

REFERENCE: R-5799

PROJECT: 44984

SEE SHEET 3 FOR PLAN SHEET LAYOUT
AT TIME OF INVESTIGATION

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

ROADWAY
SUBSURFACE INVESTIGATION

COUNTY TRANSYLVANIA
PROJECT DESCRIPTION US 64 AT NC 280 /US 64
INTERSECTION IMPROVEMENTS

INVENTORY

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-L-	7+00 - 32+95	4 - 6
-Y2-	15+50 - 27+10	7
-Y3-	13+50 - 17+20	8

CROSS SECTIONS

<u>LINE</u>	<u>STATION</u>	<u>SHEETS</u>
-L-	9+00 - 31+00	9 - 23
-RA1-	10+00 - 13+00	24 - 26
-RA2-	10+00 - 13+00	27 - 30
-Y1-	10+37 - 16+00	31 - 36
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STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-5799	1	68

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT 1919 T07-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

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

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

NOTES:

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

PERSONNEL

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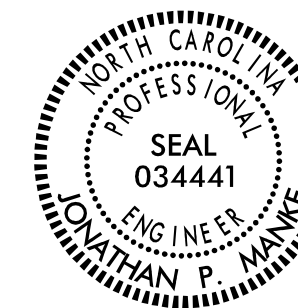
SUBMITTED BY J. P. MANKE

DATE OCTOBER 2019

Prepared in the Office of:

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NC REGISTERED ENGINEERING FIRM: P-0869
NC REGISTERED GEOLOGIC FIRM: C-367



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, VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</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 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 DISLOGGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>																																																												
SOIL LEGEND AND AASHTO CLASSIFICATION										ANGULARITY OF GRAINS										WEATHERED ROCK (WR)										CRYSTALLINE ROCK (CR)																																																												
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MINERALOGICAL COMPOSITION										COMPRESSION										NON-CRYSTALLINE ROCK (NCR)										COASTAL PLAIN SEDIMENTARY ROCK (CP)																																																												
<p>MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.</p>										<p>SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50</p>										<p>FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.</p>										<p>COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.</p>																																																												
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GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE	< 4 4 TO 10 10 TO 30 30 TO 50 > 50	N/A																																																																																							
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD	< 2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 > 30	< 0.25 0.25 TO 0.5 0.5 TO 1.0 1 TO 2 2 TO 4 > 4																																																																																							
TERM	SPACING	TERM	THICKNESS																																																																																							
VERY WIDE	MORE THAN 10 FEET	VERY THICKLY BEDDED	4 FEET																																																																																							
WIDE	3 TO 10 FEET	THICKLY BEDDED	1.5 - 4 FEET																																																																																							
MODERATELY CLOSE	1 TO 3 FEET	THINLY BEDDED	0.16 - 1.5 FEET																																																																																							
CLOSE	0.16 TO 1 FOOT	VERY THINLY BEDDED	0.03 - 0.16 FEET																																																																																							
VERY CLOSE	LESS THAN 0.16 FEET	THICKLY LAMINATED	0.008 - 0.03 FEET																																																																																							
		THINLY LAMINATED	< 0.008 FEET																																																																																							
TEXTURE OR GRAIN SIZE										EQUIPMENT USED ON SUBJECT PROJECT										INDURATION										BENCH MARK: SEE NOTES																																																												
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>U.S. STD. SIEVE SIZE OPENING (MM)</th> <th>4</th> <th>10</th> <th>40</th> <th>60</th> <th>200</th> <th>270</th> </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 (CSE. SD.)</th> <th>FINE SAND (F SD.)</th> <th>SILT (SL.)</th> <th>CLAY (CL.)</th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>										U.S. STD. SIEVE SIZE OPENING (MM)	4	10	40	60	200	270		4.75	2.00	0.42	0.25	0.075	0.053	BOULDER (BLDR.)	COBBLE (COB.)	GRAVEL (GR.)	COARSE SAND (CSE. SD.)	FINE SAND (F SD.)	SILT (SL.)	CLAY (CL.)								<p>DRILL UNITS:</p> <p><input type="checkbox"/> CME-45C</p> <p><input checked="" type="checkbox"/> CME-55</p> <p><input type="checkbox"/> CME-550</p> <p><input type="checkbox"/> VANE SHEAR TEST</p> <p><input type="checkbox"/> PORTABLE HOIST</p> <p><input checked="" type="checkbox"/> GEOPROBE 20CPT</p> <p>ADVANCING TOOLS:</p> <p><input type="checkbox"/> CLAY BITS</p> <p><input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER</p> <p><input checked="" type="checkbox"/> 8" HOLLOW AUGERS</p> <p><input type="checkbox"/> HARD FACED FINGER BITS</p> <p><input type="checkbox"/> TUNG-CARBIDE INSERTS</p> <p><input type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER</p> <p><input type="checkbox"/> TRICONE * STEEL TEETH</p> <p><input type="checkbox"/> TRICONE * TUNG-CARB.</p> <p><input type="checkbox"/> CORE BIT</p> <p>HAMMER TYPE:</p> <p><input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL</p> <p>CORE SIZE:</p> <p><input type="checkbox"/> -B <input type="checkbox"/> -H <input type="checkbox"/> -N</p> <p>HAND TOOLS:</p> <p><input type="checkbox"/> POST HOLE DIGGER</p> <p><input type="checkbox"/> HAND AUGER</p> <p><input type="checkbox"/> SOUNDING ROD</p> <p><input type="checkbox"/> VANE SHEAR TEST</p>										<p>VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.</p> <p>HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.</p> <p>MODERATELY HARD CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.</p> <p>MEDIUM HARD CAN BE GROUDED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.</p> <p>SOFT CAN BE GROUDED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.</p> <p>VERY SOFT CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGER NAIL.</p>										<p>FRAGILE RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.</p> <p>MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.</p> <p>INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.</p> <p>EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</p>										<p>ELEVATION: N/A FEET</p> <p>NOTES: FIAD - FILLED IMMEDIATELY AFTER DRILLING</p> <p>PROJECT DRAFTED USING R5799_Is.tbl.edited.TIN FILE</p>																						
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09/08/19

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

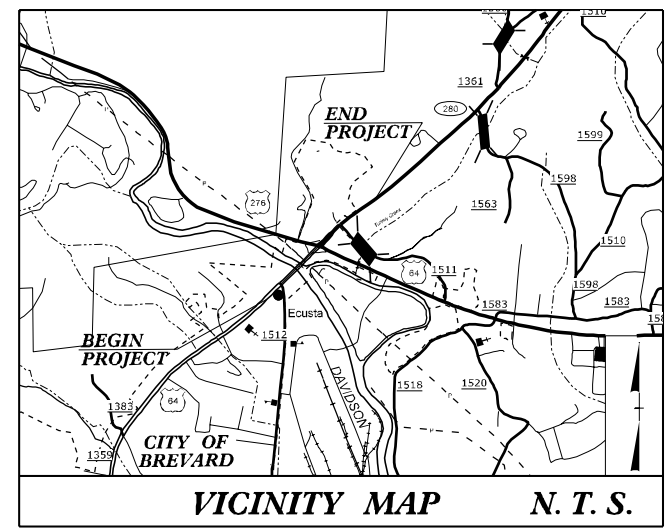
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSYLVANIA COUNTY

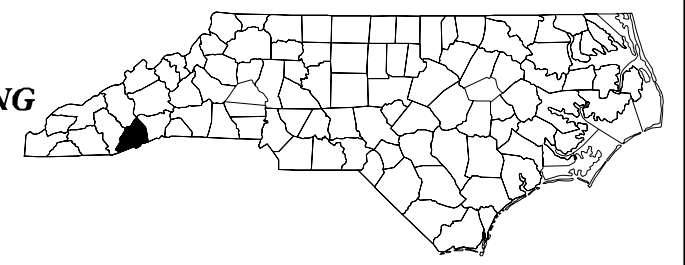
LOCATION: US 64 AT NC 280 /US 64
INTERSECTION IMPROVEMENTS

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-5799	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
44984.1.1	N/A	P.E.	
44984.2.1	N/A	ROW, UTIL	

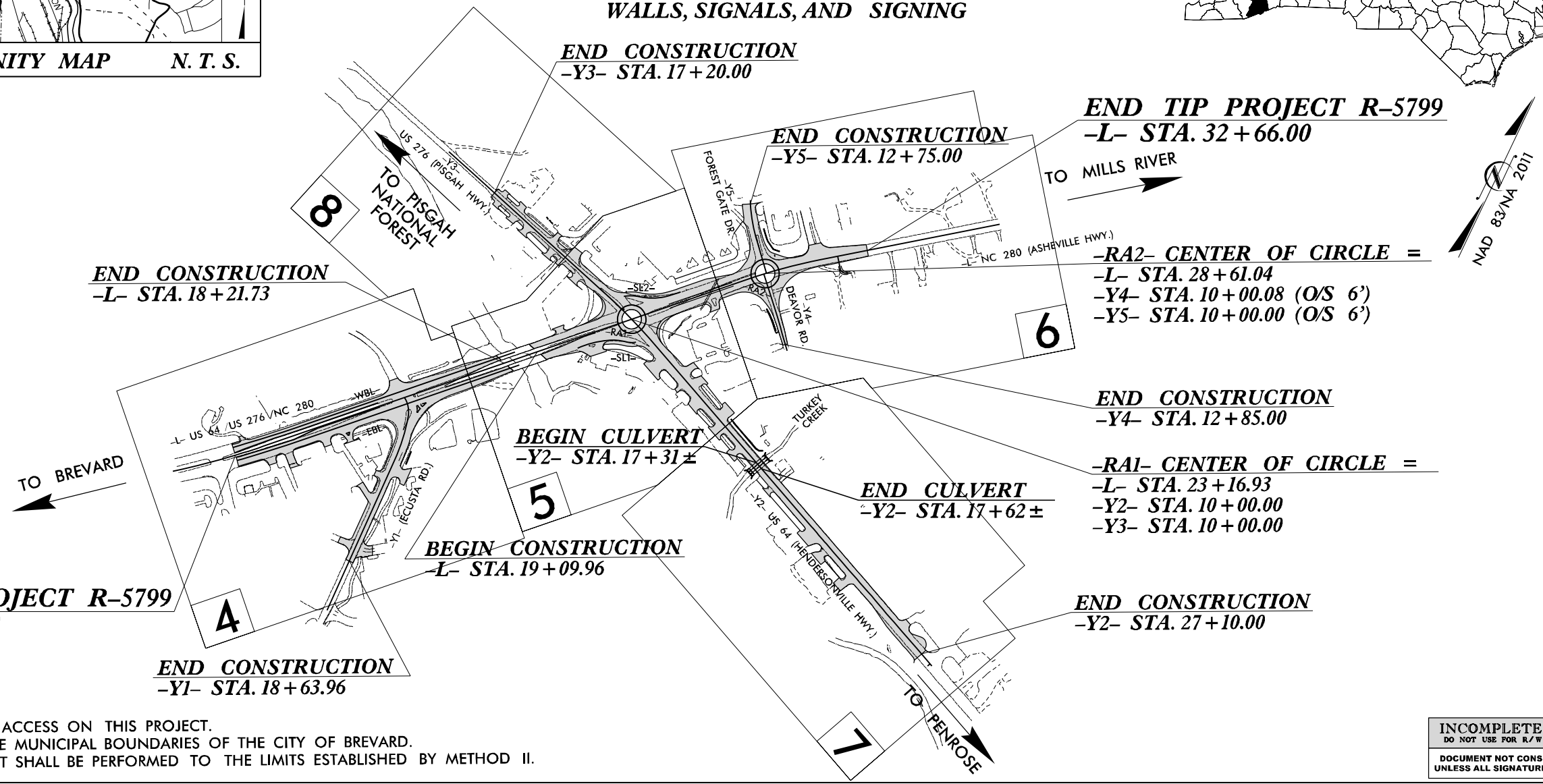


ROW PLANS



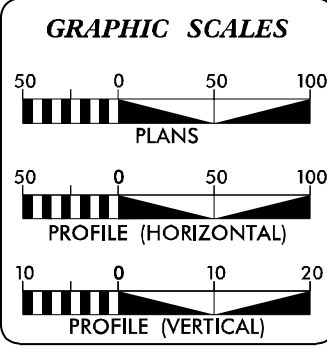
TIP PROJECT: R-5799

CONTRACT:



THERE IS NO CONTROL OF ACCESS ON THIS PROJECT.
THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE CITY OF BREVARD.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.

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



DESIGN DATA

ADT 2021 =	24,900
ADT 2041 =	29,800
K =	9 %
D =	55 %
T =	6 % *
V =	45 MPH
* TTST =	2% + DUAL 4%
FUNC CLASS =	PRINCIPAL ARTERIAL REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-5799 =	0.486 MILES
TOTAL LENGTH TIP PROJECT R-5799 =	0.486 MILES
-L- USED TO CALCULATE PROJECT LENGTH	

PREPARED IN THE OFFICE OF:

RS&H
1520 SOUTH BOULEVARD, SUITE 200
CHARLOTTE, NC 28203
NC FIRM LICENSE No: F-0493

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MARCH 27, 2020

LETTING DATE: AUGUST 17, 2021

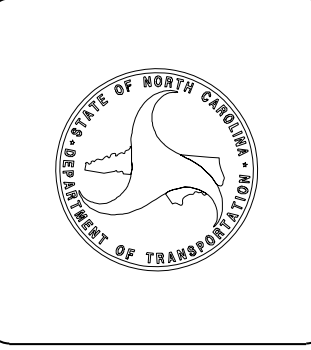
ALLISON DRAKE, PE PROJECT ENGINEER
DREW MORROW, PE PROJECT DESIGN ENGINEER
JOSHUA DEYTON, PE NCDOT CONTACT

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.



08-JAN-2020 08:21
R:\Roadway\Proj\NCR5799-Rdy.-tsh.dgn
\$\$\$\$\$SERVNAME\$\$\$\$\$

Date: February 13, 2020
 WBS Number: 44984.1.1
 TIP Number: R-5799
 County: Transylvania
 Description: US 64 at NC 280 / US 64 Intersection Improvements

-Y4- 10+00 to 13+10
 -Y5- 10+00 to 12+90

Subject: Roadway Geotechnical Report - Inventory

Project Description

The project is located in the City of Brevard and unincorporated community of Pisgah Forest in Transylvania County, North Carolina and consists of the addition of two roundabouts, raised medians, and supporting lane additions and widenings. The first roundabout is proposed at the intersection where northeast-bound US 64 / US 276 (aka. Asheville Highway, -L-) splits apart into US 276 to the northwest (aka. Pisgah Highway, -Y3-), and US 64 to the southeast (aka. Hendersonville Highway, -Y2-) and continues to the northeast as NC 280 (aka. Asheville Highway, -L-). A second roundabout is planned to the northeast of the first where NC 280 intersects with Deaver Road (-Y4-) to the southeast and Forest Gate Drive (-Y5-) to the northwest. Additional turn lanes are proposed on US 64 / US 276 at the intersection with Ecusta Road (-Y1-), which is southwest of the first roundabout.

The length of the project is about 0.49 miles along -L- with two roundabouts (-RA1-, -RA2-), about 0.14 miles along -Y1- and -Y3- each, 0.32 miles along -Y2-, and about 0.056 miles along -Y4- and -Y5- each. The project corridor is in an urban setting with mostly commercial development along each alignment.

The geotechnical subsurface investigation was performed in January 2019. The site was investigated with 45 standard penetration test (SPT) borings that were advanced using a CME 55 ATV mounted rotary drill rig equipped with a calibrated automatic hammer. The SPT borings were advanced with hollow stem augers to depths of 6 to 45 feet beneath the ground surface. Representative soil samples were collected in the field for visual classification and selected samples were submitted for laboratory analysis by Terracon's soil testing laboratory. Laboratory testing was performed in accordance with the AASHTO Soil Classification System.

In order to evaluate very soft soil conditions and to provide subsurface information for a retaining wall added after the initial subsurface investigation, cone penetration test (CPT) soundings were performed on August 2019 at three locations to depths of about 10 to 46 feet.

The following alignments were investigated by soil testing and visual reconnaissance:

Alignment	Stations (±)
-L-	7+00 to 32+95
-RA1-	10+00 to 13+00
-RA2-	10+00 to 13+00
-Y1-	10+00 to 17+00
-Y2-	10+00 to 27+10
-Y3-	10+00 to 17+20

Physiography and Geography

The site is located near the post-metamorphic thrust fault between the Blue Ridge Belt and Chauga Belt and is underlain by muscovite-biotite-gneiss of the Ashe Metamorphic Suite and metamorphic schist and phyllonite of the Rocks of Brevard Fault Zone. The existing elevations along the investigated corridor range from approximately 2,220 feet to 2,110 feet. Due to the presence of several rivers and creeks and the surrounding undulating terrain with flat to steep slopes, the site appears to be located in an alluvial valley with significant alluvial deposits and pockets of highly weathered residual soils.

Soil Properties

Soils encountered during this investigation are separated into four categories based on their origin. The soils encountered consist of roadway embankment, artificial fill, alluvial deposits, and residual soils. The rivers and creeks likely deposited most of the alluvial soils over the residual soils during flood events and meandered across the valley over time. We anticipate that roadway embankments were constructed to provide access through the alluvial valley and then development followed along the roadway corridors, resulting in artificial fill soils placed to level sites for commercial development. Some areas with single family home development appear to have been developed without significant or any artificial fill placement and surficial alluvial soils remain.

In general, the artificial fill soils consist of soft to stiff sandy clay and silty clay (A-7-5, A-7-6, A-6), very soft to stiff sandy silt and clayey silt (A-5, A-4), loose to dense silty sand (A-2-4), and medium dense to dense sand (A-3). The roadway embankment soils generally consist of soft to very stiff sandy clay and clay (A-7-5, A-7-6), soft to very stiff clayey silt and sandy silt (A-4, A-5), and very loose to medium dense silty sand (A-2-4). Alluvial soils consisted of very soft to stiff sandy clay and silty clay (A-7-5, A-7-6, A-6), very soft to stiff sandy silt and clayey silt (A-4, A-5), loose to medium dense sand with silt (A-3, A-1), and loose to medium dense clayey sand and silty sand (A-2-5, A-2-6, A-2-4). Residual soils encountered consisted of very soft to hard sandy clay (A-7-5, A-6), very loose to very dense silty sand (A-2-4), medium stiff to hard sandy silt (A-4), and very dense sand (A-1b, A-2, A-3).

Groundwater Properties

The Davidson River traverses the site from west to east, running approximately parallel to -Y3- and -Y2-. Two tributary creeks run north to south, one crossing -L- and then -Y2-, and another crossing -Y2-. Both tie into the Davidson River. Groundwater was encountered during drilling and sampling along the alignments investigated at depths as shallow as 2 feet to greater than 8 feet beneath the ground surface. Surface water was not observed in ditches at the time of our investigation.

The depth of groundwater, beneath the ground surface, will fluctuate with seasonal precipitation and may occur at higher levels at other times of the year above less permeable clayey soils.



Areas of Special Geotechnical Interest

1) Very soft residual soils were encountered at the following approximate location:

<u>Alignment</u>	<u>Stations (±)</u>
-RA2-	10+00 to 11+50

2) Organic-laden alluvial soils were encountered at the following approximate location:

<u>Alignment</u>	<u>Stations (±)</u>
-Y5-	10+84 to 12+25

3) Groundwater was encountered at the following approximate locations within 6 feet of proposed grades:

<u>Alignment</u>	<u>Stations (±)</u>
-L-	7+00 to 12+00
-L-	25+00 to 32+66
-Y1-	12+00 to 15+00
-Y4-	12+00 to 13+10
-Y5-	10+00 to 12+90

4) Artificial Fill was encountered at the following approximate locations:

<u>Alignment</u>	<u>Stations (±)</u>
-L-	20+25 to 31+00
-RA1-	12+00 to 13+00
-RA2-	10+00 to 13+00
-Y2-	12+00 to 20+00
-Y3-	11+50 to 17+00
-Y4-	10+85 to 12+50
-Y5-	10+85 to 12+75

BULK SAMPLES

The following bulk samples were taken for tests to determine the engineering properties of the soil.

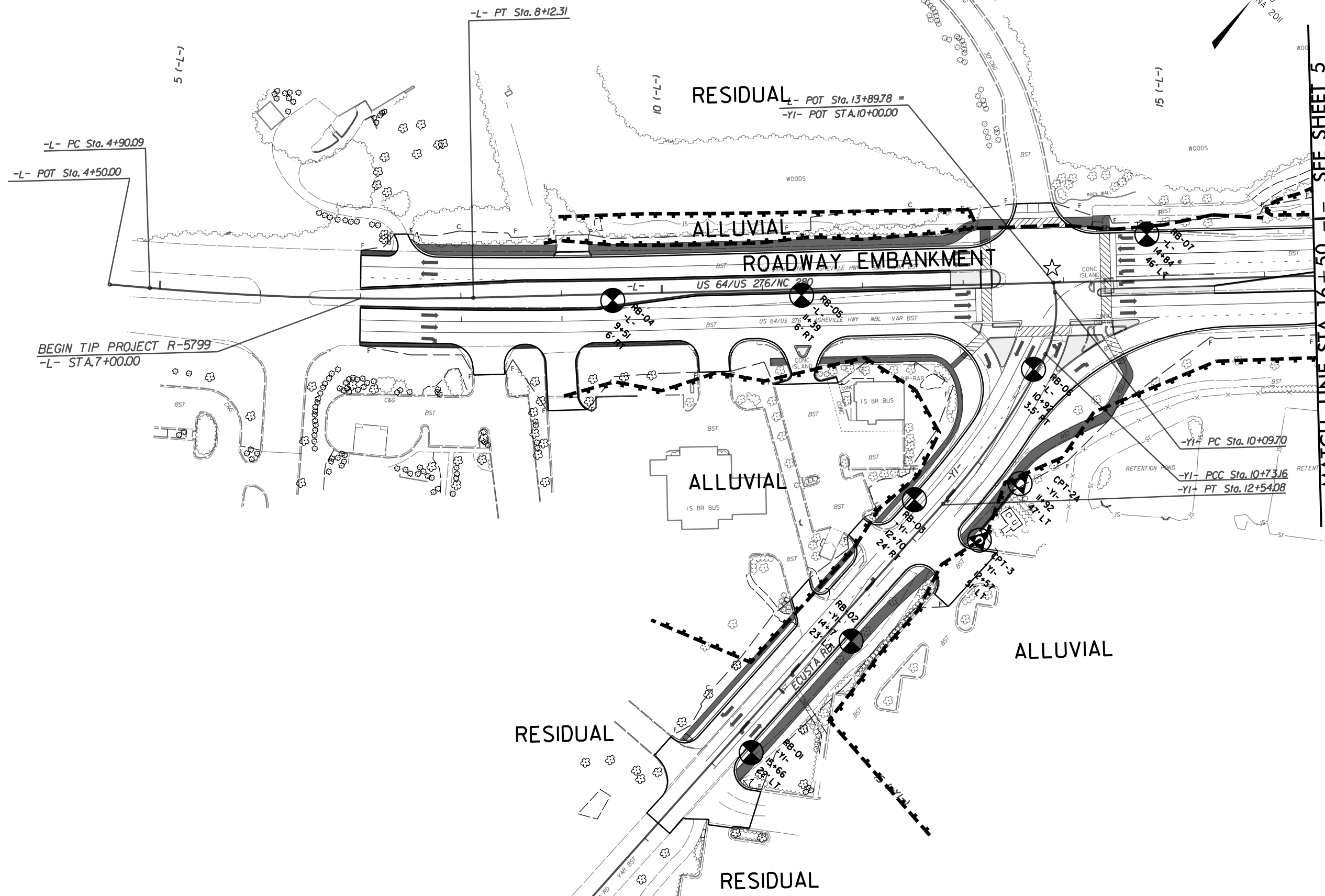
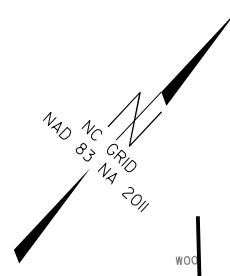
<u>Sample No.</u>	<u>Location</u>	<u>Depth (ft.)</u>	<u>Test</u>
CBR-1	22+12 -L- 99' LT	0.5 – 2.0	Proctor and CBR
CBR-2	24+29 -Y2- 25' RT	0.5 – 2.0	Proctor and CBR

Closing

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report, or if we may be of further service, please contact us at your convenience.

Sincerely,
Terracon Consultants, Inc.

Jonathan P. Manke, PE
Senior Geotechnical Engineer



MATCH LINE STA. 16+50 -L- SEE SHEET 5

BEGIN TIP PROJECT R-5799
-L- STA. 7+00.00

POC Sta. 28+06.04 = RB-15
 - PC Sta. 10+00.00
 - PT Sta. 13+45.576

PC Sta. 27+81.65

SEE SHEET 5

MATCH LINE STA. 27+00 -L-

ARTIFICIAL FILL

- PT Sta. 12+38.31

FOREST GATE DR.

30 (-L-)

ARTIFICIAL FILL

ROADWAY EMBANKMENT

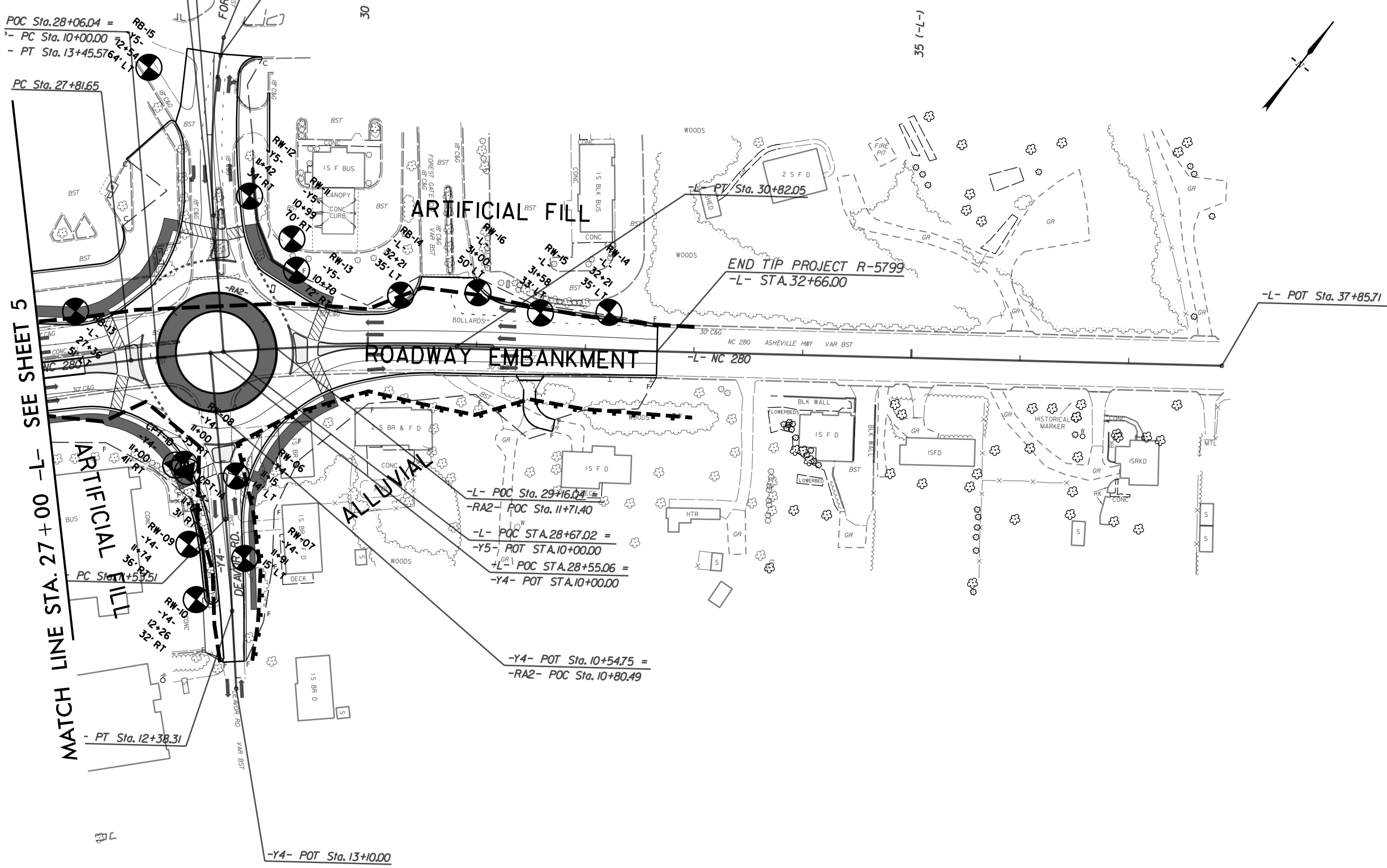
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 -L- STA. 32+66.00

-L- POT Sta. 37+85.71

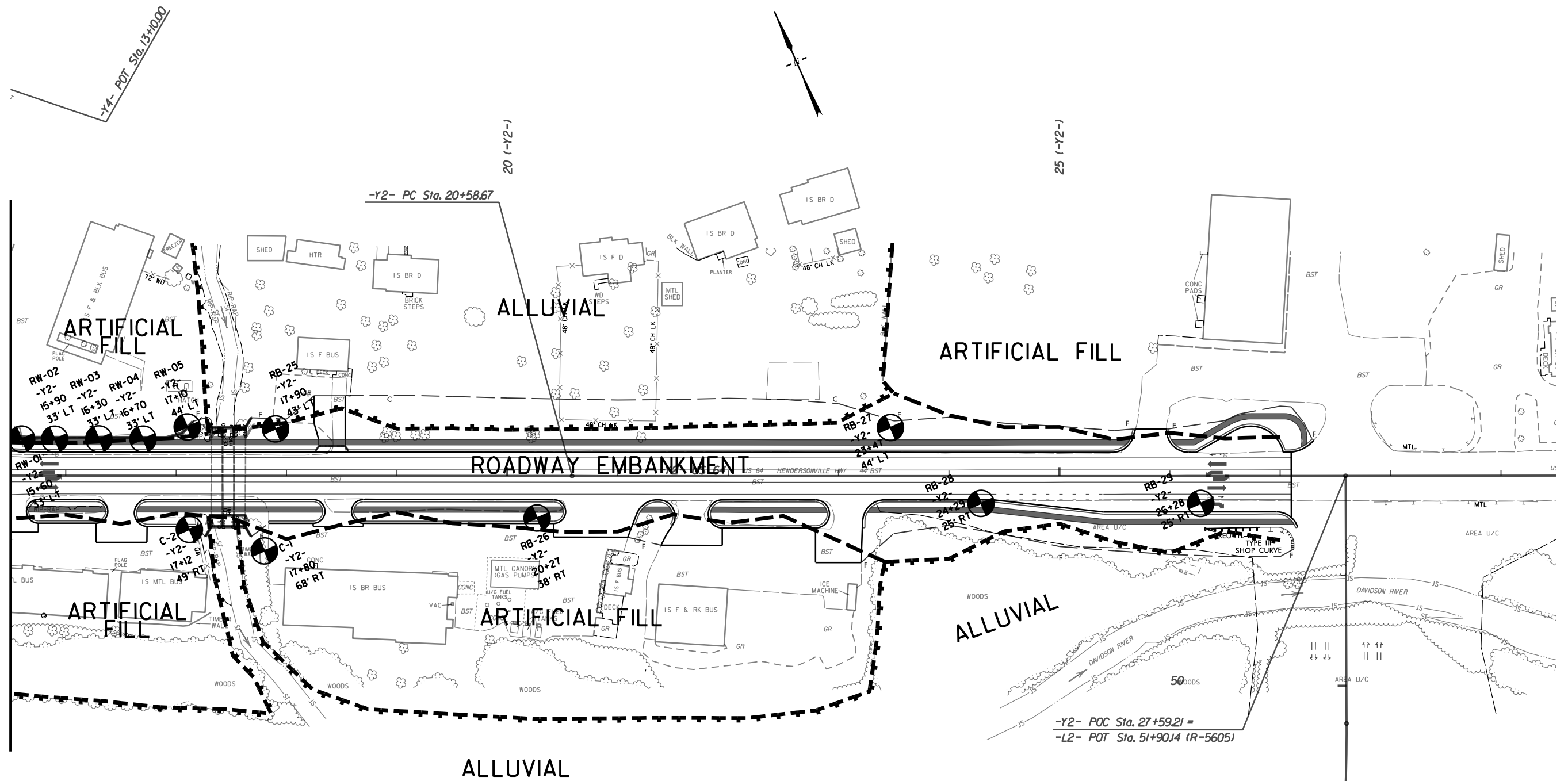
-L- POC Sta. 29+16.04
 -RA2- POC Sta. 11+71.40
 -L- POC STA. 28+67.02 =
 -Y5- POT STA. 10+00.00
 +L- POC STA. 28+55.06 =
 -Y4- POT STA. 10+00.00

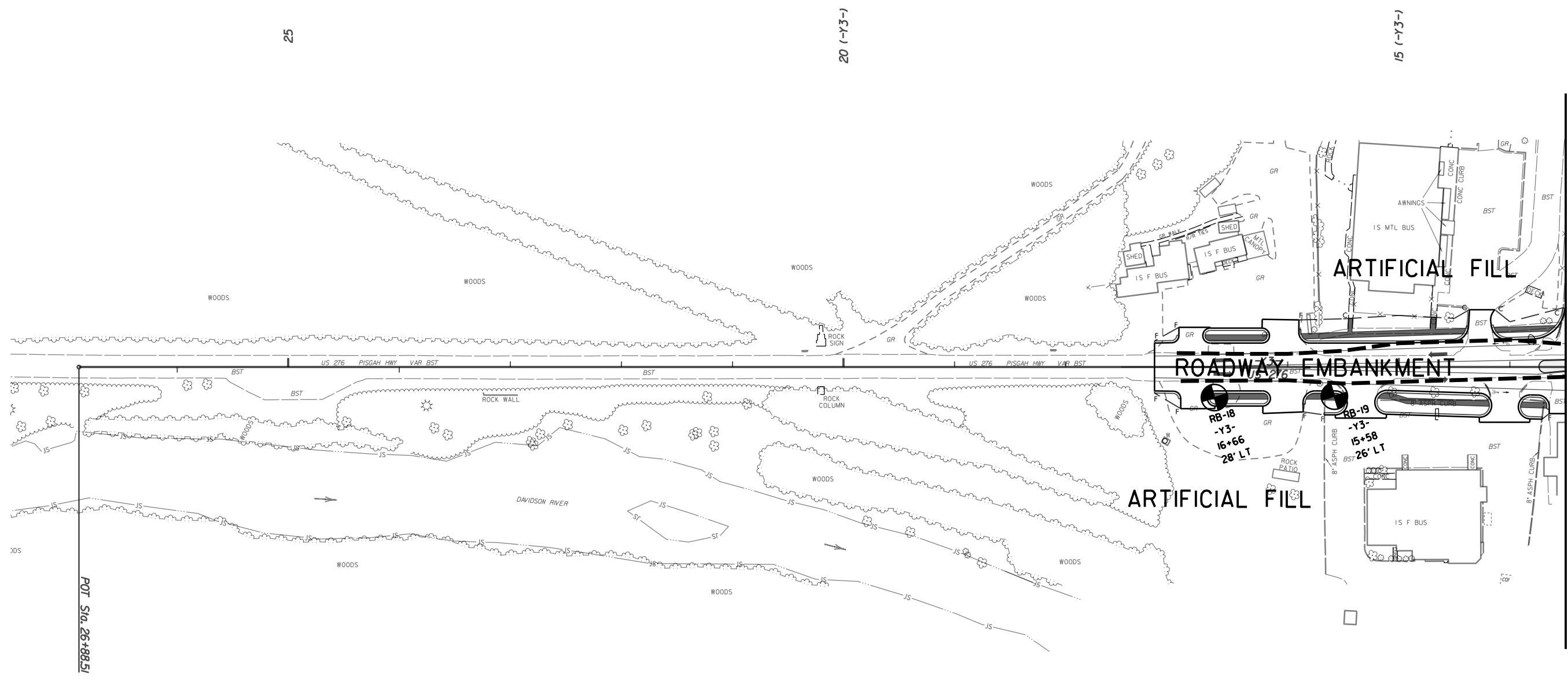
-Y4- POT Sta. 10+54.75 =
 -RA2- POC Sta. 10+80.49

-Y4- POT Sta. 13+10.00

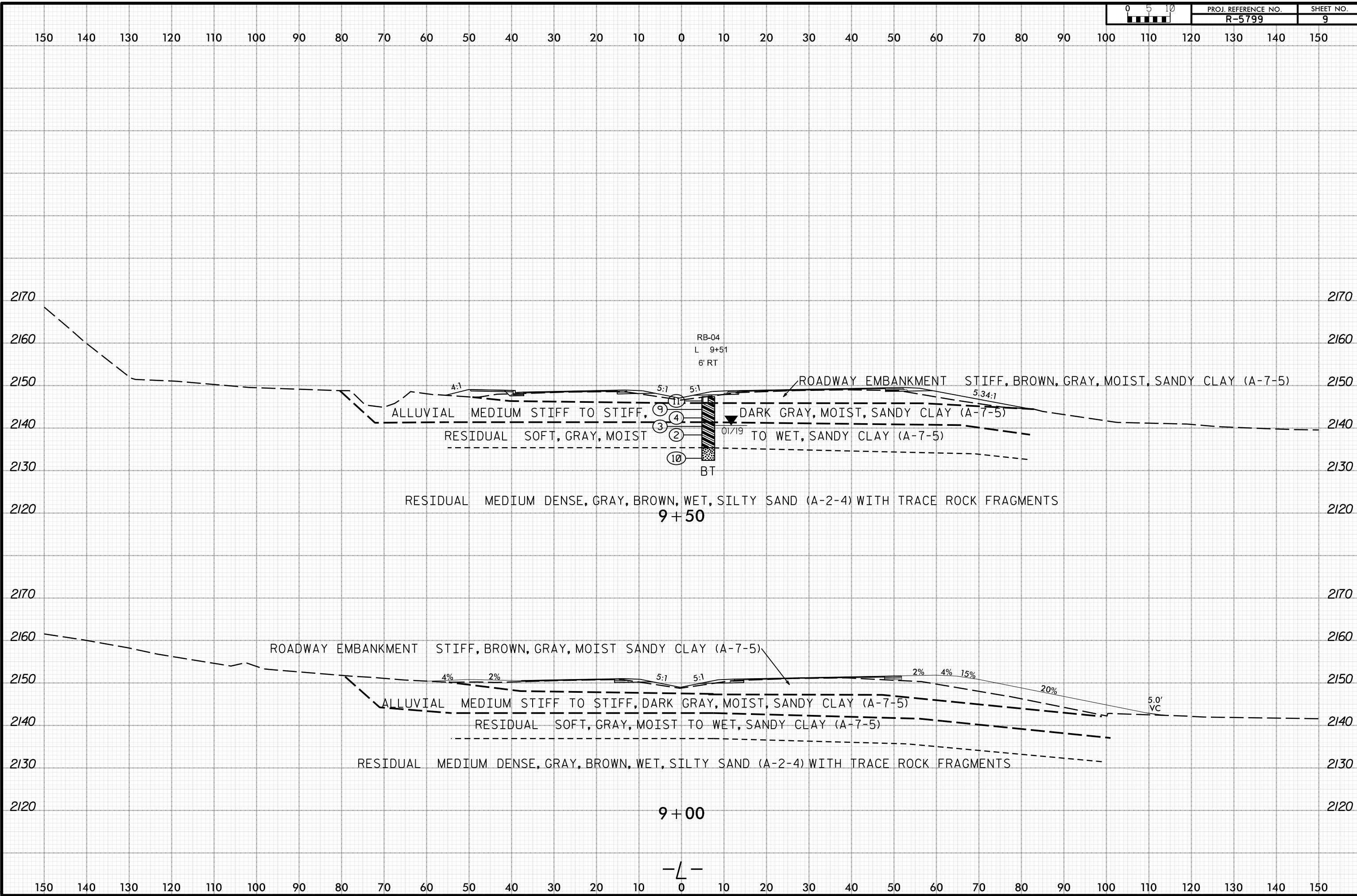


MATCH LINE STA. 15 + 50 -Y2- SEE SHEET 5

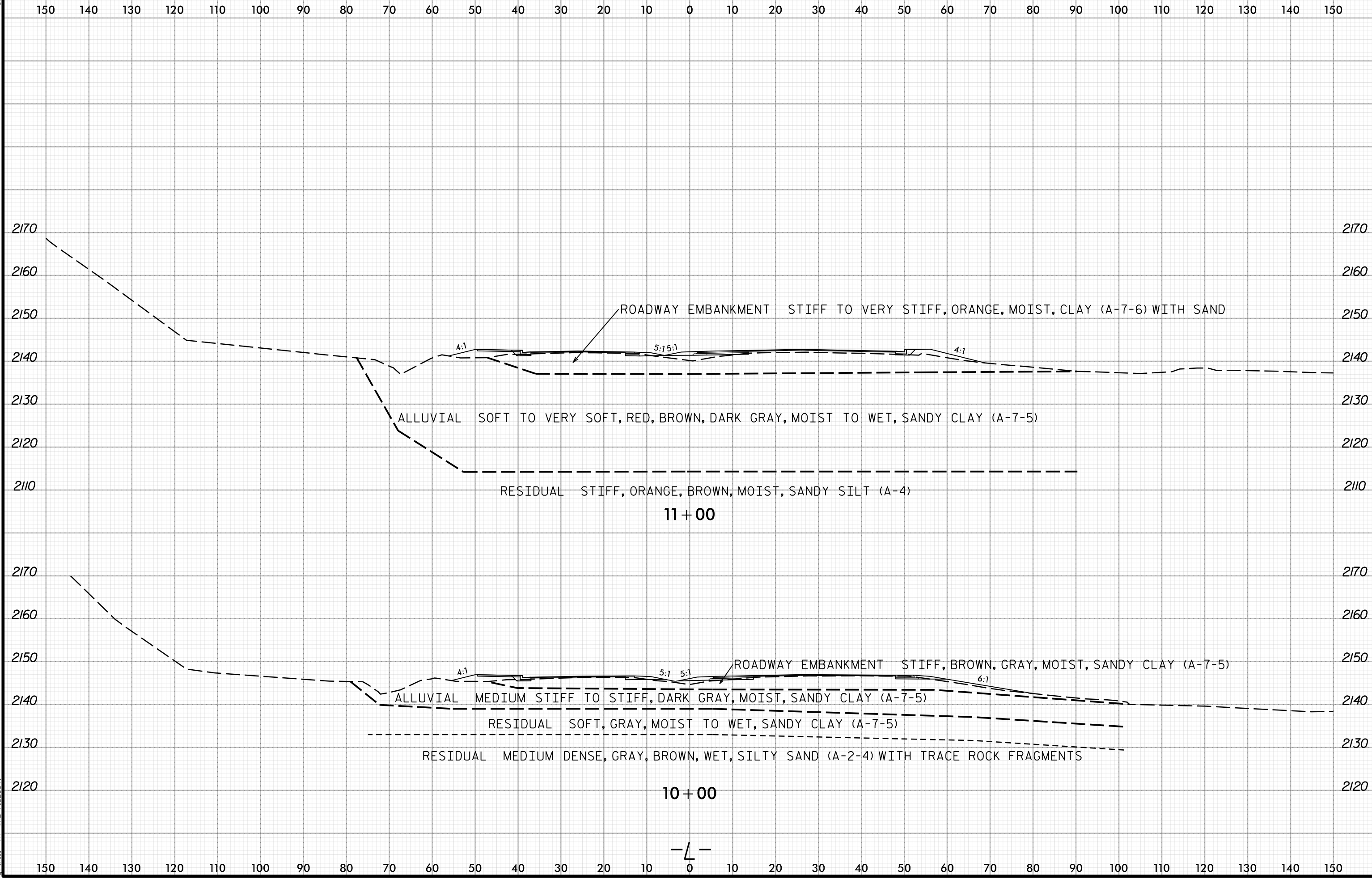




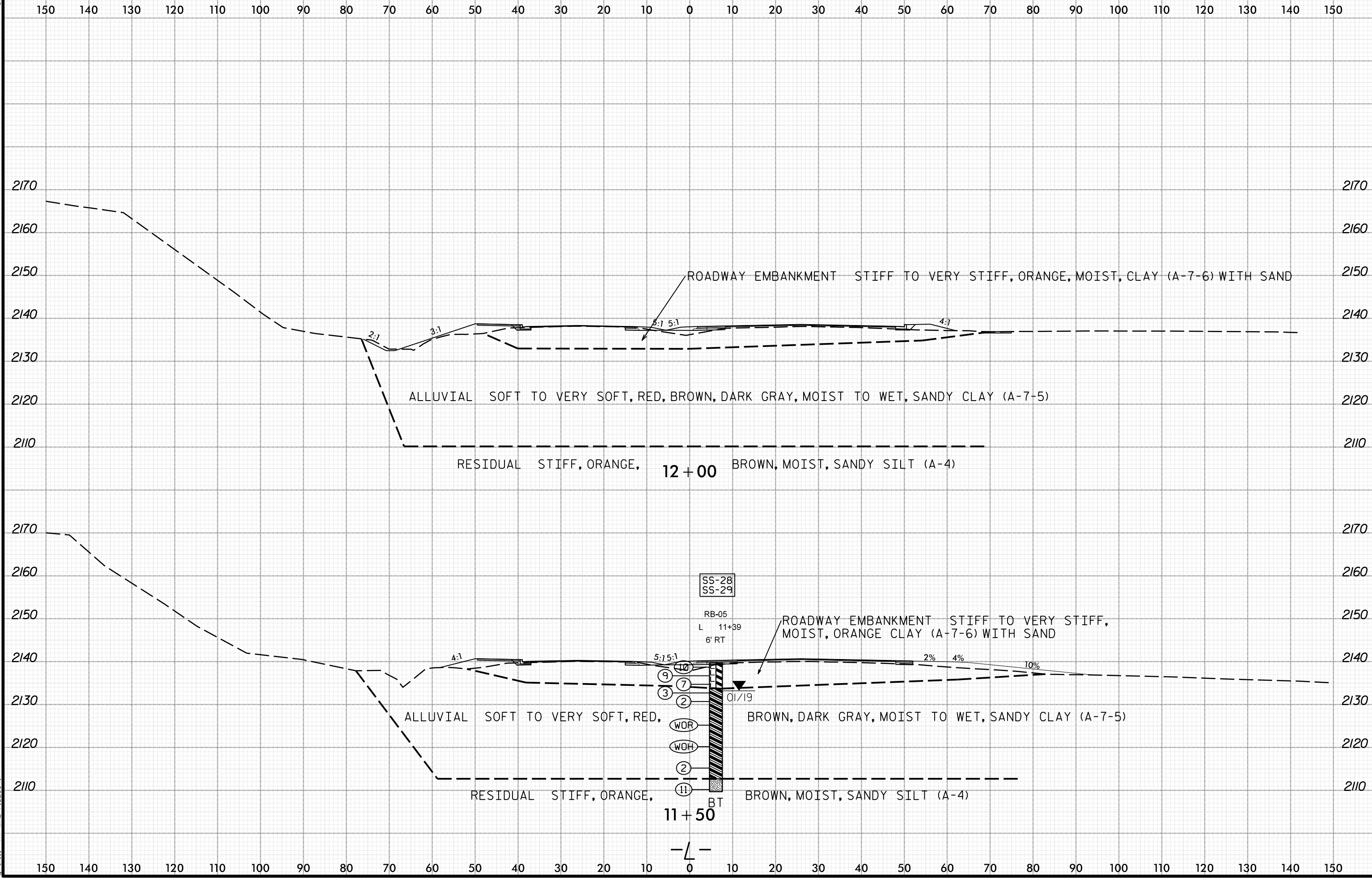
MATCH LINE STA. 13 + 50 -Y3- SEE SHEET 2



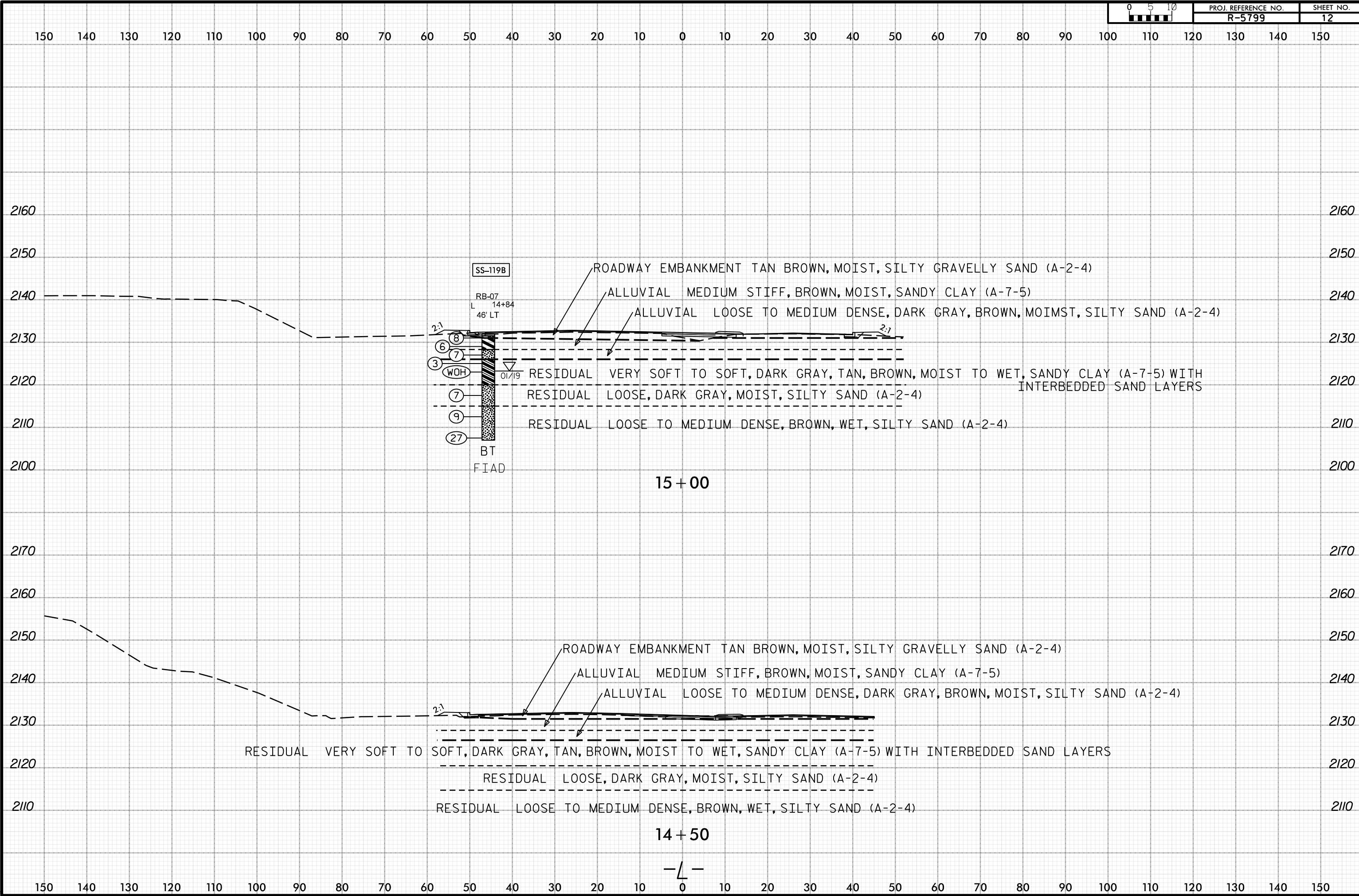
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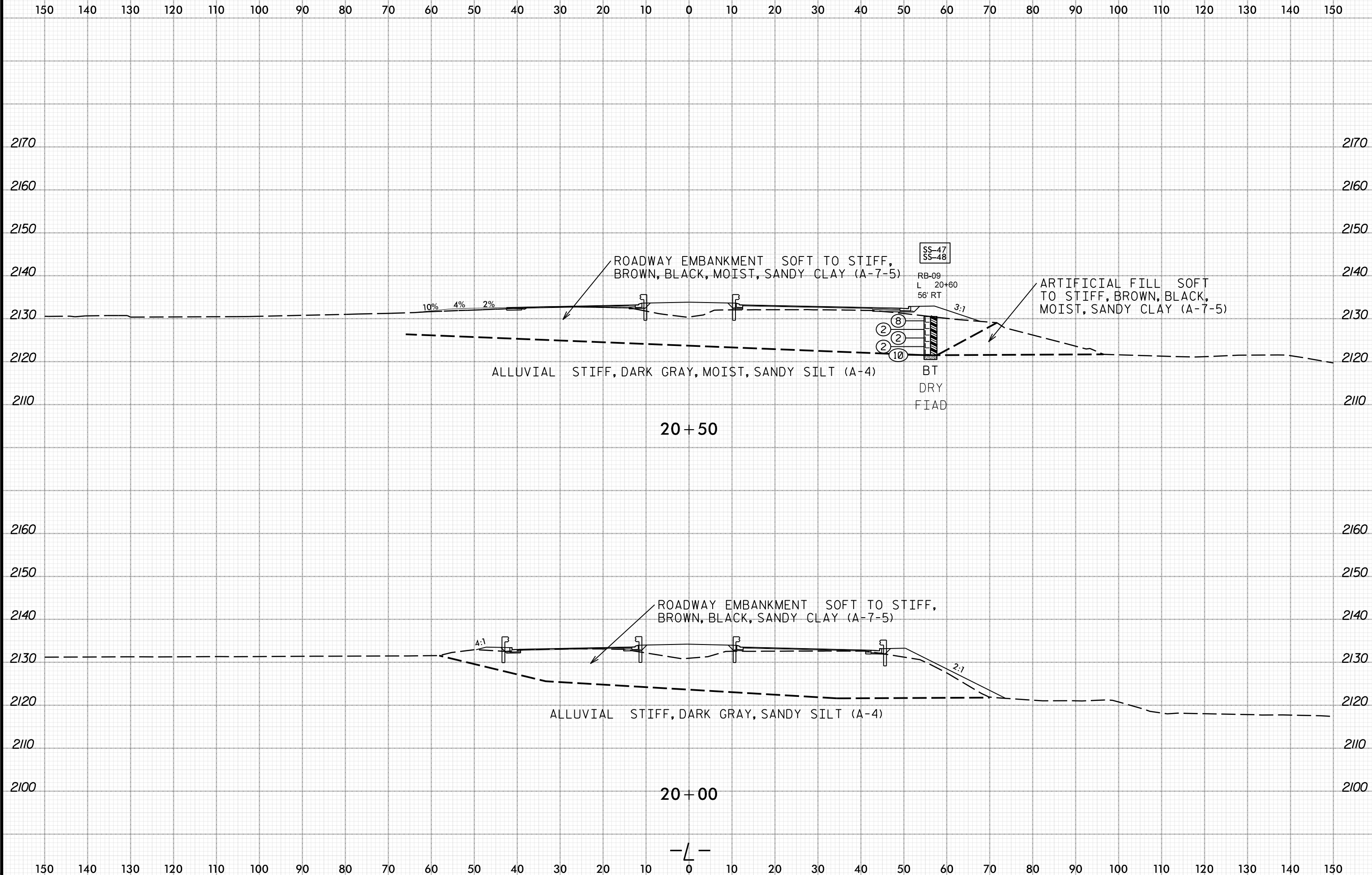


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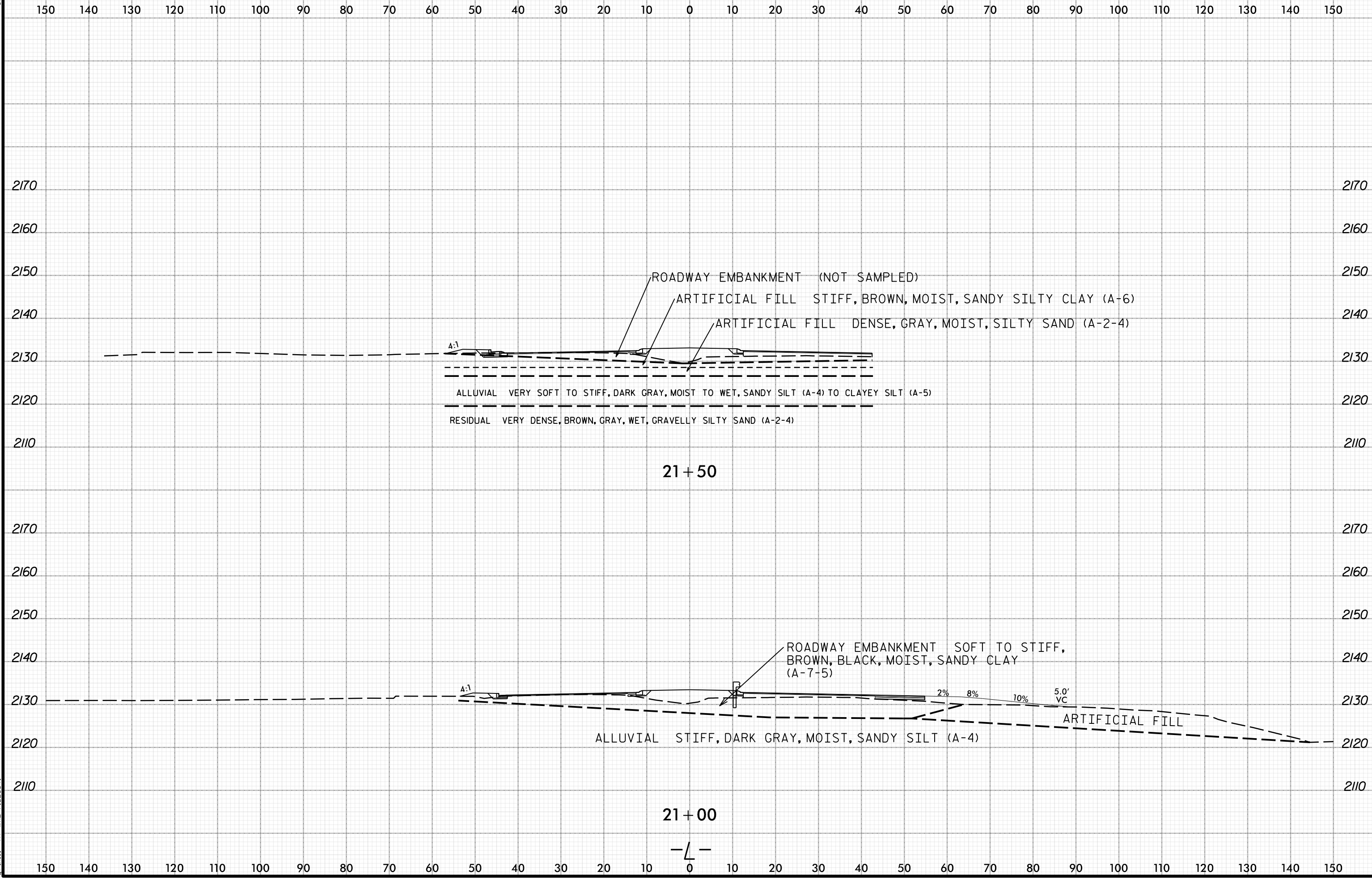


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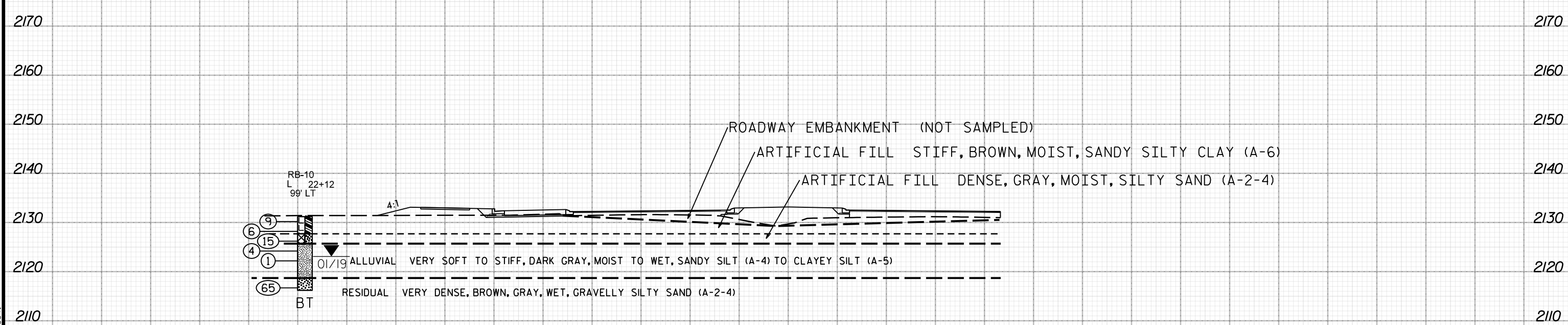
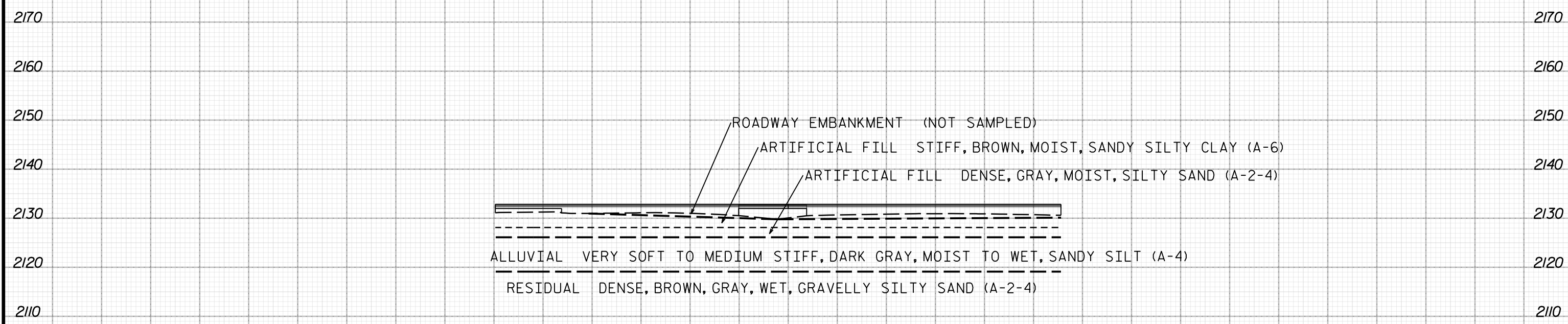


30-OCT-2019 11:26
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 at thil\A\WXE-71023641

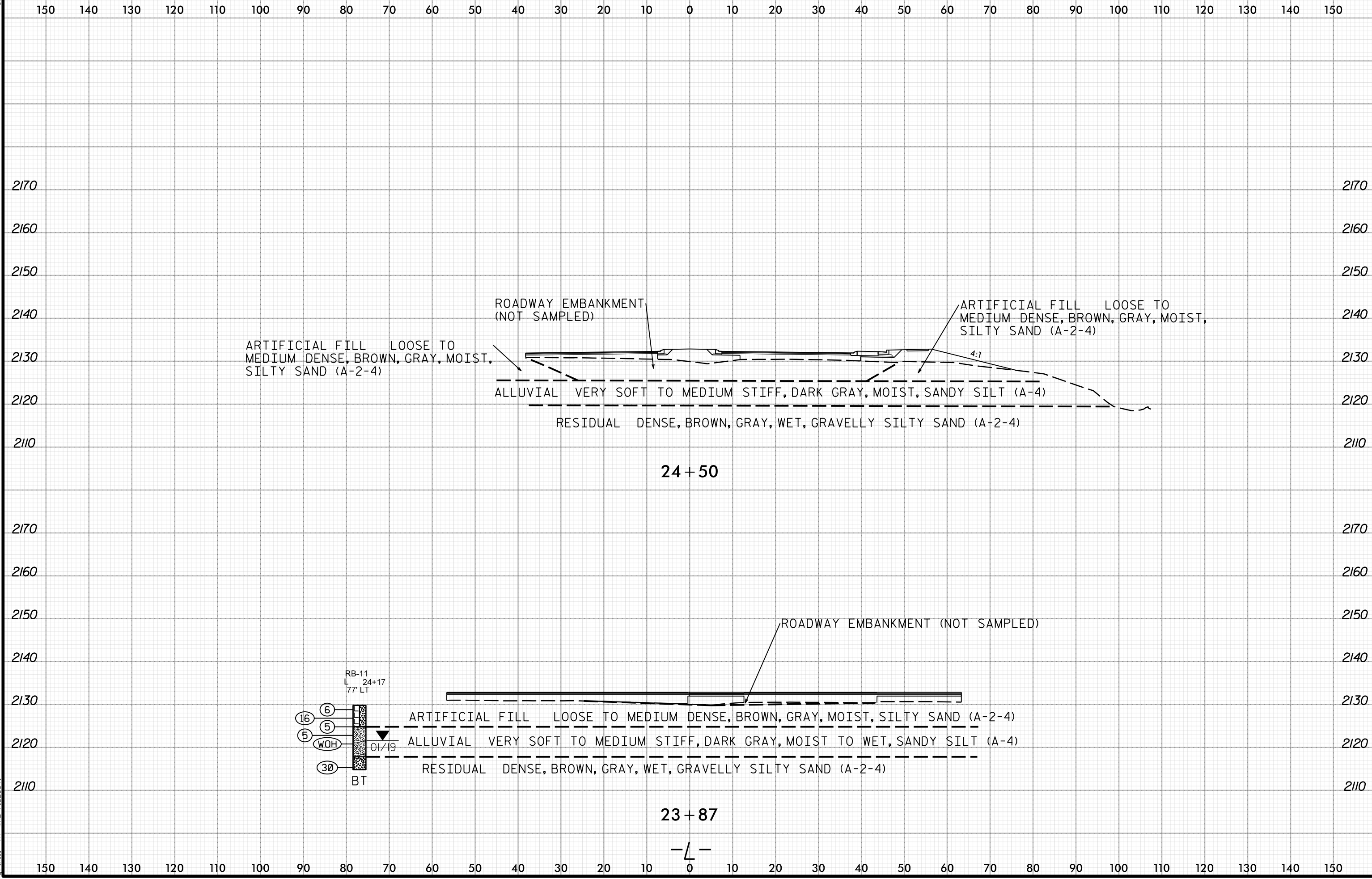


30-OCT-2019 11:26 N:\Projects\2019\71195003\RS799\NCDOT File Structure\RS799.GEO\RDWY - trans\j.vano\CADD.GEOTECH\XSEC\RS799.GEO.XSL.L.DGN

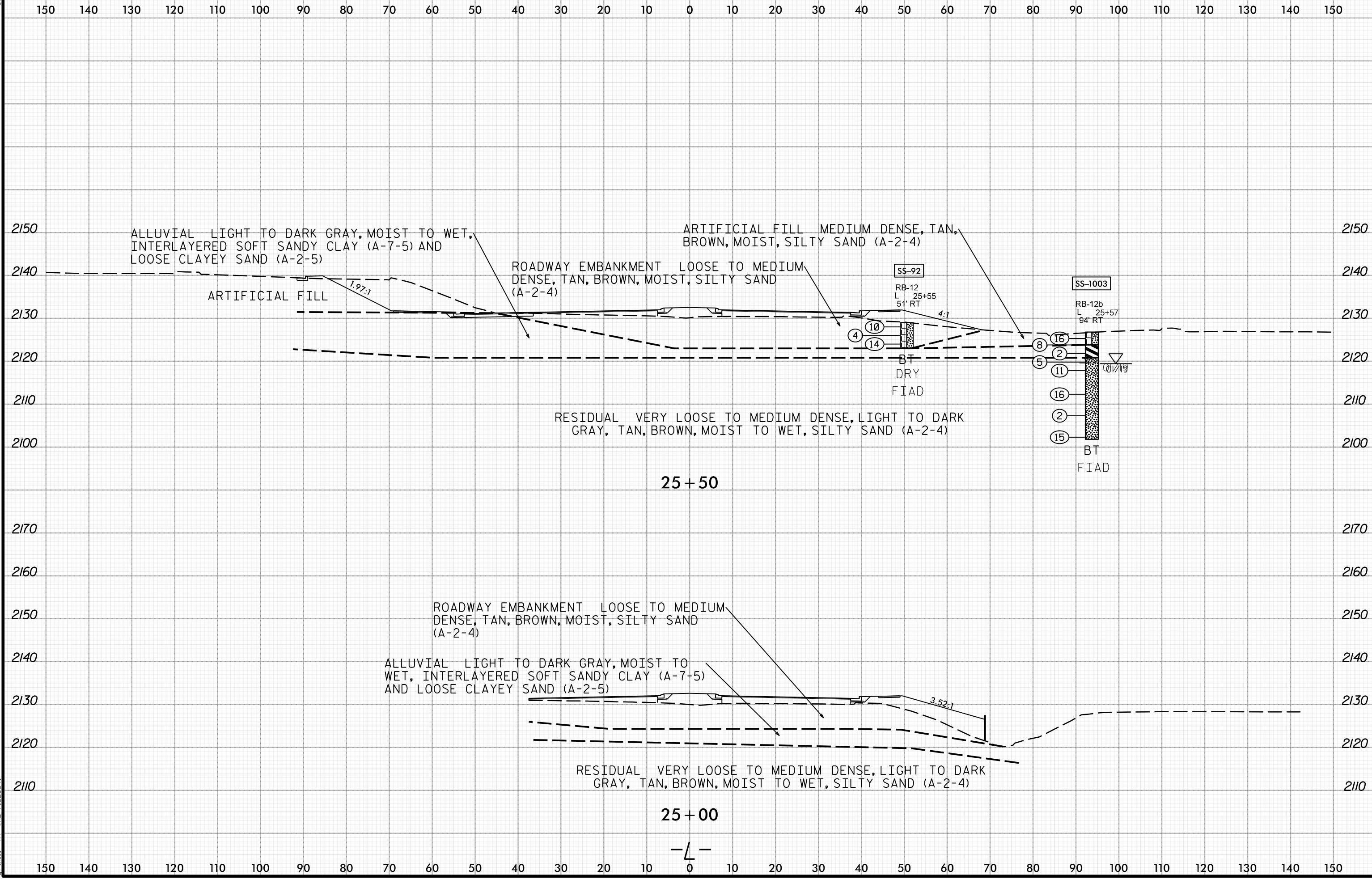
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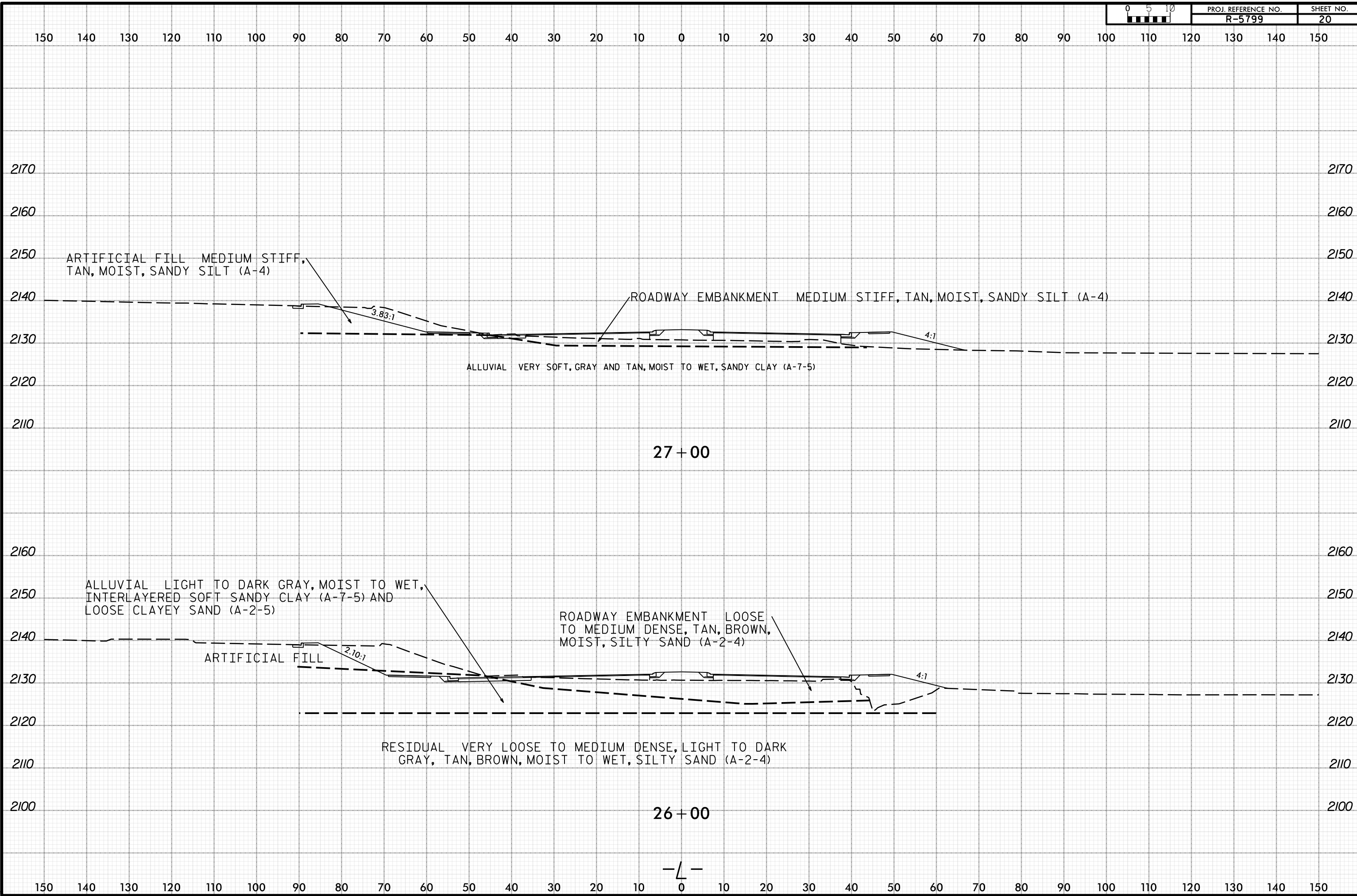
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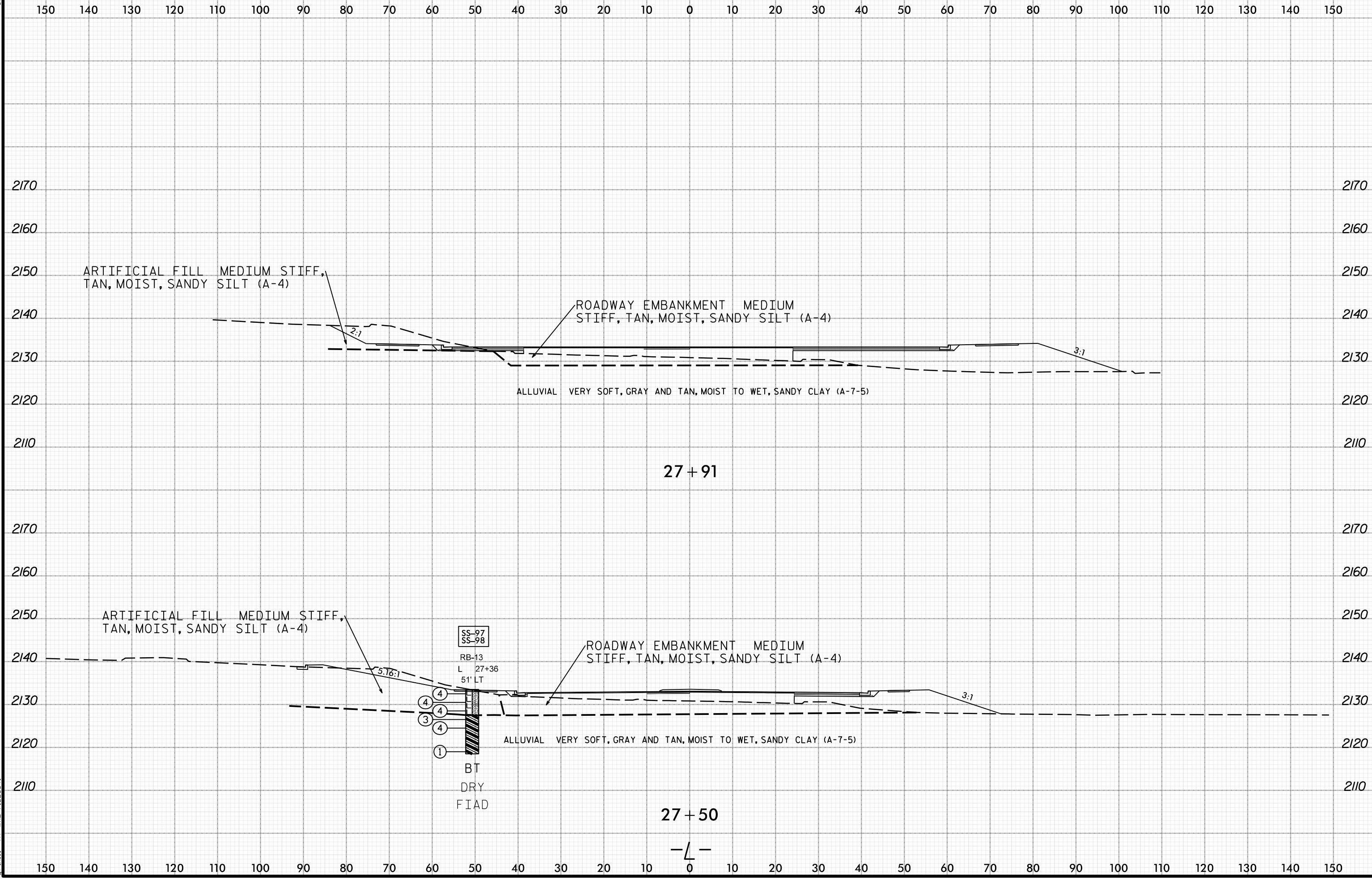


30-OCT-2019 11:26
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 at th...

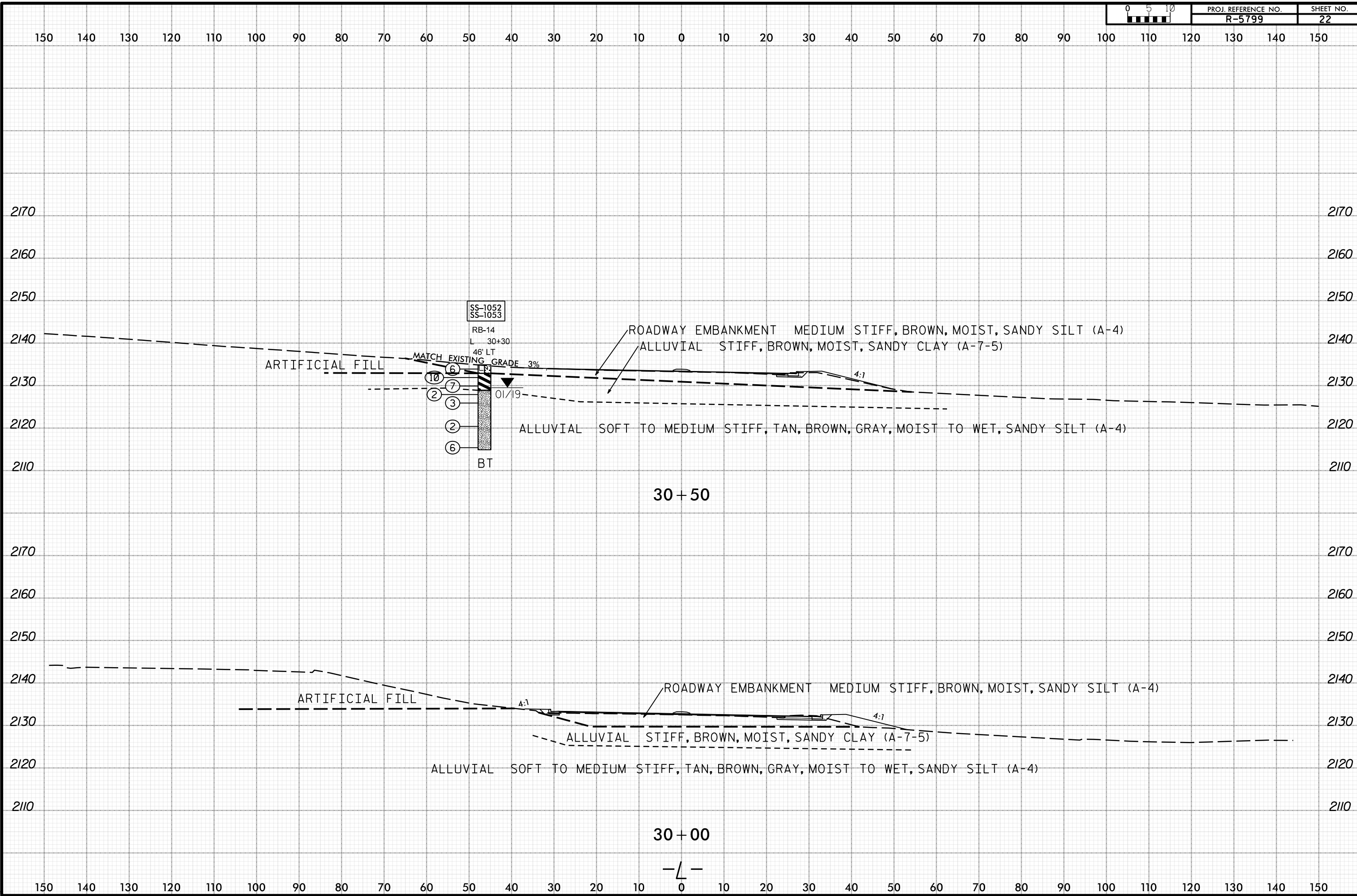


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 at thil\A\WXE-71023641





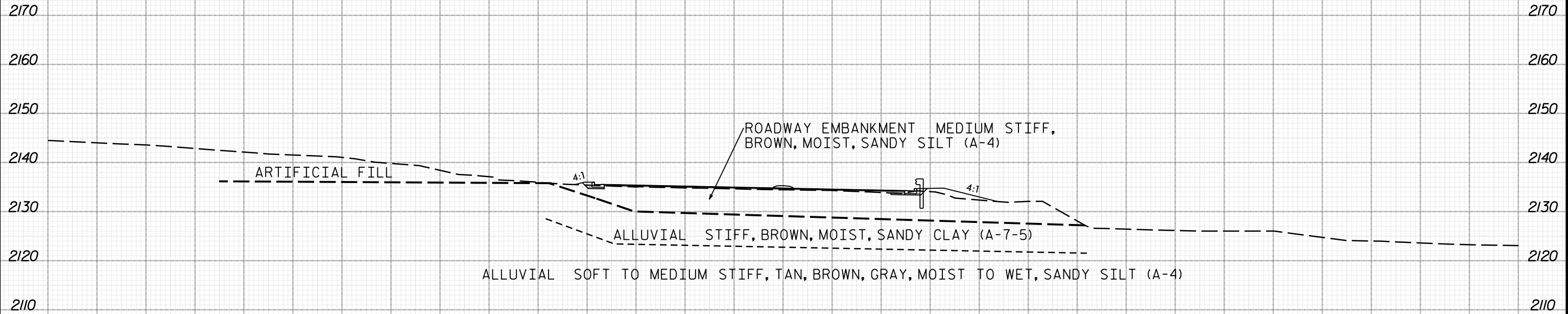
30-OCT-2019 11:26
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 at thiln\A\WXE-71023641



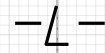
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 at thiln\A\WXE-71023641



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



31 + 00



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

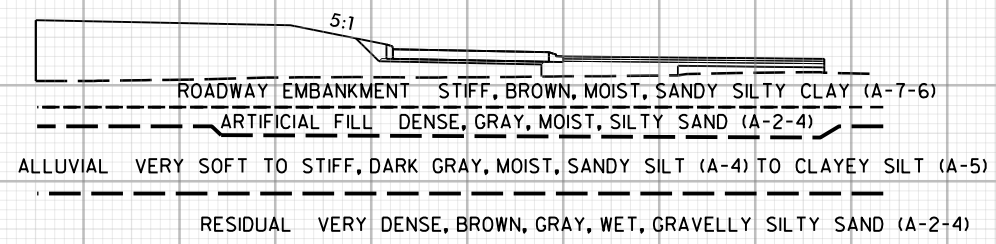
6/23/16
24-OCT-2019 13:52
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2150 2150

2140 2140

2130 2130

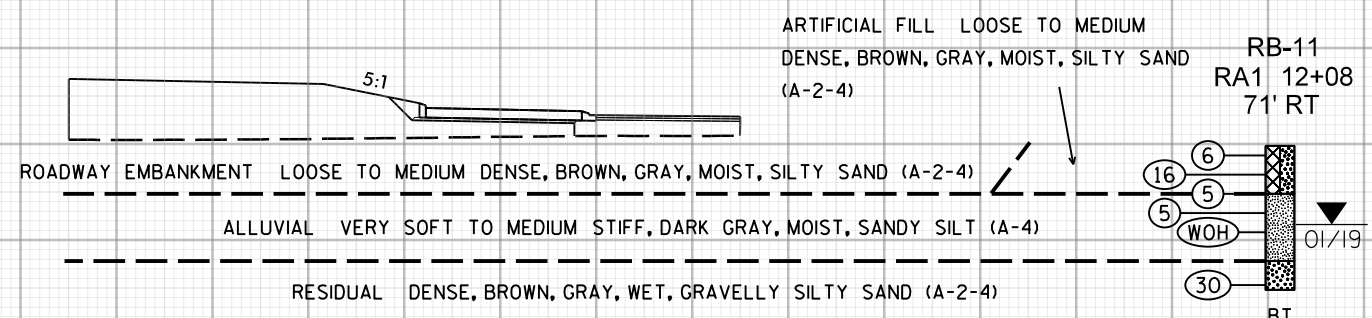


12 + 50

2150 2150

2140 2140

2130 2130

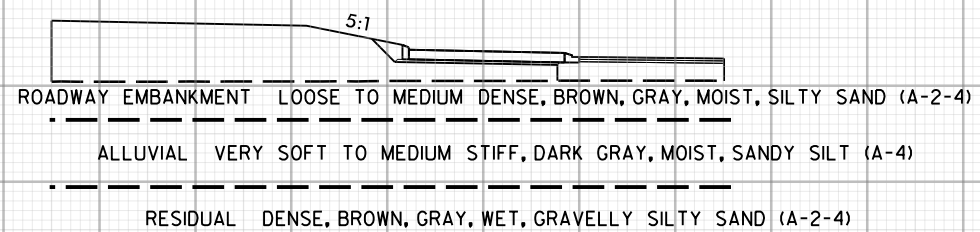


12 + 00

2150 2150

2140 2140

2130 2130

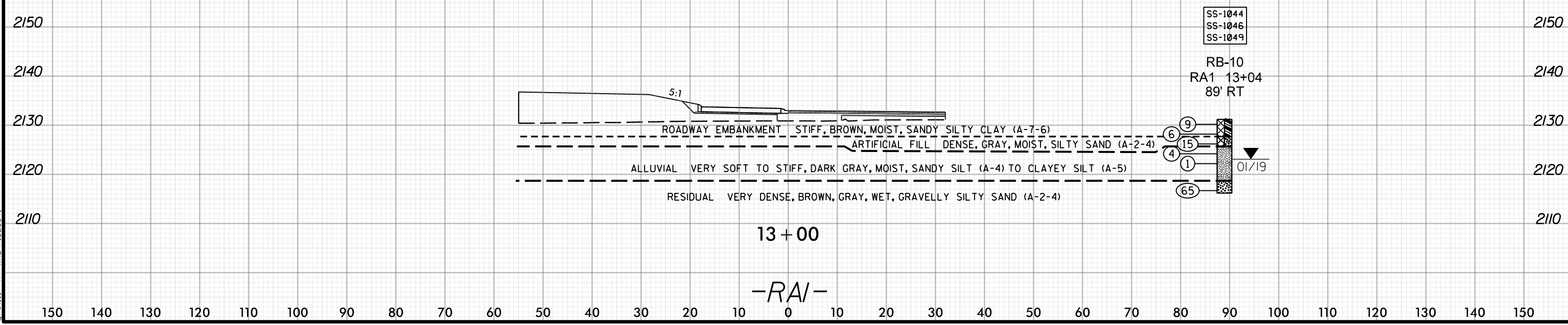


11 + 50

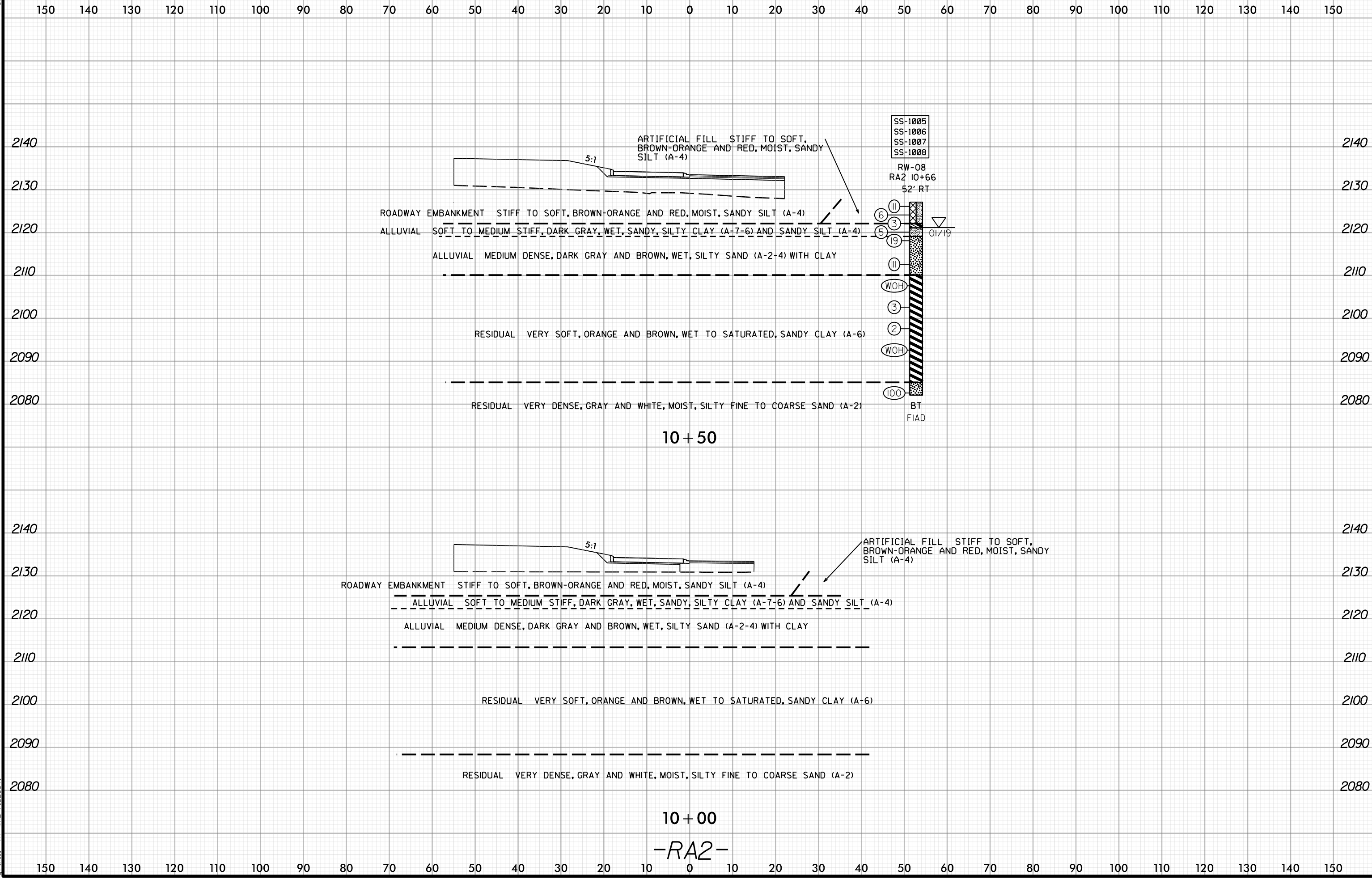
-RAI-

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

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

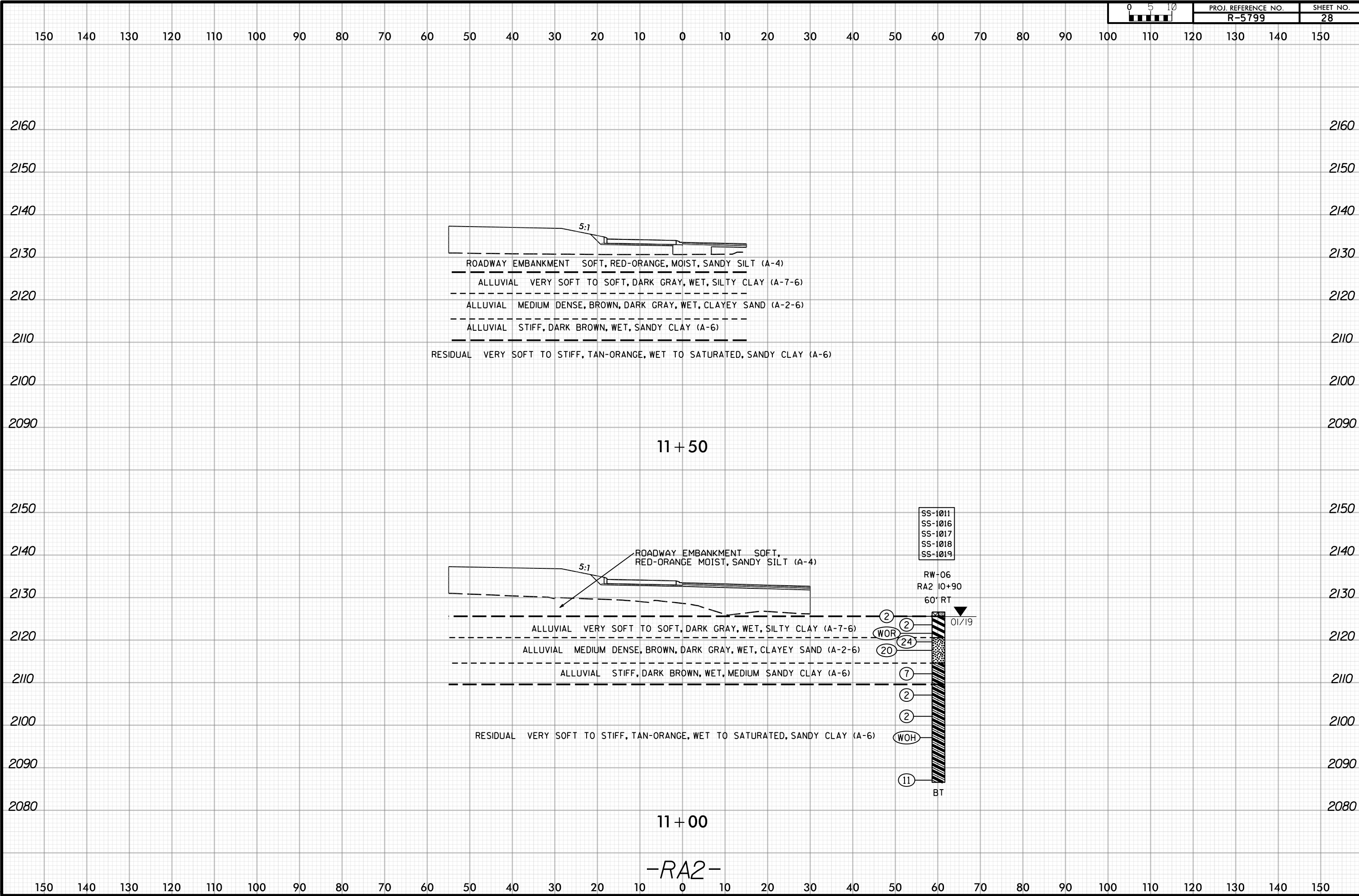


24-OCT-2019 13:52
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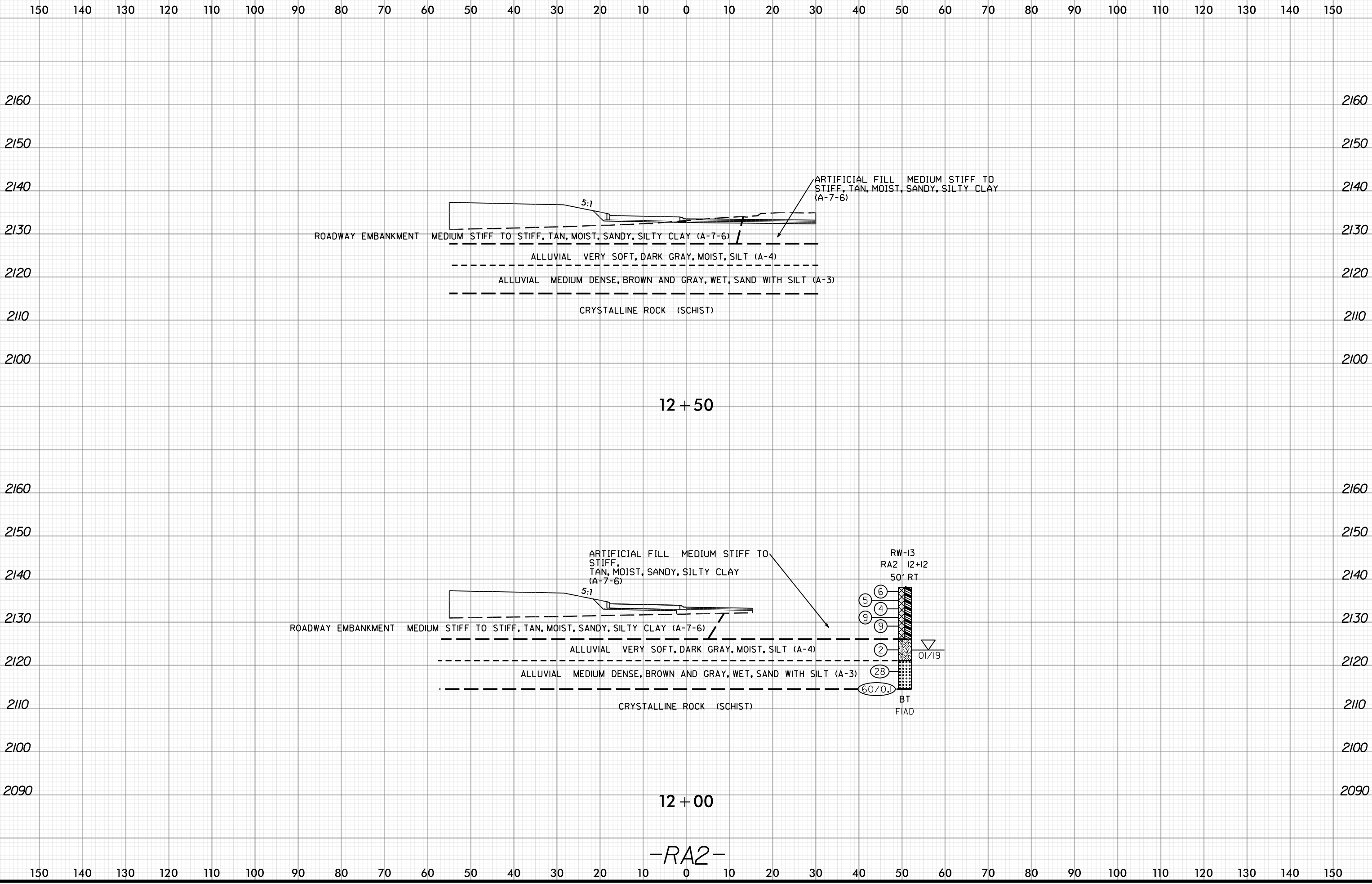


2-AUG-2019 10:54
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 at th...

-RA2-



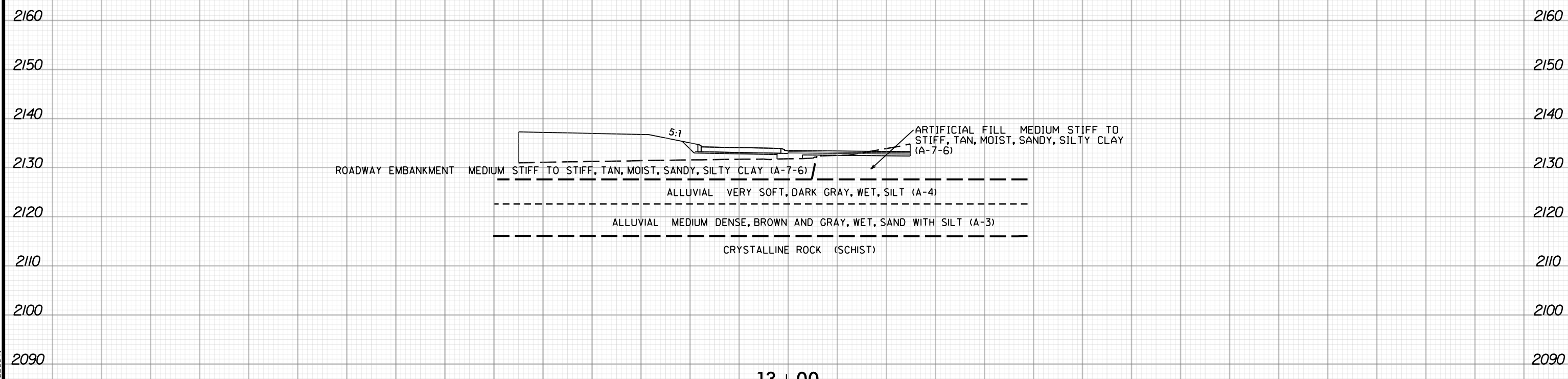
6/23/16



2-AUG-2019 10:54 AM C:\Program Files\Autodesk\AutoCAD 2019\AutoCAD.exe [2019/7/19 5:00:31] R5799 NCDDT File Structure R5799\RA2\RA2.DGN

-RA2-

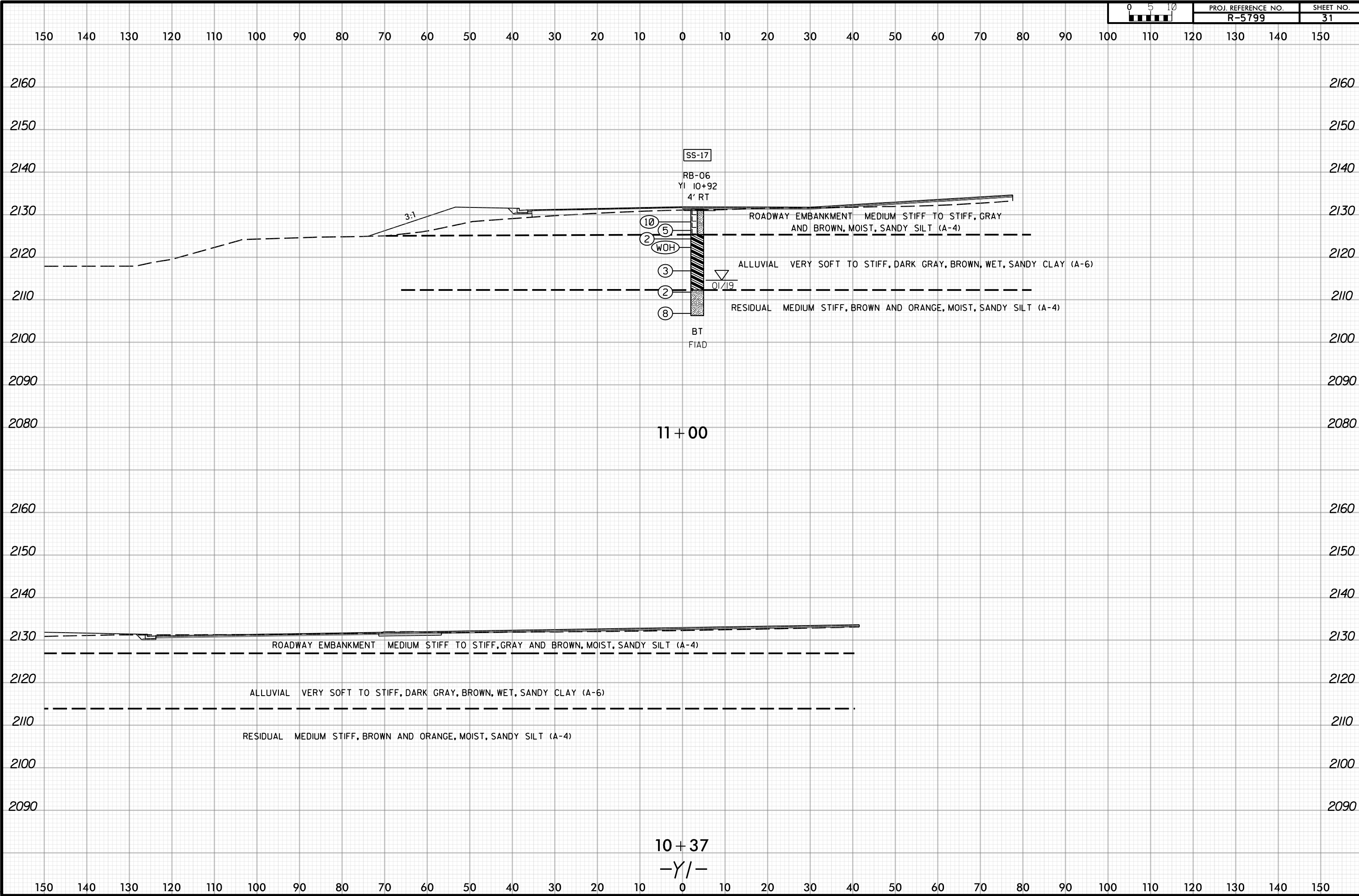
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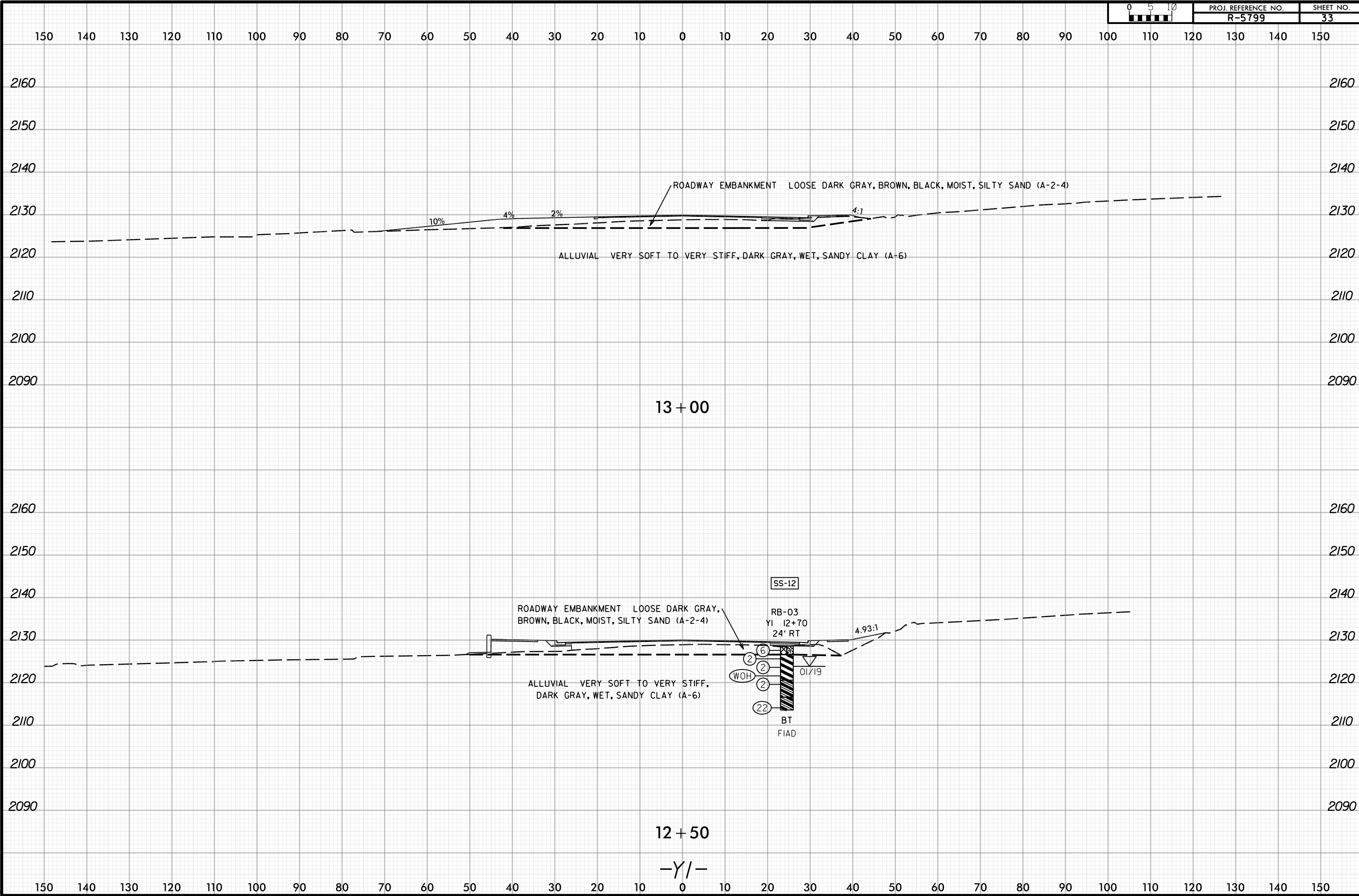
-RA2-

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

2-AUG-2019 10:54
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 at th...



6/23/16



30-OCT-2019 11:29 AM N:\Projects\2019\71195003\RB5799_NCDOT_File_Structure\RB5799_GEO_PDMY - trans\j\vario\CADD_GEO\TECH\ssc\RB5799_GEO_XSI_Y1.dgn

13 + 00

12 + 50

-Y/-

ROADWAY EMBANKMENT LOOSE DARK GRAY, BROWN, BLACK, MOIST, SILTY SAND (A-2-4)

ALLUVIAL VERY SOFT TO VERY STIFF, DARK GRAY, WET, SANDY CLAY (A-6)

ROADWAY EMBANKMENT LOOSE DARK GRAY, BROWN, BLACK, MOIST, SILTY SAND (A-2-4)

ALLUVIAL VERY SOFT TO VERY STIFF, DARK GRAY, WET, SANDY CLAY (A-6)

SS-12

RB-03
Y1 12+70
24' RT

6
2
2
2
22

WOH

BT
FIAD

01/19

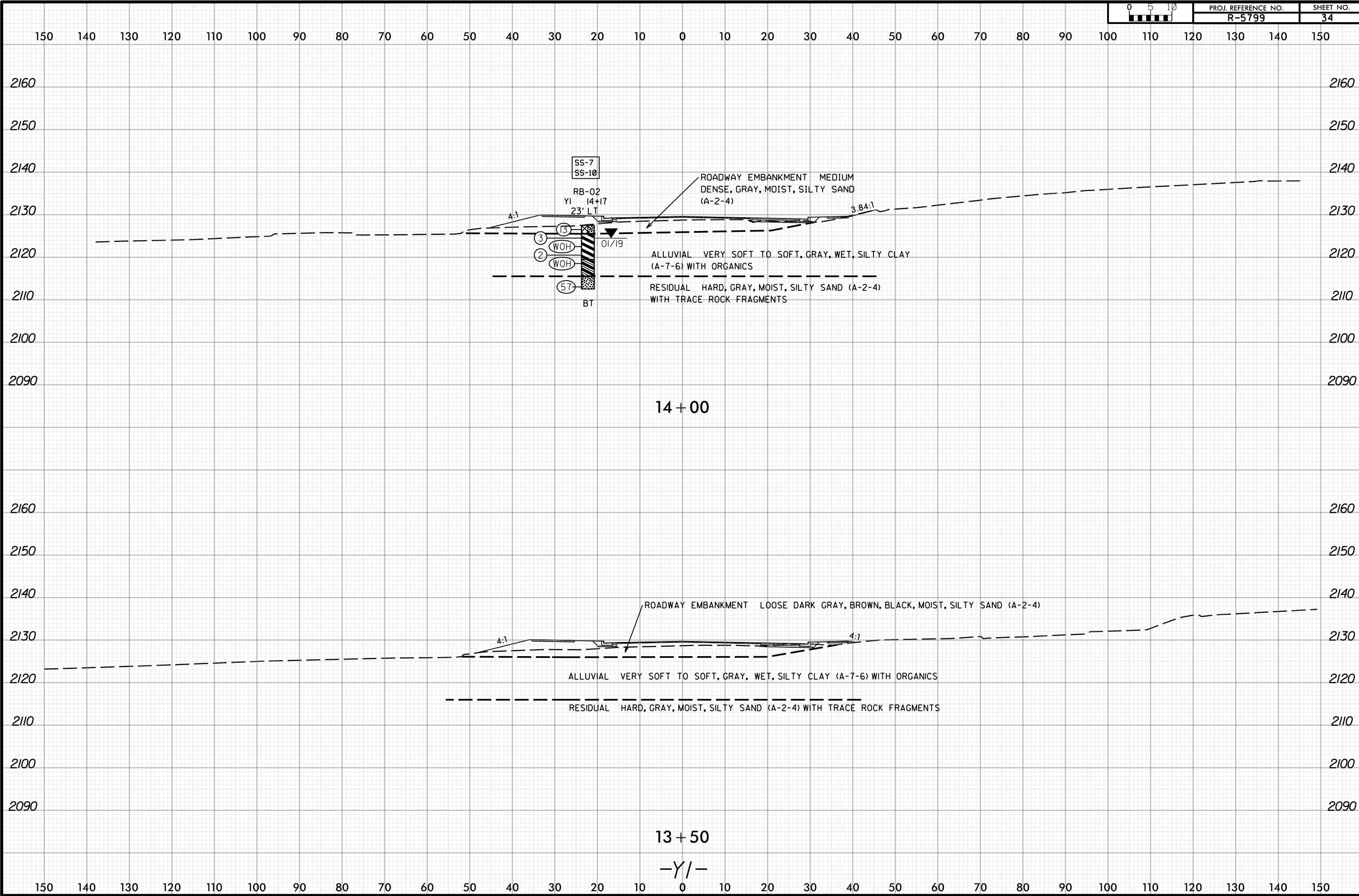
4.93:1

10%

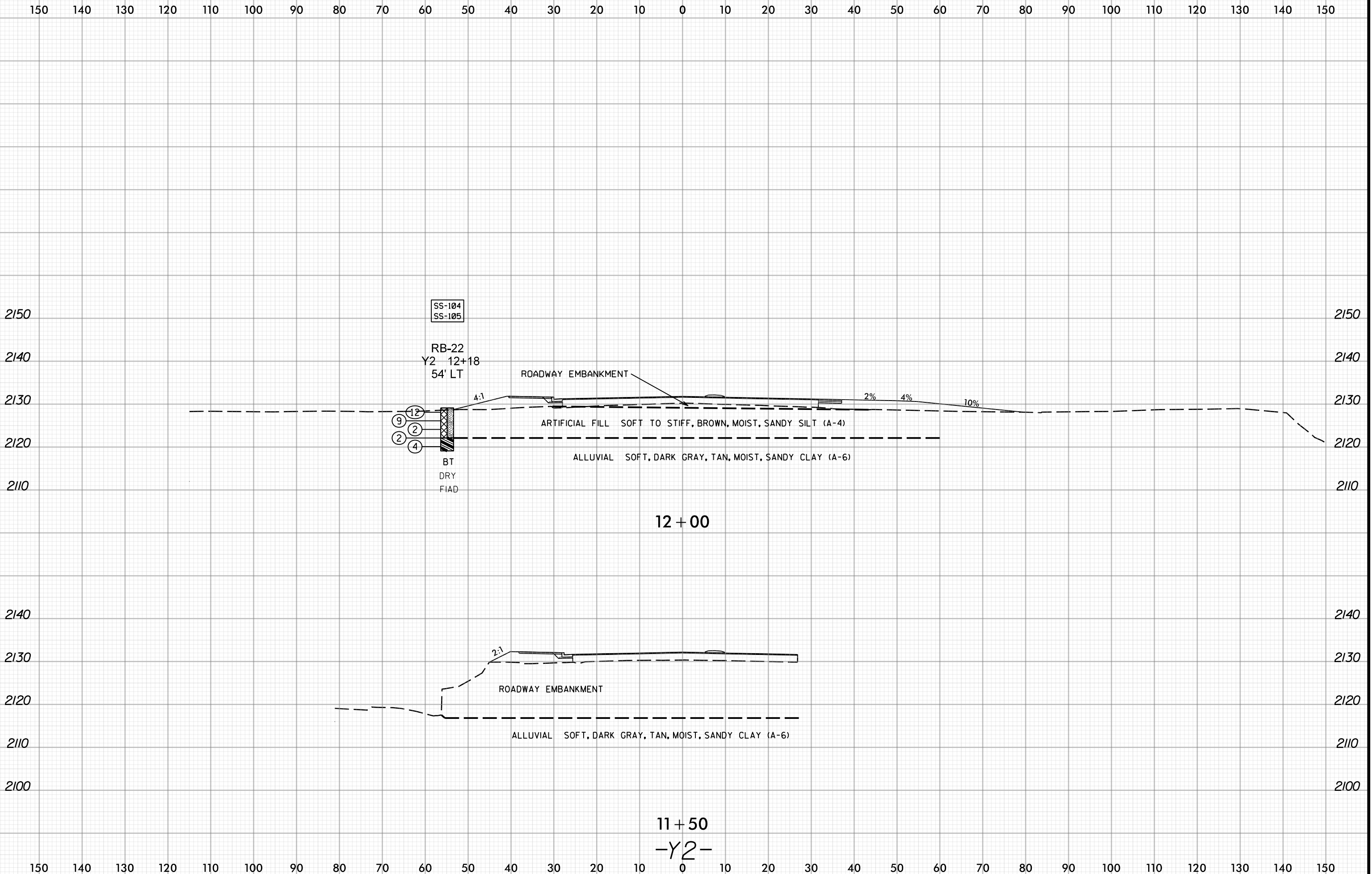
4%

2%

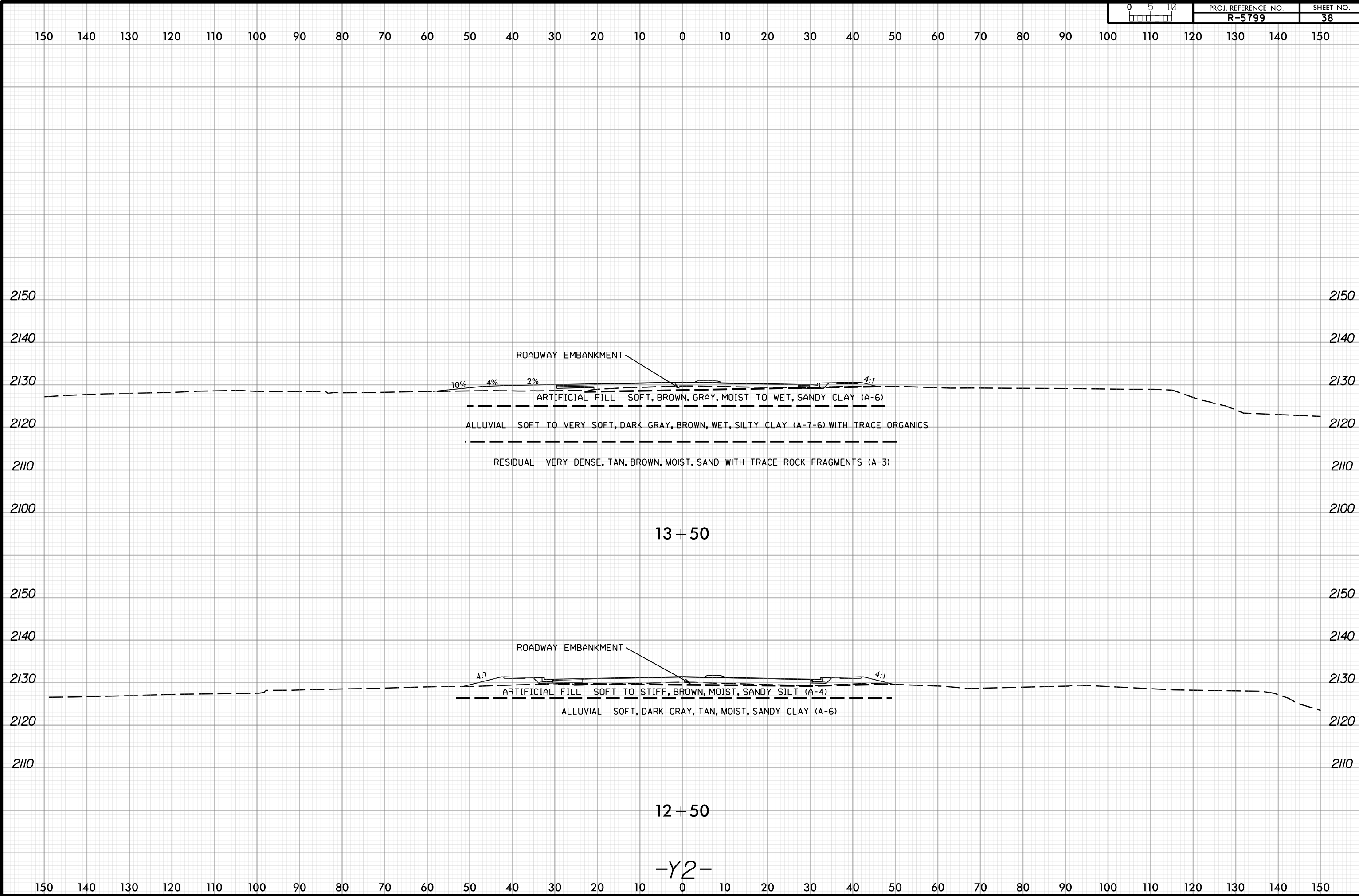
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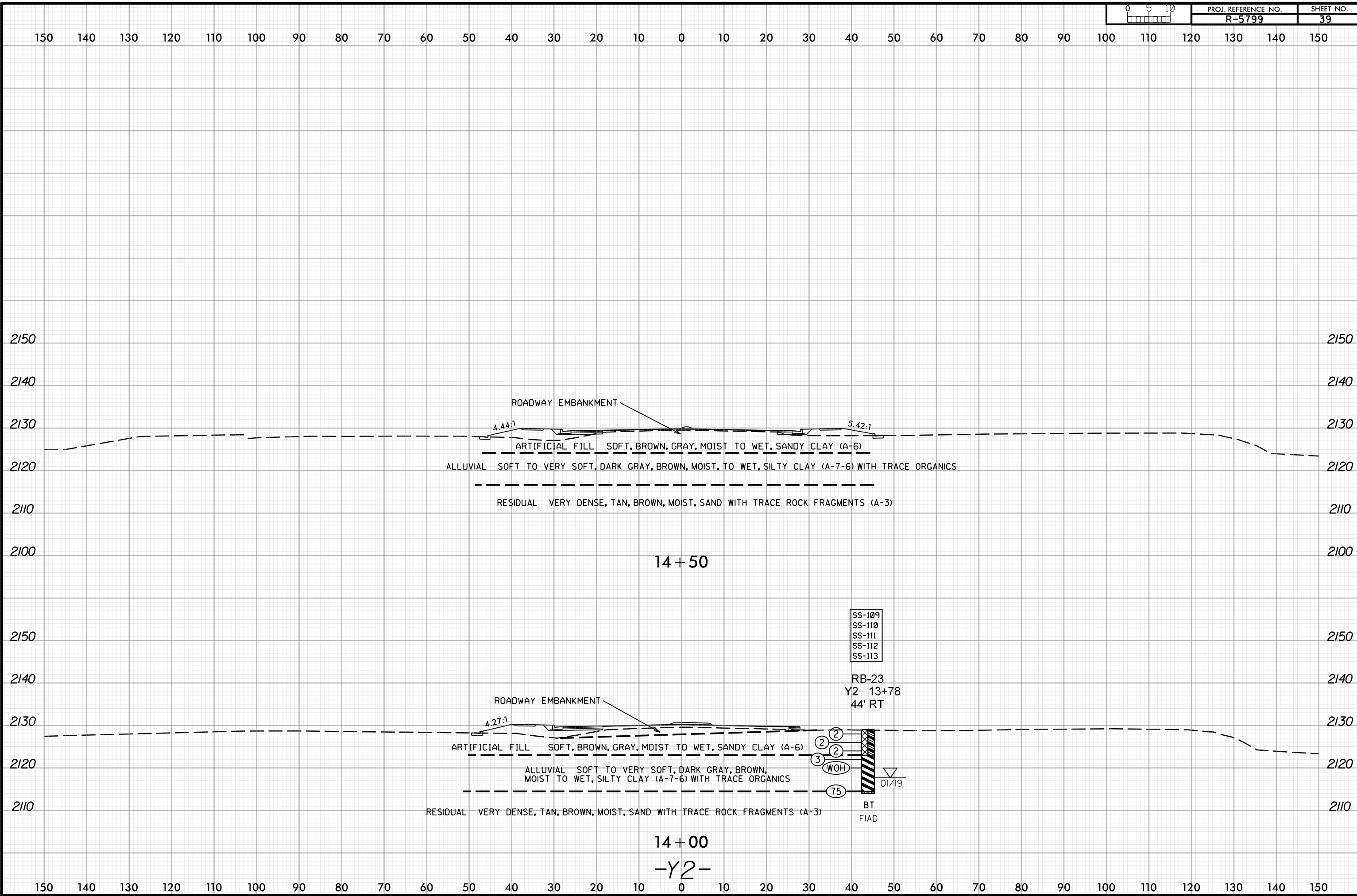
6/23/16
04-NOV-2019 12:45
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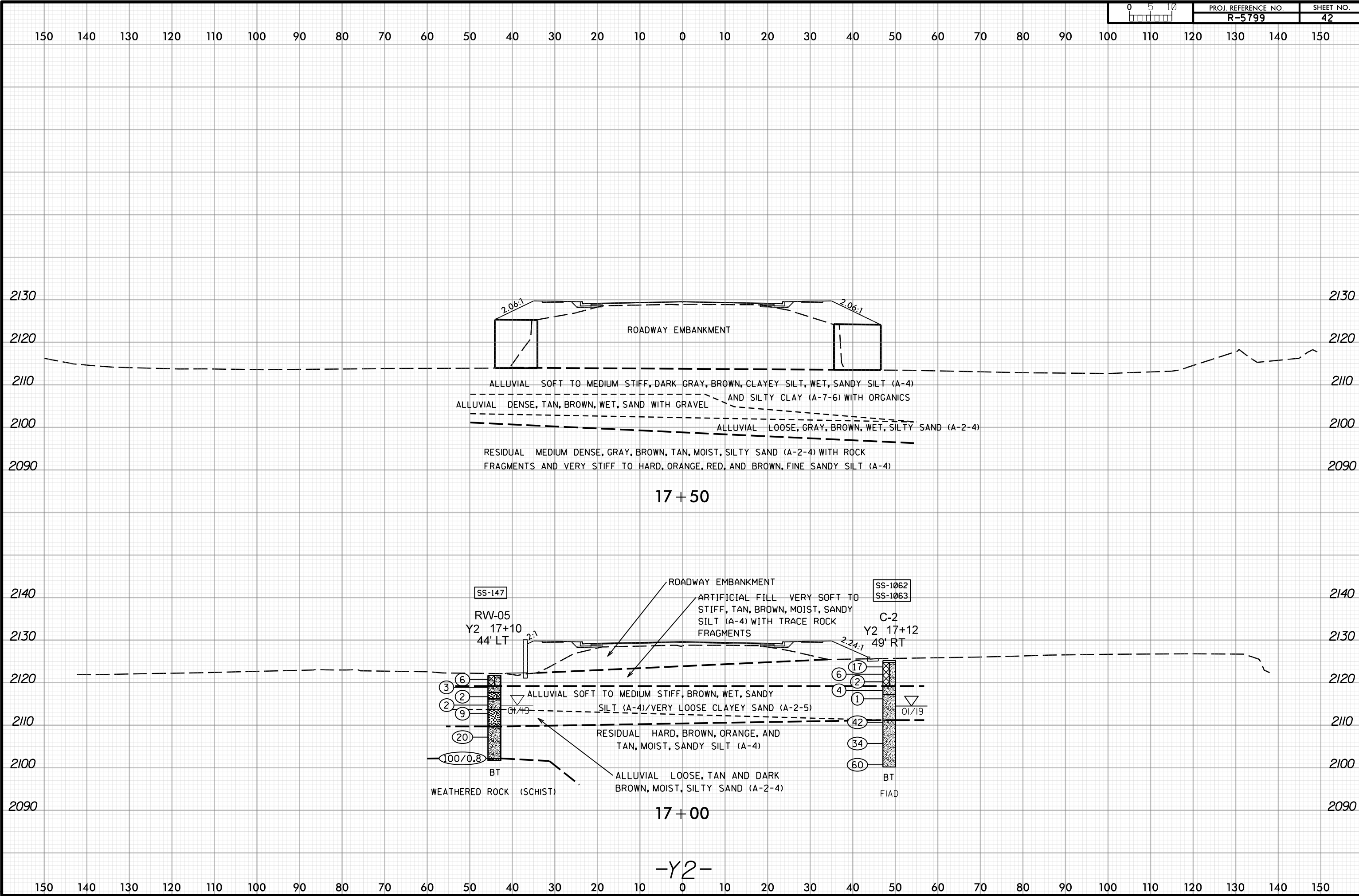


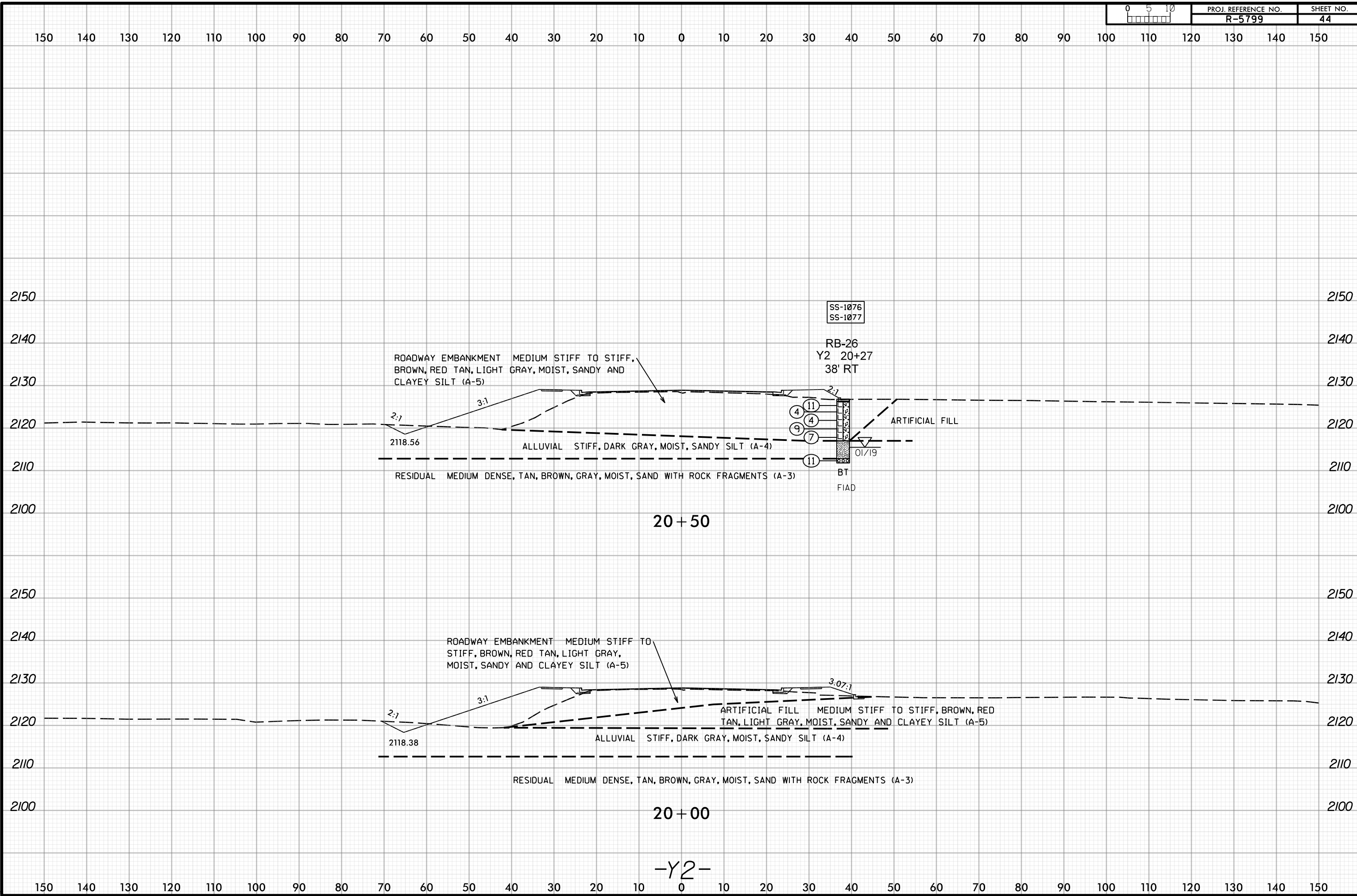
6/23/16



04-NOV-2019 12:45 N:\Projects\2019\71195003\R5799\NCDOT File Structure\R5799_GEO_PDWY - trans\j\van\cadd\GEO\TECH\ssc\R5799_GEO_XSL_V2.dgn

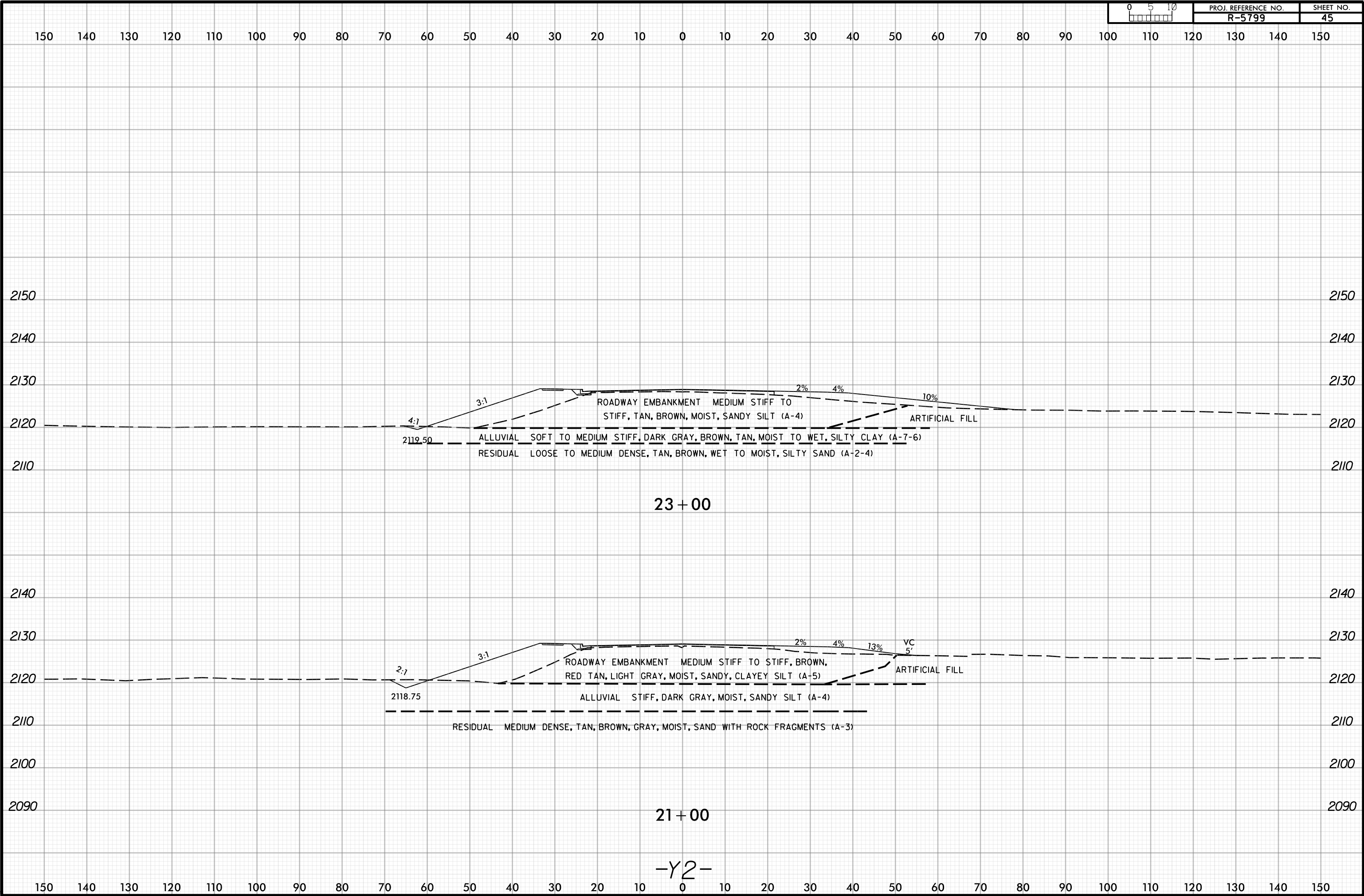




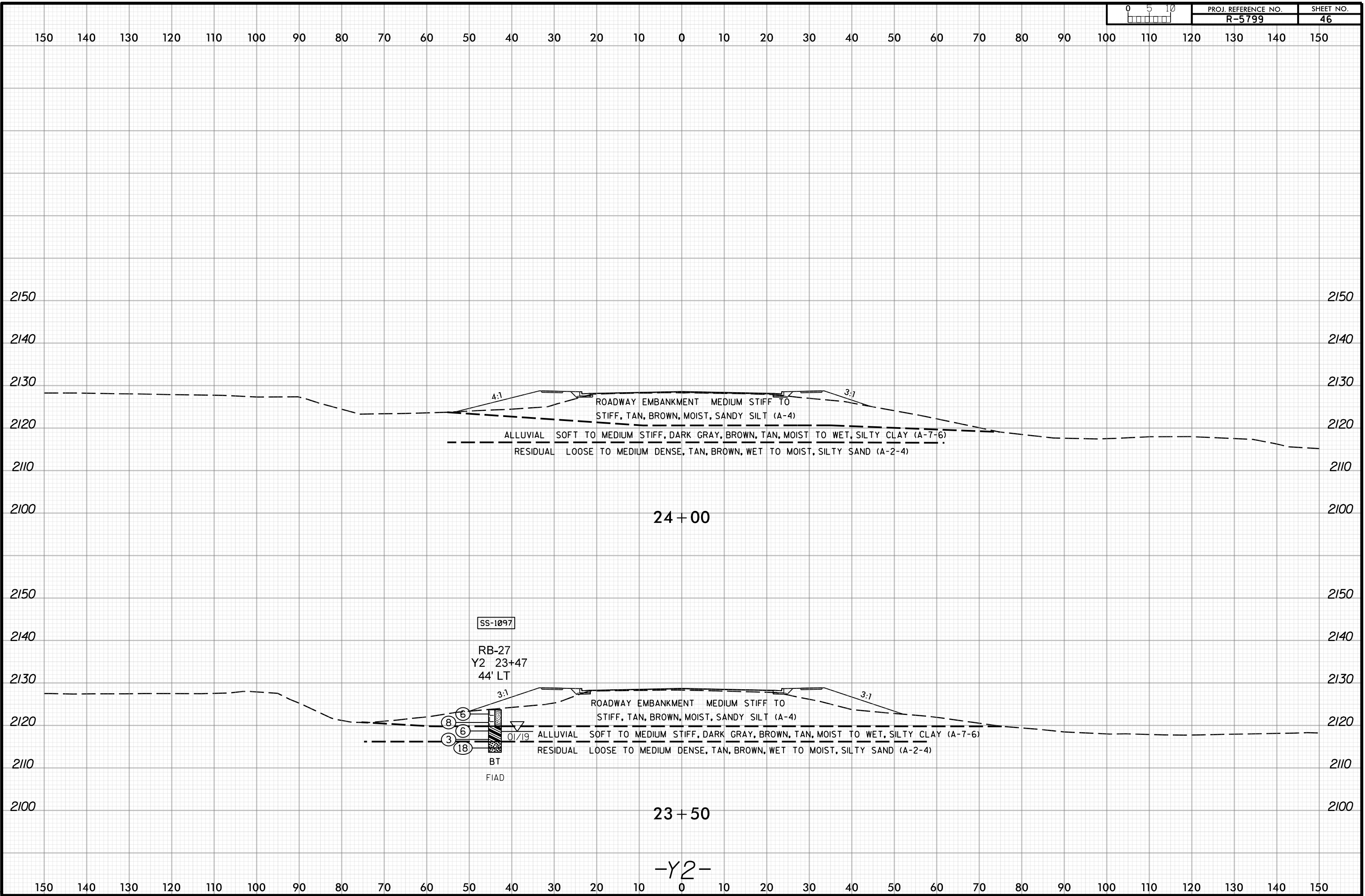


04-NOV-2019 12:45
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 at th...

-Y2-



04-NOV-2019 12:45
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at thilj\A\WXE-71023641



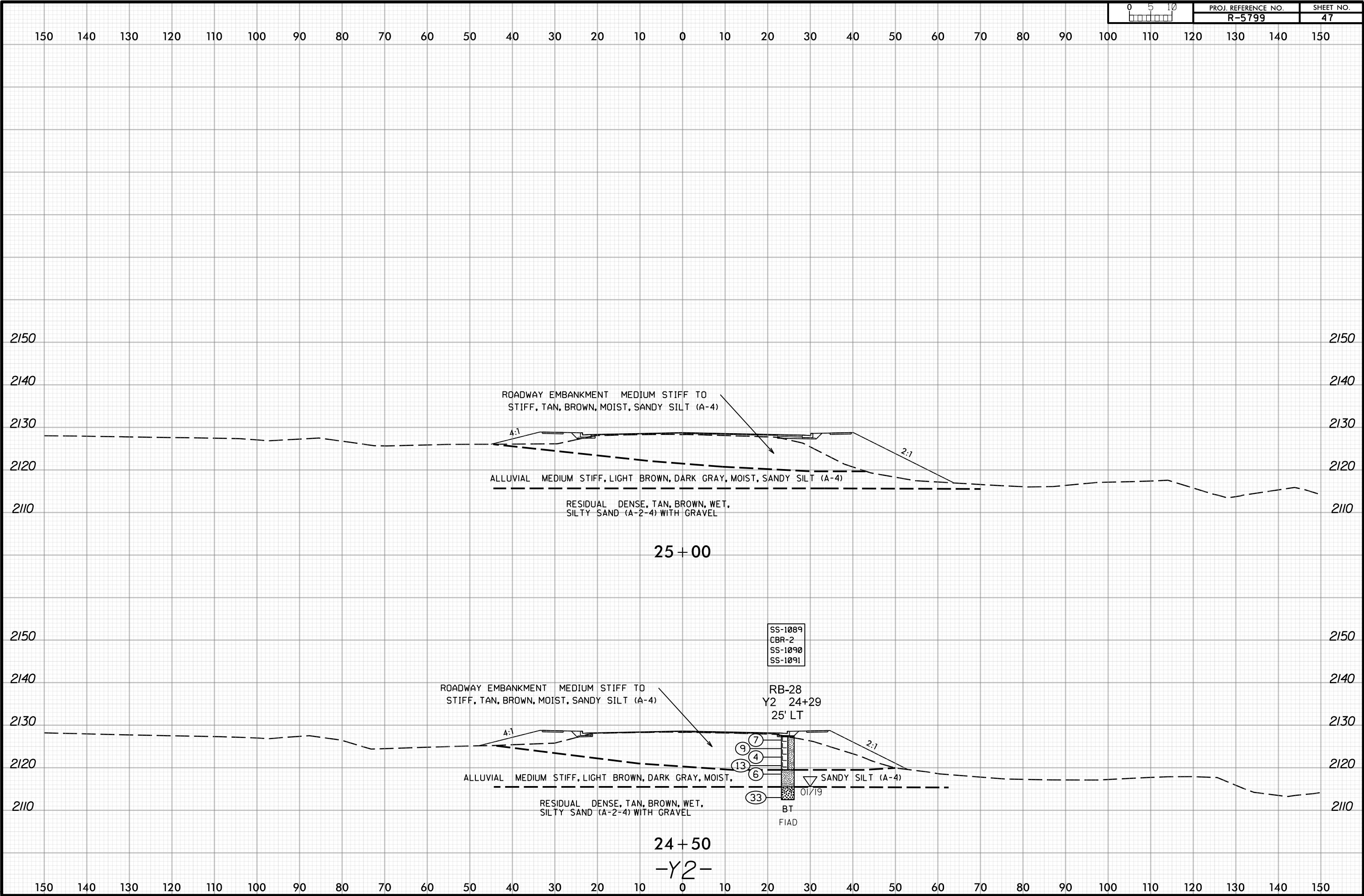
04-NOV-2019 12:45
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24+00

23+50

-Y2-

6/23/16
04-NOV-2019 12:45
N:\Projects\2019\71195003\RB5799\WBX-71023641\CDOT File Structure\RB5799.GEO\RDWY - tranajl\vania\CADD_GEO\TECH\ssc\RB5799.GEO.XSL.Y2.dgn

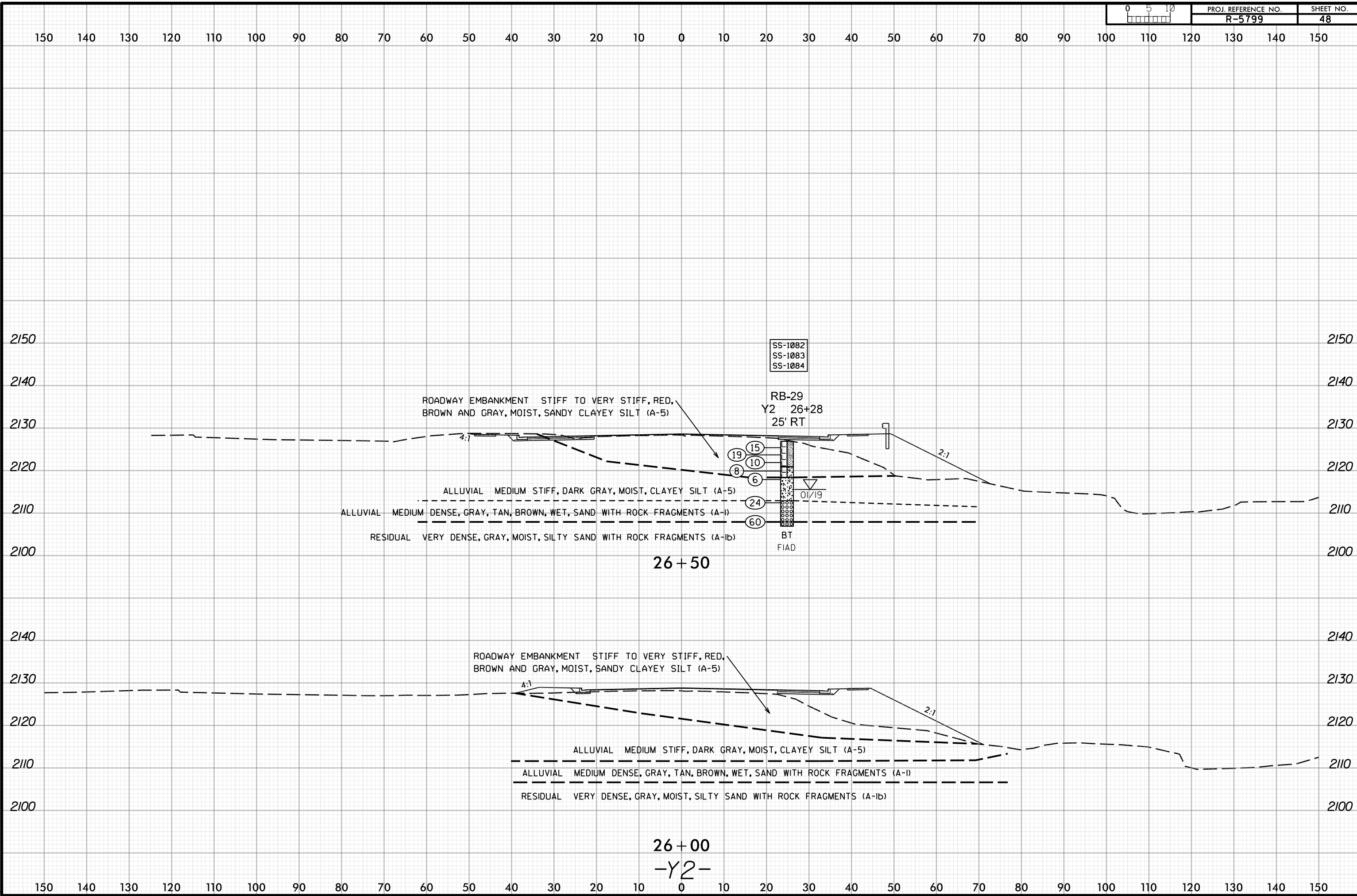


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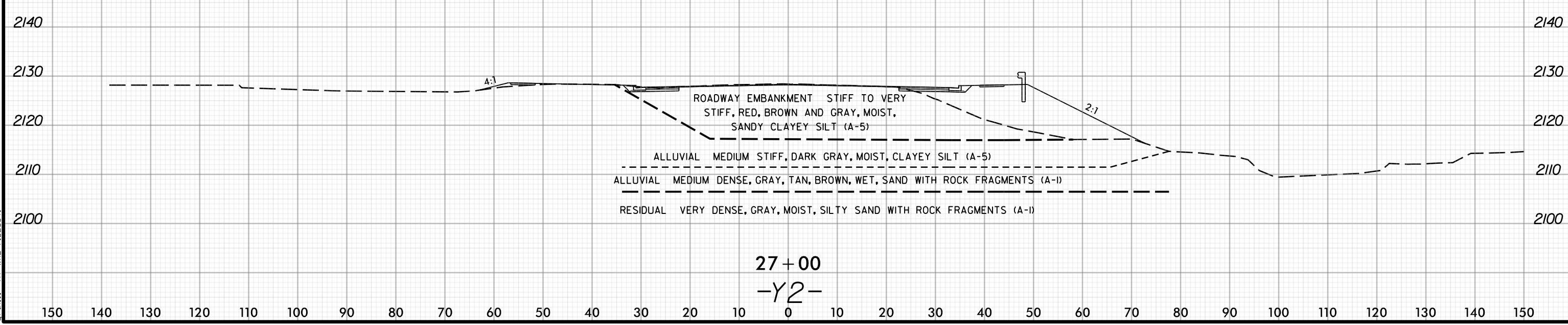
2150
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2110

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2110

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

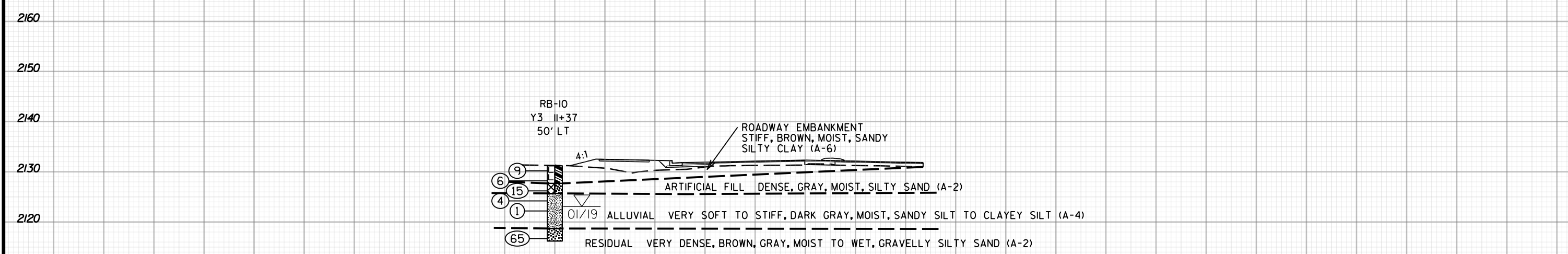
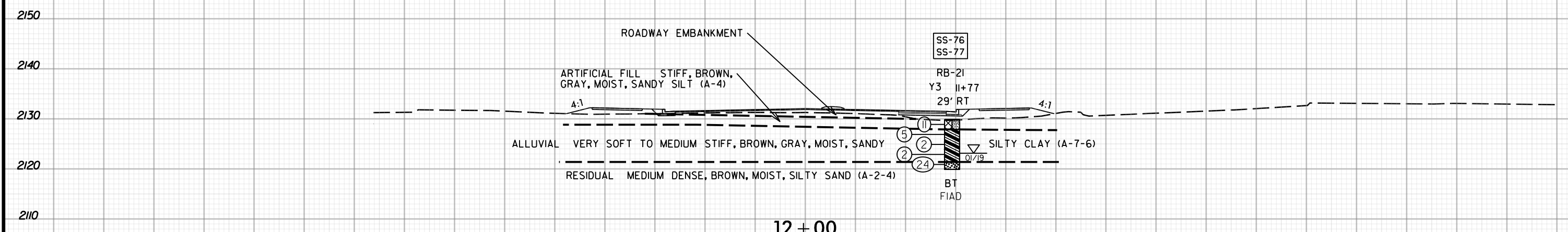


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04-NOV-2019 12:46
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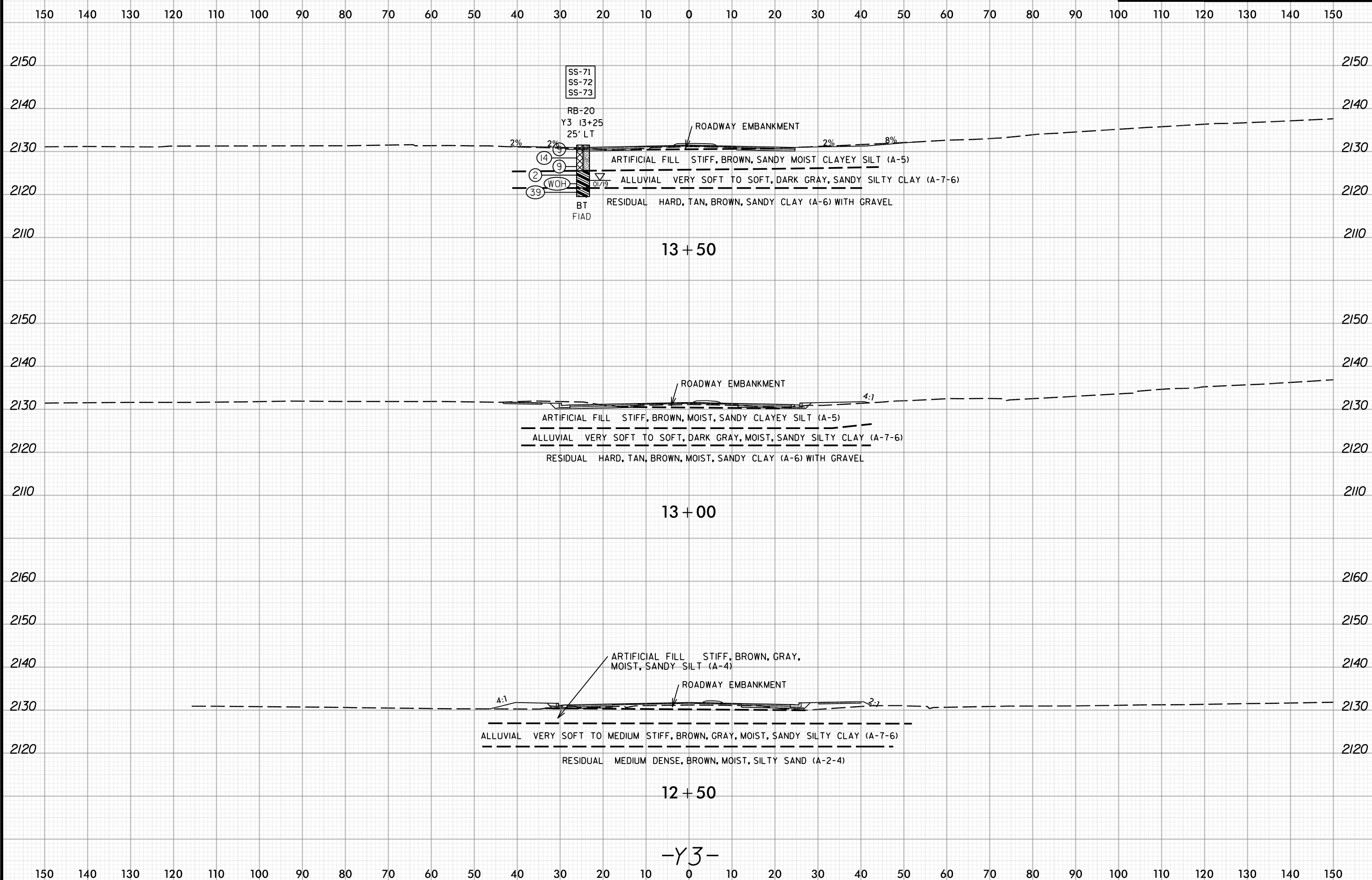
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150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

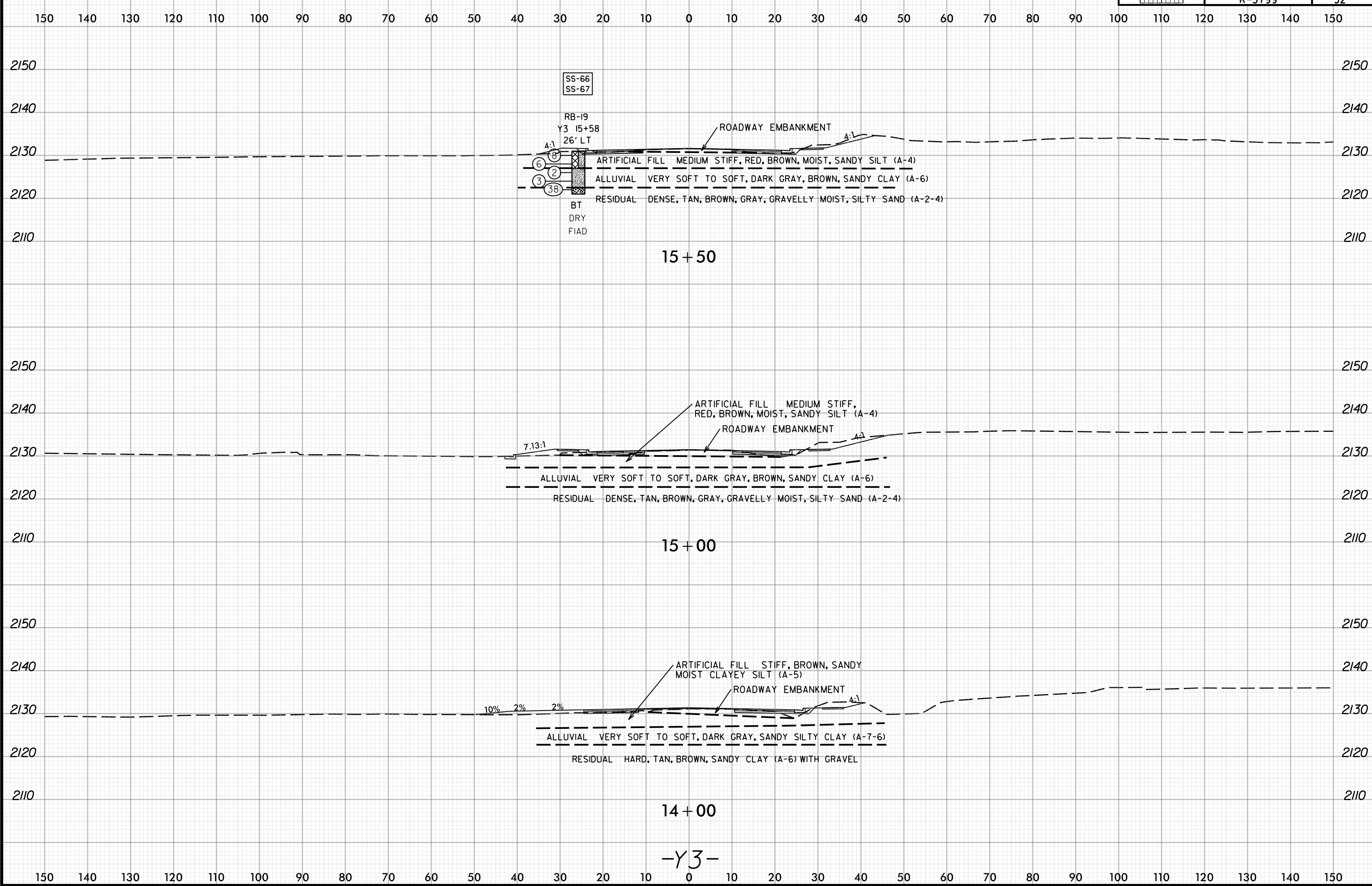
-Y3-

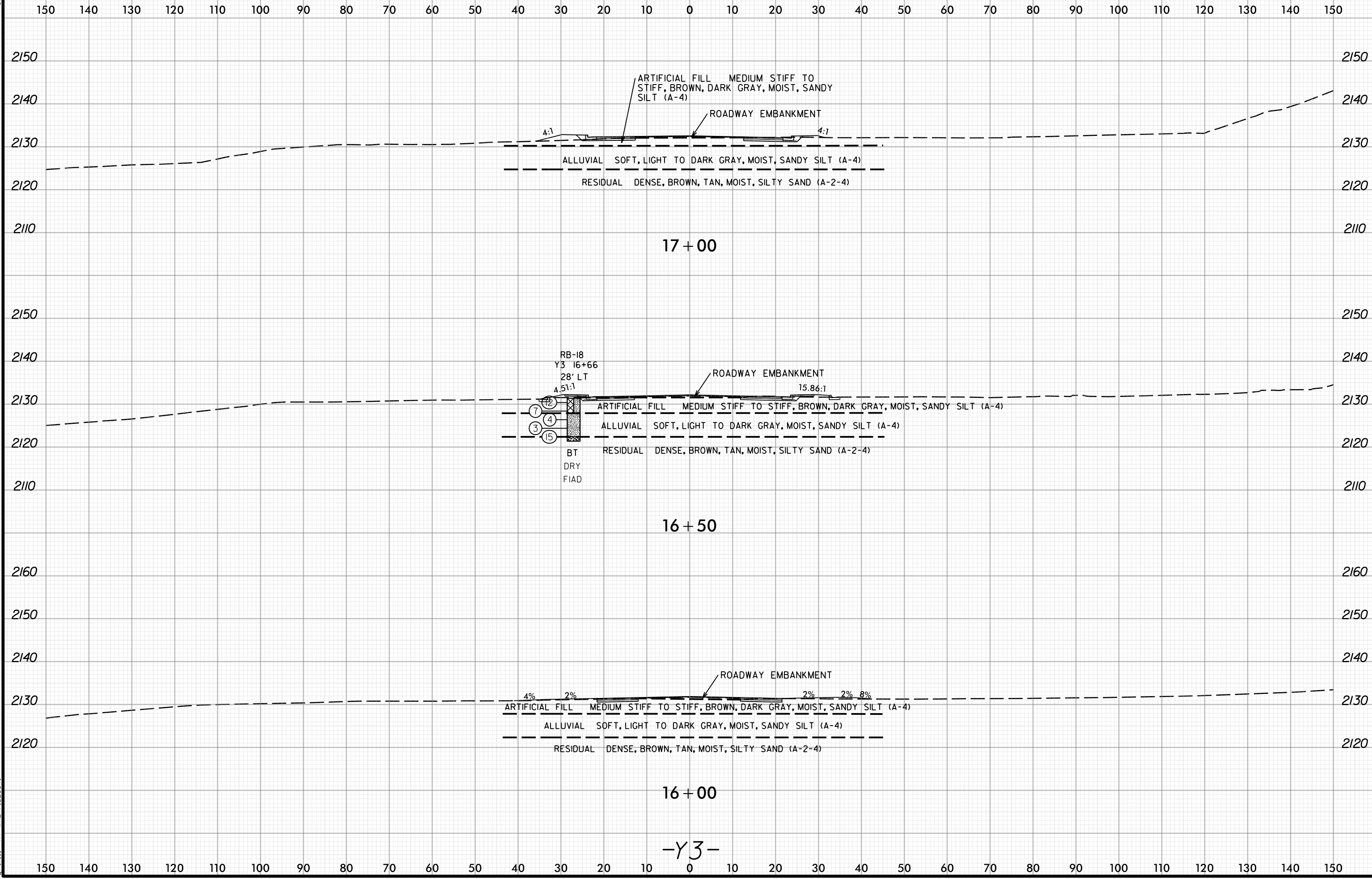
2-AUG-2019 10:55
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-Y3-

2-AUG-2019 10:55 AM C:\p\proj\ec\2019\71195003\VR5799\NCDOT File Structure\VR5799.GEO_PDMY - trans\j\van\cadd\GEO\TECH\ssc\VR5799.GEO.XSL\3.DGN





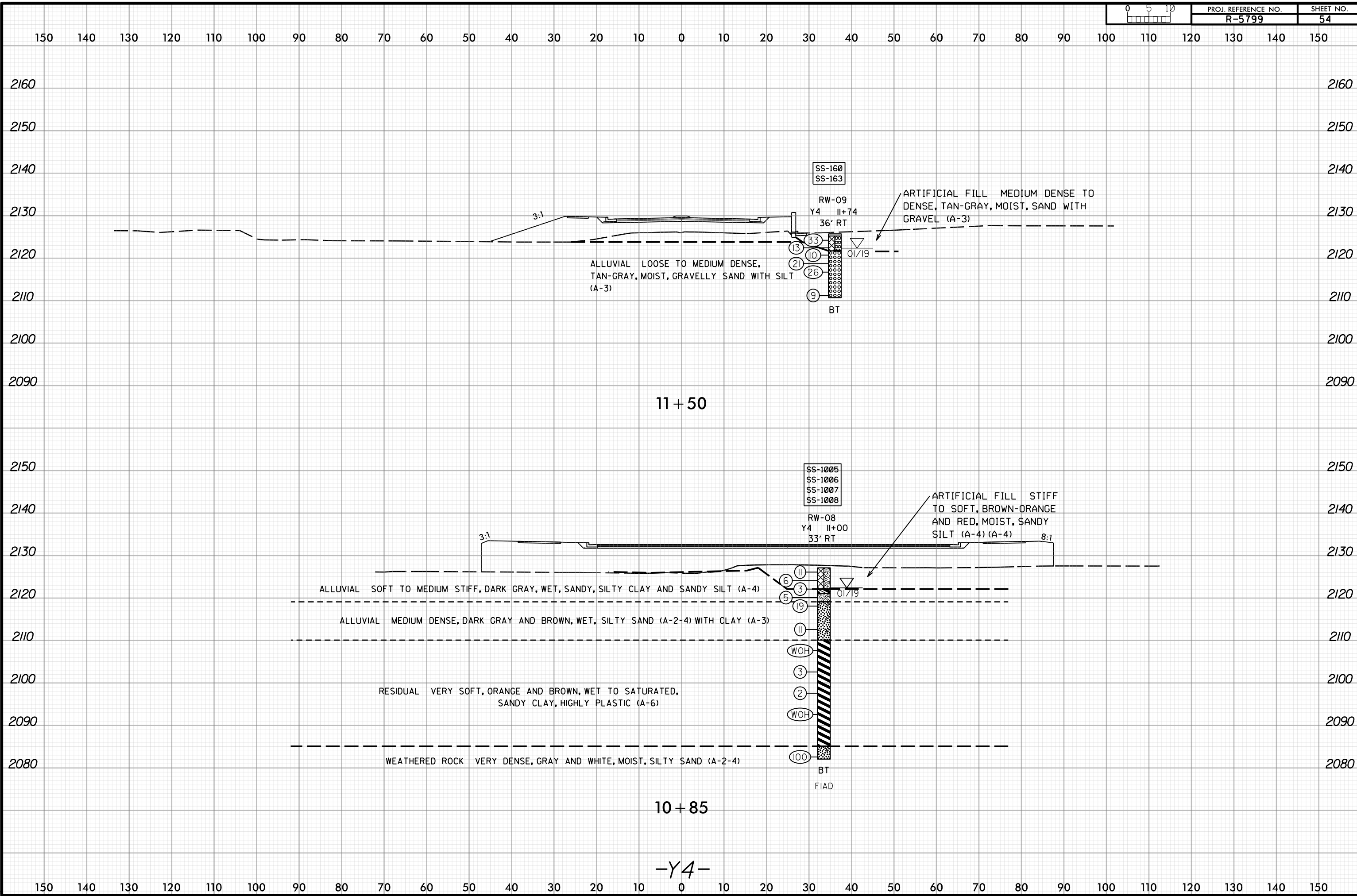
17 + 00

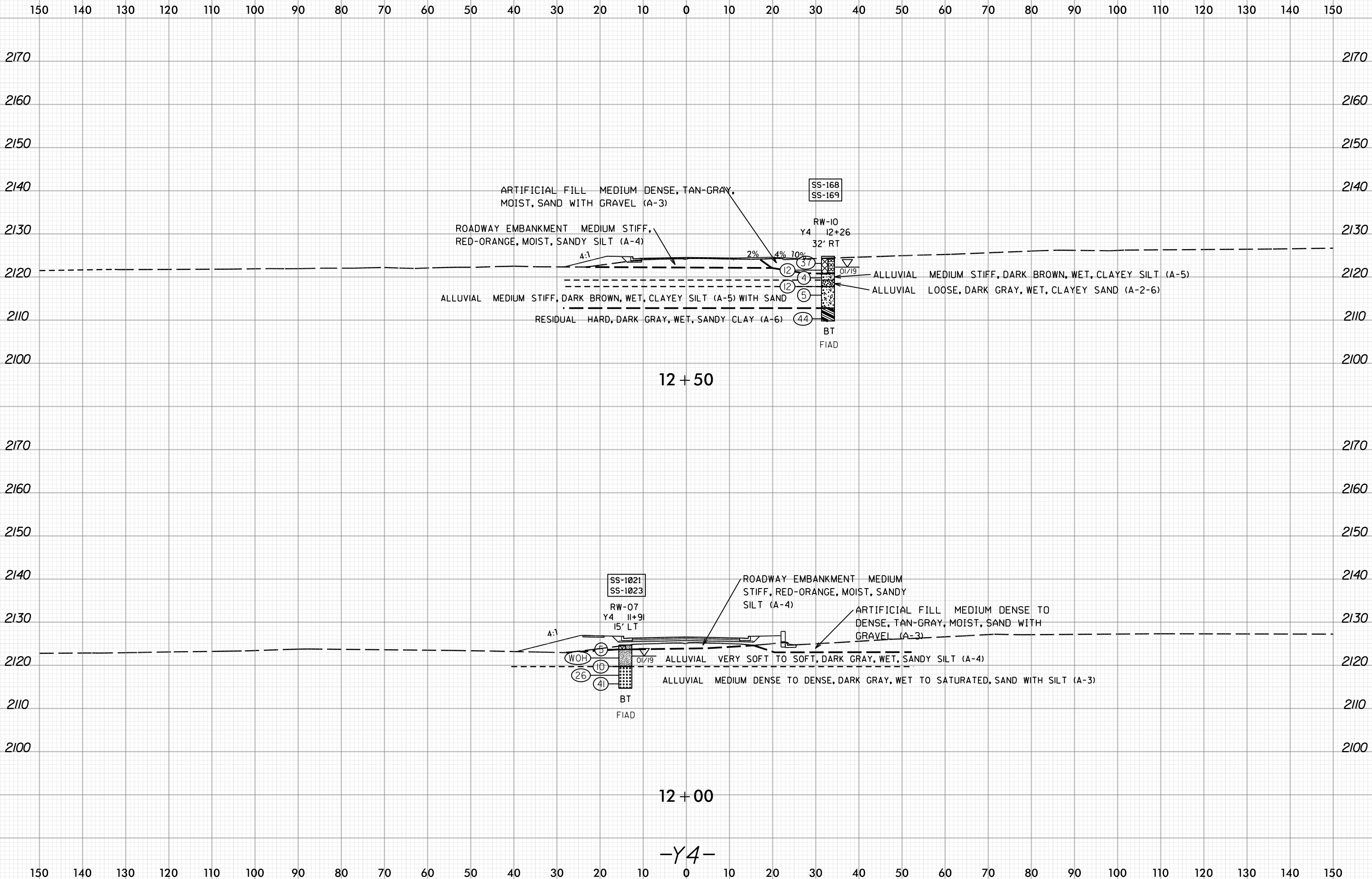
16 + 50

16 + 00

-Y3-

2-AUG-2019 10:55 AM C:\Program Files\Autodesk\AutoCAD 2019\AutoCAD.exe -i -s -u -p -t -l -m -n -o -r -v -w -x -y -z -aa -ac -ad -ae -af -ag -ah -ai -aj -ak -al -am -an -ao -ap -aq -ar -as -at -au -av -aw -ax -ay -az -ba -bb -bc -bd -be -bf -bg -bh -bi -bj -bk -bl -bm -bn -bo -bp -bq -br -bs -bt -bu -bv -bw -bx -by -bz -ca -cb -cc -cd -ce -cf -cg -ch -ci -cj -ck -cl -cm -cn -co -cp -cq -cr -cs -ct -cu -cv -cw -cx -cy -cz -da -db -dc -dd -de -df -dg -dh -di -dj -dk -dl -dm -dn -do -dp -dq -dr -ds -dt -du -dv -dw -dx -dy -dz -ea -eb -ec -ed -ee -ef -eg -eh -ei -ej -ek -el -em -en -eo -ep -eq -er -es -et -eu -ev -ew -ex -ey -ez -fa -fb -fc -fd -fe -ff -fg -fh -fi -fj -fk -fl -fm -fn -fo -fp -fq -fr -fs -ft -fu -fv -fw -fx -fy -fz -ga -gb -gc -gd -ge -gf -gg -gh -gi -gj -gk -gl -gm -gn -go -gp -gq -gr -gs -gt -gu -gv -gw -gx -gy -gz -ha -hb -hc -hd -he -hf -hg -hh -hi -hj -hk -hl -hm -hn -ho -hp -hq -hr -hs -ht -hu -hv -hw -hx -hy -hz -ia -ib -ic -id -ie -if -ig -ih -ii -ij -ik -il -im -in -io -ip -iq -ir -is -it -iu -iv -iw -ix -iy -iz -ja -jb -jc -jd -je -jf -jg -jh -ji -jj -jk -jl -jm -jn -jo -jp -jq -jr -js -jt -ju -jv -jw -jx -jy -jz -ka -kb -kc -kd -ke -kf -kg -kh -ki -kj -kk -kl -km -kn -ko -kp -kq -kr -ks -kt -ku -kv -kw -kx -ky -kz -la -lb -lc -ld -le -lf -lg -lh -li -lj -lk -ll -lm -ln -lo -lp -lq -lr -ls -lt -lu -lv -lw -lx -ly -lz -ma -mb -mc -md -me -mf -mg -mh -mi -mj -mk -ml -mm -mn -mo -mp -mq -mr -ms -mt -mu -mv -mw -mx -my -mz -na -nb -nc -nd -ne -nf -ng -nh -ni -nj -nk -nl -nm -nn -no -np -nq -nr -ns -nt -nu -nv -nw -nx -ny -nz -oa -ob -oc -od -oe -of -og -oh -oi -oj -ok -ol -om -on -oo -op -oq -or -os -ot -ou -ov -ow -ox -oy -oz -pa -pb -pc -pd -pe -pf -pg -ph -pi -pj -pk -pl -pm -pn -po -pp -pq -pr -ps -pt -pu -pv -pw -px -py -pz -qa -qb -qc -qd -qe -qf -qg -qh -qi -qj -qk -ql -qm -qn -qo -qp -qq -qr -qs -qt -qu -qv -qw -qx -qy -qz -ra -rb -rc -rd -re -rf -rg -rh -ri -rj -rk -rl -rm -rn -ro -rp -rq -rr -rs -rt -ru -rv -rw -rx -ry -rz -sa -sb -sc -sd -se -sf -sg -sh -si -sj -sk -sl -sm -sn -so -sp -sq -sr -ss -st -su -sv -sw -sx -sy -sz -ta -tb -tc -td -te -tf -tg -th -ti -tj -tk -tl -tm -tn -to -tp -tq -tr -ts -tt -tu -tv -tw -tx -ty -tz -ua -ub -uc -ud -ue -uf -ug -uh -ui -uj -uk -ul -um -un -uo -up -uq -ur -us -ut -uu -uv -uw -ux -uy -uz -va -vb -vc -vd -ve -vf -vg -vh -vi -vj -vk -vl -vm -vn -vo -vp -vq -vr -vs -vt -vu -vv -vw -vx -vy -vz -wa -wb -wc -wd -we -wf -wg -wh -wi -wj -wk -wl -wm -wn -wo -wp -wq -wr -ws -wt -wu -wv -ww -wx -wy -wz -xa -xb -xc -xd -xe -xf -xg -xh -xi -xj -xk -xl -xm -xn -xo -xp -xq -xr -xs -xt -xu -xv -xw -xx -xy -xz -ya -yb -yc -yd -ye -yf -yg -yh -yi -yj -yk -yl -ym -yn -yo -yp -yq -yr -ys -yt -yu -yv -yw -yx -yy -yz -za -zb -zc -zd -ze -zf -zg -zh -zi -zj -zk -zl -zm -zn -zo -zp -zq -zr -zs -zt -zu -zv -zw -zx -zy -zz





2:\AUG-2019 18:55
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6/23/16

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

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2110
2100

ALLUVIAL LOOSE, DARK GRAY, WET, CLAYEY SAND (A-2-6)

ROADWAY EMBANKMENT

4:1

ALLUVIAL MEDIUM STIFF, DARK BROWN, WET, CLAYEY SILT (A-5)

ALLUVIAL MEDIUM STIFF, DARK BROWN, WET, CLAYEY SILT (A-5) WITH SAND

RESIDUAL HARD, DARK GRAY, WET, SANDY CLAY (A-6)

12 + 85

-Y4-

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

2-AUG-2019 10:55 N:\P\Projects\2019\71195003\VR5799_NCDOT_File_Structure\VR5799_GEO_PDMY_trans\j\vr5799\GEO_XSI_14.DGN

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

2160

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2110

2110

- SS-1026
- SS-1027
- SS-1028
- SS-1029
- SS-1032

RW-12
Y5 11+42
34' RT

01/19

ARTIFICIAL FILL, MEDIUM STIFF TO STIFF, TAN, MOIST, SANDY CLAY (A-6)

ALLUVIAL VERY SOFT, DARK BROWN, WET, SANDY SILT (A-4) AND SILT (A-4) WITH ORGANICS (ORGANIC CONTENT = 42%)

RESIDUAL MEDIUM DENSE, BROWN AND GRAY, WET, SILTY FINE TO COARSE SAND (A-2-4)

BT

11 + 50

2160

2160

2150

2150

2140

2140

2130

2130

2120

2120

2110

2110

- SS-1044
- SS-1046
- SS-1049

RW-11
Y5 10+99
70' RT

01/19

ARTIFICIAL FILL, LOOSE, TAN, MOIST, CLAYEY SAND (A-2)

ARTIFICIAL FILL MEDIUM STIFF TO STIFF, TAN, GRAY, AND BROWN, MOIST, SANDY SILT (A-4)

ALLUVIAL VERY SOFT, DARK BROWN, WET, SILT (A-4) WITH ORGANICS (ORGANIC CONTENT = 23%)

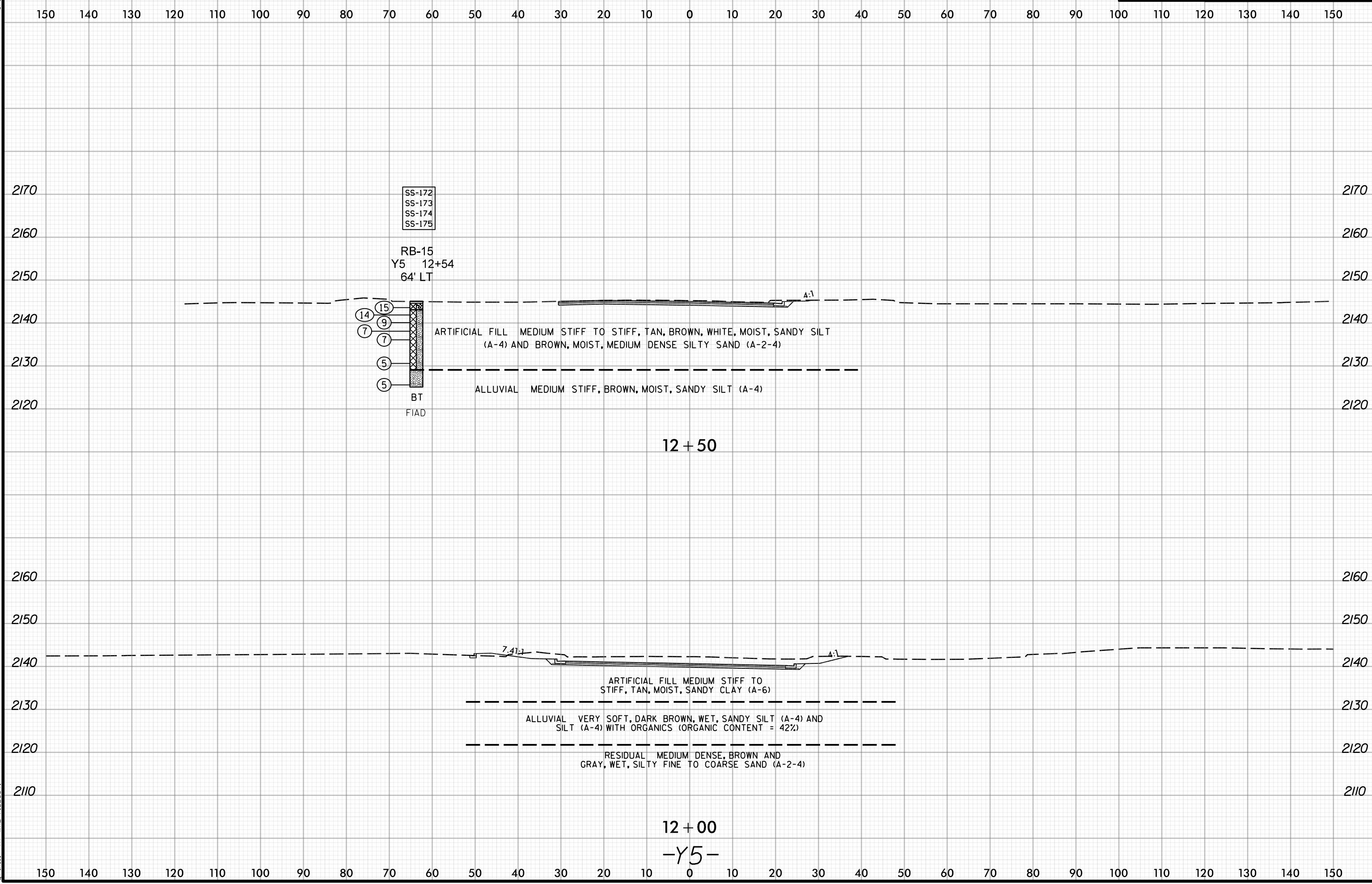
RESIDUAL VERY DENSE, GRAY, MOIST, SILTY FINE TO MEDIUM SAND (A-2)

BT

FIAD

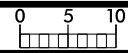
10 + 85
-Y5-

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



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6/23/16



PROJ. REFERENCE NO.
R-5799

SHEET NO.
59

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

2170

2170

2160

2160

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2150

2140

2140

2130

2130

2120

2120

4:1

ARTIFICIAL FILL MEDIUM STIFF TO STIFF, TAN, BROWN, WHITE, MOIST, SANDY SILT (A-4) AND BROWN, MOIST, MEDIUM DENSE SILTY SAND (A-2-4)

ALLUVIAL MEDIUM STIFF, BROWN, MOIST, SANDY SILT (A-4)

12+75

-Y5-

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

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

REFERENCE: R-5799

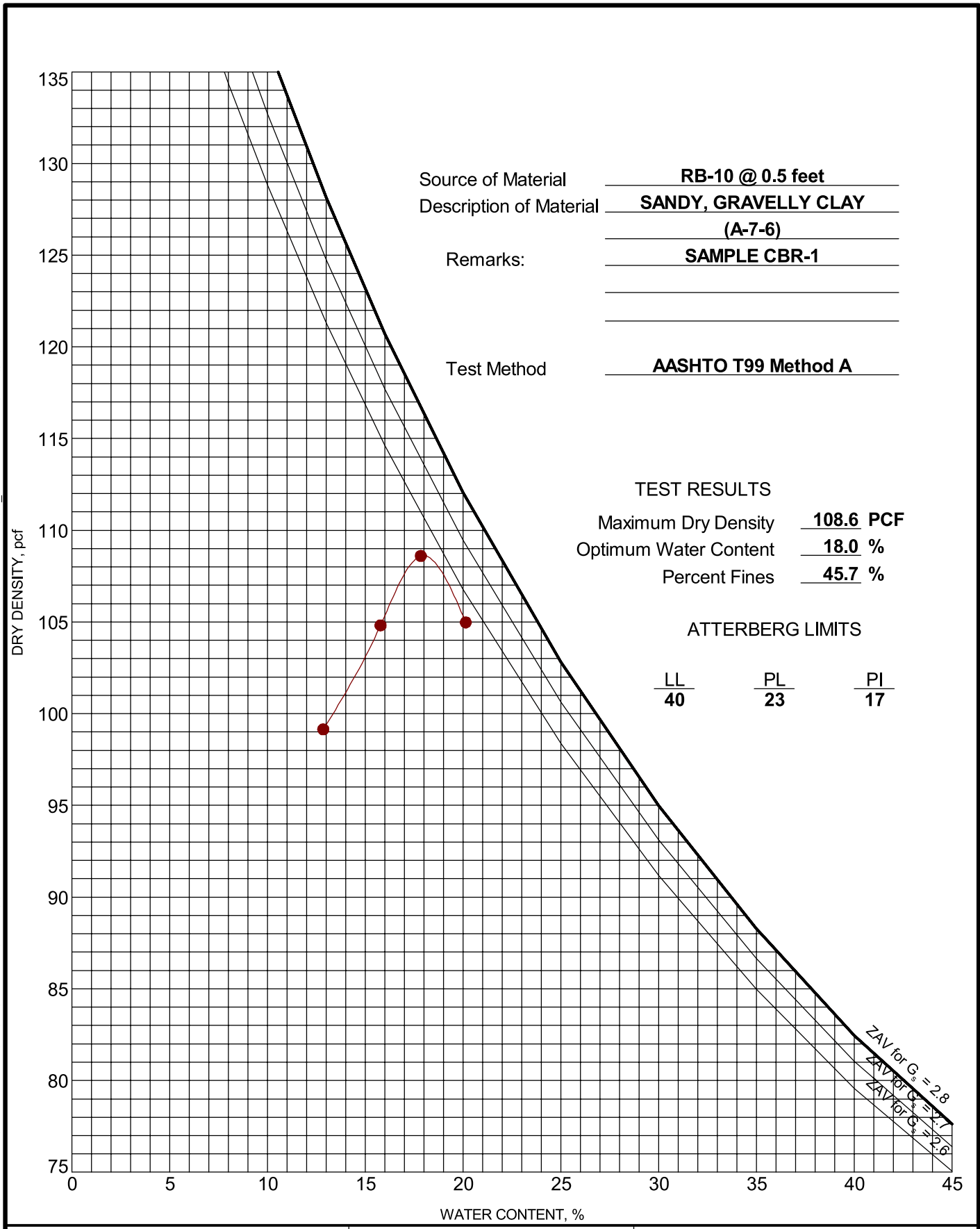
PROJECT: 44984

Prepared in the Office of:

Terracon
Consulting Engineers and Scientists

2701 WESTPORT ROAD
CHARLOTTE, NORTH CAROLINA 28208
NC REGISTERED ENGINEERING FIRM: F-0869
NC REGISTERED GEOLOGIC FIRM: C-367

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. COMPACTON - V2, 71195003 R-5799 - CBR AND PROCTOR.GPJ TERRACON_DATATEMPLATE.GDT, 3/22/19



Source of Material: RB-10 @ 0.5 feet
 Description of Material: SANDY, GRAVELLY CLAY (A-7-6)
 Remarks: SAMPLE CBR-1
 Test Method: AASHTO T99 Method A

PROJECT: R-5799
 SITE: US64 NC280 Intersection Design
 PISGAH FOREST, NC

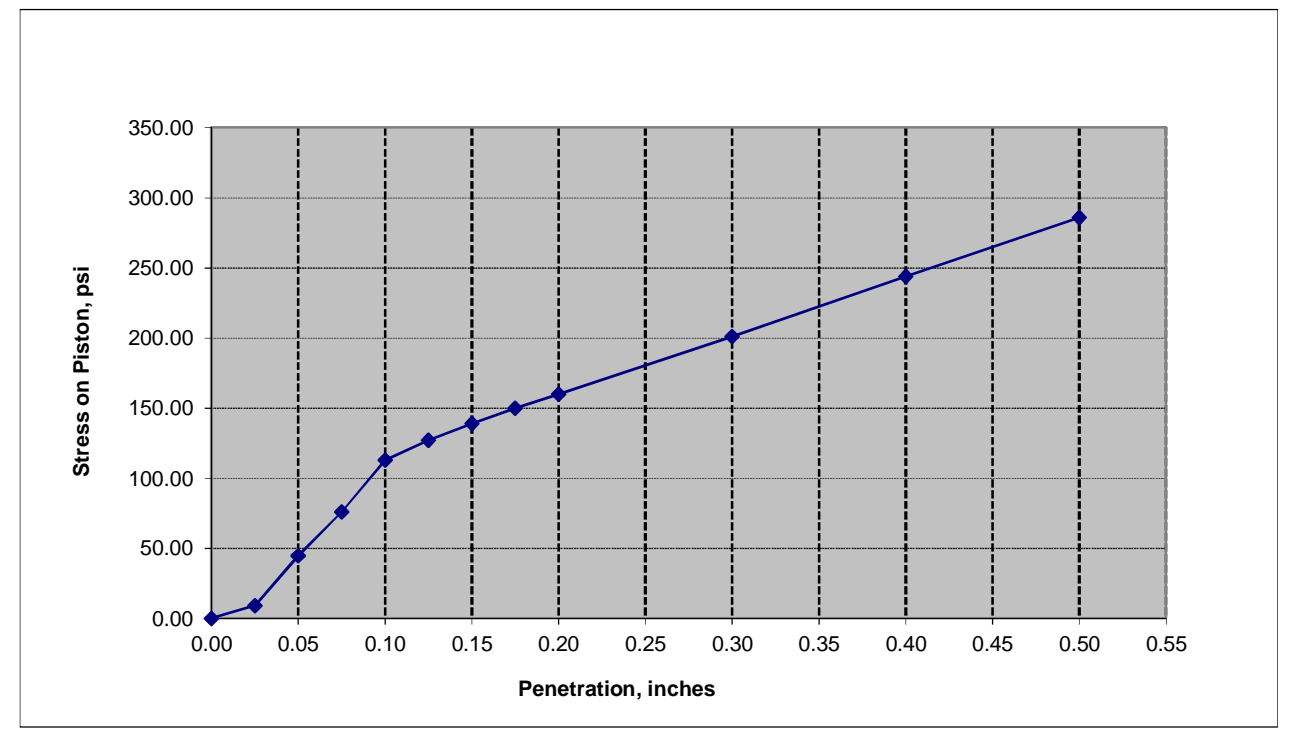


PROJECT NUMBER: 71195003
 CLIENT: RS&H
 ARCHITECTS-ENGINEERS-PLANNERS, INC.
 CHARLOTTE, NC
 EXHIBIT: B-1

California Bearing Ratio (CBR) Test

Project: R-5799 (US64 at NC280 Intersection Design) Project No.: 71195003
 Sample: RB-10 (-L- STA. 22+12, 99' LT) Date: 3/21/2019
 Client: RS&H Engineer: J. Manke
 Sample Description: Sandy, Gravelly Clay (A-7-6) Soaked

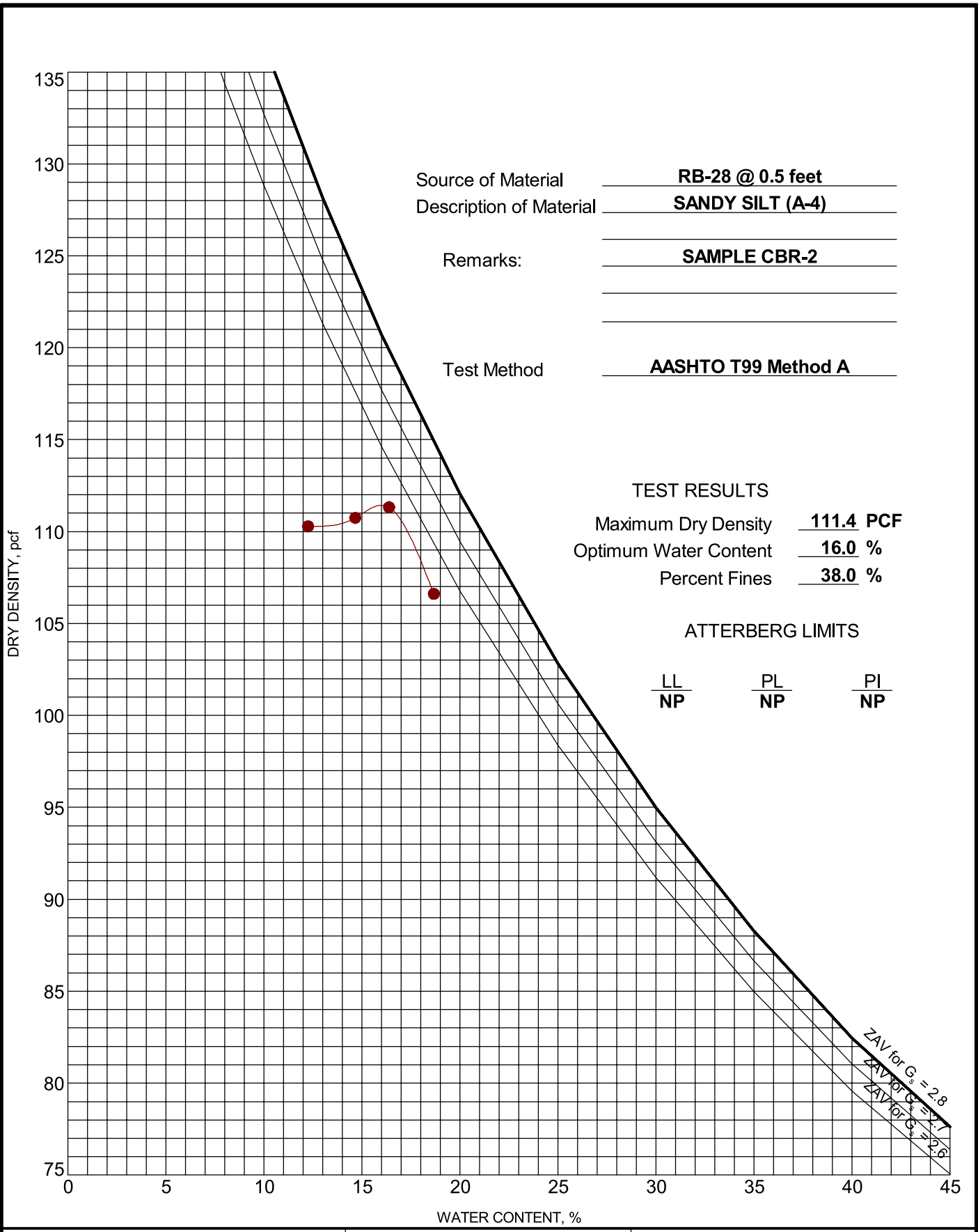
LAB ID#: CBR-1 (0.5 to 2 feet)



Sample No.	1
Maximum Dry Density, (pcf)	108.6
Optimum Moisture Content, (%)	18.0
Dry Density before Soaking, (pcf)	106.8
Degree of Compaction, (%)	98.3
Dry Density after Soaking, (pcf)	102.4
Moisture Content, (%)	
Before Compaction	17.5
After Compaction	17.7
Top 1" After Soaking	25.5
Average After Soaking	-
Surcharge, (lbs)	10
Swell, (%)	0.49
Bearing Ratio (%)	11.3
Corrected Bearing Ratio, (%)	12.9

EXHIBIT B-2

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. COMPACTION - V2, 71195003 R-5799 - CBR AND PROCTOR.GPJ TERRACON_DATATEMPLATE.GDT, 3/22/19

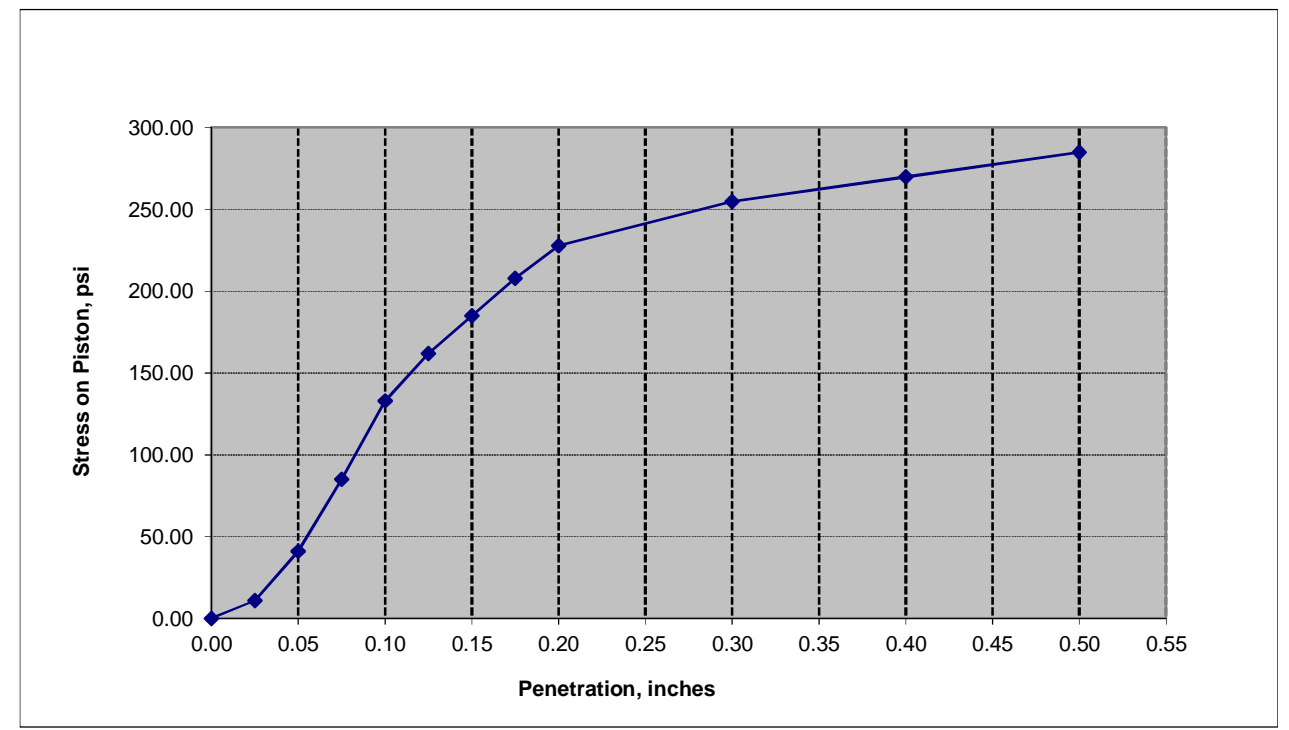


PROJECT: R-5799	 <p>2701 Westport Rd Charlotte, NC</p>	PROJECT NUMBER: 71195003
SITE: US64 NC280 Intersection Design PISGAH FOREST, NC		CLIENT: RS&H ARCHITECTS-ENGINEERS-PLANNERS, INC. CHARLOTTE, NC
		EXHIBIT: B-3

California Bearing Ratio (CBR) Test

Project:	R-5799 (US64 at NC280 Intersection Design)	Project No.:	71195003
Sample:	RB-28 (-Y2- STA. 24+29, 25' RT)	Date:	3/21/2019
Client:	RS&H	Engineer:	J. Manke
Sample Description:	Sandy Silt (A-4)		Soaked

LAB ID#: CBR-2 (0.5 to 2 feet)



Sample No.	CBR-2
Maximum Dry Density, (pcf)	111.4
Optimum Moisture Content, (%)	16.0
Dry Density before Soaking, (pcf)	111.9
Degree of Compaction, (%)	100.4
Dry Density after Soaking, (pcf)	118.0
Moisture Content, (%)	
Before Compaction	16.0
After Compaction	15.1
Top 1" After Soaking	17.5
Average After Soaking	-
Surcharge, (lbs)	10
Swell, (%)	0.04
Bearing Ratio (%)	13.3
Corrected Bearing Ratio, (%)	16.5

EXHIBIT B-4

