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REFERENCE: I-5714

PROJECT: 50127

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.	I-5714	1	39

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EC2ABBE99DB48C... 4/10/2017

SIGNATURE DATE

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-YWB-	18+26 - 35+74	6	9-10
-YIO-	10+00 - 11+14	4	
-YII-	10+32 - 14+90	4	
-RPA-	10+00 - 23+61	8	11
-RPB-	10+00 - 21+50	8	11
-RPC-	13+28 - 25+58	7	12
-RPD-	18+13 - 28+66	7	12
-SPURA-	10+00 - 12+70	5	13
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CROSS SECTIONS

LINE	STATION	SHEETS
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-RPB-	11+98 - 13+00	28
-RPD-	25+50 - 27+82	29-30
-SPURA-	10+43 - 11+38	31
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ROADWAY SUBSURFACE INVESTIGATION

COUNTY MECKLENBURG
PROJECT DESCRIPTION I-77 & SR 2136 (GILEAD RD)
INTERCHANGE - UPGRADE EXISTING DIAMOND
INTERCHANGE TO DIVERGING DIAMOND
INTERCHANGE

INVENTORY

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

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

SOIL LEGEND AND AASHTO CLASSIFICATION

Table with columns for General Class, Group Class, Symbol, % Passing, Material Passing, Group Index, Usual Types of Major Materials, and Gen. Rating as Subgrade. Includes AASHTO soil classification symbols and descriptions.

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

CONSISTENCY OR DENSENESS

Table mapping soil types (e.g., Generally Granular Material, Generally Silty-Clay Material) to consistency/denseness levels (e.g., Very Loose, Medium Dense, Very Dense) and unconfined compressive strength ranges.

TEXTURE OR GRAIN SIZE

Table showing U.S. Std. Sieve Size (mm) and corresponding grain size ranges for Boulder, Cobble, Gravel, Coarse Sand, Fine Sand, Silt, and Clay.

SOIL MOISTURE - CORRELATION OF TERMS

Table correlating Soil Moisture Scale (Atterberg Limits) with Field Moisture Description (e.g., Saturated, Wet, Moist, Dry) and Guide for Field Moisture Description.

PLASTICITY

Table showing Plasticity Index (PI) ranges (Non-Plastic, Slightly Plastic, Moderately Plastic, Highly Plastic) and corresponding Dry Strength levels (Very Low, Slight, Medium, High).

COLOR

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

GRADATION

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

ANGULARITY OF GRAINS

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

MINERALOGICAL COMPOSITION

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

COMPRESSIBILITY

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

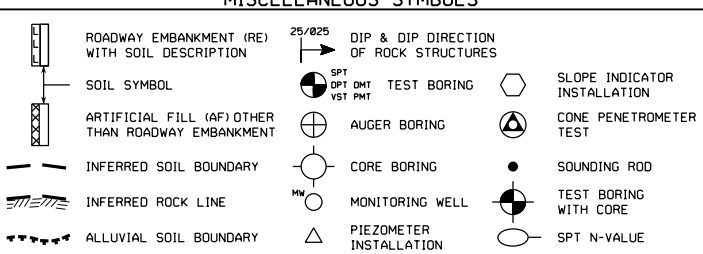
PERCENTAGE OF MATERIAL

Table showing percentages for Organic Material, Granular Soils, Silty-Clay Soils, and Other Material.

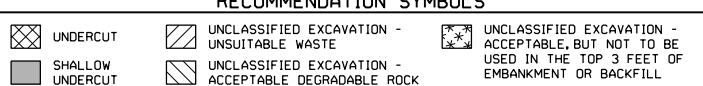
GROUND WATER

Water level symbols: Water level in bore hole immediately after drilling, Static water level after 24 hours, Perched water, saturated zone, or water bearing strata, Spring or seep.

MISCELLANEOUS SYMBOLS



RECOMMENDATION SYMBOLS



ABBREVIATIONS

Table of abbreviations for AR (Auger Refusal), BT (Boring Terminated), CL (Clay), CPT (Cone Penetration Test), CSE (Coarse), DMT (Dilatometer Test), DPT (Dynamic Penetration Test), e (Void Ratio), F (Fine), FOSS (Fossiliferous), FRAC (Fractured/Fractures), FRAG (Fragments), HI (Highly), MED (Medium), MICA (Micaceous), MOD (Moderately), NP (Non-Plastic), ORG (Organic), PMT (Pressuremeter Test), SAP (Saprolite), SD (Sand/Sandy), SL (Silt/Silty), SLI (Slightly), TCR (Tricone Refusal), w (Moisture Content), V (Very), VST (Vane Shear Test), WEA (Weathered), U (Unit Weight), D (Dry Unit Weight), SAMPLE ABBREVIATIONS (S, SS, ST, RS, RT, CBR, etc.).

EQUIPMENT USED ON SUBJECT PROJECT

Form for recording equipment used, including Drill Units (CME-550-X, Dierich D-50, CME-55, Vane Shear Test, Portable Hoist), Advancing Tools (Clay Bits, Continuous Flight Auger, Hollow Augers, Hard Faced Finger Bits, Tung-Carbide Inserts, Casing, Tricone, Core Bit), Hammer Type (Automatic, Manual), Core Size (-B, -H, -N), and Hand Tools (Post Hole Digger, Hand Auger, Sounding Rod, Vane Shear Test).

ROCK DESCRIPTION

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

WEATHERED ROCK (WR) NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.

CRYSTALLINE ROCK (CR) FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.

NON-CRYSTALLINE ROCK (NCR) FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.

COASTAL PLAIN SEDIMENTARY ROCK (CP) COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.

WEATHERING

Descriptions of weathering levels: FRESH (Rock fresh, crystals bright, few joints), VERY SLIGHT (S.L.I.) (Rock generally fresh, joints stained), SLIGHT (S.L.) (Rock generally fresh, joints stained and discoloration extends), MODERATE (MOD.) (Significant portions of rock show discoloration), MODERATELY SEVERE (MOD. SEV.) (All rock except quartz discolored or stained), SEVERE (SEV.) (All rock except quartz discolored or stained, rock fabric clear), VERY SEVERE (V. SEV.) (All rock except quartz discolored or stained, rock fabric elements discernible), COMPLETE (Rock reduced to soil, rock fabric not discernible).

ROCK HARDNESS

Descriptions of rock hardness levels: VERY HARD (Cannot be scratched by knife or sharp pick), HARD (Can be scratched by knife or pick only with difficulty), MODERATELY HARD (Can be scratched by knife or pick, gouges or grooves to 0.25 inches deep), MEDIUM HARD (Can be grooved or gouged 0.05 inches deep), SOFT (Can be grooved or gouged readily by knife or pick), VERY SOFT (Can be carved with knife).

FRACTURE SPACING

Table mapping Fracture Spacing (Very Wide, Wide, Moderately Close, Close, Very Close) to Bedding Thickness (Very Thickly Bedded, Thickly Bedded, Thinly Bedded, Very Thinly Bedded, Thickly Laminated, Thinly Laminated).

INDURATION

Descriptions of induration levels: FRIABLE (Rubbing with finger frees numerous grains), MODERATELY INDURATED (Grains can be separated from sample with steel probe), INDURATED (Grains are difficult to separate with steel probe), EXTREMELY INDURATED (Sharp hammer blows required to break sample).

TERMS AND DEFINITIONS

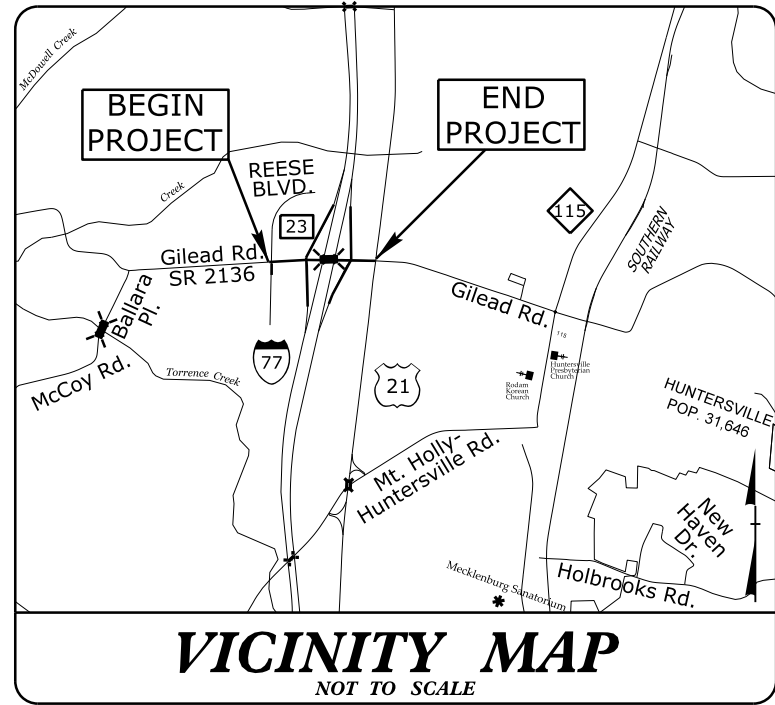
DEFINITIONS: ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN. 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. 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. 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. 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. 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. STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER. BENCH MARK: BL I-5714-18; N-608845.50, E-1446008.21, ELEV.-766.75. CONTROL POINT #820CL: N-609229.67, E-1446466.61, EL.-753.882. LEAD: N-609124.14, E-1446787.05, EL.-773.45 ELEVATION: FEET. NOTES: NORTHINGS AND EASTINGS OBTAINED USING A TRIMBLE GEO7X WITH SUB-FOOT ACCURACY. COORDINATES AND ELEVATION FOR CONTROL POINT #820CL (LOCATED AT STATION 820+00 ALONG I-77 (-L-) CENTERLINE) WAS PROVIDED BY SUGAR CREEK CONSTRUCTION, LLC. ROADWAY BORING ELEVATIONS OBTAINED USING THE PROVIDED ROADWAY DESIGN FILES PROVIDED 02/28/17.

09/28/99

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5714	3	39
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
50127.1.FSI	NHPP-077-1(219)23	PE	

TIP PROJECT: I-5714



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
MECKLENBURG COUNTY

LOCATION: I-77 AT SR 2136 (GILEAD ROAD) INTERCHANGE, UPGRADE EXISTING DIAMOND INTERCHANGE TO DIVERGING DIAMOND

TYPE OF WORK: GRADING, PAVING, DRAINAGE, STRUCTURE, SIGNALS & SIGNING

END CONSTRUCTION
-Y10- STA. 11 + 14.47

PROPOSED BRIDGE

END CONSTRUCTION
-RPA- STA. 23 + 61.84

BEG. PROP. BRIDGE
-YEB- STA. 25 + 34.12

25% PLANS

BEGIN TIP PROJECT I-5714
-Y- STA. 9 + 53.65

BEGIN CONSTRUCTION
-Y11- STA. 10 + 32.00

RETAIN EXISTING BRIDGE

END PROP. BRIDGE
-YEB- STA. 28 + 85.28

END TIP PROJECT I-5714
-Y- STA. 35 + 29.03

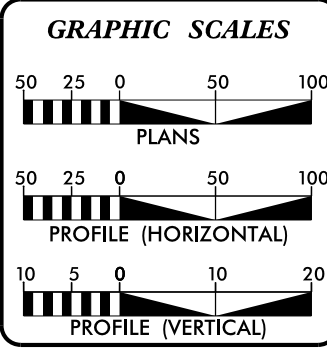
BEGIN CONSTRUCTION
-RPC- STA. 13 + 28.18

BEGIN CONSTRUCTION
-RPD- STA. 18 + 13.17

THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE TOWN OF HUNTERSVILLE.
THIS IS A CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO THE INTERCHANGE.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD ____.

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
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CONTRACT:



DESIGN DATA

ADT 2018 =	40,300
ADT 2040 =	52,300
K =	8 %
D =	55 %
T =	4 % *
V =	40 MPH & 30 MPH
* TTST =	1% DUAL 3%
FUNC CLASS =	MINOR ARTERIAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT I-5714	=	0.424 MI.
LENGTH STRUCTURE TIP PROJECT I-5714	=	0.067 MI.
TOTAL LENGTH OF TIP PROJECT I-5714	=	0.491 MI.

Prepared for the North Carolina Department of Transportation
In the Office of:

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Raleigh, NC 27607
NC License No. C-3705

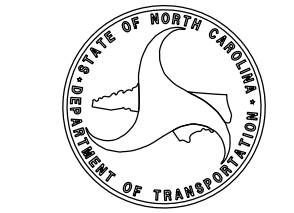
2012 STANDARD SPECIFICATIONS	JIMMY GOODNIGHT, PE PROJECT ENGINEER
RIGHT OF WAY DATE: JULY 21, 2017	
LETTING DATE: JULY 17, 2018	JONATHAN SOIKA, PE PROJECT DESIGN ENGINEER
NCDOT CONTACT	BRYAN KEY, PE PROJECT DESIGN ENGINEER-ROADWAY DESIGN

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.



24-MAR-2017 14:46
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mbrwewer2 AT ECS-T014P6HLL0



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March 31, 2017

WBS NO: 50127.1.FS1
 TIP NO: I-5714
 F.A. NUMBER: 50127
 COUNTY: Mecklenburg
 DESCRIPTION: I-77 & SR 2136 (Gilead Road) Interchange – Upgrade Existing Diamond Interchange to Diverging Diamond Interchange

SUBJECT: Geotechnical Report – Inventory

Project Description

The project is located in Huntersville, Mecklenburg County, North Carolina. This project is identified by the NCDOT as TIP No. I-5714 and will consist of upgrading the existing diamond interchange at I-77 & SR 2136 (Gilead Road) to a diverging diamond interchange. The interchange project also consists of ramps and spurs in each of the four (4) quadrants. The existing bridge on Gilead Road crossing I-77 will remain in-place and will serve as the westbound bridge. A new eastbound bridge will be constructed north of the existing bridge.

Preliminary grading plans indicate cut and fill depths will be minimal (less than 4 feet) along the ramps and spur lines with the exception of an approximately 200-foot long section of Ramp B (approximate station 12+25 to 14+25) which will consist of an approximately 7-foot deep cut.

A geotechnical field investigation consisting of soil test borings and hand auger borings was performed by ECS between March 4 and March 22, 2017. During this time period, a total of eleven (11) standard penetration test (SPT) borings were advanced with ATV- mounted Diedrich D-50 and CME-550 drill rigs, each equipped with an automatic hammer. Two (2) of the borings were drilled for the proposed roadway and nine (9) of the borings were drilled for the proposed Left Lane (-Y-) bridge. Additionally, ten (10), six-foot deep hand auger borings were performed along the various ramp and spur locations. Representative soil samples were collected for visual classification in the field and for analysis by ECS’s testing laboratory.

The following alignments were investigated:

<u>Line</u>	<u>Station (±)</u>	<u>Offsets</u>
-Y-	9+53 to 35+29	LT to RT
-YEB-	18+26 to 35+81	LT to RT
-YWB-	18+26 to 35+74	LT to RT
-Y10-	10+00 to 11+14	LT to RT
-Y11-	10+32 to 14+90	LT to RT
-RPA-	10+00 to 23+61	LT to RT
-RPB-	10+00 to 21+50	LT to RT
-RPC-	13+28 to 25+58	LT to RT
-RPD-	18+13 to 28+66	LT to RT
-SPURA-	10+00 to 12+70	LT to RT
-SPURB-	10+89 to 13+09	LT to RT
-SPURC-	10+00 to 12+55	LT to RT
-SPURD-	10+00 to 11+83	LT to RT

Physiography and Geology

The project site is located in the Piedmont Physiographic Province. In accordance with the Geologic Map of North Carolina, 1985, the predominant rock types in this area are mapped as granodiorite. The virgin soils are the residual product of in-place chemical weathering of rock that was similar to the rock presently underlying the site.

The project corridor is comprised mostly of commercial properties. In the vicinity of the proposed interchange, the area is relatively open with few scattered trees. The topography along the ramps and spur alignments is relatively flat with cut and fill depths expected to be minimal (less than 4 feet). An approximately 7-foot deep cut, approximately 200 feet long, is located along -RPB- from approximate station 12+25 to 14+25. At the existing SR 2136 (Gilead Road) bridge, the topography slopes downward approximately 25 feet to the I-77 corridor.

Soil Properties

The subsurface conditions discussed below are based on interpretation of the hand auger boring, roadway boring, and bridge boring data using normally accepted geotechnical engineering judgments. The transitions between different soil strata are usually less distinct than those shown on the Bore Logs. Sometimes the relatively small sample obtained in the field is insufficient to definitively describe the origin of the subsurface material. Although individual soil test borings are representative of the subsurface conditions at the boring locations on the dates shown, they are not necessarily indicative of subsurface conditions at other locations or at other times.

Soils within the area of this project have been divided into three categories: artificial fill, roadway embankment, and residual soils.

Artificial Fill: Artificial fill (A.F.) soils were encountered along the following alignments and at the approximate stationing:

<u>Line</u>	<u>Station (±)</u>	<u>Offsets</u>
-YEB-	32+00 to 35+81	LT to RT
-RPD-	25+00 to 28+66	LT to RT

The artificial fill encountered generally consisted of red-brown, moist to wet, soft to medium stiff, fine to coarse sandy, silty clay (A-7-5) and extends to depths ranging from approximately 3.0 to 5.0 feet below existing grades. Laboratory testing indicated PI's ranging from 22 to 25 for the A-7-5 soils.

Roadway Embankment: Roadway Embankment (R.E.) soils were encountered along the following alignments and at the approximate stationing:

<u>Line</u>	<u>Station (±)</u>	<u>Offsets</u>
-Y-	18+50 to 35+29	LT to RT
-RPA-	10+40 to 11+80	LT to RT
-RPB-	11+45 to 12+10	LT to RT
-SPURA-	10+10 to 11+35	LT to RT
-SPURC-	10+45 to 12+55	LT to RT
-SPURD-	10+00 to 11+83	LT to RT

The roadway embankment encountered generally consisted of red-brown, moist, medium stiff, fine sandy, silty clay (A-7-5) or soft to medium stiff, tan-brown-red, moist, fine sandy or clayey silt (A-4 or A-5). The roadway embankment extends to depths ranging from approximately 0.5 to 2.0 feet below existing grades.

Residual Soils: Residual soils throughout the proposed corridor are derived from the weathering of the underlying parent bedrock. A majority of the residual soils encountered generally consisted of red-brown-tan-maroon, moist to wet, medium stiff to very stiff, fine to coarse sandy, silty clay (A-7-5), red-brown-tan-maroon-black-white-orange-gray, moist to wet, soft to hard, fine to coarse fine sandy, clayey silt (A-4, A-5), or gray-brown-black-tan-white, moist to wet, loose to very dense, silty fine sand (A-2-4). Laboratory testing indicated PI's ranging from 22 to 28 for the A-7-5 soils and PI's ranging from 1 to 10 for the A-5 soils.

Rock Properties

Weathered Rock: Weathered Rock (WR) was encountered at several locations along the -Y- and -SPURB- alignments indicated below. Weathered rock is defined as residual material exhibiting an SPT N-value of at least 100 blows per foot.

<u>Line</u>	<u>Station (±)</u>	<u>Offsets</u>
-Y-	25+15 to 28+67	LT to RT
-SPURB-	11+00 to 12+00	LT to RT

Along the Y- Line, the top of the weathered rock was encountered at depths ranging from approximately 36.3 to 88.5 feet below existing grades. Along the -SPURB- Line, the top of the weathered rock was encountered at a depth of approximately 20.7 feet below existing grades. Lenses of weathered rock were encountered within the residual soil zone in the vicinity of -Y- station 28+75 and -SPURB- station 11+64.

Crystalline Rock: Crystalline Rock (CR) is defined by SPT refusal (i.e., 60/0.1' or 60/0.0'). Several borings were terminated upon encountering CR at the following locations.

<u>Line</u>	<u>Station (±)</u>	<u>Offsets</u>
-Y-	25+15 to 28+67	LT to RT

Groundwater Properties

Groundwater levels were measured in the soil test borings immediately after drilling and, where applicable, after a stabilization period of at least 24 hours. At the time of drilling, water was encountered in four (4) of the bridge borings at depths ranging from approximately 18.1 to 44.7 feet below existing grades. After a stabilization period of at least 24 hours, groundwater was encountered in eight (8) of the bridge borings at depths ranging from approximately 12.8 to 36.8 feet below existing grades. The recovered soil samples were generally described as moist above the groundwater level and moist to wet below the groundwater level.

Areas of Special Geotechnical Interest

- 1) High Plasticity Soils: The following areas contain high plasticity soils with plasticity indices (PI's) in excess of 25. High plasticity soils have the potential to cause subgrade problems during construction, embankment stability or long term settlement problems:

<u>Line</u>	<u>Station (±)</u>	<u>Offsets</u>
-YEB-	32+00 to 35+81	LT to RT
-RPA-	10+00 to 13+00	LT to RT

- 2) Wet or Saturated Soils: The following areas contain soils with high moisture contents noted in the field during drilling, or soils encountered below the water table:

<u>Line</u>	<u>Station (±)</u>	<u>Offsets</u>
-Y-	25+15 to 28+67	LT to RT
-YEB-	32+00 to 35+81	LT to RT
-YWB-	32+00 to 35+74	LT to RT
-RPD-	25+00 to 28+66	LT to RT

- 3) Soft/Very Loose Soils: The following areas contain relatively soft or very loose soils that have the potential for subgrade problems, embankment stability or long-term settlement problems during construction. However, the soft soils encountered in the bridge borings (-Y-) will not impact roadway construction, but are still identified as an area of special geotechnical interest in this report.

<u>Line</u>	<u>Station (±)</u>	<u>Offsets</u>
-Y-	25+15 to 28+67	LT to RT
-RPD-	25+00 to 28+66	LT to RT

Respectively submitted,




DocuSigned by:
D. Matthew Brewer
 D. Matthew Brewer, P.E.
 Senior Project Engineer
 N.C. Registration No. 041986

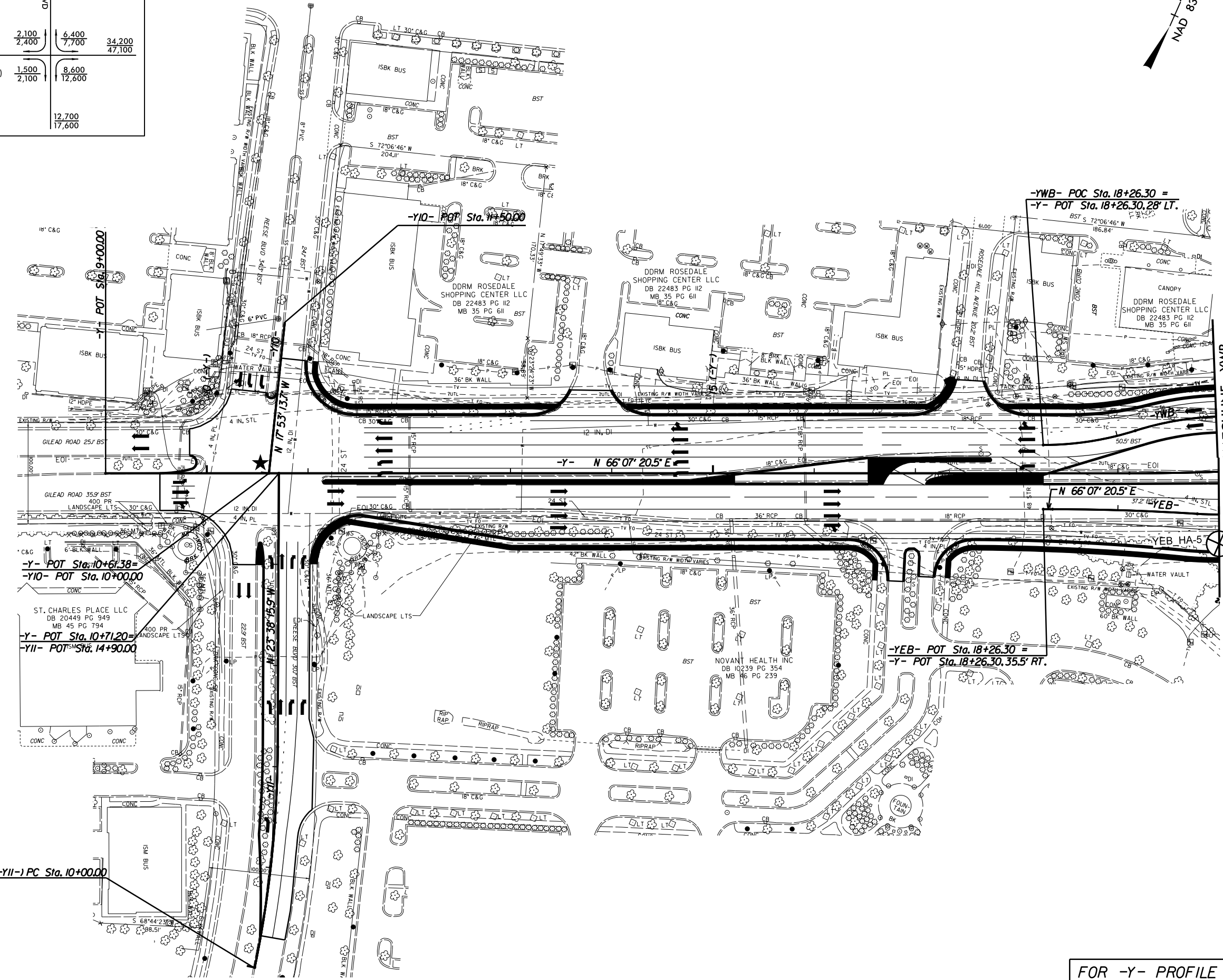
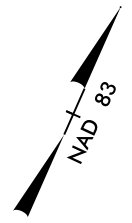
DocuSigned by:
Michael J. Walko
 54F1F8F352D2406...

Michael J. Walko, P.E.
 Principal Engineer

8/17/99
 24 MAR 2017 14:45
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 1-5714.RDWY 1-77 and SR 2136 (Gilead Road) Interchange.CADD.GEOTECH\Plan\1-5714_geo_rdwy_psh04.dgn
 REVISIONS

2015 ADT	11,100	RESEF BLVD	13,000
2040	22,800	2,100	6,400
	31,300	2,400	7,700
			34,200
SR 2136 (GILEAD RD)	1,500	8,600	47,100
	2,100	12,600	
		12,700	17,600

PROJECT REFERENCE NO.	SHEET NO.
1-5714	4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Prepared by	
 4000 WestChase Boulevard, Suite 530 Raleigh, NC 27607 NC License No. C-3705	



-YWB- POC Sta. 18+26.30 =
 -Y- POT Sta. 18+26.30, 28' LT.

-Y10- POT Sta. 14+50.00

-Y- POT Sta. 10+61.38 =
 -Y10- POT Sta. 10+00.00

-Y- POT Sta. 10+71.20 =
 -Y11- POT Sta. 14+90.00

(-Y11-) PC Sta. 10+00.00

-YEB- POT Sta. 18+26.30 =
 -Y- POT Sta. 18+26.30, 35.5' RT.

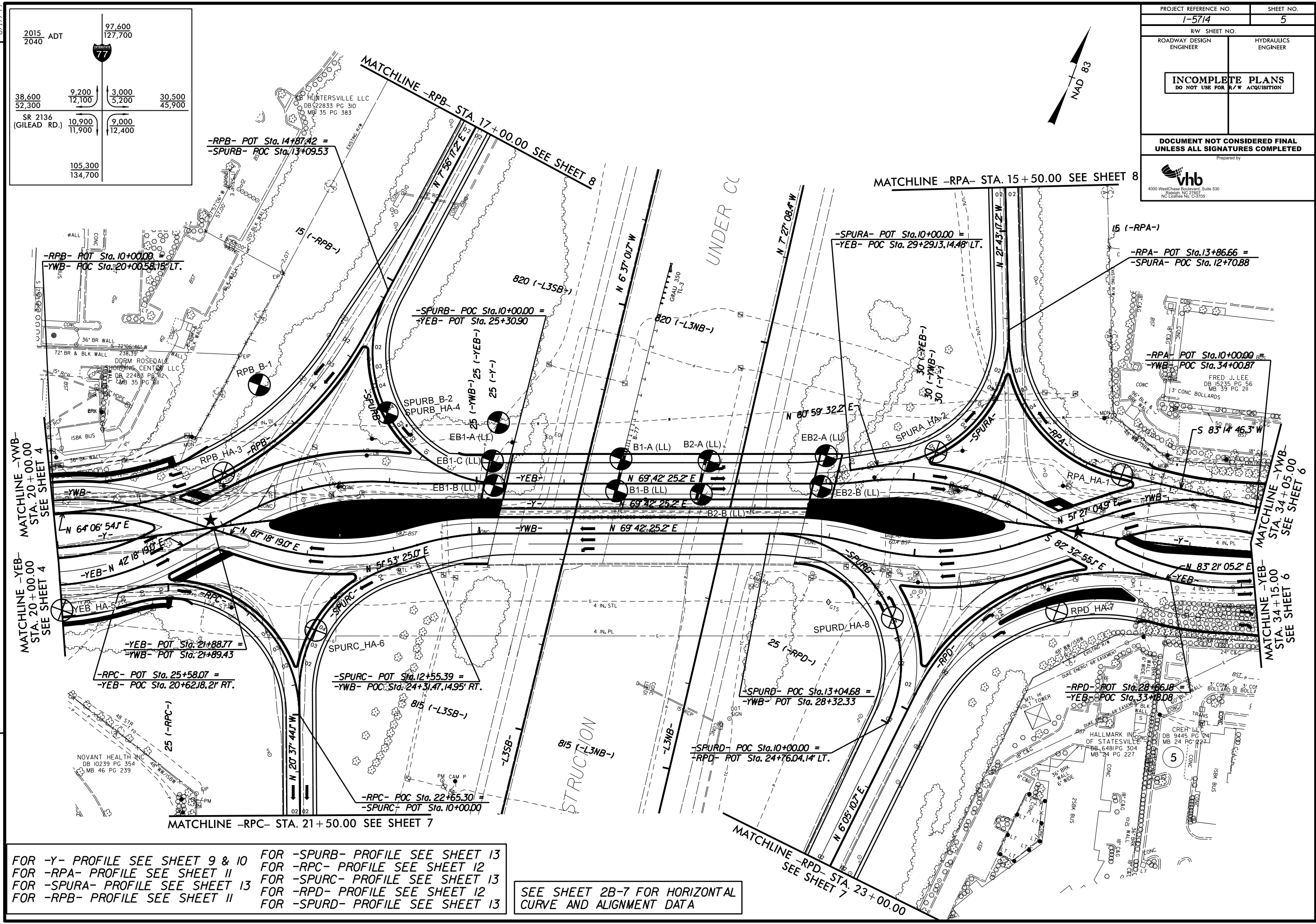
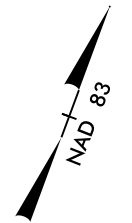
MATCHLINE -YWB- STA. 20+00.00 SEE SHEET 5

MATCHLINE -YEB- STA. 20+00.00 SEE SHEET 5

FOR -Y- PROFILE SEE SHEET 9 & 10

PROJECT REFERENCE NO.	SHEET NO.
1-5714	5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Prepared by vhb 4000 WestChase Boulevard, Suite 530 Raleigh, NC 27607 NC License No. C-3705	

2015 ADT	97,600
2040	127,700
38,600	9,200
52,300	12,100
SR 2136 (GILEAD RD.)	10,900
	11,900
	9,000
	12,400
	105,300
	134,700



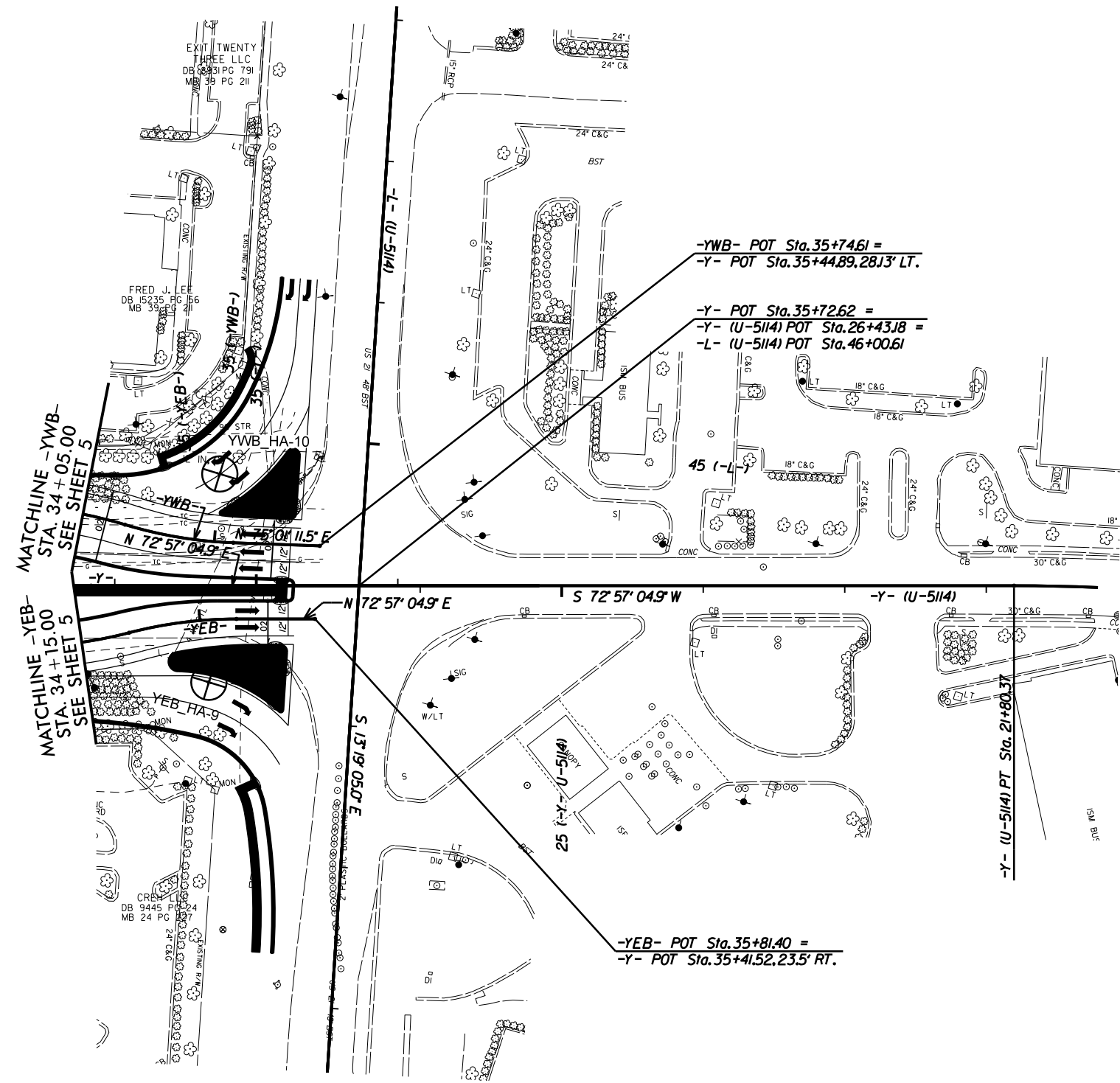
FOR -Y- PROFILE SEE SHEET 9 & 10
 FOR -RPA- PROFILE SEE SHEET 11
 FOR -SPURA- PROFILE SEE SHEET 13
 FOR -RPB- PROFILE SEE SHEET 11

FOR -SPURB- PROFILE SEE SHEET 13
 FOR -RPC- PROFILE SEE SHEET 12
 FOR -SPURC- PROFILE SEE SHEET 13
 FOR -RPD- PROFILE SEE SHEET 12
 FOR -SPURD- PROFILE SEE SHEET 13

SEE SHEET 2B-7 FOR HORIZONTAL CURVE AND ALIGNMENT DATA

REVISIONS
 3: VAB:2017.03.27 - PROJECTIONS: 12000-12999\12100\12109 - 1-5714 ROWY 1-77 and SR 2136 (Gilead Road) Inter-change\CADD_GEO\TECH\Plan\1-5714_geo_rdwj_psh05.dgn
 1: M:2017.03.27 - AT: ECS-1044P6HLL0


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2040		61,800	
30,500	9,400	3,000	19,200
45,900	14,900	7,700	33,500
6,900		2,000	
8,000		2,800	
		SR 2136 (GILEAD RD)	
		17,900	
		50,000	



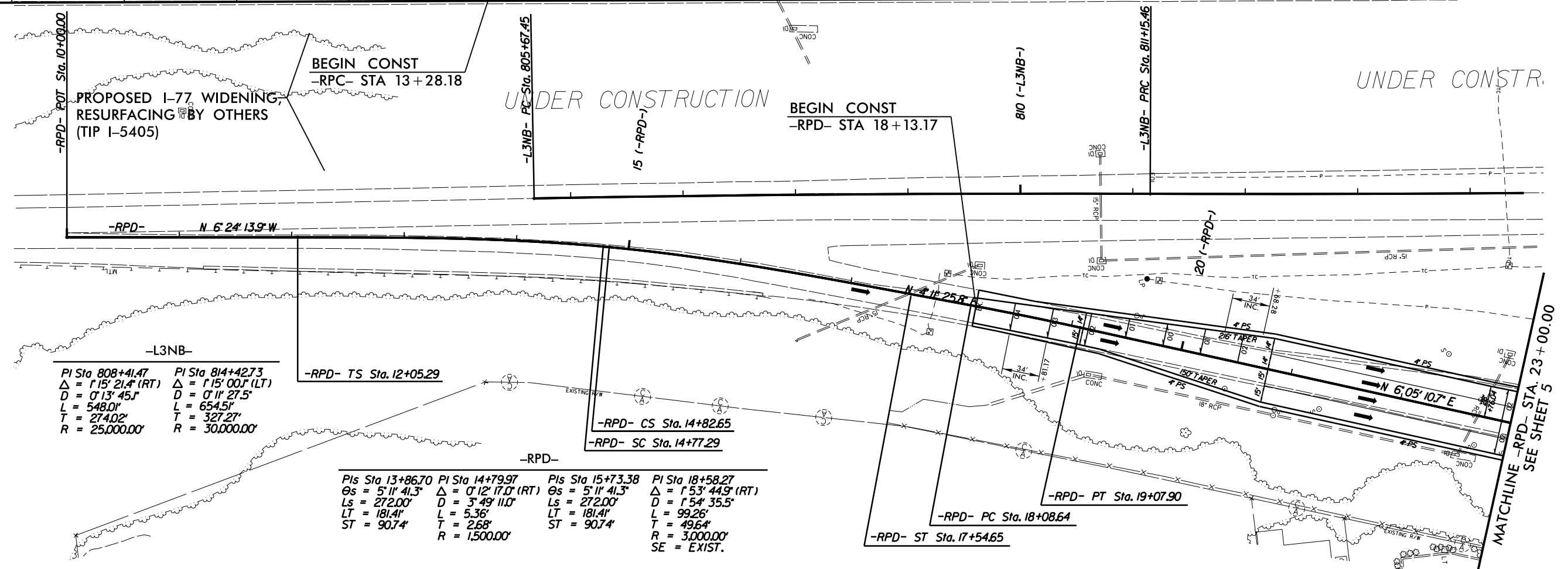
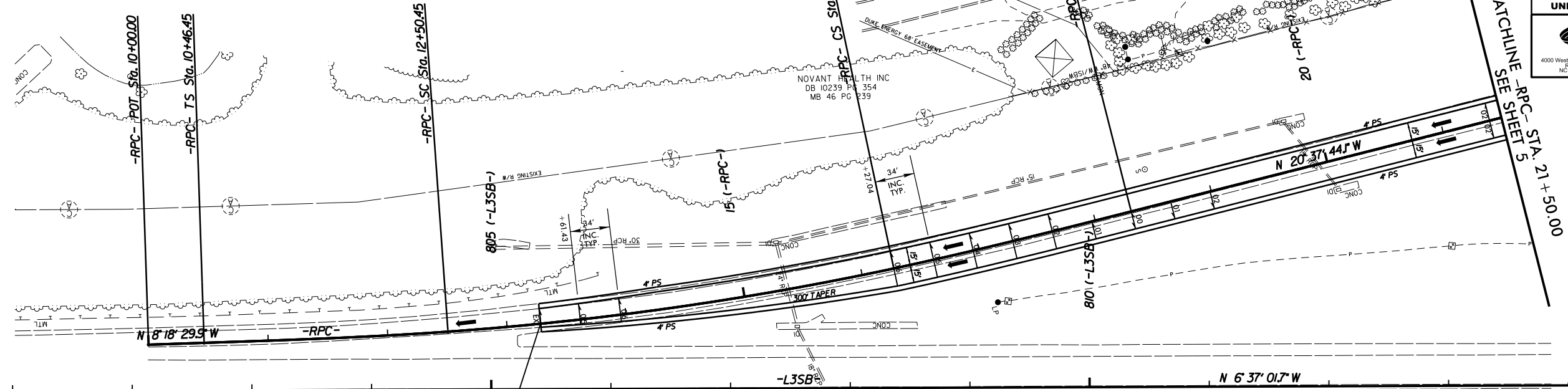
PROJECT REFERENCE NO. 1-5714	SHEET NO. 6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Prepared by vhb 4000 WestChase Boulevard, Suite 530 Raleigh, NC 27607 NC License No. C-3705	

SEE SHEET 2B-8 FOR HORIZONTAL CURVE AND ALIGNMENT DATA

FOR -Y- PROFILE SEE SHEET 9 & 10

PROJECT REFERENCE NO.	SHEET NO.
1-5714	7
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Prepared by	
 4000 WindChase Boulevard, Suite 530 Raleigh, NC 27607 NC License No. C-3785	

-RPC-		
PIs Sta 11+82.46	PI Sta 14+39.05	PIs Sta 16+95.05
$\Delta = 2^{\circ} 09' 52.2"$	$\Delta = 7^{\circ} 59' 29.8"$ (LT)	$\Delta = 2^{\circ} 09' 52.2"$
Ls = 204.00'	D = 2' 07' 19.4"	Ls = 204.00'
LT = 136.01'	L = 376.60'	LT = 136.01'
ST = 68.01'	T = 188.60'	ST = 68.01'
	R = 2700.00'	
	SF = 06	
	RO = 68'	




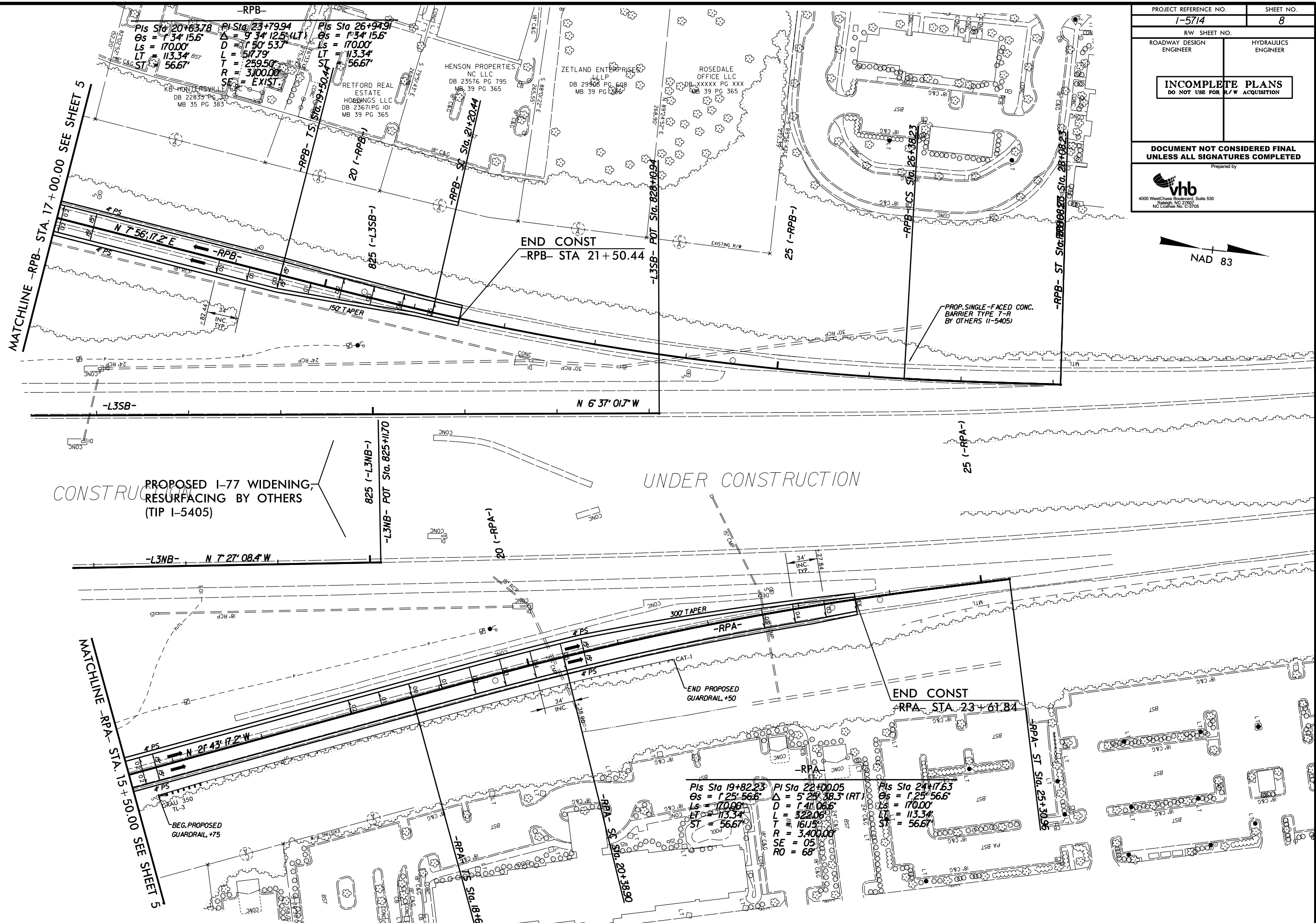
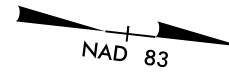
-L3NB-	
PI Sta 808+41.47	PI Sta 814+42.73
$\Delta = 1^{\circ} 15' 21.4"$ (RT)	$\Delta = 1^{\circ} 15' 00.1"$ (LT)
D = 0' 13' 45.1"	D = 0' 11' 27.5"
L = 548.01'	L = 654.51'
T = 274.02'	T = 327.27'
R = 25000.00'	R = 30000.00'

-RPD-			
PIs Sta 13+86.70	PI Sta 14+79.97	PIs Sta 15+73.38	PI Sta 18+58.27
$\Delta = 5^{\circ} 11' 41.3"$	$\Delta = 0^{\circ} 12' 17.0"$ (RT)	$\Delta = 5^{\circ} 11' 41.3"$	$\Delta = 1^{\circ} 53' 44.9"$ (RT)
Ls = 272.00'	D = 3' 49' 11.0"	Ls = 272.00'	D = 1' 54' 35.5"
LT = 181.41'	L = 5.36'	LT = 181.41'	L = 99.26'
ST = 90.74'	T = 2.68'	ST = 90.74'	T = 49.64'
	R = 1500.00'		R = 3000.00'
			SE = EXIST.

FOR -RPC- PROFILE SEE SHEET 12
FOR -RPD- PROFILE SEE SHEET 12

REVISIONS
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 AT FCS-10-424811.0

PROJECT REFERENCE NO.	SHEET NO.
I-5714	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Prepared by	
 4000 WestChase Boulevard, Suite 500 Raleigh, NC 27607 NC License No. C-3705	



FOR -RPA- PROFILE SEE SHEET II
FOR -RPB- PROFILE SEE SHEET II

REVISIONS

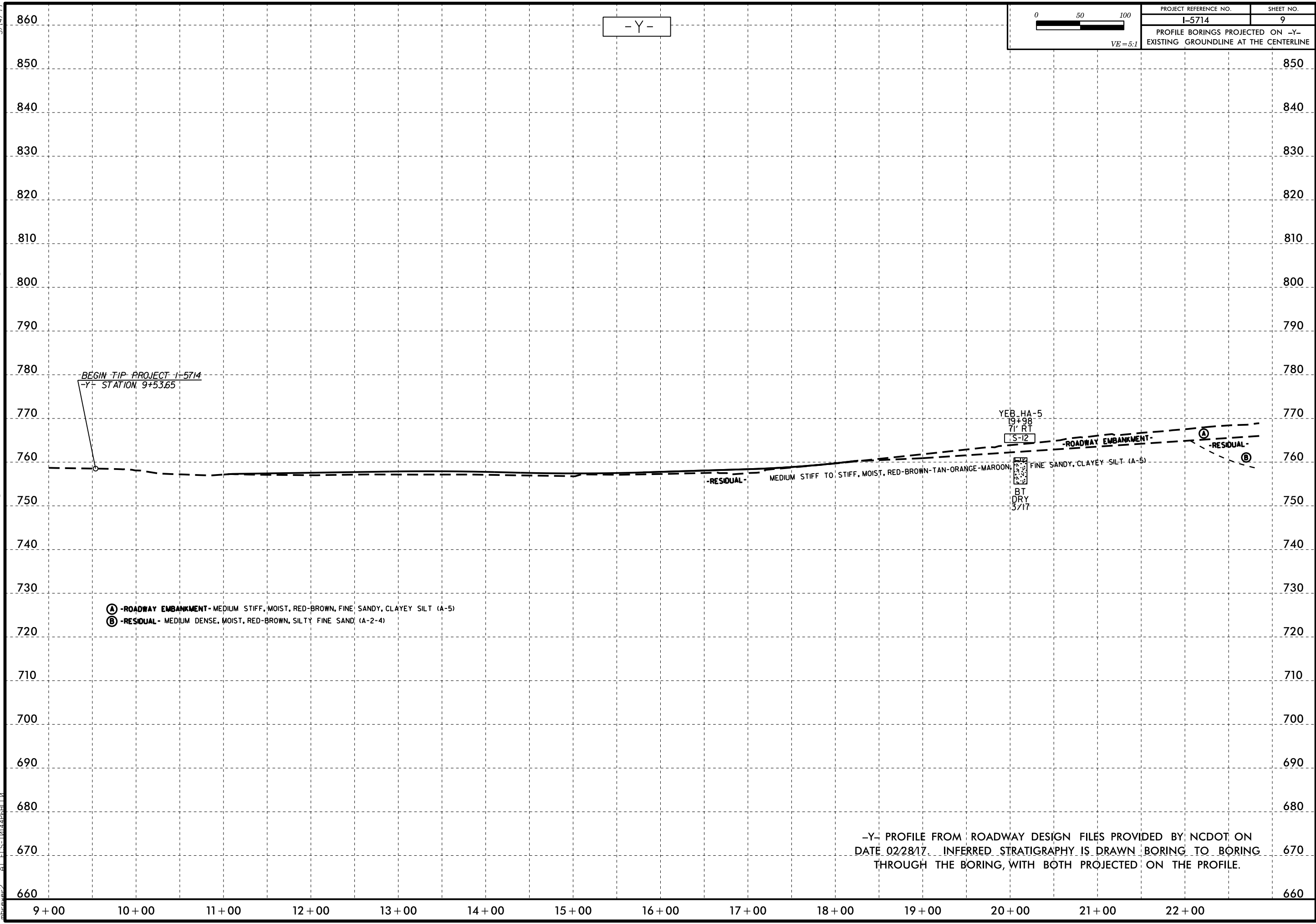
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5/14/99
24-MAR-2017 14:47
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AT FRS-104425110

-Y-

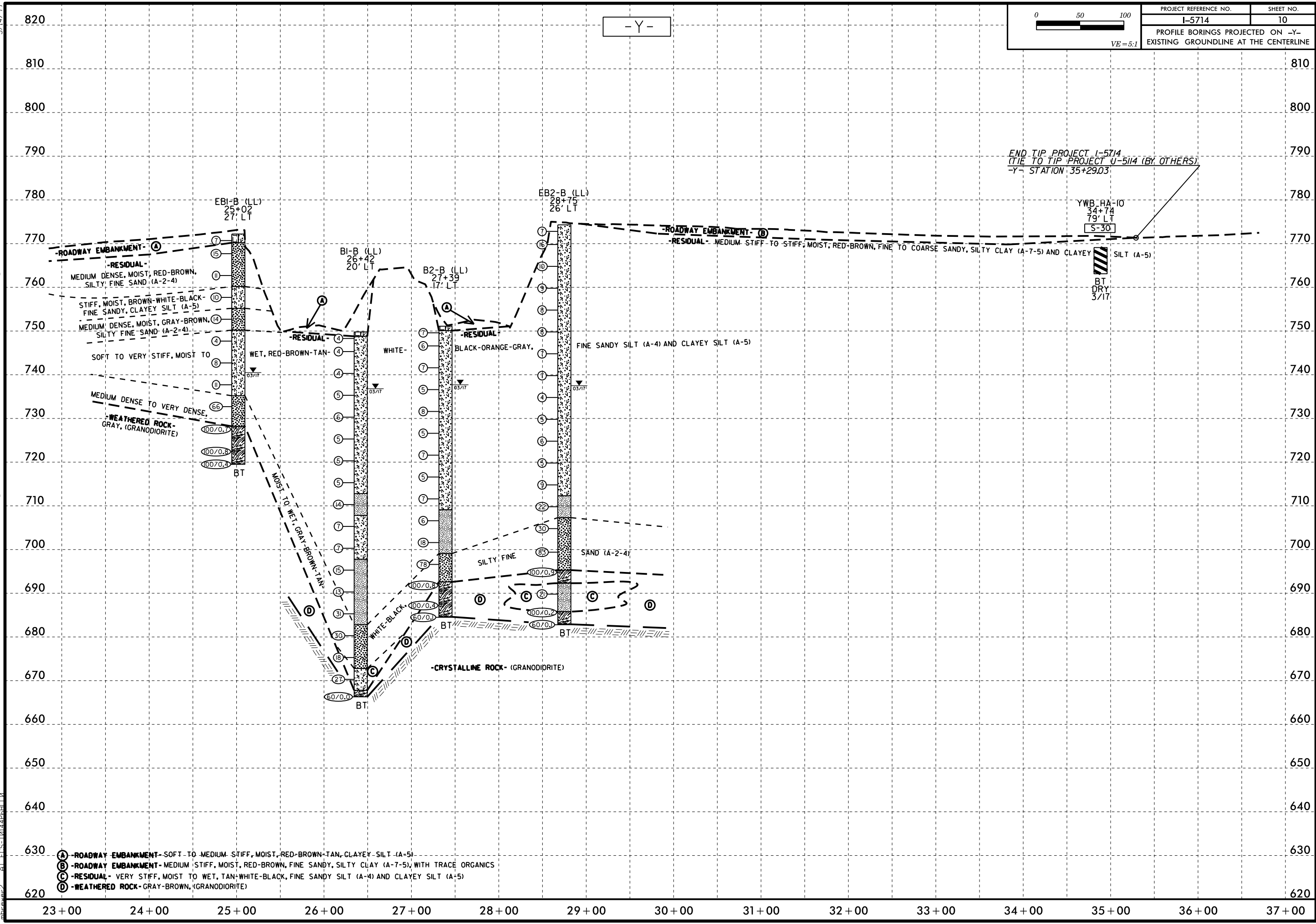
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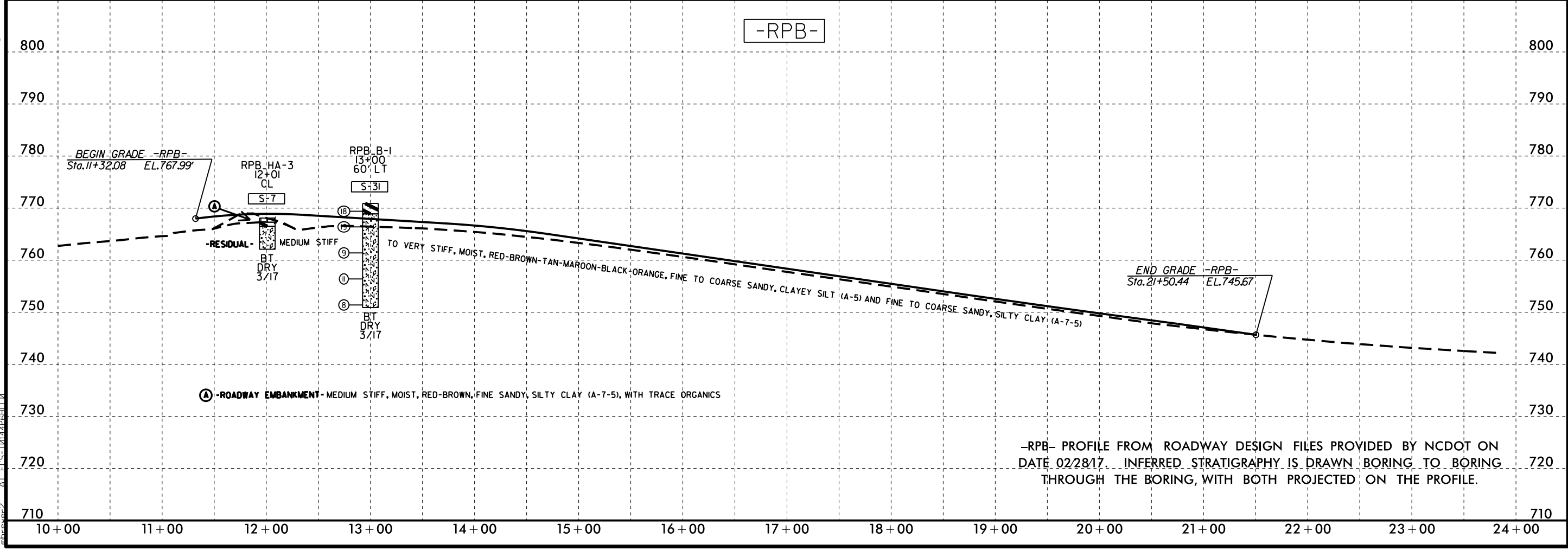
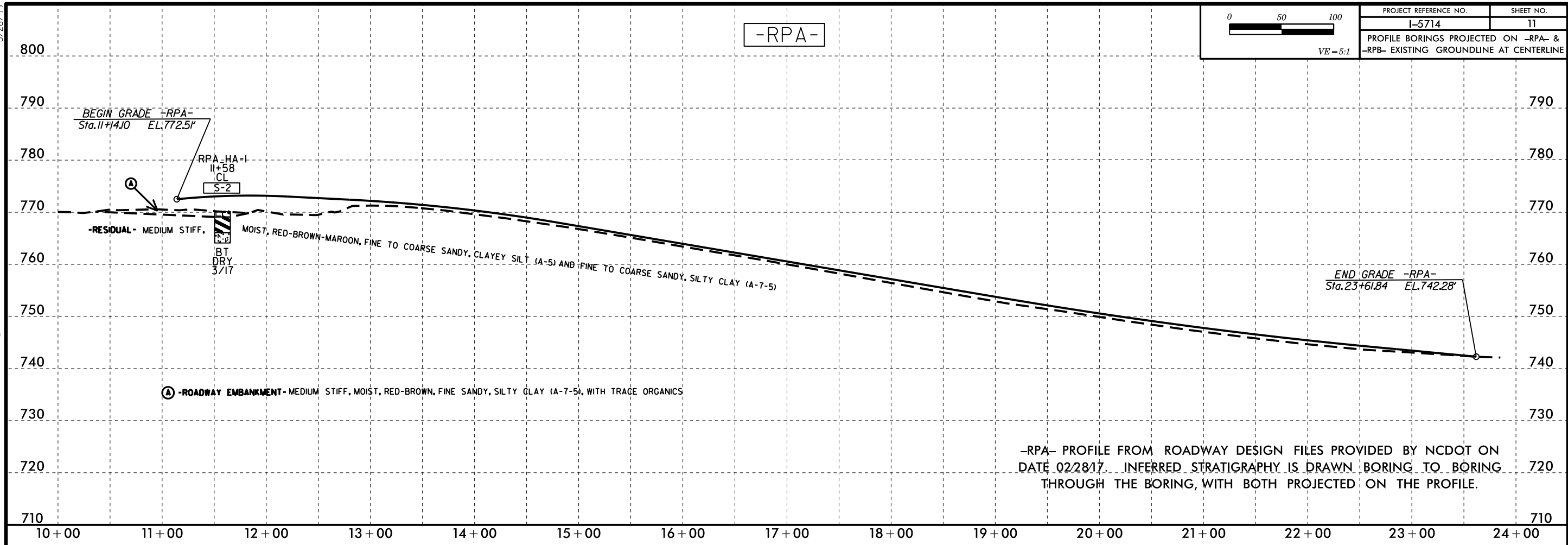
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I-5714	10
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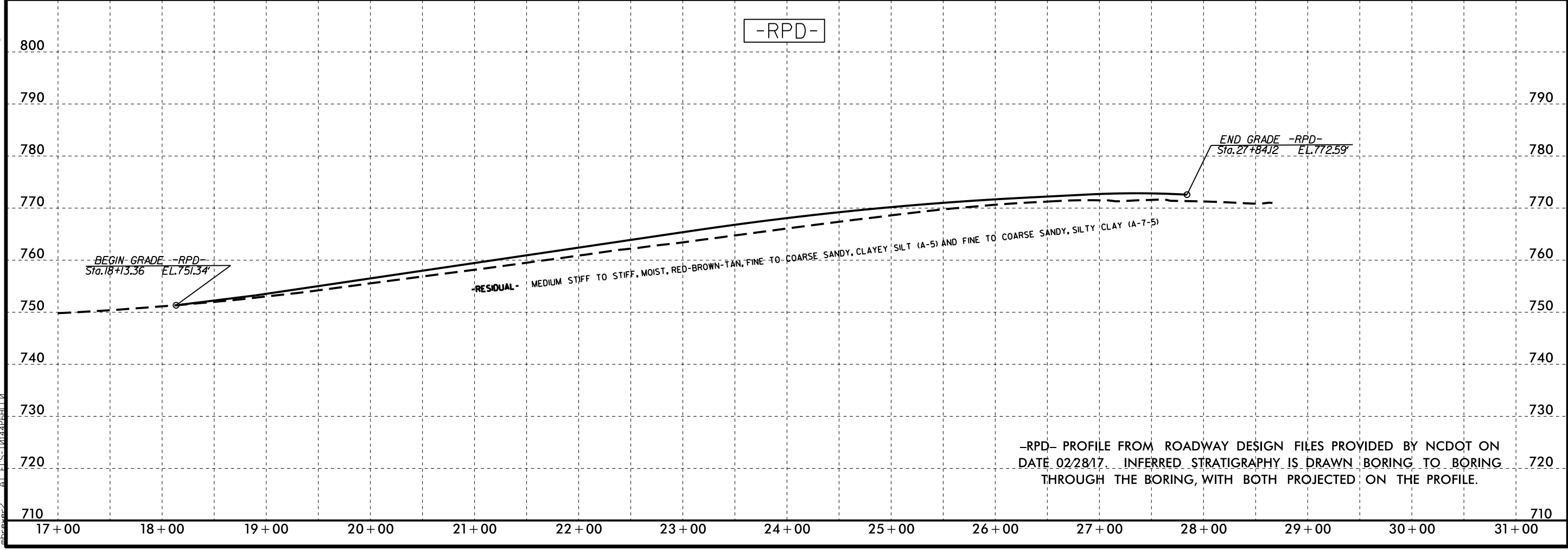
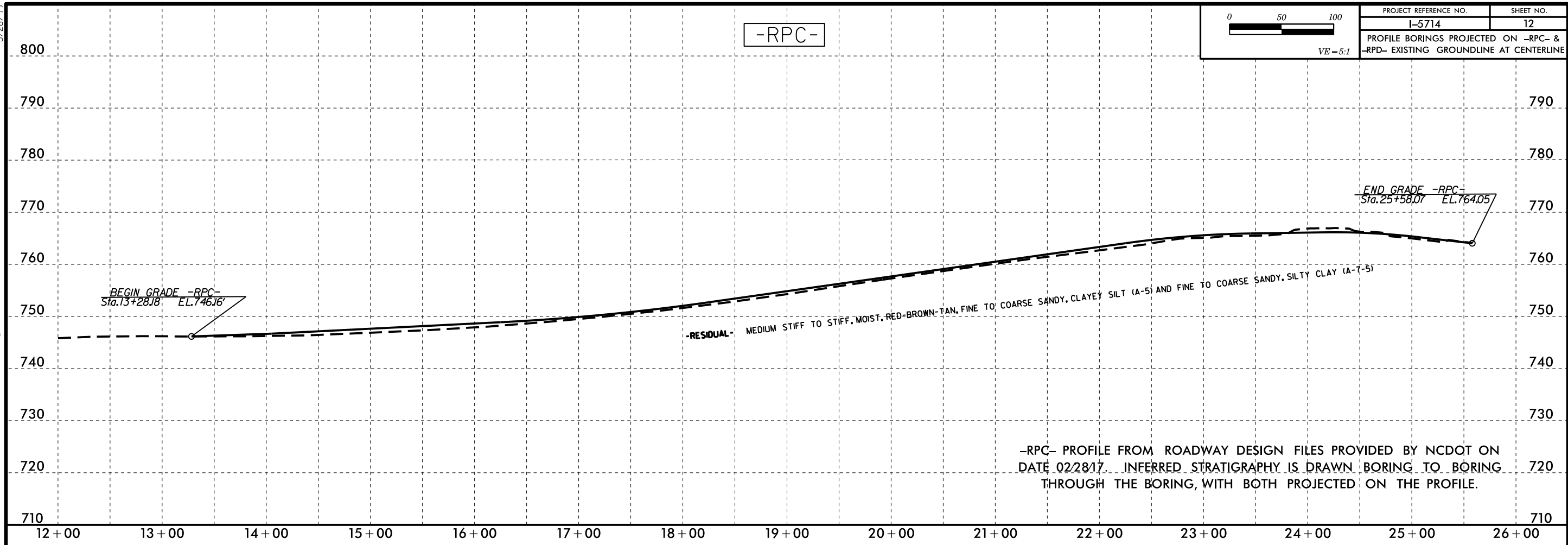
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 AT FRS-10448511.0
 INTERVIEW 2

PROJECT REFERENCE NO.	SHEET NO.
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PROFILE BORINGS PROJECTED ON -RPA- & -RPB- EXISTING GROUNDLINE AT CENTERLINE	
VE=5:1	



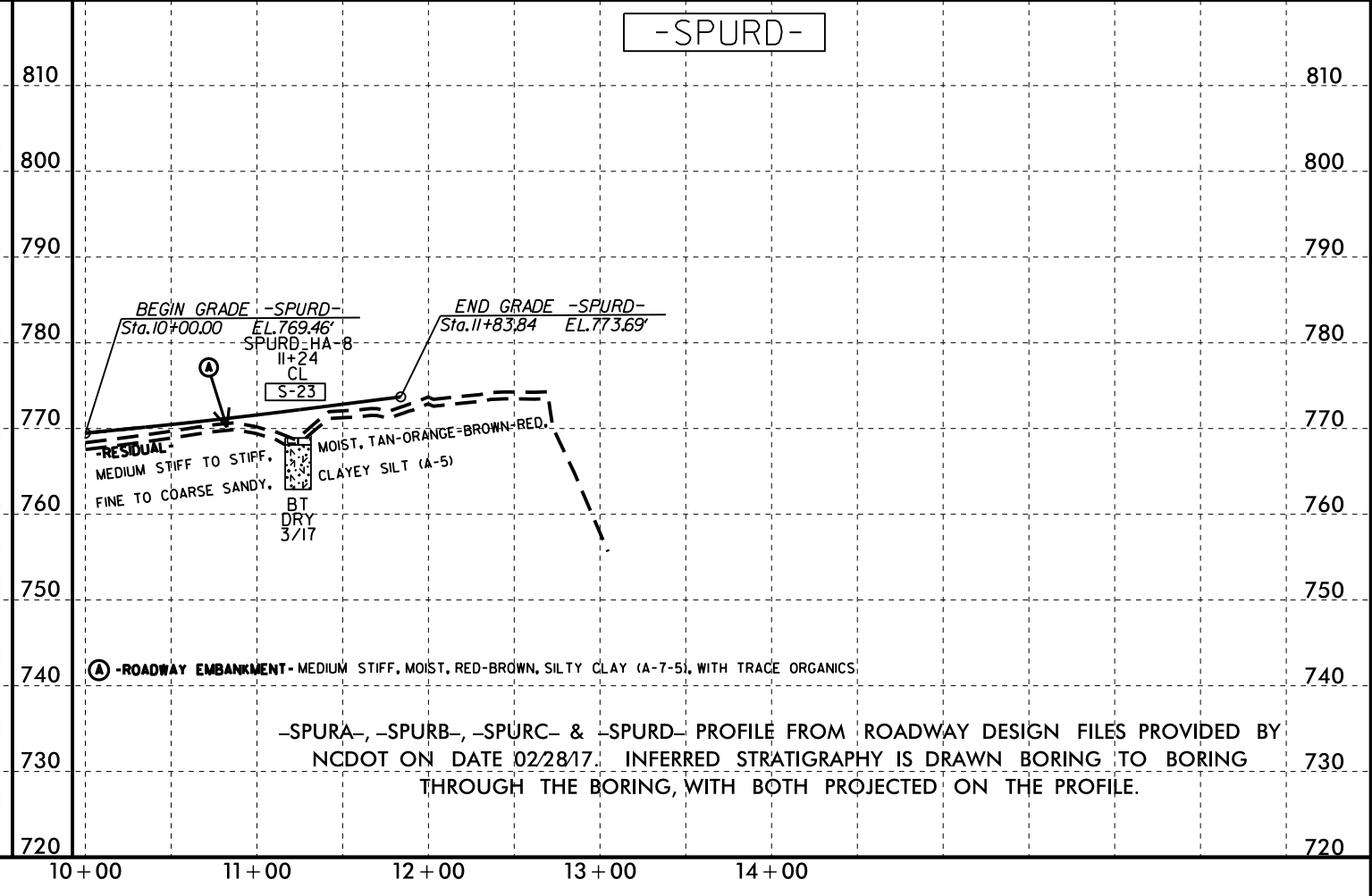
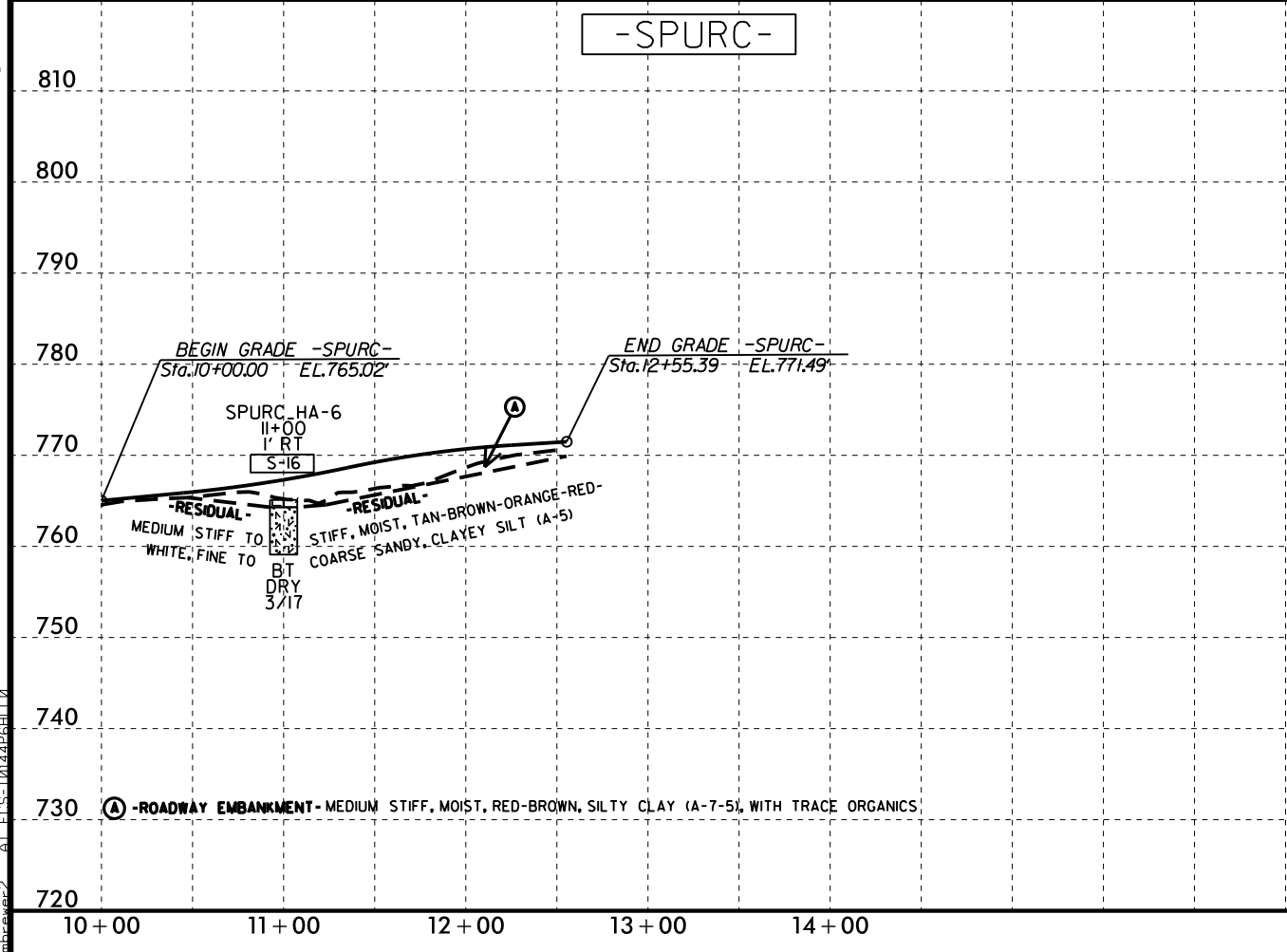
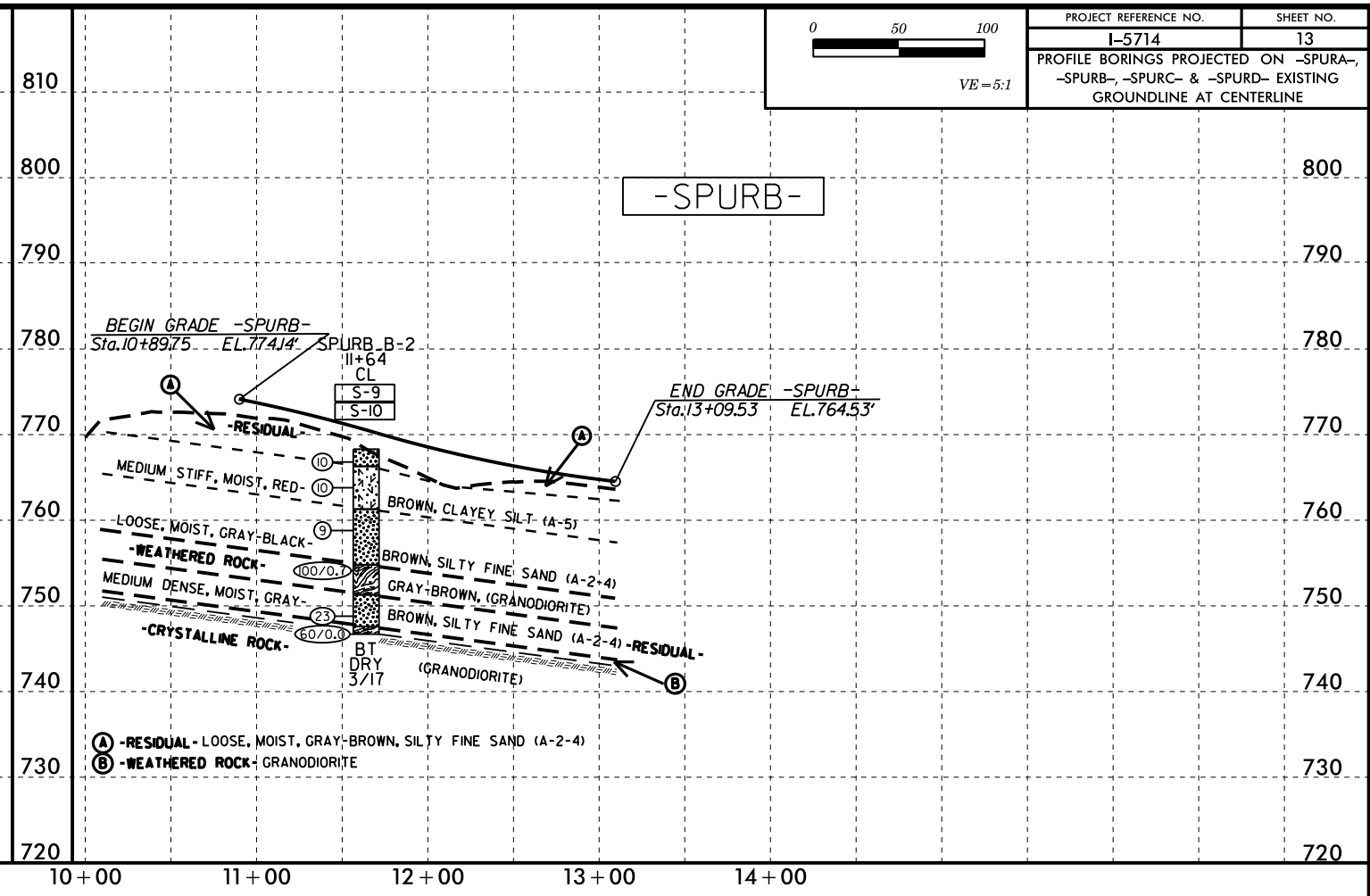
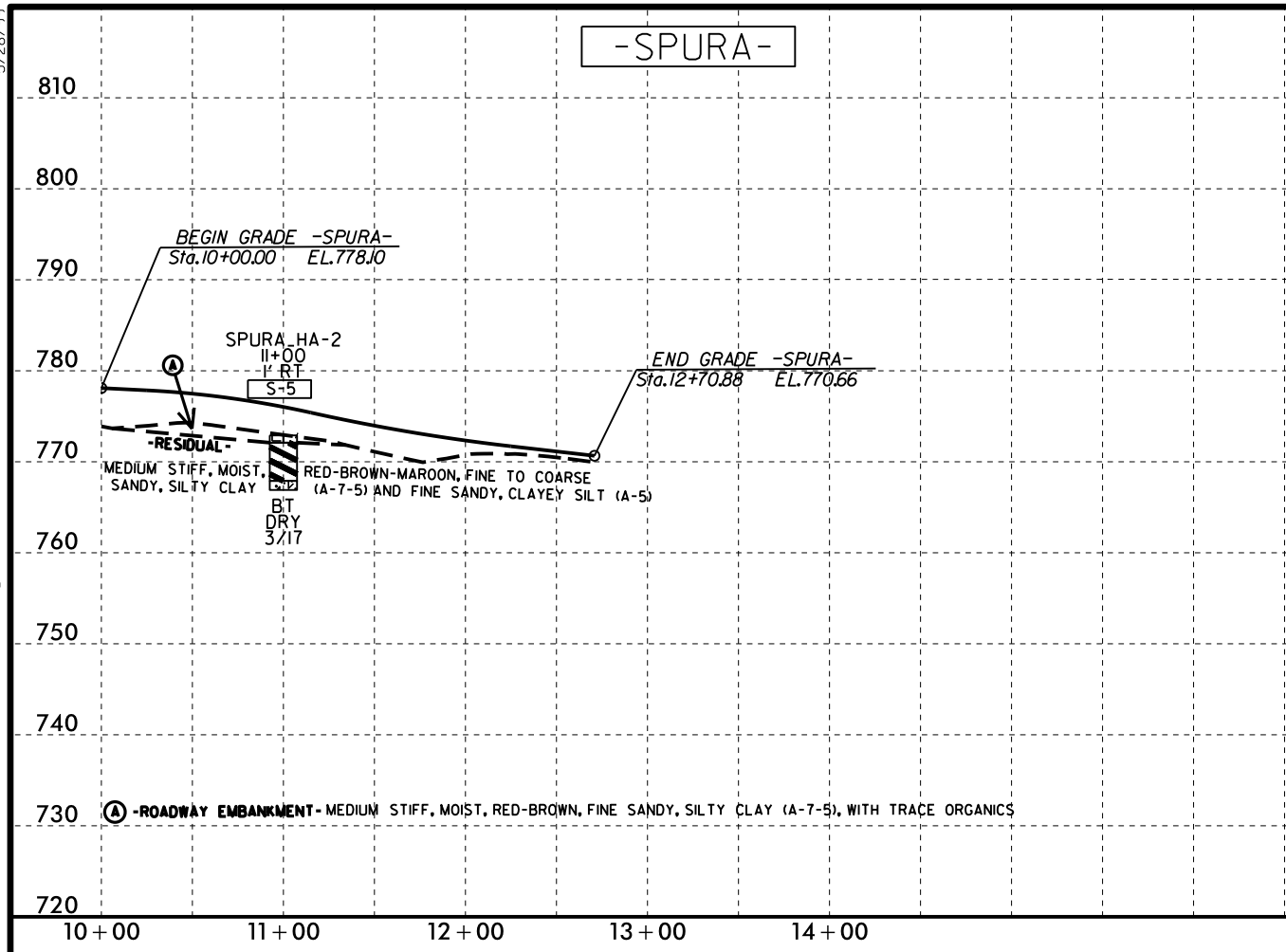
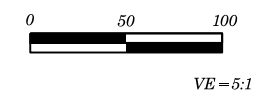
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PROJECT REFERENCE NO.	SHEET NO.
I-5714	12
PROFILE BORINGS PROJECTED ON -RPC- & -RPD- EXISTING GROUNDLINE AT CENTERLINE	
VE=5:1	



5/28/99
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 11/13/17

PROJECT REFERENCE NO.	SHEET NO.
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PROFILE BORINGS PROJECTED ON -SPURA-, -SPURB-, -SPURC- & -SPURD- EXISTING GROUNDLINE AT CENTERLINE	

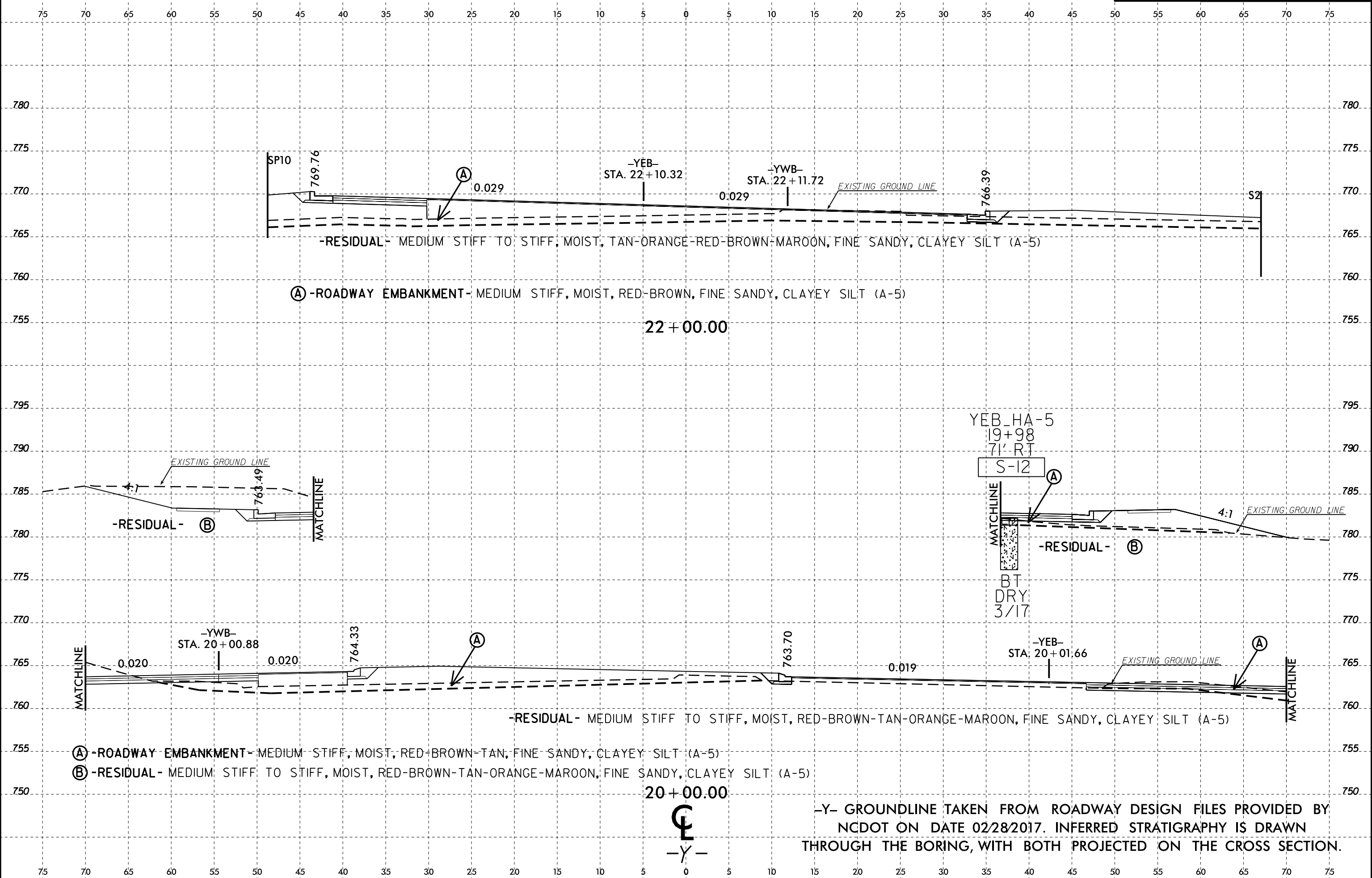


-SPURA-, -SPURB-, -SPURC- & -SPURD- PROFILE FROM ROADWAY DESIGN FILES PROVIDED BY
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 THROUGH THE BORING, WITH BOTH PROJECTED ON THE PROFILE.

6/23/16

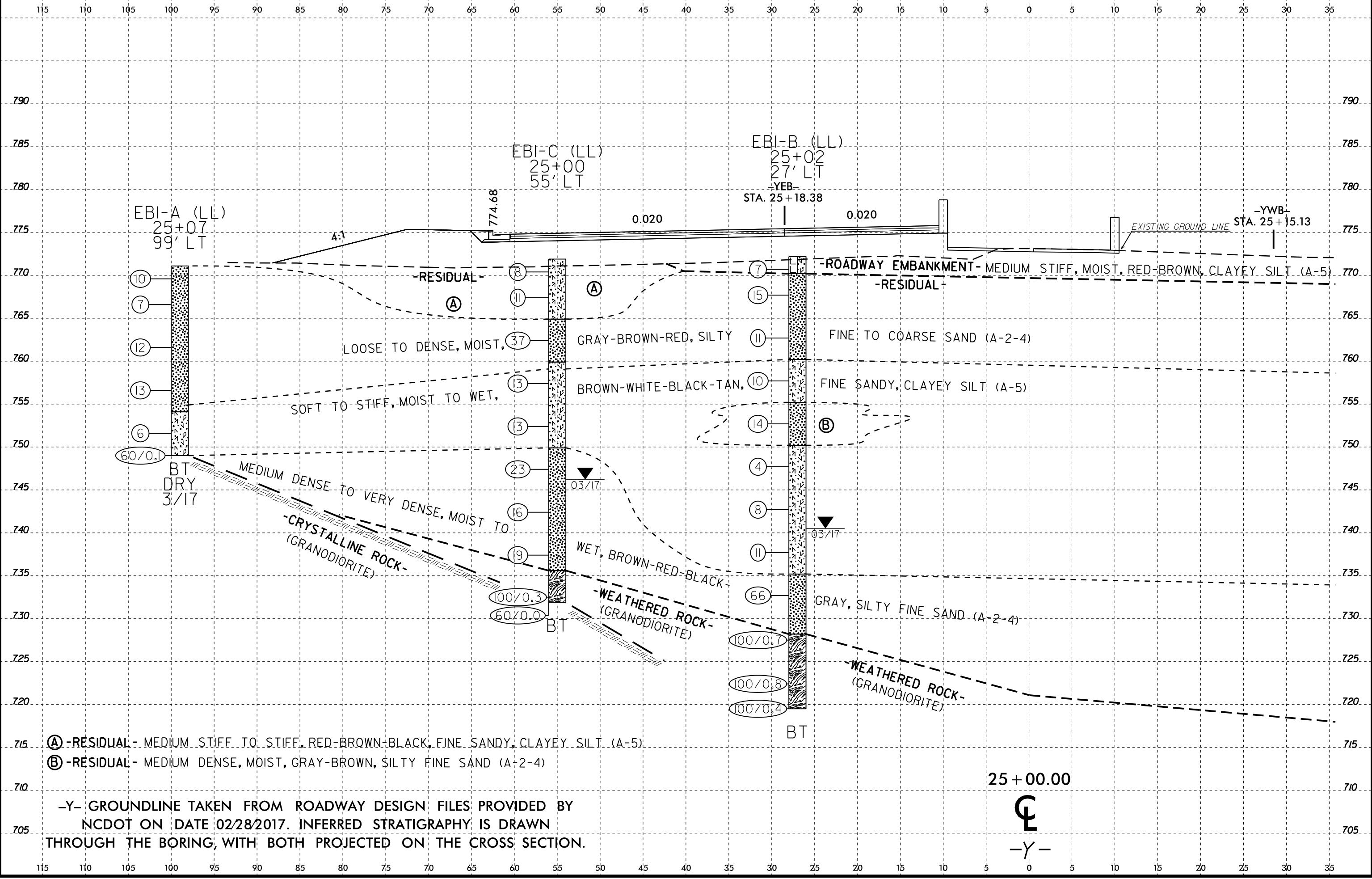


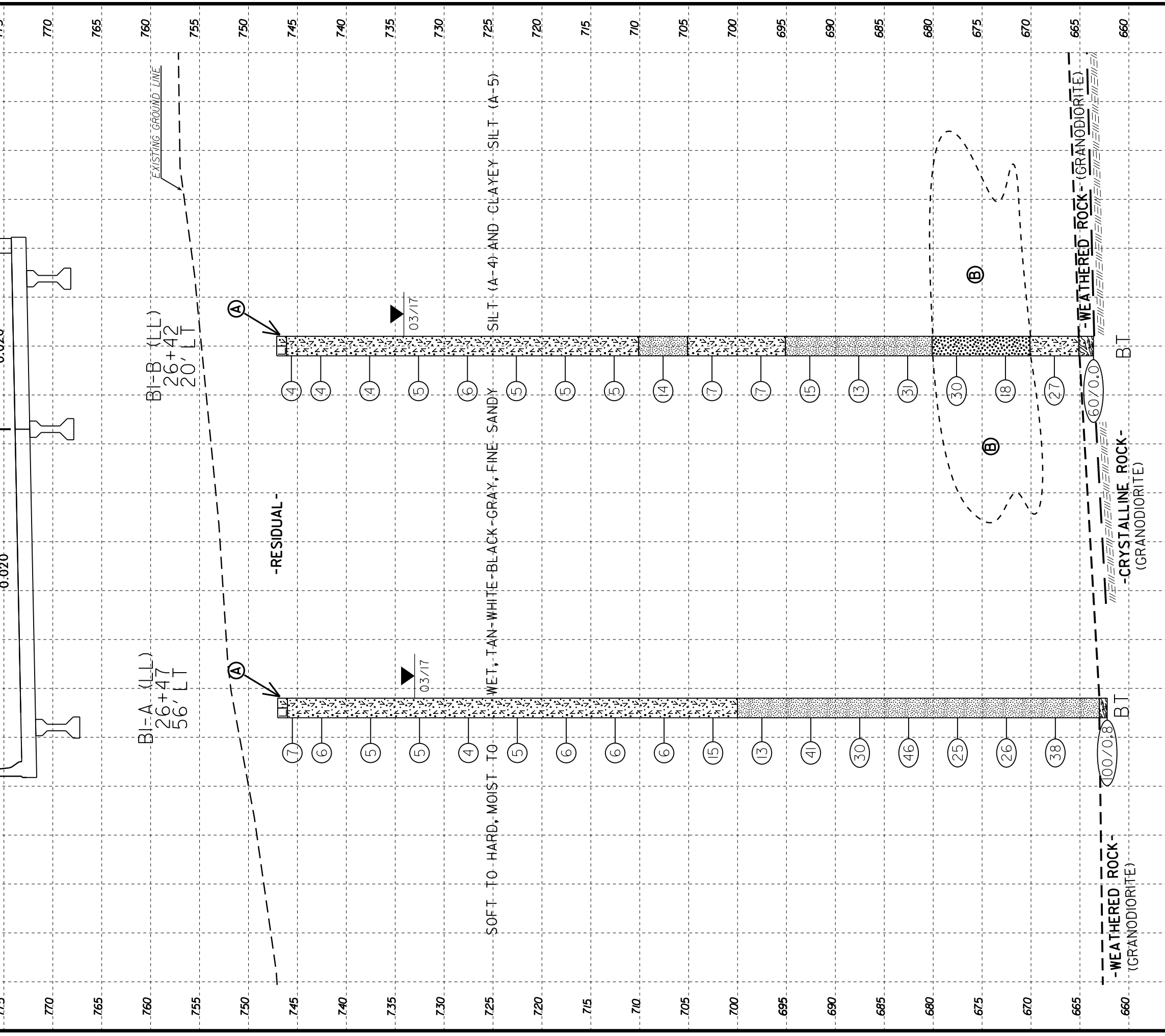
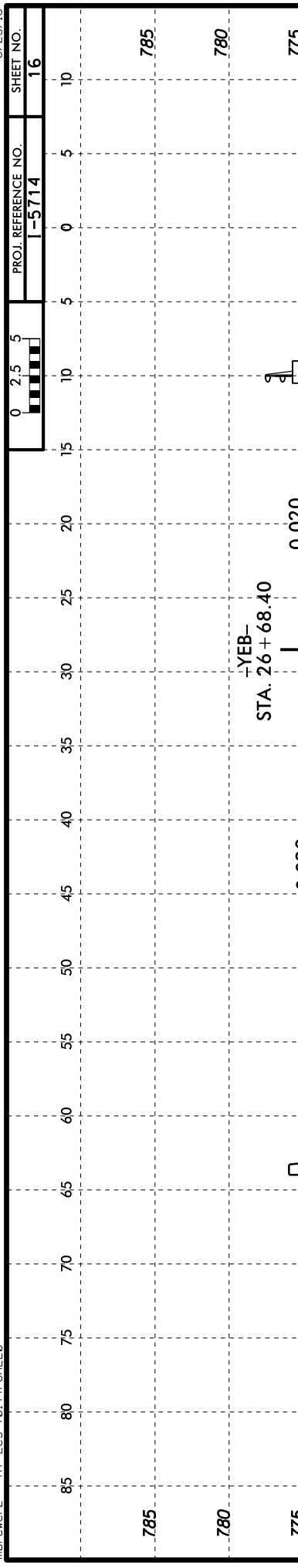
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6/23/16
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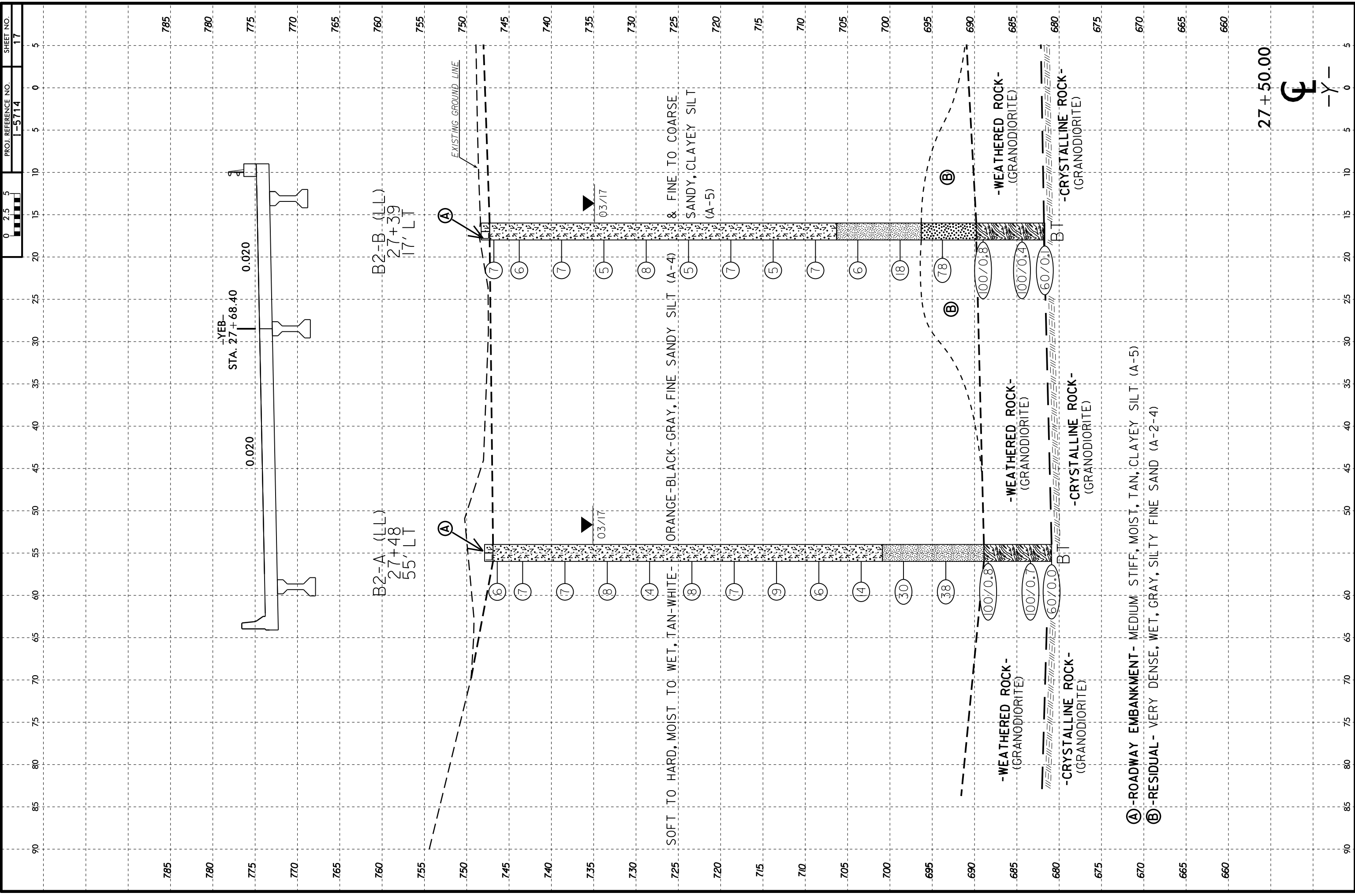




(A) -ROADWAY EMBANKMENT- SOFT TO MEDIUM STIFF, MOIST, BROWN-TAN, CLAYEY SILT (A-5)
 (B) -RESIDUAL- DENSE TO MEDIUM DENSE, MOIST, TAN-WHITE-BLACK, SILTY FINE TO COARSE SAND (A-2-4)

26+50.00

BT



B2-A (LL)
 27+48
 55' LT

B2-B (LL)
 27+39
 17' LT

STA. 27+68.40

0.020

0.020

(A)

(A)

EXISTING GROUND LINE

0.3/17

0.3/17

SOFT TO HARD, MOIST TO WET, TAN-WHITE

& FINE TO COARSE SANDY, CLAYEY SILT (A-5)

ORANGE-BLACK-GRAY, FINE SANDY SILT (A-4)

-WEATHERED ROCK- (GRANODIORITE)

-WEATHERED ROCK- (GRANODIORITE)

-WEATHERED ROCK- (GRANODIORITE)

-CRYSTALLINE ROCK- (GRANODIORITE)

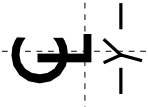
-CRYSTALLINE ROCK- (GRANODIORITE)

-CRYSTALLINE ROCK- (GRANODIORITE)

(A) -ROADWAY EMBANKMENT- MEDIUM STIFF, MOIST, TAN, CLAYEY SILT (A-5)

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

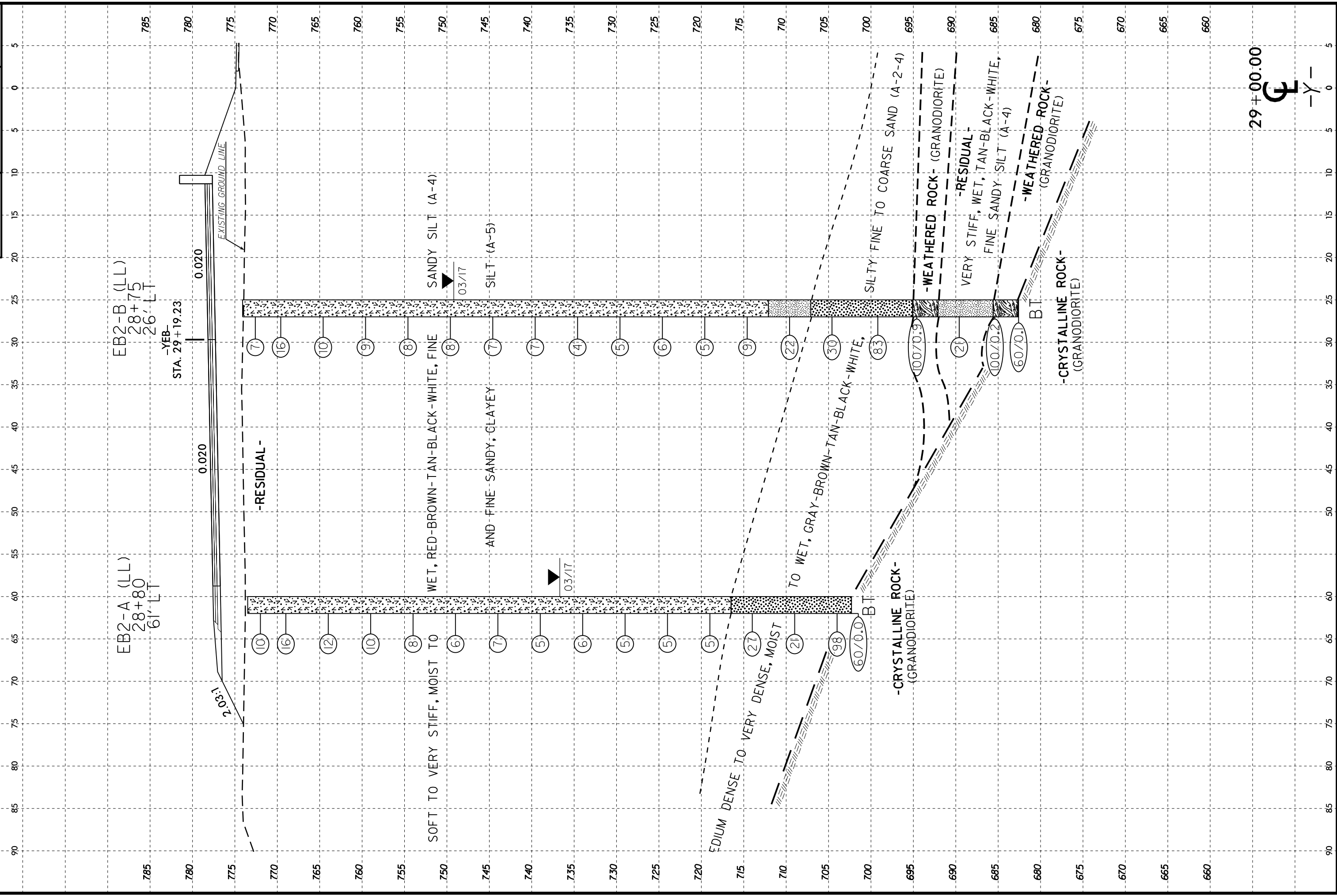
27+50.00



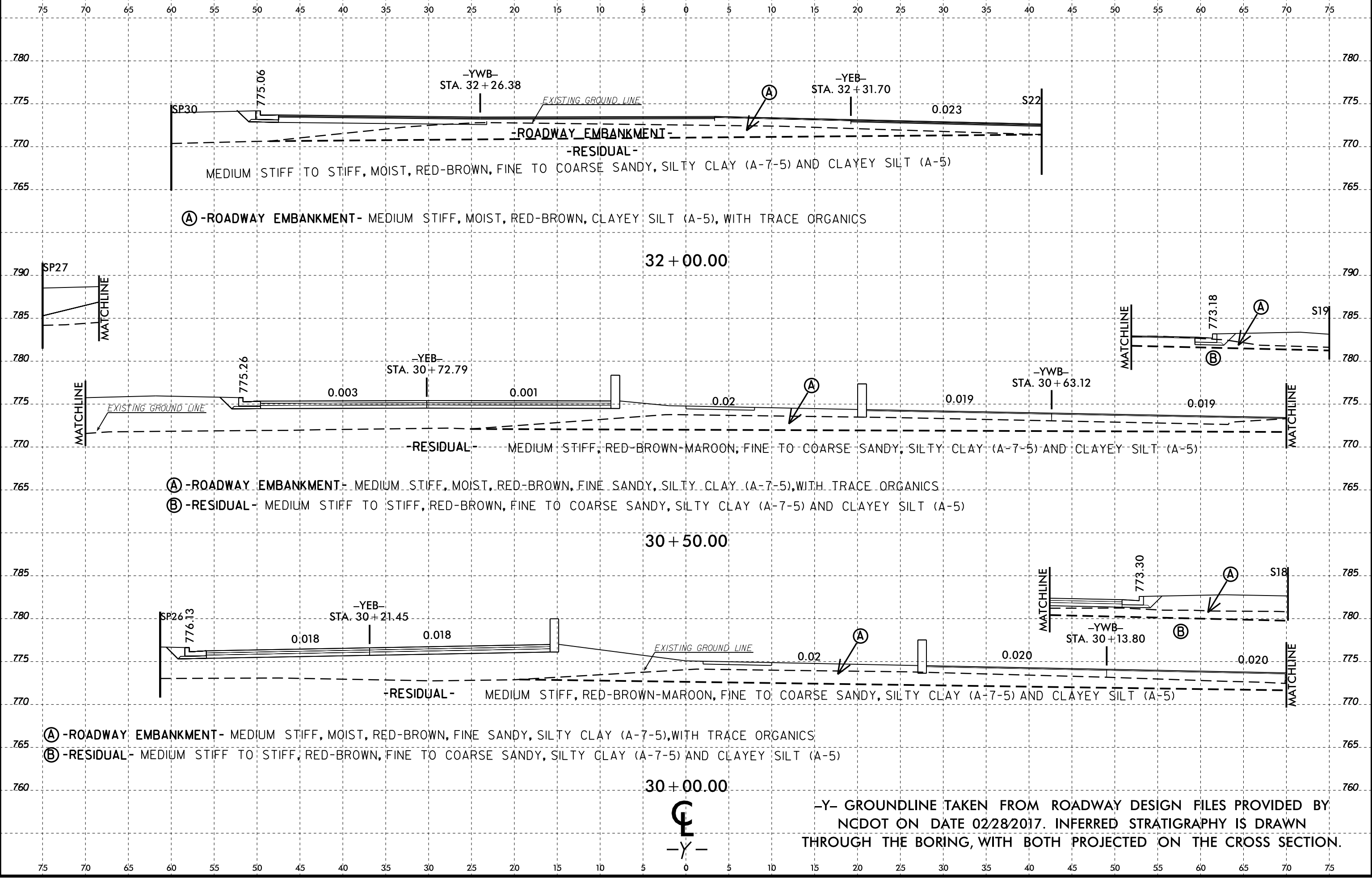
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0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90



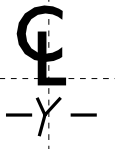
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1:200
AT EBS-1014481110



① -ROADWAY EMBANKMENT- MEDIUM STIFF, MOIST, RED-BROWN, CLAYEY SILT (A-5), WITH TRACE ORGANICS

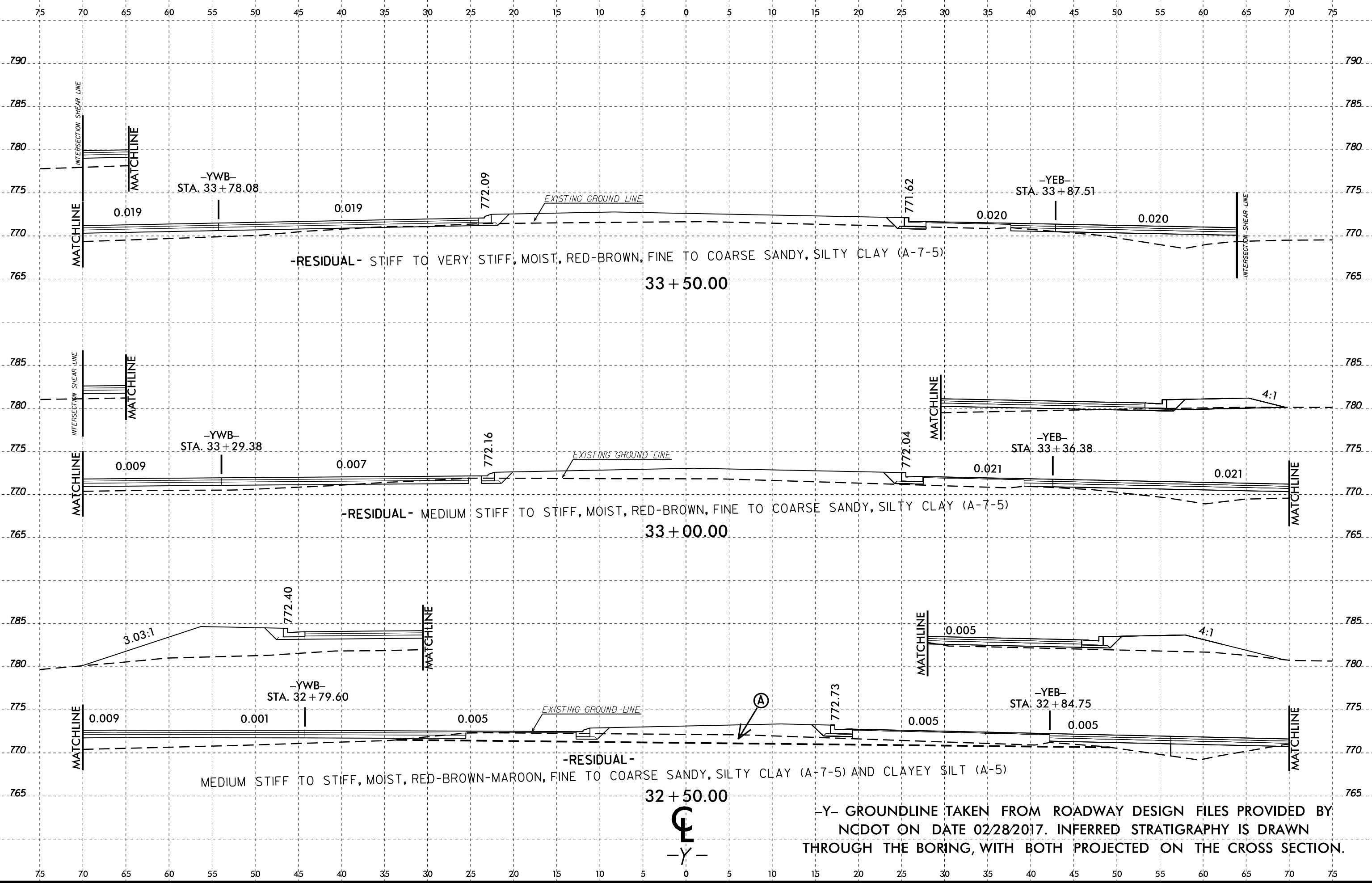
① -ROADWAY EMBANKMENT- MEDIUM STIFF, MOIST, RED-BROWN, FINE SANDY, SILTY CLAY (A-7-5), WITH TRACE ORGANICS
② -RESIDUAL- MEDIUM STIFF TO STIFF, RED-BROWN, FINE TO COARSE SANDY, SILTY CLAY (A-7-5) AND CLAYEY SILT (A-5)

① -ROADWAY EMBANKMENT- MEDIUM STIFF, MOIST, RED-BROWN, FINE SANDY, SILTY CLAY (A-7-5), WITH TRACE ORGANICS
② -RESIDUAL- MEDIUM STIFF TO STIFF, RED-BROWN, FINE TO COARSE SANDY, SILTY CLAY (A-7-5) AND CLAYEY SILT (A-5)

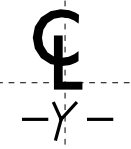


-Y- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY NCDOT ON DATE 02/28/2017. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.

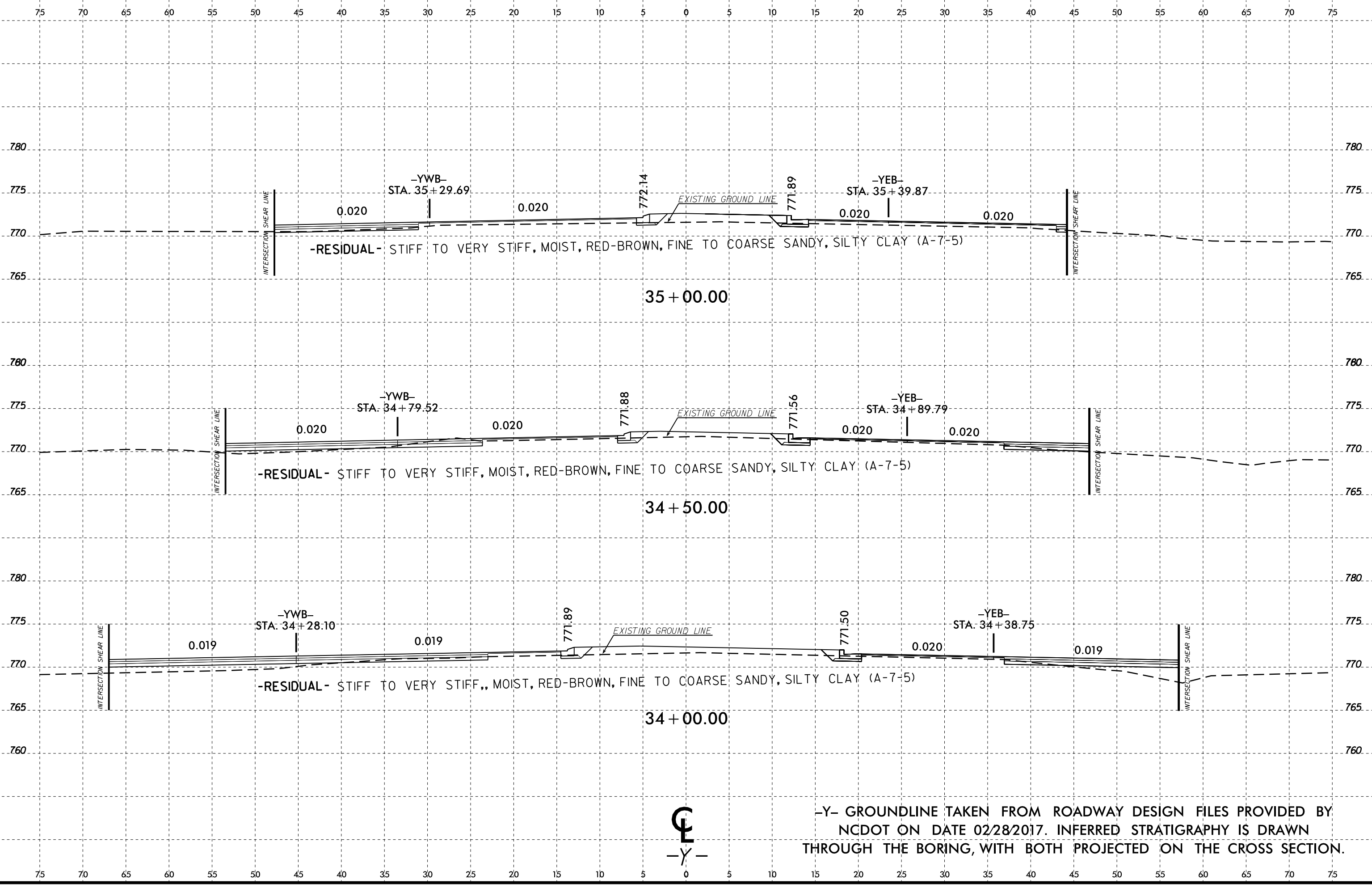
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AF
ECS-T01416HL0
mbrwer_2



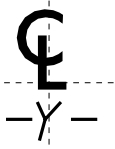
-Y- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY NCDOT ON DATE 02/28/2017. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.



6/23/16

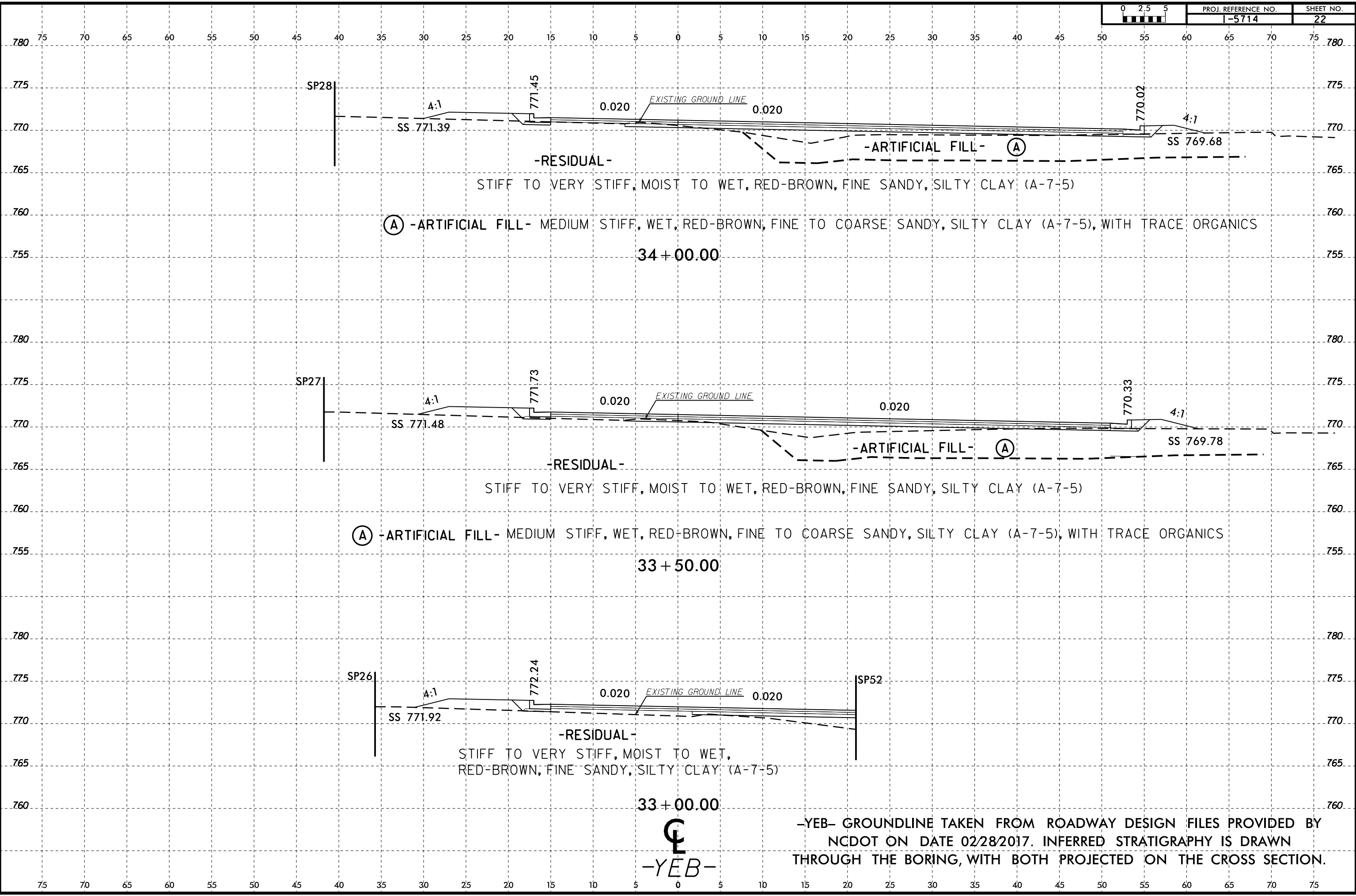


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mbr:er2



-Y- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY NCDOT ON DATE 02/28/2017. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.

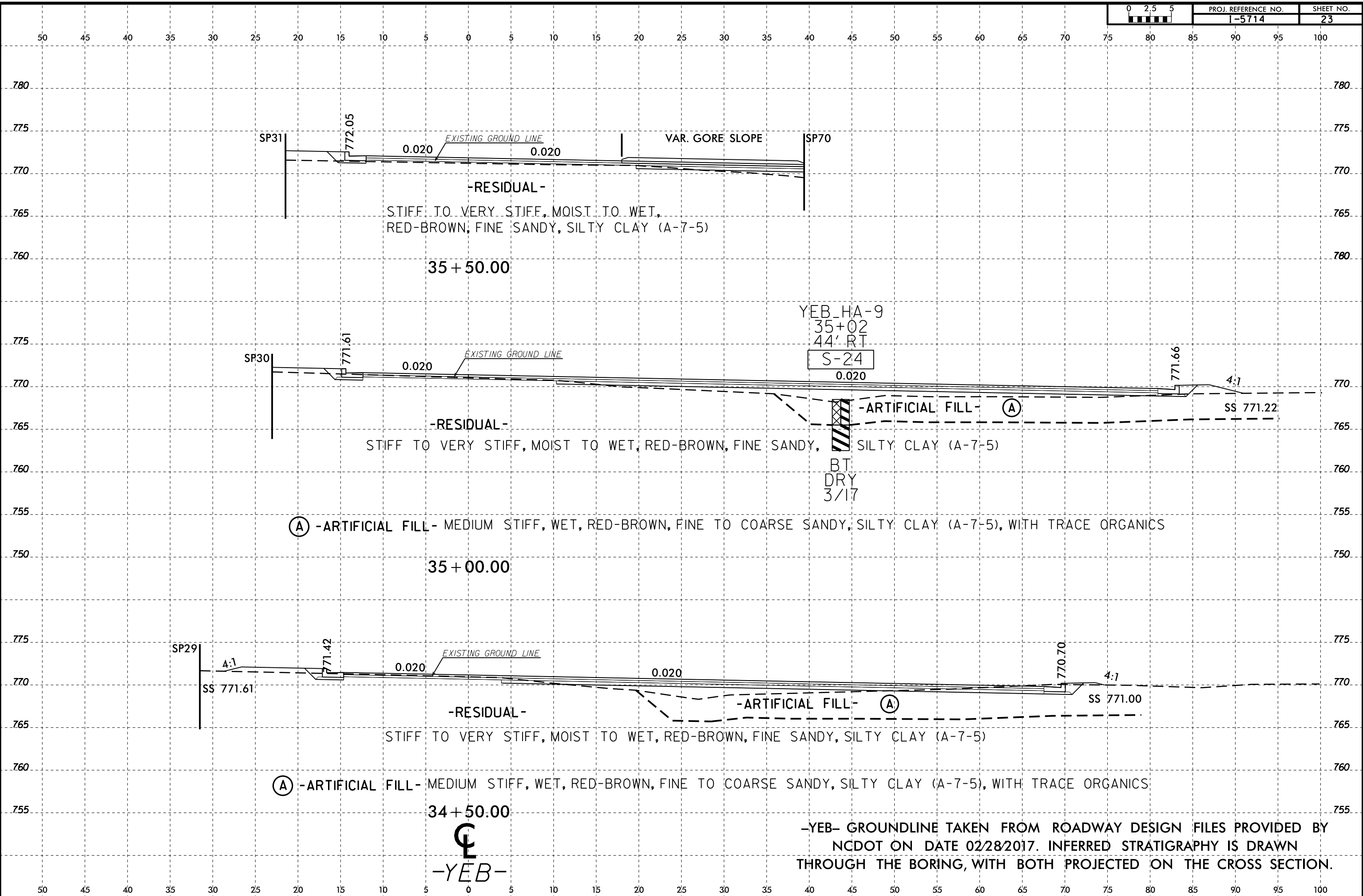
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 YEB
 AT 10:44:01



-YEB- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY
 NCDOT ON DATE 02/28/2017. INFERRED STRATIGRAPHY IS DRAWN
 THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.

YEB

6/23/16
24-MAR-2017 14:48
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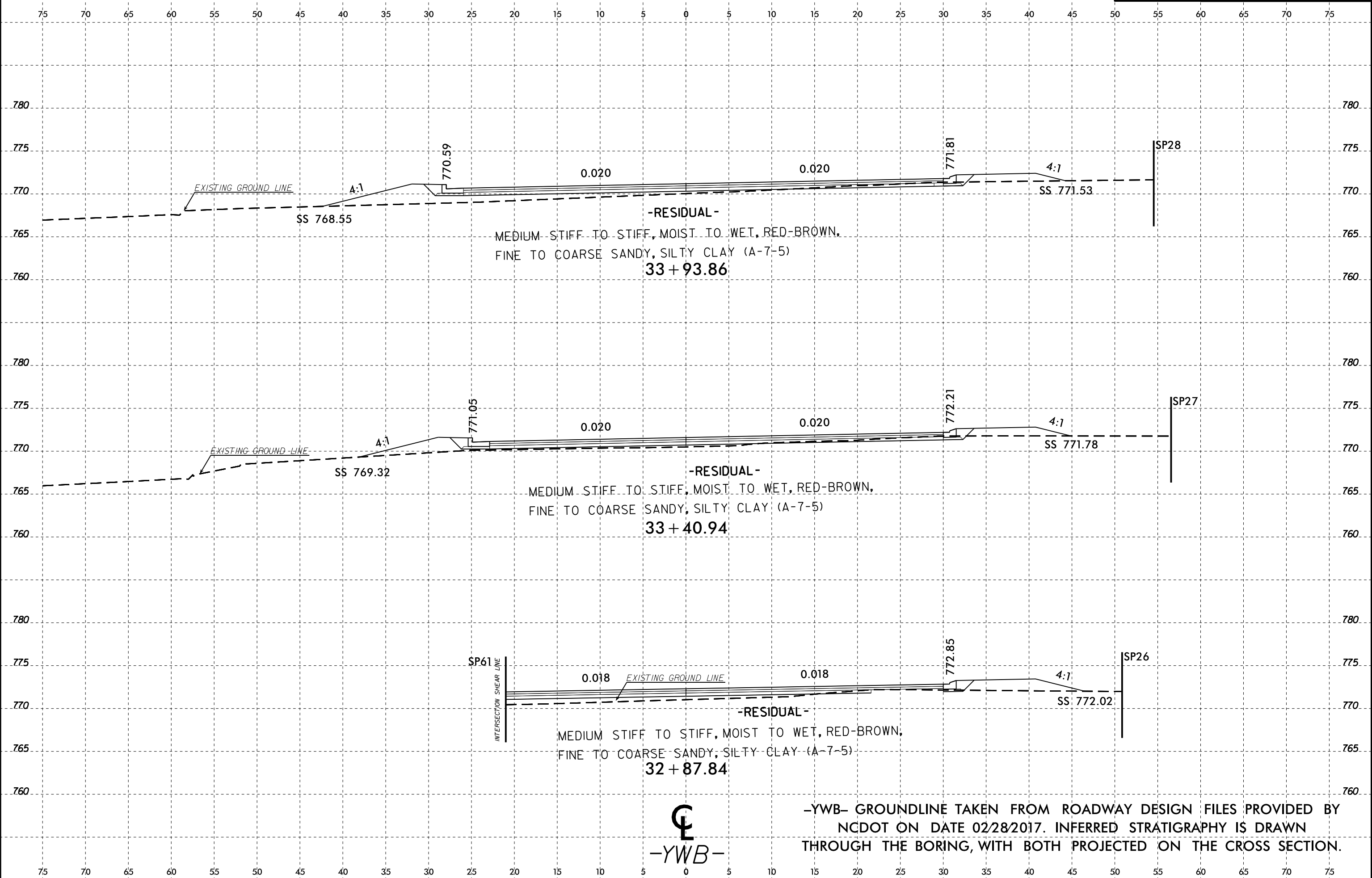
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-YEB-

6/23/16
24-MAR-2017 14:48
I:\2\GEO\TECH\02 PROJ\PROJECTS\2000\12999\12100\12109 - I-5714 RDWY I-77 and SR 2136 (I-lead Road) Interchange\CADD\GEO\TECH\15714_Geo_rdy_xsl_YWB.dgn



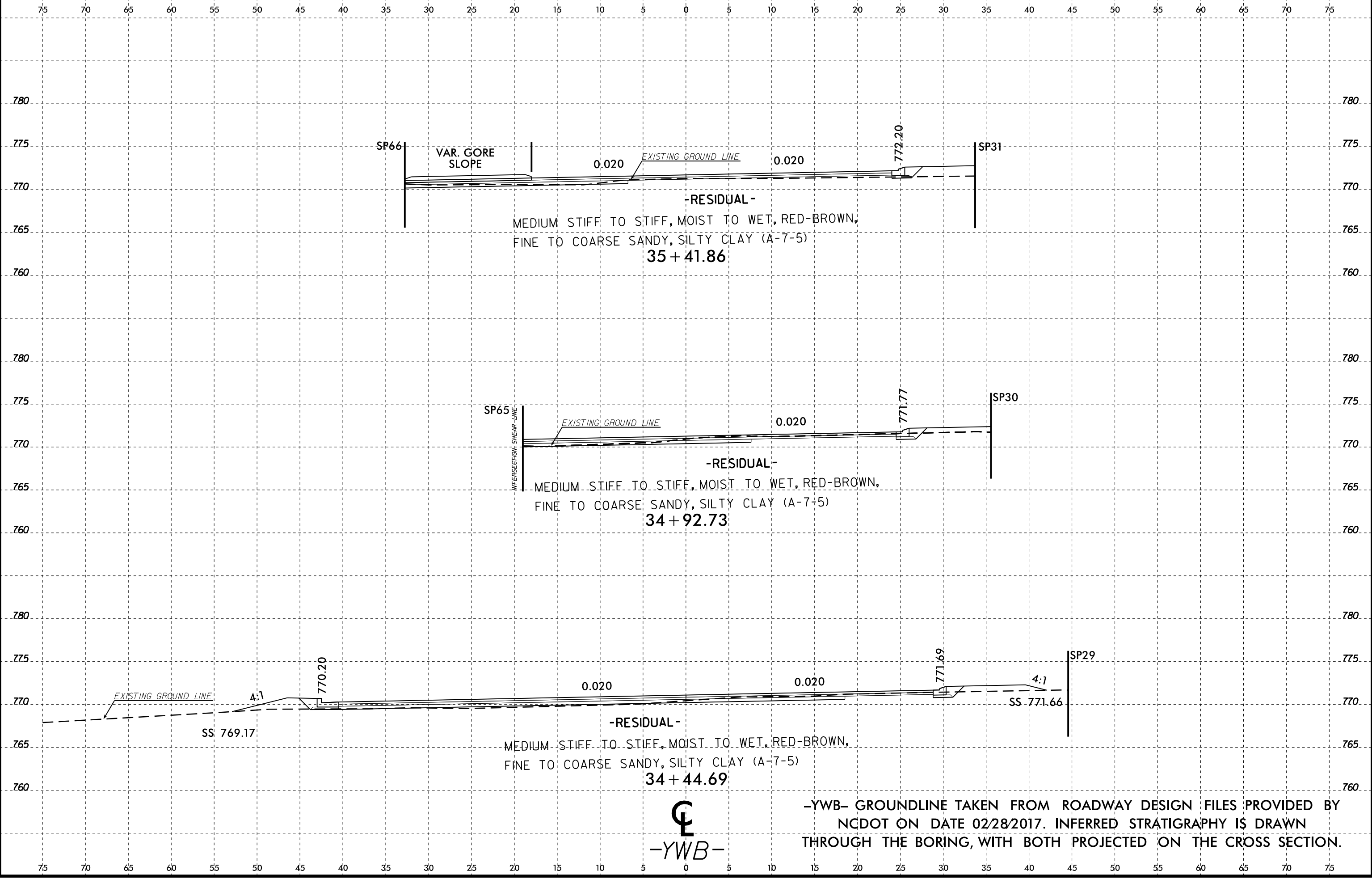
PROJ. REFERENCE NO.	SHEET NO.
1-5714	24





-YWB-

-YWB- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY NCDOT ON DATE 02/28/2017. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.

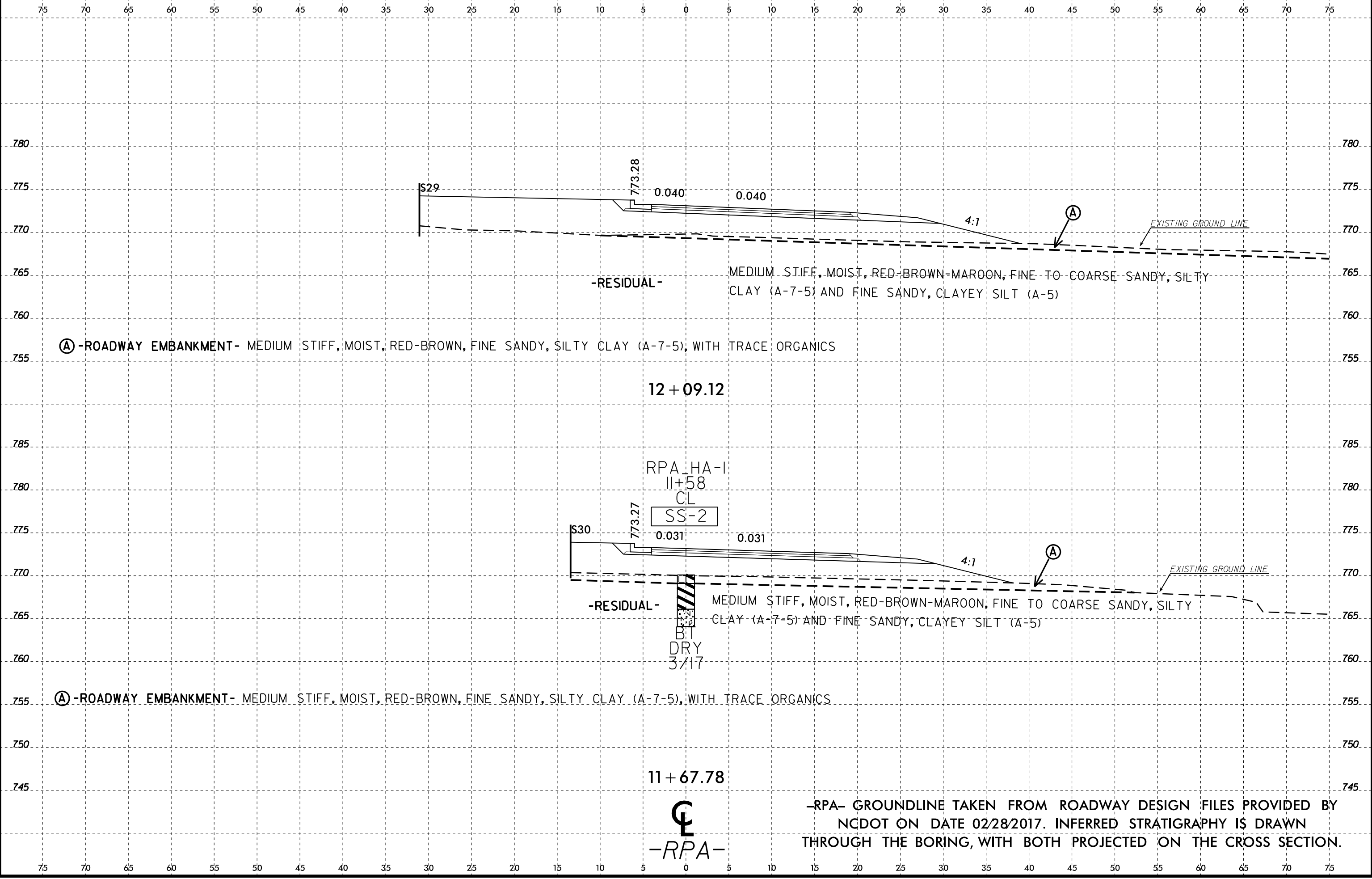
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-YWB-

-YWB- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY NCDOT ON DATE 02/28/2017. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.

6/23/16
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RPA.dgn



(A) -ROADWAY EMBANKMENT- MEDIUM STIFF, MOIST, RED-BROWN, FINE SANDY, SILTY CLAY (A-7-5), WITH TRACE ORGANICS

12 + 09.12

RPA_HA-1
11+58
CL
SS-2

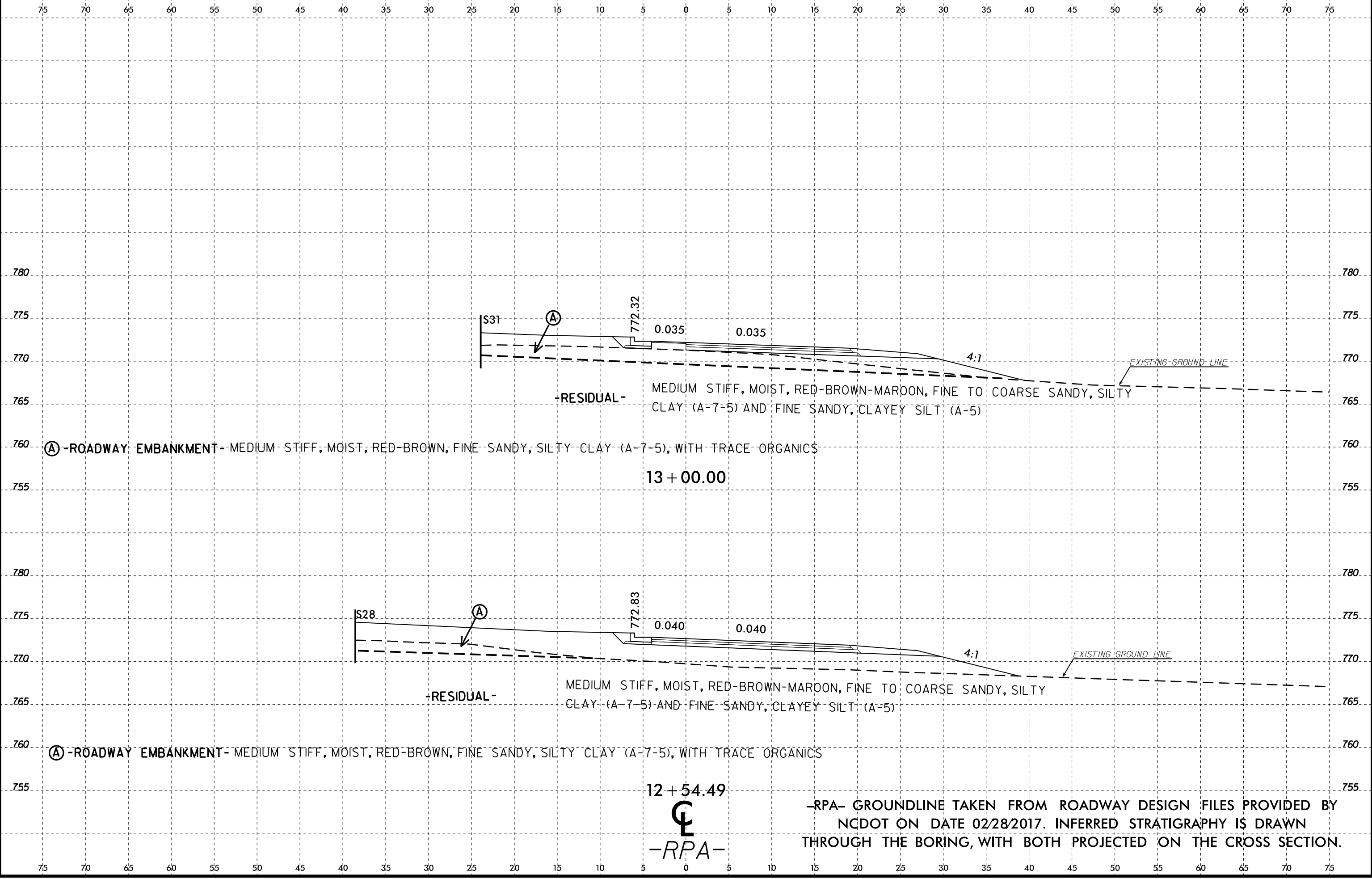
(A) -ROADWAY EMBANKMENT- MEDIUM STIFF, MOIST, RED-BROWN, FINE SANDY, SILTY CLAY (A-7-5), WITH TRACE ORGANICS

11 + 67.78

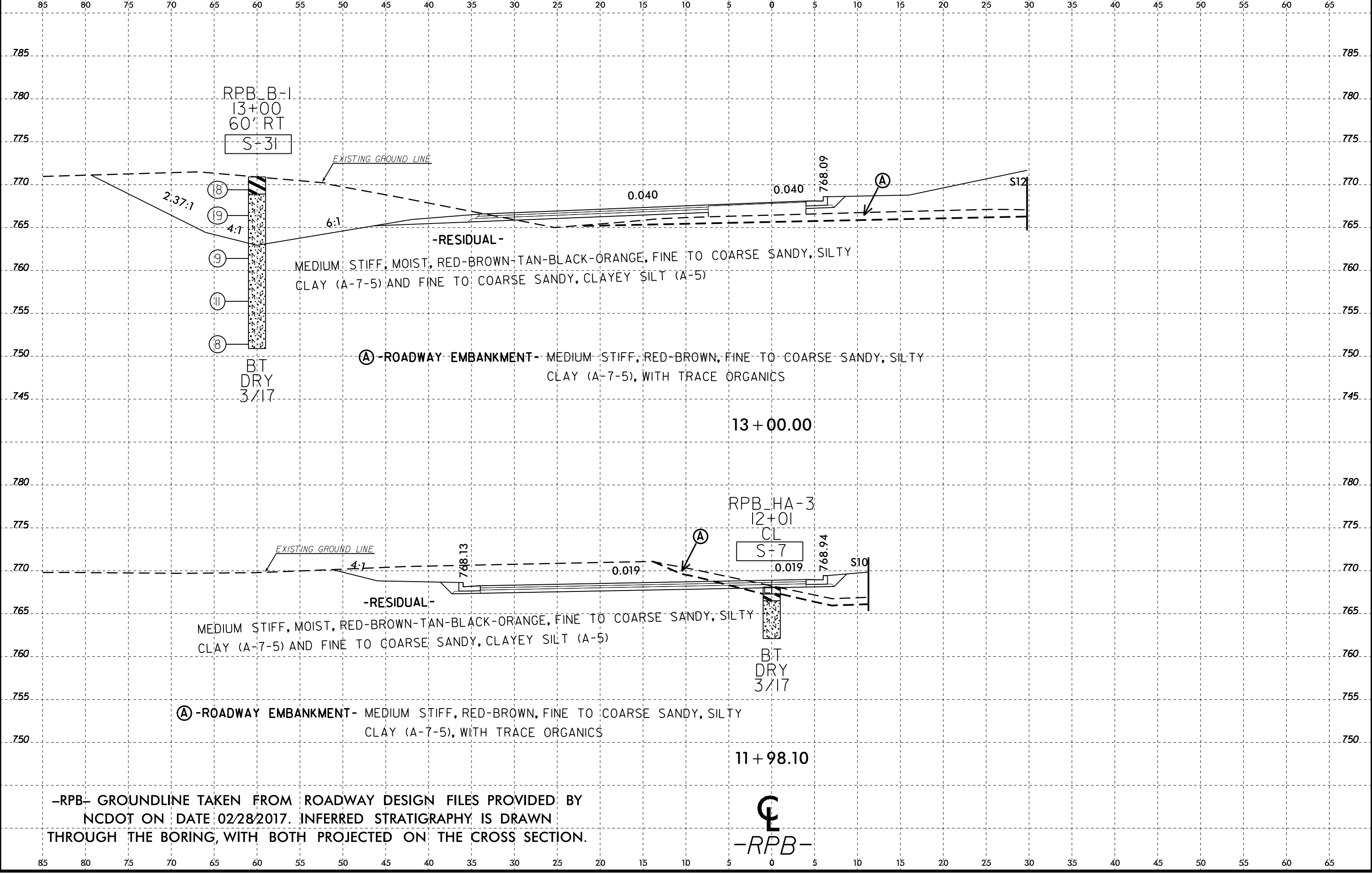
-RPA-

-RPA- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY NCDOT ON DATE 02/28/2017. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.

6/23/16
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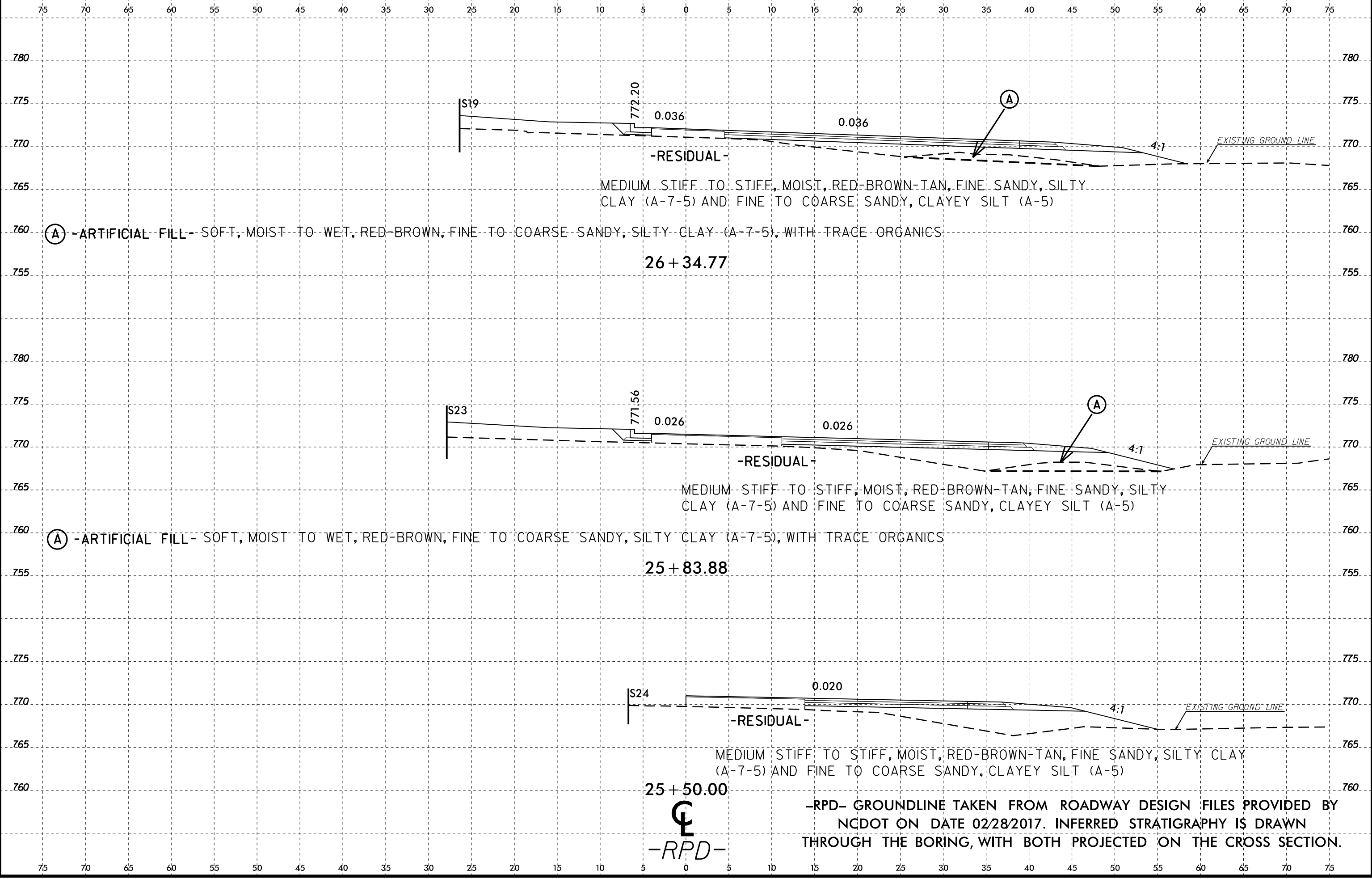
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 DRAWN BY: AT EES-10147@NCDOT



-RPB- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY
 NCDOT ON DATE 02/28/2017. INFERRED STRATIGRAPHY IS DRAWN
 THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.

-RPB-

6/23/16
24-MAR-2017 14:48
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DRAWN BY: JES-10144@DILLCO



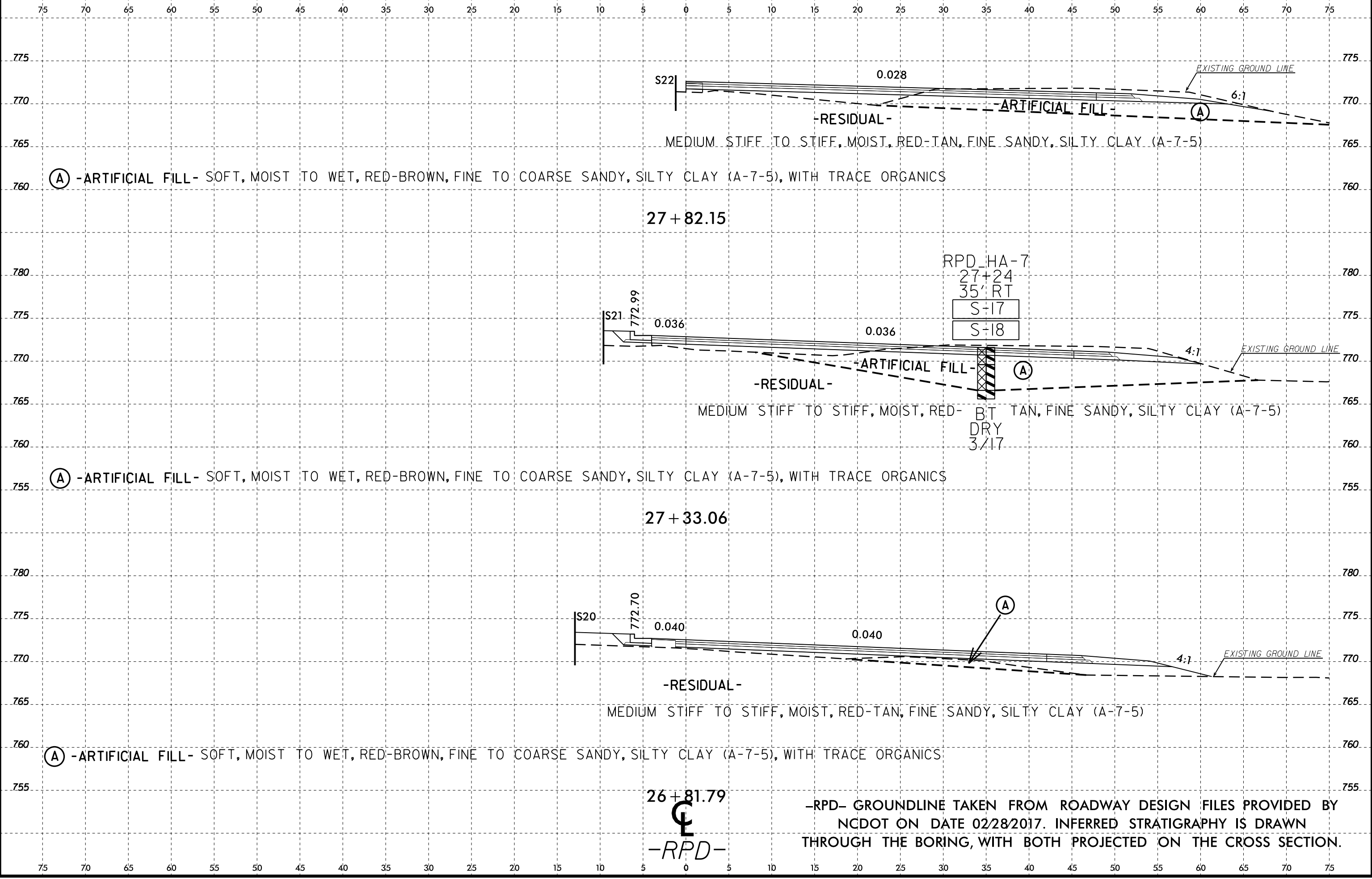
S19
772.20
0.036
0.036
-RESIDUAL-
MEDIUM STIFF TO STIFF, MOIST, RED-BROWN-TAN, FINE SANDY, SILTY CLAY (A-7-5) AND FINE TO COARSE SANDY, CLAYEY SILT (A-5)
26 + 34.77
A

S23
771.56
0.026
0.026
-RESIDUAL-
MEDIUM STIFF TO STIFF, MOIST, RED-BROWN-TAN, FINE SANDY, SILTY CLAY (A-7-5) AND FINE TO COARSE SANDY, CLAYEY SILT (A-5)
25 + 83.88
A

S24
0.020
-RESIDUAL-
MEDIUM STIFF TO STIFF, MOIST, RED-BROWN-TAN, FINE SANDY, SILTY CLAY (A-7-5) AND FINE TO COARSE SANDY, CLAYEY SILT (A-5)
25 + 50.00
A

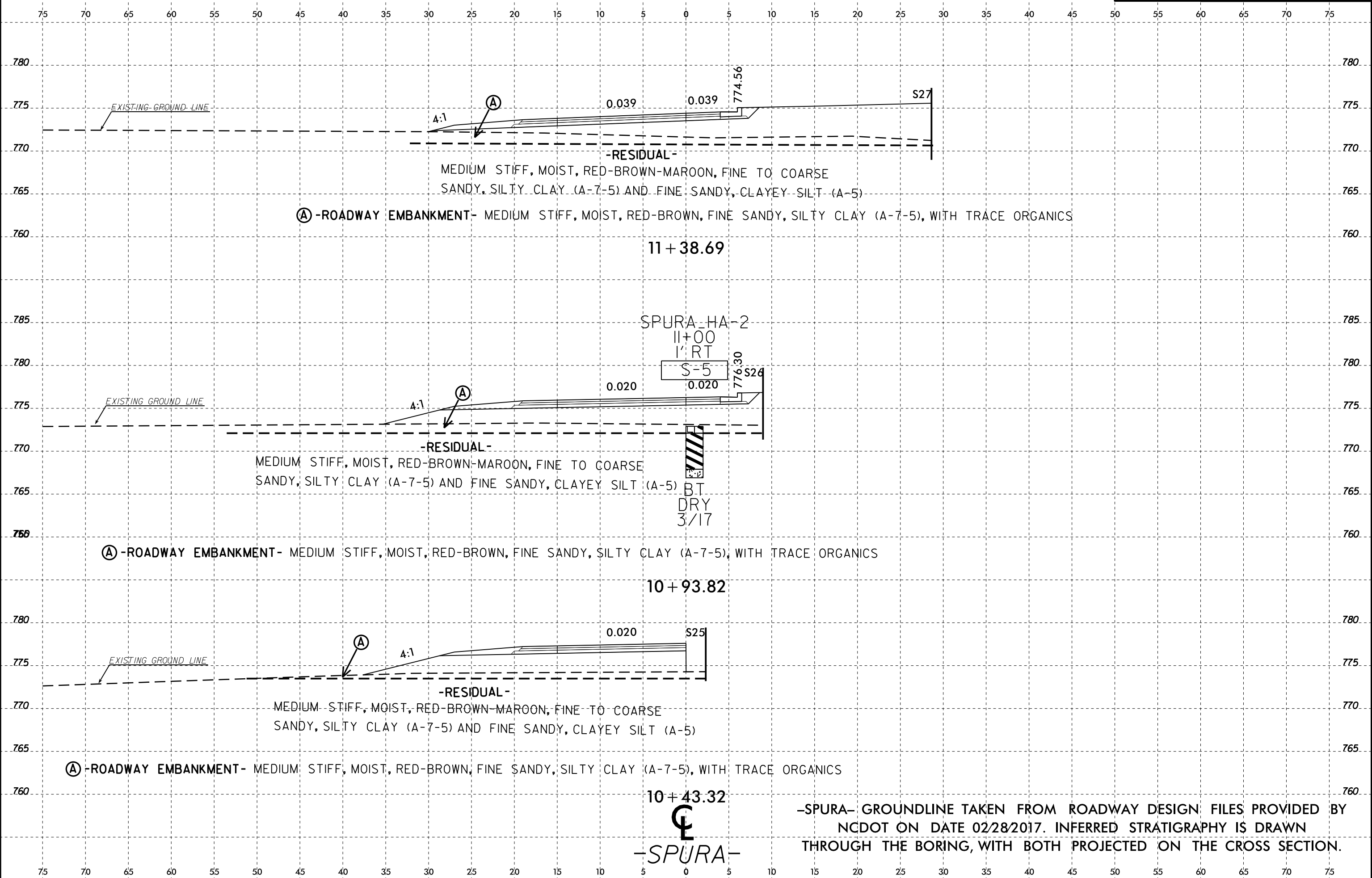
Ⓞ
-RPD-
-RPD- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY NCDOT ON DATE 02/28/2017. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.

6/23/16
24-MAR-2017 14:48
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DWGNAMEZ AT EES-1014481160

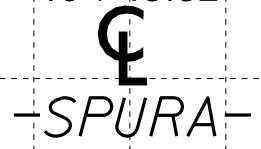


-RPD- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY NCDOT ON DATE 02/28/2017. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.

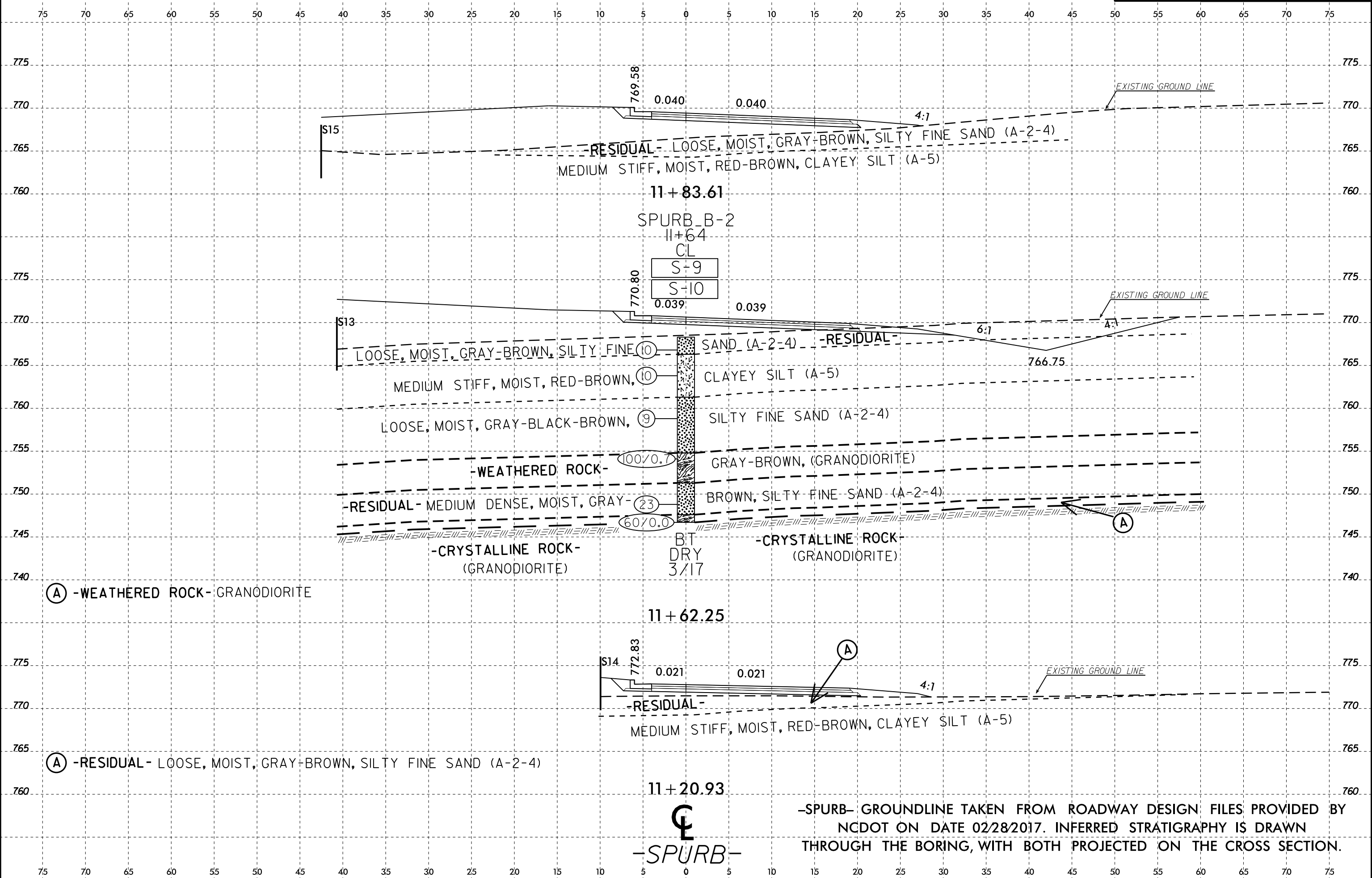
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-SPURA- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY NCDOT ON DATE 02/28/2017. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.



6/23/16
24-MAR-2017 14:48
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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

775 770 765 760 755 750 745 740 735 730 725 720 715 710 705 700 695 690 685 680 675 670 665 660 655 650 645 640 635 630 625 620 615 610 605 600 595 590 585 580 575 570 565 560 555 550 545 540 535 530 525 520 515 510 505 500 495 490 485 480 475 470 465 460 455 450 445 440 435 430 425 420 415 410 405 400 395 390 385 380 375 370 365 360 355 350 345 340 335 330 325 320 315 310 305 300 295 290 285 280 275 270 265 260 255 250 245 240 235 230 225 220 215 210 205 200 195 190 185 180 175 170 165 160 155 150 145 140 135 130 125 120 115 110 105 100 95 90 85 80 75

769.58 0.040 0.040 4:1
S15
RESIDUAL - LOOSE, MOIST, GRAY-BROWN, SILTY FINE SAND (A-2-4)
MEDIUM STIFF, MOIST, RED-BROWN, CLAYEY SILT (A-5)
11 + 83.61
SPURB_B-2
11+64
CL
S-9
S-10
770.80 0.039 0.039 6:1 4:1
S13
LOOSE, MOIST, GRAY-BROWN, SILTY FINE SAND (A-2-4)
MEDIUM STIFF, MOIST, RED-BROWN, CLAYEY SILT (A-5)
LOOSE, MOIST, GRAY-BLACK-BROWN, SILTY FINE SAND (A-2-4)
WEATHERED ROCK - GRAY-BROWN, (GRANODIORITE)
RESIDUAL - MEDIUM DENSE, MOIST, GRAY-BROWN, SILTY FINE SAND (A-2-4)
CRYSTALLINE ROCK - (GRANODIORITE)
BT DRY 3/17
CRYSTALLINE ROCK - (GRANODIORITE)
11 + 62.25
S14 772.83 0.021 0.021 4:1
RESIDUAL - MEDIUM STIFF, MOIST, RED-BROWN, CLAYEY SILT (A-5)
11 + 20.93
SPURB

EXISTING GROUND LINE
EXISTING GROUND LINE
EXISTING GROUND LINE

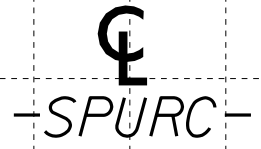
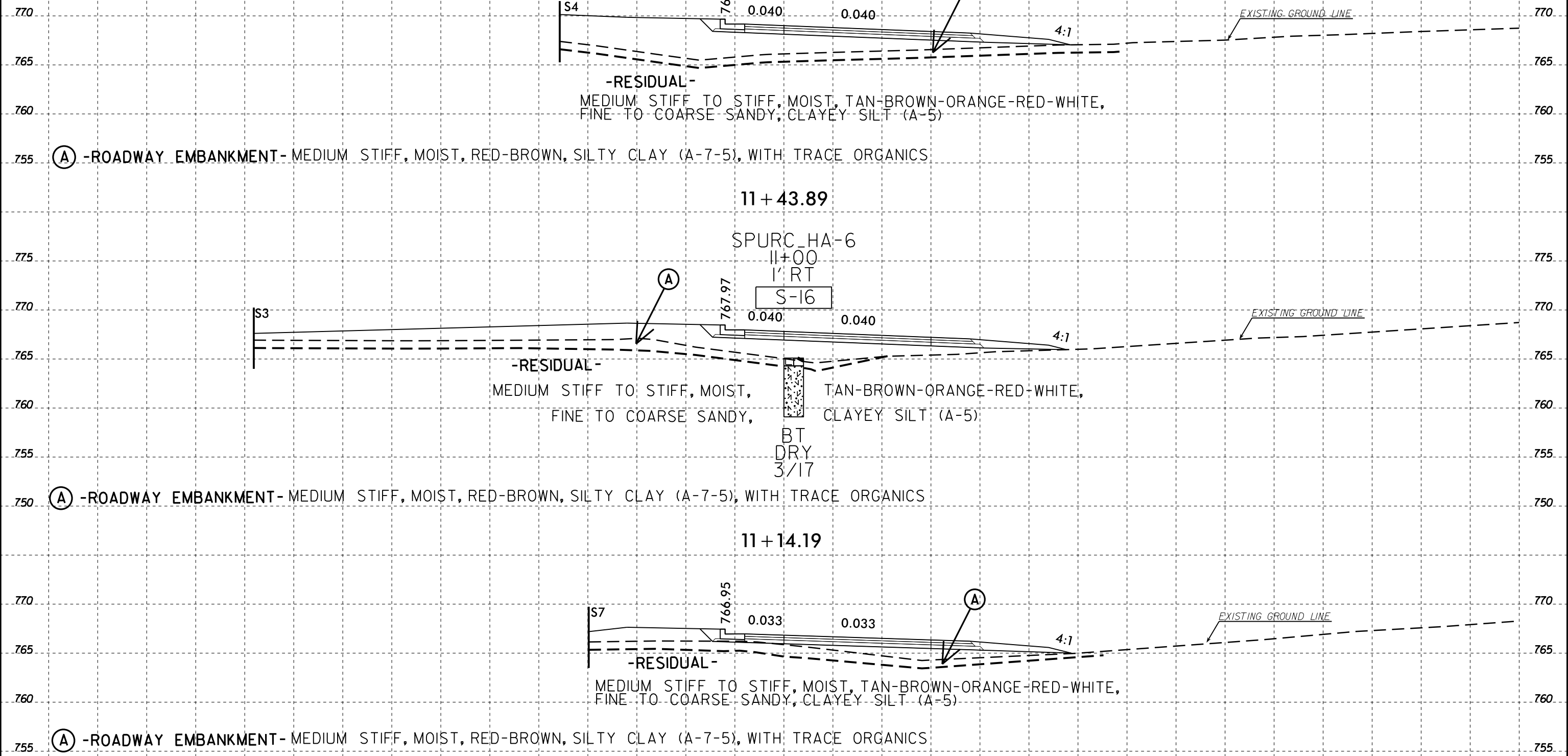
(A) - WEATHERED ROCK - GRANODIORITE
(A) - RESIDUAL - LOOSE, MOIST, GRAY-BROWN, SILTY FINE SAND (A-2-4)

-SPURB- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY NCDOT ON DATE 02/28/2017. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.

6/23/16



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



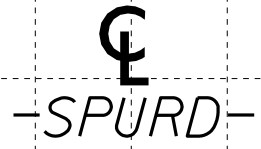
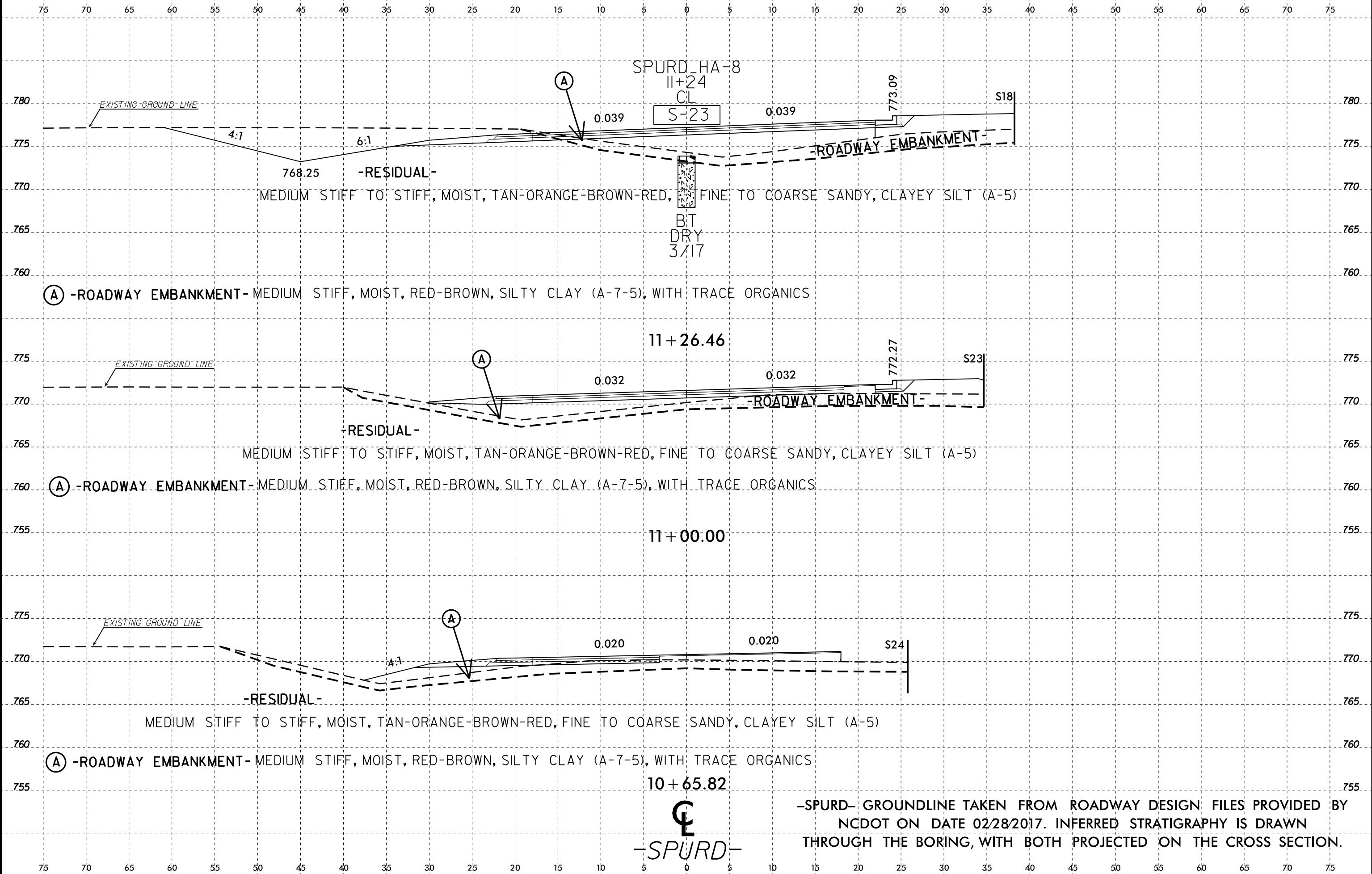
-SPURC- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY NCDOT ON DATE 02/28/2017. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.

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

24-MAR-2017 14:48 I:\2\GEO\TECH\02 PROJ\121000\121009 - I-5714 RDWY 1-77 and SR 2136 (I-5714 Road) Interchange\CADD\GEO\TECH\15714_Geo_rdy_xsl_SPURC.dgn

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RBR-2

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	I-5714	34



-SPURD- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY NCDOT ON DATE 02/28/2017. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.

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

REFERENCE: I-5714

PROJECT: 50127

Prepared in the Office of:



ECS SOUTHEAST, LLP
1812 CENTER PARK DRIVE, SUITE D
CHARLOTTE, NC 28217
(704) 525-5152 [PHONE]
(704) 357-0023 [FAX]
NC REGISTERED
ENGINEERING
FIRM # F-1078

SOIL TEST RESULTS

BORING NO.	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		
RPA_HA-1	S-2	CL	11+58 -RPA-	2.0 - 3.0'	A-7-5(28)	75	28	10.2	14.1	15.9	59.8	100.0	95.0	79.0	31.2	-
SPURA_HA-2	S-5	1' RT	11+00 -SPURA-	2.0 - 3.0'	A-7-5(19)	59	22	10.8	16.7	20.2	52.3	100.0	96.0	76.0	30.6	-
RPB_HA-3	S-7	CL	12+01 -RPB-	3.0 - 4.0'	A-5(5)	66	1	13.3	31.4	22.9	32.4	100.0	94.0	62.0	34.4	-
SPURB_HA-4	S-9	CL	11+64 -SPURB-	2.0 - 3.0'	A-5(5)	46	10	19.4	28.0	19.5	33.1	100.0	89.0	57.0	33.4	-
SPURB_HA-4	S-10	CL	11+64 -SPURB-	4.0 - 5.0'	N/A	-	-	-	-	-	-	-	-	-	33.9	-
YEB_HA-5	S-12	29' RT	20+00 -YEB-	2.0 - 3.0'	N/A	-	-	-	-	-	-	-	-	-	38.3	-
SPURC_HA-6	S-16	1' RT	11+00 -SPURC-	4.0 - 5.0'	A-5(2)	47	6	38.2	14.8	23.7	23.3	93.0	67.0	47.0	21.8	-
RPD_HA-7	S-17	35' RT	27+24 -RPD-	0.0 - 1.0'	N/A	-	-	-	-	-	-	-	-	-	27.3	-
RPD_HA-7	S-18	35' RT	27+24 -RPD-	2.0 - 3.0'	A-7-5(22)	60	22	7.6	13.0	24.1	55.3	99.0	96.0	81.0	34.0	-
SPURD_HA-8	S-23	CL	11+24 -SPURD-	4.0 - 5.0'	A-5(11)	52	8	5.3	17.2	41.6	35.9	100.0	99.0	82.0	32.8	-
YEB_HA-9	S-24	44' RT	35+03 -YEB-	0.0 - 1.0'	A-7-5(25)	67	25	7.1	14.4	22.5	56.1	99.0	97.0	81.0	38.4	-
YWB_HA-10	S-30	48' RT	35+00 -YWB-	4.0 - 5.0'	A-7-5(19)	66	22	14.4	15.4	12.9	57.3	99.0	92.0	72.0	30.5	-
RPB_B-1*	S-31	60' LT	13+00 -RPB-	4.0 - 4.5'	A-5(12)	61	10	8.5	22.0	29.6	39.9	100.0	97.0	75.0	28.2	-

NOTE: TEST SAMPLE S-31 WAS OBTAINED AT AN OFFSET LOCATION WITH A HAND AUGER ADJACENT TO RPB_B-1

LAB TECHNICIAN: AMANDA ROTH

NCDOT CERTIFICATION NO. 112-09-1003

SIGNATURE:  _____