REFERENCE: R-2915E

PROJECT: 34518

SEE SHEET 3 FOR PLAN SHEET LAYOUT AT TIME OF INVESTIGATION

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

ROADWAY SUBSURFACE INVESTIGATION

COUNTY *ASHE*

PROJECT DESCRIPTION *US 221 FROM US 221 BYPASS TO US 221 BUSINESS/NC 88 IN JEFFERSON*

INVENTORY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2915E	1	109

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.

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SIGNATURE DATE

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PROJECT REFERENCE NO.	SHEET NO.
R-2915E	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	50 MX													
#40	30 MX	50 MX	51 MN											
#200	15 MX	25 MX	10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
MATERIAL PASSING #40														
LL	—		—	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
PI	6 MX		NP	10 MX	10 MX	11 MN	11 MN	10 MX	10 MX	11 MN	11 MN			
GROUP INDEX	0		0	0		4 MX		8 MX	12 MX	16 MX	NO MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND		FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS				
GEN. RATING AS 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	< 4	
	LOOSE	4 TO 10	
	MEDIUM DENSE	10 TO 30	
	DENSE	30 TO 50	
	VERY DENSE	> 50	N/A
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT	< 2	< 0.25
	SOFT	2 TO 4	0.25 TO 0.5
	MEDIUM STIFF	4 TO 8	0.5 TO 1.0
	STIFF	8 TO 15	1 TO 2
	VERY STIFF	15 TO 30	2 TO 4
	HARD	> 30	> 4

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE	4	10	40	60	200	270
OPENING (MM)	4.76	2.00	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	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
SL — SHRINKAGE LIMIT		
	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
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, SPT 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:
- [ ] CME-45C
- [ ] CME-55
- [ ] CME-550
- [ ] VANE SHEAR TEST
- [ ] PORTABLE HOIST
- [X] Mobile B-57 ATV
- [ ] _____

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

HAMMER TYPE:
- [X] AUTOMATIC [ ] MANUAL

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

HAND TOOLS:
- [ ] POST HOLE DIGGER
- [ ] HAND AUGER
- [X] 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:

BOREHOLE ELEVATIONS DETERMINED FROM PROVIDED .TIN FILE AND GPS

ABBREVIATIONS:

F.I.A.D. - FILLED IMMEDIATELY AFTER DRILLING

T T T T: APPROXIMATE BOUNDARY OF ALLUVIAL SOILS

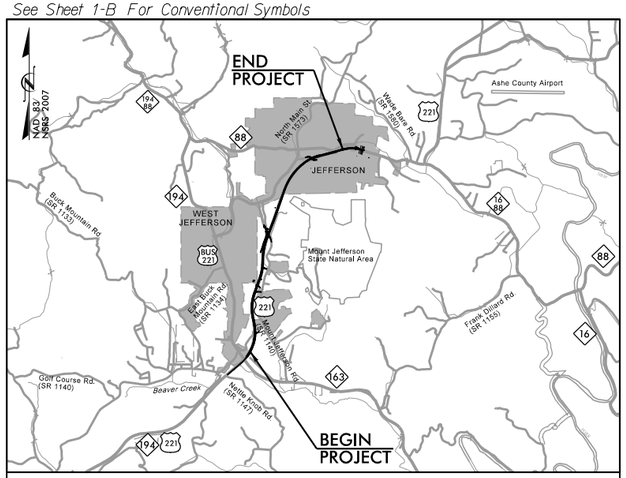
DATE: 8-15-14

09/08/2018

TIP PROJECT: R-2915E

CONTRACT:

See Sheet 1-B For Conventional Symbols



VICINITY MAP (NTS)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ASHE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2915E	3	

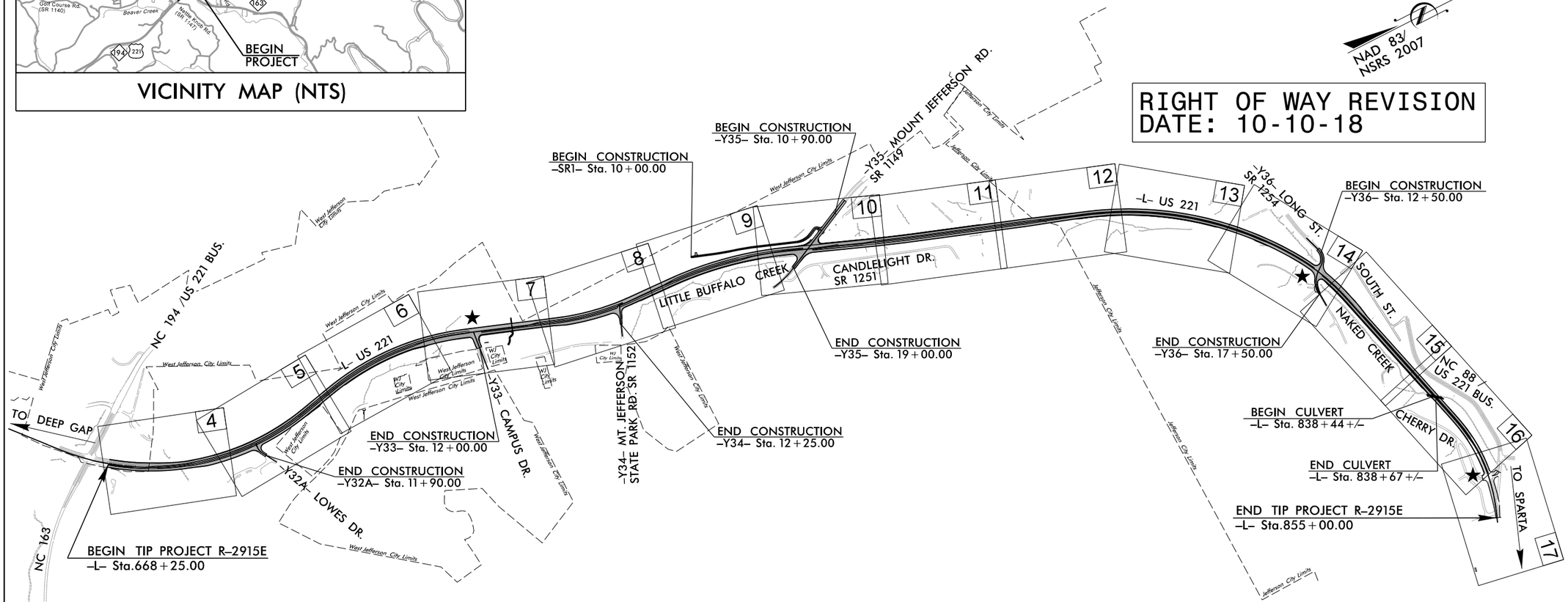
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34518.1.FR6	STP-0221(45)	PE
34518.2.6		R/W
34518.2.7		UTIL.

LOCATION: US 221 FROM US 221 BYPASS TO US 221 BUSINESS/NC 88 IN JEFFERSON

TYPE OF WORK: GRADING, DRAINAGE, PAVING, WIDENING, RESURFACING, CULVERTS, AND SIGNALS

NAD 83/ NSRS 2007

RIGHT OF WAY REVISION
DATE: 10-10-18



CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.
THIS IS A PARTIAL CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON PLANS.
A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF WEST JEFFERSON AND JEFFERSON.

★ PROPOSED TRAFFIC SIGNAL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

PLANS: 50 25 0 50 100

PROFILE (HORIZONTAL): 50 25 0 50 100

PROFILE (VERTICAL): 10 5 0 10 20

DESIGN DATA

ADT 2019 = 15,900
ADT 2039 = 19,400
K = 8%
D = 55%
T = 6%*
V = 60 MPH
FUNC. CLASSIFICATION = RURAL ARTERIAL
* TTST=3% + DUALS=3%

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2915E..... 3.533 mi
LENGTH CULVERT TIP PROJECT R-2915E..... 0.004 mi
TOTAL LENGTH TIP PROJECT R-2915E..... 3.537 mi

NCDOT CONTACT

Joe Laws, P.E.
PROJECT ENGINEER – DIVISION 11

PLANS PREPARED BY:

RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE, SUITE 350
RALEIGH, NORTH CAROLINA 27609
NC LICENSE NO. F-0112

FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MAY 8, 2018

LETTING DATE: SEPTEMBER 17, 2019

Scott D. Blevins, P.E.
PROJECT ENGINEER RK&K, LLP

Cathy S. Houser P.E.
PROJECT DESIGN ENGINEER RK&K, LLP

HYDRAULICS ENGINEER

P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

P.E.
SIGNATURE:

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

11/28/2018
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dbozorgi

December 17, 2018

WBS Number: 34518
TIP Number: R-2915E
County: Ashe
Description: US 221 from US 221 Bypass to US 221 Business/ NC 88 in Jefferson

Subject: Roadway Subsurface Inventory Report

PROJECT DESCRIPTION

The proposed project consists of roadway improvements to US 221 from NC 194/US 221 Bypass to NC 88/US 221 Business/E Main Street in Jefferson, NC. The improvements include grading, drainage, paving, widening, and resurfacing.

The geotechnical investigation was performed during July and August of 2018. During this time, a total of 106 borings including 81 Standard Penetration Tests (SPT) borings, 24 auger probe borings, and 1 rod sounding were completed. The borings were advanced with an ATV mounted Mobile B-57 drill rig equipped with an automatic hammer. Representative soil samples were collected from split spoon and soil cuttings for field visual classification and laboratory analysis and classification. Bulk samples were collected from select proposed excavation areas for laboratory testing.

The following alignments were investigated. Selected cross sections of these alignments are included in this report.

Line	Stations (±)
-L-	668+25 – 855+00
-SR1-	10+00 – 26+04

PHYSIOGRAPHY AND GEOLOGY

The proposed project is located within the Blue Ridge Physiographic Province. The terrain within the project corridor consists of rolling hills and mountainsides that have been cut and graded, and valleys that have been filled during construction if the existing roadway. Outside the project corridor, the landscape is dominated by forested hills and mountains.

The proposed project is underlain by Late Proterozoic biotite gneiss and amphibolite. The occurrence of these rock types is indicated by the weathered and crystalline rock samples recovered during the geotechnical investigation, as well as the composition of the local residual soils.

Amphibolite is a highly competent, mid- to high-grade metamorphic rock. Some occurrences of amphibolite are foliated, but the foliation is not typically as pronounced as the foliation observed in biotite gneiss. Crystalline amphibolite was encountered during the geotechnical investigation. In all cases, the amphibolite was found at depths greater than 24 feet.

Biotite gneiss is a foliated metamorphic rock, composed primarily of biotite mica. Evidence of this rock is observed in the mica content of the local residual soils and in mineral grains in weathered rock fragments. The high mica content of the soils indicates that there is a highly micaceous rock that is weathering to generate these soils. The observations of mineral grains in weathered rock confirm that the mica-bearing rock underlying the proposed project is a biotite gneiss.

SOIL PROPERTIES

Soils encountered during the geotechnical investigation are split into four categories based on their origin. The origins consist of roadway embankment, artificial fill, alluvial soils, and residual.

Roadway Embankment: Materials interpreted as roadway embankment were encountered within the limits of the existing US 221 alignment. The roadway embankment generally consisted of very loose to medium dense silty gravely SAND (A-1-b, A-2-4, A-2-5) and very soft to stiff sandy SILT and sandy silty CLAY (A-4, A-5, A-6, A-7-5, A-7-6).

Artificial Fill: Artificial fill was found in the proposed project area where land had been graded for construction of businesses. The fill consists of very loose to loose silty SAND (A-2-5) and soft sandy SILT (A-4).

Alluvial Soils: Alluvial soils were typically associated with drainage features or areas where creeks previously crossed the proposed alignment. Alluvial soils generally consisted of very loose silty SAND (A-2-4, A-2-5), very soft to medium stiff fine sandy clayey SILT and silty CLAY (A-4, A-7-5).

Residual Soils: Residual soils generally consisted of loose to very dense silty and clayey SAND (A-2-4, A-2-6) as well as medium stiff to hard SILT and CLAY (A-4, A-6, A-7-5, A-7-6). Varying amounts of mica and rock fragments were noted within soils interpreted as residual soils.

ROCK PROPERTIES

Weathered Rock: Weathered rock was encountered in twenty-one (21) borings at elevations ranging from 3,135.6 to 2,940.5.

Crystalline Rock: Crystalline rock is defined as auger refusal or SPT refusal with penetration by split spoon of less than or equal to 0.1 feet per 60 blows. Crystalline rock was encountered in six (6) borings at elevations ranging from 3,119.1 to 3,091.9. Parent bedrock encountered at the project site is Amphibolite.

GROUNDWATER

Groundwater was encountered during drilling operations (0-hr reading) at elevations ranging from 2861.1 to 3137.5. Stabilized groundwater table (24-hr reading) measurements were recorded at elevations ranging from 2863.0 to 3137.5.

Springs: Springs were observed in proposed fill sections at the following locations:

Line	Stations (±)	Offset (+/-)
-L-	702+90	43’ LT
-L-	705+29	48’ LT
-L-	811+99	110’ LT

AREAS OF SPECIAL GEOTECHNICAL INTEREST

Alluvial Soils: The following areas contain alluvial soils:

Line	Stations (±)	Offset
-L-	710+85 - 712+80	LT & RT
-L-	810+40 - 813+55	LT & RT

Highly Plastic Soils: The following areas contain highly plastic soils with plasticity indices (PI) greater than 25 within proposed cut sections or greater than 35 within 3-ft of subgrade:

Line	Stations (±)	Offset
-L-	823+50 – 824+50	LT & RT
-L-	830+50 – 831+50	LT & RT
-L-	834+50 – 835+50	LT & RT
-L-	847+00 – 849+50	LT & RT

Weathered Rock: The following areas contain weathered rock above or within six (6) feet of proposed grade:

Line	Stations (±)	Offset
-L-	682+50 – 684+50	RT
-L-	727+00 – 729+00	LT
-L-	731+00 – 735+00	LT
-L-	741+00 – 742+50	LT
-L-	751+00 – 753+25	LT
-L-	759+00 – 761+00	RT
-L-	773+00 – 775+00	RT

Groundwater: The following areas contain groundwater within proposed cut sections:

Line	Stations (±)	Offset
-L-	735+00 – 737+00	LT
-L-	742+50 – 744+00	LT
-L-	746+50 – 748+50	LT

The following areas contain groundwater within six (6) feet of the proposed grade:

Line	Stations (±)	Offset
-L-	671+50 – 673+50	LT
-L-	742+50 – 744+25	LT & RT
-L-	746+50 – 746+50	LT & RT
-L-	777+00 – 783+00	LT & RT
-L-	828+50 – 829+50	LT & RT
-L-	832+50 – 834+50	LT & RT
-L-	835+50 – 836+50	LT & RT
-L-	839+50 – 843+00	LT & RT
-L-	847+00 – 849+50	LT & RT

The following areas contain groundwater within three (3) feet of the existing grade:

Line	Stations (±)	Offset
-L-	671+50 – 673+50	LT
-L-	742+50 – 744+25	LT & RT
-L-	746+50 – 746+50	LT & RT
-L-	777+00 – 783+00	LT & RT
-L-	828+50 – 829+50	LT & RT
-L-	832+50 – 834+50	LT & RT
-L-	835+50 – 836+50	LT & RT
-L-	841+00 – 843+00	LT & RT

Prepared by,

DocuSigned by:
Matthew Snyder
9822EB64E80842E...

Matthew R. Snyder, P.E.
Project Engineer, Geotechnical
Registered, North Carolina 044566

DocuSigned by:
Arash Bozorgi
1D9ECF51F010436...

Arash Bozorgi, Ph.D., E.I.T.
Geotechnical Professional

Appendix A

Bulk Samples

The following bulk samples were collected from cut sections for laboratory testing:

Sample No.	Line	Station	Offset	Depth (ft)	Test(s) Performed
CBR-1	-L-	683+50	80’ RT	1.0-10.0	Standard Proctor, California Bearing Ratio
CBR-2	-L-	728+00	90’ LT	5.0-15.0	Standard Proctor, California Bearing Ratio
CBR-3	-L-	745+40	114’ LT	1.0-15.0	Standard Proctor, California Bearing Ratio

PROJECT REFERENCE NO.	SHEET NO.
R-2915E	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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NAD 83/NSRS 2007

R-2915D TO BE CONST. BY OTHERS

BEGIN TIP PROJECT R-2915E
-L- POT Sta. 668+25.00

END TIP PROJECT R-2915D
-L- POT Sta. 679+90.00

MATCHLINE -L- STA. 682+00 SEE SHEET 5

NC GRID NAD 83/CORS

AMELIA PROPERTIES, LLC
DB 394 PG 14

ILIT REAL ESTATE HOLDINGS, LLC
DB 292 PG 109

WILEY AUSTIN BAKER
DB 174 PG 2360

WEST JEFFERSON II, LLC
DB 429 PG 113

FIRST COMMUNITY BANK
DB 440 PG 110

BRADLEY W. JORDAN
DB 403 PG 2289

KENNETH TIMOTHY PARSONS
HUSBAND AND WIFE
BETTY WADDELL PARSONS
DB 232 PG 1915
DB 427 PG 2452

WILEY AUSTIN BAKER
AND KAY M. BAKER
DB 26 PG 1510

LOWE'S HOME CENTERS, INC.
DB 358 PG 403

LARRY D. BOOTH
DB 354 PG 733

K. DICKSON
PG 1744

-L-
PI Sta 679+01.03
Δ = 57° 00' 37.6" (LT)
D = 2° 00' 37.4"
L = 2,835.81'
T = 1,547.76'
R = 2,850.00'
SE = 0.05

PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

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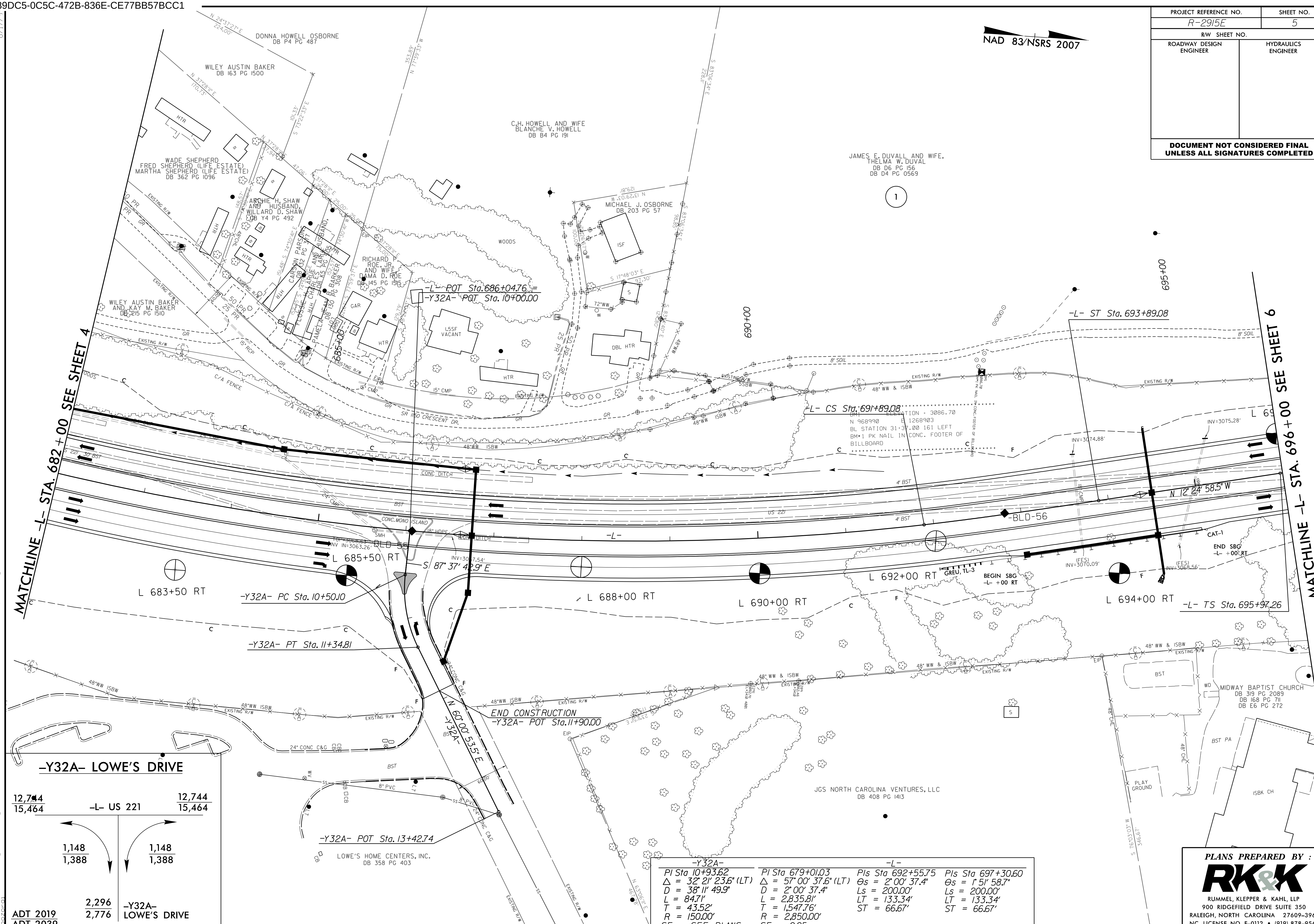
PROJECT REFERENCE NO.	SHEET NO.
R-2915E	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



-Y32A-	-L-		
PI Sta 10+93.62	PI Sta 679+01.03	PIs Sta 692+55.75	PIs Sta 697+30.60
Δ = 32° 21' 23.6" (LT)	Δ = 57° 00' 37.6" (LT)	Θs = 2° 00' 37.4"	Θs = 1° 51' 58.7"
D = 38° 11' 49.9"	D = 2° 00' 37.4"	Ls = 200.00'	Ls = 200.00'
L = 84.71'	L = 2,835.81'	LT = 133.34'	LT = 133.34'
T = 43.52'	T = 1,547.76'	ST = 66.67'	ST = 66.67'
R = 150.00'	R = 2,850.00'		
SE = SEE PLANS	SE = 0.05		

PLANS PREPARED BY:

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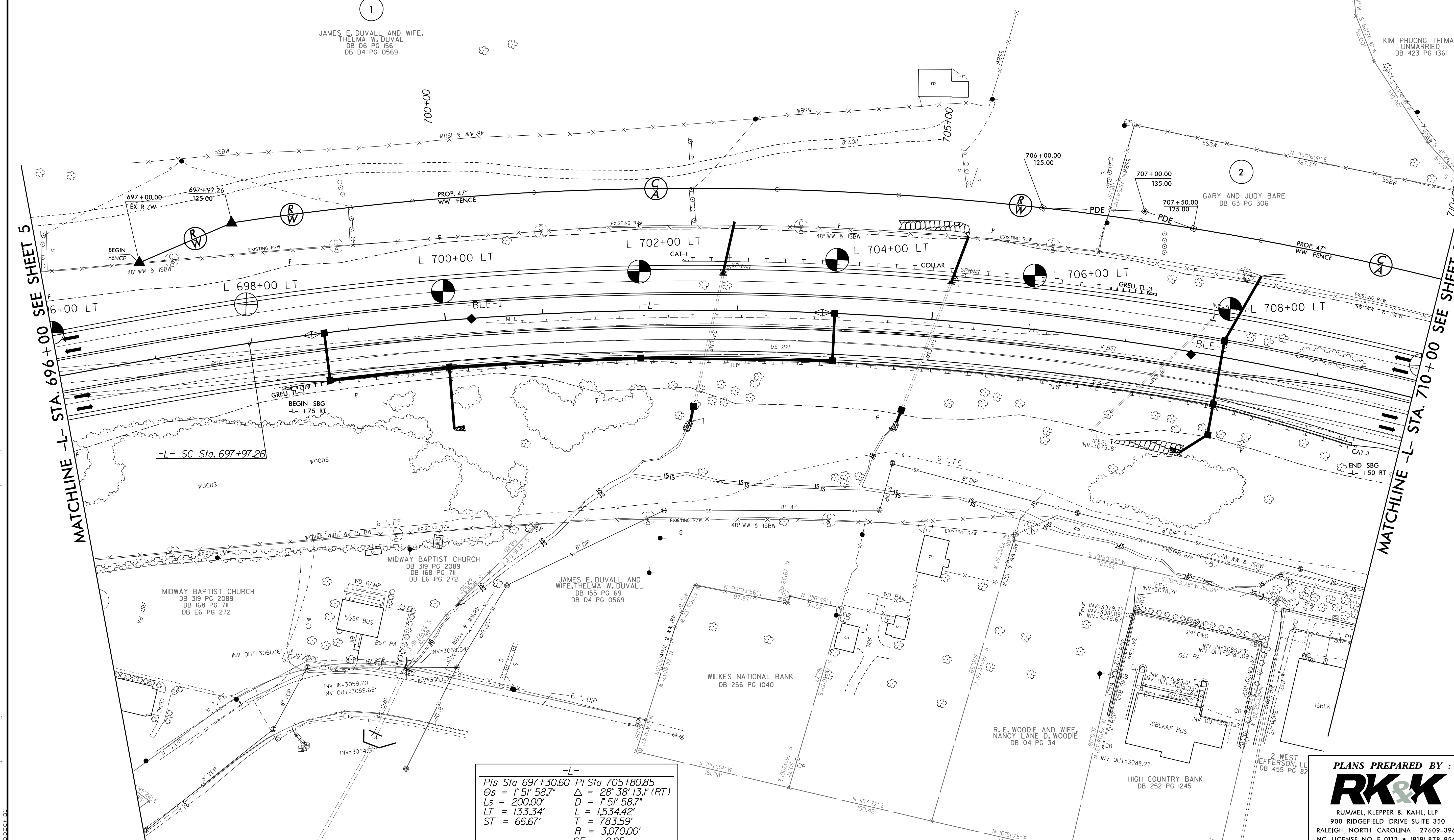
PROJECT REFERENCE NO.	SHEET NO.
R-2915E	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



-L-	
PIs Sta 697+30.60	PI Sta 705+80.85
Θs = 1° 51' 58.7"	Δ = 28° 38' 13.1" (RT)
Ls = 200.00'	D = 1° 51' 58.7"
LT = 133.34'	L = 1,534.42'
ST = 66.67'	T = 783.59'
	R = 3,070.00'
	SE = 0.05

PLANS PREPARED BY:
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RUMMEL, KLEPPER & KAHL, LLP
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RALEIGH, NORTH CAROLINA 27609-3960
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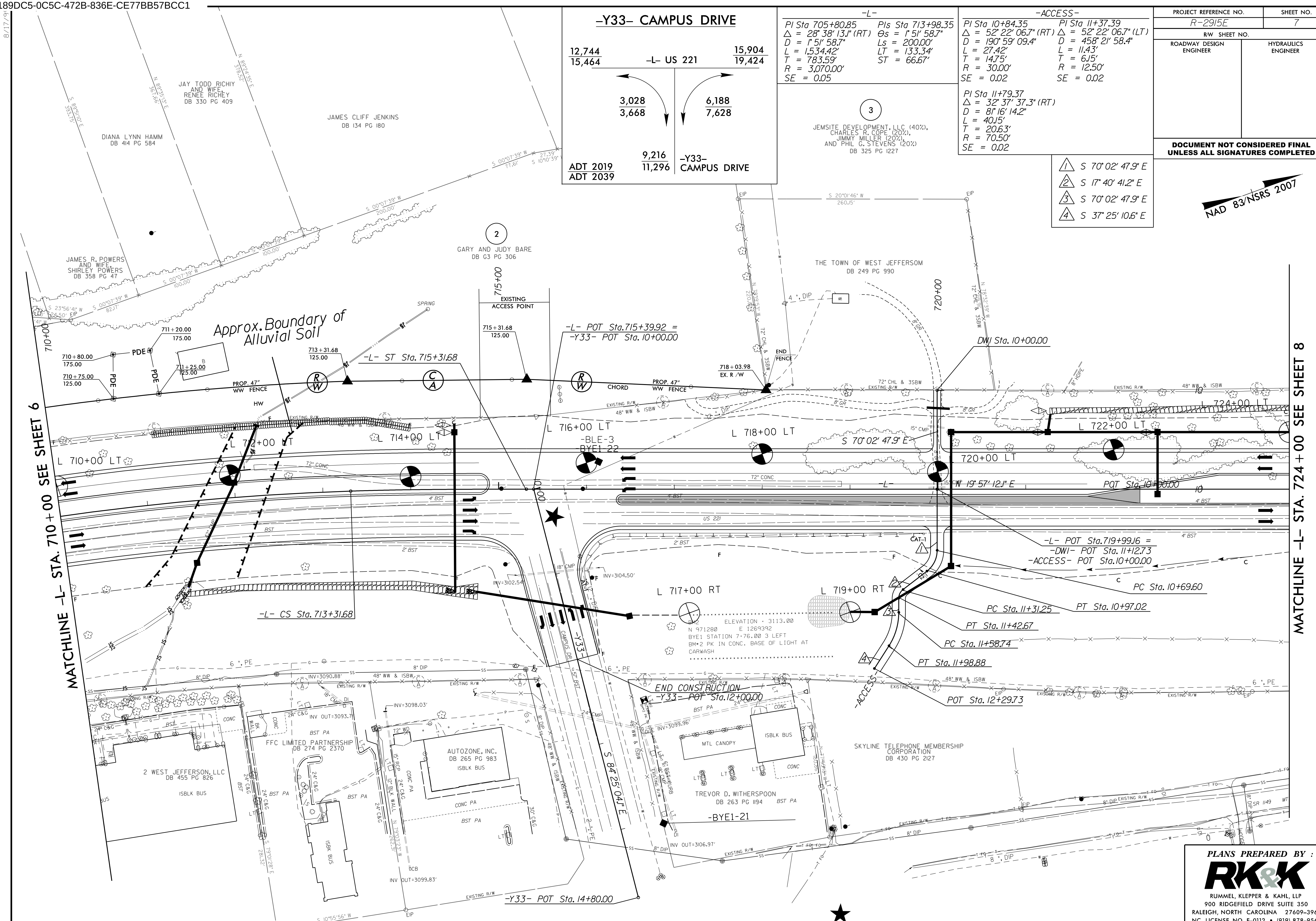
PROJECT REFERENCE NO.	SHEET NO.
R-2915E	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



-Y33- CAMPUS DRIVE
12,744
15,464
-L- US 221
15,904
19,424
3,028
3,668
6,188
7,628
9,216
11,296
ADT 2019
ADT 2039
-Y33- CAMPUS DRIVE
-L-
PI Sta 705+80.85
Δ = 28° 38' 13.1" (RT)
D = 1° 51' 58.7"
L = 1,534.42'
T = 783.59'
R = 3,070.00'
SE = 0.05
PIs Sta 713+98.35
Θs = 1° 51' 58.7"
Ls = 200.00'
LT = 133.34'
ST = 66.67'
-ACCESS-
PI Sta 10+84.35
Δ = 52° 22' 06.7" (RT)
D = 190° 59' 09.4"
L = 27.42'
T = 14.75'
R = 30.00'
SE = 0.02
PI Sta 11+37.39
Δ = 52° 22' 06.7" (LT)
D = 458° 21' 58.4"
L = 11.43'
T = 6.15'
R = 12.50'
SE = 0.02
PI Sta 11+79.37
Δ = 32° 37' 37.3" (RT)
D = 81° 16' 14.2"
L = 40.15'
T = 20.63'
R = 70.50'
SE = 0.02
1 S 70° 02' 47.9" E
2 S 17° 40' 41.2" E
3 S 70° 02' 47.9" E
4 S 37° 25' 10.6" E
NAD 83/NSRS 2007
JAY TODD RICHIY AND WIFE, RENEE RICHEY DB 330 PG 409
JAMES CLIFF JENKINS DB 134 PG 180
DIANA LYNN HAMM DB 414 PG 584
JEMSITE DEVELOPMENT, LLC (40%), CHARLES R. COPE (20%), JIMMY MILLER (20%), AND PHIL G. STEVENS (20%) DB 325 PG 1227
GARY AND JUDY BARE DB 63 PG 306
JAMES R. POWERS AND WIFE, SHIRLEY POWERS DB 358 PG 47
THE TOWN OF WEST JEFFERSOM DB 249 PG 990
Approx. Boundary of Alluvial Soil
EXISTING ACCESS POINT
-L- POT Sta. 715+39.92 = -Y33- POT Sta. 10+00.00
-L- ST Sta. 715+31.68
-L- CS Sta. 713+31.68
DWI Sta. 10+00.00
S 70° 02' 47.9" E
N 19° 57' 12.1" E
POT Sta. 10+00.00
-L- POT Sta. 719+99.16 = -DWI- POT Sta. 11+12.73 -ACCESS- POT Sta. 10+00.00
PC Sta. 10+69.60
PT Sta. 10+97.02
PC Sta. 11+31.25
PT Sta. 11+42.67
PC Sta. 11+58.74
PT Sta. 11+98.88
POT Sta. 12+29.73
END CONSTRUCTION -Y33- POT Sta. 12+00.00
-Y33- POT Sta. 14+80.00
S 84° 25' 04.1" E
L 710+00 LT
L 712+00 LT
L 714+00 LT
L 716+00 LT
L 718+00 LT
720+00 LT
L 722+00 LT
L 724+00 LT
L 717+00 RT
L 719+00 RT
-BLE-3
-BYE1 22
-BYE1-21
BYE1 STATION 7+76.00 3 LEFT BM-2 PK IN CONC. BASE OF LIGHT AT CARWASH
ELEVATION = 3113.00
N 971280 E 1269392
2 WEST JEFFERSON, LLC DB 455 PG 826
FFC LIMITED PARTNERSHIP DB 274 PG 2370
AUTOZONE, INC. DB 265 PG 983
TREVOR D. WITHERSPOON DB 263 PG 1194
SKYLINE TELEPHONE MEMBERSHIP CORPORATION DB 430 PG 2127
MATCHLINE -L- STA. 710+00 SEE SHEET 6
MATCHLINE -L- STA. 724+00 SEE SHEET 8

PLANS PREPARED BY :

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11/28/2018

-Y34- MT. JEFFERSON STATE PARK ROAD

15,904 / 19,424	-L- US 221	14,840 / 18,040
1,680 / 2,080		616 / 696
ADT 2019 / ADT 2039	2,296 / 2,776	-Y34- MT. JEFFERSON STATE PARK ROAD

-L-

PIs Sta 725+67.24	PI Sta 729+93.07	PIs Sta 734+15.51
Θs = 1° 54' 35.5"	Δ = 13° 39' 15.3" (LT)	Θs = 1° 54' 35.5"
Ls = 200.00'	D = 1° 54' 35.5"	Ls = 200.00'
LT = 133.34'	L = 714.94'	LT = 133.34'
ST = 66.67'	T = 359.17'	ST = 66.67'
	R = 3,000.00'	
	SE = 0.05	

PROJECT REFERENCE NO.	SHEET NO.
R-2915E	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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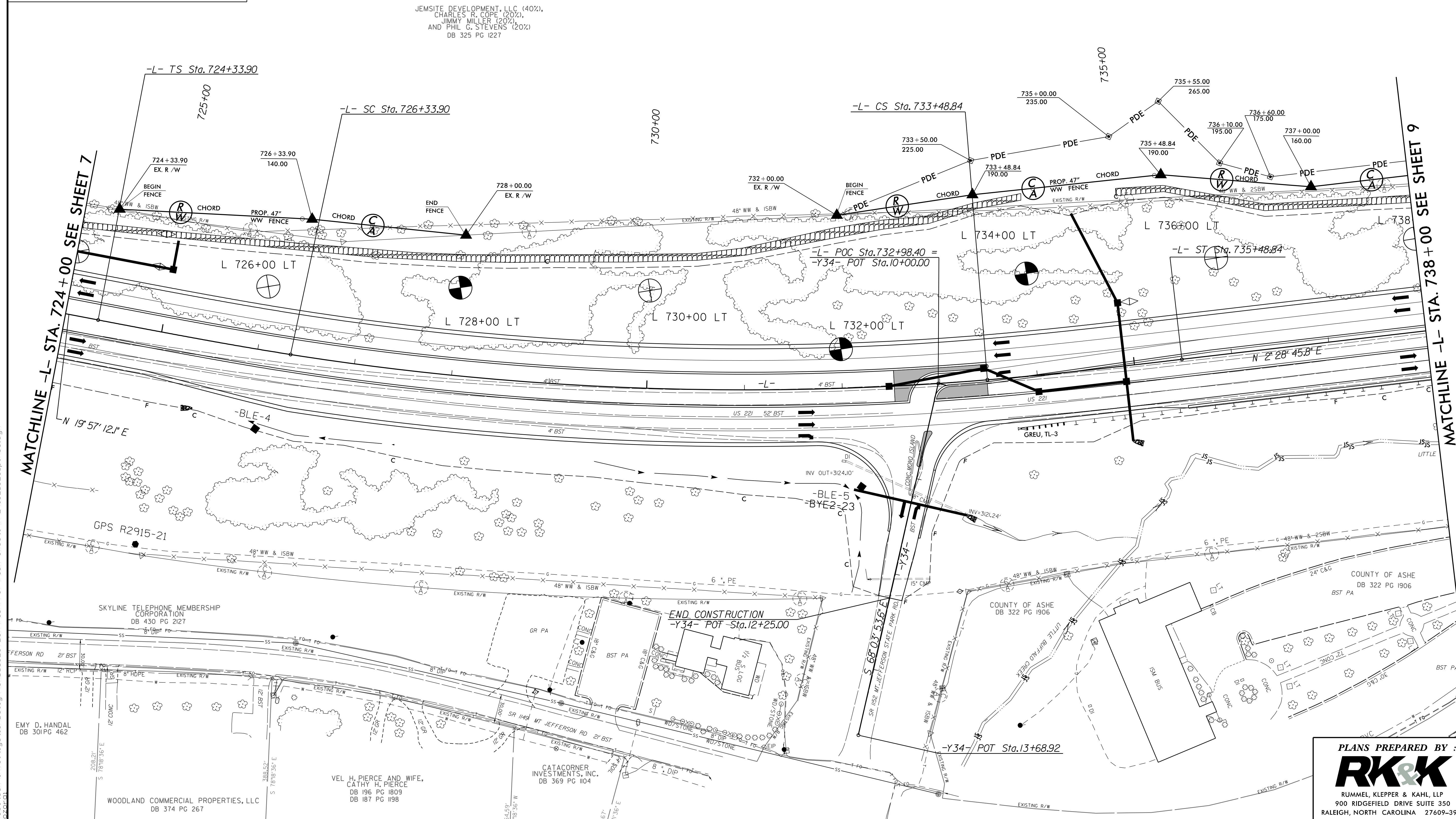

NC GRID NAD 83/CORS
NAD 83/NSRS 2007
3
JEMSITE DEVELOPMENT, LLC (40%), CHARLES R. COPE (20%), JIMMY MILLER (20%), AND PHIL G. STEVENS (20%) DB 325 PG 1227
-L- TS Sta. 724+33.90
-L- SC Sta. 726+33.90
-L- CS Sta. 733+48.84
-L- ST Sta. 735+48.84
-L- POC Sta. 732+98.40 = -Y34- POT Sta. 10+00.00
MATCHLINE -L- STA. 724+00 SEE SHEET 7
MATCHLINE -L- STA. 738+00 SEE SHEET 9
L 726+00 LT
L 728+00 LT
L 730+00 LT
L 732+00 LT
L 734+00 LT
L 736+00 LT
N 19° 57' 12.1" E
N 2° 28' 45.8" E
S 68° 03' 53.6" E
BLE-4
BLE-5
BYE2-23
GPS R2915-21
US 221
GREU, TL-3
END CONSTRUCTION -Y34- POT Sta. 12+25.00
-Y34- POT Sta. 13+68.92
SKYLINE TELEPHONE MEMBERSHIP CORPORATION DB 430 PG 2127
COUNTY OF ASHE DB 322 PG 1906
EMY D. HANDAL DB 301 PG 462
WOODLAND COMMERCIAL PROPERTIES, LLC DB 374 PG 267
VEL H. PIERCE AND WIFE, CATHY H. PIERCE DB 196 PG 1809 DB 187 PG 1198
CATACORNER INVESTMENTS, INC. DB 369 PG 1104
SR 1149 MT. JEFFERSON RD
SR 1152 MT. JEFFERSON STATE PARK ROAD
LITTLE BUFFALO CREEK

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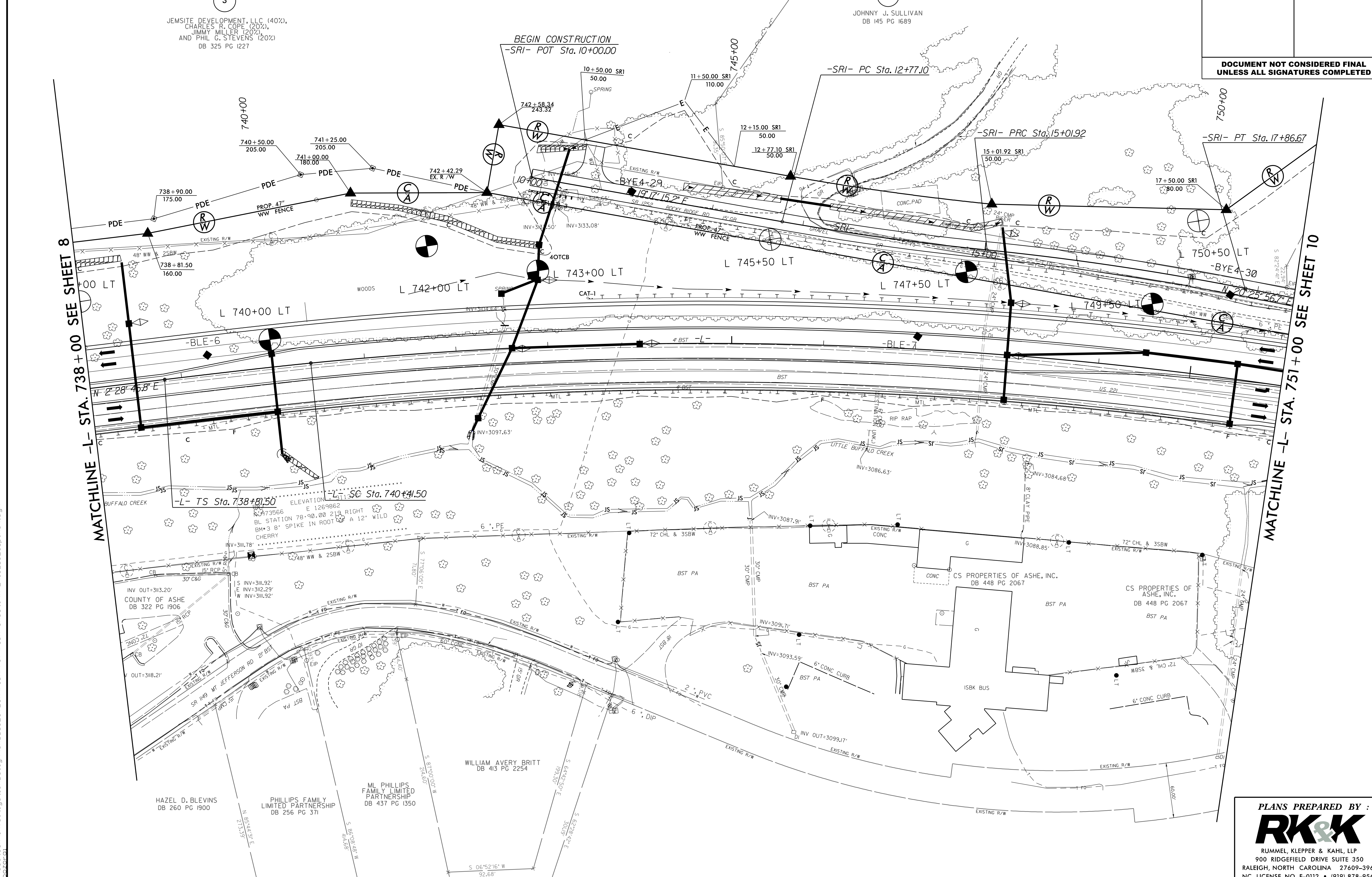
PROJECT REFERENCE NO.	SHEET NO.
R-2915E	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-L-		-SRI-	
PIs Sta 739+88.17	PI Sta 746+79.88	PI Sta 13+89.56	PI Sta 16+44.40
Θs = 1° 03' 57.5"	Δ = 16° 53' 20.8" (RT)	Δ = 4° 17' 36.8" (LT)	Δ = 5° 26' 18.4" (RT)
Ls = 160.00'	D = 1° 19' 56.9"	D = 1° 54' 35.5"	D = 1° 54' 35.5"
LT = 106.67'	L = 1,267.51'	L = 224.81'	L = 284.76'
ST = 53.34'	T = 638.39'	T = 112.46'	T = 142.48'
	R = 4,300.00'	R = 3,000.00'	R = 3,000.00'
	SE = 0.04	SE = NC	SE = NC



PLANS PREPARED BY :

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NC LICENSE NO. F-0112 • (919) 878-9560

-L-	-Y35-	-SRI-
PI Sta 746+79.88 △ = 16° 53' 20.8" (RT) D = 1° 19' 56.9" L = 1,267.51' T = 638.39' R = 4,300.00' SE = 0.04	PIs Sta 753+62.35 PI Sta 766+25.13 s = 1° 03' 57.5" Ls = 160.00' LTP = 106.67' ST = 53.34'	△ = 2° 08' 50.5" (LT) D = 0° 19' 05.9" L = 674.61' T = 337.35' R = 18,000.00' SE = NC	PI Sta 20+85.20 △ = 18° 44' 49.7" (RT) D = 6° 21' 58.3" L = 294.48' T = 148.57' R = 900.00' SE = SEE PLANS	PI Sta 23+61.86 △ = 46° 08' 54.1" (LT) D = 22° 55' 05.9" L = 201.36' T = 106.50' R = 250.00' SE = 0.04	PI Sta 25+64.52 △ = 89° 56' 43.4" (RT) D = 143° 14' 22.0" L = 62.79' T = 39.96' R = 40.00' SE = SEE PLANS

PROJECT REFERENCE NO.	SHEET NO.
R-2915E	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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NAD 83/NSRS 2007

MATCHLINE –L– STA. 751+00 SEE SHEET 9

MATCHLINE –L– STA. 765+00 SEE SHEET 11

–Y35– MT. JEFFERSON ROAD

1/2 SFD

5,656 / 6,936	–Y35– MT. JEFFERSON RD.	
4,492 / 5,452		316 / 396
14,840 / 18,040	–L– US 221	12,544 / 15,264
–100 / –100		1,880 / 2,280
ADT 2019 / ADT 2039	2,728 / 3,368	–Y35– MT. JEFFERSON RD.

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PROJECT REFERENCE NO.	SHEET NO.
R-2915E	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NAD 83/NSRS 2007

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MATCHLINE –L– STA. 765+00 SEE SHEET 10

MATCHLINE –L– STA. 779+00 SEE SHEET 12

JOHN S. TRESKI AND WIFE, JENNIFER VANNOY TRESKI DB 287 PG 2347

W.R. WOOD AND WIFE, CAROLYN C. WOOD DB R4 PG 94

MILLARD B. DANCY AND WIFE, GEORGIA L. DANCY DB X4 PG 57

BOBBY LEE WADDELL, WIDOWER DB 367 PG 810

BRIAN BORELLE AND MARY CORDELLA MILLER DB 242 PG 754

JERRY L. BROWN DB 180 PG 2494

RODNEY TERRELL MORGAN, HUSBAND, AND WIFE, AMILLE MORGAN DB 295 PG 1166

CHARITY B. CHRISTOFERSON DB 363 PG 1009

JERRY AND ROBIN BROWN DB 454 PG 2172

NCDOT DB 05 PG 52

MICHAEL ALOIA AND WIFE, CINDEE ALOIA DB 308 PG 377 DB 337 PG 1354

THOMAS JARMEN AND WIFE, LINDA JARMEN DB 355 PG 251

WILLIAM H. WILKINSON HUSBAND, AND WIFE KAREN WILKINSON DB 231PG 1547

D. NEWTON CAVINESS DB 385 PG 1798

CHRIS A. PELEZO AND WIFE, DORIS F. PELEZO DB 215 PG 1561 DB 215 PG 1563 DB 215 PG 1565

BM4 ELEVATION = 3137.33
N 976105 E 1270546
BYE5 STATION 19+16.00 32 LEFT
BM=4 8" SPIKE IN ROOT OF A 12" WHITE PINE

-L- PI Sta 766+25.13
Δ = 2° 08' 50.5" (LT)
D = 0° 19' 05.9"
L = 674.61'
T = 337.35'
R = 18,000.00'
SE = NC

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PROJECT REFERENCE NO.	SHEET NO.
R-2915E	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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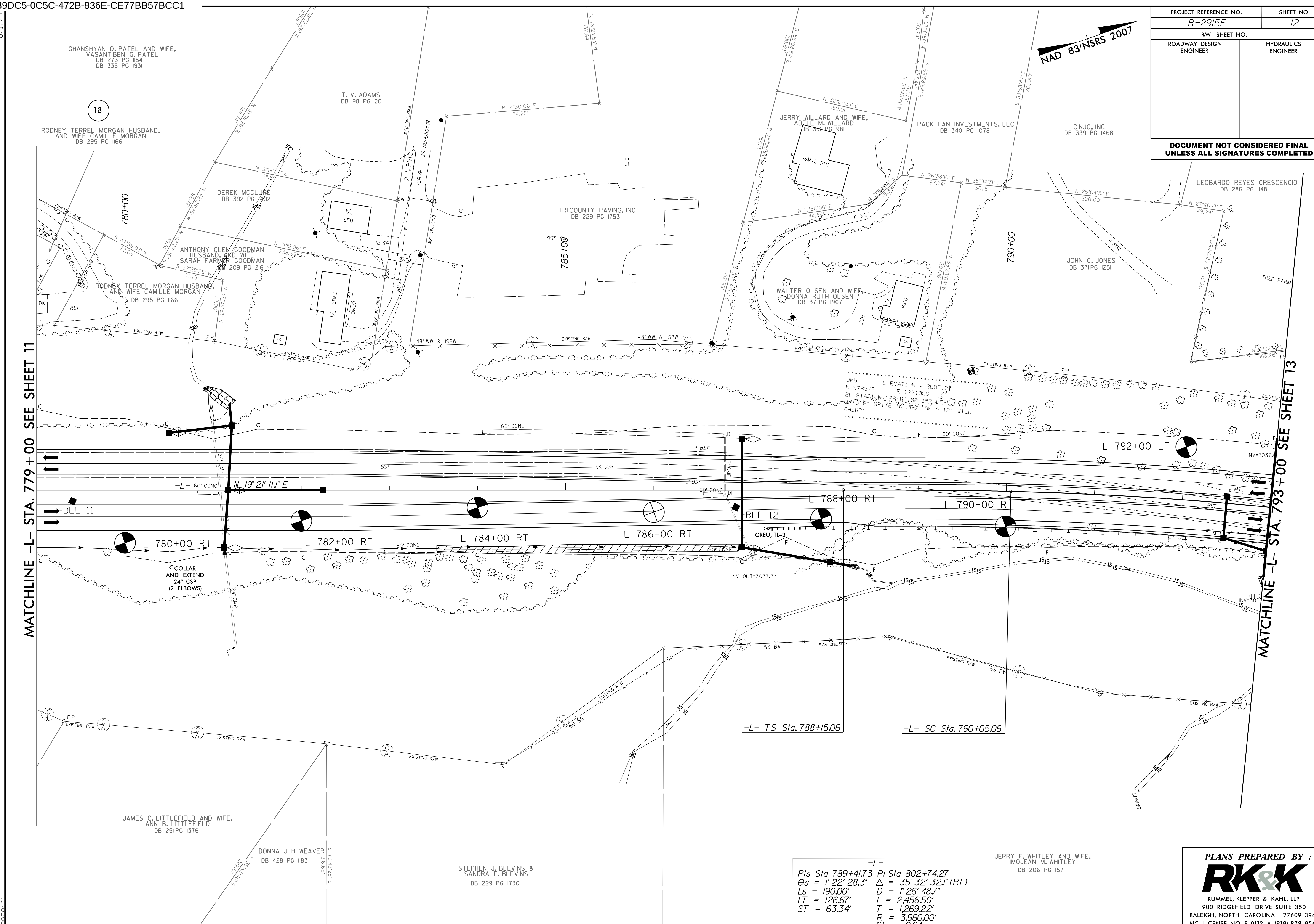

NAD 83/NSRS 2007
MATCHLINE -L- STA. 779+00 SEE SHEET 11
MATCHLINE -L- STA. 793+00 SEE SHEET 13
13
GHANSHYAN D. PATEL AND WIFE, VASANTIBEN G. PATEL DB 273 PG 1154 DB 335 PG 1931
T. V. ADAMS DB 98 PG 20
RODNEY TERREL MORGAN HUSBAND, AND WIFE CAMILLE MORGAN DB 295 PG 1166
DEREK MCCLURE DB 392 PG 1402
ANTHONY GLEN GOODMAN HUSBAND, AND WIFE SARAH FARMER GOODMAN DB 209 PG 216
TRI COUNTY PAVING, INC DB 229 PG 1753
JERRY WILLARD AND WIFE, ADELE M. WILLARD DB 313 PG 981
PACK FAN INVESTMENTS, LLC DB 340 PG 1078
CINJO, INC DB 339 PG 1468
LEOBARDO REYES CRESCENCIO DB 286 PG 1148
WALTER OLSEN AND WIFE, DONNA RUTH OLSEN DB 371 PG 1967
JOHN C. JONES DB 371 PG 1251
BM5 N 978372 E 1271056 ELEVATION - 3085.26 BL STATION 128+81.00 157' LEFT
CHERRY
780+00
785+00
790+00
BLE-11
BLE-12
L 780+00 RT
L 782+00 RT
L 784+00 LT
L 786+00 RT
L 788+00 RT
L 790+00 RT
L 792+00 LT
N 19° 21' 11.1" E
US 221
GREU, TL-3
INV OUT=3077.71'
C COLLAR AND EXTEND 24" CSP (2 ELBOWS)
-L- TS Sta. 788+15.06
-L- SC Sta. 790+05.06
JAMES C. LITTLEFIELD AND WIFE, ANN B. LITTLEFIELD DB 251 PG 1376
DONNA J H WEAVER DB 428 PG 1183
STEPHEN J. BLEVINS & SANDRA E. BLEVINS DB 229 PG 1730
JERRY F. WHITLEY AND WIFE, IMOJEAN M. WHITLEY DB 206 PG 157

-L-	
PIs Sta 789+41.73	PI Sta 802+74.27
Θs = 1° 22' 28.3"	Δ = 35° 32' 32.1" (RT)
Ls = 190.00'	D = 1° 26' 48.7"
LT = 126.67'	L = 2,456.50'
ST = 63.34'	T = 1,269.22'
	R = 3,960.00'
	SE = 0.04

PLANS PREPARED BY :

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PROJECT REFERENCE NO.	SHEET NO.
R-2915E	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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NAD 83/NSRS 2007

14 SAMUEL B. CHURCH AND WIFE, SHIRLEY CHURCH DB 187 PG 2406 DB 188 PG 837

SAMUEL FLORES, HUSBAND AND WIFE, MARIA FLORES DB 350 PG 70

15 TRACIE JORDAN DB 319 PG 1685

16 DWIGHT C. RASH DB 400 PG 523

17 JOHN F. BAKER DB 63 PG 462

ANDREW C. JACKSON DB 437 PG

ROBERT STEVEN FREEMAN, GREGORY DENNIS FREEMAN, AND ROY LOGAN FREEMAN DB 145 PG 1001

WAYNE F. STANLEY DB 217 PG 1702

BERTHA CLURE WOOD DB 285 PG 125

MATTHEW FRAMPTON AND CHRISTOPHER FRAMPTON DB 438 PG 1510

BENNY B. HURLEY AND VICKEY S. HURLEY DB 228 PG 292 DB 423 PG 1047

MATCHLINE -L- STA. 793+00 SEE SHEET 12

MATCHLINE -L- STA. 807+00 SEE SHEET 14

-L-
PI Sta 802+74.27
△ = 35° 32' 32.1" (RT)
D = 1° 26' 48.7"
L = 2,456.50'
T = 1,269.22'
R = 3,960.00'
SE = 0.04

PLANS PREPARED BY :

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PROJECT REFERENCE NO.	SHEET NO.
R-2915E	14

R/W SHEET NO.

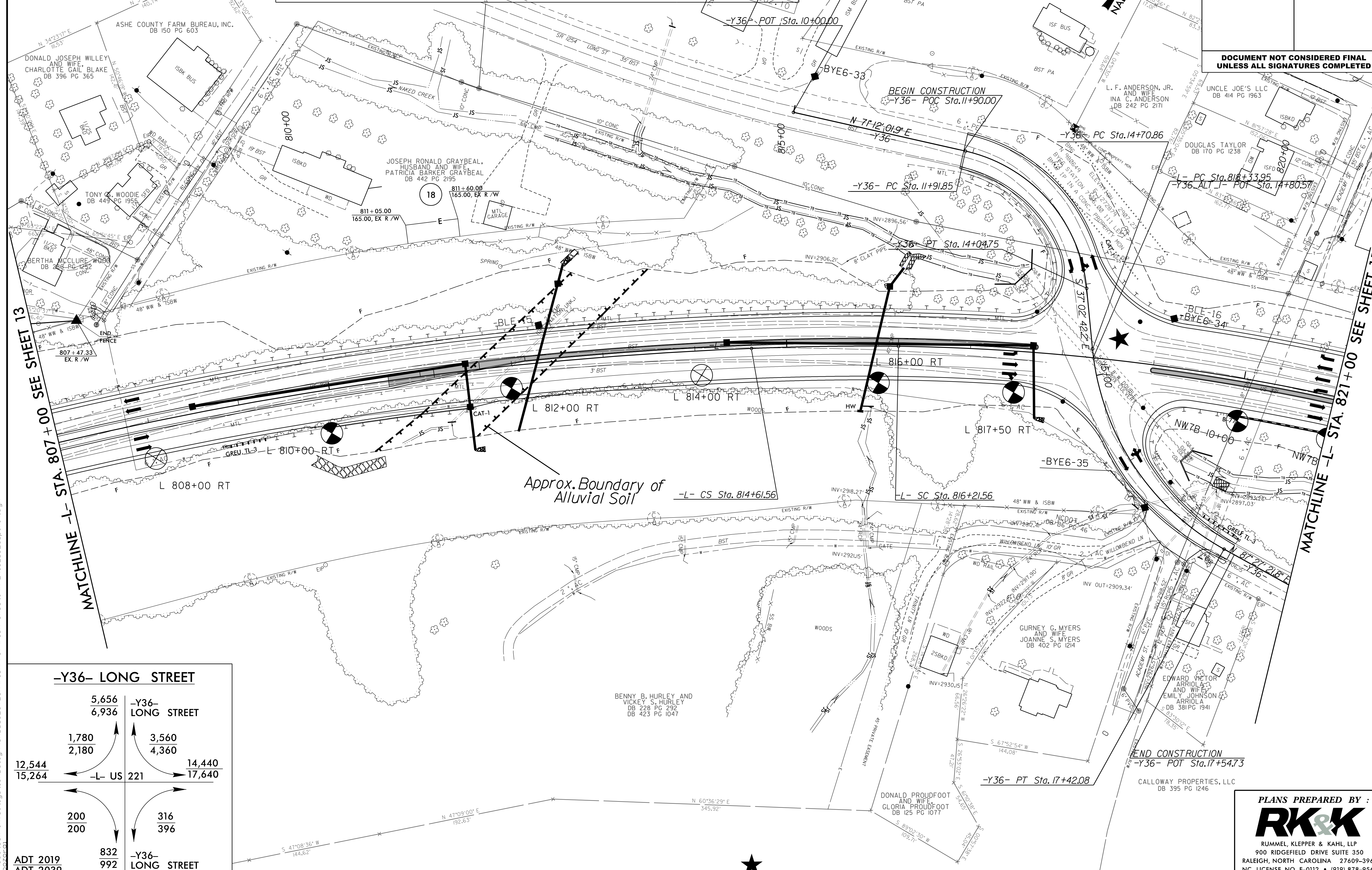
ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-L-

PI Sta 802+74.27	PIs Sta 815+48.12	PI Sta 818+95.22	PI Sta 13+14.81	PI Sta 16+18.17
△ = 35° 32' 32.1" (RT)	Θs = 1° 09' 26.9"	△ = 13° 00' 35.0" (RT)	△ = 71° 45' 15.9" (RT)	△ = 55° 29' 56.0" (LT)
D = 1° 26' 48.7"	Θs = 1° 54' 35.6"	D = 2° 23' 14.4"	D = 33° 42' 12.2"	D = 20° 27' 46.0"
L = 2,456.50'	Ls = 160.00'	L = 544.95'	L = 212.90'	L = 271.22'
T = 1,269.22'	LT = 86.56'	T = 273.65'	T = 122.96'	T = 147.31'
R = 3,960.00'	ST = 73.48'	R = 2,400.00'	R = 170.00'	R = 280.00'
SE = 0.04		SE = 0.05	SE = SEE PLANS	SE = SEE PLANS
			V = 25 MPH	V = 30 MPH

-Y36-



NAD 83/NSRS 2007
ASHE COUNTY FARM BUREAU, INC. DB 150 PG 603
DONALD JOSEPH WILLEY AND WIFE, CHARLOTTE GAIL BLAKE DB 396 PG 365
TONY G. WOODIE DB 449 PG 1956
BERTHA MCCLURE WOOD DB 256 PG 1252
JOSEPH RONALD GRAYBEAL, HUSBAND AND WIFE, PATRICIA BARKER GRAYBEAL DB 442 PG 2195
WANDA WALKER AND HUSBAND, RONALD GIRTMAN, JR DB 157 PG 155
L. F. ANDERSON, JR. AND WIFE INA C. ANDERSON DB 242 PG 2171
UNCLE JOE'S LLC DB 414 PG 1963
DOUGLAS TAYLOR DB 170 PG 1238
GURNEY G. MYERS AND WIFE JOANNE S. MYERS DB 402 PG 1214
BENNY B. HURLEY AND VICKEY S. HURLEY DB 228 PG 292 DB 423 PG 1047
EDWARD VICTOR ARRIOLA AND WIFE EMILY JOHNSON ARRIOLA DB 381 PG 1941
DONALD PROUDFOOT AND WIFE GLORIA PROUDFOOT DB 125 PG 1077
CALLOWAY PROPERTIES, LLC DB 395 PG 1246
-Y36- POT Sta. 10+00.00
BEGIN CONSTRUCTION -Y36- POC Sta. 11+90.00
-Y36- PC Sta. 14+70.86
-Y36- PC Sta. 11+91.85
-Y36- PT Sta. 14+04.75
-L- PC Sta. 818+33.95
-Y36_ALT_1- POT Sta. 14+80.57
-L- CS Sta. 814+61.56
-L- SC Sta. 816+21.56
-Y36- PT Sta. 17+42.08
END CONSTRUCTION -Y36- POT Sta. 17+54.73
N 71° 12' 01.9" E
S 37° 02' 42.2" E
-BLE-15
-BLE-16
-BYE6-33
-BYE6-34
-BYE6-35
NW7B 10+00
L 808+00 RT
L 810+00 RT
L 812+00 RT
L 814+00 RT
L 816+00 RT
L 817+50 RT
CAT-1
Approx. Boundary of Alluvial Soil
807+47.33 EX. R/W
811+05.00 165.00, EX R/W
811+60.00 165.00, EX R/W
810+00
815+00
820+00
SR 1254 LONG ST
WILLOWBEND LN
TRINITY LN
WOODS
MATCHLINE -L- STA. 807+00 SEE SHEET 13
MATCHLINE -L- STA. 821+00 SEE SHEET 15

-Y36- LONG STREET

PLANS PREPARED BY:

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PROJECT REFERENCE NO.	SHEET NO.
R-2915E	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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NAD 83/NSRS 2007

MATCHLINE -L- STA. 821+00 SEE SHEET 14

MATCHLINE -L- STA. 835+00 SEE SHEET 16

-L- CS Sta. 821+66.51

-L- ST Sta. 824+06.51

-Y36- POT Sta. 19+14.44

Approx. Boundary of Alluvial Soil

-L-

PI Sta 818+95.22	PIs Sta 822+46.53
Δ = 13° 00' 35.0" (RT)	Θs = 2° 51' 53.2"
D = 2° 23' 14.4"	Ls = 240.00'
L = 544.95'	LT = 160.02'
T = 273.65'	ST = 80.02'
R = 2,400.00'	
SE = 0.05	

PLANS PREPARED BY :

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PROJECT REFERENCE NO.	SHEET NO.
R-2915E	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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NAD 83/CORS

NAD 83/NSRS 2007

MATCHLINE -L- STA. 835+00 SEE SHEET 15

MATCHLINE -L- STA. 848+00 SEE SHEET 17

JENNIE W. HIGHTOWER, EMILY H. JOHNSTON AND JOESPH E. HIGHTOWER
DB 343 PG 1044

JOHN N. BOWER AND WIFE, KATHY B. BOWER; JUDY B. MILLER AND HUSBAND, HOWARD MILLER; THOMAS D. BOWER AND WIFE, SANDY H. BOWER; BENNETT B. DARNELL AND HUSBAND, PHIL DARNELL; AND JENNY B. JOHNSON AND HUSBAND, GREG JOHNSON
DB 217 PG 1212

NORTH CAROLINA AND CAROLINA FARM CREDIT, ACA
DB 397 PG 1039

TOWN OF JEFFERSON
DB 159 PG 566

ESSENTIAL PROPERTIES, INC.
DB 456 PG 2460
DB 456 PG 2460

ESSENTIAL PROPERTIES, INC.
DB 456 PG 2460
TRACT 1

JORENA K. BARNES
DB 321PG 933

TABER M. BELL
DB 194 PG 406

GENEVA D. JONES
DB 223 PG 102

THE COUNTY OF ASHE
DB 342 PG 1485

BM7
ELEVATION = 2869.27
N 981205 E 1275323
BL STATION 181+94.80 70 LEFT
BM#7 RR NAIL IN TOE OF CONC. R/W MON

-L- TS Sta. 840+83.01

-L- SC Sta. 843+63.01

SEE CULVERT OUTLET DETAIL -L- STA. 838+56

SEE CULVERT INLET DETAIL -L- STA. 838+56

-L-
PIs Sta 842+69.73 PI Sta 848+19.16
Θs = 4°12'00.0" Δ = 26°51'57.8" (RT)
Ls = 280.00' D = 3°00'00.0"
LT = 186.72' L = 895.54'
ST = 93.38' T = 456.16'
R = 1,909.86'
SE = SEE PLANS

PLANS PREPARED BY :

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PROJECT REFERENCE NO.	SHEET NO.
R-2915E	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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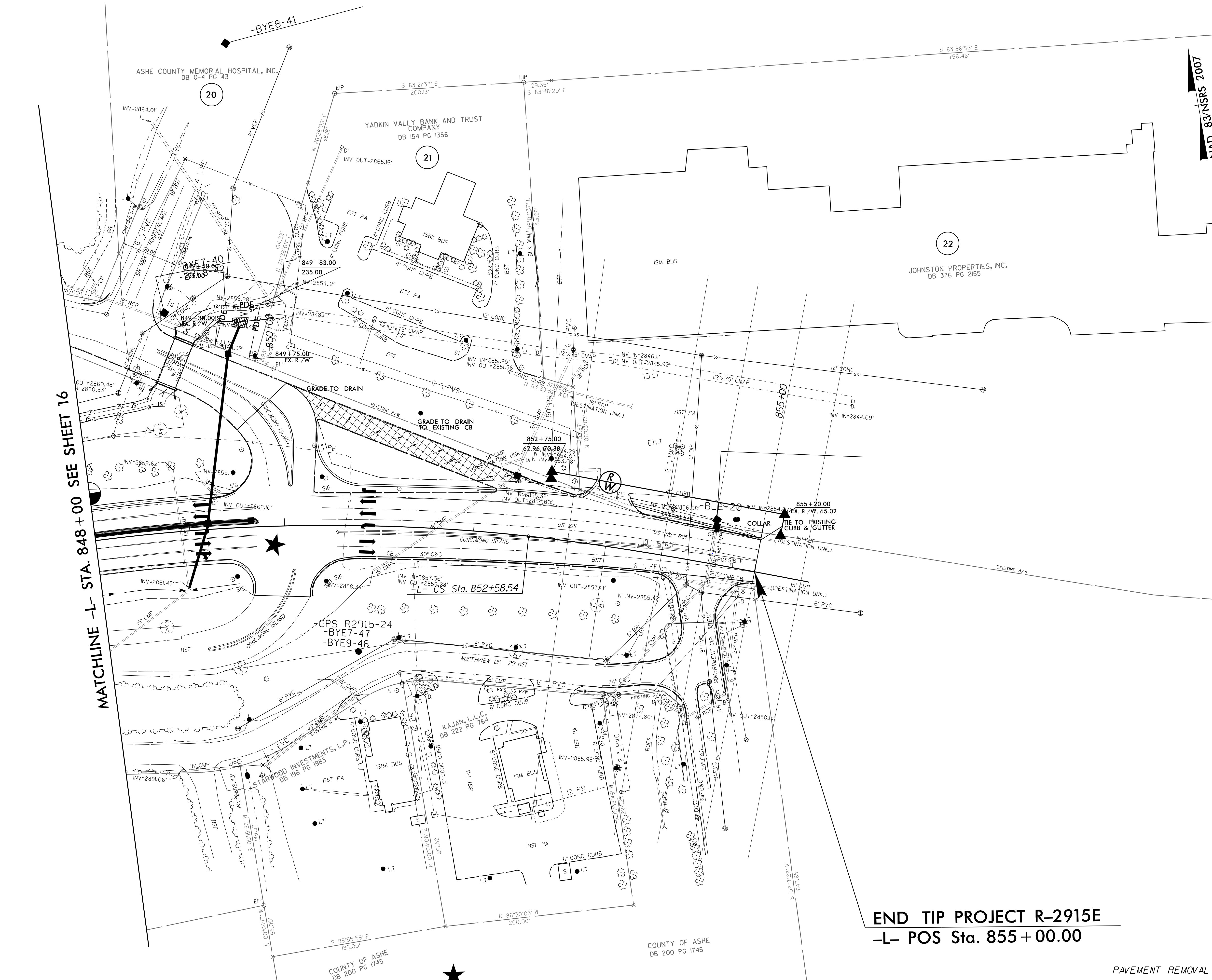

-L-	
PI Sta 848+19.16	PIs Sta 853+58.60
Δ = 26° 51′ 57.8″ (RT)	Θs = 4° 29′ 58.92″
D = 3° 00′ 00.0″	Ls = 299.98′
L = 895.54′	LT = 200.05′
T = 456.16′	ST = 100.05′
R = 1,909.86′	
SE = SEE PLANS	

END TIP PROJECT R-2915E
-L- POS Sta. 855+00.00

PAVEMENT REMOVAL

PLANS PREPARED BY :
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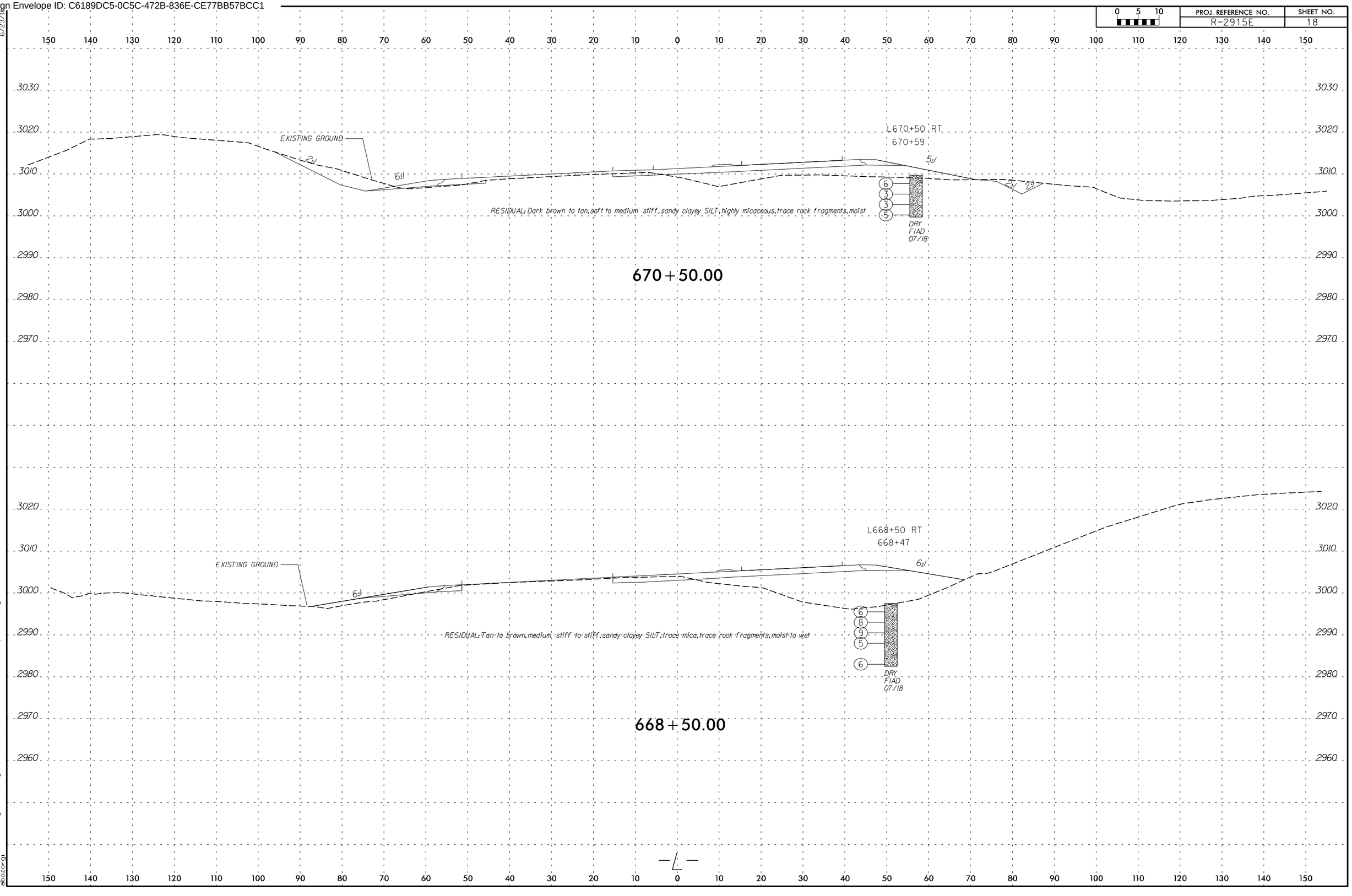
PROJ. REFERENCE NO.	SHEET NO.
R-2915E	18



6/23/18

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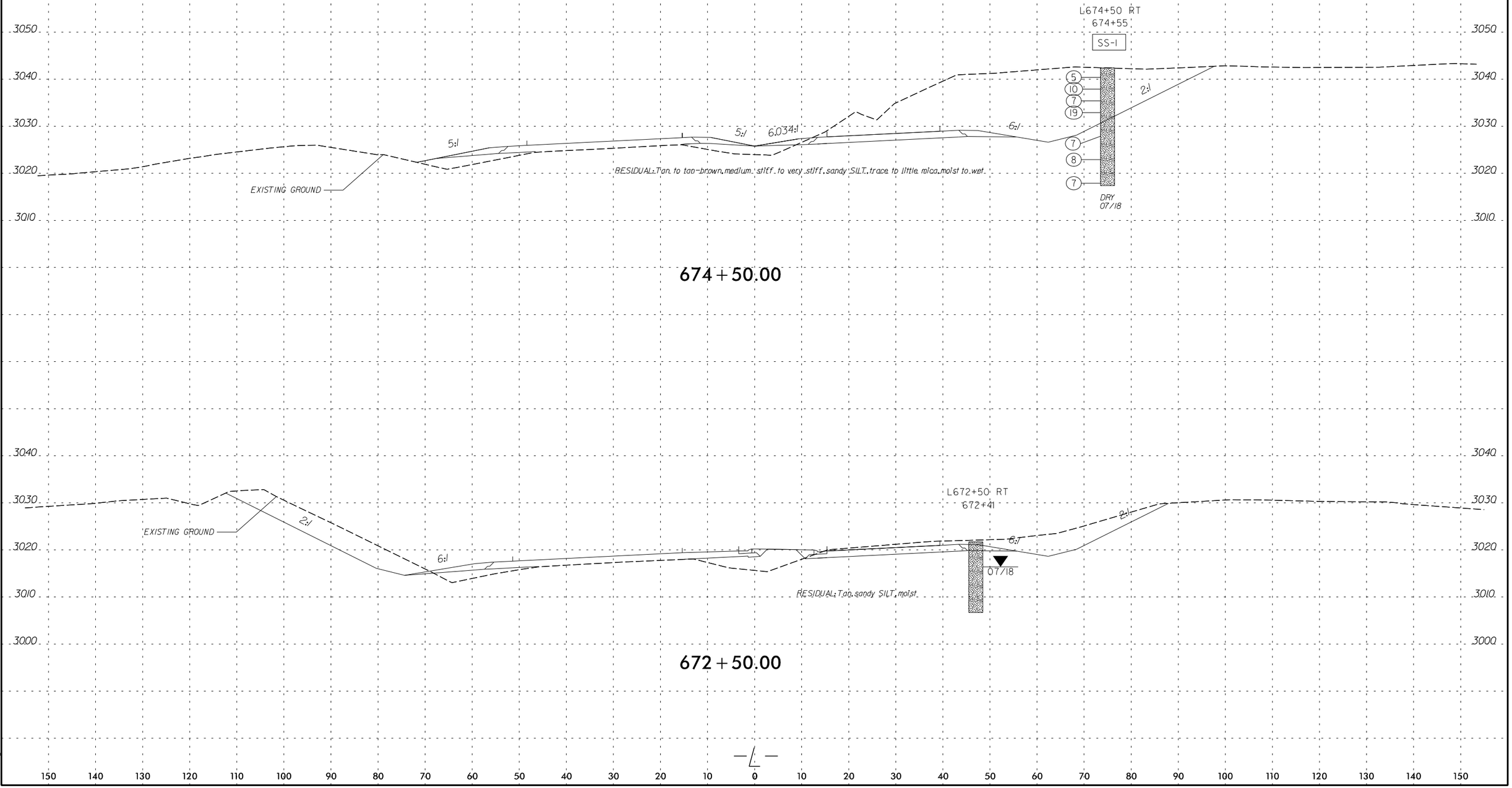
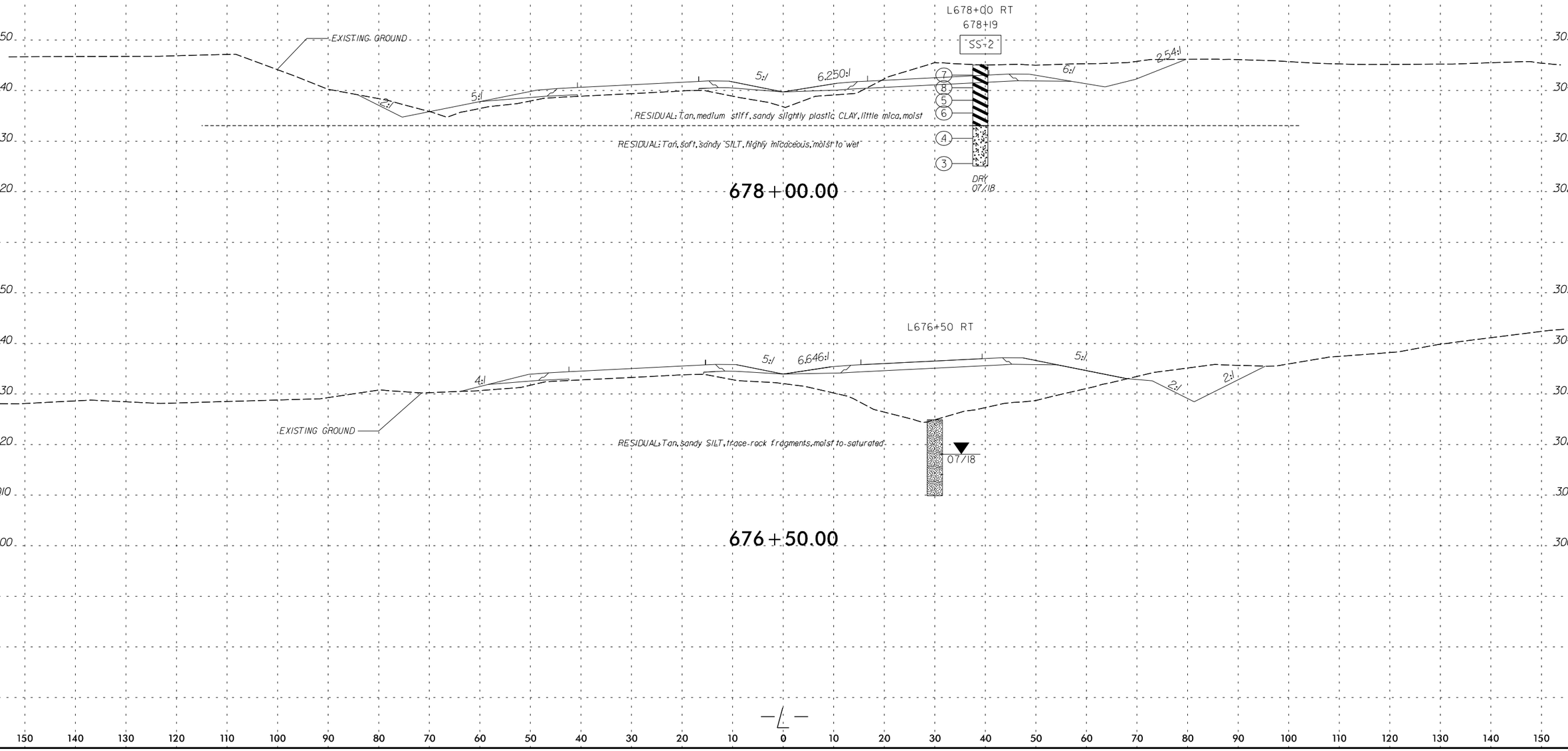
SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-1	674+55	75' RT	13.5-15.0	A-4(0)	39	1	20	41	30	9	100	92	49	36	N/A

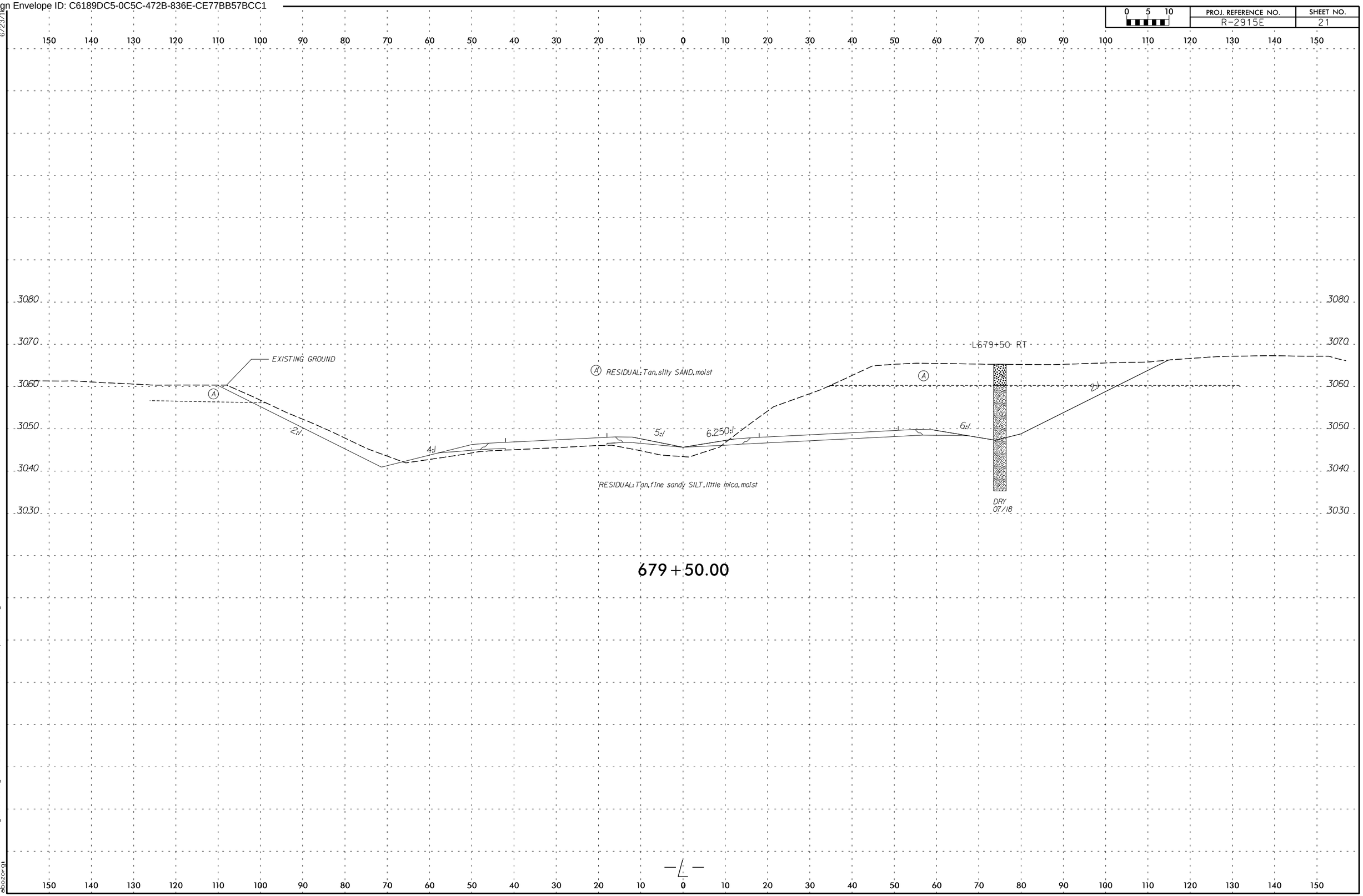


SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-2	678+19	39' RT	6.0-7.5	A-7-5(3)	51	11	16	30	25	29	76	70	45	17	N/A

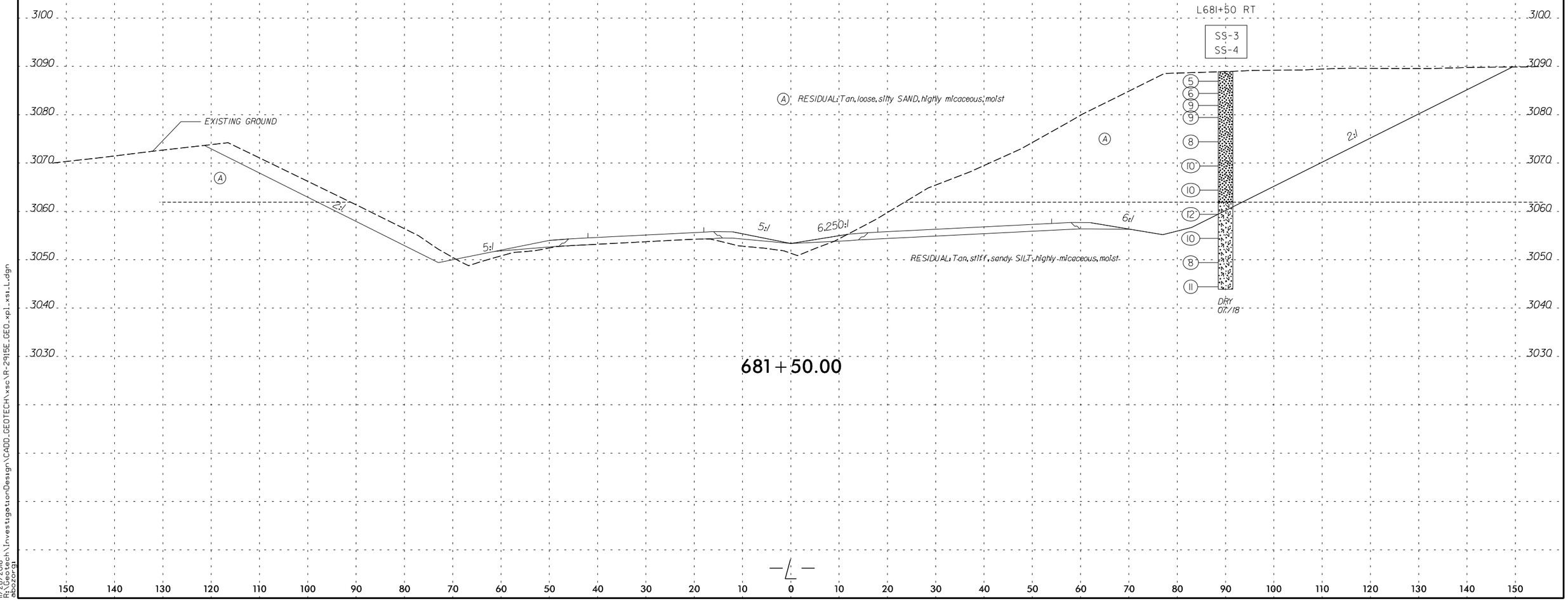


0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2915E	21



SOIL TEST RESULTS

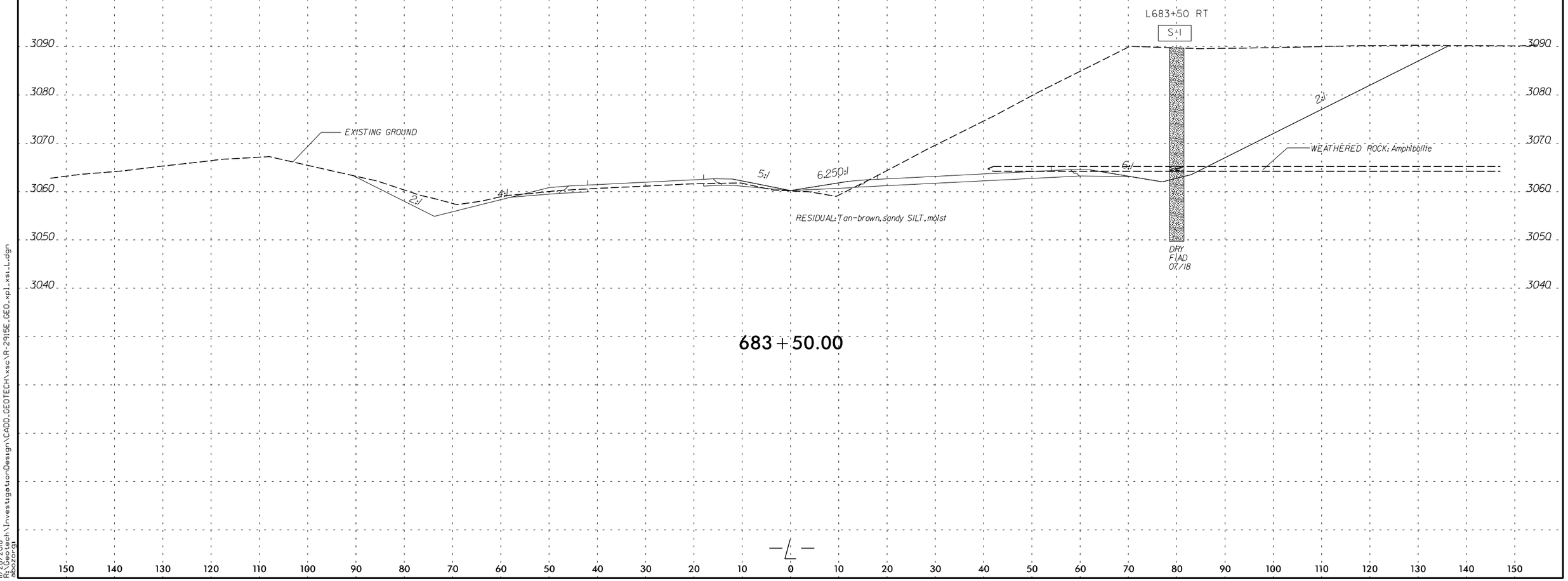
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-3	681+50	90' RT	8.5-10.0	A-2-5(0)	48	2	24	51	18	7	100	90	33	20	N/A
SS-4	681+50	90' RT	28.5-30.0	A-5(0)	42	3	16	52	22	10	90	84	37	22	N/A



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2915E	23

SOIL TEST RESULTS

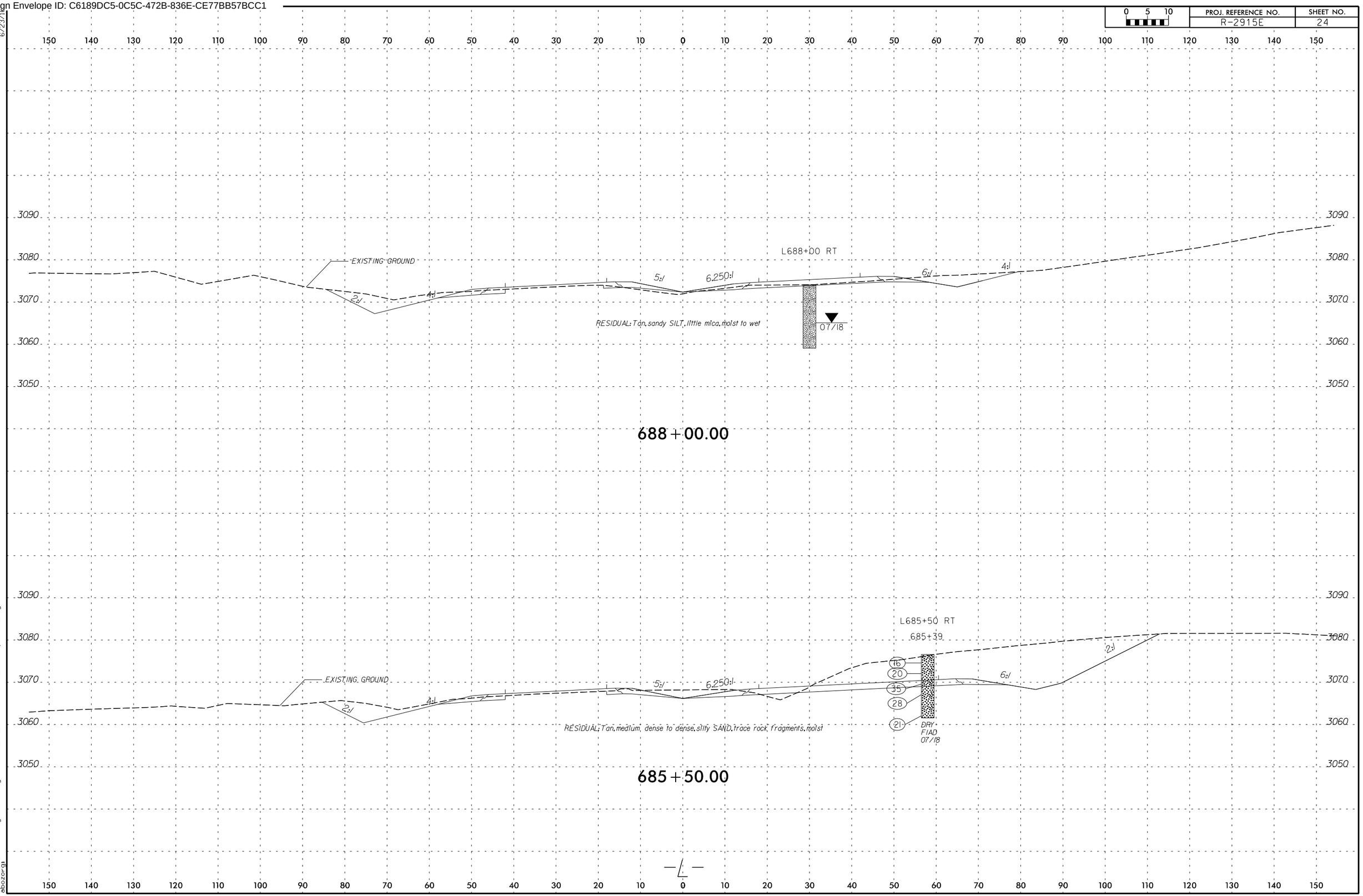
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-1	683+50	80' RT	1.0-10.0	A-4(0)	36	5	35	29	18	18	94	72	39	25	N/A



683+50.00

6/23/18

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2915E	24



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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

SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-5	690+00	40' RT	3.5-5.0	A-2-5(0)	41	0	36	45	11	8	100	83	25	17	N/A

3100
3090
3080
3070
3060

EXISTING GROUND

2:1 5:1 5:1 6.250:1 6:1 2:1

L690+00 RT
SS-5

5
6
6
7
8
7

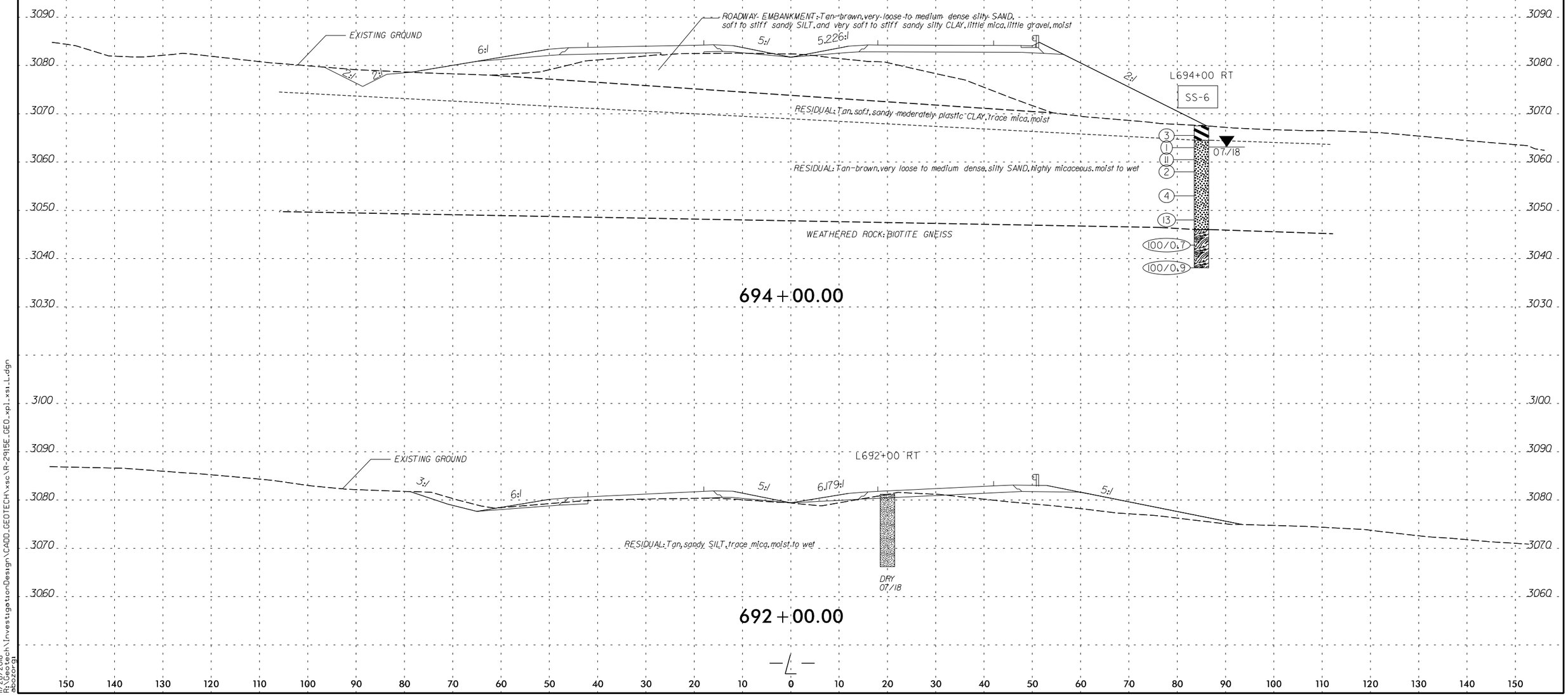
-RESIDUAL: Tan, loose, silty SAND, little to some mica, moist-

DRY
07/18

690+00.00

SOIL TEST RESULTS

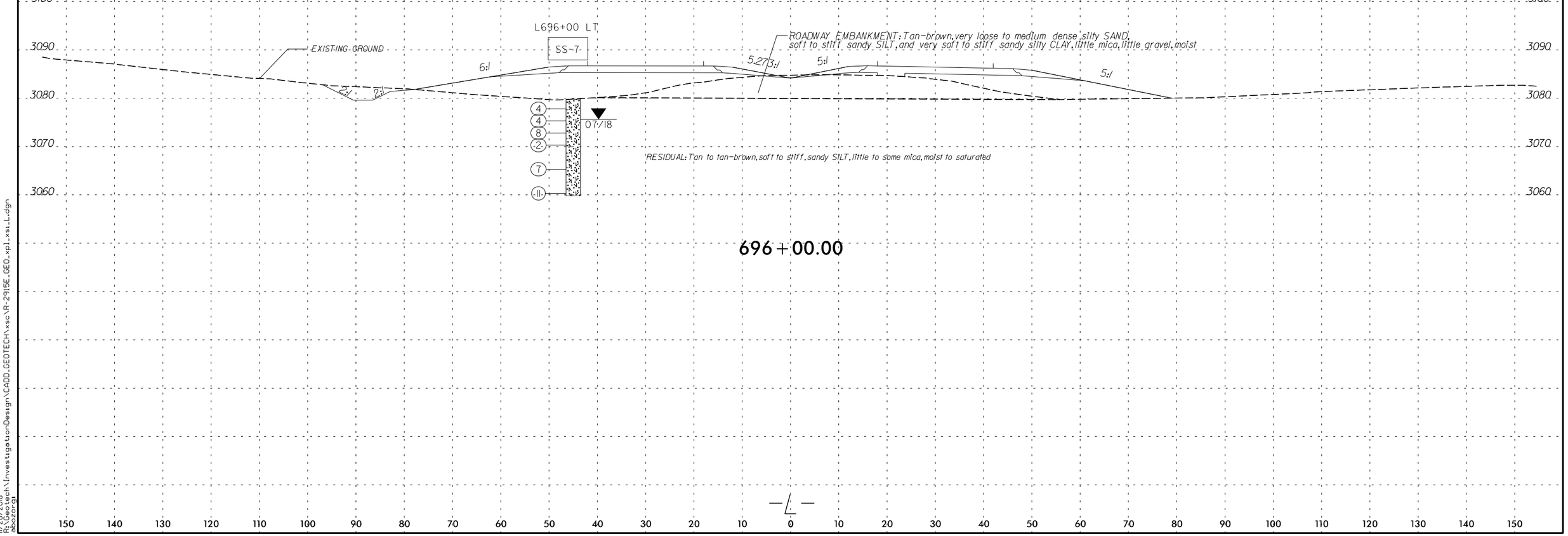
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-6	694+00	85' RT	1.0-2.5	A-7-5(13)	55	23	15	25	20	40	93	85	60	31	N/A



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

SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-7	696+00	45' LT	3.5-5.0	A-5(3)	53	10	15	46	23	16	92	87	45	39	N/A



6/23/18

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2915E	28

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

3100
3090
3080
3070

L698+00 LT

8:1 2:1 2:1

EXISTING GROUND

07/18

RESIDUAL: Tan, sandy SILT, wet to saturated

6.25%

5:1

4.34:1

ROADWAY EMBANKMENT: Tan-brown, very loose to medium dense silty SAND, soft to stiff sandy SILT, and very soft to stiff sandy silty CLAY, little mica, little gravel, moist

698+00.00

—L—

3100
3090
3080
3070

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

11/28/2018
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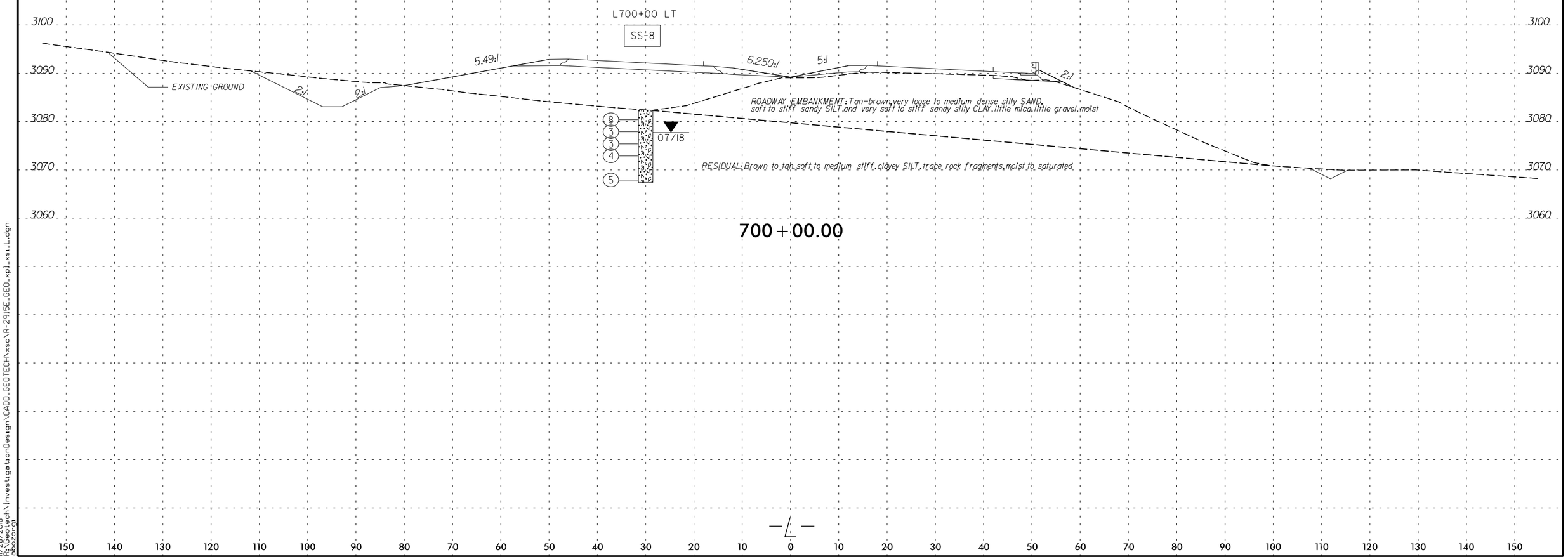
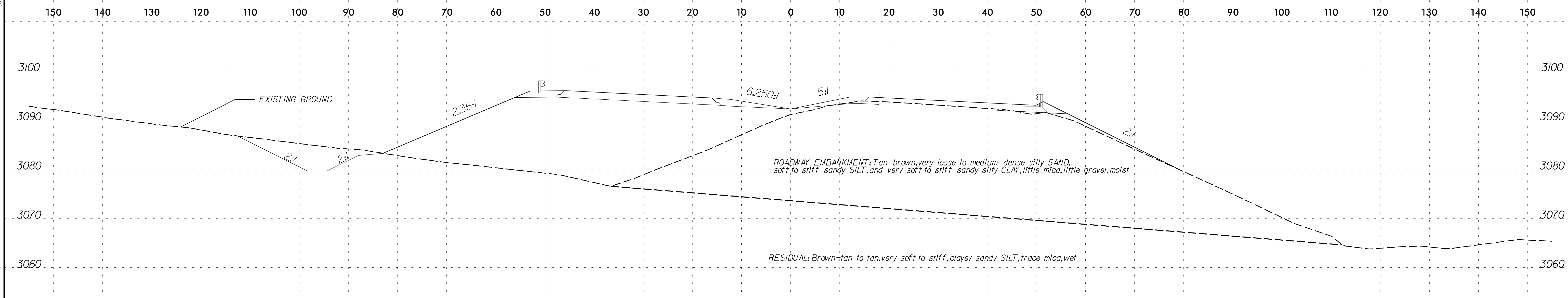
SOIL TEST RESULTS

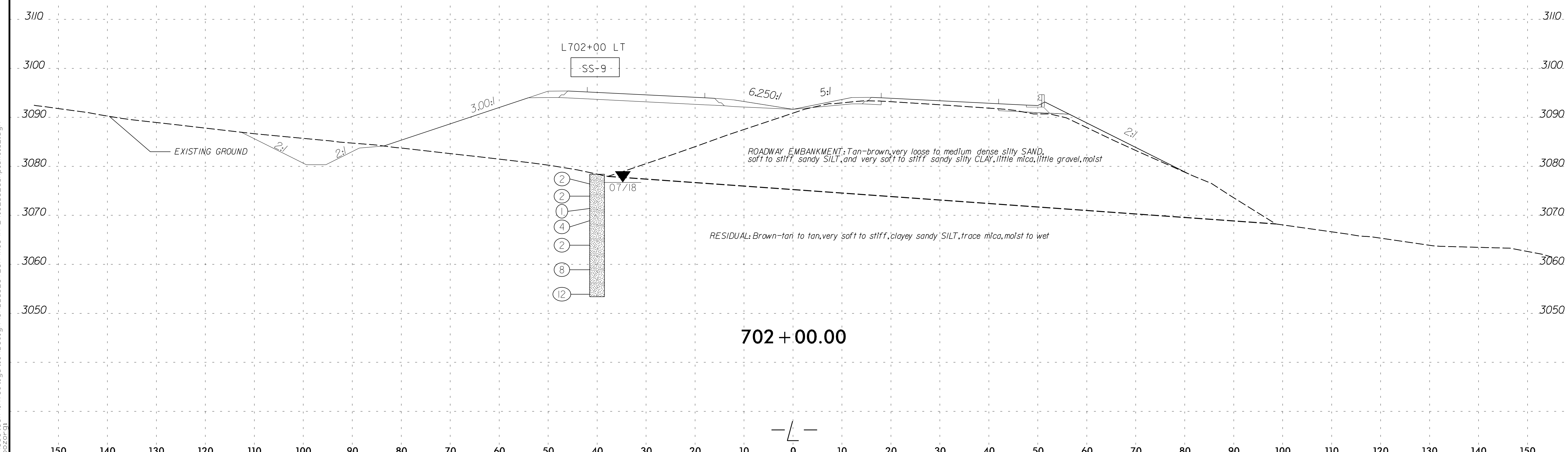
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-8	700+00	30' LT	3.5-5.0	A-5(7)	56	9	12	36	36	16	100	94	61	67	N/A





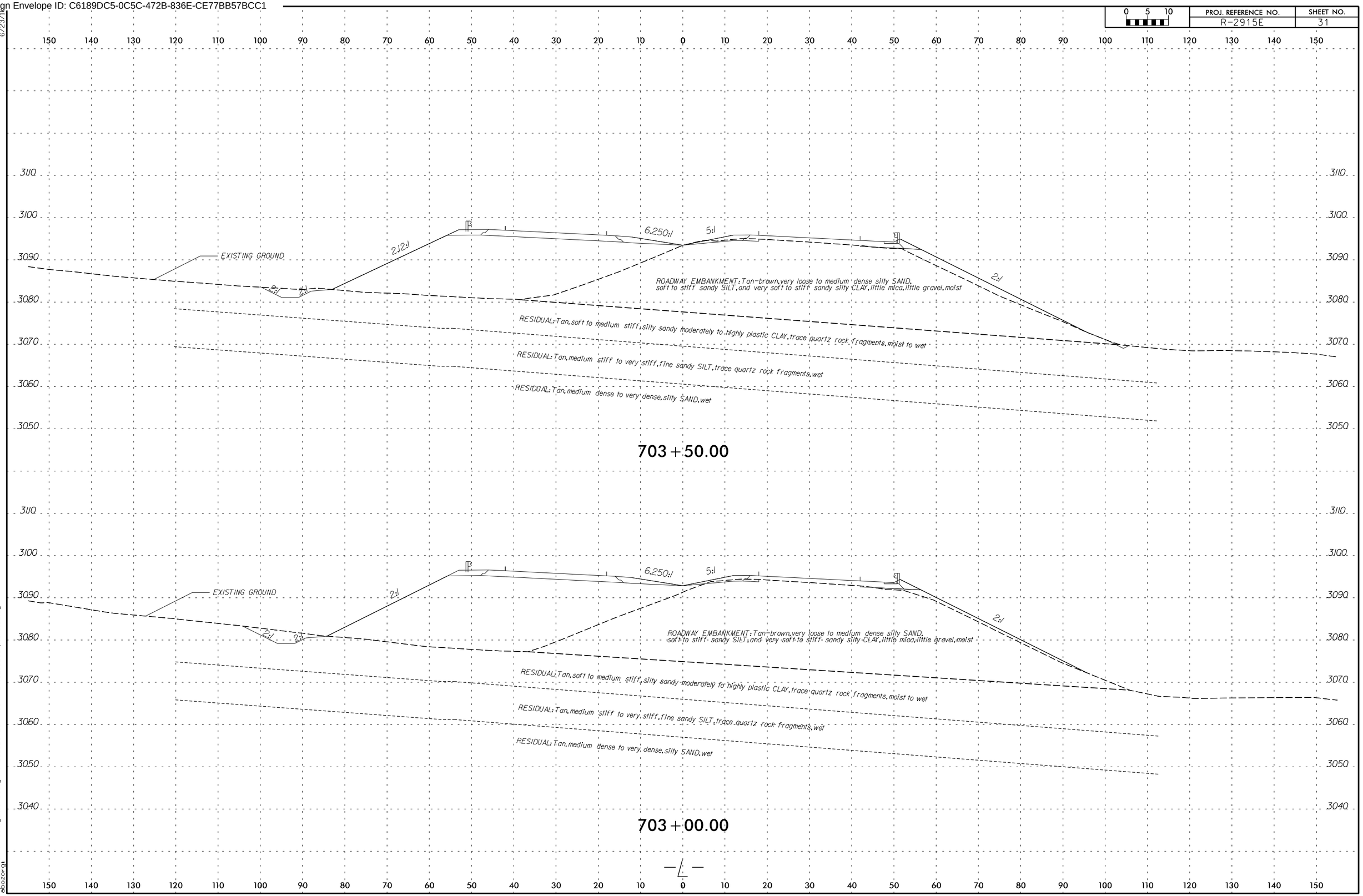
702 + 50.00

SOIL TEST RESULTS															
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-9	702+00	40' LT	1.0-2.5	A-4(2)	36	4	8	38	10	44	100	97	61	22	N/A

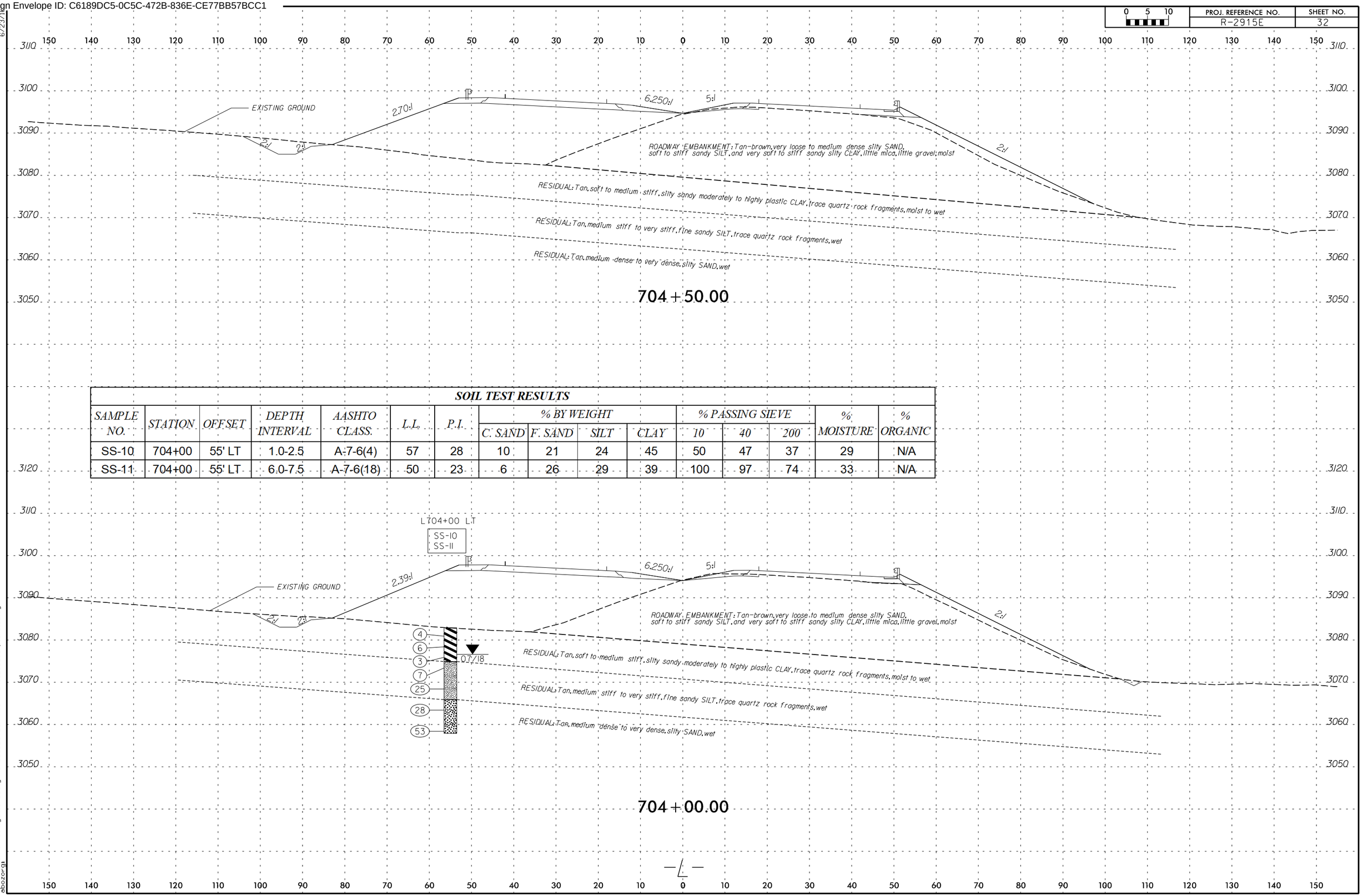


702 + 00.00

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2915E	31



PROJ. REFERENCE NO.	SHEET NO.
R-2915E	32

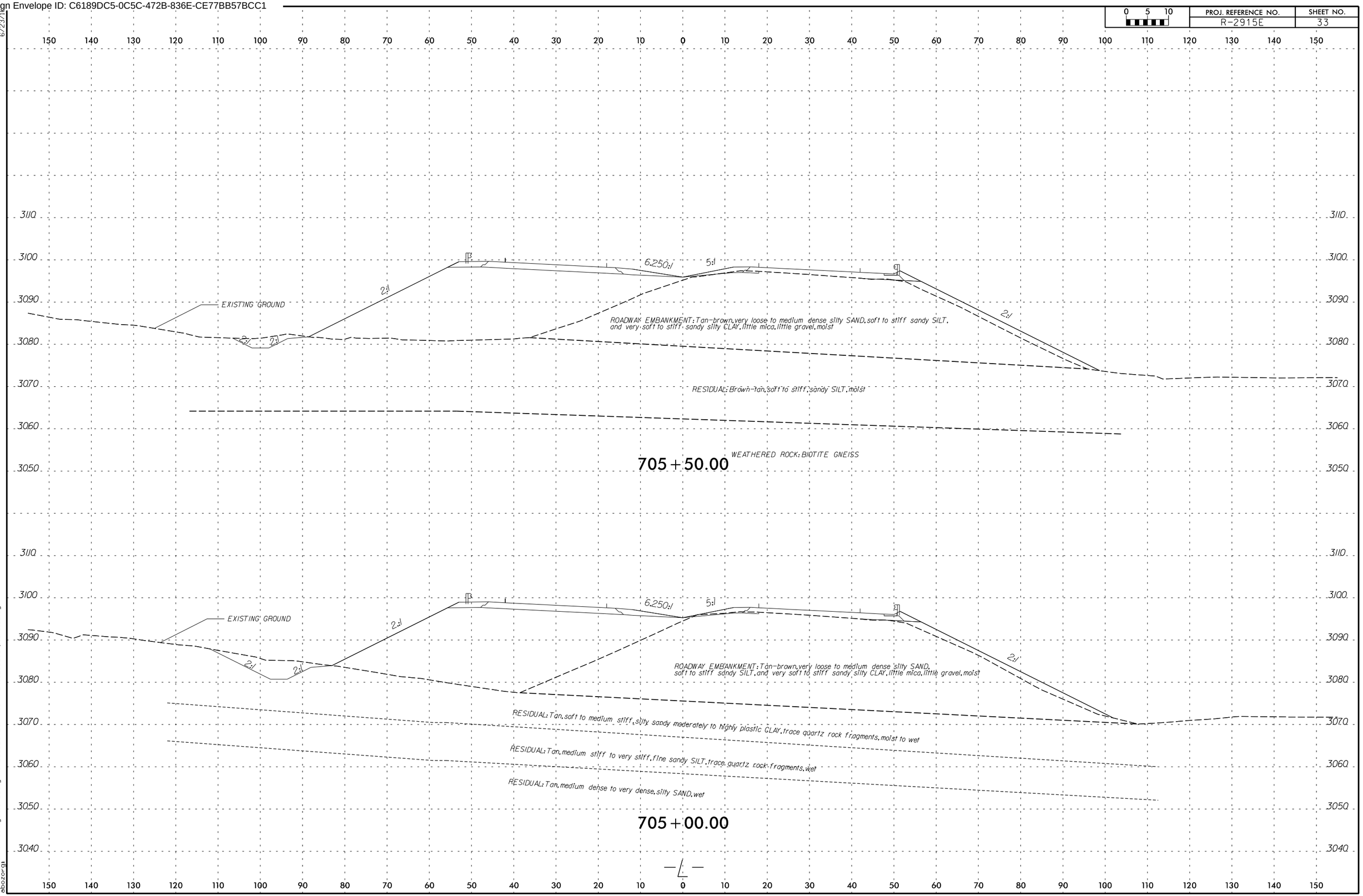


SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-10	704+00	55' LT	1.0-2.5	A-7-6(4)	57	28	10	21	24	45	50	47	37	29	N/A
SS-11	704+00	55' LT	6.0-7.5	A-7-6(18)	50	23	6	26	29	39	100	97	74	33	N/A

PROJ. REFERENCE NO.	SHEET NO.
R-2915E	33

0 5 10



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11/28/2018
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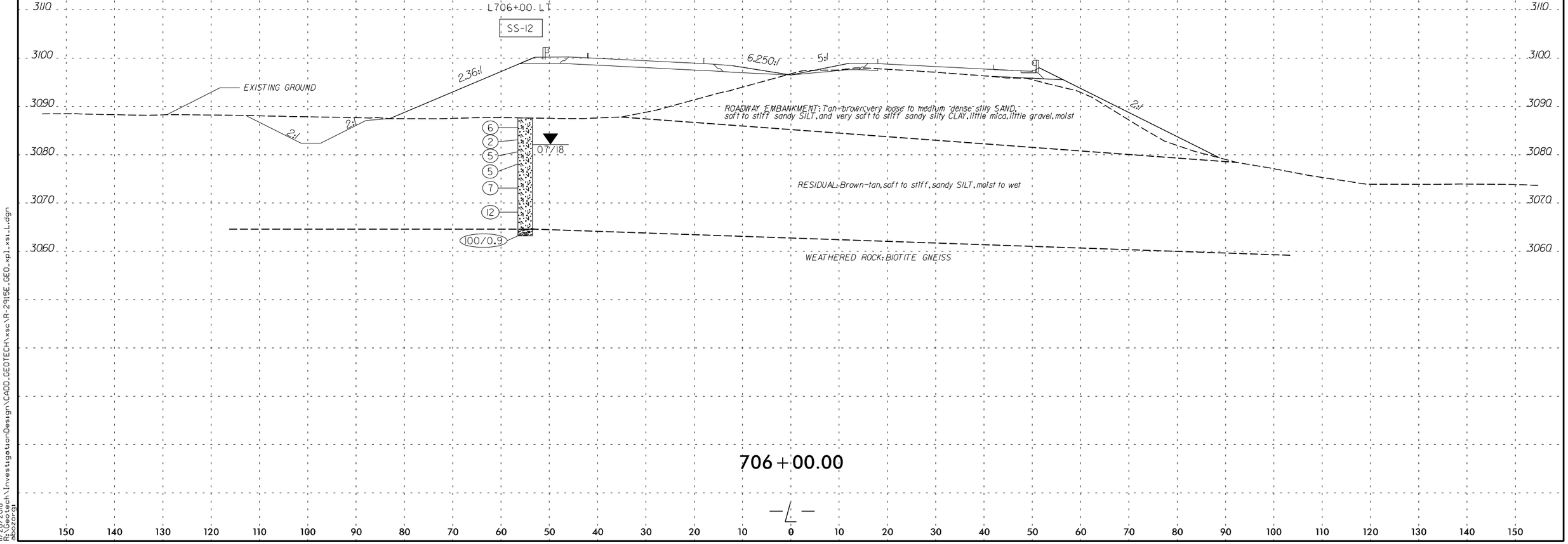
ab.corgil

SOIL TEST RESULTS

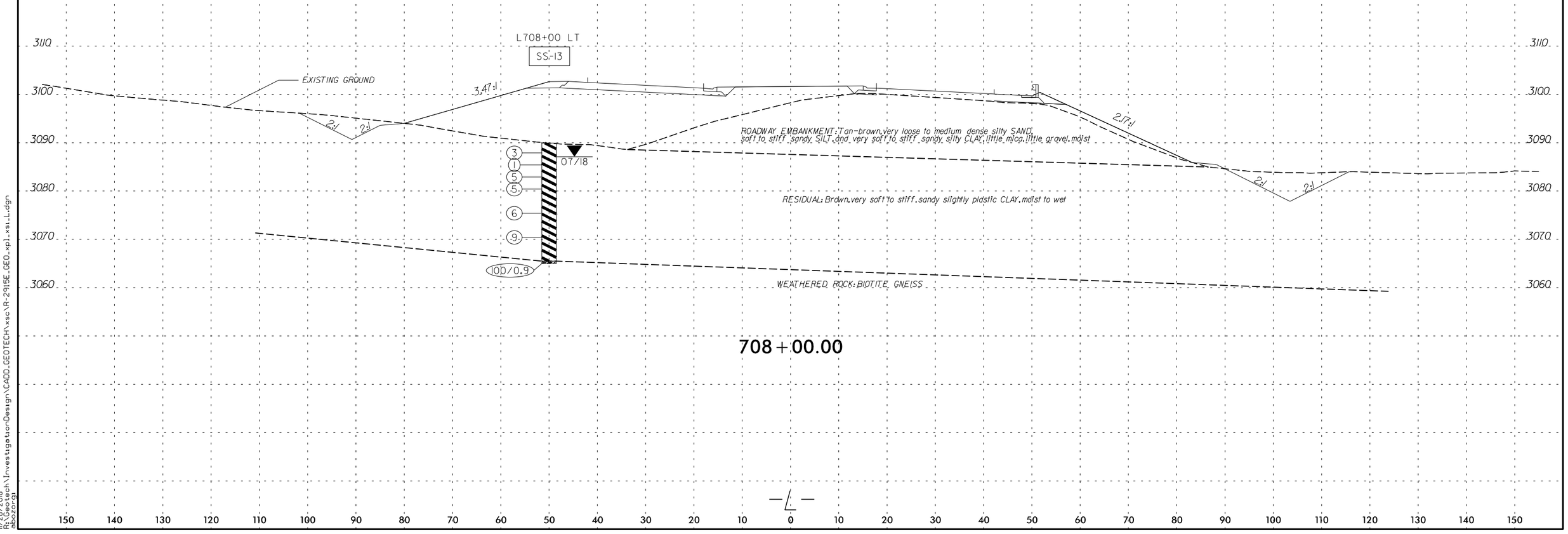
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-12	706+00	55' LT	3.5-5.0	A-5(0)	42	0	23	45	23	9	100	88	41	59	N/A



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

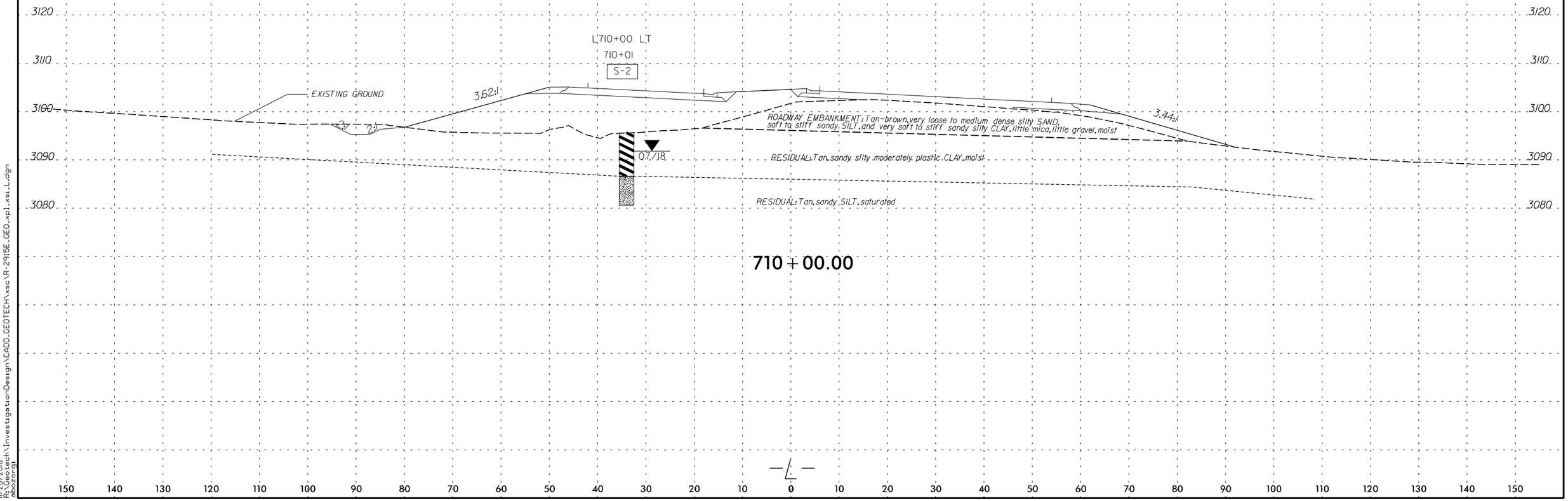
SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-13	708+00	50' LT	3.5-5.0	A-7-5(7)	46	13	16	29	28	27	96	87	59	55	N/A



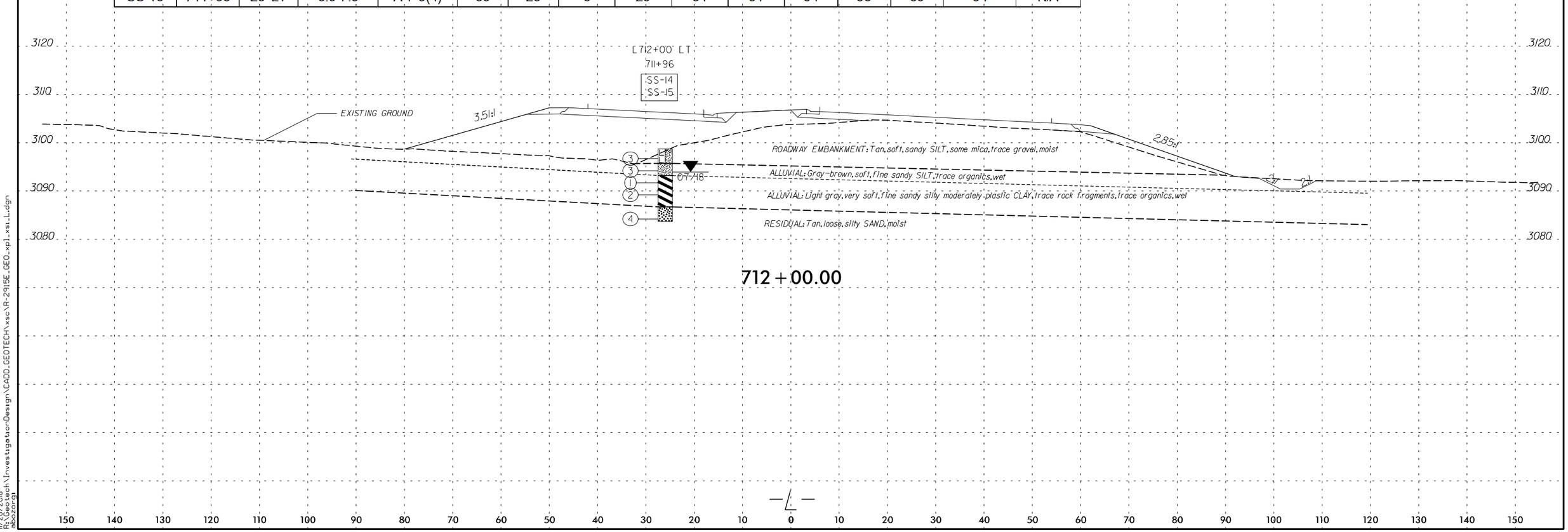
SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-2	710+01	34' LT	1.0-3.5	A-7-6(15)	50	24	11	26	21	42	98	92	67	34	N/A



SOIL TEST RESULTS

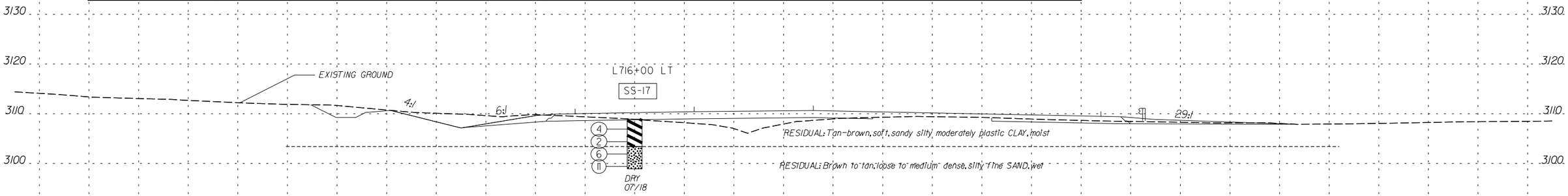
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-14	711+96	26' LT	3.5-5.0	A-4(3)	34	8	13	34	27	26	97	89	58	32	N/A
SS-15	711+96	26' LT	6.0-7.5	A-7-5(4)	55	23	6	29	34	31	54	53	39	54	N/A



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

SOIL TEST RESULTS

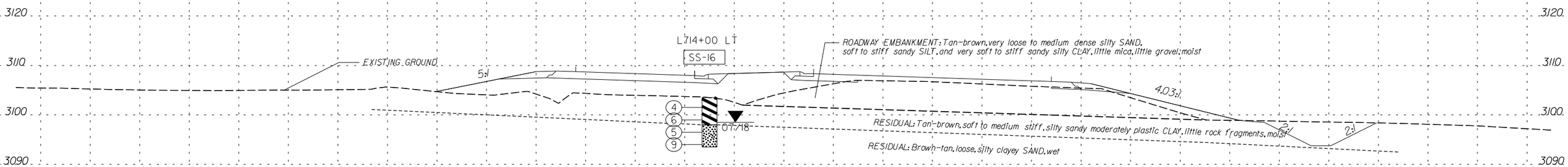
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-17	716+00	30' LT	1.0-2.5	A-7-5(11)	49	18	13	29	20	38	100	93	65	34	N/A



716+00.00

SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-16	714+00	15' LT	1.0-2.5	A-7-6(10)	43	19	9	33	20	38	100	96	62	33	N/A

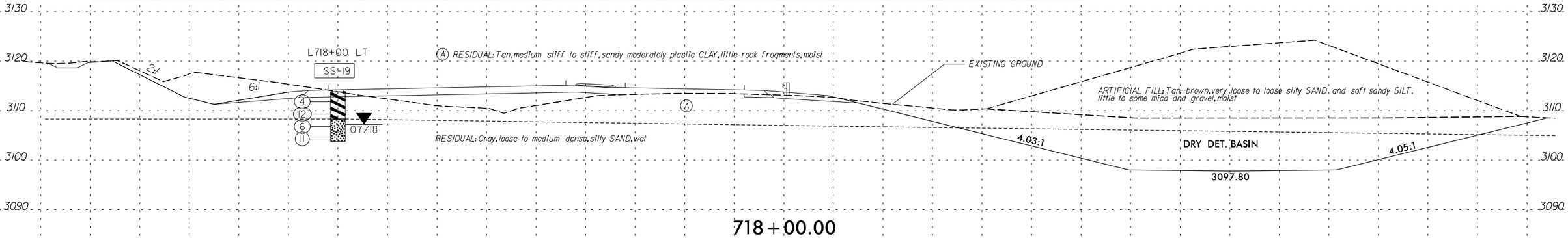


714+00.00

100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200

SOIL TEST RESULTS

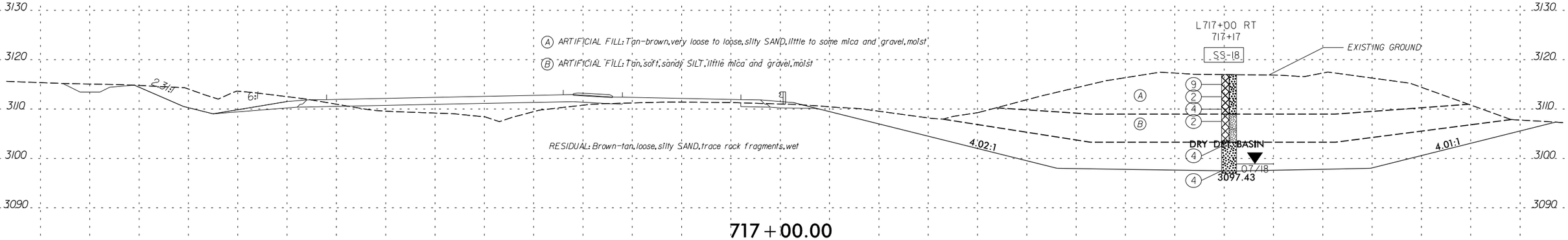
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-19	718+00	40' LT	1.0-2.5	A-7-6(8)	41	22	10	49	29	12	97	93	51	28	N/A



718+00.00

SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-18	717+17	141' RT	3.5-5.0	A-2-5(0)	47	8	27	45	14	14	92	77	32	25	N/A



717+00.00

100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200

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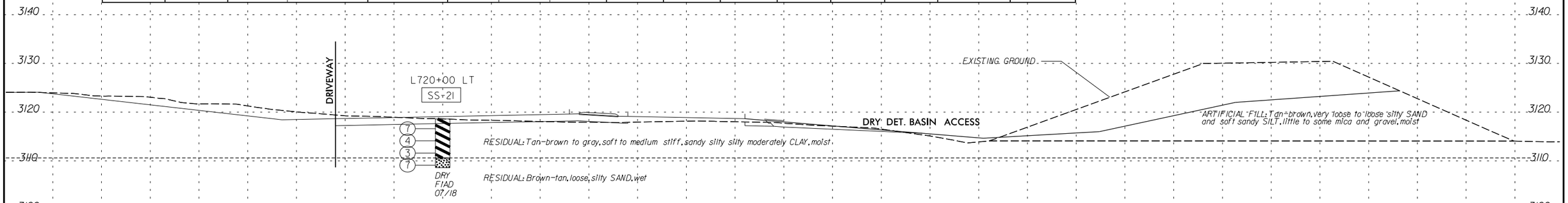
100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200

SOIL TEST RESULTS

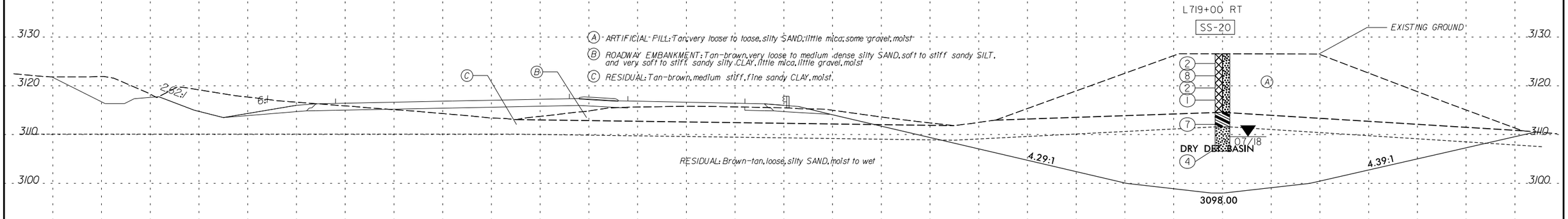
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-21	720+00	20' LT	3.5-5.0	A-7-6(15)	44	22	5	29	22	44	100	98	72	28	N/A



720+00.00

SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-20	719+00	140' RT	1.0-2.5	A-2-5(0)	47	0	26	45	14	15	86	73	32	24	N/A



719+00.00

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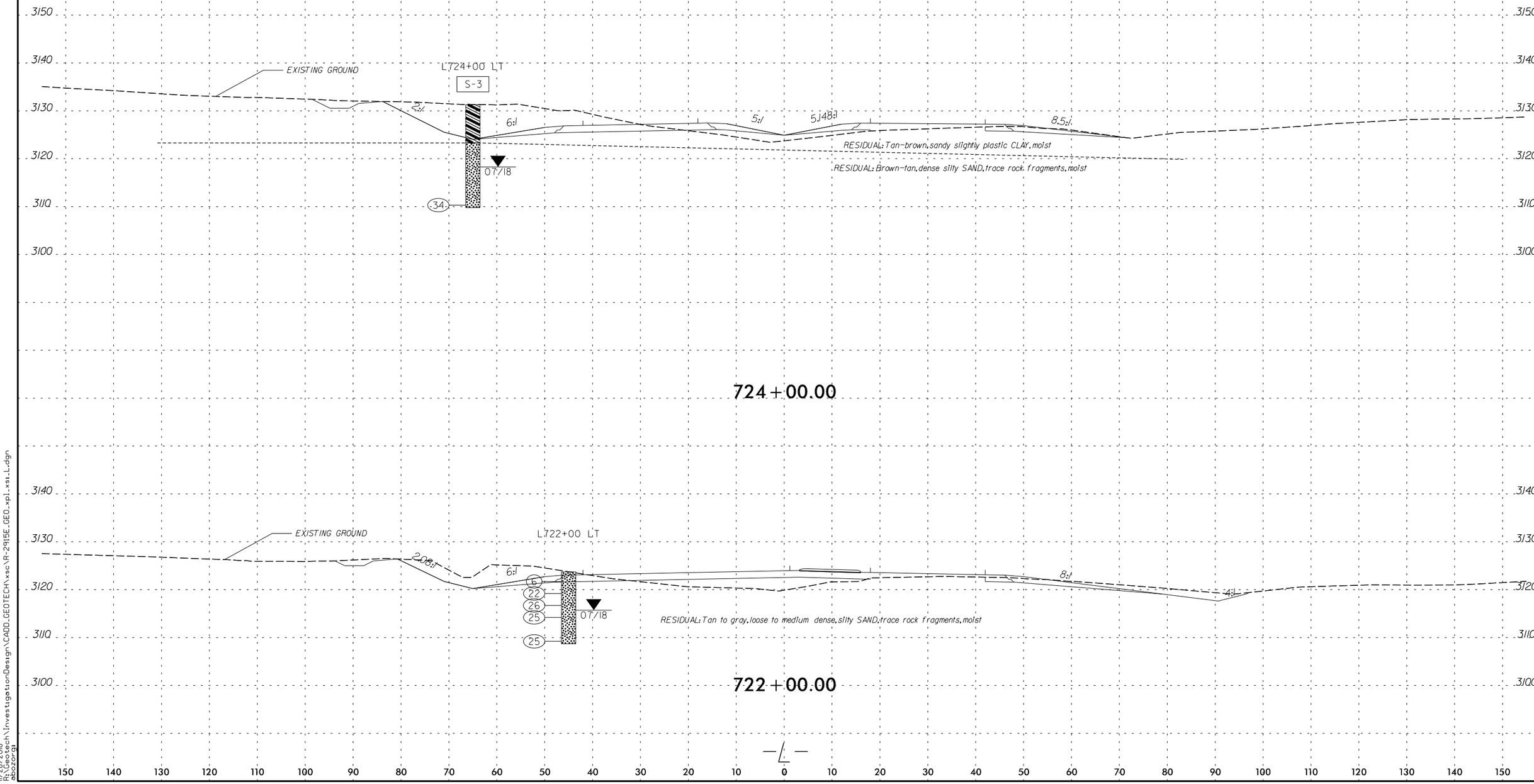
abozorgi

100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200

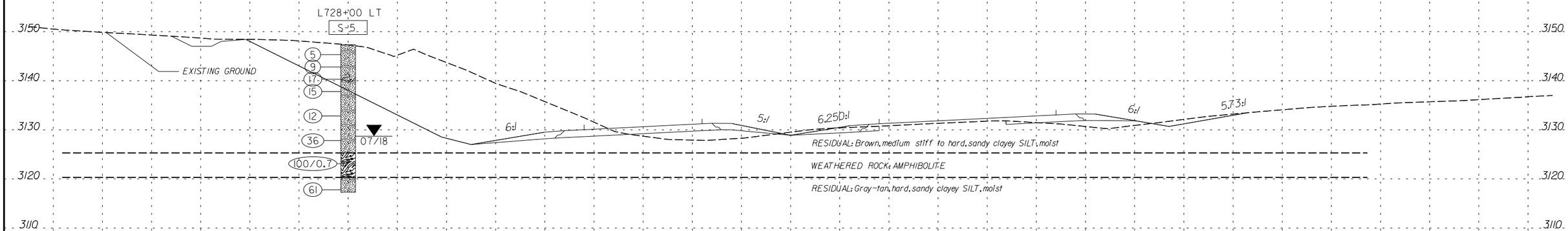
SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-3	724+00	65' LT	1.0-3.5	A-6(10)	40	15	3	36	25	36	99	99	69	26	N/A



SOIL TEST RESULTS

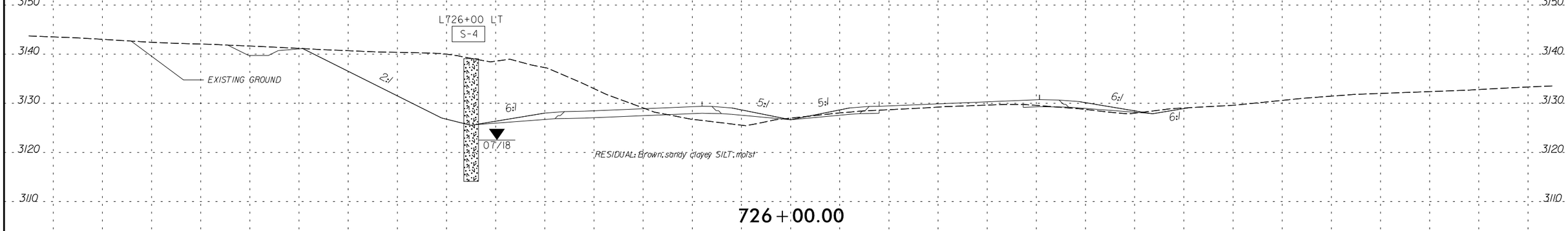
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-5	728+00	90' LT	5.0-15.0	A-4(1)	30	7	16	42	19	23	100	95	50	24	N/A



728+00.00

SOIL TEST RESULTS

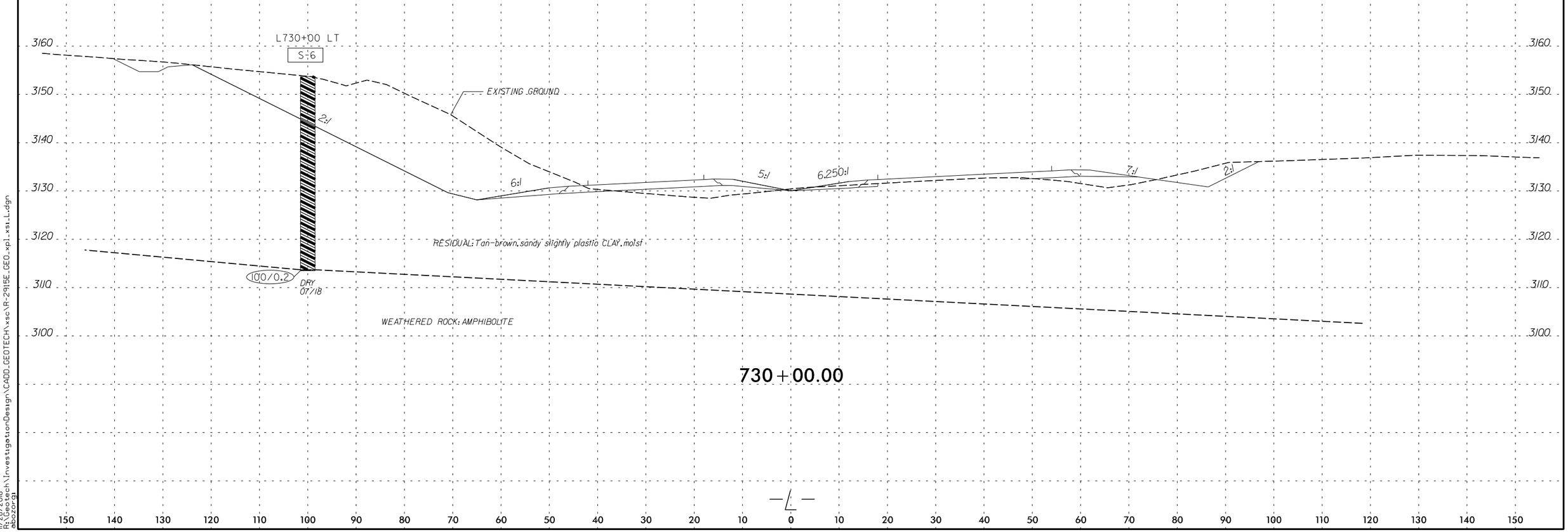
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-4	726+00	65' LT	13.0-15.0	A-5(3)	41	5	12	33	31	24	100	94	64	33	N/A



726+00.00

SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-6	730+00	100' LT	3.0-6.0	A-6(3)	32	11	18	38	16	28	100	91	50	20	N/A



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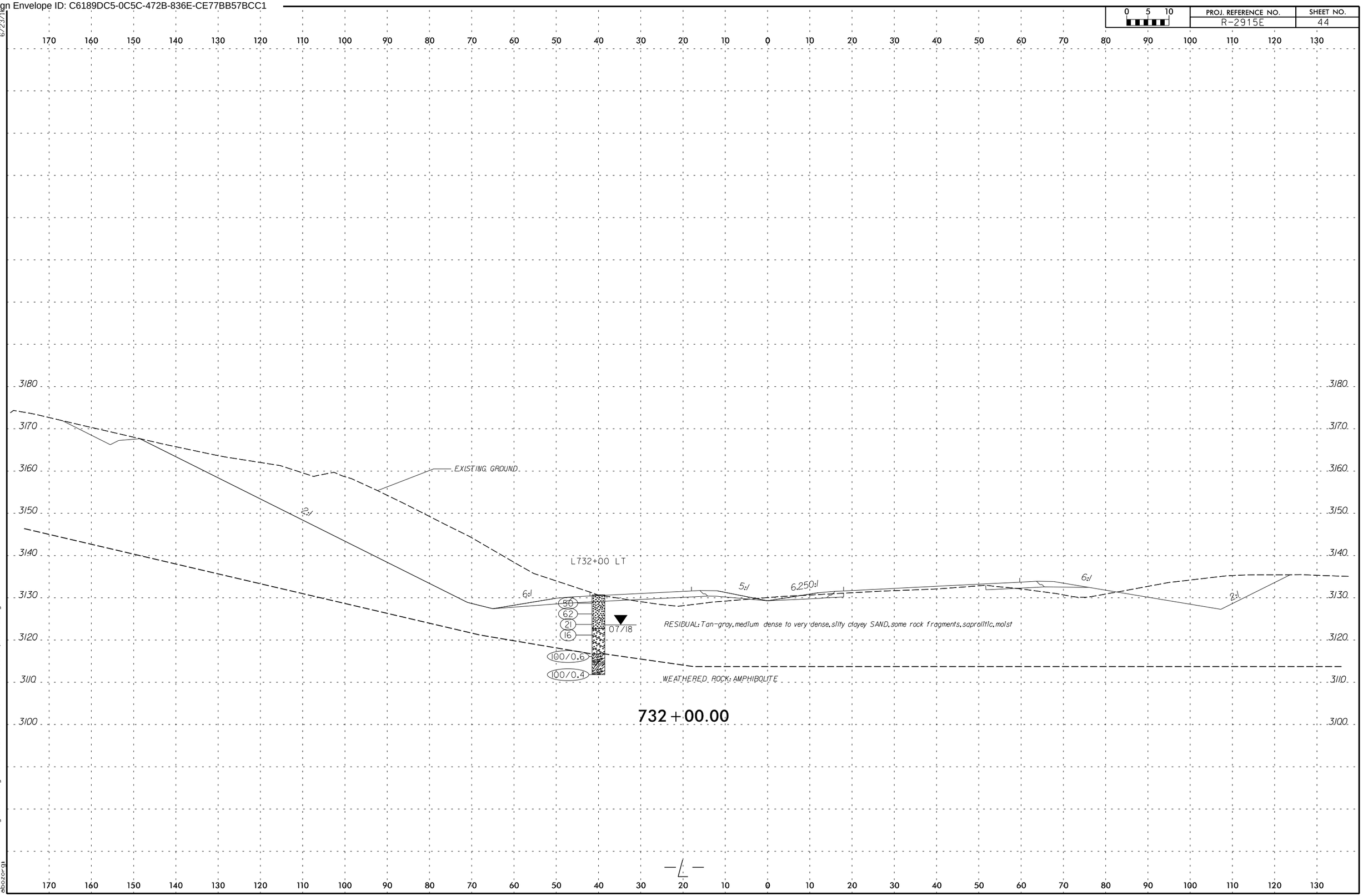
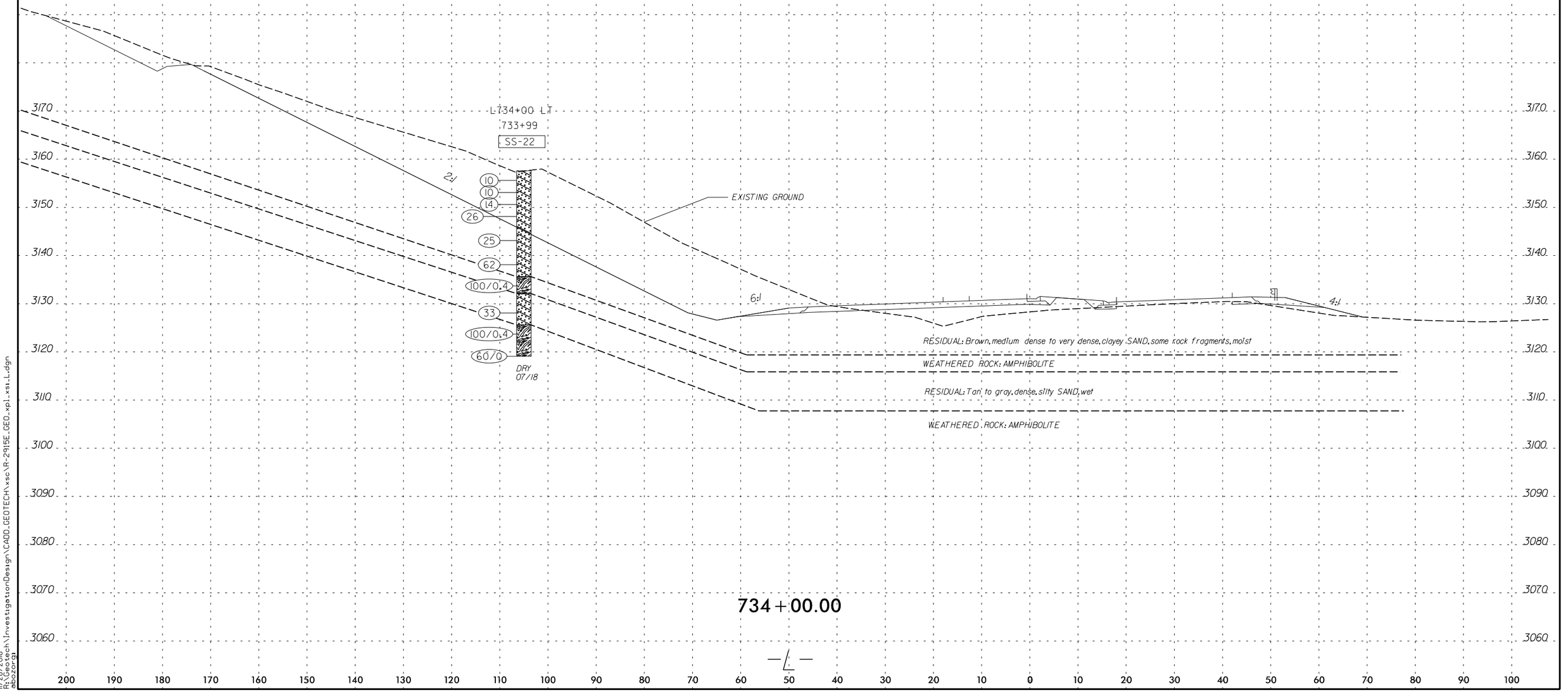
	R-2915E	44



SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-22	733+99	105' LT	6.0-7.5	A-2-4(0)	36	0	15	65	13	7	100	95	31	13	N/A

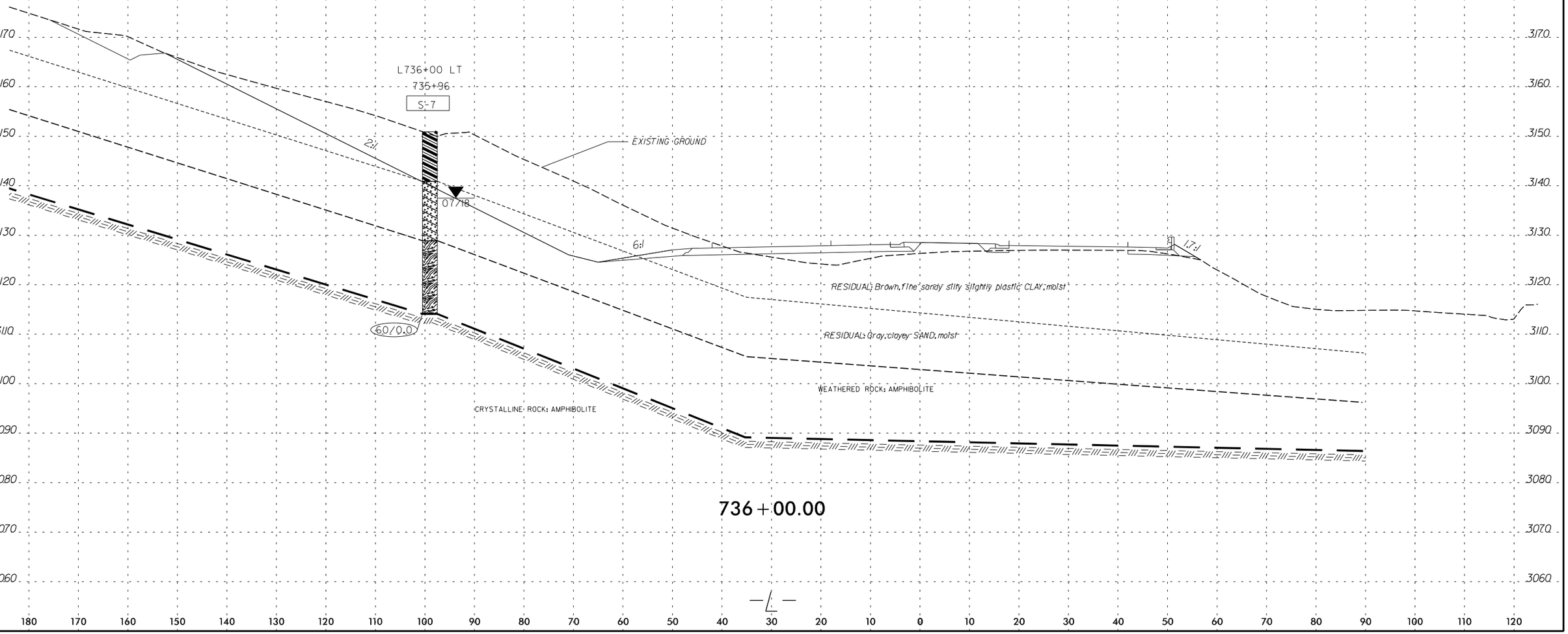


734+00.00

6/23/16

SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-7	735+96	99' LT	1.0-3.5	A-6(6)	38	13	9	34	21	36	96	92	62	27	N/A



736+00.00

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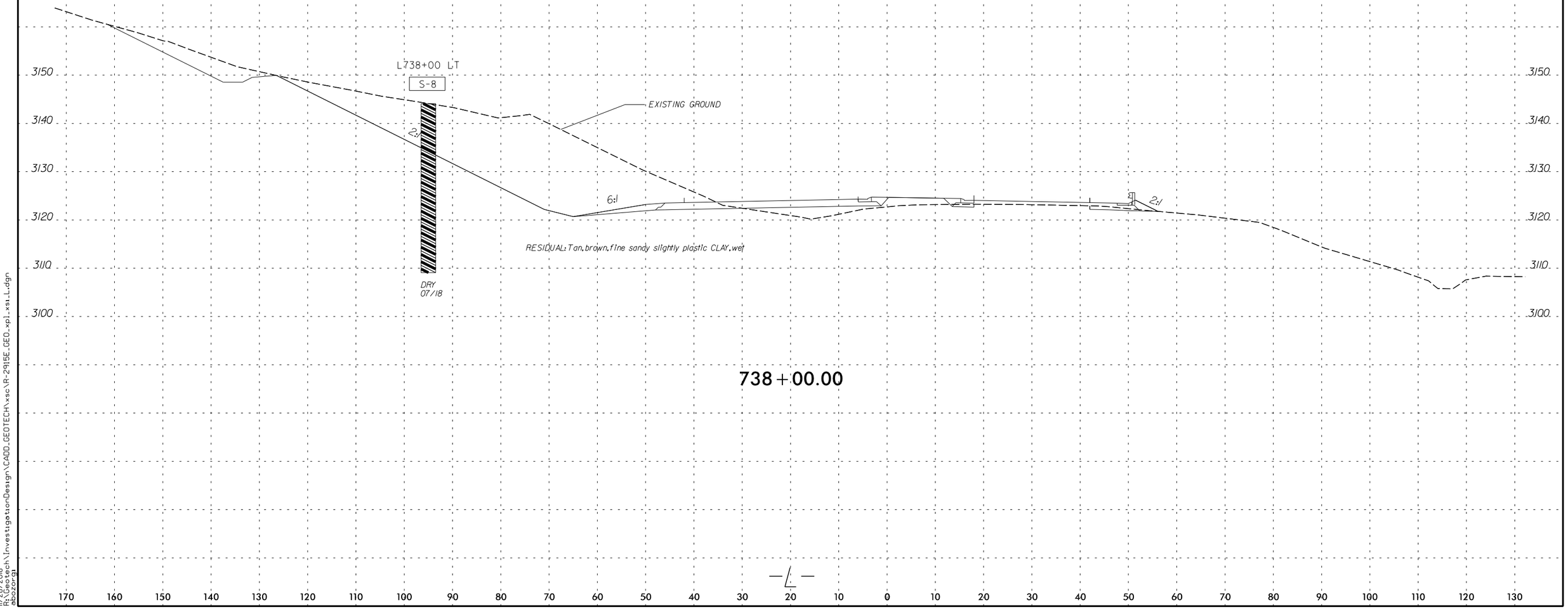
SOIL TEST RESULTS

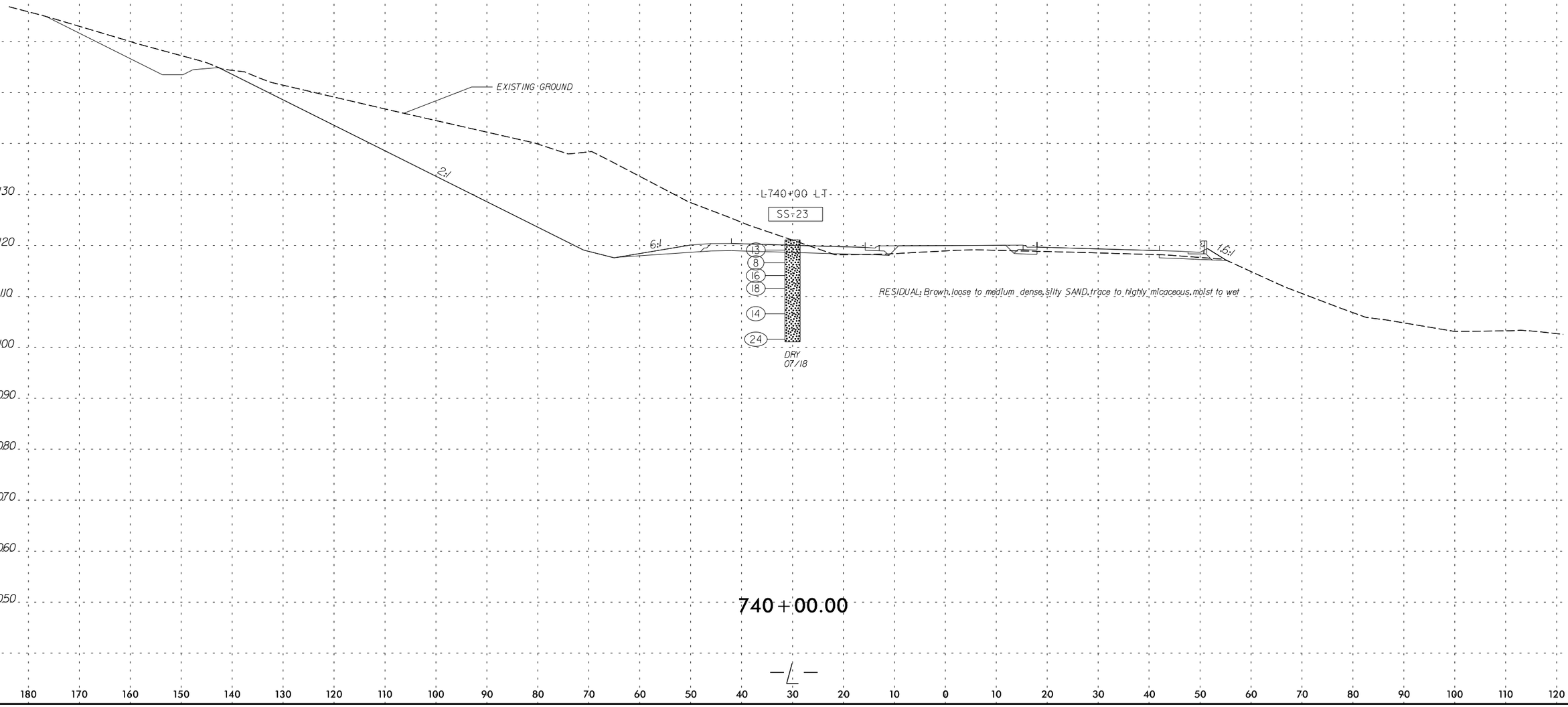
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-8	738+00	95' LT	8.0-10.0	A-6(4)	38	12	10	42	25	23	100	99	54	24	N/A



180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120

SOIL TEST RESULTS

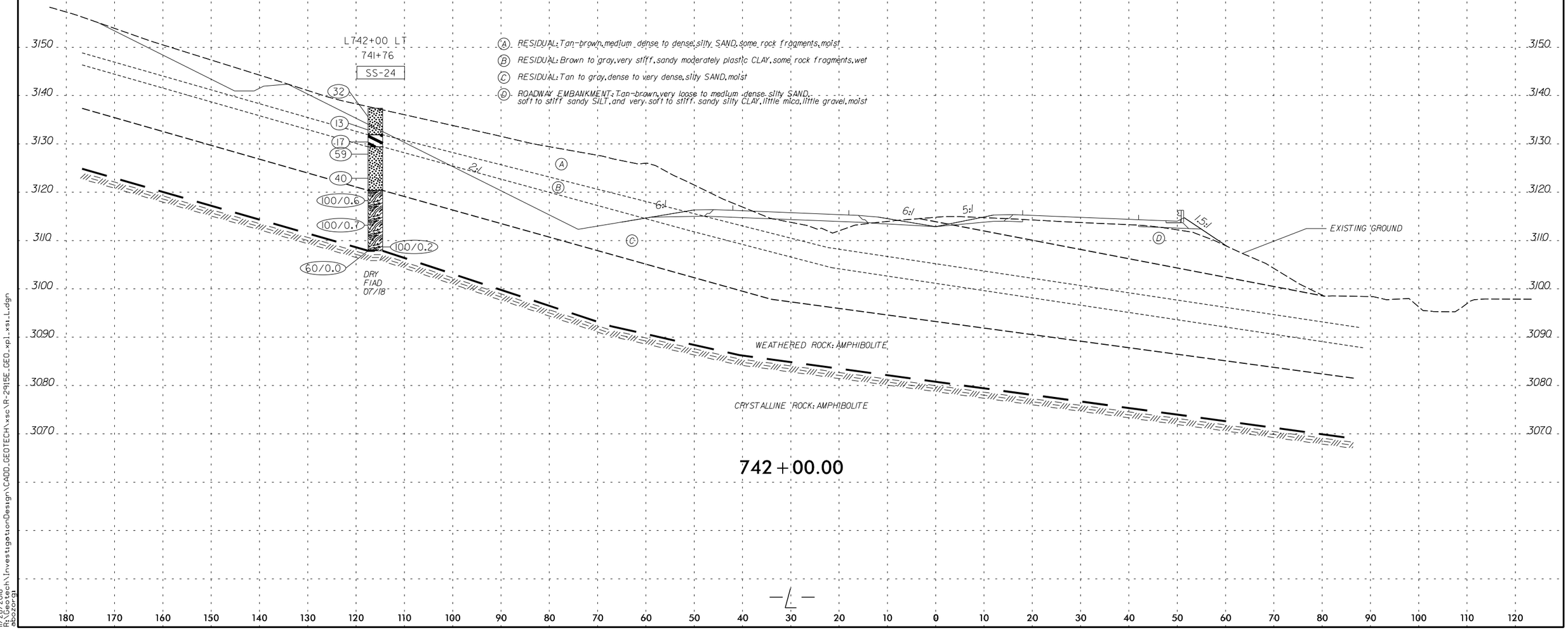
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-23	740+00	30' LT	3.5-5.0	A-2-4(0)	32	0	21	57	16	6	100	97	29	20	N/A



740+00.00

SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-24	741+76	116' LT	6.0-7.5	A-7-6(5)	46	25	17	22	10	51	62	55	41	44	N/A



(A) RESIDUAL: Tan-brown, medium dense to dense, silty SAND, some rock fragments, moist

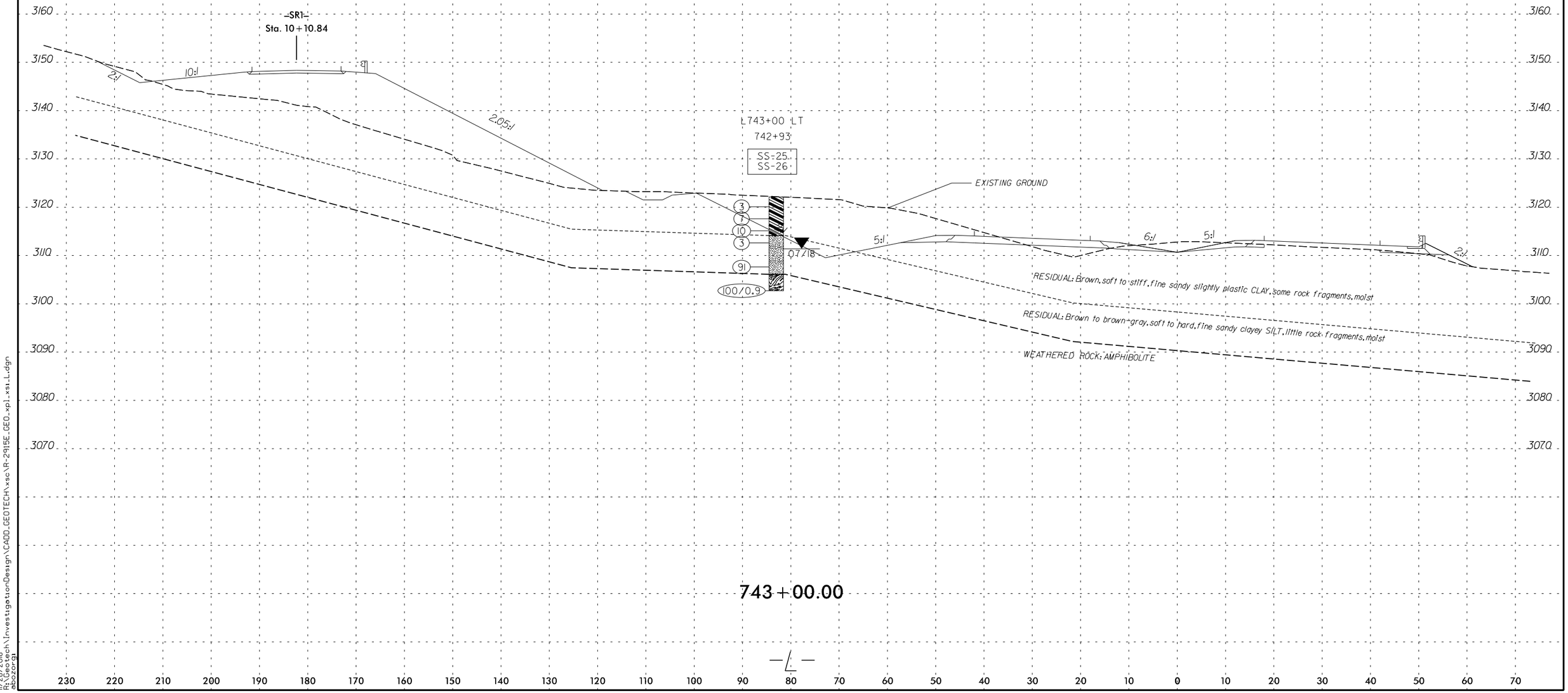
(B) RESIDUAL: Brown to gray, very stiff, sandy moderately plastic CLAY, some rock fragments, wet

(C) RESIDUAL: Tan to gray, dense to very dense, silty SAND, moist

(D) ROADWAY EMBANKMENT: Tan-brown, very loose to medium dense silty SAND, soft to stiff sandy SILT, and very soft to stiff, sandy silty CLAY, little mica, little gravel, moist

SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-25	742+93	83' LT	1.0-2.5	A-6(6)	40	14	8	43	17	32	100	97	57	23	N/A
SS-26	742+93	83' LT	8.5-10.0	A-4(2)	28	9	11	43	18	28	94	90	50	21	N/A



743+00.00

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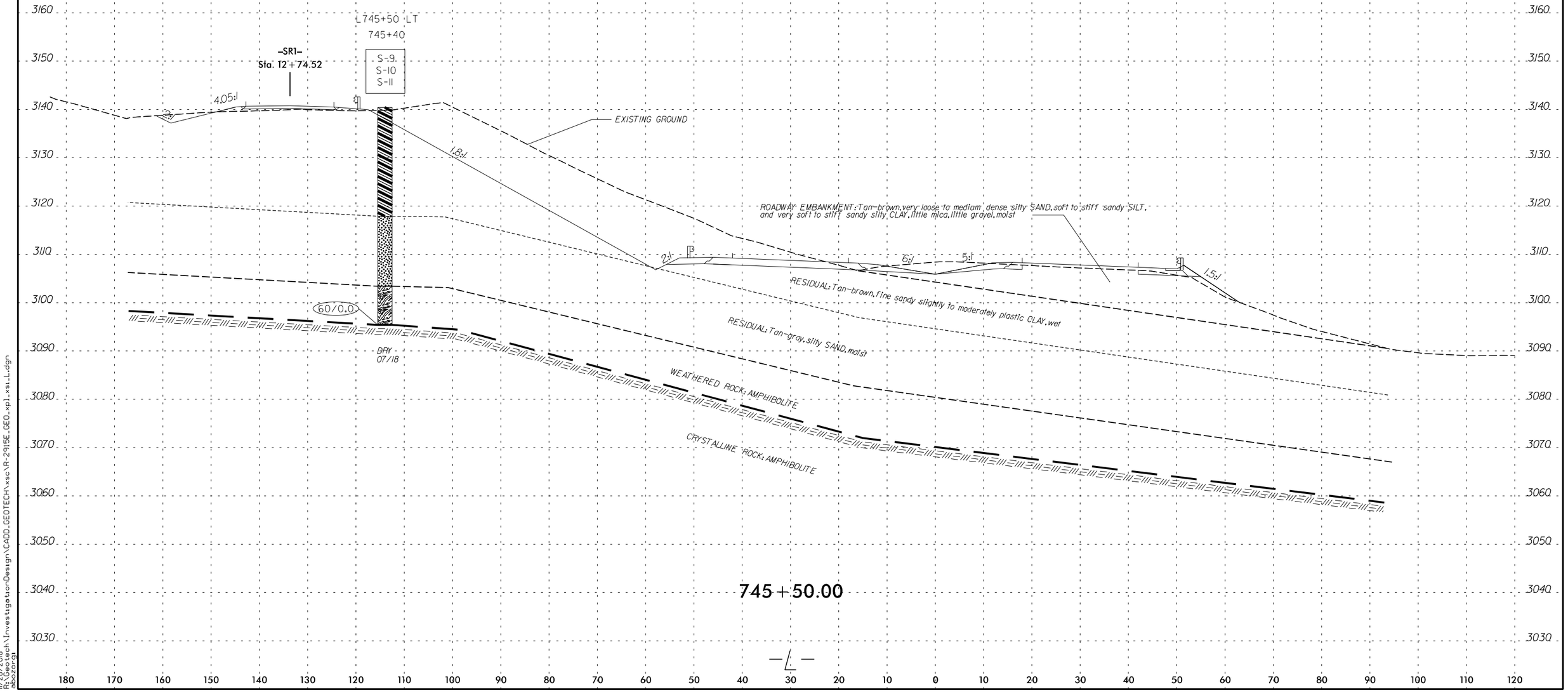
180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120

SOIL TEST RESULTS

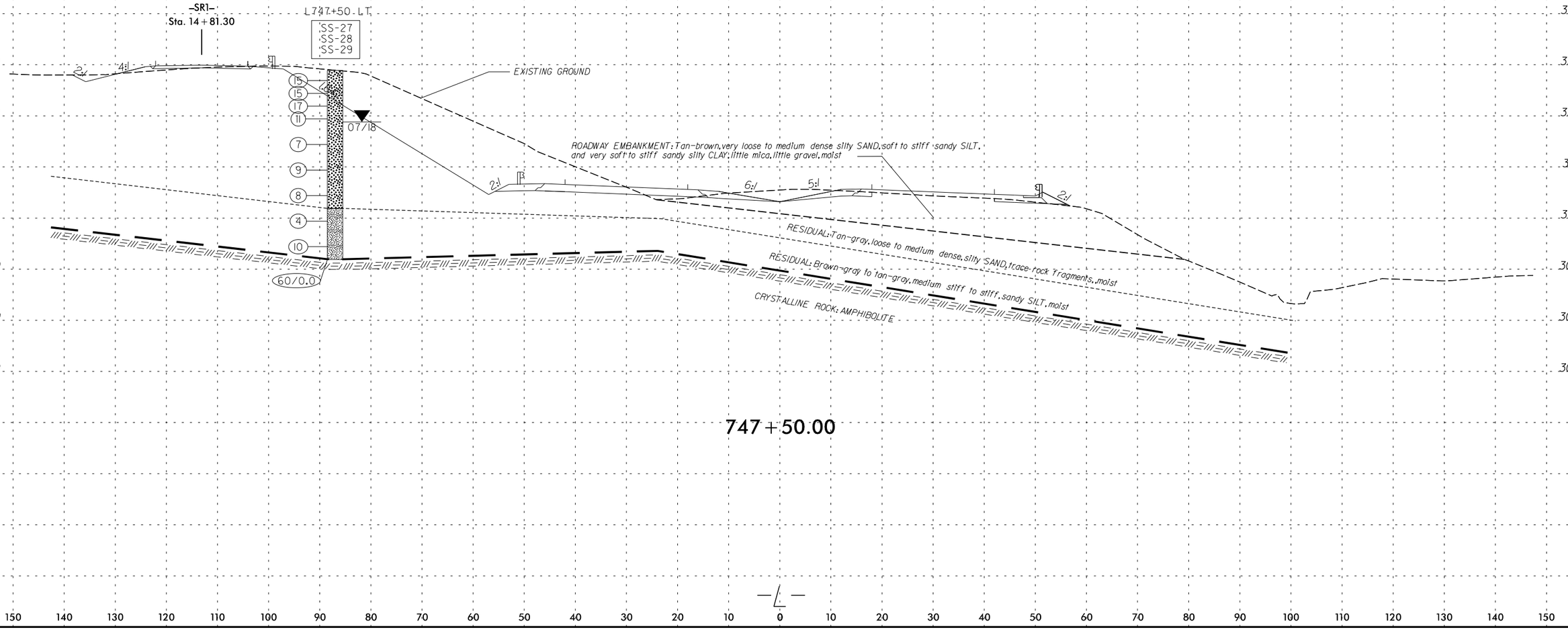
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-9	745+40	114' LT	1.0-15.0	A-6(6)	38	15	13	35	20	32	94	88	55	27	N/A
S-10	745+40	114' LT	10.0-11.0	A-7-6(7)	41	16	11	34	25	30	94	89	58	26	N/A
S-11	745+40	114' LT	21.0-22.0	A-6(6)	37	16	11	41	21	27	100	97	56	25	N/A



745+50.00

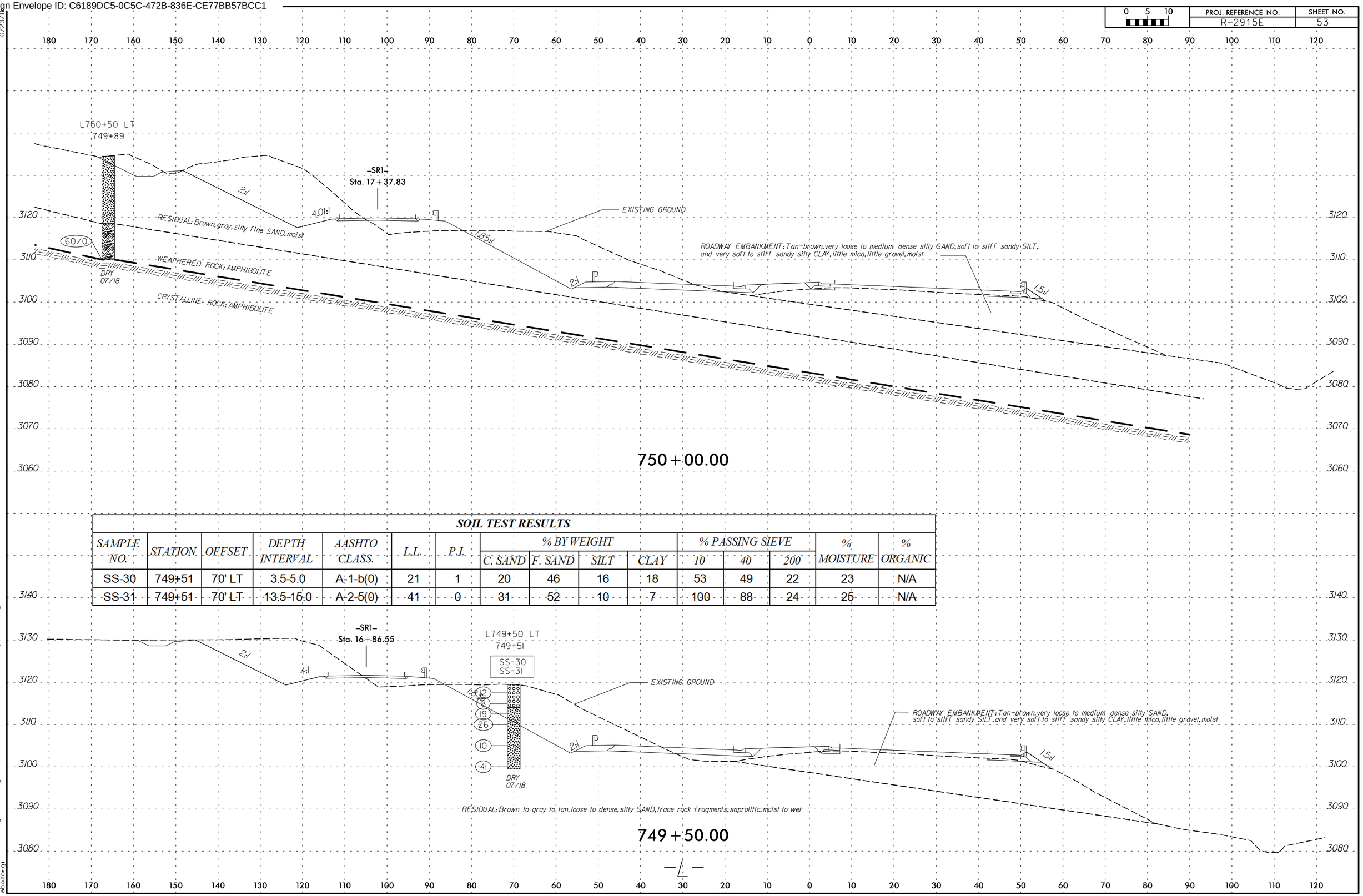
SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-27	747+50	87' LT	3.5-5.0	A-2-4(0)	27	0	28	46	13	13	97	85	31	22	N/A
SS-28	747+50	87' LT	13.5-15.0	A-2-4(0)	23	0	27	49	12	12	98	88	30	18	N/A
SS-29	747+50	87' LT	28.5-30.0	A-4(3)	33	9	11	44	20	25	100	94	54	29	N/A



747+50.00

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2915E	53

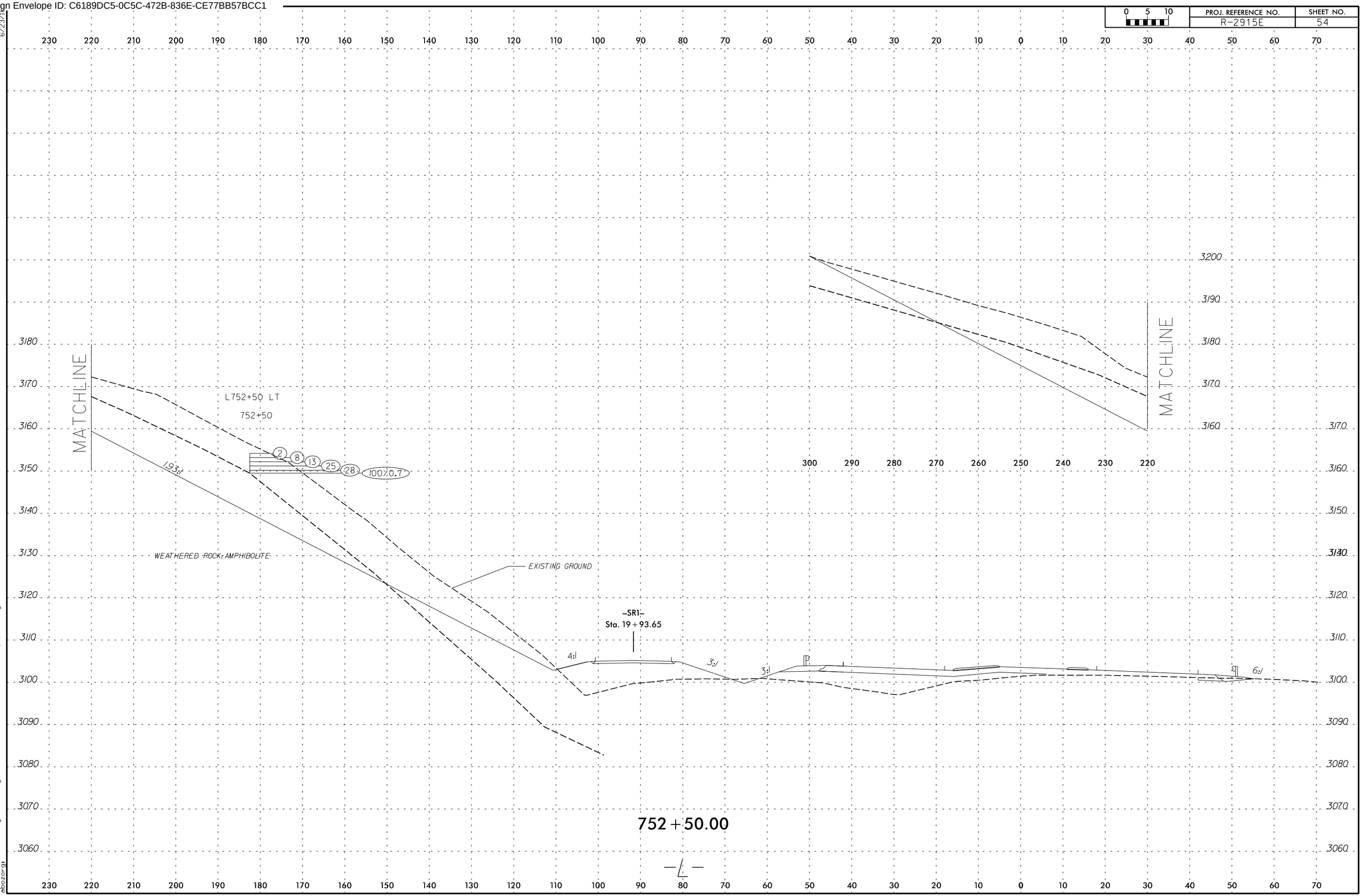


SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-30	749+51	70' LT	3.5-5.0	A-1-b(0)	21	1	20	46	16	18	53	49	22	23	N/A
SS-31	749+51	70' LT	13.5-15.0	A-2-5(0)	41	0	31	52	10	7	100	88	24	25	N/A

PROJ. REFERENCE NO.	SHEET NO.
R-2915E	54

0 5 10



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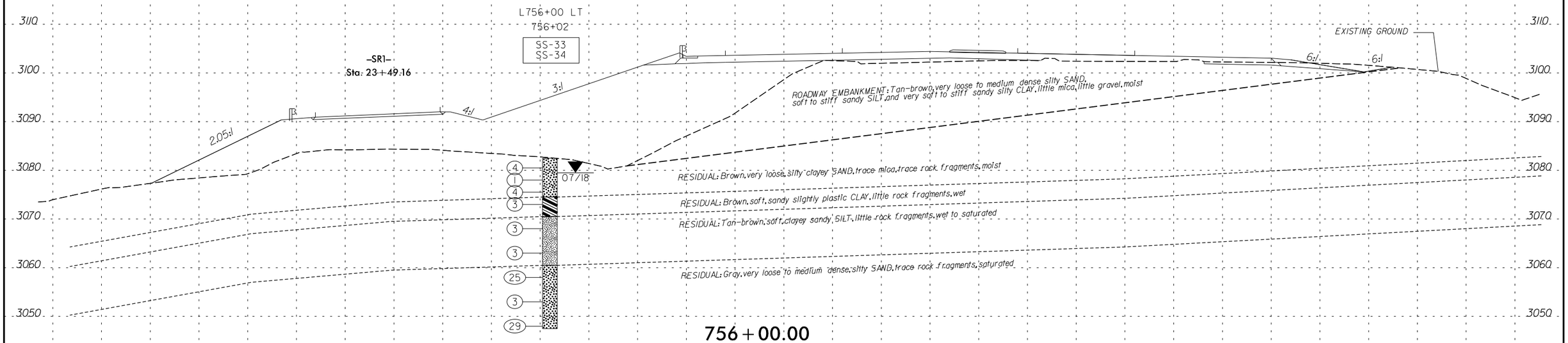
180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120

SOIL TEST RESULTS

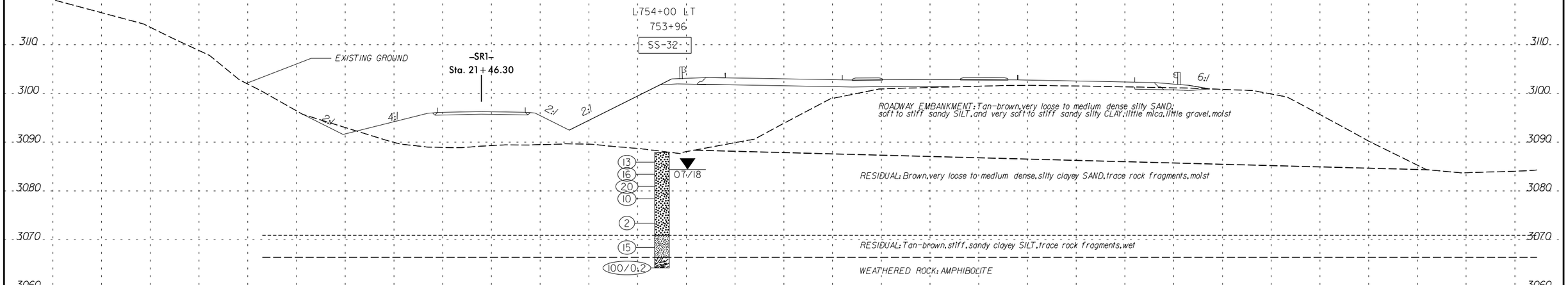
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-33	756+02	78' LT	3.5-5.0	A-2-4(0)	33	0	25	45	17	13	88	77	32	22	N/A
SS-34	756+02	78' LT	8.5-10.0	A-6(3)	38	14	19	37	14	30	88	78	45	40	N/A



756+00.00

SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-32	753+96	55' LT	13.5-15.0	A-4(3)	34	10	13	39	19	29	99	94	55	28	N/A



754+00.00

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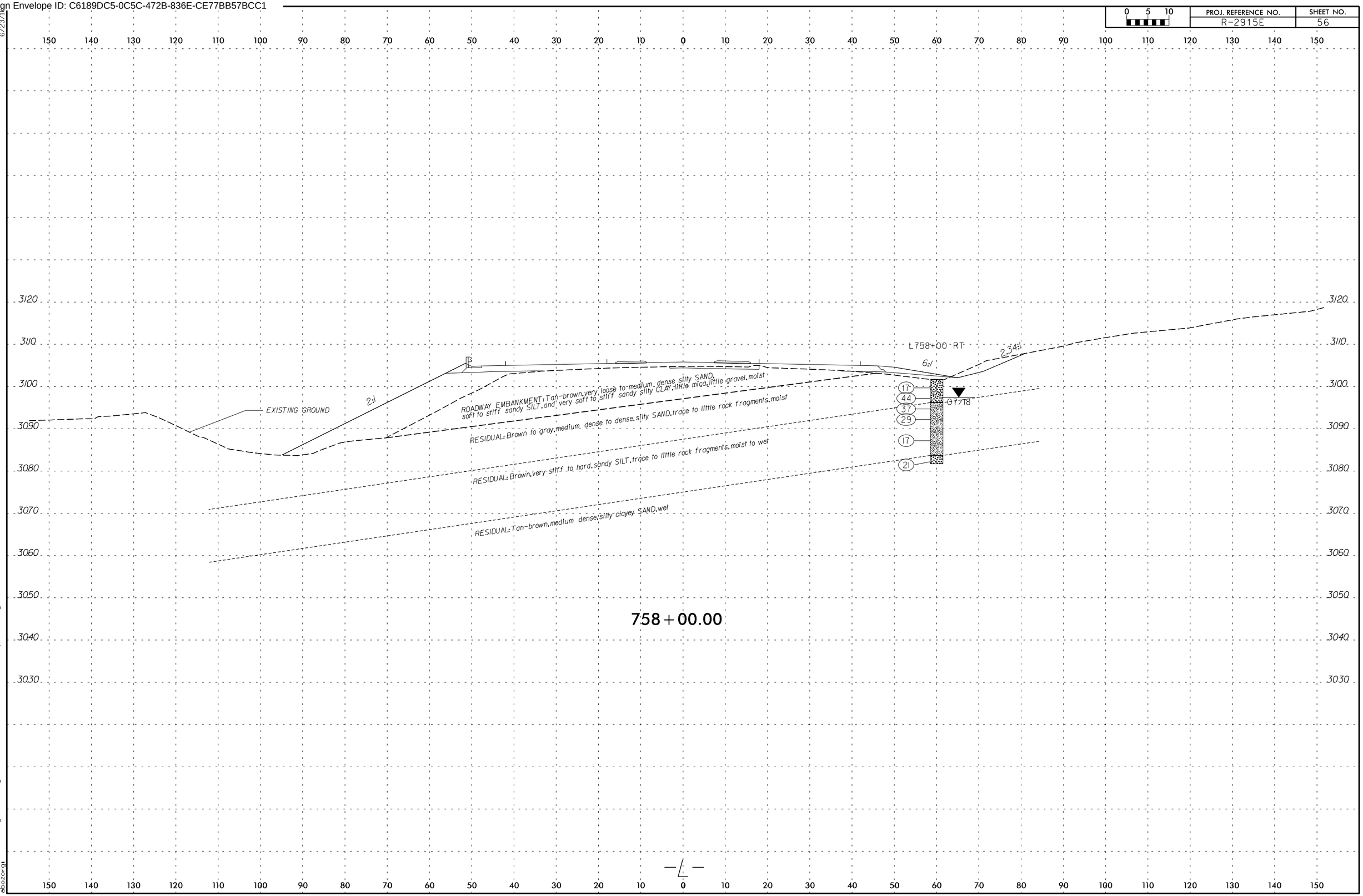
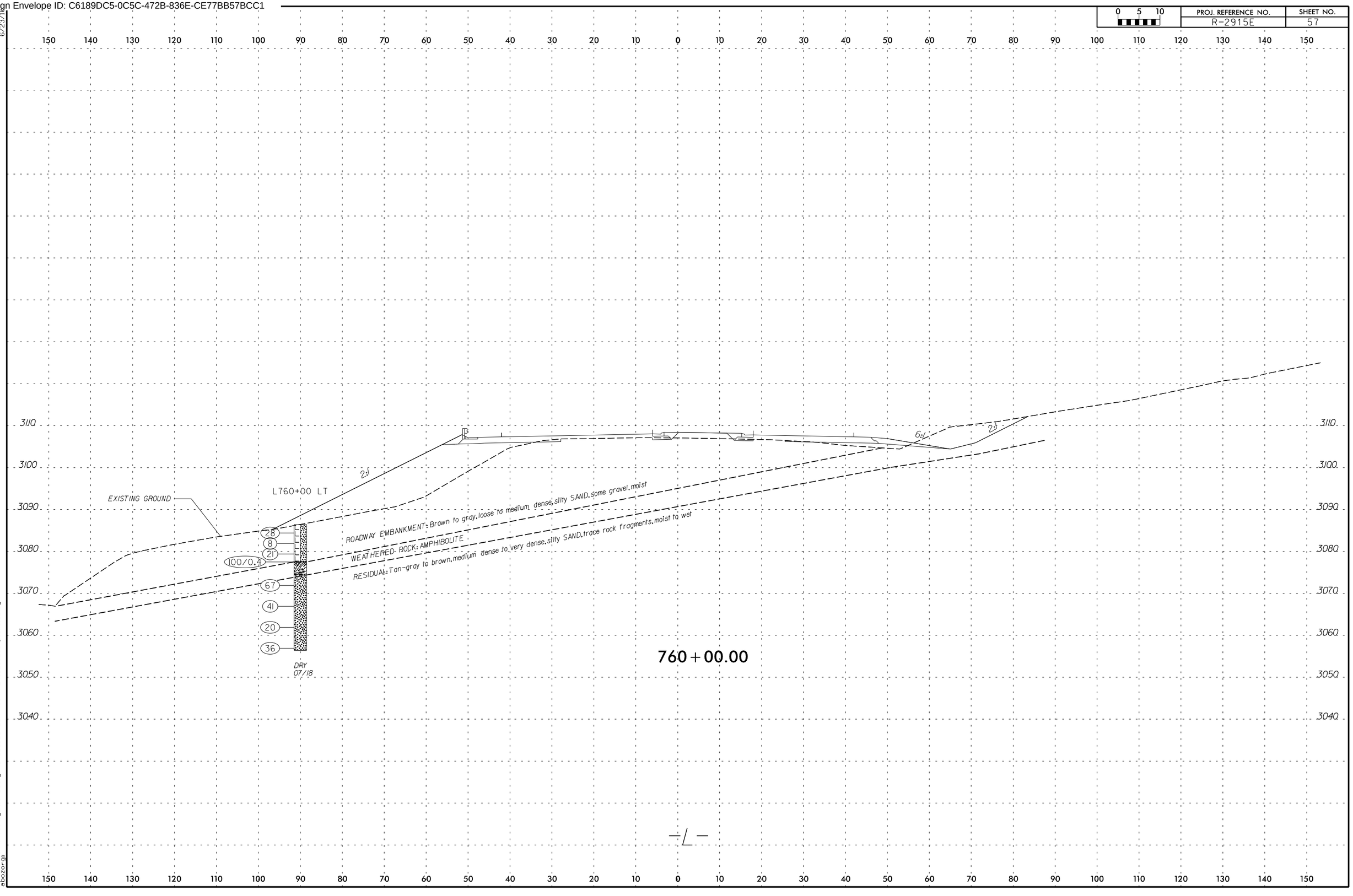
180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120

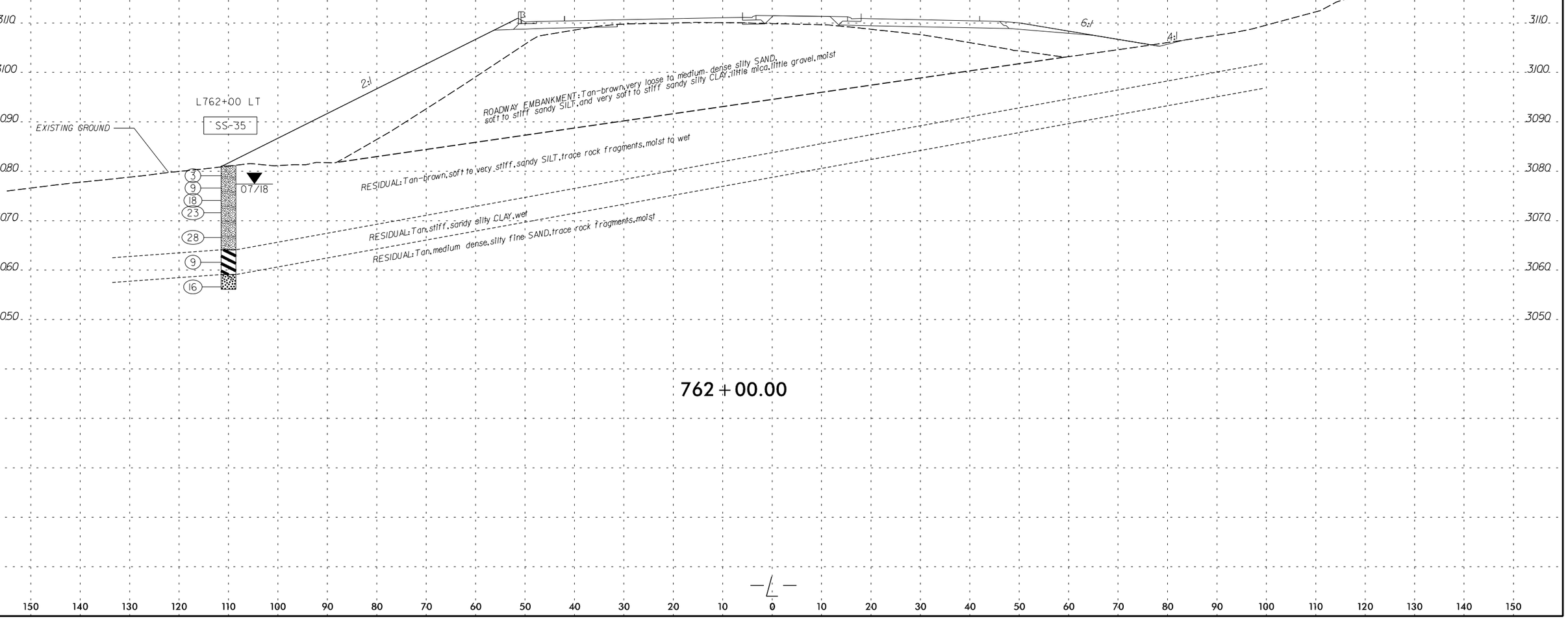
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2915E	56





SOIL TEST RESULTS

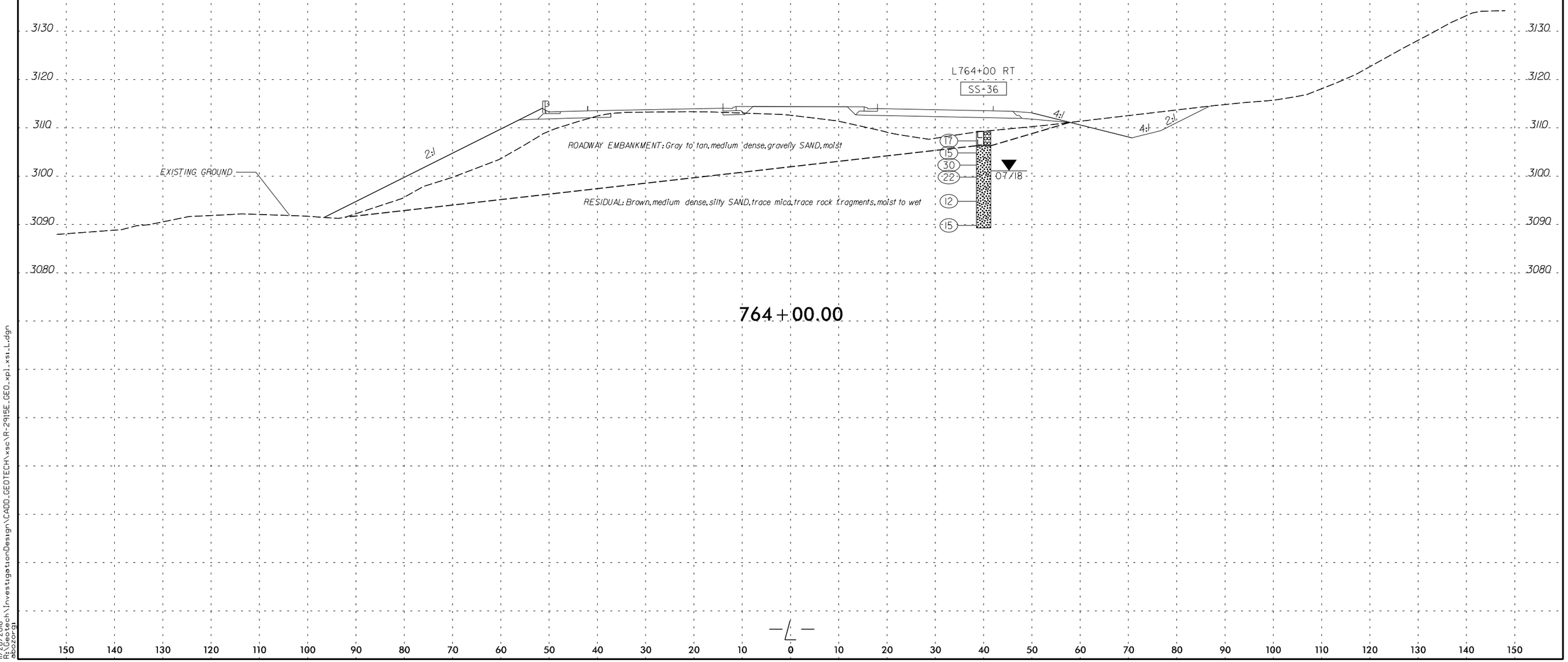
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-35	762+00	110' LT	1.0-2.5	A-4(1)	32	7	9	43	21	27	83	79	48	18	N/A



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

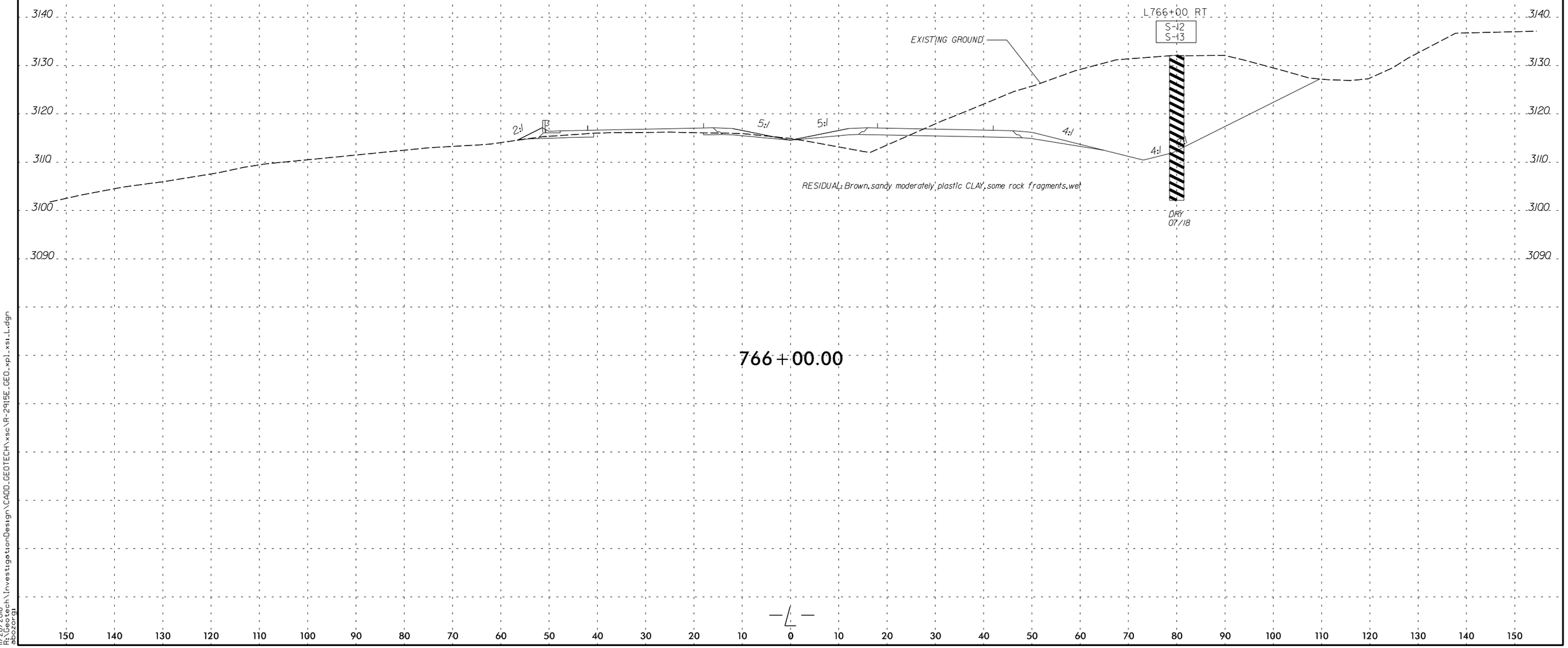
SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-36	764+00	40' RT	1.0-2.5	A-1-b(0)	24	2	24	43	18	15	36	31	15	6	N/A



SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-12	766+00	80' RT	6.0-8.0	A-7-6(12)	46	21	12	27	19	42	94	87	63	31	N/A
S-13	766+00	80' RT	27.0-28.0	A-7-6(12)	45	24	12	35	20	33	99	94	61	26	N/A



766+00.00

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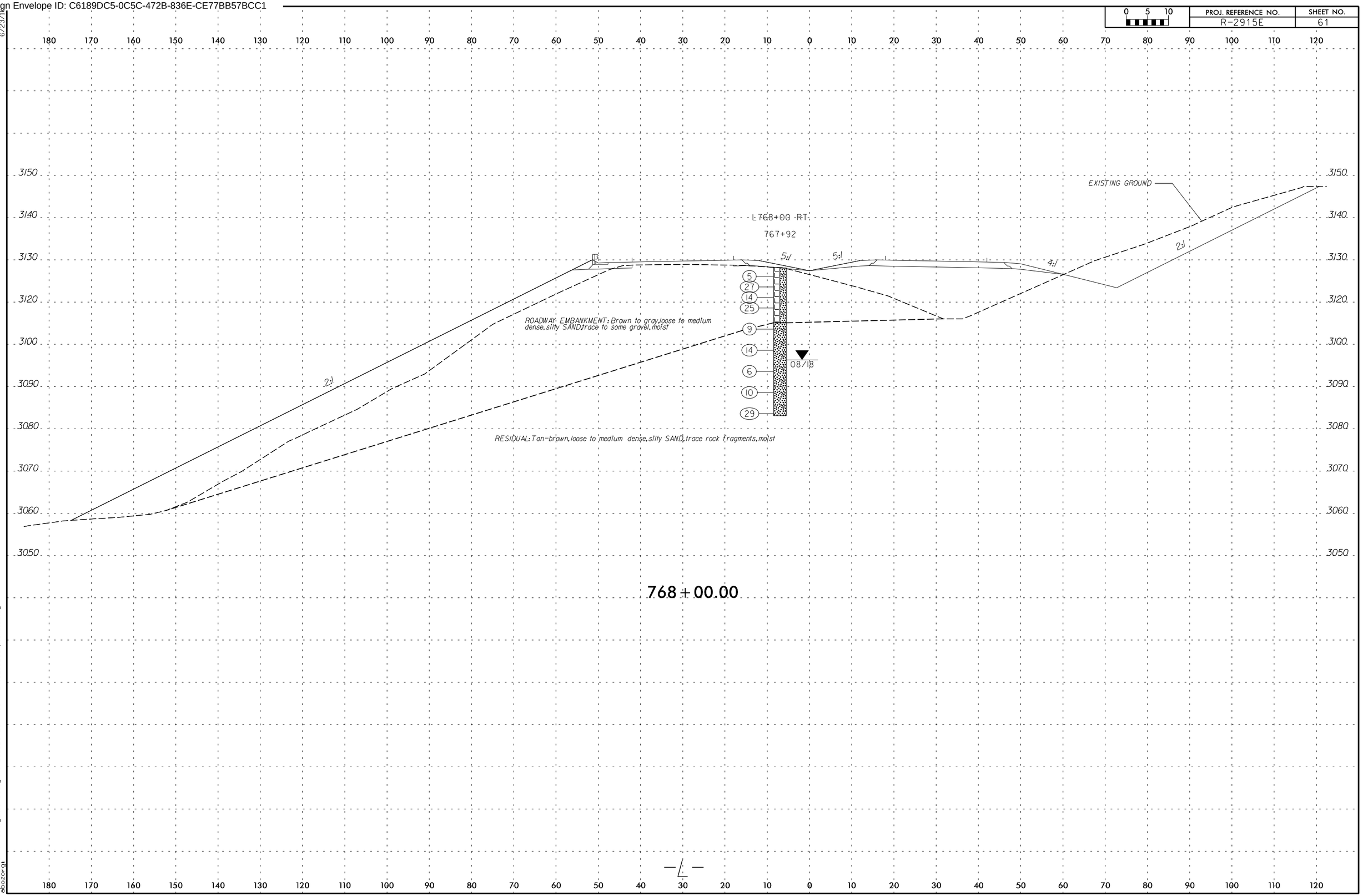
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2915E	61



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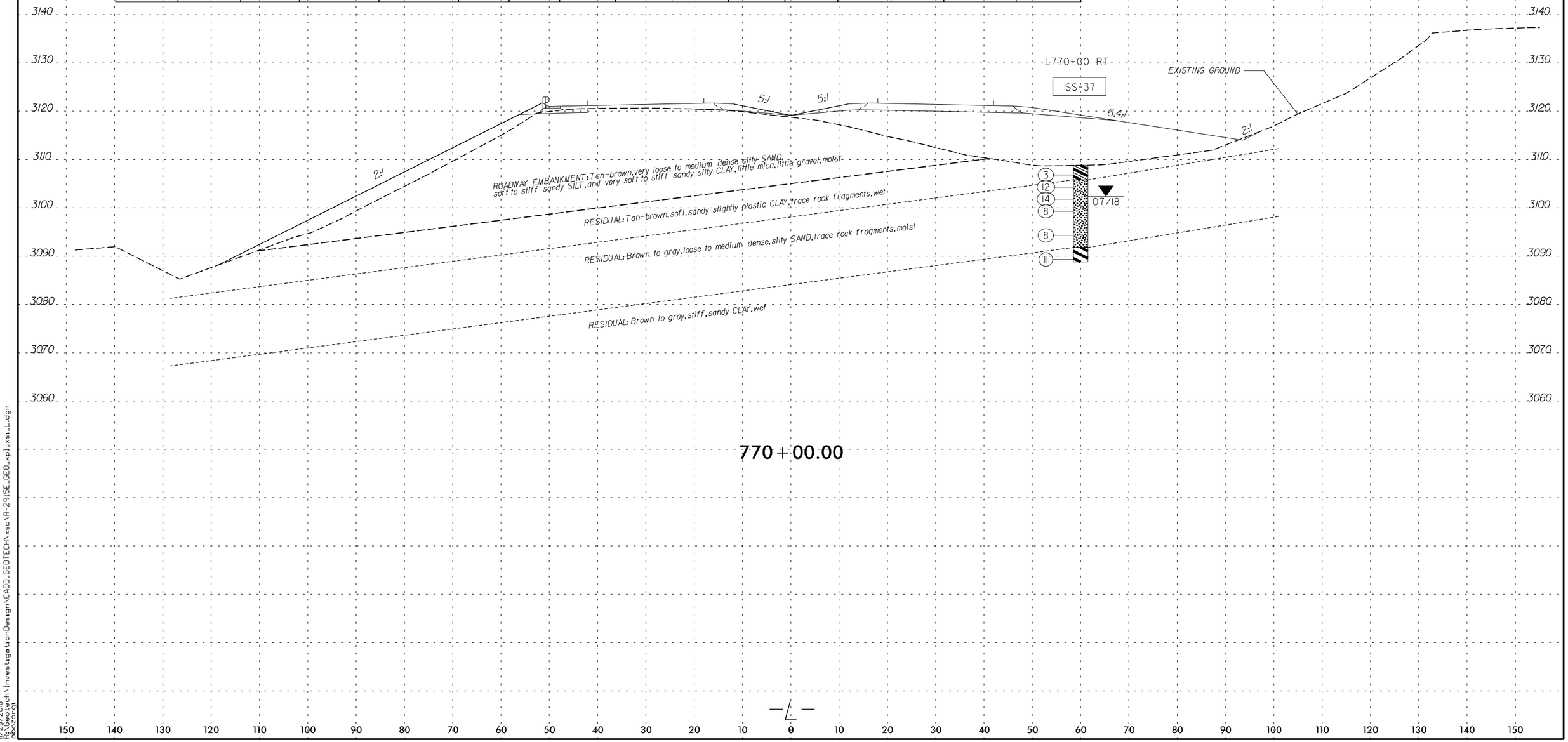
SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-37	770+00	60' RT	1.0-2.5	A-6(3)	39	11	22	34	21	23	96	85	47	26	N/A



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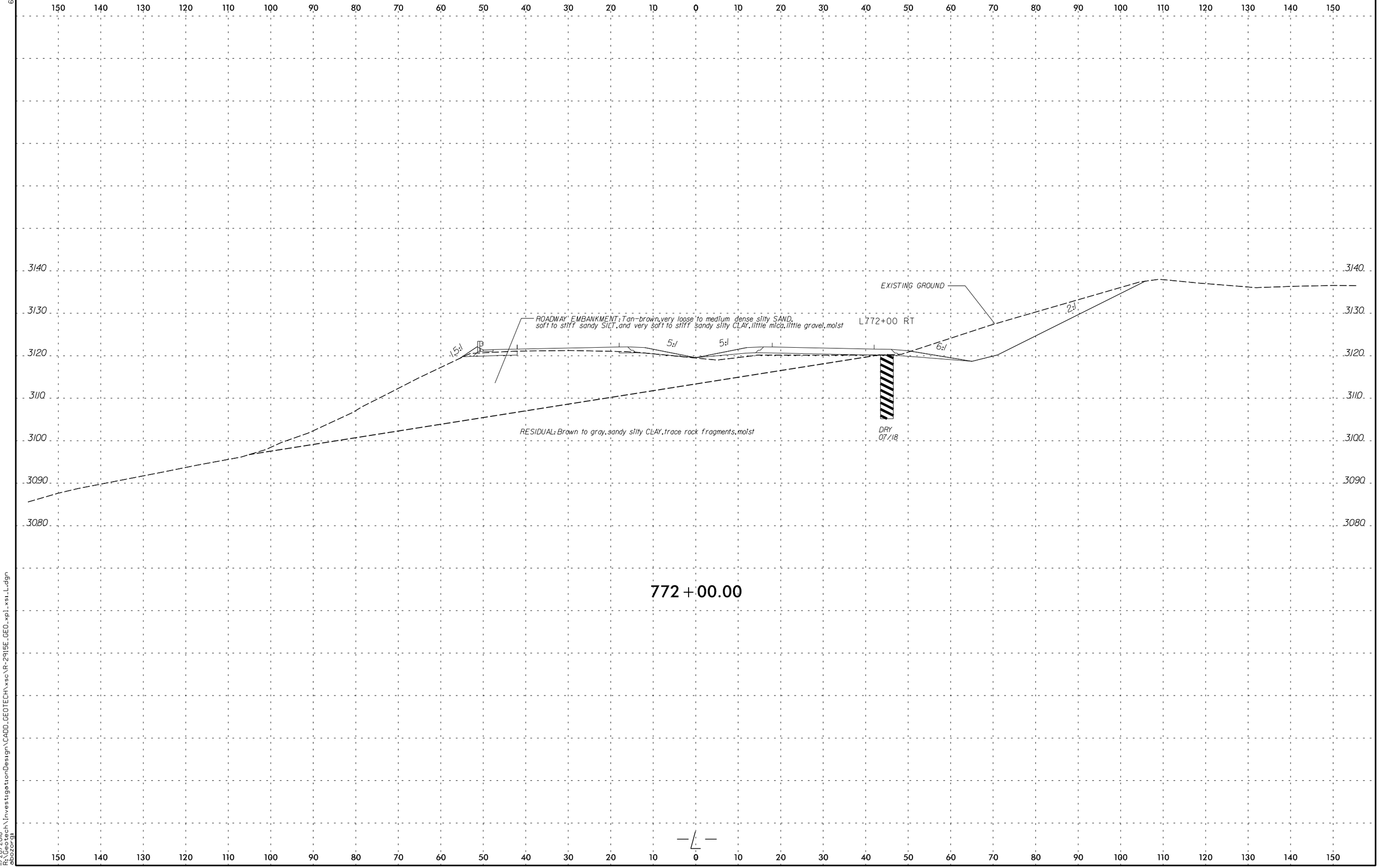
	R-2915E	63



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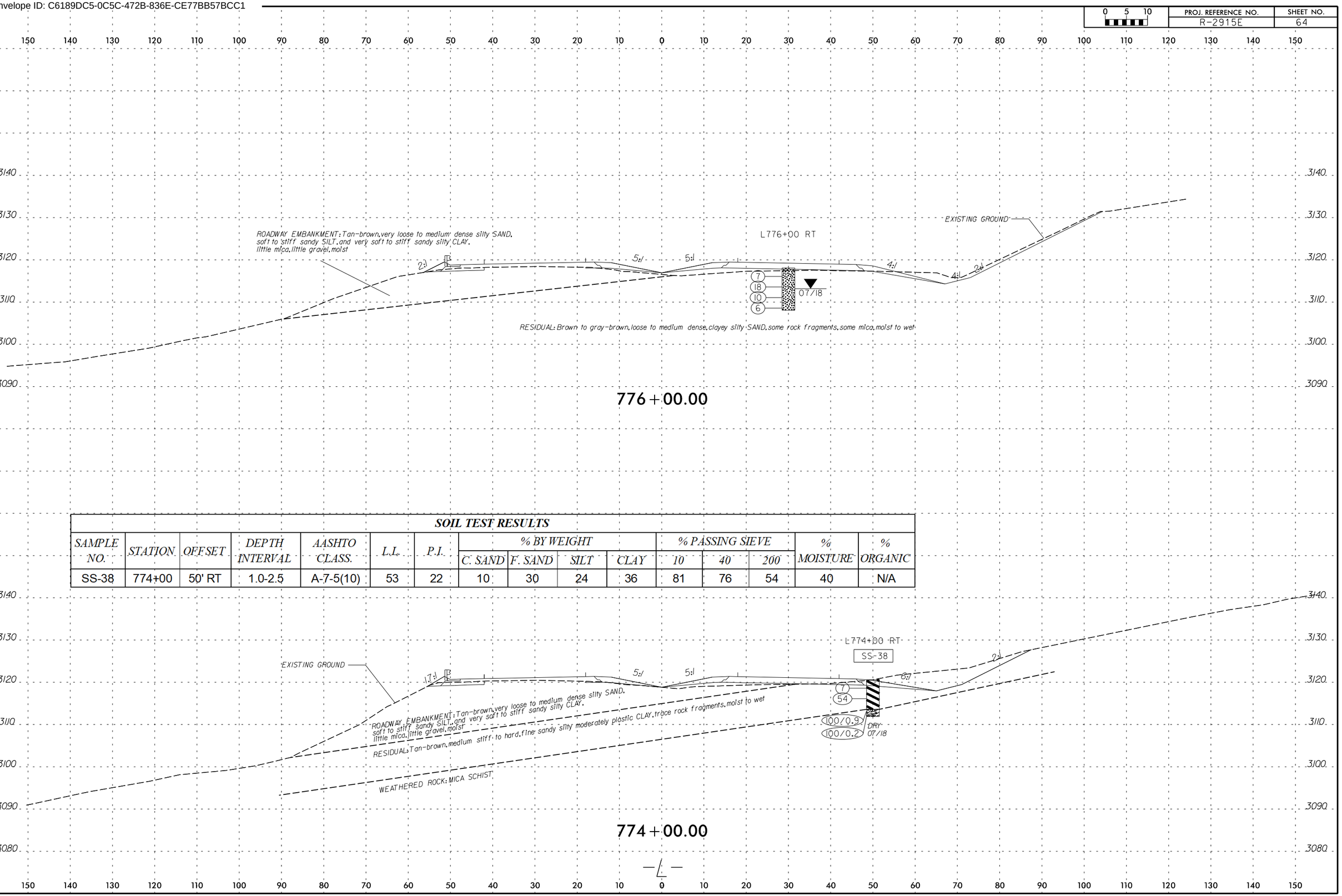
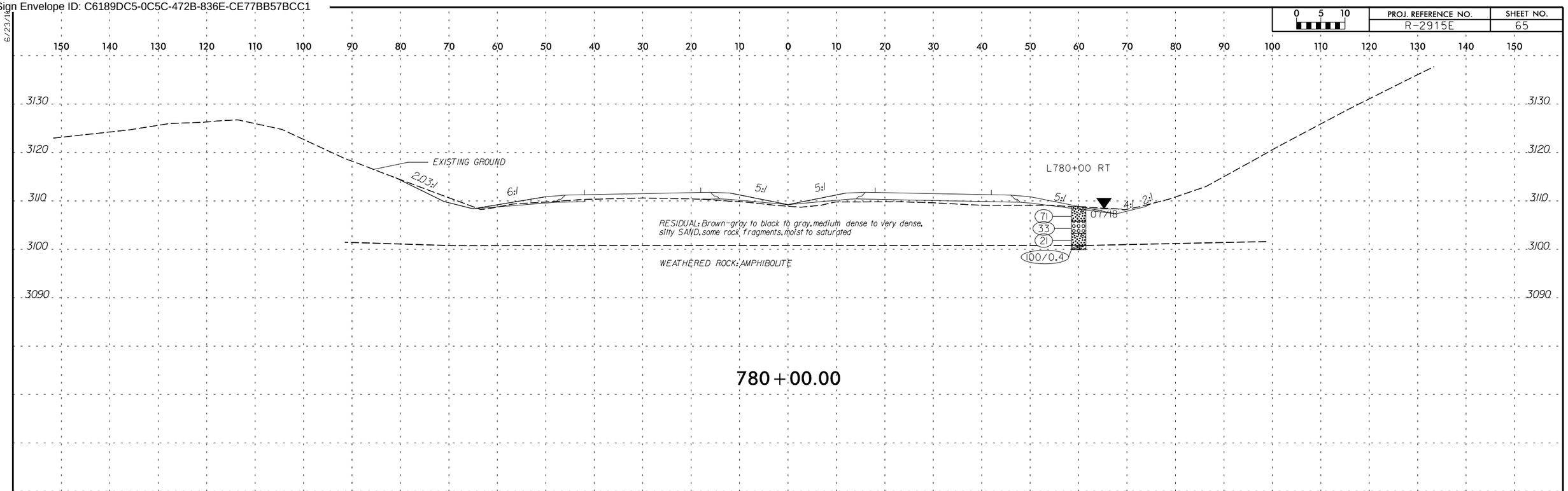
	R-2915E	64



SOIL TEST RESULTS

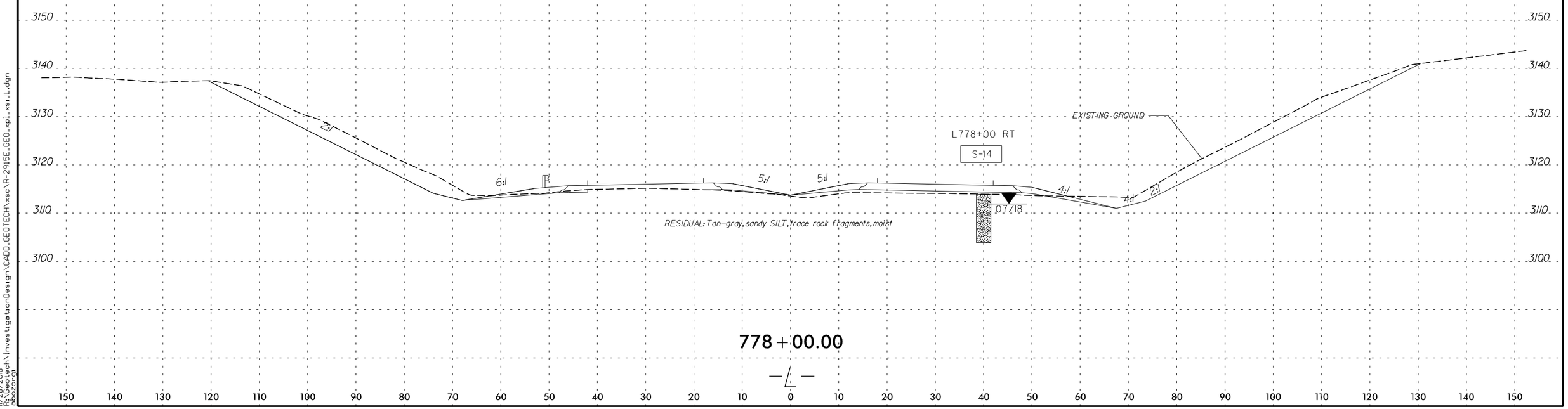
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-38	774+00	50' RT	1.0-2.5	A-7-5(10)	53	22	10	30	24	36	81	76	54	40	N/A

PROJ. REFERENCE NO.	SHEET NO.
R-2915E	65



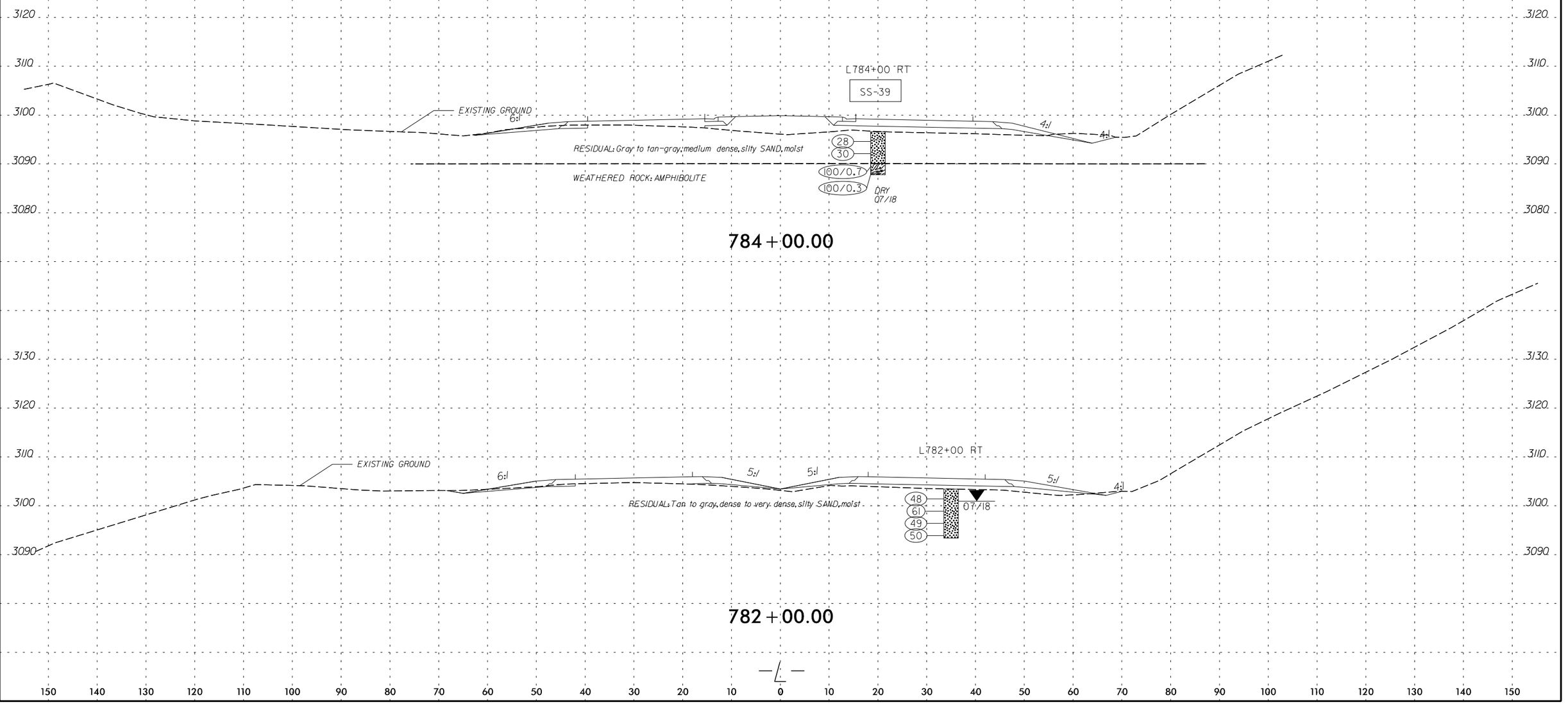
SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-14	778+00	40' RT	1.0-3.5	A-4(0)	22	2	20	47	19	14	99	91	40	13	N/A

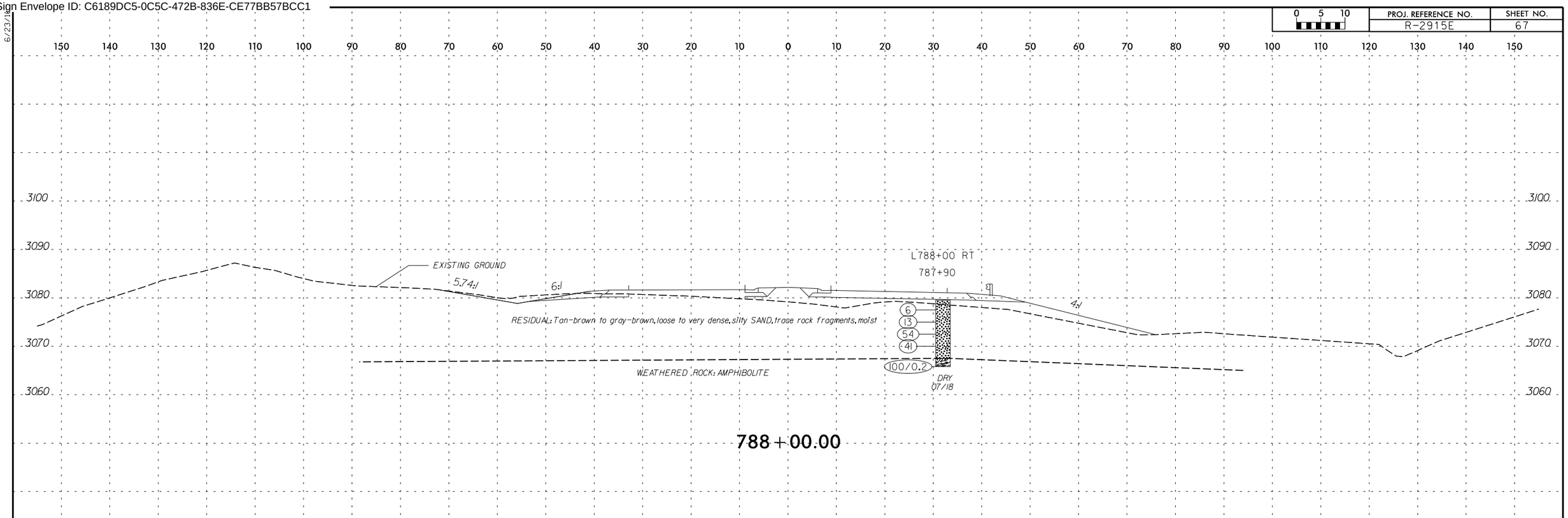


SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-39	784+00	20' RT	1.0-2.5	A-2-4(0)	21	0	21	53	20	6	100	95	34	11	N/A

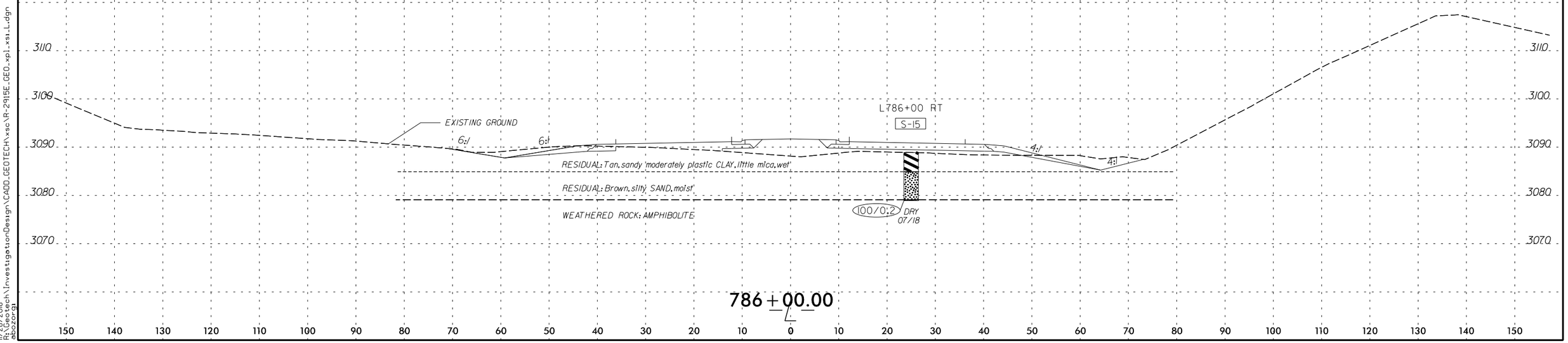


0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2915E	67



SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-15	786+00	25' RT	1.0-3.5	A-7-5(9)	49	18	10	43	27	20	100	97	56	28	N/A



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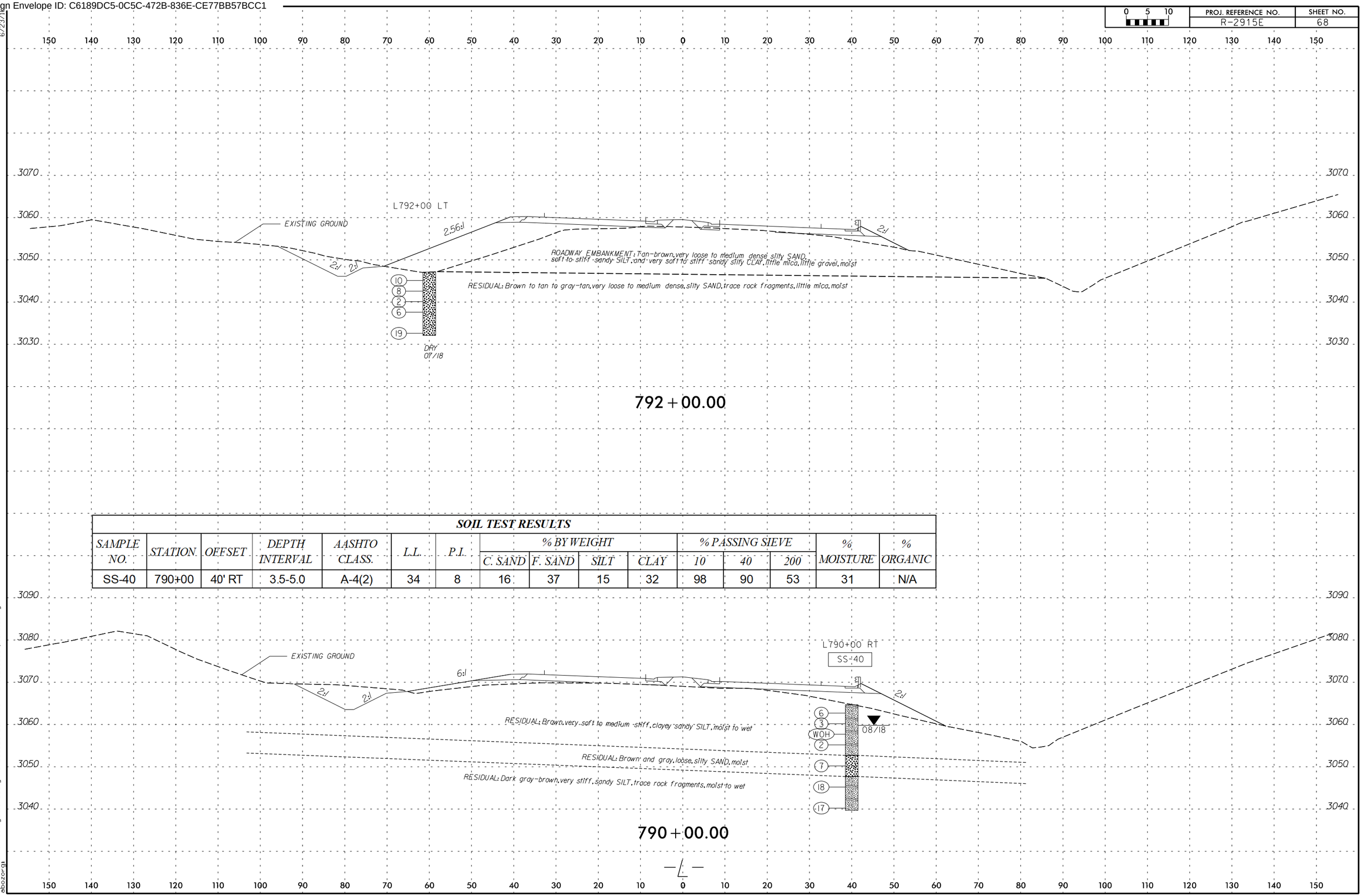
	R-2915E	68



SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-40	790+00	40' RT	3.5-5.0	A-4(2)	34	8	16	37	15	32	98	90	53	31	N/A

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2915E	69

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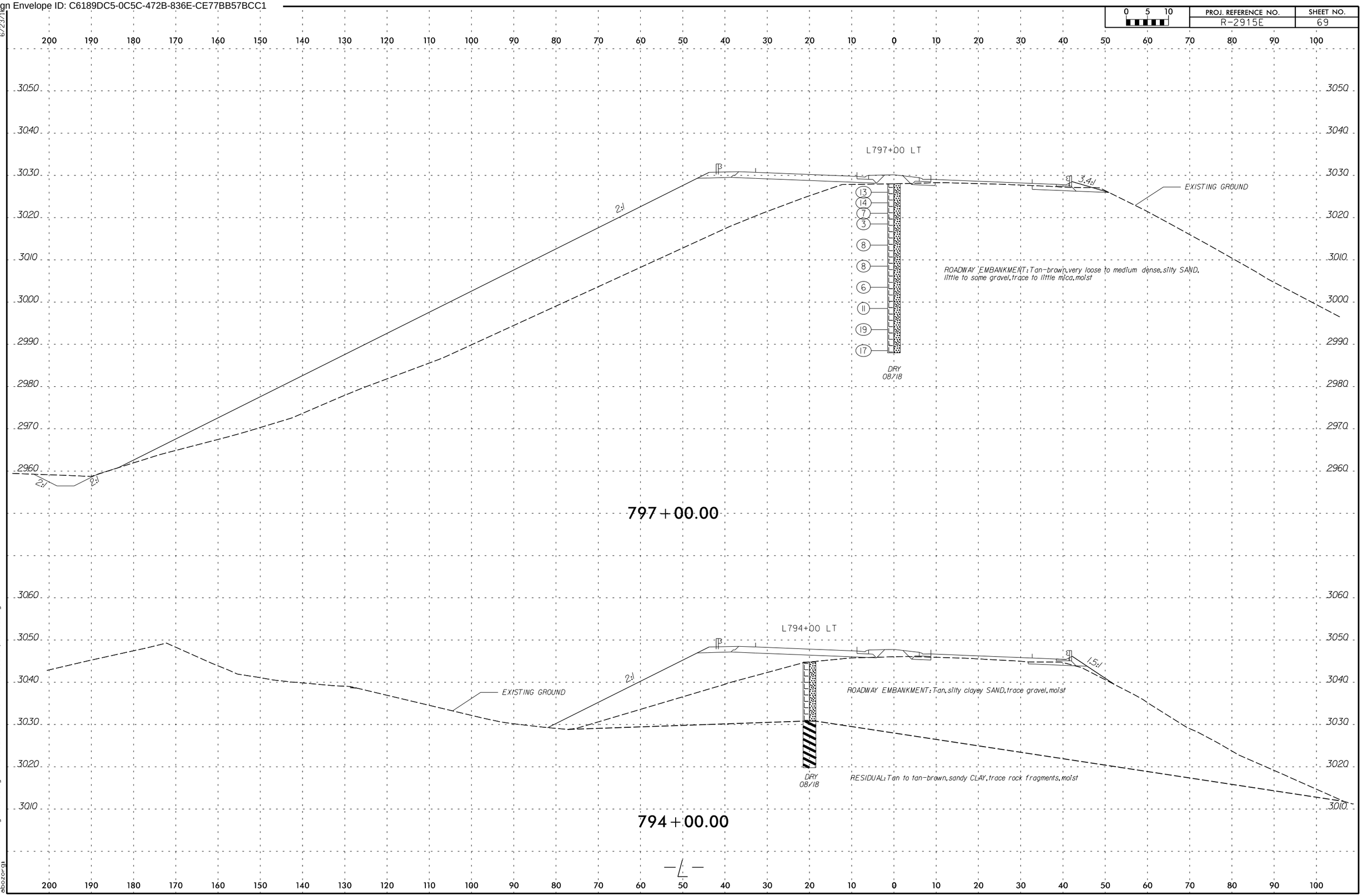

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0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2915E	70

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3040
3030
3020
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3000
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2980
2970
2960
2950
2940
2930

2:1

3.8:1

EXISTING GROUND

ROADWAY EMBANKMENT: Tan-brown, very loose to medium dense silty SAND, soft to stiff sandy SILT, and very soft to stiff sandy silty CLAY, little mica, little gravel, moist

L798+00 LT

2:1

27 28 36 100/0.9 17 100/0.5 100/0.7

08/18

RESIDUAL: Tan-gray, medium dense to dense, silty SAND, trace to little mica, moist

WEATHERED ROCK: AMPHIBOLITE

RESIDUAL: Tan and gray, medium dense, silty SAND, wet

WEATHERED ROCK: AMPHIBOLITE

798+00.00

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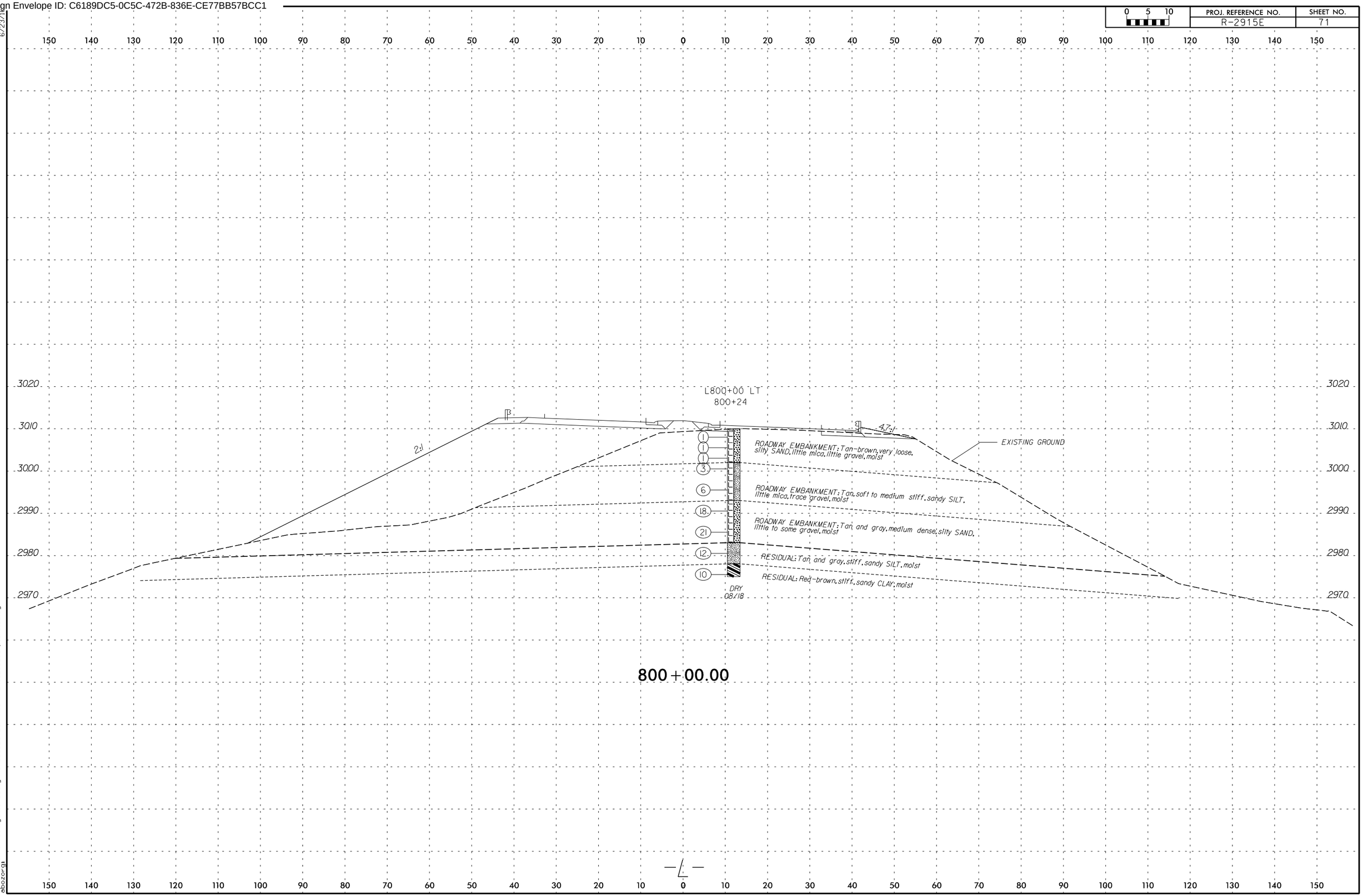
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2915E	71



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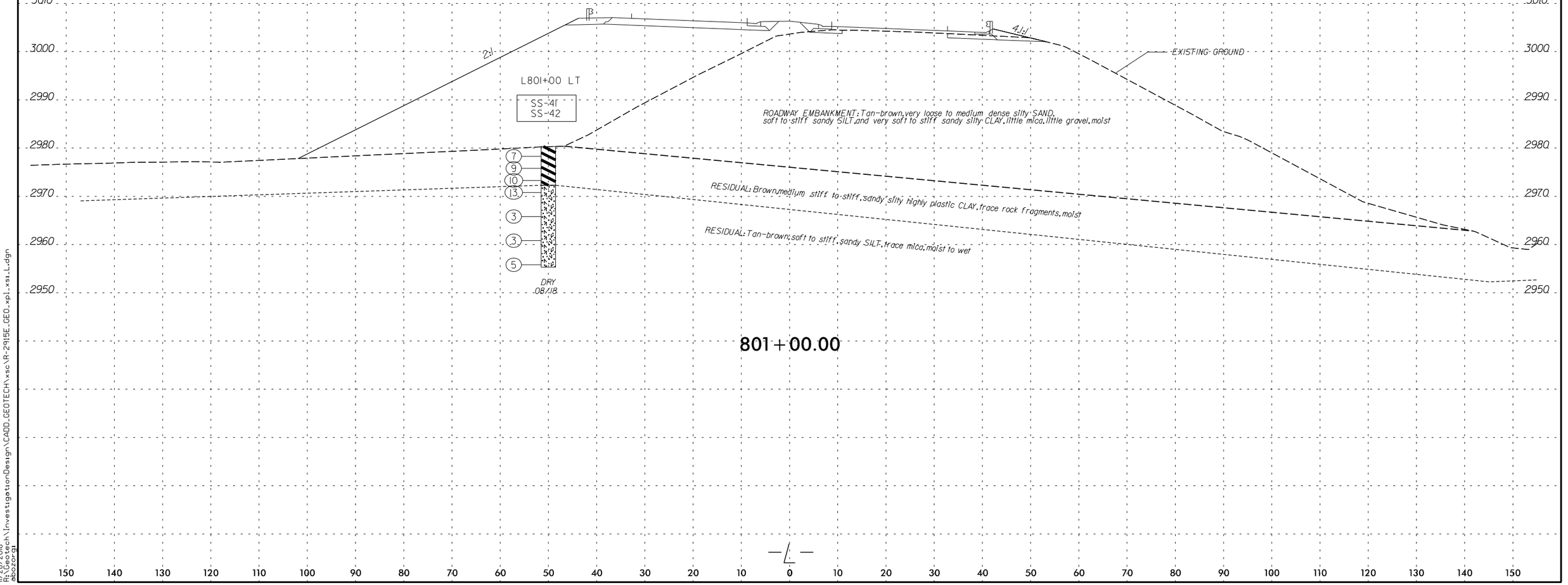
SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-41	801+00	50' LT	3.5-5.0	A-7-5(54)	86	51	4	8	7	81	100	98	90	33	N/A
SS-42	801+00	50' LT	13.5-15.0	A-5(2)	63	0	16	42	23	19	100	92	52	52	N/A



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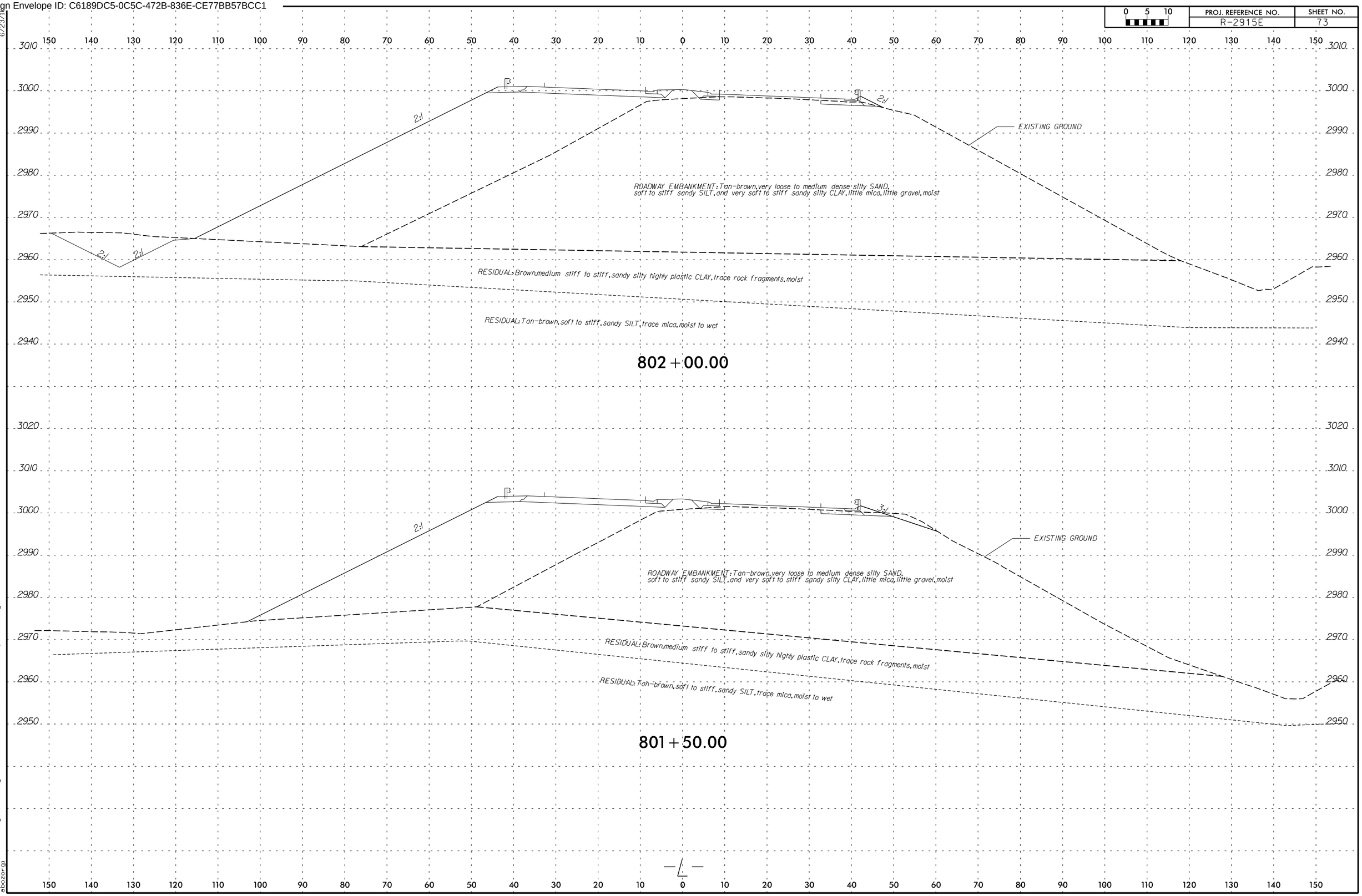
	R-2915E	73



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0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2915E	74

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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2980
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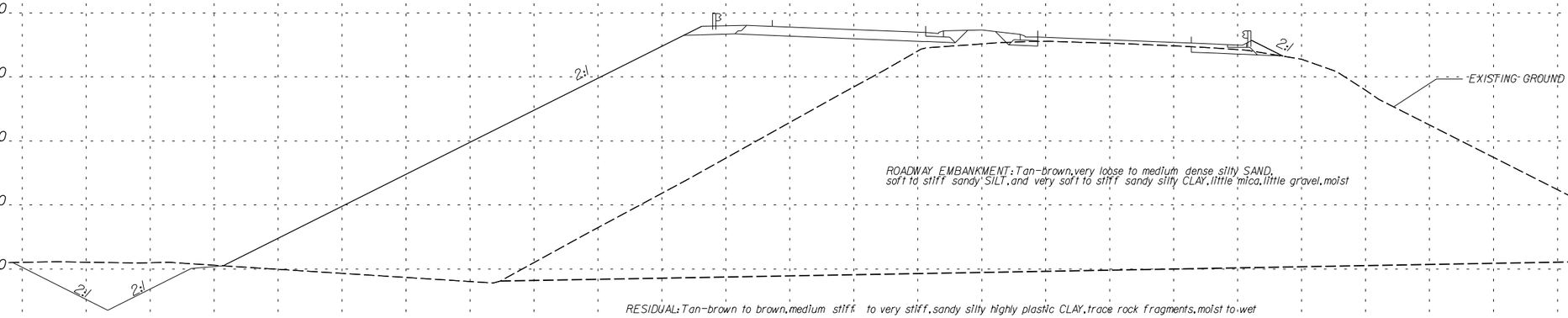
2930



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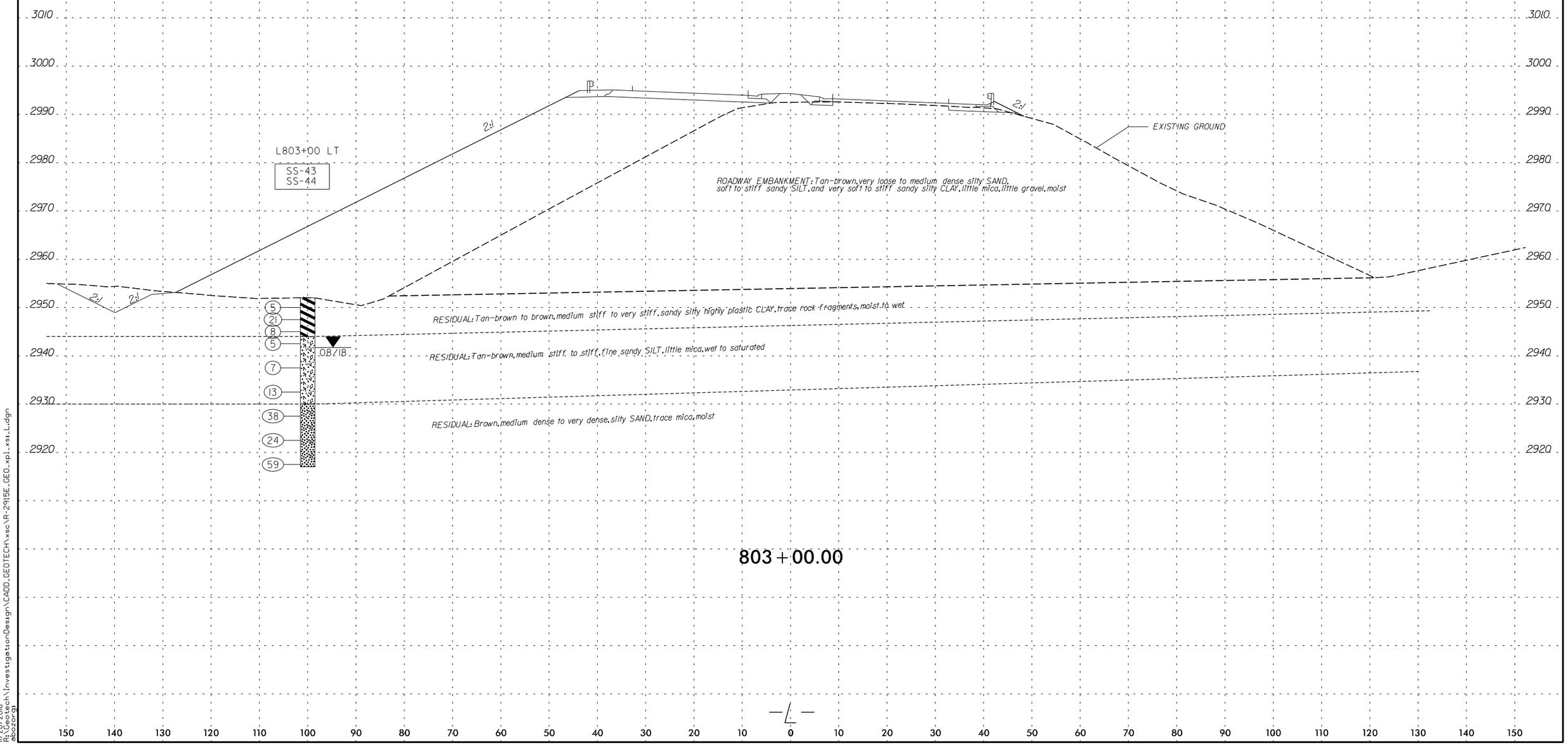
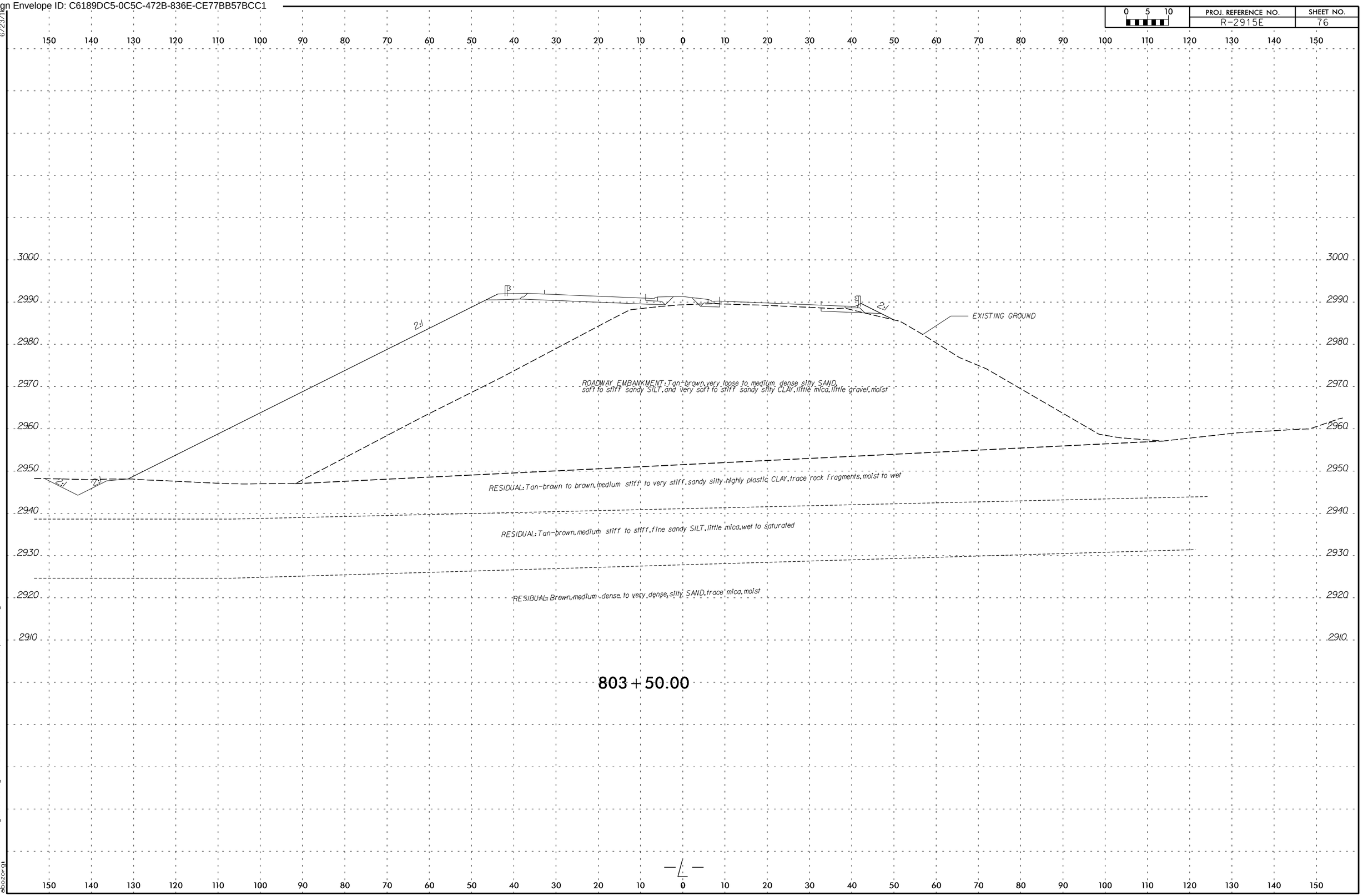
SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-43	803+00	100' LT	1.0-2.5	A-7-6(20)	60	35	12	30	20	38	100	94	63	28	N/A
SS-44	803+00	100' LT	8.5-10.0	A-5(0)	51	0	19	46	17	18	100	93	43	53	N/A



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2915E	76



6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2915E	77

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

2990
2980
2970
2960
2950
2940
2930
2920
2910

2:1
2:1
2:1
1.6:1

EXISTING GROUND

ROADWAY EMBANKMENT: Tan-brown, very loose to medium dense silty SAND, soft to stiff sandy SILT, and very soft to stiff sandy silty CLAY, little mica, little gravel, moist

RESIDUAL: Tan-brown to brown, medium stiff to very stiff, sandy silty highly plastic CLAY, trace rock fragments, moist to wet

RESIDUAL: Tan-brown, medium stiff to stiff, fine sandy SILT, little mica, wet to saturated

RESIDUAL: Brown, medium dense to very dense, silty SAND, trace mica, moist

804+00.00

11/28/2018
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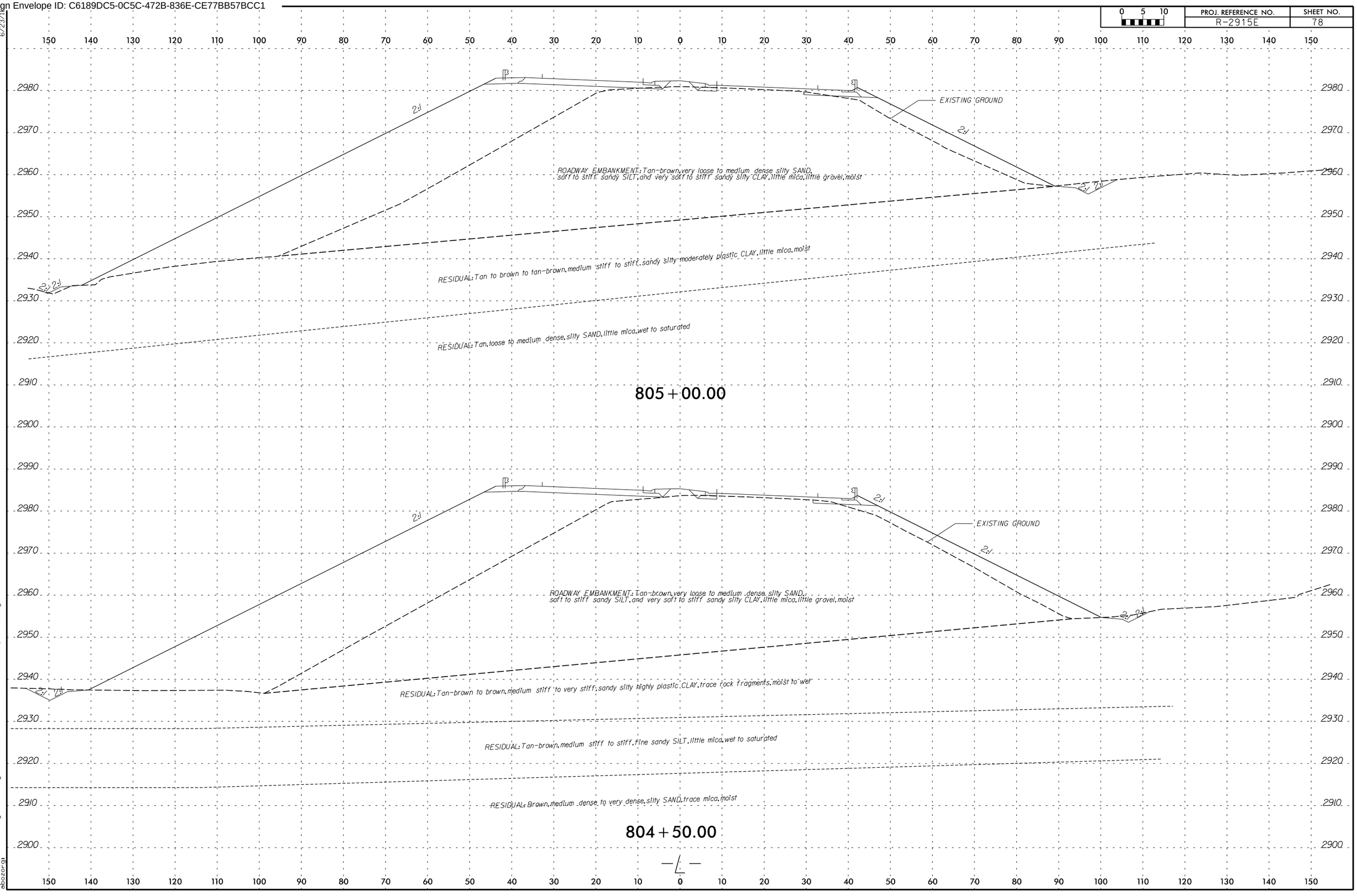
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2915E	78



6/23/16

11/28/2018
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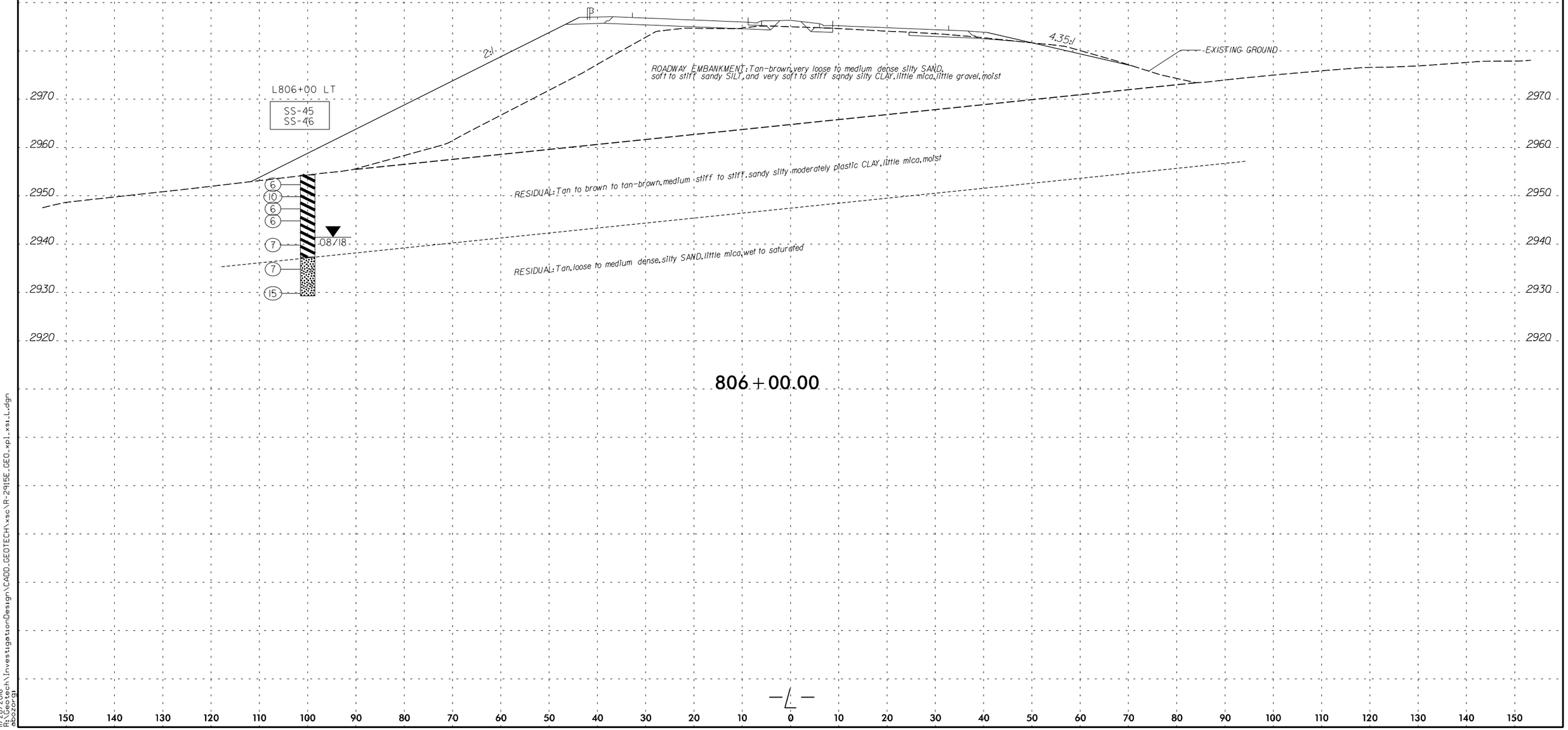
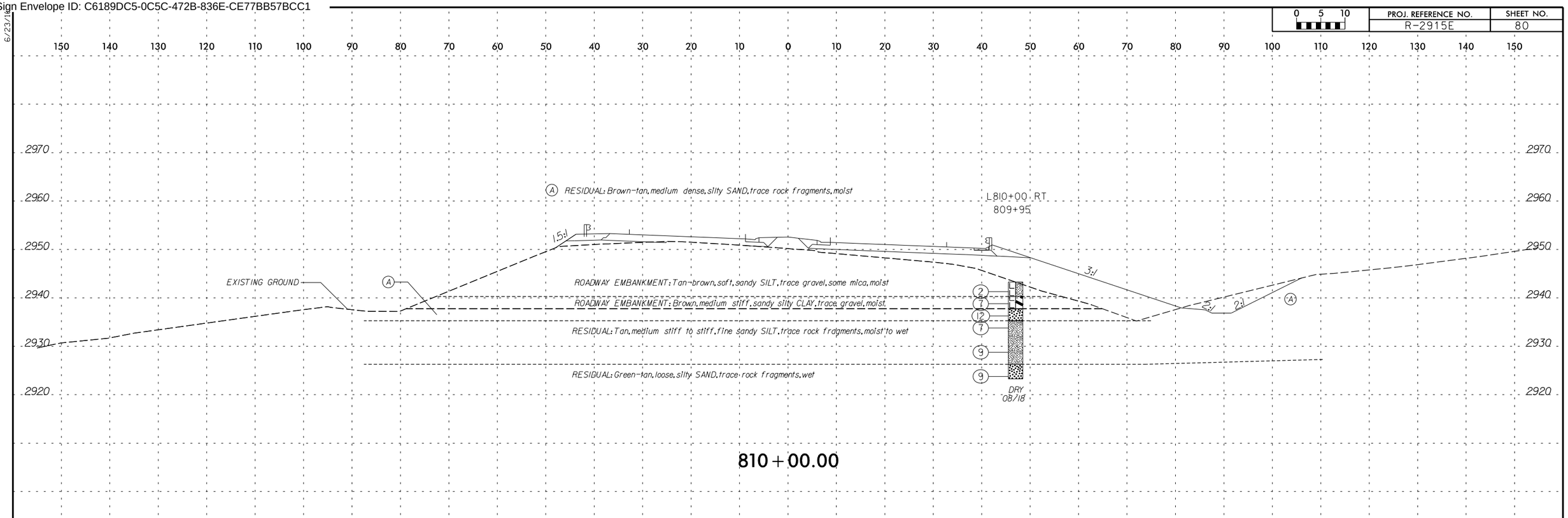
150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

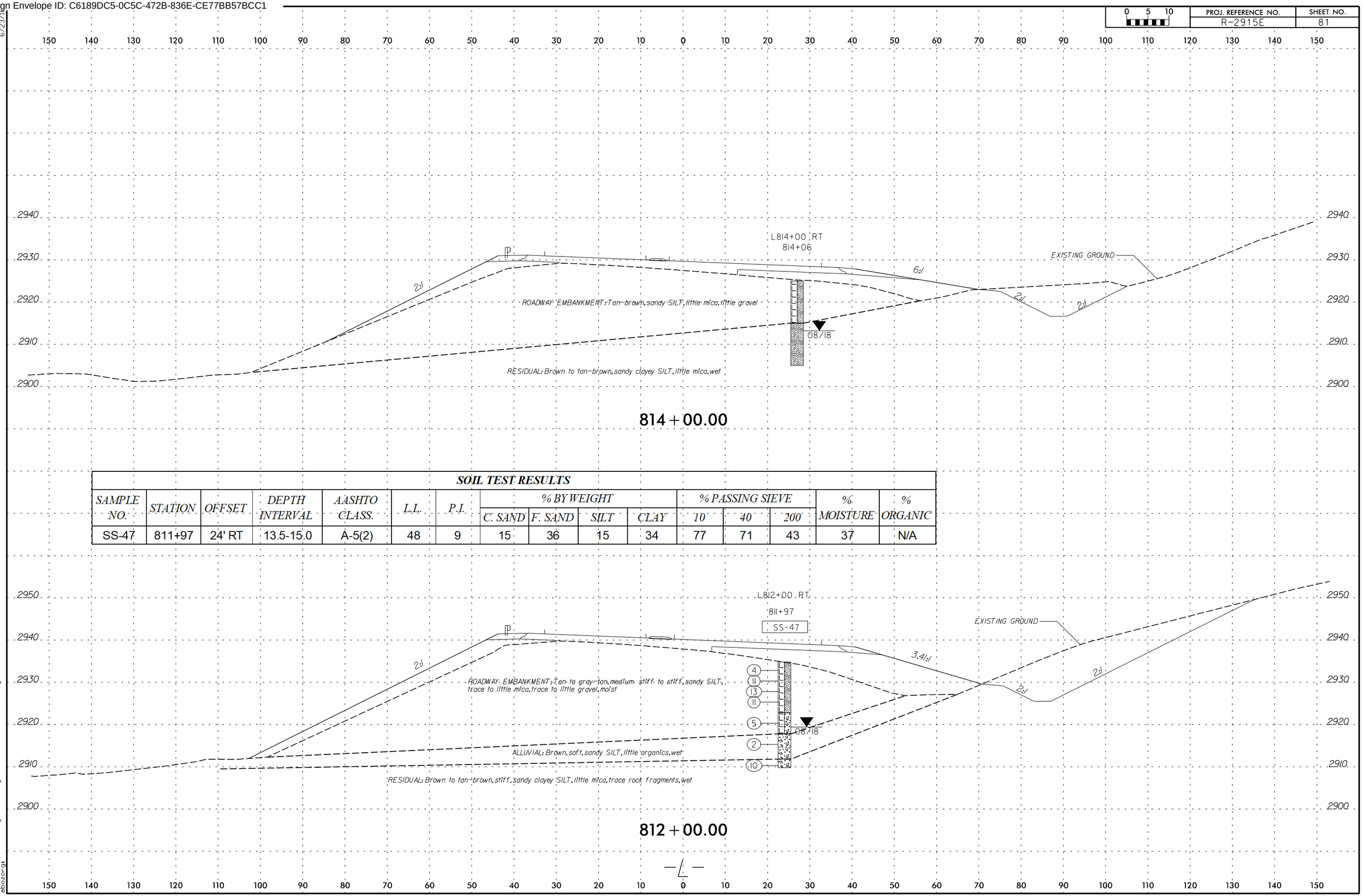
SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-45	806+00	100' LT	6.0-7.5	A-7-6(3)	45	18	24	45	16	15	100	90	39	31	N/A
SS-46	806+00	100' LT	13.5-15.0	A-7-6(10)	48	20	10	39	11	40	99	94	58	42	N/A



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2915E	80



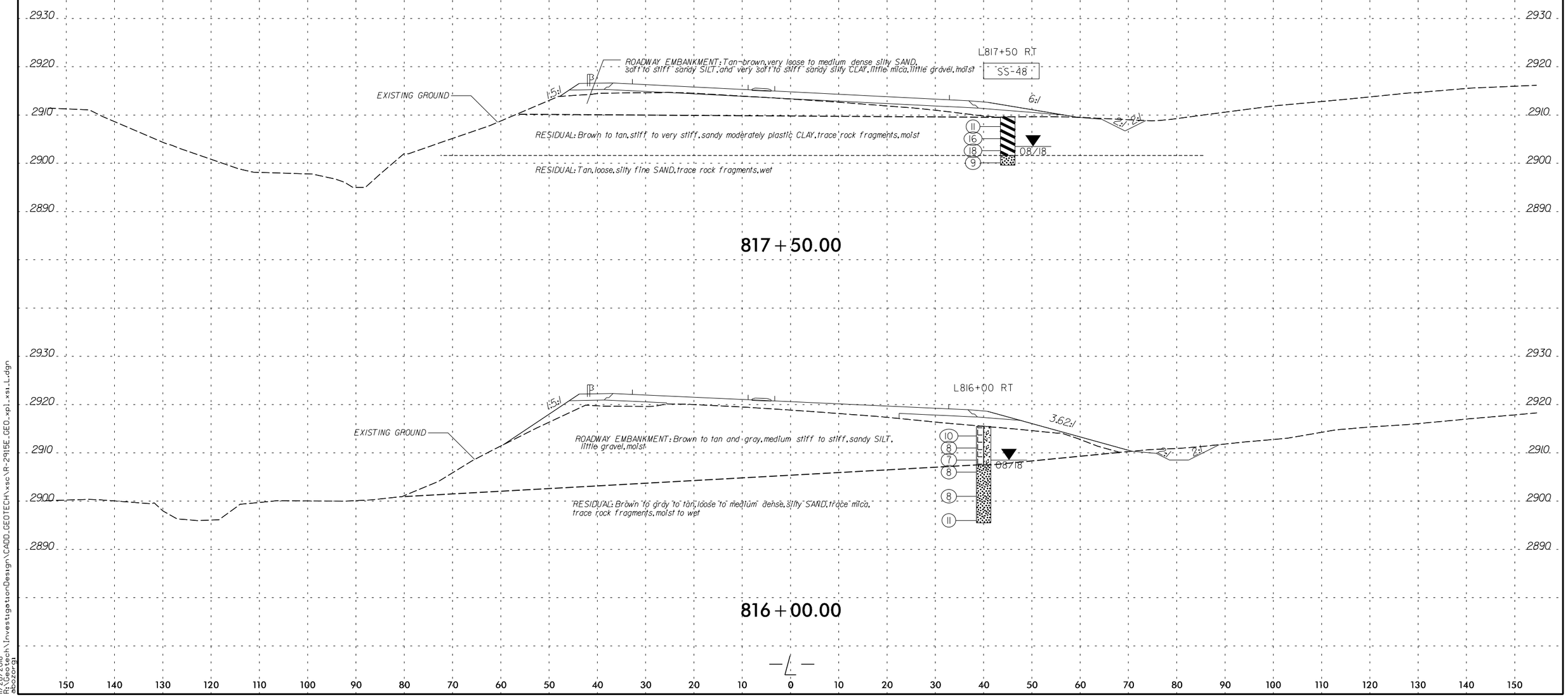


SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-47	811+97	24' RT	13.5-15.0	A-5(2)	48	9	15	36	15	34	77	71	43	37	N/A

SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-48	817+50	45' RT	1.0-2.5	A-7-5(11)	49	18	12	27	17	44	97	90	64	25	N/A

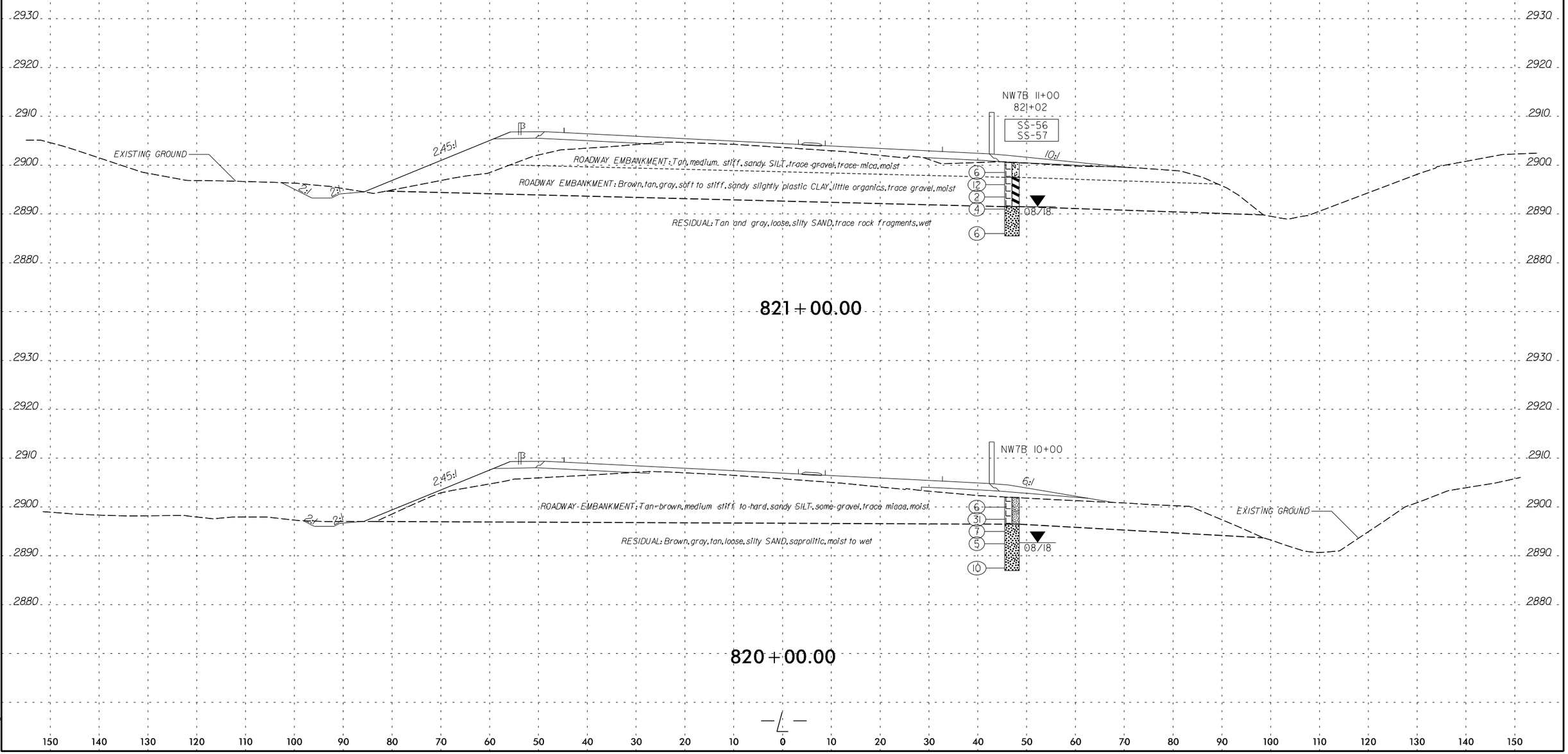


0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2915E	83

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

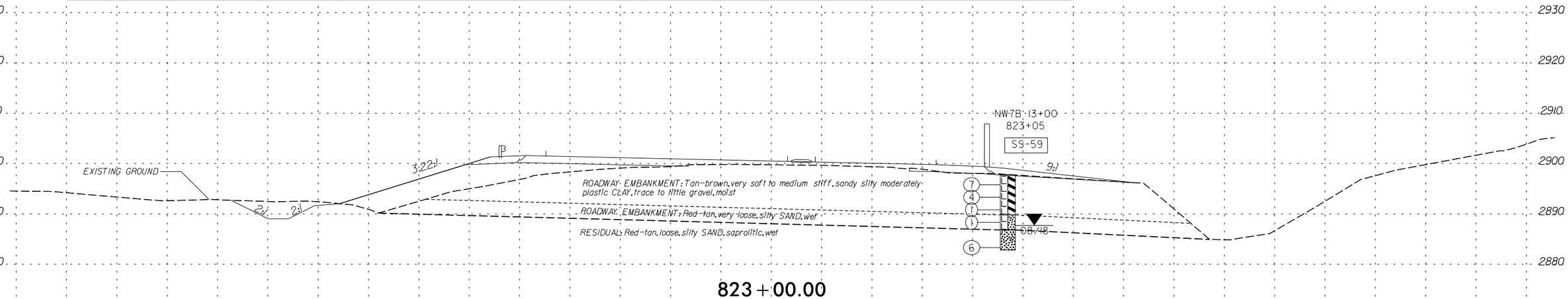
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-56	821+02	47' LT	1.0-2.5	A-5(3)	47	10	19	39	20	22	100	90	49	26	N/A
SS-57	821+02	47' LT	6.0-7.5	A-7-5(5)	43	12	11	37	22	30	94	89	56	54	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

SOIL TEST RESULTS

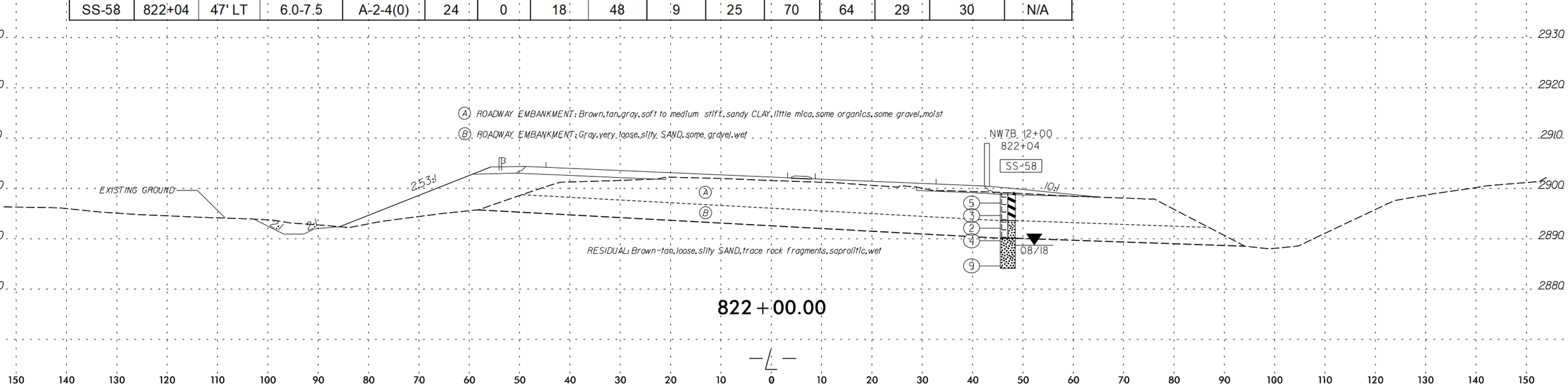
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-59	823+05	47' LT	6.0-7.5	A-7-6(14)	50	21	9	25	17	49	96	92	68	33	N/A



823+00.00

SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-58	822+04	47' LT	6.0-7.5	A-2-4(0)	24	0	18	48	9	25	70	64	29	30	N/A



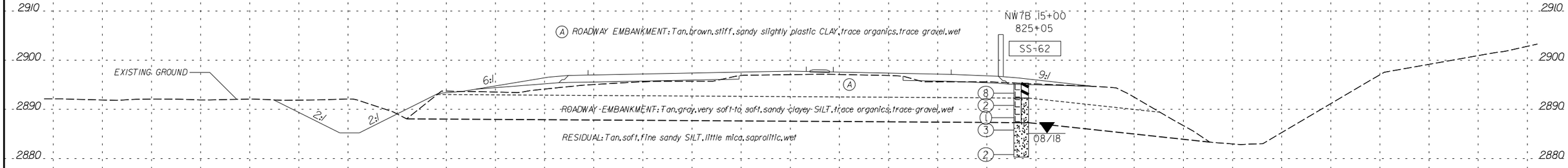
822+00.00

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

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

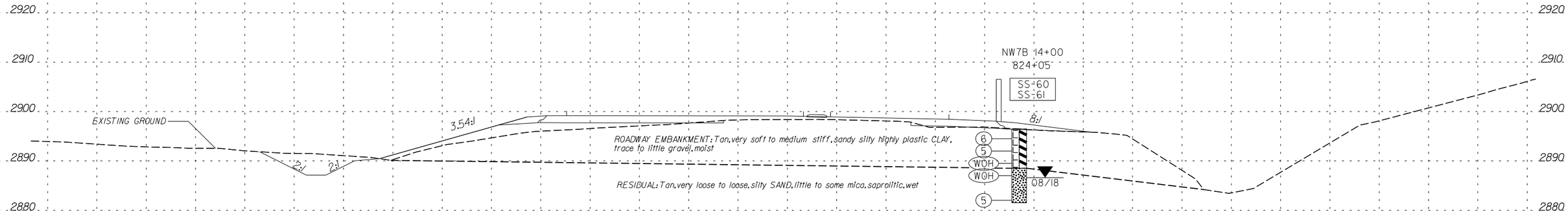
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-62	825+06	47' LT	1.0-2.5	A-7-5(3)	46	14	13	29	23	35	67	63	43	25	N/A



825+00.00

SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-60	824+06	47' LT	6.0-7.5	A-7-6(18)	55	27	9	23	17	51	93	89	69	34	N/A
SS-61	824+06	47' LT	8.5-10.0	A-2-5(0)	62	10	18	48	14	20	73	68	31	71	N/A



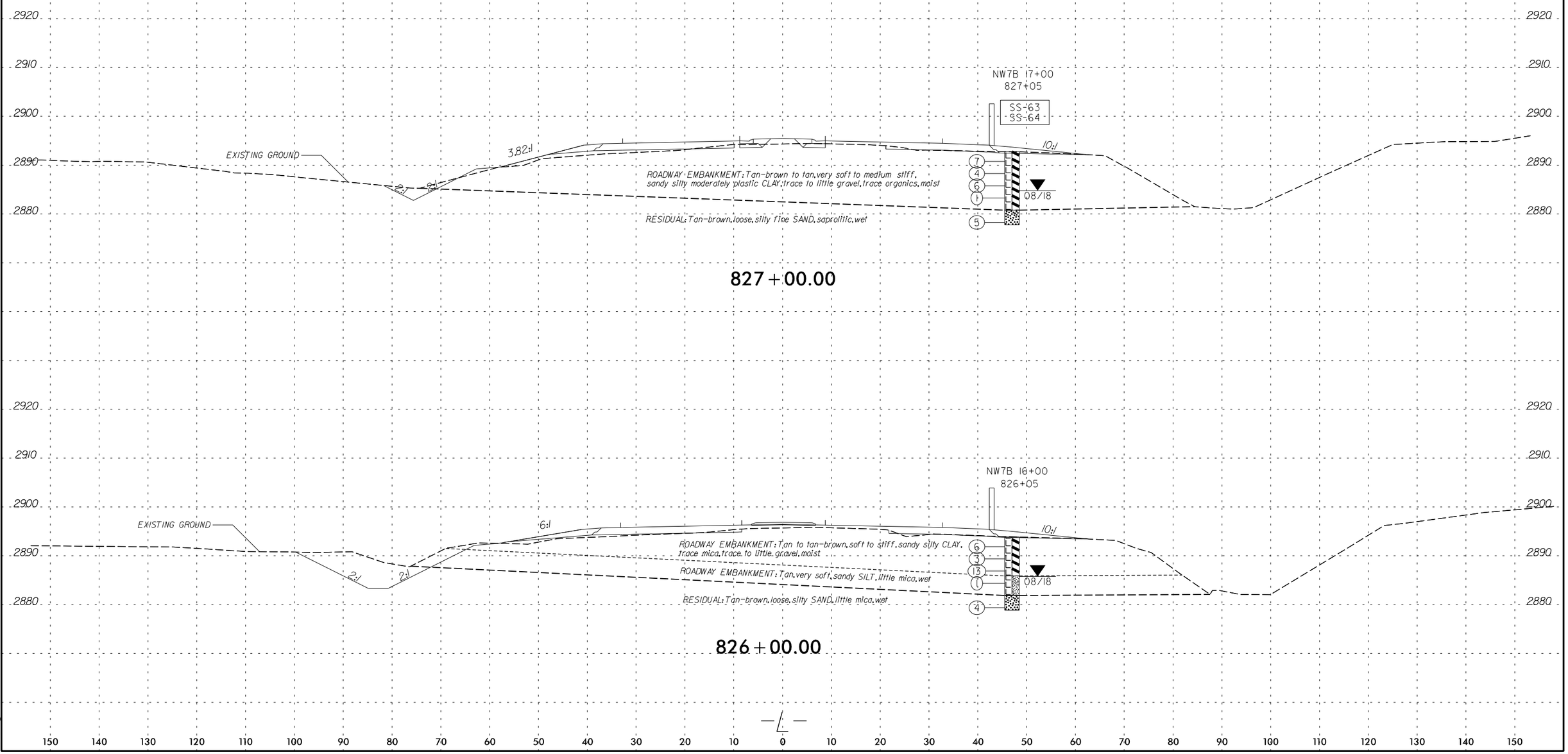
824+00.00

6/23/18

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.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-63	827+06	47' LT	1.0-2.5	A-7-6(10)	48	23	13	28	15	44	86	80	56	28	N/A
SS-64	827+06	47' LT	8.5-10.0	A-7-5(13)	56	18	6	39	36	19	100	98	67	81	N/A



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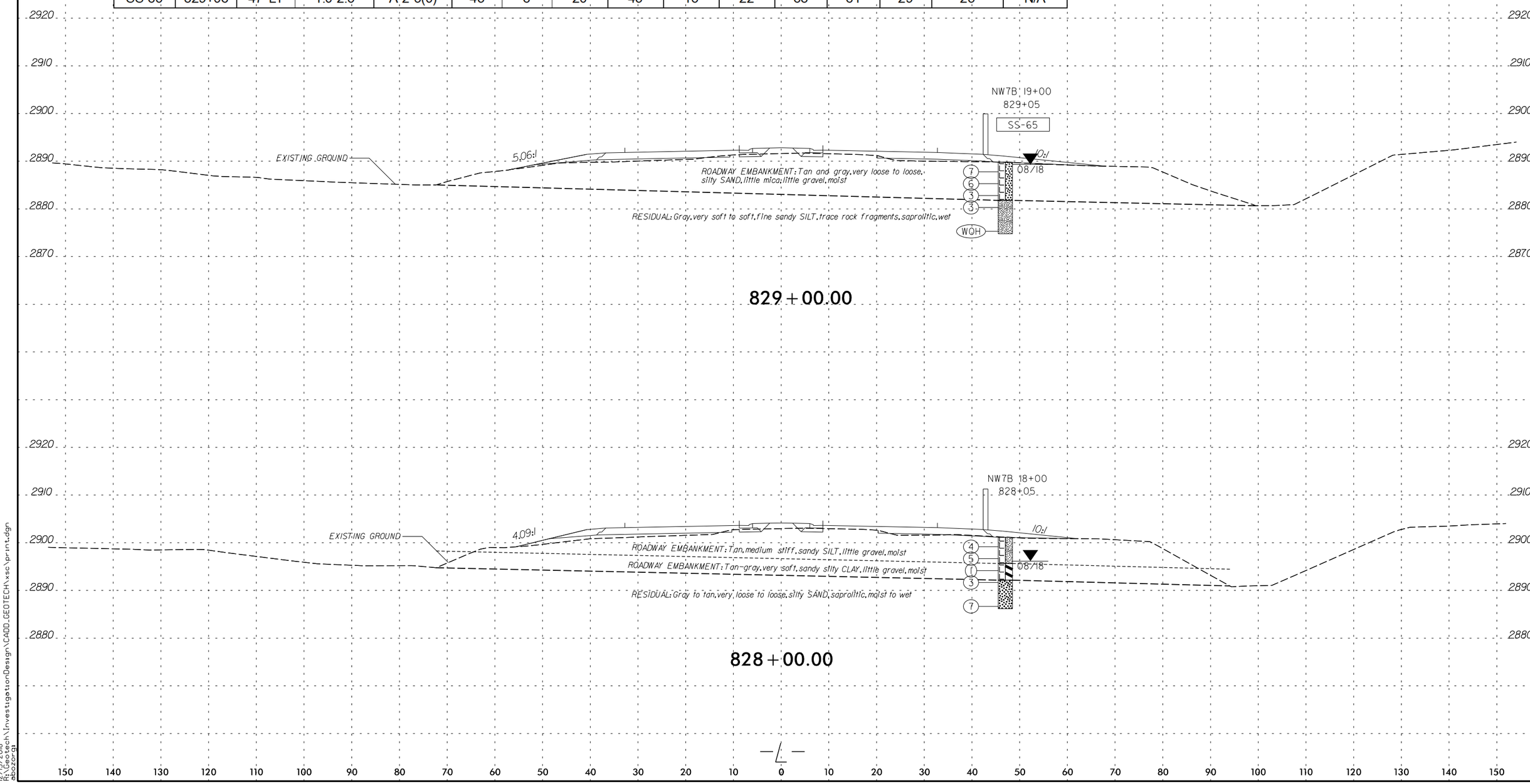
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2915E	87

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

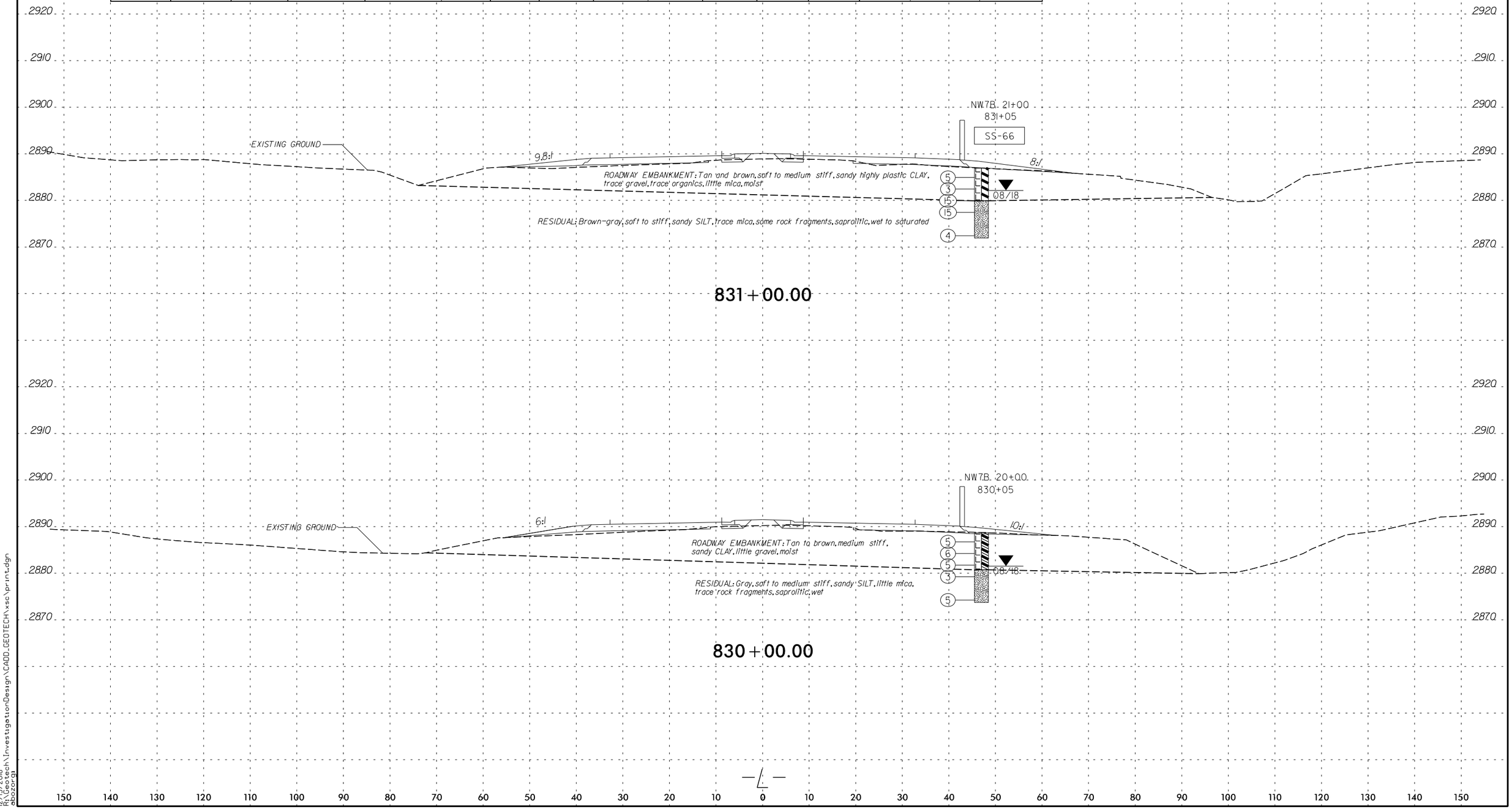
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-65	829+06	47' LT	1.0-2.5	A-2-5(0)	43	6	20	43	15	22	68	61	29	23	N/A



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

SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-66	831+06	47' LT	1.0-2.5	A-7-5(17)	66	26	6	34	10	50	91	89	62	33	N/A



0 5 10

PROJ. REFERENCE NO.	SHEET NO.
R-2915E	89

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.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-49	834+00	60' LT	3.5-5.0	A-7-5(13)	65	14	8	30	15	47	100	96	69	58	N/A

2900 2890 2880 2870

L834+00 LT
SS-49
(8) (3) (4) (4) (6)
08/18
2.6:1
6:1

(A) ROADWAY EMBANKMENT: Tan to gray to brown, medium stiff, sandy slightly plastic CLAY, trace to little mica, trace rock fragments, moist

(B) RESIDUAL: Tan to gray to brown, soft to medium stiff, sandy slightly plastic CLAY, trace to little mica, trace rock fragments, saprolitic, moist to wet

RESIDUAL: Brown to gray, loose, silty fine SAND, little mica, saprolitic, wet

NW7B 24+00
834+05
(8) (4) (4) (5) (8)
08/18
10:1

EXISTING GROUND

834+00.00

2910 2900 2890 2880 2870

EXISTING GROUND
2.6:1
6:1

(A) ROADWAY EMBANKMENT: Tan and brown to gray-brown, soft to medium stiff, clayey sandy SILT, trace organics, trace to some gravel, moist

RESIDUAL: Tan-brown to brown-gray, loose to medium dense, silty SAND, little mica, some rock fragments, saprolitic, wet to saturated

NW7B 23+00
833+05
(5) (3) (17) (6) (10)
08/18

833+00.00

2910 2900 2890 2880 2870

EXISTING GROUND
9.1:1
6:1

ROADWAY EMBANKMENT: Tan, medium stiff, sandy CLAY, trace to some gravel, moist

RESIDUAL: Gray to tan, very loose to loose, silty SAND, little mica, saprolitic, wet

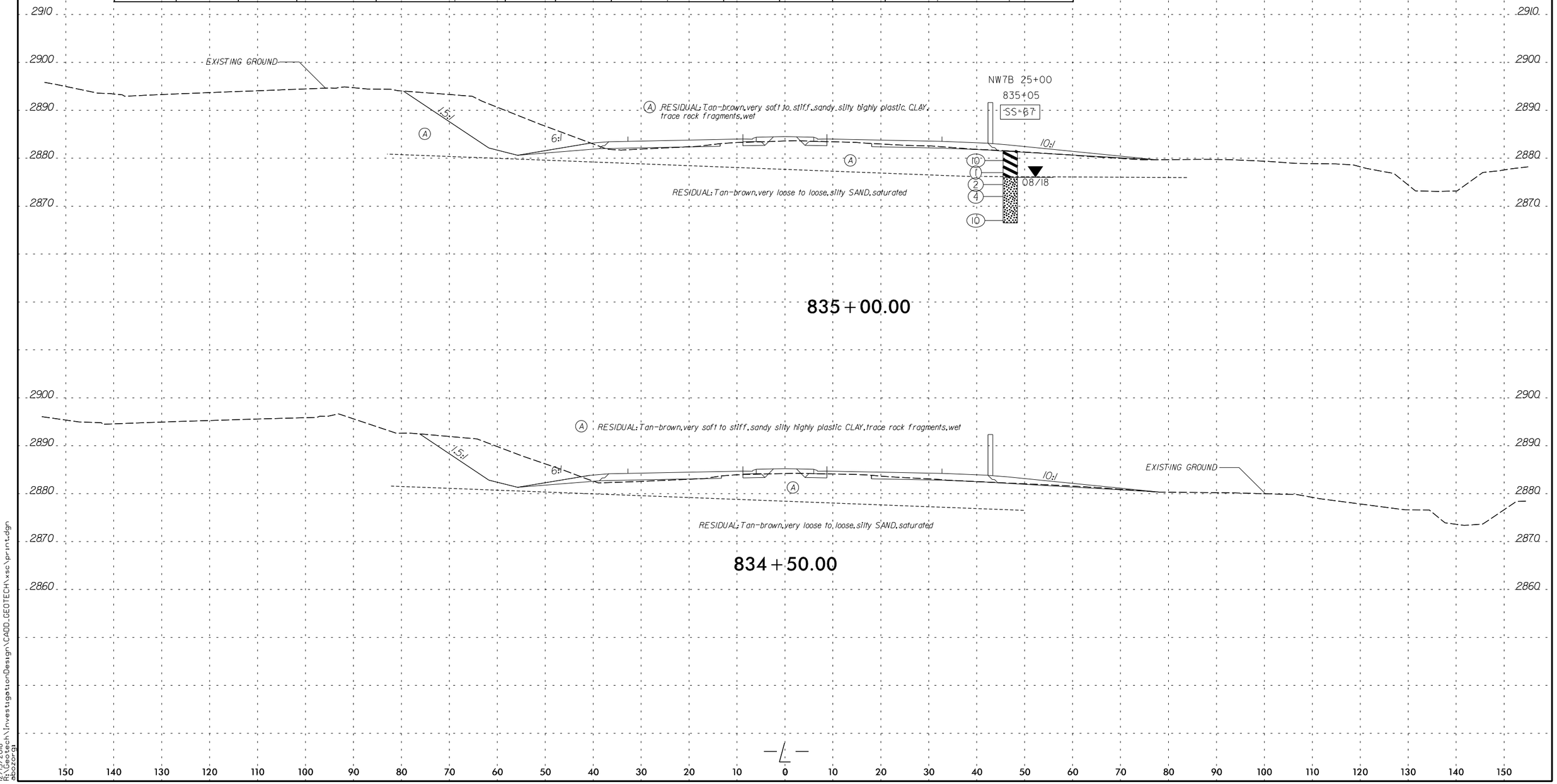
NW7B 22+00
832+05
(5) (3) (7) (6) (4)
08/18

832+00.00

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.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-67	835+06	47' LT	1.0-2.5	A-7-5(27)	68	34	8	19	13	60	94	90	72	33	N/A

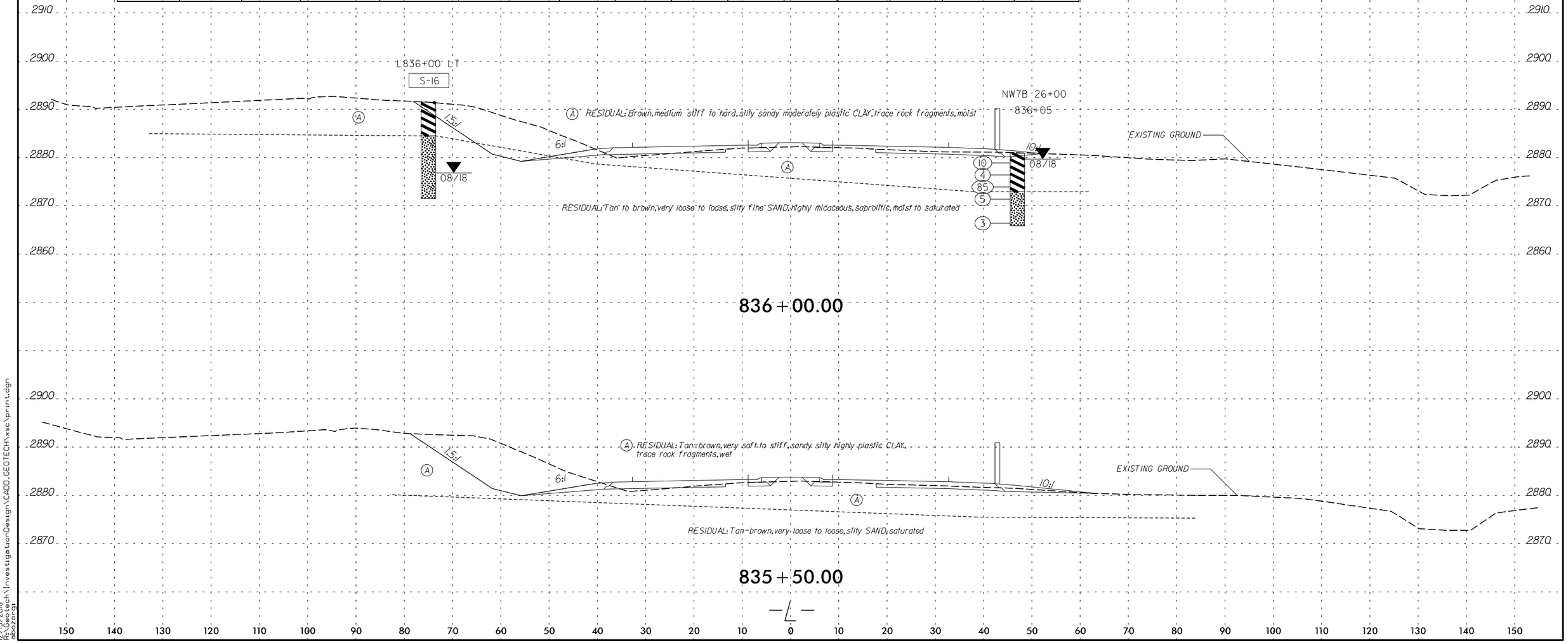


0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2915E	91

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

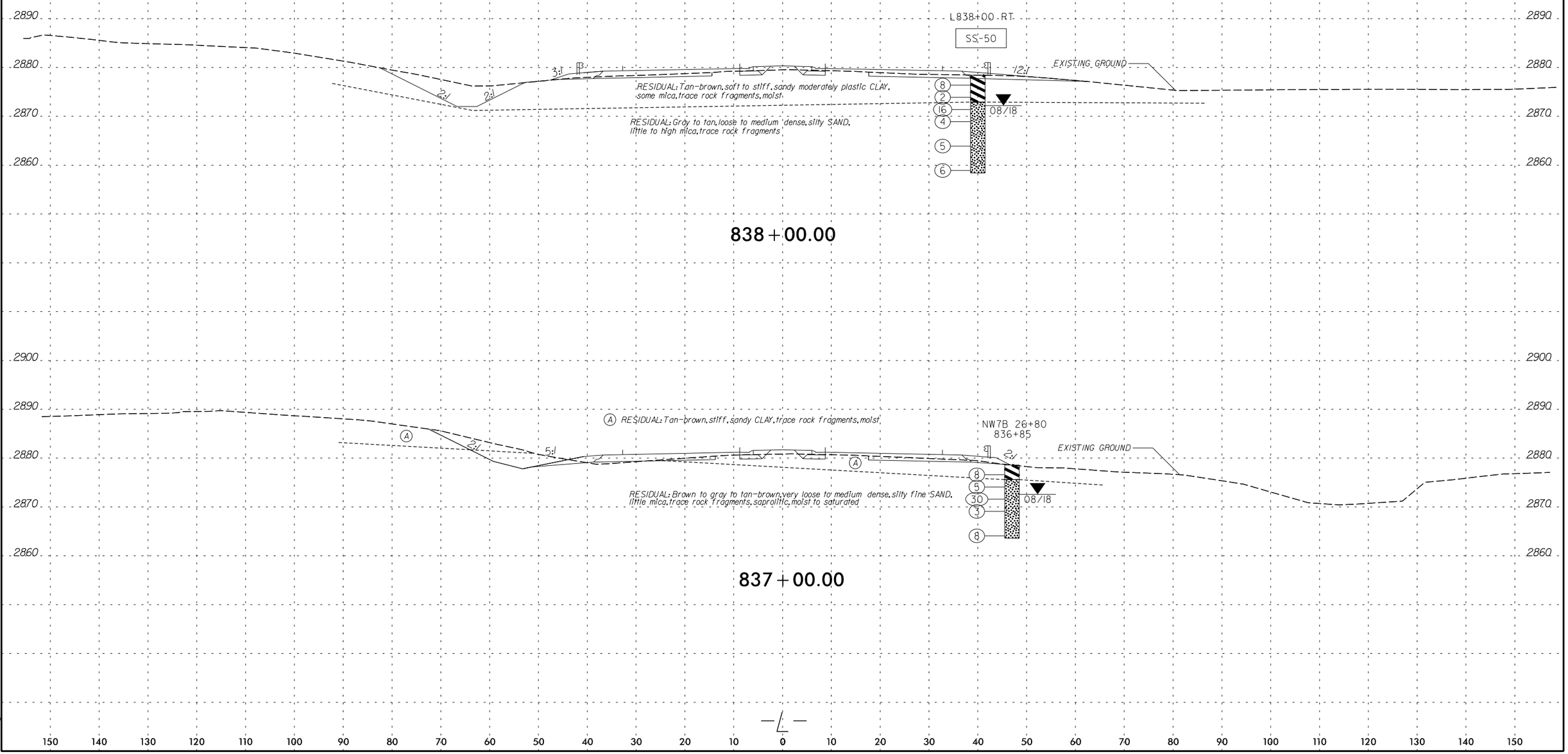
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-16	836+00	75' LT	2.0-3.0	A-7-6(9)	41	17	16	23	11	50	99	92	64	19	N/A



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

SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-50	838+00	40' RT	3.5-5.0	A-7-5(13)	59	23	12	21	19	48	85	79	60	32	N/A



6/23/16

PROJ. REFERENCE NO.	SHEET NO.
R-2915E	93

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

SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-51	839+19	44' LT	3.5-5.0	A-2-7(1)	43	18	15	35	14	36	53	49	30	27	N/A

2900 2890 2880 2870 2860 2850

L 838+50 LT
839+19
SS-51

(A) ROADWAY EMBANKMENT: Brown; medium stiff, sandy CLAY, little gravel; moist

EXISTING GROUND

2:1 2:1 7:1

6 4 5 49 22 32

08/18

RESIDUAL: Gray-brown to tan-brown, loose to dense, clayey SAND, trace rock fragments, moist to saturated

839+00.00

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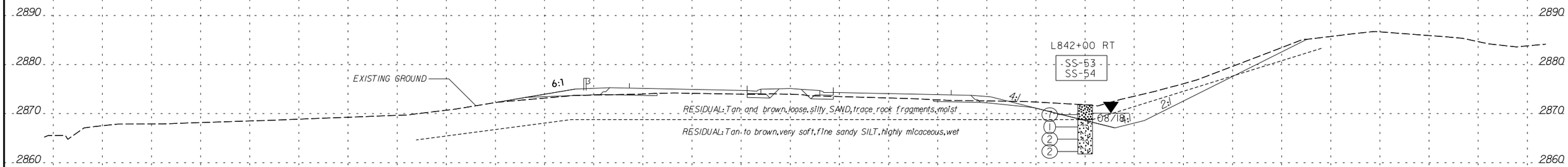
6/23/16

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

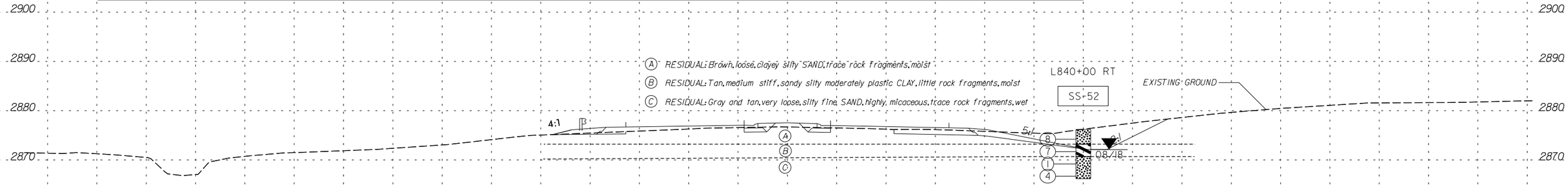
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-53	842+00	60' RT	1.0-2.5	A-2-5(0)	43	10	19	37	8	36	57	50	29	18	N/A
SS-54	842+00	60' RT	3.5-5.0	A-5(4)	53	0	7	24	5	64	99	96	74	59	N/A



842+00.00

SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-52	840+00	60' RT	3.5-5.0	A-7-6(8)	44	21	12	39	10	39	91	85	51	27	N/A



840+00.00

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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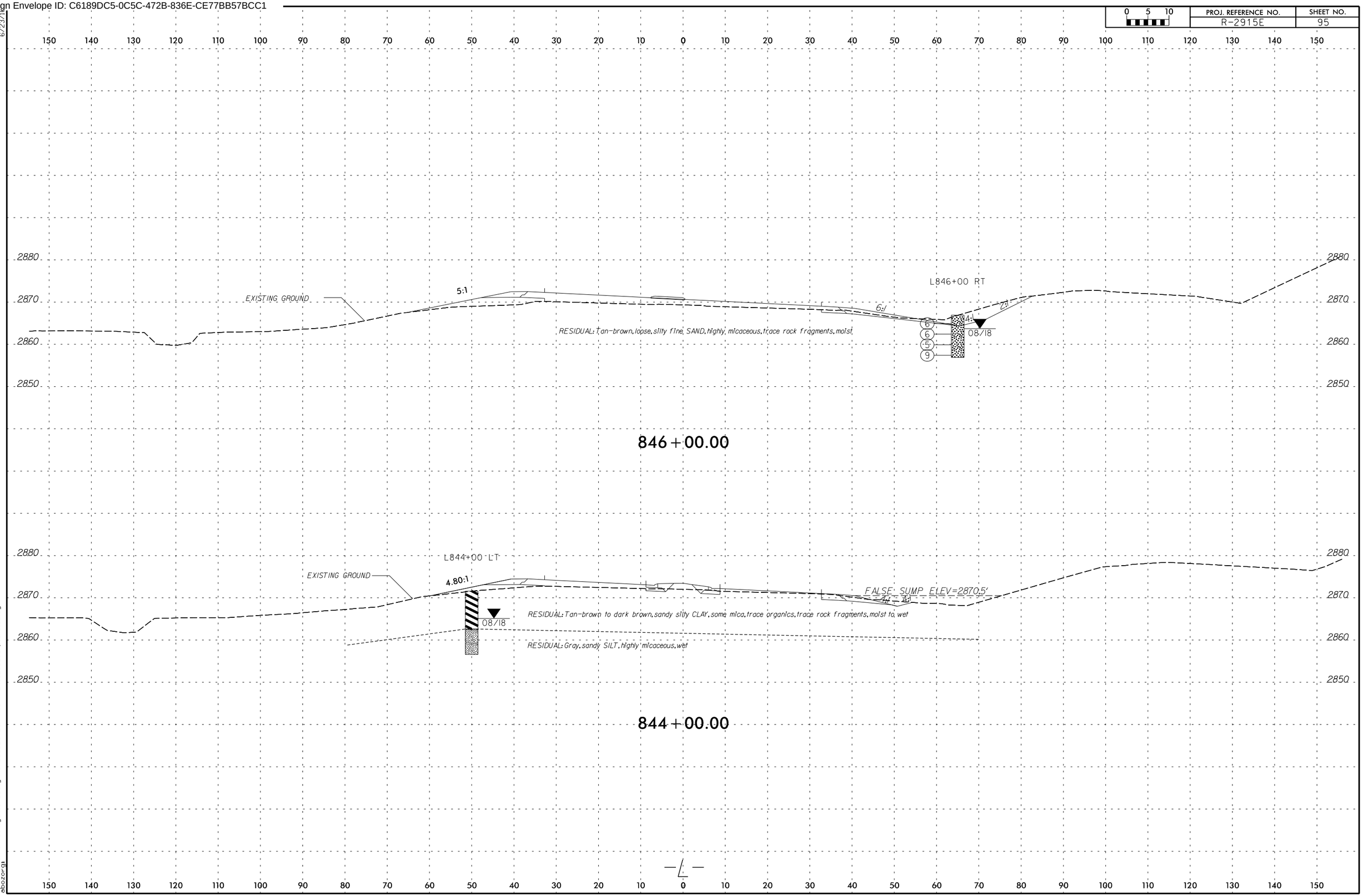
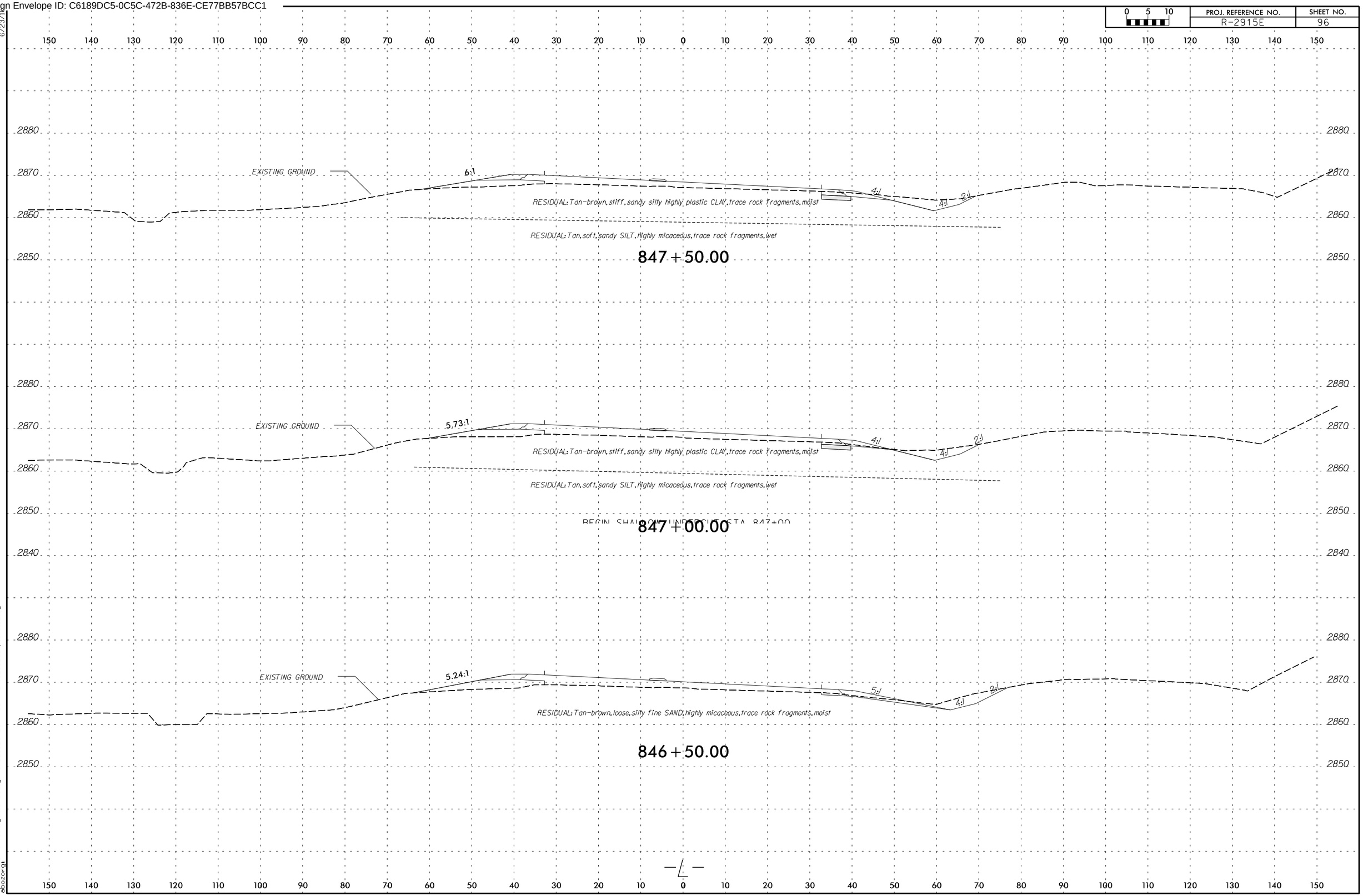
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2915E	95



6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2915E	96



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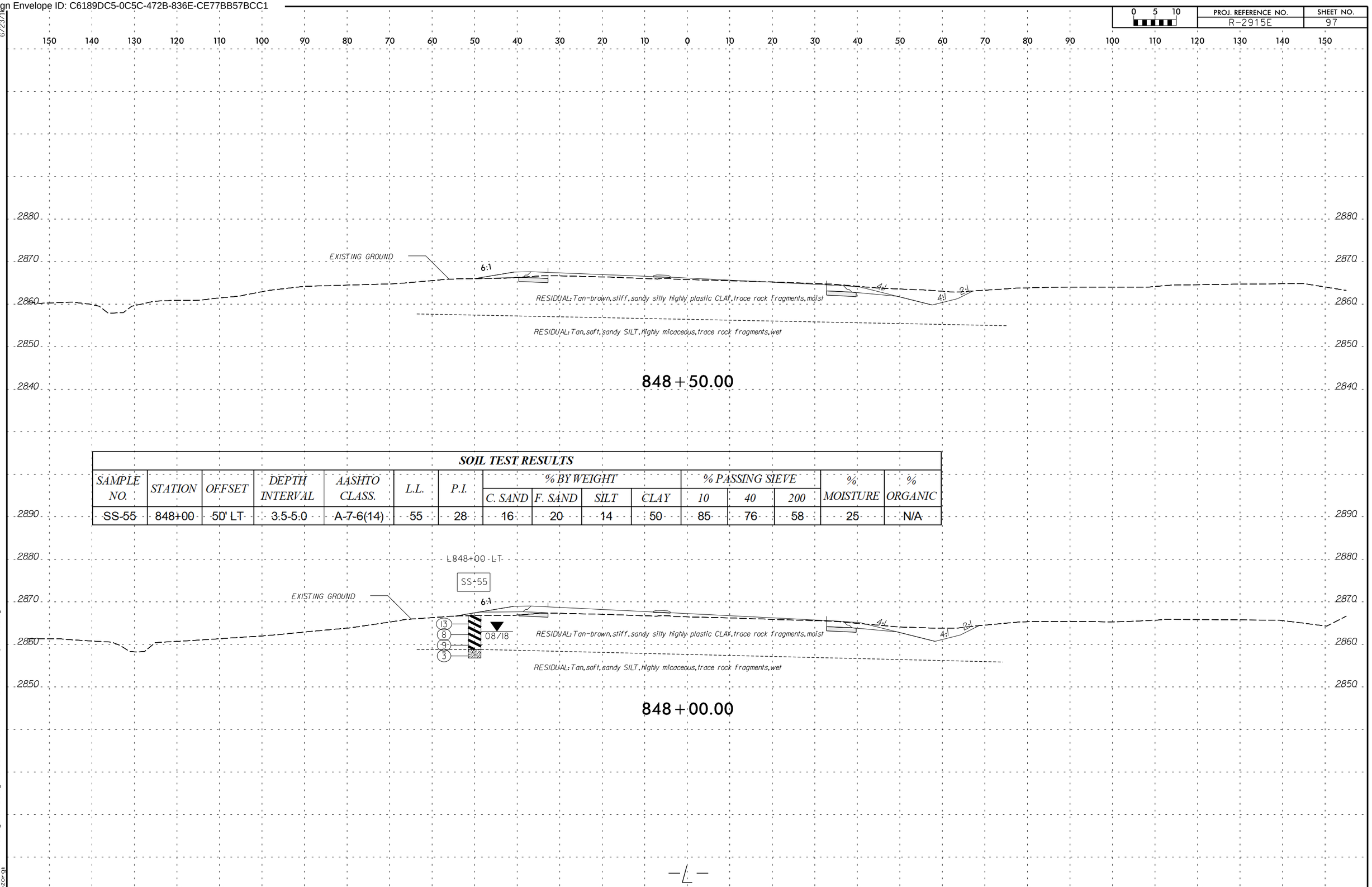
dbozarth

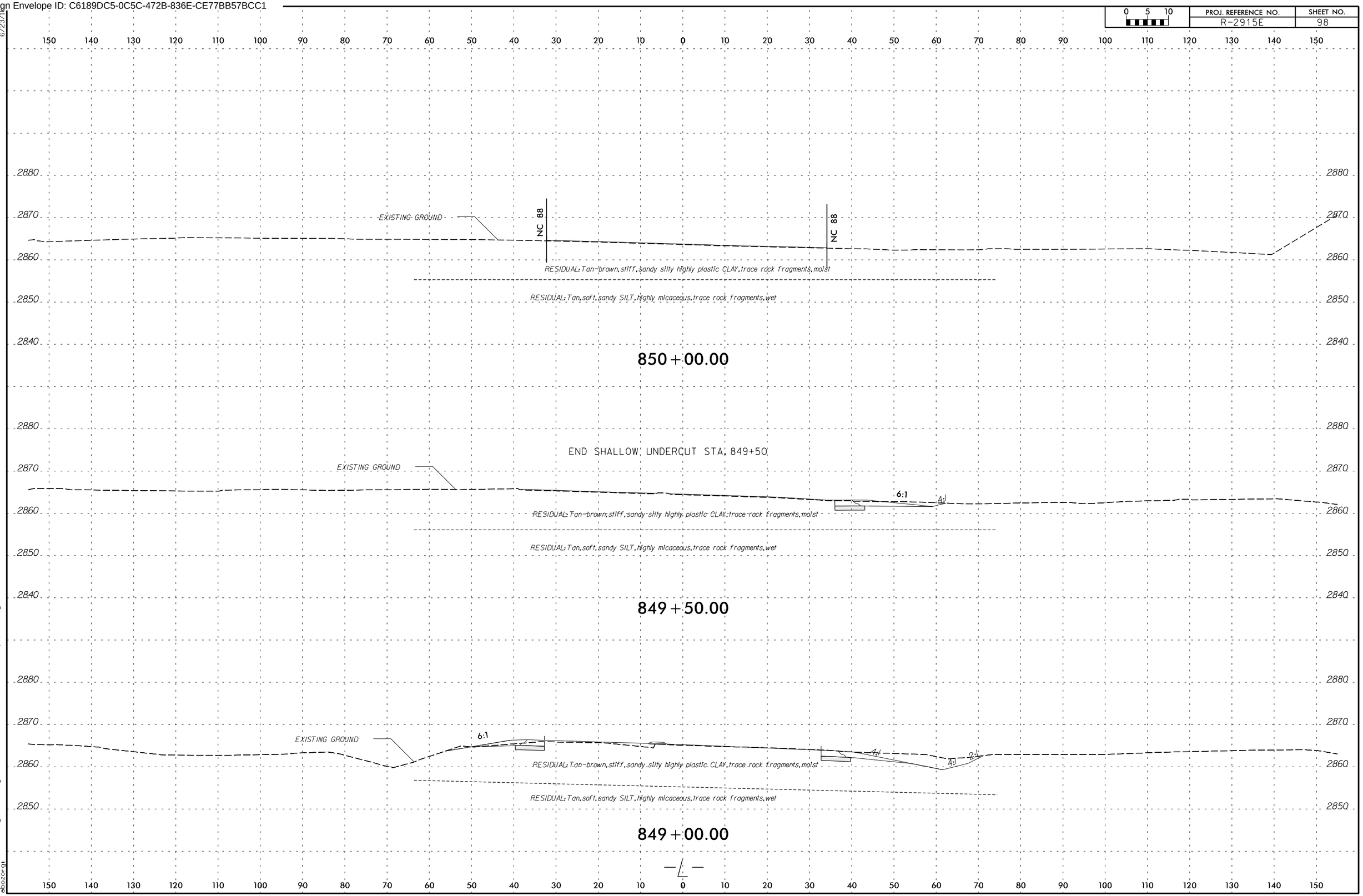


SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-55	848+00	50' LT	3.5-5.0	A-7-6(14)	55	28	16	20	14	50	85	76	58	25	N/A

6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2915E	98



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PROJECT REFERENCE NO.	SHEET NO.
R–5742	99

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

APPENDIX A
LABORATORY RESULTS

REFERENCE: R–2915E

PROJECT: 34518

Prepared in the Office of:

RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE, SUITE 350
RALEIGH, NORTH CAROLINA 27609
NC LICENSE NO. F–0112

LABORATORY TEST RESULTS

RKK R2915E US221 Widening Ashe County

Ashe County, NC

NCDOT Project: R2915E

Falcon Engineering Project No: G18018.00

SAMPLE		DEPTH	AASHTO	ATTERBERG LIMITS		PERCENT BY WEIGHT				PERCENT PASSING SIEVE			MOISTURE	BULK DENSITY	ORGANICS
NO.	LOCATION	INTERVAL	CLASS.	LL	PI	C.SAND	F.SAND	SILT	CLAY	#10	#40	#200	(%)	(pcf)	(%)
SS-56	NW7B 11+00	1.0-2.5	A-5(3)	47	10	19	39	20	22	100	90	49	26	N/A	N/A
SS-57	NW7B 11+00	6.0-7.5	A-7-5(5)	43	12	11	37	22	30	94	89	56	54	N/A	N/A
SS-58	NW7B 12+00	6.0-7.5	A-2-4(0)	24	0	18	48	9	25	70	64	29	30	N/A	N/A
SS-59	NW7B 13+00	6.0-7.5	A-7-6(14)	50	21	9	25	17	49	96	92	68	33	N/A	N/A
SS-60	NW7B 14+00	6.0-7.5	A-7-6(18)	55	27	9	23	17	51	93	89	69	34	N/A	N/A
SS-61	NW7B 14+00	8.5-10.0	A-2-5(0)	62	10	18	48	14	20	73	68	31	71	N/A	N/A
SS-62	NW7B 15+00	1.0-2.5	A-7-5(3)	46	14	13	29	23	35	67	63	43	25	N/A	N/A
SS-63	NW7B 17+00	1.0-2.5	A-7-6(10)	48	23	13	28	15	44	86	80	56	28	N/A	N/A
SS-64	NW7B 17+00	8.5-10.0	A-7-5(13)	56	18	6	39	36	19	100	98	67	81	N/A	N/A
SS-65	NW7B 19+00	1.0-2.5	A-2-5(0)	43	6	20	43	15	22	68	61	29	23	N/A	N/A
SS-66	NW7B 21+00	1.0-2.5	A-7-5(17)	66	26	6	34	10	50	91	89	62	33	N/A	N/A
SS-67	NW7B 25+00	1.0-2.5	A-7-5(27)	68	34	8	19	13	60	94	90	72	33	N/A	N/A

Reviewed By

Patrick Clark

Certification: 105-01-0803

LABORATORY TEST RESULTS

RKK R2915E US221 Widening Ashe County

Ashe County, NC

NCDOT Project: R2915E

Falcon Engineering Project No: G18018.00

SAMPLE		DEPTH	AASHTO	ATTERBERG LIMITS		PERCENT BY WEIGHT				PERCENT PASSING SIEVE			MOISTURE	BULK DENSITY	ORGANICS
NO.	LOCATION	INTERVAL	CLASS.	LL	PI	C.SAND	F.SAND	SILT	CLAY	#10	#40	#200	(%)	(pcf)	(%)
SS-1	L 674+50 RT	13.5-15.0	A-4(0)	39	1	20	41	30	9	100	92	49	36	N/A	N/A
SS-2	L 678+00 RT	6.0-7.5	A-7-5(3)	51	11	16	30	25	29	76	70	45	17	N/A	N/A
SS-3	L 681+50 RT	8.5-10.0	A-2-5(0)	48	2	24	51	18	7	100	90	33	20	N/A	N/A
SS-4	L 681+50 RT	28.5-30.0	A-5(0)	42	3	16	52	22	10	90	84	37	22	N/A	N/A
S-1	L 683+50 LT	1.0-10.0	A-4(0)	36	5	35	29	18	18	94	72	39	25	N/A	N/A
SS-5	L 690+00 RT	3.5-5.0	A-2-5(0)	41	0	36	45	11	8	100	83	25	17	N/A	N/A
SS-6	L 694+00 RT	1.0-2.5	A-7-5(13)	55	23	15	25	20	40	93	85	60	31	N/A	N/A
SS-7	L 696+00 LT	3.5-5.0	A-5(3)	53	10	15	46	23	16	92	87	45	39	N/A	N/A
SS-8	L 700+00 LT	3.5-5.0	A-5(7)	56	9	12	36	36	16	100	94	61	67	N/A	N/A
SS-9	L702+00LT	1.0-2.5	A-4(2)	36	4	8	38	10	44	100	97	61	22	N/A	N/A
SS-10	L 704+00 LT	1.0-2.5	A-7-6(4)	57	28	10	21	24	45	50	47	37	29	N/A	N/A
SS-11	L 704+00 LT	6.0-7.5	A-7-6(18)	50	23	6	26	29	39	100	97	74	33	N/A	N/A
SS-12	L 706+00 LT	3.5-5.0	A-5(0)	42	0	23	45	23	9	100	88	41	59	N/A	N/A
SS-13	L 708+00 LT	3.5-5.0	A-7-5(7)	46	13	16	29	28	27	96	87	59	55	N/A	N/A
S-2	L 710+00 LT	1.0-3.5	A-7-6(15)	50	24	11	26	21	42	98	92	67	34	N/A	N/A
SS-14	L 712+00 LT	3.5-5.0	A-4(3)	34	8	13	34	27	26	97	89	58	32	N/A	N/A
SS-15	L 712+00 LT	6.0-7.5	A-7-5(4)	55	23	6	29	34	31	54	53	39	54	N/A	N/A
SS-16	L 714+00 LT	1.0-2.5	A-7-6(10)	43	19	9	33	20	38	100	96	62	33	N/A	N/A
SS-17	L 716+00 LT	1.0-2.5	A-7-5(11)	49	18	13	29	20	38	100	93	65	34	N/A	N/A
SS-18	L 717+00 LT	3.5-5.0	A-2-5(0)	47	8	27	45	14	14	92	77	32	25	N/A	N/A
SS-19	L 718+00 LT	1.0-2.5	A-7-6(8)	41	22	10	49	29	12	97	93	51	28	N/A	N/A
SS-20	L 719+00 RT	1.0-2.5	A-2-5(0)	47	0	26	45	14	15	86	73	32	24	N/A	N/A
SS-21	L 720+00 LT	3.5-5.0	A-7-6(15)	44	22	5	29	22	44	100	98	72	28	N/A	N/A
S-3	L 724+00 LT	1.0-3.5	A-6(10)	40	15	3	36	25	36	99	99	69	26	N/A	N/A
S-4	L 726+00 LT	13.0-15.0	A-5(3)	41	5	12	33	31	24	100	94	64	33	N/A	N/A
S-5	L 728+00 LT	5.0-15.0	A-4(1)	30	7	16	42	19	23	100	95	50	24	N/A	N/A
S-6	L 730+00 LT	3.0-6.0	A-6(3)	32	11	18	38	16	28	100	91	50	20	N/A	N/A
SS-22	L 734+00 LT	6.0-7.5	A-2-4(0)	36	0	15	65	13	7	100	95	31	13	N/A	N/A

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LABORATORY TEST RESULTS

RKK R2915E US221 Widening Ashe County

Ashe County, NC

NCDOT Project: R2915E

Falcon Engineering Project No: G18018.00

SAMPLE		DEPTH	AASHTO	ATTERBERG LIMITS		PERCENT BY WEIGHT				PERCENT PASSING SIEVE			MOISTURE	BULK DENSITY	ORGANICS
NO.	LOCATION	INTERVAL	CLASS.	LL	PI	C.SAND	F.SAND	SILT	CLAY	#10	#40	#200	(%)	(pcf)	(%)
S-7	L 736+00 LT	1.0-3.5	A-6(6)	38	13	9	34	21	36	96	92	62	27	N/A	N/A
S-8	L 738+00 LT	8.0-10.0	A-6(4)	38	12	10	42	25	23	100	99	54	24	N/A	N/A
SS-23	L 740+00 LT	3.5-5.0	A-2-4(0)	32	0	21	57	16	6	100	97	29	20	N/A	N/A
SS-24	L 742+00 LT	6.0-7.5	A-7-6(5)	46	25	17	22	10	51	62	55	41	44	N/A	N/A
SS-25	L 743+00 LT	1.0-2.5	A-6(6)	40	14	8	43	17	32	100	97	57	23	N/A	N/A
SS-26	L 743+00 LT	8.5-10.0	A-4(2)	28	9	11	43	18	28	94	90	50	21	N/A	N/A
S-9	L 745+50 LT	1.0-15.0	A-6(6)	38	15	13	35	20	32	94	88	55	27	N/A	N/A
S-10	L 745+50 LT	10.0-11.0	A-7-6(7)	41	16	11	34	25	30	94	89	58	26	N/A	N/A
S-11	L 745+50 LT	21.0-22.0	A-6(6)	37	16	11	41	21	27	100	97	56	25	N/A	N/A
SS-27	L 747+50 LT	3.5-5.0	A-2-4(0)	27	0	28	46	13	13	97	85	31	22	N/A	N/A
SS-28	L 747+50 LT	13.5-15.0	A-2-4(0)	23	0	27	49	12	12	98	88	30	18	N/A	N/A
SS-29	L 747+50 LT	28.5-30.0	A-4(3)	33	9	11	44	20	25	100	94	54	29	N/A	N/A
SS-30	L 749+50 LT	3.5-5.0	A-1-b(0)	21	1	20	46	16	18	53	49	22	23	N/A	N/A
SS-31	L 749+50 LT	13.5-15.0	A-2-5(0)	41	0	31	52	10	7	100	88	24	25	N/A	N/A
SS-32	L 754+00 LT	13.5-15.0	A-4(3)	34	10	13	39	19	29	99	94	55	28	N/A	N/A
SS-33	L 756+00 LT	3.5-5.0	A-2-4(0)	33	0	25	45	17	13	88	77	32	22	N/A	N/A
SS-34	L 756+00 LT	8.5-10.0	A-6(3)	38	14	19	37	14	30	88	78	45	40	N/A	N/A
SS-35	L 762+00 LT	1.0-2.5	A-4(1)	32	7	9	43	21	27	83	79	48	18	N/A	N/A
SS-36	L 764+00 RT	1.0-2.5	A-1-b(0)	24	2	24	43	18	15	36	31	15	6	N/A	N/A
S-12	L 766+00 RT	6.0-8.0	A-7-6(12)	46	21	12	27	19	42	94	87	63	31	N/A	N/A
S-13	L 766+00 RT	27.0-28.0	A-7-6(12)	45	24	12	35	20	33	99	94	61	26	N/A	N/A
SS-37	L 770+00 RT	1.0-2.5	A-6(3)	39	11	22	34	21	23	96	85	47	26	N/A	N/A
SS-38	L 774+00 RT	1.0-2.5	A-7-5(10)	53	22	10	30	24	36	81	76	54	40	N/A	N/A
S-14	L 778+00 RT	1.0-3.5	A-4(0)	22	2	20	47	19	14	99	91	40	13	N/A	N/A
SS-39	L 784+00 RT	1.0-2.5	A-2-4(0)	21	0	21	53	20	6	100	95	34	11	N/A	N/A
S-15	L786+00RT	1.0-3.5	A-7-5(9)	49	18	10	43	27	20	100	97	56	28	N/A	N/A

Reviewed by

LABORATORY TEST RESULTS

RKK R2915E US221 Widening Ashe County

Ashe County, NC

NCDOT Project: R2915E

Falcon Engineering Project No: G18018.00

SAMPLE		DEPTH	AASHTO	ATTERBERG LIMITS		PERCENT BY WEIGHT				PERCENT PASSING SIEVE			MOISTURE	BULK DENSITY	ORGANICS
NO.	LOCATION	INTERVAL	CLASS.	LL	PI	C.SAND	F.SAND	SILT	CLAY	#10	#40	#200	(%)	(pcf)	(%)
SS-40	L 790+00 RT	3.5-5.0	A-4(2)	34	8	16	37	15	32	98	90	53	31	N/A	N/A
SS-41	L 801+00 LT	3.5-5.0	A-7-5(54)	86	51	4	8	7	81	100	98	90	33	N/A	N/A
SS-42	L 801+00 LT	13.5-15.0	A-5(2)	63	0	16	42	23	19	100	92	52	52	N/A	N/A
SS-43	L 803+00 LT	1.0-2.5	A-7-6(20)	60	35	12	30	20	38	100	94	63	28	N/A	N/A
SS-44	L 803+00 LT	8.5-10.0	A-5(0)	51	0	19	46	17	18	100	93	43	53	N/A	N/A
SS-45	L 806+00 LT	6.0-7.5	A-7-6(3)	45	18	24	45	16	15	100	90	39	31	N/A	N/A
SS-46	L 806+00 RT	13.5-15.0	A-7-6(10)	48	20	10	39	11	40	99	94	58	42	N/A	N/A
SS-47	L 812+00 RT	13.5-15.0	A-5(2)	48	9	15	36	15	34	77	71	43	37	N/A	N/A
SS-48	L 817+50 RT	1.0-2.5	A-7-5(11)	49	18	12	27	17	44	97	90	64	25	N/A	N/A
SS-49	L 834+00 LT	3.5-5.0	A-7-5(13)	65	14	8	30	15	47	100	96	69	58	N/A	N/A
S-16	L 836+00 LT	2.0-3.0	A-7-6(9)	41	17	16	23	11	50	99	92	64	19	N/A	N/A
SS-50	L 838+00 RT	3.5-5.0	A-7-5(13)	59	23	12	21	19	48	85	79	60	32	N/A	N/A
SS-51	L 838+50 LT	3.5-5.0	A-2-7(1)	43	18	15	35	14	36	53	49	30	27	N/A	N/A
SS-52	L 840+00 RT	3.5-5.0	A-7-6(8)	44	21	12	39	10	39	91	85	51	27	N/A	N/A
SS-53	L 842+00 RT	1.0-2.5	A-2-5(0)	43	10	19	37	8	36	57	50	29	18	N/A	N/A
SS-54	L 842+00 RT	3.5-5.0	A-5(4)	53	0	7	24	5	64	99	96	74	59	N/A	N/A
SS-55	L 848+00 LT	3.5-5.0	A-7-6(14)	55	28	16	20	14	50	85	76	58	25	N/A	N/A

Reviewed By

Patrick Clark

Certification: 105-01-0803

FALCON ENGINEERING
1210 TRINITY ROAD, SUITE 110
CARY, NC 27513
PHONE: 919.871.0800
www.falconengineers.com

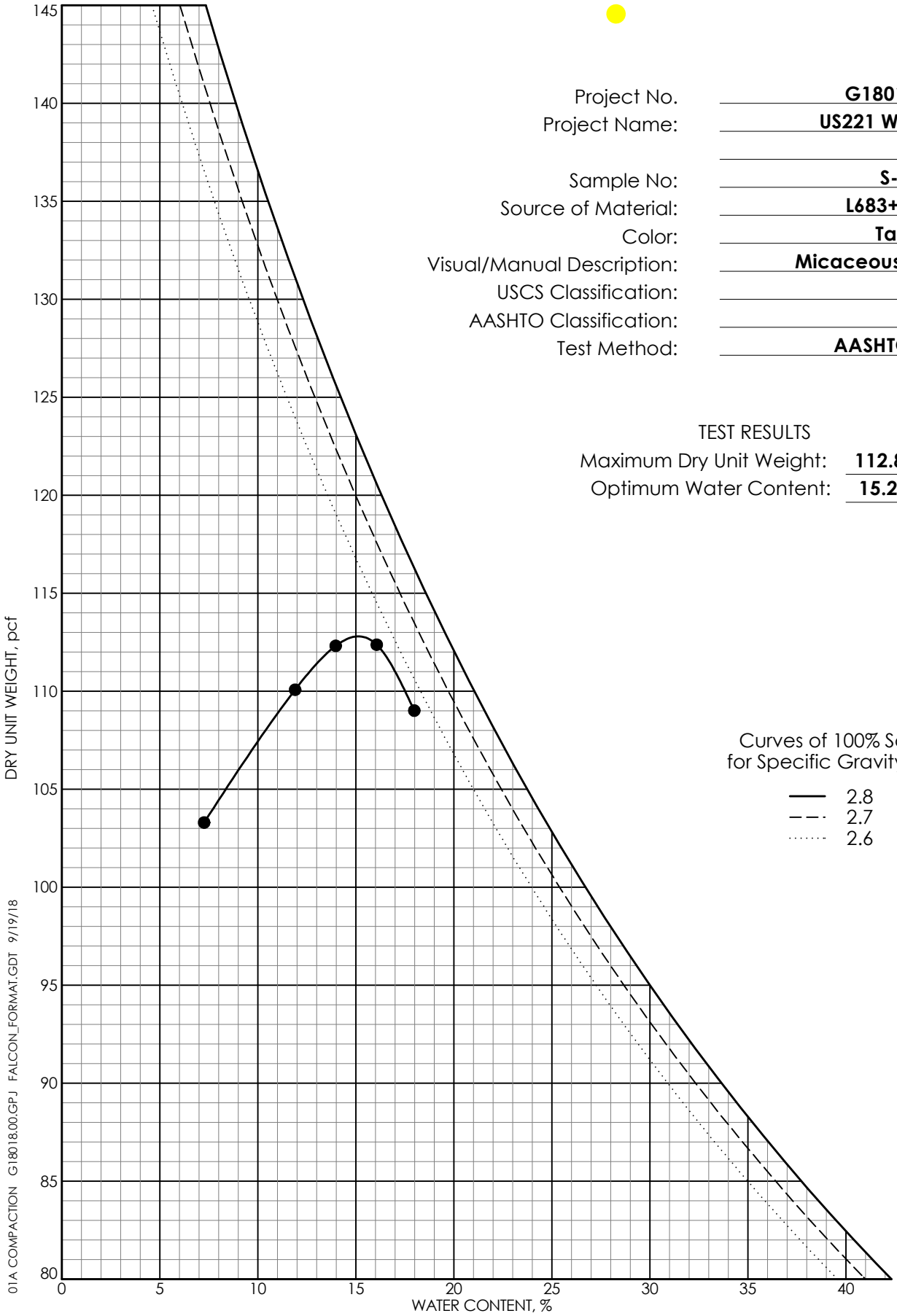
LABORATORY COMPACTION TEST RESULTS

9/19/2018

Project No.	**G18018.00**
Project Name:	**US221 Widening**
Sample No:	**S-1**
Source of Material:	**L683+50 LT**
Color:	**Tan,**
Visual/Manual Description:	**Micaceous SILT (A-4)**
USCS Classification:	
AASHTO Classification:	
Test Method:	**AASHTO T-99**

TEST RESULTS

Maximum Dry Unit Weight:	**112.8 PCF**
Optimum Water Content:	**15.2 %**



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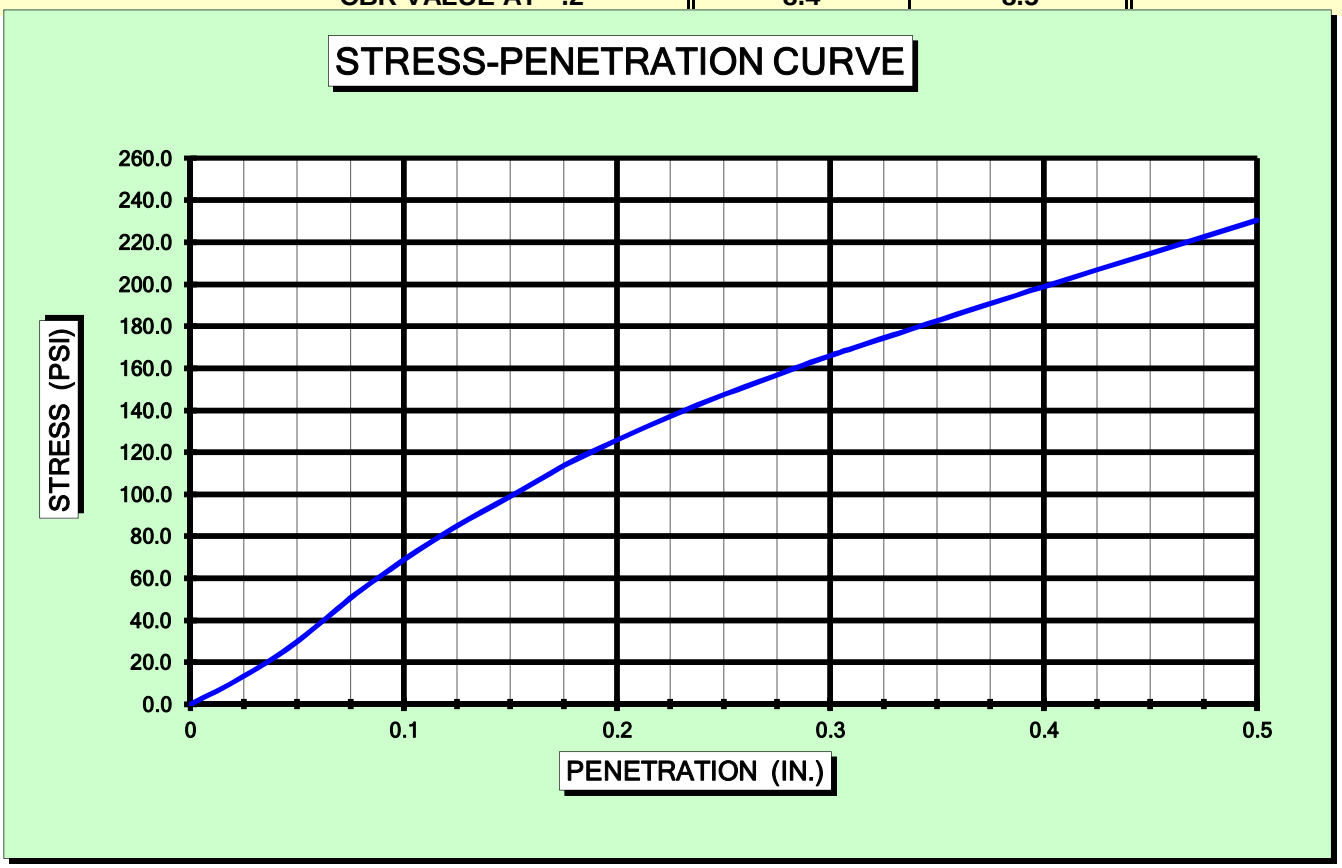
CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

AASHTO T-193 \ ASTM D-1883

PROJECT #:	G18108.00	**DATE:**	9/11/2018
PROJECT NAME:	R2915E US221 Widening		
BORING:	L683+50LT	**SAMPLE:** S-1	**DEPTH:** 1-10'
SOIL DESCRIPTION:	Tan Micaceous Silt (A-4)		

COMPACTION METHOD	AASHTO T-99A	SOAK	96 HRS.
MAXIMUM DRY DENSITY	112.8 PCF	STRAIN RATE	.05 IN / MIN.
OPTIMUM MOISTURE CONTENT	15.2%	LOAD CELL	6000
TEST DATA		SURCHARGE WEIGHT	10 lb.
DRY DENSITY	109.6 PCF	SURCHARGE PER SQUARE FOOT	51 lbs/sq.ft.
MOISTURE CONTENT	15.4%	FINAL MOISTURE CONTENT	N/A
PERCENT COMPACTION	97.2%	SWELL	0.79%

	ACTUAL	CORRECTED
CBR VALUE AT .1"	6.9	7.0
CBR VALUE AT .2"	8.4	8.5



LIQUID LIMIT	36	PLASTIC LIMIT	31	PLASTIC INDEX	5

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LABORATORY COMPACTION TEST RESULTS

9/19/2018

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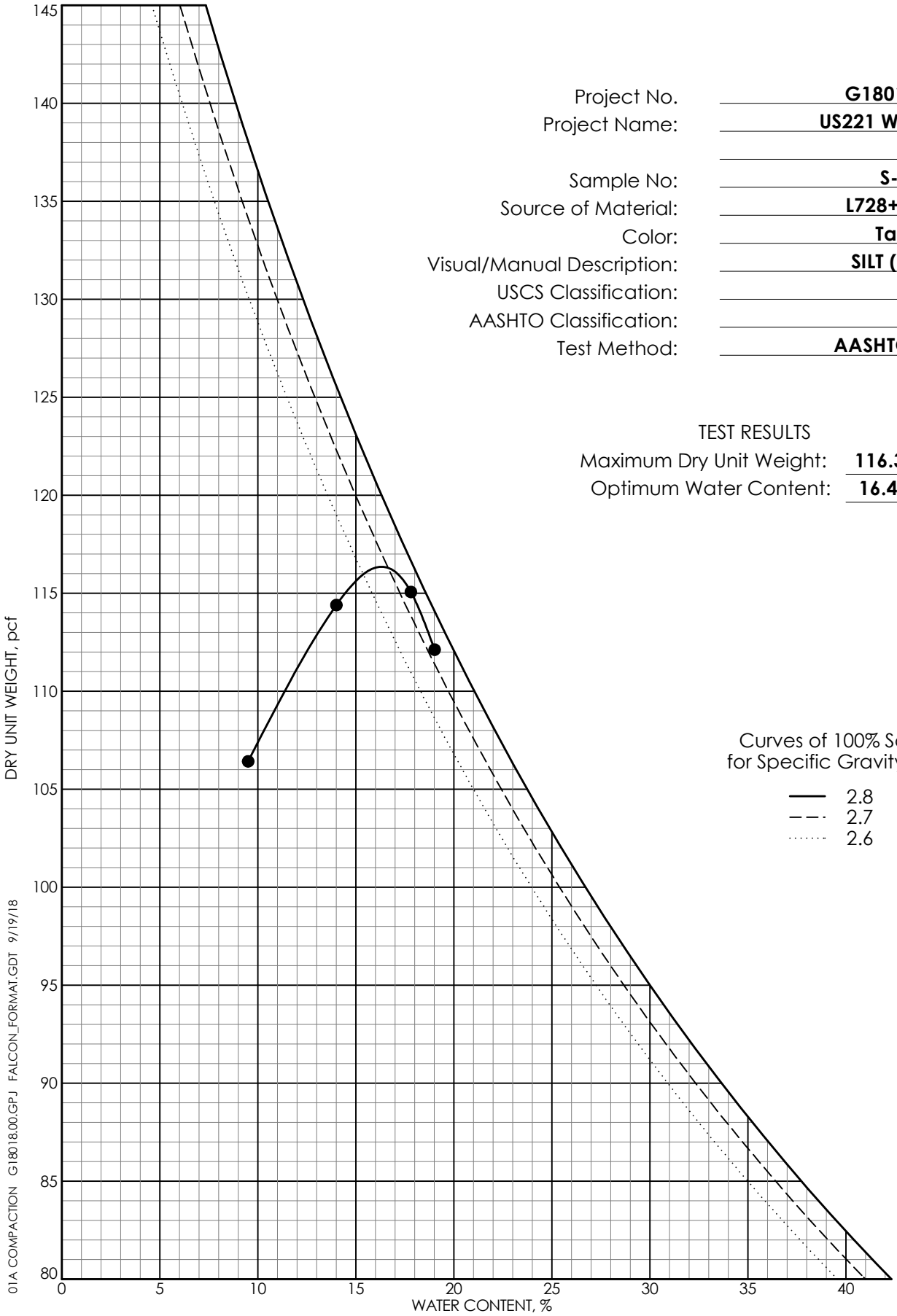
Project No.	**G18018.00**
Project Name:	**US221 Widening**
Sample No:	**S-5**
Source of Material:	**L728+00 LT**
Color:	**Tan,**
Visual/Manual Description:	**SILT (A-4)**
USCS Classification:	
AASHTO Classification:	
Test Method:	**AASHTO T-99**

TEST RESULTS

Maximum Dry Unit Weight:	**116.3 PCF**
Optimum Water Content:	**16.4 %**



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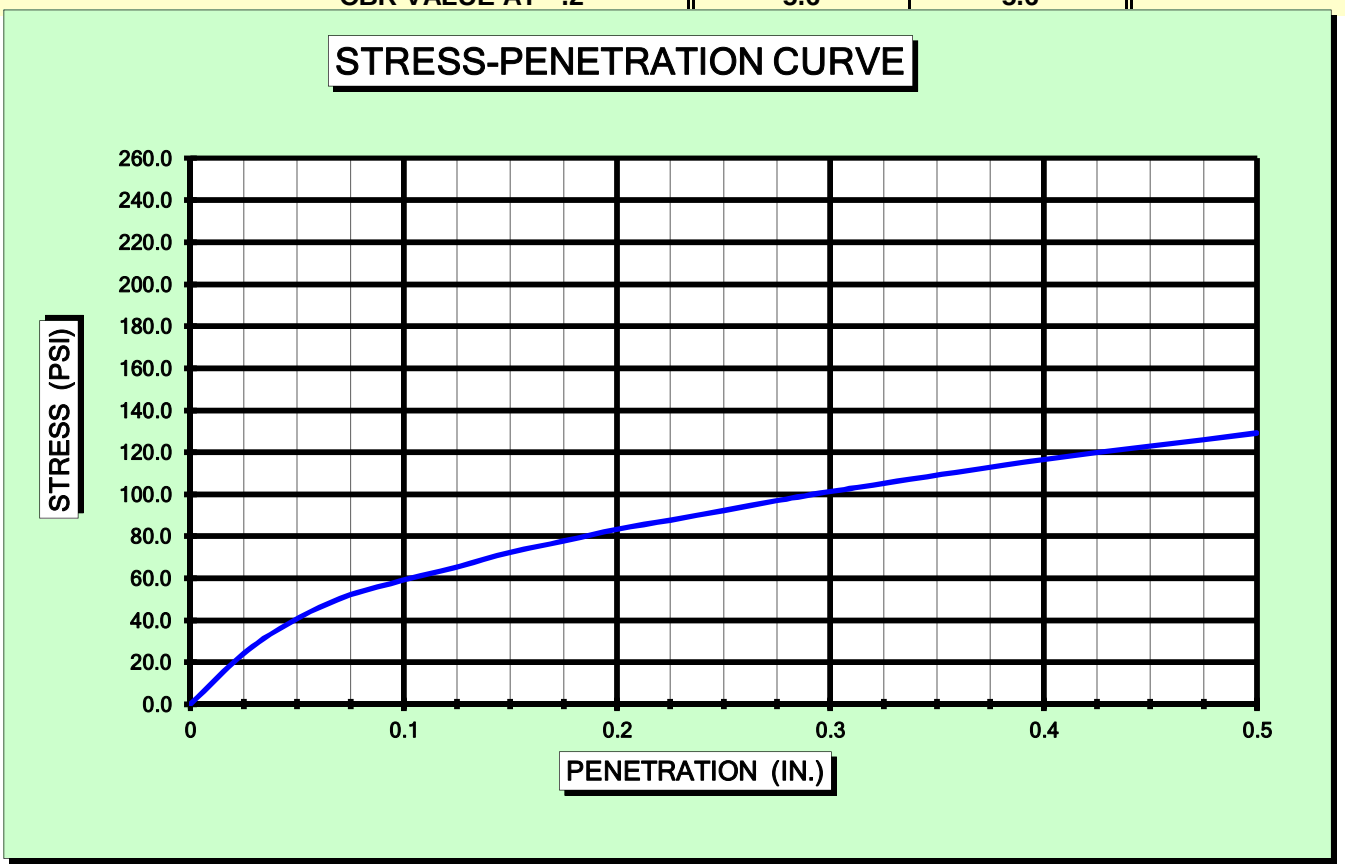
CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

AASHTO T-193 \ ASTM D-1883

PROJECT #:	G18108.00	**DATE:**	9/11/2018
PROJECT NAME:	R2915E US221 Widening		
BORING:	L728+00 LT	**SAMPLE:** S-5	**DEPTH:** 5-15'
SOIL DESCRIPTION:	Tan Silt (A-4)		

COMPACTION METHOD	AASHTO T-99A	SOAK	96 HRS.
MAXIMUM DRY DENSITY	116.3 PCF	STRAIN RATE	.05 IN / MIN.
OPTIMUM MOISTURE CONTENT	16.4%	LOAD CELL	6000
TEST DATA		SURCHARGE WEIGHT	10 lb.
DRY DENSITY	113.4 PCF	SURCHARGE PER SQUARE FOOT	51 lbs/sq.ft.
MOISTURE CONTENT	16.4%	FINAL MOISTURE CONTENT	N/A
PERCENT COMPACTION	97.5%	SWELL	0.81%

	ACTUAL	CORRECTED
CBR VALUE AT .1"	5.9	5.9
CBR VALUE AT .2"	5.6	5.6



LIQUID LIMIT	30	PLASTIC LIMIT	23	PLASTIC INDEX	7

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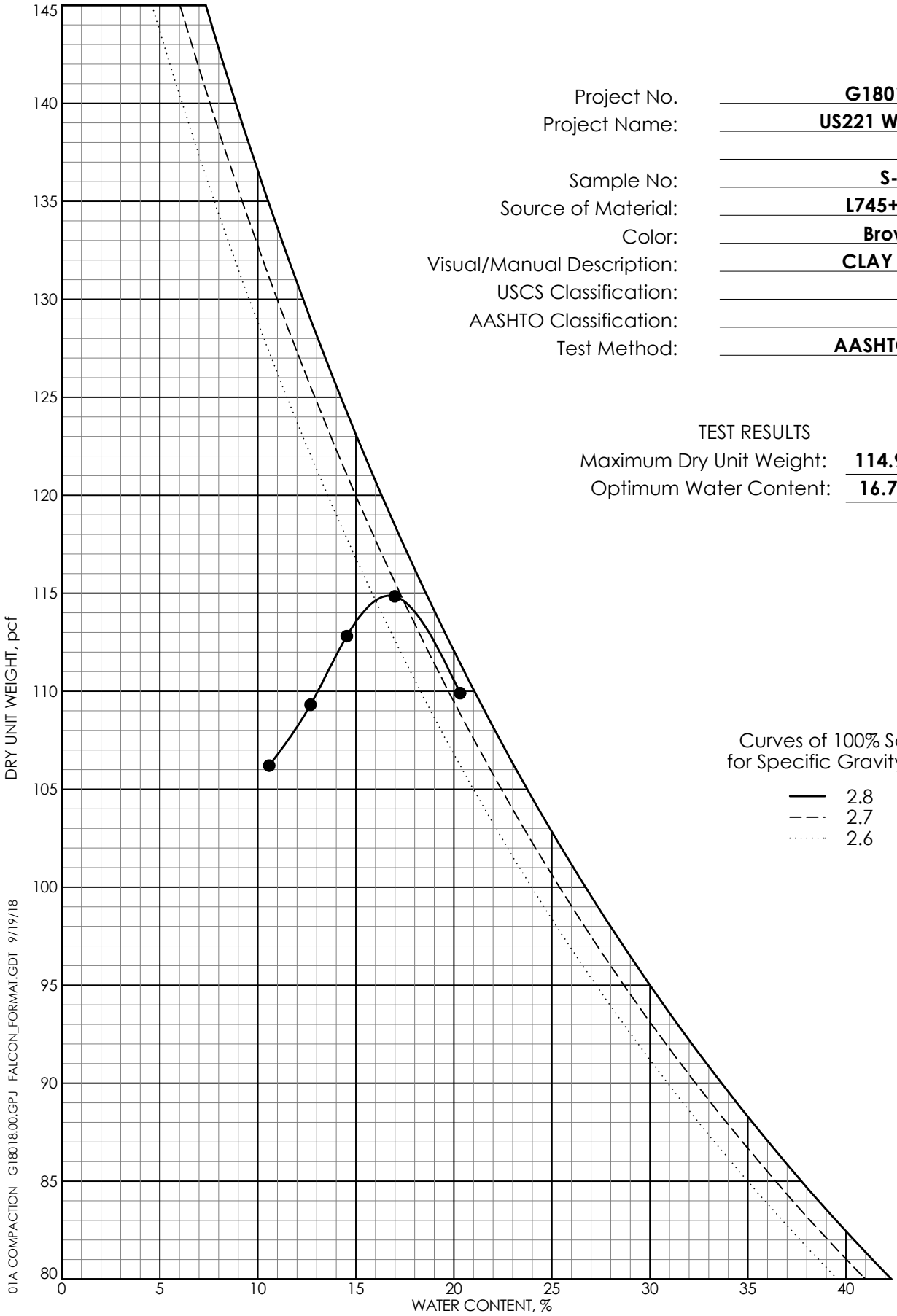
LABORATORY COMPACTION TEST RESULTS

9/19/2018

108



Project No.	**G18018.00**
Project Name:	**US221 Widening**
Sample No:	**S-9**
Source of Material:	**L745+50 LT**
Color:	**Brown,**
Visual/Manual Description:	**CLAY (A-6)**
USCS Classification:	
AASHTO Classification:	
Test Method:	**AASHTO T-99**

TEST RESULTS

Maximum Dry Unit Weight:	**114.9 PCF**
Optimum Water Content:	**16.7 %**

Curves of 100% Saturation for Specific Gravity Equal to:

- 2.8
- 2.7
- 2.6

FALCON ENGINEERING 1210 TRINITY RD., SUITE 110, Cary, NC 27513

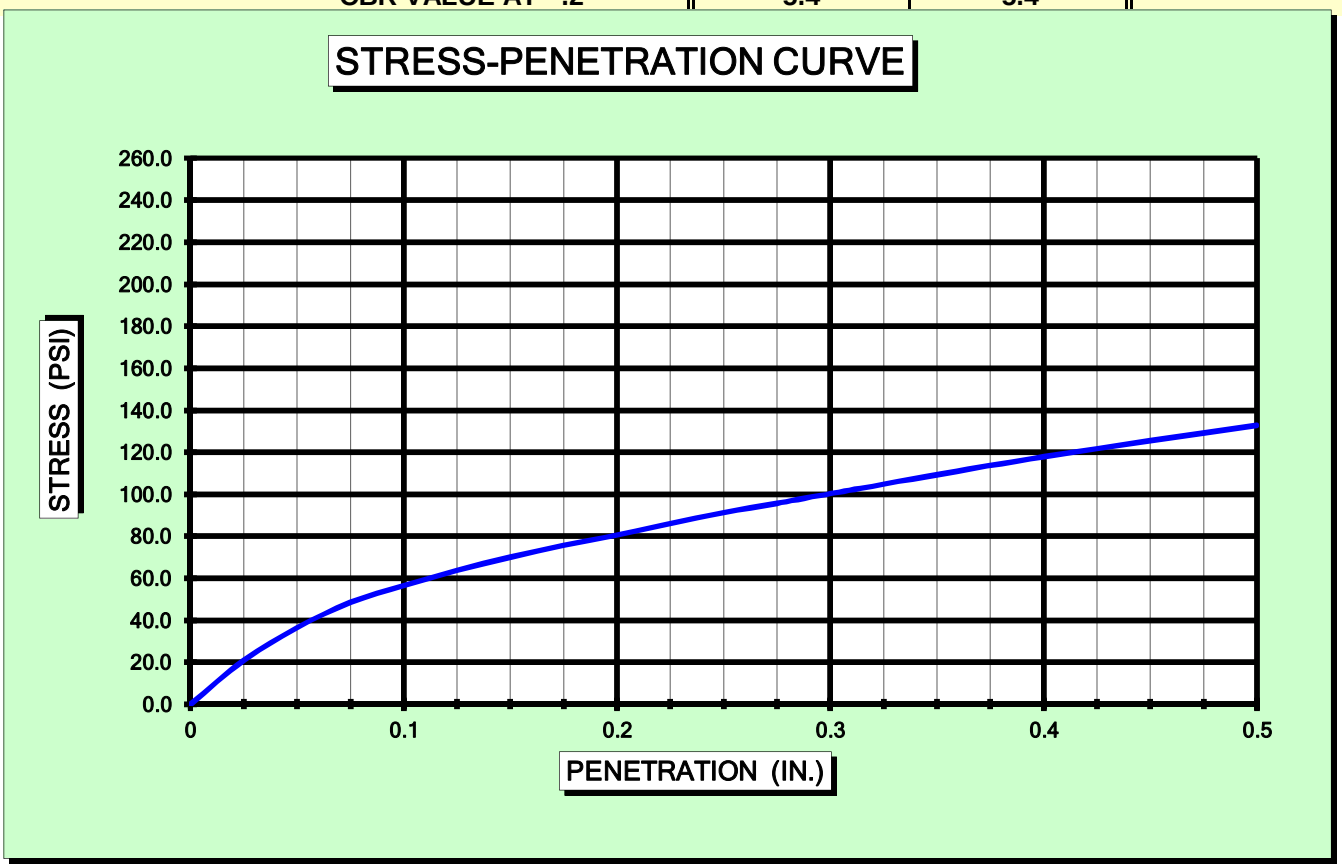
CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

AASHTO T-193 \ ASTM D-1883

PROJECT #:	G18108.00	**DATE:**	9/11/2018
PROJECT NAME:	R2915E US221 Widening		
BORING:	L745+50LT	**SAMPLE:**	S-9
DEPTH:	1-15'		
SOIL DESCRIPTION:	TAN CLAY (A-6)		

COMPACTION METHOD	AASHTO T-99A	SOAK	96 HRS.
MAXIMUM DRY DENSITY	114.9 PCF	STRAIN RATE	.05 IN / MIN.
OPTIMUM MOISTURE CONTENT	16.7%	LOAD CELL	6000
TEST DATA		SURCHARGE WEIGHT	10 lb.
DRY DENSITY	112.5 PCF	SURCHARGE PER SQUARE FOOT	51 lbs/sq.ft.
MOISTURE CONTENT	17.1%	FINAL MOISTURE CONTENT	N/A
PERCENT COMPACTION	97.9%	SWELL	1.00%

	ACTUAL	CORRECTED
CBR VALUE AT .1"	5.6	5.6
CBR VALUE AT .2"	5.4	5.4



LIQUID LIMIT	38	PLASTIC LIMIT	23	PLASTIC INDEX	15