

**This electronic collection of documents is provided
for the convenience of the user
and is Not a Certified Document –**

**The documents contained herein were originally issued
and sealed by the individuals whose names and license
numbers appear on each page, on the dates appearing
with their signature on that page.**

**This file or an individual page
shall not be considered a certified document.**

REFERENCE: B-4968

PROJECT: 40162

SEE SHEET 3 FOR PLAN SHEET LAYOUT AT TIME OF INVESTIGATION

CONTENTS

LINE	STATION	PLAN	PROFILE
-L-	13+00 - 63+00	4-7	8-9
-Y-	12+00 - 14+15	6	N/A

CROSS SECTIONS

LINE	STATION	SHEETS
-L-	14+00 - 63+00	10-47

APPENDICES

APPENDIX	TITLE	SHEETS
A	LABORATORY TEST RESULTS	48-49

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

**ROADWAY
SUBSURFACE INVESTIGATION**

COUNTY LEE AND CHATHAM
PROJECT DESCRIPTION REPLACE BRIDGE NO. 10 OVER
DEEP RIVER ON US 15-50/NC 87

INVENTORY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4968	1	53

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:

- 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.
- BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

PERSONNEL

M&W DRILLING

S. CARPENTER

A. BEATY

INVESTIGATED BY ECS SOUTHEAST, LLP

DRAWN BY M. BREWER, P.E.

CHECKED BY M. WALKO, P.E.

SUBMITTED BY ECS SOUTHEAST, LLP

DATE MARCH 2018

Prepared in the Office of:



ECS SOUTHEAST, LLP
1812 CENTER PARK DRIVE, SUITE D
CHARLOTTE, NC 28217
(704) 525-5152 [PHONE]
(704) 525-0023 [FAX]
NC REGISTERED
ENGINEERING
FIRM # F-1078



DocuSigned by:

Michael J. Walko, P.E. 3/29/2018

54F1F8F352027406

SIGNATURE

DATE

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

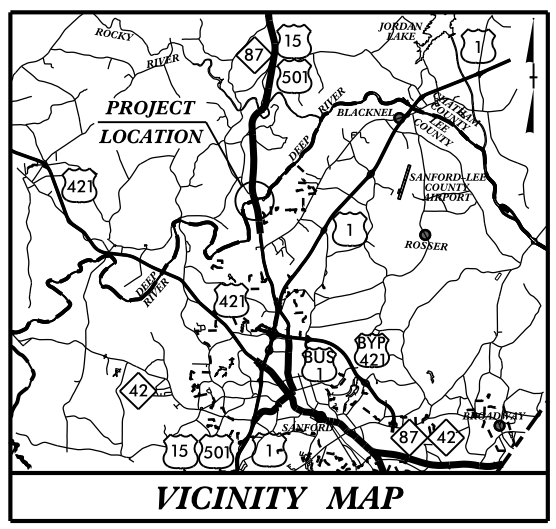
**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS**

SOIL DESCRIPTION										GRADATION										ROCK DESCRIPTION										TERMS AND DEFINITIONS																			
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										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.										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:										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 DISLOADED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS IN OR BPF OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.																			
SOIL LEGEND AND AASHTO CLASSIFICATION										ANGULARITY OF GRAINS										WEATHERING										WEATHERING																			
GENERAL CLASS. GRANULAR MATERIALS (<= 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS										THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.										WEATHERED ROCK (WR)										NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.																			
MINERALOGICAL COMPOSITION										COMPRESSION										CRYSTALLINE ROCK (CR)										FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, ONEISS, GABBRO, SCHIST, ETC.																			
COMPRESSION										PERCENTAGE OF MATERIAL										NON-CRYSTALLINE ROCK (NCR)										FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.																			
PERCENTAGE OF MATERIAL										GROUND WATER										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.																			
ORGANIC MATERIAL GRANULAR SOILS SILT - CLAY SOILS OTHER MATERIAL										WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING										FRESH										ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.																			
TRACE OF ORGANIC MATTER 2 - 3% LITTLE ORGANIC MATTER 3 - 5% MODERATELY ORGANIC 5 - 10% HIGHLY ORGANIC > 10%										STATIC WATER LEVEL AFTER 24 HOURS										VERY SLIGHT (V SL.)										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.																			
SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER										PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA										SLIGHT (SL.)										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.																			
FAIR TO POOR POOR UNSUITABLE										SPRING OR SEEP										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.																			
CONSISTENCY OR DENSENESS										MISCELLANEOUS SYMBOLS										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																			
PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)										ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION										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																			
GENERALLY GRANULAR MATERIAL (NON-COHESIVE) VERY LOOSE 4 TO 10 MEDIUM DENSE 10 TO 30 DENSE 30 TO 50 VERY DENSE > 50										ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT										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																			
GENERALLY SILT-CLAY MATERIAL (COHESIVE) VERY SOFT 2 TO 4 MEDIUM STIFF 4 TO 8 STIFF 8 TO 15 VERY STIFF 15 TO 30 HARD > 30										INFERRED SOIL BOUNDARY										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.																			
TEXTURE OR GRAIN SIZE										RECOMMENDATION SYMBOLS										ROCK HARDNESS										ROCK HARDNESS																			
U.S. STD. SIEVE SIZE OPENING (MM) 4 10 40 60 200 270 4.76 2.00 0.42 0.25 0.075 0.053										UNDERCUT UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL										VERY HARD										CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.																			
BOULDER (BLDR.) COBBLE (COB.) GRAVEL (GR.) COARSE SAND (CSE. SD.) FINE SAND (F SD.) SILT (SL.) CLAY (CL.)										SHALLOW UNDERCUT UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK										HARD										CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.																			
GRAIN SIZE MM 305 75 2.0 0.25 0.05 0.005										ABBREVIATIONS										MODERATELY HARD										CAN BE SCRATCHED BY KNIFE OR PICK. COUGES 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.																			
SOIL MOISTURE - CORRELATION OF TERMS										AR - AUGER REFUSAL MED. - MEDIUM VST - VANE SHEAR TEST										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 PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.																			
SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION										BT - BORING TERMINATED MICA - MICACEOUS MOD. - MODERATELY NP - NON PLASTIC CPT - CONE PENETRATION TEST CSE - COARSE PMT - PRESSUREMETER TEST SAP. - SAPROLITIC e - VOID RATIO SO. - SAND, SANDY SL. - SILT, SILTY F - FINE FOSS. - FOSSILIFEROUS FRAC. - FRACTURED, FRACTURES FRAGS. - FRAGMENTS HI. - HIGHLY										UNIT WEIGHT % DRY UNIT WEIGHT										SOFT										CAN BE GROOVED 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.									
LL - LIQUID LIMIT PL - PLASTIC LIMIT OM - OPTIMUM MOISTURE SL - SHRINKAGE LIMIT										- SATURATED - (SAT.) USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE										SAMPLE ABBREVIATIONS										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 FINGER NAIL.									
PLASTICITY										EQUIPMENT USED ON SUBJECT PROJECT										FRACTURE SPACING										BEDDING																			
NON PLASTIC 0-5 SLIGHTLY PLASTIC 6-15 MODERATELY PLASTIC 16-25 HIGHLY PLASTIC 26 OR MORE										DRILL UNITS: CME-45C CME-55 CME-550 VANE SHEAR TEST PORTABLE HOIST										TERM SPACING MORE THAN 10 FEET 3 TO 10 FEET 1 TO 3 FEET 0.16 TO 1 FOOT LESS THAN 0.16 FEET										TERM THICKNESS 4 FEET 1.5 - 4 FEET 0.16 - 1.5 FEET 0.03 - 0.16 FEET 0.008 - 0.03 FEET < 0.008 FEET																			
COLOR										ADVANCING TOOLS: CLAY BITS 6" CONTINUOUS FLIGHT AUGER 8" HOLLOW AUGERS HARD FACED FINGER BITS TUNG-CARBIDE INSERTS CASING w/ ADVANCER TRICONE * STEEL TEETH TRICONE * TUNG-CARB. CORE BIT										ELEVATION: FEET										NOTES: ROADWAY DESIGN AND ELEVATION SURVEY INFORMATION PROVIDED BY NCDOT																			
DESCRIPTORS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.										HAMMER TYPE: AUTOMATIC MANUAL CORE SIZE: -B -H -N HAND TOOLS: POST HOLE DIGGER HAND AUGER SOUNDING ROD VANE SHEAR TEST										INDURATION										NORTHINGS AND EASTINGS OBTAINED USING A TRIBBLE GEO7X WITH SUB-METER ACCURACY																			
																				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.																													

09/08/99
 14-MAR-2018 10:22
 I:\ZGEO\TECH\02-PROJECTS\2000-12999\2500\2596 - B-4968 Bridge No.10 on US 15-50/NC 87 over Deep River\CADD_GEO\TECH\Plan\Prof\B4968_Rdy_t.sh.dgn
 \$\$\$SERNAME\$\$\$

CONTRACT: TIP PROJECT: B-4968

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



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

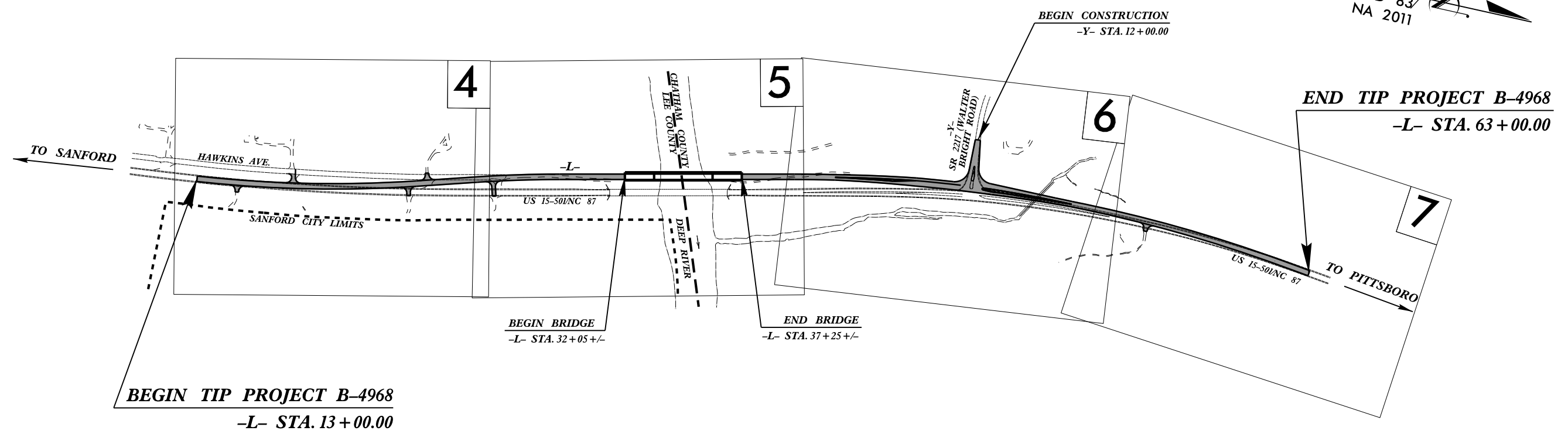
LEE & CHATHAM COUNTIES

**LOCATION: BRIDGE NO. 10 OVER DEEP RIVER
ON US 15-50/NC 87**

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

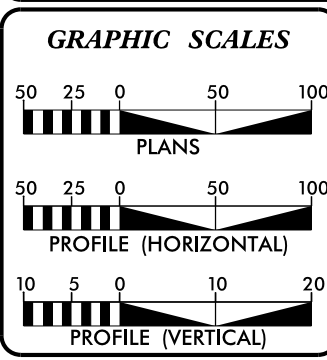
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4968	3	53
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
40162.1.1	NA	PE	

25% PLANS



THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD ___.

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



DESIGN DATA

ADT 2019 =	7750
ADT 2039 =	9425
K =	9 %
D =	55 %
T =	8 % *
V =	60 MPH
* TTST = 4% + DUAL = 4%	
FUNC CLASS =	
MINOR ARTERIAL	
REGIONAL TIER	

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4968	=	0.849 MILES
LENGTH STRUCTURE TIP PROJECT B-4968	=	0.098 MILES
TOTAL LENGTH TIP PROJECT B-4968	=	0.947 MILES

Prepared for NCDOT In the Office of:

Mead&Hunt

133 Fayetteville Street, Suite 210
 Raleigh, North Carolina 27601
 919-714-8670 | meadhunt.com
 NC License No. F-1235

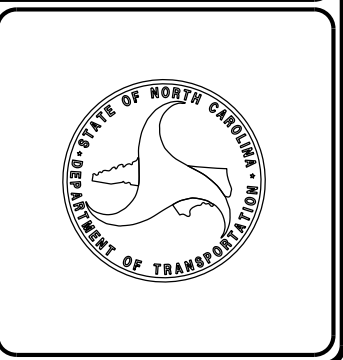
2012 STANDARD SPECIFICATIONS RIGHT OF WAY DATE: JULY 20, 2018 LETTING DATE: JULY 16, 2019	<table style="width: 100%;"> <tr> <td style="text-align: center;"> RICK DECOLA, PE <small>PROJECT ENGINEER</small> </td> </tr> <tr> <td style="text-align: center;"> VASIM BARODAWALA <small>PROJECT DESIGN ENGINEER</small> </td> </tr> <tr> <td style="text-align: center;"> DAVID STUTTS, PE <small>NCDOT CONTACT</small> </td> </tr> </table>	RICK DECOLA, PE <small>PROJECT ENGINEER</small>	VASIM BARODAWALA <small>PROJECT DESIGN ENGINEER</small>	DAVID STUTTS, PE <small>NCDOT CONTACT</small>
RICK DECOLA, PE <small>PROJECT ENGINEER</small>				
VASIM BARODAWALA <small>PROJECT DESIGN ENGINEER</small>				
DAVID STUTTS, PE <small>NCDOT CONTACT</small>				

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.





ECS Southeast, LLP

1812 Center Park Drive, Suite D
 Charlotte, NC 28217
 T 704.525.5152 | F 704.357.0023
 www.ecslimited.com

March 26, 2018

WBS NO: 40162.1.1
 TIP NO: B-4968
 F.A. NUMBER: N/A
 COUNTY: Chatham and Lee
 DESCRIPTION: Replace Bridge No. 10 over Deep River on US 15-501/NC 87

SUBJECT: Geotechnical Report – Inventory (REV2)

Project Description

The project is located along the west side of US 15-501/NC 87 just north of Sanford, North Carolina and will begin at -L- Station 13+00 and continue northward to Station 63+00 for a distance of approximately 5,000 linear feet. The project will consist of realigning US 15-501 from Hawkins Avenue to Walter Bright Road to the west of the existing alignment to facilitate the construction of a new bridge over the Deep River. The new bridge crossing the Deep River will be constructed at approximate Station 31+25 and will continue to approximate Station 36+75 for a length of approximately 550 feet.

Along the south side of the river, cut and fill depths along the new alignment are relatively minor, on the order of 5 feet or less. Nearing the bridge approaches, fill depths increase to approximately 16 to 18 feet in depth. North of the river, at approximate Station 38+50, the mass grading transitions from a fill section to a cut section. Maximum cut depths on the order of approximately 17 feet are anticipated. Along the centerline at approximate Station 45+00, the cut section transitions back into a fill section. However, left of centerline, the cut slope continues to the end of the project. From approximate Station 45+00 to 63+00, fill depths are relatively minor, on the order of 5 feet or less.

A geotechnical field investigation was performed by ECS between January 16 and January 20, 2018. During this time period, a total of twenty five (25) Standard Penetration Test (SPT) borings and eleven (11) Rock Sounding (RS) borings were advanced with an ATV-mounted drill rig equipped with an automatic hammer. Representative soil samples were collected for visual classification in the field and for analysis by ECS’s testing laboratory. A bulk sample of the auger cuttings was collected from the cut area north of the bridge and was used for standard Proctor and California Bearing Ratio (CBR) testing. A relatively undisturbed

(Shelby) tube sample was obtained from the south side of the bridge and was used for consolidation testing.

The following alignment was investigated as part of this exploration. Subsurface profiles and/or cross sections of the alignment are included in this report.

<u>Line</u>	<u>Station (±)</u>	<u>Offsets</u>
-L-	13+00 to 63+00	LT to RT
-Y-	12+00 to 14+15.25	LT to RT

Physiography and Geology

This realignment project is located within the existing NCDOT right-of-way. In general, a majority of the project corridor south of the Deep River (Lee County) is relatively open and is located in the median of Hawkins Road (US 15-501/NC 87). Several residential properties are located along the west side of the roadway. North of the Deep River (Chatham County), the topography is rolling terrain that is moderately wooded with gently sloping hills.

In accordance with the Geologic Map of North Carolina, 1985, the alignment is located in the Piedmont Physiographic Provinces of North Carolina. South of the Deep River, the physiology consists of Carolina Slate Belt (Metamudstone, Meta-Argillite) and Triassic Basin sedimentary rocks (Chatham Group; Sanford Formation). North of the Deep River, the physiology consists of Triassic Basin sedimentary rocks (Chatham Group; Sanford Formation) and Carolina Slate Belt (Felsic and Mafic Metavolcanic Rock). Triassic deposits are sediments that were deposited in what is commonly referred to as normal fault basins (i.e. Gulf Fault). A normal fault occurs when two masses of rock are pulled apart, as in tension. Residual soils are a product of in-place chemical weathering of rock that is similar to the rock presently underlying the site.

Soil Properties

Soils within the area of this project have been divided into five categories: roadway embankment, artificial fill, alluvial soils, Triassic residual soils, and residual soils.

Artificial Fill: Artificial Fill soils were encountered along the following alignment at the approximate stationing:

<u>Line</u>	<u>Station (±)</u>	<u>Offsets</u>
-L-	31+00 to 33+60	LT to RT

The artificial fill encountered generally consisted of stiff to very stiff, moist, gray-red-brown, clayey silt (A-5), and stiff, moist, red-brown sandy clay (A-6). The top 0.5 feet of the artificial fill encountered contained highly (27.3%) organic material. The artificial fill extends to depths of approximately 8.0 feet below existing grades.

Roadway Embankment: Roadway Embankment (R.E.) soils were encountered along the following alignment at the approximate stationing:

<u>Line</u>	<u>Station (±)</u>	<u>Offsets</u>
-L-	13+00 to 31+00	LT to RT
-L-	46+00 to 63+00	LT to RT

The roadway embankment encountered generally consisted of loose to medium dense, moist, red-brown-tan, silty/clayey sand (A-2-4, A-2-6), medium stiff to hard, moist to wet, red-brown-orange-gray, sandy/clayey silt (A-4, A-5), and stiff, red-brown, moist, silty clay (A-7-6). The roadway embankment extends to depths ranging from approximately 1.1 to 10.0 feet below existing grades. Laboratory testing of the Roadway Embankment soils indicated PI's ranging from 8 to 9 for the silty (A-4) soils and a PI of 20 for the clayey (A-7-6) soils.

Alluvial: Alluvial (water deposited) soils were encountered along the following alignment at the approximate stationing:

<u>Line</u>	<u>Station (±)</u>	<u>Offsets</u>
-L-	31+75 to 36+75	LT to RT

The alluvial soils encountered generally consisted of soft, wet, gray-blue-brown, sandy clay (A-6) and extend to depths of approximately 6.0 feet below existing grades. Laboratory testing of the Alluvial soils indicated a PI of 14 for the clayey (A-6) soils.

Triassic Residual Soils: Triassic Residual soils were encountered along the following alignment at the approximate stationing:

<u>Line</u>	<u>Station (±)</u>	<u>Offsets</u>
-L-	25+00 to 38+75	LT to RT

The Triassic residual soils encountered consisted of very dense, saturated, gray-tan-maroon, silty sand (A-2-4), very stiff to hard, moist, red-tan-orange-gray-brown-maroon, sandy silt (A-4), and medium stiff to very stiff, moist to wet, red-gray-brown-maroon-tan-orange, sandy/silty clay (A-6, A-7-6). Laboratory testing of the Triassic Residual soils indicated a PI of 14 for the clayey (A-6) soils.

Residual Soils: With the exception of the Triassic soils, Residual soils were encountered at a majority of the locations throughout the proposed alignment and are derived from the weathering of the underlying parent bedrock. In general, the residual soils encountered consisted of medium dense to very dense, moist, gray-brown, silty sand (A-2-4), stiff to hard, moist to wet, red-brown-tan-orange-gray, sandy/clayey silt (A-4, A-5) and very soft to hard, moist to wet, red-brown-black, silty clay (A-7-5, A-7-6). Laboratory testing of the Residual soils indicated a PI of 3 for the sandy (A-2-4) soils, a PI of 7 for the silty (A-4) soils, and PI's ranging from 23 to 29 for the clayey (A-7-5, A-7-6) soils.

Rock Properties

Weathered Rock: Weathered Rock (WR) was encountered at numerous areas along the -L- alignment at the locations indicated below.

<u>Line</u>	<u>Station (±)</u>	<u>Offsets</u>	<u>Rock Origin / Type</u>
-L-	19+10 to 23+10	LT to RT	Carolina Slate Belt/Meta-Argillite
-L-	24+90 to 29+40	LT to RT	Triassic Basin/Conglomerate
-L-	32+00 to 33+75	LT to RT	Triassic Basin/Conglomerate
-L-	35+60 to 38+75	LT to RT	Triassic Basin/Conglomerate
-L-	40+00 to 49+75	LT to RT	Carolina Slate Belt/Metavolcanic
-L-	54+00 to 63+00	LT to RT	Carolina Slate Belt/Metavolcanic

The top of the weathered rock varied across the site and was encountered at depths ranging from approximately 3.5 to 18.5 feet below existing grades. The top of weathered rock elevations ranged from a low of approximately 193.6 feet in vicinity of the bridge, and trending upwards to a high of approximate elevation 271.9 feet at the northern end of the site.

Crystalline Rock and Non-Crystalline Rock: Crystalline Rock (CR) and Non-Crystalline Rock (NCR) are defined by SPT refusal (i.e., 60/0.1' or 60/0.0'). Several borings were terminated upon encountering CR and NCR at the following locations.

<u>Line</u>	<u>Station (±)</u>	<u>Offsets</u>	<u>Rock Origin / Type</u>
-L-	30+60 to 38+75	LT to RT	Triassic Basin/Conglomerate
-L-	40+00 to 43+60	LT to RT	Carolina Slate Belt/Metavolcanic
-L-	47+90 to 49+80	LT to RT	Carolina Slate Belt/Metavolcanic
-L-	60+10 to 63+00	LT to RT	Carolina Slate Belt/Metavolcanic

The top of the crystalline/non crystalline rock varied across the site and was encountered at depths ranging from approximately 3.9 to 22.3 feet below existing grades. Crystalline / Non-Crystalline rock elevations ranged from a low of approximately 191.2 feet in vicinity of the bridge, and trending upwards to a high of approximate elevation 270.0 feet at the northern end of the site.

Groundwater Properties

Groundwater levels were measured in the borings both immediately after drilling and, where applicable, after a stabilization period of at least 24 hours. At the time of drilling, water was encountered in Boring EB1-A at a depth of approximately 3.6 feet below existing grades (approximate elevation 209.0 feet). The remaining borings were dry when groundwater readings were taken. After a stabilization period of at least 24 hours, groundwater was encountered in 5 borings at depths ranging from approximately 3.7 to 19.1 feet below existing grades which corresponds to elevations ranging from 263.0 feet to 202.1 feet. Several of the borings that were drilled in close proximity to the existing roadway were backfilled immediately after drilling for safety reasons, making stabilized water readings unobtainable. The recovered soil samples were generally described as moist above the groundwater level and moist to saturated below the groundwater level.

Areas of Special Geotechnical Interest

1) Wet or Saturated Soils: The following areas contain soils within 3 feet of proposed subgrade with natural moisture contents in excess of the liquid limit, high moisture contents noted in the field during drilling, or soils encountered below the water table:

<u>Line</u>	<u>Station (±)</u>	<u>Offsets</u>
-L-	13+00 to 17+00	LT to RT
-L-	27+00 to 39+00	LT to RT
-L-	43+00 to 45+00	LT to RT
-L-	56+00 to 58+00	LT to RT

2) Shallow Groundwater: Relatively shallow groundwater was encountered within six feet of the proposed subgrade elevation at the following location:

<u>Line</u>	<u>Station (±)</u>	<u>Offsets</u>
-L-	44+00	LT to RT

3) High Plasticity Soils: The following areas contain high plasticity soils with plasticity indices (PI's) in excess of 25. High plasticity soils have the potential to cause subgrade instability during construction, embankment stability or long term settlement problems.

<u>Line</u>	<u>Station (±)</u>	<u>Offsets</u>
-L-	44+75 to 46+75	LT to RT
-L-	55+25 to 60+25	LT to RT

4) Organic Soil: The following areas contain soils with little to high organic content. Organic soils have the potential to cause subgrade problems during construction, embankment stability or long term settlement problems.

<u>Line</u>	<u>Station (±)</u>	<u>Offsets</u>
-L-	31+75 to 33+60	LT to RT

5) Shallow Crystalline/Non-Crystalline Rock: The following areas were found to contain rock above or within 6 feet of proposed subgrade:

<u>Line</u>	<u>Station (±)</u>	<u>Offsets</u>
-L-	40+00 to 43+60	LT to RT
-L-	60+10 to 63+00	LT to RT

6) Soft/Very Loose Soils: The following areas contain relatively soft or very loose soils that have the potential for subgrade instability, embankment stability or long-term settlement problems during construction:

<u>Line</u>	<u>Station (±)</u>	<u>Offsets</u>
-L-	31+75 to 33+60	LT to RT

7) Artificial Fill: The following areas encountered artificial fill. Artificial fill poses risks associated with undetected deleterious inclusions or soft zones within the fill and/or deleterious materials at the virgin ground/fill interface.

<u>Line</u>	<u>Station (±)</u>	<u>Offsets</u>
-L-	30+90 to 33+60	LT to RT

8) Alluvial Soils: The following locations were found to have soft alluvial soils at the approximate stationing:

<u>Line</u>	<u>Station (±)</u>	<u>Offsets</u>
-L-	31+75 to 36+75	LT to RT

Bulk Samples / Undisturbed Samples

One (1) bulk soil sample of the auger cuttings was obtained from Boring L_4550 that was used for standard Proctor and California Bearing Ratio (CBR) testing. Additionally, one (1) relatively undisturbed thin wall (Shelby tube) sample was obtained at Boring EB1-A (from a depth of approximately 4 to 6 feet) and was used for consolidation testing.

Respectively submitted,

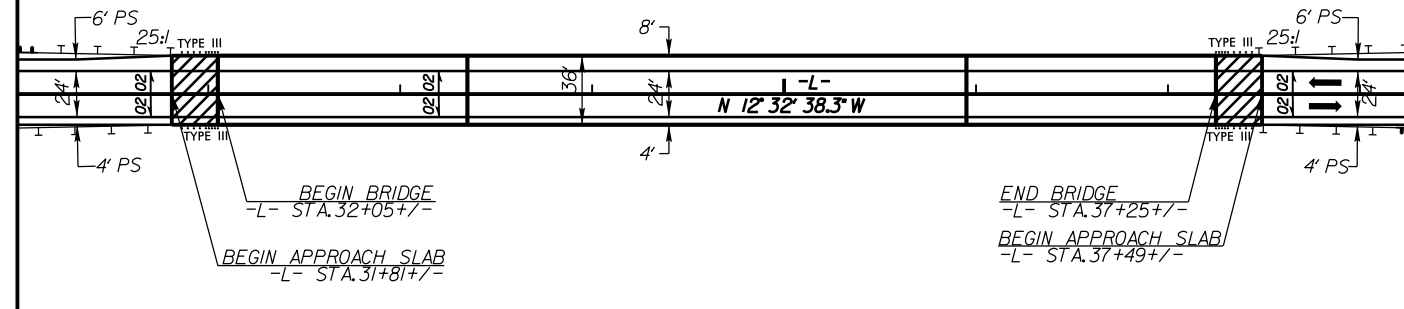


DocuSigned by:
D. Matthew Brewer
 EC2ABBEE99DB48C...
 D. Matthew Brewer, P.E.
 Senior Project Engineer

DocuSigned by:
Michael J. Walko, P.E.
 54F1F8F352D2406...
 Michael J. Walko, P.E.
 Principal Engineer
 N.C. Registration No. 026917

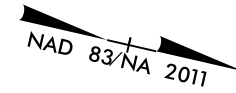
8/17/99

RELATIONSHIP OF BRIDGE TO PROPOSED PAVEMENT



-L- CURVE DATA

PI Sta 27+30.66	PI Sta 50+75.26
$\Delta = 3^\circ 49' 37.3\" (RT)$	$\Delta = 2^\circ 05' 46.5\" (RT)$
$D = 1^\circ 02' 30.3\"$	$D = 0^\circ 54' 34.0\"$
$L = 367.37'$	$L = 2,209.70'$
$T = 183.75'$	$T = 1,116.32'$
$R = 5,500.00'$	$R = 6,300.00'$
$SE = 3\%$	$SE = 3\%$
$RO = 8'$	$RO = 8'$



PROJECT REFERENCE NO. B-4968	SHEET NO. 5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

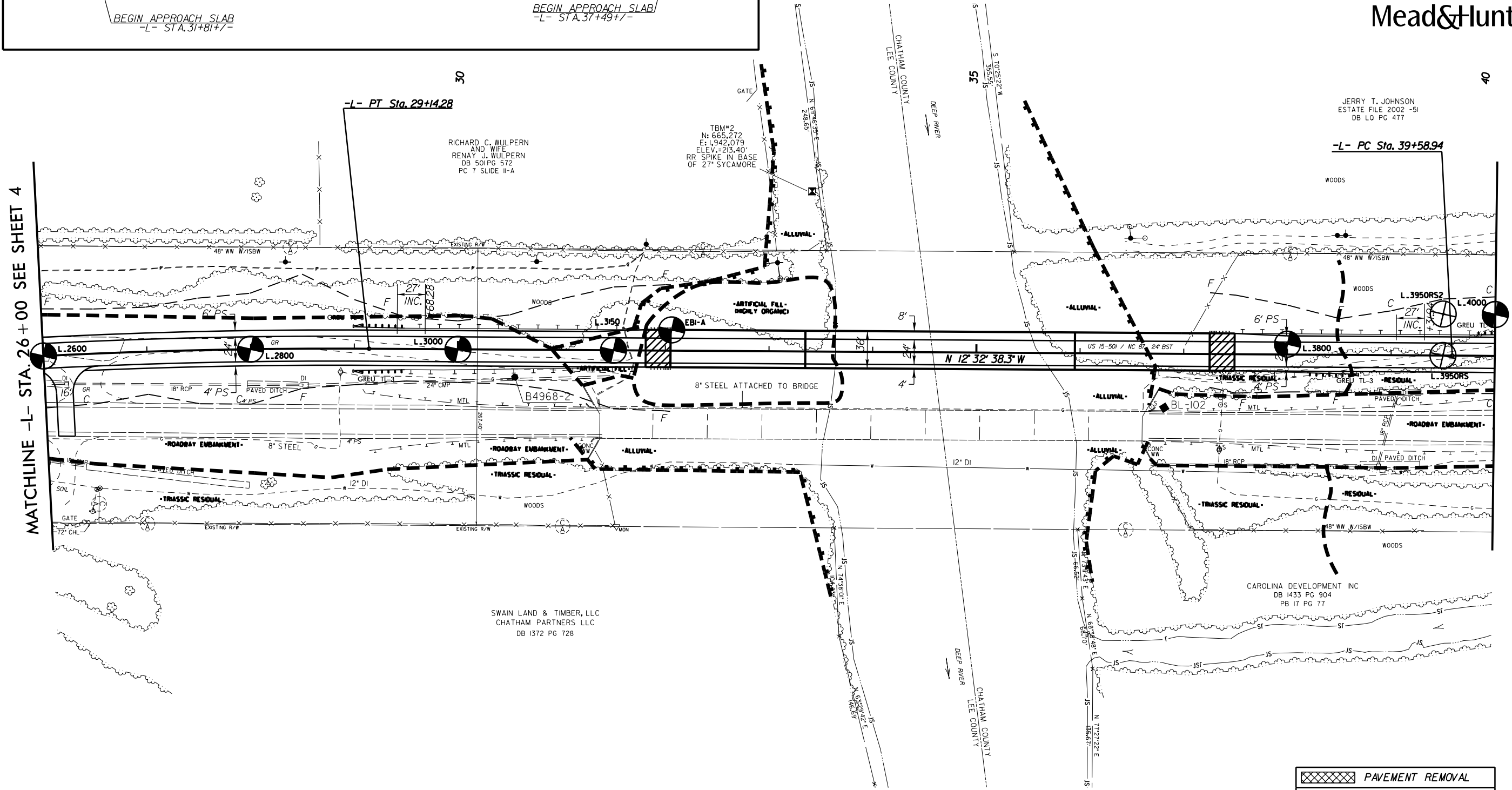
Mead&Hunt

JERRY T. JOHNSON
ESTATE FILE 2002 -51
DB LO PG 477

-L- PC Sta. 39+58.94

MATCHLINE -L- STA. 26+00 SEE SHEET 4

MATCHLINE -L- STA. 40+00 SEE SHEET 6



	PAVEMENT REMOVAL
	BRIDGE APPROACH SLAB
NOTE: ALL DRIVEWAY RADII ARE 25'	
FOR -L- PROFILE, SEE SHEET 8	

FOR STRUCTURE PLANS, SEE SHEET S-? THRU S-?

REVISIONS
 15-MAR-2018 10:22
 15-GEOTECH-12000-12999\12500\12696 - B-4968 Bridge No.10 on US 15-501 INC 87 over Deep River-CADD_GEO TECH\Plan\Prof\B4968_Rd.dwg psh_5.dgn
 15-GEOTECH-12000-12999\12500\12696 - B-4968 Bridge No.10 on US 15-501 INC 87 over Deep River-CADD_GEO TECH\Plan\Prof\B4968_Rd.dwg psh_5.dgn

SWAIN LAND & TIMBER, LLC
CHATHAM PARTNERS LLC
DB 1372 PG 728

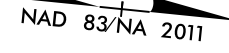
RICHARD C. WULPERN
AND WIFE
RENAV J. WULPERN
DB 501 PG 572
PC 7 SLIDE II-A

TBM#2
N: 665,272
E: 1,942,079
ELEV. = 213.40'
RR SPIKE IN BASE
OF 27\"/>

CAROLINA DEVELOPMENT INC
DB 1433 PG 904
PB 17 PG 77

PROJECT REFERENCE NO. B-4968	SHEET NO. 6
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

Mead&Hunt



-L- CURVE DATA
 PI Sta 50+75.26
 $\Delta = 20^{\circ} 05' 46.5''$ (RT)
 $D = 0^{\circ} 54' 34.0''$
 $L = 2,209.70'$
 $T = 1,116.32'$
 $R = 6,300.00'$
 $SE = 3\%$
 $RO = 8'$

-Y- CURVE DATA
 PI Sta 10+82.94
 $\Delta = 12^{\circ} 23' 32.6''$ (LT)
 $D = 7^{\circ} 30' 00.0''$
 $L = 165.23'$
 $T = 82.94'$
 $R = 763.94'$
 $SE = EXIST.$

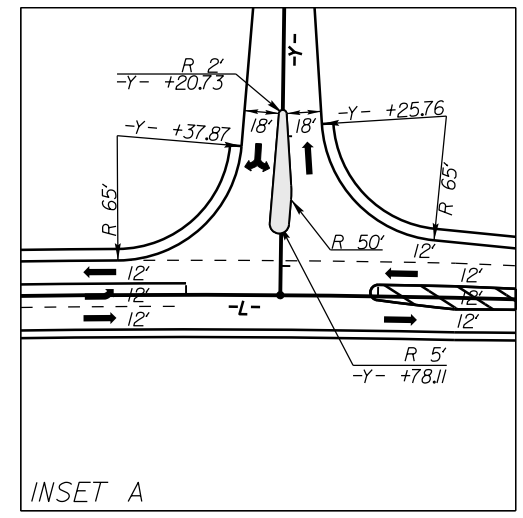
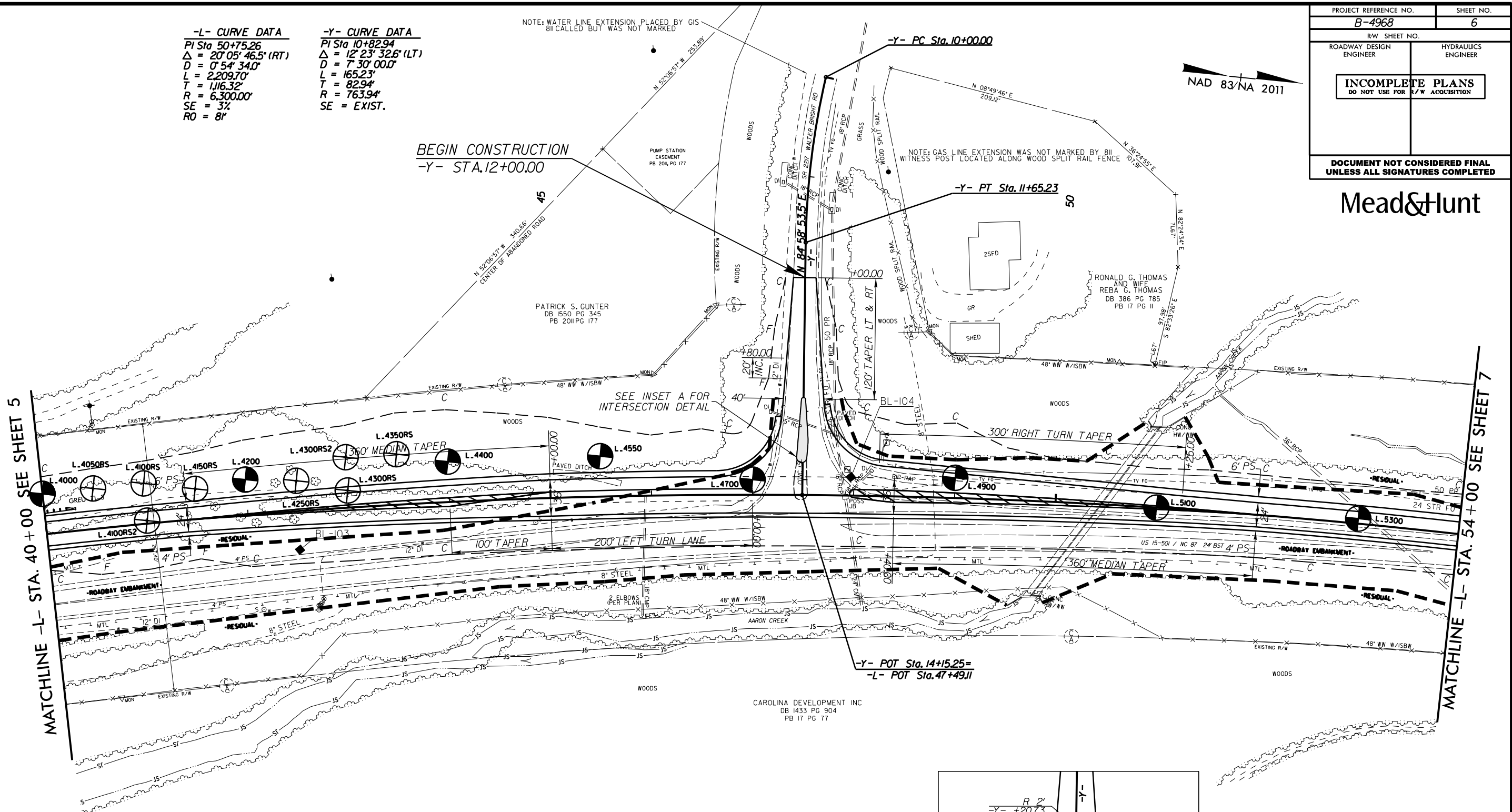
NOTE: WATER LINE EXTENSION PLACED BY GIS
 BICALLED BUT WAS NOT MARKED

NOTE: GAS LINE EXTENSION WAS NOT MARKED BY BII
 WITNESS POST LOCATED ALONG WOOD SPLIT RAIL FENCE

BEGIN CONSTRUCTION
-Y- STA.12+00.00

MATCHLINE -L- STA. 40 + 00 SEE SHEET 5

MATCHLINE -L- STA. 54 + 00 SEE SHEET 7

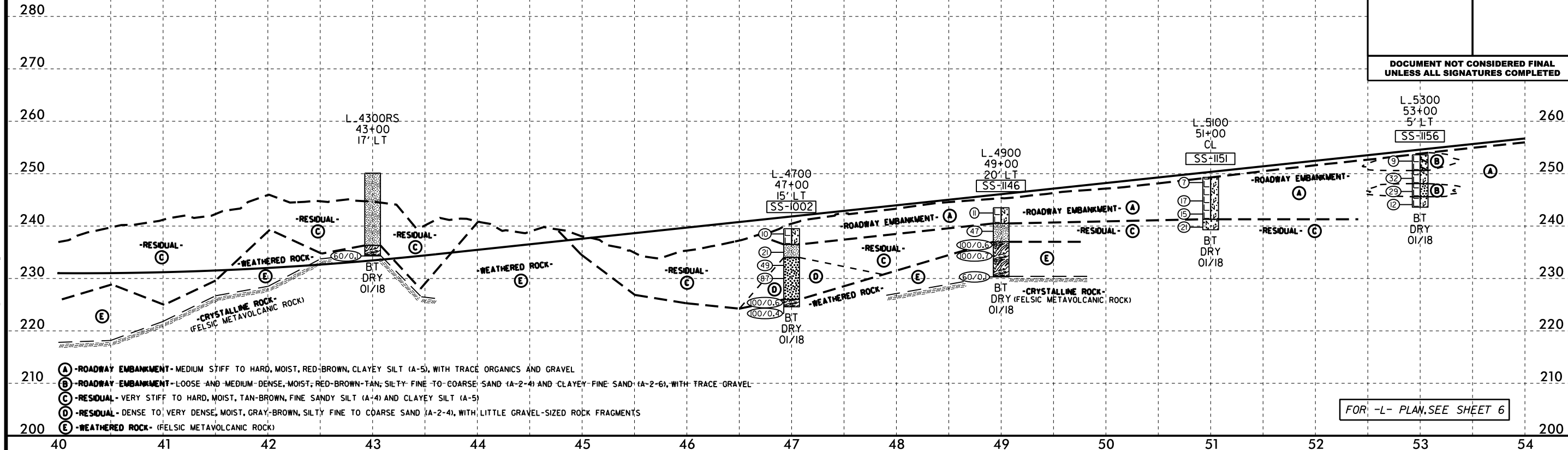


PAVEMENT REMOVAL
 FOR -L- PROFILE, SEE SHEET 9
 FOR -Y- PROFILE, SEE SHEET 10

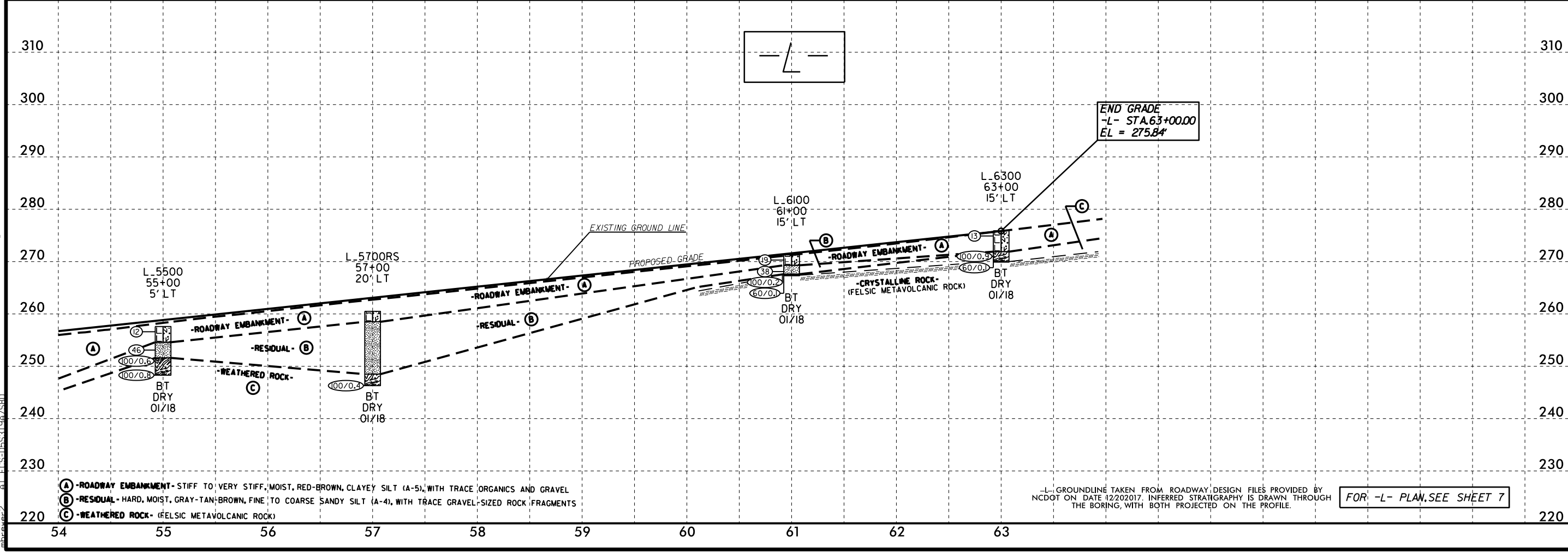
REVISIONS
 15-MAR-2018 10:22
 15-GEOTECH-12000-12999\12500\12696 - B-4968 Bridge No.10 on US 15-50INC 87 over Deep River-CADD_GEO TECH\Plan\Prof\B4968_Rd.dwg psh_6.dgn
 8/17/99

5/28/99
 14-MAR-2018 10:22 AM
 C:\PROJECTS\12000-12999\12500\12596 - B-4968 Bridge No.10 on US 15-50INC B7 over Deep River\CADD_GEO\TECH\Plan\Prof\B4968_Geo_Rdy_pf11_9.dgn

PROJECT REFERENCE NO. B-4968	SHEET NO. 9
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



FOR -L- PLAN, SEE SHEET 6



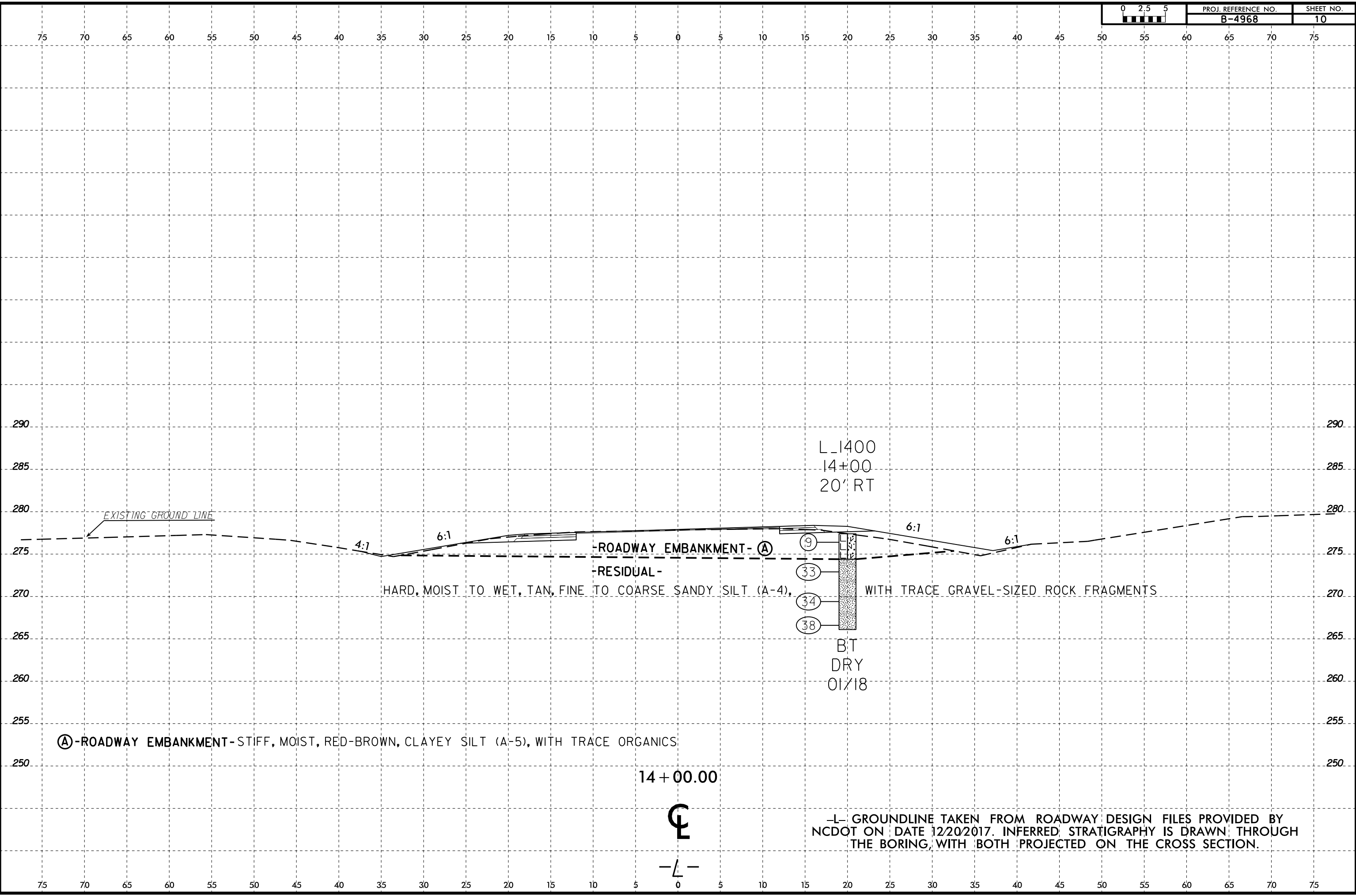
END GRADE
-L- STA. 63+00.00
EL = 275.84'

-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY NCDOT ON DATE 12/20/2017. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE PROFILE.

FOR -L- PLAN, SEE SHEET 7

6/23/16
14-MAR-2018 10:22
I:\2018\PROJECTS\2000\12999\12500\12596 - B-4968 Bridge No.10 on US 15-50\INC 87 over Deep River\CADD_GEO\TECH\asc\B4968_Geo_Rdy_XSI.L.dgn

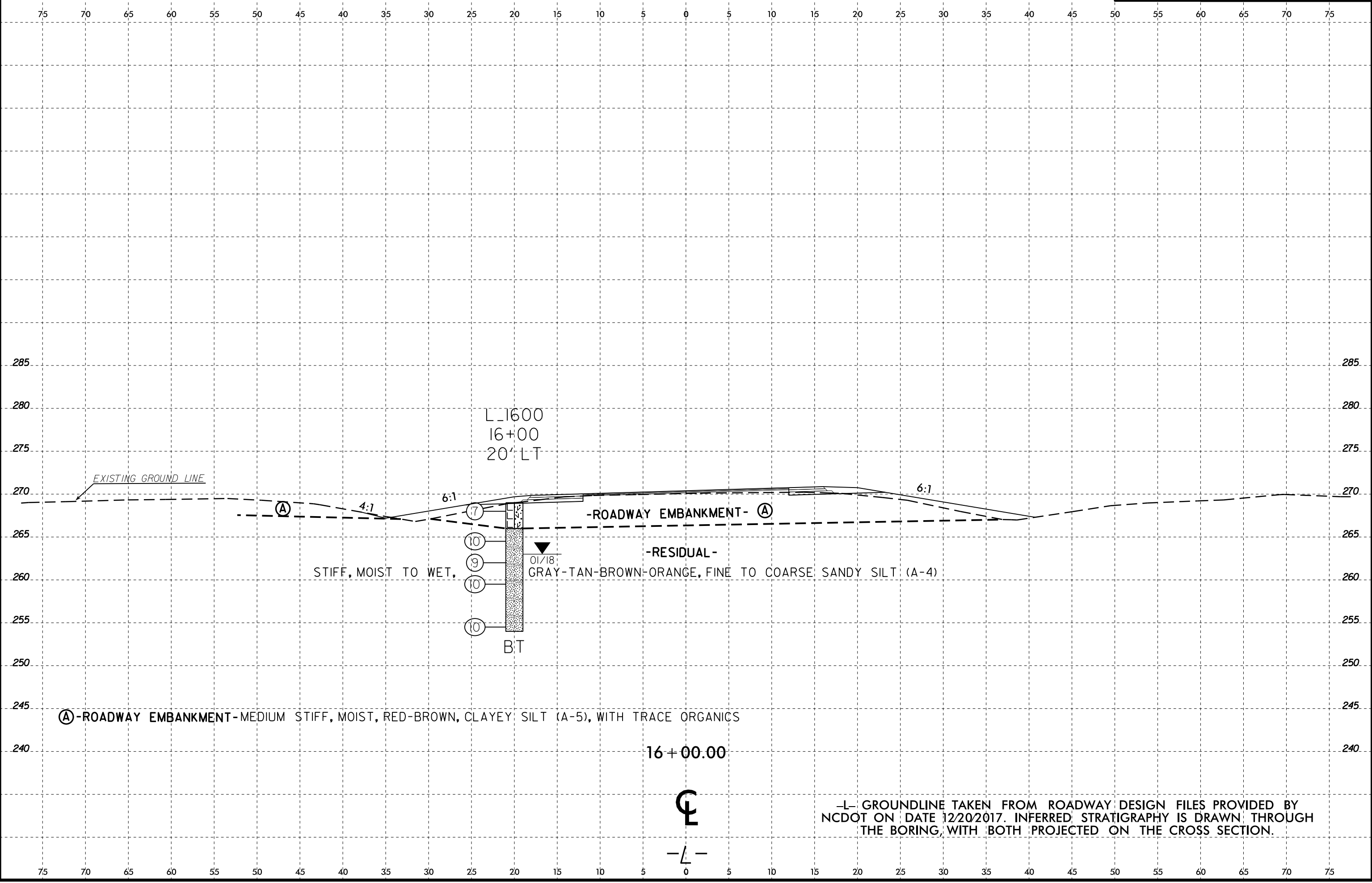
0 2.5 5	PROJ. REFERENCE NO. B-4968	SHEET NO. 10
---------	-------------------------------	-----------------



14-MAR-2018 10:22 PROJ: E:\PROJECTS\20000\2999\12500\12506 - B-4968 Bridge No.10 on US 15-501NC B7 over Deep River\CADD_GEO TECH\B-4968_Geo_Rdy_XSI.L.dgn



PROJ. REFERENCE NO.	SHEET NO.
B-4968	11



L_1600
16+00
20' LT

EXISTING GROUND LINE

(A)

4:1

6:1

(7)

(10)

(9)

(10)

(10)

BT

01/18

-ROADWAY EMBANKMENT- (A)

-RESIDUAL-

STIFF, MOIST TO WET,

GRAY-TAN-BROWN-ORANGE, FINE TO COARSE SANDY SILT (A-4)

6:1

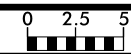
(A) -ROADWAY EMBANKMENT-MEDIUM STIFF, MOIST, RED-BROWN, CLAYEY SILT (A-5), WITH TRACE ORGANICS

16 + 00.00

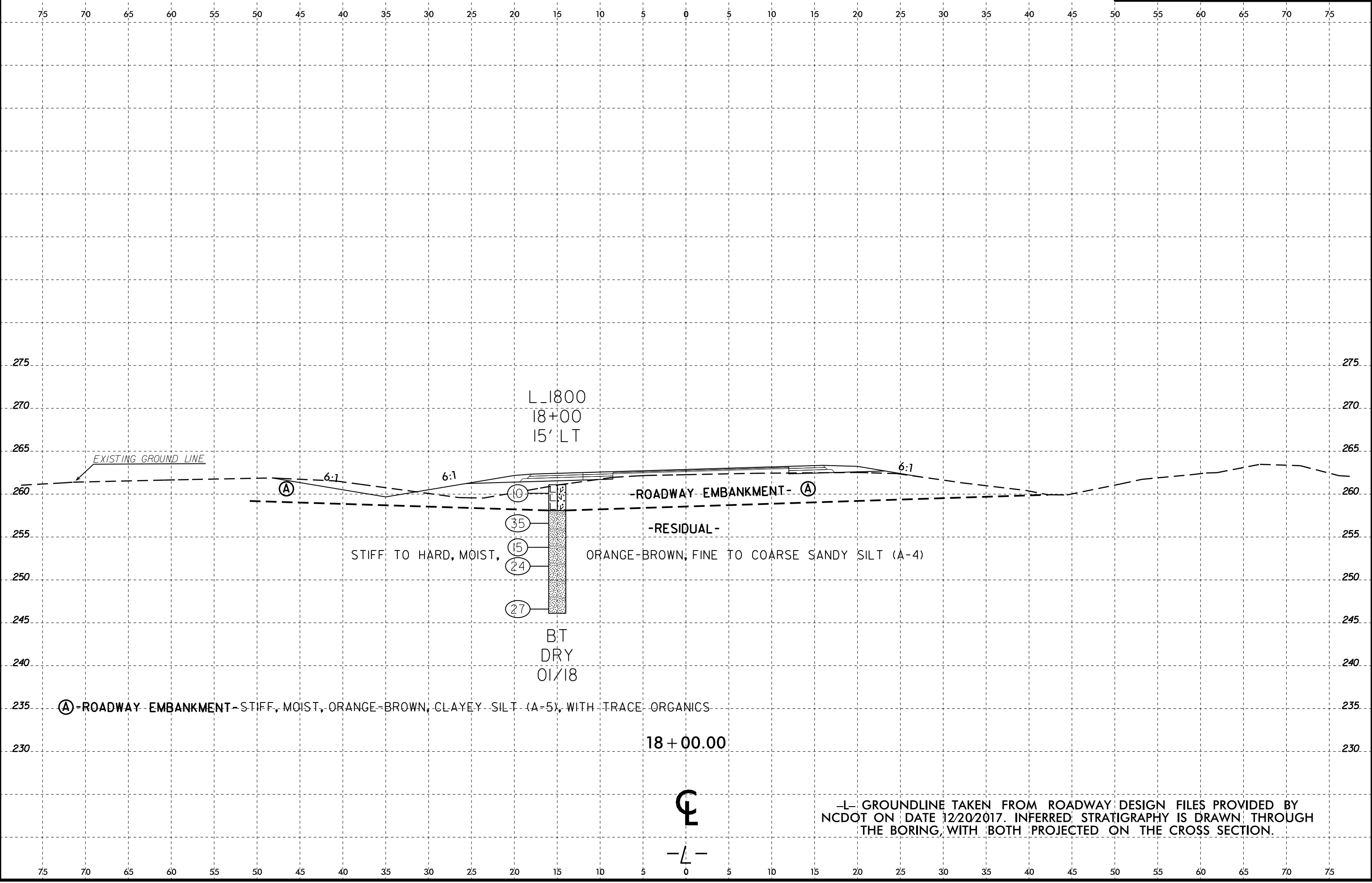


-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY NCDOT ON DATE 12/20/2017. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.

14-MAR-2018 10:22 PROJ: E:\PROJECTS\20000\12999\12500\12596 - B-4968 Bridge No.10 on US 15-501NC 87 over Deep River\CADD\GEO TECH\B-4968_Geo_Rdy_XSI.L.dgn
L:\GEO\TECH\02_EFS\BSS\17\380
6/23/16



PROJ. REFERENCE NO.	SHEET NO.
B-4968	12



L_1800
18+00
15' LT

EXISTING GROUND LINE

Ⓐ

6:1

6:1

10

35

15

24

27



ROADWAY EMBANKMENT - Ⓐ

-RESIDUAL-

ORANGE-BROWN, FINE TO COARSE SANDY SILT (A-4)

STIFF TO HARD, MOIST,

BT
DRY
01/18

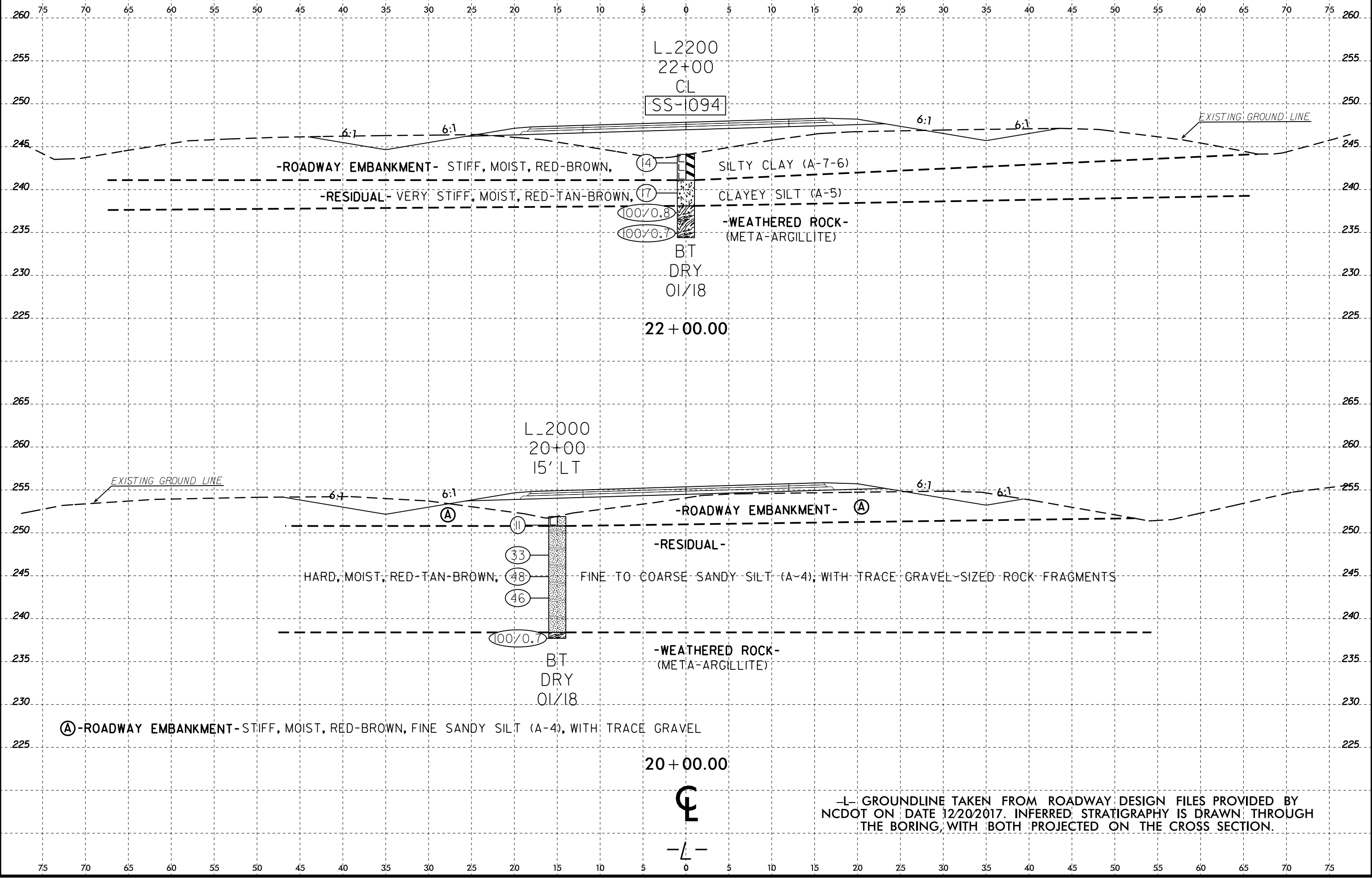
Ⓐ ROADWAY EMBANKMENT - STIFF, MOIST, ORANGE-BROWN, CLAYEY SILT (A-5), WITH TRACE ORGANICS

18 + 00.00

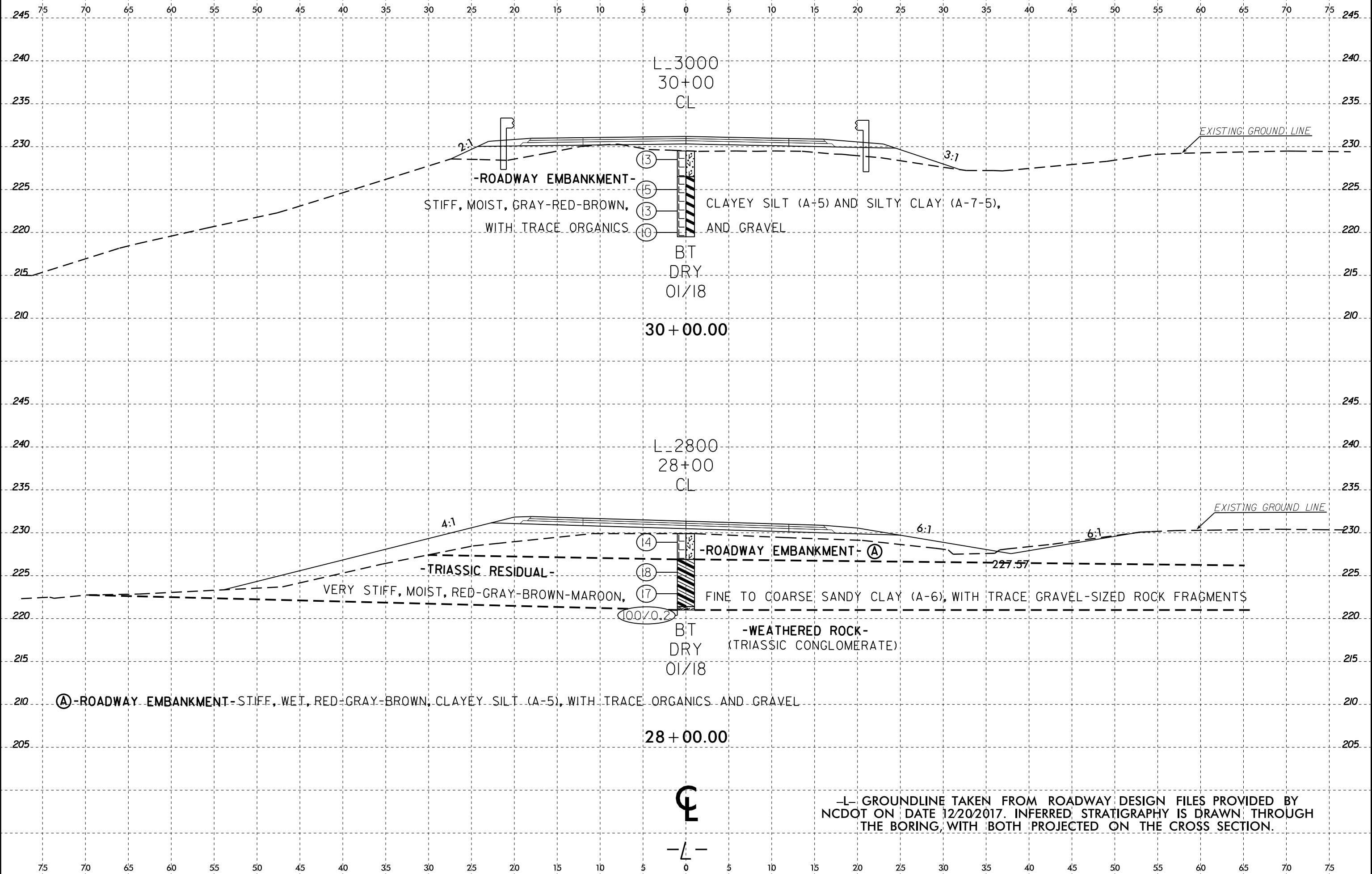


-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY NCDOT ON DATE 12/20/2017. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.

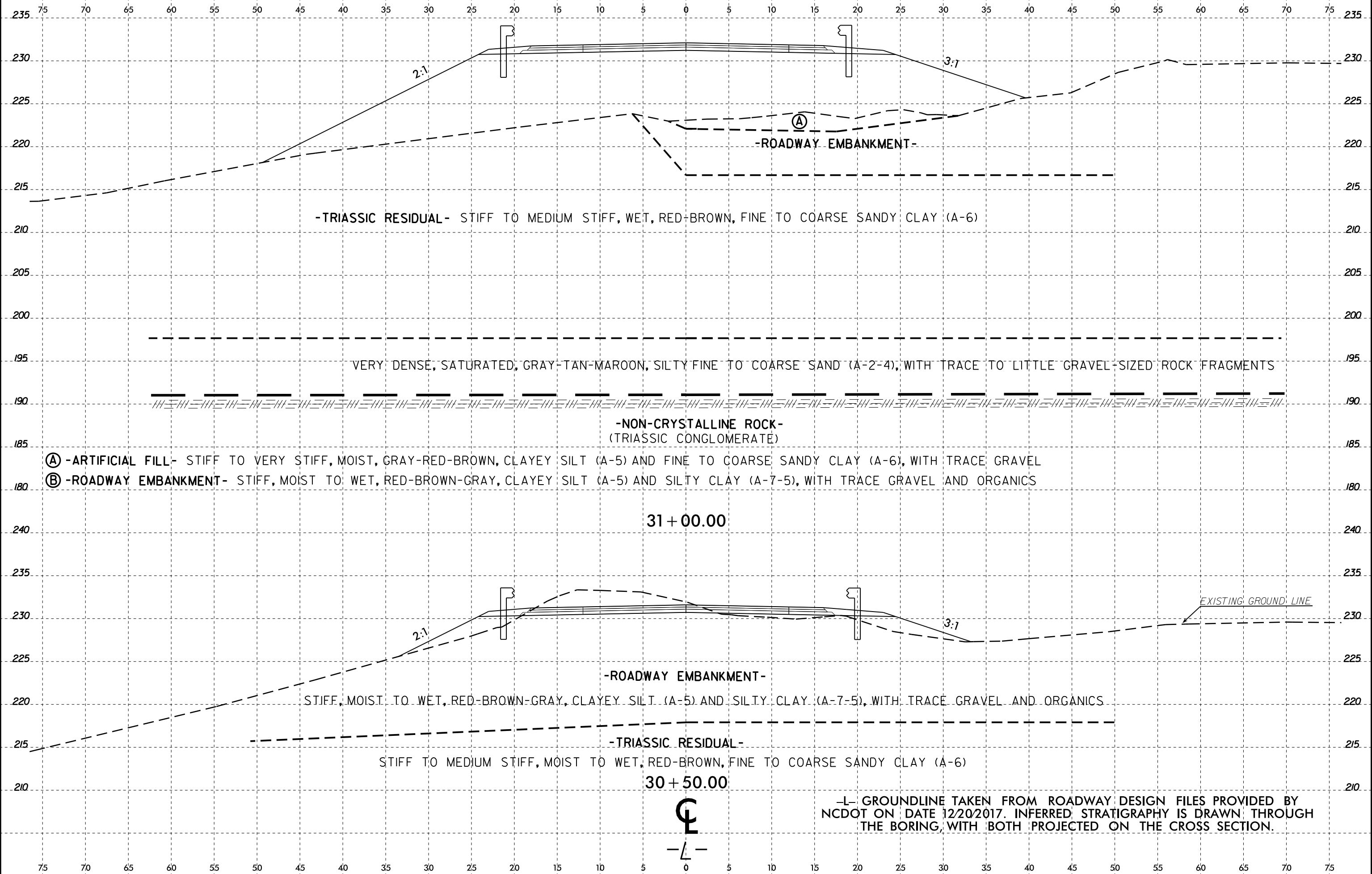
6/23/16
14-MAR-2018 10:22
I:\2\GEO\1\CH\02_EFS\BSS1\X\380
proj\BSS1\X\380
B-4968 Br-idge No.10 on US 15-50\INC 87 over Deep River\CADD_GEO\TECH\ssc\B4968_Geo_Rdy_XSI.L.dgn



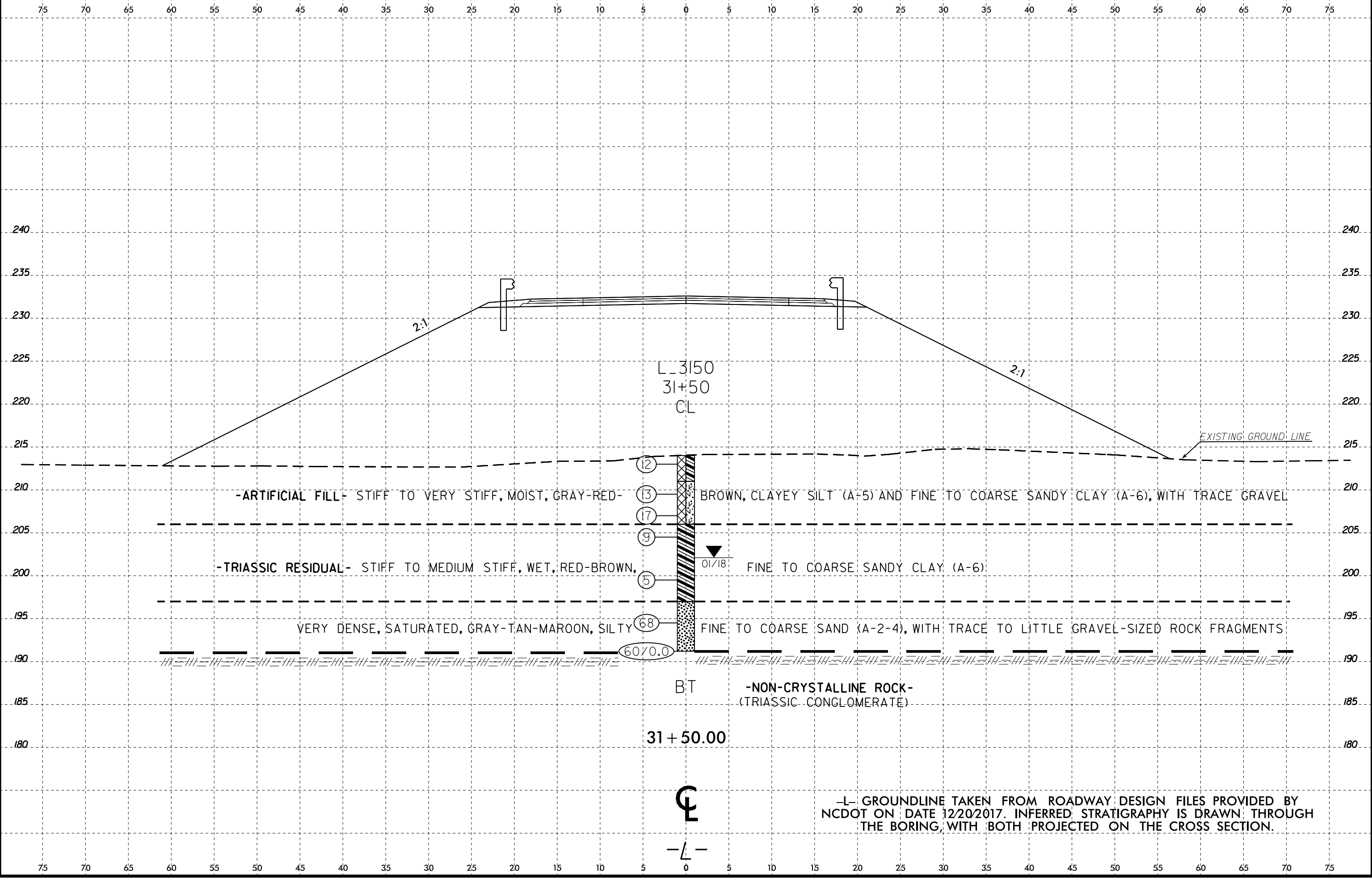
6/23/16
14-MAR-2018 10:23
I:\2018\14-MAR-2018 10:23\PROJECTS\2000\12999\12500\12596 - B-4968 Bridge No.10 on US 15-50\INC 87 over Deep River\CADD\GEO\TECH\XSC\B4968_Geo_Rdy_XSI.L.dgn



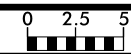
6/23/16
14-MAR-2018 10:23
I:\2018\14-MAR-2018 10:23\PROJECTS\2000\12999\12500\12596 - B-4968 Bridge No.10 on US 15-50\INC 87 over Deep River\CADD\GEO\TECH\XSC\B4968_Geo_Rdy_XSI.L.dgn



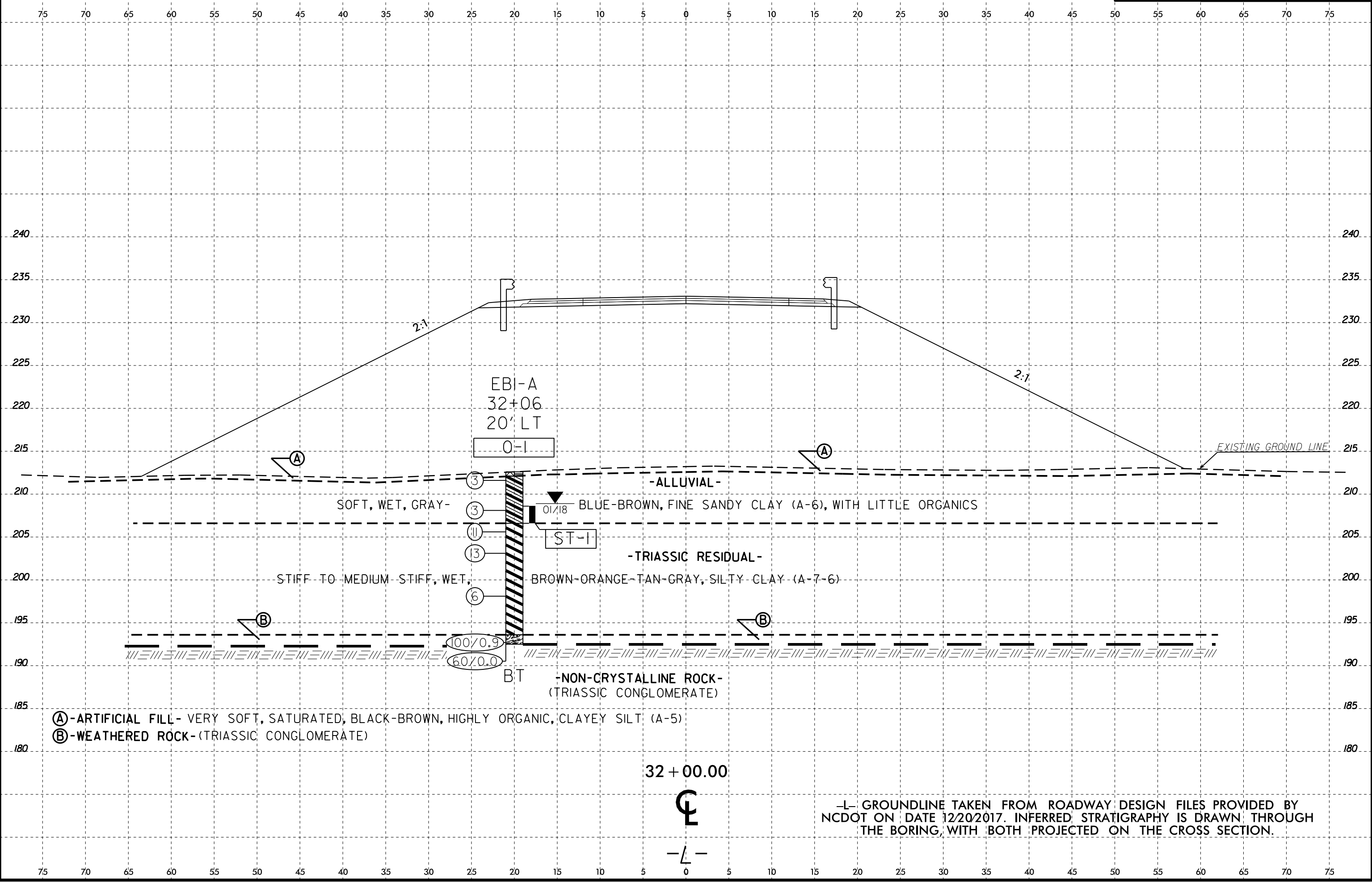
6/23/16
14-MAR-2018 10:23
I:\2018\14-MAR-2018 10:23\PROJECTS\2000\12999\12500\12596 - B-4968 Bridge No.10 on US 15-50\INC 87 over Deep River\CADD\GEO\TECH\XSC\B4968_Geo_Rdy_XSI.L.dgn
DWG: 12500\12596 - B-4968 Bridge No.10 on US 15-50\INC 87 over Deep River\CADD\GEO\TECH\XSC\B4968_Geo_Rdy_XSI.L.dgn



6/23/16
14-MAR-2018 10:23
I:\2\BENTLEY\CH\07_EFS\BSS\1\2596 - B-4968 Br-idge No.10 on US 15-50\INC B7 over Deep River\CADD_GEO\TECH\asc\B4968_Geo_Rdy_XSI.L.dgn



PROJ. REFERENCE NO. B-4968	SHEET NO. 18
-------------------------------	-----------------



EBI-A
32+06
20' LT

0-1

-ALLUVIAL-

SOFT, WET, GRAY-

01/18 BLUE-BROWN, FINE SANDY CLAY (A-6), WITH LITTLE ORGANICS

-TRIASSIC RESIDUAL-

STIFF TO MEDIUM-STIFF, WET,

BROWN-ORANGE-TAN-GRAY, SILTY CLAY (A-7-6)

100%0.9
60%0.0

BT
-NON-CRYSTALLINE ROCK-
(TRIASSIC CONGLOMERATE)

Ⓐ -ARTIFICIAL FILL- VERY SOFT, SATURATED, BLACK-BROWN, HIGHLY ORGANIC, CLAYEY SILT (A-5)

Ⓑ -WEATHERED ROCK- (TRIASSIC CONGLOMERATE)

32 + 00.00

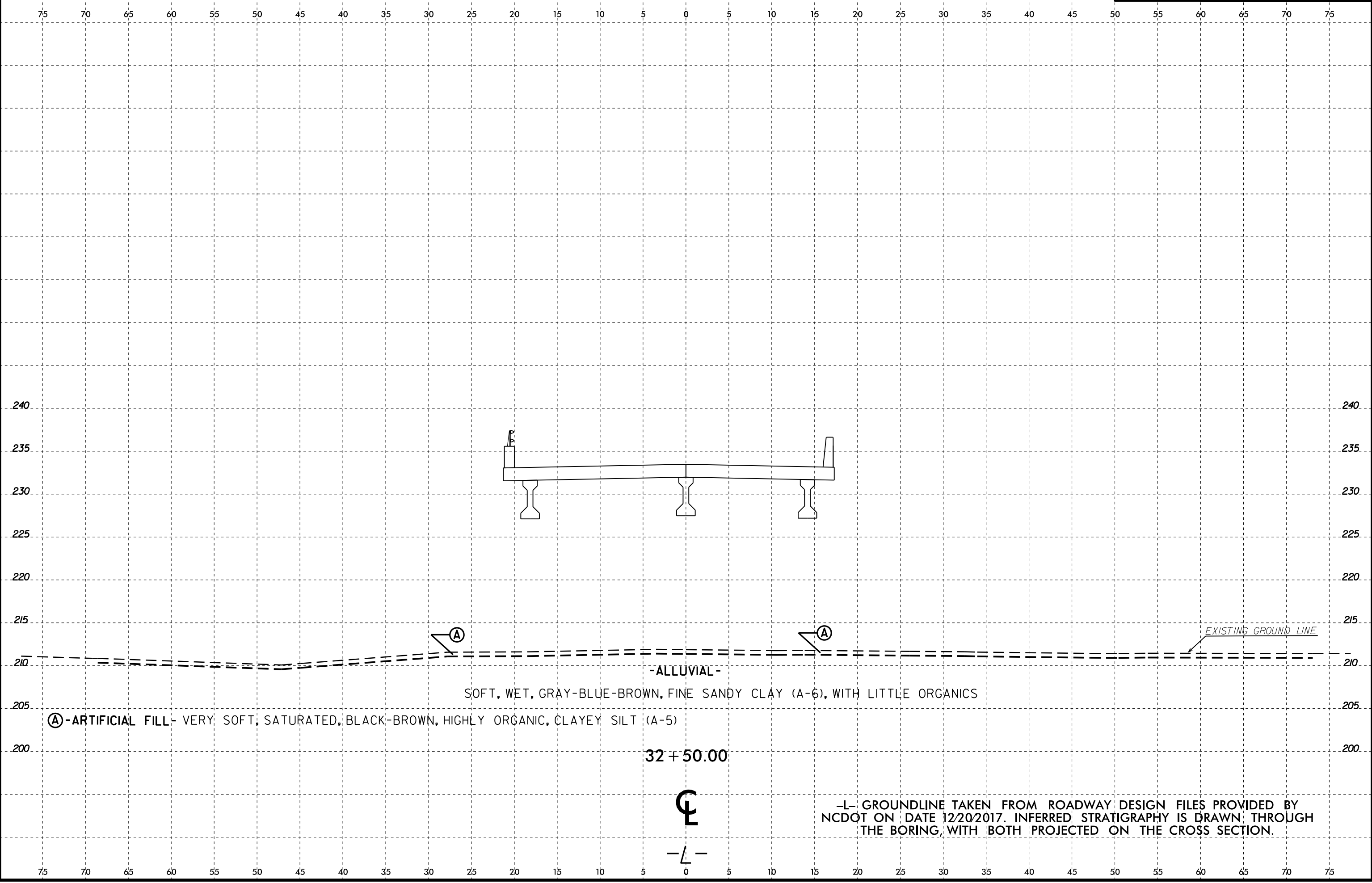


-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY
NCDOT ON DATE 12/20/2017. INFERRED STRATIGRAPHY IS DRAWN THROUGH
THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.

6/23/16
14-MAR-2018 10:23
I:\2\BENTLEY\CH07\EGS\BSS1\X7380
proj\egwz AT EGS\BSS1\X7380
- B-4968 Bridge No.10 on US 15-50INC 87 over Deep River\CADD\GEO TECH\asc\B4968_Geo_Rdy_XSI.L.dgn



PROJ. REFERENCE NO.	SHEET NO.
B-4968	19



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

240 240

235 235

230 230

225 225

220 220

215 215

210 210

205 205

200 200

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

Ⓐ - ARTIFICIAL FILL - VERY SOFT, SATURATED, BLACK-BROWN, HIGHLY ORGANIC, CLAYEY SILT (A-5)

- ALLUVIAL -
SOFT, WET, GRAY-BLUE-BROWN, FINE SANDY CLAY (A-6), WITH LITTLE ORGANICS

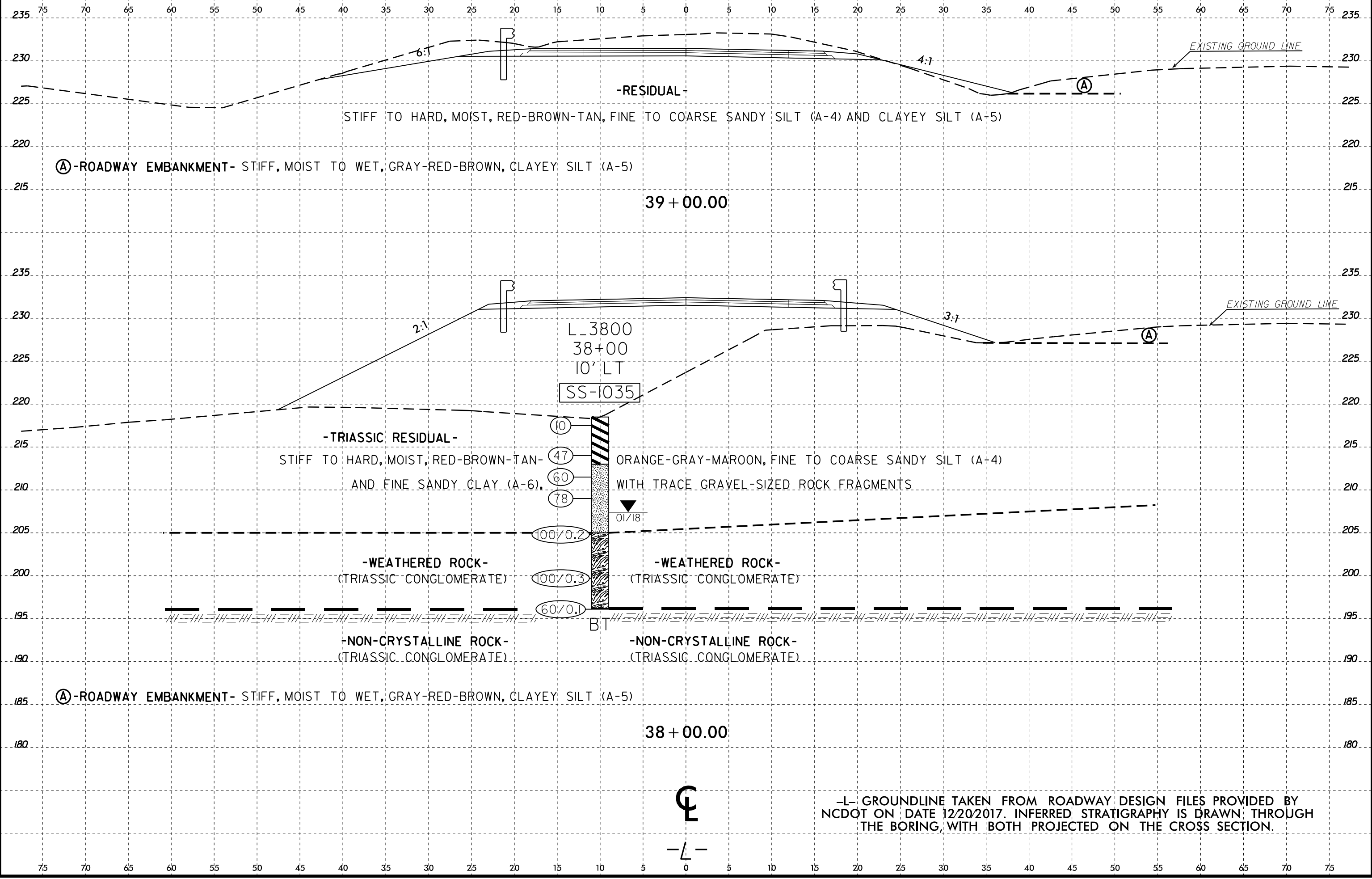
32 + 50.00



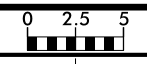
-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY NCDOT ON DATE 12/20/2017. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.

EXISTING GROUND LINE

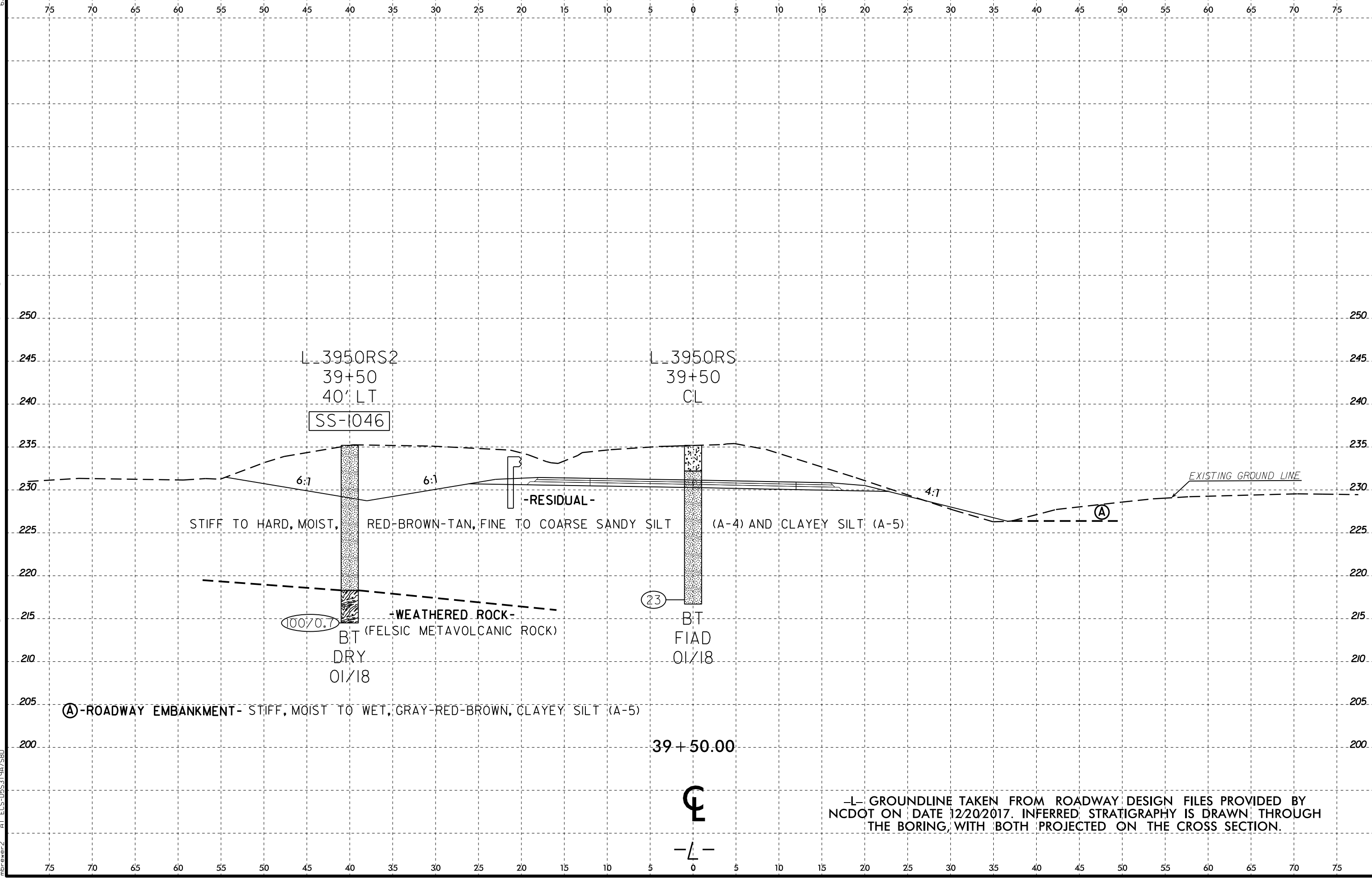
6/23/16
 14-MAR-2018 10:23
 I:\2018\PROJECTS\2000\12999\12500\12596 - B-4968 Bridge No.10 on US 15-50\INC 87 over Deep River\CADD\GEO\TECH\SSC\B4968_Geo_Rdy_XSI.L.dgn
 AT E:\SSC\12596



6/23/16
14-MAR-2018 10:23
I:\2018\PROJECTS\2000\12999\12500\12596 - B-4968 Bridge No.10 on US 15-50\INC 87 over Deep River\CADD\GEO TECH\SSC\B4968_Geo_Rdy_XSI.L.dgn



PROJ. REFERENCE NO.	SHEET NO.
B-4968	21



L-3950RS2
39+50
40' LT

SS-1046

L-3950RS
39+50
CL

STIFF TO HARD, MOIST, RED-BROWN-TAN, FINE TO COARSE SANDY SILT (A-4) AND CLAYEY SILT (A-5)

-RESIDUAL-

100%
BT (FELSIC METAVOLCANIC ROCK)

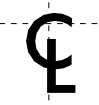
-WEATHERED ROCK-

BT
DRY
01/18

BT
FIAD
01/18

(A)-ROADWAY EMBANKMENT- STIFF, MOIST TO WET, GRAY-RED-BROWN, CLAYEY SILT (A-5)

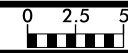
39 + 50.00



-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY NCDOT ON DATE 12/20/2017. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.

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

6/23/16

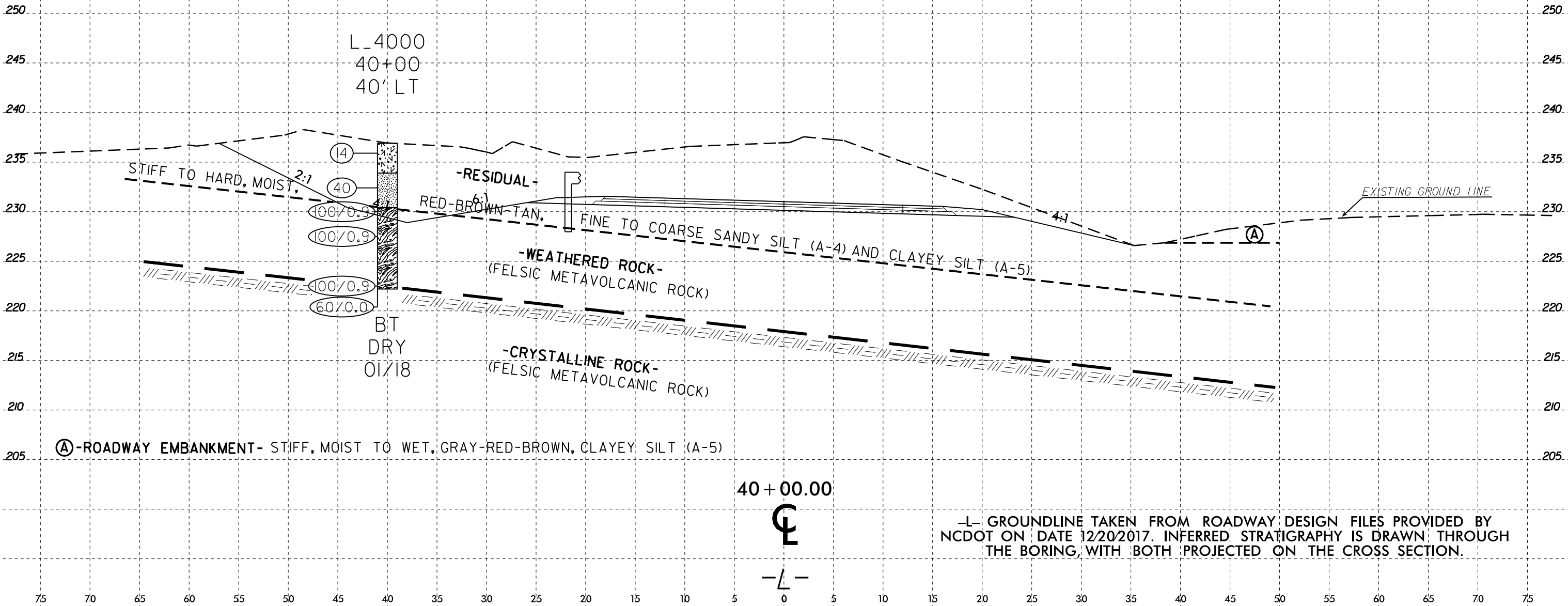


PROJ. REFERENCE NO.
B-4968

SHEET NO.
22

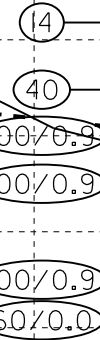
75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

14-MAR-2018 10:23 PROJ: I:\2018\PROJECTS\12596\12596 - B-4968 Bridge No.10 on US 15-50\INC 87 over Deep River\CADD\GEO\TECH\B4968_Geo_Rdy_XSI.L.dgn



L_4000
40+00
40' LT

STIFF TO HARD, MOIST, 2:1



BT
DRY
01/18

-RESIDUAL-
RED-BROWN-TAN, 6:1

FINE TO COARSE SANDY SILT (A-4) AND CLAYEY SILT (A-5)

-WEATHERED ROCK-
(FELSIC METAVOLCANIC ROCK)

-CRYSTALLINE ROCK-
(FELSIC METAVOLCANIC ROCK)

(A) -ROADWAY EMBANKMENT- STIFF, MOIST TO WET, GRAY-RED-BROWN, CLAYEY SILT (A-5)

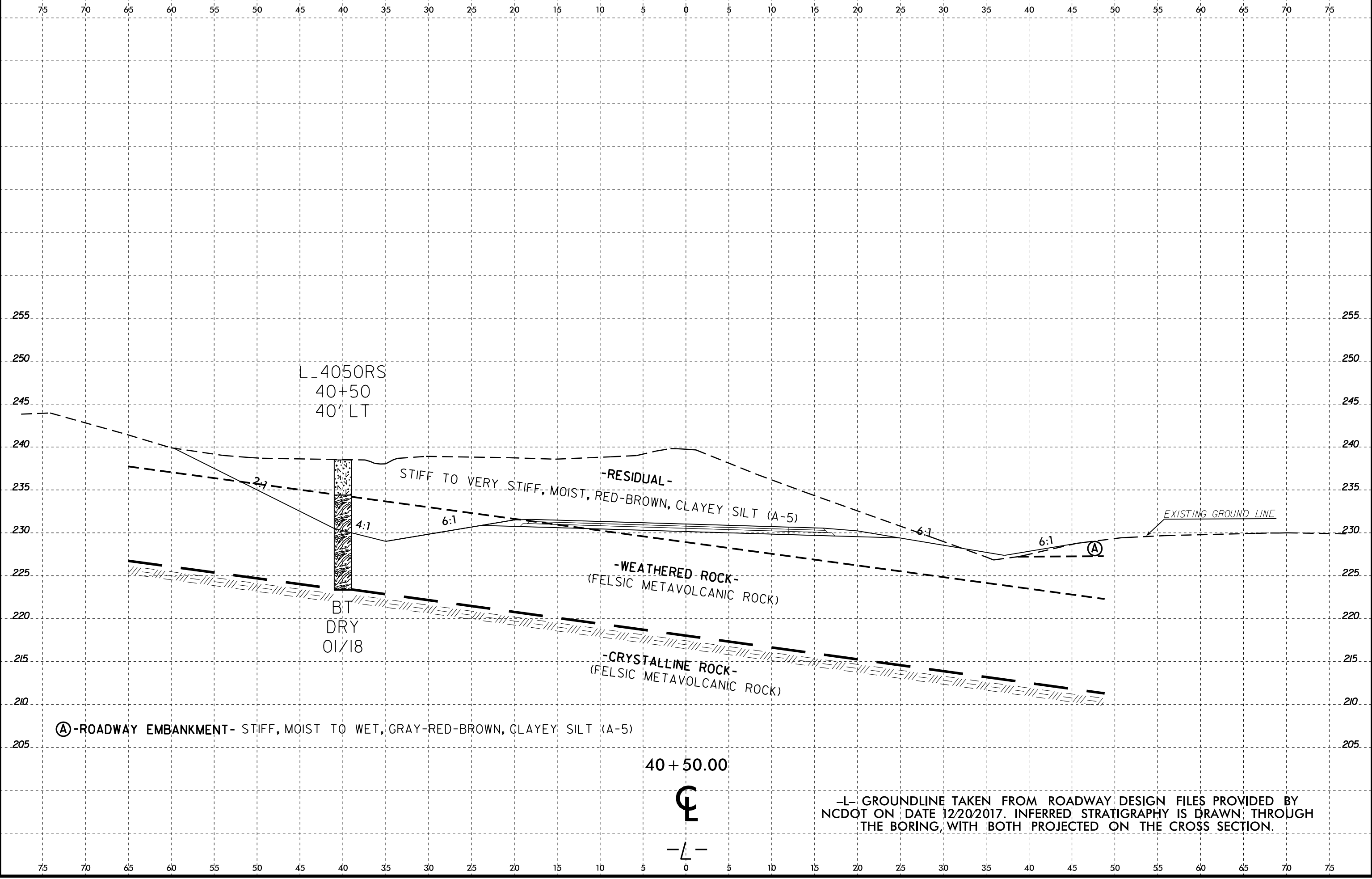
40 + 00.00



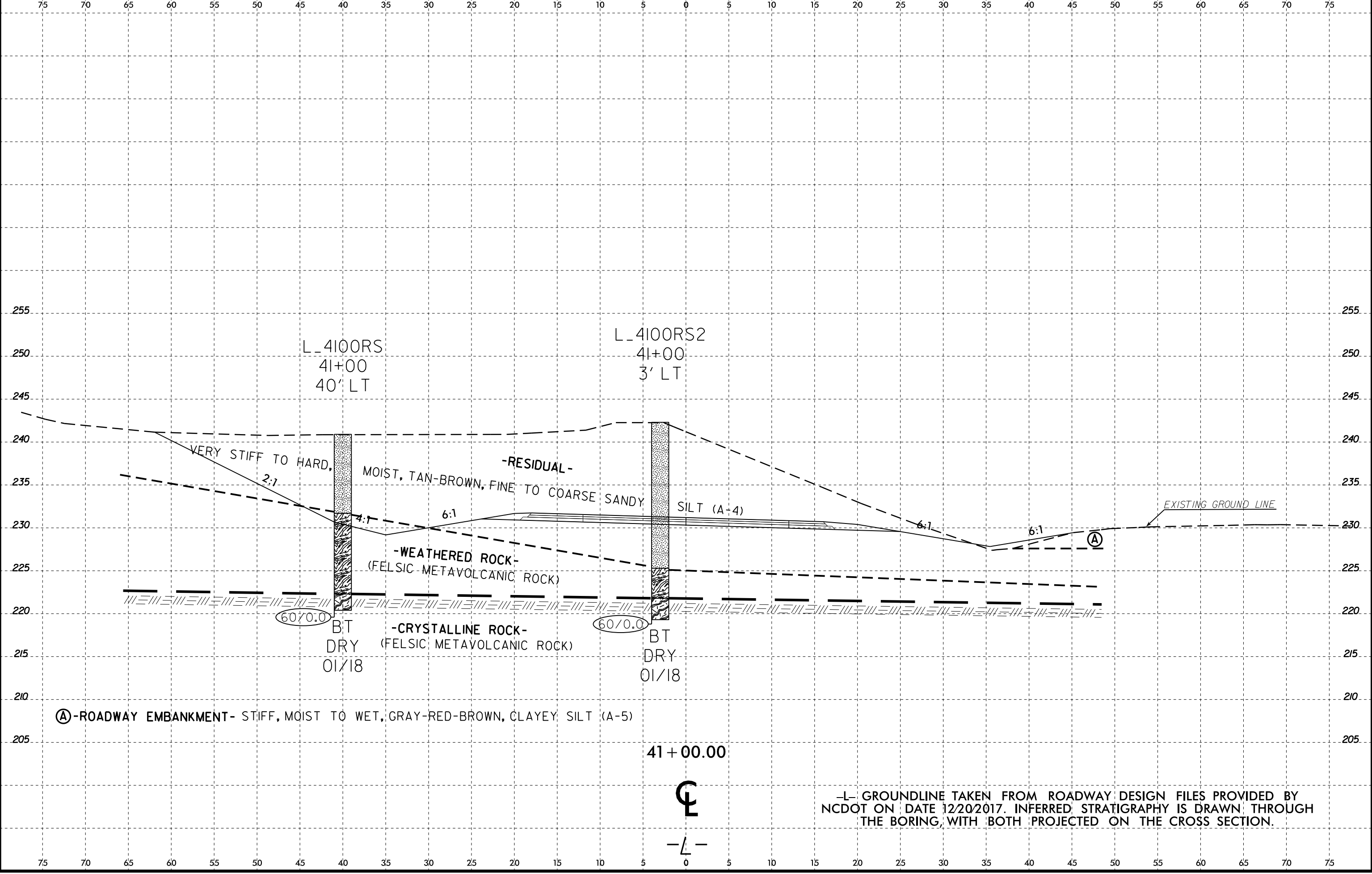
-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY NCDOT ON DATE 12/20/2017. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.

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

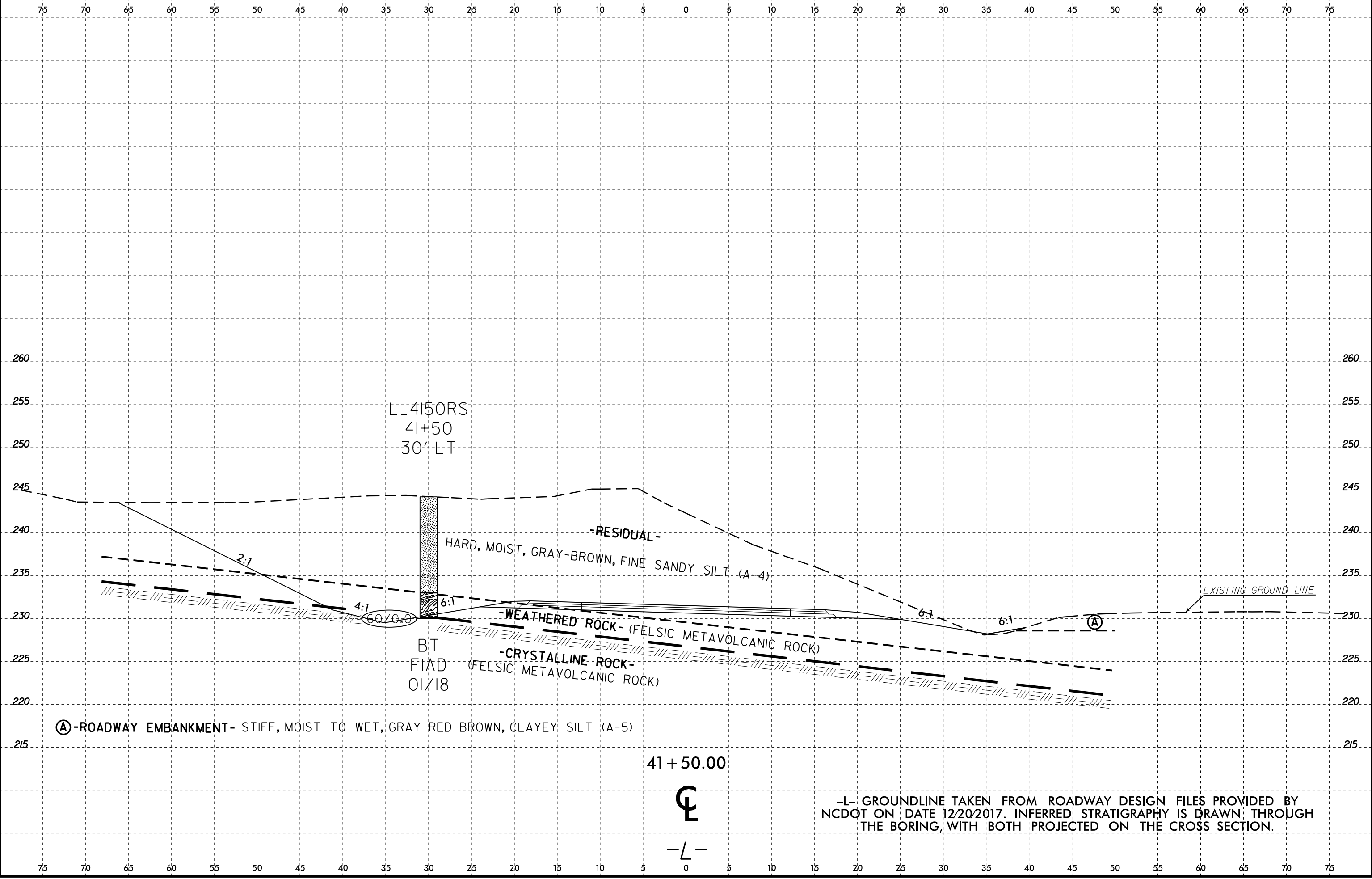
6/23/16
14-MAR-2018 10:23
I:\2018\PROJECTS\2000\12999\12500\12596 - B-4968 Br-ridge No.10 on US 15-50\INC B7 over Deep River\CADD\GEO\TECH\asc\B4968_Geo_Rdy_XSI.L.dgn
PROJECT CH 02 EGS.DSS\X7380



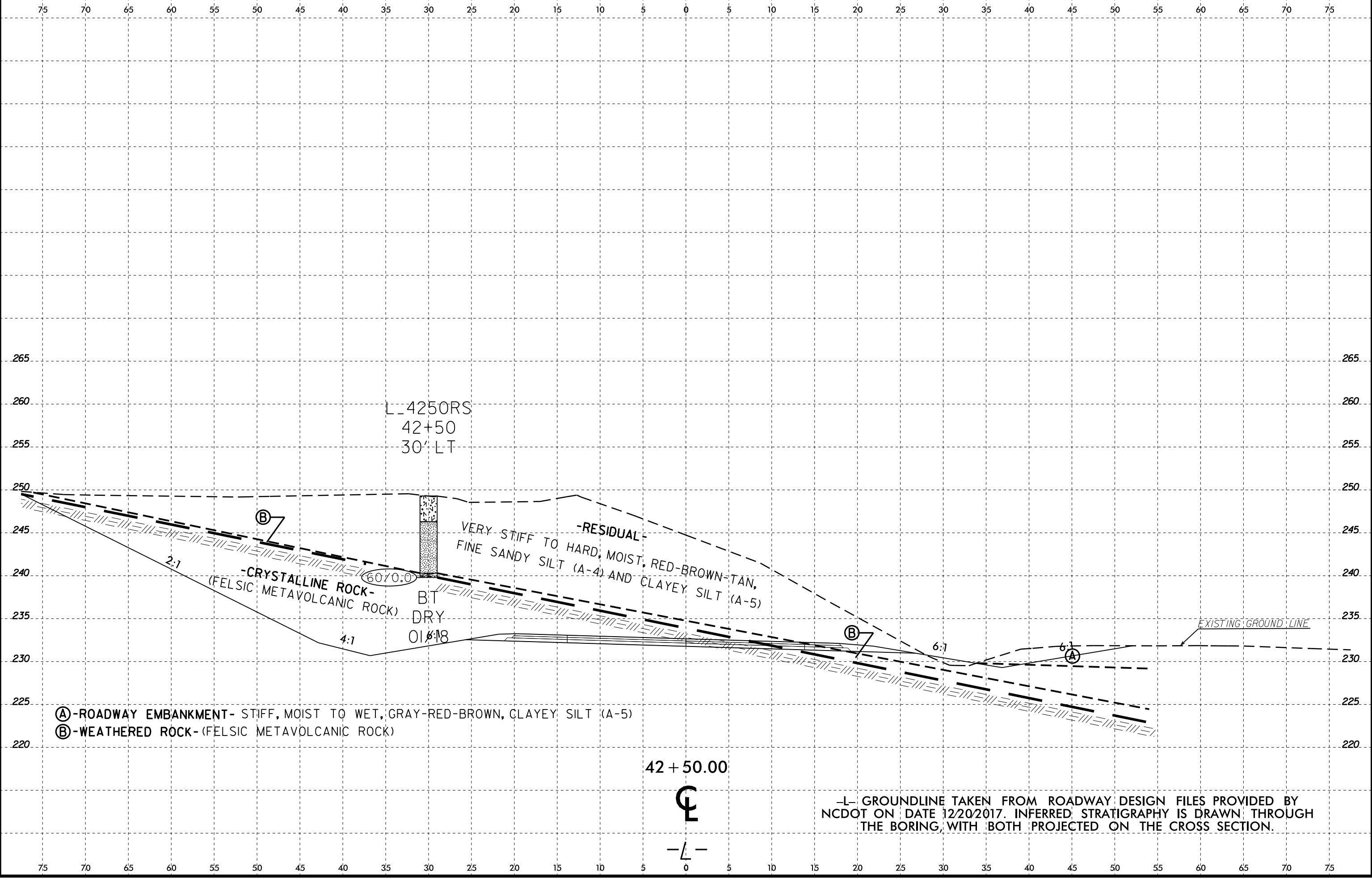
6/23/16
14-MAR-2018 10:23
I:\2\BENTLEY\CH\07_EFS\BSS1\X\380
proj\BSS1\X\380.dgn



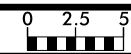
6/23/16
14-MAR-2018 10:23
I:\2018\14-MAR-2018 10:23\PROJECTS\2000-12999\12500\12596 - B-4968 Bridge No.10 on US 15-50\INC 87 over Deep River\CADD\GEO\TECH\XSC\B4968_Geo_Rdy_XSI.L.dgn



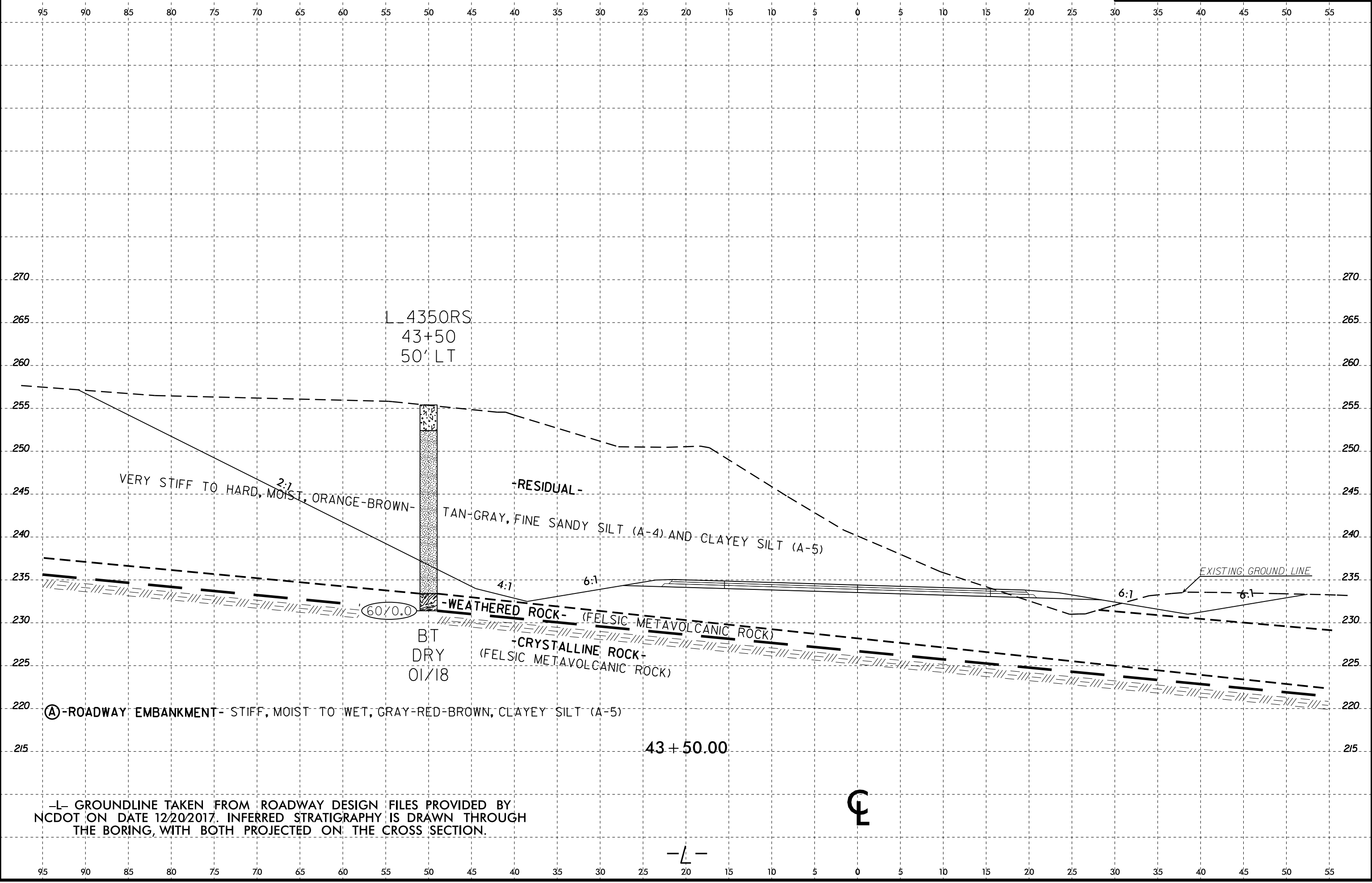
6/23/16
14-MAR-2018 10:23
I:\2018\14-MAR-2018 10:23\PROJECTS\2000\12999\12500\12596 - B-4968 Br-ridge No.10 on US 15-50\INC 87 over Deep River\CADD\GEO\TECH\XSC\B4968_Geo_Rdy_XSI.L.dgn



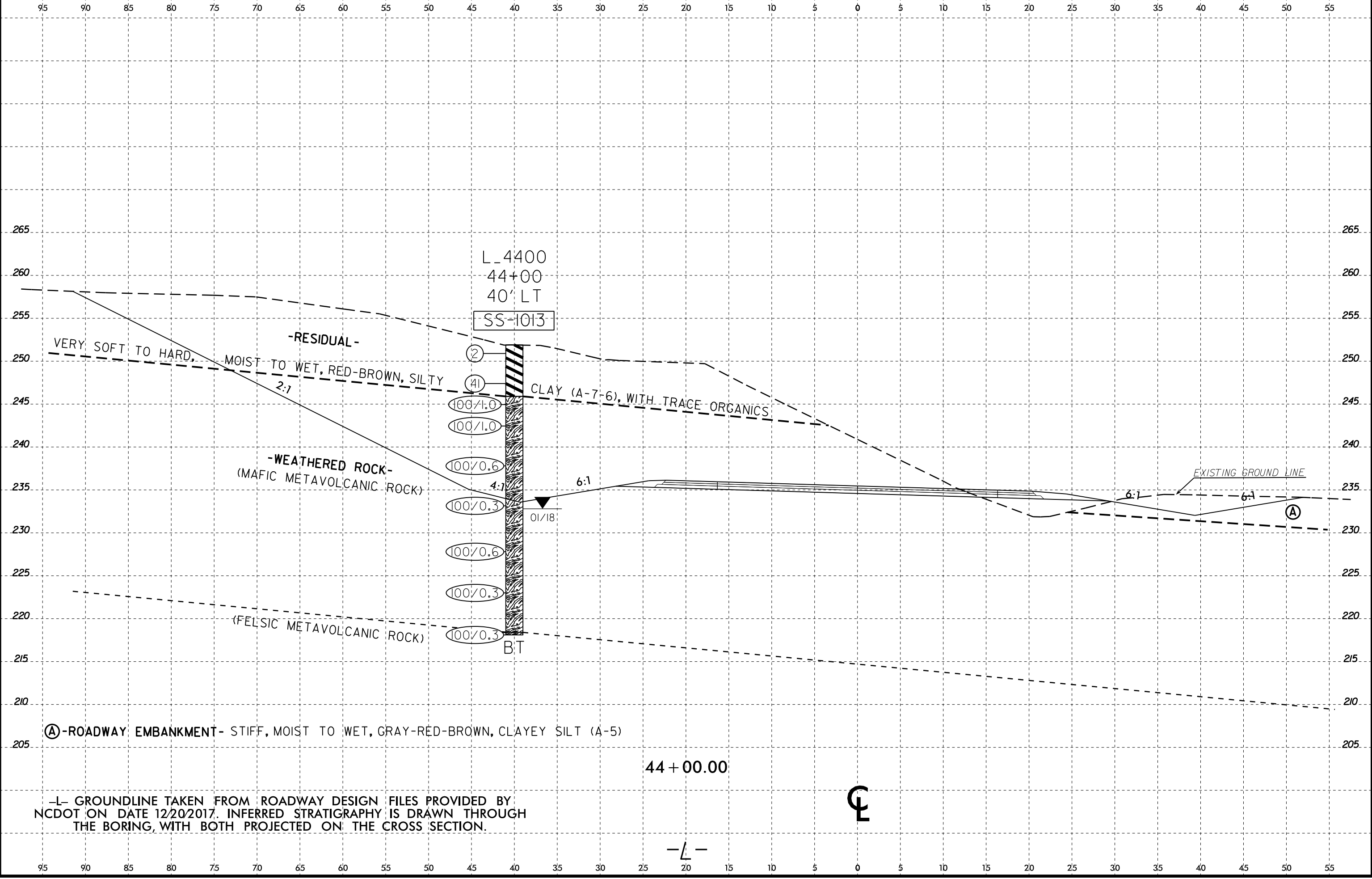
6/23/16
14-MAR-2018 10:24
I:\2\B01\1\CH\02_FCS\BSS\X\7380
proj\BSS\AT_FCS\BSS\X\7380



PROJ. REFERENCE NO.	SHEET NO.
B-4968	29



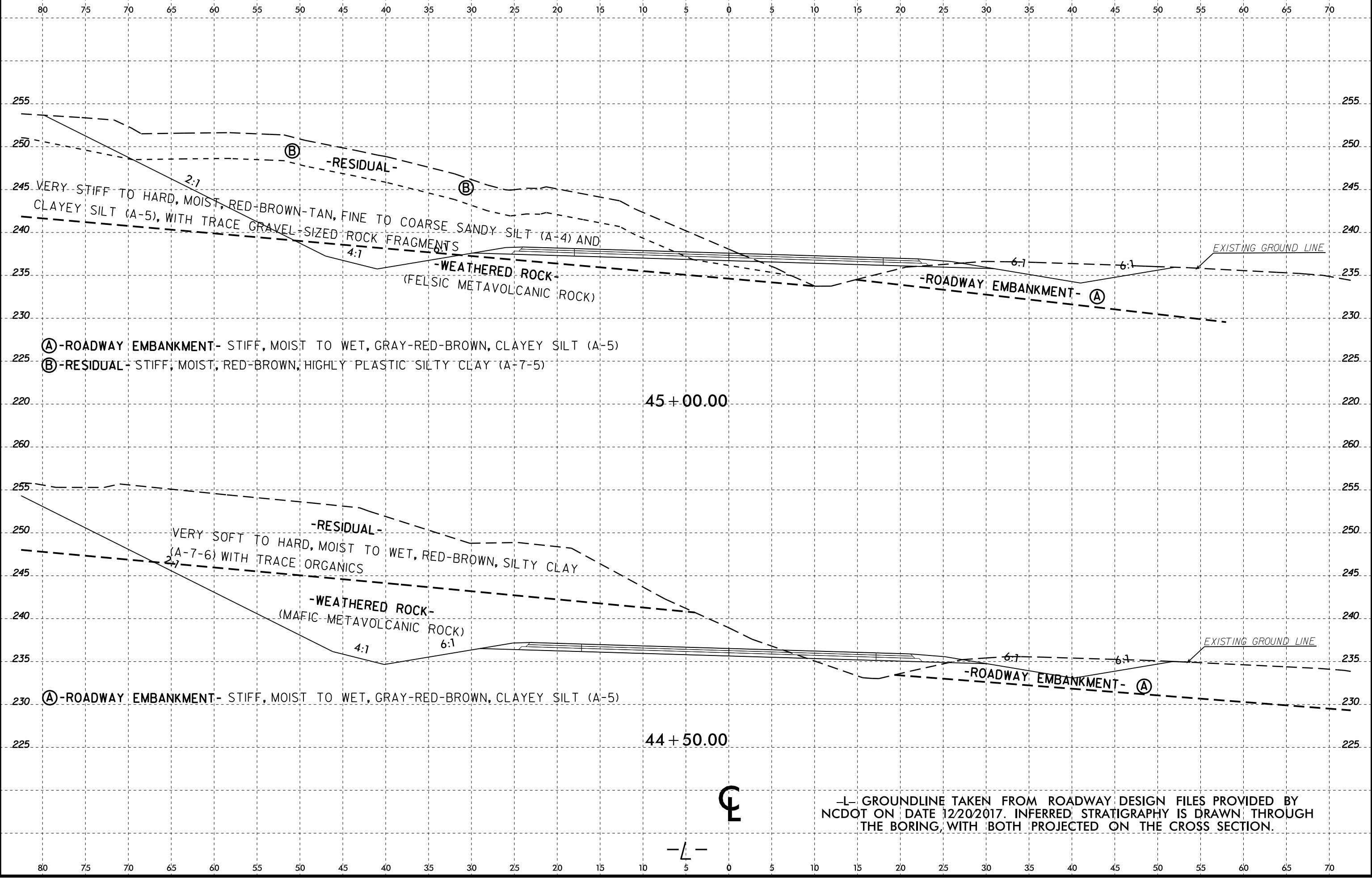
6/23/16
14-MAR-2018 10:24
I:\2\GEO\TECH\02_EFS\BSS1\X7380
proj\BSS1\X7380.dgn
B-4968 Br-idge No.10 on US 15-50INC B7 over Deep River\CADD_GEO\TECH\XSC\B4968_Geo_Rdy_XSI.L.dgn



—L— GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY NCDOT ON DATE 12/20/2017. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.



6/23/16
14-MAR-2018 10:24
I:\2018\11\CH\02_EFS\BSS1\7380
proj\BSS1\7380.dgn
B-4968 Bridge No.10 on US 15-501NC 87 over Deep River\CADD_GEO TECH\B-4968_Geo_Rdy_XSI.L.dgn

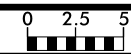


-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY NCDOT ON DATE 12/20/2017. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.

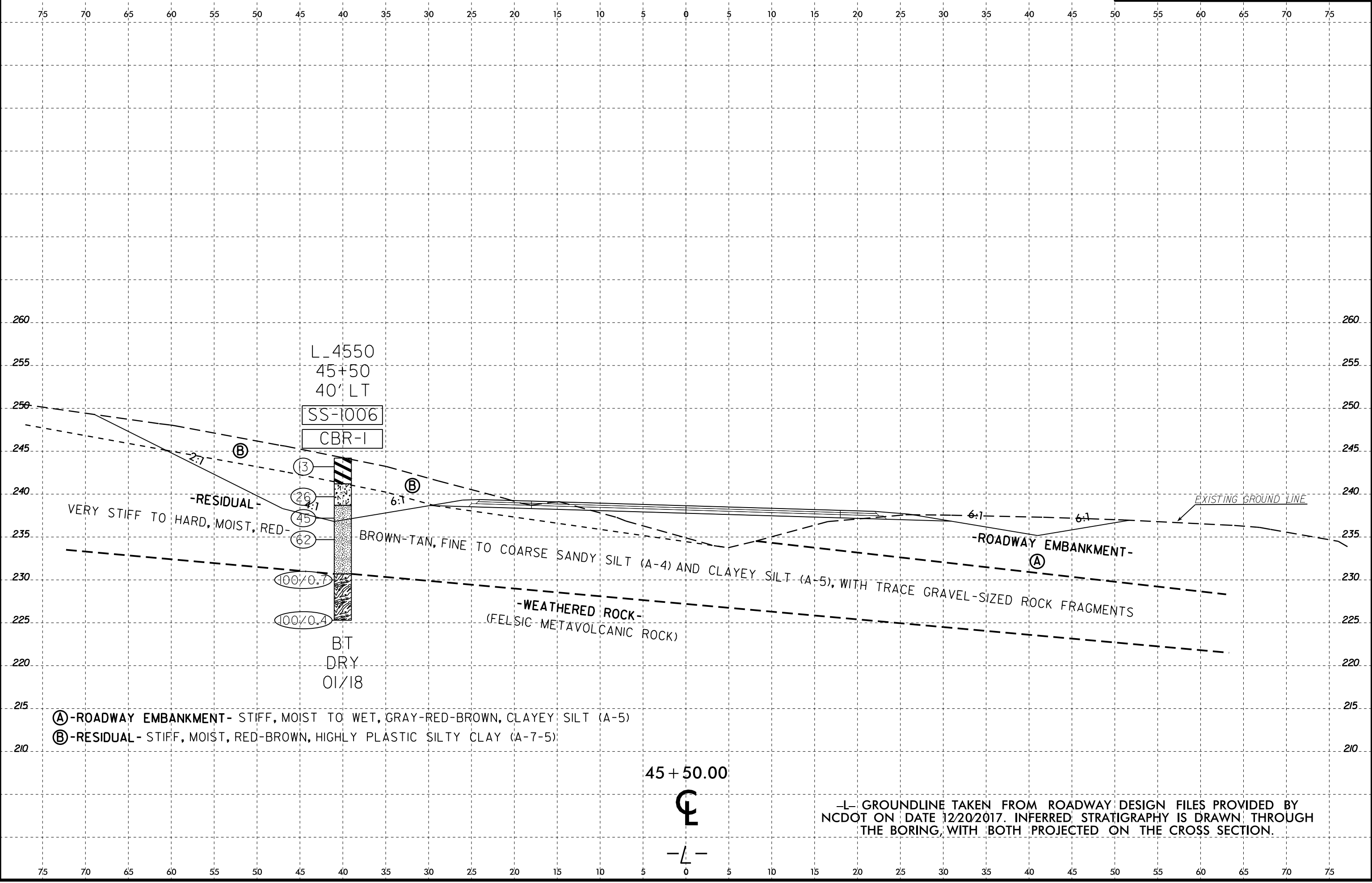


-L-

6/23/16
14-MAR-2018 10:24
I:\2\GEO\TECH\02_EFS\BSS\17\380
proj\BSS\17\380
- B-4968 Br-ridge No.10 on US 15-50\INC 87 over Deep River\CADD_GEO\TECH\SSC\B4968_Geo_Rdy_XSI.L.dgn



PROJ. REFERENCE NO.	SHEET NO.
B-4968	32



L_4550
45+50
40' LT
SS-1006
CBR-I
BT
DRY
01/18

-RESIDUAL-
VERY STIFF TO HARD, MOIST, RED-

BROWN-TAN, FINE TO COARSE SANDY SILT (A-4) AND CLAYEY SILT (A-5), WITH TRACE GRAVEL-SIZED ROCK FRAGMENTS

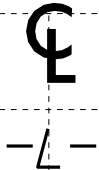
-WEATHERED ROCK-
(FELSIC-METAVOLCANIC ROCK)

ROADWAY EMBANKMENT-

EXISTING GROUND LINE

- Ⓐ -ROADWAY EMBANKMENT- STIFF, MOIST TO WET, GRAY-RED-BROWN, CLAYEY SILT (A-5)
- Ⓑ -RESIDUAL- STIFF, MOIST, RED-BROWN, HIGHLY PLASTIC SILTY CLAY (A-7-5)

45 + 50.00

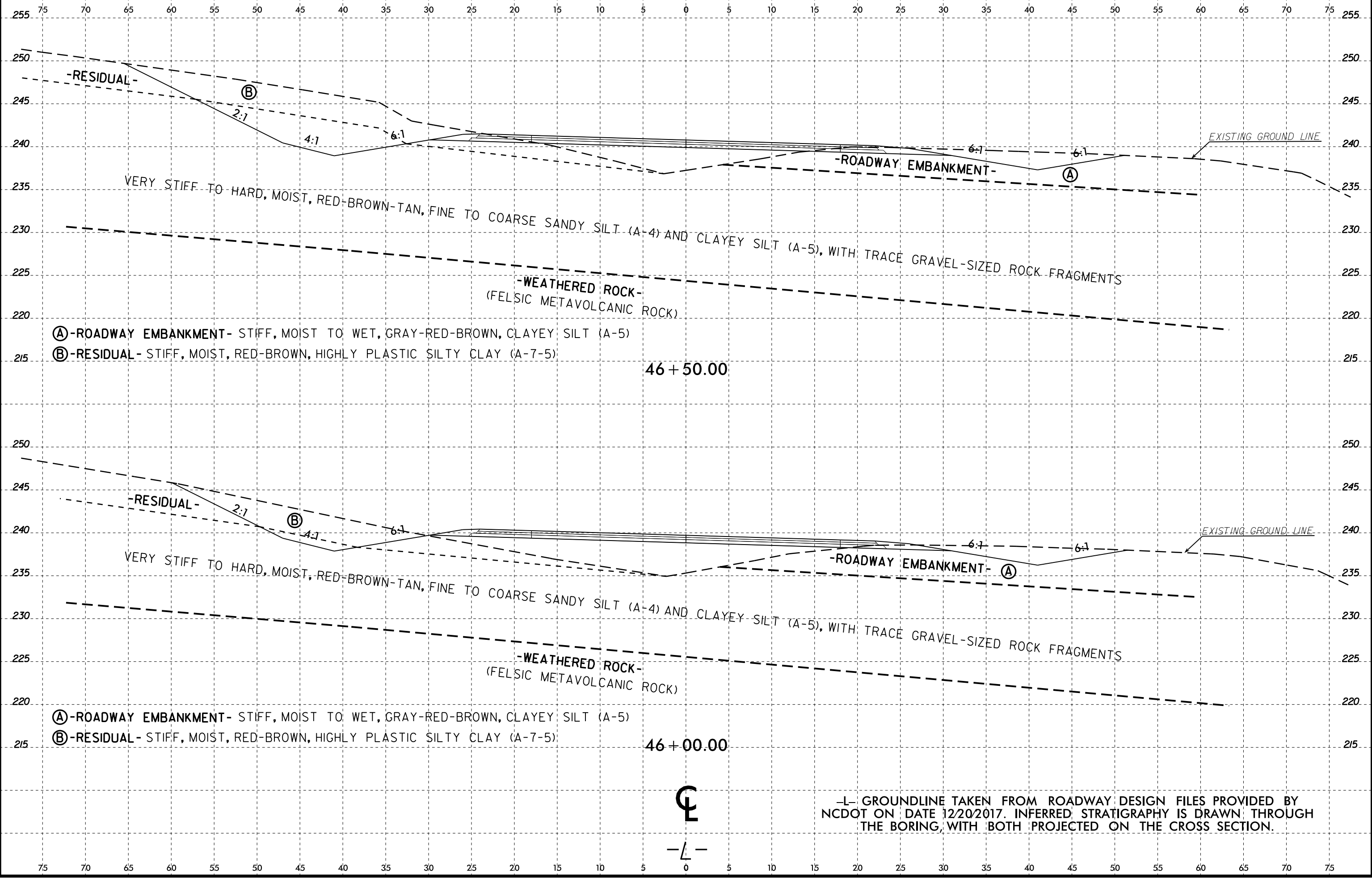


-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY NCDOT ON DATE 12/20/2017. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.

6/23/16
14-MAR-2018 10:24
I:\2\GEO\1\CH\02\EGS\BSS1\X\380
proj\emerz



PROJ. REFERENCE NO.	SHEET NO.
B-4968	33

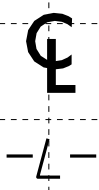


- Ⓐ -ROADWAY EMBANKMENT- STIFF, MOIST TO WET, GRAY-RED-BROWN, CLAYEY SILT (A-5)
- Ⓑ -RESIDUAL- STIFF, MOIST, RED-BROWN, HIGHLY PLASTIC SILTY CLAY (A-7-5)

46 + 50.00

- Ⓐ -ROADWAY EMBANKMENT- STIFF, MOIST TO WET, GRAY-RED-BROWN, CLAYEY SILT (A-5)
- Ⓑ -RESIDUAL- STIFF, MOIST, RED-BROWN, HIGHLY PLASTIC SILTY CLAY (A-7-5)

46 + 00.00

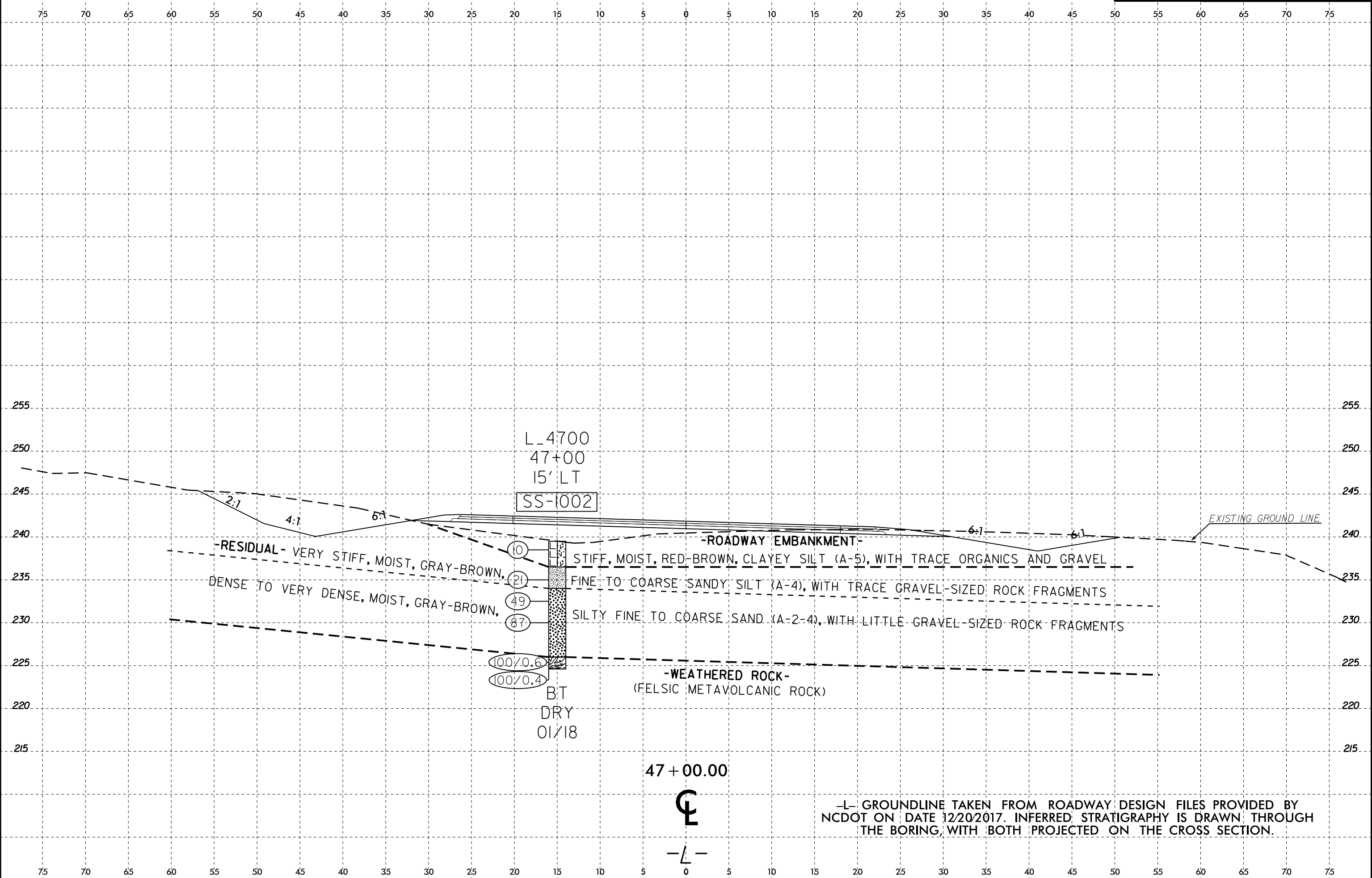


-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY NCDOT ON DATE 12/20/2017. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.

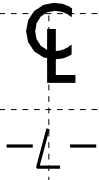
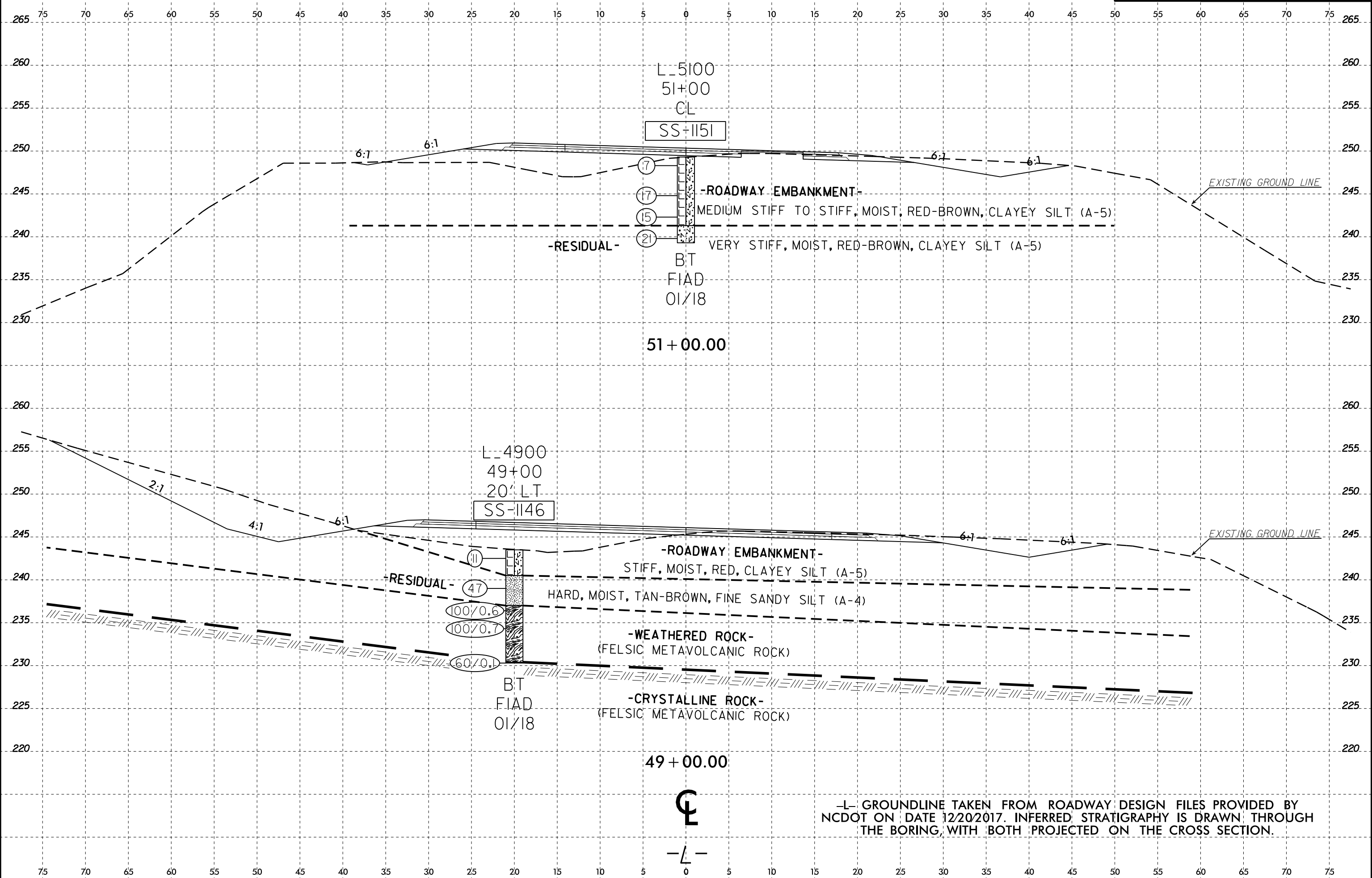
6/23/16
14-MAR-2018 10:24
I:\2018\PROJECTS\2000\12999\12500\12596 - B-4968 Bridge No.10 on US 15-50\INC 87 over Deep River\CADD\GEO\TECH\SSC\B4968_Geo_Rdy_XSI.L.dgn



PROJ. REFERENCE NO.	SHEET NO.
B-4968	34

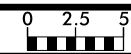


6/23/16
14-MAR-2018 10:24
I:\2018\11\CH\02\EGS\BSS\1\12596.dgn
B-4968 Br-idge No.10 on US 15-501NC 87 over Deep River\CADD_GEO TECH\ssc\B4968_Geo_Rdy_XSI.L.dgn

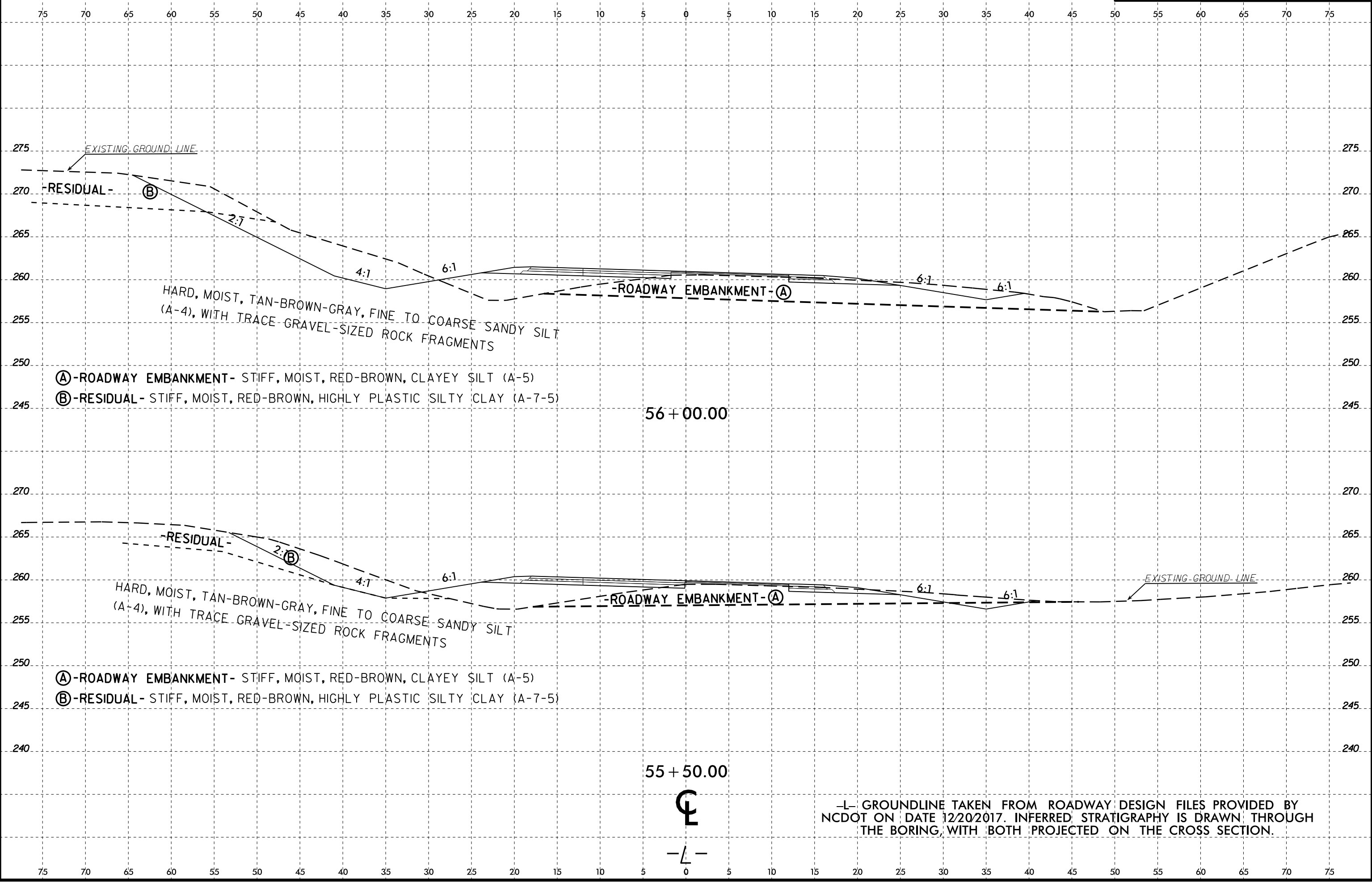


-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY NCDOT ON DATE 12/20/2017. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.

6/23/16
14-MAR-2018 10:24
I:\2\BENTLEY\CH\02_EFS\BSS1\X\380
proj\BSS1\X\380
- B-4968 Br-idge No.10 on US 15-50INC 87 over Deep River\CADD_GEO TECH.xsc \B4968_Geo_Rdy_XSL.dgn

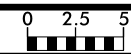


PROJ. REFERENCE NO.	SHEET NO.
B-4968	37

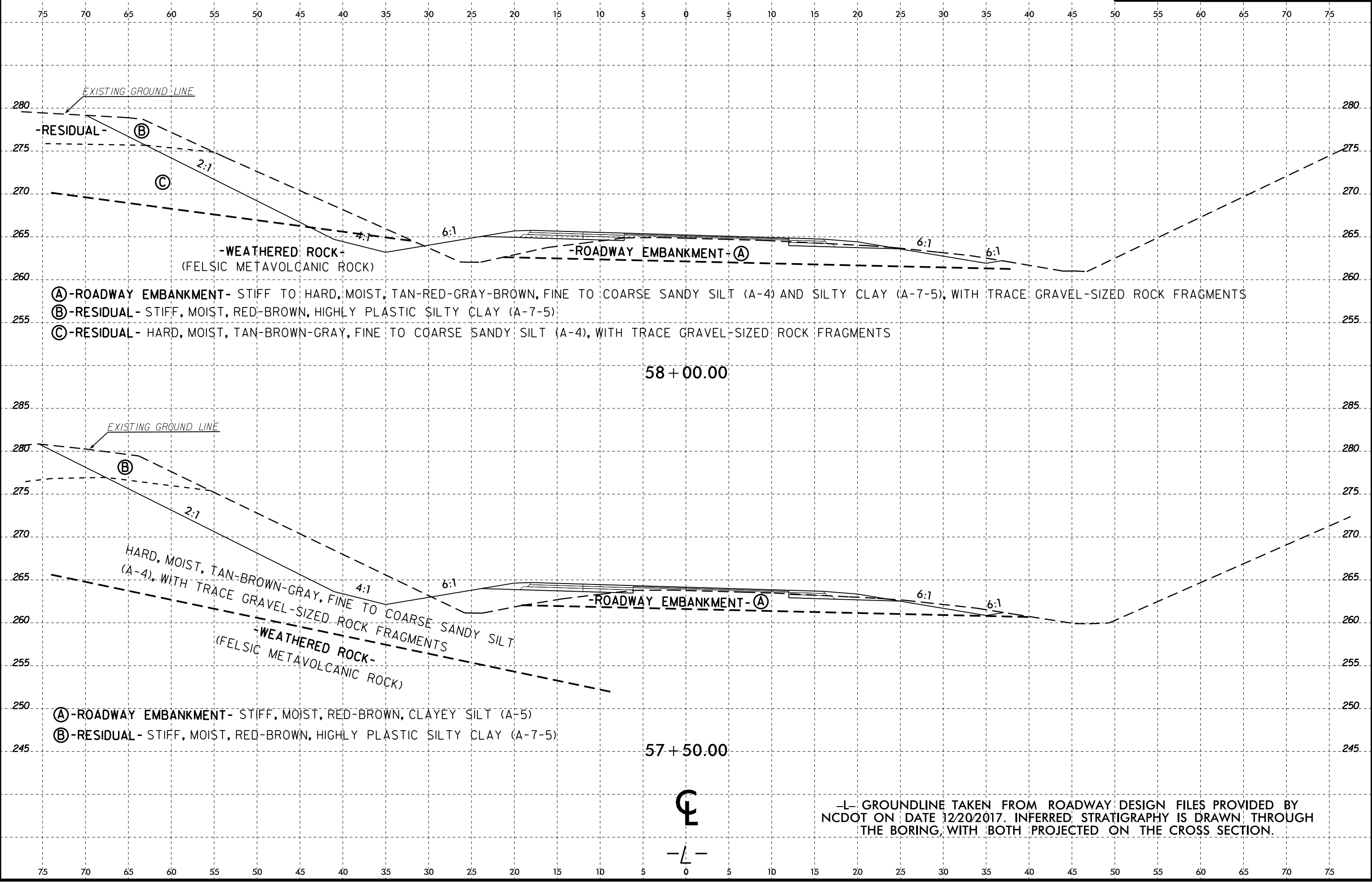


-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY NCDOT ON DATE 12/20/2017. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.

14-MAR-2018 10:24 I:\2018\PROJECTS\2000\12999\12500\12596 - B-4968 Bridge No.10 on US 15-50\INC 87 over Deep River\CADD\GEO\TECH\XSC\B4968_Geo_Rdy_XSL.dgn



PROJ. REFERENCE NO.	SHEET NO.
B-4968	40



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

EXISTING GROUND LINE

-RESIDUAL- (B)

2:1

4:1

6:1

-WEATHERED ROCK- (FELSIC METAVOLCANIC ROCK)

-ROADWAY EMBANKMENT- (A)

6:1

6:1

- (A) -ROADWAY EMBANKMENT- STIFF TO HARD, MOIST, TAN-RED-GRAY-BROWN, FINE TO COARSE SANDY SILT (A-4) AND SILTY CLAY (A-7-5), WITH TRACE GRAVEL-SIZED ROCK FRAGMENTS
- (B) -RESIDUAL- STIFF, MOIST, RED-BROWN, HIGHLY PLASTIC SILTY CLAY (A-7-5)
- (C) -RESIDUAL- HARD, MOIST, TAN-BROWN-GRAY, FINE TO COARSE SANDY SILT (A-4), WITH TRACE GRAVEL-SIZED ROCK FRAGMENTS

58 + 00.00

EXISTING GROUND LINE

(B)

2:1

4:1

6:1

HARD, MOIST, TAN-BROWN-GRAY, FINE TO COARSE SANDY SILT (A-4), WITH TRACE GRAVEL-SIZED ROCK FRAGMENTS

-WEATHERED ROCK- (FELSIC METAVOLCANIC ROCK)

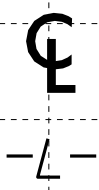
-ROADWAY EMBANKMENT- (A)

6:1

6:1

- (A) -ROADWAY EMBANKMENT- STIFF, MOIST, RED-BROWN, CLAYEY SILT (A-5)
- (B) -RESIDUAL- STIFF, MOIST, RED-BROWN, HIGHLY PLASTIC SILTY CLAY (A-7-5)

57 + 50.00



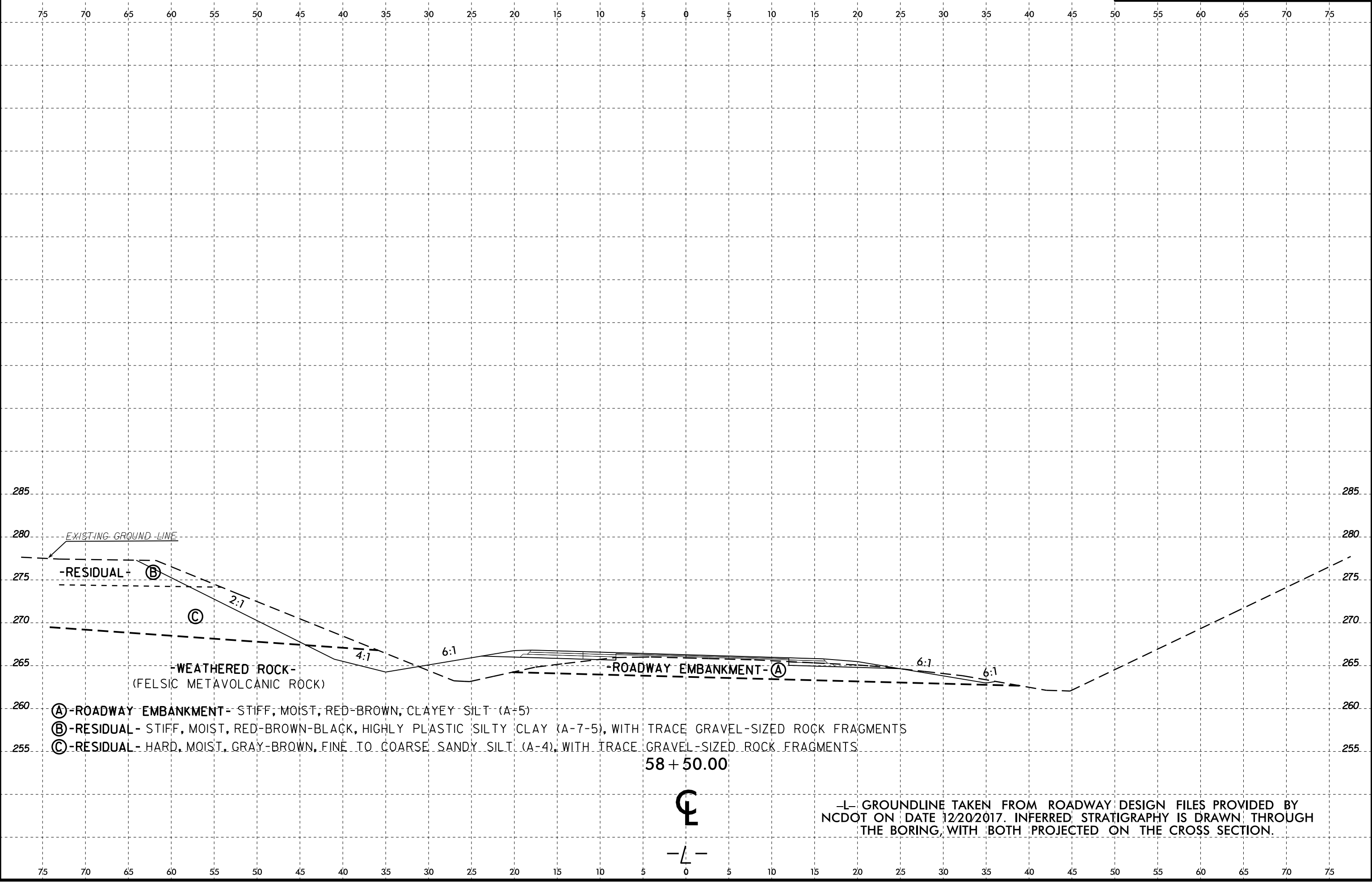
-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY NCDOT ON DATE 12/20/2017. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.

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

6/23/16
14-MAR-2018 10:24
I:\2018\PROJECTS\2000\12999\12500\12596 - B-4968 Bridge No.10 on US 15-50\INC 87 over Deep River\CADD\GEO TECH\B-4968_Geo_Rdy_XSI.L.dgn



PROJ. REFERENCE NO.	SHEET NO.
B-4968	41



EXISTING GROUND LINE

-RESIDUAL-

-WEATHERED ROCK-
(FELSIC METAVOLCANIC ROCK)

-ROADWAY EMBANKMENT-

- (A) -ROADWAY EMBANKMENT- STIFF, MOIST, RED-BROWN, CLAYEY SILT (A-5)
- (B) -RESIDUAL- STIFF, MOIST, RED-BROWN-BLACK, HIGHLY PLASTIC SILTY CLAY (A-7-5), WITH TRACE GRAVEL-SIZED ROCK FRAGMENTS
- (C) -RESIDUAL- HARD, MOIST, GRAY-BROWN, FINE TO COARSE SANDY SILT (A-4), WITH TRACE GRAVEL-SIZED ROCK FRAGMENTS

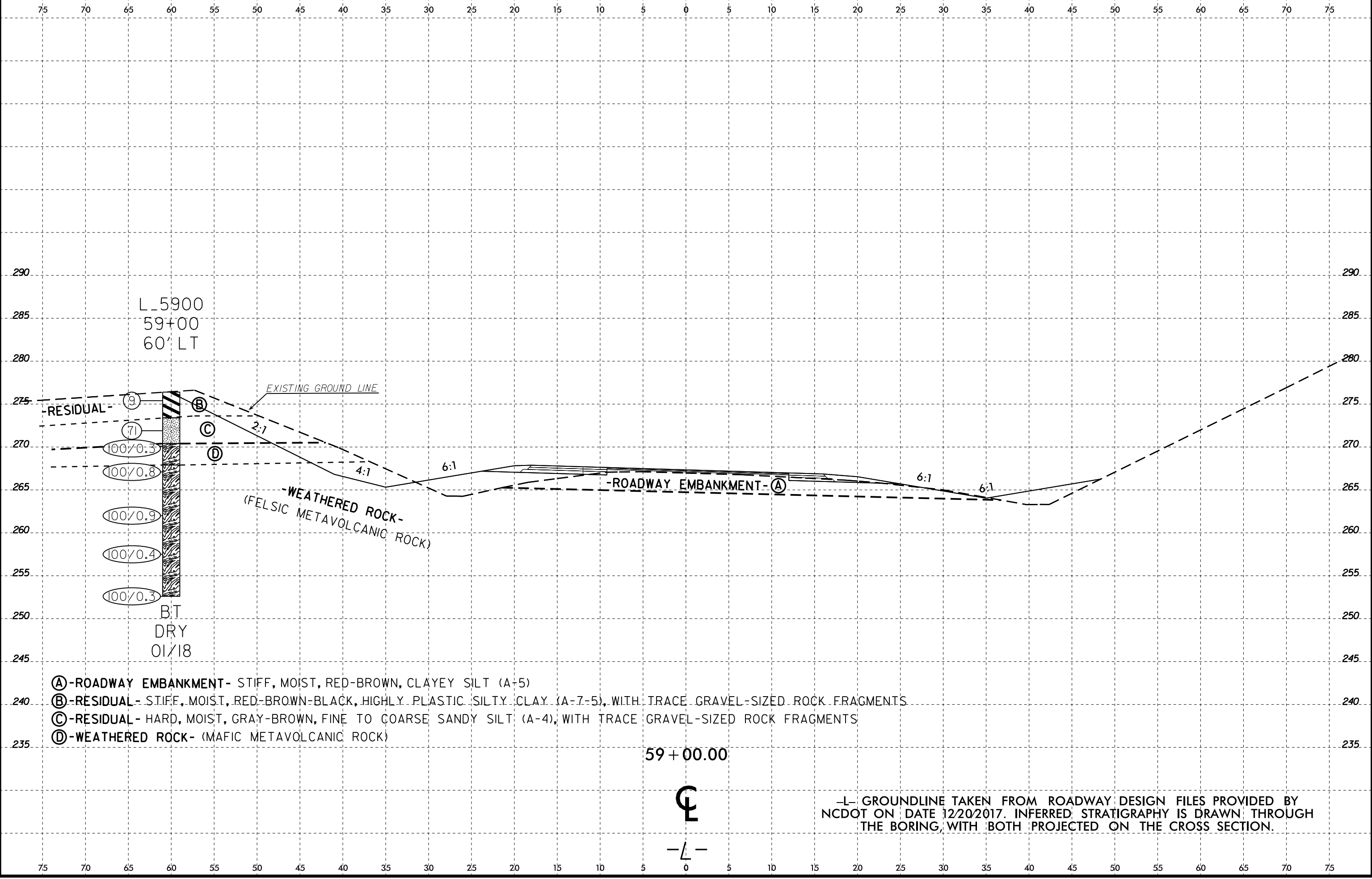
58 + 50.00

CL

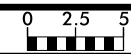
L

-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY NCDOT ON DATE 12/20/2017. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.

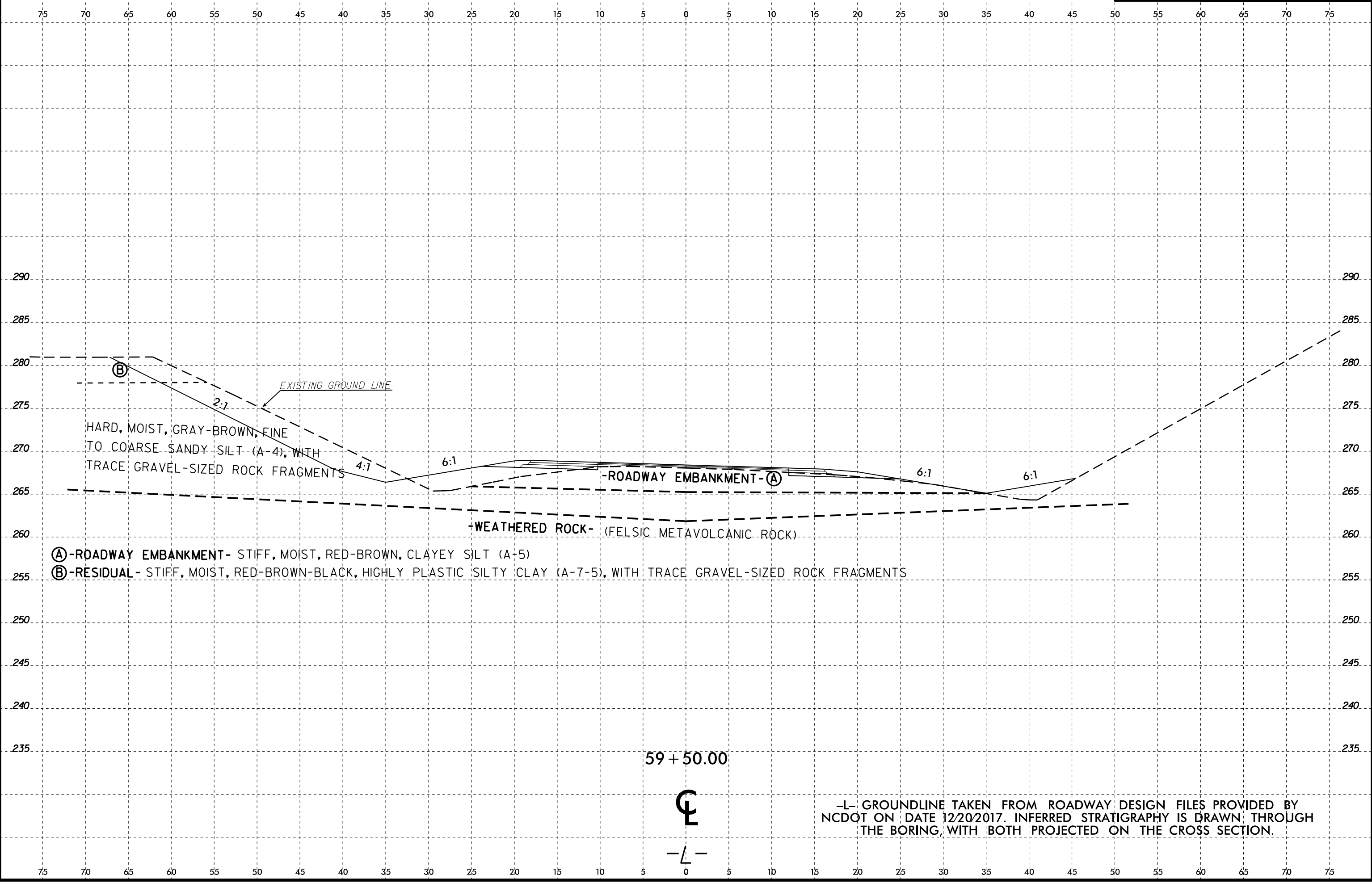
6/23/16
14-MAR-2018 10:25
I:\2018\PROJECTS\2000\12999\12500\12596 - B-4968 Bridge No.10 on US 15-50\INC 87 over Deep River\CADD\GEO\TECH\B4968_Geo_Rdy_XSI.L.dgn



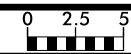
6/23/16
14-MAR-2018 10:25
I:\2\BENTLEY\CH\02_EFS\BSS1\X\380
proj\BSS1\X\380
over Deep River \CADD\GEO\TECH\BSS1\Geo_Rdy_XSI.L.dgn



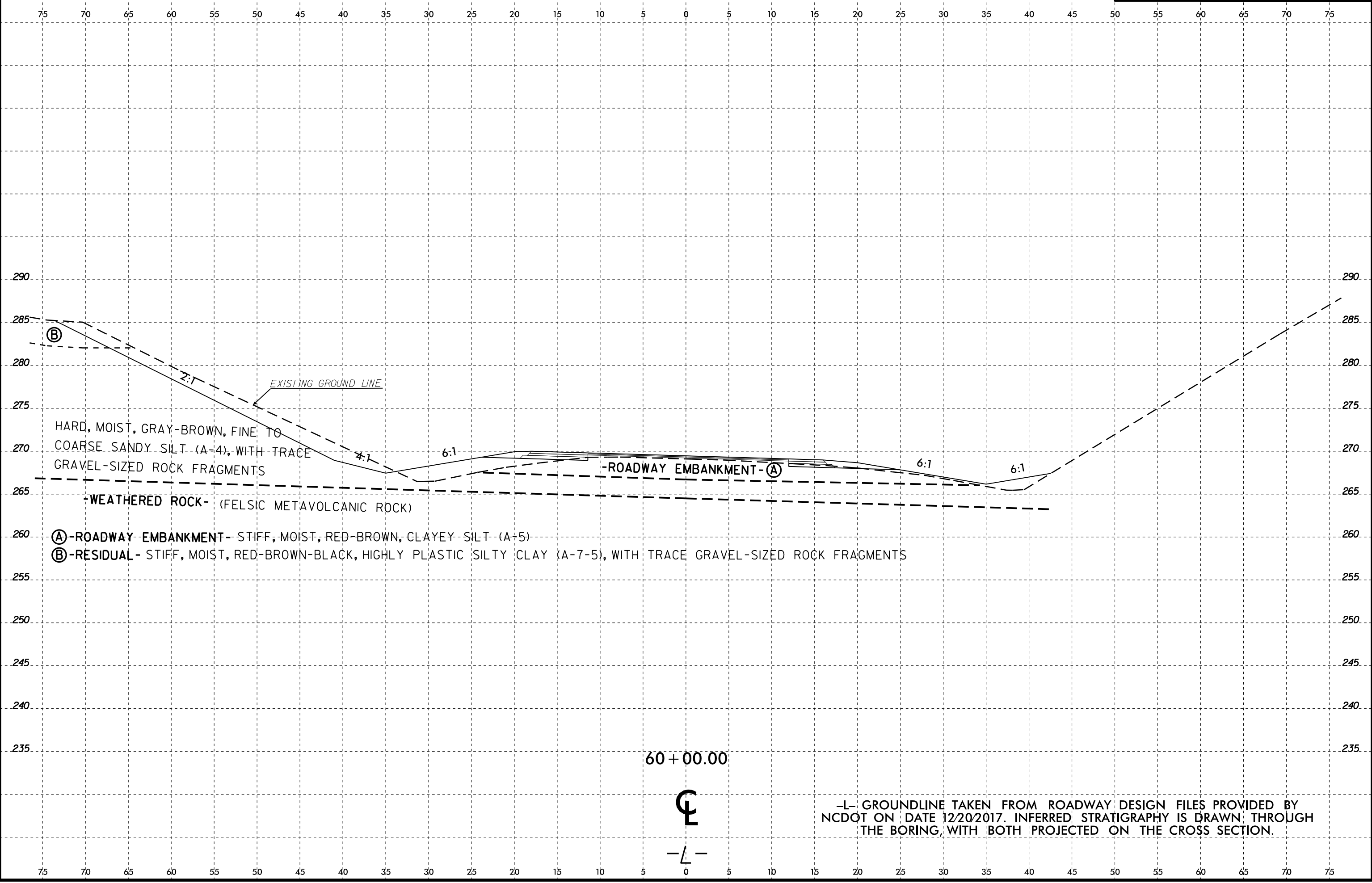
PROJ. REFERENCE NO.	SHEET NO.
B-4968	43



14-MAR-2018 10:25 I:\2\BENTLEY\CH\02_EFS\BENTLEY\12596 - B-4968 Bridge No.10 on US 15-50\INC 87 over Deep River\CADD\GEO\TECH\B-4968_Geo_Rdy_XSI.L.dgn



PROJ. REFERENCE NO.	SHEET NO.
B-4968	44



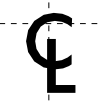
HARD, MOIST, GRAY-BROWN, FINE TO COARSE SANDY SILT - (A-4), WITH TRACE GRAVEL-SIZED ROCK FRAGMENTS

-WEATHERED ROCK- (FELSIC METAVOLCANIC ROCK)

(A) -ROADWAY EMBANKMENT- STIFF, MOIST, RED-BROWN, CLAYEY SILT (A-5)

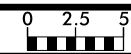
(B) -RESIDUAL- STIFF, MOIST, RED-BROWN-BLACK, HIGHLY PLASTIC SILTY CLAY (A-7-5), WITH TRACE GRAVEL-SIZED ROCK FRAGMENTS

60 + 00.00

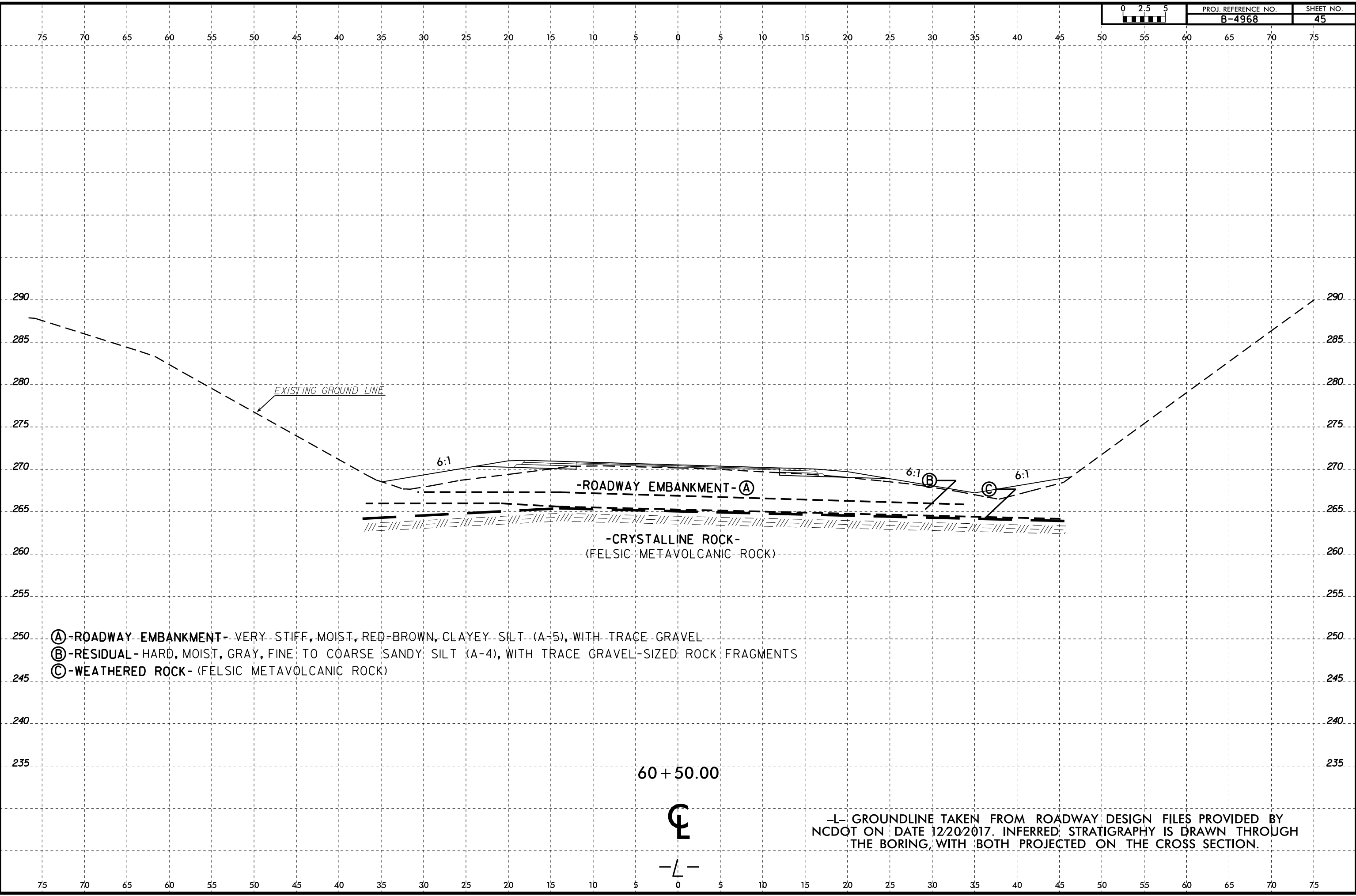


-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY NCDOT ON DATE 12/20/2017. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.

14-MAR-2018 10:25 I:\2018\PROJECTS\2000\12999\12500\12596 - B-4968 Br-idge No.10 on US 15-50\INC 87 over Deep River\CADD_GEO\TECH\asc\B4968_Geo_Rdy_XSI.L.dgn

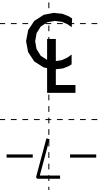


PROJ. REFERENCE NO.	SHEET NO.
B-4968	45



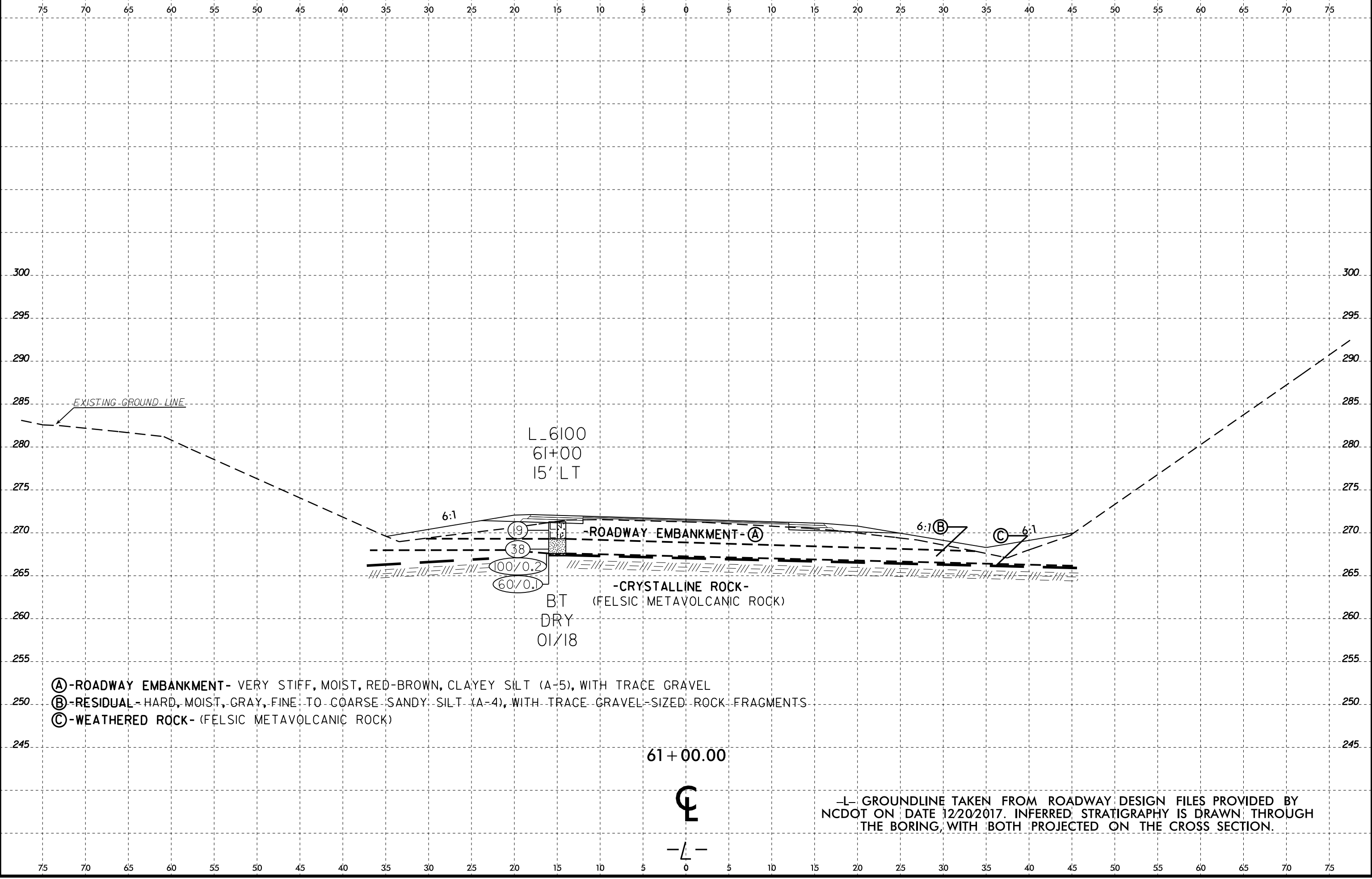
- Ⓐ -ROADWAY EMBANKMENT- VERY STIFF, MOIST, RED-BROWN, CLAYEY SILT (A-5), WITH TRACE GRAVEL
- Ⓑ -RESIDUAL- HARD, MOIST, GRAY, FINE TO COARSE SANDY SILT (A-4), WITH TRACE GRAVEL-SIZED ROCK FRAGMENTS
- Ⓒ -WEATHERED ROCK- (FELSIC METAVOLCANIC ROCK)

60 + 50.00

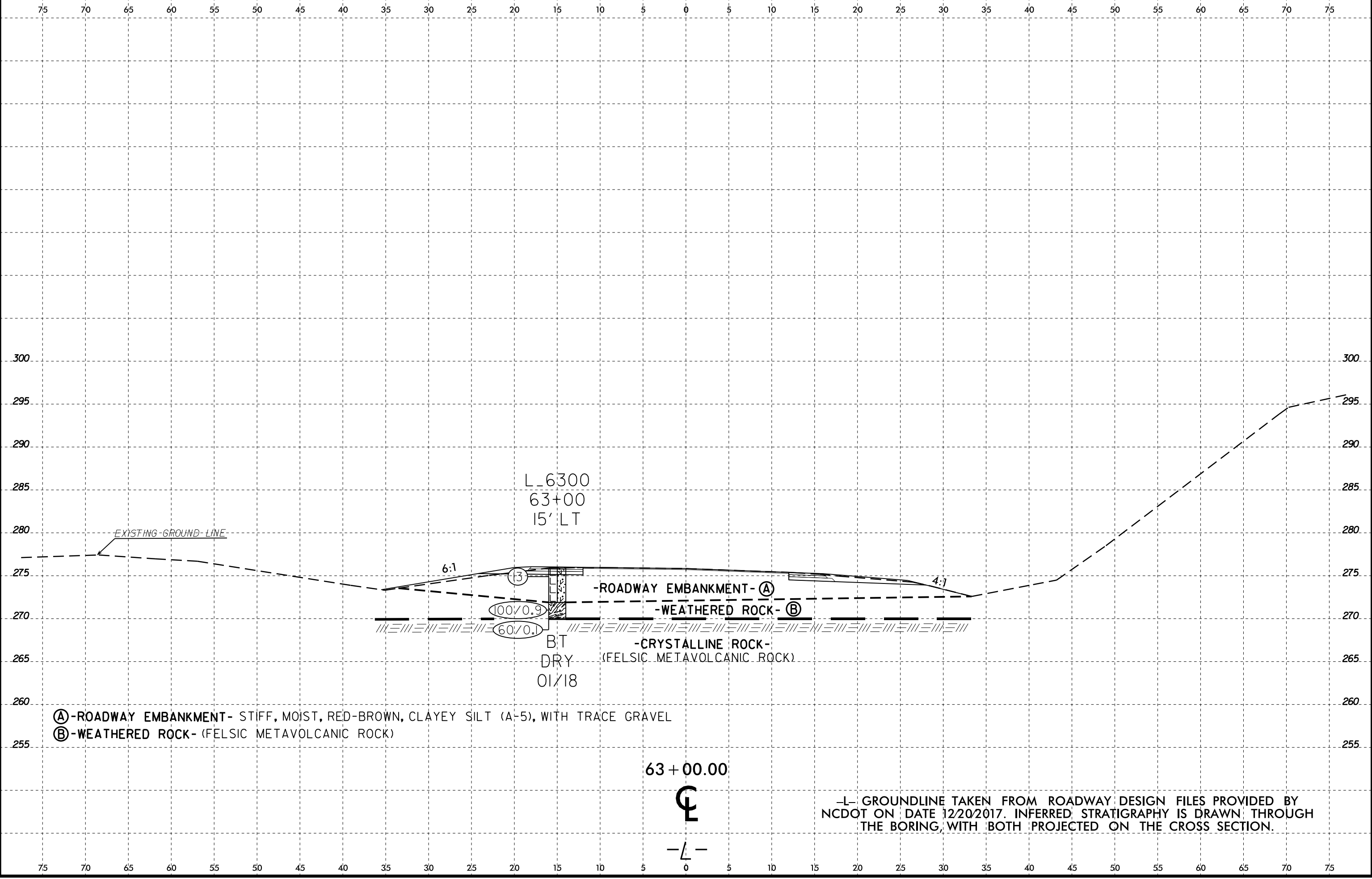


-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY NCDOT ON DATE 12/20/2017. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.

6/23/16
14-MAR-2018 10:25
I:\2\GEO\1\CH\02_EFS\BSS\1\7380
B-4968 Br-idge No.10 on US 15-50\INC 87 over Deep River\CADD_GEO\TECH\ssc\B4968_Geo_Rdy_XSI.L.dgn



6/23/16
14-MAR-2018 10:25
I:\2018\PROJECTS\2000\12999\12500\12596 - B-4968 Bridge No.10 on US 15-50\INC 87 over Deep River\CADD\GEO\TECH\XSC\B4968_Geo_Rdy_XSI.L.dgn



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
APPENDIX A
LABORATORY TEST RESULTS

REFERENCE: B-4968

PROJECT: 40162

Prepared in the Office of:



ECS SOUTHEAST, LLP
1812 CENTER PARK DRIVE, SUITE D
CHARLOTTE, NC 28217
(704) 525-5152 [PHONE]
(704) 357-0023 [FAX]
NC REGISTERED
ENGINEERING
FIRM # F-1078

SOIL TEST RESULTS

BORING NO.	SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
								C. SAND	F. SAND	SILT	CLAY	10	40	200		
L_2200	SS-1094	CL	22+00	0.0 - 1.5'	A-7-6(14)	48	20	15.1	12.6	24.7	47.6	93.0	84.0	70.0	21.4	*
L_3800	SS-1035	10' LT	38+00	0.0 - 1.5'	A-6(10)	33	14	6.4	17.7	41.4	34.5	98.2	84.2	80.9	17.5	*
L_3950RS2	SS-1046	40' LT	39+50	20.0 - 20.7'	A-2-4(0)	26	6	41.7	20.1	20.1	18.1	71.3	47.8	30.4	12.7	*
L_4400	SS-1013	40' LT	44+00	3.5 - 5.0'	A-7-6(14)	47	23	6.6	22.6	30.6	40.2	86.4	82.9	67.5	22.8	*
L_4550	SS-1006	40' LT	45+50	0.0 - 1.5'	A-7-5(26)	60	29	4.9	5.9	20.2	69.0	89.1	85.9	81.1	29.4	*
L_4700	SS-1002	15' LT	47+00	6.0 - 7.5'	A-2-4(0)	20	3	31.0	34.5	18.1	16.4	68.7	53.9	29.1	7.5	*
L_4900	SS-1146	20' LT	49+00	6.0 - 7.1'	A-4(3)	30	7	13.1	34.5	26.3	26.1	99.9	92.7	61.9	8.2	*
L_5100	SS-1151	CL	51+00	6.0 - 7.5'	A-4(2)	32	9	21.7	25.8	22.6	29.9	80.9	68.6	48.0	16.8	*
L_5300	SS-1156	5' LT	53+00	8.5 - 10.0'	A-4(1)	32	8	21.5	19.5	24.9	34.1	72.3	60.7	46.3	15.9	*
L_5700	SS-1047	65' LT	57+00	0.0 - 1.5'	A-7-5(19)	58	26	11.6	13.6	26.6	48.2	90.9	84.1	71.2	31.8	*
EB1-A	O-1	20' LT	32+06	0.0 - 0.5'	A-5(3)	87	NP	24.5	17.8	37.3	20.4	79.1	66.8	48.6	138.0	27.3
EB1-A	ST-1	20' LT	32+06	4.0 - 6.0'	A-6(15)	38	14	1.0	6.1	48.8	44.1	100.0	99.6	96.0	27.0	*
L_4550	CBR-1	40' LT	45+50	3.0 - 10.0'	A-6(4)	32	12	21.9	24.6	24.2	29.2	91.8	77.5	54.9	32.8	*

LAB TECHNICIAN: AMANDA ROTH

NCDOT CERTIFICATION NO. 112-09-1003