

REFERENCE: Y-4810K

PROJECT: 40325

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.	Y-4810K	1	95

ROADWAY
SUBSURFACE INVESTIGATION

COUNTY CABARRUS
PROJECT DESCRIPTION NORFOLK SOUTHERN MAINLINE
GRADE CROSSING SEPARATION AT ROGERS
LAKE ROAD CROSSING #724408Y IN KANNAPOLIS
INVENTORY

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 TOTTENHAM. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

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

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

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

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PERSONNEL

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DATE FEBRUARY 2019

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522807396442019

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. 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)										NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.																																																																									
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<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>ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.</p>										<p>VERY SLIGHT (IV SLI) - ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN. CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.</p>																																																																									
PERCENTAGE OF MATERIAL										GROUND WATER										MODERATE (MOD.)										SEVERE (SEV.)																																																																									
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<p>DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-BROWN). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.</p>										<p>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.</p>										<p>RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.</p>										<p>GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.</p>																																																																									
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										<p>FIAD - FILLED IMMEDIATELY AFTER DRILLING</p> <p>PROJECT WAS DRAFTED USING PROVIDED TIN FILE FILE: y4810k_ls_tin.tin (DATED: 10/31/2017)</p>										<p>GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.</p>										<p>SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</p>																																																																									

TIP PROJECT: Y-4810K

CONTRACT:

STATE OF NORTH CAROLINA
RAIL DIVISION

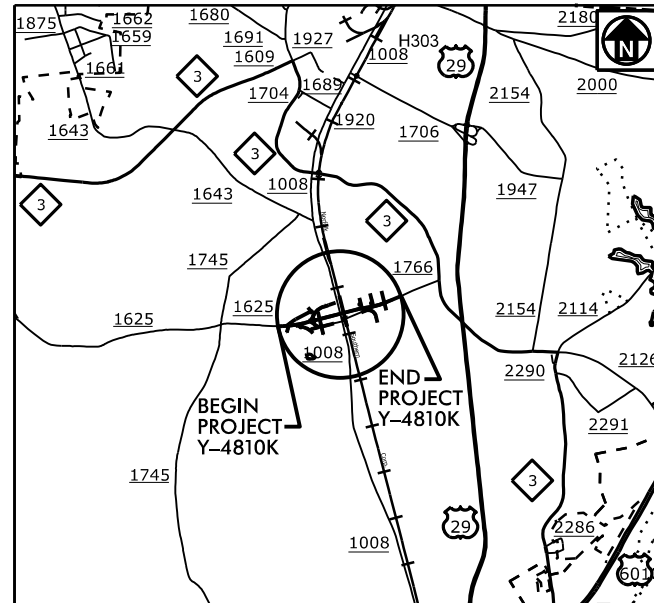
CABARRUS COUNTY

**LOCATION: GRADE SEPERATION AT SR 1625 (ROGERS LAKE ROAD)
OVER NSNCRR RAILROAD AND CLOSURE OF AT-GRADE
CROSSING (#724408Y) IN KANNAPOLIS**

**TYPE OF WORK: GRADING, PAVING, DRAINAGE, SIGNALS, AND
STRUCTURE**

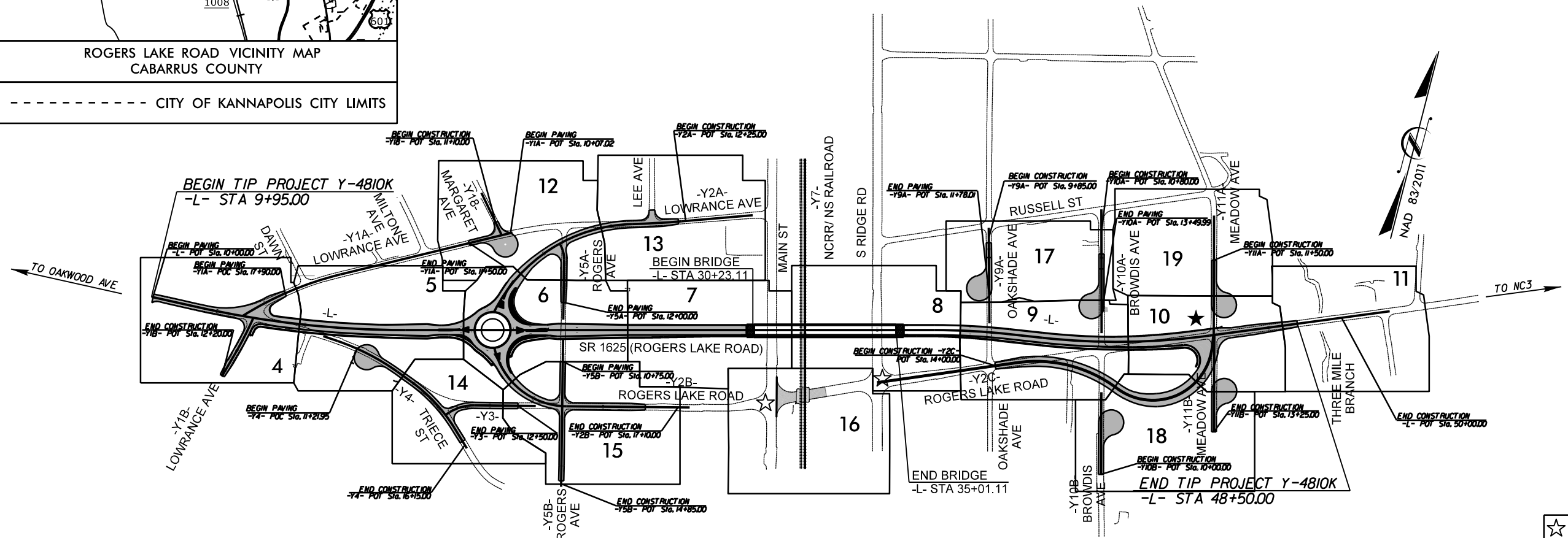
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	Y-4810K	3	95
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
40325.1.46	TCSP-1034(18)	P.E.	
40325.2.46	TCSP-1034(18)	RW	

90% SUBMITTAL



ROGERS LAKE ROAD VICINITY MAP
CABARRUS COUNTY

----- CITY OF KANNAPOLIS CITY LIMITS

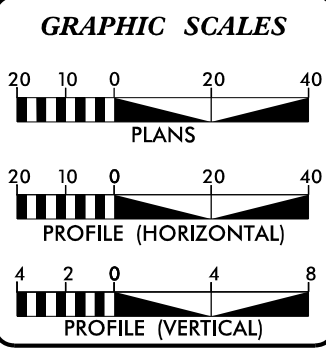


- ☆ EXISTING SIGNAL
- ★ PROPOSED SIGNAL

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

*DESIGN EXCEPTION:
LANE TAPER RATE



DESIGN DATA

ADT 2020 =	8,600
ADT 2040 =	11,200
K =	10 %
D =	55 %
T =	5 % *
V =	50 MPH
* TTST =	1% DUAL 4%
FUNC CLASS =	URBAN MAJOR COLLECTOR SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT Y-4810K =	0.639 MILES
LENGTH STRUCTURE TIP PROJECT Y-4810K =	0.091 MILES
TOTAL LENGTH OF TIP PROJECT Y-4810K =	0.730 MILES

PLANS PREPARED FOR THE NCDOT BY:

S&E ASSOCIATES 1640 Stone Drive Durham, NC 27704 (919) 252-2223 www.sea-engineers.com	MOTT MACDONALD P.O. Box 700 Fayetteville, NC 27526 (919) 552-2223 (919) 552-2234 (fax) www.mottmac.com	SUNGATE DESIGN GROUP, P.A. 200 JONES BRANCH DRIVE DURHAM, NC 27604 (919) 486-1100 www.sungate.com
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2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JUNE 14, 2018

LETTING DATE:
JUNE 18, 2019

MICHAEL PEKAREK, PE PROJECT ENGINEER PEF ENGINEER	JORDAN WOODARD, PE PROJECT DESIGN ENGINEER PEF ENGINEER	KUMAR TRIVEDI, PE NCDOT CONTACT NCDOT RAIL DIVISION
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HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.

NC DEPARTMENT OF
TRANSPORTATION
RAIL DIVISION

1556 MAIL SERVICE CENTER
RALEIGH, NC 27699-1556
(919) 707 4110
(919) 707-4154 (FAX)

Date: February 6, 2018

WBS Number: 40325.1.46
 TIP Number: Y-4810K
 County: Cabarrus
 Description: Norfolk Southern Mainline Grade Crossing Separation at Rogers Lake Road Crossing #724408Y in Kannapolis

Subject: Roadway Geotechnical Report - Inventory

Alignment
 -Y11B-
 -Y18-

Stations(±)
 10+00 to 11+80
 11+10 to 11+58

Project Description

The project is located along existing SR 1625 (Rogers Lake Road) at the Norfolk Southern Mainline Grade Crossing (#724408Y) in Kannapolis, North Carolina in Cabarrus County. The total length of the project is 0.730 miles and consists of a new roadway alignment and roadway realignments with a MSE wall within a fill section along the new roadway and a new four span bridge at the railroad crossing. The project corridor is in an urban setting with both residential and commercial development. The project will require minimal cuts of less than 5 feet and maximum fill placement of about 34 feet at the bridge approaches.

The geotechnical subsurface investigation was performed in December of 2017. Standard penetration test (SPT) borings were advanced using a Diedrich D-50 rotary drill rig equipped with a recently calibrated automatic hammer. Borings were advanced utilizing hollow stem auger drilling techniques to the necessary depths. In addition to soil test borings a hand auger boring was performed at boring B-12 due to limited access beneath overhead utilities. 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.

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

<u>Alignment</u>	<u>Stations(±)</u>
-L-	9+95 to 48+50
-Y1A-	10+00 to 11+50
-Y1A-	17+90 to 19+52
-Y1B-	10+00 to 12+20
-Y2A-	12+25 to 19+82
-Y2B-	10+00 to 16+00
-Y2C-	14+00 to 22+90
-Y3-	10+00 to 12+50
-Y4-	10+00 to 16+15
-Y5A-	10+00 to 12+00
-Y5B-	10+00 to 14+85
-Y9A-	9+85 to 12+71
-Y10A-	11+35 to 14+16
-Y11A-	12+40 to 14+01

Physiography and Geology

The site is located within the Piedmont Physiographic Province of North Carolina, northeast of Charlotte, North Carolina. Topography in the area is rolling to moderately steep. The Piedmont Province is characterized by gently to steeply sloping topography with well-rounded hills and along rolling ridges with a northeast-southwest trend dissected by a moderate to well developed (mature) dendritic-type drainage system consisting of drainage swales, hollows, tributaries, streams and rivers.

Geologically, the site is located within the Charlotte Belt. Based on the North Carolina Geologic Map 1985, and recovered rock core samples on-site, the underlying rock formation at this site consist of igneous, plutonic, granitic rock of Permian/Pennsylvanian Age. These granitic rocks have a megacrystic to equigranular rock structure. These rocks typically weather in an irregular pattern with deep residual soils overlying saprolite to bedrock. The typical residual profile consists of finer grain clays and silts near the ground surface which gradually transition to coarser and denser material with depth and contain mica.

Soil Properties

Soils encountered during this investigation are separated into four categories based on their origin. Soils encountered consist of roadway embankment fill, artificial fill, residual and rock materials.

Roadway embankment soils were encountered along the existing roadway shoulders to depths of about 2 to 3 feet. The roadway embankment soils consist of moderately to highly plastic, stiff to very stiff, moist, silty clay (A-7-6, A-7-5, A-6). The roadway embankment soils appear to be reworked near-by residual soils.

Artificial fill materials were encountered within isolated areas along the new alignment in previously graded areas adjacent to both residential and commercial structures. These areas are listed in “Areas of Special Geotechnical Interest.” The artificial fill soils extend to depths of about 2 to 3 feet beneath the ground surface and are underlain by residual soils. The artificial fill soils consist of stiff to very stiff, moist, silty clay (A-7-6, A-7-5). The exception to this exists beneath the pavement along Triage Street (-Y4-) where about 8 feet of very soft to soft, moist, coarse to fine sandy silt (A-4) was encountered beneath the pavement. These fill materials appear to be within a possible utility trench beneath the roadway.

Residual soils are present at the surface along the majority of the project and beneath the roadway embankment soils, asphalt pavement sections and artificial fill in the remaining portions of the project. The residual soils are deeply weathered and extend to greater than the roadway boring termination depths of 45 feet. The residual soils can be generalized as about 5 to 10 feet of moderate to highly plastic, medium stiff to hard, dry to wet, silty clay and sandy clay (A-7-6, A-7-5, A-6) with trace to little mica, at the surface, underlain by low to non-plastic sandy clays, clayey silts, sandy silts and clayey to silty sands. These clays exhibit moderate to high plastic indices of 18 to 60 percent. The highly plastic residual soils are indicated on the attached cross section graphics. The low to non-plastic silts consist of soft to hard, dry to moist, fine to



coarse sandy silts and clayey silts (A-4, A-5) with a trace of mica to highly micaceous. The sands consist of and loose to very dense, dry to wet silty to clayey fine to coarse sands (A-2-4, A-2-6, A-2-7) with varying amounts of mica.

Rock Properties

Weathered rock was not encountered during the roadway investigation. However, weathered rock was encountered during the investigation for the bridge structure. The depth to weathered rock varied significantly across the bridge structure from about 77 to 83.5 feet at the west approach of the bridge to about 4 to 35 feet at the east approach of the bridge. The weathered rock originates from the underlying granitic crystalline rock.

Crystalline rock (granite) was not encountered during the roadway investigation but was encountered during the investigation for the bridge structure. Crystalline rock is present at depths of 18.5 to 35 feet beneath the ground surface, at the east approach to the bridge. No outcrops of crystalline rock were observed during drilling operations.

Groundwater

Groundwater was not encountered within about 16.2 feet of the ground surface and deeper borings caved dry at depths of 18.6 feet at time of drilling. The depth of groundwater, beneath the ground surface, will fluctuate with seasonal precipitation and may occur a higher levels at other times of the year above less permeable clayey soils.

Areas of Special Geotechnical Interest

1) Plastic Soils – High plasticity soils occur throughout the upland portions of the project and may impact grading at the following locations:

<u>Alignment</u>	<u>Stations(±)</u>
-L-	12+25 to 23+75
-L-	39+75 to 46+75
-Y1A-	17+90 to 19+52
-Y1B-	10+00 to 12+20
-Y2A-	12+50 to 19+82
-Y2B-	10+00 to 11+75
-Y2B-	13+75 to 16+00
-Y2C-	15+25 to 22+70
-Y3-	10+00 to 12+50
-Y5B-	10+50 to 12+25
-Y5B-	13+25 to 14+85
-Y9A-	9+85 to 12+71
-Y10A-	11+35 to 13+50
-Y11A-	12+50 to 14+00
-Y11B-	10+00 to 11+50

A discussion of these plastic soils is located above in the section titled “Soil Properties”.

2) Artificial Fill- Artificial fill was encountered at the following locations:

<u>Alignment</u>	<u>Station (±)</u>
-L-	25+48 to 28+25
-Y2B-	12+15 to 12+53
-Y4-	11+63

A discussion of these artificial soils is located above in the section titled “Soil Properties”.

BULK SAMPLES

No bulk samples were obtained.

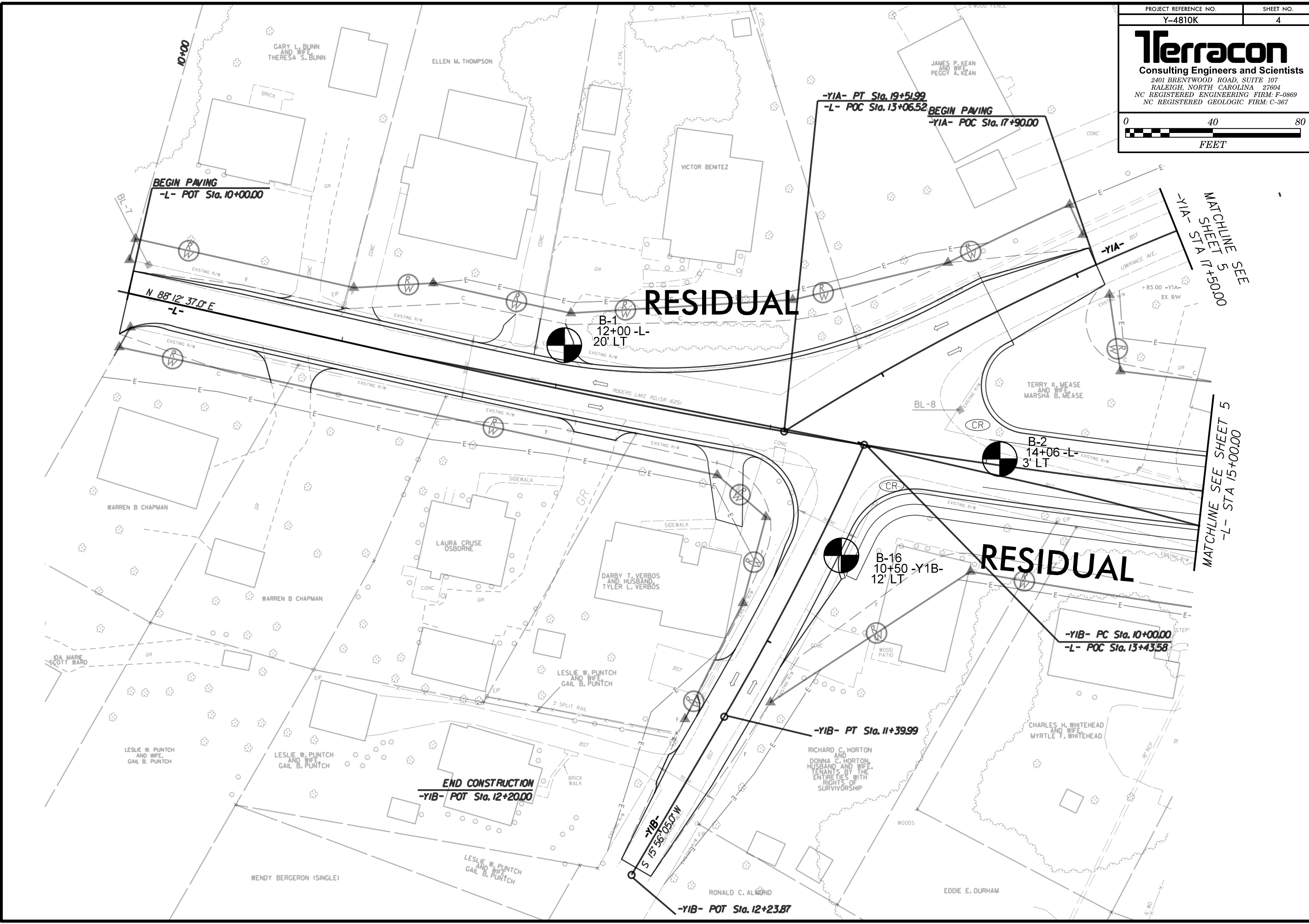
UNDISTURBED SAMPLES

No undisturbed samples were obtained.

Sincerely,
Terracon Consultants, Inc.

Abner F. Riggs, Jr., P.E.
Senior Geotechnical Engineer

Andrew A. Nash, P.E.
Geotechnical Department Manager



BEGIN PAVING
-L- POT Sta. 10+00.00

-Y1A- PT Sta. 19+51.99
-L- POC Sta. 13+06.52
BEGIN PAVING
-Y1A- POC Sta. 17+90.00

MATCHLINE SEE SHEET 5
-Y1A- STA 17+5000

RESIDUAL

B-1
12+00 -L-
20' LT

B-2
14+06 -L-
3' LT

MATCHLINE SEE SHEET 5
-L- STA 15+00.00

RESIDUAL

B-16
10+50 -Y1B-
12' LT

-Y1B- PC Sta. 10+00.00
-L- POC Sta. 13+43.58

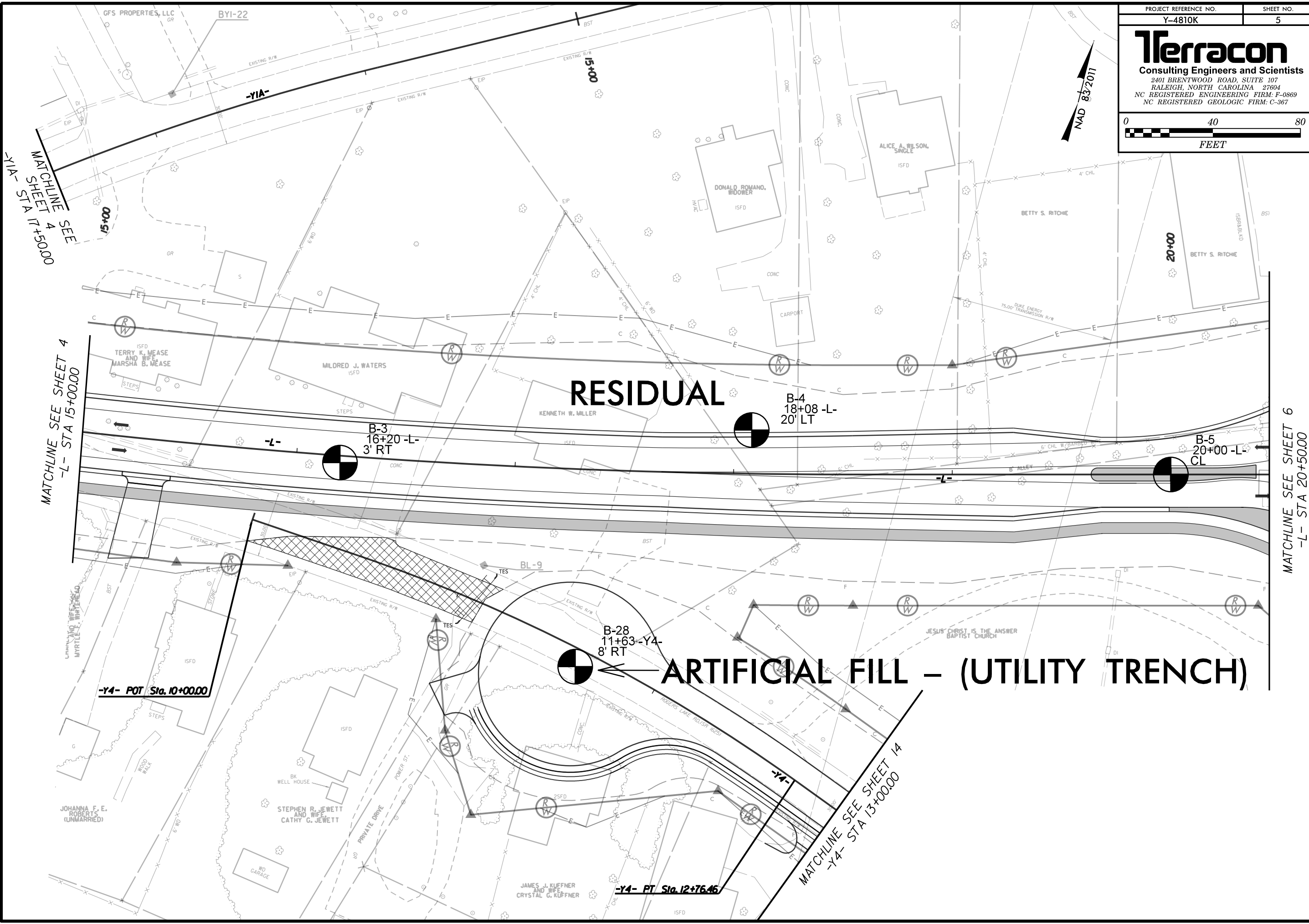
END CONSTRUCTION
-Y1B- POT Sta. 12+20.00

-Y1B- PT Sta. 11+39.99

-Y1B-
S 15° 56' 05" W

-Y1B- POT Sta. 12+23.87

PROJECT REFERENCE NO. Y-4810K	SHEET NO. 5
Terracon Consulting Engineers and Scientists 2401 BRENTWOOD ROAD, SUITE 107 RALEIGH, NORTH CAROLINA 27604 NC REGISTERED ENGINEERING FIRM: P-0869 NC REGISTERED GEOLOGIC FIRM: C-367	
 0 40 80 FEET	



RESIDUAL

ARTIFICIAL FILL – (UTILITY TRENCH)

MATCHLINE SEE SHEET 4
-Y1A- STA 17+50.00

MATCHLINE SEE SHEET 4
-L- STA 15+00.00

MATCHLINE SEE SHEET 6
-L- STA 20+50.00

-Y4- POT Sta. 10+00.00

MATCHLINE SEE SHEET 14
-Y4- STA 13+00.00

B-3
16+20 -L-
3' RT

B-4
18+08 -L-
20' LT

B-5
20+00 -L-
CL

B-28
11+63 -Y4-
8' RT

-Y4- PT Sta. 12+76.46

JOHANNA F. E. ROBERTS (UNMARRIED)

STEPHEN R. JEWETT AND WIFE CATHY G. JEWETT

JAMES J. KUEFFNER AND WIFE CRYSTAL G. KUEFFNER

JESUS CHRIST IS THE ANSWER BAPTIST CHURCH

GFS PROPERTIES, LLC BYI-22

ALICE A. WILSON, SINGLE ISFD

DONALD ROMANO, WIDOWER ISFD

BETTY S. RITCHE

BETTY S. RITCHE

TERRY K. MEASE AND WIFE MARSHA B. MEASE ISFD

MILDRED J. WATERS ISFD

KENNETH W. MILLER ISFD

LYNN AND WESLEY MYRTLE F. WHITEHEAD

BK WELL HOUSE

PRIVATE DRIVE

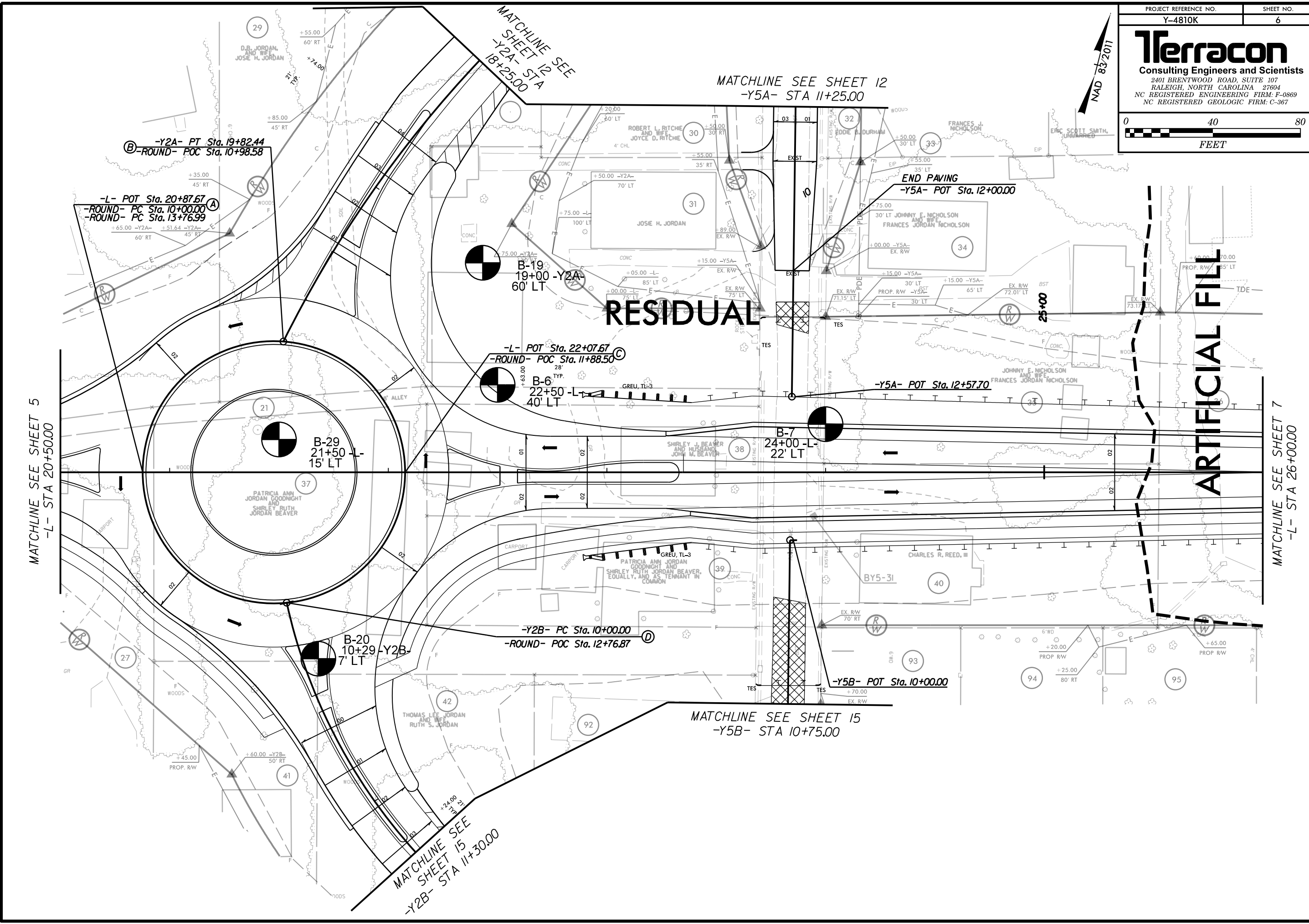
POWER ST.

ROBERTS LAKE RD (SP 1029)

WOOD WALK

WD GARAGE

-Y4-



MATCHLINE SEE SHEET 5
 -L- STA 20+50.00

MATCHLINE SEE SHEET 7
 -L- STA 26+00.00

MATCHLINE SEE SHEET 15
 SHEET 15
 -Y2B- STA 11+30.00

MATCHLINE SEE SHEET 15
 -Y5B- STA 10+75.00

RESIDUAL

ARTIFICIAL FILL

-Y2A- PT Sta. 19+82.44
 (B)-ROUND- POC Sta. 10+98.58

-L- POT Sta. 20+87.67 (A)
 -ROUND- PC Sta. 10+00.00
 -ROUND- PC Sta. 13+76.99

-L- POT Sta. 22+07.67 (C)
 -ROUND- POC Sta. 11+88.50

END PAVING
 -Y5A- POT Sta. 12+00.00

-Y5A- POT Sta. 12+57.70

-Y2B- PC Sta. 10+00.00 (D)
 -ROUND- POC Sta. 12+76.87

-Y5B- POT Sta. 10+00.00

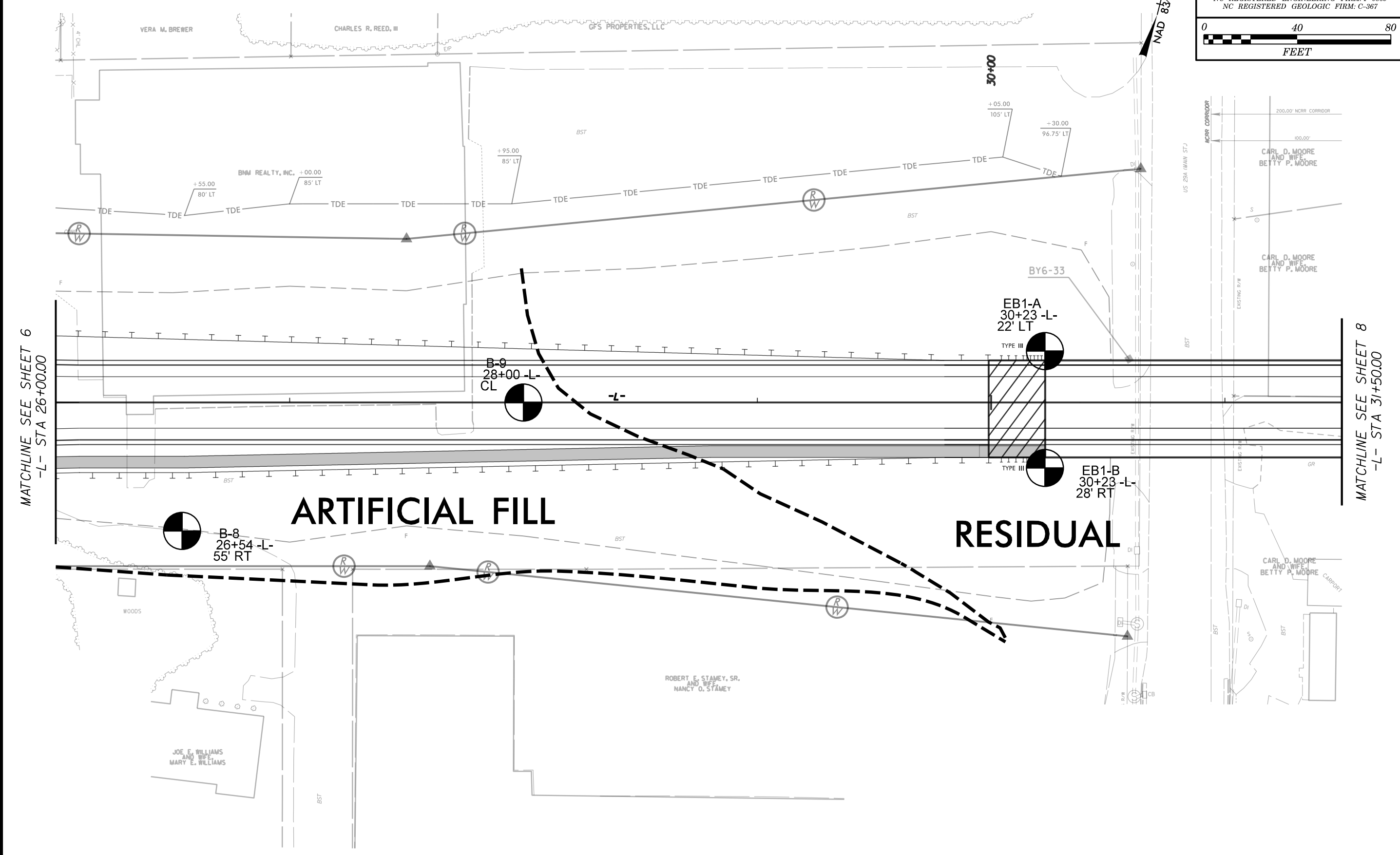
B-20
 10+29 -Y2B-
 7' LT

B-6
 22+50 -L-
 40' LT

B-7
 24+00 -L-
 22' LT

B-19
 19+00 -Y2A-
 60' LT

B-29
 21+50 -L-
 15' LT



MATCHLINE SEE SHEET 6
 -L- STA 26+00.00

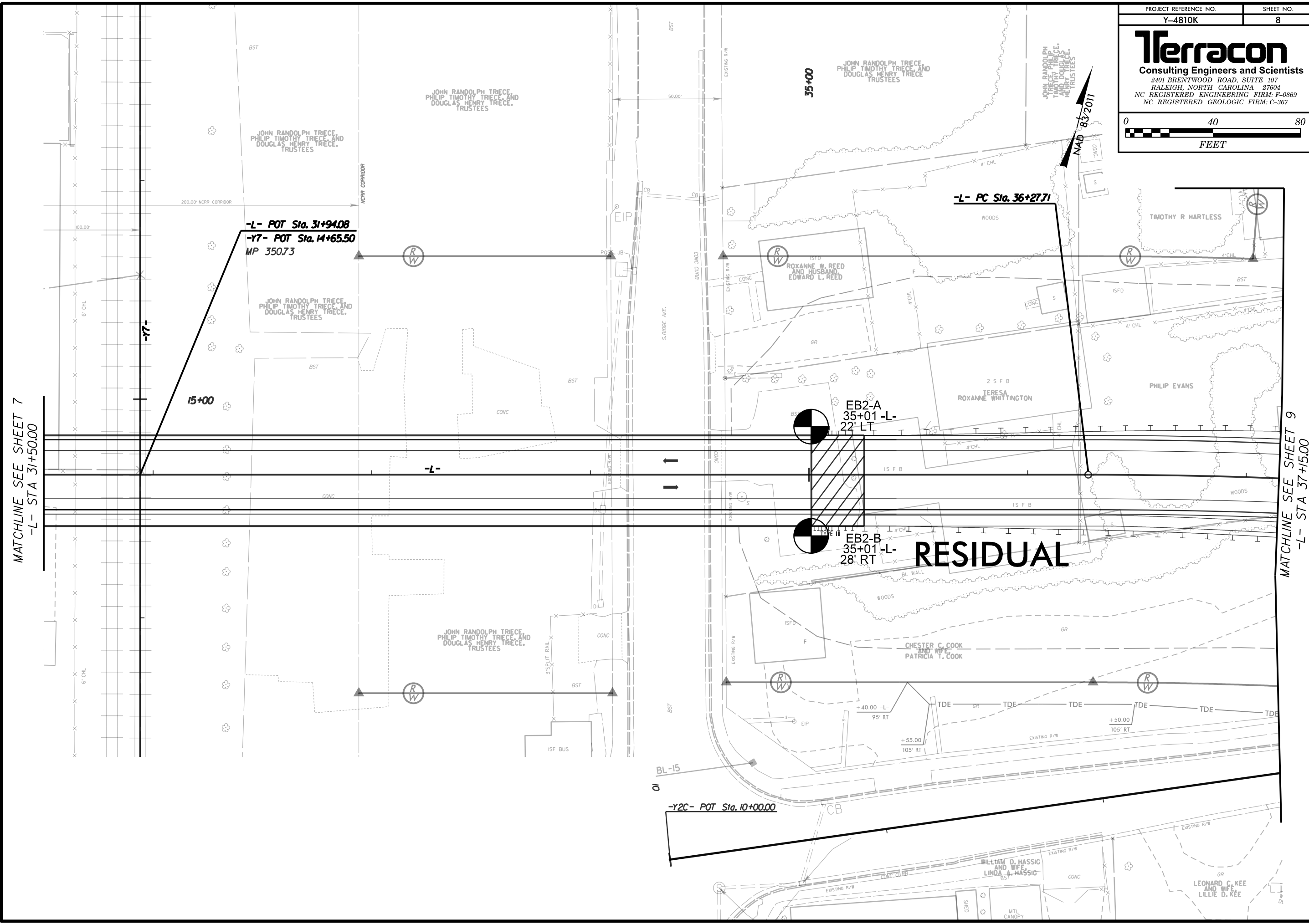
MATCHLINE SEE SHEET 8
 -L- STA 31+50.00



NAD 83 2011

MATCHLINE SEE SHEET 7
-L- STA 31+50.00

MATCHLINE SEE SHEET 9
-L- STA 37+15.00



RESIDUAL

-L- POT Sta. 31+94.08
-Y7- POT Sta. 14+65.50
MP 350.73

-L- PC Sta. 36+27.71

EB2-A
35+01 -L-
22' LT

EB2-B
35+01 -L-
28' RT

-Y2C- POT Sta. 10+00.00

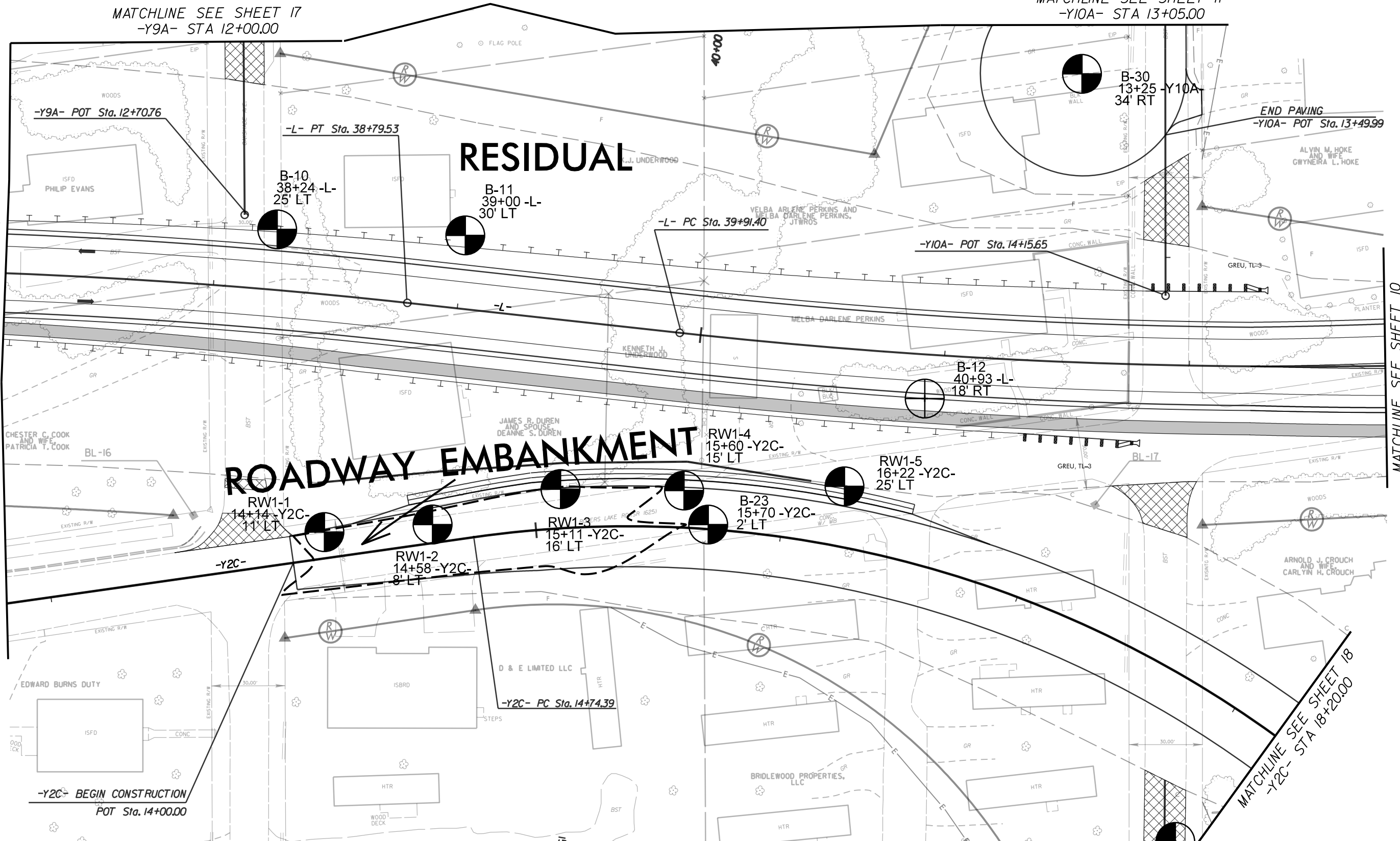


MATCHLINE SEE SHEET 17
 -Y9A- STA 12+00.00

MATCHLINE SEE SHEET 17
 -Y10A- STA 13+05.00

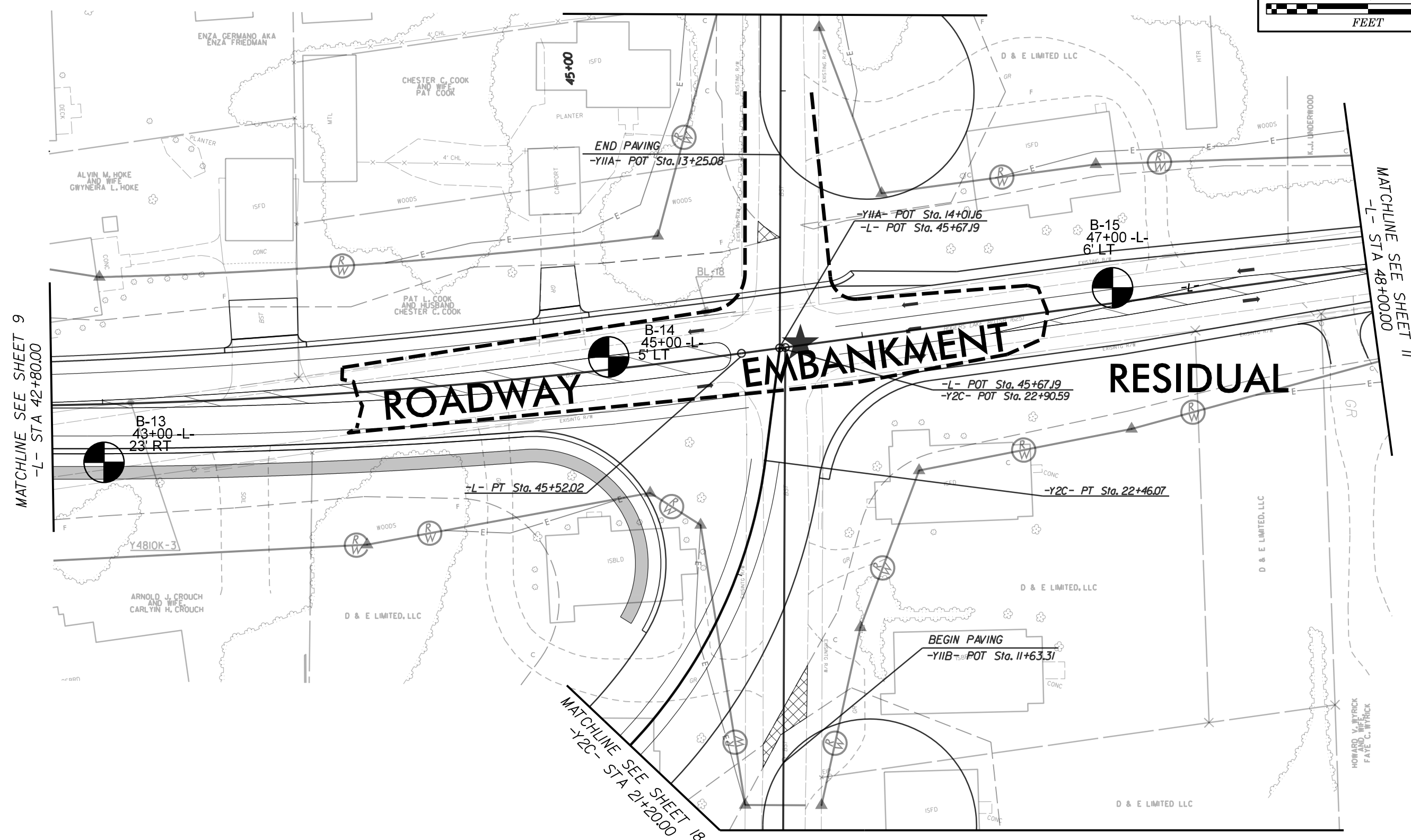
MATCHLINE SEE SHEET 8
 -L- STA 37+15.00

MATCHLINE SEE SHEET 10
 -L- STA 42+80.00



-Y2C- BEGIN CONSTRUCTION
 POT Sta. 14+00.00

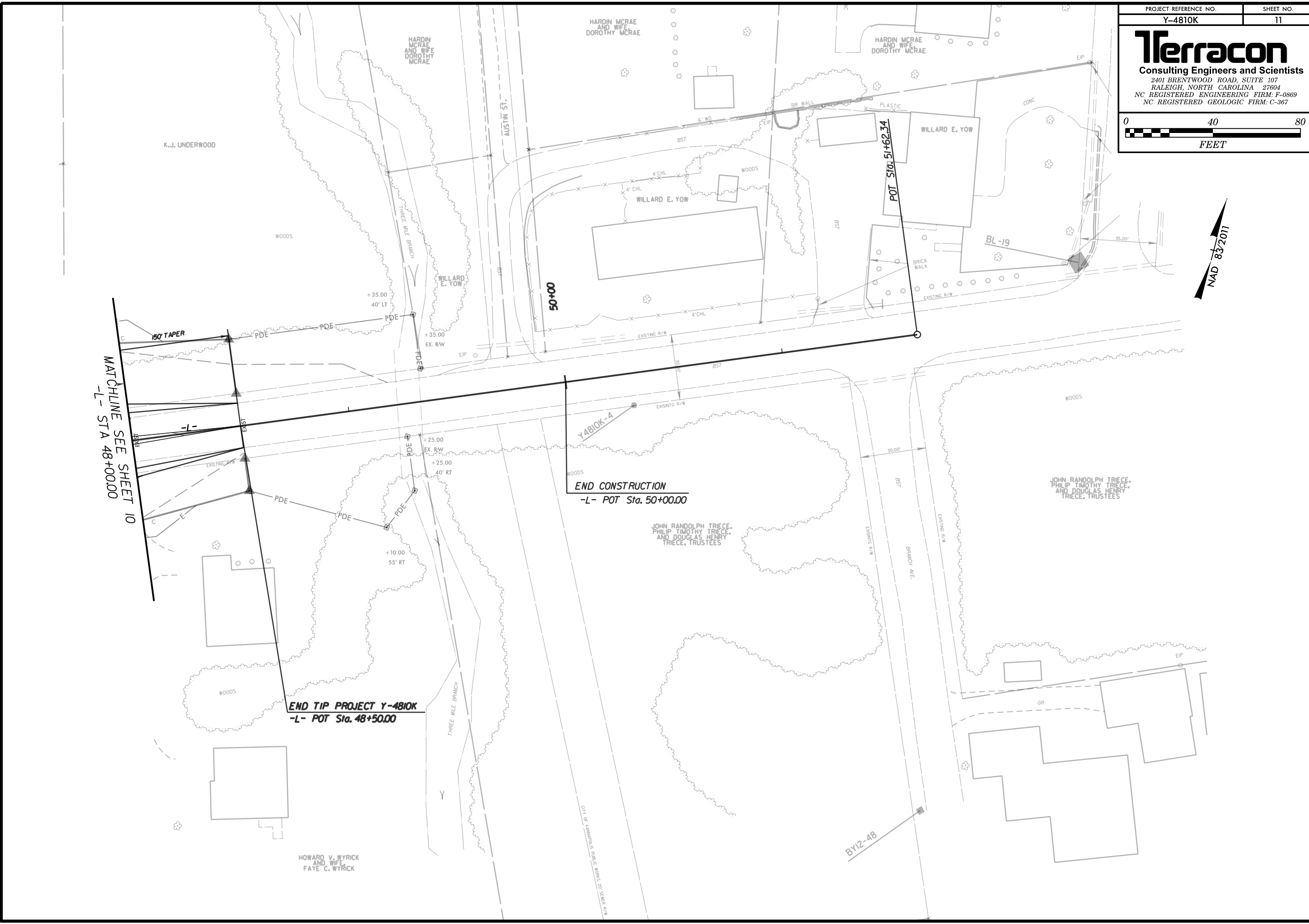
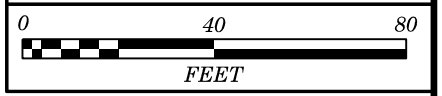
MATCHLINE SEE SHEET 18
 -Y2C- STA 18+20.00



MATCHLINE SEE SHEET 9
-L- STA 42+80.00

MATCHLINE SEE SHEET 11
-L- STA 48+00.00

MATCHLINE SEE SHEET 18
-Y2C- STA 21+20.00

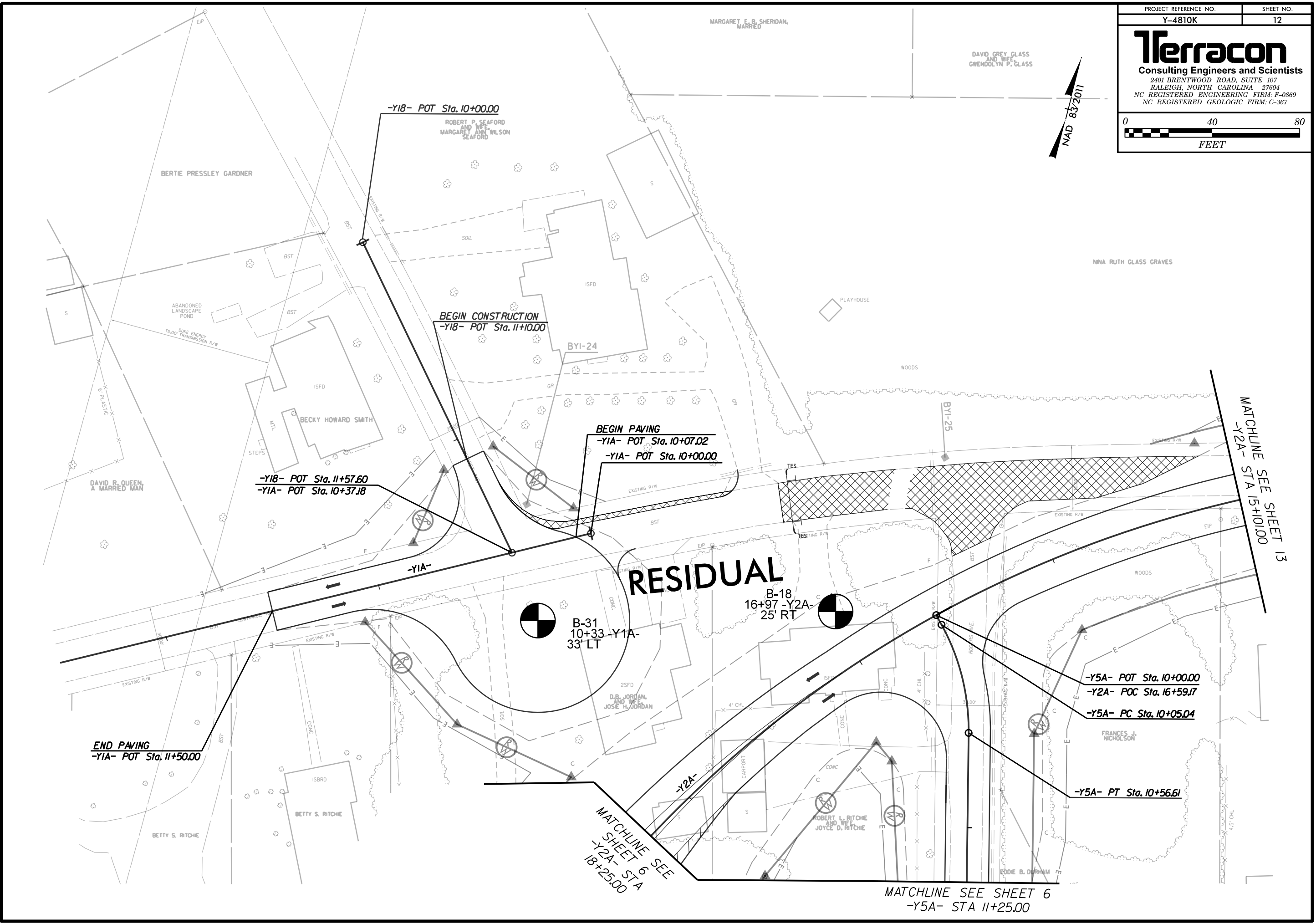


MATCHLINE SEE SHEET 10
 -L- STA 48+00.00

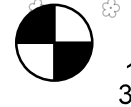
END TIP PROJECT Y-4810K
 -L- POT Sta. 48+50.00

END CONSTRUCTION
 -L- POT Sta. 50+00.00

CITY OF KANAWHA PUBLIC WORKS DEPT. STREET LIGHTING DIVISION



RESIDUAL



B-31
10+33 -Y1A-
33' LT



B-18
16+97 -Y2A-
25' RT

-Y5A- POT Sta. 10+00.00
-Y2A- POC Sta. 16+59.17
-Y5A- PC Sta. 10+05.04

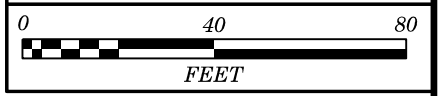
END PAVING
-Y1A- POT Sta. 11+50.00

MATCHLINE SEE SHEET 6
-Y2A- STA 18+25.00

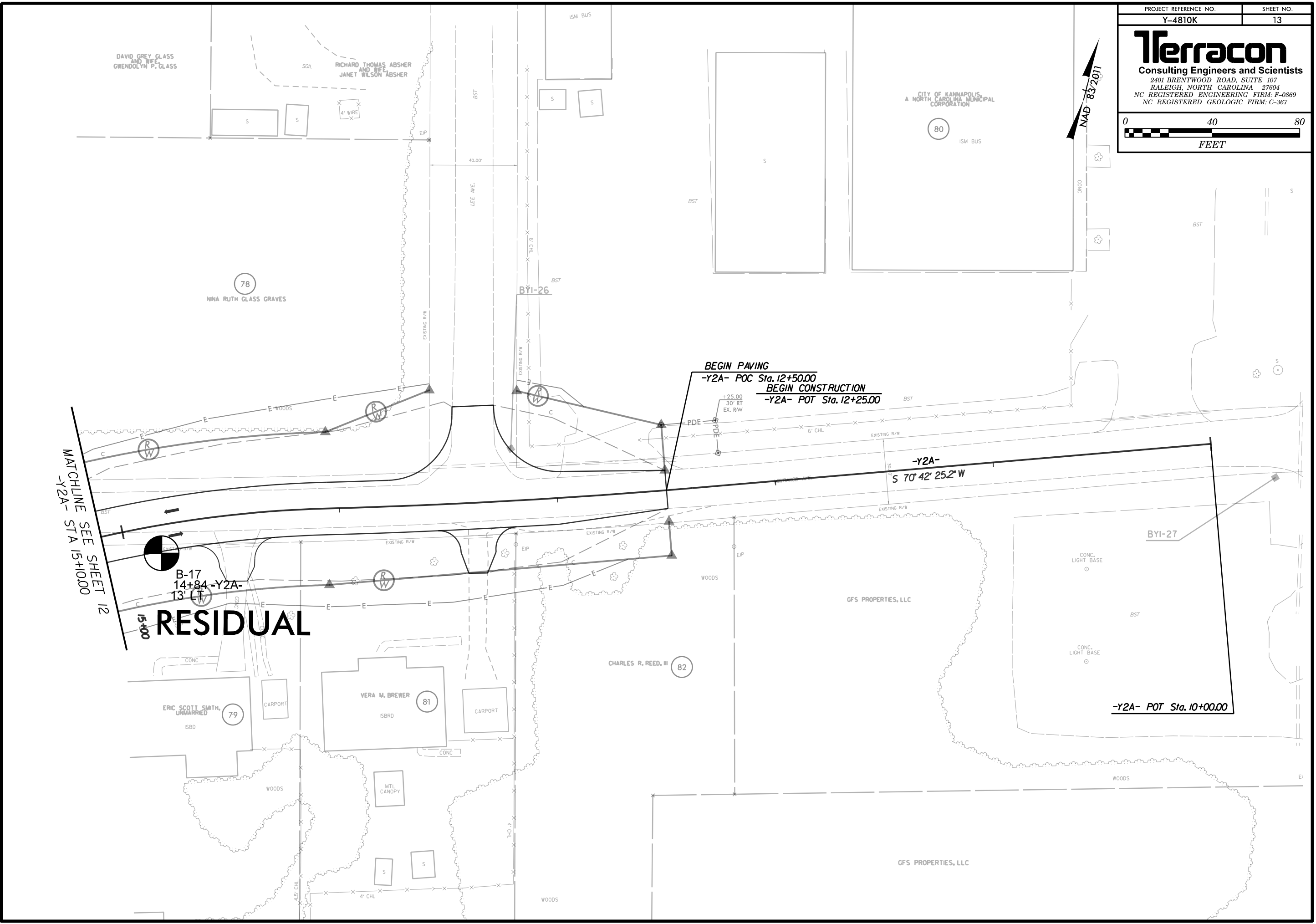
MATCHLINE SEE SHEET 6
-Y5A- STA 11+25.00

MATCHLINE SEE SHEET 13
-Y2A- STA 15+10.00

Terracon
 Consulting Engineers and Scientists
 2401 BRENTWOOD ROAD, SUITE 107
 RALEIGH, NORTH CAROLINA 27604
 NC REGISTERED ENGINEERING FIRM: P-0869
 NC REGISTERED GEOLOGIC FIRM: C-367



NAD 83/2011

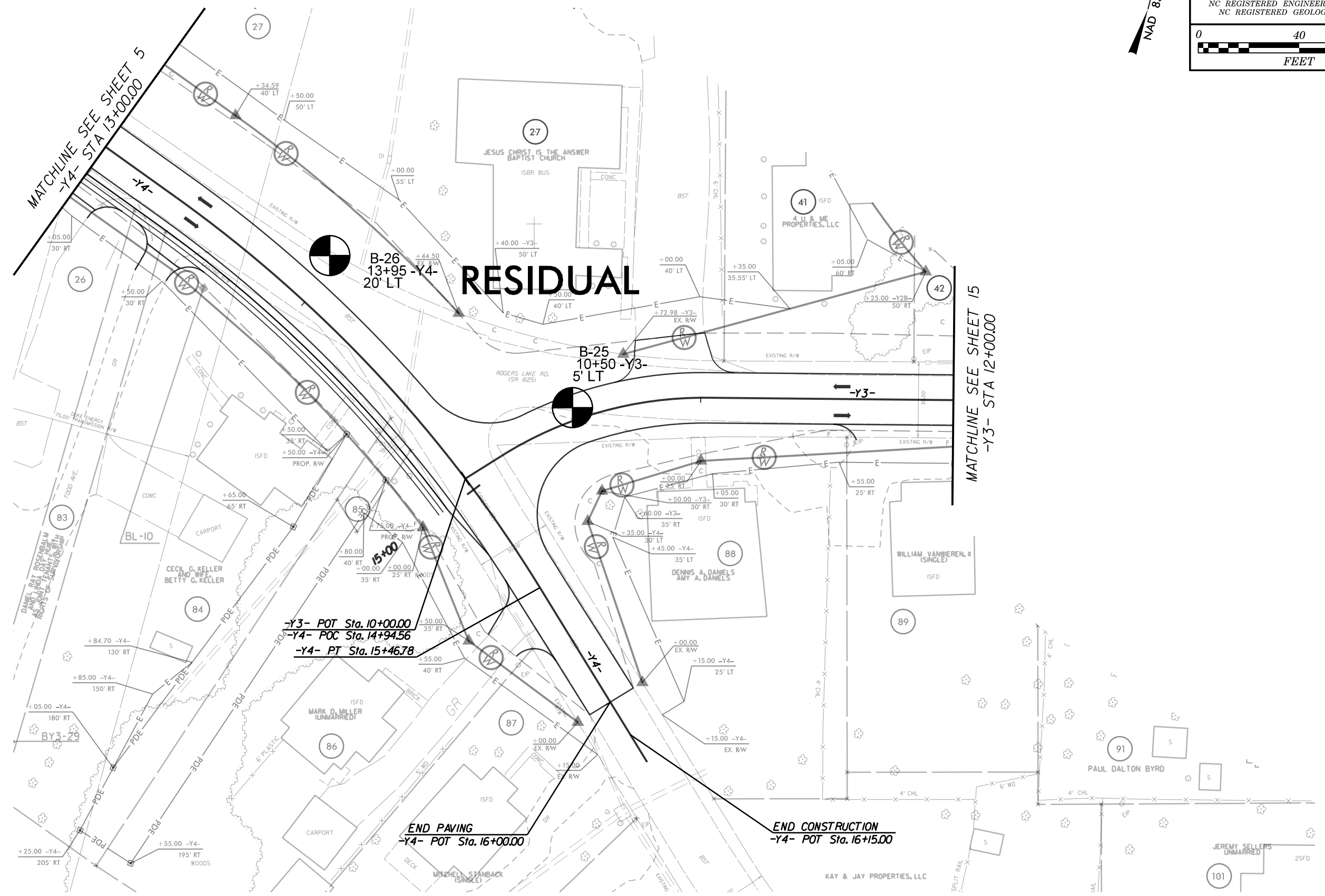


MATCHLINE SEE SHEET 12
 -Y2A- STA 15+10.00

B-17
 14+84 -Y2A-
 13'
RESIDUAL
 15+40

BEGIN PAVING
 -Y2A- POC Sta. 12+50.00
 BEGIN CONSTRUCTION
 -Y2A- POT Sta. 12+25.00

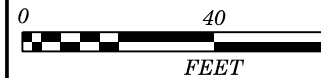
-Y2A- POT Sta. 10+00.00



MATCHLINE SEE SHEET 6 -Y5B- STA 10+75.00

PROJECT REFERENCE NO.
Y-4810K

Terraco
Consulting Engineers and S
2401 BRENTWOOD ROAD, SUITE
RALEIGH, NORTH CAROLINA
NC REGISTERED ENGINEERING FIR
NC REGISTERED GEOLOGIC FIRM



MATCHLINE SEE SHEET 6
-Y2B- STA 11+30.00

MATCHLINE SEE SHEET 14
-Y3- STA 12+00.00

ARTIFICIAL FILL

END PAVING
-Y3- POT Sta. 12+50.00

B-21
12+50 -Y2B-
15' LT

BEGIN PAVING
-Y5B- POT Sta. 10+75.00

-Y2B- PT Sta. 13+36.05

END PAVING
-Y2B- POT Sta. 16+00.00
END CONSTRUCTION
-Y2B- POT

+25.00 -Y3-
PROP. R/W

-Y3- POT Sta. 13+09.72

B-27
12+50 -Y5B-
15' LT

RESIDUAL

B-22
15+49 -Y2B-
4' RT

-Y2B- POC Sta. 13+21.65
-Y5B- POT Sta. 12+24.29

CECIL G. KELLER
AND WIFE,
BETTY G. KELLER

PAUL DALTON BYRD

+55.00
40' RT

JAMES WILBUR FINK
AND WIFE,
DOROTHY LEE ALWRAN FINK

JOHN H.
WOOLLERTON, JR.

MICHAEL DERON
SIMMONS

H.L. RED SMITH, LLC.

JEREMY SELLERS
OR UNMARRIED

MICHAEL JEFFREY CARVER
AND WIFE,
EVA MURRAY CARVER

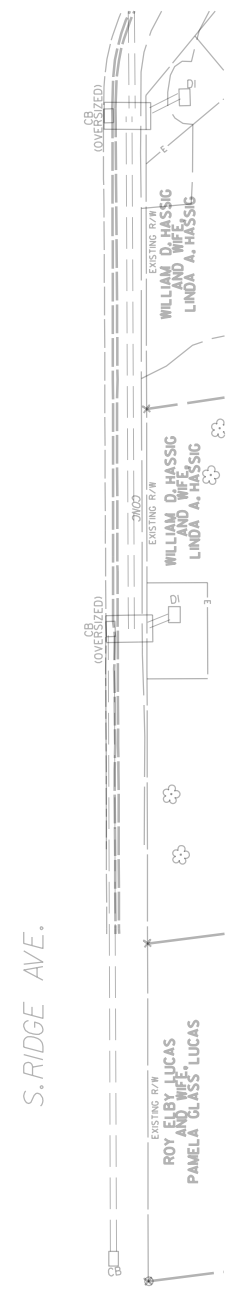
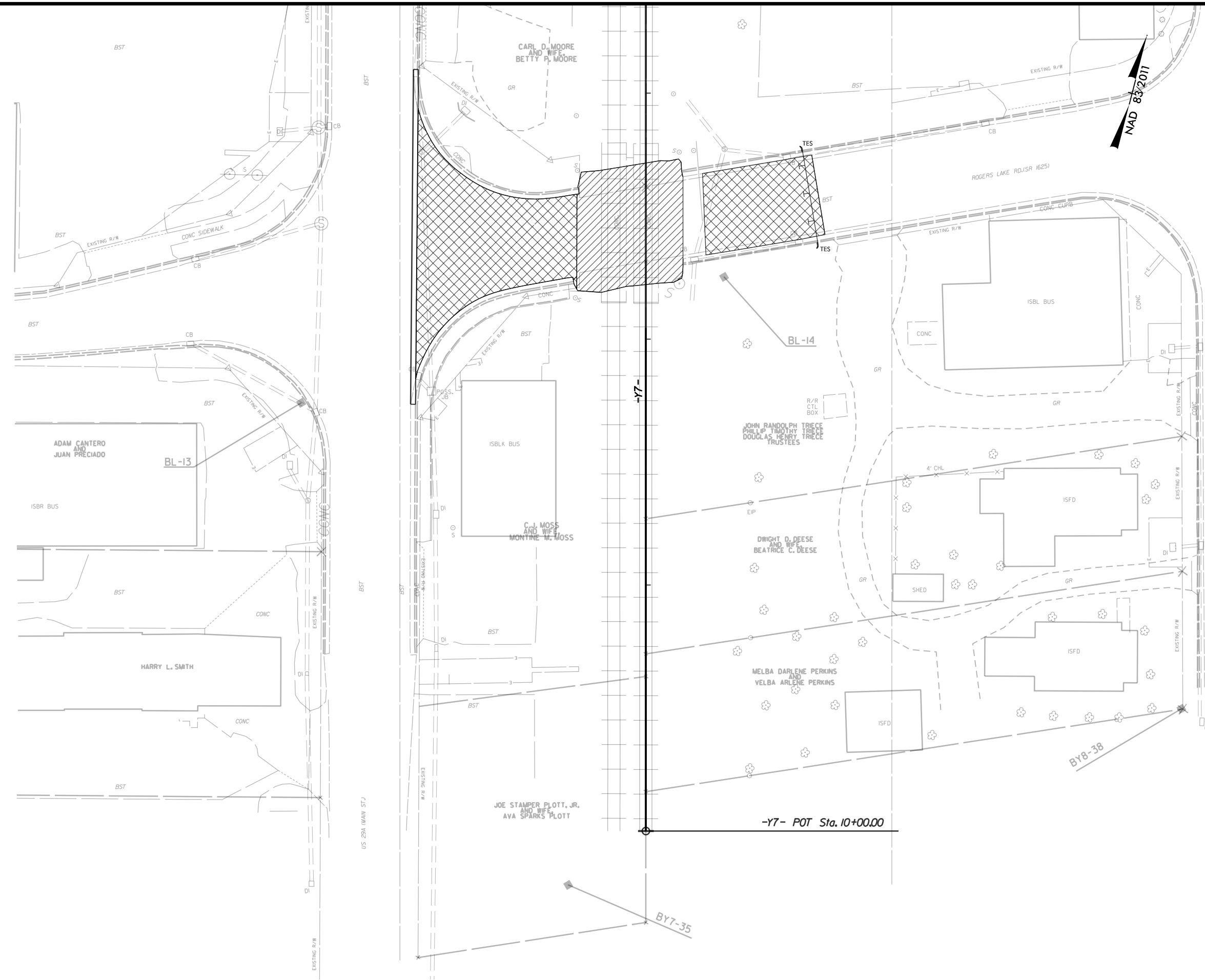
RICHARD C. OWINGS
AND SPOUSE,
TAMMY S. OWINGS

END PAVING
-Y5B- POT Sta. 14+75.00
END CONSTRUCTION
-Y5B- POT Sta. 14+85.00

-Y2B-
PI Sta 11+98.92
 $\Delta = 77^{\circ} 00' 57.3" (LT)$
 $D = 22^{\circ} 55' 05.9"$
 $L = 336.05'$
 $T = 198.92'$
 $R = 250.00'$

PAVEMENT

Terracon
Consulting Engineers and Scientists
2401 BRENTWOOD ROAD, SUITE 107
RALEIGH, NORTH CAROLINA 27604
NC REGISTERED ENGINEERING FIRM: F-0869
NC REGISTERED GEOLOGIC FIRM: C-367



S. RIDGE AVE.

-Y7- POT Sta. 10+00.00



RESIDUAL



B-32
11+53 -Y9A-
34' RT

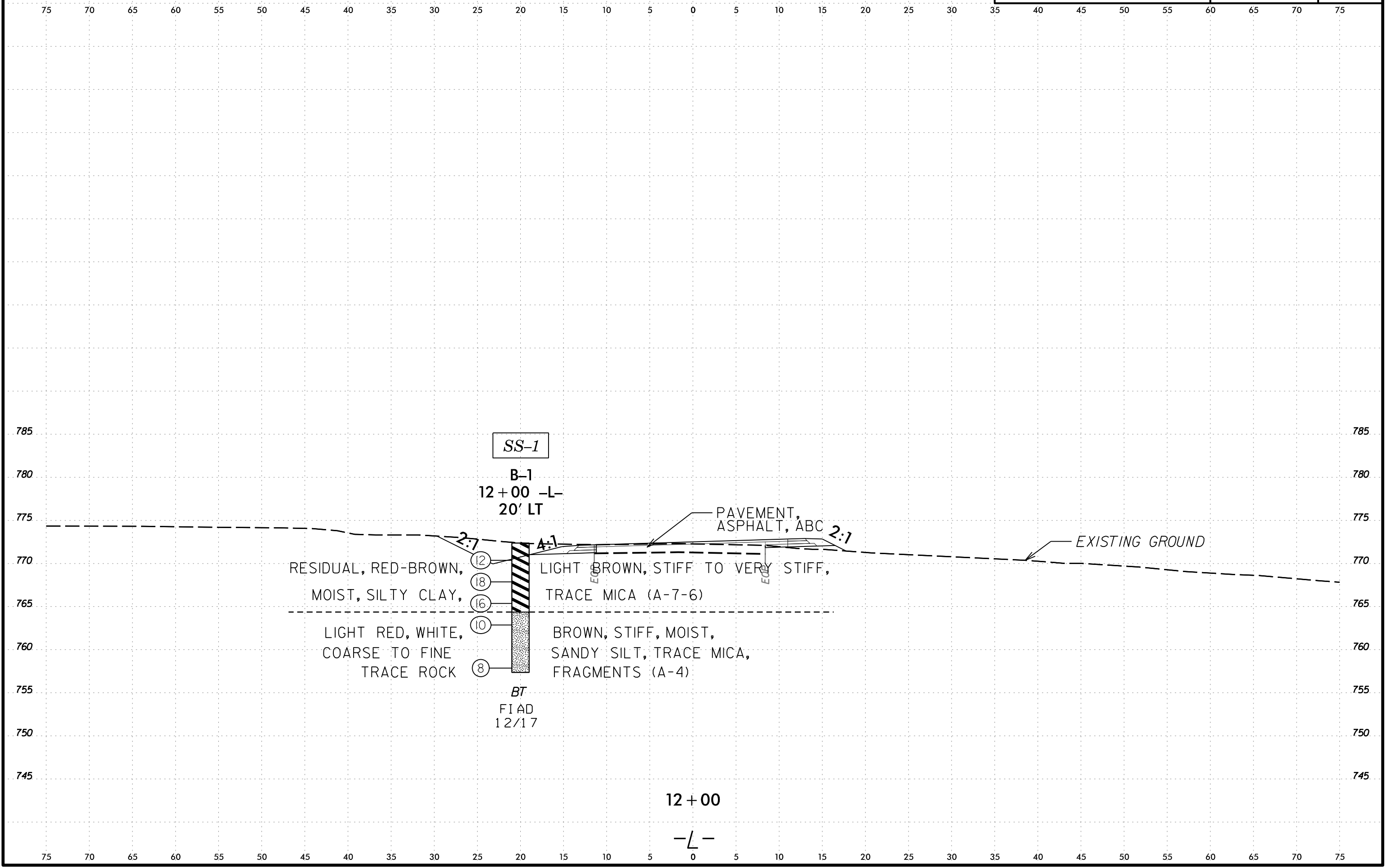
BEGIN PAVING
-Y9A- POT Sta. 10+00.00

END PAVING
-Y9A- POT Sta. 11+78.01

BEGIN PAVING
-Y10A- POT Sta. 11+50.00

MATCHLINE SEE SHEET 9
-Y9A- STA 12+00.00

MATCHLINE SEE SHEET 9
-Y10A- STA 13+05.00



SS-1

B-1
12+00 -L-
20' LT

PAVEMENT,
ASPHALT, ABC

EXISTING GROUND

RESIDUAL, RED-BROWN,
MOIST, SILTY CLAY,

LIGHT BROWN, STIFF TO VERY STIFF,
TRACE MICA (A-7-6)

LIGHT RED, WHITE,
COARSE TO FINE
TRACE ROCK

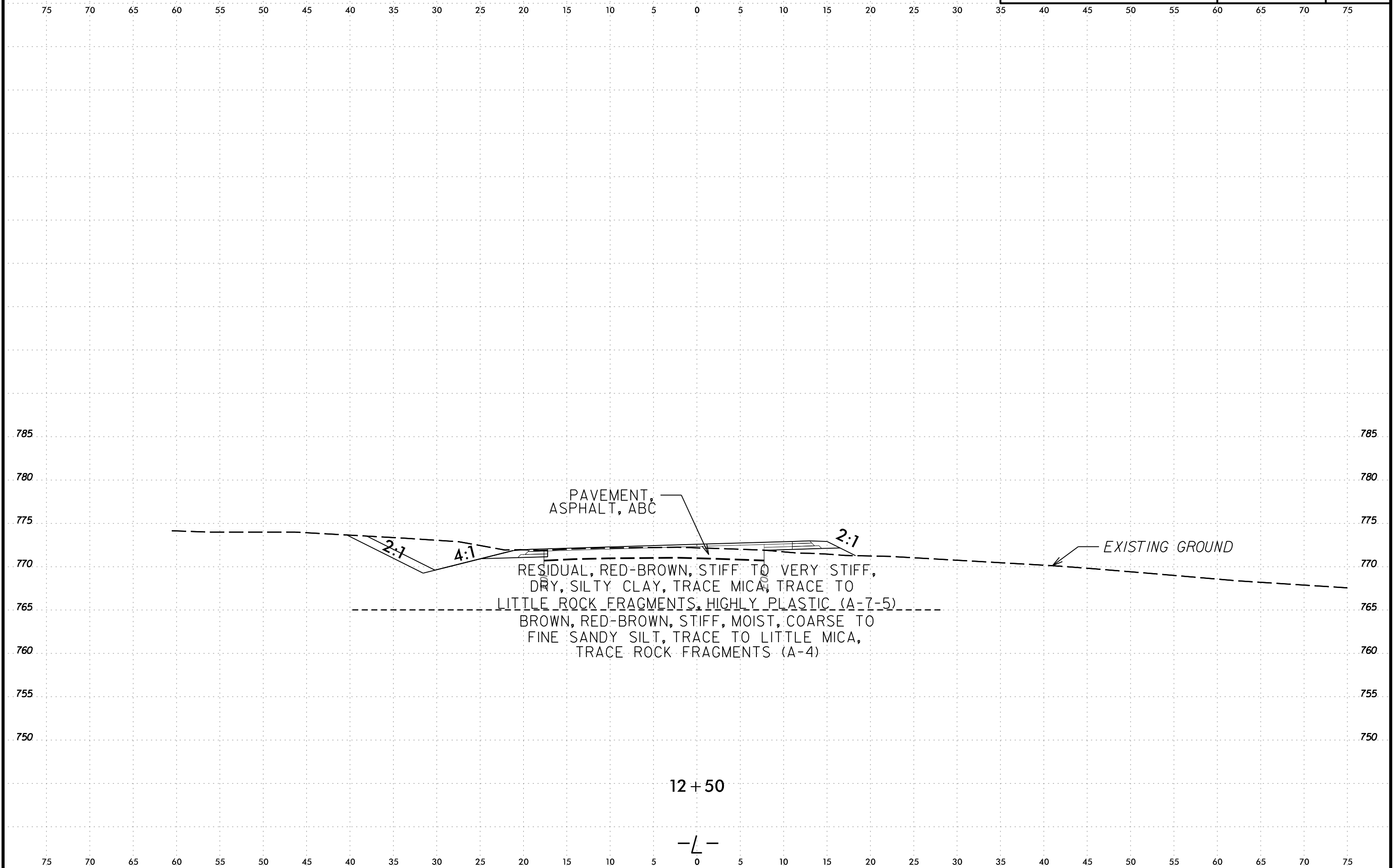
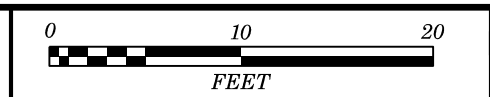
BROWN, STIFF, MOIST,
SANDY SILT, TRACE MICA,
FRAGMENTS (A-4)

- 12
- 18
- 16
- 10
- 8

BT
FIAD
12/17

12+00

-L-



PAVEMENT,
ASPHALT, ABC

2:1

4:1

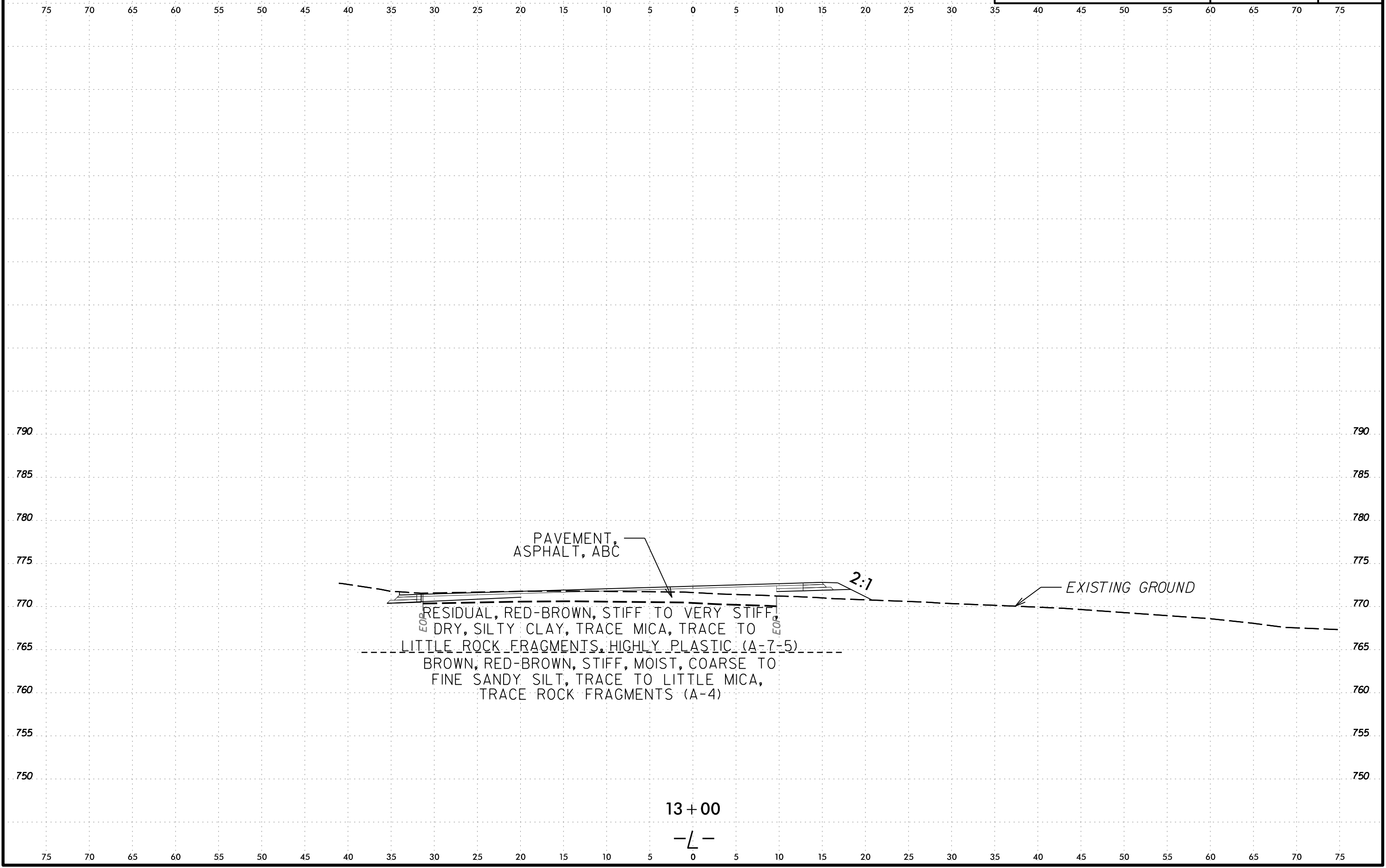
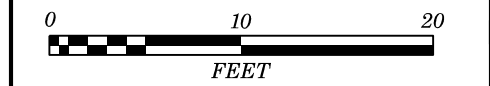
2:1

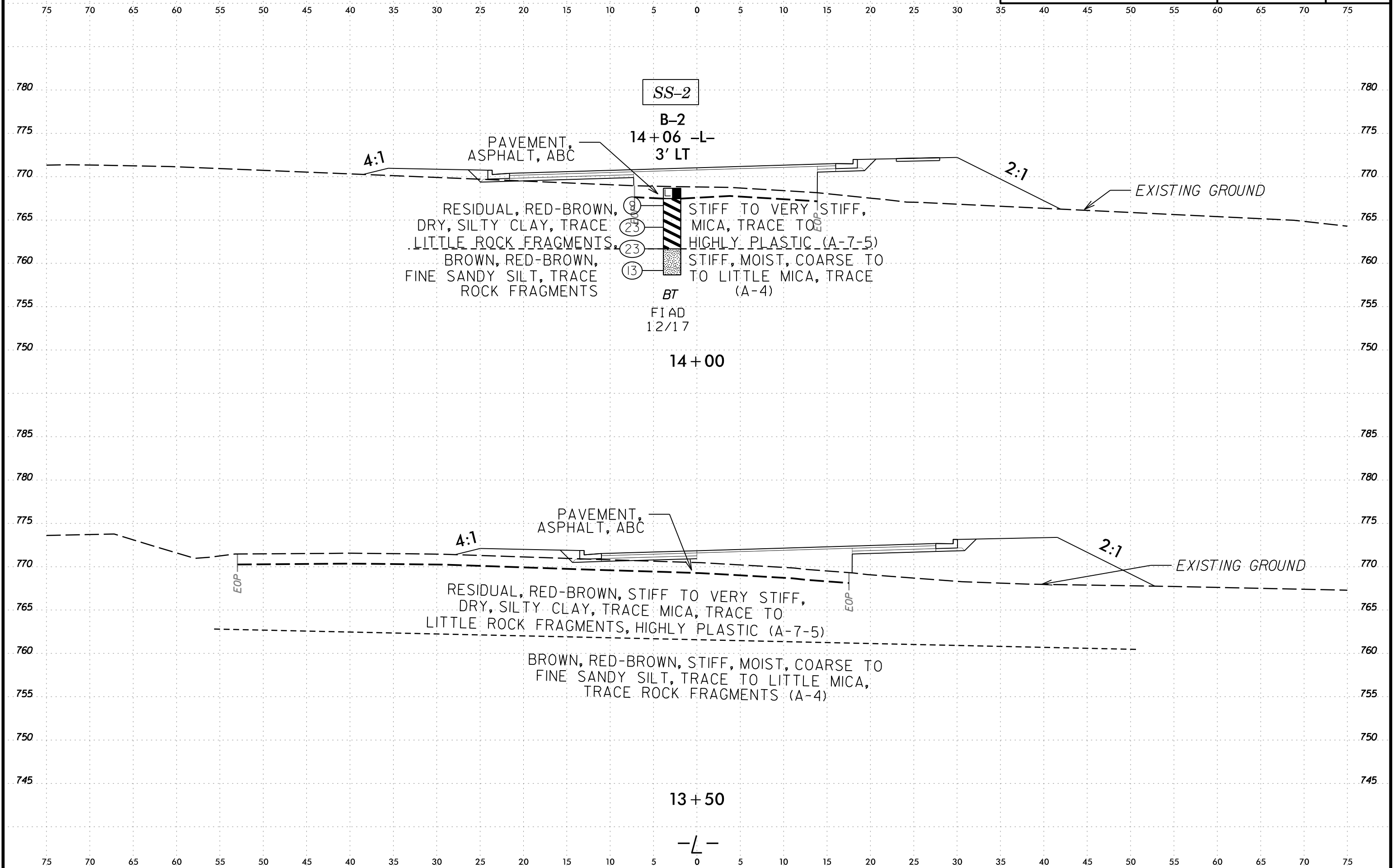
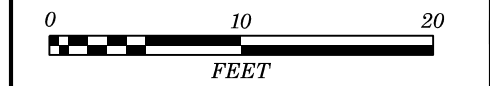
EXISTING GROUND

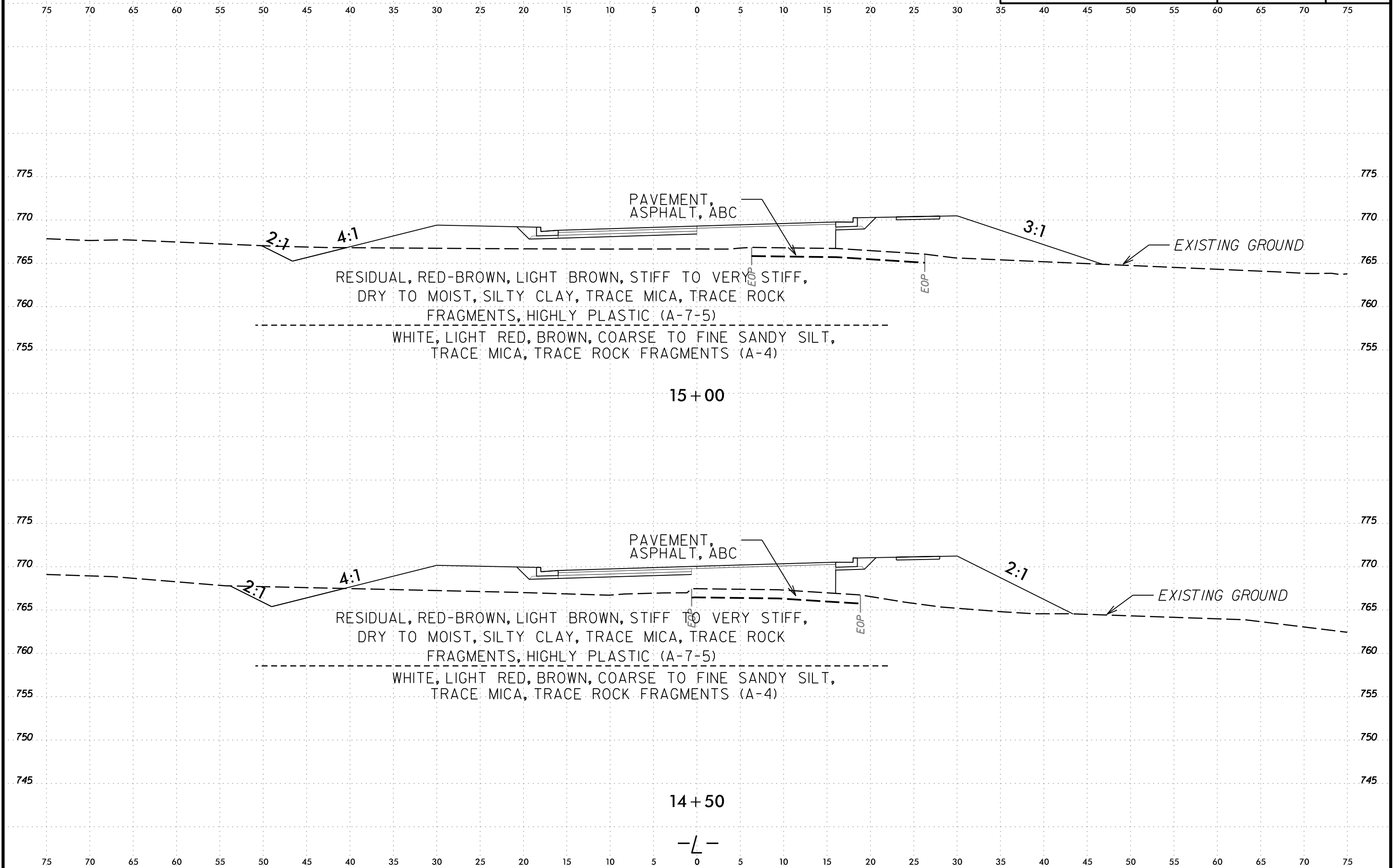
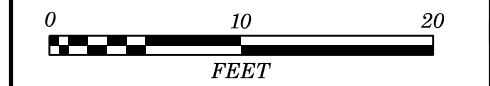
RESIDUAL, RED-BROWN, STIFF TO VERY STIFF,
 DRY, SILTY CLAY, TRACE MICA, TRACE TO
 LITTLE ROCK FRAGMENTS, HIGHLY PLASTIC (A-7-5)
 BROWN, RED-BROWN, STIFF, MOIST, COARSE TO
 FINE SANDY SILT, TRACE TO LITTLE MICA,
 TRACE ROCK FRAGMENTS (A-4)

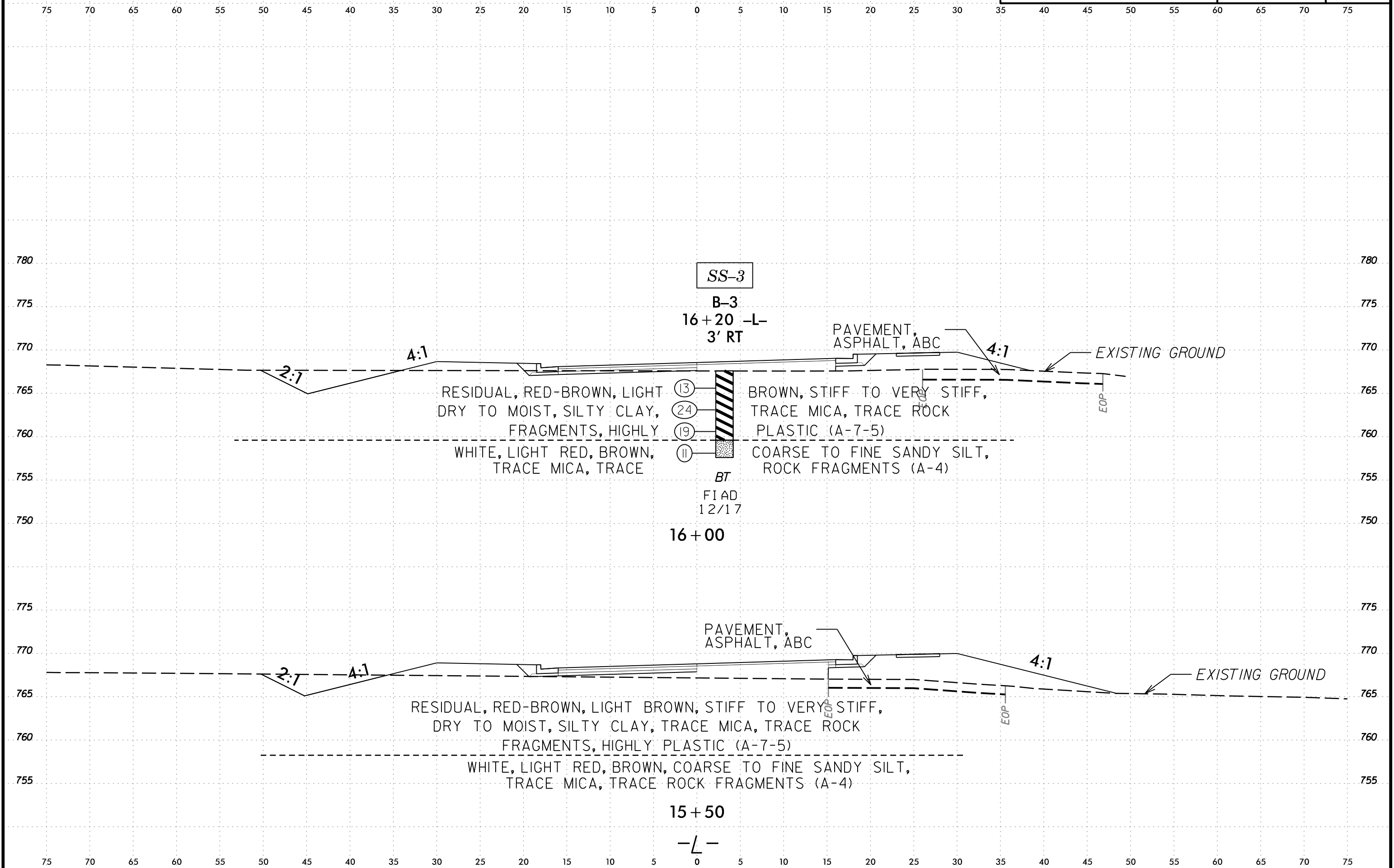
12 + 50

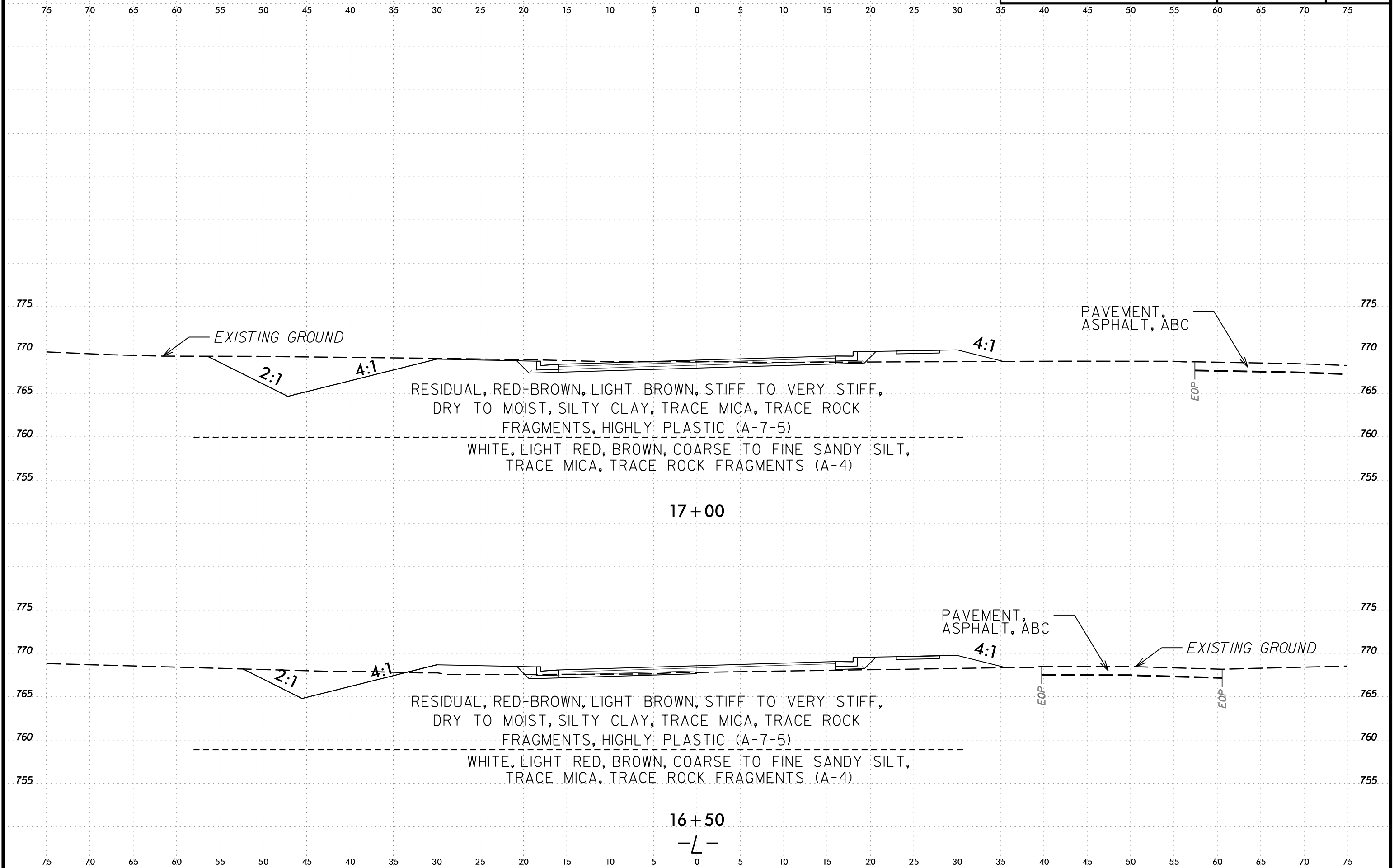
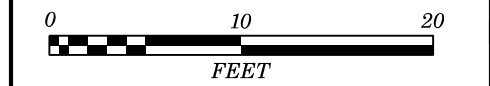
—L—

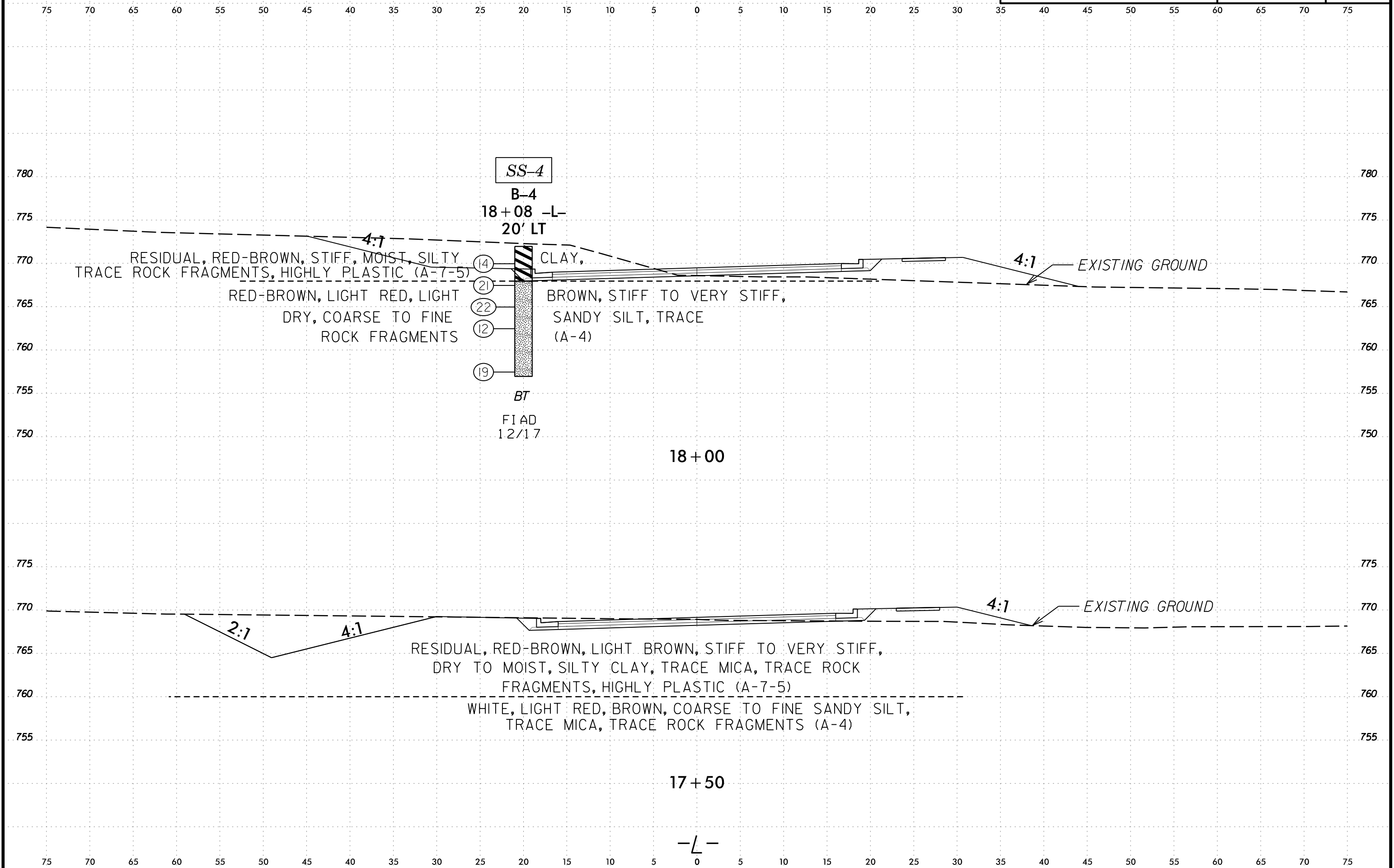
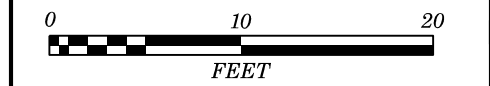


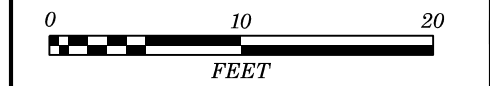




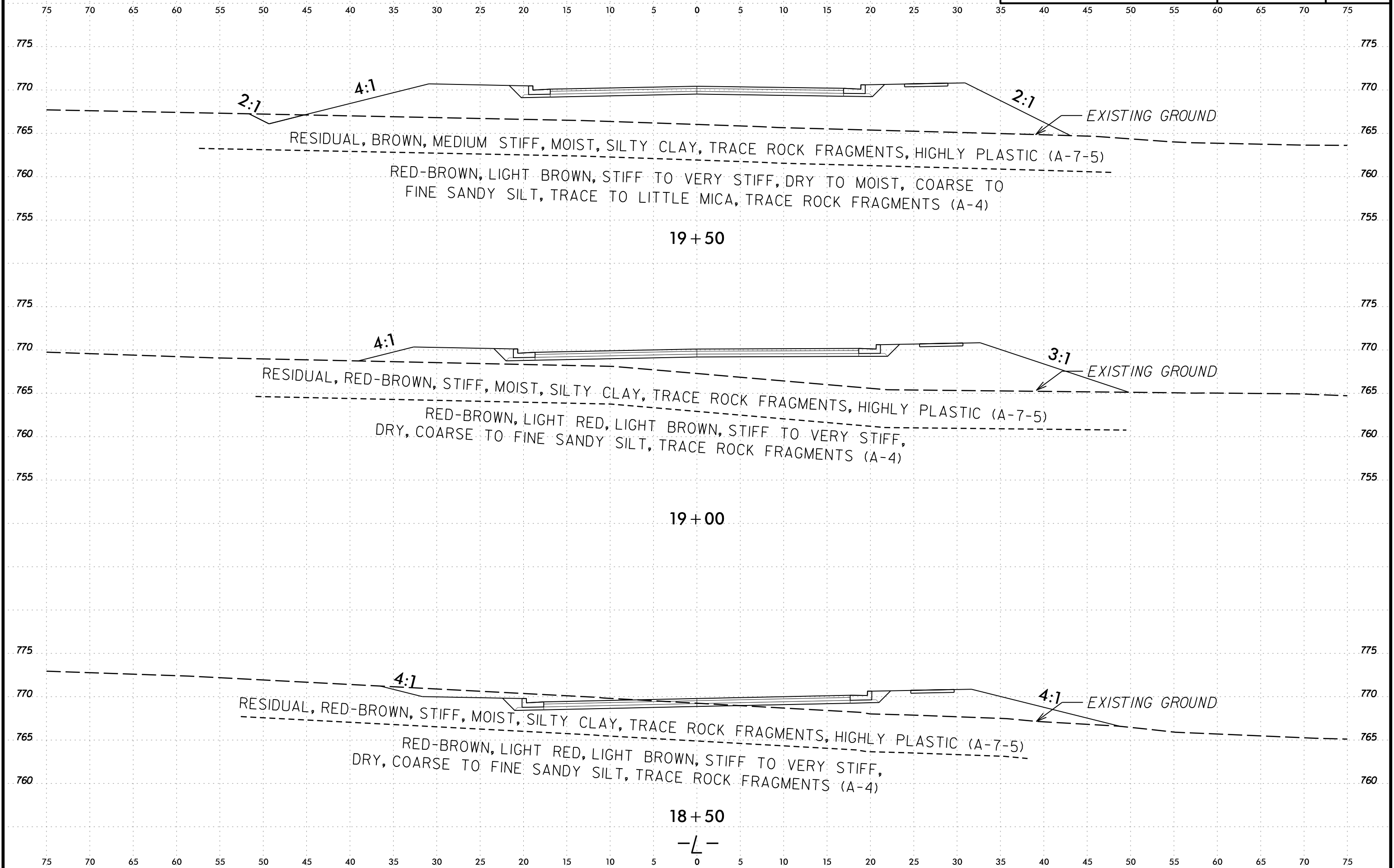


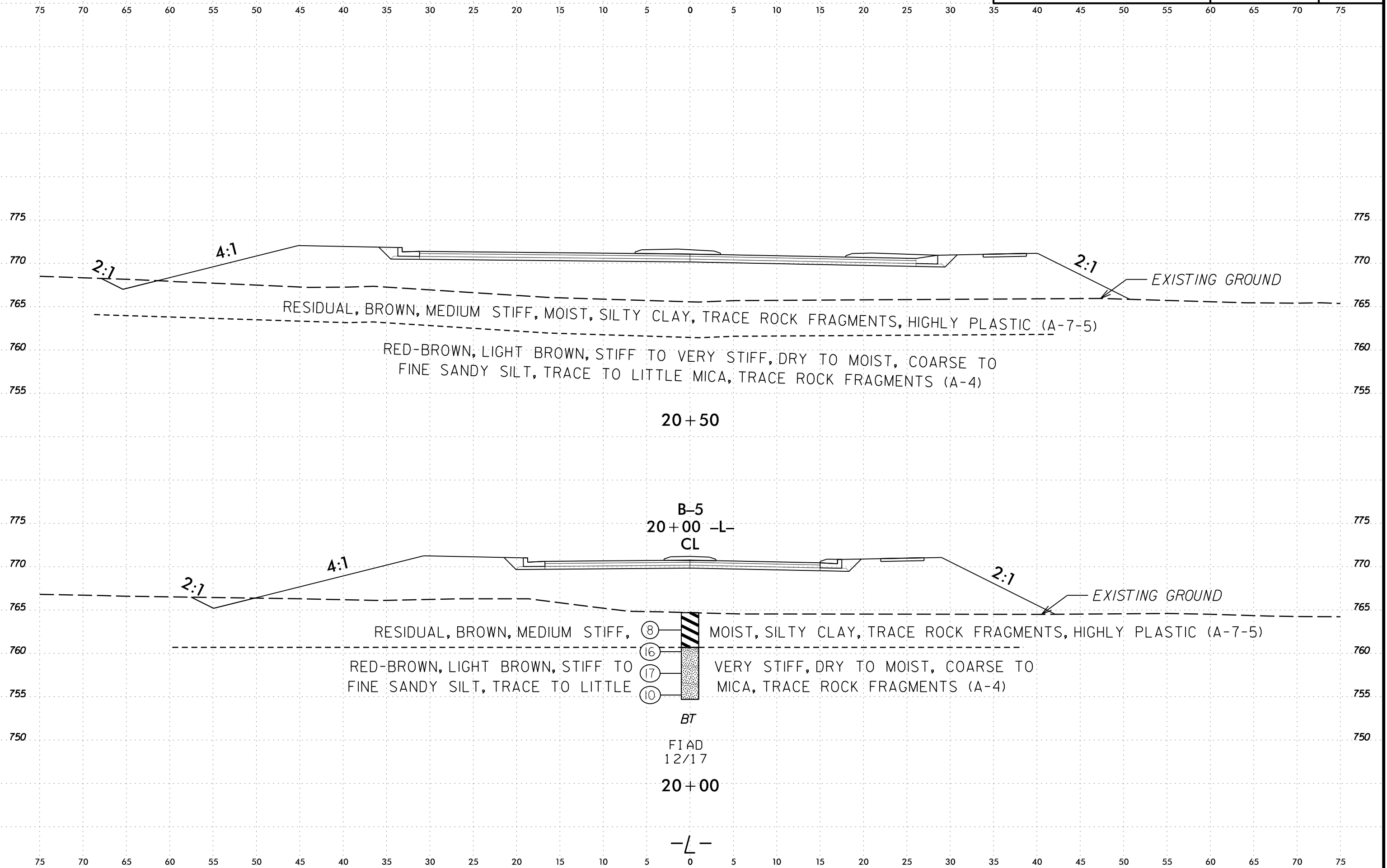
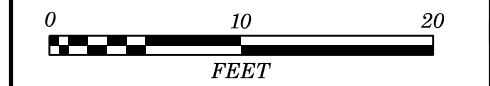






PROJ. REFERENCE NO.	SHEET NO.
Y-4810K	27





RESIDUAL, BROWN, MEDIUM STIFF, MOIST, SILTY CLAY, TRACE ROCK FRAGMENTS, HIGHLY PLASTIC (A-7-5)

RED-BROWN, LIGHT BROWN, STIFF TO VERY STIFF, DRY TO MOIST, COARSE TO FINE SANDY SILT, TRACE TO LITTLE MICA, TRACE ROCK FRAGMENTS (A-4)

20+50

B-5
20+00 -L-
CL

RESIDUAL, BROWN, MEDIUM STIFF, (8) MOIST, SILTY CLAY, TRACE ROCK FRAGMENTS, HIGHLY PLASTIC (A-7-5)

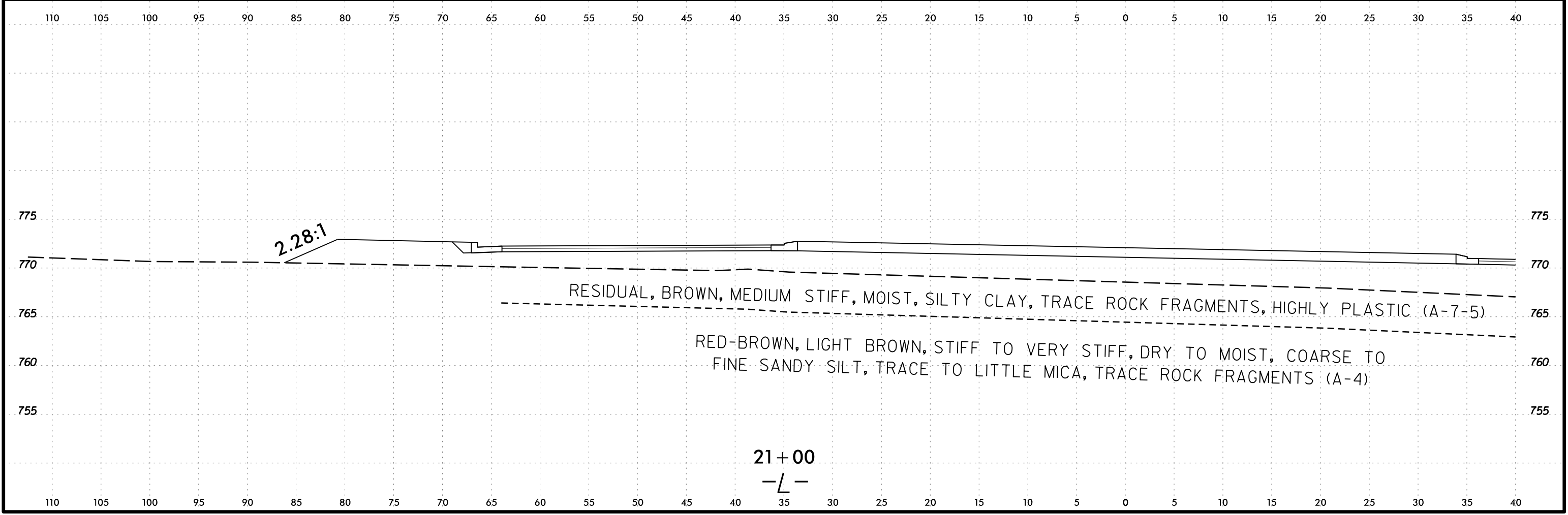
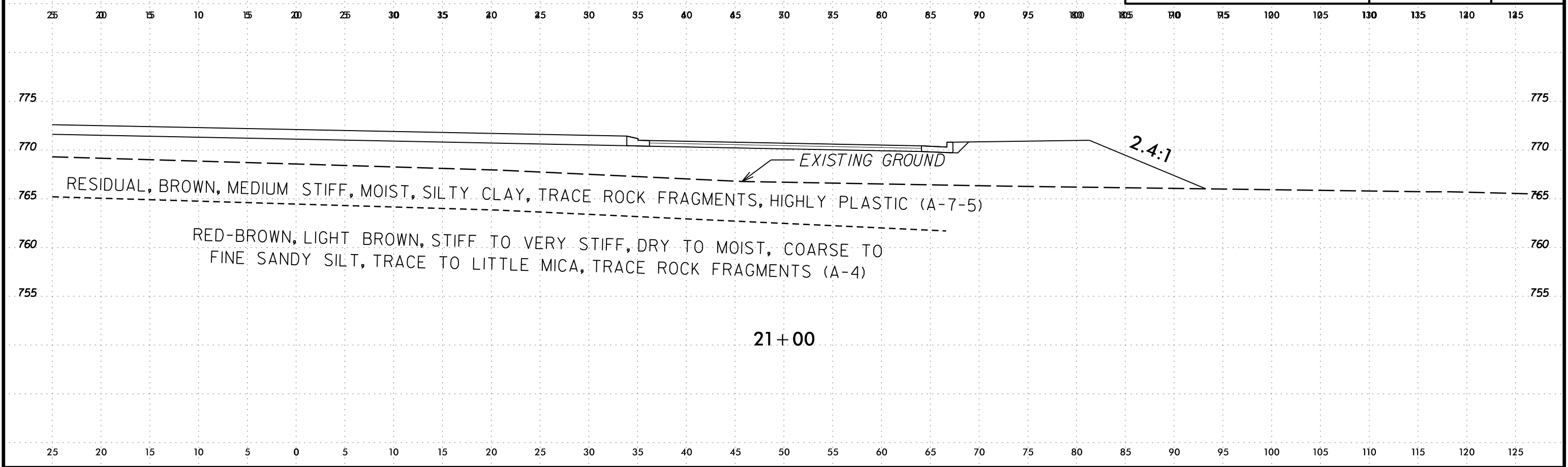
RED-BROWN, LIGHT BROWN, STIFF TO (16) VERY STIFF, DRY TO MOIST, COARSE TO (17) FINE SANDY SILT, TRACE TO LITTLE (10) MICA, TRACE ROCK FRAGMENTS (A-4)

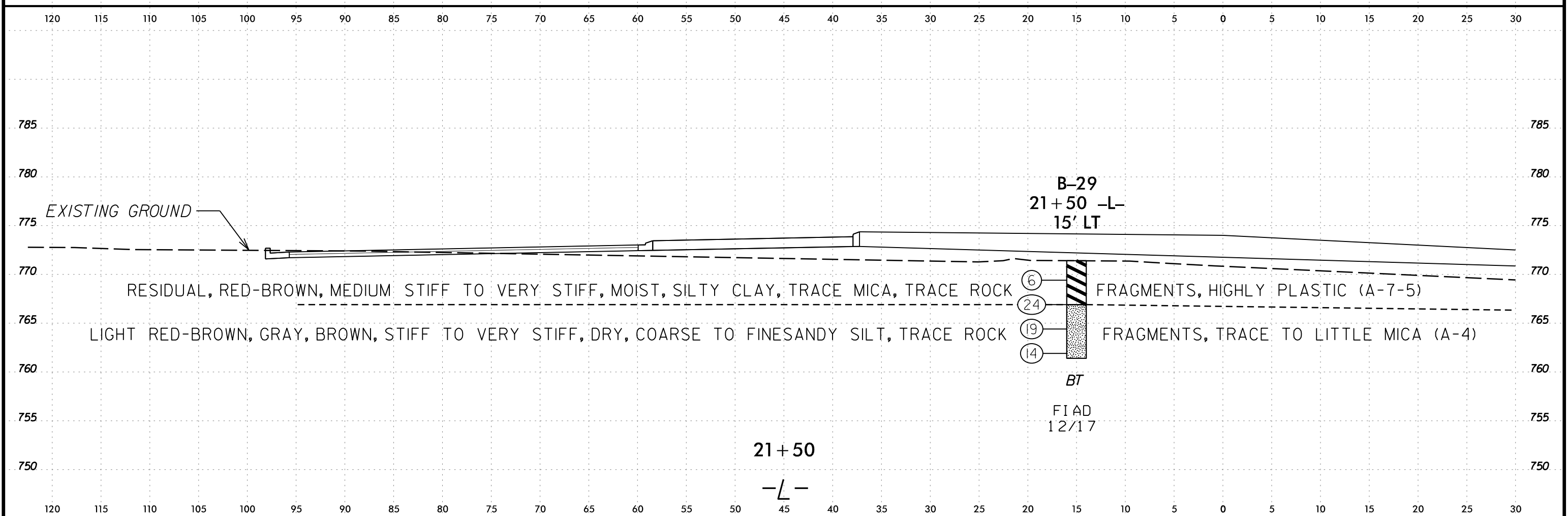
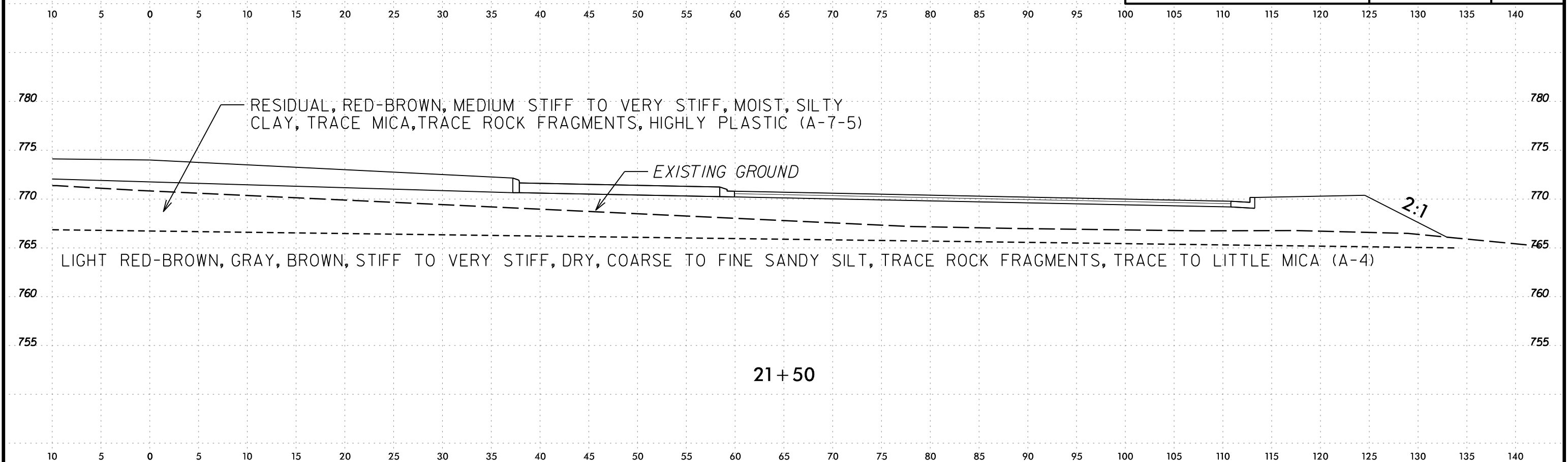
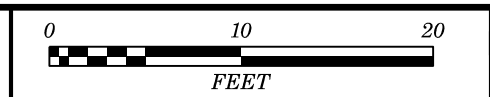
BT

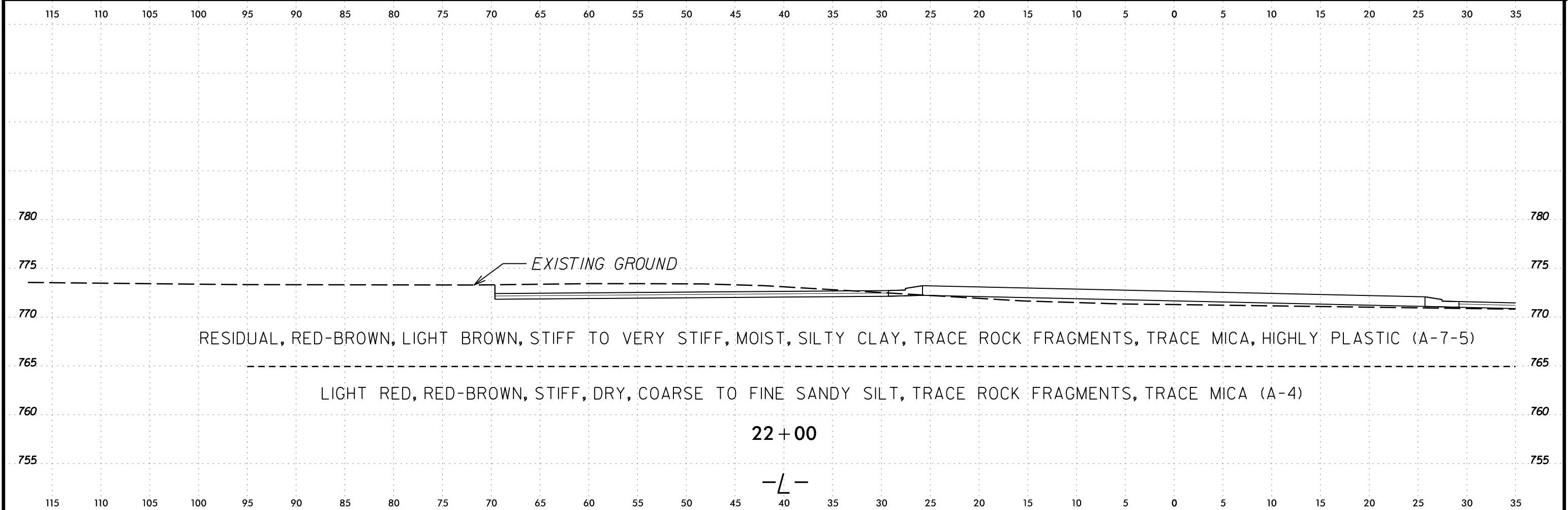
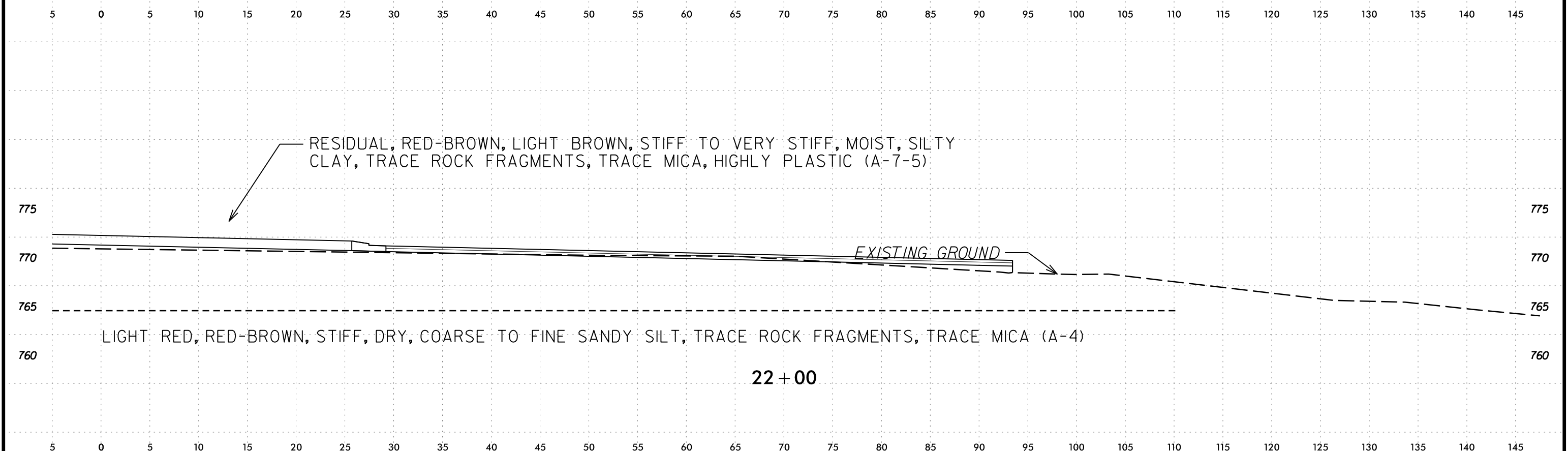
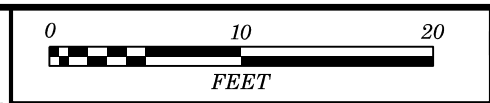
FIAD
12/17

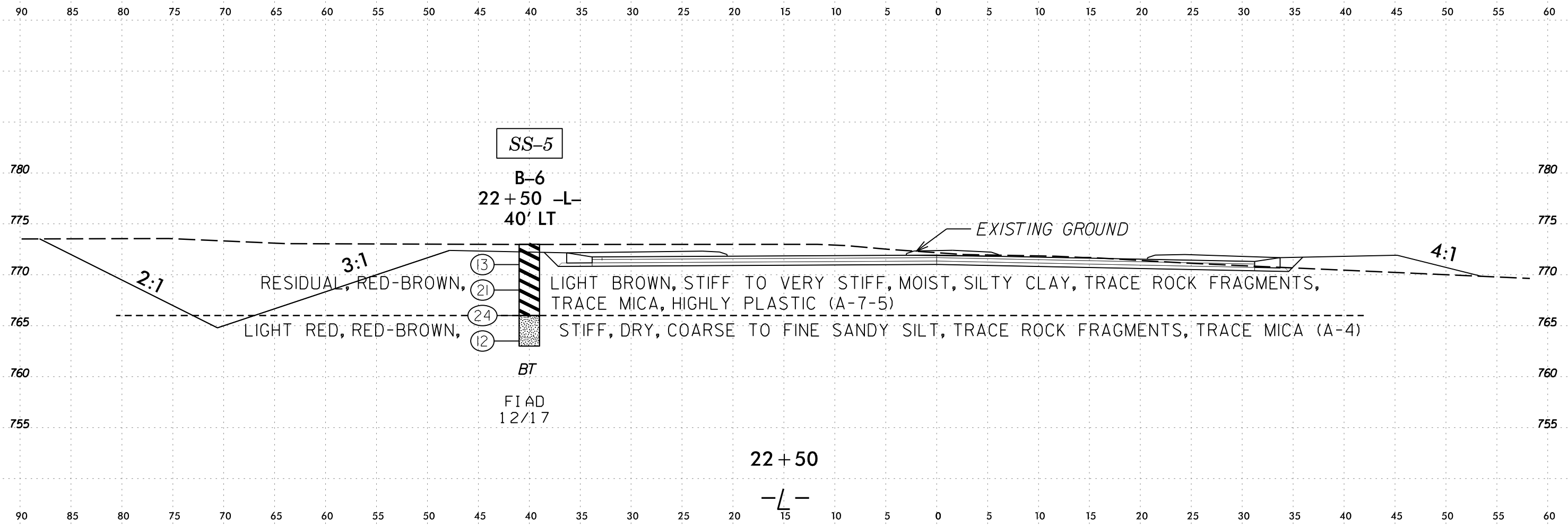
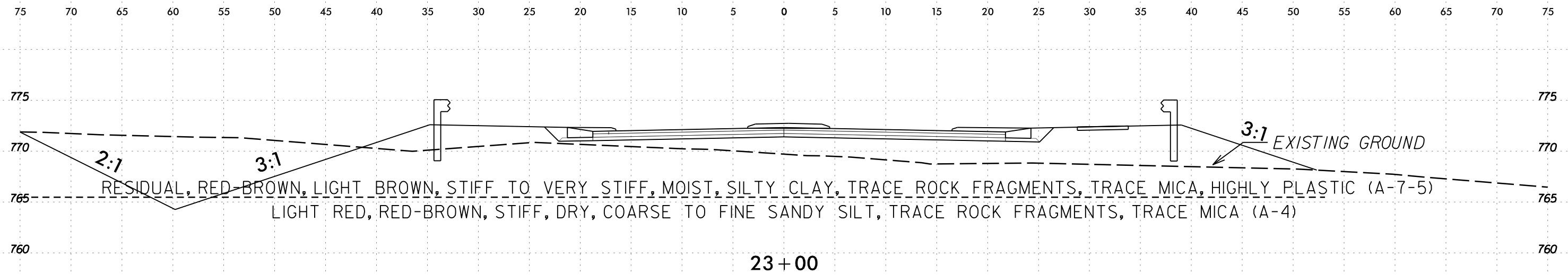
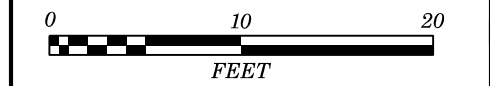
20+00

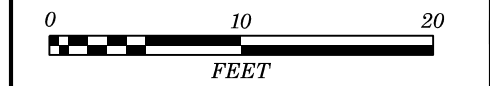
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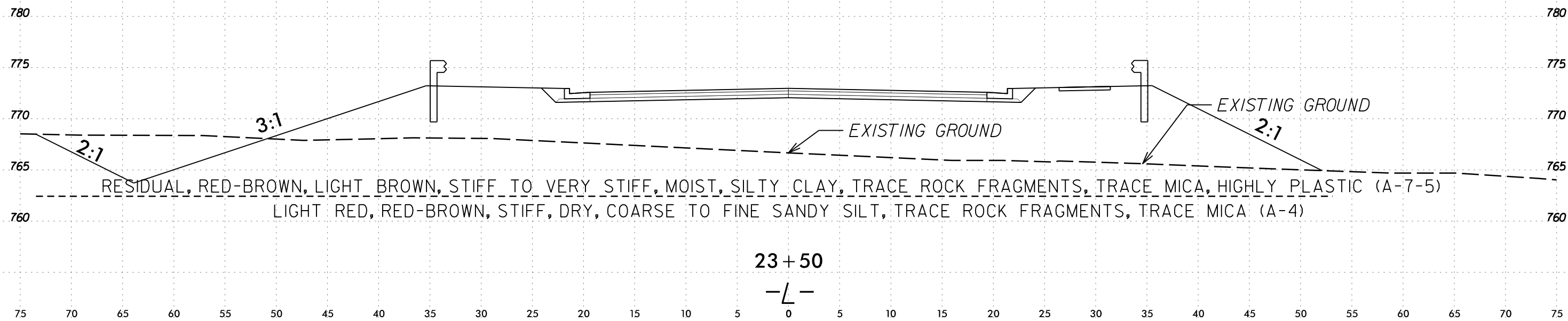
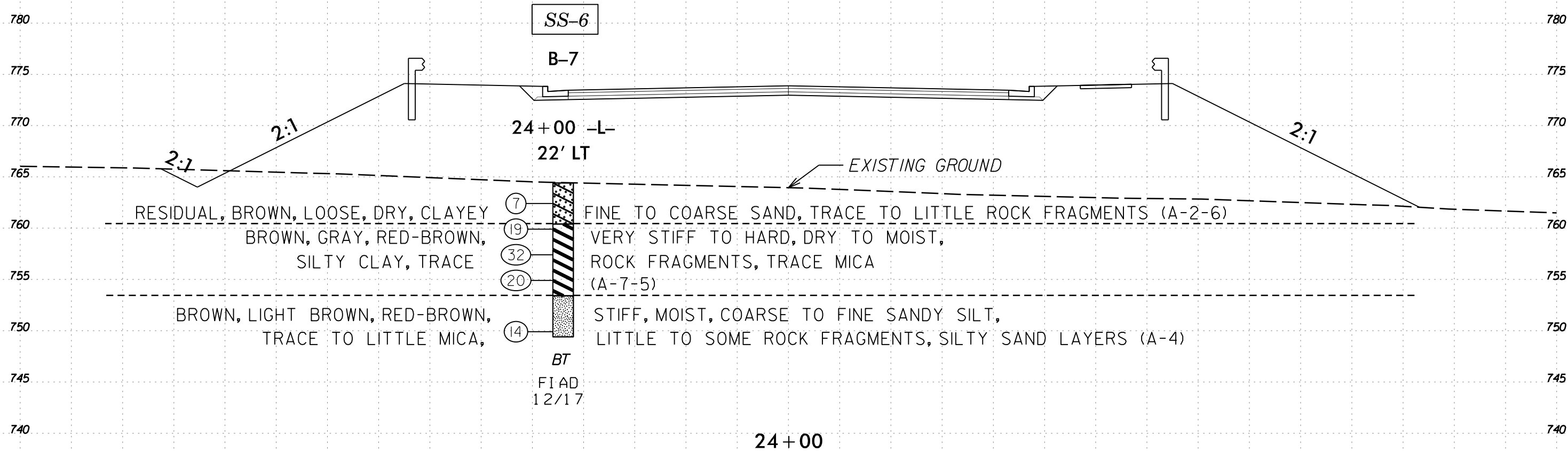




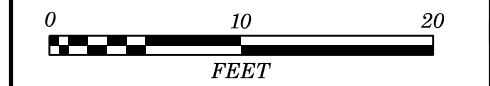




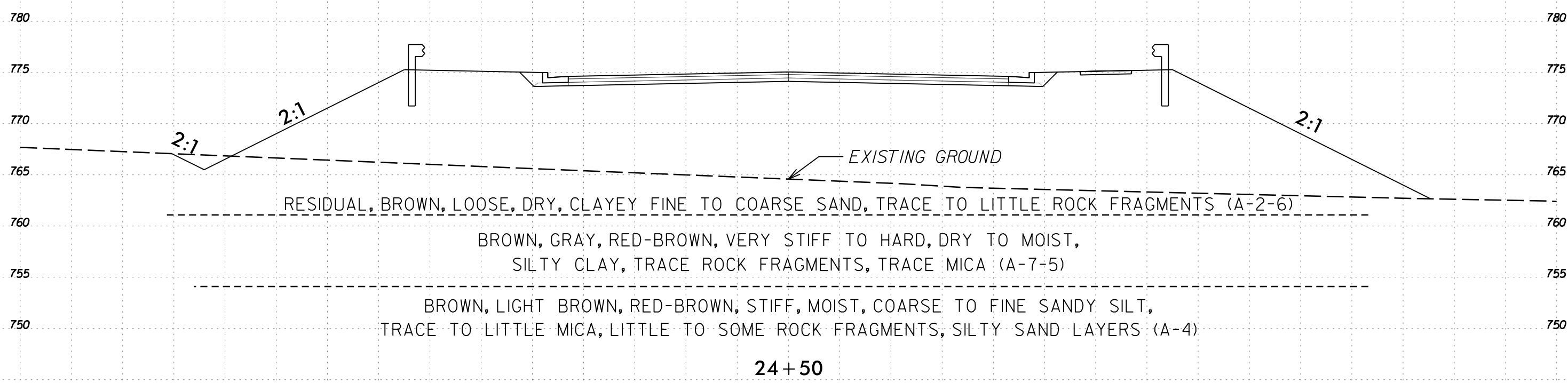
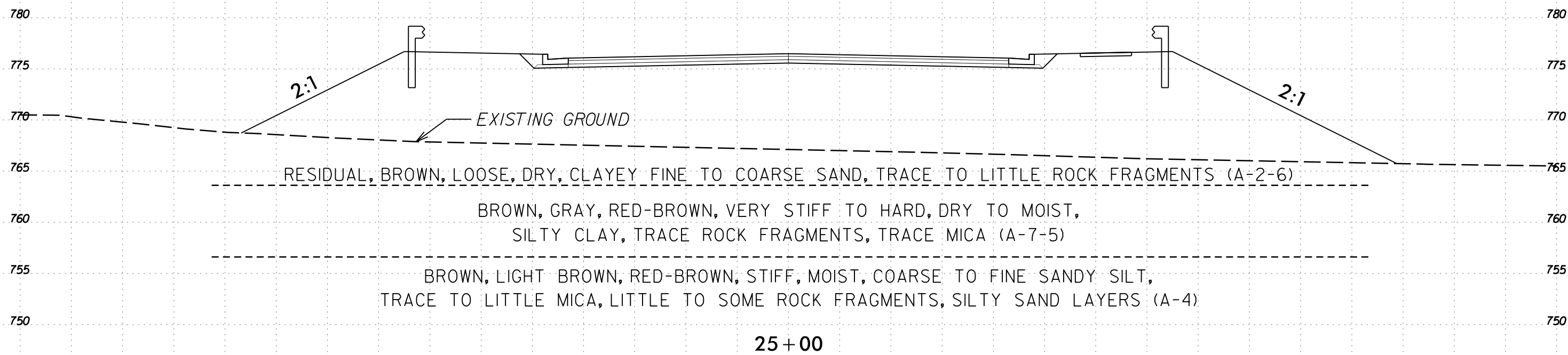
75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75



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



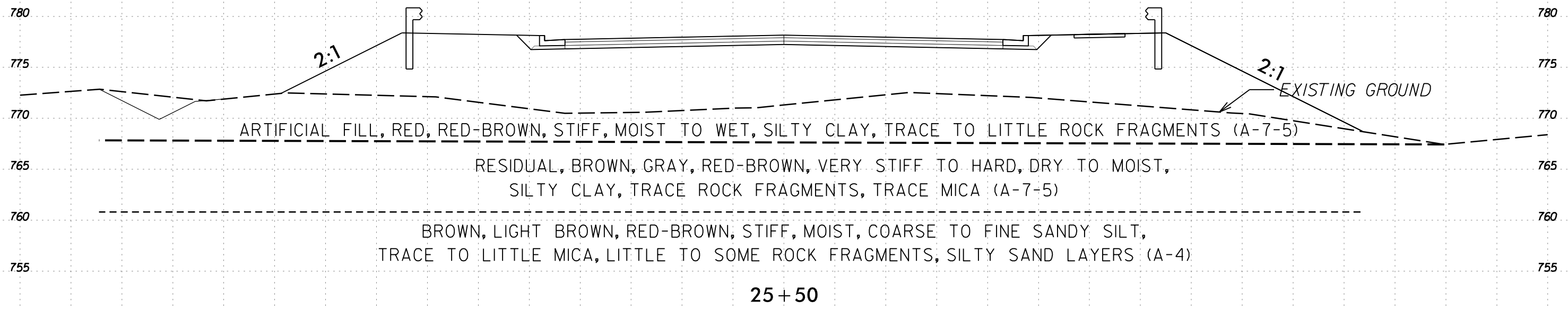
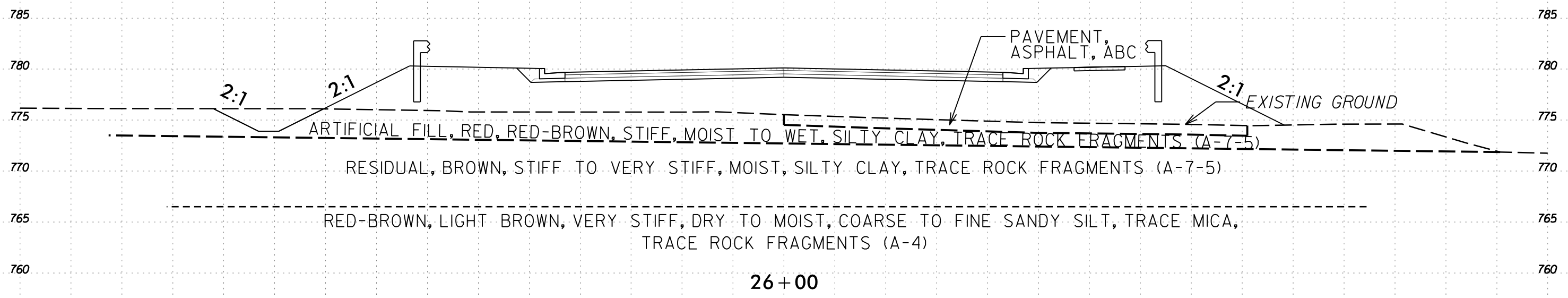
75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75



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

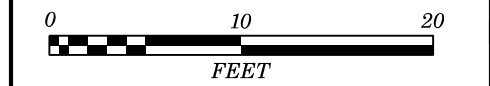


75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

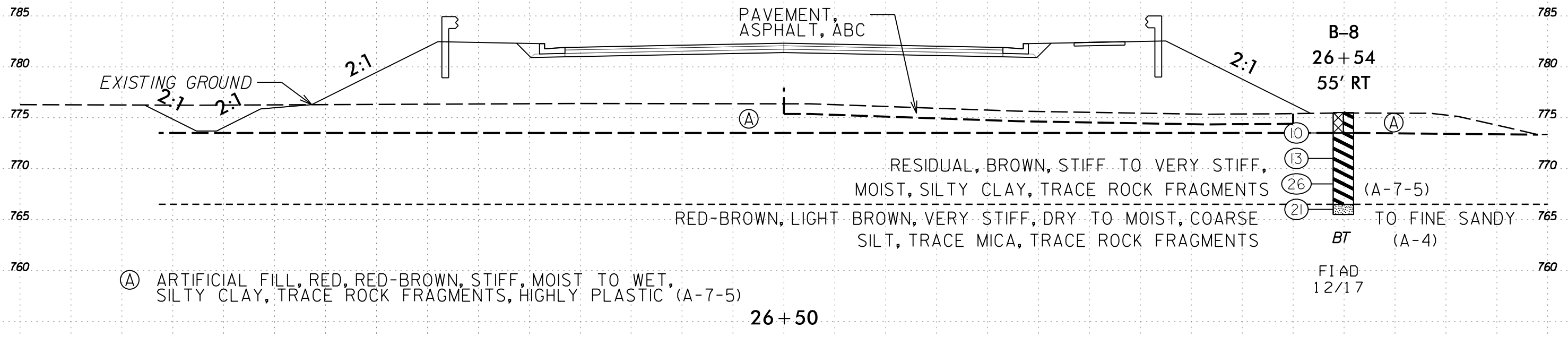
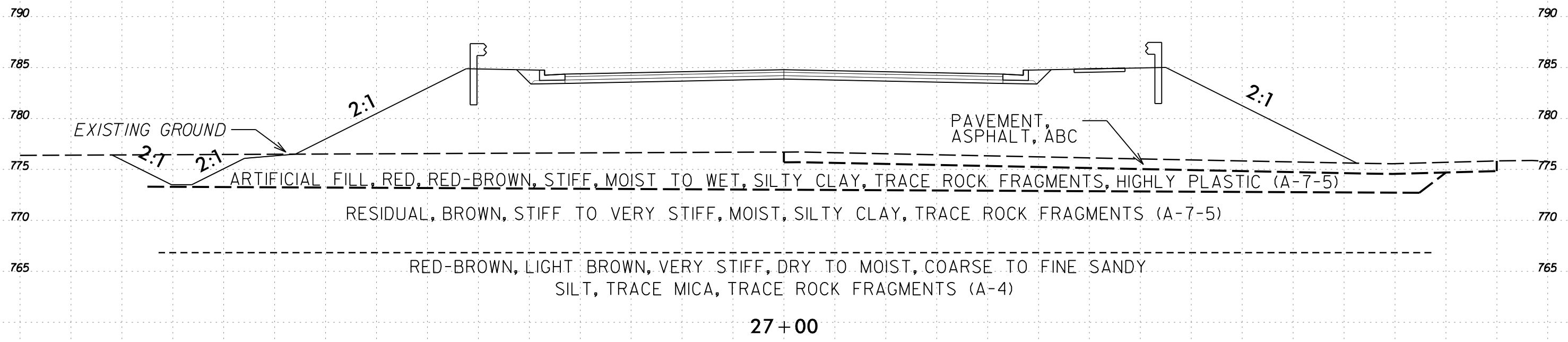


75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

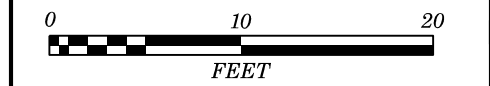
-L-



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

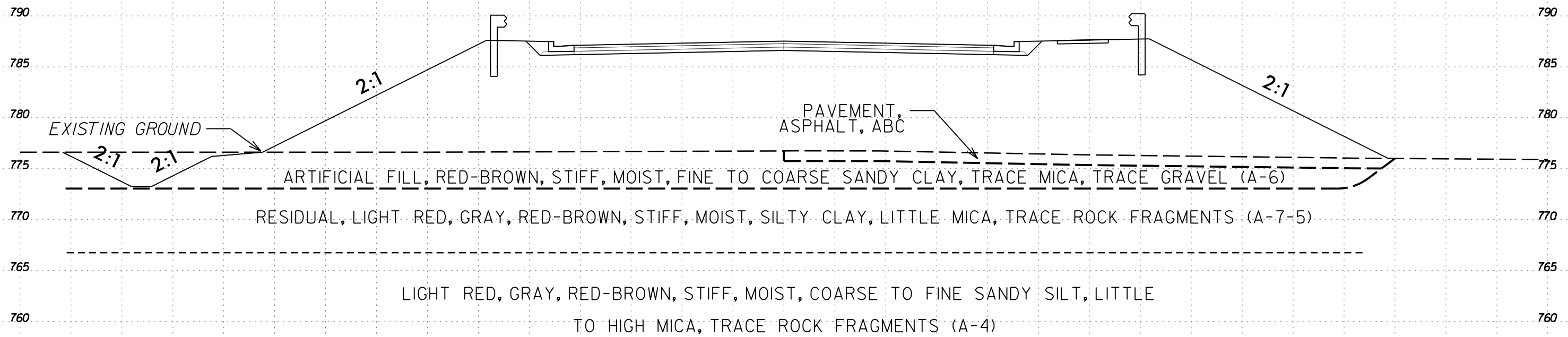


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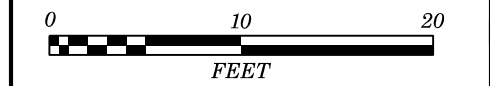
PROJ. REFERENCE NO.	SHEET NO.
Y-4810K	37

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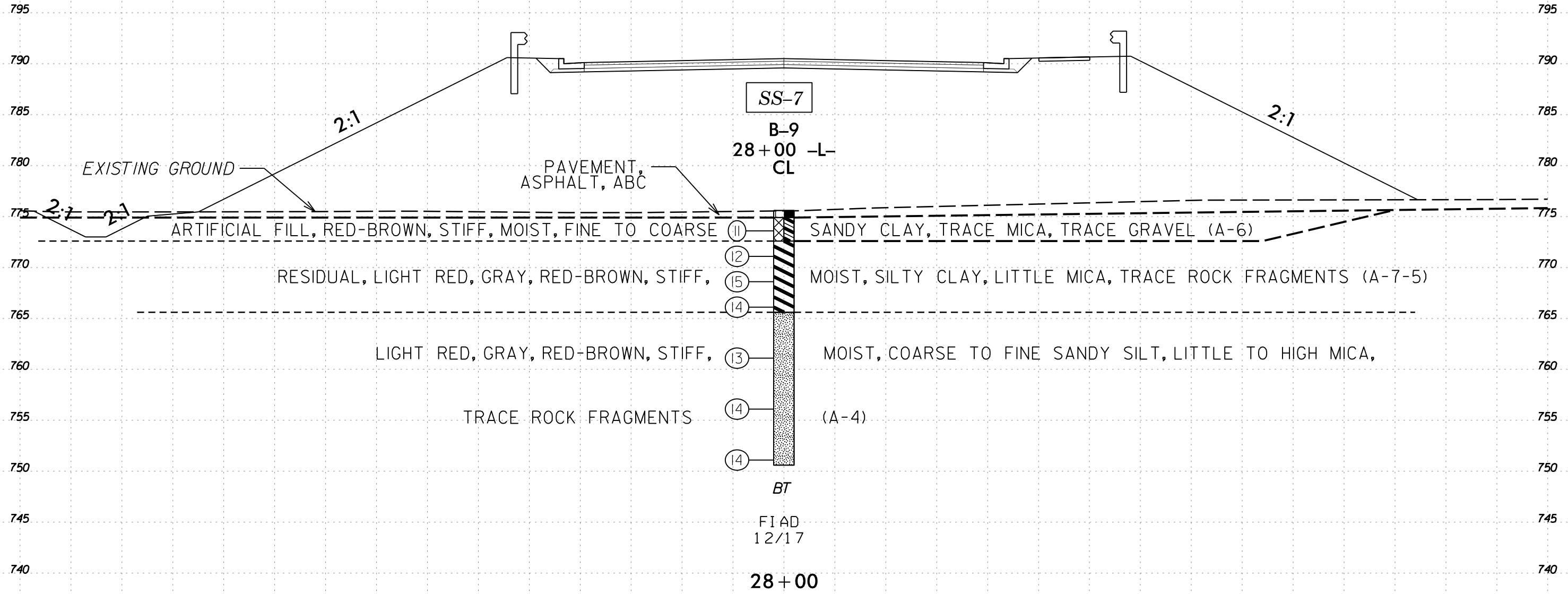


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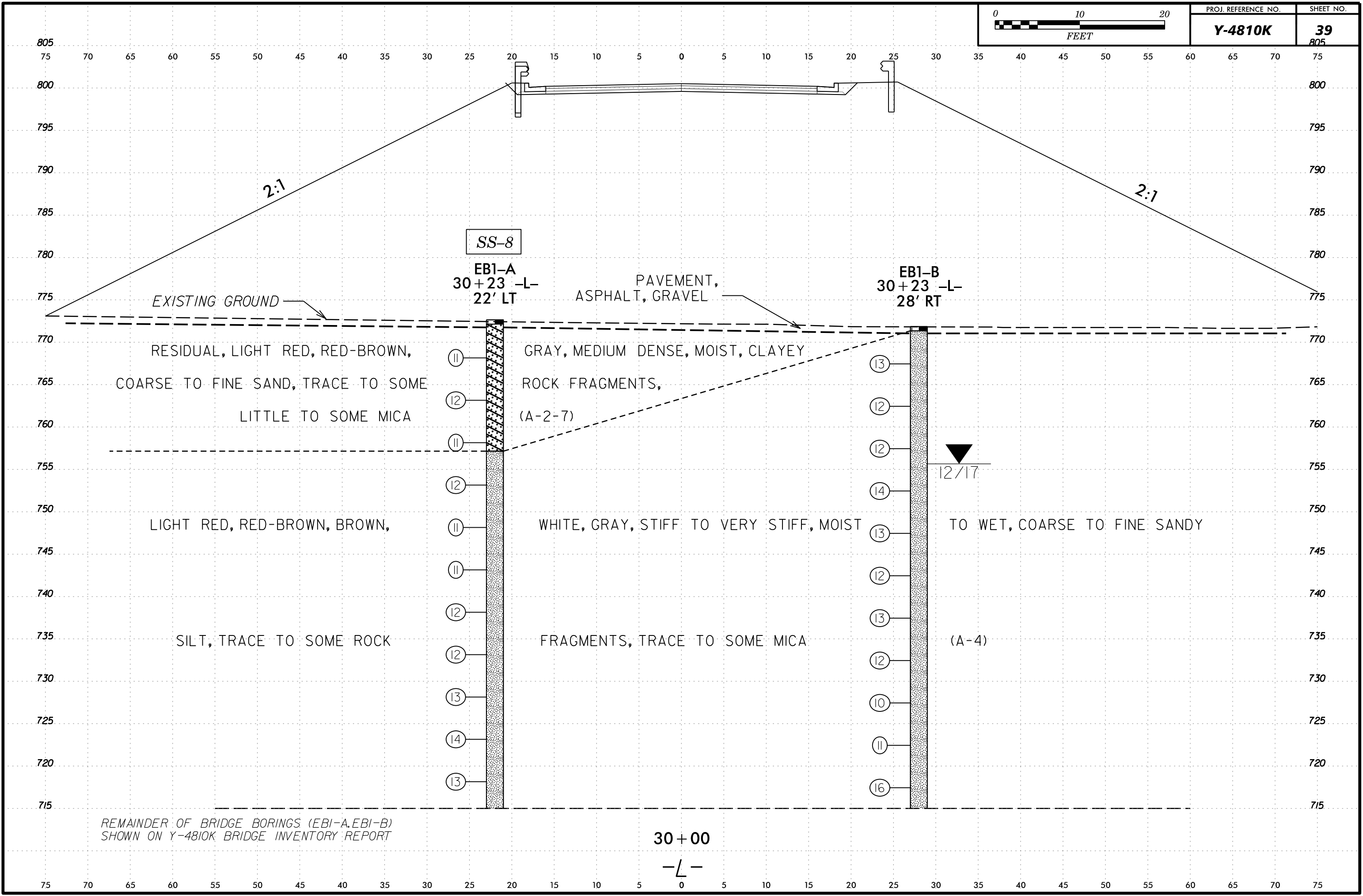
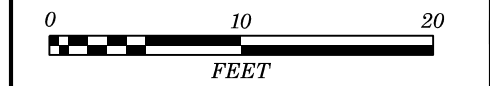
27+50
-L-



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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



EXISTING GROUND

SS-8

EB1-A
30+23 -L-
22' LT

PAVEMENT,
ASPHALT, GRAVEL

EB1-B
30+23 -L-
28' RT

RESIDUAL, LIGHT RED, RED-BROWN,
COARSE TO FINE SAND, TRACE TO SOME
LITTLE TO SOME MICA

GRAY, MEDIUM DENSE, MOIST, CLAYEY
ROCK FRAGMENTS,
(A-2-7)

12/17

LIGHT RED, RED-BROWN, BROWN,

WHITE, GRAY, STIFF TO VERY STIFF, MOIST

TO WET, COARSE TO FINE SANDY

SILT, TRACE TO SOME ROCK

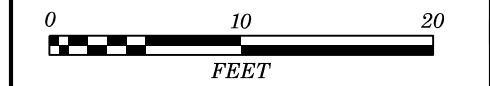
FRAGMENTS, TRACE TO SOME MICA

(A-4)

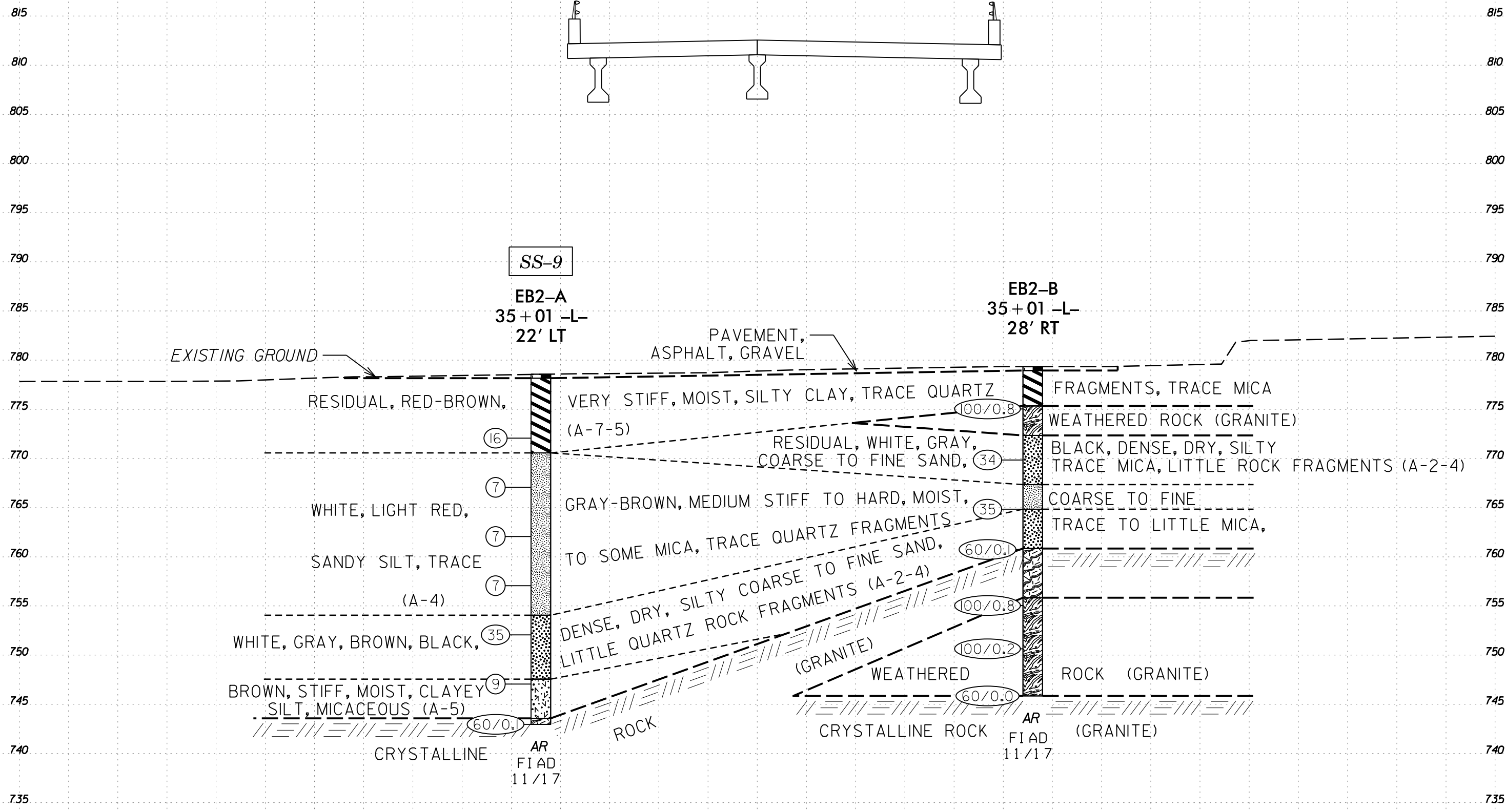
REMAINDER OF BRIDGE BORINGS (EB1-A, EB1-B)
SHOWN ON Y-4810K BRIDGE INVENTORY REPORT

30+00

-L-



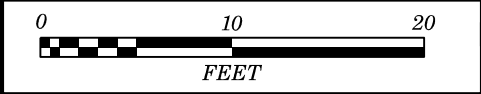
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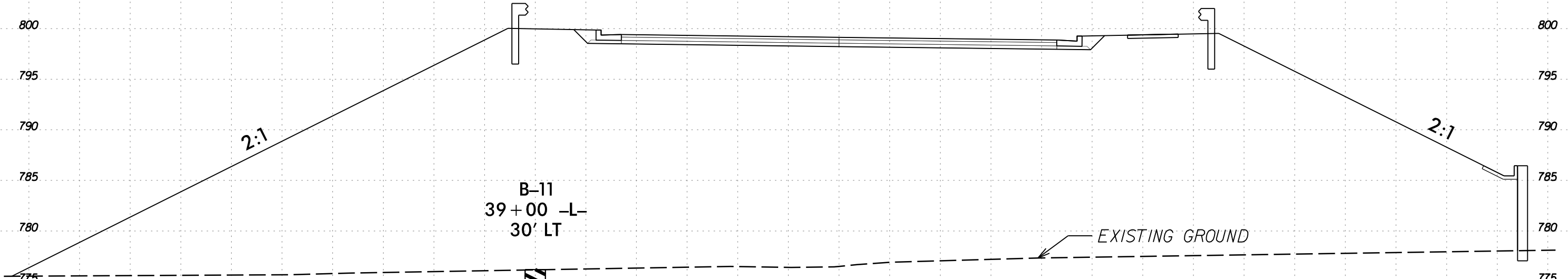
35+00

-L-

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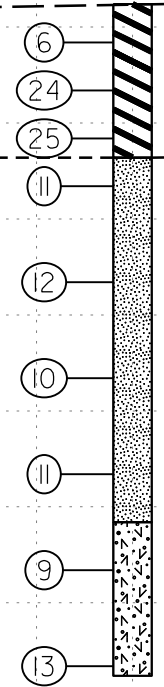
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RESIDUAL, BROWN, RED-BROWN, MEDIUM STIFF TO VERY STIFF, WET TO MOIST, SILTY CLAY, TRACE ROCK FRAGMENTS, TRACE MICA (A-7-5)

LIGHT BROWN, DARK BROWN, WHITE, LIGHT RED, STIFF, MOIST TO WET, COARSE TO FINE SANDY SILT

AND CLAYEY SILT, TRACE TO SOME MICA, TRACE ROCK FRAGMENTS (A-4, A-5)



BT
CAVED DRY
@ 13.1'
12/17

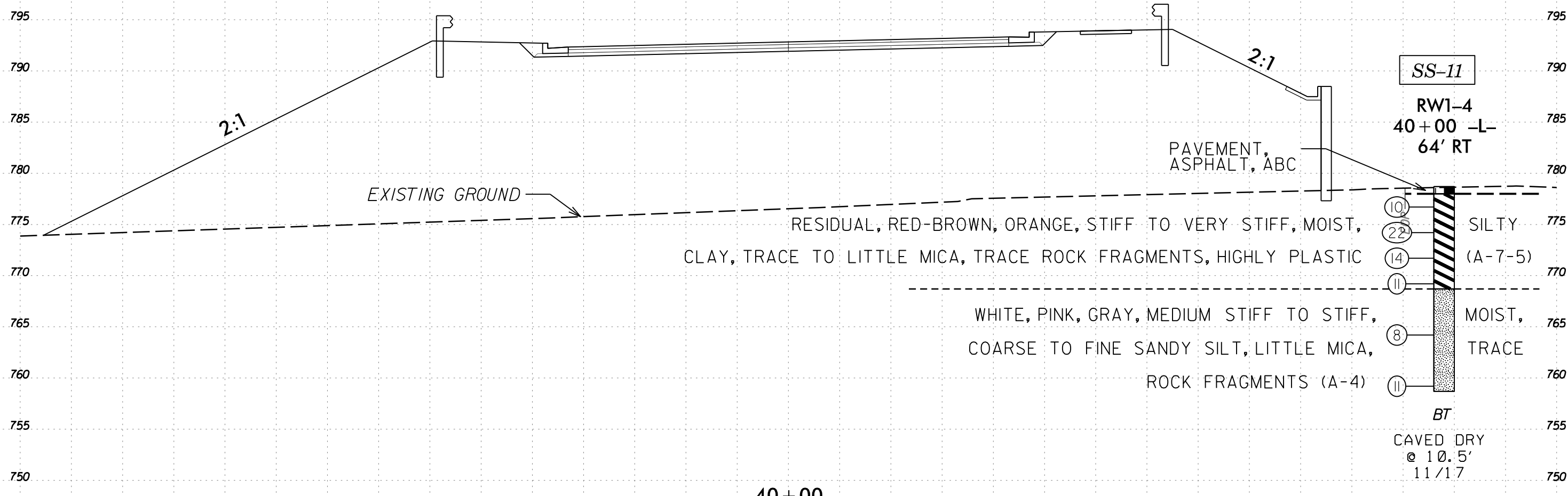
39+00

-L-

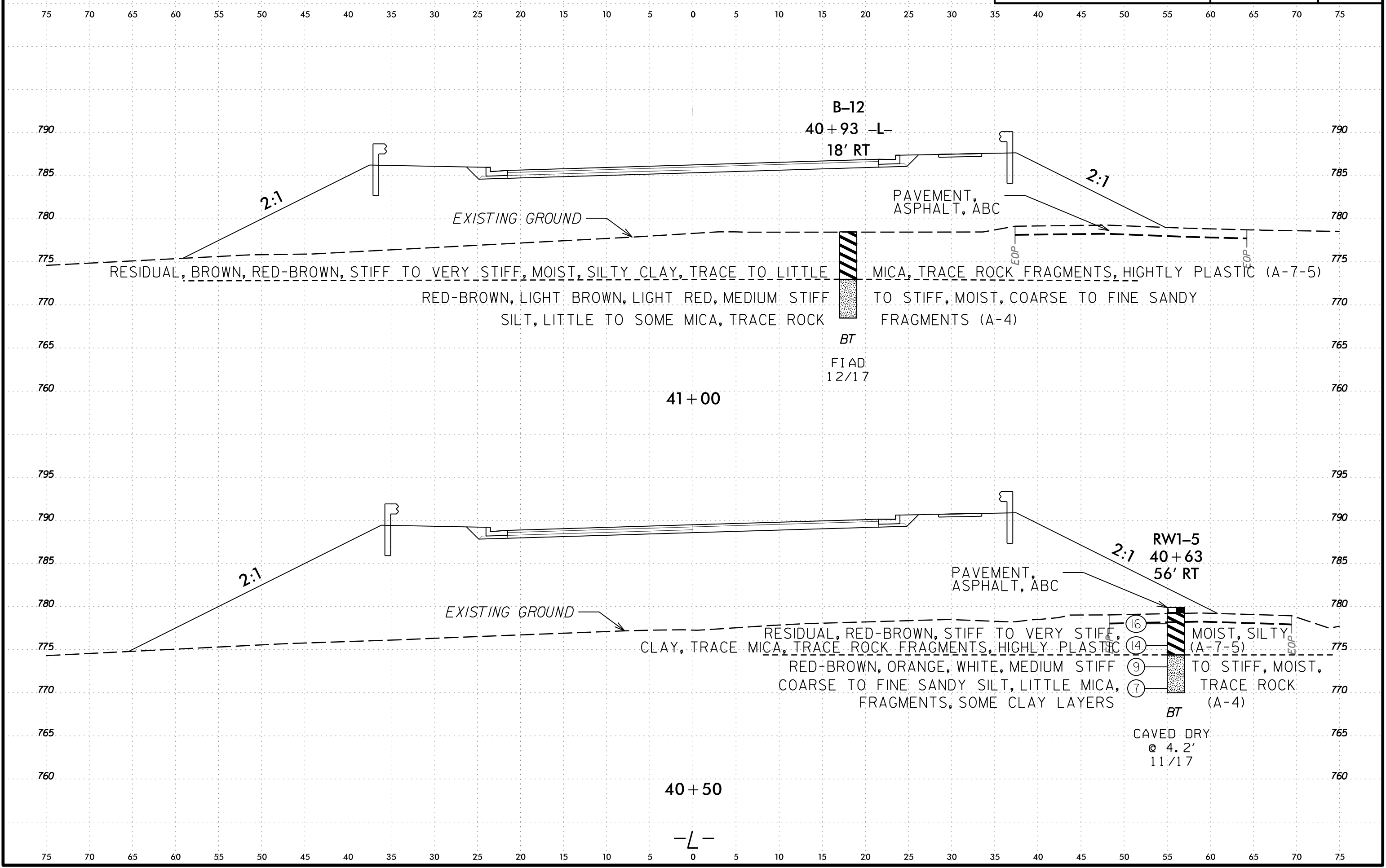
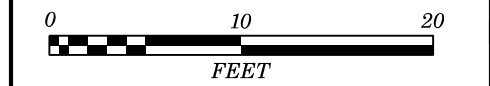
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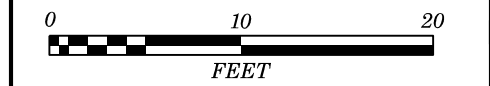


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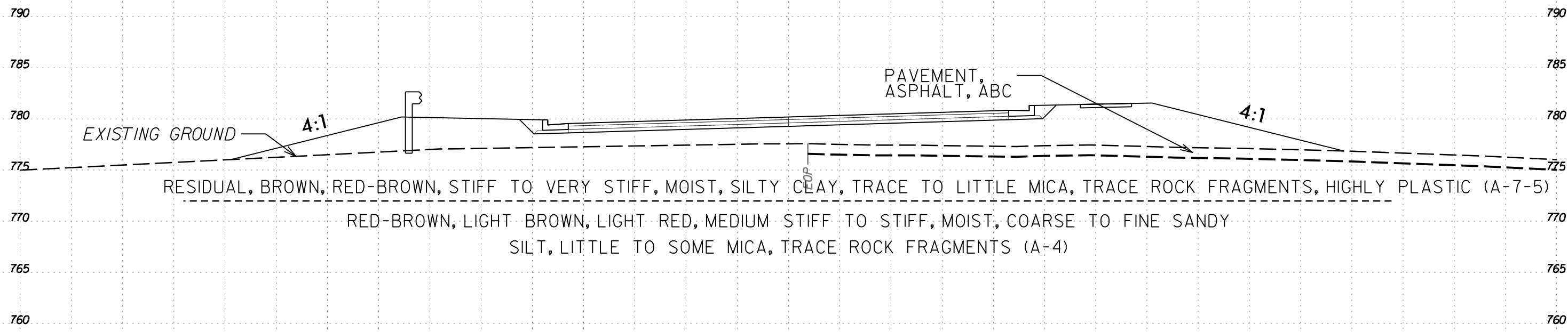


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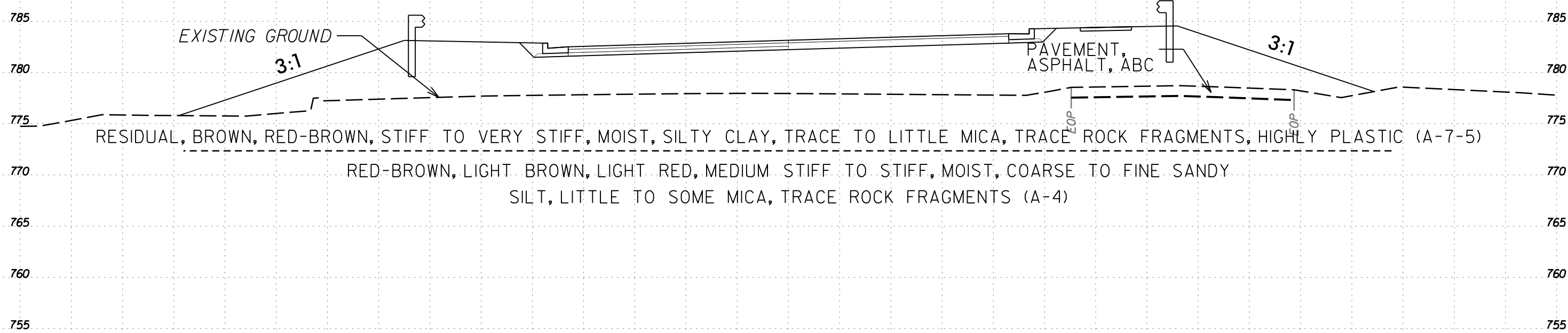




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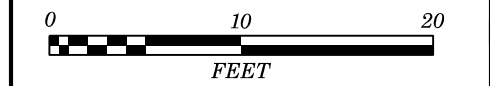
42 + 00



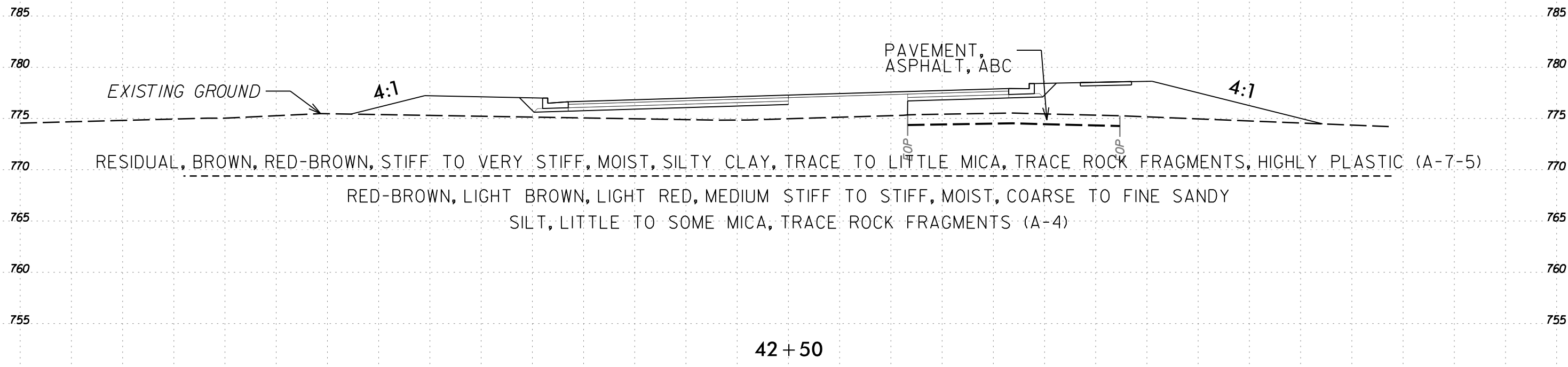
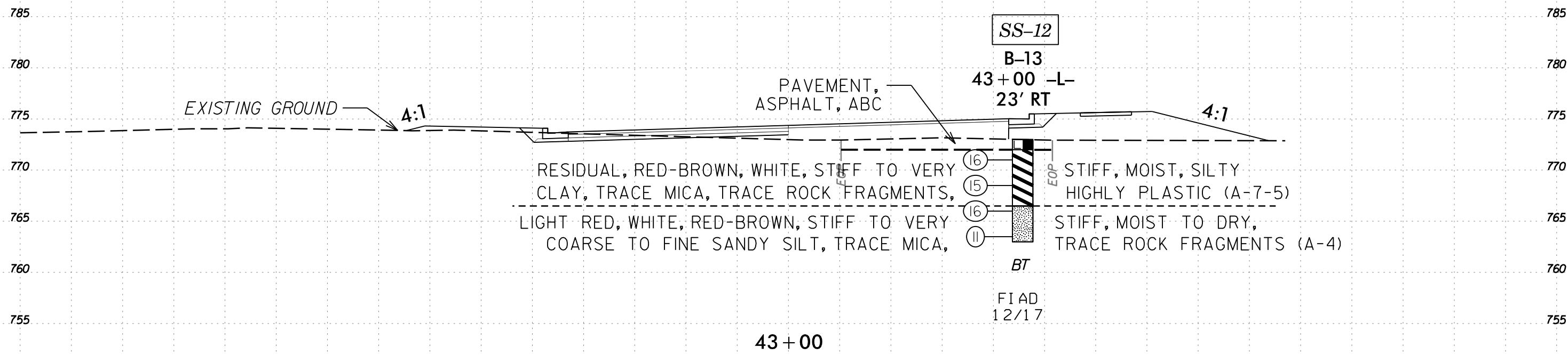
41 + 50

—L—

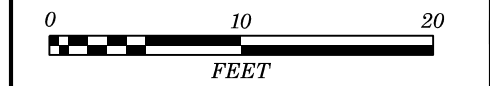
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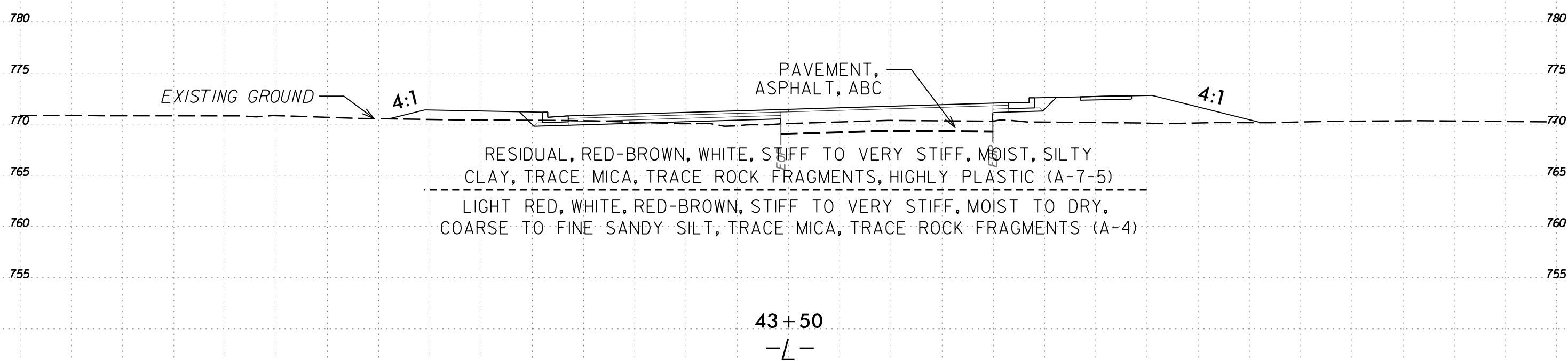
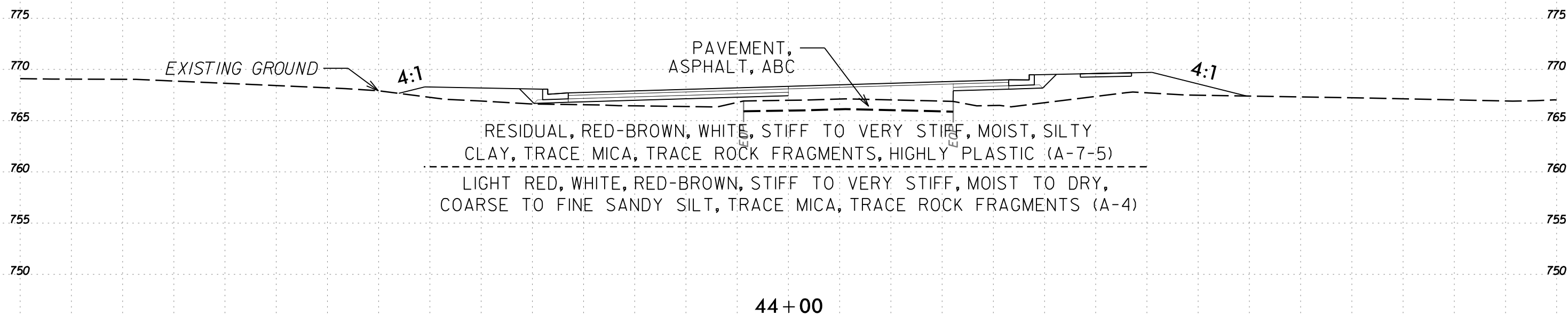
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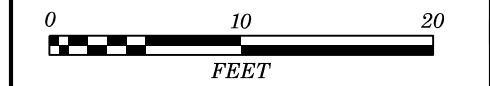
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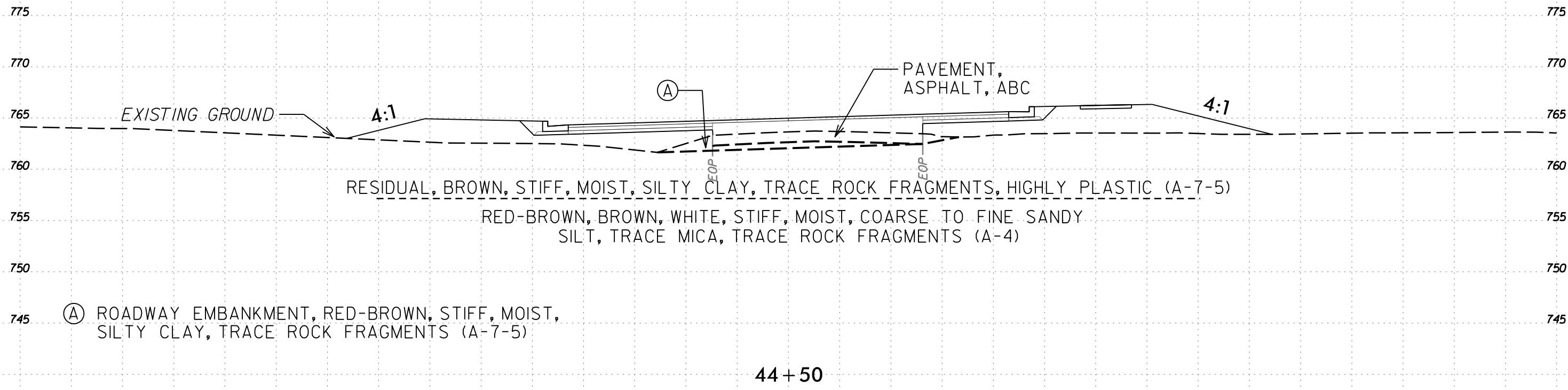
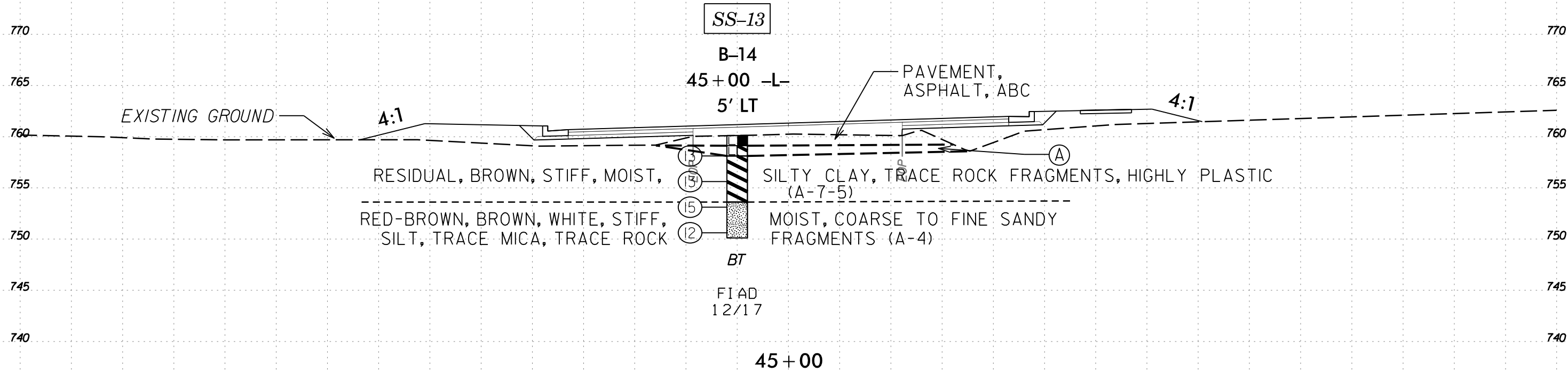
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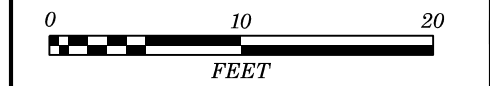
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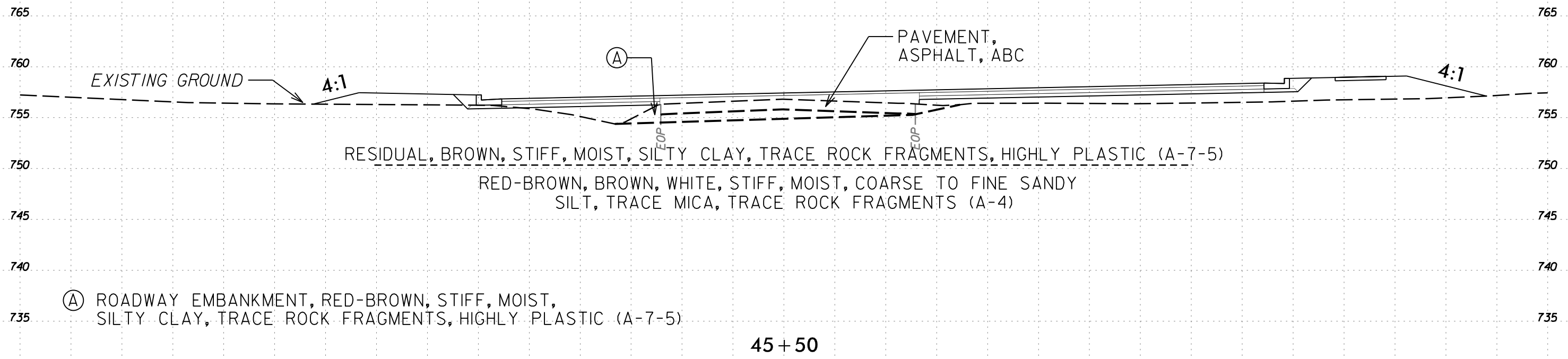
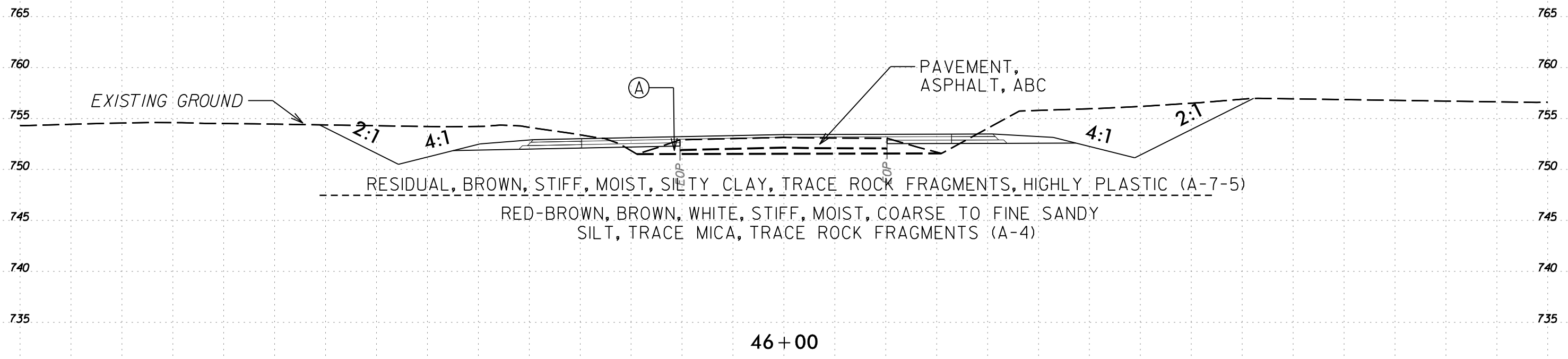
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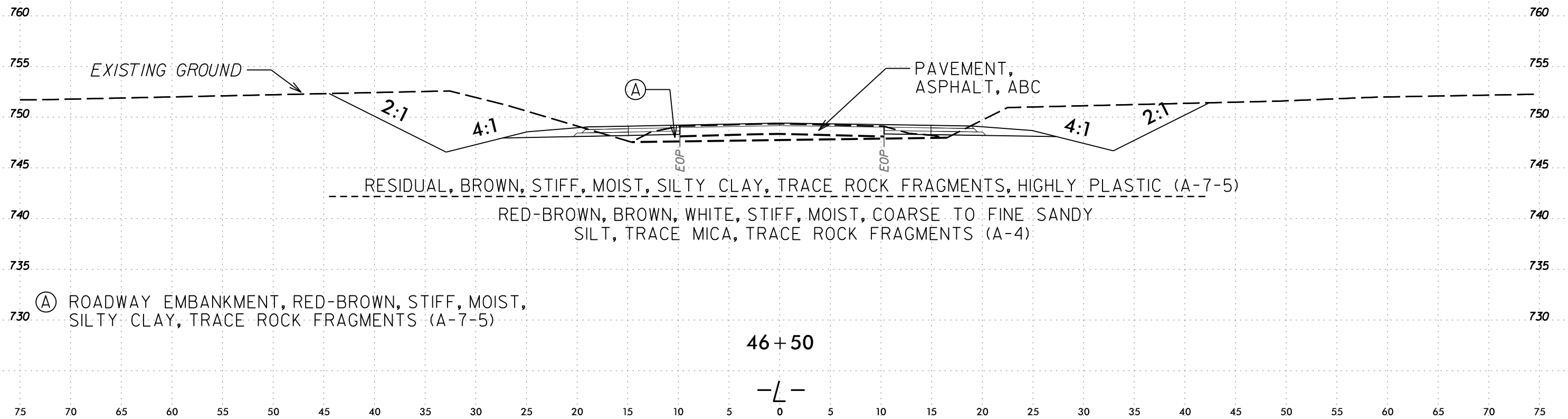
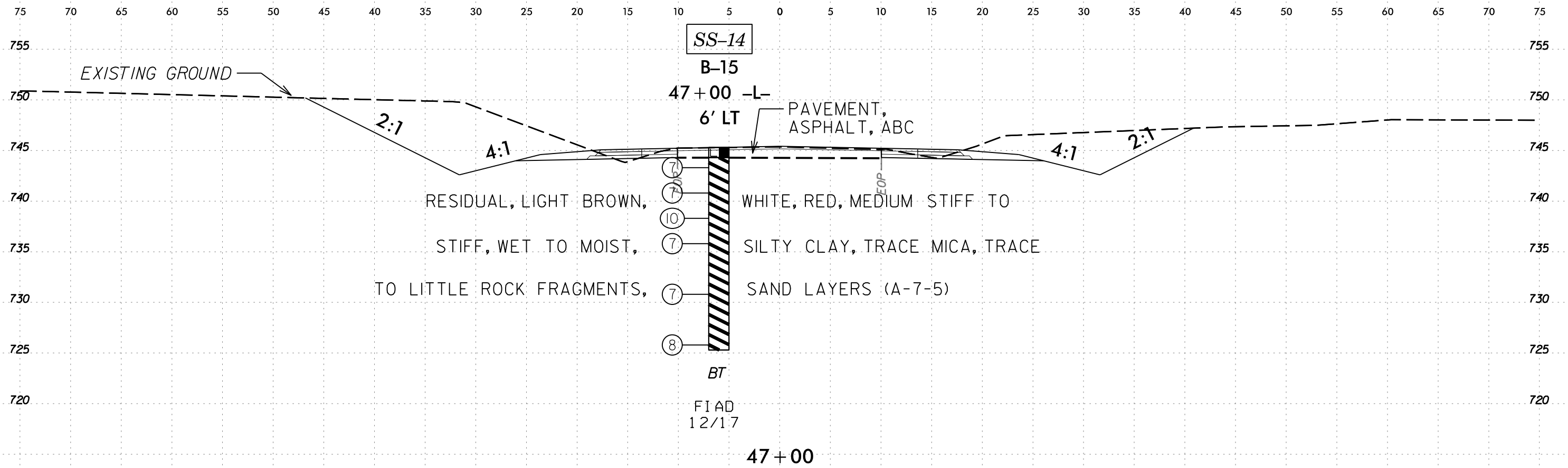
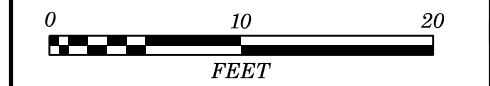


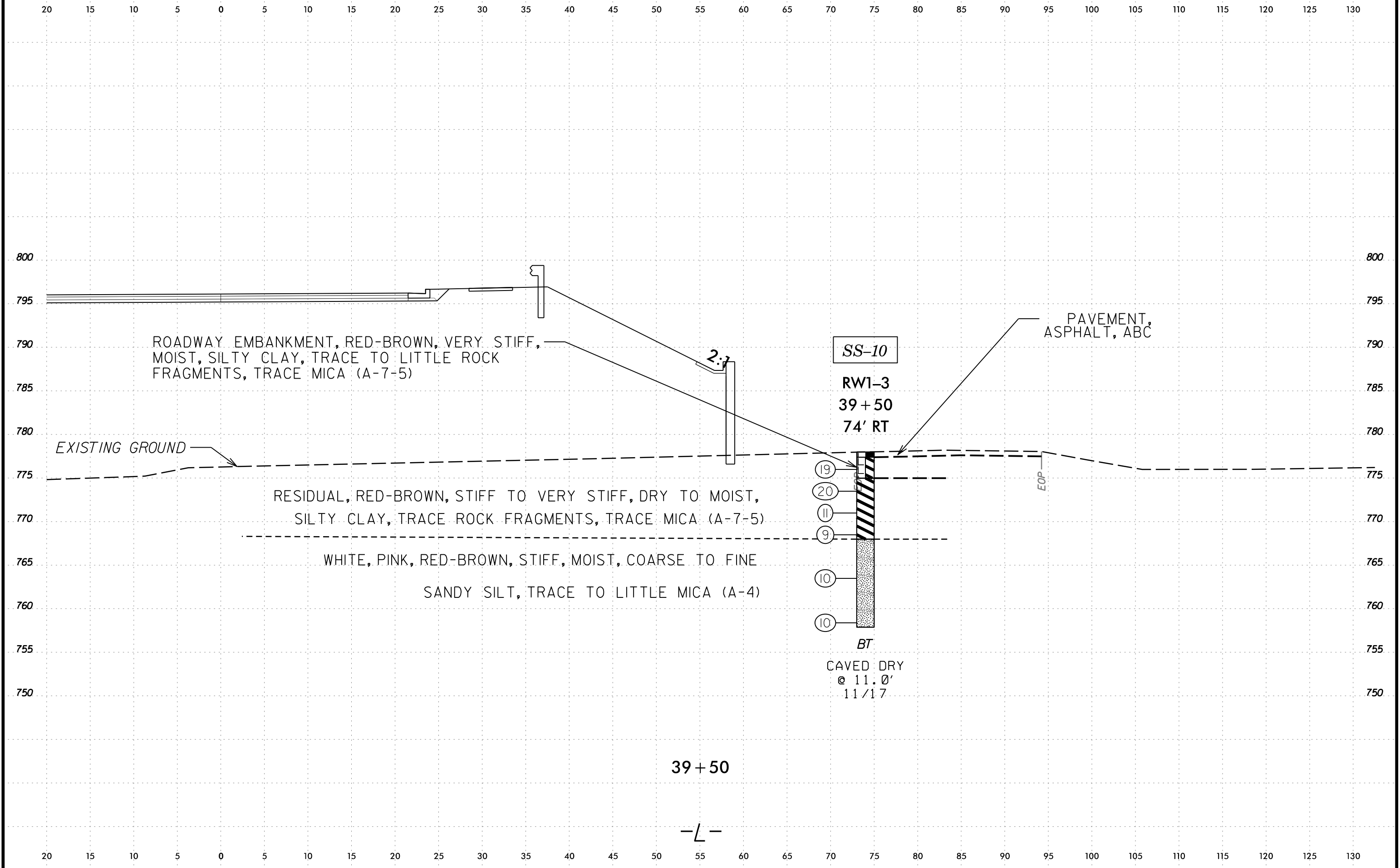
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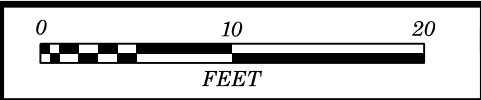


Ⓐ ROADWAY EMBANKMENT, RED-BROWN, STIFF, MOIST, SILTY CLAY, TRACE ROCK FRAGMENTS, HIGHLY PLASTIC (A-7-5)

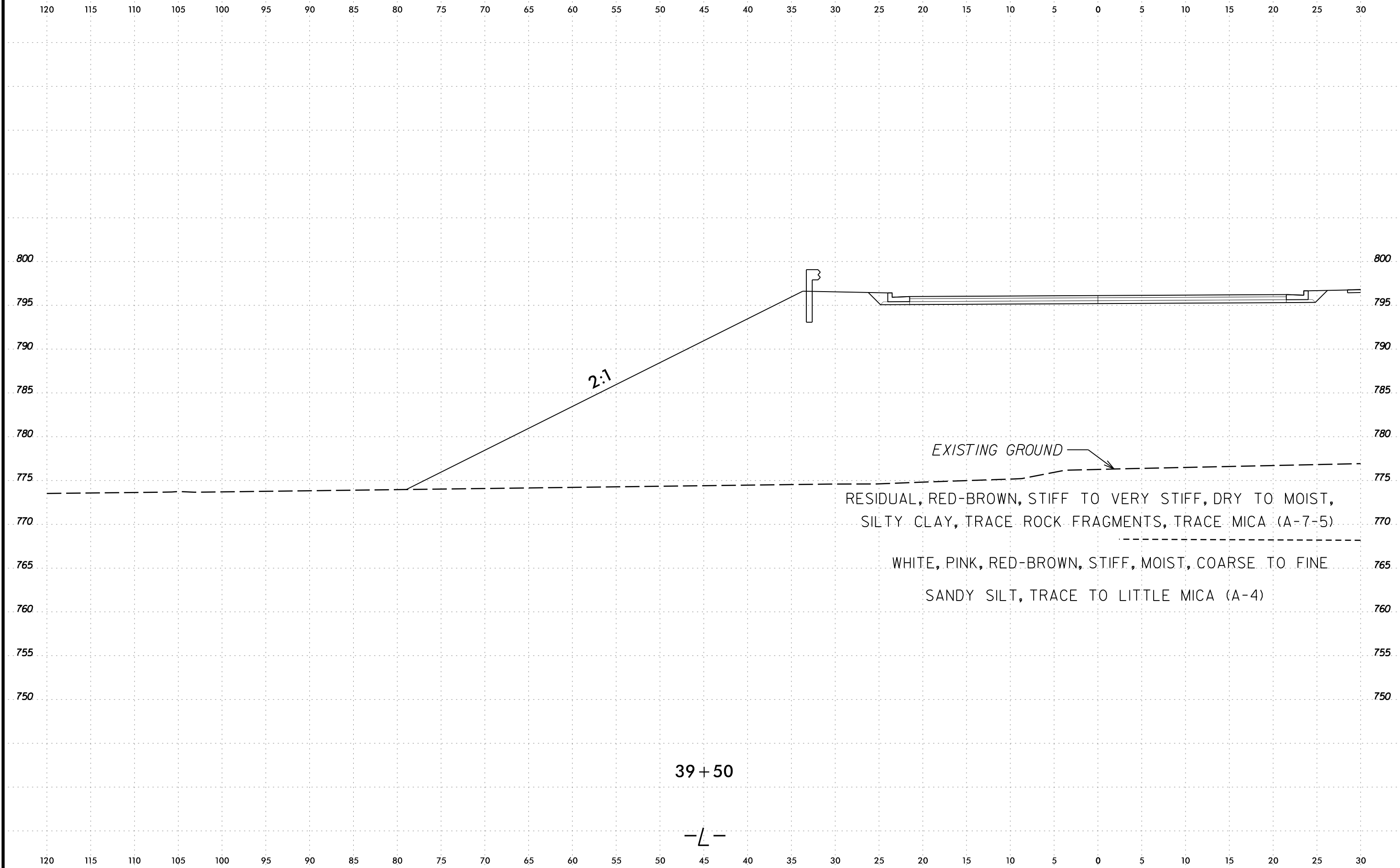
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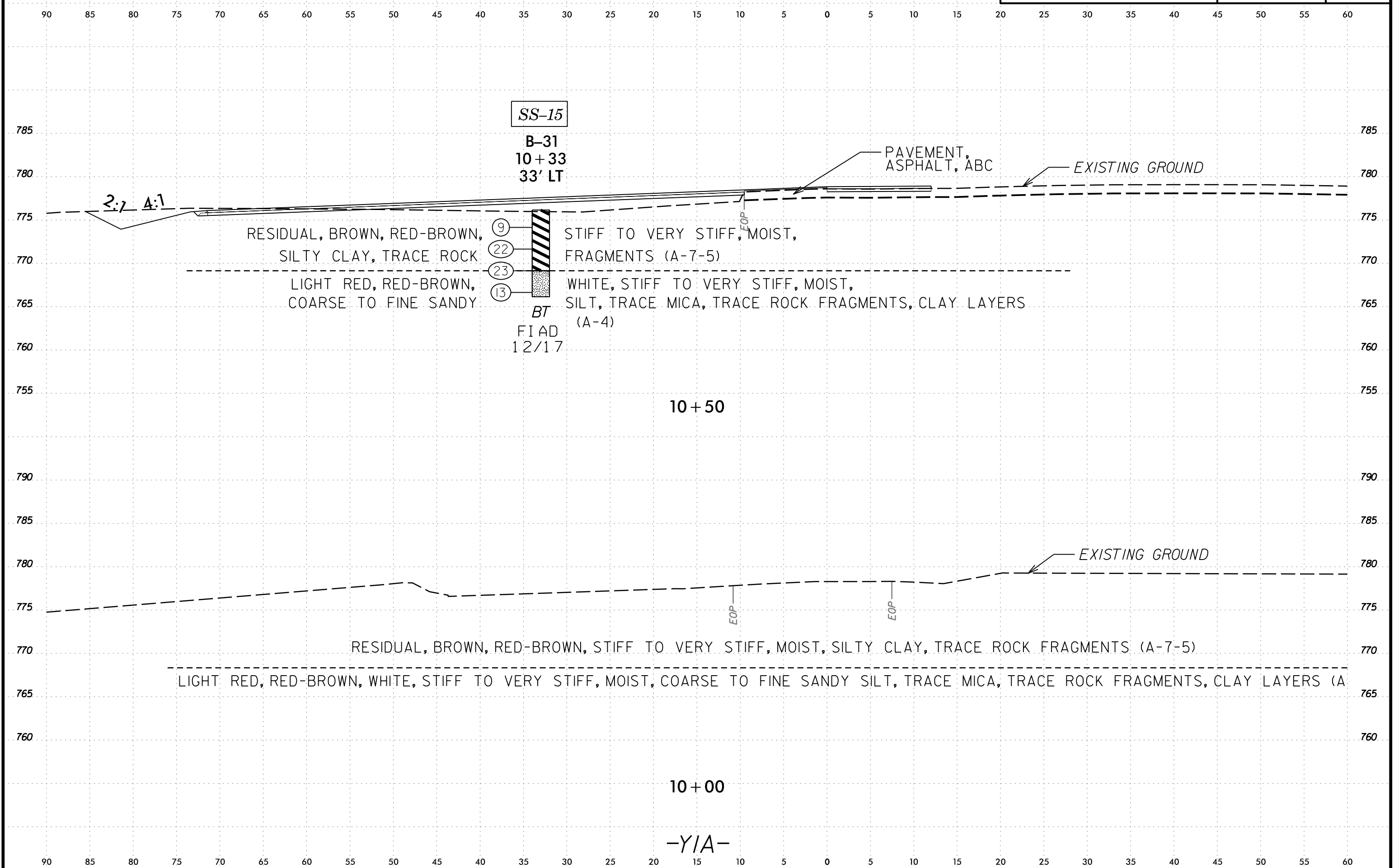
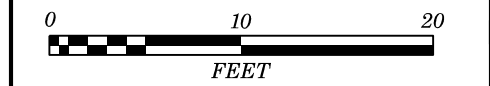






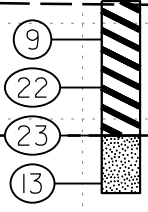
PROJ. REFERENCE NO.	SHEET NO.
Y-4810K	43





SS-15

B-31
10+33
33' LT



RESIDUAL, BROWN, RED-BROWN,
SILTY CLAY, TRACE ROCK

STIFF TO VERY STIFF, MOIST,
FRAGMENTS (A-7-5)

LIGHT RED, RED-BROWN,
COARSE TO FINE SANDY

WHITE, STIFF TO VERY STIFF, MOIST,
SILT, TRACE MICA, TRACE ROCK FRAGMENTS, CLAY LAYERS
(A-4)

BT
FIAD
12/17

PAVEMENT,
ASPHALT, ABC

EXISTING GROUND

2:1 A:1

10+50

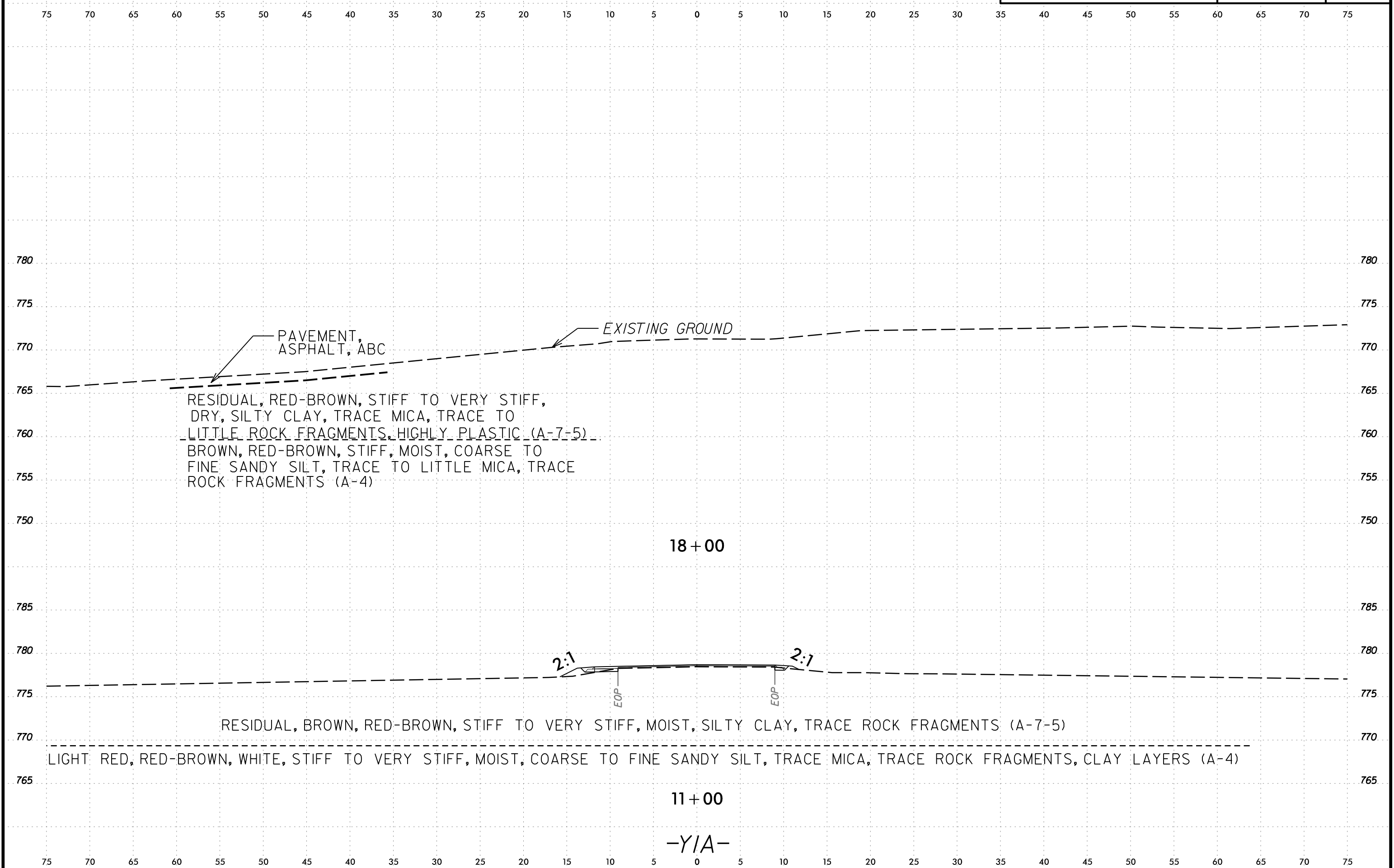
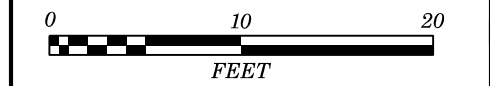
EXISTING GROUND

RESIDUAL, BROWN, RED-BROWN, STIFF TO VERY STIFF, MOIST, SILTY CLAY, TRACE ROCK FRAGMENTS (A-7-5)

LIGHT RED, RED-BROWN, WHITE, STIFF TO VERY STIFF, MOIST, COARSE TO FINE SANDY SILT, TRACE MICA, TRACE ROCK FRAGMENTS, CLAY LAYERS (A-4)

10+00

-Y/A-



PAVEMENT,
ASPHALT, ABC

RESIDUAL, RED-BROWN, STIFF TO VERY STIFF,
DRY, SILTY CLAY, TRACE MICA, TRACE TO
LITTLE ROCK FRAGMENTS, HIGHLY PLASTIC (A-7-5)

BROWN, RED-BROWN, STIFF, MOIST, COARSE TO
FINE SANDY SILT, TRACE TO LITTLE MICA, TRACE
ROCK FRAGMENTS (A-4)

EXISTING GROUND

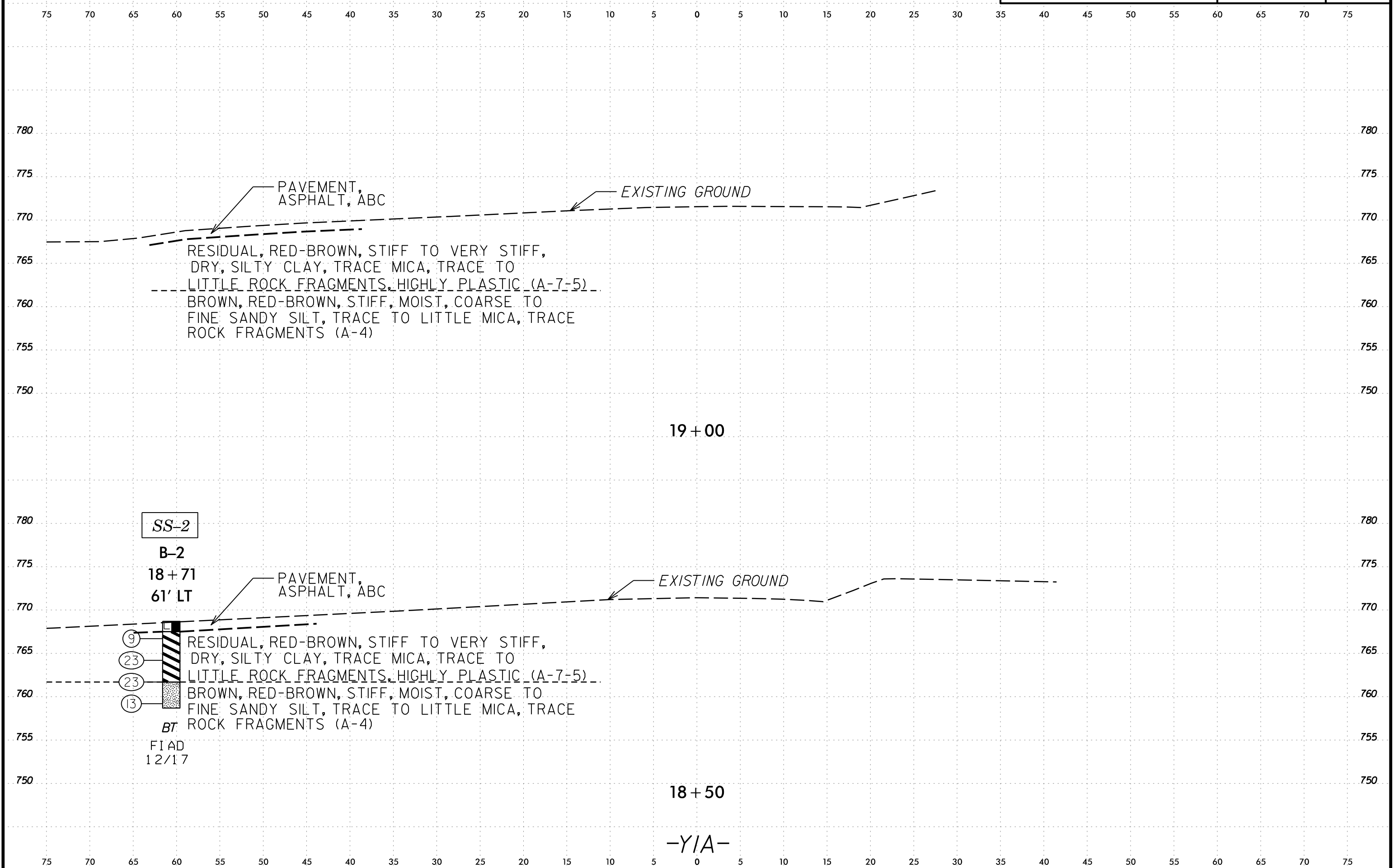
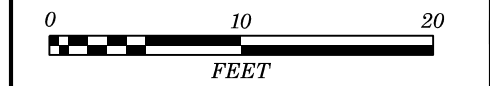
18+00

RESIDUAL, BROWN, RED-BROWN, STIFF TO VERY STIFF, MOIST, SILTY CLAY, TRACE ROCK FRAGMENTS (A-7-5)

LIGHT RED, RED-BROWN, WHITE, STIFF TO VERY STIFF, MOIST, COARSE TO FINE SANDY SILT, TRACE MICA, TRACE ROCK FRAGMENTS, CLAY LAYERS (A-4)

11+00

-Y/A-



SS-2

B-2
18+71
61' LT

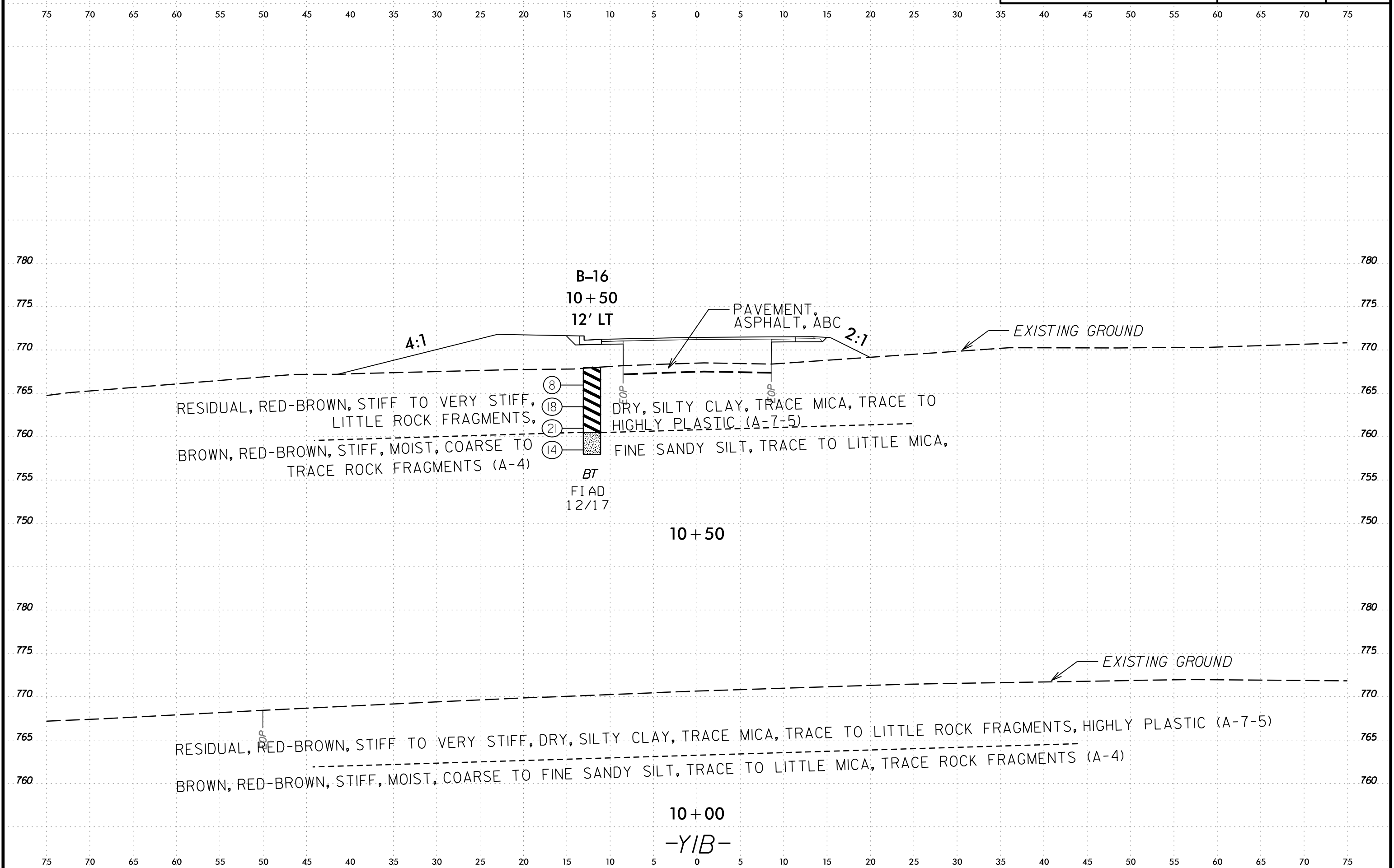
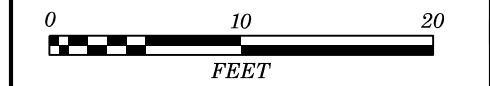
- 9
- 23
- 23
- 13

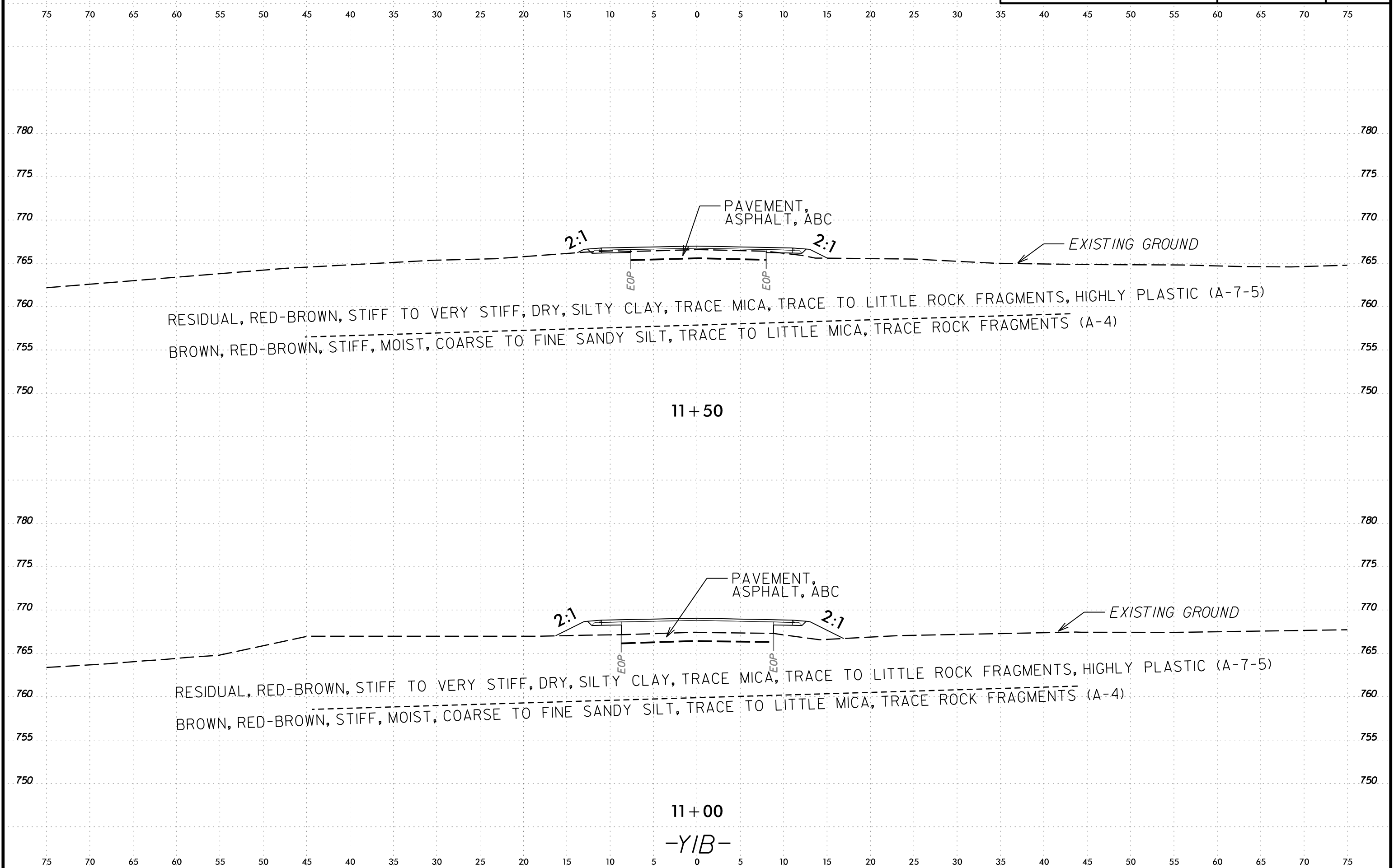
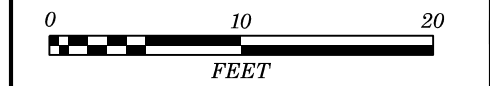
BT
FIAD
12/17

19+00

18+50

-Y/A-





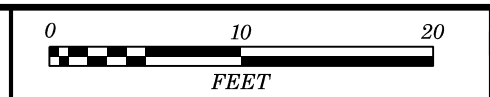
RESIDUAL, RED-BROWN, STIFF TO VERY STIFF, DRY, SILTY CLAY, TRACE MICA, TRACE TO LITTLE ROCK FRAGMENTS, HIGHLY PLASTIC (A-7-5)
BROWN, RED-BROWN, STIFF, MOIST, COARSE TO FINE SANDY SILT, TRACE TO LITTLE MICA, TRACE ROCK FRAGMENTS (A-4)

11+50

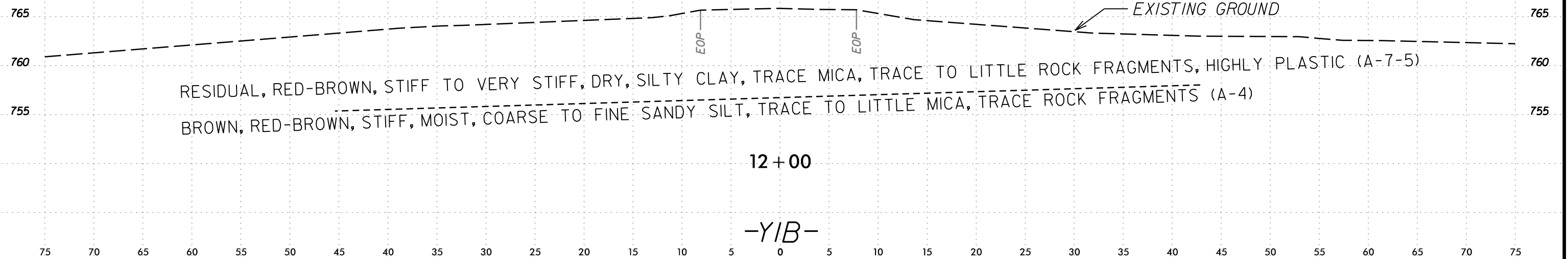
RESIDUAL, RED-BROWN, STIFF TO VERY STIFF, DRY, SILTY CLAY, TRACE MICA, TRACE TO LITTLE ROCK FRAGMENTS, HIGHLY PLASTIC (A-7-5)
BROWN, RED-BROWN, STIFF, MOIST, COARSE TO FINE SANDY SILT, TRACE TO LITTLE MICA, TRACE ROCK FRAGMENTS (A-4)

11+00

-YIB-



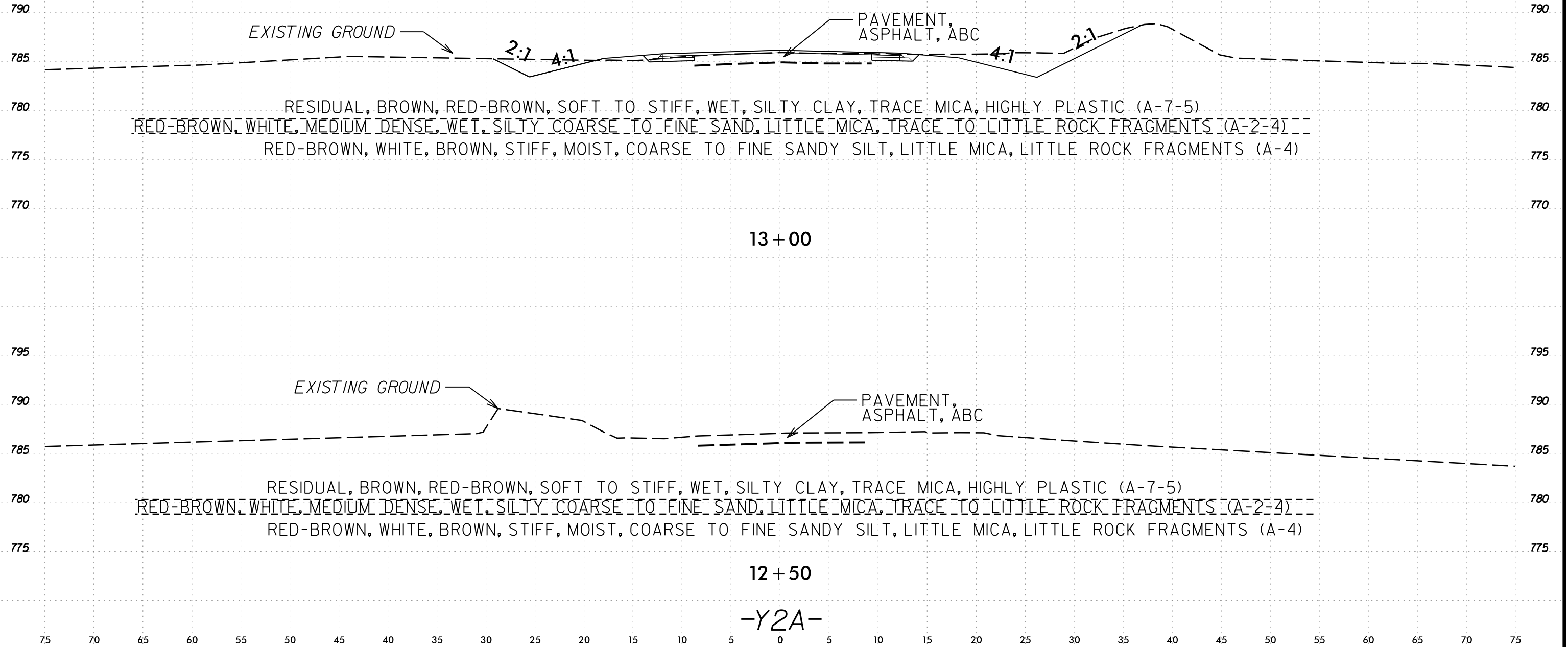
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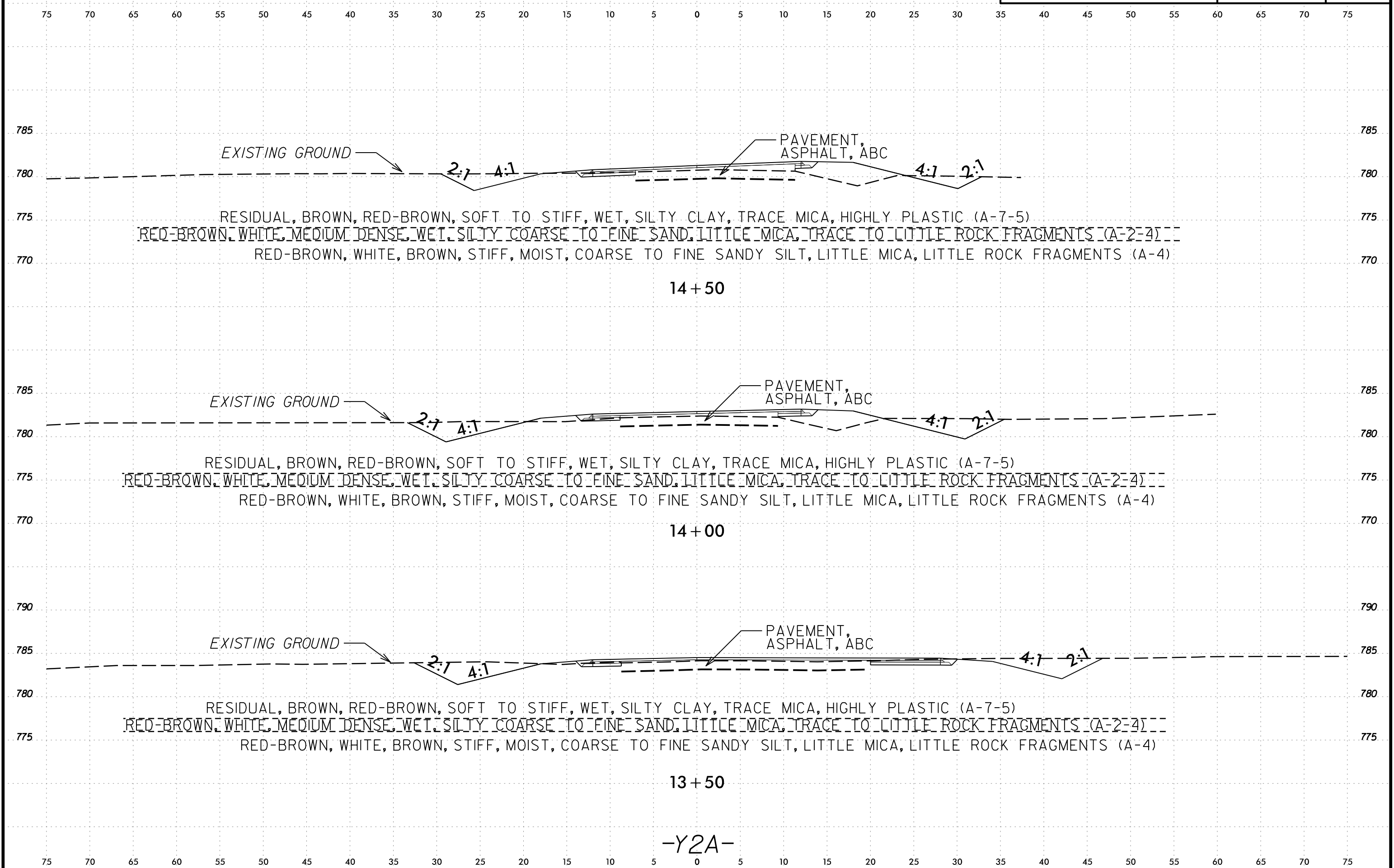
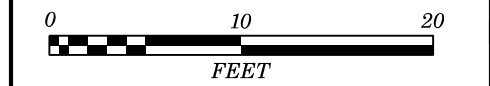


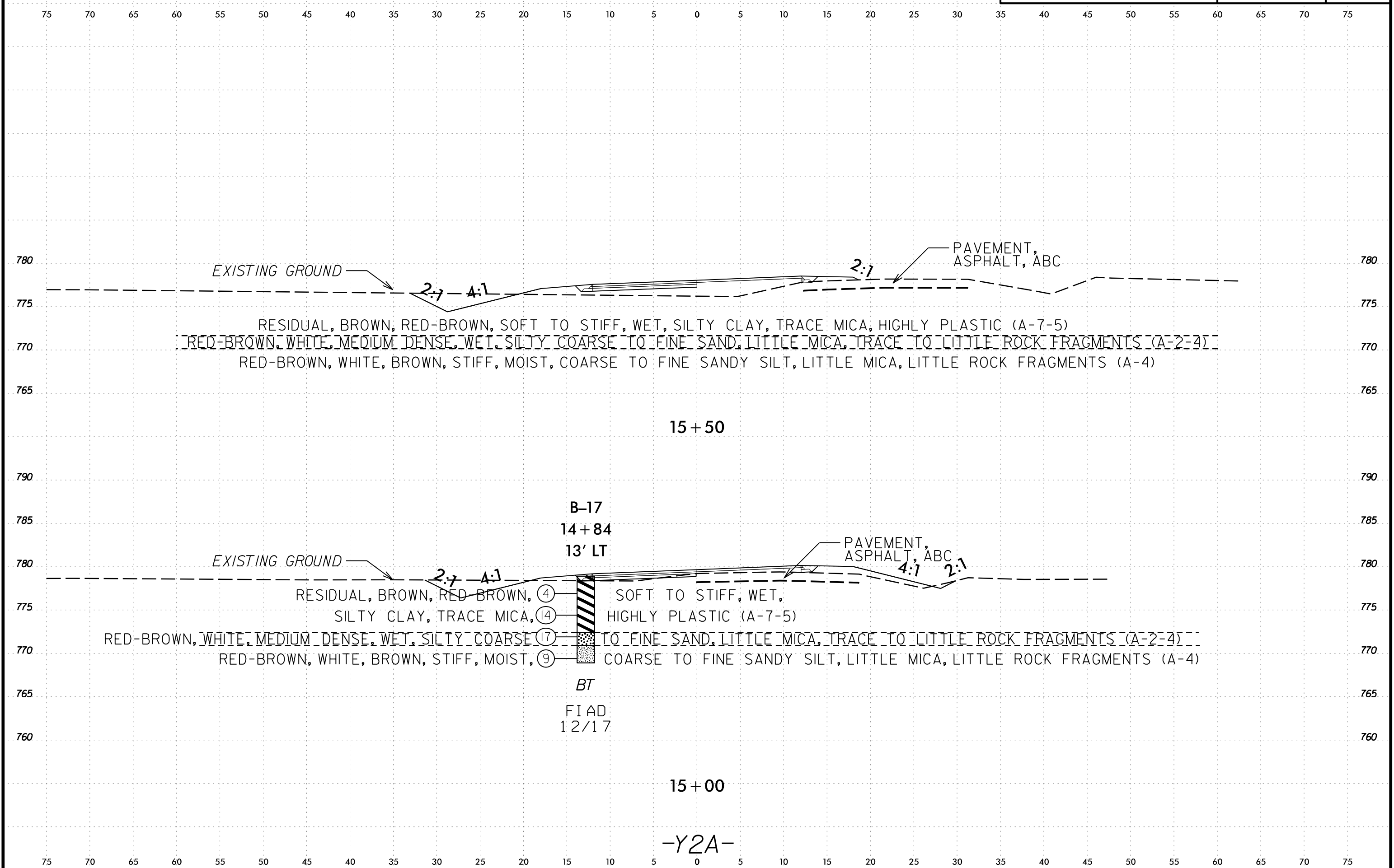
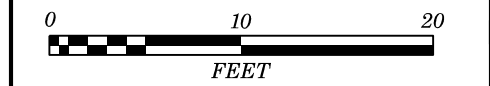
PROJ. REFERENCE NO.	SHEET NO.
Y-4810K	59

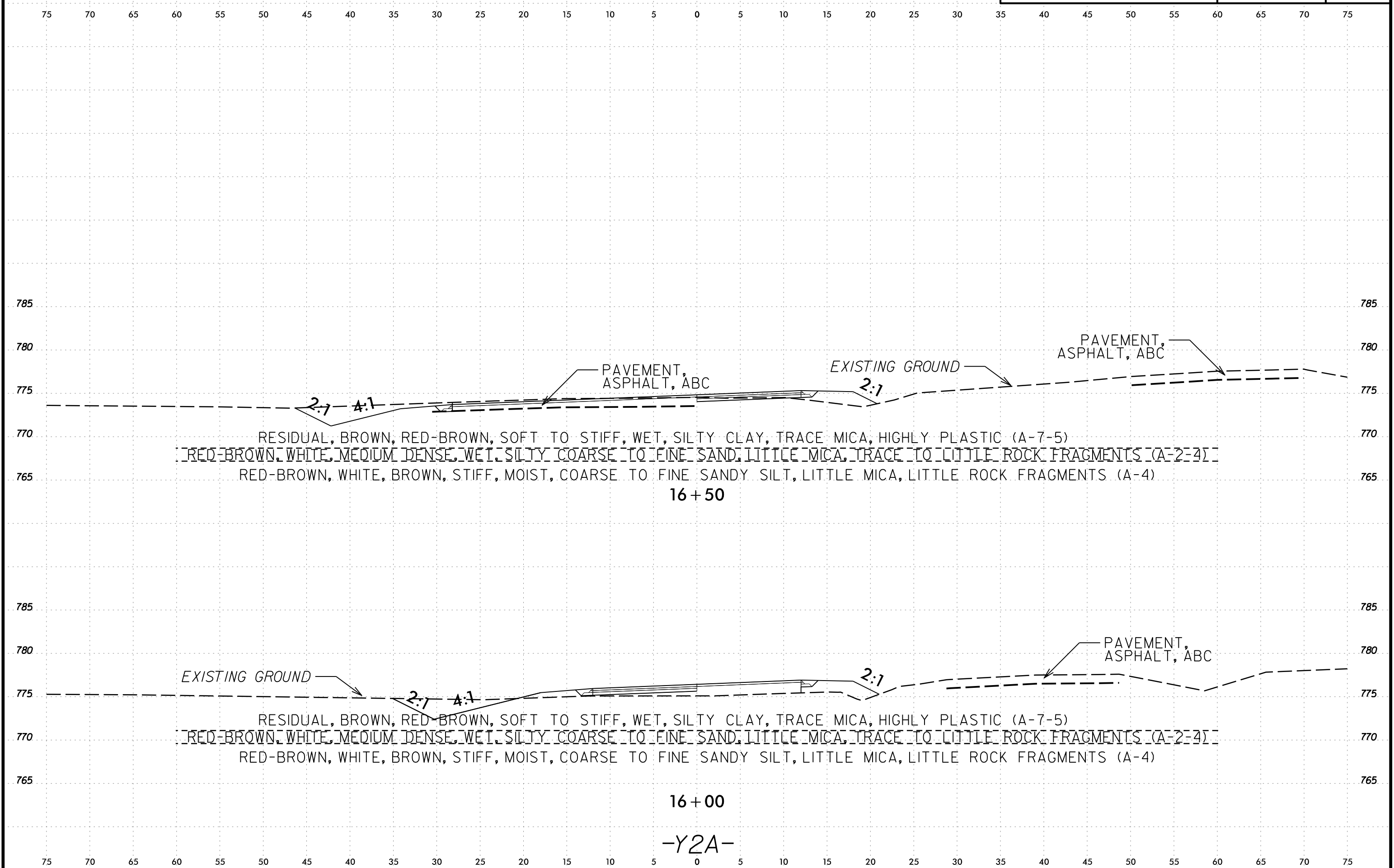
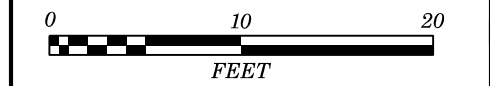
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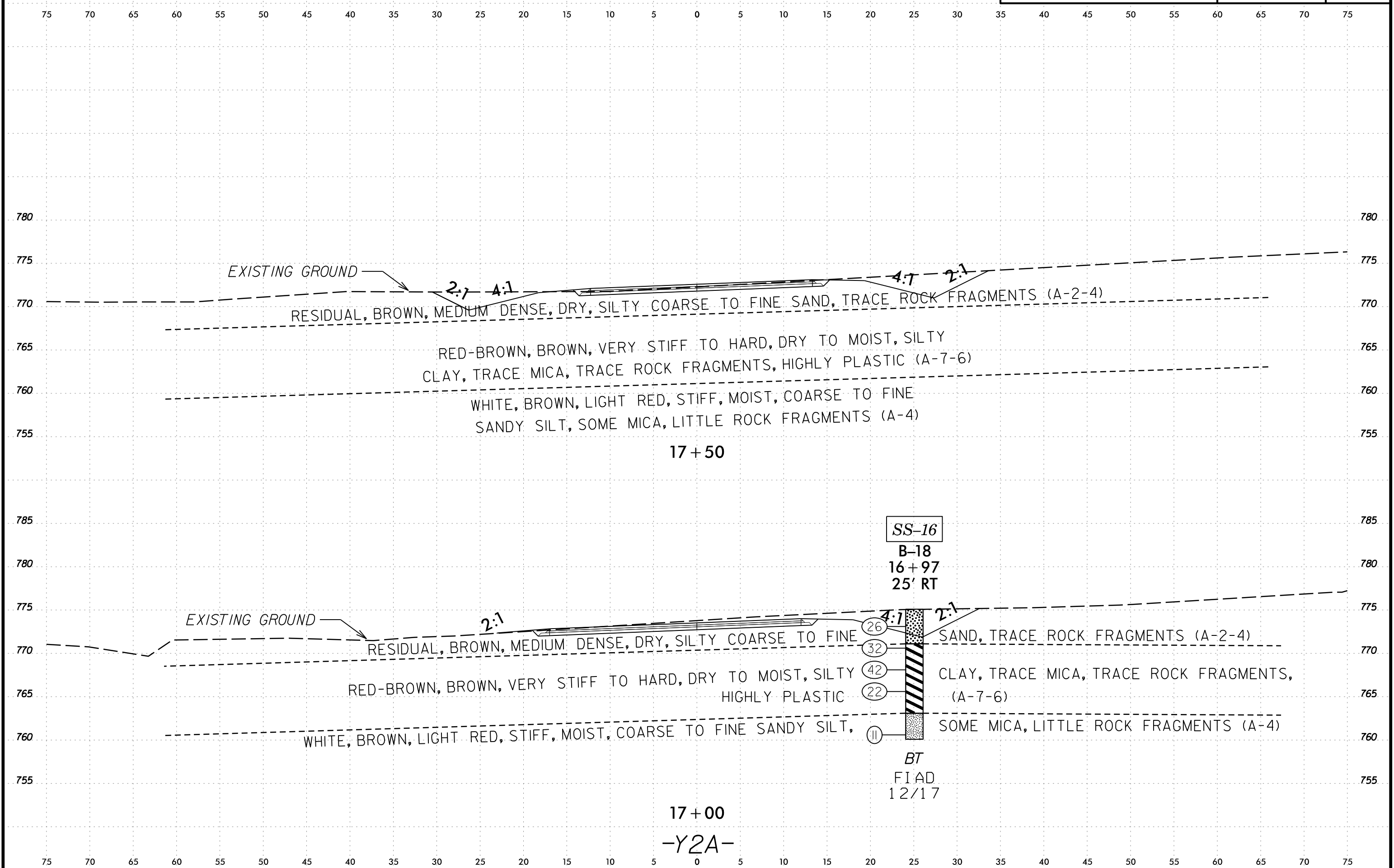
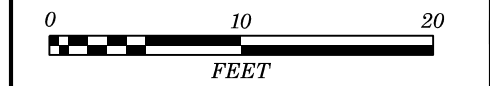
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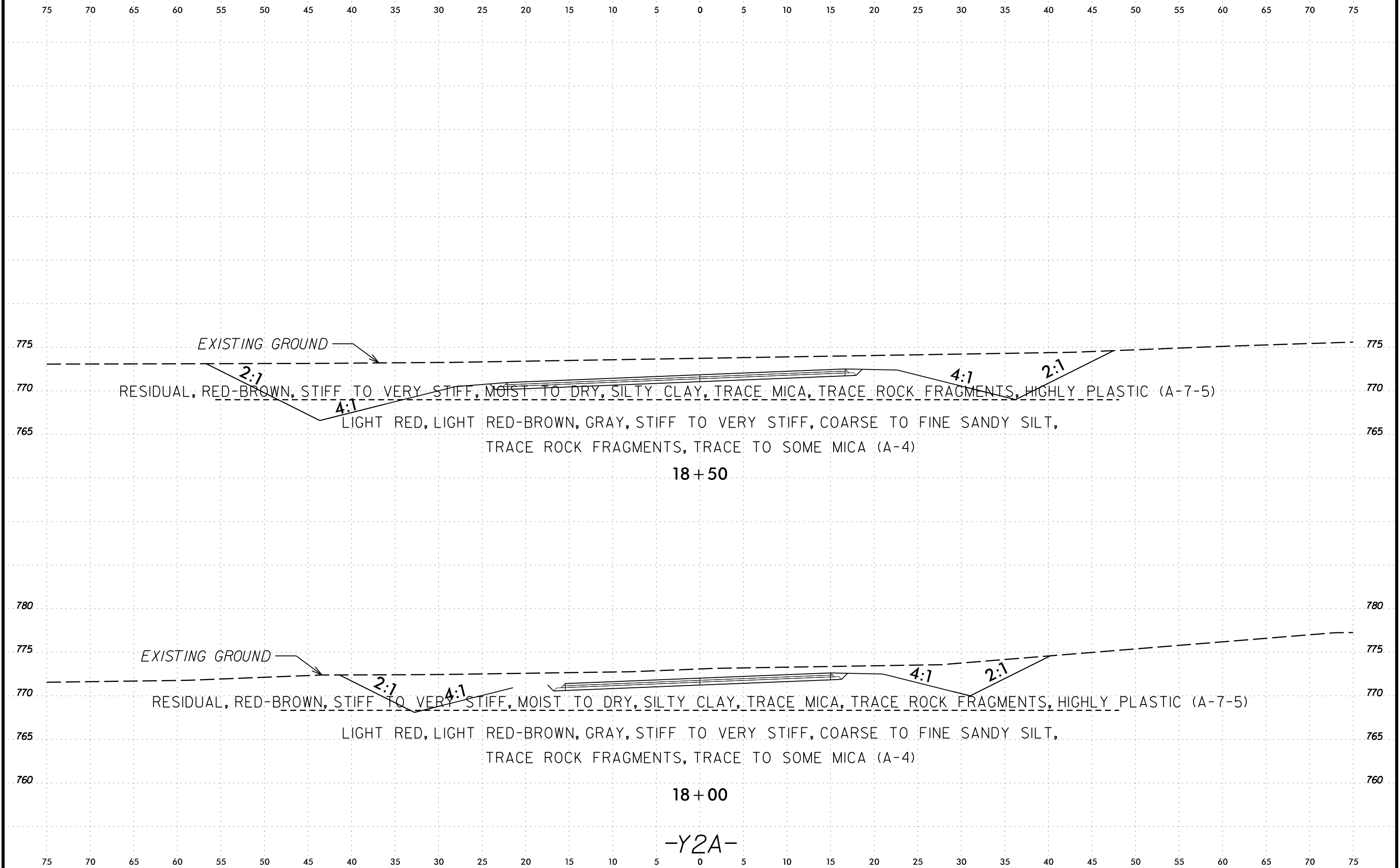
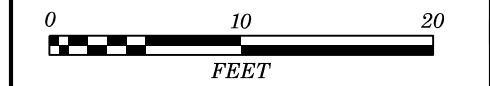




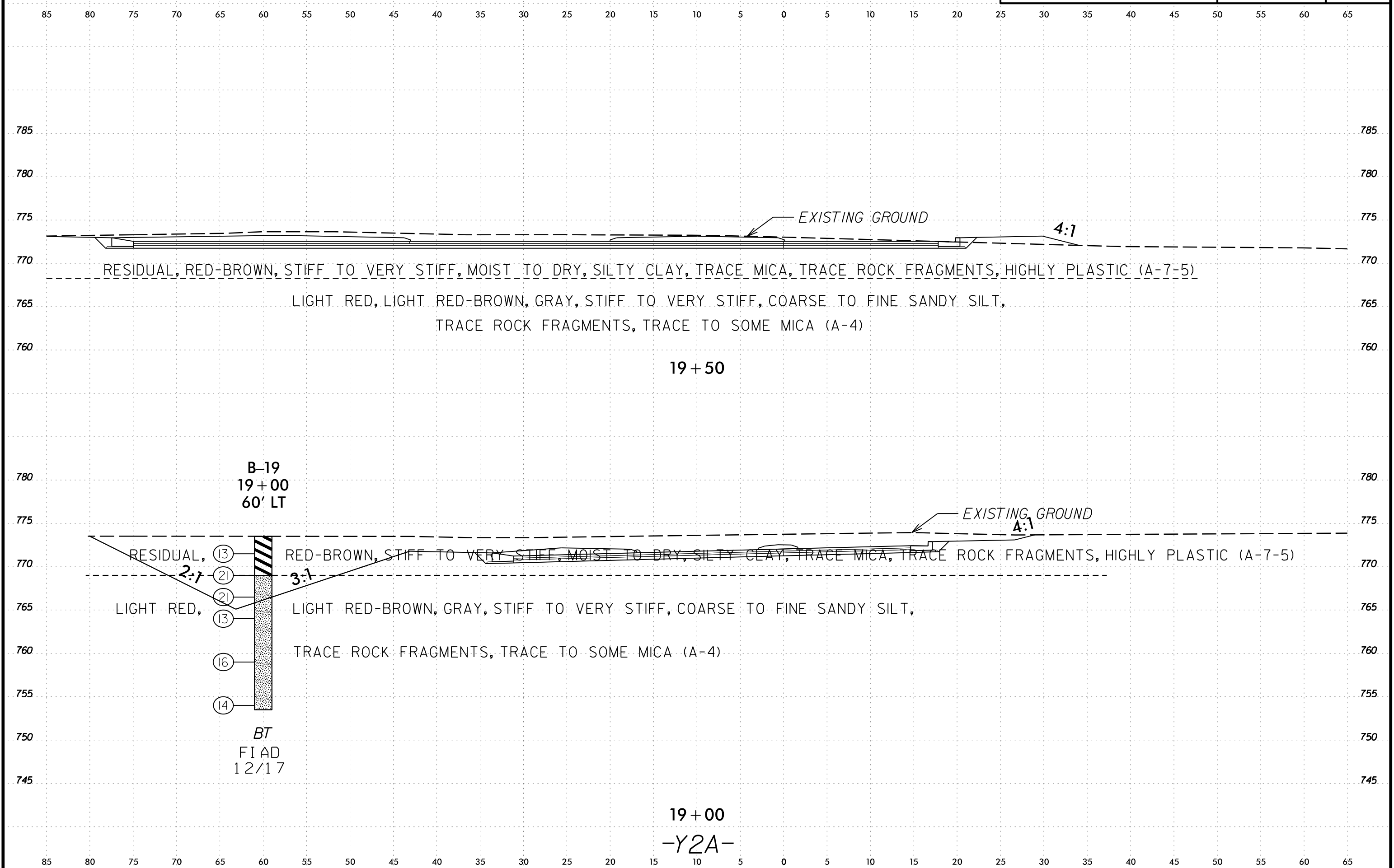
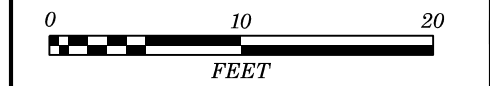


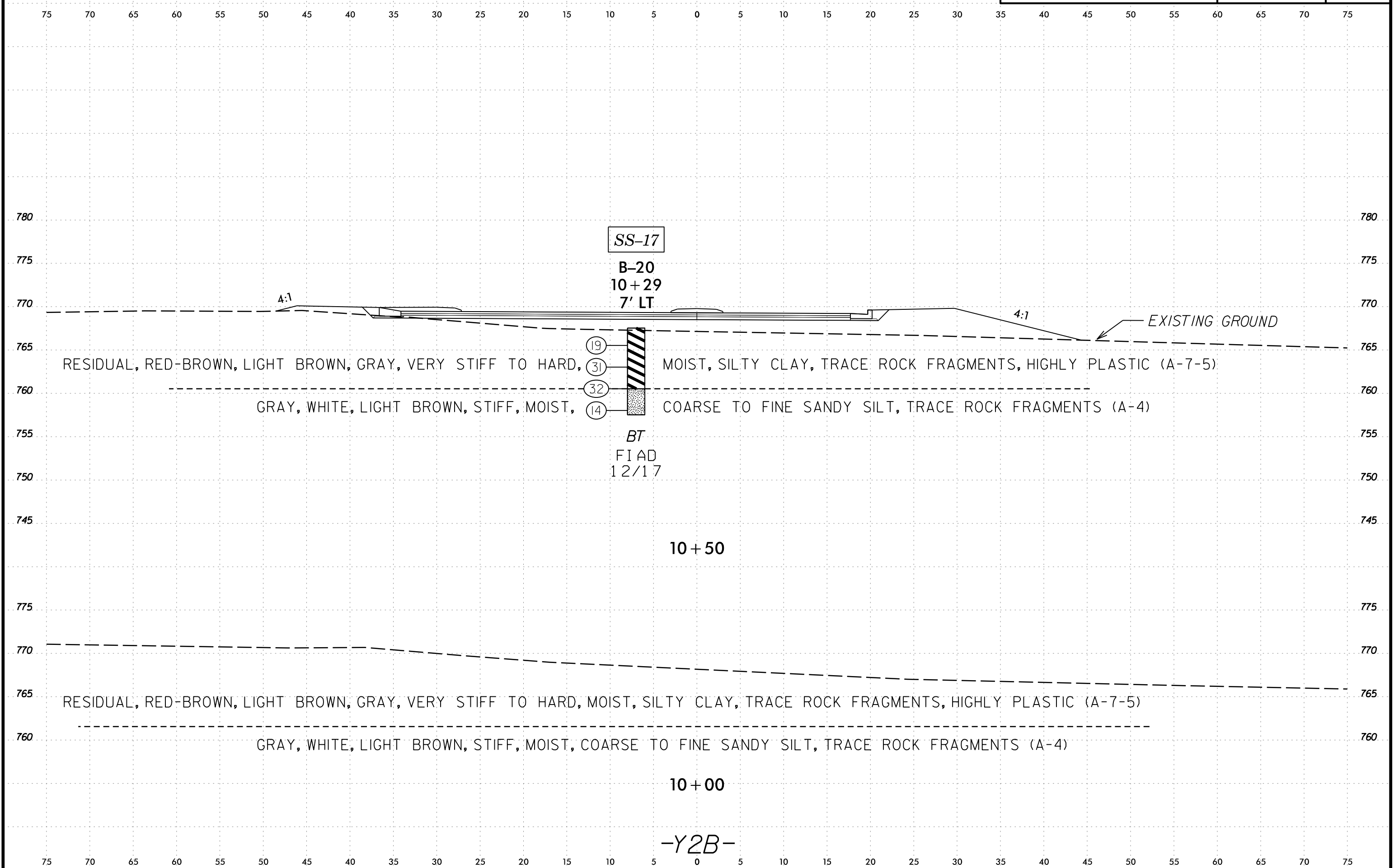
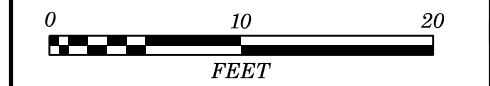
-Y2A-

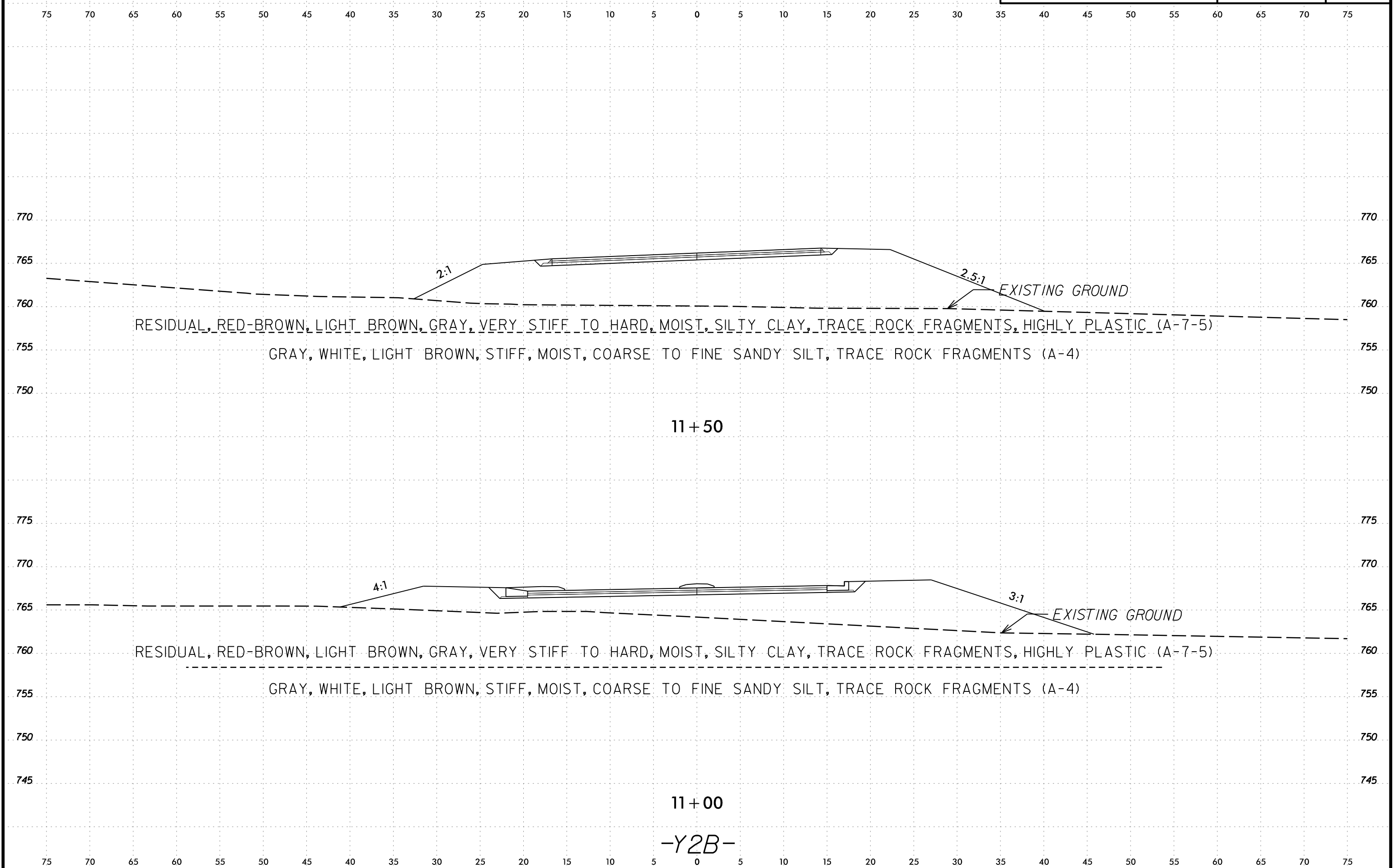


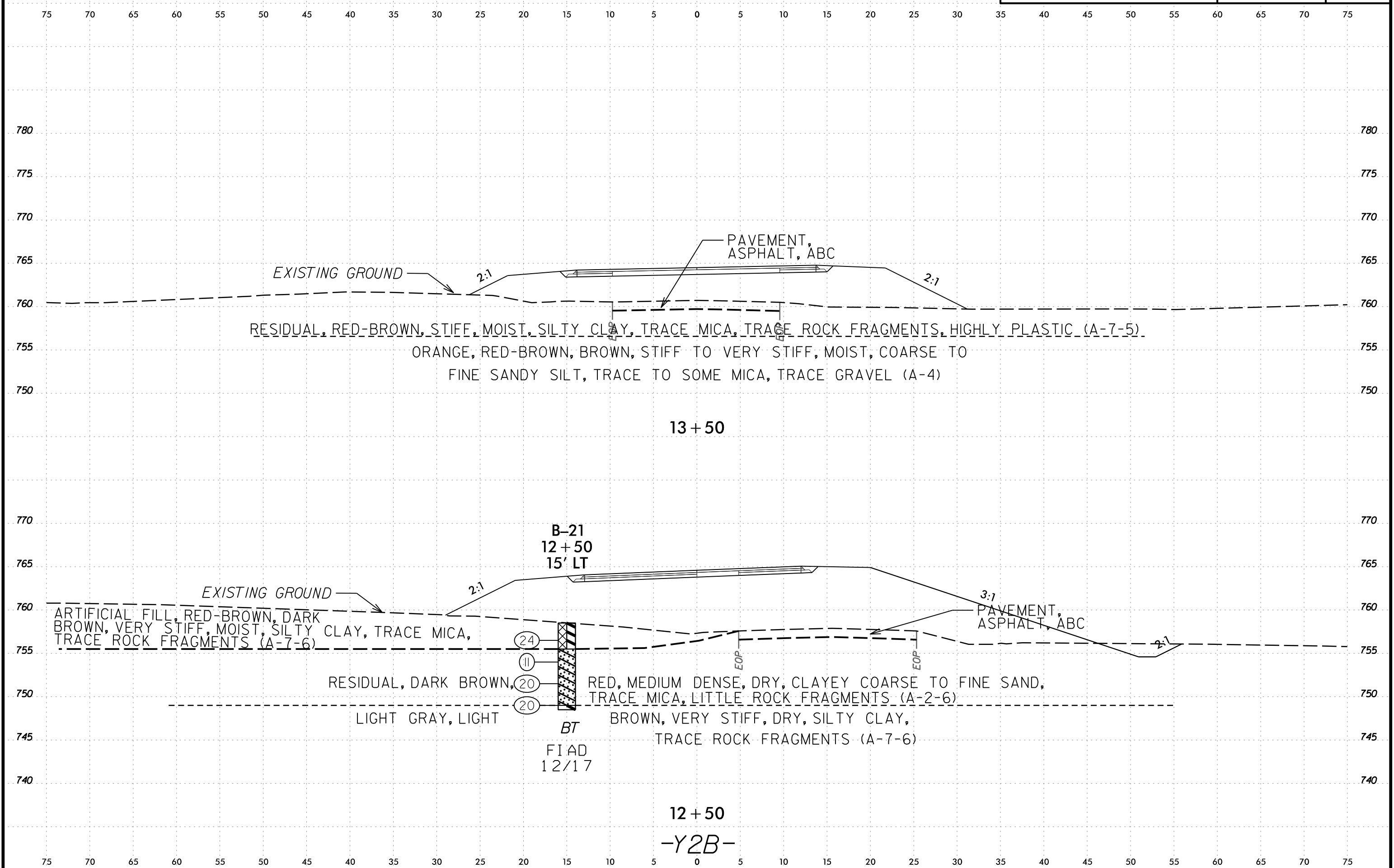
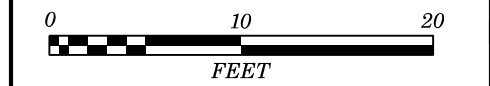


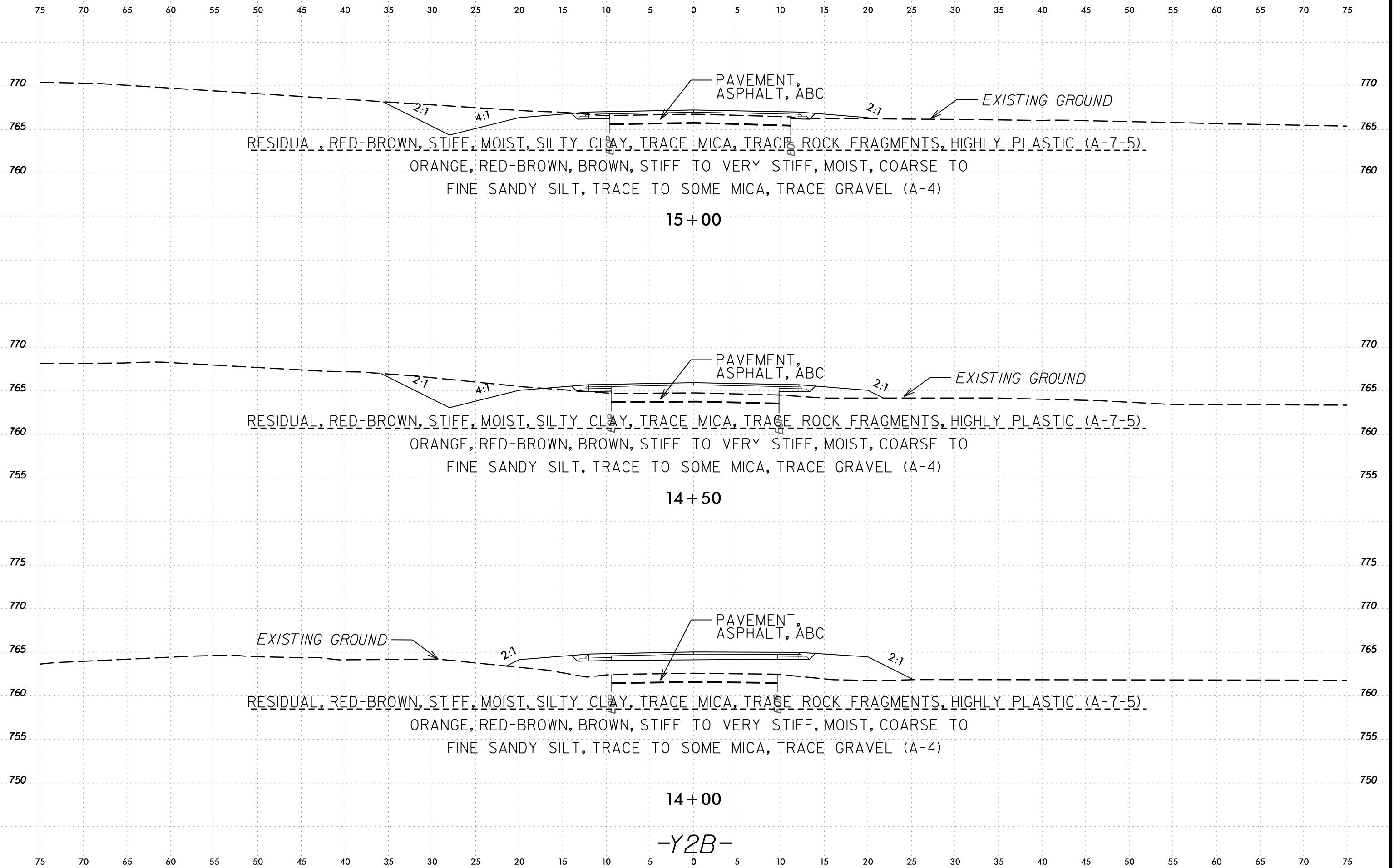
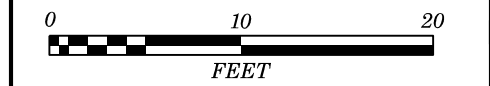
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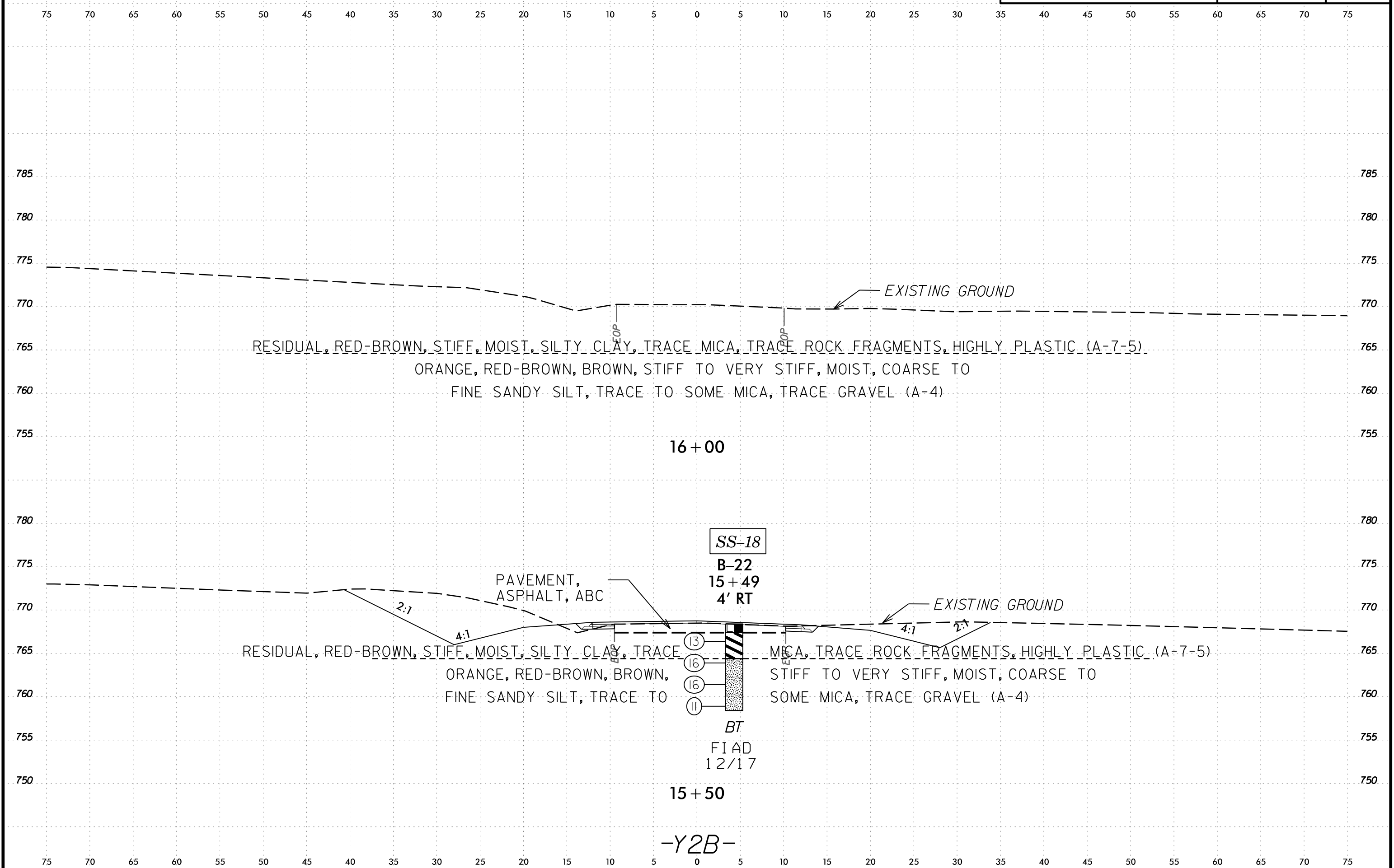
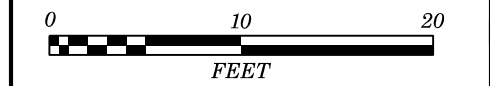


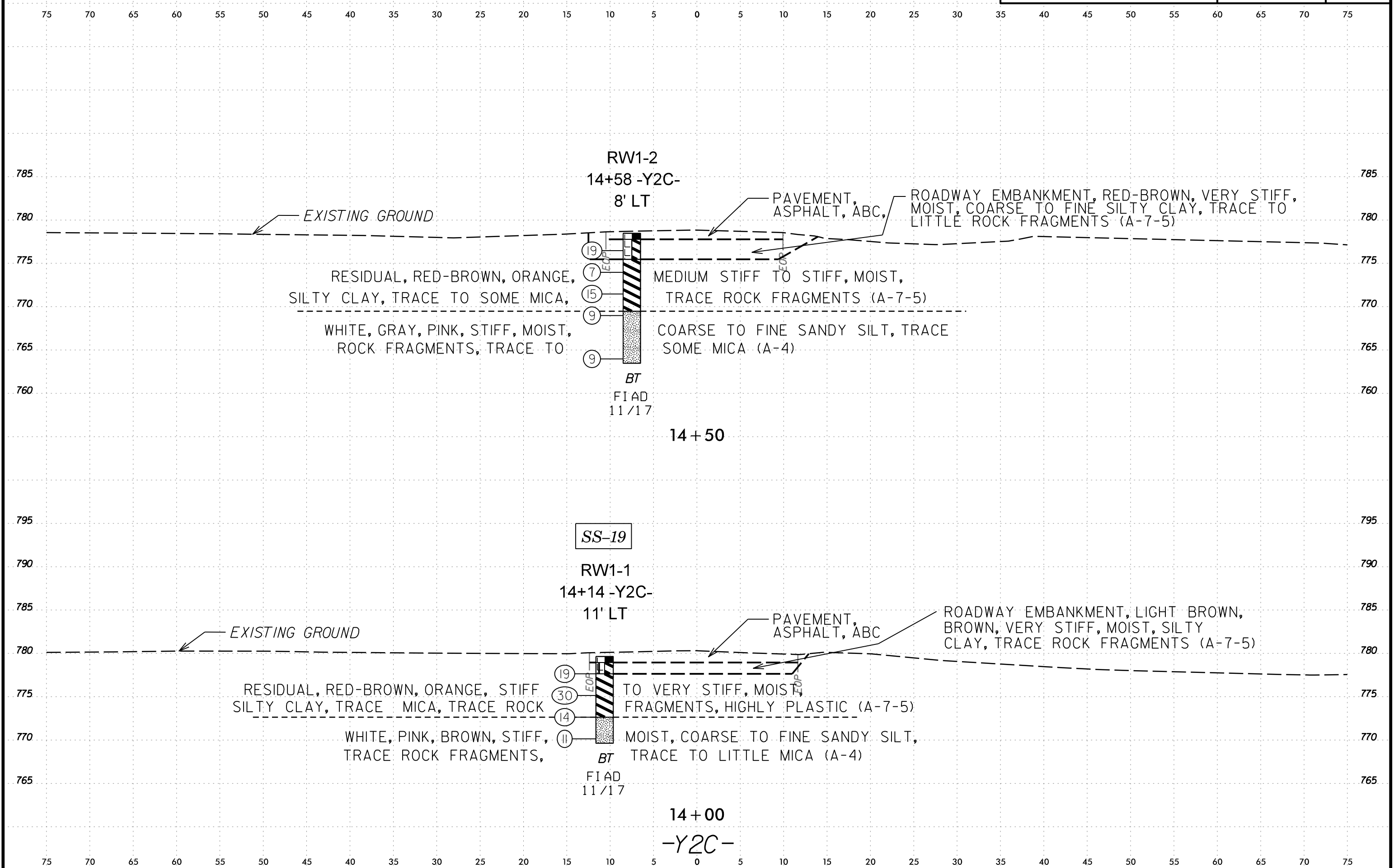
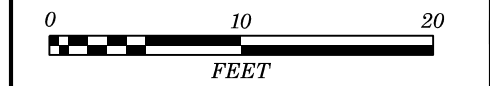


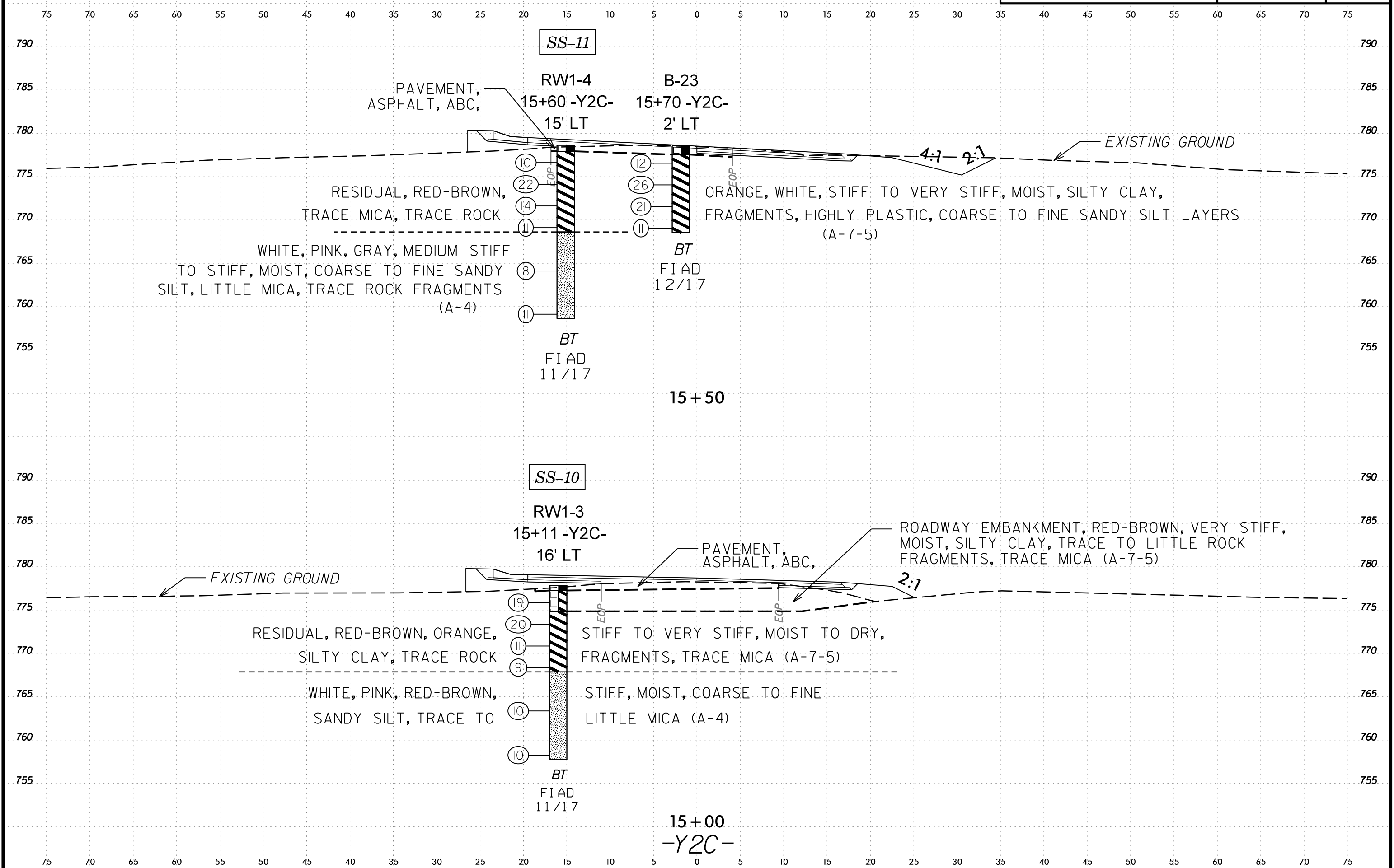
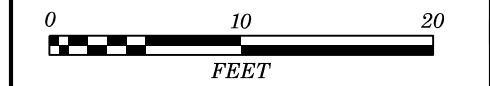


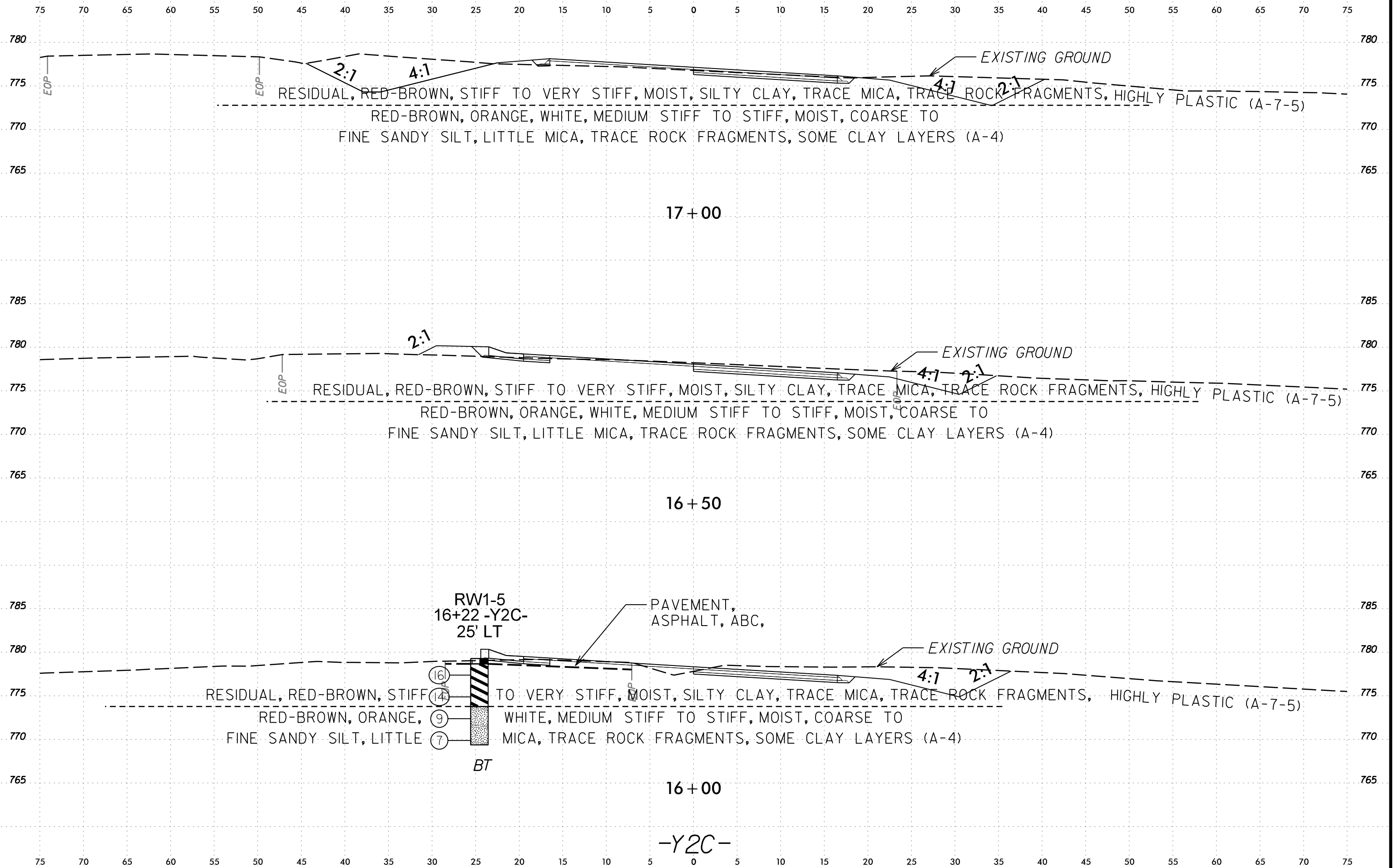
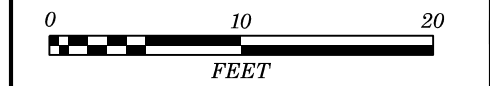


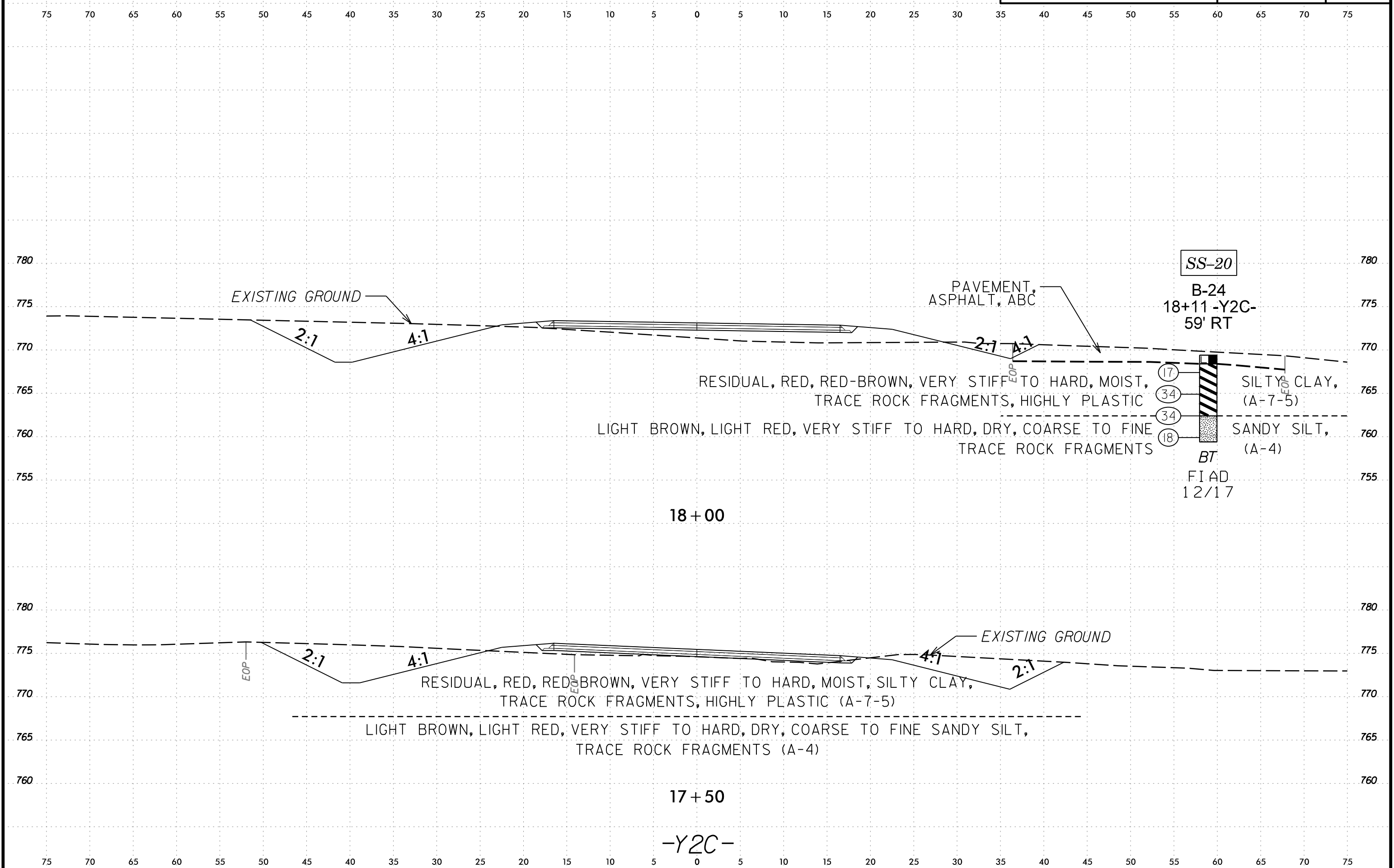
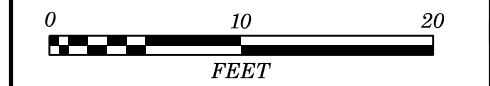






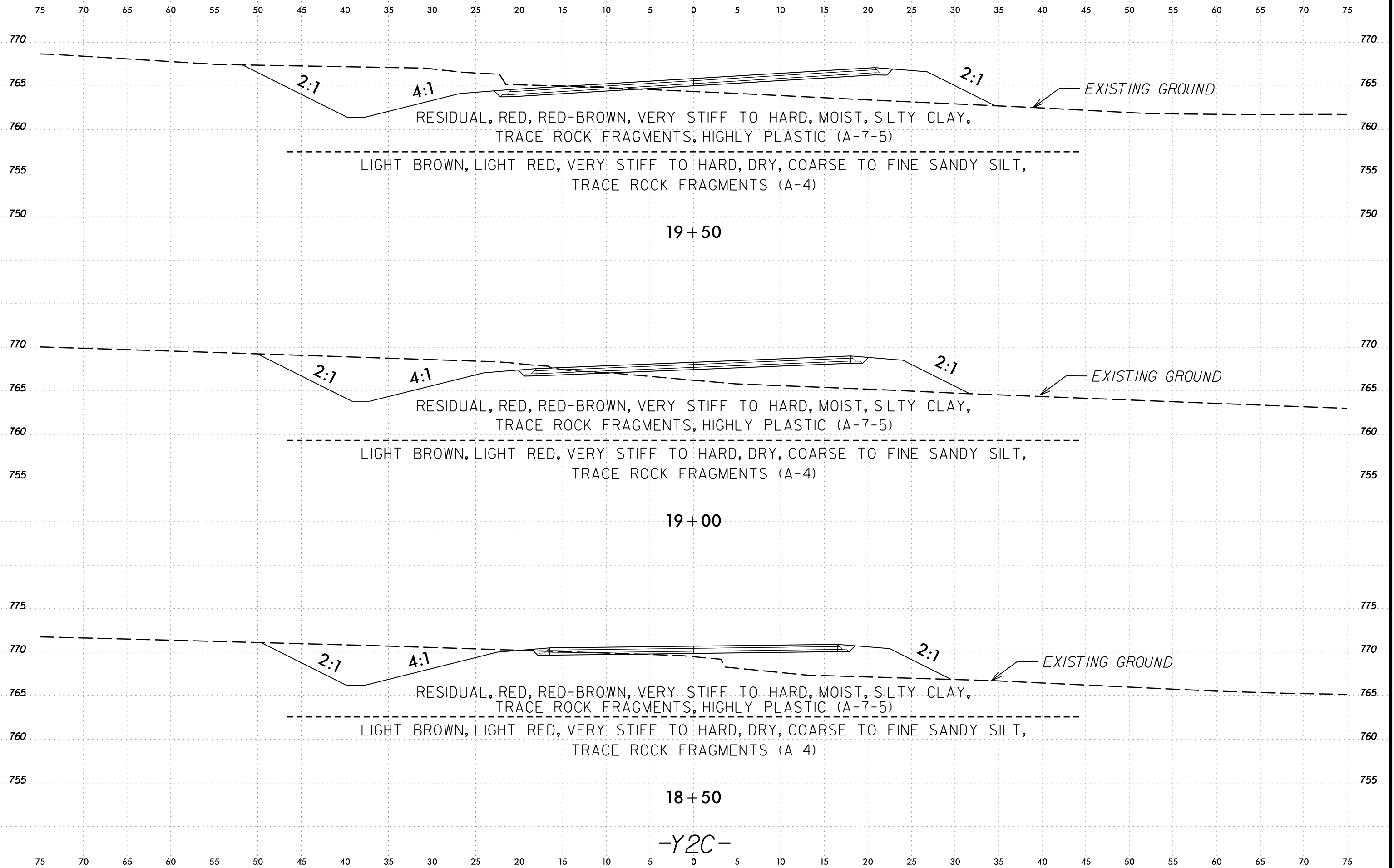




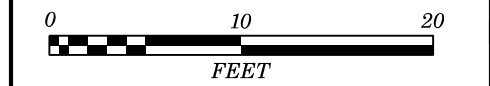




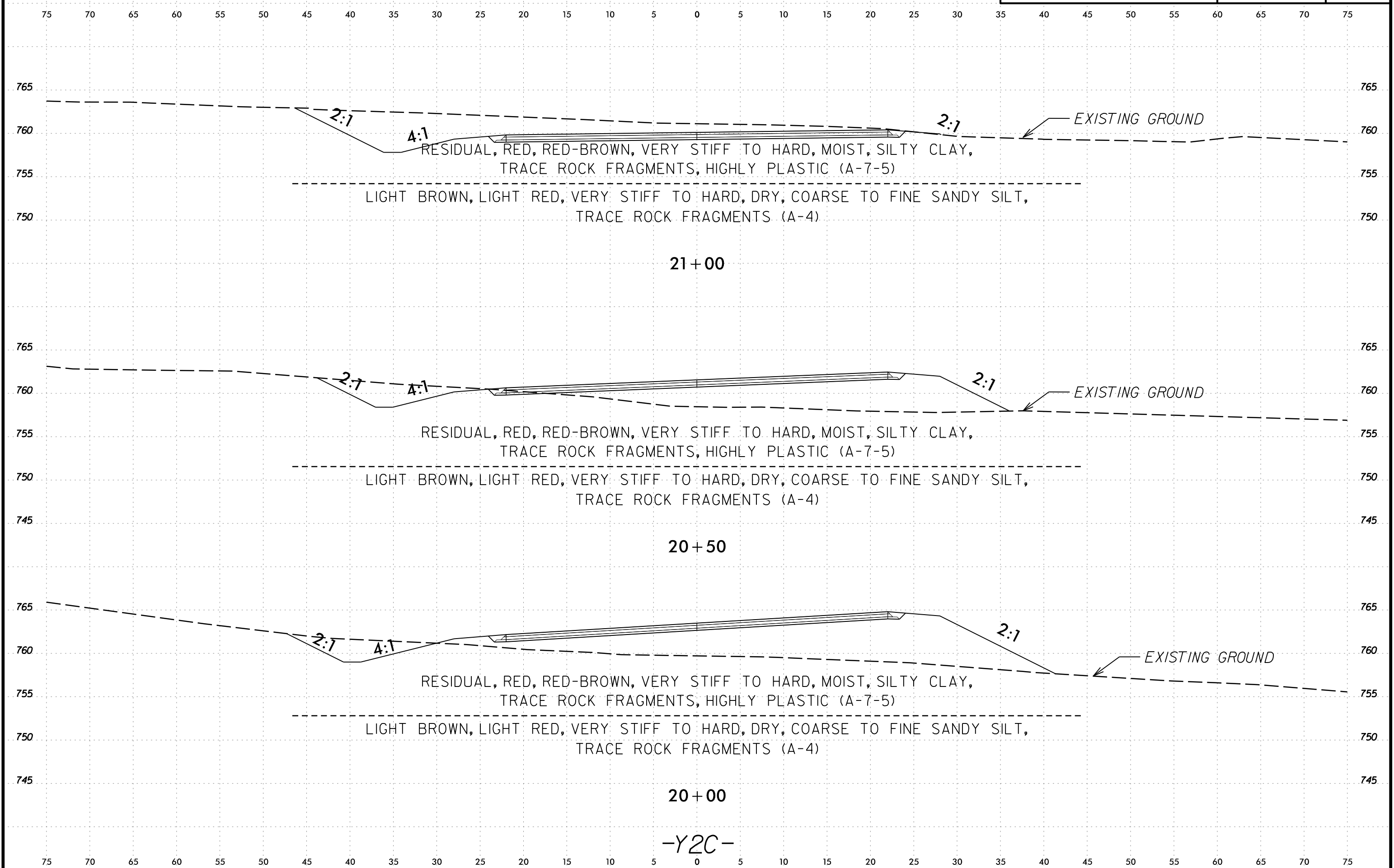
PROJ. REFERENCE NO.	SHEET NO.
Y-4810K	75

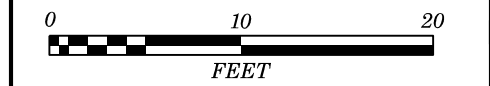


-Y2C-

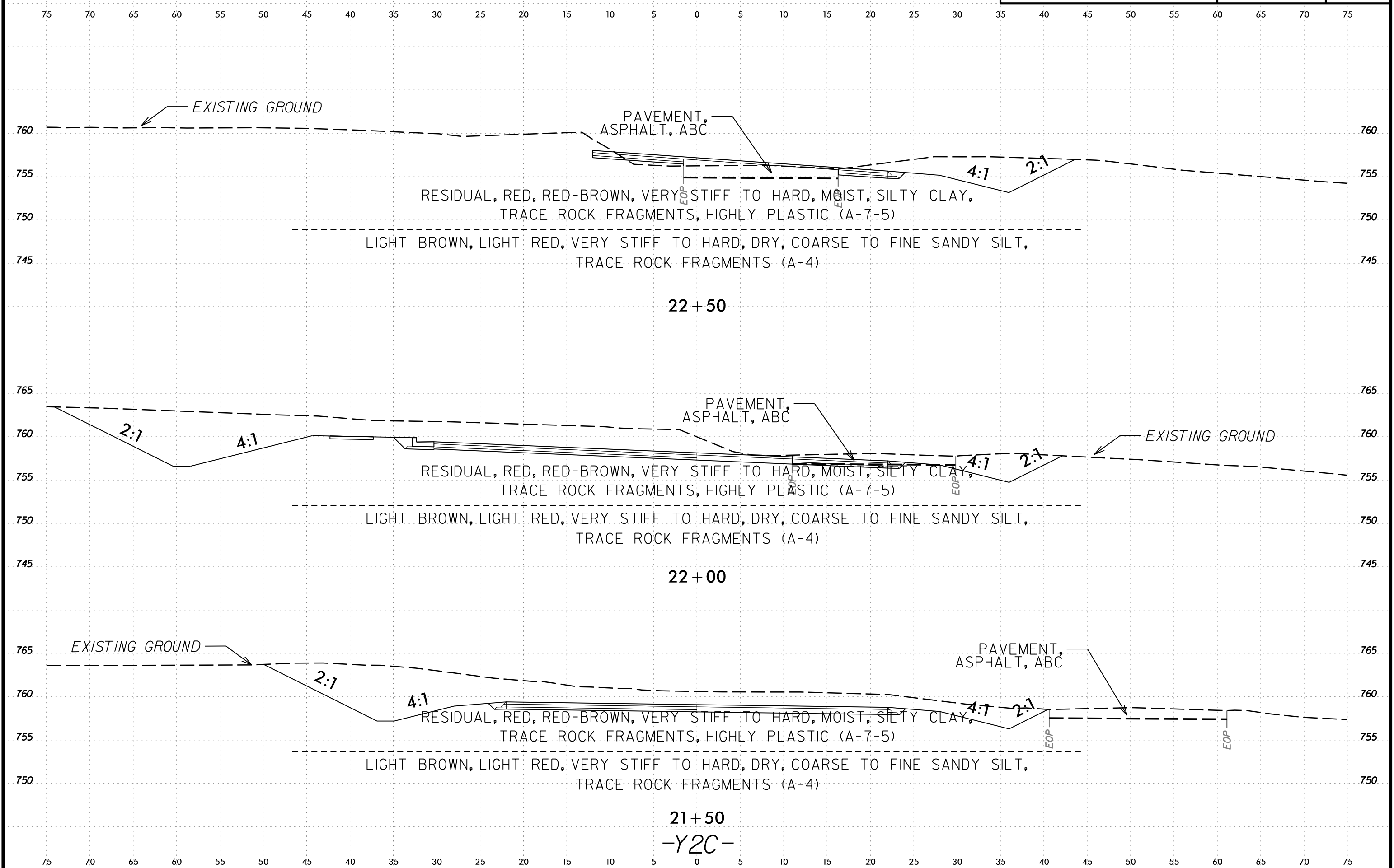


PROJ. REFERENCE NO.	SHEET NO.
Y-4810K	76

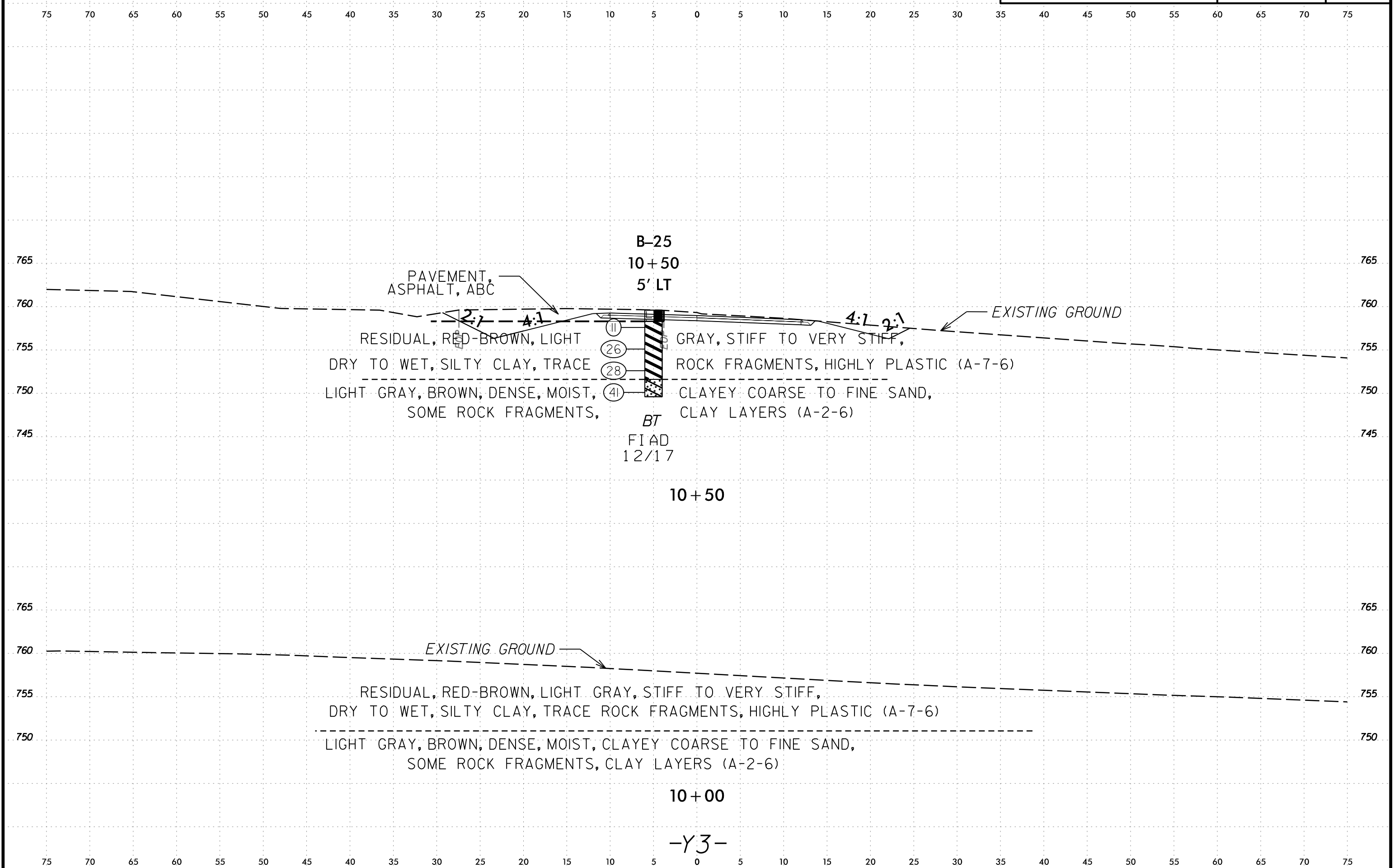
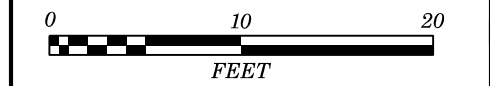


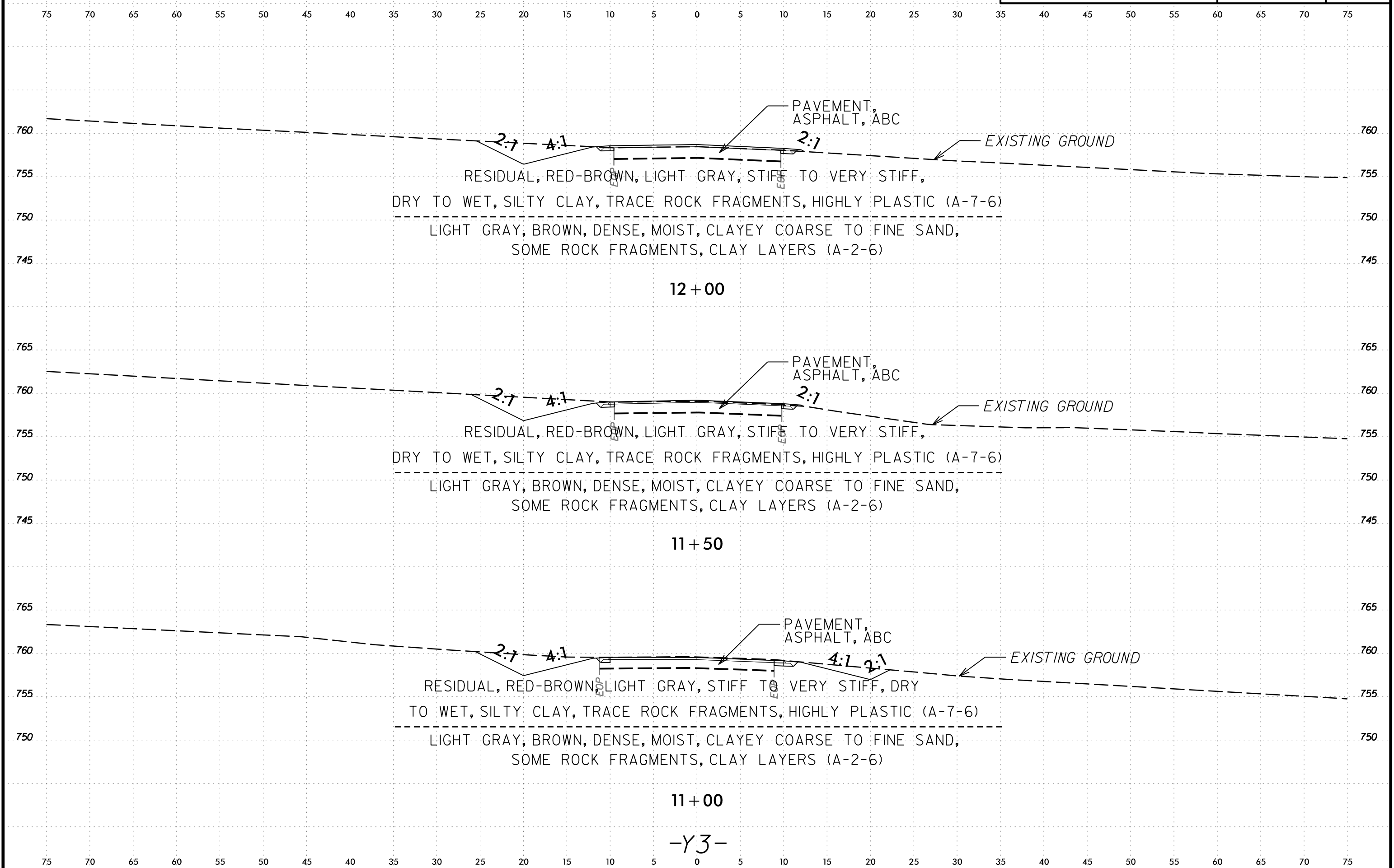
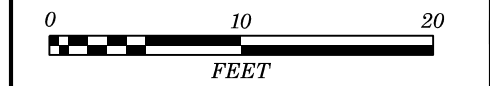


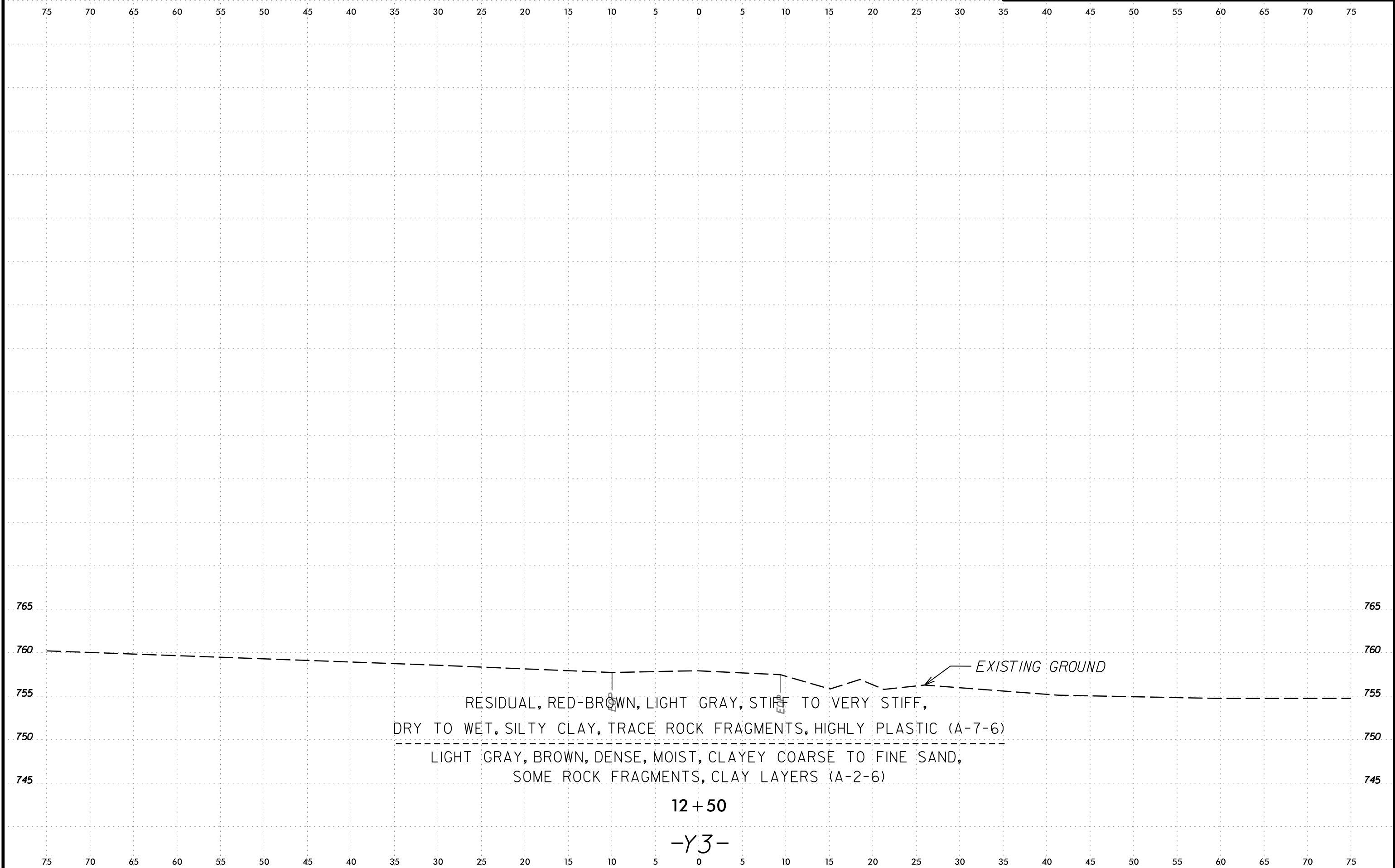
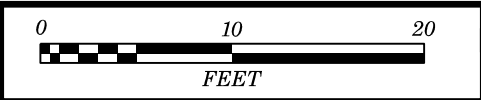
PROJ. REFERENCE NO.	SHEET NO.
Y-4810K	77



21+50
-Y2C-





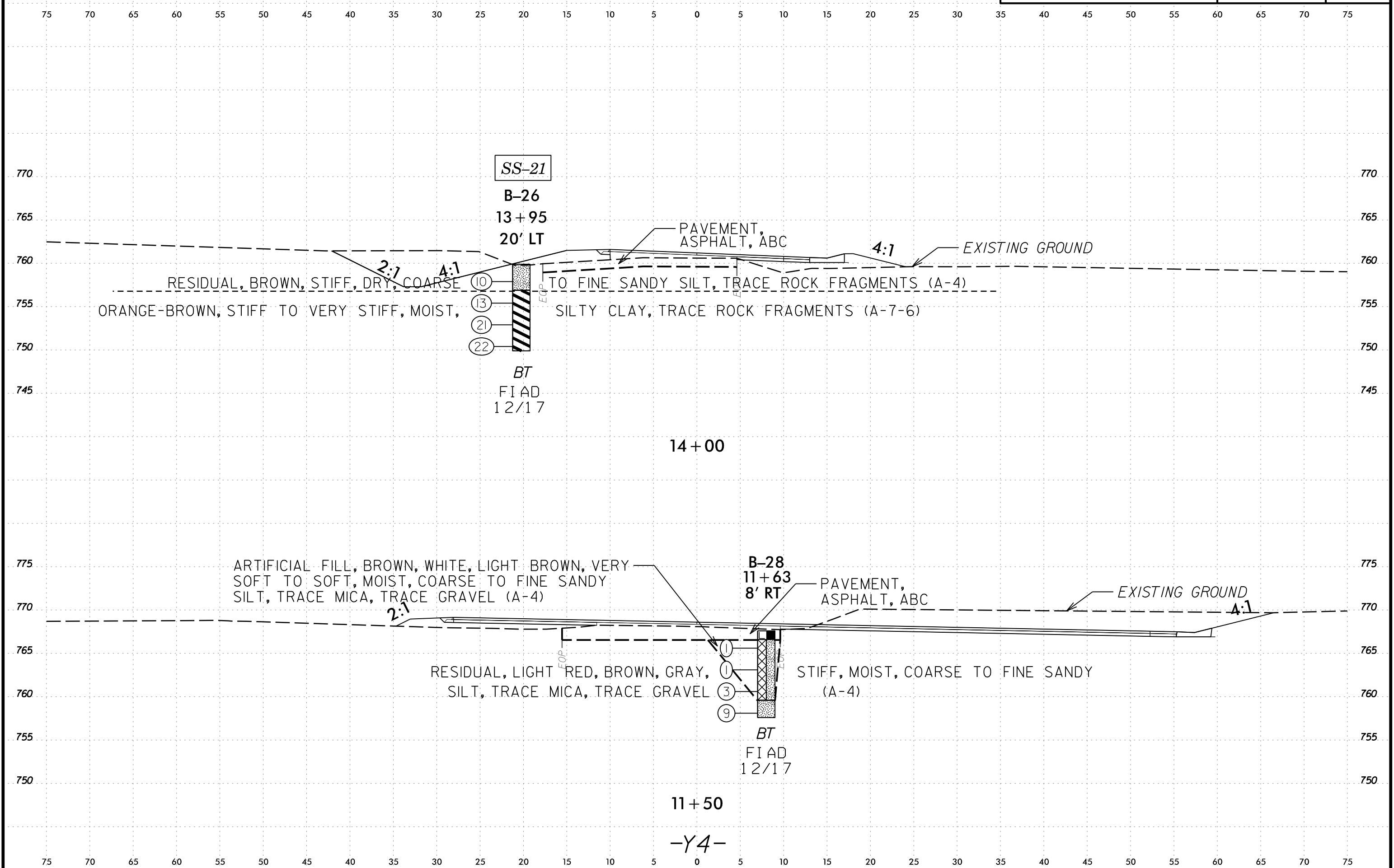
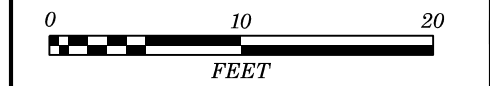


RESIDUAL, RED-BROWN, LIGHT GRAY, STIFF TO VERY STIFF,
DRY TO WET, SILTY CLAY, TRACE ROCK FRAGMENTS, HIGHLY PLASTIC (A-7-6)

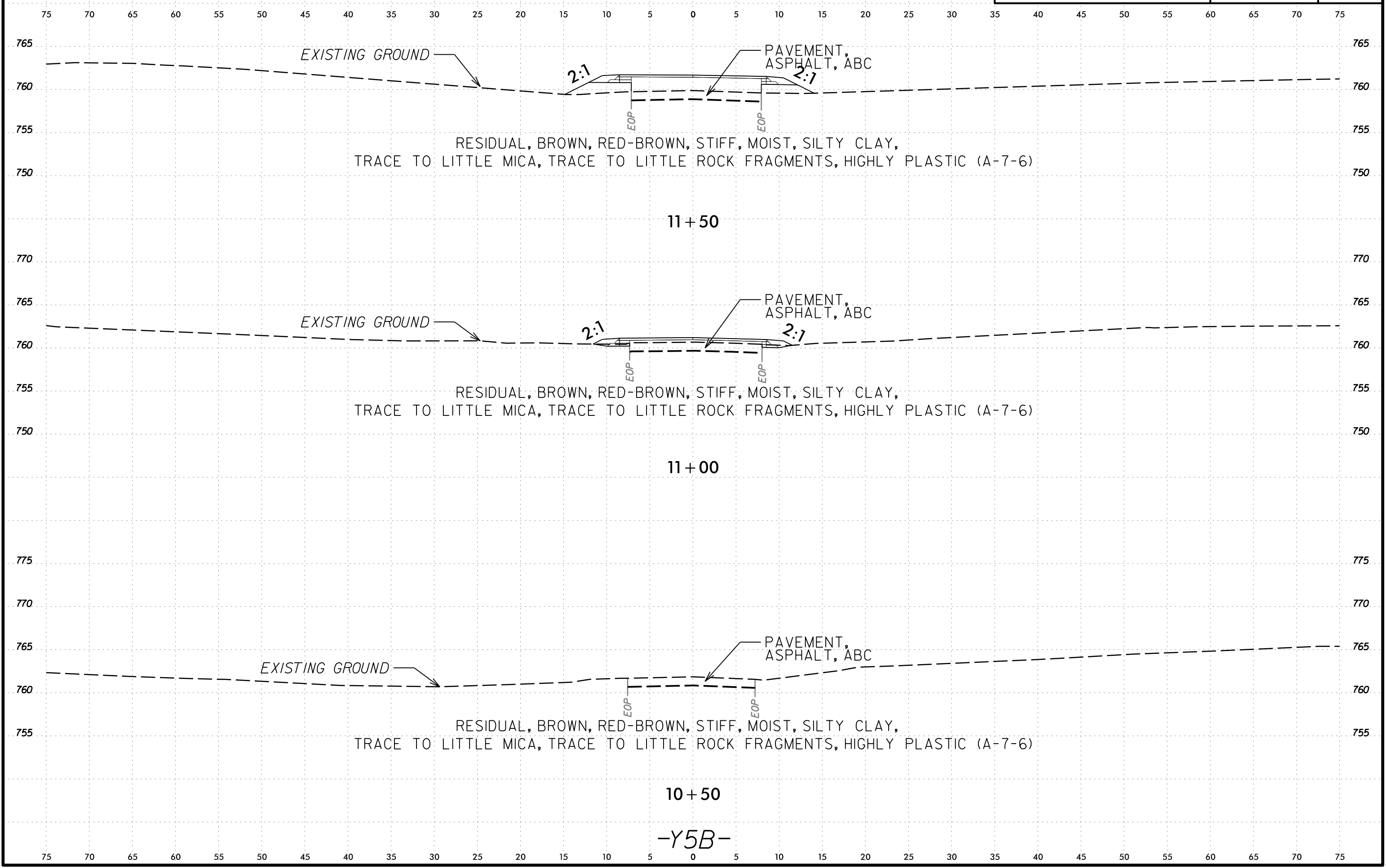
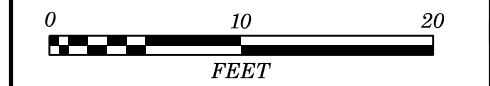
LIGHT GRAY, BROWN, DENSE, MOIST, CLAYEY COARSE TO FINE SAND,
SOME ROCK FRAGMENTS, CLAY LAYERS (A-2-6)

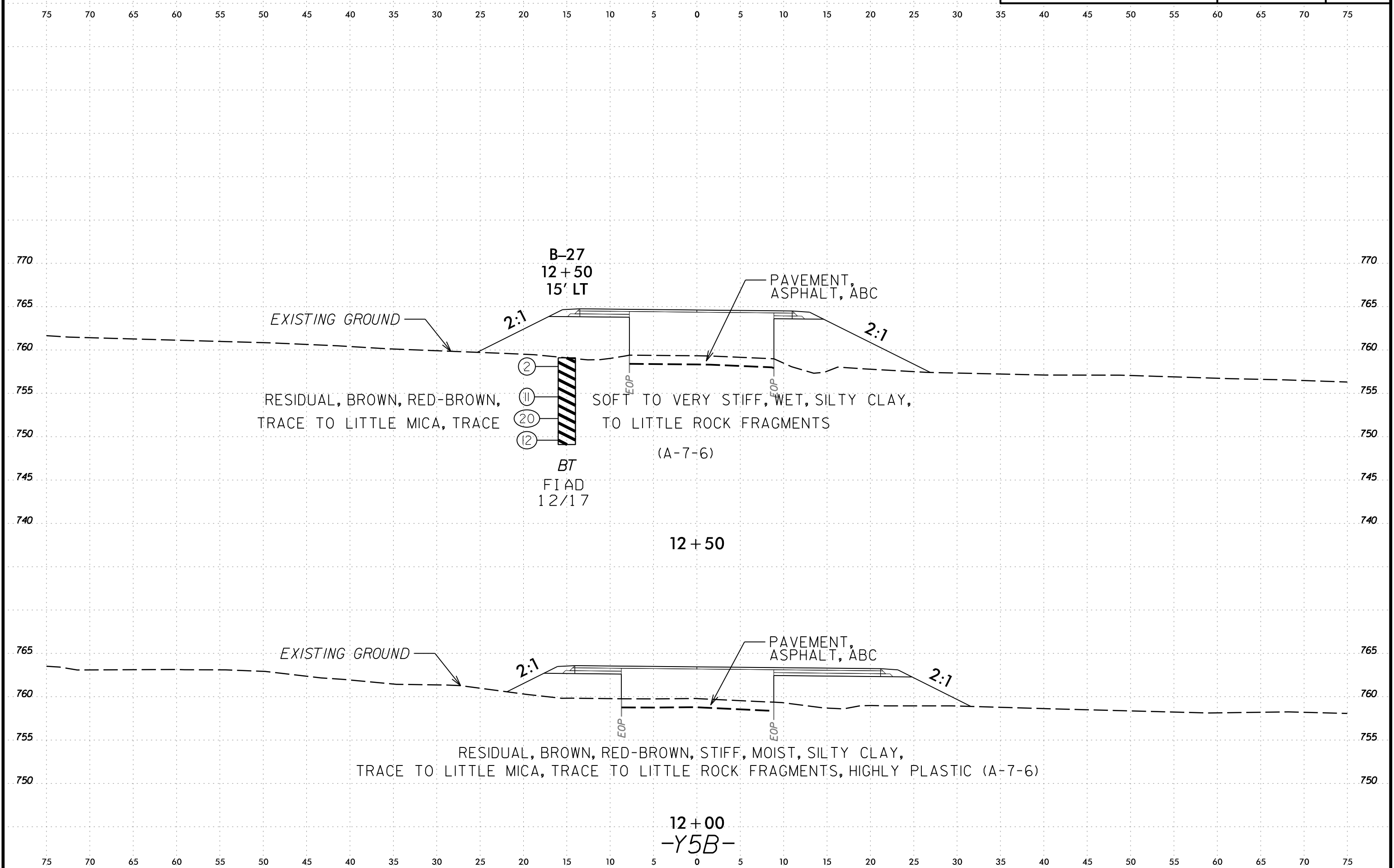
EXISTING GROUND

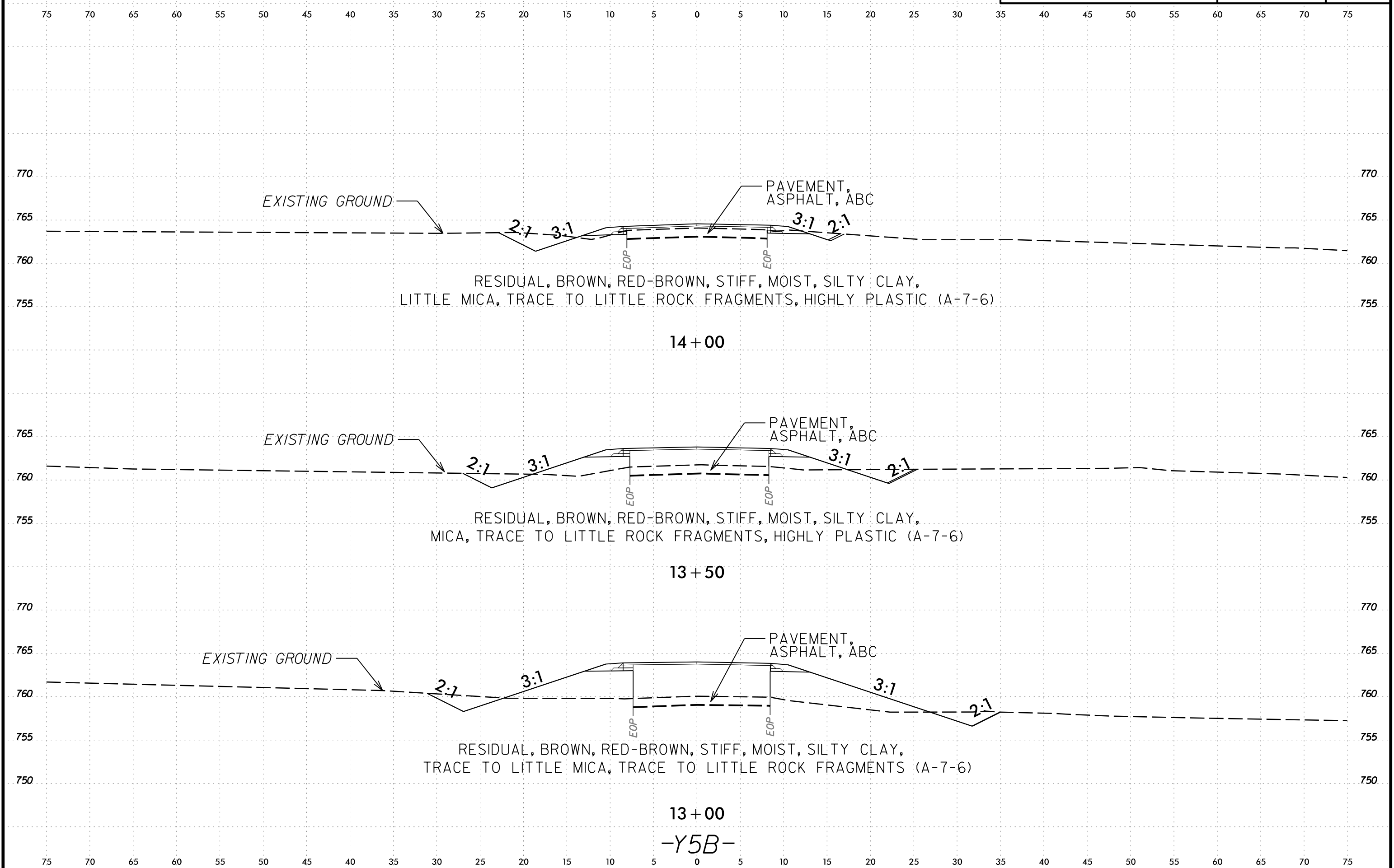
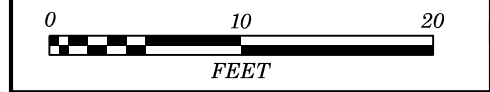
12+50
-Y3-

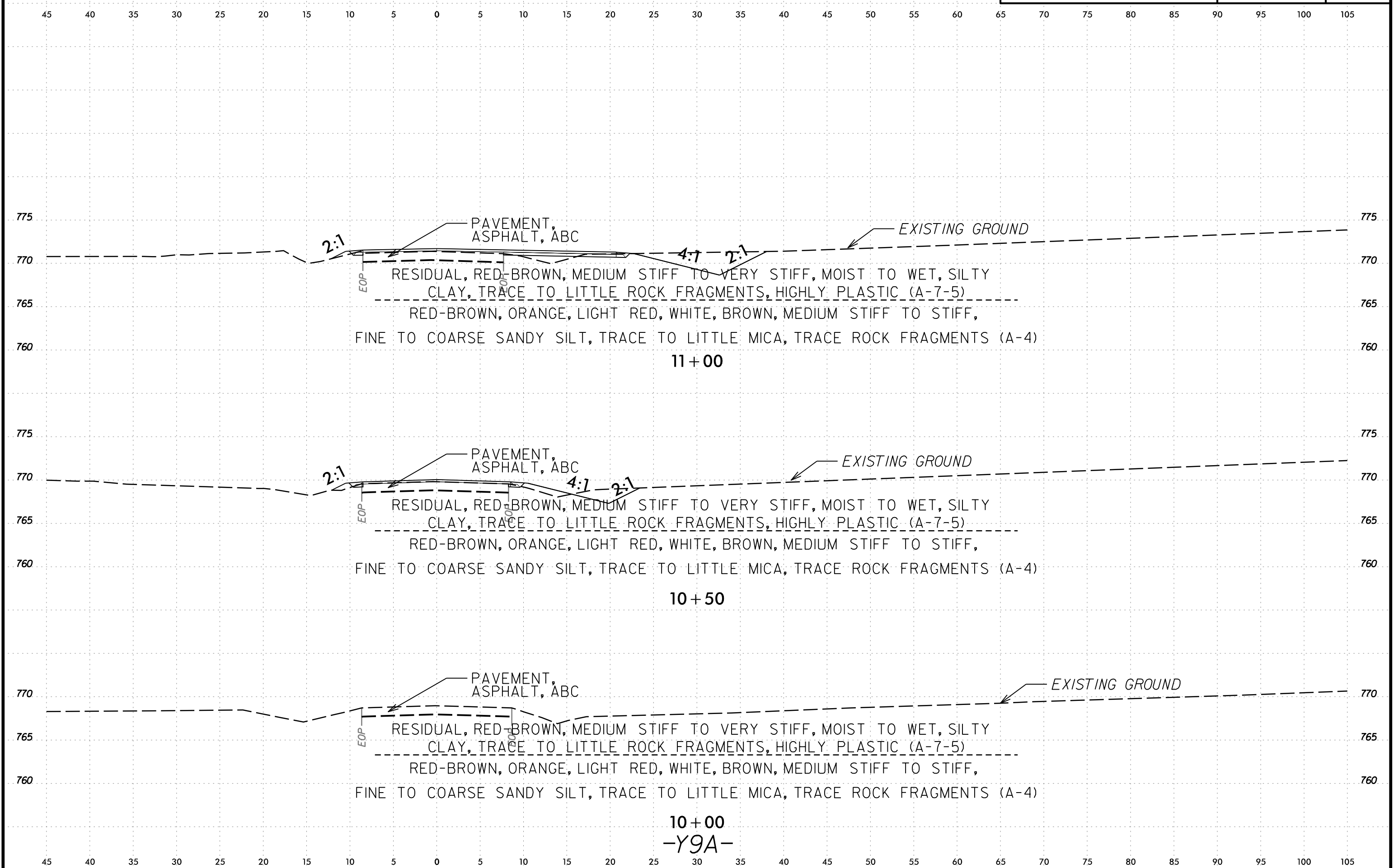
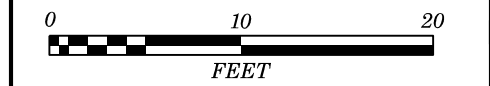


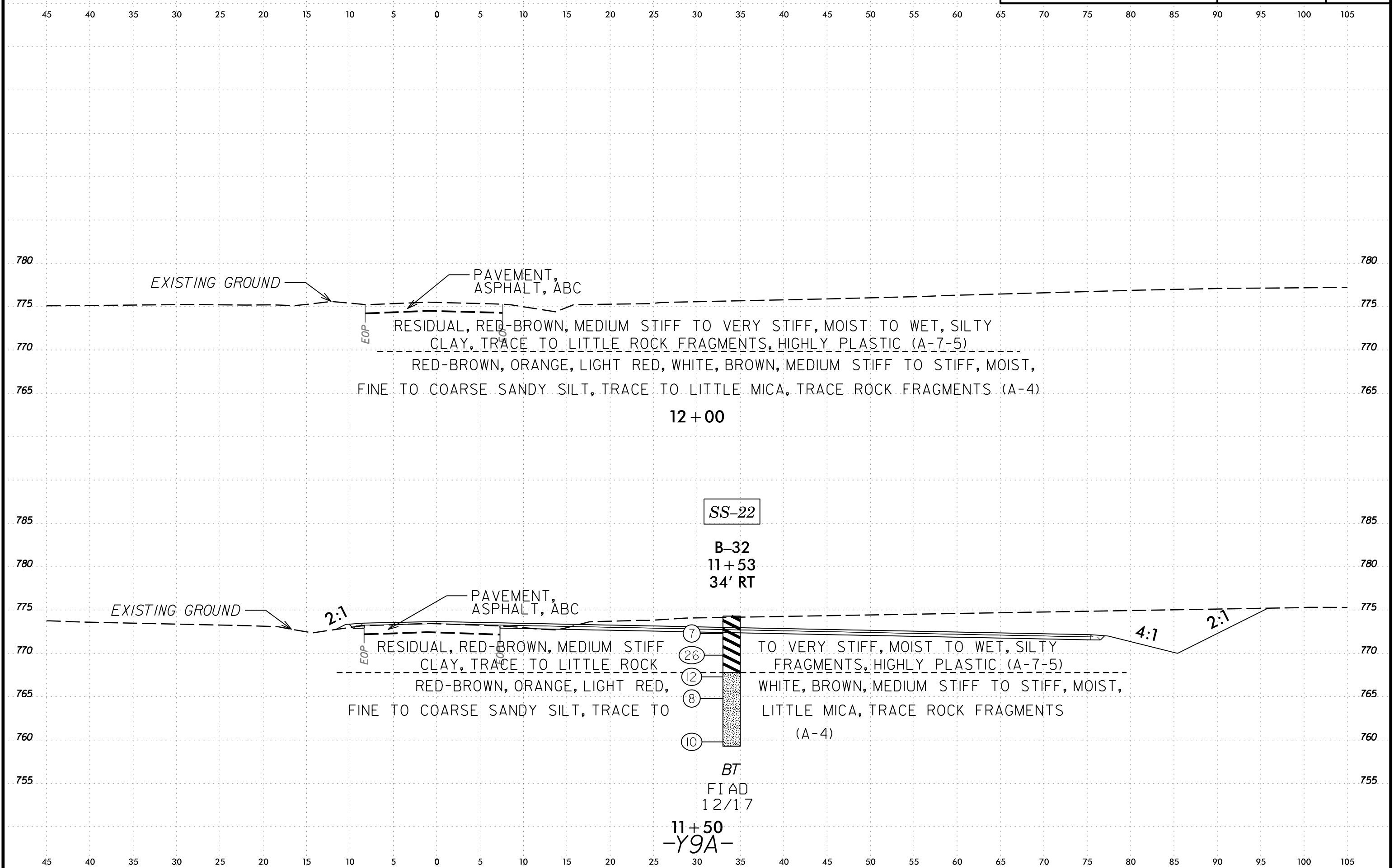
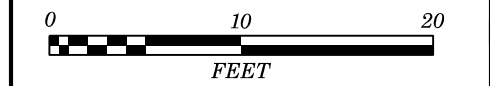
-Y4-

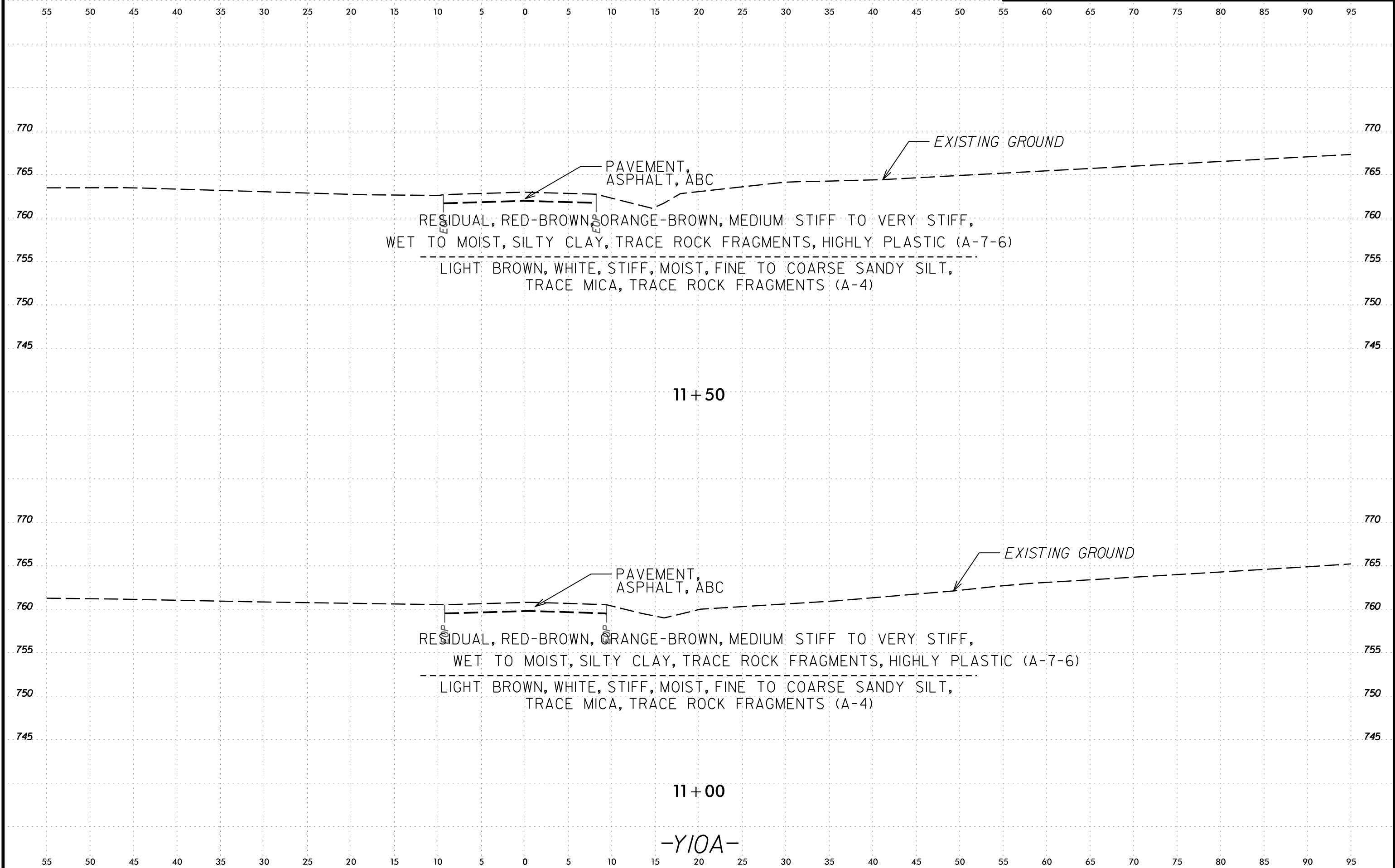
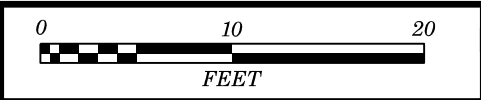








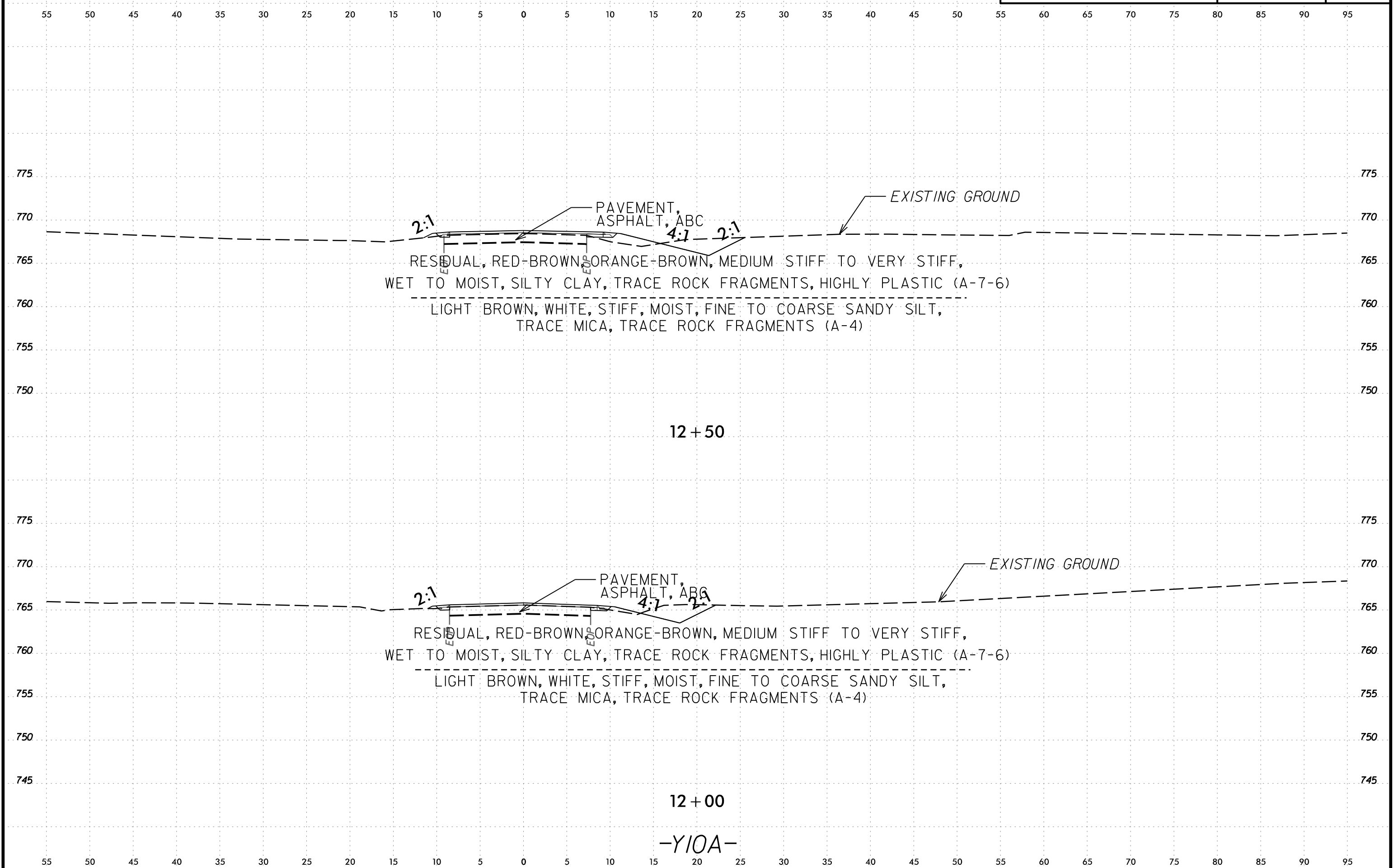
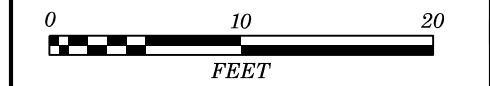


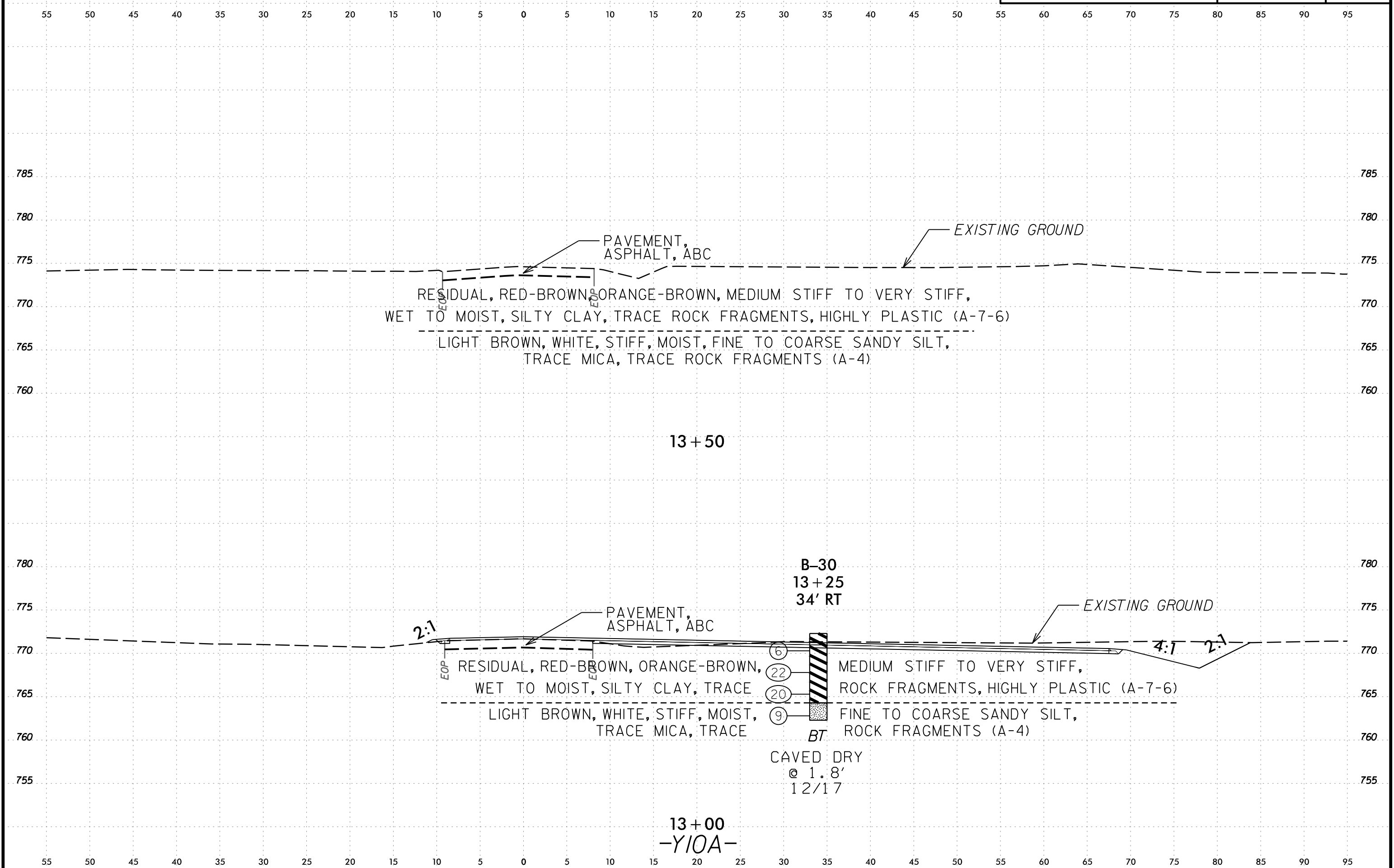
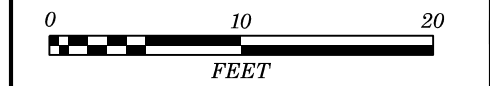


11+50

11+00

-Y10A-





13+50

B-30
13+25
34' RT

13+00
-Y10A-

2:1

4:1

2:1

6

22

20

9

BT

CAVED DRY
@ 1.8'
12/17

EOP

EOP

EOP

EOP

PAVEMENT,
ASPHALT, ABC

EXISTING GROUND

RESIDUAL, RED-BROWN, ORANGE-BROWN, MEDIUM STIFF TO VERY STIFF,
WET TO MOIST, SILTY CLAY, TRACE ROCK FRAGMENTS, HIGHLY PLASTIC (A-7-6)

LIGHT BROWN, WHITE, STIFF, MOIST, FINE TO COARSE SANDY SILT,
TRACE MICA, TRACE ROCK FRAGMENTS (A-4)

PAVEMENT,
ASPHALT, ABC

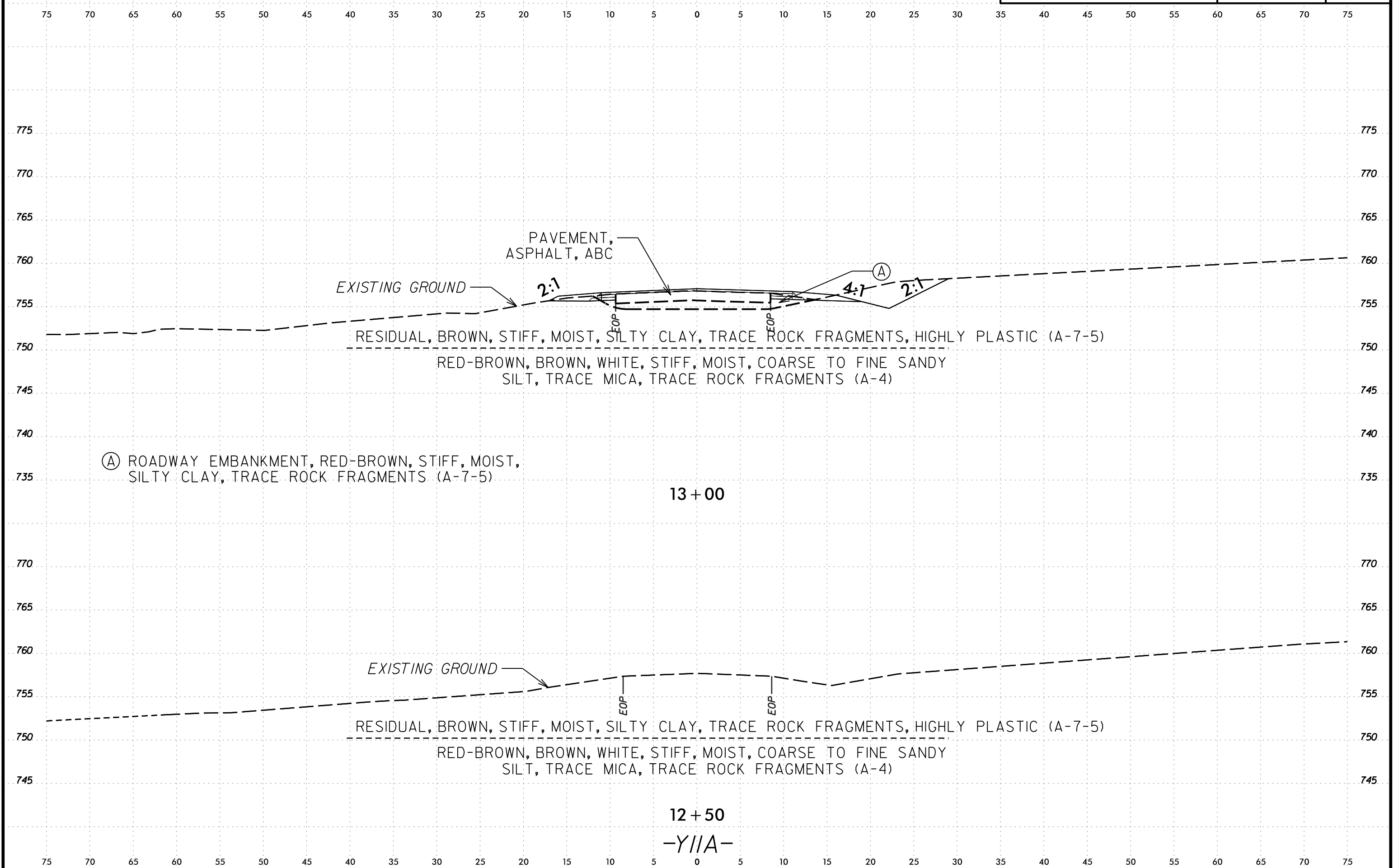
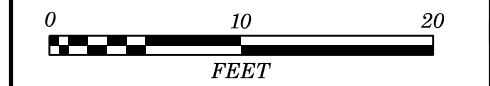
EXISTING GROUND

RESIDUAL, RED-BROWN, ORANGE-BROWN,
WET TO MOIST, SILTY CLAY, TRACE

LIGHT BROWN, WHITE, STIFF, MOIST,
TRACE MICA, TRACE

MEDIUM STIFF TO VERY STIFF,
ROCK FRAGMENTS, HIGHLY PLASTIC (A-7-6)

FINE TO COARSE SANDY SILT,
ROCK FRAGMENTS (A-4)

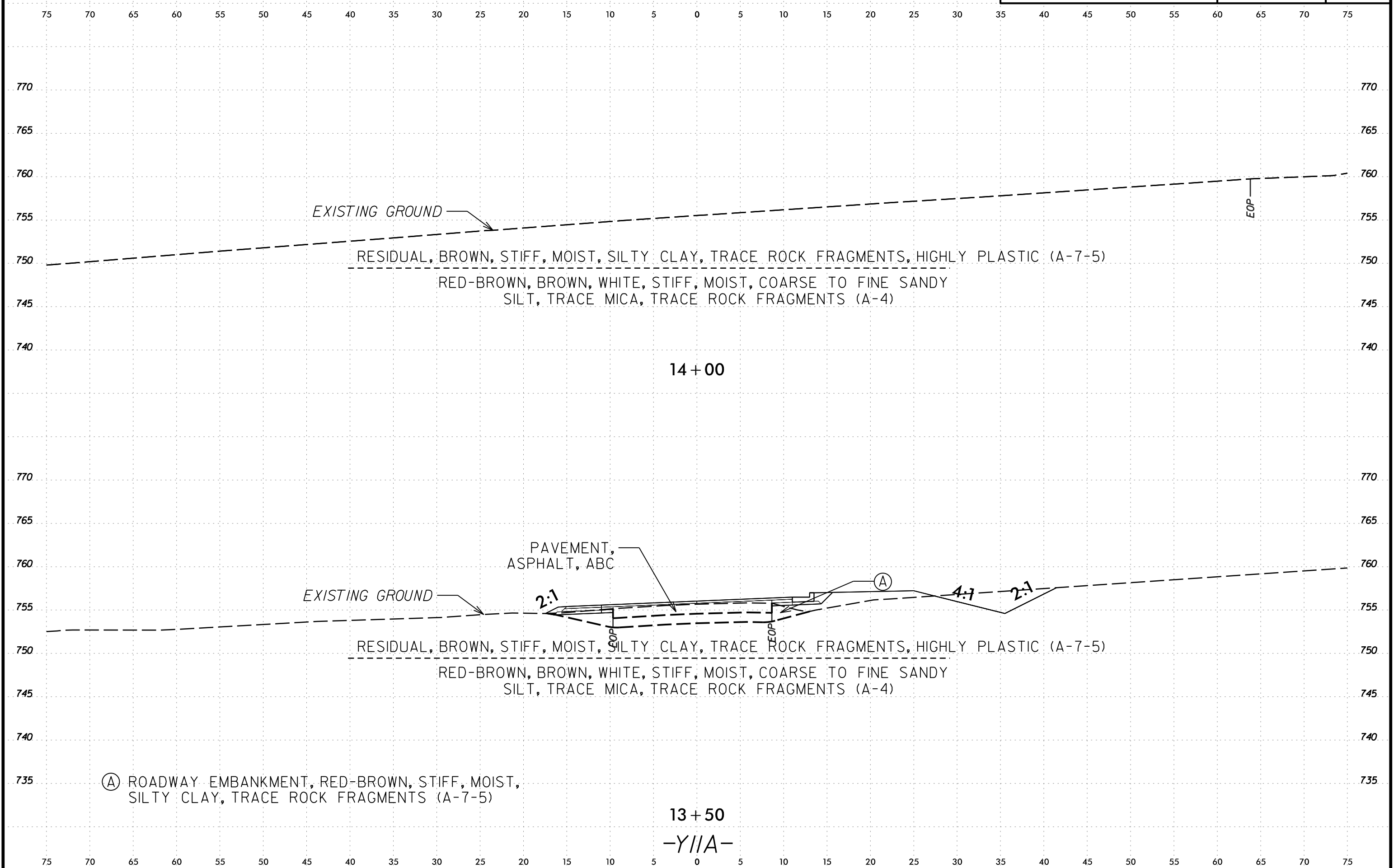


Ⓐ ROADWAY EMBANKMENT, RED-BROWN, STIFF, MOIST, SILTY CLAY, TRACE ROCK FRAGMENTS (A-7-5)

13+00

12+50

-Y//A-



EXISTING GROUND

RESIDUAL, BROWN, STIFF, MOIST, SILTY CLAY, TRACE ROCK FRAGMENTS, HIGHLY PLASTIC (A-7-5)

RED-BROWN, BROWN, WHITE, STIFF, MOIST, COARSE TO FINE SANDY SILT, TRACE MICA, TRACE ROCK FRAGMENTS (A-4)

14 + 00

EXISTING GROUND

PAVEMENT, ASPHALT, ABC

2:1

(A)

4:1

2:1

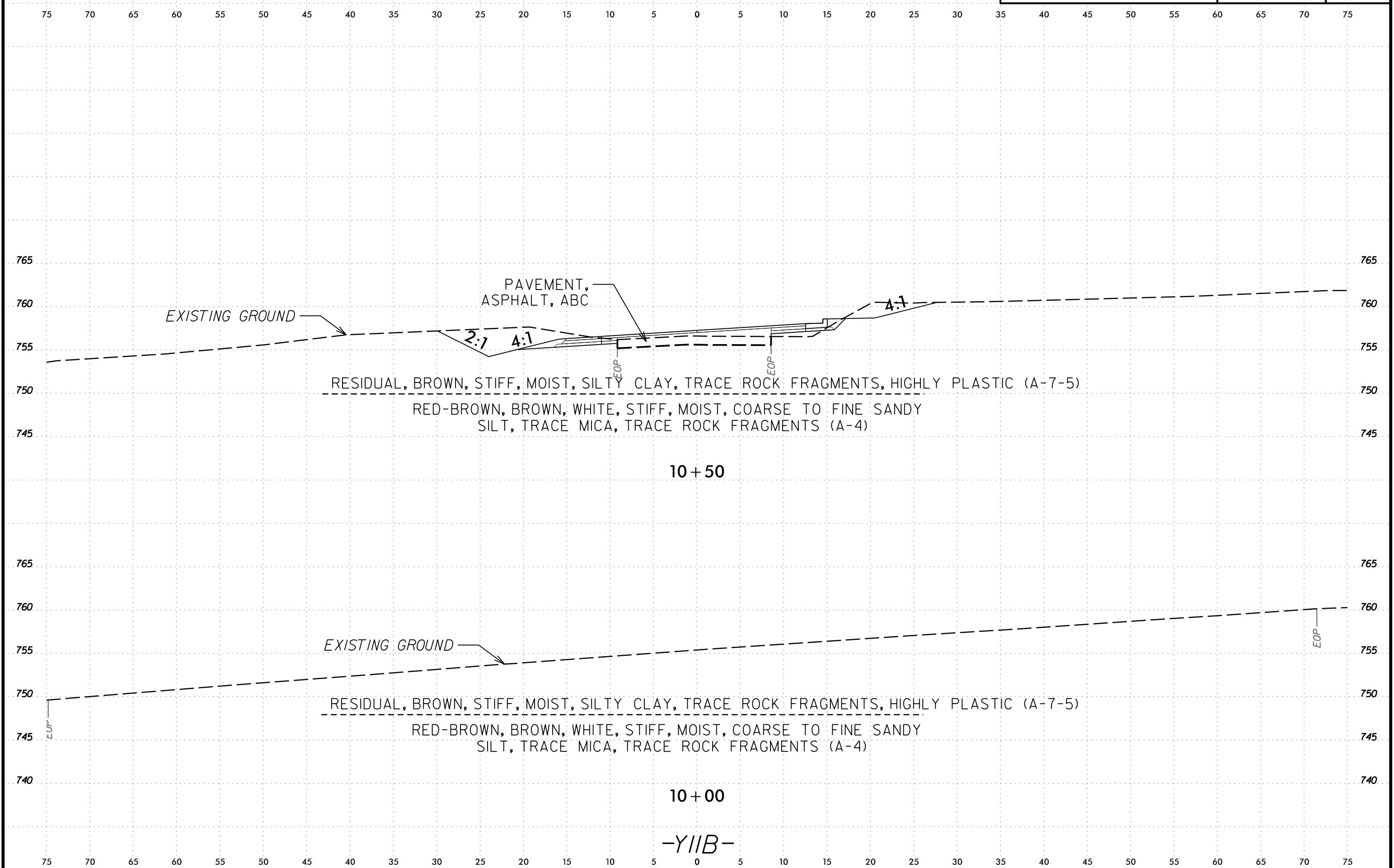
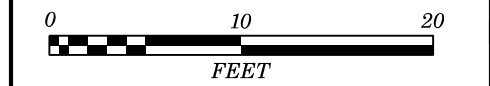
RESIDUAL, BROWN, STIFF, MOIST, SILTY CLAY, TRACE ROCK FRAGMENTS, HIGHLY PLASTIC (A-7-5)

RED-BROWN, BROWN, WHITE, STIFF, MOIST, COARSE TO FINE SANDY SILT, TRACE MICA, TRACE ROCK FRAGMENTS (A-4)

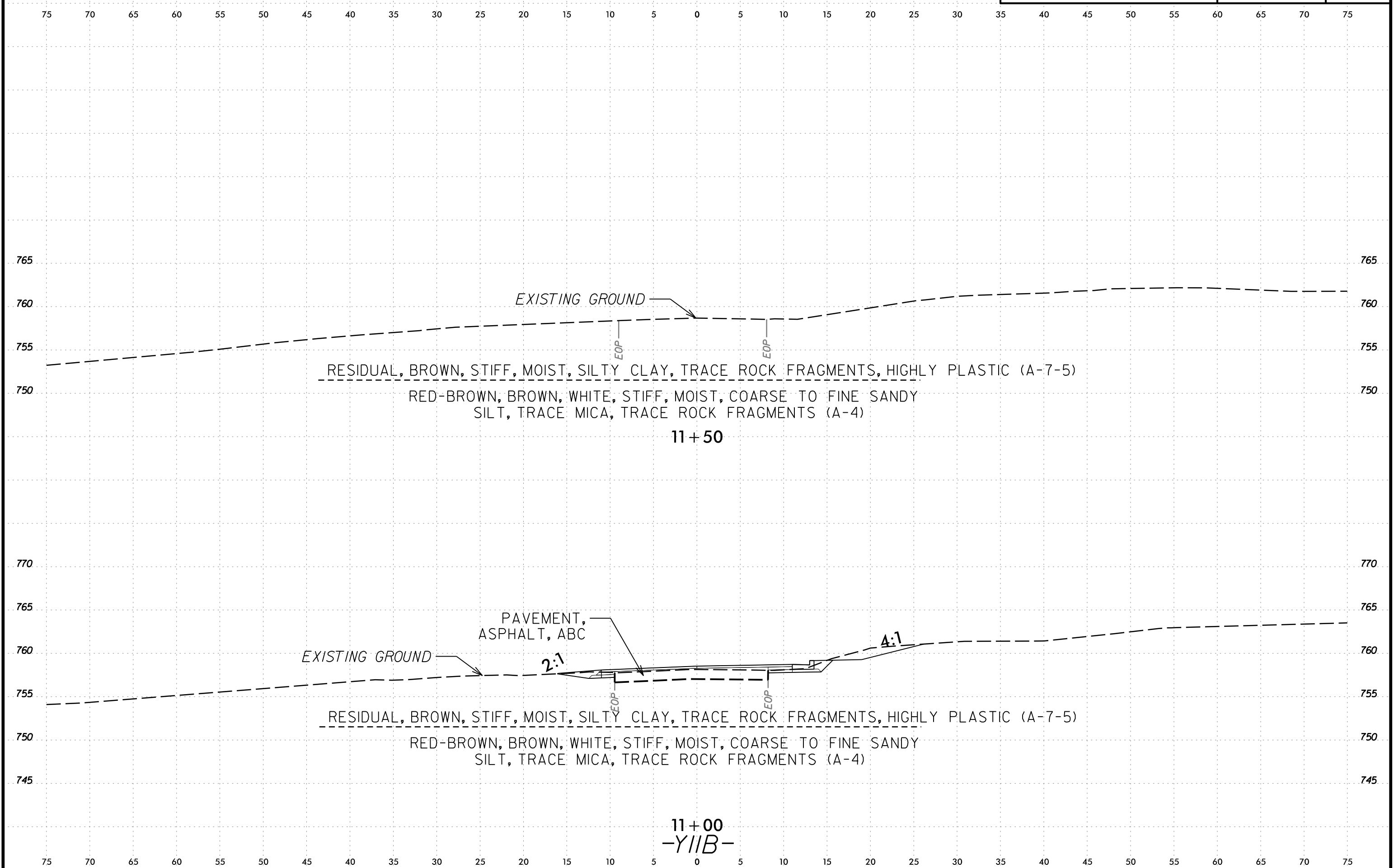
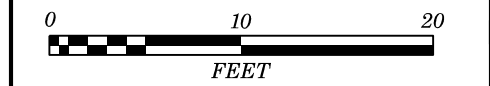
13 + 50

-Y//A-

(A) ROADWAY EMBANKMENT, RED-BROWN, STIFF, MOIST, SILTY CLAY, TRACE ROCK FRAGMENTS (A-7-5)



-YIIB-



11+00
-YIIB-

PROJECT: 40325

REFERENCE: Y-4810K

PROJECT REFERENCE NO.

SHEET NO.

Y-4810K

94

Terracon

Consulting Engineers and Scientists

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APPENDIX A
LABORATORY TESTING SUMMARY

