

REFERENCE: BR-0069

PROJECT: 67069

SEE SHEET 3 FOR PLAN SHEET LAYOUT
AT TIME OF INVESTIGATION

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR-0069	1	23

CONTENTS

LINE	STATION	PLAN	XSC	PROFILE
-L-	12+40.00 to 26+50.00	4	6-17	-
-LDET-	10+40.00 to 23+33.02	4	6-17	5

APPENDICES

APPENDIX	TITLE	SHEETS
A	LABORATORY TESTS RESULTS SUMMARY	18-19
B	SOIL TEST BORING LOG	20-21

ROADWAY SUBSURFACE INVESTIGATION

COUNTY CASWELL
PROJECT DESCRIPTION REPLACE BRIDGE NO. 160001 ON
US 158 OVER COUNTRY LINE CREEK

INVENTORY

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT 1919 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

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P.B. GONZALEZ

Summit Design &

Engineering

INVESTIGATED BY ESP Associates, INC.

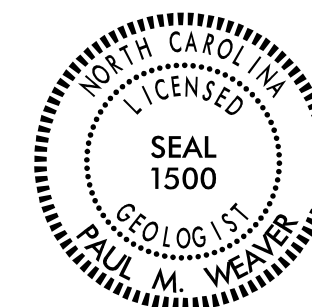
DRAWN BY P.B. GONZALEZ

CHECKED BY P.M. WEAVER

SUBMITTED BY ESP Associates, INC.

DATE June 2022

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DocuSigned by: Paul Weaver 07/21/2022
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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								
	A-1	A-3	A-2	A-2-4	A-2-5	A-2-6	A-2-7	A-4	A-5	A-6	A-7	A-1, A-2	A-3	A-4, A-5	A-6, A-7								
GROUP CLASS.	A-1-a	A-1-b	A-2-4	A-2-5	A-2-6	A-2-7		A-4	A-5	A-6	A-7	A-1, A-2	A-3	A-4, A-5	A-6, A-7								
SYMBOL	[Pattern]							[Pattern]							[Pattern]								
% PASSING #10 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX	51 MN 35 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	36 MN	36 MN										
MATERIAL PASSING #40 LL PI	[Values]							[Values]							[Values]								
GROUP INDEX	[Values]							[Values]							[Values]								
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND		FINE SAND		SILTY OR CLAYEY GRAVEL AND SAND			SILTY SOILS		CLAYEY SOILS			SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER			HIGHLY ORGANIC SOILS							
GEN. RATING AS SUBGRADE	EXCELLENT TO GOOD							FAIR TO POOR							FAIR TO POOR			POOR			UNSATURABLE		

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 RESISTANCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE	< 4 4 TO 10 10 TO 30 30 TO 50 > 50	N/A
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD	< 2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 > 30	< 0.25 0.25 TO 0.5 0.5 TO 1.0 1 TO 2 2 TO 4 > 4

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE OPENING (MM)	4	10	40	60	200	270
	4.76	2.00	0.42	0.25	0.075	0.053
BOULDER (BLDR.)						
COBBLE (COB.)						
GRAVEL (GR.)						
COARSE SAND (CS, SD.)						
FINE SAND (F SD.)						
SILT (SL.)						
CLAY (CL.)						
GRAIN SIZE	305	75	2.0	0.25	0.05	0.005
MM						
IN.	12	3				

SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
LL - LIQUID LIMIT	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
PL - PLASTIC LIMIT	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
OM - OPTIMUM MOISTURE SHRINKAGE LIMIT	- 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-BROWN). 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

	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

DIP & DIP DIRECTION OF ROCK STRUCTURES
 SPT TEST BORING
 AUGER BORING
 CORE BORING
 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 - COARSE 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
 U - UNIT WEIGHT
 UG - DRY UNIT WEIGHT

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
 CME 550X

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

HAMMER TYPE:
 AUTOMATIC MANUAL

CORE SIZE:
 -B -H -N

HAND TOOLS:
 POST HOLE DIGGER
 HAND AUGER
 SOUNDING ROD
 VANE SHEAR TEST

ROCK DESCRIPTION

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

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

NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.
 FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.
 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.
 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 (IV 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 (IV 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 GROUDED 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.
 SOFT CAN BE GROUDED 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 FINGER NAIL.

FRACTURE SPACING

TERM	SPACING	TERM	THICKNESS
VERY WIDE	MORE THAN 10 FEET	VERY THICKLY BEDDED	4 FEET
WIDE	3 TO 10 FEET	THICKLY BEDDED	1.5 - 4 FEET
MODERATELY CLOSE	1 TO 3 FEET	THINLY BEDDED	0.16 - 1.5 FEET
CLOSE	0.16 TO 1 FOOT	VERY THINLY BEDDED	0.03 - 0.16 FEET
VERY CLOSE	LESS THAN 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 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 (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.
 STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.
 STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.
 TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK: TIN FILE "br0069_is.tin" WAS USED TO DETERMINE GROUND ELEVATION FOR ALL BORINGS

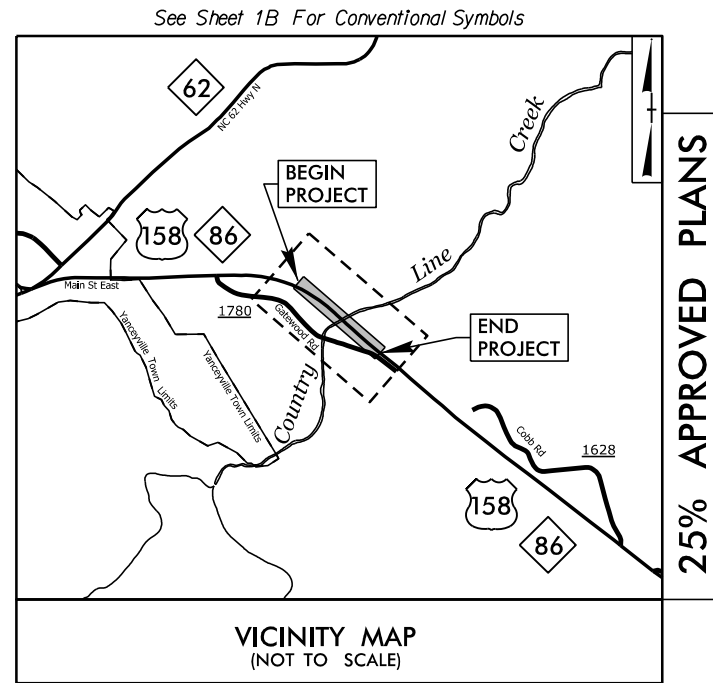
ELEVATION: FEET

NOTES:

F.J.A.D. FILLED IN AFTER DRILLING

6/9/2022 3:10:01PM W:\Projects\2020\NCDOT\2020-2022 On-CallContract\N\I\4\319 (BR-0069 Roadway)\BR0069.GEO_RDWY\CADD_GEO\TECH\PlanProf\BR-0069_r_dy_tsh.dgn
 09/08/99

CONTRACT: BR-0069



25% APPROVED PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

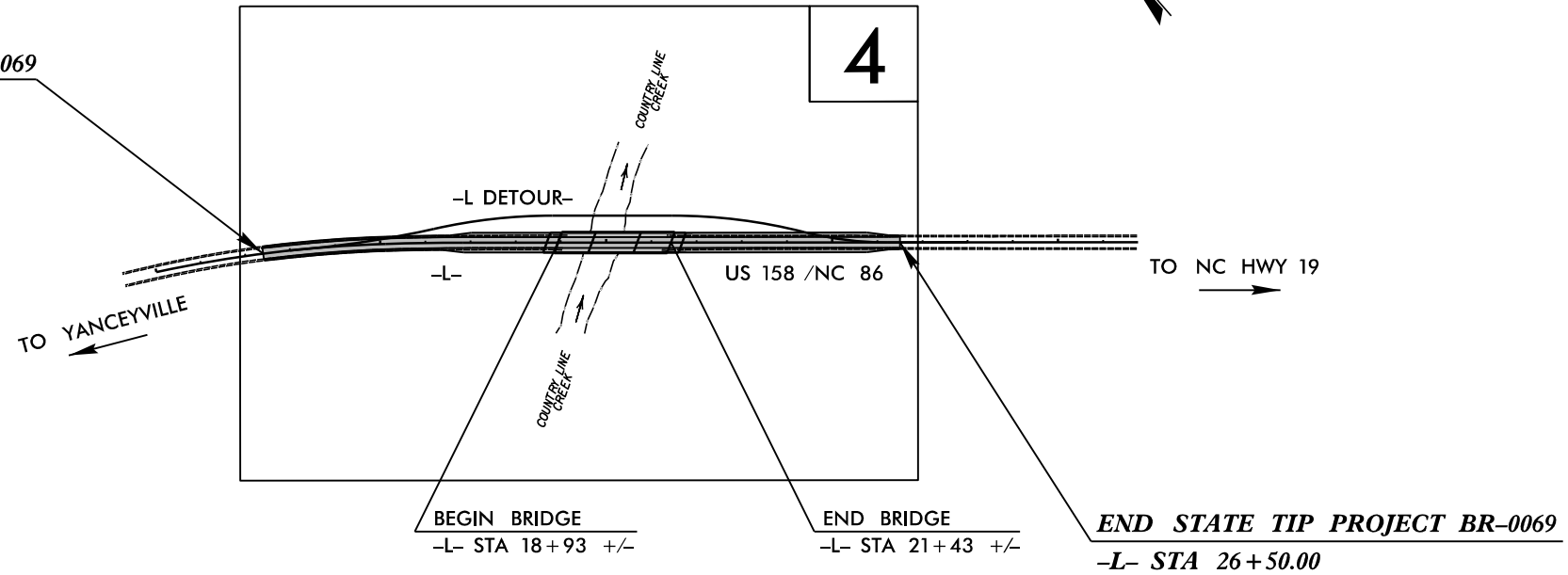
CASWELL COUNTY

**LOCATION: BRIDGE NO. 160001 OVER COUNTRY LINE CREEK ON
US 158 / NC 86**

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR-0069	3	23
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
67069.1.1	N/A	PE	

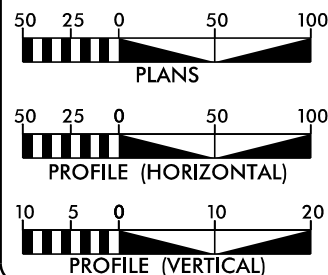
BEGIN STATE TIP PROJECT BR-0069
-L- STA 12+40.00



THIS IS CONTROLLED OF ACCESS PROJECT.
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

GRAPHIC SCALES



DESIGN DATA

ADT 2023 = 8,525
 ADT 2043 = 10,025
 K = TBD %
 D = TBD %
 T = 10 % *
 V = 60 MPH
 * TTST = 6% DUAL 4%
 FUNC CLASS =
 PRINCIPAL RURAL ARTERIAL
 -REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT BR-0069 = 0.220
 LENGTH STRUCTURE TIP PROJECT BR-0069 = 0.047
 TOTAL LENGTH TIP PROJECT BR-0069 = 0.267

Prepared for NCDOT In the Office of:

moffatt & nichol
4700 FALLS OF NEUSE ROAD, SUITE 300
RALEIGH, NORTH CAROLINA 27609
919.781-4655 VOICE 919.781-4869 FAX
NC License NO.: F-0105

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MAY 2, 2022

LETTING DATE:
APRIL 18, 2023

TRENT HUFFMAN, P.E.
PROJECT ENGINEER

GRAY MODLIN, P.E.
PROJECT DESIGN ENGINEER

DAVID STUTTS, P.E.
NCDOT CONTACT

HYDRAULICS ENGINEER

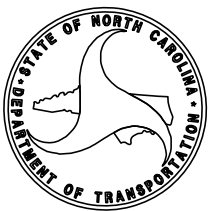
moffatt & nichol

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

moffatt & nichol

SIGNATURE: _____ P.E.



June 9, 2022

STATE PROJECT NO.: 67069.1.1
 TIP: BR-0069
 COUNTY: Caswell
 DESCRIPTION: Replace Bridge 160001 on US 158 over Country Line Creek
 SUBJECT: Geotechnical Report – Roadway Inventory

Project Description

This proposed project is located on the east side of Yanceyville, North Carolina. The project begins at -L- (US 158) Station 12+40.00 and continues to -L-Station 26+50.00. The total length of the project is 0.267 miles. The existing -L- within the project corridor is generally a two-lane road. The project area is undeveloped.

The proposed project construction consists of the following:

- The replacement of the existing bridge on the -L- alignment over Country Line Creek
- The construction of a detour roadway (-LDET-) on the north side of the existing -L- alignment
- The construction of an approximately 170-foot-long detour bridge on the north side of the existing -L- alignment between approximately -LDET- Stations 16+25 and 17+95
- Widening of -L-

The proposed maximum new embankment fill heights are approximately 20 feet. The maximum cuts proposed for the project are approximately 22 feet.

The drainage along the project is generally handled by side ditches.

This geotechnical investigation was confined to the areas of proposed construction.

Initial site scoping was performed on April 20, 2022. The field investigation was performed from April 28, 2022 to May 2, 2022. Standard Penetration Test borings were advanced with a CME 550X drilling machine equipped with an automatic hammer. Three borings were performed via hand auger with Dynamic Cone Penetrometer (DCP) testing due to inaccessibility to machine drilling equipment. Representative soil samples were collected for visual classification in the field and for laboratory analyses.

The following alignments were investigated. Subsurface cross sections of the -L- alignment (which also show the -LDET- alignment), as well as a subsurface profile for -LDET-, are included in this report:

Alignment	Station (±)
-L-	12+40.00 to 26+50.00
-LDET-	10+40.00 to 23+33.02

Physiography and Geography

The project corridor is located in the Milton Belt of the Piedmont physiographic province. “The Milton Belt is characterized by strongly foliated gneiss and schist, commonly with compositional layering and having felsic

composition; quartzite, calc-silicate gneiss, and marble are minor units” (*The Geology of the Carolinas*, Horton and Zullo, 1991). Gneiss and schist of the Milton belt may overlies mafic intrusive rocks of the Charlotte Belt along part of the boundary with the Charlotte Belt. Sillimanite and kyanite zones of regional metamorphism comprise the majority of the Milton Belt and the eastern boundary with the Carolina Slate Belt is a lithologic discontinuity with locally sheared rocks indicating that the boundary may be a fault zone. Existing evidence suggest that the rocks of the Milton Belt are mainly Precambrian in age with metamorphosis and deformation occurring during the early to middle Paleozoic. According to the Geologic Map of North Carolina, 1985, the rock underlying the project corridor consists of biotite gneiss and schist which is inequigranular and magacrystic with abundant potassic feldspar and garnet, and that it is interlayered and gradational with calc-silicate rock, sillimanite-mica schist, mica schist, and amphibolite with small masses of granitic rock. The weathered rock encountered in some of the soil test borings performed for the project indicates that the underlying rock at the project site is biotite gneiss.

The topography along the project corridor generally consists of rolling hills. The roadways along US 158 (-L-) and along the proposed -LDET- slope down from each end of the project to the bridge over Country Line Creek with elevations ranging from approximately 460 feet (MSL) to approximately 405 feet (MSL) at the bottom of the creek. The project grading work west of Country Line Creek will primarily consist of cut while the grading work east of the creek will primarily consist of fill.

Soil Properties

Soils encountered within this project area have been divided into four categories: roadway embankment, alluvial soils, residual soils, and weathered rock.

Alluvial material is present outside of the existing roadway embankment on the east side of the existing bridge over Country Line Creek (the existing embankment was constructed within the Country Line Creek floodplain). The alluvium ranges in thickness from less than 1 foot to approximately 2 feet. The alluvial materials encountered consist of soft to medium stiff sandy silt (A-4), and of very loose silty sand (A-2-4).

Roadway embankment is present on the east side of Country Line Creek. The roadway embankment ranges in thickness from approximately 8 feet to 19 feet and consist of very stiff silty clay (A-7-5), and of loose to dense sand and gravel (A-1-b) and silty sand (A-2-4).

Residual soils were encountered in all the borings drilled for this project. The residual soils consist of very loose to very dense silty sand (A-2-4) and of medium stiff to hard sandy silt (A-4) and silty clay (A-7-6). Plasticities within the cohesive residual soils range from non-plastic to moderately plastic with laboratory plasticity index results ranging from 3 to 16.

Weathered rock classified as Biotite Gneiss was encountered underlying the residual soils within the depths explored in 7 of the borings drilled as part of this investigation. The top of the weathered rock was encountered at depths ranging from 4.0 feet to 24.0 feet below the existing ground surface and at elevations ranging from 468.0 feet to 443.6 feet above sea level.

Rock Properties

Crystalline rock classified as Biotite Gneiss with Granitic Rock was encountered underlying the weathered rock in 6 borings drilled as part of this investigation. The depth to the top of the crystalline rock ranged from 6.0 feet to 23.1 feet and at elevations ranging from 466.0 feet to 444.4 feet above sea level. The crystalline rock was visible in areas of existing cut on the left side of the existing roadway west of Country Line Creek and was

encountered at depths within the borings that will affect project roadway construction based on the 25 percent project plans.

Groundwater Properties

Groundwater data was collected in April and May 2022. Groundwater was not encountered in the borings drilled on the west side of Country Line Creek but was encountered in the borings on the east side of Country Line Creek. Water depths at the time of drilling was recorded in all of the borings but a 24-hour water reading was only obtainable in one boring (LDET_1800). The groundwater depths ranged from approximately 4 feet to 16 feet below the existing ground surface which corresponds with groundwater elevations ranging from approximately 413 to 408 feet above sea level. Groundwater was not encountered within 6 feet of the proposed grade in any boring.

Areas of Special Geotechnical Interest

- 1) The following areas contains loose sands or soft cohesive material at the base of proposed embankments which have the potential to cause embankment, subgrade, and/or slope stability problems during construction:

Alignment	STA (±) to STA (±)	Offset (±)
-LDET-	17+50 to 22+25	20' left to 120'+ left
-L-	22+25 to 23+25	50' right to 70'+ right

- 2) The following area contains wet to saturated soils at the base of proposed embankments which have the potential to cause embankment, subgrade, and/or slope stability problems during construction:

Alignment	STA (±) to STA (±)	Offset (±)
-LDET-	17+50 to 22+25	20' left to 120'+ left

- 3) The following areas contain rock above or within 6 feet of the proposed grade:

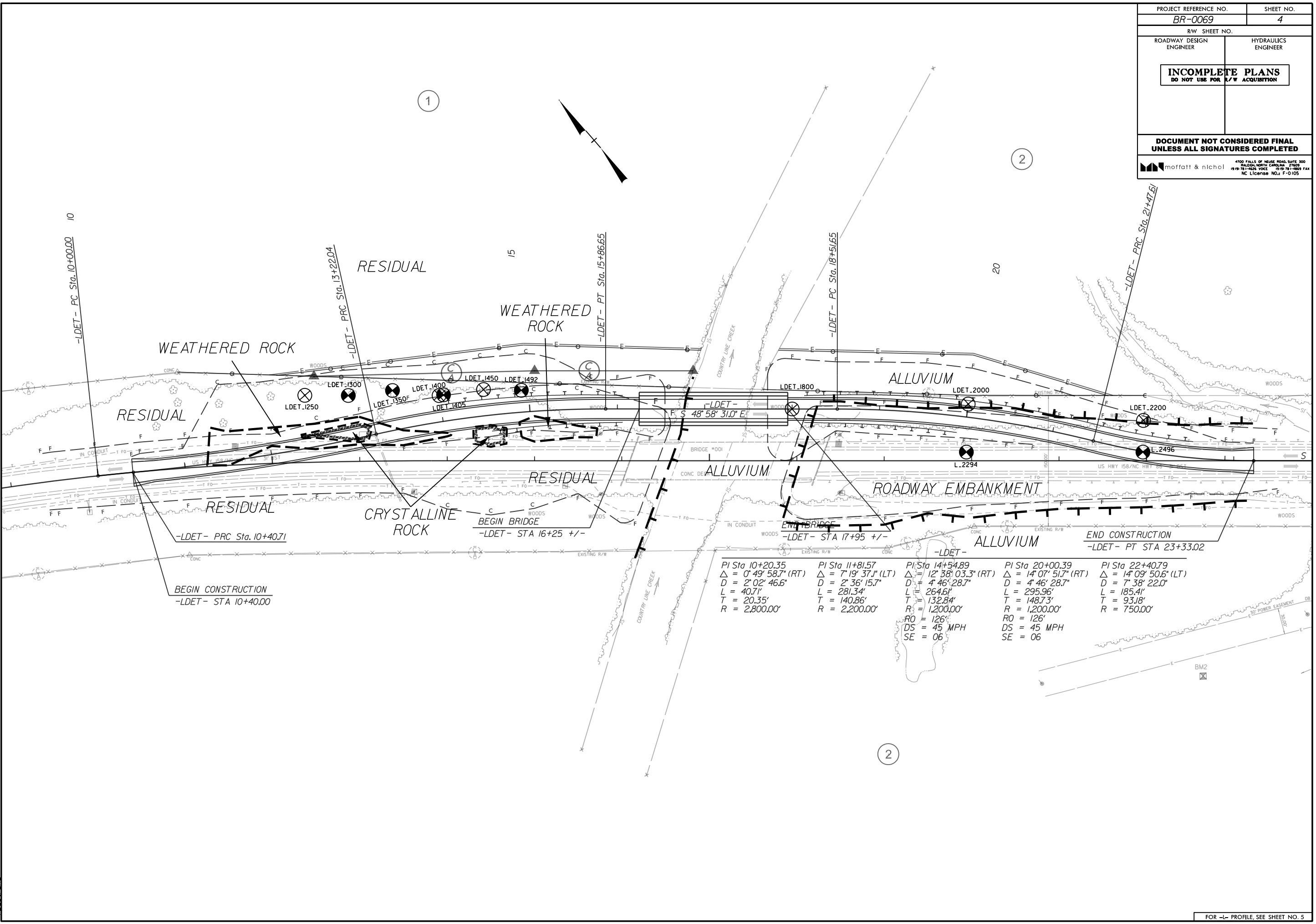
Alignment	STA (±) to STA (±)	Offset (±)
-LDET-	10+40 to 16+25	Across extents of construction
-L-	12+40 to 19+25	Across extents of construction

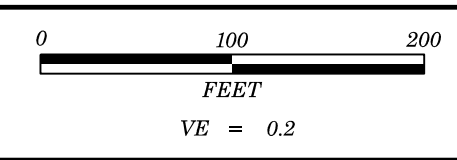
Water Wells

No water wells were identified within or adjacent to the proposed right-of-way on the plans provided to ESP or by ESP personnel in the field.

PROJECT REFERENCE NO. BR-0069	SHEET NO. 4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
<small>4700 FALLS OF NEUSE ROAD, SUITE 200 RALEIGH, NORTH CAROLINA 27609 919.781.4624 VOICE 919.781.4624 FAX NC License No. F-0105</small>	

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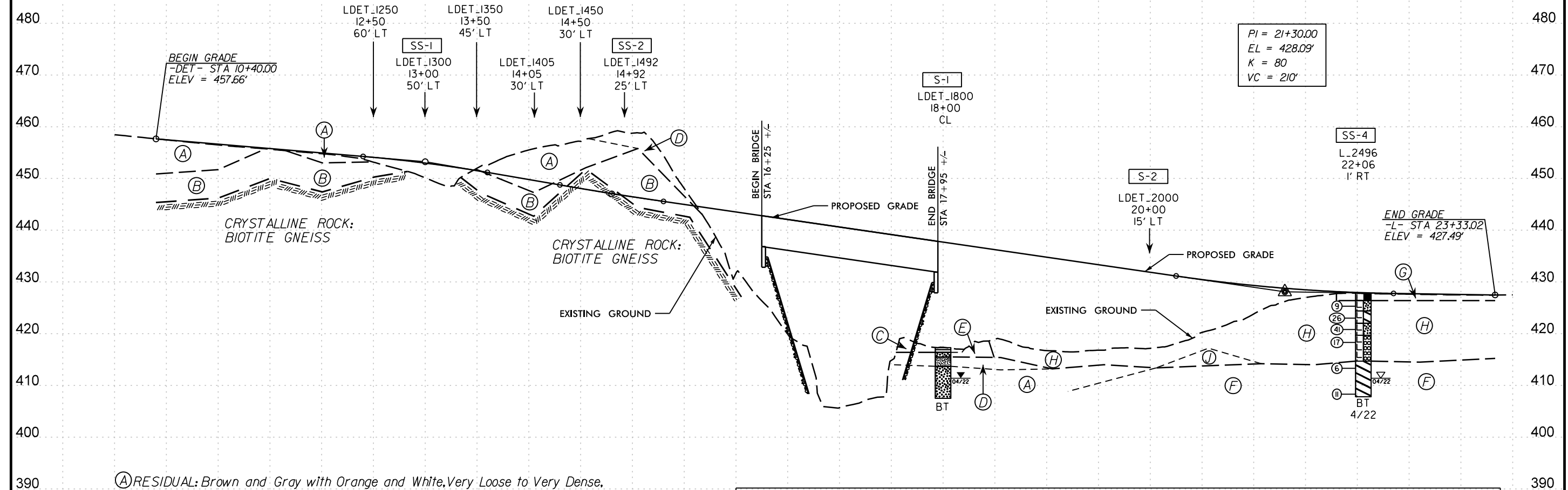


PROJECT REFERENCE NO.	SHEET NO.
BR-0069	5
PROFILE ALONG -LDET-	

PI = 13+00.00
 EL = 453.24'
 K = 69
 VC = 120'

PI = 14+80.00
 EL = 447.03'
 K = 186
 VC = 100'

NOTE: SOME BORINGS, DESIGNATED BY THE ARROW BELOW BORING DESIGNATIONS, FOR CLARITY ARE NOT SHOWN ON PROFILE DUE TO OFFSET FROM -LDET- CL. SEE CROSS SECTIONS FOR DETAILS.



- (A) RESIDUAL: Brown and Gray with Orange and White, Very Loose to Very Dense, Silty Coarse to Fine SAND (A-2-4), Trace Mica, Moist to Saturated
- (B) WEATHERED ROCK: BIOTITE GNEISS
- (C) ALLUVIAL: Brown, Soft to Medium Stiff, Fine Sandy SILT (A-4), Moderately Organic, Moist
- (D) RESIDUAL: Brown with Orange, Stiff to Hard, Fine Sandy SILT (A-4), Moist to Wet
- (E) ALLUVIAL: Brown with Orange, Very Loose to Loose, Silty Coarse to Fine SAND (A-2-4), Moist
- (F) RESIDUAL: Brown and Orange with Gray, Medium Stiff to Hard, Silty CLAY (A-7-6), Moist to Wet
- (G) ROADWAY EMBANKMENT: Existing PAVEMENT STRUCTURE
- (H) ROADWAY EMBANKMENT: Orange, Brown, and White with Gray, Medium Dense, Silty Coarse to Fine SAND and GRAVEL (A-1-b and A-2-4), with a Layer of Orange, Very Stiff, Silty CLAY (A-7-5), Moist
- (J) ROADWAY EMBANKMENT: Dark Gray, Medium Stiff to Stiff, Coarse to Fine Sandy SILT (A-4), Moist

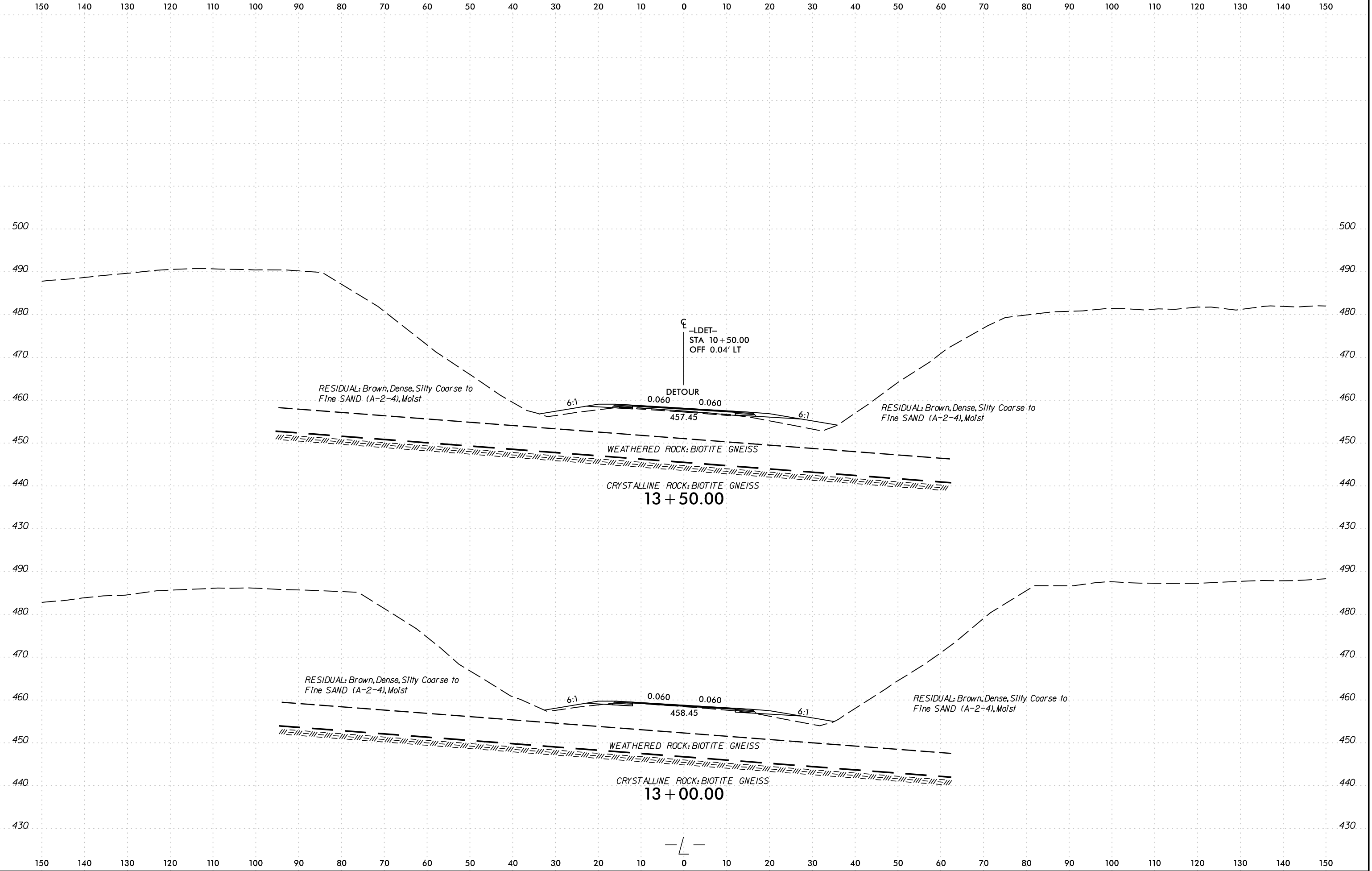
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							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-1	50' LT	13+00	1.0-2.5	A-2-4(0)	NP	NP	31	46	20	3	100	81	31	6.5	-
SS-2	25' LT	14+92	3.5-5.0	A-4(0)	21	3	20	48	19	13	99	90	40	6.3	-
S-1	CL	18+00	1.8-3.6	A-4(5)	28	6	3	12	44	41	99	98	88	19.0	-
S-2	15' LT	20+00	2.2-4.0	A-7-6(12)	43	16	1	47	26	26	100	100	73	33.5	-
SS-4	10' LT	24+96	8.5-10.0	A-1-b(0)	NP	NP	43	36	12	9	49	34	14	-	-

* NOTE: STATION AND OFFSET FOR SS-4 REFER TO -L- ALIGNMENT

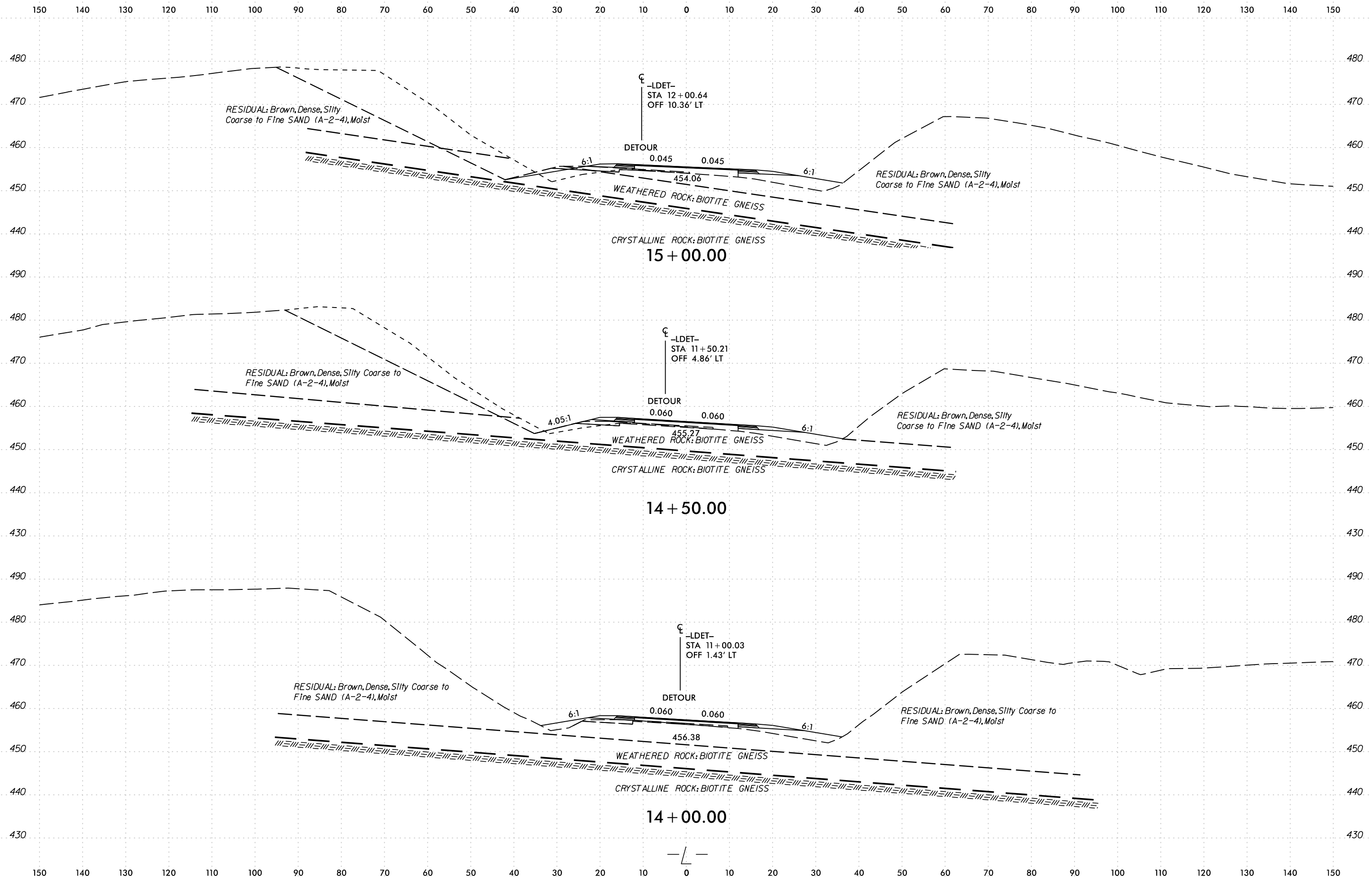
-LDET-

- PROFILE TAKEN FROM "BR-0069_rdy_pro.dgn" FILE PROVIDED BY NCDOT ON 04/19/22

10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00 20+00 21+00 22+00 23+00

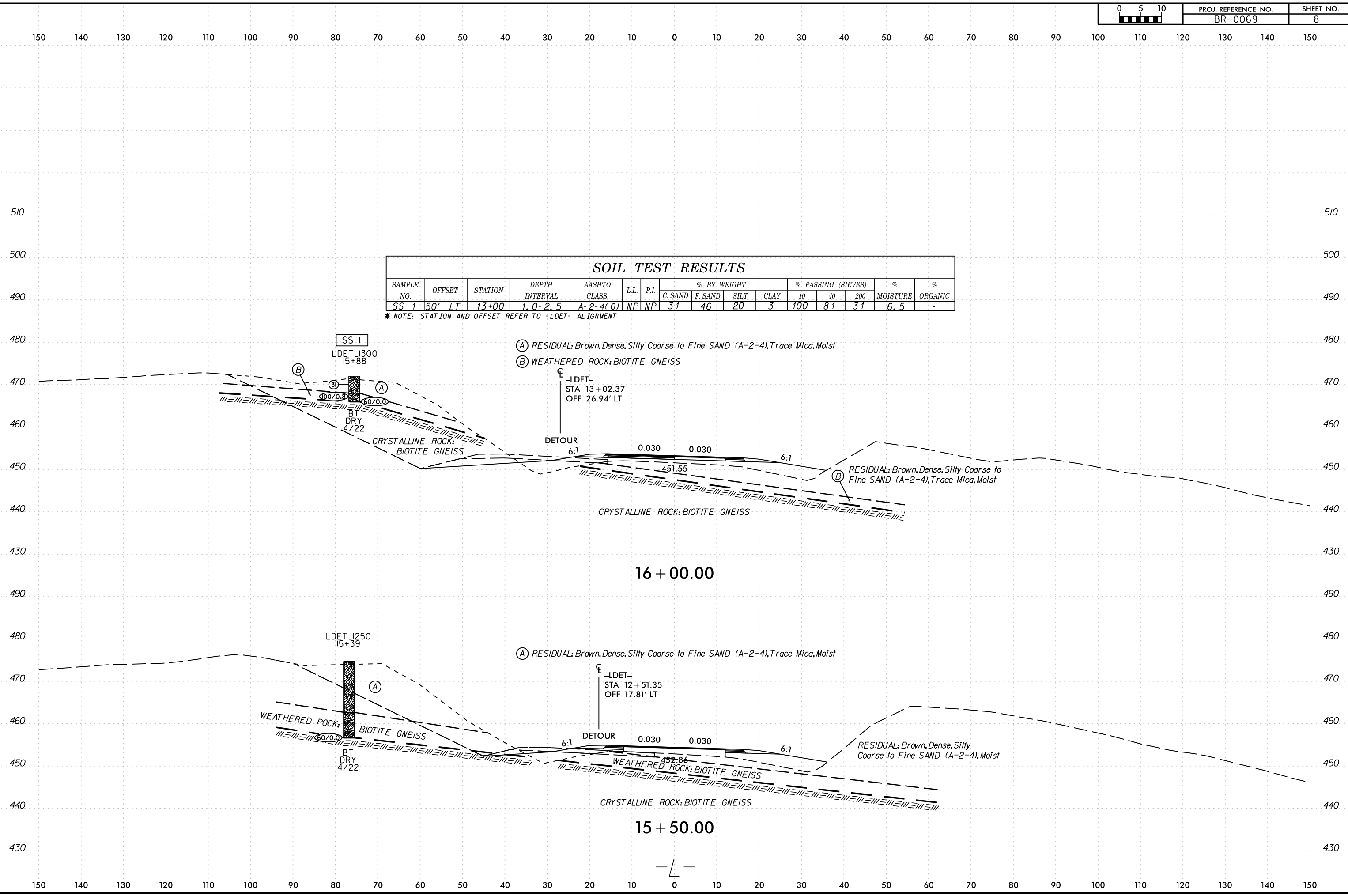


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SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-1	50' LT	13+00	1.0-2.5	A-2-4(0)	NP	NP	31	46	20	3	100	81	31	6.5	-

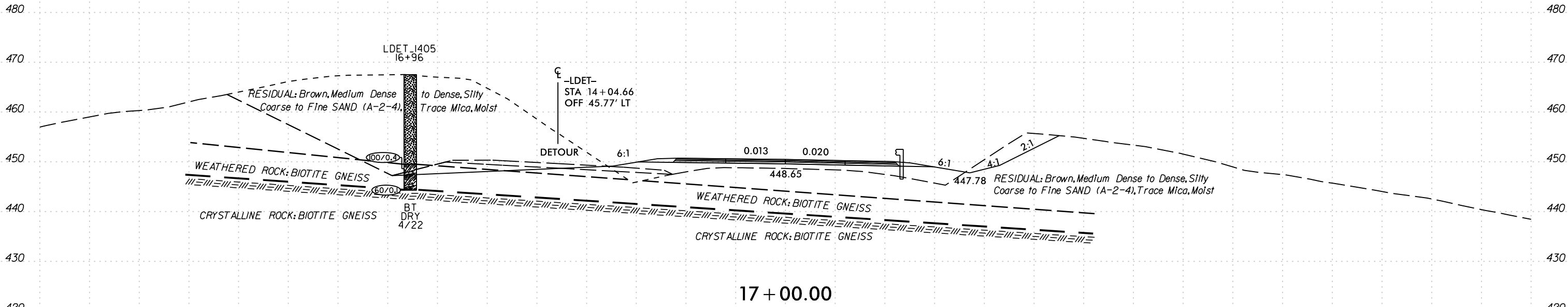
* NOTE: STATION AND OFFSET REFER TO LDET ALIGNMENT

- (A) RESIDUAL: Brown, Dense, Silty Coarse to Fine SAND (A-2-4), Trace Mica, Moist
- (B) WEATHERED ROCK: BIOTITE GNEISS

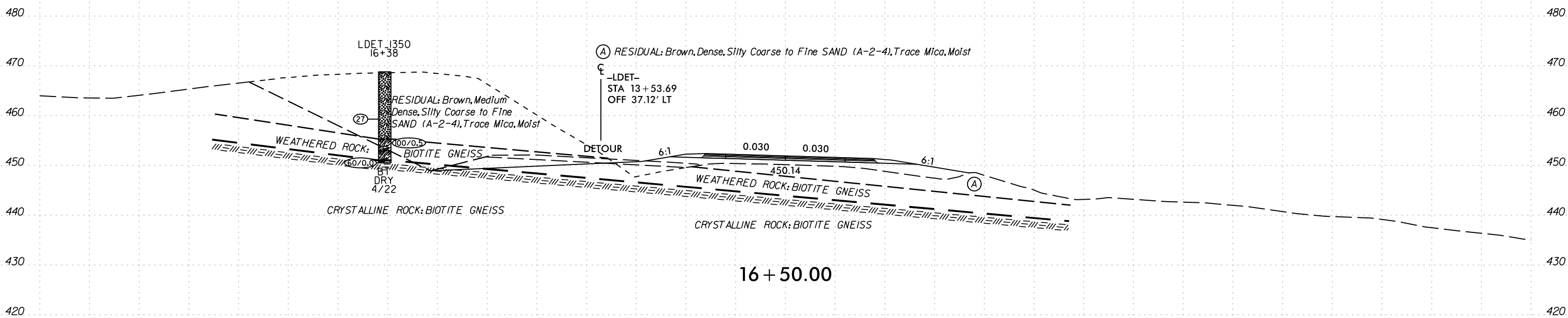
- (A) RESIDUAL: Brown, Dense, Silty Coarse to Fine SAND (A-2-4), Trace Mica, Moist



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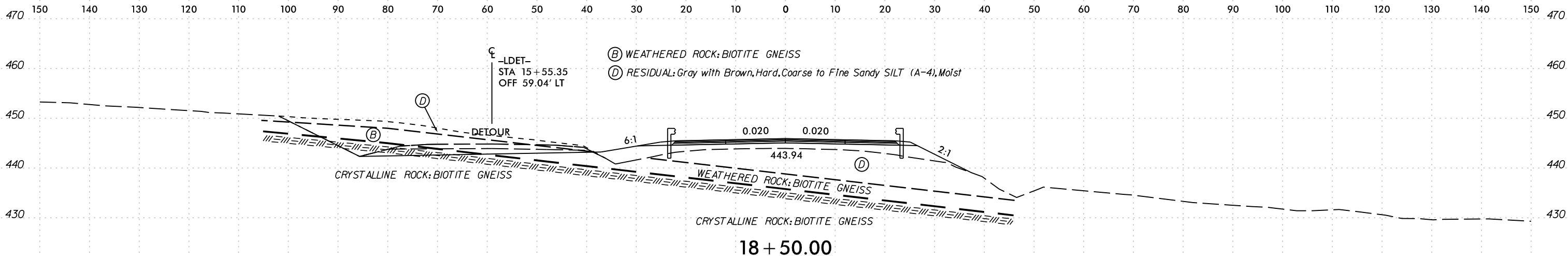


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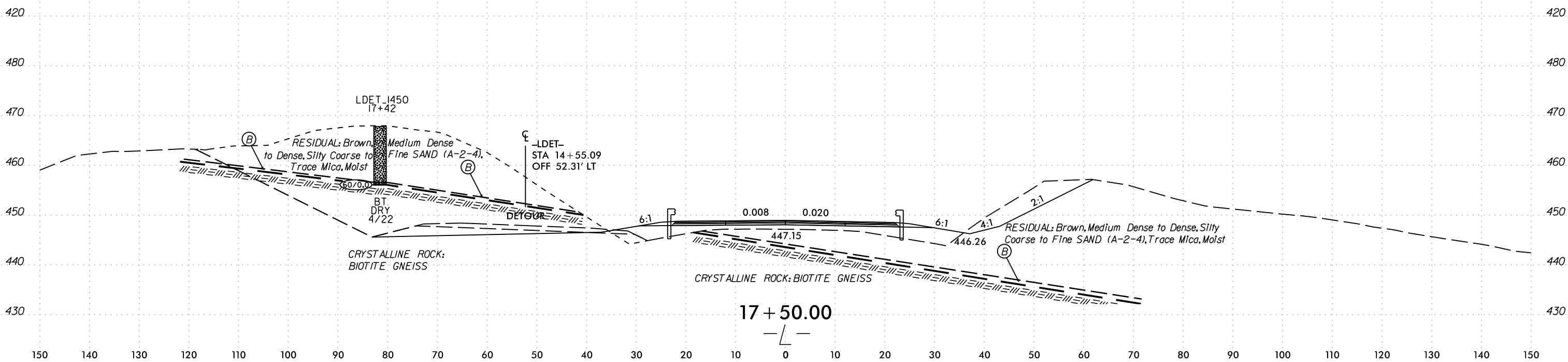
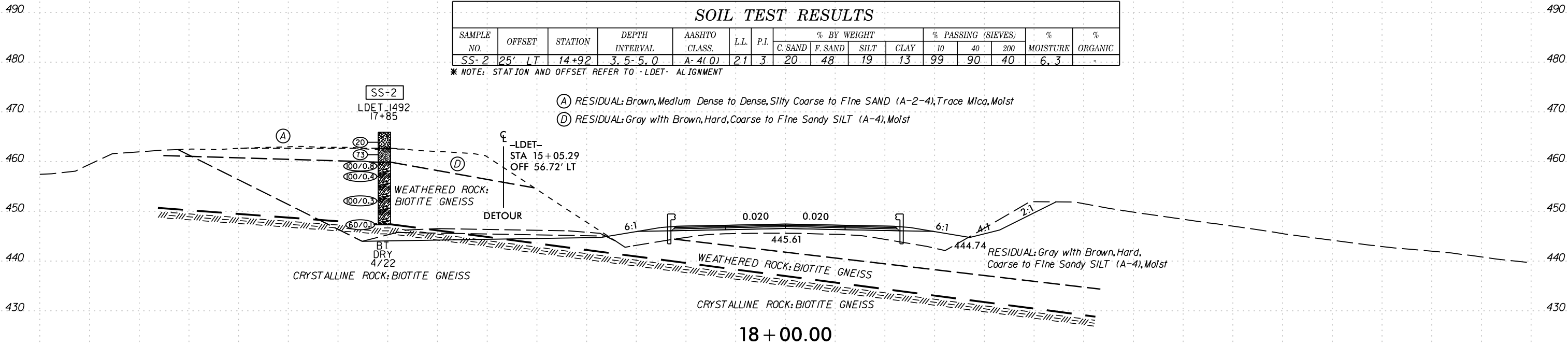
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SOIL TEST RESULTS																
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							C. SAND	F. SAND	SILT	CLAY	10	40	200			
SS-2	25' LT	14+92	3.5-5.0	A-4(0)	21	3	20	48	19	13	99	90	40	6.3	-	

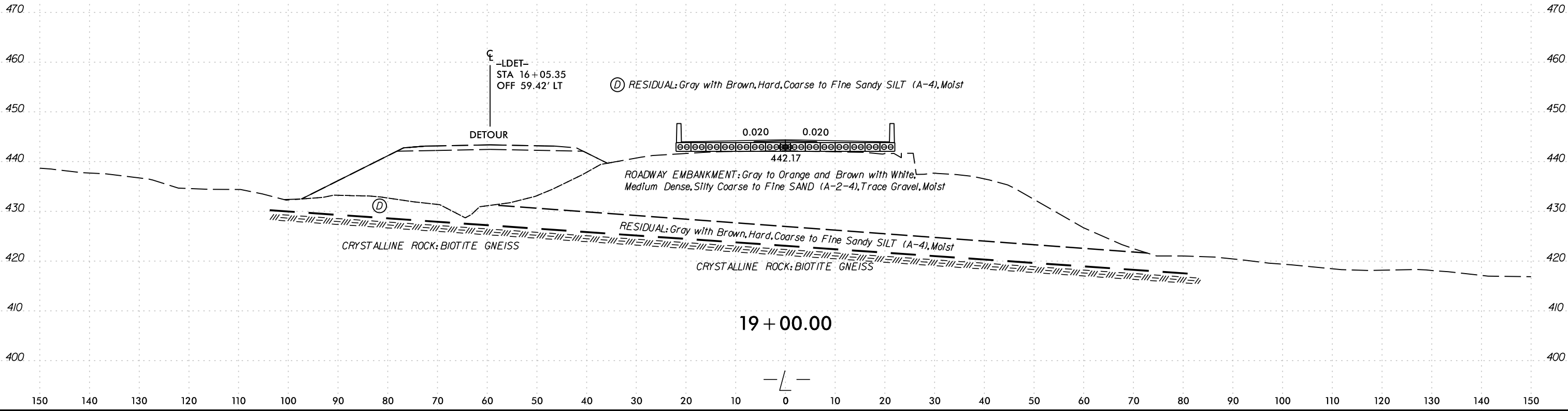
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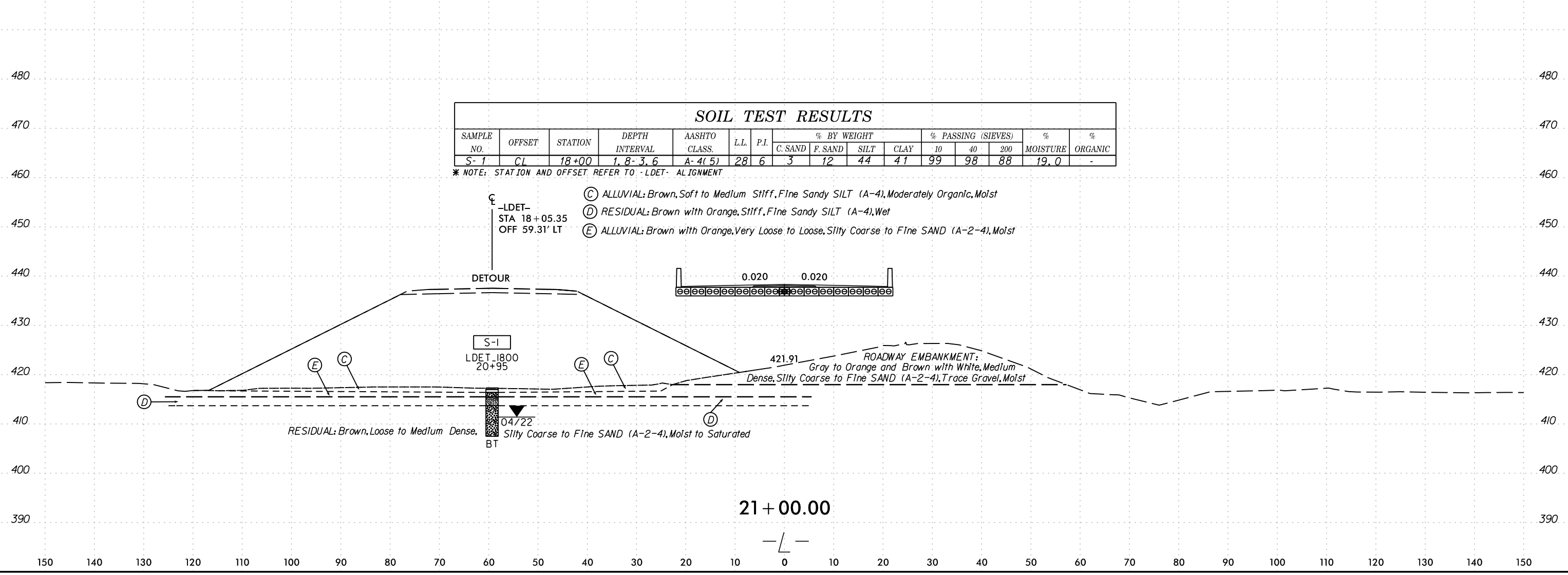
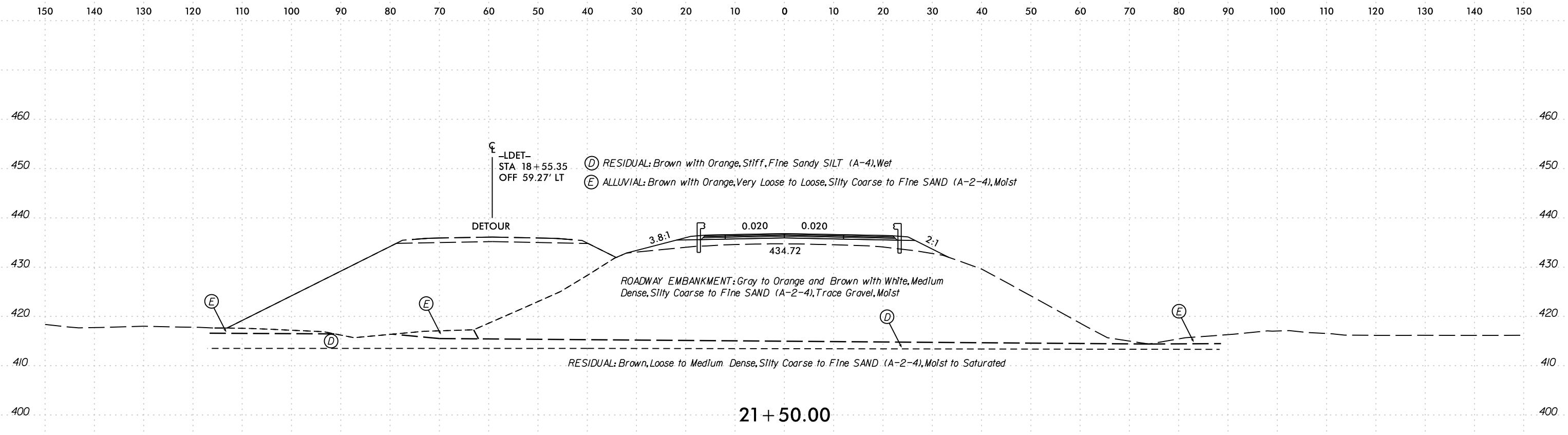
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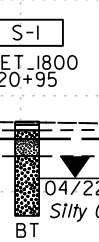


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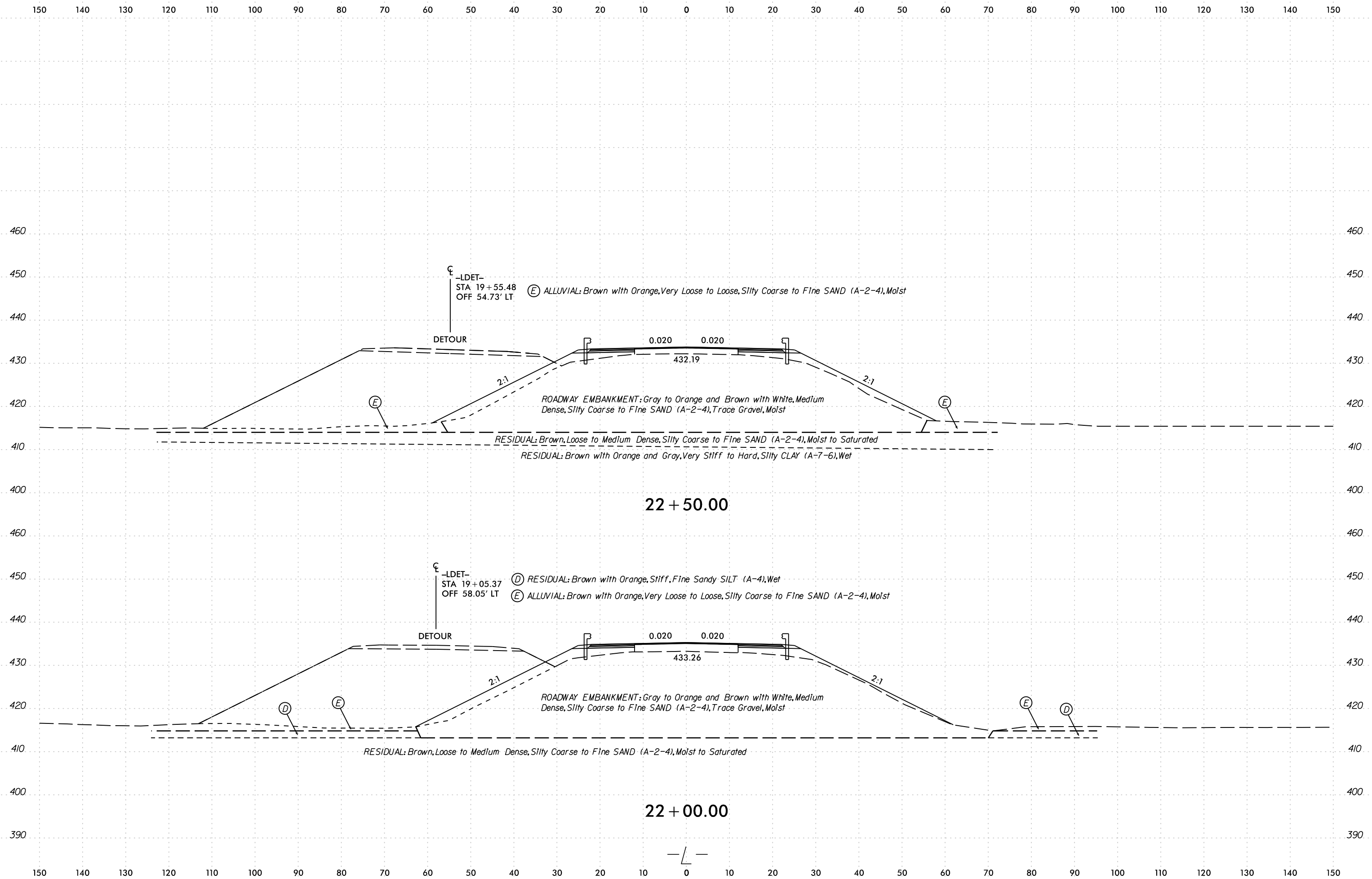


SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-1	CL	18+00	1.8-3.6	A-4(5)	28	6	3	12	44	41	99	98	88	19.0	-

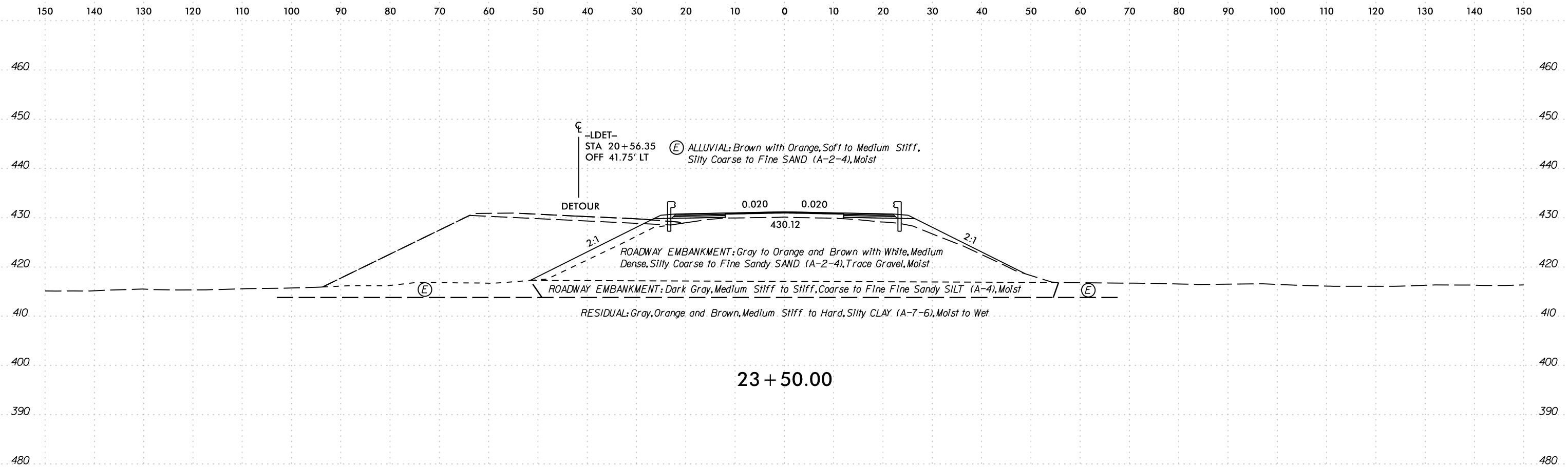
* NOTE: STATION AND OFFSET REFER TO -LDET- ALIGNMENT



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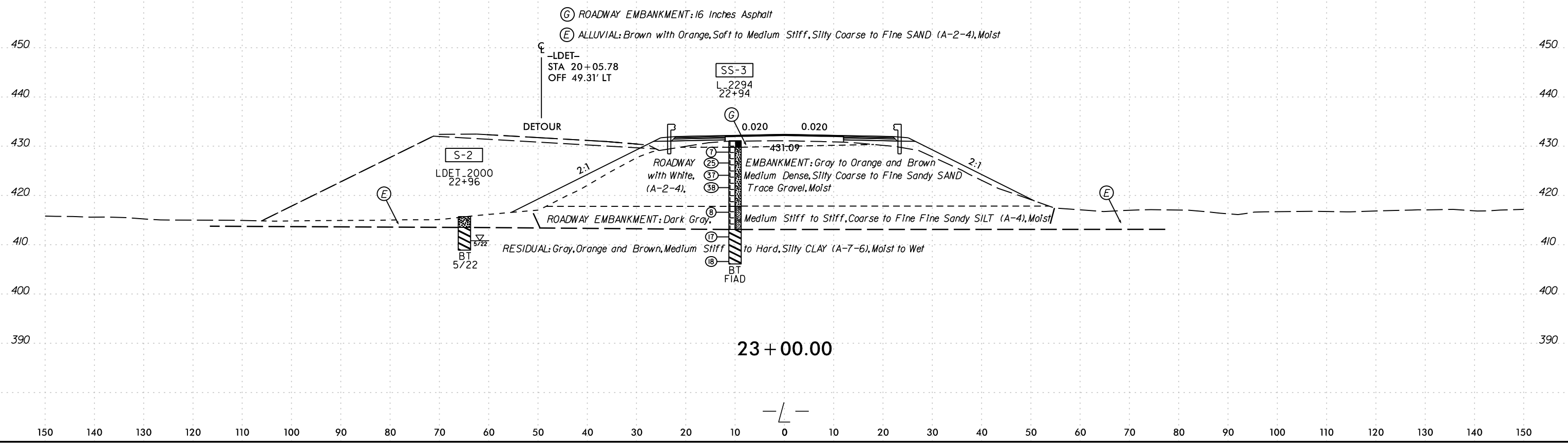
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23 + 50.00

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-2	15' LT	20+00	2.2-4.0	A-7-6(12)	43	16	1	47	26	26	100	100	7.3	33.5	-
SS-3	10' LT	22+94	6.0-7.5	A-2-4(0)	NP	NP	24	49	17	10	95	83	35	8.8	-

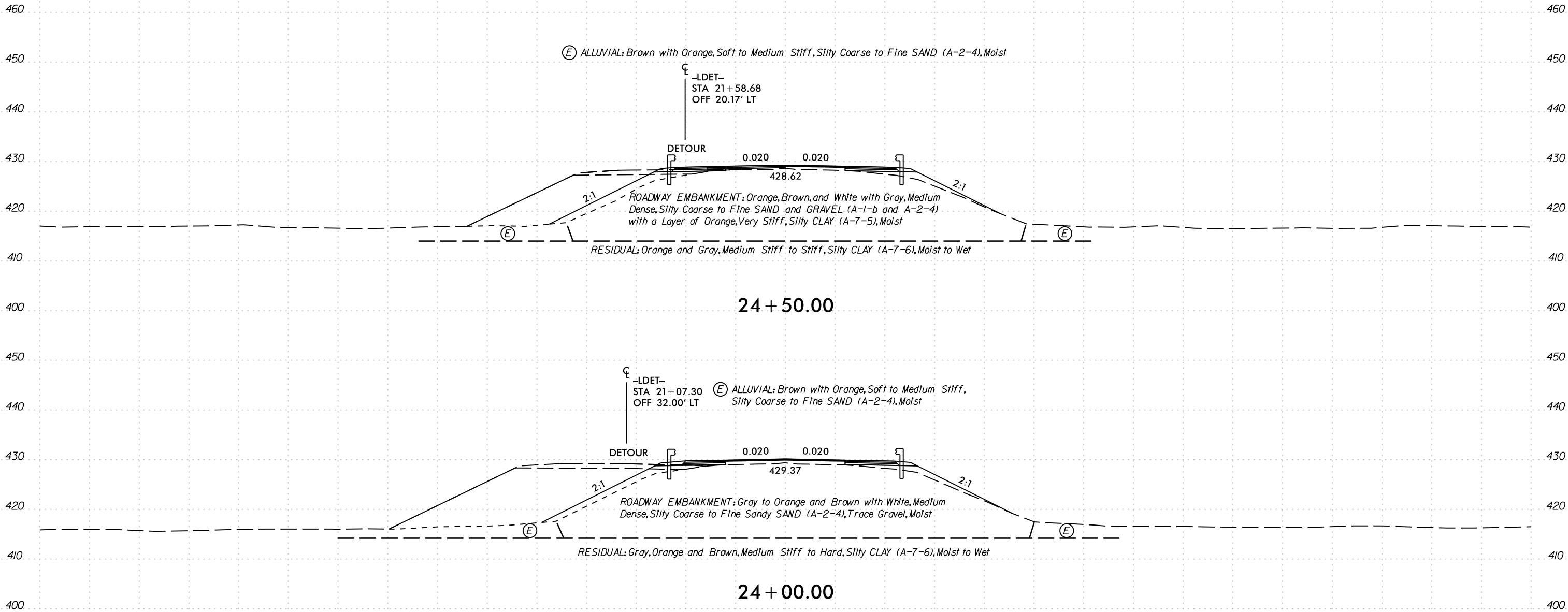
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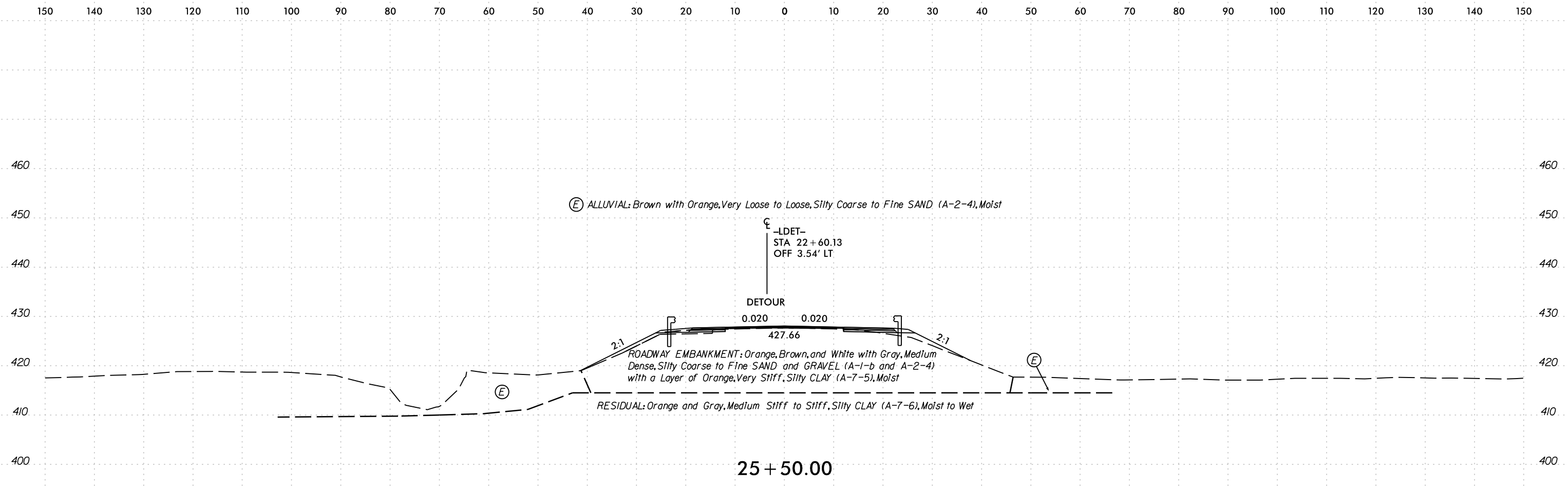


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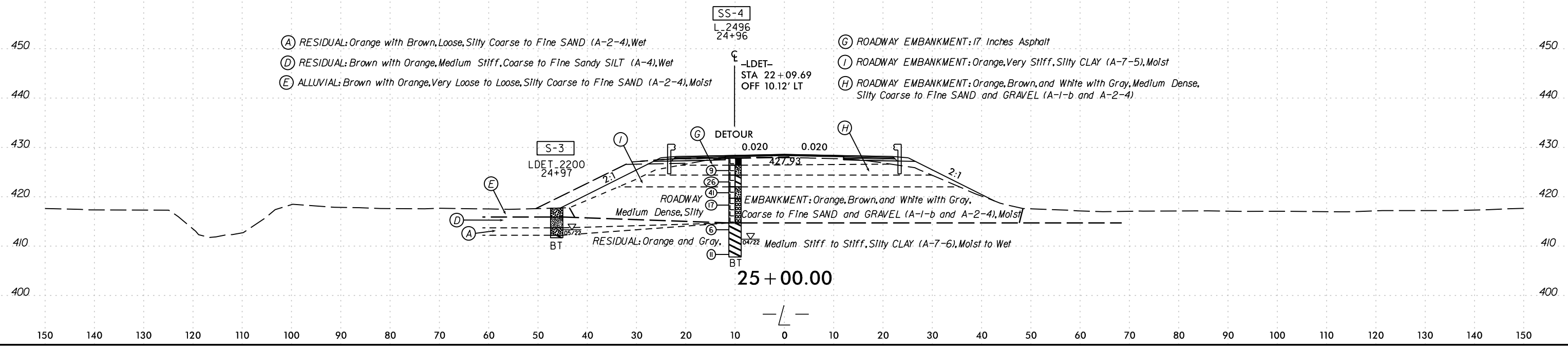




SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	#10	#40	#200		
S-3	35' LT	22+00	1.8-4.0	A-4(1)	30	4	10	42	23	25	100	95	57	32.6	-
SS-4	10' LT	24+96	8.5-10.0	A-1-b(0)	NP	NP	43	36	12	9	49	49	14	-	-

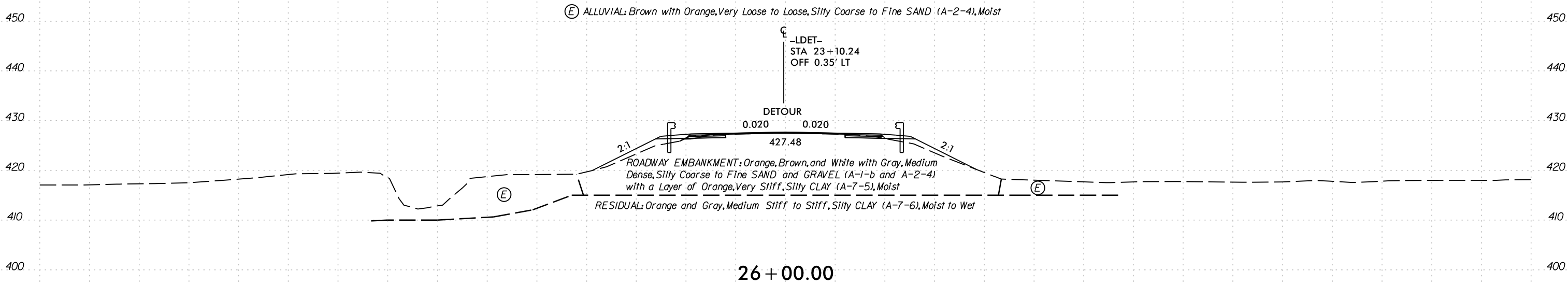
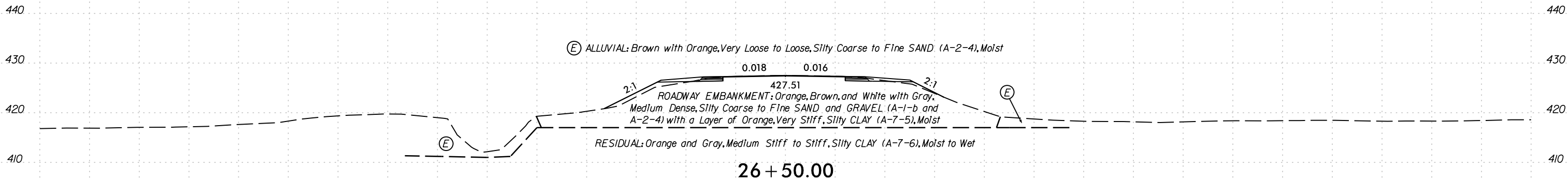
* NOTE: STATION AND OFFSET FOR S-3 REFER TO -LDET- ALIGNMENT



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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

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

REFERENCE: BR-0069

PROJECT: 67069

SOILS LABORATORY TESTS RESULTS

WBS NO.: 67069.1.1


TIP NO.: BR-0069

COUNTY: Caswell

SITE DESCRIPTION: Replace Bridge No. 160001 on US 158 Over Country Line Creek

BORING NO.	SAMPLE NO.	BORING LOCATION	DEPTH INTERVAL (FT)	AASHTO CLASS	N	L.L	P.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
								CSE. SAND	F. SAND	SILT	CLAY	10	40	200		
LDET_1300	SS-1	-LDET- STA. 13+00, 50' LT	1.0-2.5	A-2-4 (0)	31	NP	NP	31	46	20	3	100	81	31	6.5	-
LDET_1492	SS-2	-LDET- STA. 14+92, 25' LT	3.5-5.0	A-4 (0)	73	21	3	20	48	19	13	99	90	40	6.3	-
LDET_1800	S-1	-LDET- STA. 18+00, CL	1.8-3.6	A-4 (5)	*13	28	6	3	12	44	41	99	98	88	19.0	-
LDET_2000	S-2	-LDET- STA. 20+00, 15' LT	2.2-4.0	A-7-6 (12)	*5	43	16	1	47	26	26	100	100	73	33.5	-
L_2294	SS-3	-L- STA. 22+94, 10' LT	6.0-7.5	A-2-4 (0)	37	NP	NP	24	49	17	10	95	83	35	8.8	-
LDET_2200	S-3	-LDET- STA. 22+00, 35' LT	1.8-4.0	A-4 (1)	*6	30	4	10	42	23	25	100	95	57	32.6	-
L_2496	SS-4	-L- STA. 24+96, 10' LT	8.5-10.0	A-1-b (0)	17	NP	NP	43	36	12	9	49	34	14	-	-

*Note: Inferred N-Value from DCP



 Certification No. 144-02-0718

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
APPENDIX B
SOIL TEST BORING LOG

REFERENCE: BR-0069

PROJECT: 67069

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 67069.1.1		TIP BR-0069		COUNTY CASWELL		GEOLOGIST Gonzales, P.B.										
SITE DESCRIPTION Replace Bridge 160001 on US 158 over Country Line Creek							GROUND WTR (ft)									
BORING NO. LDET_1400		STATION 14+00		OFFSET 30 ft LT		ALIGNMENT -LDET-										
COLLAR ELEV. 467.6 ft		TOTAL DEPTH 30.0 ft		NORTHING 966,492		EASTING 1,912,164										
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/2/2021				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Moseley, M.		START DATE 04/29/22		COMP. DATE 04/29/22		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			ELEV. (ft)	DEPTH (ft)		
470														467.6	0.0	GROUND SURFACE
465																RESIDUAL Brown, Medium Dense to Dense, Silty Coarse to Fine SAND, Trace Mica, Moist
460																
455																
450																
445																
440														443.6	24.0	
														437.6	30.0	Boring Terminated at Elevation 437.6 ft in Weathered Rock: BIOTITE GNEISS

NCDOT BORE DOUBLE BR0069 GEO_RDWY_GINTLOGS.GPJ NC_DOT.GDT 5/16/22