STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-6003	1	98

REFERENCE: U-6003

PROJECT: 47138

SEE SHEET 3 FOR PLAN SHEET LAYOUT AT TIME OF INVESTIGATION

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LINE	STATION	PLAN	PROFILE
-L-	11+69.67 - 62+49.70	4-8	9-12
-Y15-	12+10.00 - 21+50.00	4	13
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-DR1-	10+60.00 - 11+27.63	5	15
-DR2-	10+20.00 - 11+21.02	5	16

CROSS SECTIONS

LINE	STATION	SHEETS
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-Y15-	12+10 - 21+50	67-76
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LABORATORY TESTING

TITLE	SHEETS
AASHTO CLASSIFICATION RESULTS	83-91
CBR RESULTS	92-94

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

ROADWAY SUBSURFACE INVESTIGATION

COUNTY *FORSYTH*

PROJECT DESCRIPTION *KERNERSVILLE LOOP FROM SR 1969 (PINEY GROVE ROAD) TO NC 150 (NORTH MAIN STREET)*

INVENTORY

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT 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 THE 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.

NOTES:
1. THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT.
2. 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.

PERSONNEL

B. SMITH, PG

B. WORLEY, PG

M. SHIPMAN, EI

A. GROSS, GIT

M.B. MOSELEY

C. BOWEN

INVESTIGATED BY *B. SMITH, PG*

DRAWN BY *B. SMITH, PG*

CHECKED BY *B. WORLEY, PG*

SUBMITTED BY *B. SMITH, PG*

DATE *NOVEMBER, 2018*

Prepared in the Office of:

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12/4/2018

SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
U-6003	2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR 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
MATERIAL PASSING #40 LL PI	— 6 MX		— NP	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 SUBGRADE	EXCELLENT TO GOOD							FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE

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

CONSISTENCY OR DENSENESS

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

TEXTURE OR GRAIN SIZE

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

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

GRAIN SIZE	MM	305	75	2.0	0.25	0.05	0.005
	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 SL — SHRINKAGE LIMIT	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
NON PLASTIC	0-5	VERY LOW
SLIGHTLY PLASTIC	6-15	SLIGHT
MODERATELY PLASTIC	16-25	MEDIUM
HIGHLY PLASTIC	26 OR MORE	HIGH

COLOR

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

GRADATION

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

ANGULARITY OF GRAINS

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

MINERALOGICAL COMPOSITION

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

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LL < 31
MODERATELY COMPRESSIBLE	LL = 31 - 50
HIGHLY COMPRESSIBLE	LL > 50

PERCENTAGE OF MATERIAL

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

GROUND WATER

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

MISCELLANEOUS SYMBOLS

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

RECOMMENDATION SYMBOLS

- UNDERCUT
- SHALLOW UNDERCUT
- UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE
- UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK
- UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL

ABBREVIATIONS

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

SAMPLE ABBREVIATIONS

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

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [X] DIEDRICH D-50
- [ ] CME-55
- [ ] CME-550
- [ ] VANE SHEAR TEST
- [ ] PORTABLE HOIST
- [ ] _____
- [ ] _____

ADVANCING TOOLS:
- [ ] CLAY BITS
- [ ] 6" CONTINUOUS FLIGHT AUGER
- [X] 2.25" HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [ ] TUNG.-CARBIDE INSERTS
- [ ] CASING [ ] W/ ADVANCER
- [ ] TRICONE _____" STEEL TEETH
- [ ] TRICONE _____" TUNG.-CARB.
- [ ] CORE BIT
- [ ] _____

HAMMER TYPE:
- [X] AUTOMATIC [ ] MANUAL

CORE SIZE:
- [ ] -B _____ [ ] -H _____
- [ ] -N _____

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

ROCK DESCRIPTION

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

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

WEATHERING

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

ROCK HARDNESS

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

FRACTURE SPACING

TERM	SPACING
VERY WIDE	MORE THAN 10 FEET
WIDE	3 TO 10 FEET
MODERATELY CLOSE	1 TO 3 FEET
CLOSE	0.16 TO 1 FOOT
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 MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.

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

TERMS AND DEFINITIONS

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

AQUIFER - A WATER BEARING FORMATION OR STRATA.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

BENCH MARK:

ELEVATION: FEET

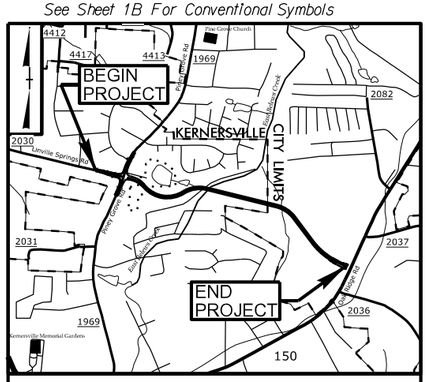
NOTES:

ELEVATIONS OBTAINED FROM U6003.tin (file dated 7/31/2018)

FIAD = FILLED IMMEDIATELY AFTER DRILLING

DATE: 8-15-14

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



VICINITY MAP

25% PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

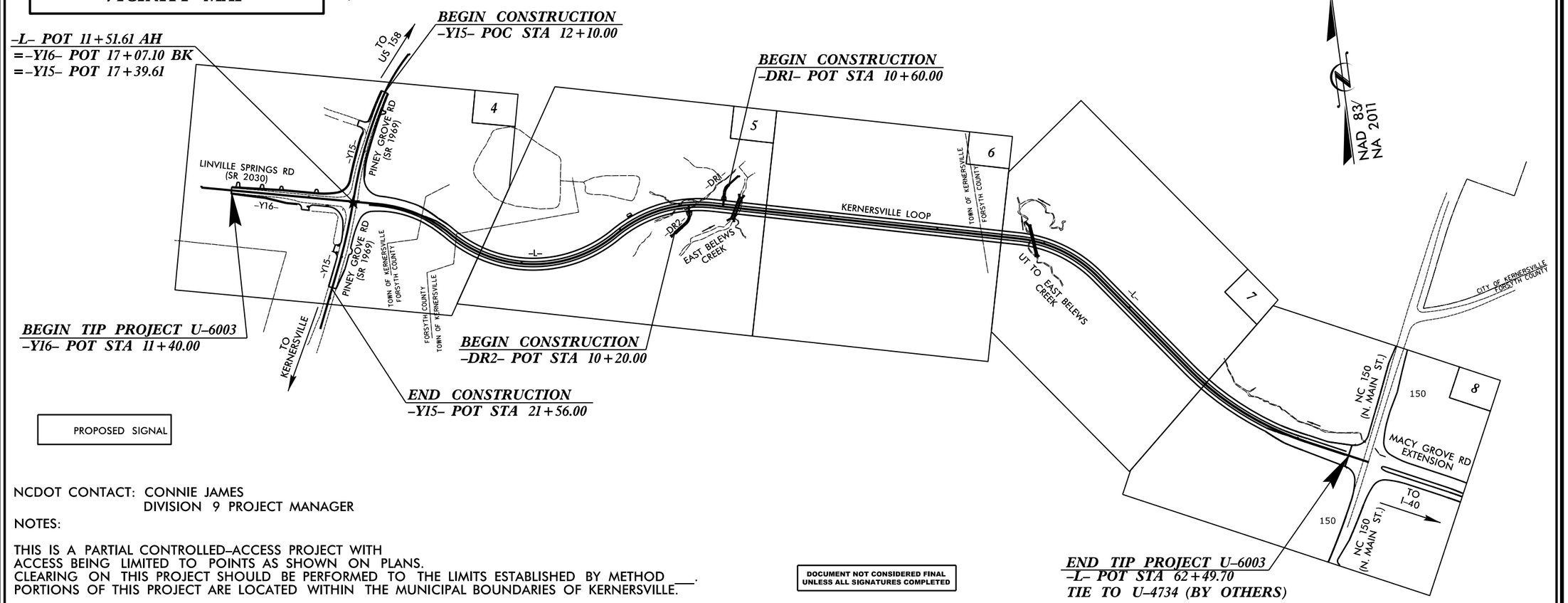
FORSYTH COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-6003	3	98

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
47138.1.1		PE

LOCATION: *KERNERSVILLE – KERNERSVILLE LOOP*
FROM SR 1969 (PINEY GROVE RD) TO NC 150
(N. MAIN ST.)

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



PROPOSED SIGNAL

NCDOT CONTACT: CONNIE JAMES
DIVISION 9 PROJECT MANAGER

NOTES:

THIS IS A PARTIAL CONTROLLED–ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON PLANS.
CLEARING ON THIS PROJECT SHOULD BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD ___.
PORTIONS OF THIS PROJECT ARE LOCATED WITHIN THE MUNICIPAL BOUNDARIES OF KERNERSVILLE.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TIP PROJECT: U–6003

CONTRACT:

$DATE$
$FILE$
$$$$USERNAME$$$$

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 (2019) = 5,400
ADT (2039) = 10,100
K = 10 %
D = 55 %
T = 3 % *
V = 40 MPH
* TTST = 1% DUAL 2%
FUNC CLASS = ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U–6003 = 1.073 MILES

TOTAL LENGTH TIP PROJECT U–6003 = 1.073 MILES

Prepared In the Office of:
HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: AUGUST 28, 2018

LETTING DATE: AUGUST 28, 2019

DENA C. SNEAD, PE
PROJECT ENGINEER

ALEXANDER D. SNIDER, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

STATE OF NORTH CAROLINA

SUMMIT
DESIGN AND ENGINEERING SERVICES
919.732.3883 SUMMIT-ENGINEER.COM
504 Meadowland Drive, Hillsborough, NC 27278

October 24, 2018

WBS Number: 47138.1.1
TIP Number: U-6003
County: Forsyth
Description: Kernersville Loop from SR 1969 (Piney Grove Road) to NC 150 (North Main Street)

SUBJECT: Geotechnical Report - Roadway Subsurface Inventory

Project Description

The proposed 1.073-mile project is located both within and just outside of the city limits of Kernersville. The bulk of the project consists of 0.965 miles of new roadway alignment associated with the future "Kernersville Loop." The project also involves work along Piney Grove Road (SR 1969) and Linville Springs Road (SR 2030) designed to improve traffic flow in association with the new roadway. Lastly, some minor work is proposed that is designed to maintain access to a small gravel road (Whispering Brook Road) intersecting the new roadway alignment. The proposed earthworks are significant in some areas of the project corridor. There are several proposed cut sections along the new roadway alignment with one large cut section surpassing 30 feet in depth. Roadway embankment heights vary greatly within the project corridor but in some areas are proposed as high as 20 feet. No structures are proposed on this project at the time of this report.

The geotechnical investigation was conducted from August 14, 2018 to September 19, 2018. Borings were advanced using a Diedrich D-50 drill machine equipped with an automatic hammer. Standard Penetration Tests (SPT) were performed at all planned boring locations to provide subsurface information for roadbed and slope design/construction. Rock soundings were performed in areas where Crystalline Rock was encountered above or within 6 feet of proposed grade. Representative soil samples were collected and submitted to Summit's soils laboratory for classification and moisture content testing. Bulk samples were submitted to Geotechnics, Inc. for California Bearing Ratio (CBR) testing. Borings were left open for a minimum of 24 hours to collect groundwater data if they intercepted wet or saturated soils. They were also left open if they were deeper or drilled in less trafficked areas. Some borings in higher trafficked areas and/or containing only dry to moist soils were filled in immediately after drilling (FIAD). In these cases, if it was deemed that the borings did not come close to intercepting groundwater, the borings were indicated as "DRY" and not "FIAD" in the following report. All investigations and reporting were performed in accordance with the NCDOT Geotechnical Engineering Unit's 2016 "Geotechnical Investigation and Recommendations Manual."

The following alignments were investigated for this project:

Alignment	Station(±)
-L-	11+69.67 - 62+49.70
-Y15-	12+10.00 – 21+50.00
-Y16-	11+40.00 – 16+77.00
-DR1-	10+60.00 – 11+27.63
-DR2-	10+20.00 – 11+21.02

Physiography, Geography, and Geology

The project corridor is located in north-central North Carolina in the Piedmont Physiographic Province. Topography in the region is characterized by gently rolling, well rounded hills and long low ridges with a few hundred feet of elevation difference between the hills and valleys. In general, the topography within the project corridor would fit this description. Elevations along the project range from approximately 916 feet to approximately 1,003 feet above sea level. The topographic high occurs near the intersection of Piney Grove Road (-Y15), and Linville Springs Road (-Y16-). The topographic low occurs within the floodplain of East Belews Creek.

The project corridor intersects East Belews Creek near its headwaters. The creek generally flows towards the northeast eventually emptying into the Dan River, and is a part of the Roanoke River Basin. Several unnamed tributaries associated with East Belews Creek are also present within the project corridor. In addition, two retention ponds are located north of the project corridor but are well outside of the proposed right of way.

Geologically, the project corridor is sandwiched in between the Milton and Carolina Terrane in an area of Late Paleozoic intrusions known as the Churchland Plutonic Suite. These rocks intruded the surrounding older rocks as giant blobs of molten rock (magma) during the formation of the Appalachian Mountain chain (approximately 280 to 320 million years ago). The intrusive rocks are mainly composed of the igneous rock Granite and Granodiorite. During the investigation, the project corridor was found to be underlain by Granite that has intruded into Biotite Gneiss and Schist.

Soil Properties

Residual soils, soils derived from the weathering of rock, are the dominant soil origin within the project corridor. In general, the Residual soils underlying the project follow the typical weathering profile observed throughout the piedmont. The clays, when present, are usually found closer to the ground surface. The silts and sands are typically found deeper and closer to the parent rock source. However, much like the parent rocks that they weather from, the Residual soils can vary significantly in some areas in both composition and vertical/horizontal distribution. The compositional boundaries (also known as contacts) within the Residual soils are shown in the graphical section of this report as dashed lines. However, in reality, the contacts are much more likely gradational in nature. Meaning that the

compositional changes between clay, silt, and sand occur gradually and over some vertical/horizontal distance.

Residual silty and sandy clays (A-7-5, A-7-6, and A-6) are prevalent throughout the project corridor and are typically present within 6 feet of the ground surface. They are generally not saprolitic and contain less visible mica than the silts and sands. Laboratory testing of the Residual clays revealed a range of liquid limits from 38 to 97 with an average of 63. Plasticity Index (PI) values varied from 11 to 57 with an average of 27. Moisture content ranged from 12.1% to 37.9% with an average of 24.7%. The majority of the samples tested were AASHTO classified as A-7-5. Several samples were classified as A-7-6 and a few were classified as A-6. SPT results in Residual clay strata showed soil densities typically range from medium stiff to stiff with some soft and very stiff areas. Softer areas typically corresponded with areas of higher moisture content. Many areas within the project corridor contain highly plastic clays (PI value greater than 26). Sieve analysis showed that the clays often have an increasing sand content with depth which also corresponds to PI values decreasing with depth. Almost all of the highly plastic clays encountered and tested were positioned from 0 – 3 feet within the subsurface. Areas containing highly plastic clays will be highlighted in the “Areas of Special Geotechnical Interest” section of this text report.

Residual clayey and sandy silts (A-5 and A-4) are common throughout the project corridor and typically underlie the clays. These soils can be saprolitic and are usually micaceous. They can also contain trace to little amounts of gravel-sized crystalline rock fragments. Laboratory analysis of the Residual silts indicated a range of liquid limits from 31 to 64 with an average of 52. PI values varied from 0 to 10 with an average of 5. Moisture content ranged from 14.2% to 41.7% with an average of 25.7%. All but one of the samples tested were AASHTO classified as A-5 with one sample resulting in an A-4 classification. SPT results in Residual silt strata showed soil densities that typically ranged from medium stiff to stiff with some soft and very stiff areas. Softer areas typically corresponded with areas of higher moisture content. Sieve analysis showed that the silts mostly had a very high sand content. Some trace amounts of Manganese Oxide (MnO) were observed within silts. Manganese Oxide will generate nearly frictionless surfaces of indeterminate orientation throughout the Residual soil profile, which can lead to slope stability issues. However, no significant amounts of Manganese Oxide were encountered during the geotechnical investigation. Areas containing soft fine-grained Residuals soils will be highlighted in the “Areas of Special Geotechnical Interest” section of this text report.

Residual clayey and silty sands (A-2-5, A-2-4, A-2-6, and A-2-7) are also common throughout the project corridor and typically underlie the clays and/or silts. The sands are generally saprolitic and micaceous with trace to little amounts of gravel-sized crystalline rock fragments. Laboratory testing of the Residual sands indicated a range of liquid limits from 34 to 52 with an average of 46. PI values varied from 0 to 15 with an average of 4. Moisture content ranged from 11.0% to 33.0% with an average of 18.4%. The majority of the samples tested were AASHTO classified as A-2-5. A few were classified as A-2-4, one A-2-6, and one A-2-7. SPT results in Residual sand strata showed soil densities of the sands typically range from loose to medium dense with some dense areas.

Alluvial soils, soils that have been transported and deposited by water, were encountered in the project corridor within the floodplains of East Belews creek and its associated tributaries. These topographically low areas are often very near or even below the water table and Alluvial soils are typically wet to saturated. As a consequence of their high moisture content and nature of deposition, alluvial soils typically exhibit very soft to soft/very loose to loose soil densities. Alluvial soils also often contain varying amounts of organic matter, mica, and gravel. Approximate locations where these soils are believed to be present will be highlighted in the “Areas of Special Geotechnical Interest” section of this text report.

Alluvial silty, clayey, and fine to coarse sands (A-2-4, A-2-6, and A-1-b) are the most prevalent soil type within the floodplains of the project corridor. Laboratory testing of the alluvial sands indicated a range of liquid limits from 20 to 44 with an average of 32. PI values varied from 0 to 15 with an average of 5. Moisture content ranged from 10.5% to 35.0% with an average of 22.2%. The majority of the samples tested were AASHTO classified as A-2-4 with one A-2-6 and one A-1-b. SPT results in alluvial sand strata showed soil densities that typically ranged from very loose to loose with some medium dense areas.

Alluvial sandy silts (A-4) are also present within the floodplains of the project corridor. Laboratory testing of the alluvial silts indicated a range of liquid limits from 32 to 35 with an average of 34. PI values varied from 1 to 8 with an average of 5. Moisture content ranged from 19.4% to 22.5% with an average of 21.0%. All samples tested were AASHTO classified as A-4. SPT results in alluvial silt strata showed soil densities that typically ranged from very soft to soft.

While not encountered during the investigation, Alluvial clays are also likely present within the project corridor. These clays typically get deposited in the lower energy areas of the floodplain and usually have moderate to high PI values and organic content.

Roadway Embankment soils from the construction of existing Piney Grove Road (-Y15), Linville Springs Road (-Y16-), and Whispering Brook Road (-DR1-/-DR2-) are present within the project corridor. Due to access, traffic, and underground utility issues these soils were only sampled on a very limited basis during the investigation. One sample was obtained along Whispering Brooke Drive (-DR2-) and field classified as a moist, medium dense, clayey, silty sand (A-2-5). No Roadway Embankment soils were lab tested during this investigation. These soils are likely quite similar to the local Residual soils that they were sourced from. However, they often have a “reworked” appearance, with a large variation in grain size. They can contain little to trace amounts of organic material, gravel, cobbles, boulders and/or other types of debris. If properly compacted during construction, Roadway Embankment soils typically produce stiff/medium dense soil densities.

Engineered Artificial Fill soils from the development and construction of businesses along Piney Grove and Linville Springs Road are present within the project corridor. These soils were also sampled on a very limited basis. One sample was obtained along Piney Grove Road (-Y15-) and was associated with the construction of a nearby gas station. The sample was field classified as moist, medium dense, clayey, silty sand (A-2-5). Another area of Engineered Artificial Fill was observed right of and near the beginning of the mainline (-L-). This fill was associated with the construction of a nearby business. No Engineered Artificial Fill soils were lab tested during this investigation. These soils are also likely quite similar to the local Residual soils that they were sourced from and maintain a “reworked” appearance with a large variation in grain size. They can also contain little to trace amounts of organic material, gravel, cobbles, boulders and/or other types of debris. These soils are also engineered, and if properly compacted during construction typically produce stiff/medium dense soil densities.

Rock Properties

Biotite Gneiss and Schist underlies a large portion of the project corridor. This unit is believed to be Late Proterozoic-Cambrian in age which is approximately 570-900 million years old. This unit is deeply weathered and has undergone both ductile and brittle deformation. When you combine the deep weathering, compositional layering of the gneiss/schist, and the complex folds, faults, and joints from the deformation, you can get some highly irregular weathering patterns. Based on boring data within this unit, major areas of Crystalline Rock are unlikely to be encountered at or above grade. One area of Crystalline Rock well below proposed grade was encountered in a culvert boring. However, given the highly irregular weathering patterns, it should be assumed that unexpected minor areas of Crystalline Rock could be encountered within this unit. Residual soils developed from this unit generally consist of silty clays and sandy clays that transition to clayey silts, sandy silts, clayey sands and silty sands with depth. They are typically obviously saprolitic with metamorphic foliations still evident and highly micaceous. Some minor amounts of MnO occur within this unit in a few areas.

Approximately 245 – 320 million years ago and several miles below the earth's surface, a series of magmas intruded and expanded into the above-mentioned older unit. The expansion into the surrounding rock was erratic and random, likely following fractures, faults, joints, and other weaknesses within the rock. These intrusions occurred on both a large scale where they can be measured in miles and on a small scale where they can be measured in inches. Over time this magma cooled and crystallized into what is now Granite. This Granite is more resistant to weathering than the Biotite Gneiss and Schist and was encountered in several areas of the project corridor above or within six feet of proposed grade. The Granite is also subject to some irregular weathering due to brittle deformation and the complex contacts between it and the less resistant rock unit surrounding it. This is evident in several areas of the project within this unit where Weathered and/or Crystalline Rock seems to abruptly appear then disappear. The rock lines drawn in the following report are a best interpretation given the information available. Given the irregular weathering patterns, some unexpected areas of Crystalline Rock should be anticipated in areas of proposed cut. The granite will likely require some blasting and should be suitable for rip rap, gravel, rock embankments, etc. Residual soils developed from this unit generally consist of silty clays and sandy clays that transition to clayey silts, sandy silts, clayey sands and silty sands with depth. These soils are typically saprolitic and have fairly high mica content. For specific information on the locations of near and above grade Crystalline Rock within this unit, refer to the "Areas of Special Geotechnical Interest" section of this text report.

Groundwater Properties

The field investigation as conducted during a period of near average to slightly above average rainfall. Groundwater was only encountered in thirteen borings. These borings were mostly located in the topographically lowest areas of the project and were typically within or near floodplains. Groundwater measurements varied from 916.5 feet to 956.1 feet above sea level. An average water table elevation of 922.7 feet above sea was calculated within the project corridor. Approximate locations where groundwater is present above or within six feet of proposed grade will be highlighted in the following section, "Areas of Special Geotechnical Interest."

A visual reconnaissance for water wells was conducted throughout the project corridor. This was used in conjunction with the final survey file to attempt to identify water wells within or adjacent to the proposed right of way of the project. Properly abandoned wells are not included in the following list. Some water well locations are well hidden, and it is possible that some wells were missed or misidentified by the final survey and/or visual reconnaissance. The following residential water wells were identified within or adjacent to the project corridor:

Alignment	Station(±)	Offset
-Y15-	15+95	72'RT
-Y15-	20+07	63'LT
-Y16-	12+35	79'LT

In addition to the residential wells, several monitoring wells associated with nearby gas stations were also observed. The following monitoring wells were identified within or adjacent to the project corridor:

Alignment	Station(±)	Offset
-Y15-	18+38	59'RT
-Y15-	18+57	93'RT
-Y15-	18+90	47'LT
-Y16-	15+57	72'RT
-Y16-	15+86	66'RT
-Y16-	15+93	49'RT
-Y16-	16+09	62'RT

Retention ponds, designed to handle storm water run-off, are located adjacent to the project corridor at the following locations:

Alignment	Station(±)	Offset
-L-	15+68 – 22+62	253' – 294'LT
-L-	24+83 – 26+48	132' – 241'LT

Areas of Special Geotechnical Interest

Plastic Soils - During the geotechnical investigation, highly plastic clays were encountered in many areas within the project corridor. Highly plastic soils can be problematic during and after construction. They can negatively affect embankment stability, embankment settlement, subgrade stability, and may not be suitable for use as embankment material. More detailed information on these soils can be found in the "Soil Properties" section of this text report. The following approximate locations listed below show areas where highly plastic clays are present within the project corridor:

Alignment	Station(±)	Offset
-L-	11+69.67 – 15+25	Left & Right
-L-	16+75 – 24+25	Left & Right
-L-	30+75 – 33+25	Left & Right
-L-	34+75 – 39+25	Left & Right
-L-	46+75 – 51+25	Left & Right

-L-	52+75 – 55+75	Left & Right
-L-	57+25 – 59+25	Left & Right
-L-	60+75 – 62+49.70	Left & Right
-Y15-	12+75 – 17+75	Left & Right
-Y16-	11+40 – 16+77	Left & Right

Alluvial Soils - During the geotechnical investigation, areas of Alluvial soils were observed and encountered. Alluvial soils can be problematic during and after construction. They can negatively impact embankment stability, embankment settlement, and subgrade stability. More detailed information on these soils can be found in the "Soil Properties" section of this text report. The following approximate locations listed below show areas where Alluvial soils are present within the project corridor:

Alignment	Station(±)	Offset
-L-	26+75 – 31+75	Left & Right
-L-	43+75 – 46+25	Left & Right
-L-	55+25 – 58+25	Left & Right

Soft Soils – During the geotechnical investigation, areas containing soft Residual soils were encountered. Soft soils can be problematic during and after construction. These soils can negatively impact embankment stability, embankment settlement, and subgrade stability. Especially when they are fine-grained and have a high moisture or mica content. More detailed information on these soils can be found in the "Soil Properties" section of this text report. The following approximate locations listed below show areas where soft Residual soils are present within the project corridor.

Alignment	Station(±)	Offset
-L-	13+25 – 16+75	Left & Right
-L-	20+75 – 24+25	Left & Right
-L-	27+25 – 29+25	Left & Right
-L-	30+25 – 31+75	Left & Right
-L-	56+25 – 59+25	Left & Right

Crystalline Rock - During the geotechnical investigation, Crystalline Rock was encountered in several areas. Crystalline Rock can present issues during construction with excavation and may require blasting. More detailed information on the rocks underlying the project corridor can be found in the "Rock Properties" section of this text report. The following approximate locations listed below show areas where Crystalline Rock is above or within 6 feet of proposed grade:

Alignment	Station(±)	Offset
-L-	40+25 – 43+25	Left & Right
-L-	48+75 – 52+75	Left

Groundwater - During the geotechnical investigation, groundwater was encountered in several areas. Groundwater can present issues during and after construction if not properly dealt with. More detailed information on the groundwater underlying the project corridor can be found in the "Groundwater Properties" section of this text report. The following approximate locations listed below show areas where groundwater is above or within 6 feet of proposed grade:

Alignment	Station(±)	Offset
-L-	31+25 – 32+75	Left & Right

Appendix A

Bulk Samples – California Bearing Ratio (CBR)

L3420R
(-L-) 34+20, 40'RT
0.0 – 30.5 ft.
S – 554

L4200R
(-L-) 42+00, 40'RT
0.0 – 15.0 ft.
S – 555

L5000L
(-L-) 50+00, 40'LT
0.0 – 8.2 ft.
S - 556

References

North Carolina Geological Survey, 1985, Geologic map of North Carolina: North Carolina Geological Survey, General Geologic Map, scale 1:500000.

The Geology of the Carolinas, J. Wright Horton, Jr., and Victor A. Zullo

Respectfully Submitted,

Brett Smith, PG
Project Geologist
Summit Design and Engineering Services, PLLC

8/17/99
18-OCT-2018 09:54
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555 Fayetteville St. Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
U-6003	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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BEGIN CONSTRUCTION
-Y15- POC 12+10.00

BEGIN TIP PROJECT U-6003
-Y16- POT Sta 11+40.00

END CONSTRUCTION
-Y15- POT 21+56.00

MATCHLINE -Y15- STA. 18+00
SEE SHEET 5

NAD 83/2011

ROADWAY EMBANKMENT

ARTIFICIAL FILL (ENGINEERED)

RESIDUAL

ALLUVIAL

WELL

WELLS

U6003-42

TO HEDRICK DR

KINGSTON AVE 30' PAVED

15" RCP

18" RCP

24"C&G

8" DI

10" STL

ISBKD

2SBKD

ISMASBUS

ISBKBUS

25FD

DOCK

POOL

CONC

PAVED

72" WD

BL-45

BL-46

15+00

20+00

TOWN OF KERNERSVILLE
FORSYTH COUNTY

FORSYTH COUNTY
TOWN OF KERNERSVILLE

MAT. GAS METER STATION

8/17/99

HDR Engineering, Inc. of the Carolinas 555 Fayetteville St. Suite 900 Raleigh, N.C. 27601 N.C.B.E.I.S. License Number: F-0116	PROJECT REFERENCE NO.	SHEET NO.
	U-6003	5
	R/W SHEET NO.	
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NAD 83/2011

BEGIN CONSTRUCTION -DR1- POT 10+60.00

ROADWAY EMBANKMENT

ALLUVIAL

RESIDUAL

POND

25FD

72" RCP

15" RCP

42" CMP

42" CMP BRANCH

TO SEWER PUMP STATION

DITCH

BM 2 ELEV.=920.69'

BL-39

BL-41

BL-40

BL-44

10" STL

30+00

25+00

20+00

E. BELEWS CREEK

WHISPERING BROOK RD

FORSYTH COUNTY
TOWN OF KERNERSVILLE

MATCHLINE -L- STA. 18+00
SEE SHEET 4

MATCHLINE -L- STA. 32+00
SEE SHEET 6

BEGIN CONSTRUCTION -DR2- POT 10+20.00

6" WATER MAIN RELOCATED PER CITY OF WINSTON-SALEM PROJECT 2009

10" LAMEDAISY DR

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N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
U-6003	6
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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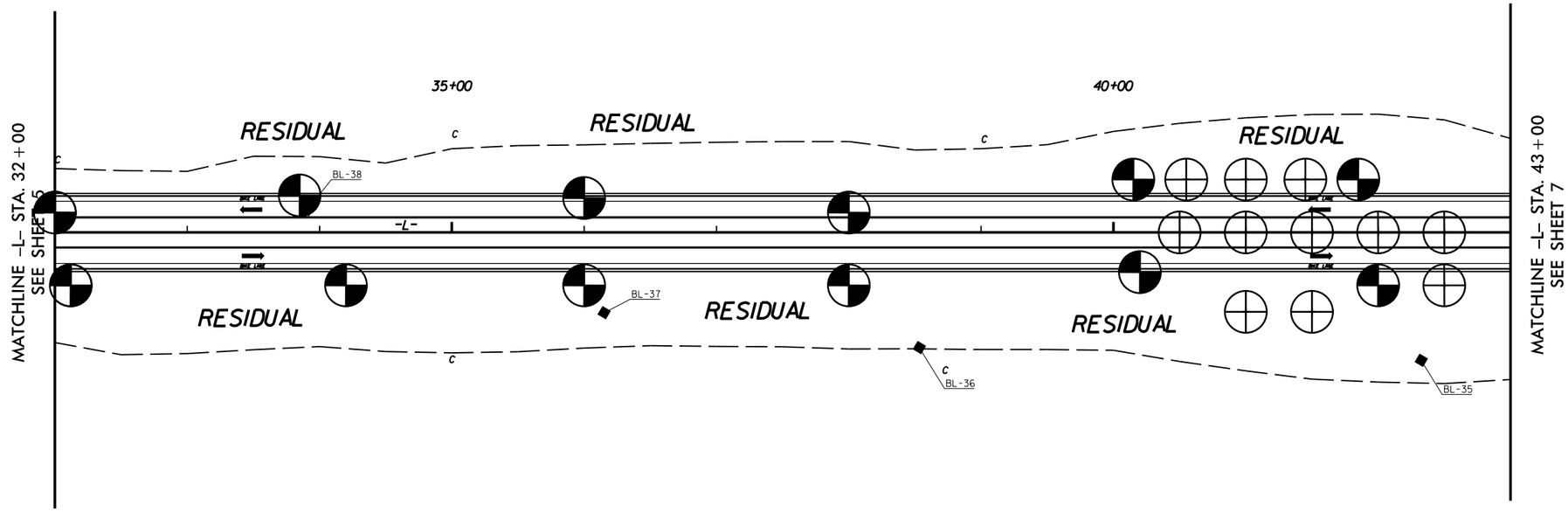
NAD 83/2011



HDR Engineering, Inc. of the Carolinas 555 Fayetteville St. Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116	PROJECT REFERENCE NO.	SHEET NO.
	U-6003	7
	R/W SHEET NO.	
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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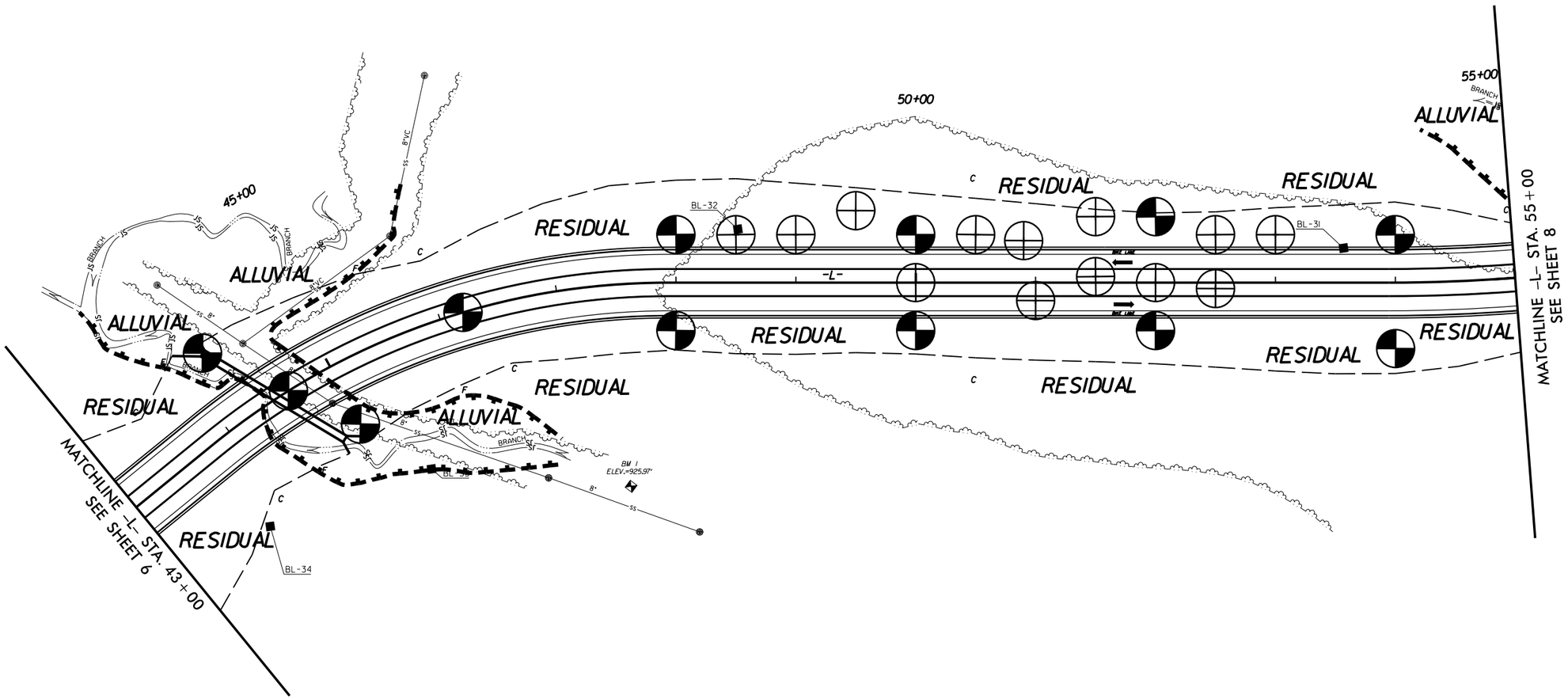
NAD 83/2011



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PROJECT REFERENCE NO.	SHEET NO.
U-6003	8
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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NAD 83/2011

END TIP PROJECT U-6003
-L- POT Sta 62+49.70
TIE TO U-4734 (BY OTHERS)

MATCHLINE -L- STA. 55+00
SEE SHEET 7

RESIDUAL
ALLUVIAL
RESIDUAL
60+00
ALLUVIAL
RESIDUAL
ALLUVIAL
RESIDUAL
RESIDUAL
RESIDUAL
ALLUVIAL
RESIDUAL
RESIDUAL

BL-30

U4734-6

NC 150 OAK RIDGE RD
24' BST
8" DI
4" PL
FO
ABAND
EOR
ISFD
BY-27
INV=973.65
12" RCP
16' PL
16' PE

8/17/99
09-OCT-2018 14:10
C:\Users\tsmith\Documents\NCDOT Projects\Active Projects\U-6003 ROWY for NCDOT GEU\U6003_GEO_ROWY_InventoryDRAFT_Summit\CADD_GEOTECH\PlanProf\U6003_GEO_inv_08.dgn
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
U-6003	9
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

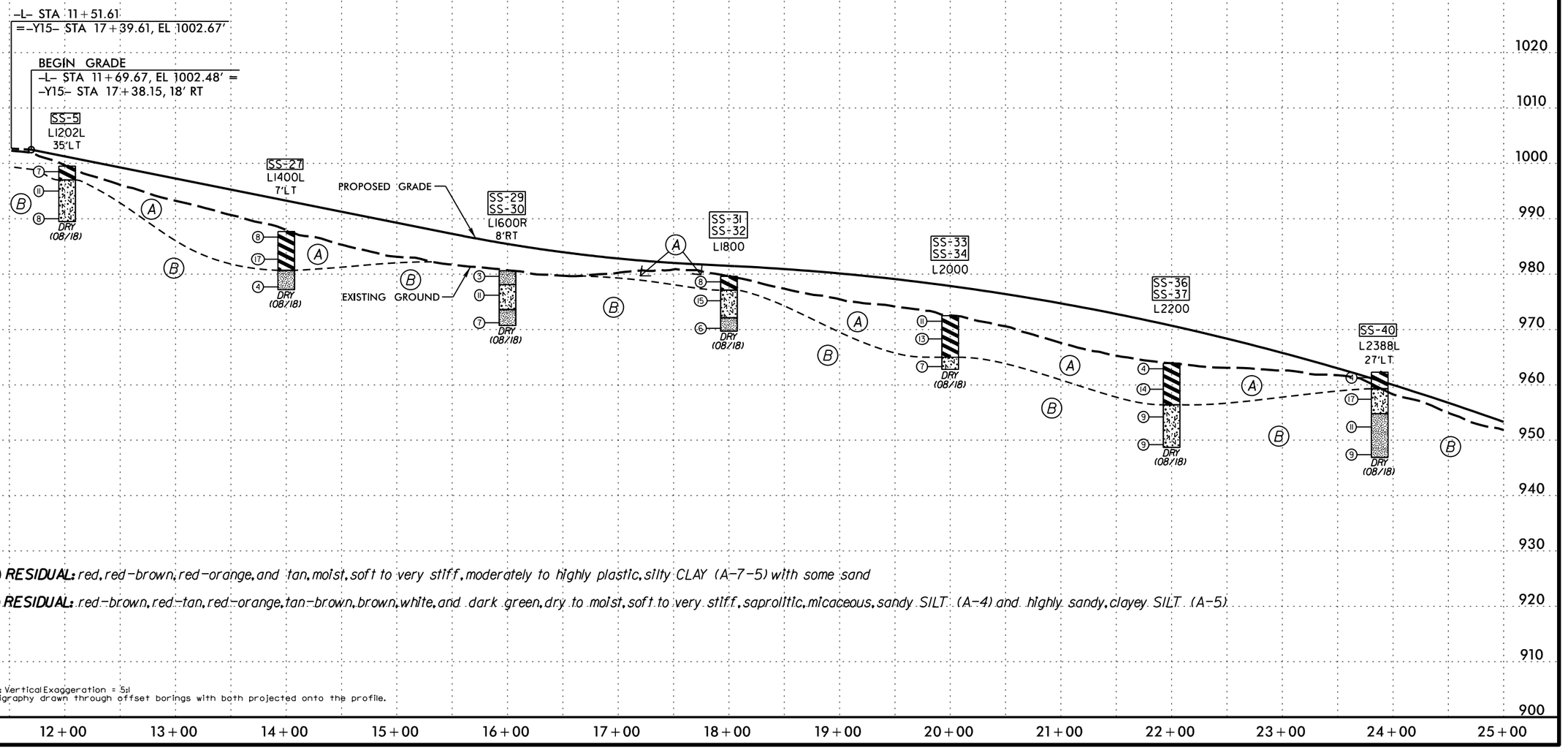
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

–L– PROFILE

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	35'LT	12+02	0.0' - 1.5'	A-7-5(50)	97	51	12.9	6.1	0.2	80.8	99	89	82	26.1	N/A
SS-27	7'LT	14+00	4.0' - 5.5'	A-7-5(8)	52	16	27.0	16.1	14.8	42.2	91	73	54	19.6	N/A
SS-29	8'RT	16+00	0.0' - 1.5'	A-4(0)	31	8	44.8	17.0	16.3	21.9	96	62	39	14.2	N/A
SS-30	8'RT	16+00	3.4' - 4.9'	A-5(3)	53	8	32.0	21.0	14.9	32.1	95	71	49	20.9	N/A
SS-31	CL	18+00	0.0' - 1.5'	A-7-5(34)	77	38	13.2	11.5	17.6	57.7	98	90	77	28.5	N/A
SS-32	CL	18+00	3.4' - 4.9'	A-5(2)	49	2	26.5	23.6	25.8	24.2	97	78	56	19.0	N/A
SS-33	CL	20+00	0.0' - 1.5'	A-7-5(16)	61	28	23.0	15.6	16.3	45.1	93	78	60	21.5	N/A
SS-34	CL	20+00	3.2' - 4.7'	A-7-5(13)	57	25	24.5	21.7	10.3	43.6	98	80	59	21.0	N/A
SS-36	CL	22+00	0.0' - 1.5'	A-7-5(45)	94	57	19.3	10.8	0.1	69.7	99	84	72	30.8	N/A
SS-37	CL	22+00	3.7' - 5.2'	A-7-5(19)	63	27	20.5	15.8	9.9	53.8	98	81	68	35.8	N/A
SS-40	27'LT	23+88	0.0' - 1.5'	A-7-5(29)	70	37	15.2	12.8	9.8	62.2	98	88	73	27.4	N/A



PROJECT REFERENCE NO.	SHEET NO.
U-6003	10
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

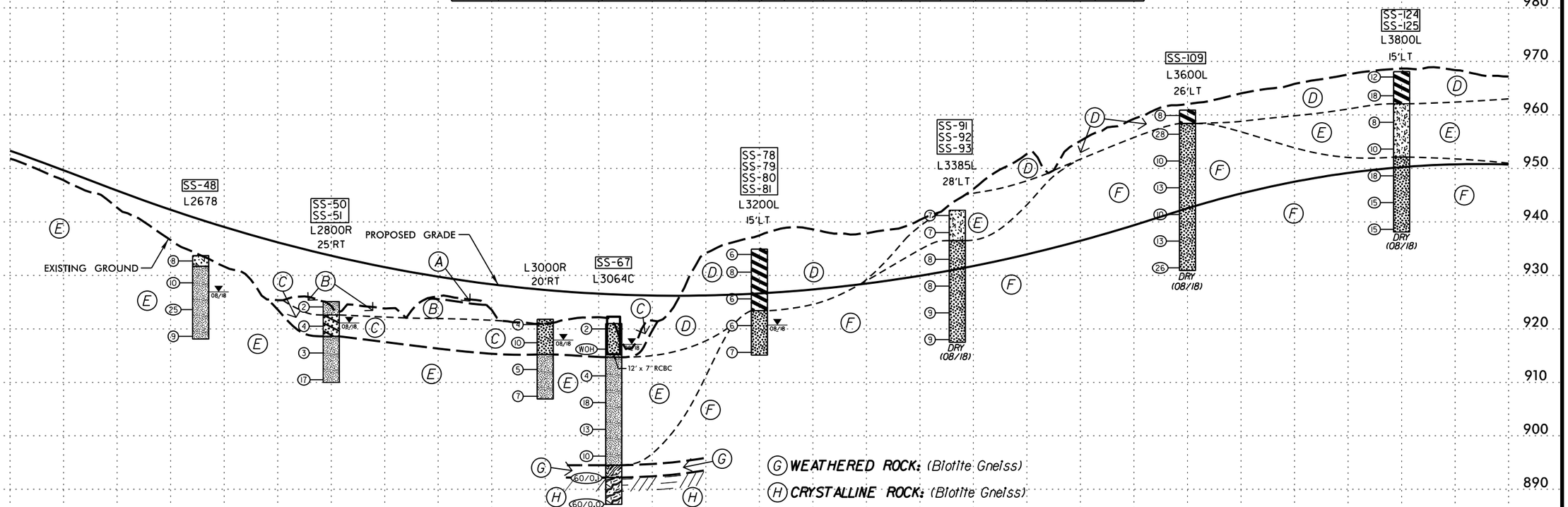
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

–L– PROFILE

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-48	CL	26+78	0.0' - 1.5'	A-5(0)	51	0	30.3	30.6	12.3	26.9	98	79	45	39.7	N/A
SS-50	25'RT	28+00	0.0' - 1.5'	A-4(0)	32	1	40.9	25.3	9.9	23.9	95	68	36	22.5	N/A
SS-51	25'RT	28+00	3.6' - 5.1'	A-2-6(1)	38	15	52.1	21.5	0.3	26.0	90	57	26	14.1	N/A
SS-67	CL	30+64	3.8' - 5.3'	A-2-4(0)	26	0	22.3	53.6	7.1	17.0	100	94	28	31.4	N/A
SS-78	15'LT	32+00	0.0' - 1.5'	A-7-5(10)	70	35	36.8	22.5	9.7	31.0	98	73	43	29.2	N/A
SS-79	15'LT	32+00	3.3' - 4.8'	A-7-5(8)	58	24	31.9	21.4	1.7	45.0	97	76	48	14.6	N/A
SS-80	15'LT	32+00	8.3' - 9.8'	A-7-5(13)	58	26	28.4	15.6	15.5	40.4	96	75	57	33.4	N/A
SS-81	15'LT	32+00	13.3' - 14.8'	A-2-5(0)	43	6	45.6	32.6	14.1	7.7	97	65	28	33.0	N/A
SS-91	28'LT	33+85	3.2' - 4.7'	A-5(0)	45	1	24.9	43.4	19.8	12.0	99	88	39	25.4	N/A
SS-92	28'LT	33+85	8.2' - 9.7'	A-2-5(0)	47	0	42.8	41.6	11.5	4.1	98	74	21	14.5	N/A
SS-93	28'LT	33+85	13.2' - 14.7'	A-2-5(0)	44	0	38.2	47.1	10.6	4.1	98	77	21	15.8	N/A
SS-109	26'LT	36+00	0.0' - 1.5'	A-7-5(6)	48	15	30.8	18.3	12.8	38.0	94	73	50	12.1	N/A
SS-124	15'LT	38+00	0.0' - 1.5'	A-7-6(5)	46	20	32.9	24.6	5.4	37.1	98	77	45	18.7	N/A
SS-125	15'LT	38+00	3.5' - 5.0'	A-7-5(5)	50	12	21.0	33.4	8.9	36.6	100	88	52	20.0	N/A



(G) **WEATHERED ROCK:** *(Biotite Gneiss)*

(H) **CRYSTALLINE ROCK:** *(Biotite Gneiss)*

(A) **ROADWAY EMBANKMENT:** *red, moist, medium dense, clayey SAND (A-2-7) with some ABC Stone*

(B) **ALLUVIAL:** *gray and tan, moist to wet, soft, sandy SILT (A-4) with some clay*

(C) **ALLUVIAL:** *gray, red-brown, brown, green and tan, moist to saturated, very loose to medium dense, silty SAND (A-2-4), clayey, silty SAND (A-2-5) and clayey SAND (A-2-6) with some mica, trace gravel and organics*

(D) **RESIDUAL:** *red, red-brown, brown, light gray, and white, dry to moist, medium stiff to very stiff, slightly to highly plastic, highly sandy, silty CLAY (A-7-5) with trace mica and gravel sized rock fragments*

(E) **RESIDUAL:** *red-brown, brown, tan-brown, white, and dark gray, dry to saturated, soft to very stiff, saprolitic, micaceous, sandy SILT (A-4) and highly sandy, clayey SILT (A-5) with trace gravel sized rock fragments*

(F) **RESIDUAL:** *brown, red-brown, tan, black, and white, dry to saturated, loose to medium dense, micaceous, clayey, silty SAND (A-2-5) and silty SAND (A-2-4) trace gravel sized rock fragments*

Notes: Vertical Exaggeration = 5:1
Stratigraphy drawn through offset borings with both projected onto the profile.

PROJECT REFERENCE NO.	SHEET NO.
U-6003	11
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

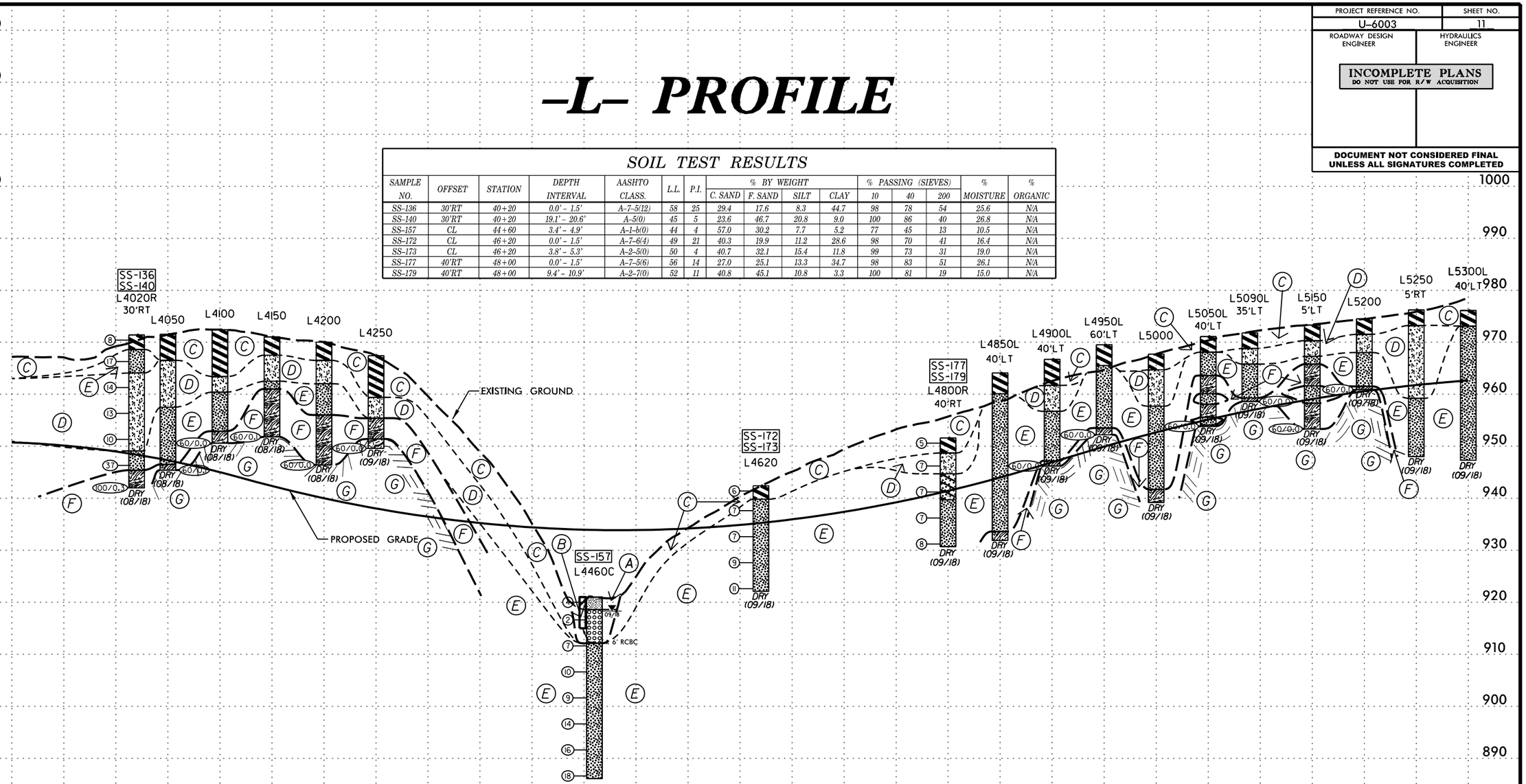
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

–L– PROFILE

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-136	30'RT	40+20	0.0' - 1.5'	A-7-5(12)	58	25	29.4	17.6	8.3	44.7	98	78	54	25.6	N/A
SS-140	30'RT	40+20	19.1' - 20.6'	A-5(0)	45	5	23.6	46.7	20.8	9.0	100	86	40	26.8	N/A
SS-157	CL	44+60	3.4' - 4.9'	A-1-b(0)	44	4	57.0	30.2	7.7	5.2	77	45	13	10.5	N/A
SS-172	CL	46+20	0.0' - 1.5'	A-7-6(4)	49	21	40.3	19.9	11.2	28.6	98	70	41	16.4	N/A
SS-173	CL	46+20	3.8' - 5.3'	A-2-5(0)	50	4	40.7	32.1	15.4	11.8	99	73	31	19.0	N/A
SS-177	40'RT	48+00	0.0' - 1.5'	A-7-5(6)	56	14	27.0	25.1	13.3	34.7	98	83	51	26.1	N/A
SS-179	40'RT	48+00	9.4' - 10.9'	A-2-7(0)	52	11	40.8	45.1	10.8	3.3	100	81	19	15.0	N/A



(A) **ALLUVIAL:** brown to light brown, moist to wet, very soft to soft, sandy SILT (A-4) with trace organics

(B) **ALLUVIAL:** gray, wet to saturated, very loose to loose, fine to coarse SAND (A-1-b) and silty SAND (A-2-4)

(C) **RESIDUAL:** red to red-brown, dry to wet, medium stiff to stiff, slightly to highly plastic, highly sandy, silty CLAY (A-7-5/A-7-6) with trace mica

(D) **RESIDUAL:** red-brown, maroon-brown, brown, tan, white, black, dry to wet, medium stiff to stiff, highly sandy, clayey SILT (A-5) with little mica

(E) **RESIDUAL:** red-brown, brown, tan, gray, white, and black, dry to saturated, loose to dense, micaceous, clayey, silty SAND (A-2-5), clayey SAND (A-2-7), and silty SAND (A-2-4) with trace gravel sized rock fragments

(F) **WEATHERED ROCK:** (Granite)

(G) **CRYSTALLINE ROCK:** (Granite)

Notes: Vertical Exaggeration = 5:1
Stratigraphy drawn through offset borings with both projected onto the profile.

1030 1020 1010 1000 990 980 970 960 950 940 930 920 910 900 890 880 870 860 850 840 830

40+00 41+00 42+00 43+00 44+00 45+00 46+00 47+00 48+00 49+00 50+00 51+00 52+00 53+00

PROJECT REFERENCE NO.	SHEET NO.
U-6003	12
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

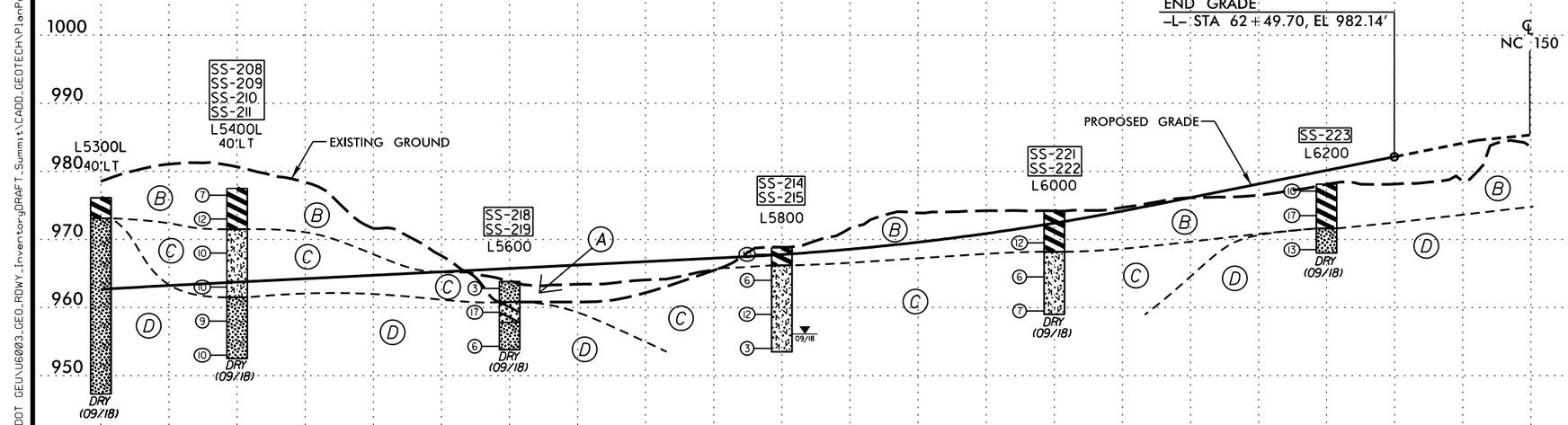
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

–L– PROFILE

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-208	40'LT	54+00	0.0' – 1.5'	A-7-5(31)	72	32	9.8	13.1	21.0	56.1	100	93	81	22.0	N/A
SS-209	40'LT	54+00	3.5' – 5.0'	A-7-5(25)	70	21	6.7	15.8	31.8	45.7	100	95	84	37.2	N/A
SS-210	40'LT	54+00	8.5' – 10.0'	A-5(5)	54	6	24.7	24.6	29.0	21.7	99	81	59	27.1	N/A
SS-211	40'LT	54+00	13.5' – 15.0'	A-5(0)	52	2	19.1	45.6	26.2	9.2	99	92	44	24.2	N/A
SS-218	CL	56+00	0.0' – 1.5'	A-2-4(0)	20	2	53.9	19.5	15.0	11.5	98	58	30	20.2	N/A
SS-219	CL	56+00	3.5' – 5.0'	A-2-6(1)	34	15	48.3	20.2	12.3	19.2	98	62	34	13.8	N/A
SS-214	CL	58+00	0.0' – 1.5'	A-7-6(14)	56	28	33.3	10.8	11.9	44.0	99	74	58	21.2	N/A
SS-215	CL	58+00	3.8' – 5.3'	A-5(0)	53	6	42.4	23.8	20.1	13.8	100	67	39	23.7	N/A
SS-221	CL	60+00	3.7' – 5.2'	A-7-5(1)	51	13	41.6	27.3	14.5	16.5	99	69	37	21.8	N/A
SS-222	CL	60+00	8.7' – 10.2'	A-5(0)	51	7	40.2	27.0	22.8	9.9	99	71	39	31.0	N/A
SS-223	CL	62+00	0.0' – 1.5'	A-7-6(10)	54	29	38.8	14.5	11.4	35.3	97	68	48	17.2	N/A



(A) **ALLUVIAL:** brown, moist to wet, very loose, silty SAND (A-2-4)

(B) **RESIDUAL:** red-brown, orange-brown, tan-brown and gray-brown, moist, medium stiff to very stiff, slightly to highly plastic, silty CLAY (A-7-5/A-7-6) with some sand

(C) **RESIDUAL:** red-brown, brown, orange-brown, green, tan, gray and white, dry to saturated, soft to stiff, micaceous, highly sandy, clayey SILT (A-5)

(D) **RESIDUAL:** brown, tan, gray, and white, dry to moist, loose to medium dense, micaceous, clayey, silty SAND (A-2-5) and clayey SAND (A-2-6)

Notes: Vertical Exaggeration = 5:1
Stratigraphy drawn through offset borings with both projected onto the profile.

1070 1060 1050 1040 1030 1020 1010 1000 990 980 970 960 950 940 930 920 910 900 890 880 870

54+00 55+00 56+00 57+00 58+00 59+00 60+00 61+00 62+00 63+00

PROJECT REFERENCE NO.	SHEET NO.
U-6003	13
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

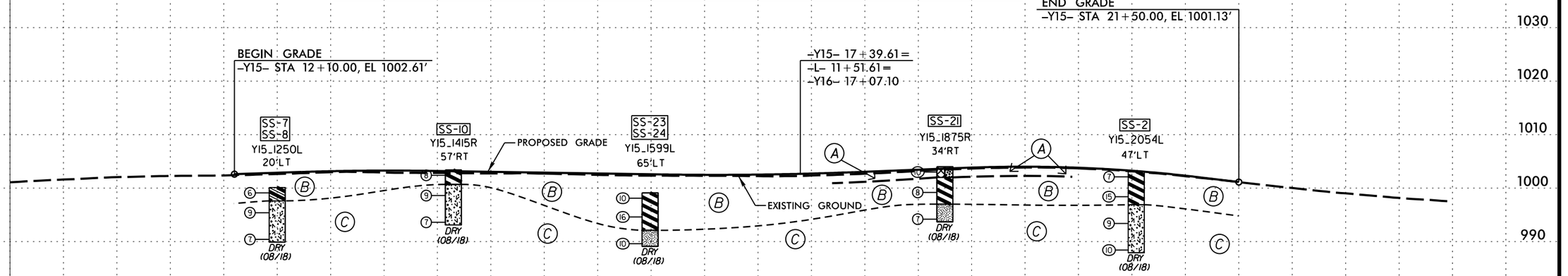
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-Y15- PROFILE

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-7	20'LT	12+50	0.0' - 1.5'	A-6(2)	38	11	32.9	22.6	13.7	30.9	93	74	45	18.0	N/A
SS-8	20'LT	12+50	3.7' - 5.2'	A-5(3)	53	5	26.9	25.7	7.4	40.0	100	84	56	31.9	N/A
SS-10	57'RT	14+15	0.0' - 1.5'	A-7-5(24)	68	32	17.3	14.3	6.4	62.0	98	88	69	32.2	N/A
SS-23	65'LT	15+99	0.0' - 1.5'	A-7-5(26)	71	38	22.4	11.8	6.8	59.0	99	84	67	26.1	N/A
SS-24	65'LT	15+99	3.5' - 5.0'	A-7-5(8)	58	14	27.1	25.9	14.2	32.8	100	80	56	16.8	N/A
SS-21	34'RT	18+75	3.8' - 5.3'	A-7-5(13)	64	25	33.4	13.8	13.5	39.3	99	72	57	25.5	N/A
SS-2	47'LT	20+54	3.7' - 5.2'	A-7-5(12)	61	22	32.4	16.5	15.1	36.0	100	72	56	12.8	N/A



(A) **ARTIFICIAL FILL (ENGINEERED):** *red, moist, medium dense, clayey, silty SAND (A-2-5) with little gravel*

(B) **RESIDUAL:** *red-brown, brown, red, dark red, and orange, dry to moist, medium stiff to very stiff, slightly to highly plastic, sandy CLAY (A-6) and silty CLAY (A-7-5) with some sand*

(C) **RESIDUAL:** *red-brown, tan, purple, white, pink, and dark green, dry to moist, medium stiff to stiff, micaceous, highly sandy, clayey SILT (A-5) and sandy SILT (A-4)*

Notes: Vertical Exaggeration = 5:1
Stratigraphy drawn through offset borings with both projected onto the profile.

PROJECT REFERENCE NO.	SHEET NO.
U-6003	14
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

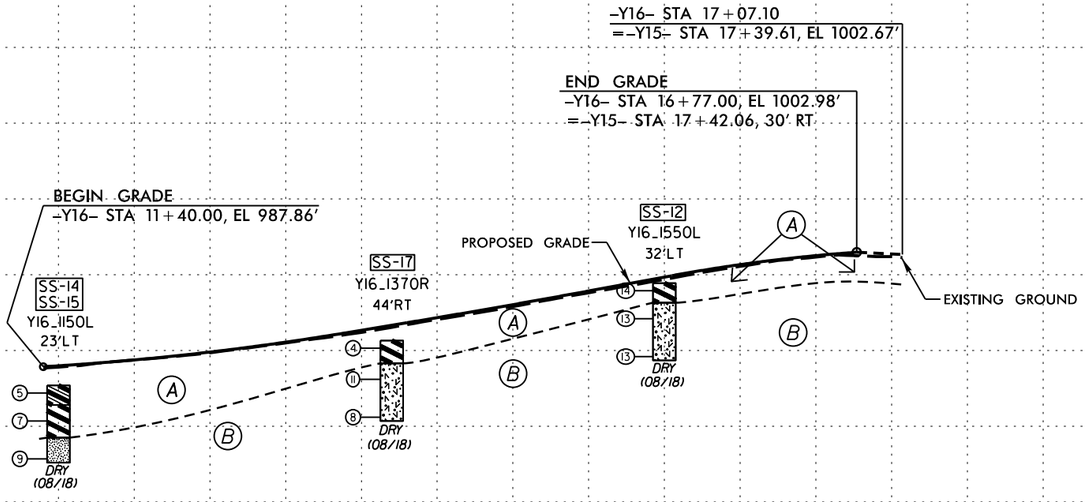
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

–Y16– PROFILE

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-14	23'LT	11+50	0.0' - 1.5'	A-6(3)	39	16	35.8	22.7	11.0	30.5	95	71	43	16.7	N/A
SS-15	23'LT	11+50	3.7' - 5.2'	A-7-5(43)	97	51	17.6	10.1	5.8	66.5	99	87	73	37.9	N/A
SS-17	44'RT	13+70	0.0' - 1.5'	A-7-5(31)	91	44	23.4	11.9	7.3	57.4	99	83	65	35.6	N/A
SS-12	32'LT	15+50	0.0' - 1.5'	A-7-5(36)	84	43	15.5	12.1	3.4	69.0	99	89	74	14.1	N/A



(A) **RESIDUAL:** red-brown, gray-brown, red, tan, and orange, dry to moist, soft to stiff, sandy CLAY (A-6) and highly plastic, silty CLAY (A-7-5) with some sand

(B) **RESIDUAL:** red-brown, brown, red, orange, purple, dark gray, and white, moist, stiff, micaceous, highly sandy, clayey SILT (A-5) and sandy SILT (A-4)

Notes: Vertical Exaggeration = 5:1
Stratigraphy drawn through offset borings with both projected onto the profile.

1090 1080 1070 1060 1050 1040 1030 1020 1010 1000 990 980 970 960 950 940 930 920 910 900 890

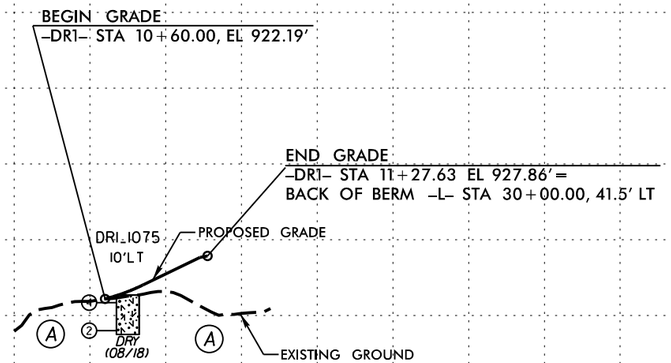
10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00

PROJECT REFERENCE NO.	SHEET NO.
U-6003	15
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

–DR1– PROFILE



1020 1010 1000 990 980 970 960 950 940 930 920 910 900 890 880 870 860 850 840 830 820

(A) ***RESIDUAL:*** *brown to red-brown and gray, moist, soft, micaceous, highly sandy, clayey SILT (A-5)*

Notes: Vertical Exaggeration = 5:1
Stratigraphy drawn through offset borings with both projected onto the profile.

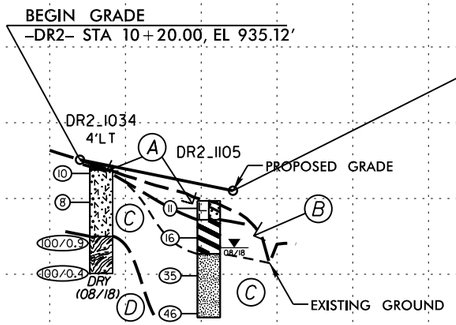
10+00 11+00

PROJECT REFERENCE NO.	SHEET NO.
U-6003	16
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

–DR2– PROFILE



(A) **ROADWAY EMBANKMENT:** *red, moist, medium dense, clayey SAND (A-2-7) with some ABC Stone*

(B) **RESIDUAL:** *gray, moist, very stiff, highly sandy, silty CLAY (A-7)*

(C) **RESIDUAL:** *red, white, tan-brown, and gray, dry to saturated, stiff to hard, saprolitic, micaceous, sandy SILT (A-4) and highly sandy, clayey SILT (A-5)*

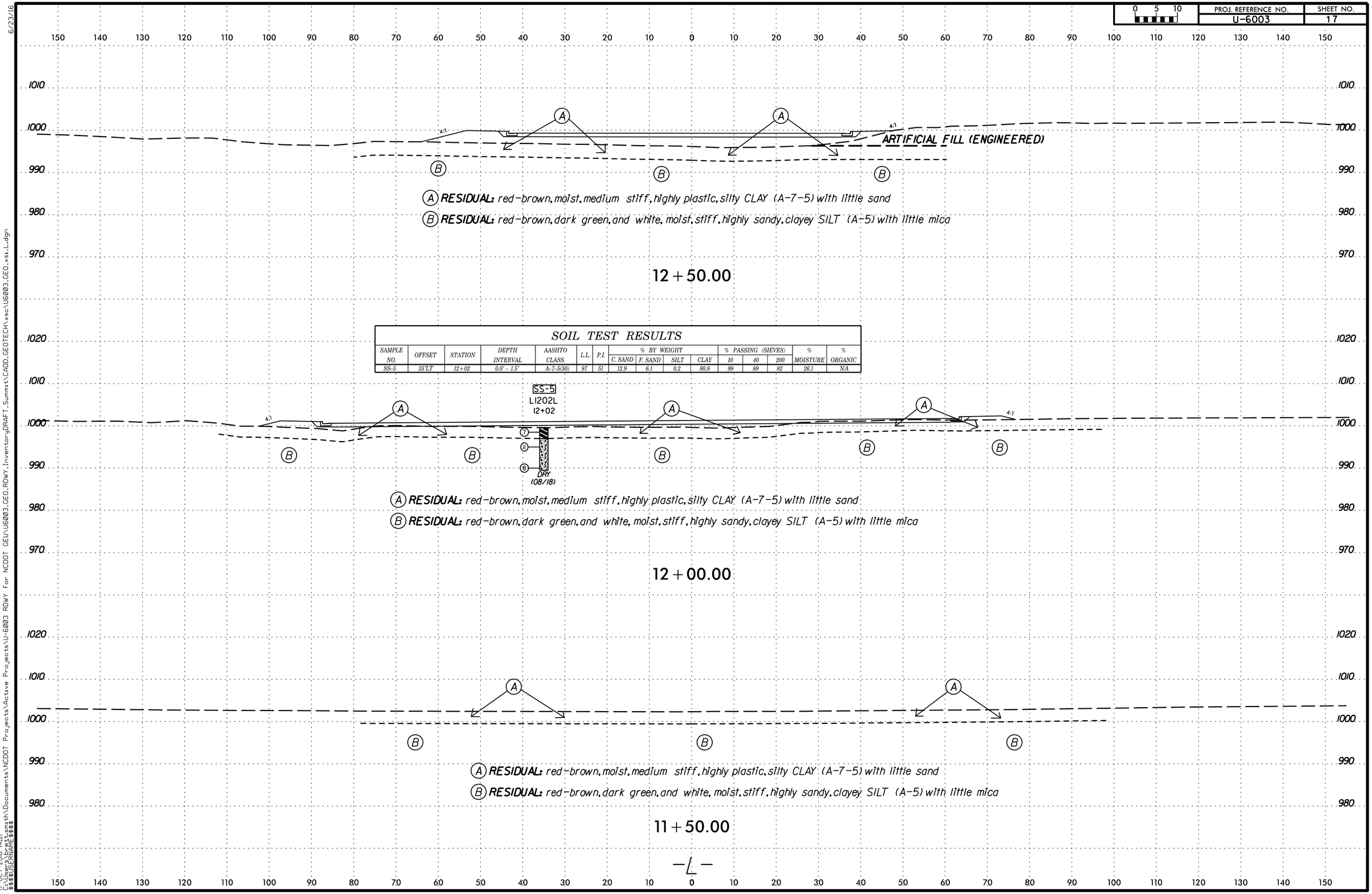
(D) **WEATHERED ROCK:** *(Biotite Gneiss)*

Notes: Vertical Exaggeration = 5:1
Stratigraphy drawn through offset borings with both projected onto the profile.

1030 1020 1010 1000 990 980 970 960 950 940 930 920 910 900 890 880 870 860 850 840 830

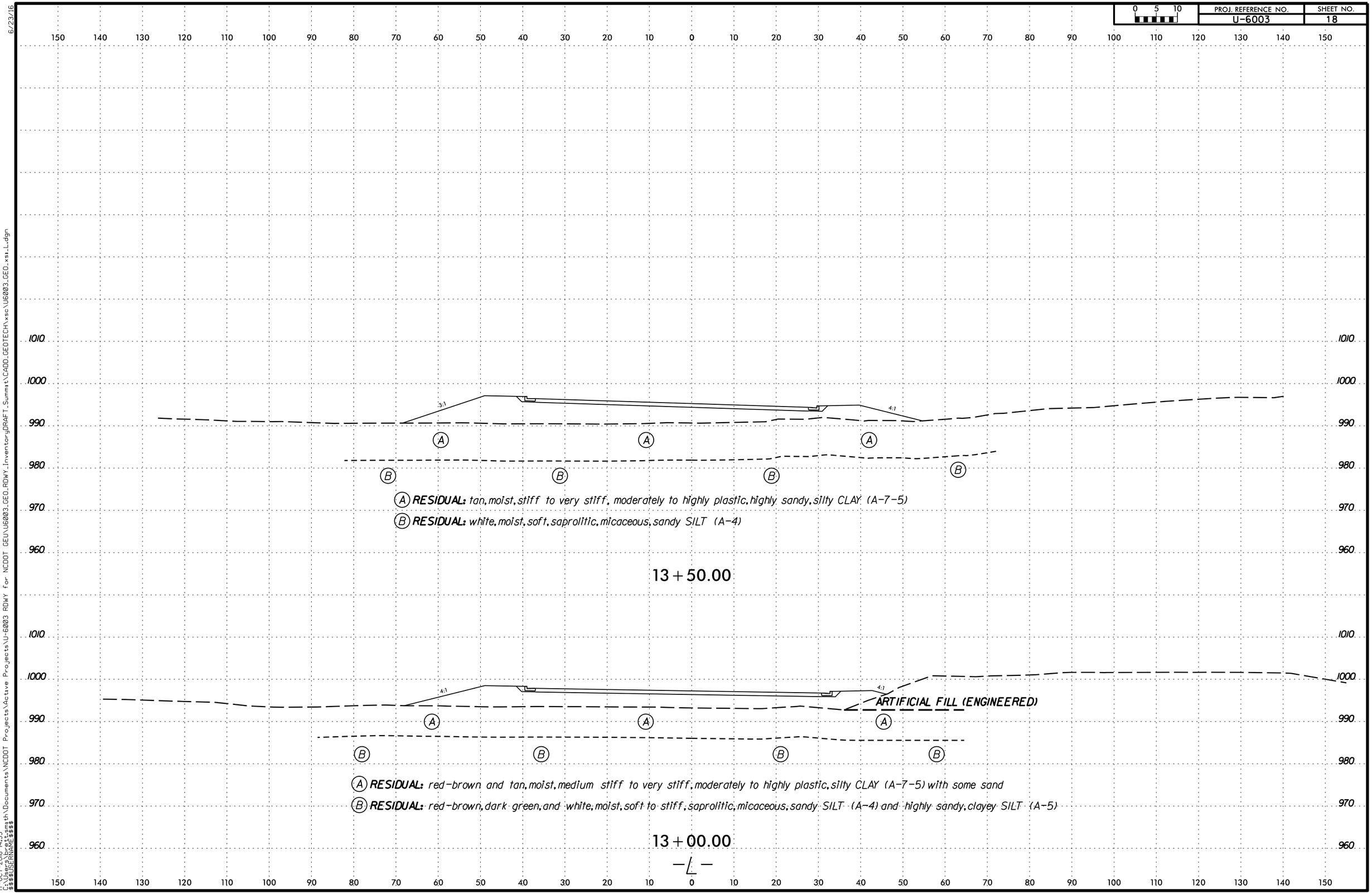
10+00 11+00

5/14/99



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	35'LT	12+02	0.0' - 1.5'	A-7-5(50)	97	51	12.9	6.1	0.2	80.8	99	89	82	26.1	N/A

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-6003	18



6/23/16

17-OCT-2018 14:35
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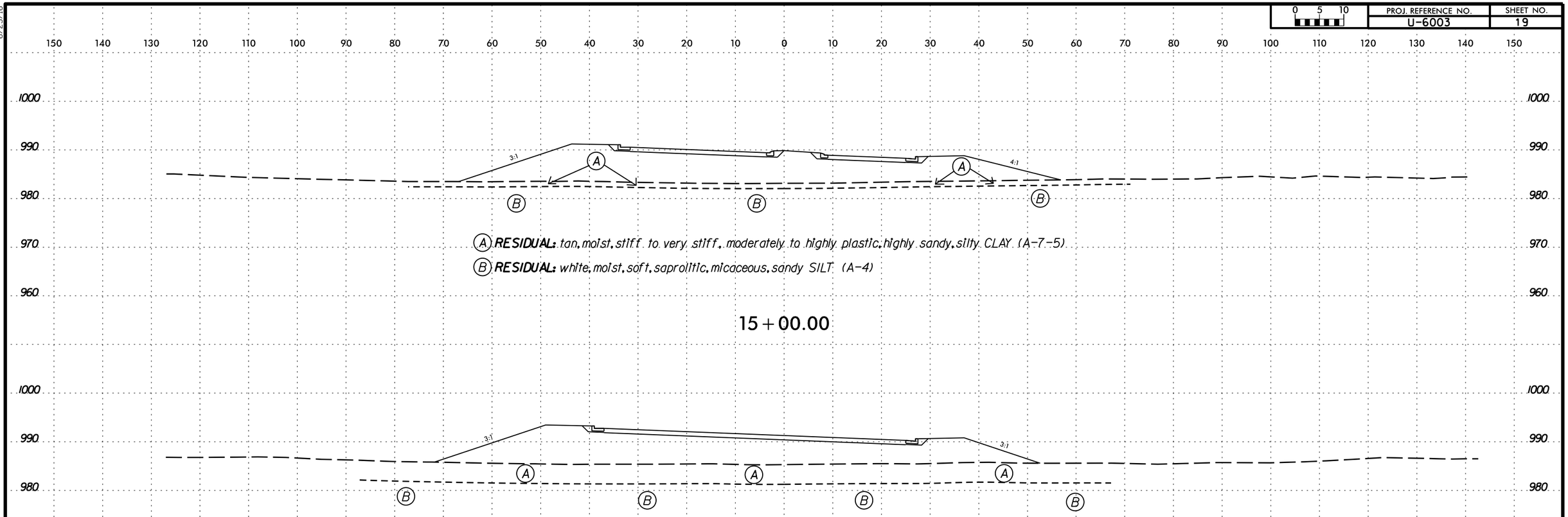
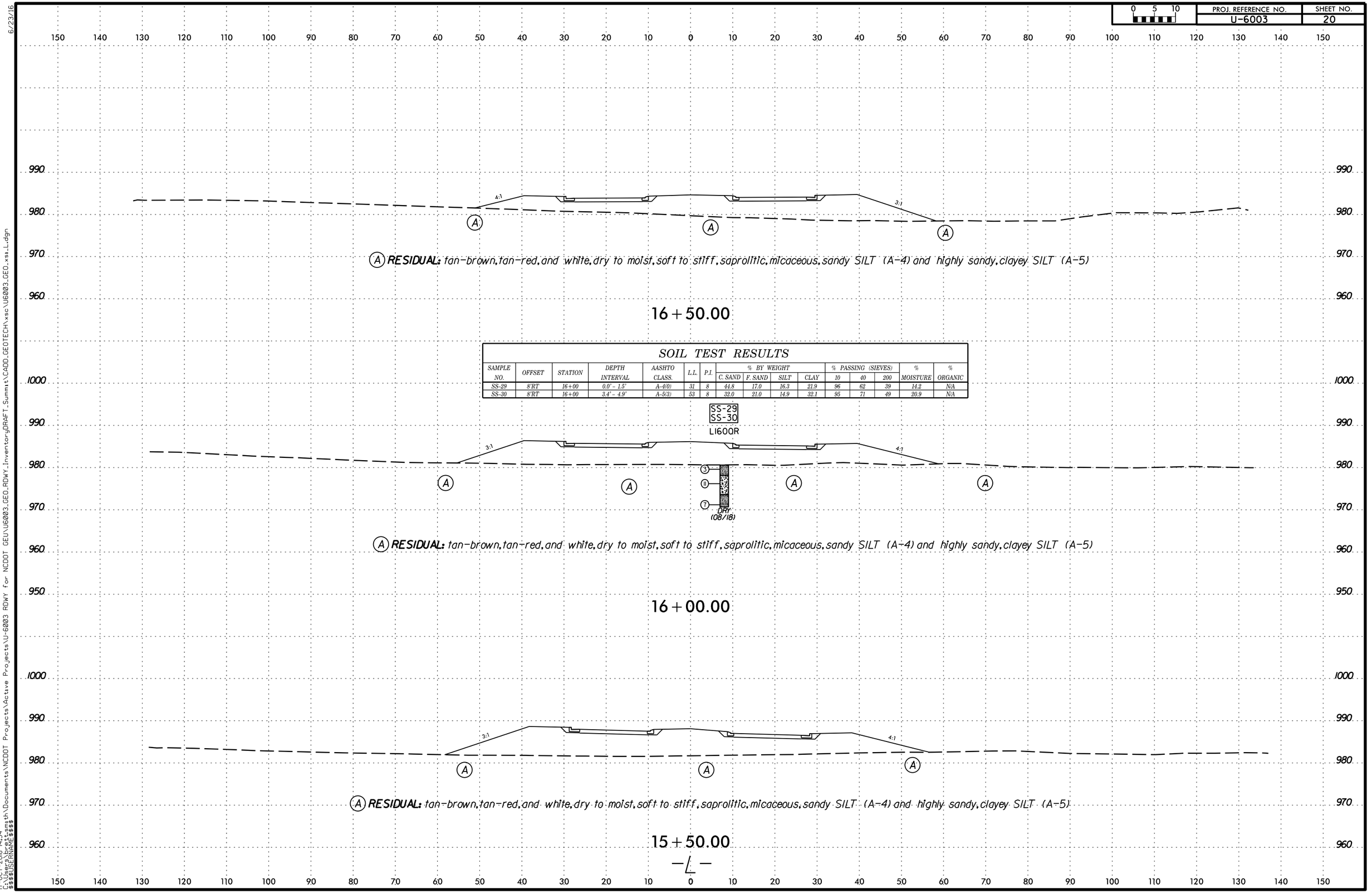


SOIL TEST RESULTS

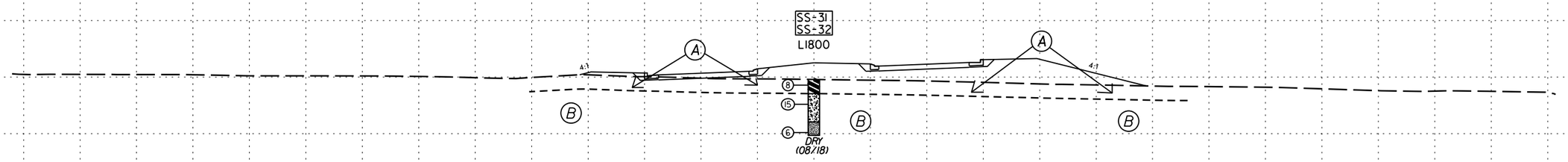
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-27	7'LT	14+00	4.0' - 5.5'	A-7-5(8)	52	16	27.0	16.1	14.8	42.2	91	73	54	19.6	N/A



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-29	8'RT	16+00	0.0' - 1.5'	A-4(0)	31	8	44.8	17.0	16.3	21.9	96	62	39	14.2	N/A
SS-30	8'RT	16+00	3.4' - 4.9'	A-5(3)	53	8	32.0	21.0	14.9	32.1	95	71	49	20.9	N/A

SOIL TEST RESULTS

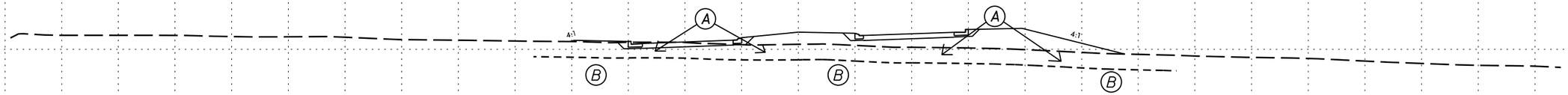
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			%	%
							C. SAND	F. SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
SS-31	CL	18+00	0.0' - 1.5'	A-7-5(34)	77	38	13.2	11.5	17.6	57.7	98	90	77	28.5	N/A
SS-32	CL	18+00	3.4' - 4.9'	A-5(2)	49	2	26.5	23.6	25.8	24.2	97	78	56	19.0	N/A



(A) **RESIDUAL:** red, moist, stiff, highly plastic, silty CLAY (A-7-5) with some sand

(B) **RESIDUAL:** red-tan and white, moist, medium stiff to stiff, saprolitic, micaceous, sandy SILT (A-4) and highly sandy, clayey SILT (A-5)

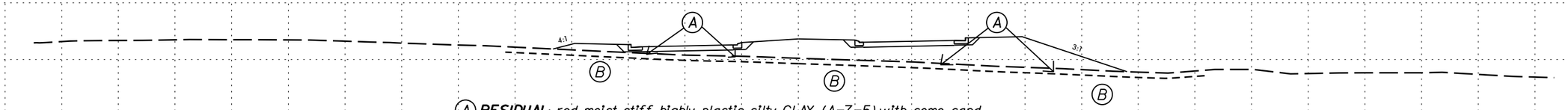
18+00.00



(A) **RESIDUAL:** red, moist, stiff, highly plastic, silty CLAY (A-7-5) with some sand

(B) **RESIDUAL:** red-tan and white, moist, medium stiff to stiff, saprolitic, micaceous, sandy SILT (A-4) and highly sandy, clayey SILT (A-5)

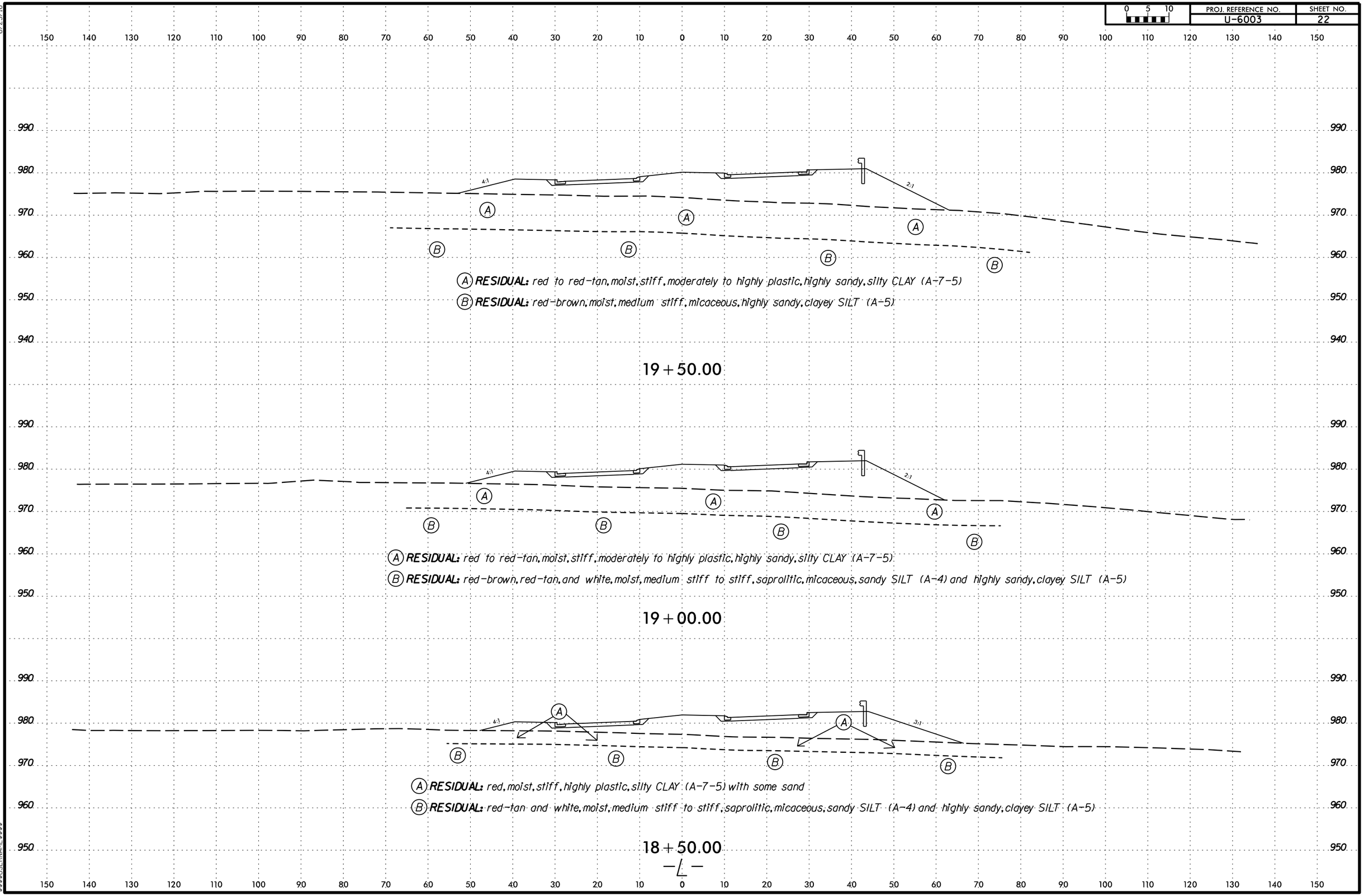
17+50.00

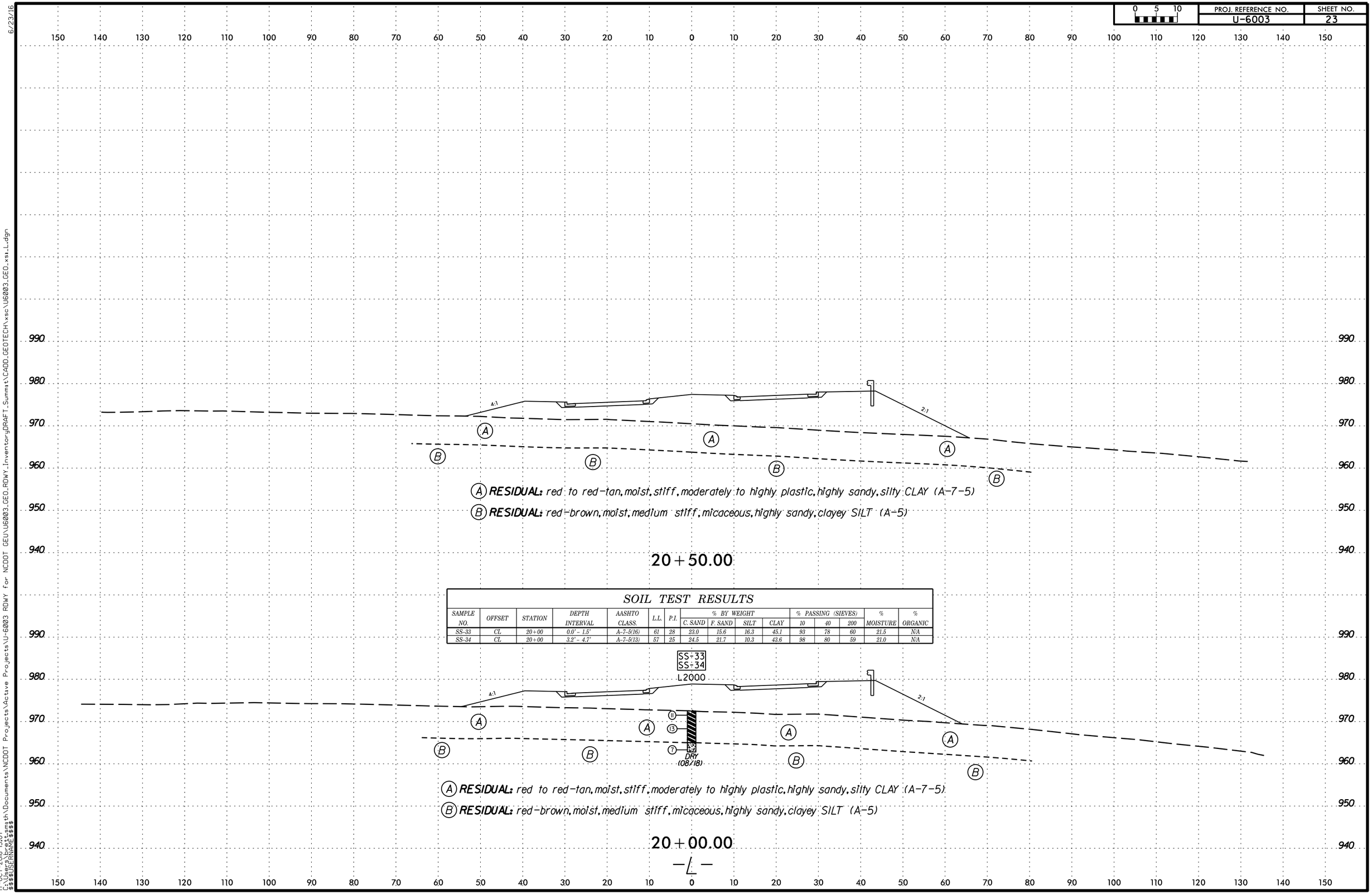


(A) **RESIDUAL:** red, moist, stiff, highly plastic, silty CLAY (A-7-5) with some sand

(B) **RESIDUAL:** red-tan and white, moist, medium stiff to stiff, saprolitic, micaceous, sandy SILT (A-4) and highly sandy, clayey SILT (A-5)

17+00.00





SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-33	CL	20+00	0.0' - 1.5'	A-7-5(16)	61	28	23.0	15.6	16.3	45.1	93	78	60	21.5	N/A
SS-34	CL	20+00	3.2' - 4.7'	A-7-5(13)	57	25	24.5	21.7	10.3	43.6	98	80	59	21.0	N/A

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

980 970 960 950 940

4:1 2:1

(A) (B)

(A) **RESIDUAL:** red-tan to tan, moist, soft to stiff, highly plastic, highly sandy, silty CLAY (A-7-5)

(B) **RESIDUAL:** brown, moist, stiff, micaceous, highly sandy, clayey SILT (A-5)

21+50.00

990 980 970 960 950 940

4:1 2:1

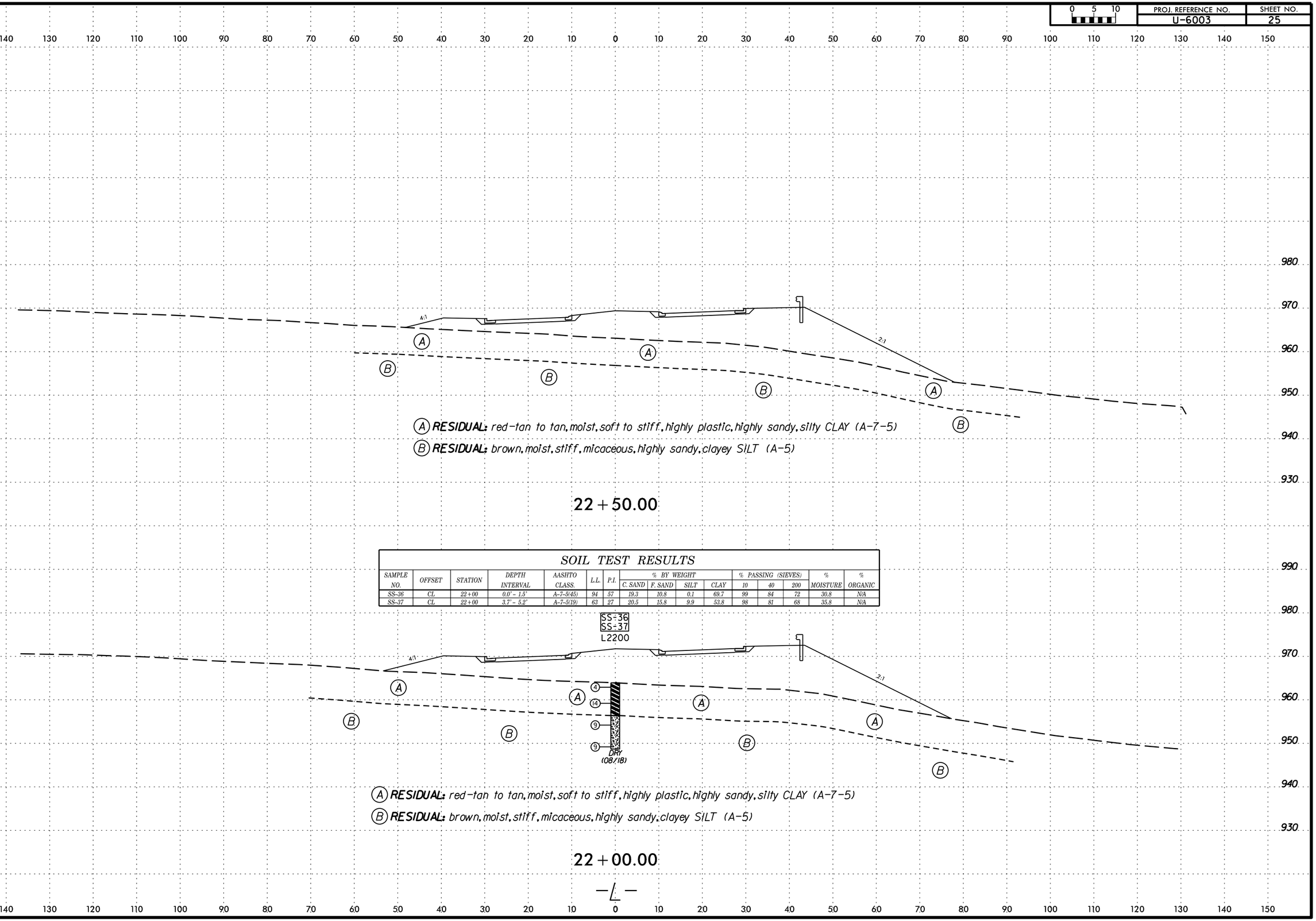
(A) (B)

(A) **RESIDUAL:** red, red-tan, and tan, moist, soft to stiff, moderately to highly plastic, highly sandy, silty CLAY (A-7-5)

(B) **RESIDUAL:** red-brown to brown, moist, medium stiff to stiff, micaceous, highly sandy, clayey SILT (A-5)

21+00.00

—L—



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-36	CL	22+00	0.0' - 1.5'	A-7-5(45)	94	57	19.3	10.8	0.1	69.7	99	84	72	30.8	N/A
SS-37	CL	22+00	3.7' - 5.2'	A-7-5(19)	63	27	20.5	15.8	9.9	53.8	98	81	68	35.8	N/A

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17-OCT-2018 15:34
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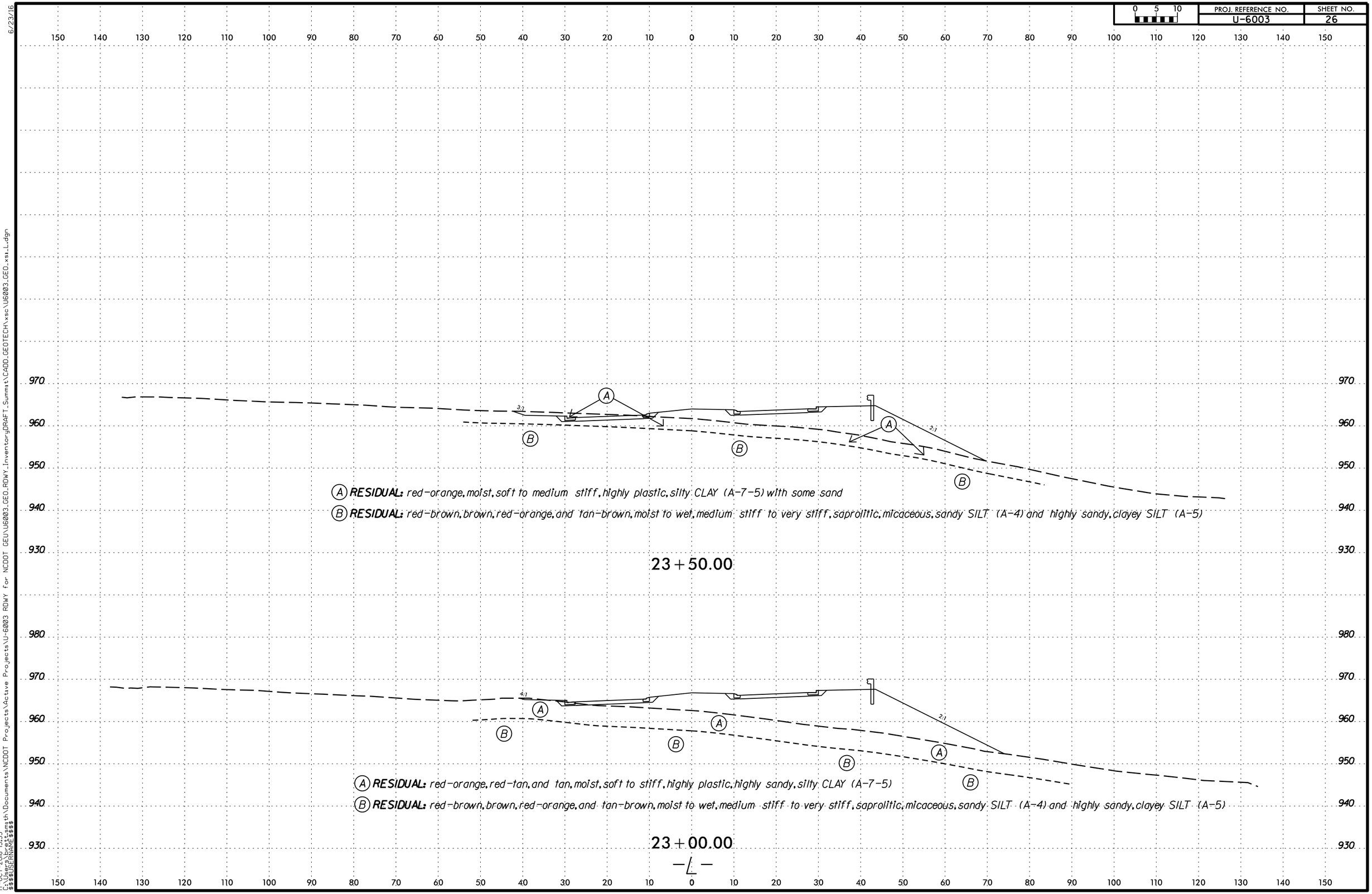
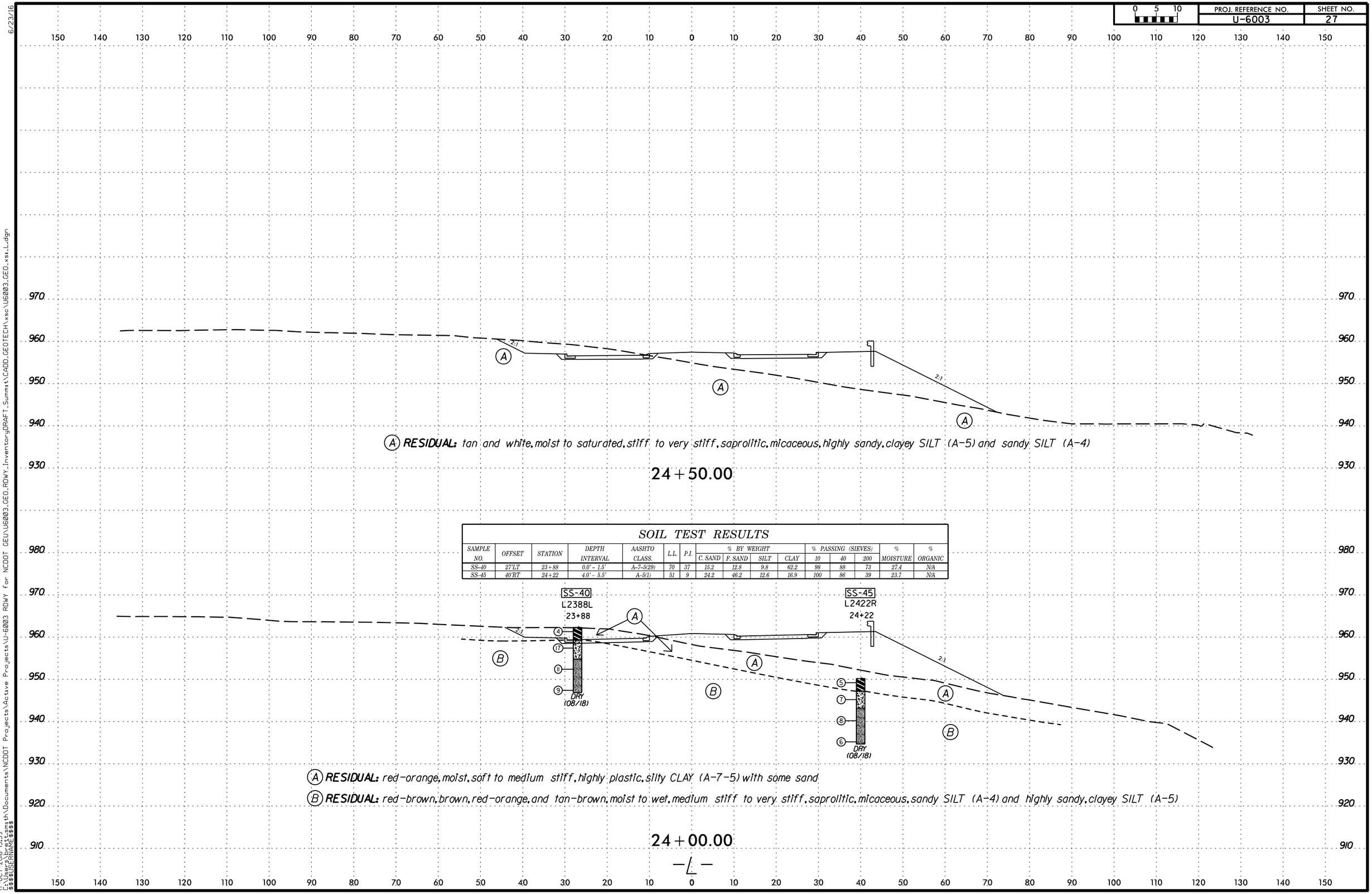




Ⓐ **RESIDUAL:** *tan and white, moist to saturated, stiff to very stiff, saprolitic, micaceous, highly sandy, clayey SILT (A-5) and sandy SILT (A-4)*

24+50.00

SOIL TEST RESULTS

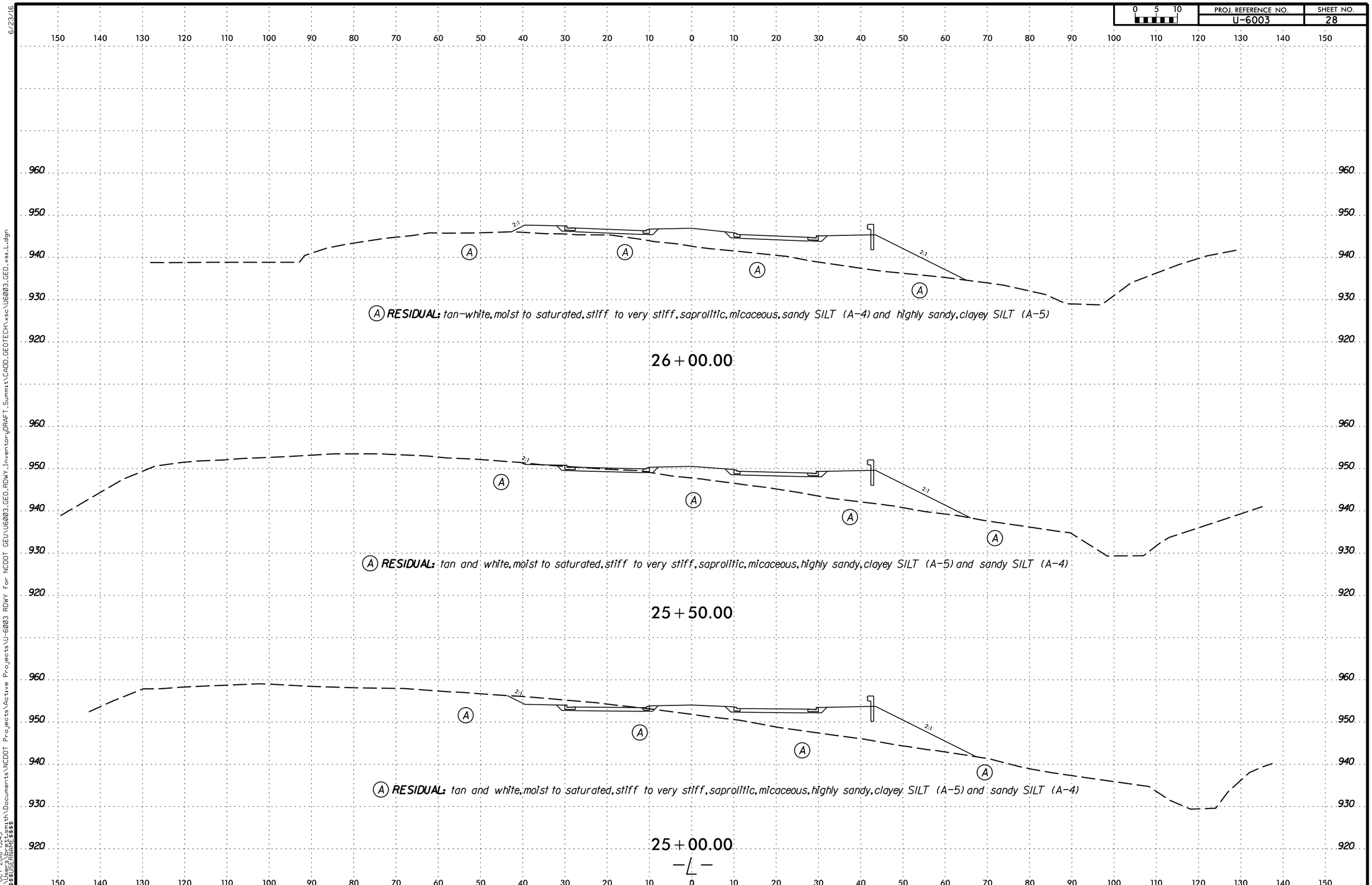
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			%	%
							C. SAND	F. SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
SS-40	27'LT	23+88	0.0' - 1.5'	A-7-5(29)	70	37	15.2	12.8	9.8	62.2	98	88	73	27.4	N/A
SS-45	40'RT	24+22	4.0' - 5.5'	A-5(1)	51	9	24.2	46.2	12.6	16.9	100	86	39	23.7	N/A

Ⓐ **RESIDUAL:** *red-orange, moist, soft to medium stiff, highly plastic, silty CLAY (A-7-5) with some sand*

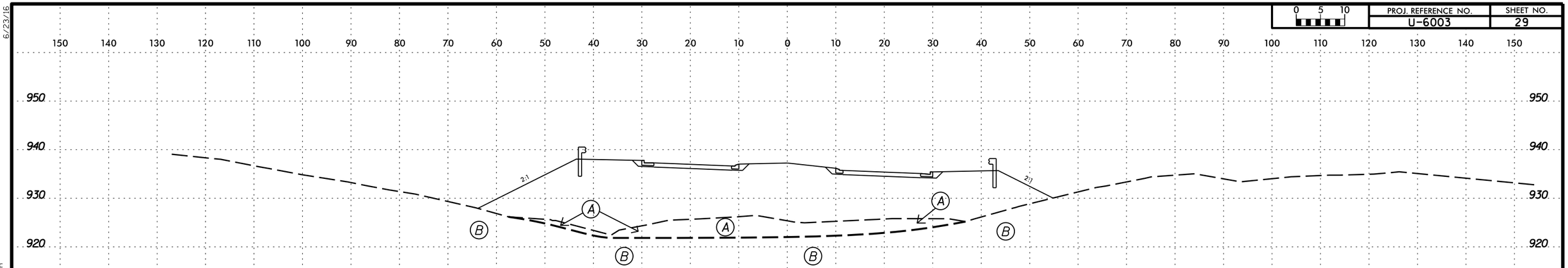
Ⓑ **RESIDUAL:** *red-brown, brown, red-orange, and tan-brown, moist to wet, medium stiff to very stiff, saprolitic, micaceous, sandy SILT (A-4) and highly sandy, clayey SILT (A-5)*

24+00.00

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-6003	28



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-6003	29



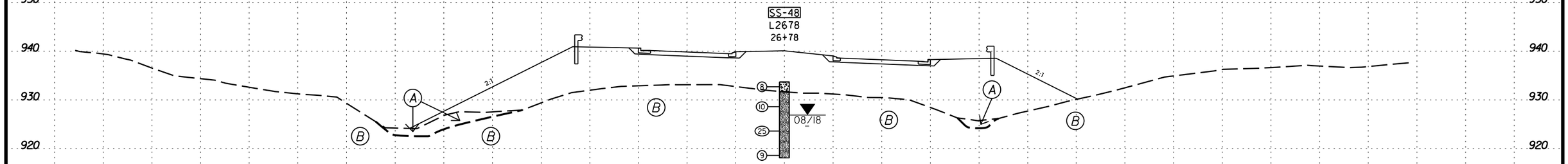
(A) **ALLUVIAL:** *gray, wet to saturated, loose, clayey SAND (A-2-6)*

(B) **RESIDUAL:** *dark gray to tan-white, moist to saturated, soft to very stiff, saprolitic, micaceous, sandy SILT (A-4) and highly sandy clayey SILT (A-5)*

27 + 50.00

SOIL TEST RESULTS

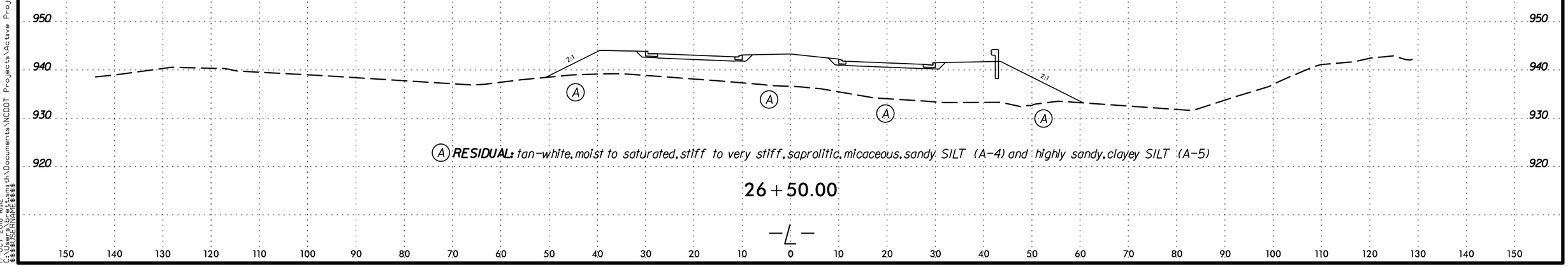
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-48	CL	26+78	0.0' - 1.5'	A-5(0)	51	0	30.3	30.6	12.3	26.9	98	79	45	39.7	N/A



(A) **ALLUVIAL:** *gray, wet to saturated, loose, clayey SAND (A-2-6)*

(B) **RESIDUAL:** *tan-white, moist to saturated, stiff to very stiff, saprolitic, micaceous, sandy SILT (A-4) and highly sandy, clayey SILT (A-5)*

27 + 00.00



(A) **RESIDUAL:** *tan-white, moist to saturated, stiff to very stiff, saprolitic, micaceous, sandy SILT (A-4) and highly sandy, clayey SILT (A-5)*

26 + 50.00

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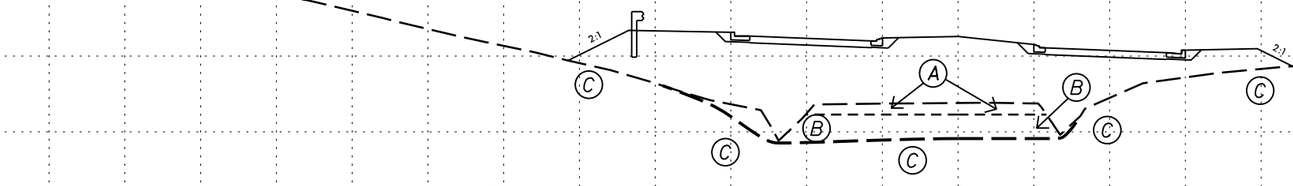


(A) **ALLUVIAL:** gray and tan, moist to wet, soft, sandy SILT (A-4) with some clay

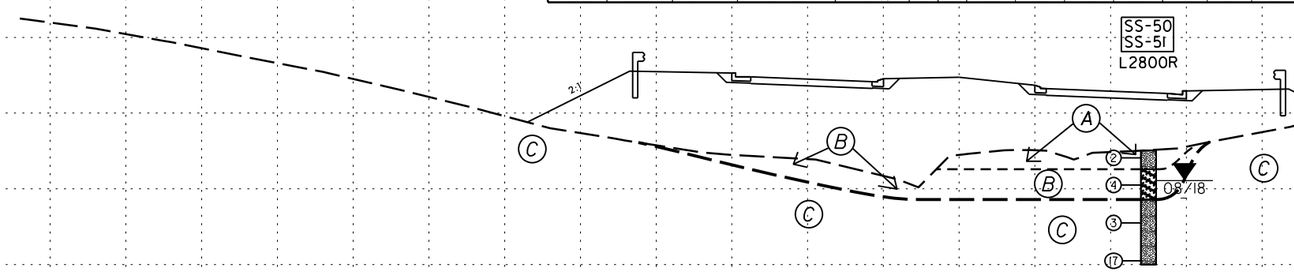
(B) **ALLUVIAL:** gray, wet to saturated, loose, clayey SAND (A-2-6)

(C) **RESIDUAL:** dark gray to white, moist to saturated, soft to very stiff, saprolitic, micaceous, sandy SILT (A-4)

28+50.00

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-50	25'RT	28+00	0.0' - 1.5'	A-4(0)	32	1	40.9	25.3	9.9	23.9	95	68	36	22.5	N/A
SS-51	25'RT	28+00	3.6' - 5.1'	A-2-6(1)	38	15	52.1	21.5	0.3	26.0	90	57	26	14.1	N/A



(A) **ALLUVIAL:** gray and tan, moist to wet, soft, sandy SILT (A-4) with some clay

(B) **ALLUVIAL:** gray, wet to saturated, loose, clayey SAND (A-2-6)

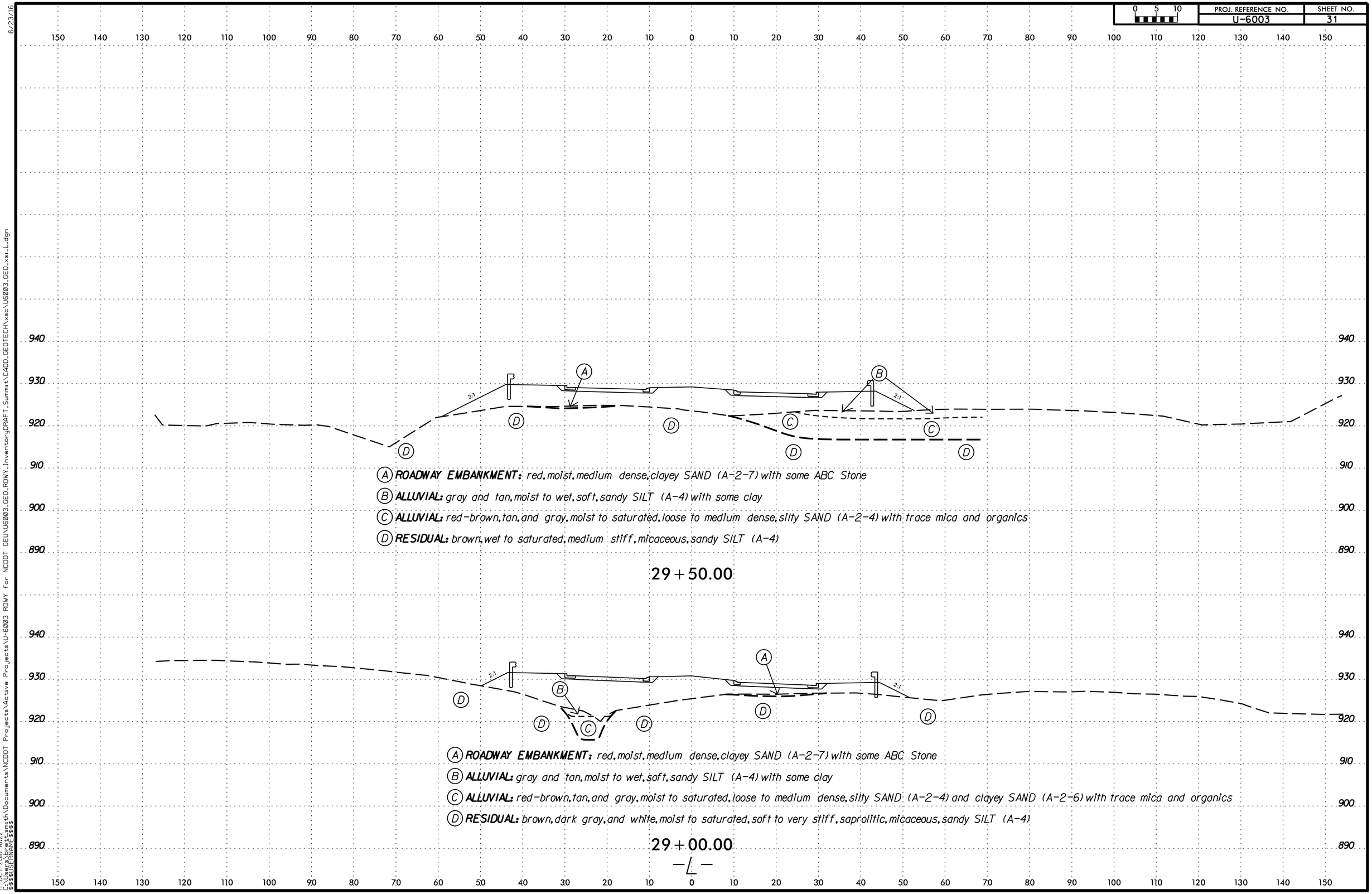
(C) **RESIDUAL:** dark gray to white, moist to saturated, soft to very stiff, saprolitic, micaceous, sandy SILT (A-4)

28+00.00

—L—

PROJ. REFERENCE NO.	SHEET NO.
U-6003	31

0 5 10



(A) **ROADWAY EMBANKMENT:** red, moist, medium dense, clayey SAND (A-2-7) with some ABC Stone

(B) **ALLUVIAL:** gray and tan, moist to wet, soft, sandy SILT (A-4) with some clay

(C) **ALLUVIAL:** red-brown, tan, and gray, moist to saturated, loose to medium dense, silty SAND (A-2-4) with trace mica and organics

(D) **RESIDUAL:** brown, wet to saturated, medium stiff, micaceous, sandy SILT (A-4)

29+50.00

(A) **ROADWAY EMBANKMENT:** red, moist, medium dense, clayey SAND (A-2-7) with some ABC Stone

(B) **ALLUVIAL:** gray and tan, moist to wet, soft, sandy SILT (A-4) with some clay

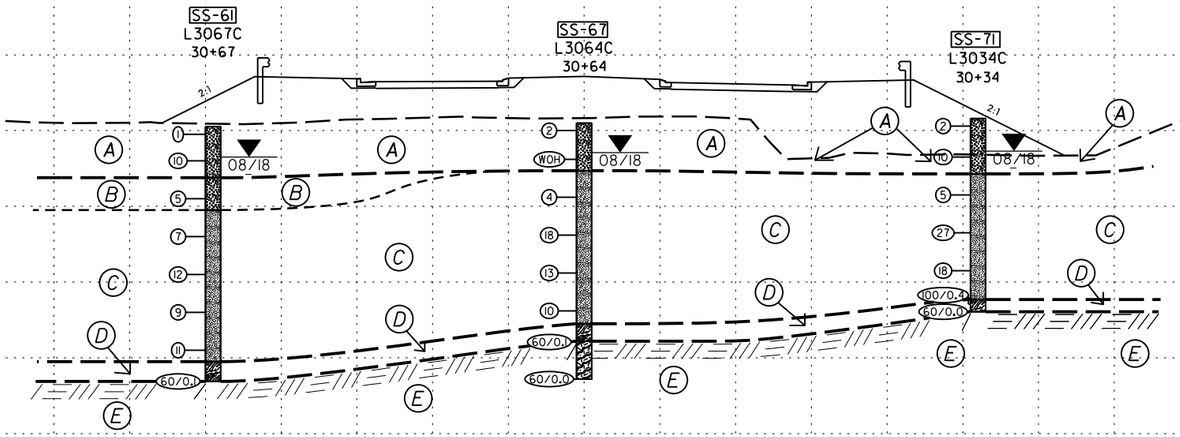
(C) **ALLUVIAL:** red-brown, tan, and gray, moist to saturated, loose to medium dense, silty SAND (A-2-4) and clayey SAND (A-2-6) with trace mica and organics

(D) **RESIDUAL:** brown, dark gray, and white, moist to saturated, soft to very stiff, saprolitic, micaceous, sandy SILT (A-4)

29+00.00

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-71	52'RT	30+34	0.0' - 1.5'	A-2-4(0)	35	8	42.8	25.1	10.9	21.2	98	73	34	35.0	N/A
SS-67	CL	30+64	3.8' - 5.3'	A-2-4(0)	26	0	22.3	53.6	7.1	17.0	100	94	28	31.4	N/A
SS-61	49'LT	30+67	8.5' - 10.0'	A-2-5(0)	51	9	34.6	42.2	11.7	11.5	99	78	29	32.4	N/A



(A) **ALLUVIAL:** brown, tan, red-brown, gray, and green, moist to saturated, very loose to medium dense, silty SAND (A-2-4) and clayey, silty SAND (A-2-5) with some mica, trace gravel and organics

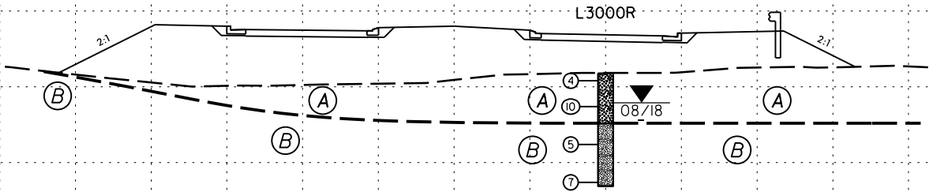
(B) **RESIDUAL:** brown, saturated, loose, micaceous, clayey, silty SAND (A-2-5) with trace gravel sized rock fragments

(C) **RESIDUAL:** red-brown, brown, dark gray, and white, saturated, soft to very stiff, saprolitic, micaceous, sandy SILT (A-4) with trace gravel sized rock fragments

(D) **WEATHERED ROCK:** (Biotite Gneiss)

(E) **CRYSTALLINE ROCK:** (Biotite Gneiss)

30+50.00

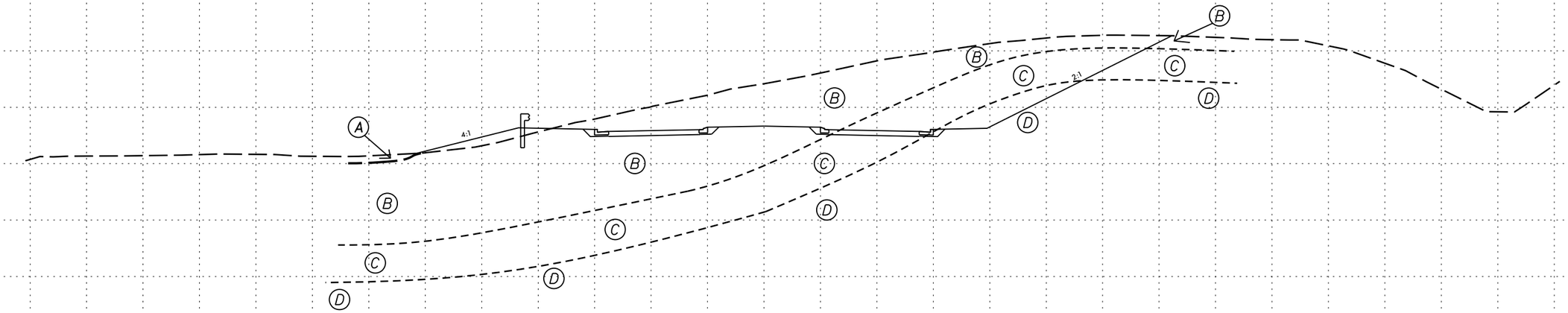


(A) **ALLUVIAL:** red-brown, tan, and gray, moist to saturated, loose to medium dense, silty SAND (A-2-4) with trace mica and organics

(B) **RESIDUAL:** brown, wet to saturated, medium stiff, micaceous, sandy SILT (A-4)

30+00.00

—L—



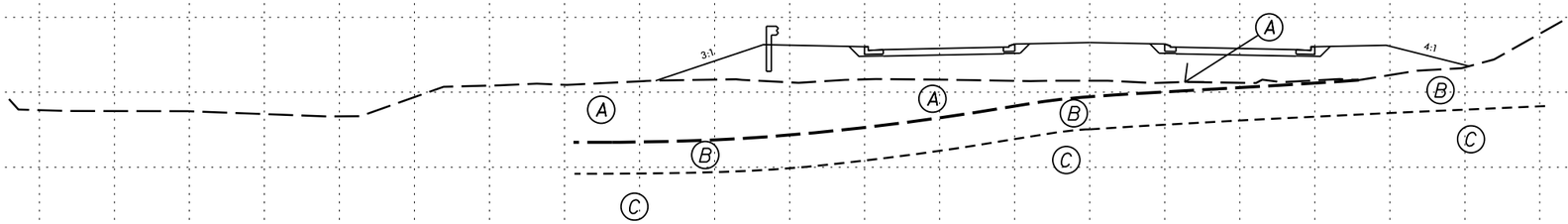
(A) **ALLUVIAL:** brown, tan, red-brown, gray, and green, moist to saturated, very loose to medium dense, silty SAND (A-2-4) and clayey, silty SAND (A-2-5) with some mica, trace gravel and organics

(B) **RESIDUAL:** brown, red-brown, light gray, and white, dry to moist, medium stiff to stiff, moderately to highly plastic, highly sandy, silty CLAY (A-7-5)

(C) **RESIDUAL:** red-brown, brown, dark gray, and white, saturated, soft to very stiff, saprolitic, micaceous, sandy SILT (A-4) with trace gravel sized rock fragments

(D) **RESIDUAL:** red-brown, brown, tan, and white, moist to saturated, loose to medium dense, saprolitic, micaceous, clayey, silty SAND (A-2-5) and silty SAND (A-2-4)

31+50.00

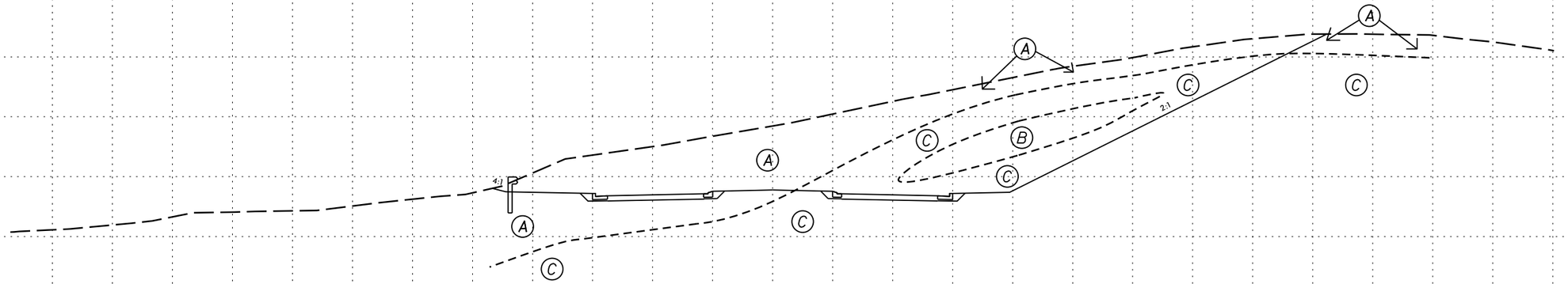


(A) **ALLUVIAL:** brown, tan, red-brown, gray, and green, moist to saturated, very loose to medium dense, silty SAND (A-2-4) and clayey, silty SAND (A-2-5) with some mica, trace gravel and organics

(B) **RESIDUAL:** red-brown, light gray, and white, dry to moist, medium stiff to stiff, moderately to highly plastic, highly sandy, silty CLAY (A-7-5)

(C) **RESIDUAL:** red-brown, brown, dark gray, and white, saturated, soft to very stiff, saprolitic, micaceous, sandy SILT (A-4) with trace gravel sized rock fragments

31+00.00



(A) **RESIDUAL:** brown, red-brown, light gray, and white, dry to moist, medium stiff to stiff, moderately to highly plastic, highly sandy, silty CLAY (A-7-5)

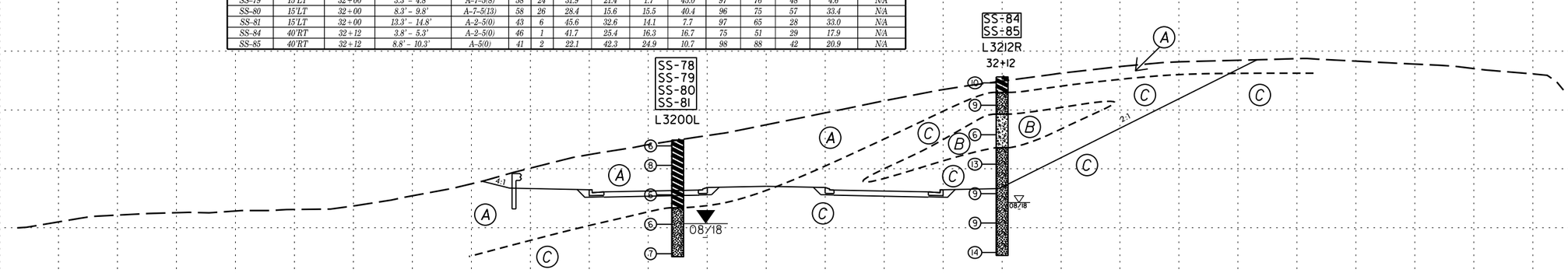
(B) **RESIDUAL:** red-brown and white, moist, medium stiff, highly sandy, clayey SILT (A-5)

(C) **RESIDUAL:** red-brown, brown, tan, and white, moist to saturated, loose to medium dense, saprolitic, micaceous, clayey, silty SAND (A-2-5) and silty SAND (A-2-4)

32+50.00

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-78	15'LT	32+00	0.0' - 1.5'	A-7-5(10)	70	35	36.8	22.5	9.7	31.0	98	73	43	29.2	N/A
SS-79	15'LT	32+00	3.3' - 4.8'	A-7-5(8)	58	24	31.9	21.4	1.7	45.0	97	76	48	4.6	N/A
SS-80	15'LT	32+00	8.3' - 9.8'	A-7-5(13)	58	26	28.4	15.6	15.5	40.4	96	75	57	33.4	N/A
SS-81	15'LT	32+00	13.3' - 14.8'	A-2-5(0)	43	6	45.6	32.6	14.1	7.7	97	65	28	33.0	N/A
SS-84	40'RT	32+12	3.8' - 5.3'	A-2-5(0)	46	1	41.7	25.4	16.3	16.7	75	51	29	17.9	N/A
SS-85	40'RT	32+12	8.8' - 10.3'	A-5(0)	41	2	22.1	42.3	24.9	10.7	98	88	42	20.9	N/A

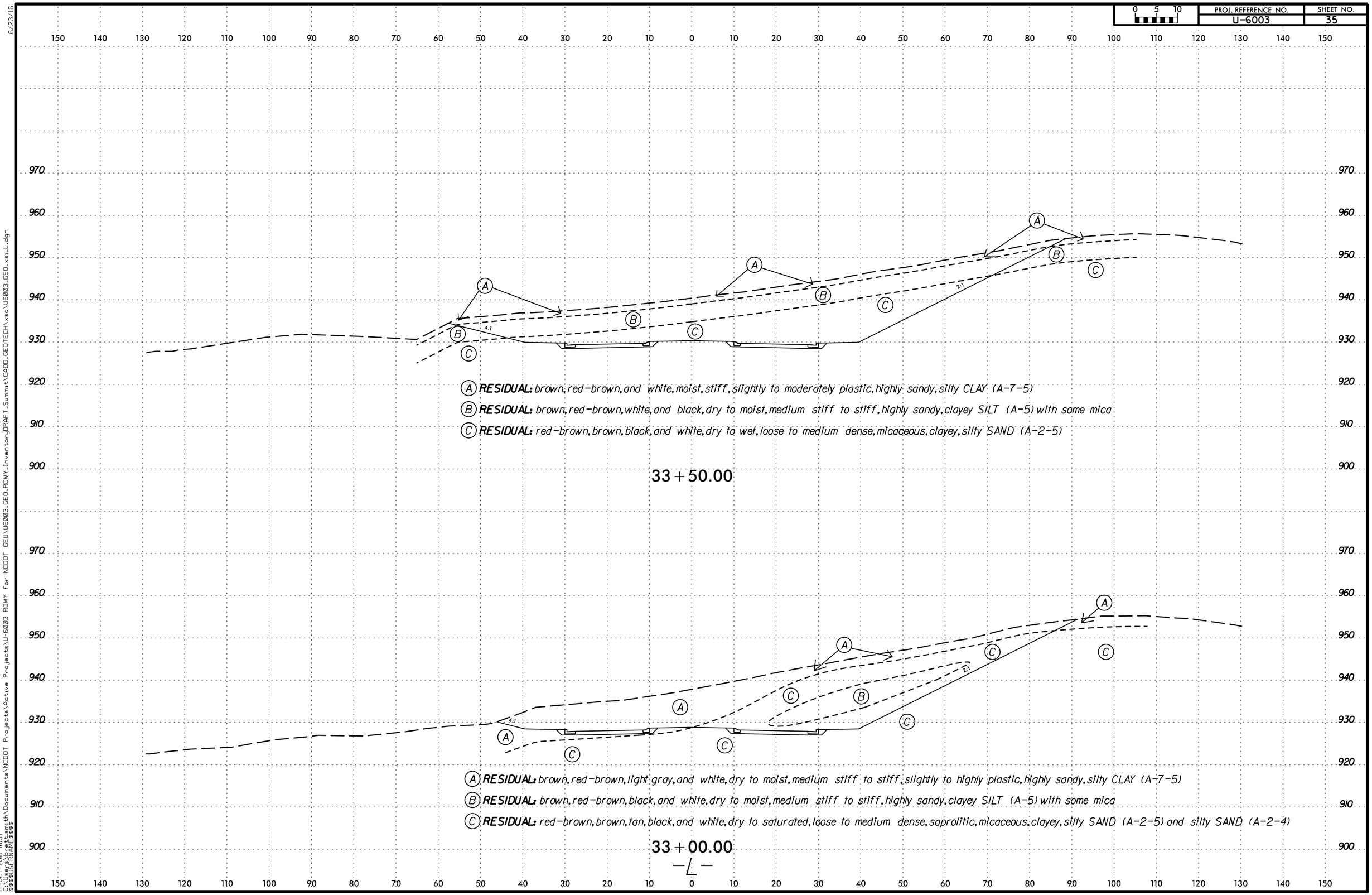


(A) **RESIDUAL:** brown, red-brown, light gray, and white, dry to moist, medium stiff to stiff, moderately to highly plastic, highly sandy, silty CLAY (A-7-5)

(B) **RESIDUAL:** red-brown and white, moist, medium stiff, highly sandy, clayey SILT (A-5)

(C) **RESIDUAL:** red-brown, brown, tan, and white, moist to saturated, loose to medium dense, saprolitic, micaceous, clayey, silty SAND (A-2-5) and silty SAND (A-2-4)

32+00.00



(A) **RESIDUAL:** brown, red-brown, and white, moist, stiff, slightly to moderately plastic, highly sandy, silty CLAY (A-7-5)

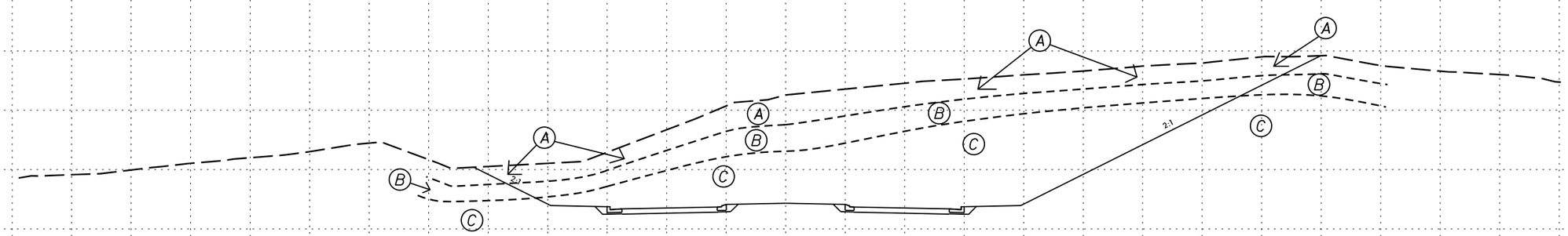
(B) **RESIDUAL:** brown, red-brown, white, and black, dry to moist, medium stiff to stiff, highly sandy, clayey SILT (A-5) with some mica

(C) **RESIDUAL:** red-brown, brown, black, and white, dry to wet, loose to medium dense, micaceous, clayey, silty SAND (A-2-5)

(A) **RESIDUAL:** brown, red-brown, light gray, and white, dry to moist, medium stiff to stiff, slightly to highly plastic, highly sandy, silty CLAY (A-7-5)

(B) **RESIDUAL:** brown, red-brown, black, and white, dry to moist, medium stiff to stiff, highly sandy, clayey SILT (A-5) with some mica

(C) **RESIDUAL:** red-brown, brown, tan, black, and white, dry to saturated, loose to medium dense, saprolitic, micaceous, clayey, silty SAND (A-2-5) and silty SAND (A-2-4)



(A) **RESIDUAL:** brown, red-brown, and white, moist, stiff, slightly to moderately plastic, highly sandy, silty CLAY (A-7-5)

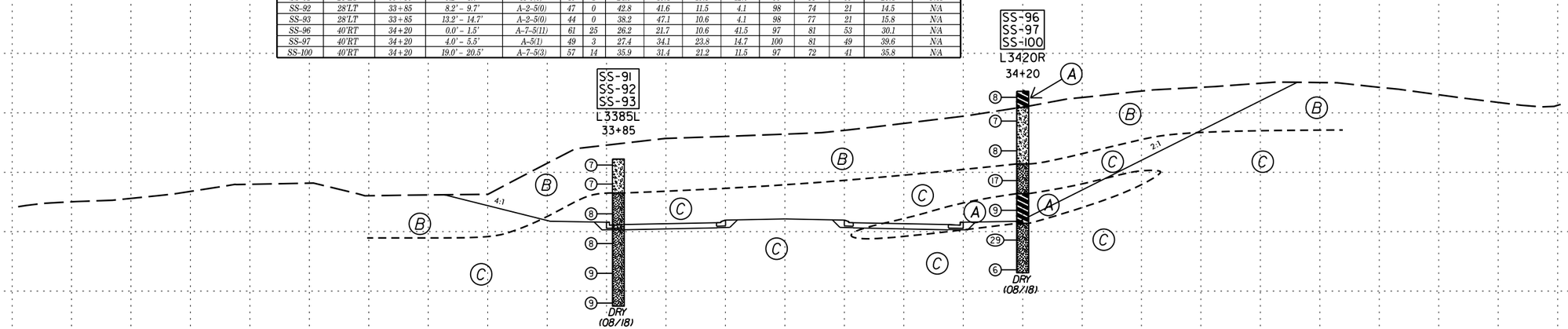
(B) **RESIDUAL:** brown, red-brown, white, and black, dry to moist, medium stiff to stiff, highly sandy, clayey SILT (A-5) with some mica

(C) **RESIDUAL:** red-brown, brown, black, and white, dry to wet, loose to medium dense, micaceous, clayey, silty SAND (A-2-5)

34+50.00

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-91	28'LT	33+85	3.2' – 4.7'	A-5(0)	45	1	24.9	43.4	19.8	12.0	99	88	39	25.4	N/A
SS-92	28'LT	33+85	8.2' – 9.7'	A-2-5(0)	47	0	42.8	41.6	11.5	4.1	98	74	21	14.5	N/A
SS-93	28'LT	33+85	13.2' – 14.7'	A-2-5(0)	44	0	38.2	47.1	10.6	4.1	98	77	21	15.8	N/A
SS-96	40'RT	34+20	0.0' – 1.5'	A-7-5(11)	61	25	26.2	21.7	10.6	41.5	97	81	53	30.1	N/A
SS-97	40'RT	34+20	4.0' – 5.5'	A-5(1)	49	3	27.4	34.1	23.8	14.7	100	81	49	39.6	N/A
SS-100	40'RT	34+20	19.0' – 20.5'	A-7-5(3)	57	14	35.9	31.4	21.2	11.5	97	72	41	35.8	N/A



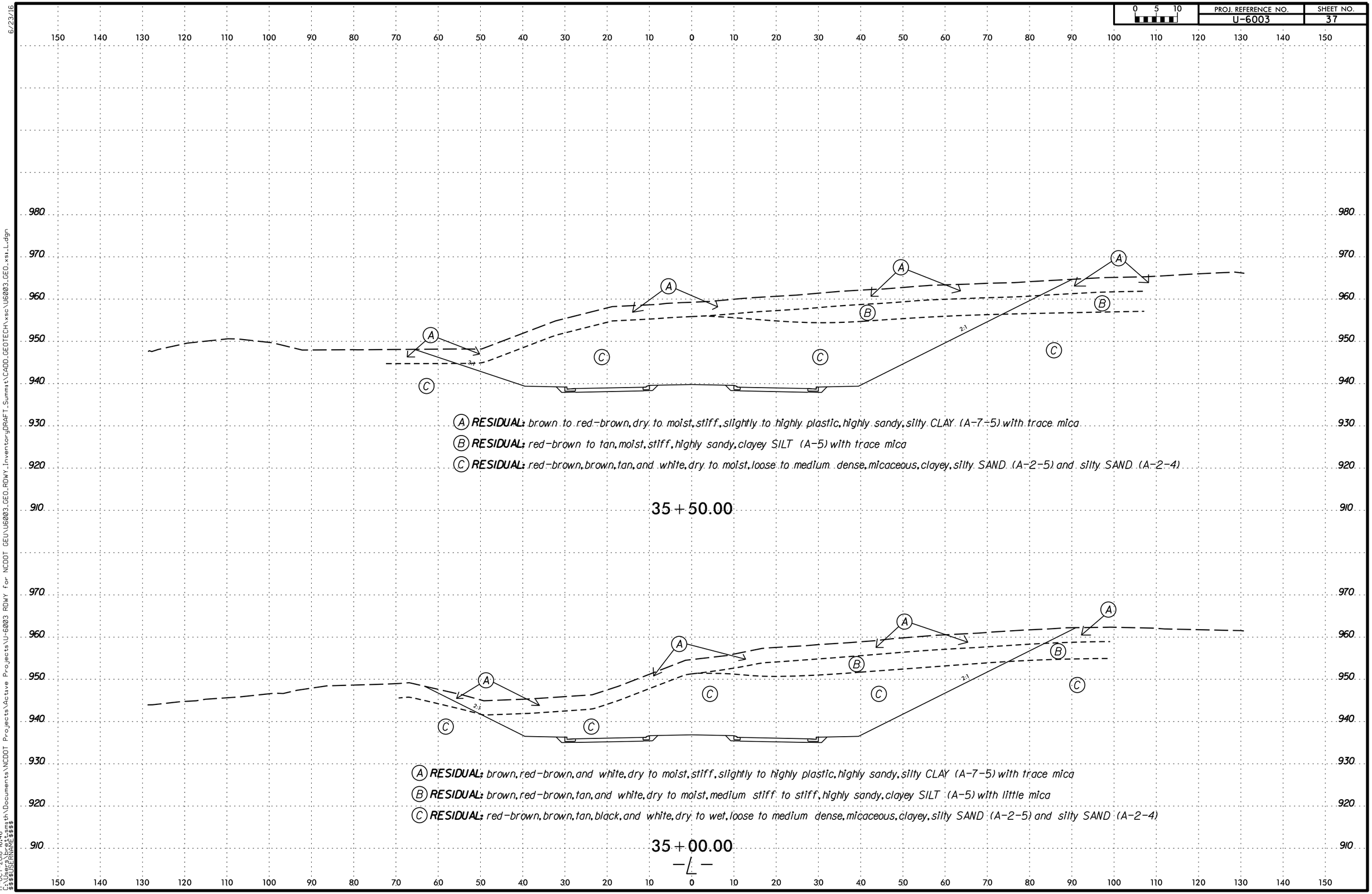
(A) **RESIDUAL:** brown, red-brown, and white, moist, stiff, slightly to moderately plastic, highly sandy, silty CLAY (A-7-5)

(B) **RESIDUAL:** brown, red-brown, white, and black, dry to moist, medium stiff to stiff, highly sandy, clayey SILT (A-5) with some mica

(C) **RESIDUAL:** red-brown, brown, black, and white, dry to wet, loose to medium dense, micaceous, clayey, silty SAND (A-2-5)

34+00.00

—L—



(A) **RESIDUAL:** *brown to red-brown, dry to moist, stiff, slightly to highly plastic, highly sandy, silty CLAY (A-7-5) with trace mica*

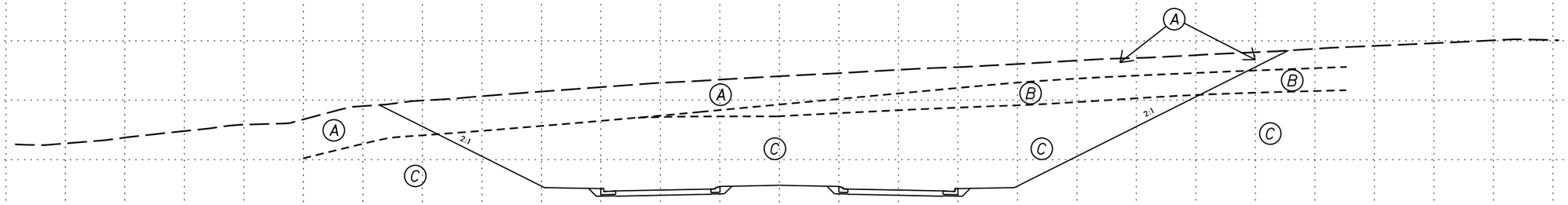
(B) **RESIDUAL:** *red-brown to tan, moist, stiff, highly sandy, clayey SILT (A-5) with trace mica*

(C) **RESIDUAL:** *red-brown, brown, tan, and white, dry to moist, loose to medium dense, micaceous, clayey, silty SAND (A-2-5) and silty SAND (A-2-4)*

(A) **RESIDUAL:** *brown, red-brown, and white, dry to moist, stiff, slightly to highly plastic, highly sandy, silty CLAY (A-7-5) with trace mica*

(B) **RESIDUAL:** *brown, red-brown, tan, and white, dry to moist, medium stiff to stiff, highly sandy, clayey SILT (A-5) with little mica*

(C) **RESIDUAL:** *red-brown, brown, tan, black, and white, dry to wet, loose to medium dense, micaceous, clayey, silty SAND (A-2-5) and silty SAND (A-2-4)*



(A) **RESIDUAL:** brown to red-brown, dry to moist, stiff, slightly to highly plastic, highly sandy, silty CLAY (A-7-5) with trace mica

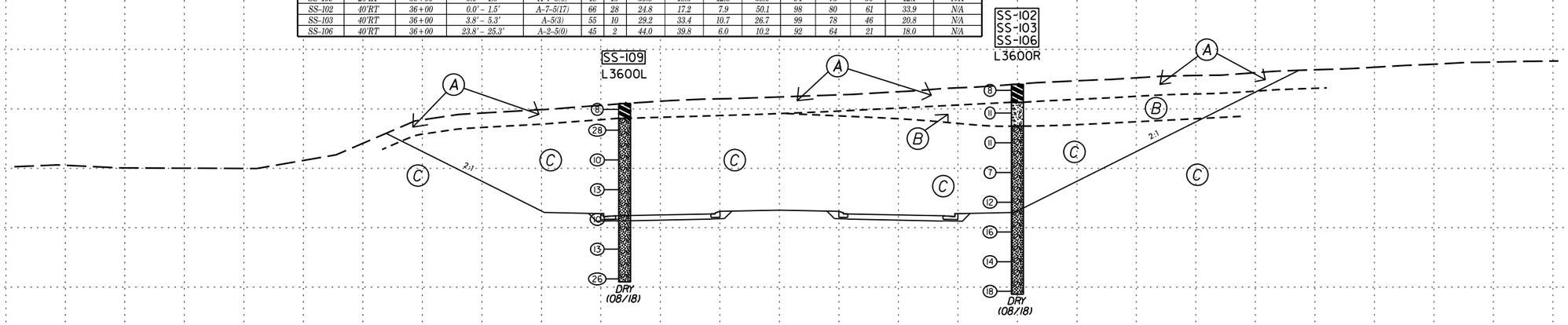
(B) **RESIDUAL:** red-brown to tan, moist, stiff, highly sandy, clayey SILT (A-5) with trace mica

(C) **RESIDUAL:** red-brown, brown, tan, and white, dry to moist, loose to medium dense, micaceous, clayey, silty SAND (A-2-5) and silty SAND (A-2-4)

36 + 50.00

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-109	26'LT	36+00	0.0' - 1.5'	A-7-5(6)	48	15	30.8	18.3	12.8	38.0	94	73	50	12.1	N/A
SS-102	40'RT	36+00	0.0' - 1.5'	A-7-5(17)	66	28	24.8	17.2	7.9	50.1	98	80	61	33.9	N/A
SS-103	40'RT	36+00	3.8' - 5.3'	A-5(3)	55	10	29.2	33.4	10.7	26.7	99	78	46	20.8	N/A
SS-106	40'RT	36+00	23.8' - 25.3'	A-2-5(0)	45	2	44.0	39.8	6.0	10.2	92	64	21	18.0	N/A



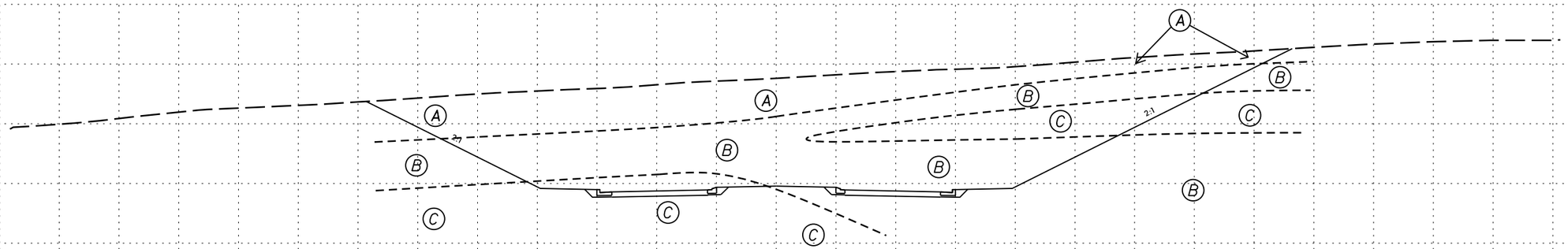
(A) **RESIDUAL:** brown to red-brown, dry to moist, stiff, slightly to highly plastic, highly sandy, silty CLAY (A-7-5) with trace mica

(B) **RESIDUAL:** red-brown to tan, moist, stiff, highly sandy, clayey SILT (A-5) with trace mica

(C) **RESIDUAL:** red-brown, brown, tan, and white, dry to moist, loose to medium dense, micaceous, clayey, silty SAND (A-2-5) and silty SAND (A-2-4)

36 + 00.00

— L —

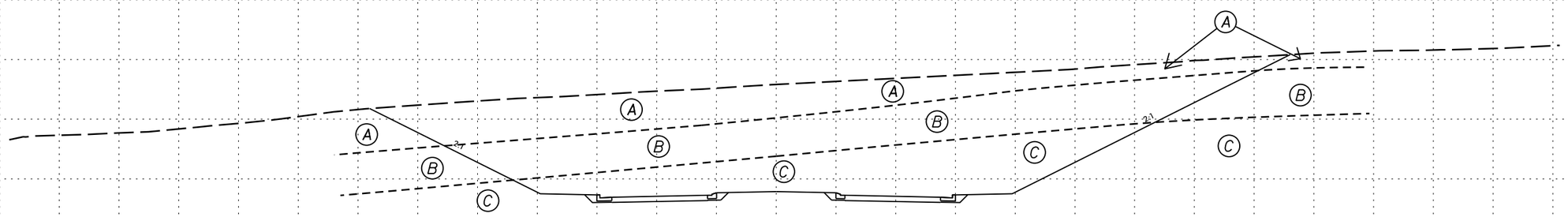


(A) **RESIDUAL:** red to red-brown, moist, stiff to very stiff, slightly to highly plastic, highly sandy, silty CLAY (A-7-5/A-7-6) with trace mica

(B) **RESIDUAL:** red-brown, brown, tan-brown, and white, dry to moist, stiff to very stiff, micaceous, highly sandy, clayey SILT (A-5)

(C) **RESIDUAL:** brown, red-brown, tan, and white, dry, medium dense, clayey, silty SAND (A-2-5) with trace mica

37+50.00



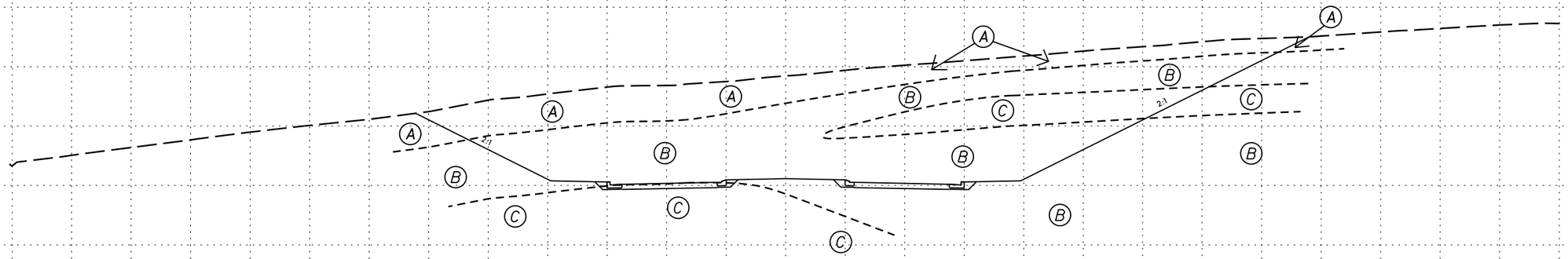
(A) **RESIDUAL:** red, red-brown, and brown, dry to moist, stiff to very stiff, slightly to highly plastic, highly sandy, silty CLAY (A-7-5/A-7-6) with trace mica

(B) **RESIDUAL:** red-brown, brown, tan-brown, and white, dry to moist, stiff to very stiff, micaceous, highly sandy, clayey SILT (A-5)

(C) **RESIDUAL:** brown, red-brown, tan, and white, dry to moist, loose to medium dense, micaceous, clayey, silty SAND (A-2-5) and silty SAND (A-2-4)

37+00.00

—L—



(A) **RESIDUAL:** red to red-brown, moist, stiff to very stiff, slightly to highly plastic, highly sandy, silty CLAY (A-7-5/A-7-6) with trace mica

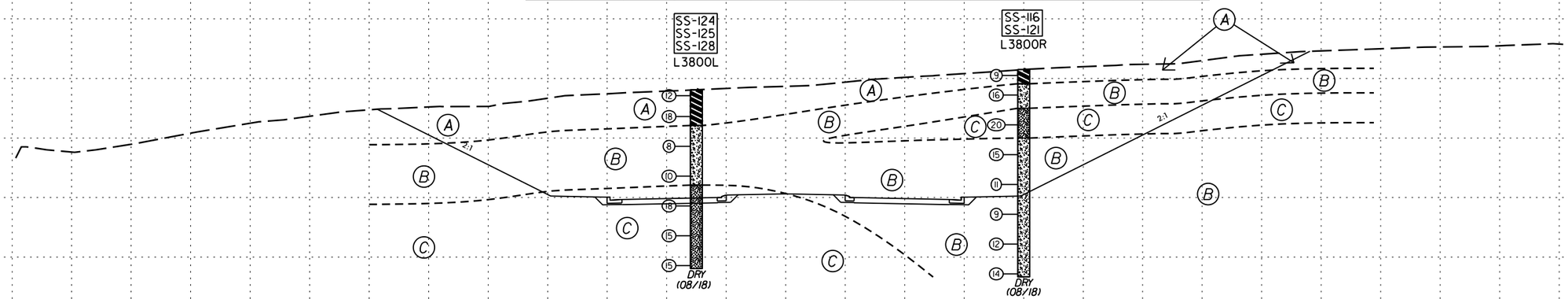
(B) **RESIDUAL:** red-brown, brown, tan-brown, and white, dry to moist, stiff to very stiff, micaceous, highly sandy, clayey SILT (A-5)

(C) **RESIDUAL:** brown, red-brown, tan, and white, dry, medium dense, clayey, silty SAND (A-2-5) with trace mica

38+50.00

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-124	15'LT	38+00	0.0' - 1.5'	A-7-6(5)	46	20	32.9	24.6	5.4	37.1	98	77	45	18.7	N/A
SS-125	15'LT	38+00	3.5' - 5.0'	A-7-5(5)	50	12	21.0	33.4	8.9	36.6	100	88	52	20.0	N/A
SS-128	15'LT	38+00	18.5' - 20.0'	A-2-5(0)	43	3	35.3	40.8	12.9	11.1	99	77	31	14.9	N/A
SS-116	40'RT	38+00	0.0' - 1.5'	A-7-5(14)	65	26	26.8	17.6	9.3	46.3	99	81	58	34.4	N/A
SS-121	40'RT	38+00	23.3' - 24.8'	A-5(0)	61	2	33.7	30.0	21.5	14.9	92	72	39	41.7	N/A



(A) **RESIDUAL:** red to red-brown, moist, stiff to very stiff, slightly to highly plastic, highly sandy, silty CLAY (A-7-5/A-7-6) with trace mica

(B) **RESIDUAL:** red-brown, brown, tan-brown, and white, dry to moist, stiff to very stiff, micaceous, highly sandy, clayey SILT (A-5)

(C) **RESIDUAL:** brown, red-brown, tan, and white, dry, medium dense, clayey, silty SAND (A-2-5) with trace mica

38+00.00

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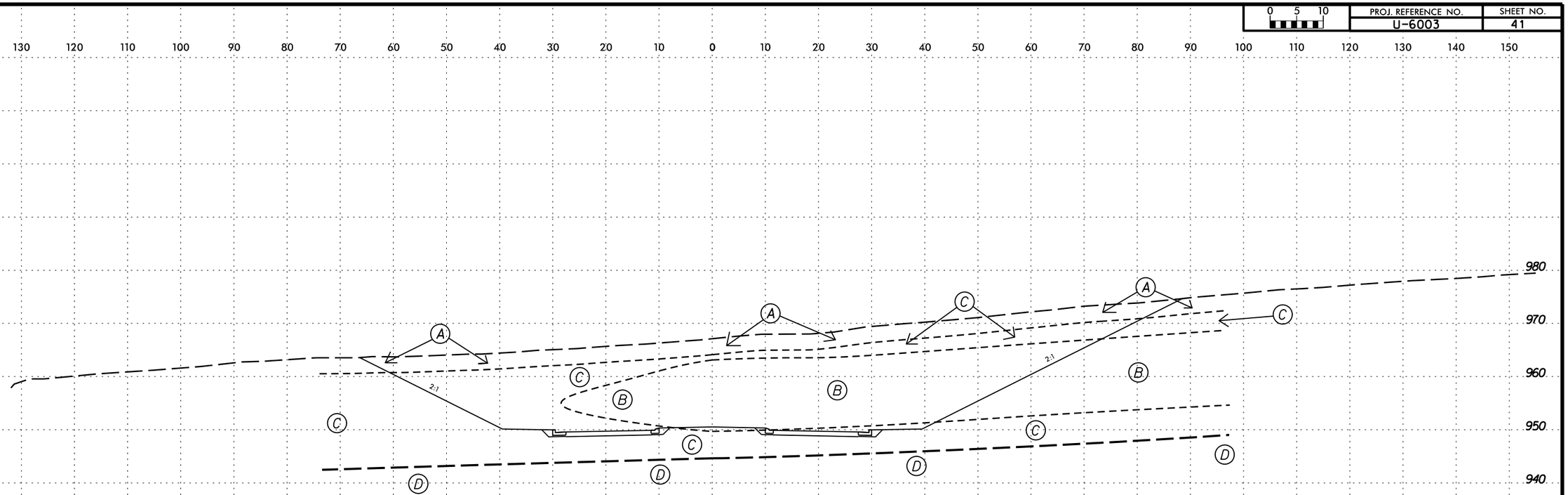


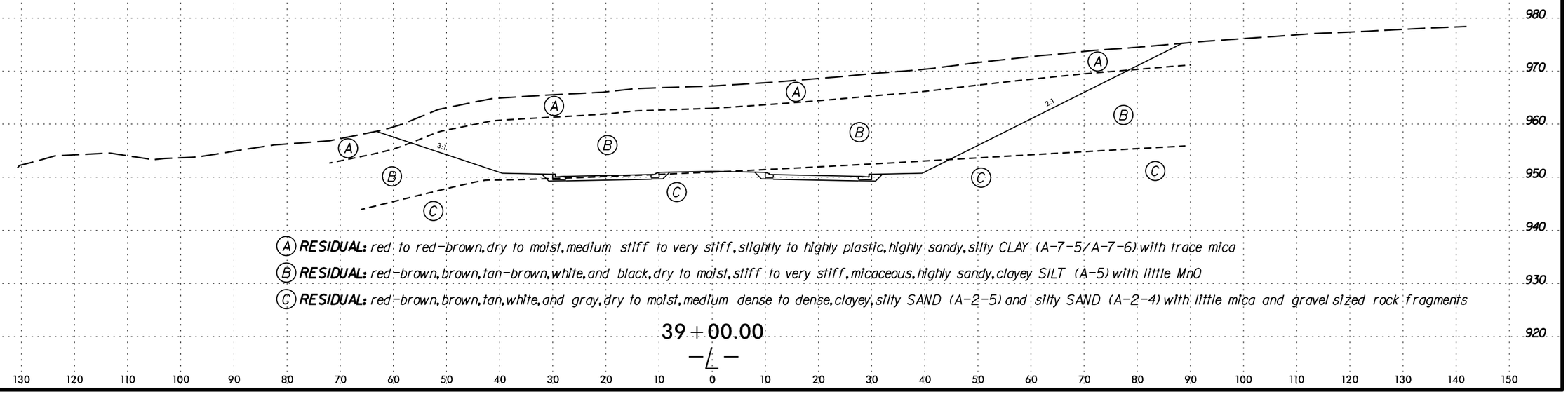
(A) **RESIDUAL:** *red to red-brown, dry to moist, medium stiff to stiff, moderately plastic, highly sandy, silty CLAY (A-7-5) with trace mica*

(B) **RESIDUAL:** *red-brown, brown, and black, dry to moist, stiff, highly sandy, clayey SILT (A-5) with little mica and MnO*

(C) **RESIDUAL:** *red-brown, brown, white, and gray, dry to moist, medium dense to dense, clayey, silty SAND (A-2-5) and silty SAND (A-2-4) with little mica and gravel sized rock fragments*

(D) **WEATHERED ROCK:** *(Granite)*

39 + 50.00



(A) **RESIDUAL:** *red to red-brown, dry to moist, medium stiff to very stiff, slightly to highly plastic, highly sandy, silty CLAY (A-7-5/A-7-6) with trace mica*

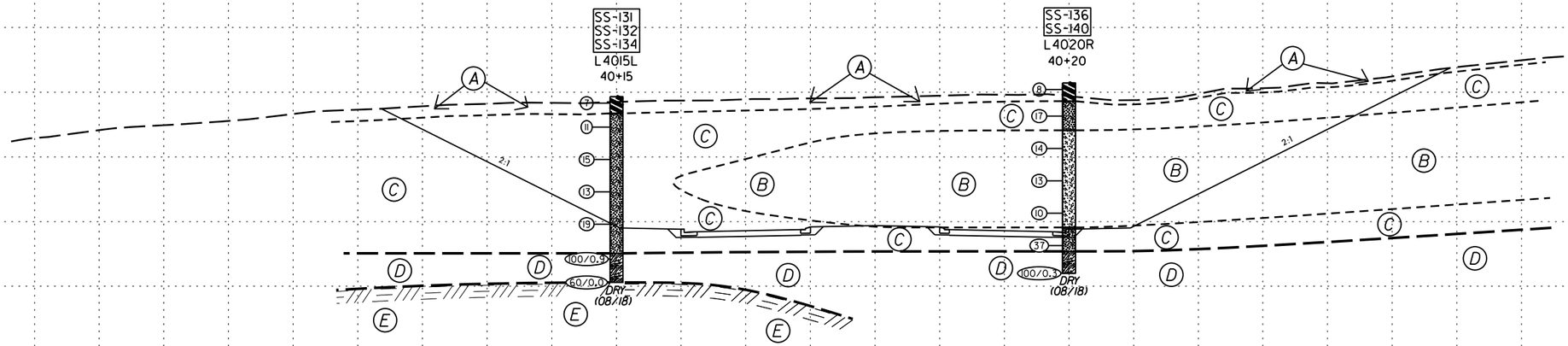
(B) **RESIDUAL:** *red-brown, brown, tan-brown, white, and black, dry to moist, stiff to very stiff, micaceous, highly sandy, clayey SILT (A-5) with little MnO*

(C) **RESIDUAL:** *red-brown, brown, tan, white, and gray, dry to moist, medium dense to dense, clayey, silty SAND (A-2-5) and silty SAND (A-2-4) with little mica and gravel sized rock fragments*

39 + 00.00

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-131	40'LT	40+15	0.0' - 1.5'	A-7-5(9)	55	24	28.5	20.5	11.2	39.8	94	76	51	18.7	N/A
SS-132	40'LT	40+15	3.7' - 5.2'	A-2-5(0)	49	4	38.2	39.4	5.0	17.4	98	77	27	21.3	N/A
SS-134	40'LT	40+15	13.7' - 15.2'	A-2-4(0)	35	3	43.3	42.8	4.7	9.1	90	70	17	13.6	N/A
SS-136	30'RT	40+20	0.0' - 1.5'	A-7-5(12)	58	25	29.4	17.6	8.3	44.7	98	78	54	25.6	N/A
SS-140	30'RT	40+20	19.1' - 20.6'	A-5(0)	45	5	23.6	46.7	20.8	9.0	100	86	40	26.8	N/A



(A) **RESIDUAL:** red to red-brown, dry to moist, medium stiff to stiff, moderately plastic, highly sandy, silty CLAY (A-7-5) with trace mica

(B) **RESIDUAL:** red-brown, brown, and black, dry to moist, stiff, highly sandy, clayey SILT (A-5) with little mica and MnO

(C) **RESIDUAL:** red-brown, brown, white, and gray, dry to moist, medium dense to dense, clayey, silty SAND (A-2-5) and silty SAND (A-2-4) with little mica and gravel sized rock fragments

(D) **WEATHERED ROCK:** (Granite)

(E) **CRYSTALLINE ROCK:** (Granite)

40+00.00

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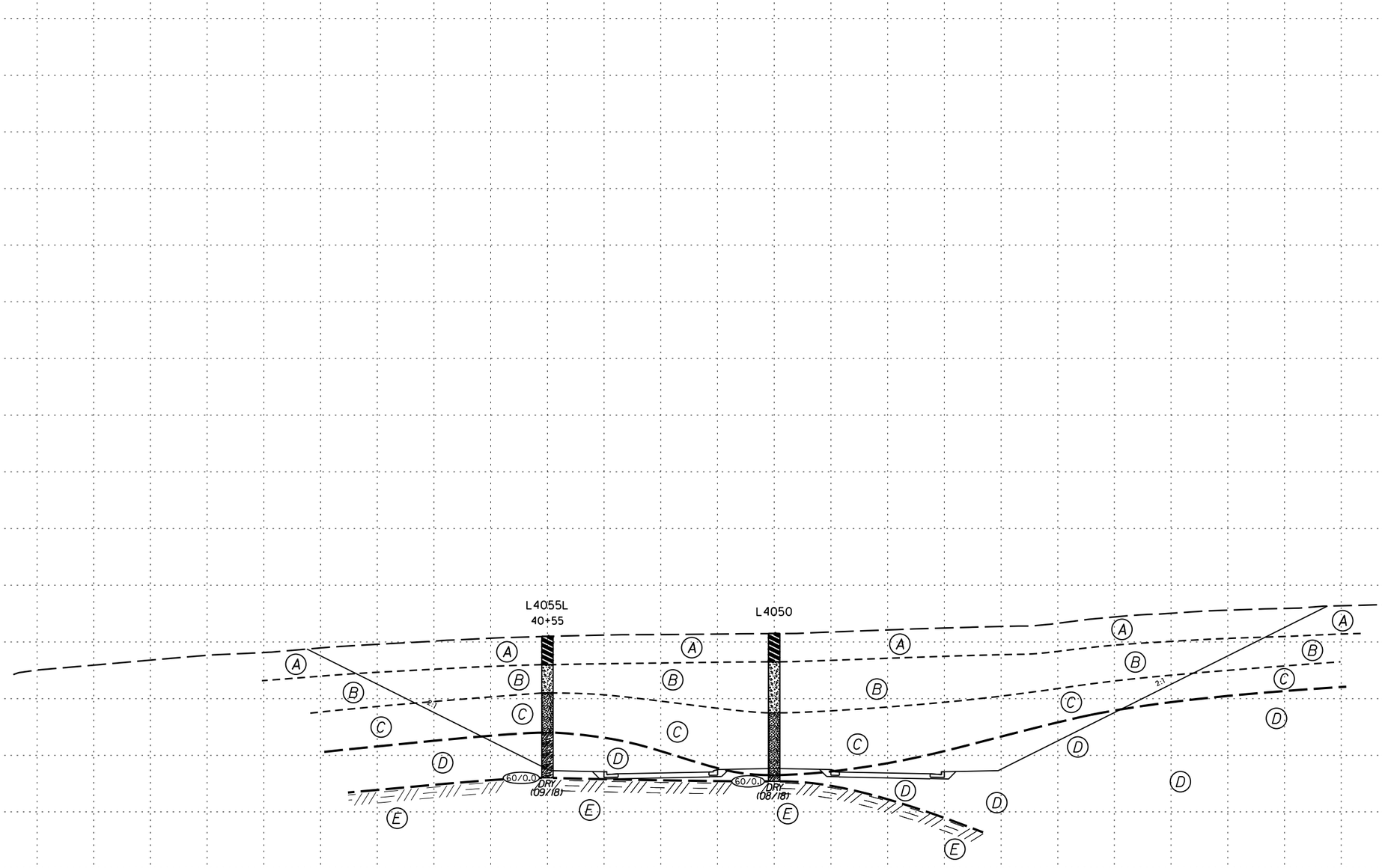
6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-6003	43



(A) **RESIDUAL:** *red to red-brown, dry to moist, medium stiff to stiff, moderately plastic, highly sandy, silty CLAY (A-7-5) with trace mica*

(B) **RESIDUAL:** *red-brown, brown, and black, dry to moist, stiff, highly sandy, clayey SILT (A-5) with little mica and MnO*

(C) **RESIDUAL:** *red-brown, brown, white, and gray, dry to moist, medium dense to dense, clayey, silty SAND (A-2-5) and silty SAND (A-2-4) with little mica and gravel sized rock fragments*

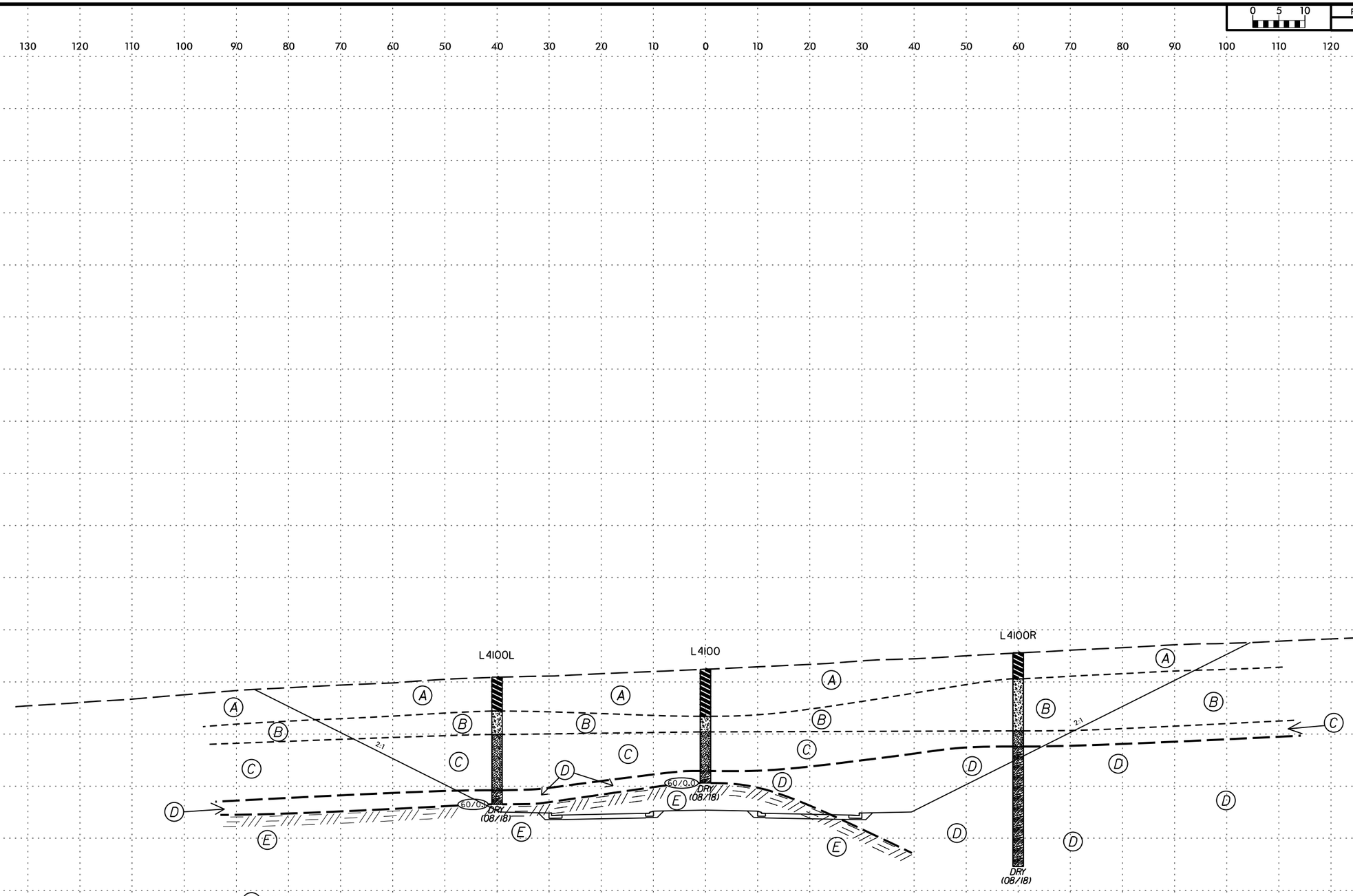
(D) **WEATHERED ROCK:** *(Granite)*

(E) **CRYSTALLINE ROCK:** *(Granite)*

40+50.00

-L-

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-6003	44



(A) **RESIDUAL:** *red to red-brown, dry to moist, medium stiff to stiff, moderately plastic, highly sandy, silty CLAY (A-7-5/A-7-6) with trace mica*

(B) **RESIDUAL:** *red-brown, maroon-brown, brown, and black, dry to moist, stiff, highly sandy, clayey SILT (A-5) with little mica and MnO*

(C) **RESIDUAL:** *red-brown, brown, gray, white, and black, dry to moist, medium dense to dense, micaceous, clayey, silty SAND (A-2-5) and silty SAND (A-2-4) with little gravel sized rock fragments*

(D) **WEATHERED ROCK:** *(Granite)*

(E) **CRYSTALLINE ROCK:** *(Granite)*

41+00.00

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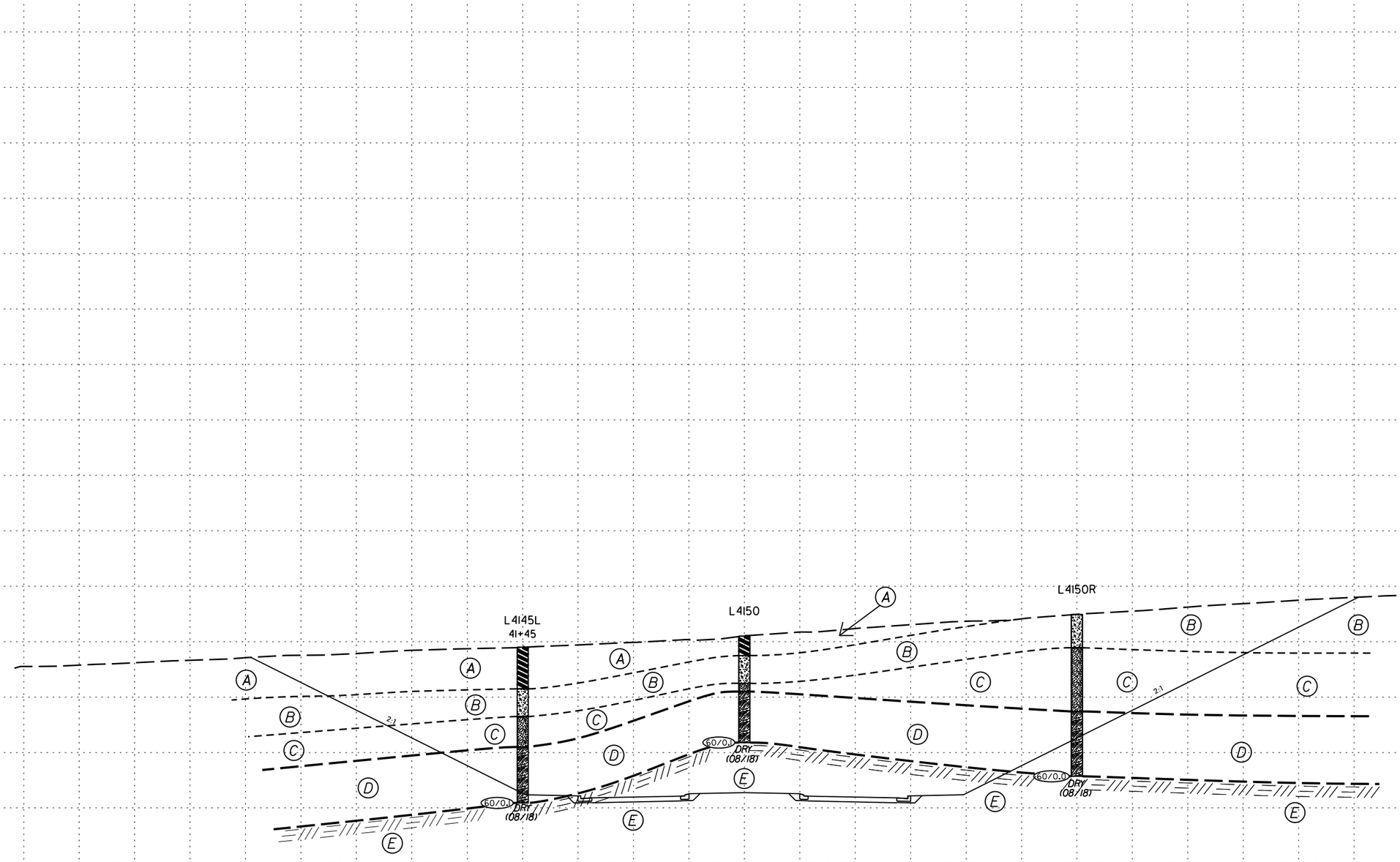
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-6003	45



(A) **RESIDUAL:** red-brown, moist, medium stiff to stiff, moderately plastic, highly sandy, silty CLAY (A-7-5/A-7-6)

(B) **RESIDUAL:** maroon-brown, moist, stiff, highly sandy, clayey SILT (A-5) with little mica

(C) **RESIDUAL:** red-brown, brown, gray, white, and black, dry to moist, medium dense, micaceous, clayey, silty SAND (A-2-5) and silty SAND (A-2-4)

(D) **WEATHERED ROCK:** (Granite)

(E) **CRYSTALLINE ROCK:** (Granite)

41+50.00

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6/23/16

18-OCT-2018 14:28
C:\Users\tsmith\Documents\NCDOT Projects\Active Projects\U-6003 RDWY for NCDOT GEU\U6003_GEO_RDWY_Inventory_DRAFT_Summit\CADD_GEOTECH\xsc\U6003_GEO_xs1_L.dgn
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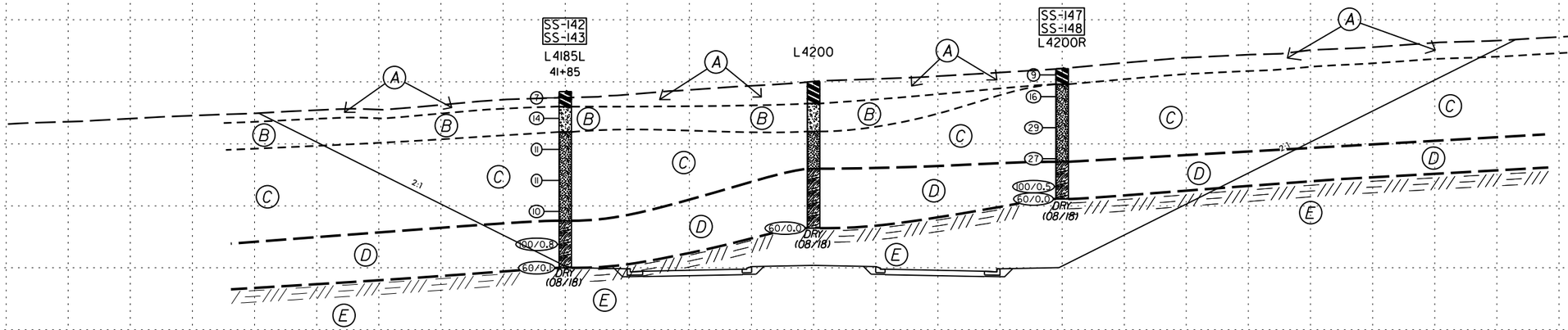
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-142	40'LT	41+85	0.0' - 1.5'	A-7-6(6)	45	19	36.2	19.0	9.4	35.3	98	73	47	24.3	N/A
SS-143	40'LT	41+85	3.3' - 4.8'	A-5(3)	53	10	27.1	32.9	16.1	23.9	100	83	46	24.5	N/A
SS-147	40'RT	42+00	0.0' - 1.5'	A-7-5(6)	53	20	31.5	23.9	8.6	36.0	97	76	46	24.1	N/A
SS-148	40'RT	42+00	3.5' - 5.0'	A-2-5(0)	50	3	42.8	34.3	7.3	15.6	98	70	28	20.7	N/A



(A) **RESIDUAL:** red-brown, moist, medium stiff to stiff, moderately plastic, highly sandy, silty CLAY (A-7-5/A-7-6)

(B) **RESIDUAL:** maroon-brown, moist, stiff, highly sandy, clayey SILT (A-5) with little mica

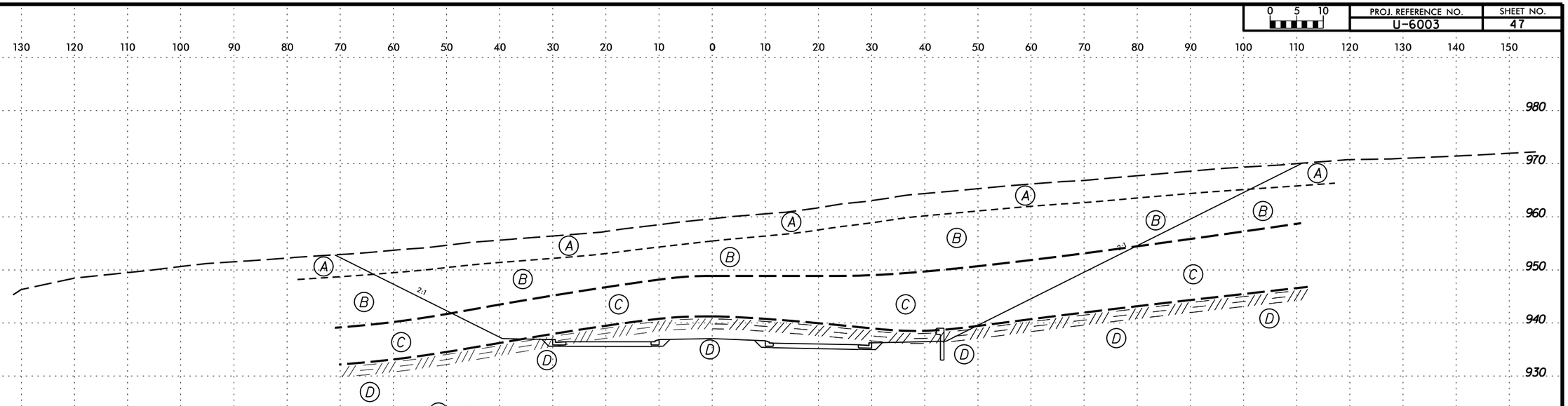
(C) **RESIDUAL:** red-brown, brown, gray, white, and black, dry to moist, medium dense, micaceous, clayey, silty SAND (A-2-5) and silty SAND (A-2-4)

(D) **WEATHERED ROCK:** (Granite)

(E) **CRYSTALLINE ROCK:** (Granite)

42 + 00.00

$-\underline{L}-$



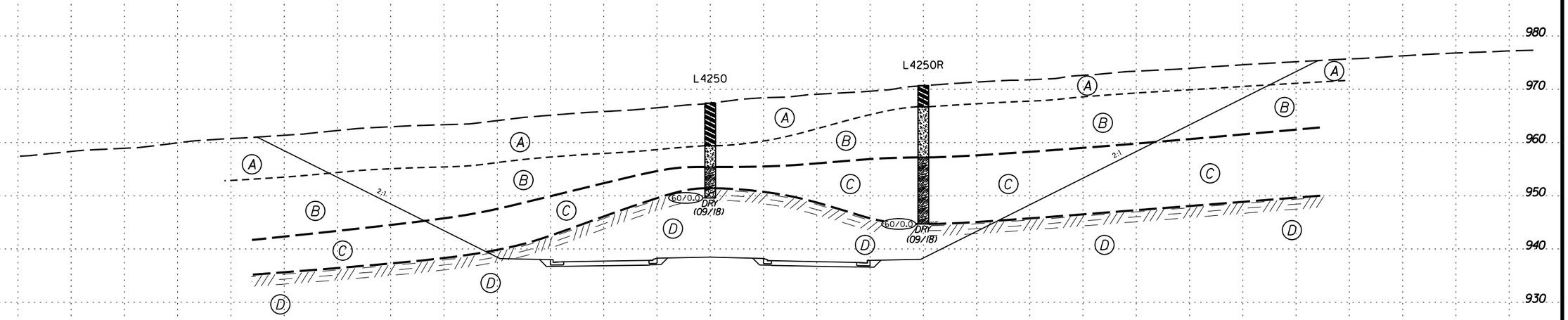
(A) **RESIDUAL:** red-brown, moist, medium stiff to stiff, moderately plastic, highly sandy, silty CLAY (A-7-5/A-7-6)

(B) **RESIDUAL:** maroon-brown, moist, stiff, highly sandy, clayey SILT (A-5) with little mica

(C) **WEATHERED ROCK:** (Granite)

(D) **CRYSTALLINE ROCK:** (Granite)

43+00.00



(A) **RESIDUAL:** red-brown, moist, medium stiff to stiff, moderately plastic, highly sandy, silty CLAY (A-7-5/A-7-6)

(B) **RESIDUAL:** maroon-brown, moist, stiff, highly sandy, clayey SILT (A-5) with little mica

(C) **WEATHERED ROCK:** (Granite)

(D) **CRYSTALLINE ROCK:** (Granite)

42+50.00

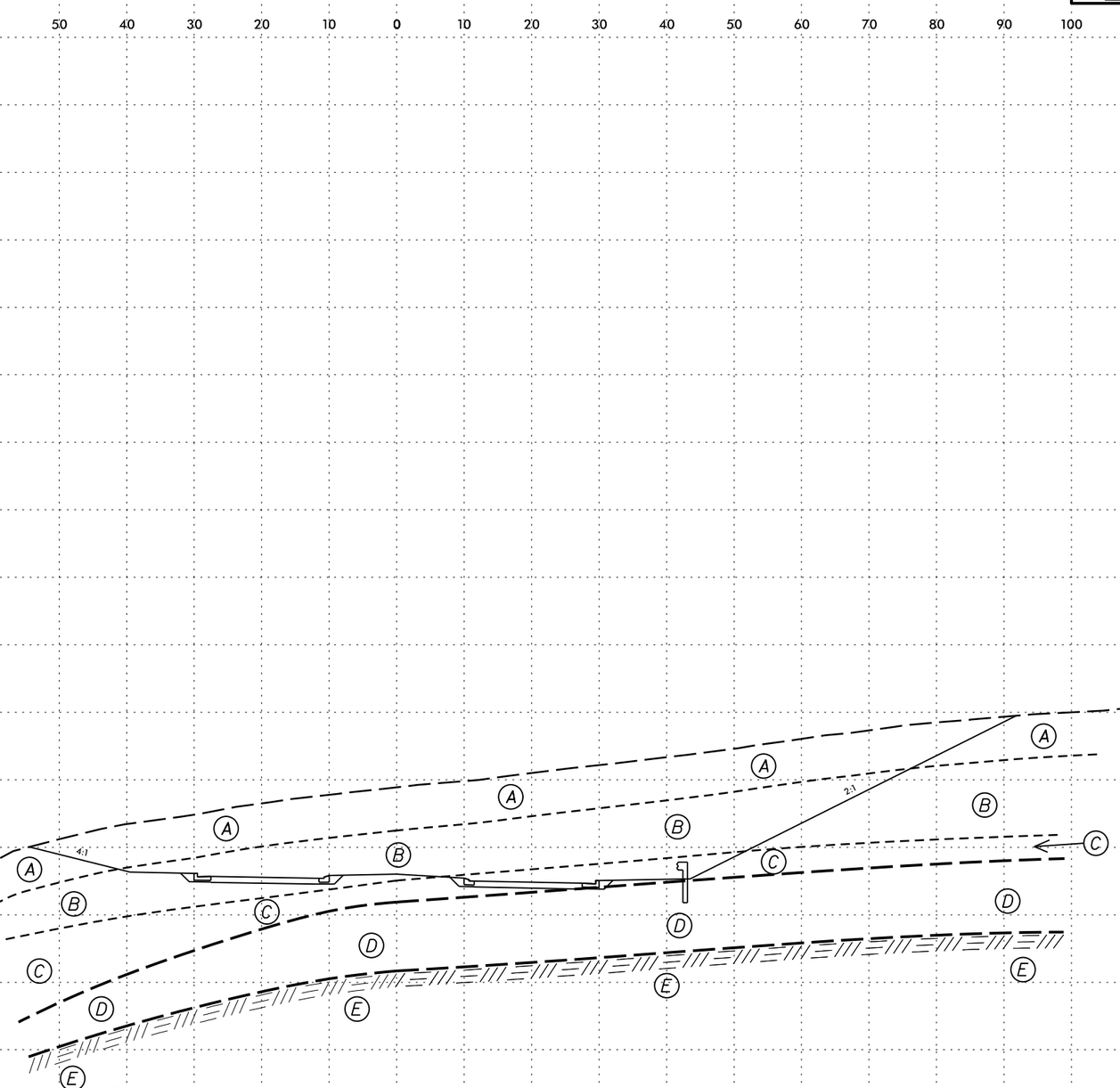
$-\underline{L}-$

PROJ. REFERENCE NO.	SHEET NO.
U-6003	48

0 5 10

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

970 960 950 940 930 920 910 900 890 880



(A) **RESIDUAL:** red-brown, moist, medium stiff to stiff, moderately plastic, highly sandy, silty CLAY (A-7-5/A-7-6)

(B) **RESIDUAL:** maroon-brown, moist, stiff, highly sandy, clayey SILT (A-5) with little mica

(C) **RESIDUAL:** brown, dark brown, and black, saturated, loose, saprolitic, micaceous, clayey, silty SAND (A-2-5)

(D) **WEATHERED ROCK:** (Granite)

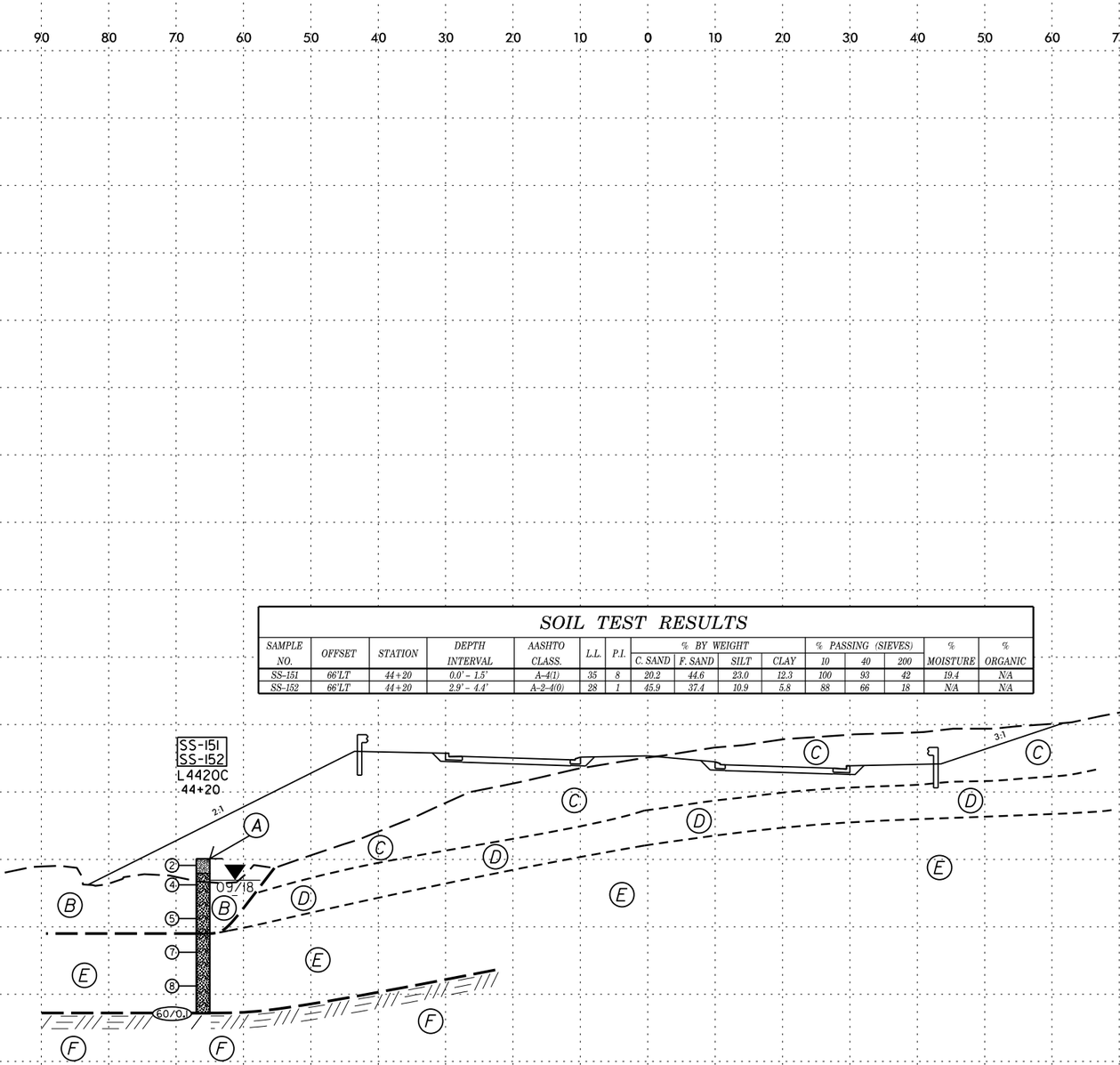
(E) **CRYSTALLINE ROCK:** (Granite)

43 + 50.00

$-\underline{L}-$

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-151	66'LT	44+20	0.0' - 1.5'	A-4(1)	35	8	20.2	44.6	23.0	12.3	100	93	42	19.4	N/A
SS-152	66'LT	44+20	2.9' - 4.4'	A-2-4(0)	28	1	45.9	37.4	10.9	5.8	88	66	18	N/A	N/A



(A) **ALLUVIAL:** brown to light brown, moist, soft, sandy SILT (A-4) with trace organics

(B) **ALLUVIAL:** gray, wet to saturated, loose, silty SAND (A-2-4)

(C) **RESIDUAL:** red-brown, moist, medium stiff to stiff, moderately plastic, highly sandy, silty CLAY (A-7-5/A-7-6)

(D) **RESIDUAL:** maroon-brown, moist, stiff, highly sandy, clayey SILT (A-5) with little mica

(E) **RESIDUAL:** brown, dark brown, and black, saturated, loose, saprolitic, micaceous, clayey, silty SAND (A-2-5)

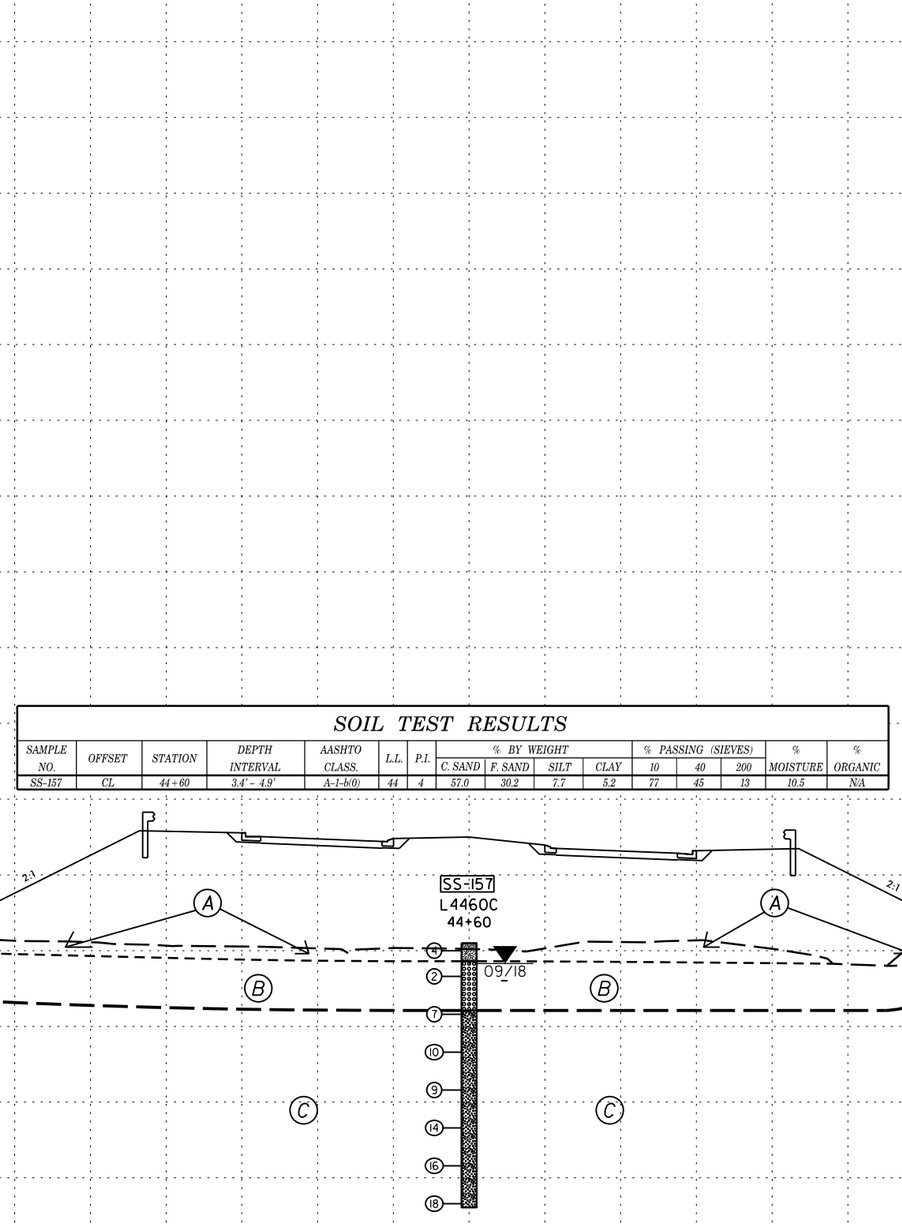
(F) **CRYSTALLINE ROCK:** (Biotite Gneiss)

44+00.00

-L-

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-157	CL	44+60	3.4' - 4.9'	A-1-b(0)	44	4	57.0	30.2	7.7	5.2	77	45	13	10.5	N/A



(A) **ALLUVIAL:** brown to light brown, moist, soft, sandy SILT (A-4) with trace organics

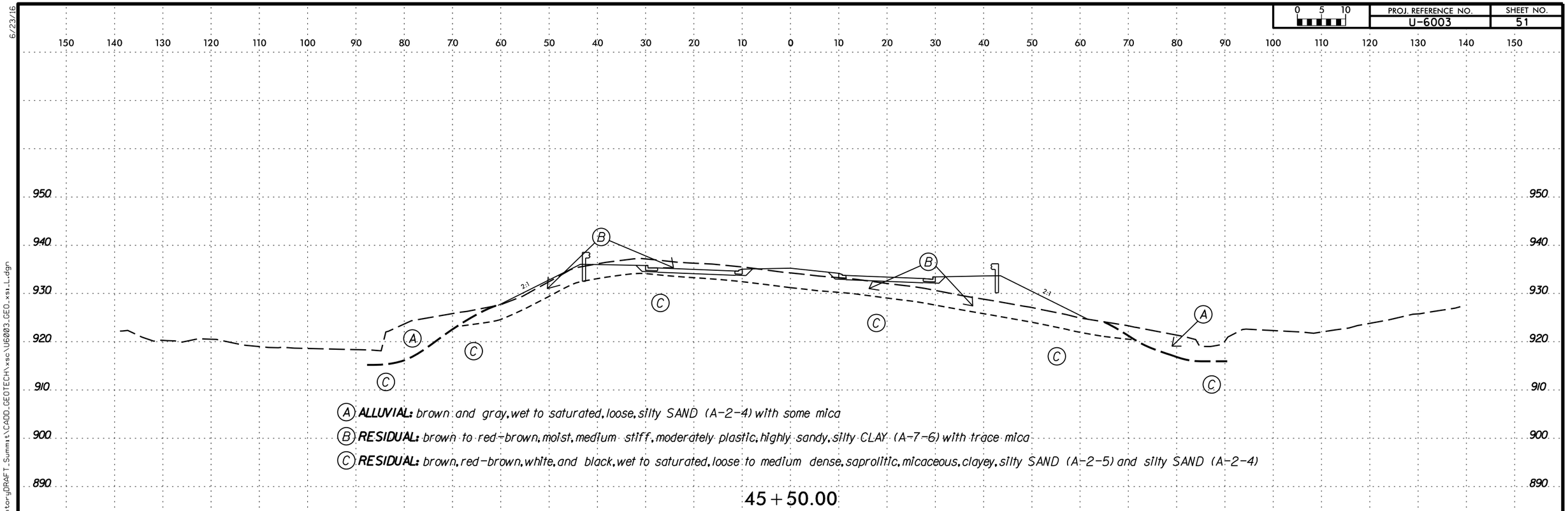
(B) **ALLUVIAL:** gray, saturated, very loose, fine to coarse SAND (A-1-b)

(C) **RESIDUAL:** brown, red-brown, and black, saturated, loose to medium dense, saprolitic, micaceous, silty SAND (A-2-4) and clayey, silty SAND (A-2-5)

44+50.00

—L—

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-6003	51

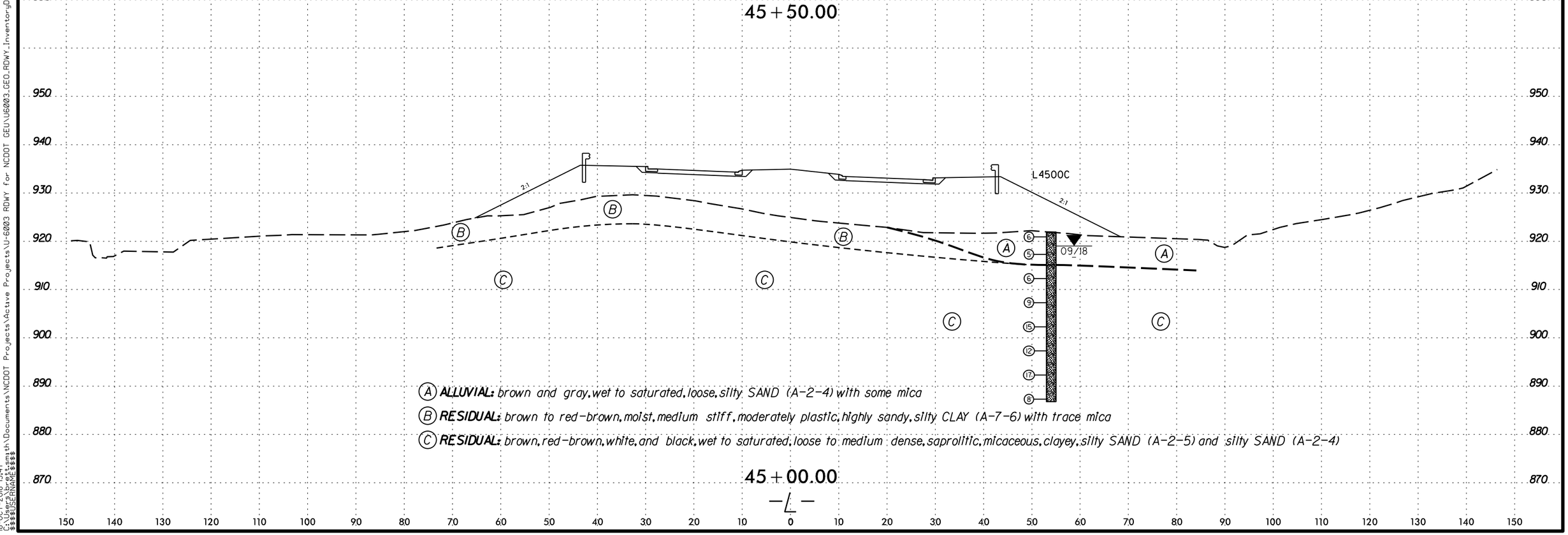


(A) **ALLUVIAL:** brown and gray, wet to saturated, loose, silty SAND (A-2-4) with some mica

(B) **RESIDUAL:** brown to red-brown, moist, medium stiff, moderately plastic, highly sandy, silty CLAY (A-7-6) with trace mica

(C) **RESIDUAL:** brown, red-brown, white, and black, wet to saturated, loose to medium dense, saprolitic, micaceous, clayey, silty SAND (A-2-5) and silty SAND (A-2-4)

45 + 50.00



(A) **ALLUVIAL:** brown and gray, wet to saturated, loose, silty SAND (A-2-4) with some mica

(B) **RESIDUAL:** brown to red-brown, moist, medium stiff, moderately plastic, highly sandy, silty CLAY (A-7-6) with trace mica

(C) **RESIDUAL:** brown, red-brown, white, and black, wet to saturated, loose to medium dense, saprolitic, micaceous, clayey, silty SAND (A-2-5) and silty SAND (A-2-4)

45 + 00.00

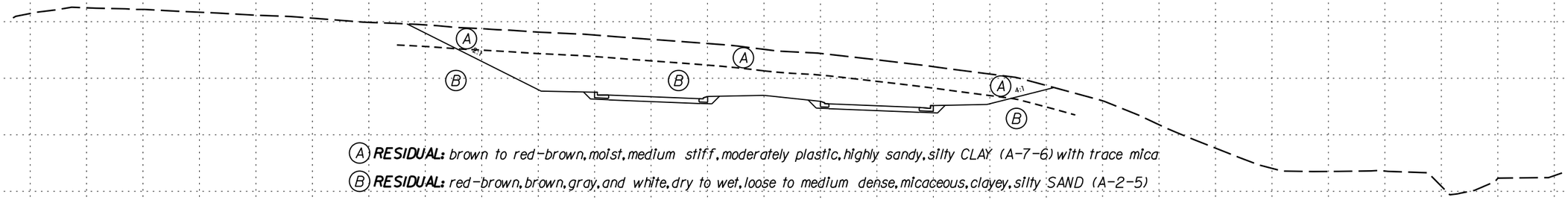
— L —

PROJ. REFERENCE NO.	SHEET NO.
U-6003	52

0 5 10

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

960 950 940 930 920 910 900



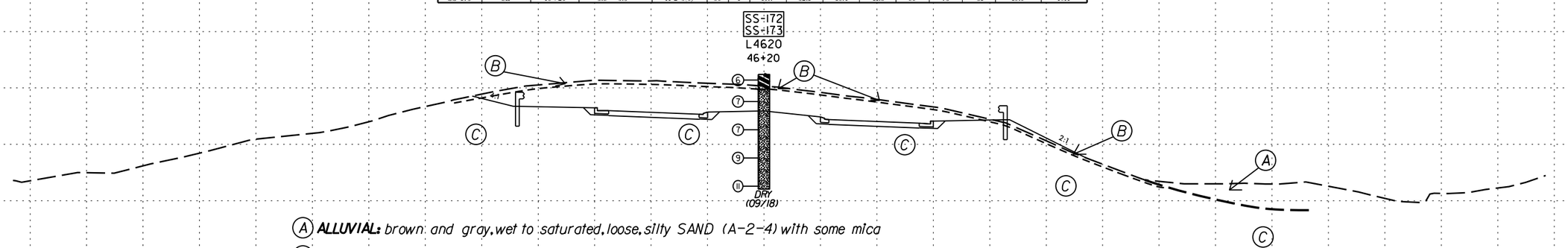
(A) **RESIDUAL:** brown to red-brown, moist, medium stiff, moderately plastic, highly sandy, silty CLAY (A-7-6) with trace mica

(B) **RESIDUAL:** red-brown, brown, gray, and white, dry to wet, loose to medium dense, micaceous, clayey, silty SAND (A-2-5)

46+50.00

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-172	CL	46+20	0.0' - 1.5'	A-7-6(4)	49	21	40.3	19.9	11.2	28.6	98	70	41	16.4	N/A
SS-173	CL	46+20	3.8' - 5.3'	A-2-5(0)	50	4	40.7	32.1	15.4	11.8	99	73	31	19.0	N/A



(A) **ALLUVIAL:** brown and gray, wet to saturated, loose, silty SAND (A-2-4) with some mica

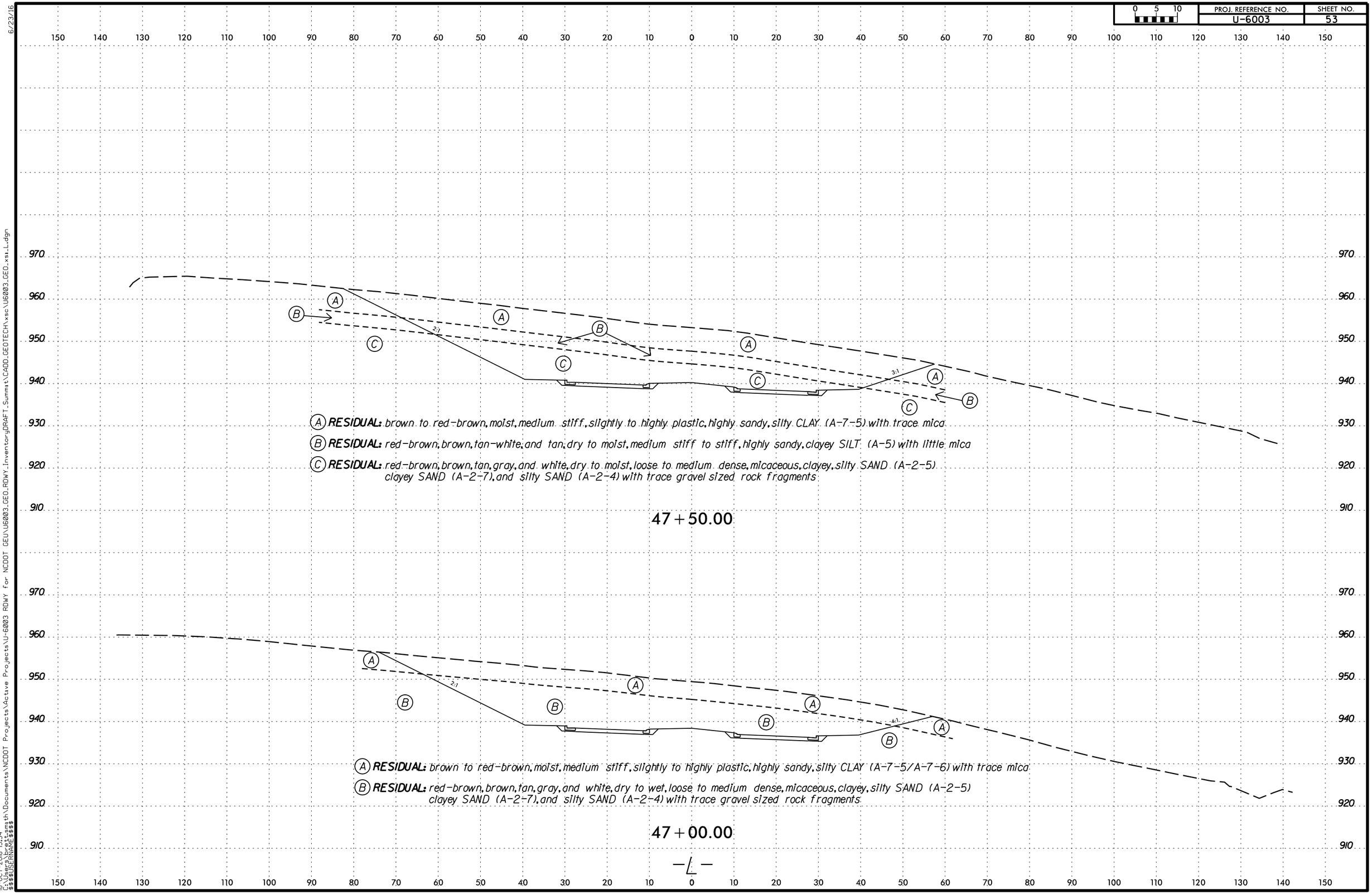
(B) **RESIDUAL:** brown to red-brown, moist, medium stiff, moderately plastic, highly sandy, silty CLAY (A-7-6) with trace mica

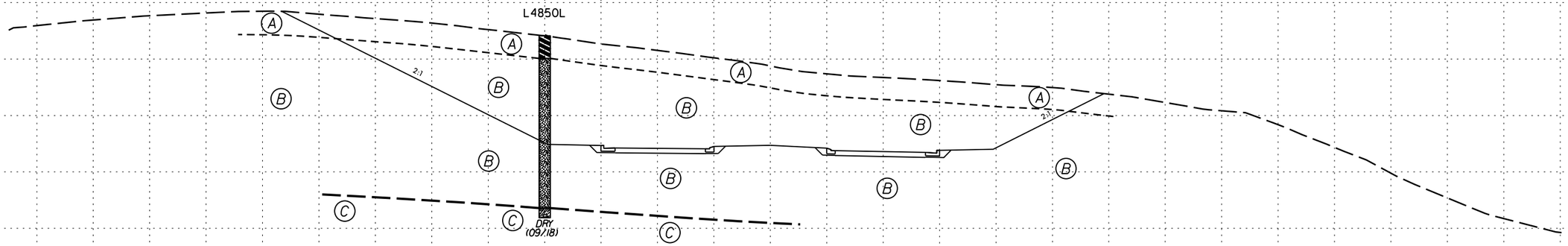
(C) **RESIDUAL:** red-brown, brown, gray, and white, dry to wet, loose to medium dense, micaceous, clayey, silty SAND (A-2-5)

46+00.00

6/23/16

18-OCT-2018 15:52
C:\Users\jsmith\Documents\NCDOT Projects\Active Projects\U-6003 RDWY for NCDOT GEU\U6003_GEO_RDWY_InventorygDRAFT_Summit\CADD_GEOTECH\xsc\U6003_GEO_xs1_L.dgn
$$$$USERNAME$$$$





(A) **RESIDUAL:** *brown to red-brown, moist, medium stiff, slightly to highly plastic, highly sandy, silty CLAY (A-7-5) with trace mica*

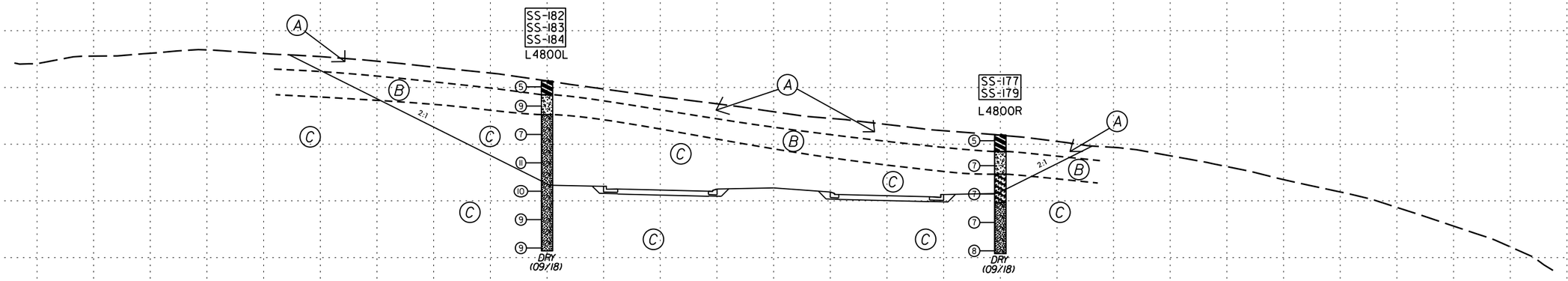
(B) **RESIDUAL:** *red-brown, brown, tan, gray, and white, dry to moist, loose to medium dense, micaceous, clayey, silty SAND (A-2-5) clayey SAND (A-2-7), and silty SAND (A-2-4) with trace gravel sized rock fragments*

(C) **WEATHERED ROCK:** *(Granite)*

48+50.00

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-182	40'LT	48+00	0.0' - 1.5'	A-7-5(16)	65	27	21.4	21.0	13.8	43.7	99	86	60	16.6	N/A
SS-183	40'LT	48+00	3.4' - 4.9'	A-5(0)	55	10	38.0	30.6	17.2	14.2	99	74	36	18.8	N/A
SS-184	40'LT	48+00	8.4' - 9.9'	A-2-5(0)	50	3	32.5	45.8	14.4	7.3	100	85	28	11.0	N/A
SS-177	40'RT	48+00	0.0' - 1.5'	A-7-5(6)	56	14	27.0	25.1	13.3	34.7	98	83	51	26.1	N/A
SS-179	40'RT	48+00	9.4' - 10.9'	A-2-7(0)	52	11	40.8	45.1	10.8	3.3	100	81	19	15.0	N/A

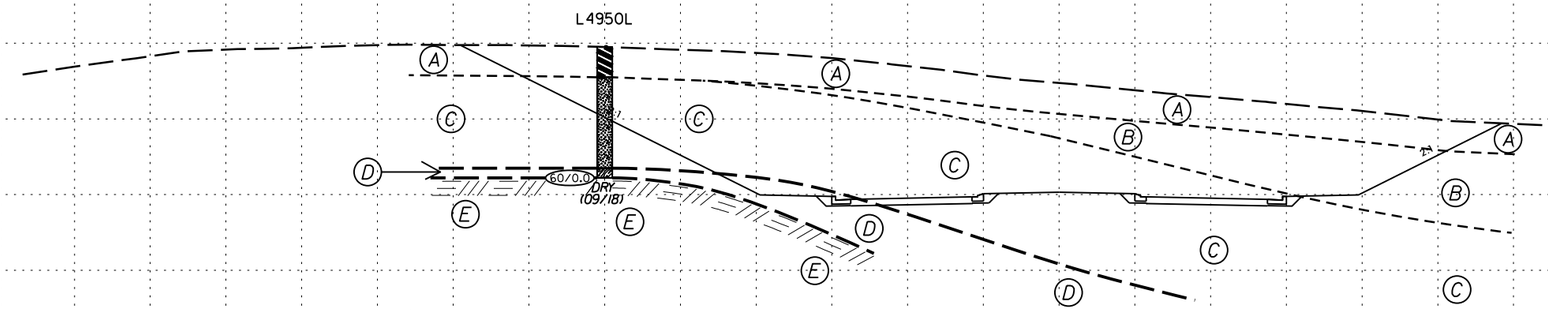


(A) **RESIDUAL:** *brown to red-brown, moist, medium stiff, slightly to highly plastic, highly sandy, silty CLAY (A-7-5) with trace mica*

(B) **RESIDUAL:** *red-brown, brown, tan-white, and tan, dry to moist, medium stiff to stiff, highly sandy, clayey SILT (A-5) with little mica*

(C) **RESIDUAL:** *red-brown, brown, tan, gray, and white, dry to moist, loose to medium dense, micaceous, clayey, silty SAND (A-2-5) clayey SAND (A-2-7), and silty SAND (A-2-4) with trace gravel sized rock fragments*

48+00.00



(A) **RESIDUAL:** *red-brown, moist, medium stiff, moderately to highly plastic, highly sandy, silty CLAY (A-7-5/A-7-6) with trace mica*

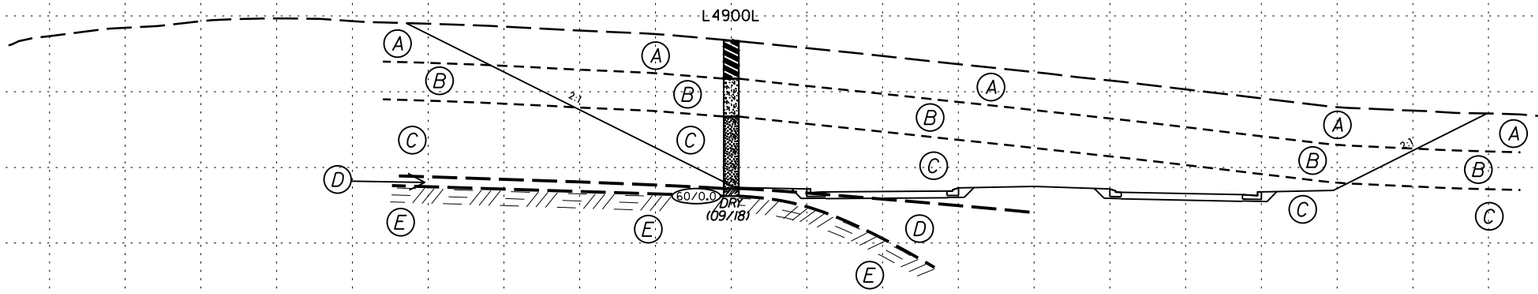
(B) **RESIDUAL:** *red-brown and brown, dry to moist, stiff, highly sandy, clayey SILT (A-5) with trace mica and gravel sized rock fragments*

(C) **RESIDUAL:** *brown and white, dry, medium dense, saprolitic, clayey, silty SAND (A-2-5)*

(D) **WEATHERED ROCK:** *(Granite)*

(E) **CRYSTALLINE ROCK:** *(Granite)*

49+50.00



(A) **RESIDUAL:** *red-brown, moist, medium stiff, slightly to highly plastic, highly sandy, silty CLAY (A-7-5/A-7-6) with trace mica*

(B) **RESIDUAL:** *red-brown and brown, dry to moist, stiff, highly sandy, clayey SILT (A-5) with trace mica and gravel sized rock fragments*

(C) **RESIDUAL:** *red-brown, brown, tan, gray, and white, dry to moist, loose to medium dense, micaceous, clayey, silty SAND (A-2-5) clayey SAND (A-2-7), and silty SAND (A-2-4) with trace gravel sized rock fragments*

(D) **WEATHERED ROCK:** *(Granite)*

(E) **CRYSTALLINE ROCK:** *(Granite)*

49+00.00

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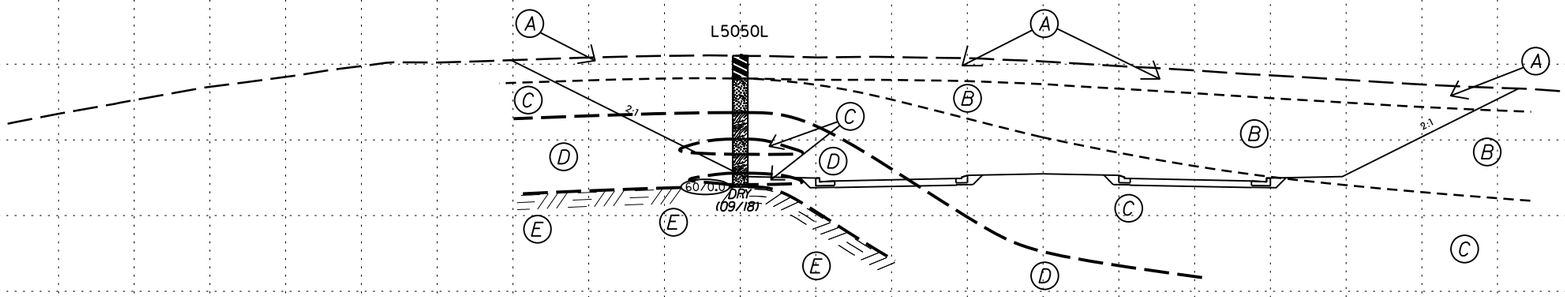


(A) **RESIDUAL:** red-brown, moist, medium stiff, moderately to highly plastic, highly sandy, silty CLAY (A-7-5/A-7-6) with trace mica

(B) **RESIDUAL:** red-brown and brown, dry to moist, stiff, highly sandy, clayey SILT (A-5) with trace mica and gravel sized rock fragments

(C) **RESIDUAL:** brown and white, dry, medium dense, saprolitic, clayey, silty SAND (A-2-5)

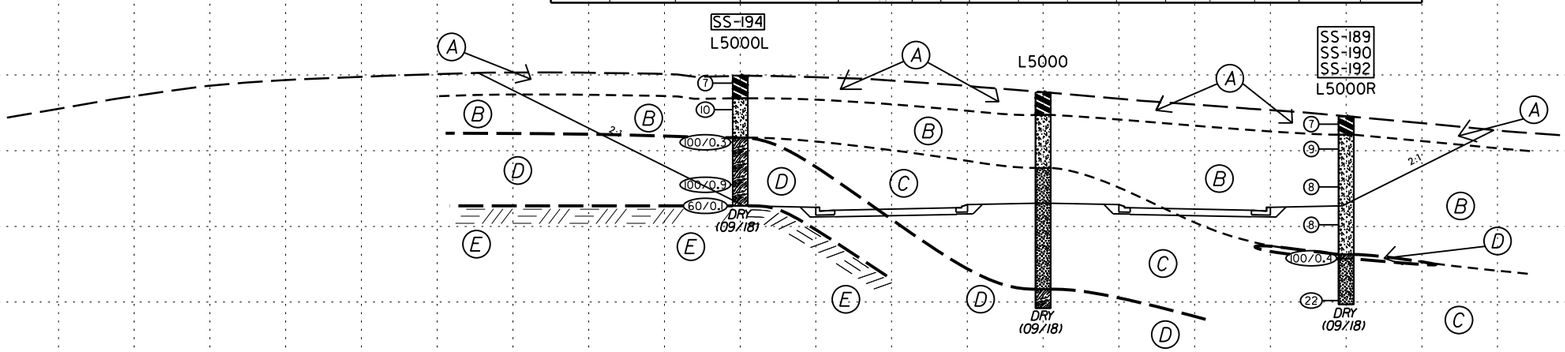
(D) **WEATHERED ROCK:** (Granite)

(E) **CRYSTALLINE ROCK:** (Granite)

50+50.00

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-194	40'LT	50+00	0.0' - 1.5'	A-7-6(12)	60	31	28.5	19.2	13.0	39.4	91	74	50	29.3	N/A
SS-189	40'RT	50+00	0.0' - 1.5'	A-7-5(9)	61	16	27.1	20.7	12.5	39.8	98	80	55	26.4	N/A
SS-190	40'RT	50+00	3.3' - 4.8'	A-5(0)	64	5	38.0	32.0	13.3	16.7	100	76	36	26.3	N/A
SS-192	40'RT	50+00	13.3' - 14.8'	A-5(1)	60	8	39.3	26.1	24.3	10.3	97	69	41	21.9	N/A



(A) **RESIDUAL:** red-brown, moist, medium stiff, moderately to highly plastic, highly sandy, silty CLAY (A-7-5/A-7-6) with trace mica

(B) **RESIDUAL:** red-brown and brown, dry to moist, stiff, highly sandy, clayey SILT (A-5) with trace mica and gravel sized rock fragments

(C) **RESIDUAL:** brown and white, dry, medium dense, saprolitic, clayey, silty SAND (A-2-5)

(D) **WEATHERED ROCK:** (Granite)

(E) **CRYSTALLINE ROCK:** (Granite)

50+00.00

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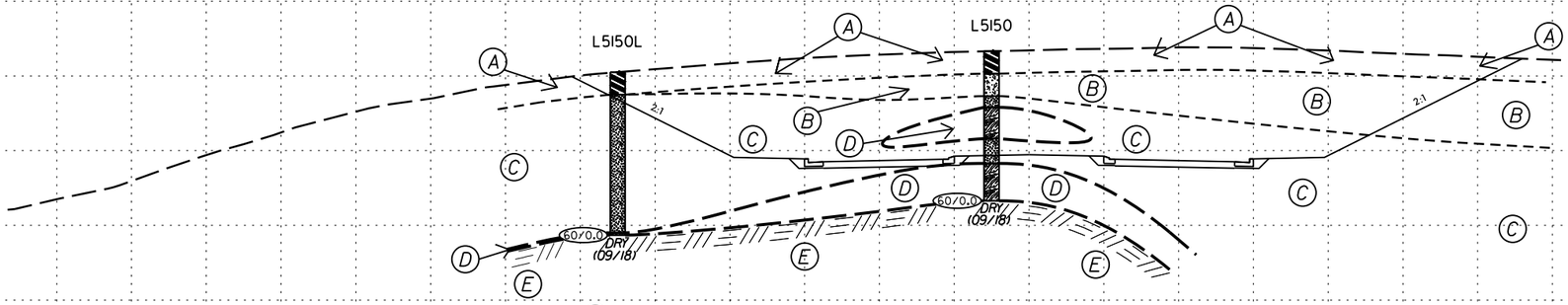


(A) **RESIDUAL:** *red-brown, moist, medium stiff, moderately plastic, highly sandy, silty CLAY (A-7-5) with trace mica*

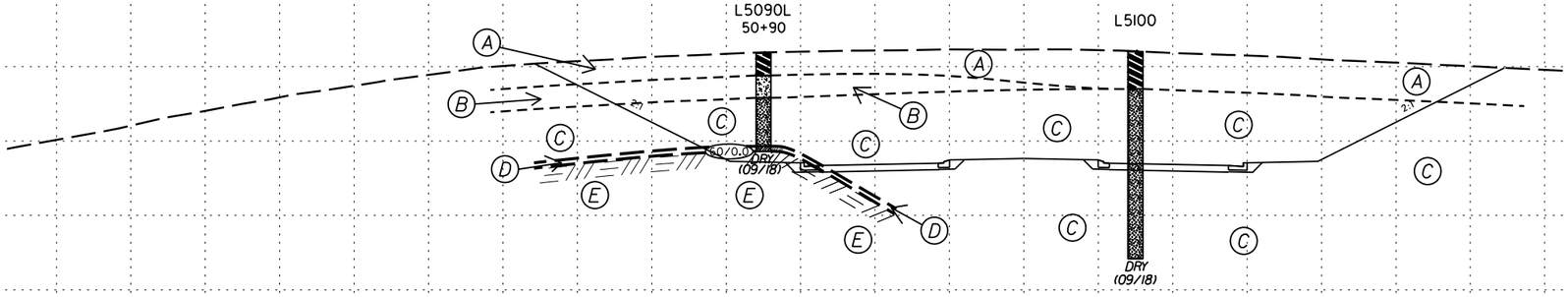
(B) **RESIDUAL:** *red-brown, dry to moist, medium stiff to stiff, highly sandy, clayey SILT (A-5) with trace mica*

(C) **RESIDUAL:** *brown, dry to moist, loose to medium dense, micaceous, clayey, silty SAND (A-2-5)*

(D) **WEATHERED ROCK:** *(Granite)*

(E) **CRYSTALLINE ROCK:** *(Granite)*

51+50.00



(A) **RESIDUAL:** *red-brown, moist, medium stiff, moderately to highly plastic, highly sandy, silty CLAY (A-7-5/A-7-6) with trace mica*

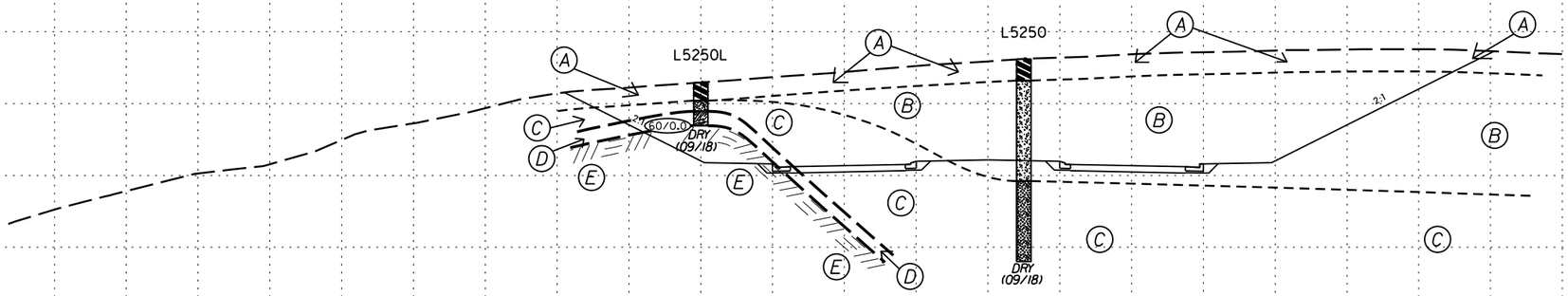
(B) **RESIDUAL:** *red-brown and brown, dry to moist, medium stiff to stiff, highly sandy, clayey SILT (A-5) with trace mica and gravel sized rock fragments*

(C) **RESIDUAL:** *brown and white, dry to moist, loose to medium dense, saprolitic, micaceous, clayey, silty SAND (A-2-5)*

(D) **WEATHERED ROCK:** *(Granite)*

(E) **CRYSTALLINE ROCK:** *(Granite)*

51+00.00



(A) **RESIDUAL:** *red-brown, moist, medium stiff, moderately plastic, highly sandy, silty CLAY (A-7-5) with trace mica*

(B) **RESIDUAL:** *red-brown, dry to moist, medium stiff to stiff, highly sandy, clayey SILT (A-5) with trace mica*

(C) **RESIDUAL:** *brown, dry to moist, loose to medium dense, micaceous, clayey, silty SAND (A-2-5)*

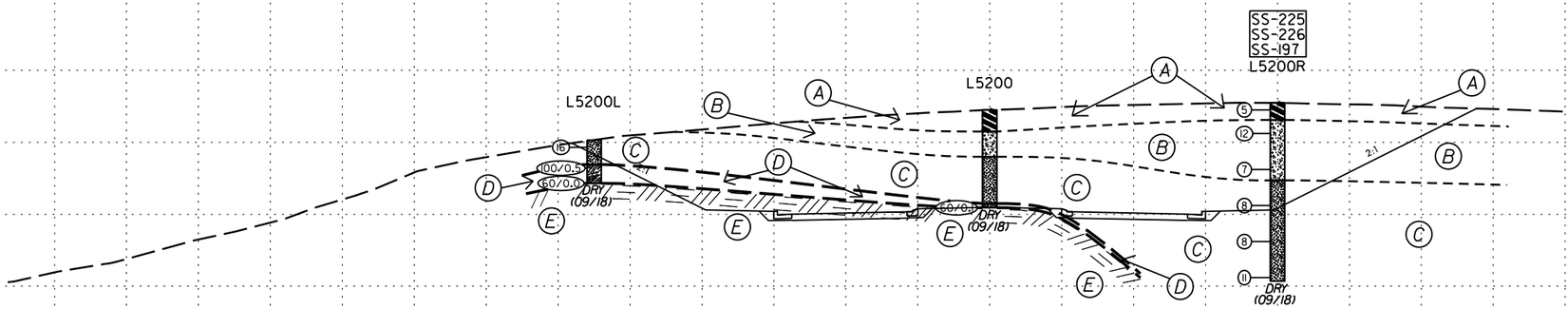
(D) **WEATHERED ROCK:** *(Granite)*

(E) **CRYSTALLINE ROCK:** *(Granite)*

52+50.00

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-225	40'RT	52+00	0.0' - 1.5'	A-7-5(17)	57	25	22.9	13.5	19.0	44.6	99	83	66	15.7	N/A
SS-226	40'RT	52+00	3.3' - 4.8'	A-5(3)	59	3	28.2	21.6	35.5	14.6	100	80	54	16.7	N/A
SS-197	40'RT	52+00	13.3' - 14.8'	A-2-5(0)	48	2	49.8	32.4	14.6	3.2	99	68	23	15.6	N/A



(A) **RESIDUAL:** *red-brown, moist, medium stiff, moderately plastic, highly sandy, silty CLAY (A-7-5) with trace mica*

(B) **RESIDUAL:** *red-brown, dry to moist, medium stiff to stiff, highly sandy, clayey SILT (A-5) with trace mica*

(C) **RESIDUAL:** *brown, dry to moist, loose to medium dense, micaceous, clayey, silty SAND (A-2-5)*

(D) **WEATHERED ROCK:** *(Granite)*

(E) **CRYSTALLINE ROCK:** *(Granite)*

52+00.00

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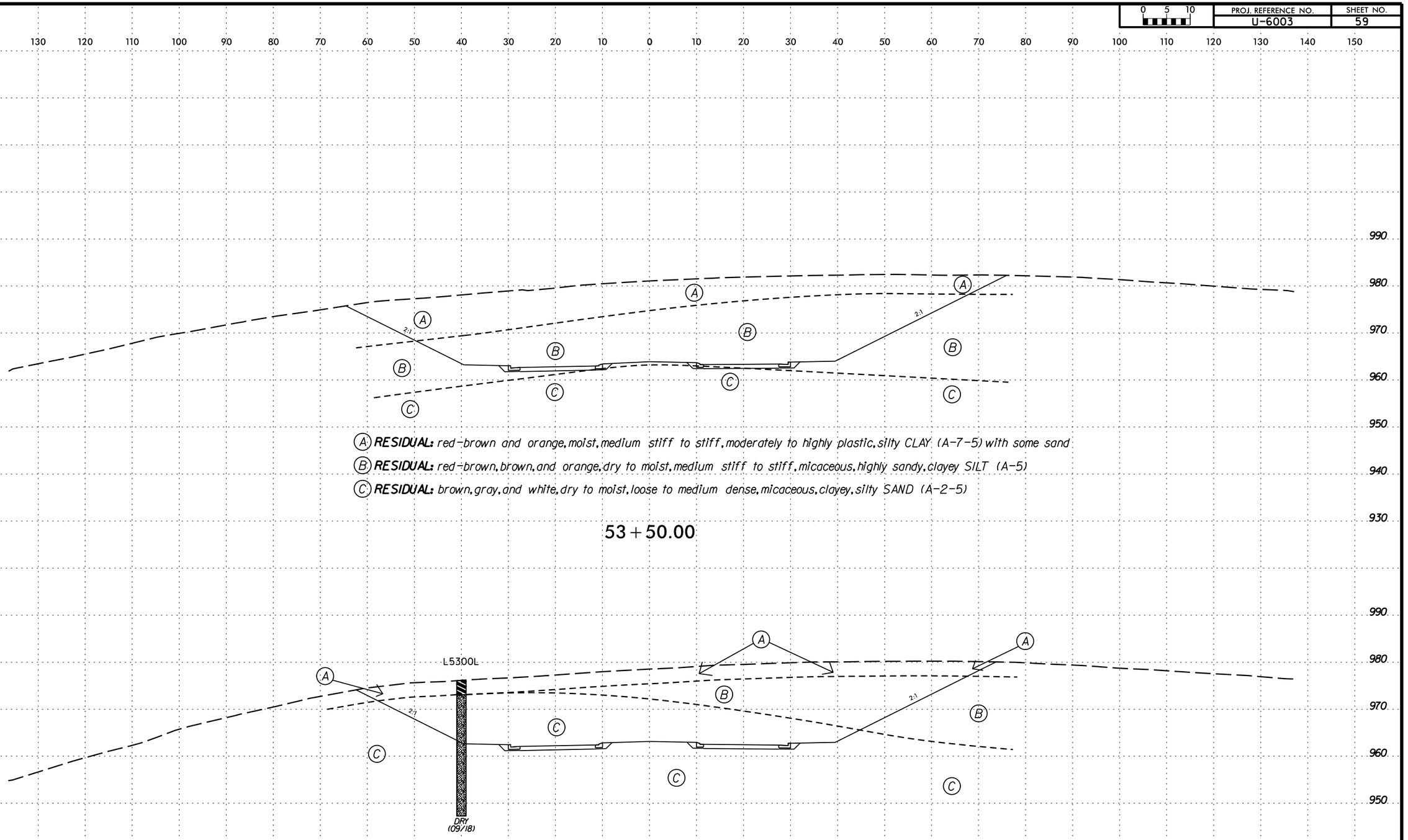


(A) **RESIDUAL:** *red-brown and orange, moist, medium stiff to stiff, moderately to highly plastic, silty CLAY (A-7-5) with some sand*

(B) **RESIDUAL:** *red-brown, brown, and orange, dry to moist, medium stiff to stiff, micaceous, highly sandy, clayey SILT (A-5)*

(C) **RESIDUAL:** *brown, gray, and white, dry to moist, loose to medium dense, micaceous, clayey, silty SAND (A-2-5)*

53+50.00

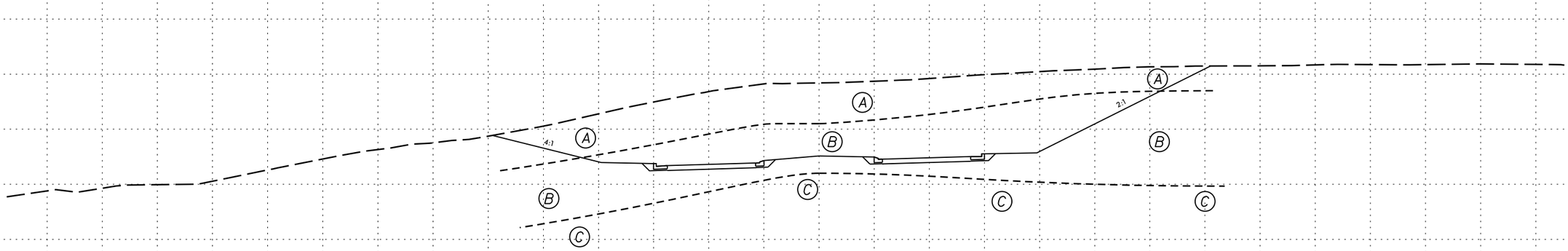
(A) **RESIDUAL:** *red-brown and orange, moist, medium stiff to stiff, moderately to highly plastic, silty CLAY (A-7-5) with some sand and trace mica*

(B) **RESIDUAL:** *red-brown, brown, and orange, dry to moist, medium stiff to stiff, micaceous, highly sandy, clayey SILT (A-5)*

(C) **RESIDUAL:** *brown, gray, and white, dry to moist, loose to medium dense, micaceous, clayey, silty SAND (A-2-5)*

53+00.00

—L—



(A) **RESIDUAL:** red-brown and orange, moist, medium stiff to stiff, moderately to highly plastic, silty CLAY (A-7-5) with some sand

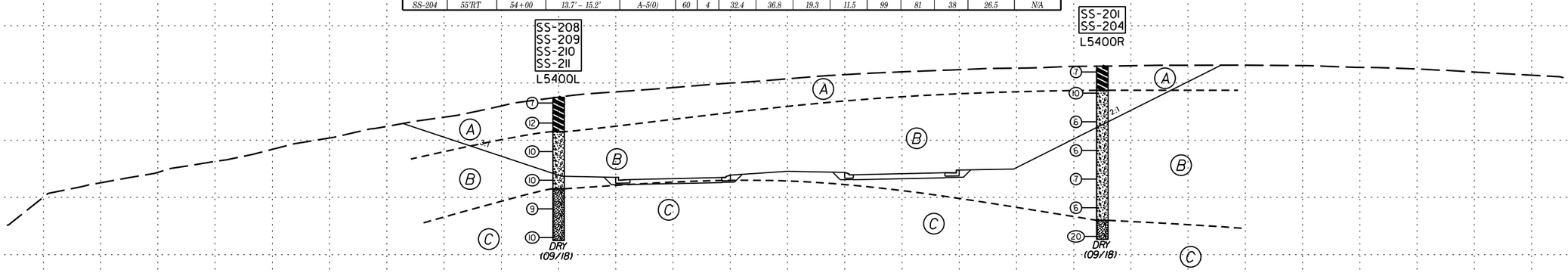
(B) **RESIDUAL:** red-brown, brown, and orange, dry to moist, medium stiff to stiff, micaceous, highly sandy, clayey SILT (A-5)

(C) **RESIDUAL:** brown, gray, and white, dry to moist, loose to medium dense, micaceous, clayey, silty SAND (A-2-5)

54+50.00

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-208	40'LT	54+00	0.0' - 1.5'	A-7-5(31)	72	32	9.8	13.1	21.0	56.1	100	93	81	22.0	N/A
SS-209	40'LT	54+00	3.5' - 5.0'	A-7-5(25)	70	21	6.7	15.8	31.8	45.7	100	95	84	37.2	N/A
SS-210	40'LT	54+00	8.5' - 10.0'	A-5(5)	54	6	24.7	24.6	29.0	21.7	99	81	59	27.1	N/A
SS-211	40'LT	54+00	13.5' - 15.0'	A-5(0)	52	2	19.1	45.6	26.2	9.2	99	92	44	24.2	N/A
SS-201	55'RT	54+00	0.0' - 1.5'	A-7-5(44)	85	43	8.1	12.5	23.5	56.0	100	95	84	36.1	N/A
SS-204	55'RT	54+00	13.7' - 15.2'	A-5(0)	60	4	32.4	36.8	19.3	11.5	99	81	38	26.5	N/A



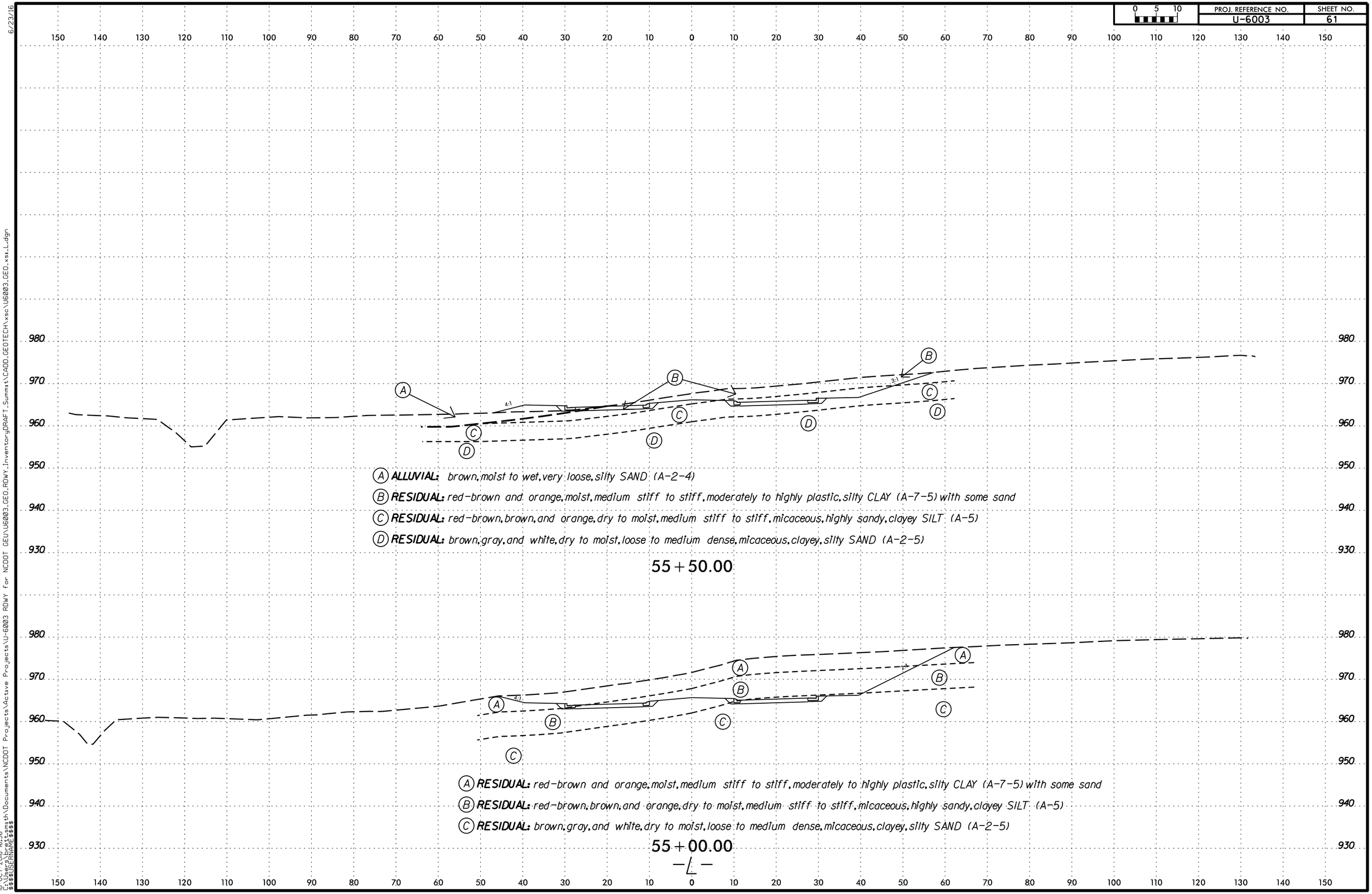
(A) **RESIDUAL:** red-brown and orange, moist, medium stiff to stiff, moderately to highly plastic, silty CLAY (A-7-5) with some sand

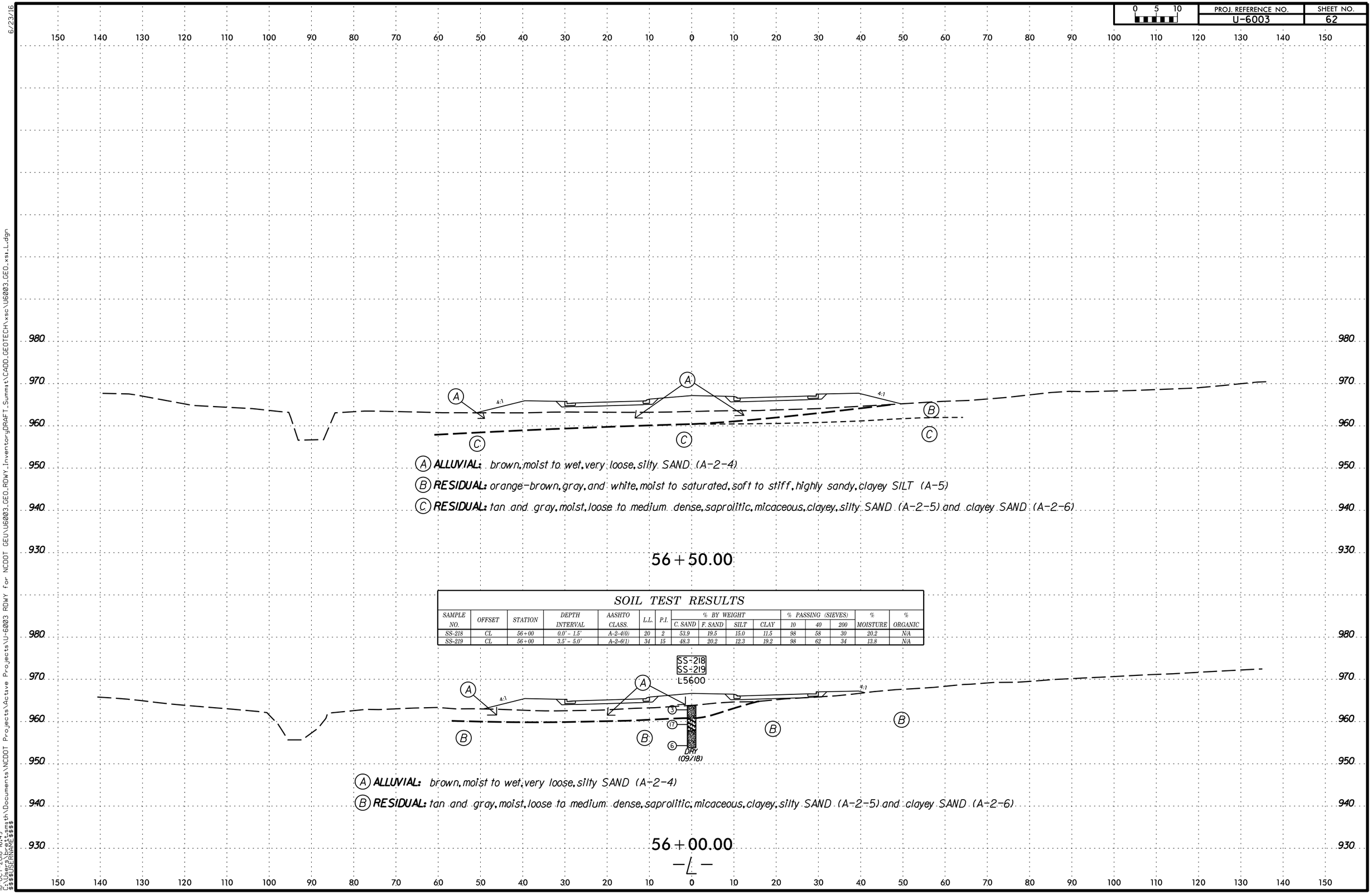
(B) **RESIDUAL:** red-brown, brown, and orange, dry to moist, medium stiff to stiff, micaceous, highly sandy, clayey SILT (A-5)

(C) **RESIDUAL:** brown, gray, and white, dry to moist, loose to medium dense, micaceous, clayey, silty SAND (A-2-5)

54+00.00

—L—





Ⓐ **ALLUVIAL:** *brown, moist to wet, very loose, silty SAND (A-2-4)*

Ⓑ **RESIDUAL:** *orange-brown, gray, and white, moist to saturated, soft to stiff, highly sandy, clayey SILT (A-5)*

Ⓒ **RESIDUAL:** *tan and gray, moist, loose to medium dense, saprolitic, micaceous, clayey, silty SAND (A-2-5) and clayey SAND (A-2-6)*

56+50.00

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-218	CL	56+00	0.0' - 1.5'	A-2-4(0)	20	2	53.9	19.5	15.0	11.5	98	58	30	20.2	N/A
SS-219	CL	56+00	3.5' - 5.0'	A-2-6(1)	34	15	48.3	20.2	12.3	19.2	98	62	34	13.8	N/A

Ⓐ **ALLUVIAL:** *brown, moist to wet, very loose, silty SAND (A-2-4)*

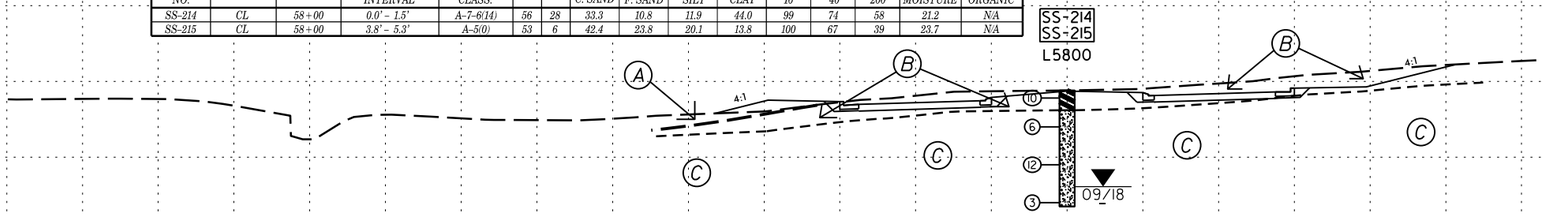
Ⓑ **RESIDUAL:** *tan and gray, moist, loose to medium dense, saprolitic, micaceous, clayey, silty SAND (A-2-5) and clayey SAND (A-2-6)*

56+00.00

—L—

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-214	CL	58+00	0.0' – 1.5'	A-7-6(14)	56	28	33.3	10.8	11.9	44.0	99	74	58	21.2	N/A
SS-215	CL	58+00	3.8' – 5.3'	A-5(0)	53	6	42.4	23.8	20.1	13.8	100	67	39	23.7	N/A

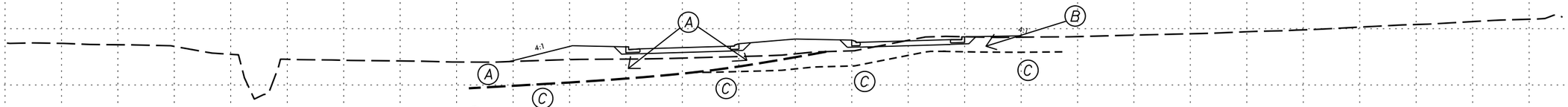


(A) **ALLUVIAL:** brown, moist to wet, very loose, silty SAND (A-2-4)

(B) **RESIDUAL:** gray-brown to orange-brown, moist, stiff, highly plastic, highly sandy, silty CLAY (A-7-6)

(C) **RESIDUAL:** orange-brown, gray, and white, moist to saturated, soft to stiff, highly sandy, clayey SILT (A-5)

58+00.00

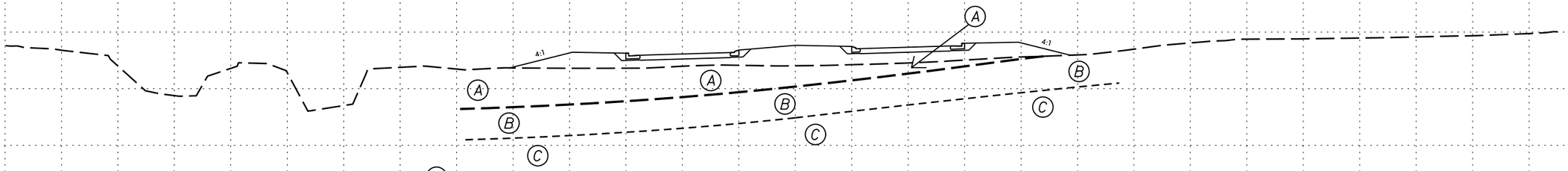


(A) **ALLUVIAL:** brown, moist to wet, very loose, silty SAND (A-2-4)

(B) **RESIDUAL:** gray-brown to orange-brown, moist, stiff, highly plastic, highly sandy, silty CLAY (A-7-6)

(C) **RESIDUAL:** orange-brown, gray, and white, moist to saturated, soft to stiff, highly sandy, clayey SILT (A-5)

57+50.00



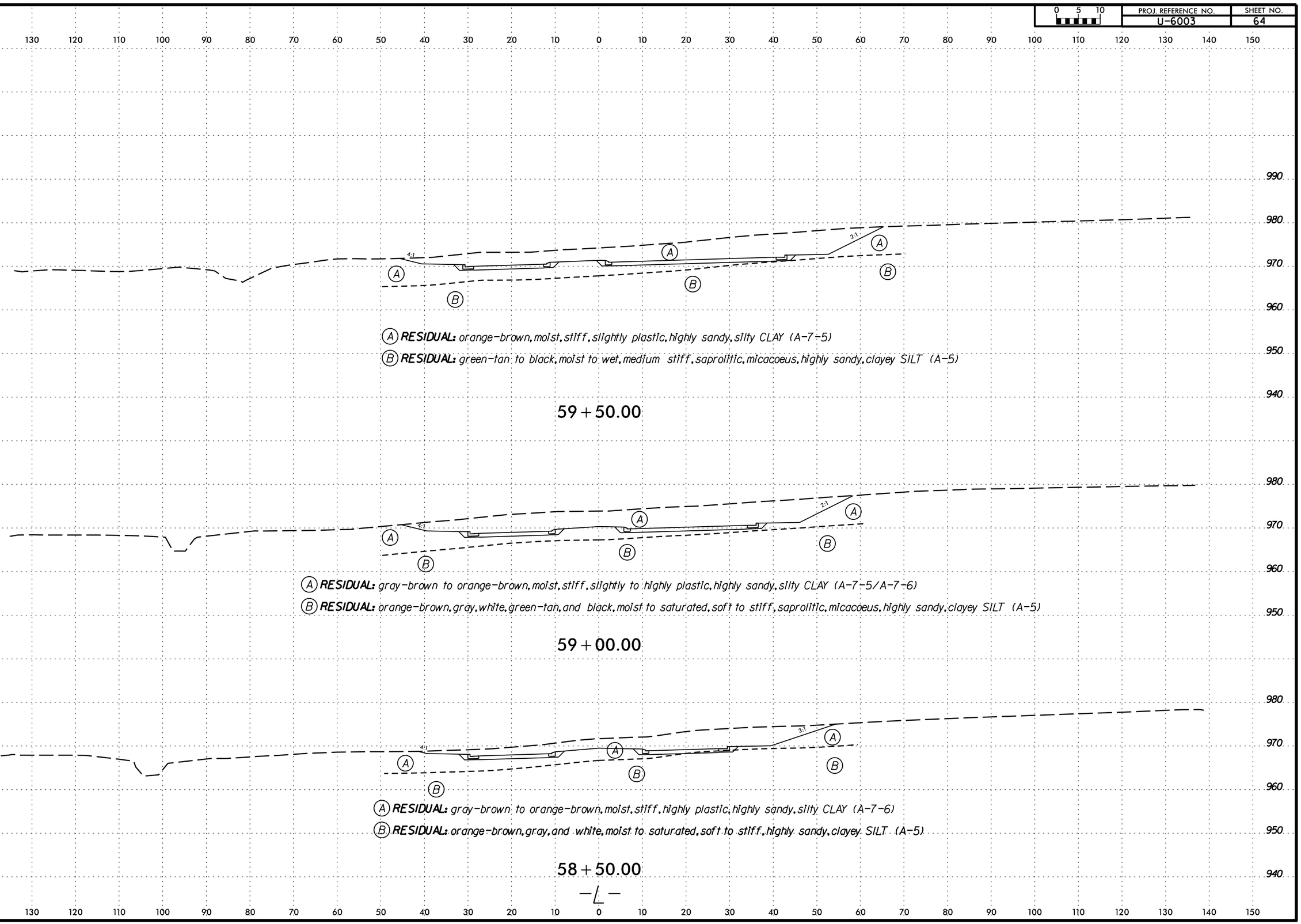
(A) **ALLUVIAL:** brown, moist to wet, very loose, silty SAND (A-2-4)

(B) **RESIDUAL:** orange-brown, gray, and white, moist to saturated, soft to stiff, highly sandy, clayey SILT (A-5)

(C) **RESIDUAL:** tan and gray, moist, loose to medium dense, saprolitic, micaceous, clayey, silty SAND (A-2-5) and clayey SAND (A-2-6)

57+00.00

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-6003	64



(A) **RESIDUAL:** orange-brown, moist, stiff, slightly plastic, highly sandy, silty CLAY (A-7-5)

(B) **RESIDUAL:** green-tan to black, moist to wet, medium stiff, saprolitic, micacoeus, highly sandy, clayey SILT (A-5)

59 + 50.00

(A) **RESIDUAL:** gray-brown to orange-brown, moist, stiff, slightly to highly plastic, highly sandy, silty CLAY (A-7-5/A-7-6)

(B) **RESIDUAL:** orange-brown, gray, white, green-tan, and black, moist to saturated, soft to stiff, saprolitic, micacoeus, highly sandy, clayey SILT (A-5)

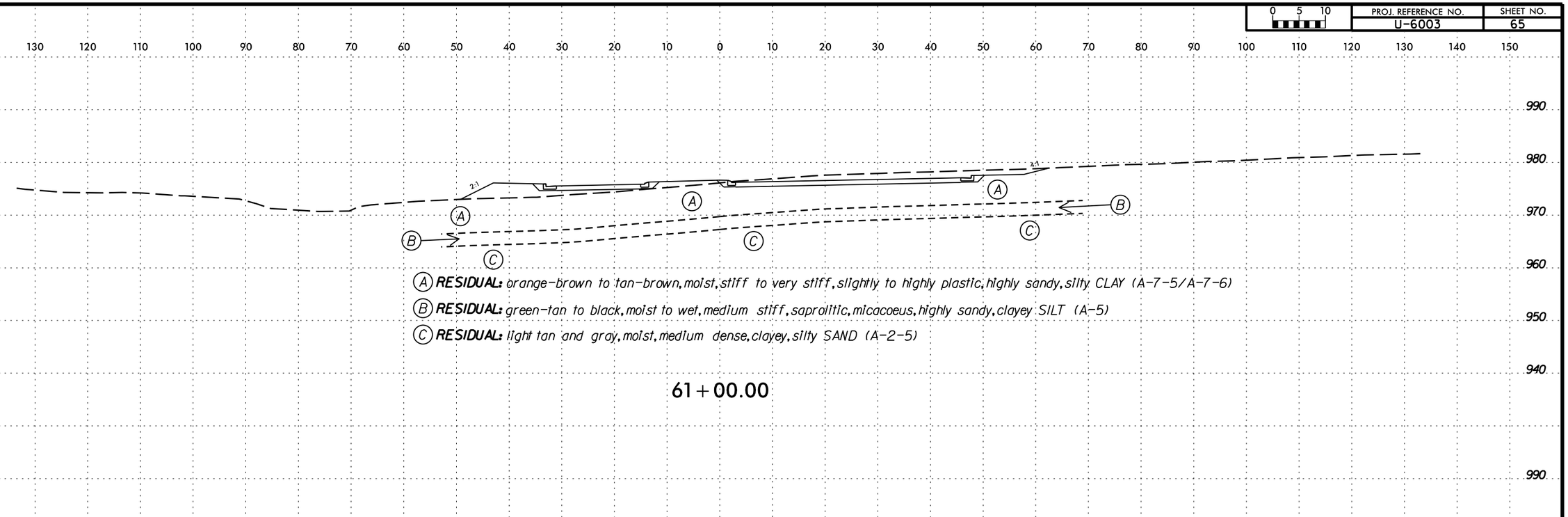
59 + 00.00

(A) **RESIDUAL:** gray-brown to orange-brown, moist, stiff, highly plastic, highly sandy, silty CLAY (A-7-6)

(B) **RESIDUAL:** orange-brown, gray, and white, moist to saturated, soft to stiff, highly sandy, clayey SILT (A-5)

58 + 50.00

— L —

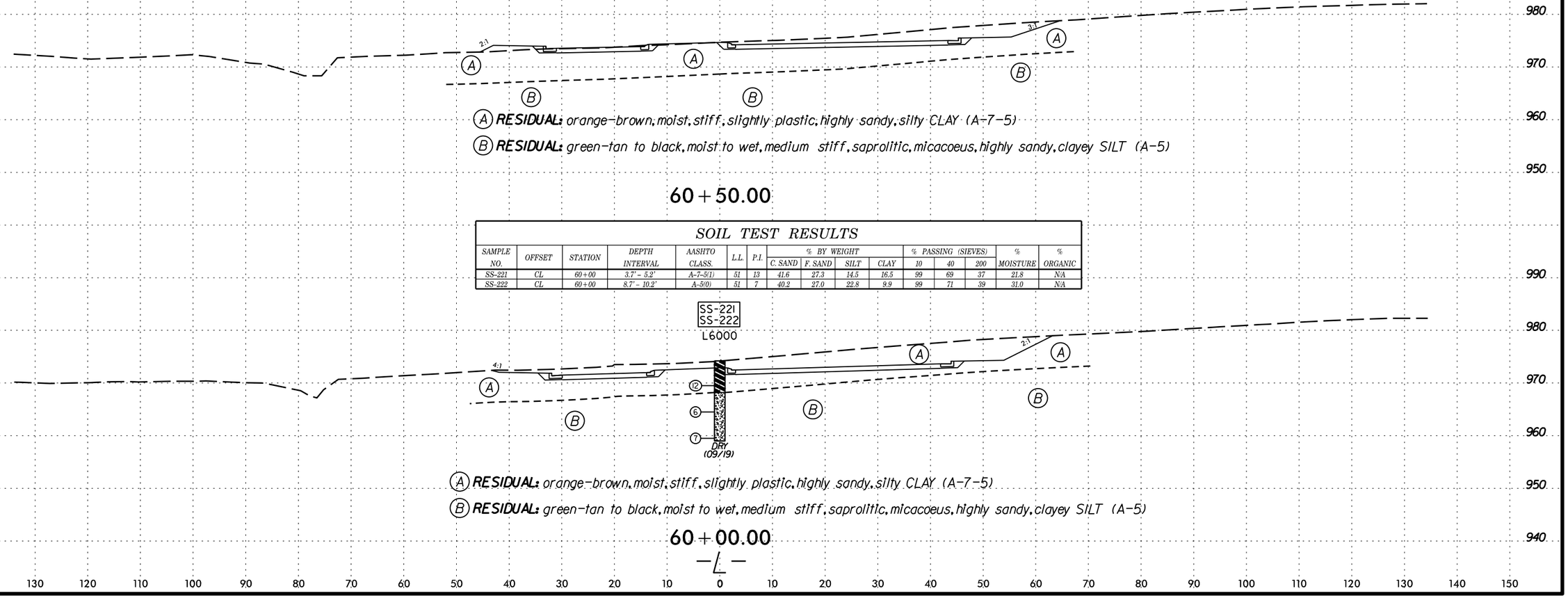


(A) **RESIDUAL:** *orange-brown, moist, stiff to very stiff, slightly to highly plastic, highly sandy, silty CLAY (A-7-5/A-7-6)*

(B) **RESIDUAL:** *green-tan to black, moist to wet, medium stiff, saprolitic, micacoeus, highly sandy, clayey SILT (A-5)*

(C) **RESIDUAL:** *light tan and gray, moist, medium dense, clayey, silty SAND (A-2-5)*

61+00.00



(A) **RESIDUAL:** *orange-brown, moist, stiff, slightly plastic, highly sandy, silty CLAY (A-7-5)*

(B) **RESIDUAL:** *green-tan to black, moist to wet, medium stiff, saprolitic, micacoeus, highly sandy, clayey SILT (A-5)*

60+50.00

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-221	CL	60+00	3.7' - 5.2'	A-7-5(1)	51	13	41.6	27.3	14.5	16.5	99	69	37	21.8	N/A
SS-222	CL	60+00	8.7' - 10.2'	A-5(0)	51	7	40.2	27.0	22.8	9.9	99	71	39	31.0	N/A

(A) **RESIDUAL:** *orange-brown, moist, stiff, slightly plastic, highly sandy, silty CLAY (A-7-5)*

(B) **RESIDUAL:** *green-tan to black, moist to wet, medium stiff, saprolitic, micacoeus, highly sandy, clayey SILT (A-5)*

60+00.00

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-223	CL	62+00	0.0' - 1.5'	A-7-6(10)	54	29	38.8	14.5	11.4	35.3	97	68	48	17.2	N/A

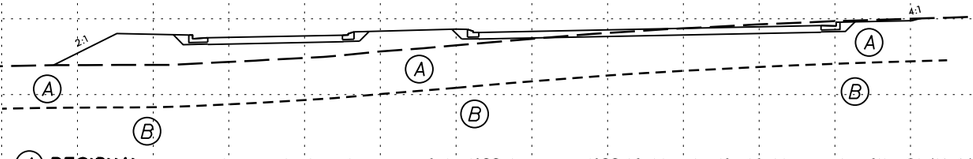
SS-223

L6200

Ⓐ **RESIDUAL:** *orange-brown to tan-brown, moist, stiff to very stiff, highly plastic, highly sandy, silty CLAY (A-7-6)*

Ⓑ **RESIDUAL:** *light tan and gray, moist, medium dense, clayey, silty SAND (A-2-5)*

62+00.00



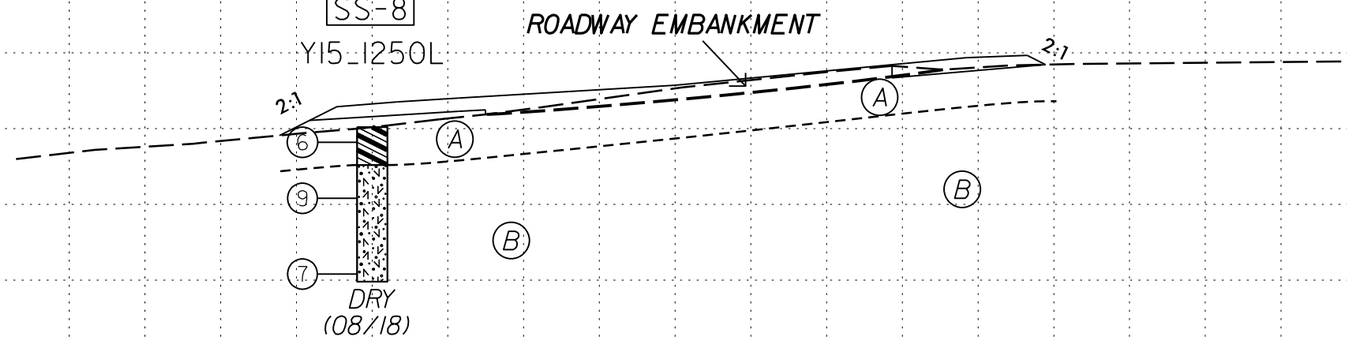
Ⓐ **RESIDUAL:** *orange-brown to tan-brown, moist, stiff to very stiff, highly plastic, highly sandy, silty CLAY (A-7-6)*

Ⓑ **RESIDUAL:** *light tan and gray, moist, medium dense, clayey, silty SAND (A-2-5)*

61+50.00

SOIL TEST RESULTS

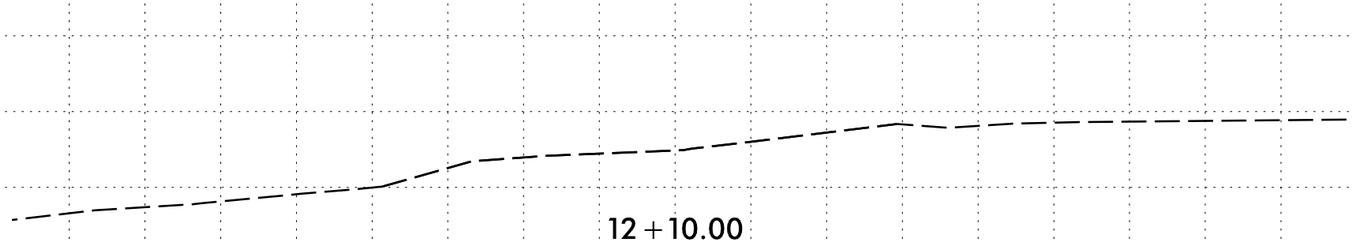
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-7	20'LT	12+50	0.0' - 1.5'	A-6(2)	38	11	32.9	22.6	13.7	30.9	93	74	45	18.0	N/A
SS-8	20'LT	12+50	3.7' - 5.2'	A-5(3)	53	5	26.9	25.7	7.4	40.0	100	84	56	31.9	N/A



(A) **RESIDUAL:** red-brown, dry, medium stiff, slightly plastic, sandy CLAY (A-6) with little mica

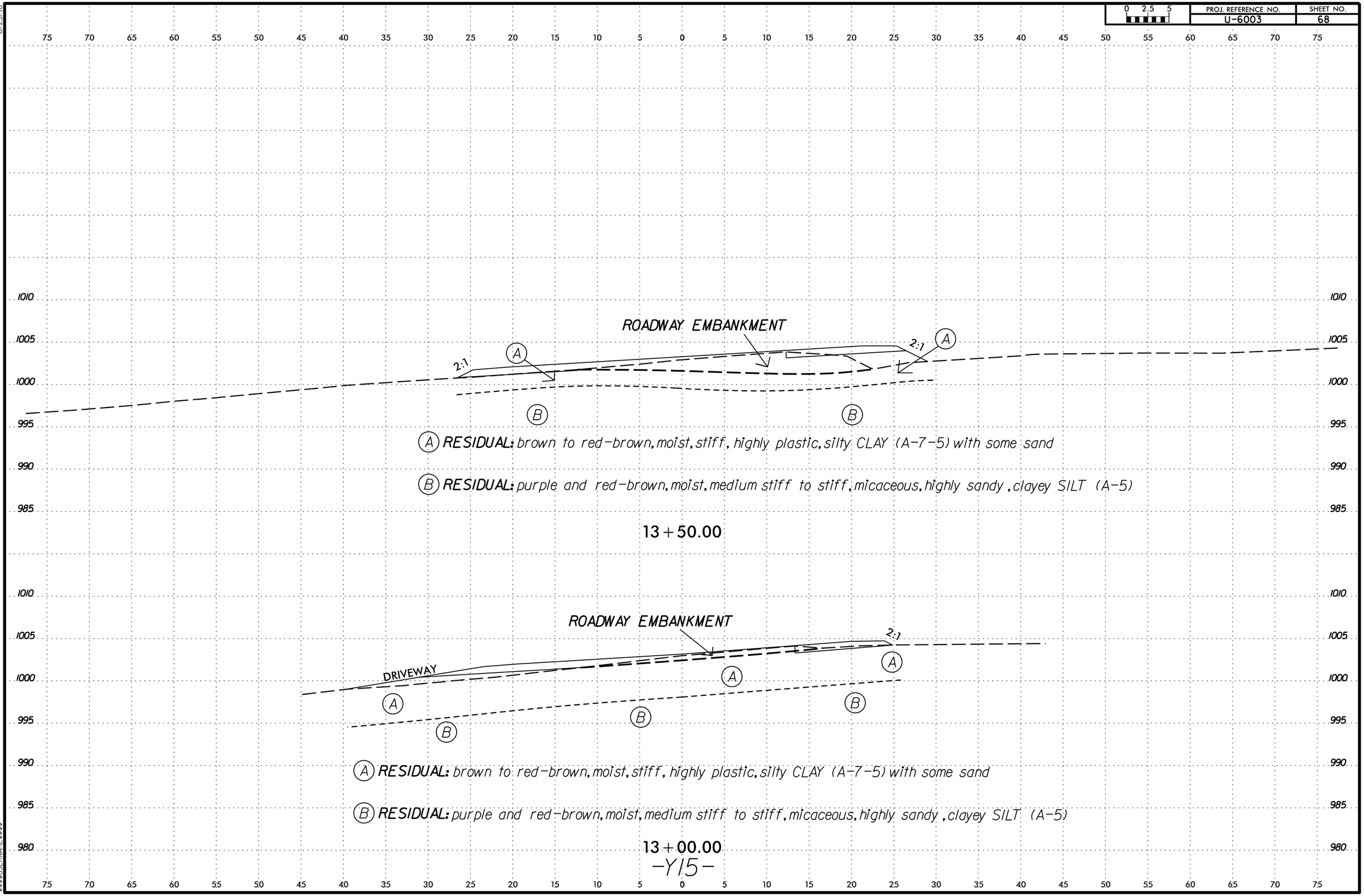
(B) **RESIDUAL:** red-brown and tan, moist, medium stiff to stiff, highly sandy, clayey SILT (A-5)

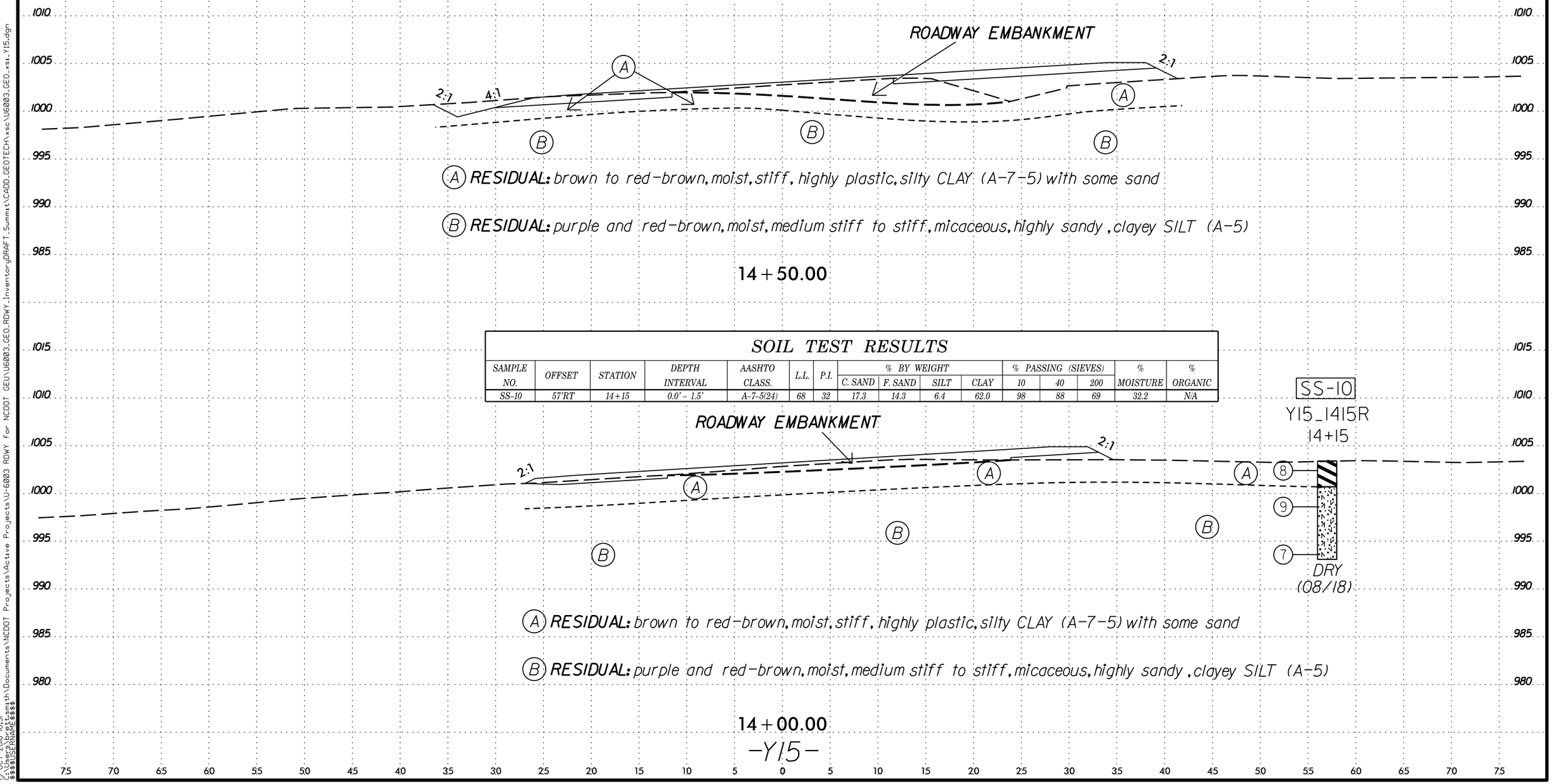
12+50.00



12+10.00

-Y15-





(A) **RESIDUAL:** brown to red-brown, moist, stiff, highly plastic, silty CLAY (A-7-5) with some sand

(B) **RESIDUAL:** purple and red-brown, moist, medium stiff to stiff, micaceous, highly sandy, clayey SILT (A-5)

14+50.00

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-10	57'RT	14+15	0.0' - 1.5'	A-7-5(24)	68	32	17.3	14.3	6.4	62.0	98	88	69	32.2	N/A

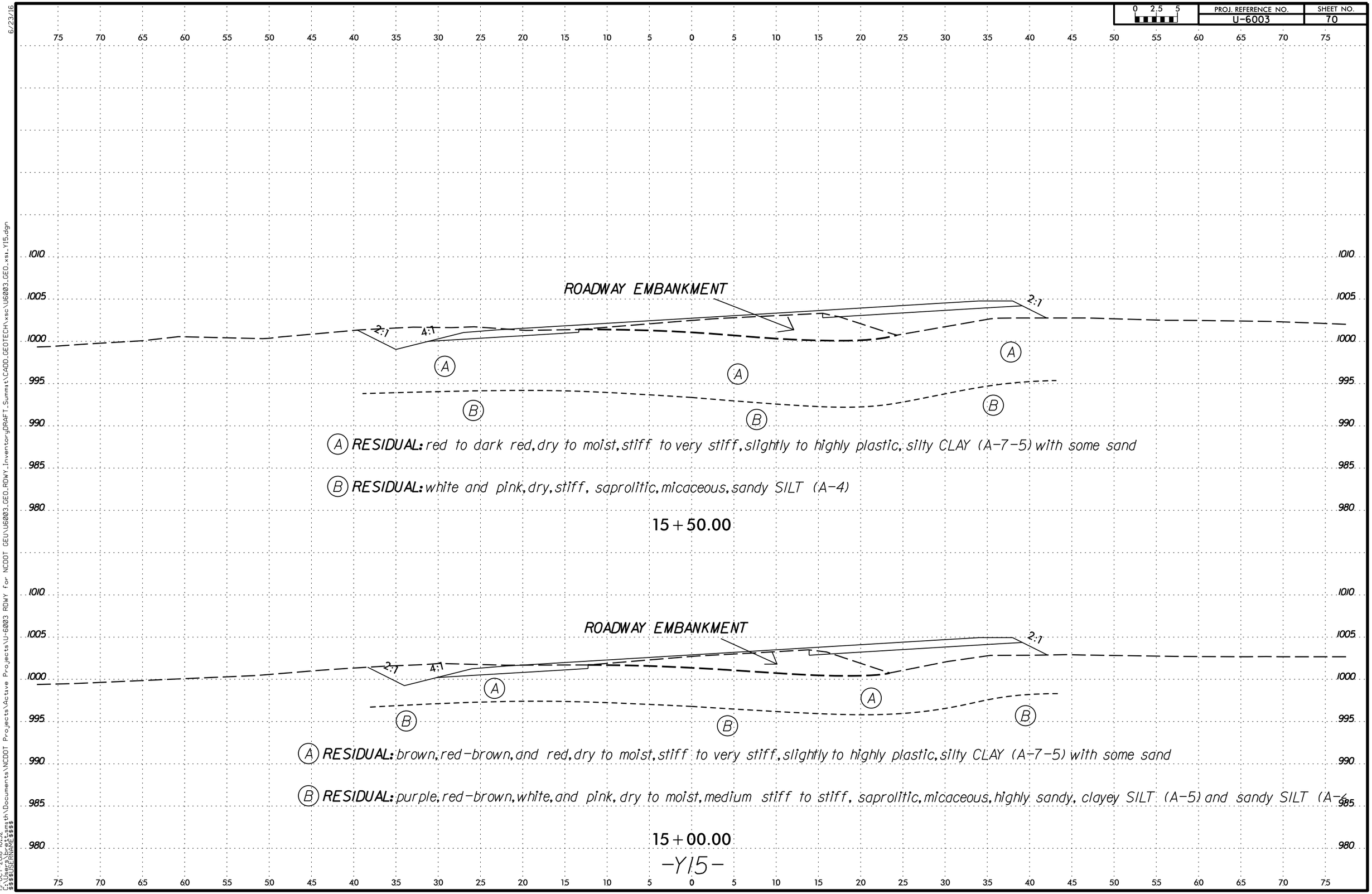
(A) **RESIDUAL:** brown to red-brown, moist, stiff, highly plastic, silty CLAY (A-7-5) with some sand

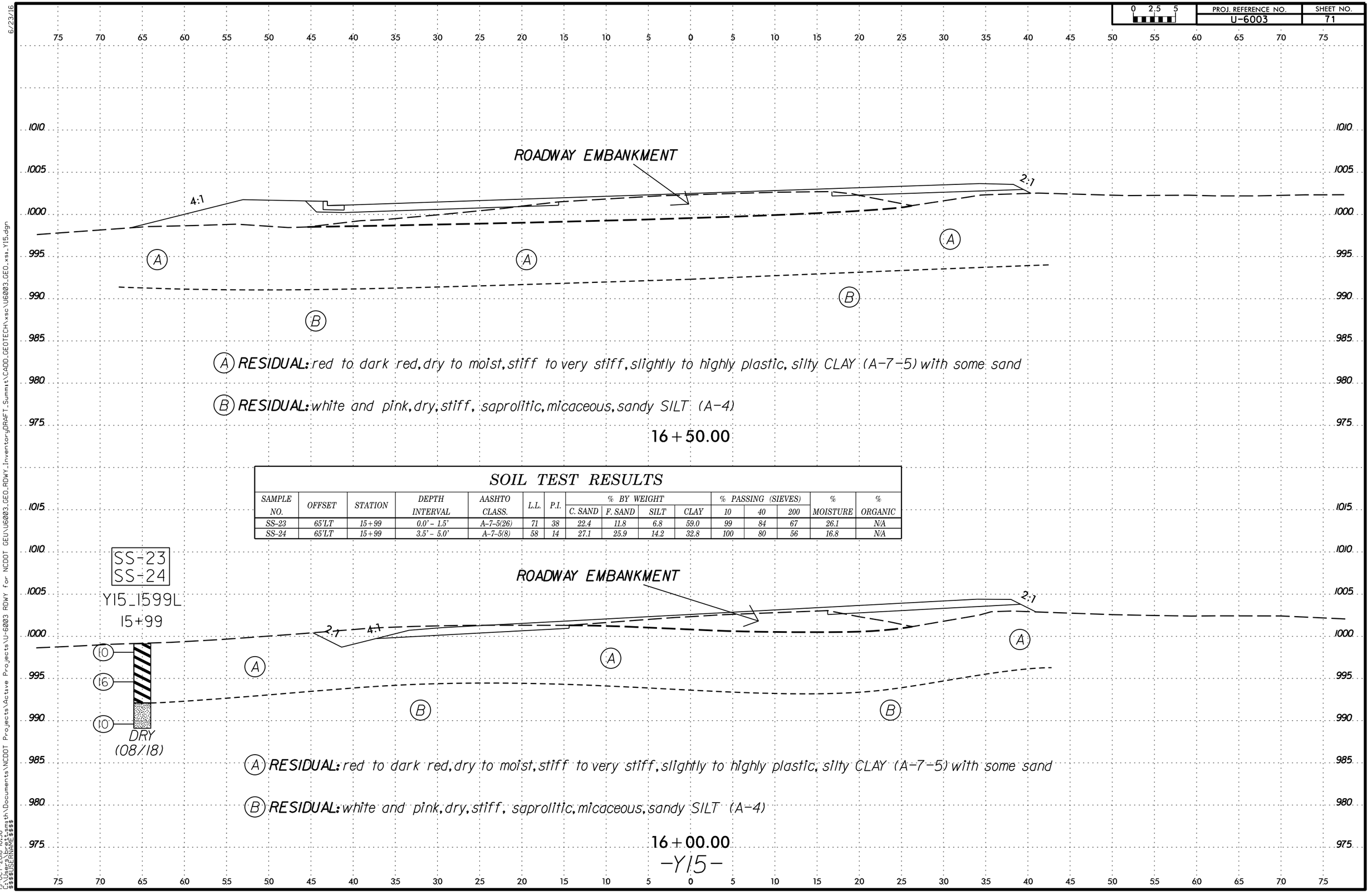
(B) **RESIDUAL:** purple and red-brown, moist, medium stiff to stiff, micaceous, highly sandy, clayey SILT (A-5)

14+00.00

-Y15-

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	U-6003	70





(A) **RESIDUAL:** red to dark red, dry to moist, stiff to very stiff, slightly to highly plastic, silty CLAY (A-7-5) with some sand

(B) **RESIDUAL:** white and pink, dry, stiff, saprolitic, micaceous, sandy SILT (A-4)

16 + 50.00

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-23	65'LT	15+99	0.0' - 1.5'	A-7-5(26)	71	38	22.4	11.8	6.8	59.0	99	84	67	26.1	N/A
SS-24	65'LT	15+99	3.5' - 5.0'	A-7-5(8)	58	14	27.1	25.9	14.2	32.8	100	80	56	16.8	N/A

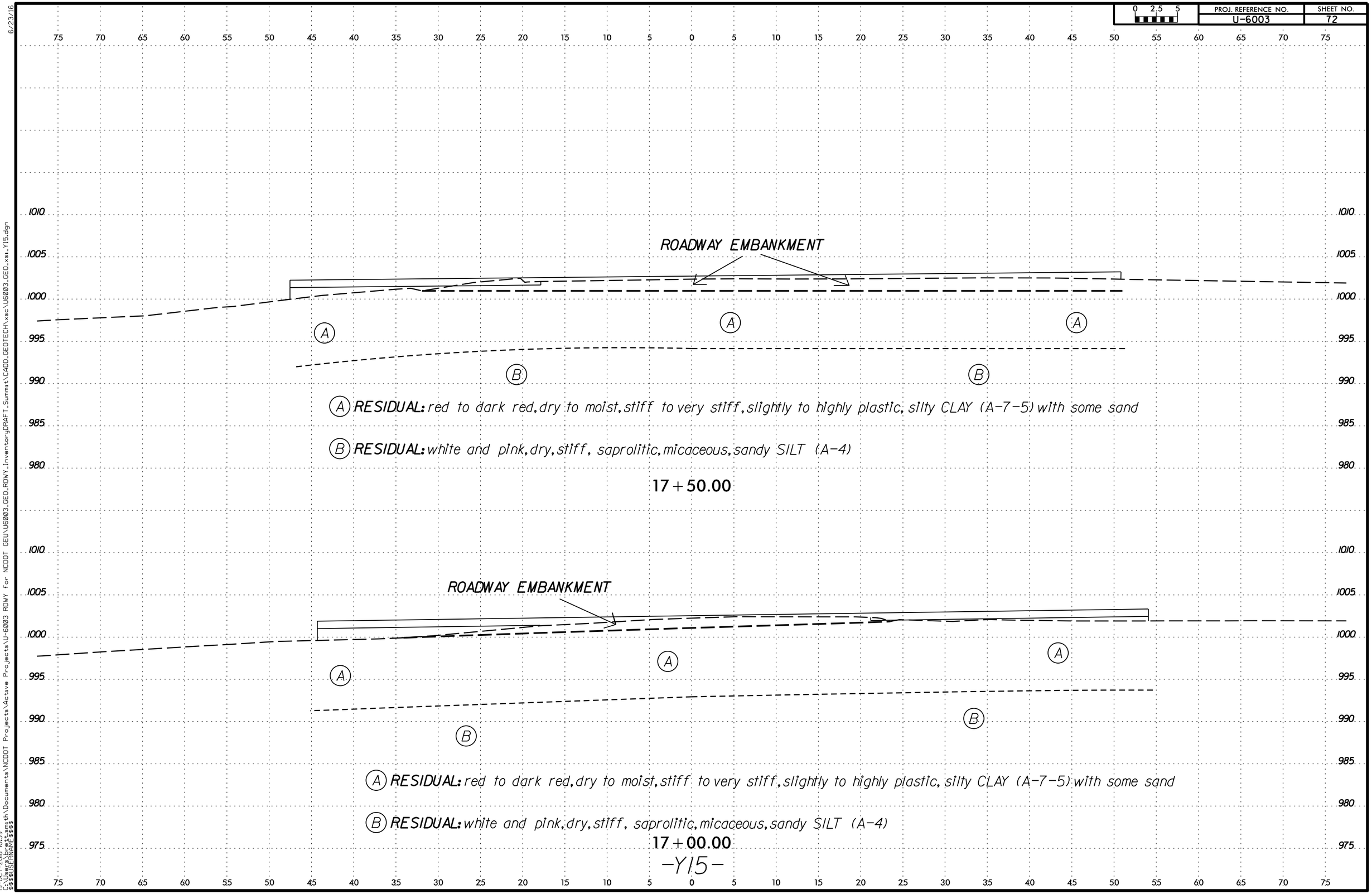
(A) **RESIDUAL:** red to dark red, dry to moist, stiff to very stiff, slightly to highly plastic, silty CLAY (A-7-5) with some sand

(B) **RESIDUAL:** white and pink, dry, stiff, saprolitic, micaceous, sandy SILT (A-4)

16 + 00.00

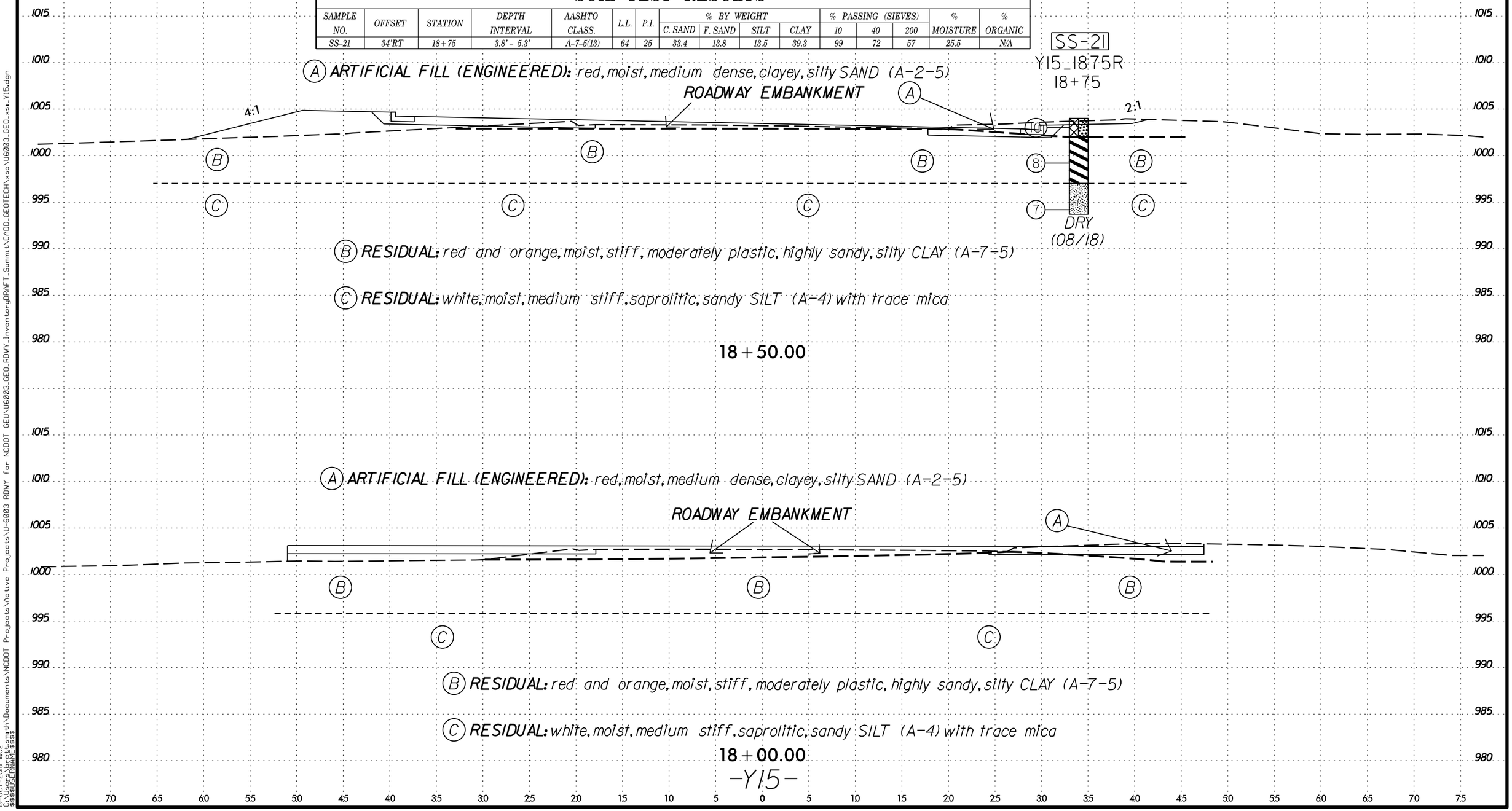
-Y15-

PROJ. REFERENCE NO.	SHEET NO.
U-6003	72



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-21	34'RT	18+75	3.8' - 5.3'	A-7-5(13)	64	25	33.4	13.8	13.5	39.3	99	72	57	25.5	N/A



(A) **ARTIFICIAL FILL (ENGINEERED):** red, moist, medium dense, clayey, silty SAND (A-2-5)

(B) **RESIDUAL:** red and orange, moist, stiff, moderately plastic, highly sandy, silty CLAY (A-7-5)

(C) **RESIDUAL:** white, moist, medium stiff, saprolitic, sandy SILT (A-4) with trace mica

18+50.00

(A) **ARTIFICIAL FILL (ENGINEERED):** red, moist, medium dense, clayey, silty SAND (A-2-5)

(B) **RESIDUAL:** red and orange, moist, stiff, moderately plastic, highly sandy, silty CLAY (A-7-5)

(C) **RESIDUAL:** white, moist, medium stiff, saprolitic, sandy SILT (A-4) with trace mica

18+00.00

-Y15-

PROJ. REFERENCE NO.	SHEET NO.
U-6003	74

0 2.5 5

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

1015 1010 1005 1000 995 990 985 980

(A) **ARTIFICIAL FILL (ENGINEERED):** red, moist, medium dense, clayey, silty SAND (A-2-5)

ROADWAY EMBANKMENT

2:1

(B) **RESIDUAL:** red-brown, dry to moist, medium stiff to stiff, moderately plastic, highly sandy, silty CLAY (A-7-5) with trace mica

(C) **RESIDUAL:** red-brown, dark green, and white, dry to moist, medium stiff to stiff, saprolitic, sandy SILT (A-4) and highly sandy, clayey SILT (A-5) with trace mica

19+50.00

(A) **ARTIFICIAL FILL (ENGINEERED):** red, moist, medium dense, clayey, silty SAND (A-2-5)

ROADWAY EMBANKMENT

3:1

2:1

(B) **RESIDUAL:** red and orange, moist, stiff, moderately plastic, highly sandy, silty CLAY (A-7-5)

(C) **RESIDUAL:** white, moist, medium stiff, saprolitic, sandy SILT (A-4) with trace mica

19+00.00

-Y15-

6/23/16

19-OCT-2018 11:06
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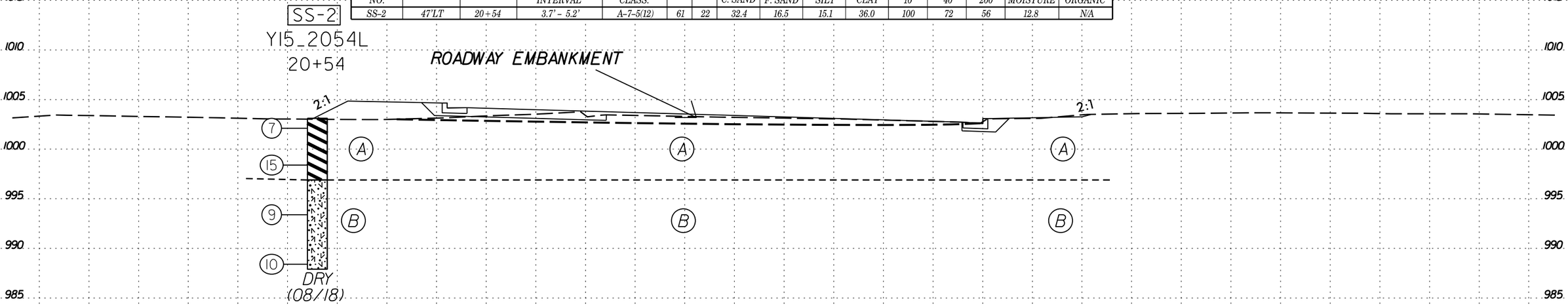
SOIL TEST RESULTS

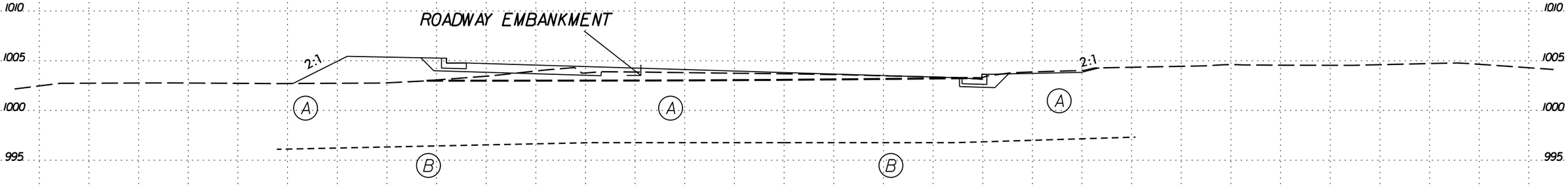
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-2	47'LT	20+54	3.7' - 5.2'	A-7-5(12)	61	22	32.4	16.5	15.1	36.0	100	72	56	12.8	N/A



(A) **RESIDUAL:** red-brown, dry to moist, medium stiff to stiff, moderately plastic, highly sandy, silty CLAY (A-7-5) with trace mica

(B) **RESIDUAL:** red-brown, dark green, and white, dry to moist, stiff, highly sandy, clayey SILT (A-5) with trace mica

20+50.00



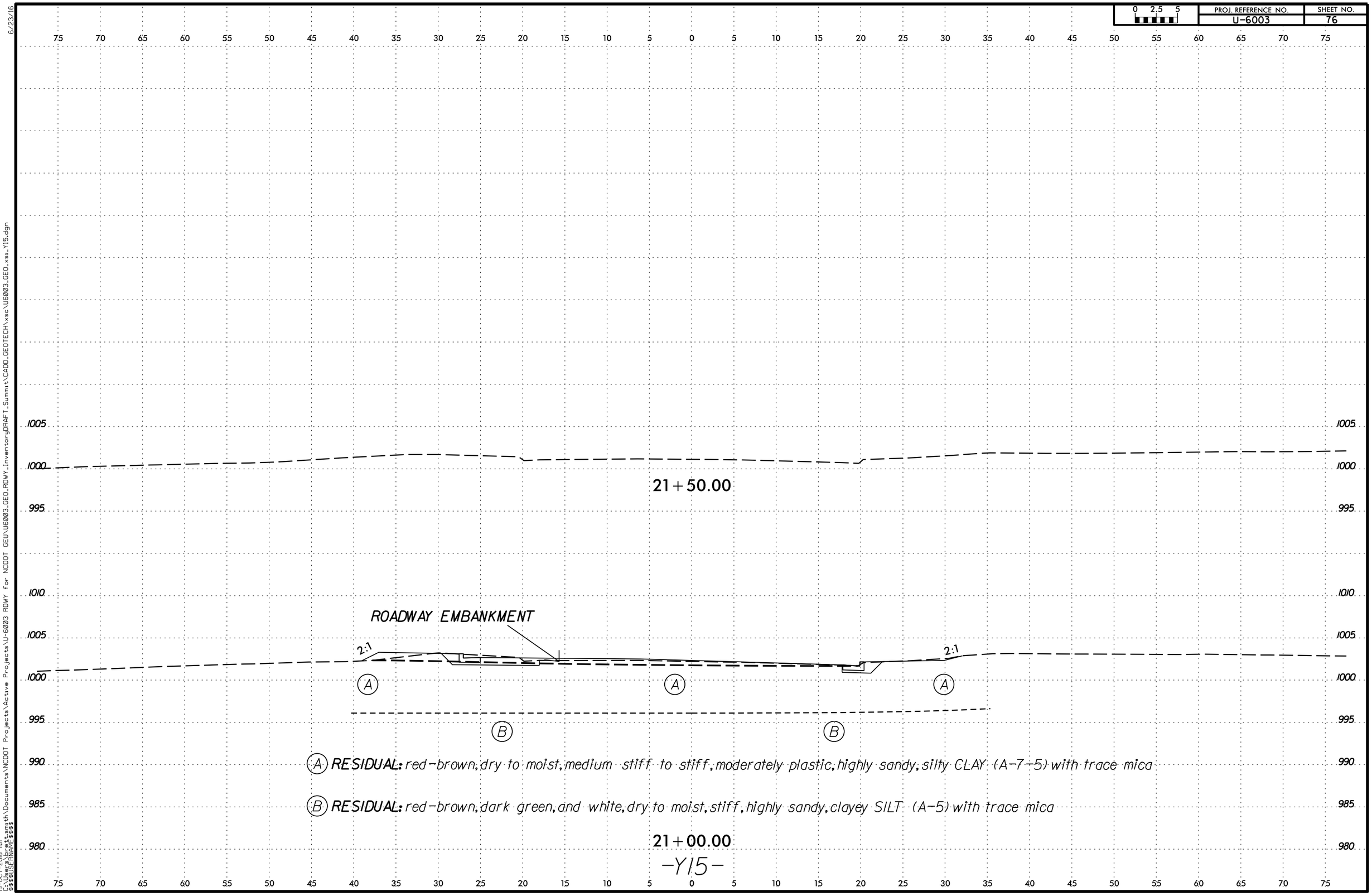
(A) **RESIDUAL:** red-brown, dry to moist, medium stiff to stiff, moderately plastic, highly sandy, silty CLAY (A-7-5) with trace mica

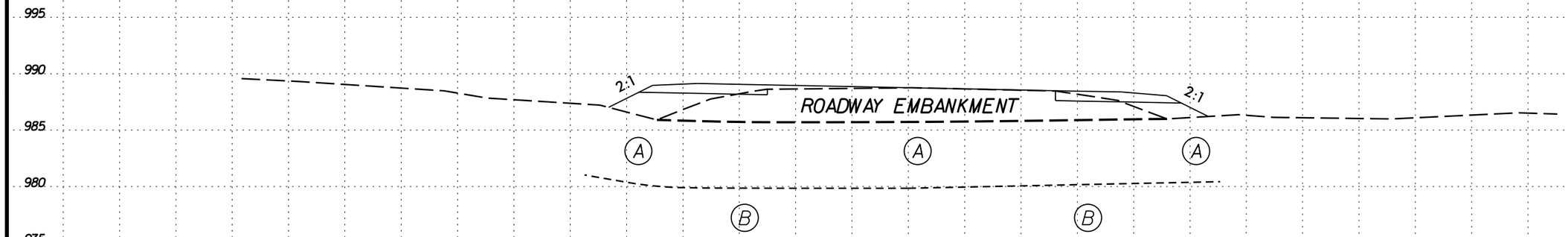
(B) **RESIDUAL:** red-brown, dark green, and white, dry to moist, stiff, highly sandy, clayey SILT (A-5) with trace mica

20+00.00

-Y15-

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	U-6003	76





(A) **RESIDUAL:** *red-brown, gray-brown, and tan, moist, medium stiff, sandy CLAY (A-6) and highly plastic, silty CLAY (A-7-5) with some sand*

(B) **RESIDUAL:** *dark brown, dark gray, red-brown, and white, moist, stiff, micaceous, sandy SILT (A-4)*

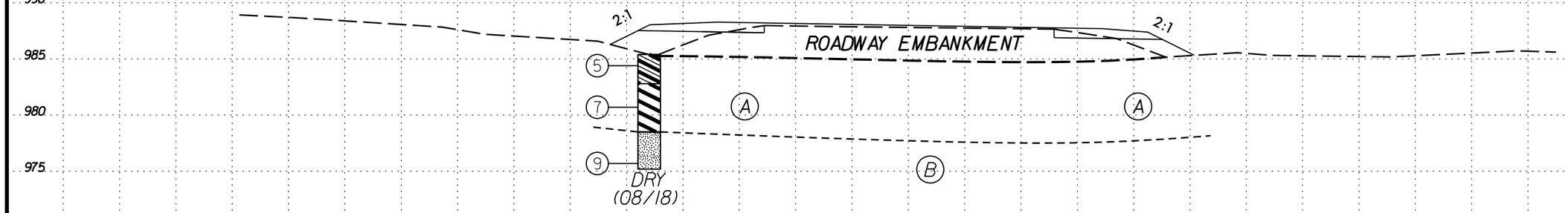
12 + 00.00

SS-14
SS-15

Y16_1150L

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-14	23'LT	11+50	0.0' - 1.5'	A-6(3)	39	16	35.8	22.7	11.0	30.5	95	71	43	16.7	N/A
SS-15	23'LT	11+50	3.7' - 5.2'	A-7-5(43)	97	51	17.6	10.1	5.8	66.5	99	87	73	37.9	N/A



(A) **RESIDUAL:** *red-brown, gray-brown, and tan, moist, medium stiff, sandy CLAY (A-6) and highly plastic, silty CLAY (A-7-5) with some sand*

(B) **RESIDUAL:** *dark brown, dark gray, red-brown, and white, moist, stiff, micaceous, sandy SILT (A-4)*

11 + 50.00

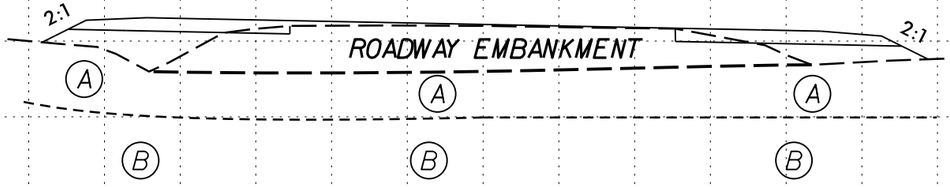
-Y16-

PROJ. REFERENCE NO.	SHEET NO.
U-6003	78

0 2.5 5

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

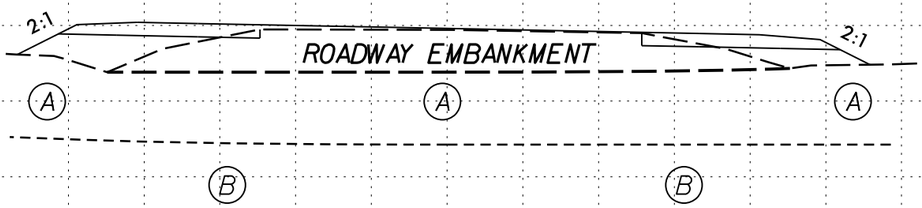
995 990 985 980 975 970



(A) **RESIDUAL:** *orange and red, moist, soft, highly plastic, silty CLAY (A-7-5) with some sand*

(B) **RESIDUAL:** *orange and red, moist, stiff, micaceous, highly sandy, clayey SILT (A-5)*

13+00.00

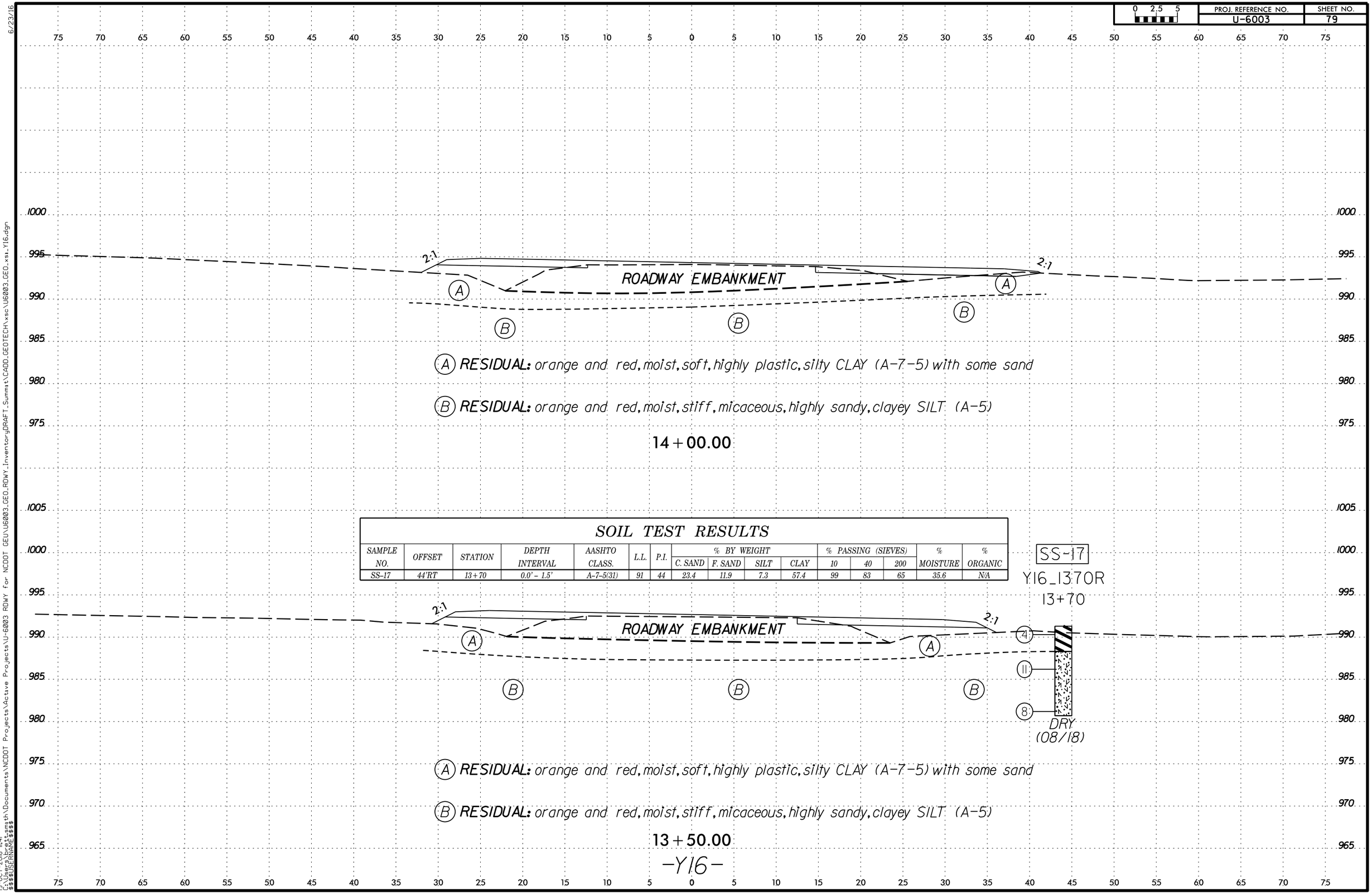


(A) **RESIDUAL:** *red-brown, gray-brown, and tan, moist, medium stiff, sandy CLAY (A-6) and highly plastic, silty CLAY (A-7-5) with some sand*

(B) **RESIDUAL:** *dark brown, dark gray, red-brown, and white, moist, stiff, micaceous, sandy SILT (A-4)*

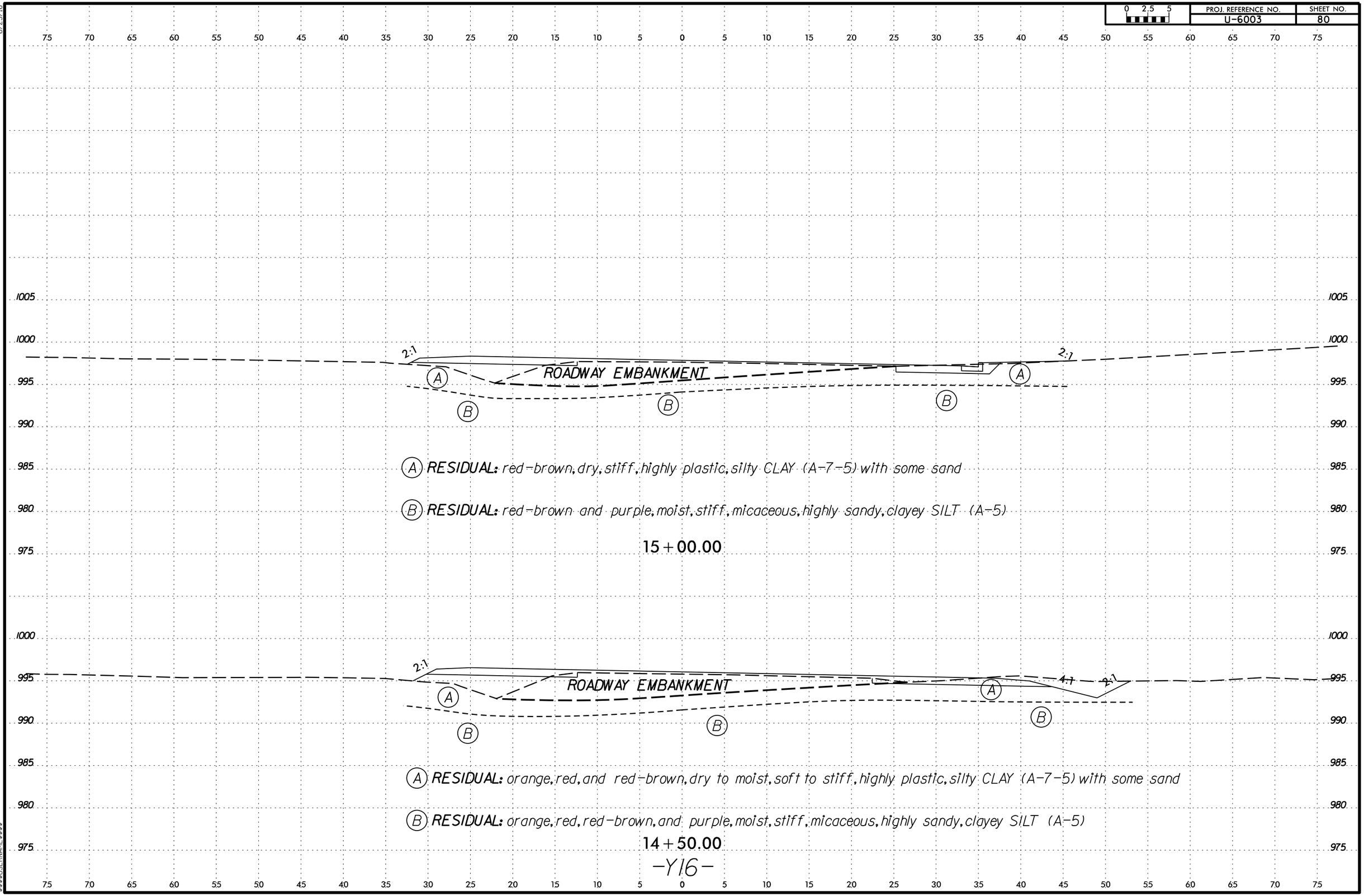
12+50.00

-Y16-



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-17	44'RT	13+70	0.0' - 1.5'	A-7-5(31)	91	44	23.4	11.9	7.3	57.4	99	83	65	35.6	N/A



(A) **RESIDUAL:** red-brown, dry, stiff, highly plastic, silty CLAY (A-7-5) with some sand

(B) **RESIDUAL:** red-brown and purple, moist, stiff, micaceous, highly sandy, clayey SILT (A-5)

15+00.00

(A) **RESIDUAL:** orange, red, and red-brown, dry to moist, soft to stiff, highly plastic, silty CLAY (A-7-5) with some sand

(B) **RESIDUAL:** orange, red, red-brown, and purple, moist, stiff, micaceous, highly sandy, clayey SILT (A-5)

14+50.00

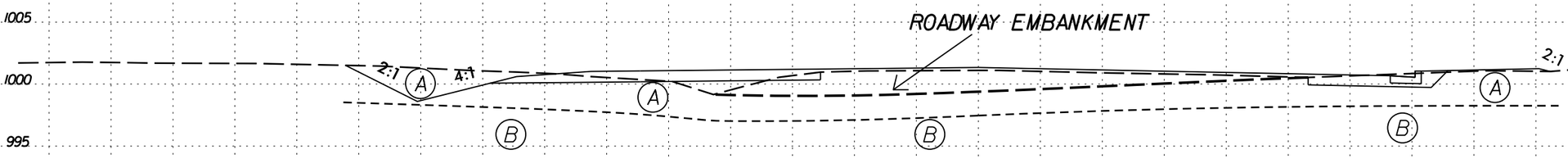
-Y16-

PROJ. REFERENCE NO.	SHEET NO.
U-6003	81

0 2.5 5

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

1010 1005 1000 995 990 985 980



(A) **RESIDUAL:** red-brown, dry, stiff, highly plastic, silty CLAY (A-7-5) with some sand

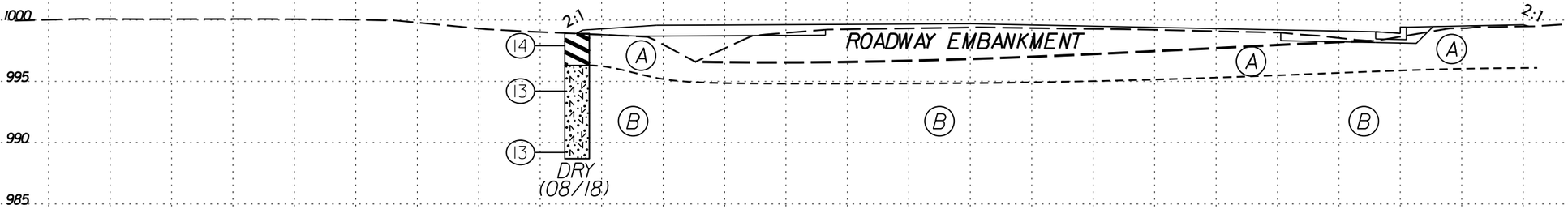
(B) **RESIDUAL:** red-brown and purple, moist, stiff, micaceous, highly sandy, clayey SILT (A-5)

16+00.00

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-12	32'LT	15+50	0.0' - 1.5'	A-7-5(36)	84	43	15.5	12.1	3.4	69.0	99	89	74	14.1	N/A

SS-12
Y16_1550L



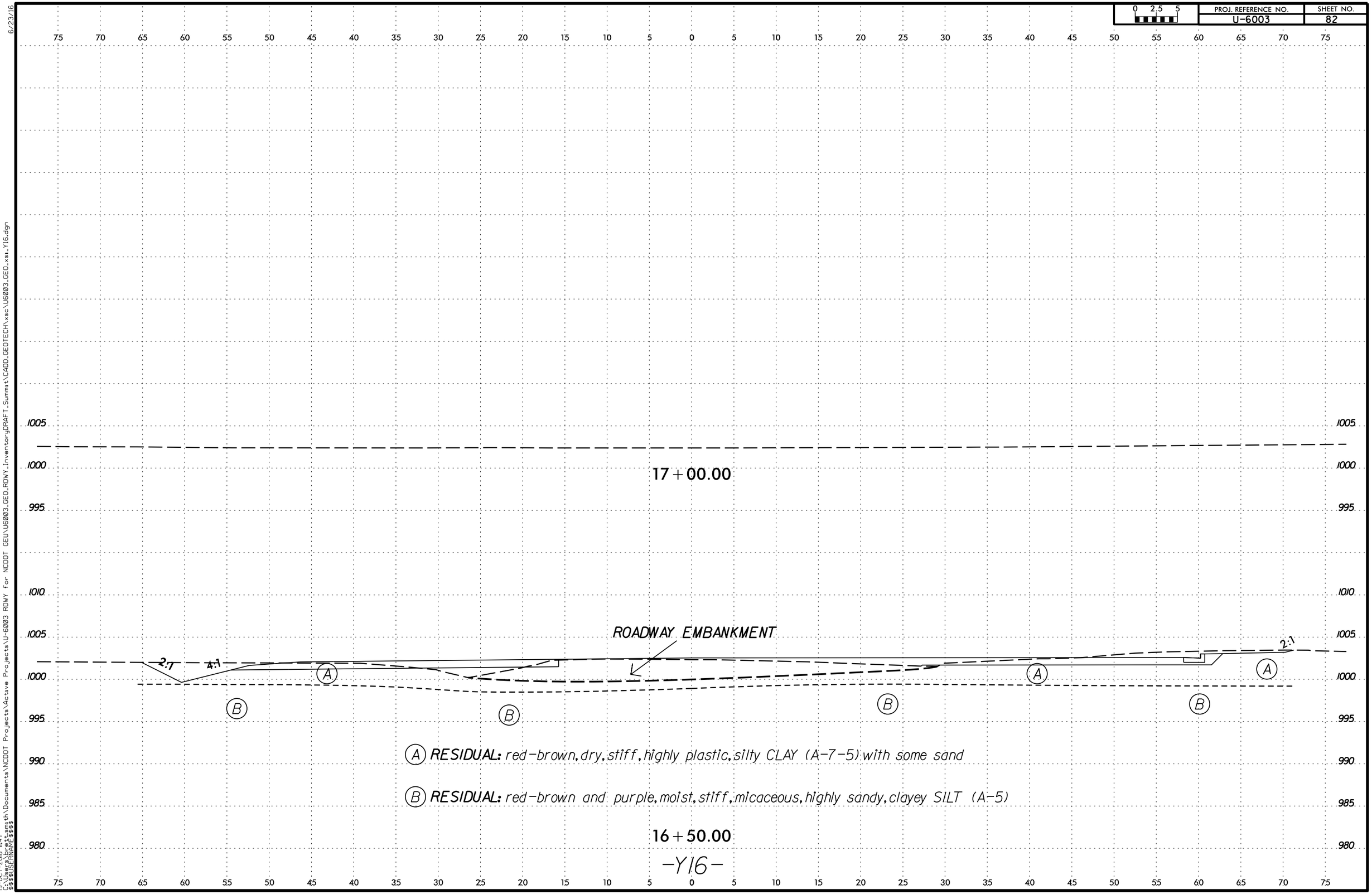
(A) **RESIDUAL:** red-brown, dry, stiff, highly plastic, silty CLAY (A-7-5) with some sand

(B) **RESIDUAL:** red-brown and purple, moist, stiff, micaceous, highly sandy, clayey SILT (A-5)

15+50.00

-Y16-

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	U-6003	82



(A) **RESIDUAL:** *red-brown, dry, stiff, highly plastic, silty CLAY (A-7-5) with some sand*

(B) **RESIDUAL:** *red-brown and purple, moist, stiff, micaceous, highly sandy, clayey SILT (A-5)*

-Y16-

M & T Form 503

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAY
MATERIALS & TESTS UNIT
SOILS LABORATORY

T. I. P. No. U-6003

REPORT ON SAMPLES OF Kernersville Loop from SR 1969 to NC 150

Project	47138.1.1	**County**	Forsyth	**Owner**	Geotech
Date: Sampled	August, 2018	**Received**	8/17/18	**Reported**	8/29/18
Sampled from	Roadway Investigation		**By**	Geotech	
Submitted by	B. Smith			2008	**Standard Specifications**

8/29/18

TEST RESULTS

Proj. Sample No.		SS-7	SS-8	SS-10	SS-23	SS-24	SS-21
Boring No.		Y15_1250L	Y15_1250L	Y15_1415R	Y15_1599L	Y15_1599L	Y15_1875R
Retained #4 Sieve	%	3	0	1	0	0	0
Passing #10 Sieve	%	93	100	98	99	100	99
Passing #40 Sieve	%	74	84	88	84	80	72
Passing #200 Sieve	%	45	56	69	67	56	57

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%							
Coarse Sand Ret - #60	%	32.9	26.9	17.3	22.4	27.1	33.4
Fine Sand Ret - #270	%	22.6	25.7	14.3	11.8	25.9	13.8
Silt 0.05 - 0.005 mm	%	13.7	7.4	6.4	6.8	14.2	13.5
Clay < 0.005 mm	%	30.9	40.0	62.0	59.0	32.8	39.3
Passing #40 Sieve	%	79.3	84.1	89.4	84.1	80.7	72.5
Passing #200 Sieve	%	48.2	55.7	70.5	67.7	55.7	57.4

L. L.		38	53	68	71	58	64
P. I.		11	5	32	38	14	25
AASHTO Classification		A-6	A-5	A-7-5	A-7-5	A-7-5	A-7-5
Group Index		2	3	24	26	8	13
pH		N/A	N/A	N/A	N/A	N/A	N/A
Station		12+50	12+50	14+15	15+99	15+99	18+75
OFFSET		20'LT	20'LT	57'RT	65'LT	65'LT	34'RT
ALIGNMENT		-Y15-	-Y15-	-Y15-	-Y15-	-Y15-	-Y15-
Depth (Ft)		0.0	3.7	0.0	0.0	3.5	3.8
	to	1.5	5.2	1.5	1.5	5.0	5.3
Natural Moisture %		18.0	31.9	32.2	26.1	16.8	25.5

Aaron Hackett
Soils Engineer

M & T Form 503

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
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Project 47138.1.1 County Forsyth Owner Geotech
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Sampled from Roadway Investigation By Geotech
Submitted by B. Smith 2008 Standard Specifications

8/29/18

TEST RESULTS

Proj. Sample No.		SS-2	SS-14	SS-15	SS-17	SS-12	SS-5
Boring No.		Y15_2054L	Y16_1150L	Y16_1150L	Y16_1370R	Y16_1550L	L1202L
Retained #4 Sieve	%	0	2	0	0	0	0
Passing #10 Sieve	%	100	95	99	99	99	99
Passing #40 Sieve	%	72	71	87	83	89	89
Passing #200 Sieve	%	56	43	73	65	74	82

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%							
Coarse Sand Ret - #60	%	32.4	35.8	17.6	23.4	15.5	12.9
Fine Sand Ret - #270	%	16.5	22.7	10.1	11.9	12.1	6.1
Silt 0.05 - 0.005 mm	%	15.1	11.0	5.8	7.3	3.4	0.2
Clay < 0.005 mm	%	36.0	30.5	66.5	57.4	69.0	80.8
Passing #40 Sieve	%	72.7	74.8	87.3	84.4	89.9	90.0
Passing #200 Sieve	%	56.4	45.6	74.0	66.0	74.6	82.5

L. L.		61	39	97	91	84	97
P. I.		22	16	51	44	43	51
AASHTO Classification		A-7-5	A-6	A-7-5	A-7-5	A-7-5	A-7-5
Group Index		12	3	43	31	36	50
pH		N/A	N/A	N/A	N/A	N/A	N/A
Station		20+54	11+50	11+50	13+70	15+50	12+02
OFFSET		47'LT	23'LT	23'LT	44'RT	32'LT	35'LT
ALIGNMENT		-Y15-	-Y16-	-Y16-	-Y16-	-Y16-	-L-
Depth (Ft)		3.7	0.0	3.7	0.0	0.0	0.0
	to	5.2	1.5	5.2	1.5	1.5	1.5
Natural Moisture %		12.8	16.7	37.9	35.6	14.1	26.1

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Sampled from	Roadway Investigation		**By**	Geotech	
Submitted by	B. Smith			2008	**Standard Specifications**

8/29/18

TEST RESULTS

Proj. Sample No.		SS-27	SS-29	SS-30	SS-31	SS-32	SS-33
Boring No.		L1400L	L1600	L1600	L1800	L1800	L2000
Retained #4 Sieve	%	2	0	0	0	0	0
Passing #10 Sieve	%	91	96	95	98	97	93
Passing #40 Sieve	%	73	62	71	90	78	78
Passing #200 Sieve	%	54	39	49	77	56	60
MINUS NO. 10 FRACTION							
SOIL MORTAR - 100%							
Coarse Sand Ret - #60	%	27.0	44.8	32.0	13.2	26.5	23.0
Fine Sand Ret - #270	%	16.1	17.0	21.0	11.5	23.6	15.6
Silt 0.05 - 0.005 mm	%	14.8	16.3	14.9	17.6	25.8	16.3
Clay < 0.005 mm	%	42.2	21.9	32.1	57.7	24.2	45.1
Passing #40 Sieve	%	80.2	65.2	74.8	91.2	80.0	83.7
Passing #200 Sieve	%	60.0	41.1	51.2	78.5	57.3	64.8
L. L.		52	31	53	77	49	61
P. I.		16	8	8	38	2	28
AASHTO Classification		A-7-5	A-4	A-5	A-7-5	A-5	A-7-5
Group Index		8	0	3	34	2	16
pH		N/A	N/A	N/A	N/A	N/A	N/A
Station		14+00	16+00	16+00	18+00	18+00	20+00
OFFSET		7'LT	8'RT	8'RT	CL	CL	CL
ALIGNMENT		-L-	-L-	-L-	-L-	-L-	-L-
Depth (Ft)		4.0	0.0	3.4	0.0	3.4	0.0
	to	5.5	1.5	4.9	1.5	4.9	1.5
Natural Moisture %		19.6	14.2	20.9	28.5	19.0	21.5

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Soils Engineer

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8/29/18

TEST RESULTS

Proj. Sample No.		SS-34	SS-36	SS-37			
Boring No.		L2000	L2200	L2200			
Retained #4 Sieve	%	0	0	0			
Passing #10 Sieve	%	98	99	98			
Passing #40 Sieve	%	80	84	81			
Passing #200 Sieve	%	59	72	68			
MINUS NO. 10 FRACTION							
SOIL MORTAR - 100%							
Coarse Sand Ret - #60	%	24.5	19.3	20.5			
Fine Sand Ret - #270	%	21.7	10.8	15.8			
Silt 0.05 - 0.005 mm	%	10.3	0.1	9.9			
Clay < 0.005 mm	%	43.6	69.7	53.8			
Passing #40 Sieve	%	81.2	84.8	83.3			
Passing #200 Sieve	%	60.5	73.0	69.8			
L. L.		57	94	63			
P. I.		25	57	27			
AASHTO Classification		A-7-5	A-7-5	A-7-5			
Group Index		13	45	19			
pH		N/A	N/A	N/A			
Station		20+00	22+00	22+00			
OFFSET		CL	CL	CL			
ALIGNMENT		-L-	-L-	-L-			
Depth (Ft)		3.2	0.0	3.7			
	to	4.7	1.5	5.2			
Natural Moisture %		21.0	30.8	35.8			

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Submitted by	B. Smith			2008	**Standard Specifications**

9/5/18

TEST RESULTS

Proj. Sample No.		SS-40	SS-45	SS-48	SS-50	SS-51	SS-71
Boring No.		L2388L	L2422R	L2678	L2800R	L2800R	L3034C
Retained #4 Sieve	%	2	0	0	2	5	1
Passing #10 Sieve	%	98	100	98	95	90	98
Passing #40 Sieve	%	88	86	79	68	57	73
Passing #200 Sieve	%	73	39	45	36	26	34
MINUS NO. 10 FRACTION							
SOIL MORTAR - 100%							
Coarse Sand Ret - #60	%	15.2	24.2	30.3	40.9	52.1	42.8
Fine Sand Ret - #270	%	12.8	46.2	30.6	25.3	21.5	25.1
Silt 0.05 - 0.005 mm	%	9.8	12.6	12.3	9.9	0.3	10.9
Clay < 0.005 mm	%	62.2	16.9	26.9	23.9	26.0	21.2
Passing #40 Sieve	%	89.7	85.8	80.7	71.7	63.0	74.4
Passing #200 Sieve	%	74.9	39.3	46.2	37.4	28.6	34.8
L. L.		70	51	51	32	38	35
P. I.		37	9	0	1	15	8
AASHTO Classification		A-7-5	A-5	A-5	A-4	A-2-6	A-2-4
Group Index		29	1	0	0	1	0
pH		N/A	N/A	N/A	N/A	N/A	N/A
Station		23+88	24+22	26+78	28+00	28+00	30+34
OFFSET		27'LT	40'RT	CL	25'RT	25'RT	52'RT
ALIGNMENT		-L-	-L-	-L-	-L-	-L-	-L-
Depth (Ft)		0.0	4.0	0.0	0.0	3.6	0.0
	to	1.5	5.5	1.5	1.5	5.1	1.5
Natural Moisture %		27.4	23.7	39.7	22.5	14.1	35.0

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Soils Engineer

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MATERIALS & TESTS UNIT
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T. I. P. No. U-6003

REPORT ON SAMPLES OF Kernersville Loop from SR 1969 to NC 150

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Date: Sampled	August, 2018	**Received**	8/27/18	**Reported**	9/5/18
Sampled from	Roadway Investigation		**By**	Geotech	
Submitted by	B. Smith			2008	**Standard Specifications**

9/5/18

TEST RESULTS

Proj. Sample No.		SS-67	SS-61	SS-78	SS-79	SS-80	SS-81
Boring No.		L3064C	L3067C	L3200L	L3200L	L3200L	L3200L
Retained #4 Sieve	%	0	0	0	0	0	1
Passing #10 Sieve	%	100	99	98	97	96	97
Passing #40 Sieve	%	94	78	73	76	75	65
Passing #200 Sieve	%	28	29	43	48	57	28
MINUS NO. 10 FRACTION							
SOIL MORTAR - 100%							
Coarse Sand Ret - #60	%	22.3	34.6	36.8	31.9	28.4	45.6
Fine Sand Ret - #270	%	53.6	42.2	22.5	21.4	15.6	32.6
Silt 0.05 - 0.005 mm	%	7.1	11.7	9.7	1.7	15.5	14.1
Clay < 0.005 mm	%	17.0	11.5	31.0	45.0	40.4	7.7
Passing #40 Sieve	%	94.4	79.3	74.7	78.0	78.4	67.0
Passing #200 Sieve	%	27.9	29.5	43.7	49.2	59.7	28.3
L. L.		26	51	70	58	58	43
P. I.		0	9	35	24	26	6
AASHTO Classification		A-2-4	A-2-5	A-7-5	A-7-5	A-7-5	A-2-5
Group Index		0	0	10	8	13	0
pH		N/A	N/A	N/A	N/A	N/A	N/A
Station		30+64	30+67	32+00	32+00	32+00	32+00
OFFSET		CL	49'LT	15'LT	15'LT	15'LT	15'LT
ALIGNMENT		-L-	-L-	-L-	-L-	-L-	-L-
Depth (Ft)		3.8	8.5	0.0	3.3	8.3	13.3
	to	5.3	10.0	1.5	4.8	9.8	14.8
Natural Moisture %		31.4	32.4	29.2	4.6	33.4	33.0

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T. I. P. No. U-6003

REPORT ON SAMPLES OF Kernersville Loop from SR 1969 to NC 150

Project	47138.1.1	**County**	Forsyth	**Owner**	Geotech
Date: Sampled	August, 2018	**Received**	8/27/18	**Reported**	9/5/18
Sampled from	Roadway Investigation		**By**	Geotech	
Submitted by	B. Smith			2008	**Standard Specifications**

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TEST RESULTS

Proj. Sample No.		SS-84	SS-85	SS-91	SS-92	SS-93	SS-96
Boring No.		L3212R	L3212R	L3385L	L3385L	L3385L	L3420R
Retained #4 Sieve	%	14	1	0	0	0	1
Passing #10 Sieve	%	75	98	99	98	98	97
Passing #40 Sieve	%	51	88	88	74	77	81
Passing #200 Sieve	%	29	42	39	21	21	53

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%							
Coarse Sand Ret - #60	%	41.7	22.1	24.9	42.8	38.2	26.2
Fine Sand Ret - #270	%	25.4	42.3	43.4	41.6	47.1	21.7
Silt 0.05 - 0.005 mm	%	16.3	24.9	19.8	11.5	10.6	10.6
Clay < 0.005 mm	%	16.7	10.7	12.0	4.1	4.1	41.5
Passing #40 Sieve	%	68.9	90.4	88.4	75.1	77.8	83.5
Passing #200 Sieve	%	39.2	43.4	39.0	21.0	21.0	54.7

L. L.		46	41	45	47	44	61
P. I.		1	2	1	0	0	25
AASHTO Classification		A-2-5	A-5	A-5	A-2-5	A-2-5	A-7-5
Group Index		0	0	0	0	0	11
pH		N/A	N/A	N/A	N/A	N/A	N/A
Station		32+12	32+12	33+85	33+85	33+85	34+20
OFFSET		40'RT	40'RT	28'LT	28'LT	28'LT	40'RT
ALIGNMENT		-L-	-L-	-L-	-L-	-L-	-L-
Depth (Ft)		3.8	8.8	3.2	8.2	13.2	0.0
	to	5.3	10.3	4.7	9.7	14.7	1.5
Natural Moisture %		17.9	20.9	25.4	14.5	15.8	30.1

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Project 47138.1.1 County Forsyth Owner Geotech
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Submitted by B. Smith 2008 Standard Specifications

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TEST RESULTS

Proj. Sample No.		SS-97	SS-100	SS-102	SS-103	SS-106	
Boring No.		L3420R	L3420R	L3600R	L3600R	L3600R	
Retained #4 Sieve	%	0	2	0	0	3	
Passing #10 Sieve	%	100	97	98	99	92	
Passing #40 Sieve	%	81	72	80	78	64	
Passing #200 Sieve	%	49	41	61	46	21	

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%							
Coarse Sand Ret - #60	%	27.4	35.9	24.8	29.2	44.0	
Fine Sand Ret - #270	%	34.1	31.4	17.2	33.4	39.8	
Silt 0.05 - 0.005 mm	%	23.8	21.2	7.9	10.7	6.0	
Clay < 0.005 mm	%	14.7	11.5	50.1	26.7	10.2	
Passing #40 Sieve	%	81.4	73.7	81.8	79.5	69.3	
Passing #200 Sieve	%	49.4	42.0	61.9	47.1	23.1	

L. L.		49	57	66	55	45	
P. I.		3	14	28	10	2	
AASHTO Classification		A-5	A-7-5	A-7-5	A-5	A-2-5	
Group Index		1	3	17	3	0	
pH		N/A	N/A	N/A	N/A	N/A	
Station		34+20	34+20	36+00	36+00	36+00	
OFFSET		40'RT	40'RT	40'RT	40'RT	40'RT	
ALIGNMENT		-L-	-L-	-L-	-L-	-L-	
Depth (Ft)		4.0	19.0	0.0	3.8	23.8	
	to	5.5	20.5	1.5	5.3	25.3	
Natural Moisture %		39.6	35.8	33.9	20.8	18.0	

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TEST RESULTS

Proj. Sample No.		SS-109	SS-124	SS-125	SS-128	SS-116	SS-121
Boring No.		L3600L	L3800L	L3800L	L3800L	L3800R	L3800R
Retained #4 Sieve	%	4	0	0	0	1	1
Passing #10 Sieve	%	94	98	100	99	99	92
Passing #40 Sieve	%	73	77	88	77	81	72
Passing #200 Sieve	%	50	45	52	31	58	39
MINUS NO. 10 FRACTION							
SOIL MORTAR - 100%							
Coarse Sand Ret - #60	%	30.8	32.9	21.0	35.3	26.8	33.7
Fine Sand Ret - #270	%	18.3	24.6	33.4	40.8	17.6	30.0
Silt 0.05 - 0.005 mm	%	12.8	5.4	8.9	12.9	9.3	21.5
Clay < 0.005 mm	%	38.0	37.1	36.6	11.1	46.3	14.9
Passing #40 Sieve	%	77.4	78.5	88.2	77.8	81.7	78.3
Passing #200 Sieve	%	53.9	46.0	52.1	31.6	58.5	42.9
L. L.		48	46	50	43	65	61
P. I.		15	20	12	3	26	2
AASHTO Classification		A-7-5	A-7-6	A-7-5	A-2-5	A-7-5	A-5
Group Index		6	5	5	0	14	0
pH		N/A	N/A	N/A	N/A	N/A	N/A
Station		36+00	38+00	38+00	38+00	38+00	38+00
OFFSET		26'LT	15'LT	15'LT	15'LT	40'RT	40'RT
ALIGNMENT		-L-	-L-	-L-	-L-	-L-	-L-
Depth (Ft)		0.0	0.0	3.5	18.5	0.0	23.3
	to	1.5	1.5	5.0	20.0	1.5	24.8
Natural Moisture %		12.1	18.7	20.0	14.9	34.4	41.7

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TEST RESULTS

Proj. Sample No.		SS-131	SS-132	SS-134	SS-136	SS-140	SS-142
Boring No.		L4015L	L4015L	L4015L	L4020R	L4020R	L4185L
Retained #4 Sieve	%	4	0	9	0	0	0
Passing #10 Sieve	%	94	98	90	98	100	98
Passing #40 Sieve	%	76	77	70	78	86	73
Passing #200 Sieve	%	51	27	17	54	40	47
MINUS NO. 10 FRACTION							
SOIL MORTAR - 100%							
Coarse Sand Ret - #60	%	28.5	38.2	43.3	29.4	23.6	36.2
Fine Sand Ret - #270	%	20.5	39.4	42.8	17.6	46.7	19.0
Silt 0.05 - 0.005 mm	%	11.2	5.0	4.7	8.3	20.8	9.4
Clay < 0.005 mm	%	39.8	17.4	9.1	44.7	9.0	35.3
Passing #40 Sieve	%	80.8	79.4	76.9	79.6	86.4	74.4
Passing #200 Sieve	%	53.8	27.5	18.8	55.3	39.6	47.5
L. L.		55	49	35	58	45	45
P. I.		24	4	3	25	5	19
AASHTO Classification		A-7-5	A-2-5	A-2-4	A-7-5	A-5	A-7-6
Group Index		9	0	0	12	0	6
pH		N/A	N/A	N/A	N/A	N/A	N/A
Station		40+15	40+15	40+15	40+20	40+20	41+85
OFFSET		40'LT	40'LT	40'LT	30'RT	30'RT	40'LT
ALIGNMENT		-L-	-L-	-L-	-L-	-L-	-L-
Depth (Ft)		0.0	3.7	13.7	0.0	19.1	0.0
	to	1.5	5.2	15.2	1.5	20.6	1.5
Natural Moisture %		18.7	21.3	13.6	25.6	26.8	24.3

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TEST RESULTS

Proj. Sample No.		SS-143	SS-147	SS-148			
Boring No.		L4185L	L4200R	L4200R			
Retained #4 Sieve	%	0	2	0			
Passing #10 Sieve	%	100	97	98			
Passing #40 Sieve	%	83	76	70			
Passing #200 Sieve	%	46	46	28			
MINUS NO. 10 FRACTION							
SOIL MORTAR - 100%							
Coarse Sand Ret - #60	%	27.1	31.5	42.8			
Fine Sand Ret - #270	%	32.9	23.9	34.3			
Silt 0.05 - 0.005 mm	%	16.1	8.6	7.3			
Clay < 0.005 mm	%	23.9	36.0	15.6			
Passing #40 Sieve	%	83.4	78.2	70.7			
Passing #200 Sieve	%	46.2	48.0	28.2			
L. L.		53	53	50			
P. I.		10	20	3			
AASHTO Classification		A-5	A-7-5	A-2-5			
Group Index		3	6	0			
pH		N/A	N/A	N/A	N/A	N/A	N/A
Station		41+85	42+00	42+00			
OFFSET		40'LT	40'RT	40'RT			
ALIGNMENT		-L-	-L-	-L-			
Depth (Ft)		3.3	0.0	3.5			
	to	4.8	1.5	5.0			
Natural Moisture %		24.5	24.1	20.7			

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TEST RESULTS

Proj. Sample No.		SS-151	SS-157	SS-172	SS-173	SS-177	SS-179
Boring No.		L4420C	L4460C	L4620	L4620	L4800R	L4800R
Retained #4 Sieve	%	0	12	0	0	0	0
Passing #10 Sieve	%	100	77	98	99	98	100
Passing #40 Sieve	%	93	45	70	73	83	81
Passing #200 Sieve	%	42	13	41	31	51	19
MINUS NO. 10 FRACTION							
SOIL MORTAR - 100%							
Coarse Sand Ret - #60	%	20.2	57.0	40.3	40.7	27.0	40.8
Fine Sand Ret - #270	%	44.6	30.2	19.9	32.1	25.1	45.1
Silt 0.05 - 0.005 mm	%	23.0	7.7	11.2	15.4	13.3	10.8
Clay < 0.005 mm	%	12.3	5.2	28.6	11.8	34.7	3.3
Passing #40 Sieve	%	93.3	58.4	72.1	74.1	84.0	81.4
Passing #200 Sieve	%	41.6	17.2	42.3	31.0	51.7	19.3
L. L.		35	44	49	50	56	52
P. I.		8	4	21	4	14	11
AASHTO Classification		A-4	A-1-b	A-7-6	A-2-5	A-7-5	A-2-7
Group Index		1	0	4	0	6	0
pH		N/A	N/A	N/A	N/A	N/A	N/A
Station		44+20	44+60	46+20	46+20	48+00	48+00
OFFSET		66'LT	CL	CL	CL	40'RT	40'RT
ALIGNMENT		-L-	-L-	-L-	-L-	-L-	-L-
Depth (Ft)		0.0	3.4	0.0	3.8	0.0	9.4
	to	1.5	4.9	1.5	5.3	1.5	10.9
Natural Moisture %		19.4	10.5	16.4	19.0	26.1	15.0

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TEST RESULTS

Proj. Sample No.		SS-182	SS-183	SS-184	SS-152		
Boring No.		L4800L	L4800L	L4800L	L4420C		
Retained #4 Sieve	%	1	0	0	6		
Passing #10 Sieve	%	99	99	100	88		
Passing #40 Sieve	%	86	74	85	66		
Passing #200 Sieve	%	60	36	28	18		

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%							
Coarse Sand Ret - #60	%	21.4	38.0	32.5	45.9		
Fine Sand Ret - #270	%	21.0	30.6	45.8	37.4		
Silt 0.05 - 0.005 mm	%	13.8	17.2	14.4	10.9		
Clay < 0.005 mm	%	43.7	14.2	7.3	5.8		
Passing #40 Sieve	%	86.9	75.4	85.2	74.2		
Passing #200 Sieve	%	60.9	36.8	28.2	19.8		

L. L.		65	55	50	28		
P. I.		27	10	3	1		
AASHTO Classification		A-7-5	A-5	A-2-5	A-2-4		
Group Index		16	0	0	0		
pH		N/A	N/A	N/A	N/A		
Station		48+00	48+00	48+00	44+20		
OFFSET		40'LT	40'LT	40'LT	66'LT		
ALIGNMENT		-L-	-L-	-L-	-L-		
Depth (Ft)		0.0	3.4	8.4	2.9		
	to	1.5	4.9	9.9	4.4		
Natural Moisture %		16.6	18.8	11.0	N/A		

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TEST RESULTS

Proj. Sample No.		SS-194	SS-189	SS-190	SS-192	SS-225	SS-226
Boring No.		L5000L	L5000R	L5000R	L5000R	L5200R	L5200R
Retained #4 Sieve	%	0	1	0	1	0	0
Passing #10 Sieve	%	91	98	100	97	99	100
Passing #40 Sieve	%	74	80	76	69	83	80
Passing #200 Sieve	%	50	55	36	41	66	54

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%							
Coarse Sand Ret - #60	%	28.5	27.1	38.0	39.3	22.9	28.2
Fine Sand Ret - #270	%	19.2	20.7	32.0	26.1	13.5	21.6
Silt 0.05 - 0.005 mm	%	13.0	12.5	13.3	24.3	19.0	35.5
Clay < 0.005 mm	%	39.4	39.8	16.7	10.3	44.6	14.6
Passing #40 Sieve	%	81.9	81.5	75.9	71.2	84.2	80.7
Passing #200 Sieve	%	55.5	56.2	35.7	42.0	66.5	54.7

L. L.		60	61	64	60	57	59
P. I.		31	16	5	8	25	3
AASHTO Classification		A-7-6	A-7-5	A-5	A-5	A-7-5	A-5
Group Index		12	9	0	1	17	3
pH		N/A	N/A	N/A	N/A	N/A	N/A
Station		50+00	50+00	50+00	50+00	52+00	52+00
OFFSET		40'LT	40'RT	40'RT	40'RT	40'RT	40'RT
ALIGNMENT		-L-	-L-	-L-	-L-	-L-	-L-
Depth (Ft)		0.0	0.0	3.3	13.3	0.0	3.3
	to	1.5	1.5	4.8	14.8	1.5	4.8
Natural Moisture %		29.3	26.4	26.3	21.9	15.7	16.7

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TEST RESULTS

Proj. Sample No.		SS-197	SS-201	SS-204	SS-208	SS-209	SS-210
Boring No.		L5200R	L5400R	L5400R	L5400L	L5400L	L5400L
Retained #4 Sieve	%	0	0	0	0	0	0
Passing #10 Sieve	%	99	100	99	100	100	99
Passing #40 Sieve	%	68	95	81	93	95	81
Passing #200 Sieve	%	23	84	38	81	84	59

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%							
Coarse Sand Ret - #60	%	49.8	8.1	32.4	9.8	6.7	24.7
Fine Sand Ret - #270	%	32.4	12.5	36.8	13.1	15.8	24.6
Silt 0.05 - 0.005 mm	%	14.6	23.5	19.3	21.0	31.8	29.0
Clay < 0.005 mm	%	3.2	56.0	11.5	56.1	45.7	21.7
Passing #40 Sieve	%	68.6	95.0	82.1	93.2	95.2	81.4
Passing #200 Sieve	%	23.2	84.0	38.3	81.6	84.2	59.5

L. L.	48	85	60	72	70	54
P. I.	2	43	4	32	21	6
AASHTO Classification	A-2-5	A-7-5	A-5	A-7-5	A-7-5	A-5
Group Index	0	44	0	31	25	5
pH	N/A	N/A	N/A	N/A	N/A	N/A
Station	52+00	54+00	54+00	54+00	54+00	54+00
OFFSET	40'RT	55'RT	55'RT	40'LT	40'LT	40'LT
ALIGNMENT	-L-	-L-	-L-	-L-	-L-	-L-
Depth (Ft)	13.3	0.0	13.7	0.0	3.5	8.5
to	14.8	1.5	15.2	1.5	5.0	10.0
Natural Moisture %	15.6	36.1	26.5	22.0	37.2	27.1

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10/3/18

TEST RESULTS

Proj. Sample No.		SS-211	SS-214	SS-215	SS-218	SS-219	SS-221
Boring No.		L5400L	L5800	L5800	L5600	L5600	L6000
Retained #4 Sieve	%	0	0	0	0	0	0
Passing #10 Sieve	%	99	99	100	98	98	99
Passing #40 Sieve	%	92	74	67	58	62	69
Passing #200 Sieve	%	44	58	39	30	34	37

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%							
Coarse Sand Ret - #60	%	19.1	33.3	42.4	53.9	48.3	41.6
Fine Sand Ret - #270	%	45.6	10.8	23.8	19.5	20.2	27.3
Silt 0.05 - 0.005 mm	%	26.2	11.9	20.1	15.0	12.3	14.5
Clay < 0.005 mm	%	9.2	44.0	13.8	11.5	19.2	16.5
Passing #40 Sieve	%	92.6	74.5	67.6	59.0	63.6	69.3
Passing #200 Sieve	%	44.6	58.0	39.2	30.8	35.0	37.7

L. L.	52	56	53	20	34	51
P. I.	2	28	6	2	15	13
AASHTO Classification	A-5	A-7-6	A-5	A-2-4	A-2-6	A-7-5
Group Index	0	14	0	0	1	1
pH	N/A	N/A	N/A	N/A	N/A	N/A
Station	54+00	58+00	58+00	56+00	56+00	60+00
OFFSET	40'LT	CL	CL	CL	CL	CL
ALIGNMENT	-L-	-L-	-L-	-L-	-L-	-L-
Depth (Ft)	13.5	0.0	3.8	0.0	3.5	3.7
to	15.0	1.5	5.3	1.5	5.0	5.2
Natural Moisture %	24.2	21.2	23.7	20.2	13.8	21.8

Aaron Hackett
Soils Engineer

M & T Form 503

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAY
MATERIALS & TESTS UNIT
SOILS LABORATORY

T. I. P. No. U-6003

REPORT ON SAMPLES OF Kernersville Loop from SR 1969 to NC 150

Project 47138.1.1 **County** Forsyth **Owner**

Date: Sampled 8/1/18 **Received** 8/17/18 **Reported**

Sampled from Roadway Investigation **By** Geotech

Submitted by B. Smith 2008 **Standard Specifications**

10/3/18

TEST RESULTS

Proj. Sample No.		SS-222	SS-223				
Boring No.		L6000	L6200				
Retained #4 Sieve	%	0	0				
Passing #10 Sieve	%	99	97				
Passing #40 Sieve	%	71	68				
Passing #200 Sieve	%	39	48				

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%							
Coarse Sand Ret - #60	%	40.2	38.8				
Fine Sand Ret - #270	%	27.0	14.5				
Silt 0.05 - 0.005 mm	%	22.8	11.4				
Clay < 0.005 mm	%	9.9	35.3				
Passing #40 Sieve	%	72.5	69.6				
Passing #200 Sieve	%	39.3	49.0				

L. L.		51	54				
P. I.		7	29				
AASHTO Classification		A-5	A-7-6				
Group Index		0	10				
pH		N/A	N/A				
Station		60+00	62+00				
OFFSET		-L-	-L-				
ALIGNMENT		-L-	-L-				
Depth (Ft)		8.7	0.0				
	to	10.2	1.5				
Natural Moisture %		31.0	17.2				

Aaron Hackett
Soils Engineer

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DIVISION OF HIGHWAY
MATERIALS & TESTS UNIT
SOILS LABORATORY

T. I. P. No. U-6003

REPORT ON SAMPLES OF Kernersville Loop from SR 1969 to NC 150

Project 47138.1.1 **County** Forsyth **Owner**

Date: Sampled **Received** **Reported** 11/14/18

Sampled from Roadway Investigation **By** Geotech

Submitted by Brad Worley 2008 **Standard Specifications**

11/14/18

TEST RESULTS

Proj. Sample No.		S-554	S-555	S-556			
Boring No.		L3420R	L4200R	L5000L			
Retained #4 Sieve	%	0	0	0			
Passing #10 Sieve	%	91	96	95			
Passing #40 Sieve	%	68	71	72			
Passing #200 Sieve	%	44	31	36			

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%							
Coarse Sand Ret - #60	%	34.3	38.8	37.2			
Fine Sand Ret - #270	%	23.3	35.6	32.1			
Silt 0.05 - 0.005 mm	%	18.4	14.4	13.2			
Clay < 0.005 mm	%	24.0	11.2	17.5			
Passing #40 Sieve	%	74.9	74.4	75.9			
Passing #200 Sieve	%	48.1	32.8	37.2			

L. L.		52	44	30			
P. I.		14	11	3			
AASHTO Classification		A-7-5	A-2-7	A-4			
Group Index		4	0	0			
pH		N/A	N/A	N/A			
Station		34+20	42+00	50+00			
OFFSET		40'RT	40'RT	40'LT			
ALIGNMENT		-L-	-L-	-L-			
Depth (Ft)		0.0	0.0	0.0			
	to	30.5	15.0	8.2			
Natural Moisture %		N/A	N/A	N/A			

Aaron Hackett
Soils Engineer

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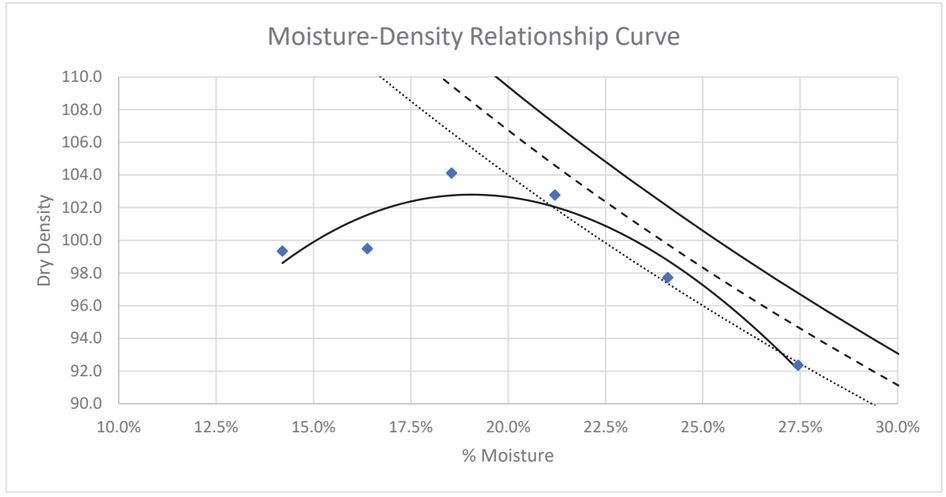
Standard Moisture-Density Relationship Report

ASTM D698

Project Number	**18-0173.I41**	Date	**11/9/2018**
Project Name	**U-6003**	Sample Number	**S-554**
Client	**NCDOT**		
Sample Description	**A-7-5**	Maximum Dry Density	**102.8**
Sample Location	**L3420R**	Optimum Moisture	**19.0%**



Natural Moisture:		Rammer Type:	**Manual**
Specific Gravity:	**2.60 (Assumed)**	Preparation Method:	**Dry**
Liquid Limit:	**52**	Method:	**A**
Plasticity Index:	**14**	Oversize Correction:	**Not Required**
% Fines:	**44.0%**		
% Sand:	**56.0%**		
% Gravel:	**0.0%**		

Aaron Hackett, EI
Lab Manager

Jeff Elliott, PE
CMT & SI Department Manager

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Report on California Bearing Ratio (ASTM D 1883/AASHTO T 193)

Date	**11/14/2018**	Project Name	**U-6003**
Sample No.	**S-554**	Project No.	**18-0173.I41**
Sample Location	**L3420R**	Client	**NCDOT**

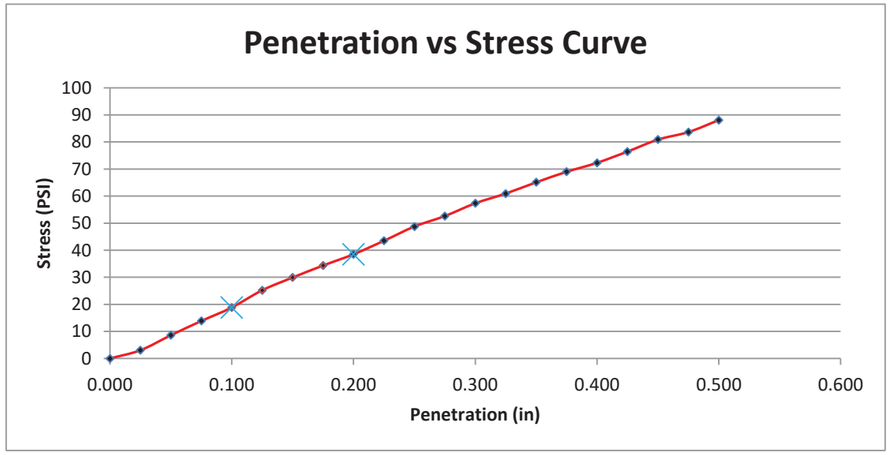
Proctor and Classification Data		**CBR Preparation Data**	
Sample Description	**N/A**	Rammer Used	**5.5 lbs, 12" Drop**
Classification	**A-7-5**	Compaction Method	**3 Layers, 56 Blows**
Max. Dry Density	**102.8**	Surcharge Amount	**10 lbs**
Optimum Moisture	**19.0%**	Soaked/Unsoaked	**Soaked**

CBR Results

Compaction Moisture Content	**22.4%**	Dry unit weight (lbs/cu.ft)	**101.5**
Moisture Content of Top 1" After Soaking	**25.8%**	Percent of Max. Dry Density	**98.7%**
Swell	**0.3%**		

CBR Values

Penetration (in)	**0.100**	**0.200**
Stress (psi)	**18.84**	**38.50**
CBR	**1.9**	**2.6**



Remarks:

No zero-point correction.

Aaron Hackett
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CMT & SI Dept. Manager

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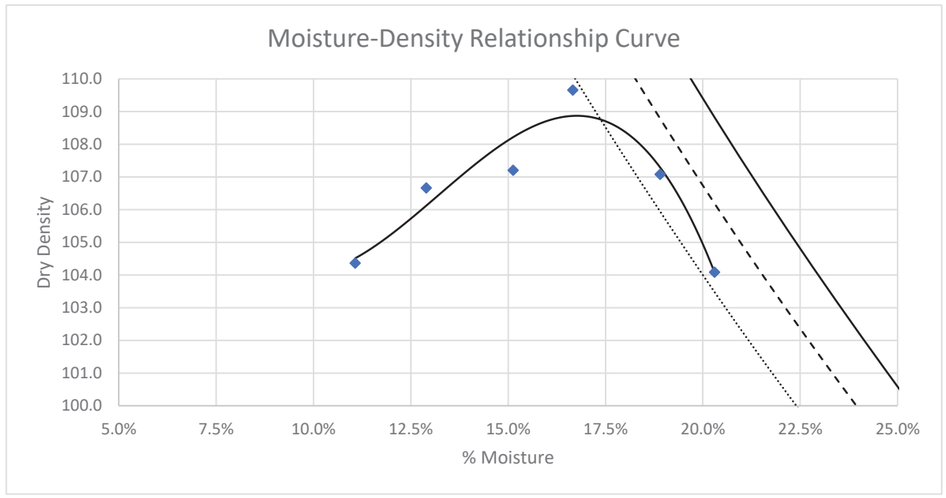
Standard Moisture-Density Relationship Report

ASTM D698

Project Number	**18-0173.I41**	Date	**11/8/2018**
Project Name	**U-6003**	Sample Number	**S-555**
Client	**NCDOT**		
Sample Description	**A-2-7**	Maximum Dry Density	**108.9**
Sample Location	**L4200R**	Optimum Moisture	**16.8%**



Natural Moisture:		Rammer Type:	**Manual**
Specific Gravity:	**2.60 (Assumed)**	Preparation Method:	**Dry**
Liquid Limit:	**44**	Method:	**A**
Plasticity Index:	**11**	Oversize Correction:	**Not Required**
% Fines:	**31.0%**		
% Sand:	**69.0%**		
% Gravel:	**0.0%**		

Aaron Hackett, EI
Lab Manager

Jeff Elliott, PE
CMT & SI Department Manager

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Report on California Bearing Ratio (ASTM D 1883/AASHTO T 193)

Date	**11/14/2018**	Project Name	**U-6003**
Sample No.	**S-555**	Project No.	**18-0173.I41**
Sample Location	**L4200R**	Client	**NCDOT**

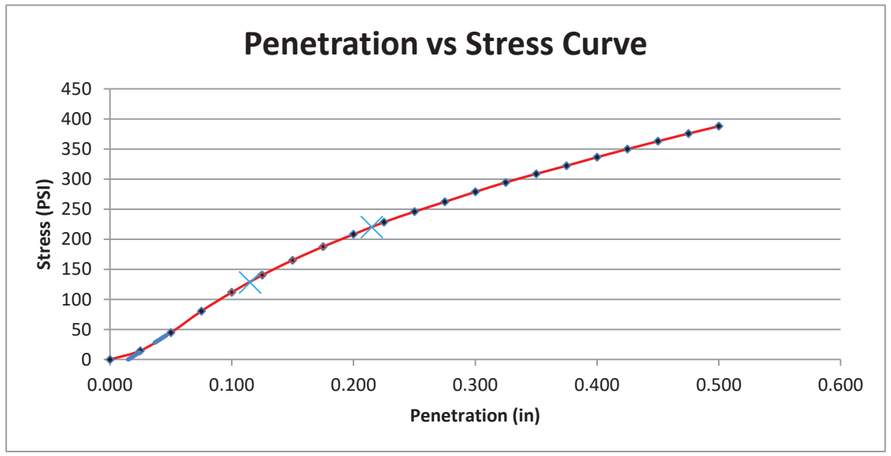
Proctor and Classification Data		**CBR Preparation Data**	
Sample Description	**N/A**	Rammer Used	**5.5 lbs, 12" Drop**
Classification	**A-2-7**	Compaction Method	**3 Layers, 56 Blows**
Max. Dry Density	**108.9**	Surcharge Amount	**10 lbs**
Optimum Moisture	**16.8%**	Soaked/Unsoaked	**Soaked**

CBR Results

Compaction Moisture Content	**15.0%**	Dry unit weight (lbs/cu.ft)	**109.3**
Moisture Content of Top 1" After Soaking	**21.5%**	Percent of Max. Dry Density	**100.4%**
Swell	**0.4%**		

CBR Values

Penetration (in)	**0.115**	**0.215**
Stress (psi)	**128.00**	**220.00**
CBR	**12.8**	**14.7**



Remarks:

Zero-point correction applied.

Aaron Hackett
Lab Manager

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CMT & SI Dept. Manager

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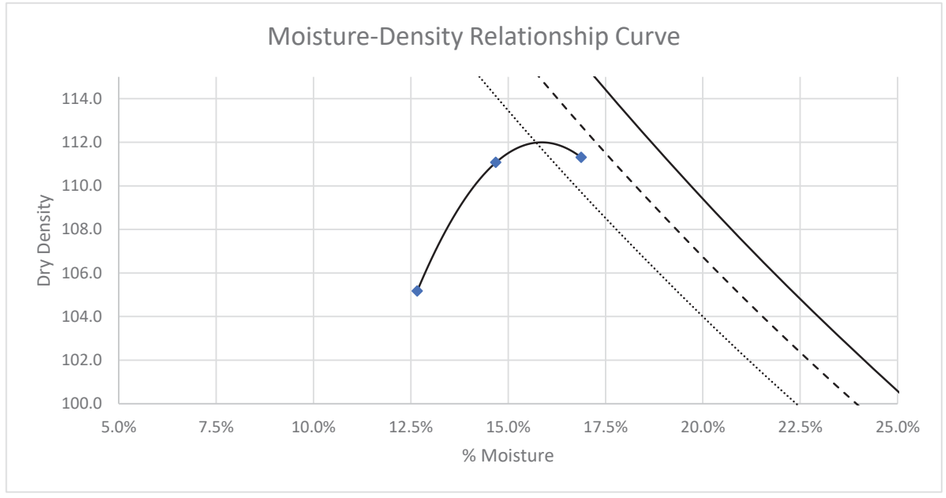
Standard Moisture-Density Relationship Report

ASTM D698

Project Number	**18-0173.I41**	Date	**11/14/2018**
Project Name	**U-6003**	Sample Number	**S-556**
Client	**NCDOT**		
Sample Description	**A-4**	Maximum Dry Density	**112.0**
Sample Location	**L5000L**	Optimum Moisture	**15.9%**



Natural Moisture:		Rammer Type:	**Manual**
Specific Gravity:	**2.60 (Assumed)**	Preparation Method:	**Dry**
Liquid Limit:	**30**	Method:	**A**
Plasticity Index:	**3**	Oversize Correction:	**Not Required**
% Fines:	**36.0%**		
% Sand:	**64.0%**		
% Gravel:	**0.0%**		

Aaron Hackett, EI
Lab Manager

Jeff Elliott, PE
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Report on California Bearing Ratio (ASTM D 1883/AASHTO T 193)

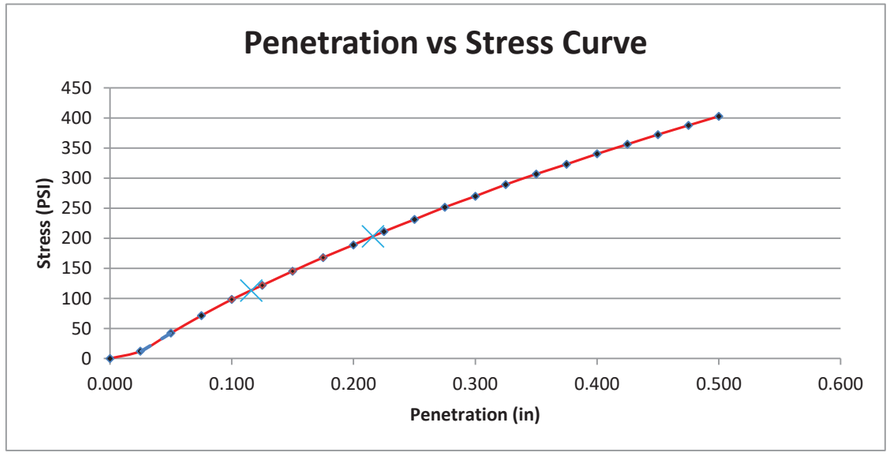
Date	**11/14/2018**	Project Name	**U-6003**
Sample No.	**S-556**	Project No.	**18-0173.I41**
Sample Location	**L5000L**	Client	**NCDOT**

Proctor and Classification Data		**CBR Preparation Data**	
Sample Description	**N/A**	Rammer Used	**5.5 lbs, 12" Drop**
Classification	**A-4**	Compaction Method	**3 Layers, 56 Blows**
Max. Dry Density	**112.0**	Surcharge Amount	**10 lbs**
Optimum Moisture	**15.9%**	Soaked/Unsoaked	**Soaked**

CBR Results

Compaction Moisture Content	**15.1%**	Dry unit weight (lbs/cu.ft)	**111.9**
Moisture Content of Top 1" After Soaking	**20.1%**	Percent of Max. Dry Density	**99.9%**
Swell	**0.1%**		

CBR Values		
Penetration (in)	**0.116**	**0.216**
Stress (psi)	**113.00**	**203.00**
CBR	**11.3**	**13.5**



Remarks:

Zero-point correction applied

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