

REFERENCE: R-5843

PROJECT: 47085

SEE SHEET 3 FOR PLAN SHEET LAYOUT
AT TIME OF INVESTIGATION

CONTENTS

LINE	STATION	PLAN	PROFILE
-L-	11+65 to 13+80, 22+06 to 22+45	4,5	-
-L1-	10+00 to 11+00, 16+31 to 21+64	5,6	7
-Y1-	11+81 to 13+59	4	-
-Y2-	11+00 to 15+65	5	-
-Y4-	10+00 to 10+90	6	7
-Y5-	10+66 to 12+66	6	7

CROSS SECTIONS

LINE	STATION	SHEETS
-L1-	16+31 to 21+64	8-17
-Y4-	10+25 to 10+90	18-19
-Y5-	10+50 to 12+75	20-22

APPENDICES

APPENDIX	TITLE	SHEETS
A	SOIL TEST RESULTS SUMMARY	23-24
B	BORE LOGS	25-29

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

ROADWAY
SUBSURFACE INVESTIGATION

COUNTY SWAIN

PROJECT DESCRIPTION INTERSECTIONS IN BRYSON CITY:

SLOPE ST (SR 1364)/BRYSON WALK (SR 1321)

EVERETT ST (SR 1364)/DEPOT ST (SR 1336)

DEPOT STREET (SR 1336)/RAMSEUR ST (SR 1336)

DEEP CREEK RD (SR 1336)/RAMSEUR ST (SR 1336)

INVENTORY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-5843	1	29

CAUTION NOTICE

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

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

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

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

PERSONNEL

P.M. WEAVER

C.R. PASTRANA

F&R

INVESTIGATED BY ESP Associates, Inc.

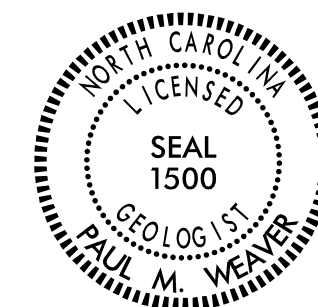
DRAWN BY C.R. PASTRANA

CHECKED BY P.M. WEAVER

SUBMITTED BY ESP Associates, Inc.

DATE July 2018

 **ESP ASSOCIATES, INC.**
7011 ALBERT PICK RD
SUITE E
GREENSBORO, NC 27409
FIRM # C-0587
WWW.ESPASSOCIATES.COM



SIGNATURE

DATE

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UNLESS ALL SIGNATURES COMPLETED**

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

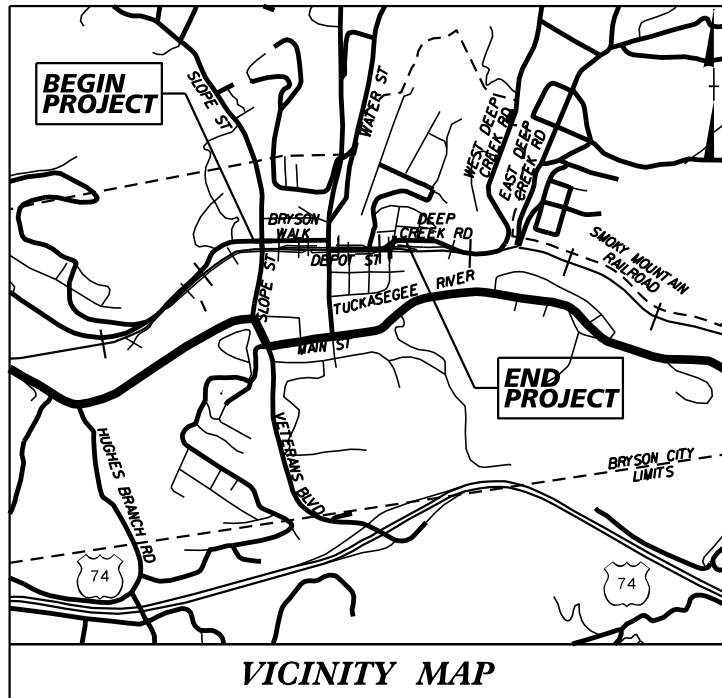
SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

Table with 4 main columns: SOIL DESCRIPTION, GRADATION, ROCK DESCRIPTION, and TERMS AND DEFINITIONS. It contains detailed technical information including soil classification tables, gradation standards, rock hardness scales, and various symbols for field use.

TIP PROJECT: R-5843

See Sheet 1-B For Conventional Symbols

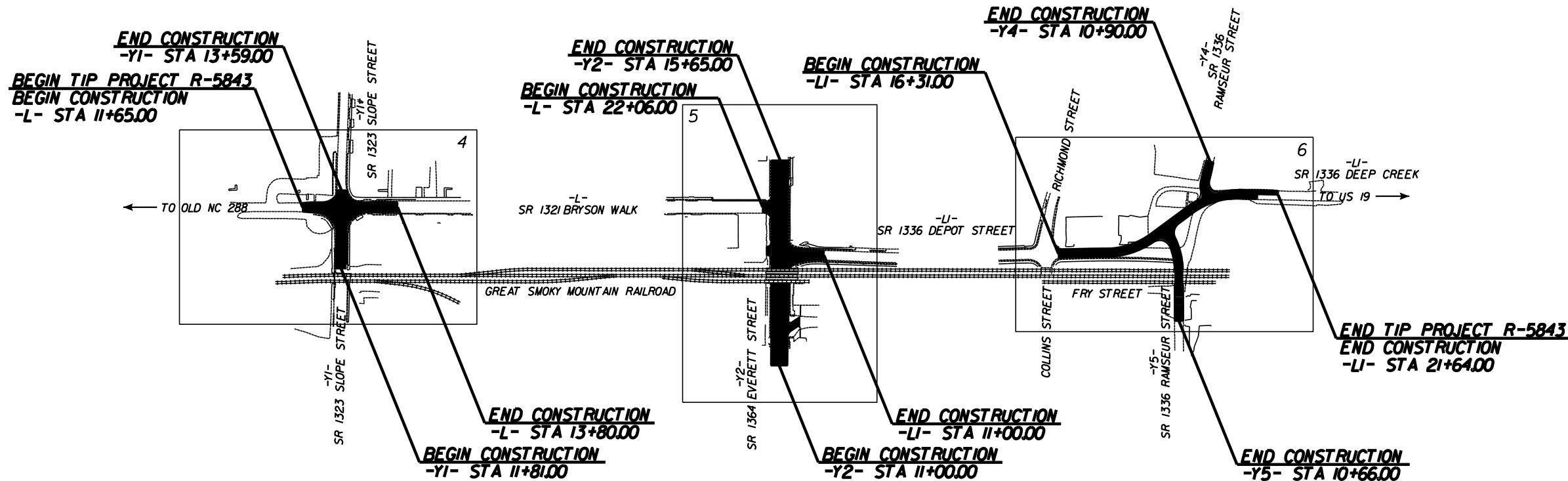
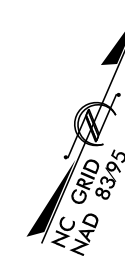


STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
SWAIN COUNTY

**LOCATION: INTERSECTIONS: SLOPE STREET (SR 1323) / BRYSON WALK (SR 1321)
EVERETT STREET (SR 1364) / DEPOT STREET (SR 1336)
DEPOT STREET (SR 1336) / RAMSEUR STREET (SR 1336)
DEEP CREEK ROAD (SR 1336) / RAMSEUR STREET (SR 1336)**

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

Kimley»Horn

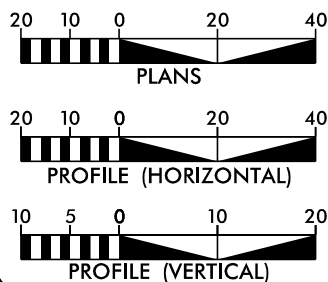


★ TRAFFIC SIGNAL

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II
THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF BRYSON CITY

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES



PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-5843 = 0.338 MILES
TOTAL LENGTH TIP PROJECT R-5843 = 0.338 MILES

PLANS PREPARED FOR
THE NCDOT BY:

Kimley»Horn

© 2018 Post Office Box 33048
Raleigh, North Carolina 27636
PE NO. F-0102

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JUNE 30, 2018

LETTING DATE:
OCTOBER 22, 2019

CHARLES NUCKOLS, P.E.
PROJECT ENGINEER

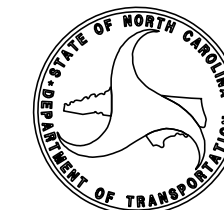
CALEB LOWMAN, E.I.
PROJECT DESIGN ENGINEER

SCOTT MILLER, III
NCDOT CONTACT

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.
ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.



\$DATE\$

July 6, 2018

STATE PROJECT: 35520.1.S5
 TIP: R-5843
 COUNTY: Swain
 DESCRIPTION: Realignment of Depot Street (SR 1336), Ramseur Street (SR 1336), and Deep Creek Road (SR 1336) Intersection in Bryson City
 SUBJECT: Roadway Subsurface Geotechnical Inventory

Project Description

This proposed project is located in Bryson City, North Carolina. It encompasses the following areas:

Line	Intersecting Line(s)	Beginning Station (±)	Ending Station (±)
-L- (Bryson Walk)	-Y1- (Slope Street)	11+65	13+80
-Y1- (Slope Street)	-L- (Bryson Walk)	11+81	13+59
-L- (Bryson Walk)	-Y2- (Everett Street)	22+06	22+45
-L1- (Depot Street)	-Y2- (Everett Street)	10+00	11+00
-Y2- (Everett Street)	-RR-, -L1-, -L-	11+00	15+65
-L1- (Depot Street)	-Y4- & -Y5- (Ramseur Street)	16+31	21+64
-Y4- (Ramseur Street)	-L1- (Depot Street/Deep Creek Road)	10+00	10+90
-Y5- (Ramseur Street)	-L1- (Depot Street/Deep Creek Road)	10+66	12+82

The project area is primarily commercial. The existing grade along the project is relatively level and appears to be constructed of fill material in many locations with alluvial material and residual soils present at the existing ground surface where fill material has not been placed.

Proposed is the rehabilitation of the existing two-lane roadway at the subject intersections with the exception of the area at the west end of the project where a new roadway alignment is proposed to improve the intersection of Depot Street, Ramseur Street, and Deep Creek Road. The realignment is proposed at the following locations: Depot Street (-L1-) from approximately Station 17+39 to approximately Station 20+76, Ramseur Street (-Y4-) from approximately Station 10+00 to approximately Station 10+45, and Ramseur Street (-Y5-) from approximately Station 11+84 to approximately Station 12+82. The only proposed grade changes are within the area of the new alignment where the proposed maximum embankment heights are approximately 2 feet.

This geotechnical investigation was confined to the areas of proposed construction and this report is confined to the area of roadway on new alignment. A Pavement Investigation and Recommendations Report discussing the pavement and subgrade conditions within all of the areas listed in the table above has been submitted under separate cover.

Initial site scoping was performed on May 14, 2018. The field roadway investigation was performed from May 29 to May 31, 2018. Standard Penetration Test borings were advanced with a CME 55 drill machine equipped

with an automatic hammer. Representative soil samples were collected for visual classification in the field and for laboratory analyses.

The alignments listed on the previous page under "Project Description" were investigated. Given that only pavement rehabilitation is envisioned for the majority of the project, a pavement and subgrade investigation without SPT testing was performed within the majority of the project area. For the areas of new alignment, SPT borings were performed in addition to the pavement and subgrade investigation for the section along -L1- from Station 16+31 to Station 21+64, along -Y5- from Station 10+66 to Station 12+82 (±), and along -Y4- from Station 10+00 to Station 10+90. Subsurface profiles and cross sections of the area of new alignment are included in this report.

Physiography and Geography

The existing roadway within the project corridor sits in a valley amid a mountain terrain. The elevations along the existing roadway generally slopes down from the beginning (west end) of the project to the end (east end) of the project with elevations ranging from approximately 1690 feet (MSL) to approximately 1550 feet (MSL).

The project corridor is located within the Blue Ridge Belt of the Blue Ridge Physiographic Province. The Blue Ridge Belt is composed of metamorphic rocks with varying degrees of metamorphism. According to the Geologic Map of North Carolina, the rock underlying the project consists of Biotite Granitic Gneiss and Granite.

The topography along the project generally slopes up from west to east with elevations ranging from approximately 1,734 feet (MSL) to approximately 1,738 feet (MSL).

Soil Properties

Soils encountered within this project area have been divided into three categories: alluvial deposits, roadway embankment, and residual soils.

Roadway embankment soils were encountered in borings B-1, B-2, and B-15. The roadway embankment ranged in thickness from approximately 2 feet to approximately 4 feet and was composed of sandy clay (A-6) and silty sand (A-2-4).

Soils identified as alluvial deposits were encountered in borings B-2, B-3, B-4, and B-6. In boring B-2, the alluvial material was encountered underlying the roadway embankment at a depth of approximately 2 feet. In borings B-3, B-4, and B-6, the alluvium was encountered directly underlying the surface pavement structure. The alluvium extends to a depth of approximately 12 feet below the existing ground surface. The alluvial deposits encountered generally consist of very loose silty sand (A-2-4), and very soft to medium stiff silty clay (A-7) and sandy silt (A-4). It should be noted that in boring B-3, the sandy alluvial material below 8 feet included river gravel, classified as A-1-b material, and exhibited relatively high blow counts due the river gravel. Trace amounts of organic material was common within the alluvium. Borings B-2 and B-3 were terminated within alluvial materials.

Residual soils were encountered underlying the roadway embankment in borings B-1 and B-5, and underlying the alluvium in borings B-4, B-6, and B-15. The residual soils consisted of soft silty clay (A-7-5) and loose to

very dense silty sand with varying amounts of rock fragments (A-1-b and A-2-4). Borings B-1, B-4, B-5, B-6, and B-15 were terminated in residual soil.

Groundwater Properties

Ground water data was collected in May, 2018. Ground water depths ranged from 4.5± to 7± feet below the existing ground surface, and groundwater elevations ranged from 1728± to 1730± feet above sea level. It should be noted that heavy seasonal rains at the time of this investigation may have resulted in higher than average recorded ground water elevations.

Areas of Special Geotechnical Interest

- 1) The following sections contain soft, cohesive soils within 3 feet of the proposed grade which have the potential to cause embankment/subgrade and/or slope stability problems during construction:

Alignment	Station (±)
-L1-	18+30 to 20+75
-Y4-	10+00 to 10+40

- 2) The following sections contain wet to saturated soils within 3 feet of the proposed grade which have the potential to cause embankment/subgrade and or slope stability problems during construction:

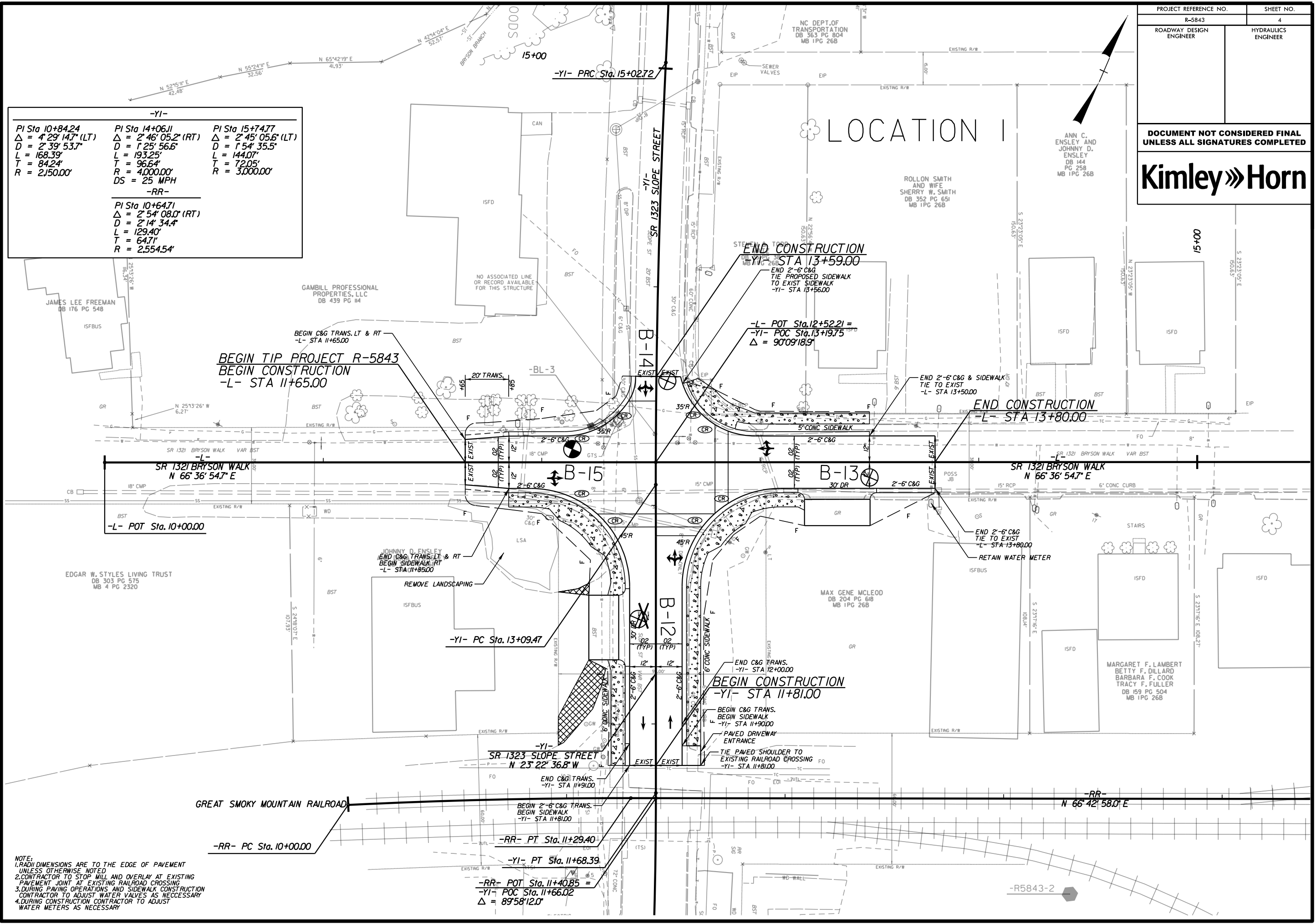
Alignment	Station (±)
-L1-	16+31 to 20+75
-Y4-	10+00 to 10+90
-Y5-	12+35 to 12+82

- 3) The following sections contain groundwater within 6 feet of the proposed grade:

Alignment	Station(±)
-L1-	16+31 to 20+60
-Y4-	10+00 to 10+90
-Y5-	12+65 to 12+82

-YI-		
PI Sta 10+84.24	PI Sta 14+06.11	PI Sta 15+74.77
$\Delta = 4' 29' 14.7''$ (LT)	$\Delta = 2' 46' 05.2''$ (RT)	$\Delta = 2' 45' 05.6''$ (LT)
$D = 2' 39' 53.7''$	$D = 1' 25' 56.6''$	$D = 1' 54' 35.5''$
$L = 168.39'$	$L = 193.25'$	$L = 144.07'$
$T = 84.24'$	$T = 96.64'$	$T = 72.05'$
$R = 2,150.00'$	$R = 4,000.00'$	$R = 3,000.00'$
-RR-		
PI Sta 10+64.71		
$\Delta = 2' 54' 08.0''$ (RT)		
$D = 2' 14' 34.4''$		
$L = 129.40'$		
$T = 64.71'$		
$R = 2,554.54'$		

REVISIONS



NOTE:
 1. RADI DIMENSIONS ARE TO THE EDGE OF PAVEMENT UNLESS OTHERWISE NOTED
 2. CONTRACTOR TO STOP MILL AND OVERLAY AT EXISTING PAVEMENT JOINT AT EXISTING RAILROAD CROSSING
 3. DURING PAVING OPERATIONS AND SIDEWALK CONSTRUCTION CONTRACTOR TO ADJUST WATER VALVES AS NECESSARY
 4. DURING CONSTRUCTION CONTRACTOR TO ADJUST WATER METERS AS NECESSARY

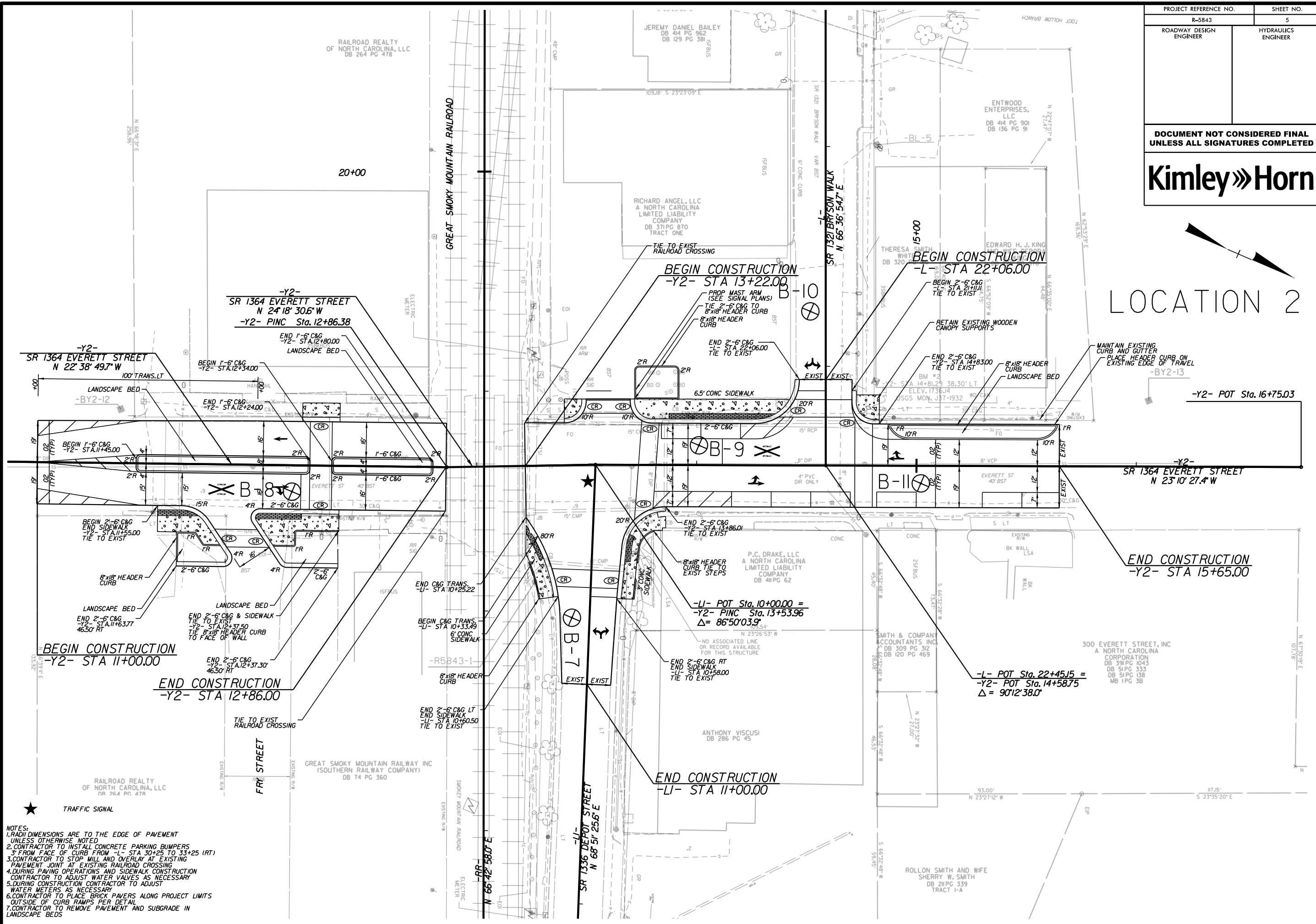
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LOCATION 2

REVISIONS



- NOTES:
1. RADIUS DIMENSIONS ARE TO THE EDGE OF PAVEMENT UNLESS OTHERWISE NOTED
 2. CONTRACTOR TO INSTALL CONCRETE PARKING BUMPERS 3' FROM FACE OF CURB FROM -L- STA 30+25 TO 33+25 (RT)
 3. CONTRACTOR TO STOP MILL AND OVERLAY AT EXISTING PAVEMENT JOINT AT EXISTING RAILROAD CROSSING
 4. DURING PAVING OPERATIONS AND SIDEWALK CONSTRUCTION CONTRACTOR TO ADJUST WATER VALVES AS NECESSARY
 5. DURING CONSTRUCTION CONTRACTOR TO ADJUST WATER METERS AS NECESSARY
 6. CONTRACTOR TO PLACE BRICK PAVERS ALONG PROJECT LIMITS OUTSIDE OF CURB RAMPS PER DETAIL
 7. CONTRACTOR TO REMOVE PAVEMENT AND SUBGRADE IN LANDSCAPE BEDS

★ TRAFFIC SIGNAL

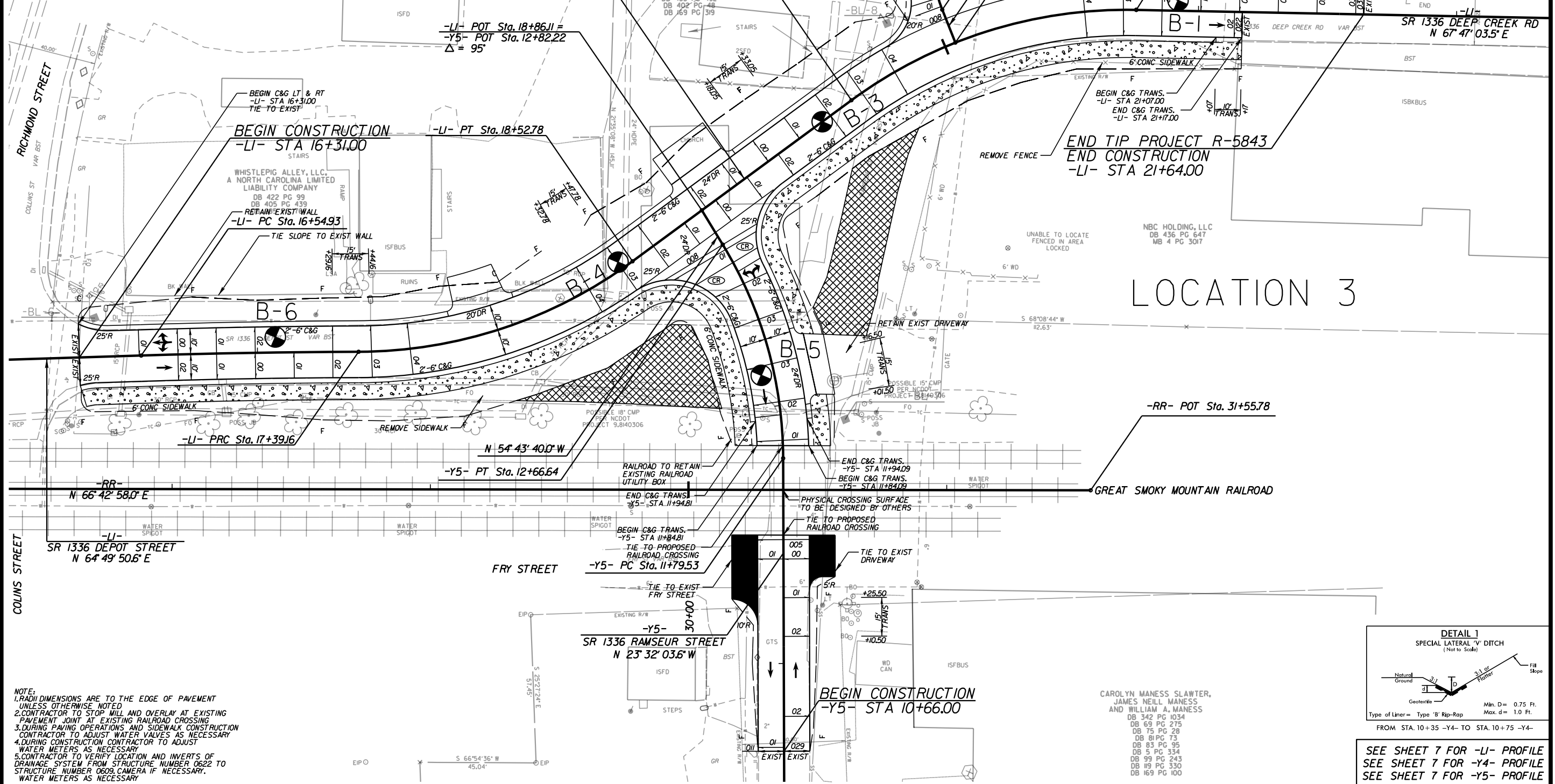
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BRYSON INVESTMENT GROUP LLC DB 437 PG 234 MB 4 PG 3017

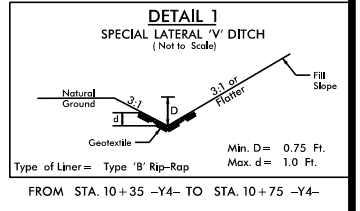
-LI-		
PI Sta 16+97.04	PI Sta 17+97.93	PI Sta 20+19.17
$\Delta = 1^{\circ} 36' 31.3"$ (RT)	$\Delta = 36^{\circ} 10' 01.8"$ (LT)	$\Delta = 37^{\circ} 30' 43.5"$ (RT)
D = 154' 35.5"	D = 31' 49' 51.6"	D = 31' 49' 51.6"
L = 84.23'	L = 113.62'	L = 117.85'
T = 42.12'	T = 58.78'	T = 61.12'
R = 3000.00'	R = 180.00'	R = 180.00'
DS = 25 MPH	DS = 25 MPH	DS = 25 MPH
SE = 0.04	SE = 0.04	SE = 0.04
RO = 60	RO = 60	RO = 60

-Y4-		-Y5-	
PI Sta 10+28.31	PI Sta 12+11.05	PI Sta 12+11.05	PI Sta 12+11.05
$\Delta = 3^{\circ} 39' 48.6"$ (RT)	$\Delta = 32^{\circ} 42' 48.6"$ (LT)	$\Delta = 32^{\circ} 42' 48.6"$ (LT)	$\Delta = 32^{\circ} 42' 48.6"$ (LT)
D = 114' 35' 29.6"	D = 35' 48' 35.5"	D = 35' 48' 35.5"	D = 35' 48' 35.5"
L = 27.63'	L = 91.35'	L = 91.35'	L = 91.35'
T = 14.18'	T = 46.96'	T = 46.96'	T = 46.96'
R = 50.00'	R = 160.00'	R = 160.00'	R = 160.00'
DS = 15 MPH	DS = 25 MPH	DS = 25 MPH	DS = 25 MPH



LOCATION 3

NOTE:
 1. RADIUS DIMENSIONS ARE TO THE EDGE OF PAVEMENT UNLESS OTHERWISE NOTED.
 2. CONTRACTOR TO STOP MILL AND OVERLAY AT EXISTING PAVEMENT JOINT AT EXISTING RAILROAD CROSSING.
 3. DURING PAVING OPERATIONS AND SIDEWALK CONSTRUCTION CONTRACTOR TO ADJUST WATER VALVES AS NECESSARY.
 4. DURING CONSTRUCTION CONTRACTOR TO ADJUST WATER METERS AS NECESSARY.
 5. CONTRACTOR TO VERIFY LOCATION AND INVERTS OF DRAINAGE SYSTEM FROM STRUCTURE NUMBER 0622 TO STRUCTURE NUMBER 0609, CAMERA IF NECESSARY.
 WATER METERS AS NECESSARY.



FROM STA. 10+35 -Y4- TO STA. 10+75 -Y4-
 SEE SHEET 7 FOR -LI- PROFILE
 SEE SHEET 7 FOR -Y4- PROFILE
 SEE SHEET 7 FOR -Y5- PROFILE

REVISIONS

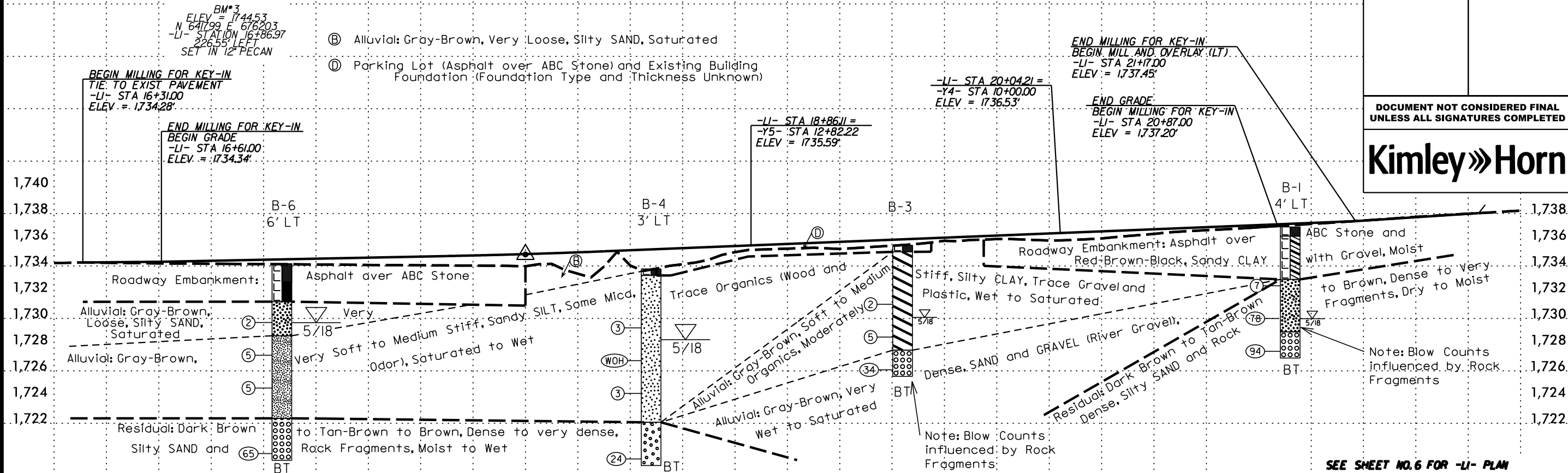
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 DB 69 PG 275
 DB 75 PG 28
 DB 81 PG 73
 DB 83 PG 95
 DB 5 PG 334
 DB 99 PG 243
 DB 119 PG 330
 DB 169 PG 100

5/28/99

-LI- SR 1336 DEEP CREEK RD/DEPOT STREET

PROJECT REFERENCE NO. R-5843	SHEET NO. 7
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
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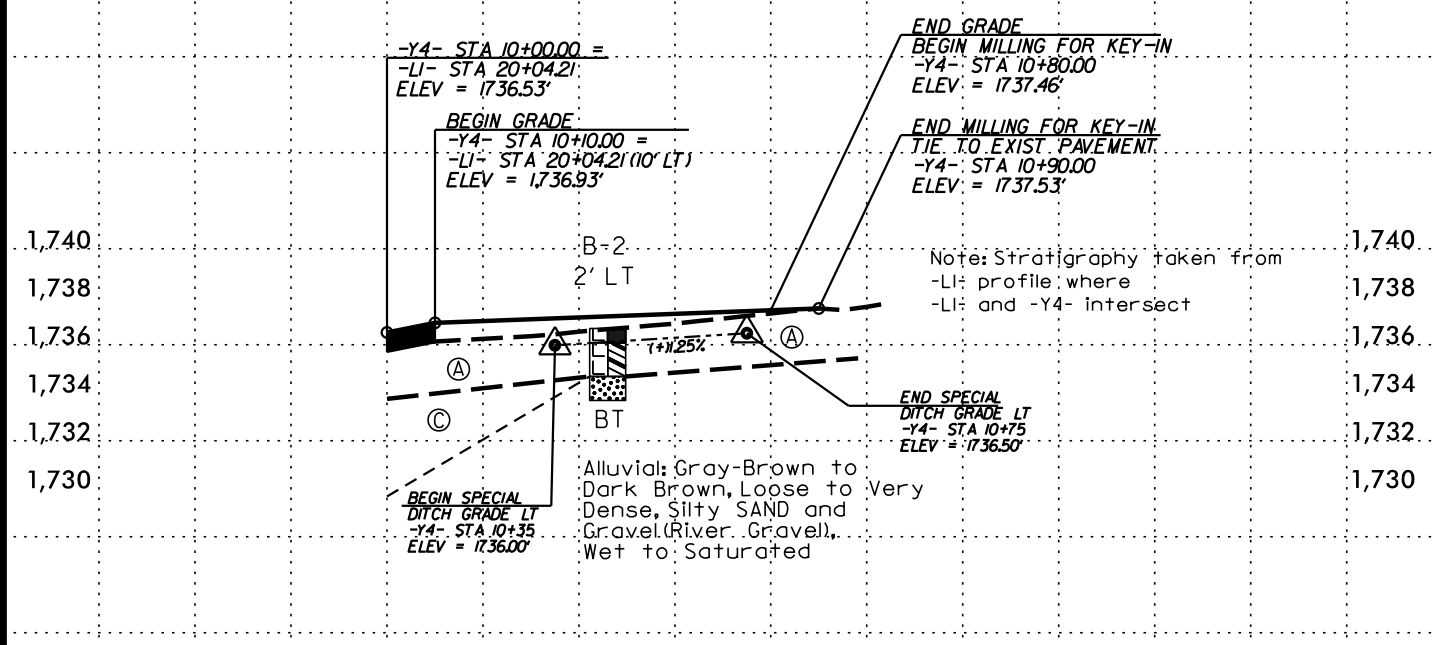
Kimley»Horn



SEE SHEET NO. 6 FOR -LI- PLAN

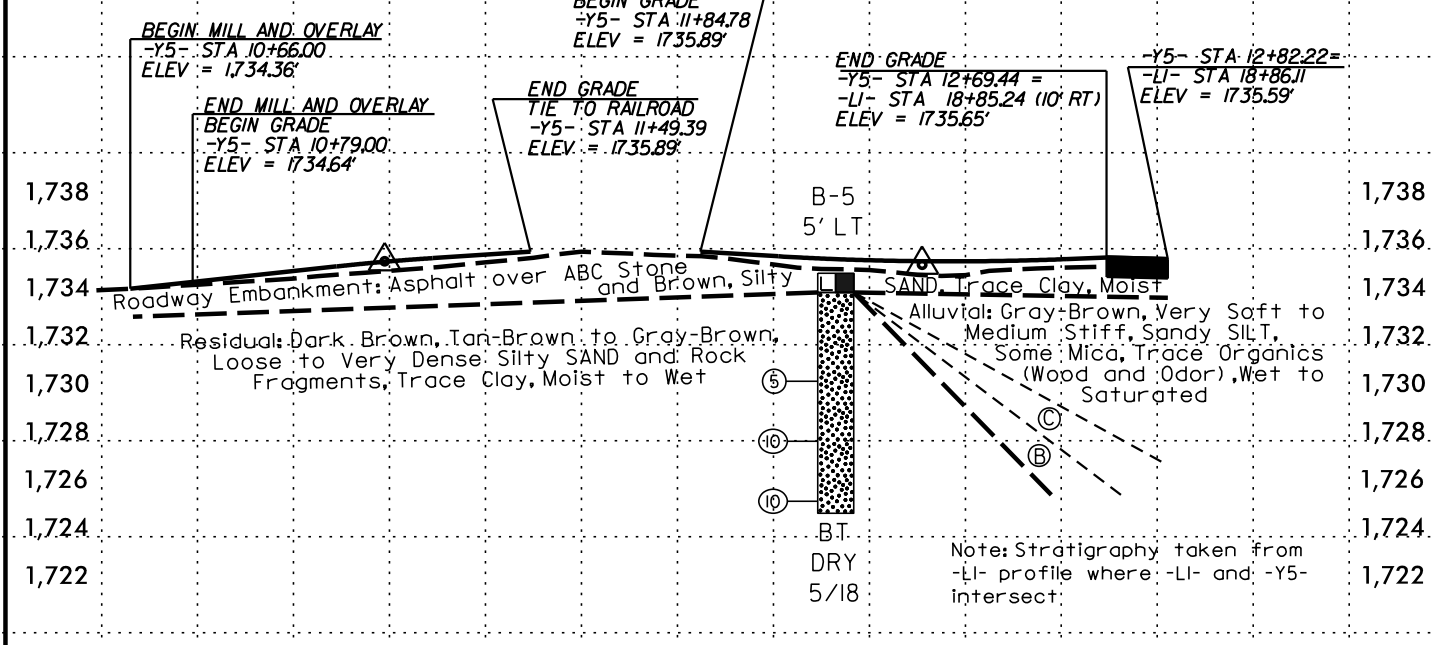
- (A) Roadway Embankment: Asphalt over ABC Stone and Red-Brown-Black, Sandy CLAY with Gravel, Moist
Note: Around -Y4- Sta. 10+40 Subbase becomes concrete and extends past -Y4- Sta. 10+90
- (C) Alluvial: Gray-Brown, Soft to Medium Stiff, Silty CLAY, Trace Gravel and Organics, Moderately Plastic, Wet

- (B) Alluvial: Gray-Brown, Very Dense, SAND and Gravel (River Gravel), Saturated
- (C) Alluvial: Gray-Brown, Soft, Silty CLAY, Trace Gravel and Organics, Moderately Plastic, Saturated to Wet



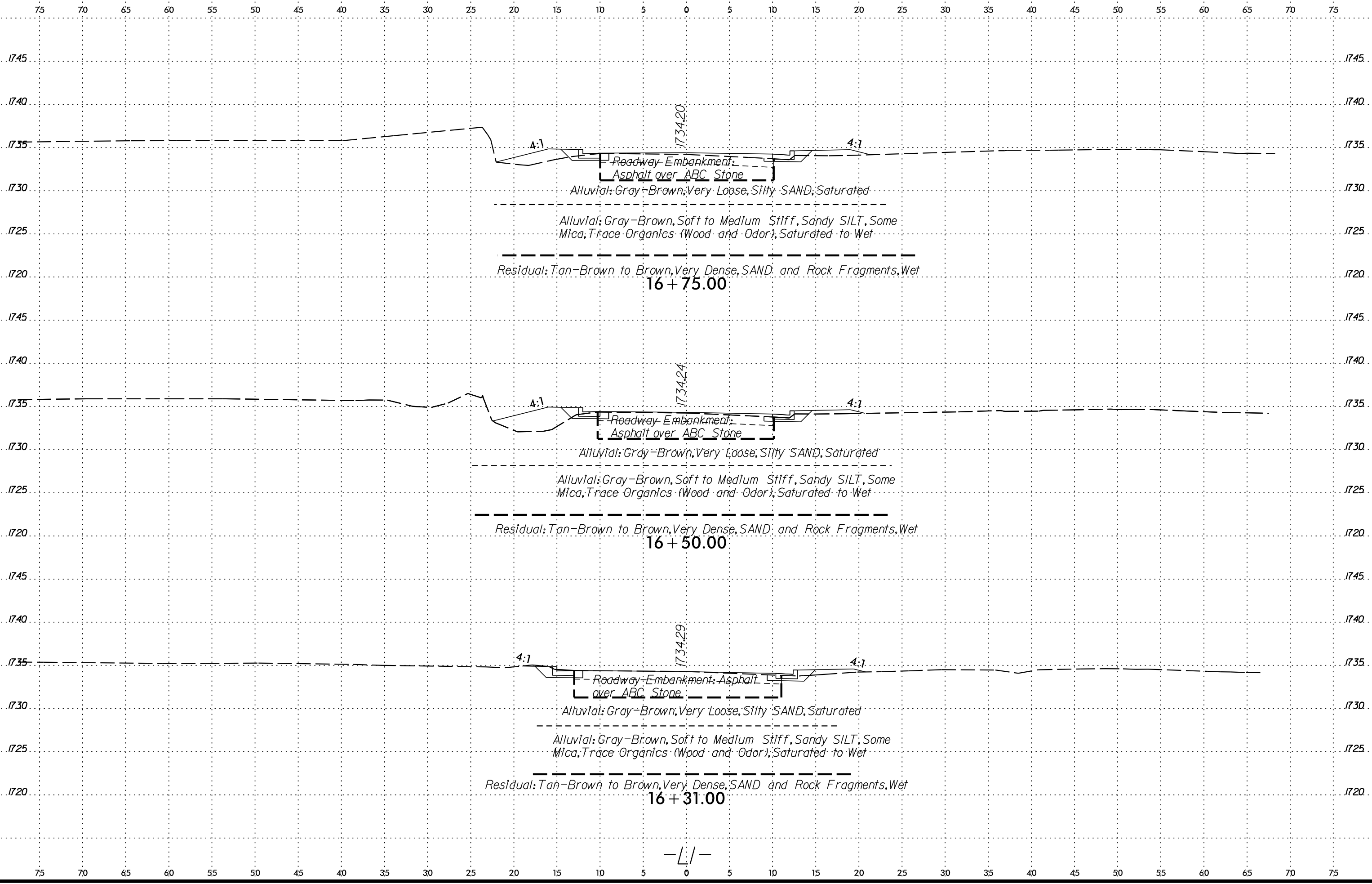
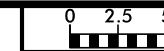
-Y4- SR 1336 RAMSEUR STREET

SEE SHEET NO. 6 FOR -Y4- PLAN

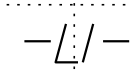


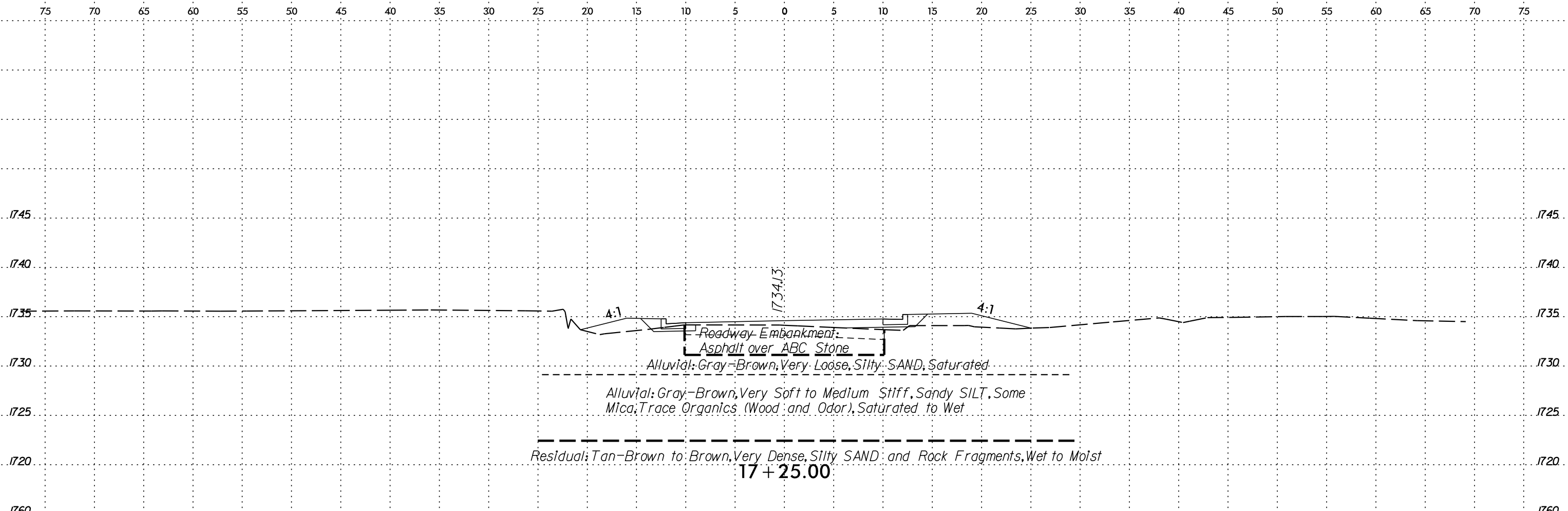
-Y5- SR 1336 RAMSEUR STREET

SEE SHEET NO. 6 FOR -Y5- PLAN



SYSTEM: \$\$\$\$
 SECTION: \$\$\$\$
 SURNAME: \$\$\$\$

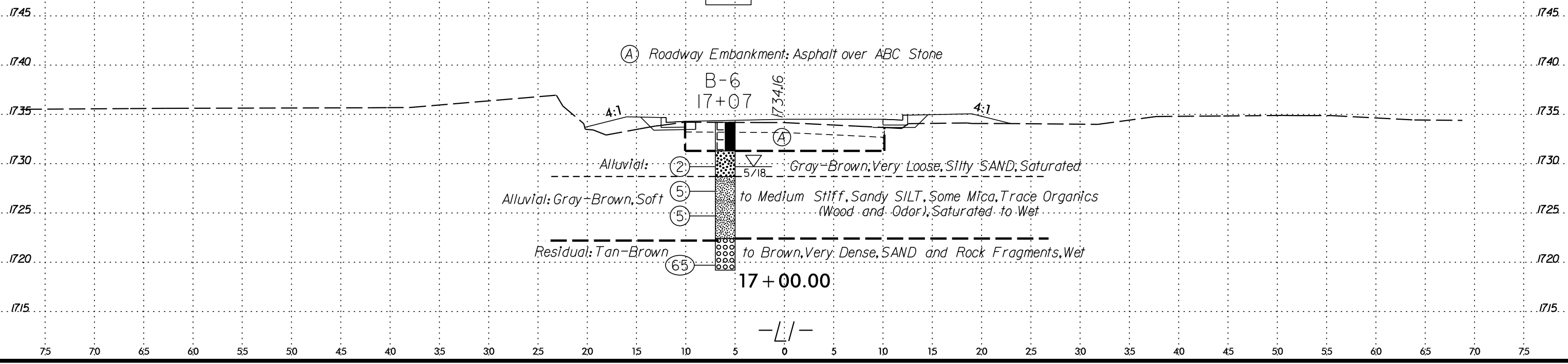




SOIL TEST RESULTS

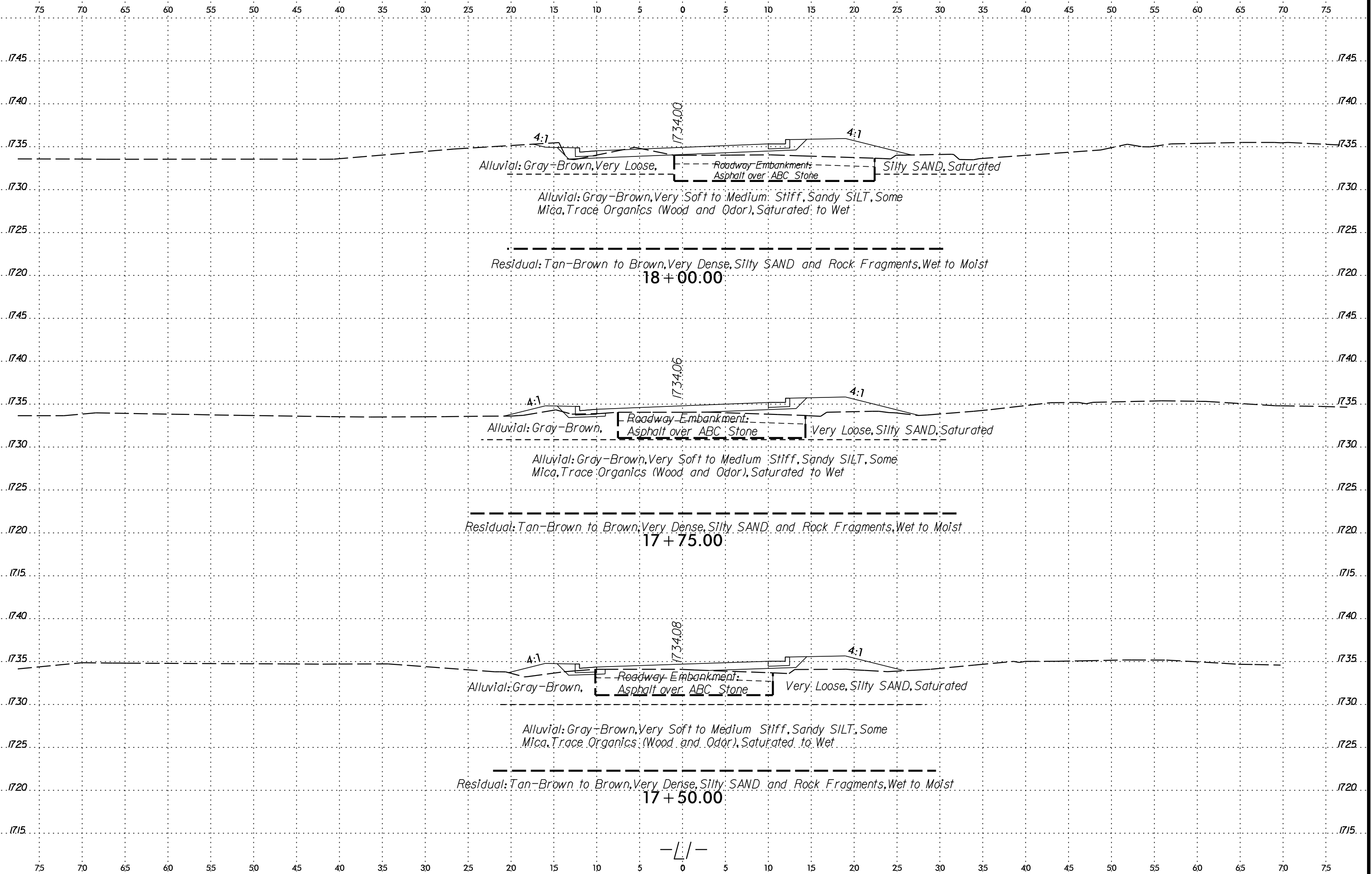
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	#10	#40	#200		
SS-4	6' LT	17+07	8.5-10.0	A-4(1)	30	6	15	48	24	13	100	97	48	37.1	3.5

SS-4



SYSTEM: \$\$\$\$
 SECTION: \$\$\$\$
 SURNAME: \$\$\$\$

6/23/16



SYSTEM: \$\$\$\$
SECTION: \$\$\$\$
SUBURNAME: \$\$\$\$

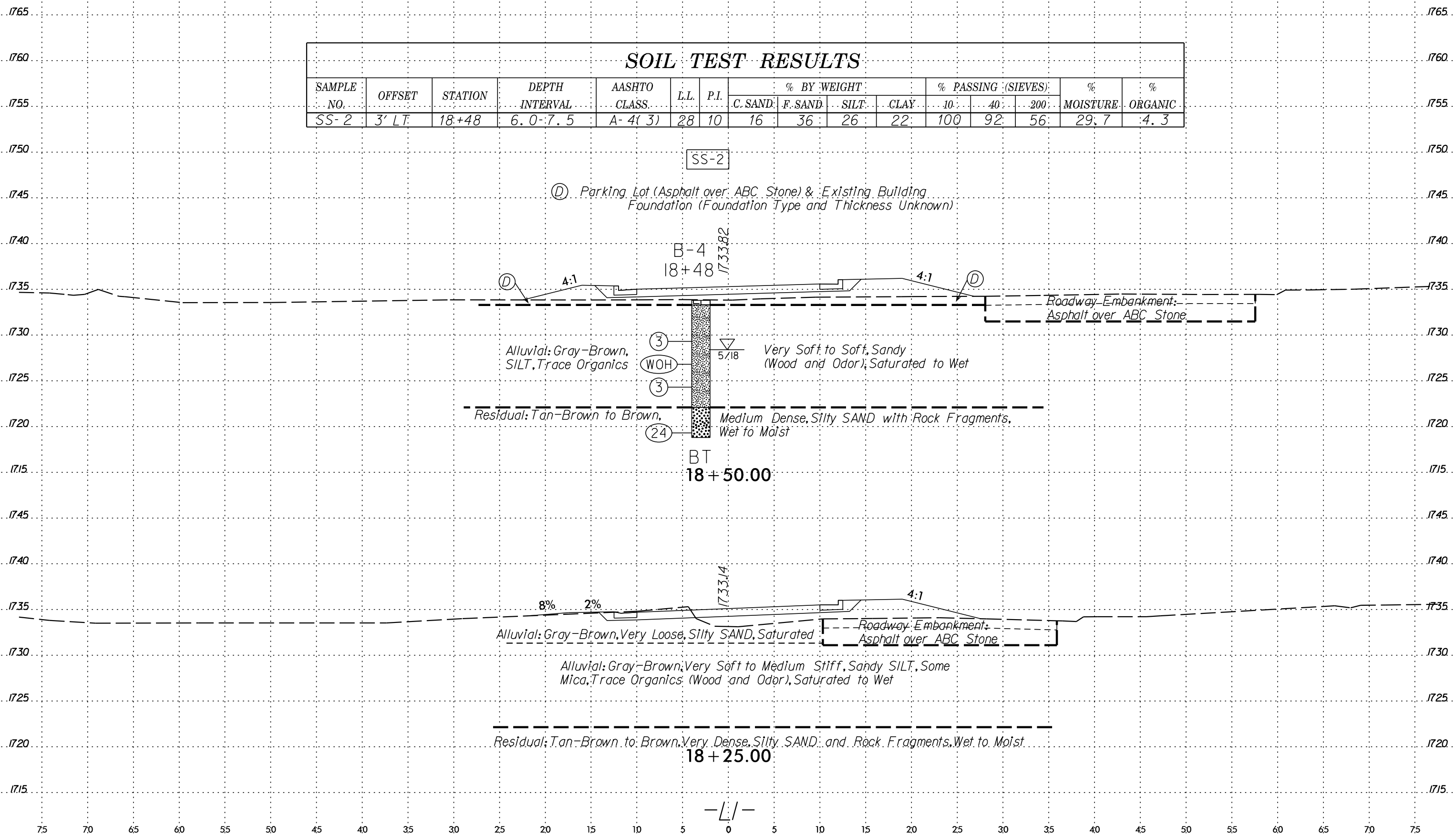
-L/-

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-2	3' LT	18+48	6.0-7.5	A-4(3)	28	10	16	36	26	22	100	92	56	29.7	4.3

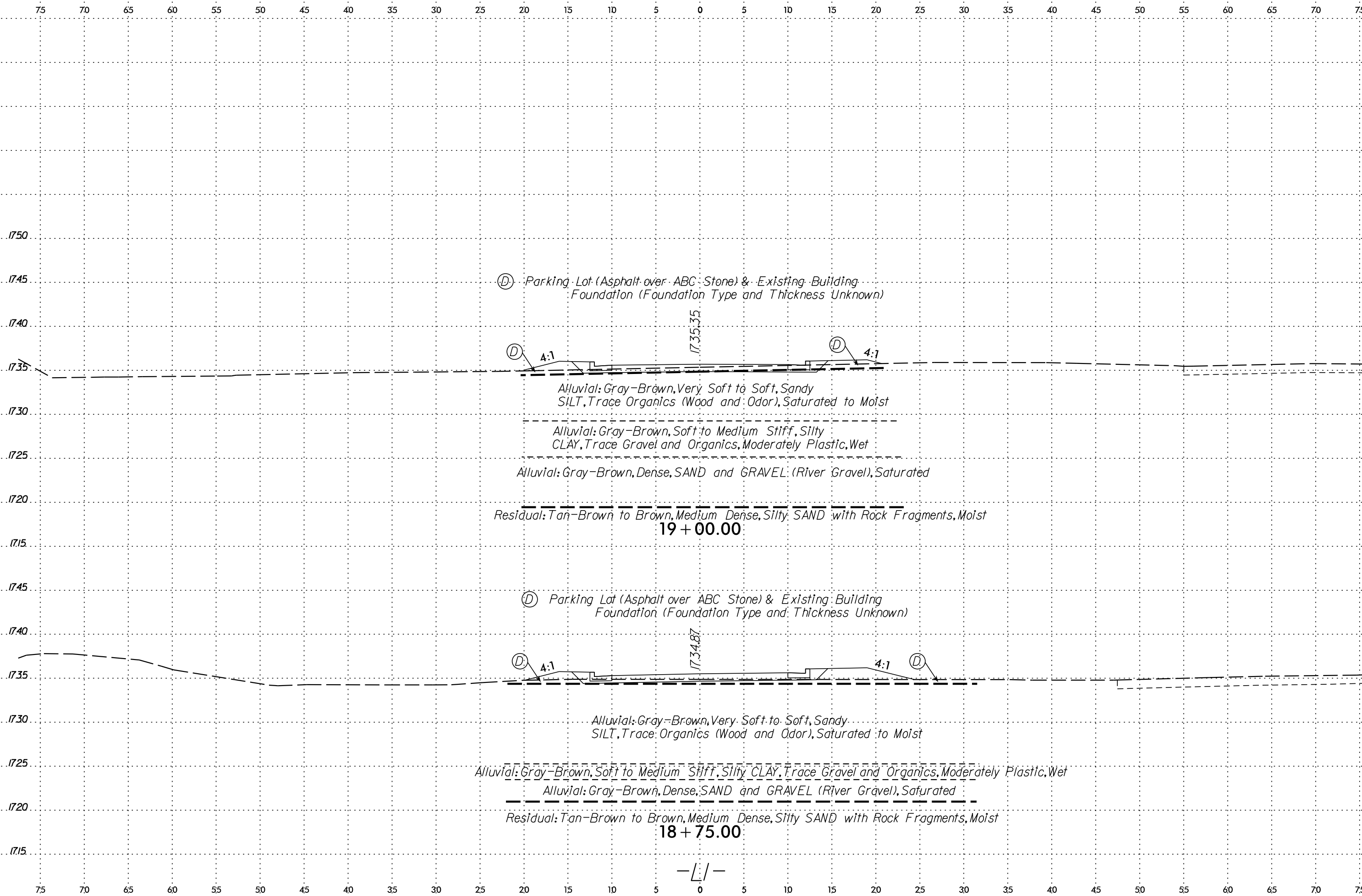
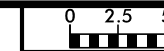
SS-2

Ⓧ Parking Lot (Asphalt over ABC Stone) & Existing Building Foundation (Foundation Type and Thickness Unknown)



SYSTEM: \$\$\$\$
SECTION: \$\$\$\$
SUBNAME: \$\$\$\$

6/23/16



SYSTEM: \$\$\$\$\$\$
SECTION: \$\$\$\$\$\$
SUBURNAME: \$\$\$\$\$\$

-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

.1770 .1770

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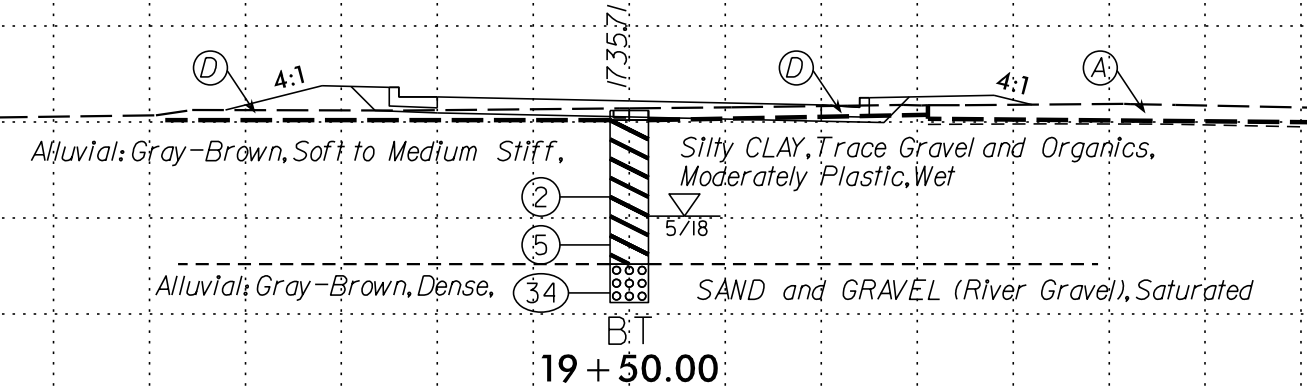
75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

SOIL TEST RESULTS																
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC	
							C. SAND	F. SAND	SILT	CLAY	#10	#40	#200			
SS-1	4' LT	20+92	3.5-5.0	A-7-6(9)	43	16	10	29	27	34	95	91	65	43.5	-	

SS-1

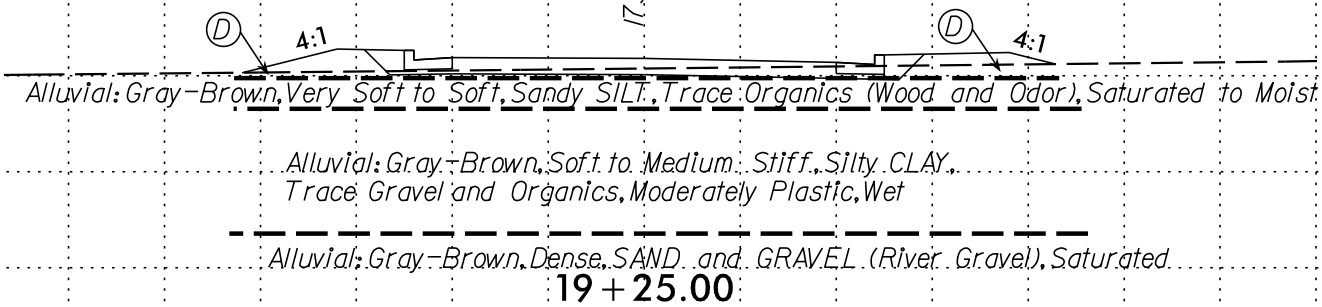
- (A) Roadway Embankment: Asphalt over ABC Stone
- (D) Parking Lot (Asphalt over ABC Stone) & Existing Building Foundation (Foundation Type and Thickness Unknown)

B-3
20+92



- (D) Parking Lot (Asphalt over ABC Stone) & Existing Building Foundation (Foundation Type and Thickness Unknown)

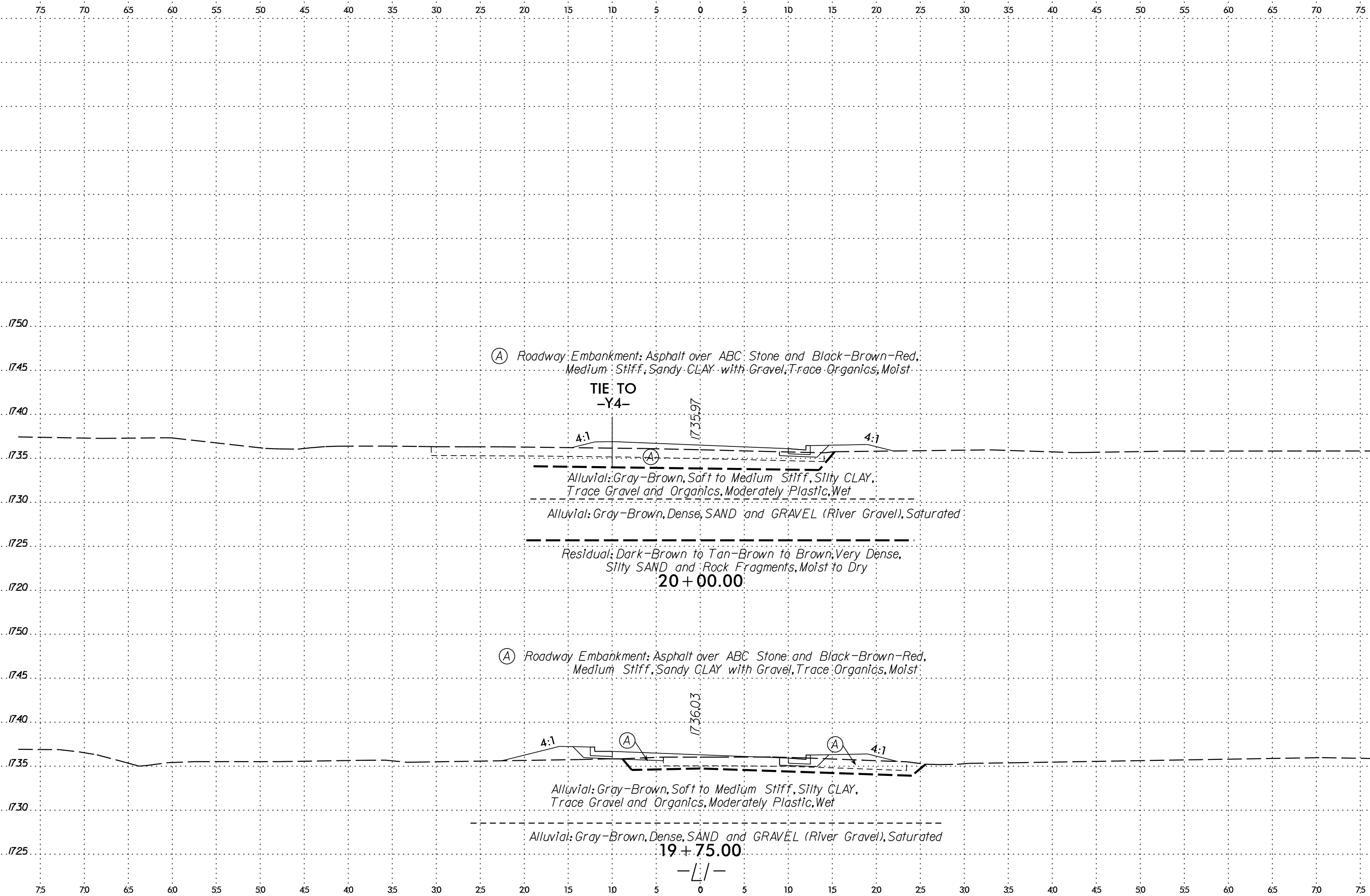
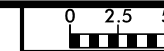
1735.38



-1/-

SYSTEM: \$\$\$\$
SECTION: \$\$\$\$
SUBNAME: \$\$\$\$

6/23/16



(A) Roadway Embankment: Asphalt over ABC Stone and Black-Brown-Red,
Medium Stiff, Sandy CLAY with Gravel, Trace Organics, Moist

TIE TO
-Y4-

4:1

4:1

Alluvial: Gray-Brown, Soft to Medium Stiff, Silty CLAY,
Trace Gravel and Organics, Moderately Plastic, Wet

Alluvial: Gray-Brown, Dense, SAND and GRAVEL (River Gravel), Saturated

Residual: Dark-Brown to Tan-Brown to Brown, Very Dense,
Silty SAND and Rock Fragments, Moist to Dry

20 + 00.00

(A) Roadway Embankment: Asphalt over ABC Stone and Black-Brown-Red,
Medium Stiff, Sandy CLAY with Gravel, Trace Organics, Moist

4:1

4:1

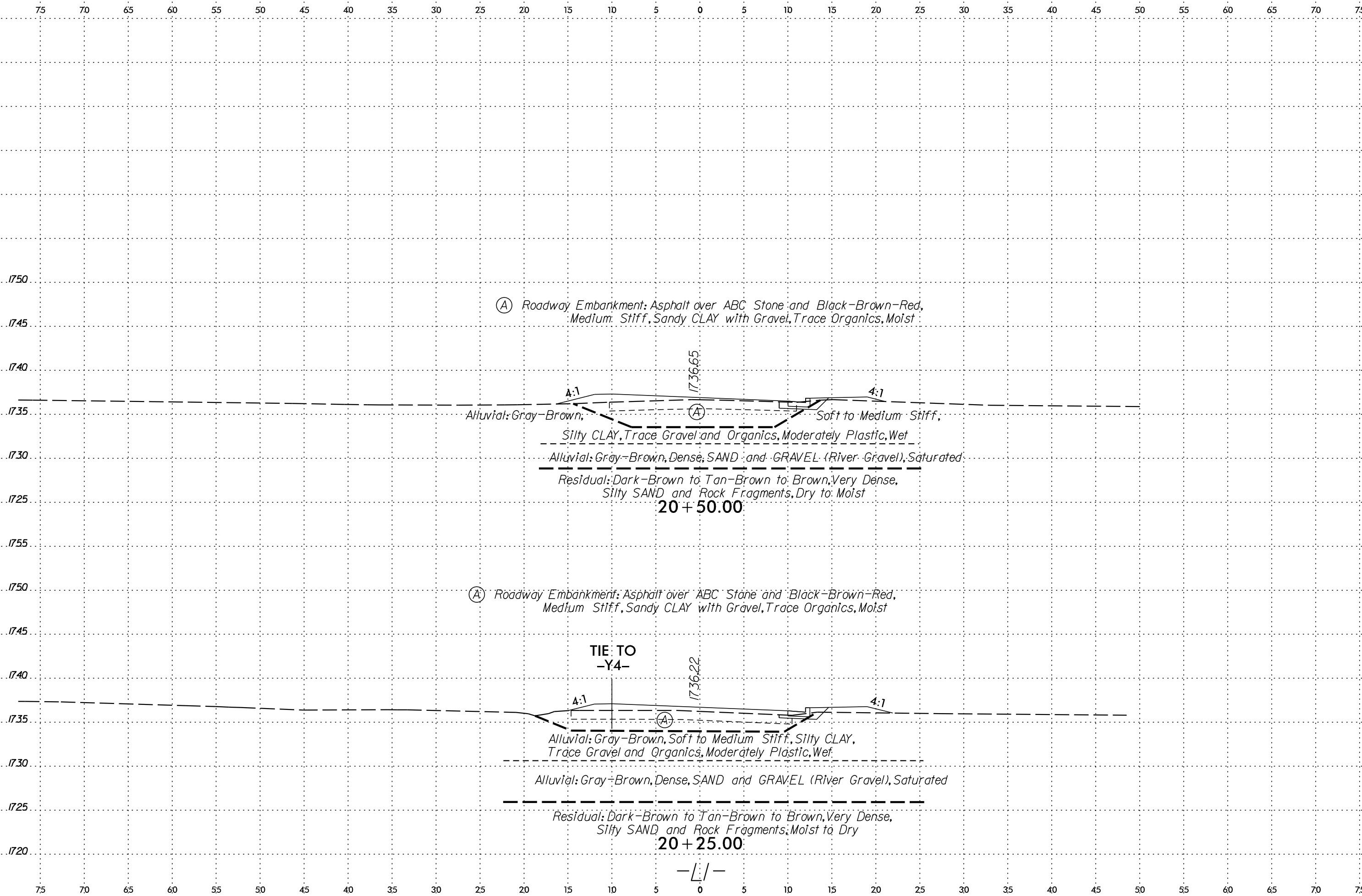
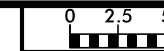
Alluvial: Gray-Brown, Soft to Medium Stiff, Silty CLAY,
Trace Gravel and Organics, Moderately Plastic, Wet

Alluvial: Gray-Brown, Dense, SAND and GRAVEL (River Gravel), Saturated

19 + 75.00

-L/-

SYSTEM: \$\$\$\$\$\$
SECTION: \$\$\$\$\$\$
SUBNAME: \$\$\$\$\$\$



(A) Roadway Embankment: Asphalt over ABC Stone and Black-Brown-Red, Medium Stiff, Sandy CLAY with Gravel, Trace Organics, Moist

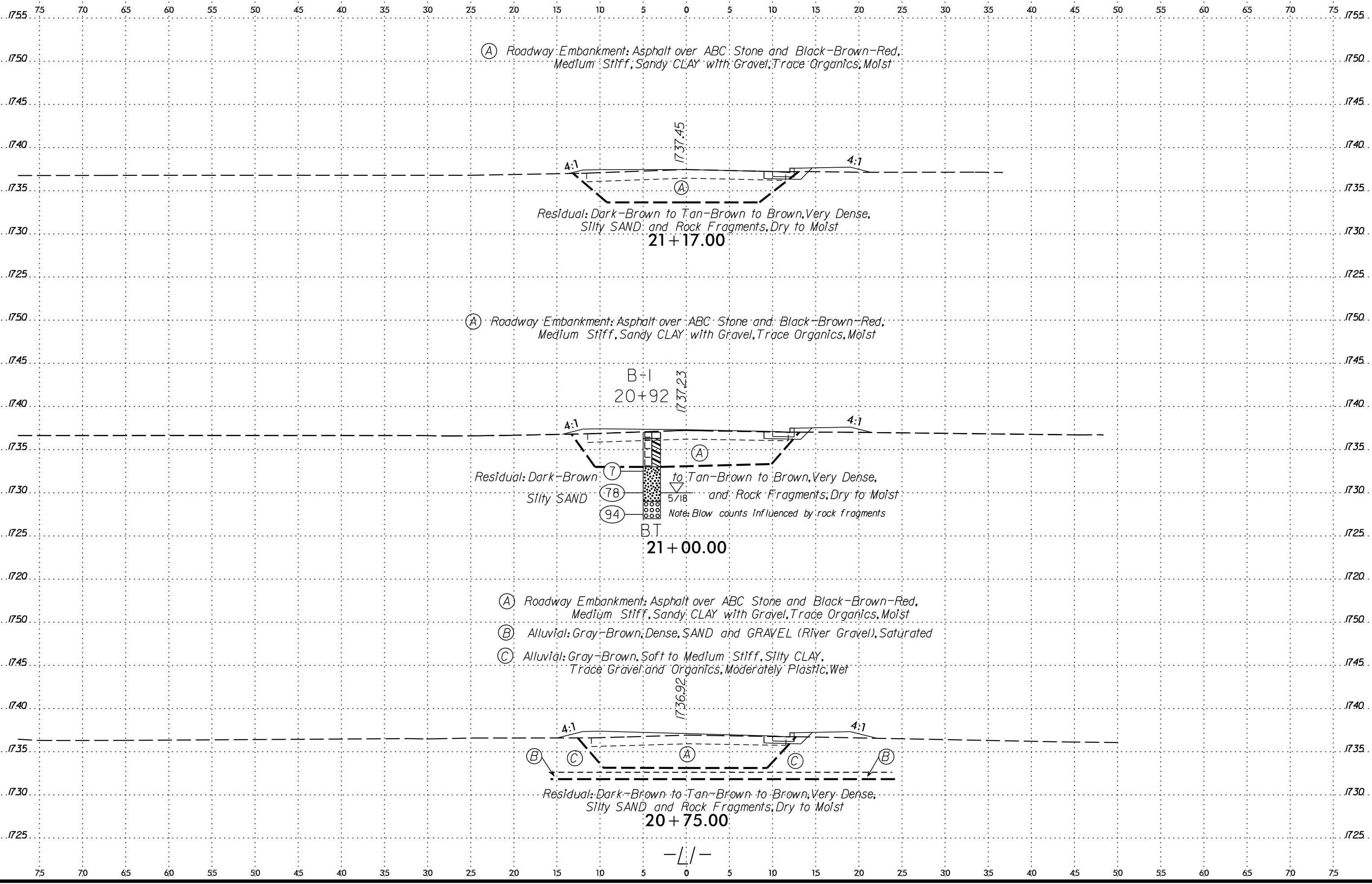
Alluvial: Gray-Brown, Silty CLAY, Trace Gravel and Organics, Moderately Plastic, Wet
 Alluvial: Gray-Brown, Dense, SAND and GRAVEL (River Gravel), Saturated
 Residual: Dark-Brown to Tan-Brown to Brown, Very Dense, Silty SAND and Rock Fragments, Dry to Moist
20 + 50.00

(A) Roadway Embankment: Asphalt over ABC Stone and Black-Brown-Red, Medium Stiff, Sandy CLAY with Gravel, Trace Organics, Moist

TIE TO
 -Y4-
 Alluvial: Gray-Brown, Soft to Medium Stiff, Silty CLAY, Trace Gravel and Organics, Moderately Plastic, Wet
 Alluvial: Gray-Brown, Dense, SAND and GRAVEL (River Gravel), Saturated
 Residual: Dark-Brown to Tan-Brown to Brown, Very Dense, Silty SAND and Rock Fragments, Moist to Dry
20 + 25.00

-L/-

SYSTEM: \$\$\$\$\$\$
 SECTION: \$\$\$\$\$\$
 SURNAME: \$\$\$\$\$\$



SYSTEM: SDN
USER: JEROME



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

.1750 .1750

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.1735 .1735

.1730 .1730

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.1735 .1735

.1730 .1730

.1750 .1750

.1745 .1745

.1740 .1740

.1735 .1735

.1730 .1730

(A) Roadway Embankment: Asphalt over ABC Stone and Black-Brown-Red, Medium Stiff, Sandy CLAY with Gravel, Trace Organics, Moist

17.38.06

Residual: Dark-Brown to Tan-Brown to Brown, Very Dense, Silty SAND and Rock Fragments, Dry to Moist

21 + 64.00

(A) Roadway Embankment: Asphalt over ABC Stone and Black-Brown-Red, Medium Stiff, Sandy CLAY with Gravel, Trace Organics, Moist

17.37.89

Residual: Dark-Brown to Tan-Brown to Brown, Very Dense, Silty SAND and Rock Fragments, Dry to Moist

21 + 50.00

(A) Roadway Embankment: Asphalt over ABC Stone and Black-Brown-Red, Medium Stiff, Sandy CLAY with Gravel, Trace Organics, Moist

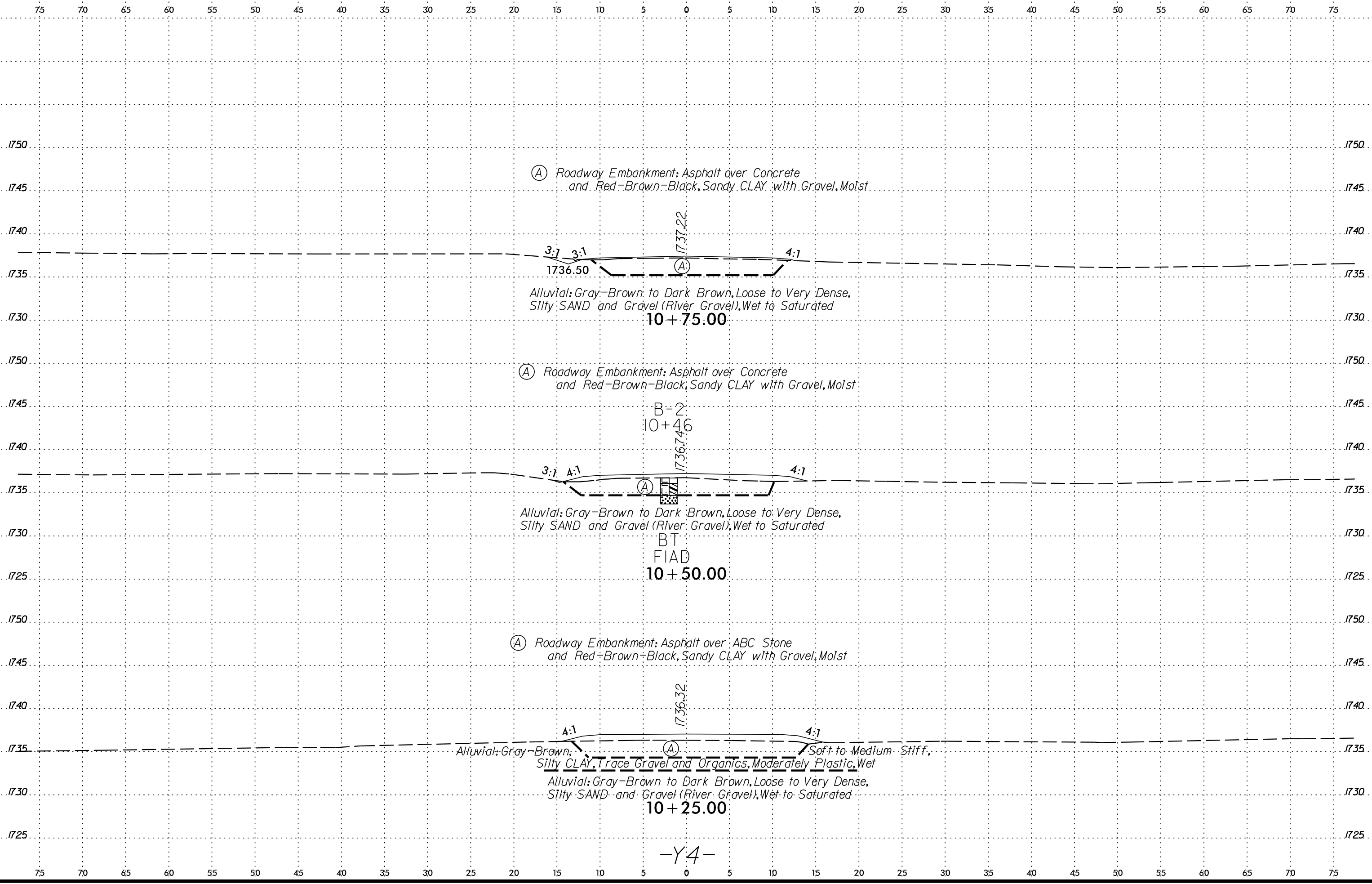
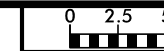
17.37.56

Residual: Dark-Brown to Tan-Brown to Brown, Very Dense, Silty SAND and Rock Fragments, Dry to Moist

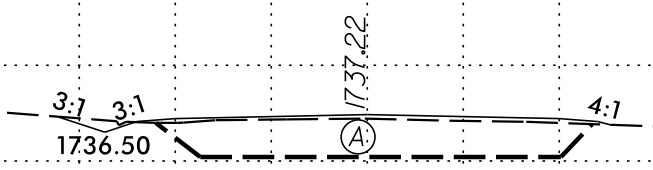
21 + 25.00

-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



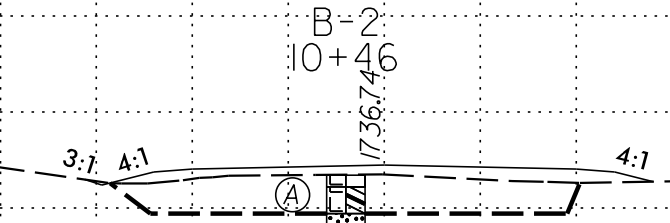
(A) Roadway Embankment: Asphalt over Concrete and Red-Brown-Black, Sandy CLAY with Gravel, Moist



Alluvial: Gray-Brown to Dark Brown, Loose to Very Dense, Silty SAND and Gravel (River Gravel), Wet to Saturated

10+75.00

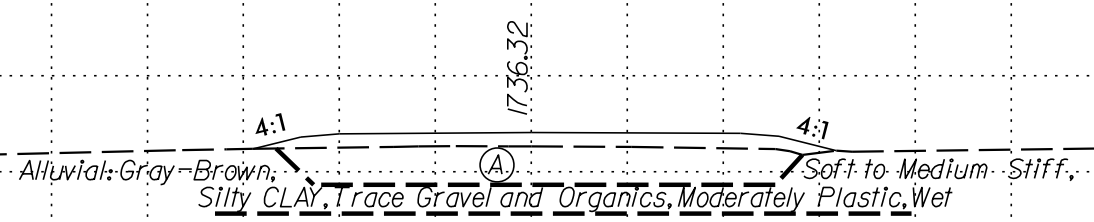
(A) Roadway Embankment: Asphalt over Concrete and Red-Brown-Black, Sandy CLAY with Gravel, Moist



Alluvial: Gray-Brown to Dark Brown, Loose to Very Dense, Silty SAND and Gravel (River Gravel), Wet to Saturated

BT
FIAD
10+50.00

(A) Roadway Embankment: Asphalt over ABC Stone and Red-Brown-Black, Sandy CLAY with Gravel, Moist



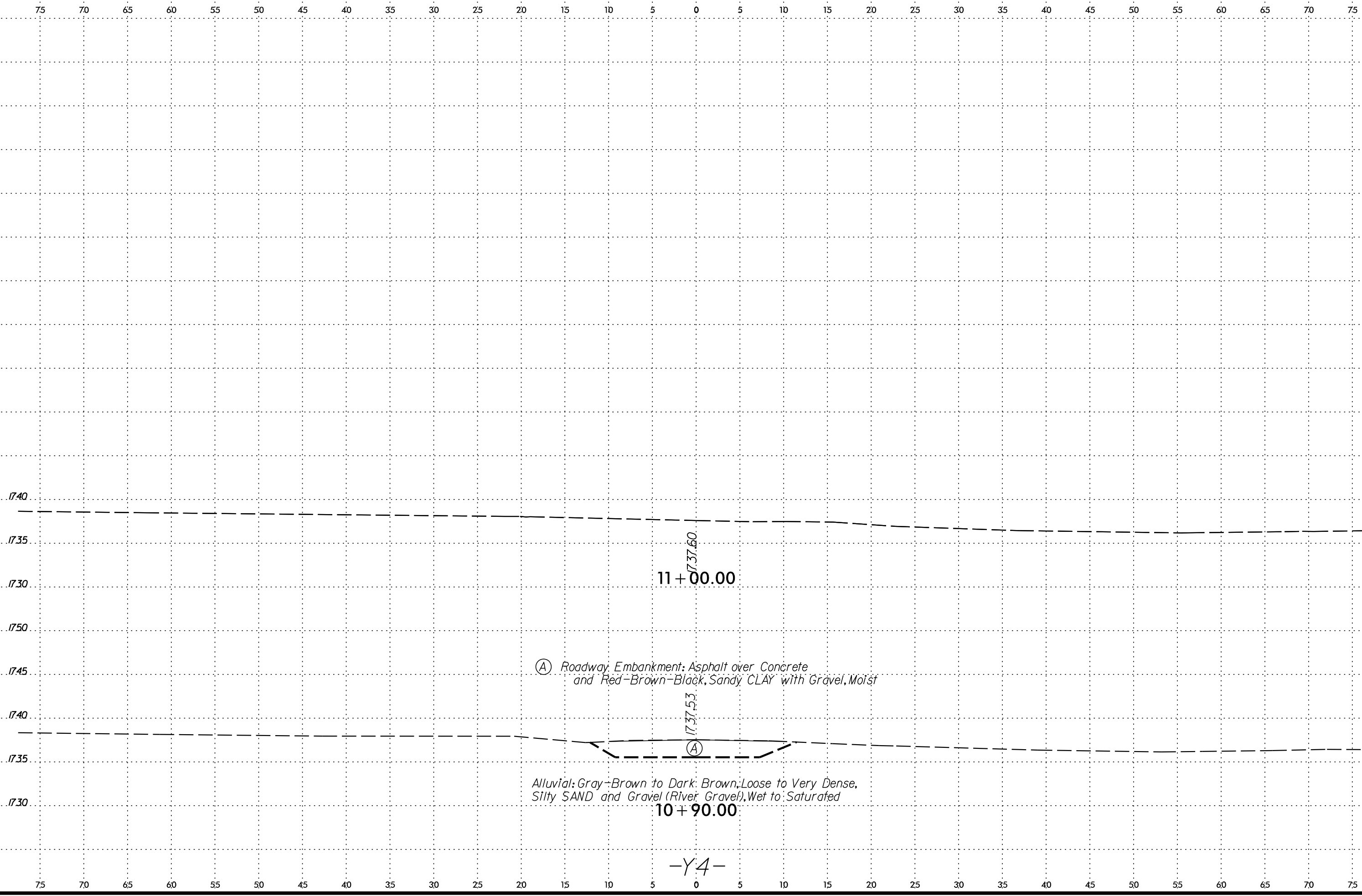
Alluvial: Gray-Brown, Silty CLAY, Trace Gravel and Organics, Moderately Plastic, Wet

Alluvial: Gray-Brown to Dark Brown, Loose to Very Dense, Silty SAND and Gravel (River Gravel), Wet to Saturated

10+25.00

-Y4-

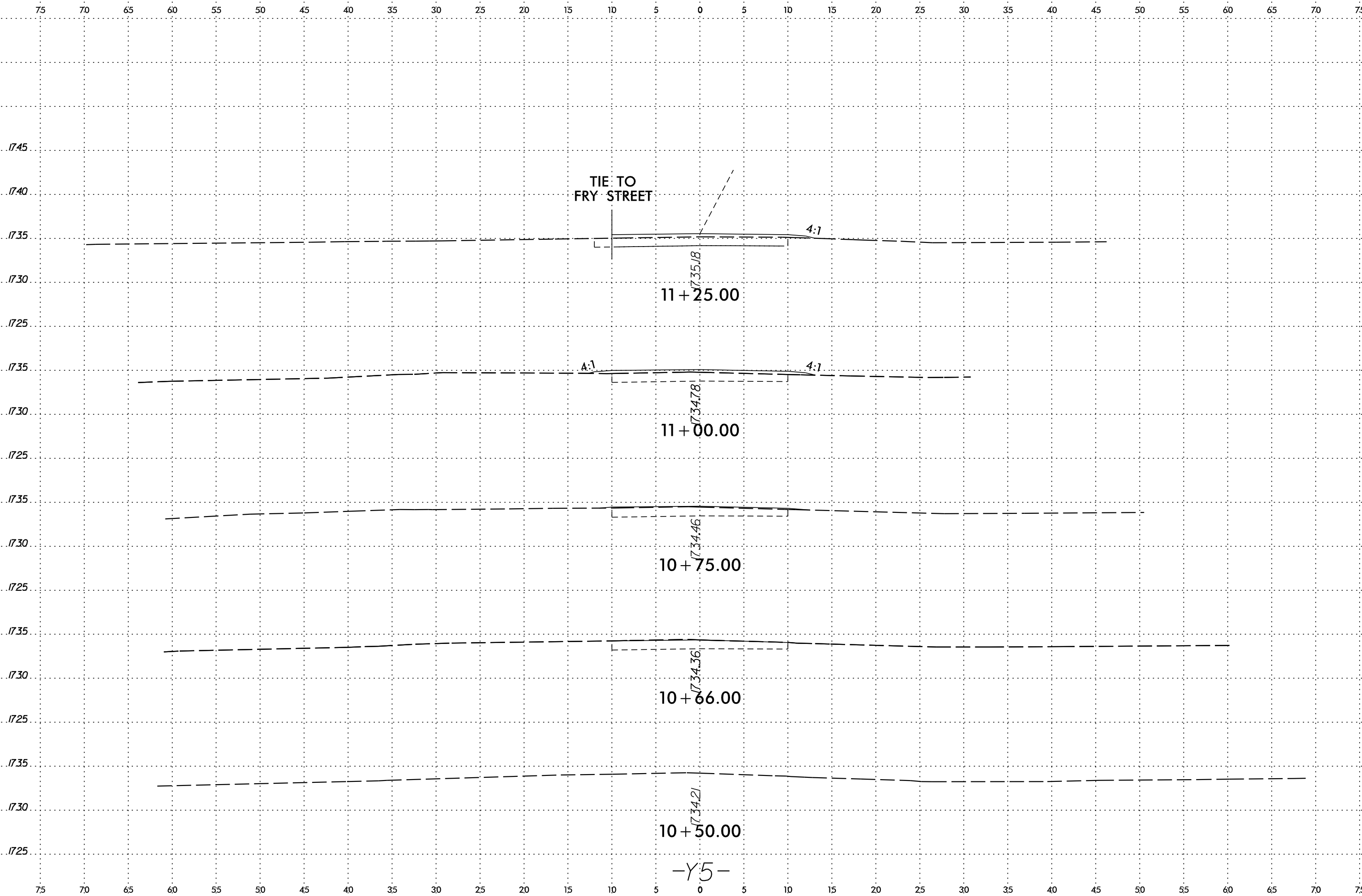
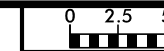
SYSTEM: \$\$\$\$
SECTION: \$\$\$\$
SUBURNAME: \$\$\$\$



SYSTEM
 SECTION
 SURNAME

-Y4-

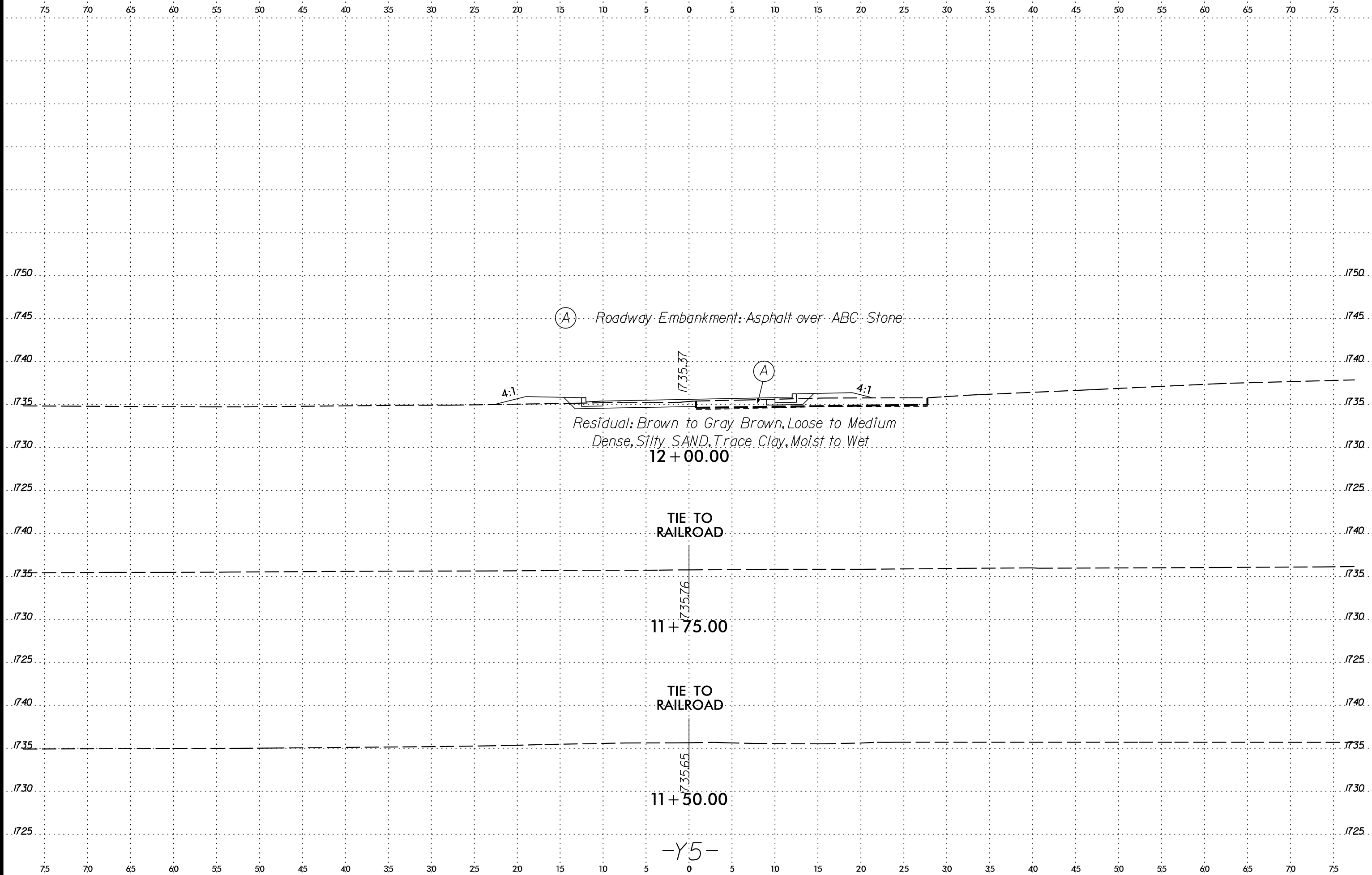
6/23/16



SYSTEM \$\$\$\$\$\$
SECTION \$\$\$\$\$\$
SUBNAME \$\$\$\$\$\$

-Y5-

6/23/16



(A) Roadway Embankment: Asphalt over ABC Stone

Residual: Brown to Gray Brown, Loose to Medium Dense, Silty SAND, Trace Clay, Moist to Wet

12 + 00.00

TIE TO RAILROAD

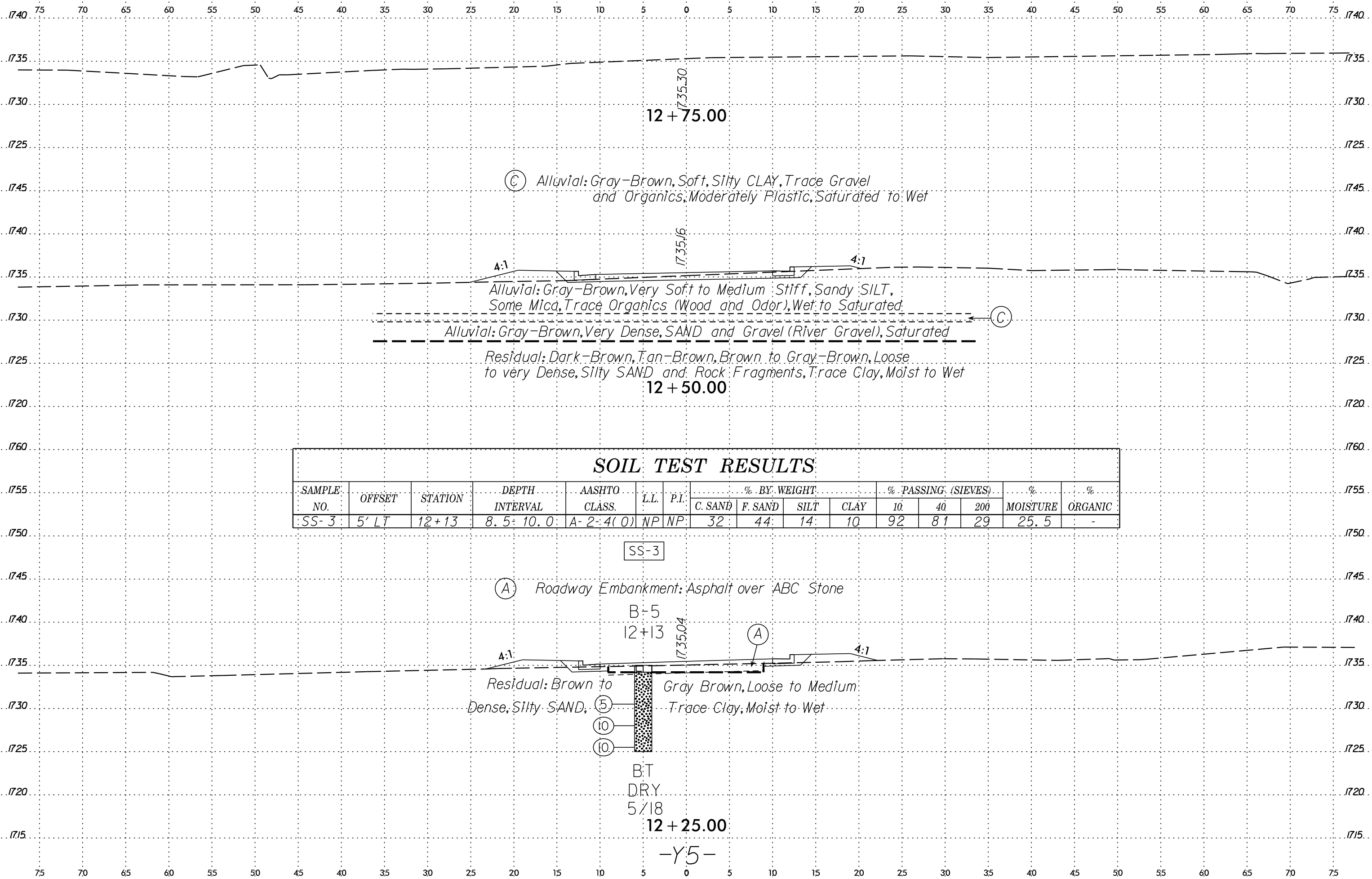
11 + 75.00

TIE TO RAILROAD

11 + 50.00

-Y5-

SYSTEM: \$\$\$\$
SECTION: \$\$\$\$
SUBURNAME: \$\$\$\$



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-3	5' LT	12+13	8.5 - 10.0	A-2-4(0)	NP	NP	32	44	14	10	92	81	29	25.5	-

SS-3

(A) Roadway Embankment: Asphalt over ABC Stone

B-5
12+13

Residual: Brown to Dense, Silty SAND, (5)
Gray Brown, Loose to Medium Trace Clay, Moist to Wet

(10)
(10)

BT
DRY
5/18
12+25.00

-Y5-

SYSTEM: \$\$\$\$\$\$
SECTION: \$\$\$\$\$\$
SUBURNAME: \$\$\$\$\$\$

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

REFERENCE: R-5843

PROJECT: 47085



ESP ASSOCIATES, INC.
7011 ALBERT PICK RD
SUITE E
GREENSBORO, NC 27409
FIRM # C-0587
WWW.ESPASSOCIATES.COM

SOILS LABORATORY TESTS RESULTS


WBS NO.: 47085.1.1

TIP NO.: R-5843

COUNTY: Swain

SITE DESCRIPTION: Intersection and Roadway Improvements in Downtown Bryson City

BORING NO.	SAMPLE NO.	BORING LOCATION	DEPTH INTERVAL (FT)	AASHTO CLASS	N	L.L	P.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
								CSE. SAND	F. SAND	SILT	CLAY	10	40	200		
B-3	SS-1	-L- 20+92, 4' LT	3.5-5.0	A-7-6 (9)	2	43	16	10	29	27	34	95	91	65	43.5	-
B-4	SS-2	-L1- 18+48, 3' LT	6.0-7.5	A-4 (3)	0	28	10	16	36	26	22	100	92	56	29.7	4.3
B-5	SS-3	-Y5- 12+13, 5' LT	8.5-10.0	A-2-4 (0)	10	NP	NP	32	44	14	10	92	81	29	25.5	-
B-6	SS-4	-L1-17+07, 6' LT	8.5-10.0	A-4 (1)	5	30	6	15	48	24	13	100	97	48	37.1	3.5
B-10	G-1	-L- 21+75, 7' RT	0.9-2.0	A-4 (0)	N/A	29	5	31	30	22	17	88	71	40	18.0	-
B-11	G-2	Y2- 15+02, 8' RT	2.0-3.0	A-4 (3)	N/A	28	10	18	28	23	31	92	82	56	25.5	-
B-14	G-3	-Y1- 13+57, 5' RT	0.9-3.0	A-6 (10)	N/A	35	15	9	24	32	35	98	93	75	30.8	4.2


 Certification No. 121-01-1108

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
APPENDIX B
BORE LOGS

REFERENCE: R-5843

PROJECT: 47085



ESP ASSOCIATES, INC.
7011 ALBERT PICK RD
SUITE E
GREENSBORO, NC 27409
FIRM # C-0587
WWW.ESPASSOCIATES.COM

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 47085.1.1	TIP R-5843	COUNTY SWAIN	GEOLOGIST Pastrana, C.R.
SITE DESCRIPTION Intersection Improvements in Downtown Bryson City			GROUND WTR (ft)
BORING NO. B-1	STATION 20+92	OFFSET 4 ft LT	ALIGNMENT -L1-
COLLAR ELEV. 1,737.0 ft	TOTAL DEPTH 10.0 ft	NORTHING 641,865	EASTING 676,583
DRILL RIG/HAMMER EFF./DATE F&R3495 CME-55 83% 02/05/2018		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER Tignor, D.	START DATE 05/29/18	COMP. DATE 05/29/18	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
1740																
														1,737.0	0.0	GROUND SURFACE
														1,736.3	0.7	2.75 in Asphalt over 5.5 in ABC Stone
1735														1,733.0	4.0	ROADWAY EMBANKMENT Red-Brown-Black, Sandy CLAY with Gravel
	1,733.5	3.5	4	3	4											
	1,731.0	6.0	21	23	55											
1730														1,729.0	8.0	RESIDUAL Dark Brown, Silty SAND with Rock Fragments
	1,728.5	8.5	25	36	58									1,727.0	10.0	Brown to Tan-Brown, Silty SAND and Rock Fragments
																Boring Terminated at Elevation 1,727.0 ft In Residual Soil: SAND and Rock Fragments

WBS 47085.1.1	TIP R-5843	COUNTY SWAIN	GEOLOGIST Pastrana, C.R.
SITE DESCRIPTION Intersection Improvements in Downtown Bryson City			GROUND WTR (ft)
BORING NO. B-2	STATION 10+46	OFFSET 2 ft LT	ALIGNMENT -Y4-
COLLAR ELEV. 1,736.7 ft	TOTAL DEPTH 3.0 ft	NORTHING 641,854	EASTING 676,484
DRILL RIG/HAMMER EFF./DATE F&R3495 CME-55 83% 02/05/2018		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER Tignor, D.	START DATE 05/29/18	COMP. DATE 05/29/18	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
1740																
														1,736.7	0.0	GROUND SURFACE
														1,736.1	0.6	1.25 in Asphalt over 5.75 in Concrete
1735														1,734.7	2.0	ROADWAY EMBANKMENT Black-Brown, Sandy CLAY, Trace Organics
														1,733.7	3.0	ALLUVIAL Dark Brown, Silty SAND
																Boring Terminated at Elevation 1,733.7 ft In Alluvial: Silty SAND

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 47085.1.1		TIP R-5843		COUNTY SWAIN		GEOLOGIST Pastrana, C.R.								
SITE DESCRIPTION Intersection Improvements in Downtown Bryson City							GROUND WTR (ft)							
BORING NO. B-3		STATION 19+44		OFFSET CL		ALIGNMENT -L1-								
COLLAR ELEV. 1,735.6 ft		TOTAL DEPTH 10.0 ft		NORTHING 641,767		EASTING 676,475								
DRILL RIG/HAMMER EFF./DATE F&R3495 CME-55 83% 02/05/2018			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER Tignor, D.		START DATE 05/29/18		COMP. DATE 05/29/18		SURFACE WATER DEPTH N/A								
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
1740														
1735														
1730	1,732.1	3.5	1	1	1						SS-1	43%	GROUND SURFACE 2.5 in Asphalt over 3.5 in ABC Stone	
	1,729.6	6.0	2	1	4							W	ALLUVIAL Gray-Brown, Silty CLAY, Trace Gravel and Organics, Moderately Plastic	
	1,727.1	8.5	6	12	22							Sat.	Gray-Brown, SAND and GRAVEL (River Gravel) Note: Blow Counts Influenced by Gravel Boring Terminated at Elevation 1,725.6 ft In Alluvial: SAND and GRAVEL	

WBS 47085.1.1		TIP R-5843		COUNTY SWAIN		GEOLOGIST Pastrana, C.R.								
SITE DESCRIPTION Intersection Improvements in Downtown Bryson City							GROUND WTR (ft)							
BORING NO. B-4		STATION 18+48		OFFSET 3 ft LT		ALIGNMENT -L1-								
COLLAR ELEV. 1,733.8 ft		TOTAL DEPTH 15.0 ft		NORTHING 641,686		EASTING 676,424								
DRILL RIG/HAMMER EFF./DATE F&R3495 CME-55 83% 02/05/2018			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER Tignor, D.		START DATE 05/29/18		COMP. DATE 05/29/18		SURFACE WATER DEPTH N/A								
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
1735														
1730	1,730.3	3.5	WOH	1	2							Sat.	GROUND SURFACE 2.75 in Asphalt over 3.5 in ABC Stone	
	1,727.8	6.0	WOH	WOH	WOH							SS-2	ALLUVIAL Gray-Brown, Sandy SILT, Trace Organics (Wood Fragments and Odor)	
1725	1,725.3	8.5	WOH	WOH	3							M		
1720	1,720.3	13.5	10	10	14							M	RESIDUAL Tan-Brown to Brown, Silty SAND with Rock Fragments Boring Terminated at Elevation 1,718.8 ft In Residual: Silty SAND	

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 47085.1.1		TIP R-5843		COUNTY SWAIN		GEOLOGIST Pastrana, C.R.										
SITE DESCRIPTION Intersection Improvements in Downtown Bryson City							GROUND WTR (ft)									
BORING NO. B-5		STATION 12+13		OFFSET 5 ft LT		ALIGNMENT -Y5-										
COLLAR ELEV. 1,735.0 ft		TOTAL DEPTH 10.0 ft		NORTHING 641,668		EASTING 676,492										
DRILL RIG/HAMMER EFF./DATE F&R3495 CME-55 83% 02/05/2018			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER Tignor, D.		START DATE 05/30/18		COMP. DATE 05/30/18		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
1735															1,735.0	0.0
															1,734.2	0.8
	1,731.5	3.5														
1730																
	1,729.0	6.0	2	2	3											
	1,726.5	8.5	3	4	6											
1725															1,725.0	10.0

WBS 47085.1.1		TIP R-5843		COUNTY SWAIN		GEOLOGIST Pastrana, C.R.										
SITE DESCRIPTION Intersection Improvements in Downtown Bryson City							GROUND WTR (ft)									
BORING NO. B-6		STATION 17+07		OFFSET 6 ft LT		ALIGNMENT -L1-										
COLLAR ELEV. 1,734.2 ft		TOTAL DEPTH 15.0 ft		NORTHING 641,607		EASTING 676,313										
DRILL RIG/HAMMER EFF./DATE F&R3495 CME-55 83% 02/05/2018			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER Tignor, D.		START DATE 05/30/18		COMP. DATE 05/30/18		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
1735															1,734.2	0.0
															1,731.3	2.9
	1,730.7	3.5	1	1	1											
1730																
	1,728.2	6.0	WOH	2	3											
	1,725.7	8.5	2	1	4											
1725																
	1,720.7	13.5	37	27	38											
1720																

NCDOT BORE DOUBLE R5843_GEO_GINTLOGS.GPJ NC_DOT_GDT 7/5/18

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 47085.1.1		TIP R-5843		COUNTY SWAIN		GEOLOGIST Pastrana, C.R.									
SITE DESCRIPTION Intersection Improvements in Downtown Bryson City							GROUND WTR (ft)								
BORING NO. B-15		STATION 12+14		OFFSET 6 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 1,728.7 ft		TOTAL DEPTH 5.0 ft		NORTHING 641,013		EASTING 674,678									
DRILL RIG/HAMMER EFF./DATE F&R3495 CME-55 83% 02/05/2018				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER Tignor, D.		START DATE 05/31/18		COMP. DATE 05/31/18		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
1730														GROUND SURFACE	0.0
														Asphalt over Concrete	0.9
														ROADWAY EMBANKMENT	1.4
														Moist, Black-Brown, Silty SAND	
1725	1,725.2	3.5	1	1	2								Sat.	RESIDUAL	5.0
														Gray with Tan-Brown, Silty CLAY	
														Boring Terminated at Elevation 1,723.7 ft In Residual Soil: CLAY	

NCDOT BORE DOUBLE R5843_GEO_GINTLOGS.GPJ NC_DOT_GDT 7/5/18