLAY
C: WEATHERED ROCK (CLAYSTONE AND SILTSTONE)
D: ALLUVIAL, BLUE-GRAY AND BROWN, SOFT TO STIFF, MOIST TO WET, SANDY SILT
E: ROADWAY EMBANKMENT

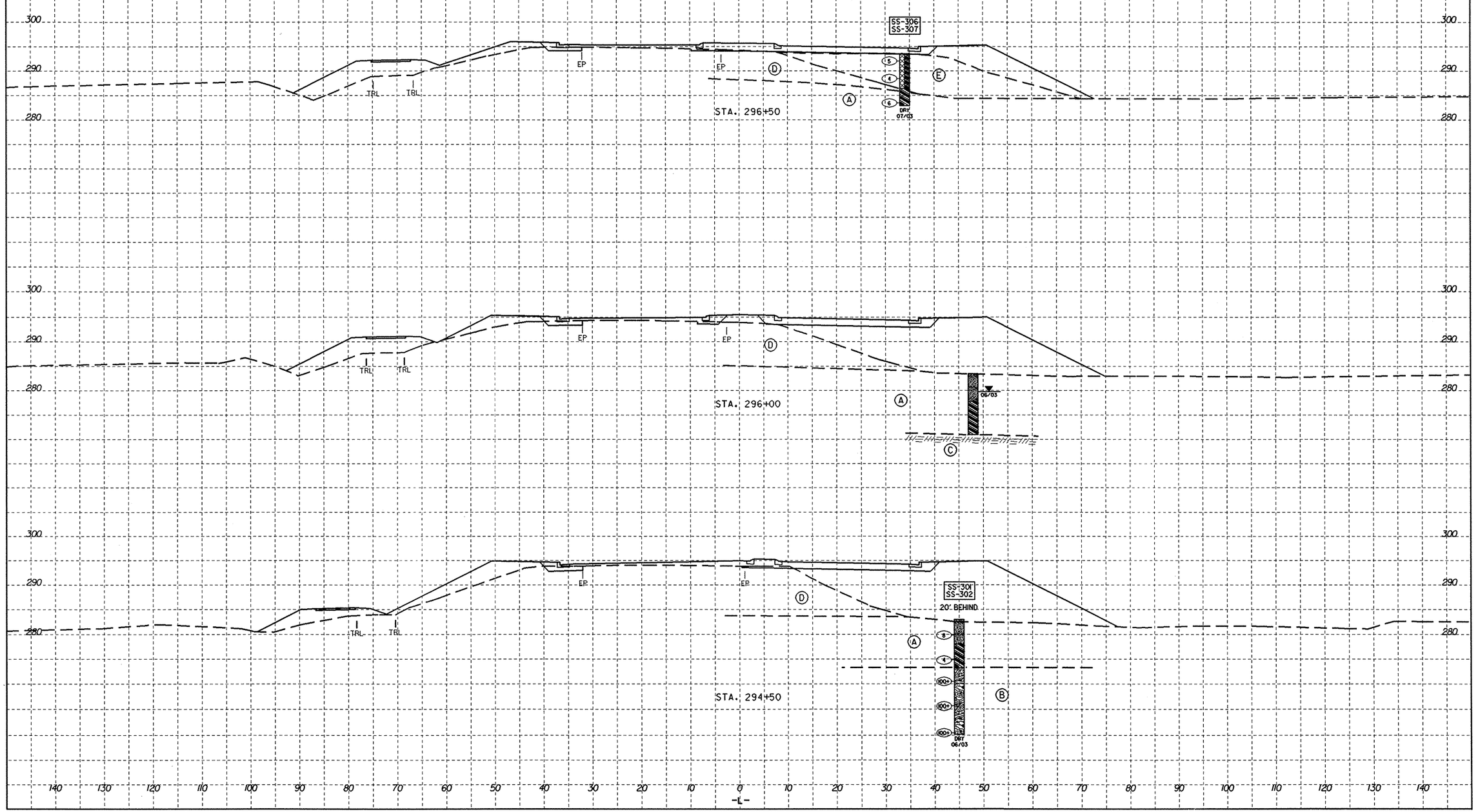


SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-301	45' RT	294+30	2.2-3.7	A-4(0)	20	NP	9.4	56.6	19.6	14.4	100	98	43	-	-
SS-302	45' RT	294+30	7.2-8.7	A-6(8)	34	18	18.1	24.2	24.9	32.8	97	87	60	20.3	-
SS-306	34' RT	296+50	0.5-2.0	A-6(10)	36	19	12.0	20.5	33.1	34.5	88	82	64	-	-
SS-307	34' RT	296+50	9.1-10.6	A-6(13)	40	24	8.9	31.4	23.1	36.5	99	96	64	-	-

LEGEND

A: RESIDUAL, GREEN-GRAY AND RED-BROWN, SOFT TO STIFF, MOIST TO WET, SANDY SILT AND MODERATELY PLASTIC, SANDY CLAY
B: WEATHERED ROCK (CLAYSTONE)
C: NON-CRYSTALLINE ROCK (CLAYSTONE)
D: ROADWAY EMBANKMENT
E: ARTIFICIAL FILL, BROWN, MEDIUM STIFF, MODERATELY PLASTIC, DRY, SANDY CLAY



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	96

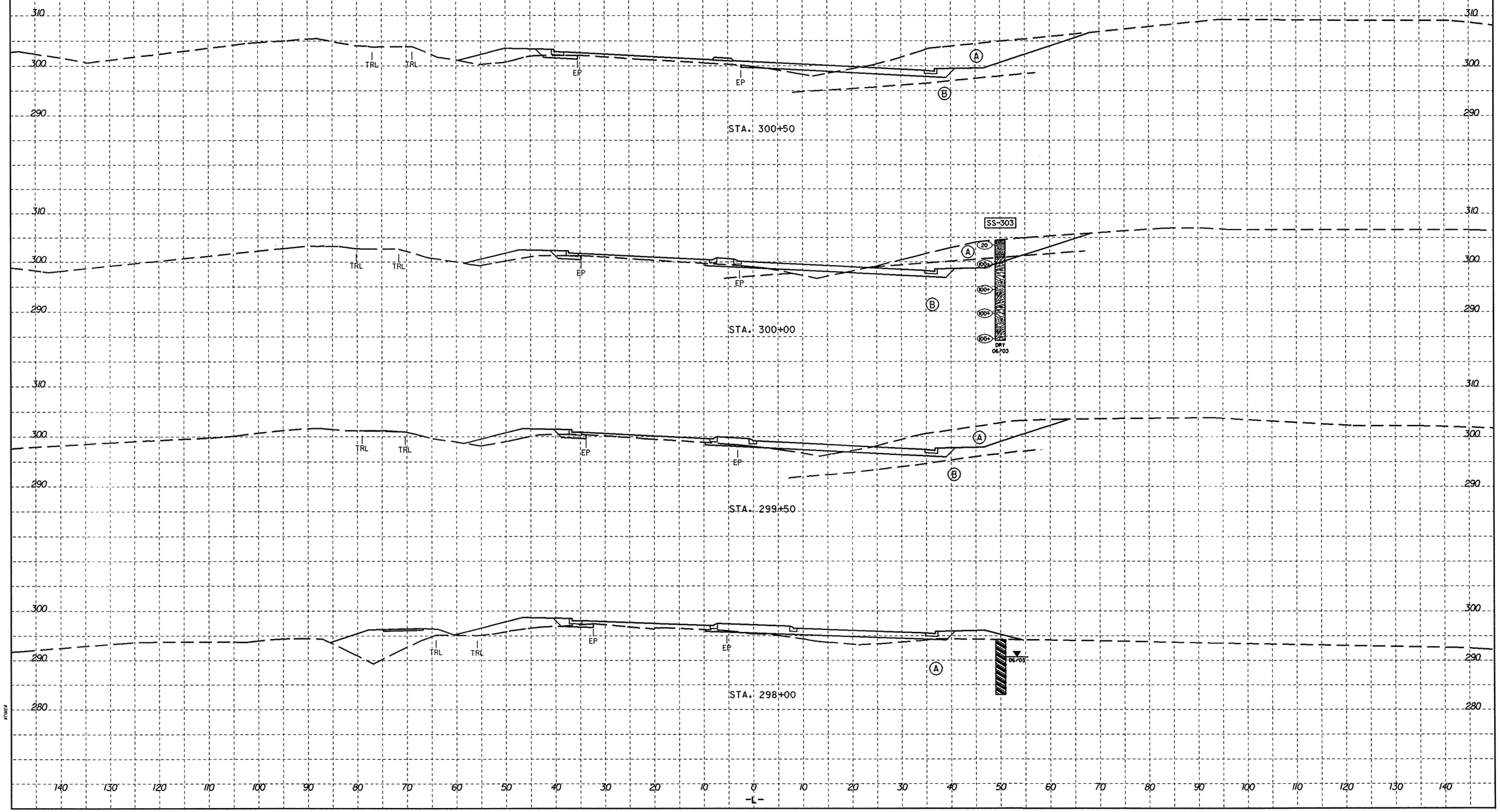
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-303	50' RT	300+00	0.0-1.5	A-4(2)	33	10	40.2	8.8	28.4	22.6	84	54	45	8.1	-

LEGEND

A: RESIDUAL, RED-BROWN, MEDIUM STIFF TO VERY STIFF, DRY TO WET, SANDY SILT AND MODERATELY PLASTIC, SANDY CLAY

B: WEATHERED ROCK (CLAYSTONE)



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	97

SOIL TEST RESULTS

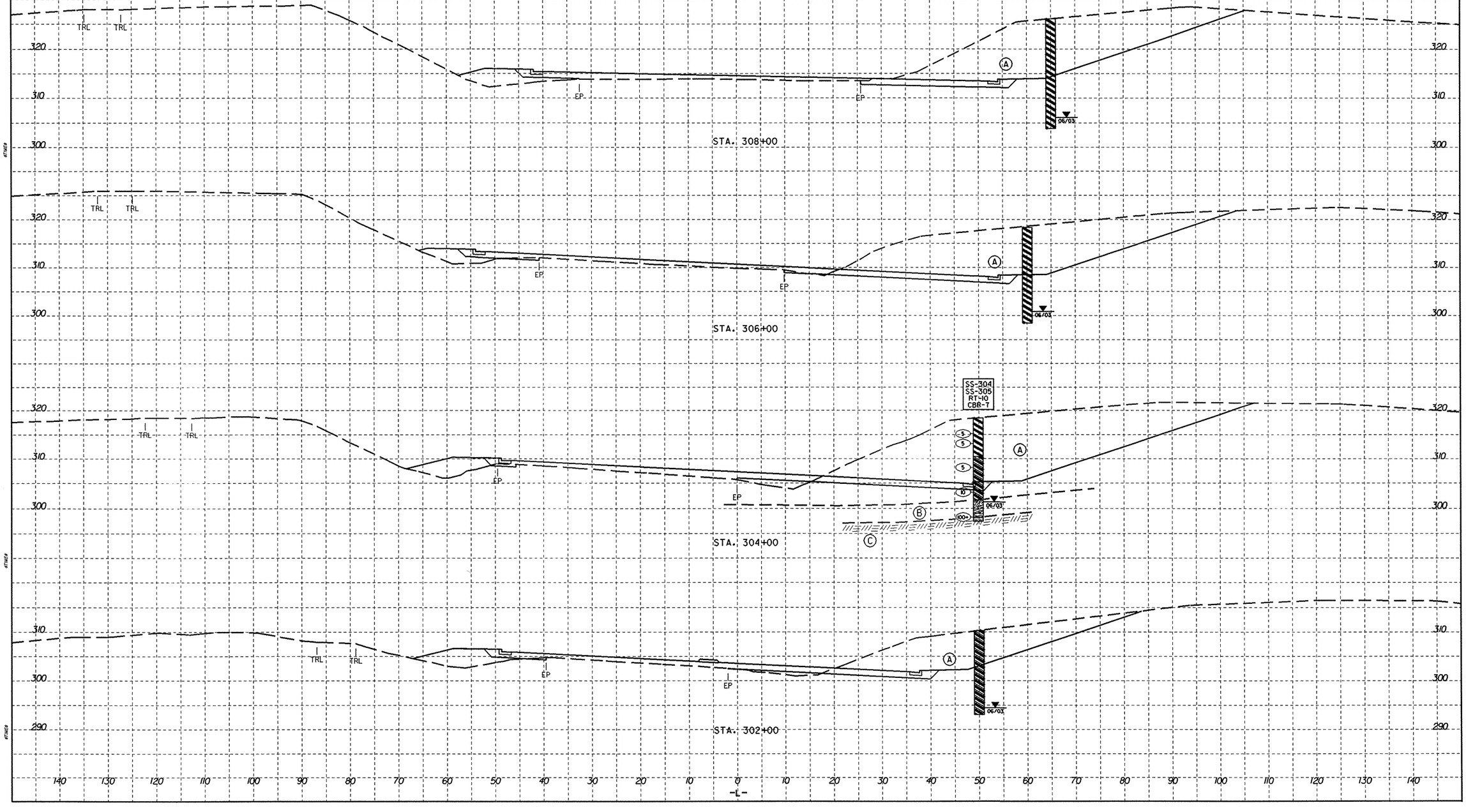
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-304	50' RT	304+00	2.3-3.8	A-7-6(10)	41	23	24.8	7.8	34.6	32.8	84	66	58	14.5	-
RT-10	50' RT	304+00	5.0-8.0	A-7-6(14)	44	24	15.9	10.1	32.6	41.4	88	78	67	-	-
SS-305	50' RT	304+00	9.3-10.8	A-6(5)	40	19	39.4	9.4	24.5	26.7	86	58	45	-	-
CBR-7	50' RT	304+00	10.0-13.0	A-6(5)	33	16	23.7	21.6	32.5	22.2	88	74	52	-	-

LEGEND

A: RESIDUAL, RED-BROWN, MEDIUM STIFF TO STIFF, MODERATELY PLASTIC, DRY TO WET, SANDY AND SILTY CLAY

B: WEATHERED ROCK (CLAYSTONE)

C: NON-CRYSTALLINE ROCK (CLAYSTONE)



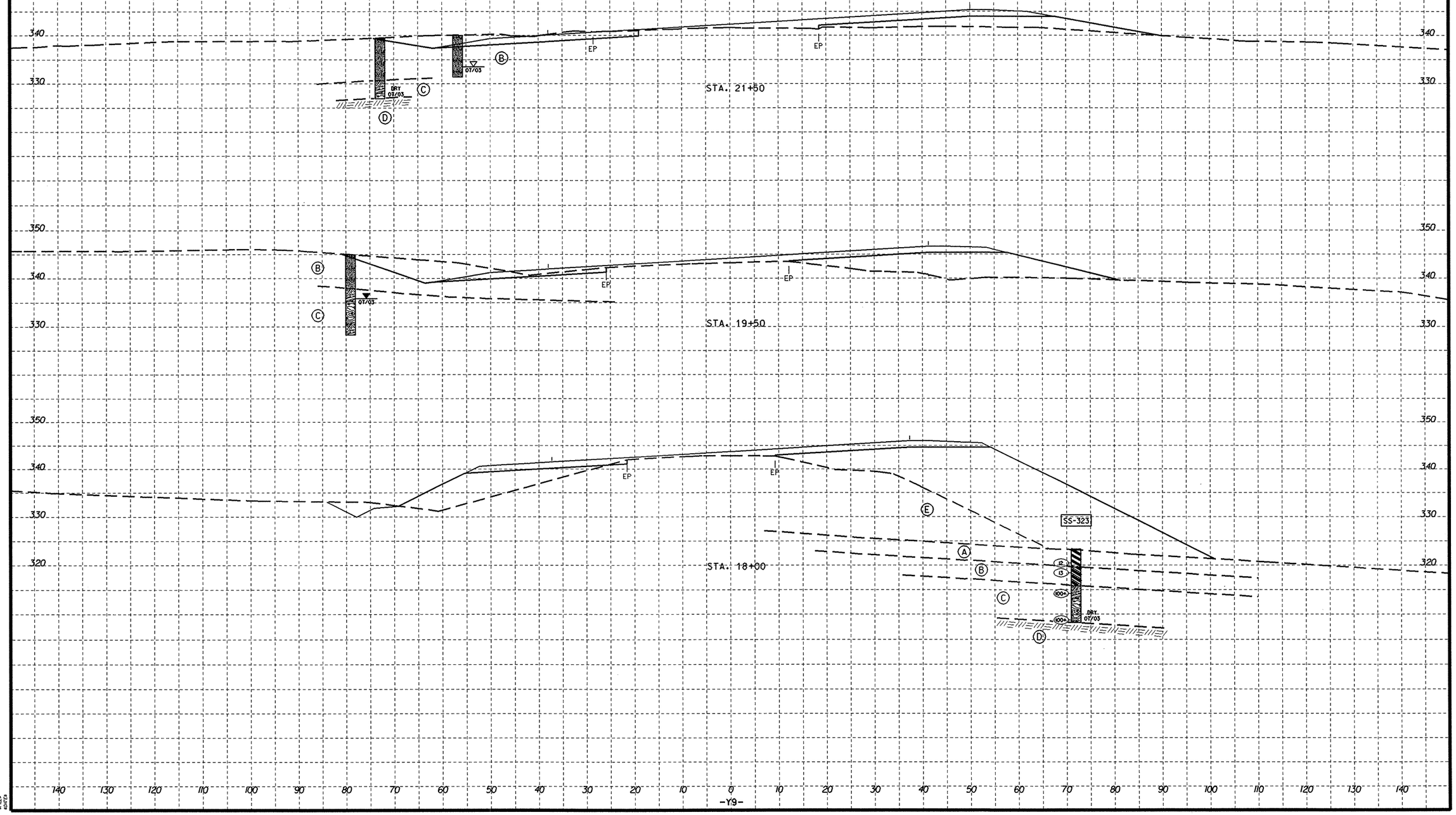
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	98

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-323	72' RT	18+00	1.9-3.4	A-7-6(21)	55	38	15.5	25.9	21.9	36.7	100	93	63	-	-

LEGEND

A: RESIDUAL, BROWN AND GRAY, STIFF, HIGHLY PLASTIC, MOIST, SILTY CLAY
B: RESIDUAL, RED-BROWN AND BROWN, MEDIUM STIFF TO STIFF, MOIST TO WET, SANDY SILT AND SLIGHTLY PLASTIC, SANDY CLAY
C: WEATHERED ROCK (SANDSTONE AND SILTSTONE)
D: NON-CRYSTALLINE ROCK (SANDSTONE AND SILTSTONE)
E: ROADWAY EMBANKMENT



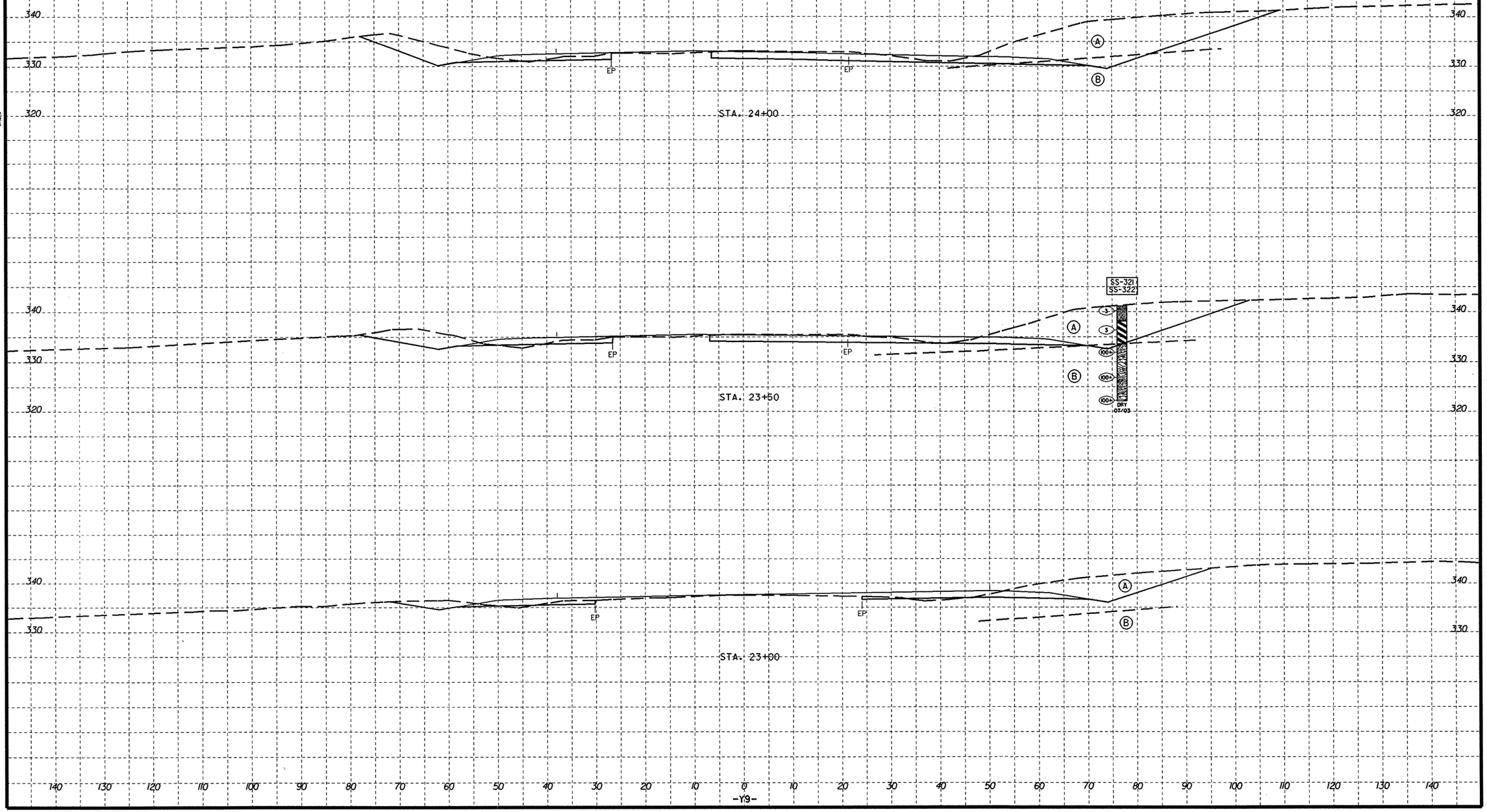
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-321	77' RT	23+50	0.0-1.5	A-4(3)	29	10	18.3	30.8	30.6	20.3	100	90	58	18.0	-
SS-322	77' RT	23+50	3.8-5.3	A-7-6(12)	42	25	14.0	20.7	28.8	36.5	84	77	59	-	-

LEGEND

A: RESIDUAL, RED-BROWN, GREEN-GRAY, AND BROWN, SOFT TO MEDIUM STIFF, MOIST TO WET, SANDY SILT AND SLIGHTLY TO MODERATLY PLASTIC, SANDY CLAY

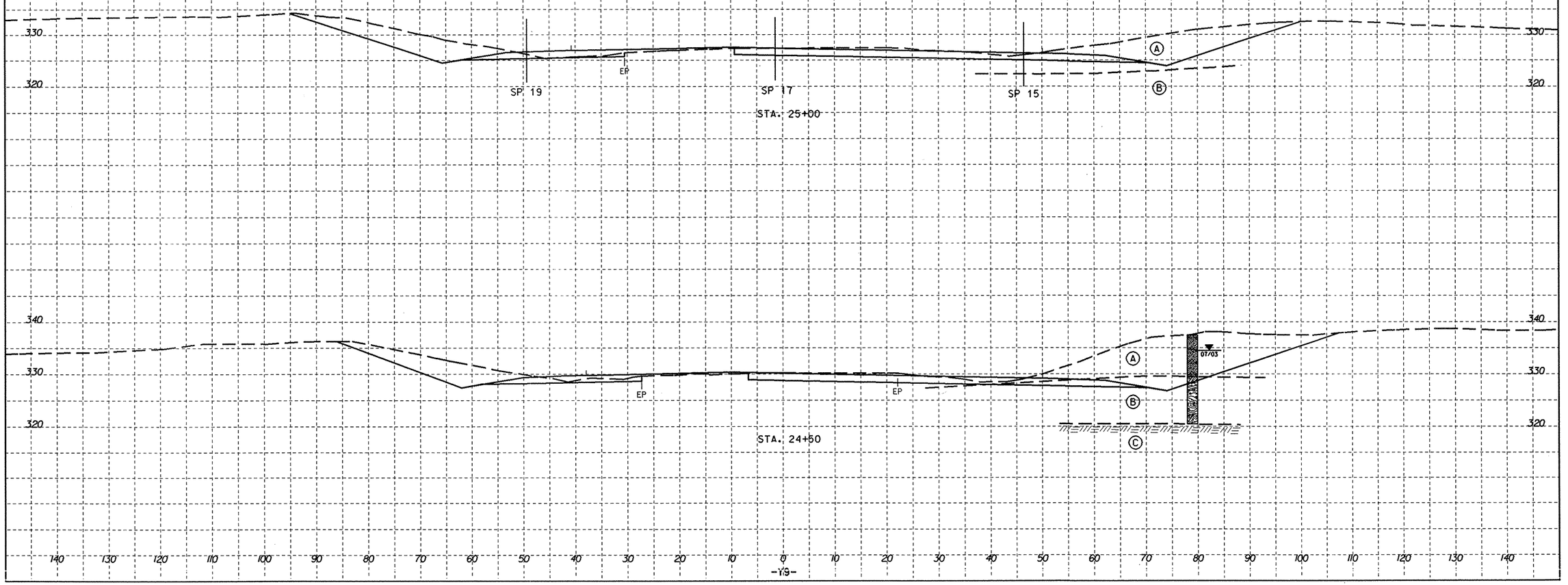
B: WEATHERED ROCK (CLAYSTONE)



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	100

LEGEND

A: RESIDUAL, RED-BROWN AND BROWN, MEDIUM STIFF TO STIFF, MOIST TO WET, SANDY SILT
B: WEATHERED ROCK (CLAYSTONE)
C: NON-CRYSTALLINE ROCK (CLAYSTONE)

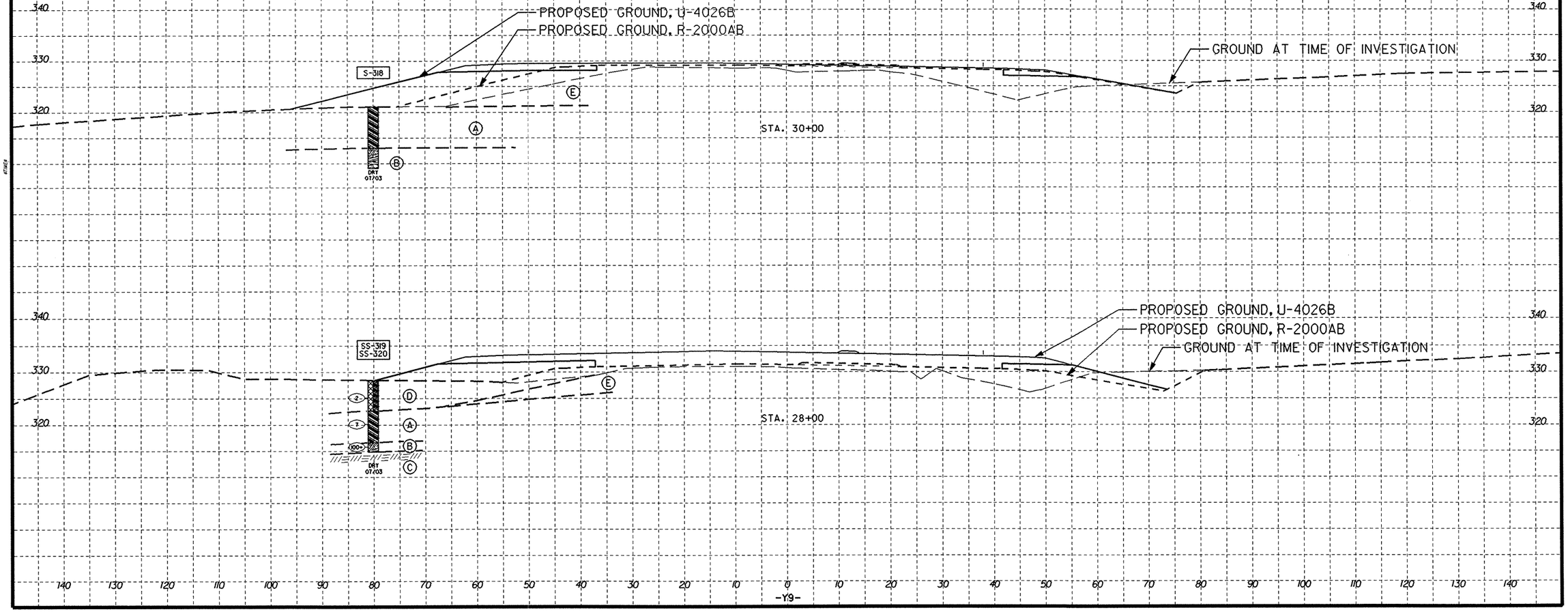


SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-319	80' LT	28+00	2.3-3.8	A-6(12)	35	19	8.1	19.5	40.0	32.5	92	87	72	-	-
SS-320	80' LT	28+00	7.3-8.8	A-6(6)	33	17	20.9	26.8	28.0	24.3	94	80	54	-	-
S-318	80' LT	30+00	1.0-4.0	A-6(3)	29	13	20.7	33.1	21.9	24.3	99	89	51	-	-

LEGEND

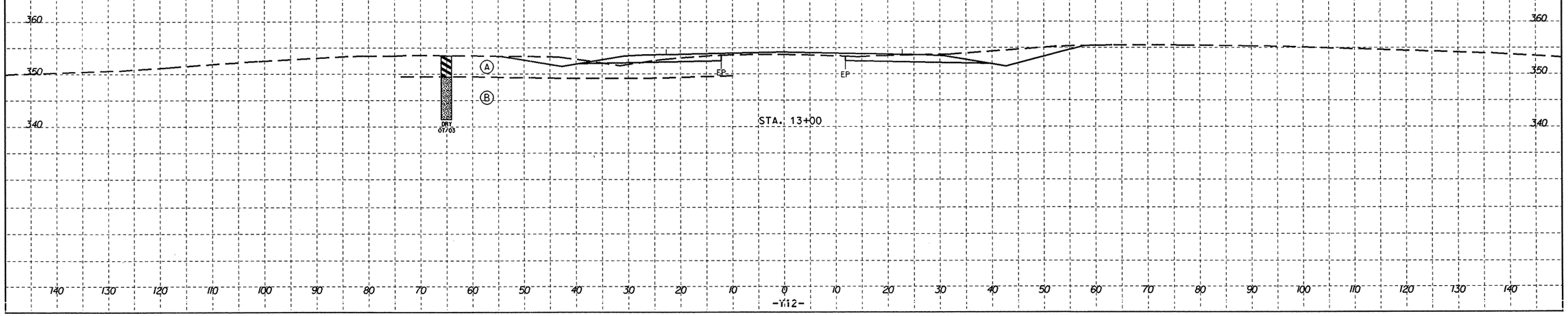
A: RESIDUAL, BROWN, MEDIUM STIFF TO VERY STIFF, SLIGHTLY TO MODERATELY PLASTIC, MOIST, SANDY CLAY
B: WEATHERED ROCK (CLAYSTONE)
C: NON-CRYSTALLINE ROCK (SANDSTONE AND SILTSTONE)
D: ARTIFICIAL FILL, BROWN, SOFT TO MEDIUM STIFF, SLIGHTLY TO MODERATELY PLASTIC, MOIST, SANDY CLAY, WITH SOME GRAVEL
E: ROADWAY EMBANKMENT



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	102

LEGEND

A: RESIDUAL, RED-BROWN, STIFF, MODERATELY PLASTIC, DRY, SILTY CLAY
B: RESIDUAL, RED-BROWN, VERY DENSE, DRY, SILTY SAND



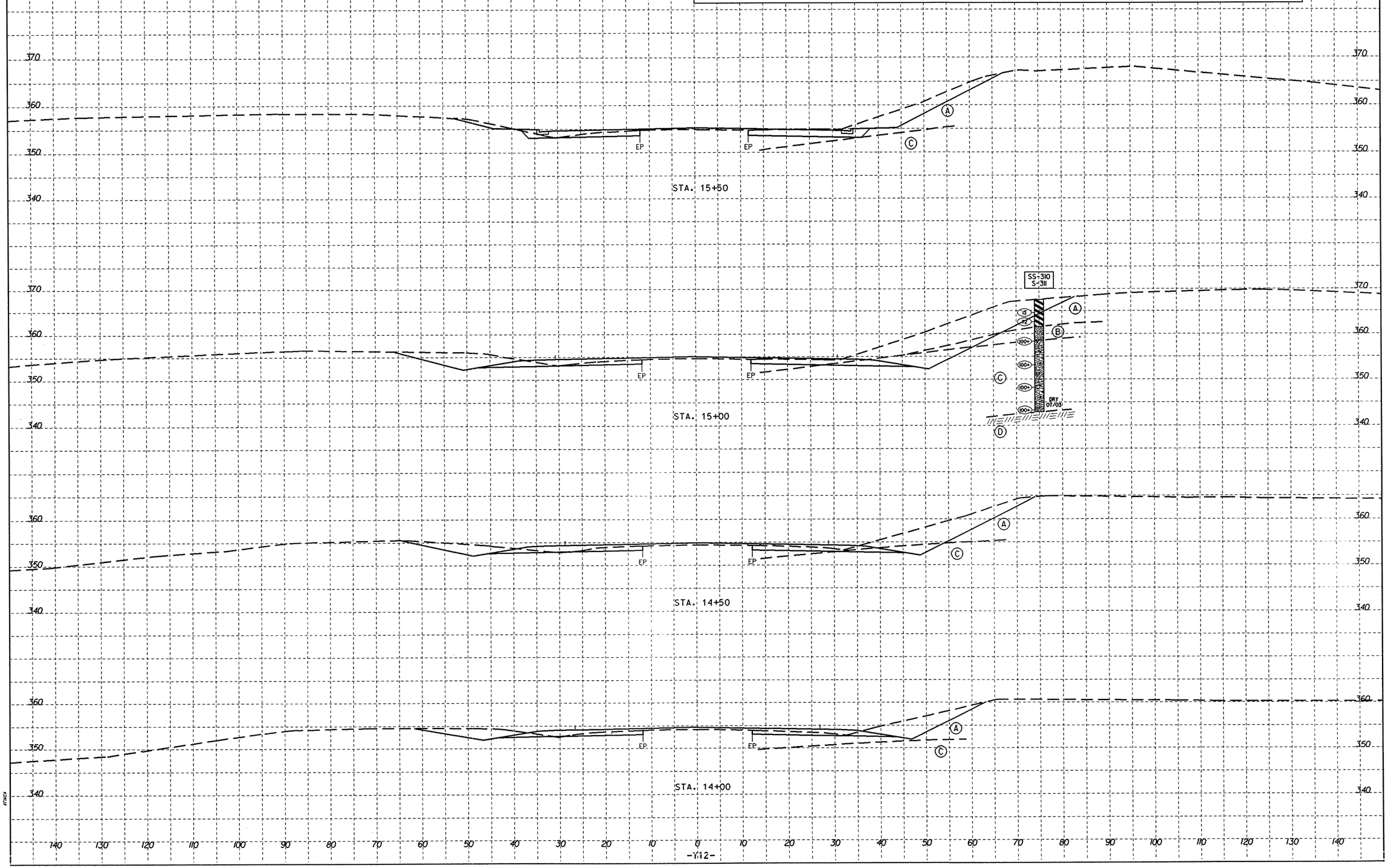
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	103

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-310	75' RT	15+00	2.0-3.5	A-7-6(26)	49	30	0.6	24.5	36.3	38.5	100	100	85	9.3	-
S-311	75' RT	15+00	6.0-9.0	A-2-4(0)	27	NP	41.4	29.8	18.7	10.1	100	75	33	-	-

LEGEND

A: RESIDUAL, RED-BROWN, STIFF TO HARD, HIGHLY PLASTIC, DRY, SILTY CLAY
B: RESIDUAL, BROWN, VERY DENSE, DRY, SILTY SAND
C: WEATHERED ROCK (SANDSTONE AND CLAYSTONE)
D: NON-CRYSTALLINE ROCK (CLAYSTONE)



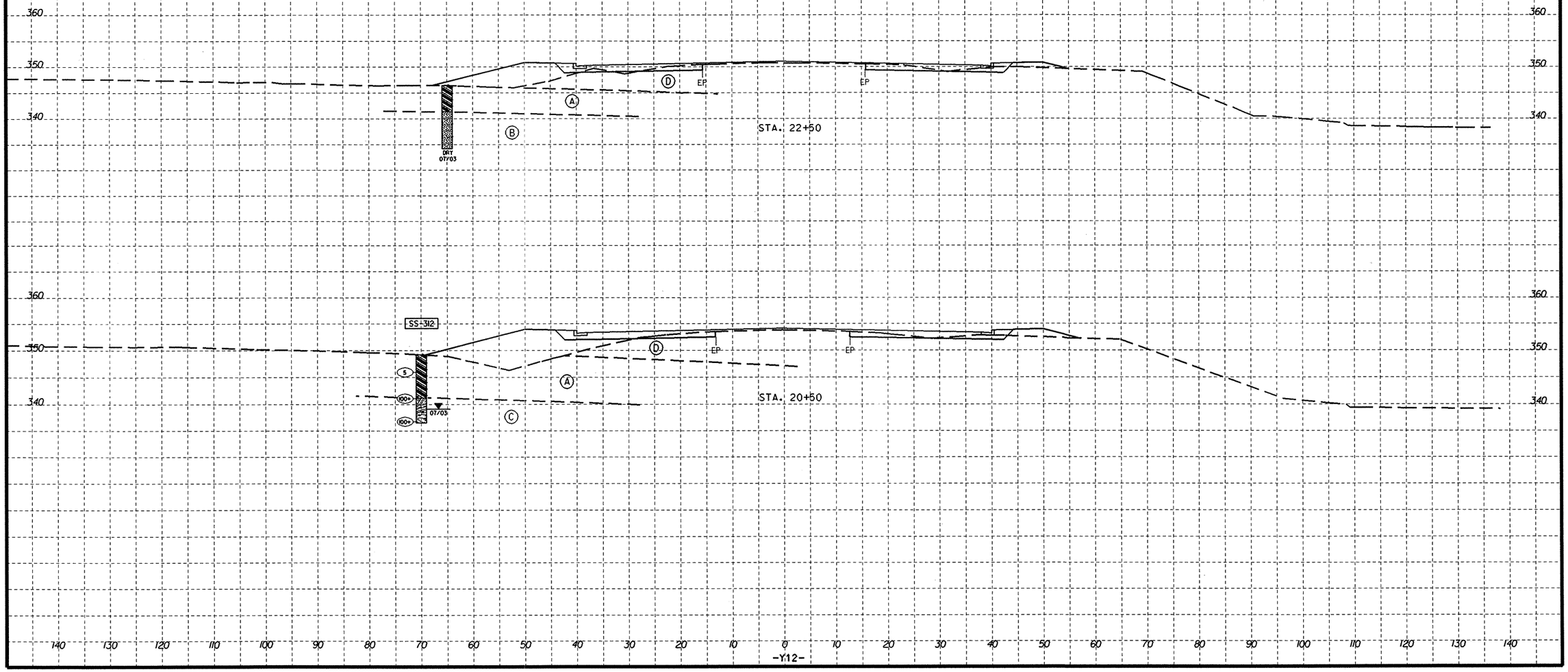
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	104

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-312	70' LT	20+50	2.3-3.2	A-6(15)	39	24	9.1	26.4	32.0	32.5	100	96	70	25.3	-

LEGEND

A: RESIDUAL, BROWN AND GRAY, SOFT TO STIFF, MODERATELY PLASTIC, DRY, SANDY CLAY
B: RESIDUAL, BROWN, DENSE, DRY, SILTY SAND
C: WEATHERED ROCK (CLAYSTONE)
D: ROADWAY EMBANKMENT



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	105

SOIL TEST RESULTS

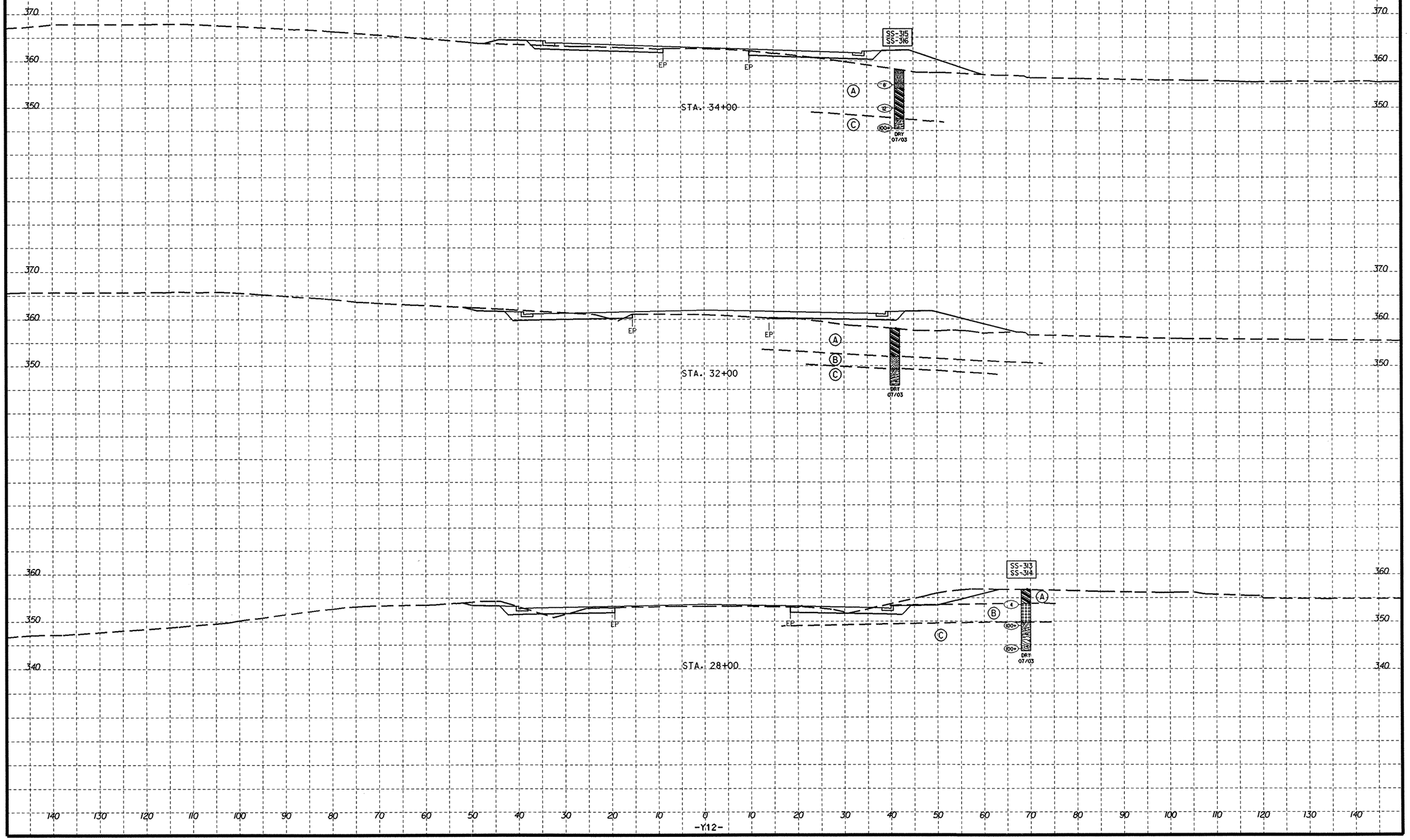
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-313	58' RT	28+00	2.3-3.0	A-6(7)	29	12	5.5	28.0	40.2	26.4	100	97	75	-	-
SS-314	58' RT	28+00	3.0-3.8	A-1-b(0)	18	NP	68.9	16.3	6.7	8.1	89	39	14	-	-
SS-315	47' RT	34+00	2.3-3.8	A-4(0)	22	4	16.0	39.1	26.6	18.3	97	90	52	14.5	-
SS-316	47' RT	34+00	7.3-8.8	A-6(15)	37	19	0.8	25.6	39.1	34.5	100	100	83	-	-

LEGEND

A: RESIDUAL, RED-BROWN AND BROWN, MEDIUM STIFF TO STIFF, DRY TO MOIST, SANDY SILT AND SLIGHTLY TO MODERATELY PLASTIC, SANDY CLAY

B: RESIDUAL, BROWN, LOOSE TO DENSE, DRY TO MOIST, SILTY SAND AND SAND

C: WEATHERED ROCK (CLAYSTONE)



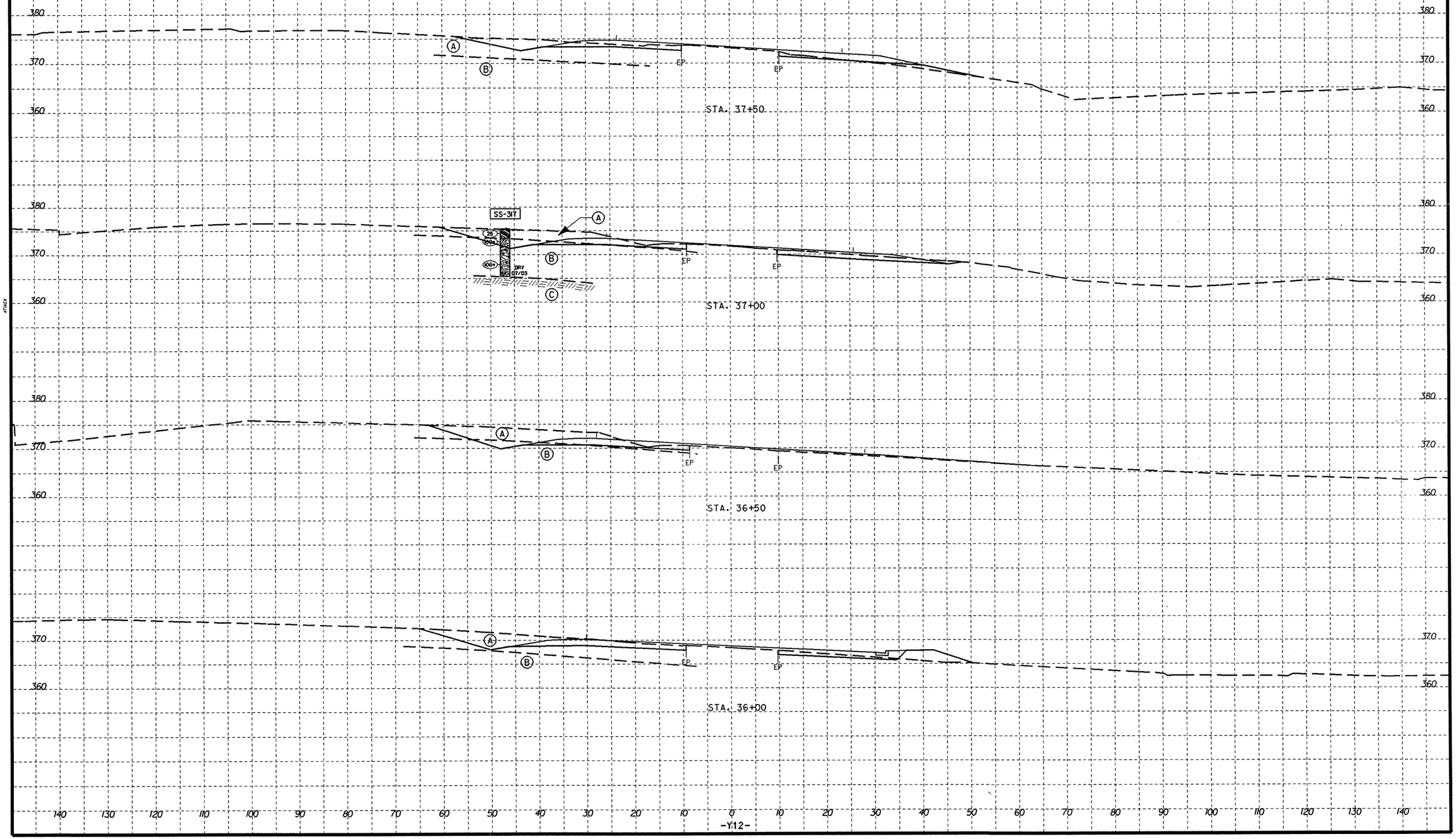
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	106

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-317	47' LT	37+00	0.0-1.5	A-6(12)	37	18	12.2	16.6	40.8	30.4	100	94	75	6.9	-

LEGEND

A: RESIDUAL, RED-BROWN, VERY STIFF, MODERATELY PLASTIC, DRY, SANDY CLAY
B: WEATHERED ROCK (CLAYSTONE)
C: NON-CRYSTALLINE ROCK (CLAYSTONE)

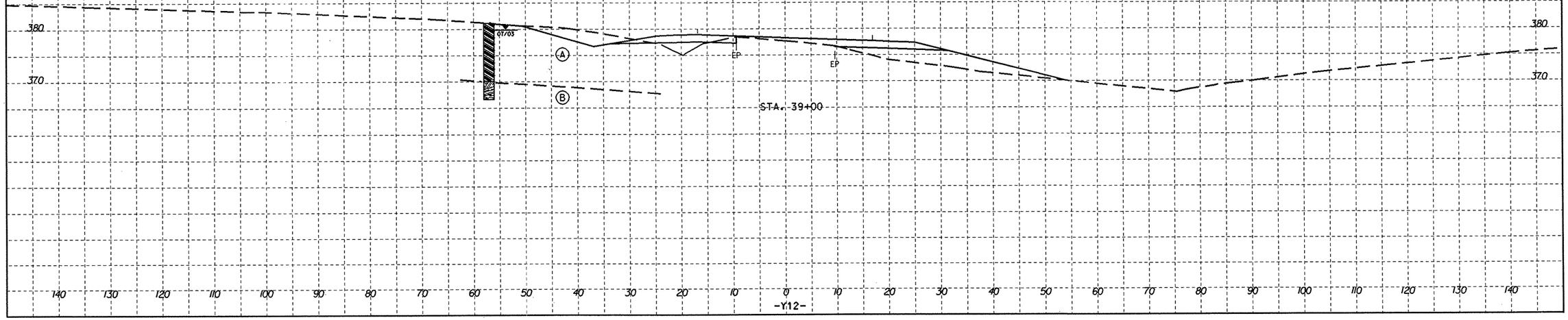


0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4026B	107

LEGEND

A: RESIDUAL, RED-BROWN, STIFF TO VERY STIFF, MODERATELY PLASTIC, MOIST TO WET, SANDY CLAY

B: WEATHERED ROCK (CLAYSTONE)



CONTRACT: C200840 ID: R-2904

CONTENTS

LINE	STATION	PLAN	PROFILE	XSECTS
-L-	10+35 - 57+39	4-7	N/A	8-24

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

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

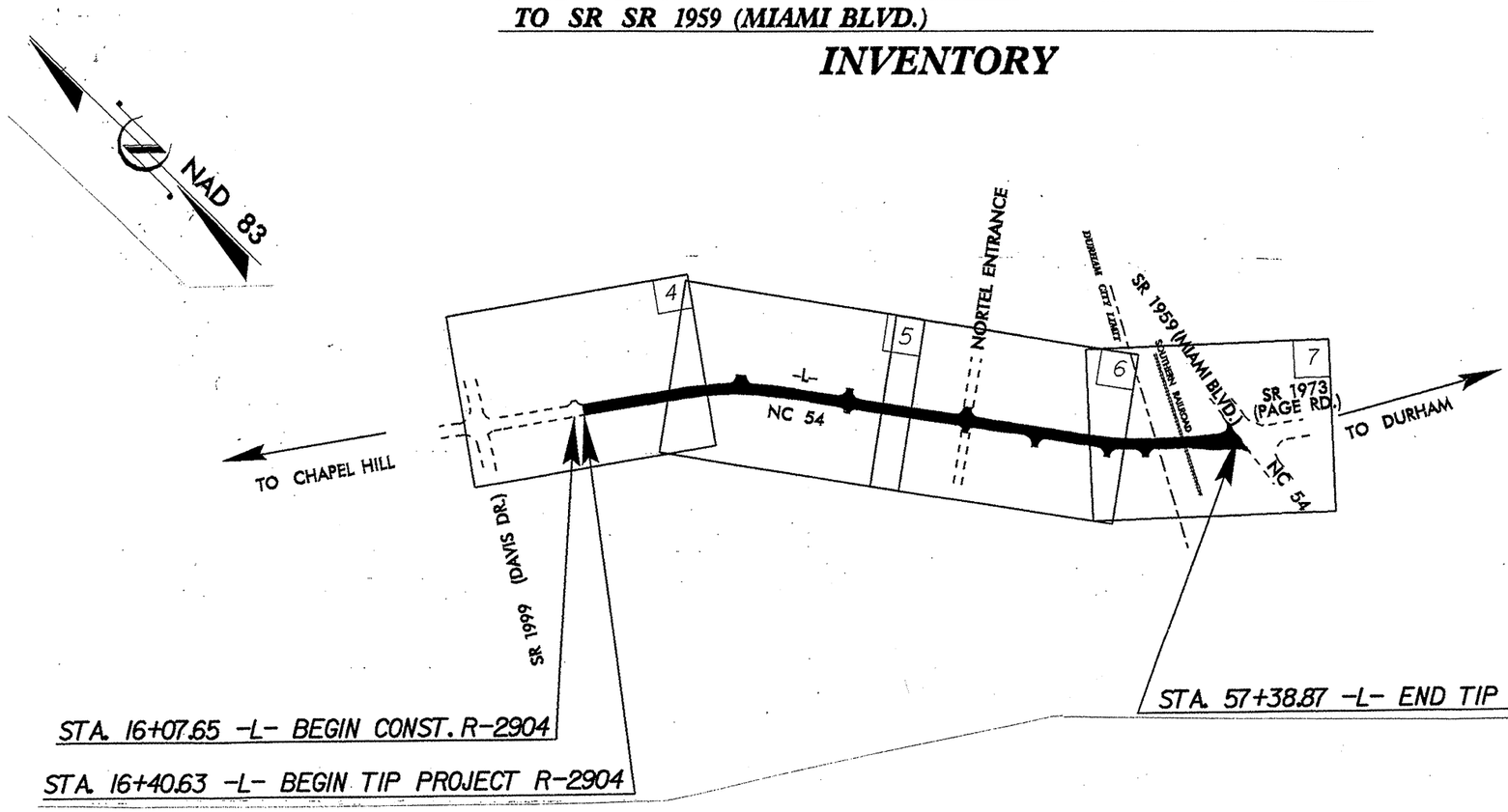
ROADWAY SUBSURFACE INVESTIGATION

STATE PROJ. 34512.3.1 I.D. R-2904 F.A. PROJ. STP-54(5)

COUNTY DURHAM

PROJECT DESCRIPTION NC 54 FROM SR 1999 (DAVIS DRIVE) TO SR SR 1959 (MIAMI BLVD.)

INVENTORY



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2904	1	24

STATE PROJECT NO.	F.A. PROJECT NO.	DESCRIPTION
34512.1.1	STP-54(2)	P.E.
34512.2.2	STP-54(2)	R /W, UTIL.
34512.3.1	STP-54(2)	CONST.

CAUTION NOTICE

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

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

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

PERSONNEL

A. M. HARRIS
C. A. YOUNGBLOOD
E. C. CAMPBELL
D. W. DIXON
R. D. BRANON
D. S. TIGNOR (F&R)
S. DAVIS (F&R)

INVESTIGATED BY S. P. BROWN

CHECKED BY D. N. ARGENBRIGHT

SUBMITTED BY D. N. ARGENBRIGHT

DATE JANUARY 2004

NORTH CAROLINA LICENSED SEAL 1873 GEOLOGIST STEVE P. BROWN 12/04

DRAWN BY: A. N. KARPA

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.

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
R-2904	34512.1.1	2	24

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL 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 WHICH CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND WHICH YIELDS LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM AND BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:

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

SOIL LEGEND AND AASHTO CLASSIFICATION

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

P.I. OF A-7-5 ≤ L.L. - 30 ; P.I. OF A-7-6 > L.L. - 30

CONSISTENCY OR DENSENESS

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

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE	4	10	40	60	200	270
OPENING (MM)	4.76	2.0	0.42	0.25	0.075	0.053

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

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

SOIL MOISTURE - CORRELATION OF TERMS

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

PLASTICITY

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

COLOR

DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YEL-BRN, 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 ARE 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 30
MODERATELY COMPRESSIBLE	LIQUID LIMIT 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 SEEPAGE

MISCELLANEOUS SYMBOLS

- ROADWAY EMBANKMENT WITH SOIL DESCRIPTION
- SOIL SYMBOL
- ARTIFICIAL FILL OTHER THAN ROADWAY EMBANKMENTS
- INFERRED SOIL BOUNDARIES
- INFERRED ROCK LINE
- ALLUVIAL SOIL BOUNDARY
- 25/825 — DIP/DIP DIRECTION OF ROCK STRUCTURES
- ● - SOUNDING ROD
- SPT CPT DPT DMT VST PMT — TEST BORING
- AUGER BORING
- CORE BORING
- 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 - CBR 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
FRAGS. - FRAGMENTS
MED. - MEDIUM
PMT - PRESSUREMETER TEST
SD. - SAND, SANDY
SL. - SILT, SILTY
SLI. - SLIGHTLY
TCR - TRICONE REFUSAL
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT
W - MOISTURE CONTENT
V. - VERY
VST - VANE SHEAR TEST

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] MOBILE B-___
- [ ] BK-51
- [X] CME-45C
- [X] CME-750
- [ ] PORTABLE HOIST
- [ ] OTHER _____
- [ ] OTHER _____

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

HAMMER TYPE:
- [X] AUTOMATIC [ ] MANUAL

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

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

ROCK DESCRIPTION

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

WEATHERED ROCK (WR)	NON-COASTAL PLAIN MATERIAL THAT YIELDS SPT N VALUES > 100 BLOWS PER FOOT.
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 ROCKS EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. *IF TESTED, YIELDS SPT N VALUES > 100 BPF*
VERY SEVERE (V. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, YIELDS SPT N VALUES < 100 BPF*
COMPLETE	ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.

ROCK HARDNESS

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

FRACTURE SPACING

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

BEDDING

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

INDURATION

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

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

TERMS AND DEFINITIONS

ALLUVIUM (ALLUV.) - SOILS WHICH 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 IS IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.

CALCAREOUS (CALC.) - SOILS WHICH 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 (F.P.) - 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 SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

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

SAPROLITE (SAP.) - RESIDUAL SOIL WHICH 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, WHICH HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS

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

STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR B.P.F.) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS LESS THAN 0.1 FOOT PENETRATION WITH 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 (S.R.Q.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY: TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 10 CENTIMETERS DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.

TOPSOIL (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK: N/A

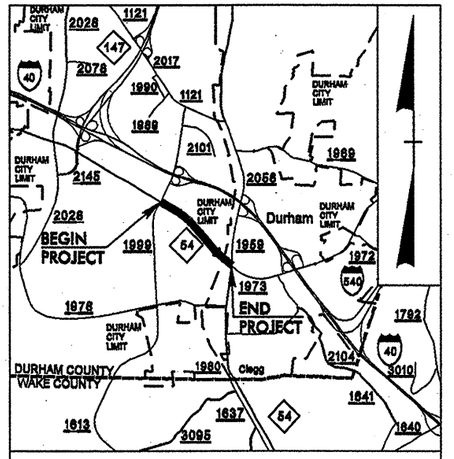
ELEVATION: N/A

NOTES:

REVISED 09/15/00

CONTRACT: 34512.1.1 ID: R-2904

See Sheet 1-A For Index of Sheets
See Sheet 1-B For Symbology



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

DURHAM COUNTY

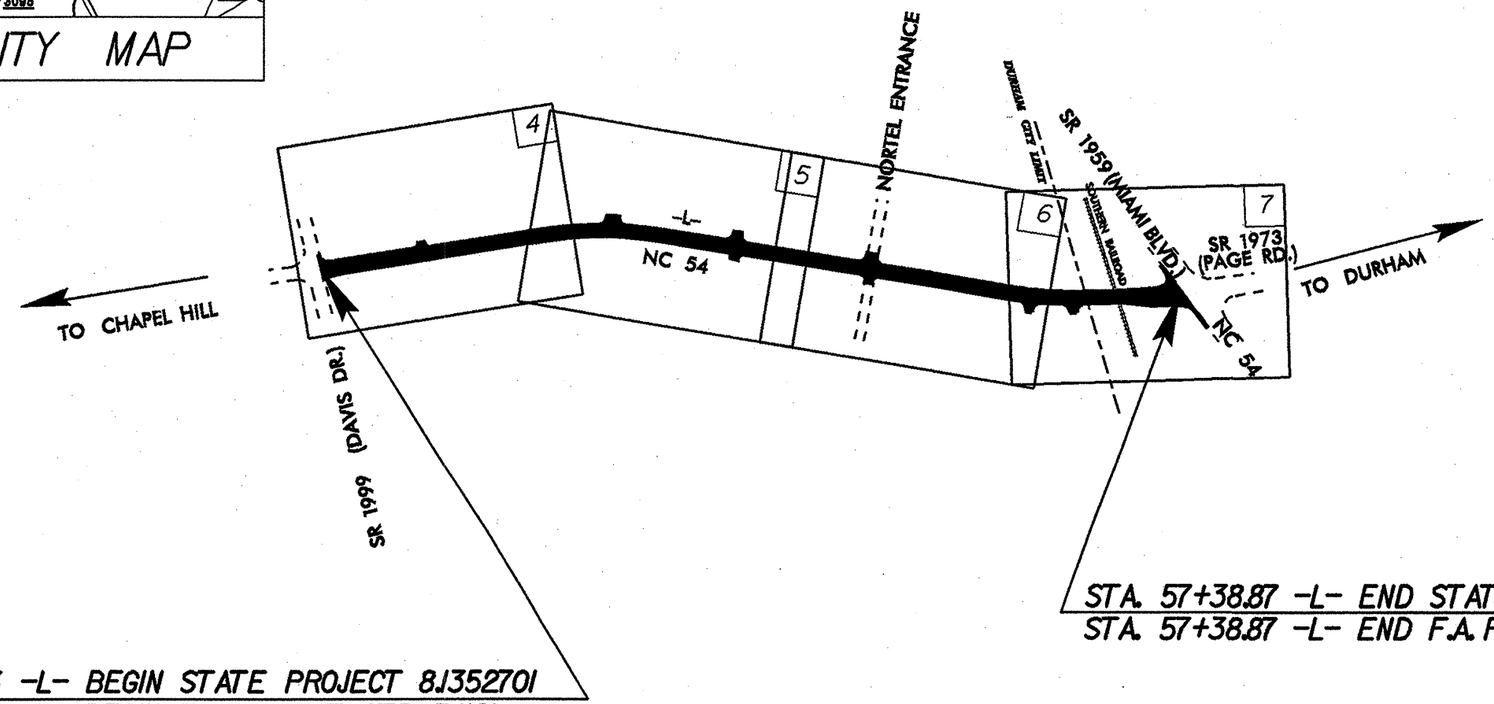
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2904	2A	24

STATE PROJECT NO.	F.A. PROJECT NO.	DESCRIPTION
34512.1.1	STP-54(2)	P.E.

LOCATION: ***NC 54 FROM SR 1999 (DAVIS DRIVE) TO SR 1959 (MIAMI BLVD.)***

TYPE OF WORK: ***GRADING, PAVING, DRAINAGE, GUARDRAIL, SIGNALS, AND SIGNING***

NAD 83



STA. 10+34.63 -L- BEGIN STATE PROJECT 8.1352701
STA. 10+34.63 -L- BEGIN F.A. PROJECT STP-54(2)

STA. 57+38.87 -L- END STATE PROJECT 8.1352701
STA. 57+38.87 -L- END F.A. PROJECT STP-54(2)

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

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

A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF DURHAM.

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2005 = 17,800
ADT 2025 = 37,700
DHV = 10 %
D = 60 %
T = 5 % *
V = 50 MPH
* (TTST 2 % + DUAL 3 %)
** DESIGN EXCEPTION REQUIRED FOR CREST VERTICAL CURVE.

PROJECT LENGTH

LENGTH ROADWAY F.A. PROJECT STP-54(2) = 0.891 MILES
TOTAL LENGTH STATE PROJECT 8.1352701 = 0.891 MILES

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

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
NOVEMBER 21, 2003 (PROD.)
APRIL 21, 2006 (TIP)

LETTING DATE:
NOVEMBER 16, 2004 (PROD.)
APRIL 15, 2008 (TIP)

B. L. MOORE, P.E.
PROJECT ENGINEER

PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: *P.E.*

ROADWAY DESIGN ENGINEER

SIGNATURE: *P.E.*

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER *P.E.*

DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR *DATE*

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

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

LYNDO TIPPETT
SECRETARY

December 16, 2003

STATE PROJECT: 34512.1.1 (R-2904)
FEDERAL PROJECT: STP-54(2)
COUNTY: Durham

DESCRIPTION: NC 54 from SR 1999 (Davis Drive) to SR 1959 (Miami Boulevard)

SUBJECT: Geotechnical Report - Inventory

PROJECT DESCRIPTION

The project consists primarily of widening of approximately 0.9 miles of existing NC 54 (-L- Stations 10+35 to 57+39). Vertical realignment is proposed near the end of the project (approximately -L- Station 47+00 and ahead).

A geotechnical investigation was conducted from May to December 2003, using CME-45C and CME-750, ATV-mounted, drill machines with automatic hammers. Standard Penetration Tests were performed at selected locations and additional borings were advanced using continuous flight augers. Representative soil samples were collected for visual classification in the field and for laboratory analysis by the Materials and Tests Unit.

The following alignment, totaling 0.9 miles, was investigated.

Line	Station
-L-	10+35 to 57+39

AREAS OF SPECIAL GEOTECHNICAL INTEREST

1) Highly Plastic Soils: Highly plastic clays, with plasticity indices equal to or greater than 26, were found in the following areas.

Line	Station
-L-	11+25 to 11+75
-L-	15+75 to 16+25
-L-	21+75 to 22+25
-L-	33+25 to 37+25
-L-	47+75 to 48+25

2) Groundwater: The following sections were found to exhibit a high water table, seasonal high groundwater, or the potential for groundwater related construction problems.

Line	Station
-L-	31+60 to 34+40
-L-	43+75 to 56+75

3) Degradable Rock: Degradable rock is defined as rock material (including both weathered rock and non-crystalline rock) that exhibits high slaking characteristics when exposed to air and water. Degradable rock occurs as unclassified excavation in the following cut areas.

Line	Station
-L-	30+75 to 31+90
-L-	33+75 to 34+25
-L-	38+75 to 39+75
-L-	43+75 to 45+90
-L-	49+60 to 52+25
-L-	52+60 to 55+25

4) Non-crystalline Rock: Non-crystalline rock occurs above or within 6 feet below proposed grade at the following locations. Non-crystalline rock on this project is primarily Triassic sandstone, siltstone, and mudstone.

Line	Station
-L-	33+75 to 34+25
-L-	49+65 to 55+75

PHYSIOGRAPHY AND GEOLOGY

The project is in gently rolling terrain of the Piedmont Physiographic Province. Surface drainage is very good. The project corridor is wooded or in commercial land use. Triassic age, sedimentary rocks of the Durham Sub-basin underlie the area. They are mostly interbedded sandstone, mudstone, and siltstone. Most soils are residual, and have been derived by weathering of the underlying, sedimentary rocks. Alluvial soil, roadway embankment, and engineered, artificial fill are also present.

SOIL PROPERTIES

Residual soils are the dominant soils on the project. They are derived from in-place weathering of the underlying Triassic sedimentary rocks. Most of these soils are medium stiff to hard, moist to wet, silty clay (A-7-5, A-7-6), sandy clay (A-6), and sandy silt (A-4). The sandy clays are slightly to moderately plastic. Silty clays are slightly to highly plastic. No highly plastic, residual clays were encountered ahead of -L- Station 37+50. Behind Station 37+50, the highly plastic clays tend to be concentrated near the ground surface. Plasticity typically decreases with depth, grading to moderately to slightly plastic within 3 to 5 feet of the surface. Sandy silt increases in abundance from west to east. Residual, loose, moist, silty sand (A-2-4) is also present, but rare.

Existing roadway embankment soils are the next most abundant soils on the project. These soils were not investigated in detail, as existing embankments are stable. Where drilled, these soils are medium stiff to very stiff, moist to wet, sandy silt (A-4) and slightly to moderately plastic, silty clay (A-7-6) and sandy clay (A-6).

Alluvial soils are present in the floodplains of the creeks that cross the project. A maximum thickness of 14 feet occurs in the floodplain of the creek that crosses -L- at Station 47+50. Alluvial soils are typically moist to wet, loose to dense, silty sand (A-2-4) and soft to stiff, sandy silt (A-4). Highly plastic, silty clay (A-7-6) is present, but less common than sand and silt.

Commercial drive embankments are connected to existing -L- at approximately Stations 26+30, 33+00, and 40+35. These embankments are classified as engineered, artificial fill. They were not investigated, as they appear stable and less than two feet of grade change is proposed at each location.

ROCK PROPERTIES

Triassic sedimentary rocks underlie the project area. Bedrock consists of interbedded sandstone, siltstone, and mudstone. Jar slake and slake durability tests were completed on representative samples of rock core recovered from nearby project R-2000AB. These test results indicate that the Triassic mudstones and siltstones are degradable. Core samples of mudstone and siltstone exhibited significant slaking when exposed to air and water, as well as very low to low durability values. Sandstone, as well as the more indurated siltstone samples, did not slake and had medium to high durability values. However, sandstone and siltstone have been included in this report as "degradable rock" because these rock types are commonly interbedded with degradable mudstone and siltstone layers.

Degradable rock is present in the unclassified excavation as noted above, in "Areas of Special Geotechnical Interest, Degradable Rock". Non-crystalline rock occurs above or within 6 feet below grade as noted above, in "Areas of Special Geotechnical Interest, Non-Crystalline Rock".

GROUNDWATER

The areas noted above in "Areas of Special Geotechnical Interest, Groundwater" were found to exhibit a high water table, seasonal high groundwater, or the potential for groundwater related construction problems. Groundwater occurred well below grade over the remainder of the project area.

BULK SAMPLES

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

Sample No.	Location	Depth (m)	Test
RT-1	-L- 52+50, 55' LT	1.0 – 6.0	Recompacted Triaxial CU
RT-2	-L- 51+50, 50' LT	4.0 – 8.0	Recompacted Triaxial CU
CBR-1	-L- 49+50, 35' LT	8.0 – 12.0	California Bearing Ratio

Respectfully submitted,

Steve P. Brown

Steve P. Brown, LG
Project Engineering Geologist

PROJECT: R-2904 COUNTY: DURHAM SHEET 1 OF 1

	STATION	STATION	EXCAVATION					EMBANKMENT				BORROW	WASTE			
			TOTAL EXCAV. (UNCL)	ROCK	UNDERCUT	UNSUIT. UNCLASS.	SUITABLE UNCLASS.	TOTAL	ROCK	EARTH	EMB. + 18 %		ROCK	SUITABLE	UNSUIT.	TOTAL
-L- RIGHT																
-L-	16+40.63	45+50.00	131				131	10,491		10,491	12,379	12,248				
-L-	45+50.00	57+38.87	5,989	1,765		265	3,959	8,083		8,083	9,538	5,579	1,765		2,030	2,030
-L- RIGHT SUBTOTAL:			6,120	1,765		265	4,090	18,574		18,574	21,917	17,827	1,765		2,030	2,030
-L- MEDIAN																
-L-	16+40.63	45+50.00	252				252	297		297	350	98				
-L-	45+50.00	46+50.00	15				15	28		28	33	18				
-L- MEDIAN SUBTOTAL:			267				267	325		325	383	116				
-L- LEFT																
-L-	16+40.63	45+50.00	4,017		279	332	3,685	751		751	886			2,799	611	3,410
-L-	45+50.00	57+38.87	8,736	2,482		1,024	5,230	2,848		2,848	3,361		2,482	1,869	3,506	5,375
-L- LEFT SUBTOTAL:			12,753	2,482	279	1,356	8,915	3,599		3,599	4,247		2,482	4,668	4,117	8,785
ADDITIONAL UNDERCUT:					500			500		500	590	590			500	500
LOSS DUE TO CLEAR. & GRUB.:			-650				-650							-650		-650
EST. SHOULDER MATERIAL:								1,441		1,441	1,700	1,700				
SUBTOTAL:			18,490	4,247	779	1,621	12,622	24,439		24,439	28,837	20,233	4,247	4,018	6,647	10,665
WASTE IN LIEN OF BORROW												-4,018		-4,018		-4,018
GRAND TOTALS:			18,490	4,247	779	1,621	12,622	24,439		24,439	28,837	16,215	4,247		6,647	6,647
SAY:			18,500 CY		800 CY							16,300 CY				
DDE = 25 CY																

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2904	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83

-L-
Pls Sta 23+02.76
Fs = 3° 00' 56.0"
Ls = 200.00
LT = 133.35
ST = 66.68

STA. 10+34.63 -L- BEGIN STATE PROJECT R-2904

15

20

BECTON, DICKINSON AND COMPANY
DB 355 PG 138
PB 60 PG 77

RESIDUAL

+23
EX. R/W

+74
84'

+81
84'

+34
EX. R/W

+11
EX. R/W

+50
82'

POT Sta. 10+00.00

50' R

330' FULL

100' LANE TAPER

APPROXIMATE

CONC FLUME

WOODS

EXISTING R/W

ROADWAY EMBANKMENT

2' R

8' R

S 59° 36' 00.4" E

-L-

100' MEDIAN TAPER

150' FULL

250' FULL

-BL- 134 PINC 12+89.62
-U4026BL-134 PINC 319+69.01
-L- STA 10+37.84
65.82' RT

-BL- 279 PINC 15+24.83
-L- STA 15+52.23
38.09' RT

BM #1
-BL- STA 15+13.79
110.23' RIGHT
ELEV. 323.73

+32
EX. R/W

+50
81'

+73
EX. R/W

NORTHERN TELECOM, INC
DB 2289 PG 349
DB 2450 PG 794
PB 80 PG 185
PB 130 PG 109

+70
EX. R/W

+99
81'

ALLUVIAL

TS Sta. 21+69.41

MATCH TO SHEET 5 STA. 23+00

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "R2000-25" WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 765141.40311 EASTING: 2040223.34401 THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99991540 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "R2000-25" TO -L- STATION 10+00.00 IS 14087.88' N 2° 29' 34.17" E ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NGVD 29

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2904	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83

-L-

Pls Sta 23+02.76	Pl Sta 25+79.89	Pls Sta 28+55.34
Fs = 3°00'56.0"	Δ = 12°38'33.8" (RT)	Fs = 3°00'56.0"
Ls = 200.00	D = 3°00'56.0"	Ls = 200.00
LT = 133.35	L = 419.25	LT = 133.35
ST = 66.68	T = 210.48	ST = 66.68
	R = 1,900.00	
	SE = 0.04	

MATCH TO SHEET 4 STA. 23+00

MATCH TO SHEET 6 STA. 36+00

ALLUVIAL

ARTIFICIAL FILL

RESIDUAL

ROADWAY EMBANKMENT

SC Sta. 23+69.41

CS Sta. 27+88.66

ST Sta. 29+88.66

-BL- 301 PINC 25+81.58
-L- STA 26+15.05
123.74' RT

-BL- 302 PINC 32+22.57
-L- STA 32+60.35
36.11' RT

BM #2
-BL- STA 31+65.20
179.52' RIGHT
ELEV. 310.31'

NORTHERN TELECOM INC
DB 1008 PG 88
DB 1064 PG 905
DB 1125 PG 224
PB 85 PG 187
PB 90 PG 147

NORTHERN TELECOM, INC
DB 2289 PG 349
DB 2450 PG 794
PB 80 PG 193
PB 130 PG 109

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2904	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83

-L-
Pls Sta 48+33.92
Fs = 3°00'56.0"
Ls = 200.00
LT = 133.35
ST = 66.68

MATCH TO SHEET 5 STA. 36+00

MATCH TO SHEET 7 STA. 49+00

NORTHERN TELECOM INC
DB 1008 PG 609
DB 1064 PG 905
DB 825 PG 224
PB 95 PG 197
PB 99 PG 147

NORTHERN TELECOM, INC
DB 2289 PG 349
DB 2450 PG 794
PB 80 PG 193
PB 130 PG 109

RESEARCH TRIANGLE FOUNDATION OF NORTH CAROLINA
DB 980 PG 395
DB 365 PG 537
PB 52 PG 72
PB 94 PG 48

MTL
23.5' RST
30" C&G
30" CMG
37.0' RST
BRUSH
WOODS
+75 92'
+43 89'
+50 90'
+49 99'
+99 98'
+00 92'
+54 95'
BASEBALL FIELD
+80 88'
96" CMP
RIPRAP
+99 99'
WATER FOUNDATION
SOCCER FIELD
48" CMP
42" CMP
+01 86'
+00 79'
TS Sta. 47+00.57
+00 85'
330' FULL
100' MEDIAN TAPER
RESIDUAL
ALLUVIAL
CONC HW
S 40°55'34.6" E -L-
NC 54 (CHAPEL HILL BLVD)
2' R
ROADWAY EMBANKMENT
S 42°19'56.7" E
100' MEDIAN TAPER
258' FULL
ARTIFICIAL FILL
+52 81'
150' RT TURN LANE TAPER
+00 88'
+50 85'
100' FULL
+00 86'
50' R
GRAU 350
2-18" CONC HW'S
PROP. GR.
+00 82'
+48 88'
+86 121'
+52 99'
150' RT TURN LANE TAPER
100' FULL
-BL 303 PINC 40+26.03
-L- STA 40+63.80
31.25' RT
-BL- 304 PINC 47+26.51
-L- STA 47+63.99
14.17' RT

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2904	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L-

PIs Sta 48+33.92	PI Sta 49+85.99	PIs Sta 51+37.98
Fs = 3°00'56.0"	Δ = 5°08'54.3" (LT)	Fs = 3°00'56.0"
Ls = 200.00	D = 3°00'56.0"	Ls = 200.00
LT = 133.35	L = 170.73	LT = 133.35
ST = 66.68	T = 85.42	ST = 66.68
	R = 1,900.00	
	SE = 0.04	

NON-CRYSTALLINE ROCK AT AND/OR NEAR SURFACE

NAD 83

STA. 57+38.87 -L- END STATE PROJECT R-2904

MATCH TO SHEET 6 STA. 49+00

SC Sta. 49+00.57

CS Sta. 50+71.30

ST Sta. 52+71.30

BL- 305 PINC 52+90.03
-BY- PINC 11+19.52
-L- STA 53+25.70
18.58' RT

BL- 306 PINC 56+37.80
-L- STA 56+66.50
30.70' RT

POT Sta. 62+00.58

-NCGS CREEKSTONE POT 59+16+24.16 PINC
-BY- 116+50.50
5+00.00
BY

S 52°06'21.0"E -L-

CEDAR FORK BAPTIST CHURCH DB UNKNOWN

CEDAR FORK BAPTIST CHURCH DB 302 PG 437 PB 48 PG 13

QUILITY OIL COMPANY, LIMITED PARTNERSHIP DB 1934 PG 787 PB 130 PG 215

REBECCA J GREEN DB 338 PG 46

NORTHERN TELECOM INC DB 1008 PG 569 DB 1064 PG 908 DB 825 PG 224 PB 56 PG 191 PB 99 PG 147

RESEARCH TRIANGLE FOUNDATION OF NORTH CAROLINA DB 980 PG 395 DB 395 PG 557 PB 52 PG 42 PB 54 PG 48

HIGHWOODS/FORSYTH LIMITED PARTNERSHIP DB 2065 PG 99 PB 83 PG 46 PB 132 PG 84

HIGHWOODS/FORSYTH LIMITED PARTNERSHIP DB 2086 PG 287 PB 120 PG 135

CENTRAL CAROLINA BANK AND TRUST DB 2940 PG 838 PB 147 PG 133

PRINCIPAL MUTUAL LIFE INSURANCE COMPANY DB 2396 PG 266 PB 147 PG 133

DURHAM CITY LIMITS

SR 1569 (MAIN BOULEVARD) EAST

OLD PAGE ROAD (SR 1573) EAST

RAILWAY

STATION PLATFORM

SIDEWALK

FUTURE PARKING DECK (BY OTHERS)

ELEVATOR / STAIRS

PEDESTRIAN BRIDGE

UNDER CONSTRUCTION

THIS AREA UNDER CONSTRUCTION NO IRON PINS FOUND AT TIME OF SURVEYS R/W AND PROPERTY PUT IN FROM DIGITAL PLANS BY STANTEC AND RECORD INFORMATION

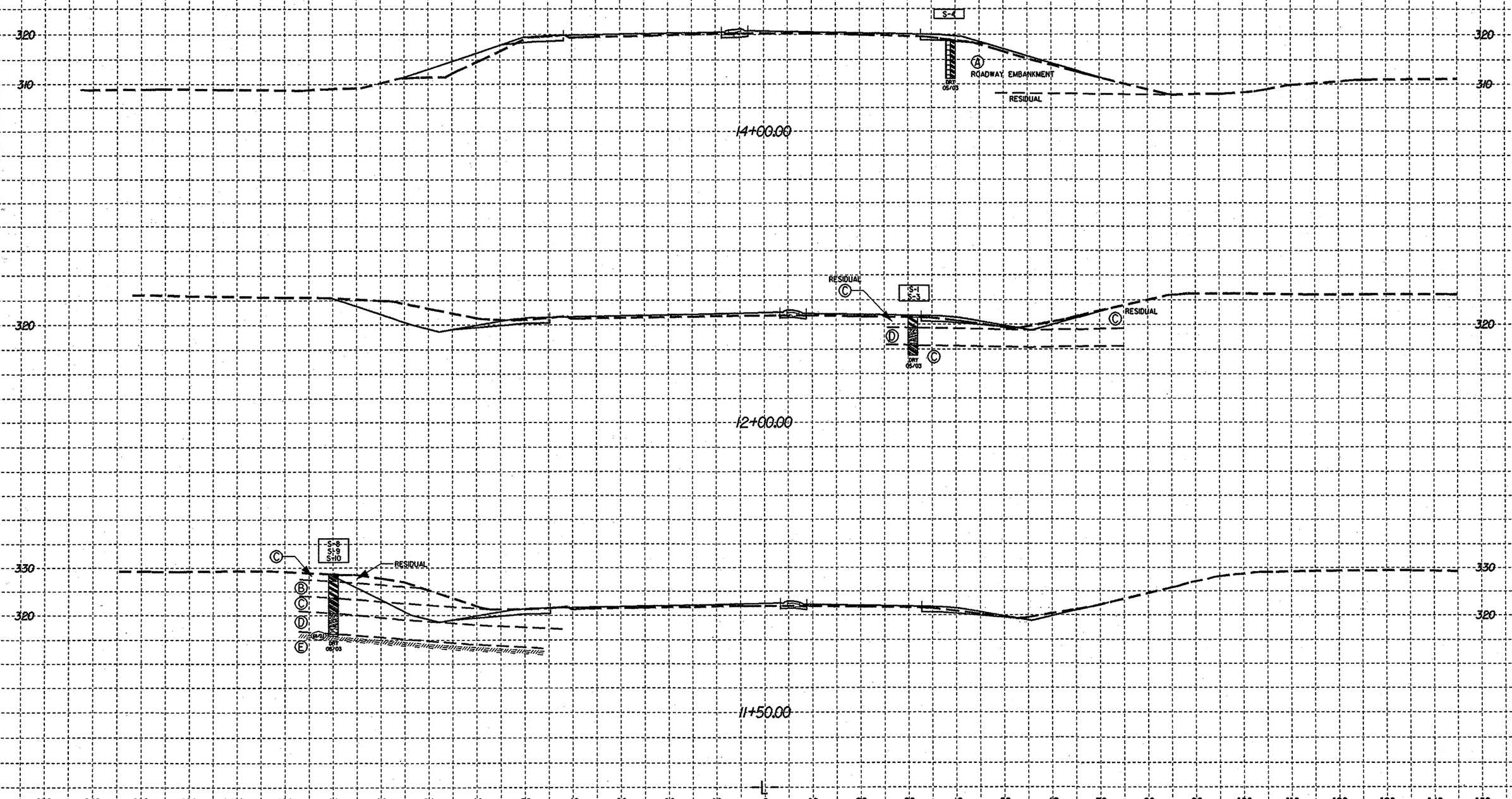
BOLLARDS

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-1	31' RT	12+00	1.0-1.5	A-7-6(12)	41	23	11.3	19.8	36.0	32.9	87	81	64	-	-
S-3	31' RT	12+00	7.0-7.5	A-6(10)	31	13	2.1	11.3	57.8	28.8	95	94	87	-	-
S-4	38' RT	14+00	3.0-3.5	A-7-6(14)	41	23	9.9	16.7	38.5	35.0	86	81	68	-	-
S-8	90' LT	11+50	0.5-1.0	A-6(3)	28	11	13.6	37.2	26.5	22.6	100	95	56	-	-
S-9	90' LT	11+50	3.0-3.5	A-7-6(17)	42	27	6.2	27.8	31.1	35.0	100	98	72	-	-
S-10	90' LT	11+50	7.0-7.5	A-6(11)	39	22	9.3	34.4	27.6	28.8	100	97	63	-	-

LEGEND

A: ROADWAY EMBANKMENT, RED-BROWN, MEDIUM STIFF, MODERATELY PLASTIC, MOIST, SILTY CLAY
B: RESIDUAL, RED-ORANGE, MEDIUM STIFF, HIGHLY PLASTIC, MOIST, SILTY CLAY
C: RESIDUAL, RED AND RED-BROWN, MEDIUM STIFF TO STIFF, SLIGHTLY TO MODERATELY PLASTIC, MOIST, SILTY AND SANDY CLAY
D: WEATHERED ROCK (SANDSTONE)
E: NON-CRYSTALLINE ROCK (SANDSTONE)



3-DEC-2003 07:58
C:\Projects\r2904\eddd_geotech\Xsections\L_xp1_Geo.dgn
K.PHOD

8/23/99

0 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2904	9

SOIL TEST RESULTS

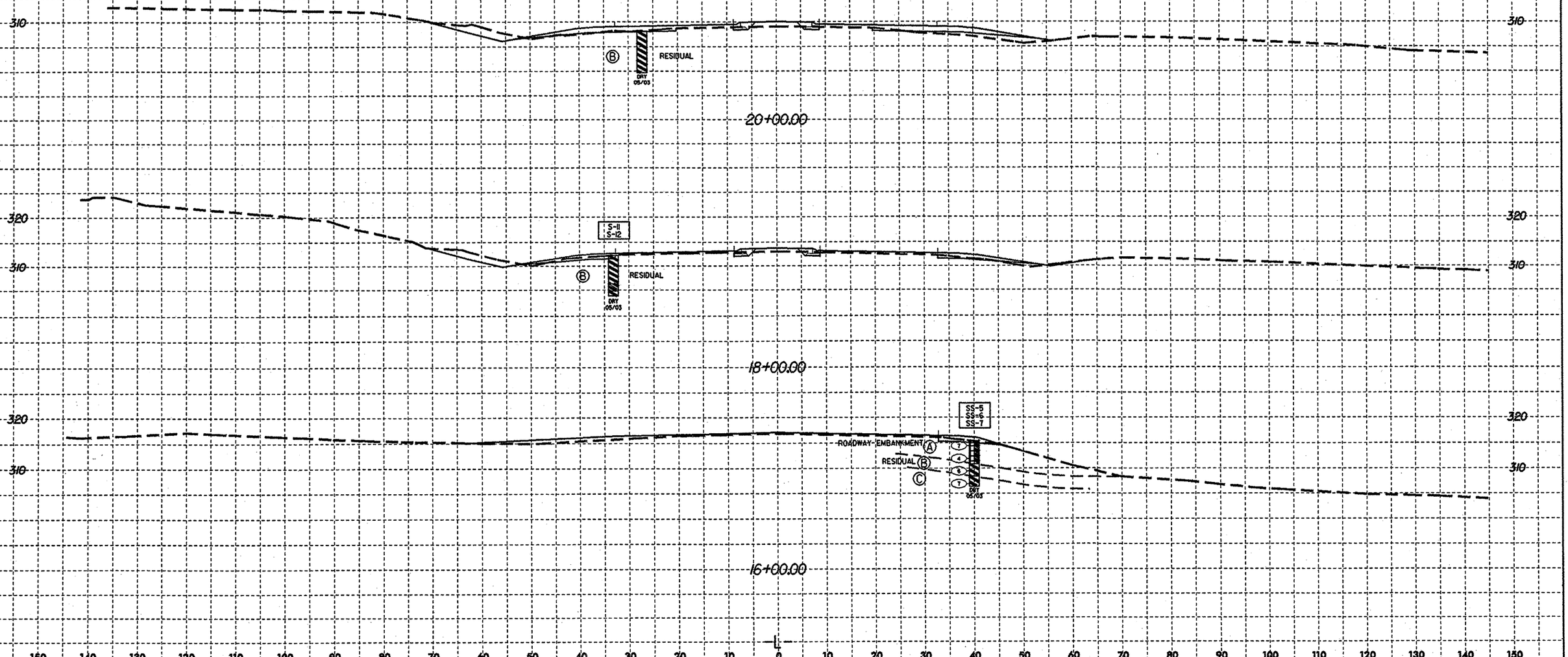
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-5	40' RT	16+00	0.0-1.5	A-6(10)	39	17	7.6	19.1	42.4	30.9	88	84	69	18	-
SS-6	40' RT	16+00	5.0-6.5	A-7-5(11)	45	12	6.6	16.9	37.4	39.1	98	94	80	-	-
SS-7	40' RT	16+00	7.5-9.0	A-7-5(58)	93	63	1.6	6.6	30.0	61.7	89	88	83	-	-
S-11	33' LT	18+00	3.0-3.5	A-7-6(20)	45	24	8.4	11.3	39.1	41.2	98	92	82	-	-
S-12	33' LT	18+00	6.5-7.0	A-6(12)	38	18	1.2	36.2	33.7	28.8	100	99	75	-	-

LEGEND

A: ROADWAY EMBANKMENT, RED-BROWN, MEDIUM STIFF, MODERATELY PLASTIC, MOIST, SANDY CLAY

B: RESIDUAL, GRAY-BROWN, RED-BROWN, ORANGE, AND BROWN, MEDIUM STIFF TO STIFF, SLIGHTLY TO MODERATELY PLASTIC, MOIST, SILTY AND SANDY CLAY

C: RESIDUAL, BROWN, MEDIUM STIFF, HIGHLY PLASTIC, MOIST, SILTY CLAY



10-DEC-2003 08:00
R:\PROJECTS\r2904\cadd_geotech\Xsections\l_xpl_Geo.dgn
dkarpa A1

8/23/99

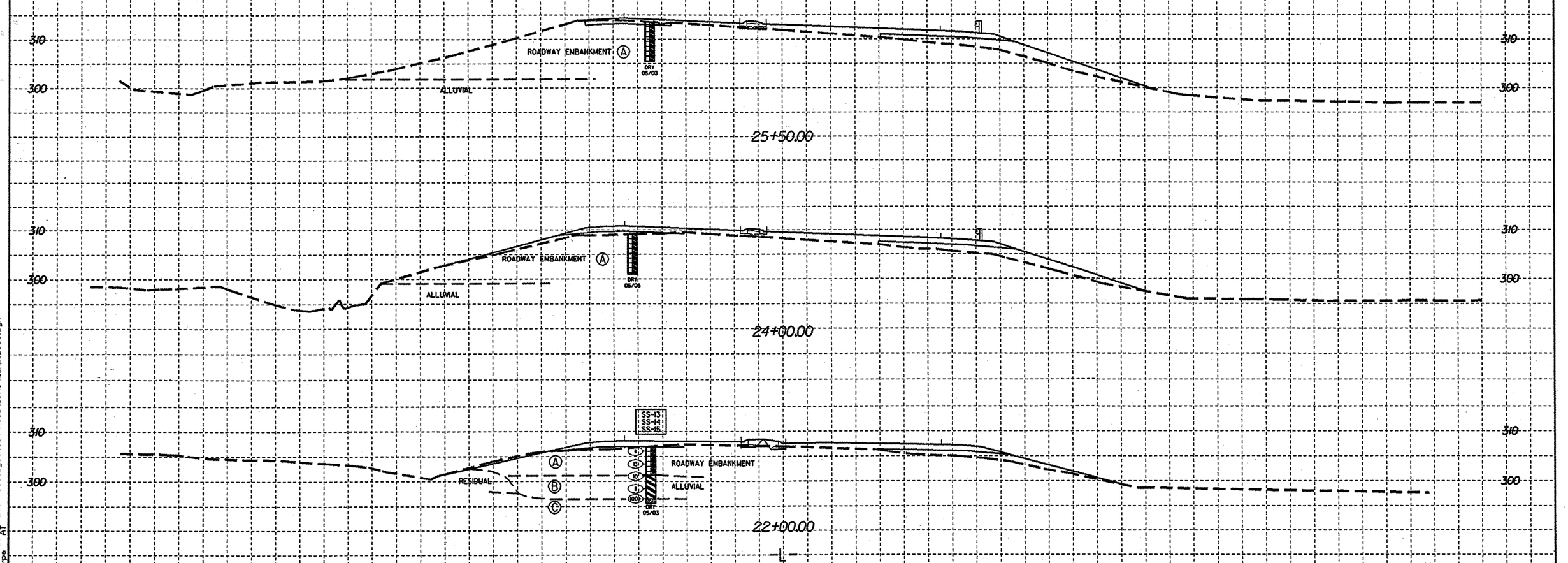
PROJ. REFERENCE NO.	SHEET NO.
R-2904	10

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-13	27' LT	22+00	0.0-1.5	A-6(11)	36	14	4.9	19.1	47.1	28.8	99	96	81	-	-
SS-14	27' LT	22+00	5.7-6.5	A-7-6(20)	47	27	5.8	21.8	33.3	39.1	100	97	77	-	-
SS-15	27' LT	22+00	7.5-9.0	A-7-6(28)	53	33	4.5	17.9	38.5	39.1	97	94	82	-	-

LEGEND

A: ROADWAY EMBANKMENT, RED-BROWN, MEDIUM STIFF TO STIFF, SLIGHTLY PLASTIC, MOIST, SANDY CLAY
B: ALLUVIAL, GRAY, STIFF, HIGHLY PLASTIC, MOIST, SILTY CLAY
C: WEATHERED ROCK (SILTSTONE)



10-DEC-2003 08:01
N:\PROJECTS\r2904\eddi_geotech\Xsections\l_xp1_Geo.dgn
Olympia (A)

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
R-2904	11

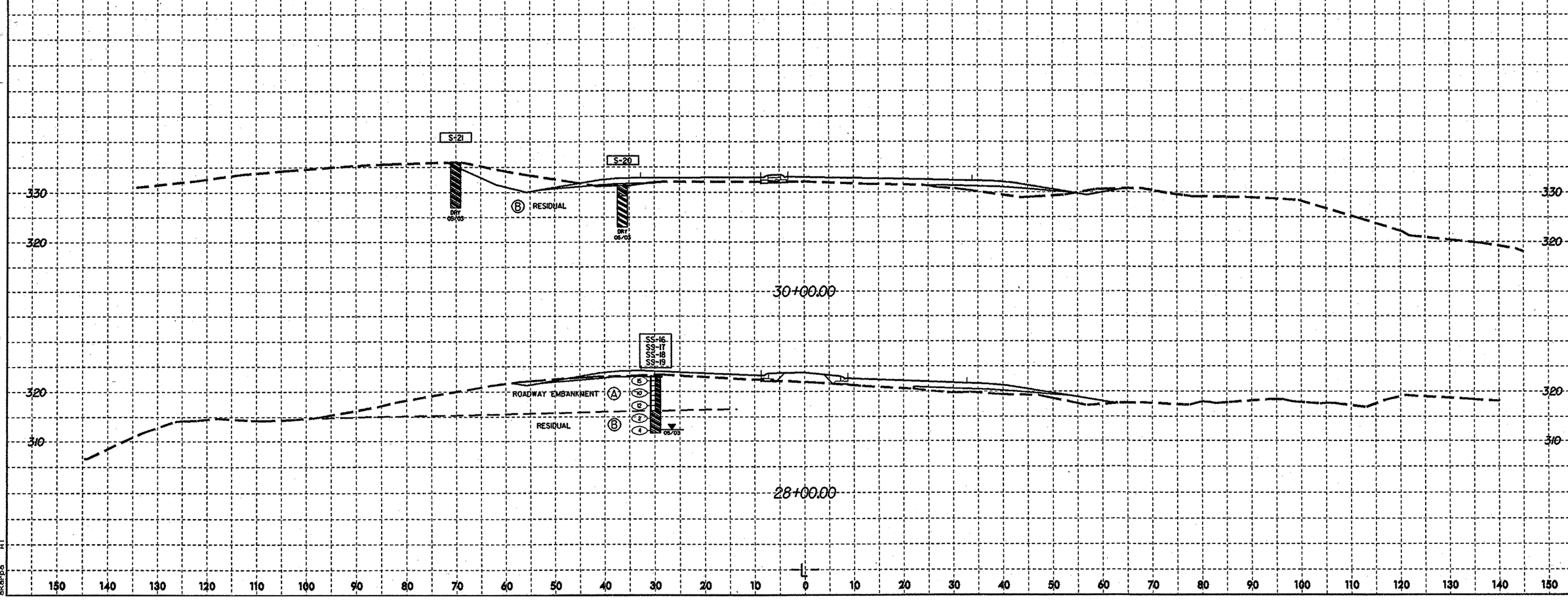
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-16	30' LT	28+00	0.5-1.5	A-6(11)	37	18	7.2	26.7	39.3	26.7	94	90	69	-	-
SS-17	30' LT	28+00	5.0-6.2	A-6(7)	31	12	10.5	18.7	46.1	24.7	97	92	73	-	-
SS-18	30' LT	28+00	7.5-9.0	A-6(10)	35	15	9.3	21.4	40.5	28.8	100	96	75	-	-
SS-19	30' LT	28+00	10.0-11.5	A-6(7)	31	12	7.0	31.5	36.8	24.7	100	97	70	-	-
S-20	36' LT	30+00	4.5-5.0	A-7-6(17)	44	23	11.3	5.3	40.1	43.2	91	83	77	-	-
S-21	70' LT	30+00	3.4-3.9	A-6(13)	36	21	8.9	27.0	29.5	34.5	100	96	71	15	-

LEGEND

A: ROADWAY EMBANKMENT, RED-BROWN, STIFF, SLIGHTLY TO MODERATELY PLASTIC, MOIST, SANDY CLAY

B: RESIDUAL, RED, RED-BROWN, AND ORANGE, SOFT TO MEDIUM STIFF, SLIGHTLY TO MODERATELY PLASTIC, MOIST TO WET, SILTY AND SANDY CLAY



10-DEC-2003 08:01
R:\R-2904\eddd_geotech\xsections\L_xpl_Geo.dgn
PLOTTED BY: akarpo

0 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2904	12

SOIL TEST RESULTS

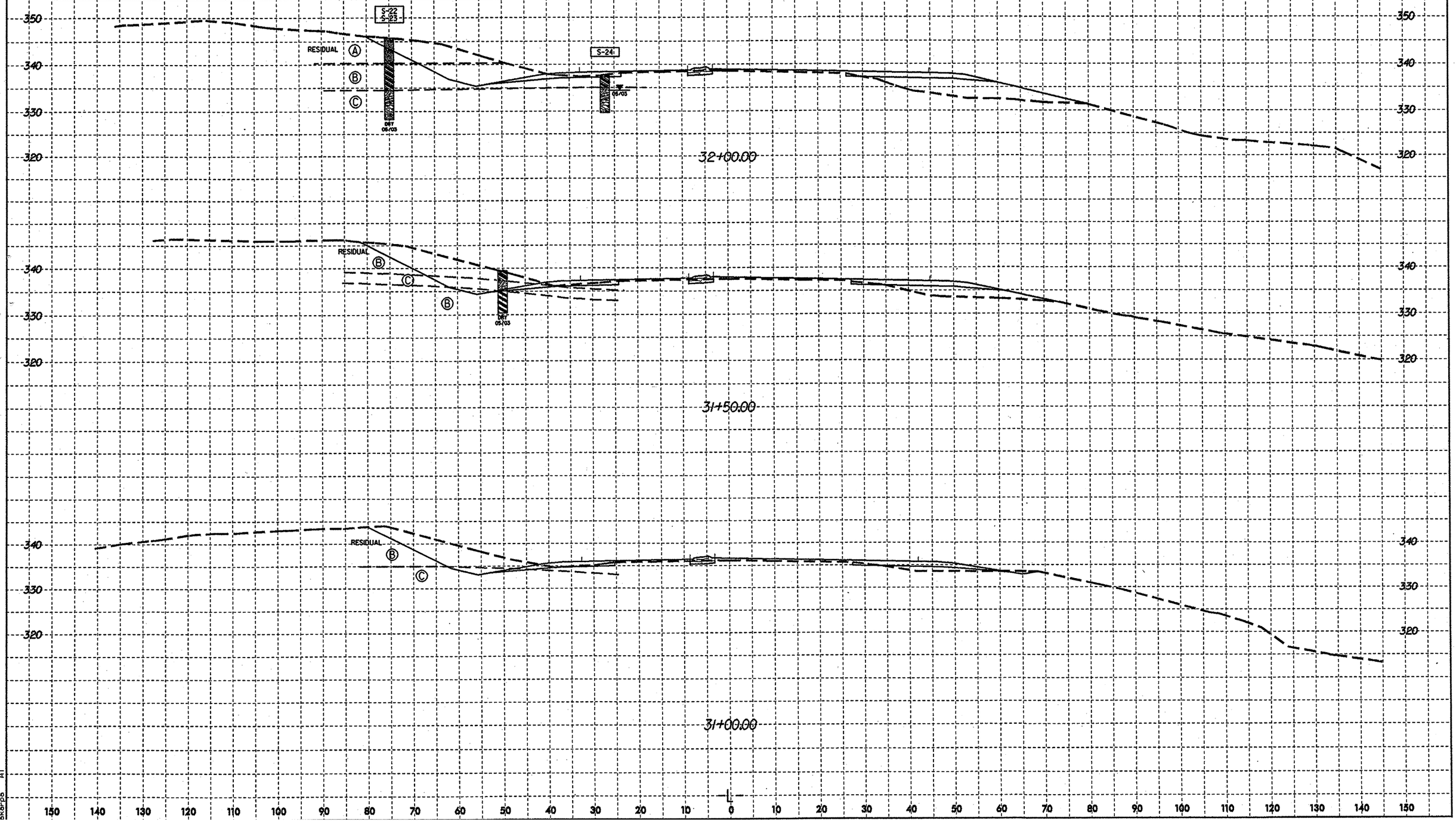
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-22	75' LT	32+00	2.6-3.1	A-4(4)	27	10	11.0	28.6	29.9	30.5	100	96	68	-	-
S-23	75' LT	32+00	8.0-8.5	A-6(16)	38	19	4.7	13.2	37.5	44.7	99	96	86	-	-
S-24	27' LT	32+00	2.0-2.5	A-6(8)	34	16	9.5	27.6	28.3	34.5	94	90	66	-	-

LEGEND

A: RESIDUAL, RED-PURPLE, MEDIUM STIFF TO STIFF, MOIST, CLAYEY SILT

B: RESIDUAL, RED AND ORANGE, MEDIUM STIFF TO HARD, MODERATELY PLASTIC, MOIST, SANDY AND SILTY CLAY

C: WEATHERED ROCK (SANDSTONE AND MUDSTONE)



10-DEC-2003 08:02
R:\PROJECTS\R-2904\cadd_geotech\Xsections\L_xp1_Geo.dgn
dkarpe
A1

8/23/99

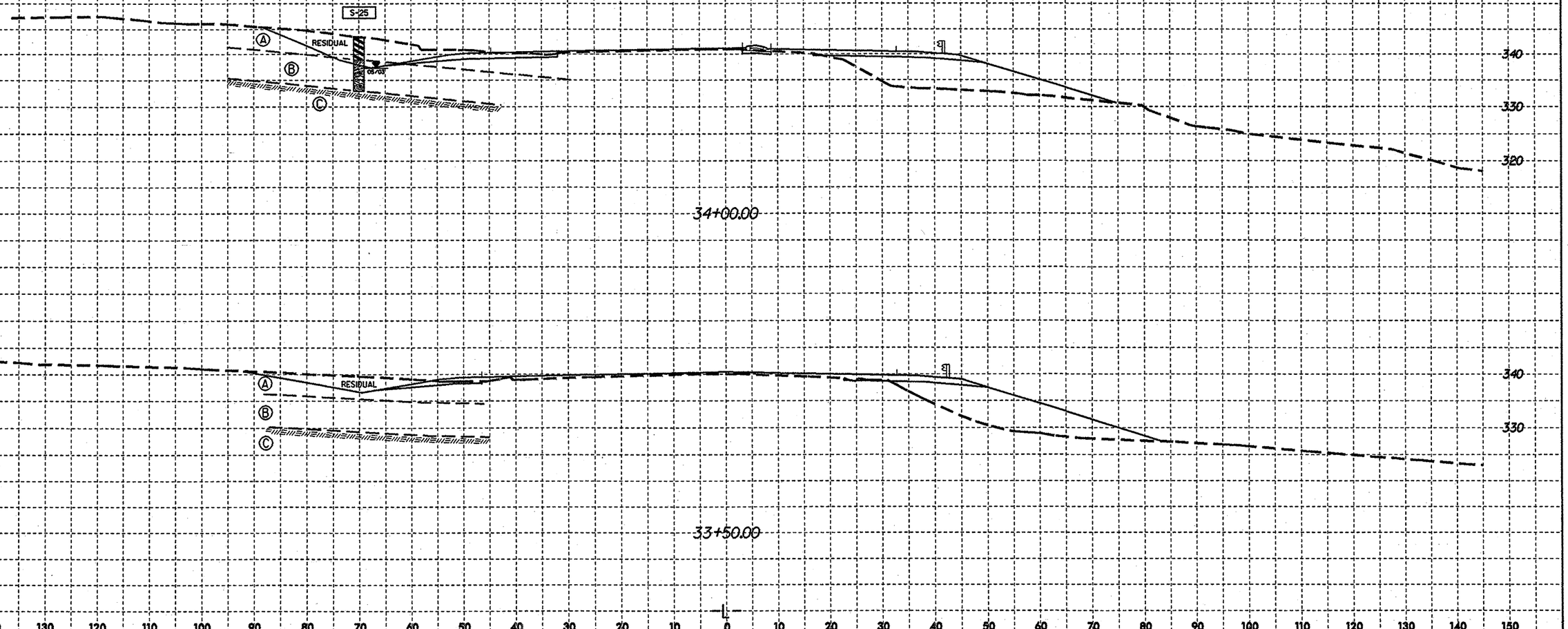
0 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2904	13

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-25	70' LT	34+00	2.0-2.5	A-7-6(37)	61	42	1.2	22.5	23.5	52.8	100	100	84	-	-

LEGEND:

A: RESIDUAL, BROWN, MEDIUM STIFF, HIGHLY PLASTIC, MOIST, SILTY CLAY
B: WEATHERED ROCK (SANDSTONE)
C: NON-CRYSTALLINE ROCK (SANDSTONE)



10-DEC-2003 08:02
R:\PROJECTS\r-2904\coddd_geotechVXsections\1_xpl_Geo.dgn
dkerpa

8/23/99

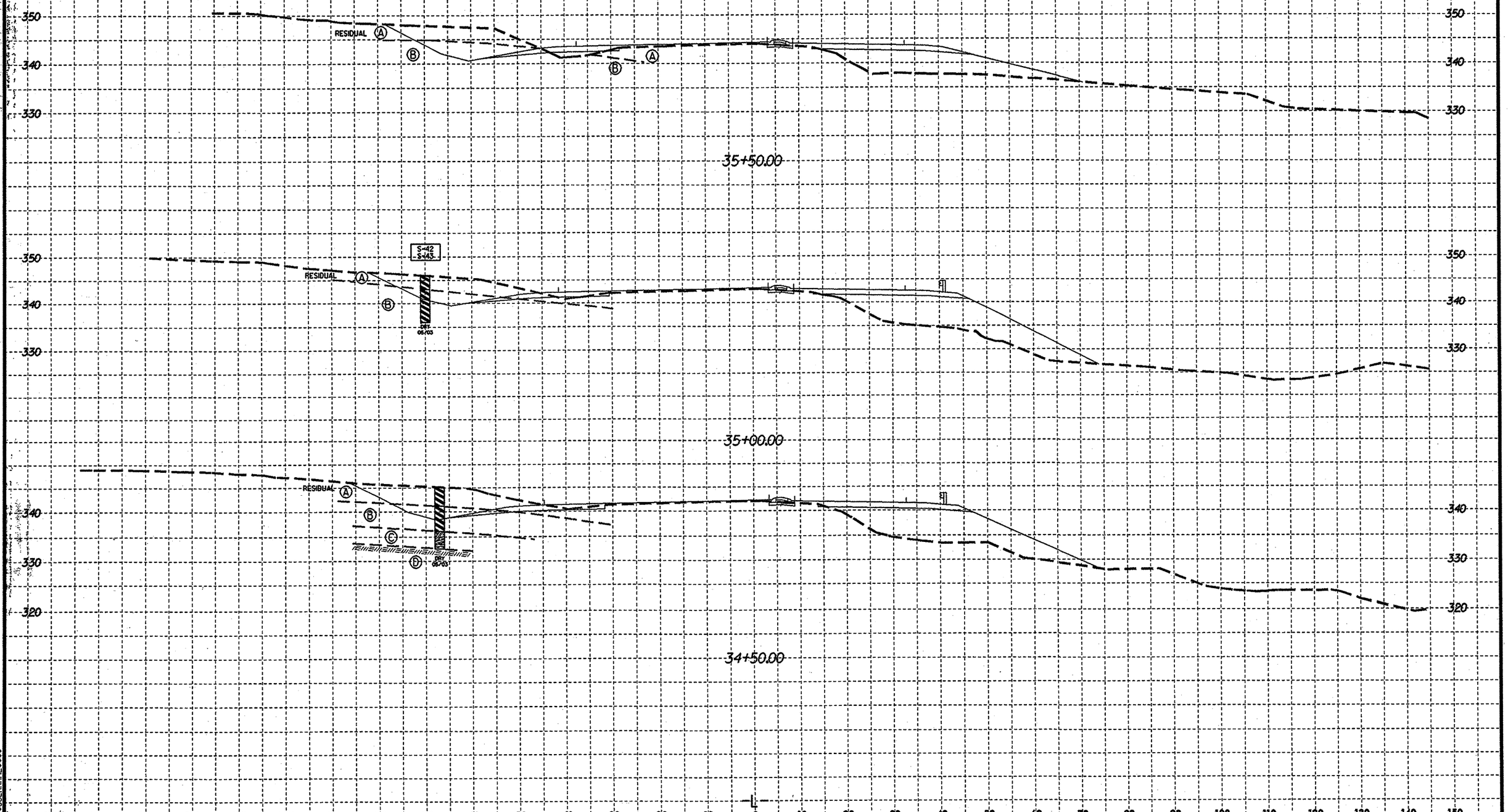
0 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2904	14

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-42	70' LT	35+00	0.0-3.0	A-7-6(48)	75	55	3.5	21.0	26.6	48.9	100	99	82	-	-
S-43	70' LT	35+00	3.0-5.5	A-7-6(16)	41	20	1.6	25.7	40.1	32.6	100	100	80	-	-

LEGEND

A: RESIDUAL, BROWN, MEDIUM STIFF, HIGHLY PLASTIC, DRY TO MOIST, SILTY CLAY
B: RESIDUAL, RED-BROWN AND RED-PURPLE, MEDIUM STIFF TO HARD, MODERATELY PLASTIC, DRY TO MOIST, SILTY CLAY
C: WEATHERED ROCK (SANDSTONE)
D: NON-CRYSTALLINE ROCK (SANDSTONE)



8/23/99

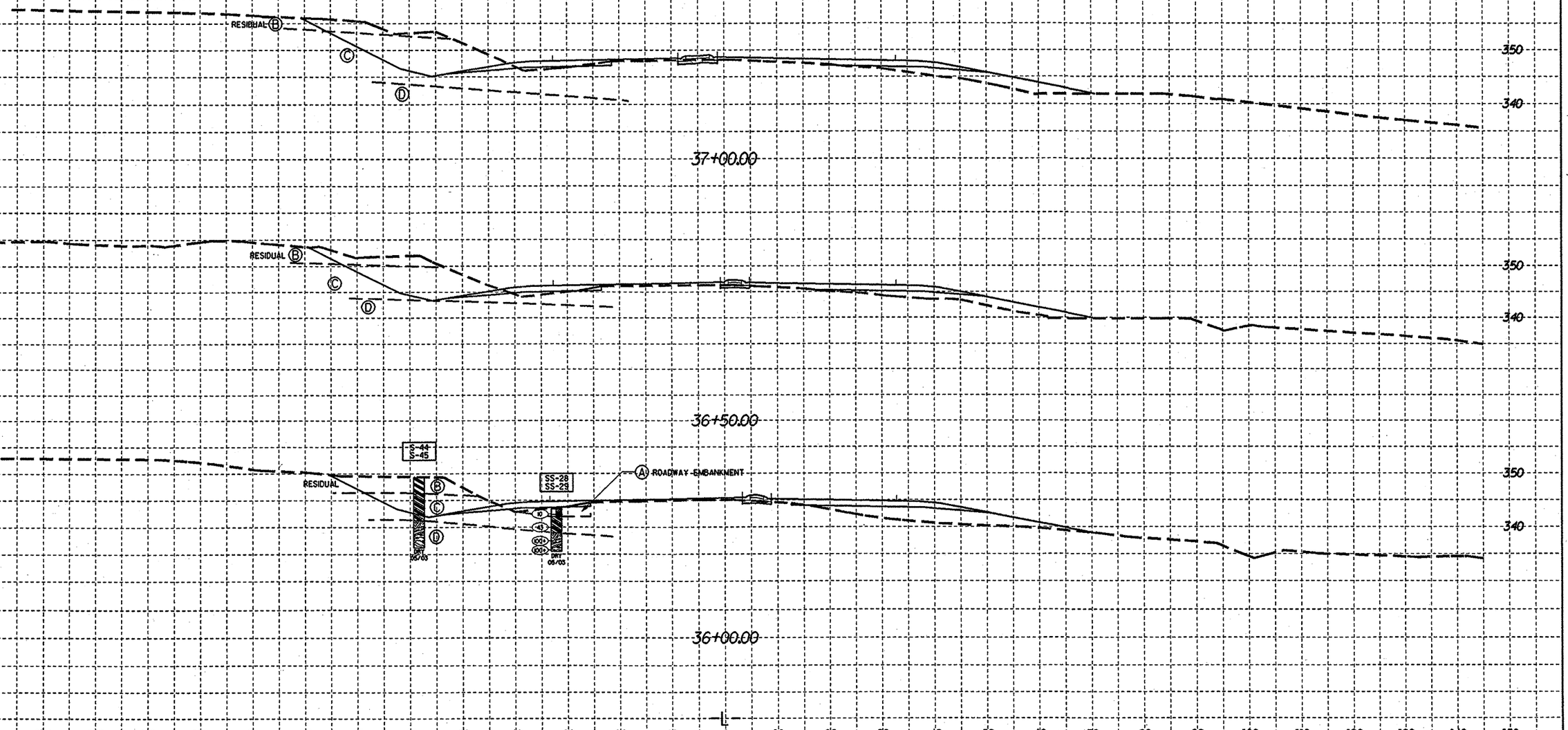
0 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2904	15

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-28	32' LT	36+00	0.8-1.5	A-6(14)	38	17	2.8	27.2	37.5	32.5	100	99	82	-	-
SS-29	32' LT	36+00	3.2-4.0	A-6(4)	30	11	8.7	39.6	31.4	20.3	100	98	61	-	-
S-44	58' LT	36+00	0.0-3.0	A-7-6(50)	76	55	4.1	17.7	19.1	59.1	100	98	84	-	-
S-45	58' LT	36+00	3.0-5.5	A-6(7)	34	16	10.2	39.8	25.6	24.5	98	92	59	-	-

LEGEND

A: ROADWAY EMBANKMENT, RED-BROWN, STIFF, MODERATELY PLASTIC, MOIST, SANDY CLAY
B: RESIDUAL, RED-BROWN, MEDIUM STIFF TO HARD, HIGHLY PLASTIC, MOIST, SILTY CLAY
C: RESIDUAL, GREEN, BROWN, AND GRAY, MEDIUM STIFF TO HARD, SLIGHTLY TO MODERATELY PLASTIC, MOIST, SANDY CLAY
D: WEATHERED ROCK (MUDSTONE AND SANDSTONE)



10-DEC-2003 08:03
R:\projects\R-2904\cadd_geotech\Xsections\L_xpl_Geo.dgn
Bentley Systems, Inc.

8/23/99

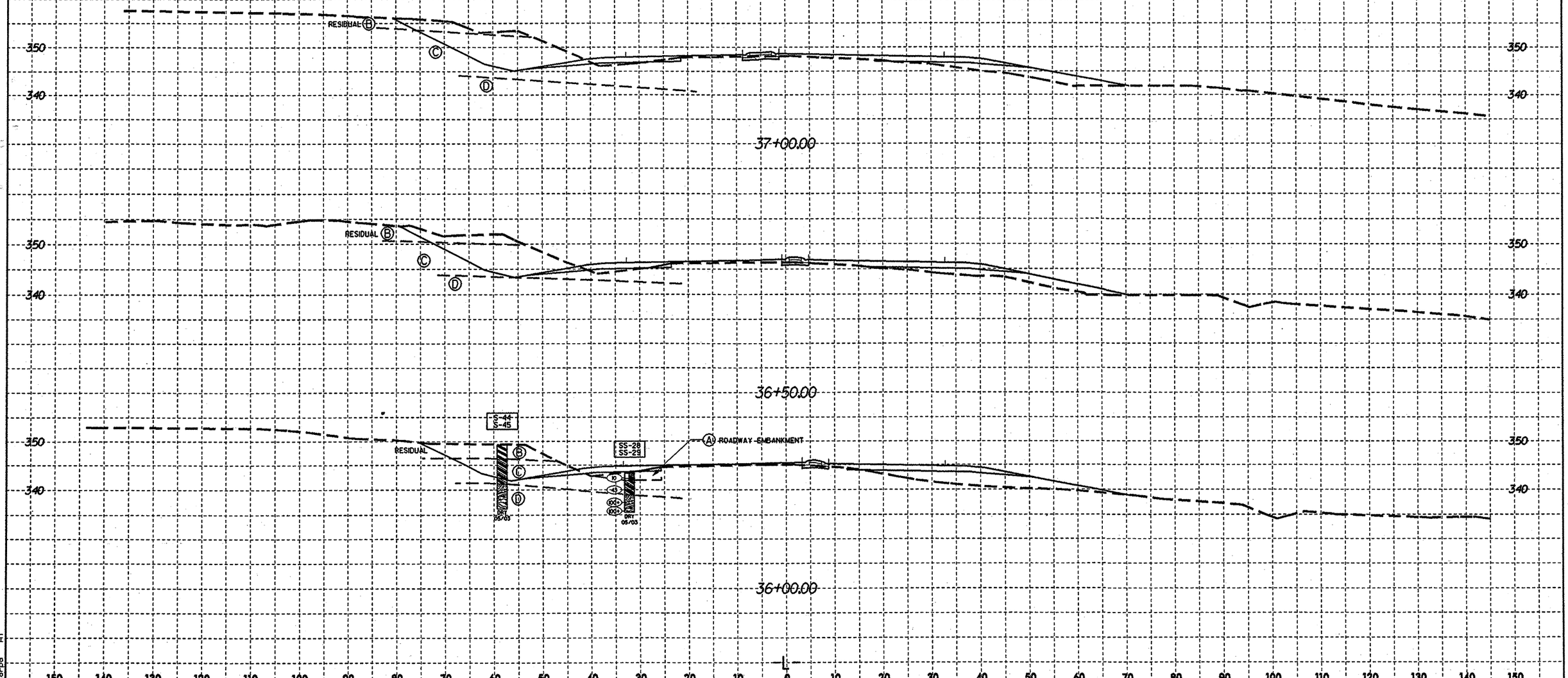
PROJ. REFERENCE NO.	SHEET NO.
R-2904	15

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-28	32' LT	36+00	0.8-1.5	A-6(14)	38	17	2.8	27.2	37.5	32.5	100	99	82	-	-
SS-29	32' LT	36+00	3.2-4.0	A-6(4)	30	11	8.7	39.6	31.4	20.3	100	98	61	-	-
S-44	58' LT	36+00	0.0-3.0	A-7-6(50)	76	55	4.1	17.7	19.1	59.1	100	98	84	-	-
S-45	58' LT	36+00	3.0-5.5	A-6(7)	34	16	10.2	39.8	25.6	24.5	98	92	59	-	-

LEGEND:

A: ROADWAY EMBANKMENT, RED-BROWN, STIFF, MODERATELY PLASTIC, MOIST, SANDY CLAY
B: RESIDUAL, RED-BROWN, MEDIUM STIFF TO HARD, HIGHLY PLASTIC, MOIST, SILTY CLAY
C: RESIDUAL, GREEN, BROWN, AND GRAY, MEDIUM STIFF TO HARD, SLIGHTLY TO MODERATELY PLASTIC, MOIST, SANDY CLAY
D: WEATHERED ROCK (MUDSTONE AND SANDSTONE)



10-DEC-2003 08:03
R:\PROJECTS\R-2904\oadd_geotech\Xsections\L_xpl_Geo.dgn
akarpa

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
R-2904	16

0 10

SOIL TEST RESULTS

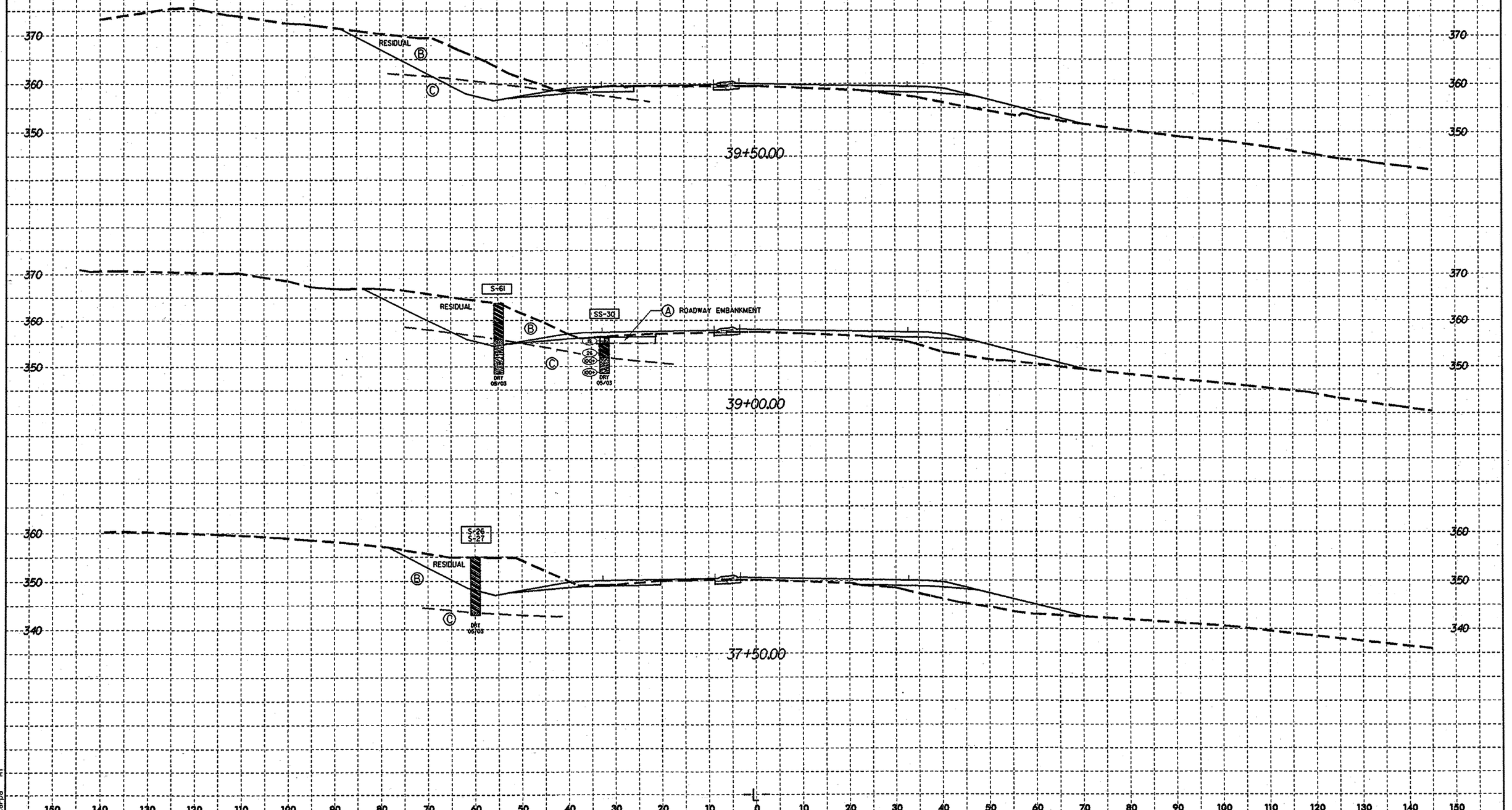
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-26	60' LT	37+50	2.5-3.0	A-6(14)	37	20	5.3	27.4	30.8	36.5	100	98	76	-	-
S-27	60' LT	37+50	10.0-10.5	A-6(15)	37	21	3.2	26.2	29.9	40.6	100	99	77	-	-
SS-30	32' LT	39+00	0.8-1.5	A-4(4)	27	10	10.8	28.6	32.2	28.4	100	95	67	-	-
S-61	55' LT	39+00	0.0-3.0	A-7-6(21)	43	25	4.0	18.7	39.2	38.2	100	98	85	-	-

LEGEND

A: ROADWAY EMBANKMENT, RED-BROWN, VERY STIFF, MOIST, SANDY SILT

B: RESIDUAL, ORANGE, BROWN, AND ORANGE-BROWN, MEDIUM STIFF TO HARD, MODERATELY PLASTIC, MOIST, SILTY AND SANDY CLAY

C: WEATHERED ROCK (SANDSTONE AND MUDSTONE)



10-DEC-2003 08:04
R:\PROJECTS\r2904\cadd_geotech\Xsections\L_xpl_Geo.dgn
akarpa
A1

8/23/99

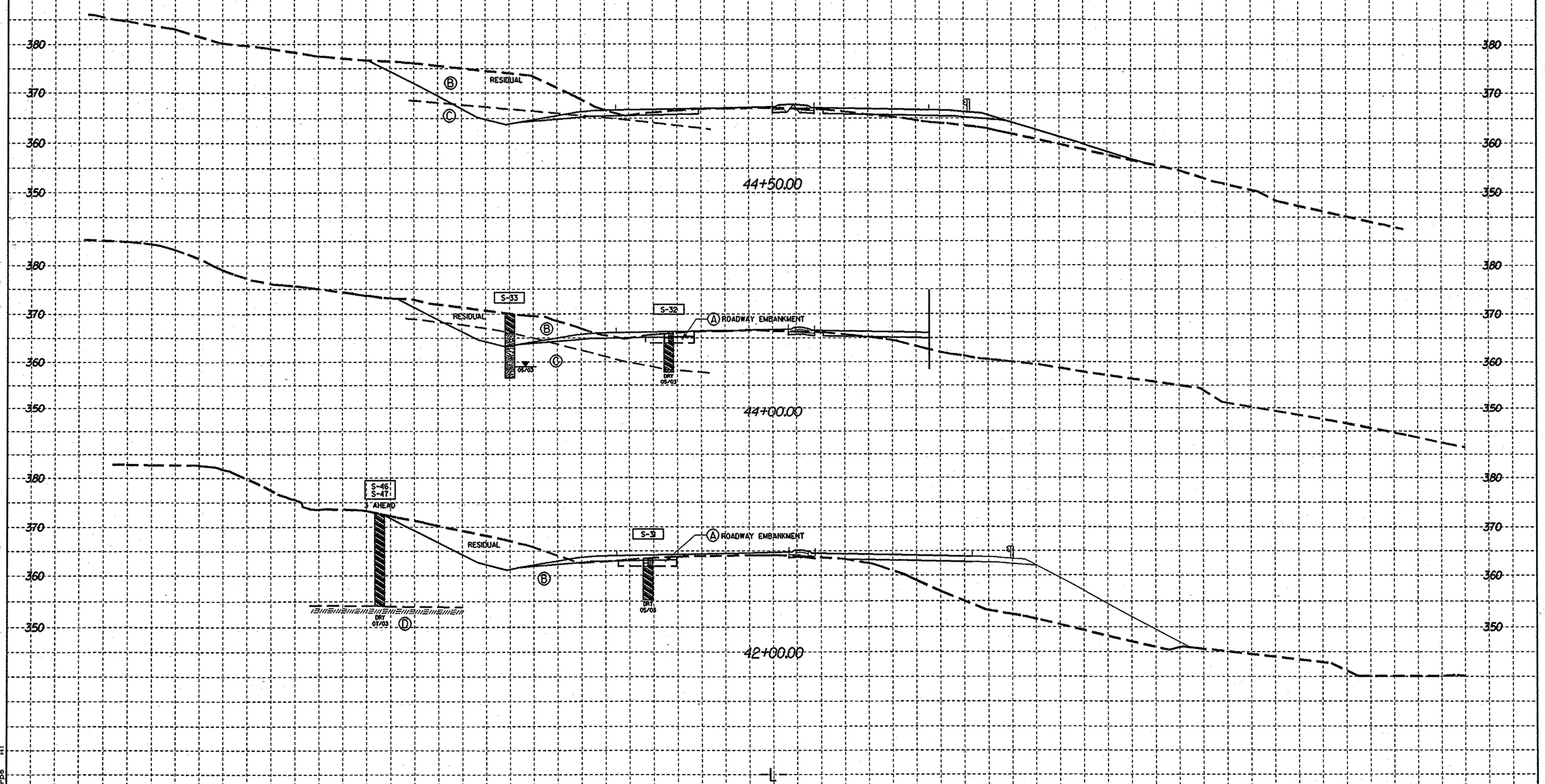
0 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2904	17

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-46	82' LT	42+03	2.5-6.0	A-6(5)	30	11	9.6	29.4	26.3	34.7	100	96	68	-	-
S-47	82' LT	42+03	8.0-12.0	A-6(7)	31	13	9.8	28.4	31.2	30.6	100	95	70	-	-
S-31	26' LT	42+00	7.5-8.0	A-6(8)	34	17	16.2	27.6	25.7	30.5	100	93	61	-	-
S-32	22' LT	44+00	1.5-2.0	A-6(11)	37	19	10.4	28.8	30.4	30.5	100	95	70	-	-
S-33	55' LT	44+00	2.5-3.0	A-6(7)	28	11	7.7	23.1	34.6	34.5	100	96	77	-	-

LEGEND

A: ROADWAY EMBANKMENT, RED-BROWN, STIFF TO VERY STIFF, MOIST, SANDY SILT AND MODERATELY PLASTIC, SANDY CLAY
B: RESIDUAL, RED-BROWN, BROWN, AND ORANGE-BROWN, SOFT TO HARD, SLIGHTLY TO MODERATELY PLASTIC, MOIST, SANDY CLAY
C: WEATHERED ROCK (MUDSTONE, SANDSTONE, AND CONGLOMERATE)
D: NON-CRYSTALLINE ROCK (MUDSTONE)

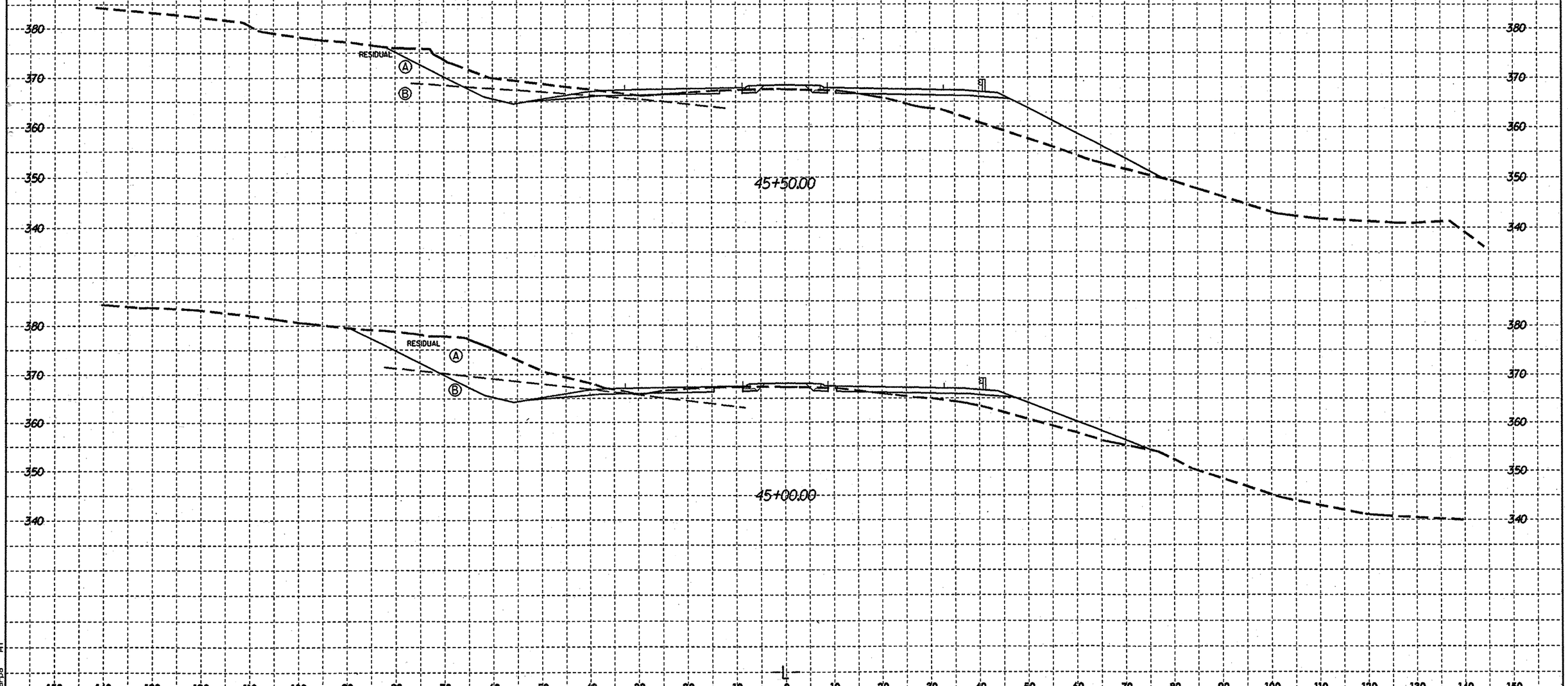


10-DEC-2003 08:04
R-2904 Q:\2904\cadd_geotech\Xsections\L_xp1.Geo.dgn
akemp

LEGEND

A: RESIDUAL, RED-BROWN, ORANGE-RED, AND ORANGE-BROWN, SOFT TO HARD, SLIGHTLY TO MODERATELY PLASTIC, MOIST, SANDY CLAY

B: WEATHERED ROCK (MUDSTONE, SANDSTONE, AND CONGLOMERATE)



8/23/99
10-DEC-2003 08:04
S:\PROJECTS\R-2904\cadd_geotech\Xsections\L_xp1_Geo.dgn
skarpa A1

8/23/99

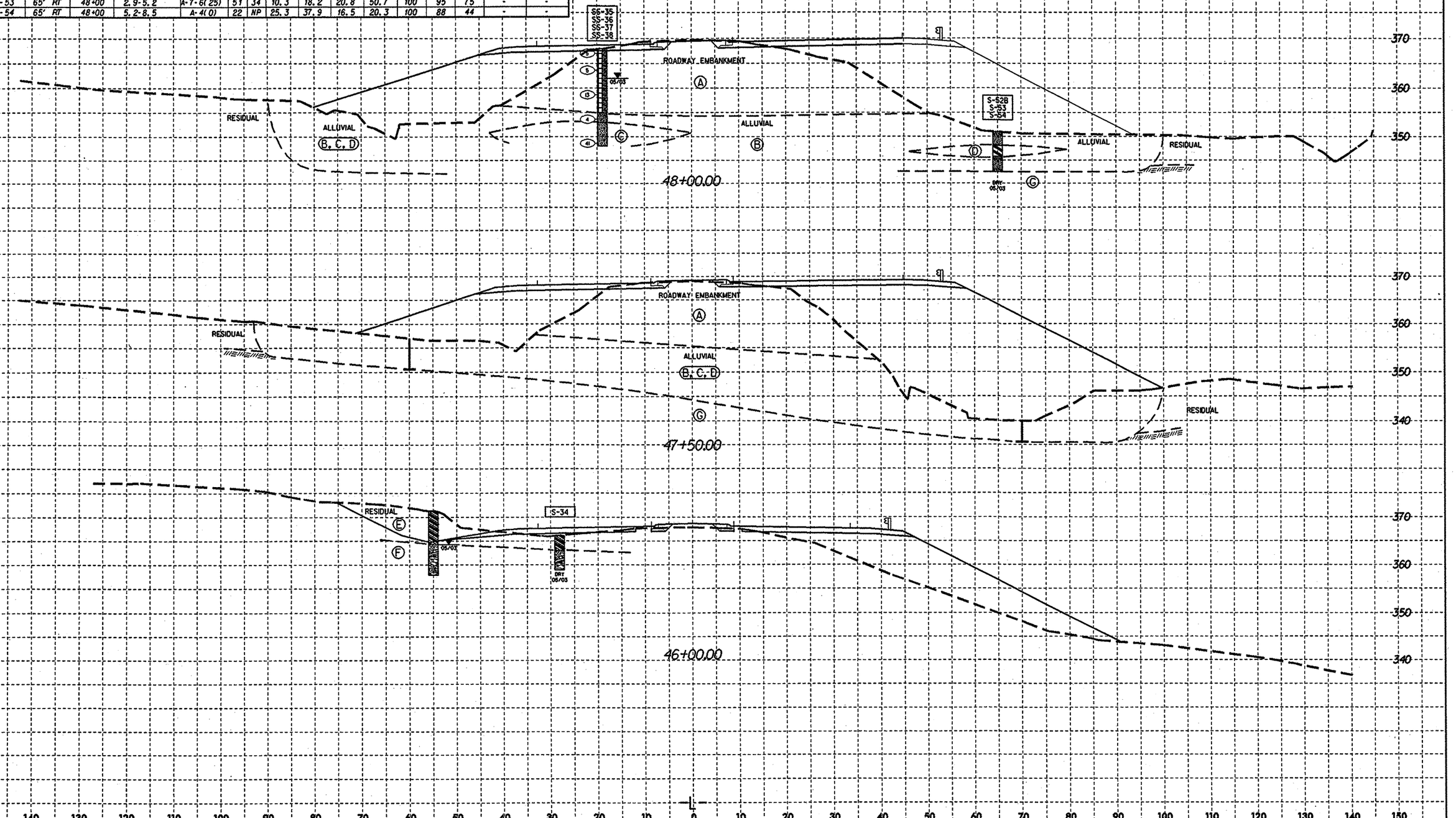
0 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2904	19

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-34	28' LT	46+00	1.8-2.2	A-6(11)	39	19	13.8	24.2	27.5	34.5	98	91	67	17	-
SS-35	19' LT	48+00	0.0-1.5	A-4(0)	27	8	27.6	30.5	21.6	20.3	84	70	41	-	-
SS-36	19' LT	48+00	8.4-9.9	A-4(5)	29	9	11.8	23.4	36.4	28.4	99	93	71	-	-
SS-37	19' LT	48+00	13.4-14.5	A-4(0)	19	4	17.7	37.8	24.3	20.3	100	91	53	-	-
SS-38	19' LT	48+00	18.4-19.9	A-2-4(0)	15	NP	53.2	27.4	9.2	10.2	100	71	23	-	-
S-52B	65' RT	48+00	0.0-2.9	A-4(0)	25	4	17.0	34.7	22.0	26.3	100	92	55	-	-
S-53	65' RT	48+00	2.9-5.2	A-7-6(25)	51	34	10.3	18.2	20.8	50.7	100	95	75	-	-
S-54	65' RT	48+00	5.2-8.5	A-4(0)	22	NP	25.3	37.9	16.5	20.3	100	88	44	-	-

LEGEND

A: ROADWAY EMBANKMENT, ORANGE-BROWN AND BROWN, MEDIUM STIFF TO STIFF, MOIST TO WET, SANDY SILT
B: ALLUVIAL, YELLOW AND GRAY, SOFT TO HARD, MOIST TO WET, SANDY SILT
C: ALLUVIAL, ORANGE, DENSE , MOIST TO WET, SILTY SAND
D: ALLUVIAL, GRAY, MEDIUM STIFF TO HARD, HIGHLY PLASTIC, MOIST TO WET, SILTY CLAY
E: RESIDUAL, ORANGE-BROWN, MEDIUM STIFF TO STIFF, SLIGHTLY TO MODERATELY PLASTIC, MOIST, SANDY CLAY
F: WEATHERED ROCK (MUDSTONE, SANDSTONE, AND CONGLOMERATE)
G: NON-CRYSTALLINE ROCK (MUDSTONE, SANDSTONE, AND CONGLOMERATE)



10-DEC-2003 08:04
R:\PROJECTS\R-2904\cadd_geotech\Xsections\L_xpl_Geo.dgn
dlr.corpo

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
R-2904	20

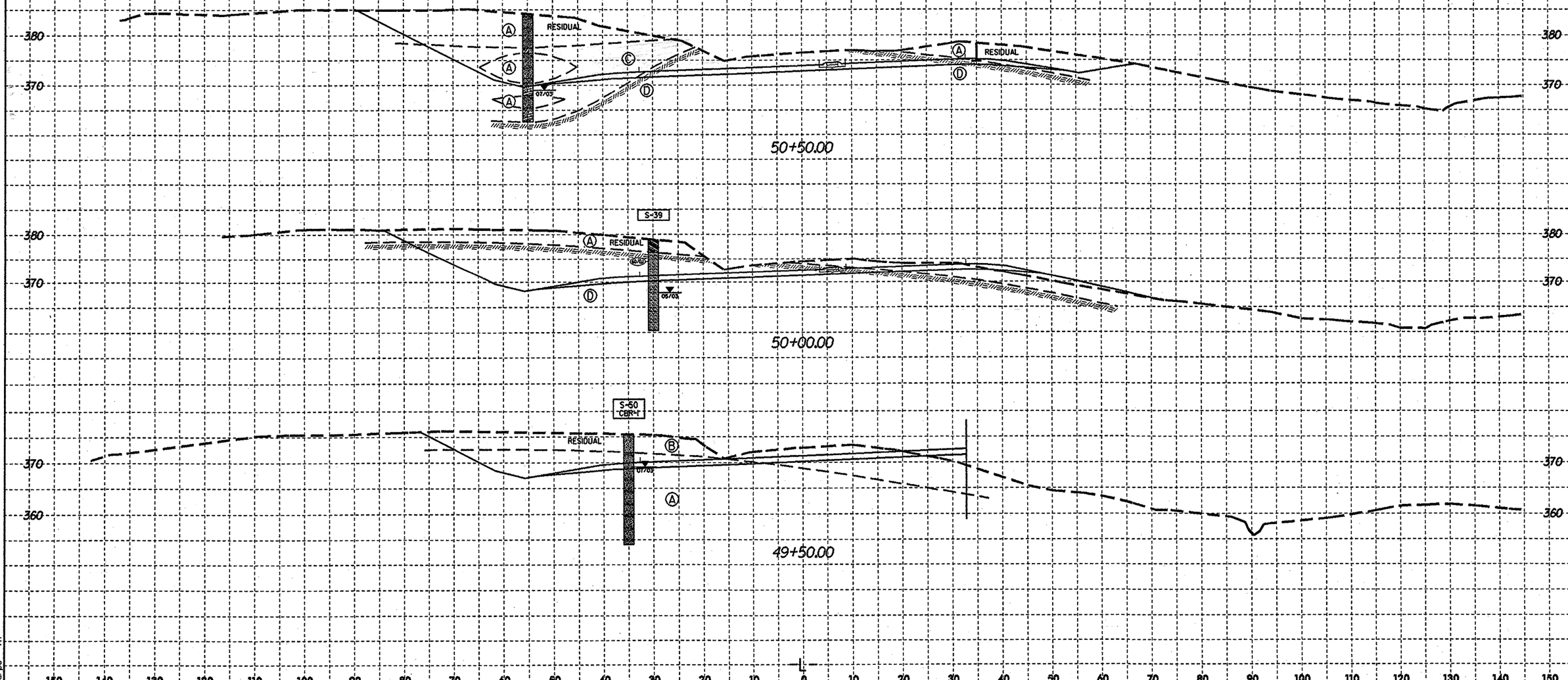
0 10

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-39	30' LT	50+00	2.0-2.5	A-6(7)	31	13	10.2	27.8	29.5	32.5	100	95	69	-	-
CBR-1	35' LT	49+50	8.0-12.0	A-4(0)	20	NP	22.4	36.9	26.6	14.1	98	90	46	-	-
S-50	35' LT	49+50	7.0-11.0	A-4(0)	22	5	21.6	34.9	25.1	18.4	100	91	51	-	-

LEGEND

A: RESIDUAL, ORANGE-BROWN, RED-BROWN, AND BROWN, MEDIUM STIFF TO HARD, MOIST TO WET, SANDY SILT AND SLIGHTLY PLASTIC, SANDY CLAY
B: RESIDUAL, BROWN, LOOSE, MOIST, SILTY SAND
C: WEATHERED ROCK (SANDSTONE AND MUDSTONE)
D: NON-CRYSTALLINE ROCK (SANDSTONE AND MUDSTONE)



10-DEC-2003 08:05
R:\PROJECTS\r2904\caddd_geotech\Xsections\L_xp1_Geo.dgn
dkarpa

8/23/99

0 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2904	21

SOIL TEST RESULTS

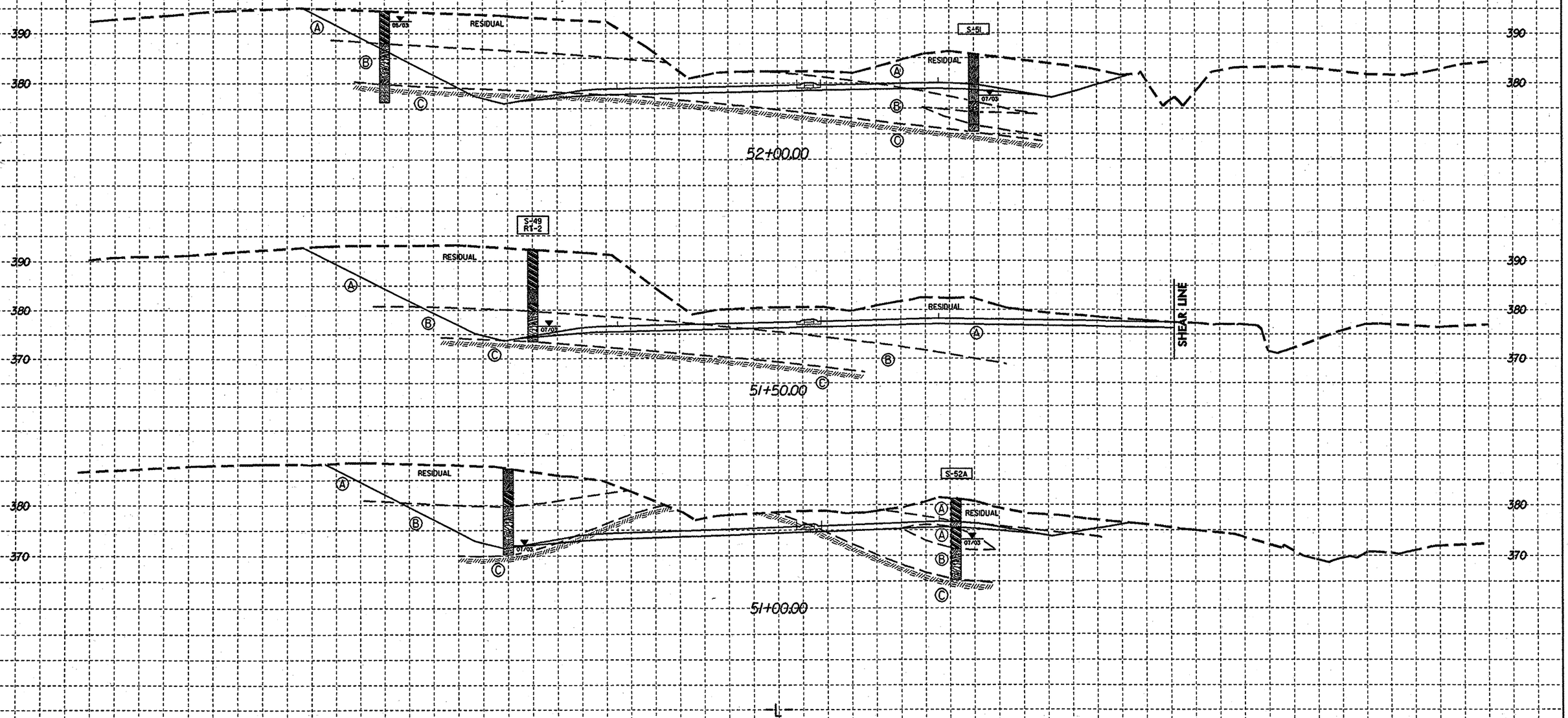
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-49	50' LT	51+50	4.0-8.0	A-6(6)	30	12	11.6	25.7	40.2	22.4	100	95	70	-	-
S-51	40' RT	52+00	11.5-14.0	A-4(0)	22	NP	15.6	35.5	32.7	16.2	99	91	58	-	-
RT-2	50' LT	51+50	4.0-8.0	A-6(5)	30	11	14.8	24.1	40.8	20.3	100	94	68	-	-
S-52A	36' RT	51+00	0.5-4.4	A-6(5)	28	12	14.8	27.0	27.9	30.4	100	95	65	-	-

LEGEND

A: RESIDUAL, BROWN, RED-BROWN, RED-PURPLE, AND RED-ORANGE, SOFT TO HARD, DRY TO WET, SANDY SILT AND SLIGHTLY PLASTIC, SANDY CLAY

B: WEATHERED ROCK (SANDSTONE, SILTSTONE, AND MUDSTONE)

C: NON-CRYSTALLINE ROCK (SANDSTONE, SILTSTONE, AND MUDSTONE)



10-DEC-2003 08:06
N:\PROJECTS\r2904\cadd_geotech\Xsections\L_xpl_Geo.dgn
jlcampo

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
R-2904	22

SOIL TEST RESULTS

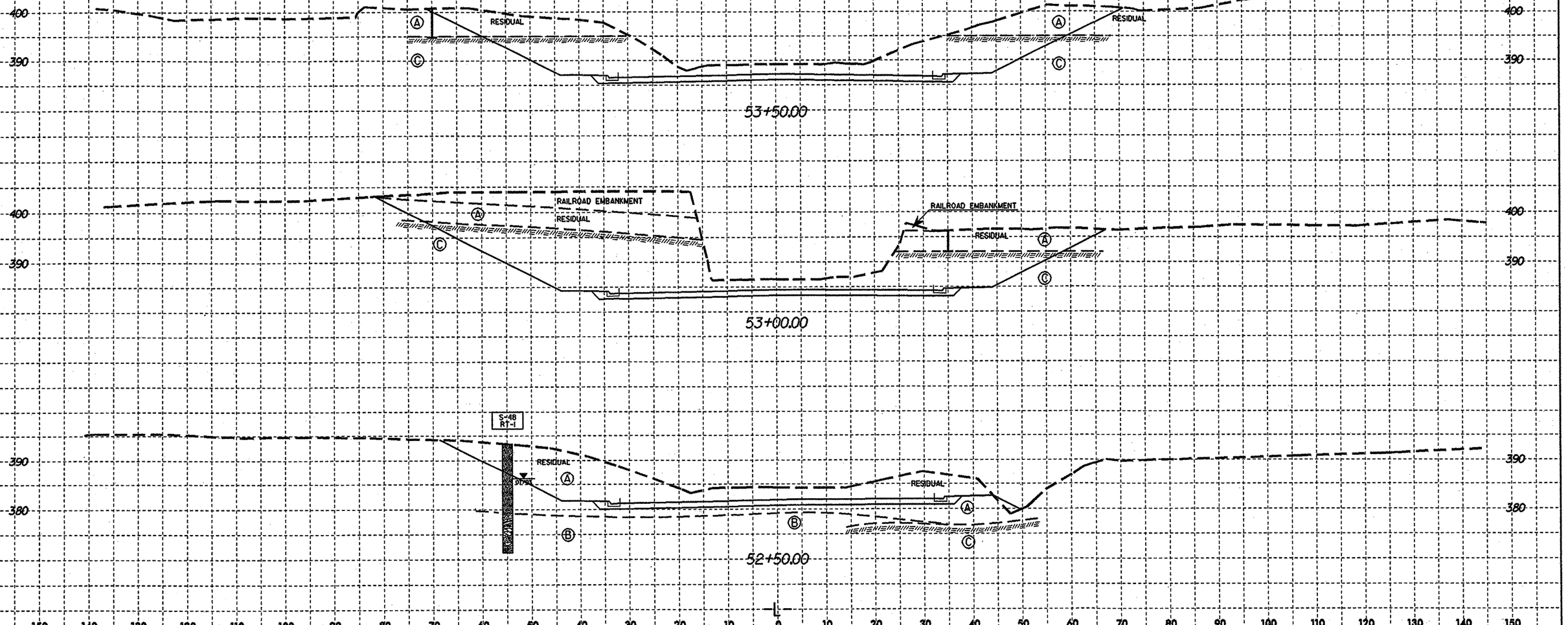
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-48	55' LT	52+50	1.0-4.0	A-4(0)	22	NP	7.1	52.7	25.9	14.3	100	99	51	-	-
RT-1	55' LT	52+50	1.0-6.0	A-4(1)	27	5	7.7	38.5	35.6	18.2	100	98	63	-	-

LEGEND

A: RESIDUAL, BROWN, ORANGE, YELLOW-BROWN, AND RED-BROWN, SOFT TO HARD, MOIST TO WET, SANDY SILT AND SLIGHTLY TO MODERATELY PLASTIC, SANDY CLAY

B: WEATHERED ROCK (MUDSTONE, SILTSTONE, AND SANDSTONE)

C: NON-CRYSTALLINE ROCK (MUDSTONE, SILTSTONE, AND SANDSTONE)



10-DEC-2003 08:06
R:\PROJECTS\R-2904\add_geotech\Xsections\L_xpl_Geo.dgn
akarpa
AT

8/23/99

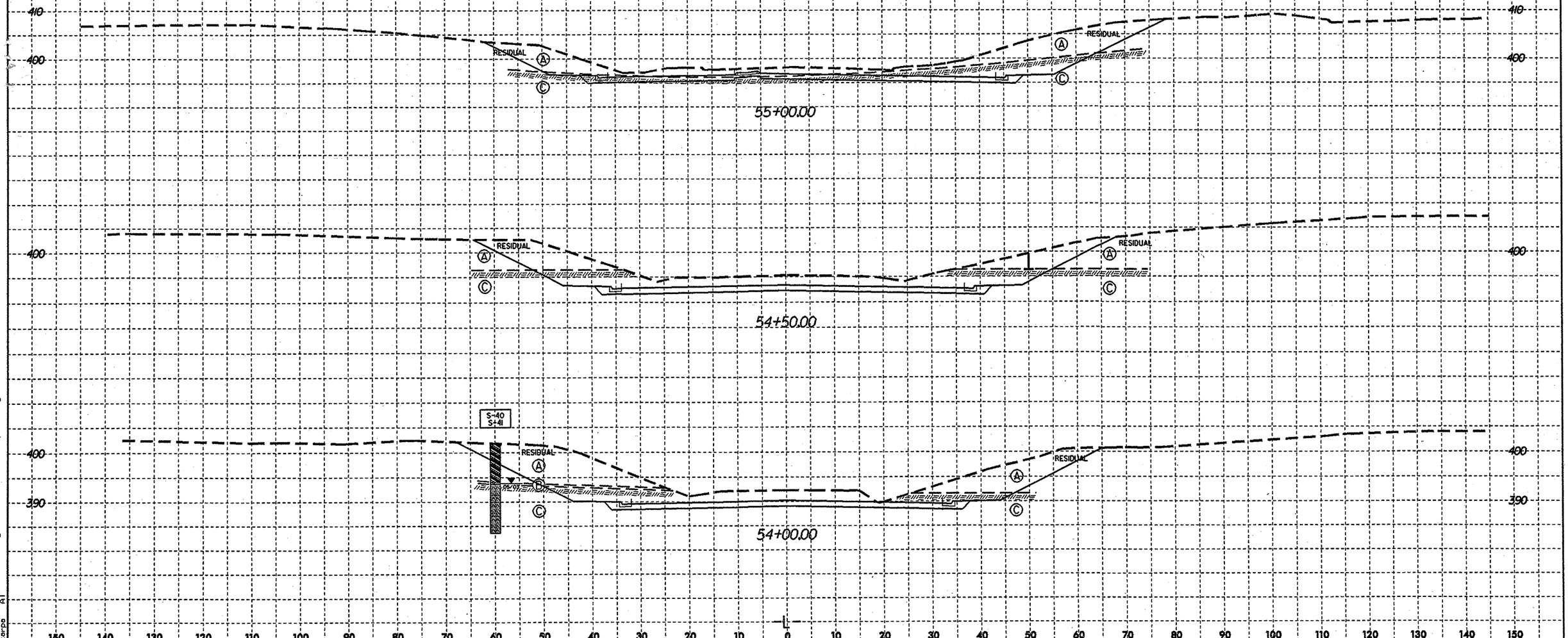
PROJ. REFERENCE NO.	SHEET NO.
R-2904	23

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-40	60' LT	54+00	2.0-2.5	A-6(10)	39	20	15.8	28.8	20.8	34.5	99	90	62	-	-
S-41	60' LT	54+00	5.0-5.5	A-6(7)	32	15	12.2	31.7	25.7	30.5	100	94	62	-	-

LEGEND

A: RESIDUAL, ORANGE, GRAY, YELLOW-BROWN, AND RED-BROWN, SOFT TO HARD, SLIGHTLY TO MODERATELY PLASTIC, MOIST, SANDY CLAY AND SILTY CLAY
B: WEATHERED ROCK (MUDSTONE)
C: NON-CRYSTALLINE ROCK (SANDSTONE AND MUDSTONE)



10-DEC-2003 08:07
R:\PROJECTS\r2904\vedd_geotech\Xsections\L_xpl_Geo.dgn
akarpo

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
R-2904	24

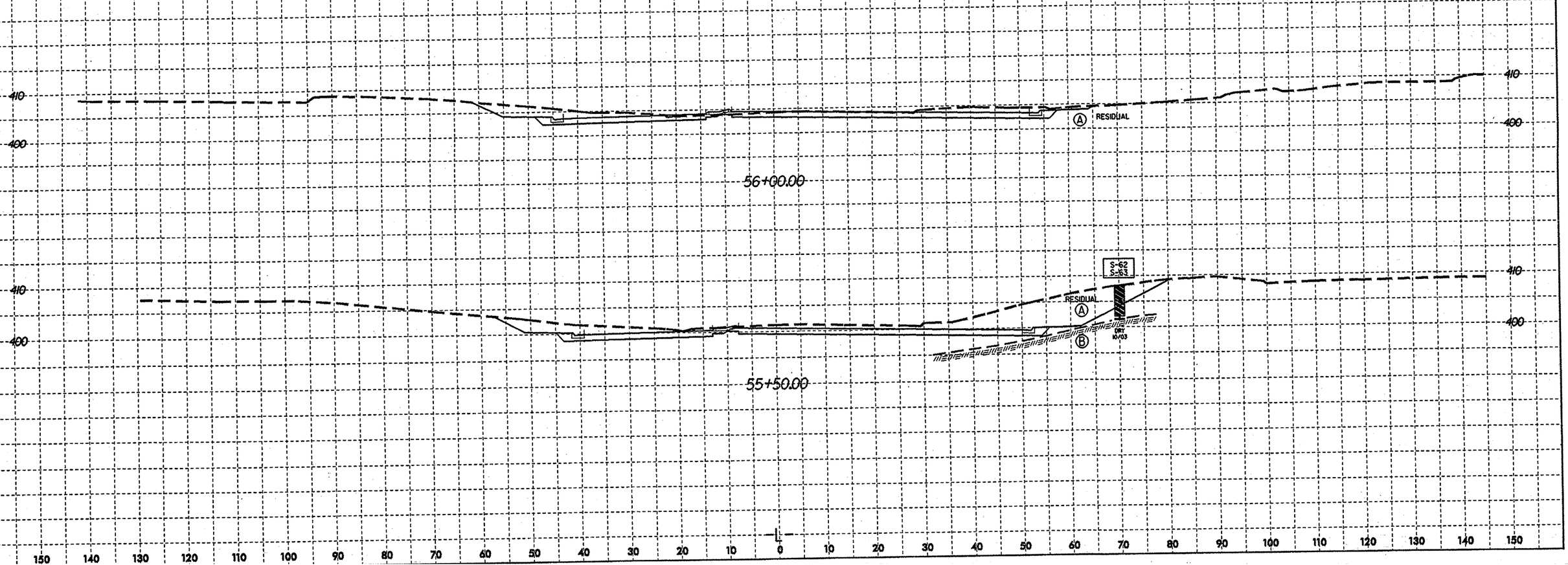
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-62	70' RT	55+50	0.0-3.0	A-6(8)	35	19	19.3	24.3	30.3	26.1	92	81	57	-	-
S-63	70' RT	55+50	3.0-6.0	A-7-6(16)	43	23	6.2	27.7	33.9	32.1	99	96	75	-	-

LEGEND:

A: RESIDUAL, RED-BROWN AND GRAY, SOFT TO MEDIUM STIFF, MODERATELY PLASTIC, MOIST, SANDY CLAY AND SILTY CLAY

B: NON-CRYSTALLINE ROCK (MUDSTONE AND SANDSTONE)



DEC-2003 08:07
P:\PROJECTS\R-2904\cadd_geotech\Xsections\L_xp1_Geo.dgn
karpa