

REFERENCE: A-0009CA

PROJECT: 32572

SEE SHEET 3 FOR PLAN SHEET LAYOUT  
AT TIME OF INVESTIGATION

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	A-0009CA	1	172

**ROADWAY**  
**SUBSURFACE INVESTIGATION**

COUNTY GRAHAM  
PROJECT DESCRIPTION UPGRADE US 129 FROM  
SOUTH OF SR 1275 TO NC 143 AND UPGRADE  
NC 143 FROM US 129 TO SR 1223

**INVENTORY**

**CONTENTS**

LINE	STATION	PLAN	PROFILE
-L-	10+00-208+00	4, 6-19	N/A
-Y1-	13+70-36+70	4-5	N/A
-Y6-	11+05-13+03	8	N/A
-DR1-	10+20-11+89	16-17	N/A
-DRIA-	10+05-11+25	16	N/A
-DR2-	10+00-11+60	6	N/A

**CROSS SECTIONS**

LINE	STATION	SHEETS
-L-	11+00-208+00	20-156
-Y1-	15+50-37+00	157-165
-DRIA-	10+25	166

**APPENDICES**

APPENDIX	TITLE	SHEETS
A	BORE LOGS, CORE LOGS, & ROCK CORE PHOTOS	167-170
B	SOIL TEST RESULTS	171-172

**CAUTION NOTICE**

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

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

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

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

FIELD PERSONNEL

M. BREWER

S. BRAUN

N. MCLAREN

D. GOODNIGHT

S. PATTERSON

CG2 EXPLORATION

BRECCIA

INVESTIGATED BY CG2, PLLC

DRAWN BY M. BREWER, P.E.

CHECKED BY R. KRAL, P.E.

SUBMITTED BY CG2, PLLC

DATE APRIL 2022

Prepared in the Office of:



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DocuSigned by:  
D. Matthew Brewer 4/29/22  
386129C0A4C1462 SIGNATURE DATE

**DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED**

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

# SUBSURFACE INVESTIGATION

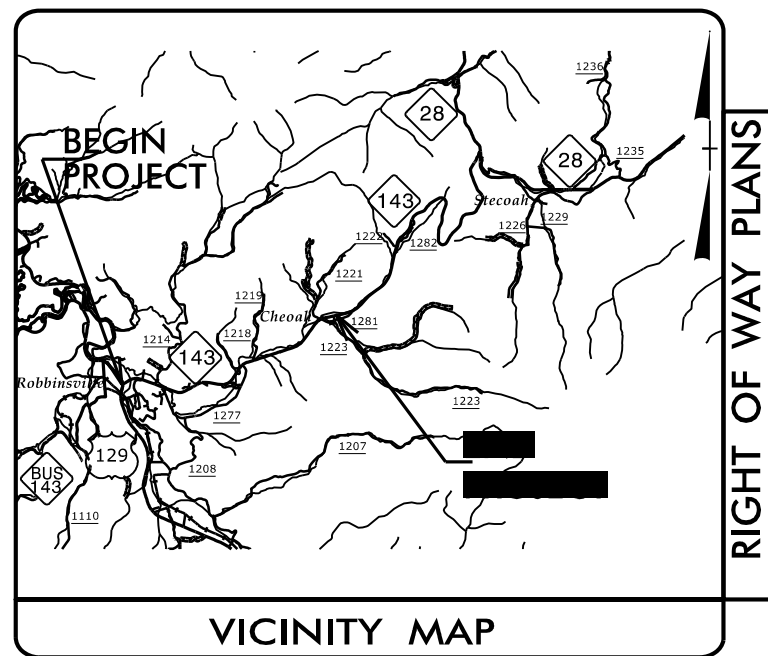
**SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS**

SOIL DESCRIPTION										GRADATION										ROCK DESCRIPTION										TERMS AND DEFINITIONS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
<p>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, <i>VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i></p>										<p>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.</p>										<p>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:</p>										<p>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 (ROD)-A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.)-RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL-AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE-POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT)-NUMBER OF BLOWS IN OR BPF OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC.)-TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SROD)-A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS.)-SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
<p style="text-align: center;"><b>SOIL LEGEND AND AASHTO CLASSIFICATION</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th rowspan="2">GENERAL CLASS.</th> <th colspan="5">GRANULAR MATERIALS (&lt;= 35% PASSING #200)</th> <th colspan="5">SILT-CLAY MATERIALS (&gt; 35% PASSING #200)</th> <th colspan="5">ORGANIC MATERIALS</th> </tr> <tr> <th>A-1</th> <th>A-3</th> <th>A-2</th> <th>A-2-6</th> <th>A-2-7</th> <th>A-4</th> <th>A-5</th> <th>A-6</th> <th>A-7</th> <th>A-1, A-2</th> <th>A-3</th> <th>A-4, A-5</th> <th>A-6, A-7</th> <th></th> <th></th> <th></th> </tr> <tr> <th>GROUP CLASS.</th> <td>A-1-a</td> <td>A-1-b</td> <td>A-2-4</td> <td>A-2-5</td> <td>A-2-6</td> <td>A-2-7</td> <td></td> <td></td> <td>A-7-5</td> <td>A-7-6</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <th>SYMBOL</th> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <th>% PASSING #10 #40 #200</th> <td>50 MX 30 MX 15 MX</td> <td>50 MX 25 MX</td> <td>51 MN 35 MX 35 MX</td> <td>40 MX 41 MN 10 MX 11 MN</td> <td>40 MX 41 MN 11 MN 11 MN</td> <td>40 MX 41 MN 11 MN 11 MN</td> <td>36 MN 36 MN</td> <td>36 MN 36 MN</td> <td>36 MN 36 MN</td> <td>36 MN 36 MN</td> <td>36 MN 36 MN</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <th>MATERIAL PASSING #40 LL PI</th> <td>-</td> <td>-</td> <td>40 MX 41 MN NP</td> <td>40 MX 41 MN 10 MX 11 MN</td> <td>40 MX 41 MN 11 MN 11 MN</td> <td>40 MX 41 MN 11 MN 11 MN</td> <td>40 MX 41 MN 11 MN 11 MN</td> <td>40 MX 41 MN 11 MN 11 MN</td> <td>40 MX 41 MN 11 MN 11 MN</td> <td>40 MX 41 MN 11 MN 11 MN</td> <td>40 MX 41 MN 11 MN 11 MN</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <th>GROUP INDEX</th> <td>0</td> <td>0</td> <td>0</td> <td>4 MX</td> <td>8 MX</td> <td>12 MX</td> <td>16 MX</td> <td>NO MX</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <th>USUAL TYPES OF MAJOR MATERIALS</th> <td>STONE FRAGS. GRAVEL, AND SAND</td> <td>FINE SAND</td> <td>SILTY OR CLAYEY GRAVEL AND SAND</td> <td>SILTY SOILS</td> <td>CLAYEY SOILS</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <th>GEN. RATING AS SUBGRADE</th> <td colspan="5">EXCELLENT TO GOOD</td> <td colspan="5">FAIR TO POOR</td> <td>FAIR TO POOR</td> <td>POOR</td> <td>UNSATURABLE</td> <td></td> <td></td> <td></td> </tr> <tr> <td colspan="10">PI OF A-7-5 SUBGROUP IS LL-30 ; PI OF A-7-6 SUBGROUP IS &gt; LL-30</td> <td colspan="10"></td> <td colspan="10"></td> </tr> <tr> <td colspan="10"> <p style="text-align: center;"><b>CONSISTENCY OR DENSENESS</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>PRIMARY SOIL TYPE</th> <th>COMPACTNESS OR CONSISTENCY</th> <th>RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)</th> <th>RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT<sup>2</sup>)</th> </tr> <tr> <td>GENERALLY GRANULAR MATERIAL (NON-COHESSIVE)</td> <td>VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE</td> <td>&lt; 4 4 TO 10 10 TO 30 30 TO 50 &gt; 50</td> <td>N/A</td> </tr> <tr> <td>GENERALLY SILT-CLAY MATERIAL (COHESIVE)</td> <td>VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD</td> <td>&lt; 2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 &gt; 30</td> <td>&lt; 0.25 0.25 TO 0.5 0.5 TO 1.0 1 TO 2 2 TO 4 &gt; 4</td> </tr> </table> </td> <td colspan="10"> <p style="text-align: center;"><b>MISCELLANEOUS SYMBOLS</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td></td> <td>ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION</td> <td></td> <td>DIP &amp; DIP DIRECTION OF ROCK STRUCTURES</td> <td></td> <td>SOIL SYMBOL</td> <td></td> <td>TEST BORING</td> <td></td> <td>SLOPE INDICATOR INSTALLATION</td> </tr> <tr> <td></td> <td>ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT</td> <td></td> <td>AUGER BORING</td> <td></td> <td>CONE PENETROMETER TEST</td> <td></td> <td>SOUNDING ROD</td> <td></td> <td>TEST BORING WITH CORE</td> </tr> <tr> <td></td> <td>INFERRED SOIL BOUNDARY</td> <td></td> <td>CORE BORING</td> <td></td> <td>MONITORING WELL</td> <td></td> <td>PIEZOMETER INSTALLATION</td> <td></td> <td>SPT N-VALUE</td> </tr> <tr> <td></td> <td>INFERRED ROCK LINE</td> <td></td> <td>ALLUVIAL SOIL BOUNDARY</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> </td> <td colspan="10"> <p style="text-align: center;"><b>RECOMMENDATION SYMBOLS</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td></td> <td>UNDERCUT</td> <td></td> <td>UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE</td> <td></td> <td>UNCLASSIFIED EXCAVATION - ACCEPTABLE ROCK</td> <td></td> <td>UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL</td> </tr> </table> </td> </tr> <tr> <td colspan="10"> <p style="text-align: center;"><b>TEXTURE OR GRAIN SIZE</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>U.S. STD. SIEVE SIZE OPENING (MM)</th> <td>4</td> <td>10</td> <td>40</td> <td>60</td> <td>200</td> <td>270</td> </tr> <tr> <td></td> <td>4.75</td> <td>2.00</td> <td>0.42</td> <td>0.25</td> <td>0.075</td> <td>0.053</td> </tr> <tr> <th>BOULDER (BLDR.)</th> <th>COBBLE (COB.)</th> <th>GRAVEL (GR.)</th> <th>COARSE SAND (CS.E. 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BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.</td> <td>CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.</td> <td>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.</td> <td>CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.</td> <td>CAN BE GROOVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.</td> <td>CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGER NAIL.</td> </tr> </table> </td> </tr> <tr> <td colspan="10"> <p style="text-align: center;"><b>FRACTURE SPACING</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>TERM</th> <th>SPACING</th> </tr> <tr> <td>VERY WIDE</td> <td>MORE THAN 10 FEET</td> </tr> <tr> <td>WIDE</td> <td>3 TO 10 FEET</td> </tr> <tr> <td>MODERATELY CLOSE</td> <td>1 TO 3 FEET</td> </tr> <tr> <td>CLOSE</td> <td>0.16 TO 1 FOOT</td> </tr> <tr> <td>VERY CLOSE</td> <td>LESS THAN 0.16 FEET</td> </tr> </table> </td> <td colspan="10"> <p style="text-align: center;"><b>BEDDING</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>TERM</th> <th>THICKNESS</th> </tr> <tr> <td>VERY THICKLY BEDDED</td> <td>4 FEET</td> </tr> <tr> <td>THICKLY BEDDED</td> <td>1.5-4 FEET</td> </tr> <tr> <td>THINLY BEDDED</td> <td>0.16-1.5 FEET</td> </tr> <tr> <td>VERY THINLY BEDDED</td> <td>0.03-0.16 FEET</td> </tr> <tr> <td>THICKLY LAMINATED</td> <td>0.008-0.03 FEET</td> </tr> <tr> <td>THINLY LAMINATED</td> <td>&lt; 0.008 FEET</td> </tr> </table> </td> </tr> <tr> <td colspan="10"> <p style="text-align: center;"><b>INDURATION</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>FRIBLE</th> <th>MODERATELY INDURATED</th> <th>INDURATED</th> <th>EXTREMELY INDURATED</th> </tr> <tr> <td>RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.</td> <td>GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.</td> <td>GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.</td> <td>SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</td> </tr> </table> </td> <td colspan="10"> <p style="text-align: center;"><b>NOTES:</b> ROADWAY DESIGN FILES DATED 11/15/2021 PROVIDED BY TGS ENGINEERS</p> </td> </tr> <tr> <td colspan="10"> <p style="text-align: center;"><b>COLOR</b></p> <p>DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-BROWN). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.</p> </td> <td colspan="10"> <p style="text-align: center;"><b>ELEVATION: FEET</b></p> </td> </tr> </table>										GENERAL CLASS.	GRANULAR MATERIALS (<= 35% PASSING #200)					SILT-CLAY MATERIALS (> 35% PASSING #200)					ORGANIC MATERIALS					A-1	A-3	A-2	A-2-6	A-2-7	A-4	A-5	A-6	A-7	A-1, A-2	A-3	A-4, A-5	A-6, A-7				GROUP CLASS.	A-1-a	A-1-b	A-2-4	A-2-5	A-2-6	A-2-7			A-7-5	A-7-6							SYMBOL																	% PASSING #10 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX	51 MN 35 MX 35 MX	40 MX 41 MN 10 MX 11 MN	40 MX 41 MN 11 MN 11 MN	40 MX 41 MN 11 MN 11 MN	36 MN 36 MN	36 MN 36 MN	36 MN 36 MN	36 MN 36 MN	36 MN 36 MN						MATERIAL PASSING #40 LL PI	-	-	40 MX 41 MN NP	40 MX 41 MN 10 MX 11 MN	40 MX 41 MN 11 MN 11 MN	40 MX 41 MN 11 MN 11 MN	40 MX 41 MN 11 MN 11 MN	40 MX 41 MN 11 MN 11 MN	40 MX 41 MN 11 MN 11 MN	40 MX 41 MN 11 MN 11 MN	40 MX 41 MN 11 MN 11 MN						GROUP INDEX	0	0	0	4 MX	8 MX	12 MX	16 MX	NO MX									USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND	FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND	SILTY SOILS	CLAYEY SOILS												GEN. 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CONTRACT: TIP PROJECT: A-0009CA

See Sheet 1A For Index of Sheets

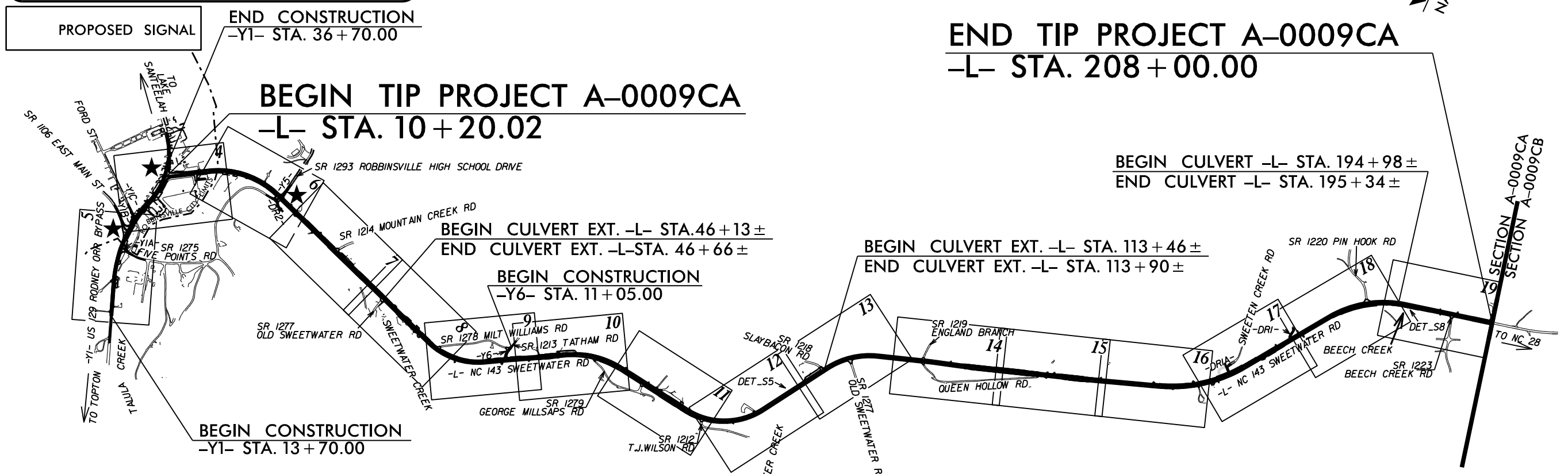


STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS GRAHAM COUNTY

Table with project details: STATE PROJECT REFERENCE NO. A-0009CA, SHEET NO. 3, TOTAL SHEETS 172.

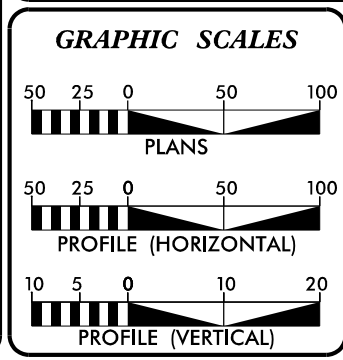
LOCATION: UPGRADE US 129 FROM SOUTH OF SR 1275 (FIVE POINTS ROAD) TO NC 143 AND UPGRADE NC 143 FROM US 129 TO SR 1223 (BEECH CREEK ROAD)

TYPE OF WORK: GRADING, PAVING, DRAINAGE, CULVERTS, RETAINING WALLS, AND SIGNALS



CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II. A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF TOWN OF ROBBINSVILLE.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

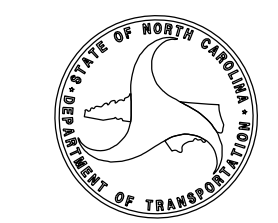


DESIGN DATA table: ADT 2019 = 6300, ADT 2045 = 8800, K = 11%, D = 57.5%, T = 7%, 50MPH - BEGIN PROJECT TO FIVE POINTS RD, 60MPH - FIVE POINTS RD TO END OF PROJECT, \* TTST = 2% DUAL = 5%, FUNC CLASS = RURAL ARTERIAL REGIONAL TIER

PROJECT LENGTH table: LENGTH ROADWAY TIP PROJECT A-0009CA = 3.746 MILES, LENGTH STRUCTURE TIP PROJECT A-0009CA = 0.027 MILES, TOTAL LENGTH TIP PROJECT A-0009CA = 3.746 MILES

PLANS PREPARED BY: TGS ENGINEERS; PLANS PREPARED FOR: NORTH CAROLINA DEPARTMENT OF TRANSPORTATION; RIGHT OF WAY DATE: JULY 16, 2021; LETTING DATE: AUGUST 16, 2022

HYDRAULICS ENGINEER and ROADWAY DESIGN ENGINEER signature lines.



4/28/2022

STATE PROJECT: 35272.1.FS10  
 TIP NUMBER: A-0009CA  
 F/A NUMBER: APD-0074(178)  
 COUNTY: GRAHAM  
 DESCRIPTION: UPGRADE US 129 FROM SOUTH OF SR 1275 (FIVE POINTS ROAD) TO NC 143 AND UPGRADE NC 143 FROM US 129 TO SR 1223 (BEECH CREEK ROAD)  
 SUBJECT: Geotechnical Roadway Inventory Report

**PROJECT DESCRIPTION**

This roadway widening project consists of improvements to NC 143 beginning at the intersections of US 129 and extending to just east of SR 1223 (Beech Creek Road). The project is approximately 3.8 miles in length, measured along -L- (NC 143) from Station 10+00 to 208+00. Additionally, work will be performed along -Y1- (US 129) from Station 13+70 to 36+70. The construction consists of widening the existing two-lane facility to accommodate additional lanes, full depth paved shoulders, secondary roadway and driveway improvements, additional sidewalk, and supporting infrastructure for the widening. The following alignments are included as part of this investigation:

<u>Alignment</u>	<u>Stations</u>
-L- (NC 143)	10+00 to 208+00
-Y1- (US 129)	13+70 to 36+70
-Y6- (Tatham Road)	11+05 to 13+03
-DR1-	10+20 to 11+89
-DR1A- (Sweeten Creek Road)	10+05 to 11+25
-DR2-	10+00 to 11+60

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

The following structures are included as part of this investigation:

<u>Culvert</u>	<u>Stations (Alignment)</u>
Structure over Sweetwater Creek	46+41 (-L-)
Structure over Upper Tributary to Sweetwater Creek	57+14 (-L-)
Structure over Slay Bacon Branch	108+27 (-L-)
Structure over Sweetwater Creek	113+69 (-L-)
Structure over Harwood Branch	144+74 (-L-)
Structure over Beech Creek	195+16 (-L-)
Structure over Sweetwater Creek	10+59 (-DR1A-)

The following retaining walls are included as part of this investigation:

<u>Wall</u>	<u>Stations (Alignment)</u>	<u>Offset</u>
Retaining wall #1	32+55 to 34+16 (-Y1-)	42' RT to 54' RT
Retaining wall #2	11+79 to 12+50 (-L-)	36' LT to 40' LT
Retaining wall #4	167+75 to 171+75 (-L-)	33' LT
Retaining wall #5	175+35 to 176+65 (-L-)	28' RT
Retaining wall #6	186+75 to 192+05 (-L-)	34' RT

The following 1.5:1 (H:V) sliver fill slopes are included as part of this investigation:

<u>Stations (Alignment)</u>	<u>Offset</u>
16+75 to 17+75 (-L-)	RT
17+25 to 17+75 (-L-)	LT
14+75 to 18+25 (-Y1-)	LT

The following 1.5:1 (H:V) fill slopes with rock plating are included as part of this investigation:

<u>Stations (Alignment)</u>	<u>Offset</u>
42+25 to 45+75 (-L-)	LT
44+75 to 45+25 (-L-)	RT
46+75 to 48+15 (-L-)	RT
55+75 to 58+25 (-L-)	RT
56+75 to 59+75 (-L-)	LT

The following 1.5:1 (H:V) sliver cut slopes are included as part of this investigation:

<u>Stations (Alignment)</u>	<u>Offset</u>
38+25 to 39+75 (-L-)	RT

The following 1.5:1 (H:V) soil cut slopes are included as part of this investigation:

<u>Stations (Alignment)</u>	<u>Offset</u>
60+25 to 63+75 (-L-)	RT
70+25 to 71+25 (-L-)	RT
74+25 to 77+75 (-L-)	RT
86+75 to 87+25 (-L-)	LT
192+50 (-L-)	RT

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

The project has been divided into sections to describe the change in grades in a more descriptive manner across the entire project. A summary of the proposed grade changes and construction improvements are listed below:

**Section No. 1: -Y1- Station 13+70 to 36+70**

Along -Y1- (US 129), this section of the project contains relatively flat grades, resulting in proposed cuts and fills on the order of 5 feet or less. One large existing rock cut is located along the left side of the alignment from Station 20+24 to 25+00. Construction along -Y1- will not impact this slope. The new construction for this section contains improvements to several secondary intersections with the addition of new and widened turn lanes and widened travel lanes. Grade changes along -Y1- are minimal; however, a new curb and gutter will be constructed to accommodate the widening. Retaining Wall #1 is located in this section of the project just south of the intersection with NC 143.

**Section No. 2: -L- Station 10+00 to 60+00**

This section of the project is a combination of rural and urban. The construction on this section of the project consists of symmetrical widening of the existing route. A portion of NC 143 is supported by a built-up roadway embankment section on the order of 15 to 25 feet in height near several water crossings. In order to accommodate the widening, fill sections will be constructed on both sides of existing NC 143 along -L- in these areas. These proposed fills range from 5 to 27 feet in height. This section also contains Retaining Wall #2 and culvert extensions for several of the water crossings.

**Section No. 3: -L- Station 60+00 to 103+00**

The majority of this section of the project contains large cut slopes on both sides of existing NC 143 and intermittent fill slopes due to the variable topography through this section. The existing cut slope geometry ranges from 1:1 (H:V) to 1.5:1 (H:V). The proposed cuts through this section are on the order of 5 to 60 feet in height. Typical fill heights are on the order to 15 to 25 feet. A larger fill section will be constructed between -L- 88+50 and 94+50 and fills on the order of 10 to 50 feet are anticipated. Also, a large cut will be constructed near the end of this section on the left side of the alignment from 92+00 to 100+00. The new construction for this section includes improvements to the intersections along -L- with the addition of new turn lanes and widened travel lanes.

**Section No. 4: -L- Station 103+00 to 208+00:**

This section of the project contains relatively minimal grade changes, resulting in proposed cuts and fills on the order of 10 to 15 feet or less. Larger cuts are present along the alignment near -L- Station 121+00, from 152+00 to 156+00, and from -L- Station 171+50 to 174+50, which contains cuts on the order of 20 to 25 feet. The new construction for this section of the project includes improvements to the intersections of -L- with existing drives and with the addition of widened travel lanes. Several culverts and culvert widenings will be constructed in this section as part of the construction. Retaining Wall #4 will be constructed as a fill wall along the left side of the alignment in this section. Retaining Wall #5 and #6 will be constructed as cut walls along the right side of the alignment through this section of the project. Retaining Wall #6 will be constructed in a rock cut.

The geotechnical field investigation was conducted by CG2 during the period of September 2020 through December 2021. This investigation was performed in several phases due to project schedule and other demands which required moving equipment around to various sections of the project. Subcontracted drill crews were used to drill, sample, and log 140 of the borings in this report. The drill rigs used were ATV-mounted CME-550 and CME 550X, truck-mounted Mobile B-29, and track-mounted Diedrich D-50 equipped with automatic hammers. Standard Penetration Tests were performed at selected depths for the 140 borings. Hand auger borings were performed at sixteen locations due to utility and access conflicts. Rock coring was performed in one boring to evaluate the consistency of the bedrock behind a large

cut wall. Representative soil samples were collected for visual-manual classification in the field and selected samples were submitted for laboratory analysis by an approved NCDOT M&T testing facility.

**PHYSIOGRAGHY AND GEOLOGY**

This widening project is not located entirely within NCDOT right-of-way. In general, a majority of the project corridor is rolling terrain consistent with the mountain region that is moderately wooded with intermittent mountainous slopes at variable distances along the alignment.

The project corridor is located within the Blue Ridge Physiographic Province of North Carolina. According to the 1985 Geologic Map of North Carolina, the bedrock under the site consists of Metasandstone, Metagraywacke, Metasiltstone and Mica Schist of the Ocoee Supergroup, Great Smokey Group. The rock encountered during the investigation was classified as Mica Schist, Schist, Metasiltstone, and Metasandstone. The rock units encountered in this section of the project do not produce acidic runoff.

Much of the project footprint contains near surface soils with varying ages of alluvial deposits primarily from Tulula Creek, Sweetwater Creek, and several other creeks and streams present on the project. The older, weathered alluvial deposits are also referred to as fans or stream terraces. These stream terraces cover a large portion of the project footprint and are primarily located in the areas that will require new fill slopes. In areas immediately adjacent to existing waterways, younger alluvial deposits (floodplain soils) were encountered at lower elevations than terrace deposits or residual soils. Colluvial deposits (gravity deposited) were also observed within a portion of the project footprint. It is common for colluvial soils to be present at the bases of ridges and slopes within this area. These gravity deposited soils are typically the result of mass soil movement and long-term soil creep, which can occur frequently in this geographical area at the base of hills, slopes, and mountain ridges.

Residual soils are derived from the continued in situ chemical and physical weathering of the rocks in the area. Residual soils are typically finer grained and have higher clay content near the surface because of the advanced weathering. Similarly, the soils typically become coarser grained with increasing depth because of decreased weathering. As the degree of weathering decreases, the residual soils generally retain the overall appearance and fabric of the parent rock. The boundary between soil and rock is not always sharply defined. A transitional zone termed "weathered rock" is normally found overlying the parent bedrock.

**SOIL PROPERTIES**

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

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

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

Alluvial soils (floodplain and stream terrace) were encountered in many of the borings across the project footprint. The fine-grained alluvial soils consist of very soft to hard, non-plastic to slightly plastic, sandy silt (A-4), clayey silt (A-5), slightly plastic, sandy clay (A-6), and slightly plastic, silty clay (A-7-5), trace to little pea gravel and gravel, trace organics, and trace mica. The coarse-grain soils encountered consist of very loose to very dense, sandy gravel (A-1-a), silty gravelly sand (A-1-b), silty sand (A-2-4), and clayey sand (A-2-6), with trace organics, trace to little pea gravel and gravel, and trace to little mica. Alluvial boulders were also encountered infrequently across the project.

Colluvial soils were encountered as unconsolidated soils deposited at the base of hillsides by creep and/or water flow. These soils were encountered in L\_7800L, L\_7900L, L\_7900R, L\_9000R, L\_12600L, and L\_12800R. The fine-grained colluvial soils consist of very soft to very stiff, sandy silt (A-4), with trace to little gravel. The coarse-grained soils consist of very loose to medium dense, silty sand (A-2-4), with trace to little gravel.

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

Weathered rock was also encountered along the project corridor within fifty-five boring locations. The weathered rock consists of Schist, Mica Schist, Metasandstone, and Metasiltstone. The top of weathered rock was encountered at depths ranging from the existing ground surface to 63.5 feet below existing grades.

Crystalline rock was encountered along the project corridor within twenty of the project borings. The crystalline rock was classified as Mica Schist, Schist, Metasandstone, and Metasiltstone and was encountered at depths ranging from 2.1 to 43.5 feet below existing grades.

#### GROUNDWATER

Groundwater measurements were taken between September 2020 through December 2021. Groundwater was encountered in 54 of the borings and hand augers at depths ranging from 2.2 feet to 45.0 feet below existing grades at the completion of drilling activities. Groundwater was encountered in 46 of the borings and hand augers at depths ranging from 0.5 feet to 36.5 feet below existing grades after a stabilization period of at least 24 hours. Fifty-five of the borings were backfilled immediately upon completion of drilling activities for safety reasons. Those reasons included boreholes being located in an active roadway and/or at the request of the property owner. The remaining hand augers and borings were recorded as dry at the bottom of the boring cylinder. Groundwater is expected to cause significant impacts for construction. The soils encountered were generally described as moist to wet above the groundwater elevation and moist to saturated below groundwater elevation.

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

<u>Alignment</u>	<u>Stations</u>	<u>Offsets (ft)</u>
-L-	75+71	54' LT
-L-	89+06	158' RT
-L-	132+16	140' LT
-L-	145+29	62' LT

<u>Alignment</u>	<u>Stations</u>	<u>Offsets (ft)</u>
-L-	179+88	76' LT
-L-	200+00	131' RT
-L-	207+82	254' LT

A spring and/or seep was encountered within the project corridor at the following location:

<u>Type</u>	<u>Alignment</u>	<u>Stations</u>	<u>Offsets (ft)</u>
Seep	-L-	124+48	20' RT
Spring	-L-	64+98	65' LT
Spring	-L-	129+96	52' RT
Spring	-L-	164+82	85' RT

#### AREAS OF SPECIAL GEOTECHNICAL INTEREST

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

<u>Alignment</u>	<u>Stations</u>	<u>Offsets (ft)</u>
-L-	11+00 to 12+37	23 LT to 21 RT
-L-	16+89 to 17+77	21 LT to 15 RT
-L-	21+00 to 23+00	21LT to 21 RT
-L-	31+00	25 RT
-L-	35+50 to 36+50	10 LT
-L-	42+00	25 LT
-L-	45+77 to 46+93	19 LT to 52 RT
-L-	53+00 to 62+00	25 LT to 73 RT
-L-	71+00 to 72+50	64 LT to 59 RT
-L-	77+68 to 78+00	97 RT
-L-	81+00 to 82+00	29RT to 67 RT
-L-	88+00 to 90+00	27 RT to 112 RT
-L-	107+00 to 109+00	43 LT to 20 RT
-L-	113+17	22 RT
-L-	113+80 to 119+00	13 LT to 23 RT
-L-	126+00 to 130+00	35 LT to 22 RT
-L-	133+50 to 139+00	40 RT to 55 RT
-L-	149+50 to 150+50	64 LT
-L-	157+50 to 160+50	15 LT to 13 LT
-L-	163+00 to 164+50	16 LT
-L-	168+79 to 169+84	15 LT
-L-	172+00 to 173+50	65 LT
-L-	176+62	46 RT
-L-	179+50 to 181+00	30 LT
-L-	181+50 to 187+50	22 RT to 32 RT

<u>Alignment</u>	<u>Stations</u>	<u>Offsets (ft)</u>	<u>Alignment</u>	<u>Stations</u>	<u>Offsets (ft)</u>
-L-	194+95 to 198+00	22 RT 29 RT	-L-	93+00	59 LT
-L-	204+00 to 208+00	25 LT to 25 RT	-L-	95+00	68 LT
-Y1-	15+50	16 RT	-L-	97+00	95 LT
-Y1-	19+50	58 RT	-L-	107+00	35 LT
-Y1-	27+50	20 RT	-L-	108+24	43 LT
-Y1-	31+50	21 RT	-L-	175+33	43 RT
-Y1-	33+50 to 35+00	20 LT to 42 RT	-Y1-	23+54	162 RT
-DR1A-	10+27	27 LT			

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

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

<u>Alignment</u>	<u>Stations</u>	<u>Offsets (ft)</u>
-L-	126+00 to 132+00	35 LT to 55 RT
-L-	192+56	29 RT
-L-	206+00	25 LT

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

<u>Alignment</u>	<u>Stations</u>	<u>Offsets (ft)</u>
-L-	57+00	72 RT
-L-	90+00	112 RT
-L-	105+00	19 RT
-L-	108+40	20 RT
-L-	113+17	22 RT
-L-	114+11	13 LT
-L-	134+00 to 138+00	40 RT to 55 RT
-L-	164+00	16 LT
-L-	167+75 to 171+75	15 LT
-L-	173+05	65 LT
-L-	178+00 to 180+00	21 LT to 18 LT
-L-	192+56 to 198+00	55 LT to 29 RT
-L-	206+00 to 208+00	25 LT to 25 RT
-Y1-	36+66	35 LT

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

<u>Alignment</u>	<u>Stations</u>	<u>Offsets (ft)</u>
-L-	14+94	59 RT
-L-	29+00	38 RT
-L-	42+00	25 LT

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

<u>Alignment</u>	<u>Stations</u>	<u>Offsets (ft)</u>
-L-	78+00	32 LT
-L-	79+00	32 LT
-L-	90+00	18 RT
-L-	126+00	35 LT
-L-	128+00	22 RT


Rock outcrops were observed on the project at the following locations:

<u>Outcrop Number</u>	<u>Alignment</u>	<u>Stations</u>	<u>Offsets (ft)</u>
1	-Y1-	20+24 to 25+00	LT
2	-L-	53+00 to 54+84	LT
3	-L-	60+79 to 61+41	RT
4	-L-	74+82 to 75+38	RT
5A	-L-	96+46	LT
5B	-L-	97+89 to 102+10	LT
6	-L-	121+75 to 123+63	RT
7	-L-	174+39 to 174+68	RT
8	-L-	186+37 to 192+19	RT

Rock was encountered within 6 feet of the proposed cut elevation at the following borehole locations:

<u>Alignment</u>	<u>Stations</u>	<u>Offsets (ft)</u>
-L-	187+76 to 191+21	8 RT 66 RT

Sincerely,  
Carolinas Geotechnical Group, PLLC

DocuSigned by:  
  
8AD703B2A8484F4  
Robert E. Kral, PE  
Senior Project Engineer

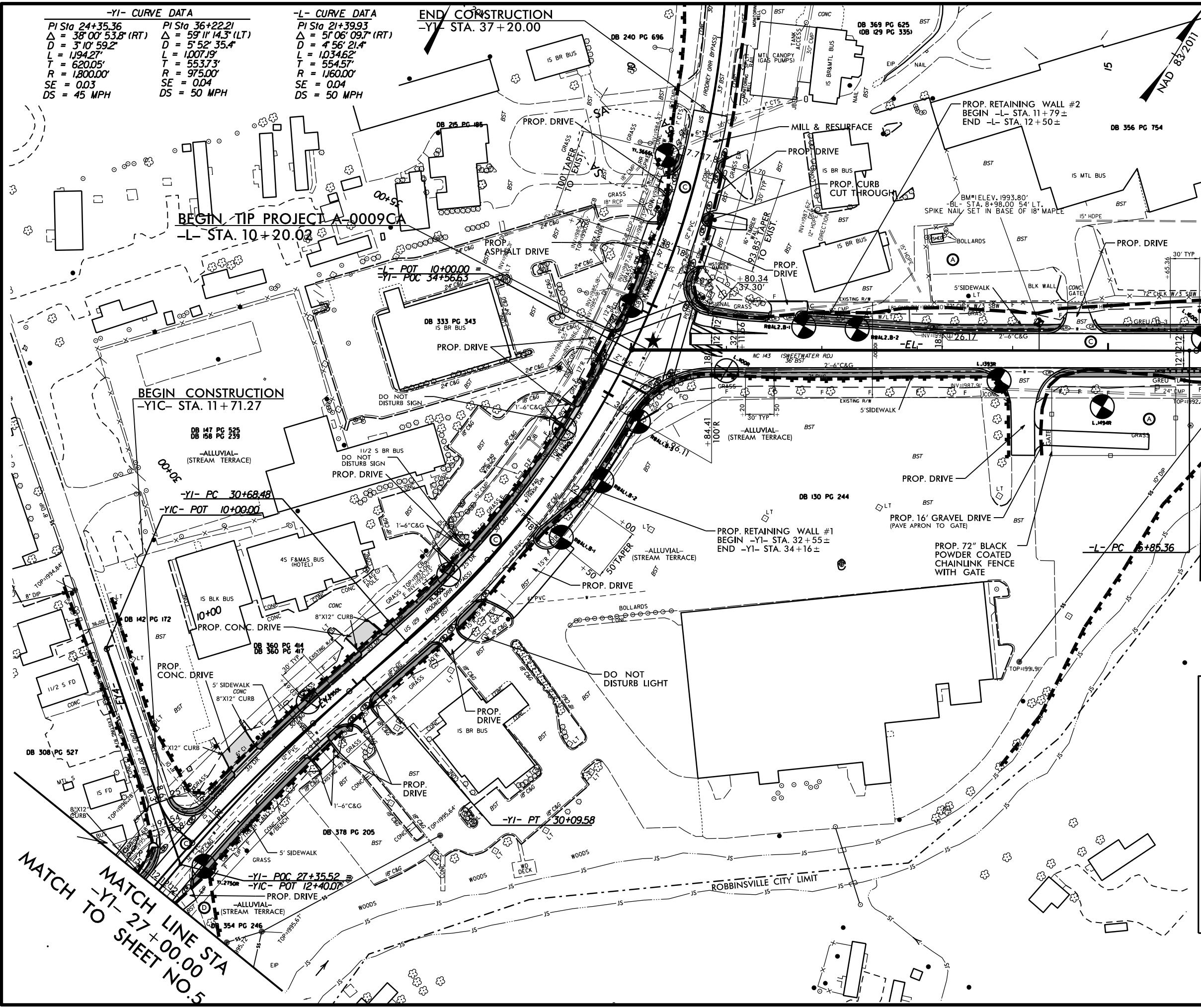
DocuSigned by:  
  
386129C0A4C1462...  
D. Matthew Brewer, PE  
Senior Project Engineer

**DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED**

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

-YI- CURVE DATA		-L- CURVE DATA		END CONSTRUCTION	
PI Sta 24+35.36	PI Sta 36+22.21	PI Sta 21+39.93	-YI- STA. 37+20.00		
$\Delta = 38^{\circ}00'53.8"$ (RT)	$\Delta = 59^{\circ}11'14.3"$ (LT)	$\Delta = 5^{\circ}06'09.7"$ (RT)			
D = 3'10'59.2"	D = 5'52'35.4"	D = 4'56'21.4"			
L = 1,942.27'	L = 1,007.19'	L = 1,034.62'			
T = 620.05'	T = 553.73'	T = 554.57'			
R = 1,800.00'	R = 975.00'	R = 1,160.00'			
SE = 0.03	SE = 0.04	SE = 0.04			
DS = 45 MPH	DS = 50 MPH	DS = 50 MPH			

8/17/99  
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MATCH LINE STA -L- 16+00.00  
 MATCH TO SHEET NO.6

- (A) -ARTIFICIAL FILL-
- (B) -ALLUVIAL-
- (C) -ROADWAY EMBANKMENT-
- (D) -RESIDUAL-

NOTE:  
 ALL DRIVEWAYS ARE TO BE ASPHALT UNLESS OTHERWISE NOTED. END LOCATION OF DRIVEWAY SHOWN ON PLANS REPRESENTS TIE-IN PER CROSS-SECTIONS, THE CONTRACTOR SHALL EXTEND THE DRIVES AND PAVE UP TO THE RIGHT OF WAY LINE FROM ROW POINT ON MATCH DRIVEWAY IN KIND, UNLESS OTHERWISE NOTED.

ELIGIBLE AND UNASSESSED SITES
PROP CONC SIDEWALK
PROPOSED SIGNAL

AVERAGE DAILY TRAFFIC			
		9,500	12,900
		200	3,600
		300	4,300
COMMERCIAL DRIVE		7,200	8,500
		700	3,500
		900	4,100
		400	3,500
		500	4,100
		9,600	12,900
		2045ADT	

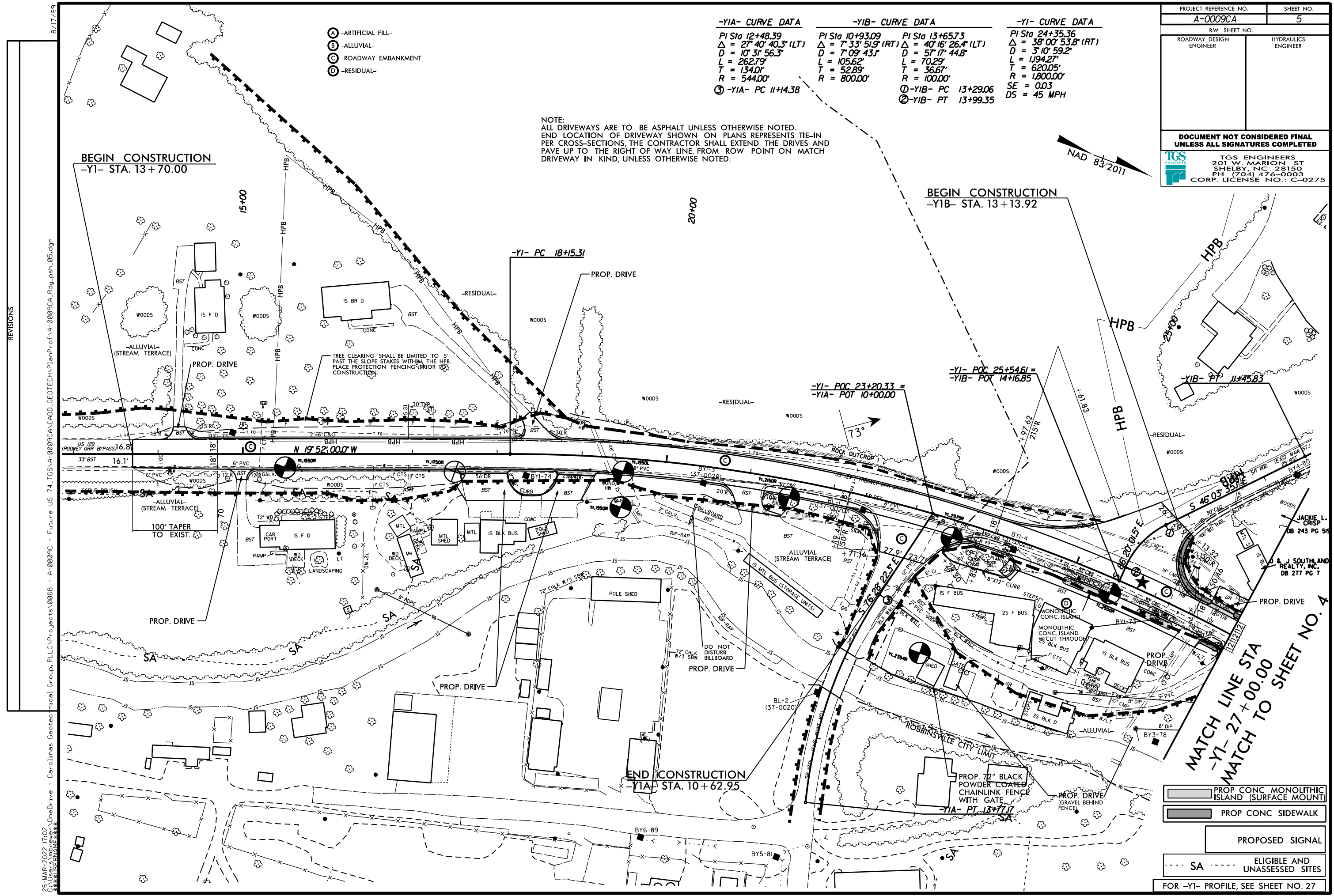
-L- NC 143


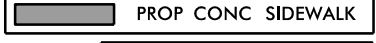


FOR -L- PROFILE, SEE SHEET NO. 20  
 FOR -YI- PROFILE, SEE SHEET NO. 28



-YIA- CURVE DATA	-YIB- CURVE DATA	-YI- CURVE DATA
PI Sta 12+48.39	PI Sta 10+93.09	PI Sta 13+65.73
$\Delta = 27^\circ 40' 40.3" (LT)$	$\Delta = 7^\circ 33' 51.9" (RT)$	$\Delta = 40^\circ 16' 26.4" (LT)$
$D = 10^\circ 31' 56.3"$	$D = 7^\circ 09' 43.1"$	$D = 57^\circ 17' 44.8"$
$L = 262.79'$	$L = 105.62'$	$L = 70.29'$
$T = 134.01'$	$T = 52.89'$	$T = 36.67'$
$R = 544.00'$	$R = 800.00'$	$R = 100.00'$
① -YIA- PC 11+14.38	① -YIB- PC 13+29.06	SE = 0.03
	② -YIB- PT 13+99.35	DS = 45 MPH

NOTE:  
 ALL DRIVEWAYS ARE TO BE ASPHALT UNLESS OTHERWISE NOTED.  
 END LOCATION OF DRIVEWAY SHOWN ON PLANS REPRESENTS TIE-IN  
 PER CROSS-SECTIONS, THE CONTRACTOR SHALL EXTEND THE DRIVES AND  
 PAVE UP TO THE RIGHT OF WAY LINE FROM ROW POINT ON MATCH  
 DRIVEWAY IN KIND, UNLESS OTHERWISE NOTED.



	PROP CONC MONOLITHIC ISLAND (SURFACE MOUNT)
	PROP CONC SIDEWALK
	PROPOSED SIGNAL
	ELIGIBLE AND UNASSESSED SITES
FOR -YI- PROFILE, SEE SHEET NO. 27	

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PROJECT REFERENCE NO.	SHEET NO.
A-0009CA	6
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>DOCUMENT NOT CONSIDERED FINAL</b> <b>UNLESS ALL SIGNATURES COMPLETED</b>	
TGS ENGINEERS 201 W. MARION ST SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275	

**-L- CURVE DATA**  
PI Sta 21+39.93  
 $\Delta = 51^{\circ} 06' 09.7" (RT)$   
 $D = 4^{\circ} 56' 21.4"$   
 $L = 1034.62'$   
 $T = 554.57'$   
 $R = 1160.00'$   
 $SE = 0.04$   
 $DS = 50 MPH$

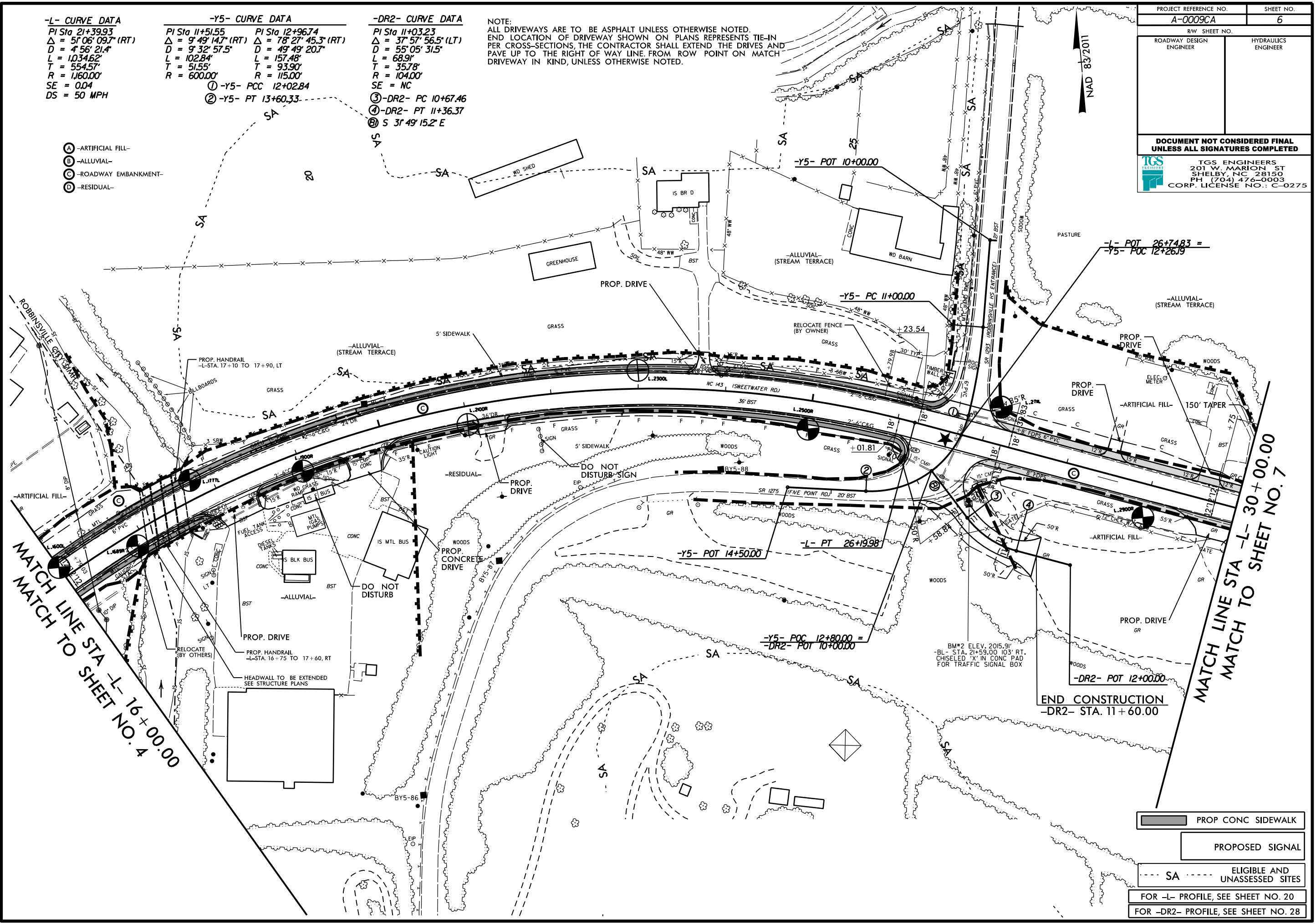
**-Y5- CURVE DATA**  
PI Sta 11+51.55    PI Sta 12+96.74  
 $\Delta = 9^{\circ} 49' 14.7" (RT)$      $\Delta = 78^{\circ} 27' 45.3" (RT)$   
 $D = 9^{\circ} 32' 57.5"$      $D = 49^{\circ} 49' 20.7"$   
 $L = 102.84'$      $L = 157.48'$   
 $T = 51.55'$      $T = 93.90'$   
 $R = 600.00'$      $R = 115.00'$

**-DR2- CURVE DATA**  
PI Sta 11+03.23  
 $\Delta = 37^{\circ} 57' 56.5" (LT)$   
 $D = 55^{\circ} 05' 31.5"$   
 $L = 68.91'$   
 $T = 35.78'$   
 $R = 104.00'$   
 $SE = NC$

**NOTE:**  
ALL DRIVEWAYS ARE TO BE ASPHALT UNLESS OTHERWISE NOTED.  
END LOCATION OF DRIVEWAY SHOWN ON PLANS REPRESENTS TIE-IN PER CROSS-SECTIONS, THE CONTRACTOR SHALL EXTEND THE DRIVES AND PAVE UP TO THE RIGHT OF WAY LINE FROM ROW POINT ON MATCH DRIVEWAY IN KIND, UNLESS OTHERWISE NOTED.

- ① -Y5- PCC 12+02.84  
② -Y5- PT 13+60.33  
③ -DR2- PC 10+67.46  
④ -DR2- PT 11+36.37  
⑤ S 31° 49' 15.2" E

- Ⓐ -ARTIFICIAL FILL-  
Ⓑ -ALLUVIAL-  
Ⓒ -ROADWAY EMBANKMENT-  
Ⓓ -RESIDUAL-




PROP CONC SIDEWALK

PROPOSED SIGNAL

SA - ELIGIBLE AND UNASSESSED SITES

FOR -L- PROFILE, SEE SHEET NO. 20  
FOR -DR2- PROFILE, SEE SHEET NO. 28

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8/17/99

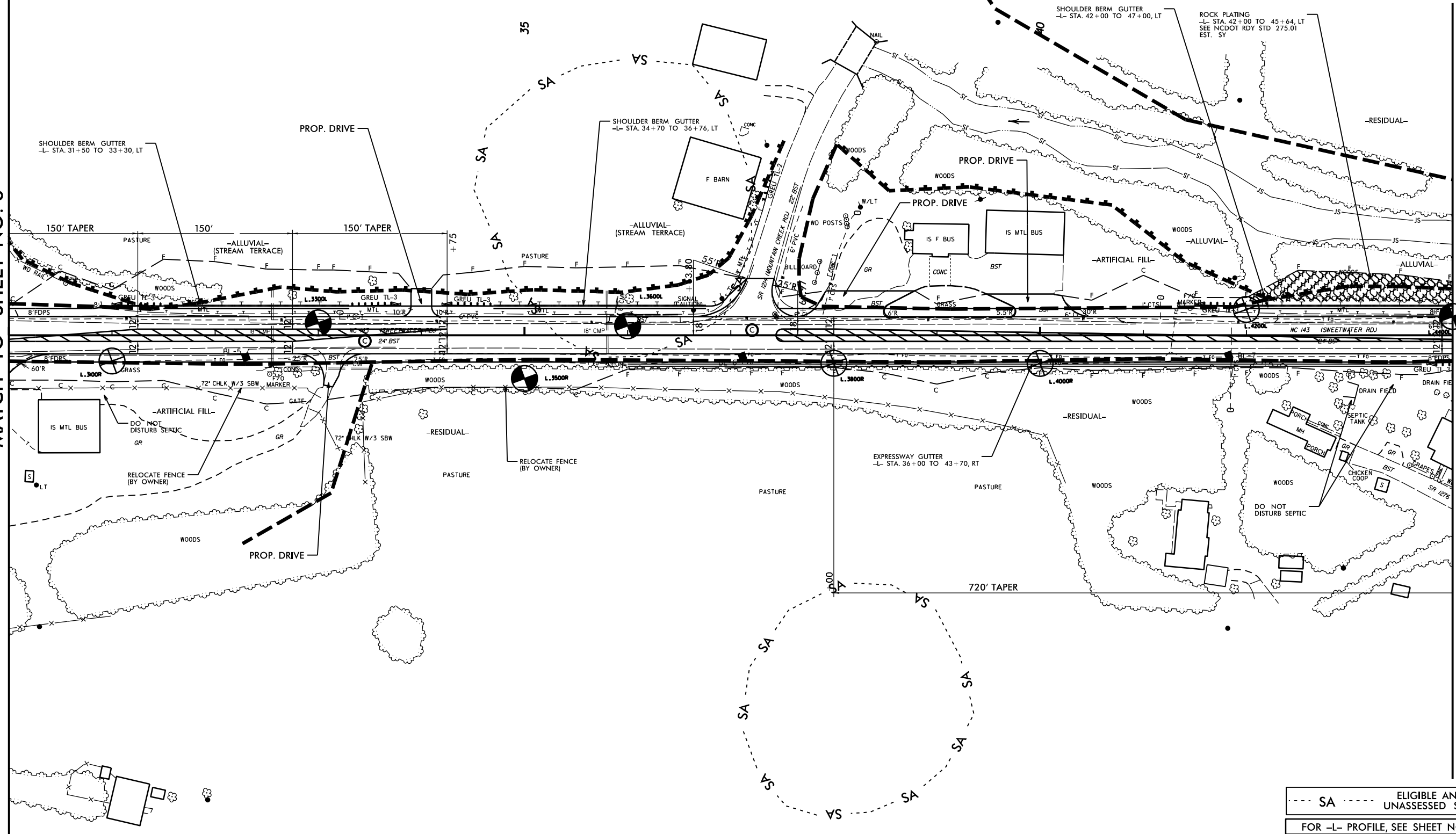
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RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
 <b>TGS ENGINEERS</b> 201 W. MARION ST SHELBY, NC 28150 PH: (704) 476-0003 CORP. LICENSE NO.: C-0275	

NOTE:  
ALL DRIVEWAYS ARE TO BE ASPHALT UNLESS OTHERWISE NOTED.  
END LOCATION OF DRIVEWAY SHOWN ON PLANS REPRESENTS TIE-IN PER CROSS-SECTIONS, THE CONTRACTOR SHALL EXTEND THE DRIVES AND PAVE UP TO THE RIGHT OF WAY LINE. FROM ROW POINT ON MATCH DRIVEWAY IN KIND, UNLESS OTHERWISE NOTED.

- (A) -ARTIFICIAL FILL-
- (B) -ALLUVIAL-
- (C) -ROADWAY EMBANKMENT-
- (D) -RESIDUAL-


MATCH LINE STA -L- 30+00.00  
 MATCH TO SHEET NO. 6

MATCH LINE STA -L- 44+00.00  
 MATCH TO SHEET NO. 8



- - - SA - - - ELIGIBLE AND UNASSESSED SITES  
 FOR -L- PROFILE, SEE SHEET NO. 21

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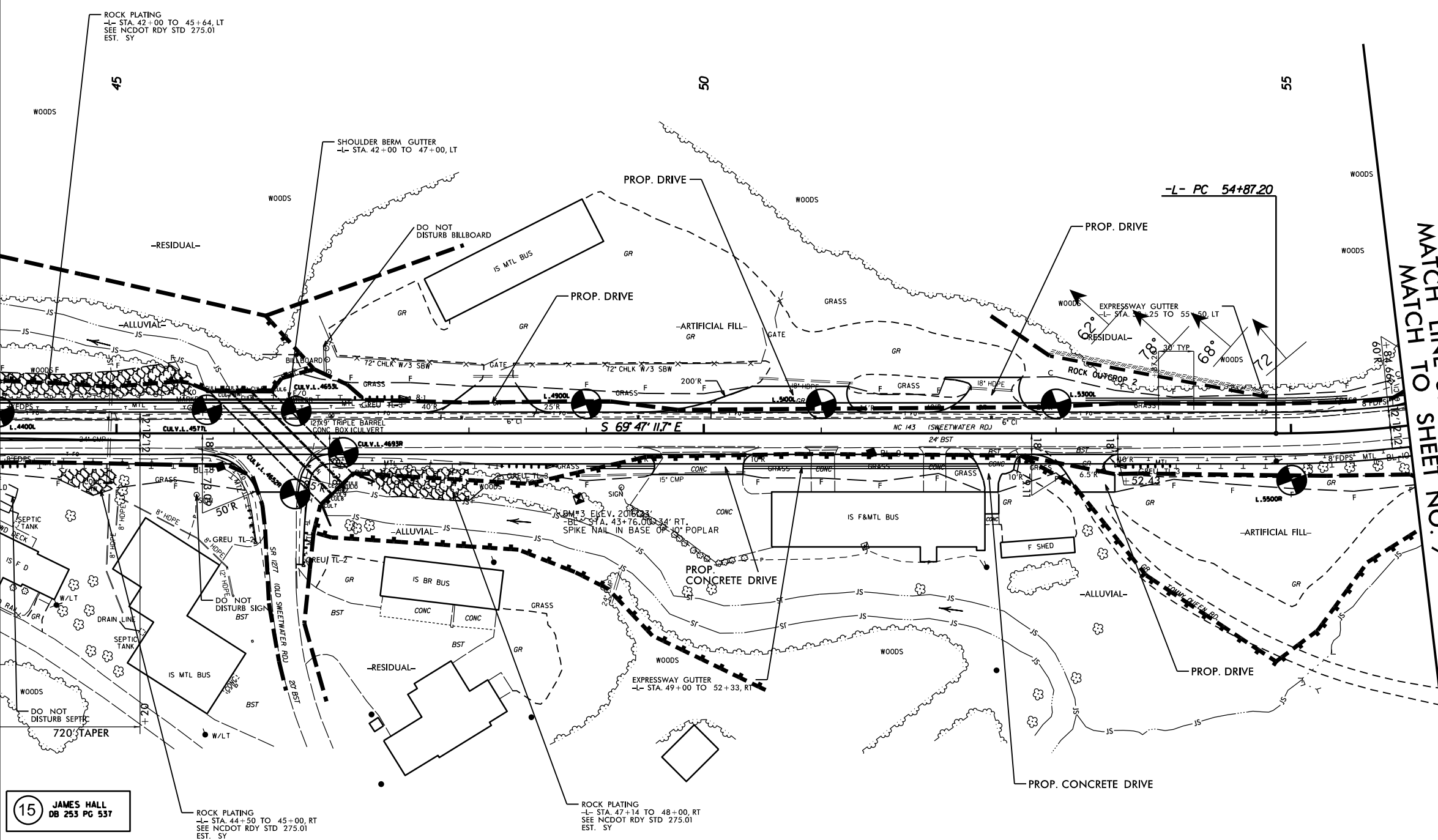
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A-0009CA	8
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
 <b>TGS ENGINEERS</b> 201 W. MARION ST SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275	

NOTE:  
 ALL DRIVEWAYS ARE TO BE ASPHALT UNLESS OTHERWISE NOTED.  
 END LOCATION OF DRIVEWAY SHOWN ON PLANS REPRESENTS TIE-IN  
 PER CROSS-SECTIONS, THE CONTRACTOR SHALL EXTEND THE DRIVES AND  
 PAVE UP TO THE RIGHT OF WAY LINE, FROM ROW POINT ON MATCH  
 DRIVEWAY IN KIND, UNLESS OTHERWISE NOTED.

**-L- CURVE DATA**  
 PI Sta 59+31.02  
 $\Delta = 49^\circ 37' 23.2" (LT)$   
 $D = 5^\circ 58' 05.9"$   
 $L = 831.44'$   
 $T = 443.82'$   
 $R = 960.00'$   
 $SE = 0.08$   
 $DS = 55 MPH$

- (A) -ARTIFICIAL FILL-
- (B) -ALLUVIAL-
- (C) -ROADWAY EMBANKMENT-
- (D) -RESIDUAL-


12 JACK MILLSAPS  
 DB 327 PG 22



15 JAMES HALL  
 DB 253 PG 537

FOR -L- PROFILE, SEE SHEET NO. 21

25-MAR-2022 11:02  
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 8/17/99  
 REVISIONS

PROJECT REFERENCE NO. A-0009CA	SHEET NO. 9
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
 <b>TGS ENGINEERS</b> 201 W. MARION ST SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275	

**-L- CURVE DATA**  
 PI Sta 59+31.02  
 $\Delta = 49^\circ 37' 23.2" (LT)$   
 $D = 5' 58' 05.9"$   
 $L = 831.44'$   
 $T = 443.82'$   
 $R = 960.00'$   
 $SE = 0.08$   
 $DS = 55 \text{ MPH}$

**-Y3- CURVE DATA**  
 PI Sta 12+33.55  
 $\Delta = 43^\circ 48' 04.8" (LT)$   
 $D = 57' 17' 44.8"$   
 $L = 76.45'$   
 $T = 40.20'$   
 $R = 100.00'$   
 ① -Y3- PC 12+93.35  
 ② -Y3- PT 11+69.80  
 ③ S 29° 24' 34.8" E

NOTE:  
 ALL DRIVEWAYS ARE TO BE ASPHALT UNLESS OTHERWISE NOTED.  
 END LOCATION OF DRIVEWAY SHOWN ON PLANS REPRESENTS TIE-IN  
 PER CROSS-SECTIONS, THE CONTRACTOR SHALL EXTEND THE DRIVES AND  
 PAVE UP TO THE RIGHT OF WAY LINE. FROM ROW POINT ON MATCH  
 DRIVEWAY IN KIND, UNLESS OTHERWISE NOTED.

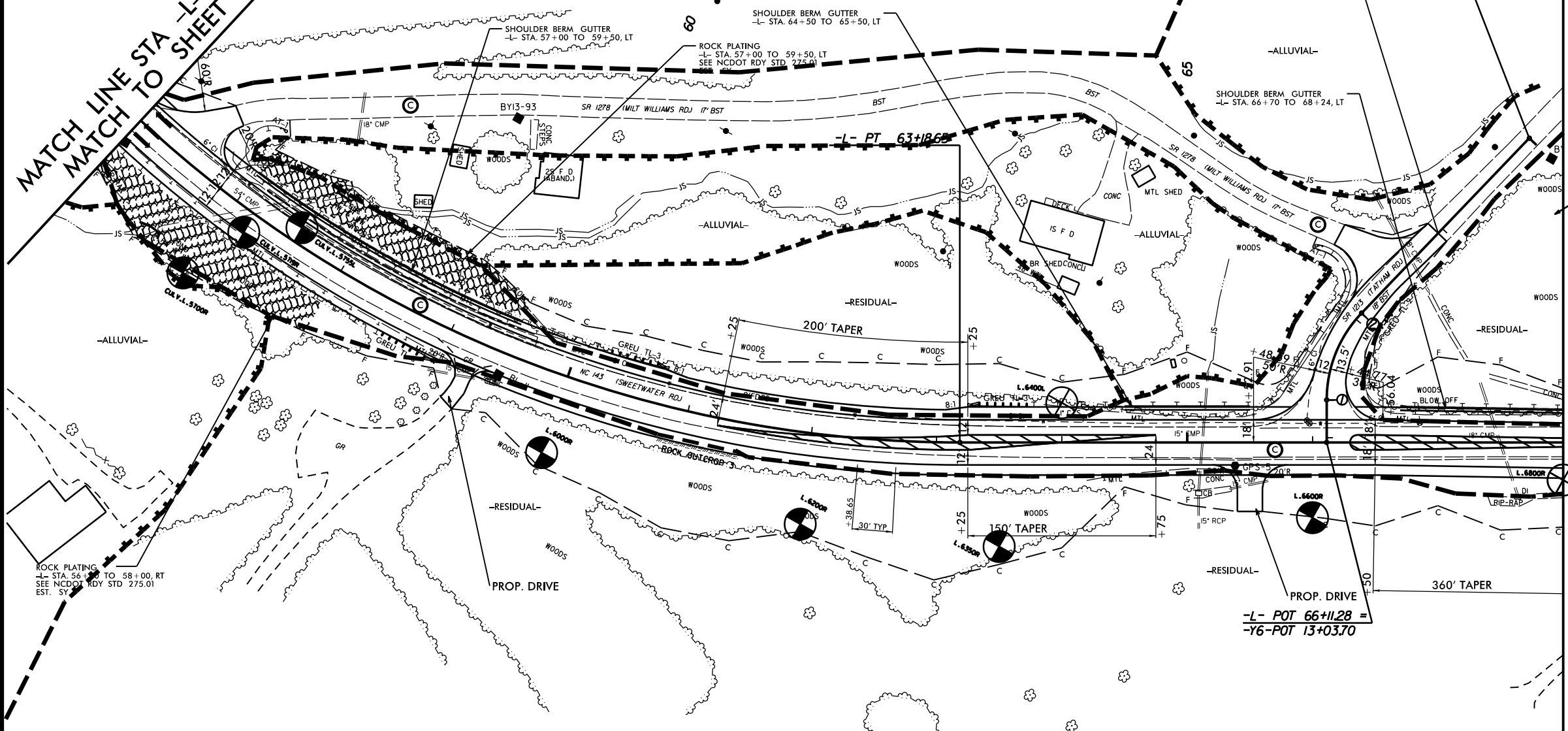
**BEGIN CONSTRUCTION**  
 -Y6- STA. 11+05.00

NOTE:  
 -Y6- TO BE RESURFACED WITH 1 1/2" S9.5B.  
 SHOULDER SHALL BE CONSTRUCTED USING NCDOT  
 STD. 560.01 (SHEET 1 OF 2) AND GUARDRAIL PLACED  
 AS SHOWN ON THE PLANS. MINIMUM OF 3'  
 WIDENING BEHIND THE FACE OF GUARDRAIL OR  
 EXTRA DEPTH POSTS TO BE USED.

MATCH LINE STA -L- 56+00.00  
 MATCH TO SHEET NO. 8

BILLY K. ANDERSON  
 DB 149 PG 543


MATCH LINE STA -L- 68+00.00  
 MATCH TO SHEET NO. 10



- (A) -ARTIFICIAL FILL-
- (B) -ALLUVIAL-
- (C) -ROADWAY EMBANKMENT-
- (D) -RESIDUAL-

FOR -L- PROFILE, SEE SHEET NO. 22

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 8/17/99  
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PROJECT REFERENCE NO.	SHEET NO.
A-0009CA	10
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
 <b>TGS ENGINEERS</b> 201 W. MARION ST SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275	

NOTE:  
 ALL DRIVEWAYS ARE TO BE ASPHALT UNLESS OTHERWISE NOTED. END LOCATION OF DRIVEWAY SHOWN ON PLANS REPRESENTS TIE-IN PER CROSS-SECTIONS, THE CONTRACTOR SHALL EXTEND THE DRIVES AND PAVE UP TO THE RIGHT OF WAY LINE FROM ROW POINT ON MATCH DRIVEWAY IN KIND, UNLESS OTHERWISE NOTED.

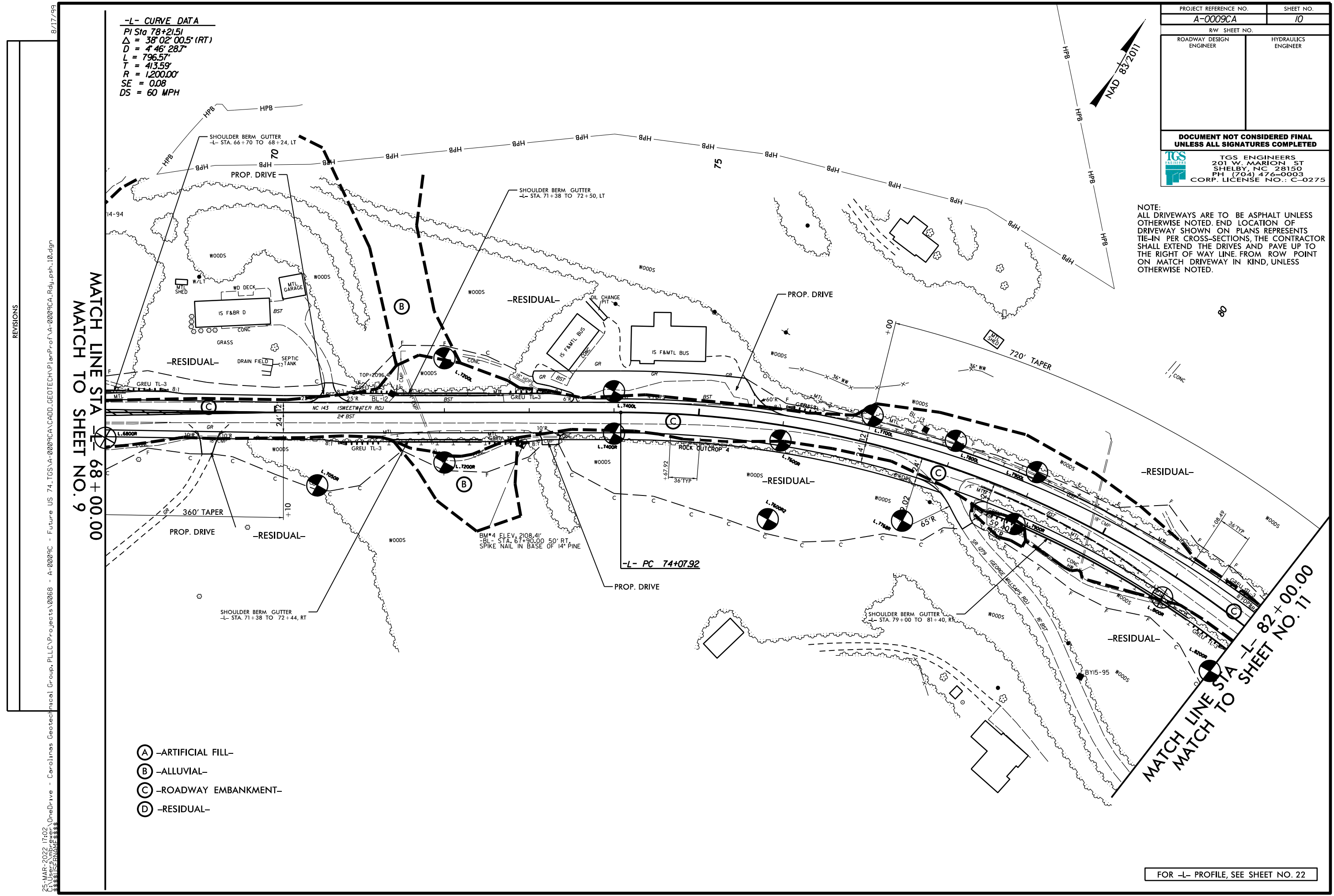
**-L- CURVE DATA**  
 PI Sta 78+21.51  
 $\Delta = 38^{\circ} 02' 00.5" (RT)$   
 $D = 4' 46" 28.7"$   
 $L = 796.57'$   
 $T = 413.59'$   
 $R = 1,200.00'$   
 $SE = 0.08$   
 $DS = 60 MPH$

MATCH LINE STA 68+00.00  
 MATCH TO SHEET NO. 9

MATCH LINE STA 82+00.00  
 MATCH TO SHEET NO. 11

- (A) -ARTIFICIAL FILL-
- (B) -ALLUVIAL-
- (C) -ROADWAY EMBANKMENT-
- (D) -RESIDUAL-

FOR -L- PROFILE, SEE SHEET NO. 22




REVISIONS  
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8/17/99

-L- CURVE DATA	-L- CURVE DATA
PI Sta 78+21.51	PI Sta 98+90.11
$\Delta = 38^{\circ} 02' 00.5" (RT)$	$\Delta = 65^{\circ} 35' 01.6" (LT)$
$D = 4' 46" 28.7"$	$D = 5' 58" 05.9"$
$L = 796.57'$	$L = 1,098.87'$
$T = 413.59'$	$T = 618.49'$
$R = 1,200.00'$	$R = 960.00'$
$SE = 0.08$	$SE = 0.08$
$DS = 60 \text{ MPH}$	$DS = 55 \text{ MPH}$

NOTE:  
 ALL DRIVEWAYS ARE TO BE ASPHALT UNLESS OTHERWISE NOTED.  
 END LOCATION OF DRIVEWAY SHOWN ON PLANS REPRESENTS TIE-IN  
 PER CROSS-SECTIONS, THE CONTRACTOR SHALL EXTEND THE DRIVES AND  
 PAVE UP TO THE RIGHT OF WAY LINE FROM ROW POINT ON MATCH  
 DRIVEWAY IN KIND, UNLESS OTHERWISE NOTED.

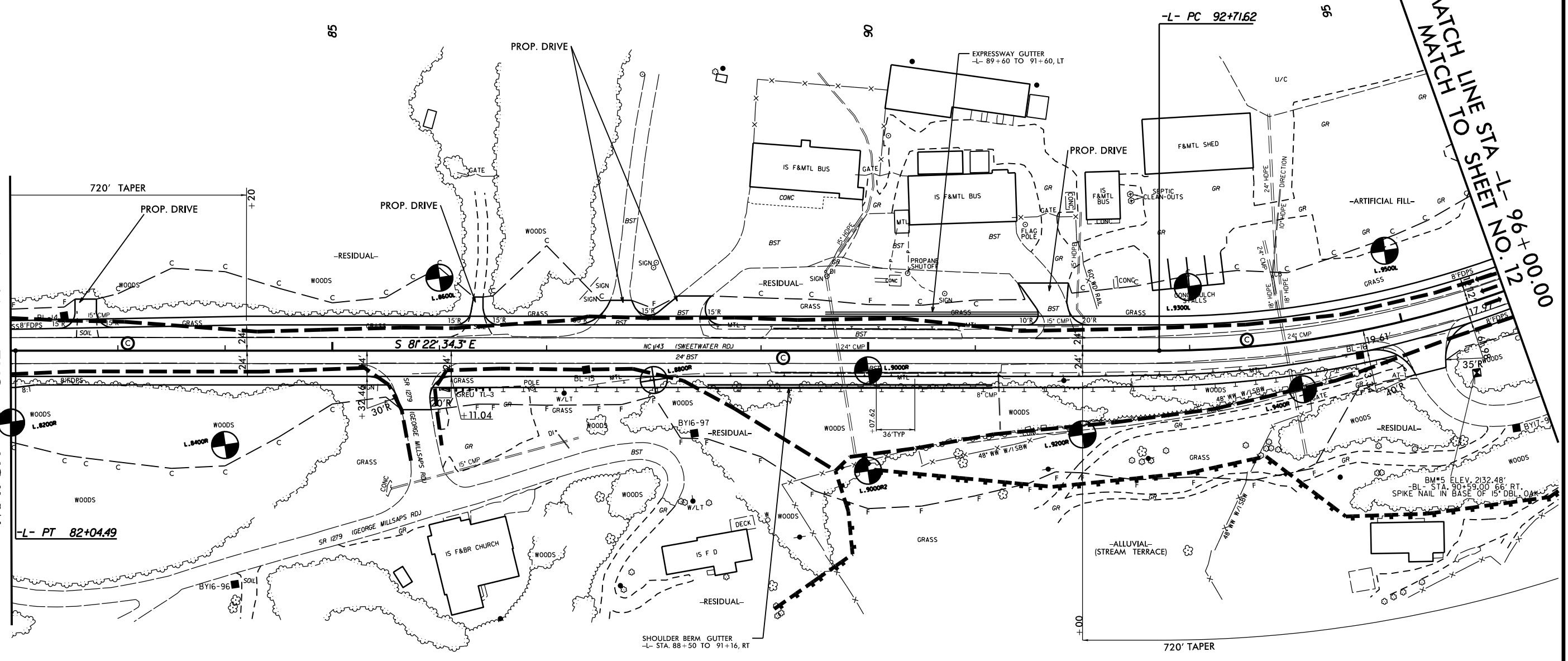
PROJECT REFERENCE NO. <b>A-0009CA</b>	SHEET NO. <b>11</b>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
 <b>TGS ENGINEERS</b> 201 W. MARION ST SHELBY, NC 28150 PH: (704) 476-0003 CORP. LICENSE NO.: C-0275	

NAD 83/2011

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 REVISIONS

MATCH LINE STA -L- 82+00.00  
 MATCH TO SHEET NO. 10

MATCH LINE TO SHEET NO. 12  
 -L- 96+00.00




- (A) -ARTIFICIAL FILL-
- (B) -ALLUVIAL-
- (C) -ROADWAY EMBANKMENT-
- (D) -RESIDUAL-

FOR -L- PROFILE, SEE SHEET NO. 23

8/17/99

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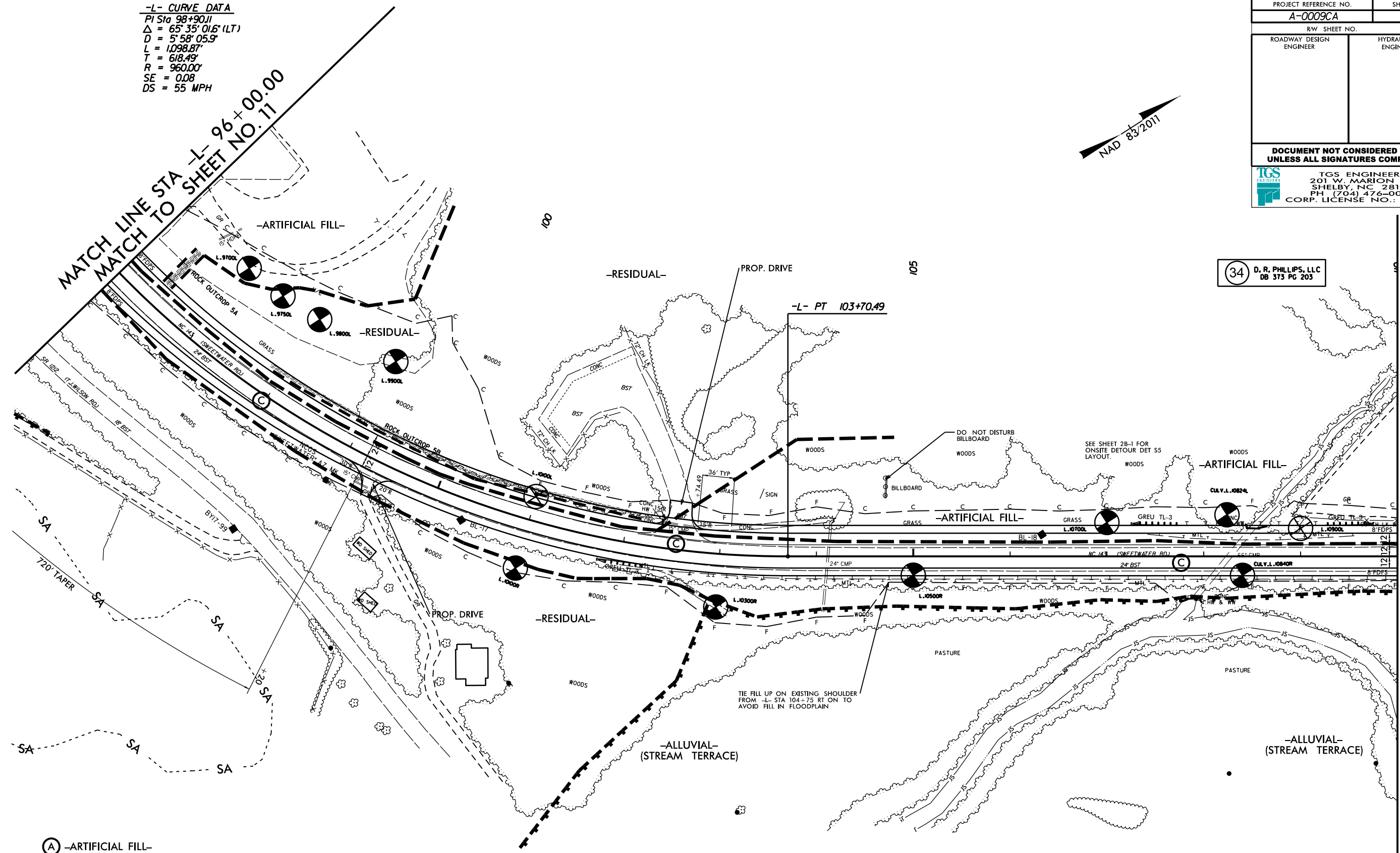
-L- CURVE DATA  
PI Sta 98+90.11  
 $\Delta = 65^\circ 35' 01.6" (LT)$   
 $D = 5^\circ 58' 05.9"$   
 $L = 1,098.87'$   
 $T = 618.49'$   
 $R = 960.00'$   
 $SE = 0.08$   
 $DS = 55 \text{ MPH}$

PROJECT REFERENCE NO. A-0009CA	SHEET NO. 12
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
 <b>TGS ENGINEERS</b> 201 W. MARION ST SHELBY, NC 28150 PH: (704) 476-0003 CORP. LICENSE NO.: C-0275	



MATCH LINE STA L- 96+00.00  
MATCH TO SHEET NO. 11

MATCH LINE STA L- 110+00.00  
MATCH TO SHEET NO. 13



- (A) -ARTIFICIAL FILL-
- (B) -ALLUVIAL-
- (C) -ROADWAY EMBANKMENT-
- (D) -RESIDUAL-

NOTE:  
ALL DRIVEWAYS ARE TO BE ASPHALT UNLESS OTHERWISE NOTED.  
END LOCATION OF DRIVEWAY SHOWN ON PLANS REPRESENTS TIE-IN  
PER CROSS-SECTIONS, THE CONTRACTOR SHALL EXTEND THE DRIVES AND  
PAVE UP TO THE RIGHT OF WAY LINE FROM ROW POINT ON MATCH  
DRIVEWAY IN KIND, UNLESS OTHERWISE NOTED.


SEE SHEET 2B-1 FOR ONSITE DETOUR DET\_55

--- SA --- ELIGIBLE AND UNASSESSED SITES

FOR -L- PROFILE, SEE SHEET NO. 23

REVISIONS



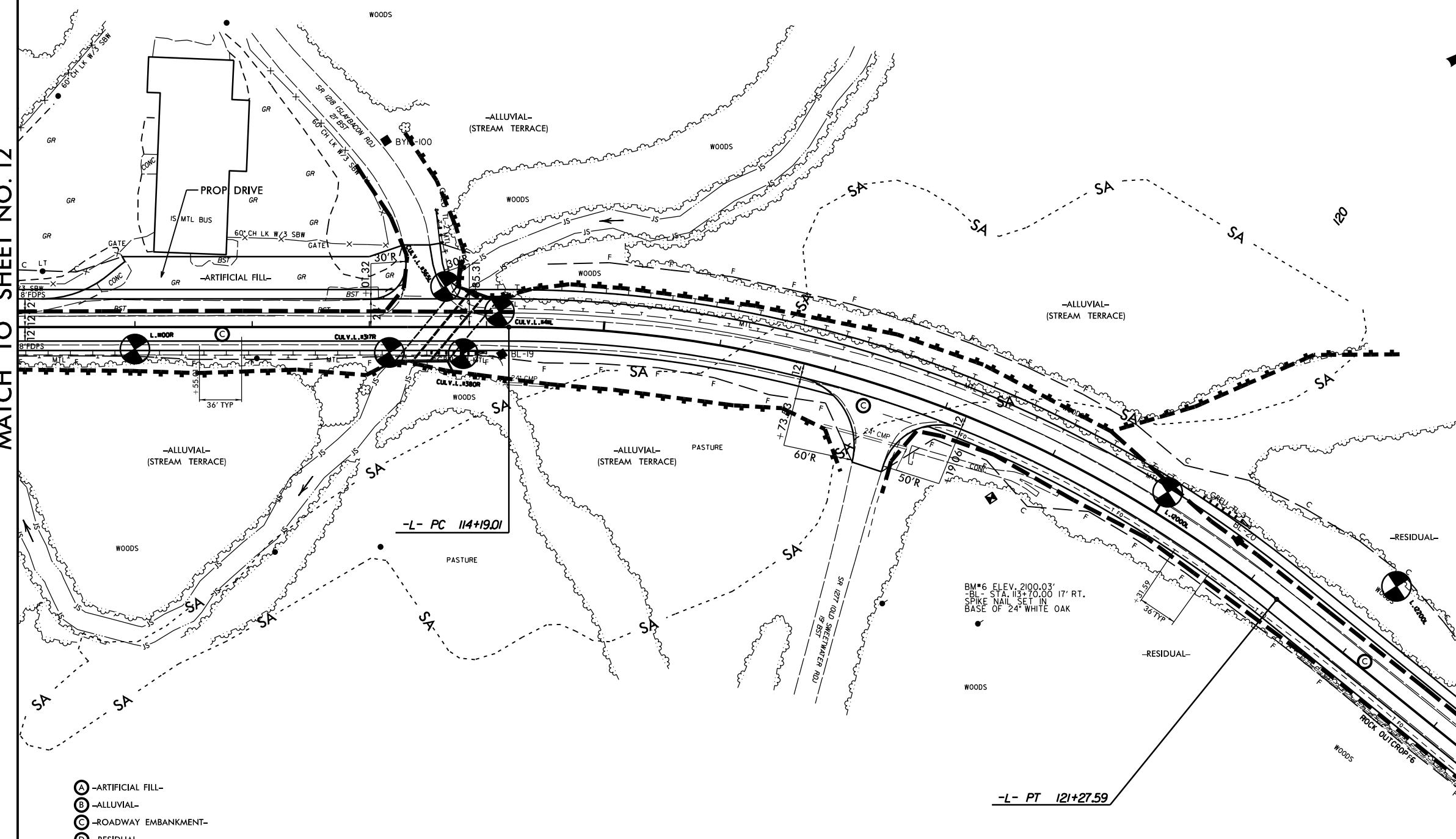
PROJECT REFERENCE NO.	SHEET NO.
A-0009CA	13
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
 <b>TGS ENGINEERS</b> 201 W. MARION ST SHELBY, NC 28150 PH: (704) 476-0003 CORP. LICENSE NO.: C-0275	

**-L- CURVE DATA**  
 PI Sta 117+87.67  
 $\Delta = 39^{\circ} 02' 13.1''$  (RT)  
 $D = 5^{\circ} 30' 33.2''$   
 $L = 708.58'$   
 $T = 368.66'$   
 $R = 1,040.00'$   
 $SE = 0.08$   
 $DS = 55$  MPH



MATCH LINE STA -L- 110+00.00  
 MATCH TO SHEET NO. 12

MATCH LINE STA -L- 124+00.00  
 MATCH TO SHEET NO. 14




- (A) -ARTIFICIAL FILL-
- (B) -ALLUVIAL-
- (C) -ROADWAY EMBANKMENT-
- (D) -RESIDUAL-

NOTE:  
 ALL DRIVEWAYS ARE TO BE ASPHALT UNLESS OTHERWISE NOTED.  
 END LOCATION OF DRIVEWAY SHOWN ON PLANS REPRESENTS TIE-IN PER CROSS-SECTIONS, THE CONTRACTOR SHALL EXTEND THE DRIVES AND PAVE UP TO THE RIGHT OF WAY LINE, FROM ROW POINT ON MATCH DRIVEWAY IN KIND, UNLESS OTHERWISE NOTED.

SEE SHEET 2B-1 FOR ONSITE DETOUR DET 5S  
 --- SA --- ELIGIBLE AND UNASSESSED SITES  
 FOR -L- PROFILE, SEE SHEET NO. 24

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 8/17/99

PROJECT REFERENCE NO. <b>A-0009CA</b>	SHEET NO. <b>14</b>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
 <b>TGS ENGINEERS</b> 201 W. MARION ST SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275	

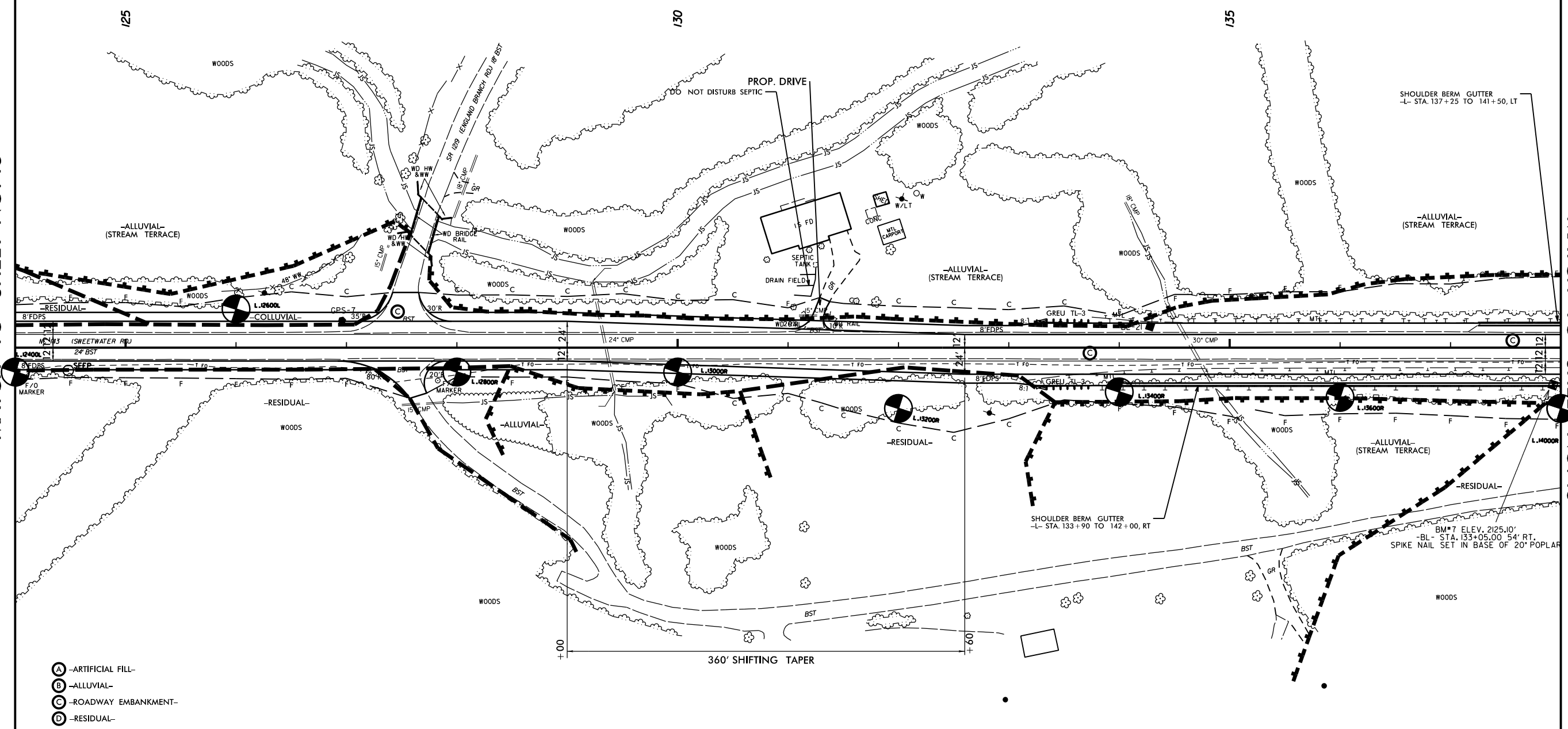
NOTE:  
 ALL DRIVEWAYS ARE TO BE ASPHALT UNLESS OTHERWISE NOTED. END LOCATION OF DRIVEWAY SHOWN ON PLANS REPRESENTS TIE-IN PER CROSS-SECTIONS, THE CONTRACTOR SHALL EXTEND THE DRIVES AND PAVE UP TO THE RIGHT OF WAY LINE. FROM ROW POINT ON MATCH DRIVEWAY IN KIND, UNLESS OTHERWISE NOTED.



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 8/17/99


**MATCH LINE STA -L- 124+00.00  
 MATCH TO SHEET NO. 13**

**MATCH LINE STA -L- 138+00.00  
 MATCH TO SHEET NO. 15**



- (A) -ARTIFICIAL FILL-
- (B) -ALLUVIAL-
- (C) -ROADWAY EMBANKMENT-
- (D) -RESIDUAL-

FOR -L- PROFILE, SEE SHEET NO. 24

PROJECT REFERENCE NO.	SHEET NO.
A-0009CA	15
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
 <b>TGS ENGINEERS</b> 201 W. MARION ST SHELBY, NC 28150 PH: (704) 476-0003 CORP. LICENSE NO.: C-0275	

**-L- CURVE DATA**  
 PI Sta 149+87.02  
 $\Delta = 0^\circ 52' 26.7" (LT)$   
 $D = 0^\circ 28' 38.9"$   
 $L = 183.07'$   
 $T = 91.54'$   
 $R = 12,000.00'$   
 $SE = NC$   
 $DS = 60 MPH$

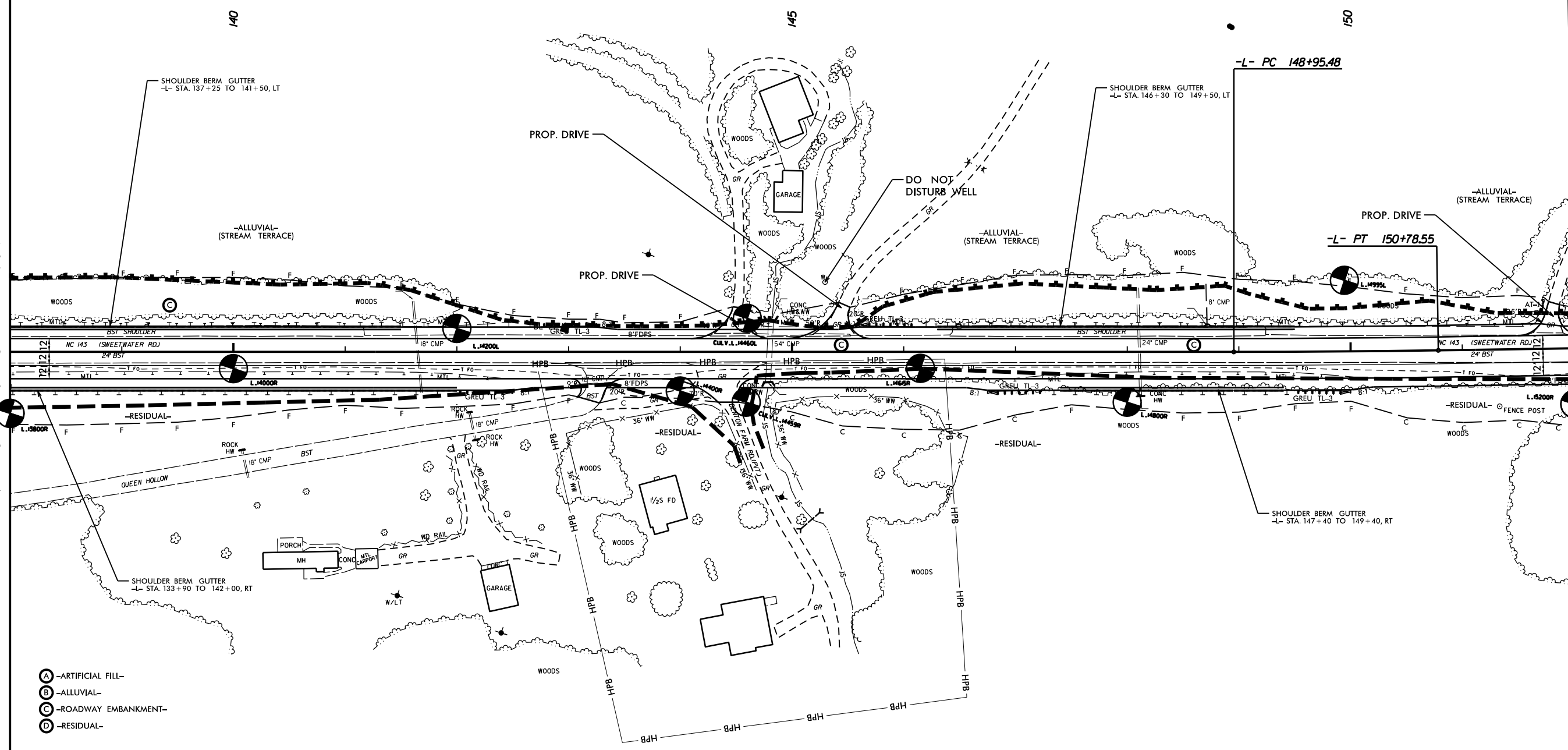
NOTE:  
 ALL DRIVEWAYS ARE TO BE ASPHALT UNLESS OTHERWISE NOTED.  
 END LOCATION OF DRIVEWAY SHOWN ON PLANS REPRESENTS TIE-IN  
 PER CROSS-SECTIONS, THE CONTRACTOR SHALL EXTEND THE DRIVES AND  
 PAVE UP TO THE RIGHT OF WAY LINE FROM ROW POINT ON MATCH  
 DRIVEWAY IN KIND, UNLESS OTHERWISE NOTED.



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 8/17/99  
 REVISIONS

MATCH LINE STA -L- 138+00.00  
 MATCH TO SHEET NO. 14


MATCH LINE STA -L- 152+00.00  
 MATCH TO SHEET NO. 16



- (A) -ARTIFICIAL FILL-
- (B) -ALLUVIAL-
- (C) -ROADWAY EMBANKMENT-
- (D) -RESIDUAL-

FOR -L- PROFILE, SEE SHEET NO. 25

8/17/99

PROJECT REFERENCE NO. <b>A-0009CA</b>		SHEET NO. <b>16</b>	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>			
 <b>TGS ENGINEERS</b> 201 W. MARION ST SHELBY, NC 28150 PH: (704) 476-0003 CORP. LICENSE NO.: C-0275			

**-L- CURVE DATA**  
 PI Sta 166+10.36  
 $\Delta = 35^\circ 44' 58.6" (LT)$   
 $D = 3^\circ 00' 56.0"$   
 $L = 1185.50'$   
 $T = 612.76'$   
 $R = 1900.00'$   
 $SE = 0.07$   
 $DS = 60 \text{ MPH}$

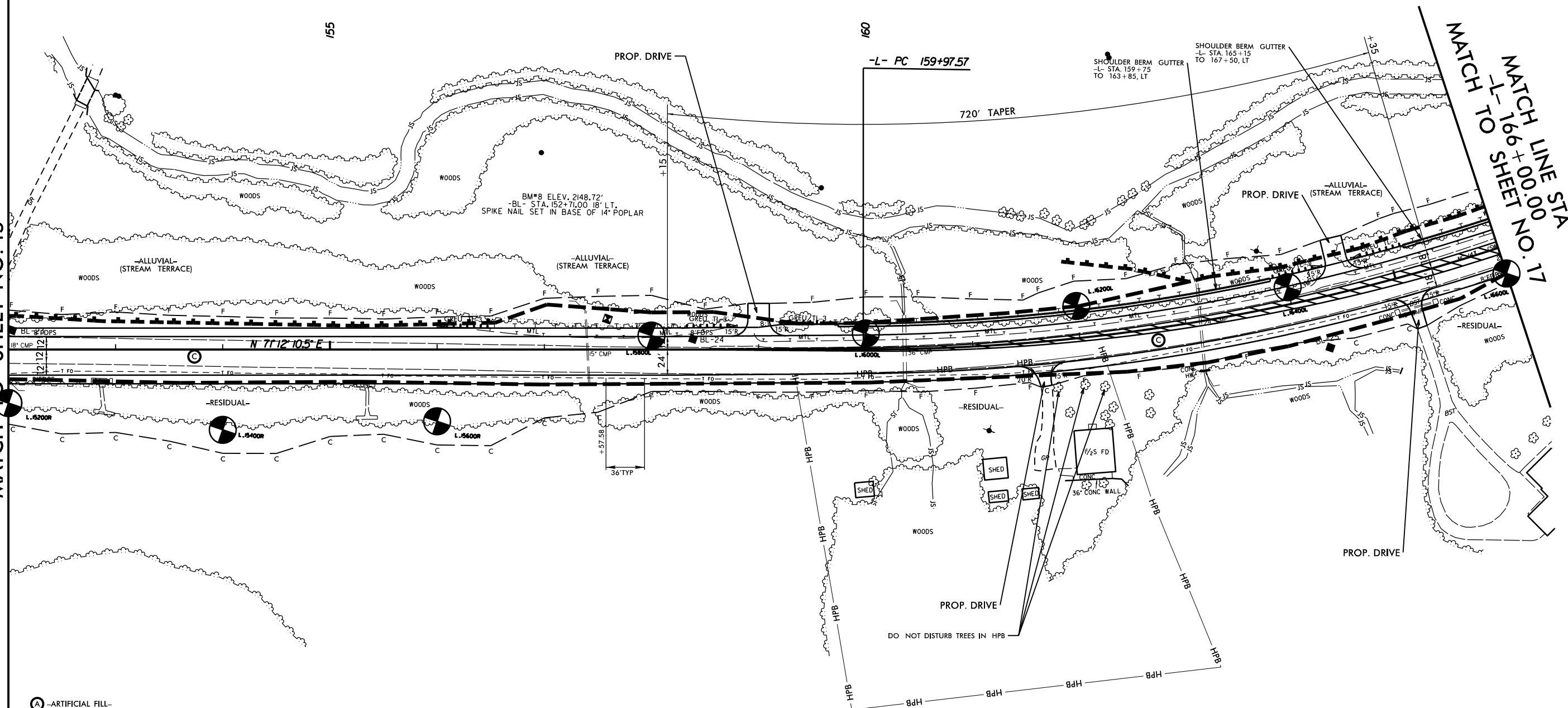
NOTE:  
 ALL DRIVEWAYS ARE TO BE ASPHALT UNLESS OTHERWISE NOTED.  
 END LOCATION OF DRIVEWAY SHOWN ON PLANS REPRESENTS TIE-IN  
 PER CROSS-SECTIONS, THE CONTRACTOR SHALL EXTEND THE DRIVES AND  
 PAVE UP TO THE RIGHT OF WAY LINE. FROM ROW POINT ON MATCH  
 DRIVEWAY IN KIND, UNLESS OTHERWISE NOTED.



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 8/17/99


MATCH LINE STA -L- 152+00.00  
 MATCH TO SHEET NO. 15

MATCH LINE STA 166+00.00  
 MATCH TO SHEET NO. 17



- (A) -ARTIFICIAL FILL-
- (B) -ALLUVIAL-
- (C) -ROADWAY EMBANKMENT-
- (D) -RESIDUAL-

FOR -L- PROFILE, SEE SHEET NO. 25

PROJECT REFERENCE NO. A-0009CA	SHEET NO. 17
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
 <b>TGS ENGINEERS</b> 201 W. MARION ST SHELBY, NC 28150 PH: (704) 476-0003 CORP. LICENSE NO.: C-0275	



**-L- CURVE DATA**  
 PI Sta 166+10.36  
 $\Delta = 35^{\circ} 44' 58.6" (LT)$   
 $D = 3^{\circ} 00' 56.0"$   
 $L = 1185.50'$   
 $T = 612.76'$   
 $R = 1900.00'$   
 $SE = 0.07$   
 $DS = 60 \text{ MPH}$

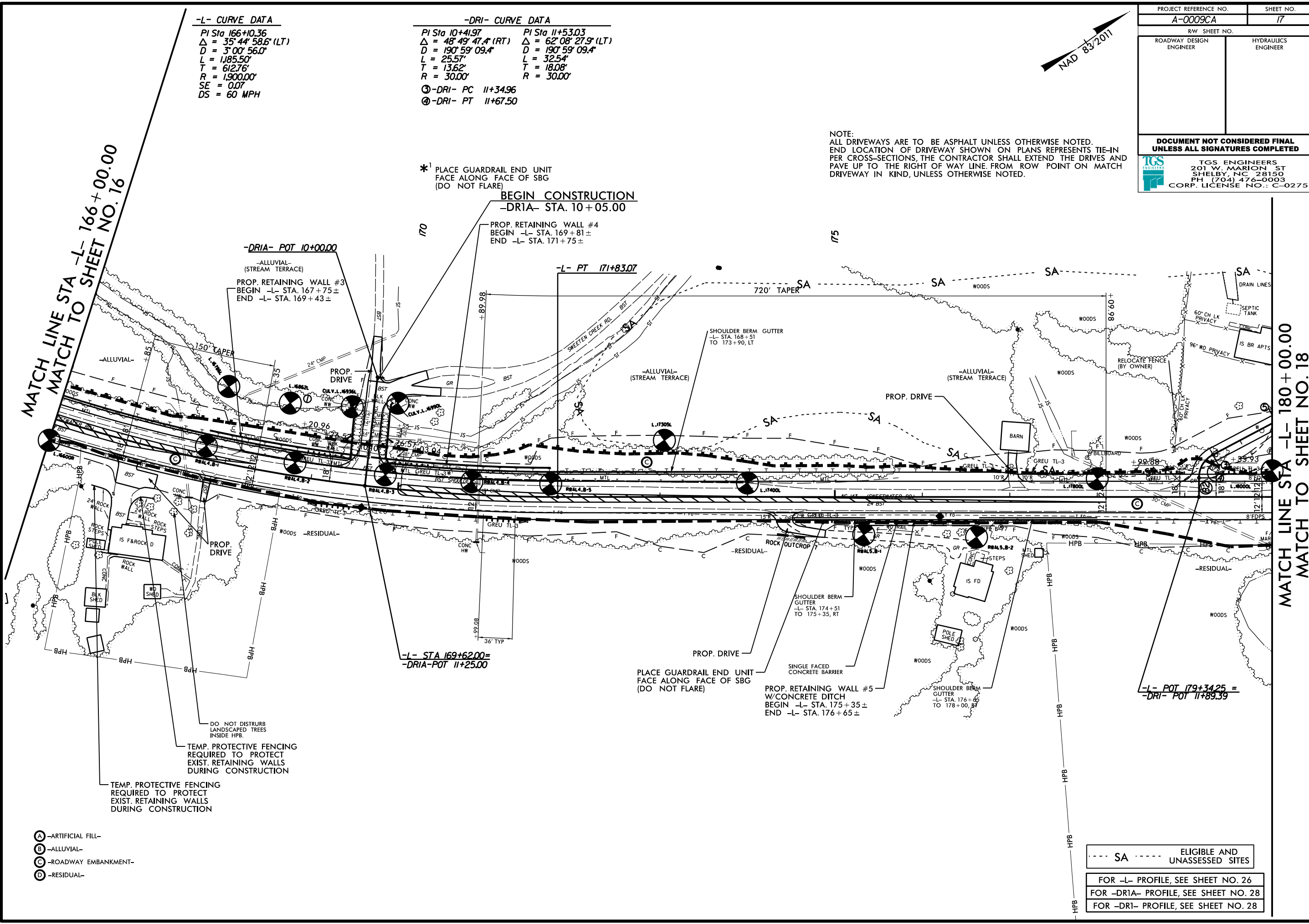
**-DRI- CURVE DATA**

PI Sta 10+41.97	PI Sta 11+53.03
$\Delta = 48^{\circ} 49' 47.4" (RT)$	$\Delta = 62^{\circ} 08' 27.9" (LT)$
$D = 190^{\circ} 59' 09.4"$	$D = 190^{\circ} 59' 09.4"$
$L = 25.57'$	$L = 32.54'$
$T = 13.62'$	$T = 18.08'$
$R = 30.00'$	$R = 30.00'$

(3) -DRI- PC 11+34.96  
 (4) -DRI- PT 11+67.50

NOTE:  
 ALL DRIVEWAYS ARE TO BE ASPHALT UNLESS OTHERWISE NOTED.  
 END LOCATION OF DRIVEWAY SHOWN ON PLANS REPRESENTS TIE-IN  
 PER CROSS-SECTIONS, THE CONTRACTOR SHALL EXTEND THE DRIVES AND  
 PAVE UP TO THE RIGHT OF WAY LINE FROM ROW POINT ON MATCH  
 DRIVEWAY IN KIND, UNLESS OTHERWISE NOTED.

\*1 PLACE GUARDRAIL END UNIT  
 FACE ALONG FACE OF SBG  
 (DO NOT FLARE)



MATCH LINE STA -L- 166+00.00  
MATCH TO SHEET NO. 16


MATCH LINE STA -L- 180+00.00  
MATCH TO SHEET NO. 18

- (A) -ARTIFICIAL FILL-
- (B) -ALLUVIAL-
- (C) -ROADWAY EMBANKMENT-
- (D) -RESIDUAL-

--- SA --- ELIGIBLE AND UNASSESSED SITES

FOR -L- PROFILE, SEE SHEET NO. 26  
 FOR -DRIA- PROFILE, SEE SHEET NO. 28  
 FOR -DRI- PROFILE, SEE SHEET NO. 28

REVISIONS  
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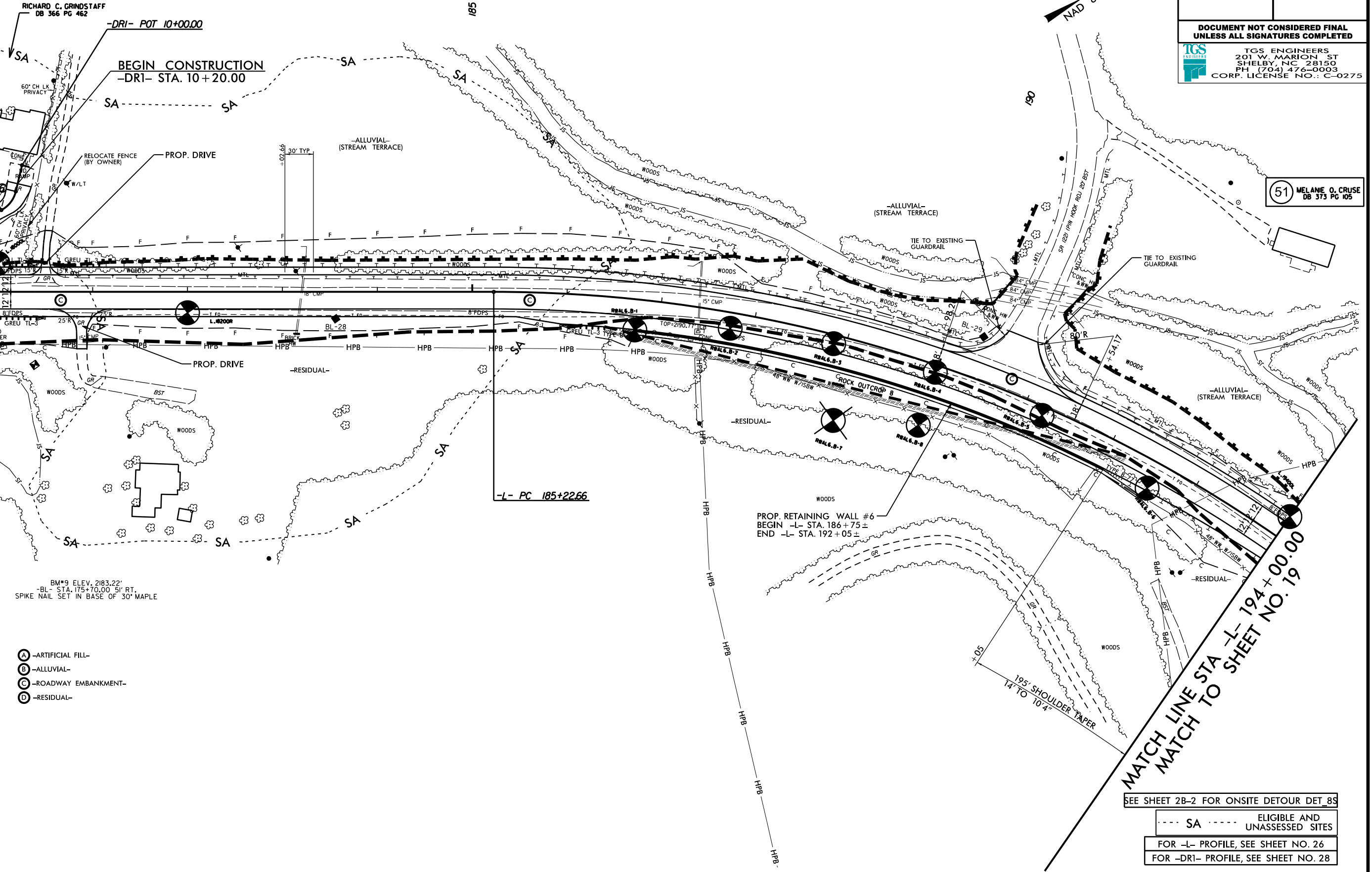
PROJECT REFERENCE NO.	SHEET NO.
A-0009CA	18
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
 <b>TGS ENGINEERS</b> 201 W. MARION ST SHELBY, NC 28150 PH: (704) 476-0003 CORP. LICENSE NO.: C-0275	

NOTE:  
 ALL DRIVEWAYS ARE TO BE ASPHALT UNLESS OTHERWISE NOTED.  
 END LOCATION OF DRIVEWAY SHOWN ON PLANS REPRESENTS TIE-IN PER CROSS-SECTIONS, THE CONTRACTOR SHALL EXTEND THE DRIVES AND PAVE UP TO THE RIGHT OF WAY LINE FROM ROW POINT ON MATCH DRIVEWAY IN KIND, UNLESS OTHERWISE NOTED.

<b>-L- CURVE DATA</b>	<b>-DRI- CURVE DATA</b>
PI Sta 190+83.76	PI Sta 10+41.97
$\Delta = 42' 18" 27.4" (RT)$	$\Delta = 48' 49" 47.4" (RT)$
$D = 3' 57" 05.2"$	$D = 190' 59" 09.4"$
$L = 1,070.69'$	$L = 25.57'$
$T = 561.07'$	$T = 13.62'$
$R = 1,450.00'$	$R = 30.00'$
SE = 0.08	⊙ -DRI- PC 10+28.35
DS = 60 MPH	⊙ -DRI- PT 10+53.92

MATCH LINE STA -L- 180+00.00  
 MATCH TO SHEET NO. 17

MATCH LINE STA -L- 194+00.00  
 MATCH TO SHEET NO. 19



BM\*9 ELEV. 2183.22'  
 -BL- STA. 175+70.00 51' RT.  
 SPIKE NAIL SET IN BASE OF 30' MAPLE

- Ⓐ -ARTIFICIAL FILL-
- Ⓑ -ALLUVIAL-
- Ⓒ -ROADWAY EMBANKMENT-
- Ⓓ -RESIDUAL-

SEE SHEET 2B-2 FOR ONSITE DETOUR DET 8S  
 - - - SA - - - ELIGIBLE AND UNASSESSED SITES  
 FOR -L- PROFILE, SEE SHEET NO. 26  
 FOR -DRI- PROFILE, SEE SHEET NO. 28

REVISIONS  
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 8/17/99

8/17/99

**-L- CURVE DATA**  
 PI Sta 190+83.76  
 $\Delta = 42^\circ 18' 27.4" (RT)$   
 $D = 3^\circ 57' 05.2"$   
 $L = 1,070.69'$   
 $T = 561.07'$   
 $R = 1,450.00'$   
 $SE = 0.08$   
 $DS = 60 \text{ MPH}$

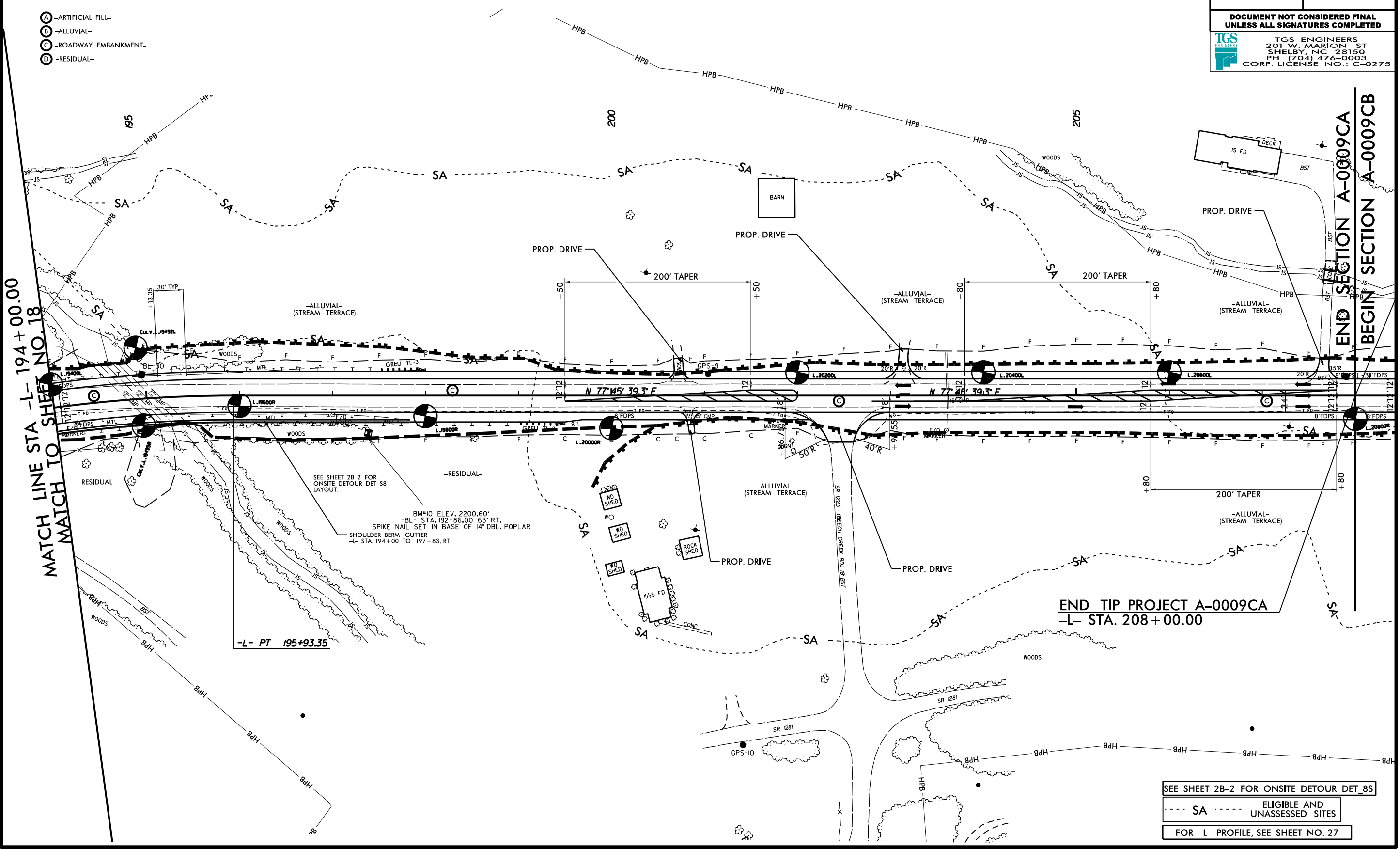
- (A) -ARTIFICIAL FILL-
- (B) -ALLUVIAL-
- (C) -ROADWAY EMBANKMENT-
- (D) -RESIDUAL-

NOTE:  
 ALL DRIVEWAYS ARE TO BE ASPHALT UNLESS OTHERWISE NOTED.  
 END LOCATION OF DRIVEWAY SHOWN ON PLANS REPRESENTS TIE-IN  
 PER CROSS-SECTIONS, THE CONTRACTOR SHALL EXTEND THE DRIVES AND  
 PAYE UP TO THE RIGHT OF WAY LINE. FROM ROW POINT ON MATCH  
 DRIVEWAY IN KIND, UNLESS OTHERWISE NOTED.



PROJECT REFERENCE NO. <b>A-0009CA</b>	SHEET NO. <b>19</b>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
<b>TGS ENGINEERS</b> 201 W. MARION ST SHELBY, NC 28150 PH: (704) 476-0003 CORP. LICENSE NO.: C-0275	

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 8/17/99  
 REVISIONS



MATCH LINE STA -L- 194+00.00  
 MATCH TO SHEET NO. 18

END SECTION A-0009CA  
 BEGIN SECTION A-0009CB

**END TIP PROJECT A-0009CA**  
 -L- STA. 208+00.00

SEE SHEET 2B-2 FOR  
 ONSITE DETOUR DET S8  
 LAYOUT.

BM#10 ELEV. 2200.60'  
 -BL- STA. 192+86.00 63' RT.  
 SPIKE NAIL SET IN BASE OF 14" DBL. POPLAR  
 -L- STA. 194+00 TO 197+83, RT

SEE SHEET 2B-2 FOR ONSITE DETOUR DET S8

SA ELIGIBLE AND UNASSESSED SITES

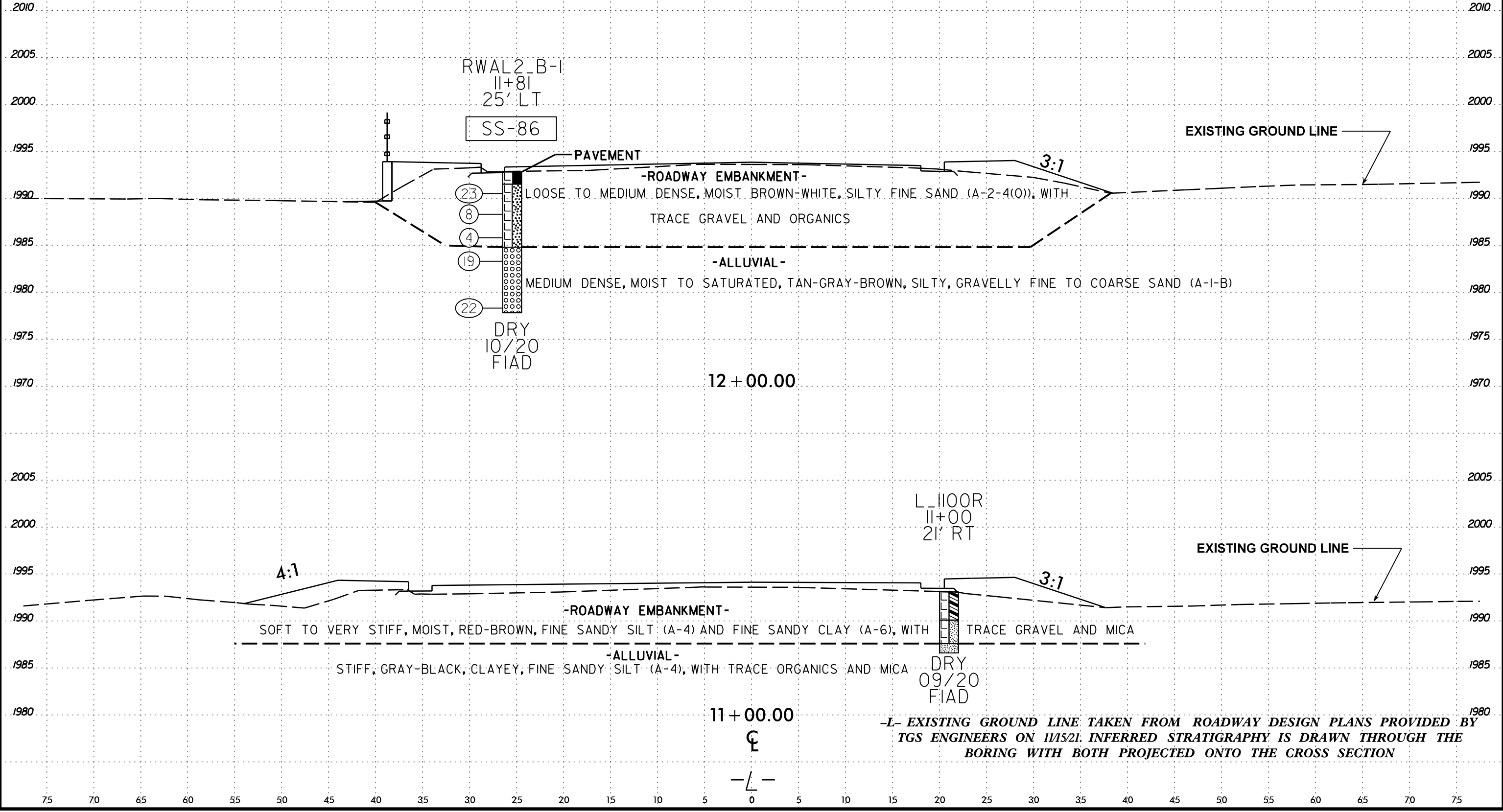
FOR -L- PROFILE, SEE SHEET NO. 27

6/23/16  
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 SSUBSERIAL#333

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### SOIL TEST RESULTS

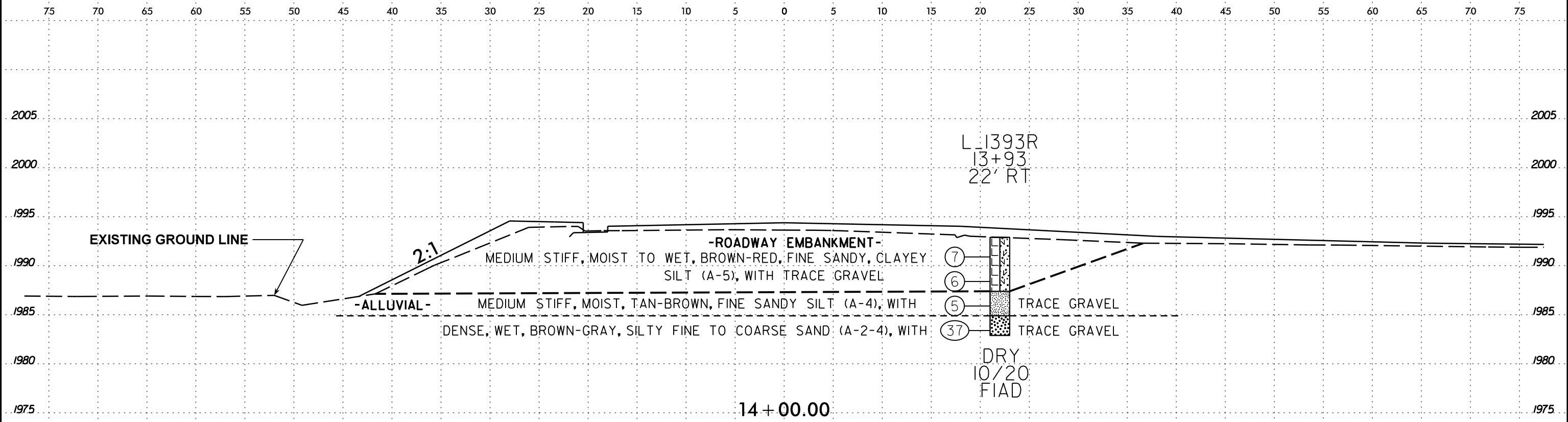
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							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-86	25' LT	11+81 -L-	3.5 - 5.0'	A-2-4(0)	27	1	25.0	49.0	14.0	12.0	95.0	82.0	34.0	11.0	-



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

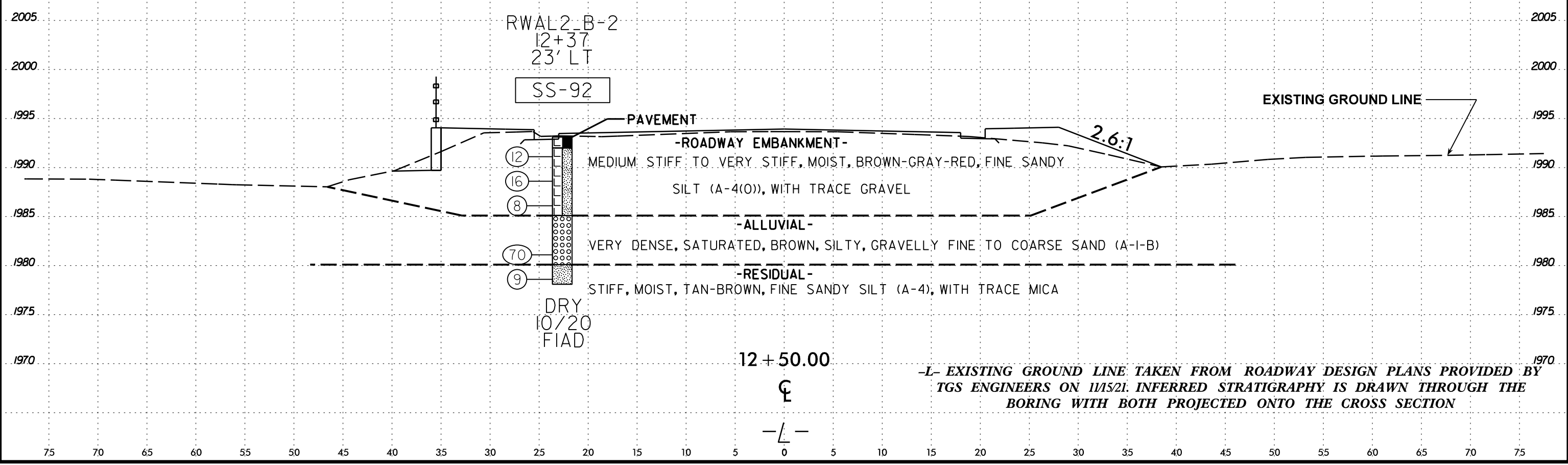


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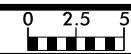


**SOIL TEST RESULTS**

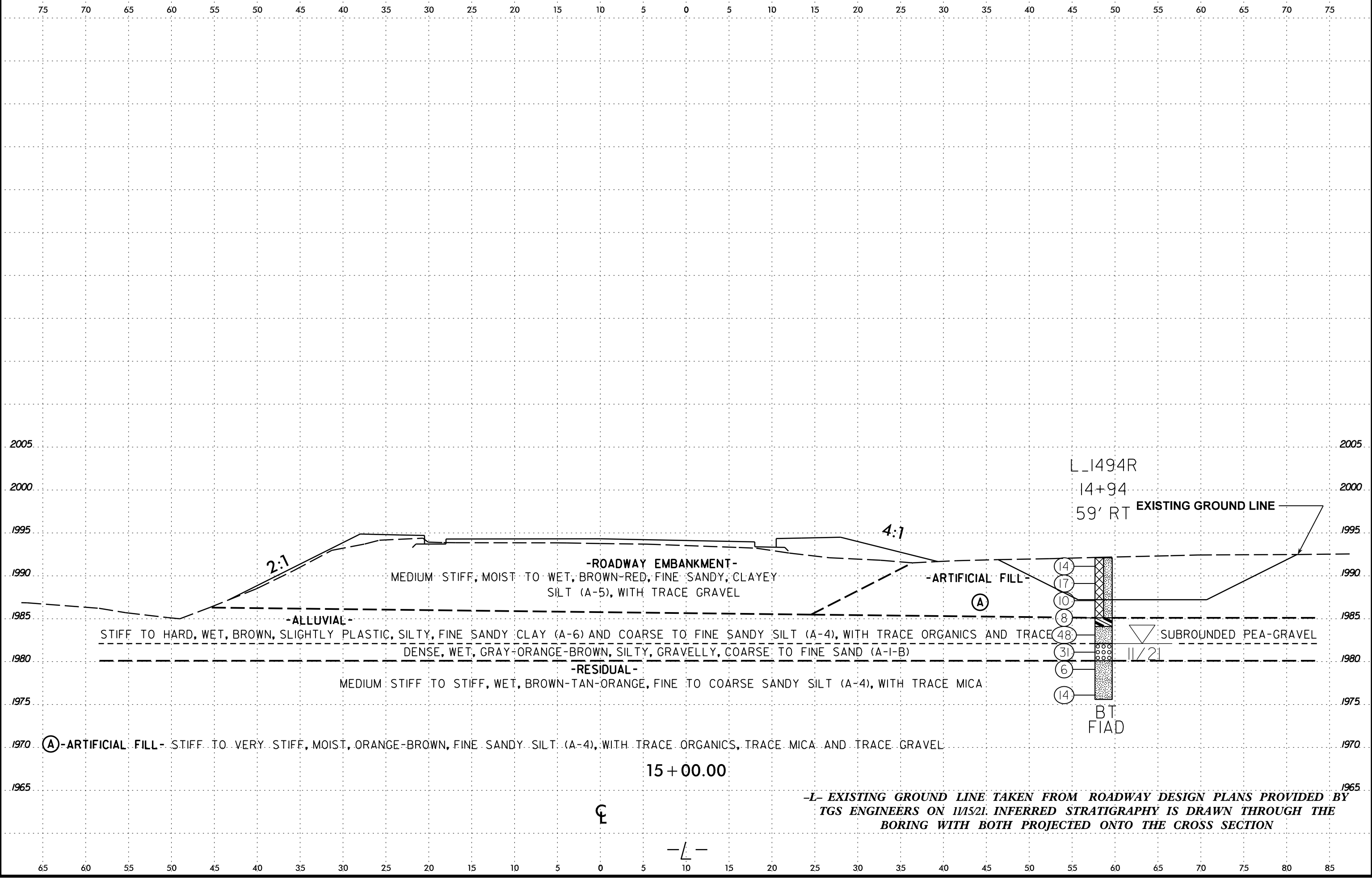
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-92	23' LT	12+37 -L-	6.0 - 7.5'	A-4(0)	27	1	21.0	40.0	21.0	18.0	88.0	77.0	42.0	16.0	-



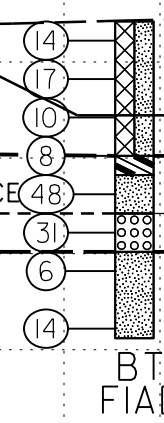
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SUBSTRATE



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



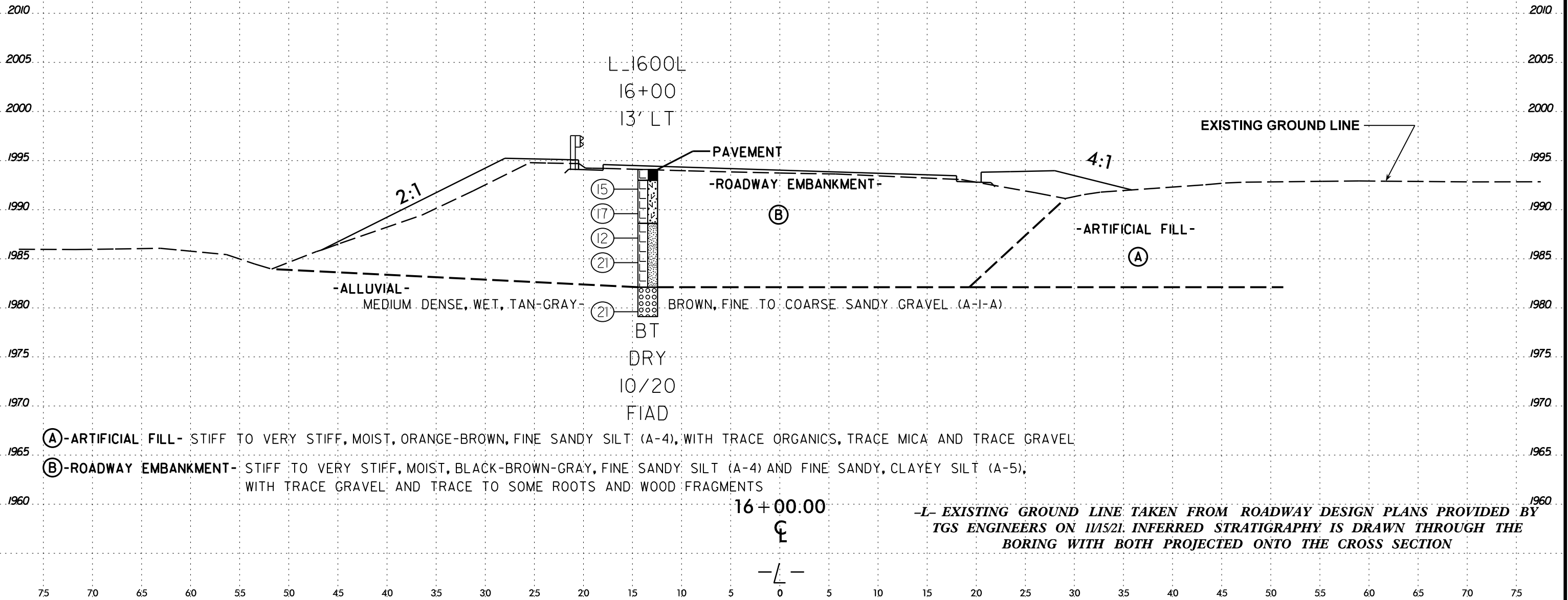
L\_1494R  
14+94  
59' RT EXISTING GROUND LINE



15 + 00.00

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/5/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

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



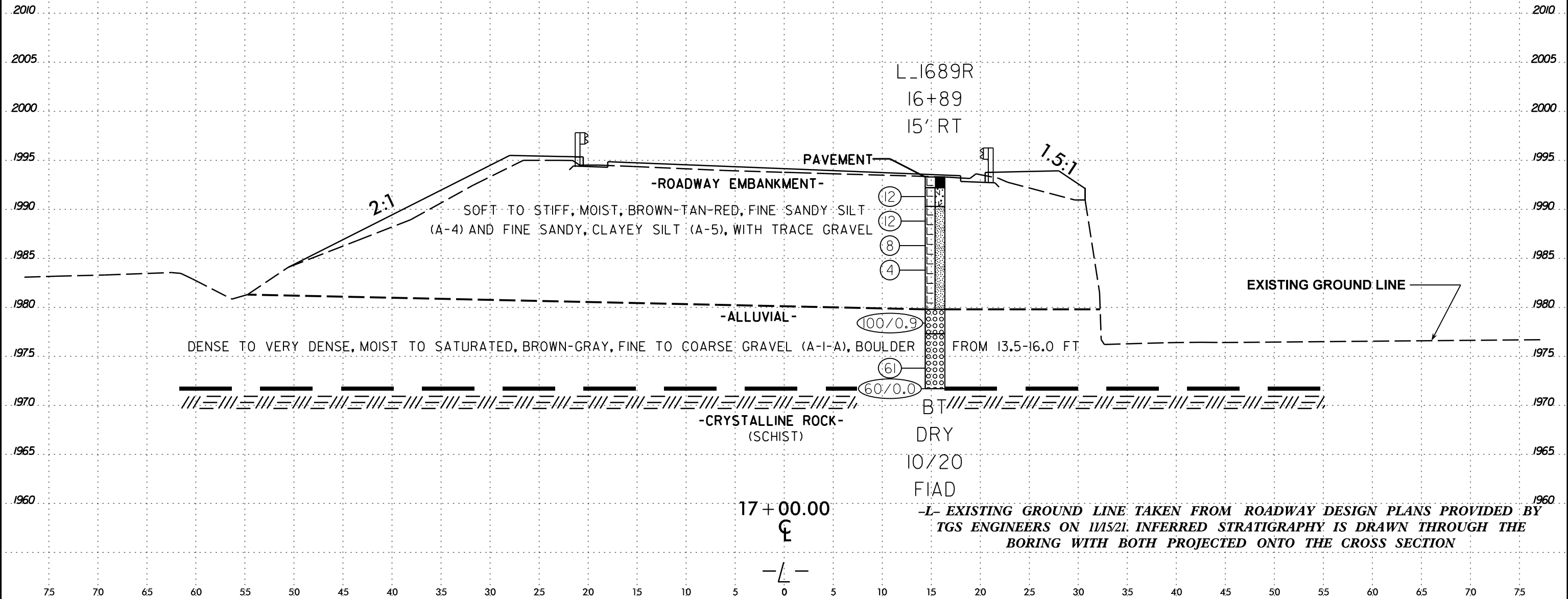
6/23/16



PROJ. REFERENCE NO.  
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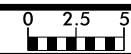
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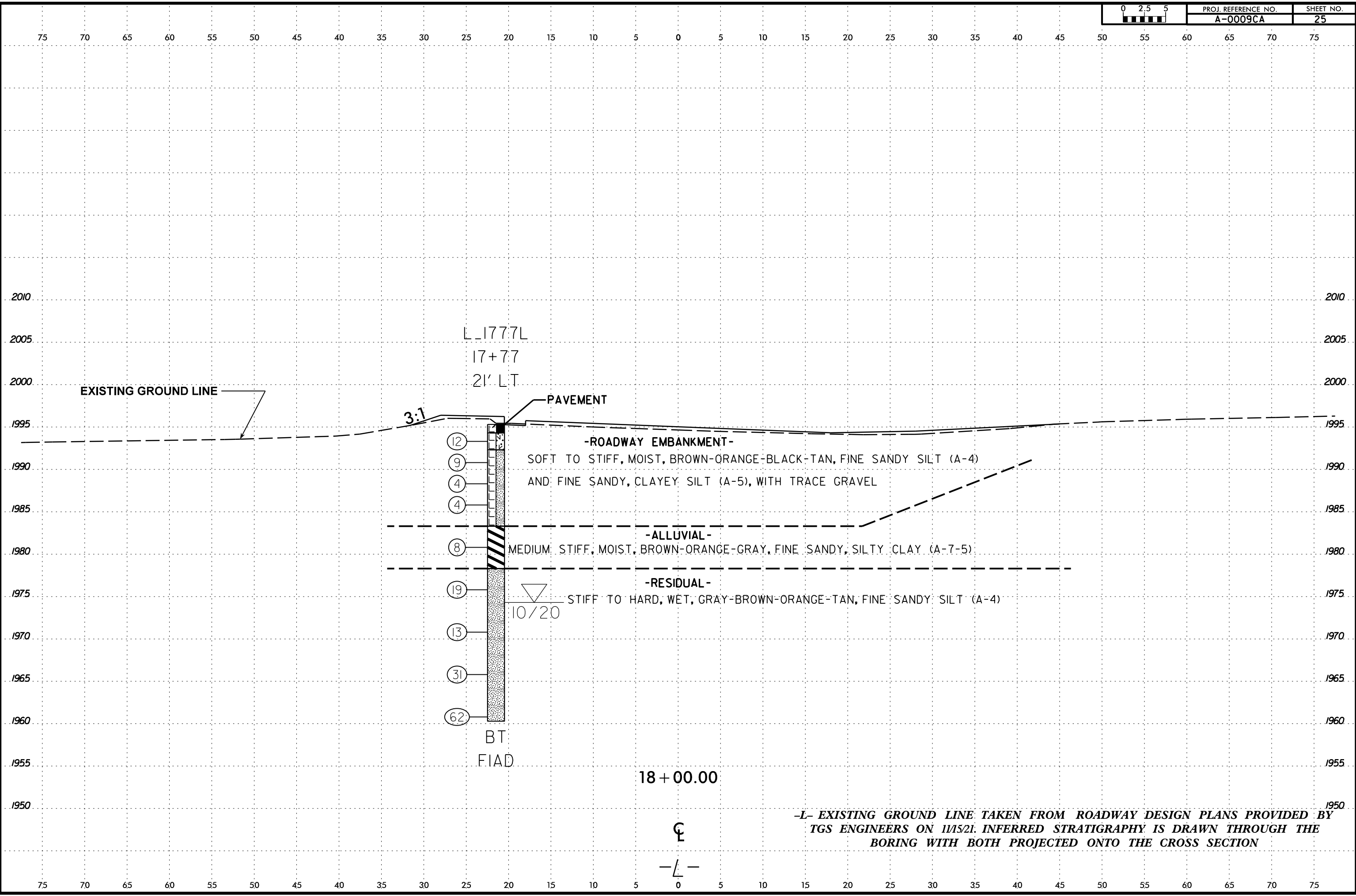


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PROJ. REFERENCE NO.	SHEET NO.
A-0009CA	25



L\_177:7L  
17+7.7  
21' LT

EXISTING GROUND LINE

3:1

PAVEMENT

- 12
- 9
- 4
- 4
- 8
- 19
- 13
- 31
- 62

-ROADWAY EMBANKMENT-

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

-ALLUVIAL-

MEDIUM STIFF, MOIST, BROWN-ORANGE-GRAY, FINE SANDY, SILTY CLAY (A-7-5)

-RESIDUAL-

STIFF TO HARD, WET, GRAY-BROWN-ORANGE-TAN, FINE SANDY SILT (A-4)

10/20

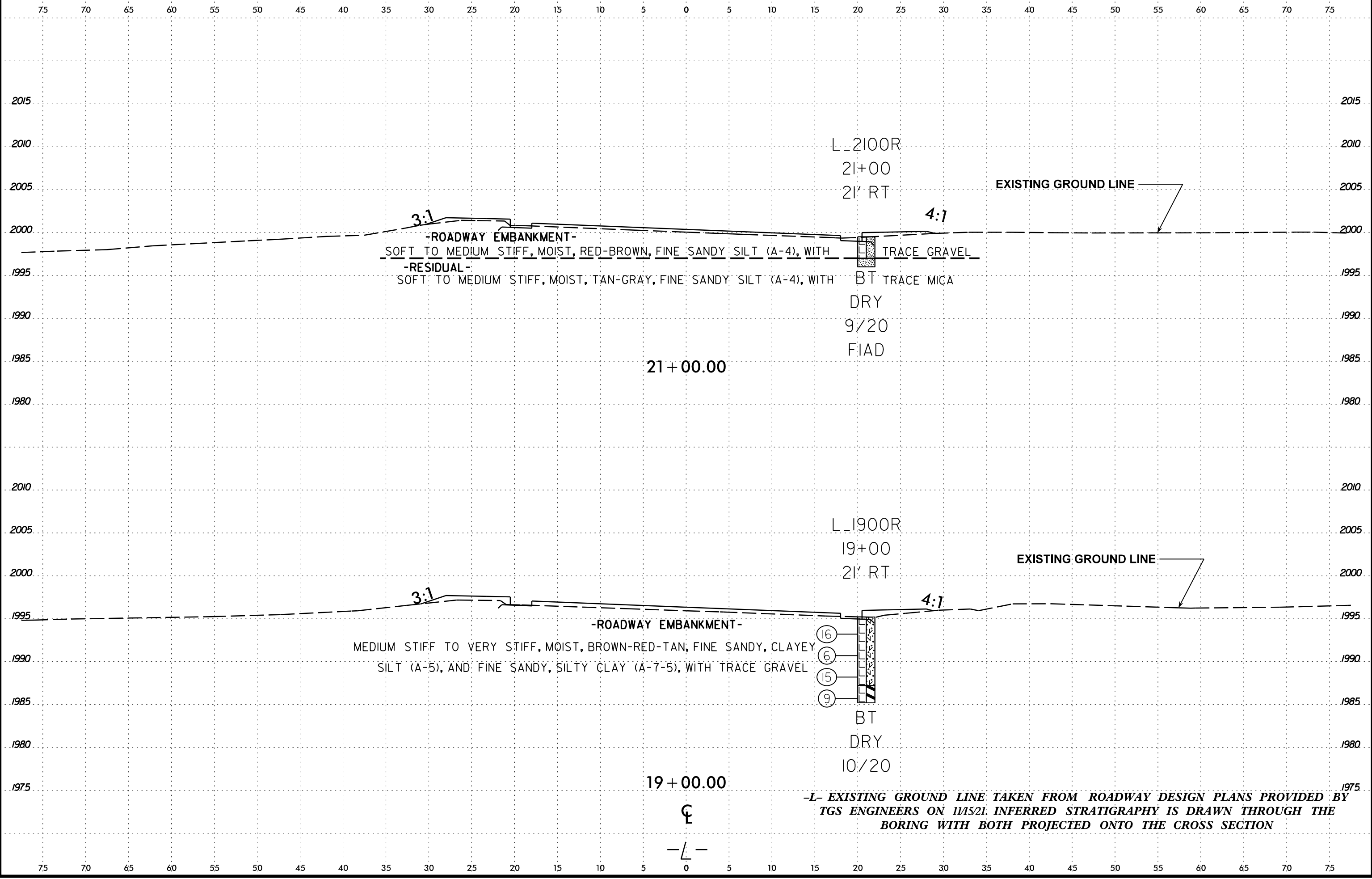
BT  
FIAD

18 + 00.00

☺

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY  
TGS ENGINEERS ON 11/5/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE  
BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

6/23/16  
29-APR-2022 12:20  
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L\_2100R  
21+00  
2' RT

**-ROADWAY EMBANKMENT-**  
SOFT TO MEDIUM STIFF, MOIST, RED-BROWN, FINE SANDY SILT (A-4), WITH TRACE GRAVEL  
**-RESIDUAL-**  
SOFT TO MEDIUM STIFF, MOIST, TAN-GRAY, FINE SANDY SILT (A-4), WITH BT TRACE MICA

21 + 00.00

L\_1900R  
19+00  
2' RT

**-ROADWAY EMBANKMENT-**  
MEDIUM STIFF TO VERY STIFF, MOIST, BROWN-RED-TAN, FINE SANDY, CLAYEY SILT (A-5), AND FINE SANDY, SILTY CLAY (A-7-5), WITH TRACE GRAVEL

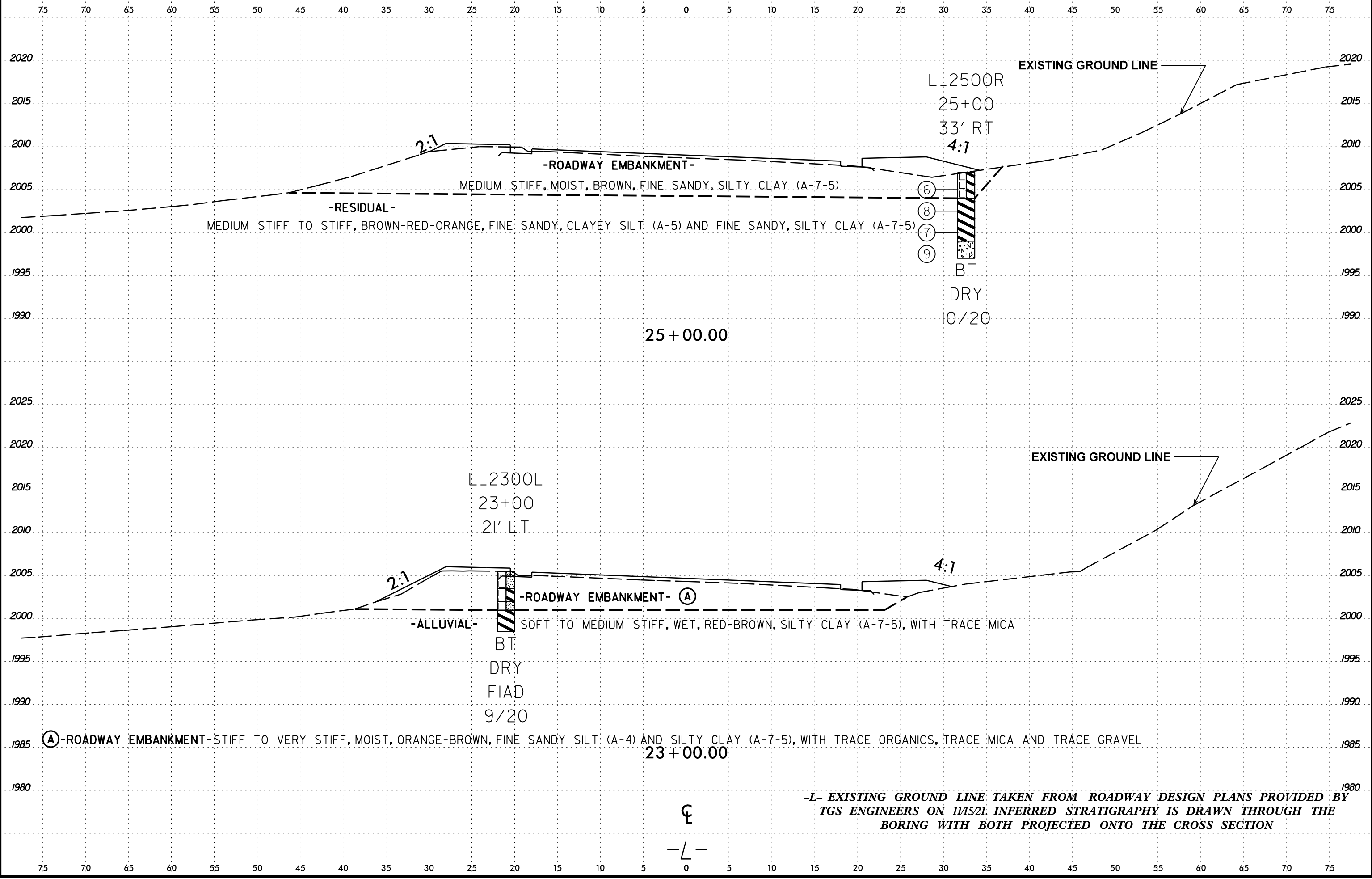
19 + 00.00

- 16
- 6
- 15
- 9

BT  
DRY  
10/20

**-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/5/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION**

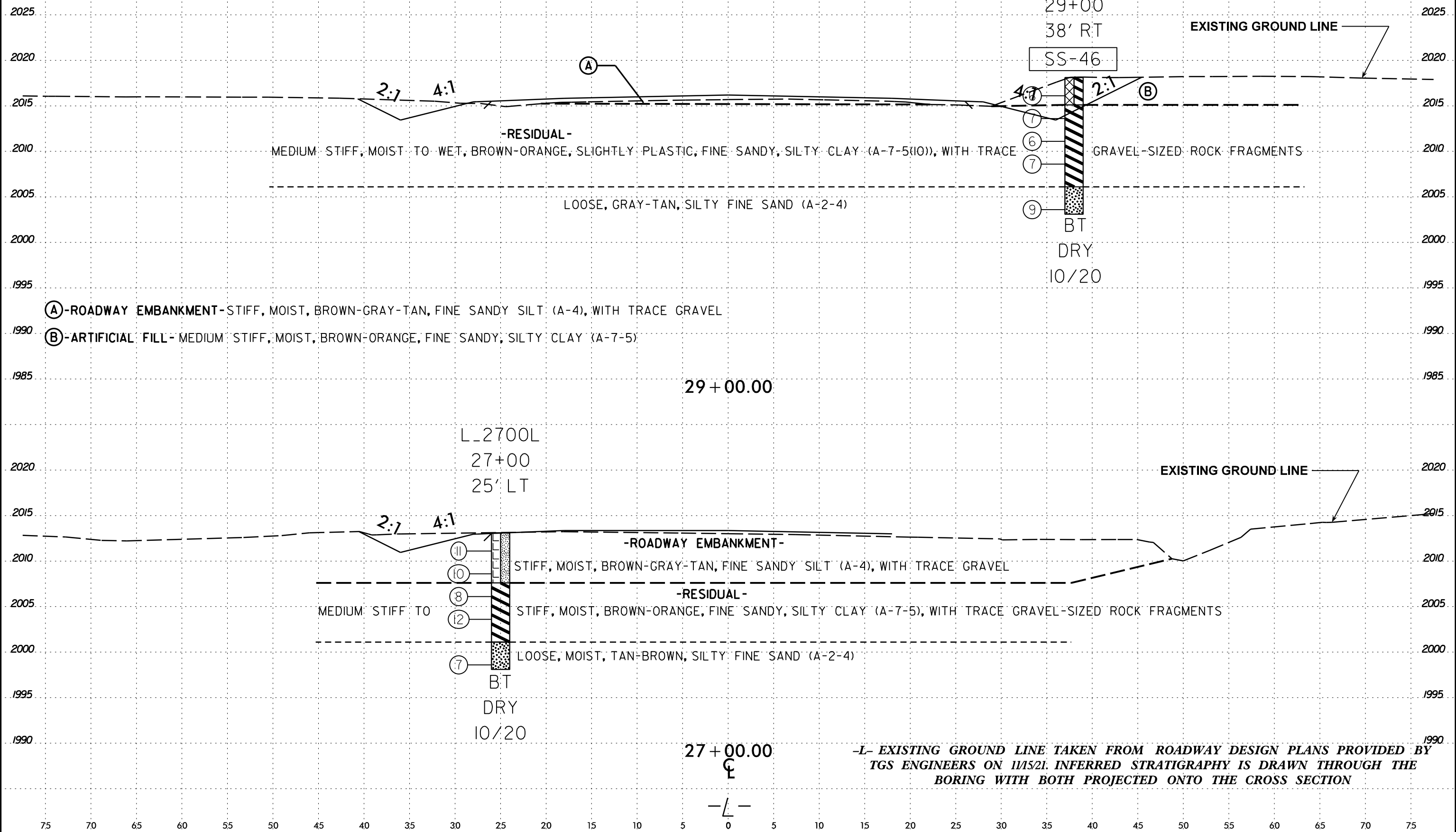
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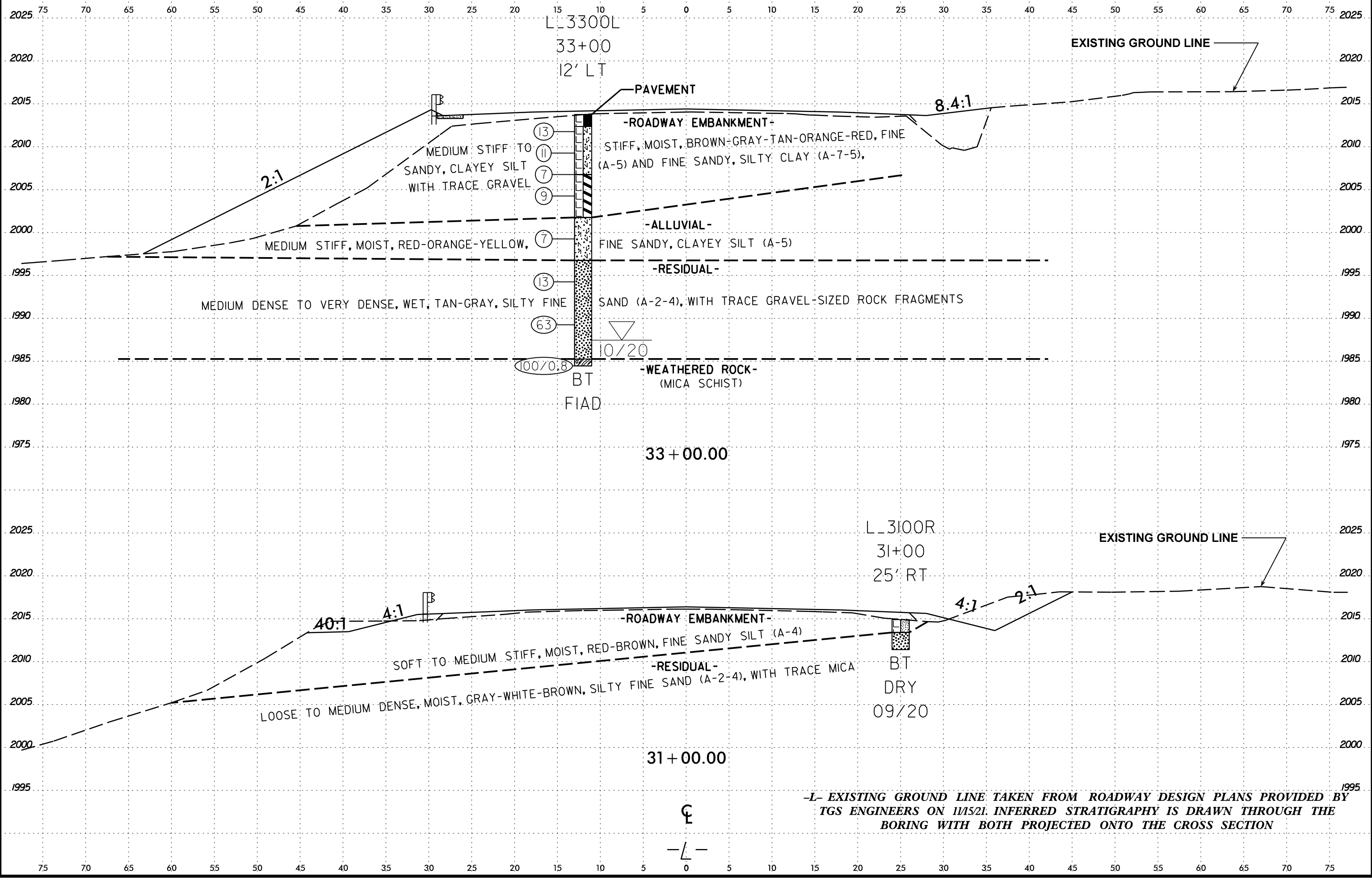
<b>SOIL TEST RESULTS</b>															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-46	38' RT	29+00 -L-	3.5 - 5.0'	A-7-5(10)	44	13	10.0	20.0	52.0	18.0	100.0	96.0	73.0	32.0	-



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



6/23/16  
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L\_3300L  
33+00  
12' LT

EXISTING GROUND LINE

PAVEMENT

-ROADWAY EMBANKMENT-

STIFF, MOIST, BROWN-GRAY-TAN-ORANGE-RED, FINE (A-5) AND FINE SANDY, SILTY CLAY (A-7-5),

MEDIUM STIFF TO SANDY, CLAYEY SILT WITH TRACE GRAVEL

- 13
- 11
- 7
- 9

8.4:1

2:1

-ALLUVIAL-

FINE SANDY, CLAYEY SILT (A-5)

MEDIUM STIFF, MOIST, RED-ORANGE-YELLOW,

- 7

-RESIDUAL-

SAND (A-2-4), WITH TRACE GRAVEL-SIZED ROCK FRAGMENTS

MEDIUM DENSE TO VERY DENSE, WET, TAN-GRAY, SILTY FINE

- 13

- 63

10/20

-WEATHERED ROCK- (MICA SCHIST)

BT  
FIAD

33 + 00.00

L\_3100R  
31+00  
25' RT

EXISTING GROUND LINE

-ROADWAY EMBANKMENT-

SOFT TO MEDIUM STIFF, MOIST, RED-BROWN, FINE SANDY SILT (A-4)

LOOSE TO MEDIUM DENSE, MOIST, GRAY-WHITE-BROWN, SILTY FINE SAND (A-2-4), WITH TRACE MICA

-RESIDUAL-

BT  
DRY  
09/20

40:1

4:1

4:1

2:1

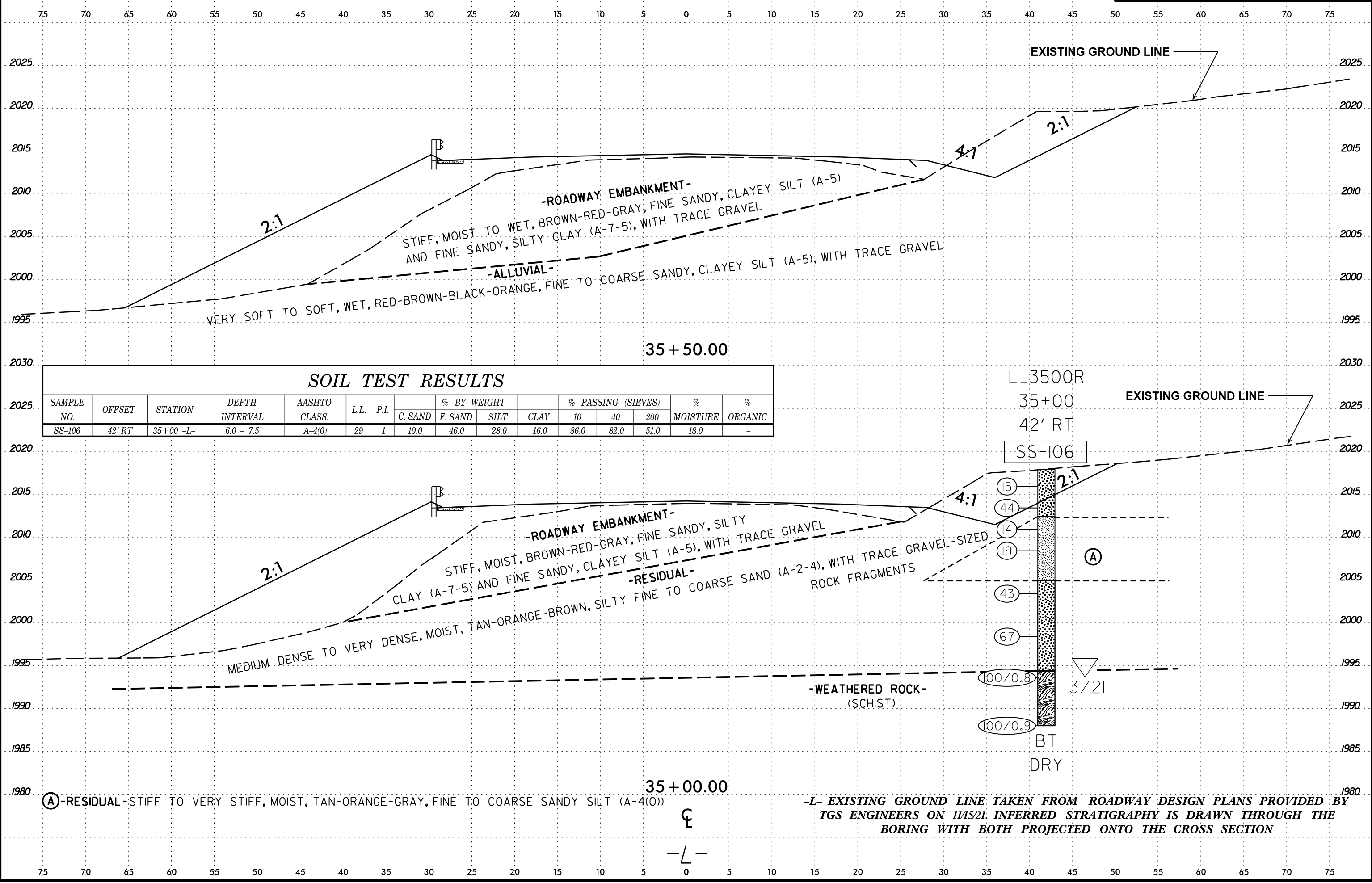
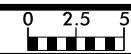
31 + 00.00

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/5/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

⊕

-L-

6/23/16  
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 jgibson



35 + 50.00

**SOIL TEST RESULTS**

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-106	42' RT	35+00 -L-	6.0 - 7.5'	A-4(0)	29	1	10.0	46.0	28.0	16.0	86.0	82.0	51.0	18.0	-

L\_3500R  
35+00  
42' RT

SS-106

- (15)
- (44)
- (44)
- (14)
- (19)
- (43)
- (67)
- (100/0.8)
- (100/0.9)

3/21

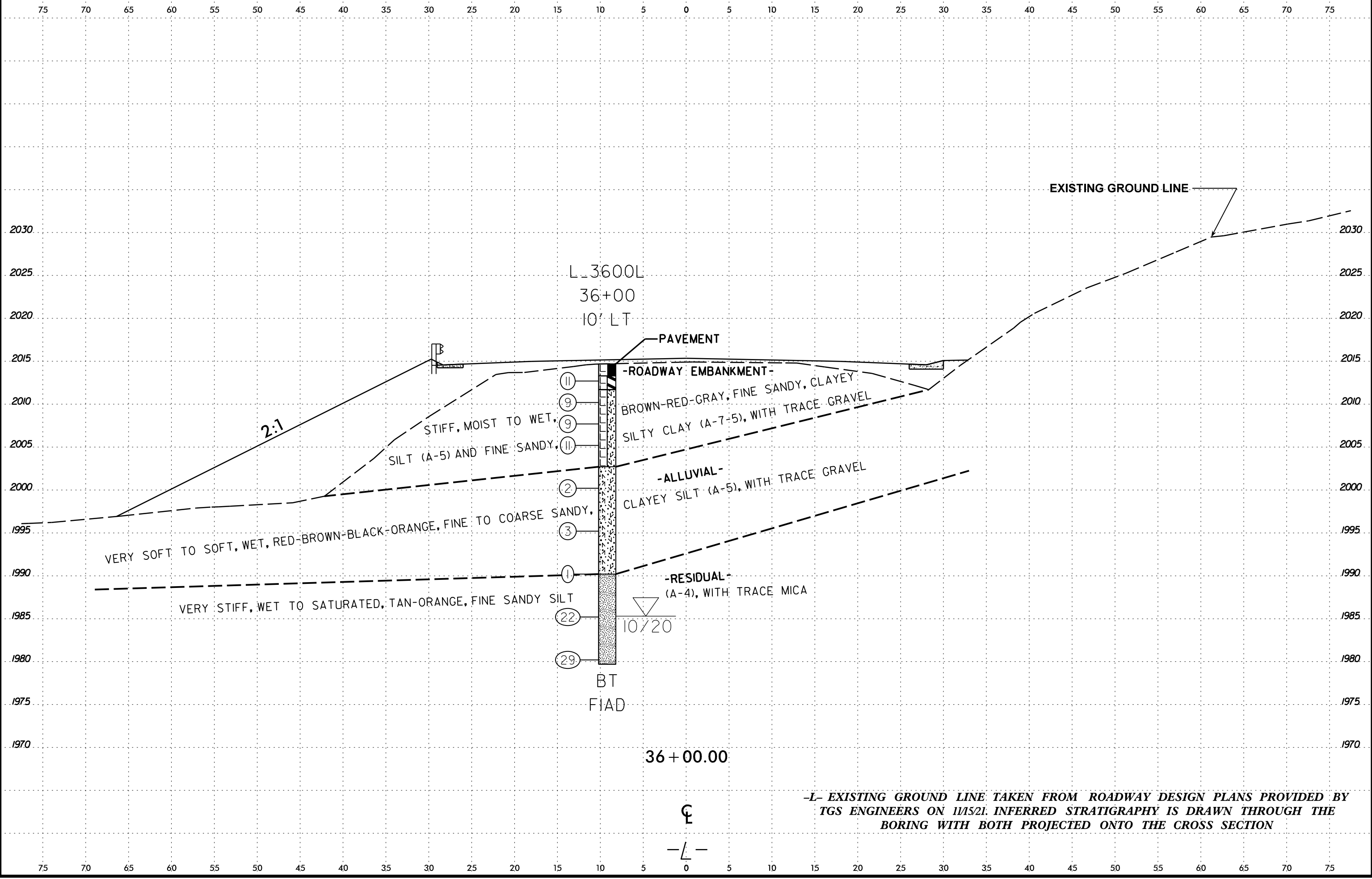
BT  
DRY

(A)-RESIDUAL-STIFF TO VERY STIFF, MOIST, TAN-ORANGE-GRAY, FINE TO COARSE SANDY SILT (A-4(0))

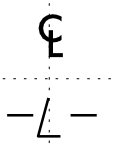
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-L-

6/23/16  
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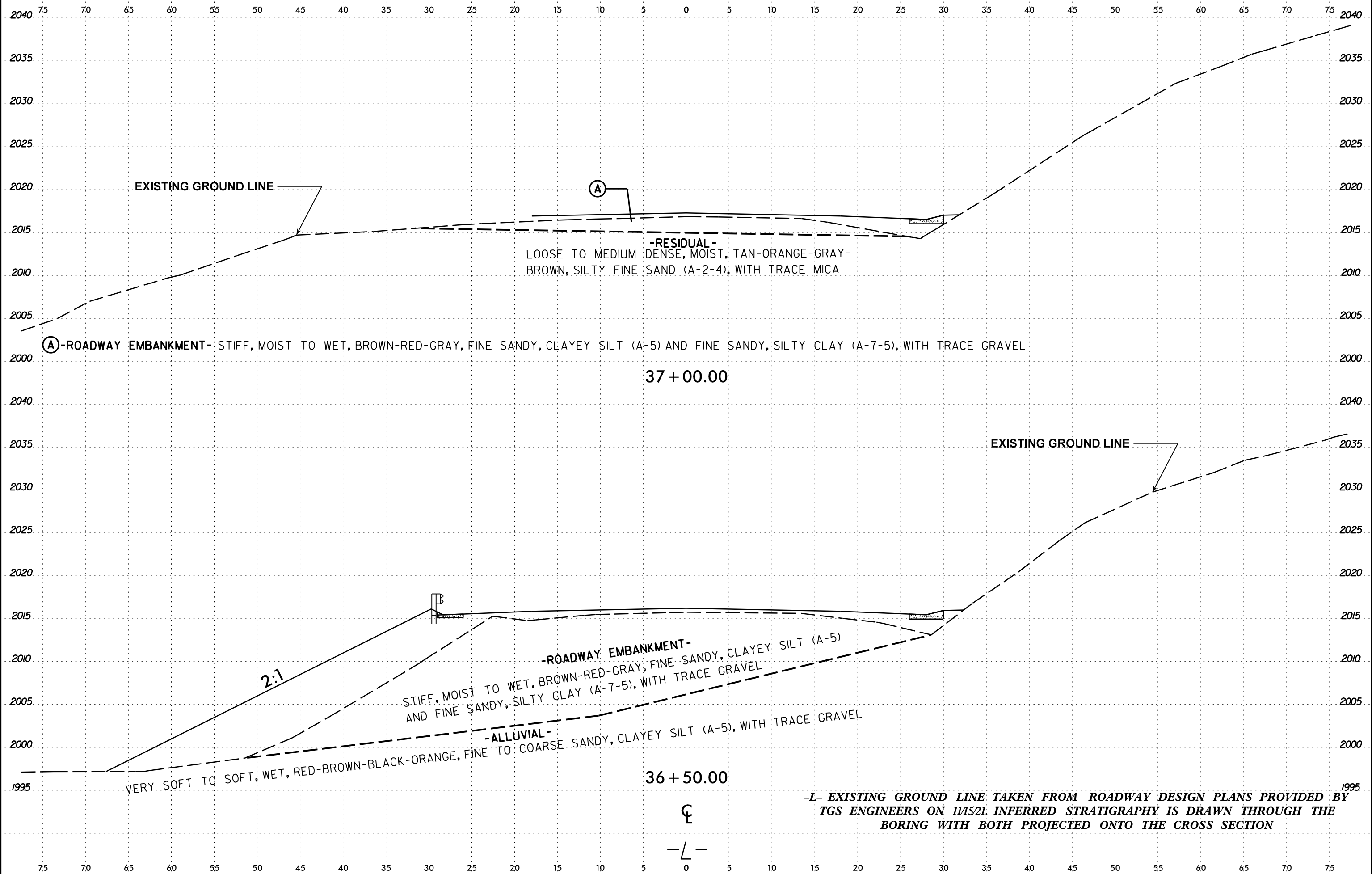
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6/23/16

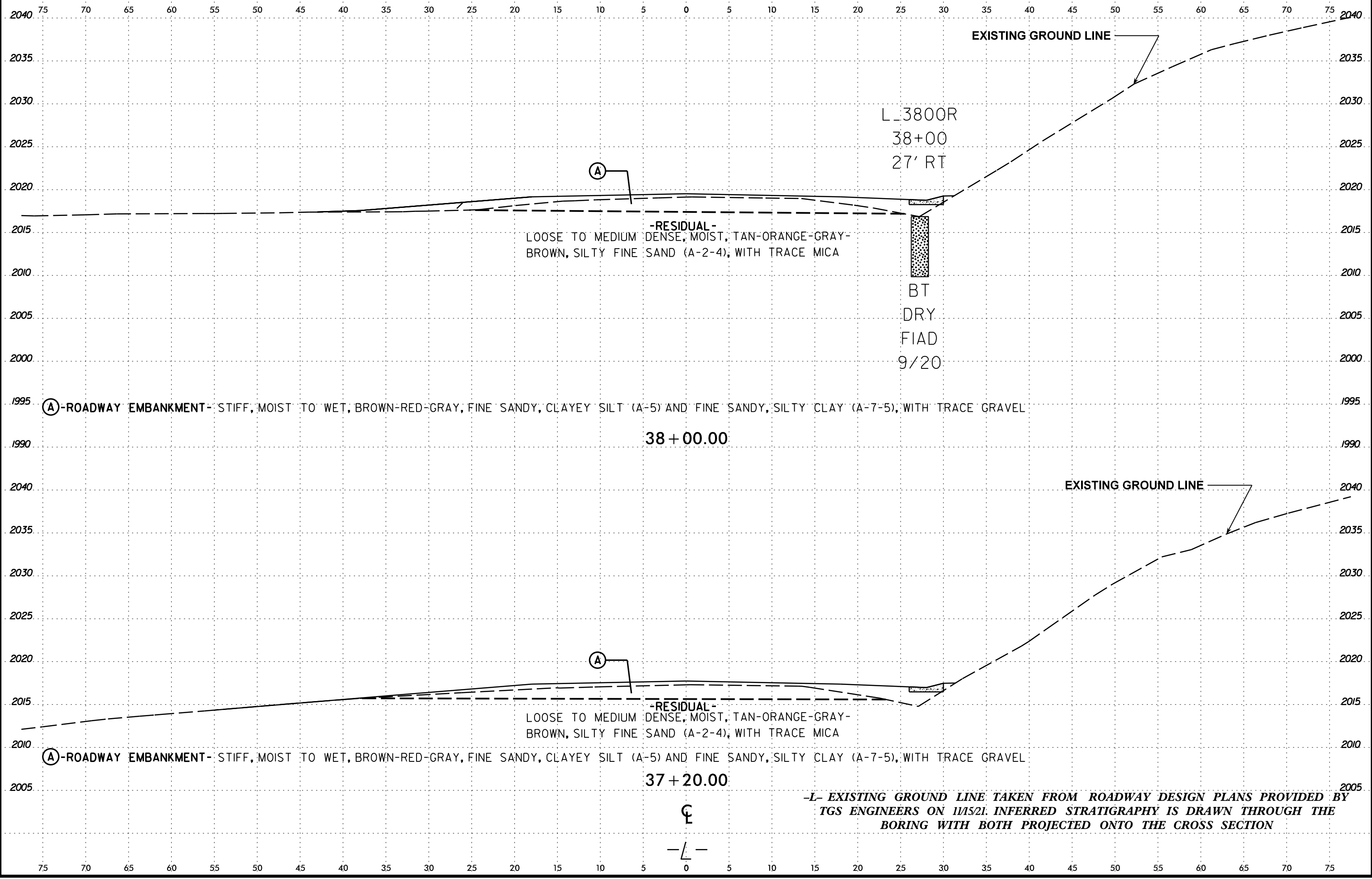


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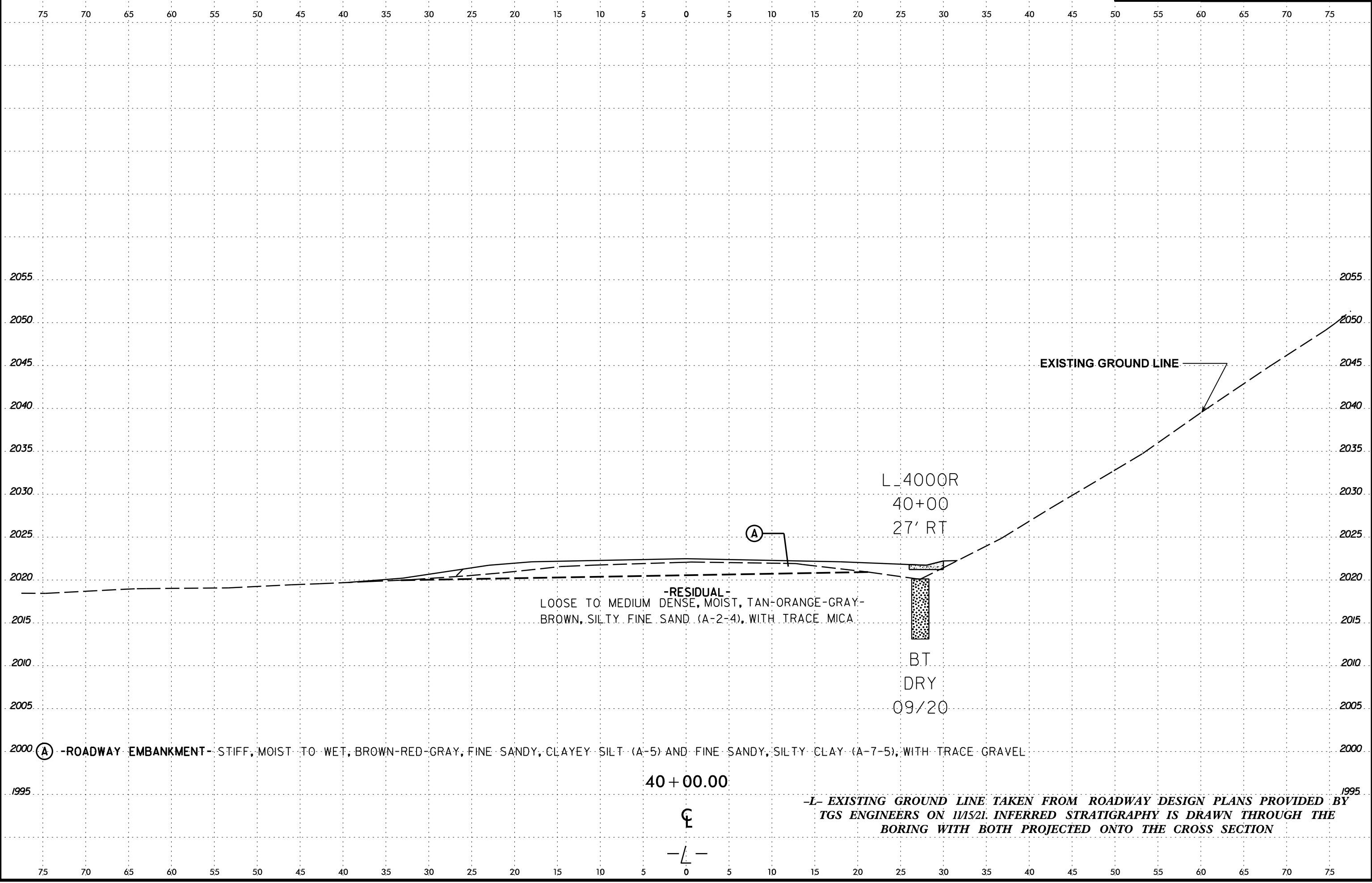
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PROJ. REFERENCE NO.	SHEET NO.
A-0009CA	34



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2055 2055

2050 2050

2045 2045

2040 2040

2035 2035

2030 2030

2025 2025

2020 2020

2015 2015

2010 2010

2005 2005

2000 2000

1995 1995

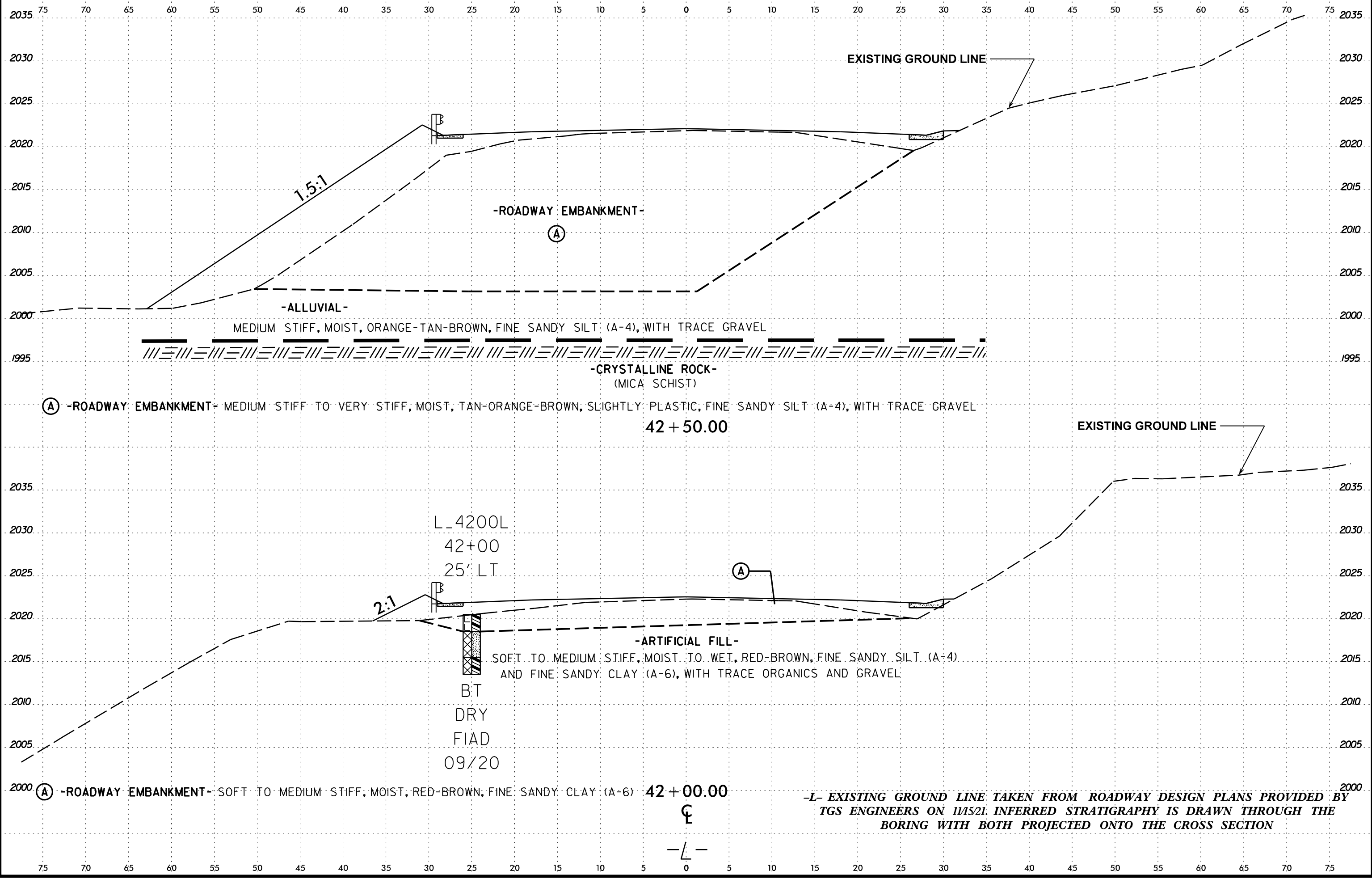
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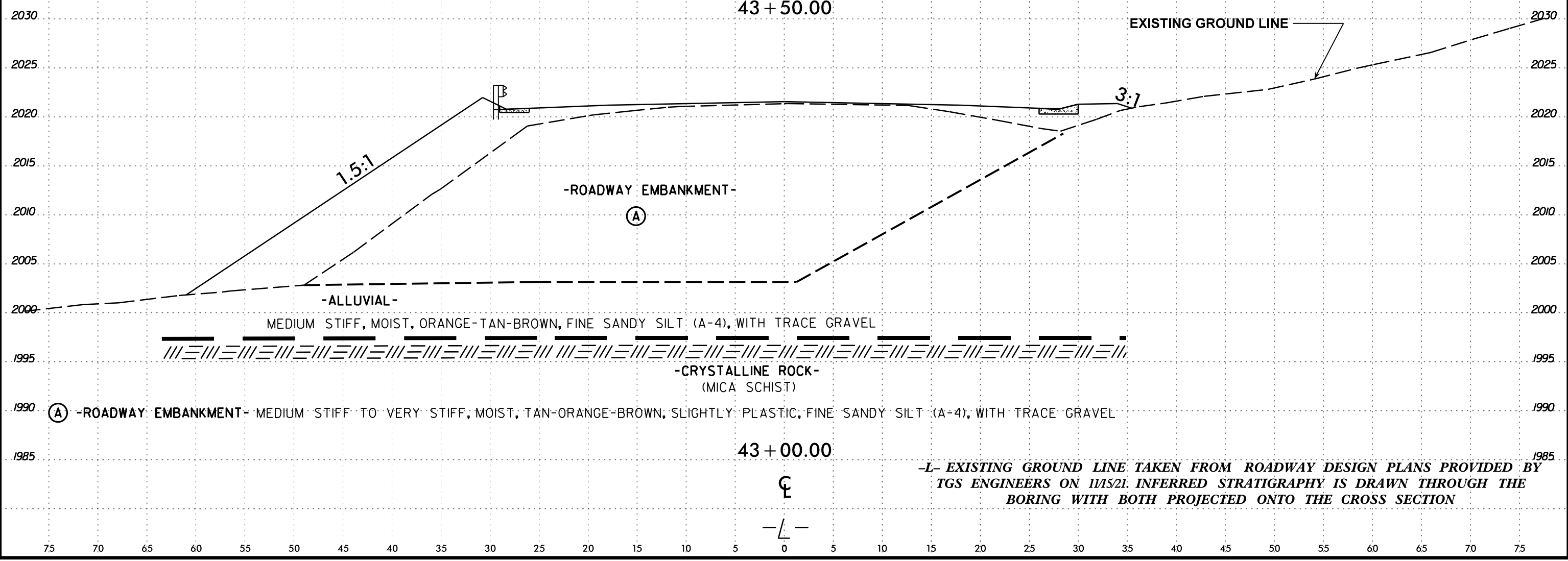
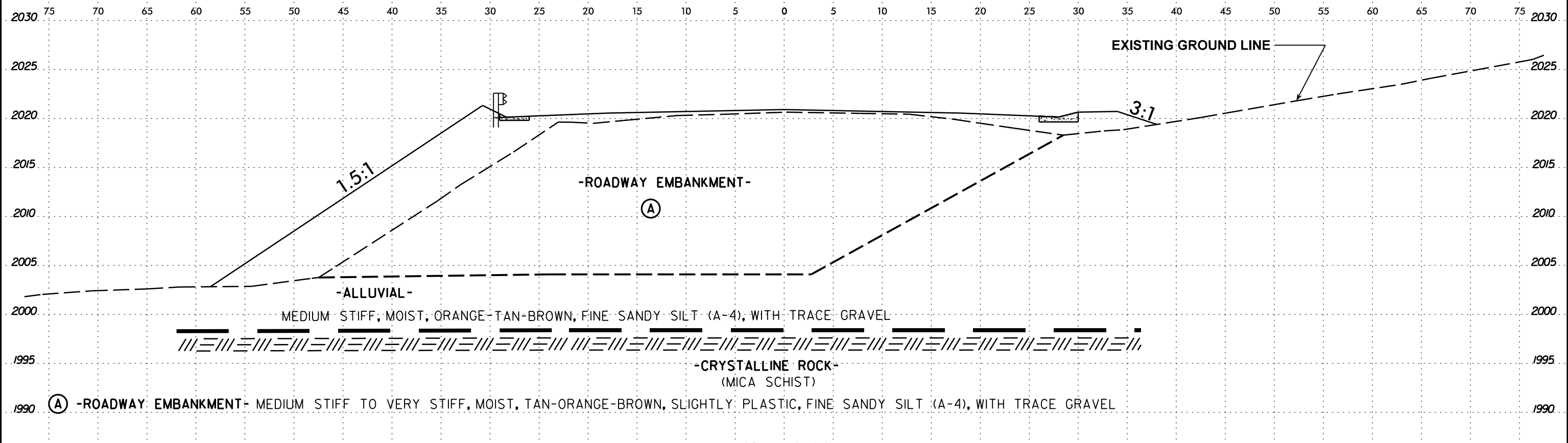
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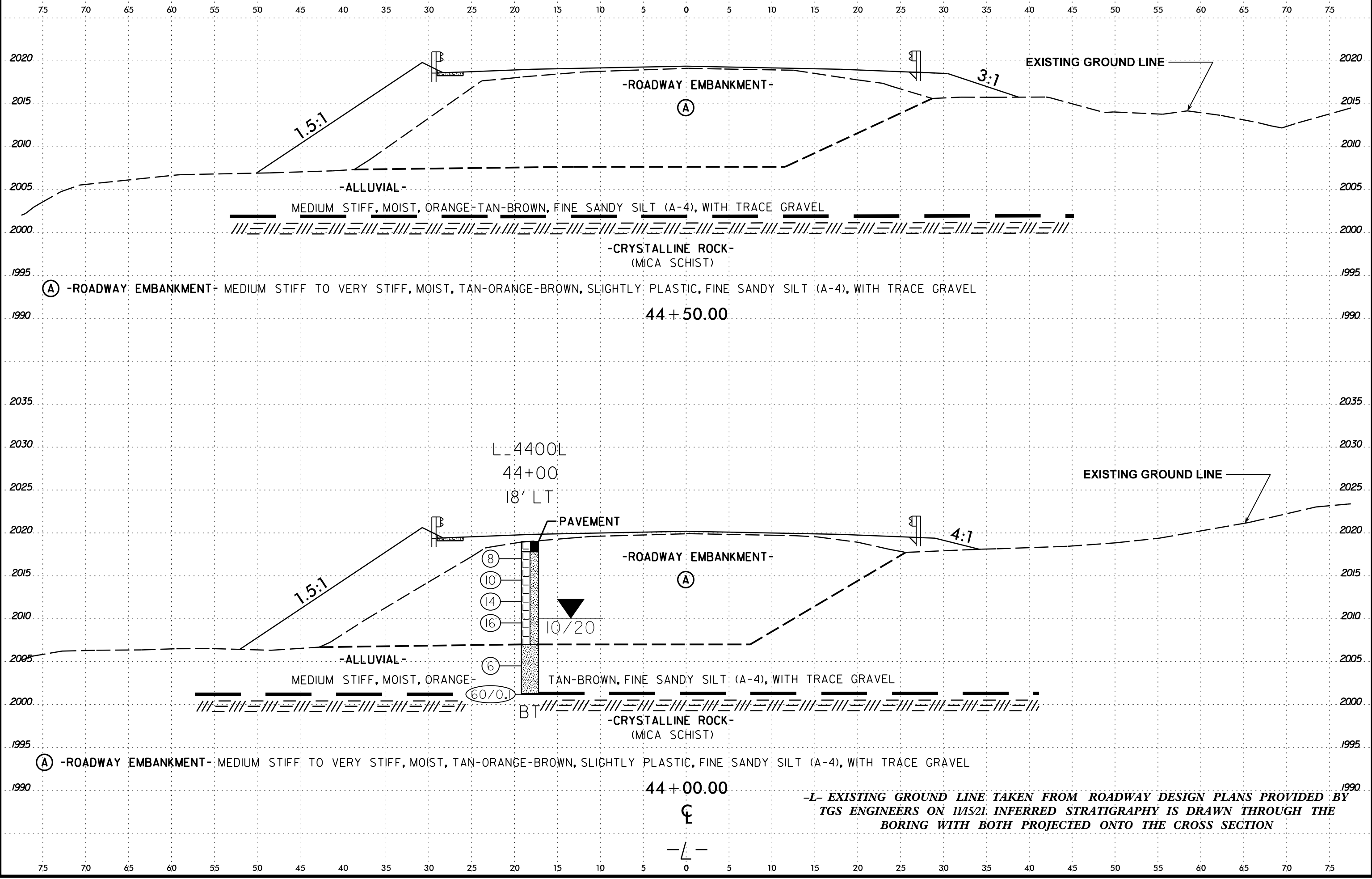


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-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

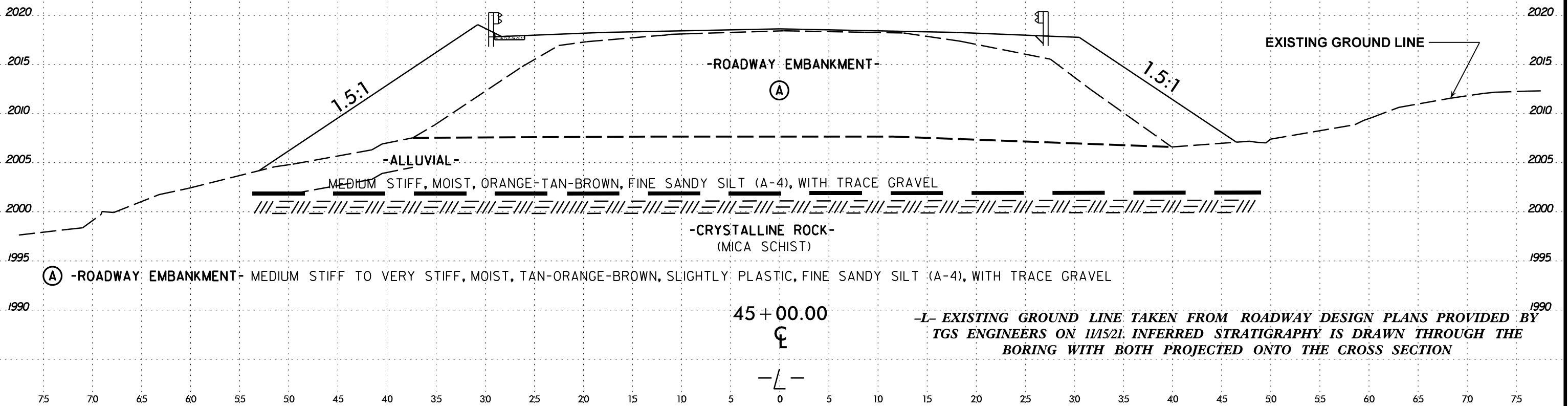
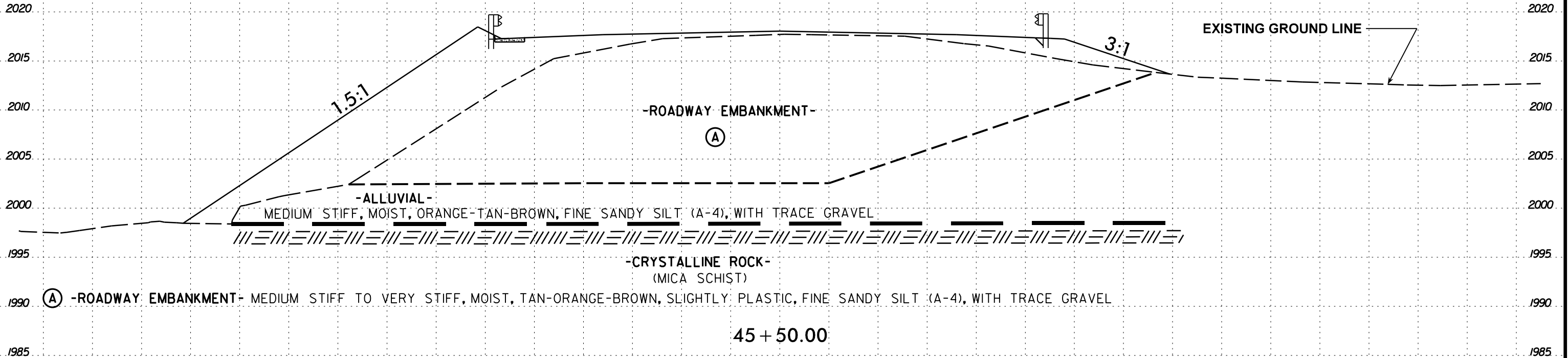
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PROJ. REFERENCE NO.  
A-0009CA

SHEET NO.  
38

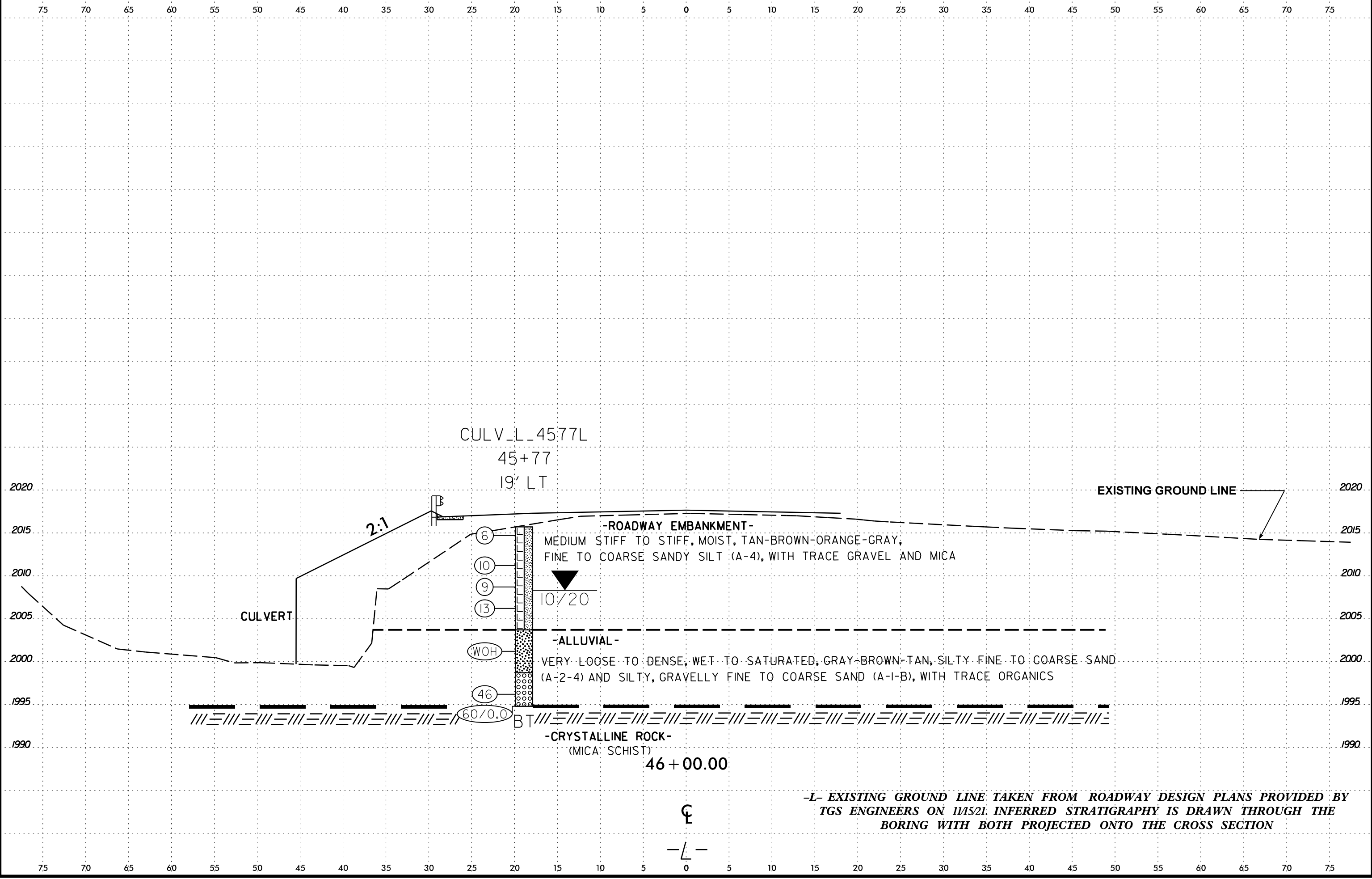
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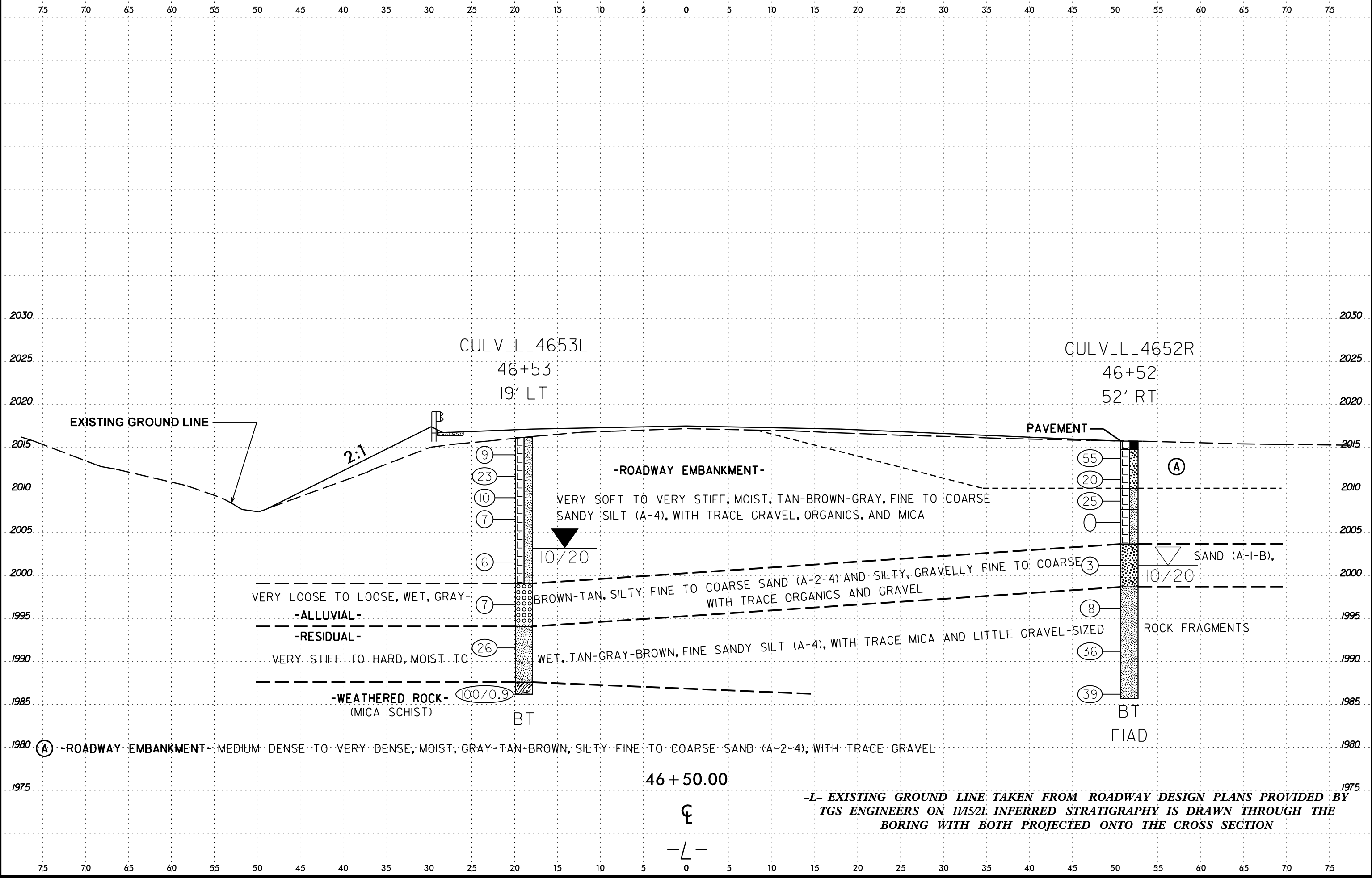
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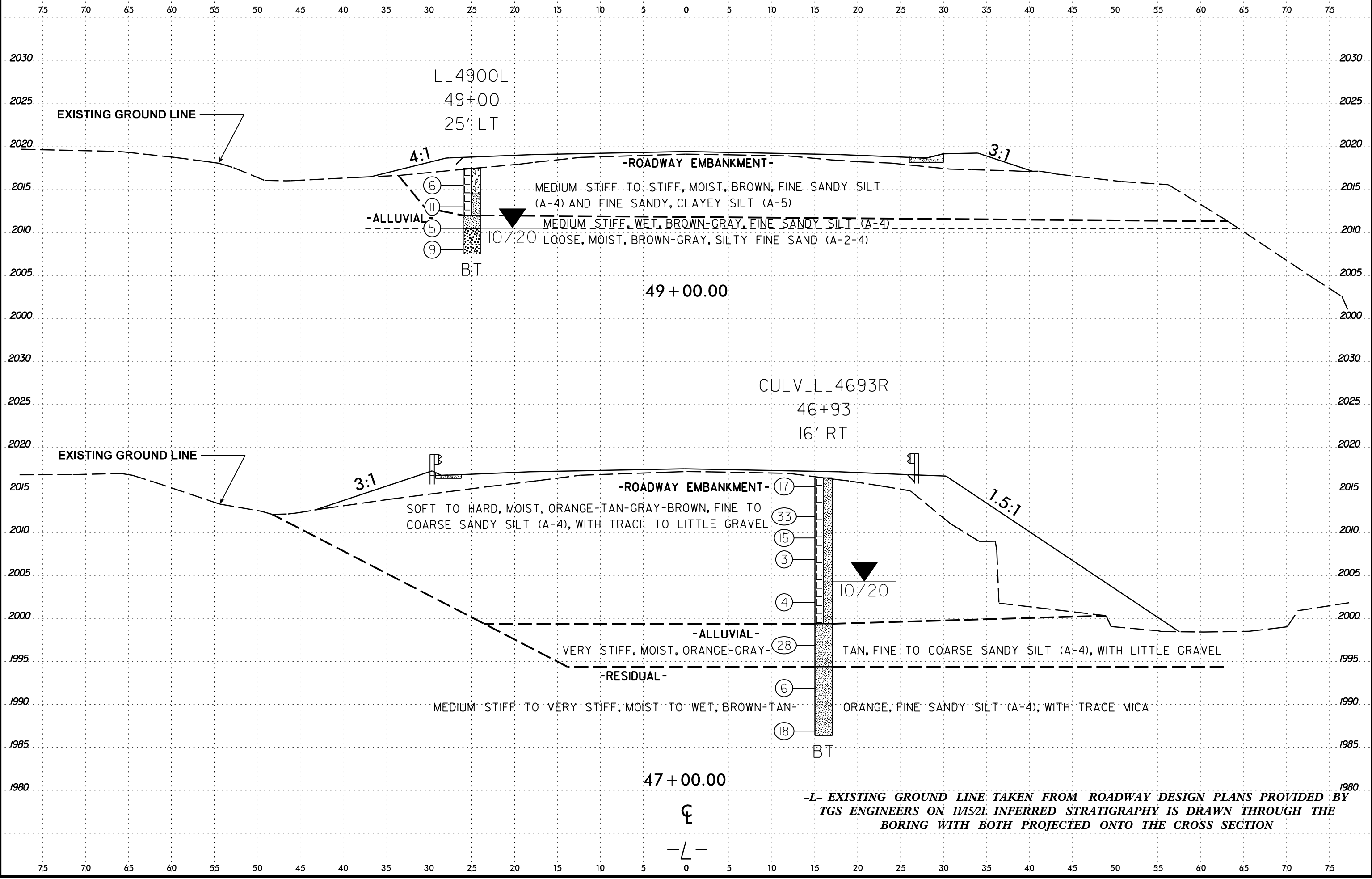
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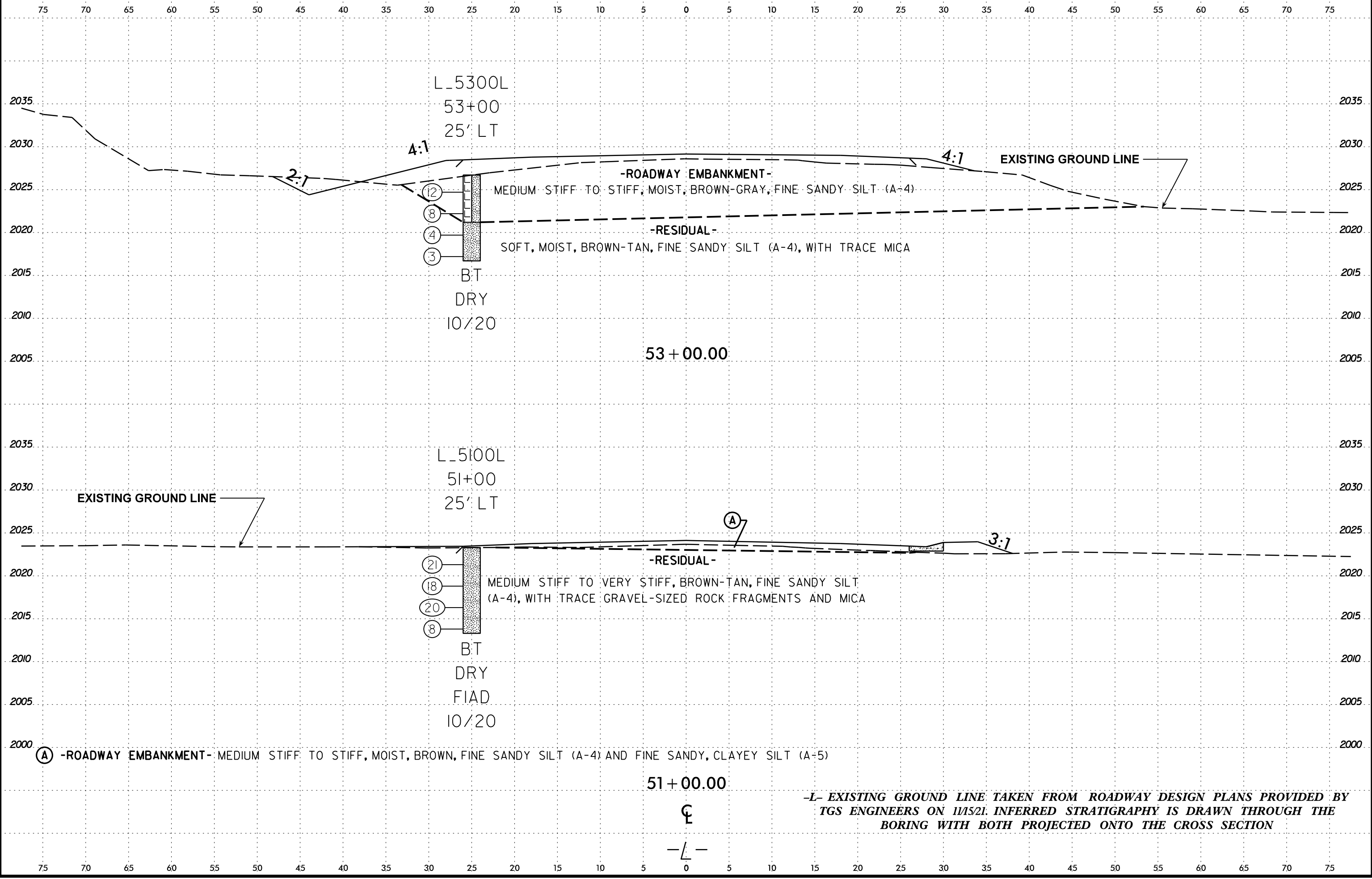
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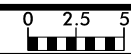
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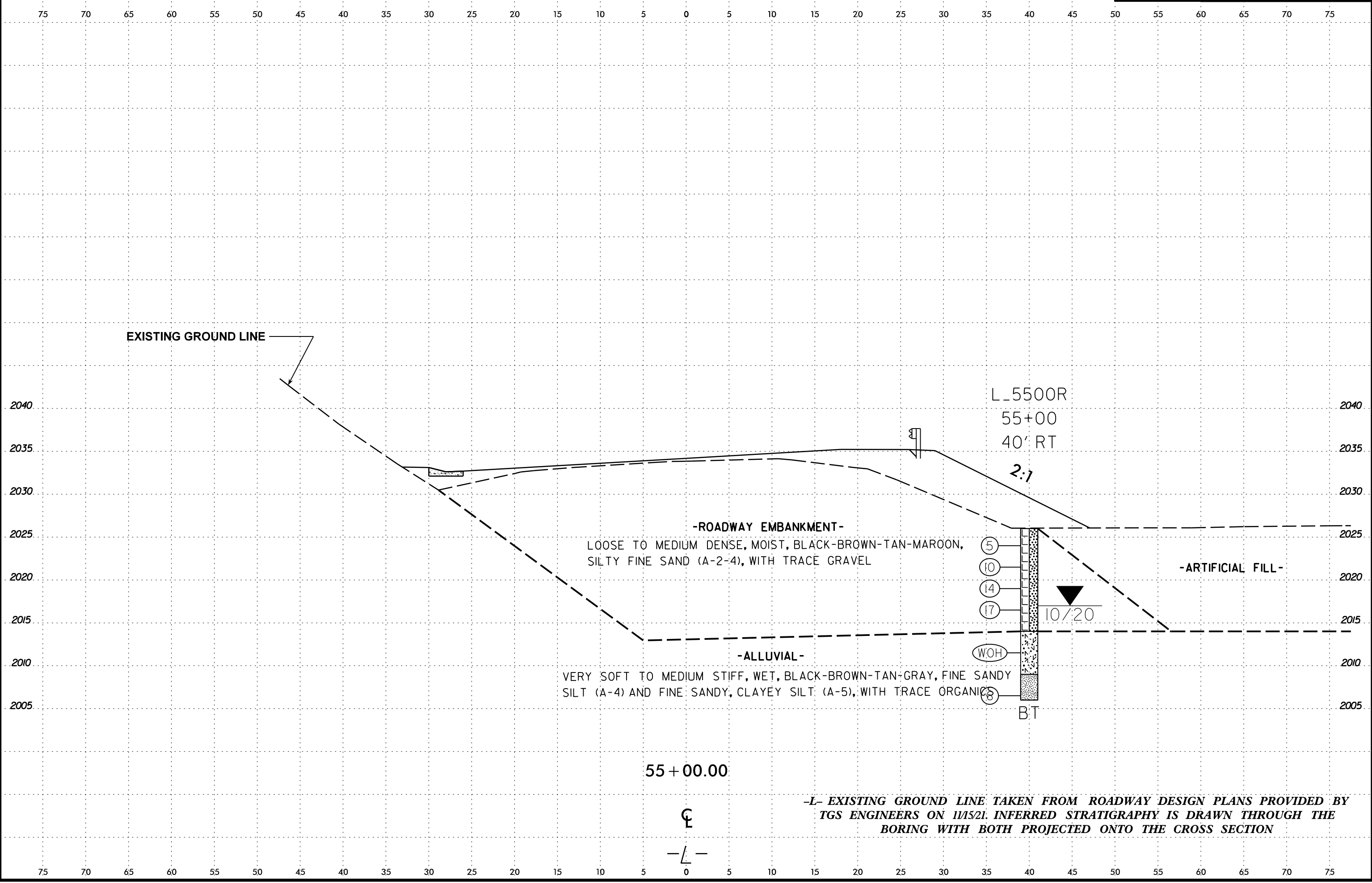
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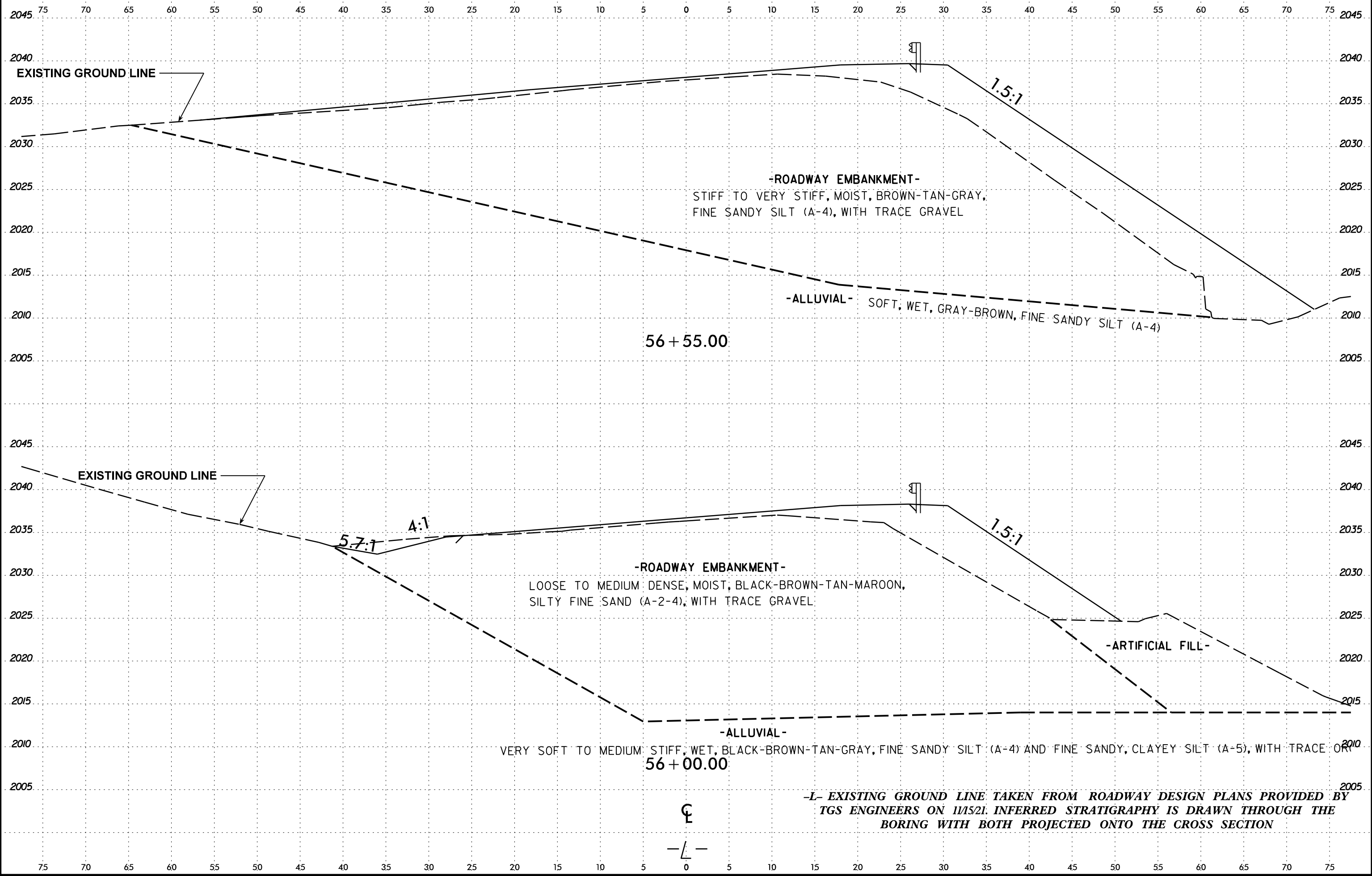
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A-0009CA	43



6/23/16  
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PROJ. REFERENCE NO.	SHEET NO.
A-0009CA	44



2045 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 2045

2040 2040

2035 2035

2030 2030

2025 2025

2020 2020

2015 2015

2010 2010

2005 2005

2045 2045

2040 2040

2035 2035

2030 2030

2025 2025

2020 2020

2015 2015

2010 2010

2005 2005

EXISTING GROUND LINE

EXISTING GROUND LINE

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

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

-ALLUVIAL-  
SOFT, WET, GRAY-BROWN, FINE SANDY SILT (A-4)

-ALLUVIAL-  
VERY SOFT TO MEDIUM STIFF, WET, BLACK-BROWN-TAN-GRAY, FINE SANDY SILT (A-4) AND FINE SANDY, CLAYEY SILT (A-5), WITH TRACE OR

56 + 55.00

56 + 00.00

1.5:1

4:1

5.7:1

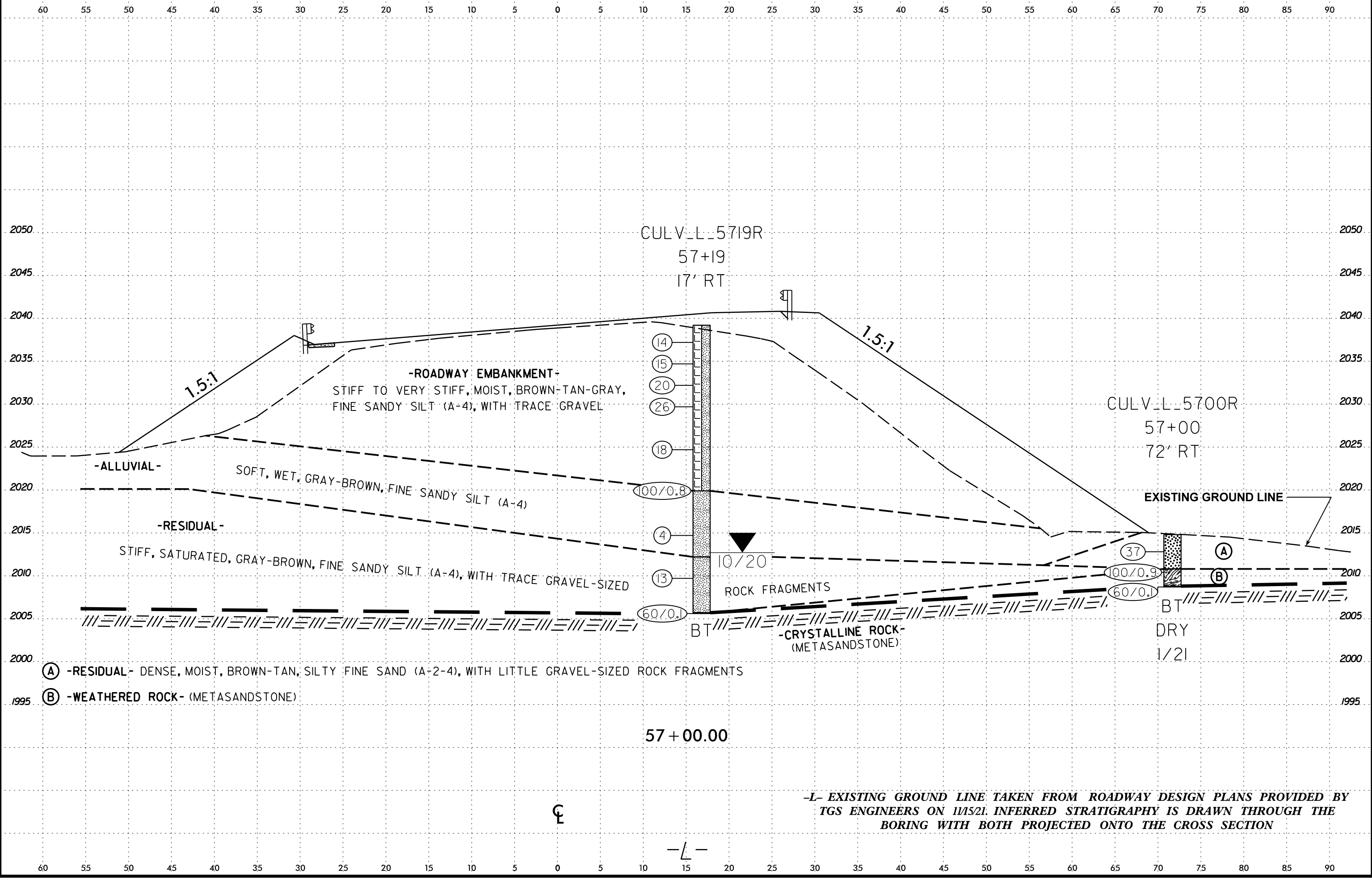
1.5:1

-ARTIFICIAL FILL-

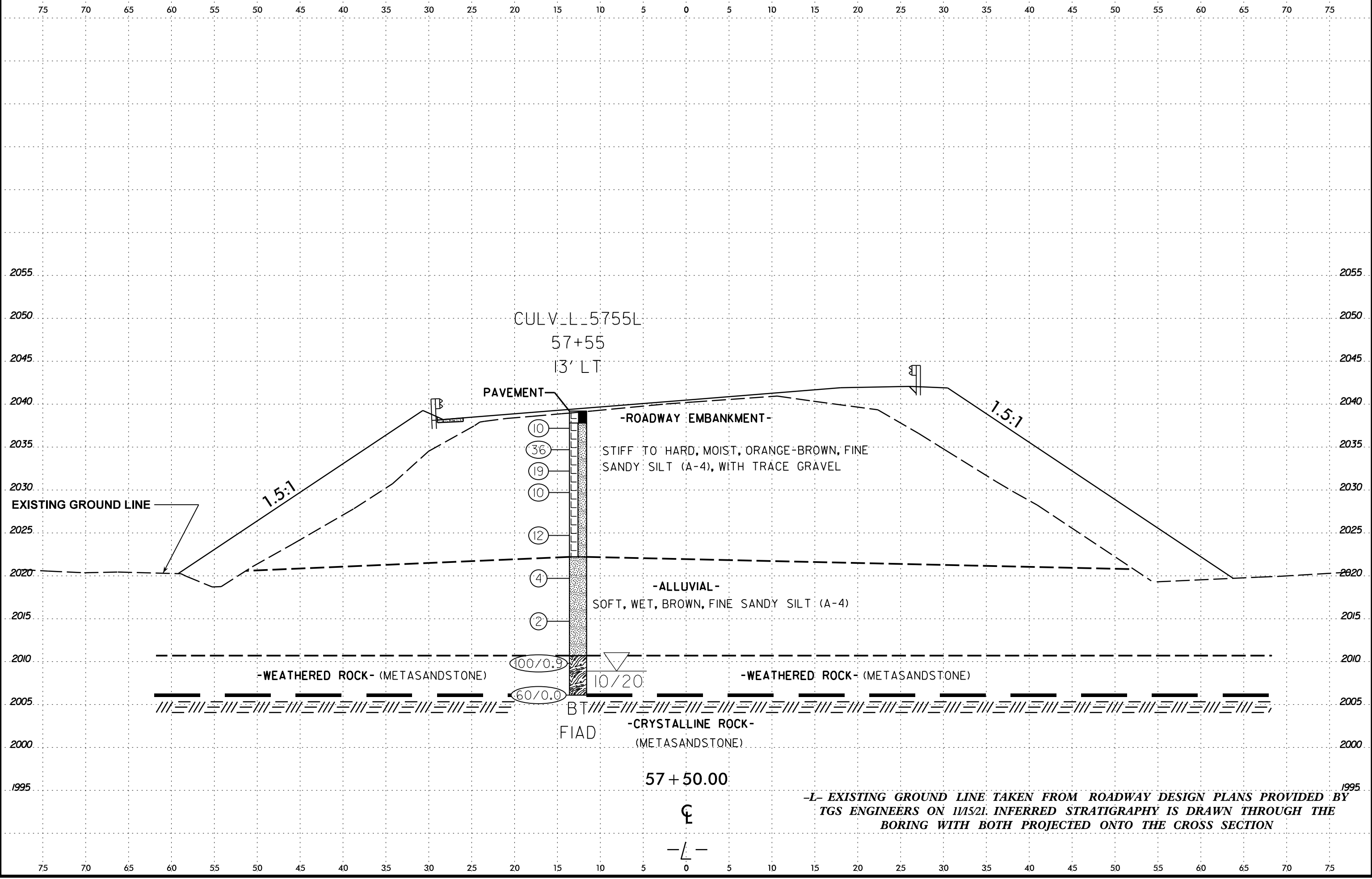
-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY  
TGS ENGINEERS ON 11/5/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE  
BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION



6/23/16  
29-APR-2022 12:21  
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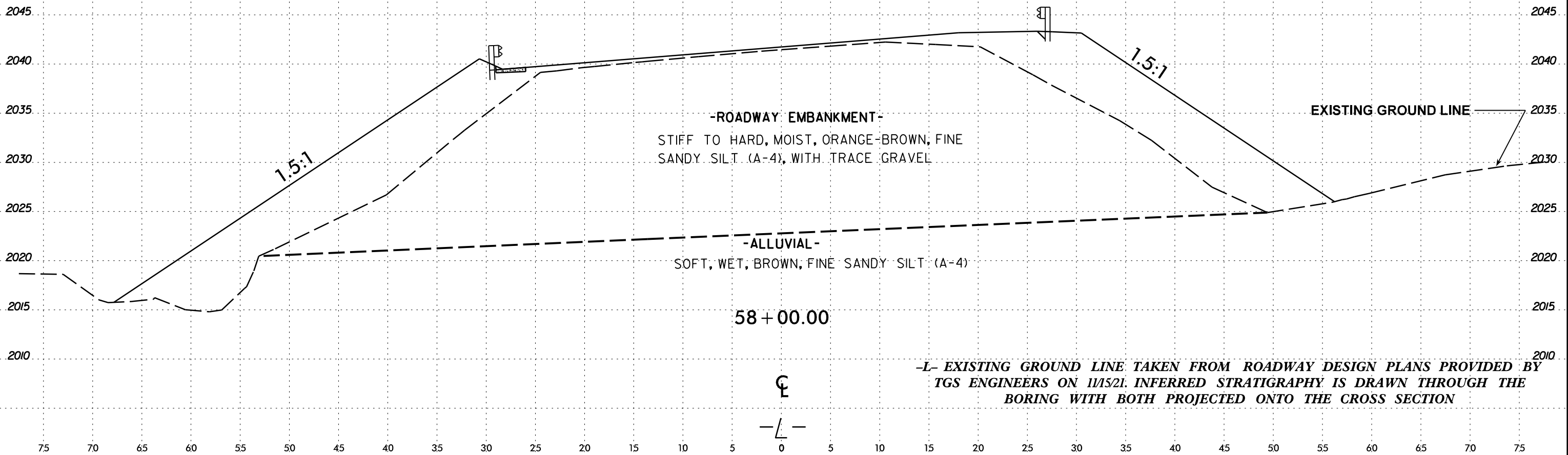
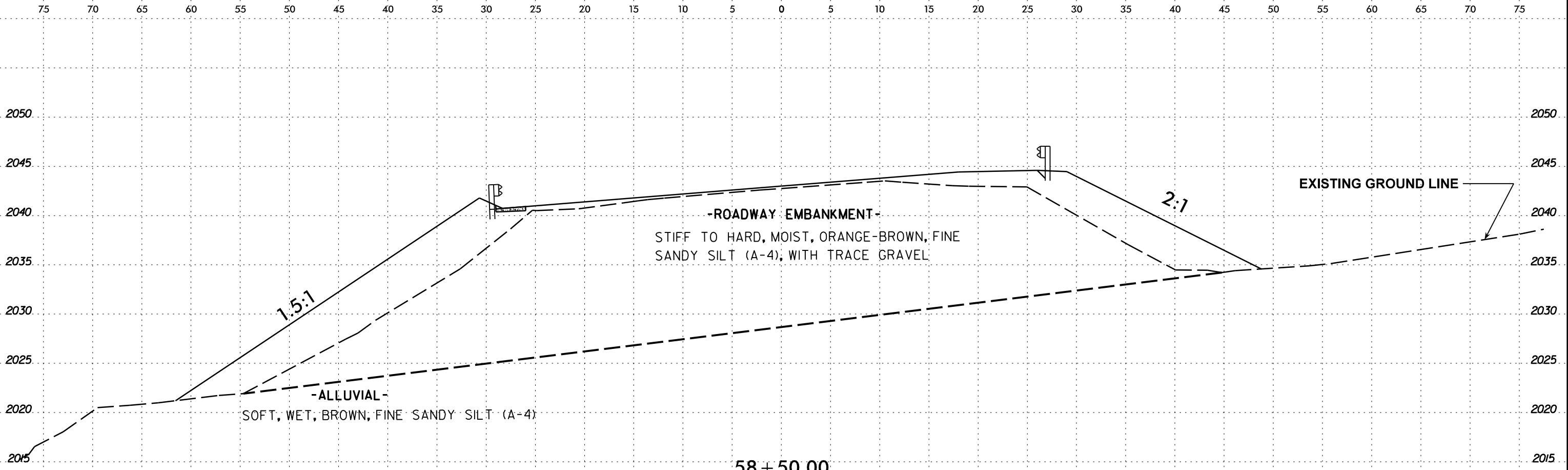


-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/5/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

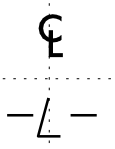
6/23/16



PROJ. REFERENCE NO.	SHEET NO.
A-0009CA	47

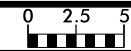


-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/5/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

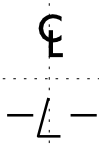
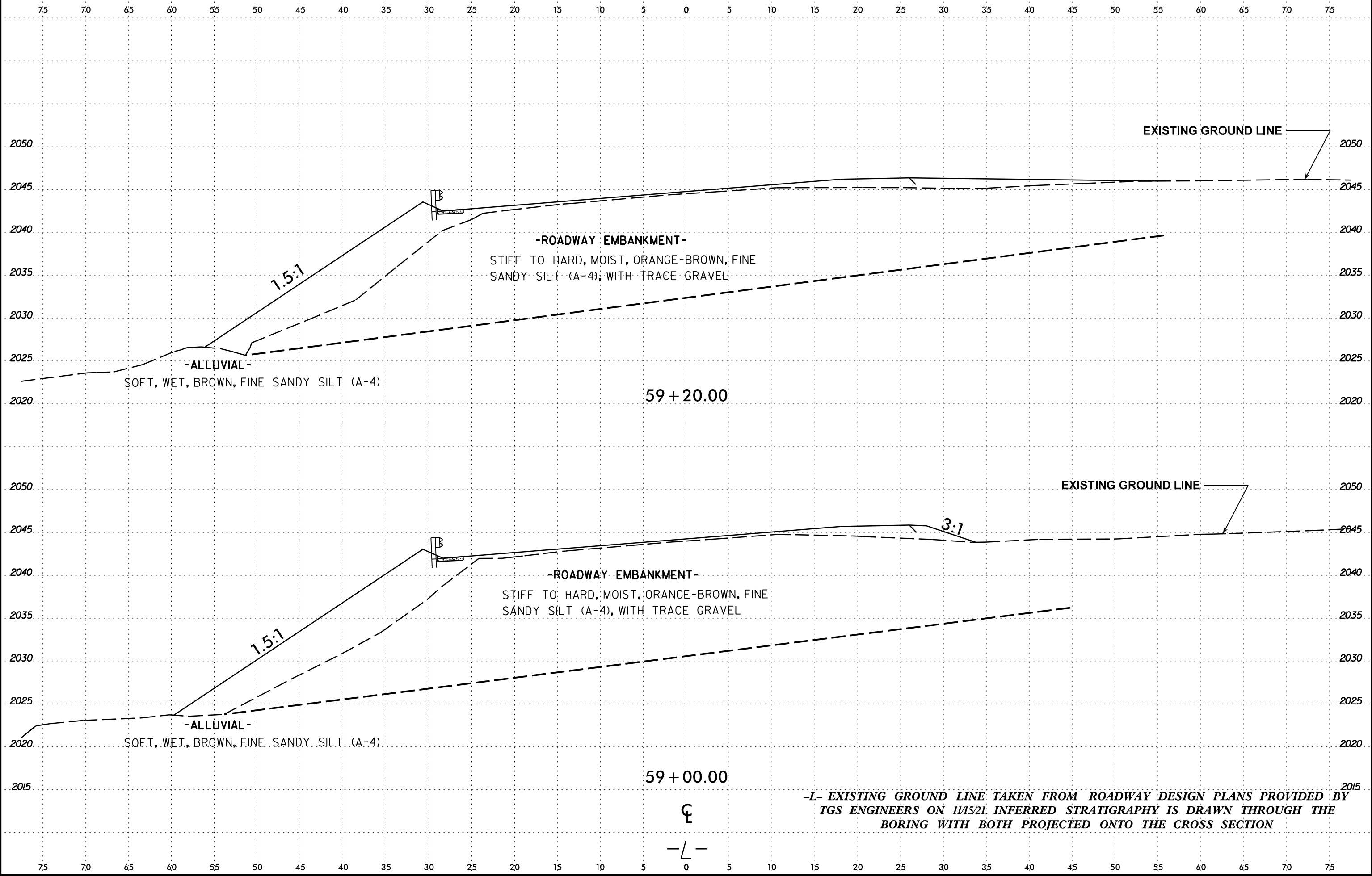


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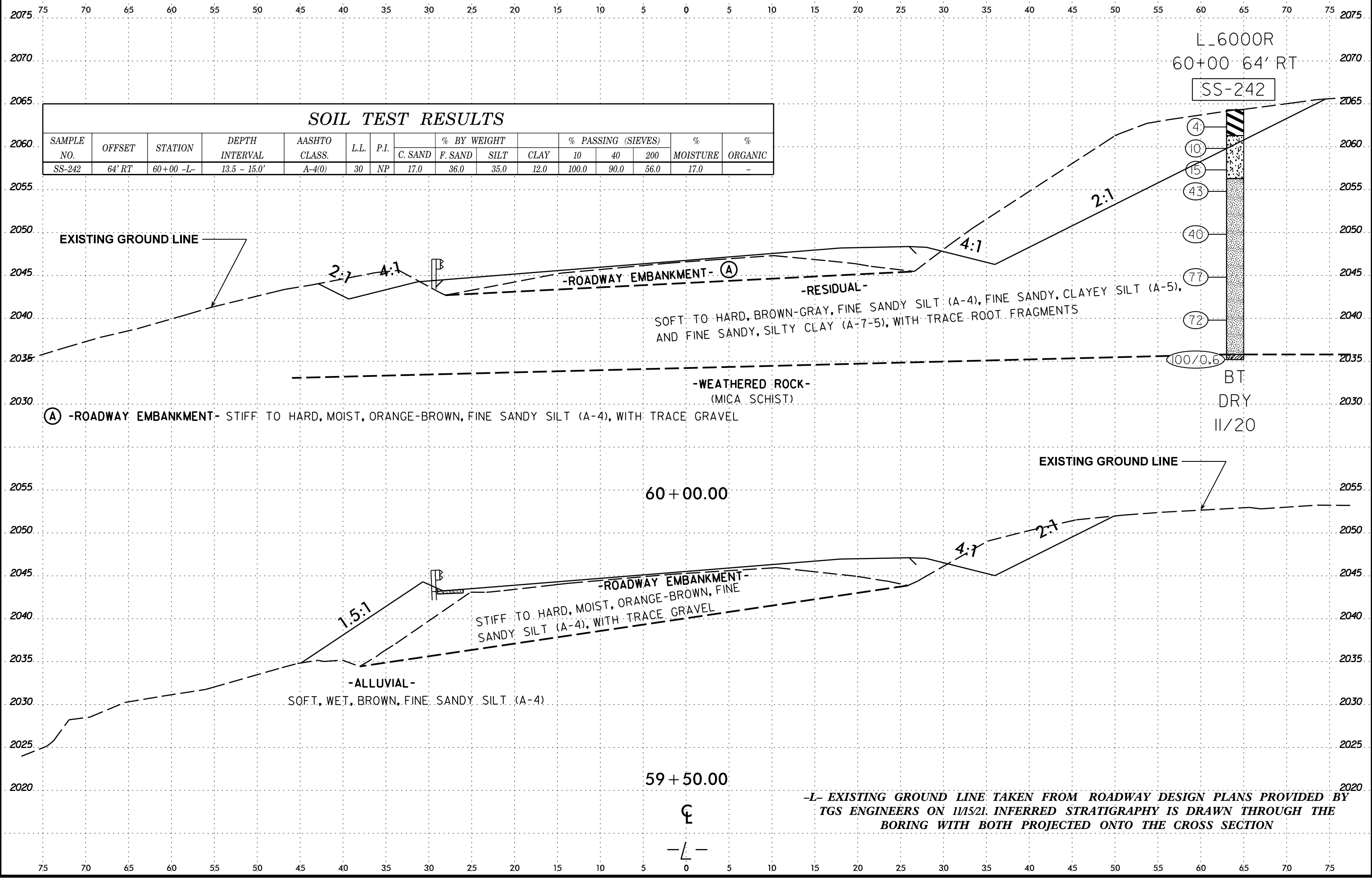
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PROJ. REFERENCE NO.	SHEET NO.
A-0009CA	48



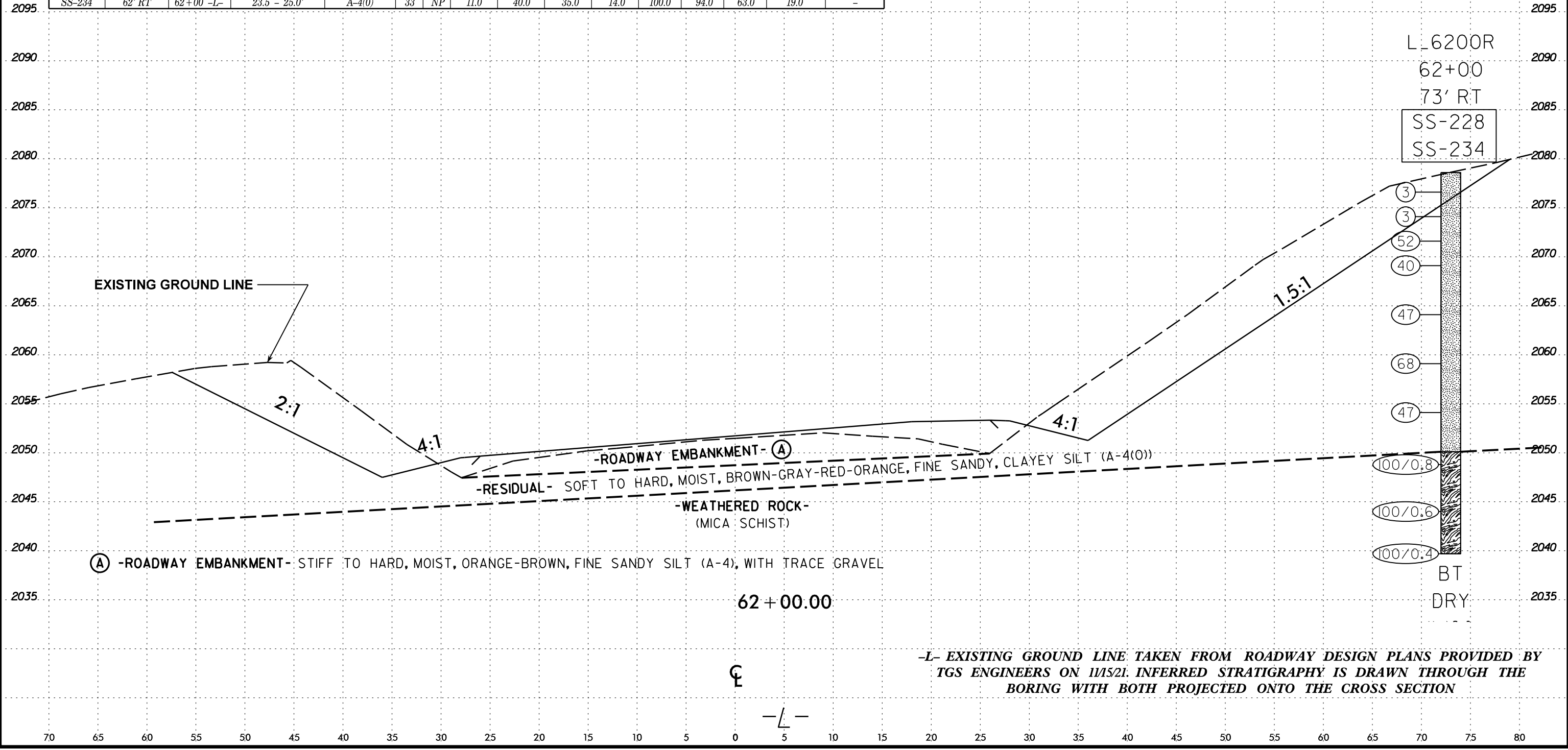
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### SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-228	62' RT	62+00 -L-	1.0 - 2.5'	A-4(3)	33	7	16.0	28.0	25.0	31.0	100.0	91.0	64.0	25.0	-
SS-234	62' RT	62+00 -L-	23.5 - 25.0'	A-4(0)	33	NP	11.0	40.0	35.0	14.0	100.0	94.0	63.0	19.0	-



EXISTING GROUND LINE

2:1

4:1

4:1

1.5:1

-ROADWAY EMBANKMENT- (A)

-RESIDUAL- SOFT TO HARD, MOIST, BROWN-GRAY-RED-ORANGE, FINE SANDY, CLAYEY SILT (A-4(0))

-WEATHERED ROCK-  
(MICA SCHIST)

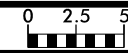
(A) -ROADWAY EMBANKMENT- STIFF TO HARD, MOIST, ORANGE-BROWN, FINE SANDY SILT (A-4), WITH TRACE GRAVEL

L\_6200R  
62+00  
73' RT

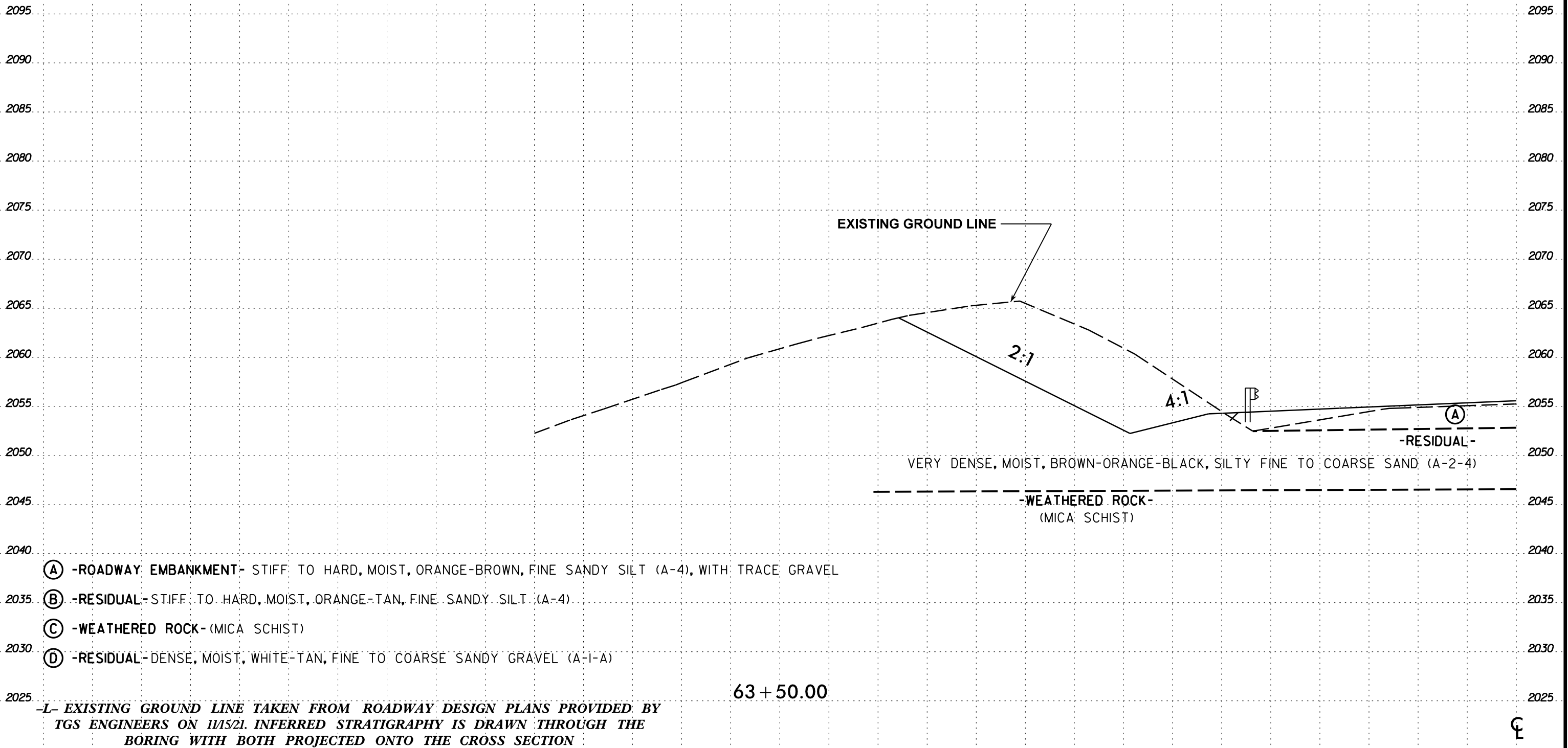
SS-228  
SS-234

- (3)
- (3)
- (52)
- (40)
- (47)
- (68)
- (47)
- (100/0.8)
- (100/0.6)
- (100/0.4)

BT  
DRY



150 145 140 135 130 125 120 115 110 105 100 95 90 85 80 75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0



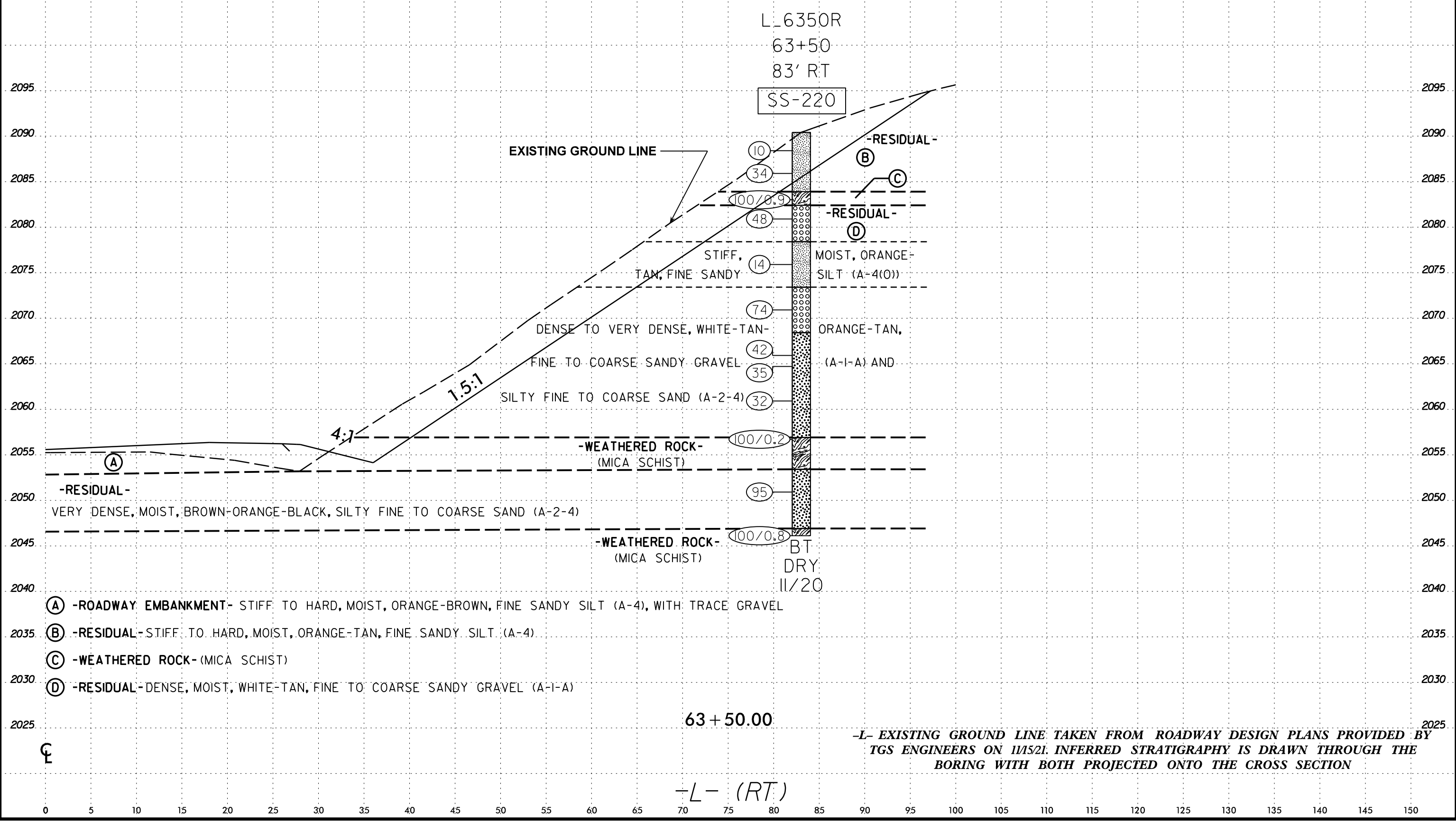
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-L- (LT)

6/23/16  
 29-APR-2022 12:21  
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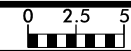
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-220	83' RT	63+50 -L-	13.5 - 15.0'	A-4(0)	35	NP	8.0	41.0	38.0	13.0	100.0	96.0	64.0	17.0	-



0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 135 140 145 150

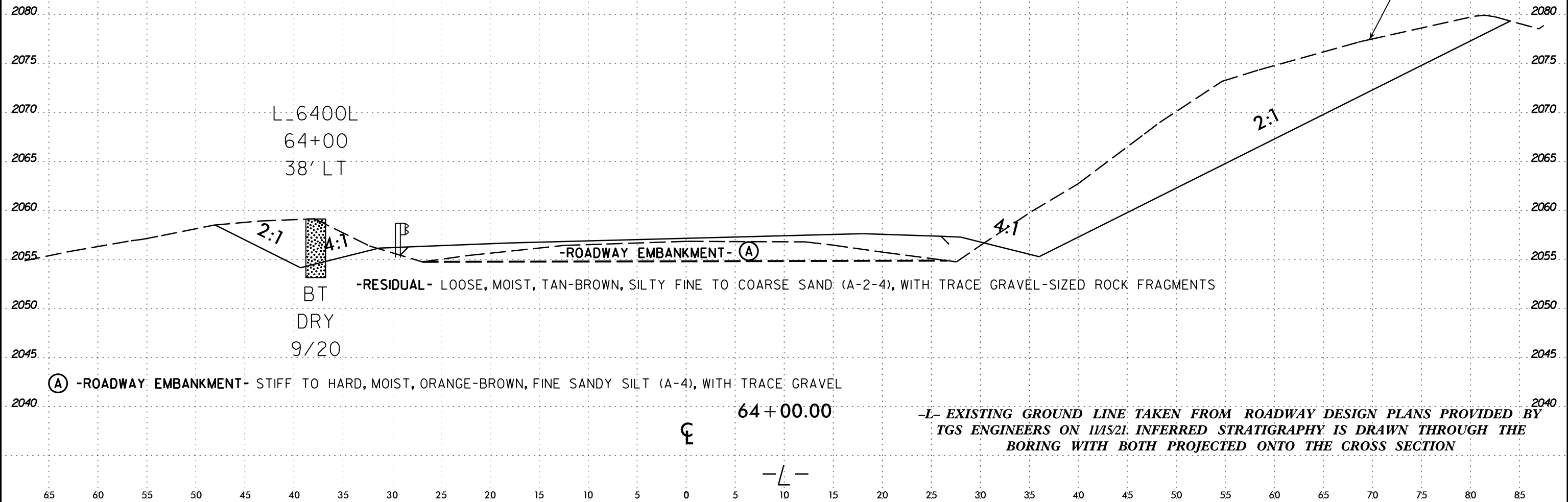


6/23/16



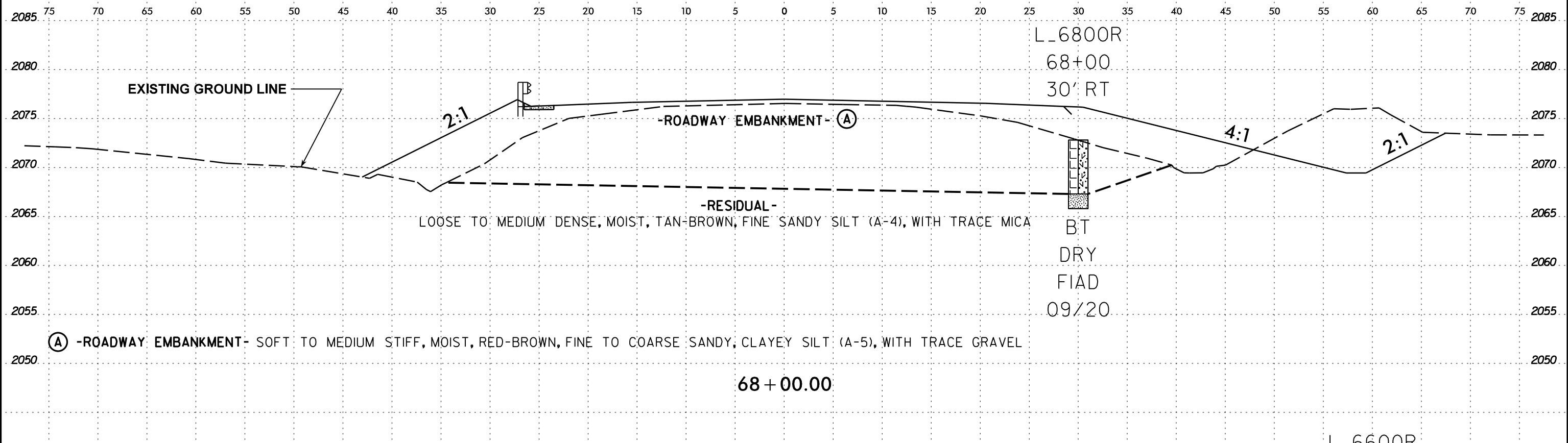
PROJ. REFERENCE NO.	SHEET NO.
A-0009CA	53

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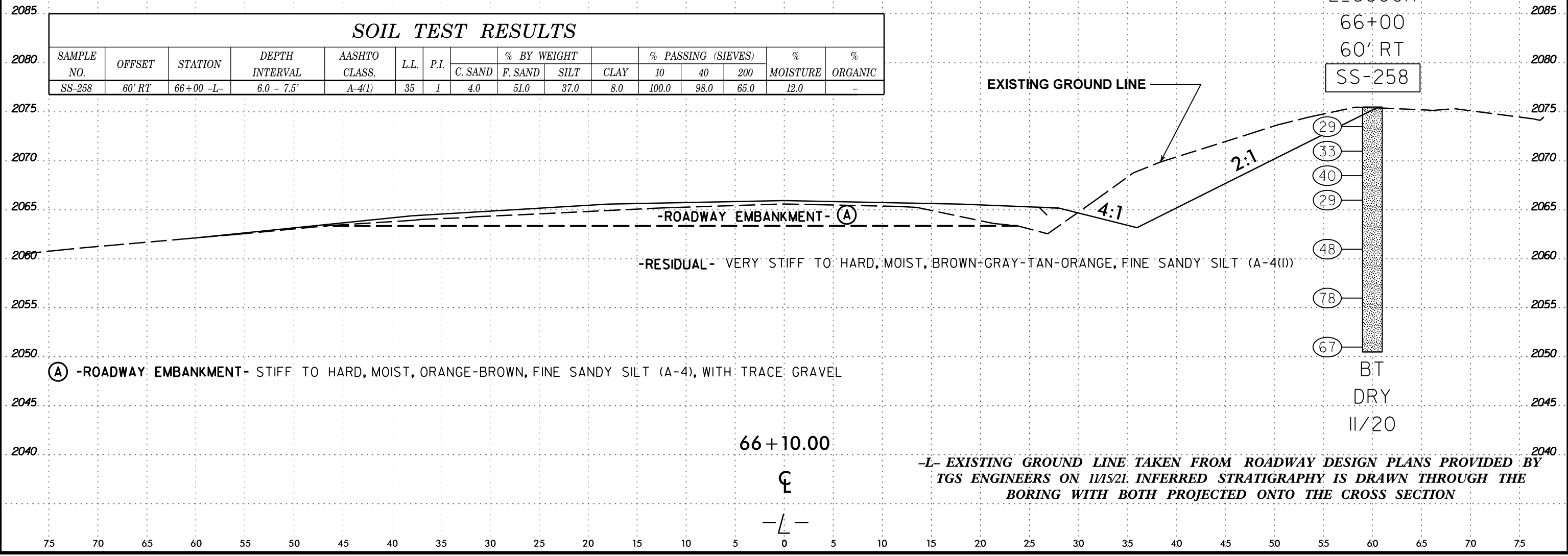


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6/23/16  
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 SSUBSERNAME:SSB



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-258	60' RT	66+00 -L-	6.0 - 7.5'	A-4(1)	35	1	4.0	51.0	37.0	8.0	100.0	98.0	65.0	12.0	-

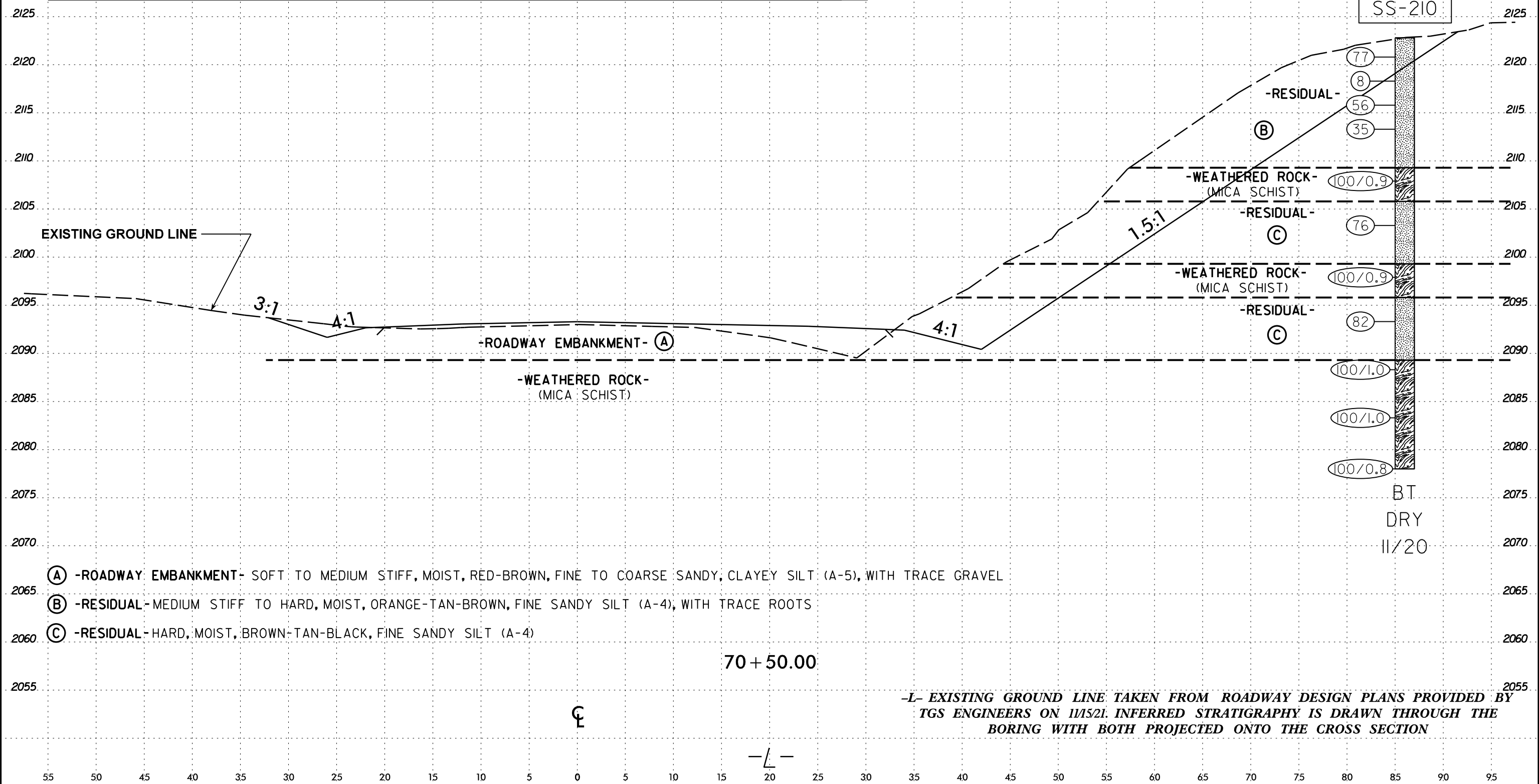


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55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

### 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-210	86' RT	70+50 -L-	28.5 - 30.0'	A-4(0)	34	NP	4.0	44.0	39.0	13.0	100.0	97.0	70.0	14.0	-

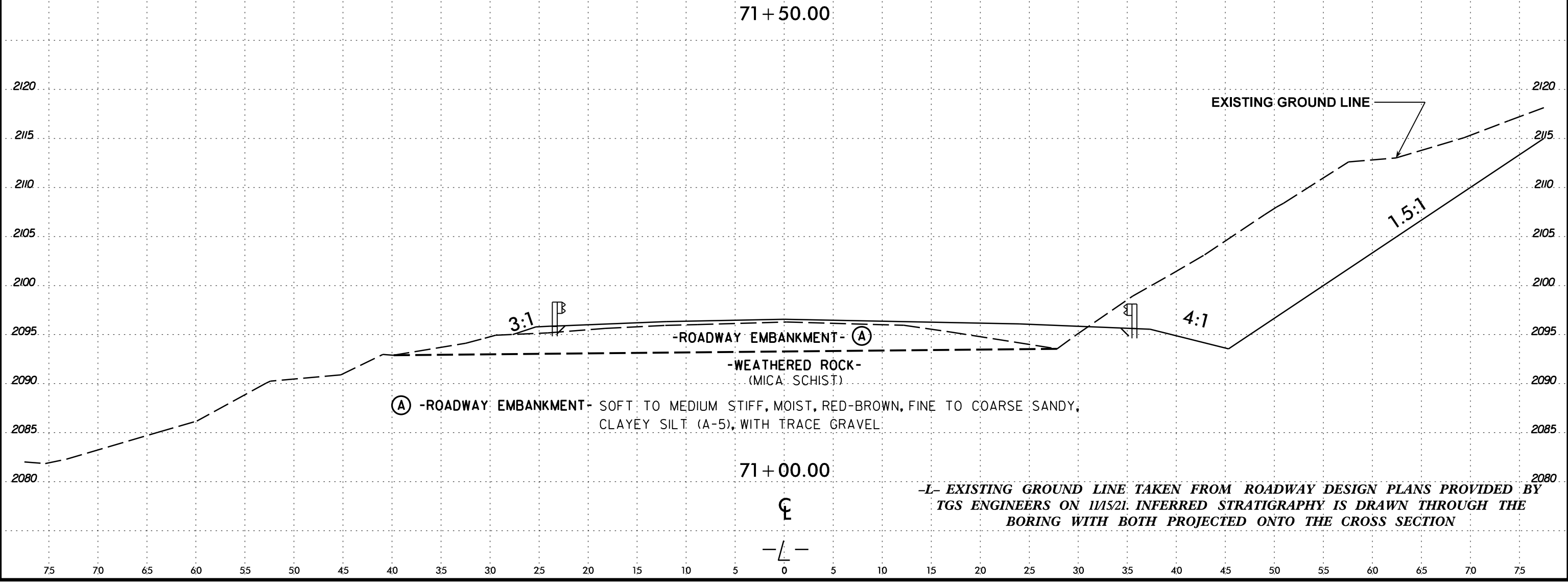
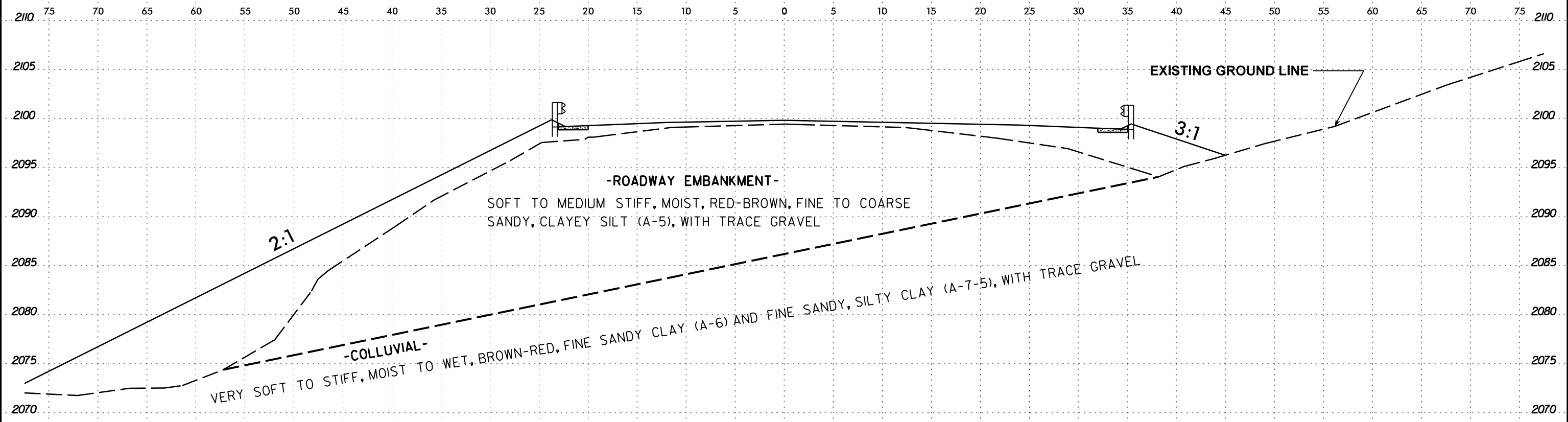


70 + 50.00

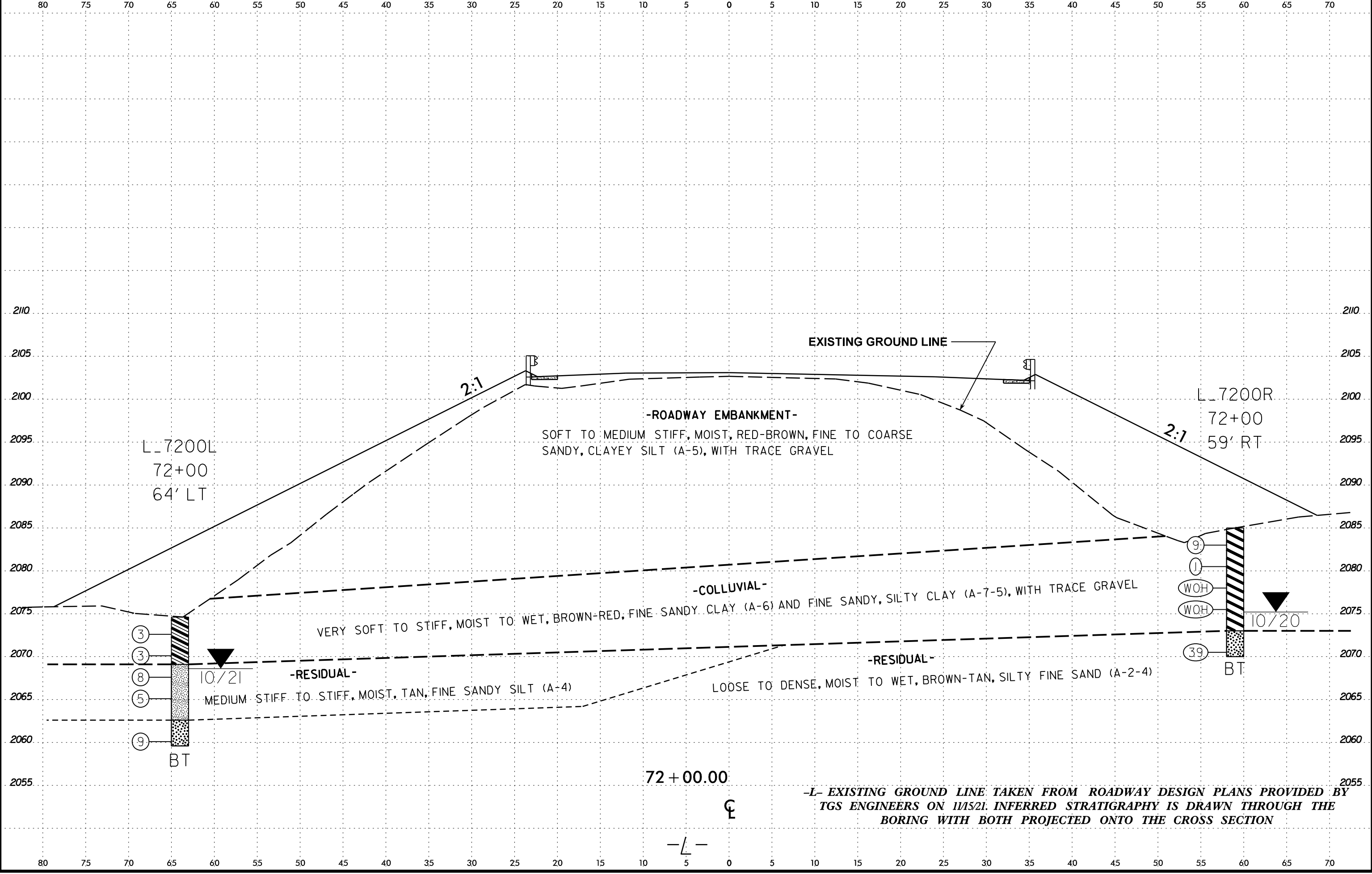
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-L-

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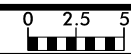


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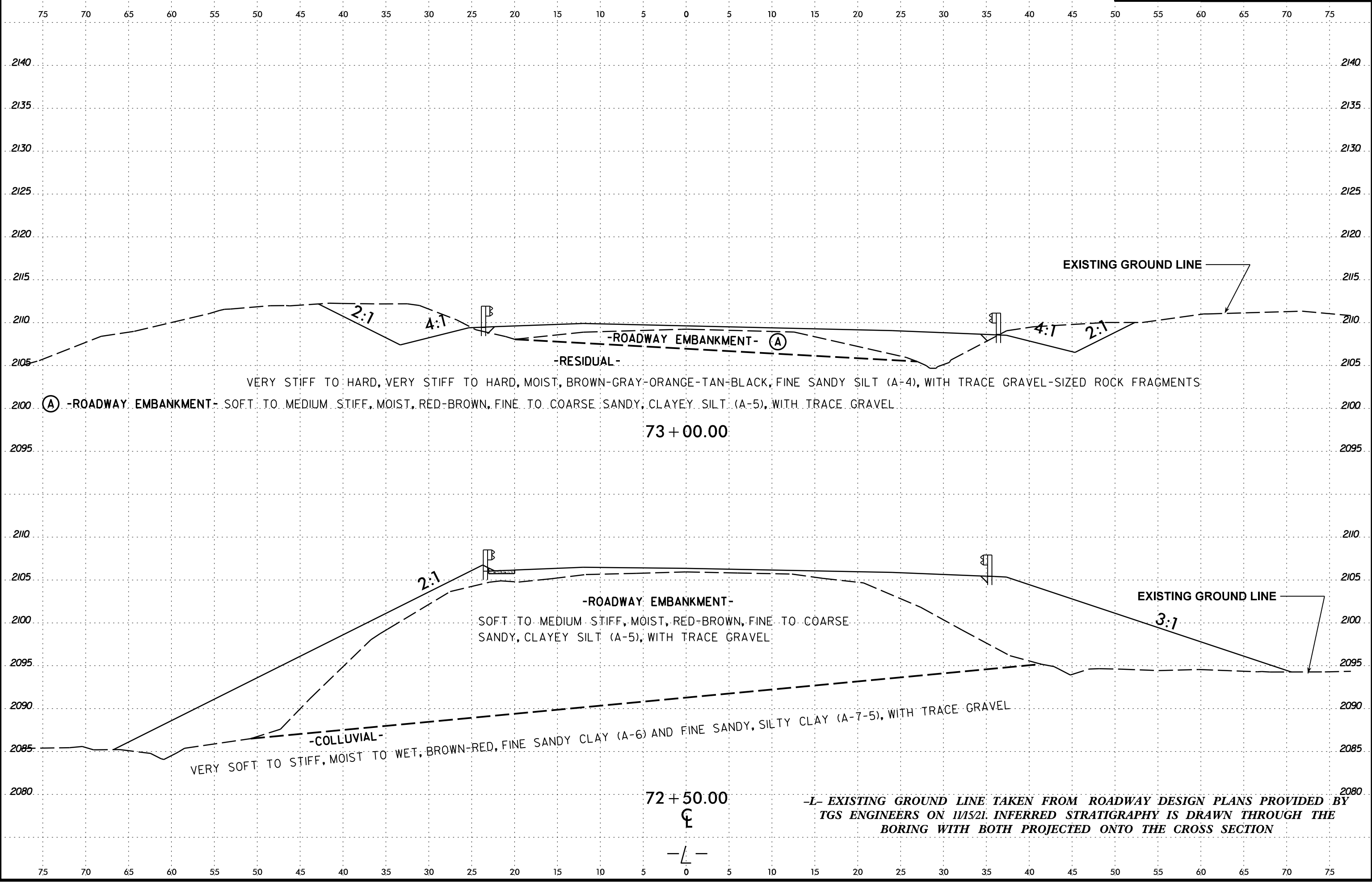


-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/5/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

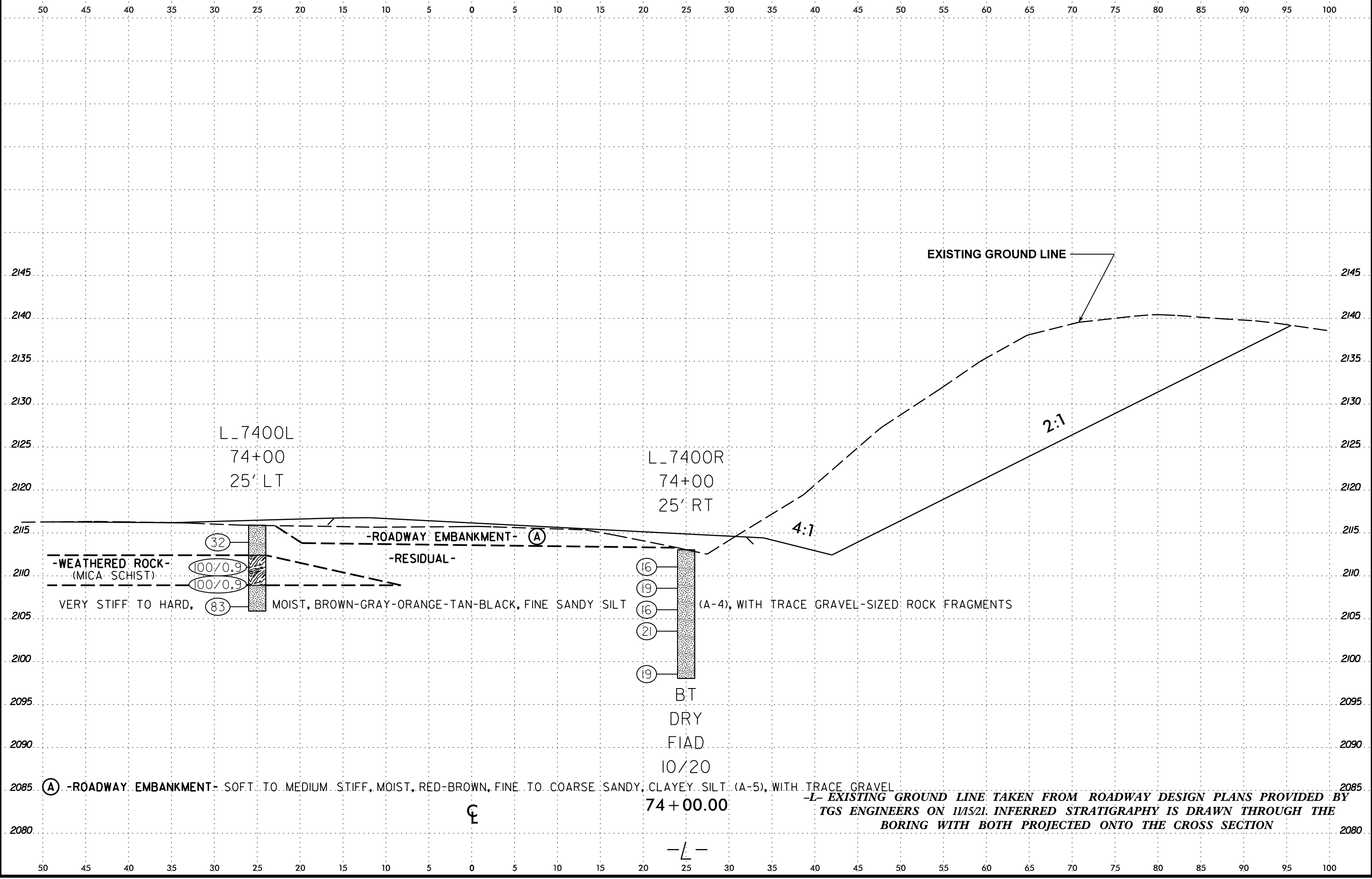
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PROJ. REFERENCE NO.	SHEET NO.
A-0009CA	58



6/23/16  
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L\_7400L  
74+00  
25' LT

L\_7400R  
74+00  
25' RT

-ROADWAY EMBANKMENT- (A)

-RESIDUAL-

-WEATHERED ROCK-  
(MICA SCHIST)

VERY STIFF TO HARD, (83)

MOIST, BROWN-GRAY-ORANGE-TAN-BLACK, FINE SANDY SILT

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

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

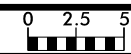
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-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 1/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

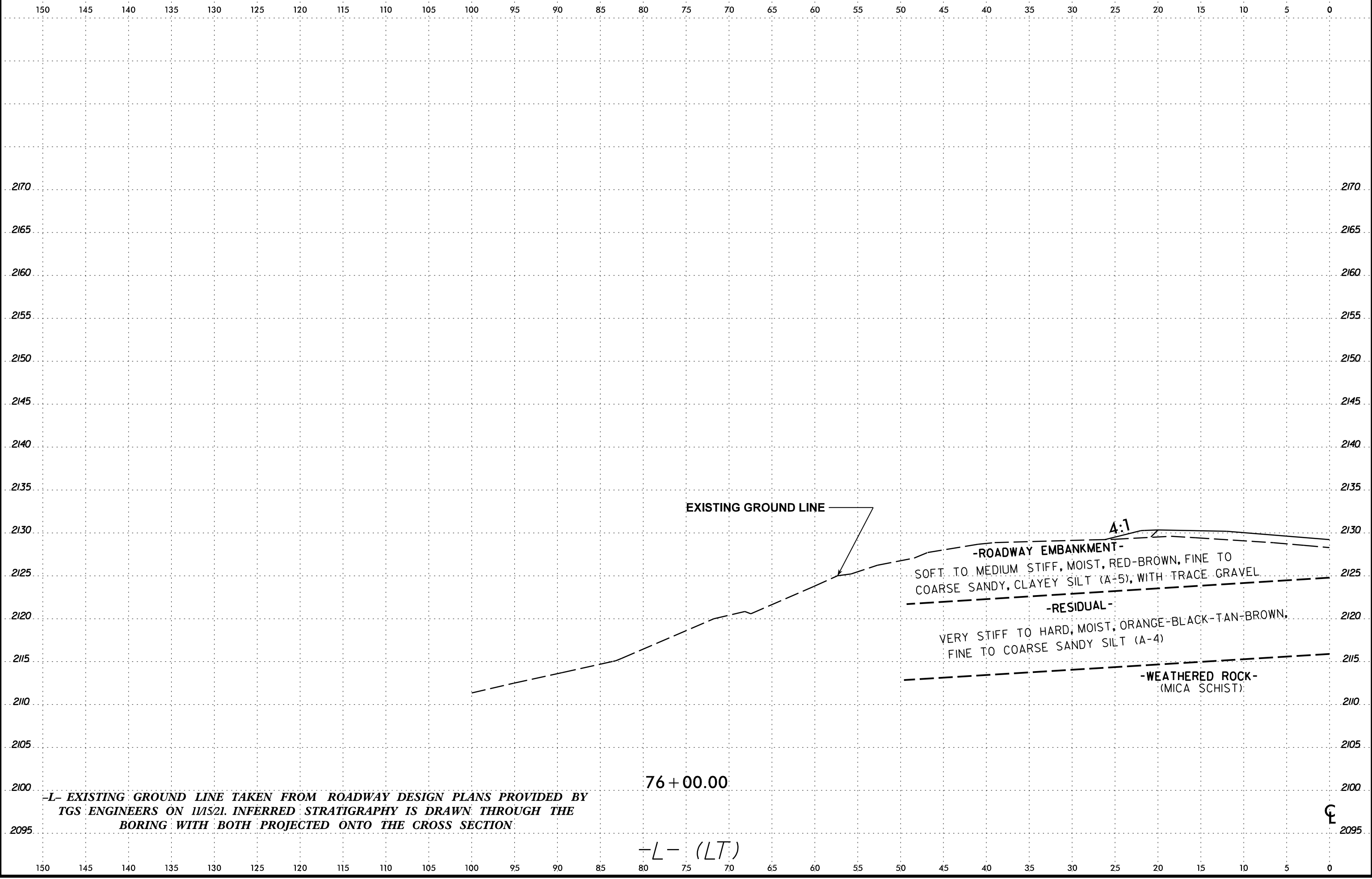
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-L-

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PROJ. REFERENCE NO.	SHEET NO.
A-0009CA	60

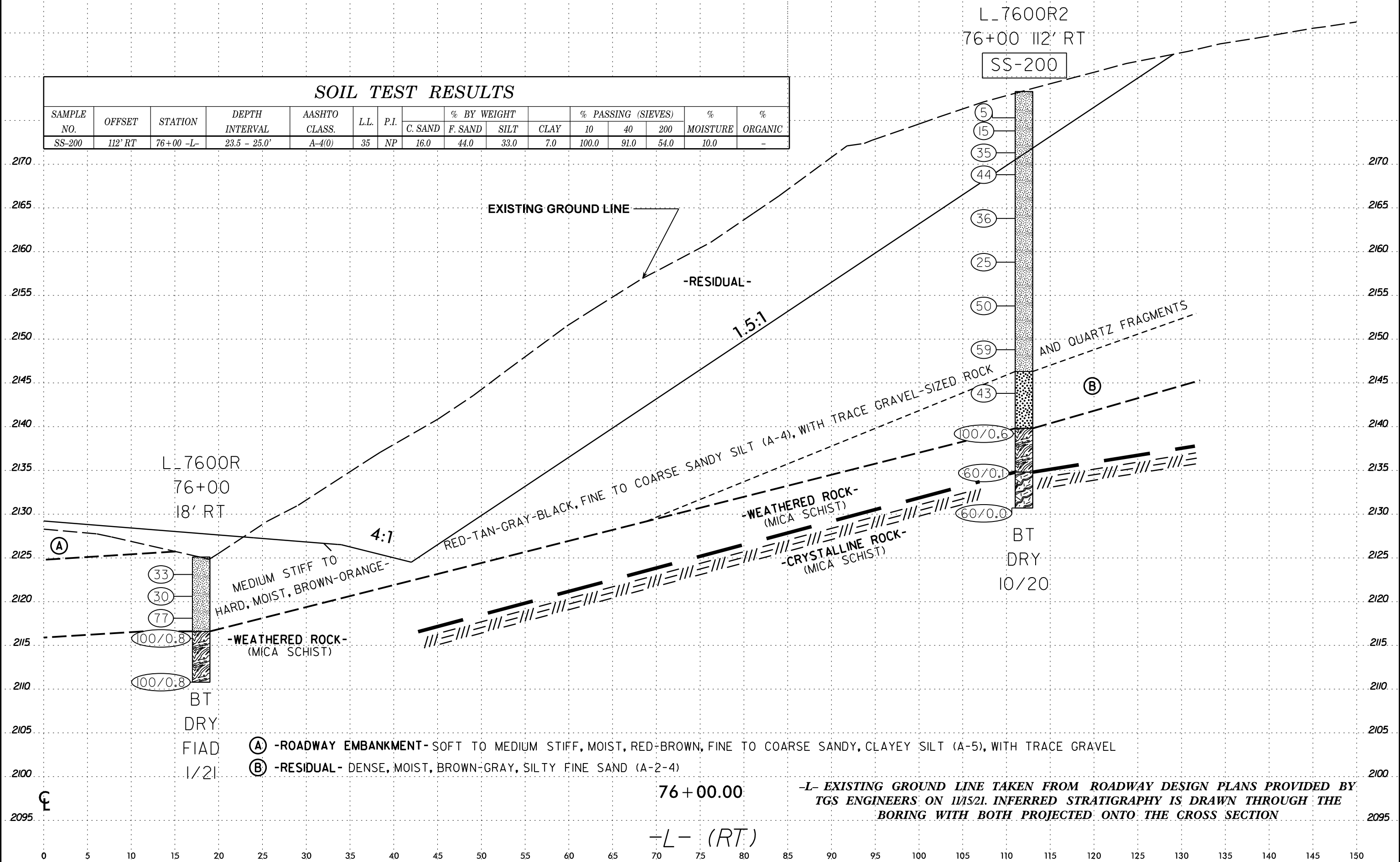




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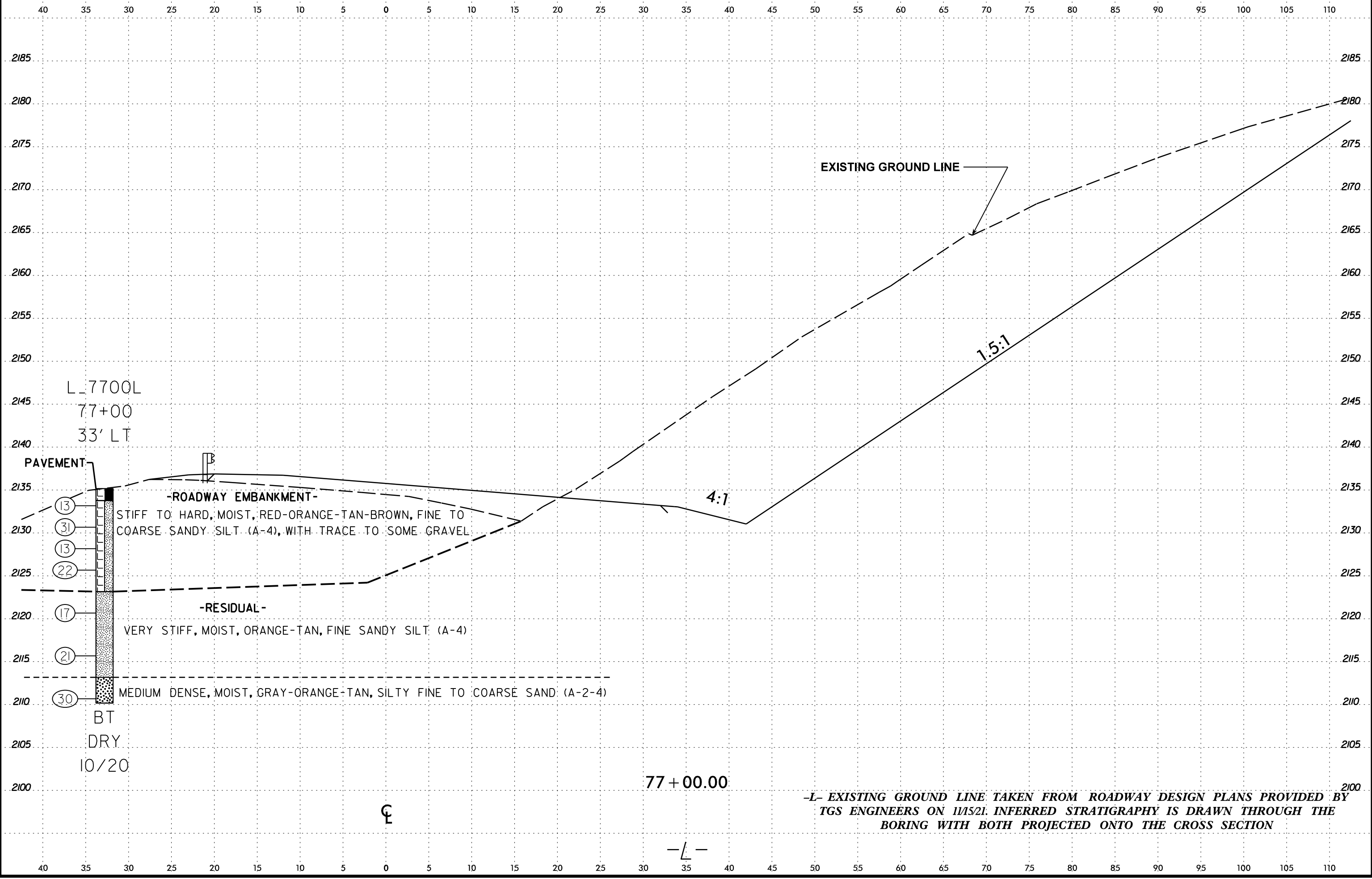
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SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-200	112' RT	76+00 -L-	23.5 - 25.0'	A-4(0)	35	NP	16.0	44.0	33.0	7.0	100.0	91.0	54.0	10.0	-



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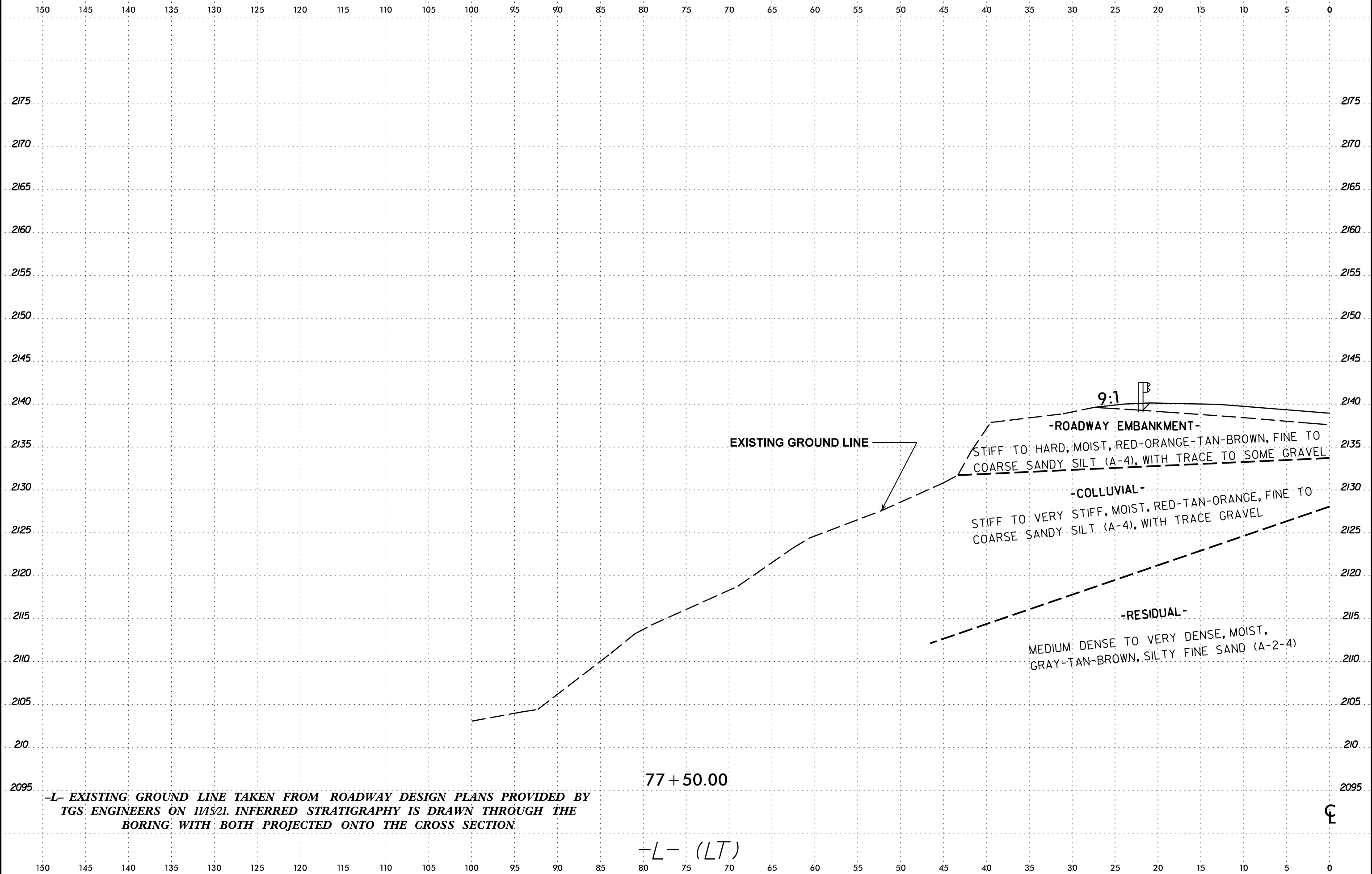
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PROJ. REFERENCE NO.	SHEET NO.
A-0009CA	63



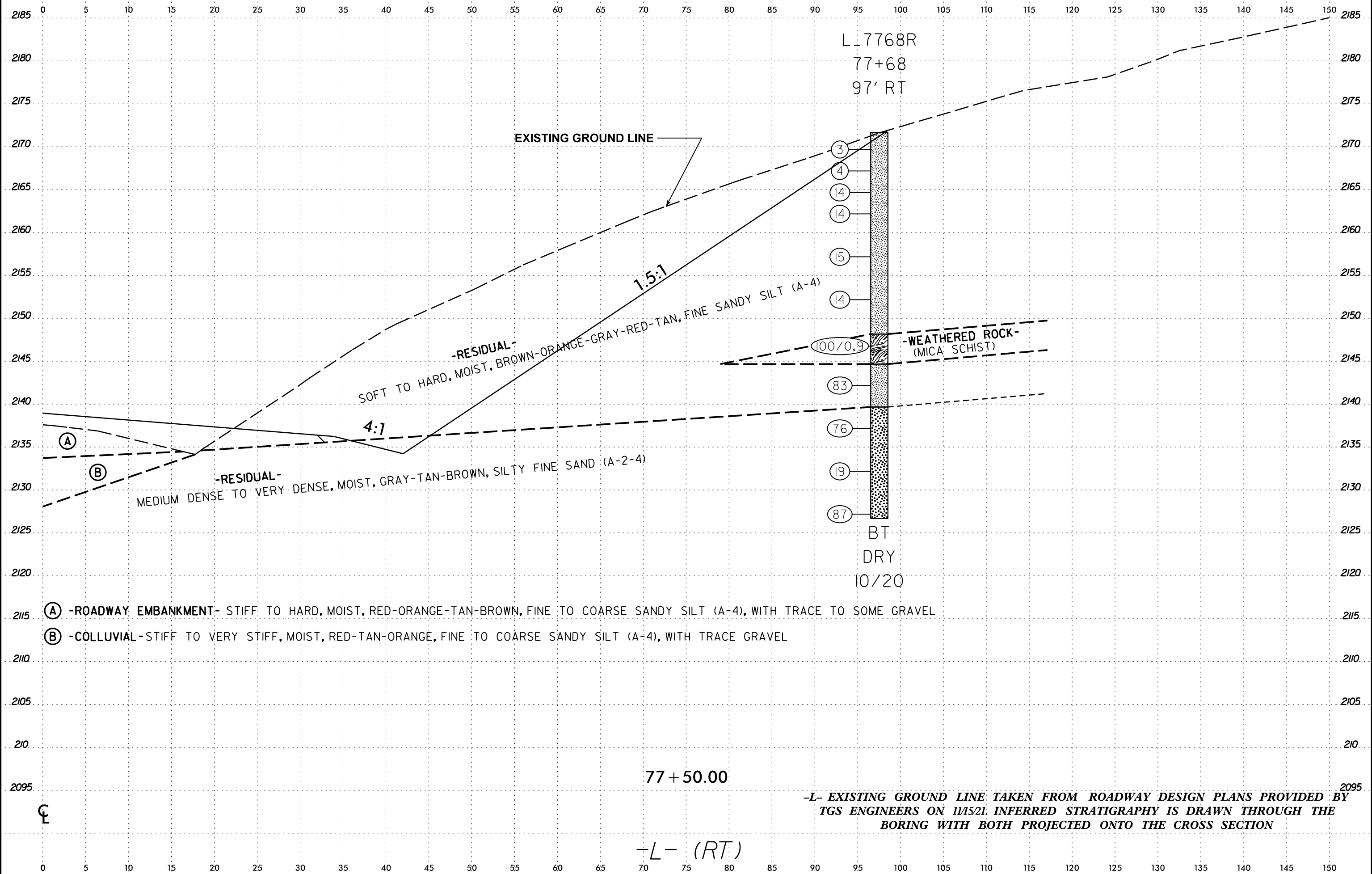
-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 1/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

77 + 50.00

-L- (LT)

CL

6/23/16  
29-APR-2022 12:21  
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L\_7768R  
77+68  
97' RT

EXISTING GROUND LINE

1.5:1

-RESIDUAL -  
SOFT TO HARD, MOIST, BROWN-ORANGE-GRAY-RED-TAN, FINE SANDY SILT (A-4)

4:1

-RESIDUAL -  
MEDIUM DENSE TO VERY DENSE, MOIST, GRAY-TAN-BROWN, SILTY FINE SAND (A-2-4)

WEATHERED ROCK -  
(MICA SCHIST)

100/0.9

BT  
DRY  
10/20

(A) -ROADWAY EMBANKMENT- STIFF TO HARD, MOIST, RED-ORANGE-TAN-BROWN, FINE TO COARSE SANDY SILT (A-4), WITH TRACE TO SOME GRAVEL

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

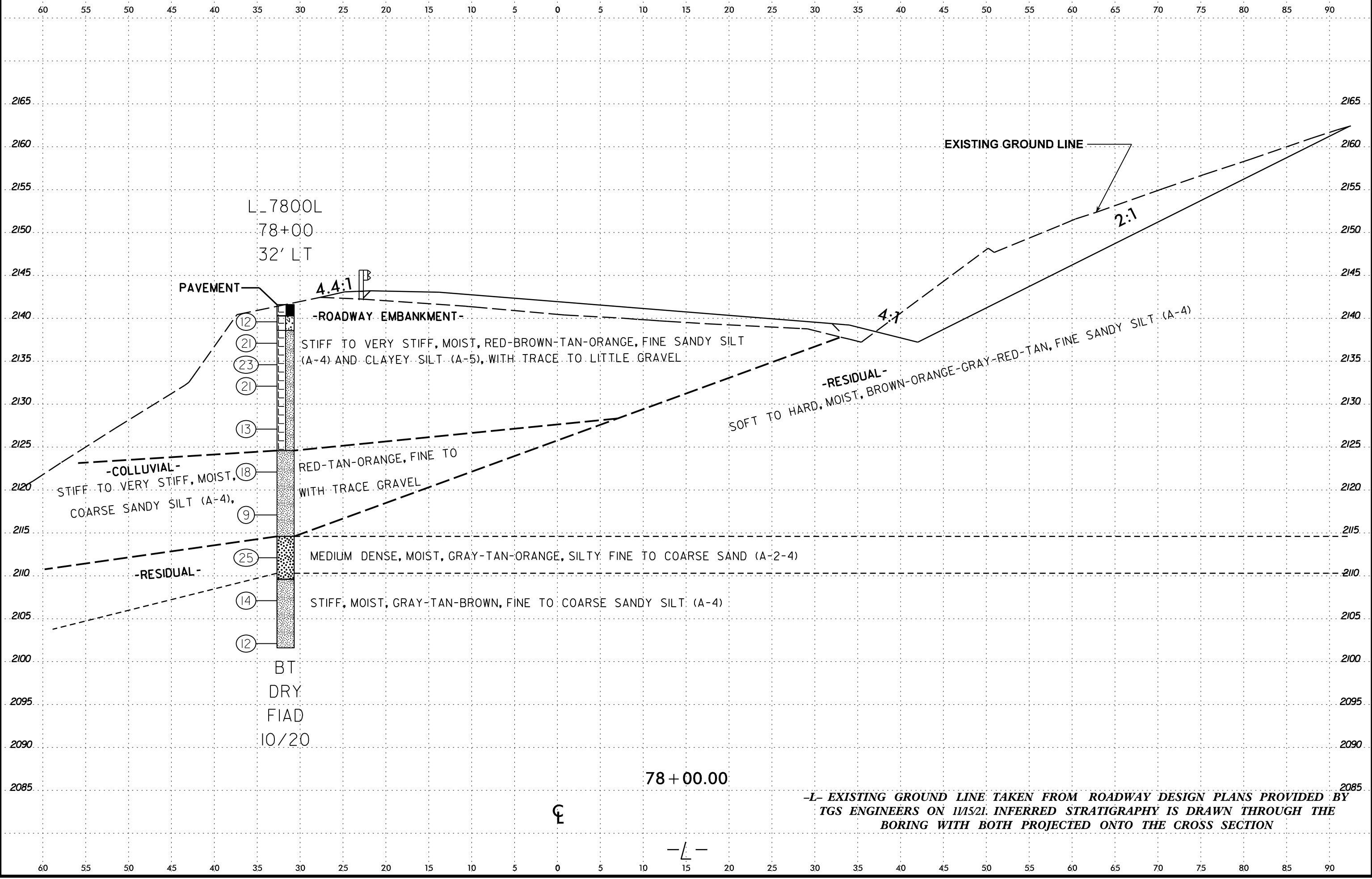
77 + 50.00

-L- (RT)

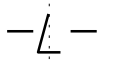
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CL

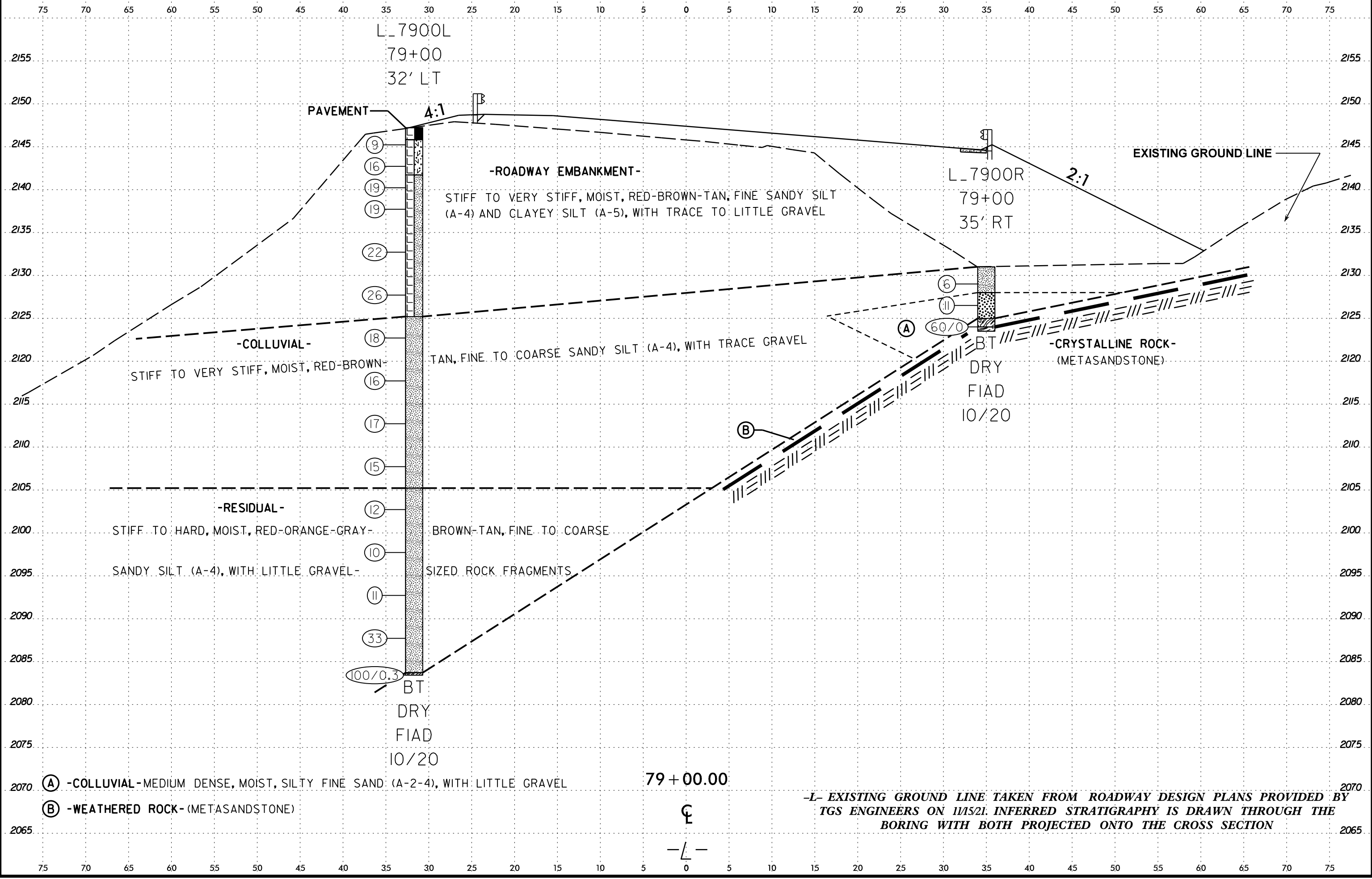
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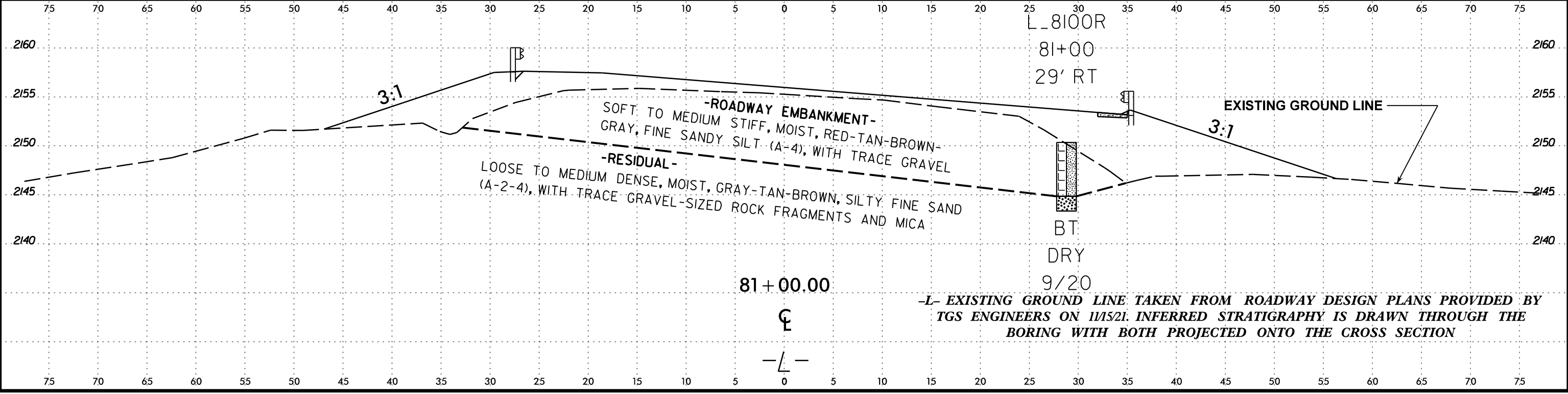
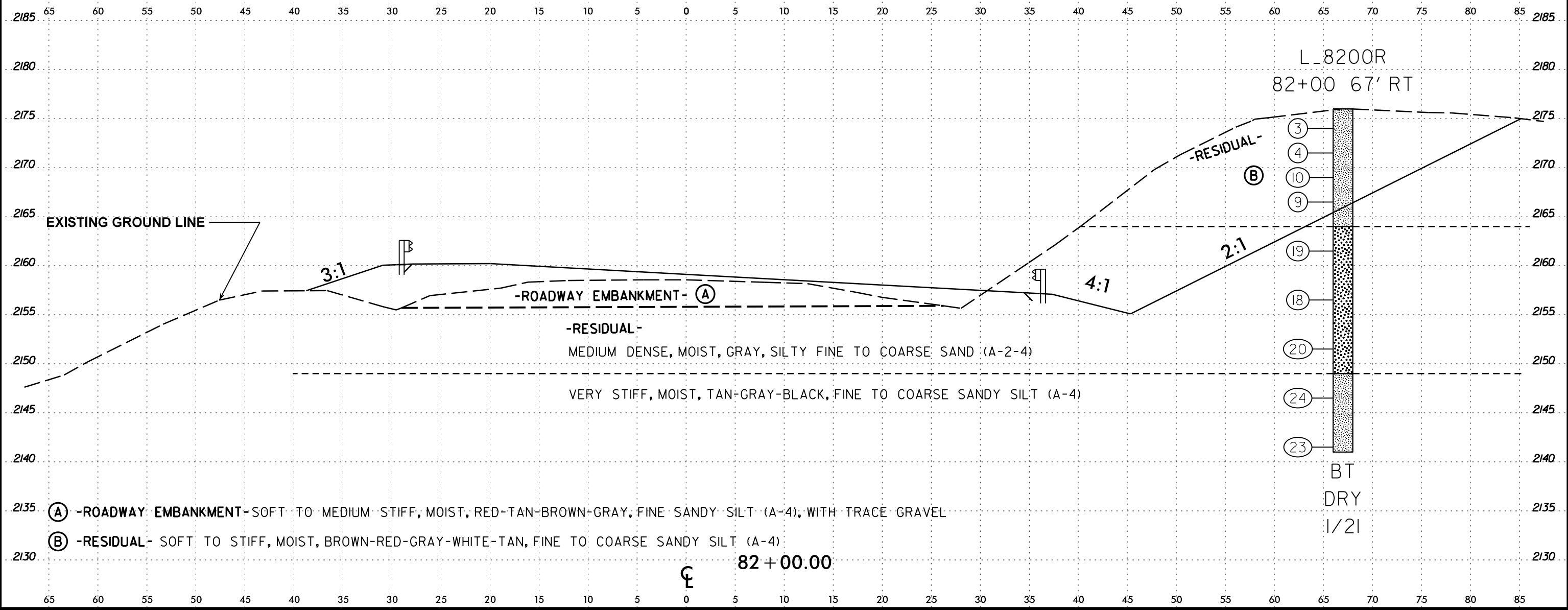
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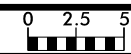
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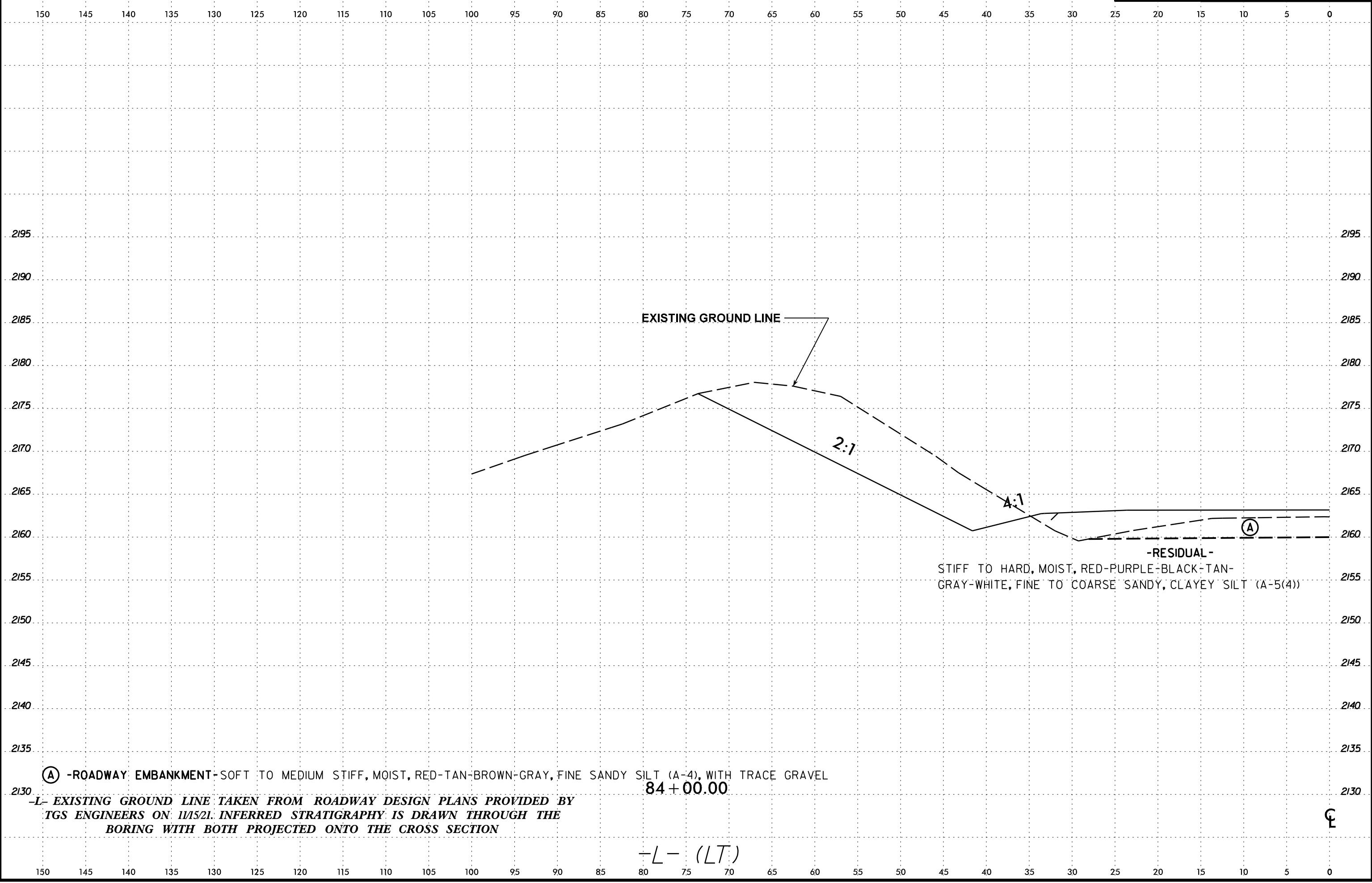
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PROJ. REFERENCE NO.	SHEET NO.
A-0009CA	68



EXISTING GROUND LINE

2:1

4:1

-RESIDUAL-

STIFF TO HARD, MOIST, RED-PURPLE-BLACK-TAN-GRAY-WHITE, FINE TO COARSE SANDY, CLAYEY SILT (A-5(4))

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

84 + 00.00

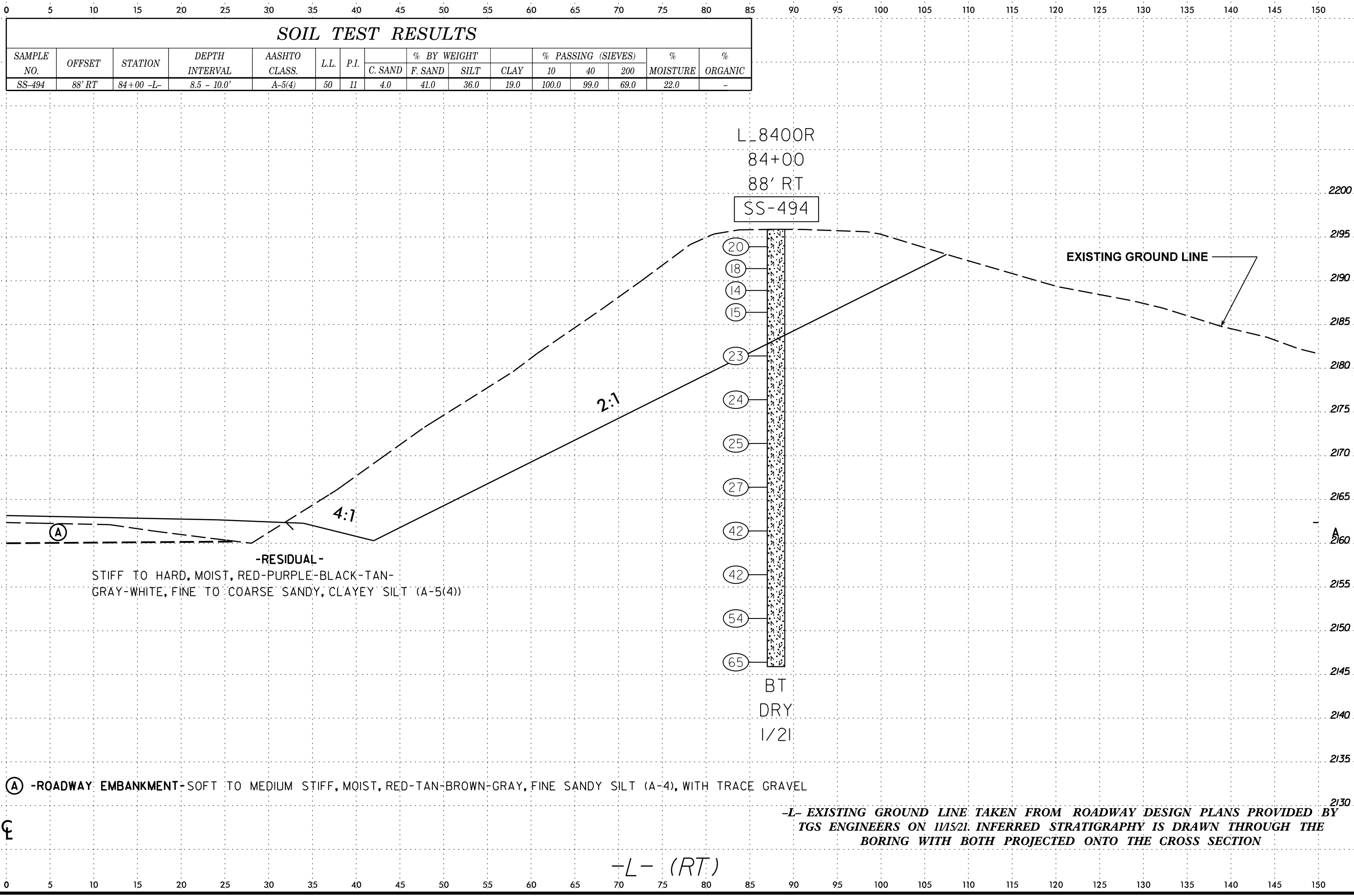
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-L- (LT)

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<b>SOIL TEST RESULTS</b>															
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-494	88' RT	84+00 -L-	8.5 - 10.0'	A-5(4)	50	11	4.0	41.0	36.0	19.0	100.0	99.0	69.0	22.0	-

L\_8400R  
 84+00  
 88' RT  
 SS-494

- (20)
- (18)
- (14)
- (15)
- (23)
- (24)
- (25)
- (27)
- (42)
- (42)
- (54)
- (65)

BT  
 DRY  
 1/21

EXISTING GROUND LINE

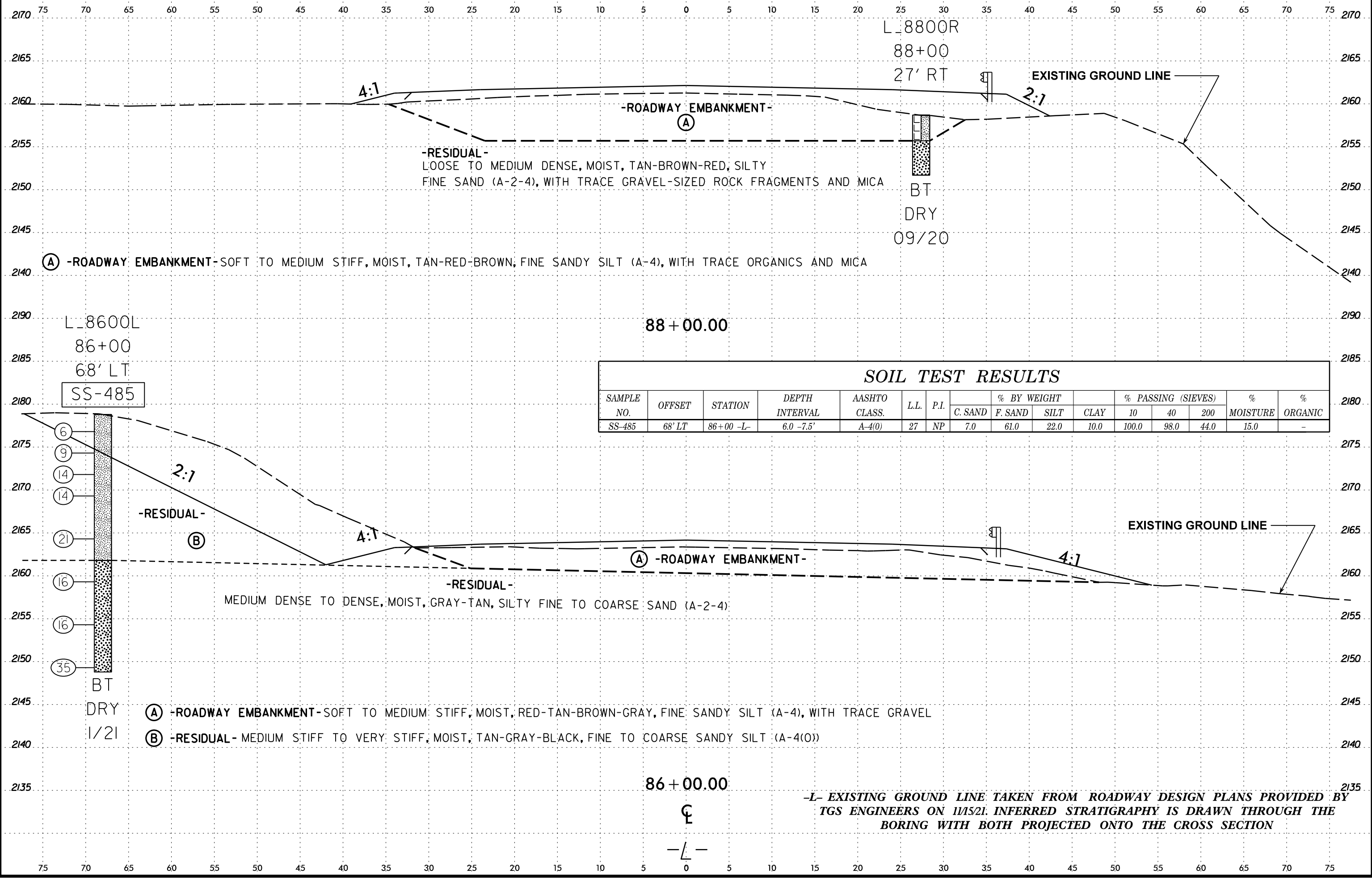
-RESIDUAL-  
 STIFF TO HARD, MOIST, RED-PURPLE-BLACK-TAN-GRAY-WHITE, FINE TO COARSE SANDY, CLAYEY SILT (A-5(4))

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

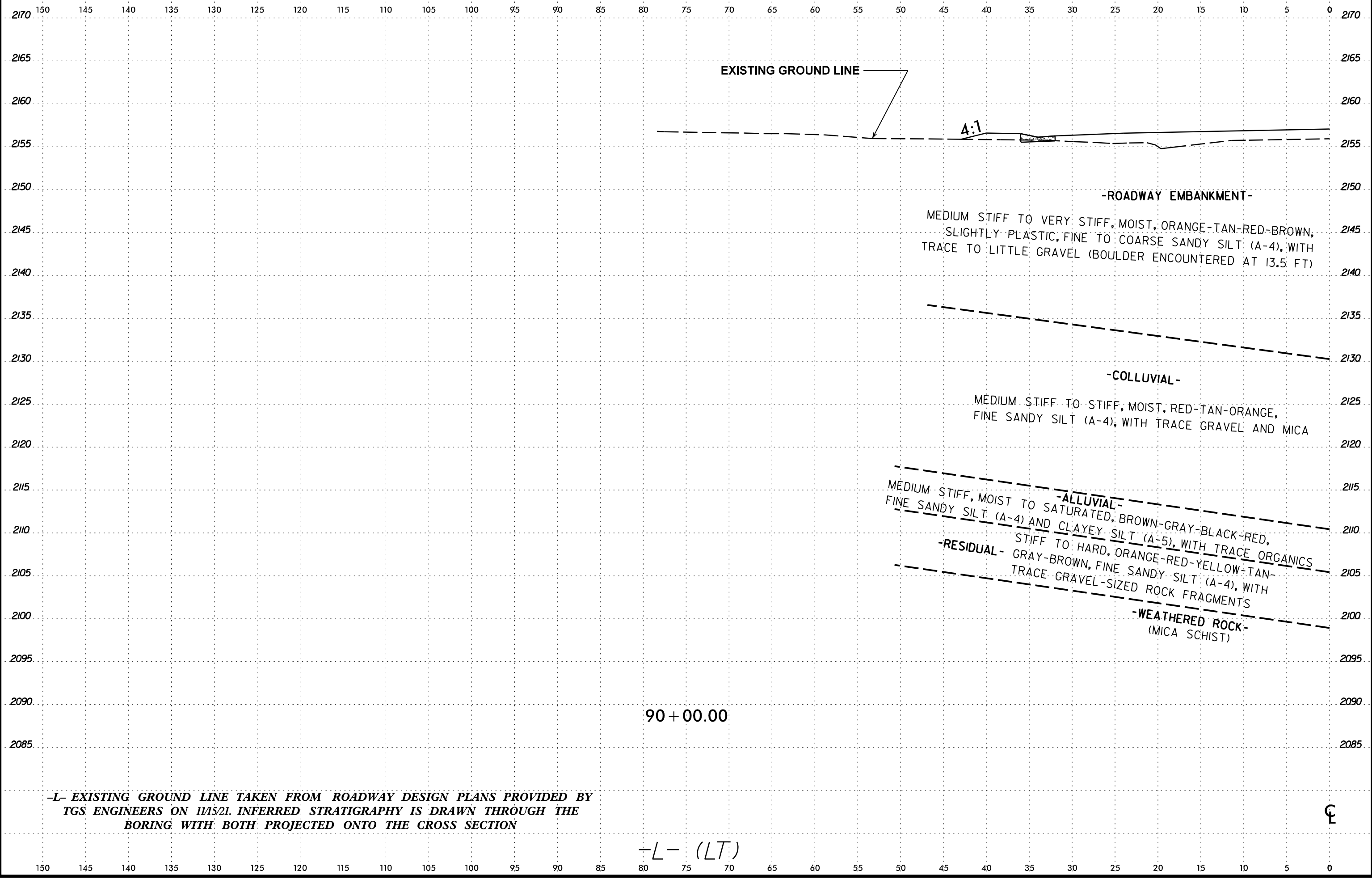
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-L- (RT)

6/23/16  
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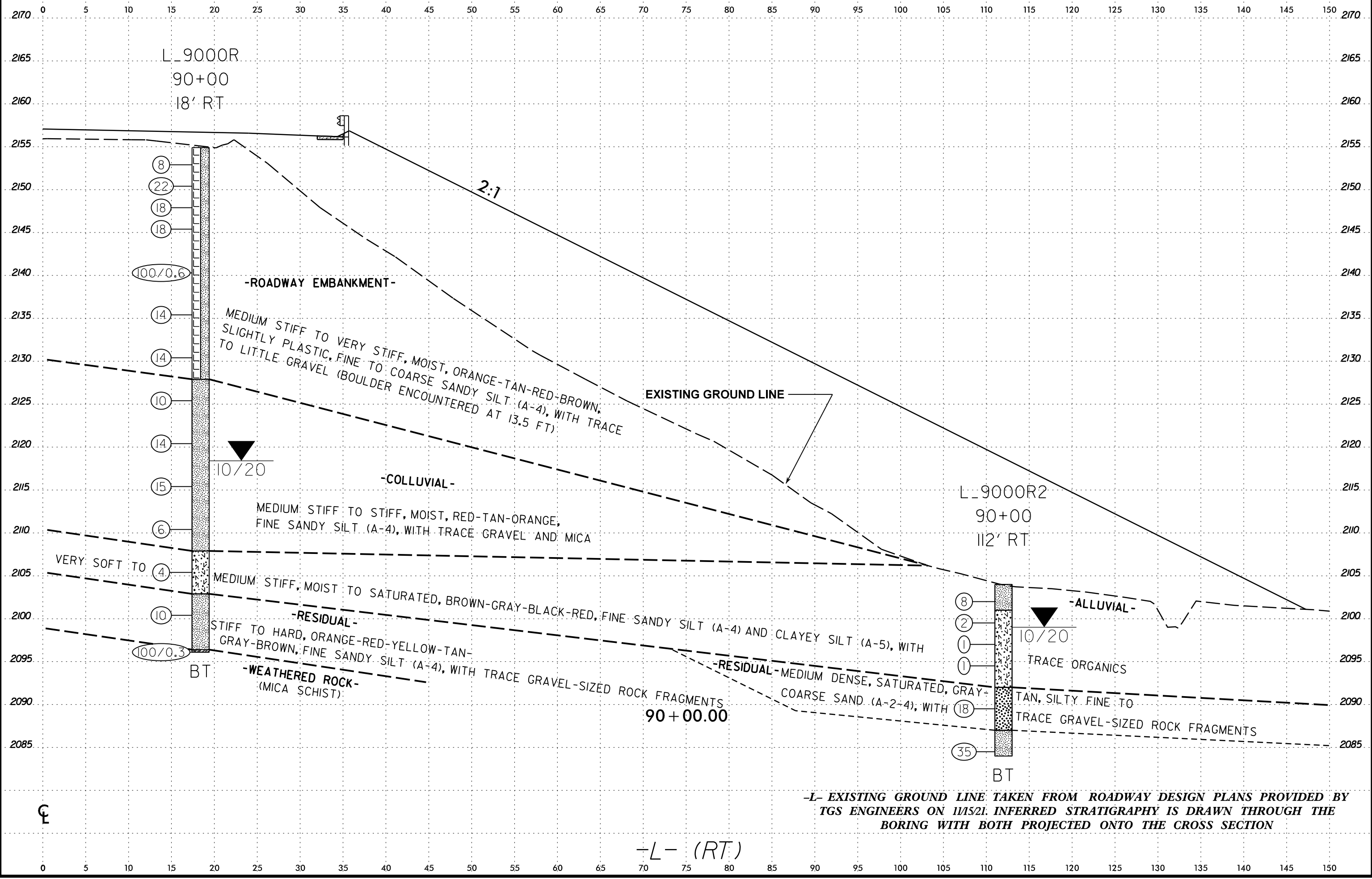
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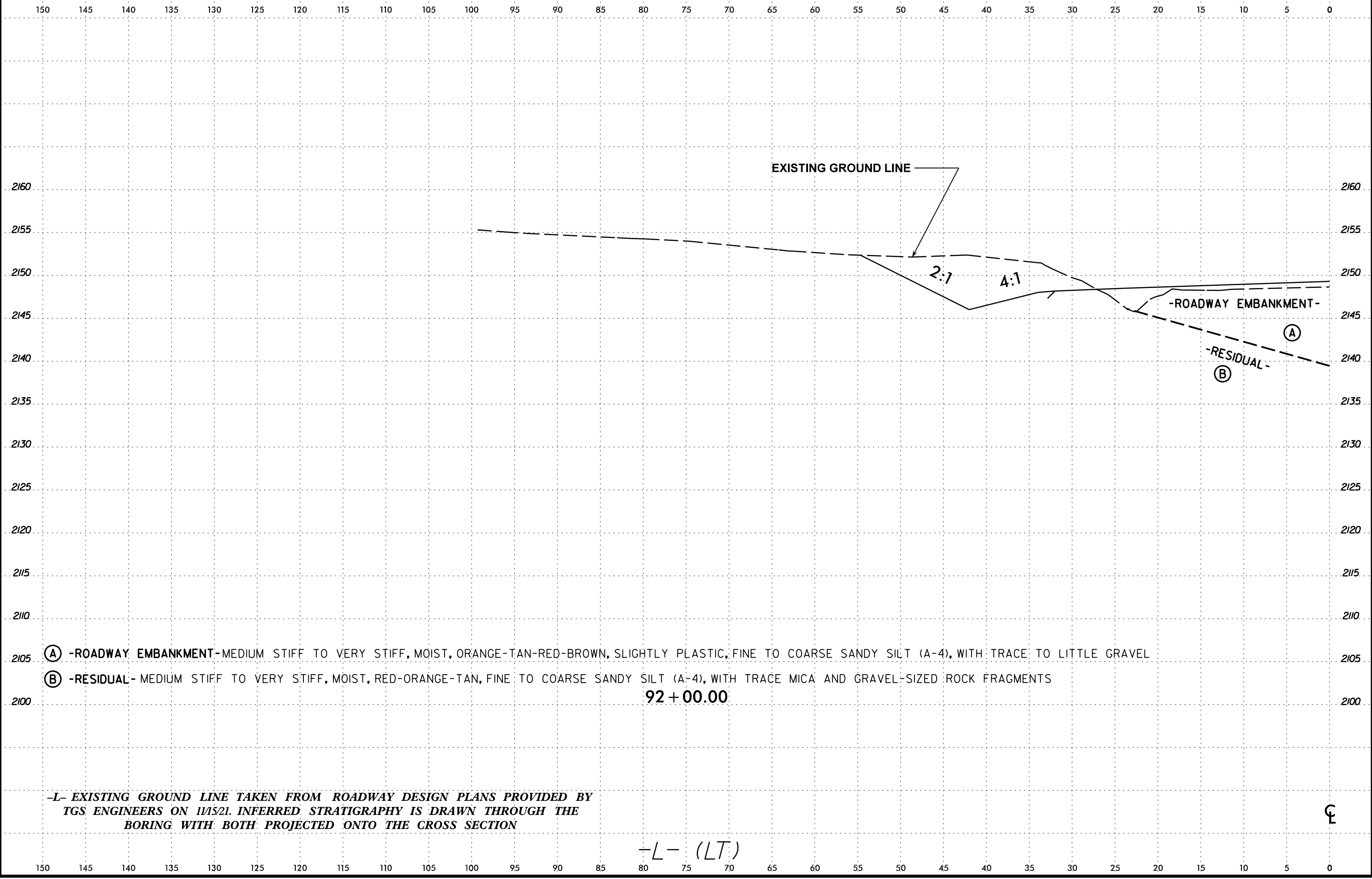
-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

-L- (LT)

6/23/16  
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(A) -ROADWAY EMBANKMENT- MEDIUM STIFF TO VERY STIFF, MOIST, ORANGE-TAN-RED-BROWN, SLIGHTLY PLASTIC, FINE TO COARSE SANDY SILT (A-4), WITH TRACE TO LITTLE GRAVEL

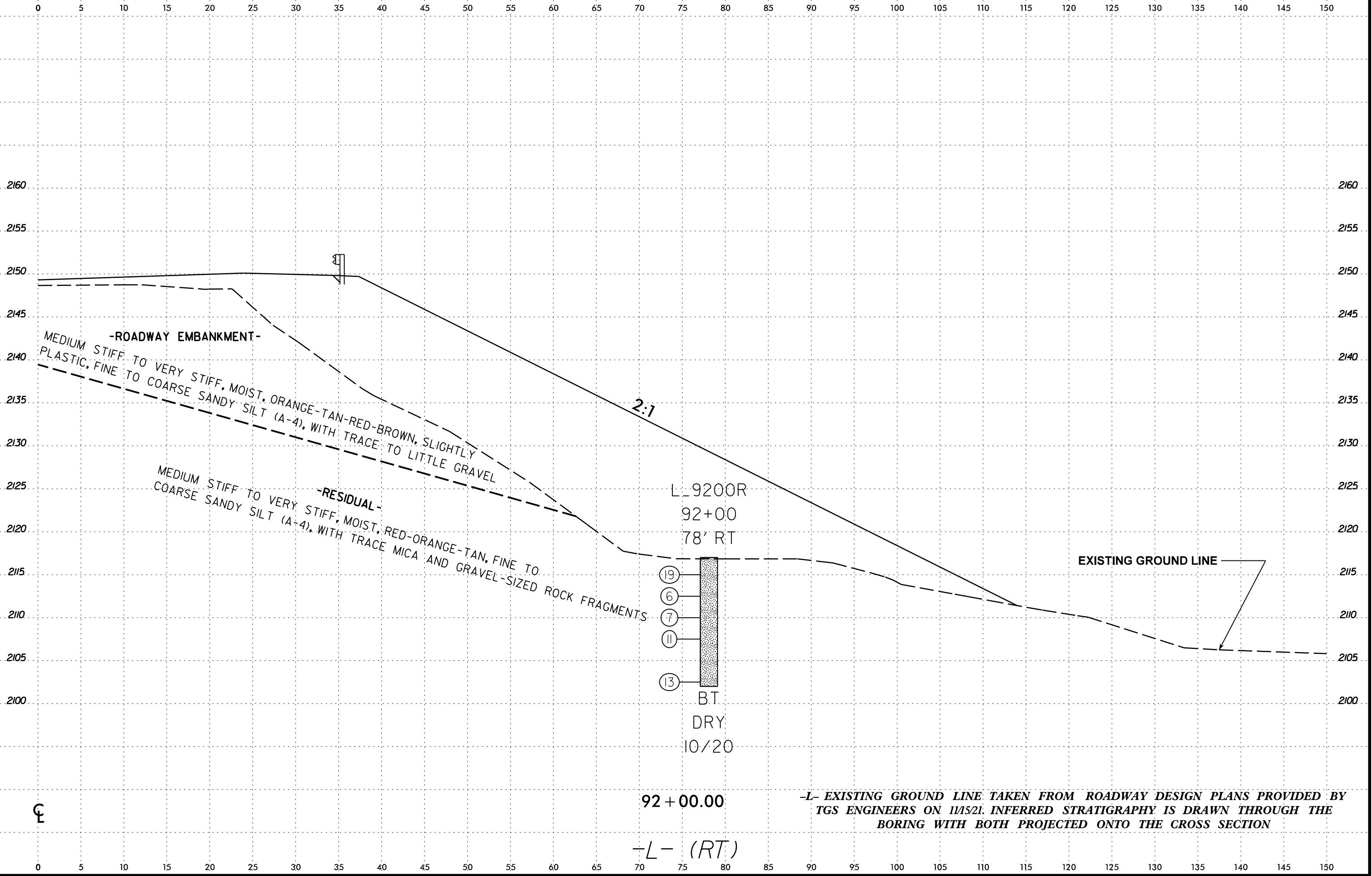
(B) -RESIDUAL- MEDIUM STIFF TO VERY STIFF, MOIST, RED-ORANGE-TAN, FINE TO COARSE SANDY SILT (A-4), WITH TRACE MICA AND GRAVEL-SIZED ROCK FRAGMENTS

92 + 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 WITH BOTH PROJECTED ONTO THE CROSS SECTION

-L- (LT)

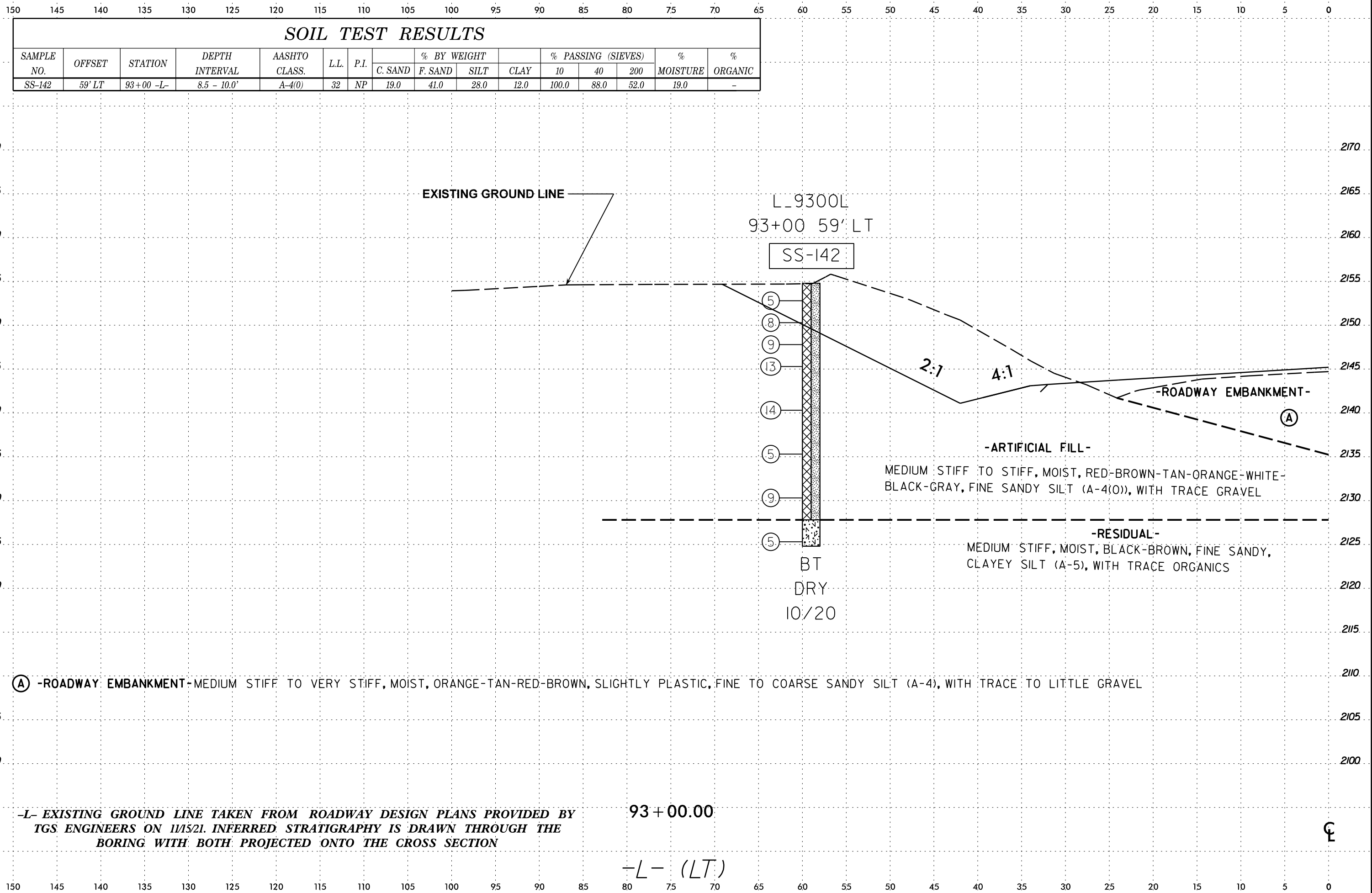
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- 13

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<b>SOIL TEST RESULTS</b>															
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-142	59' LT	93+00 -L-	8.5 - 10.0'	A-4(0)	32	NP	19.0	41.0	28.0	12.0	100.0	88.0	52.0	19.0	-

-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

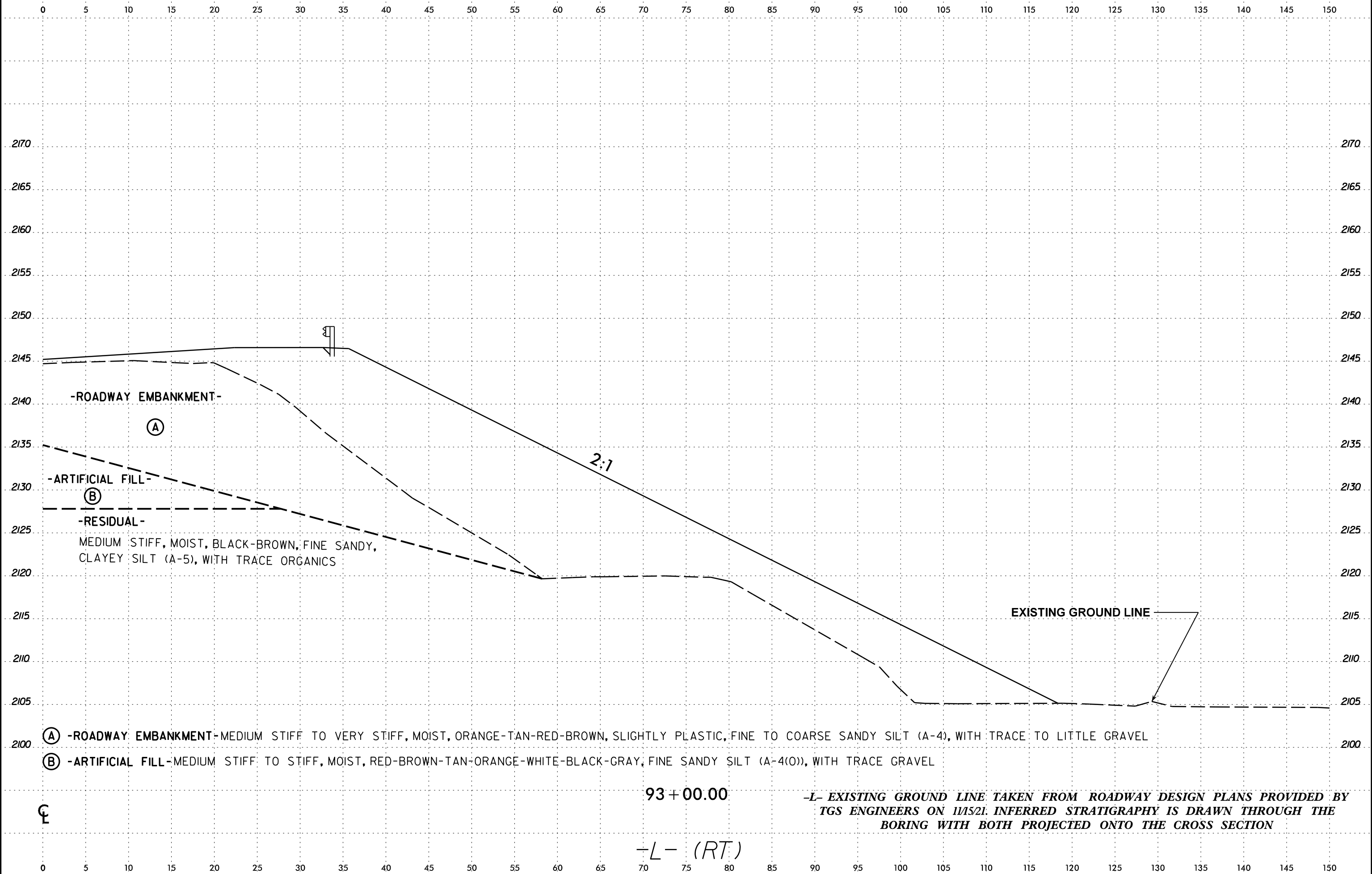
93 + 00.00  
 -L- (LT)

CL

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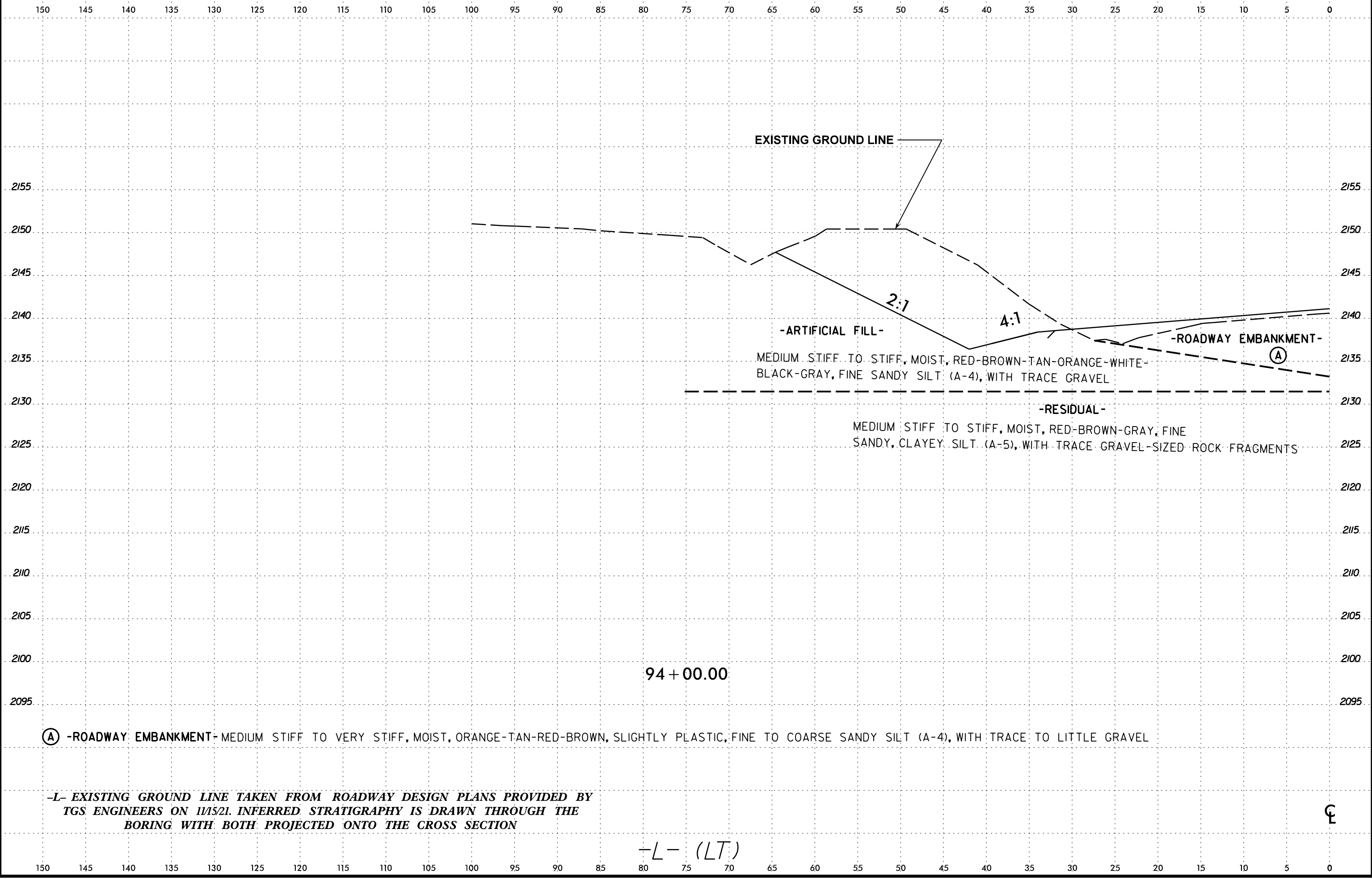


PROJ. REFERENCE NO.	SHEET NO.
A-0009CA	76

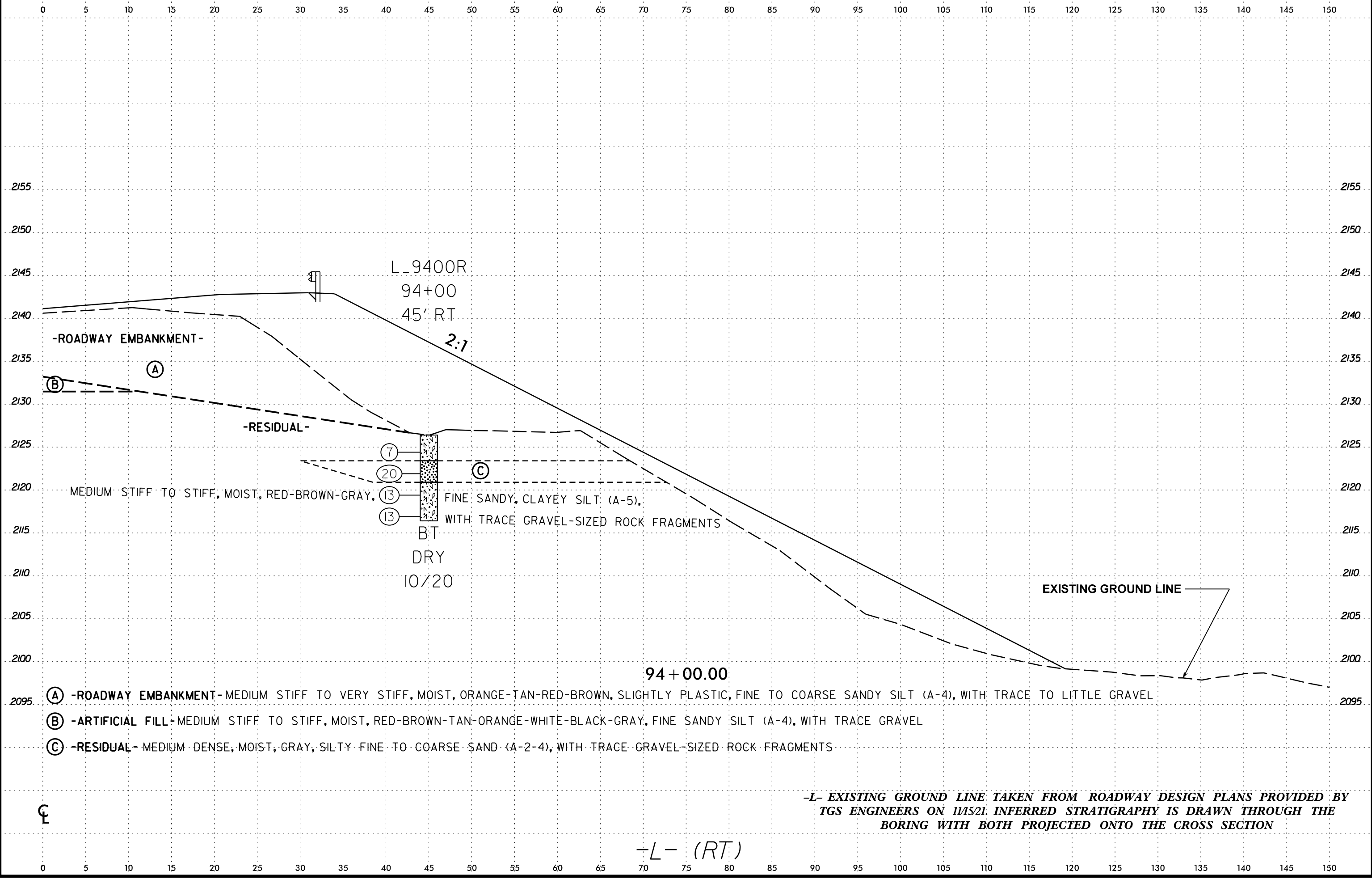




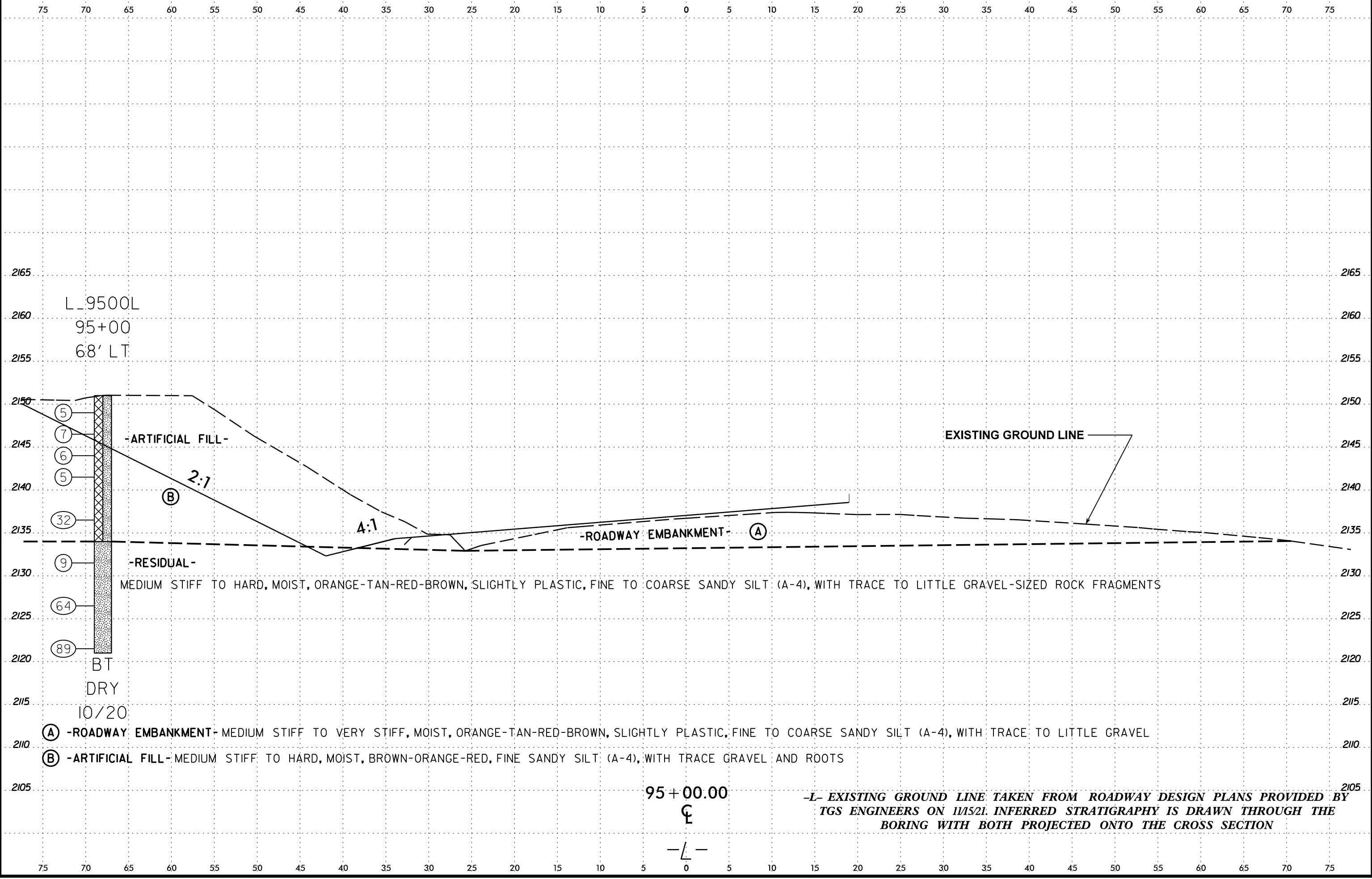
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L\_9500L  
95+00  
68' LT

-ARTIFICIAL FILL-

(B) 2:1

4:1

-ROADWAY EMBANKMENT-

(A)

EXISTING GROUND LINE

-RESIDUAL-

MEDIUM STIFF TO HARD, MOIST, ORANGE-TAN-RED-BROWN, SLIGHTLY PLASTIC, FINE TO COARSE SANDY SILT (A-4), WITH TRACE TO LITTLE GRAVEL-SIZED ROCK FRAGMENTS

BT  
DRY  
10/20

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

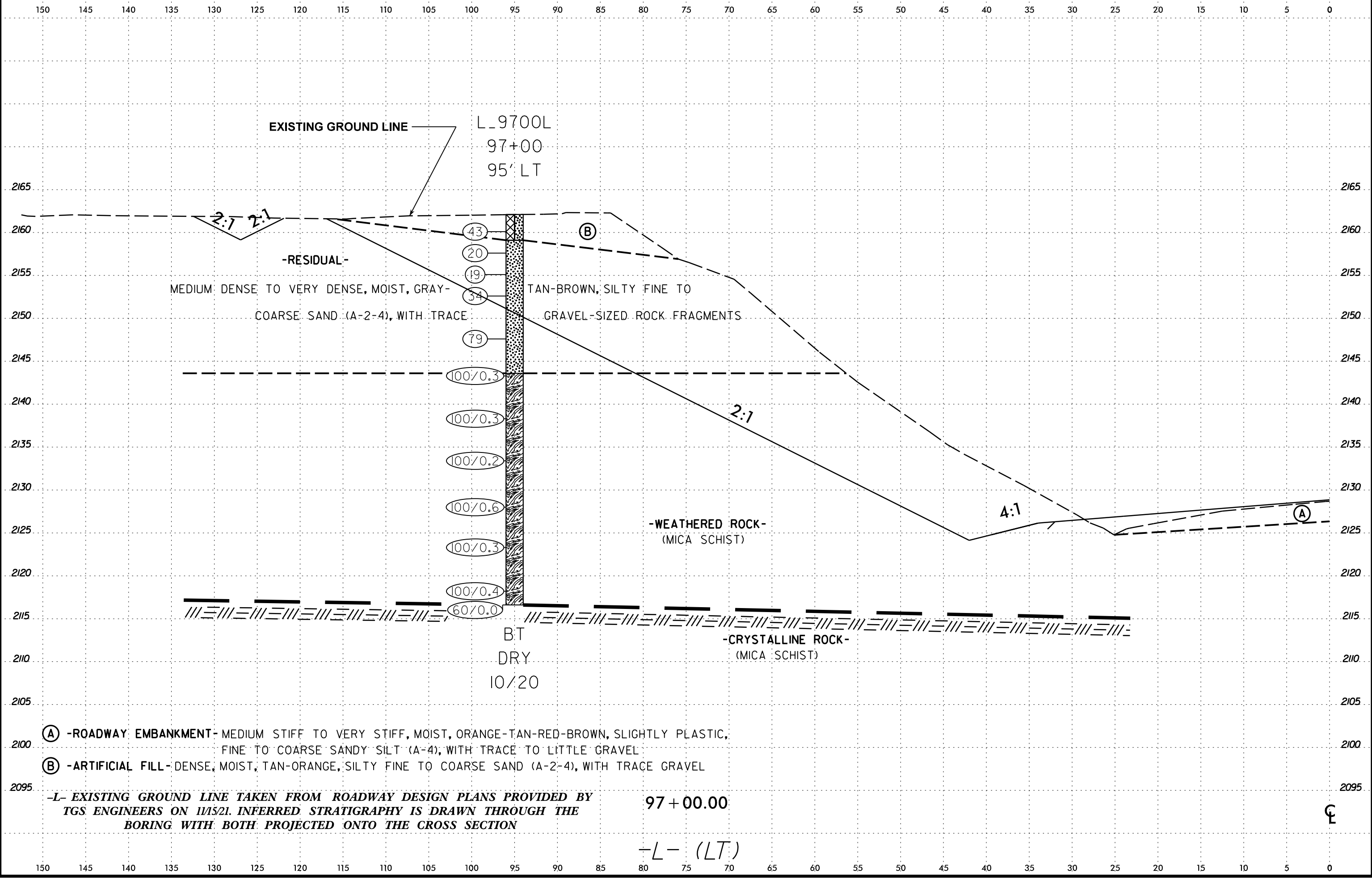
(B) -ARTIFICIAL FILL- MEDIUM STIFF TO HARD, MOIST, BROWN-ORANGE-RED, FINE SANDY SILT (A-4), WITH TRACE GRAVEL AND ROOTS

95 + 00.00

CL

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 1/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

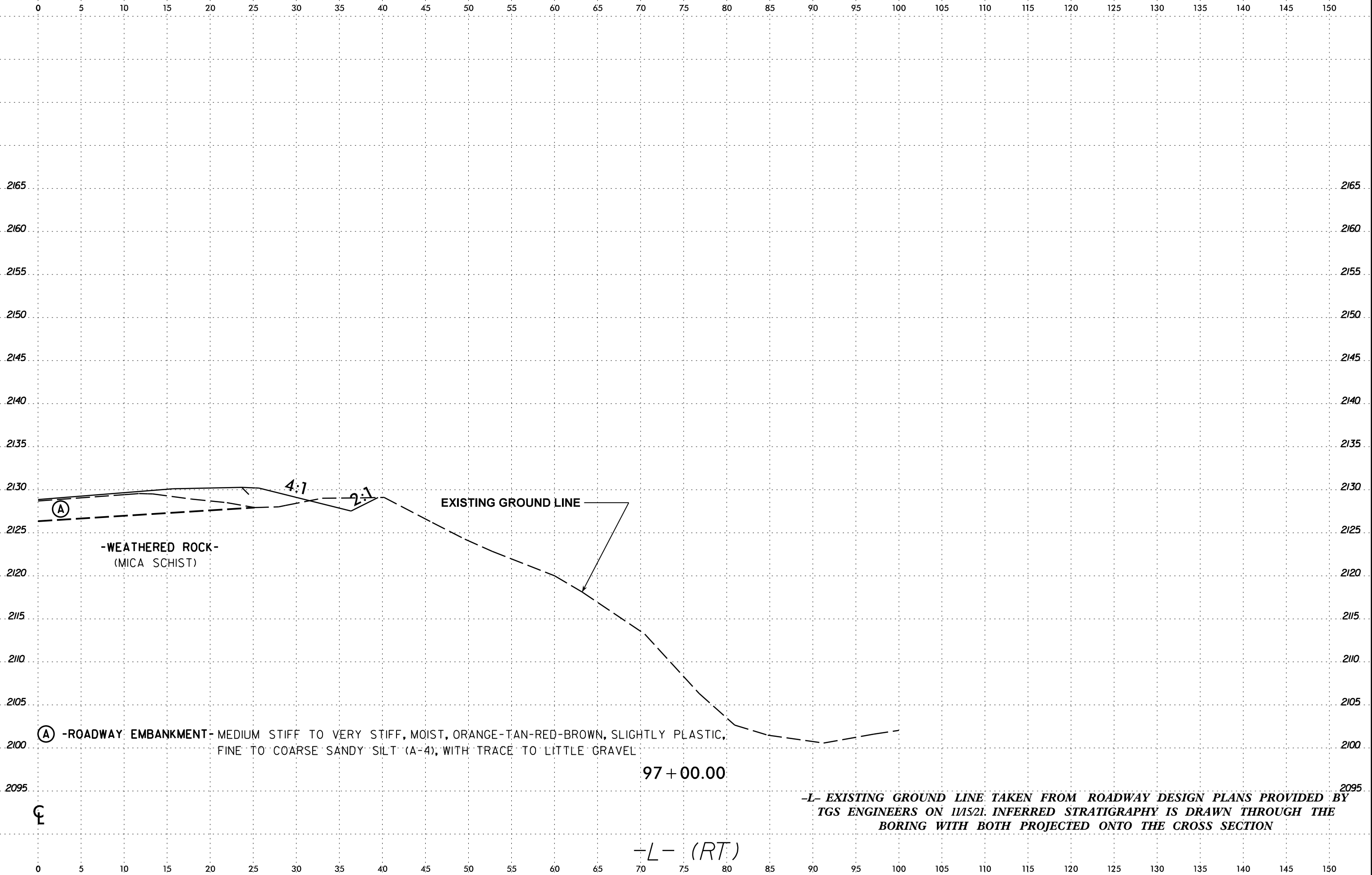
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6/23/16



PROJ. REFERENCE NO.	SHEET NO.
A-0009CA	81



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

-WEATHERED ROCK-  
(MICA SCHIST)

EXISTING GROUND LINE

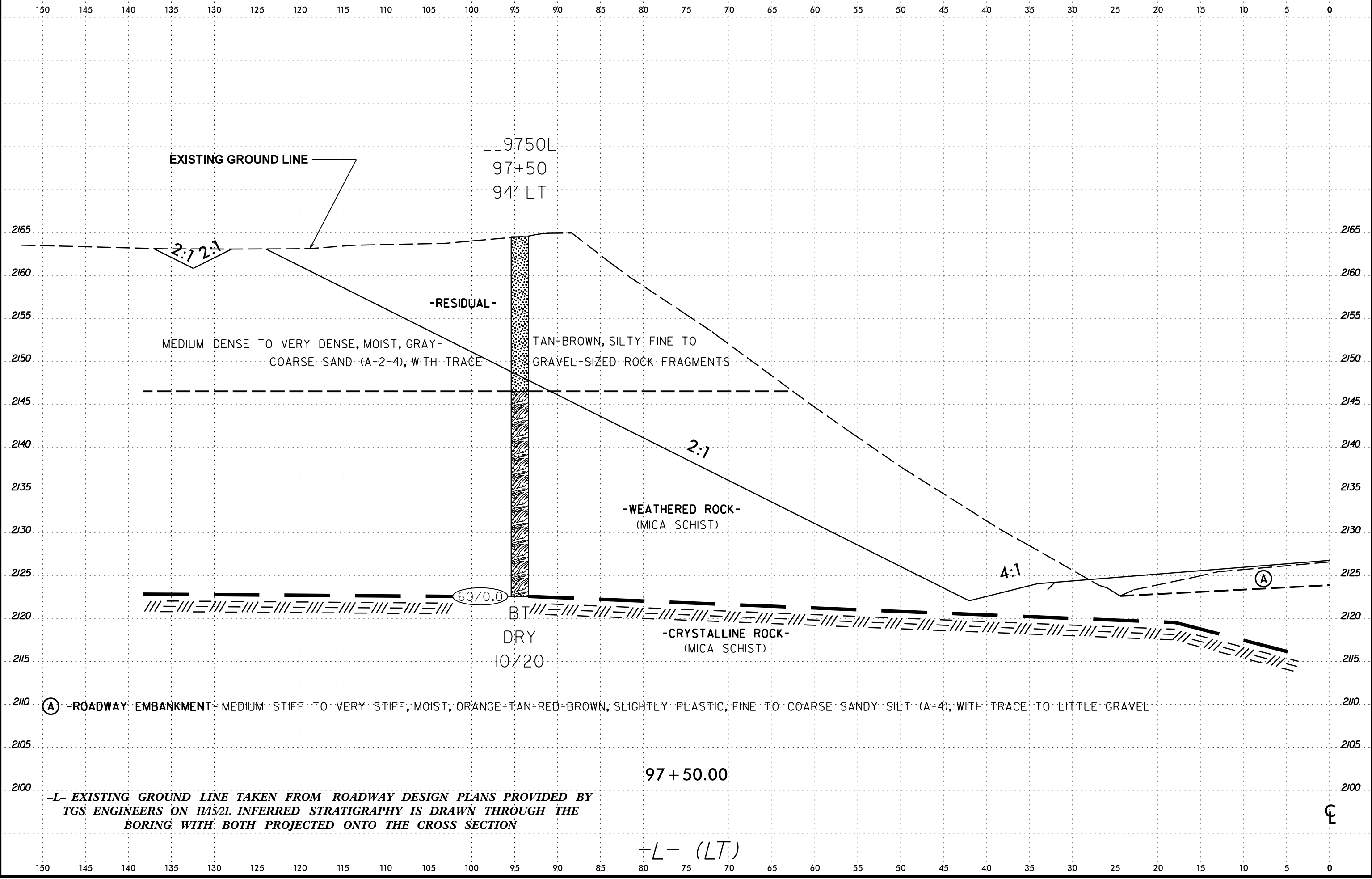
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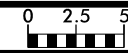
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BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

-L- (RT)

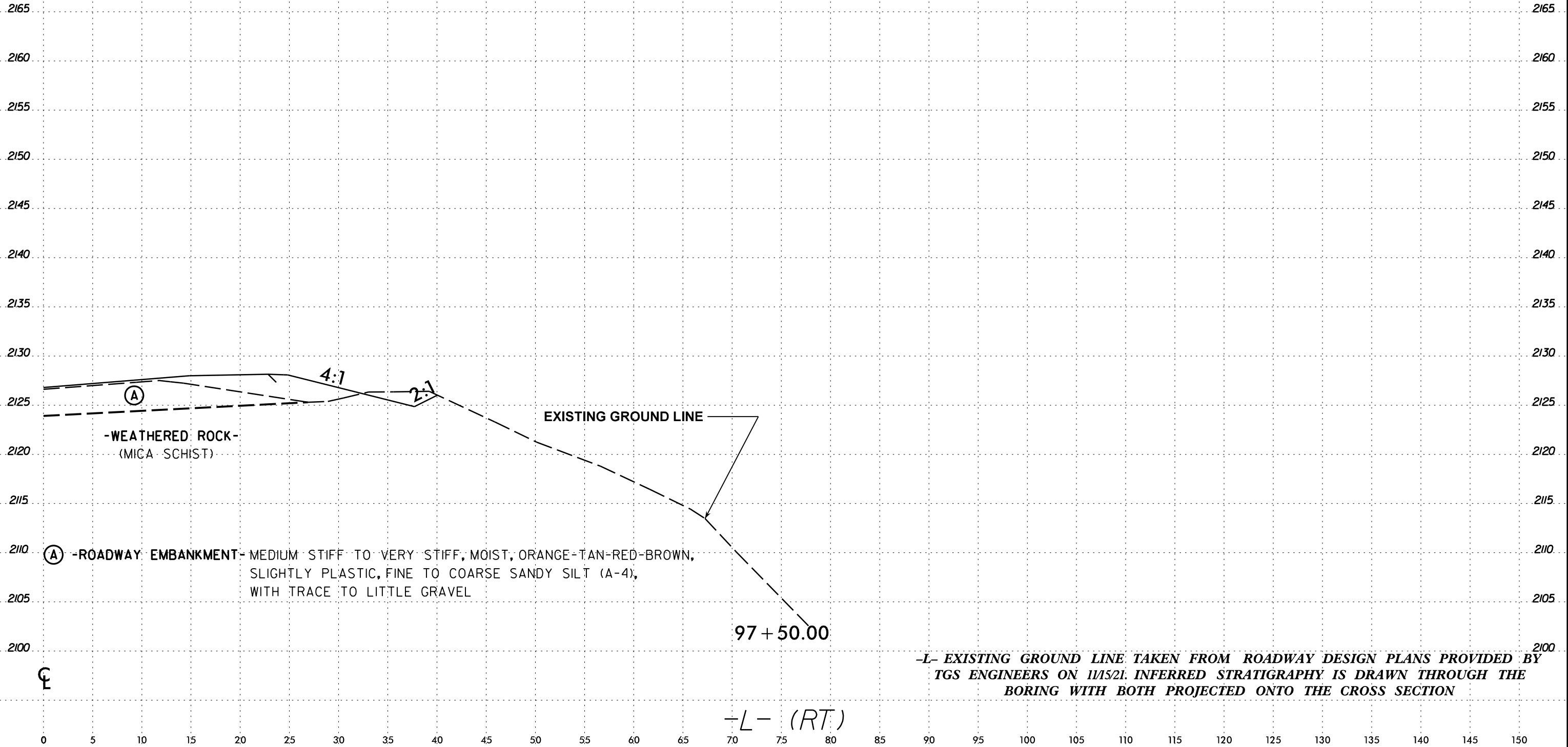
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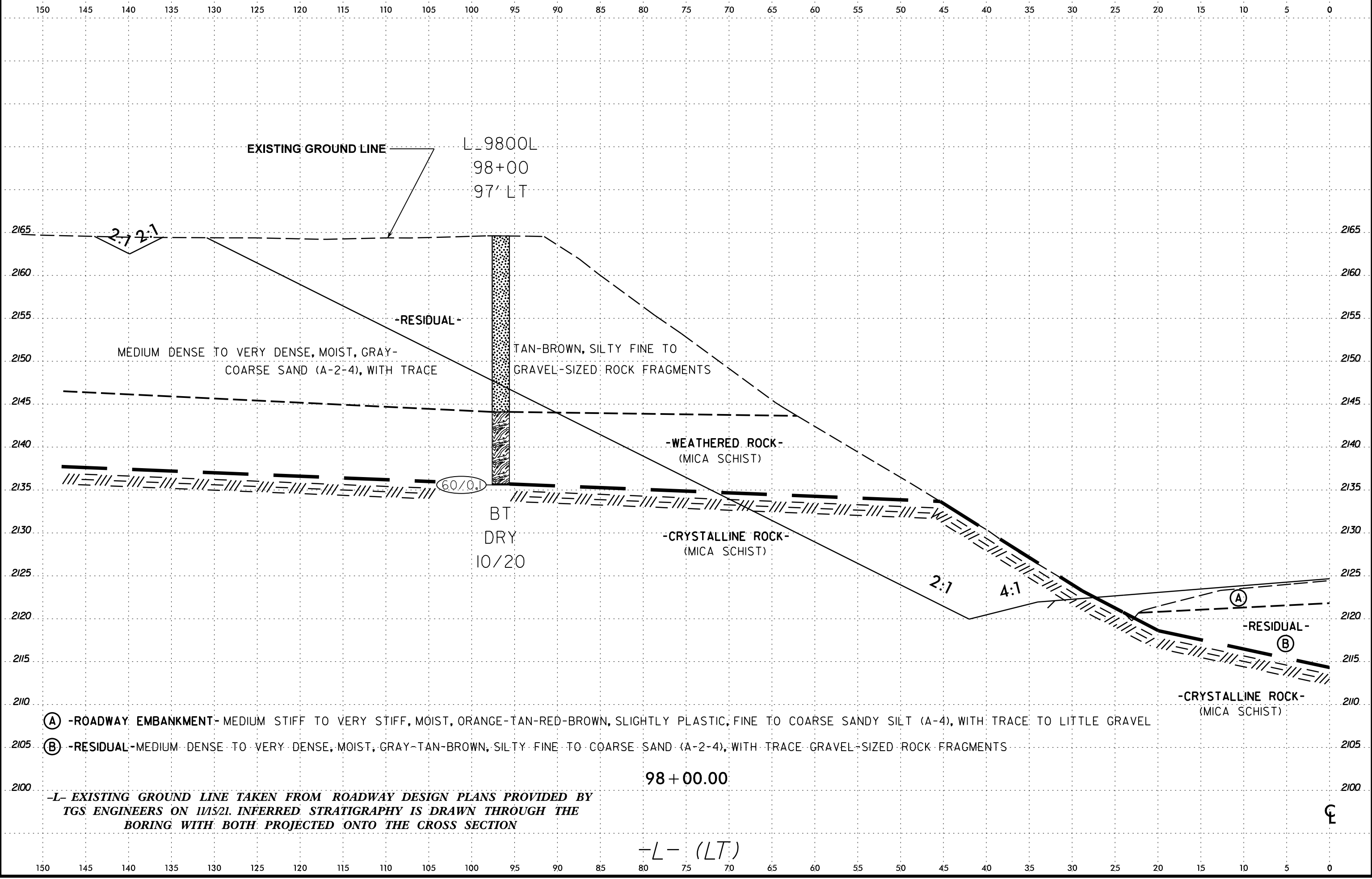


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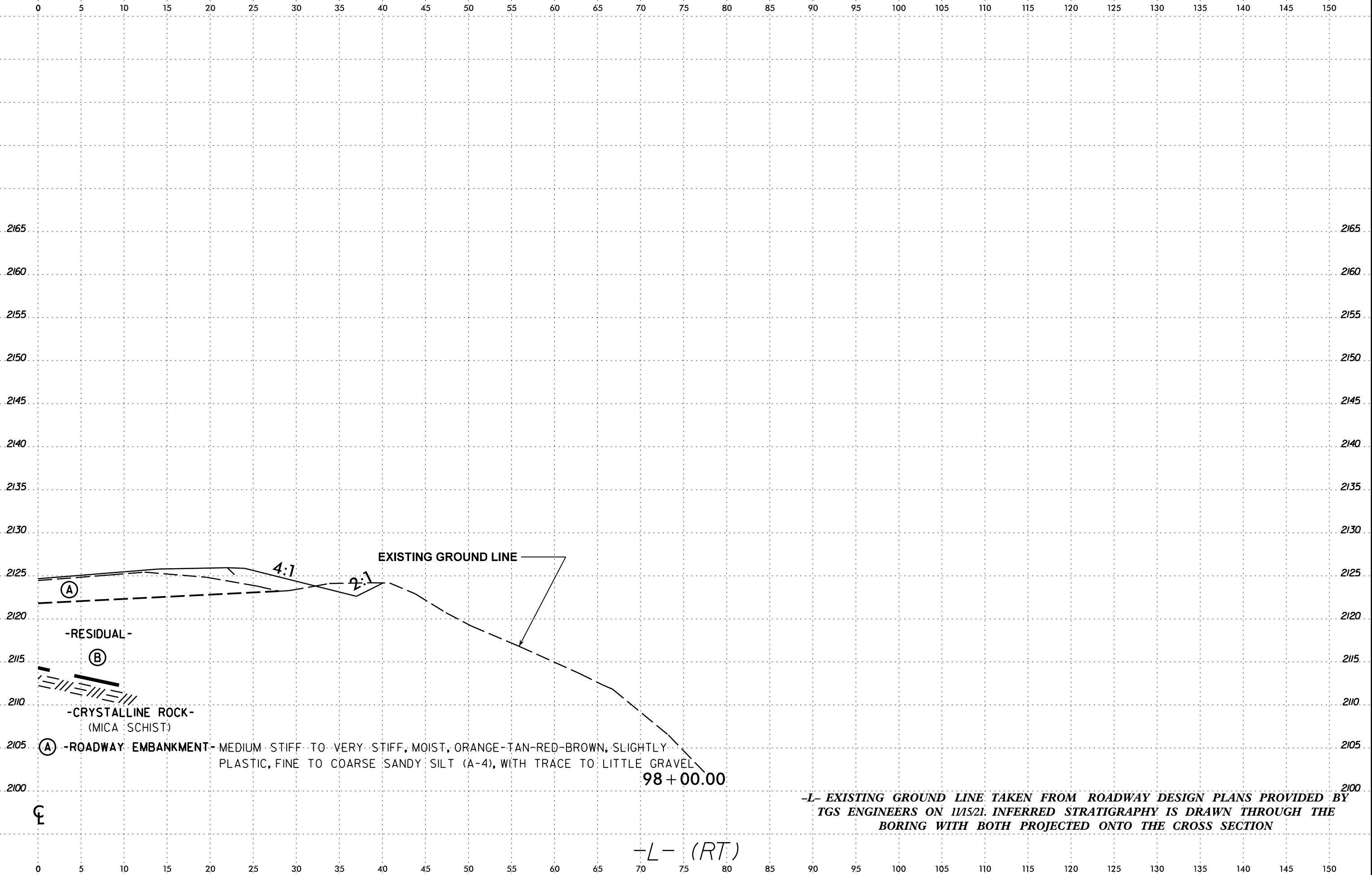
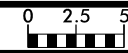


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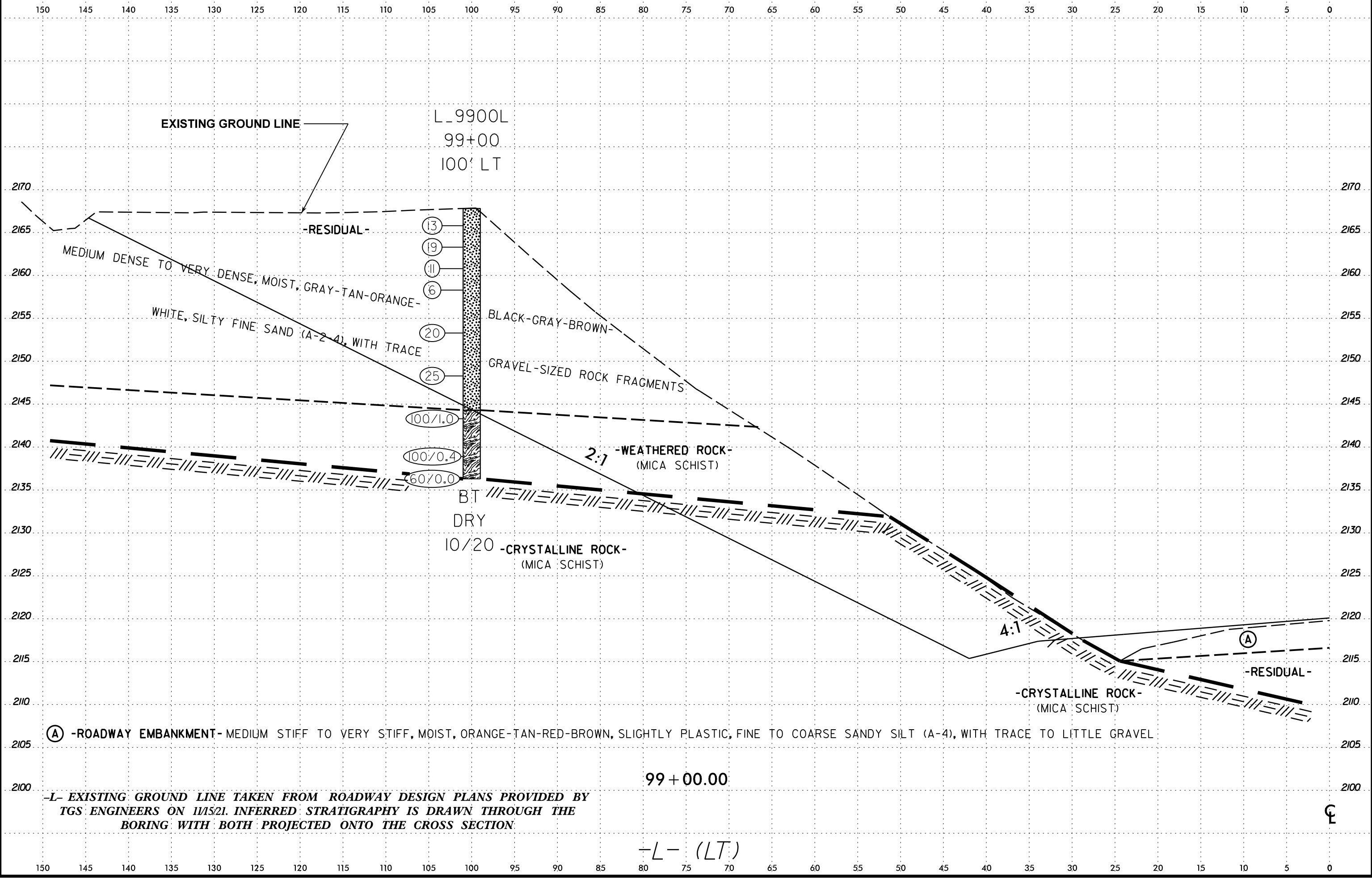






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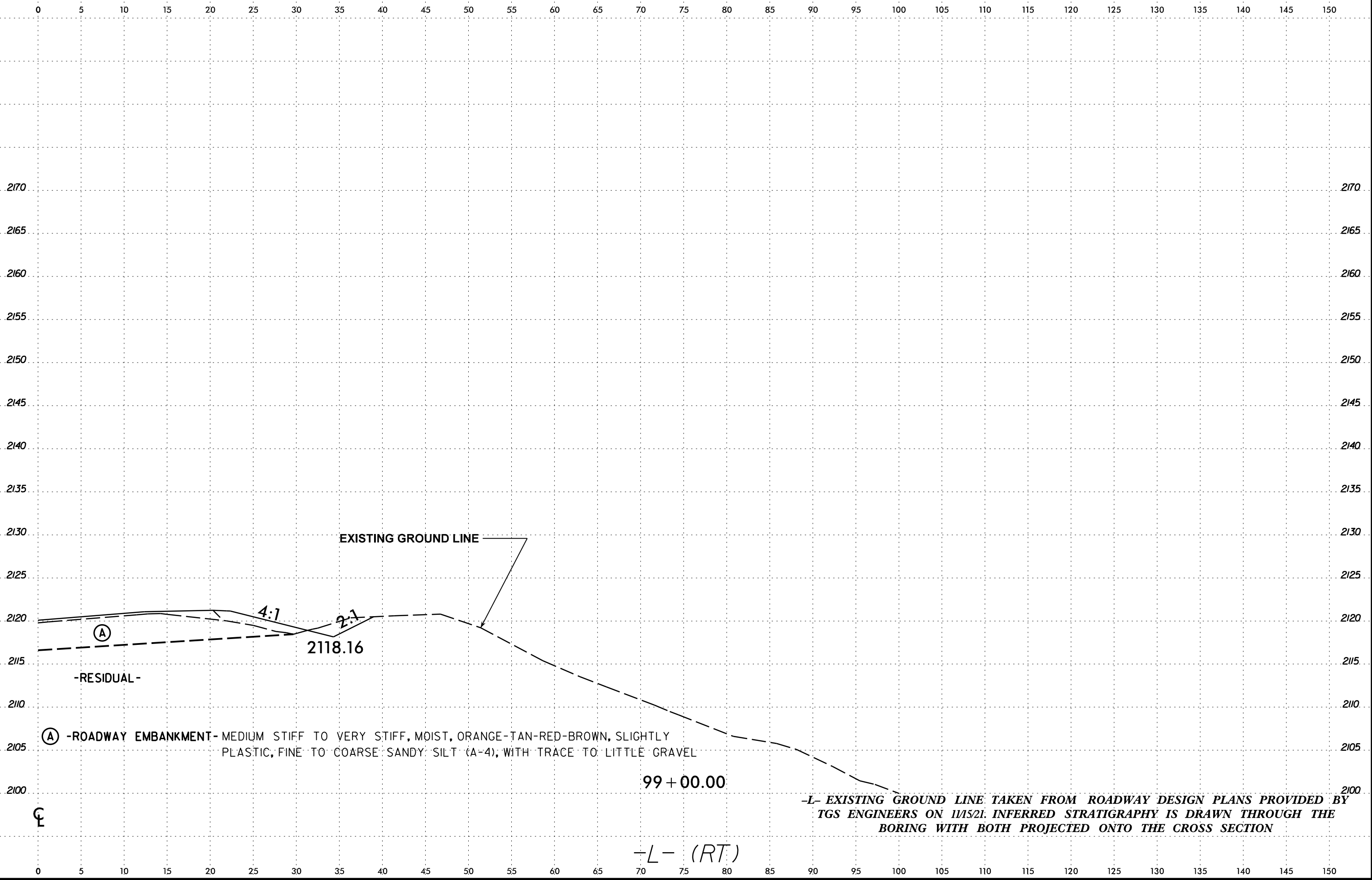
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PROJ. REFERENCE NO.	SHEET NO.
A-0009CA	87

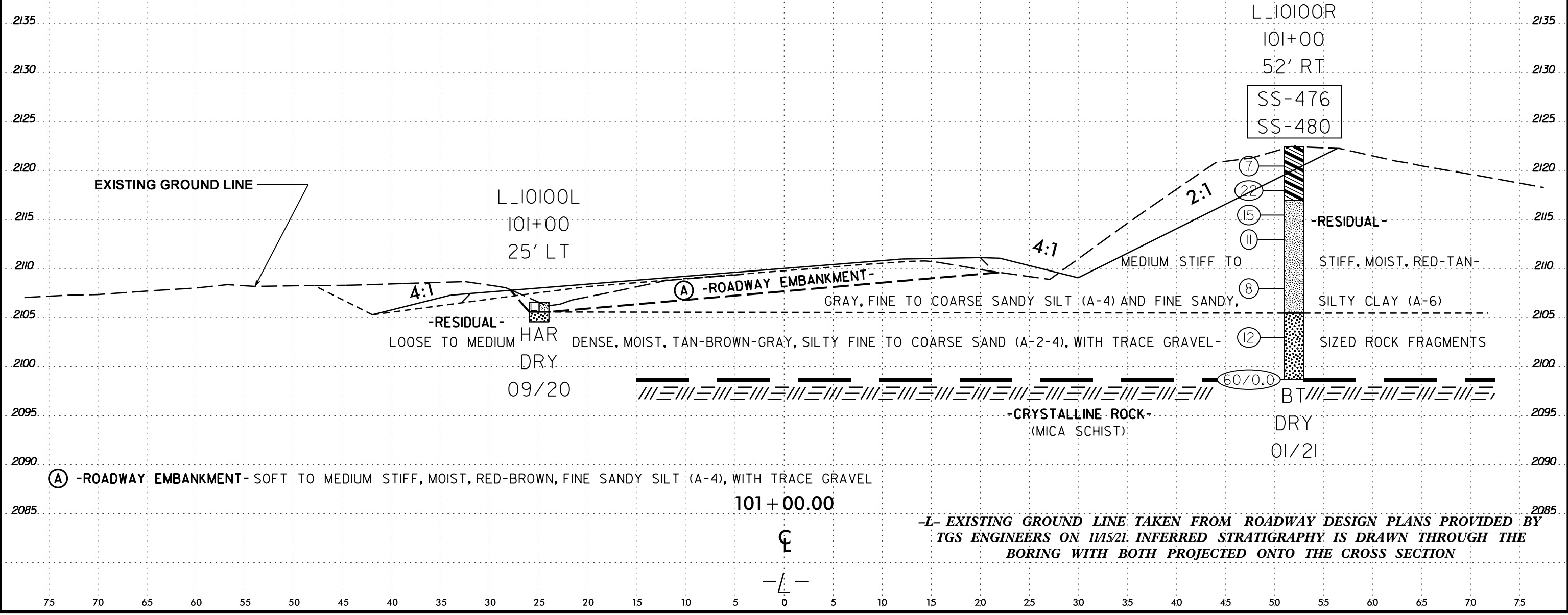


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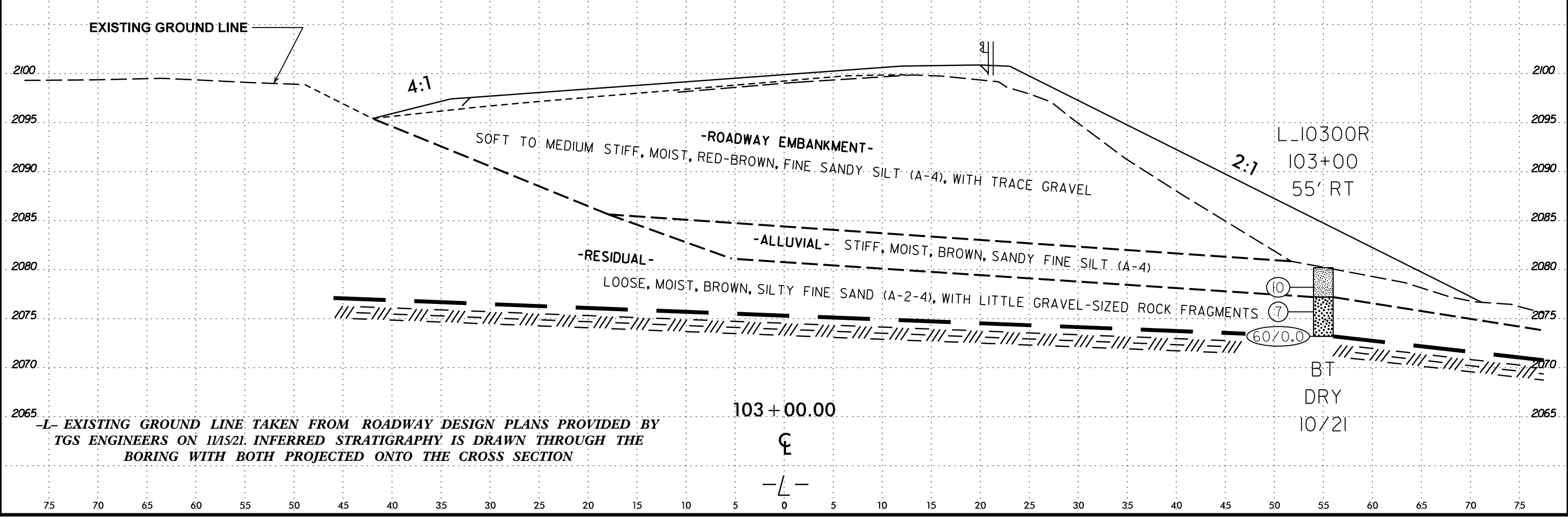
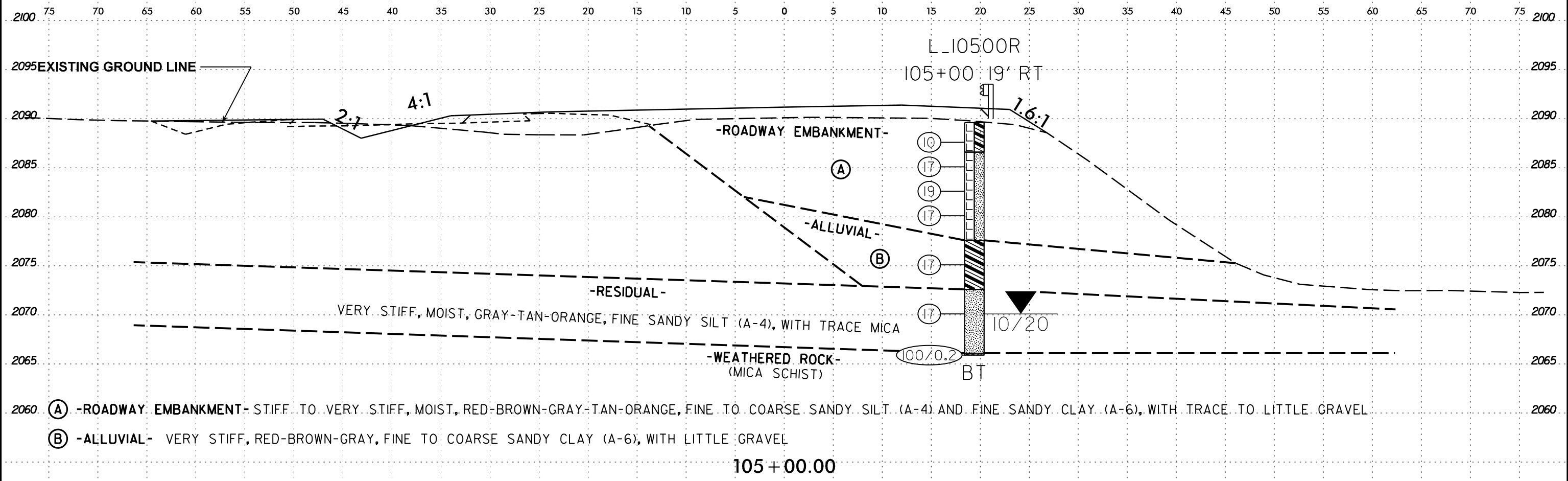
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### SOIL TEST RESULTS

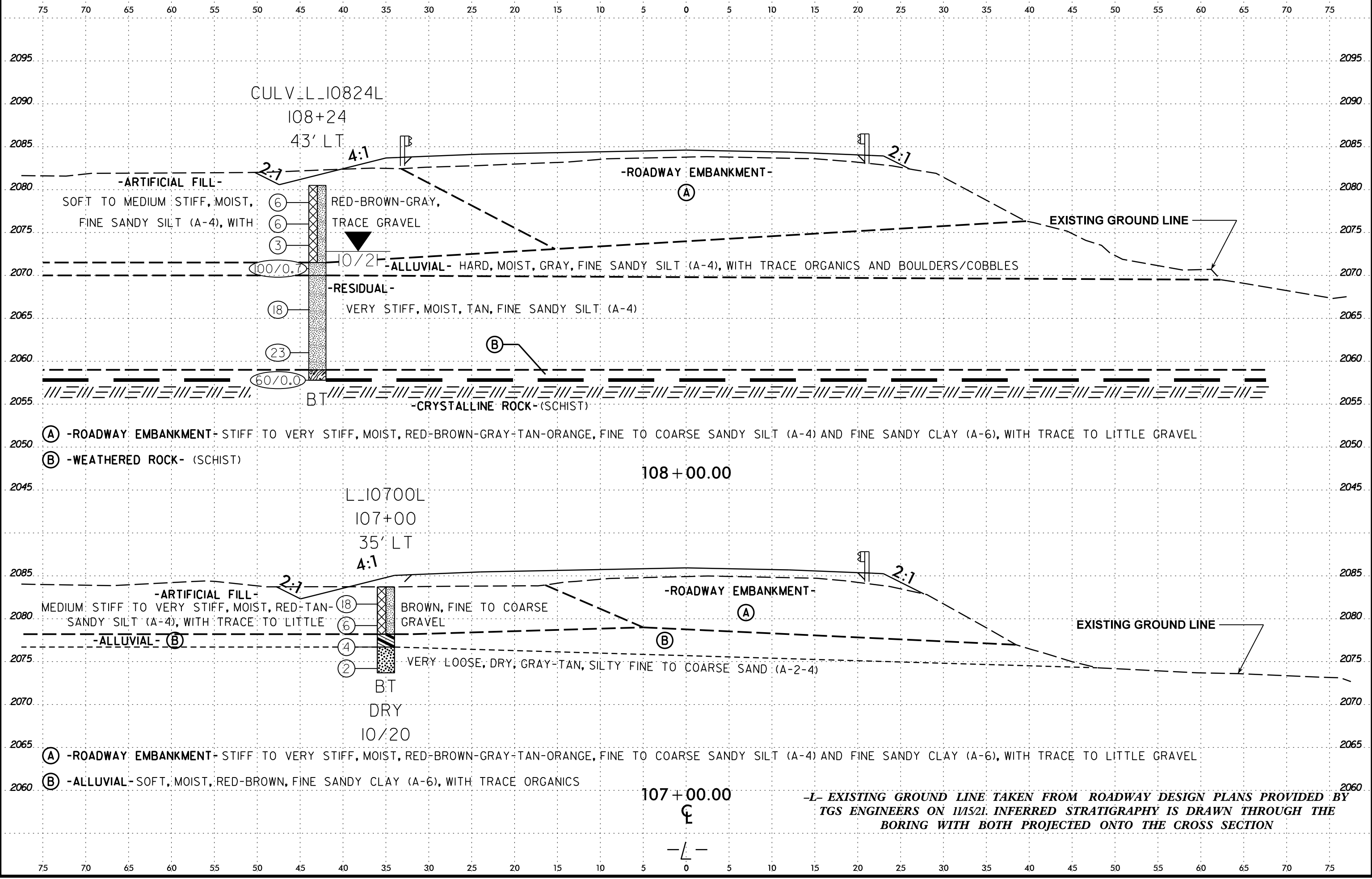
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							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-476	52' RT	101+00 -L-	1.0 - 2.5'	A-6(7)	39	11	8.0	31.0	15.0	46.0	100.0	97.0	67.0	26.0	-
SS-480	52' RT	101+00 -L-	13.5 - 15.0'	A-4(0)	25	NP	21.0	52.0	17.0	10.0	100.0	89.0	37.0	14.0	-



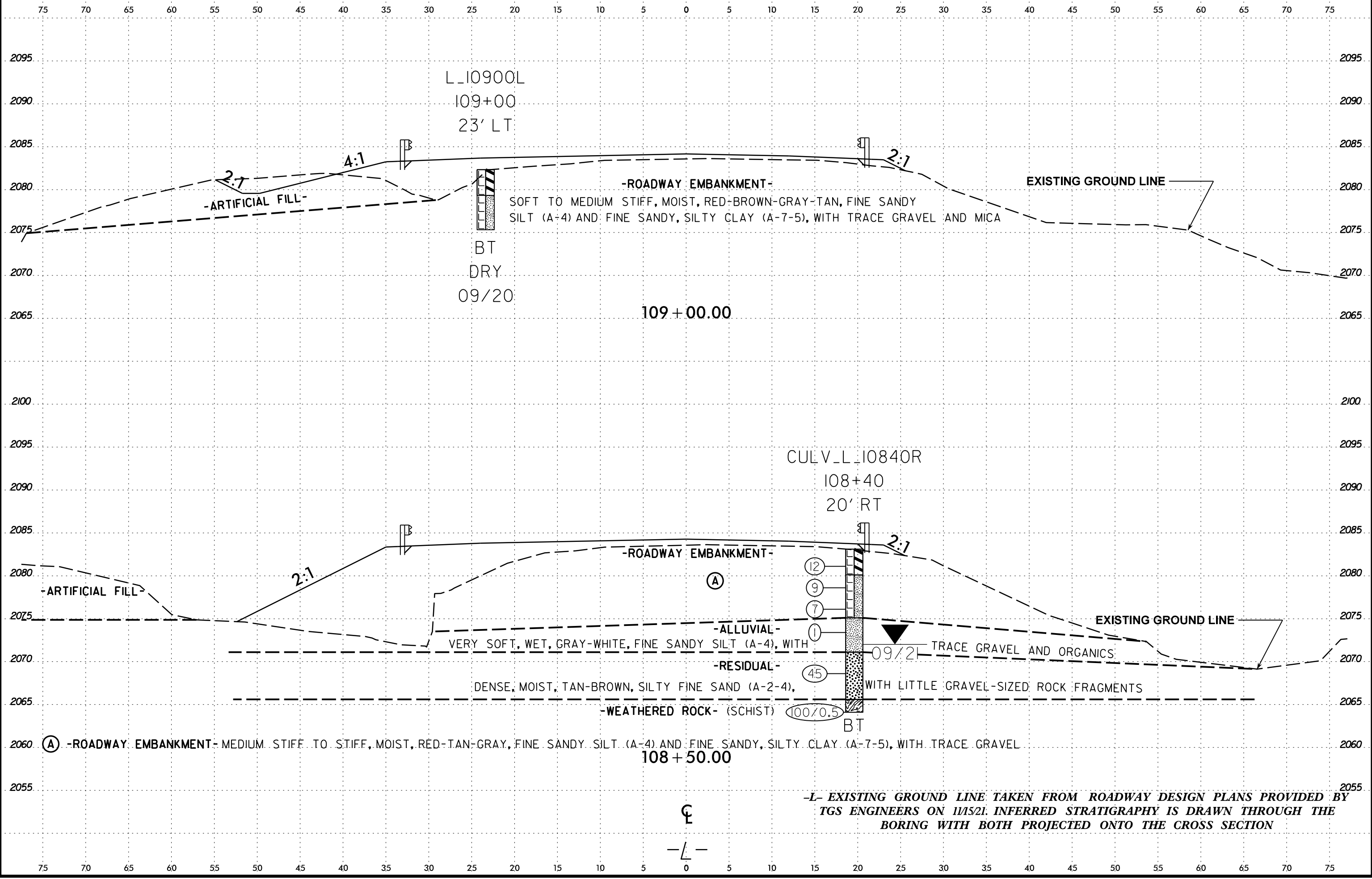
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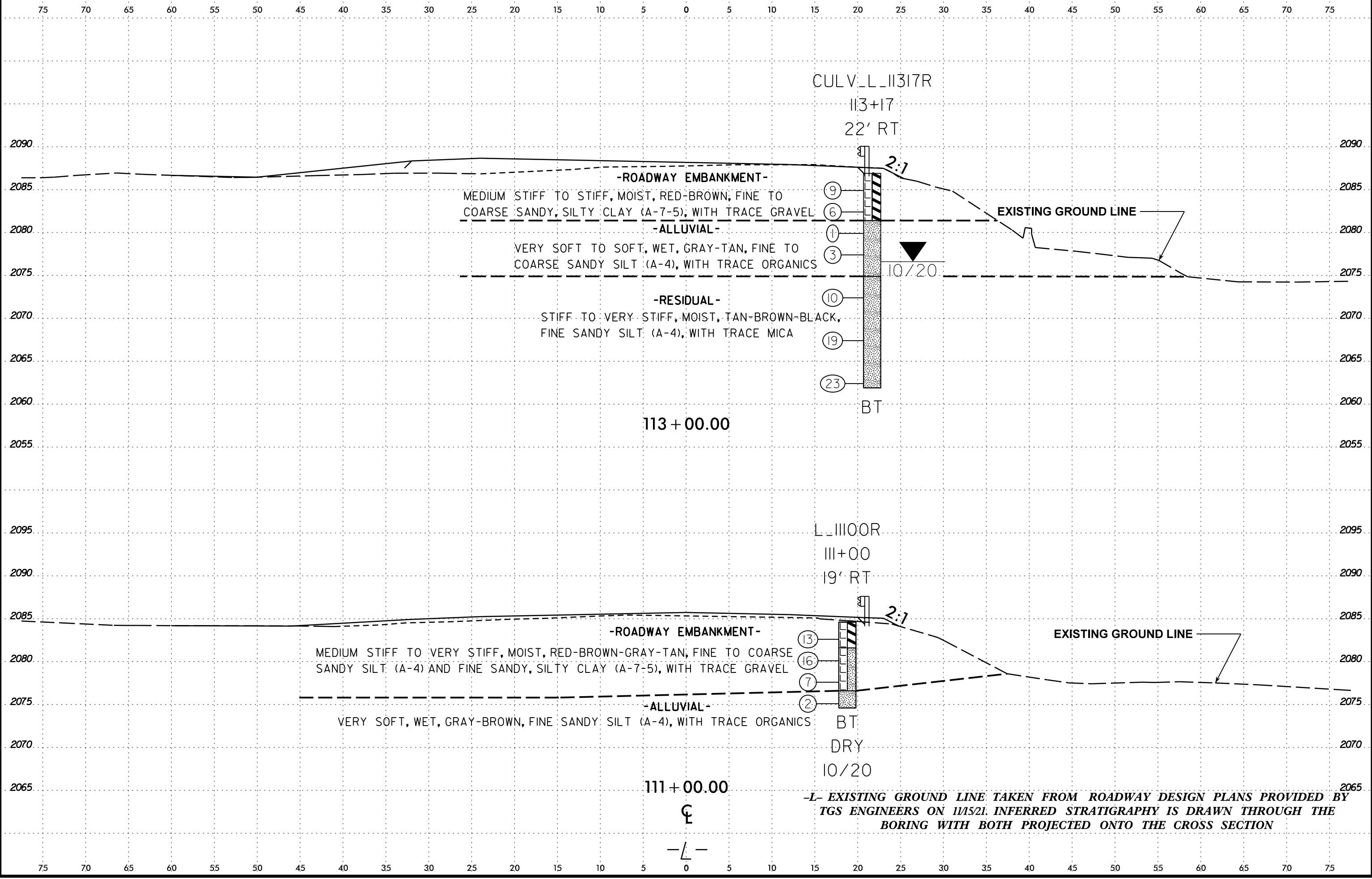


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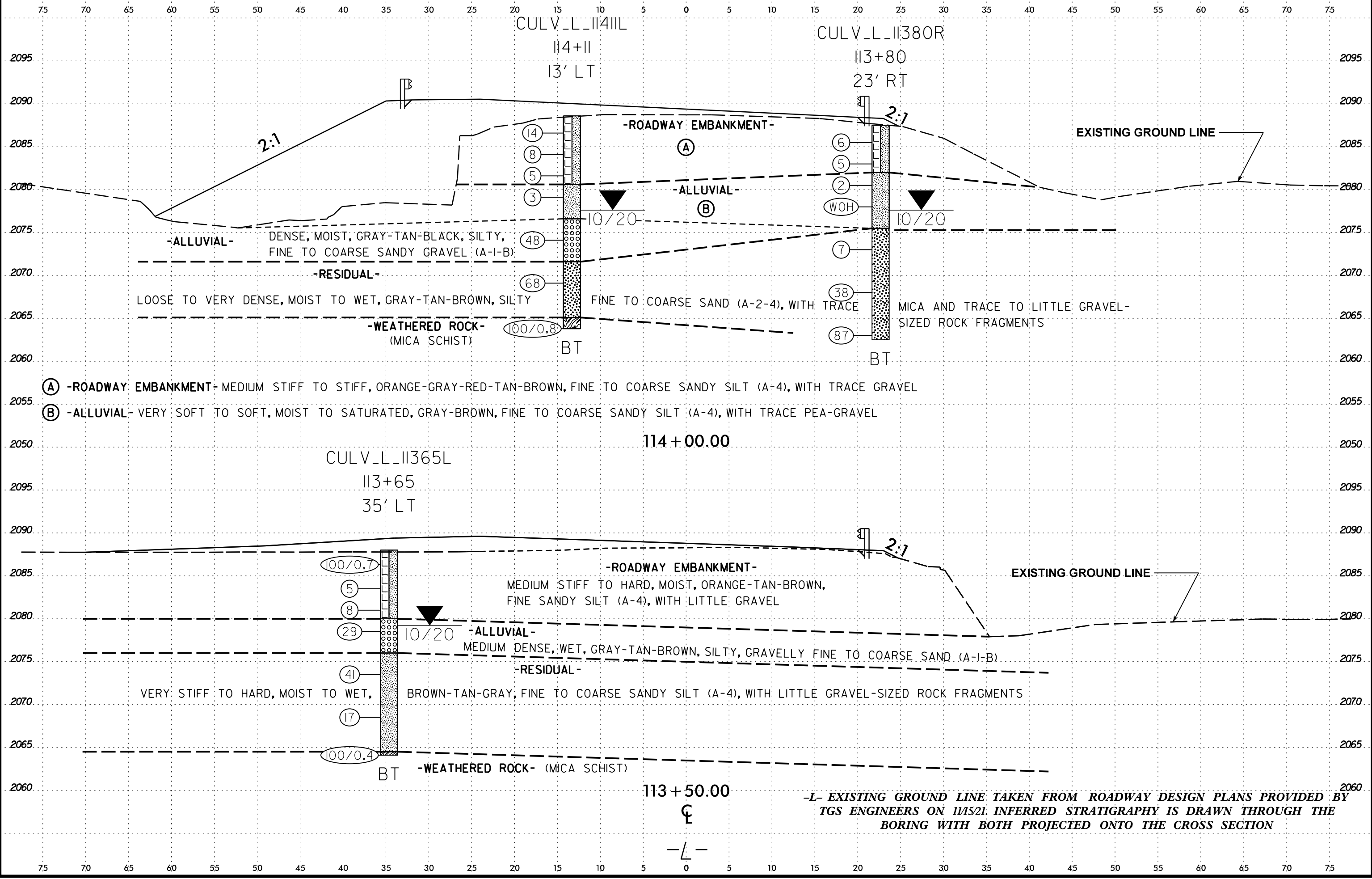
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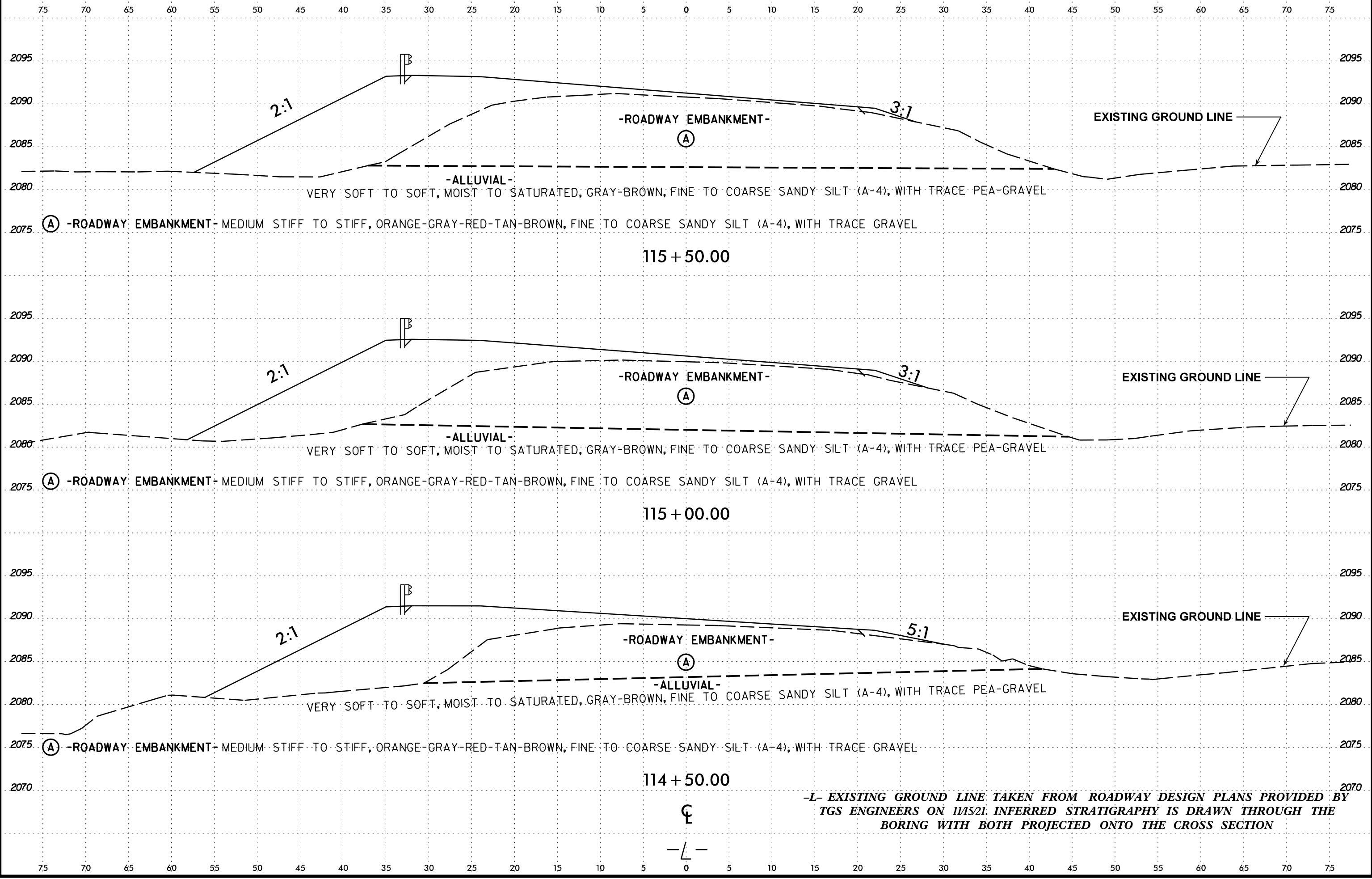




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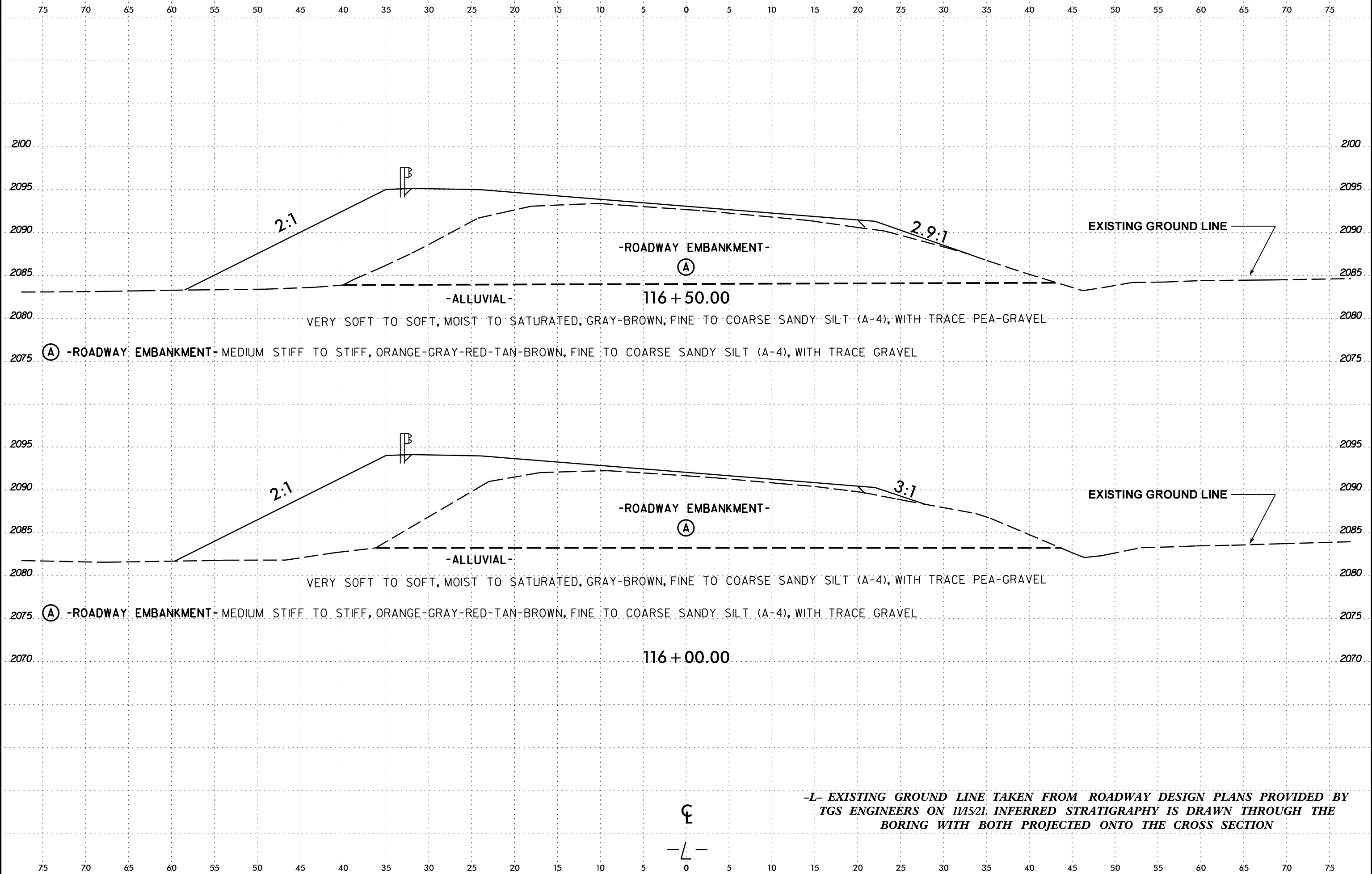


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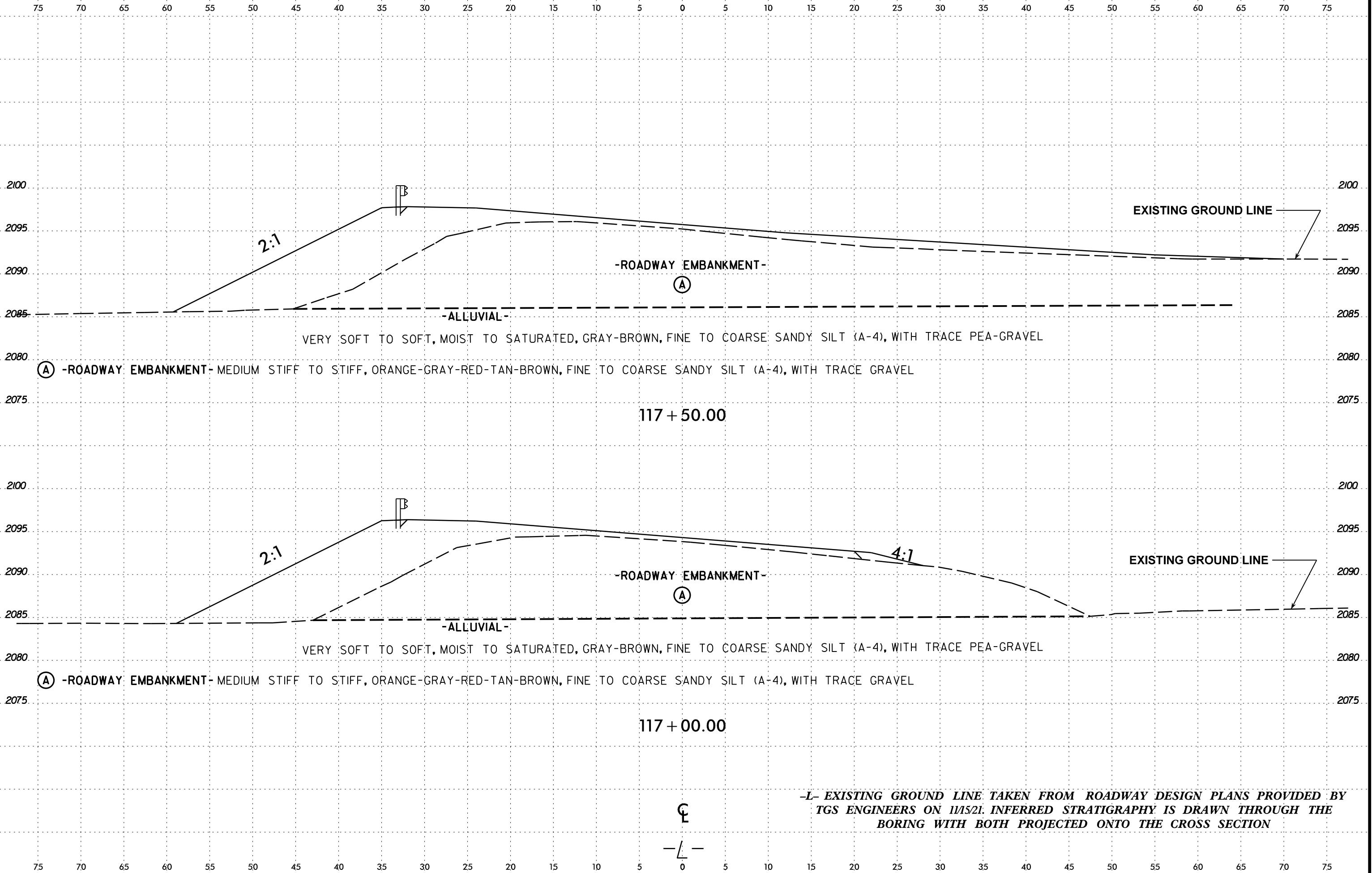
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PROJ. REFERENCE NO.	SHEET NO.
A-0009CA	95



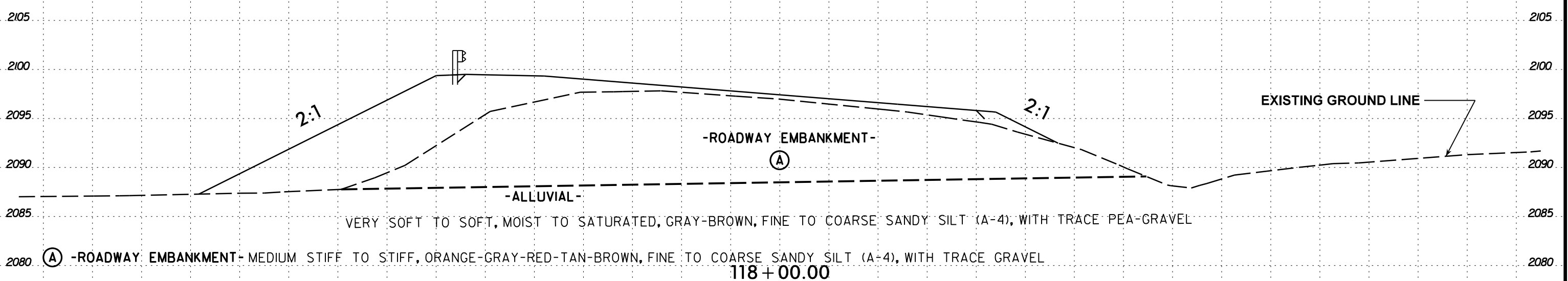
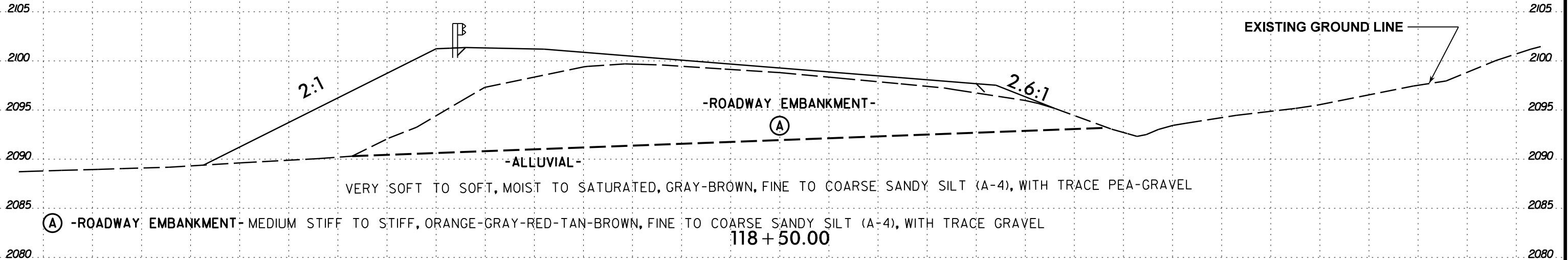
-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/5/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION



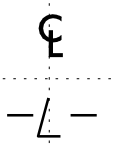
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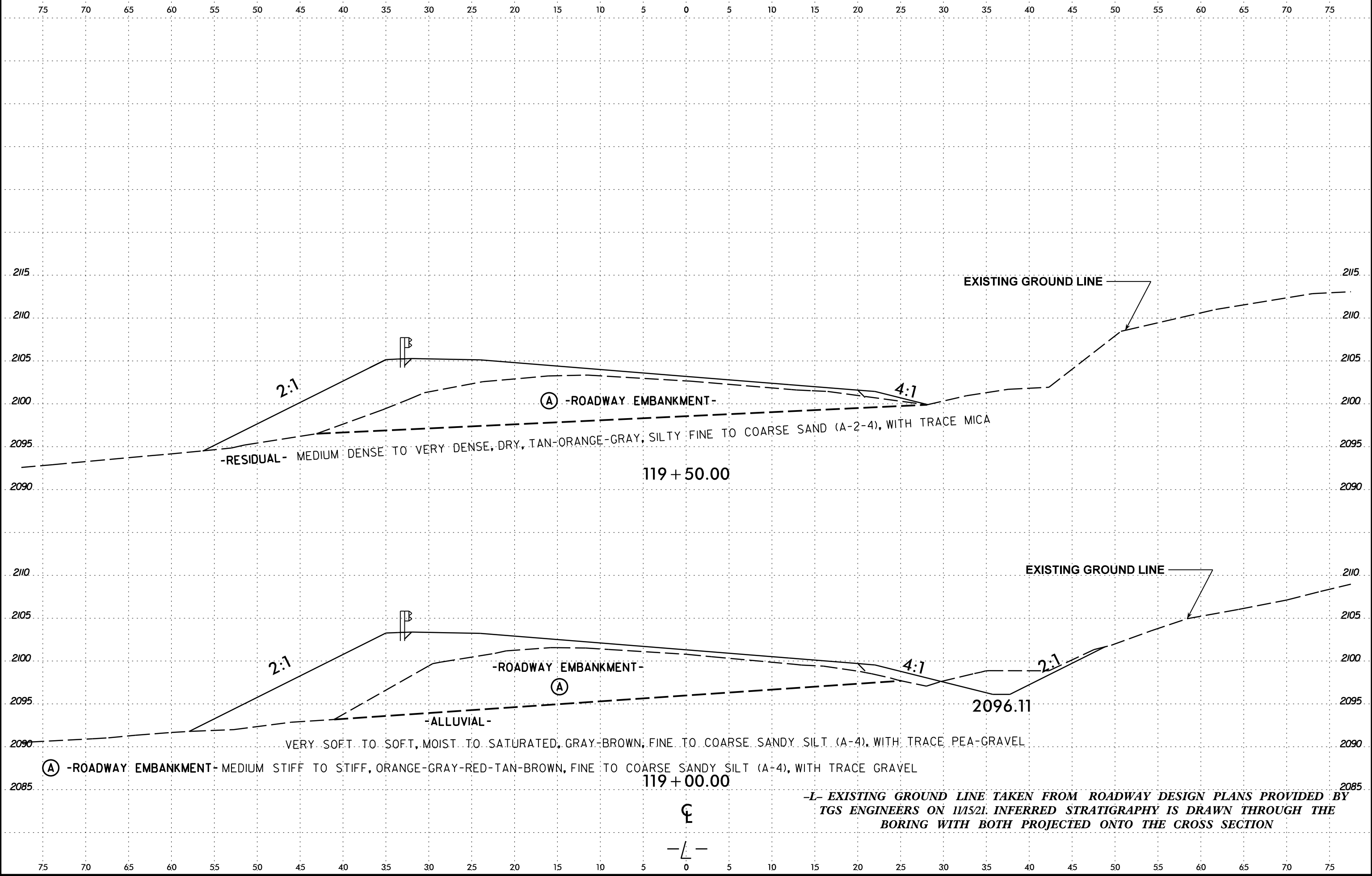
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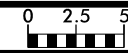
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6/23/16  
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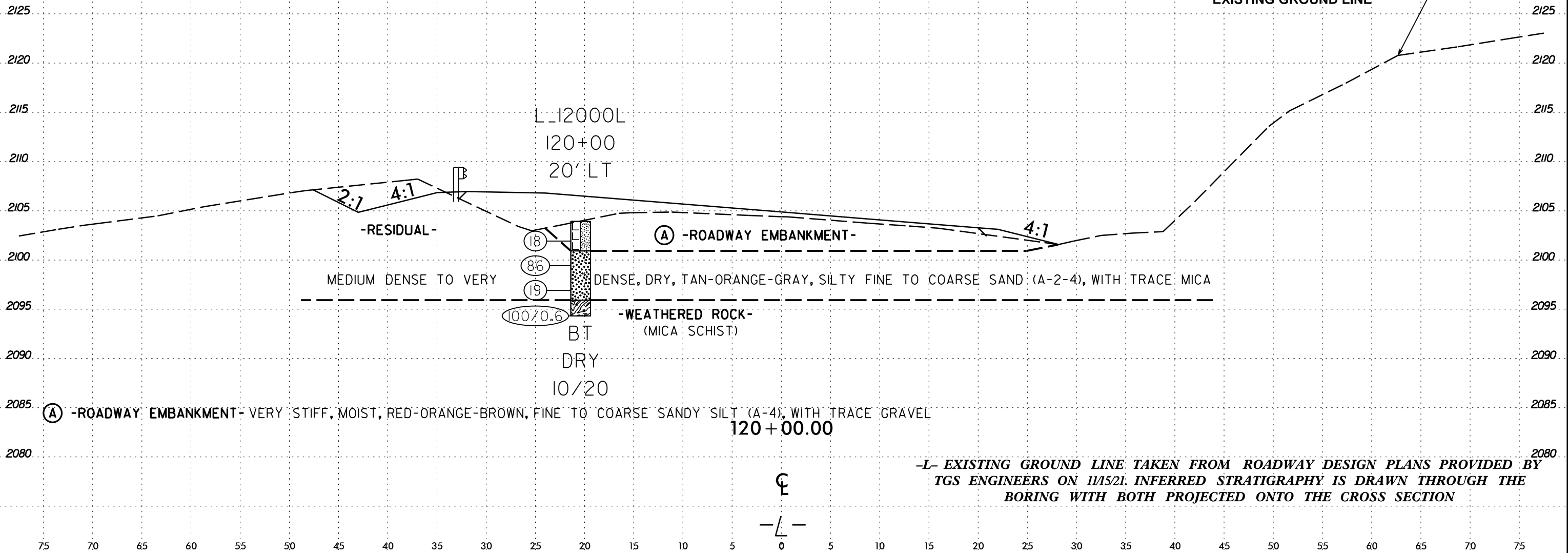


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PROJ. REFERENCE NO.	SHEET NO.
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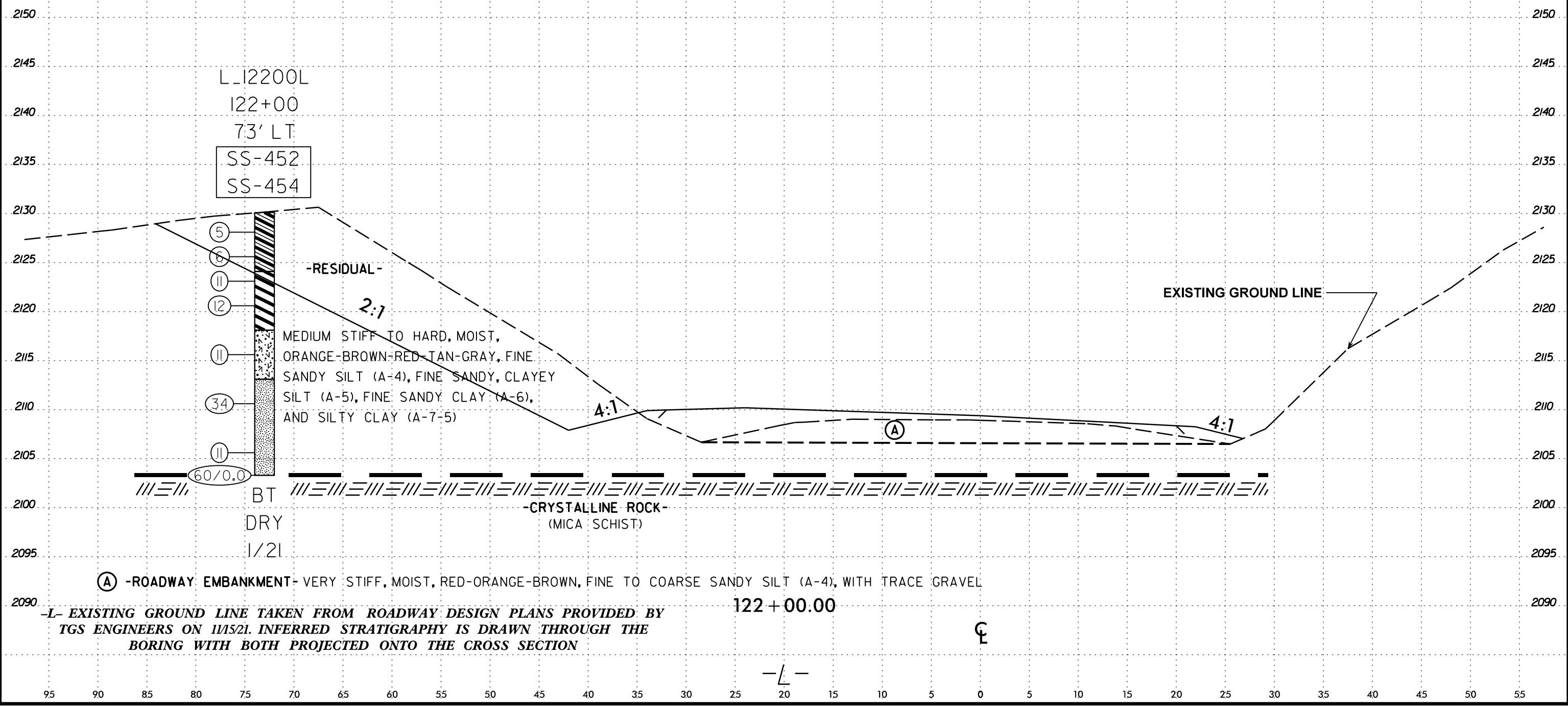
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 6/23/16

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

### 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-452	73' LT	122+00 -L-	3.5 - 5.0'	A-6(10)	39	12	6.0	21.0	25.0	48.0	100.0	97.0	78.0	25.0	-
SS-454	73' LT	122+00 -L-	8.5 - 10.0'	A-7-5(13)	49	12	6.0	17.0	12.0	65.0	100.0	97.0	81.0	34.0	-

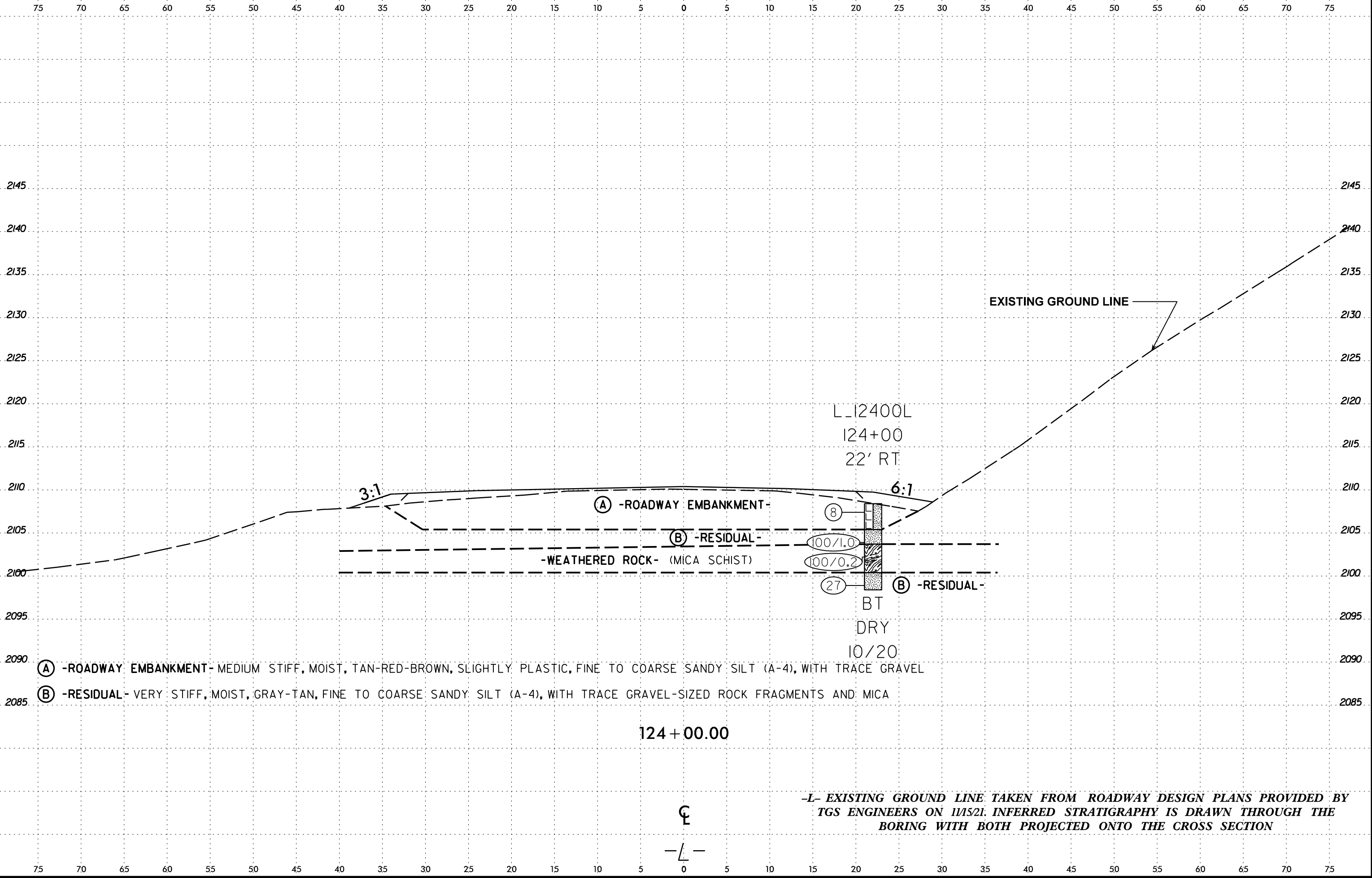




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0 2.5 5	PROJ. REFERENCE NO. A-0009CA	SHEET NO. 101
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75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

2145  
2140  
2135  
2130  
2125  
2120  
2115  
2110  
2105  
2100  
2095  
2090  
2085

EXISTING GROUND LINE

L 12400L  
124+00  
22' RT

3:1

6:1

(A) -ROADWAY EMBANKMENT-

(B) -RESIDUAL-

-WEATHERED ROCK- (MICA SCHIST)

(8)

(100/1.0)

(100/0.2)

(27)

(B) -RESIDUAL-

BT

DRY

10/20

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

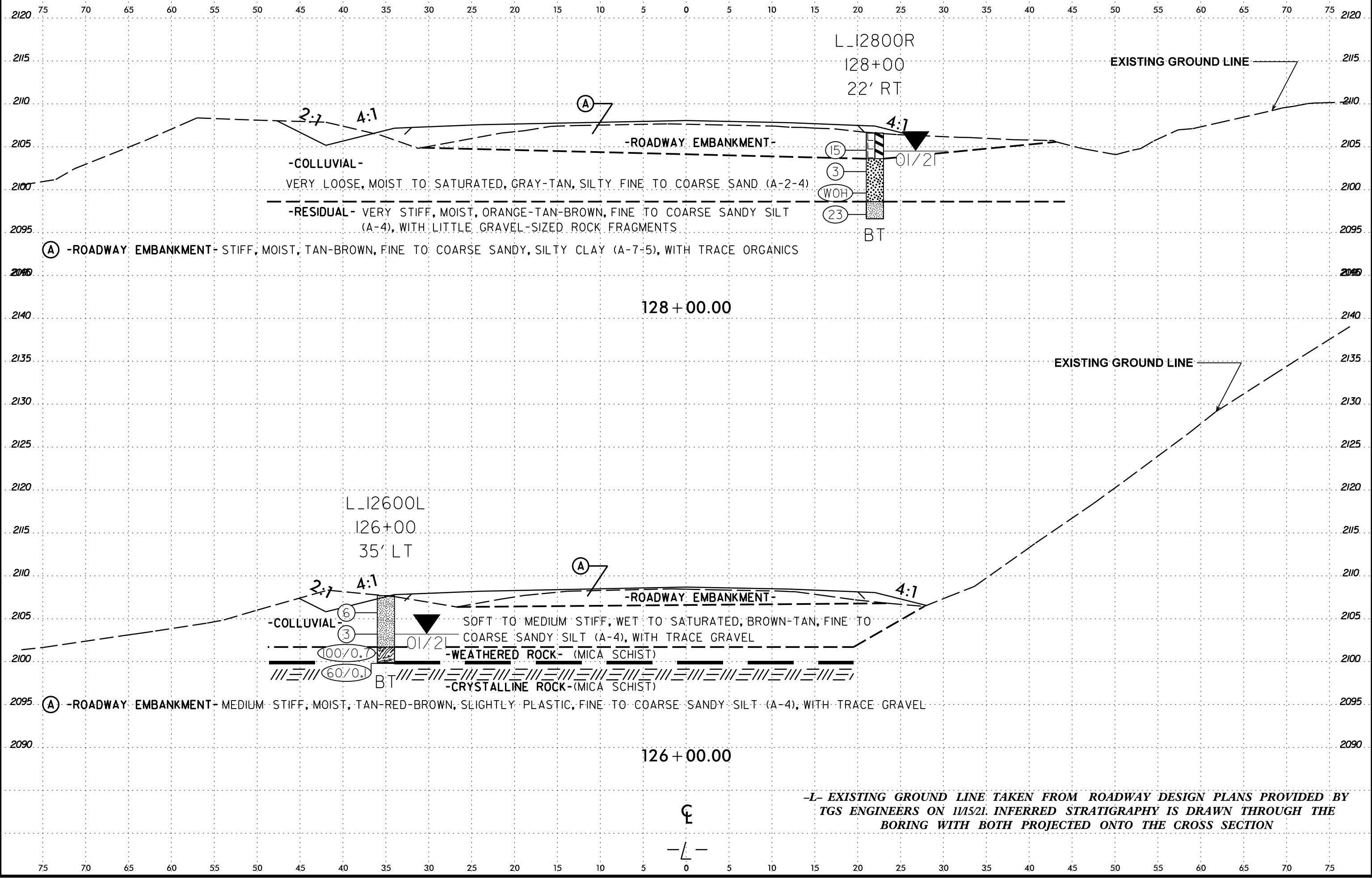
(B) -RESIDUAL- VERY STIFF, MOIST, GRAY-TAN, FINE TO COARSE SANDY SILT (A-4), WITH TRACE GRAVEL-SIZED ROCK FRAGMENTS AND MICA

124 + 00.00

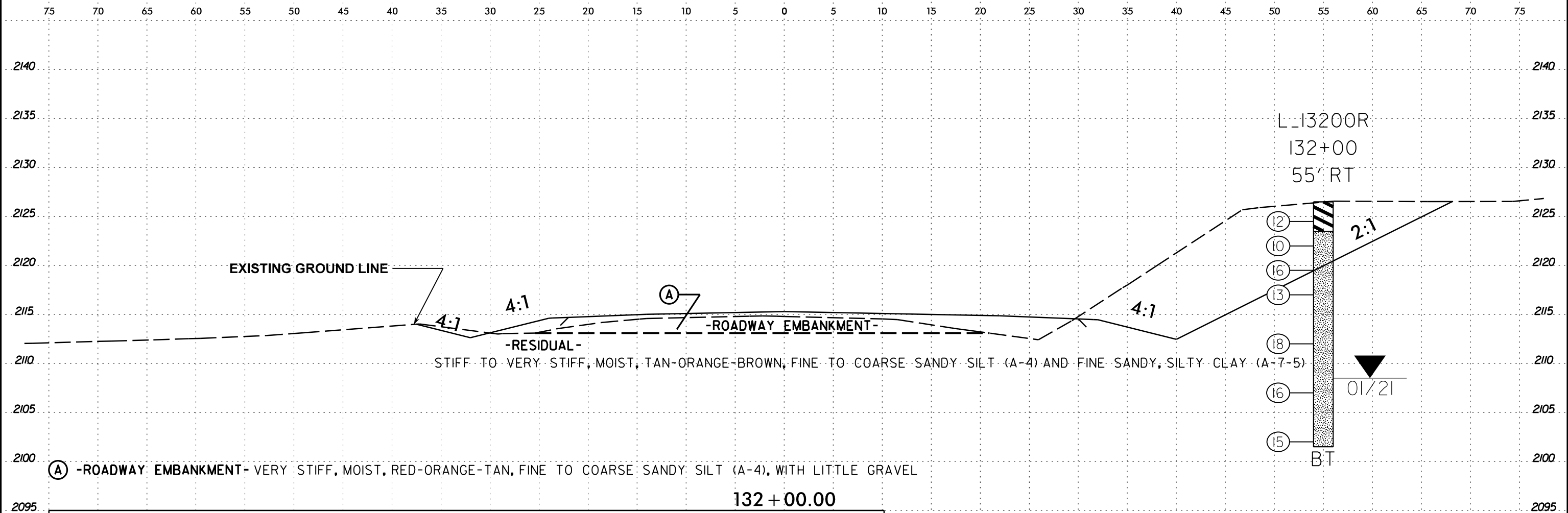
-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/5/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

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

6/23/16  
29-APR-2022 12:21  
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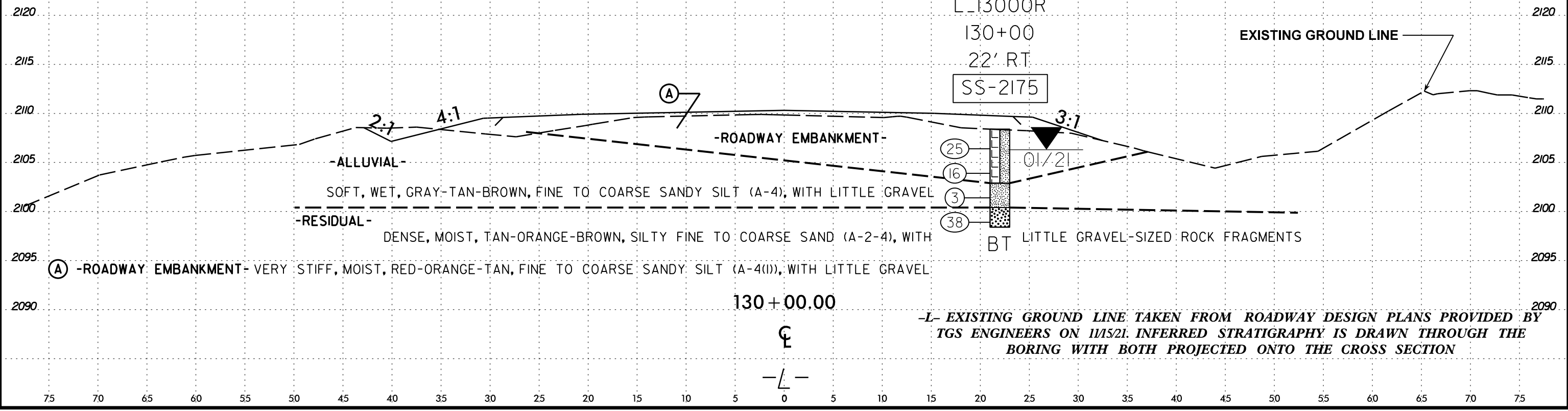


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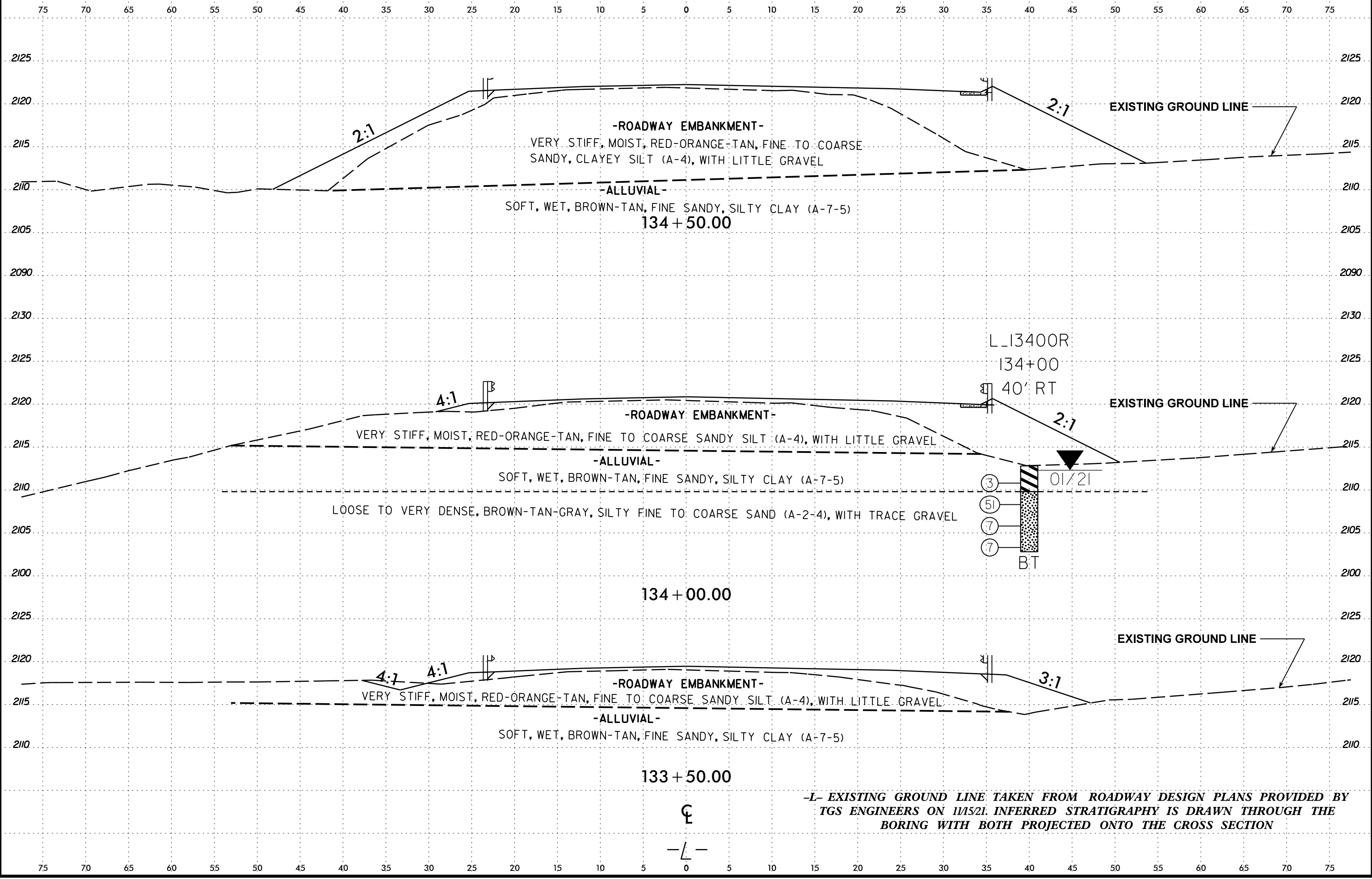
**SOIL TEST RESULTS**

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-2175	22' RT	130+00 -L-	1.0 - 2.5'	A-4(1)	29	5	17.0	35.0	25.0	23	99.0	90.0	57.0	14.0	-

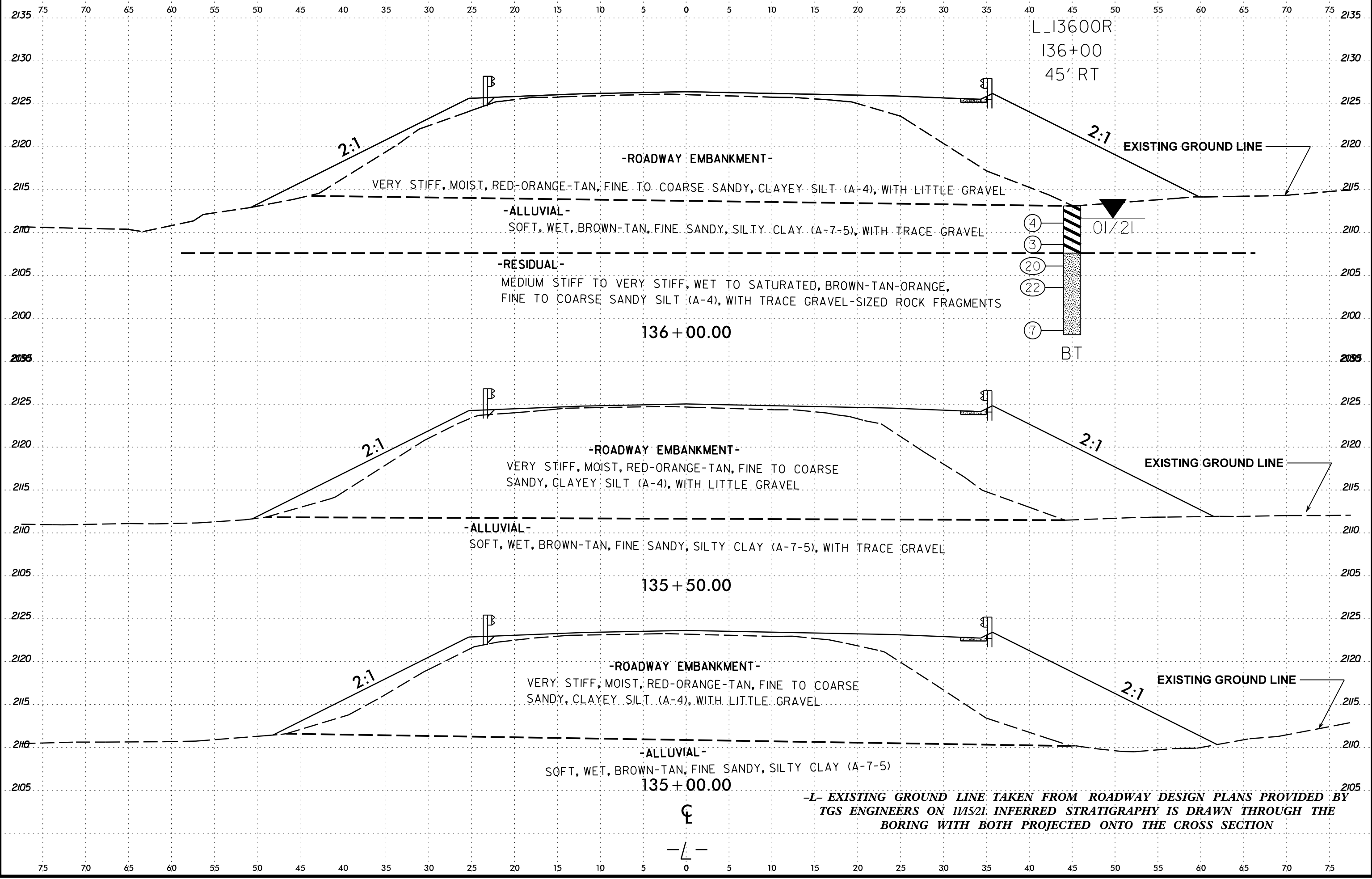


-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/5/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

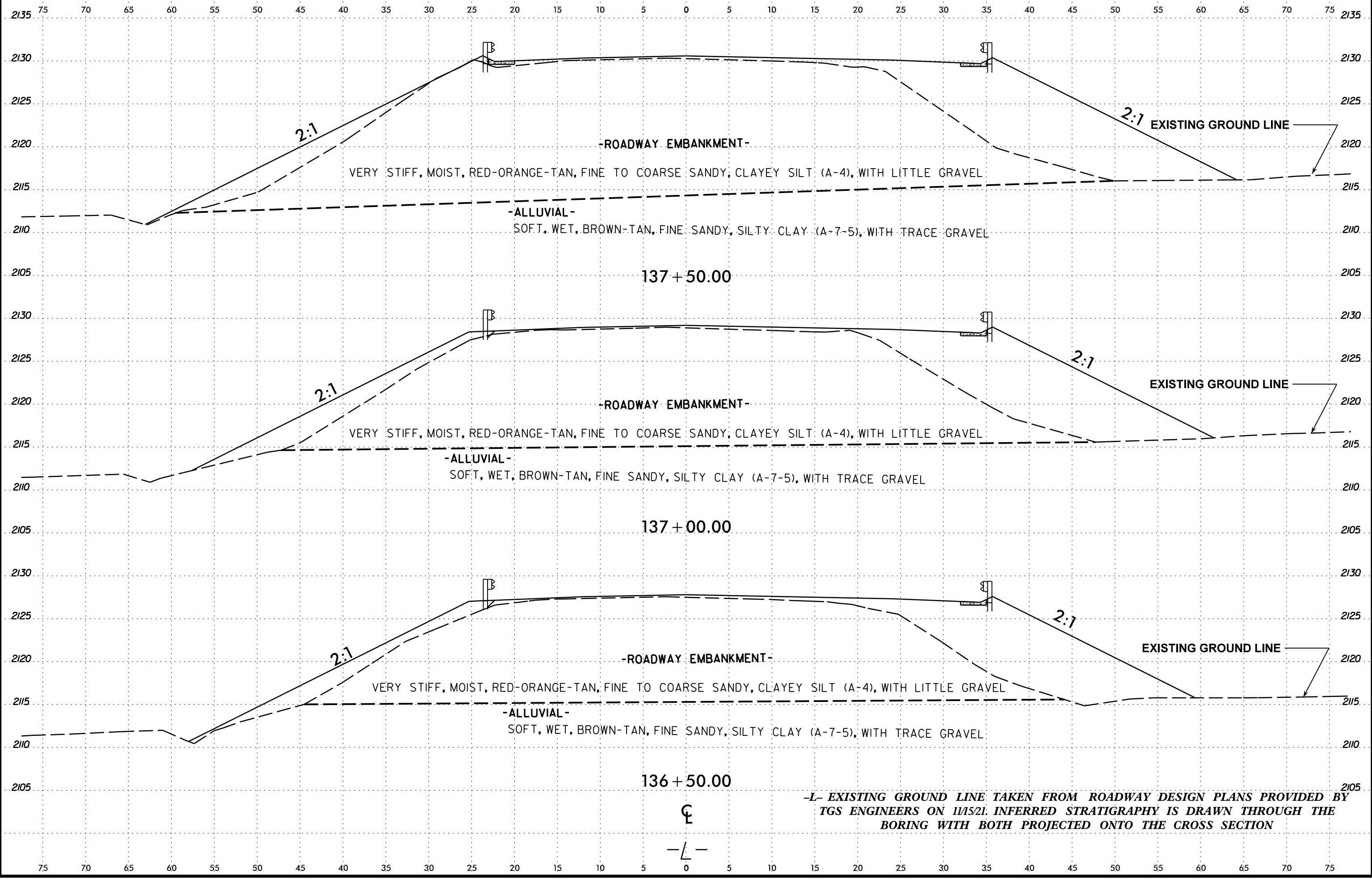
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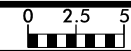
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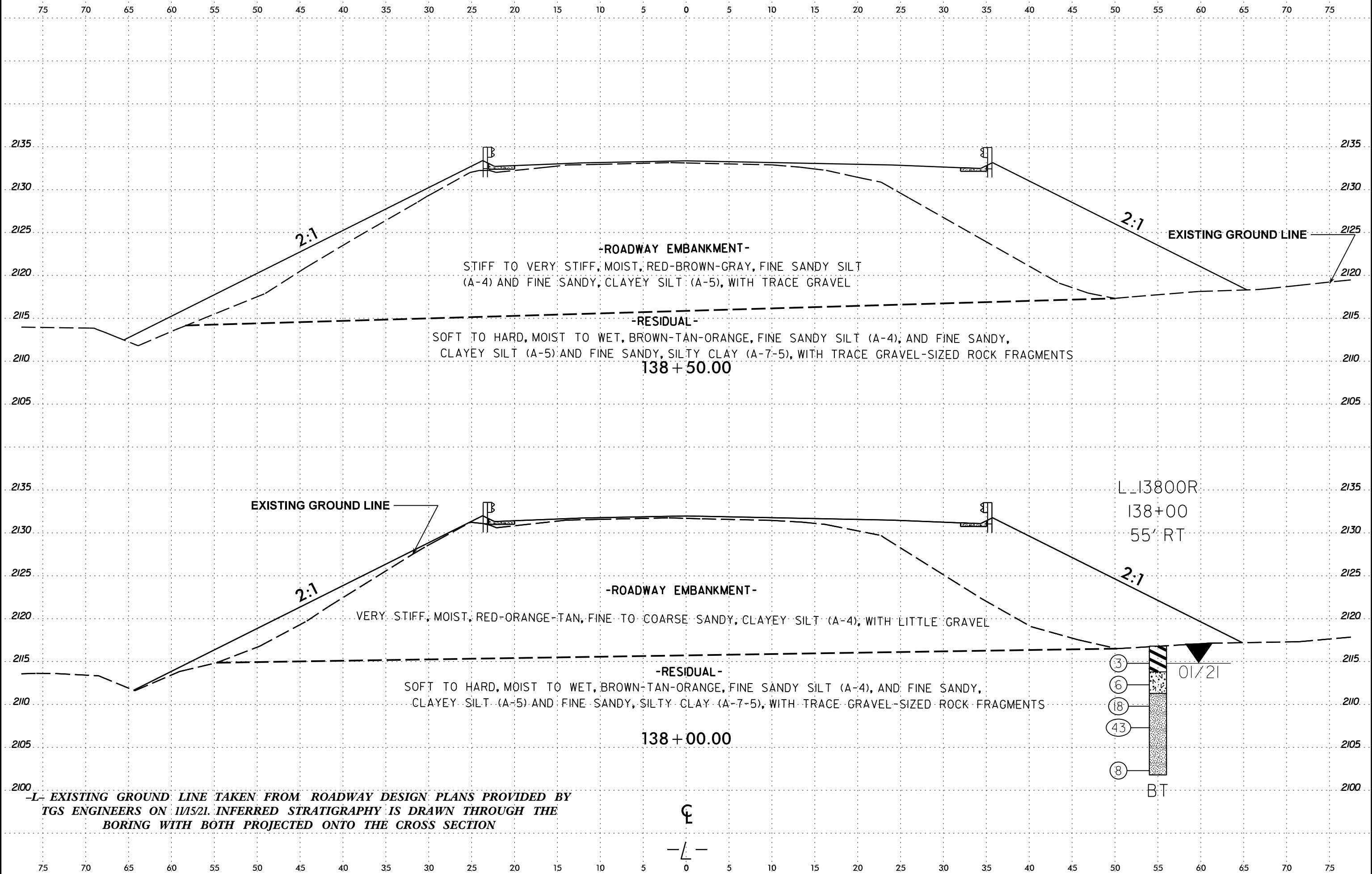
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PROJ. REFERENCE NO.	SHEET NO.
A-0009CA	107



**-ROADWAY EMBANKMENT-**  
STIFF TO VERY STIFF, MOIST, RED-BROWN-GRAY, FINE SANDY SILT (A-4) AND FINE SANDY, CLAYEY SILT (A-5), WITH TRACE GRAVEL

**-RESIDUAL-**  
SOFT TO HARD, MOIST TO WET, BROWN-TAN-ORANGE, FINE SANDY SILT (A-4), AND FINE SANDY, CLAYEY SILT (A-5) AND FINE SANDY, SILTY CLAY (A-7-5), WITH TRACE GRAVEL-SIZED ROCK FRAGMENTS  
**138 + 50.00**

EXISTING GROUND LINE

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

**-RESIDUAL-**  
SOFT TO HARD, MOIST TO WET, BROWN-TAN-ORANGE, FINE SANDY SILT (A-4), AND FINE SANDY, CLAYEY SILT (A-5) AND FINE SANDY, SILTY CLAY (A-7-5), WITH TRACE GRAVEL-SIZED ROCK FRAGMENTS  
**138 + 00.00**

L 13800R  
138+00  
55' RT

- 3
- 6
- 18
- 43
- 8

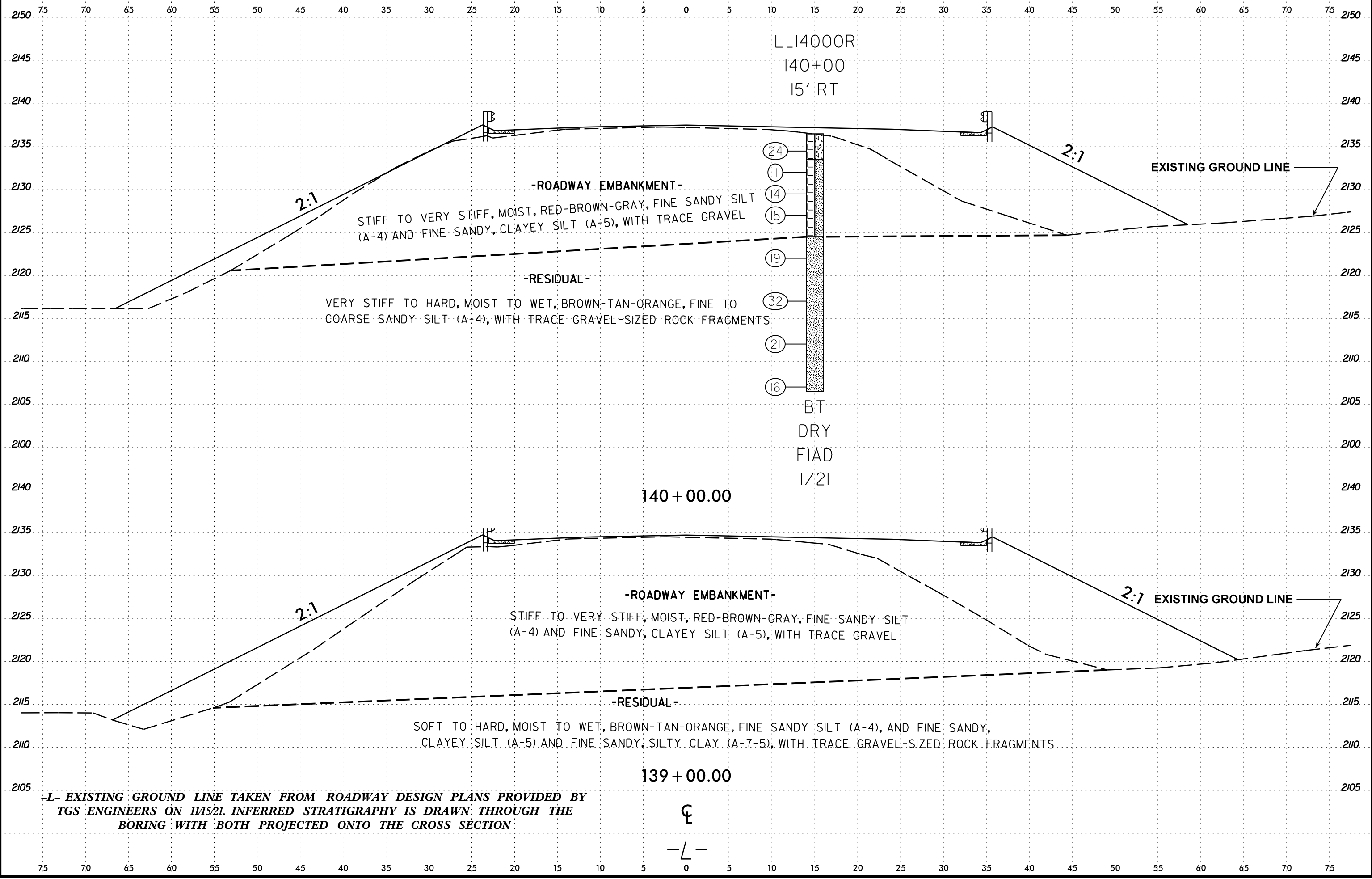
BT

☺

—L—

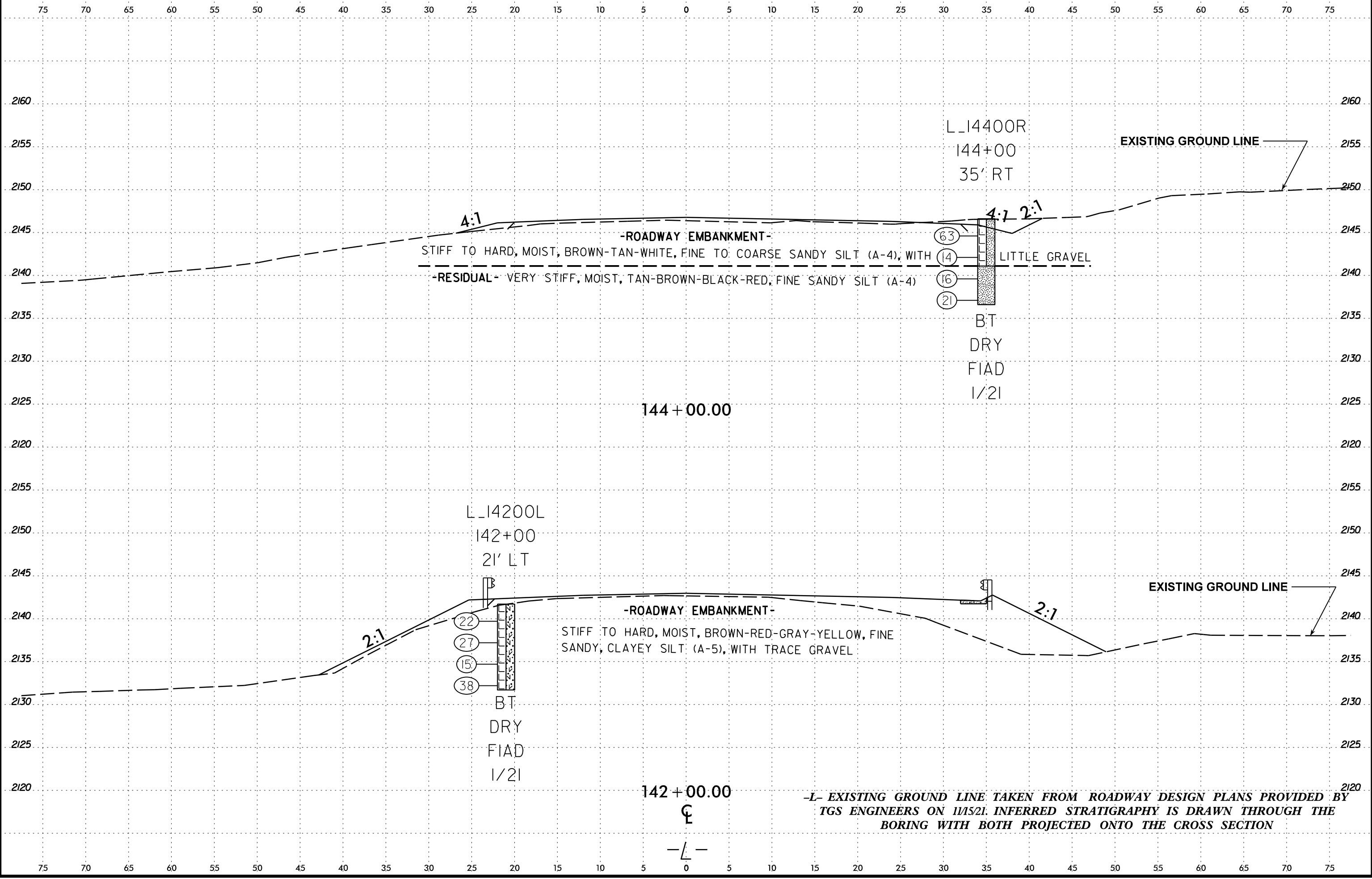
**-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/5/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION**

6/23/16  
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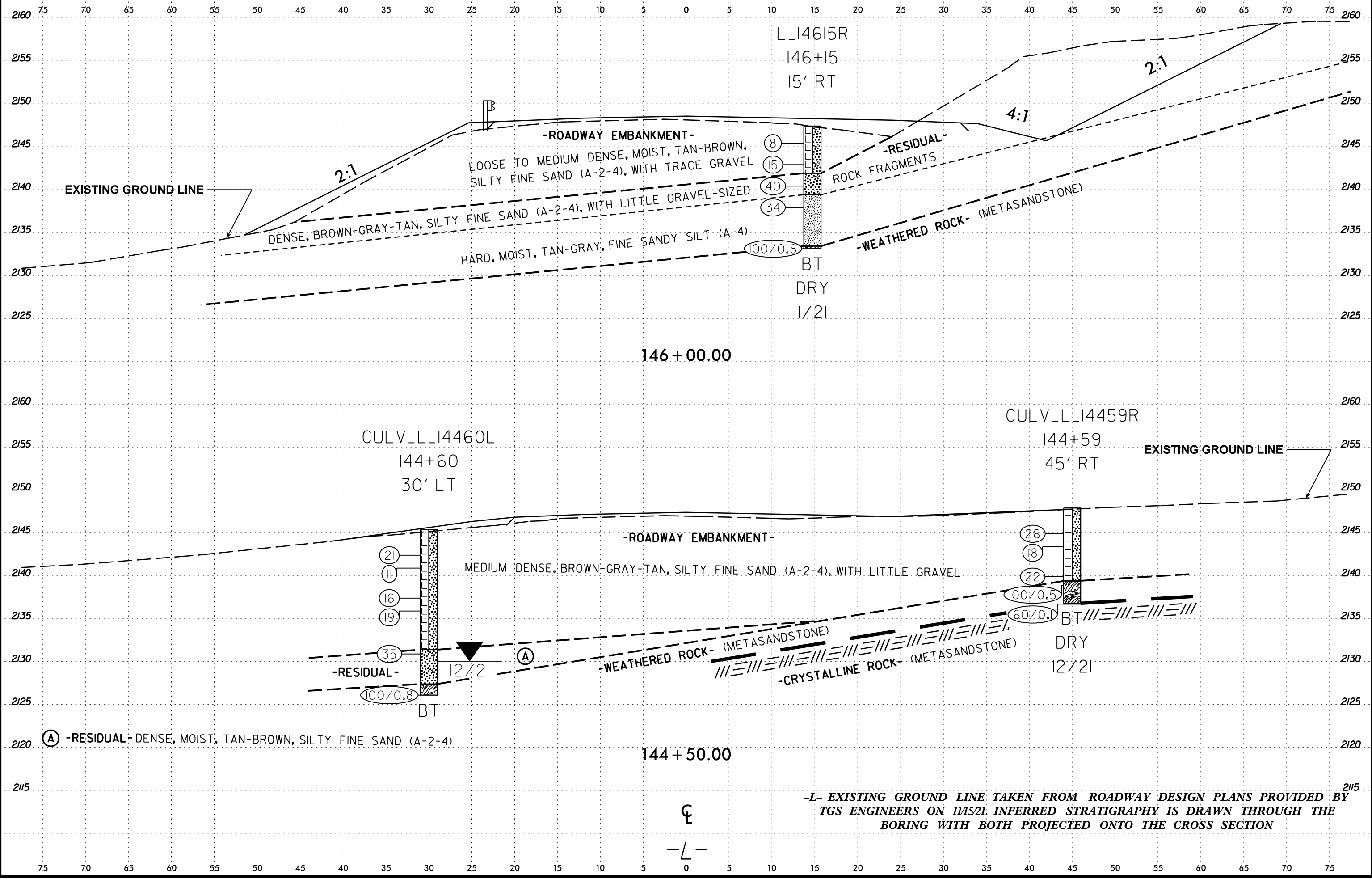


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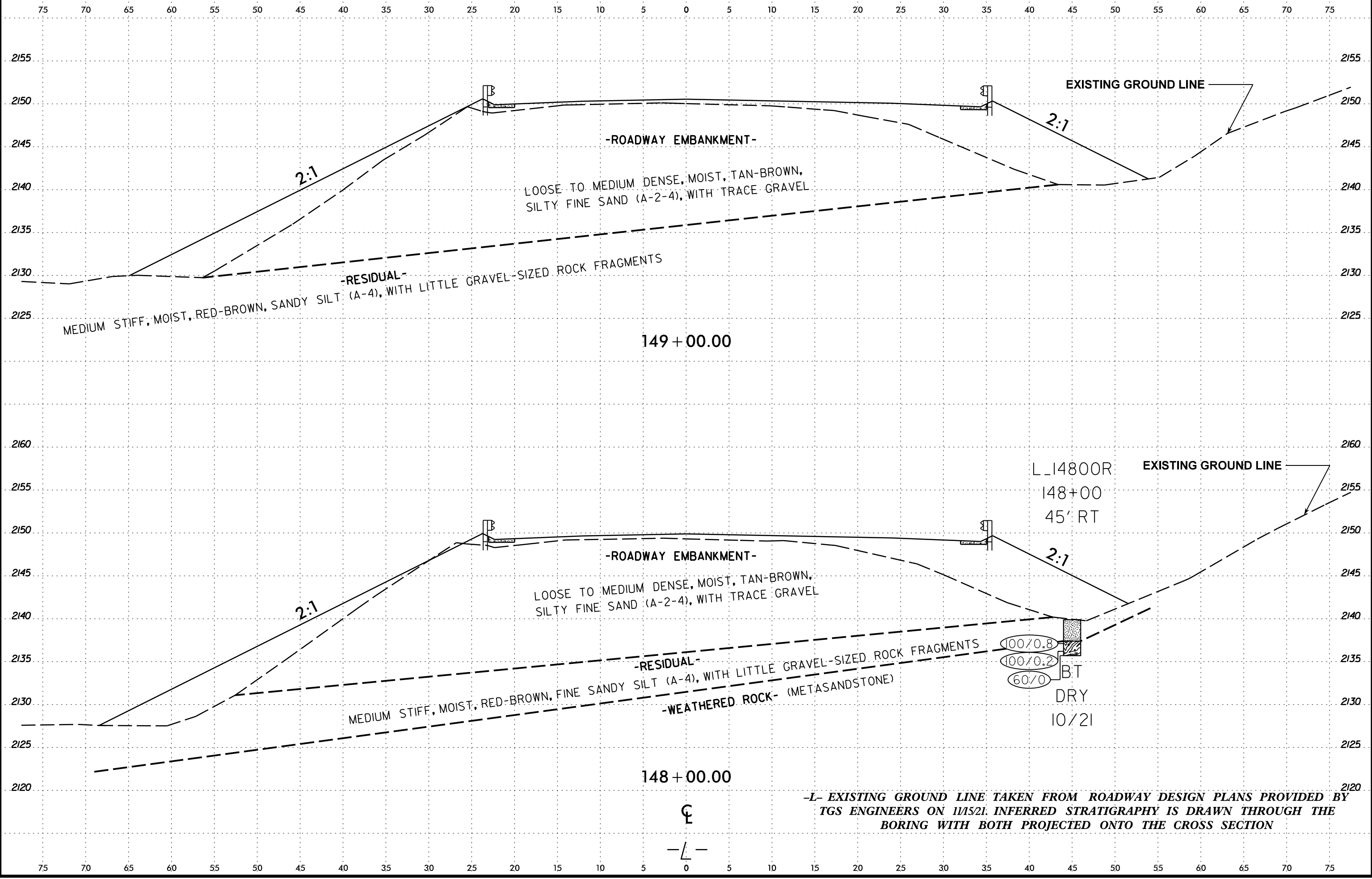


-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/5/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

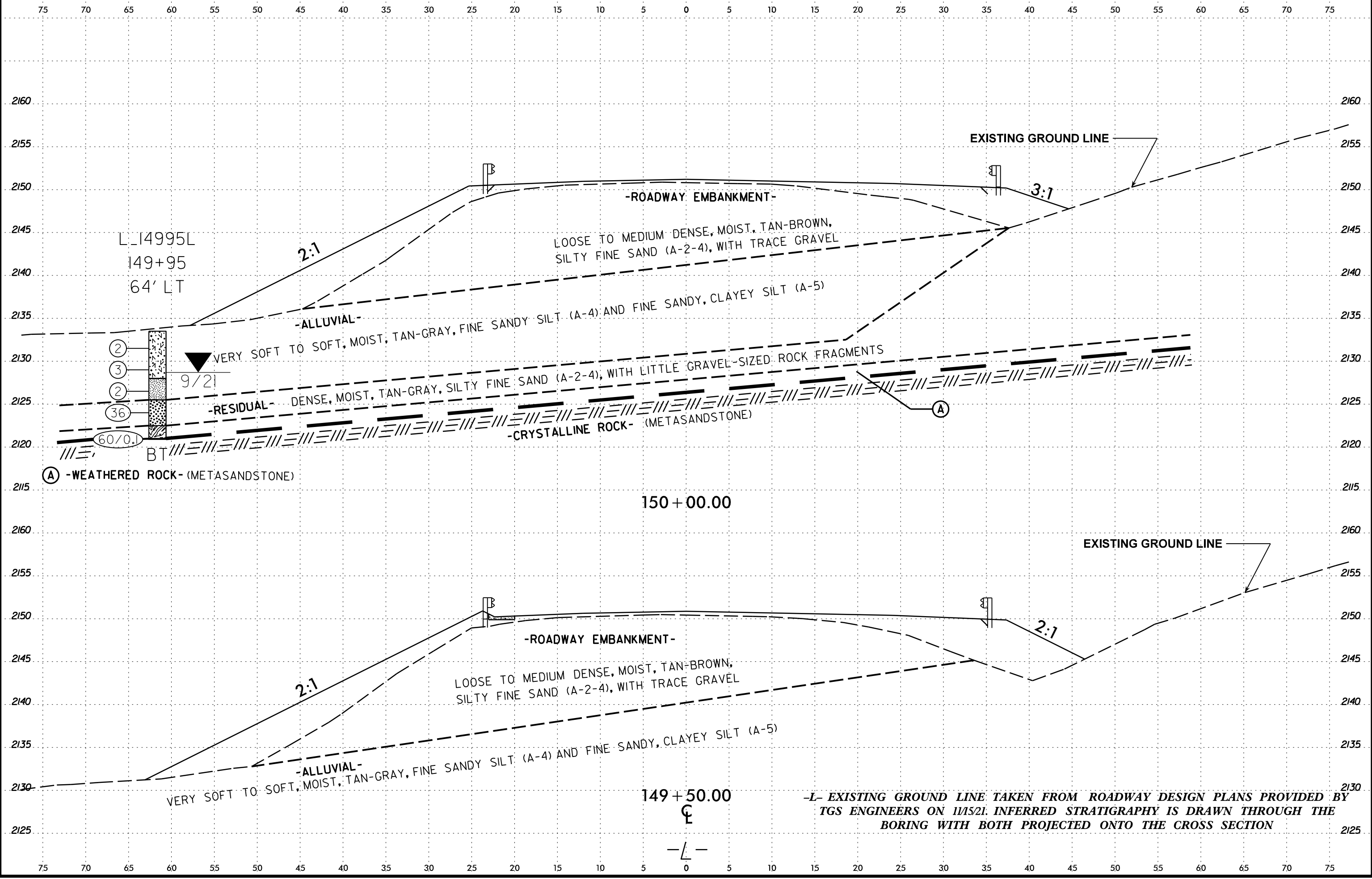
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L\_14995L  
149+95  
64' LT

- 2
- 3
- 2
- 36

9/21

60/0

BT

(A) - WEATHERED ROCK - (METASANDSTONE)

150 + 00.00

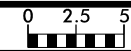
149 + 50.00

CL

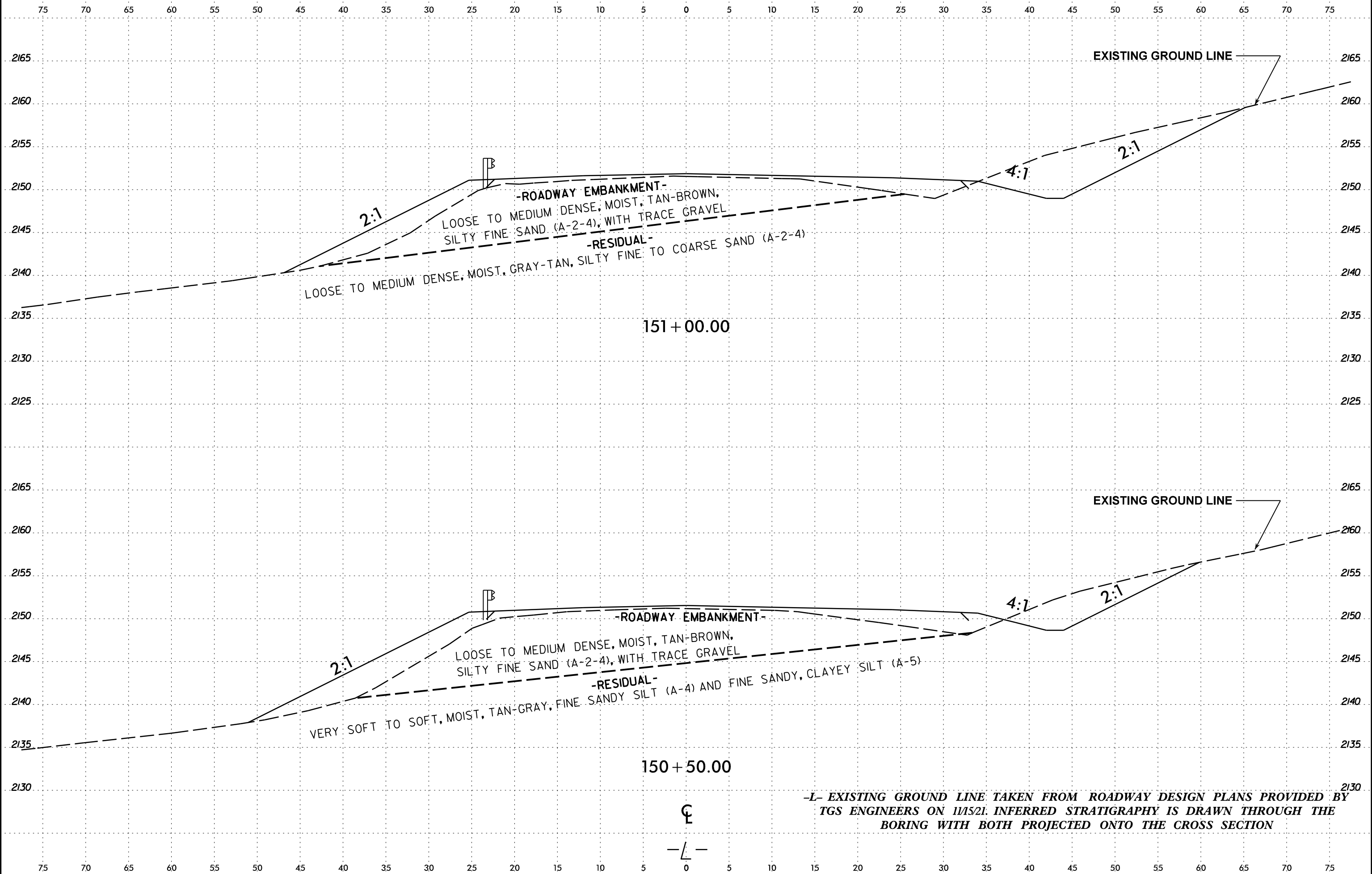
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-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

6/23/16

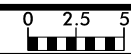


PROJ. REFERENCE NO.	SHEET NO.
A-0009CA	113



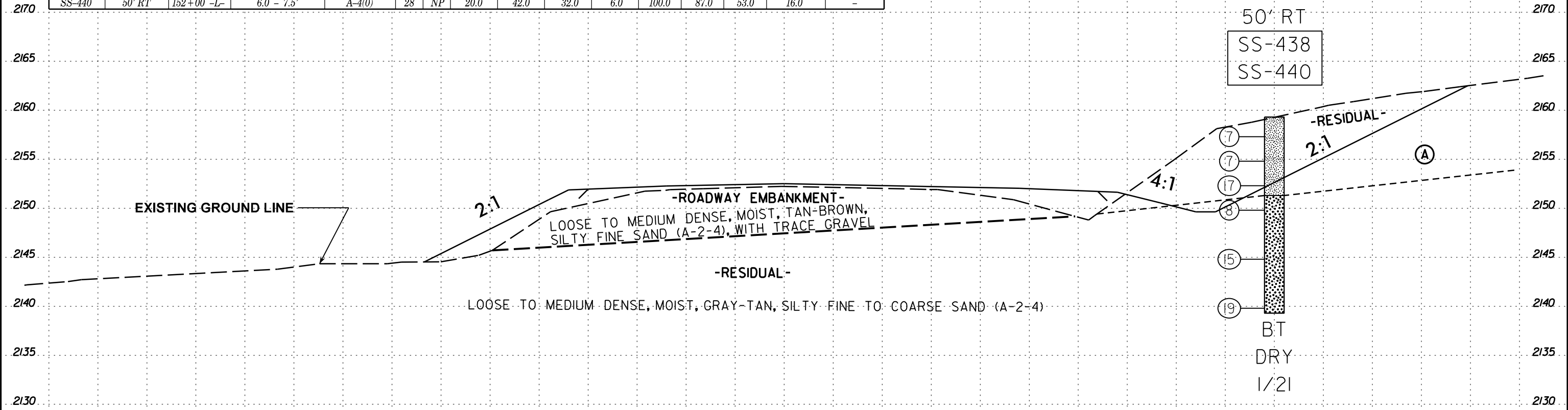
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75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

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-438	50' RT	152+00 -L-	1.0 - 2.5'	A-4(5)	40	7	10.0	31.0	23.0	36.0	100.0	94.0	69.0	29.0	-
SS-440	50' RT	152+00 -L-	6.0 - 7.5'	A-4(0)	28	NP	20.0	42.0	32.0	6.0	100.0	87.0	53.0	16.0	-



L-15200R  
 152+00  
 50' RT  
 SS-438  
 SS-440

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

152 + 00.00

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 1/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

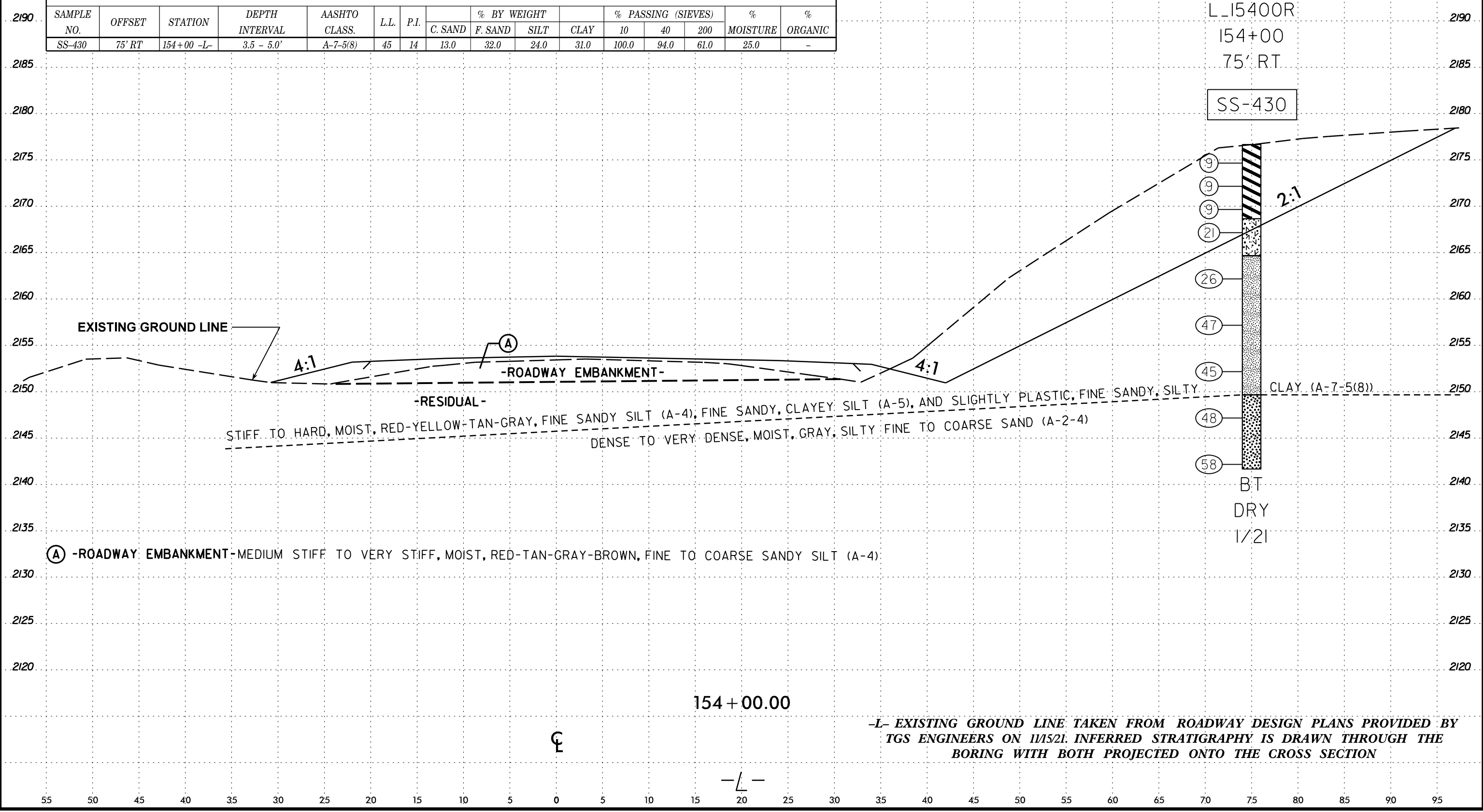
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 6/23/16

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 80 85 90 95

### 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-430	75' RT	154+00 -L-	3.5 - 5.0'	A-7-5(8)	45	14	13.0	32.0	24.0	31.0	100.0	94.0	61.0	25.0	-

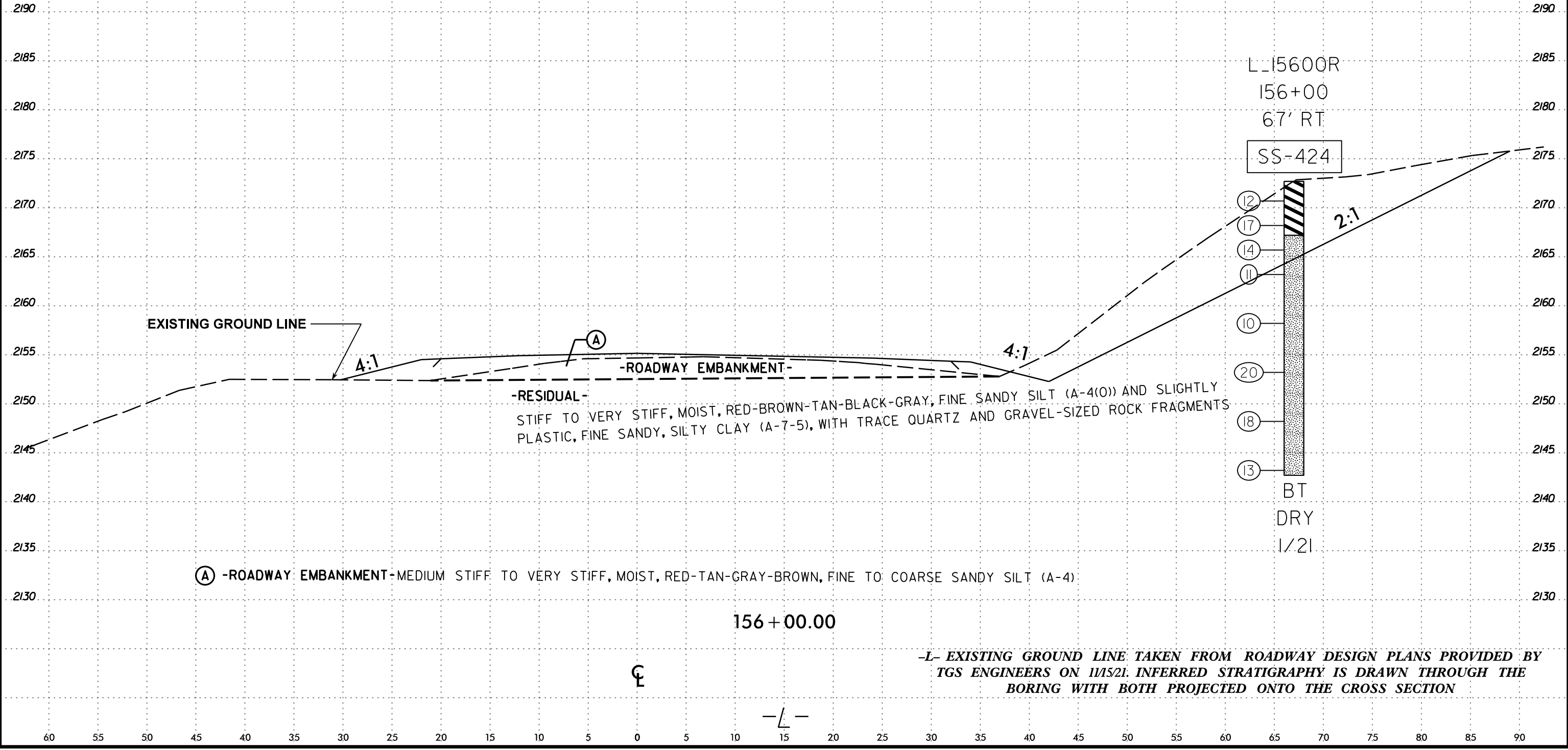


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### SOIL TEST RESULTS

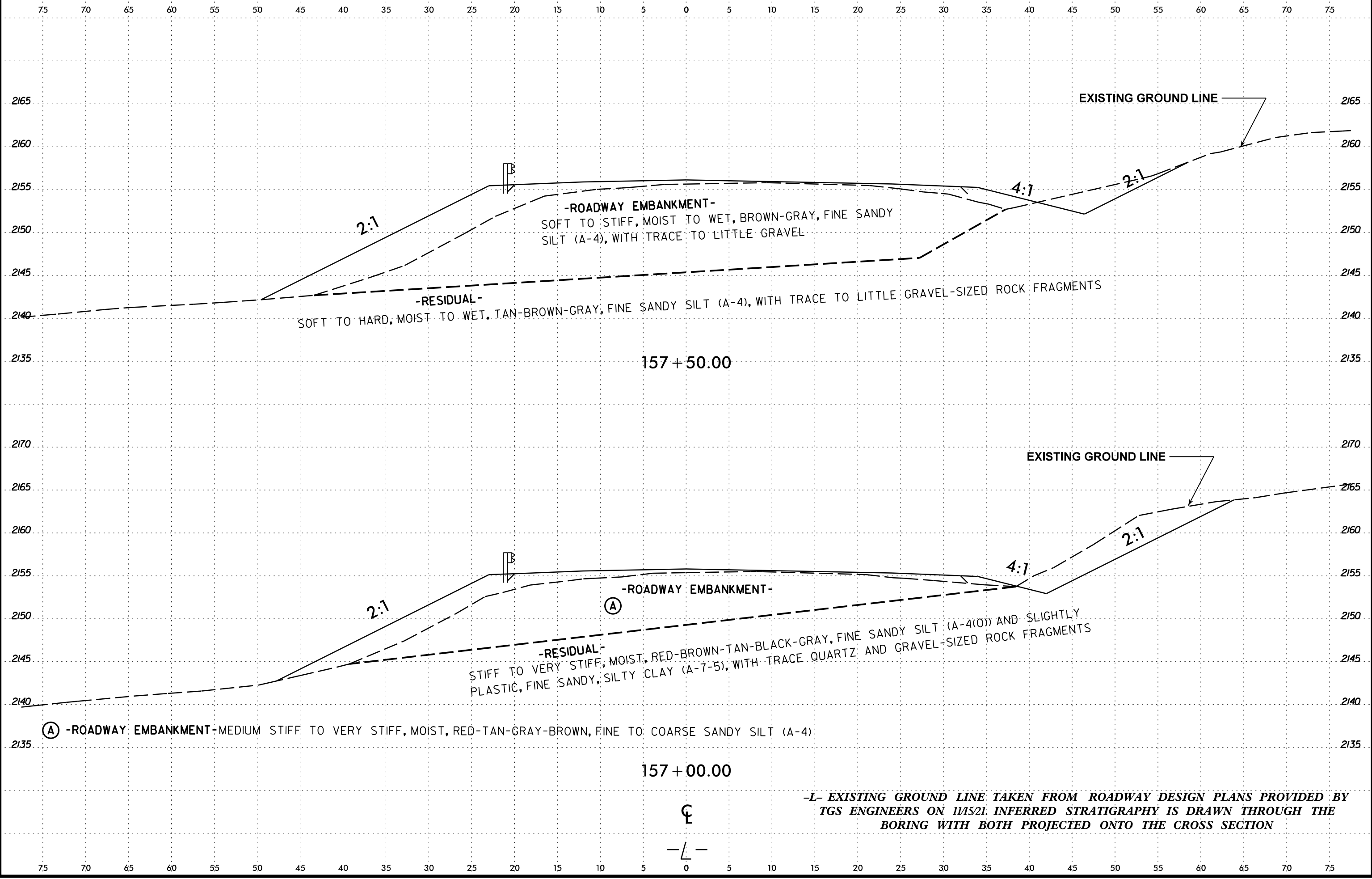
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							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-424	67' RT	156+00 -L-	8.5 - 10'	A-4(0)	39	NP	21.0	40.0	29.0	10.0	100.0	88.0	52.0	22.0	-



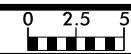


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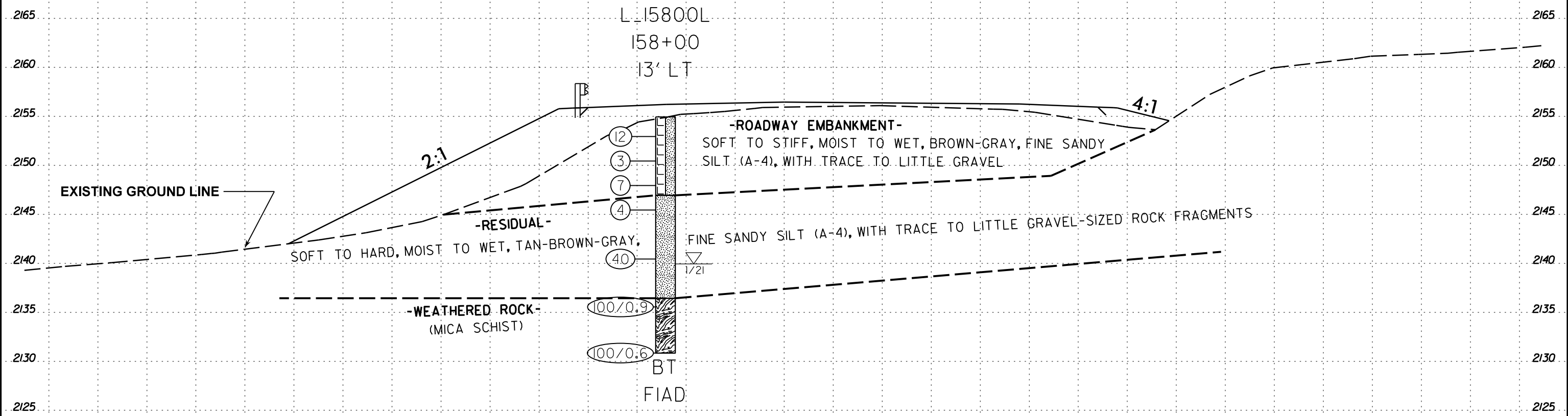


6/23/16

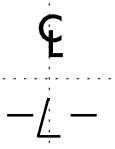


PROJ. REFERENCE NO.	SHEET NO.
A-0009CA	118

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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

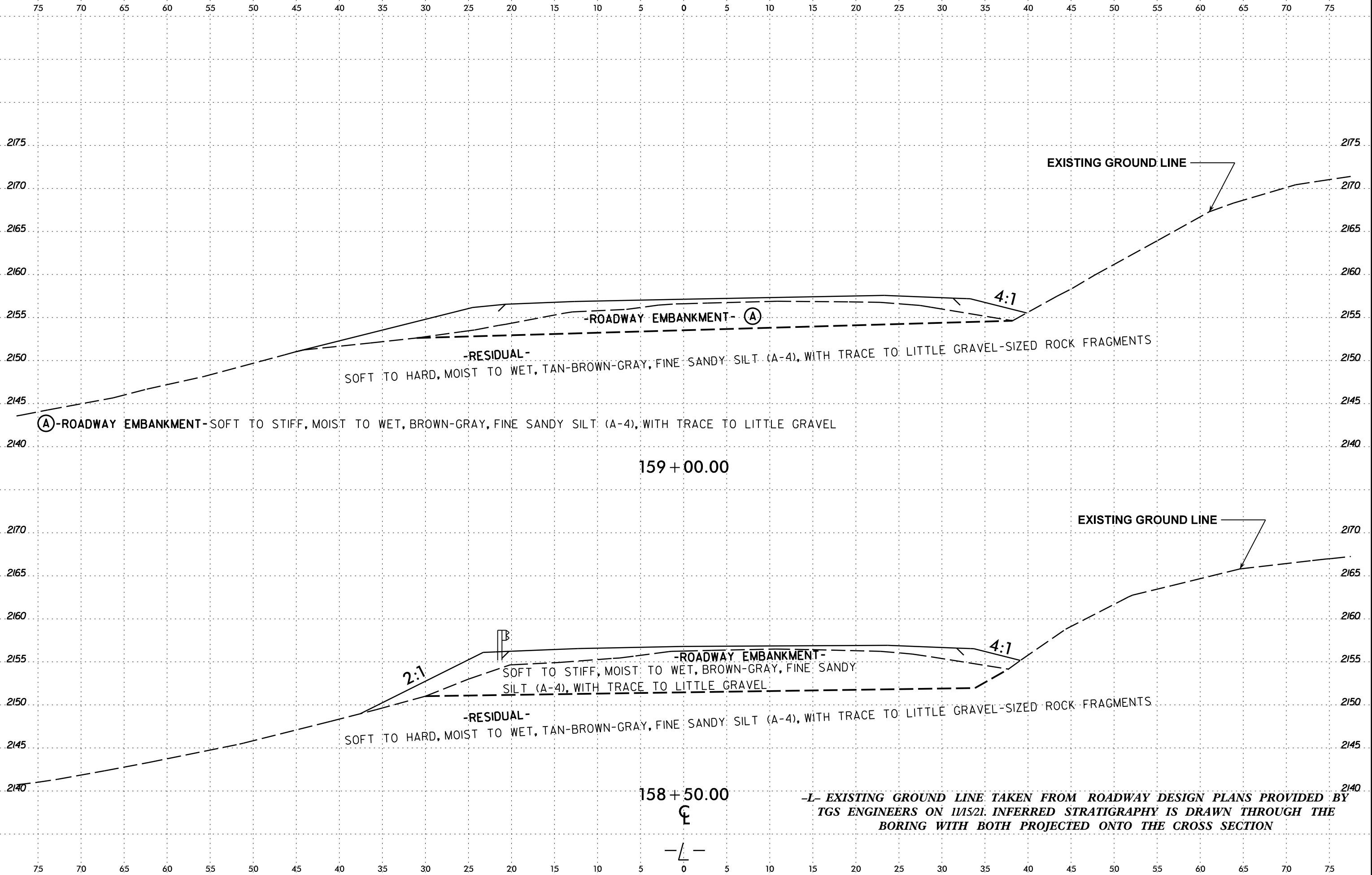


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6/23/16

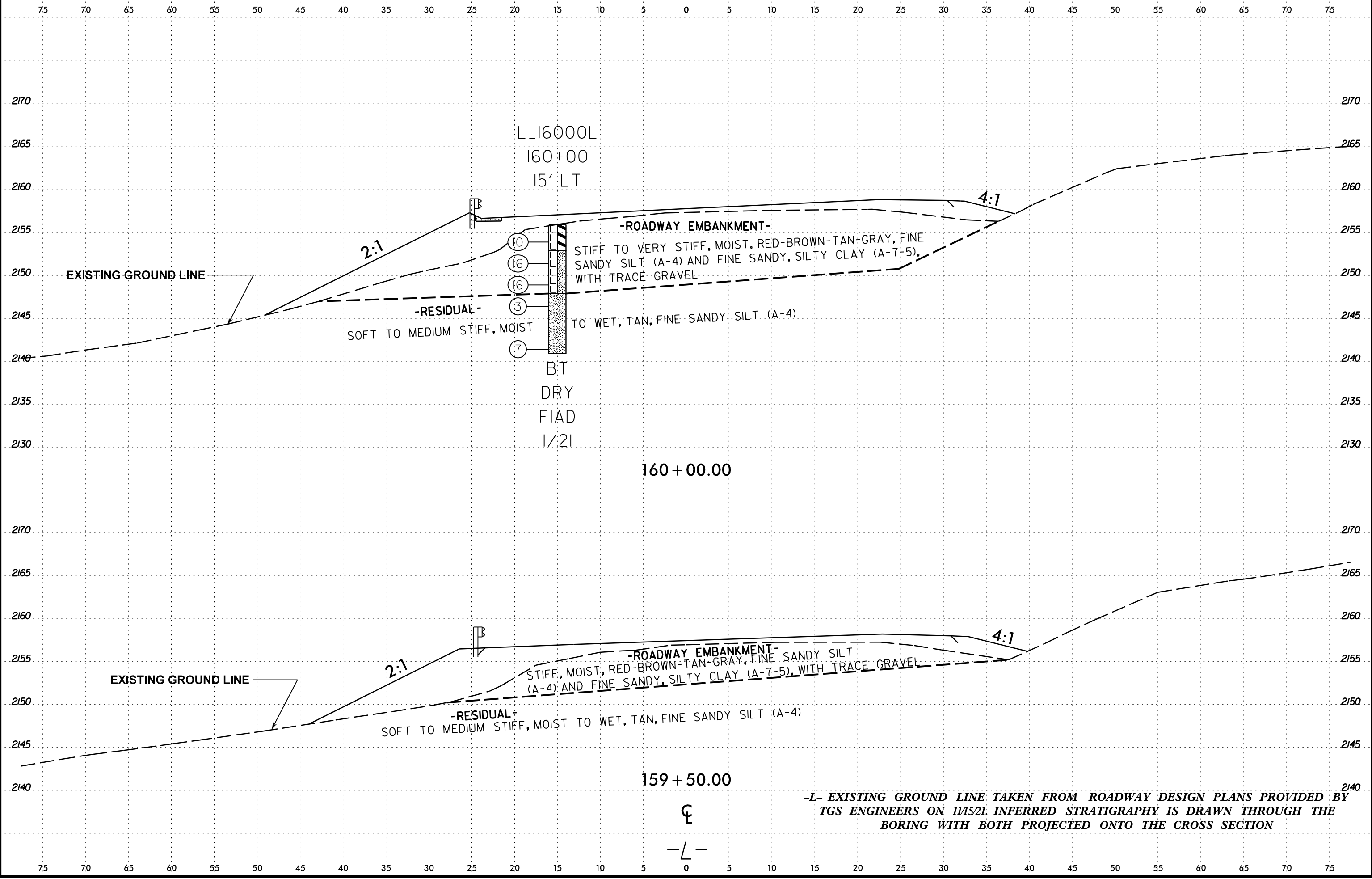


PROJ. REFERENCE NO.	SHEET NO.
A-0009CA	119



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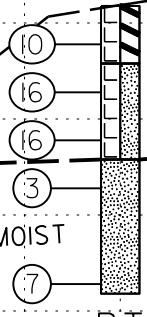
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L\_16000L  
160+00  
15' LT

-ROADWAY EMBANKMENT-  
STIFF TO VERY STIFF, MOIST, RED-BROWN-TAN-GRAY, FINE SANDY SILT (A-4) AND FINE SANDY, SILTY CLAY (A-7-5), WITH TRACE GRAVEL

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



BT  
DRY  
FIAD  
1/2I

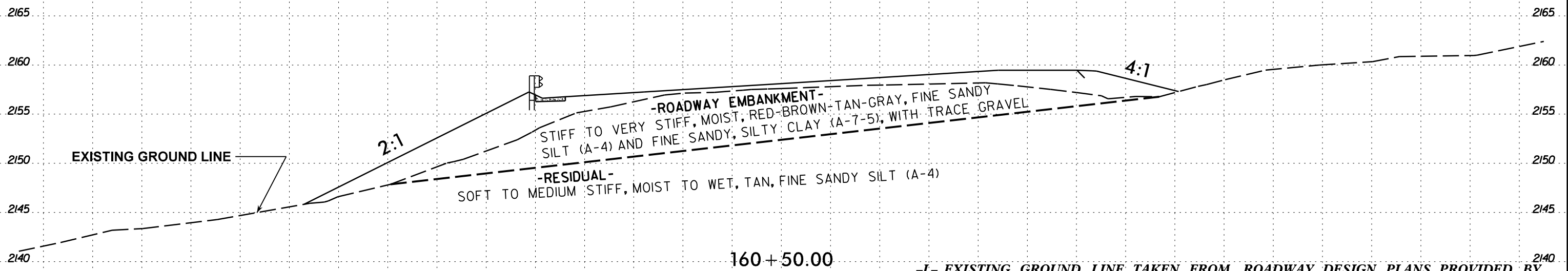
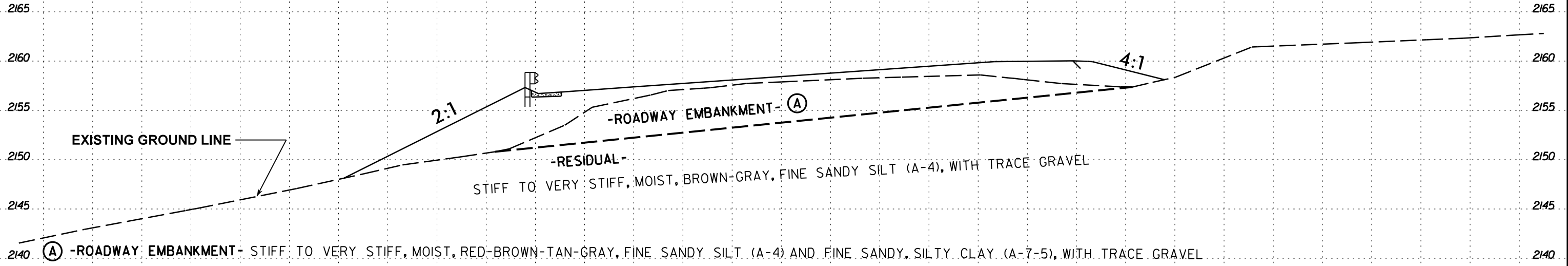
160 + 00.00

159 + 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 WITH BOTH PROJECTED ONTO THE CROSS SECTION



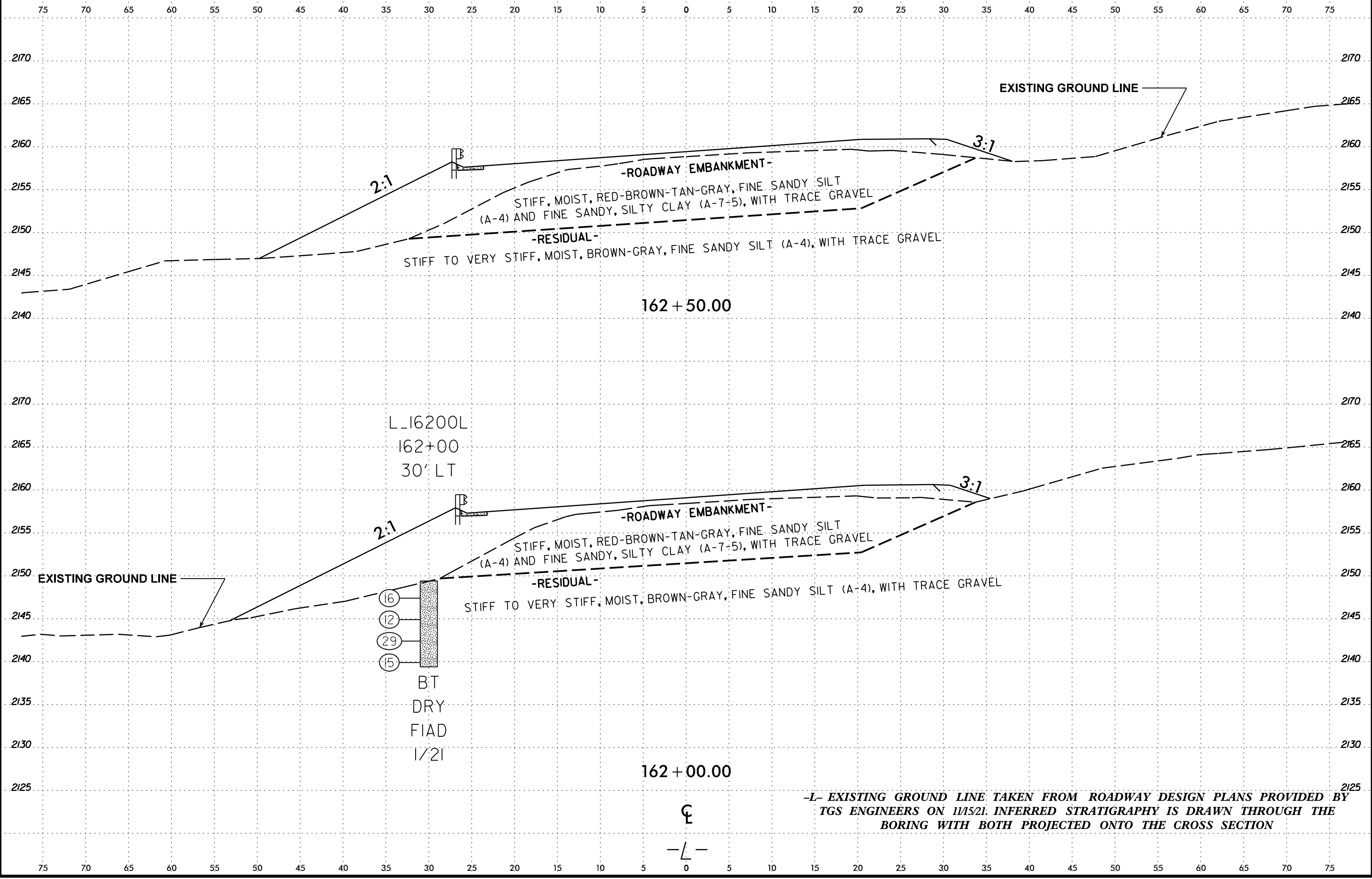
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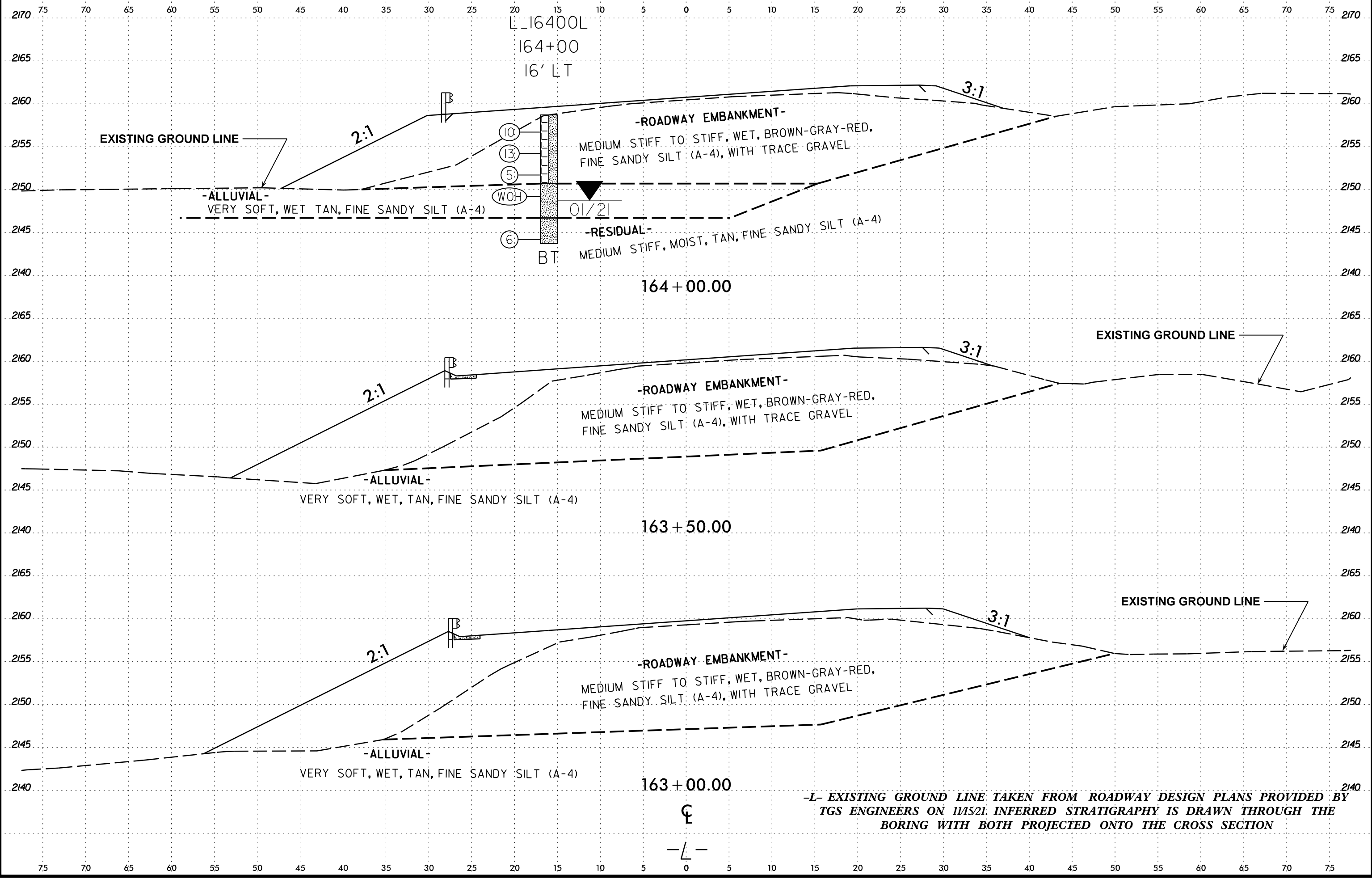
**-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 1/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION**

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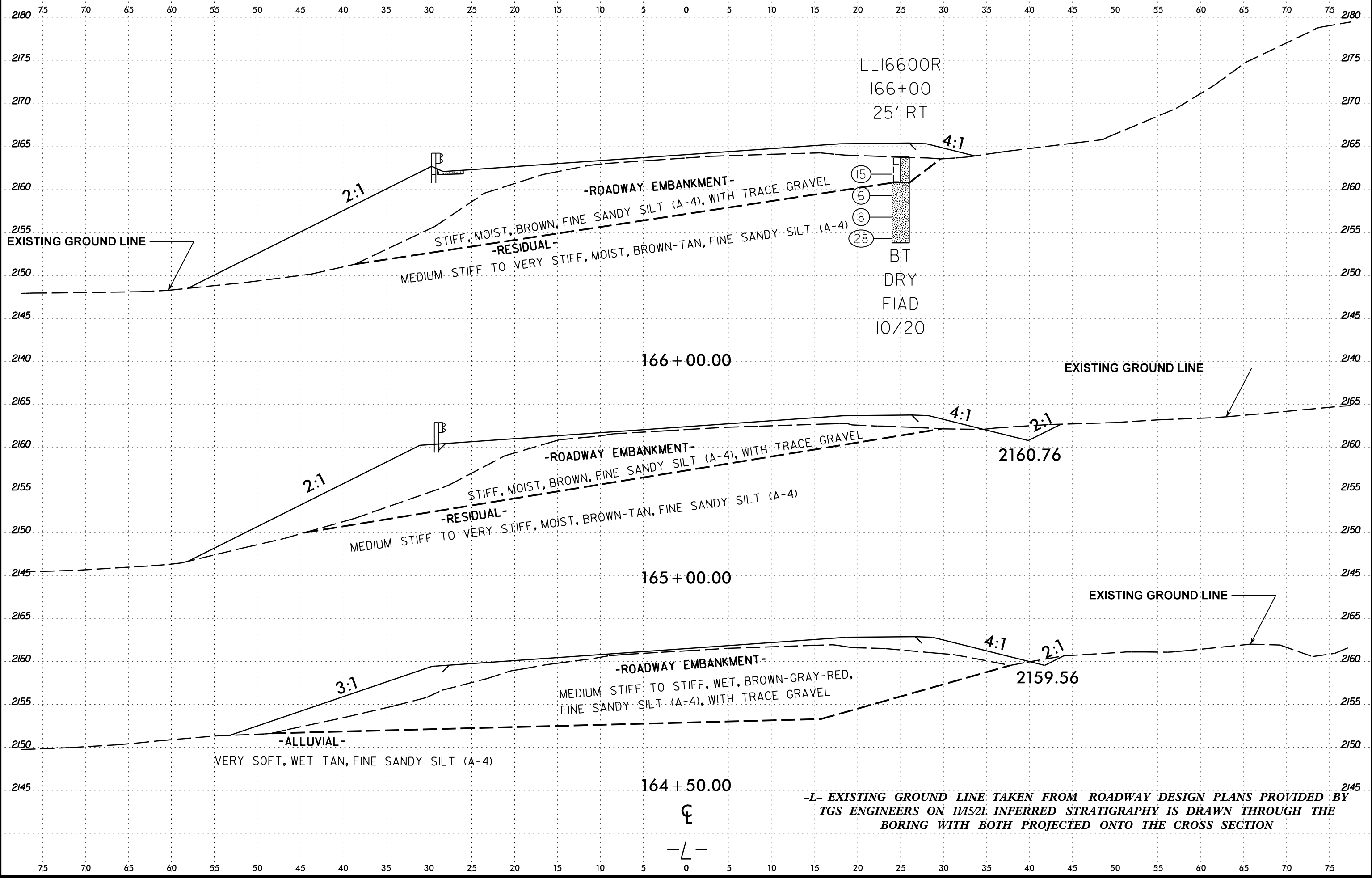
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6/23/16  
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6/23/16  
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-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/5/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

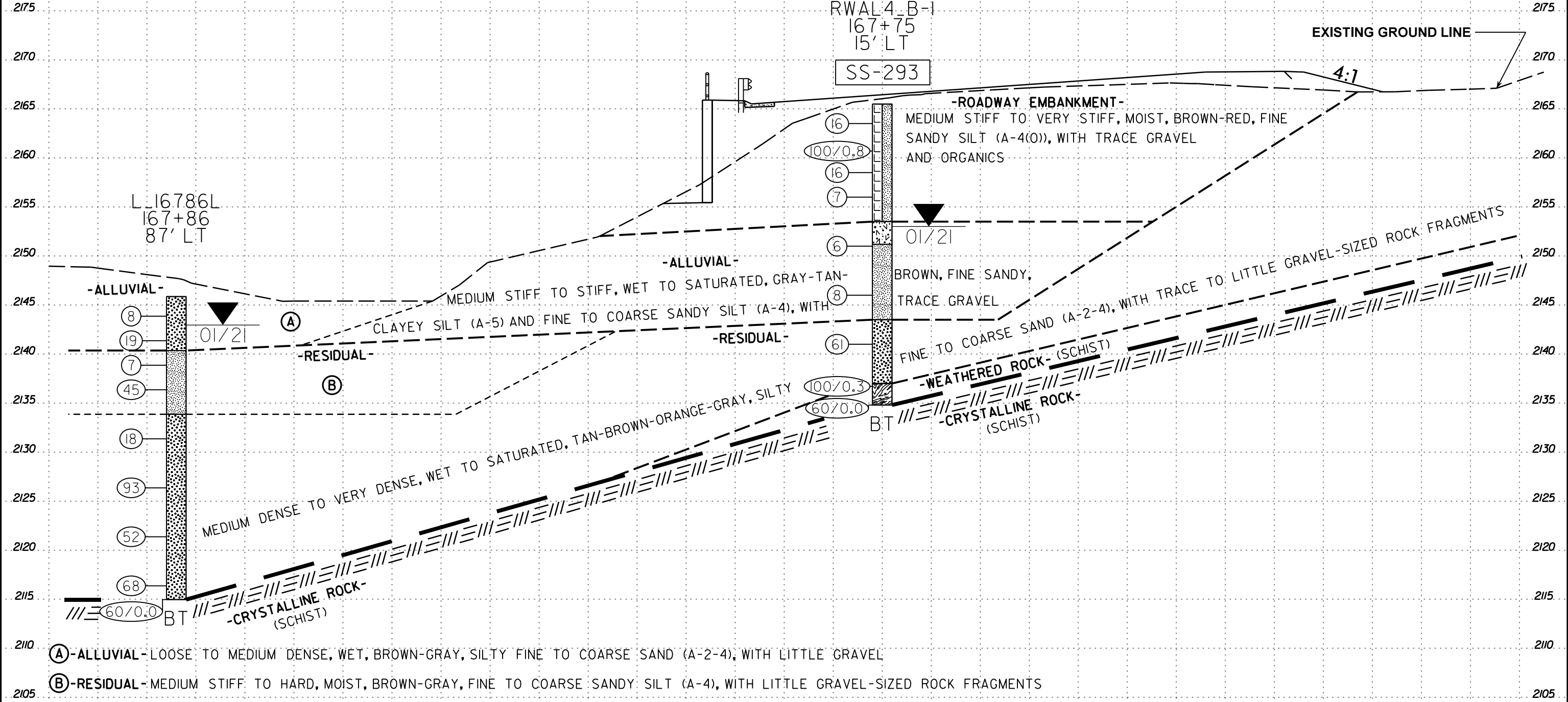


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100 95 90 85 80 75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50

### 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-293	15' LT	167+75 -L-	1.0 - 2.5'	A-4(0)	30	1	20.0	35.0	28.0	17.0	75.0	66.0	41.0	18.0	-

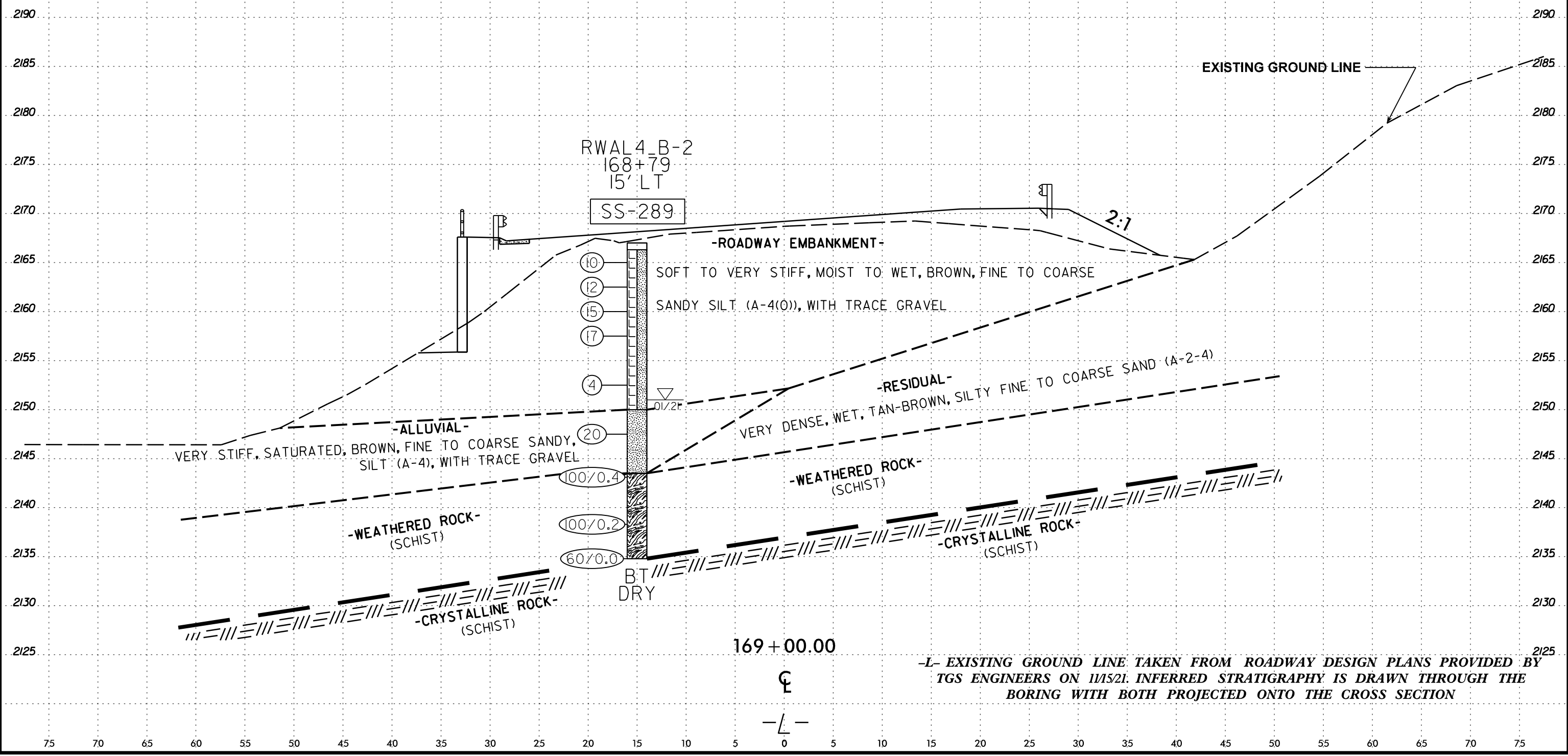


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SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-289	15' LT	168+79 -L-	13.5 - 15.0'	A-4(0)	29	NP	22.0	33.0	26.0	19.0	95.0	81.0	51.0	29.0	-



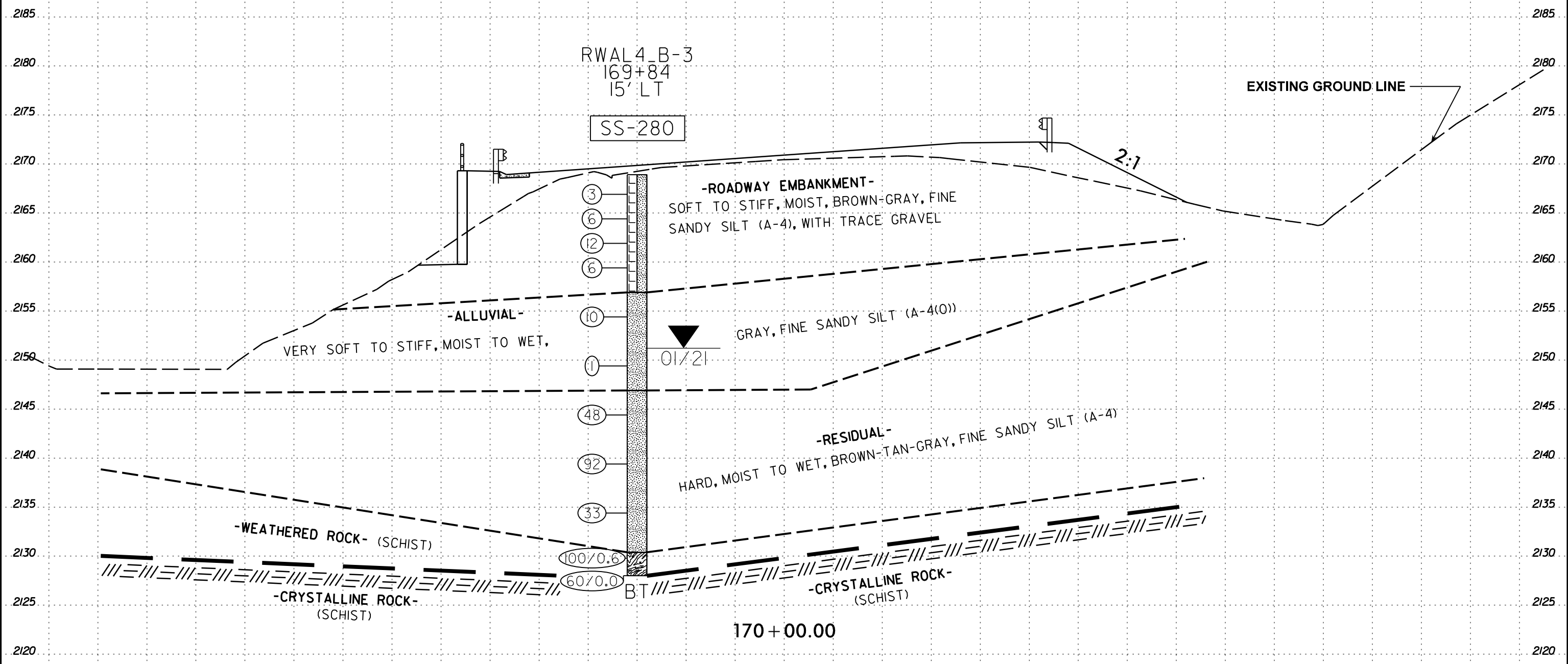
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6/23/16  
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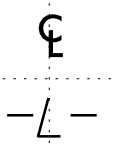
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### SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-280	15' LT	169+84 -L-	18.5 - 20.0'	A-4(0)	31	NP	33.0	30.0	23.0	14.0	80.0	64.0	36.0	28.0	-

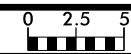


-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION



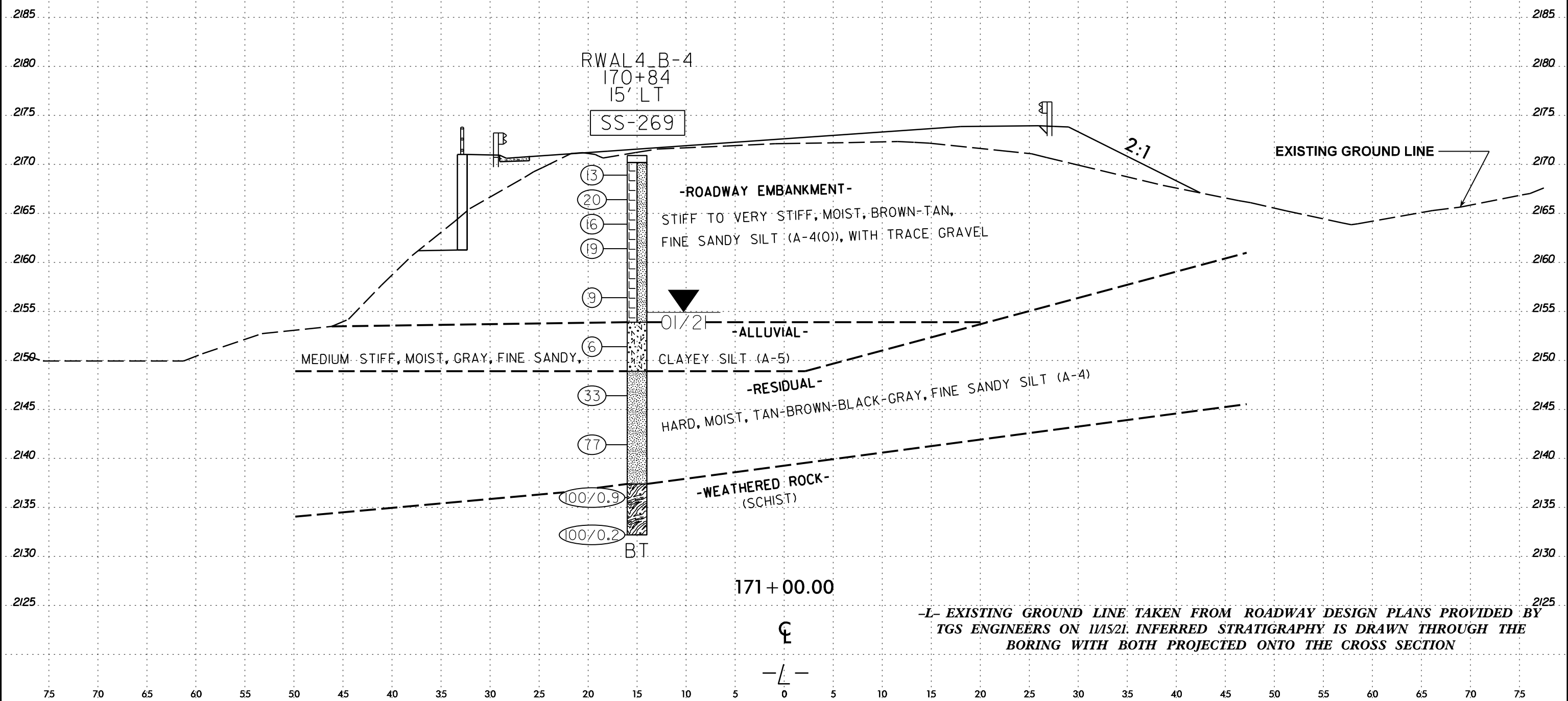
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75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

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-269	15' LT	170+84 -L-	8.5 - 10.0'	A-4(0)	28	NP	16.0	37.0	30.0	17.0	65.0	59.0	38.0	18.0	-



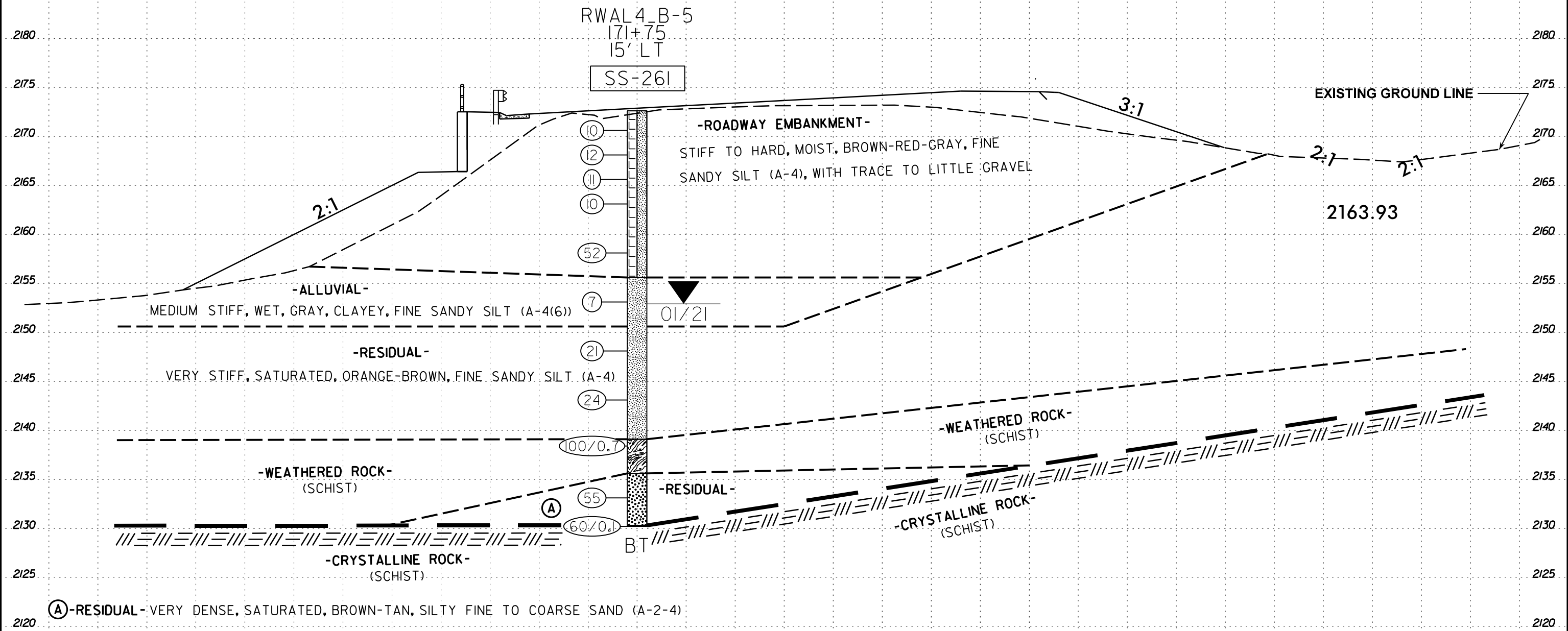
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6/23/16  
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75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

### 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-261	15' LT	171+75 -L-	18.5 - 20.0'	A-4(6)	35	8	7.0	25.0	35.0	33.0	99.0	95.0	75.0	28.0	-



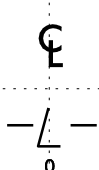
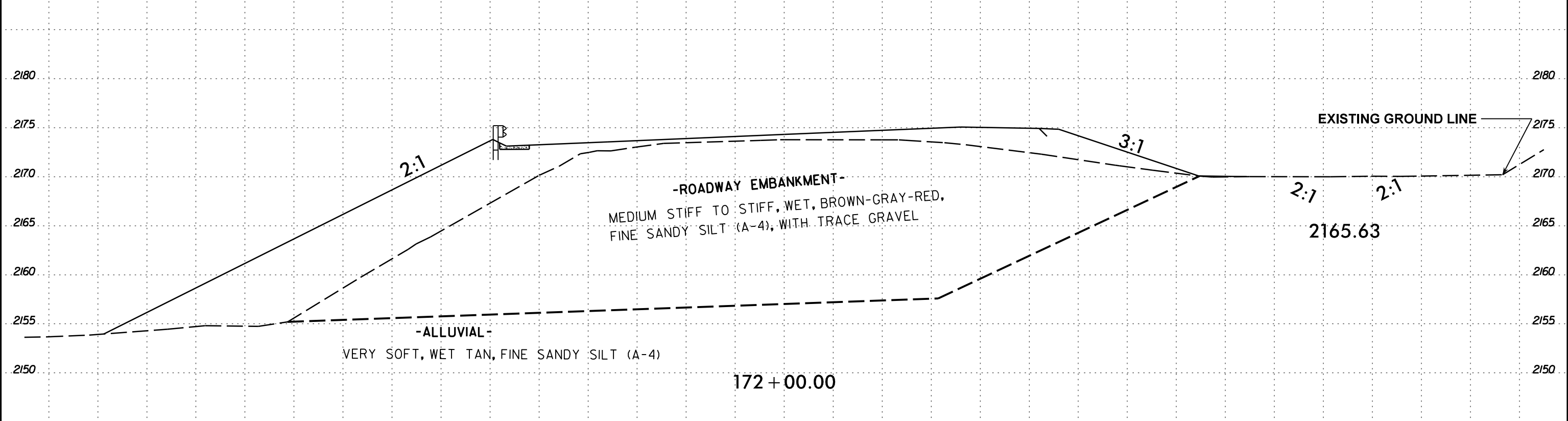
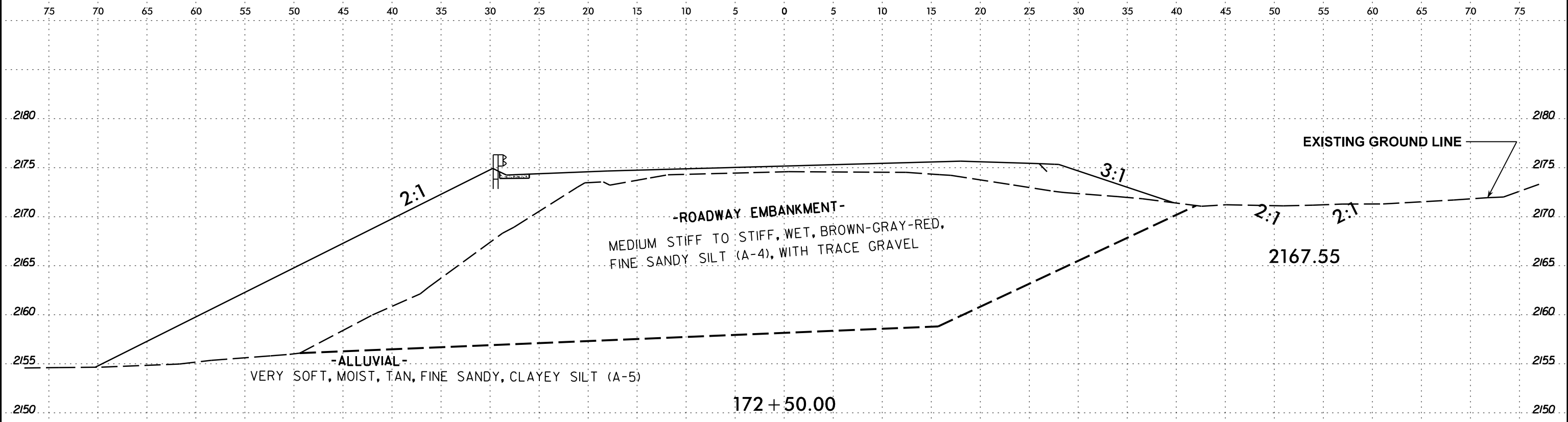
171 + 62.00

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY  
 TGS ENGINEERS ON 11/5/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE  
 BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

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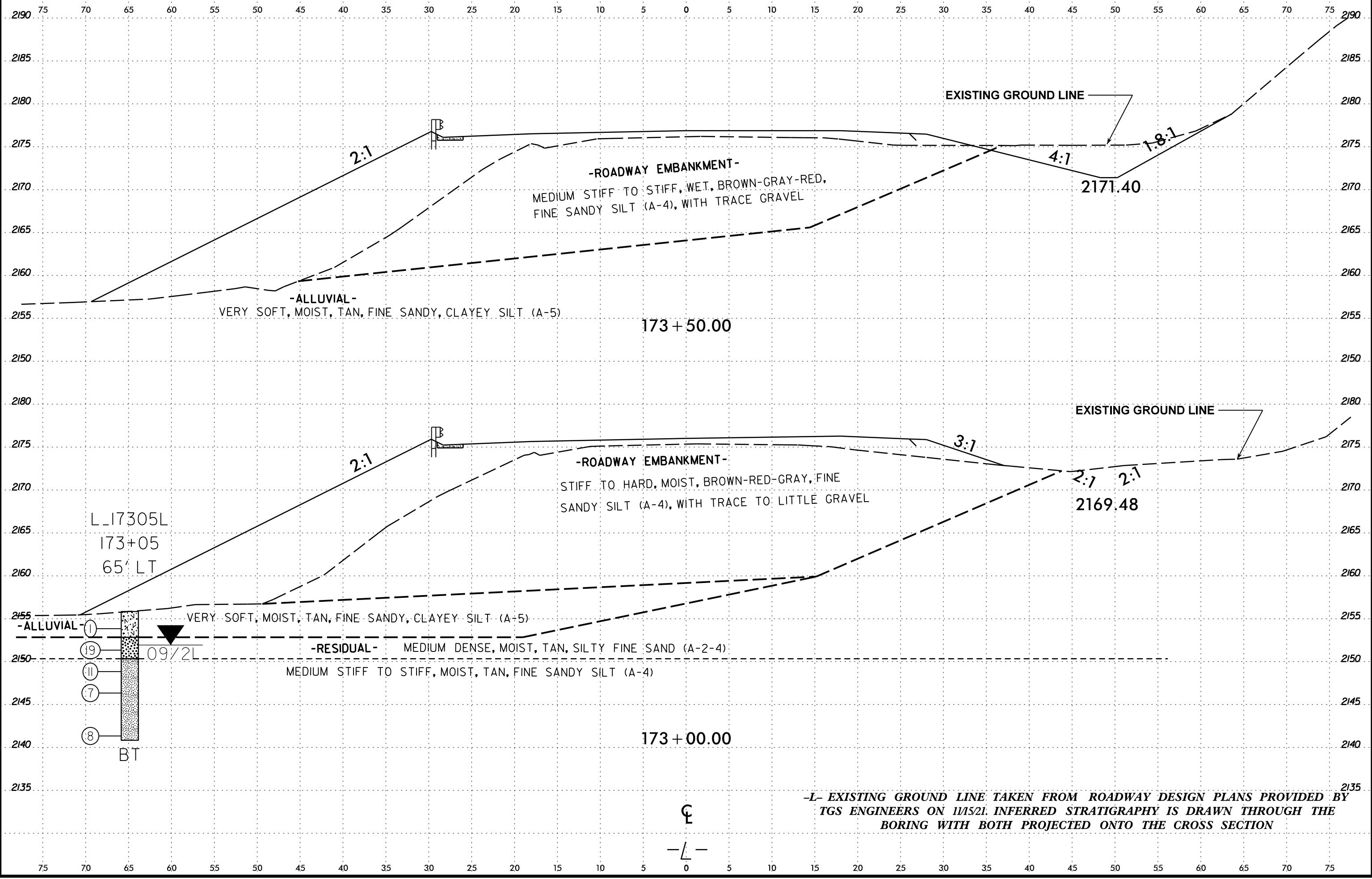
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0 2.5 5	PROJ. REFERENCE NO. A-0009CA	SHEET NO. 130
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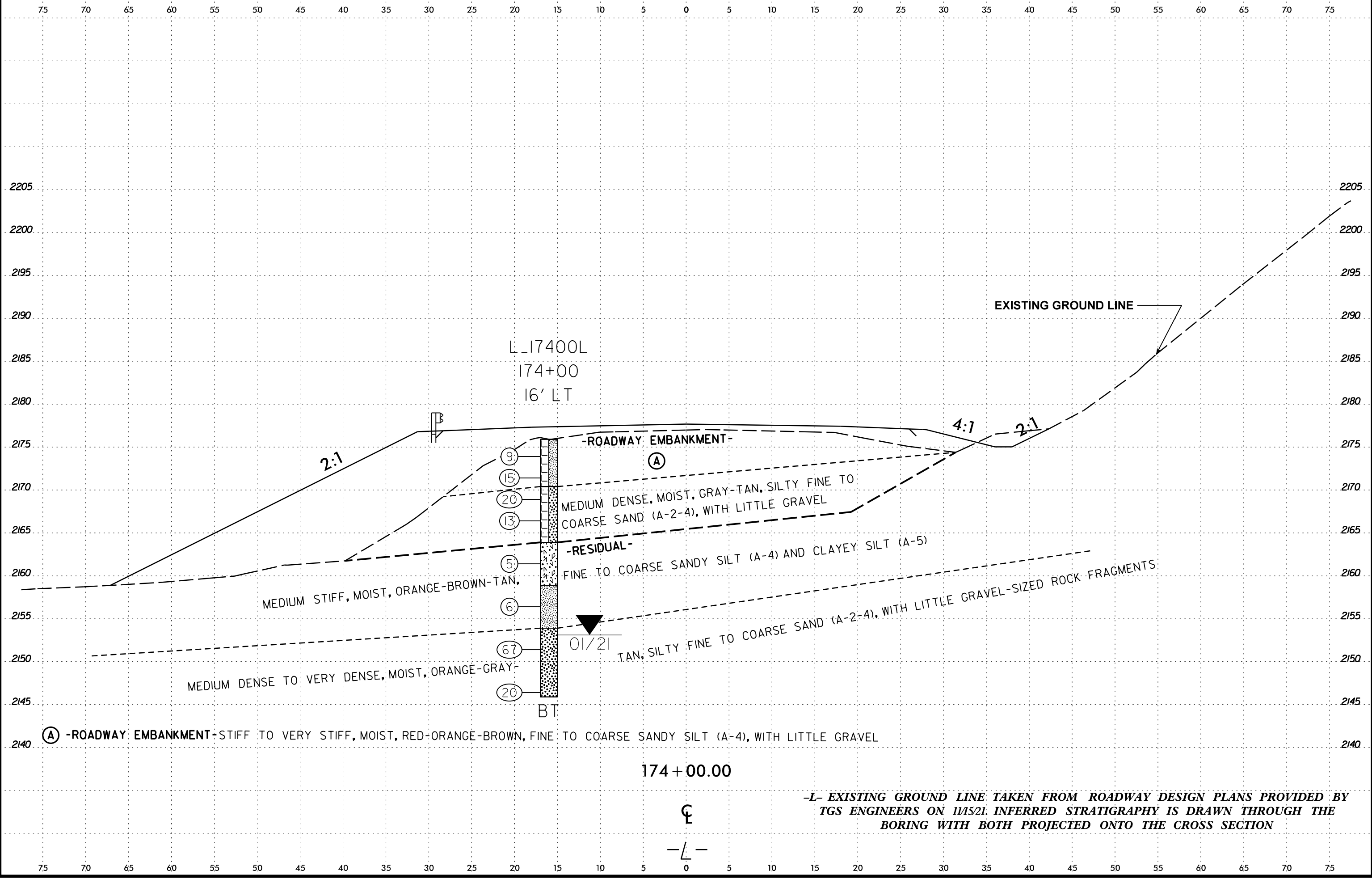


-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/5/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

6/23/16  
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L\_17400L  
174+00  
16' LT

EXISTING GROUND LINE

-ROADWAY EMBANKMENT-

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

-RESIDUAL-

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

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

01/21

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

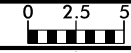
(A) -ROADWAY EMBANKMENT- STIFF TO VERY STIFF, MOIST, RED-ORANGE-BROWN, FINE TO COARSE SANDY SILT (A-4), WITH LITTLE GRAVEL

174+00.00

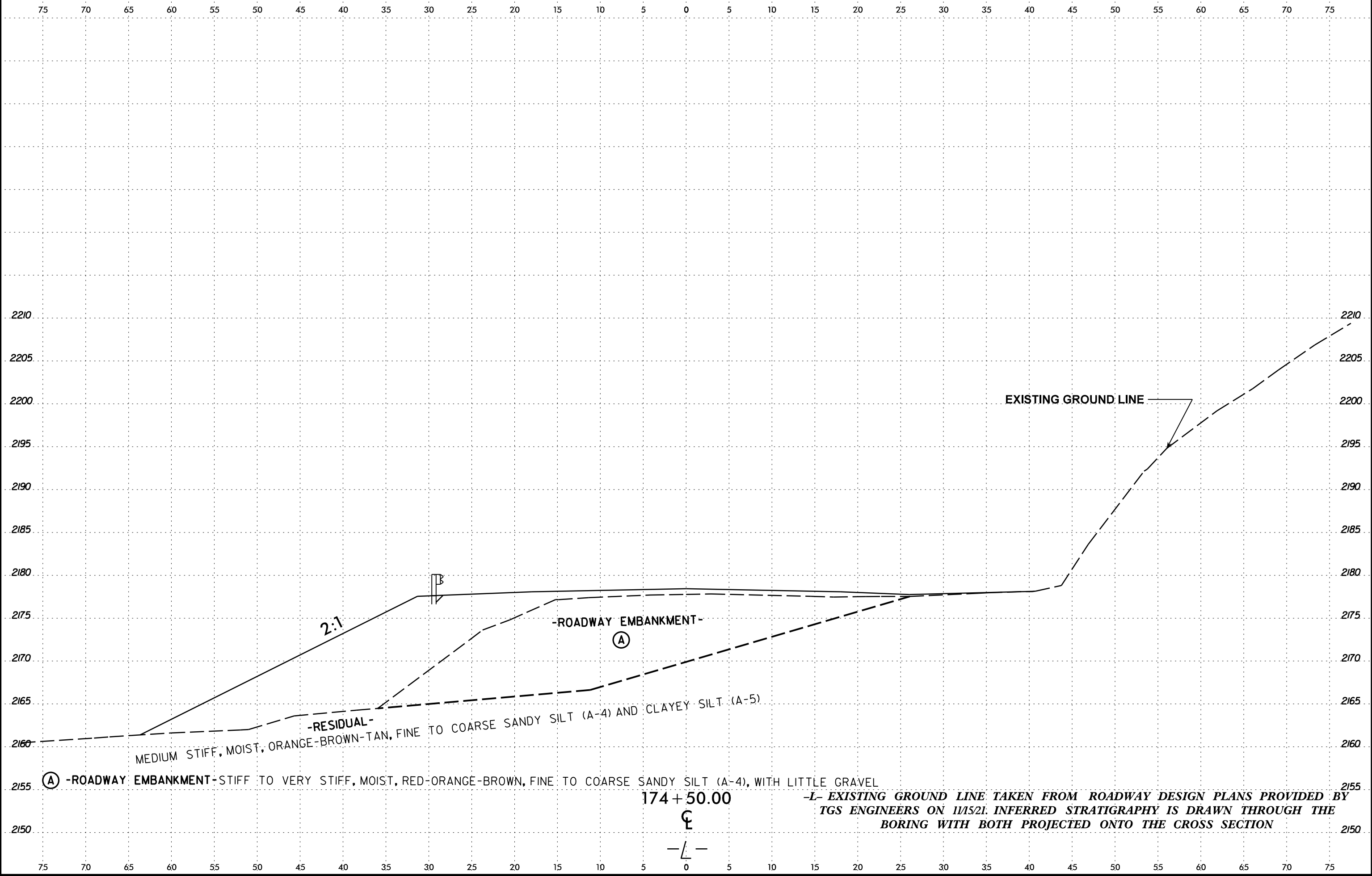
-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/5/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION



6/23/16  
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PROJ. REFERENCE NO.	SHEET NO.
A-0009CA	133



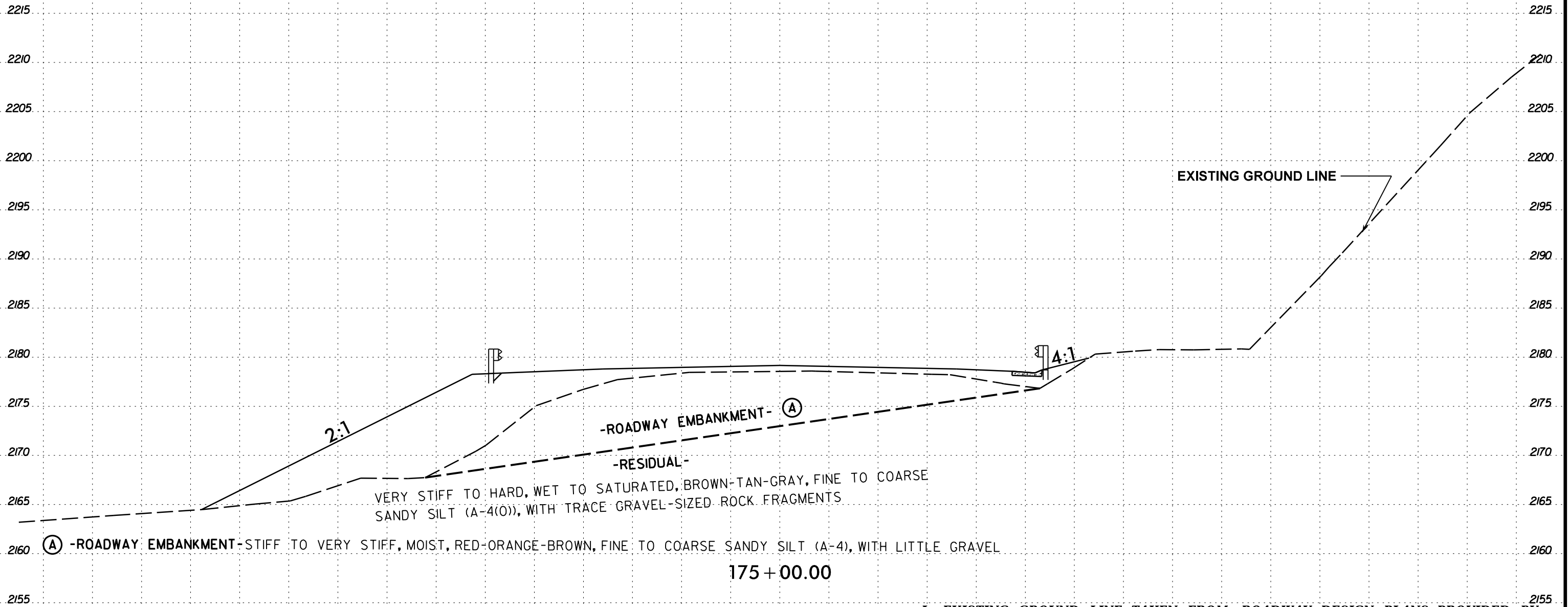
6/23/16



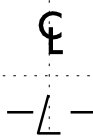
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A-0009CA

SHEET NO.  
134

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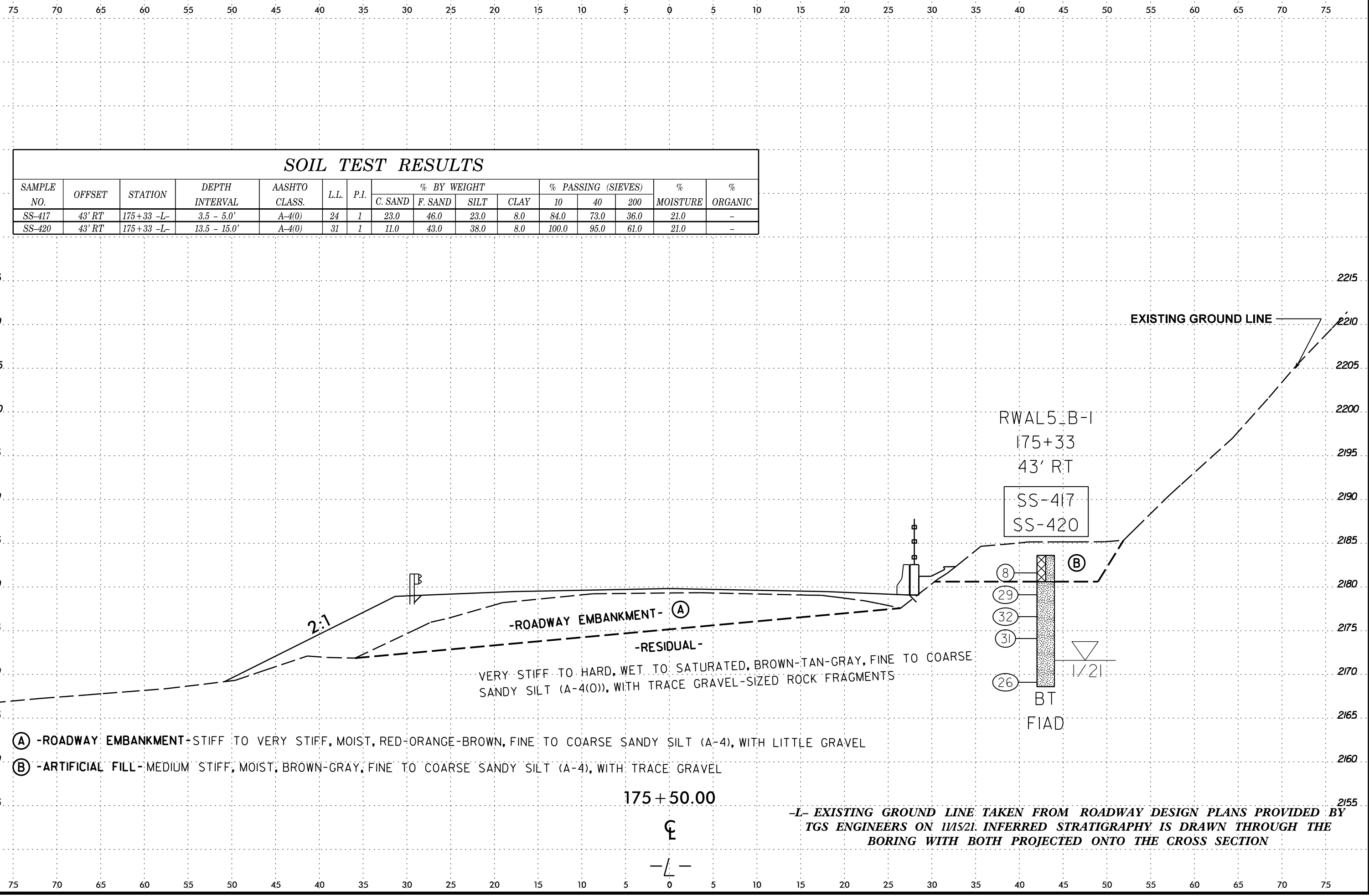


-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/5/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION



29-APR-2022 12:22  
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### SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-417	43' RT	175+33 -L-	3.5 - 5.0'	A-4(0)	24	1	23.0	46.0	23.0	8.0	84.0	73.0	36.0	21.0	-
SS-420	43' RT	175+33 -L-	13.5 - 15.0'	A-4(0)	31	1	11.0	43.0	38.0	8.0	100.0	95.0	61.0	21.0	-

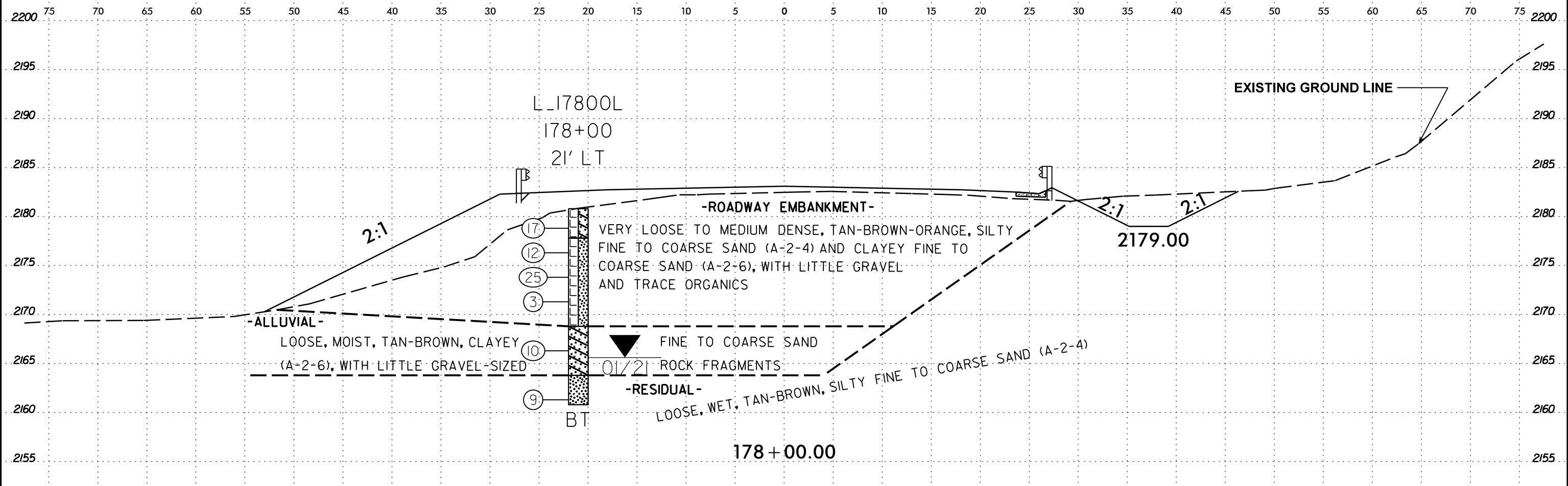
- (A) -ROADWAY EMBANKMENT- STIFF TO VERY STIFF, MOIST, RED-ORANGE-BROWN, FINE TO COARSE SANDY SILT (A-4), WITH LITTLE GRAVEL
- (B) -ARTIFICIAL FILL- MEDIUM STIFF, MOIST, BROWN-GRAY, FINE TO COARSE SANDY SILT (A-4), WITH TRACE GRAVEL

-ROADWAY EMBANKMENT- (A)  
 -RESIDUAL-  
 VERY STIFF TO HARD, WET TO SATURATED, BROWN-TAN-GRAY, FINE TO COARSE SANDY SILT (A-4(0)), WITH TRACE GRAVEL-SIZED ROCK FRAGMENTS

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 1/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

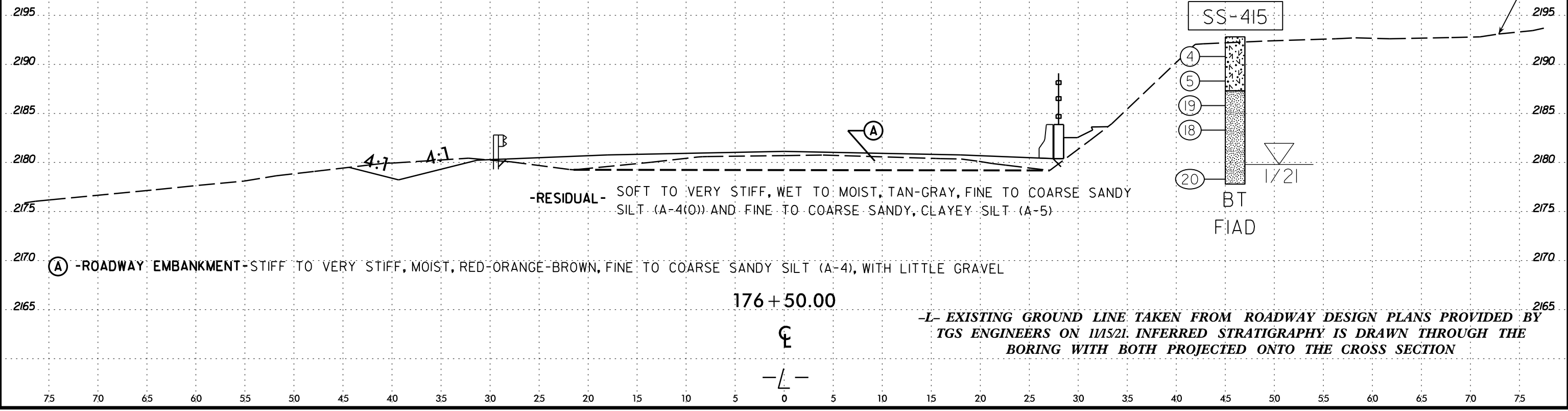
175 + 50.00  
 ☺  
 -L-

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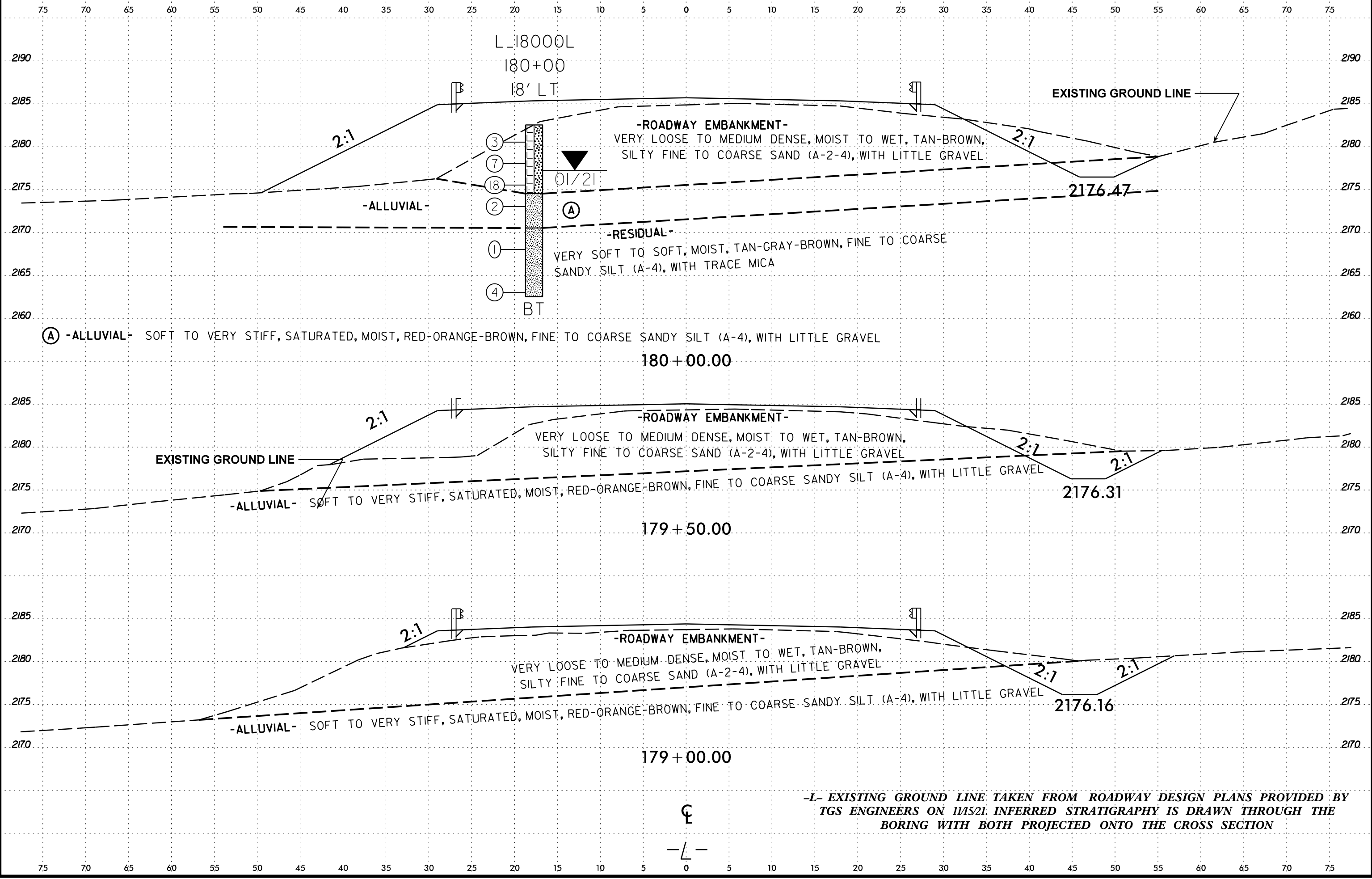


**SOIL TEST RESULTS**

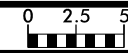
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-415	46' RT	176+62 -L-	13.5 - 15.0'	A-4(0)	26	NP	15.0	43.0	30.0	12.0	100.0	93.0	55.0	18.0	-



6/23/16  
29-APR-2022 12:22  
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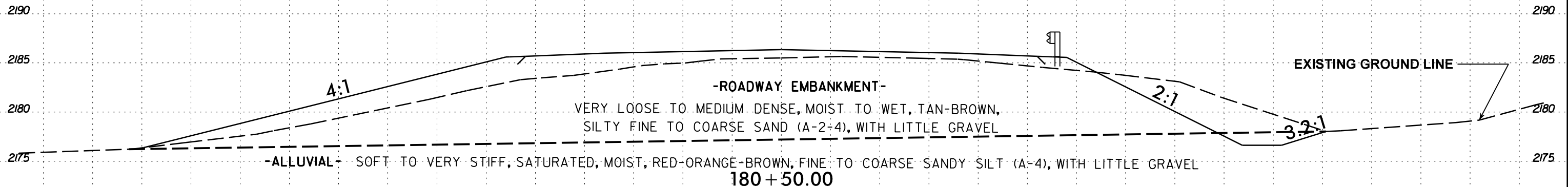
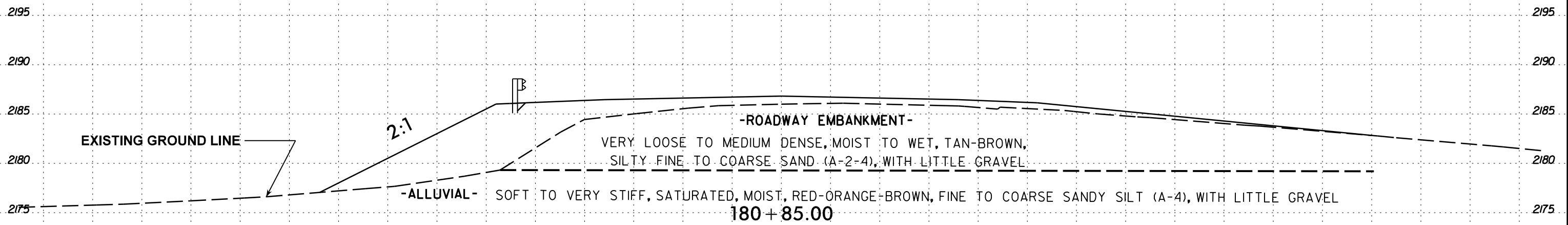
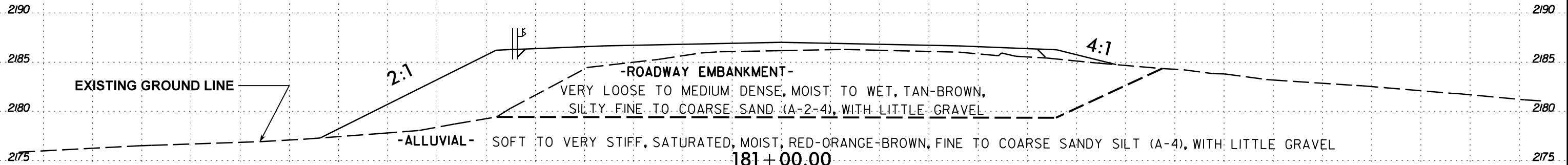


6/23/16



PROJ. REFERENCE NO.	SHEET NO.
A-0009CA	138

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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**

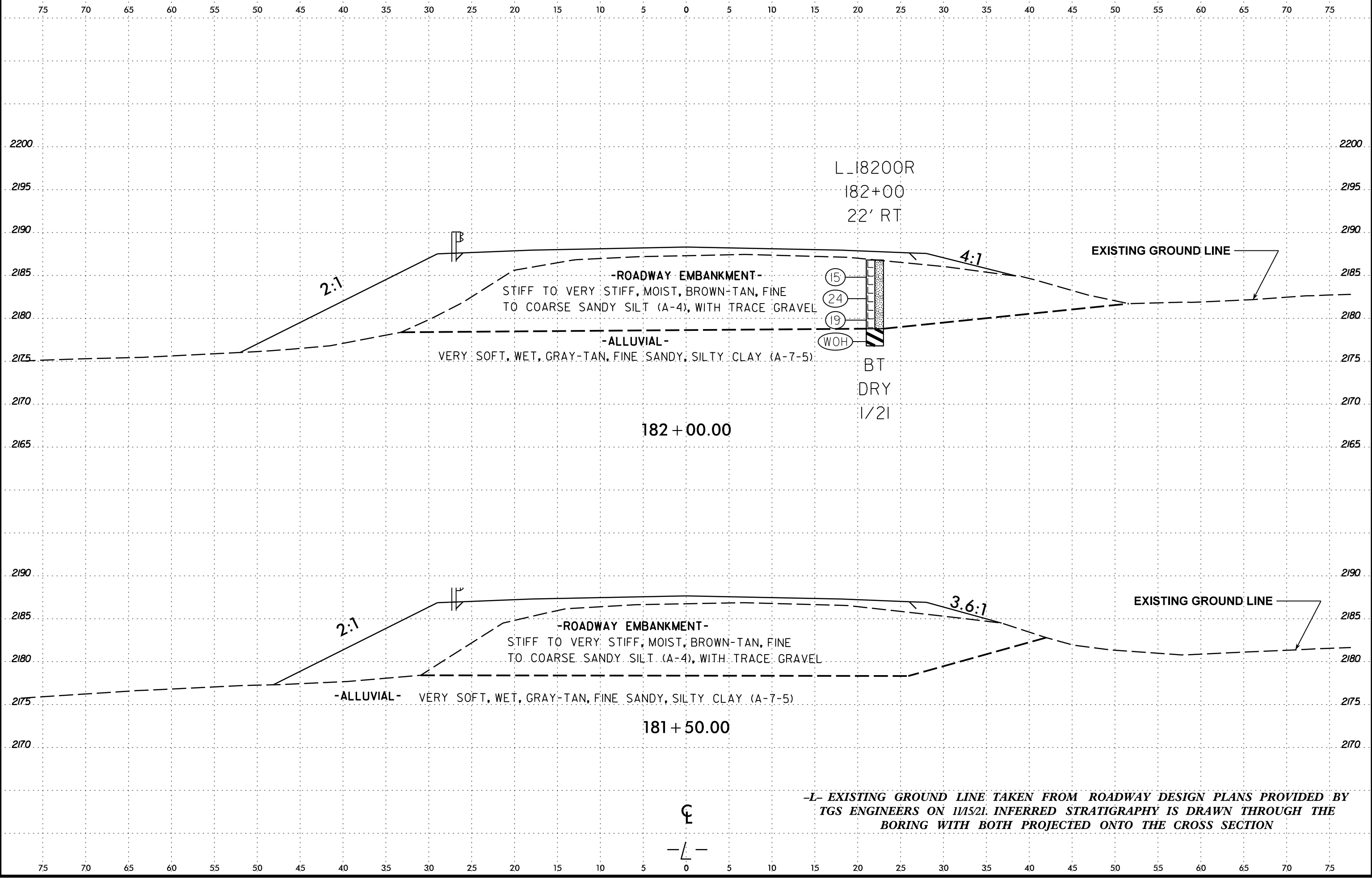
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29-APR-2022 12:22  
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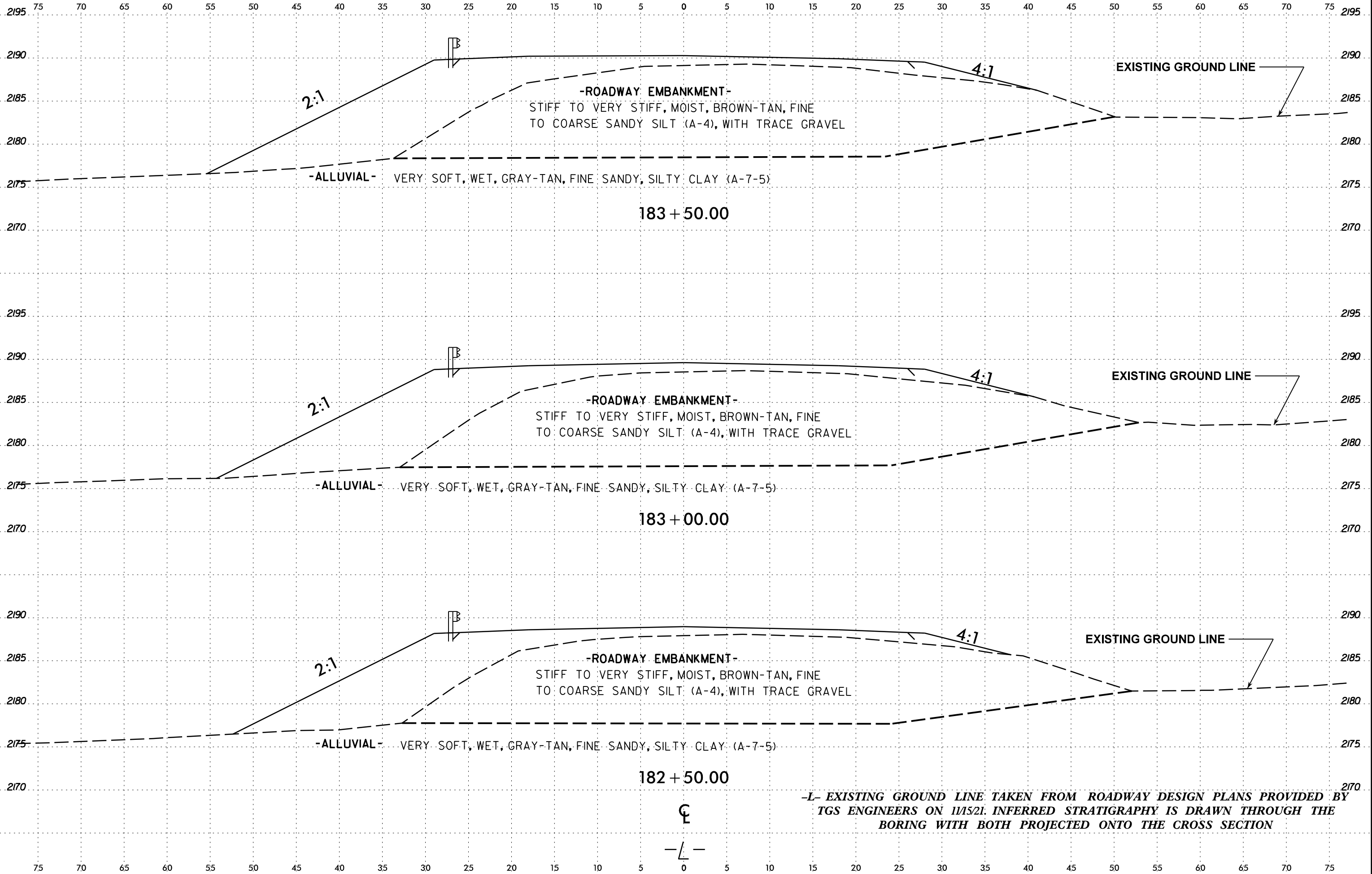
6/23/16  
29-APR-2022 12:22  
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6/23/16

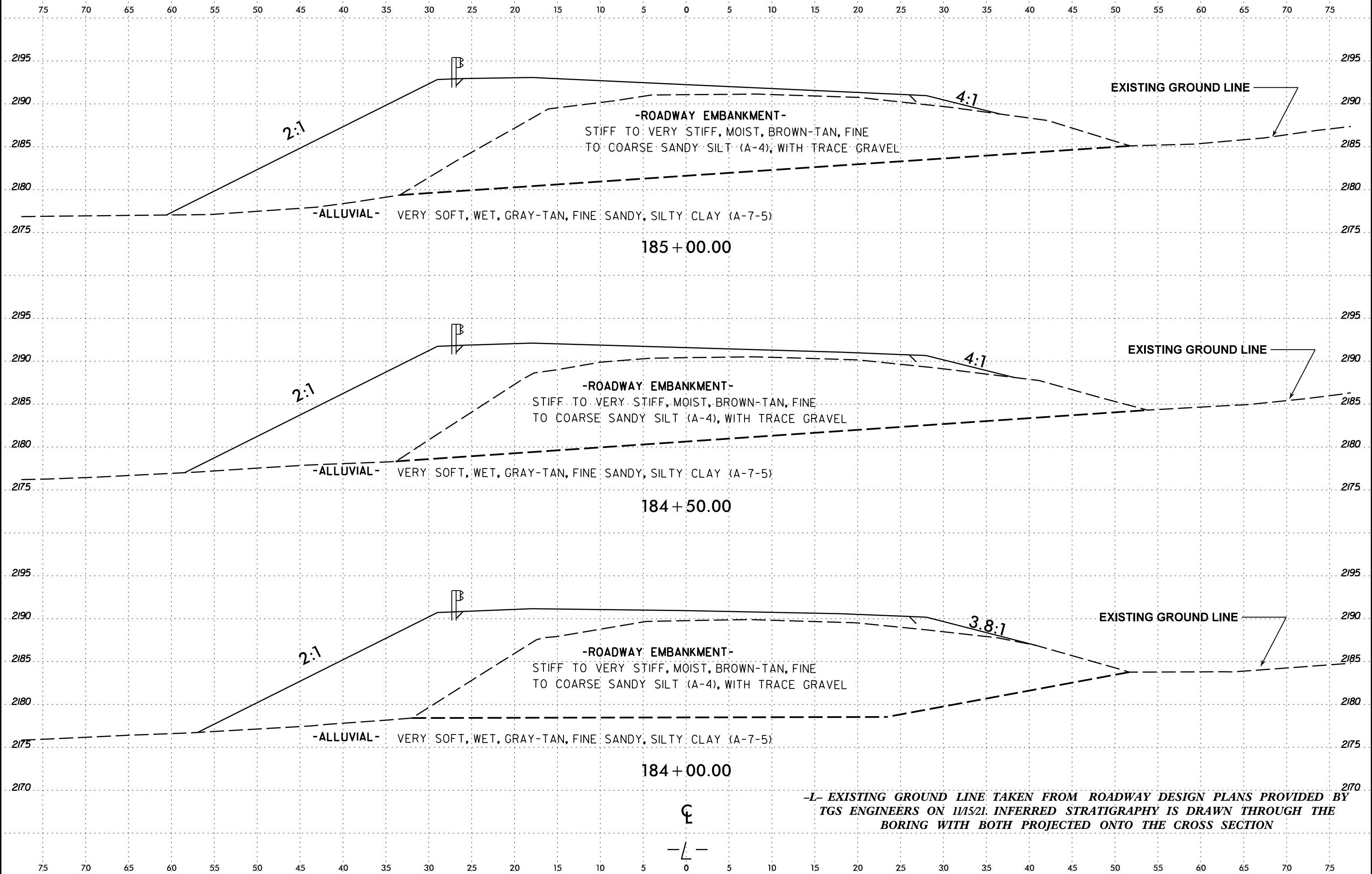
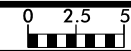


PROJ. REFERENCE NO.	SHEET NO.
A-0009CA	140



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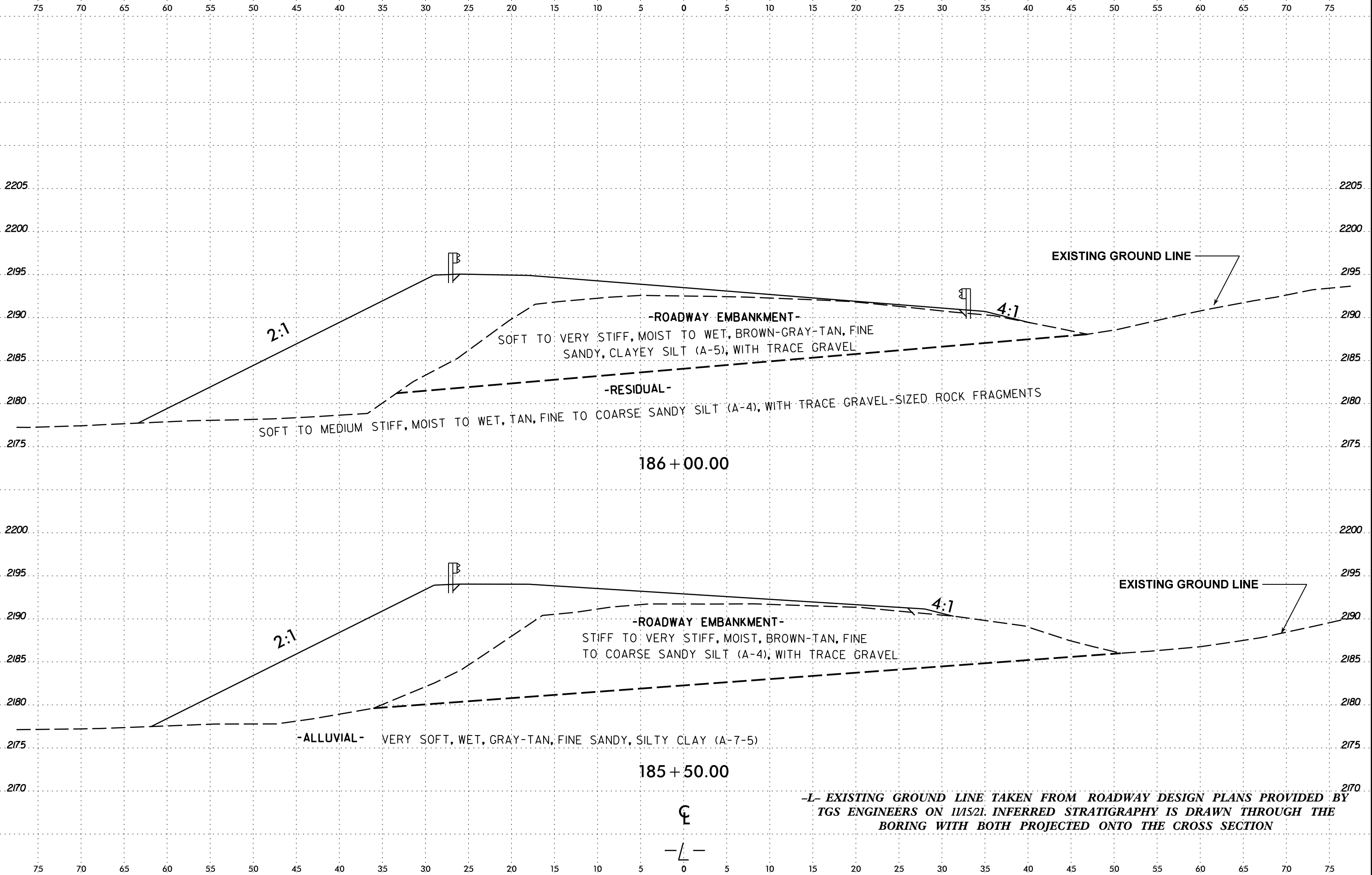
**-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 1/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION**

29-APR-2022 12:22  
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 jerry

6/23/16



PROJ. REFERENCE NO.	SHEET NO.
A-0009CA	142

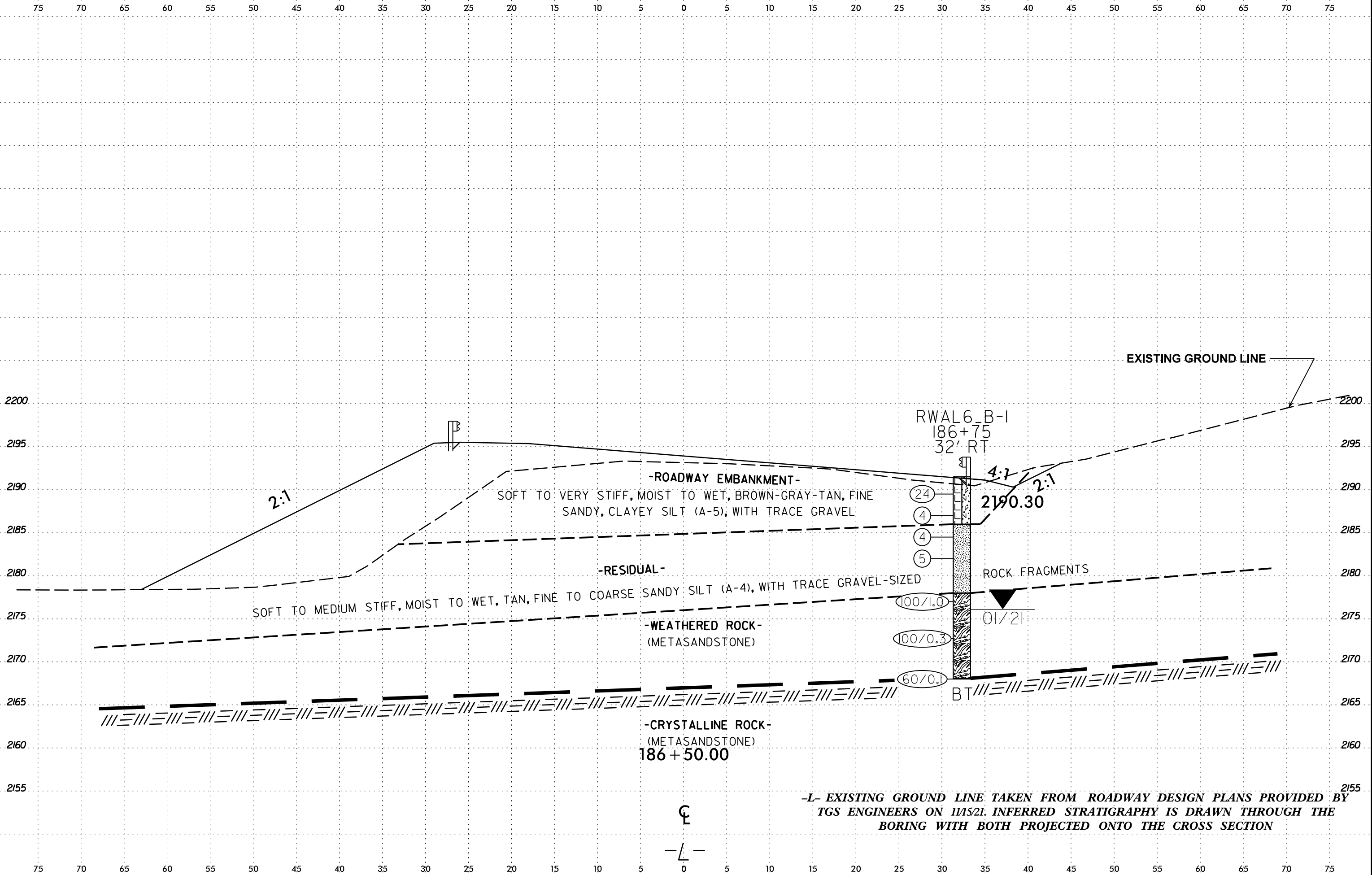


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6/23/16



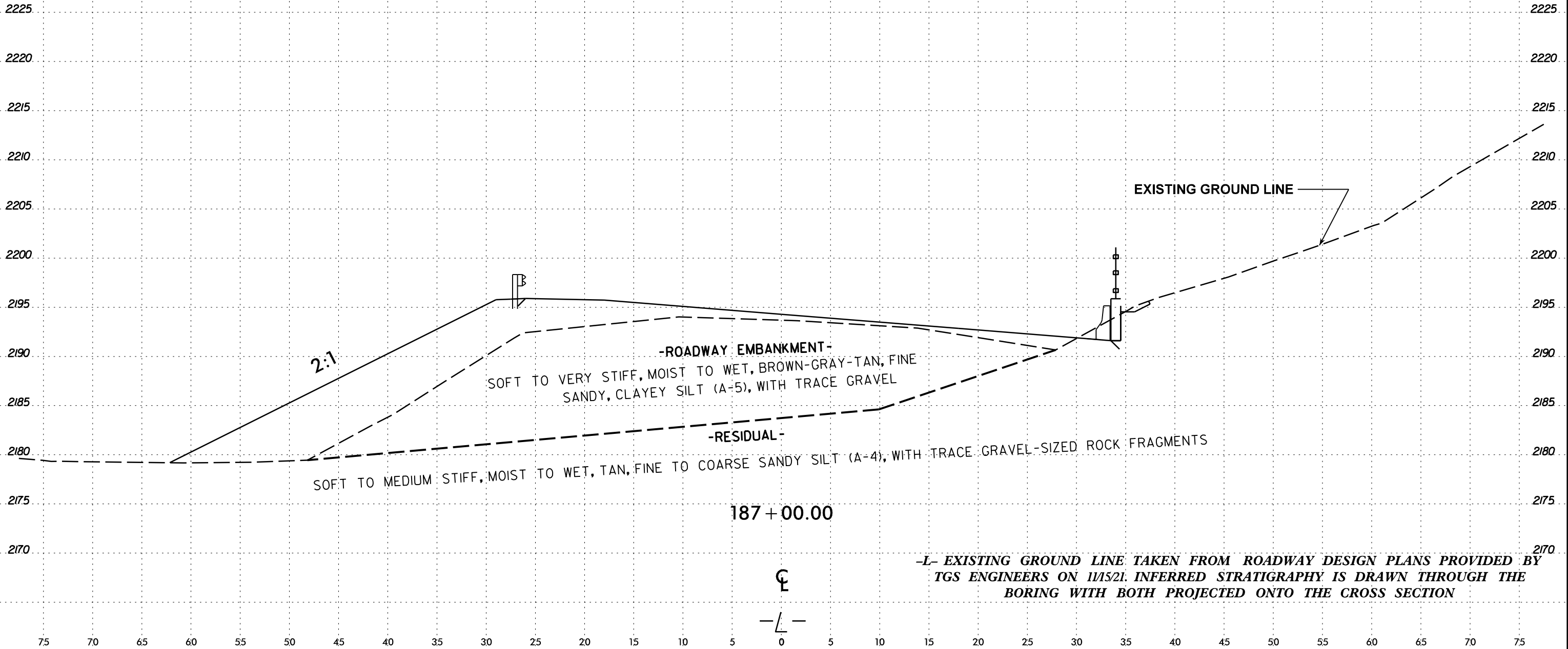
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A-0009CA	143



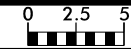
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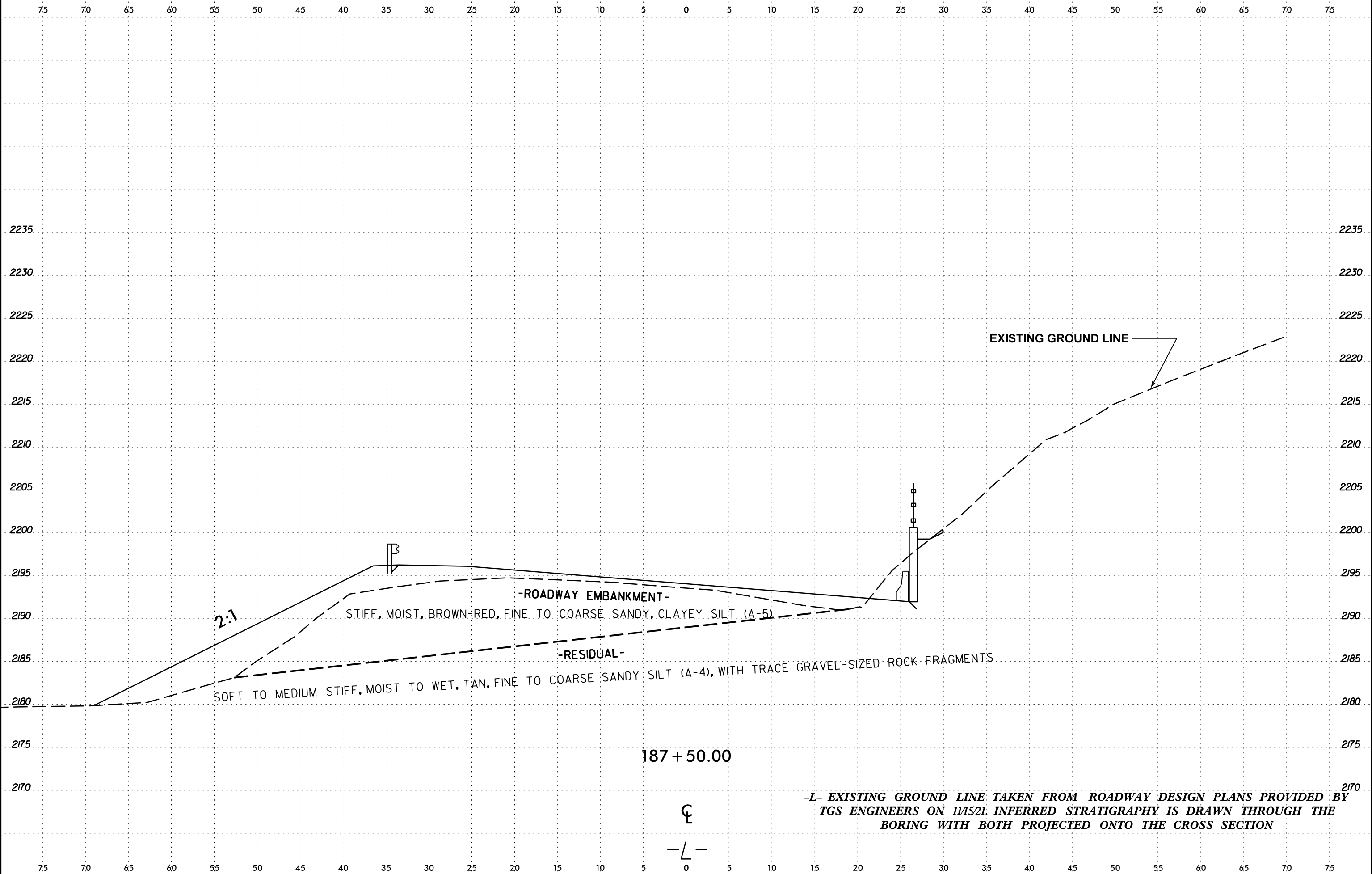
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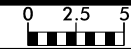
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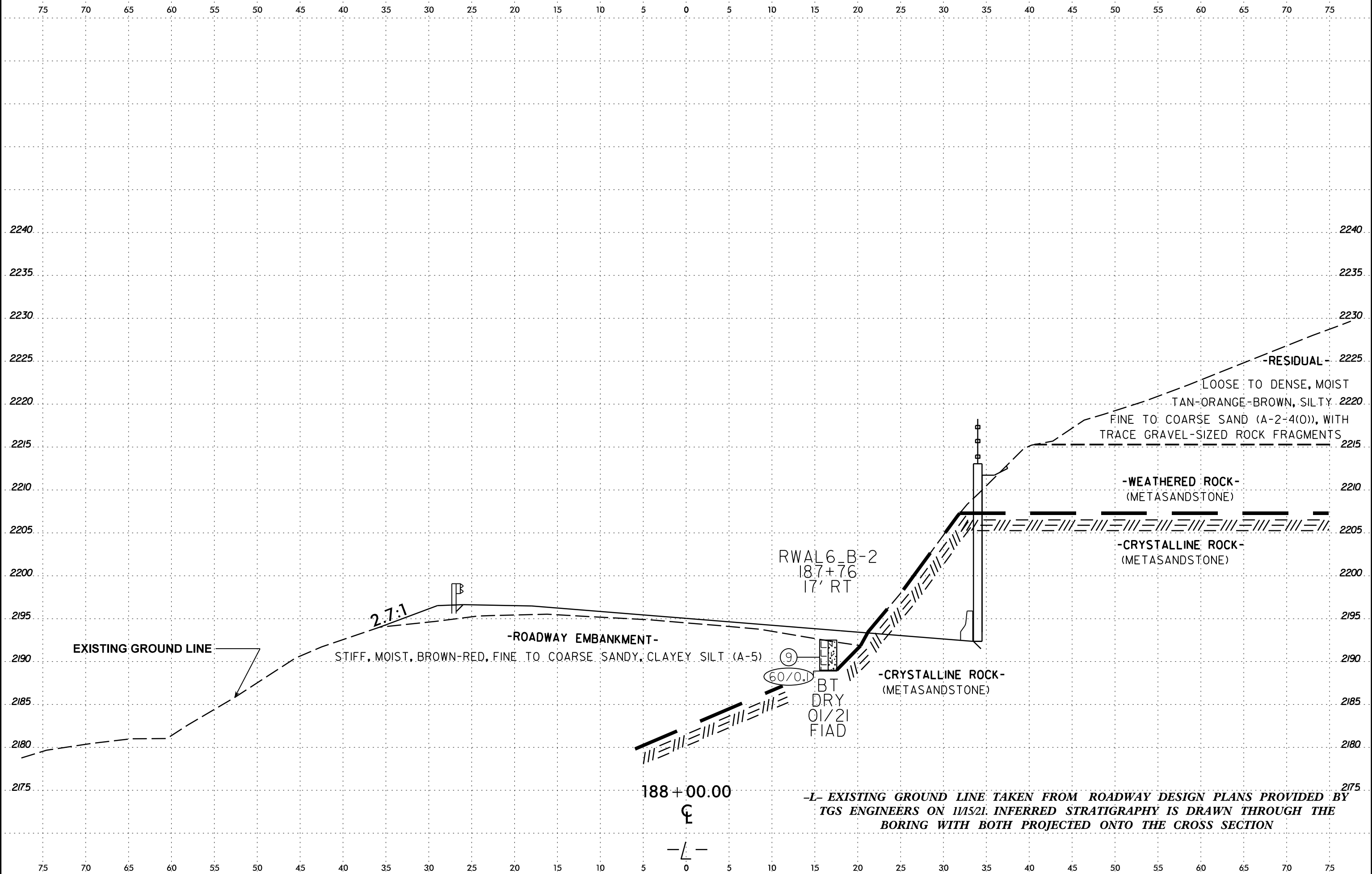
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PROJ. REFERENCE NO.	SHEET NO.
A-0009CA	146



EXISTING GROUND LINE

2.7:1

-ROADWAY EMBANKMENT-

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

RWAL6\_B-2  
18.7+76  
17' RT

9  
60/0.0

BT  
DRY  
01/21  
FIAD

-CRYSTALLINE ROCK-  
(METASANDSTONE)

-WEATHERED ROCK-  
(METASANDSTONE)

-CRYSTALLINE ROCK-  
(METASANDSTONE)

-RESIDUAL-

LOOSE TO DENSE, MOIST  
TAN-ORANGE-BROWN, SILTY  
FINE TO COARSE SAND (A-2-4(O)), WITH  
TRACE GRAVEL-SIZED ROCK FRAGMENTS

188+00.00

☉

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/5/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

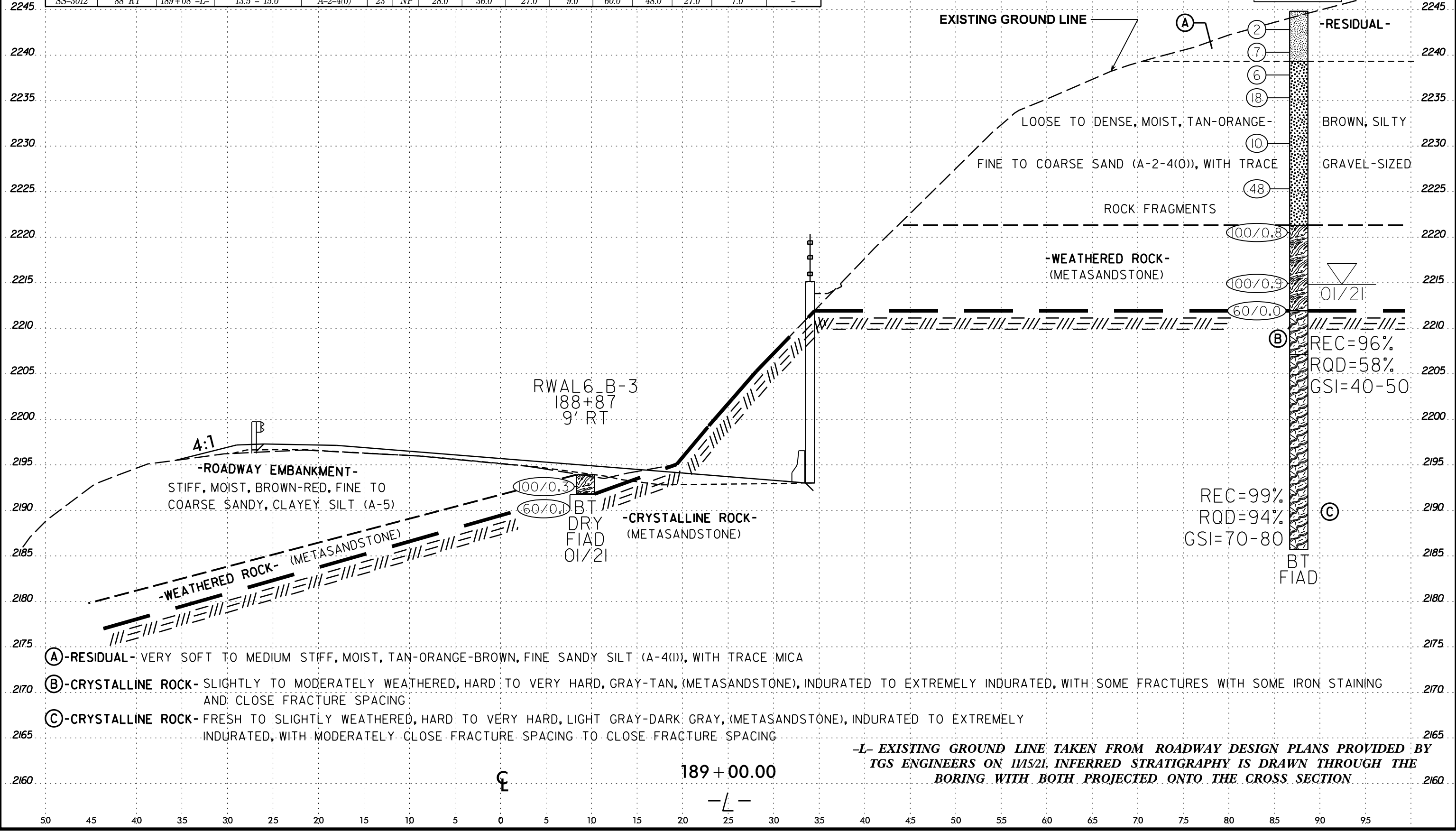
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 SSUBSERIAL#533

50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

### 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-3008	88' RT	189+08 -L-	1.0 - 2.5'	A-4(1)	33	1	10.0	28.0	41.0	21.0	99.0	93.0	72.0	23.0	-
SS-3012	88' RT	189+08 -L-	13.5 - 15.0'	A-2-4(0)	23	NP	28.0	36.0	27.0	9.0	60.0	48.0	27.0	7.0	-

RWAL6\_B-7  
 189+08 88' RT  
 SS-3008  
 SS-3012



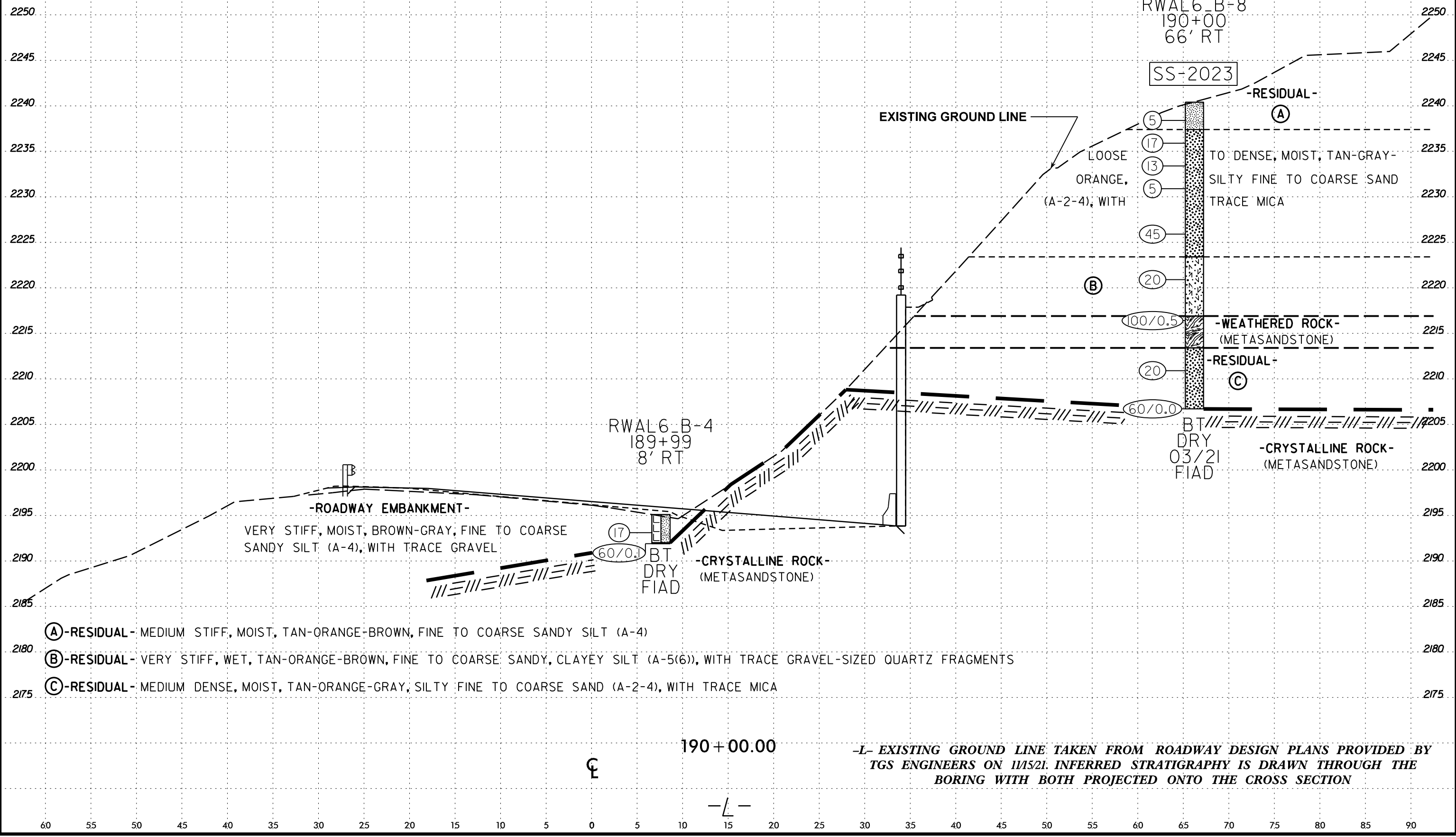
- (A) -RESIDUAL- VERY SOFT TO MEDIUM STIFF, MOIST, TAN-ORANGE-BROWN, FINE SANDY SILT (A-4(1)), WITH TRACE MICA
- (B) -CRYSTALLINE ROCK- SLIGHTLY TO MODERATELY WEATHERED, HARD TO VERY HARD, GRAY-TAN, (METASANDSTONE), INDURATED TO EXTREMELY INDURATED, WITH SOME FRACTURES WITH SOME IRON STAINING AND CLOSE FRACTURE SPACING
- (C) -CRYSTALLINE ROCK- FRESH TO SLIGHTLY WEATHERED, HARD TO VERY HARD, LIGHT GRAY-DARK GRAY, (METASANDSTONE), INDURATED TO EXTREMELY INDURATED, WITH MODERATELY CLOSE FRACTURE SPACING TO CLOSE FRACTURE SPACING

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 1/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

189 + 00.00

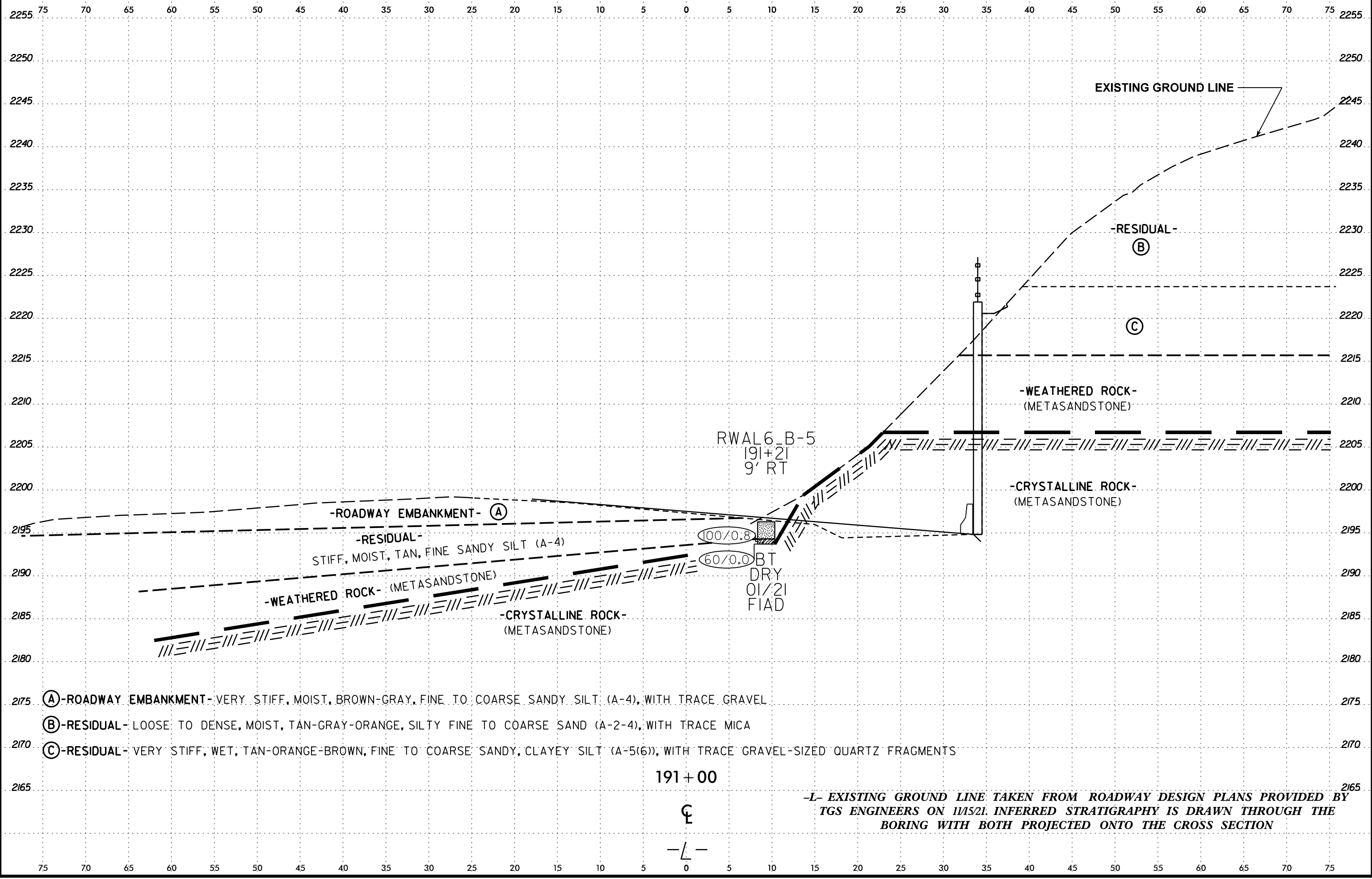
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SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-2023	46' RT	190+00 -L-	18.5 - 20.0'	A-5(6)	41	10	20.0	24.0	25.0	31.0	100.0	86.0	64.0	36.0	-





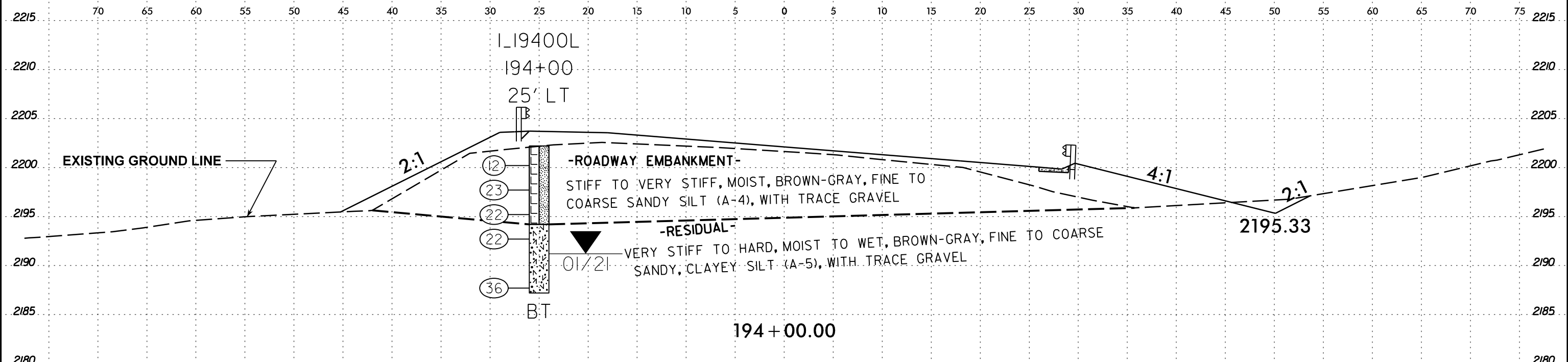
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 6/23/16



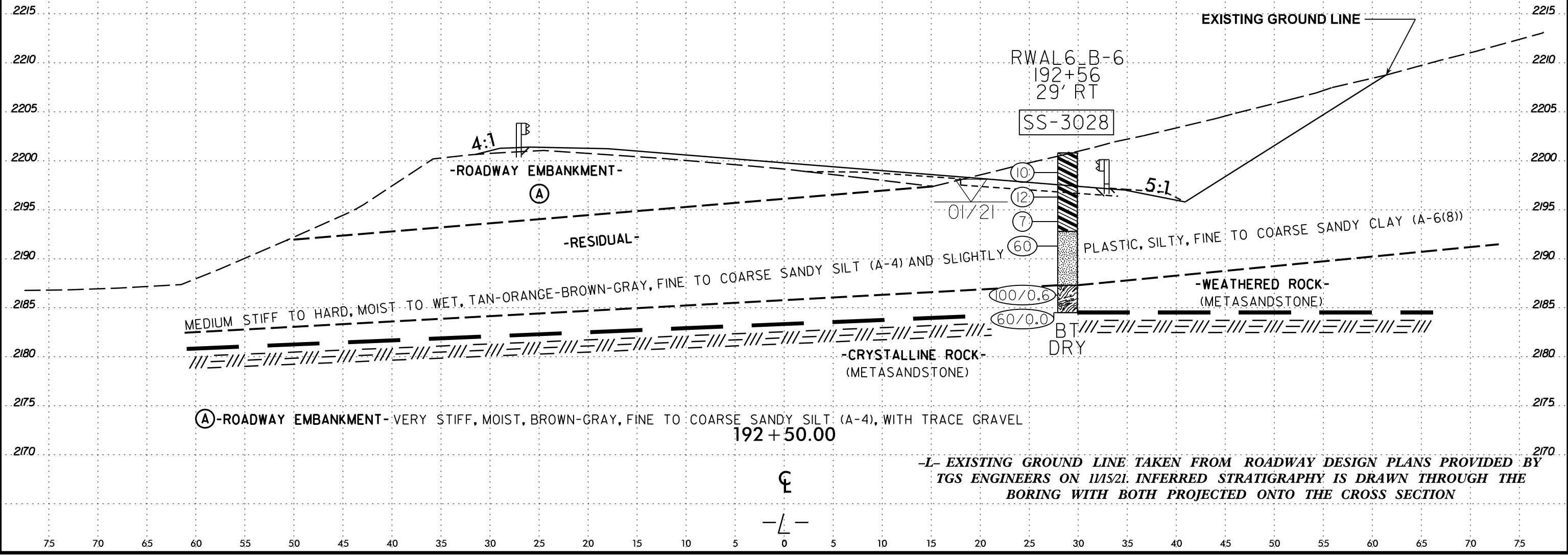
- (A) -ROADWAY EMBANKMENT- VERY STIFF, MOIST, BROWN-GRAY, FINE TO COARSE SANDY SILT (A-4), WITH TRACE GRAVEL
- (B) -RESIDUAL- LOOSE TO DENSE, MOIST, TAN-GRAY-ORANGE, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE MICA
- (C) -RESIDUAL- VERY STIFF, WET, TAN-ORANGE-BROWN, FINE TO COARSE SANDY, CLAYEY SILT (A-5(6)), WITH TRACE GRAVEL-SIZED QUARTZ 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 WITH BOTH PROJECTED ONTO THE CROSS SECTION

6/23/16  
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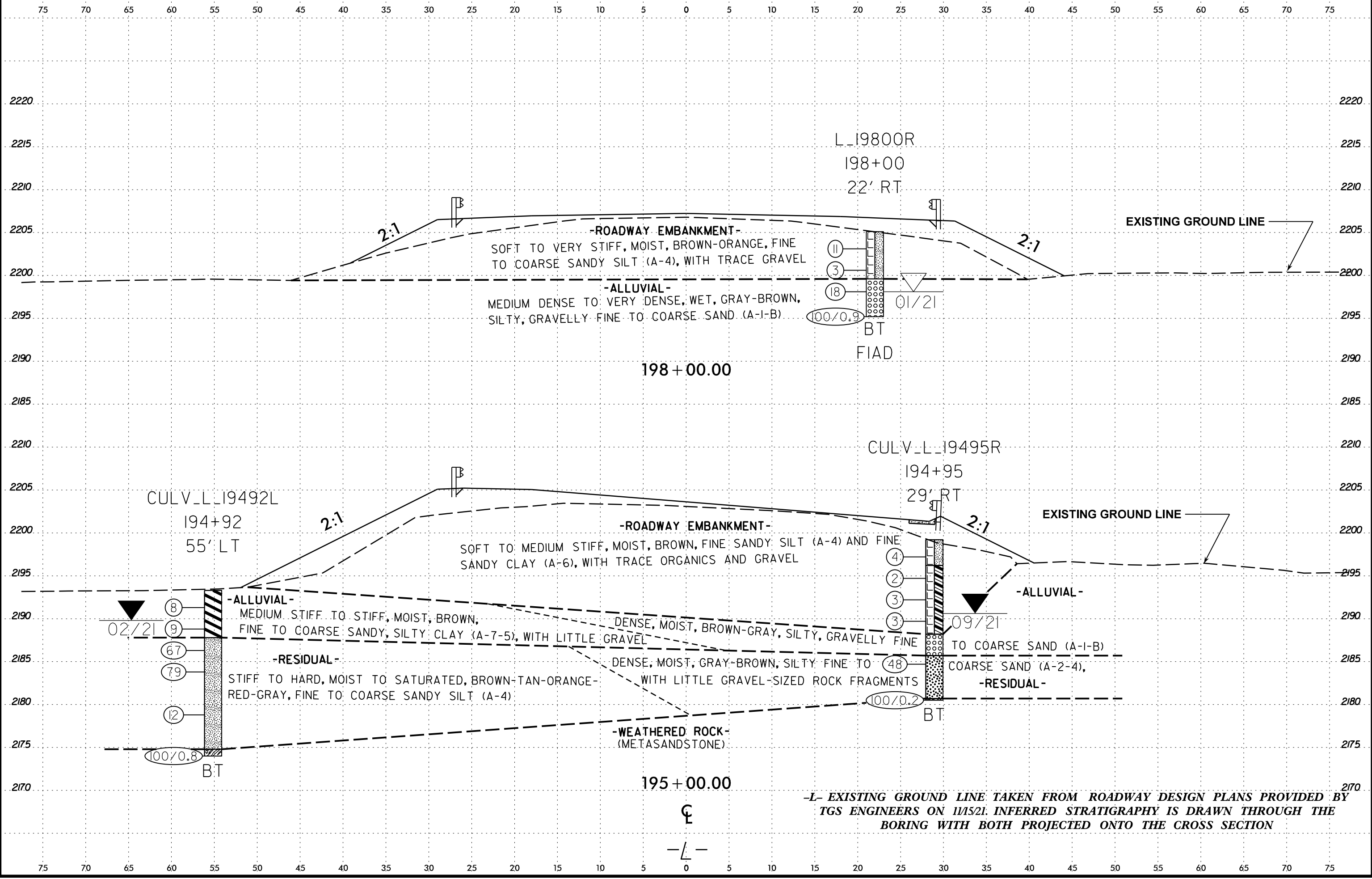


<b>SOIL TEST RESULTS</b>															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-3028	29' RT	192+56 -L-	3.5 - 5.0'	A-6(8)	39	11	6.0	27.0	32.0	35.0	100.0	97.0	75.0	28.0	-



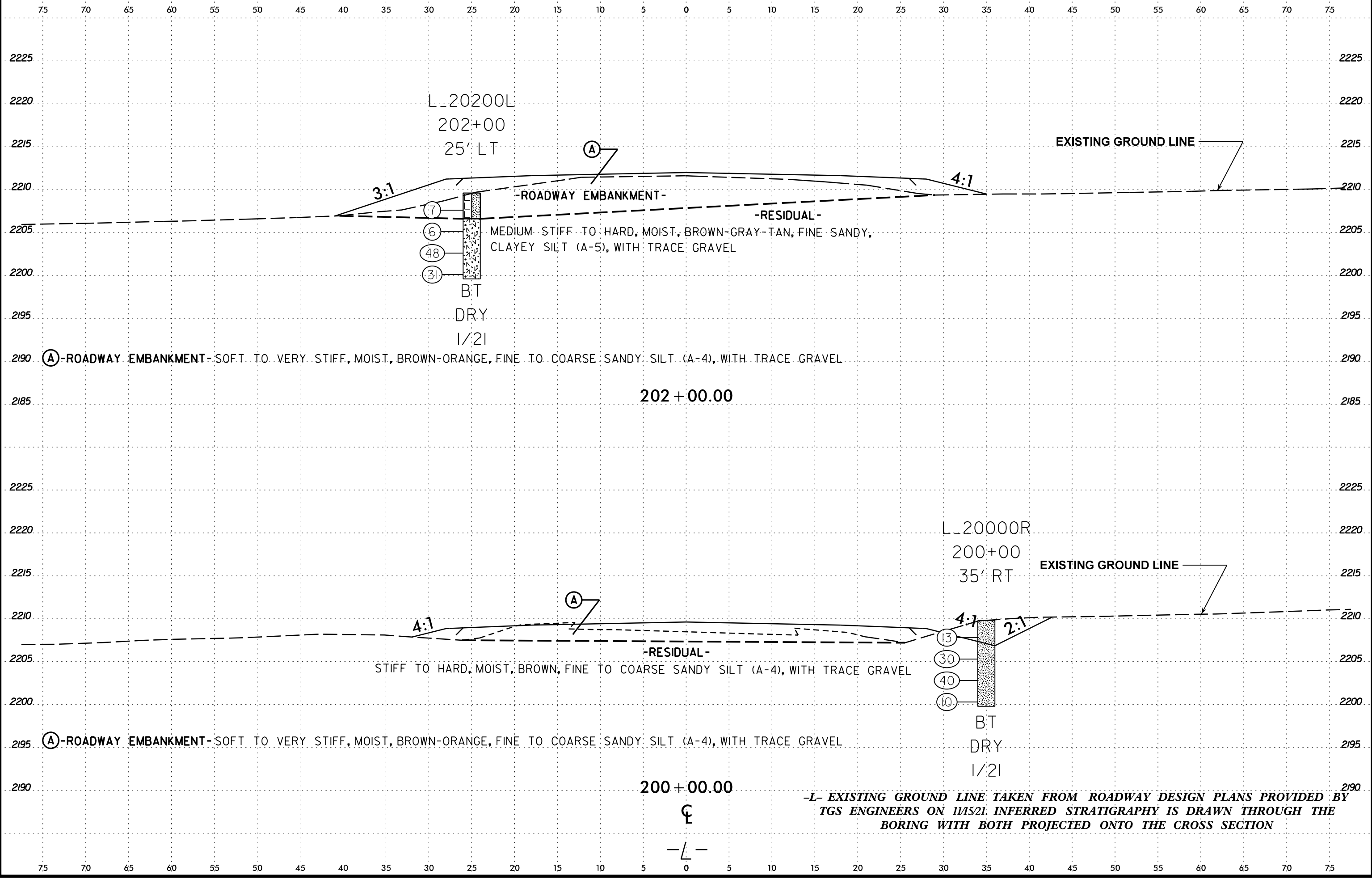
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-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/5/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

6/23/16  
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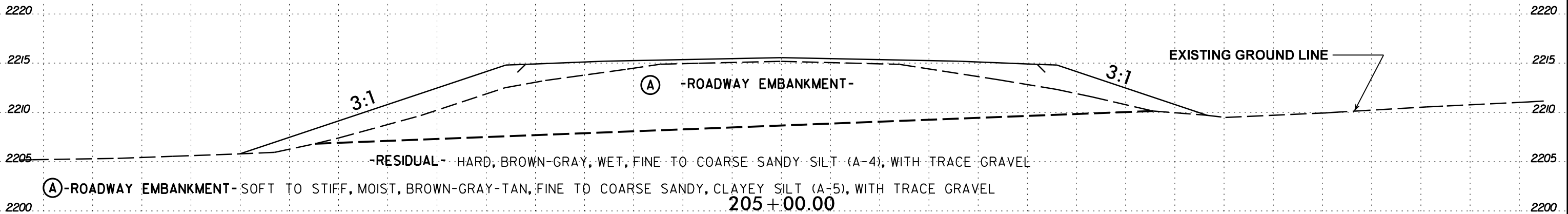


6/23/16

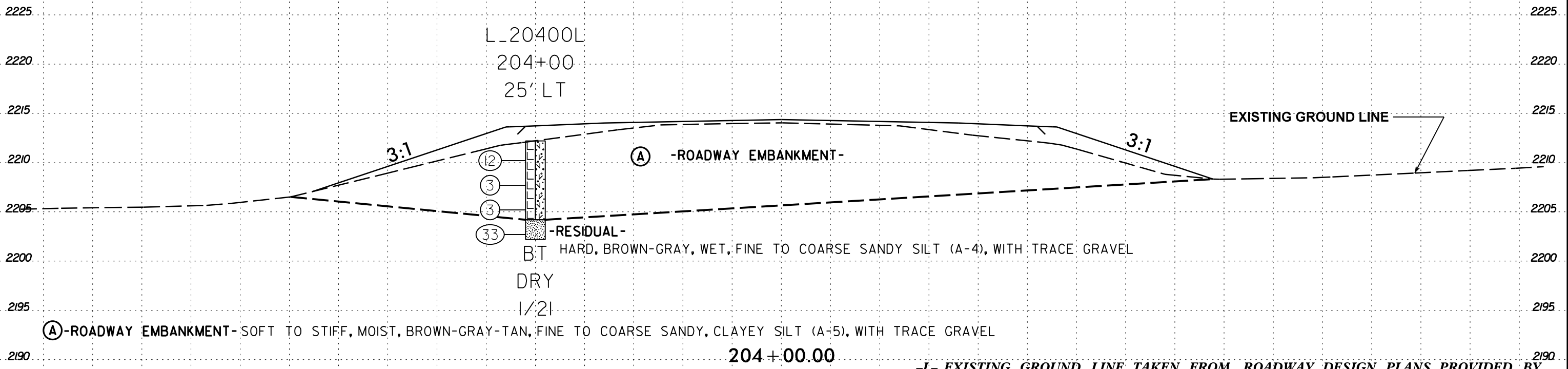


PROJ. REFERENCE NO.	SHEET NO.
A-0009CA	153

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L\_20400L  
204+00  
25' LT

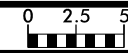


-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/5/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

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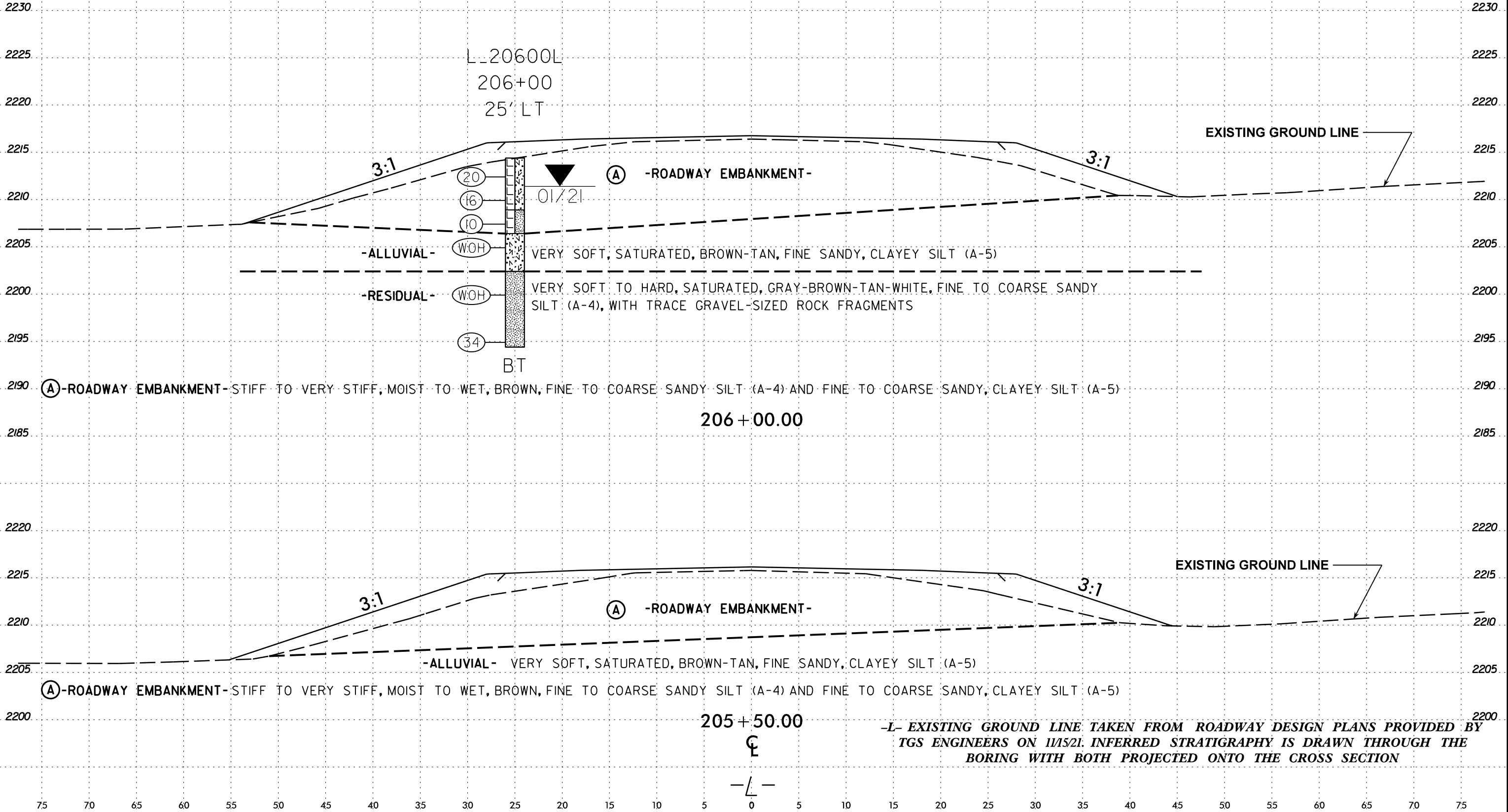
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6/23/16



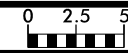
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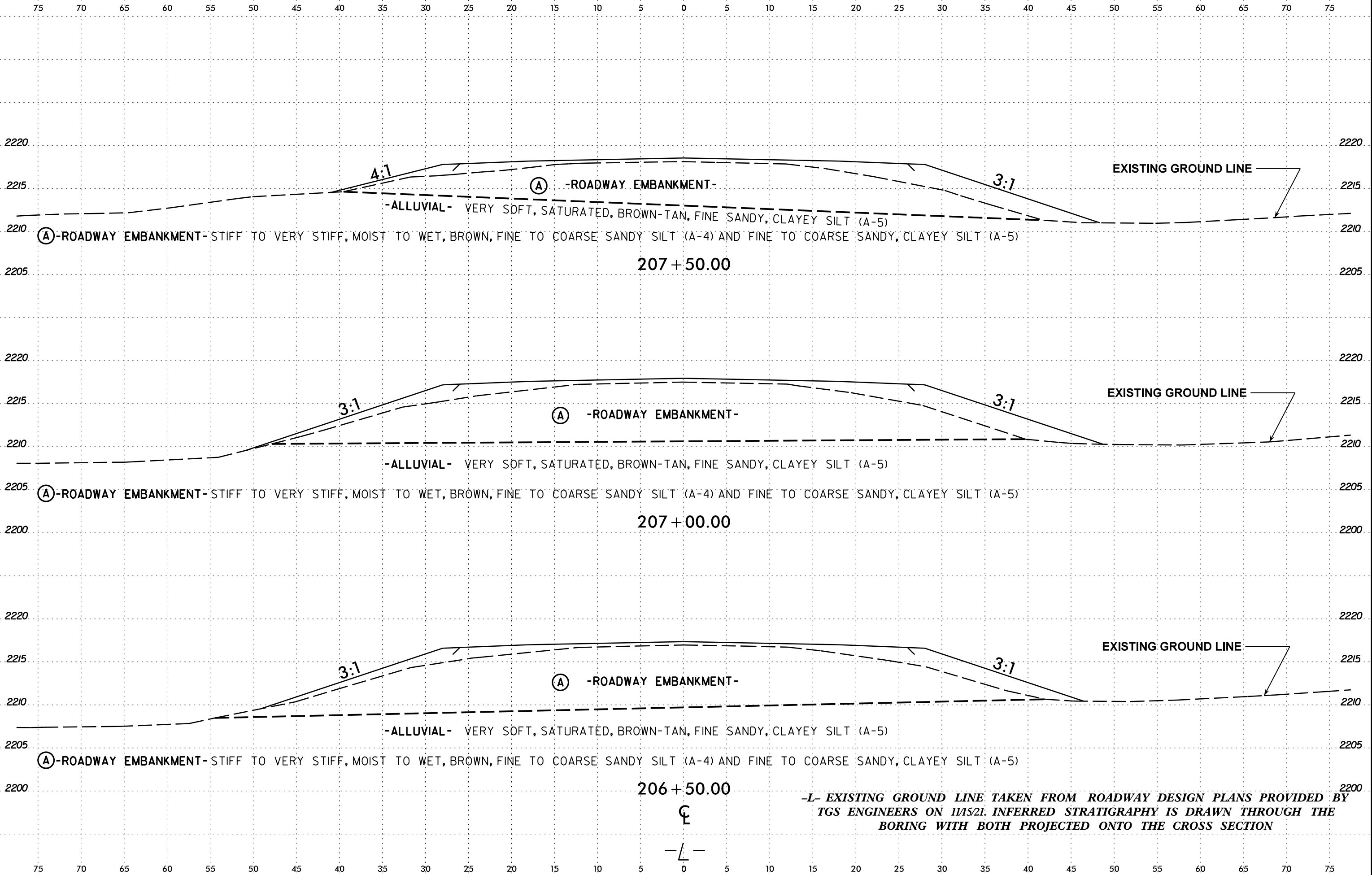


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SUBSTRATE

6/23/16



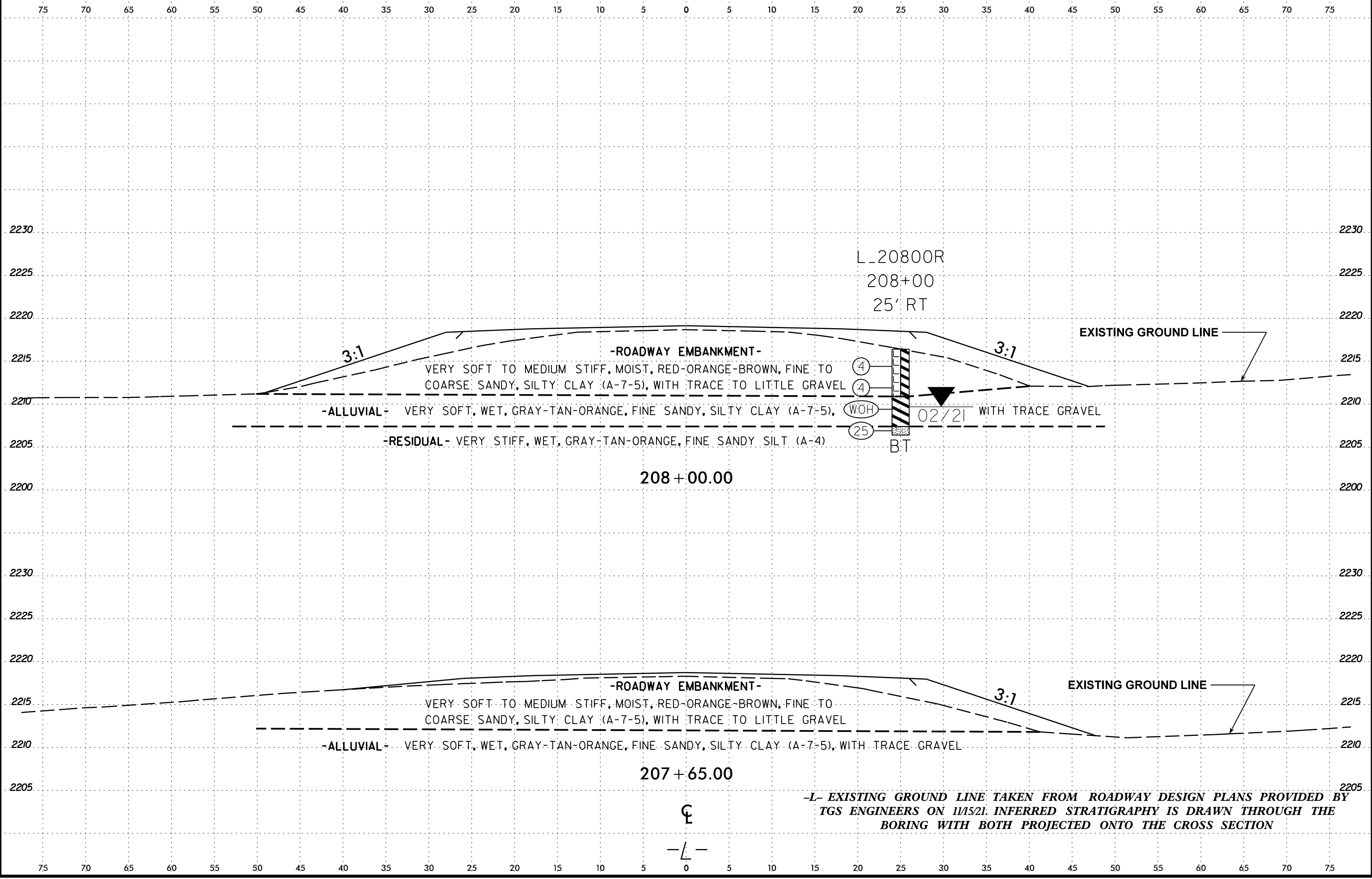
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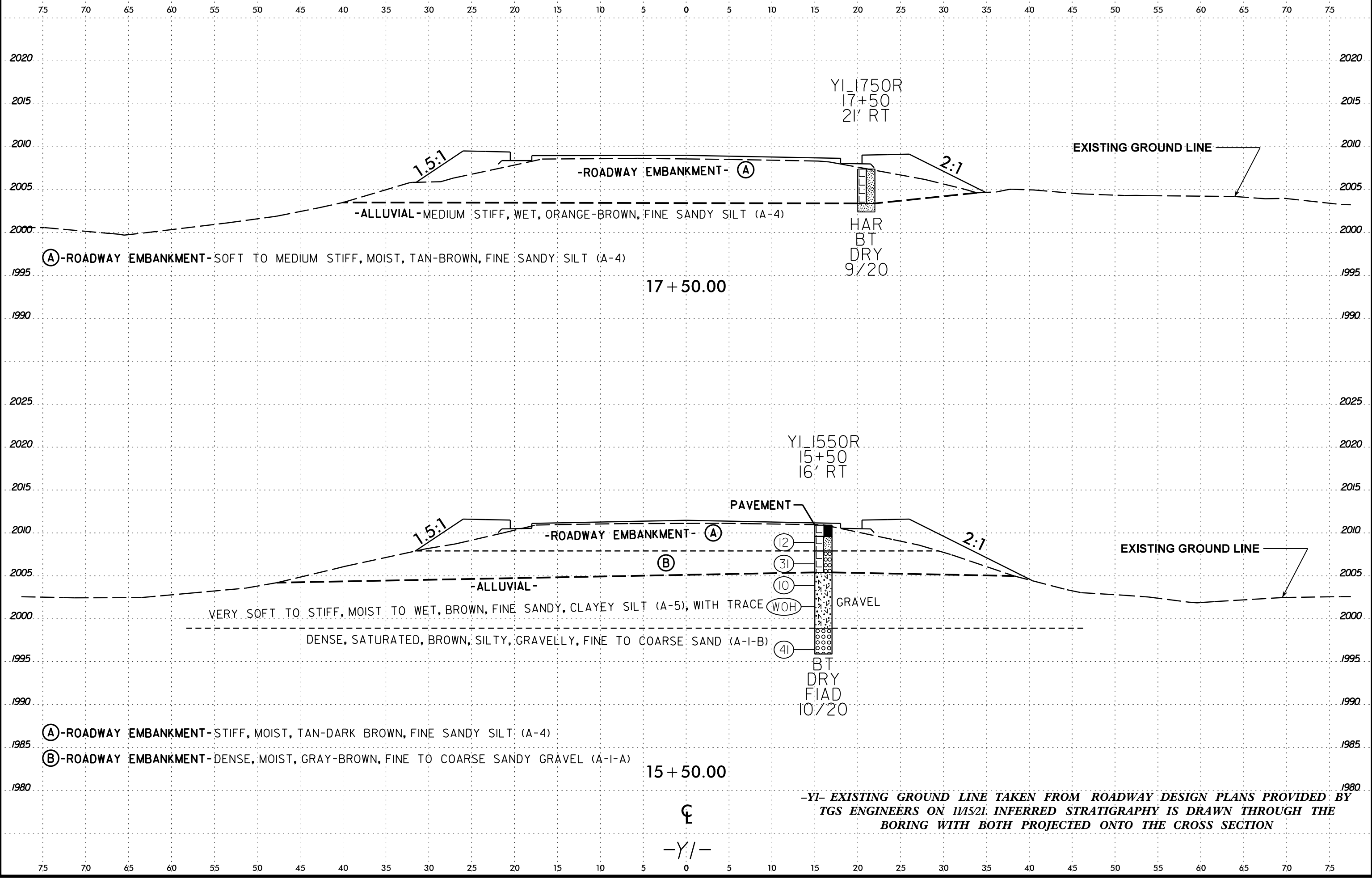
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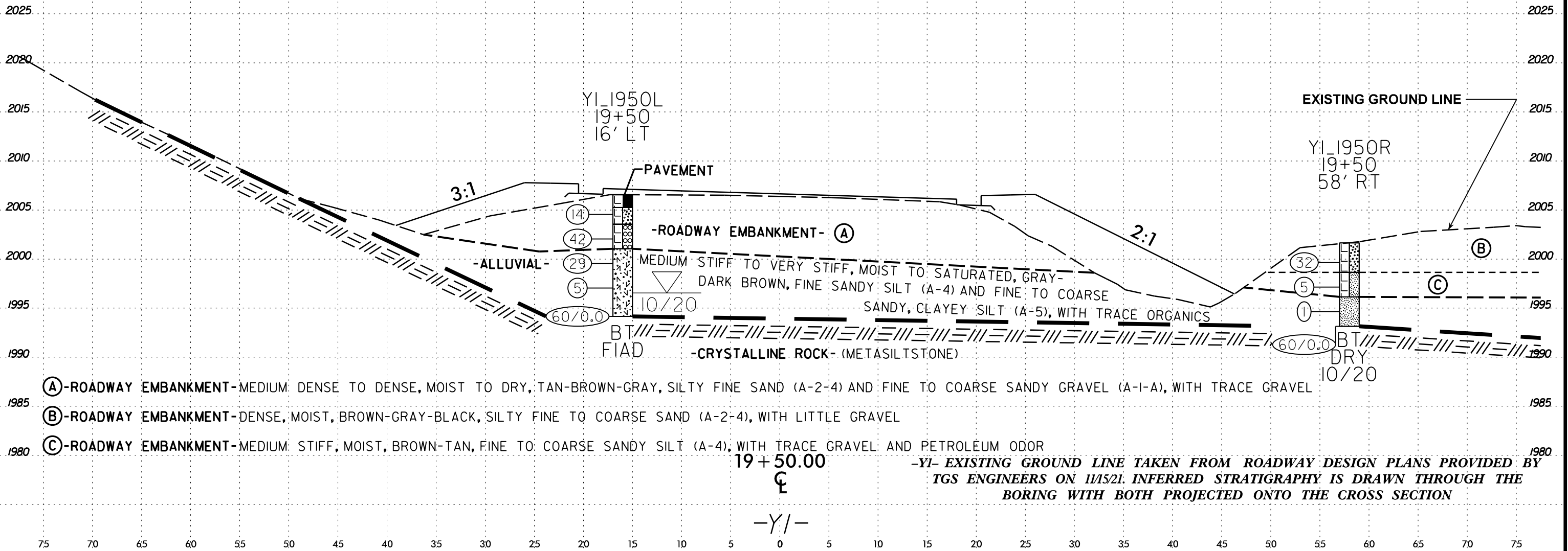
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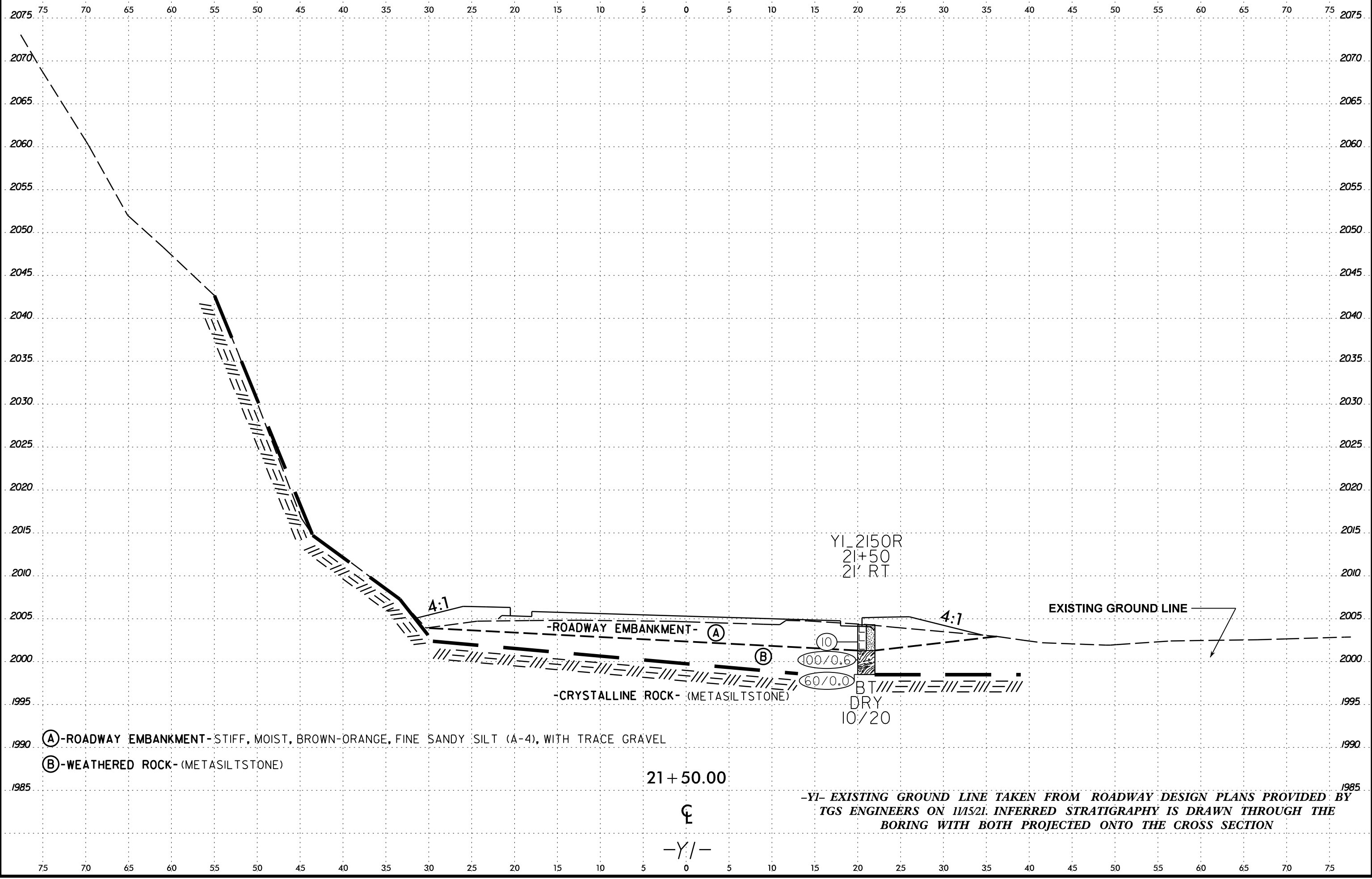
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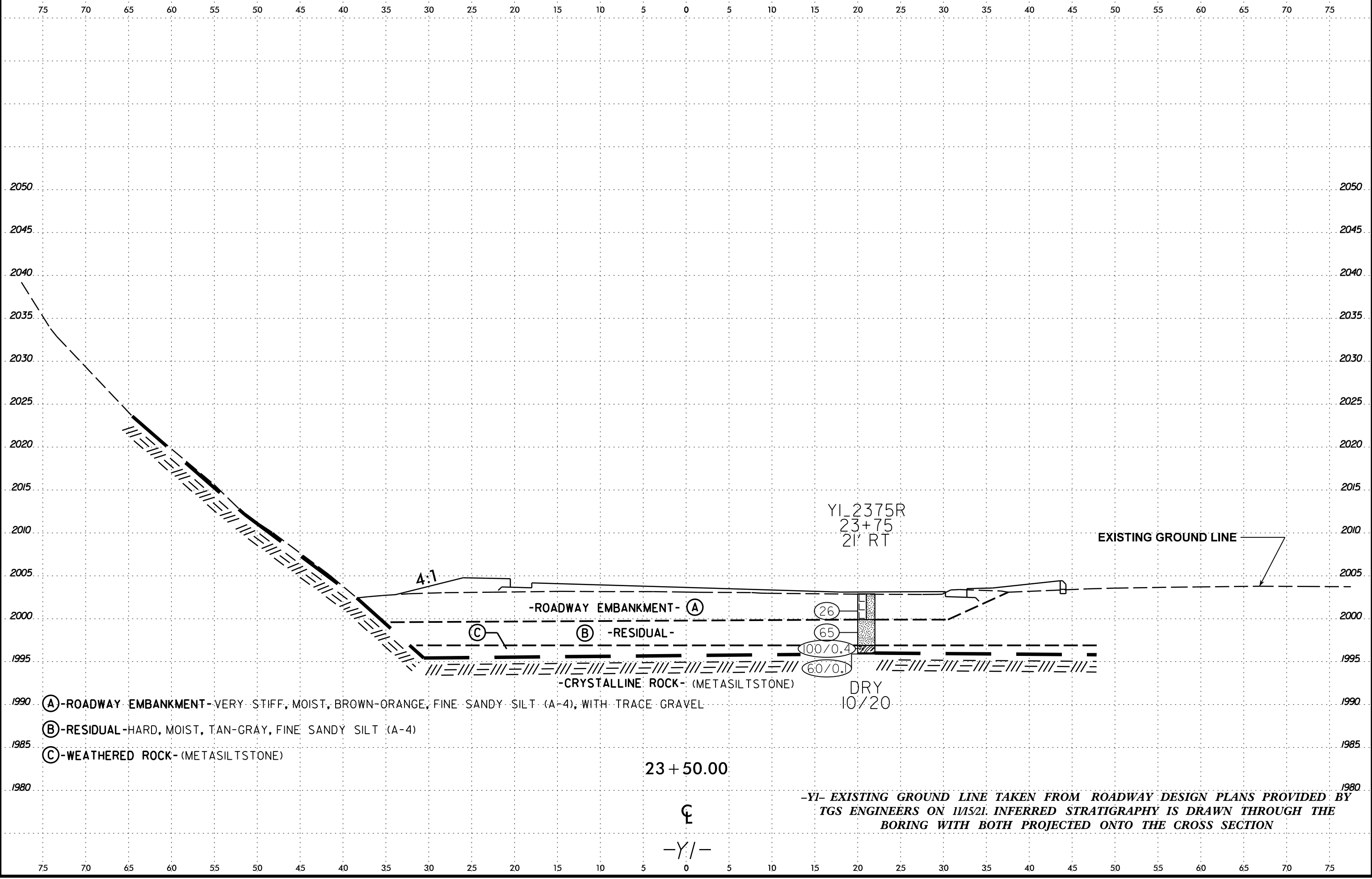


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2050  
2045  
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1995  
1990  
1985  
1980

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

4:1

-ROADWAY EMBANKMENT- (A)

(B) -RESIDUAL-

(C) -WEATHERED ROCK- (METASILTSTONE)

YI\_2375R  
23+75  
21' RT

EXISTING GROUND LINE

(26)

(65)

(100/0.4)

(60/0.0)

DRY  
10/20

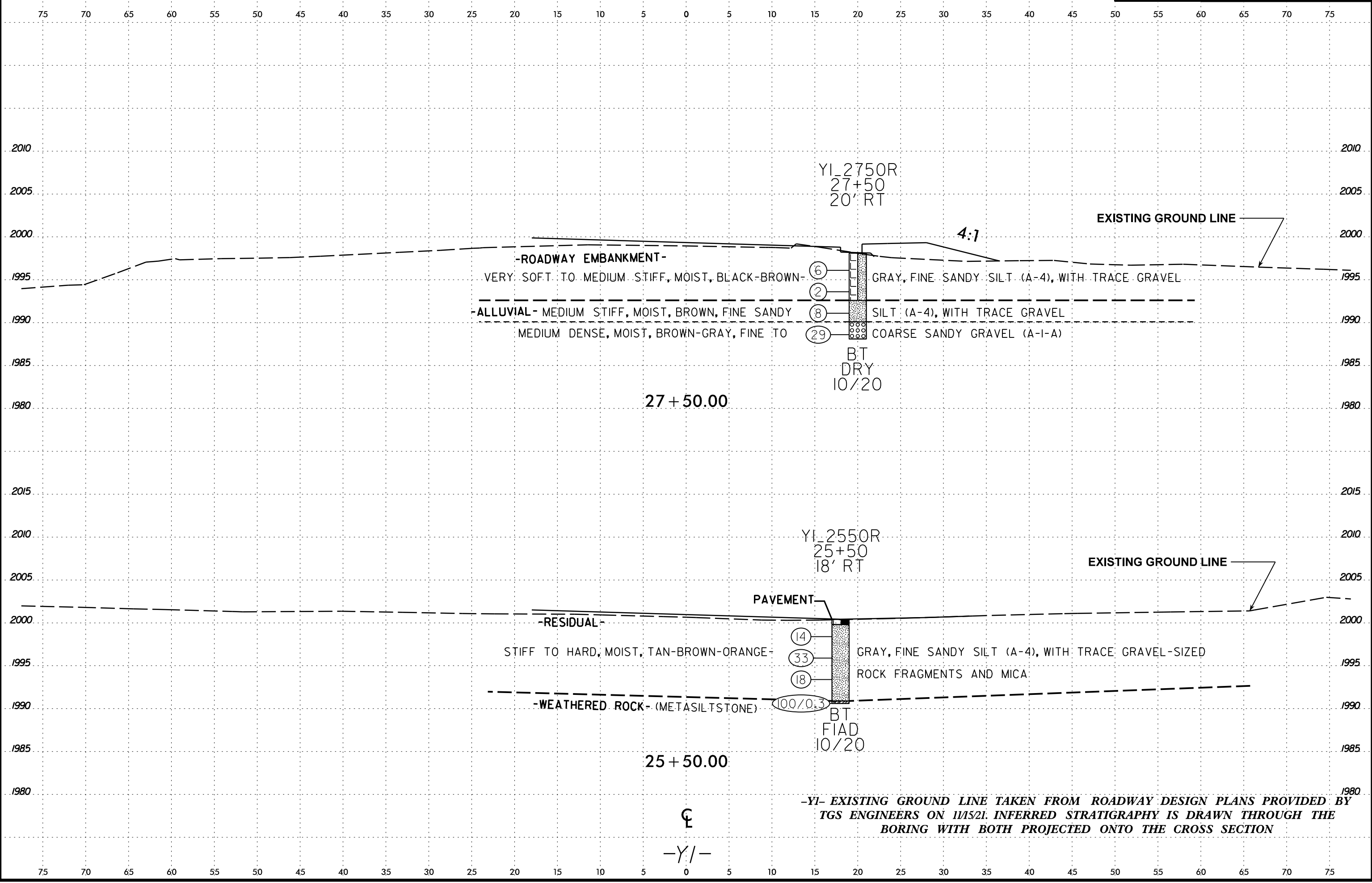
23 + 50.00

⊕

-YI-

-YI- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/5/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

6/23/16  
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YI\_2750R  
27+50  
20' RT

-ROADWAY EMBANKMENT-

VERY SOFT TO MEDIUM STIFF, MOIST, BLACK-BROWN-

(6)

GRAY, FINE SANDY SILT (A-4), WITH TRACE GRAVEL

(2)

-ALLUVIAL- MEDIUM STIFF, MOIST, BROWN, FINE SANDY

(8)

SILT (A-4), WITH TRACE GRAVEL

MEDIUM DENSE, MOIST, BROWN-GRAY, FINE TO

(29)

COARSE SANDY GRAVEL (A-I-A)

BT  
DRY  
10/20

27 + 50.00

YI\_2550R  
25+50  
18' RT

PAVEMENT

-RESIDUAL-

STIFF TO HARD, MOIST, TAN-BROWN-ORANGE-

(14)

GRAY, FINE SANDY SILT (A-4), WITH TRACE GRAVEL-SIZED

(33)

ROCK FRAGMENTS AND MICA

(18)

-WEATHERED ROCK- (METASILTSTONE)

(100/0.3)

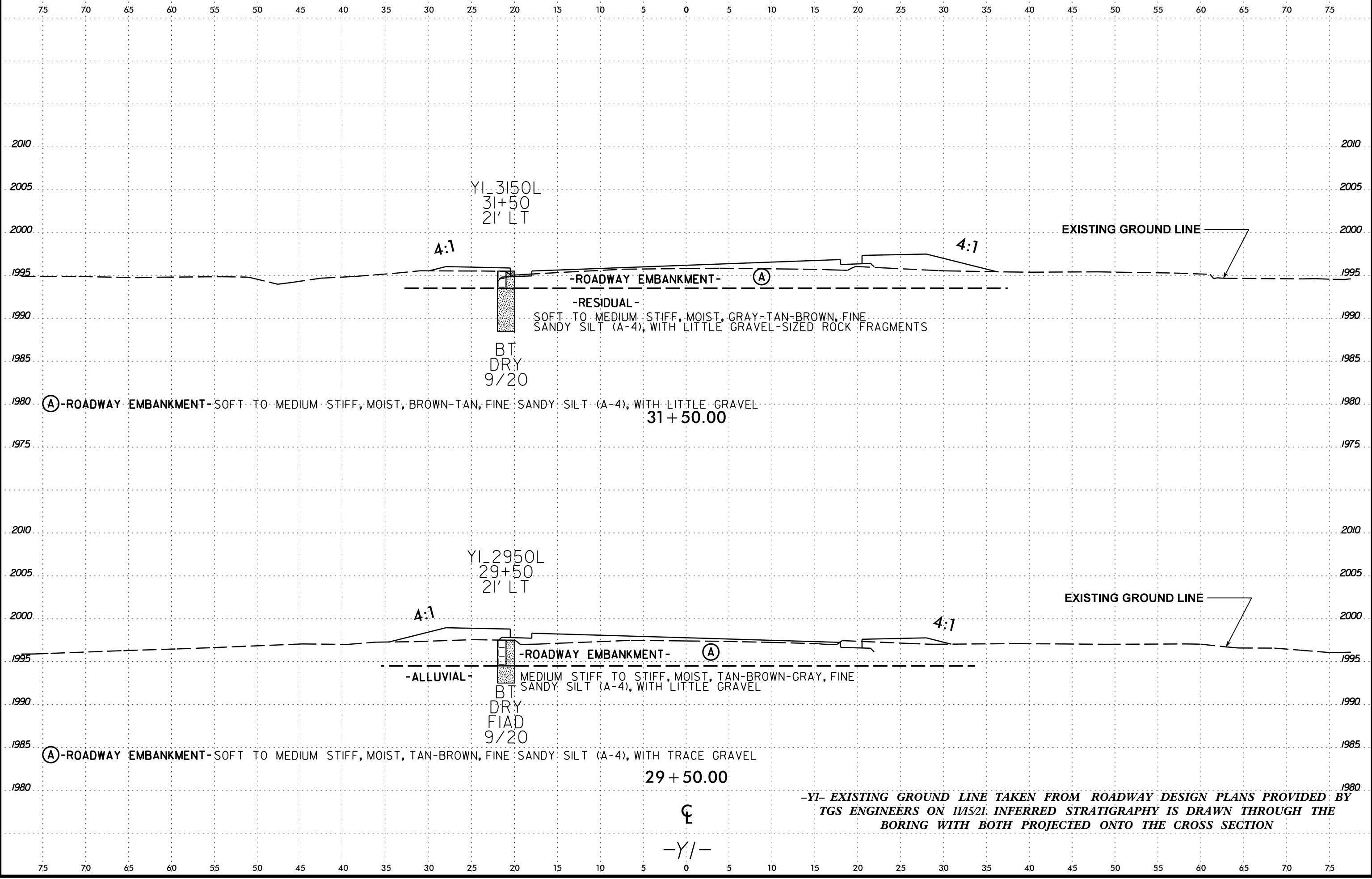
BT  
FIAD  
10/20

25 + 50.00

-YI- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/5/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

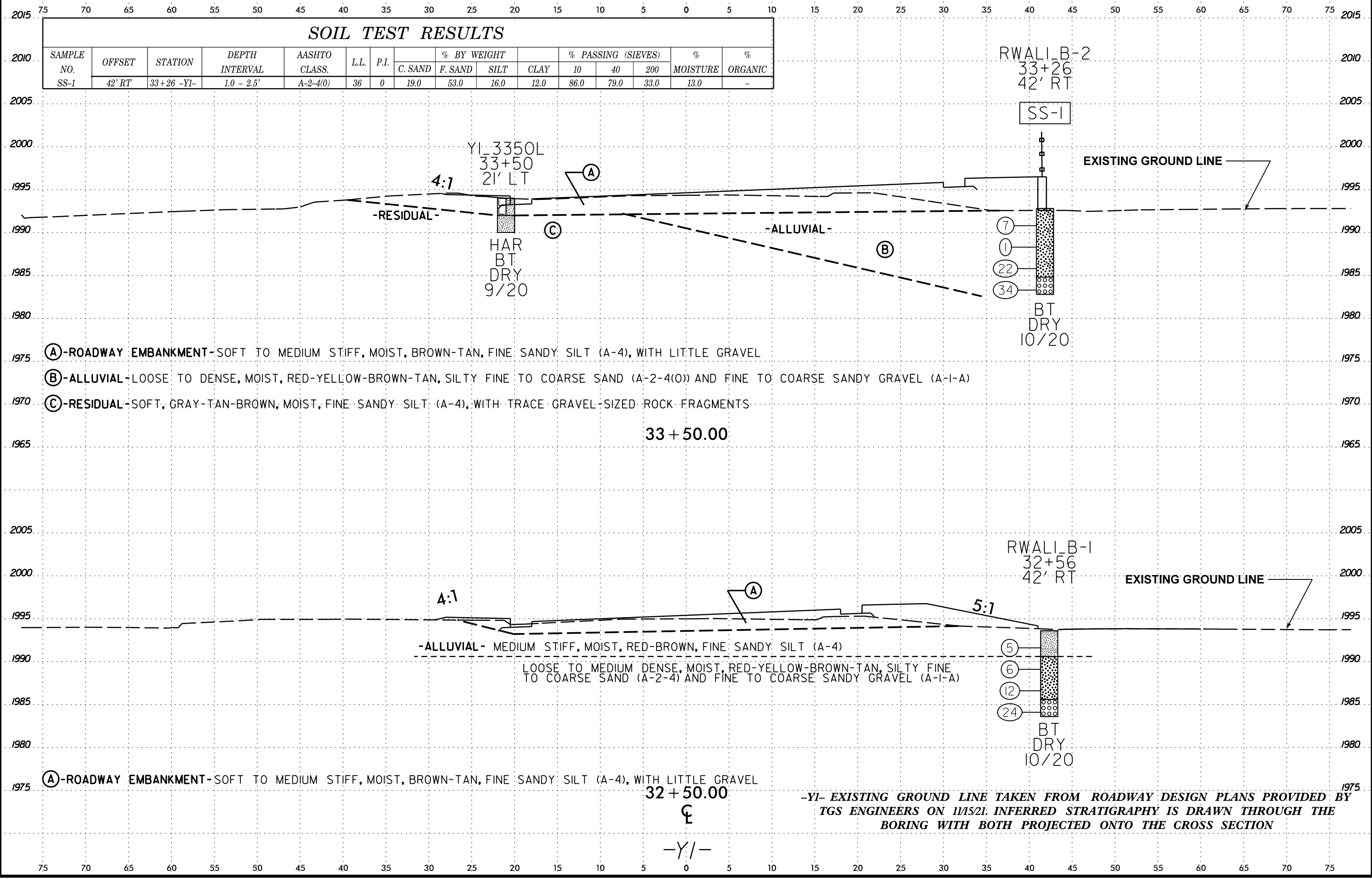
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-Y/-

6/23/16  
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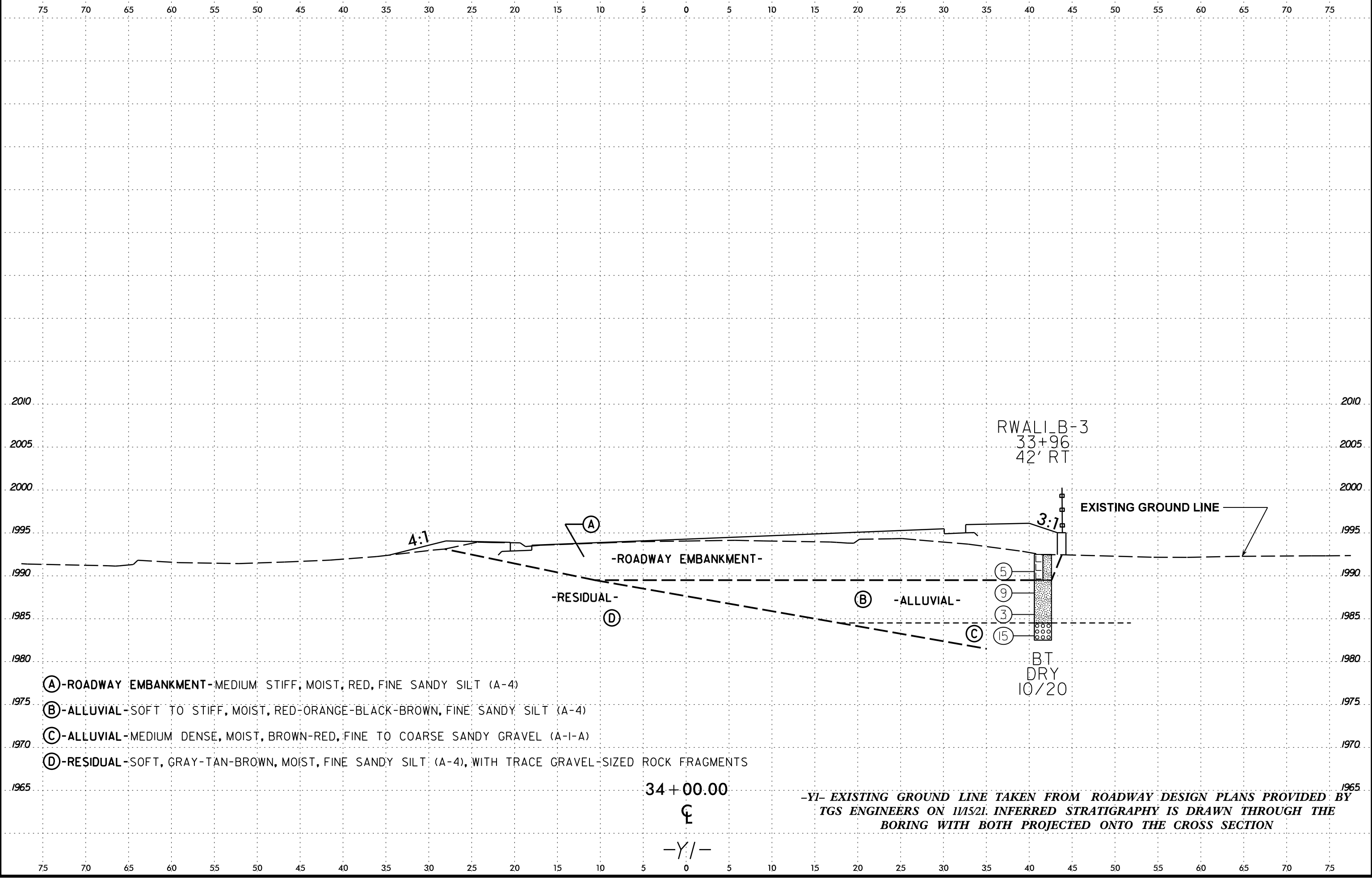


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SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-1	42' RT	33+26 -YI-	1.0 - 2.5'	A-2-4(0)	36	0	19.0	53.0	16.0	12.0	86.0	79.0	33.0	13.0	-



6/23/16  
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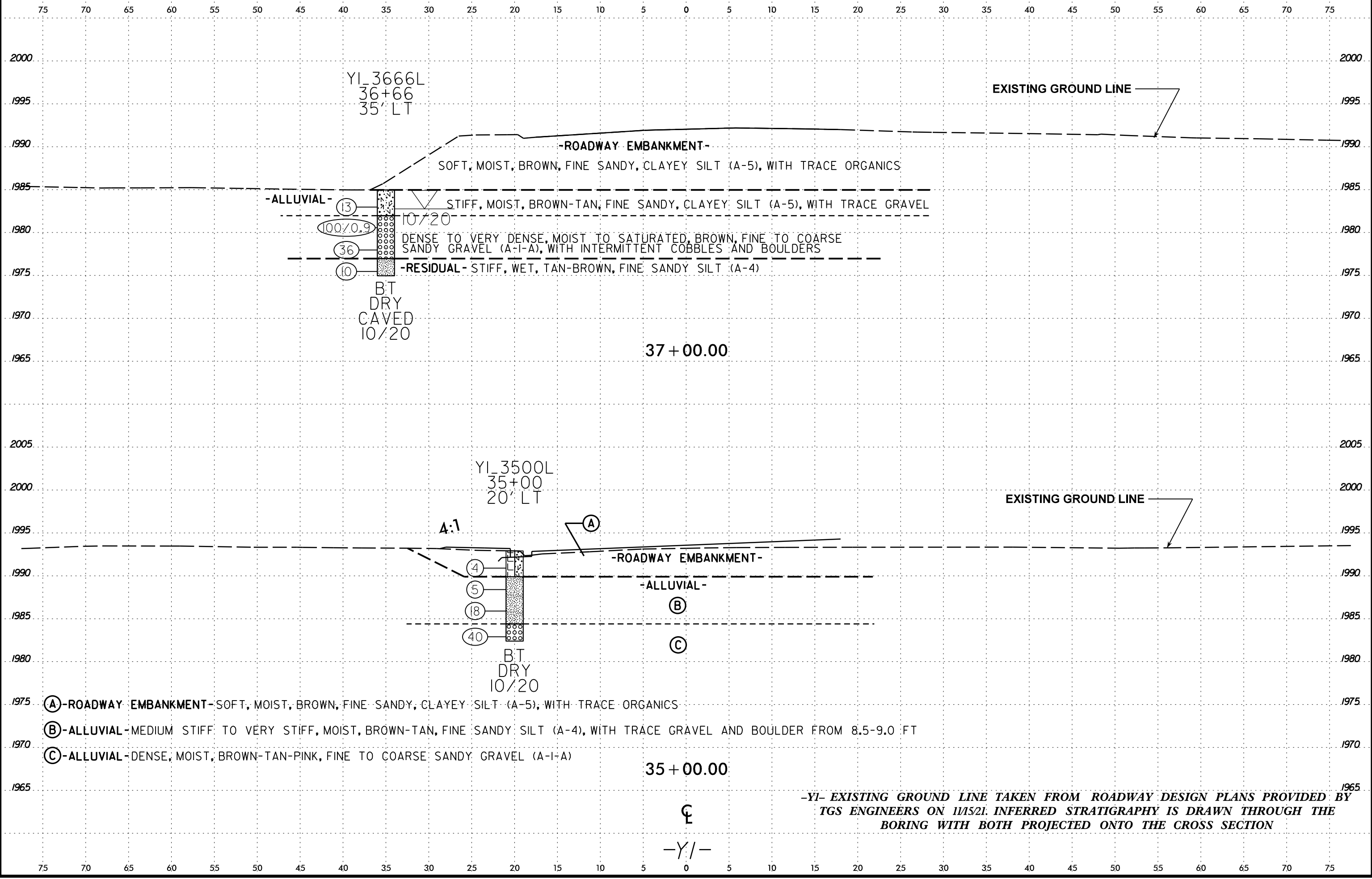
- (A) -ROADWAY EMBANKMENT-MEDIUM STIFF, MOIST, RED, FINE SANDY SILT (A-4)
- (B) -ALLUVIAL-SOFT TO STIFF, MOIST, RED-ORANGE-BLACK-BROWN, FINE SANDY SILT (A-4)
- (C) -ALLUVIAL-MEDIUM DENSE, MOIST, BROWN-RED, FINE TO COARSE SANDY GRAVEL (A-I-A)
- (D) -RESIDUAL-SOFT, GRAY-TAN-BROWN, MOIST, FINE SANDY SILT (A-4), WITH TRACE GRAVEL-SIZED ROCK FRAGMENTS

34 + 00.00  
 C  
 -Y/-

-YI- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY  
 TGS ENGINEERS ON 1/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE  
 BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION



6/23/16  
29-APR-2022 12:22  
C:\Users\jerry\OneDrive - Carolines Geotechnical Group, PLLC\Projects\0068 - A-0009C - Future US 74\_TGS\A-0009CA\CADD\GEO\TECH\XSC\A-0009CA\_GEO\_RDY\_XSL.dgn  
SUBSTRATE



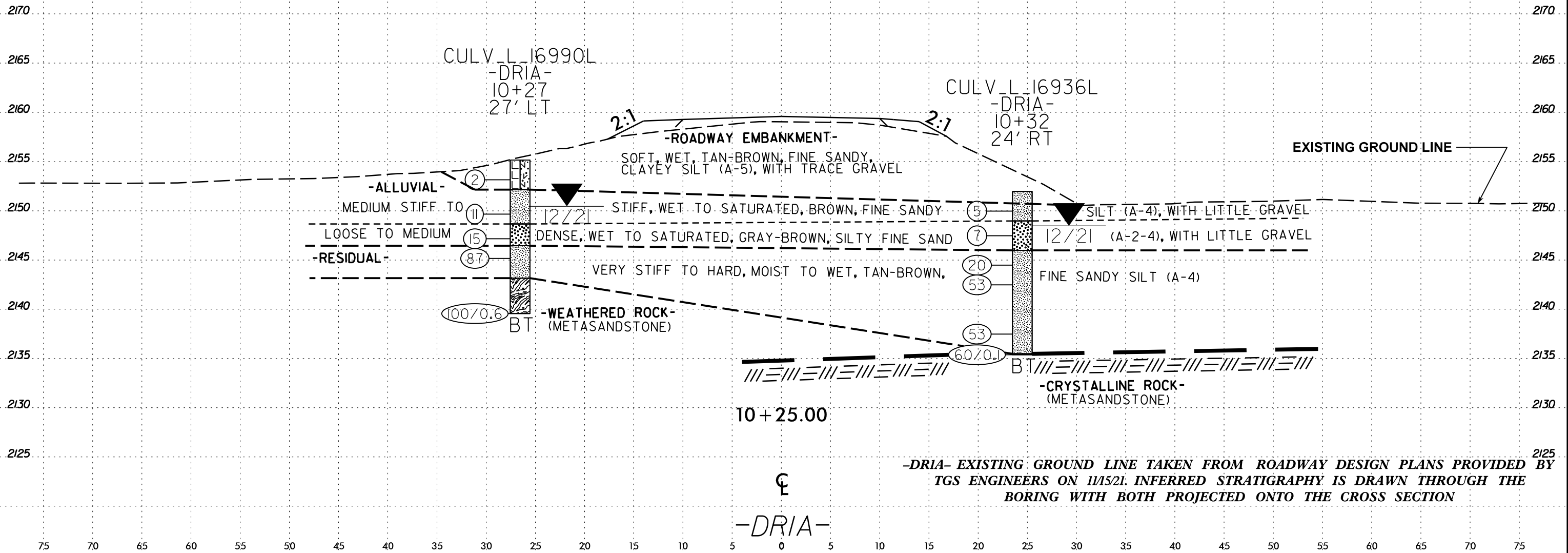
6/23/16



PROJ. REFERENCE NO.  
A-0009CA

SHEET NO.  
166

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

***SUBSURFACE INVESTIGATION***

***APPENDIX A***

***BORE LOGS, CORE LOG, & ROCK CORE PHOTOS***

***REFERENCE: A-0009CA***

***PROJECT: 32572***

# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 32572.1.FS10		TIP A-0009CA		COUNTY GRAHAM		GEOLOGIST S. Patterson									
SITE DESCRIPTION Upgrade US 129 from South of SR 1275 to NC 143 and Upgrade NC 143 from US 129 to SR 1223							GROUND WTR (ft)								
BORING NO. Y1_2354R		STATION 23+54		OFFSET 162 ft RT		ALIGNMENT Y1									
COLLAR ELEV. 1,996.8 ft		TOTAL DEPTH 15.0 ft		NORTHING 606,425		EASTING 568,111									
DRILL RIGHAMMER EFF/DATE CG29022 Mobile B-29 81% 03/12/2021			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic									
DRILLER M. Brewer		START DATE 11/05/21		COMP. DATE 11/05/21		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
2000															
	1,996.8	0.0													1,996.8
	1,994.8	2.0	3	3	3	6									1,994.8
1995	1,992.8	4.0	1	1	2	3									1,992.8
	1,990.8	6.0	0	3	5	5									1,990.8
1990	1,988.8	8.0	7	13	7	10									1,988.8
	1,987.3	9.5	12	17	21	15									1,987.3
1985	1,981.8	13.5	13	12	20	15									1,981.8

WBS 32572.1.FS10		TIP A-0009CA		COUNTY GRAHAM		GEOLOGIST S. Braun									
SITE DESCRIPTION Upgrade US 129 from South of SR 1275 to NC 143 and Upgrade NC 143 from US 129 to SR 1223							GROUND WTR (ft)								
BORING NO. L_16786L		STATION 167+86		OFFSET 87 ft LT		ALIGNMENT L									
COLLAR ELEV. 1,993.3 ft		TOTAL DEPTH 30.9 ft		NORTHING 610,882		EASTING 582,230									
DRILL RIGHAMMER EFF/DATE CG20446 Diedrich D50 89% 05/22/2019			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic									
DRILLER C. Odom		START DATE 01/25/21		COMP. DATE 01/25/21		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
1995															
	1,993.3	0.0													1,993.3
	1,992.3	1.0	1	2	6	3									1,992.3
1990	1,989.8	3.5	7	7	12	6									1,989.8
	1,987.3	6.0	11	3	4	5									1,987.3
1985	1,984.8	8.5	11	17	28	10									1,984.8
	1,979.8	13.5	8	8	10	7									1,979.8
1980	1,974.8	18.5	30	45	48	15									1,974.8
	1,969.8	23.5	31	29	23	12									1,969.8
1970	1,964.8	28.5	16	28	40	10									1,964.8
1965	1,962.4	30.9	60/0.0			60/0.0									1,962.4

NCDOT BORE DOUBLE A-0009CA\_GEO\_RDY\_GTM.GPJ\_NC\_DOT.GDT 3/24/22

# GEOTECHNICAL BORING REPORT

## BORE LOG

<b>WBS</b> 32572.1.FS10	<b>TIP</b> A-0009CA	<b>COUNTY</b> GRAHAM	<b>GEOLOGIST</b> N. McLaren / D. Goodnight
<b>SITE DESCRIPTION</b> Upgrade US 129 from South of SR 1275 to NC 143 and Upgrade NC 143 from US 129 to SR 1223			<b>GROUND WTR (ft)</b>
<b>BORING NO.</b> RWAL6_B-7	<b>STATION</b> 189+08	<b>OFFSET</b> 88 ft RT	<b>ALIGNMENT</b> L
<b>COLLAR ELEV.</b> 2,145.9 ft	<b>TOTAL DEPTH</b> 59.1 ft	<b>NORTHING</b> 612,420	<b>EASTING</b> 583,638
<b>DRILL RIG/HAMMER EFF./DATE</b> CG20446 Diedrich D50 83%/06/16/2020		<b>DRILL METHOD</b> NW Casing WSPT & Core	<b>HAMMER TYPE</b> Automatic

<b>DRILLER</b> C. Odom	<b>START DATE</b> 01/26/21	<b>COMP. DATE</b> 11/01/21	<b>SURFACE WATER DEPTH</b> N/A
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ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
2150															
2145	2,144.9	1.0	3	1	1									2,145.9	GROUND SURFACE
2140	2,142.4	3.5	2	3	4									2,140.4	<b>RESIDUAL</b> Very Soft to Medium Stiff, Tan-Orange-Brown, Fine Sandy SILT (A-4(1)), with trace mica
2135	2,139.9	6.0	3	4	2										Loose to Dense, Tan-Orange-Brown, Silty Fine to Coarse SAND (A-2-4(0)), with trace gravel-sized rock fragments
2130	2,137.4	8.5	6	4	14										
2125	2,132.4	13.5	4	5	5										
2120	2,127.4	18.5	22	18	30										
2115	2,122.4	23.5	43	57/0.3										2,122.4	<b>WEATHERED ROCK</b> Tan-Gray, (METASANDSTONE)
2110	2,117.4	28.5	11	27	73/0.4										
2105	2,113.0	32.9												2,113.0	<b>CRYSTALLINE ROCK</b> Gray-Tan, (METASANDSTONE)
2100														2,108.2	REC: 96% RQD: 58% GSI: 40-50 Light to Dark Gray, (METASANDSTONE)
2095															
2090															
														2,086.8	Boring Terminated at Elevation 2,086.8 ft In Crystalline Rock (METASANDSTONE)

NCDOT BORE DOUBLE A-0009CA GEO\_RDY\_GTM.GPJ NC\_DOT.GDT 3/17/22

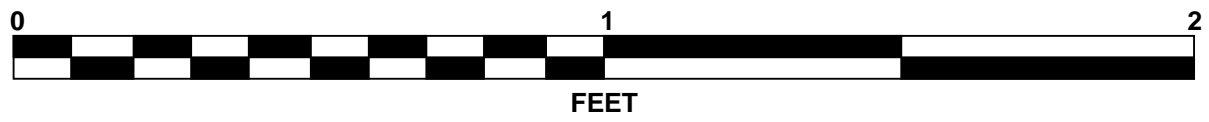
<b>WBS</b> 32572.1.FS10	<b>TIP</b> A-0009CA	<b>COUNTY</b> GRAHAM	<b>GEOLOGIST</b> N. McLaren / D. Goodnight
<b>SITE DESCRIPTION</b> Upgrade US 129 from South of SR 1275 to NC 143 and Upgrade NC 143 from US 129 to SR 1223			<b>GROUND WTR (ft)</b>
<b>BORING NO.</b> RWAL6_B-7	<b>STATION</b> 189+08	<b>OFFSET</b> 88 ft RT	<b>ALIGNMENT</b> L
<b>COLLAR ELEV.</b> 2,145.9 ft	<b>TOTAL DEPTH</b> 59.1 ft	<b>NORTHING</b> 612,420	<b>EASTING</b> 583,638
<b>DRILL RIG/HAMMER EFF./DATE</b> CG20446 Diedrich D50 83%/06/16/2020		<b>DRILL METHOD</b> NW Casing WSPT & Core	<b>HAMMER TYPE</b> Automatic

<b>DRILLER</b> C. Odom	<b>START DATE</b> 01/26/21	<b>COMP. DATE</b> 11/01/21	<b>SURFACE WATER DEPTH</b> N/A
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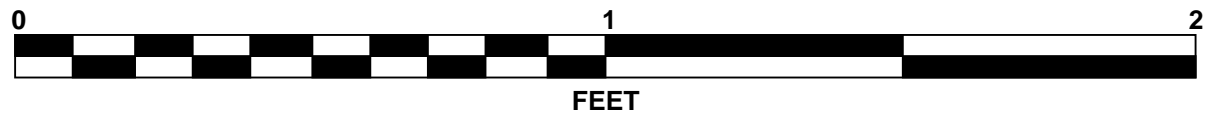
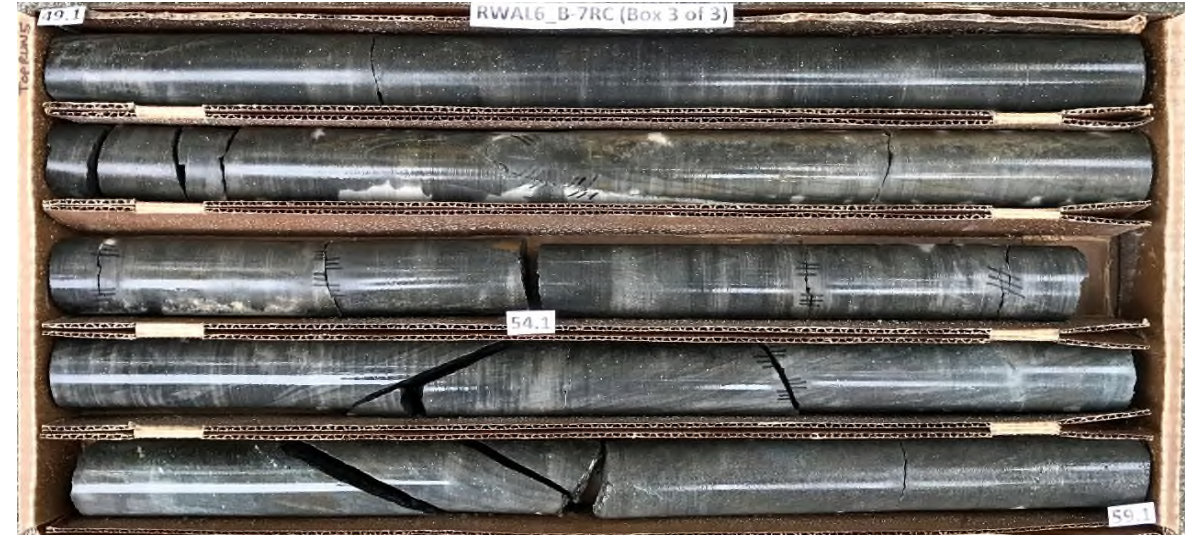
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	TOTAL RUN 26.2 ft		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	RQD (%)		REC. (%)	RQD (%)			
2112.96												
2110	2,113.0	32.9	1.2	N=60/0.0 06:22/1.0 00:32/0.2	(1.1)	(0.0)		(4.6)	(2.8)		Begin Coring @ 32.9 ft <b>CRYSTALLINE ROCK</b>	32.9
2105	2,106.8	39.1	5.0	03:13/1.0 03:00/1.0 02:24/1.0 02:38/1.0 07:03/1.0 05:00/1.0 03:15/1.0 02:37/1.0 03:02/1.0 04:31/1.0	(4.9)	(4.2)		(21.1)	(20.2)		Slightly to Moderately Weathered, Hard to Very Hard, Gray-Tan, (METASANDSTONE), Indurated to Extremely Indurated, with some iron staining and close fracture spacing	37.7
2100	2,101.8	44.1	5.0	04:11/1.0 03:52/1.0 04:00/1.0 03:45/1.0 03:44/1.0	(4.7)	(4.2)					Fresh to Slightly Weathered, Hard to Very Hard, Light Gray-Dark Gray, (METASANDSTONE) Indurated to Extremely Indurated, with moderately close fracture spacing to close fracture spacing	
2095	2,096.8	49.1	5.0	03:14/1.0 04:04/1.0 03:35/1.0 03:47/1.0 03:21/1.0	(5.0)	(4.8)						
2090	2,091.8	54.1	5.0	02:49/1.0 03:09/1.0 02:43/1.0 02:51/1.0 02:53/1.0	(5.0)	(4.8)						
	2,086.8	59.1									Boring Terminated at Elevation 2,086.8 ft In Crystalline Rock (METASANDSTONE)	59.1

Upgrade US 129 from South of SR 1275 to NC 143 and Upgrade NC 143 from US 129 to SR 1223

Rock Core Photographs  
Boring: RWAL6\_B-7  
32.9 to 49.1 Feet



Rock Core Photographs  
Boring: RWAL6\_B-7  
49.1 to 59.1 Feet



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

REFERENCE: A-0009CA

PROJECT: 32572

Prepared in the Office of:

FALCON ENGINEERS, INC  
CARY, NORTH CAROLINA  
NCDOT LAB CERT. NO. 105-0803

## SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-86	25' LT	11+81 -L-	3.5 - 5.0'	A-2-4(0)	27	1	25.0	49.0	14.0	12.0	95.0	82.0	34.0	11.0	-
SS-92	23' LT	12+37 -L-	6.0 - 7.5'	A-4(0)	27	1	21.0	40.0	21.0	18.0	88.0	77.0	42.0	16.0	-
SS-46	38' RT	29+00 -L-	3.5 - 5.0'	A-7-5(10)	44	13	10.0	20.0	52.0	18.0	100.0	96.0	73.0	32.0	-
SS-106	42' RT	35+00 -L-	6.0 - 7.5'	A-4(0)	29	1	10.0	46.0	28.0	16.0	86.0	82.0	51.0	18.0	-
SS-242	64' RT	60+00 -L-	13.5 - 15.0'	A-4(0)	30	NP	17.0	36.0	35.0	12.0	100.0	90.0	56.0	17.0	-
SS-228	62' RT	62+00 -L-	1.0 - 2.5'	A-4(3)	33	7	16.0	28.0	25.0	31.0	100.0	91.0	64.0	25.0	-
SS-234	62' RT	62+00 -L-	23.5 - 25.0'	A-4(0)	33	NP	11.0	40.0	35.0	14.0	100.0	94.0	63.0	19.0	-
SS-220	83' RT	63+50 -L-	13.5 - 15.0'	A-4(0)	35	NP	8.0	41.0	38.0	13.0	100.0	96.0	64.0	17.0	-
SS-258	60' RT	66+00 -L-	6.0 - 7.5'	A-4(1)	35	1	4.0	51.0	37.0	8.0	100.0	98.0	65.0	12.0	-
SS-210	86' RT	70+50 -L-	28.5 - 30.0'	A-4(0)	34	NP	4.0	44.0	39.0	13.0	100.0	97.0	70.0	14.0	-
SS-200	112' RT	76+00 -L-	23.5 - 25.0'	A-4(0)	35	NP	16.0	44.0	33.0	7.0	100.0	91.0	54.0	10.0	-
SS-494	88' RT	84+00 -L-	8.5 - 10.0'	A-5(4)	50	11	4.0	41.0	36.0	19.0	100.0	99.0	69.0	22.0	-
SS-485	68' LT	86+00 -L-	6.0 - 7.5'	A-4(0)	27	NP	7.0	61.0	22.0	10.0	100.0	98.0	44.0	15.0	-
SS-142	59' LT	93+00 -L-	8.5 - 10.0'	A-4(0)	32	NP	19.0	41.0	28.0	12.0	100.0	88.0	52.0	19.0	-
SS-476	52' RT	101+00 -L-	1.0 - 2.5'	A-6(7)	39	11	8.0	31.0	15.0	46.0	100.0	97.0	67.0	26.0	-
SS-480	52' RT	101+00 -L-	13.5 - 15.0'	A-4(0)	25	NP	21.0	52.0	17.0	10.0	100.0	89.0	37.0	14.0	-
SS-452	73' LT	122+00 -L-	3.5 - 5.0'	A-6(10)	39	12	6.0	21.0	25.0	48.0	100.0	97.0	78.0	25.0	-
SS-454	73' LT	122+00 -L-	8.5 - 10.0'	A-7-5(13)	49	12	6.0	17.0	12.0	65.0	100.0	97.0	81.0	34.0	-
SS-2175	22' RT	130+00 -L-	1.0 - 2.5'	A-4(1)	29	5	17.0	35.0	25.0	23	99.0	90.0	57.0	14.0	-
SS-438	50' RT	152+00 -L-	1.0 - 2.5'	A-4(5)	40	7	10.0	31.0	23.0	36.0	100.0	94.0	69.0	29.0	-
SS-440	50' RT	152+00 -L-	6.0 - 7.5'	A-4(0)	28	NP	20.0	42.0	32.0	6.0	100.0	87.0	53.0	16.0	-
SS-430	75' RT	154+00 -L-	3.5 - 5.0'	A-7-5(8)	45	14	13.0	32.0	24.0	31.0	100.0	94.0	61.0	25.0	-
SS-424	67' RT	156+00 -L-	1.0 - 2.5'	A-4(0)	39	NP	21.0	40.0	29.0	10.0	100.0	88.0	52.0	22.0	-
SS-293	15' LT	167+75 -L-	1.0 - 2.5'	A-4(0)	30	1	20.0	35.0	28.0	17.0	75.0	66.0	41.0	18.0	-
SS-289	15' LT	168+79 -L-	13.5 - 15.0'	A-4(0)	29	NP	22.0	33.0	26.0	19.0	95.0	81.0	51.0	29.0	-
SS-280	15' LT	169+84 -L-	18.5 - 20.0'	A-4(0)	31	NP	33.0	30.0	23.0	14.0	80.0	64.0	36.0	28.0	-
SS-269	15' LT	170+84 -L-	8.5 - 10.0'	A-4(0)	28	NP	16.0	37.0	30.0	17.0	65.0	59.0	38.0	18.0	-
SS-261	15' LT	171+75 -L-	18.5 - 20.0'	A-4(6)	35	8	7.0	25.0	35.0	33.0	99.0	95.0	75.0	28.0	-
SS-417	43' RT	175+33 -L-	3.5 - 5.0'	A-4(0)	24	1	23.0	46.0	23.0	8.0	84.0	73.0	36.0	21.0	-
SS-420	43' RT	175+33 -L-	13.5 - 15.0'	A-4(0)	31	1	11.0	43.0	38.0	8.0	100.0	95.0	61.0	21.0	-
SS-415	46' RT	176+62 -L-	13.5 - 15.0'	A-4(0)	26	NP	15.0	43.0	30.0	12.0	100.0	93.0	55.0	18.0	-
SS-3008	88' RT	189+08 -L-	1.0 - 2.5'	A-4(1)	33	1	10.0	28.0	41.0	21.0	99.0	93.0	72.0	23.0	-
SS-3012	88' RT	189+08 -L-	13.5 - 15.0'	A-2-4(0)	23	NP	28.0	36.0	27.0	9.0	60.0	48.0	27.0	7.0	-
SS-2023	66' RT	190+00 -L-	18.5 - 20.0'	A-5(6)	41	10	20.0	24.0	25.0	31.0	100.0	86.0	64.0	36.0	-
SS-3028	29' RT	192+56 -L-	3.5 - 5.0'	A-6(8)	39	11	6.0	27.0	32.0	35.0	100.0	97.0	75.0	28.0	-
SS-1	42' RT	33+26 -Y1-	1.0 - 2.5'	A-2-4(0)	36	0	19.0	53.0	16.0	12.0	86.0	79.0	33.0	13.0	-