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REFERENCE: A-0009CB

PROJECT: 32572.1.FS10

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	A-0009CB	1	101

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

STRUCTURE SUBSURFACE INVESTIGATION

COUNTY *GRAHAM*

PROJECT DESCRIPTION *UPGRADE NC 143 FROM SR 1223 (BEECH CREEK ROAD) TO 0.5 MILES NORTH OF APPALACHIAN TRAIL*

SITE DESCRIPTION *RETAINING WALL #19A & #19B: TIERED AND VERTICAL SOIL NAIL WALL WITH ARCHITECTURAL FORM LINER FINISH ON –L– FROM 376+65 LT TO 408+04 LT*

AND RETAINING WALL #19C & #42: SHORED CAST-IN-PLACE CONCRETE WALL AND SOIL NAIL WALL WITH ARCHITECTURAL FORM LINER FINISH ON –L– FROM 380+50 RT TO 383+50 RT

CONTENTS

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.

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

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DATE *MAY 2022*

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6/7/2022
DATE

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PROJECT REFERENCE NO.	SHEET NO.
A-0009CB	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		
	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
PLASTIC RANGE (PI)		
PL — PLASTIC LIMIT		
	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
OM — OPTIMUM MOISTURE SL — SHRINKAGE LIMIT		
	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE

PLASTICITY

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

COLOR

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

GRADATION

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

ANGULARITY OF GRAINS

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

MINERALOGICAL COMPOSITION

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

COMPRESSIBILITY

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

PERCENTAGE OF MATERIAL

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

GROUND WATER

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

MISCELLANEOUS SYMBOLS

- ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION
- SOIL SYMBOL
- ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT
- INFERRED SOIL BOUNDARY
- INFERRED ROCK LINE
- ALLUVIAL SOIL BOUNDARY
- 25/025 — DIP & DIP DIRECTION OF ROCK STRUCTURES
- SPT, 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
- [X] 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
- [X] CASING [ ] W/ ADVANCER
- [ ] TRICONE _____" STEEL TEETH
- [ ] TRICONE _____" TUNG.-CARB.
- [X] CORE BIT
- [ ] _____

HAMMER TYPE:
- [X] AUTOMATIC
- [ ] MANUAL

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

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:

SURVEY AND ROADWAY DESIGN FILES PROVIDED BY TGS ENGINEERS ON 11/15/2021

DATE: 8-15-14

PROJECT REFERENCE NO.	SHEET NO.
A-0009CB	3

SITE PLAN

0 100 200

FEET

NC GRID
NAD 83 NA 2011

-L- PC 375+53.58

PROP. RETAINING WALL #19A
TIERED WALLS W/9' WW WILDLIFE FENCE
& CONCRETE DITCH
BEGIN -L- STA. 376+65±
END -L- STA. 380+50±

BEGIN LAND BRIDGE
-L- STA. 380+50±

END LAND BRIDGE
-L- STA. 382+30±

-L- PT 384+17.58

PROP. RETAINING WALL #19B
TIERED WALLS W/9' WW WILDLIFE FENCE
& CONCRETE DITCH
BEGIN -L- STA. 382+30±
END -L- STA. 393+22±

PROP. RETAINING WALL #19B
TIERED WALLS W/9' WW WILDLIFE FENCE
& CONCRETE DITCH
BEGIN -L- STA. 382+30±
END -L- STA. 393+22±
SINGLE WALL W/9' WW WILDLIFE FENCE
& CONCRETE DITCH
BEGIN -L- STA. 393+22±
END -L- STA. 408+04±

-L- PC 389+26.67

PROP. RETAINING WALL #19C
RT OF -L- STA. 380+50±

PROP. RETAINING WALL #42
BEGIN -L- STA. 382+30±
END -L- STA. 383+50±

MATCH LINE STA -L- 394+00.00
MATCH TO SHEET NO. 4

RWAL18_B-3
RWAL18_B-4
RWAL18_B-5
L_3780L
LINE RWAL19A
LINE RWAL19.2
LINE RWAL19.3
LINE RWAL19.4
LINE RWAL19.5
LINE RWAL19.6
LINE RWAL19.7
LB_BI-A
LB_BI-B
LB_BI-C
LB_BI-D
LB_BI-E
LB_EBI-A
LB_EBI-B
LB_EBI-C
LB_EBI-D
LB_EBI-E
NC 143 (SWEETWATER RD)
ROCK OUTCROP 21
ROCK OUTCROP 22
82' TO TYPICAL
89° - 90° BEDDING & JOINT SET
35° (SECOND JOINT SET)
L_38491R
L_38492R
L_38737L
L_38917L
L_39114L
L_39320L
RWAL28_B-1
RWAL28_B-2
RWAL28_B-3
RWAL29_B-1
RETAINING WALL
BST PARKING
BST SHOULDER
WD STEPS
WD HANDRAIL
WD RAIL
TIMBER GUARDRAIL
MTL TIMBERS
CONC
CONC SLOPE
CONC DITCH
BL-58
BL-59
GPS-15
GPS-16
GPS-17
12" HDPE
18" CMP
INV=3095.52'
INV=3094.06'
INV=3087.35'
APPALACHIAN TRAIL
WOODS

PROJECT REFERENCE NO.	SHEET NO.
A-0009CB	4

SITE PLAN

0 100 200

FEET

NC GRID
NAD 83 NA 2011

MATCH LINE STA -L- 394+00.00
SHEET NO. 3
MATCH TO SHEET

-L- PT 395+12.74

-L- PC 398+98.60

-L- PT 404+33.51

-L- PC 405+68.76

PROP. RETAINING WALL #19B
SINGLE WALL W/9' WW WILDLIFE FENCE
& CONCRETE DITCH
BEGIN -L- STA. 393+22 ±
END -L- STA. 408+04 ±

PROP. RETAINING WALL #19B
SINGLE WALL W/9' WW WILDLIFE FENCE
& CONCRETE DITCH
BEGIN -L- STA. 393+22 ±
END -L- STA. 408+04 ±

395 400 405

LINE RWAL19.8 — BEGIN RWL19.8, END RWL19.8
LINE RWAL19.9 — END RWL19.9, BEGIN RWL19.9
LINE RWAL19J0 — END RWL19J0, BEGIN RWL19J0
LINE RWAL19J1 — END RWL19J1, BEGIN RWL19J1
LINE RWAL19J2 — BEGIN RWL19J2
LINE RWAL19J3 — BEGIN RWL19J3

L-39432L
L-39702L
L-39918L
L-40303L
L-40703L

RWAL29_B-2
RWAL29_B-3
RWAL29A_B-1
RWAL29A_B-2
RWAL29A_B-3
RWAL29A_B-4
RWAL29A_B-5
RWAL19_B-1
RWAL19_B-2
RWAL19_B-3

ROCK OUTCROP 23
ROCK OUTCROP 24
ROCK OUTCROP 25

BST SHOULDER
RETAINING WALL
18" CMP
24" RCP
36" RCP
48" RCP
60" RCP
INV=3051.54
DIRECTION
SINKHOLE
USFS BOUNDARY POST
BL-60
BL-62
BL-64
CONC DI
WOODS
MTL

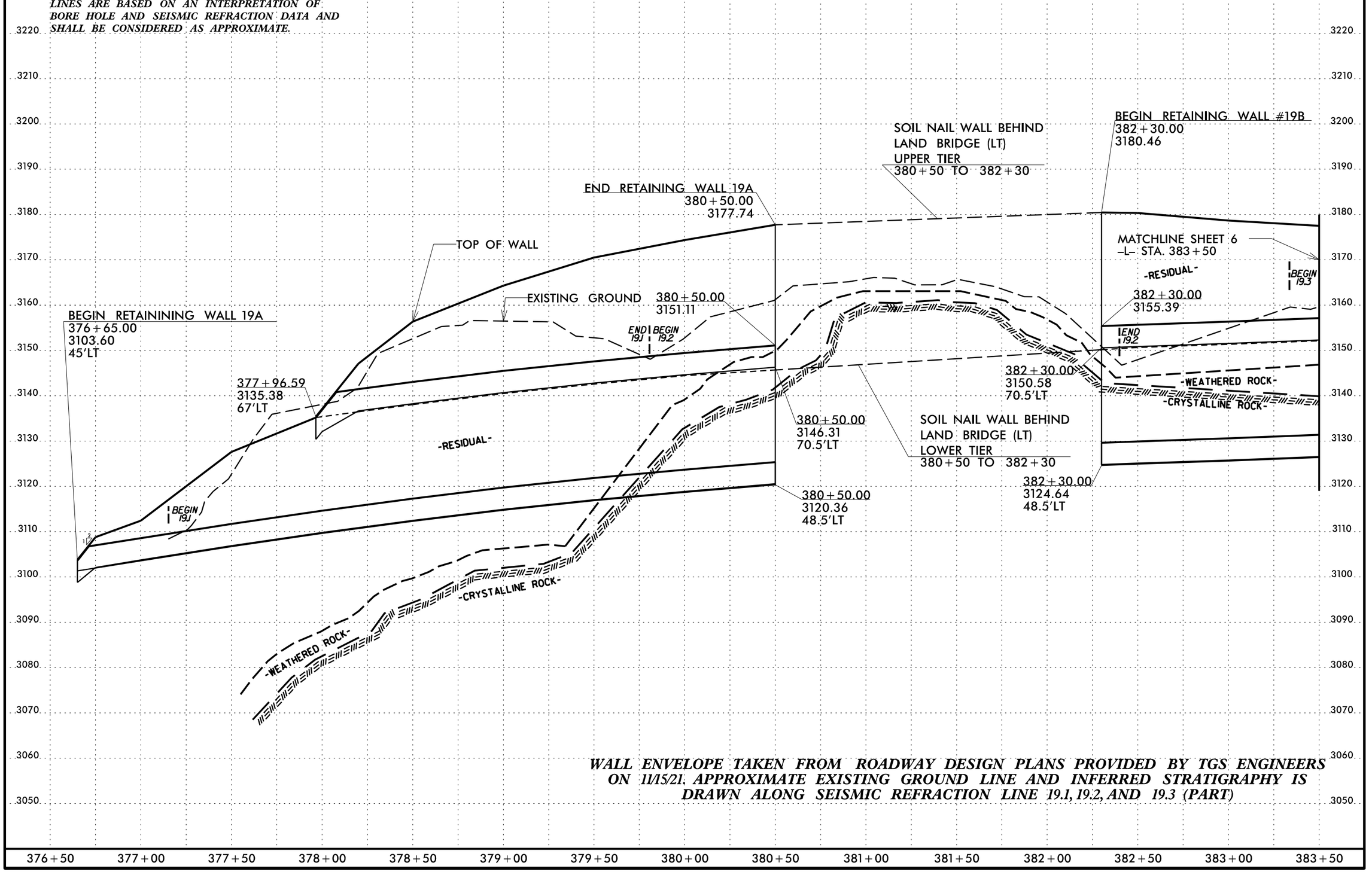
Prepared in the Office of:
CAROLINAS GEOTECHNICAL GROUP

0 50 100
FEET
VE = 2.5:1

PROJECT REFERENCE NO.	SHEET NO.
A-0009CB	5

RETAINING WALL #19A & #19B:
SEISMIC REFRACTION LINE 19.1, 19.2 & 19.3 PROJECTED ALONG WALL ENVELOPE

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.



WALL ENVELOPE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. APPROXIMATE EXISTING GROUND LINE AND INFERRED STRATIGRAPHY IS DRAWN ALONG SEISMIC REFRACTION LINE 19.1, 19.2, AND 19.3 (PART)

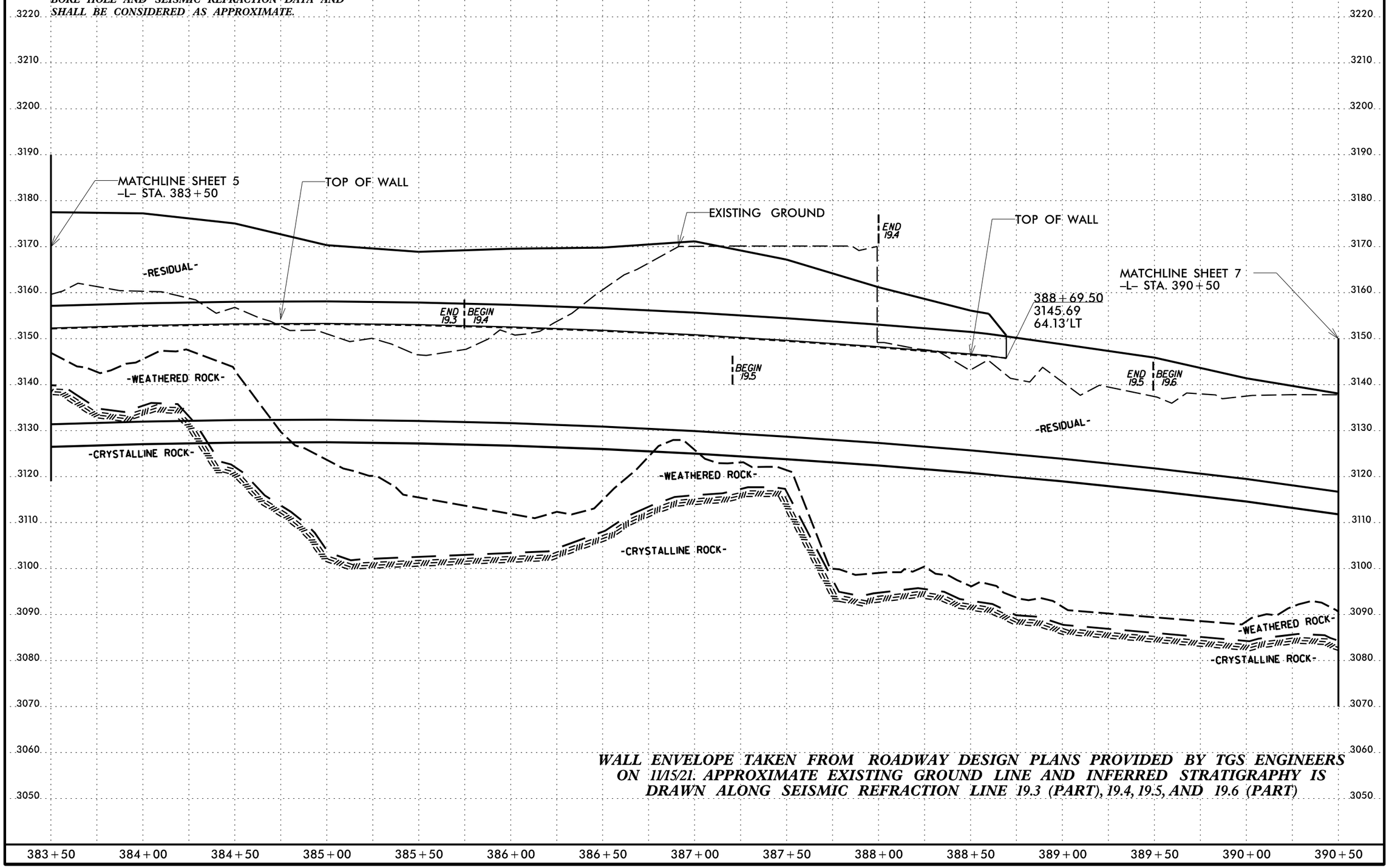
Prepared in the Office of:
CAROLINAS GEOTECHNICAL GROUP

0 50 100
FEET
VE = 2.5:1

PROJECT REFERENCE NO.	SHEET NO.
A-0009CB	6

RETAINING WALL #19A & #19B:
SEISMIC REFRACTION LINE 19.3, 19.4, 19.5 & 19.6 PROJECTED ALONG WALL ENVELOPE

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.



WALL ENVELOPE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. APPROXIMATE EXISTING GROUND LINE AND INFERRED STRATIGRAPHY IS DRAWN ALONG SEISMIC REFRACTION LINE 19.3 (PART), 19.4, 19.5, AND 19.6 (PART)

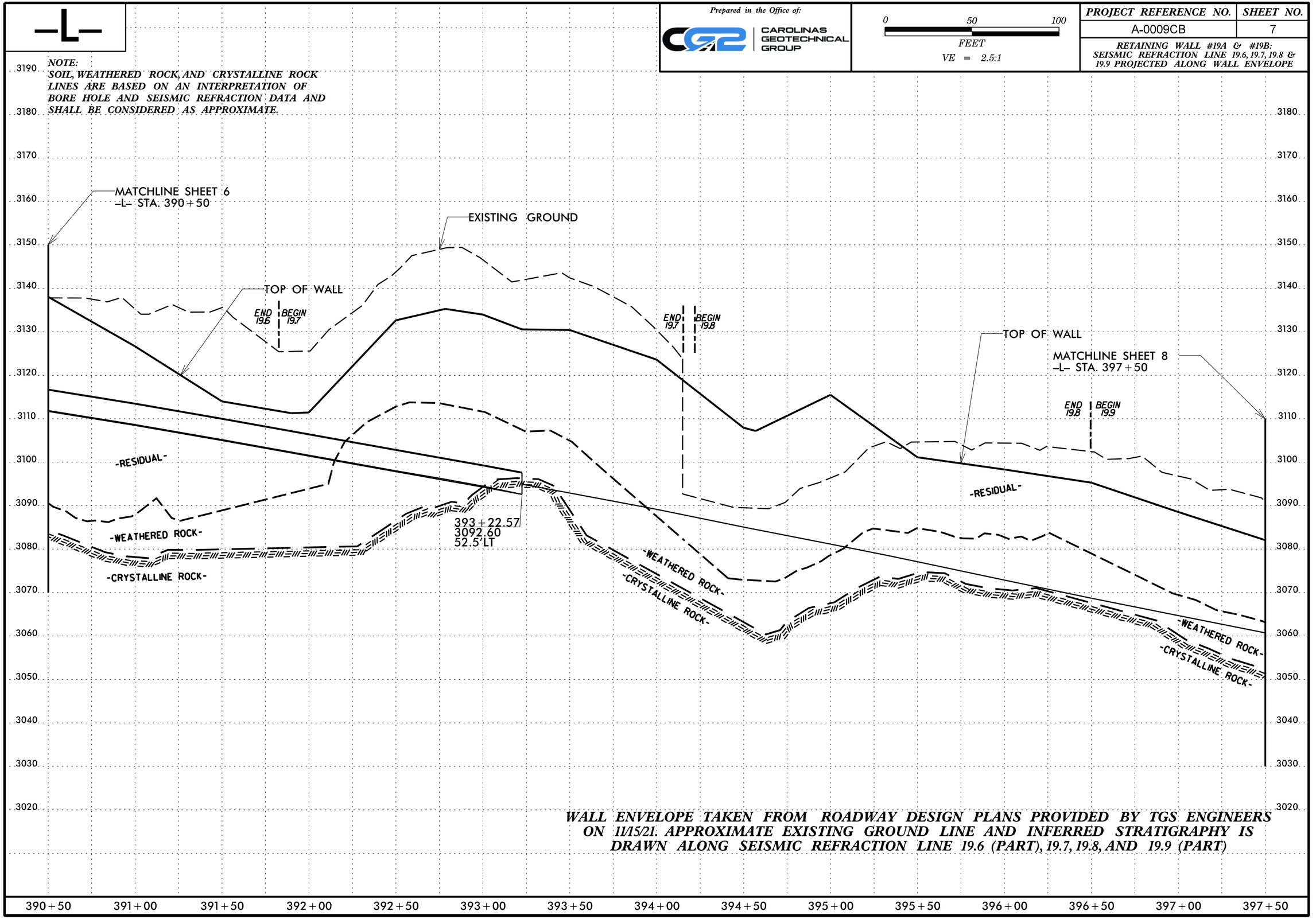
Prepared in the Office of:
CAROLINAS GEOTECHNICAL GROUP

0 50 100
FEET
VE = 2.5:1

PROJECT REFERENCE NO.	SHEET NO.
A-0009CB	7

RETAINING WALL #19A & #19B:
SEISMIC REFRACTION LINE 19.6, 19.7, 19.8 & 19.9 PROJECTED ALONG WALL ENVELOPE

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.



WALL ENVELOPE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. APPROXIMATE EXISTING GROUND LINE AND INFERRED STRATIGRAPHY IS DRAWN ALONG SEISMIC REFRACTION LINE 19.6 (PART), 19.7, 19.8, AND 19.9 (PART)

Prepared in the Office of:
CAROLINAS GEOTECHNICAL GROUP

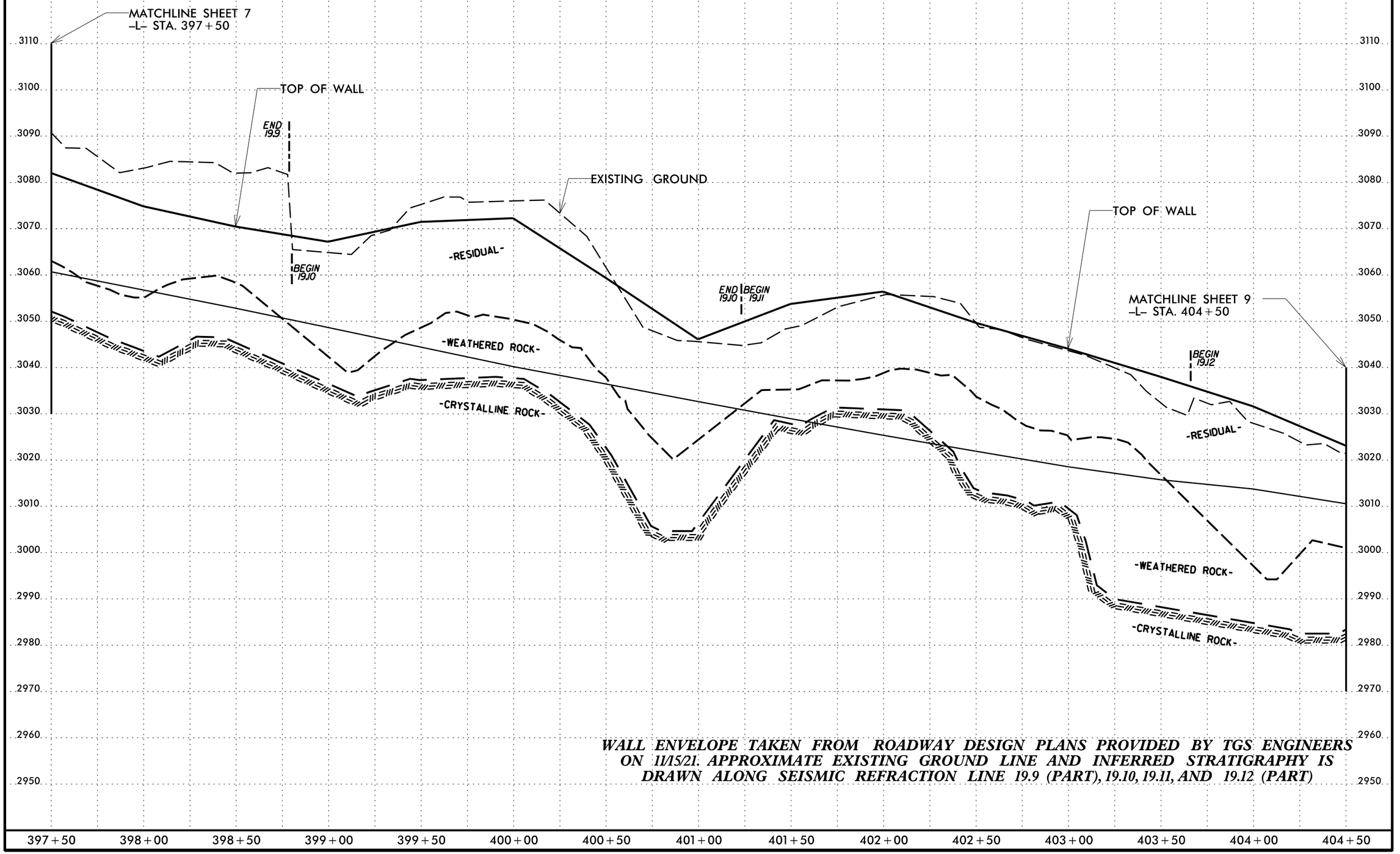
0 50 100
FEET
VE = 2.5:1

PROJECT REFERENCE NO.	SHEET NO.
A-0009CB	8

RETAINING WALL #19A & #19B:
SEISMIC REFRACTION LINE 19.9, 19.10, 19.11 & 19.12 PROJECTED ALONG WALL ENVELOPE

–L–

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.



WALL ENVELOPE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. APPROXIMATE EXISTING GROUND LINE AND INFERRED STRATIGRAPHY IS DRAWN ALONG SEISMIC REFRACTION LINE 19.9 (PART), 19.10, 19.11, AND 19.12 (PART)

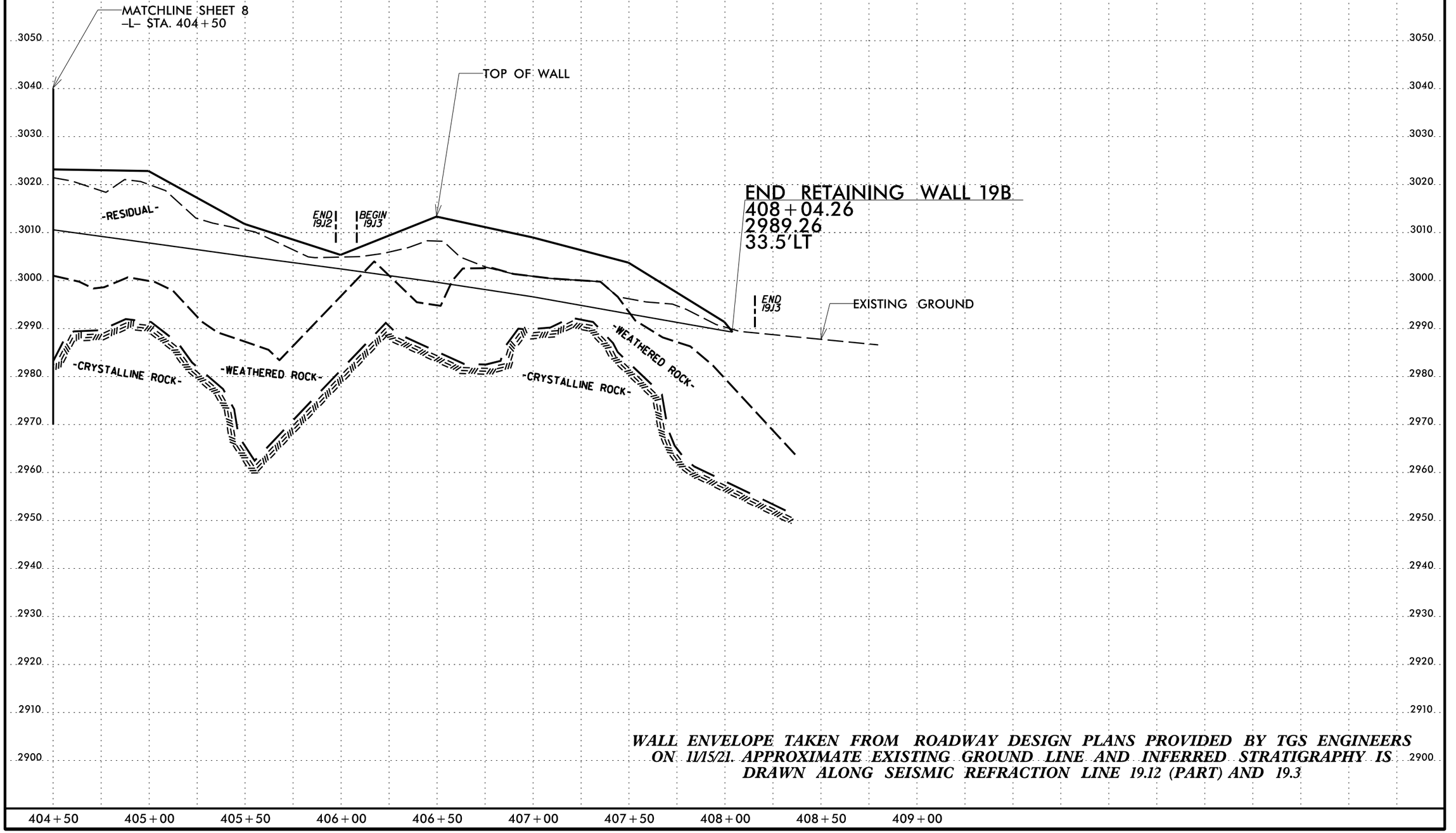
Prepared in the Office of:
CAROLINAS GEOTECHNICAL GROUP

0 50 100
FEET
VE = 2.5:1

PROJECT REFERENCE NO.	SHEET NO.
A-0009CB	9

RETAINING WALL #19A & #19B:
SEISMIC REFRACTION LINE 19.12 & 19.13
PROJECTED ALONG WALL ENVELOPE

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.



WALL ENVELOPE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. APPROXIMATE EXISTING GROUND LINE AND INFERRED STRATIGRAPHY IS DRAWN ALONG SEISMIC REFRACTION LINE 19.12 (PART) AND 19.3

RETAINING WALL #19A

EXISTING GROUND

RWAL18_B-3
376+75
33' RT

LINE 18.2

-ROADWAY EMBANKMENT-
STIFF TO VERY STIFF, MOIST, BROWN-YELLOW-RED, FINE TO COARSE SANDY SILT (A-4), WITH TRACE GRAVEL

10
16
32
12

MEDIUM DENSE TO VERY DENSE, MOIST, GRAY-BROWN, SILTY, GRAVELLY FINE TO COARSE SAND (A-1-B) AND SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE GRAVEL

100/0.9
34
24

-RESIDUAL-
LOOSE TO VERY DENSE, MOIST, BROWN-GRAY, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE GRAVEL

-COLLUVIAL-

17
MEDIUM DENSE, MOIST, BROWN, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE GRAVEL

14
23
STIFF, MOIST, BROWN, FINE TO COARSE SANDY SILT (A-4), WITH TRACE MANGANESE OXIDE

26
28
18
9
52
29

BT
DRY
04/21

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

377+00.00
℄
-L-

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-4108	31' RT	377+50 -L-	28.5' - 30.0'	A-4(0)	28	2	19	30	34	17	82	71	50	17	-

RETAINING WALL #19A

EXISTING GROUND

LINE 19.1

LINE 18.2

RWAL18_B-4
377+50
31' RT
SS-4108

-ROADWAY EMBANKMENT- Ⓐ

MEDIUM DENSE TO DENSE, DRY TO MOIST, TAN-BROWN, SILTY, GRAVELLY FINE TO COARSE SAND (A-1-B)

-RESIDUAL- MEDIUM STIFF, MOIST, TAN-BROWN-GRAY-ORANGE, FINE TO MEDIUM DENSE TO VERY DENSE, MOIST, TAN-GRAY-

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

-COLLUVIAL-

STIFF, TAN-ORANGE-GRAY, MOIST, FINE SANDY SILT (A-4(0)), WITH TRACE GRAVEL

COARSE SANDY SILT (A-4), WITH TRACE GRAVEL-SIZED ROCK FRAGMENTS

ORANGE, SILTY FINE TO COARSE SAND (A-2-4), WITH LITTLE GRAVEL-SIZED ROCK FRAGMENTS

16 15 23 25 32 22 8 13 12 8 13 98 26

BT
DRY
04/21

Ⓐ -ROADWAY EMBANKMENT- STIFF TO VERY STIFF, MOIST, TAN-ORANGE-BROWN-GRAY, FINE TO COARSE SANDY SILT (A-4) AND FINE TO COARSE SANDY CLAY (A-6), WITH LITTLE GRAVEL

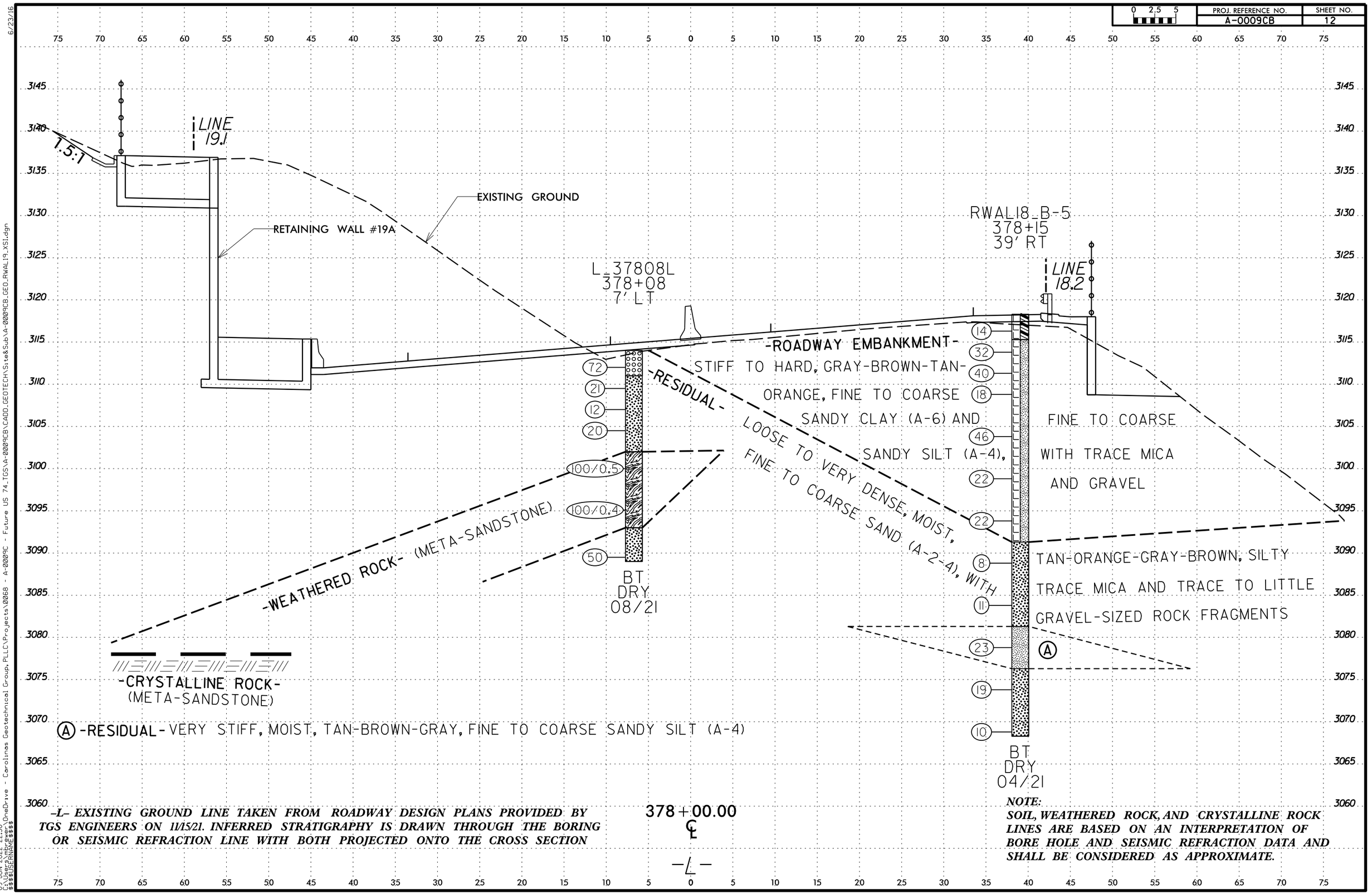
-WEATHERED ROCK- (META-SANDSTONE)

-CRYSTALLINE ROCK- (META-SANDSTONE)

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

377+50.00
℄
-L-

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.



-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

378+00.00
℄
-L-

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.

RETAINING WALL #19A

LINE 19.1

EXISTING GROUND

-RESIDUAL-
LOOSE TO MEDIUM DENSE, MOIST,
TAN-ORANGE-GRAY-BROWN, SILTY
FINE TO COARSE SAND (A-2-4), WITH
TRACE MICA AND TRACE TO LITTLE
GRAVEL-SIZED ROCK FRAGMENTS

4:1

40:1

-WEATHERED ROCK- (META-SANDSTONE)

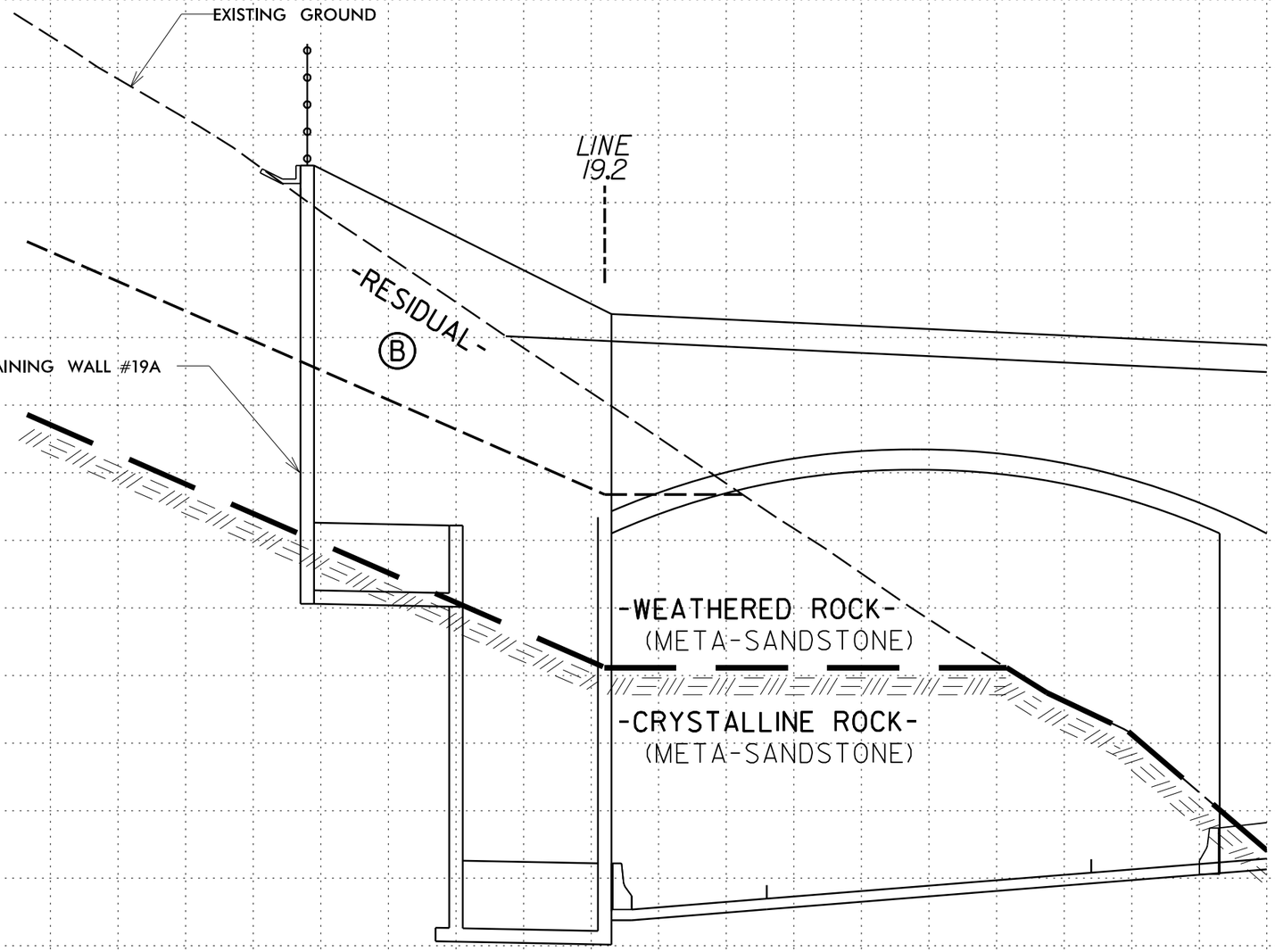
-CRYSTALLINE ROCK-
(META-SANDSTONE)

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

379+00.00
℄
-L-

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.

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.



Ⓑ **-RESIDUAL-** STIFF, MOIST, TAN-BROWN, FINE SANDY SILT (A-4)

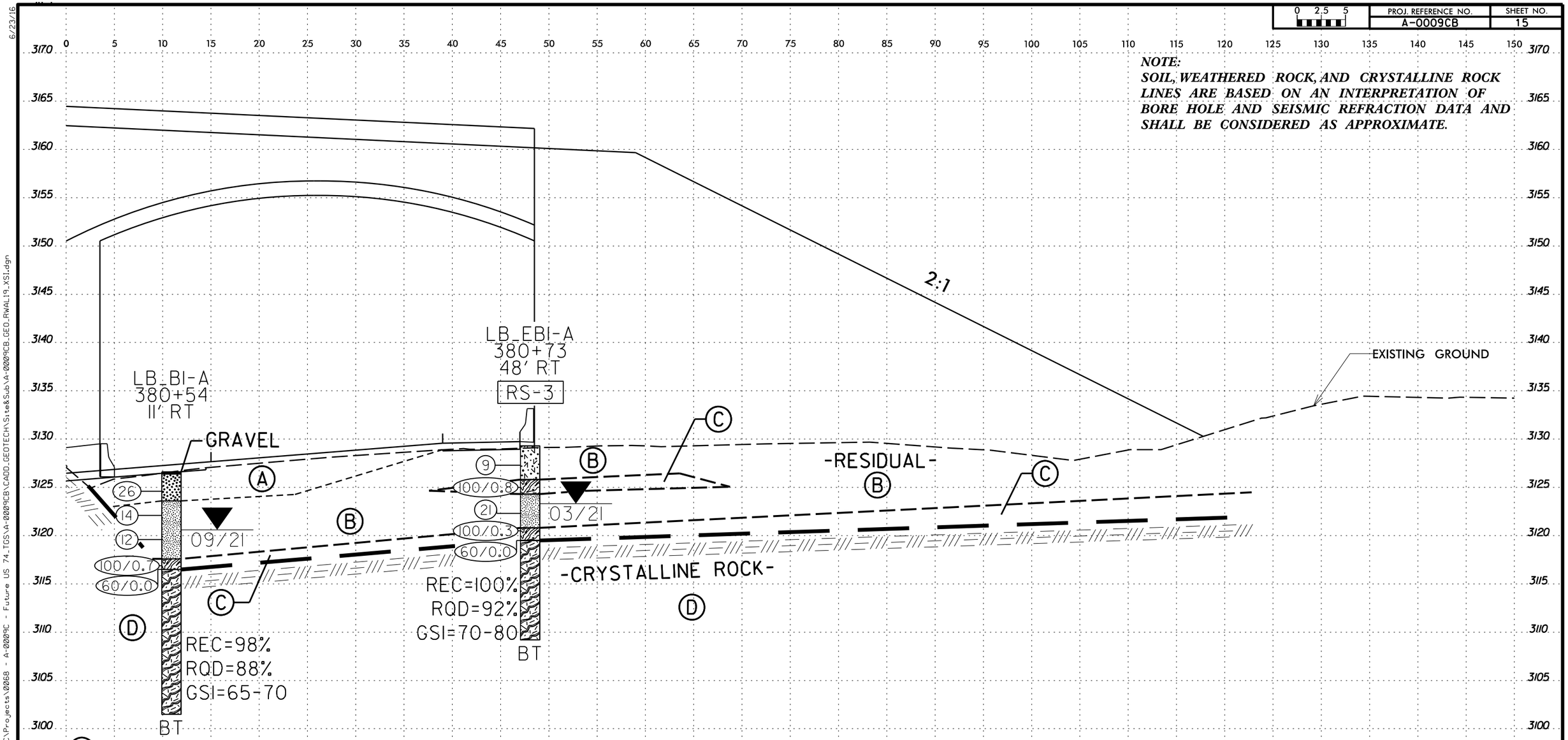
-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 02/03/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

380+50.00

-L- (LT)

℄

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.



(A) **-RESIDUAL-** MEDIUM DENSE, MOIST, BROWN, SILTY FINE SAND (A-2-4), WITH LITTLE GRAVEL-SIZED ROCK FRAGMENTS

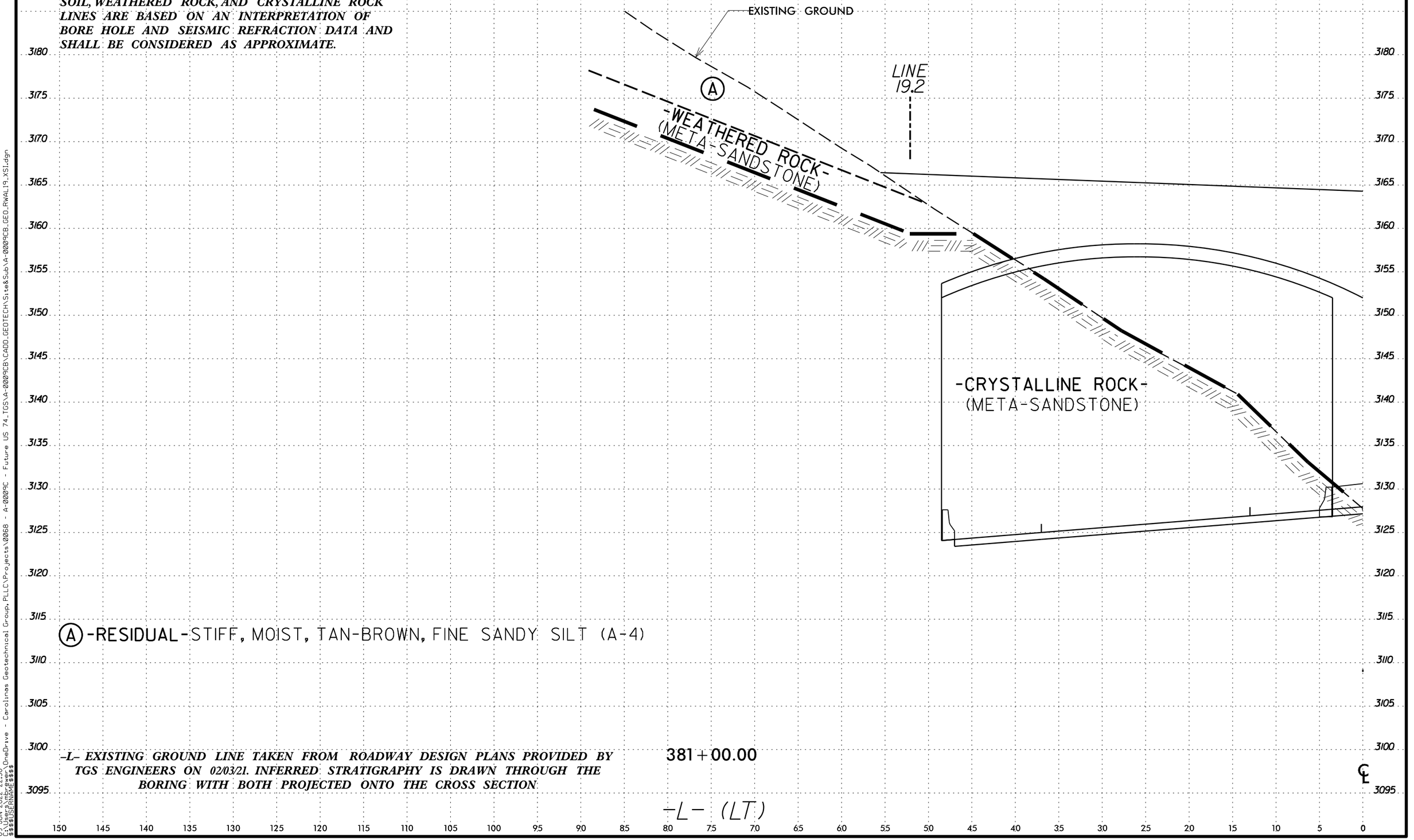
(B) **-RESIDUAL-** STIFF, MOIST, TAN-BROWN, FINE SANDY SILT (A-4) AND FINE SANDY, CLAYEY SILT (A-5)

(C) **-WEATHERED ROCK-** (META-SANDSTONE)

(D) **-CRYSTALLINE ROCK-** FRESH TO SLIGHTLY WEATHERED, MODERATELY HARD TO HARD, BLACK-WHITE-GRAY, (META-SANDSTONE), WITH VERY CLOSE TO MODERATELY CLOSE FRACTURE SPACING, EXTREMELY INDURATED, VERY THINLY BEDDED

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 02/03/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

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.



Ⓐ-RESIDUAL-STIFF, MOIST, TAN-BROWN, FINE SANDY SILT (A-4)

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 02/03/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

381+00.00

-L- (LT)

℄

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

3:1

LB_BI-D
381+22
6' RT

100/0.9
60/0.0
60/0.0

BT
DRY
04/21

-CRYSTALLINE ROCK-
(META-SANDSTONE)

-CRYSTALLINE ROCK-
(META-SANDSTONE)

Ⓑ -WEATHERED ROCK- (META-SANDSTONE)

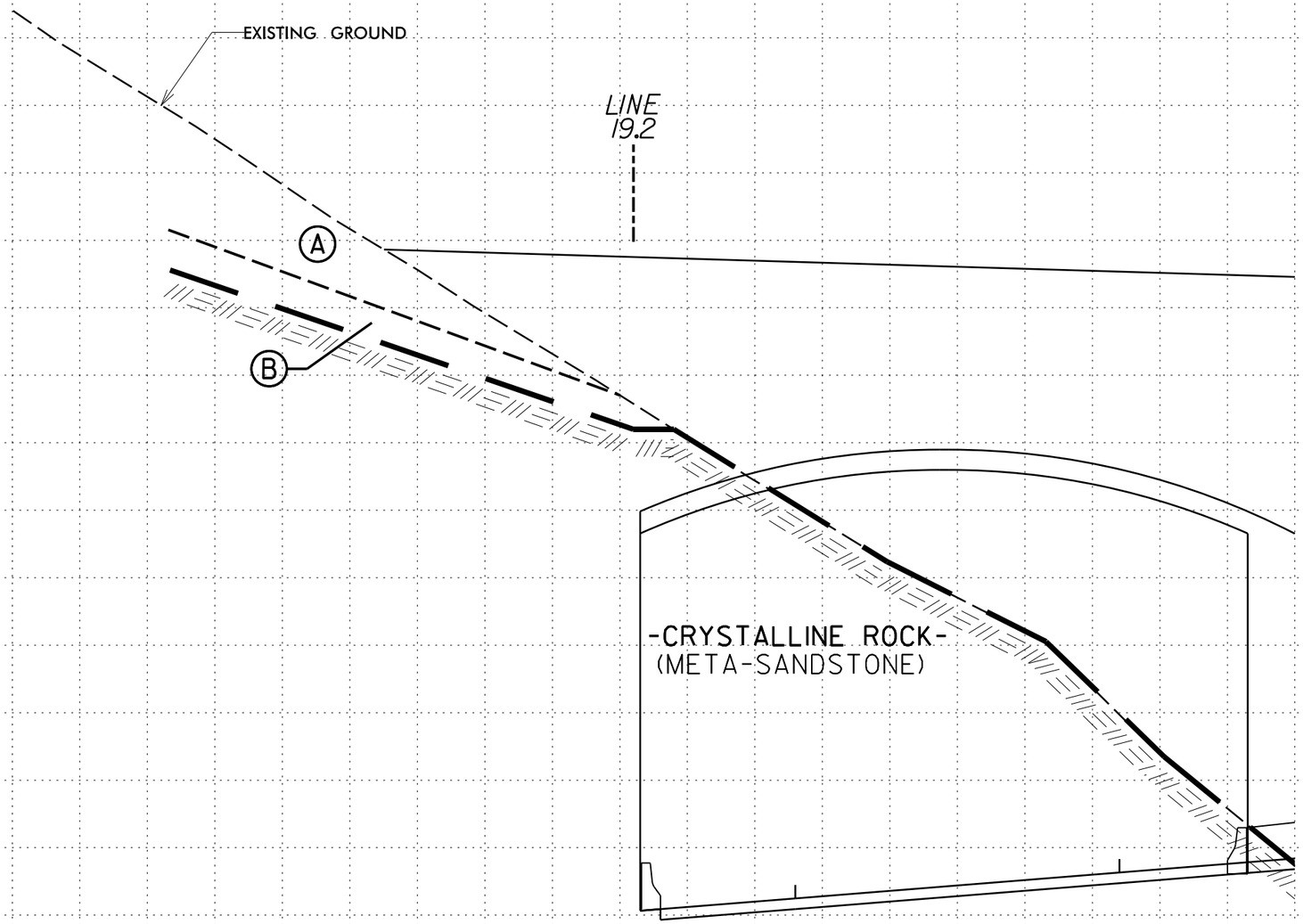
℄

381+00.00

-L- (RT)

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 02/03/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

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.



Ⓐ -RESIDUAL- STIFF, MOIST, TAN-BROWN, FINE SANDY SILT (A-4)

Ⓑ -WEATHERED ROCK- (META-SANDSTONE)

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 02/03/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

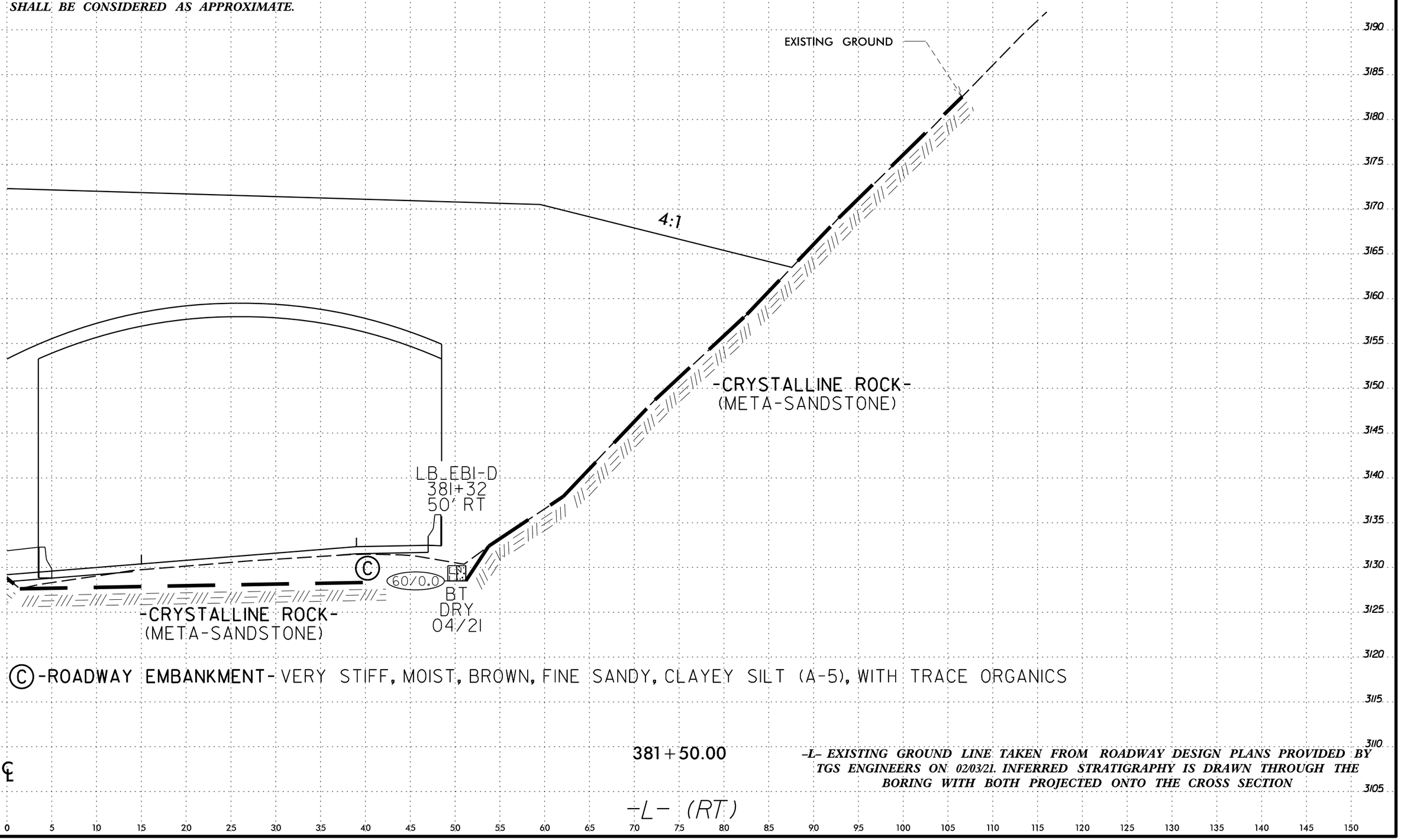
381+50.00

-L- (LT)

℄

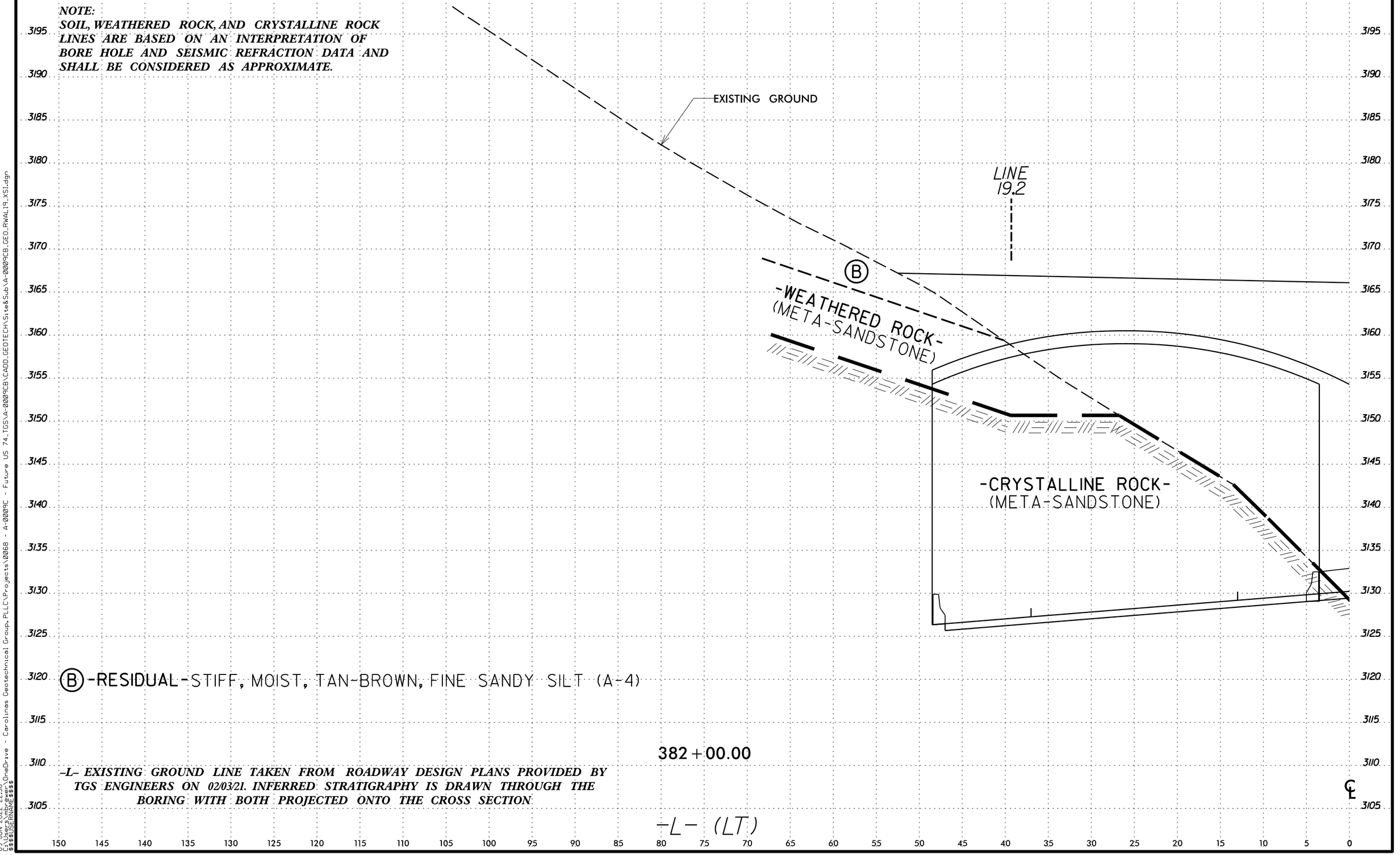
0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	A-0009CB	19

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.



-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 02/03/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

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.



Ⓑ -RESIDUAL- STIFF, MOIST, TAN-BROWN, FINE SANDY SILT (A-4)

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 02/03/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

NOTE:
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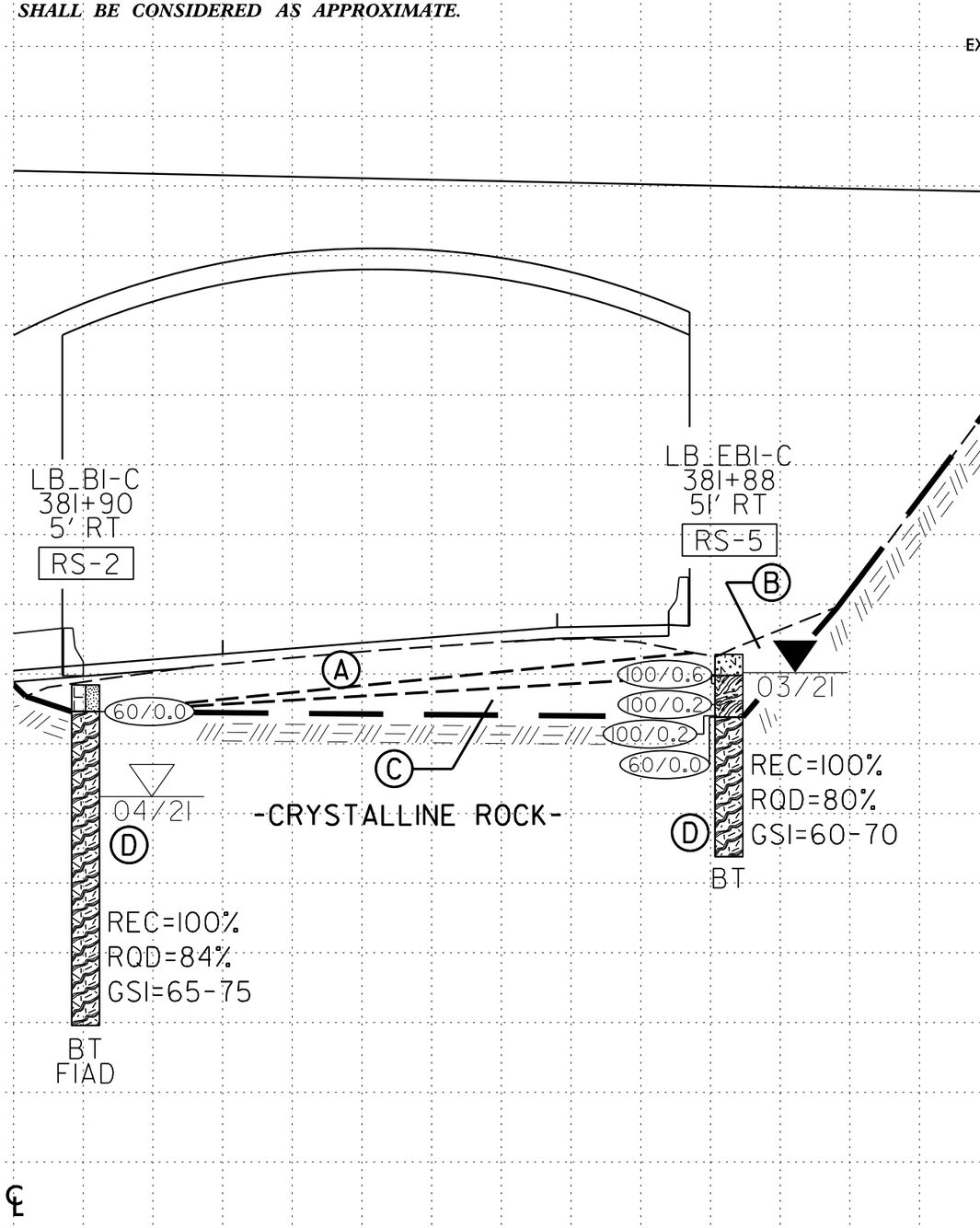


Ⓐ-**ROADWAY EMBANKMENT**- STIFF, MOIST, BROWN, CLAYEY, FINE TO COARSE SANDY SILT (A-4), WITH TRACE GRAVEL

Ⓑ-**RESIDUAL**- VERY STIFF, MOIST, BROWN, FINE SANDY, CLAYEY SILT (A-5), WITH TRACE ORGANICS

Ⓒ-**WEATHERED ROCK**- (META-SANDSTONE)

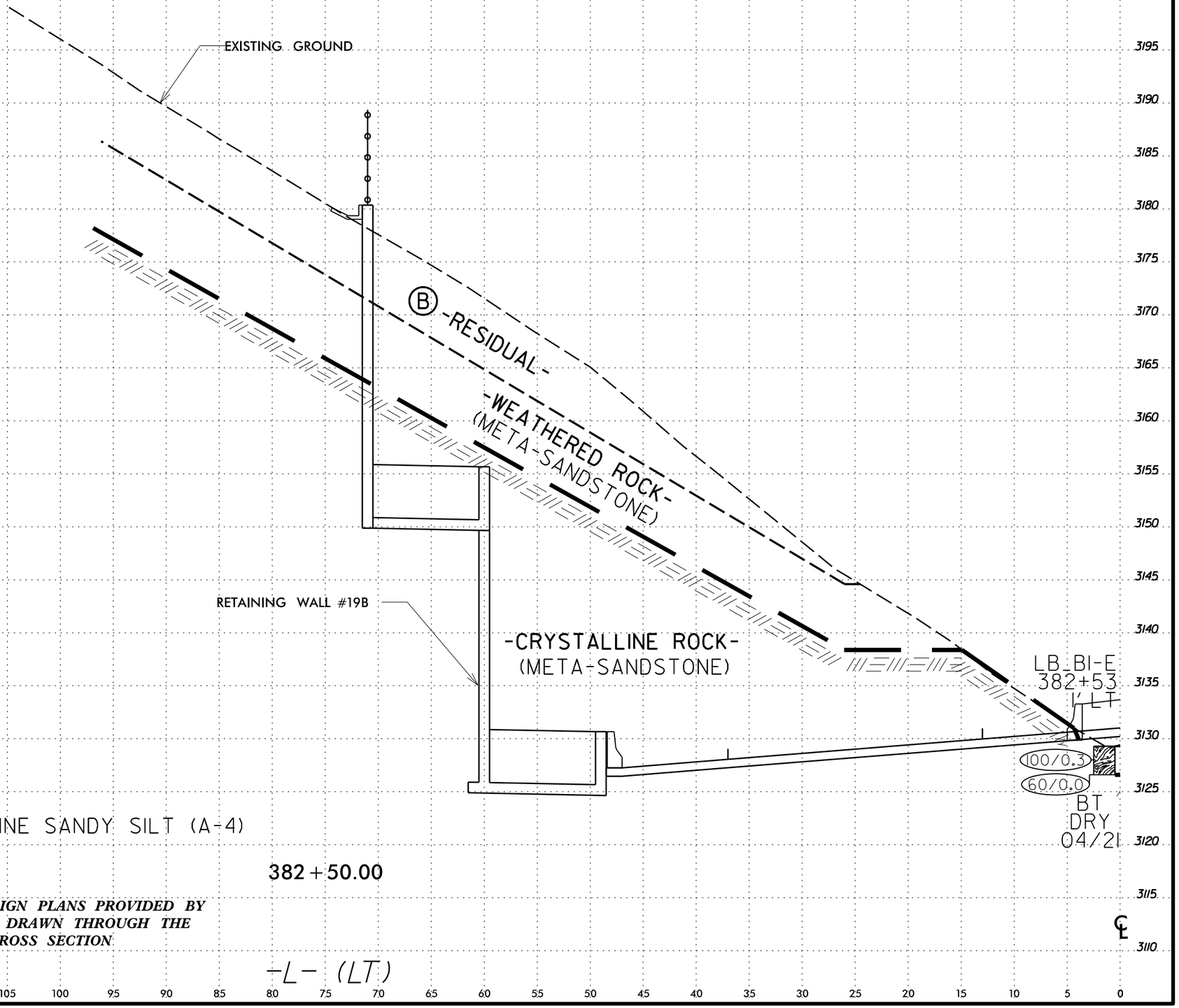
Ⓓ-**CRYSTALLINE ROCK**- FRESH TO SLIGHTLY WEATHERED, MODERATELY HARD TO HARD, BLACK-WHITE-GRAY, (META-SANDSTONE), WITH VERY CLOSE TO MODERATELY CLOSE FRACTURE SPACING

382+00.00

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 02/03/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

-L- (RT)

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.



Ⓑ -RESIDUAL- STIFF, MOIST, TAN-BROWN, FINE SANDY SILT (A-4)

382+50.00

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 02/03/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

-L- (LT)

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	A-0009CB	23

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

RETAINING WALL #42

-CRYSTALLINE ROCK-
(META-SANDSTONE)

LB_EBI-E
382+51
47' RT

8.5:1

Ⓒ

Ⓐ -RESIDUAL- 97
100/0.6
60/0.0

BT
DRY
04/21

-CRYSTALLINE ROCK-
(META-SANDSTONE)

Ⓐ -RESIDUAL- VERY DENSE, DRY, GRAY, SILTY GRAVEL (A-1-A)

Ⓒ -WEATHERED ROCK- (META-SANDSTONE)

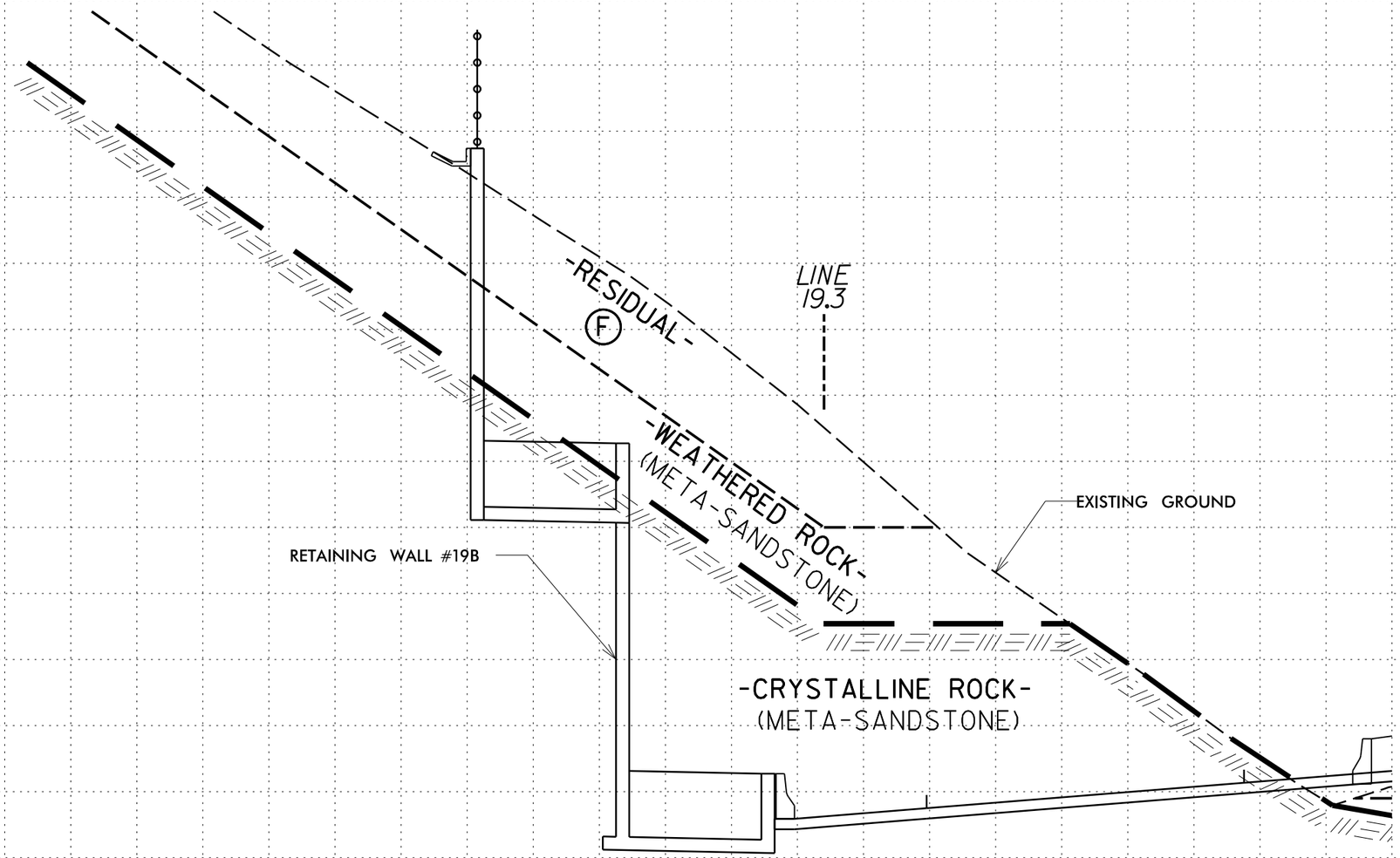
382+50.00

℄

-L- (RT)

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 02/03/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

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.



Ⓕ -RESIDUAL- STIFF, MOIST, TAN-BROWN, FINE SANDY SILT (A-4)

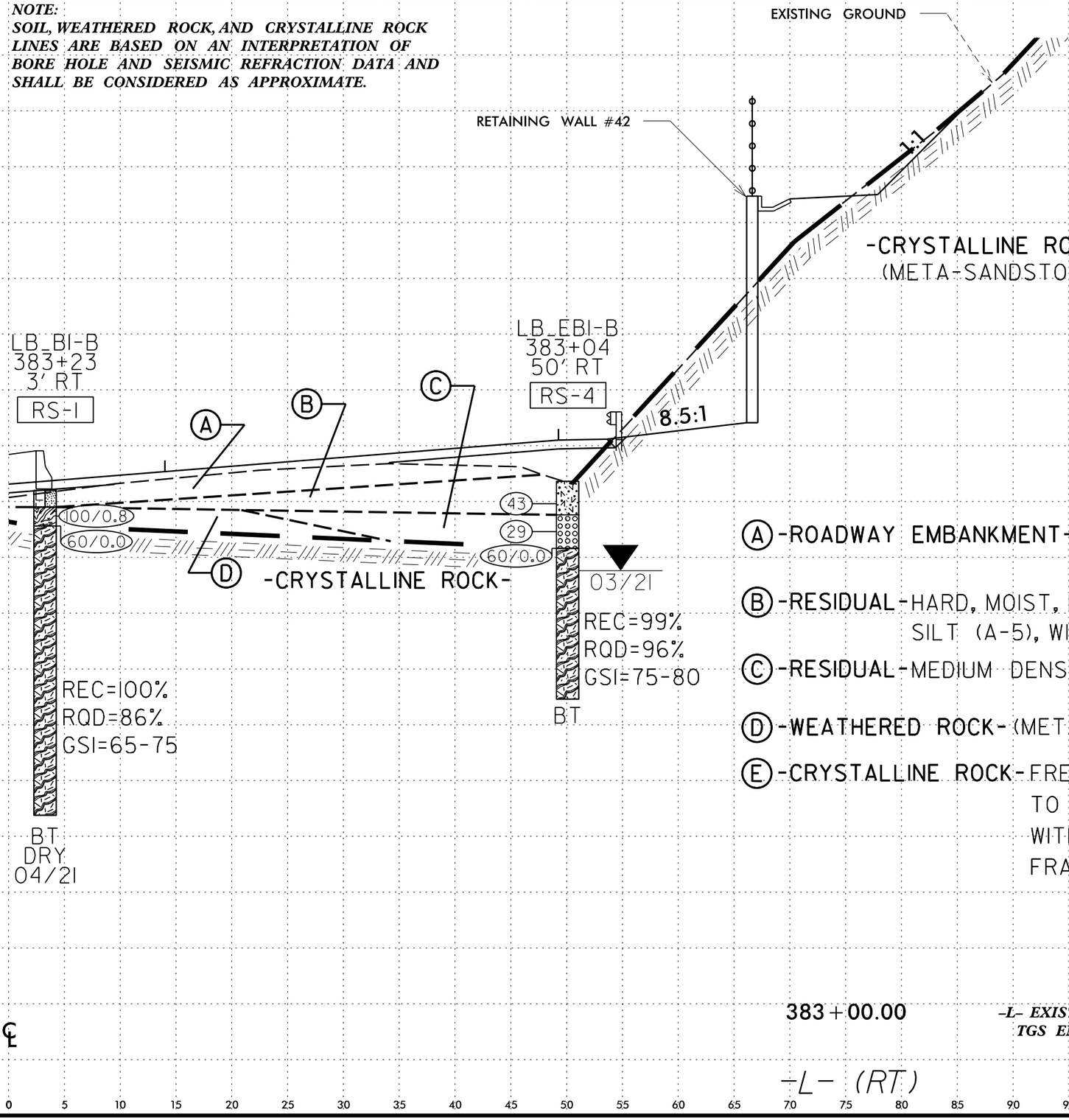
383+00.00

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 02/03/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

-L- (LT)

℄

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.



Ⓐ-**ROADWAY EMBANKMENT**-STIFF, MOIST, BROWN, CLAYEY, FINE TO COARSE SANDY SILT (A-4), WITH TRACE GRAVEL

Ⓑ-**RESIDUAL**-HARD, MOIST, BROWN-GRAY, FINE TO COARSE SANDY, CLAYEY SILT (A-5), WITH LITTLE GRAVEL-SIZED ROCK FRAGMENTS

Ⓒ-**RESIDUAL**-MEDIUM DENSE, MOIST, GRAY, SILTY GRAVEL (A-1-A)

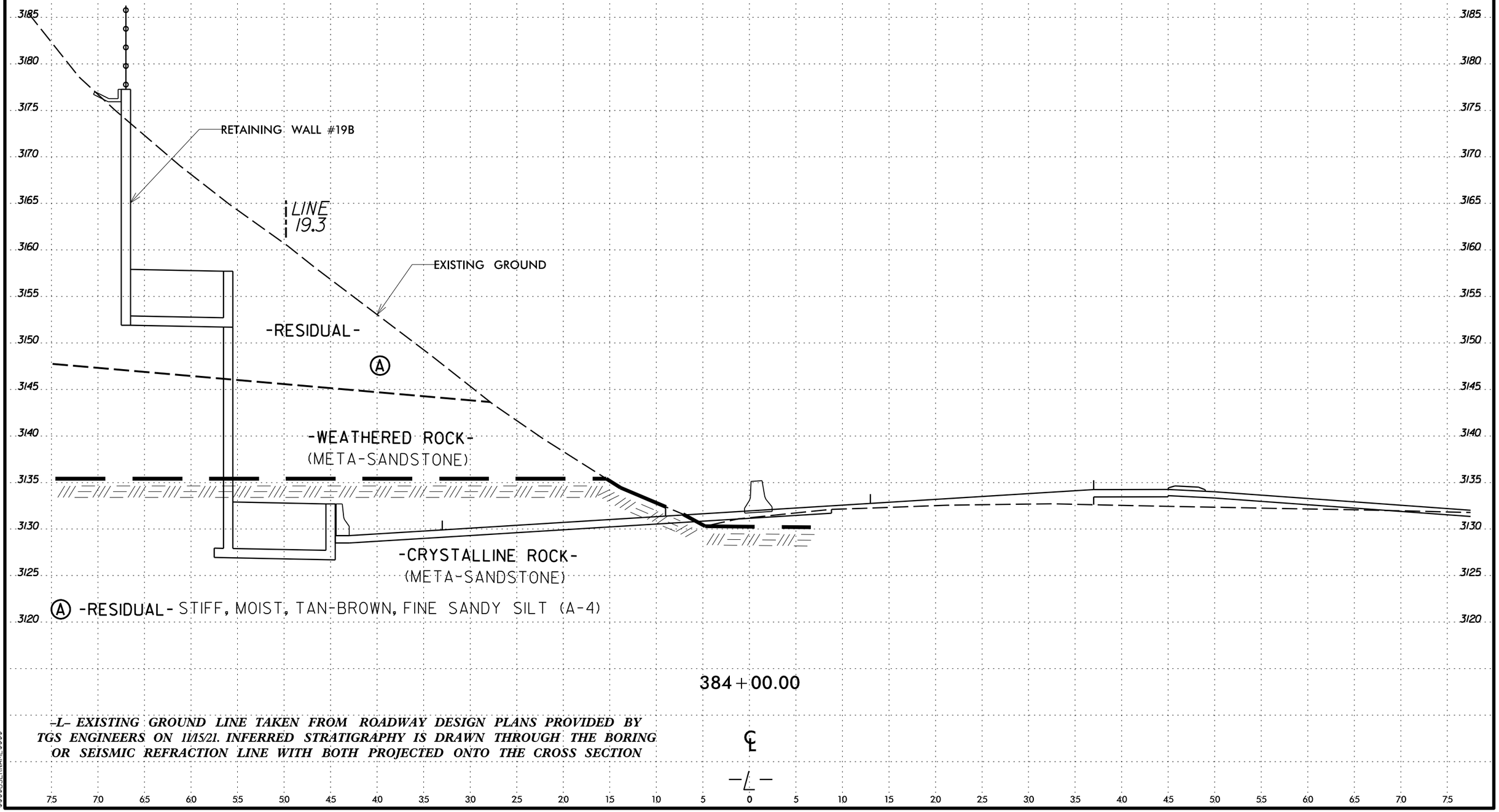
Ⓓ-**WEATHERED ROCK**-(META-SANDSTONE)

Ⓔ-**CRYSTALLINE ROCK**-FRESH TO SLIGHTLY WEATHERED, MODERATELY HARD TO HARD, BLACK-WHITE-GRAY, (META-SANDSTONE), WITH VERY CLOSE TO MODERATELY CLOSE FRACTURE SPACING

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 02/03/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	A-0009CB	26

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.



Ⓐ **-RESIDUAL-** STIFF, MOIST, TAN-BROWN, FINE SANDY SILT (A-4)

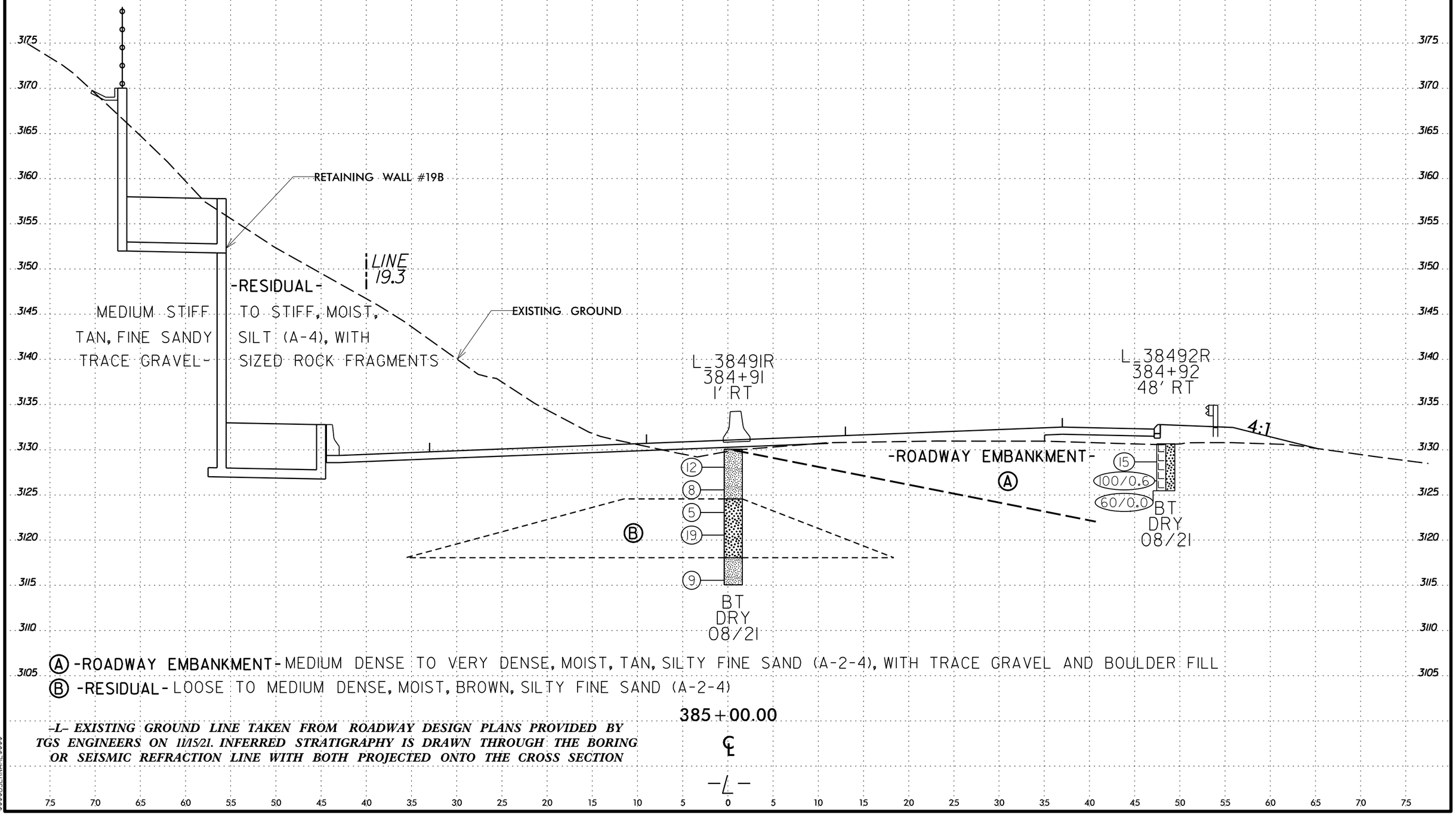
384+00.00

℄

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

-L-

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.



Ⓐ **-ROADWAY EMBANKMENT-** MEDIUM DENSE TO VERY DENSE, MOIST, TAN, SILTY FINE SAND (A-2-4), WITH TRACE GRAVEL AND BOULDER FILL

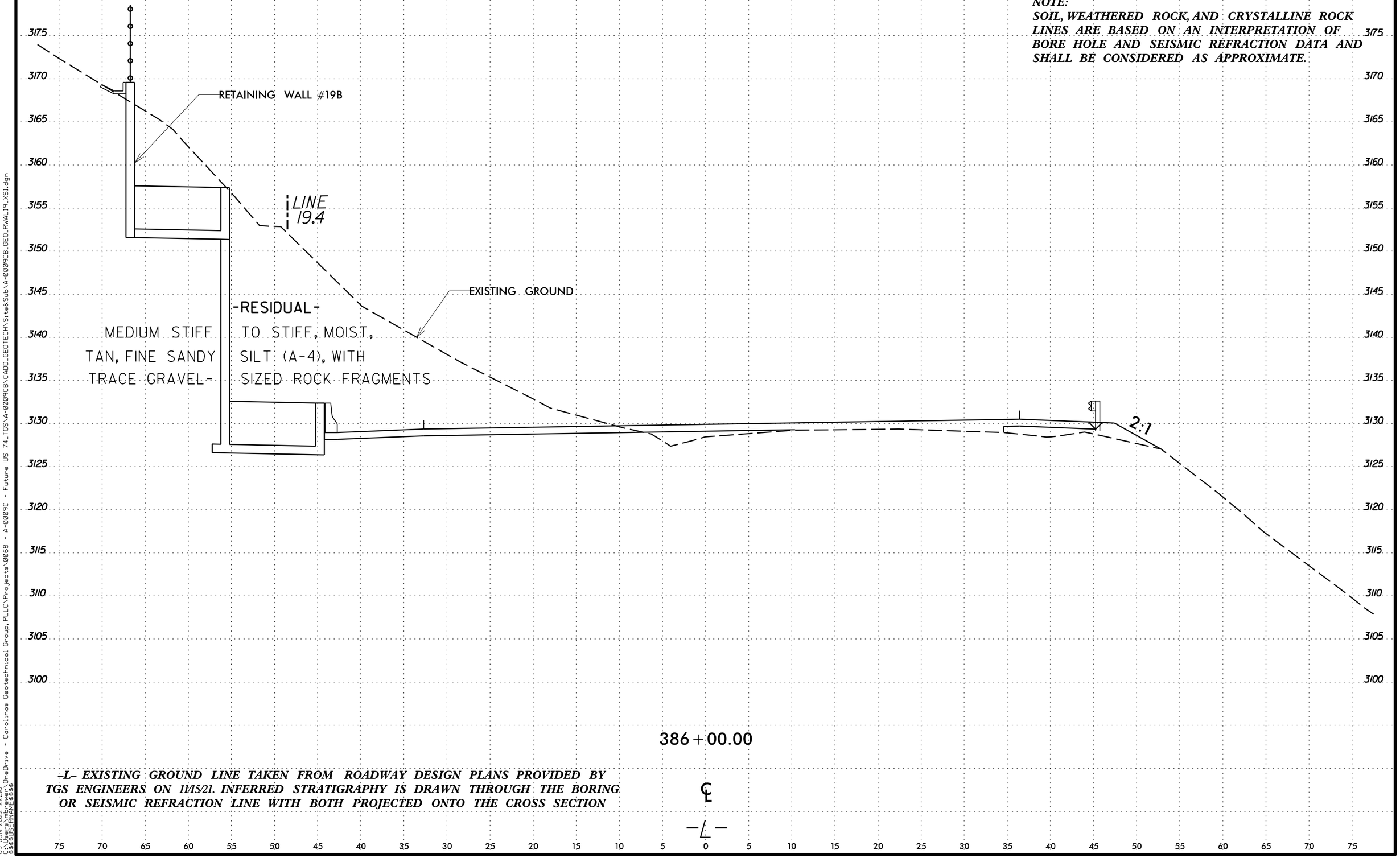
Ⓑ **-RESIDUAL-** LOOSE TO MEDIUM DENSE, MOIST, BROWN, SILTY FINE SAND (A-2-4)

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

385+00.00
℄
-L-

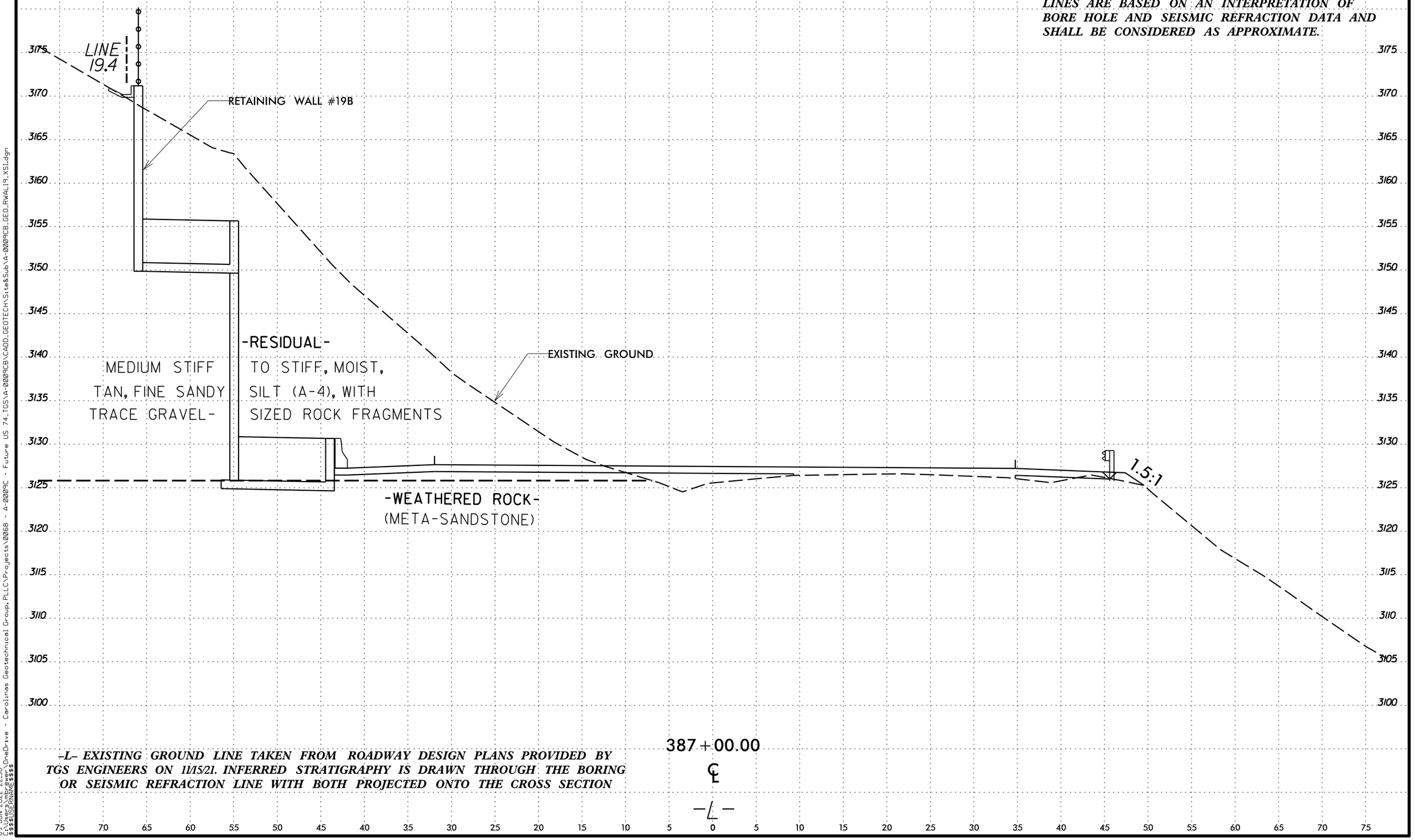
0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	A-0009CB	28

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.



-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

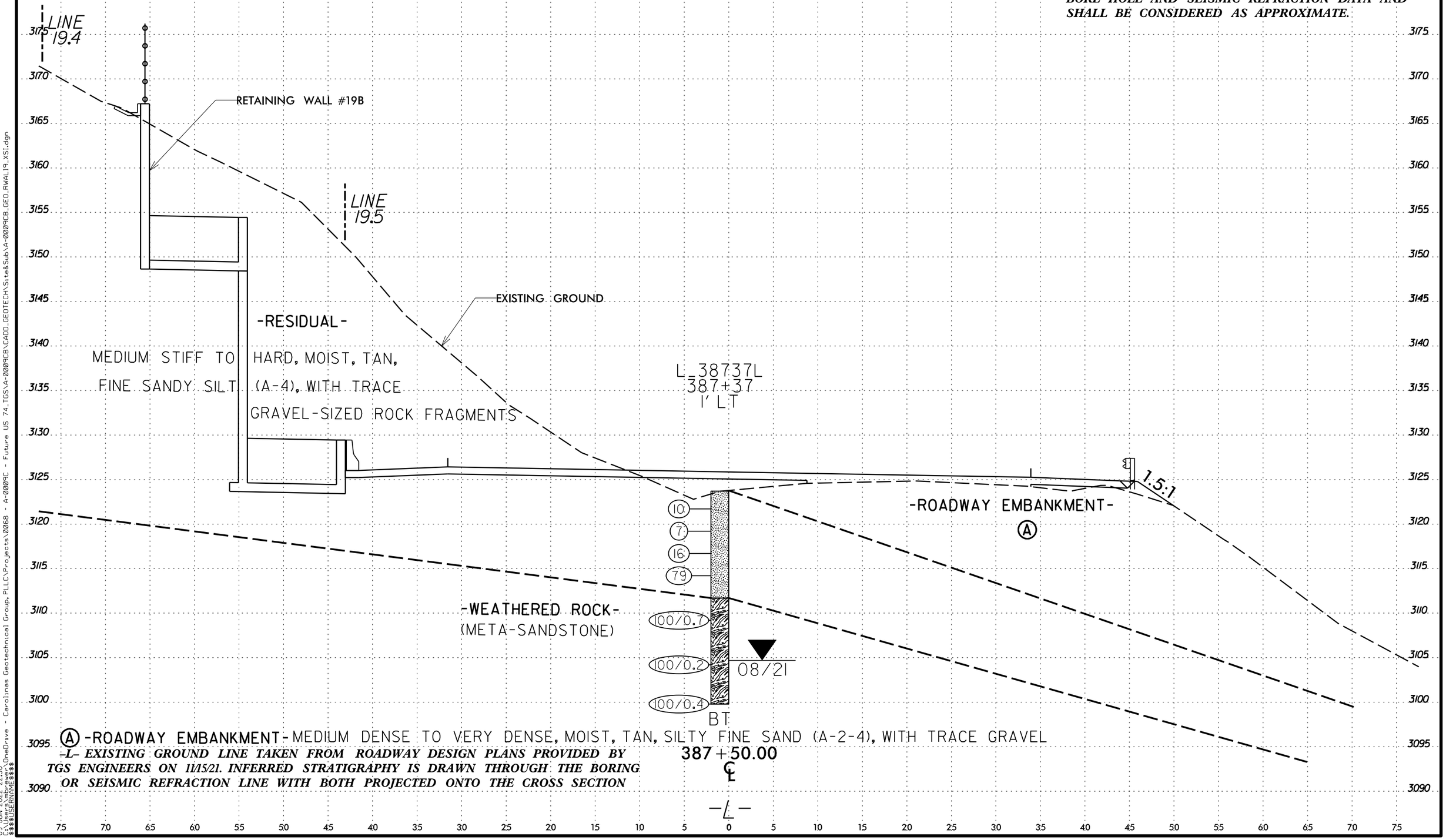
NOTE:
SOIL, WEATHERED ROCK, AND CRYSTALLINE ROCK LINES ARE BASED ON AN INTERPRETATION OF BORE HOLE AND SEISMIC REFRACTION DATA AND SHALL BE CONSIDERED AS APPROXIMATE.



-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

387+00.00
℄
-L-

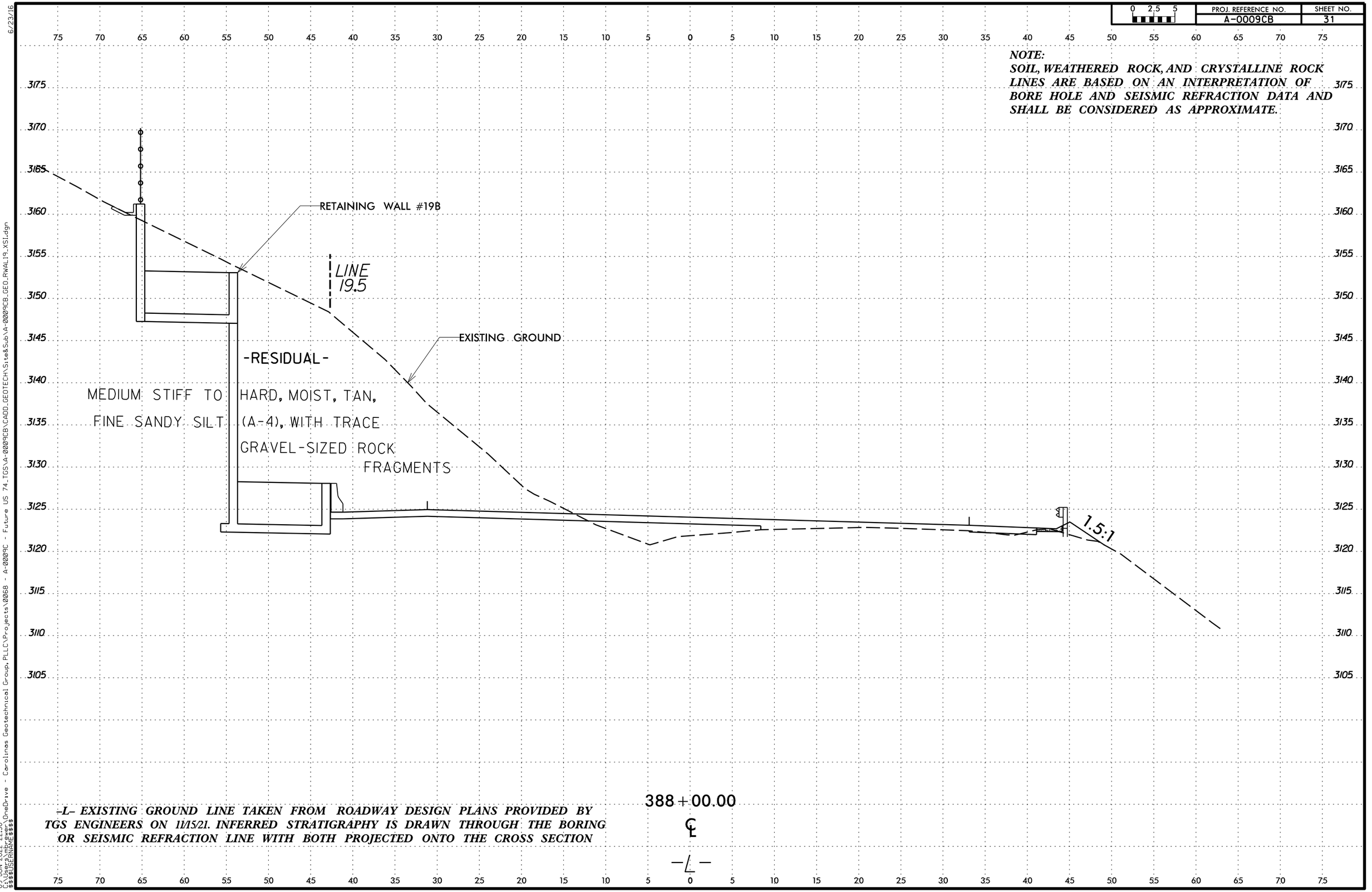
NOTE:
SOIL, WEATHERED ROCK, AND CRYSTALLINE ROCK LINES ARE BASED ON AN INTERPRETATION OF BORE HOLE AND SEISMIC REFRACTION DATA AND SHALL BE CONSIDERED AS APPROXIMATE.



-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. 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-0009CB	31

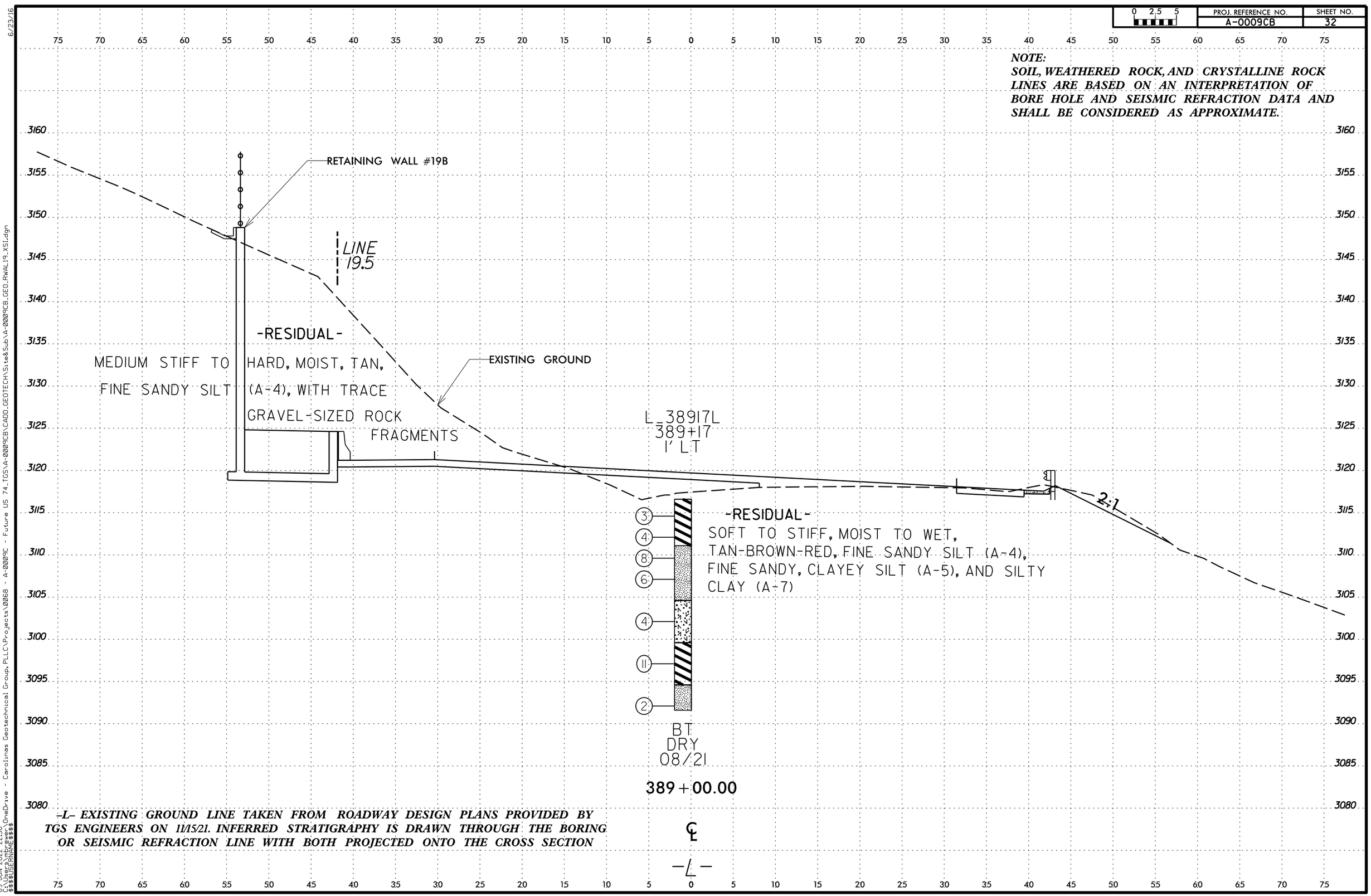
NOTE:
SOIL, WEATHERED ROCK, AND CRYSTALLINE ROCK LINES ARE BASED ON AN INTERPRETATION OF BORE HOLE AND SEISMIC REFRACTION DATA AND SHALL BE CONSIDERED AS APPROXIMATE.



-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. 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-0009CB	32

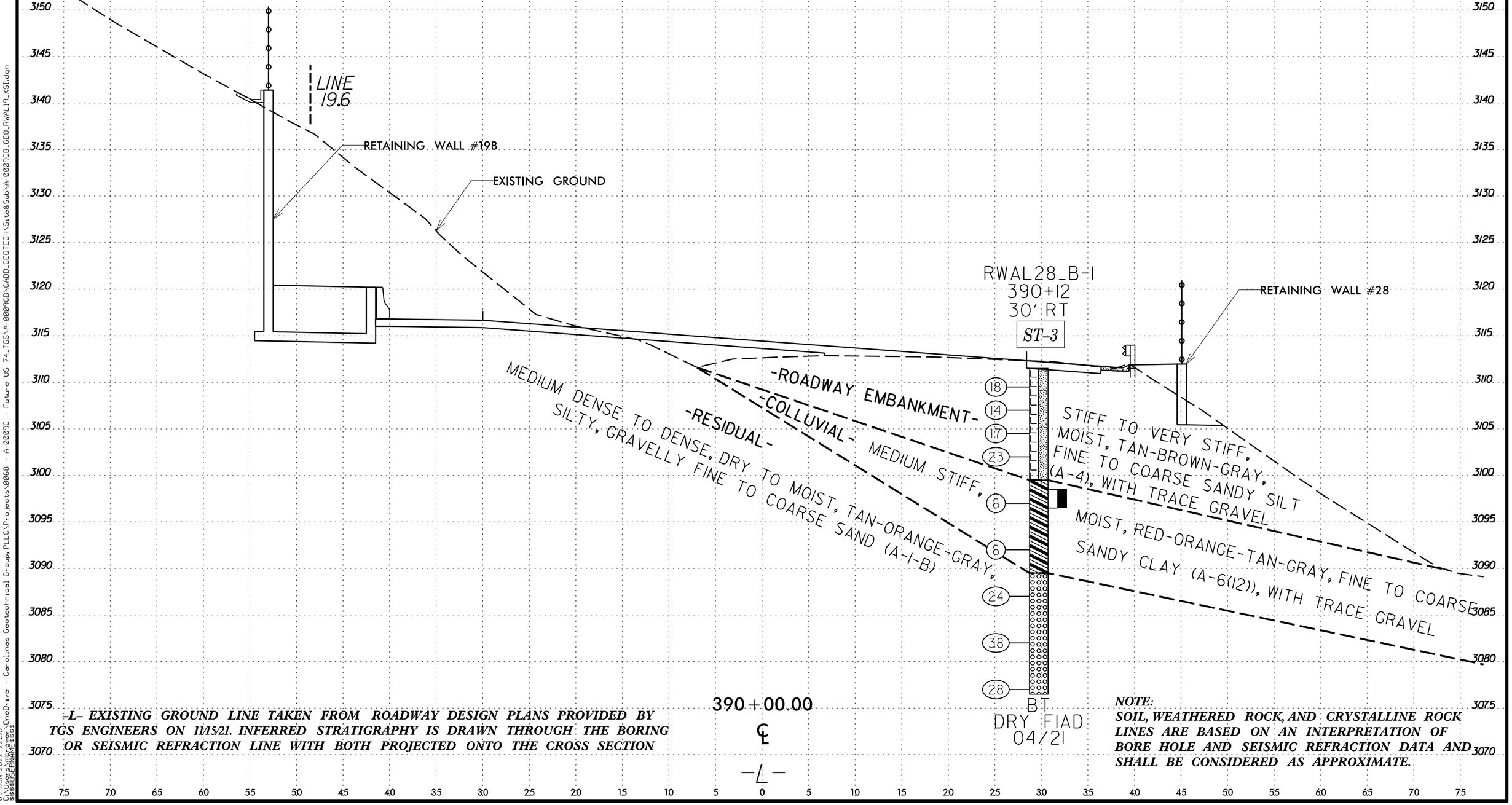
NOTE:
SOIL, WEATHERED ROCK, AND CRYSTALLINE ROCK LINES ARE BASED ON AN INTERPRETATION OF BORE HOLE AND SEISMIC REFRACTION DATA AND SHALL BE CONSIDERED AS APPROXIMATE.



-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. 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		
ST-3	30' RT	390+12 -L-	13.0' - 15.0'	A-6(12)	40	15	8.5	17.8	36.6	37.0	98.2	92.4	78.8	23.4	-



-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

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.

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	A-0009CB	34

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.

LINE 19.6

RETAINING WALL #19B

EXISTING GROUND

L_39114L
391+14
29' LT

5
75
100/0.9
100/0.3
60/0.1
BT
DRY
09/21

Ⓓ

Ⓔ

GRAY-TAN-ORANGE, SILTY, GRAVELLY FINE TO COARSE SAND (A-1-B) AND SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE MICA AND LITTLE TO SOME GRAVEL-SIZED ROCK FRAGMENTS

-CRYSTALLINE ROCK-
(META-SANDSTONE)

LOOSE TO VERY DENSE, DRY TO MOIST,

-RESIDUAL-

Ⓐ

Ⓑ

Ⓒ

RWAL28_B-2
391+00
30' RT

RETAINING WALL #28

20
21
14
11
36
12
8
7
14
69
35
60/0.0
BT
DRY
FIAD
04/21

391+00.00

℄

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

Ⓑ **-ROADWAY EMBANKMENT-** MEDIUM DENSE, MOIST, TAN-GRAY-ORANGE, SILTY FINE TO COARSE SAND (A-2-4), WITH LITTLE GRAVEL

Ⓒ **-ROADWAY EMBANKMENT-** MEDIUM STIFF TO HARD, MOIST, TAN-BROWN-GRAY, FINE TO COARSE SANDY SILT (A-4), WITH TRACE GRAVEL

Ⓓ **-RESIDUAL-** MEDIUM STIFF, MOIST, BROWN, FINE SANDY SILT (A-4), WITH SOME GRAVEL

Ⓔ **-WEATHERED ROCK-** (META-SANDSTONE)

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

℄
-L-

3145 3140 3135 3130 3125 3120 3115 3110 3105 3100 3095 3090 3085 3080 3075 3070 3065 3060 3055

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

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-4245	30' RT	391+88 -L-	6.0' - 7.5'	A-2-4(0)	26	NP	17	34	36	13	53	47	32	15	-

LINE 19.7

RETAINING WALL #19B

EXISTING GROUND

RWAL28_B-3
391+88
30' RT
SS-4245

RETAINING WALL #28

18
16
15
27
14
6
20
100/0.8
100/0.9
68
60/0.0

BT
DRY
FIAD
04/21

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

-WEATHERED ROCK-
(META-SANDSTONE)

-CRYSTALLINE ROCK-
(META-SANDSTONE)

Ⓐ -ROADWAY EMBANKMENT- MEDIUM DENSE, MOIST, TAN-ORANGE-BROWN, SILTY FINE TO COARSE SAND (A-2-4(0)), WITH LITTLE GRAVEL

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

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

Ⓓ -RESIDUAL- VERY DENSE, MOIST, GRAY-TAN, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE MICA

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

391+90.00 ℄

—L—

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.

LINE 19.7

RETAINING WALL #19B

EXISTING GROUND

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

-WEATHERED ROCK-
(META-SANDSTONE)

-CRYSTALLINE ROCK-
(META-SANDSTONE)

L_39320L
393+20
11' LT

-ROADWAY EMBANKMENT- Ⓐ

4:1

100/0.8
100/0.3
100/0.2
100/0.4
100/0.4
100/0.3
100/0.9

-WEATHERED ROCK-
(META-SANDSTONE)

08/21

BT

Ⓐ -ROADWAY EMBANKMENT- SOFT TO MEDIUM STIFF, MOIST, TAN, FINE SANDY SILT (A-4), WITH TRACE GRAVEL

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

393+00.00

℄

-L-

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.

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	A-0009CB	37

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.

LINE 19.7

RETAINING WALL #19B

EXISTING GROUND

RETAINING WALL #29

RWAL29_B-1
393+91
28' RT

-ROADWAY EMBANKMENT-
MEDIUM STIFF TO HARD, MOIST, TAN-ORANGE-GRAY, SILT (A-4),

-RESIDUAL-
VERY STIFF, MOIST TO WET, GRAY, FINE TO COARSE SANDY SILT (A-4), WITH TRACE GRAVEL-SIZED ROCK FRAGMENTS

-WEATHERED ROCK-
(META-SANDSTONE)

-CRYSTALLINE ROCK-
(META-SANDSTONE)

394+00.00

3:1

TO WET, BROWN-FINE TO COARSE SANDY WITH TRACE TO LITTLE GRAVEL

DENSE, MOIST, GRAY-ORANGE, SILTY, GRAVELLY, FINE TO COARSE SAND (A-1-B)

13	
17	
7	
13	
100/0.7	
25	
23	
36	
100/0.6	
60/0.0	

BT
DRY
FIAD
04/21

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

-L-

95 90 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

3120 3115 3110 3105 3100 3095 3090 3085 3080 3075 3070 3065 3060 3055 3050 3045 3040

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.

RETAINING WALL #19B

EXISTING GROUND

-RESIDUAL- Ⓒ

-COLLUVIAL- Ⓐ

LINE 19.8

L-39432L
394+32
40' LT

30 4 8 11 3

100/0.7

60/0.

BT
DRY
12/21

Ⓑ

-WEATHERED ROCK-
(META-SANDSTONE)

-CRYSTALLINE ROCK-
(META-SANDSTONE)

RETAINING WALL #29

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

-COLLUVIAL-
SOFT, MOIST, BROWN, FINE SANDY SILT (A-4), WITH LITTLE GRAVEL

VERY STIFF, MOIST TO WET, GRAY, FINE TO COARSE SANDY SILT (A-4), WITH -RESIDUAL- TRACE GRAVEL-SIZED ROCK FRAGMENTS

-WEATHERED ROCK- (META-SANDSTONE)

Ⓓ

Ⓐ-COLLUVIAL- VERY STIFF, MOIST, TAN, FINE SANDY SILT (A-4), WITH LITTLE GRAVEL

Ⓑ-COLLUVIAL- LOOSE TO MEDIUM DENSE, MOIST, SILTY FINE SAND (A-2-4), WITH LITTLE GRAVEL

Ⓒ-RESIDUAL- VERY STIFF, MOIST, GRAY, FINE TO COARSE SANDY SILT (A-4), WITH TRACE GRAVEL-SIZED ROCK FRAGMENTS

Ⓓ-RESIDUAL- DENSE, MOIST, GRAY-ORANGE, SILTY, GRAVELLY FINE TO COARSE SAND (A-1-B)

394+50.00

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

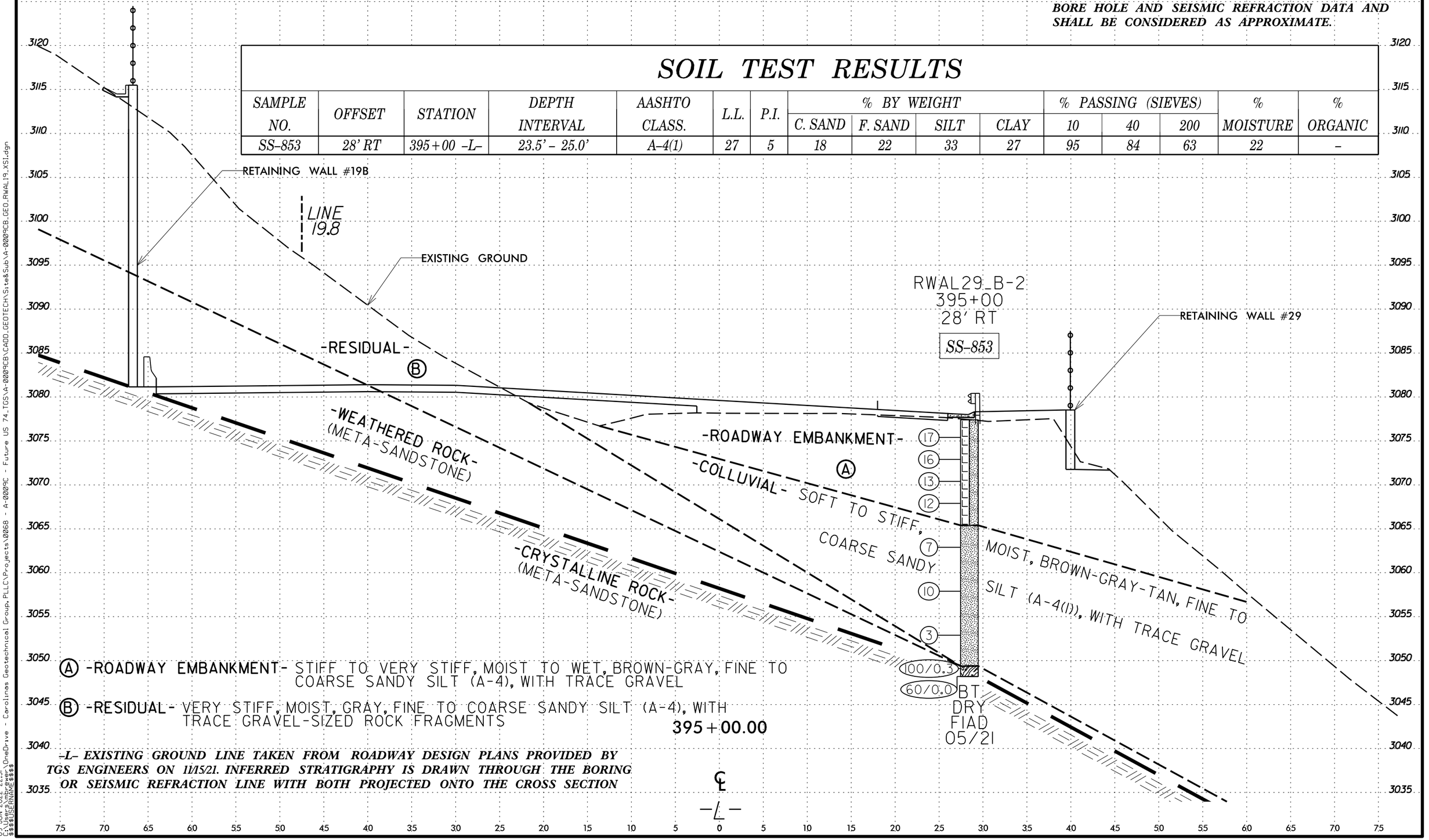
℄

-L-

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-853	28' RT	395+00 -L-	23.5' - 25.0'	A-4(1)	27	5	18	22	33	27	95	84	63	22	-



Ⓐ **-ROADWAY EMBANKMENT-** STIFF TO VERY STIFF, MOIST TO WET, BROWN-GRAY, FINE TO COARSE SANDY SILT (A-4), WITH TRACE GRAVEL

Ⓑ **-RESIDUAL-** VERY STIFF, MOIST, GRAY, FINE TO COARSE SANDY SILT (A-4), WITH TRACE GRAVEL-SIZED ROCK FRAGMENTS

395+00.00

℄
-L-

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

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.

LINE 19.8

RETAINING WALL #19B

-RESIDUAL-
Ⓑ

EXISTING GROUND

-WEATHERED ROCK-
(META-SANDSTONE)

-CRYSTALLINE ROCK-
(META-SANDSTONE)

RETAINING WALL #29

RWAL29_B-3
395+80
28' RT

PAVEMENT

-ROADWAY EMBANKMENT-
Ⓐ

LOOSE TO DENSE, MOIST, GRAY, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE GRAVEL

-RESIDUAL-
-CRYSTALLINE ROCK-
(META-SANDSTONE)

1.6:1

10	
23	
100/0.8	
7	
41	
10	
60/0.0	

BT
DRY
FIAD
05/21

Ⓐ **-ROADWAY EMBANKMENT-** LOOSE TO VERY DENSE, MOIST, GRAY-BROWN, SILTY, GRAVELLY FINE TO COARSE SANDY (A-1-B) AND SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE GRAVEL

Ⓑ **-RESIDUAL-** VERY STIFF, MOIST, GRAY, FINE TO COARSE SANDY SILT (A-4), WITH TRACE GRAVEL-SIZED ROCK FRAGMENTS

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

395+80.00
℄
-L-

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

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.

LINE 19.9

RETAINING WALL #19B

EXISTING GROUND

RETAINING WALL #29A

RWAL29A_B-1
396+86
21' RT

PAVEMENT

-RESIDUAL- MEDIUM DENSE TO DENSE, MOIST, BROWN-GRAY, (A-2-4), WITH TRACE GRAVEL-SIZED ROCK FRAGMENTS

-WEATHERED ROCK- (META-SANDSTONE)

-CRYSTALLINE ROCK- (META-SANDSTONE)

SILTY FINE TO COARSE SAND

Ⓐ	19	5	2	100/0.4	12	27
Ⓑ						
Ⓒ						

40	100/0.8	100/0.9	60/0.0

BT
DRY
FIAD
05/21

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

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

Ⓒ -ROADWAY EMBANKMENT- VERY DENSE, MOIST, GRAY, FINE TO COARSE SANDY GRAVEL (A-1-A)

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

396+80.00
℄
-L-

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.

LINE 19.9

RETAINING WALL #19B

EXISTING GROUND

L_39702L
397+02
12' LT

RETAINING WALL #29A

-ROADWAY EMBANKMENT-

Ⓐ

-RESIDUAL-

-WEATHERED ROCK-
(META-SANDSTONE)

-CRYSTALLINE ROCK-
(META-SANDSTONE)

-COLLUVIAL-

Ⓑ

MEDIUM DENSE TO DENSE, MOIST, TAN, SILTY FINE SAND (A-2-4)

-WEATHERED ROCK-
(META-SANDSTONE)

12
33
22
10
100/0.8
60/0.1

BT
DRY
08/21

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

Ⓑ -COLLUVIAL- VERY SOFT TO STIFF, MOIST, BROWN-ORANGE, FINE TO COARSE SANDY SILT (A-4), WITH TRACE GRAVEL

397+00.00

℄
—L—

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

3105 3100 3095 3090 3085 3080 3075 3070 3065 3060 3055 3050 3045 3040 3035 3030 3025 3020 3015

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

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-8131	20' RT	397+40 -L-	8.5' - 10.0'	A-4(0)	26	1	17	30	33	20	76	68	47	20	-

LINE 19.9

RETAINING WALL #19B

EXISTING GROUND

RETAINING WALL #29A

RWAL29A_B-2
397+40
20' RT
SS-8131

PAVEMENT

-ROADWAY EMBANKMENT-

Ⓐ

-COLLUVIAL-

MOIST, BROWN-ORANGE, FINE TO COARSE SANDY SILT (A-4(0)), WITH TRACE GRAVEL

-RESIDUAL-

VERY SOFT TO STIFF, MOIST TO DRY, GRAY-BROWN, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE GRAVEL-SIZED ROCK FRAGMENTS

DENSE TO VERY DENSE

-WEATHERED ROCK-
(META-SANDSTONE)

-CRYSTALLINE ROCK-
(META-SANDSTONE)

11	
8	
4	
2	
14	
31	
71	
53	
100/0.4	
100/0.9	
100/0.3	

BT
DRY
FIAD
05/21

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

397+50.00

℄

-L-

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

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-8123	20' RT	397+95 -L-	13.5' - 15.0'	A-4(0)	27	1	17	30	32	18	89	80	53	21	-

LINE 19.9

EXISTING GROUND

RETAINING WALL #19B

RETAINING WALL #29A

RWAL29A_B-3
397+95
20' RT
SS-8123

PAVEMENT

-RESIDUAL-
DRY TO MOIST, GRAY-BROWN, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE GRAVEL-SIZED ROCK FRAGMENTS

DENSE TO VERY DENSE, COARSE SANDY SILT (A-4(0)),

VERY SOFT TO MEDIUM STIFF, MOIST,

-COLLUVIAL-

-WEATHERED ROCK- (META-SANDSTONE)

-CRYSTALLINE ROCK- (META-SANDSTONE)

Ⓐ 13
Ⓑ 20
11
1
1
Ⓒ
4
5
100/0.6
60/0.1

BROWN-ORANGE, FINE TO COARSE SAND (A-2-4), WITH TRACE GRAVEL

BT
DRY
FIAD
05/21

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

Ⓑ -ROADWAY EMBANKMENT- STIFF TO VERY STIFF, MOIST, 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

398+00.00
℄
-L-

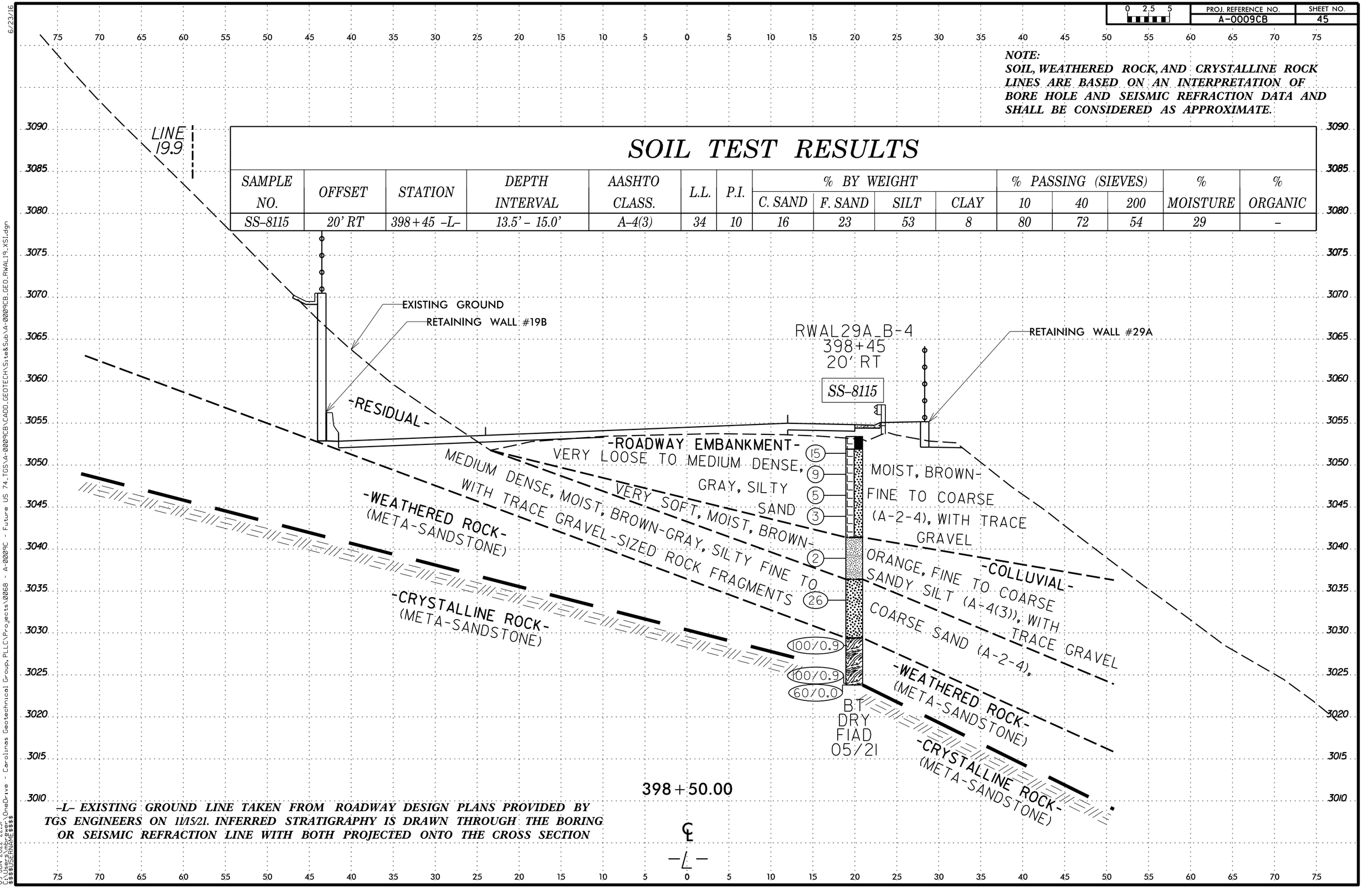
-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

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.

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-8115	20' RT	398+45 -L-	13.5' – 15.0'	A-4(3)	34	10	16	23	53	8	80	72	54	29	–



-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

NOTE:
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LINE 19.10

EXISTING GROUND

RETAINING WALL #19B

L_39918L
399+18
28' LT

RWAL29A_B-5
399+16
10' RT

Ⓐ

2:1

53
87
40
100/0.9
100/0.6
100/0.5
100/0.4
BT

-RESIDUAL-
MEDIUM DENSE TO VERY
08/21
VERY STIFF TO HARD,
MANGANESE OXIDE AND

-WEATHERED ROCK-
(META-SANDSTONE)

25
23
34
30
23
100/0.9
100/0.9
100/0.8
73
09/21
100/0.4
100/0.3
60/0.0
BT
DRY
FIAD
05/21

DENSE, MOIST, ORANGE-TAN, SILTY SAND (A-2-4), WITH TRACE GRAVEL-SIZED ROCK FRAGMENTS

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

-WEATHERED ROCK-
(META-SANDSTONE)

-CRYSTALLINE ROCK-
(META-SANDSTONE)

Ⓑ

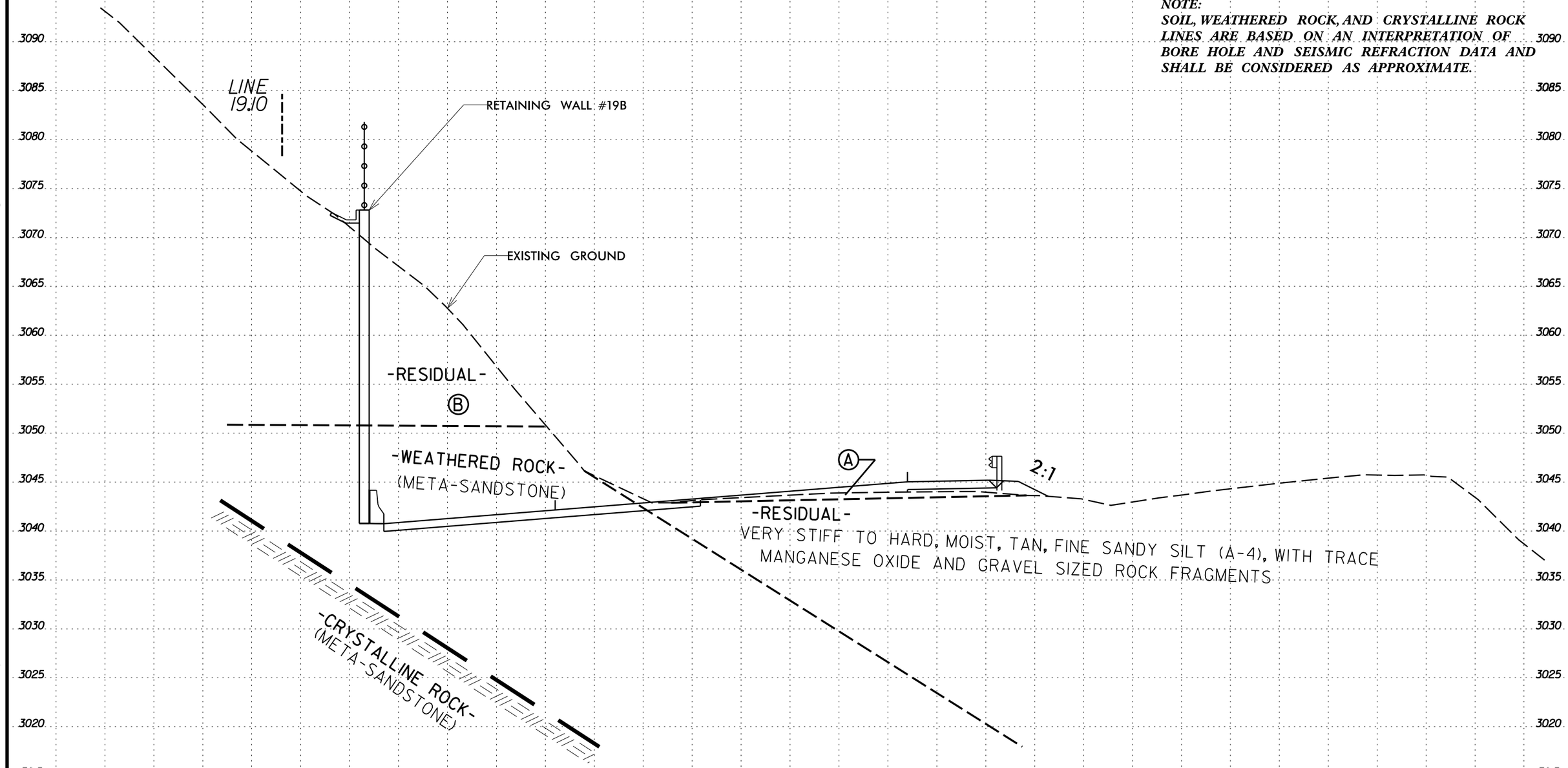
Ⓐ -ROADWAY EMBANKMENT- MEDIUM DENSE, MOIST, BROWN, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE GRAVEL

Ⓑ -RESIDUAL- HARD, MOIST, TAN, FINE SANDY SILT (A-4)

399+00.00
℄
-L-

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

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.



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

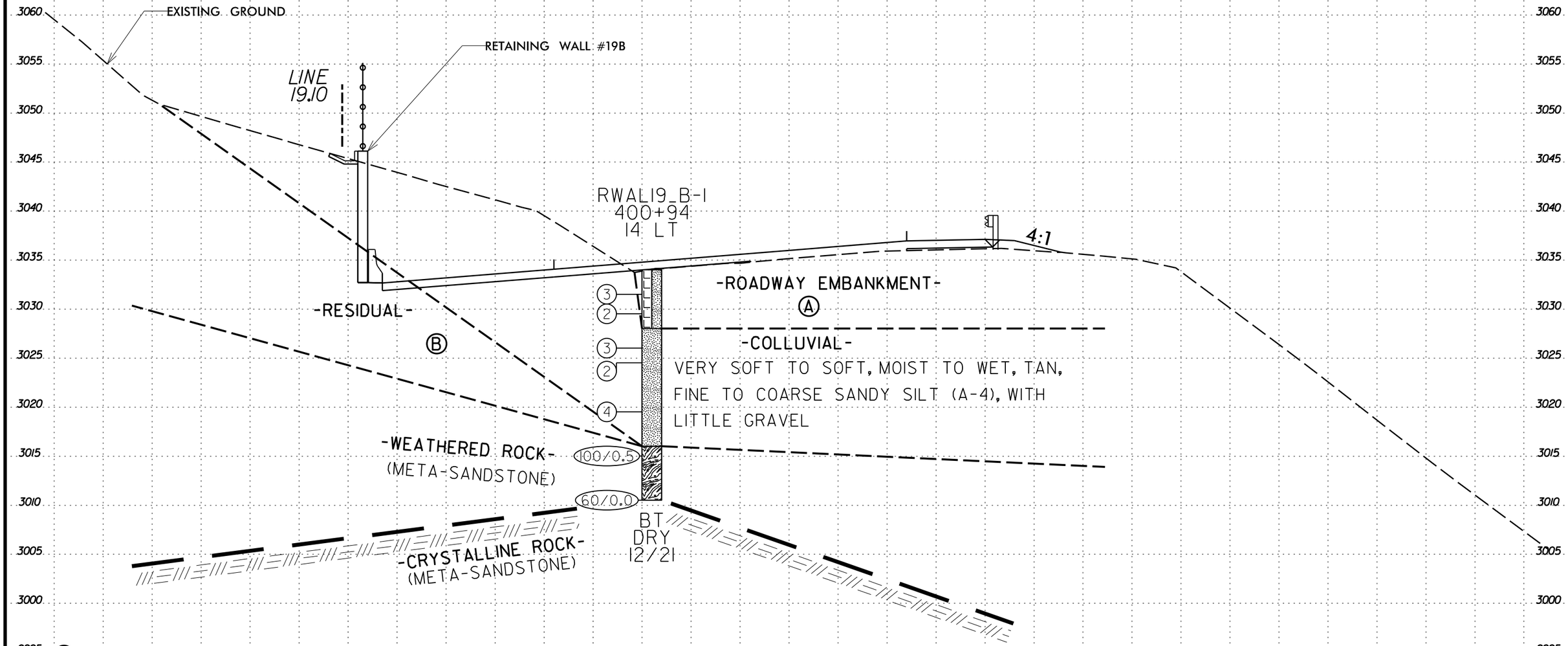
Ⓑ **-RESIDUAL-** VERY STIFF TO HARD, MOIST, TAN, FINE SANDY SILT (A-4), WITH TRACE MANGANESE OXIDE AND GRAVEL-SIZED ROCK FRAGMENTS

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

400+00.00
℄
-L-

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	A-0009CB	48

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.



Ⓐ **-ROADWAY EMBANKMENT-** VERY SOFT TO SOFT, MOIST TO WET, TAN-GRAY, FINE TO COARSE SANDY SILT (A-4), WITH TRACE GRAVEL AND ORGANICS

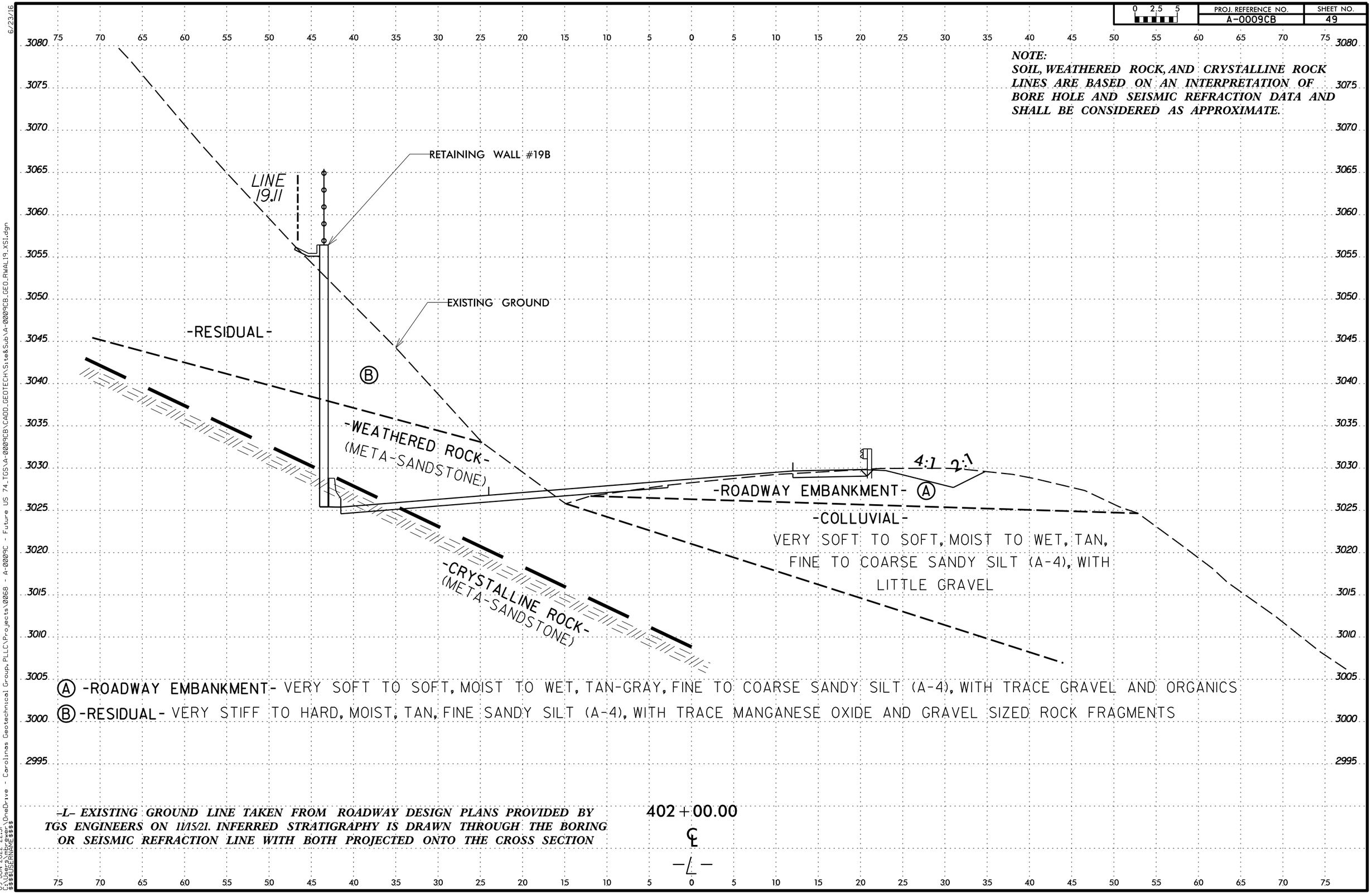
Ⓑ **-RESIDUAL-** VERY STIFF TO HARD, MOIST, TAN, FINE SANDY SILT (A-4), WITH TRACE MANGANESE OXIDE AND GRAVEL SIZED ROCK FRAGMENTS

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

401+00.00
℄
-L-

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	A-0009CB	49

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.



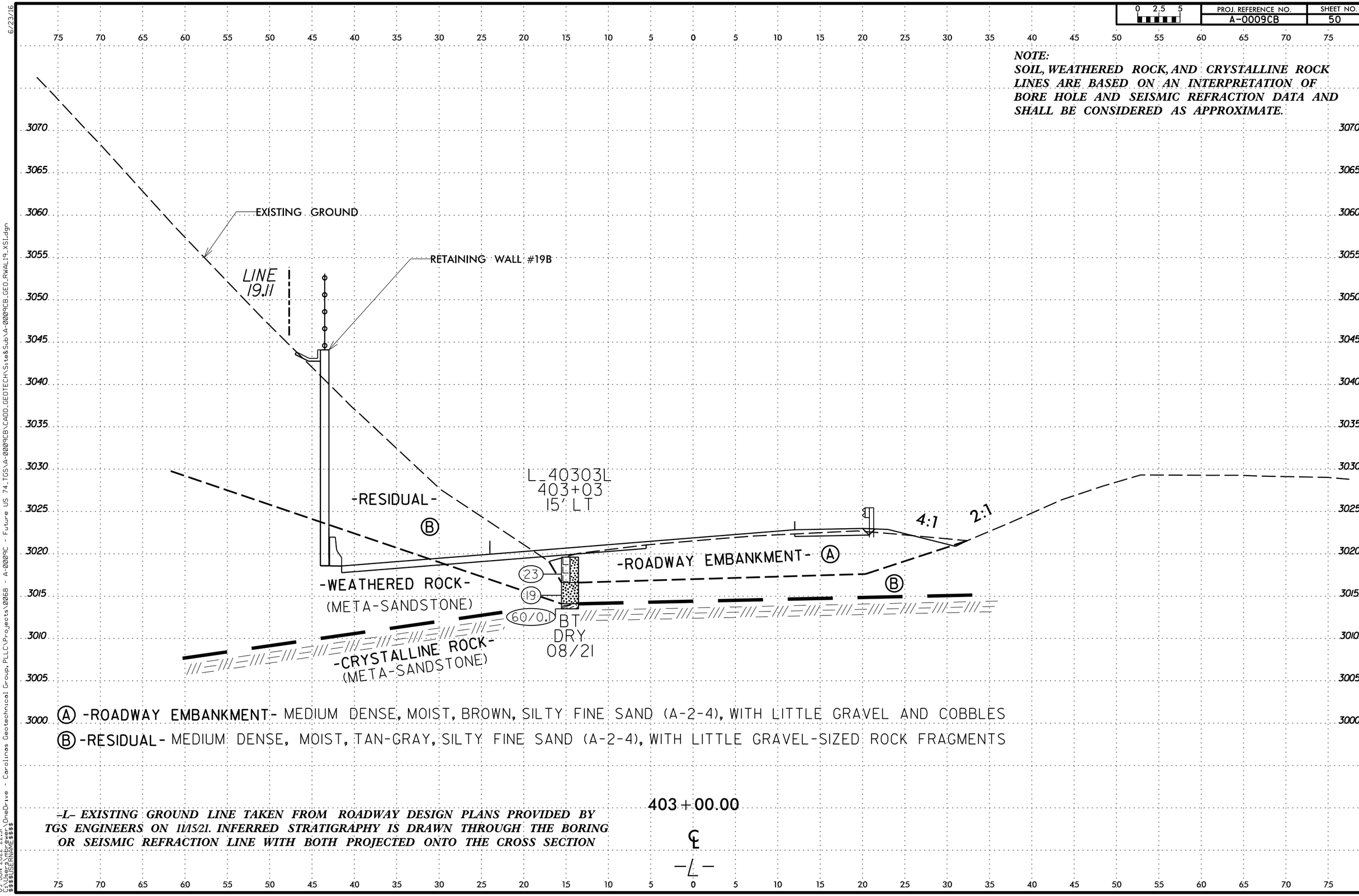
Ⓐ **-ROADWAY EMBANKMENT-** VERY SOFT TO SOFT, MOIST TO WET, TAN-GRAY, FINE TO COARSE SANDY SILT (A-4), WITH TRACE GRAVEL AND ORGANICS

Ⓑ **-RESIDUAL-** VERY STIFF TO HARD, MOIST, TAN, FINE SANDY SILT (A-4), WITH TRACE MANGANESE OXIDE AND GRAVEL SIZED ROCK FRAGMENTS

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

402+00.00
℄
-L-

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.



Ⓐ -ROADWAY EMBANKMENT- MEDIUM DENSE, MOIST, BROWN, SILTY FINE SAND (A-2-4), WITH LITTLE GRAVEL AND COBBLES

Ⓑ -RESIDUAL- MEDIUM DENSE, MOIST, TAN-GRAY, SILTY FINE SAND (A-2-4), WITH LITTLE GRAVEL-SIZED ROCK FRAGMENTS

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. 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-0009CB	51

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

RETAINING WALL #19B

LINE 19.12

2:1

-ROADWAY EMBANKMENT- Ⓐ

-COLLUVIAL- VERY SOFT TO SOFT, MOIST TO WET, TAN, FINE TO COARSE SANDY SILT (A-4), WITH LITTLE GRAVEL

-RESIDUAL- MEDIUM DENSE, MOIST, TAN-GRAY, SILTY FINE SAND (A-2-4), WITH LITTLE GRAVEL-SIZED ROCK FRAGMENTS

-WEATHERED ROCK- (META-SANDSTONE)

Ⓐ -ROADWAY EMBANKMENT- MEDIUM DENSE, MOIST, BROWN, SILTY FINE SAND (A-2-4), WITH LITTLE GRAVEL AND COBBLES

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

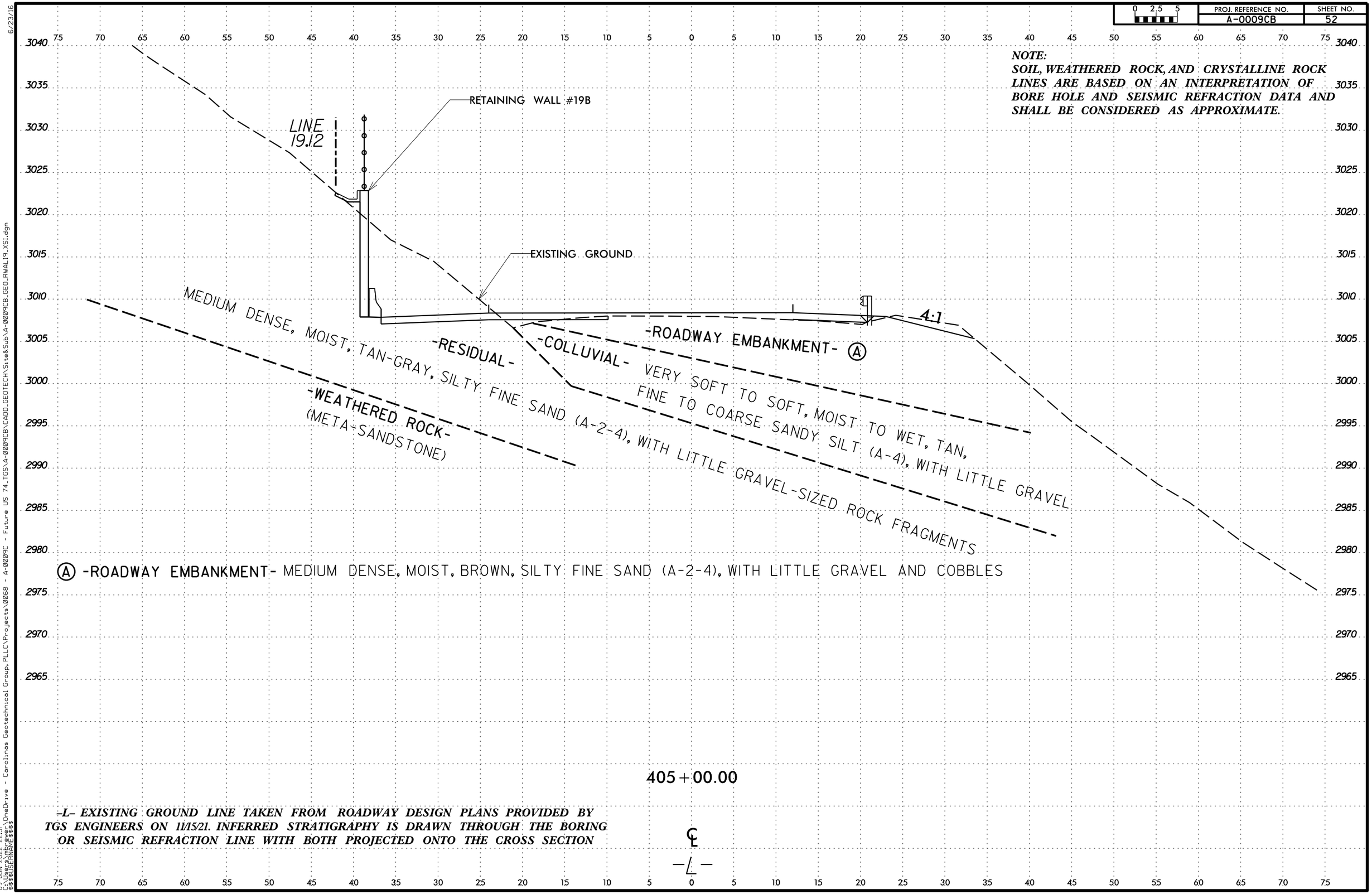
404+00.00

℄

-L-

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	A-0009CB	52

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.



Ⓐ -ROADWAY EMBANKMENT- MEDIUM DENSE, MOIST, BROWN, SILTY FINE SAND (A-2-4), WITH LITTLE GRAVEL AND COBBLES

405+00.00

℄
—L—

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

NOTE:
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RWAL19_B-2
405+73
38' LT

LINE
19.12

RETAINING WALL #19B

-RESIDUAL-

Ⓒ

Ⓑ

3
3
7
9

100/0.8
60/0.0

BT
DRY
12/21

-COLLUVIAL- SOFT TO STIFF, MOIST TO WET, TAN-BROWN, FINE TO COARSE SANDY SILT (A-4), WITH LITTLE GRAVEL AND ORGANICS

-ROADWAY EMBANKMENT- Ⓐ

4:1

-RESIDUAL- MEDIUM DENSE, MOIST, TAN-GRAY, SILTY FINE SAND (A-2-4), WITH LITTLE GRAVEL-SIZED ROCK FRAGMENTS

-CRYSTALLINE ROCK- (META-SANDSTONE)

EXISTING GROUND

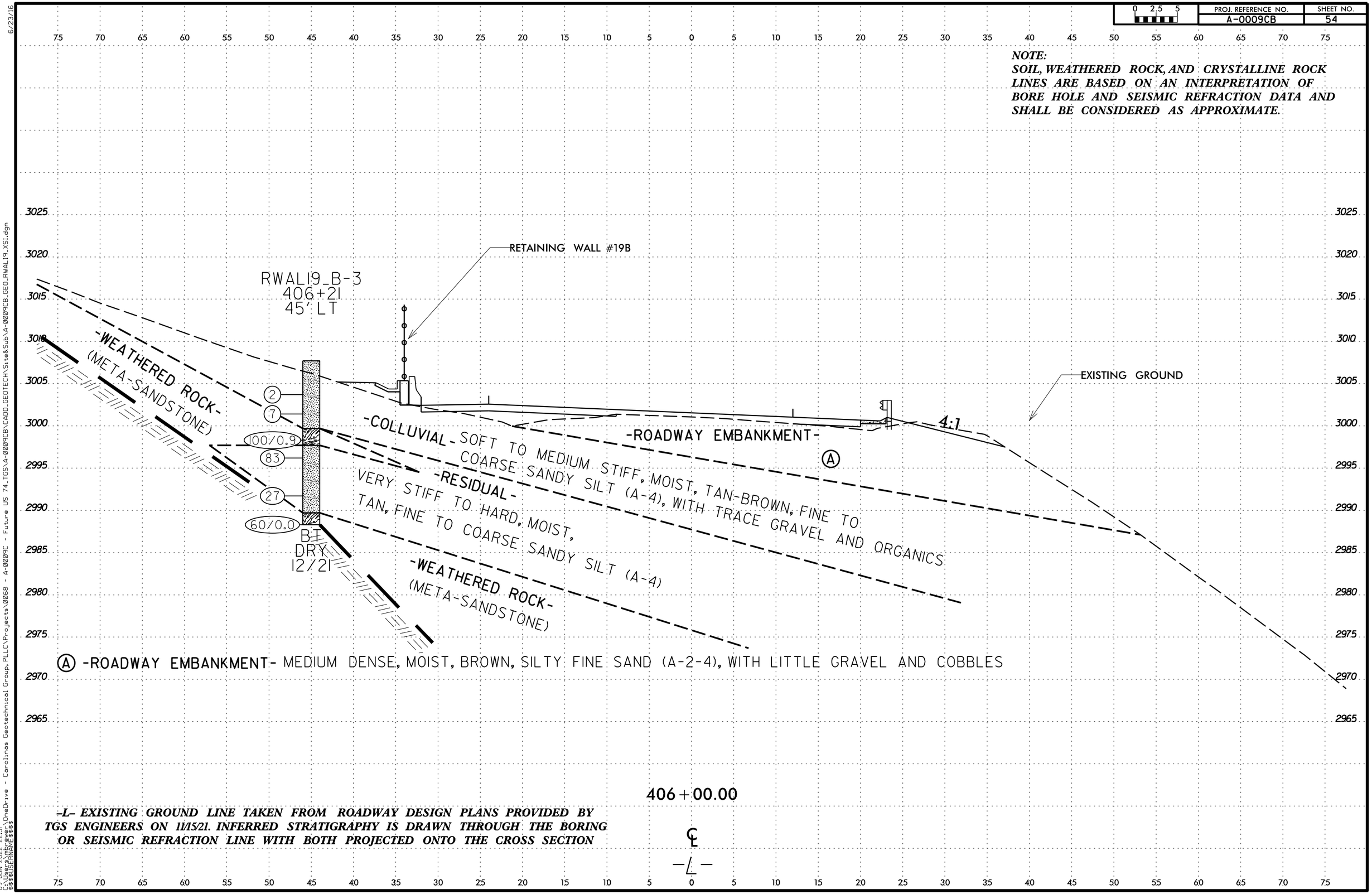
Ⓐ -ROADWAY EMBANKMENT- MEDIUM DENSE, MOIST, BROWN, SILTY FINE SAND (A-2-4), WITH LITTLE GRAVEL AND COBBLES
Ⓑ -RESIDUAL- MEDIUM DENSE, MOIST, TAN-GRAY, SILTY FINE SAND (A-2-4), WITH LITTLE GRAVEL-SIZED ROCK FRAGMENTS
Ⓒ -WEATHERED ROCK- (META-SANDSTONE)

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

405+50.00
℄
-L-

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	A-0009CB	54

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.



-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. 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-0009CB	55

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.

RETAINING WALL #19B

LINE 19.13

L_40703L
407+03
8' LT

EXISTING GROUND

4:1

2:1

-WEATHERED ROCK-
(META-SANDSTONE)

-CRYSTALLINE ROCK-
(META-SANDSTONE)

-RESIDUAL-
STIFF TO HARD, MOIST, TAN, FINE SANDY SILT (A-4)

15
76
100/0.9
61
68
100/0.9
100/0.6
08/21
BT

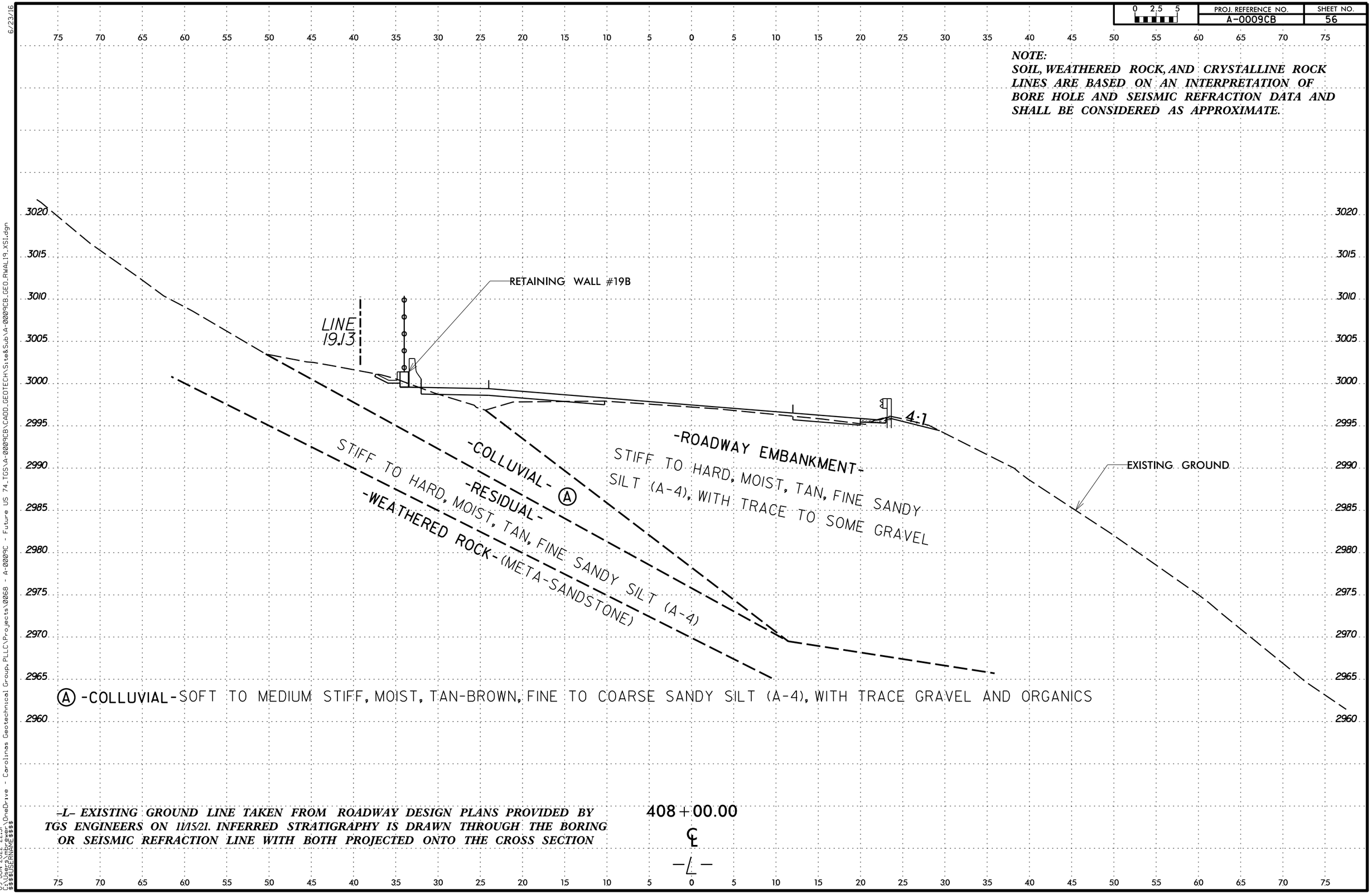
Ⓐ -ROADWAY EMBANKMENT- MEDIUM DENSE, MOIST, BROWN, SILTY FINE SAND (A-2-4), WITH LITTLE GRAVEL AND COBBLES
Ⓑ -RESIDUAL- STIFF TO HARD, MOIST, TAN, FINE SANDY SILT (A-4)
Ⓒ -WEATHERED ROCK- (META-SANDSTONE)

407+00.00

℄
-L-

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

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.



Ⓐ -COLLUVIAL- SOFT TO MEDIUM STIFF, MOIST, TAN-BROWN, FINE TO COARSE SANDY SILT (A-4), WITH TRACE GRAVEL AND ORGANICS

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING OR SEISMIC REFRACTION LINE WITH BOTH PROJECTED ONTO THE CROSS SECTION

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GEOTECHNICAL BORING REPORT
BORE LOG

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** C. Piercy
SITE DESCRIPTION Upgrade NC 143 from SR 1223 (Beech Creek Road) to 0.5 Miles North of Appalachian Trail			**GROUND WTR (ft)**
BORING NO. RWAL18_B-3	**STATION** 376+75	**OFFSET** 33 ft RT	**ALIGNMENT** L	**0 HR.** Dry
COLLAR ELEV. 3,109.0 ft	**TOTAL DEPTH** 70.0 ft	**NORTHING** 618,800	**EASTING** 593,180	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE BRE9533 CME-550X 78% 03/12/2021		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER J. Phillips	**START DATE** 04/27/21	**COMP. DATE** 04/27/21	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft) / DEPTH (ft)
3110										3,109.0 GROUND SURFACE 0.0
	3,108.0	1.0	4	4	6	10		M		**ROADWAY EMBANKMENT** Stiff to Very Stiff, Brown-Yellow-Red, Fine to Coarse Sandy SILT (A-4), with trace gravel
3105	3,105.5	3.5	8	8	8	16		M		3,103.5 5.5
	3,103.0	6.0	11	16	16	32		M		Medium Dense to Dense, Brown, Silty Fine to Coarse SAND (A-2-4), with trace gravel
3100	3,100.5	8.5	9	7	5	12		M		3,097.0 12.0
	3,095.5	13.5	13	87/0.4		100/0.9				Dense to Very Dense, Gray-Brown, Silty, Gravelly Fine to Coarse SAND (A-1-b)
3095										
3090	3,090.5	18.5	18	18	16	34		M		3,087.0 22.0
										Medium Dense, Brown, Silty Fine to Coarse SAND (A-2-4), with trace gravel
3085	3,085.5	23.5	6	11	13	24		M		3,082.0 27.0
										COLLUVIAL
3080	3,080.5	28.5	4	6	11	17		M		Medium Dense, Brown, Silty Fine to Coarse SAND (A-2-4), with trace gravel
										3,077.0 32.0
3075	3,075.5	33.5	5	7	7	14		M		Stiff, Brown, Fine to Coarse Sandy SILT (A-4), with trace manganese oxide
										3,072.0 37.0
3070	3,070.5	38.5	13	11	12	23		M		**RESIDUAL**
										Loose to Very Dense, Brown-Gray, Silty Fine to Coarse SAND (A-2-4), with trace gravel-sized rock fragments
3065	3,065.5	43.5	15	13	13	26		M		
3060	3,060.5	48.5	18	14	14	28		M		
	3,055.5	53.5	8	8	10	18		M		
3055										
3050	3,050.5	58.5	5	4	5	9		M		
3045	3,045.5	63.5	15	23	29	52		M		
3040	3,040.5	68.5	9	12	17	29		M		3,039.0 70.0
										Boring Terminated at Elevation 3,039.0 ft In Residual Silty Sand (A-2-4)

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** N. McLaren
SITE DESCRIPTION Upgrade NC 143 from SR 1223 (Beech Creek Road) to 0.5 Miles North of Appalachian Trail			**GROUND WTR (ft)**
BORING NO. RWAL18_B-4	**STATION** 377+50	**OFFSET** 31 ft RT	**ALIGNMENT** L	**0 HR.** Dry
COLLAR ELEV. 3,113.8 ft	**TOTAL DEPTH** 55.0 ft	**NORTHING** 618,727	**EASTING** 593,218	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 83% 06/16/2020		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER J. Estep	**START DATE** 04/26/21	**COMP. DATE** 04/26/21	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
3115										3,113.8 GROUND SURFACE 0.0
	3,112.8	1.0	5	6	10	16		M		**ROADWAY EMBANKMENT** Very Stiff, Tan-Orange-Brown, Fine to Coarse Sandy SILT (A-4), with little gravel
3110	3,110.3	3.5	5	5	10	15		M		3,110.8 3.0
	3,107.8	6.0	19	17	6	23		M		Stiff, Tan-Gray-Brown, Fine to Coarse Sandy CLAY (A-6), with little gravel
3105	3,105.3	8.5	13	14	11	25		D		3,108.3 5.5
										Medium Dense to Dense, Tan-Brown, Silty, Gravelly Fine to Coarse SAND (A-1-b)
3100	3,100.3	13.5	13	14	18	32		M		
3095	3,095.3	18.5	16	11	11	22		M		3,096.8 17.0
										Medium Stiff to Very Stiff, Tan-Brown-Orange, Fine to Coarse Sandy SILT (A-4), with trace mica and little gravel
3090	3,090.3	23.5	5	3	5	8		M		
3085	3,085.3	28.5	8	7	6	13	SS-4108	17%		3,086.8 27.0
										COLLUVIAL Stiff, Tan-Orange-Gray, Fine Sandy SILT (A-4(0)), with trace gravel
3080	3,080.3	33.5	4	5	7	12		M		
3075	3,075.3	38.5	6	4	4	8		M		3,076.8 37.0
										RESIDUAL Medium Stiff, Tan-Brown-Gray-Orange, Fine to Coarse Sandy SILT (A-4), with trace gravel-sized rock fragments
3070	3,070.3	43.5	2	4	9	13		M		3,071.8 42.0
										Medium Dense to Very Dense, Tan-Gray-Orange, Silty Fine to Coarse SAND (A-2-4), with little gravel-sized rock fragments
3065	3,065.3	48.5	23	69	29	98		M		
3060	3,060.3	53.5	6	14	12	26		M		3,058.8 55.0
										Boring Terminated at Elevation 3,058.8 ft In Residual Silty Sand (A-2-4)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** D. Goodnight
SITE DESCRIPTION Upgrade NC 143 from SR 1223 (Beech Creek Road) to 0.5 Miles North of Appalachian Trail			**GROUND WTR (ft)**
BORING NO. L_37808L	**STATION** 378+08	**OFFSET** 7 ft LT	**ALIGNMENT** L	**0 HR.** Dry
COLLAR ELEV. 3,114.0 ft	**TOTAL DEPTH** 25.0 ft	**NORTHING** 618,703	**EASTING** 593,285	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE RME9553 CME-550X 80% 03/12/2021		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER J. Phillips	**START DATE** 08/13/21	**COMP. DATE** 08/13/21	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
3115										3,114.0 GROUND SURFACE	0.0
	3,113.0	1.0	27	30	42	72		M		**RESIDUAL** Very Dense, Gray, Fine to Coarse Sandy GRAVEL (A-1-A)	
3110	3,110.5	3.5	4	8	13	21		M		3,111.0 Medium Dense, Tan, Silty Fine SAND (A-2-4)	3.0
	3,108.0	6.0	4	4	8	12		M			
3105	3,105.5	8.5	3	7	13	20		M			
	3,102.5	13.5	100/0.5			100/0.5				3,102.0 **WEATHERED ROCK** Tan-Gray, (META-SANDSTONE)	12.0
3100											
3095	3,095.5	18.5	100/0.4			100/0.4					
	3,093.0	21.0								3,093.0 **RESIDUAL** Dense, Tan-Gray, Silty Fine SAND (A-2-4), with trace gravel-sized rock fragments	
3090	3,090.5	23.5	16	20	30	50		M		3,089.0 Boring Terminated at Elevation 3,089.0 ft In Residual Silty Sand (A-2-4)	25.0

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** N. McLaren
SITE DESCRIPTION Upgrade NC 143 from SR 1223 (Beech Creek Road) to 0.5 Miles North of Appalachian Trail			**GROUND WTR (ft)**
BORING NO. RWAL18_B-5	**STATION** 378+15	**OFFSET** 39 ft RT	**ALIGNMENT** L	**0 HR.** Dry
COLLAR ELEV. 3,118.3 ft	**TOTAL DEPTH** 50.0 ft	**NORTHING** 618,666	**EASTING** 593,257	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 83% 06/16/2020		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER J. Estep	**START DATE** 04/26/21	**COMP. DATE** 04/26/21	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	
3120										3,118.3 GROUND SURFACE	0.0
	3,117.3	1.0	7	7	7	14		M		**ROADWAY EMBANKMENT** Stiff, Gray-Brown-Tan, Fine to Coarse Sandy CLAY (A-6), with trace gravel and mica	
3115	3,114.8	3.5	5	14	18	32		M		3,115.3 Very Stiff to Hard, Tan-Orange-Gray-Brown, Fine to Coarse Sandy SILT (A-4), with trace mica and gravel	3.0
	3,112.3	6.0	24	21	19	40		M			
3110	3,109.8	8.5	10	9	9	18		M			
	3,104.8	13.5	13	23	23	46		M			
3105											
3100	3,099.8	18.5	19	14	8	22		M			
3095	3,094.8	23.5	21	13	9	22		M			
3090	3,089.8	28.5	14	4	4	8		M		3,091.3 **RESIDUAL** Loose to Medium Dense, Tan-Orange-Gray-Brown, Silty Fine to Coarse SAND (A-2-4), with trace mica and gravel-sized rock fragments	27.0
3085	3,084.8	33.5	4	4	7	11		M			
3080	3,079.8	38.5	9	10	13	23		M		3,081.3 Very Stiff, Tan-Brown-Gray, Fine to Coarse Sandy SILT (A-4)	37.0
3075	3,074.8	43.5	5	9	10	19		M		3,076.3 Loose to Medium Dense, Tan-Gray-Brown, Silty Fine to Coarse SAND (A-2-4), with little gravel-sized rock fragments	42.0
3070	3,069.8	48.5	7	5	5	10		M		3,068.3 Boring Terminated at Elevation 3,068.3 ft In Residual Silty Sand (A-2-4)	50.0

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** S. Braun	
SITE DESCRIPTION Precast Concrete Arch Land Bridge over NC 143 Between SR 1282 and NC 28				**GROUND WTR (ft)**
BORING NO. LB_EB1-A	**STATION** 380+73	**OFFSET** 48 ft RT	**ALIGNMENT** L	**0 HR.** 3.9
COLLAR ELEV. 3,129.3 ft	**TOTAL DEPTH** 20.1 ft	**NORTHING** 618,546	**EASTING** 593,515	**24 HR.** 6.0
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 83% 06/16/2020		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER C. Odom	**START DATE** 03/30/21	**COMP. DATE** 03/30/21	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
3130										3,129.3 GROUND SURFACE	0.0
	3,128.3	1.0								**RESIDUAL** Stiff, Tan-Brown, Fine Sandy, Clayey SILT (A-5)	
3125	3,125.8	3.5	4	4	5	9		M		3,125.8	3.5
	3,123.3	6.0	68	32/0.3		100/0.8				**WEATHERED ROCK** Gray-Brown-Tan (META-SANDSTONE)	
3120	3,120.8	8.5	4	7	14	21		M		3,124.3	5.0
	3,119.5	9.8	100/0.3			100/0.3				**RESIDUAL** Very Stiff, Brown-Tan, Fine to Coarse Sandy SILT (A-4), with trace gravel-sized rock fragments	
			60/0.0			60/0.0				3,120.8	8.5
3115							RS-3			3,119.5	9.8
										WEATHERED ROCK Gray-Brown-Tan, (META-SANDSTONE)	
3110										**CRYSTALLINE ROCK** Black-White-Gray, (META-SANDSTONE)	
										REC=100% RQD=92% GSI=70-80	
										3,109.2	20.1
										Boring Terminated at Elevation 3,109.2 ft In Crystalline Rock (META-SANDSTONE)	

GEOTECHNICAL BORING REPORT
CORE LOG

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** S. Braun	
SITE DESCRIPTION Precast Concrete Arch Land Bridge over NC 143 Between SR 1282 and NC 28				**GROUND WTR (ft)**
BORING NO. LB_EB1-A	**STATION** 380+73	**OFFSET** 48 ft RT	**ALIGNMENT** L	**0 HR.** 3.9
COLLAR ELEV. 3,129.3 ft	**TOTAL DEPTH** 20.1 ft	**NORTHING** 618,546	**EASTING** 593,515	**24 HR.** 6.0
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 83% 06/16/2020		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER C. Odom	**START DATE** 03/30/21	**COMP. DATE** 03/30/21	**SURFACE WATER DEPTH** N/A	
CORE SIZE NQ	**TOTAL RUN** 10.3 ft			

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS ELEV. (ft)	DEPTH (ft)
3119.5											Begin Coring @ 9.8 ft	
	3,119.5	9.8	5.0	*N=60/0.0* 3:58/1.0 5:42/1.0 3:09/1.0 3:34/1.0 3:31/1.0	(5.0) 100%	(5.0) 100%		(10.3) 100%	(9.5) 92%		3,119.5 **CRYSTALLINE ROCK** Fresh to Slightly Weathered, Moderately Hard to Hard, Black-White-Gray, (META-SANDSTONE), with Very Close to Moderately Close Fracture Spacing	9.8
3115	3,114.5	14.8	5.3	3:28/1.0 3:07/1.0 3:12/1.0 3:11/1.0 4:17/1.3	(5.3) 100%	(4.5) 85%	RS-3				RS-3: 13.3 - 13.9 ft Unit Weight: 171.5 pcf Unconfined Compressive Strength: 20,620 psi (2,969 ksf)	
3110	3,109.2	20.1									3,109.2	20.1
											Boring Terminated at Elevation 3,109.2 ft In Crystalline Rock (META-SANDSTONE)	

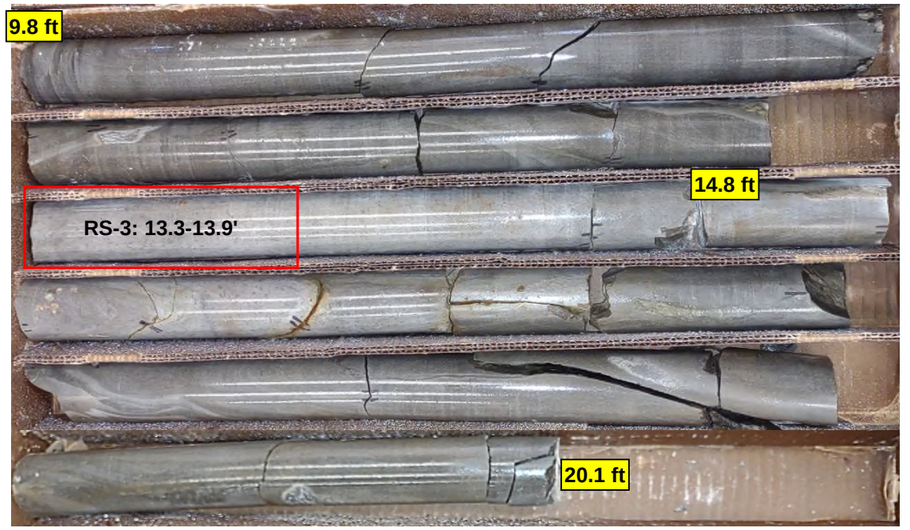
CAROLINAS GEOTECHNICAL GROUP

Precast Concrete Arch Land Bridge over NC 143 Between SR 1282 and NC 28

Rock Core Photographs

Boring: LB_EB1-A

9.8 to 20.1 Feet



GEOTECHNICAL BORING REPORT
BORE LOG

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** S. Braun	
SITE DESCRIPTION Precast Concrete Arch Land Bridge over NC 143 Between SR 1282 and NC 28				**GROUND WTR (ft)**
BORING NO. LB_EB1-D	**STATION** 381+32	**OFFSET** 50 ft RT	**ALIGNMENT** L	**0 HR.** Dry
COLLAR ELEV. 3,130.2 ft	**TOTAL DEPTH** 1.7 ft	**NORTHING** 618,549	**EASTING** 593,583	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 83% 06/16/2020		**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic
DRILLER C. Odom	**START DATE** 03/29/21	**COMP. DATE** 03/29/21	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
3135										
3130										ELEV. (ft) 3,130.2 GROUND SURFACE DEPTH (ft) 0.0
	3,128.5	1.7	60/0.0			60/0.0		M		**ROADWAY EMBANKMENT** 3,128.5 Very Stiff, Brown, Fine Sandy, Clayey SILT (A-5), with trace organics 1.7
										Boring Terminated with Standard Penetration Test Refusal at Elevation 3,128.5 ft On Crystalline Rock (META-SANDSTONE)

NCDOT BORE DOUBLE A-0009CB_GEO_RDY_GTM.GPJ NC_DOT.GDT 4/22/22

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** S. Braun	
SITE DESCRIPTION Precast Concrete Arch Land Bridge over NC 143 Between SR 1282 and NC 28				**GROUND WTR (ft)**
BORING NO. LB_EB1-C	**STATION** 381+88	**OFFSET** 51 ft RT	**ALIGNMENT** L	**0 HR.** 1.4
COLLAR ELEV. 3,131.7 ft	**TOTAL DEPTH** 14.5 ft	**NORTHING** 618,564	**EASTING** 593,646	**24 HR.** 1.3
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 83% 06/16/2020		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER C. Odom	**START DATE** 03/30/21	**COMP. DATE** 03/30/21	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
3135										3,131.7 GROUND SURFACE 0.0
3130	3,130.7	1.0	18	77	23/0.1	100/0.6		W		3,130.2 **RESIDUAL** 1.5 Very Stiff, Brown, Fine Sandy, Clayey SILT (A-5), with trace organics
	3,128.3	3.4	100/0.2			100/0.2				3,127.2 **WEATHERED ROCK** 4.5 Gray (META-SANDSTONE)
	3,127.5	4.2	100/0.2			100/0.2				**CRYSTALLINE ROCK** Black-White-Gray, (META-SANDSTONE)
3125	3,127.2	4.5	60/0.0			60/0.0				REC=100% RQD=80% GSI=60-70
3120							RS-5			3,117.2 14.5 Boring Terminated at Elevation 3,117.2 ft In Crystalline Rock (META-SANDSTONE)

GEOTECHNICAL BORING REPORT
CORE LOG

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** S. Braun	
SITE DESCRIPTION Precast Concrete Arch Land Bridge over NC 143 Between SR 1282 and NC 28				**GROUND WTR (ft)**
BORING NO. LB_EB1-C	**STATION** 381+88	**OFFSET** 51 ft RT	**ALIGNMENT** L	**0 HR.** 1.4
COLLAR ELEV. 3,131.7 ft	**TOTAL DEPTH** 14.5 ft	**NORTHING** 618,564	**EASTING** 593,646	**24 HR.** 1.3
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 83% 06/16/2020		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER C. Odom	**START DATE** 03/30/21	**COMP. DATE** 03/30/21	**SURFACE WATER DEPTH** N/A	
CORE SIZE NQ	**TOTAL RUN** 10.0 ft			

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
											ELEV. (ft) DEPTH (ft)
3127.2											Begin Coring @ 4.5 ft
3125	3,127.2	4.5	5.0	*N=60/0.0* 6:24/1.0 5:50/1.0 2:57/1.0 2:41/1.0 3:20/1.0	(5.0) 100%	(3.9) 78%		(10.0) 100%	(8.0) 80%		3,127.2 **CRYSTALLINE ROCK** 4.5 Fresh to Slightly Weathered, Moderately Hard to Hard, Black-White-Gray, (META-SANDSTONE), with Very Close to Moderately Close Fracture Spacing
	3,122.2	9.5	5.0	3:16/1.0 2:48/1.0 2:46/1.0 4:34/1.0 5:36/1.0	(5.0) 100%	(4.1) 82%	RS-5				RS-5: 10.0-10.6 ft Unit Weight: 175.6 pcf Unconfined Compressive Strength: 22,000 psi (3,168 ksf)
3120	3,117.2	14.5									3,117.2 14.5 Boring Terminated at Elevation 3,117.2 ft In Crystalline Rock (META-SANDSTONE)

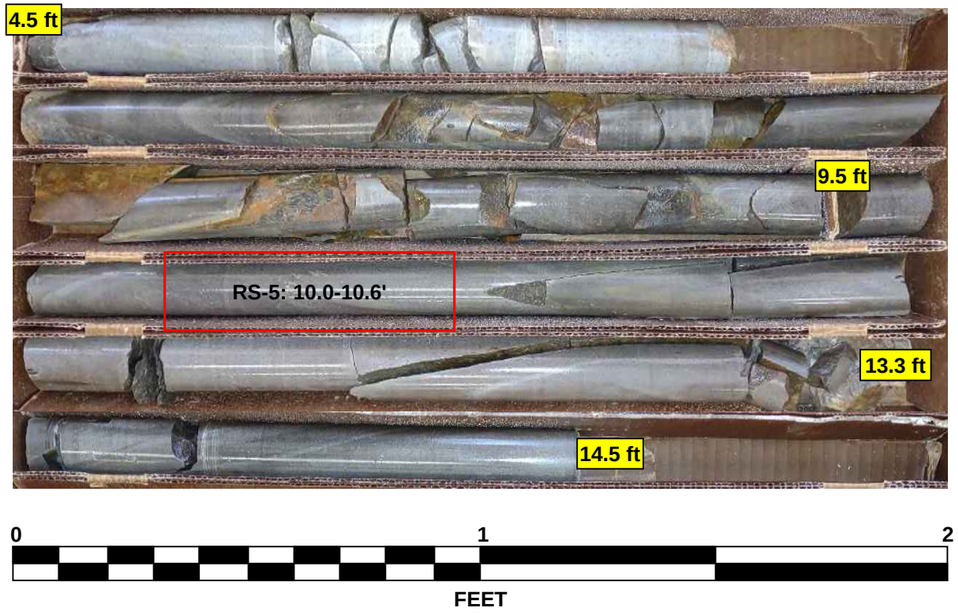
CAROLINAS GEOTECHNICAL GROUP

Precast Concrete Arch Land Bridge over NC 143 Between SR 1282 and NC 28

Rock Core Photographs

Boring: LB_EB1-C

4.5 to 14.5 Feet



GEOTECHNICAL BORING REPORT
BORE LOG

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** S. Braun	
SITE DESCRIPTION Precast Concrete Arch Land Bridge over NC 143 Between SR 1282 and NC 28				**GROUND WTR (ft)**
BORING NO. LB_EB1-E	**STATION** 382+51	**OFFSET** 47 ft RT	**ALIGNMENT** L	**0 HR.** Dry
COLLAR ELEV. 3,132.6 ft	**TOTAL DEPTH** 6.5 ft	**NORTHING** 618,598	**EASTING** 593,710	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 83% 06/16/2020		**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic
DRILLER C. Odom	**START DATE** 03/29/21	**COMP. DATE** 03/29/21	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
3135										ELEV. (ft) / DEPTH (ft)
										3,132.6 GROUND SURFACE 0.0
	3,131.6	1.0								**RESIDUAL**
3130			38	44	53	97		D		Very Dense, Gray, Silty GRAVEL (A-1-a)
	3,129.1	3.5								3,129.1 3.5
			65	35/0.1		100/0.6				**WEATHERED ROCK**
	3,126.1	6.5								Gray (META-SANDSTONE)
			60/0.0			60/0.0				3,126.1 6.5
										Boring Terminated with Standard Penetration Test Refusal at Elevation 3,126.1 ft On Crystalline Rock (META-SANDSTONE)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** S. Braun	
SITE DESCRIPTION Precast Concrete Arch Land Bridge over NC 143 Between SR 1282 and NC 28				**GROUND WTR (ft)**
BORING NO. LB_EB1-B	**STATION** 383+04	**OFFSET** 50 ft RT	**ALIGNMENT** L	**0 HR.** 8.2
COLLAR ELEV. 3,131.8 ft	**TOTAL DEPTH** 19.5 ft	**NORTHING** 618,630	**EASTING** 593,761	**24 HR.** 8.0
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 83% 06/16/2020		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER C. Odom	**START DATE** 03/30/21	**COMP. DATE** 03/30/21	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
3135										ELEV. (ft) DEPTH (ft)
										3,131.8 GROUND SURFACE 0.0
3130	3,130.8	1.0	16	16	27	43		M		**RESIDUAL** Hard, Brown-Gray, Fine to Coarse Sandy, Clayey SILT (A-5), with little gravel-sized rock fragments
	3,128.3	3.5	22	16	13	29		M		3,128.8 3.0
3125	3,125.8	6.0	60/0.0			60/0.0				Medium Dense, Gray, Silty GRAVEL (A-1-a) 3,125.8 6.0
							RS-4			**CRYSTALLINE ROCK** Black-White-Gray, (META-SANDSTONE) REC=99% RQD=96% GSI=75-80
3120										
3115										3,112.3 19.5
										Boring Terminated at Elevation 3,112.3 ft In Crystalline Rock (META-SANDSTONE)

GEOTECHNICAL BORING REPORT
CORE LOG

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** S. Braun	
SITE DESCRIPTION Precast Concrete Arch Land Bridge over NC 143 Between SR 1282 and NC 28				**GROUND WTR (ft)**
BORING NO. LB_EB1-B	**STATION** 383+04	**OFFSET** 50 ft RT	**ALIGNMENT** L	**0 HR.** 8.2
COLLAR ELEV. 3,131.8 ft	**TOTAL DEPTH** 19.5 ft	**NORTHING** 618,630	**EASTING** 593,761	**24 HR.** 8.0
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 83% 06/16/2020		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER C. Odom	**START DATE** 03/30/21	**COMP. DATE** 03/30/21	**SURFACE WATER DEPTH** N/A	
CORE SIZE NQ	**TOTAL RUN** 13.5 ft			

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
3125.8											ELEV. (ft) DEPTH (ft)
3125	3,125.8	6.0	3.5	*N=60/0.0* 4:21/1.0 5:30/1.0 4:39/1.0	(3.3) 94%	(2.9) 81%		(13.3) 99%	(12.9) 96%		Begin Coring @ 6.0 ft
	3,122.3	9.5									3,125.8 **CRYSTALLINE ROCK** 6.0 Fresh to Slightly Weathered, Moderately Hard to Hard, Black-White-Gray, (META-SANDSTONE), with Very Close to Moderately Close Fracture Spacing
3120			5.0	2:50/0.5 3:02/1.0 2:06/1.0 2:19/1.0 2:36/1.0 3:26/1.0	(5.0) 100%	(5.0) 100%	RS-4				RS-4: 10.1 - 10.6 ft Unit Weight: 174.2 pcf Unconfined Compressive Strength: 15,620 psi (2,249 ksf)
	3,117.3	14.5									
3115			5.0	2:43/1.0 2:27/1.0 2:26/1.0 2:13/1.0 2:06/1.0	(5.0) 100%	(5.0) 100%					
	3,112.3	19.5									3,112.3 19.5
											Boring Terminated at Elevation 3,112.3 ft In Crystalline Rock (META-SANDSTONE)

CAROLINAS GEOTECHNICAL GROUP

Precast Concrete Arch Land Bridge over NC 143 Between SR 1282 and NC 28

Rock Core Photographs

Boring: LB_EB1-B

6.0 to 19.5 Feet

0 1 2

FEET

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** D. Goodnight	
SITE DESCRIPTION Precast Concrete Arch Land Bridge over NC 143 Between SR 1282 and NC 28				**GROUND WTR (ft)**
BORING NO. LB_B1-A	**STATION** 380+54	**OFFSET** 11 ft RT	**ALIGNMENT** -L-	**0 HR.** 2.7
COLLAR ELEV. 3,126.7 ft	**TOTAL DEPTH** 25.1 ft	**NORTHING** 618,584	**EASTING** 593,496	**24 HR.** 6.0
DRILL RIG/HAMMER EFF./DATE FME9553 CME-550X 80% 03/12/2021		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER J. Phillips	**START DATE** 09/09/21	**COMP. DATE** 09/09/21	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft) DEPTH (ft)
3130										
	3,126.7	0.0								3,126.7 GROUND SURFACE 0.0
3125	3,125.7	1.0	9	15	11	26		M		**ROADWAY EMBANKMENT** Gravel (0.2 ft)
	3,123.2	3.5	5	7	7	14		M		3,123.7 **RESIDUAL** 3.0 Medium Dense, Brown, Silty Fine SAND (A-2-4), with little gravel-sized rock fragments
3120	3,120.7	6.0	5	5	7	12		M		Stiff, Tan-Brown, Fine Sandy SILT (A-4)
	3,118.2	8.5								3,117.7 9.0
	3,116.6	10.1	15 60/0.0	42	58/0.2	100/0.7 60/0.0				3,116.6 **WEATHERED ROCK** 10.1 Tan, (META-SANDSTONE)
3115										**CRYSTALLINE ROCK** Black-White-Gray, (META-SANDSTONE) REC=98% RQD=88% GSI=65-75
3110										
3105										
										3,101.6 25.1
										Boring Terminated at Elevation 3,101.6 ft In Crystalline Rock (META-SANDSTONE)

GEOTECHNICAL BORING REPORT
CORE LOG

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** D. Goodnight	
SITE DESCRIPTION Precast Concrete Arch Land Bridge over NC 143 Between SR 1282 and NC 28				**GROUND WTR (ft)**
BORING NO. LB_B1-A	**STATION** 380+54	**OFFSET** 11 ft RT	**ALIGNMENT** -L-	**0 HR.** 2.7
COLLAR ELEV. 3,126.7 ft	**TOTAL DEPTH** 25.1 ft	**NORTHING** 618,584	**EASTING** 593,496	**24 HR.** 6.0
DRILL RIG/HAMMER EFF./DATE FME9553 CME-550X 80% 03/12/2021		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER J. Phillips	**START DATE** 09/09/21	**COMP. DATE** 09/09/21	**SURFACE WATER DEPTH** N/A	
CORE SIZE NQ	**TOTAL RUN** 15.0 ft			

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS ELEV. (ft) DEPTH (ft)
3116.6											Begin Coring @ 10.1 ft
3115	3,116.6	10.1	5.0	N=60/0.0 10:58/1.0 06:20/1.0 04:34/1.0 04:12/1.0 04:11/1.0	(4.7) 94%	(4.0) 80%		(14.7) 98%	(13.2) 88%		3,116.6 **CRYSTALLINE ROCK** 10.1 Fresh to Very Slightly Weathered, Hard to Very Hard, Black-White-Gray, (META-SANDSTONE), with moderately close fracture spacing, extremely indurated, very thinly bedded
	3,111.6	15.1									
3110			5.0	03:56/1.0 04:26/1.0 05:36/1.0 06:16/1.0 06:03/1.0	(5.0) 100%	(4.2) 84%					
	3,106.6	20.1									
3105			5.0	04:46/1.0 05:54/1.0 05:22/1.0 05:04/1.0 04:53/1.0	(5.0) 100%	(5.0) 100%					
	3,101.6	25.1									3,101.6 25.1
											Boring Terminated at Elevation 3,101.6 ft In Crystalline Rock (META-SANDSTONE)

CAROLINAS GEOTECHNICAL GROUP

Precast Concrete Arch Land Bridge over NC 143 Between SR 1282 and NC 28
Rock Core Photographs
Boring: LB_B1-A
10.1 to 25.1 Feet

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** S. Braun	
SITE DESCRIPTION Precast Concrete Arch Land Bridge over NC 143 Between SR 1282 and NC 28				**GROUND WTR (ft)**
BORING NO. LB_B1-D	**STATION** 381+22	**OFFSET** 6 ft RT	**ALIGNMENT** L	**0 HR.** Dry
COLLAR ELEV. 3,127.9 ft	**TOTAL DEPTH** 5.1 ft	**NORTHING** 618,591	**EASTING** 593,565	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 83% 06/16/2020		**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic
DRILLER C. Odom	**START DATE** 04/01/21	**COMP. DATE** 04/01/21	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
3130											
										3,127.9 GROUND SURFACE	0.0
	3,126.9	1.0								**WEATHERED ROCK** Gray (META-SANDSTONE)	
3125	3,125.1	2.8	29 60/0.0	71/0.4		100/0.9 60/0.0				3,125.1	2.8
	3,122.8	5.1	60/0.0			60/0.0				**CRYSTALLINE ROCK** Gray (META-SANDSTONE) 3,122.8	5.1
										Boring Terminated with Standard Penetration Test Refusal at Elevation 3,122.8 ft In Crystalline Rock (META-SANDSTONE)	

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** S. Braun	
SITE DESCRIPTION Precast Concrete Arch Land Bridge over NC 143 Between SR 1282 and NC 28				**GROUND WTR (ft)**
BORING NO. LB_B1-C	**STATION** 381+90	**OFFSET** 5 ft RT	**ALIGNMENT** L	**0 HR.** 8.0
COLLAR ELEV. 3,129.2 ft	**TOTAL DEPTH** 24.4 ft	**NORTHING** 618,608	**EASTING** 593,632	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 83% 06/16/2020		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER C. Odom	**START DATE** 04/02/21	**COMP. DATE** 04/02/21	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
3130										3,129.2 GROUND SURFACE	0.0
	3,127.3	1.9						M		**ROADWAY EMBANKMENT** 3,127.3 Stiff, Brown, Clayey, Fine to Coarse Sandy SILT (A-4), with trace gravel	1.9
3125			60/0.0			60/0.0				**CRYSTALLINE ROCK** Black-White-Gray, (META-SANDSTONE)	
3120							RS-2			REC=100% RQD=84% GSI=65-75	
3115											
3110											
3105										3,104.8 Boring Terminated at Elevation 3,104.8 ft In Crystalline Rock (META-SANDSTONE)	24.4

GEOTECHNICAL BORING REPORT
CORE LOG

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** S. Braun	
SITE DESCRIPTION Precast Concrete Arch Land Bridge over NC 143 Between SR 1282 and NC 28				**GROUND WTR (ft)**
BORING NO. LB_B1-C	**STATION** 381+90	**OFFSET** 5 ft RT	**ALIGNMENT** L	**0 HR.** 8.0
COLLAR ELEV. 3,129.2 ft	**TOTAL DEPTH** 24.4 ft	**NORTHING** 618,608	**EASTING** 593,632	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 83% 06/16/2020		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER C. Odom	**START DATE** 04/02/21	**COMP. DATE** 04/02/21	**SURFACE WATER DEPTH** N/A	
CORE SIZE NQ	**TOTAL RUN** 22.5 ft			

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS ELEV. (ft)	DEPTH (ft)
3127.3											Begin Coring @ 1.9 ft	
	3,127.3	1.9	2.5	*N=60/0.0*	(2.5)	(2.2)		(22.4)	(19.0)		3,127.3 **CRYSTALLINE ROCK**	1.9
3125	3,124.8	4.4		3:41/1.0 4:49/1.0	100%	88%		100%	84%		Fresh to Slightly Weathered, Moderately Hard to Hard, Black-White-Gray, (META-SANDSTONE), with Very Close to Moderately Close Fracture Spacing	
			5.0	2:48/0.5 2:30/1.0 1:56/1.0 2:11/1.0 2:21/1.0 2:47/1.0	(5.0) 100%	(5.0) 100%	RS-2				RS-2: 6.5 - 7.0 ft Unit Weight: 169.0 pcf Unconfined Compressive Strength: 16,160 psi (2,327 ksf)	
3120	3,119.8	9.4										
			5.0	2:38/1.0 2:30/1.0 2:50/1.0 2:57/1.0 3:45/1.0	(5.0) 100%	(4.9) 98%						
3115	3,114.8	14.4										
			5.0	2:45/1.0 3:04/1.0 3:11/1.0 3:23/1.0 3:16/1.0	(4.9) 98%	(3.3) 66%						
3110	3,109.8	19.4										
			5.0	3:24/1.0 3:04/1.0 2:52/1.0 3:05/1.0 2:48/1.0	(5.0) 100%	(3.6) 72%						
3105	3,104.8	24.4									3,104.8 Boring Terminated at Elevation 3,104.8 ft In Crystalline Rock (META-SANDSTONE)	24.4

CAROLINAS GEOTECHNICAL GROUP

Precast Concrete Arch Land Bridge over NC 143 Between SR 1282 and NC 28

Rock Core Photographs

Boring: LB_B1-C

1.9 to 24.4 Feet

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** S. Braun	
SITE DESCRIPTION Precast Concrete Arch Land Bridge over NC 143 Between SR 1282 and NC 28				**GROUND WTR (ft)**
BORING NO. LB_B1-E	**STATION** 382+53	**OFFSET** 1 ft LT	**ALIGNMENT** L	**0 HR.** Dry
COLLAR ELEV. 3,129.3 ft	**TOTAL DEPTH** 2.7 ft	**NORTHING** 618,641	**EASTING** 593,687	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 83% 06/16/2020		**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic
DRILLER C. Odom	**START DATE** 04/01/21	**COMP. DATE** 04/01/21	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
3130										3,129.3 GROUND SURFACE	0.0
	3,128.3	1.0	100/0.3			100/0.3				**WEATHERED ROCK** Gray (META-SANDSTONE)	
	3,126.6	2.7	60/0.0			60/0.0				3,126.6	2.7
										Boring Terminated with Standard Penetration Test Refusal at Elevation 3,126.6 ft On Crystalline Rock (META-SANDSTONE)	

NCDOT BORE DOUBLE A-0009CB_GEO_RDY_GTM.GPJ NC_DOT.GDT 4/22/22

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** S. Braun	
SITE DESCRIPTION Precast Concrete Arch Land Bridge over NC 143 Between SR 1282 and NC 28				**GROUND WTR (ft)**
BORING NO. LB_B1-B	**STATION** 383+23	**OFFSET** 3 ft RT	**ALIGNMENT** L	**0 HR.** Dry
COLLAR ELEV. 3,131.0 ft	**TOTAL DEPTH** 29.1 ft	**NORTHING** 618,679	**EASTING** 593,746	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 83% 06/16/2020		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER C. Odom	**START DATE** 04/01/21	**COMP. DATE** 04/01/21	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft) / DEPTH (ft)
3135										
3130	3,130.0	1.0	6	35	65/0.3	100/0.8		M		3,131.0 GROUND SURFACE 0.0
	3,127.8	3.2	60/0.0			60/0.0				3,129.5 **ROADWAY EMBANKMENT** Stiff, Brown, Clayey, Fine to Coarse Sandy SILT (A-4), with trace gravel 1.5
3125										3,127.8 **WEATHERED ROCK** Gray (META-SANDSTONE) 3.2
							RS-1			**CRYSTALLINE ROCK** Black-White-Gray, (META-SANDSTONE)
3120										REC = 100% RQD = 86% GSI = 65-75
3115										
3110										
3105										3,101.9 29.1
										3,101.9 Boring Terminated at Elevation 3,101.9 ft In Crystalline Rock (META-SANDSTONE)

GEOTECHNICAL BORING REPORT
CORE LOG

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** S. Braun	
SITE DESCRIPTION Precast Concrete Arch Land Bridge over NC 143 Between SR 1282 and NC 28				**GROUND WTR (ft)**
BORING NO. LB_B1-B	**STATION** 383+23	**OFFSET** 3 ft RT	**ALIGNMENT** L	**0 HR.** Dry
COLLAR ELEV. 3,131.0 ft	**TOTAL DEPTH** 29.1 ft	**NORTHING** 618,679	**EASTING** 593,746	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 83% 06/16/2020		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER C. Odom	**START DATE** 04/01/21	**COMP. DATE** 04/01/21	**SURFACE WATER DEPTH** N/A	
CORE SIZE NQ	**TOTAL RUN** 25.9 ft			

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS ELEV. (ft) / DEPTH (ft)
3127.8											Begin Coring @ 3.2 ft
	3,127.8	3.2	0.9	*N=60/0.0*	(0.8)	(0.0)		(25.8)	(22.3)		3,127.8 **CRYSTALLINE ROCK** 3.2
	3,126.9	4.1	5.0	4:13/0.9	89%	0%		100%	86%		Slightly Weathered to Fresh, Moderately Hard to Hard, Black-White-Gray, (META-SANDSTONE), with Close to Moderately Close Fracture Spacing
3125				3:15/1.0							
				5:12/1.0	(5.0)	(4.1)					RS-1: 8.0 - 8.6 ft
				4:03/1.0	99%	81%					Unit Weight: 173.8 pcf
				4:17/1.0							Unconfined Compressive Strength: 21,490 psi (3,095 ksf)
	3,121.9	9.1		3:53/1.0			RS-1				
3120			5.0	2:54/1.0	(5.0)	(4.5)					
				2:19/1.0	100%	90%					
				2:33/1.0							
				2:41/1.0							
	3,116.9	14.1		2:27/1.0							
3115			5.0	2:53/1.0	(5.0)	(4.4)					
				1:40/1.0	100%	88%					
				5:54/1.0							
				3:36/1.0							
	3,111.9	19.1		3:21/1.0							
3110			5.0	2:04/1.0	(5.0)	(4.6)					
				3:36/1.0	100%	92%					
				3:39/1.0							
				3:26/1.0							
	3,106.9	24.1		2:38/1.0							
3105			5.0	2:40/1.0	(5.0)	(4.7)					
				2:49/1.0	100%	94%					
				3:27/1.0							
				2:27/1.0							
	3,101.9	29.1		3:07/1.0							3,101.9 29.1
											Boring Terminated at Elevation 3,101.9 ft In Crystalline Rock (META-SANDSTONE)

CAROLINAS GEOTECHNICAL GROUP

Precast Concrete Arch Land Bridge over NC 143 Between SR 1282 and NC 28

Rock Core Photographs

Boring: LB_B1-B

3.2 to 29.1 Feet

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** D. Goodnight	
SITE DESCRIPTION Upgrade NC 143 from SR 1223 (Beech Creek Road) to 0.5 Miles North of Appalachian Trail				**GROUND WTR (ft)**
BORING NO. L_38491R	**STATION** 384+91	**OFFSET** 1 ft RT	**ALIGNMENT** L	**0 HR.** Dry
COLLAR ELEV. 3,130.4 ft	**TOTAL DEPTH** 15.0 ft	**NORTHING** 618,817	**EASTING** 593,841	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE FME9553 CME-550X 80% 03/12/2021		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER J. Phillips	**START DATE** 08/18/21	**COMP. DATE** 08/18/21	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft) / DEPTH (ft)
3135										
3130	3,129.4	1.0	3	5	7	12		M		3,130.4 GROUND SURFACE 0.0 **RESIDUAL** Medium Stiff to Stiff, Tan, Fine Sandy SILT (A-4), with trace gravel-sized rock fragments
	3,126.9	3.5	2	3	5	8		M		
3125	3,124.4	6.0	5	2	3	5		M		3,124.9 5.5 Loose to Medium Dense, Brown, Silty Fine SAND (A-2-4)
	3,121.9	8.5	6	9	10	19		M		
3120	3,118.4	12.0								Stiff, Tan-Brown, Fine Sandy SILT (A-4), with trace gravel-sized rock fragments
	3,116.9	13.5	3	3	6	9		M		3,115.4 15.0 Boring Terminated at Elevation 3,115.4 ft In Residual Sandy Silt (A-4)

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** D. Goodnight	
SITE DESCRIPTION Upgrade NC 143 from SR 1223 (Beech Creek Road) to 0.5 Miles North of Appalachian Trail				**GROUND WTR (ft)**
BORING NO. L_38492R	**STATION** 384+92	**OFFSET** 48 ft RT	**ALIGNMENT** L	**0 HR.** Dry
COLLAR ELEV. 3,131.0 ft	**TOTAL DEPTH** 5.2 ft	**NORTHING** 618,794	**EASTING** 593,883	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE FME9553 CME-550X 80% 03/12/2021		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER J. Phillips	**START DATE** 09/09/21	**COMP. DATE** 09/09/21	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
3135										
3130	3,130.0	1.0	3	7	8	15		M		3,131.0 GROUND SURFACE 0.0 **ROADWAY EMBANKMENT** Medium Dense to Very Dense, Tan, Silty Fine SAND (A-2-4), with trace gravel
	3,127.5	3.5	50	50/0.1		100/0.6				
	3,125.8	5.2	60/0.0			60/0.0				3,125.8 5.2 Boring Terminated with Standard Penetration Test Refusal at Elevation 3,125.8 ft On Roadway Embankment Boulder Fill (A-2-4) Notes - Boulders and/or Hard Drilling encountered infrequently at the following depths: 3.0 to 5.2 ft

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** D. Goodnight
SITE DESCRIPTION Upgrade NC 143 from SR 1223 (Beech Creek Road) to 0.5 Miles North of Appalachian Trail			**GROUND WTR (ft)**
BORING NO. L_38737L	**STATION** 387+37	**OFFSET** 1 ft LT	**ALIGNMENT** L	**0 HR.** Dry
COLLAR ELEV. 3,123.7 ft	**TOTAL DEPTH** 23.9 ft	**NORTHING** 619,029	**EASTING** 593,966	**24 HR.** 19.0
DRILL RIG/HAMMER EFF./DATE FME9553 CME-550X 80% 03/12/2021		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER J. Phillips	**START DATE** 08/18/21	**COMP. DATE** 08/18/21	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
3125										ELEV. (ft) DEPTH (ft)
										3,123.7 GROUND SURFACE 0.0
	3,122.7	1.0	7	5	5	10		M		**RESIDUAL** Medium Stiff to Hard, Tan, Fine Sandy SILT (A-4), with trace gravel-sized rock fragments
3120	3,120.2	3.5	8	4	3	7		M		
	3,117.7	6.0	8	8	8	16		M		
3115	3,115.2	8.5	19	28	51	79		M		
										3,111.7 12.0
3110	3,110.2	13.5	50	50/0.2		100/0.7				**WEATHERED ROCK** Tan, (META-SANDSTONE)
3105	3,105.2	18.5	100/0.2			100/0.2				
3100	3,100.2	23.5	100/0.4			100/0.4				3,099.8 23.9 Boring Terminated at Elevation 3,099.8 ft In Weathered Rock (META-SANDSTONE)

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** D. Goodnight
SITE DESCRIPTION Upgrade NC 143 from SR 1223 (Beech Creek Road) to 0.5 Miles North of Appalachian Trail			**GROUND WTR (ft)**
BORING NO. L_38917L	**STATION** 389+17	**OFFSET** 1 ft LT	**ALIGNMENT** L	**0 HR.** Dry
COLLAR ELEV. 3,116.6 ft	**TOTAL DEPTH** 25.0 ft	**NORTHING** 619,184	**EASTING** 594,058	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE FME9553 CME-550X 80% 03/12/2021		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER J. Phillips	**START DATE** 08/18/21	**COMP. DATE** 08/18/21	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
3120										
										3,116.6 GROUND SURFACE 0.0
3115	3,115.6	1.0	1	1	2	3		M		**RESIDUAL** Soft, Tan-Brown, Fine Sandy Silty CLAY (A-7)
	3,113.1	3.5	2	2	2	4		M		
3110	3,110.6	6.0	2	4	4	8		M		3,111.1 5.5 Medium Stiff, Tan-Brown, Fine Sandy SILT (A-4)
	3,108.1	8.5	3	2	4	6		M		
3105										3,104.6 12.0 Soft, Red-Tan, Fine Sandy Clayey SILT (A-5)
	3,103.1	13.5	2	1	3	4		M		
3100										3,099.6 17.0 Stiff, Red-Tan, Fine Sandy, Silty CLAY (A-7)
	3,098.1	18.5	4	5	6	11		W		
3095										3,094.6 22.0 Soft, Tan, Fine Sandy SILT (A-4)
	3,093.1	23.5	1	1	1	2		W		3,091.6 25.0 Boring Terminated at Elevation 3,091.6 ft In Residual Sandy Silt (A-4)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** N. McLaren
SITE DESCRIPTION Upgrade NC 143 from SR 1223 (Beech Creek Road) to 0.5 Miles North of Appalachian Trail			**GROUND WTR (ft)**
BORING NO. RWAL28_B-1	**STATION** 390+12	**OFFSET** 30 ft RT	**ALIGNMENT** L — **0 HR.** Dry
COLLAR ELEV. 3,111.5 ft	**TOTAL DEPTH** 35.0 ft	**NORTHING** 619,248	**EASTING** 594,134 — **24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE CG29473 CME-550 79%03/12/2021		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER J. Estep	**START DATE** 04/29/21	**COMP. DATE** 04/29/21	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION — ELEV. (ft)	DEPTH (ft)
3115											
										3,111.5 GROUND SURFACE	0.0
3110	3,110.5	1.0	14	8	10	18		M		**ROADWAY EMBANKMENT** Stiff to Very Stiff, Tan-Brown-Gray, Fine to Coarse Sandy SILT (A-4), with trace gravel	
	3,108.0	3.5	7	7	7	14		M			
3105	3,105.5	6.0	8	7	10	17		M			
	3,103.0	8.5	8	9	14	23		M			
3100										3,099.5	12.0
	3,098.0	13.5	3	3	3	6		23%		**COLLUVIAL** Medium Stiff, Red-Orange-Tan-Gray, Fine to Coarse Sandy CLAY (A-6(12))	
3095	3,093.0	18.5	3	3	3	6		M			
3090										3,089.5	22.0
	3,088.0	23.5	12	12	12	24		M		**RESIDUAL** Medium Dense to Dense, Tan-Orange-Gray, Silty, Gravelly Fine to Coarse SAND (A-1-b)	
3085	3,083.0	28.5	25	21	17	38		D			
3080	3,078.0	33.5	22	15	13	28		D			
										3,076.5	35.0
										Boring Terminated at Elevation 3,076.5 ft In Residual Silty, Gravelly Sand (A-1-b)	
										Other Samples: ST-3 (13.0 - 15.0)	

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** N. McLaren
SITE DESCRIPTION Upgrade NC 143 from SR 1223 (Beech Creek Road) to 0.5 Miles North of Appalachian Trail			**GROUND WTR (ft)**
BORING NO. RWAL28_B-2	**STATION** 391+00	**OFFSET** 30 ft RT	**ALIGNMENT** L — **0 HR.** Dry
COLLAR ELEV. 3,104.9 ft	**TOTAL DEPTH** 46.3 ft	**NORTHING** 619,319	**EASTING** 594,183 — **24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE CG29473 CME-550 79%03/12/2021		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER J. Estep	**START DATE** 04/29/21	**COMP. DATE** 04/29/21	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	
3105											
										3,104.9 GROUND SURFACE	0.0
	3,103.9	1.0	7	9	11	20		M		**ROADWAY EMBANKMENT** Very Stiff, Tan-Orange-Brown, Fine to Coarse Sandy SILT (A-4), with trace gravel and organics	
3100	3,101.4	3.5	7	11	10	21		M		3,101.9	3.0
	3,098.9	6.0	5	5	9	14		M		Medium Dense, Tan-Gray-Orange, Silty Fine to Coarse SAND (A-2-4), with little gravel	
3095	3,096.4	8.5	8	6	5	11		M		3,096.9	8.0
	3,091.4	13.5	20	21	15	36		M		Medium Stiff to Hard, Tan-Brown-Gray, Fine to Coarse Sandy SILT (A-4), with trace gravel	
3090	3,086.4	18.5	6	5	7	12		M			
3085	3,081.4	23.5	4	4	4	8		M			
3080	3,076.4	28.5	7	3	4	7		M		3,077.9	27.0
3075	3,071.4	33.5	8	6	8	14		D		**RESIDUAL** Loose to Medium Dense, Gray-Tan-Orange, Silty Fine to Coarse SAND (A-2-4), with trace mica	
3070	3,066.4	38.5	48	33	36	69		D		3,067.9	37.0
3065	3,061.4	43.5	21	22	13	35		D		Very Dense, Tan-Gray, Silty, Gravelly Fine to Coarse SAND (A-1-b)	
3060	3,058.6	46.3	60/0.0			60/0.0		D		3,062.9	42.0
										Dense, Gray-Tan, Silty Fine to Coarse SAND (A-2-4), with little gravel-sized rock fragments	
										3,058.6	46.3
										Boring Terminated with Standard Penetration Test Refusal at Elevation 3,058.6 ft On Crystalline Rock (META-SANDSTONE)	

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** D. Goodnight
SITE DESCRIPTION Upgrade NC 143 from SR 1223 (Beech Creek Road) to 0.5 Miles North of Appalachian Trail			**GROUND WTR (ft)**
BORING NO. L_39114L	**STATION** 391+14	**OFFSET** 29 ft LT	**ALIGNMENT** L	**0 HR.** Dry
COLLAR ELEV. 3,108.6 ft	**TOTAL DEPTH** 10.2 ft	**NORTHING** 619,365	**EASTING** 594,144	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE FME9553 CME-550X 80% 03/12/2021		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER J. Phillips	**START DATE** 09/17/21	**COMP. DATE** 09/17/21	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
3110										
										3,108.6 GROUND SURFACE 0.0
	3,107.6	1.0	2	3	2	5		M		**RESIDUAL** Medium Stiff, Brown, Fine Sandy SILT (A-4), with some gravel
3105	3,105.1	3.5	4	15	60	75		M		3,104.6 4.0
	3,102.6	6.0	43	57/0.4						3,103.6 5.0 Very Dense, Tan-Gray, Silty Fine SAND (A-2-4), with some gravel-sized rock fragments
3100	3,100.1	8.5	100/0.3			100/0.9				**WEATHERED ROCK** Tan-Gray, (META-SANDSTONE)
	3,098.5	10.1	60/0.1			100/0.3 60/0.1				3,098.5 10.1 3,098.4 10.2 **CRYSTALLINE ROCK** Gray, (META-SANDSTONE)
										Boring Terminated with Standard Penetration Test Refusal at Elevation 3,098.4 ft In Crystalline Rock (META-SANDSTONE)

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** N. McLaren
SITE DESCRIPTION Upgrade NC 143 from SR 1223 (Beech Creek Road) to 0.5 Miles North of Appalachian Trail			**GROUND WTR (ft)**
BORING NO. RWAL28_B-3	**STATION** 391+88	**OFFSET** 30 ft RT	**ALIGNMENT** L	**0 HR.** Dry
COLLAR ELEV. 3,098.4 ft	**TOTAL DEPTH** 42.0 ft	**NORTHING** 619,388	**EASTING** 594,235	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE CG29473 CME-550 79% 03/12/2021		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER J. Estep	**START DATE** 04/30/21	**COMP. DATE** 04/30/21	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
3100										
										3,098.4 GROUND SURFACE 0.0
	3,097.4	1.0	10	9	9	18		M		**ROADWAY EMBANKMENT** Medium Dense, Tan-Orange-Brown, Silty Fine to Coarse SAND (A-2-4(0)), with little gravel
3095	3,094.9	3.5	7	7	9	16		M		
	3,092.4	6.0	8	8	7	15	SS-4245	15%		
3090	3,089.9	8.5	10	13	14	27		M		3,090.4 8.0 Very Stiff, Tan-Orange-Brown, Fine to Coarse Sandy SILT (A-4), with little gravel
										3,086.4 12.0 **COLLUVIAL** Stiff, Tan-Orange-Gray, Fine to Coarse Sandy SILT (A-4), with little gravel
3085	3,084.9	13.5	6	6	8	14		M		3,081.4 17.0 **RESIDUAL** Medium Stiff to Very Stiff, Tan-Gray-Orange, Fine to Coarse Sandy SILT (A-4), with trace mica
3080	3,079.9	18.5	3	3	3	6		M		
3075	3,074.9	23.5	2	9	11	20		M		
3070	3,069.9	28.5	28	64	36/0.3	100/0.8				3,069.9 28.5 **WEATHERED ROCK** Tan-Gray, (META-SANDSTONE)
3065	3,064.9	33.5	34	47	53/0.4	100/0.9				3,061.4 37.0 **RESIDUAL** Very Dense, Gray-Tan, Silty Fine to Coarse SAND (A-2-4), with trace mica
3060	3,059.9	38.5	23	25	43	68		M		
	3,056.4	42.0	60/0.0			60/0.0				3,056.4 42.0 Boring Terminated with Standard Penetration Test Refusal at Elevation 3,056.4 ft On Crystalline Rock (META-SANDSTONE)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** D. Goodnight
SITE DESCRIPTION Upgrade NC 143 from SR 1223 (Beech Creek Road) to 0.5 Miles North of Appalachian Trail			**GROUND WTR (ft)**
BORING NO. L_39320L	**STATION** 393+20	**OFFSET** 11 ft LT	**ALIGNMENT** L	**0 HR.** Dry
COLLAR ELEV. 3,091.6 ft	**TOTAL DEPTH** 24.4 ft	**NORTHING** 619,515	**EASTING** 594,289	**24 HR.** 22.3
DRILL RIG/HAMMER EFF./DATE FME9553 CME-550X 80% 03/12/2021		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER J. Phillips	**START DATE** 08/18/21	**COMP. DATE** 08/18/21	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
3095										
	3,091.6	0.0								3,091.6 GROUND SURFACE 0.0
3090	3,090.6	1.0	2	2	98/0.3	100/0.8		M		**ROADWAY EMBANKMENT**
	3,088.1	3.5	100/0.3			100/0.3				3,089.6 Soft to Medium Stiff, Tan, Fine Sandy SILT (A-4), with trace gravel 2.0
3085	3,085.6	6.0	100/0.2			100/0.2				**WEATHERED ROCK**
	3,083.1	8.5	100/0.4			100/0.4				Gray-Tan, (META-SANDSTONE)
3080	3,078.1	13.5	100/0.4			100/0.4				
3075	3,073.1	18.5	100/0.3			100/0.3				
3070	3,068.1	23.5	35	65/0.4		100/0.9				3,067.2 24.4
										Boring Terminated at Elevation 3,067.2 ft In Weathered Rock (META-SANDSTONE)

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** M. Brewer
SITE DESCRIPTION Upgrade NC 143 from SR 1223 (Beech Creek Road) to 0.5 Miles North of Appalachian Trail			**GROUND WTR (ft)**
BORING NO. RWAL29_B-1	**STATION** 393+91	**OFFSET** 28 ft RT	**ALIGNMENT** L	**0 HR.** Dry
COLLAR ELEV. 3,085.0 ft	**TOTAL DEPTH** 38.5 ft	**NORTHING** 619,540	**EASTING** 594,366	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE CG29473 CME-550 79% 03/12/2021		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER J. Estep	**START DATE** 05/05/21	**COMP. DATE** 05/05/21	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
3085										
	3,085.0	0.0								3,085.0 GROUND SURFACE 0.0
	3,084.0	1.0	9	8	5	13		M		**ROADWAY EMBANKMENT**
	3,081.5	3.5	25	8	9	17		M		Medium Stiff to Hard,
3080	3,079.0	6.0	2	2	5	7		W		Brown-Tan-Orange-Gray, Fine to Coarse
	3,076.5	8.5	5	6	7	13		W		Sandy SILT (A-4), with trace to little gravel
3075	3,071.5	13.5	72	28/0.2		100/0.7		M		
3070	3,069.0	16.0								3,069.0 16.0
	3,066.5	18.5	18	9	16	25		W		**RESIDUAL**
3065										Very Stiff, Gray, Fine to Coarse Sandy SILT
	3,061.5	23.5	27	10	13	23		W		(A-4), with trace gravel-sized rock
3060										fragments
	3,058.0	27.0								3,058.0 27.0
	3,056.5	28.5	31	20	16	36		M		Dense, Gray-Orange, Silty, Gravelly Fine to
3055										Coarse SAND (A-1-b)
	3,051.5	33.5	57	43/0.1		100/0.6				3,051.5 33.5
3050										**WEATHERED ROCK**
										Gray-Orange-Brown,
	3,046.5	38.5	60/0.0			60/0.0				(META-SANDSTONE)
										3,046.5 38.5
										Boring Terminated with Standard Penetration Test Refusal at Elevation 3,046.5 ft On Crystalline Rock (META-SANDSTONE)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** D. Goodnight
SITE DESCRIPTION Upgrade NC 143 from SR 1223 (Beech Creek Road) to 0.5 Miles North of Appalachian Trail			**GROUND WTR (ft)**
BORING NO. L_39432L	**STATION** 394+32	**OFFSET** 40 ft LT	**ALIGNMENT** L	**0 HR.** Dry
COLLAR ELEV. 3,088.9 ft	**TOTAL DEPTH** 20.6 ft	**NORTHING** 619,617	**EASTING** 594,346	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 76% 06/14/2021		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER C. Odom	**START DATE** 12/14/21	**COMP. DATE** 12/14/21	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
3090										
										3,088.9 GROUND SURFACE 0.0
	3,087.9	1.0	3	20	10	30		M		**COLLUVIAL** Very Stiff, Tan, Fine Sandy SILT (A-4), with little gravel
3085	3,085.4	3.5	2	2	2	4		M		3,085.9 3.0 Loose to Medium Dense, Silty Fine SAND (A-2-4), with little gravel
	3,082.9	6.0	5	5	3	8		M		
3080	3,080.4	8.5	5	6	5	11		M		
										3,076.9 12.0 Soft, Brown, Fine Sandy SILT (A-4), with little gravel
3075	3,075.4	13.5	1	1	2	3		M		
3070	3,070.4	18.5	8	62	38/0.2	100/0.7				3,069.9 19.0 **WEATHERED ROCK** Tan-Gray, (META-SANDSTONE)
	3,068.4	20.5	60/0.1			60/0.1				3,068.4 20.5 3,068.3 20.6 **CRYSTALLINE ROCK** Tan-Gray, (META-SANDSTONE) Boring Terminated with Standard Penetration Test Refusal at Elevation 3,068.3 ft In Crystalline Rock (META-SANDSTONE)

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** S. Braun
SITE DESCRIPTION Upgrade NC 143 from SR 1223 (Beech Creek Road) to 0.5 Miles North of Appalachian Trail			**GROUND WTR (ft)**
BORING NO. RWAL29_B-2	**STATION** 395+00	**OFFSET** 28 ft RT	**ALIGNMENT** L	**0 HR.** Dry
COLLAR ELEV. 3,077.4 ft	**TOTAL DEPTH** 29.2 ft	**NORTHING** 619,615	**EASTING** 594,443	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 83% 06/16/2020		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER J. Estep	**START DATE** 05/06/21	**COMP. DATE** 05/06/21	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
3080										
										3,077.4 GROUND SURFACE 0.0
	3,076.4	1.0	9	8	9	17		M		**ROADWAY EMBANKMENT** Stiff to Very Stiff, Brown-Gray, Fine to Coarse Sandy SILT (A-4), with trace gravel
3075	3,073.9	3.5	10	8	8	16		M		
	3,071.4	6.0	9	6	7	13		M		
3070	3,068.9	8.5	5	7	5	12		W		
										3,065.4 12.0 **COLLUVIAL** Soft Stiff to Stiff, Brown-Tan-Gray, Fine to Coarse Sandy SILT (A-4(1)), with trace gravel
3065	3,063.9	13.5	7	3	4	7		M		
3060	3,058.9	18.5	9	5	5	10		M		
3055	3,053.9	23.5	1	2	1	3	SS-853	22%		
3050	3,049.4	28.0	100/0.3			100/0.3				3,049.4 28.0 3,048.2 29.2 **WEATHERED ROCK** Gray-Brown, (META-SANDSTONE) Boring Terminated with Standard Penetration Test Refusal at Elevation 3,048.2 ft On Crystalline Rock (META-SANDSTONE)
	3,048.2	29.2	60/0.0			60/0.0				

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** C. Piercy
SITE DESCRIPTION Upgrade NC 143 from SR 1223 (Beech Creek Road) to 0.5 Miles North of Appalachian Trail			**GROUND WTR (ft)**
BORING NO. RWAL29_B-3	**STATION** 395+80	**OFFSET** 28 ft RT	**ALIGNMENT** L — **0 HR.** Dry
COLLAR ELEV. 3,072.1 ft	**TOTAL DEPTH** 23.0 ft	**NORTHING** 619,669	**EASTING** 594,501 — **24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE BRE9533 CME-550X 78% 03/12/2021		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER J. Phillips	**START DATE** 05/06/21	**COMP. DATE** 05/06/21	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
3075										
	3,072.1	0.0								3,072.1 GROUND SURFACE 0.0
	3,071.1	1.0								3,071.3 **ROADWAY EMBANKMENT** 0.8
3070			6	5	5	10 23 100/0.8		M		Asphalt (0.8')
	3,068.6	3.5								Loose to Medium Dense, Gray-Brown, Silty, Fine to Coarse SAND (A-2-4), with trace gravel
			5	12	11					3,066.6 5.5
	3,066.1	6.0								Very Dense, Brown, Silty, Gravelly Fine to Coarse SAND (A-1-b)
3065			71	29/0.3				M		3,065.1 7.0
	3,063.6	8.5								**RESIDUAL**
			4	3	4	7 41				Loose to Dense, Gray, Silty Fine to Coarse SAND (A-2-4), with trace gravel
3060								M		
	3,058.6	13.5								
			9	30	11					
3055								M		
	3,053.6	18.5								
			8	6	4	10				
3050								M		
	3,049.1	23.0								3,049.1 23.0
			60/0.0			60/0.0				Boring Terminated with Standard Penetration Test Refusal at Elevation 3,049.1 ft On Crystalline Rock (META-SANDSTONE)

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** C. Piercy
SITE DESCRIPTION Upgrade NC 143 from SR 1223 (Beech Creek Road) to 0.5 Miles North of Appalachian Trail			**GROUND WTR (ft)**
BORING NO. RWAL29A_B-1	**STATION** 396+86	**OFFSET** 21 ft RT	**ALIGNMENT** L — **0 HR.** Dry
COLLAR ELEV. 3,064.8 ft	**TOTAL DEPTH** 36.2 ft	**NORTHING** 619,746	**EASTING** 594,575 — **24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE BRE9533 CME-550X 78% 03/12/2021		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER J. Phillips	**START DATE** 05/06/21	**COMP. DATE** 05/06/21	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
3065										
	3,063.3	1.5								3,064.8 GROUND SURFACE 0.0
			8	8	11	19		M		3,063.3 **ROADWAY EMBANKMENT** 1.5
	3,061.3	3.5								Asphalt (0.9') and ABC (0.6')
3060			4	3	2	5		M		3,061.8 3.0
	3,058.8	6.0								Medium Dense, Brown-Gray, Silty Fine to Coarse SAND (A-2-4), with trace gravel
			2	1	1	2				Very Soft to Medium Stiff, Brown, Fine to Coarse Sandy SILT (A-4)
	3,056.3	8.5								3,056.8 8.0
3055			100/0.4			100/0.4		M		Very Dense, Gray, Fine to Coarse Sandy GRAVEL (A-1-a)
	3,051.3	13.5								3,052.8 12.0
			7	7	5	12				**RESIDUAL**
3050								M		Medium Dense to Dense, Brown-Gray, Silty Fine to Coarse SAND (A-2-4), with trace gravel-sized rock fragments
	3,046.3	18.5								
			6	9	18	27				
3045								M		
	3,041.3	23.5								
			17	20	20	40				
3040								M		
	3,036.3	28.5								3,036.3 28.5
			53	47/0.3		100/0.8				**WEATHERED ROCK**
3035										Gray, (META-SANDSTONE)
	3,031.3	33.5								
			14	26	74/0.4	100/0.9				
3030										
	3,028.6	36.2	60/0.0			60/0.0				3,028.6 36.2
										Boring Terminated with Standard Penetration Test Refusal at Elevation 3,028.6 ft On Crystalline Rock (META-SANDSTONE)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** D. Goodnight
SITE DESCRIPTION Upgrade NC 143 from SR 1223 (Beech Creek Road) to 0.5 Miles North of Appalachian Trail			**GROUND WTR (ft)**
BORING NO. L_39702L	**STATION** 397+02	**OFFSET** 12 ft LT	**ALIGNMENT** L	**0 HR.** Dry
COLLAR ELEV. 3,062.3 ft	**TOTAL DEPTH** 16.8 ft	**NORTHING** 619,781	**EASTING** 594,565	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE RME9553 CME-550X 80% 03/12/2021		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER J. Phillips	**START DATE** 08/18/21	**COMP. DATE** 08/18/21	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
3065											
										3,062.3	0.0
										GROUND SURFACE	
	3,061.3	1.0								**ROADWAY EMBANKMENT**	
3060			3	5	7	12		M		Stiff, Tan-Brown, Fine Sandy SILT (A-4), with trace gravel	
	3,058.8	3.5								3,059.3	3.0
			23	18	15	33		M		**RESIDUAL**	
	3,056.3	6.0								Medium Dense to Dense, Tan, Silty Fine Fine SAND (A-2-4)	
3055			7	11	11	22		M			
	3,053.8	8.5								3,054.3	8.0
			8	5	5	10		M		Stiff, Tan, Fine Sandy SILT (A-4)	
3050										3,050.3	12.0
	3,048.8	13.5								**WEATHERED ROCK**	
			30	70/0.3		100/0.8				Gray-Tan, (META-SANDSTONE)	
	3,045.6	16.7	60/0.1			60/0.1				3,045.6 / 3,045.5	16.7 / 16.8
										CRYSTALLINE ROCK	
										Tan-Gray, (META-SANDSTONE)	
										Boring Terminated with Standard Penetration Test Refusal at Elevation 3,045.5 ft In Crystalline Rock (META-SANDSTONE)	

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** C. Piercy
SITE DESCRIPTION Upgrade NC 143 from SR 1223 (Beech Creek Road) to 0.5 Miles North of Appalachian Trail			**GROUND WTR (ft)**
BORING NO. RWAL29A_B-2	**STATION** 397+40	**OFFSET** 20 ft RT	**ALIGNMENT** L	**0 HR.** Dry
COLLAR ELEV. 3,060.6 ft	**TOTAL DEPTH** 43.8 ft	**NORTHING** 619,783	**EASTING** 594,614	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE BRE9533 CME-550X 78% 03/12/2021		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER J. Phillips	**START DATE** 05/05/21	**COMP. DATE** 05/05/21	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
3065											
										3,060.6	0.0
										GROUND SURFACE	
3060	3,059.6	1.0	6	6	5	11		M		3,059.1 **ROADWAY EMBANKMENT** Asphalt (0.9') and ABC (0.6')	1.5
	3,057.1	3.5								Loose to Medium Dense, Brown, Silty Fine to Coarse SAND (A-2-4), with trace gravel	
			4	4	4	8		M			
3055	3,054.6	6.0	1	1	3	4		M			
	3,052.1	8.5								3,052.6	8.0
			1	1	1	2	SS-8131	20%		**COLLUVIAL** Very Soft to Stiff, Brown-Orange, Fine to Coarse Sandy SILT (A-4(0)), with trace gravel	
3050	3,047.1	13.5									
			2	8	6	14		M			
3045	3,042.1	18.5									
			7	6	25	31		M		3,043.6 **RESIDUAL** Dense to Very Dense, Gray-Brown, Silty Fine to Coarse SAND (A-2-4), with trace gravel-sized rock fragments	17.0
3040	3,037.1	23.5									
			10	34	37	71		M			
3035	3,032.1	28.5									
			18	22	31	53		D			
3030	3,027.1	33.5								3,027.1	33.5
			100/0.4			100/0.4				**WEATHERED ROCK** Gray, (META-SANDSTONE)	
3025	3,022.1	38.5									
			79	21/0.4		100/0.9					
3020	3,017.1	43.5								3,016.8	43.8
			100/0.3			100/0.3				Boring Terminated at Elevation 3,016.8 ft In Weathered Rock (META-SANDSTONE)	

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** C. Piercy
SITE DESCRIPTION Upgrade NC 143 from SR 1223 (Beech Creek Road) to 0.5 Miles North of Appalachian Trail			**GROUND WTR (ft)**
BORING NO. RWAL29A_B-3	**STATION** 397+95	**OFFSET** 20 ft RT	**ALIGNMENT** L	**0 HR.** Dry
COLLAR ELEV. 3,056.4 ft	**TOTAL DEPTH** 33.6 ft	**NORTHING** 619,820	**EASTING** 594,655	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE BRE9533 CME-550X 78% 03/12/2021		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER J. Phillips	**START DATE** 05/05/21	**COMP. DATE** 05/05/21	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
3060											
										3,056.4 GROUND SURFACE	0.0
3055	3,054.9	1.5	8	5	8	13-20		M		3,054.9 **ROADWAY EMBANKMENT** Asphalt (0.9') and ABC (0.6')	1.5
	3,052.9	3.5	8	11	9			M		3,053.4 Medium Dense, Brown, Silty Fine to Coarse SAND (A-2-4), with trace gravel	3.0
3050	3,050.4	6.0	4	7	4	11		M		Stiff to Very Stiff, Brown, Fine to Coarse Sandy SILT (A-4), with trace gravel	
	3,047.9	8.5	2	1	WOH	1		M		3,048.4 Very Loose, Brown, Silty Fine to Coarse SAND (A-2-4), with trace gravel	8.0
3045											
	3,042.9	13.5	1	WOH	1	1	SS-8123	21%		3,044.4 **COLLUVIAL** Very Soft to Medium Stiff, Brown-Orange, Fine to Coarse Sandy SILT (A-4(0)), with trace gravel	12.0
3040											
	3,037.9	18.5	2	2	2	4		M			
3035											
	3,032.9	23.5	8	2	3	5		M			
3030											
	3,027.9	28.5	76	24/0.1		100/0.6				3,027.9 **WEATHERED ROCK** Gray, (META-SANDSTONE)	28.5
3025											
	3,022.9	33.5	60/0.1			60/0.1				3,022.8 Boring Terminated with Standard Penetration Test Refusal at Elevation 3,022.8 ft In Crystalline Rock (META-SANDSTONE)	33.6

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** C. Piercy
SITE DESCRIPTION Upgrade NC 143 from SR 1223 (Beech Creek Road) to 0.5 Miles North of Appalachian Trail			**GROUND WTR (ft)**
BORING NO. RWAL29A_B-4	**STATION** 398+45	**OFFSET** 20 ft RT	**ALIGNMENT** L	**0 HR.** Dry
COLLAR ELEV. 3,053.4 ft	**TOTAL DEPTH** 29.6 ft	**NORTHING** 619,854	**EASTING** 594,692	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE BRE9533 CME-550X 78% 03/12/2021		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER J. Phillips	**START DATE** 05/05/21	**COMP. DATE** 05/05/21	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
3055										
										3,053.4 GROUND SURFACE 0.0
	3,051.9	1.5	7	7	8	15		M		3,051.9 **ROADWAY EMBANKMENT** Asphalt (0.9') and ABC (0.6') 1.5
3050	3,049.9	3.5	1	6	3	9		M		Very Loose to Medium Dense, Brown-Gray, Silty Fine to Coarse Sand (A-2-4), with trace gravel
	3,047.4	6.0	3	2	3	5		M		
3045	3,044.9	8.5	2	1	2	3		M		
3040	3,039.9	13.5	4	1	1	2	SS-8115	29%		3,041.4 **COLLUVIAL** 12.0 Very Soft, Brown-Orange, Fine to Coarse Sandy SILT (A-4(3)), with trace gravel
										3,036.4 **RESIDUAL** 17.0
3035	3,034.9	18.5	4	12	14	26		M		Medium Dense, Brown-Gray, Silty Fine to Coarse SAND (A-2-4), with trace gravel-sized rock fragments
3030	3,029.9	23.5	24	44	56/0.4	100/0.9				3,029.4 **WEATHERED ROCK** 24.0 Gray, (META-SANDSTONE)
3025	3,024.9	28.5	45	55/0.4		100/0.9				
	3,023.8	29.6	60/0.0			60/0.0				3,023.8 Boring Terminated with Standard Penetration Test Refusal at Elevation 3,023.8 ft On Crystalline Rock (META-SANDSTONE) 29.6

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** D. Goodnight
SITE DESCRIPTION Upgrade NC 143 from SR 1223 (Beech Creek Road) to 0.5 Miles North of Appalachian Trail			**GROUND WTR (ft)**
BORING NO. RWAL29A_B-5	**STATION** 399+16	**OFFSET** 10 ft RT	**ALIGNMENT** L — **0 HR.** 38.6
COLLAR ELEV. 3,049.1 ft	**TOTAL DEPTH** 45.2 ft	**NORTHING** 619,909	**EASTING** 594,737 — **24 HR.** 33.7
DRILL RIG/HAMMER EFF./DATE FME9553 CME-550X 80% 03/12/2021		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER J. Phillips	**START DATE** 09/08/21	**COMP. DATE** 09/08/21	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION — ELEV. (ft)	DEPTH (ft)
3050										3,049.1 GROUND SURFACE	0.0
	3,048.1	1.0	5	8	17	25		M		**RESIDUAL** Medium Dense, Orange-Tan, Silty Fine to Coarse SAND (A-2-4), with trace gravel-sized rock fragments	
3045	3,045.6	3.5	10	11	12	23		M			
	3,043.1	6.0	9	18	16	34		M		3,043.6	5.5
3040	3,040.6	8.5	5	13	17	30		M		Very Stiff to Hard, Tan, Fine to Coarse Sandy SILT (A-4), with trace manganese oxide and gravel-sized rock fragments	
	3,035.6	13.5	9	9	14	23		M			
3035											
3030	3,030.6	18.5	13	24	76/0.4	100/0.9				3,030.1 **WEATHERED ROCK** Tan, (META-SANDSTONE)	19.0
3025	3,025.6	23.5	52	48/0.4		100/0.9					
3020	3,020.6	28.5	38	62/0.3		100/0.8					
3015	3,015.6	33.5	15	19	54	73		M		3,016.1 **RESIDUAL** Hard, Tan, Fine Sandy SILT (A-4)	33.0
3010	3,010.6	38.5	100/0.4			100/0.4				3,010.6 **WEATHERED ROCK** Tan, (META-SANDSTONE)	38.5
3005	3,005.6	43.5	35	65/0.3		100/0.3					
	3,003.9	45.2	60/0.0			60/0.0				3,003.9 Boring Terminated with Standard Penetration Test Refusal at Elevation 3,003.9 ft On Crystalline Rock (META-SANDSTONE)	45.2

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** D. Goodnight
SITE DESCRIPTION Upgrade NC 143 from SR 1223 (Beech Creek Road) to 0.5 Miles North of Appalachian Trail			**GROUND WTR (ft)**
BORING NO. L_39918L	**STATION** 399+18	**OFFSET** 28 ft LT	**ALIGNMENT** L — **0 HR.** 22.0
COLLAR ELEV. 3,049.9 ft	**TOTAL DEPTH** 23.9 ft	**NORTHING** 619,938	**EASTING** 594,713 — **24 HR.** 6.8
DRILL RIG/HAMMER EFF./DATE FME9553 CME-550X 80% 03/12/2021		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER J. Phillips	**START DATE** 08/18/21	**COMP. DATE** 08/18/21	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
3050										3,049.9 GROUND SURFACE 0.0
	3,048.9	1.0	16	22	31	53		M		**RESIDUAL** Very Dense, Tan-Gray, Silty Fine SAND (A-2-4), with little gravel-sized rock fragments
	3,046.4	3.5	27	38	49	87		M		
3045	3,043.9	6.0	15	16	24	40		M		3,044.4 5.5
	3,041.4	8.5	11	35	65/0.4	100/0.9				Hard, Tan, Fine Sandy SILT (A-4)
3040										3,040.4 9.5
	3,036.4	13.5	70	30/0.1		100/0.6				**WEATHERED ROCK** Tan-Gray, (META-SANDSTONE)
3035										
	3,031.4	18.5	100/0.5			100/0.5				
3030										
	3,026.4	23.5	100/0.4			100/0.4				3,026.0 23.9
										Boring Terminated at Elevation 3,026.0 ft In Weathered Rock (META-SANDSTONE)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** D. Goodnight
SITE DESCRIPTION Upgrade NC 143 from SR 1223 (Beech Creek Road) to 0.5 Miles North of Appalachian Trail			**GROUND WTR (ft)**
BORING NO. RWAL19_B-1	**STATION** 400+94	**OFFSET** 14 ft LT	**ALIGNMENT** L	**0 HR.** Dry
COLLAR ELEV. 3,034.0 ft	**TOTAL DEPTH** 23.5 ft	**NORTHING** 620,061	**EASTING** 594,832	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 76% 06/14/2021		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER C. Odom	**START DATE** 12/15/21	**COMP. DATE** 12/15/21	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
3035										
										3,034.0 GROUND SURFACE 0.0
	3,032.5	1.5						M		**ROADWAY EMBANKMENT**
			2	1	2	3				Very Soft to Soft, Tan-Gray, Fine to Coarse
3030	3,030.5	3.5	1	1	1	2		W		Sandy SILT (A-4), with trace gravel and
										organics
	3,027.0	7.0						M		3,028.0 6.0
	3,025.5	8.5	2	1	2	3				**COLLUVIAL**
3025			1	1	1	2		W		Very Soft to Soft, Tan, Fine to Coarse
										Sandy SILT (A-4), with little gravel
	3,020.5	13.5						W		
3020			1	1	3	4				
										3,016.0 18.0
	3,015.5	18.5	100/0.5			100/0.5				**WEATHERED ROCK**
3015										Tan-Gray, (META-SANDSTONE)
	3,010.5	23.5	60/0.0			60/0.0				3,010.5 23.5
										Boring Terminated with Standard
										Penetration Test Refusal at Elevation
										3,010.5 ft On Crystalline Rock
										(META-SANDSTONE)
										Notes -
										Boulders and/or Hard Drilling encountered
										infrequently at the following depths:
										18.0 to 23.5 ft

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** D. Goodnight
SITE DESCRIPTION Upgrade NC 143 from SR 1223 (Beech Creek Road) to 0.5 Miles North of Appalachian Trail			**GROUND WTR (ft)**
BORING NO. L_40303L	**STATION** 403+03	**OFFSET** 15 ft LT	**ALIGNMENT** L	**0 HR.** Dry
COLLAR ELEV. 3,019.6 ft	**TOTAL DEPTH** 6.1 ft	**NORTHING** 620,246	**EASTING** 594,918	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE FME9553 CME-550X 80% 03/12/2021		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER J. Phillips	**START DATE** 08/18/21	**COMP. DATE** 08/18/21	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
3020										
										3,019.6 GROUND SURFACE 0.0
	3,018.6	1.0						M		**ROADWAY EMBANKMENT**
			2	12	11	23				Medium Dense, Brown, Silty Fine SAND
	3,016.1	3.5						M		(A-2-4), with little gravel and cobbles 3.0
3015			7	11	8	19				**RESIDUAL**
	3,013.6	6.0								3,014.1 Medium Dense, Tan-Gray, Silty Fine SAND 5.5
			60/0.1			60/0.1				3,013.5 (A-2-4), with little gravel-sized rock 6.1
										fragments
										CRYSTALLINE ROCK
										Gray, (META-SANDSTONE)
										Boring Terminated with Standard
										Penetration Test Refusal at Elevation
										3,013.5 ft In Crystalline Rock
										(META-SANDSTONE)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** D. Goodnight
SITE DESCRIPTION Upgrade NC 143 from SR 1223 (Beech Creek Road) to 0.5 Miles North of Appalachian Trail			**GROUND WTR (ft)**
BORING NO. RWAL19_B-2	**STATION** 405+73	**OFFSET** 38 ft LT	**ALIGNMENT** L	**0 HR.** Dry
COLLAR ELEV. 3,010.8 ft	**TOTAL DEPTH** 16.7 ft	**NORTHING** 620,513	**EASTING** 594,939	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 76% 06/14/2021		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER C. Odom	**START DATE** 12/15/21	**COMP. DATE** 12/15/21	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
3015										
3010										3,010.8 GROUND SURFACE 0.0
	3,008.8	2.0	2	2	1	3 3		M		**COLLUVIAL** Soft to Stiff, Tan-Brown, Fine to Coarse Sandy SILT (A-4), with little gravel and organics
	3,006.8	4.0								
3005			1	1	2			W		
	3,003.8	7.0	2	3	4	7		M		
	3,001.8	9.0				9				
3000			4	3	6			W		
	2,996.3	14.5	8	92/0.3		100/0.8				2,995.8 15.0
2995	2,994.1	16.7	60/0.0			60/0.0				**WEATHERED ROCK** 2,994.1 Tan-Gray, (META-SANDSTONE) 16.7
										Boring Terminated with Standard Penetration Test Refusal at Elevation 2,994.1 ft On Crystalline Rock (META-SANDSTONE)

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** D. Goodnight
SITE DESCRIPTION Upgrade NC 143 from SR 1223 (Beech Creek Road) to 0.5 Miles North of Appalachian Trail			**GROUND WTR (ft)**
BORING NO. RWAL19_B-3	**STATION** 406+21	**OFFSET** 45 ft LT	**ALIGNMENT** L	**0 HR.** Dry
COLLAR ELEV. 3,007.7 ft	**TOTAL DEPTH** 19.4 ft	**NORTHING** 620,565	**EASTING** 594,941	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 76% 06/14/2021		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER C. Odom	**START DATE** 12/15/21	**COMP. DATE** 12/15/21	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
3010										3,007.7 GROUND SURFACE 0.0
	3,004.7	3.0	2	1	1	2 7		M		**COLLUVIAL** Soft to Medium Stiff, Tan-Brown, Fine to Coarse Sandy SILT (A-4), with trace gravel and organics
3005	3,002.4	5.3	2	3	4			M		
	2,999.7	8.0	37	49	51/0.4	100/0.9				2,999.7 8.0
3000	2,997.2	10.5	28	41	42	83		M		**WEATHERED ROCK** 2,997.7 Tan, (META-SANDSTONE) 10.0
	2,992.7	15.0	10	9	18	27		M		**RESIDUAL** Very Stiff to Hard, Tan, Fine to Coarse Sandy SILT (A-4)
2995	2,988.3	19.4	60/0.0			60/0.0				2,989.7 18.0
2990										**WEATHERED ROCK** 2,988.3 Tan, (META-SANDSTONE) 19.4
										Boring Terminated with Standard Penetration Test Refusal at Elevation 2,988.3 ft On Crystalline Rock (META-SANDSTONE)
										Notes -
										Boulders and/or Hard Drilling encountered infrequently at the following depths: 18.0 to 19.4 ft

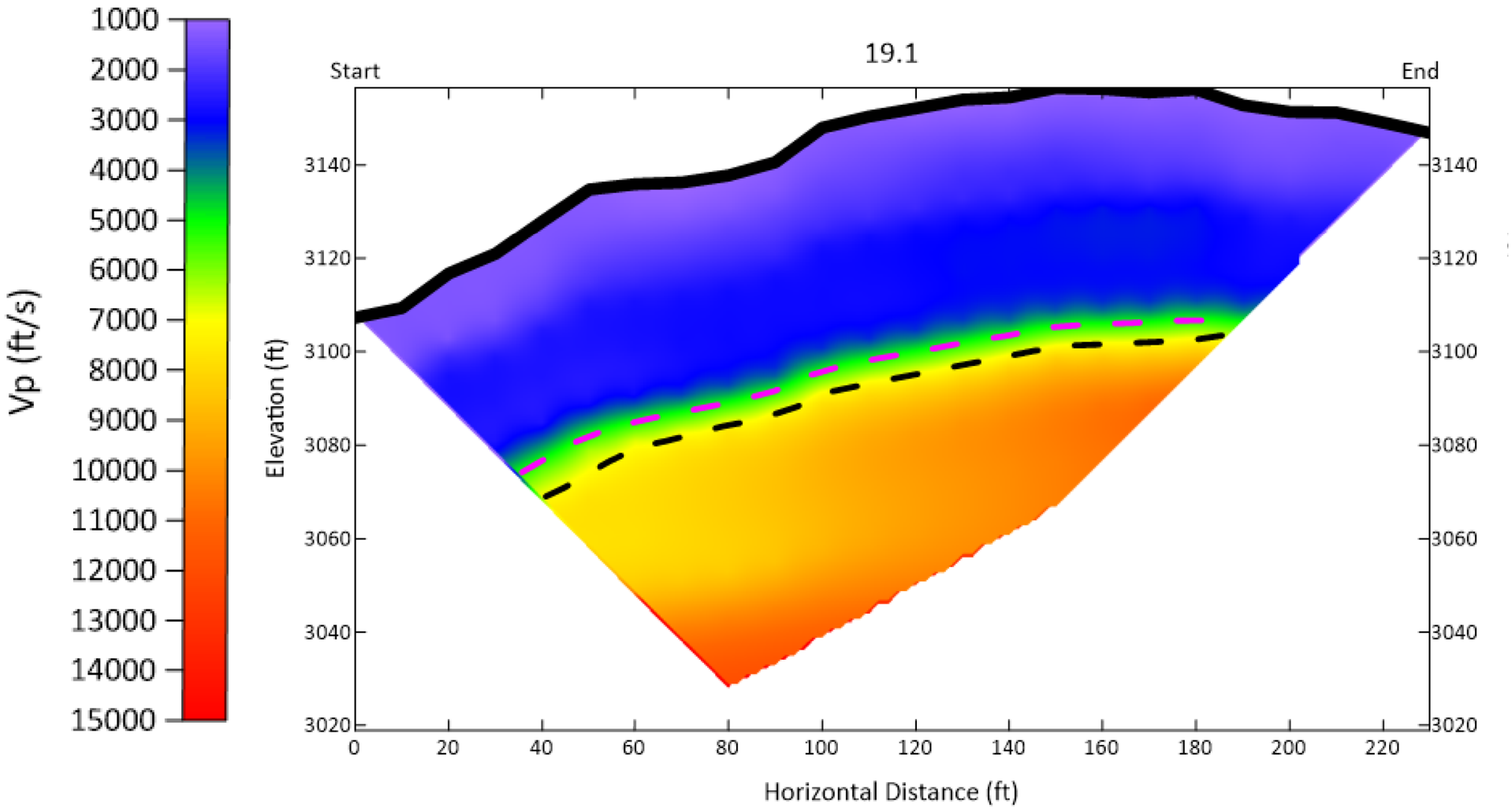
GEOTECHNICAL BORING REPORT
BORE LOG

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** D. Goodnight	
SITE DESCRIPTION Upgrade NC 143 from SR 1223 (Beech Creek Road) to 0.5 Miles North of Appalachian Trail				**GROUND WTR (ft)**
BORING NO. L_40703L	**STATION** 407+03	**OFFSET** 8 ft LT	**ALIGNMENT** L	**0 HR.** Dry
COLLAR ELEV. 2,994.6 ft	**TOTAL DEPTH** 24.1 ft	**NORTHING** 620,637	**EASTING** 595,001	**24 HR.** 20.9
DRILL RIG/HAMMER EFF./DATE RME9553 CME-550X 80% 03/12/2021		**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic
DRILLER J. Phillips	**START DATE** 08/19/21	**COMP. DATE** 08/19/21	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
2995											
										2,994.6 GROUND SURFACE	0.0
	2,993.6	1.0	5	5	10	15		M		**RESIDUAL** Stiff to Hard, Tan, Fine Sandy SILT (A-4)	
	2,991.1	3.5	23	32	44	76		M			
2990	2,988.6	6.0	19	43	57/0.4	100/0.9				2,988.1	6.5
	2,986.1	8.5	16	29	32	61		M		2,986.6 **WEATHERED ROCK** Tan, (META-SANDSTONE)	8.0
2985										**RESIDUAL** Hard, Tan, Fine Sandy SILT (A-4)	
	2,981.1	13.5	21	36	32	68		M			
2980											
	2,976.1	18.5	18	37	63/0.4	100/0.9				2,975.6	19.0
2975										**WEATHERED ROCK** Tan-Gray, (META-SANDSTONE)	
	2,971.1	23.5	71	29/0.1		100/0.6				2,970.5	24.1
										Boring Terminated at Elevation 2,970.5 ft In Weathered Rock (META-SANDSTONE)	

PROJECT REFERENCE NO.	SHEET NO.
A-0009CB	88

GEOPHYSICAL TEST RESULTS – SEISMIC REFRACTION LINE 19.1



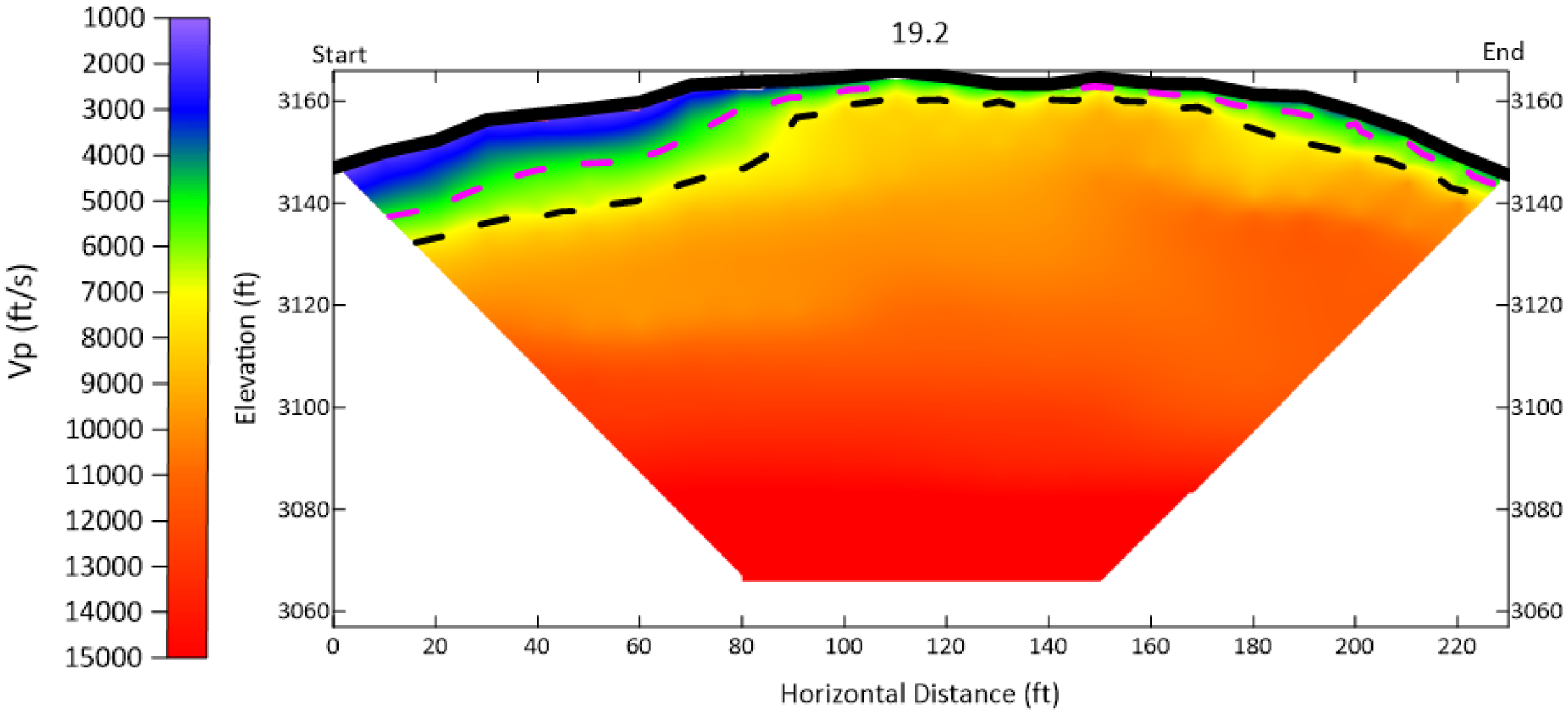
GEOPHYSICAL TESTING PERFORMED BY GEL SOLUTIONS. REFERENCE "SEISMIC REFRACTION SURVEY FOR EVALUATION OF ROCK" DATED 10/01/2021

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-0009CB	89

GEOPHYSICAL TEST RESULTS – SEISMIC REFRACTION LINE 19.2



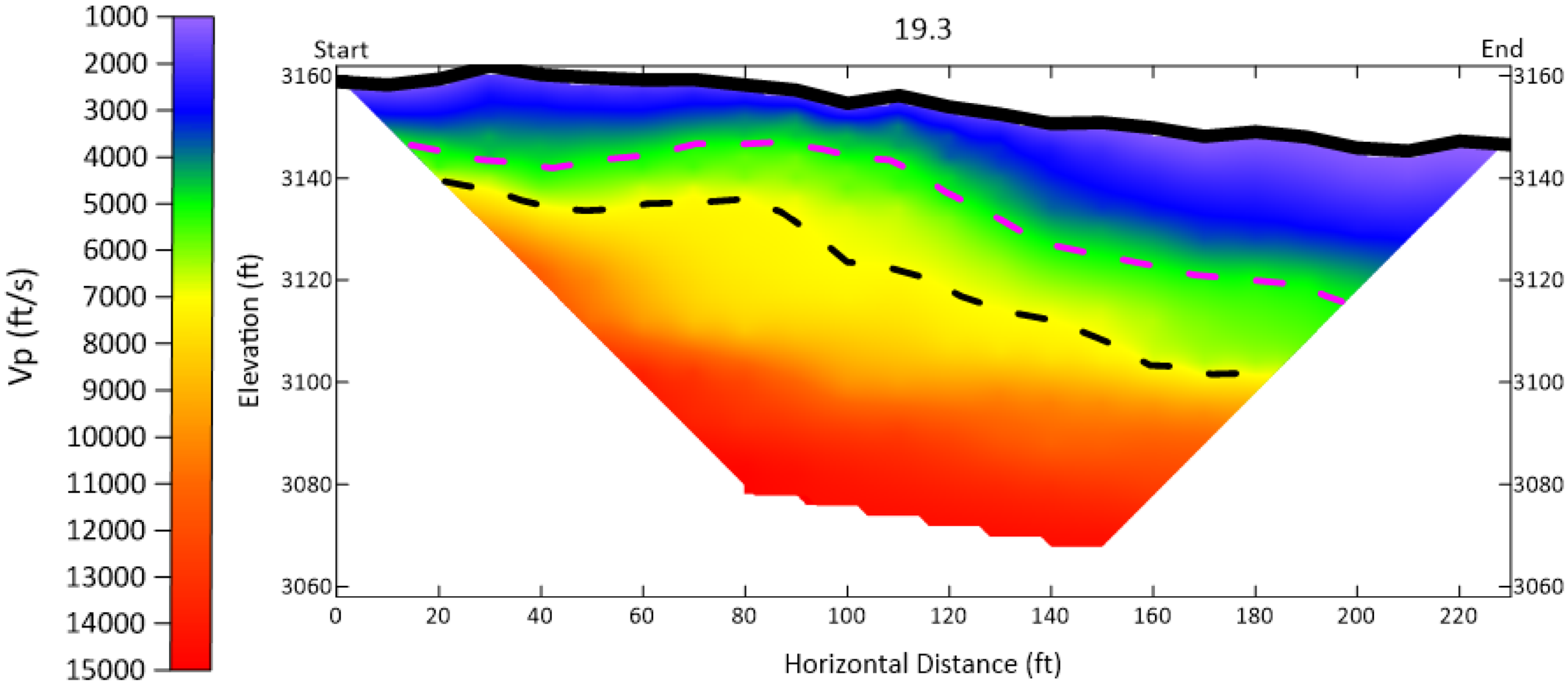
GEOPHYSICAL TESTING PERFORMED BY GEL SOLUTIONS. REFERENCE "SEISMIC REFRACTION SURVEY FOR EVALUATION OF ROCK" DATED 10/01/2021

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-0009CB	90

GEOPHYSICAL TEST RESULTS – SEISMIC REFRACTION LINE 19.3



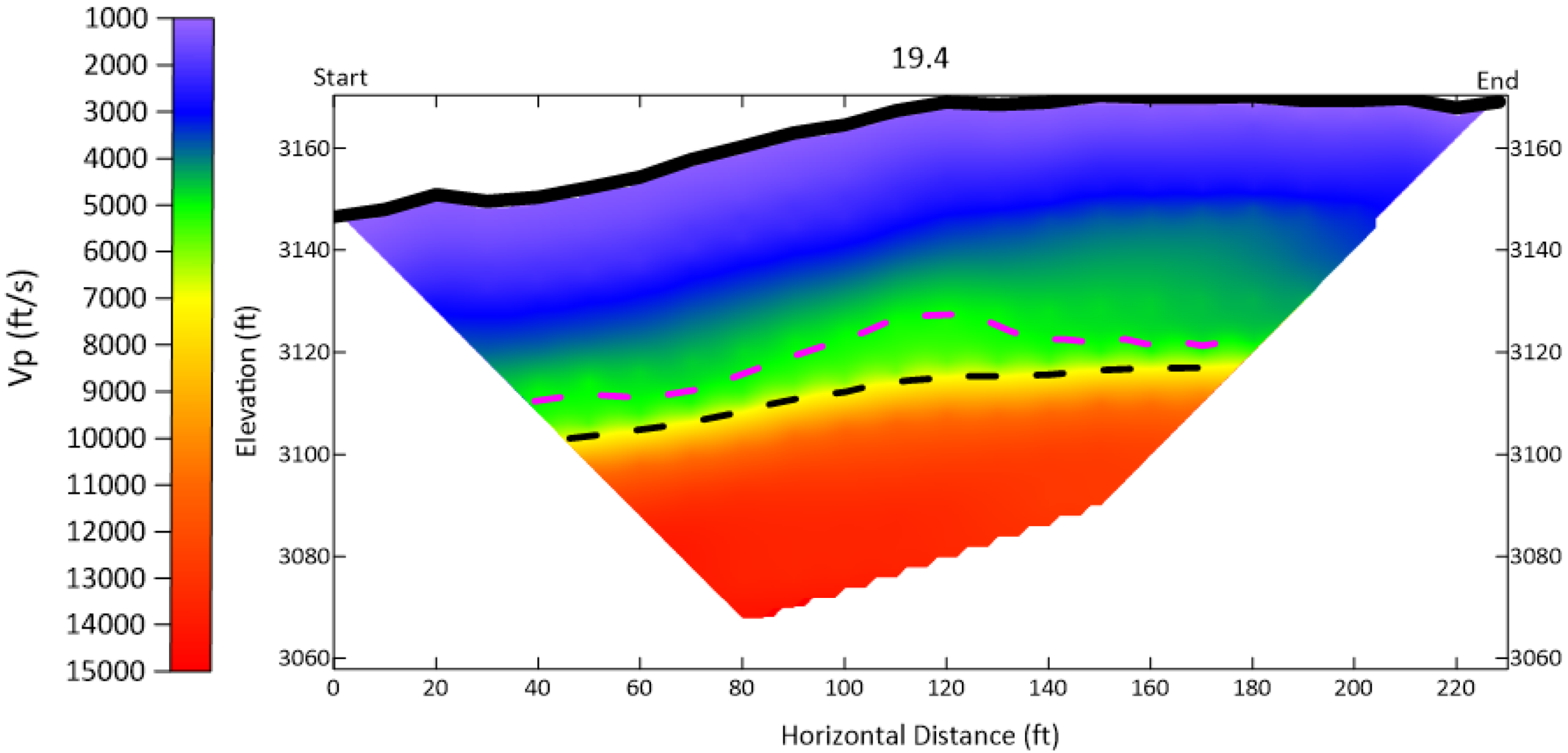
GEOPHYSICAL TESTING PERFORMED BY GEL SOLUTIONS. REFERENCE "SEISMIC REFRACTION SURVEY FOR EVALUATION OF ROCK" DATED 10/01/2021

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-0009CB	91

GEOPHYSICAL TEST RESULTS – SEISMIC REFRACTION LINE 19.4



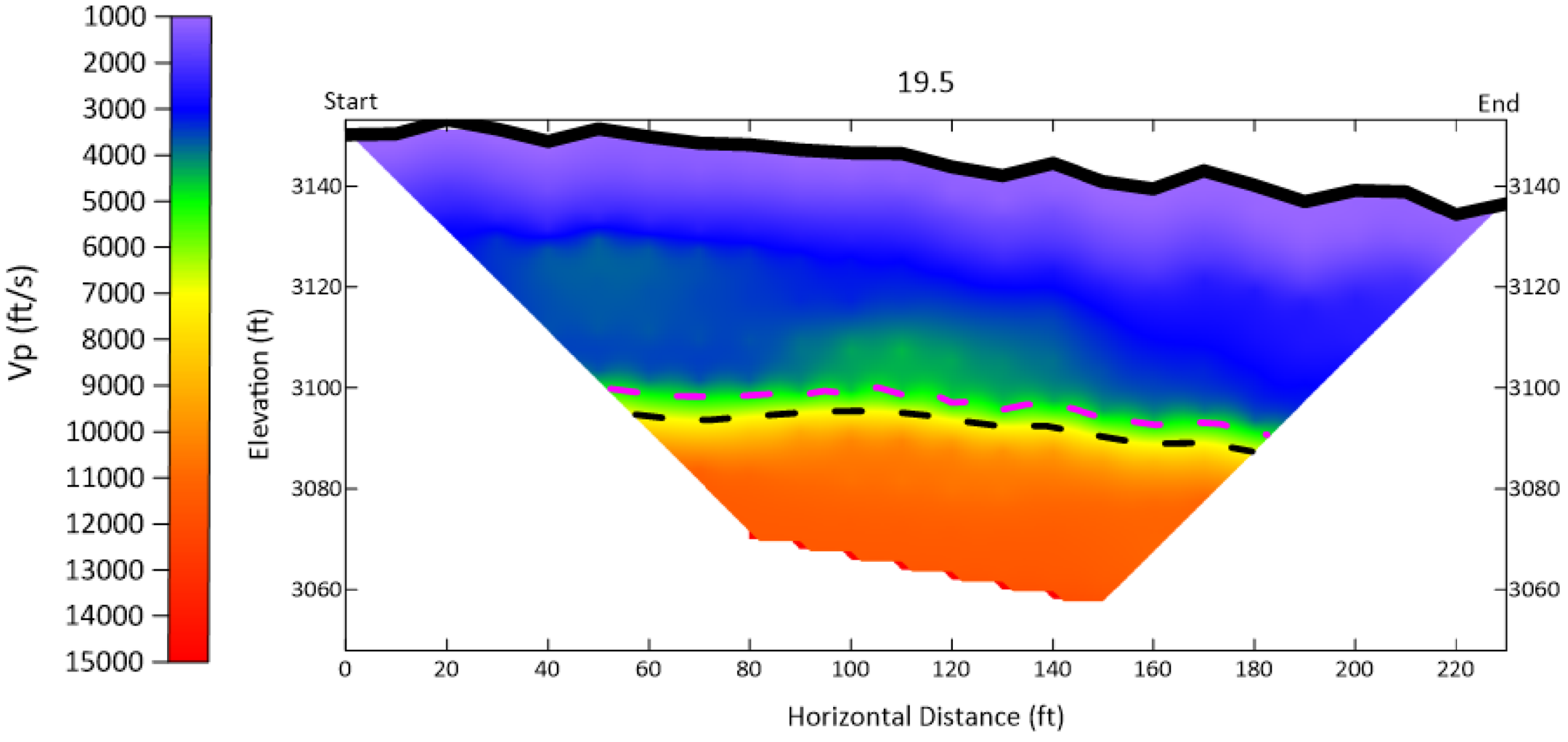
GEOPHYSICAL TESTING PERFORMED BY GEL SOLUTIONS. REFERENCE "SEISMIC REFRACTION SURVEY FOR EVALUATION OF ROCK" DATED 10/01/2021

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-0009CB	92

GEOPHYSICAL TEST RESULTS – SEISMIC REFRACTION LINE 19.5



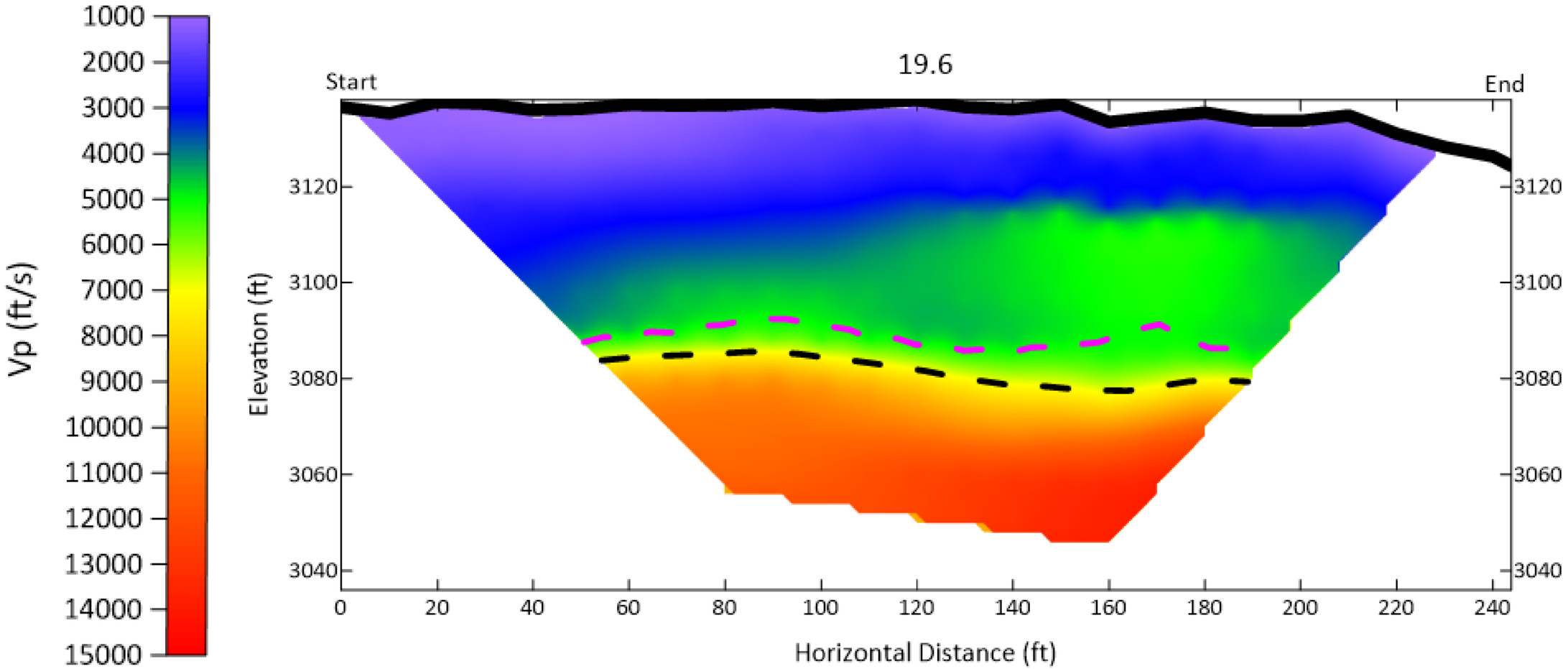
GEOPHYSICAL TESTING PERFORMED BY GEL SOLUTIONS. REFERENCE "SEISMIC REFRACTION SURVEY FOR EVALUATION OF ROCK" DATED 10/01/2021

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-0009CB	93

GEOPHYSICAL TEST RESULTS – SEISMIC REFRACTION LINE 19.6



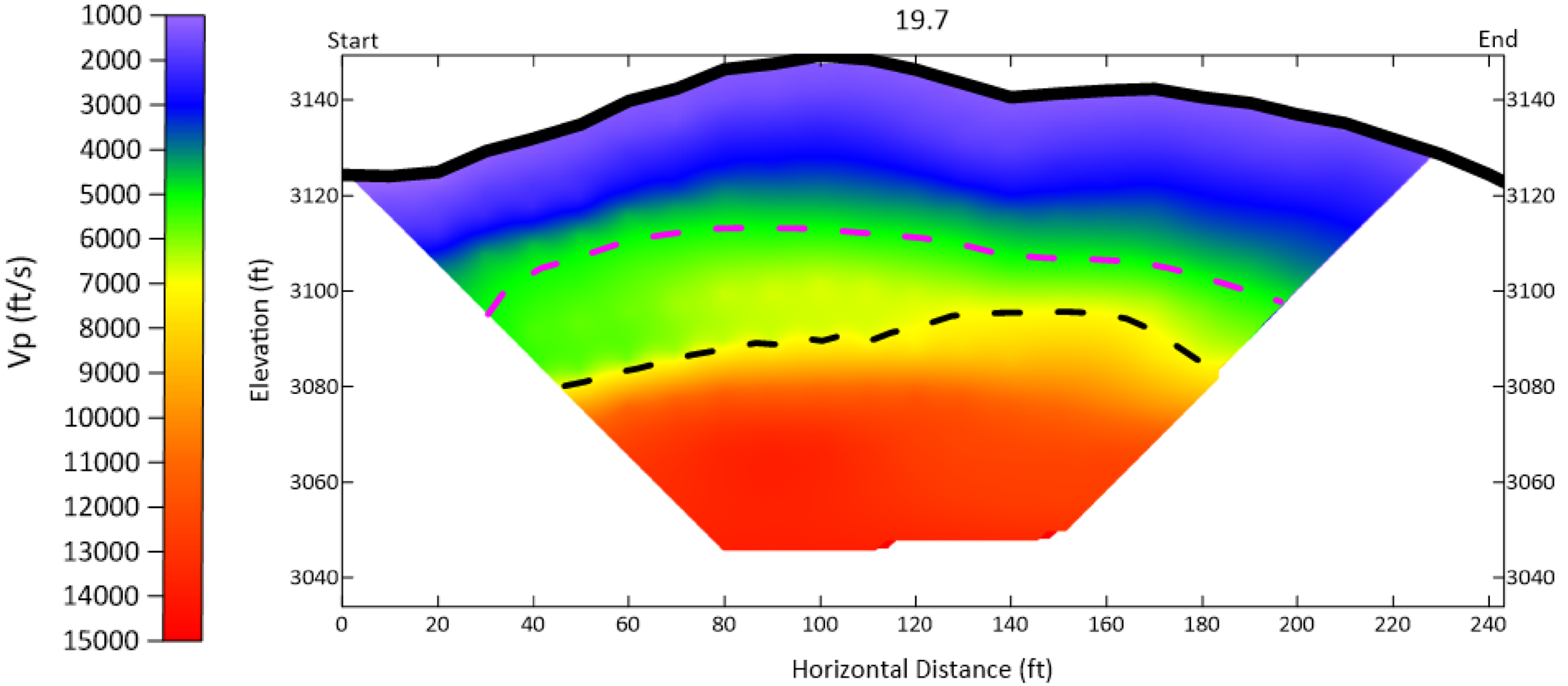
GEOPHYSICAL TESTING PERFORMED BY GEL SOLUTIONS. REFERENCE "SEISMIC REFRACTION SURVEY FOR EVALUATION OF ROCK" DATED 10/01/2021

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-0009CB	94

GEOPHYSICAL TEST RESULTS – SEISMIC REFRACTION LINE 19.7



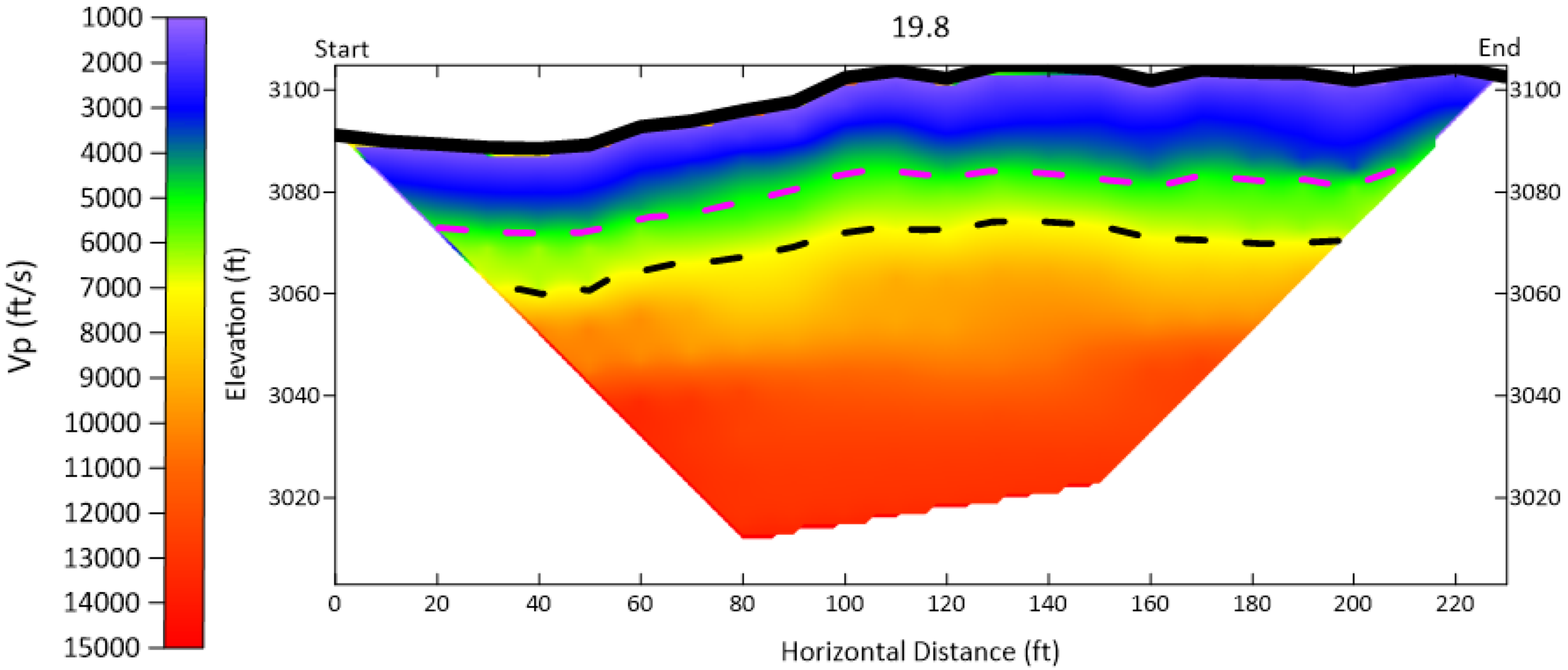
GEOPHYSICAL TESTING PERFORMED BY GEL SOLUTIONS. REFERENCE "SEISMIC REFRACTION SURVEY FOR EVALUATION OF ROCK" DATED 10/01/2021

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-0009CB	95

GEOPHYSICAL TEST RESULTS – SEISMIC REFRACTION LINE 19.8



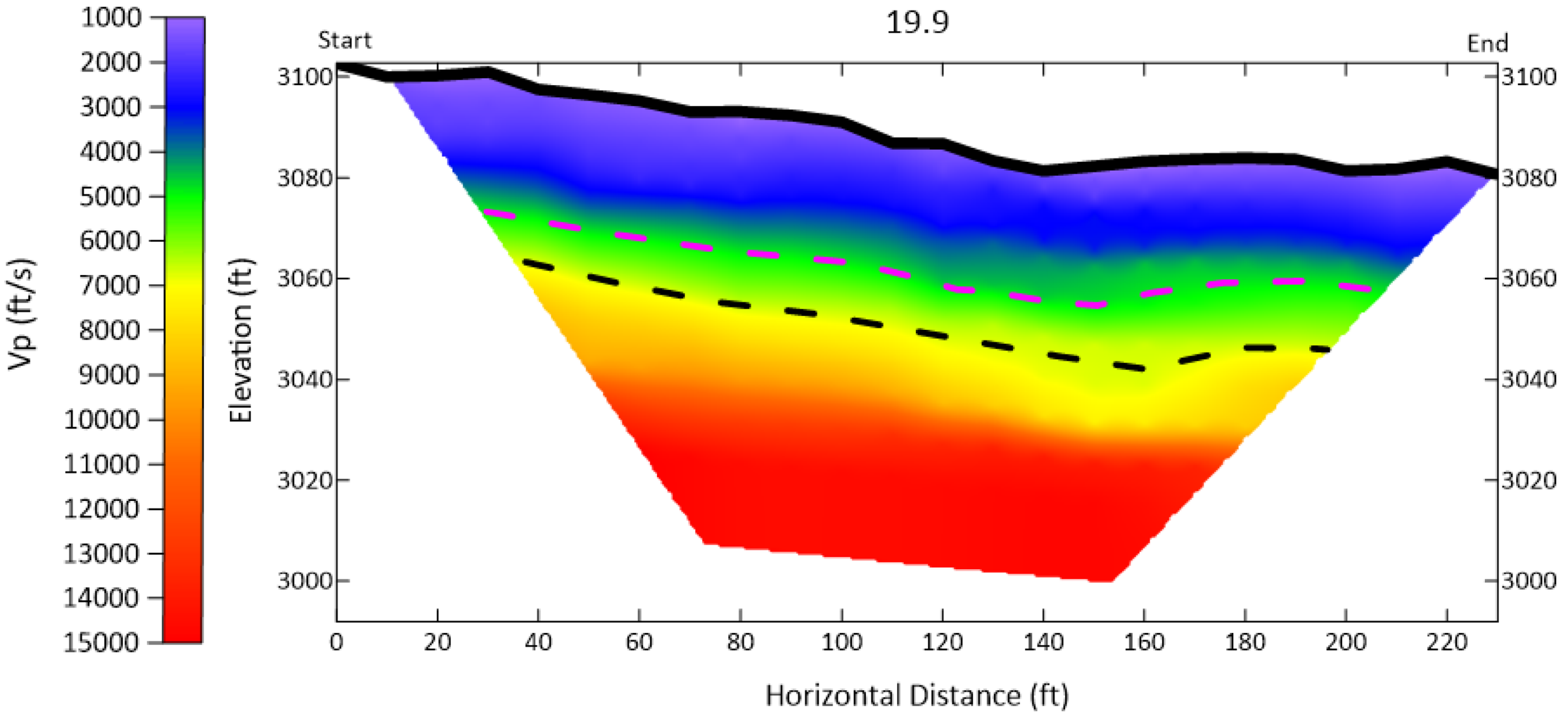
GEOPHYSICAL TESTING PERFORMED BY GEL SOLUTIONS. REFERENCE "SEISMIC REFRACTION SURVEY FOR EVALUATION OF ROCK" DATED 10/01/2021

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-0009CB	96

GEOPHYSICAL TEST RESULTS – SEISMIC REFRACTION LINE 19.9



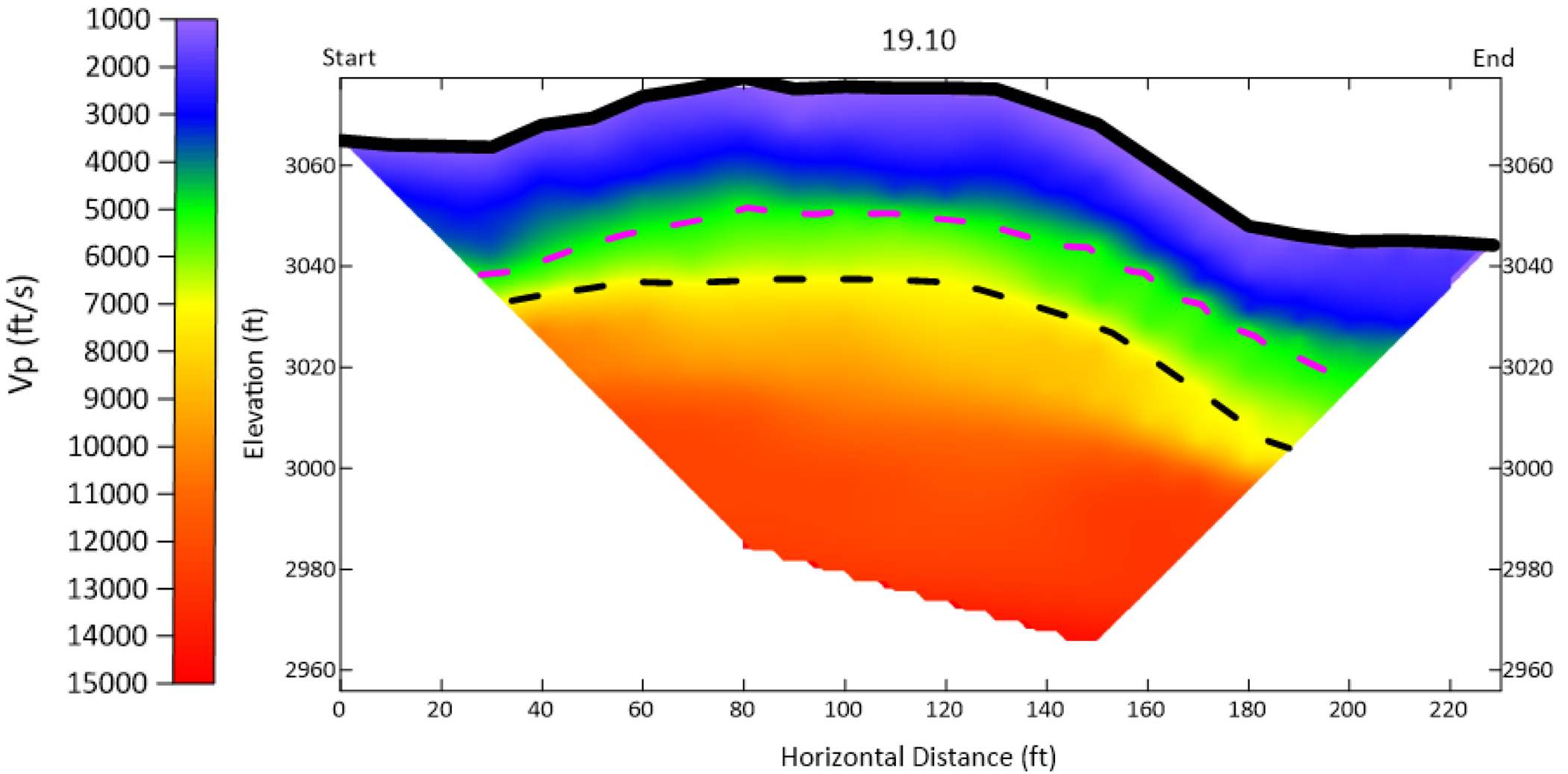
GEOPHYSICAL TESTING PERFORMED BY GEL SOLUTIONS. REFERENCE "SEISMIC REFRACTION SURVEY FOR EVALUATION OF ROCK" DATED 10/01/2021

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

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

PROJECT REFERENCE NO.	SHEET NO.
A-0009CB	97

GEOPHYSICAL TEST RESULTS – SEISMIC REFRACTION LINE 19.10



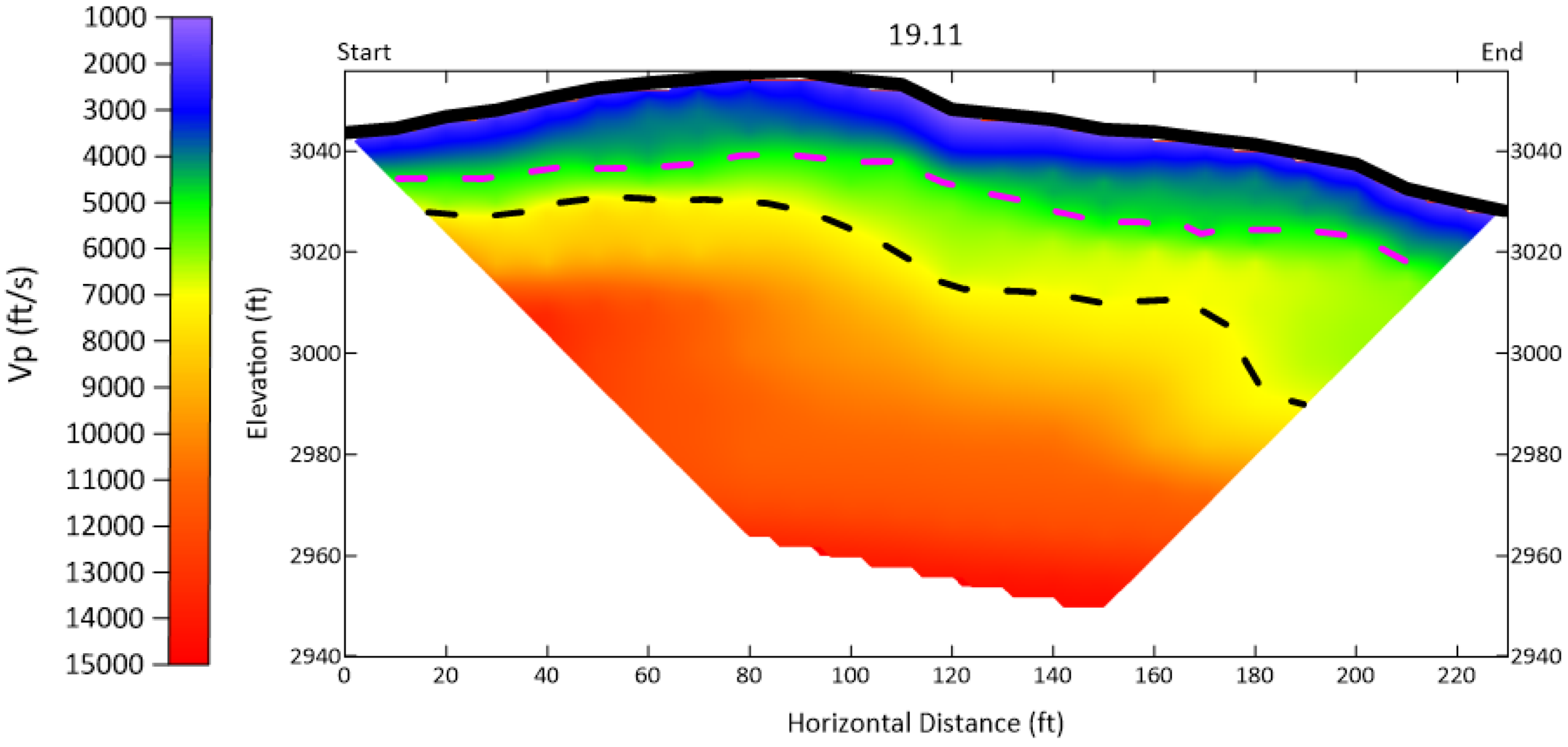
GEOPHYSICAL TESTING PERFORMED BY GEL SOLUTIONS. REFERENCE "SEISMIC REFRACTION SURVEY FOR EVALUATION OF ROCK" DATED 10/01/2021

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-0009CB	98

GEOPHYSICAL TEST RESULTS – SEISMIC REFRACTION LINE 19.11



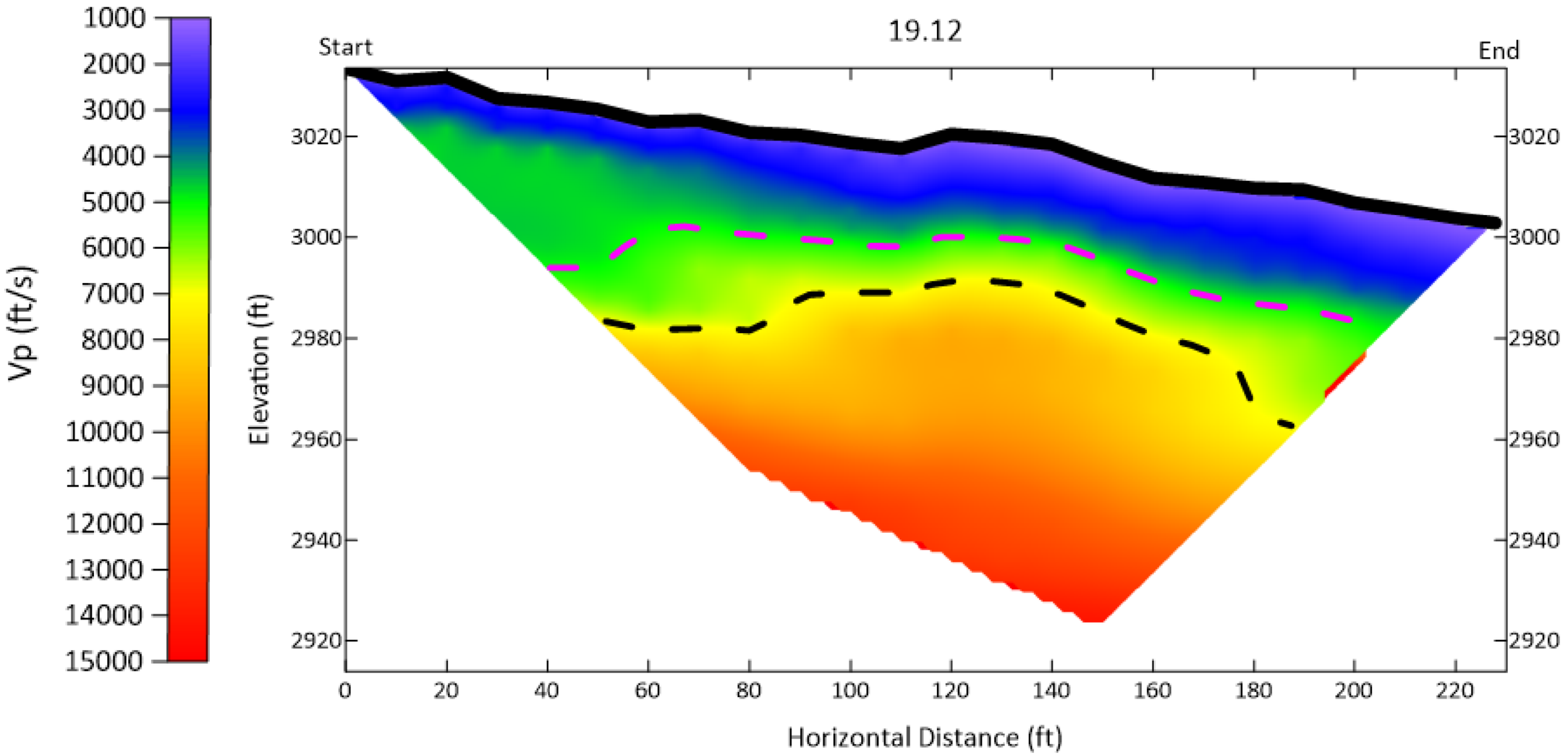
GEOPHYSICAL TESTING PERFORMED BY GEL SOLUTIONS. REFERENCE "SEISMIC REFRACTION SURVEY FOR EVALUATION OF ROCK" DATED 10/01/2021

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-0009CB	99

GEOPHYSICAL TEST RESULTS – SEISMIC REFRACTION LINE 19.12



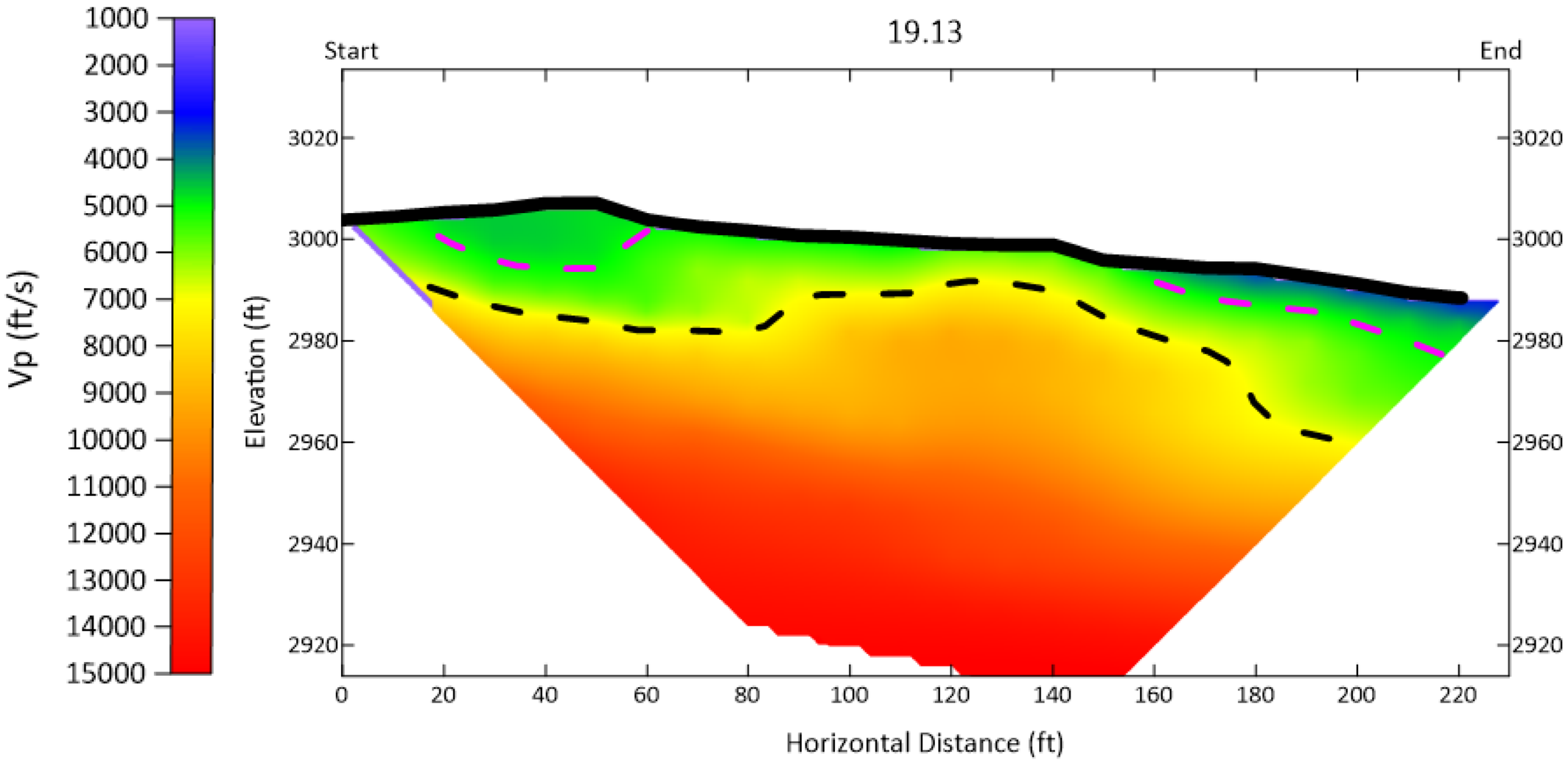
GEOPHYSICAL TESTING PERFORMED BY GEL SOLUTIONS. REFERENCE "SEISMIC REFRACTION SURVEY FOR EVALUATION OF ROCK" DATED 10/01/2021

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-0009CB	100

GEOPHYSICAL TEST RESULTS – SEISMIC REFRACTION LINE 19.13



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-0009CB	101

LAB RESULTS

ROCK TEST RESULTS

SAMPLE NO.	BORING	STATION	OFFSET	DEPTH INTERVAL	ROCK TYPE	UNIT WEIGHT (PCF)	UNCONFINED COMPRESSIVE STRENGTH
RS-1	LB_B1-B	383+23 -L-	3' RT	8.0 - 8.6'	META-SANDSTONE	173.8	21,490 psi /3,095 ksf
RS-2	LB_B1-C	381+90 -L-	5' RT	6.5 - 7.0'	META-SANDSTONE	169.0	16,160 psi /2,327 ksf
RS-3	LB_EB1-A	380+73 -L-	48' RT	13.3 - 13.9'	META-SANDSTONE	171.5	20,620 psi /2,969 ksf
RS-4	LB_EB1-B	383+04 -L-	50' RT	10.1 - 10.6'	META-SANDSTONE	174.2	15,620 psi /2,249 ksf
RS-5	LB_EB1-C	381+88 -L-	51' RT	10.0 - 10.6'	META-SANDSTONE	175.6	22,000 psi /3,168 ksf

LAB TESTING PERFORMED BY NCDOT LAB CERT NO. 117-1104

REFERENCE: A-0009CB

PROJECT: 32572.1.FS10

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	A-0009CB	1	11

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

STRUCTURE SUBSURFACE INVESTIGATION

COUNTY *GRAHAM*

PROJECT DESCRIPTION *UPGRADE NC 143 FROM SR 1223 (BEECH CREEK ROAD) TO 0.5 MILES NORTH OF APPALACHIAN TRAIL*

SITE DESCRIPTION *RETAINING WALL #20: SOIL NAIL WALL AND CAST-IN-PLACE CONCRETE WALL WITH ARCHITECTURAL FORM LINER FINISH ON -L- FROM 409+44 LT TO 411+75 LT*

CONTENTS

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.

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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.

PERSONNEL

BRECCIA

D. GOODNIGHT

GEL SOLUTIONS

INVESTIGATED BY *CG2*

DRAWN BY *M. BREWER, P.E.*

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DATE *MAY 2022*

Prepared in the Office of:

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6/7/2022
DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
A-0009CB	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:

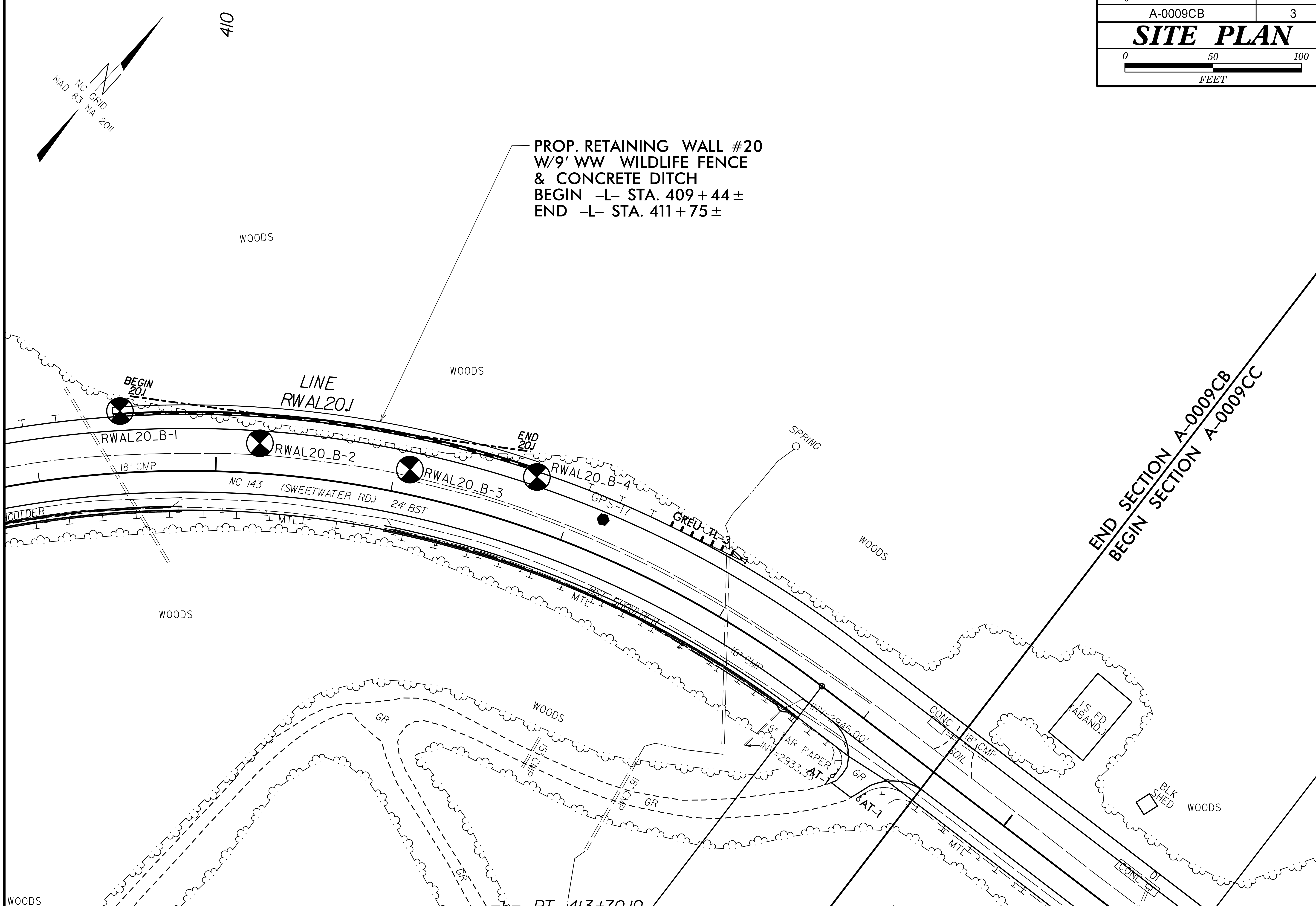
SURVEY AND ROADWAY DESIGN FILES PROVIDED BY TGS ENGINEERS ON 11/15/2021

DATE: 8-15-14

PROJECT REFERENCE NO.	SHEET NO.
A-0009CB	3

SITE PLAN

0 50 100
FEET



NC GRID
NAD 83 NA 2011
410
PROP. RETAINING WALL #20
W/9' WW WILDLIFE FENCE
& CONCRETE DITCH
BEGIN -L- STA. 409+44±
END -L- STA. 411+75±
WOODS
WOODS
LINE
RWAL20J
BEGIN
20J
END
20J
RWAL20_B-1
RWAL20_B-2
RWAL20_B-3
RWAL20_B-4
18" CMP
NC 143 (SWEETWATER RD.) 24' BST
GPS-17
SPRING
GREU_TL-3
WOODS
END SECTION A-0009CB
BEGIN SECTION A-0009CC
WOODS
MTL
18" CMP
INV=2945.00'
18" TAR PAPER
INV=2933.35
AT-1
AT-1
GR
WOODS
GR
15" CMP
18" CMP
GR
CONC
18" CMP
SOIL
1 S FD
(ABAND.)
BLK
SHED
WOODS
CONC DI
MTL
GR
WOODS
-L- PT 413+70.19

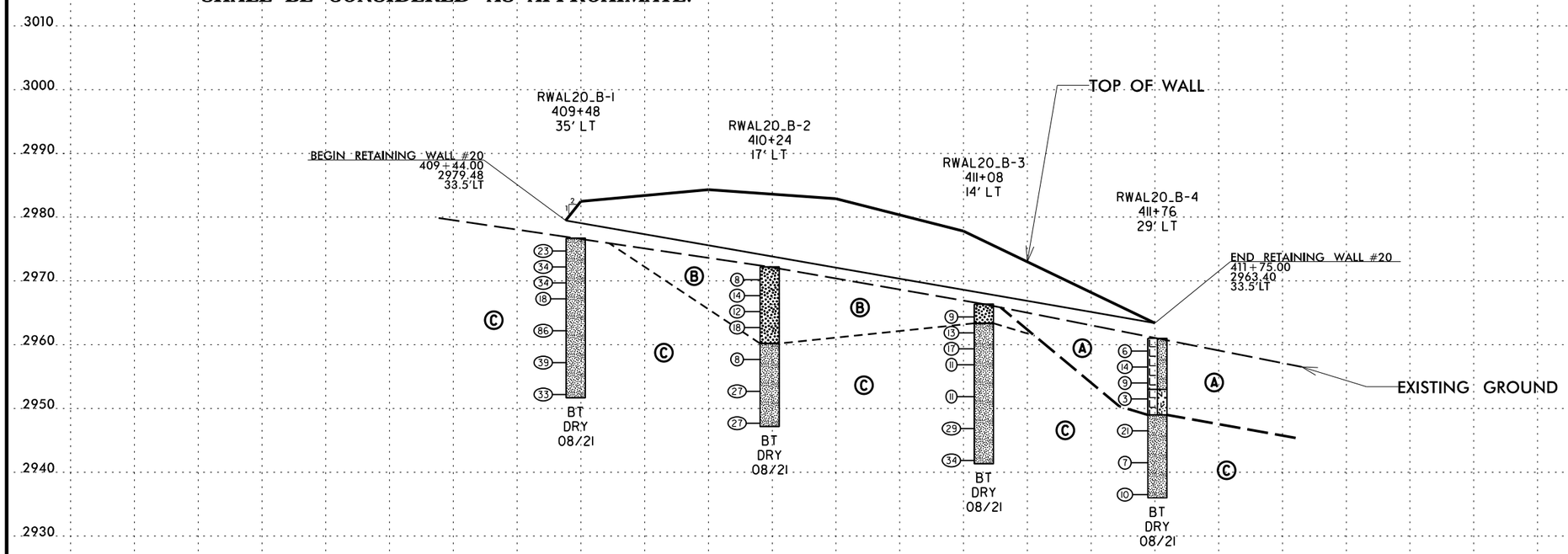
NOTE:
SOIL, WEATHERED ROCK, AND CRYSTALLINE ROCK LINES ARE BASED ON AN INTERPRETATION OF BORE HOLE AND SEISMIC REFRACTION DATA AND SHALL BE CONSIDERED AS APPROXIMATE.

Prepared in the Office of:
CAROLINAS GEOTECHNICAL GROUP

0 50 100
FEET
VE = 2.5:1

PROJECT REFERENCE NO.	*SHEET NO.*
A-0009CB	4

RETAINING WALL #20
PROFILE BORINGS PROJECTED ALONG WALL ENVELOPE



WALL ENVELOPE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE PROFILE.

RWAL20_B-1
409+48
35' LT

23
34
34
18
86
39
33

BT
DRY
08/21

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

4:1

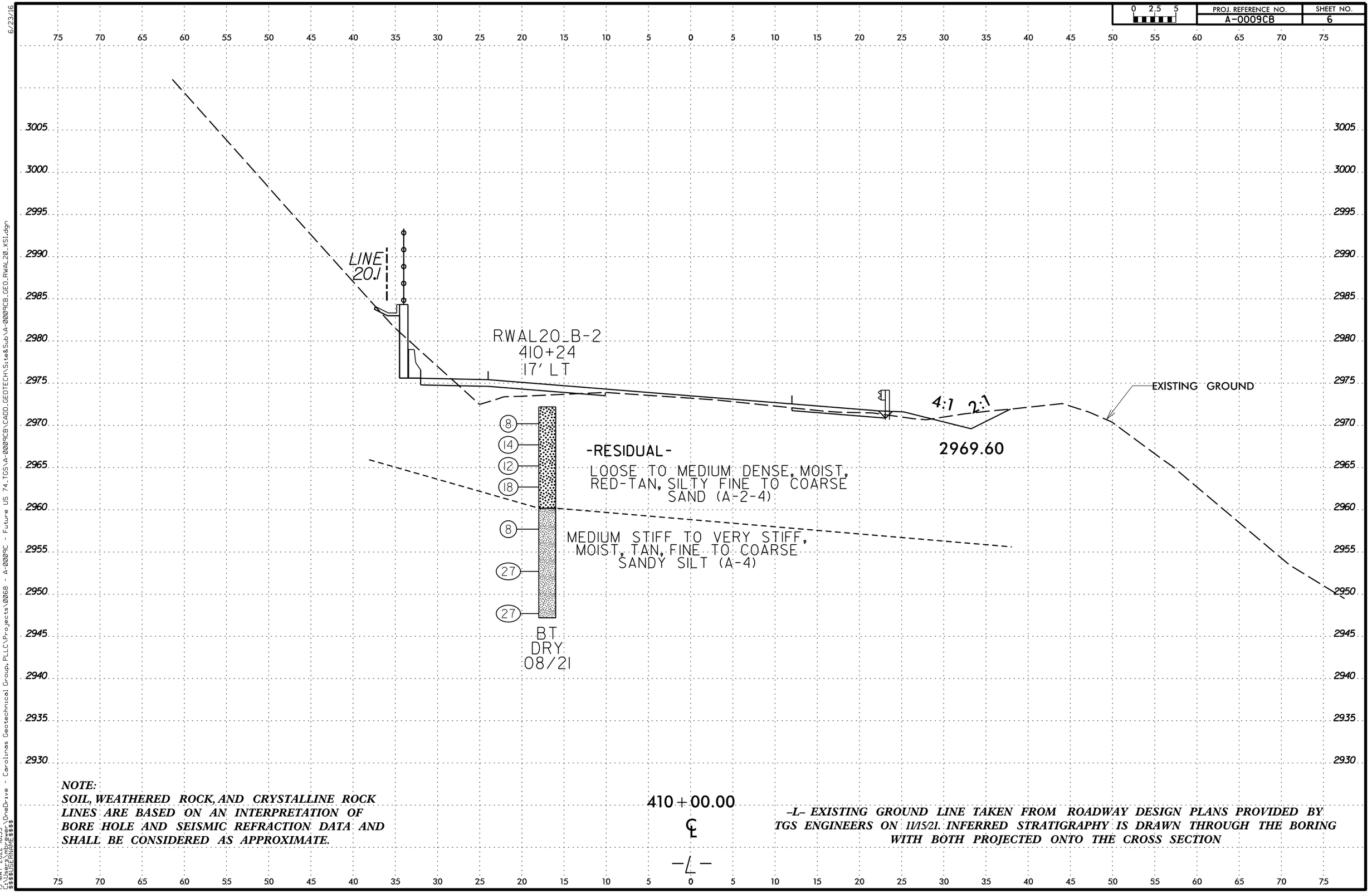
EXISTING GROUND

409+50.00

℄

—L—

–L– EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION



NOTE:
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-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	A-0009CB	7

LINE 20.1

RWAL20_B-3
411+08
14' LT

(9) (13) (17) (11) (11) (29) (34)

BT
DRY
08/21

-RESIDUAL-
LOOSE, MOIST, RED-TAN, SILTY FINE TO COARSE SAND (A-2-4)
STIFF TO HARD, MOIST, RED-TAN, FINE TO COARSE SANDY SILT (A-4), WITH TRACE MANGANESE OXIDE

2:1

EXISTING GROUND

411+00.00
℄
—℄—

NOTE:
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–L– EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	A-0009CB	8

RWAL20_B-4
411+76
29' LT

2:1

4:1

6
14
9
3
21
7
10

BT
DRY
08/21

-ROADWAY EMBANKMENT-

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

-RESIDUAL-

MEDIUM STIFF TO VERY STIFF, MOIST, RED-TAN, FINE TO COARSE SANDY SILT (A-4), WITH LITTLE GRAVEL-SIZED ROCK FRAGMENTS.

EXISTING GROUND

412+00.00
℄
—L—

–L– EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** D. Goodnight	
SITE DESCRIPTION Upgrade NC 143 from SR 1223 (Beech Creek Road) to 0.5 Miles North of Appalachian Trail				**GROUND WTR (ft)**
BORING NO. RWAL20_B-1	**STATION** 409+48	**OFFSET** 35 ft LT	**ALIGNMENT** L	**0 HR.** Dry
COLLAR ELEV. 2,976.7 ft	**TOTAL DEPTH** 25.0 ft	**NORTHING** 620,864	**EASTING** 595,113	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE FME9553 CME-550X 80% 03/12/2021		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER J. Phillips	**START DATE** 08/19/21	**COMP. DATE** 08/19/21	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
2980										
	2,976.7									2,976.7 GROUND SURFACE 0.0
	2,975.7	1.0	5	8	15	23		M		**RESIDUAL**
2975	2,973.2	3.5	11	19	15	34		M		Very Stiff to Hard, Tan-Gray, Fine to Coarse Sandy SILT (A-4)
	2,970.7	6.0	12	12	22	34		M		
2970	2,968.2	8.5	12	11	7	18		M		
2965	2,963.2	13.5	8	32	54	86		M		
2960	2,958.2	18.5	22	19	20	39		M		
2955	2,953.2	23.5	18	15	18	33		M		
	2,951.7	25.0								2,951.7 Boring Terminated at Elevation 2,951.7 ft In Residual Sandy Silt (A-4)

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** D. Goodnight	
SITE DESCRIPTION Upgrade NC 143 from SR 1223 (Beech Creek Road) to 0.5 Miles North of Appalachian Trail				**GROUND WTR (ft)**
BORING NO. RWAL20_B-2	**STATION** 410+24	**OFFSET** 17 ft LT	**ALIGNMENT** L	**0 HR.** Dry
COLLAR ELEV. 2,972.2 ft	**TOTAL DEPTH** 25.0 ft	**NORTHING** 620,904	**EASTING** 595,183	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE FME9553 CME-550X 80% 03/12/2021		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER J. Phillips	**START DATE** 08/19/21	**COMP. DATE** 08/19/21	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
2975										
	2,972.2									2,972.2 GROUND SURFACE 0.0
	2,971.2	1.0	2	3	5	8		M		**RESIDUAL**
2970	2,968.7	3.5	4	6	8	14		M		Loose to Medium Dense, Red-Tan, Silty Fine to Coarse SAND (A-2-4)
	2,966.2	6.0	5	6	6	12		M		
2965	2,963.7	8.5	6	7	11	18		M		
	2,960.2	12.0								2,960.2
2960	2,958.7	13.5	3	3	5	8		M		Medium Stiff to Very Stiff, Tan, Fine to Coarse Sandy SILT (A-4)
2955	2,953.7	18.5	9	11	16	27		M		
2950	2,948.7	23.5	8	11	16	27		M		
	2,947.2	25.0								2,947.2 Boring Terminated at Elevation 2,947.2 ft In Residual Sandy Silt (A-4)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** D. Goodnight	
SITE DESCRIPTION Upgrade NC 143 from SR 1223 (Beech Creek Road) to 0.5 Miles North of Appalachian Trail				**GROUND WTR (ft)**
BORING NO. RWAL20_B-3	**STATION** 411+08	**OFFSET** 14 ft LT	**ALIGNMENT** L	**0 HR.** Dry
COLLAR ELEV. 2,966.4 ft	**TOTAL DEPTH** 25.0 ft	**NORTHING** 620,950	**EASTING** 595,256	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE FME9553 CME-550X 80% 03/12/2021		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER J. Phillips	**START DATE** 08/19/21	**COMP. DATE** 08/19/21	**SURFACE WATER DEPTH** N/A	

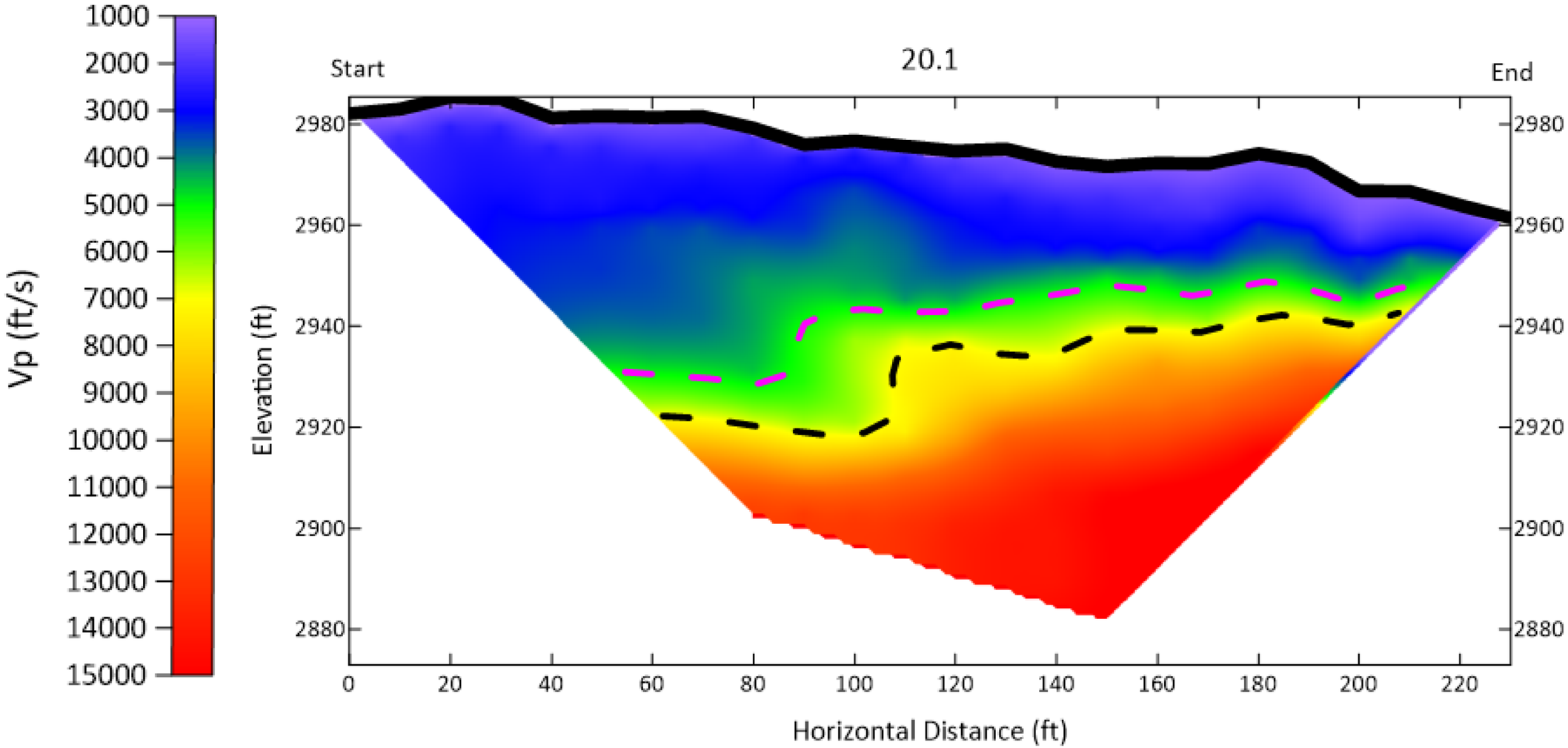
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
2970											
										2,966.4 GROUND SURFACE	0.0
2965	2,965.4	1.0	3	4	5	9		M		**RESIDUAL** Loose, Red-Tan, Silty Fine to Coarse SAND (A-2-4)	
	2,962.9	3.5	4	6	7	13		M		2,963.4	3.0
2960	2,960.4	6.0	4	7	10	17		M		Stiff to Hard, Red-Tan, Fine to Coarse Sandy SILT (A-4), with trace manganese oxide	
	2,957.9	8.5	4	6	5	11		M			
2955											
	2,952.9	13.5	4	5	6	11		M			
2950											
	2,947.9	18.5	7	15	14	29		M			
2945											
	2,942.9	23.5	11	14	20	34		M		2,941.4	25.0
										Boring Terminated at Elevation 2,941.4 ft In Residual Sandy Silt (A-4)	

WBS 32572.1.FS10	**TIP** A-0009CB	**COUNTY** GRAHAM	**GEOLOGIST** D. Goodnight	
SITE DESCRIPTION Upgrade NC 143 from SR 1223 (Beech Creek Road) to 0.5 Miles North of Appalachian Trail				**GROUND WTR (ft)**
BORING NO. RWAL20_B-4	**STATION** 411+76	**OFFSET** 29 ft LT	**ALIGNMENT** L	**0 HR.** Dry
COLLAR ELEV. 2,961.0 ft	**TOTAL DEPTH** 25.0 ft	**NORTHING** 620,996	**EASTING** 595,312	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE FME9553 CME-550X 80% 03/12/2021		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER J. Phillips	**START DATE** 08/19/21	**COMP. DATE** 08/19/21	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
2965										
										2,961.0 GROUND SURFACE 0.0
2960	2,960.0	1.0	3	1	5	6		M		**ROADWAY EMBANKMENT** Medium Stiff to Stiff, Tan-Brown, Fine to Coarse Sandy SILT (A-4), with little gravel
	2,957.5	3.5	3	5	9	14		M		
2955	2,955.0	6.0	3	5	4	9		M		
	2,952.5	8.5	2	1	2	3		W		2,953.0 8.0
2950										Soft, Tan, Fine Sandy, Clayey SILT (A-5), with trace gravel
	2,947.5	13.5	16	11	10	21		M		2,949.0 12.0
2945										**RESIDUAL** Medium Stiff to Very Stiff, Red-Tan, Fine to Coarse Sandy SILT (A-4), with little gravel-sized rock fragments
	2,942.5	18.5	3	3	4	7		M		
2940	2,937.5	23.5	2	4	6	10		M		2,936.0 25.0
										Boring Terminated at Elevation 2,936.0 ft In Residual Sandy Silt (A-4)

PROJECT REFERENCE NO.	SHEET NO.
A-0009CB	11

GEOPHYSICAL TEST RESULTS – SEISMIC REFRACTION LINE 20.1



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