

**SEE SHEET 3 FOR PLAN SHEET LAYOUT
AT TIME OF INVESTIGATION**

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-5947	1	70

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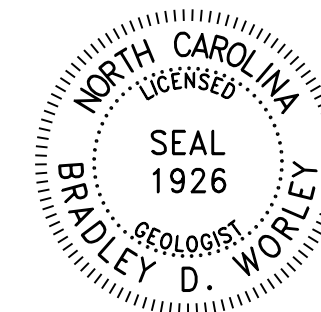
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DATE MARCH, 2022

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4/19/2022

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DATE

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**ROADWAY
SUBSURFACE INVESTIGATION**

COUNTY NASH

PROJECT DESCRIPTION CONSTRUCT ROUNDABOUT AT
NC 43 (BENVENUE RD) AND US 64 BYPASS OFFRAMP

INVENTORY

CONTENTS

<u>LINE</u>	<u>STATION</u>	<u>PLAN</u>	<u>PROFILE</u>
-LPB-	10+10.00 - 13+17.84	4	
-MUP-	10+00.00 - 17+82.22	4	
-NBL1-	10+00.00 - 16+65.85	4	
-NBL2-	10+00.00 - 16+00.00	4	
-RAB-	10+00.00 - 15+02.65	4	
-RPB-	10+00.00 - 14+07.34	4	
-Y2-	10+00.00 - 12+51.65	4	

CROSS SECTIONS

<u>LINE</u>	<u>STATION</u>	<u>SECTION</u>
-MUP-	12+75 - 15+50	5-16
-NBL1-	13+45 - 16+00	17-28
-NBL2-	10+50 - 13+75	29-42
-RAB-	11+75 - 15+00	43-56
-RPB-	10+25 - 12+75	57-67
-Y2-	11+00 - 11+50	68-70

REFERENCE: U-5947

PROJECT: 46884

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 298, 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 table with columns for GENERAL CLASS., GRANULAR MATERIALS (A-1 to A-7), SILT-CLAY MATERIALS (A-4 to A-7), ORGANIC MATERIALS (A-1, A-2 to A-6, A-7), and SYMBOL.

CONSISTENCY OR DENSENESS table with columns for PRIMARY SOIL TYPE, COMPACTNESS OR CONSISTENCY, RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE), and RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT²).

TEXTURE OR GRAIN SIZE table with columns for U.S. STD. SIEVE SIZE OPENING (MM) and various soil texture categories like BOULDER (BLDR.), COBBLE (COB.), GRAVEL (GR.), COARSE SAND (CS.E. SD.), FINE SAND (F SD.), SILT (SL.), and CLAY (CL.).

SOIL MOISTURE - CORRELATION OF TERMS table with columns for SOIL MOISTURE SCALE (ATTERBERG LIMITS), FIELD MOISTURE DESCRIPTION, and GUIDE FOR FIELD MOISTURE DESCRIPTION.

PLASTICITY table with columns for PLASTICITY INDEX (PI), NON PLASTIC, SLIGHTLY PLASTIC, MODERATELY PLASTIC, and HIGHLY PLASTIC.

COLOR table with columns for DESCRIPTIONS and 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
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

RECOMMENDATION SYMBOLS
UNDERCUT
SHALLOW UNDERCUT
UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE
UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK
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
UNIT WEIGHT
DRY UNIT WEIGHT
SAMPLE ABBREVIATIONS
S - BULK
SS - SPLIT SPOON
ST - SHELBY TUBE
RS - ROCK
RT - RECOMPACTED TRIAXIAL
CBR - CALIFORNIA BEARING RATIO

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)
CRYSTALLINE ROCK (CR)
NON-CRYSTALLINE ROCK (NCR)
COASTAL PLAIN SEDIMENTARY ROCK (CP)

WEATHERING
FRESH
VERY SLIGHT (V SLI)
SLIGHT (SLI)
MODERATE (MOD)
MODERATELY SEVERE (MOD. SEV.)
SEVERE (SEV)
VERY SEVERE (V SEV)
COMPLETE

ROCK HARDNESS
VERY HARD
HARD
MODERATELY HARD
MEDIUM HARD
SOFT
VERY SOFT

ROCK HARDNESS (continued)
CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.
CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.
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.
CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.
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.
CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGER NAIL.

FRACTURE SPACING and BEDDING tables with columns for TERM, SPACING, THICKNESS, and descriptions.

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

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.

TERMS AND DEFINITIONS (continued)
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 DISLOGGED 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 (ROD) - 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 (SROD) - 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: See Note
ELEVATION: FEET
NOTES:
*Elevations determined using Geopak and the TIN file (U5947_is_tin.tin).
F.I.A.D. = Filled In After Drilling

09/28/19

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

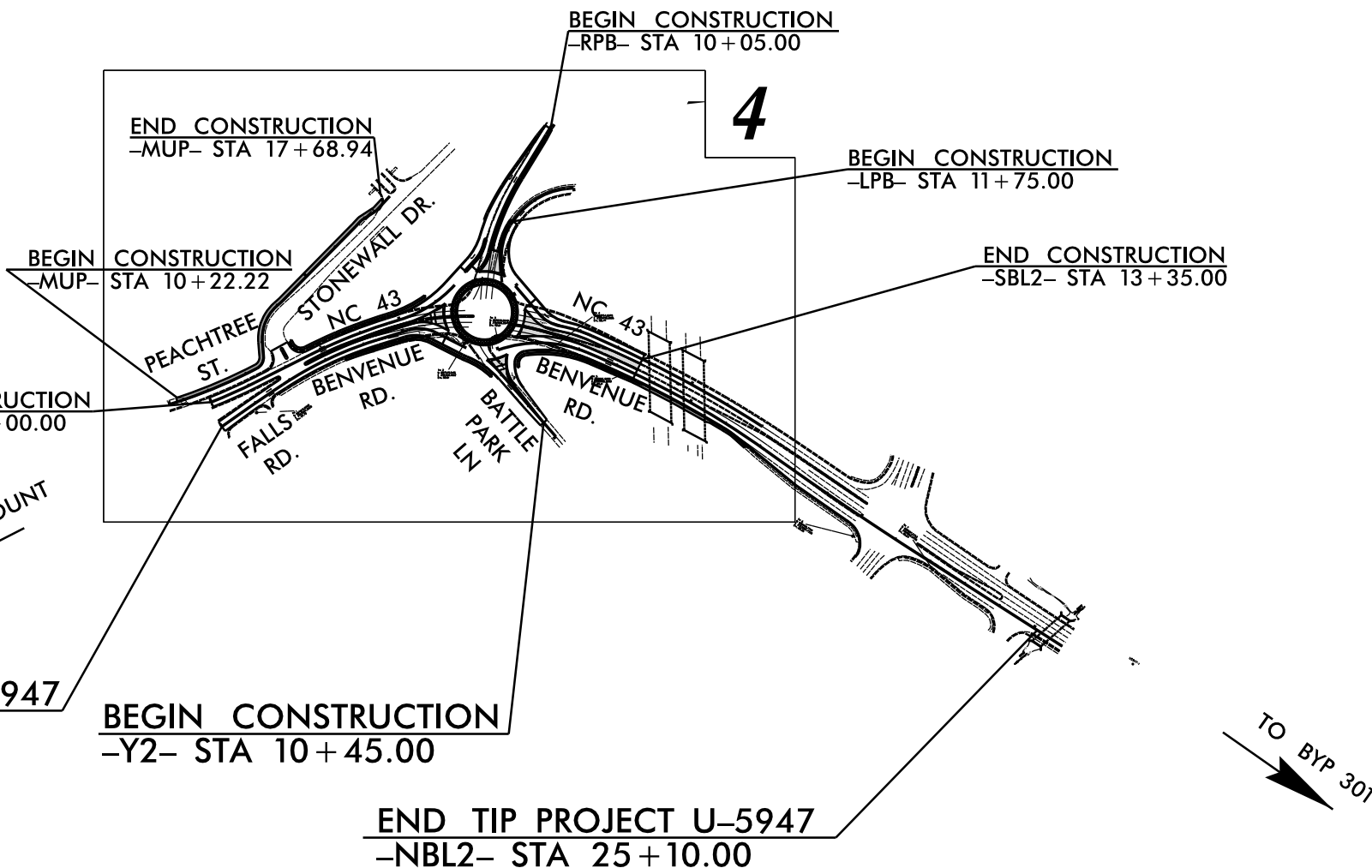
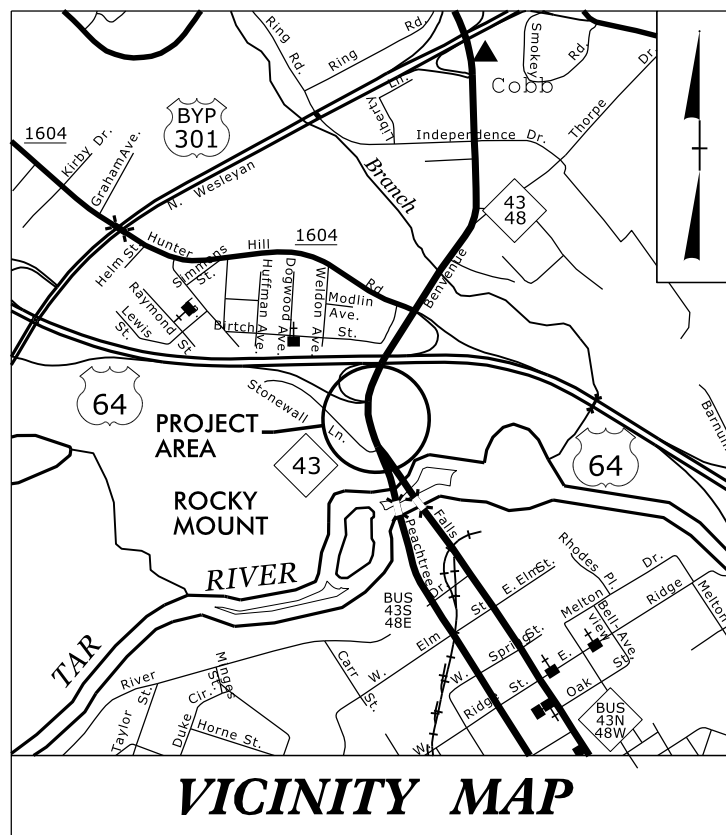
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

NASH COUNTY

LOCATION: INTERCHANGE OF US 64 BYPASS & NC 43 (BENVENUE ROAD)
TYPE OF WORK: GRADING, DRAINAGE, AND PAVING

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-5947	3	70
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
46884.1.1	-	P.E.	

25% PLANS

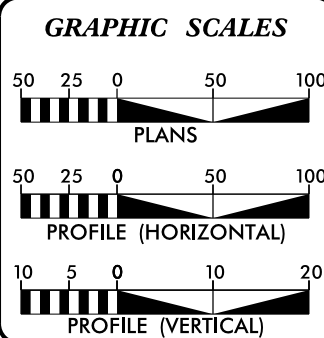


TIP PROJECT: U-5947

CONTRACT:

THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF ROCKY MOUNT
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD ?.

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



DESIGN DATA

ADT 2022 =	17500
ADT 2040 =	19000
K =	9 %
D =	55 %
T =	3 % *
V =	50 MPH
* TTST = 1% DUAL 2%	
FUNC CLASS =	
MINOR ARTERIAL	
REGIONAL TIER	

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-5947	=	0.488 MILES
TOTAL LENGTH TIP PROJECT U-5947	=	0.488 MILES
PROJECT LENGTH DETERMINED BY -NBL1-, -NBL2-, AND -RAB-		
RACHEL EVANS, PE <small>NC DOT CONTACT, DIVISION 4</small>		

Prepared in the Office of:

SUMMIT
DESIGN AND ENGINEERING SERVICES
2018 STANDARD SPECIFICATIONS

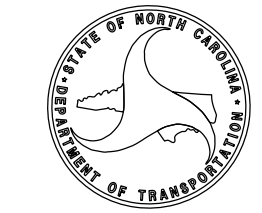
504 Meadowland Drive Hillsborough, NC 27278-8551 Voice: (919) 732-3883 Fax: (919) 732-6776 www.summitde.net	
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LETTING DATE: JANUARY 2022	JEFFREY P. MUHLBAUER, PE PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

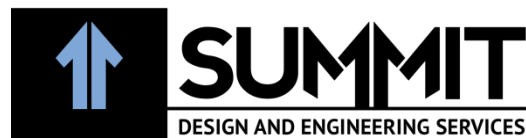
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ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.



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919.732.3883 SUMMIT-ENGINEER.COM
504 Meadowland Drive, Hillsborough, NC 27278

March 3, 2022

WBS Number: 46884.1.1
TIP Number: U-5947
County: Nash
Description: Construct Roundabout at NC 43 (Benvenue Rd) and US 64 Bypass Offramp

SUBJECT: Geotechnical Report - Roadway Subsurface Inventory

Project Description

The proposed 0.6-mile project is located inside the municipal boundary of the city of Rocky Mount, N.C. The project consists of the installation of a roundabout at the intersection of Benvenue Road and the US 64 eastbound exit ramp (-RPB-) and the on-ramp (-LPB-) from Benvenue Road onto US 64 east. The project also consists of slight realignment of Stonewall Dr. (-MUP-) and improvements to the intersection of Stonewall Dr. (-Y2-) and Benvenue Rd. The proposed earthworks are generally minor throughout the project corridor, with proposed grade elevations typically falling within a few feet of the existing grade of NC 119.

The geotechnical investigation was conducted from July 1st to July 7th, 2021. Borings were advanced using a CME-550X drill machine equipped with an automatic hammer. Standard Penetration Tests (SPT) were performed at these locations to provide subsurface information for roadway foundation design/construction. Drill tooling was advanced using 3.25-inch hollow-stem augers. Representative soil samples were collected, and 20 samples were submitted to Summit's soils laboratory for classification and moisture content testing. All borings were left open for a minimum of 24 hours to collect groundwater data. 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:

<u>Alignment</u>	<u>Station(±)</u>
-LPB-	10+00.00 – 13+17.84
-MUP-	10+00.00 – 17+82.22
-NBL1-	10+00.00 – 16+65.85
-NBL2-	10+00.00 – 16+00.00
-RAB-	10+00.00 – 15+02.65
-RPB-	10+00.00 – 14+07.34
-Y2-	10+00.00 – 12+51.65

Physiography, Geography, and Geology

The project is in eastern North Carolina on the boundary of the Piedmont and the Coastal Plain Physiographic Provinces. Topography in the project area is characterized by flat land and very gently rolling hills. In general, the topography within the project corridor would generally fit this description. Elevations along the project range from approximately 90 feet to approximately 115 feet above sea level.

The project corridor is located within the Tar-Pamlico River Basin. Surface drainage from the project corridor would be expected to mostly flow towards the east-southeast. Water, from the project, would flow into one of several smaller creeks that empty into Tar River, approximately 0.25 miles south of the project area.

Geologically, the project corridor is underlain by the Piedmont soils derived from Permian to Pennsylvanian foliated to massive granitic rock. The granitic bedrock is approximately 520 to 650 million years old and are primarily composed of unmetamorphosed to slightly metamorphosed, megacrystic to equigranular, granitic rock. The soils in the project area are the result of the weathering of the parent bedrock. In some cases, saprolitic soils were encountered during the investigation. Because of groundwater and weathering, most near-surface soils have lost any relict rock fabric. Surficial soils ranged in color from brown, to red-brown, to orange-brown and red.

Soil Properties

No roadway embankment soils were encountered during this investigation. Roadway embankment soils are often quite like the local soils that they are typically sourced from. However, they often have a "reworked" appearance, with a large variation in grain size reflecting the mixing of soils that occurs during construction. They can contain little to trace amounts of organic material, gravel and/or other types of debris. If properly constructed, roadway embankment soils typically do not present issues during future construction projects. It is our interpretation that Benvenue Road was primarily cut into the residual material, and most roadway embankment soils will be found directly under the existing pavement.

Piedmont residual soils are the dominant soil origin within the project corridor and will be commonly encountered during the roadway construction. In general, the Piedmont soils, underlying the project, are most commonly sand and/or clay. Piedmont soils with a Plastic Index (PI) above 35, soils with a high percentage of material passing the # 200 sieve, soils with a high moisture content, or soils with high mica content, can be problematic during or after construction. Moderate to highly plastic Piedmont soils could negatively affect embankment stability, embankment settlement, subgrade stability, or may not be suitable for use as embankment material on the project.

Piedmont clays are common throughout the project corridor. The Piedmont clays predominantly consist of silty clays (A-7-5 and A-7-6), and sandy clay (A-6). The clays are often interbedded with the silts. The clays are mostly orange-brown to tan, and gray, stiff to very stiff, and sometimes saprolitic. Below is a summary of the results of laboratory testing conducted on the Piedmont clays present within the project corridor:

	Liquid Limit (L.L.)	Plasticity Index (P.I.)	Natural Moisture	Passing # 200 Sieve
LOW	28	12	7.8%	38.4%
HIGH	83	55	50.8%	96.3%
AVERAGE	56	34	29.3%	67.4%

Sandy silt (A-4) was collected in several borings across the project. The A-4 soils were orange-brown to tan, and gray, stiff to very stiff, often saprolitic, and contained trace mica. No samples of clayey silt (A-5) were collected on the project.

Many of the Piedmont clays, encountered during this investigation, are considered to have a marginal or high plasticity index. They are generally moist, with moisture content increasing with depth. Approximate locations where moderate to highly plastic Piedmont soils were encountered during the investigation and are believed to be present within the project corridor, will be highlighted in the “Areas of Special Geotechnical Interest” section of this text report.

The Piedmont sands, found within the project corridor primarily consist of silty sands (A-2-4) and some coarse sand (A-1-b). The sands are typically present at the surface or just below the surficial clays. The A-2-4 sand was orange-brown, loose to medium dense, sometimes saprolitic, and contained small quartz fragments. The A-1-b sands collected were tan and orange-brown, loose to medium dense, with small quartz fragments.

Rock Properties

Shallow Piedmont crystalline rock was encountered during the geotechnical investigation and may be a factor during the construction of this project. The crystalline rock is granite and was encountered during SPT refusal at the bottom of several of the borings on this project. Shallow crystalline rock will be discussed in “Areas of Special Geotechnical Interest.” Piedmont weathered rock was encountered in multiple borings across the project. The weathered rock is derived from the granitic crystalline rock found on the project.

Groundwater Properties

The field investigation was conducted during a period of average rainfall. Groundwater was encountered in the borings drilled for the proposed -MUP- alignment but was not encountered in any borings for other alignments. -MUP- is the alignment with lowest elevation on the project. Groundwater tends to flow south-southeast across the project.

Areas of Special Geotechnical Interest

Plastic Soils - During the geotechnical investigation, moderate to highly plastic clays were encountered in several areas within the project corridor. Moderate (P.I. 16-25) to highly plastic (P.I. 26+) soils can be problematic during and after construction. 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 moderate to highly plastic clays are present, in tested soil samples, within the project corridor:

Alignment	Station(±)	Offset
-MUP-	12+75 – 15+50	Left & Right
-NBL1-	13+45 – 13+75	Left & Right
-NBL1-	15+75 – 16+00	Left & Right
-SBL1-	13+70 – 13+75	Left & Right
-SBL1-	15+87 – 16+09	Left & Right
-NBL2-	11+75 – 12+25	Left & Right
-SBL2-	11+83 – 12+40	Left & Right
-RPB-	10+25 – 10+75	Left & Right
-RAB-	13+25 – 13+75	Left & Right

Alluvial Soils - During the geotechnical investigation, no alluvial soils were encountered.

Groundwater - Groundwater can present issues during and after construction if not properly dealt with. Groundwater was only encountered in the borings on the -MUP- alignment, and ranged from 7.9’ to 10.8’ below the ground surface.

Waterwells - 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. 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. No water wells were identified within the project corridor during this investigation.

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

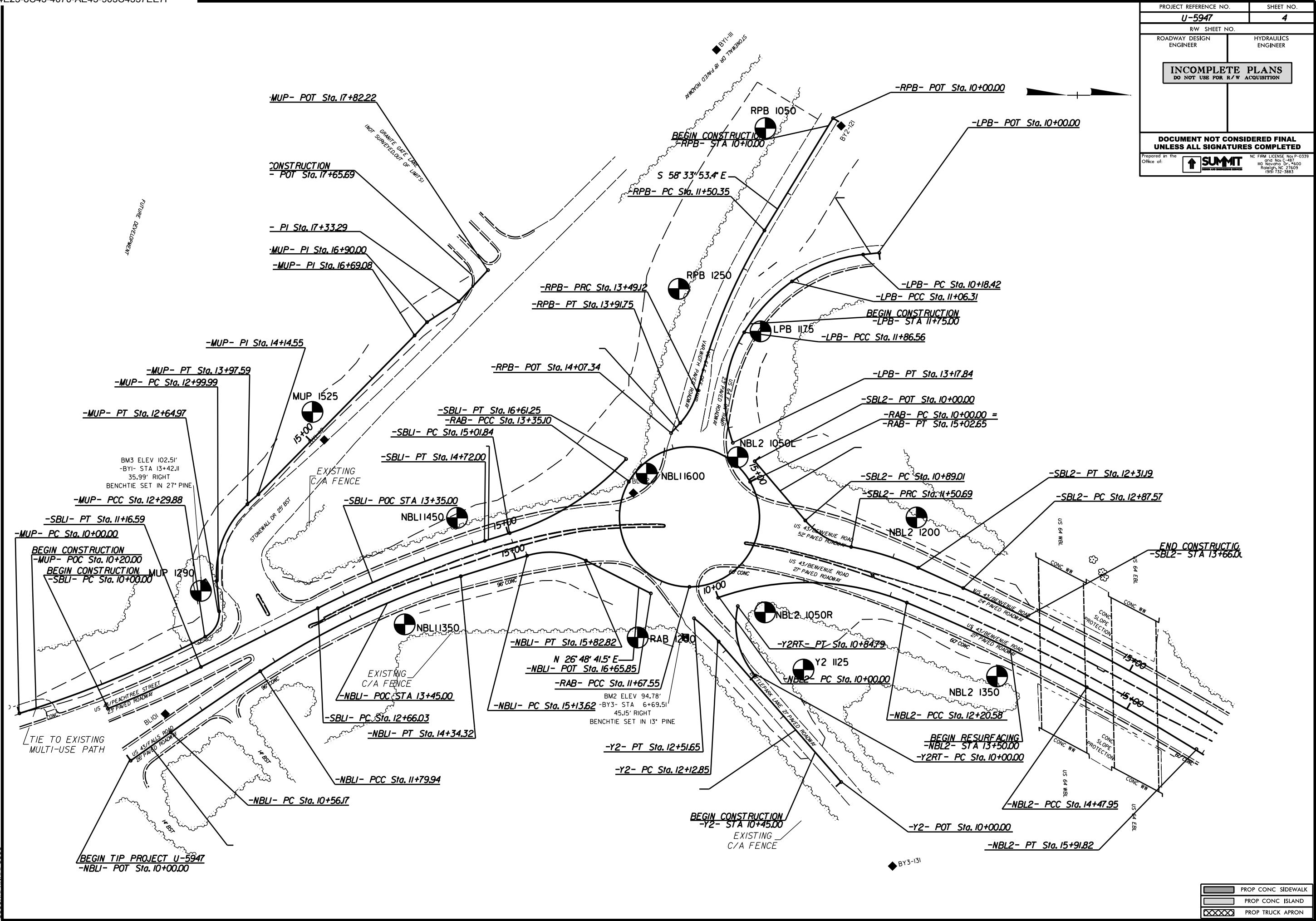
Respectfully Submitted,




Bradley D. Worley, PG
Senior Geologist
Summit Design and Engineering Services, PLLC

8/17/24

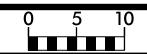
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PROJECT REFERENCE NO.		SHEET NO.	
U-5947		4	
RW SHEET NO.			
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INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
Prepared in the Office of:		 <small>NC FIRM LICENSE No. P-0339 and No. C-487 110 Novans Dr., #500 Raleigh, NC 27609 (919) 732-3883</small>	



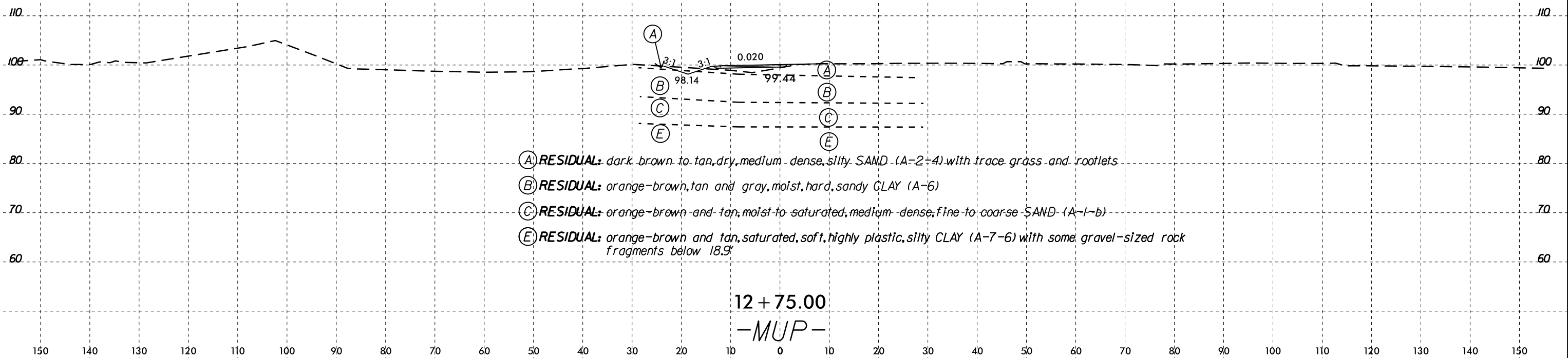
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	PROP CONC ISLAND
	PROP TRUCK APRON

6/23/16



PROJ. REFERENCE NO.	SHEET NO.
U-5947	5

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- (A) RESIDUAL: dark brown to tan, dry, medium dense, silty SAND (A-2+4) with trace grass and rootlets
- (B) RESIDUAL: orange-brown, tan and gray, moist, hard, sandy CLAY (A-6)
- (C) RESIDUAL: orange-brown and tan, moist to saturated, medium dense, fine to coarse SAND (A-1-b)
- (E) RESIDUAL: orange-brown and tan, saturated, soft, highly plastic, silty CLAY (A-7-6) with some gravel-sized rock fragments below 18.9'

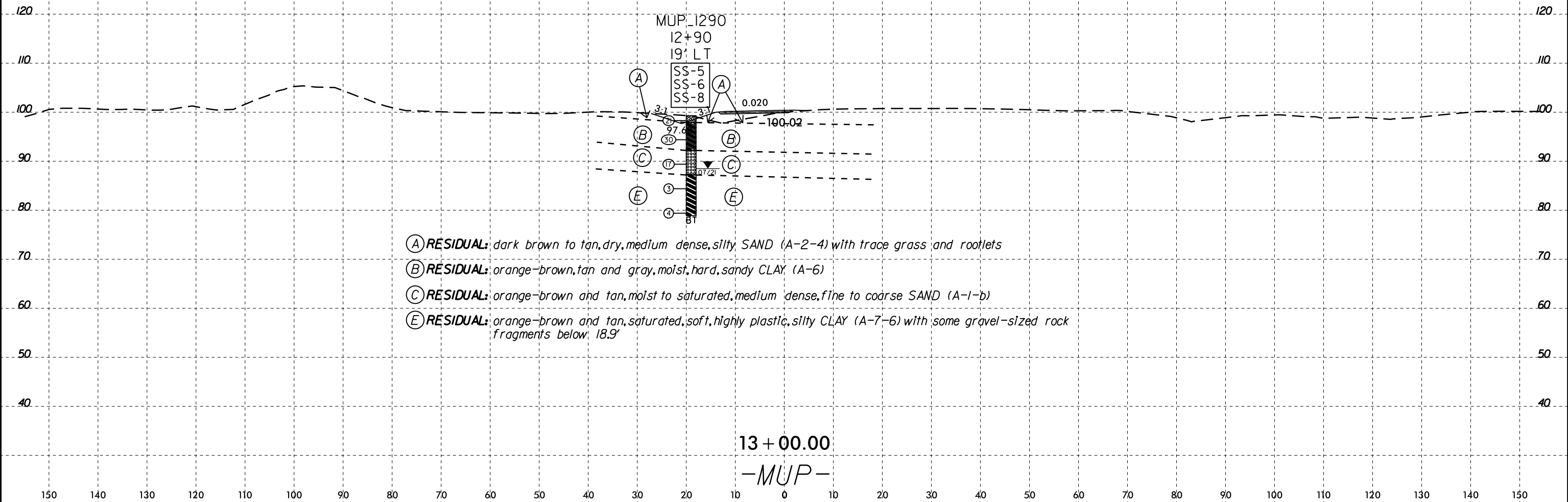
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SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-5	19' LT	12+90	0.0-1.5	A-2-4	16	1	35.2	37	12.5	15.3	98	76	33	3.6	N/A
SS-6	19' LT	12+90	3.9-5.4	A-6	29	15	35.1	31.3	14.3	77.8	99	77	38	7.8	N/A
SS-8	19' LT	12+90	13.9-15.4	A-7-6	64	47	0.6	39.1	17.0	43.3	100	100	77	38.1	N/A



- (A) RESIDUAL: dark brown to tan, dry, medium dense, silty SAND (A-2-4) with trace grass and rootlets
- (B) RESIDUAL: orange-brown, tan and gray, moist, hard, sandy CLAY (A-6)
- (C) RESIDUAL: orange-brown and tan, moist to saturated, medium dense, fine to coarse SAND (A-1-b)
- (E) RESIDUAL: orange-brown and tan, saturated, soft, highly plastic, silty CLAY (A-7-6) with some gravel-sized rock fragments below 18.9'

13 + 00.00
-MUP-

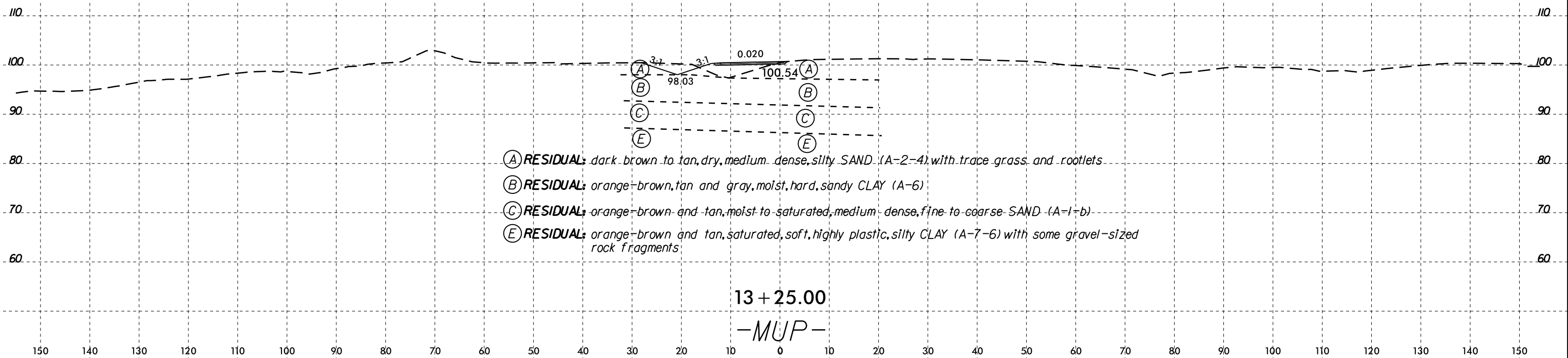
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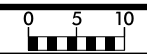
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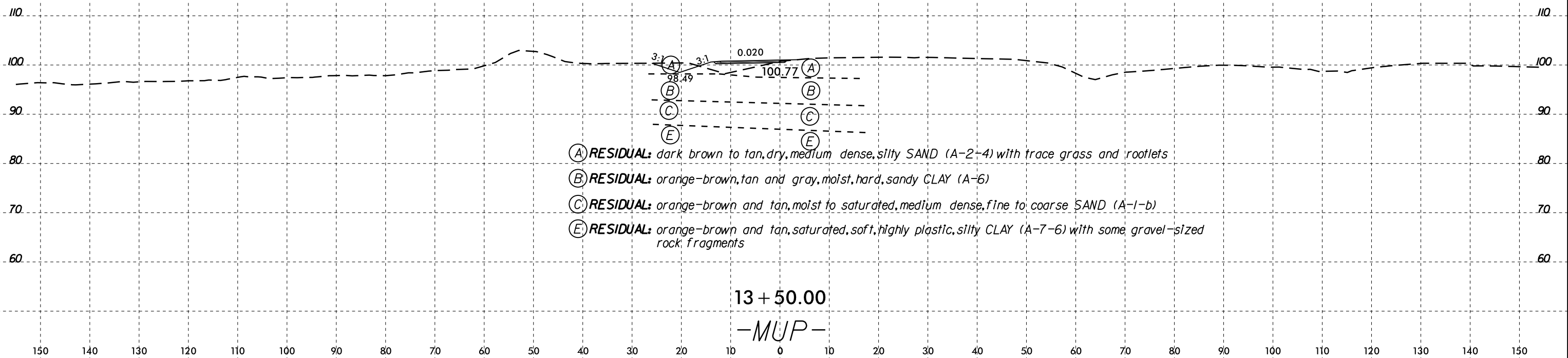
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PROJ. REFERENCE NO.	SHEET NO.
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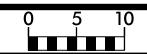


- (A) **RESIDUAL:** dark brown to tan, dry, medium dense, silty SAND (A-2-4) with trace grass and rootlets
- (B) **RESIDUAL:** orange-brown, tan and gray, moist, hard, sandy CLAY (A-6)
- (C) **RESIDUAL:** orange-brown and tan, moist to saturated, medium dense, fine to coarse SAND (A-1-b)
- (E) **RESIDUAL:** orange-brown and tan, saturated, soft, highly plastic, silty CLAY (A-7-6) with some gravel-sized rock fragments

13 + 50.00
-MJP-

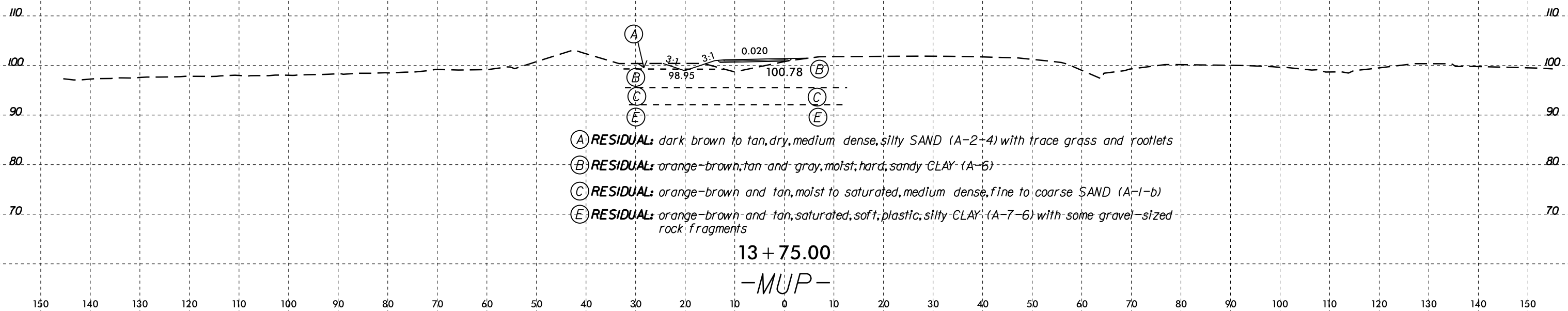
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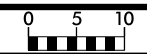
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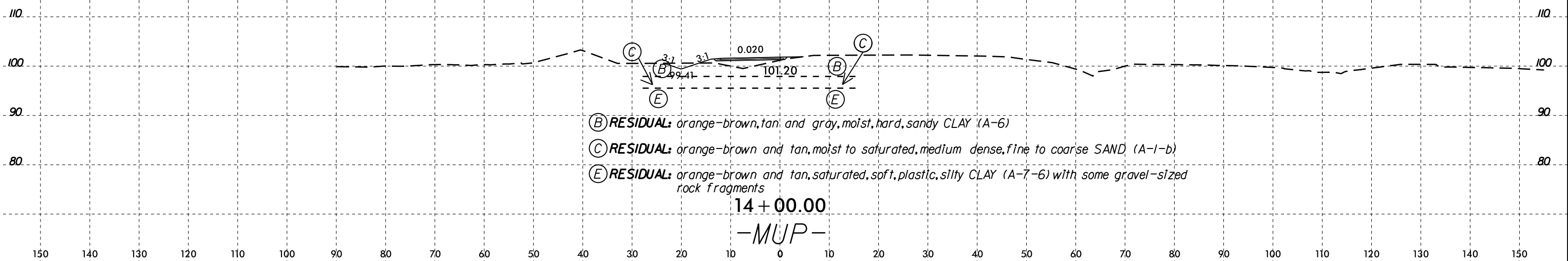
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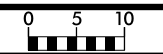
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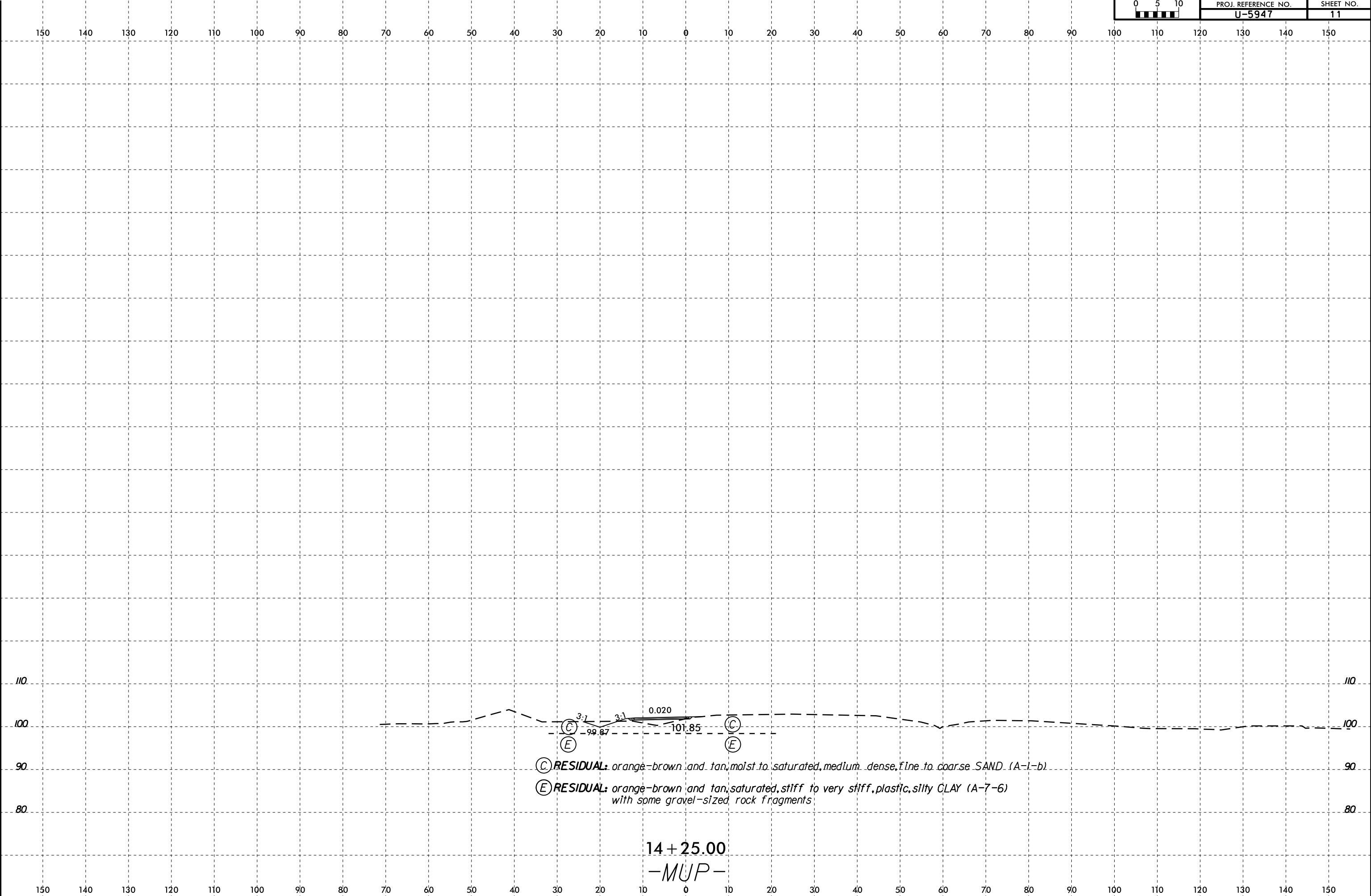


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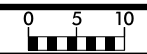


(C) **RESIDUAL:** orange-brown and tan, moist to saturated, medium dense, fine to coarse SAND (A-I-b)

(E) **RESIDUAL:** orange-brown and tan, saturated, stiff to very stiff, plastic, silty CLAY (A-7-6)
with some gravel-sized, rock fragments

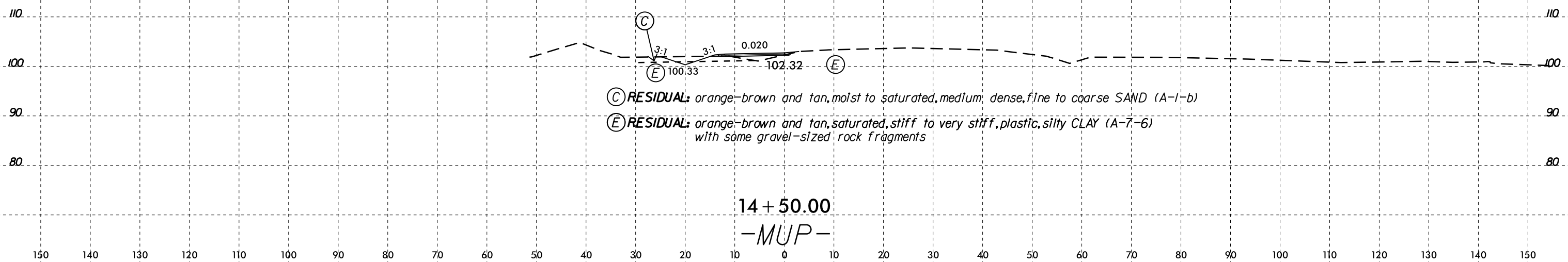
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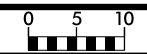


(C) RESIDUAL: orange-brown and tan, moist to saturated, medium dense, fine to coarse SAND (A-1-b)

(E) RESIDUAL: orange-brown and tan, saturated, stiff to very stiff, plastic, silty CLAY (A-7-6) with some gravel-sized rock fragments

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110 110

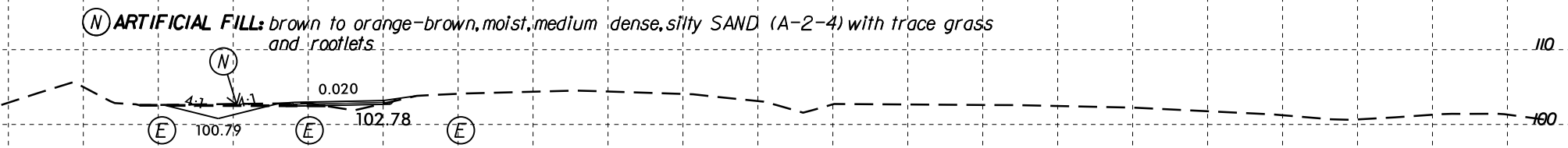
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90 90

80 80

(N) **ARTIFICIAL FILL:** brown to orange-brown, moist, medium dense, silty SAND (A-2-4) with trace grass and rootlets

(E) **RESIDUAL:** orange-brown and tan, saturated, stiff to very stiff, highly plastic, silty CLAY (A-7-6) with some gravel-sized rock fragments



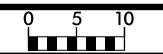
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-MJP-

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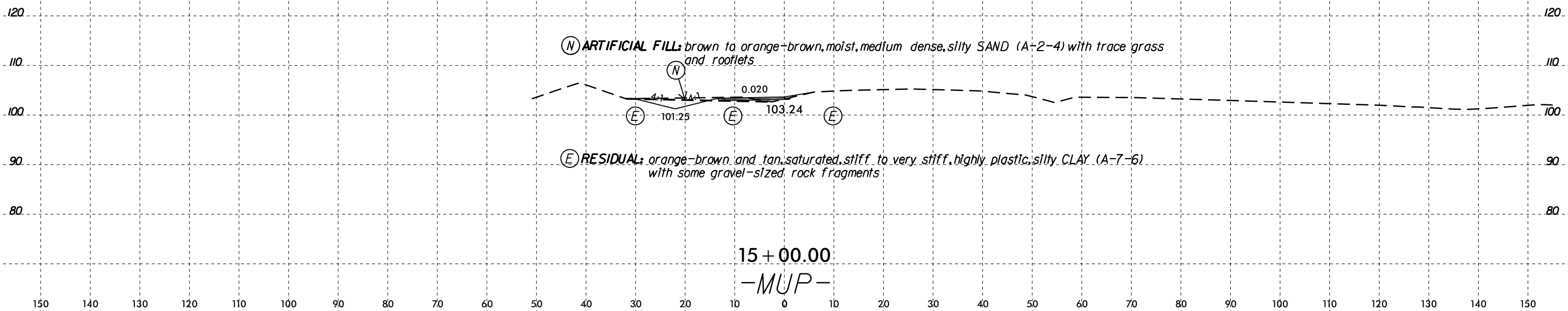
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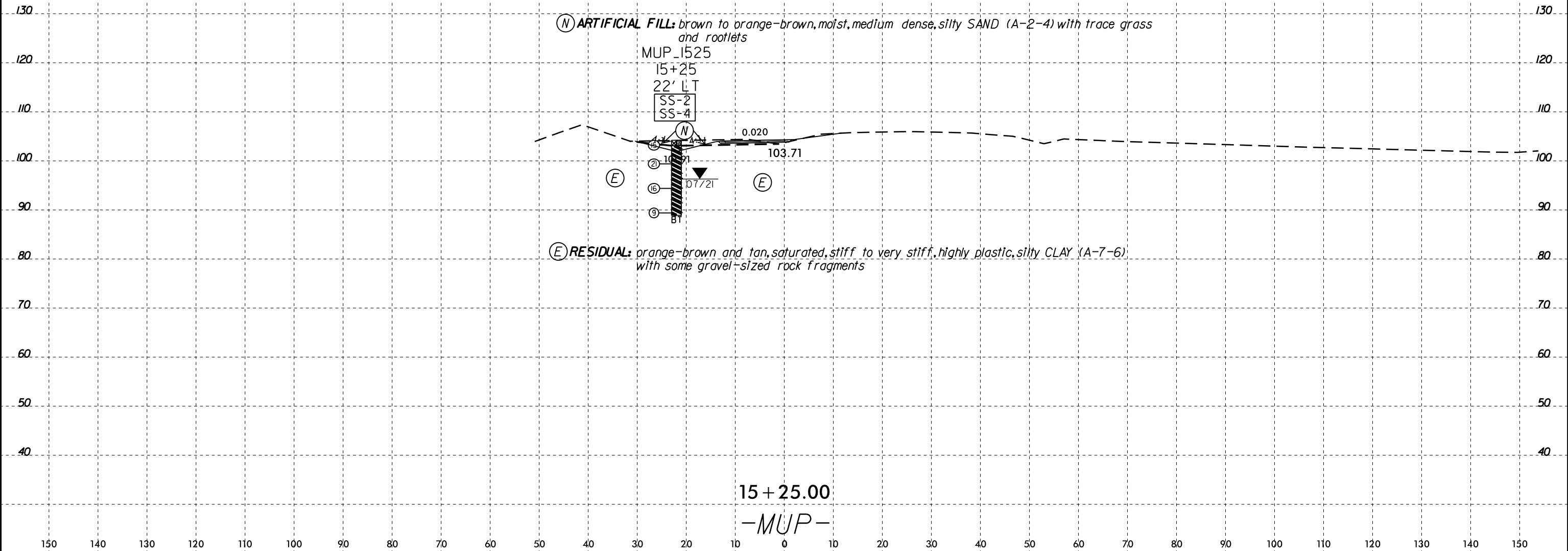
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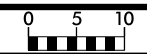
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SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-2	22' LT	15+25	3.8-5.3	A-7-6	83	55	10.6	15.5	15.4	58.5	100	94	79	26.5	NA
SS-4	22' LT	15+25	13.8-15.3	A-7-6	66	39	31.5	11.8	11.6	45.1	63	46	38	40.5	NA

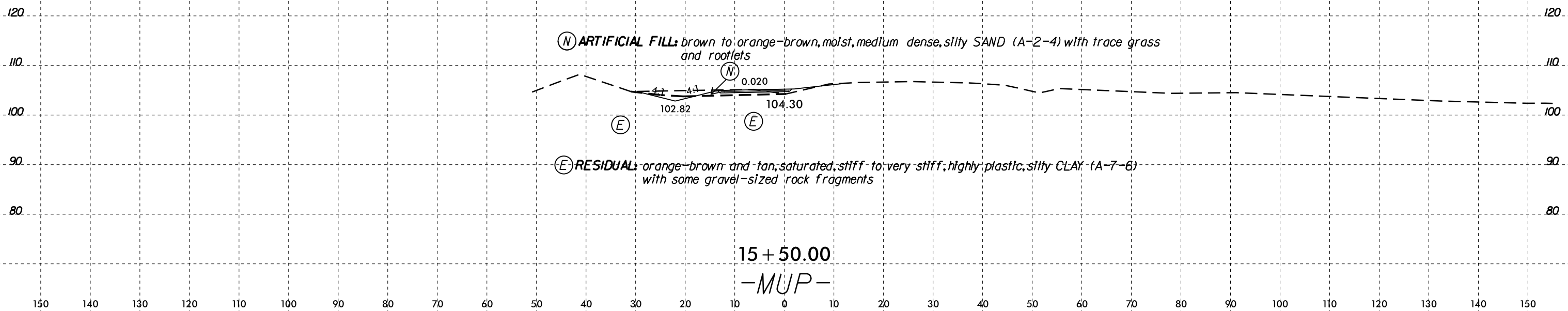


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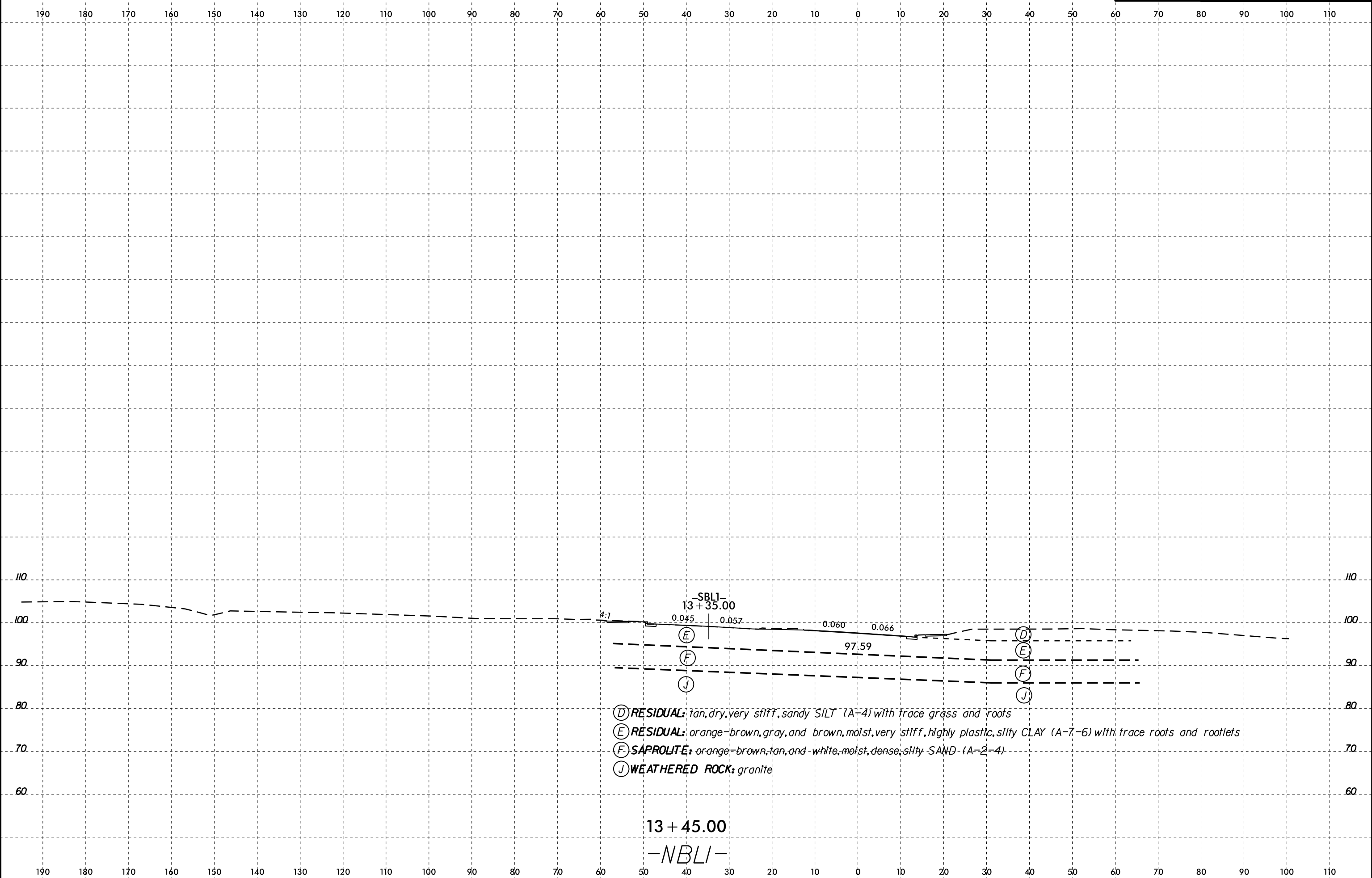


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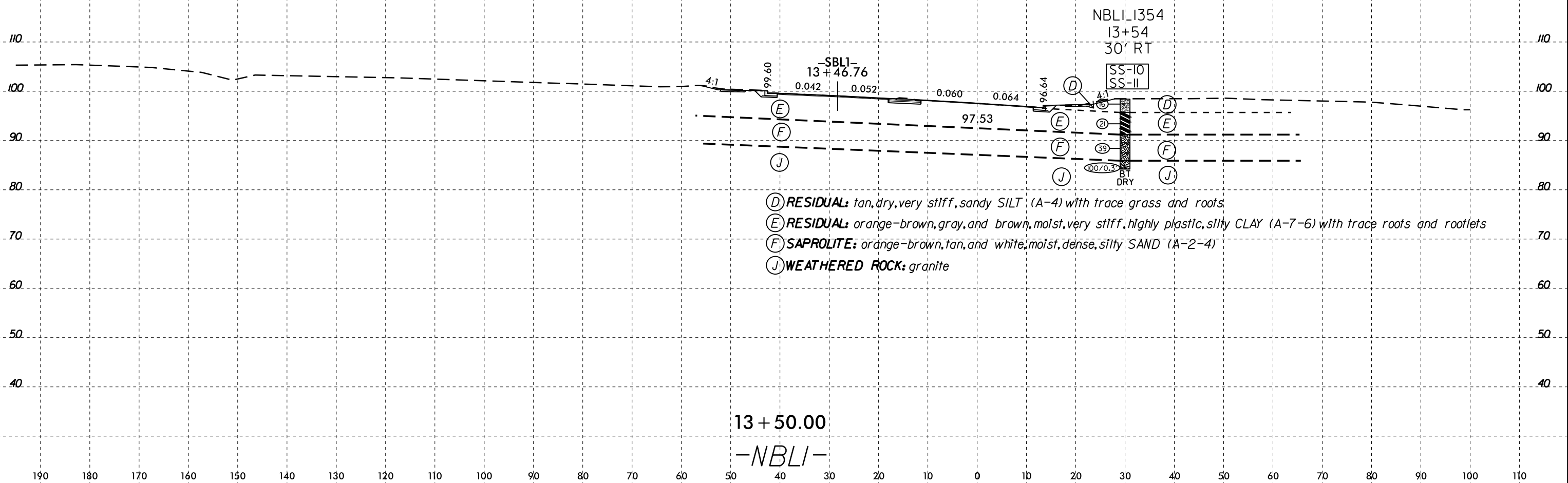
- ① **RESIDUAL:** tan, dry, very stiff, sandy SILT (A-4) with trace grass and roots
- ② **RESIDUAL:** orange-brown, gray, and brown, moist, very stiff, highly plastic, silty CLAY (A-7-6) with trace roots and rootlets
- ③ **SAPROLITE:** orange-brown, tan, and white, moist, dense, silty SAND (A-2-4)
- ④ **WEATHERED ROCK:** granite

13 + 45.00
-NBL1-

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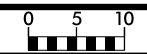
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SOIL TEST RESULTS															
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							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-10	30' RT	13+54	0-1.5	A-4	22	7	23.1	19.5	33.8	23.6	99	84	62	10.7	N/A
SS-11	30' RT	13+54	4.0-5.5	A-7-6	58	34	8.2	8.6	31.5	51.7	99	83	85	33.6	N/A



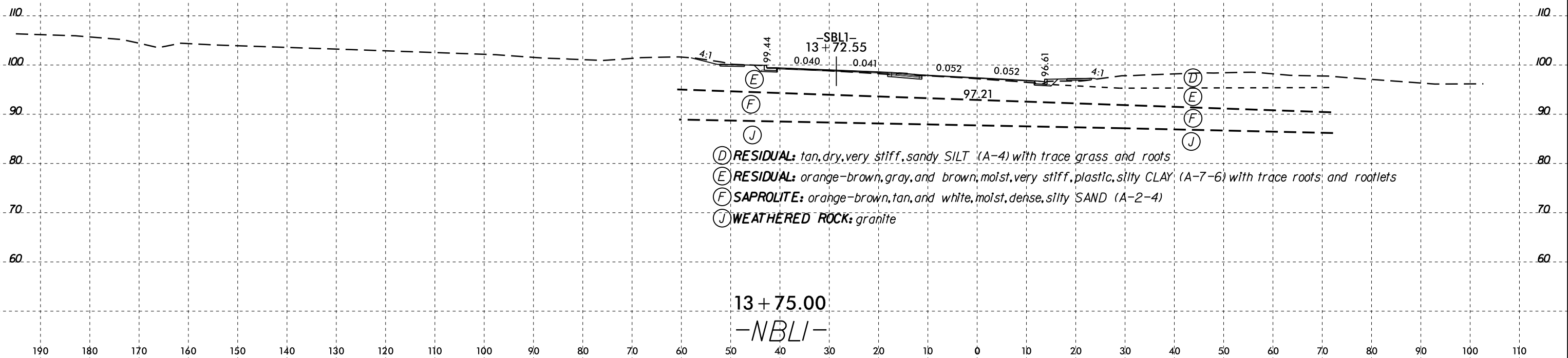
- (D) RESIDUAL: tan, dry, very stiff, sandy SILT (A-4) with trace grass and roots
- (E) RESIDUAL: orange-brown, gray, and brown, moist, very stiff, highly plastic, silty CLAY (A-7-6) with trace roots and rootlets
- (F) SAPROLITE: orange-brown, tan, and white, moist, dense, silty SAND (A-2-4)
- (J) WEATHERED ROCK: granite

6/23/16



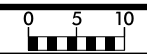
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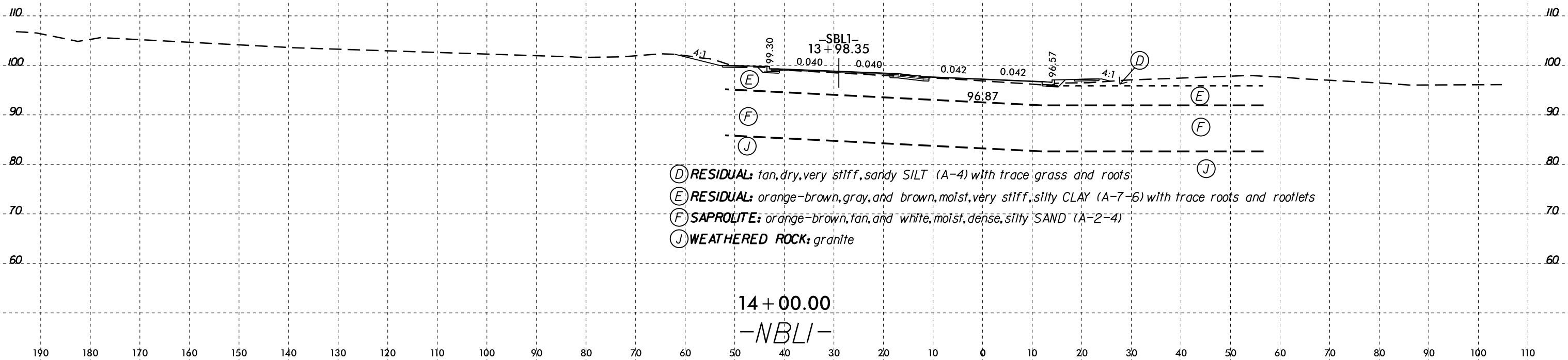
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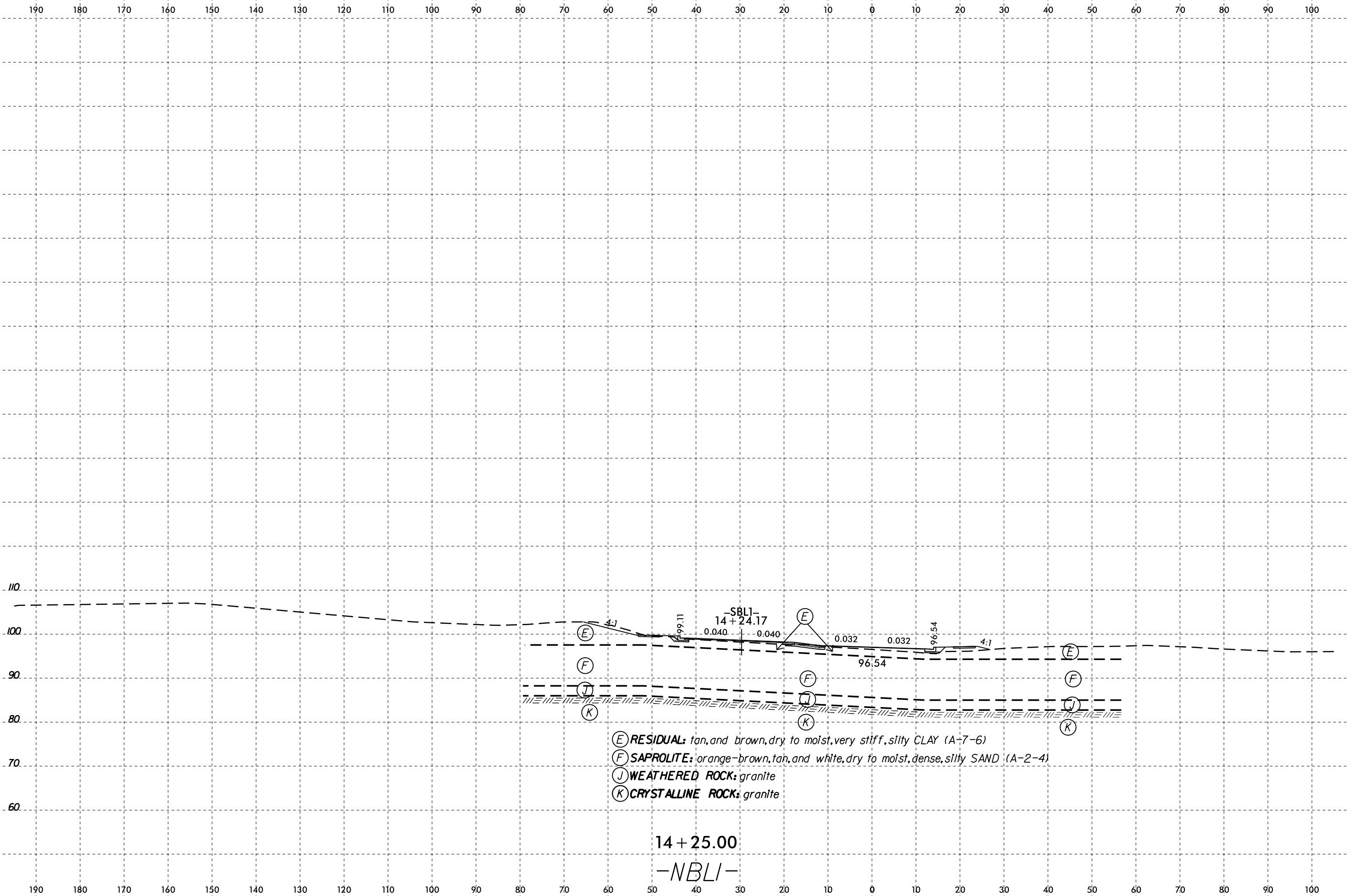
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0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-5947	21

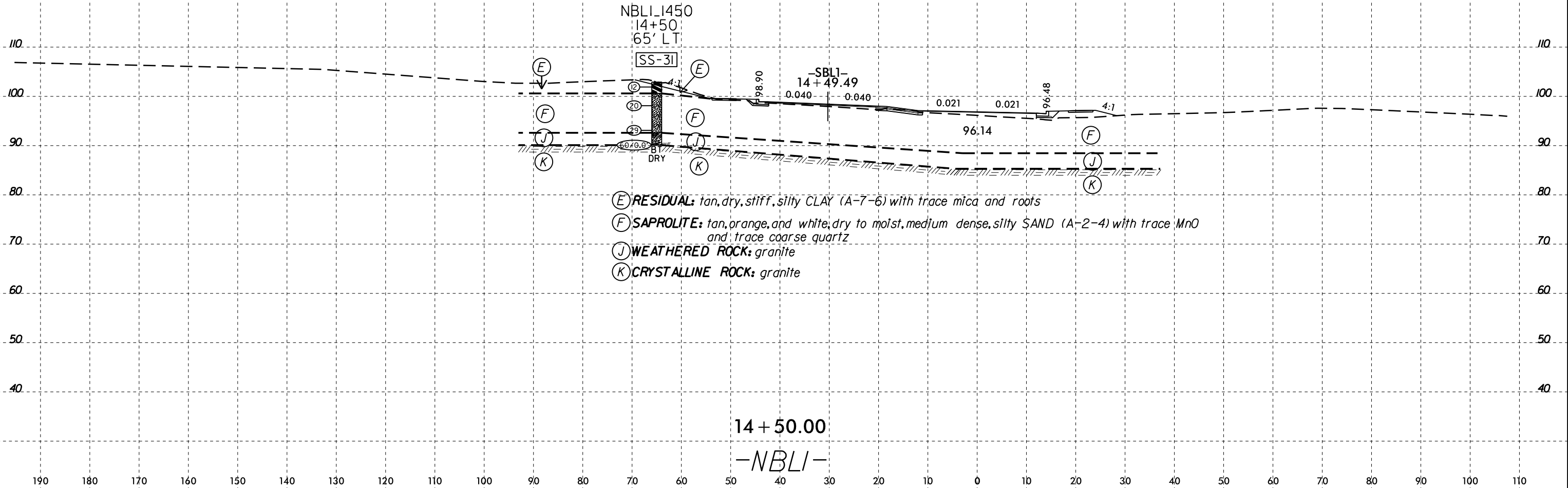


- (E) RESIDUAL: tan, and brown, dry to moist, very stiff, silty CLAY (A-7-6)
- (F) SAPROLITE: orange-brown, tan, and white, dry to moist, dense, silty SAND (A-2-4)
- (J) WEATHERED ROCK: granite
- (K) CRYSTALLINE ROCK: granite

14 + 25.00
-NBLI-

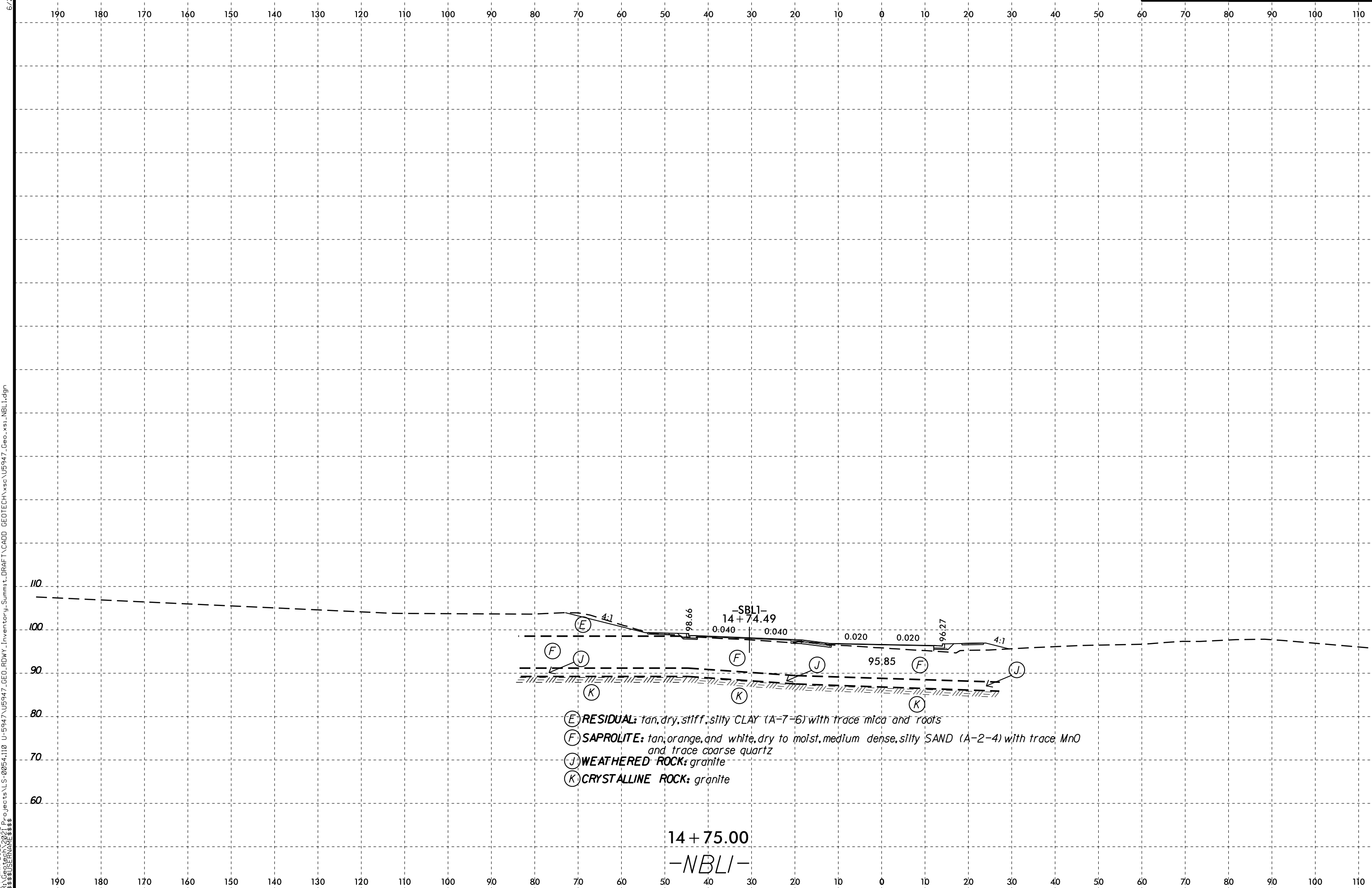
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SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-31	65' LT	14+50	0.0-1.5	A-7-6	41	20	20.4	20.6	26.8	32.2	97	82	62	14.6	NA



14 + 50.00
-NBLI-

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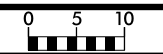
- (E) RESIDUAL: tan, dry, stiff, silty CLAY (A-7-6) with trace mica and roots
- (F) SAPROLITE: tan, orange, and white, dry to moist, medium dense, silty SAND (A-2-4) with trace MnO and trace coarse quartz
- (J) WEATHERED ROCK: granite
- (K) CRYSTALLINE ROCK: granite

14 + 75.00
 -NBLI-

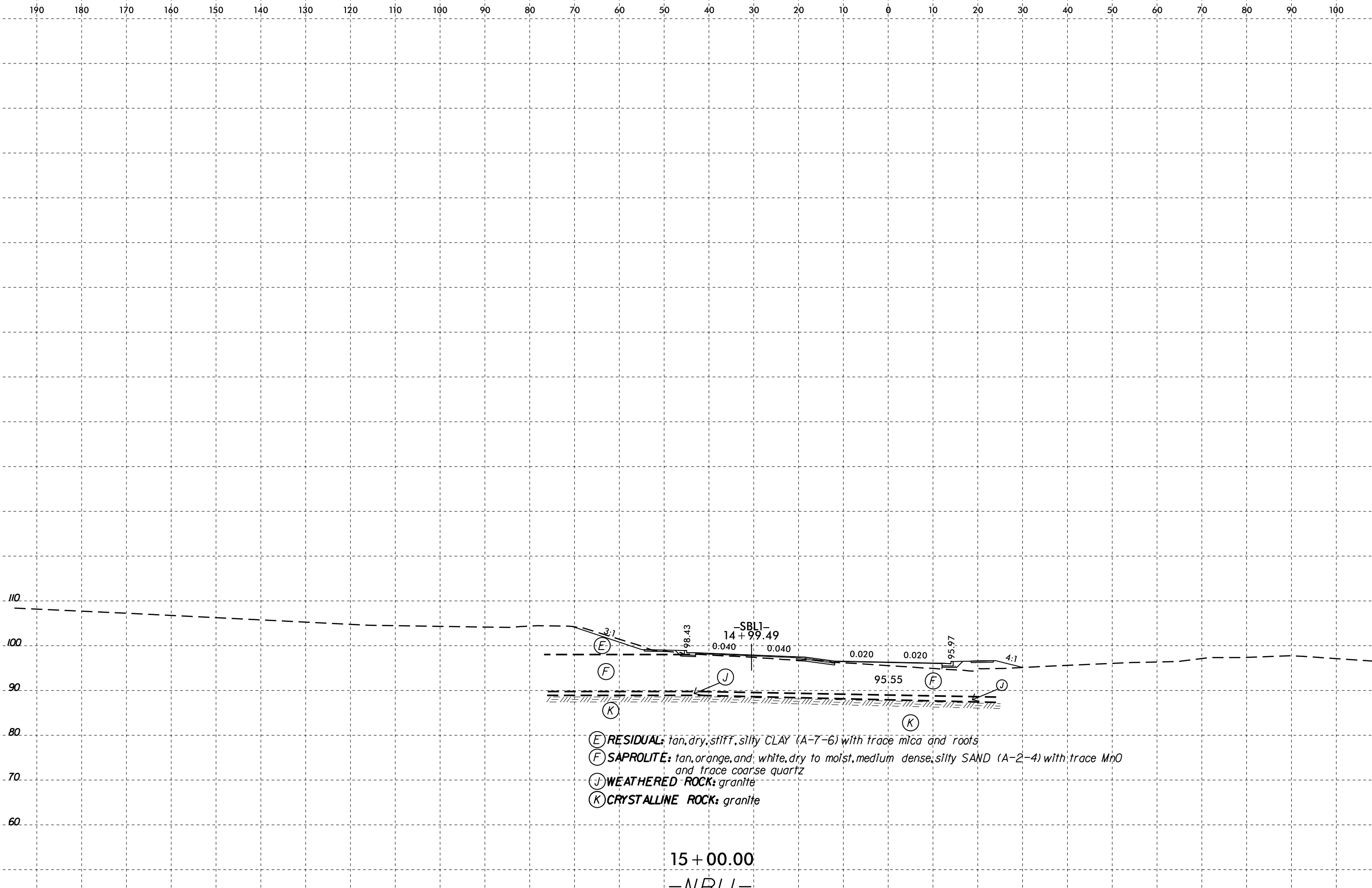
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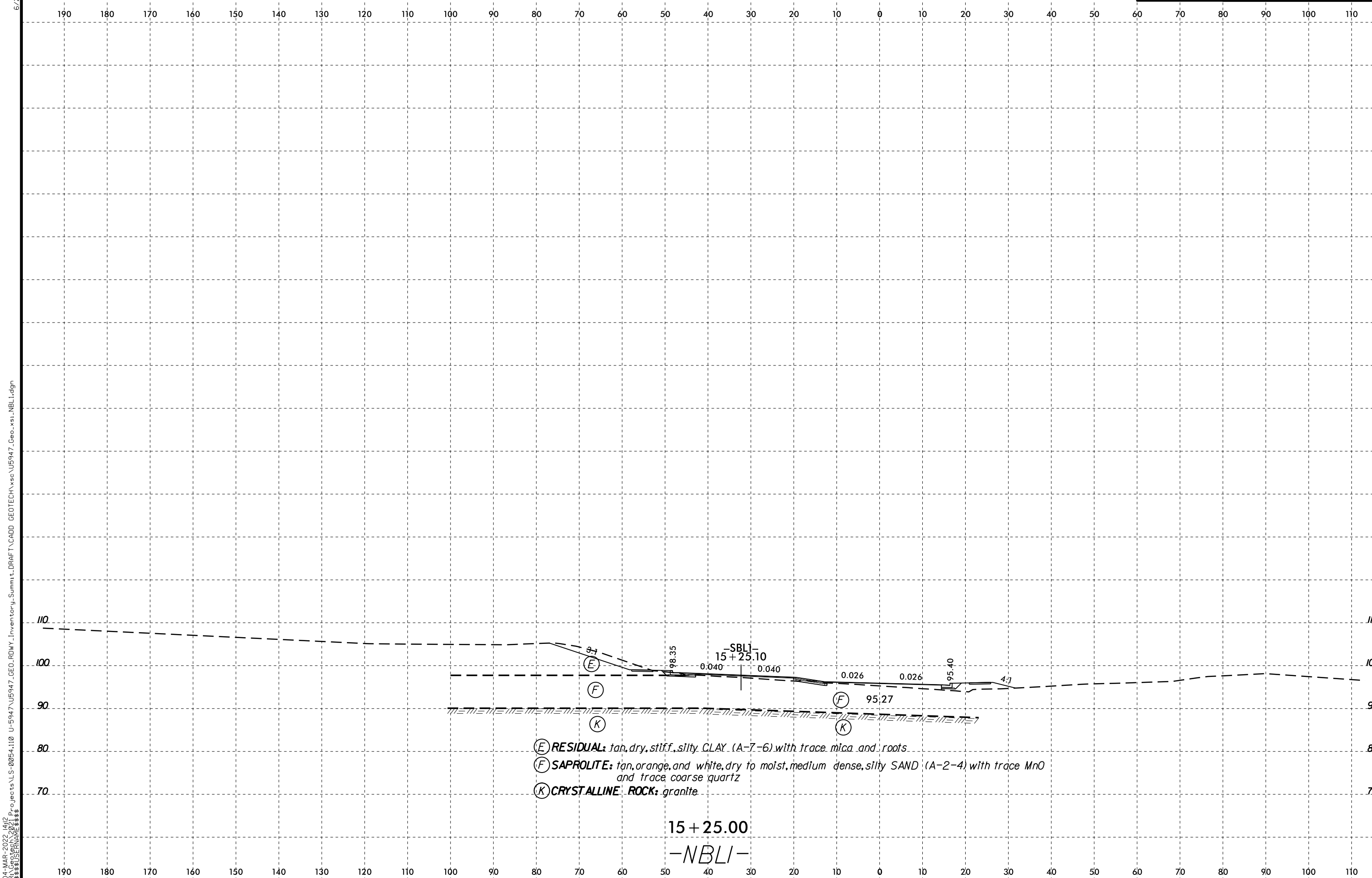


PROJ. REFERENCE NO.	SHEET NO.
U-5947	24



- (E) RESIDUAL: tan, dry, stiff, silty CLAY (A-7-6) with trace mica and roots
- (F) SAPROLITE: tan, orange, and white, dry to moist, medium dense, silty SAND (A-2-4) with trace MnO and trace coarse quartz
- (J) WEATHERED ROCK: granite
- (K) CRYSTALLINE ROCK: granite

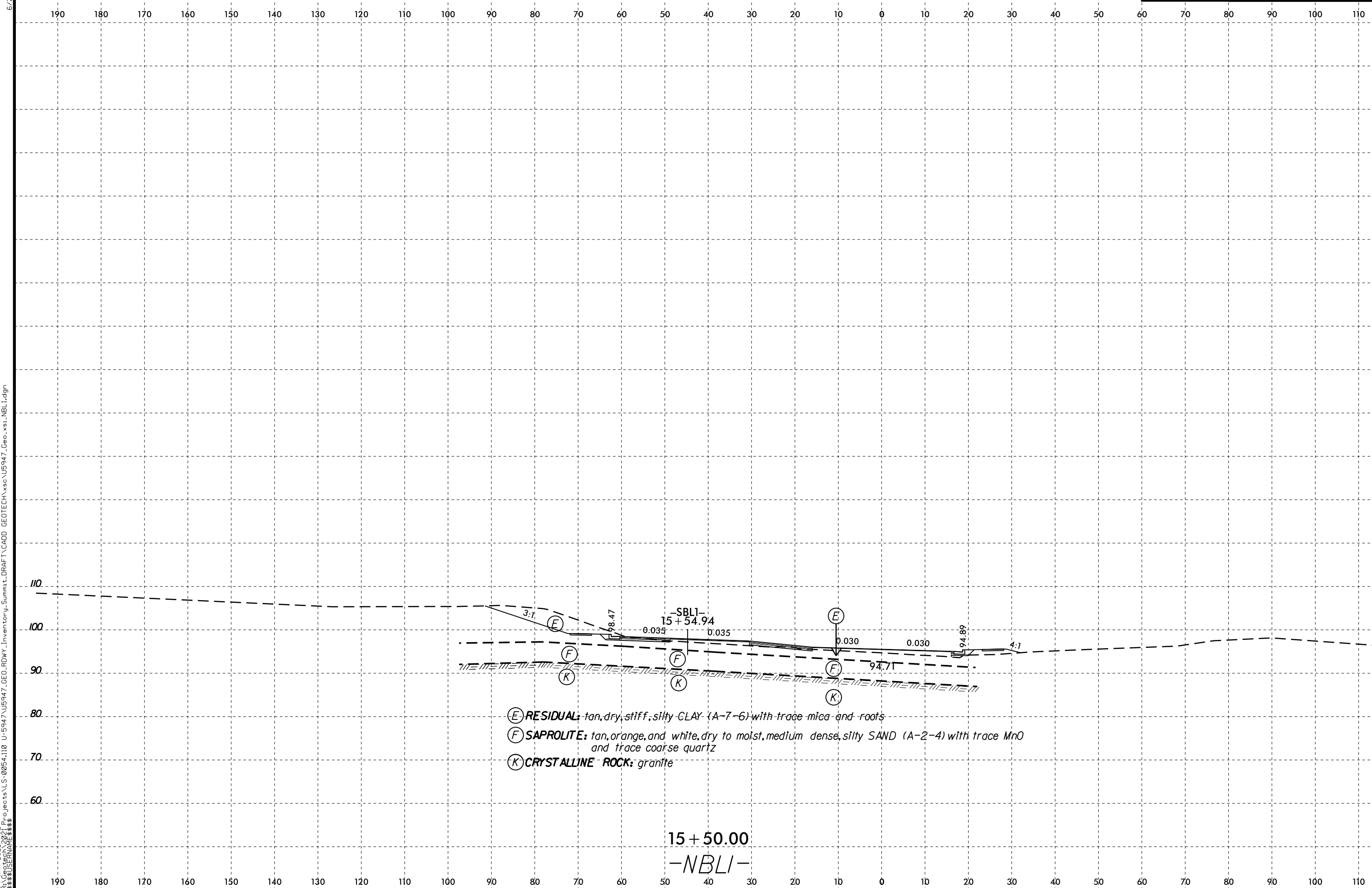
15 + 00.00
-NBL1-



- (E) RESIDUAL: tan, dry, stiff, silty CLAY (A-7-6) with trace mica and roots
- (F) SAPROLITE: tan, orange, and white, dry to moist, medium dense, silty SAND (A-2-4) with trace MnO and trace coarse quartz
- (K) CRYSTALLINE ROCK: granite

15 + 25.00
-NBLI-

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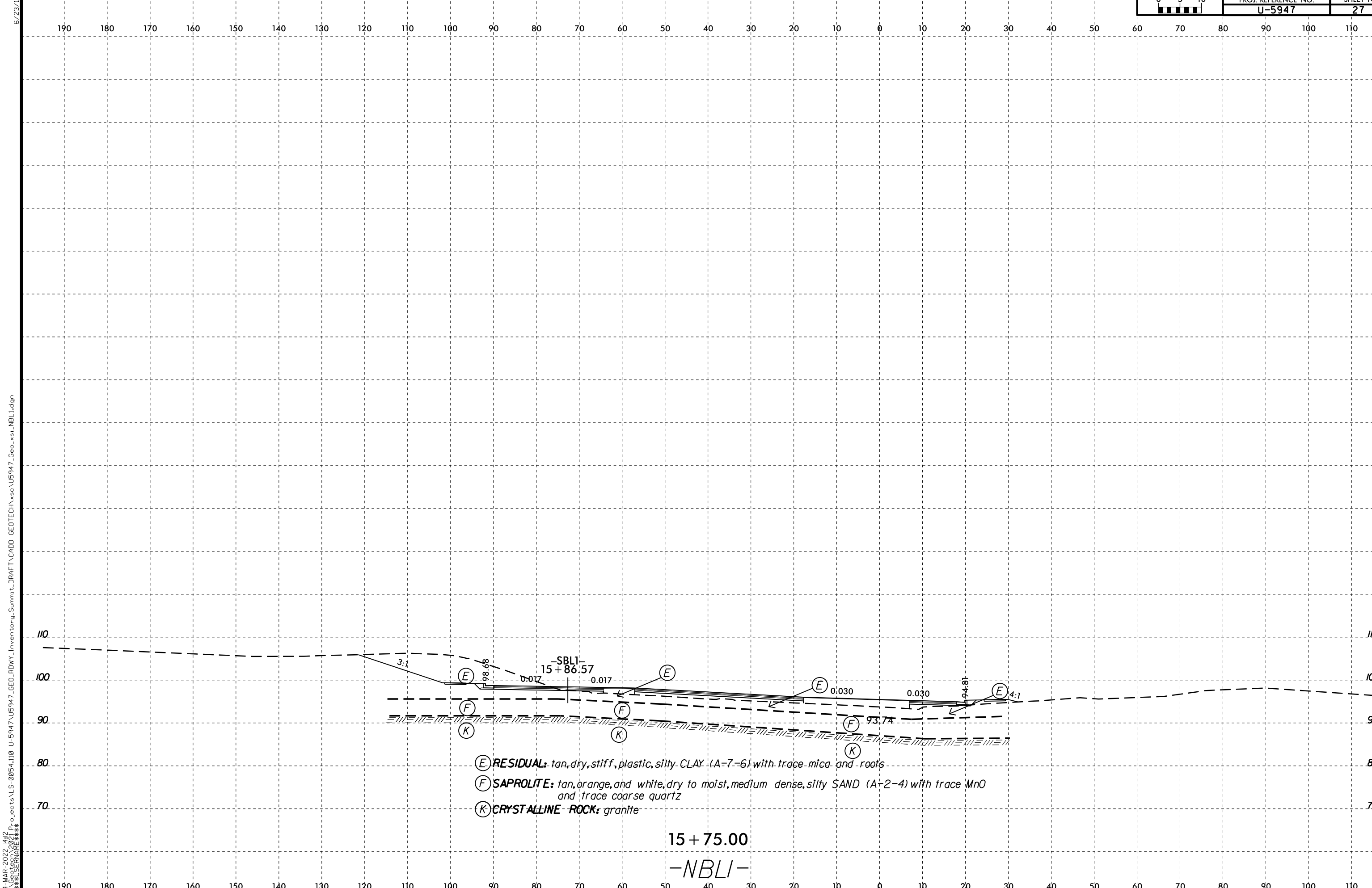


- (E) RESIDUAL: tan, dry, stiff, silty CLAY (A-7-6) with trace mica and roots
- (F) SAPROLITE: tan, orange, and white, dry to moist, medium dense, silty SAND (A-2-4) with trace MnO and trace coarse quartz
- (K) CRYSTALLINE ROCK: granite

15 + 50.00
-NBLI-

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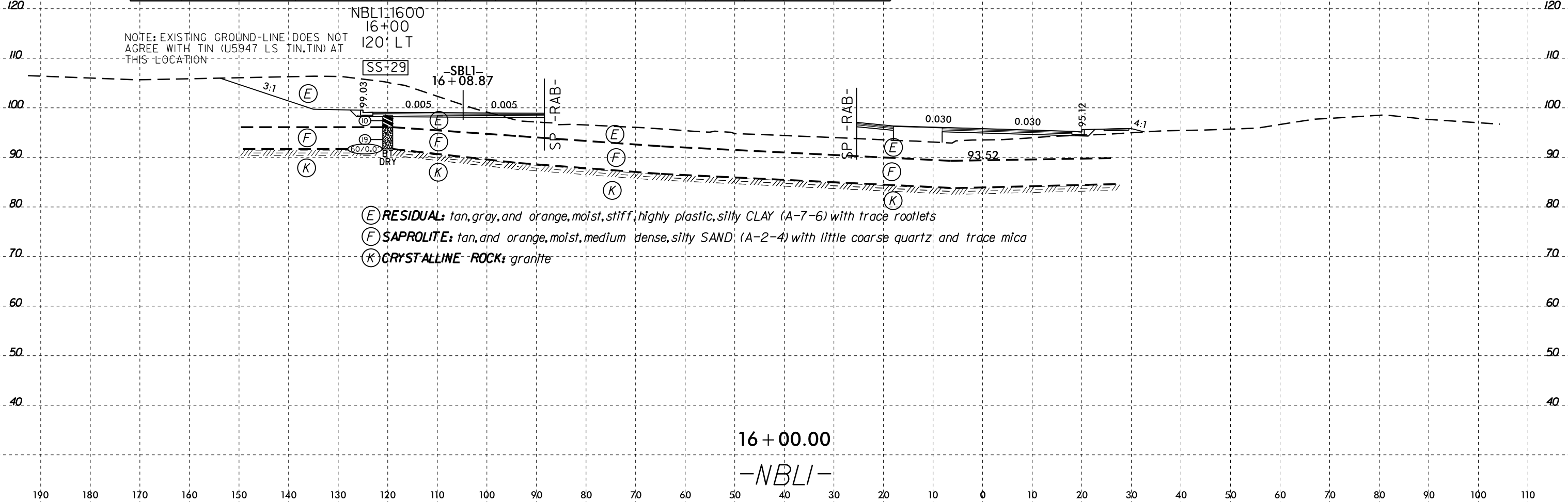
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 \$\$\$SUBENAME\$\$\$

- (E) RESIDUAL: tan, dry, stiff, plastic, silty CLAY (A-7-6) with trace mica and roots
- (F) SAPROLITE: tan, orange, and white, dry to moist, medium dense, silty SAND (A-2-4) with trace MnO and trace coarse quartz
- (K) CRYSTALLINE ROCK: granite

15 + 75.00
 -NBLI-

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-29	120' LT	16+00	0.0-1.5	A-7-6	58	34	16.9	7.9	22.1	53.1	100	88	77	27.6	N/A

NOTE: EXISTING GROUND-LINE DOES NOT AGREE WITH TIN (U5947 LS TIN.TIN) AT THIS LOCATION



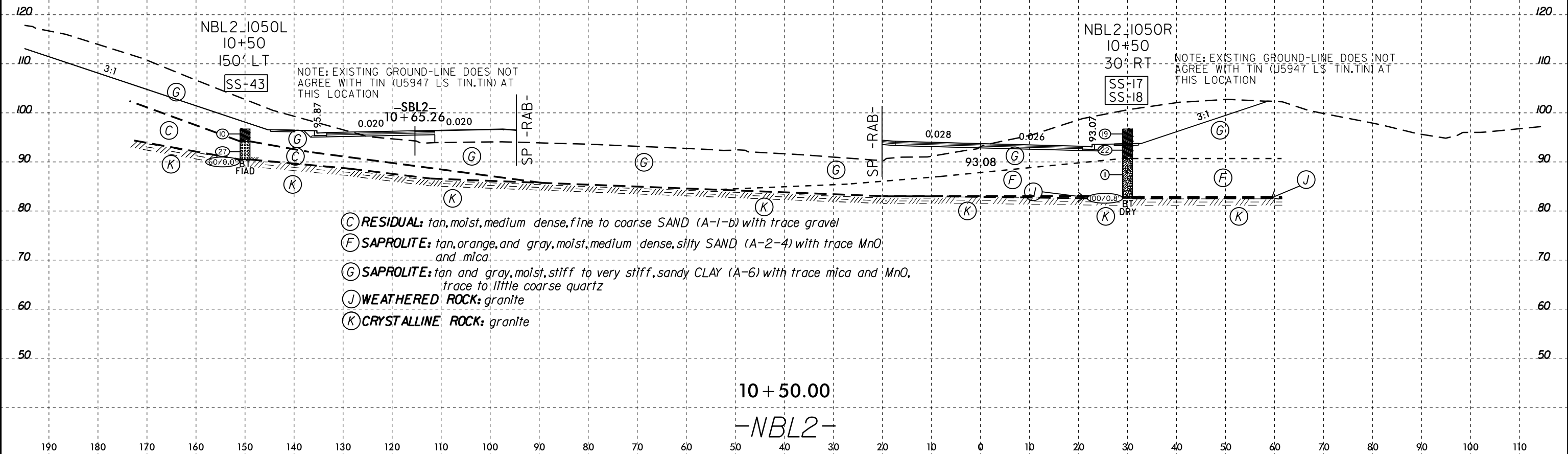
- (E) RESIDUAL: tan, gray, and orange, moist, stiff, highly plastic, silty CLAY (A-7-6) with trace rootlets
- (F) SAPROLITE: tan, and orange, moist, medium dense, silty SAND (A-2-4) with little coarse quartz and trace mica
- (K) CRYSTALLINE ROCK: granite

16 + 00.00
-NBLI-

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SOIL TEST RESULTS

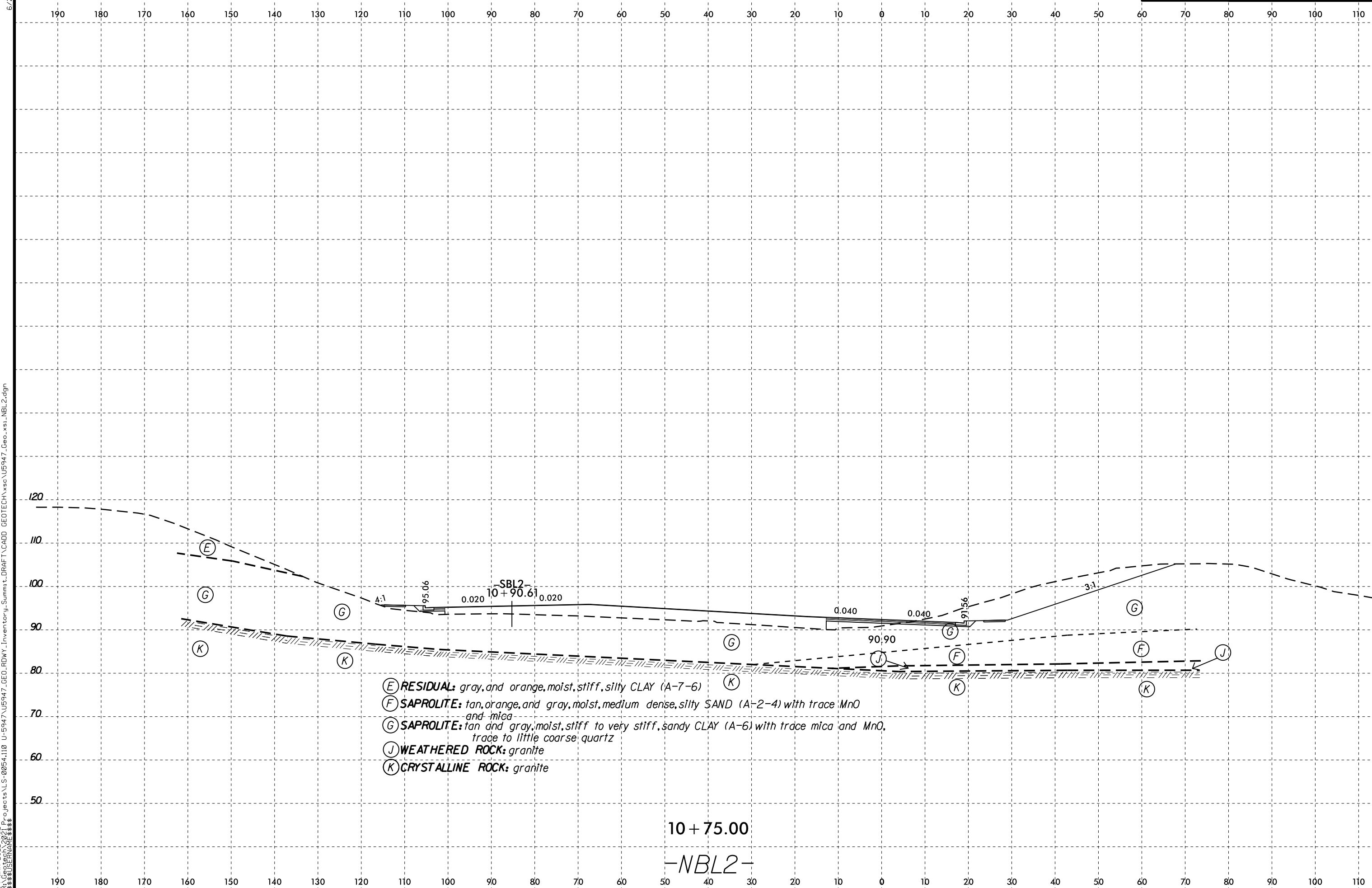
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-17	30' RT	10+50	0.0-1.5	A-6	37	20	37.3	21.3	13.8	27.6	98	72	43	13.5	N/A
SS-18	30' RT	10+50	3.3-4.8	A-6	40	17	39.5	24.1	14.4	22.0	95	71	38	12.7	N/A
SS-43	150' LT	10+50	0.0-1.5	A-6	28	12	26.1	23.2	22.7	28.0	97	79	56	11.6	N/A



- (C) RESIDUAL: tan, moist, medium dense, fine to coarse SAND (A-1-b) with trace gravel
- (F) SAPROLITE: tan, orange, and gray, moist, medium dense, silty SAND (A-2-4) with trace MnO₂ and mica
- (G) SAPROLITE: tan and gray, moist, stiff to very stiff, sandy CLAY (A-6) with trace mica and MnO₂, trace to little coarse quartz
- (J) WEATHERED ROCK: granite
- (K) CRYSTALLINE ROCK: granite

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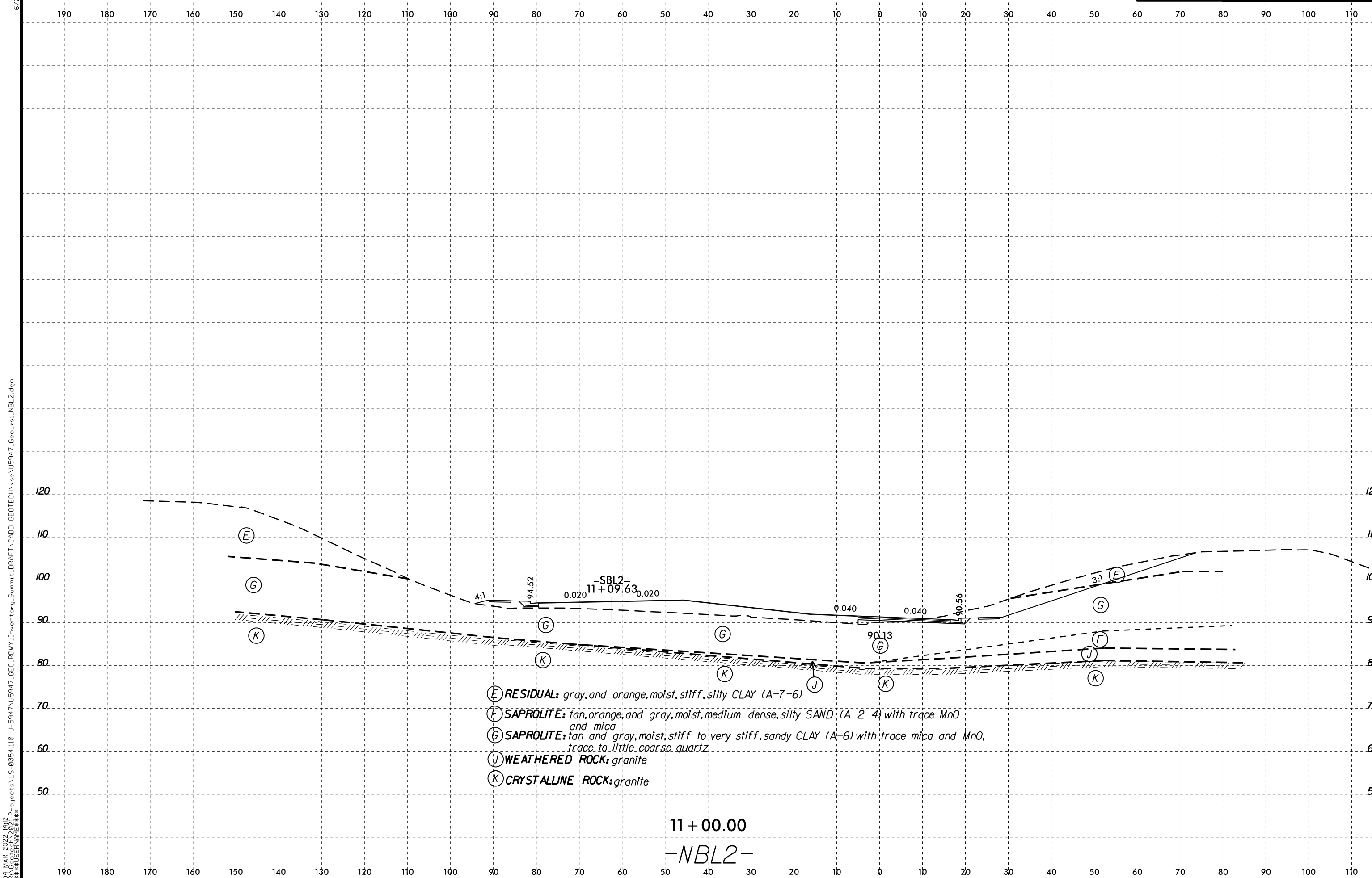


- (E) RESIDUAL: gray, and orange, moist, stiff, silty CLAY (A-7-6)
- (F) SAPROLITE: tan, orange, and gray, moist, medium dense, silty SAND (A-2-4) with trace MnO and mica
- (G) SAPROLITE: tan and gray, moist, stiff to very stiff, sandy CLAY (A-6) with trace mica and MnO, trace to little coarse quartz
- (J) WEATHERED ROCK: granite
- (K) CRYSTALLINE ROCK: granite

10 + 75.00
 -NBL2-

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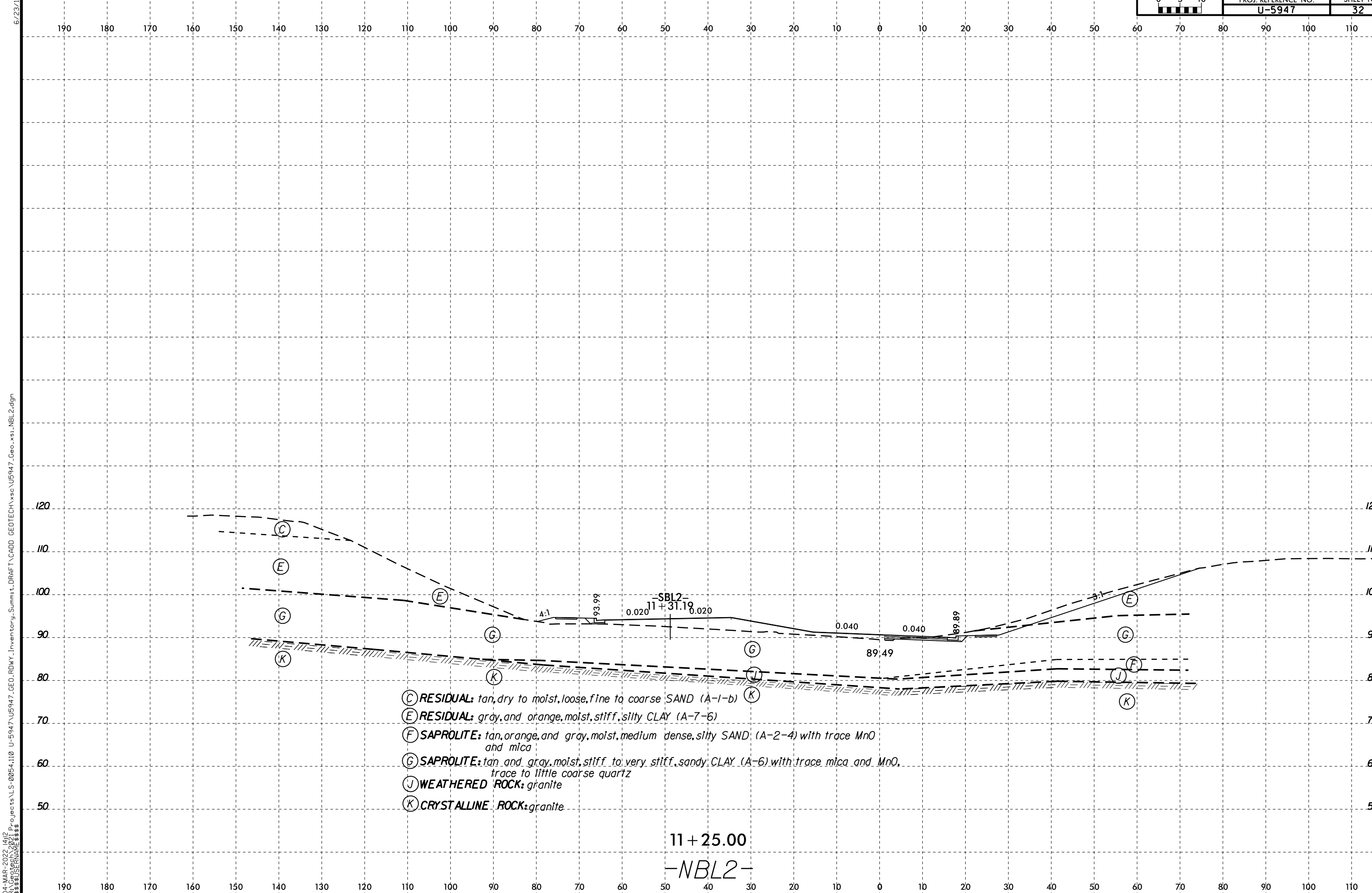


- (E) RESIDUAL: gray and orange, moist, stiff, silty CLAY (A-7-6)
- (F) SAPROLITE: tan, orange, and gray, moist, medium dense, silty SAND (A-2-4) with trace MnO and mica
- (G) SAPROLITE: tan and gray, moist, stiff to very stiff, sandy CLAY (A-6) with trace mica and MnO, trace to little coarse quartz
- (J) WEATHERED ROCK: granite
- (K) CRYSTALLINE ROCK: granite

11 + 00.00
 -NBL2-

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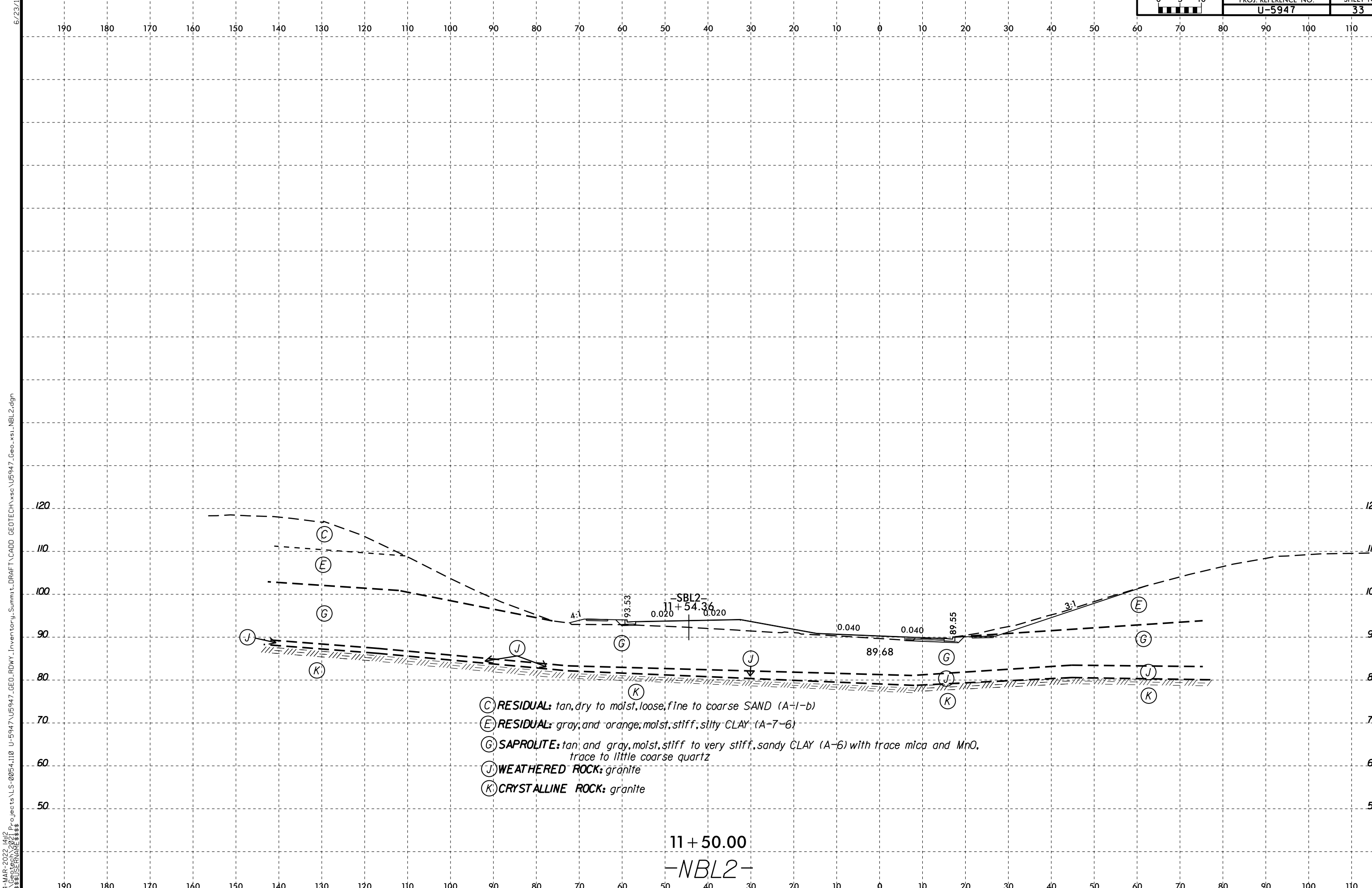
6/23/16



- (C) RESIDUAL: tan, dry to moist, loose, fine to coarse SAND (A-1-b)
- (E) RESIDUAL: gray, and orange, moist, stiff, silty CLAY (A-7-6)
- (F) SAPROLITE: tan, orange, and gray, moist, medium dense, silty SAND (A-2-4) with trace MnO and mica
- (G) SAPROLITE: tan and gray, moist, stiff to very stiff, sandy CLAY (A-6) with trace mica and MnO, trace to little coarse quartz
- (J) WEATHERED ROCK: granite
- (K) CRYSTALLINE ROCK: granite

11 + 25.00
 -NBL2-

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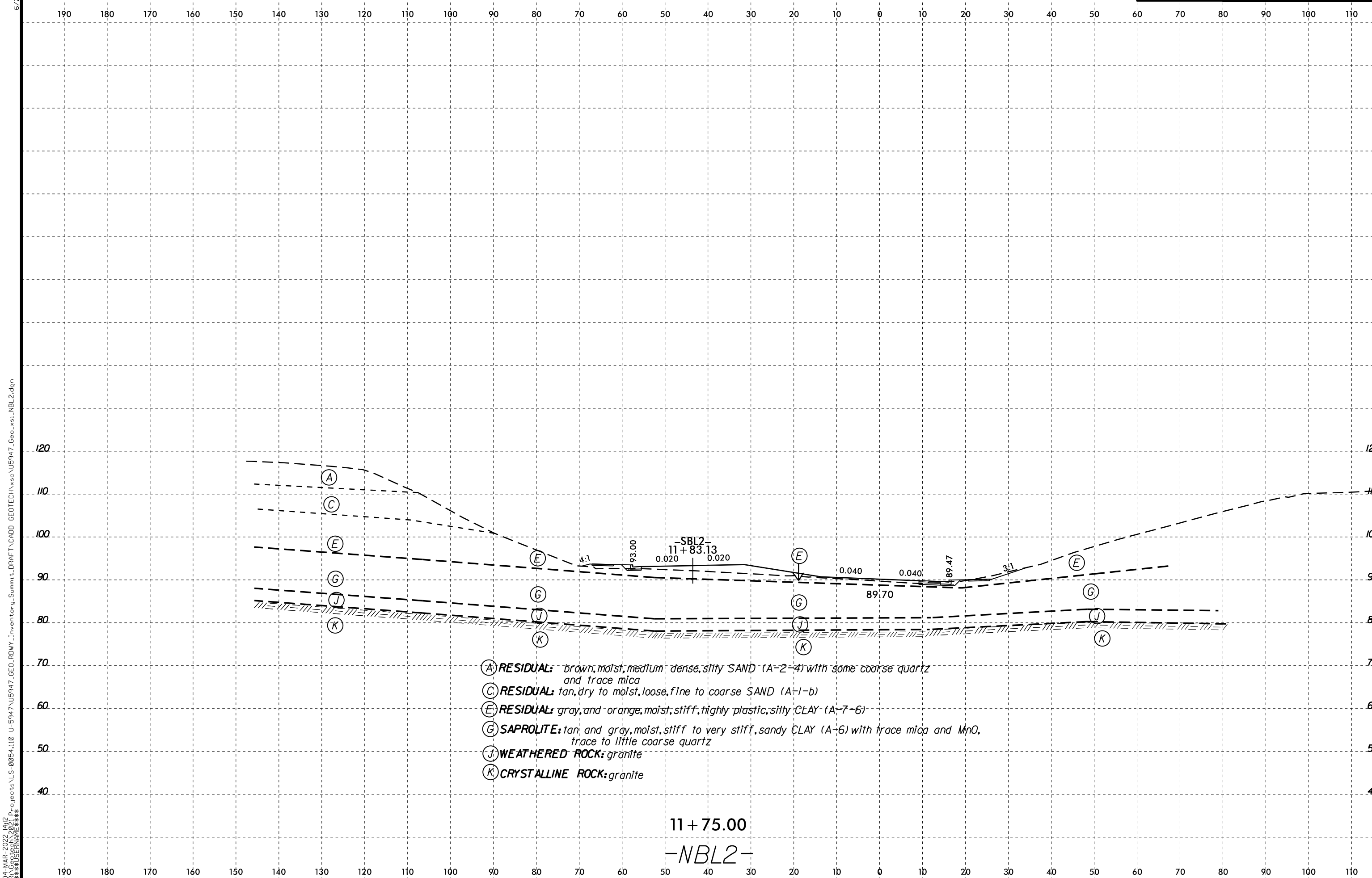


- (C) RESIDUAL: tan, dry to moist, loose, fine to coarse SAND (A-1-b)
- (E) RESIDUAL: gray and orange, moist, stiff, silty CLAY (A-7-6)
- (G) SAPROLITE: tan and gray, moist, stiff to very stiff, sandy CLAY (A-6) with trace mica and MnO, trace to little coarse quartz
- (J) WEATHERED ROCK: granite
- (K) CRYSTALLINE ROCK: granite

11 + 50.00
-NBL2-

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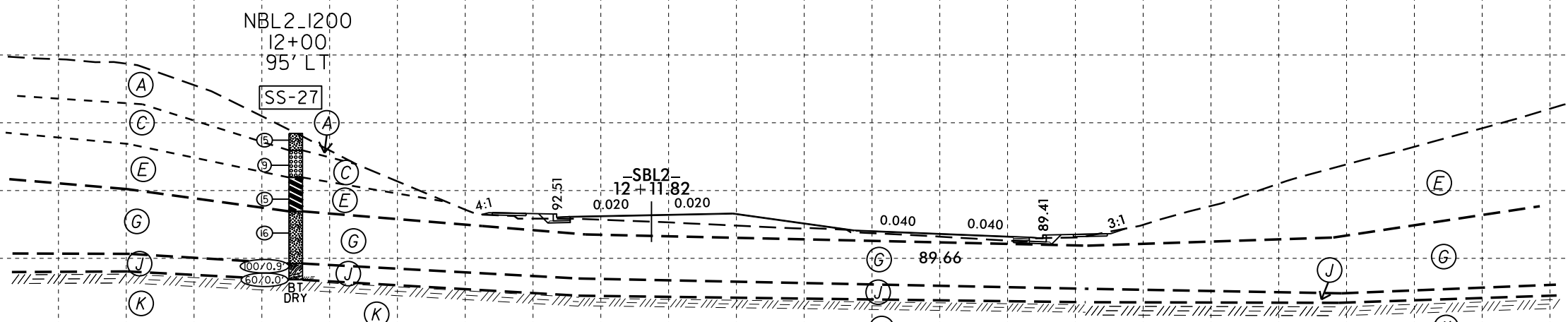


- (A) **RESIDUAL:** brown, moist, medium dense, silty SAND (A-2-4) with some coarse quartz and trace mica
- (C) **RESIDUAL:** tan, dry to moist, loose, fine to coarse SAND (A-1-b)
- (E) **RESIDUAL:** gray, and orange, moist, stiff, highly plastic, silty CLAY (A-7-6)
- (G) **SAPROLITE:** tan, and gray, moist, stiff to very stiff, sandy CLAY (A-6) with trace mica and MnO, trace to little coarse quartz
- (J) **WEATHERED ROCK:** granite
- (K) **CRYSTALLINE ROCK:** granite

11 + 75.00
 -NBL2-

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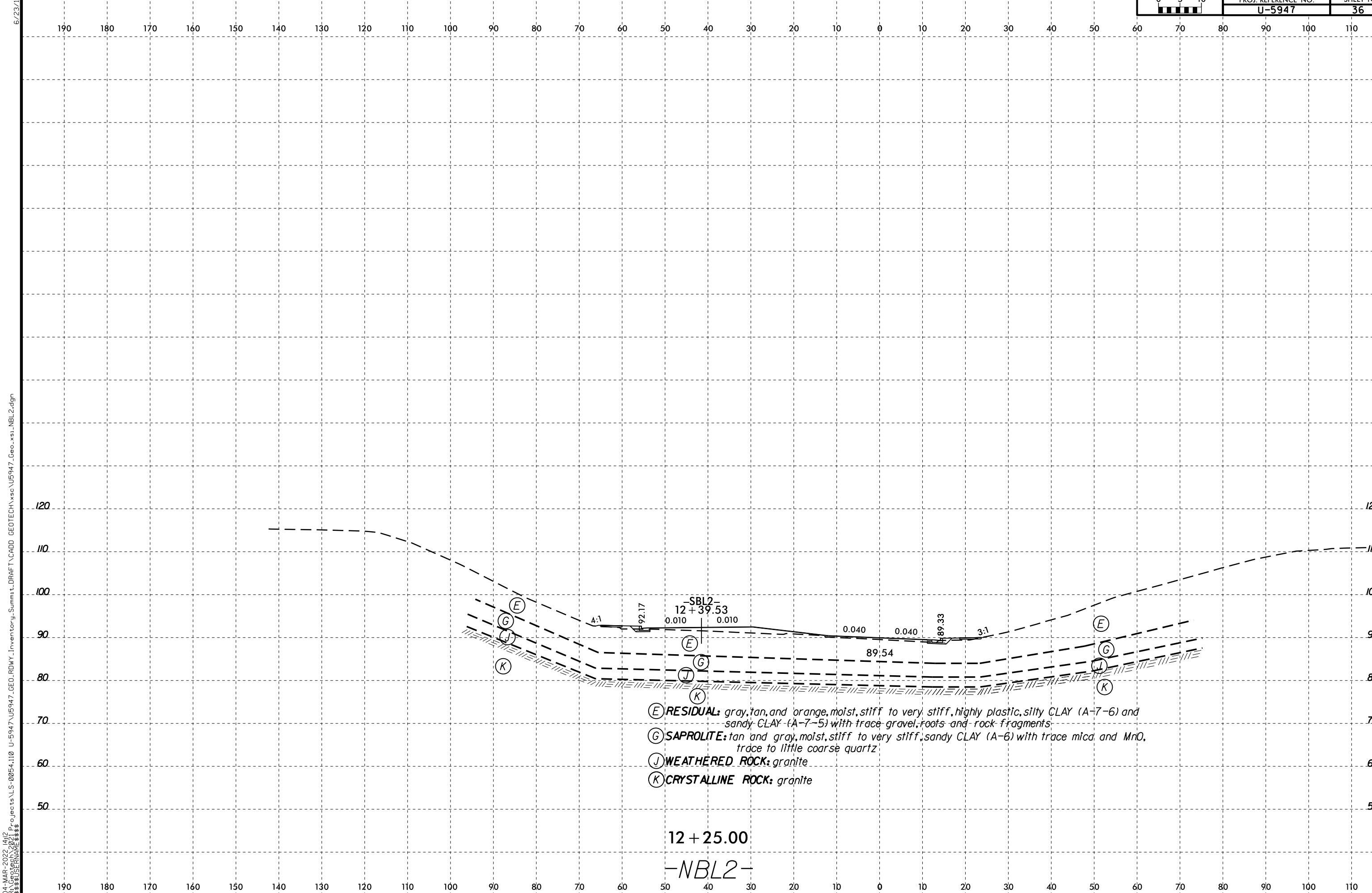
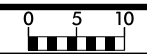
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-27	95' LT	12+00	8.7-10.2	A-7-6	69	43	3.9	3.9	32.2	60	99	97	93	33.1	NA



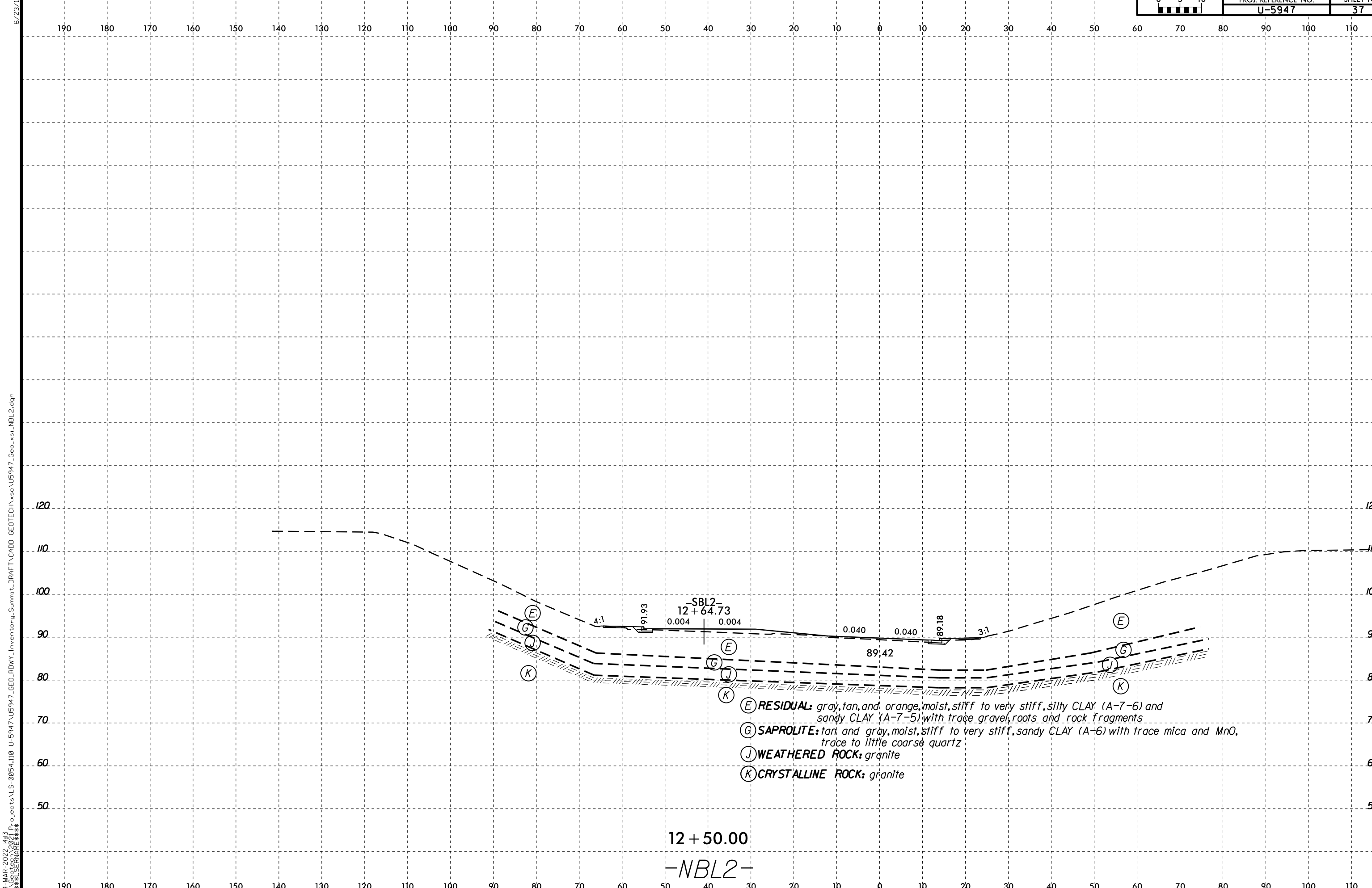
- (A) RESIDUAL: brown, moist, medium dense, silty SAND (A-2-4) with some coarse quartz and trace mica
- (C) RESIDUAL: tan, dry to moist, loose, fine to coarse SAND (A-1-b)
- (E) RESIDUAL: gray, tan, and orange, moist, stiff to very stiff, highly plastic, silty CLAY (A-7-6) and sandy CLAY (A-7-5) with trace gravel, roots and rock fragments
- (G) SAPROLITE: tan and gray, moist, stiff to very stiff, sandy CLAY (A-6) with trace mica and MnO₂, trace to little coarse quartz
- (J) WEATHERED ROCK: granite
- (K) CRYSTALLINE ROCK: granite

12 + 00.00
-NBL2-

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SUBSTRATE



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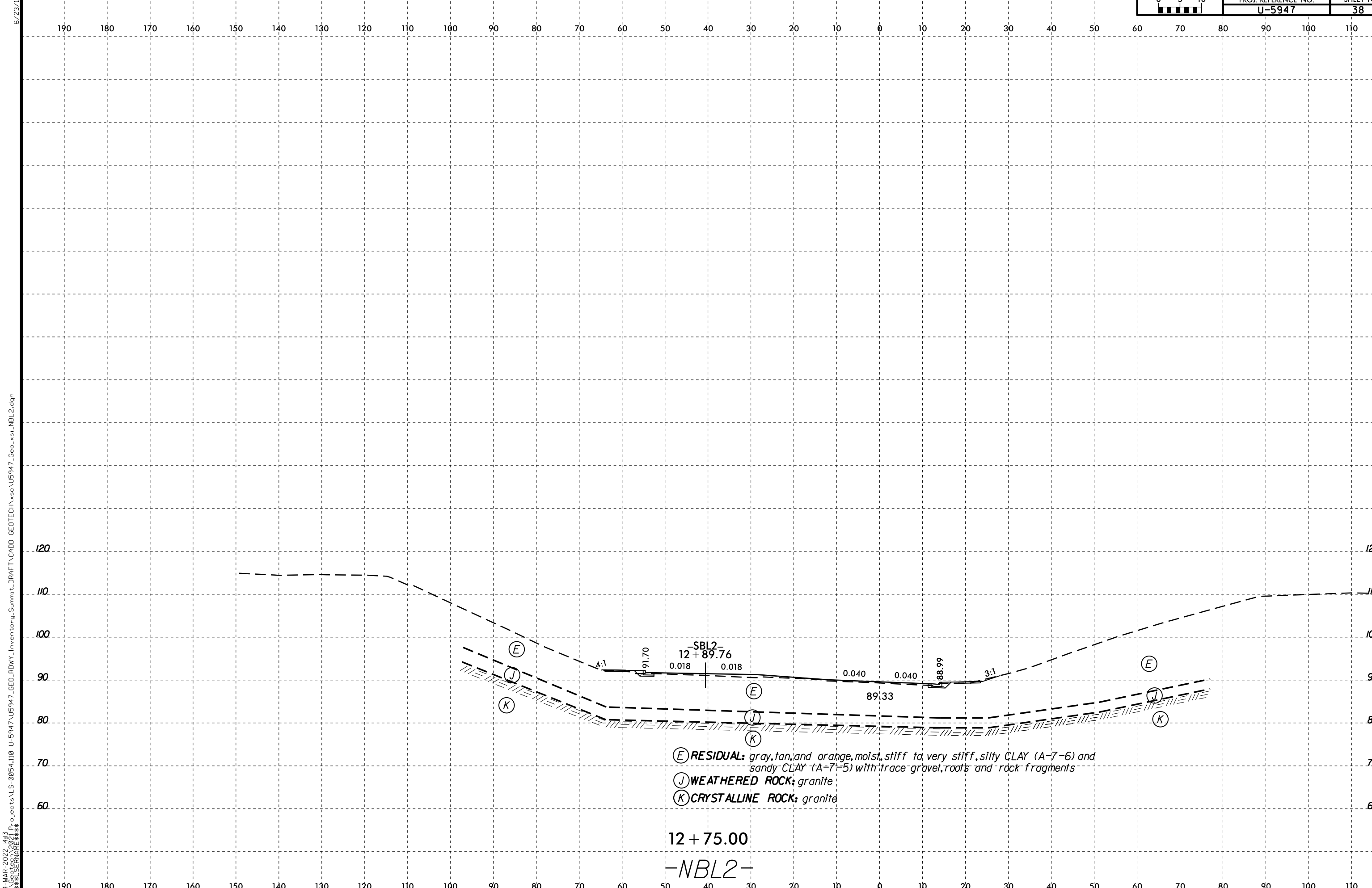


- (E) RESIDUAL: gray, tan, and orange, moist, stiff to very stiff, silty CLAY (A-7-6) and sandy CLAY (A-7-5) with trace gravel, roots and rock fragments
- (G) SAPROLITE: tan and gray, moist, stiff to very stiff, sandy CLAY (A-6) with trace mica and MnO, trace to little coarse quartz
- (J) WEATHERED ROCK: granite
- (K) CRYSTALLINE ROCK: granite

12 + 50.00
 -NBL2-

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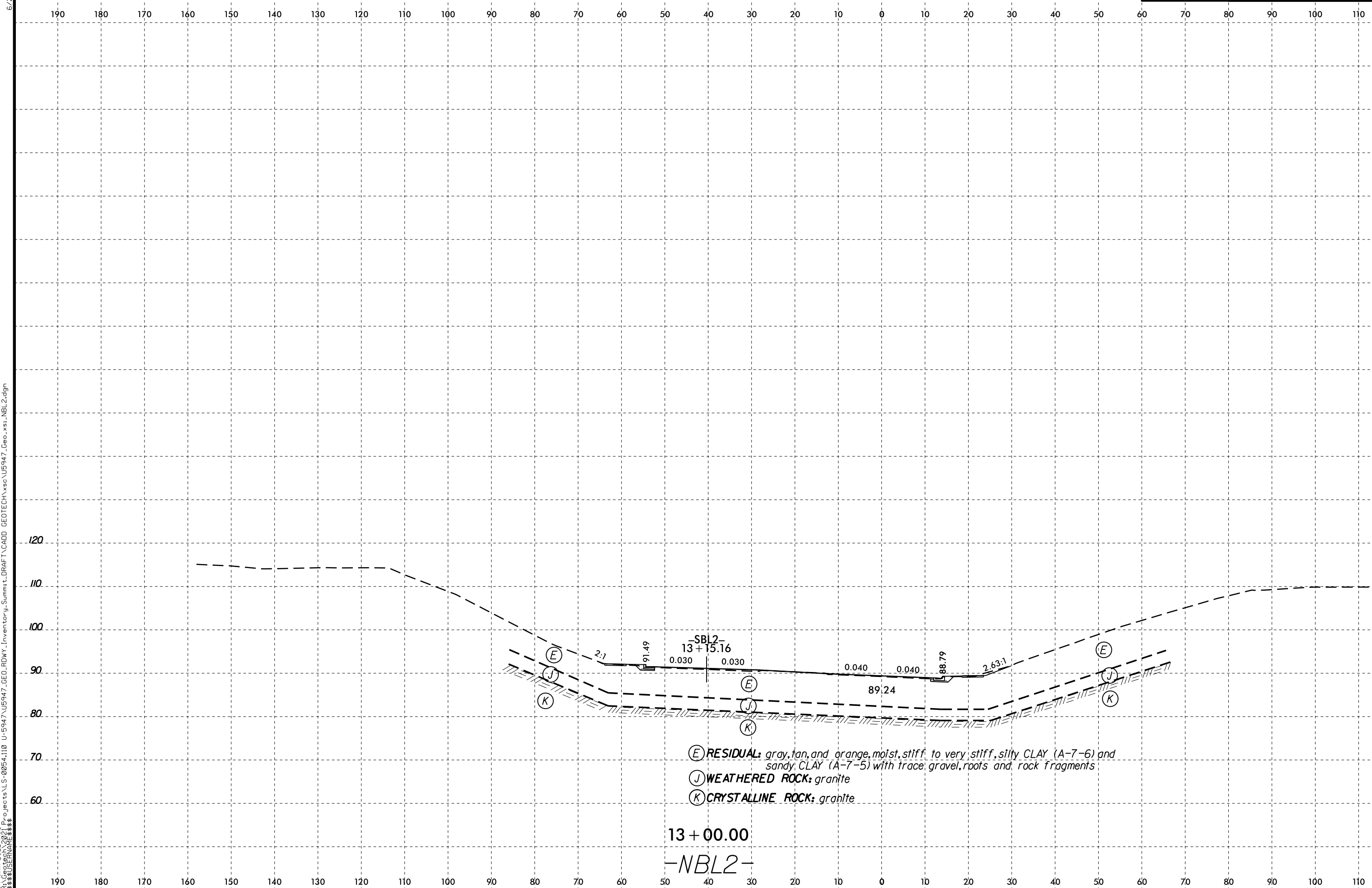


(E) RESIDUAL: gray, tan, and orange, moist, stiff to very stiff, silty CLAY (A-7-6) and sandy CLAY (A-7-5) with trace gravel, roots and rock fragments
 (J) WEATHERED ROCK: granite
 (K) CRYSTALLINE ROCK: granite

12 + 75.00
 -NBL2-

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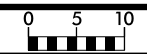


- ⓔ RESIDUAL: gray, tan, and orange, moist, stiff to very stiff, silty CLAY (A-7-6) and sandy CLAY (A-7-5) with trace gravel, roots and rock fragments
- ⓙ WEATHERED ROCK: granite
- Ⓚ CRYSTALLINE ROCK: granite

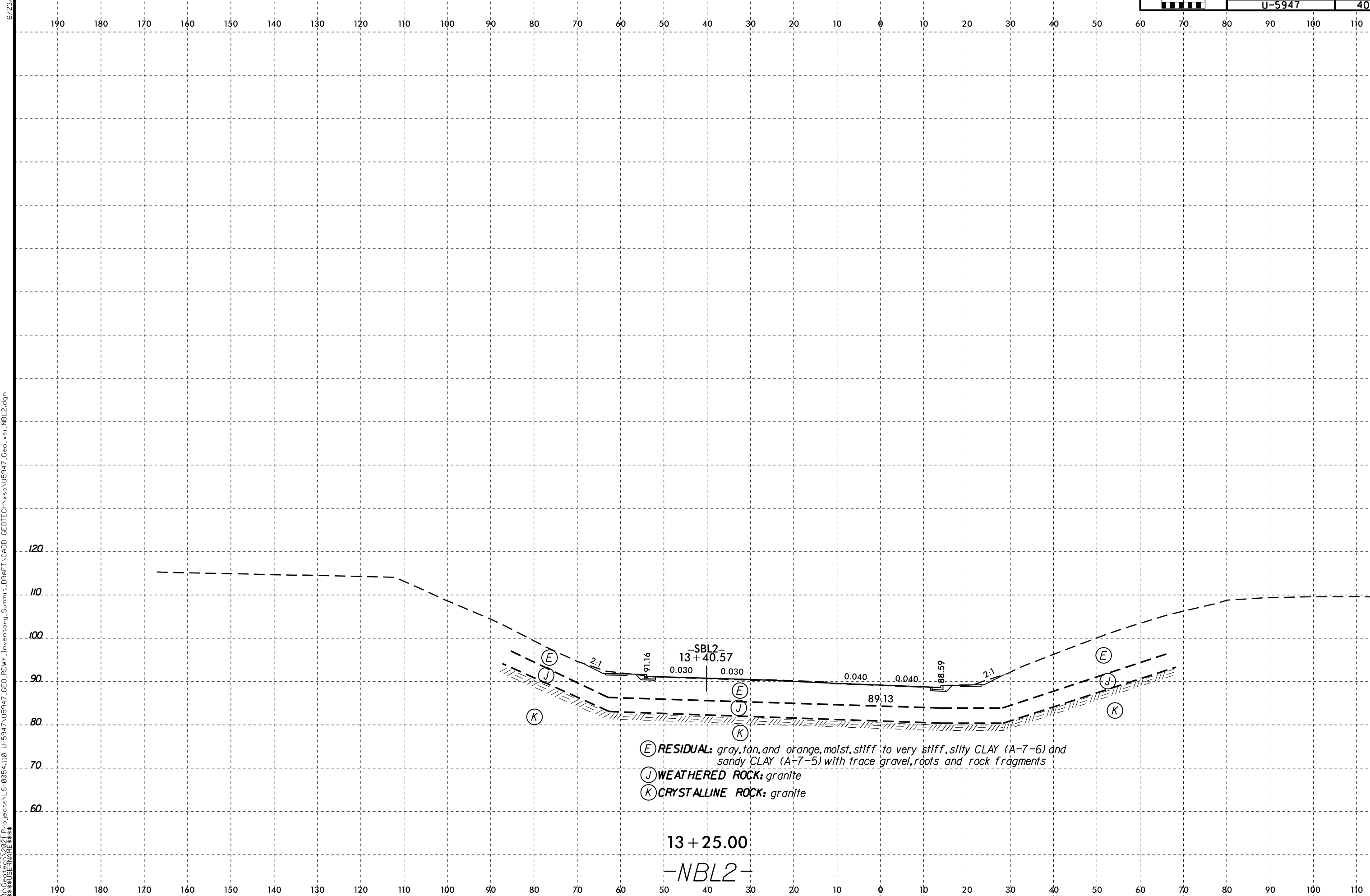
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PROJ. REFERENCE NO.	SHEET NO.
U-5947	40



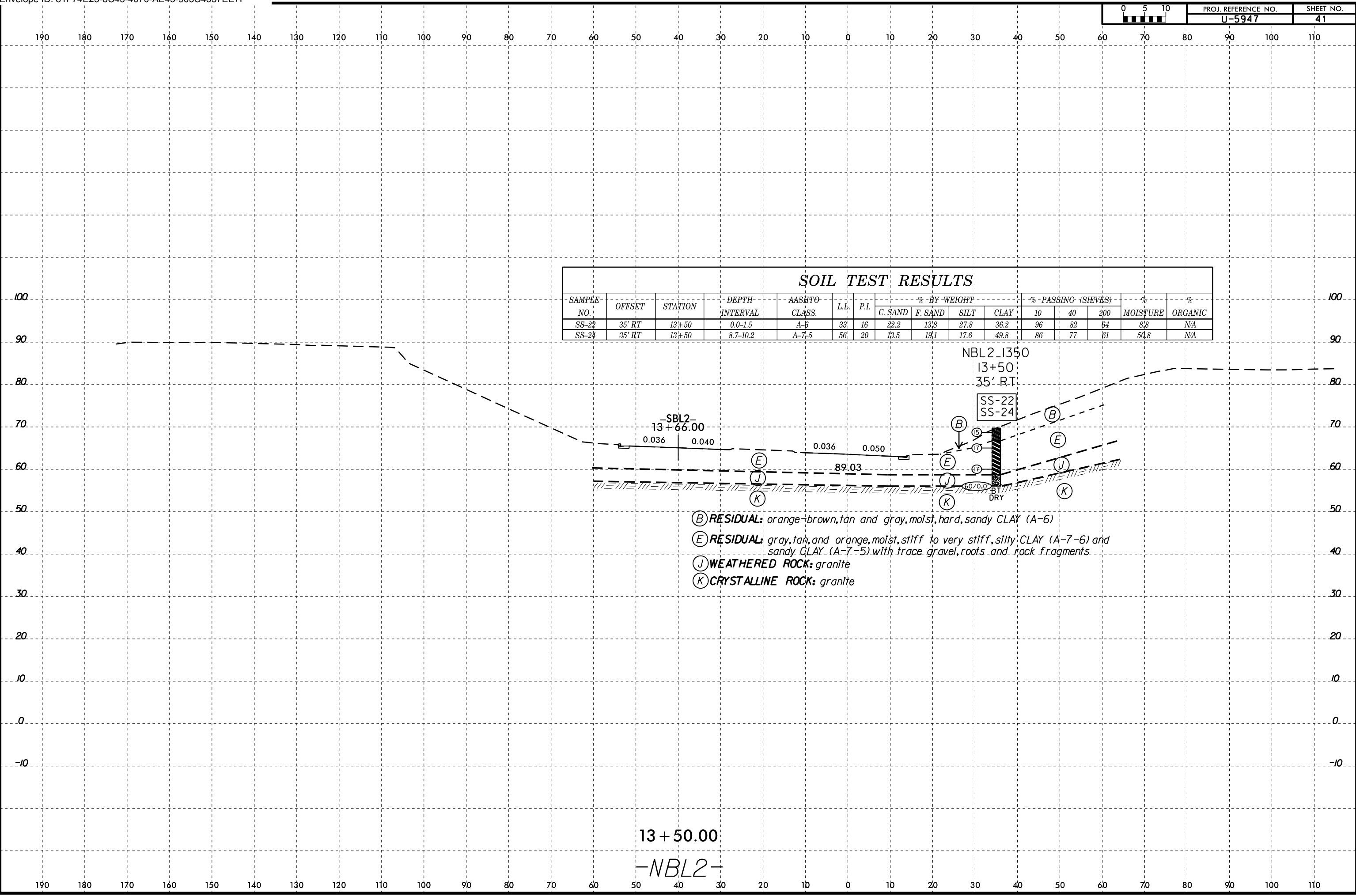
- (E) RESIDUAL: gray, tan, and orange, moist, stiff to very stiff, silty CLAY (A-7-6) and sandy CLAY (A-7-5) with trace gravel, roots and rock fragments
- (J) WEATHERED ROCK: granite
- (K) CRYSTALLINE ROCK: granite

13 + 25.00
 -NBL2-

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6/23/16

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-22	35' RT	13+50	0.0-1.5	A-6	33	16	22.2	13.8	27.8	36.2	96	82	64	8.8	N/A
SS-24	35' RT	13+50	8.7-10.2	A-7-5	56	20	13.5	19.1	17.6	49.8	86	77	61	50.8	N/A



NBL2_1350
13+50
35' RT

SS-22
SS-24

SBL2
13+66.00

0.036 0.040

0.036 0.050

89.03

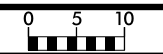
60.00
DRY

- (B) RESIDUAL: orange-brown, tan and gray, moist, hard, sandy CLAY (A-6)
- (E) RESIDUAL: gray, tan, and orange, moist, stiff to very stiff, silty CLAY (A-7-6) and sandy CLAY (A-7-5) with trace gravel, roots and rock fragments
- (J) WEATHERED ROCK: granite
- (K) CRYSTALLINE ROCK: granite

13 + 50.00
-NBL2-

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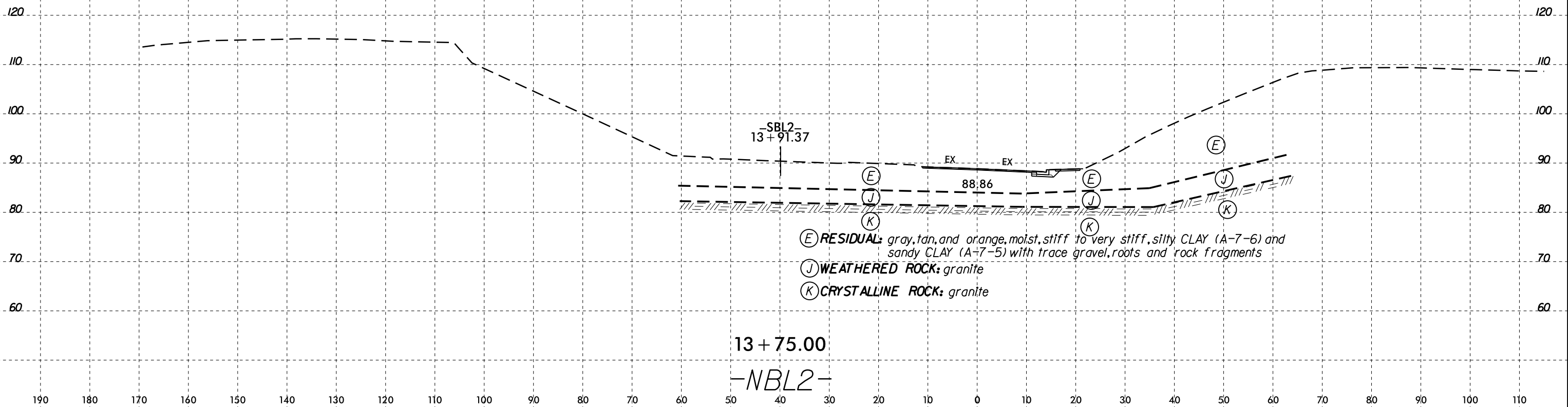
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PROJ. REFERENCE NO.	SHEET NO.
U-5947	42

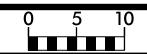
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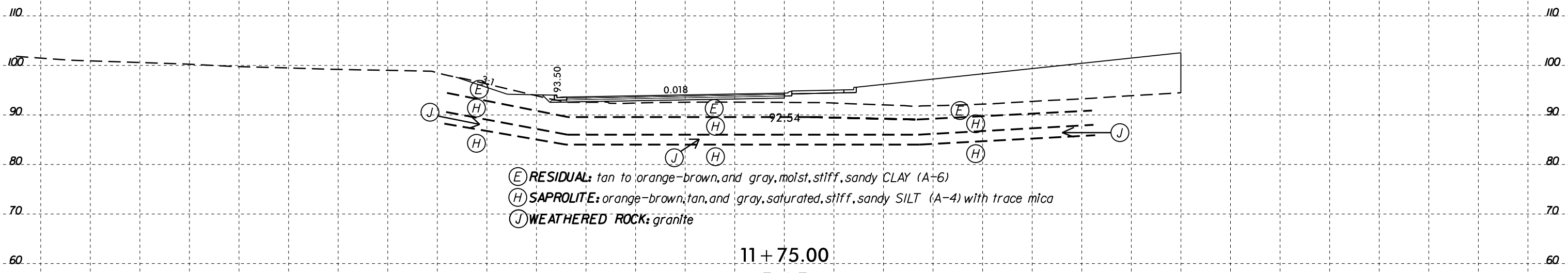
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\$\$\$\$SUBENAME\$\$\$\$

6/23/16



PROJ. REFERENCE NO.	SHEET NO.
U-5947	43

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



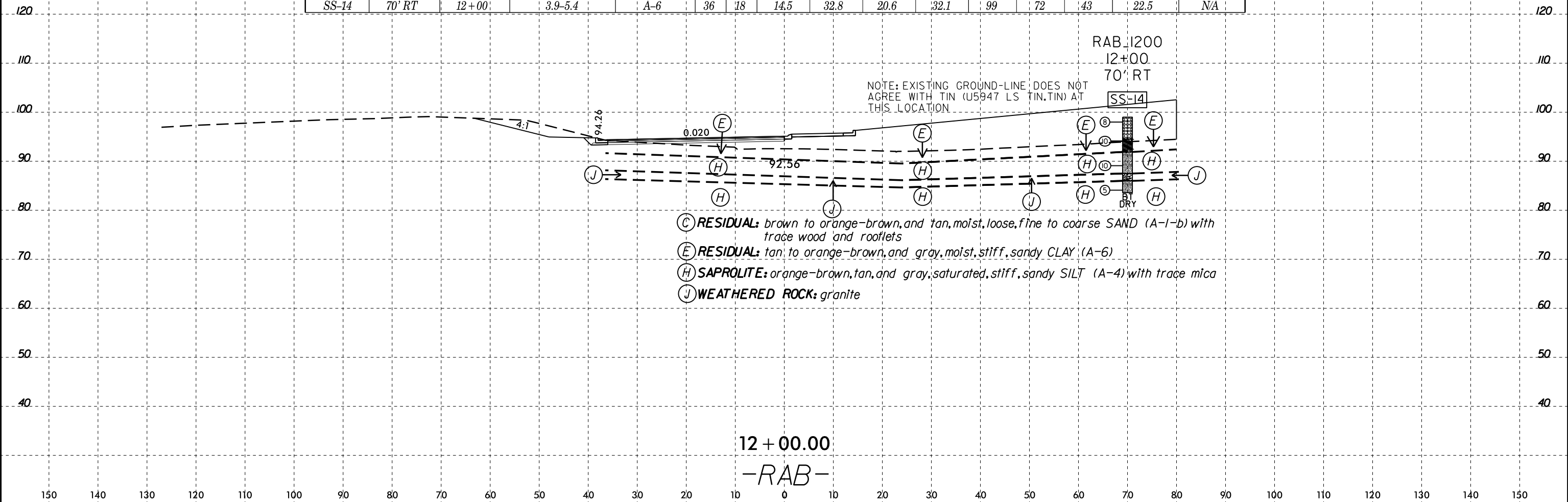
- (E) RESIDUAL: tan to orange-brown, and gray, moist, stiff, sandy CLAY (A-6)
- (H) SAPROLITE: orange-brown, tan, and gray, saturated, stiff, sandy SILT (A-4) with trace mica
- (J) WEATHERED ROCK: granite

11 + 75.00
-RAB-

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

04-MAR-2022 14:13
P:\G050565\2021\Projects\110 U-5947\U5947_GEO_RDWY_Inventory_Summit_DRAFT\CADD_GEOTECH\XSC\U5947_Geo_xsi_RAB_equiv_NEW.dgn
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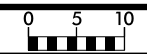
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-14	70' RT	12+00	3.9-5.4	A-6	36	18	14.5	32.8	20.6	32.1	99	72	43	22.5	N/A



04-MAR-2022 14:13
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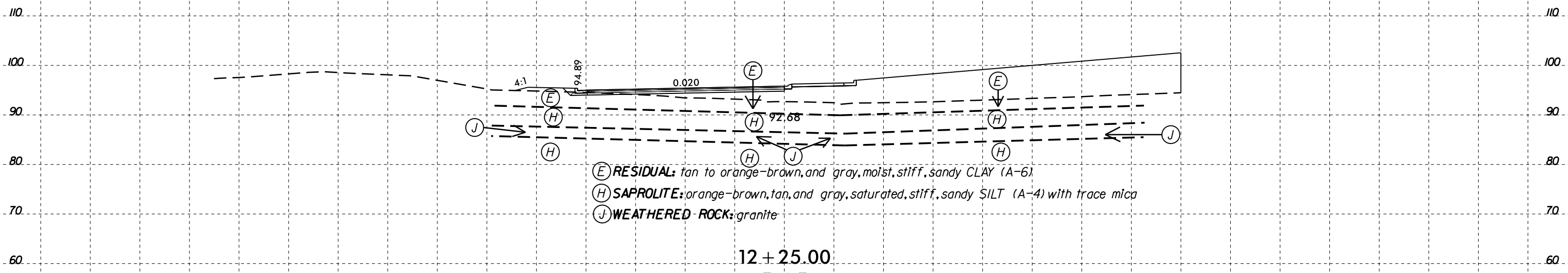
6/23/16

6/23/16



PROJ. REFERENCE NO.	SHEET NO.
U-5947	45

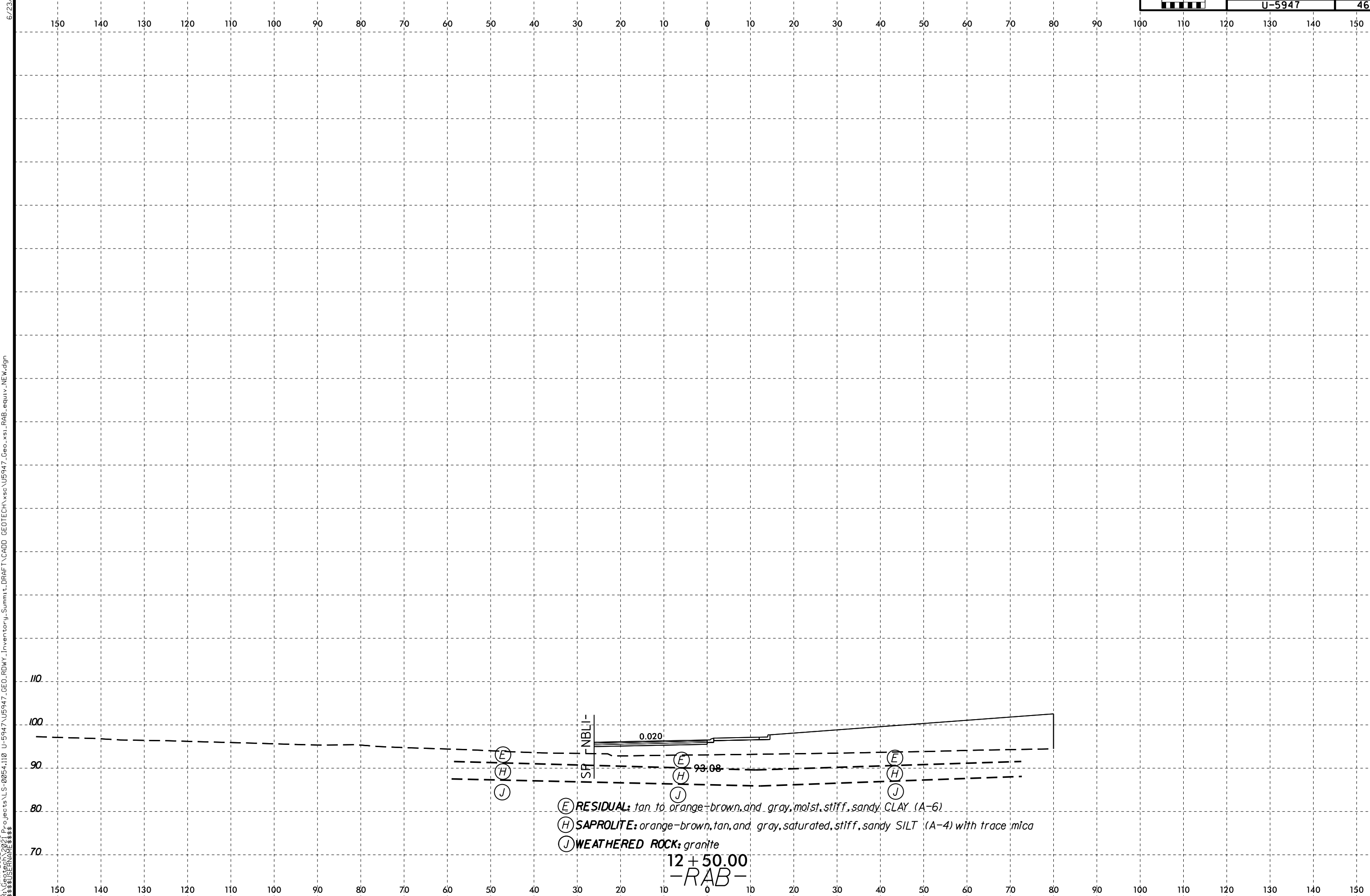
150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150



- (E) RESIDUAL: tan to orange-brown, and gray, moist, stiff, sandy CLAY (A-6)
- (H) SAPROLITE: orange-brown, tan, and gray, saturated, stiff, sandy SILT (A-4) with trace mica
- (J) WEATHERED ROCK: granite

04-MAR-2022 14:13
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\$\$\$\$SUBENAME\$\$\$\$

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



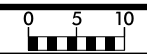
- ⓔ **RESIDUAL:** tan to orange-brown, and gray, moist, stiff, sandy CLAY (A-6)
- ⓗ **SAPROLITE:** orange-brown, tan, and gray, saturated, stiff, sandy SILT (A-4) with trace mica
- Ⓝ **WEATHERED ROCK:** granite

12+50.00
-RAB-

04-MAR-2022 14:13
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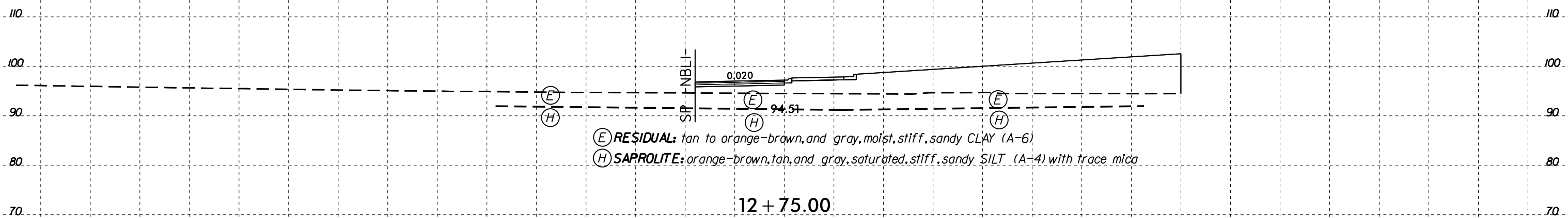
6/23/16

6/23/16



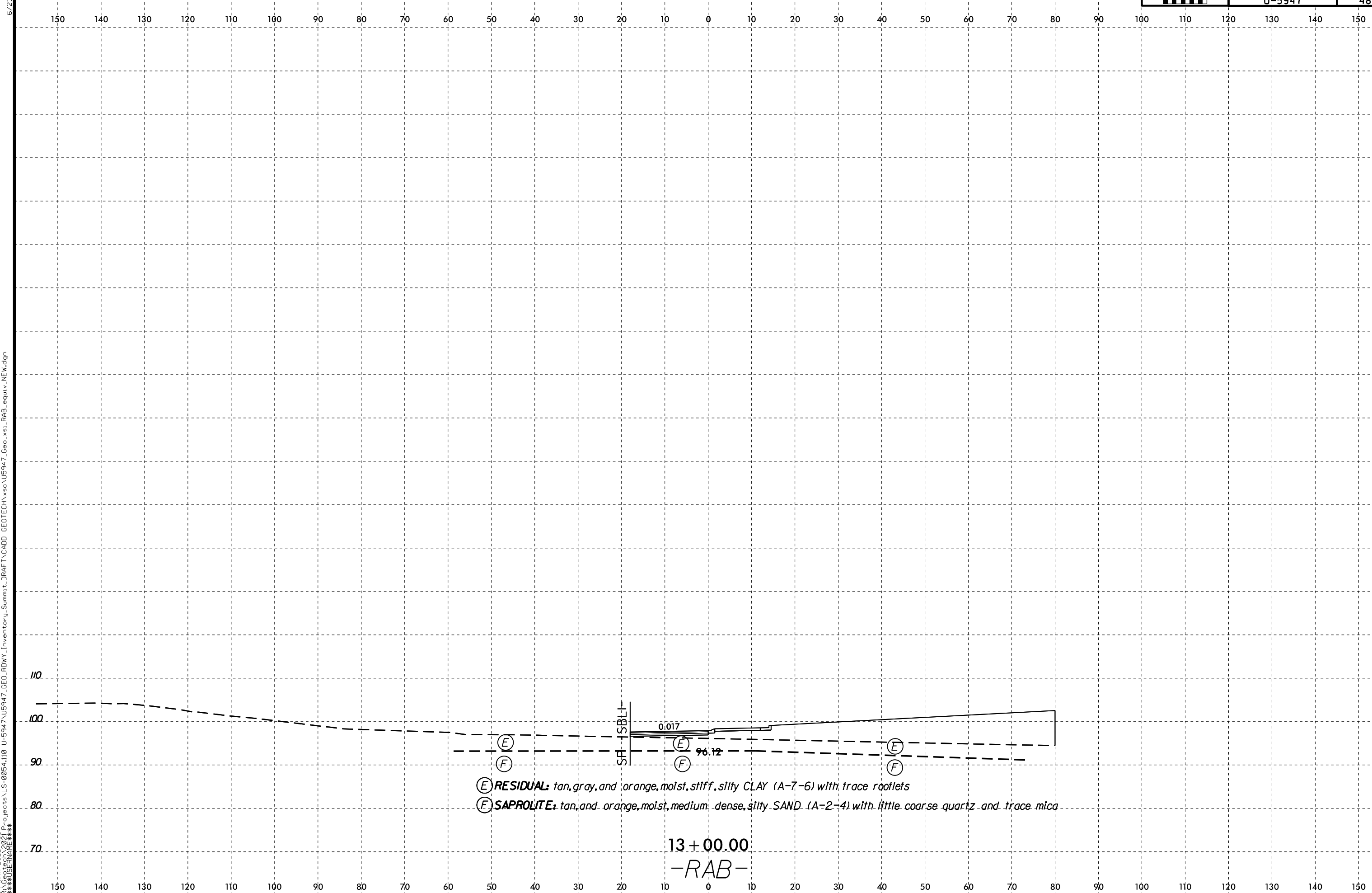
PROJ. REFERENCE NO.	SHEET NO.
U-5947	47

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



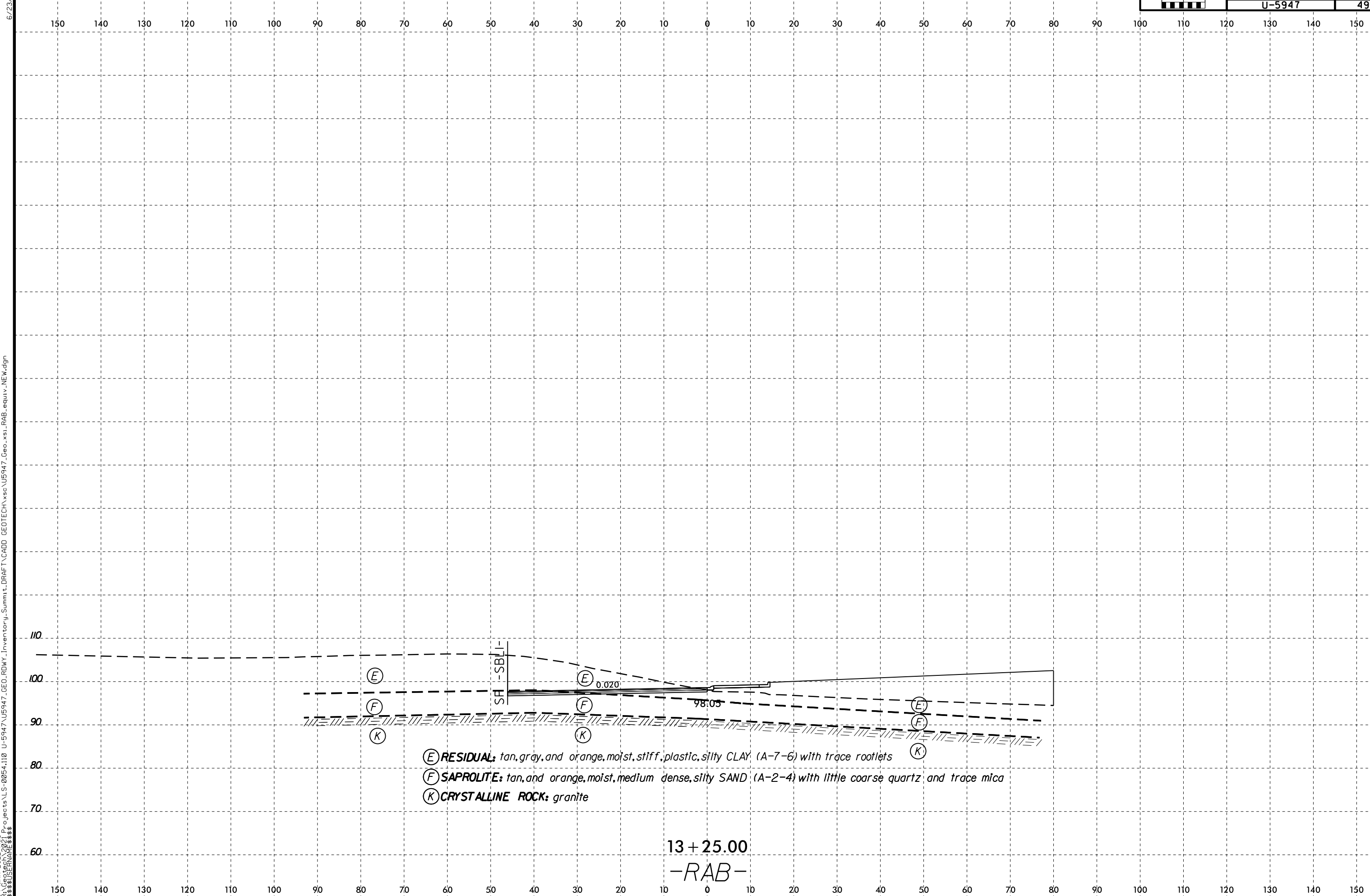
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\$\$\$\$SUBENAME\$\$\$\$



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 \$\$\$SUBENAME\$\$\$

6/23/16



- (E) **RESIDUAL:** tan, gray, and orange, moist, stiff, plastic, silty CLAY (A-7-6) with trace rootlets
- (F) **SAPROLITE:** tan, and orange, moist, medium dense, silty SAND (A-2-4) with little coarse quartz and trace mica
- (K) **CRYSTALLINE ROCK:** granite

13+25.00
-RAB-

04-MAR-2022 14:13
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 \$\$\$SUBENAME\$\$\$

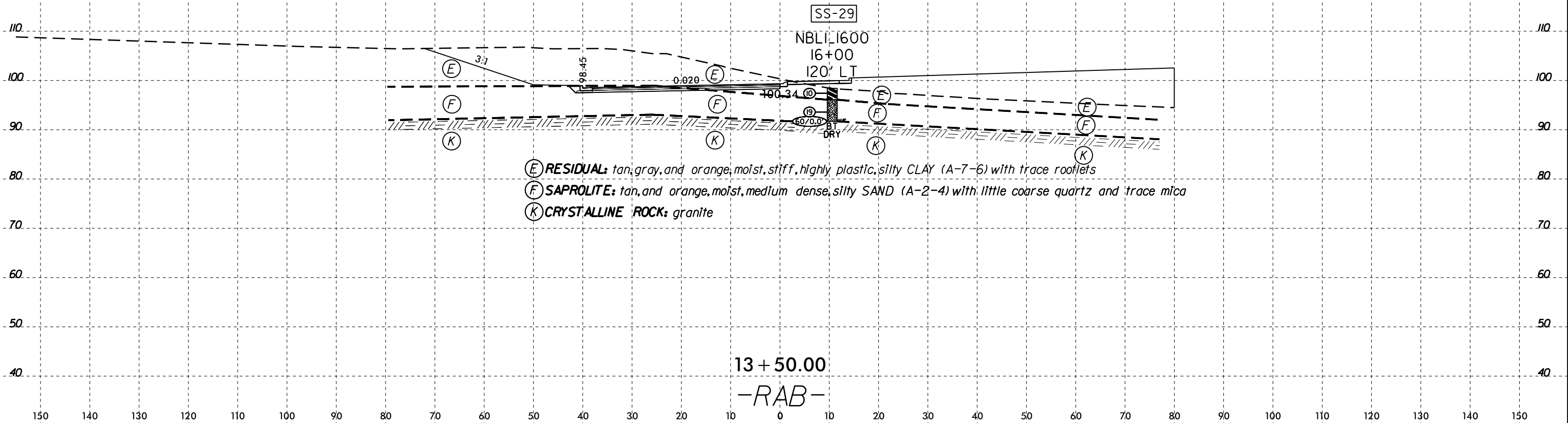
6/23/16

6/23/16



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

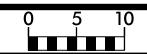
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-29	120' LT	16+00	0.0-1.5	A-7-6	58	34	16.9	7.9	22.1	53.1	100	88	77	27.6	N/A



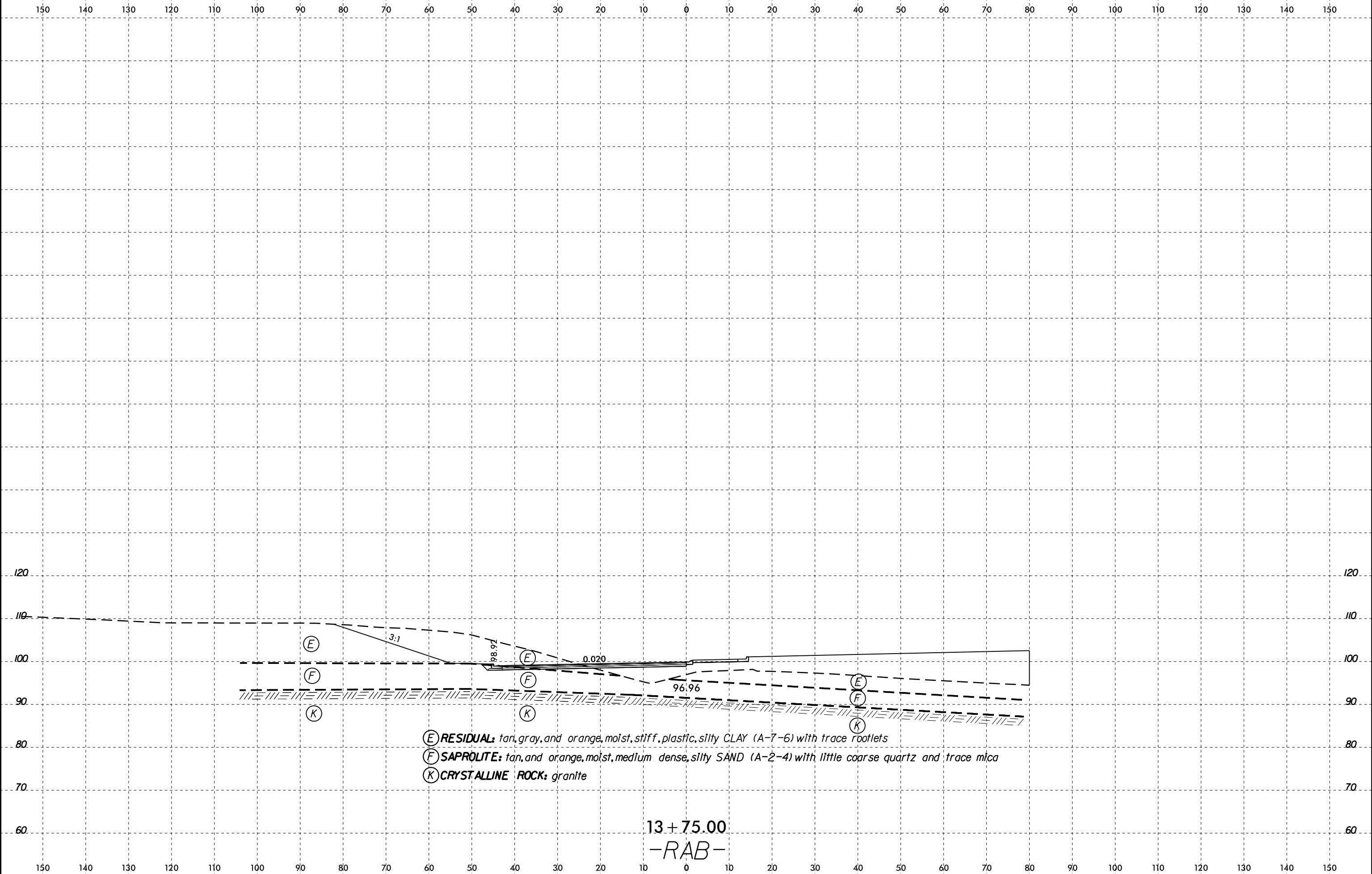
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150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

6/23/16



PROJ. REFERENCE NO.	SHEET NO.
U-5947	51



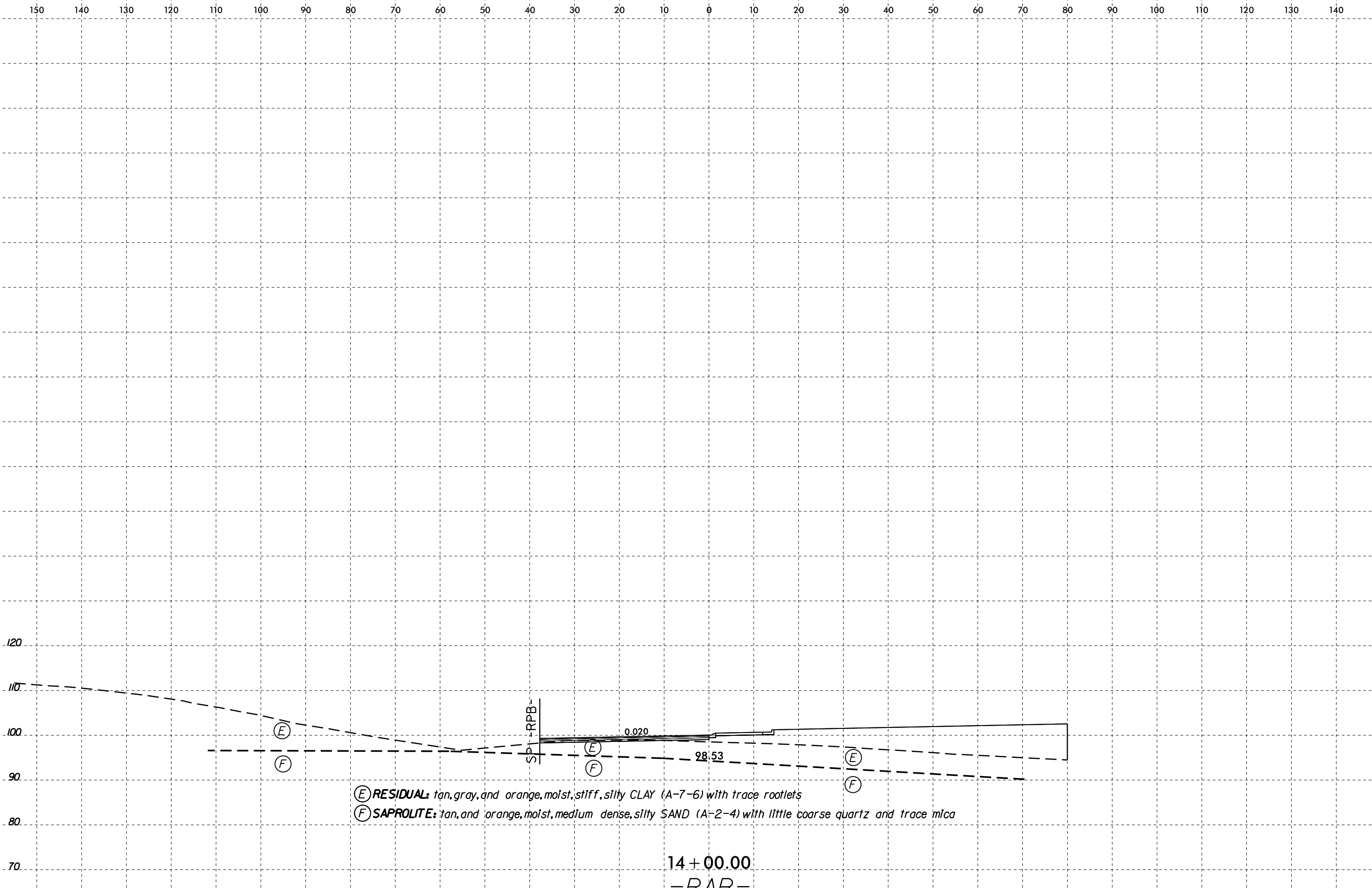
- (E) **RESIDUAL:** tan, gray, and orange, moist, stiff, plastic, silty CLAY (A-7-6) with trace rootlets
- (F) **SAPROLITE:** tan, and orange, moist, medium dense, silty SAND (A-2-4) with little coarse quartz and trace mica
- (K) **CRYSTALLINE ROCK:** granite

13+75.00
 -RAB-

04-MAR-2022 14:13
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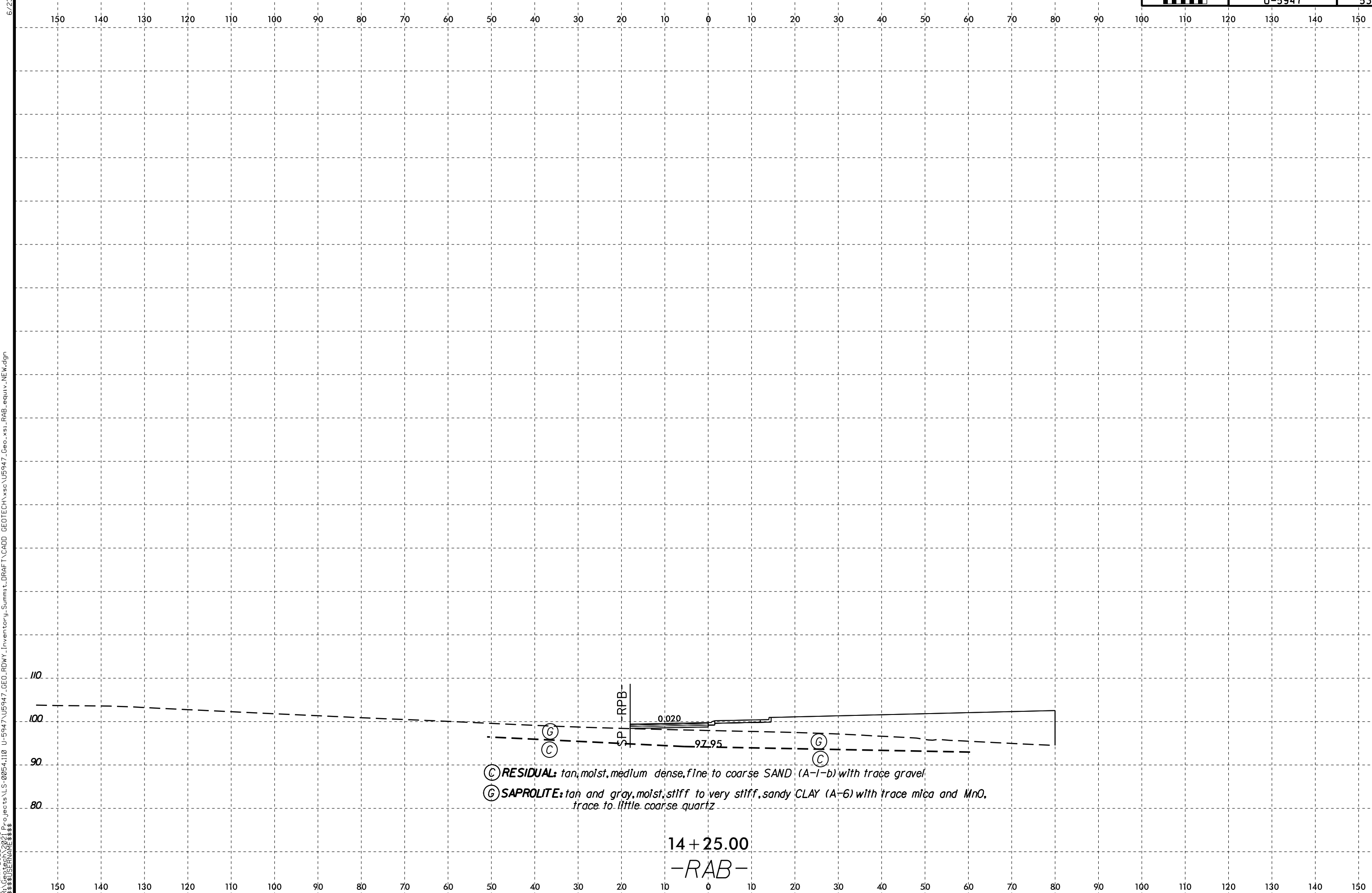
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\$\$\$\$SUBSERNAME\$\$\$\$

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-5947	52



(E) **RESIDUAL:** tan, gray, and orange, moist, stiff, silty CLAY (A-7-6) with trace rootlets
 (F) **SAPROLITE:** tan, and orange, moist, medium dense, silty SAND (A-2-4) with little coarse quartz and trace mica

14 + 00.00
 -RAB-



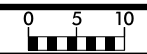
Ⓞ RESIDUAL: tan, moist, medium dense, fine to coarse SAND (A-1-b) with trace gravel

Ⓞ SAPROLITE: tan and gray, moist, stiff to very stiff, sandy CLAY (A-6) with trace mica and MnO, trace to little coarse quartz

04-MAR-2022 14:13
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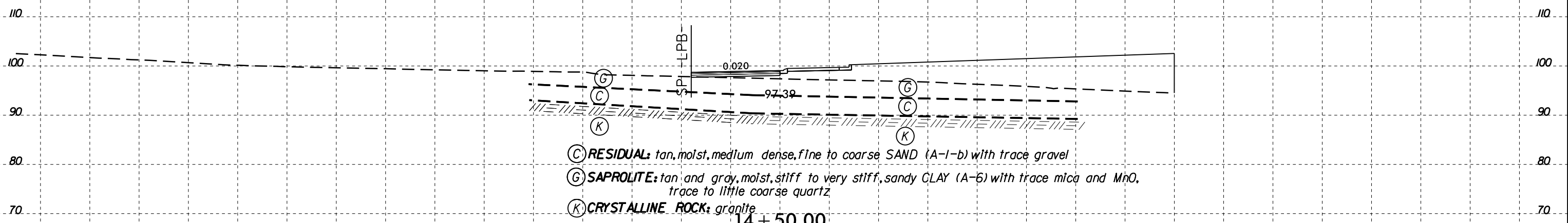
6/23/16

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PROJ. REFERENCE NO.	SHEET NO.
U-5947	54

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



- (C) RESIDUAL: tan, moist, medium dense, fine to coarse SAND (A-1-b) with trace gravel
- (G) SAPROLITE: tan and gray, moist, stiff to very stiff, sandy CLAY (A-6) with trace mica and MnO, trace to little coarse quartz
- (K) CRYSTALLINE ROCK: granite

14 + 50.00
-RAB-

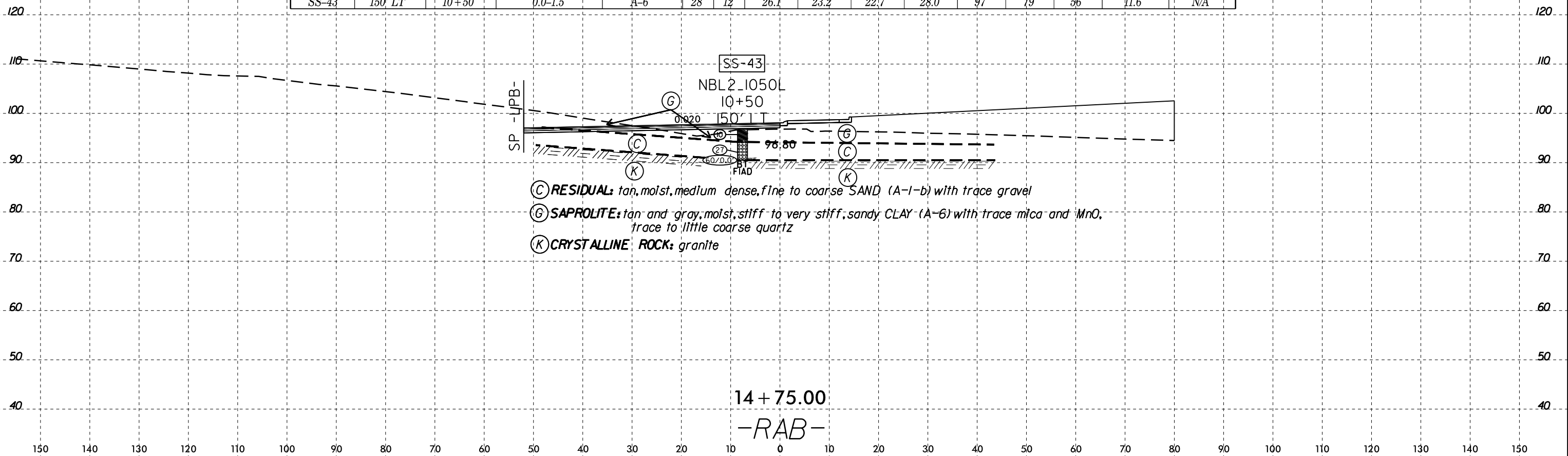
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\$\$\$\$SUBSERNAME\$\$\$\$

6/23/16

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

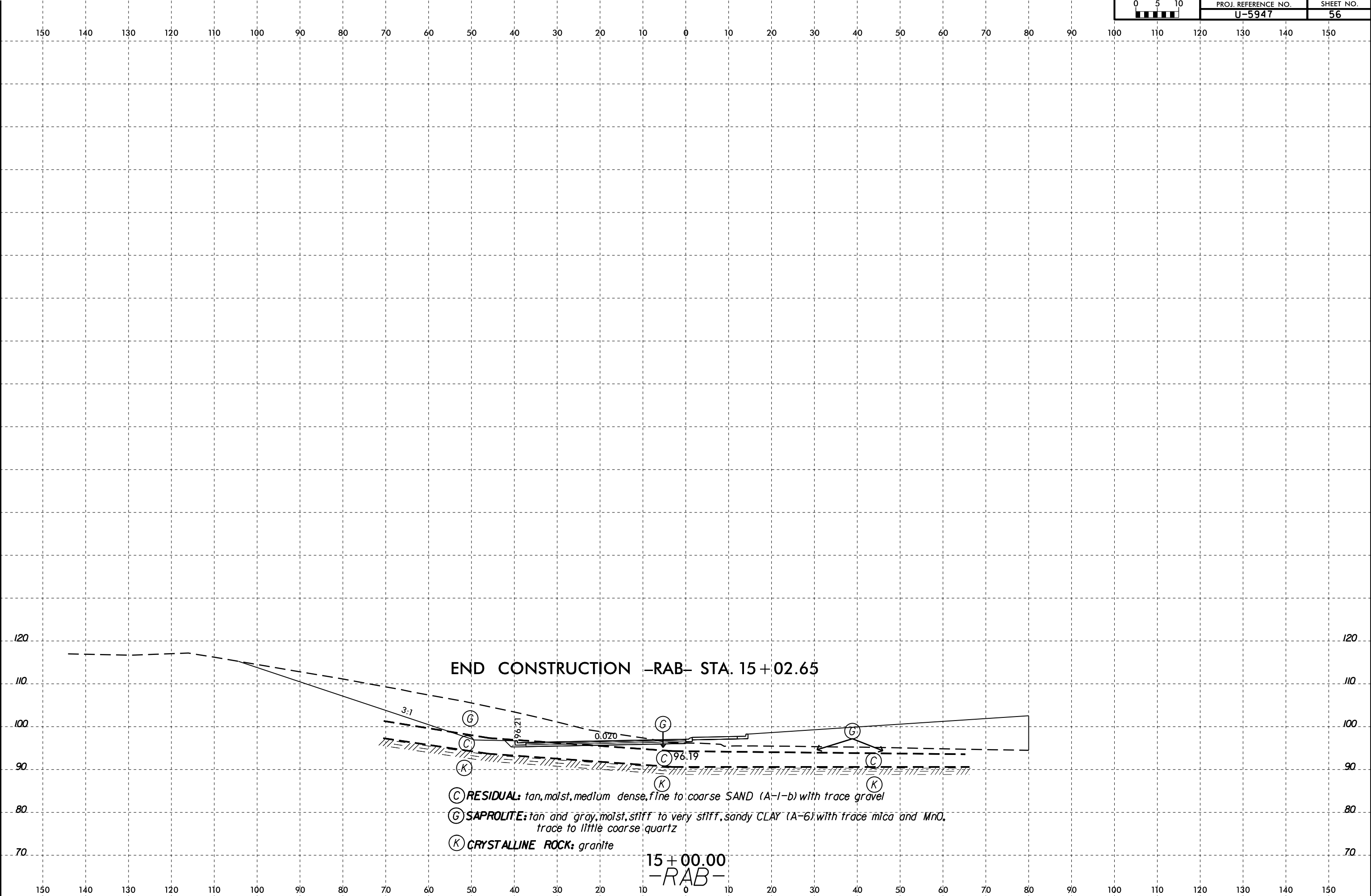
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-43	150' LT	10+50	0.0-1.5	A-6	28	12	26.1	23.2	22.7	28.0	97	79	56	11.6	NA

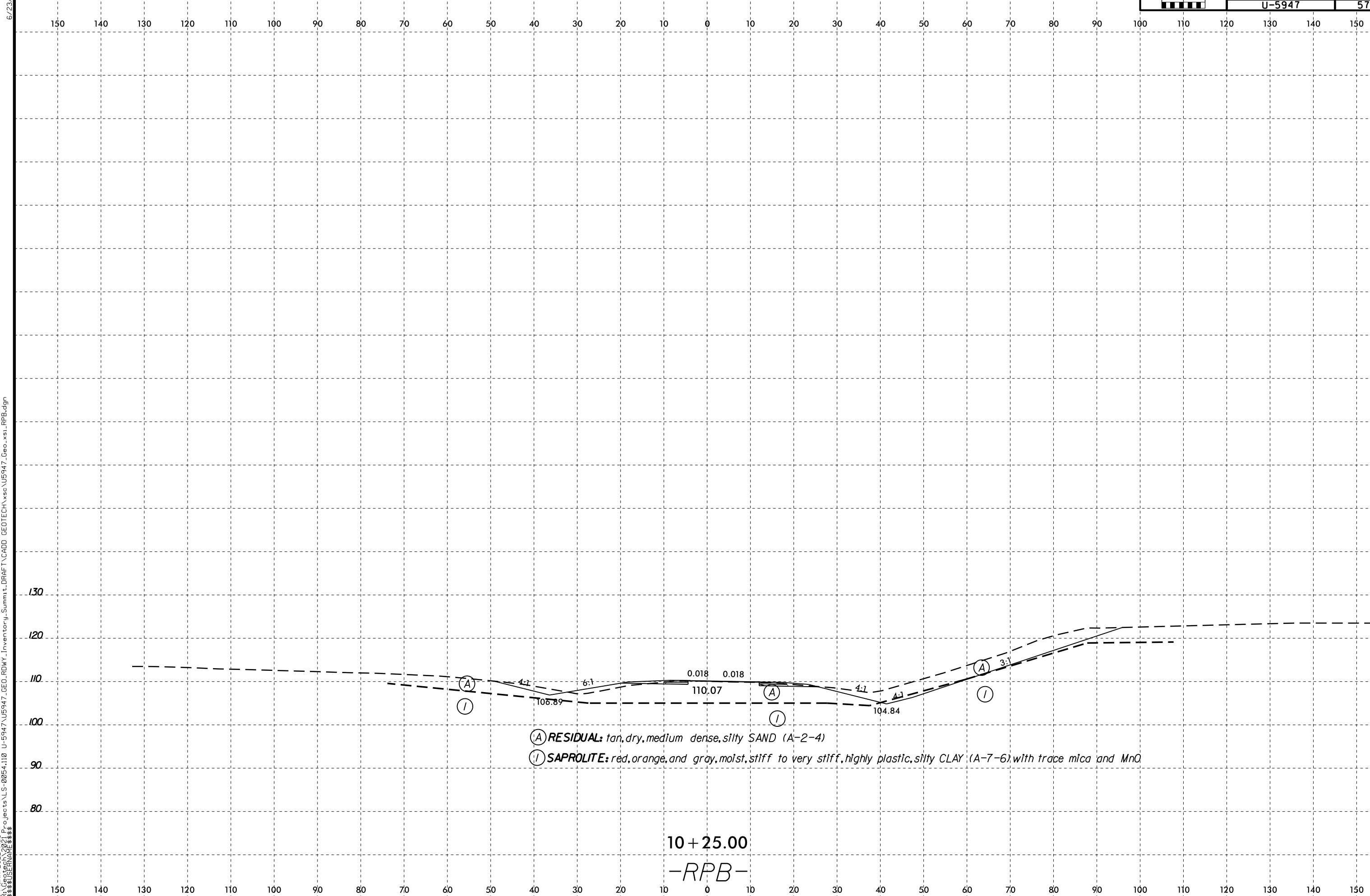


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6/23/16
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0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-5947	56





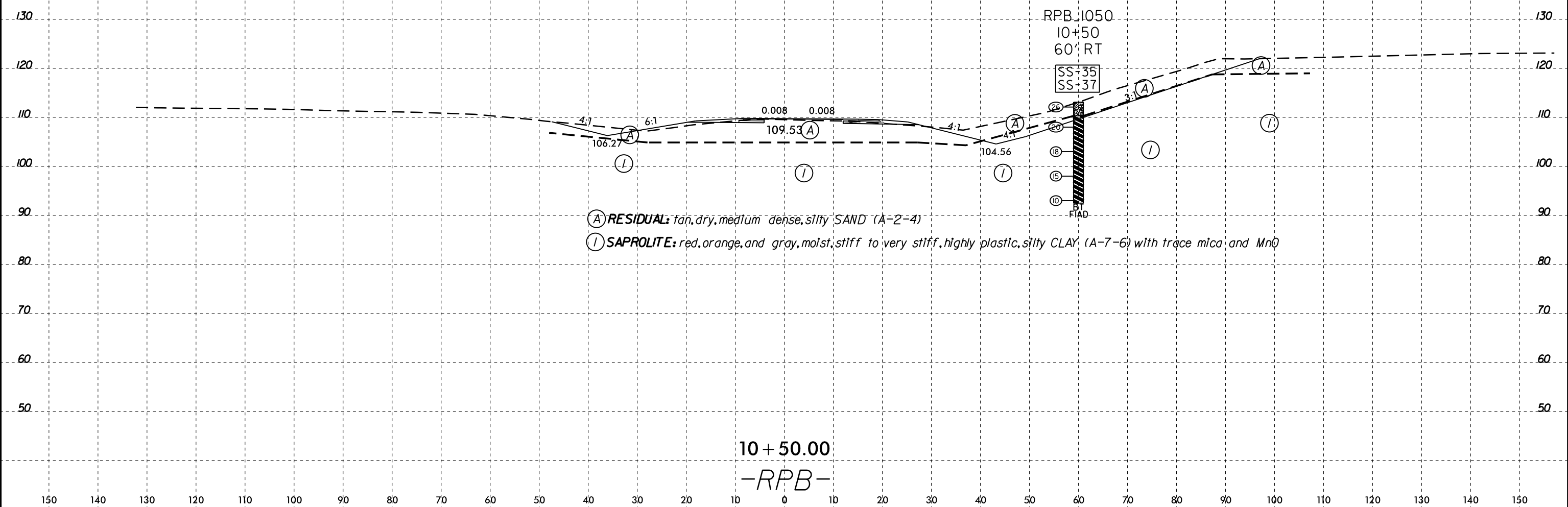
10 + 25.00

-RPB-

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\$\$\$\$SUBENAME\$\$\$\$

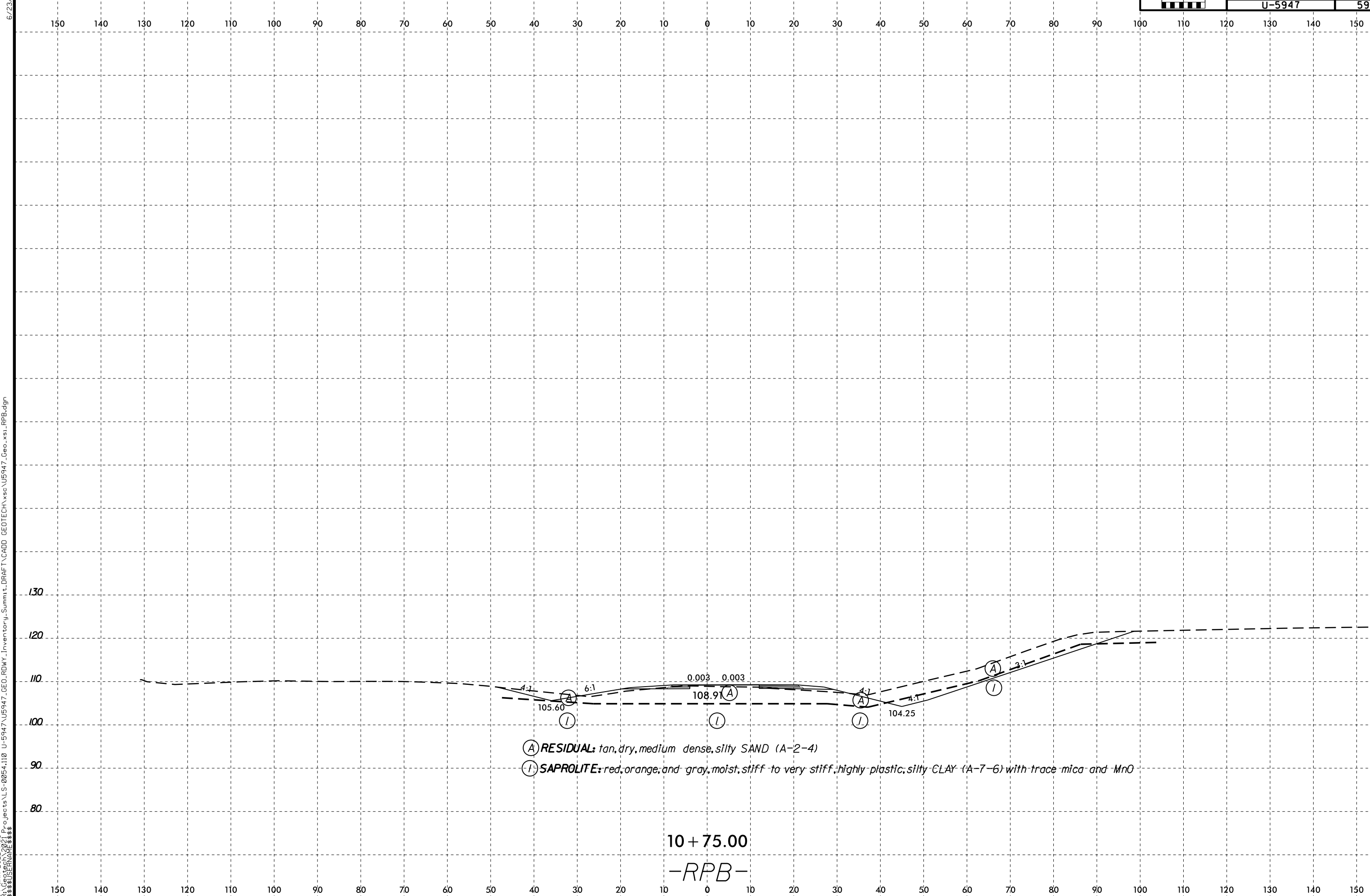
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL.	PI.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	- 10 -	- 40 -	- 200 -		
SS-35	60' RT	10+50	4.1-5.6	A-7-6	54	32	21.6	21.0	14.8	42.6	99	85	60	16.2	N/A
SS-37	60' RT	10+50	14.1-15.6	A-7-6	66	44	1.8	3.5	46.6	48.1	100	99	96	28.2	N/A



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6/23/16

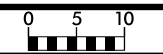


(A) **RESIDUAL:** tan, dry, medium dense, silty SAND (A-2-4)
 (I) **SAPROLITE:** red, orange, and gray, moist, stiff to very stiff, highly plastic, silty CLAY (A-7-6) with trace mica and MnO

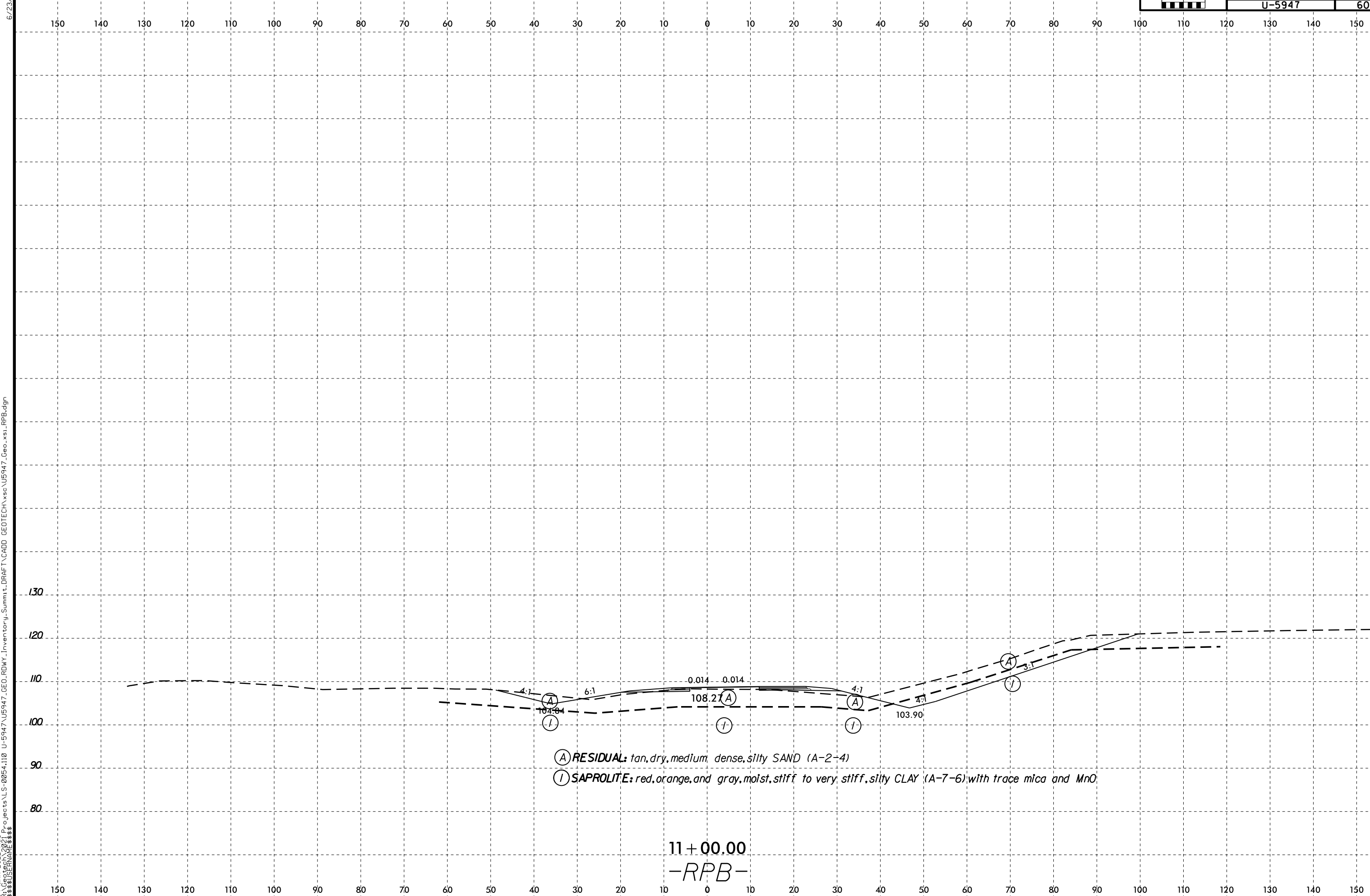
10 + 75.00
 -RPB-

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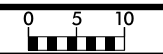
6/23/16



PROJ. REFERENCE NO.	SHEET NO.
U-5947	60



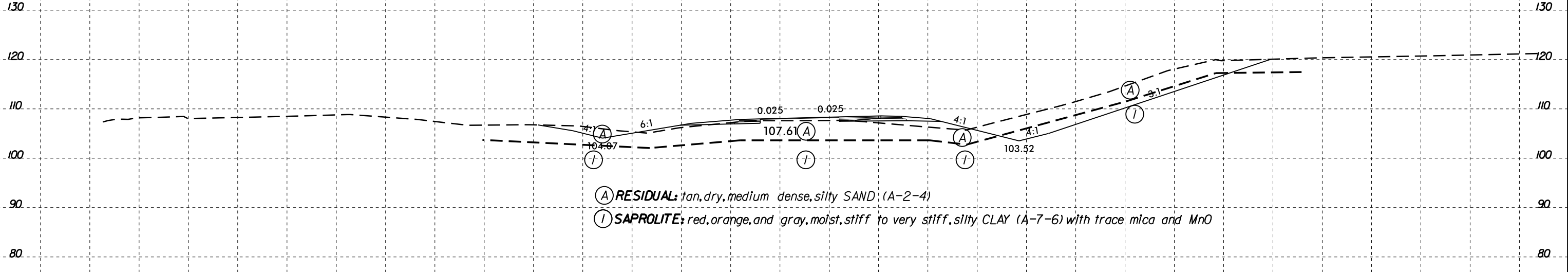
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\$\$\$\$SUBENAME\$\$\$\$



PROJ. REFERENCE NO.	SHEET NO.
U-5947	61

6/23/16

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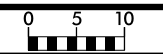


- (A) RESIDUAL: tan, dry, medium dense, silty SAND (A-2-4)
- (I) SAPROLITE: red, orange, and gray, moist, stiff to very stiff, silty, CLAY (A-7-6) with trace mica and MnO

11 + 25.00
 -RPB-

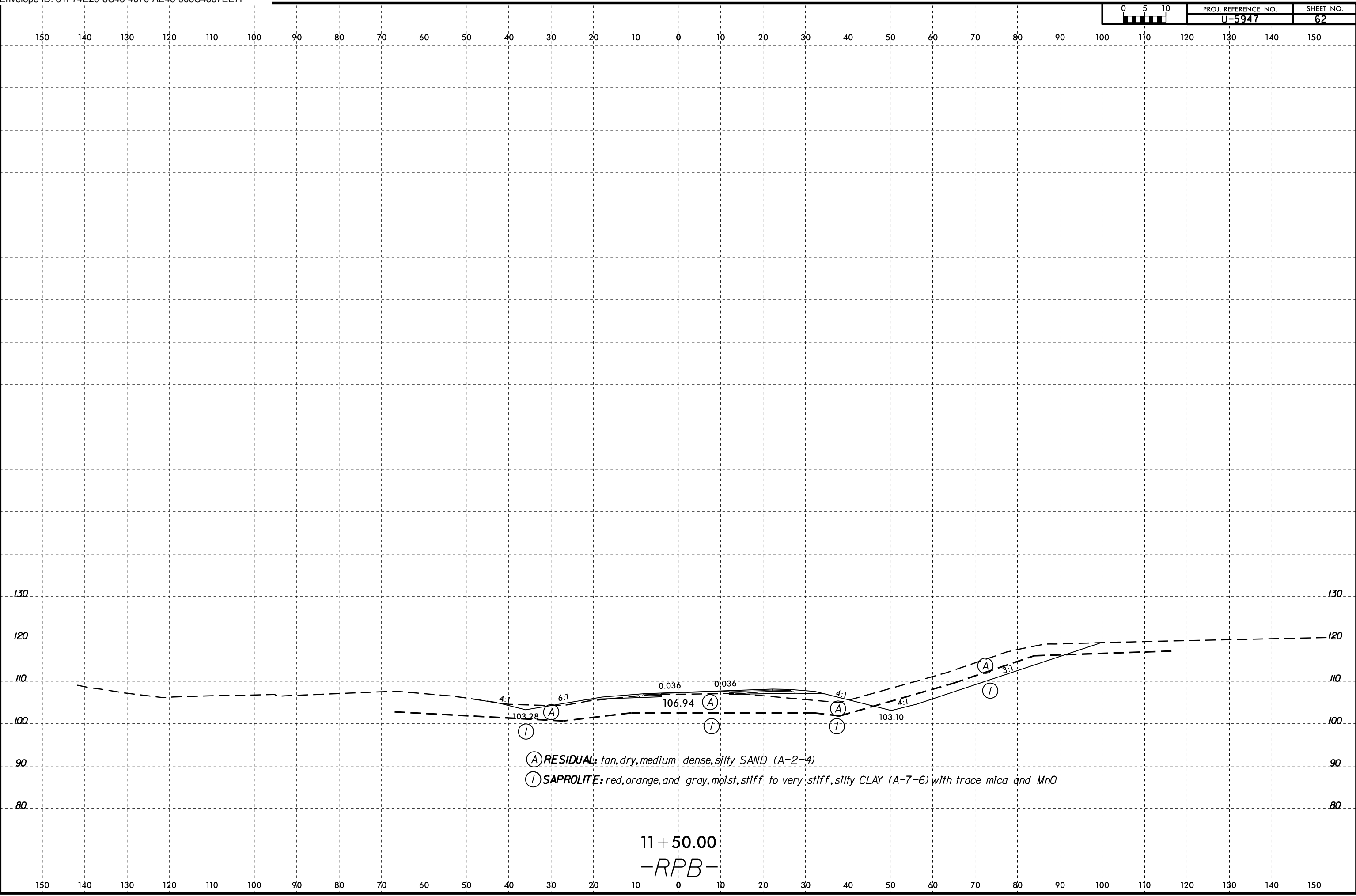
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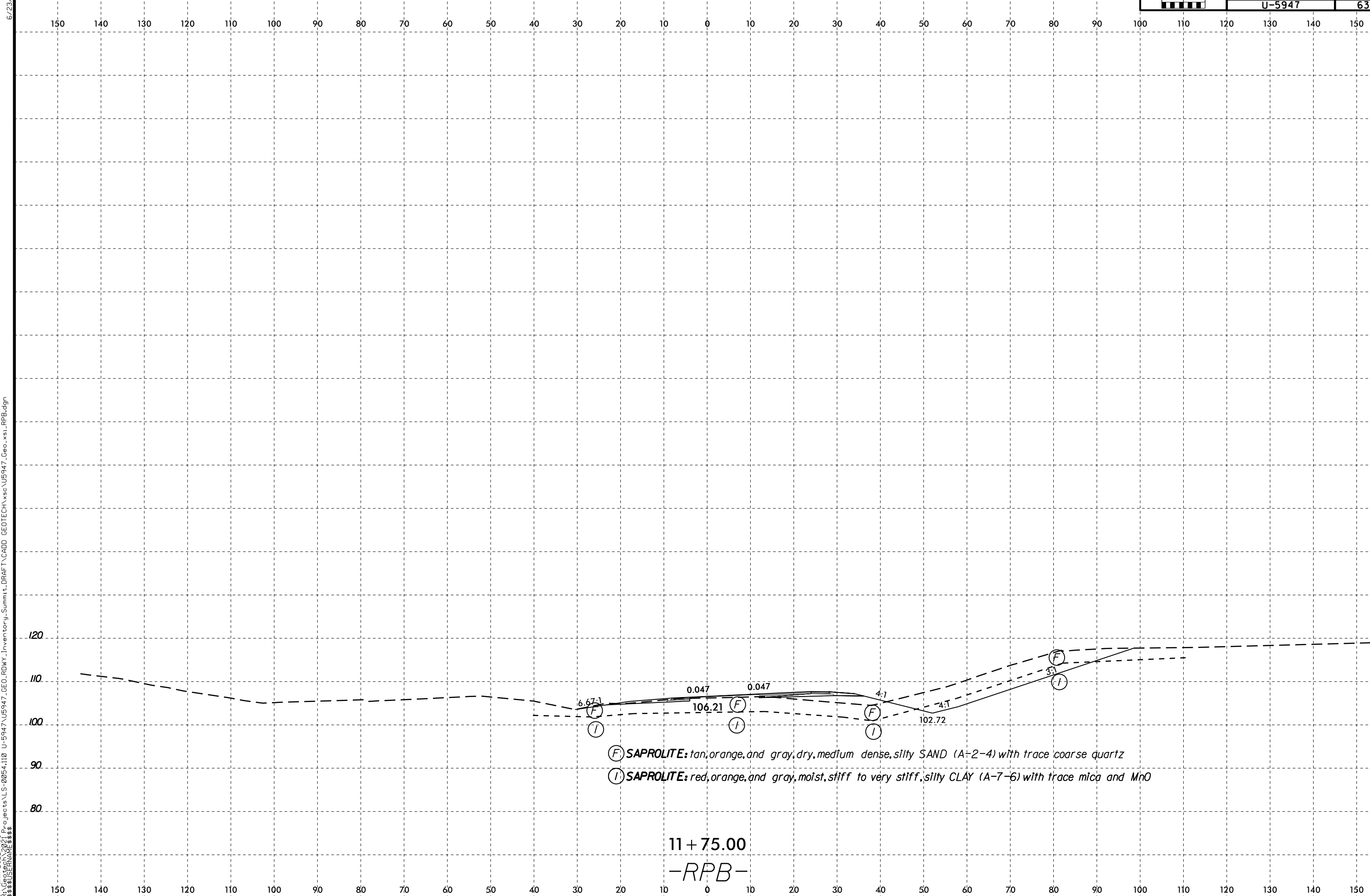
PROJ. REFERENCE NO.	SHEET NO.
U-5947	62

6/23/16
04-MAR-2022 14:13
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\$\$\$\$SUBENAME\$\$\$\$



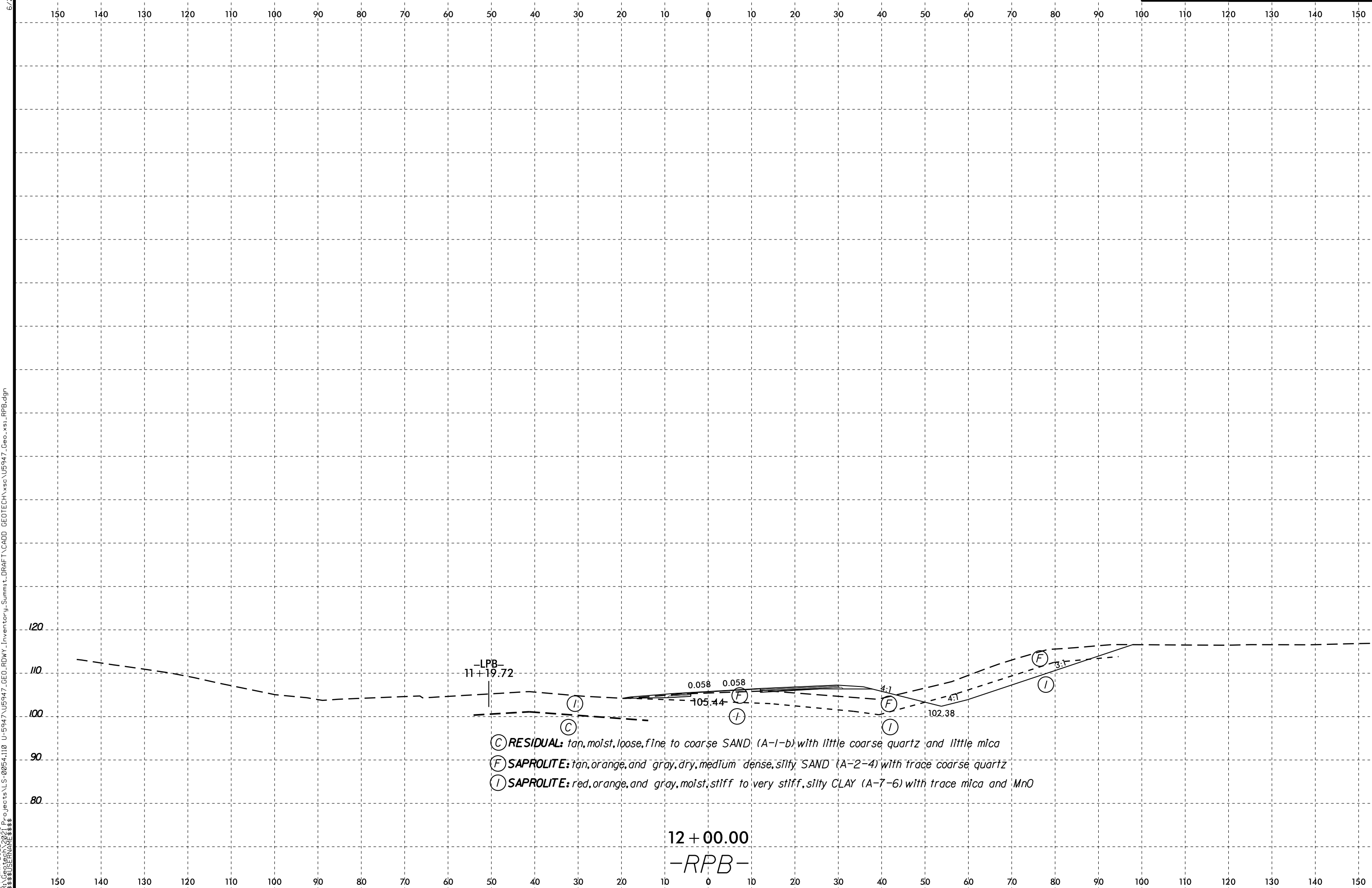
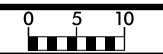
- (A) RESIDUAL: tan, dry, medium dense, silty SAND (A-2-4)
- (I) SAPROLITE: red, orange, and gray, moist, stiff to very stiff, silty CLAY (A-7-6) with trace mica and MnO

11+50.00
-RPB-



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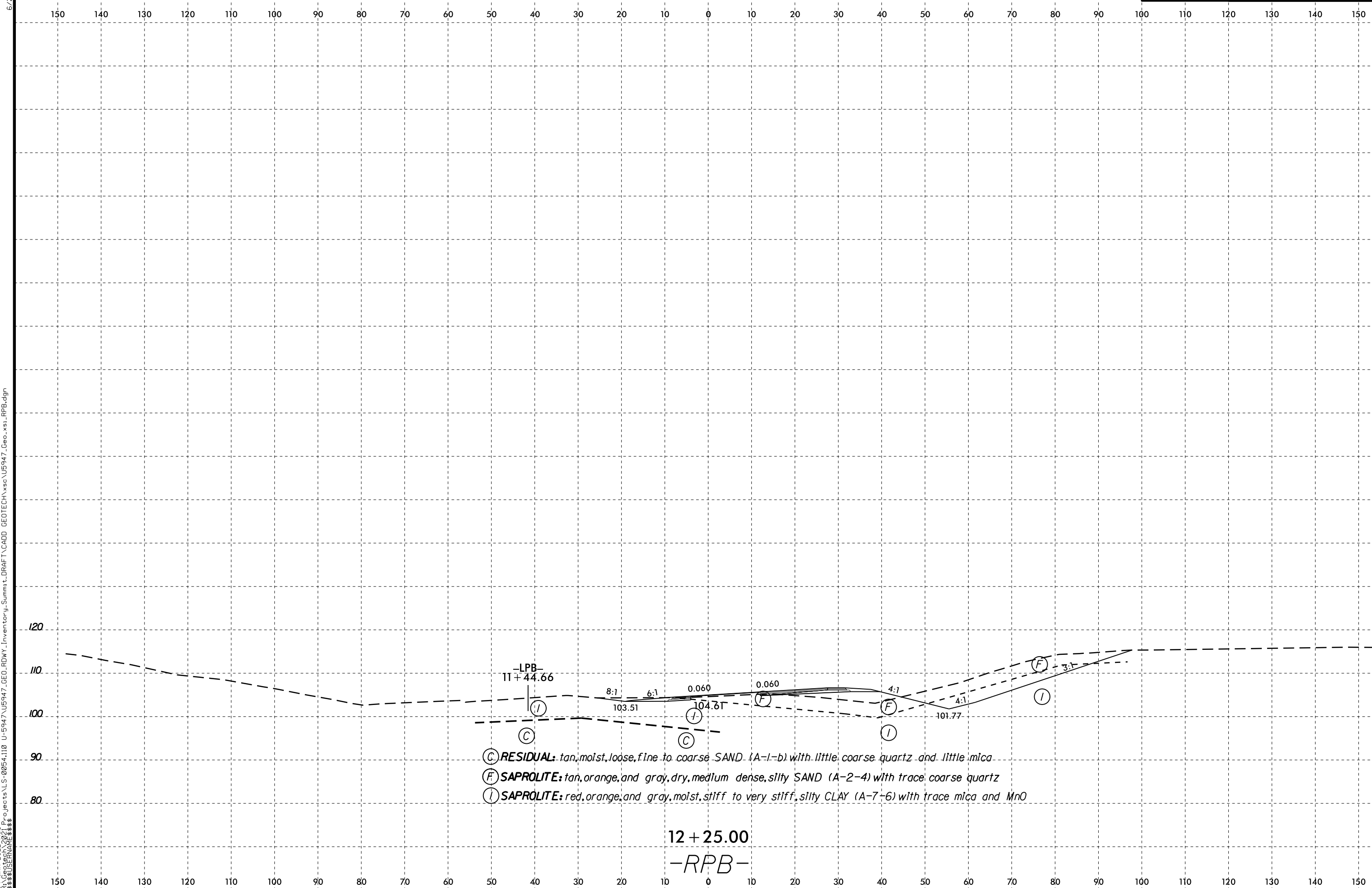
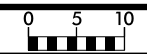


- (C) **RESIDUAL:** tan, moist, loose, fine to coarse SAND (A-1-b) with little coarse quartz and little mica
- (F) **SAPROLITE:** tan, orange, and gray, dry, medium dense, silty SAND (A-2-4) with trace coarse quartz
- (I) **SAPROLITE:** red, orange, and gray, moist, stiff to very stiff, silty CLAY (A-7-6) with trace mica and MnO

12 + 00.00
 -RPB-

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 \$\$\$SUBENAME\$\$\$

6/23/16



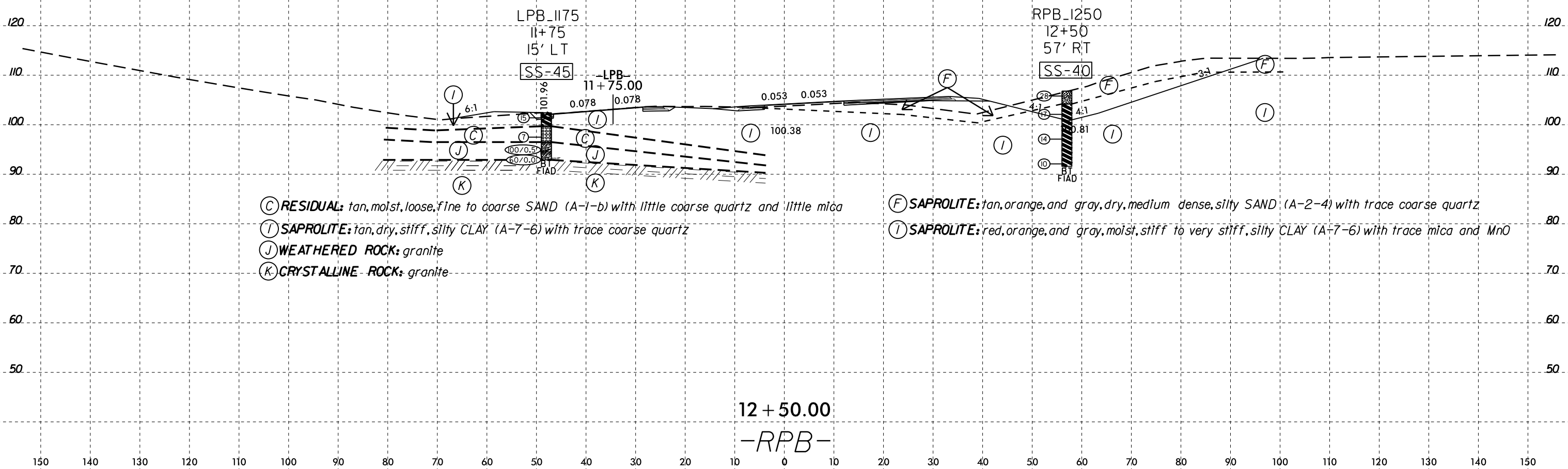
- (C) RESIDUAL: tan, moist, loose, fine to coarse SAND (A-1-b) with little coarse quartz and little mica
- (F) SAPROLITE: tan, orange, and gray, dry, medium dense, silty SAND (A-2-4) with trace coarse quartz
- (I) SAPROLITE: red, orange, and gray, moist, stiff to very stiff, silty CLAY (A-7-6) with trace mica and MnO

12 + 25.00
 -RPB-

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6/23/16

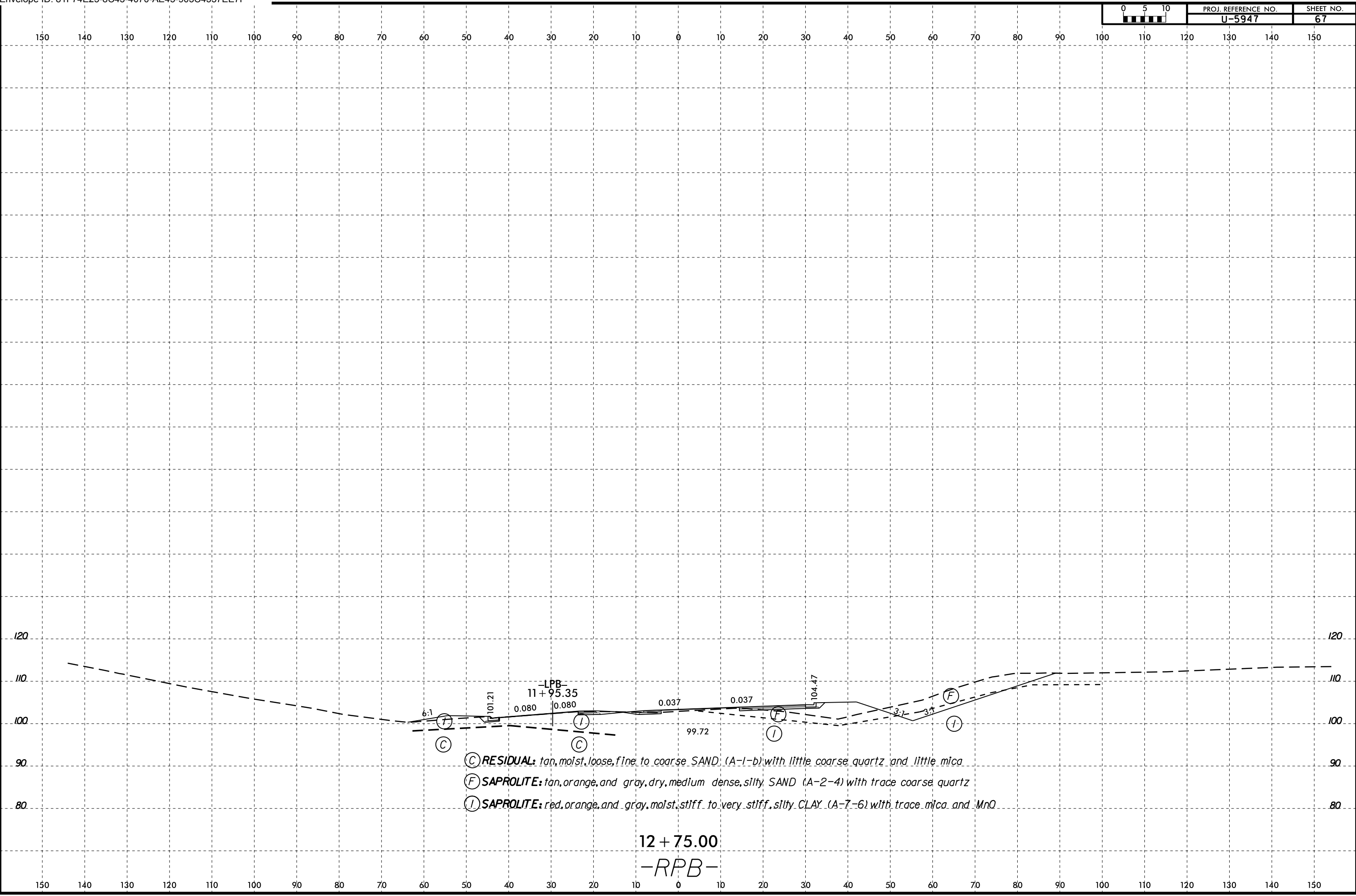
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-40	57' RT	12+50	3.7-5.2	A-7-6	68	42	12.5	5.1	20.9	61.5	100	91	83	27.2	NA
SS-45	15' LT	11+75	0.0-1.5	A-7-6	45	28	46.8	15.3	7.7	30.2	91	63	37	10.3	NA



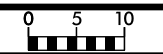
- (C) RESIDUAL: tan, moist, loose, fine to coarse SAND (A-1-b) with little coarse quartz and little mica
- (I) SAPROLITE: tan, dry, stiff, silty CLAY (A-7-6) with trace coarse quartz
- (J) WEATHERED ROCK: granite
- (K) CRYSTALLINE ROCK: granite
- (F) SAPROLITE: tan, orange, and gray, dry, medium dense, silty SAND (A-2-4) with trace coarse quartz
- (I) SAPROLITE: red, orange, and gray, moist, stiff to very stiff, silty CLAY (A-7-6) with trace mica and MnO

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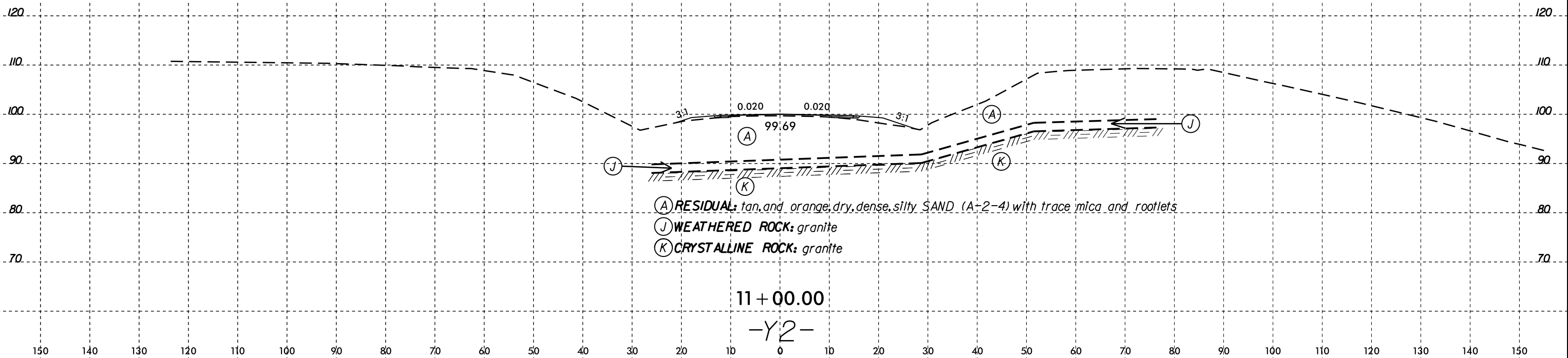


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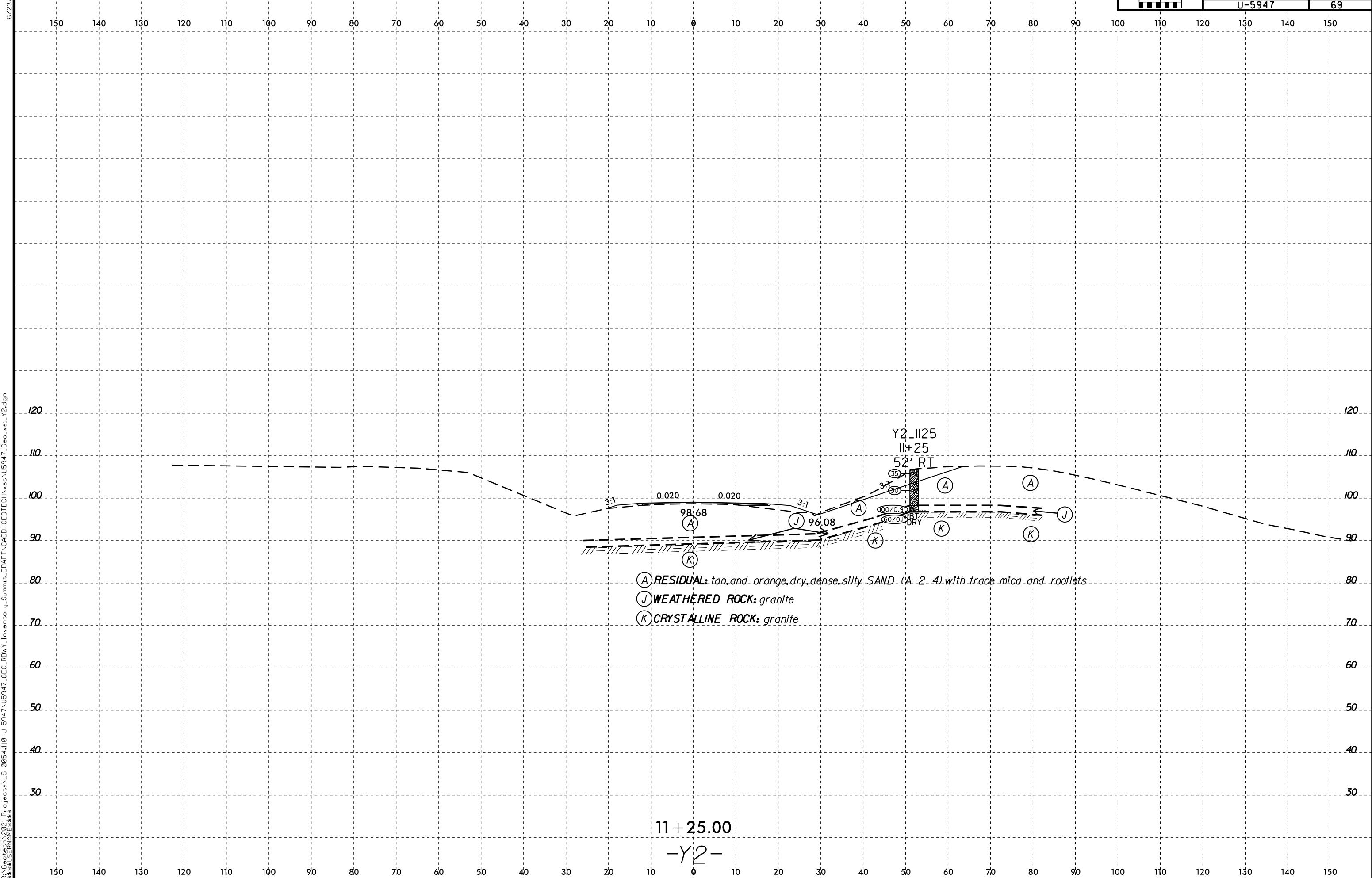


PROJ. REFERENCE NO.	SHEET NO.
U-5947	68

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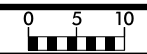


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\$\$\$\$SUBSERIAL\$\$\$\$



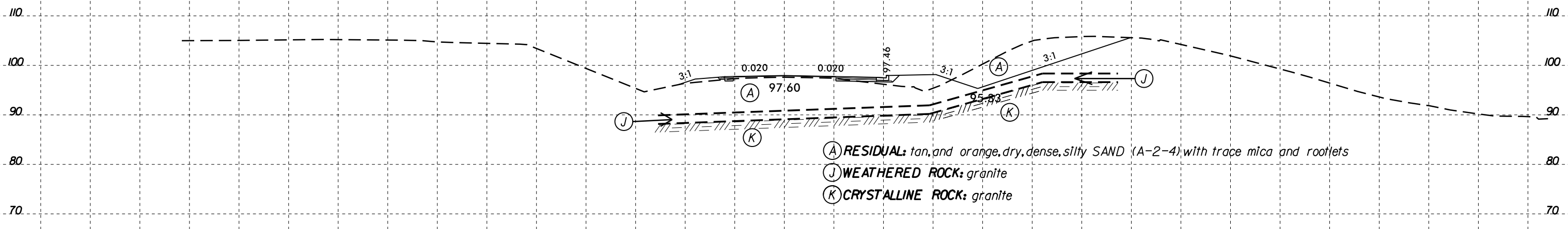
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\$\$\$\$SUBNAME\$\$\$\$

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PROJ. REFERENCE NO.	SHEET NO.
U-5947	70

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



- (A) RESIDUAL: tan, and orange, dry, dense, silty SAND (A-2-4) with trace mica and rootlets
- (J) WEATHERED ROCK: granite
- (K) CRYSTALLINE ROCK: granite

11 + 50.00
-Y2-

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

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