PROJECT: 32572 REFERENCE: A-0009CE

SEE SHEET 3 FOR PLAN SHEET LAYOUT AT TIME OF INVESTIGATION

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LINE	STATION	PLAN	PROFILE
-Y2-	98+85.00 TO 132+35.00	4-6	N/A

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

ROADWAY SUBSURFACE INVESTIGATION

COUNTY *GRAHAM*

PROJECT DESCRIPTION *MULTI-USE PATH ALONG NC 28 FROM SR 1238 (BILL CRISP RD) TO SR 1230 (HYDE TOWN RD)*

INVENTORY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	A-0009CE	1	52

CAUTION NOTICE

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

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

NOTES:
1. THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT.
2. BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

FIELD PERSONNEL

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GEL SOLUTIONS

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DATE *MAY 2024*

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SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
A-0009CE	2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE,
VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5, A-7-6			
SYMBOL														
% PASSING #10 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX	51 MN 10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
MATERIAL PASSING #40 LL PI	— 6 MX		— NP	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
GROUP INDEX	0		0	0		4 MX		8 MX	12 MX	16 MX	NO MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND		FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS				
GEN. RATING AS SUBGRADE	EXCELLENT TO GOOD							FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE

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

CONSISTENCY OR DENSENESS

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

TEXTURE OR GRAIN SIZE

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

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

GRAIN SIZE	MM	305	75	2.0	0.25	0.05	0.005
	IN.	12	3				

SOIL MOISTURE-CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
LL — LIQUID LIMIT		
PLASTIC RANGE (PI)	- WET-(W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
PL — PLASTIC LIMIT		
OM — OPTIMUM MOISTURE SL — SHRINKAGE LIMIT	- MOIST-(M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
	- DRY-(D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE

PLASTICITY

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

COLOR

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

GRADATION

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

ANGULARITY OF GRAINS

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

MINERALOGICAL COMPOSITION

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

COMPRESSIBILITY

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

PERCENTAGE OF MATERIAL

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

GROUND WATER

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

MISCELLANEOUS SYMBOLS

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

RECOMMENDATION SYMBOLS

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

ABBREVIATIONS

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

SAMPLE ABBREVIATIONS

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

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] CME-45C
- [ ] CME-550
- [X] CME-550X
- [ ] VANE SHEAR TEST
- [ ] PORTABLE HOIST
- [X] DIEDRICH D50
- [ ] _____

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

HAMMER TYPE:
- [X] AUTOMATIC [ ] MANUAL

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

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

ROCK DESCRIPTION

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

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

WEATHERING

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

ROCK HARDNESS

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

FRACTURE SPACING

TERM	SPACING
VERY WIDE	MORE THAN 10 FEET
WIDE	3 TO 10 FEET
MODERATELY CLOSE	1 TO 3 FEET
CLOSE	0.16 TO 1 FOOT
VERY CLOSE	LESS THAN 0.16 FEET

BEDDING

TERM	THICKNESS
VERY THICKLY BEDDED	4 FEET
THICKLY BEDDED	1.5-4 FEET
THINLY BEDDED	0.16-1.5 FEET
VERY THINLY BEDDED	0.03-0.16 FEET
THICKLY LAMINATED	0.008-0.03 FEET
THINLY LAMINATED	< 0.008 FEET

INDURATION

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

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

TERMS AND DEFINITIONS

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

AQUIFER-A WATER BEARING FORMATION OR STRATA.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

BENCH MARK: N/A

ELEVATION: FEET

NOTES:

ROADWAY DESIGN FILES DATED 05/02/24 PROVIDED BY TGS ENGINEERS

SOIL, WEATHERED ROCK, AND CRYSTALLINE ROCK LINES ARE BASED ON AN INTERPRETATION OF BORE HOLE AND SEISMIC REFRACTION DATA AND SHALL BE CONSIDERED AS APPROXIMATE.

DATE: 8-15-14

Docusign Envelope ID: 93A88913-0357-4FC8-954E-BE67994F0260

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	A-0009CE	3	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
32572.3.20		CONST

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GRAHAM COUNTY

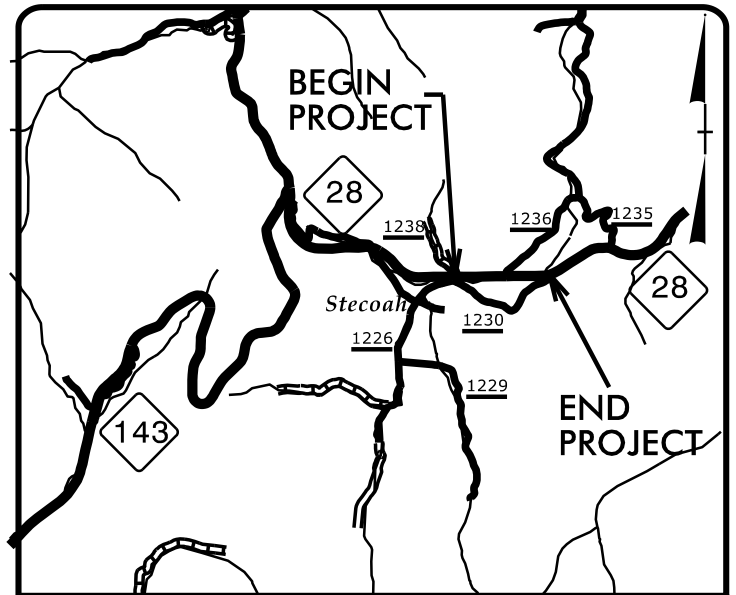
LOCATION: MULTI-USE PATH ALONG NC 28
FROM SR 1238(BILL CRISP RD) TO SR 1230 (HYDE TOWN RD)

TYPE OF WORK: GRADING, PAVING, DRAINAGE, SIGNALS & CULVERT

TIP PROJECT: A-0009CE

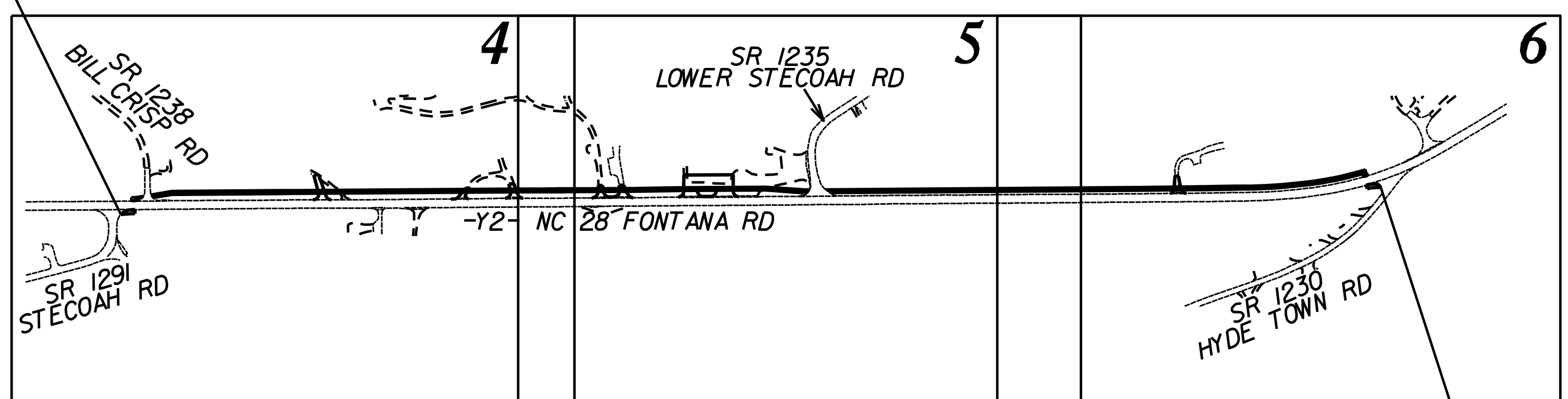
CONTRACT: DN01055

See Sheet 1A For Index of Sheets



VICINITY MAP

BEGIN TIP PROJECT A-0009CE
-Y2- STA. 98+85



NAD 83/2011

END TIP PROJECT A-0009CE
-Y2- STA. 132+35

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT A-0009CE	=	0.635 MILES
TOTAL LENGTH TIP PROJECT A-0009CE	=	0.635 MILES

NCDOT CONTACT: WANDA H. PAYNE, PE

PLANS PREPARED BY:
TGS ENGINEERS
201 W. MARION ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

PLANS PREPARED FOR:
NORTH CAROLINA DEPARTMENT OF TRANSPORATION
DIVISION 14
252 Webster Rd
Sylva, NC 28779

LETTING DATE:
AUGUST 27, 2024

2024 STANDARD SPECIFICATIONS

JIMMY L. TERRY, PE
PROJECT ENGINEER

SANDRA MELVIN
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

$$$$$SYSTIME$$$$$ $$$$$DGN$$$$$$$$$$$$$$$$$$$$$ $$$$USERNAME$$$$

5/24/2024

STATE PROJECT: 35272.3.20
TIP NUMBER: A-0009CE
F/A NUMBER: N/A
COUNTY: GRAHAM
DESCRIPTION: Multi-Use Path Along NC 28 from SR 1238 (Bill Crisp Rd) to SR 1230 (Hyde Town Rd)

SUBJECT: Geotechnical Roadway Inventory Report

PROJECT DESCRIPTION

This roadway widening project consists of improvements NC 28 between SR 1238 (Bill Crisp Rd) and SR 1230 (Hyde Town Rd). The project is approximately 0.633 miles in length, measured along -Y2- (NC 28) from Station 98+85 to 132+35. The construction consists of the addition of a multi-use path adjacent to -Y2- and a reinforced concrete culverts extension, and associated infrastructure. The project alignment is not located entirely within NCDOT right-of-way. The following alignments are included as part of this investigation:

Alignment	Stations	TIP No.
-Y2- (NC 28)	98+85 to 132+35	A-0009CE

Some boring locations were planned in archeologically sensitive areas; however, these areas could not be accessed at the time of the investigation and were excluded.

The following culverts are included as part of this investigation:

Culvert	Stations (Alignment)
Structure over Edwards Branch	99+82 (-Y2-)

The following cut slopes oriented steeper than 2:1 (H:V) but flatter than 1.5:1 (H:V) are included as part of this investigation:

Stations (Alignment)	Offset
101+00 to 102+50 (-Y2-)	LT
104+50 to 106+50 (-Y2-)	LT

All other project slopes are 2:1 (H:V) or flatter.

The project alignment is generally located in a rural area with existing grades ranging from relatively flat along the west of the project, becoming more mountainous along the central and eastern areas of the alignment. Due to the variation of existing conditions and proposed construction across the project alignment, the project has been divided into sections to describe the change in grades and proposed construction in a more descriptive manner.

This section of the project extends through the floodplain of Stecoah Creek, with generally steep slopes on the left side of the alignment and moderate fills on the right side where the route runs adjacent to Stecoah Creek. Numerous borings throughout this section encountered alluvial soils within the proposed roadway (reference Areas of Special Geotechnical Interest in this report).

The geotechnical field investigation was conducted by CG2 during the period of May 2021 through December 2021. The investigation was performed in several phases due to project schedule and other demands which required moving equipment to various sections of the project. Subcontracted drill crews were used to drill, sample, and log 41 of the borings in this report. The drill rigs used were ATV-mounted CME 550X and a track-mounted Diedrich D-50 equipped with automatic hammers. Standard Penetration Tests were performed at selected depths for the 41 borings. Additionally, some areas could not be accessed by the drilling equipment, and the presence of boulders and cobbles prevented obtaining subsurface information using hand sampling methods. In these instances, field staff visually identified areas of interest. Representative soil samples were collected for visual-manual classification in the field and selected samples were submitted for laboratory analysis by an approved NCDOT M&T testing facility.

Due to site constraints, archeologically sensitive areas, and stakeholder limitations, select areas were inaccessible to drilling equipment. As such, CG2 subcontracted GEL Solutions (GEL) to perform a seismic refraction investigation at various areas across the project alignment between May and September 2021. GEL performed 3 seismic refraction lines utilizing a Geometrics Geode Seismograph with up to 24 vertical geophones with a 16-pound sledgehammer as an energy source. The purpose of the seismic refraction investigation was to assist in estimating the top of weathered rock and/or bedrock which may affect the proposed construction. CG2 interpreted the top of weathered rock based on a compressional wave velocity (Vp) of 4,500 ft/sec and the top of bedrock based on a Vp of 7,500 ft/sec.

PHYSIOGRAPHY AND GEOLOGY

The project alignment is located within the Blue Ridge Physiographic Province of North Carolina (Blue Ridge). In general, the project alignments topography is consistent with the Blue Ridge, having rolling terrain that is moderately wooded with intermittent mountainous slopes and ridges at variable distances along the alignment. Towards the east along NC 28 (-Y2-), floodplains and stream terraces are present paralleling the existing roadways.

According to the geologic map and associated data of southwestern North Carolina from Weiner & Merschat, 1992, the project alignment mostly lies within the Murphy Syncline, a northeast-southwest trending trough fold. This now-tilted u-shaped fold has experienced multiple regional deformational events, which have overprinted the older synclinal fold with more recent foliations, faulting, and open folds. These geologic events have resulted in low to medium grade metamorphic rock (chlorite to kyanite facies). The project alignment is underlain by the Anakeesta (Wehutty) and stratigraphically overlying Ammons Formations. The bedrock under the site consists of meta-sedimentary rock including interlayers of Phyllite, Argillite, Schist, Meta-Sandstone, Meta-Siltstone, and Meta-Graywacke, and Marble of the Ammons Formation and interlayered Graphite Schist, Muscovite Schist, Meta-Sandstone and Meta-Siltstone of the Anakeesta (Wehutty) Formations. (Reference “Geological Investigation of A-9 A, B, & C (Stecoah and Tatham Gaps)” prepared by Acker & Reed, December 5, 1995). The rock encountered during this investigation was classified as Meta-Graywacke, Meta-Siltstone, and Meta-Sandstone, Mica Schist, and Schist.

Based on a review of the February 29, 2009 “Acid Producing (Hot Rock) Investigation and Potential Along Proposed Corridor” prepared by NCDOT and our experience in this region, rock with the potential to produce acidic runoff upon exposure to air and water (hot rock) may be found within the Ammons Formation and members, namely the Horse Branch Member, and the Anakeesta (Wehutty) Formation. Hot rock of the Nantahala Formation may also produce acidic conditions; however, the current proposed alignment does not appear to extend to areas underlain by this formation. As these geologic formations are known to be acid-producing, CG2 subcontracted HDR Engineering, Inc. of the Carolinas to investigate the risk for acidic potential to the project site and, if necessary, prepare a safety protocol for the handling,

treatment, and disposal of the hot rock particular to this project site ("Final Rock Slope Design" dated February 25, 2022). The evaluation consisted of twenty hand samples collected by CG2 (tested for Net Neutralization Potential (NNP)), twenty rock core samples, and three split spoon samples from boreholes to investigate three proposed rock cuts along NC 28 (-Y2-) for Acid-Base Testing. We concur with the referenced report prepared by HDR, that acid-producing rock in the project area does not appear to pose a significant risk along NC 28 (-Y2-) routed through the proposed alignment.

Within the project alignment, much of the bedrock is overlain by near-surface material consisting of residual soil and transported soil deposits of varying ages. Residual soils are derived from in situ chemical and physical weathering of the rocks in the area. The residual soils in this region are typically more fine grained with a higher clay content near the surface due to advanced weathering, and typically become more coarse grained with increasing depth as the degree of weathering decreases. As the degree of weathering decreases, the residual soils generally retain the overall appearance and fabric of the parent rock (sometimes referred to as "saprolite"). The boundary between soil and rock is not always sharply defined. A transitional zone termed "weathered rock" is often found overlying the parent bedrock. Weathered rock is defined as material requiring 100 blows with less than one foot of penetration from the SPT hammer.

Transported soils within the project alignment consist of alluvial (water-transported) and colluvial (gravity-transported) deposits of varying ages. Alluvial soil deposits are primarily from Sweetwater Creek and several other smaller creeks and streams present within the project alignment. Some streams and creeks are the byproducts of numerous springs located throughout the project corridor. Older, weathered alluvial deposits were also encountered and are referred to as fans or stream terraces. In areas immediately adjacent to existing waterways, younger alluvial deposits (floodplain soils) were encountered at lower elevations than terrace deposits or residual soils.

Colluvial soil deposits were observed within portions of the project alignment on slopes and/or at the base of slopes and ridges. Colluvial soils deposits are typically the result of mass soil movement and long-term soil creep which are common in this geographical area at the base of hills, slopes, and mountain ridges.

SOIL PROPERTIES

Soils and rock encountered during this investigation include roadway embankment, artificial fill, alluvial, colluvial, residual, weathered rock, and crystalline rock.

Organic topsoil was encountered in some borings at the ground surface up to approximately 0.5 feet below the existing ground surface.

Roadway Embankment soils are similar in nature to residual soils and may be derived from nearby sources. The fine-grained roadway embankment soils consist of very soft to hard, sandy silt (A-4), sandy, clayey silt (A-5), sandy clay (A-6), and sandy, silty clay (A-7), with trace to little gravel and trace organics. The coarse-grained soils encountered consist of very loose to very dense, sandy gravel (A-1-a), silty, gravelly sand (A-1-b), and silty sand (A-2-4), with trace to little gravel and trace organics.

Artificial Fill soils are materials that have been moved and/or placed by man or mechanical means. The artificial fill soils encountered consist of very loose to dense silty, sand (A-2-4) and soft to hard, sandy silt (A-4), sandy, clayey silt (A-5), and fine sandy clay (A-7), 6ith trace to little gravel and organics. The soils appeared to be sourced locally.

Alluvial soils are materials transported by water and are typically found in floodplains and stream terrace environments. The fine-grained alluvial soils consist of very soft to hard, sandy silt (A-4), sandy, clayey silt (A-5), sandy, silty clay (A-7), with trace to little gravel and cobbles and organics and trace mica. The coarse-grained soils encountered consist of very loose to very dense, sandy gravel (A-1-a), gravelly, silty sand (A-1-b), and silty sand (A-2-4), with little gravel. Alluvial boulders were also encountered infrequently across the project.

Colluvial soils were encountered as semi-consolidated soil deposits beneath existing embankments and unconsolidated soils deposited at the base of hillsides by creep and/or water flow. Colluvial soils were not encountered in the project borings, however, these soils may be encountered in areas in proximity to steep slopes and in valleys.

Residual soils are derived from the weathering of underlying rock in the area. The residual fine-grained soils consist of soft to hard, slightly plastic sandy silt (A-4), sandy, clayey silt (A-5), sandy clay (A-6), and sandy, silty clay (A-7-5/6), with trace mica, organics, and manganese oxide and trace to little gravel-sized rock fragments. The coarse-grained soils consist of very loose to very dense, sandy gravel (A-1-a), silty, gravelly sand (A-1-b), and silty sand (A-2-4), with trace mica and manganese oxide and trace to little gravel-sized rock fragments.

Weathered rock was also encountered along the project alignment within 7 borings. The weathered rock encountered consists of Schist and Meta-Sandstone. The top of weathered rock was encountered at depths ranging from approximately 3 to 38.5 feet below the existing ground surface.

Crystalline rock was encountered along the project alignment within two of the borings. These two borings were terminated on crystalline rock. The crystalline rock encountered was classified as Schist and Meta-Sandstone was encountered at depths ranging from approximately 4.3 to 13.0 feet below the existing ground surface. For borings terminated on crystalline rock where rock was not recovered, the rock was classified either based on materials recovered within the boring or on proximal rock outcrop type.

GROUNDWATER

Groundwater measurements were taken between the months of May to December 2021. Groundwater measurements were attempted at the completion of drilling in each boring, at which time groundwater was encountered in 25 borings at depths ranging from approximately 4.0 to 26.5 feet below the existing ground surface. Subsequent groundwater measurements were attempted after at least 24 hours following the completion of drilling, at which time groundwater was encountered in 29 of the borings at depths ranging from approximately 2.5 feet to 21.2 feet below the existing ground surface. Three of the borings were backfilled immediately upon completion of drilling activities for safety reasons or at the request of a property owner. The remaining borings were recorded as dry at the bottom of the boring cylinder. Groundwater is expected to impact construction. The soils encountered were generally described as moist to wet above the groundwater elevation and moist to saturated below groundwater elevation.

Water wells were encountered within the project alignment. Water wells could be encountered at other locations due to the presence of dwellings and businesses.

Alignment	Stations	Offsets (ft)
-Y2-	89+57	172 LT
-Y2-	95+33	118 RT

Springs and seeps were encountered within the project alignment at the following locations:

Type	Alignment	Stations	Offsets (ft)
Spring	-Y2-	111+80	215 LT

AREAS OF SPECIAL GEOTECHNICAL INTEREST

The following borehole locations encountered very soft to soft or very loose to loose soils which have the potential to cause embankment stability and/or long-term settlement problems:

Alignment	Stations	Offsets (ft)
-Y2-	99+97	7 RT
-Y2-	103+48 to 105+65	47 LT to 3 RT
-Y2-	107+75 to 113+50	3 RT to 35 RT
-Y2-	116+92 to 122+98	31 LT to 34 RT
-Y2-	124+99 to 127+40	19 LT to 34 RT
-Y2-	129+47 to 133+13	19 LT

Highly Plastic Soils: Highly plastic soils (PI > 25) were not encountered in the borings on the project.

Shallow groundwater was encountered within 6 feet of proposed subgrade at the following borehole locations:

Alignment	Stations	Offsets (ft)
-Y2-	124+01 to 124+99	31 RT to 32 RT
-Y2-	125+96 to 126+88	33 RT to 34 RT
-Y2-	128+01	32 RT

In addition, shallow groundwater may be encountered within 3 feet of the existing ground at the following locations:

Alignment	Stations	Offsets (ft)
-Y2-	108+75 to 109+50	35 RT
-Y2-	110+93	3 RT
-Y2-	121+13	31 LT
-Y2-	126+88	33 RT
Y2-	128+01	32 RT
-Y2-	129+01 to 129+47	37 LT to 19 LT

Alluvial soils were encountered on the project at the following borehole locations:

Alignment	Stations	Offsets (ft)
-Y2-	99+97	7 RT
-Y2-	107+75 to 118+01	10 LT to 35 RT
-Y2-	119+03	33 RT
-Y2-	122+03	31 RT
-Y2-	128+01 to 129+00	25 LT to 35 RT
-Y2-	129+47	19 LT

Artificial Fill soils were encountered on the project at the following borehole locations:

Alignment	Stations	Offsets (ft)
-Y2-	103+48	1 RT

Colluvial soils may be detrimental to the proposed improvements due to variable consistency and character of these soils. Colluvial soils often contain deleterious materials such as boulders, gravel, organics, loose/soft soils, and can become unstable during or after construction. Colluvial soils present significant risk if they become saturated or are left exposed to continued water infiltration which may cause previously stable colluvial soils to creep, slide, or become unstable. Colluvial soils were not encountered on the project boreholes but may be present on the project.

Rock was not encountered within 6 feet of the proposed cut elevation at the following borehole and/or seismic refraction investigation locations.

For rock locations in other areas on the project, please see the previously referenced reports prepared by HDR.

Ponds were observed in the vicinity of the project limits at the following locations:

Alignment	Stations	Offsets
-Y2-	88+40 to 89+00	RT
-Y2-	118+50 to 123+75	LT

GEOTECHNICAL TESTING

Split spoon samples were selected for laboratory testing including Atterberg limits, grain size distribution analysis with hydrometer, and natural moisture.

Sincerely,
Carolinas Geotechnical Group, PLLC

DocuSigned by:
D. Matthew Brewer
386129C0A4C1462...
D. Matthew Brewer, PE
Senior Project Engineer

NOTE:
ALL DRIVEWAYS ARE TO BE ASPHALT UNLESS OTHERWISE NOTED.

PROJECT REFERENCE NO.	SHEET NO.
A-0009CE	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST., STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

NAD 83/2011

BEGIN TIP PROJECT A-0009CE
-Y2- STA 98+85

MATCH LINE STA -Y2- 110+00.00
MATCH TO SHEET NO. 5

-COLLUVIAL-
-RESIDUAL-
-ALLUVIAL-
-ARTIFICIAL FILL-
-ALLUVIAL- (STREAM TERRACE)
-ROADWAY EMBANKMENT-

10' X 10' LANDING AREA W/DETECTABLE DOMES
10' MULTI-USE PATH
PROP. 10' PATH
DETECTABLE DOMES
PROP. DRIVE
DRIVE Y2_10348L
BLOCK WALLS ONLY
LINE SGA 9
LINE SGA 10
LINE SGA 11
BEGIN SGA 9
END SGA 9
BEGIN SGA 10
END SGA 10
BEGIN SGA 11
END SGA 11

CULV_Y2_9997L
CULV_Y2_9972R
CULV_Y3A_10871
CULV_Y3A_10821
Y2_10200L
Y2_10565R
Y2_10684L
Y2_10920L
RWAL36_B-1
RWAL36_B-2
RWAL36_B-3

B/Y31-161
B/Y31-162
B/Y27-138
B/Y27-139

NC 28 (FONTANA RD) 24' BST
SR 1259 STECOAH RD
SR 1258 (BIG CANEY RD)
SR 1230 (HYDE TOWN RD)
STECOAH CREEK
18" CMP
54" CMP
84" WD PRIVACY
48" CH LK
24" ROCK WALL
SEPTIC TANK
DRAIN FIELD
DRAIN LINES
POSSIBLE SEPTIC TANK
DILAPIDATED WD SHED
2 SF D (ABAND.)
F/O MARKER
ROCK HW
WD SHED
MTL GARAGE
MTL S
IS ROCK D
IS F&ROCK D
ISFD
IS BR D
U/G FUEL TANKS
WTL
W/LT
SHED
DECK
WD DECK
CONC
GRASS
GR
BST
WOODS

REVISIONS
8/17/99

PROJECT REFERENCE NO.	SHEET NO.
A-0009CE	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST., STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

NOTE:
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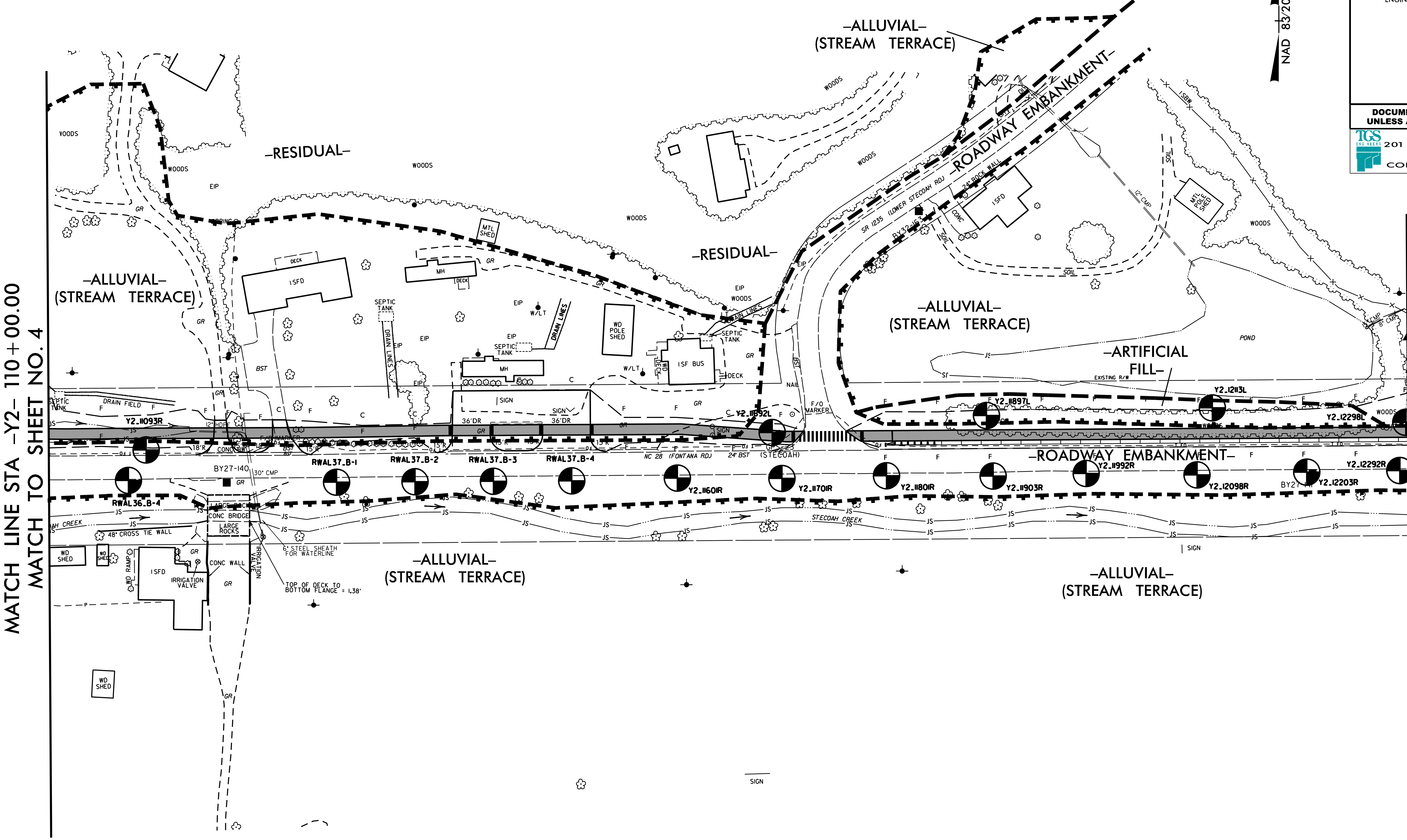

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8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
A-0009CE	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST., STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

NOTE:
ALL DRIVEWAYS ARE TO BE ASPHALT UNLESS OTHERWISE NOTED.

MATCH LINE STA -Y2- 123+00.00
MATCH TO SHEET NO. 5

SEE DETAIL SHT 2C-1
WOOD RUB RAIL
-Y2- STA 108+50 +/-
TO 126+32 +/-

SEE DETAIL SHT 2C-1
WOOD RUB RAIL
-Y2- STA 127+72 +/-
TO 131+40 +/-

10' MULTI-USE PATH

-ALLUVIAL-
(STREAM TERRACE)

-ROADWAY EMBANKMENT-

-RESIDUAL-

"OLD" STECOAH CREEK "STEAM BED"

STECOAH CREEK

PROP. DRIVE

RETAIN AND EXTEND
3@10'x9' RCBC

10' X 10' LANDING AREA
W/DETECTABLE DOMES

DETECTABLE
DOMES

PROP. 10' PATH

NC 28 (FONT ANA RD)

SR 1230 (HYDE TOWN RD)

NAD 83/2011

END TIP PROJECT A-0009CE
-Y2- STA 132+35

PROJ. REFERENCE NO.	SHEET NO.
A-0009CE	7

0 2.5 5

CULV_Y2_9997L
99+97
7' RT

2:1

EXISTING GROUND

-ROADWAY EMBANKMENT-
LOOSE TO MEDIUM DENSE, MOIST, BROWN, SILTY FINE SAND (A-2-4) WITH TRACE GRAVEL

(8) (8) (14) (19)

08/21

-ALLUVIAL- VERY STIFF, MOIST, BROWN, FINE SANDY SILT (A-4) WITH LITTLE GRAVEL

-RESIDUAL- VERY DENSE, WET, GRAY-TAN, SILTY FINE SAND (A-2-4)

100/0.8

-WEATHERED ROCK-
(SCHIST)

100/0.4

BT

℄

100+00.00

CULV_Y2_9972R
99+72
33' RT

EXISTING GROUND

-ROADWAY EMBANKMENT-
VERY SOFT TO SOFT, MOIST, BROWN, FINE SANDY SILT (A-4), WITH LITTLE GRAVEL
MEDIUM DENSE, MOIST TO WET, BROWN-GRAY, SILTY FINE SAND (A-2-4), WITH LITTLE GRAVEL

(3) (1) (15) (12)

08/21

-WEATHERED ROCK-
(SCHIST)

100/0.2

-RESIDUAL-
VERY DENSE, MOIST, BLACK-TAN, SILTY FINE SAND (A-2-4)

-WEATHERED ROCK-
(SCHIST)

100/0.7

100/0.9

BT

99+50.00

℄

-Y2-

-Y2- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 04/28/22. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

6/23/16

24-MAY-2024 13:17
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$$$$USERNAME$$$$

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	A-0009CE	8

NOTE:
SOIL, WEATHERED ROCK, AND CRYSTALLINE ROCK LINES ARE BASED ON AN INTERPRETATION OF BORE HOLE AND SEISMIC REFRACTION DATA AND SHALL BE CONSIDERED AS APPROXIMATE.

EXISTING GROUND

Y2_10200L
102+00
CL

SGA II

1.5:1

3:1

18
11
23
41
68
52
100/0.8
BT

06/21

-RESIDUAL-
MEDIUM DENSE, MOIST TO WET, TAN-BROWN-ORANGE, SILTY FINE TO COARSE SAND (A-2-4)
VERY STIFF TO HARD, MOIST, TAN-ORANGE-BROWN, FINE TO COARSE SANDY SILT (A-4), WITH TRACE MICA
VERY DENSE, TAN-GRAY-BROWN, MOIST, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE MICA

-WEATHERED ROCK-
(META-SANDSTONE)

Ⓐ **-ROADWAY EMBANKMENT-** LOOSE TO MEDIUM DENSE, MOIST, BROWN, SILTY FINE SAND (A-2-4), WITH TRACE GRAVEL

102+00.00

-Y2- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 04/28/22. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

-Y2-

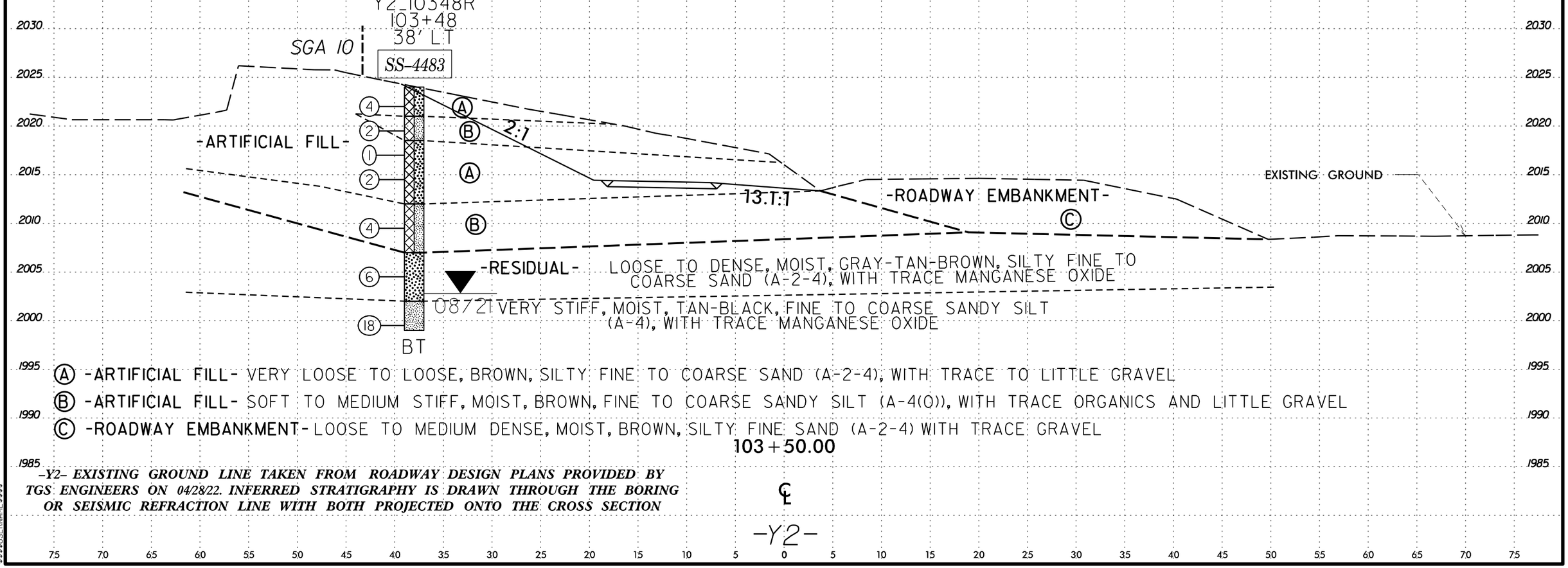
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110

2110 2100 2090 2080 2070 2060 2050 2040 2030 2020 2010 2000 1990 1980 1970

NOTE:
SOIL, WEATHERED ROCK, AND CRYSTALLINE ROCK LINES ARE BASED ON AN INTERPRETATION OF BORE HOLE AND SEISMIC REFRACTION DATA AND SHALL BE CONSIDERED AS APPROXIMATE.

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-4483	38' LT	103+48 -Y2-	3.5' - 5.0'	A-4(0)	28	2	32	25	24	19	96	74	49	14	-



Ⓐ -ARTIFICIAL FILL- VERY LOOSE TO LOOSE, BROWN, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE TO LITTLE GRAVEL

Ⓑ -ARTIFICIAL FILL- SOFT TO MEDIUM STIFF, MOIST, BROWN, FINE TO COARSE SANDY SILT (A-4(0)), WITH TRACE ORGANICS AND LITTLE GRAVEL

Ⓒ -ROADWAY EMBANKMENT- LOOSE TO MEDIUM DENSE, MOIST, BROWN, SILTY FINE SAND (A-2-4) WITH TRACE GRAVEL

103+50.00

℄

-Y2-

-Y2- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 04/28/22. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

PROJ. REFERENCE NO.	SHEET NO.
A-0009CE	10

0 5 10

NOTE:
SOIL, WEATHERED ROCK, AND CRYSTALLINE ROCK LINES ARE BASED ON AN INTERPRETATION OF BORE HOLE AND SEISMIC REFRACTION DATA AND SHALL BE CONSIDERED AS APPROXIMATE.

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

2090 2080 2070 2060 2050 2040 2030 2020 2010 2000 1990 1980 1970

SGA 9

VERY STIFF, MOIST, RED-ORANGE-BROWN, FINE TO COARSE SANDY -RESIDUAL-

1.5:1

Y2_10565R
105+65
3' RT

2010.59
Edge of MUP

2010.20
EOT

0.02

2.1 %

EXISTING GROUND

-ROADWAY EMBANKMENT-

7
3 2012 A
23
8

SILT (A-4), WITH LITTLE GRAVEL -RESIDUAL-
LOOSE, MOIST TO WET, GRAY-TAN, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE GRAVEL

06/24

100/0.2
100/0.3
100/0.2

-WEATHERED ROCK-
(META-SANDSTONE)

-CRYSTALLINE ROCK-
(META-SANDSTONE)

BT

Ⓐ -ROADWAY EMBANKMENT- SOFT TO MEDIUM STIFF, MOIST, RED-BROWN-TAN, FINE TO COARSE SANDY CLAY (A-6), WITH TRACE GRAVEL

105+50.00

-Y2- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 04/28/22. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

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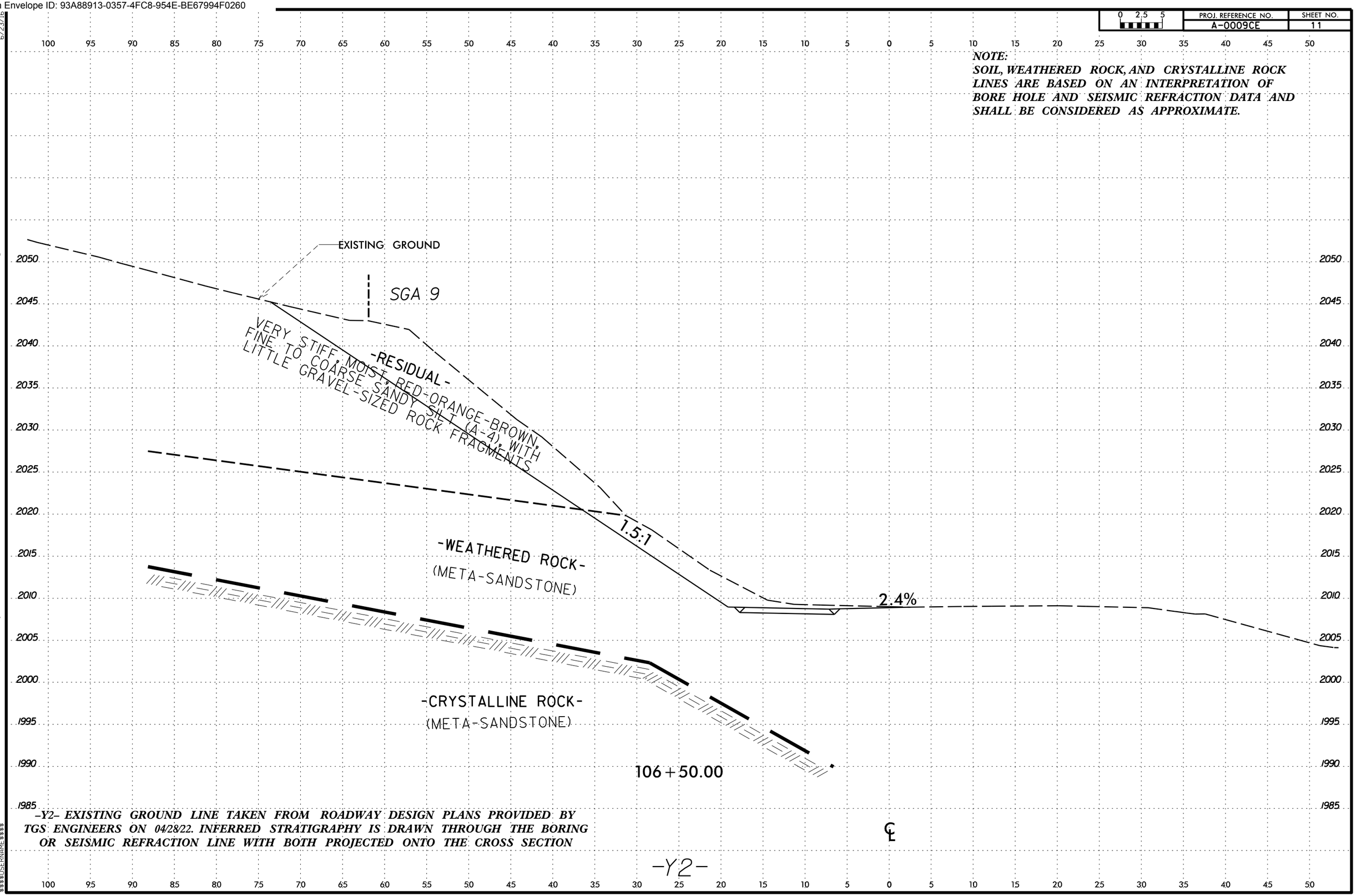
-Y2-

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	A-0009CE	11

NOTE:
SOIL, WEATHERED ROCK, AND CRYSTALLINE ROCK LINES ARE BASED ON AN INTERPRETATION OF BORE HOLE AND SEISMIC REFRACTION DATA AND SHALL BE CONSIDERED AS APPROXIMATE.



-Y2- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 04/28/22. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

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-1009	35' RT	107+75 -Y2-	8.5' - 10.0'	A-4(0)	28	3	26	24	25	25	75	61	42	16	-

RWAL36_B-1
107+75
35' RT
SS-1009

EXISTING GROUND

0.7%

-ROADWAY EMBANKMENT-

Ⓐ

13
5
2
8
3
5
4
14
15
15
16

06/21

-ALLUVIAL-
SOFT TO STIFF, MOIST, TAN-GRAY-ORANGE-BROWN, SILT (A-5), FINE TO COARSE SANDY SILT (A-4(0)) AND SILTY CLAY (A-7-5)

-RESIDUAL-
MEDIUM STIFF TO VERY STIFF, MOIST, GRAY-ORANGE-BROWN, FINE TO COARSE SANDY SILT (A-4), WITH TRACE MICA

MEDIUM DENSE, WET, GRAY-TAN, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE MICA

BT

Ⓐ -ROADWAY EMBANKMENT- STIFF TO MEDIUM STIFF, MOIST, TAN-ORANGE-GRAY, FINE TO COARSE SANDY SILT (A-4), WITH TRACE GRAVEL AND MICA

2025 2020 2015 2010 2005 2000 1995 1990 1985 1980 1975 1970 1965 1960 1955

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

107+50.00
℄
-Y2-

-Y2- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 04/28/22. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	A-0009CE	13

RWAL36_B-2
108+75
35' RT

EXISTING GROUND

-ROADWAY EMBANKMENT-

-ALLUVIAL-

-RESIDUAL-

LOOSE TO MEDIUM DENSE, MOIST TO WET, TAN-ORANGE-BROWN, SILTY FINE TO COARSE SAND (A-2-4)

STIFF TO HARD, MOIST, TAN-GRAY-ORANGE, FINE TO COARSE SANDY SILT (A-4), WITH TRACE MICA

4:1

13.5:1

06/21

BT

Ⓐ -ROADWAY EMBANKMENT- MEDIUM STIFF TO STIFF, MOIST, TAN-ORANGE-GRAY, FINE TO COARSE SANDY CLAY (A-6), WITH TRACE GRAVEL

Ⓑ -ALLUVIAL- SOFT, MOIST, BROWN-GRAY, SILT (A-5), WITH TRACE GRAVEL

Ⓒ -ALLUVIAL- MEDIUM DENSE TO DENSE, MOIST TO WET, GRAY-TAN-ORANGE, SILTY, GRAVELLY FINE TO COARSE SAND (A-1-B)

108+50.00

-Y2- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 04/28/22. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

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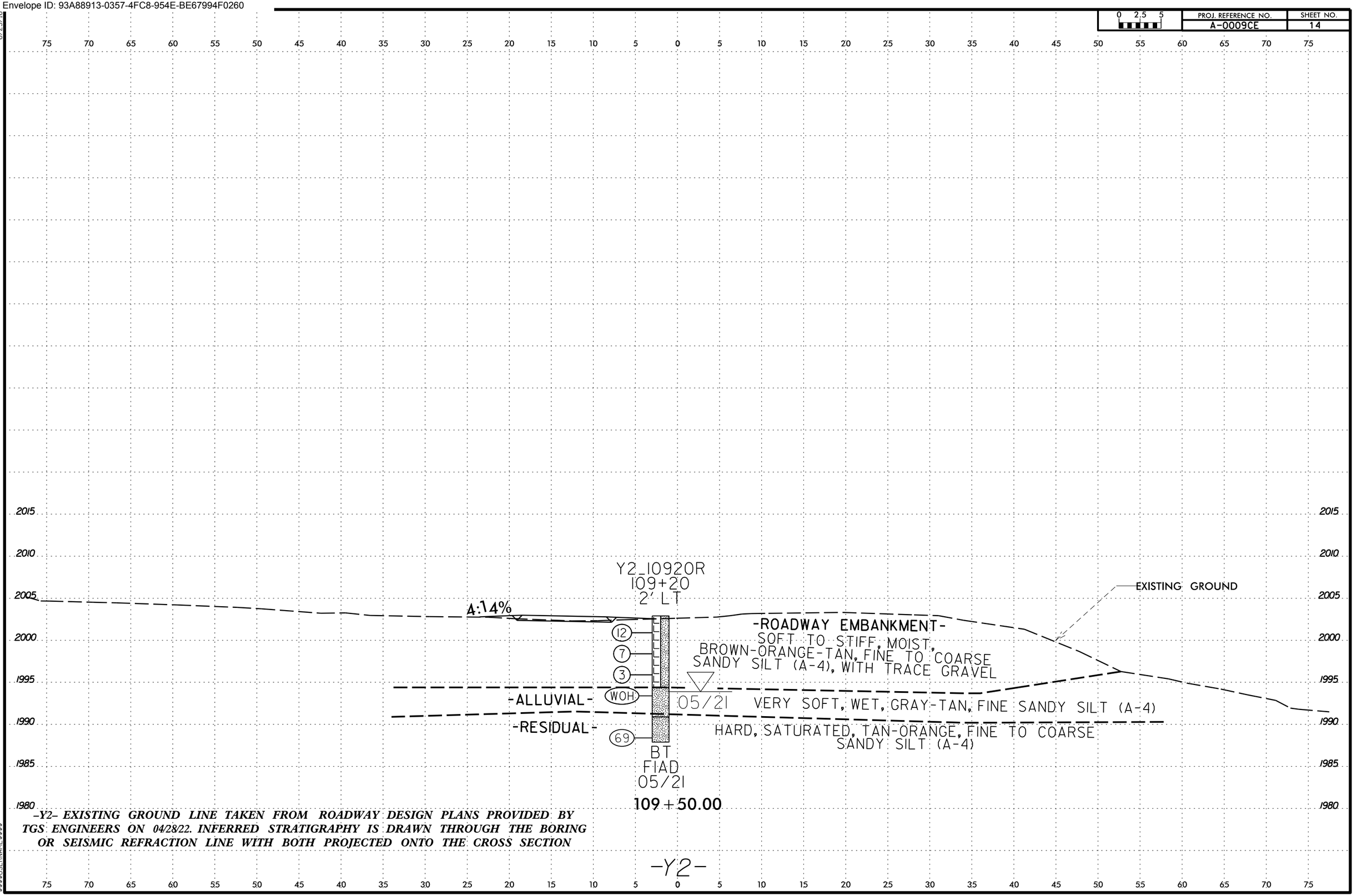
-Y2-

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	A-0009CE	14



-Y2- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 04/28/22. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	A-0009CE	15

RWAL36_B-3
109+75
35' RT

EXISTING GROUND

-ROADWAY EMBANKMENT-

VERY SOFT TO STIFF, MOIST, RED-ORANGE-TAN, FINE TO COARSE SANDY CLAY (A-6) AND FINE TO COARSE SANDY SILT (A-4), WITH LITTLE GRAVEL

-ALLUVIAL-

MEDIUM DENSE TO VERY DENSE, SATURATED, TAN-GRAY-BROWN, FINE TO COARSE SANDY, SILTY GRAVEL (A-1-B) AND SILTY FINE TO COARSE SAND (A-2-4), WITH LITTLE GRAVEL

-RESIDUAL-

LOOSE TO MEDIUM DENSE, MOIST, TAN-GRAY-ORANGE, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE MICA

VERY STIFF, MOIST, TAN-BROWN-ORANGE, FINE TO COARSE SANDY SILT (A-4), WITH TRACE MICA

110+00.00

-Y2-

06/21

BT

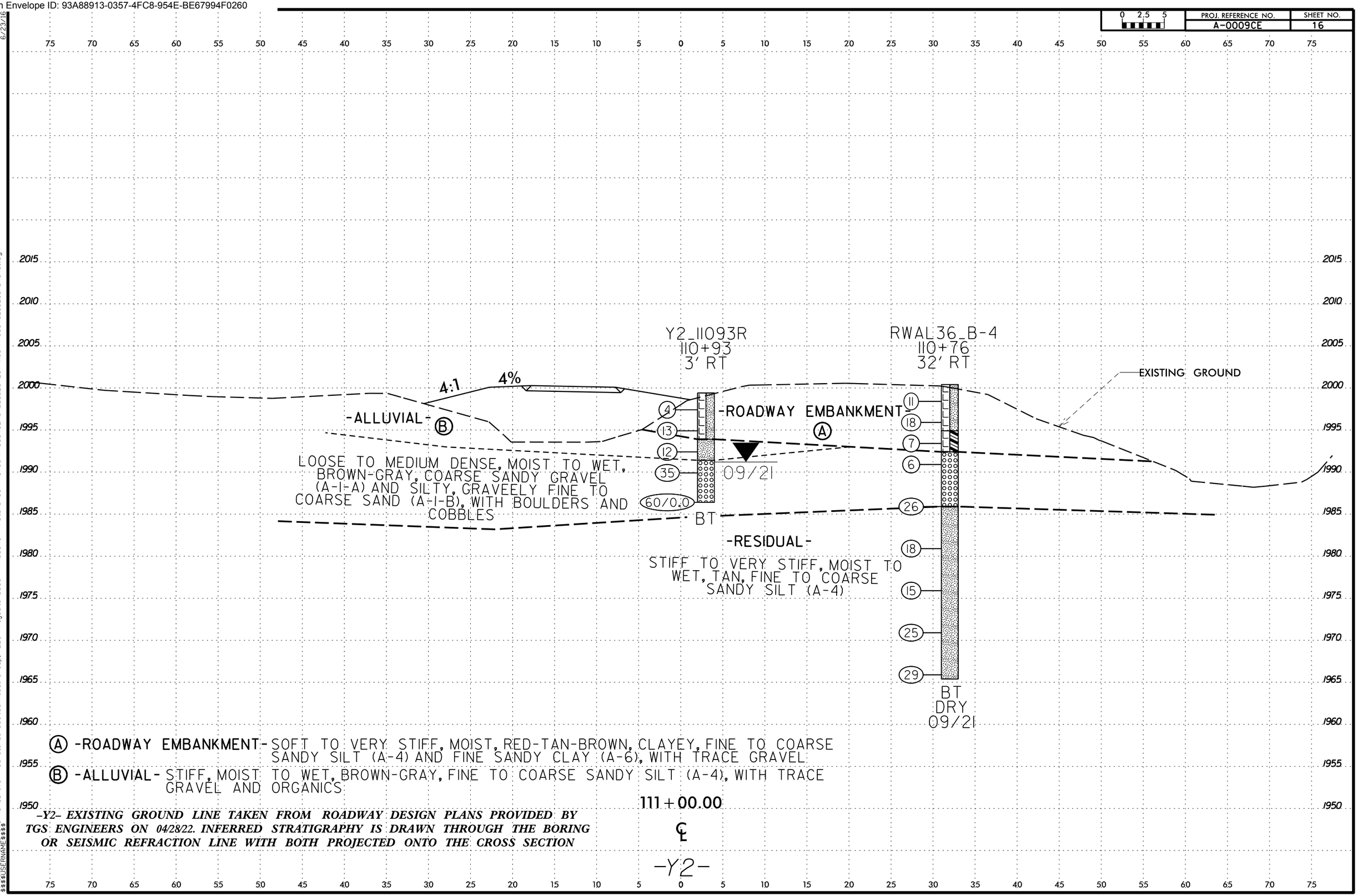
12 9 1 3 69 100/0.8 11 10 14 15 19 16

2015 2010 2005 2000 1995 1990 1985 1980 1975 1970 1965 1960 1955 1950

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

-Y2- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 04/28/22. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	A-0009CE	16

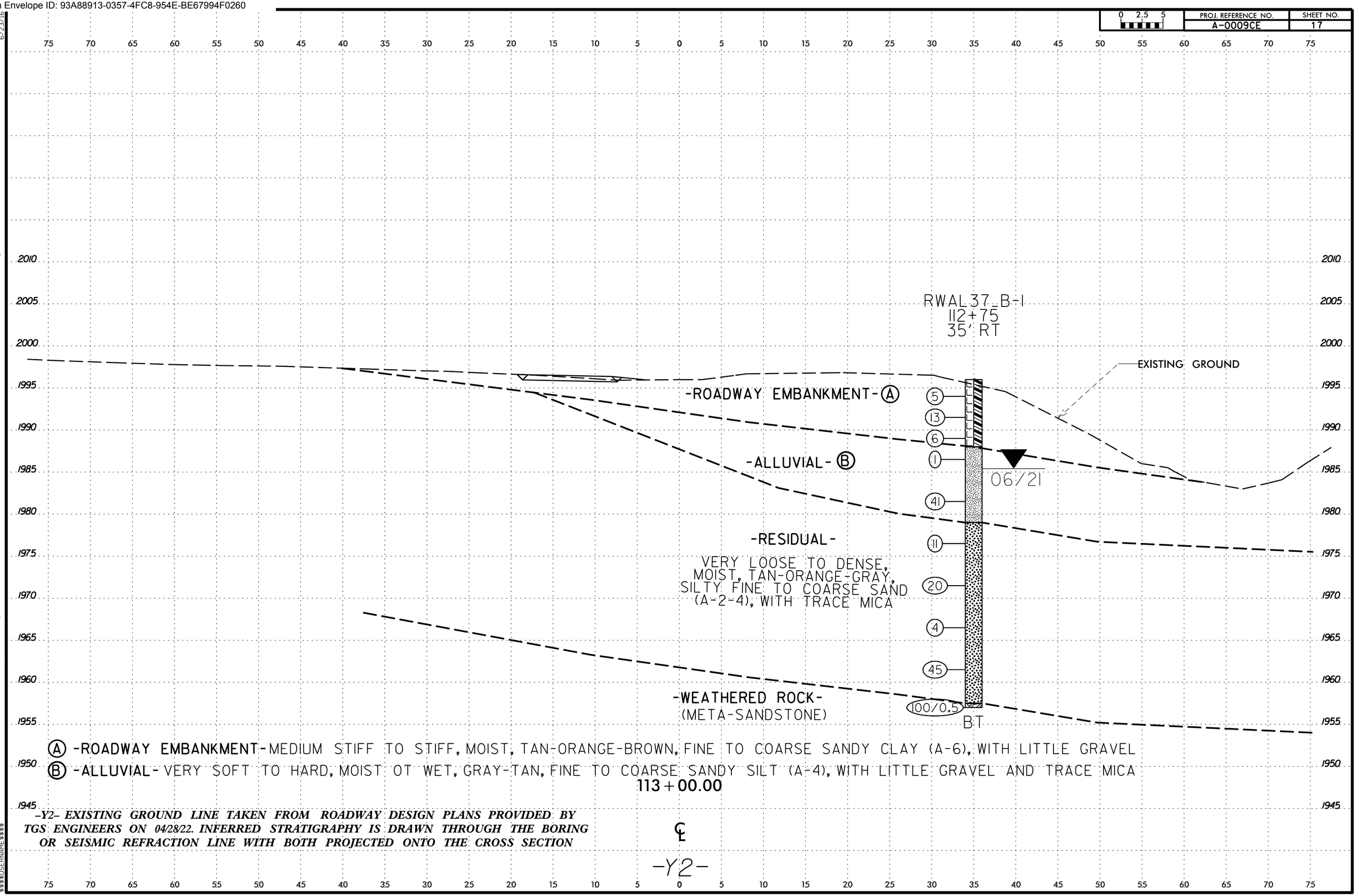


Ⓐ -ROADWAY EMBANKMENT- SOFT TO VERY STIFF, MOIST, RED-TAN-BROWN, CLAYEY, FINE TO COARSE SANDY SILT (A-4) AND FINE SANDY CLAY (A-6), WITH TRACE GRAVEL

Ⓑ -ALLUVIAL- STIFF, MOIST TO WET, BROWN-GRAY, FINE TO COARSE SANDY SILT (A-4), WITH TRACE GRAVEL AND ORGANICS

-Y2- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 04/28/22. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	A-0009CE	17



Ⓐ -ROADWAY EMBANKMENT- MEDIUM STIFF TO STIFF, MOIST, TAN-ORANGE-BROWN, FINE TO COARSE SANDY CLAY (A-6), WITH LITTLE GRAVEL

Ⓑ -ALLUVIAL- VERY SOFT TO HARD, MOIST OT WET, GRAY-TAN, FINE TO COARSE SANDY SILT (A-4), WITH LITTLE GRAVEL AND TRACE MICA

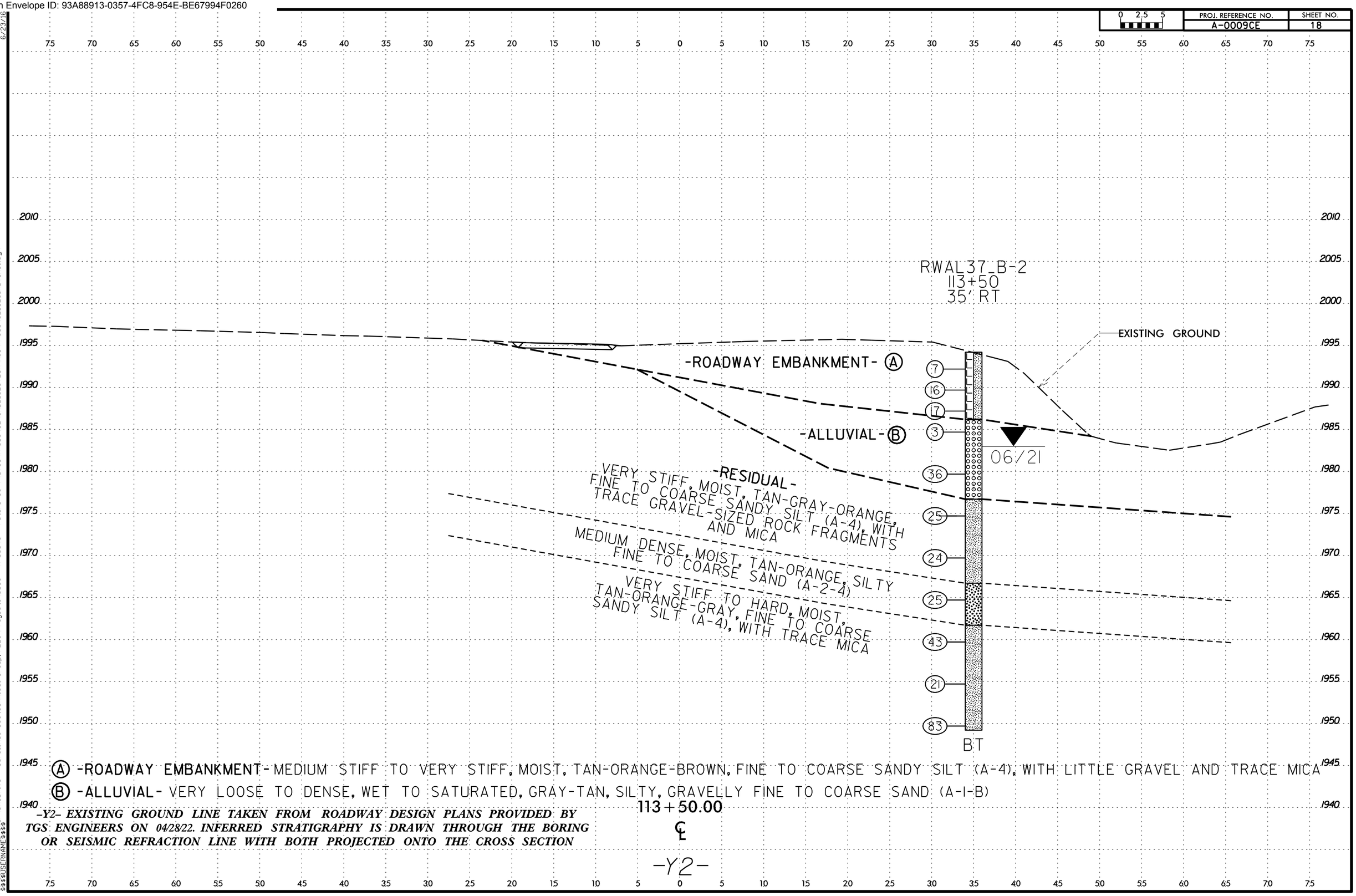
113+00.00

℄

-Y2-

-Y2- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 04/28/22. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	A-0009CE	18



(A) -ROADWAY EMBANKMENT- MEDIUM STIFF TO VERY STIFF, MOIST, TAN-ORANGE-BROWN, FINE TO COARSE SANDY SILT (A-4), WITH LITTLE GRAVEL AND TRACE MICA

(B) -ALLUVIAL- VERY LOOSE TO DENSE, WET TO SATURATED, GRAY-TAN, SILTY, GRAVELLY FINE TO COARSE SAND (A-1-B)

-Y2- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 04/28/22. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

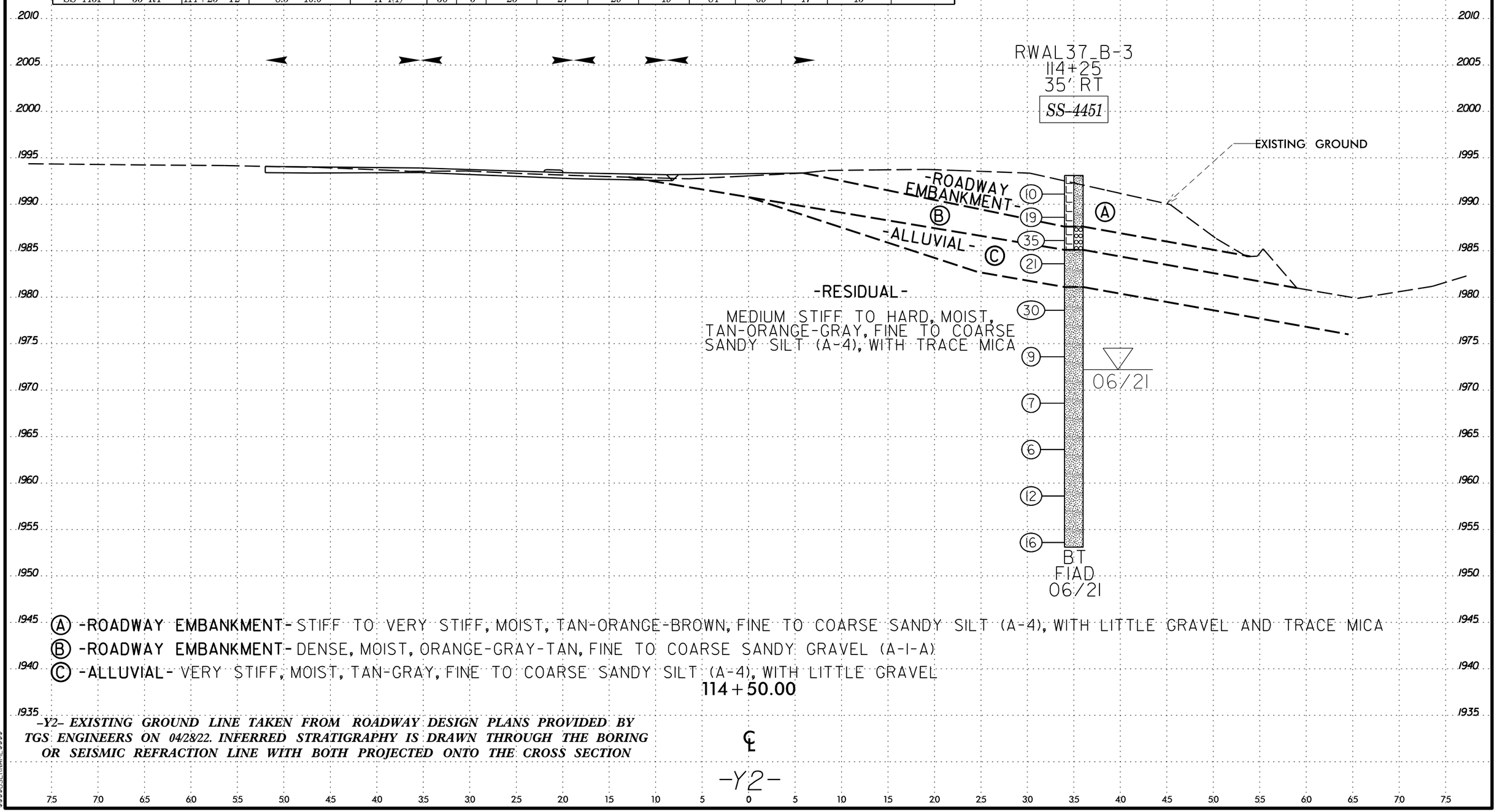
113+50.00

℄

-Y2-

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-4451	35' RT	114+25 -Y2-	8.5' - 10.0'	A-4(1)	36	5	25	27	29	19	84	69	47	15	-



Ⓐ -ROADWAY EMBANKMENT- STIFF TO VERY STIFF, MOIST, TAN-ORANGE-BROWN, FINE TO COARSE SANDY SILT (A-4), WITH LITTLE GRAVEL AND TRACE MICA

Ⓑ -ROADWAY EMBANKMENT- DENSE, MOIST, ORANGE-GRAY-TAN, FINE TO COARSE SANDY GRAVEL (A-1-A)

Ⓒ -ALLUVIAL- VERY STIFF, MOIST, TAN-GRAY, FINE TO COARSE SANDY SILT (A-4), WITH LITTLE GRAVEL

114+50.00

℄

-Y2-

-Y2- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 04/28/22. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	A-0009CE	20

6/23/16

RWAL37_B-4
115+00
35' RT

EXISTING GROUND

-ROADWAY EMBANKMENT-
STIFF, MOIST, BROWN-GRAY-ORANGE, FINE SANDY SILT (A-4), WITH TRACE GRAVEL

9
14
14
12

-ALLUVIAL-
VERY DENSE, WET, FINE TO COARSE SANDY, SILTY GRAVEL (A-1-A), WITH COBBLES AND BOULDERS

100/0.6
60/0.0

BT
DRY
05/21

115+00.00

℄

-Y2-

-Y2- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 04/28/22. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

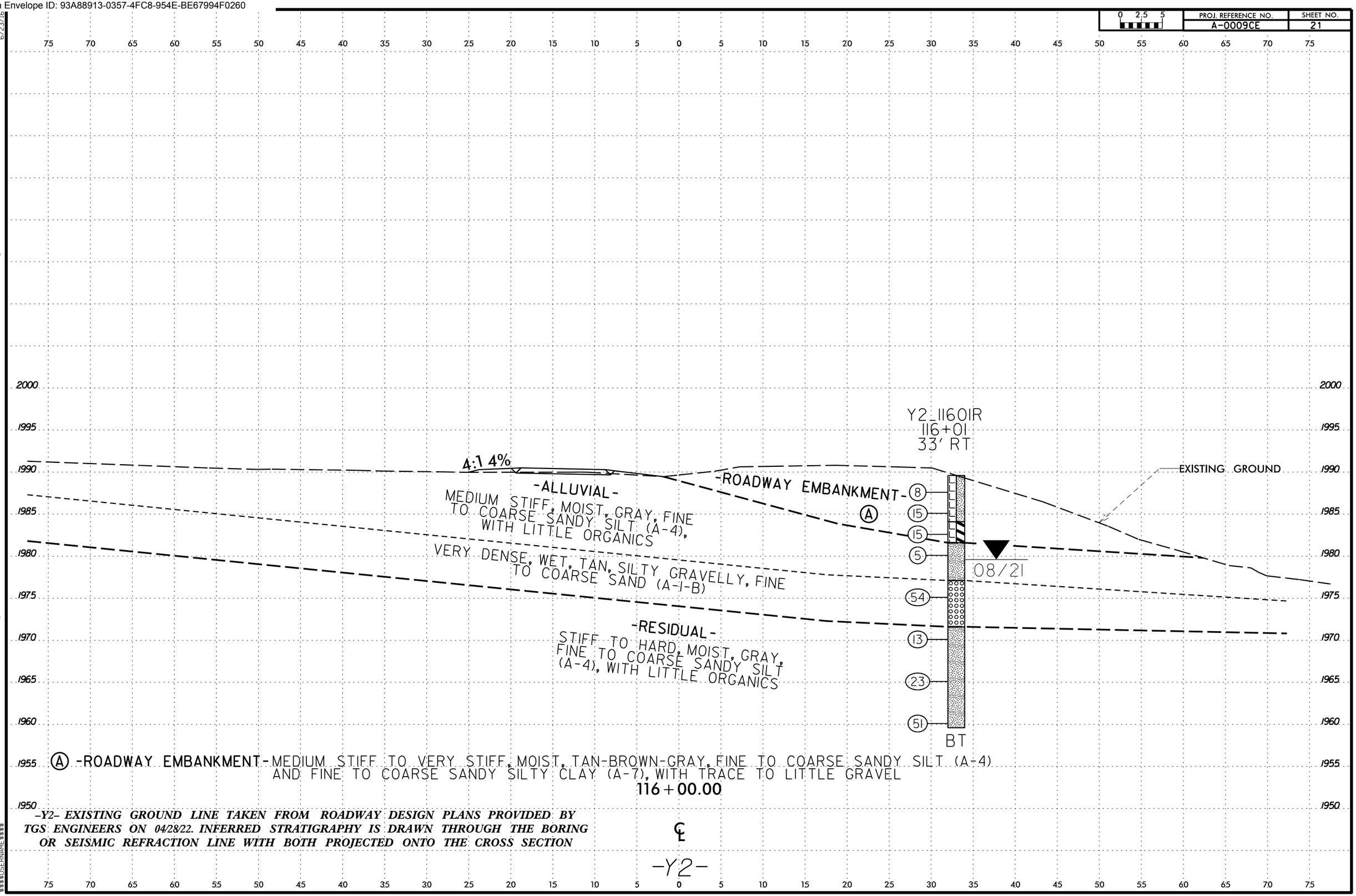
75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

2005 2000 1995 1990 1985 1980 1975 1970 1965

24-MAY-2024 13:17
C:\Users\JBrewer\OneDrive - Carolinas Geotechnical Group, PLLC\Projects\0068 - A-0009C - Future US 74_TGS\A-0009CE\CADD_GEOTECH\xsc\A-0009CE_GEO_RDY_XSI.dgn
$$$$USERNAME$$$$

PROJ. REFERENCE NO.	SHEET NO.
A-0009CE	21

0 2.5 5



-Y2- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 04/28/22. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

PROJ. REFERENCE NO.	SHEET NO.
A-0009CE	22

0 2.5 5

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

2000 1995 1990 1985 1980 1975 1970 1965 1960 1955 1950

EXISTING GROUND

-ROADWAY EMBANKMENT-

SOFT TO VERY STIFF, MOIST, TAN-BROWN, SILTY CLAY (A-7) AND FINE TO COARSE SANDY SILT (A-4), WITH TRACE TO LITTLE GRAVEL AND ORGANICS

-ALLUVIAL-

MEDIUM DENSE, MOIST, BROWN, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE GRAVEL AND ORGANICS

117+50.00

Y2_11692L
116+92
10' LT

Y2_11701R
117+01
34' RT

4:1 4%

EXISTING GROUND

-ROADWAY EMBANKMENT-

SOFT TO VERY STIFF, MOIST, TAN-BROWN, SILTY CLAY (A-7) AND FINE TO COARSE SANDY SILT (A-4), WITH TRACE TO LITTLE GRAVEL AND ORGANICS

4 2 11 3 — BT — 08/21

4 9 17 17 — 08/21

-ALLUVIAL- Ⓐ

VERY STIFF, MOIST TO WET, BROWN, FINE TO COARSE SANDY SILT (A-4), WITH TRACE TO LITTLE GRAVEL

22 51

-RESIDUAL-

VERY STIFF, MOIST, TAN-BLACK, FINE TO COARSE SANDY SILT (A-4), WITH TRACE MANGANESE OXIDE

16 17 — BT

Ⓐ -ALLUVIAL- MEDIUM DENSE, MOIST, BROWN, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE GRAVEL AND ORGANICS

117+00.00

℄

-Y2-

-Y2- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 04/28/22. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

6/23/16

24-MAY-2024 13:17
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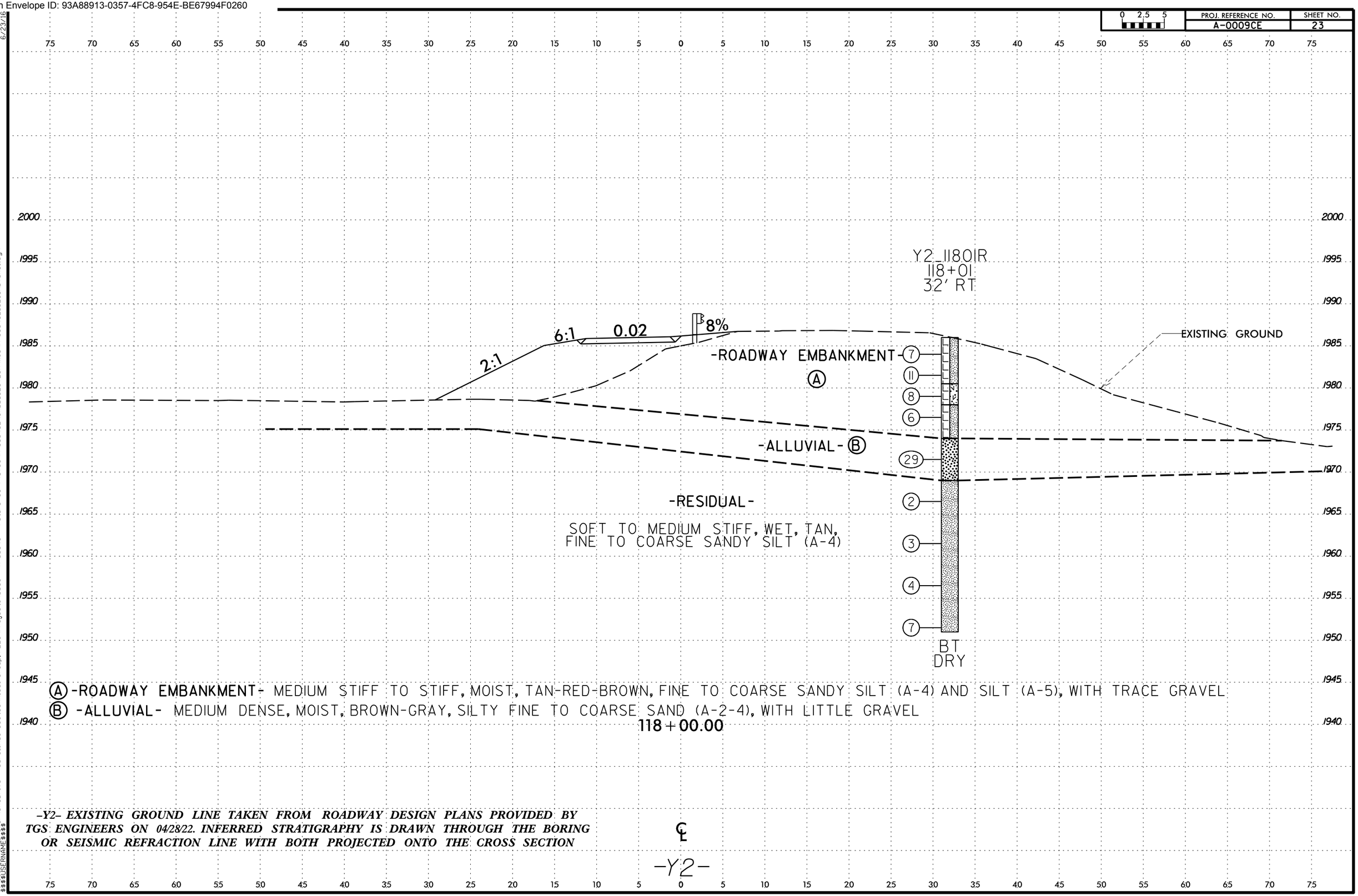
0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	A-0009CE	23



Ⓐ-ROADWAY EMBANKMENT- MEDIUM STIFF TO STIFF, MOIST, TAN-RED-BROWN, FINE TO COARSE SANDY SILT (A-4) AND SILT (A-5), WITH TRACE GRAVEL

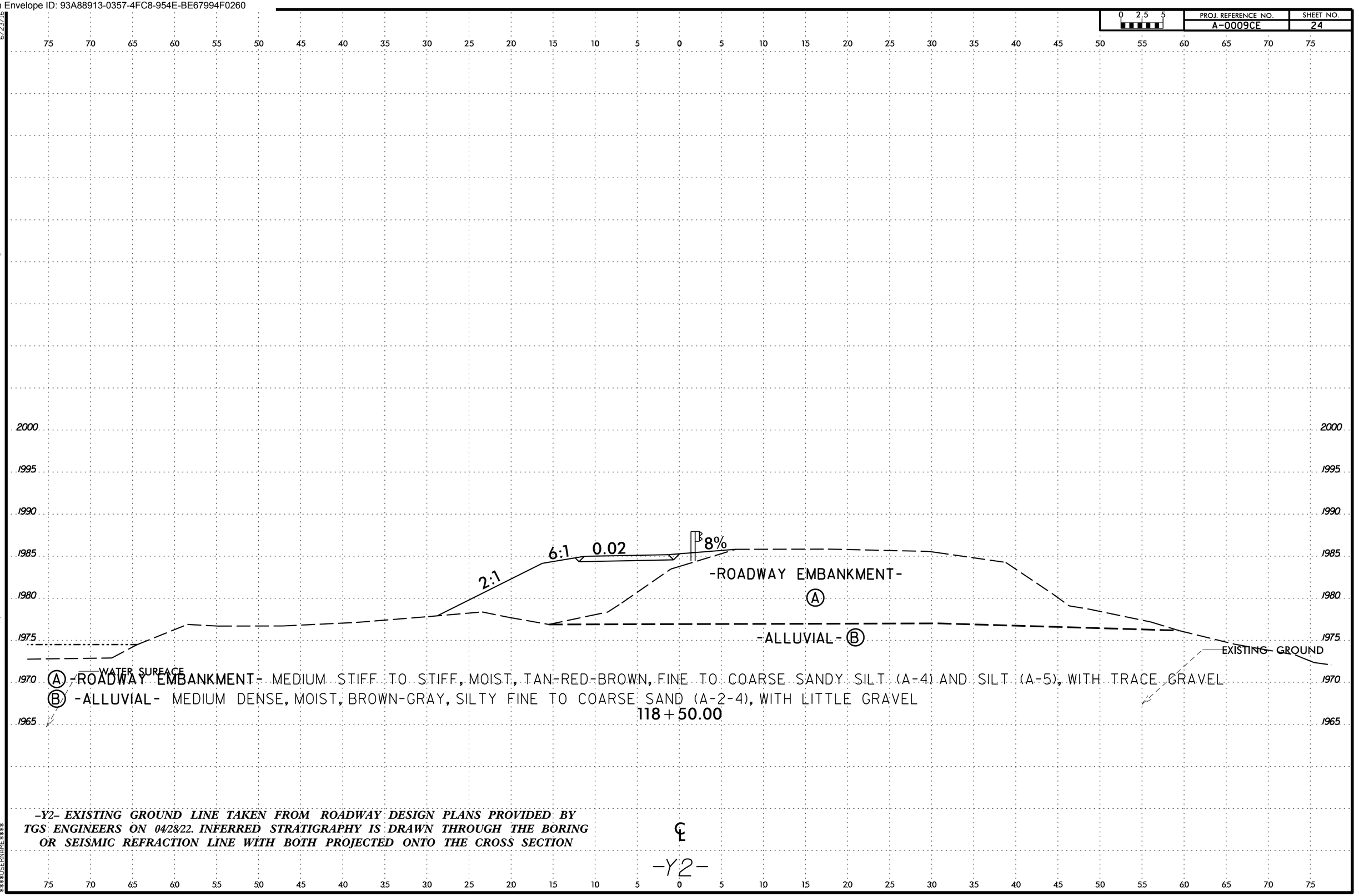
Ⓑ -ALLUVIAL- MEDIUM DENSE, MOIST, BROWN-GRAY, SILTY FINE TO COARSE SAND (A-2-4), WITH LITTLE GRAVEL

118+00.00

-Y2- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 04/28/22. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

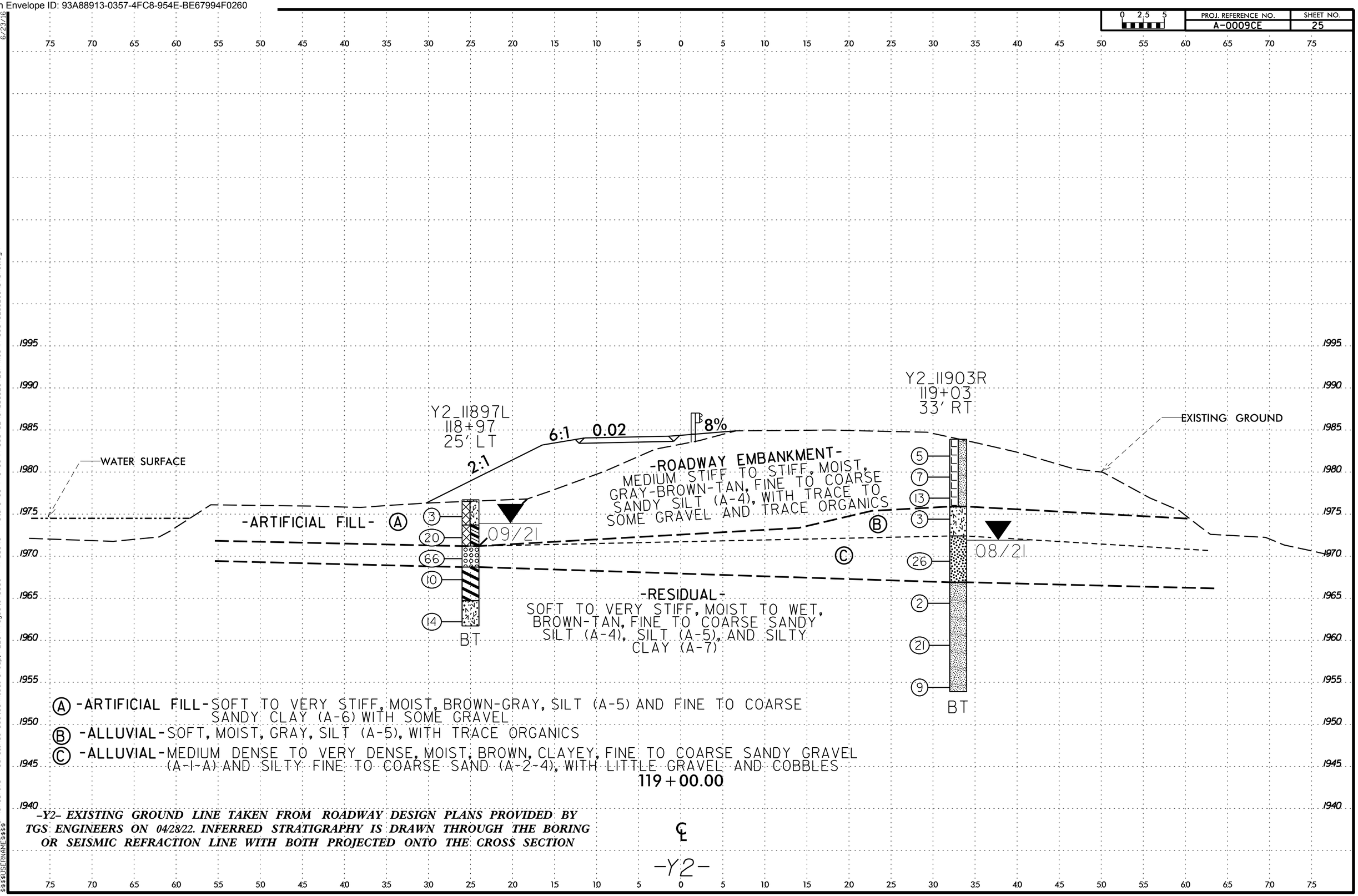
℄

-Y2-



-Y2- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 04/28/22. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	A-0009CE	25



Ⓐ -ARTIFICIAL FILL- SOFT TO VERY STIFF, MOIST, BROWN-GRAY, SILT (A-5) AND FINE TO COARSE SANDY CLAY (A-6) WITH SOME GRAVEL

Ⓑ -ALLUVIAL- SOFT, MOIST, GRAY, SILT (A-5), WITH TRACE ORGANICS

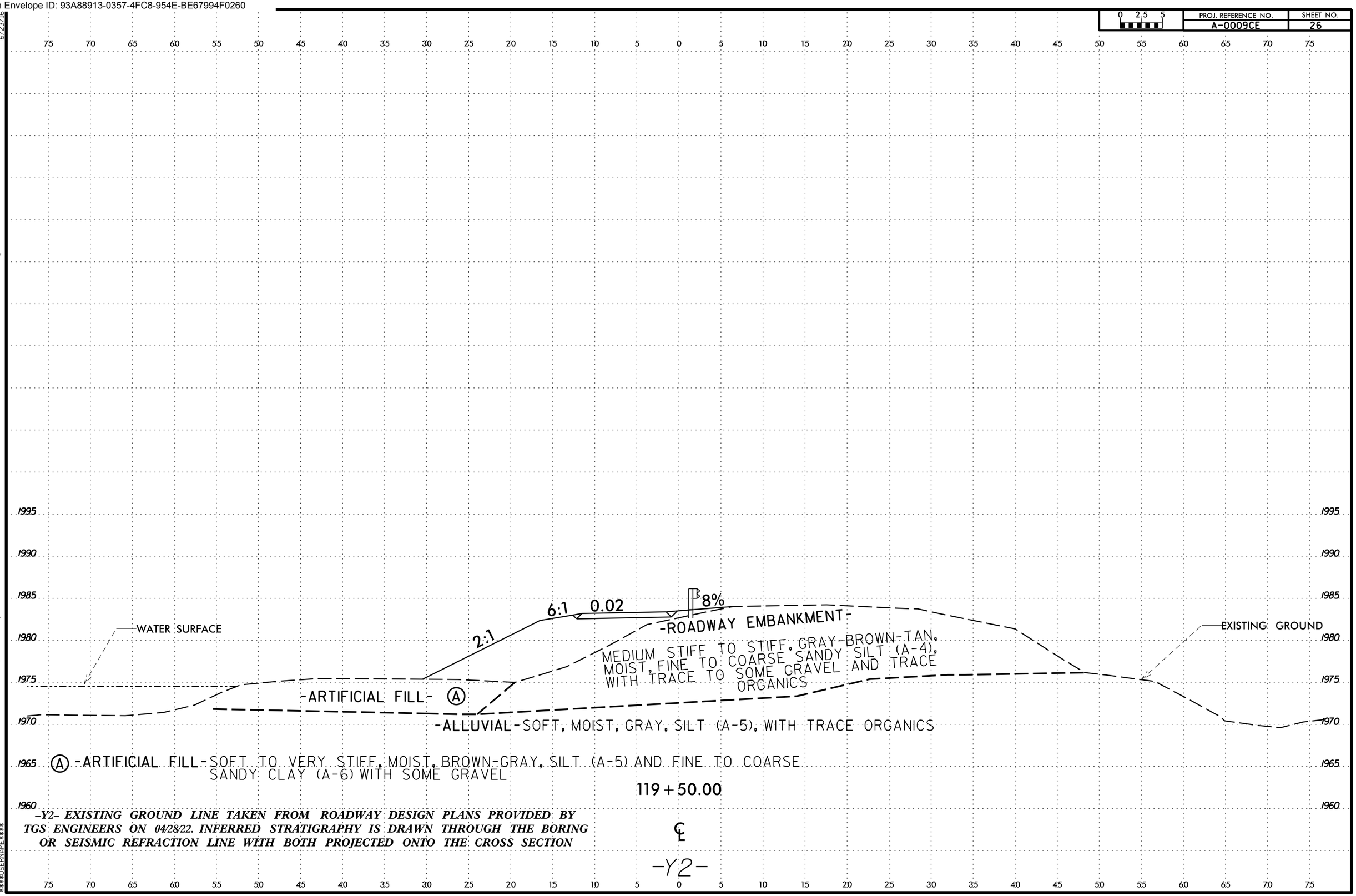
Ⓒ -ALLUVIAL- MEDIUM DENSE TO VERY DENSE, MOIST, BROWN, CLAYEY, FINE TO COARSE SANDY GRAVEL (A-1-A) AND SILTY FINE TO COARSE SAND (A-2-4), WITH LITTLE GRAVEL AND COBBLES

119+00.00

℄

-Y2-

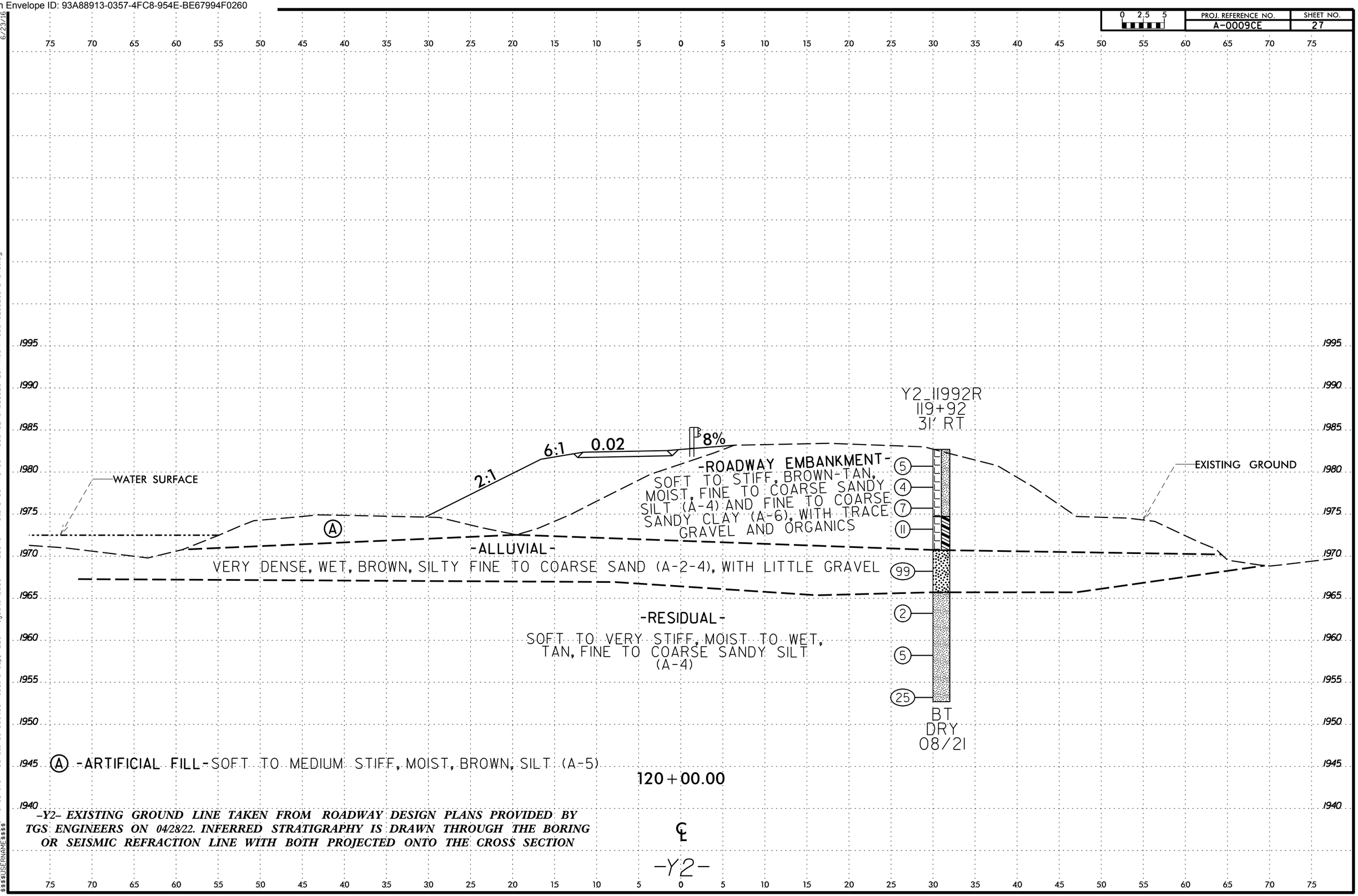
-Y2- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 04/28/22. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION



-Y2- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 04/28/22. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

PROJ. REFERENCE NO.	SHEET NO.
A-0009CE	27

0 2.5 5



-Y2- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 04/28/22. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

6/23/16

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0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	A-0009CE	28

6/23/16

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

1995 1990 1985 1980 1975 1970 1965 1960

WATER SURFACE

2:1

6:1 0.02 8%

-ROADWAY EMBANKMENT-
SOFT TO STIFF, BROWN-TAN, MOIST, FINE TO COARSE SANDY SILT (A-4) AND FINE TO COARSE SANDY CLAY (A-6), WITH TRACE GRAVEL AND ORGANICS

EXISTING GROUND

Ⓐ

-ALLUVIAL-
VERY DENSE, WET, BROWN, SILTY FINE TO COARSE SAND (A-2-4), WITH LITTLE GRAVEL

Ⓐ -ARTIFICIAL FILL- SOFT TO MEDIUM STIFF, MOIST, BROWN, SILT (A-5)

120+50.00

℄

-Y2-

-Y2- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 04/28/22. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO 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

24-MAY-2024 13:17
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$$$$USERNAME$$$$

PROJ. REFERENCE NO.	SHEET NO.
A-0009CE	29

0 2.5 5

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

1995 1990 1985 1980 1975 1970 1965 1960 1955 1950 1945 1940

Y2_12113L
121+13
31' LT

Y2_12098R
120+98
33' RT

6:1 0.02 8%

2:1

WATER SURFACE

EXISTING GROUND

-ROADWAY EMBANKMENT-
SOFT TO STIFF, MOIST, TAN-BROWN, FINE TO COARSE SANDY SILT (A-4) AND SILT (A-5), WITH TRACE ORGANICS AND TRACE TO LITTLE GRAVEL

Ⓐ 4 2 18 9 20

09/21

MEDIUM DENSE TO DENSE, DRY TO WET, GRAY-TAN-BROWN, -ALLUVIAL- SILTY FINE TO COARSE SAND (A-2-4),

3 11 7 8 49 2 6 5

FINE TO COARSE SANDY GRAVEL (A-1-A) AND WITH LITTLE GRAVEL

-RESIDUAL-
SOFT TO VERY STIFF, WET, GRAY-BROWN-TAN, FINE TO COARSE SANDY SILT (A-4) AND SILT (A-5), WITH TRACE MANGANESE OXIDE AND TRACE GRAVEL-SIZED ROCK FRAGMENTS

BT

BT
DRY
08/21

Ⓐ -ARTIFICIAL FILL- SOFT TO MEDIUM STIFF, MOIST, BROWN, SILT (A-5)

121+00.00
℄

-Y2-

-Y2- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 04/28/22. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	A-0009CE	30

6/23/16

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

1995 1990 1985 1980 1975 1970 1965 1960 1955

WATER SURFACE

EXISTING GROUND

2:1

6:1

0.02

8%

-ROADWAY EMBANKMENT-
SOFT TO STIFF, MOIST, TAN-BROWN, FINE TO COARSE SANDY SILT (A-4) AND SILT (A-5), WITH TRACE ORGANICS AND TRACE TO LITTLE GRAVEL

-ARTIFICIAL FILL- (A)

-ALLUVIAL- MEDIUM DENSE TO DENSE, DRY TO WET, GRAY-TAN-BROWN, FINE TO COARSE SANDY GRAVEL (A-1-A) AND SILTY FINE TO COARSE SAND (A-2-4), WITH LITTLE GRAVEL

(A) -ARTIFICIAL FILL- SOFT TO MEDIUM STIFF, MOIST, BROWN, SILT (A-5)

121+50.00

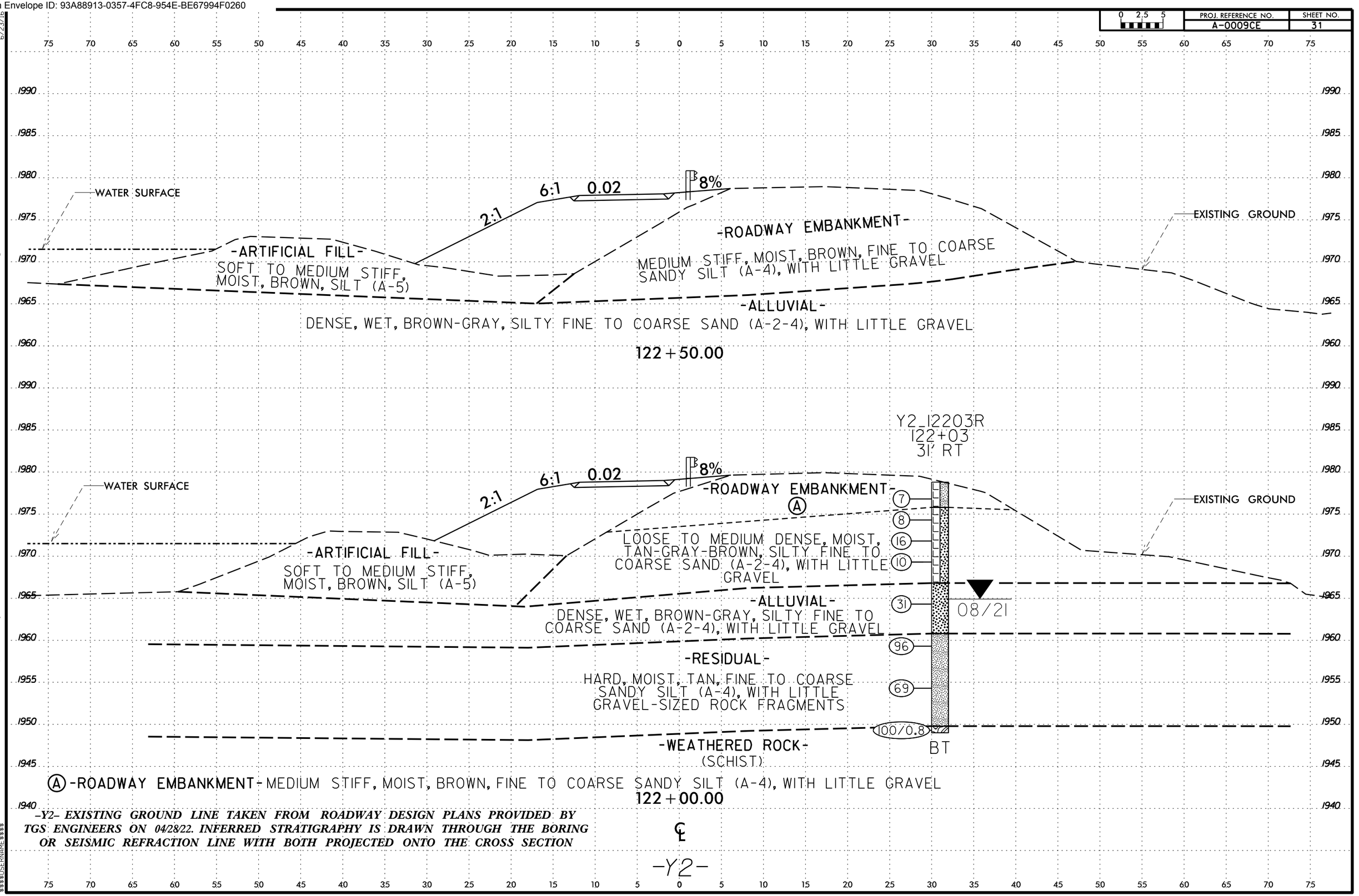
℄

-Y2-

-Y2- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 04/28/22. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

PROJ. REFERENCE NO.	SHEET NO.
A-0009CE	31

0 2.5 5



-Y2- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 04/28/22. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

6/23/16

C:\Users\$$$$USERNAME$$$$\OneDrive - Carolinas Geotechnical Group, PLLC\Projects\0068 - A-0009C - Future US 74_TGS\A-0009CE\CADD_GEOTECH\xsc\A-0009CE_GEO_RDY_XSI.dgn

24-MAY-2024 13:17

PROJ. REFERENCE NO.	SHEET NO.
A-0009CE	32

0 2.5 5

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

1985 1980 1975 1970 1965 1960 1955 1980 1975 1970 1965 1960 1955 1950 1945 1940 1935

2:1 2:1 12:1 2:1 6:1 0.02 8%

-ROADWAY EMBANKMENT-
Ⓐ

EXISTING GROUND

-ALLUVIAL-

VERY LOOSE TO MEDIUM DENSE, MOIST TO SAT., GRAY-BROWN, SILTY FINE SAND (A-2-4), CLAYEY GRAVEL (A-I-A), AND SILTY, GRAVELLY FINE TO COARSE SAND (A-I-B), WITH TRACE ORGANICS

Ⓐ-ROADWAY EMBANKMENT- LOOSE TO MEDIUM DENSE, MOIST, TAN-BROWN, SILTY FINE TO COARSE SAND (A-2-4), WITH LITTLE GRAVEL

123+50.00

Y2_I2292R
I22+92
30' RT

2:1 50:1 6:1 0.02 8%

Y2_I2298L
I22+98
I6' LT

-ROADWAY EMBANKMENT-
Ⓐ
Ⓑ

EXISTING GROUND

-ALLUVIAL-

VERY LOOSE TO MEDIUM DENSE, MOIST TO SAT., GRAY-BROWN, SILTY FINE SAND (A-2-4), CLAYEY GRAVEL (A-I-A), AND SILTY, GRAVELLY FINE TO COARSE SAND (A-I-B), WITH TRACE ORGANICS

WOH, II, I9, I8, 5, 24

BT
DRY
09/2I

8, I4, 7, 25, 25, 4, 6, I5

BT
DRY
08/2I

-RESIDUAL-

SOFT TO VERY STIFF, MOIST TO WET, TAN, SILT (A-5) AND FINE TO COARSE SANDY SILT (A-4)

Ⓐ-ROADWAY EMBANKMENT-LOOSE TO MEDIUM DENSE, MOIST, TAN-BROWN, SILTY FINE TO COARSE SAND (A-2-4), WITH LITTLE GRAVEL

Ⓑ-ROADWAY EMBANKMENT-VERY SOFT TO MEDIUM STIFF, MOIST, TAN-BROWN, FINE TO COARSE SANDY SILT (A-4), WITH LITTLE GRAVEL

123+00.00

℄

-Y2-

-Y2- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 04/28/22. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

6/23/16

24-MAY-2024 13:17
C:\Users\JBrewer\OneDrive - Carolinas Geotechnical Group, PLLC\Projects\0068 - A-0009C - Future US 74_TGS\A-0009CE\CADD_GEOTECH\xsc\A-0009CE_GEO_RDY_XSI.dgn
$$$$USERNAME$$$$

PROJ. REFERENCE NO.	SHEET NO.
A-0009CE	33

0 2.5 5

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

1985 1980 1975 1970 1965 1960 1955 1950 1945 1940

2:1 2:1 12:1 2:1 6:1 0.02 8%

-ROADWAY EMBANKMENT-
MEDIUM STIFF TO VERY STIFF, MOIST TO WET, TAN-GRAY, FINE TO COARSE SANDY SILT (A-4), WITH LITTLE GRAVEL

EXISTING GROUND

-ALLUVIAL- DENSE, MOIST, TAN-GRAY, SILTY FINE TO COARSE SAND (A-2-4), WITH LITTLE GRAVEL

124+50.00

Y2_1240IR
124+01
31' RT

6
16
7
13
45
14
29
5

08/21

-RESIDUAL-
MEDIUM STIFF TO VERY STIFF, MOIST TO WET, TAN, FINE TO COARSE SANDY SILT (A-4)

BT

124+00.00

℄

-Y2-

-Y2- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 04/28/22. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

6/23/16

24-MAY-2024 13:17
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PROJ. REFERENCE NO.	SHEET NO.
A-0009CE	34

0 2.5 5

6:1 0.02 8%

2:1

-ROADWAY EMBANKMENT-
SOFT TO HARD, MOIST, TAN-BROWN-GRAY, FINE TO COARSE SANDY SILT (A-4) AND SILT (A-5), WITH TRACE TO LITTLE GRAVEL

EXISTING GROUND

-ALLUVIAL-
DENSE TO HARD, MOIST, TAN-GRAY-BROWN, SILTY FINE TO COARSE SAND (A-2-4), WITH LITTLE GRAVEL

125+50.00

Y2_I2508L
I25+08
I8' LT

Y2_I2499R
I24+99
32' RT

2:1 2:1 12:1

13
38
2
4
4
6
BT

09/21

DENSE, MOIST, TAN-GRAY-BROWN, SILTY FINE SAND (A-2-4), WITH

-RESIDUAL-
SOFT TO VERY STIFF, MOIST, TAN-BROWN, FINE TO COARSE SANDY SILT (A-4) AND SILT (A-5), WITH TRACE TO LITTLE GRAVEL-SIZED ROCK FRAGMENTS

3
10
15
51
41
12
16
BT

08/21

TO COARSE
LITTLE GRAVEL
-ALLUVIAL-

125+00.00

-Y2- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 04/28/22. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

-Y2-

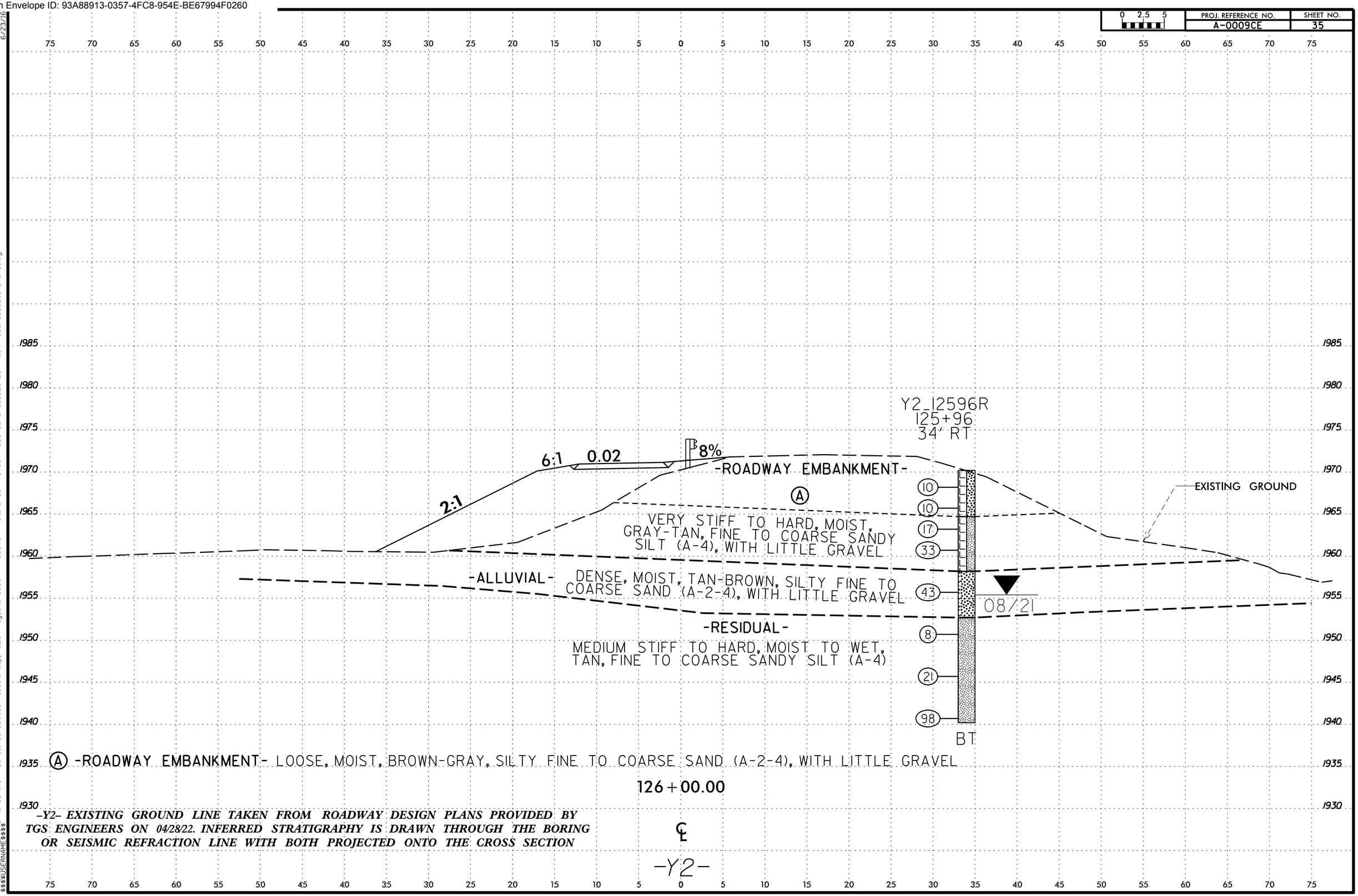
1985 1980 1975 1970 1965 1960 1955 1950 1945 1940

85 80 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

6/23/16

24-MAY-2024 13:17
C:\Users\$$$$USERNAME$$$$\TGS\A-0009CE\CADD_GEOTECH\xsc\A-0009CE_GEO_RDY_XSI.dgn

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	A-0009CE	35



Ⓐ -ROADWAY EMBANKMENT- LOOSE, MOIST, BROWN-GRAY, SILTY FINE TO COARSE SAND (A-2-4), WITH LITTLE GRAVEL

126+00.00

℄

-Y2-

-Y2- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 04/28/22. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

PROJ. REFERENCE NO.	SHEET NO.
A-0009CE	36

Y2_I2688R
I26+88
33' RT

16.67 %

-ROADWAY EMBANKMENT-
LOOSE, MOIST, BROWN, SILTY FINE TO COARSE SAND (A-2-4), WITH LITTLE GRAVEL

STIFF TO VERY STIFF, MOIST, TAN-GRAY-LIGHT GRAY, FINE TO COARSE SANDY SILT (A-4), WITH LITTLE GRAVEL

-ALLUVIAL-
LOOSE, MOIST, BROWN, SILTY FINE TO COARSE SAND (A-2-4), WITH LITTLE GRAVEL

-RESIDUAL-
VERY SOFT TO MEDIUM STIFF, MOIST TO WET, TAN, FINE TO COARSE SANDY SILT (A-4)

8 7 24 11 10 2 1 5

08/21

EXISTING GROUND

BT

127+00.00

6:1 0.02 8%

2:1

-ROADWAY EMBANKMENT-
VERY STIFF TO HARD, MOIST, GRAY-TAN, FINE TO COARSE SANDY SILT (A-4), WITH LITTLE GRAVEL

-ALLUVIAL- DENSE, MOIST, TAN-BROWN, SILTY FINE TO COARSE SAND (A-2-4), WITH LITTLE GRAVEL

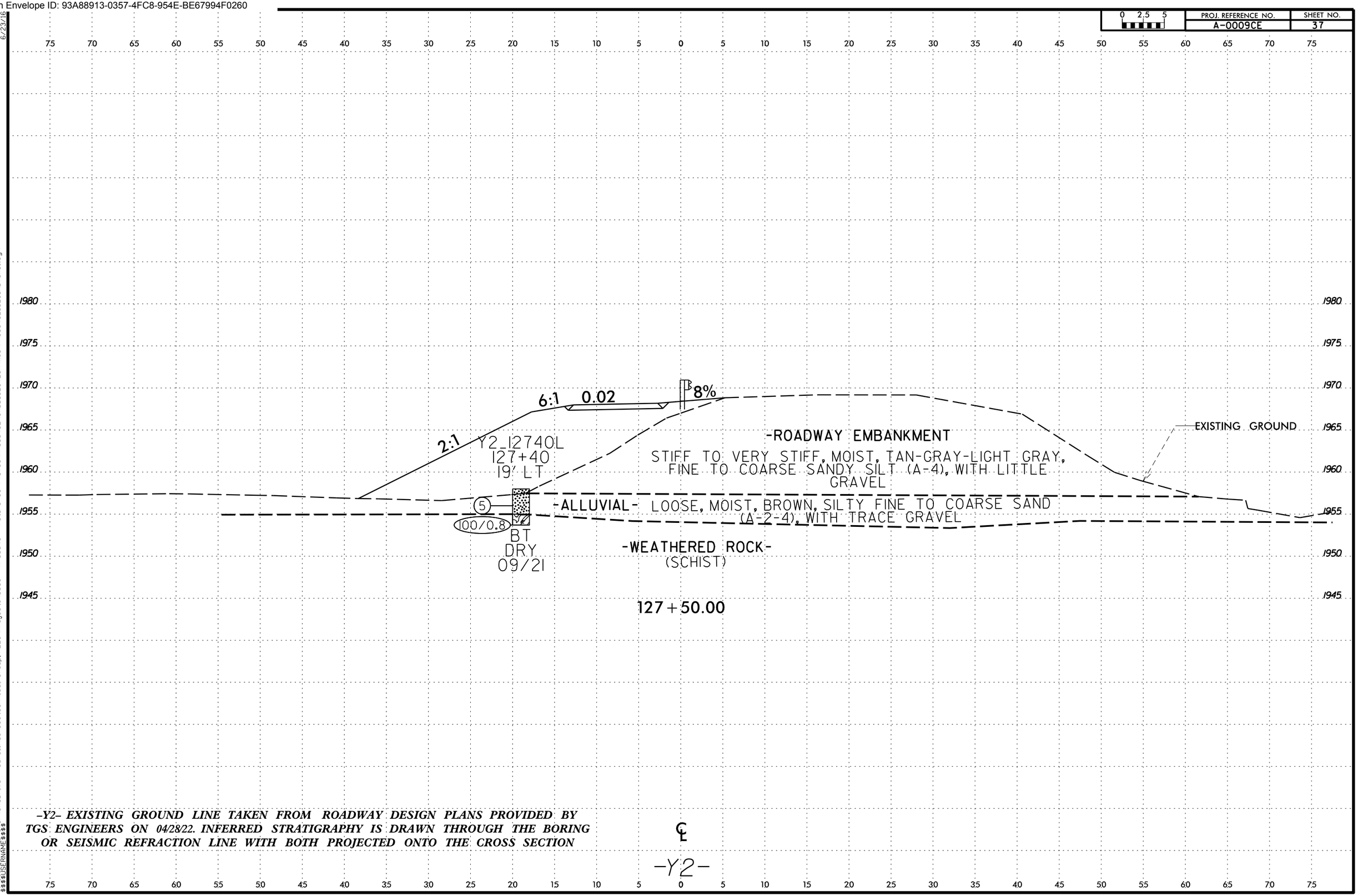
EXISTING GROUND

126+50.00

-Y2- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 04/28/22. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

℄

-Y2-



-Y2- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 04/28/22. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

6/23/16

24-MAY-2024 13:17
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PROJ. REFERENCE NO.	SHEET NO.
A-0009CE	38

0 2.5 5

6:1 0.02 8%

2:1

-ROADWAY EMBANKMENT-
MEDIUM STIFF TO VERY STIFF, MOIST, TAN-GRAY, FINE TO COARSE SANDY SILT (A-4), WITH LITTLE GRAVEL

EXISTING GROUND

-ALLUVIAL-
MEDIUM DENSE, WET, GRAY-TAN, SILTY, GRAVELLY FINE TO COARSE SAND (A-1-B)

128+50.00

Y2_I280IR
128+01
32' RT

6:1 0.02 8%

2:1

-ROADWAY EMBANKMENT-
MEDIUM STIFF TO VERY STIFF, MOIST, TAN-GRAY, FINE TO COARSE SANDY SILT (A-4), WITH LITTLE GRAVEL

EXISTING GROUND

7
23
7
18
22
27
48
47

08/21

BT

MEDIUM DENSE, MOIST, BROWN, SILTY FINE TO COARSE SAND (A-2-4), WITH LITTLE GRAVEL

-ALLUVIAL-
MEDIUM DENSE, WET, GRAY-TAN, SILTY, GRAVELLY FINE TO COARSE SAND (A-1-B)

-RESIDUAL-
VERY STIFF TO HARD, MOIST TO WET, TAN-GRAY, FINE TO COARSE SANDY SILT (A-4)

128+00.00

℄

-Y2-

-Y2- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 04/28/22. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

1980 1975 1970 1965 1960 1955 1950 1945 1940 1935 1930

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

PROJ. REFERENCE NO.	SHEET NO.
A-0009CE	39

0 2.5 5

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

1980 1975 1970 1965 1960 1955 1950 1945 1940 1935 1930

CULV_Y2_1290IL
129+01
37' LT

EXISTING GROUND

2:1 6:1 0.02 8%

-ROADWAY EMBANKMENT-
SOFT TO MEDIUM STIFF, MOIST, BROWN, FINE SANDY, CLAYEY SILT (A-5)

15
17
09/21
100/0.7
10
19
14
BT

-ALLUVIAL- MEDIUM DENSE TO VERY DENSE, MOIST, BROWN-GRAY, GRAVELLY FINE TO COARSE SAND (A-1-B)

-RESIDUAL-
STIFF TO VERY STIFF, MOIST, TAN, SILT (A-5)

129+00.00

-Y2- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 04/28/22. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

℄
-Y2-

6/23/16

24-MAY-2024 13:17
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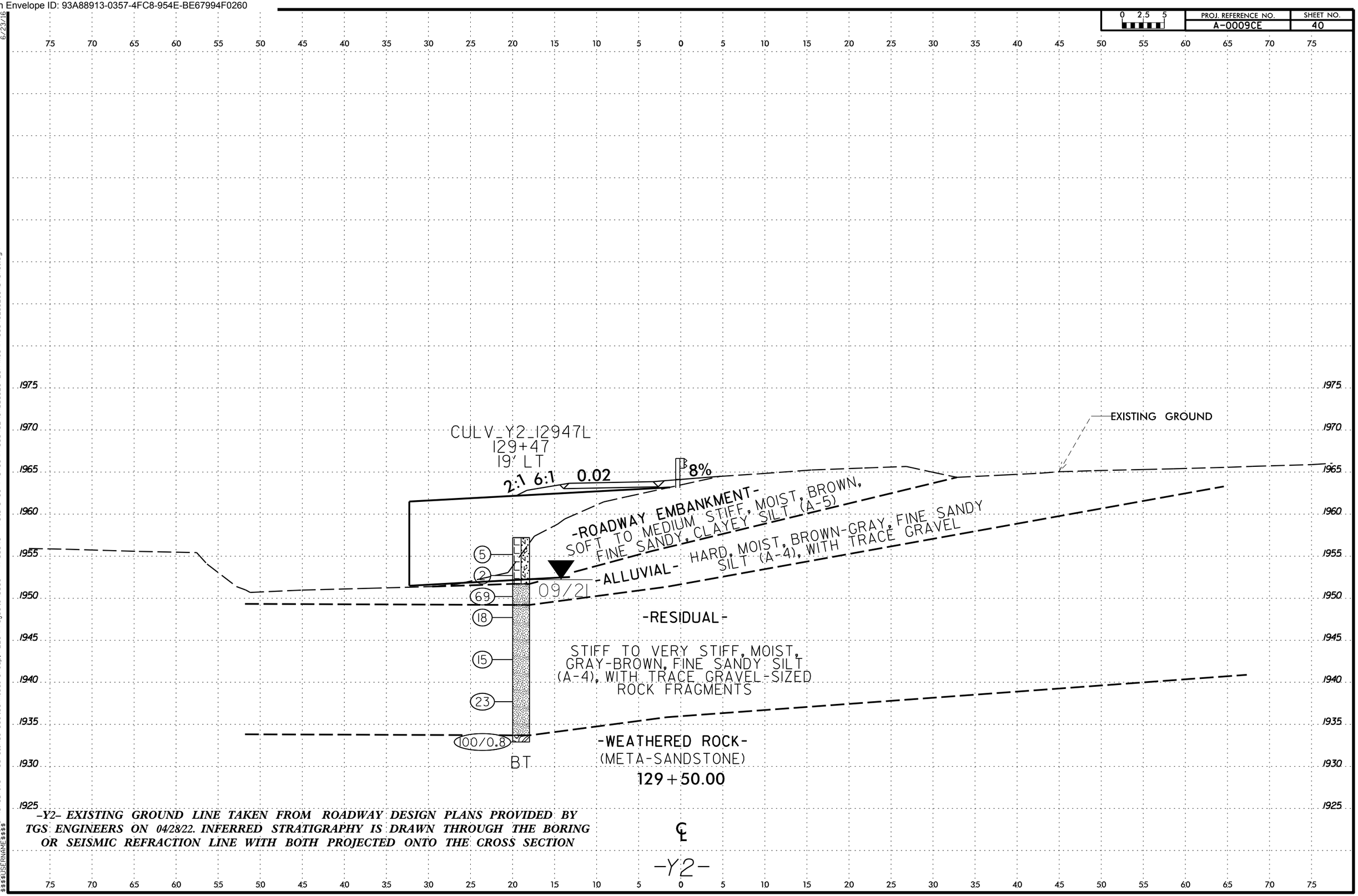
0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	A-0009CE	40



-Y2- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 04/28/22. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

6/23/16

C:\Users\$$$$USERNAME$$$$\OneDrive - Carolinas Geotechnical Group, PLLC\Projects\0068 - A-0009C - Future US 74_TGS\A-0009CE\CADD_GEOTECH\xsc\A-0009CE_GEO_RDY_XSI.dgn
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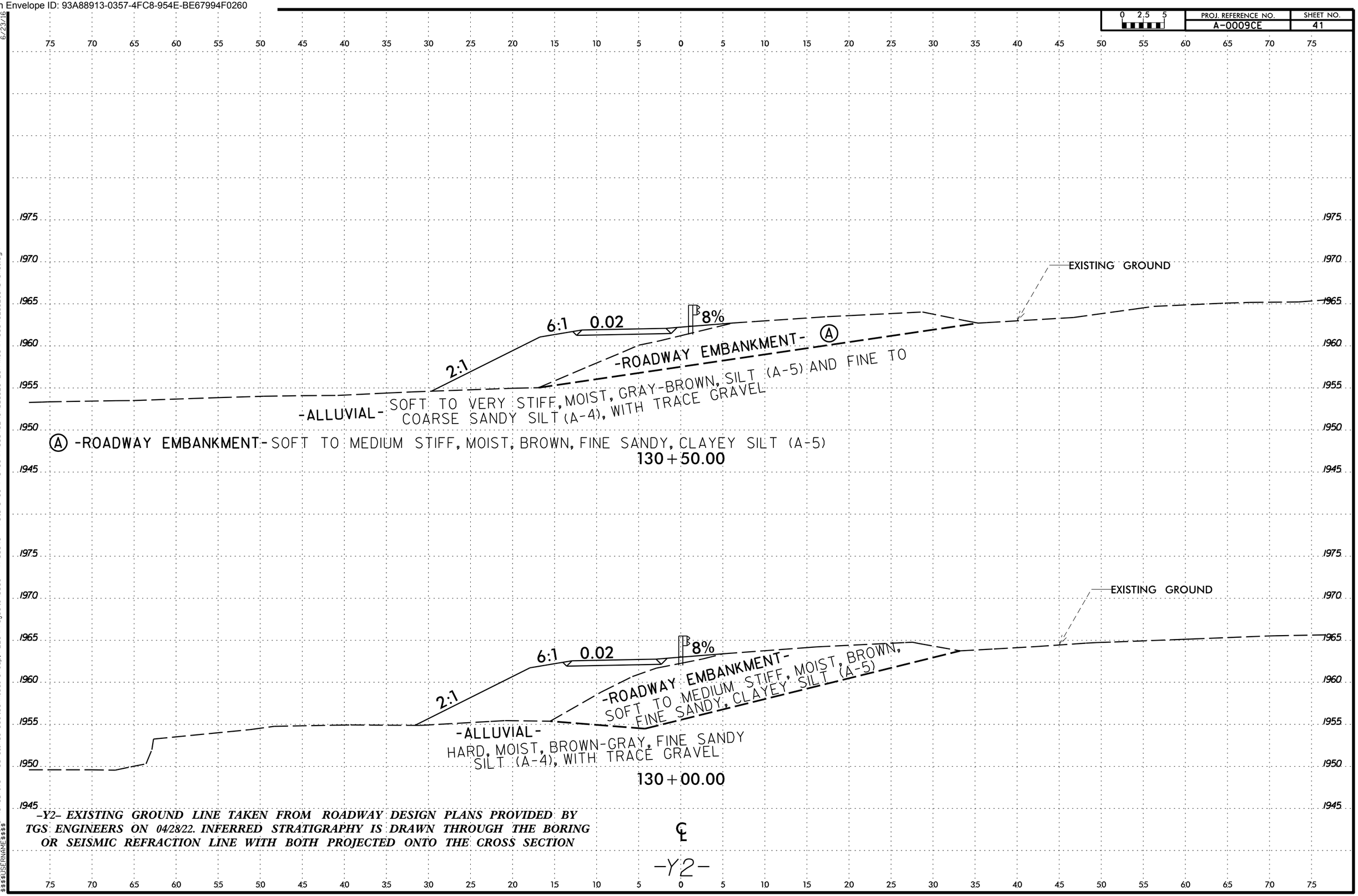
$$$$USERNAME$$$$

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	A-0009CE	41



-Y2- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 04/28/22. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

6/23/16

24-MAY-2024 13:17
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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

1975 1970 1965 1960 1955 1950 1945 1940 1935 1930 1925 1920 1915 1910

EXISTING GROUND

6:1 0.02 8%

Y2-13100L
2131+06
19' LT

-ROADWAY EMBANKMENT- (A)

-ALLUVIAL- SOFT TO VERY STIFF, COARSE SANDY SILT

MOIST, GRAY-BROWN, SILT (A-5) AND FINE TO (A-4), WITH TRACE GRAVEL

-RESIDUAL- MEDIUM STIFF TO STIFF, MOIST TO WET, GRAY-BROWN, SILT (A-5), WITH TRACE GRAVEL-SIZED ROCK FRAGMENTS

3 20 5 14

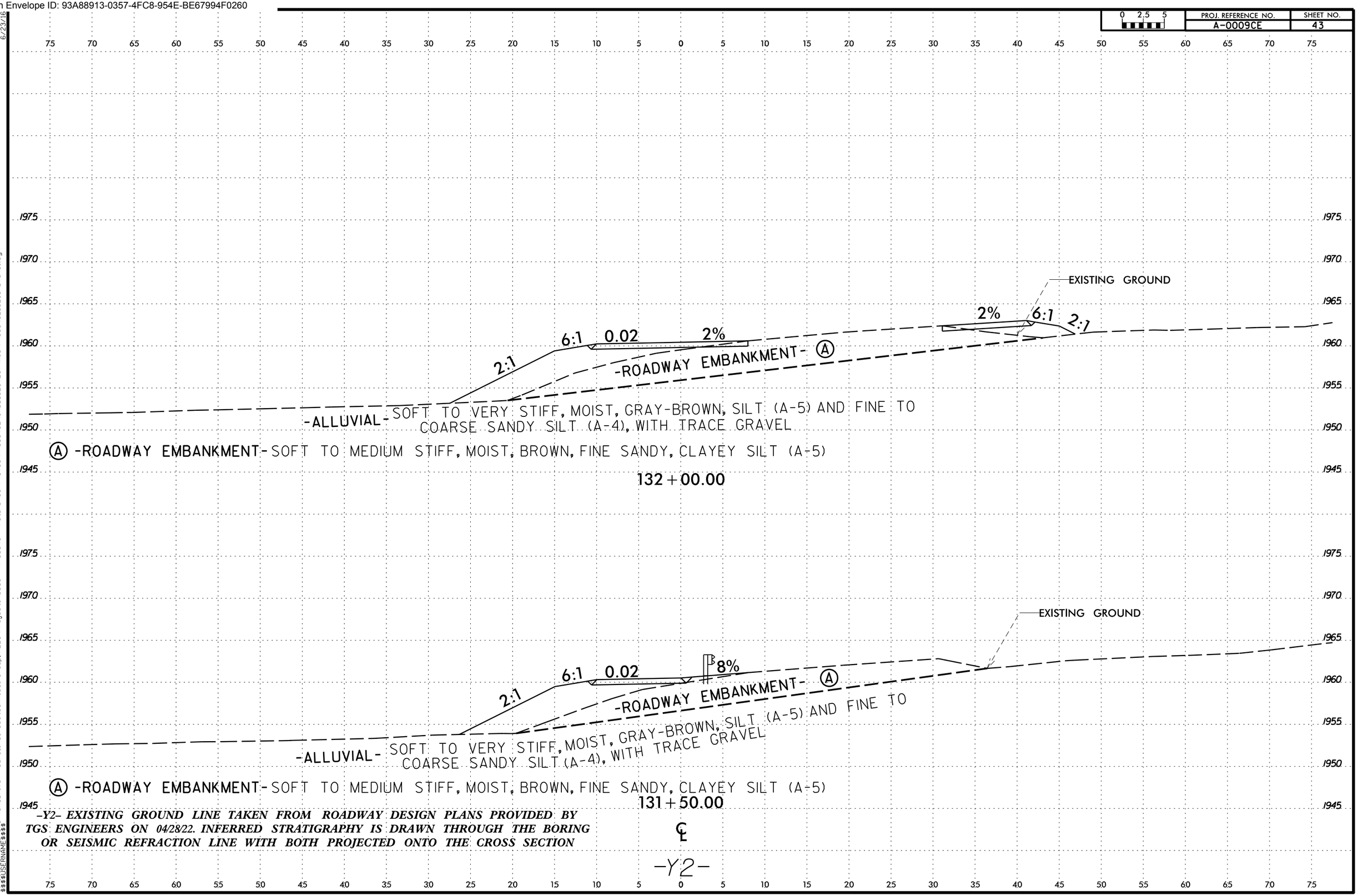
BT
DRY
09/21

(A) -ROADWAY EMBANKMENT- SOFT TO MEDIUM STIFF, MOIST, BROWN, FINE SANDY, CLAYEY SILT (A-5)

-Y2- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 04/28/22. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

131+00.00
℄
-Y2-

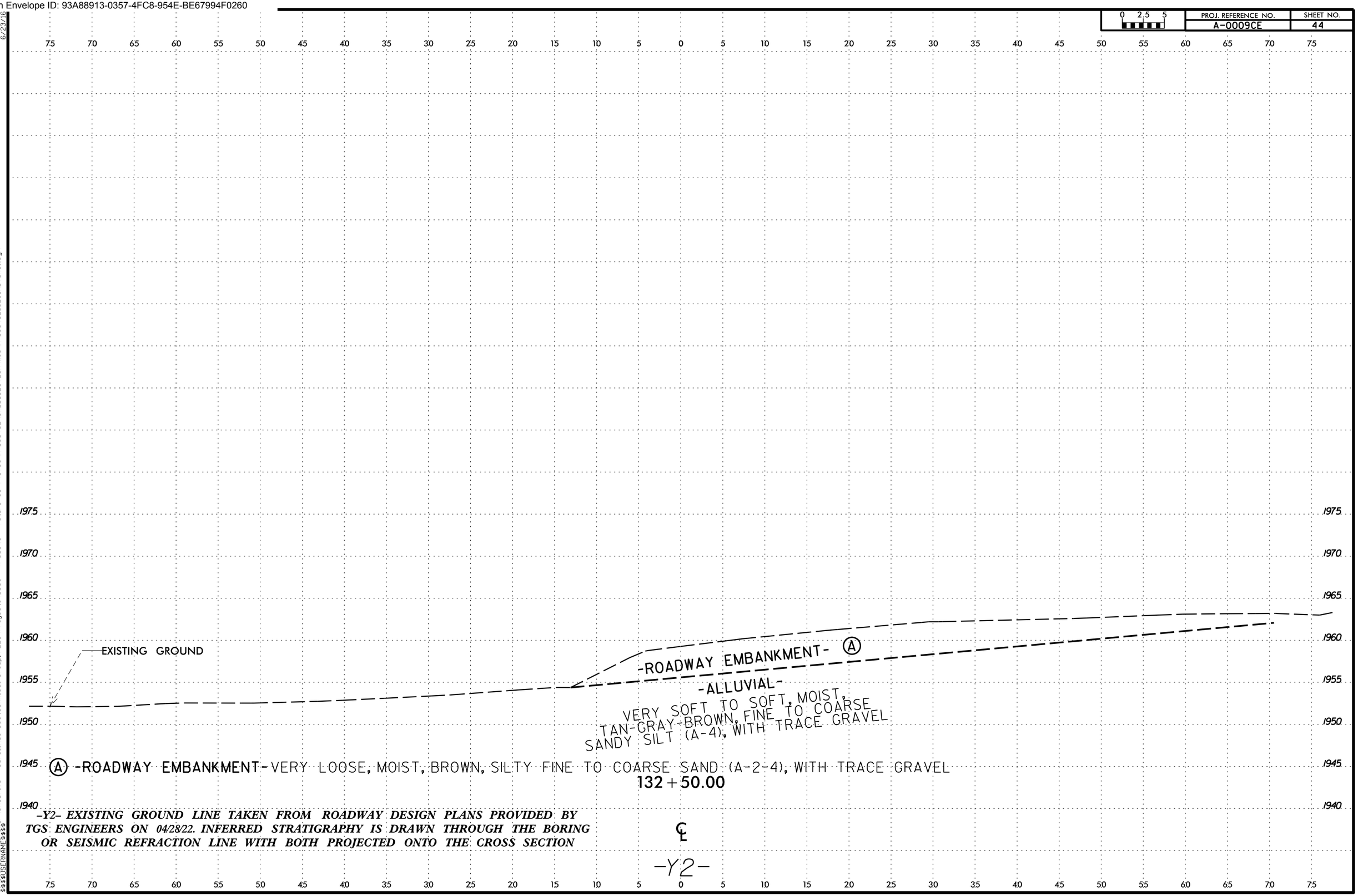
0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	A-0009CE	43



-Y2- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 04/28/22. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

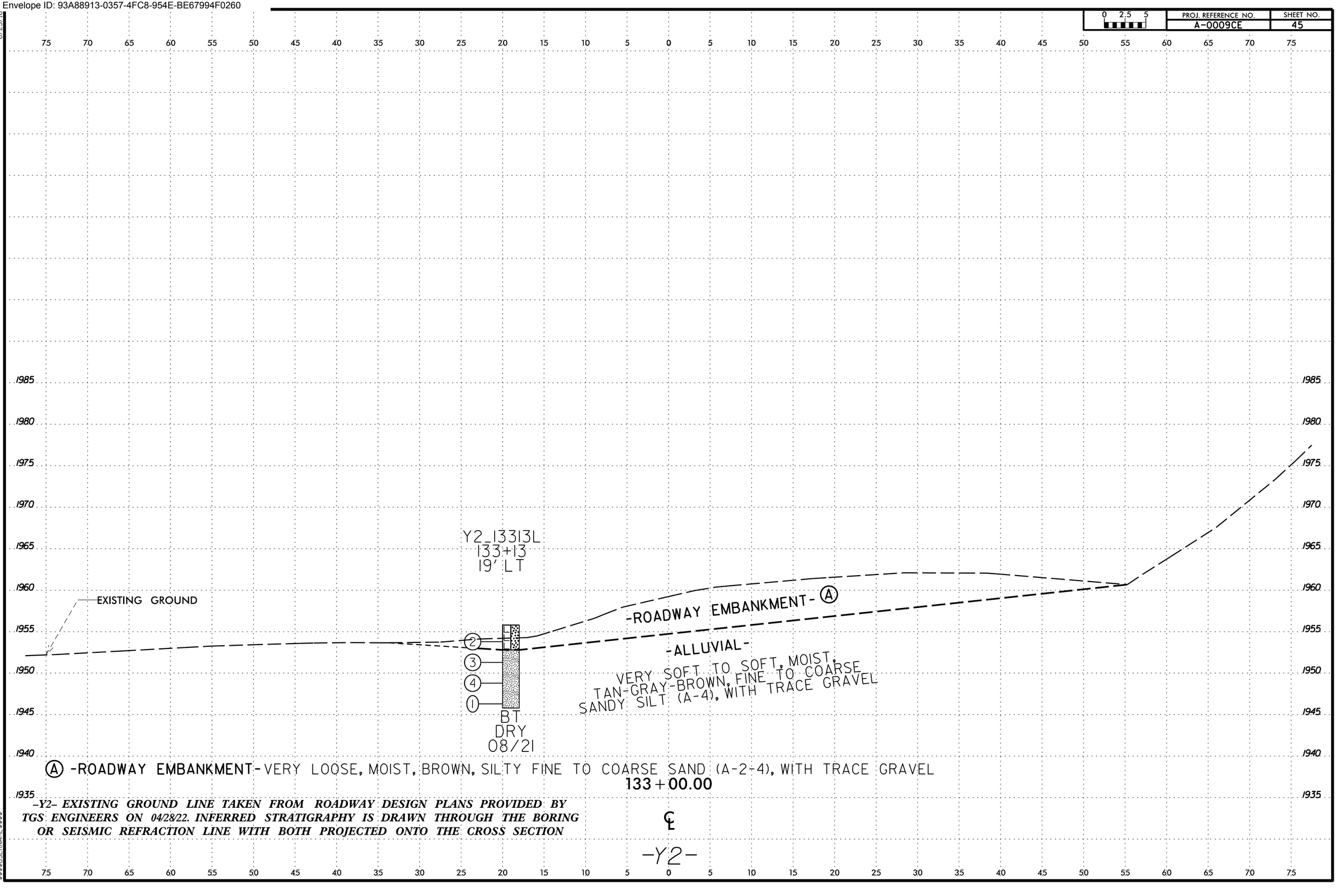
0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
A-0009CE	44



-Y2- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 04/28/22. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	A-0009CE	45



-Y2- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 04/28/22. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

6/23/16

24-MAY-2024 13:17
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$$$$USERNAME$$$$

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	A-0009CE	46

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 80 85 90 95 100

2010
2005
2000
1995
1990
1985
1980
1975
1970
1965
1960
1955
1950
1945
1940

EXISTING GROUND

-ROADWAY EMBANKMENT- Ⓐ

-ALLUVIAL-

VERY SOFT TO SOFT, MOIST, TAN-GRAY-BROWN, FINE TO COARSE SANDY SILT (A-4), WITH TRACE GRAVEL

Ⓐ -ROADWAY EMBANKMENT- VERY LOOSE, MOIST, BROWN, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE GRAVEL

133+50.00

℄

-Y2- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 04/28/22. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

-Y2-

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 80 85 90 95 100

PROJECT REFERENCE NO.	SHEET NO.
A–0009CE	47

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

APPENDIX A
SOIL TEST RESULTS (I)

PROJECT: 32572 REFERENCE: A–0009CE

Prepared in the Office of:
FALCON ENGINEERS, INC
CARY, NORTH CAROLINA
NCDOT LAB CERT. NO. 105–0803

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–4483	38' LT	103+48 –Y2–	3.5' – 5.0'	A–4(0)	28	2	32	25	24	19	96	74	49	14	–
SS–1009	35' RT	107+75 –Y2–	8.5' – 10.0'	A–4(0)	28	3	26	24	25	25	75	61	42	16	–
SS–4451	35' RT	114+25 –Y2–	8.5' – 10.0'	A–4(1)	36	5	25	27	29	19	84	69	47	15	–

PROJECT REFERENCE NO.	SHEET NO.
A–0009CE	49

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

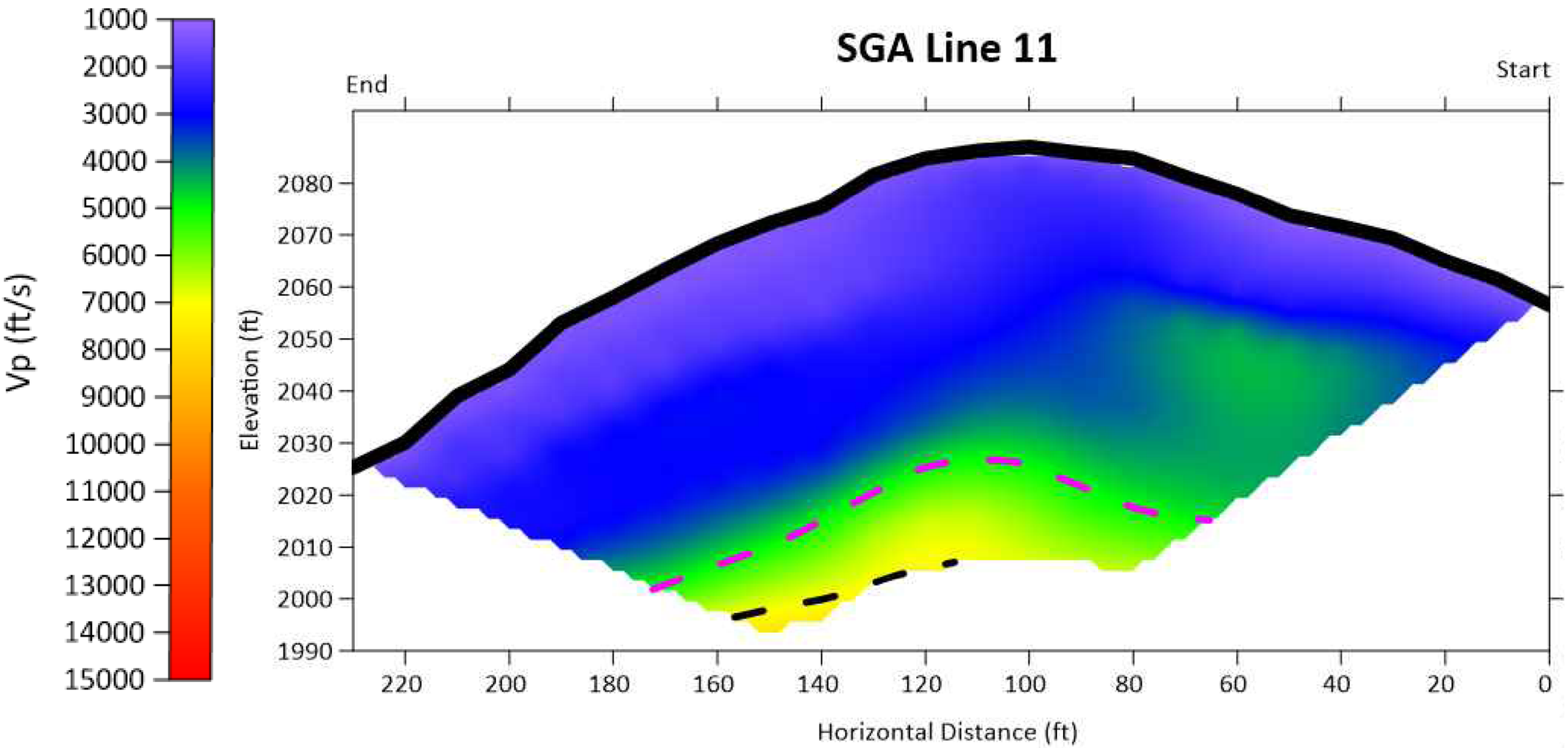
SUBSURFACE INVESTIGATION

APPENDIX B
GEOPHYSICAL TEST RESULTS

PROJECT: 32572 REFERENCE: A–0009CE

PROJECT REFERENCE NO.	SHEET NO.
A-0009CE	50

GEOPHYSICAL TEST RESULTS – SEISMIC REFRACTION LINE SGA 11



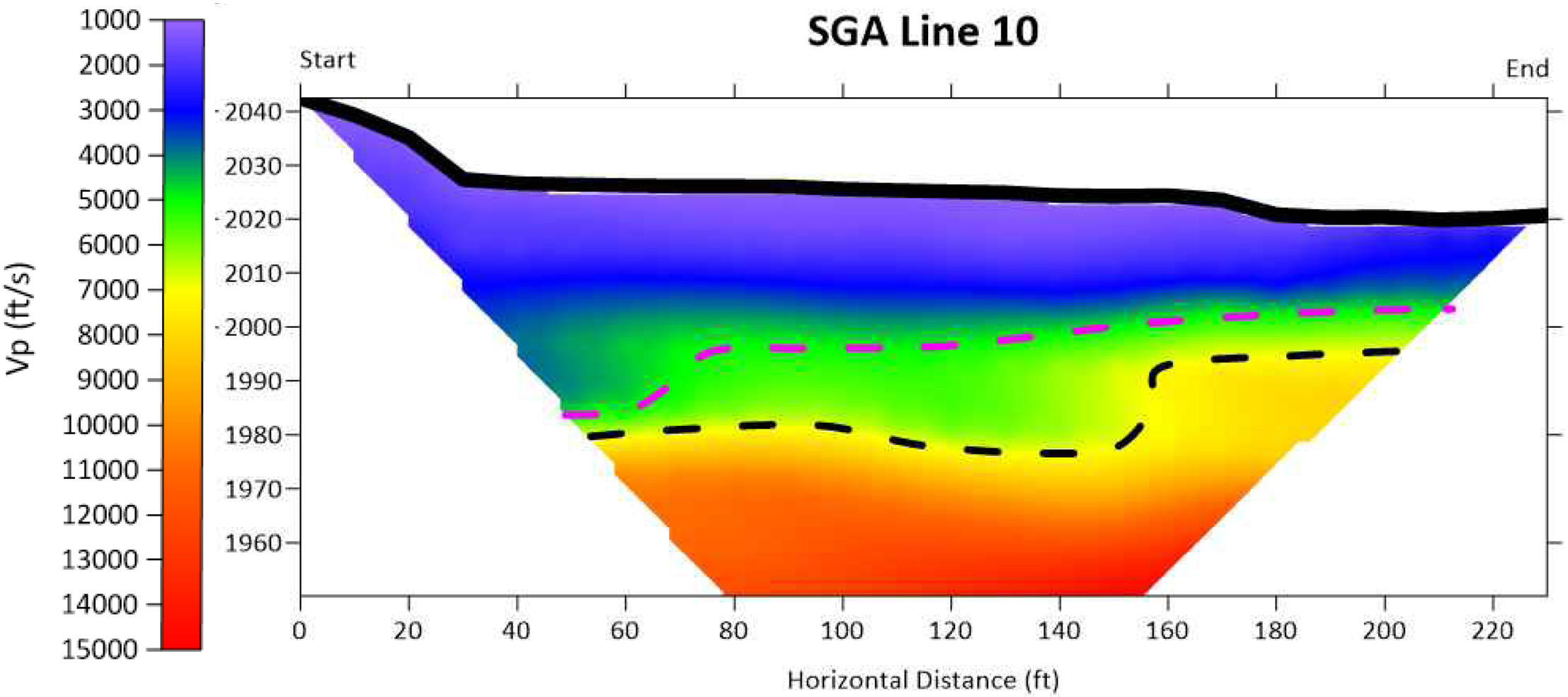
GEOPHYSICAL TESTING PERFORMED BY GEL SOLUTIONS. REFERENCE "SEISMIC REFRACTION SURVEY FOR EVALUATION OF ROCK" DATED 10/01/2021

CG2 ESTIMATED WAVE SPEED FOR WEATHERED ROCK: 4,500 FT/SEC

CG2 ESTIMATED WAVE SPEED FOR CRYSTALLINE ROCK: 7,500 FT/SEC

PROJECT REFERENCE NO.	SHEET NO.
A-0009CE	51

GEOPHYSICAL TEST RESULTS – SEISMIC REFRACTION LINE SGA 10



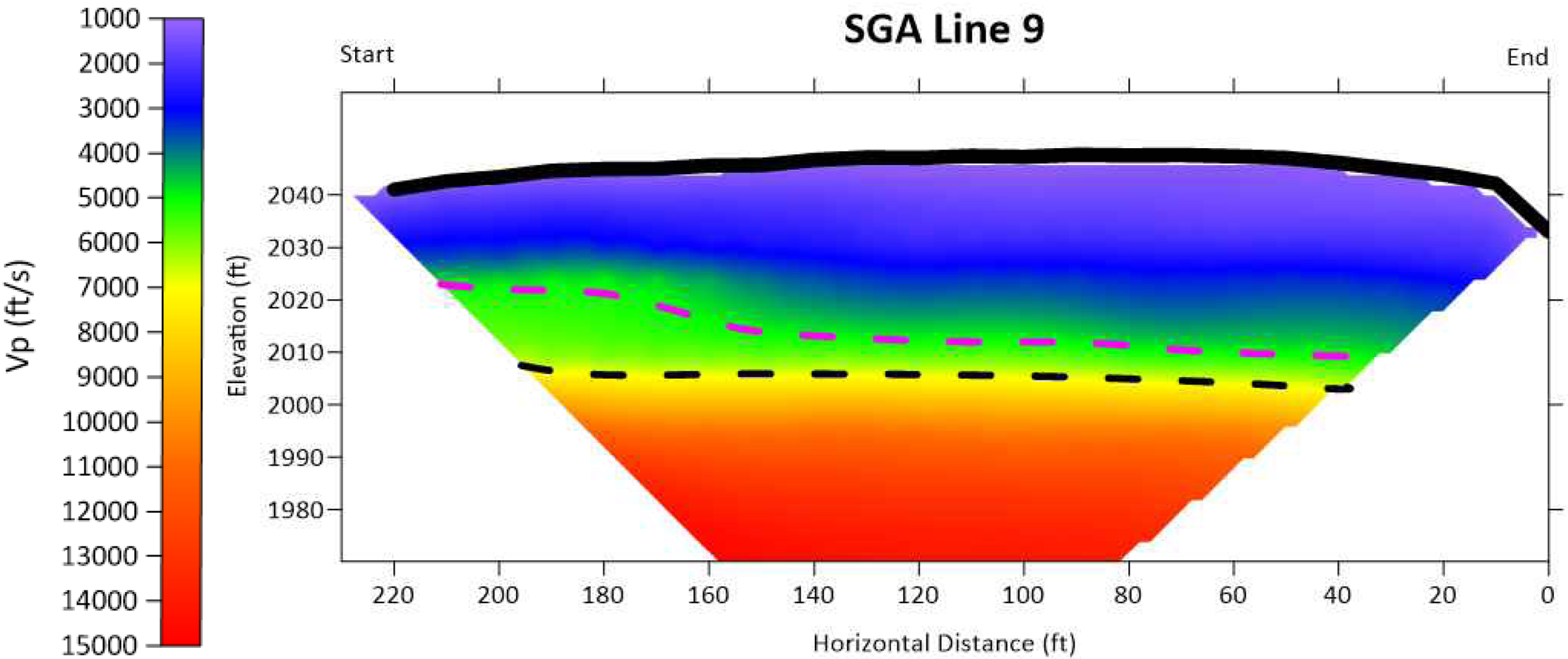
GEOPHYSICAL TESTING PERFORMED BY GEL SOLUTIONS. REFERENCE "SEISMIC REFRACTION SURVEY FOR EVALUATION OF ROCK" DATED 10/01/2021

CG2 ESTIMATED WAVE SPEED FOR WEATHERED ROCK: 4,500 FT/SEC

CG2 ESTIMATED WAVE SPEED FOR CRYSTALLINE ROCK: 7,500 FT/SEC

PROJECT REFERENCE NO.	SHEET NO.
A-0009CE	52

GEOPHYSICAL TEST RESULTS – SEISMIC REFRACTION LINE SGA 9



GEOPHYSICAL TESTING PERFORMED BY GEL SOLUTIONS. REFERENCE "SEISMIC REFRACTION SURVEY FOR EVALUATION OF ROCK" DATED 10/01/2021

CG2 ESTIMATED WAVE SPEED FOR WEATHERED ROCK: 4,500 FT/SEC

CG2 ESTIMATED WAVE SPEED FOR CRYSTALLINE ROCK: 7,500 FT/SEC