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SUBMITTED BY: PATRICK ALTON

DocuSigned by:

Patrick Alton

7/3/2019

A270EF78A6DF442...

SUBSURFACE INVENTORY

PT 2 OF 2

6/23/16



PROJ. REFERENCE NO.	SHEET NO.
I-4400BB	77



25-JUN-2019 15:28
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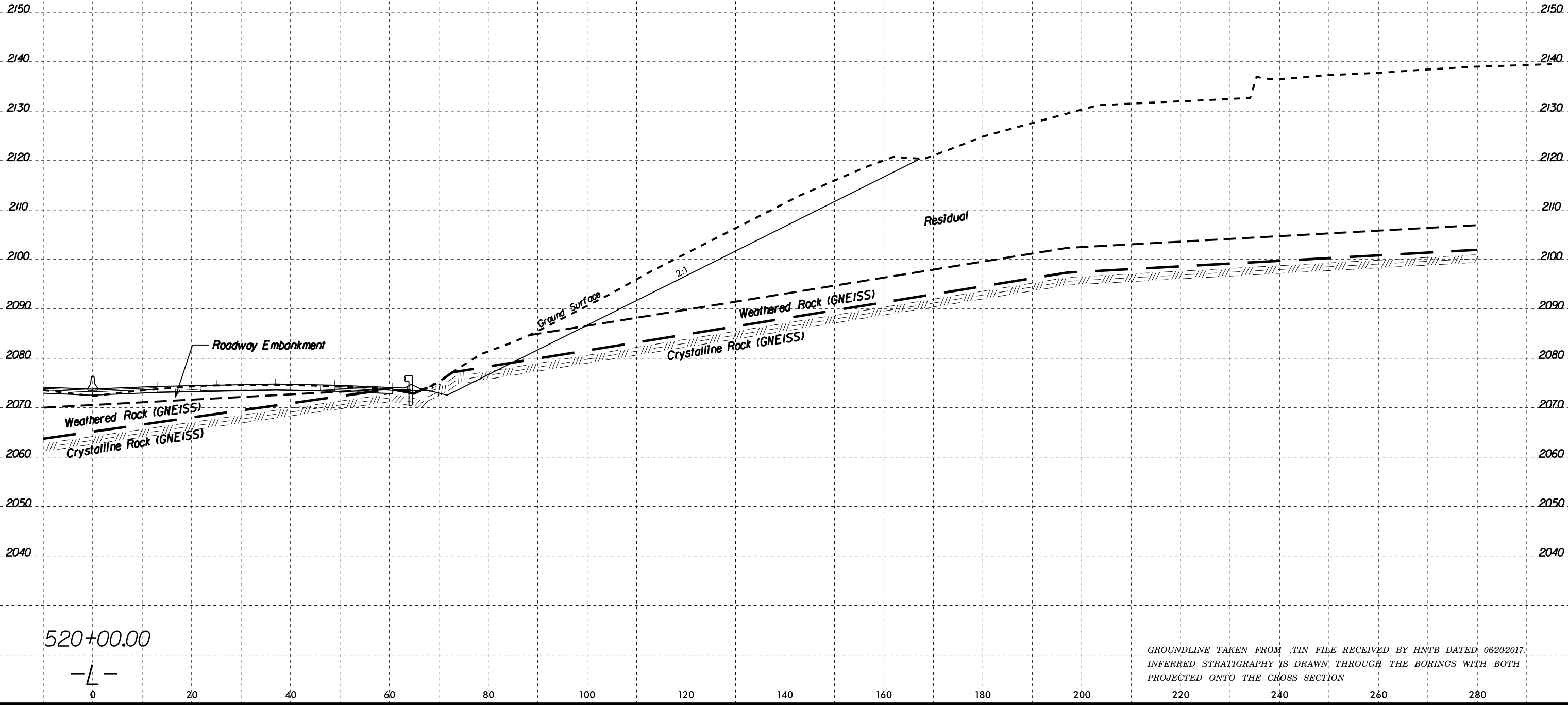
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 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
 PROJECTED ONTO THE CROSS SECTION

6/23/16
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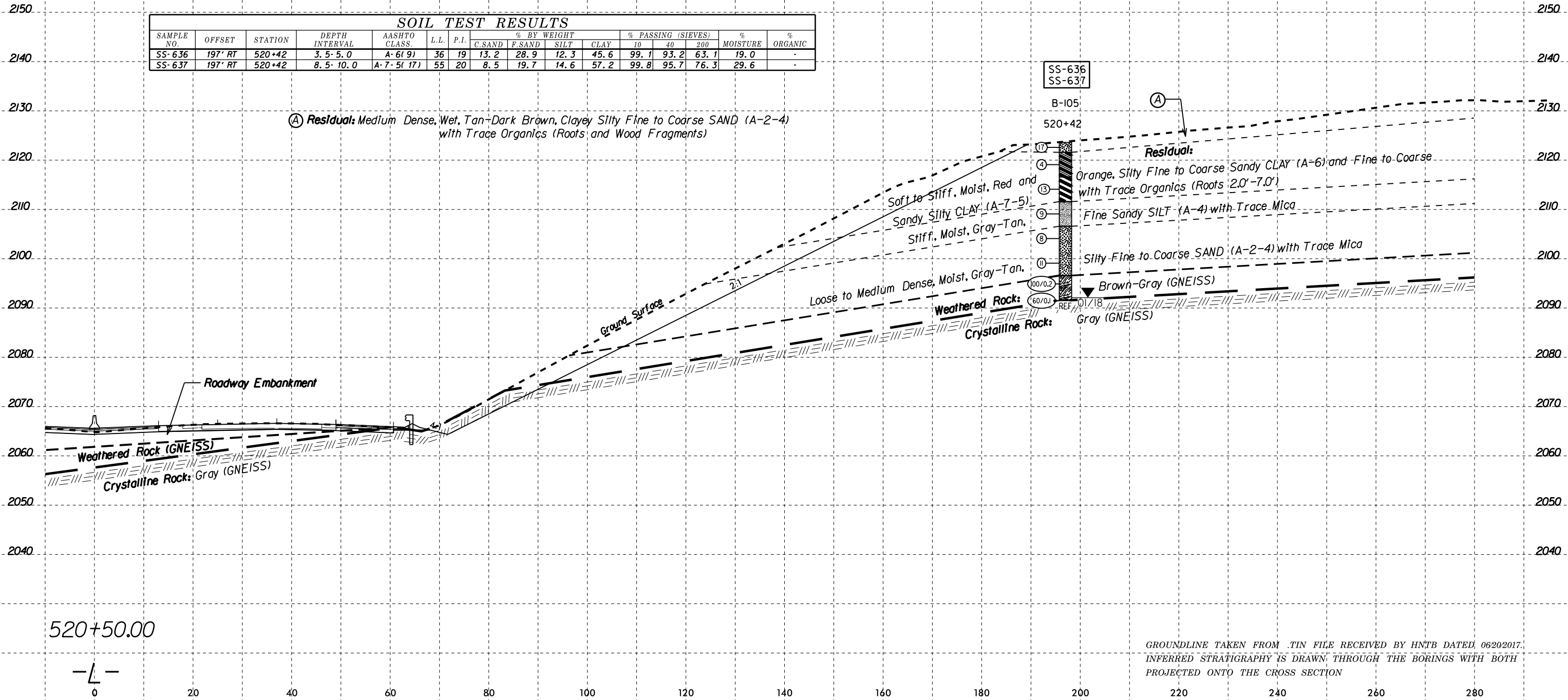
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520+00.00



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 PROJECTED ONTO THE CROSS SECTION



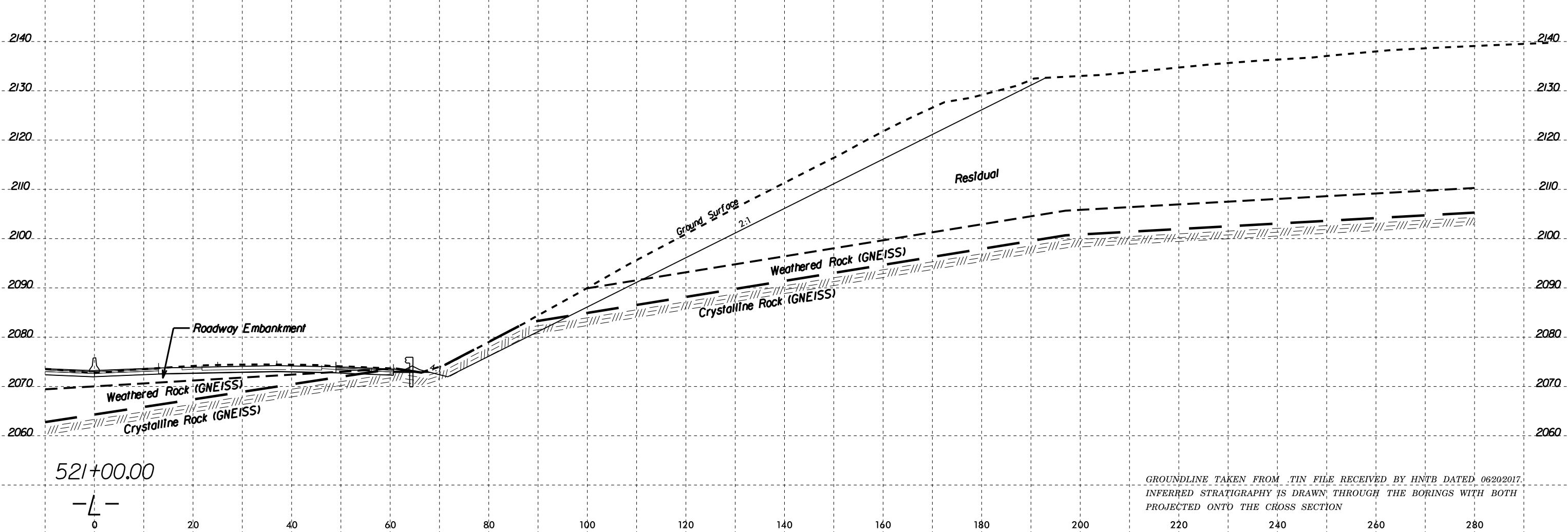
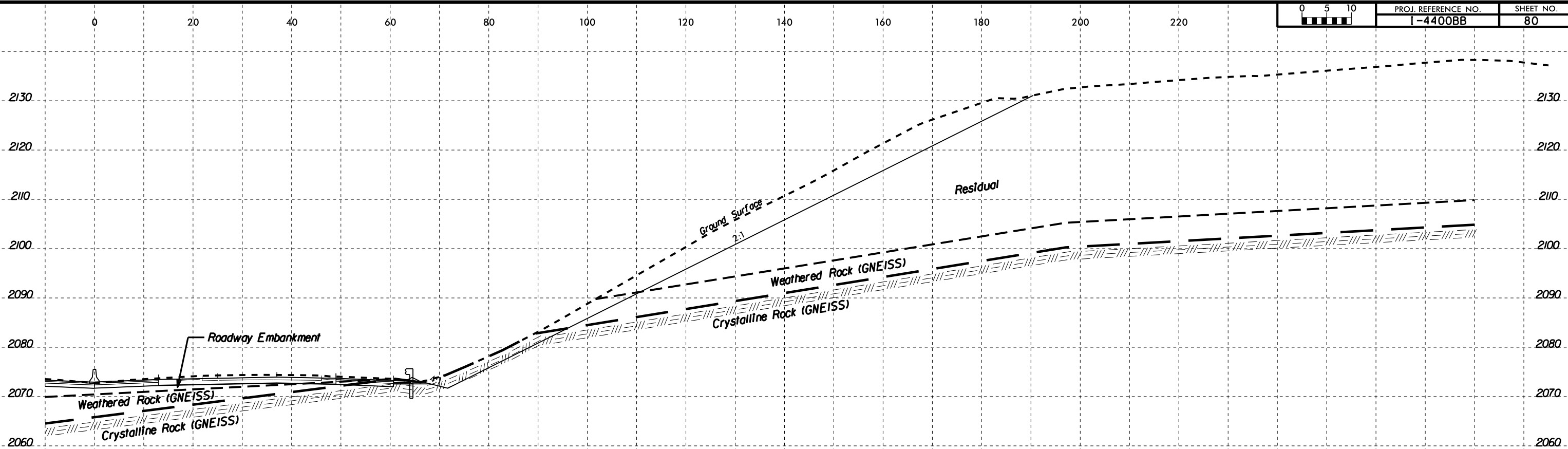
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6/23/16



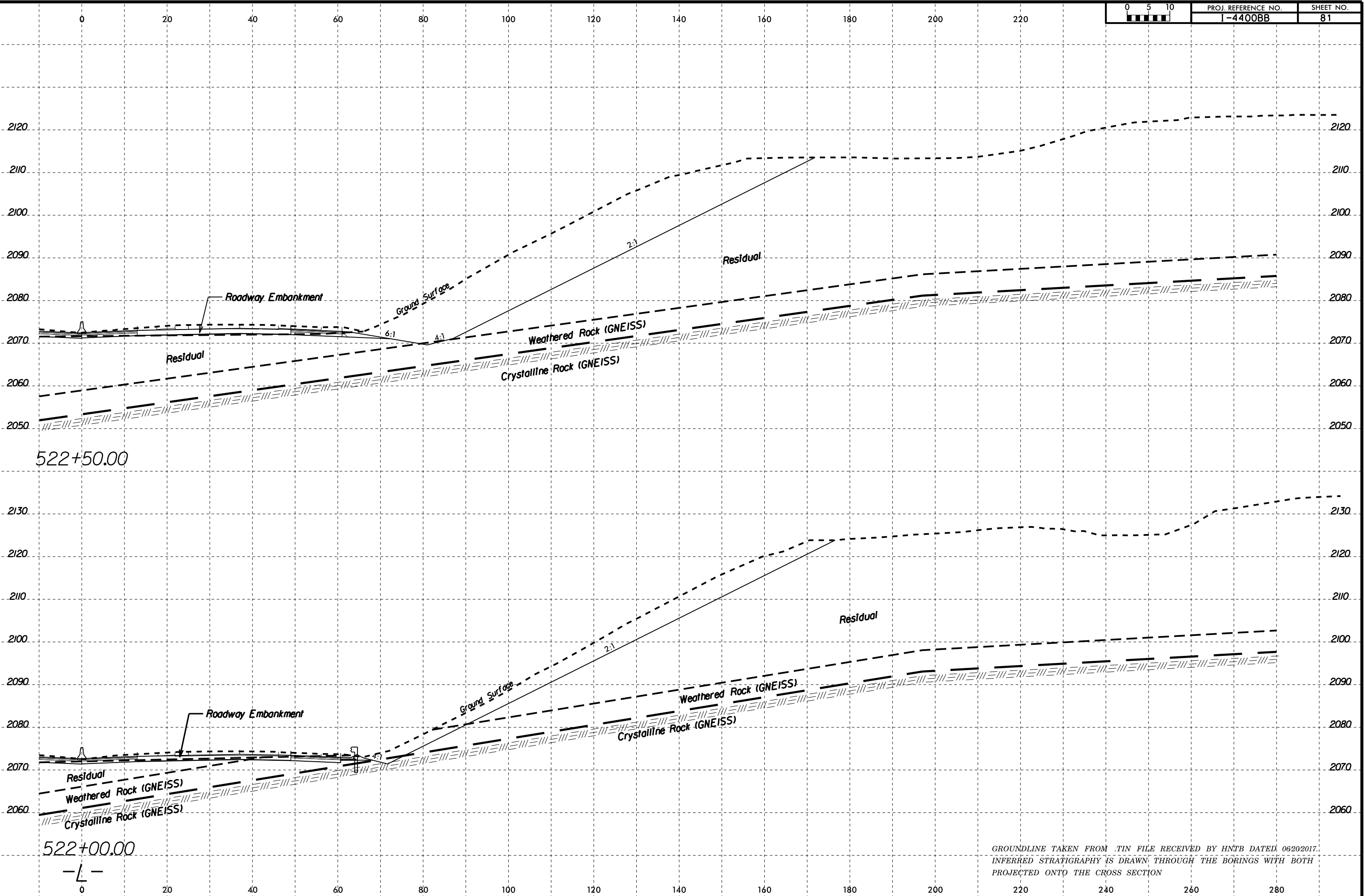
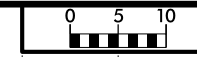
PROJ. REFERENCE NO.	SHEET NO.
I-4400BB	80



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 PROJECTED ONTO THE CROSS SECTION

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6/23/16

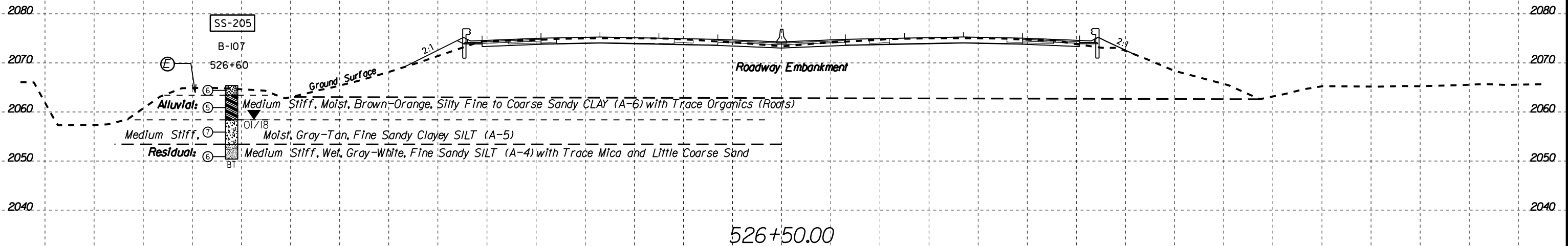


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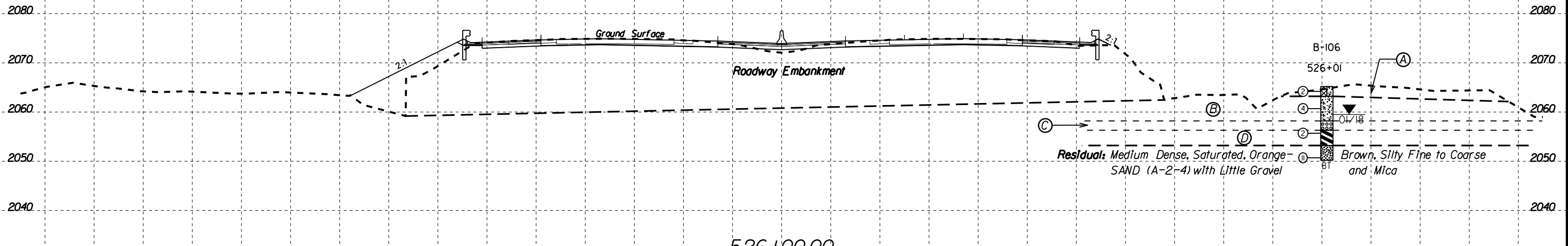
GROUNDLINE TAKEN FROM .TIN FILE RECEIVED BY HNTB DATED 06/20/2017.
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
 PROJECTED ONTO THE CROSS SECTION

- (A) Artificial Fill: Soft, Wet, Dark Brown, Fine Sandy Clayey SILT (A-5) with Trace Organics (Roots)
- (B) Alluvial: Soft to Medium Stiff, Wet, Dark Gray, Fine Sandy Clayey SILT (A-5) with Trace Organics (Roots)
- (C) Alluvial: Very Loose, Saturated, Tan, Fine to Coarse SAND (A-1-a) with Trace Organics (Roots) and Gravel
- (D) Alluvial: Soft, Wet, Gray, Fine Sandy Silty CLAY (A-7) with Trace Organics (Roots)
- (E) Alluvial: Loose, Moist, Brown-Tan, Silty Fine to Coarse SAND (A-2-4) with Trace Organics (Roots)

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-205	112' LT	526+60	3.5-5.0	A-6(3)	31	11	25.3	28.1	15.0	31.6	96.6	81.4	51.0	16.7	-



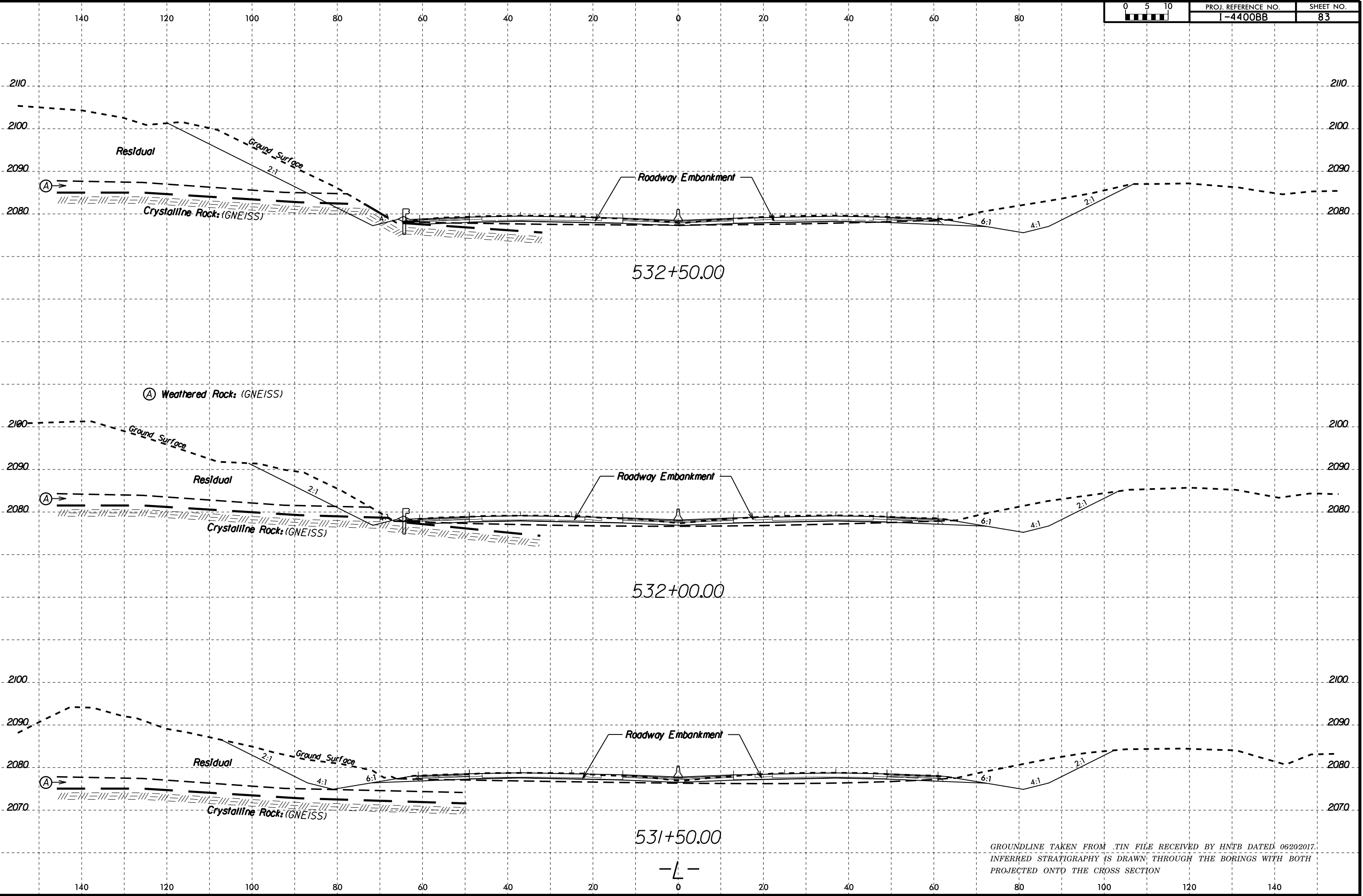
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526+00.00

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6/23/16

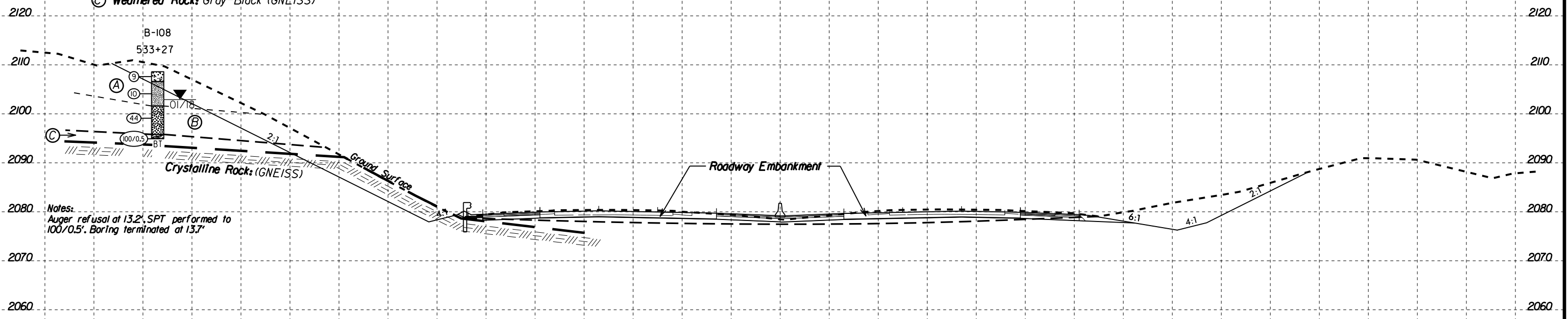


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Walker_A\660261102

GROUNDLINE TAKEN FROM .TIN FILE RECEIVED BY HNTB DATED 06/20/2017.
INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
PROJECTED ONTO THE CROSS SECTION

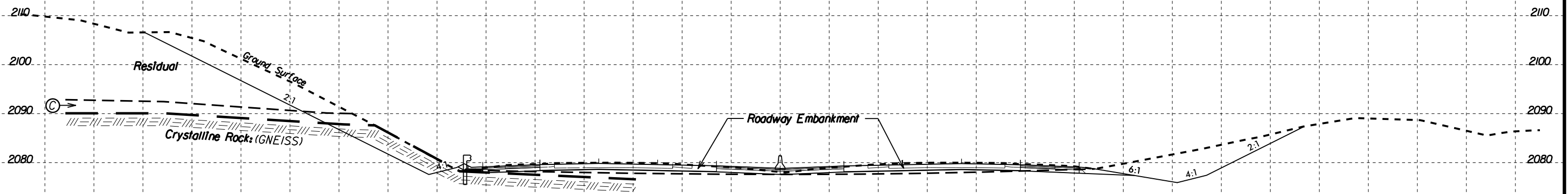
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- (A) Residual: Stiff, Moist, Brown-Red to Yellow-Gray, Fine Sandy Clayey SILT (A-5) and Fine Sandy SILT (A-4) with Trace Mica, Organics (Wood), Coarse Sand, and Rock Fragments
- (B) Residual: Dense, Moist, Gray-Red, Silty Fine to Coarse SAND (A-2-4) with Trace Gravel and Mica
- (C) Weathered Rock: Gray-Black (GNEISS)



Notes:
Auger refusal at 13.2'. SPT performed to 100'/0.5'. Boring terminated at 13.7'

533+50.00

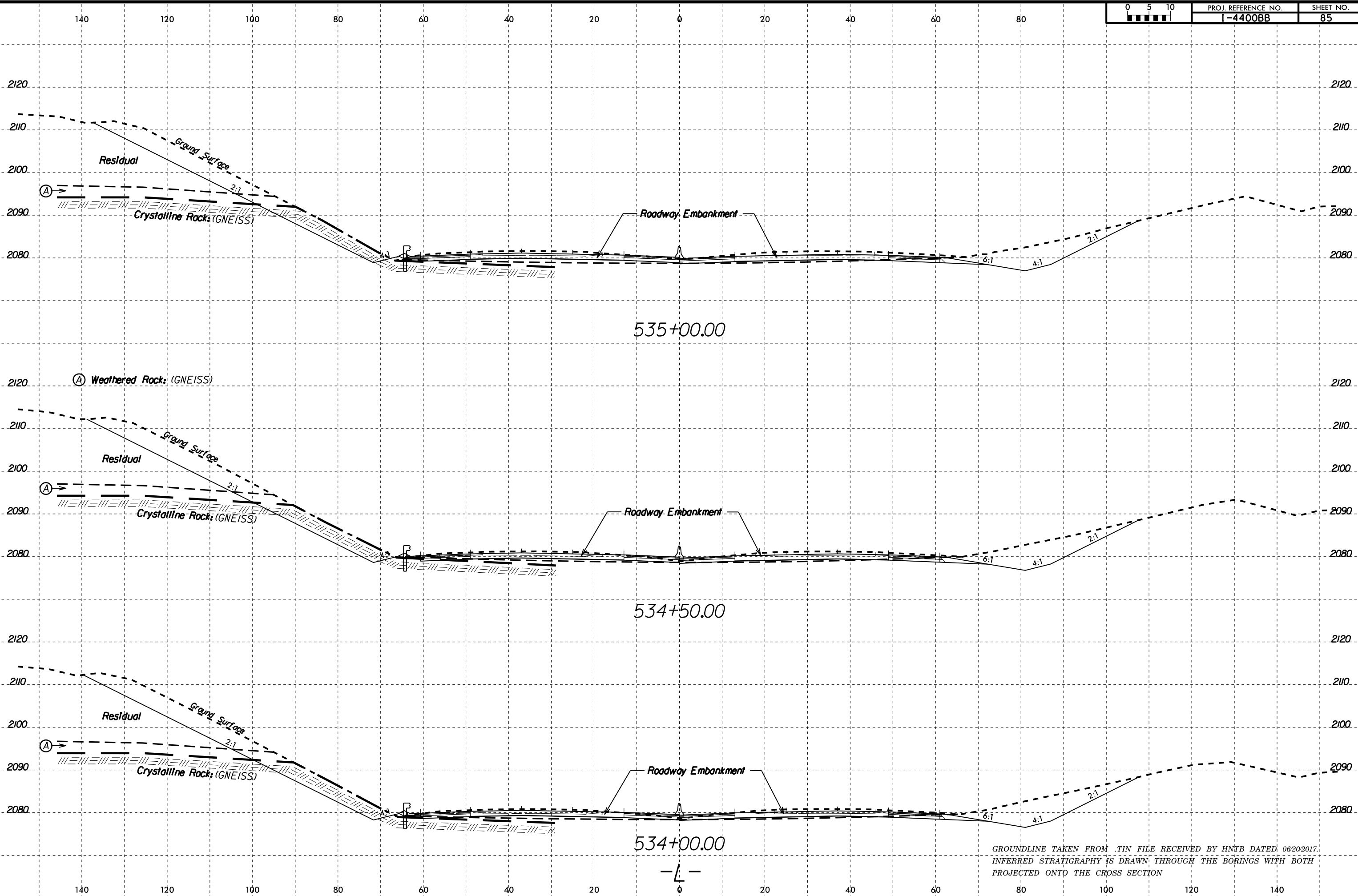


533+00.00



GROUNDLINE TAKEN FROM .TIN FILE RECEIVED BY HNTB DATED 06/20/2017.
INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
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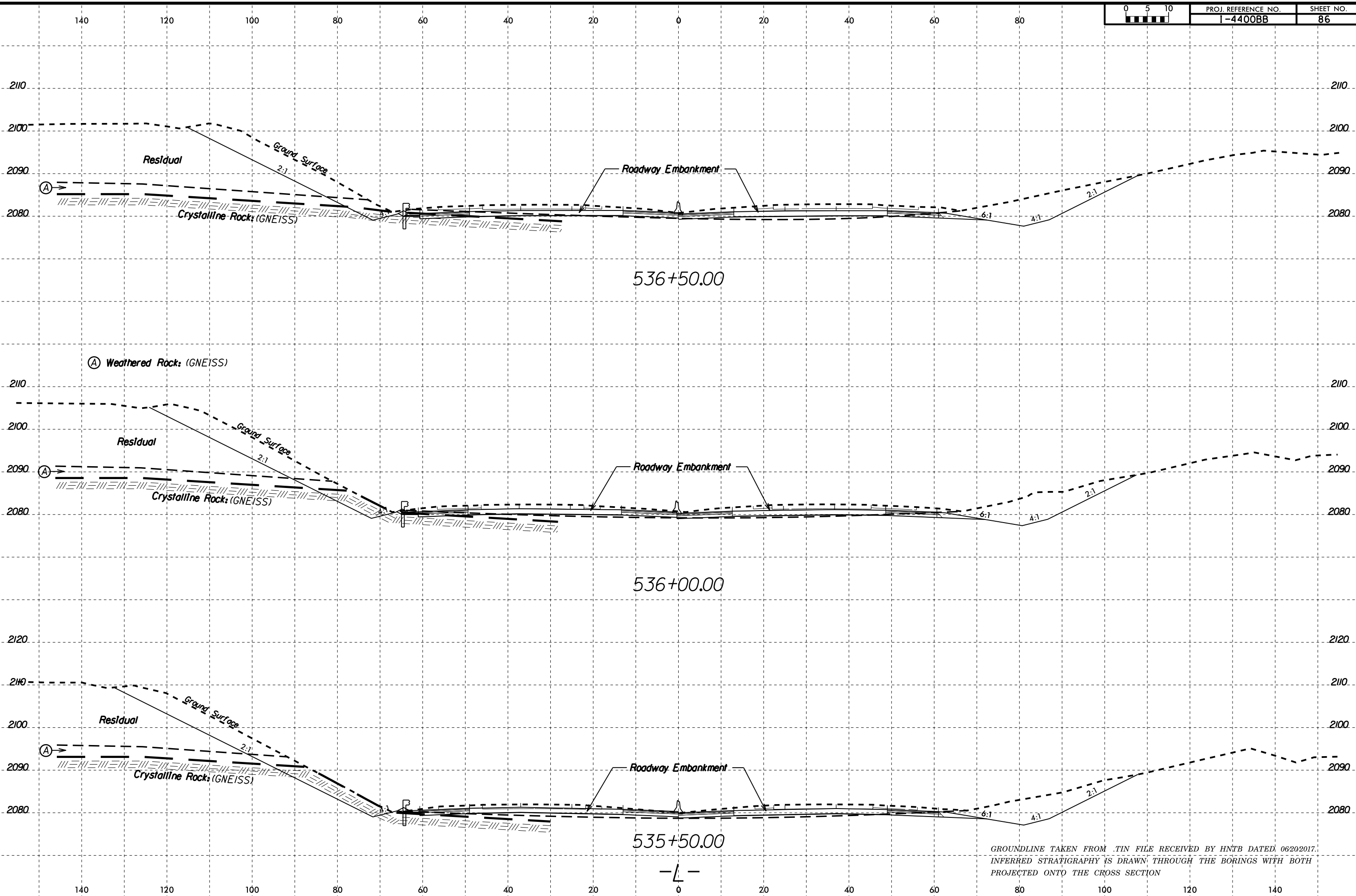
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 T.Walker

GROUNDLINE TAKEN FROM .TIN FILE RECEIVED BY HNTB DATED 06/20/2017.
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
 PROJECTED ONTO THE CROSS SECTION

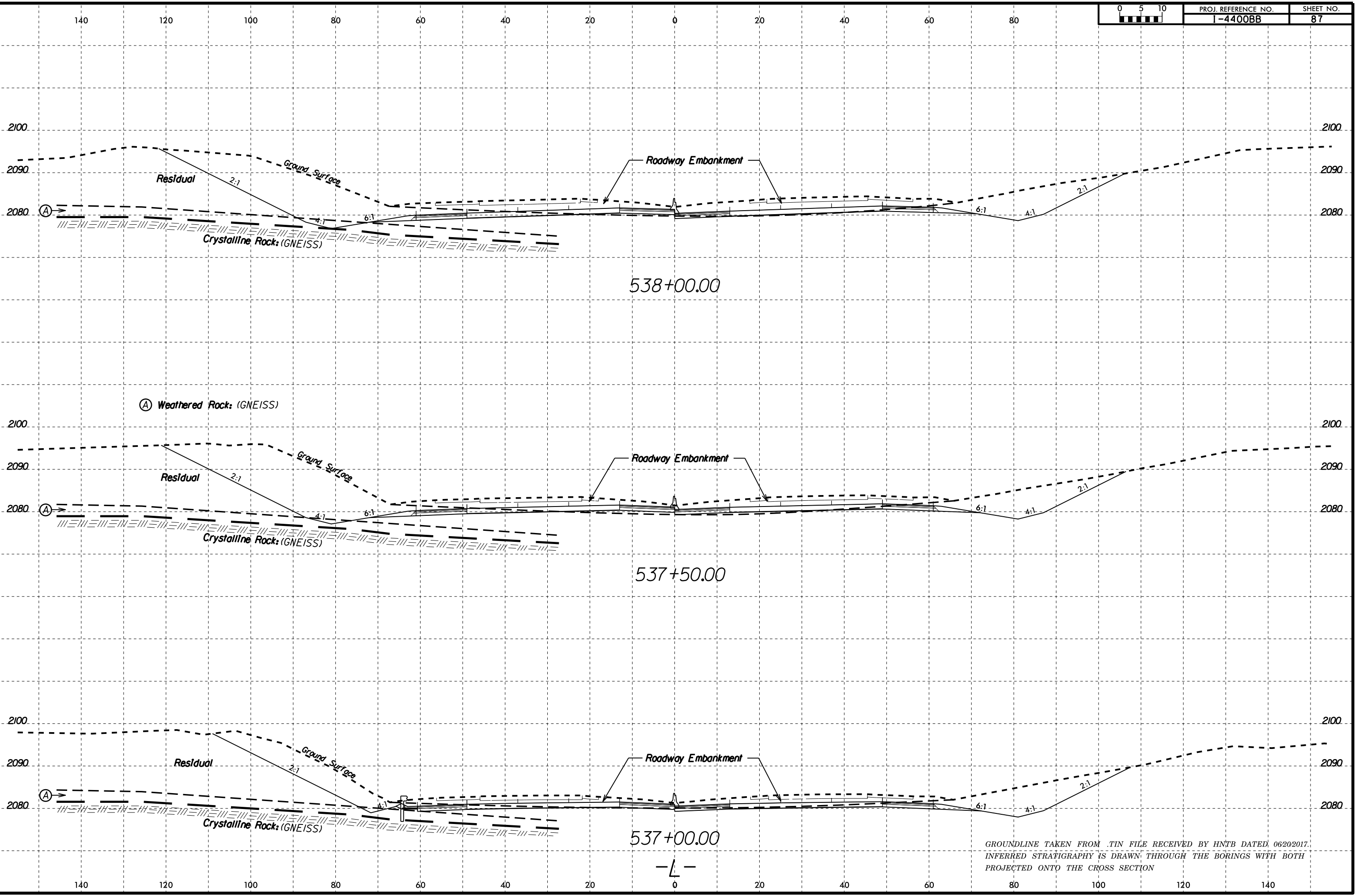
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 T.Walker

GROUNDLINE TAKEN FROM .TIN FILE RECEIVED BY HNTB DATED 06/20/2017.
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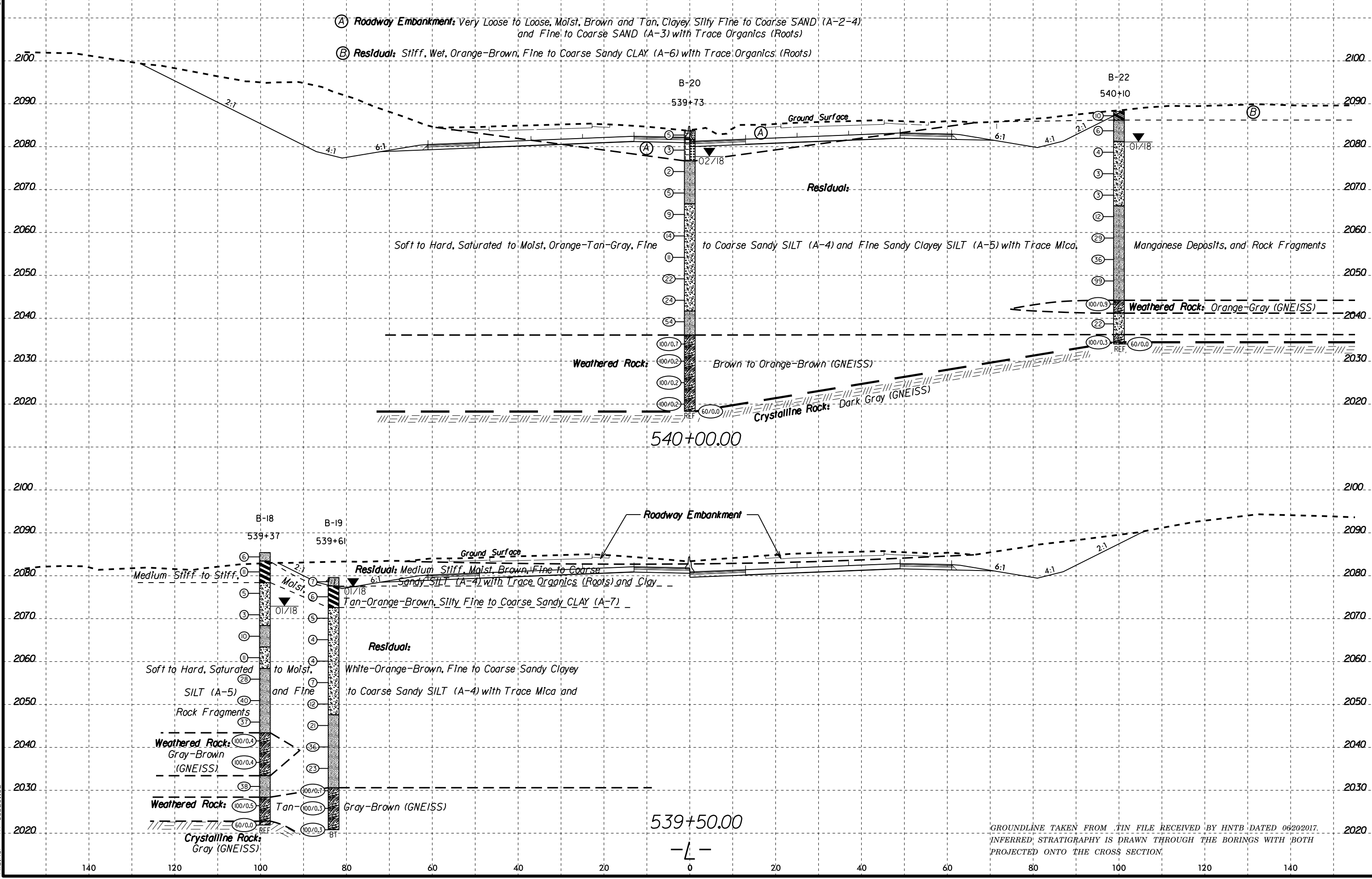
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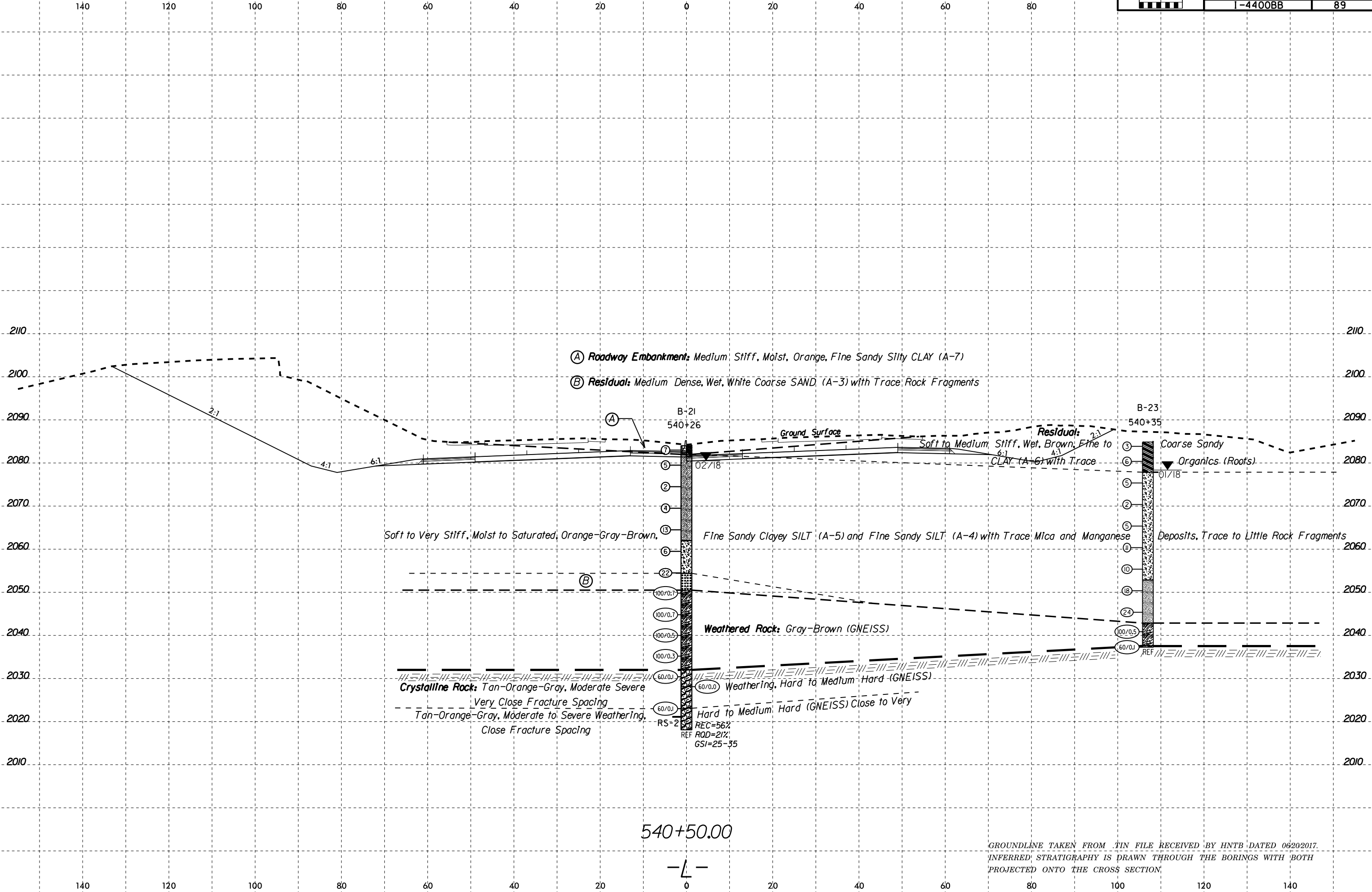


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 T.Walker

GROUNDLINE TAKEN FROM .TIN FILE RECEIVED BY HNTB DATED 06/20/2017.
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
 PROJECTED ONTO THE CROSS SECTION

6/23/16
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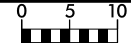


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GROUNDLINE TAKEN FROM TIN FILE RECEIVED BY HNTB DATED 06/20/2017.
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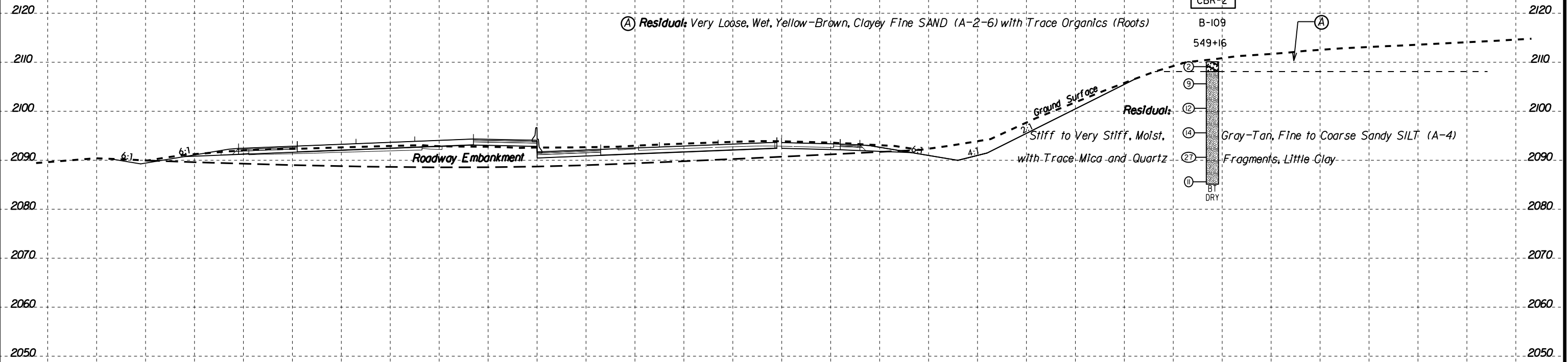
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PROJ. REFERENCE NO. I-4400BB SHEET NO. 90

SOIL TEST RESULTS															
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							C. SAND	F. SAND	SILT	CLAY	10	40	200		
CBR-2	138' RT	549+16	3.3-25.0	A-4(O)	NP	NP	19.3	34.4	30.5	15.8	98.7	86.7	56.0	12.6	-



549+00.00

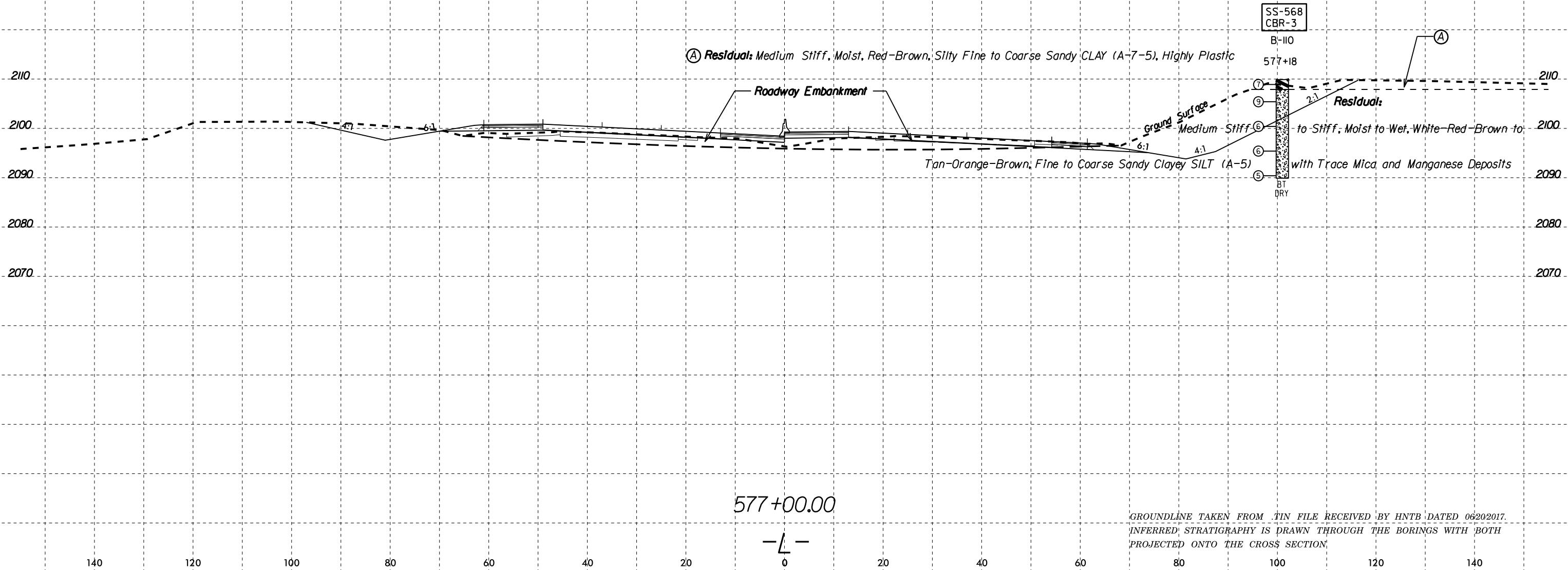
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GROUNDLINE TAKEN FROM TIN FILE RECEIVED BY HNTB DATED 06/20/2017. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION.

27 JUN 2019 11:13 AM Project: I-4400B Henderson Co.\\I-4400B_GEO_RDWY_CADD_GEO\TECH\ssc\14400B_geo_xsl.L -2.dgn

140 120 100 80 60 40 20 0 20 40 60 80

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-568	10' RT	577+18	0.2-1.5	A-7.5(27)	69	27	6.2	15.4	14.1	64.3	98.4	95.8	81.0	27.9	-
CBR-3	10' RT	577+18	3.5-10.0	A-5(4)	44	3	10.3	27.3	31.4	31.0	99.7	94.6	70.6	32.3	-



(A) Residual: Medium Stiff, Moist, Red-Brown, Silty Fine to Coarse Sandy CLAY (A-7-5), Highly Plastic

Roadway Embankment

SS-568
CBR-3

B-110
577+18

Residual:

to Stiff, Moist to Wet, White-Red-Brown to Tan-Orange-Brown, Fine to Coarse Sandy Clayey SILT (A-5) with Trace Mica and Manganese Deposits

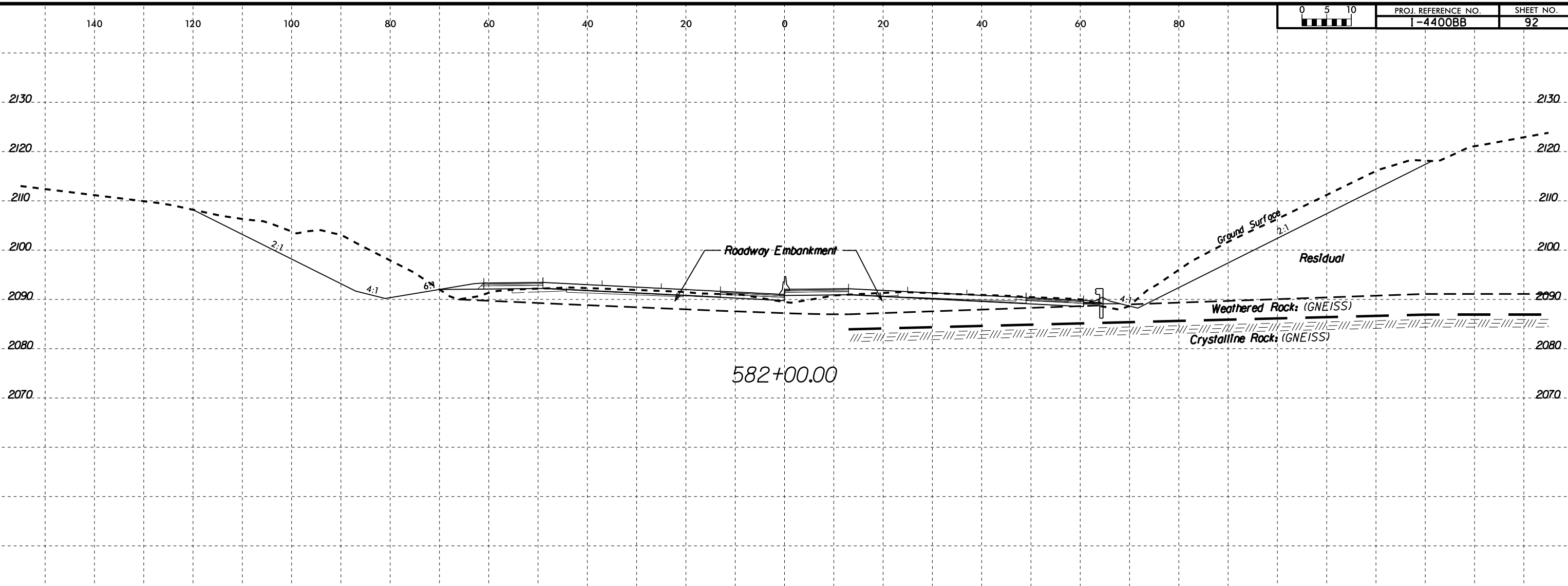
BT
DRY

577+00.00

-L-

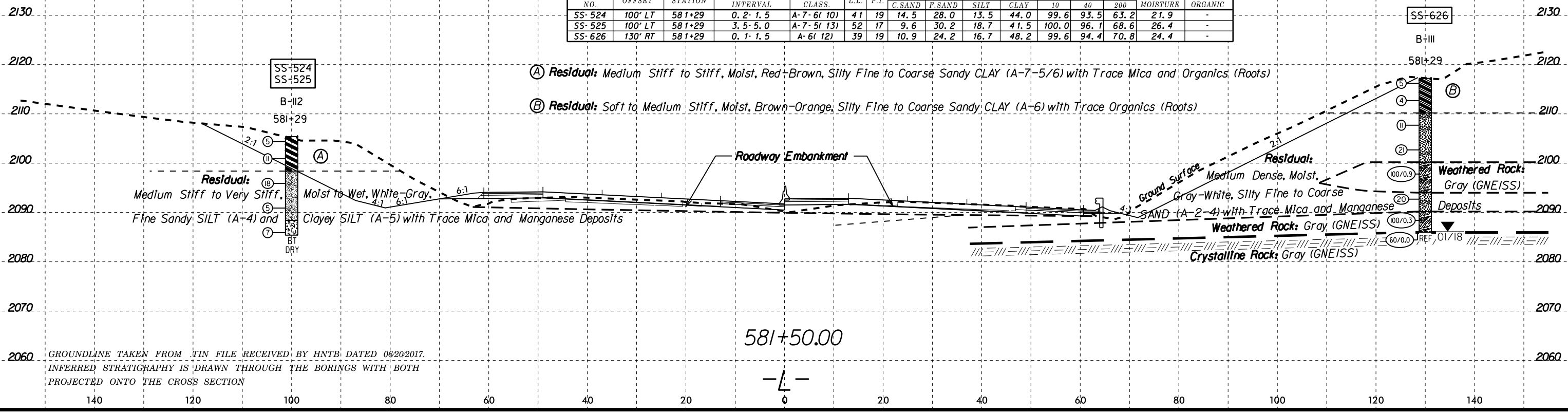
GROUNDLINE TAKEN FROM TIN FILE RECEIVED BY HNTB DATED 06/20/2017.
INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
PROJECTED ONTO THE CROSS SECTION

6/23/16
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 Walker



582+00.00

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-524	100' LT	581+29	0.2-1.5	A-7-6(10)	41	19	14.5	28.0	13.5	44.0	99.6	93.5	63.2	21.9	-
SS-525	100' LT	581+29	3.5-5.0	A-7-5(13)	52	17	9.6	30.2	18.7	41.5	100.0	96.1	68.6	26.4	-
SS-626	130' RT	581+29	0.1-1.5	A-6(12)	39	19	10.9	24.2	16.7	48.2	99.6	94.4	70.8	24.4	-



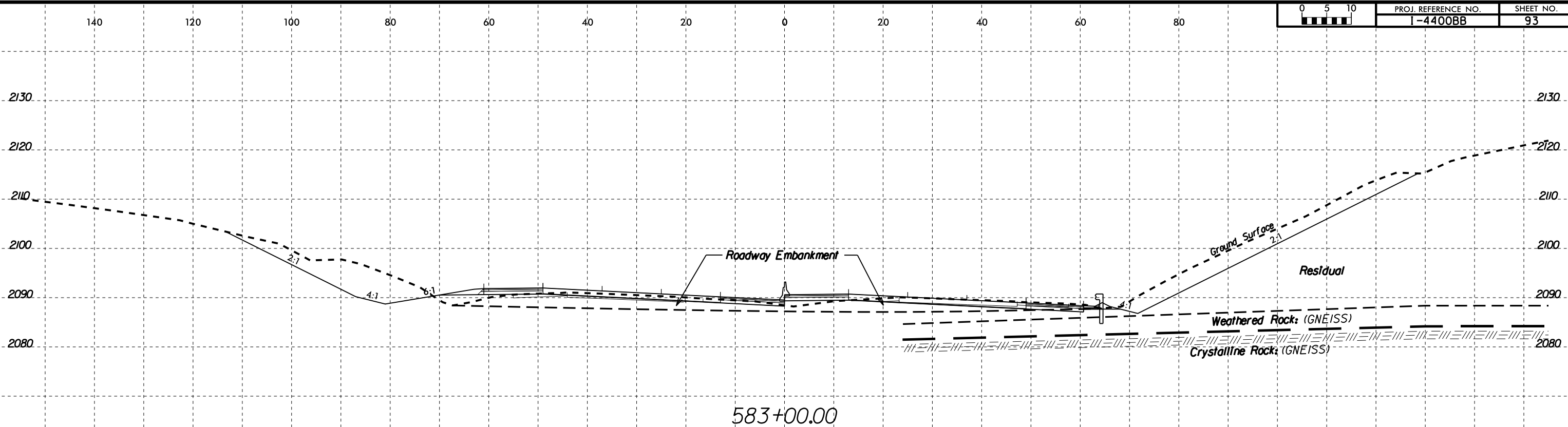
581+50.00

- (A) Residual: Medium Stiff to Stiff, Moist, Red-Brown, Silty Fine to Coarse Sandy CLAY (A-7-5/6) with Trace Mica and Organics (Roots)
- (B) Residual: Soft to Medium Stiff, Moist, Brown-Orange, Silty Fine to Coarse Sandy CLAY (A-6) with Trace Organics (Roots)

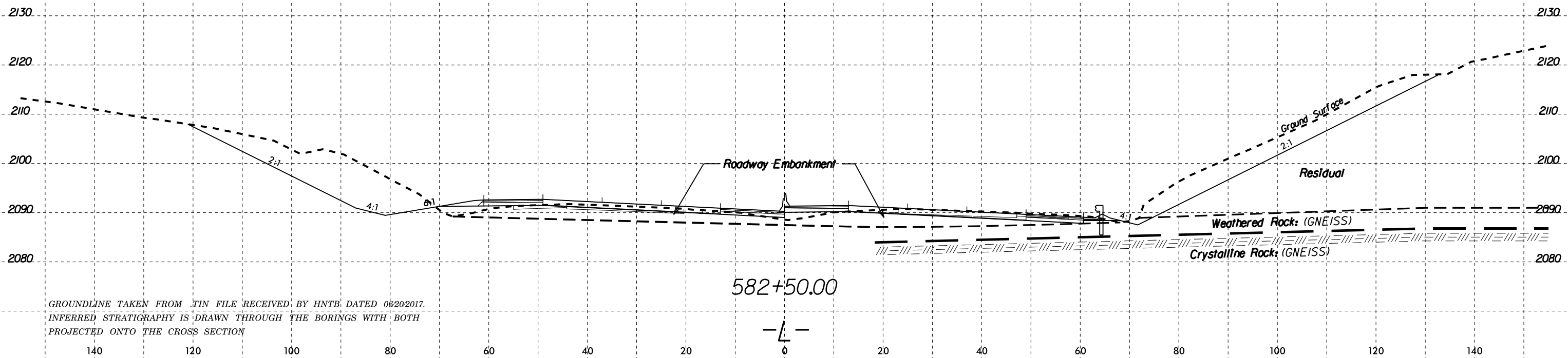
Residual: Medium Stiff to Very Stiff, Moist to Wet, White-Gray, Fine Sandy SILT (A-4) and Clayey SILT (A-5) with Trace Mica and Manganese Deposits

GROUNDLINE TAKEN FROM TIN FILE RECEIVED BY HNTB DATED 06/20/2017.
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
 PROJECTED ONTO THE CROSS SECTION

6/23/16



583+00.00



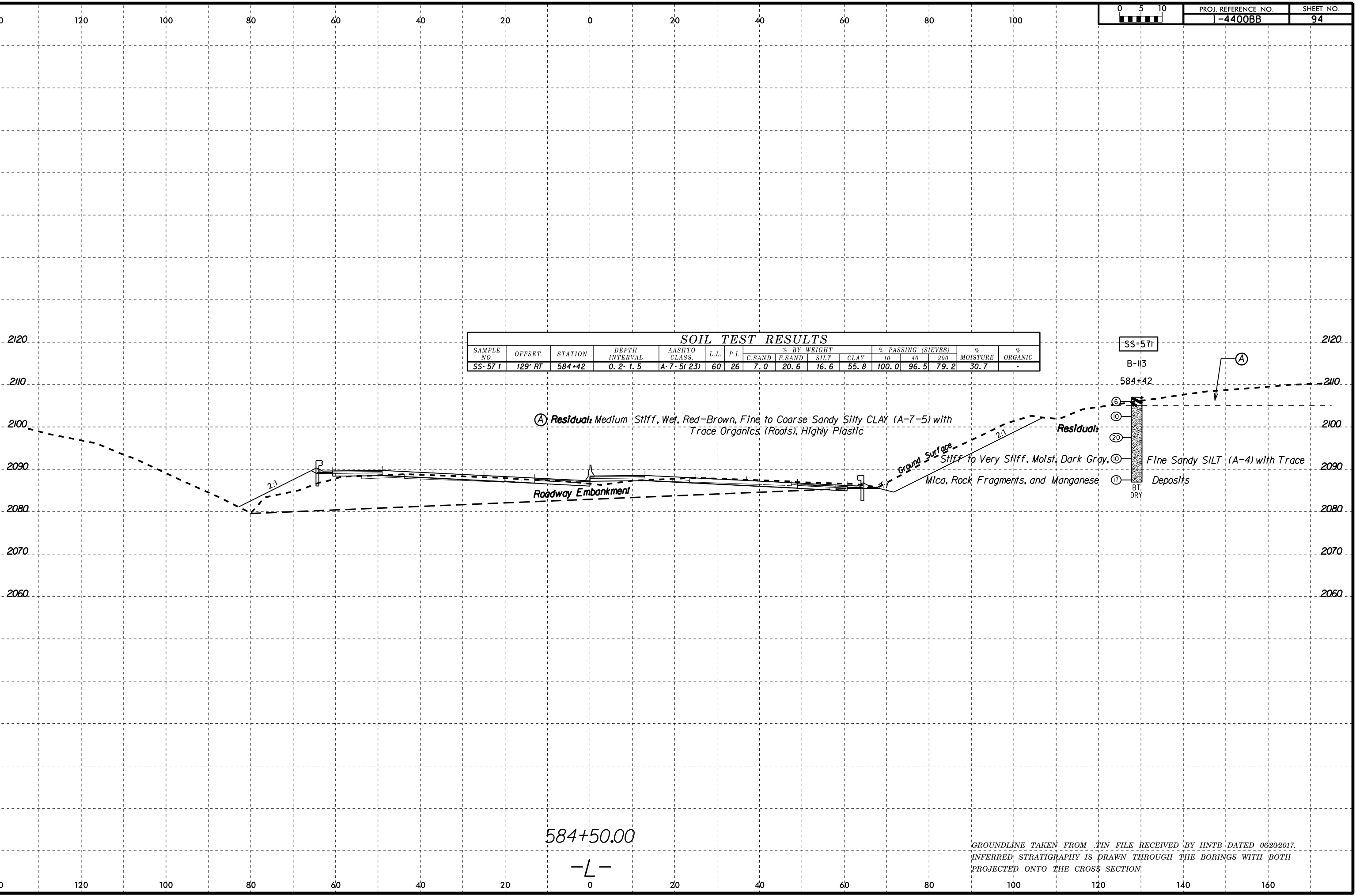
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PROJECTED ONTO THE CROSS SECTION



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 6/23/16



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-571	129' RT	584+42	0.2-1.5	A-7-5(23)	60	26	7.0	20.6	16.6	55.8	100.0	96.5	79.2	30.7	-

(A) Residual Medium Stiff, Wet, Red-Brown, Fine to Coarse Sandy Silty CLAY (A-7-5) with Trace Organics (Roots), Highly Plastic

Residual: Stiff to Very Stiff, Moist, Dark Gray, Fine Sandy SILT (A-4) with Trace Deposits
 Mica, Rock Fragments, and Manganese

Roadway Embankment

Ground Surface

584+50.00

-L-

GROUNDLINE TAKEN FROM TIN FILE RECEIVED BY HNTB DATED 06/20/2017.
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION

140

120

100

80

60

40

20

0

20

40

60

80

2090

2080

2070

2060

2050

2040

2090

2080

2070

2060

2050

2040

2:1

Roadway Embankment

Ground Surface

B-114

588+52

6:1

Residual:

Loose, Moist to Wet, Red-Orange-Brown, Silty

Coarse SAND (A-2-4) with Trace Organics

Hard, Saturated, White-Gray, Fine Sandy

Weathered Rock:

Fine to

(Roots) and Mica, Trace to Little Rock Fragments

SILT (A-4) with Trace Mica and Rock Fragments

White-Gray (GNEISS)

6

4

34

100/0.6

BT

01/18

588+50.00

-L-

140

120

100

80

60

40

20

0

20

40

60

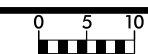
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100

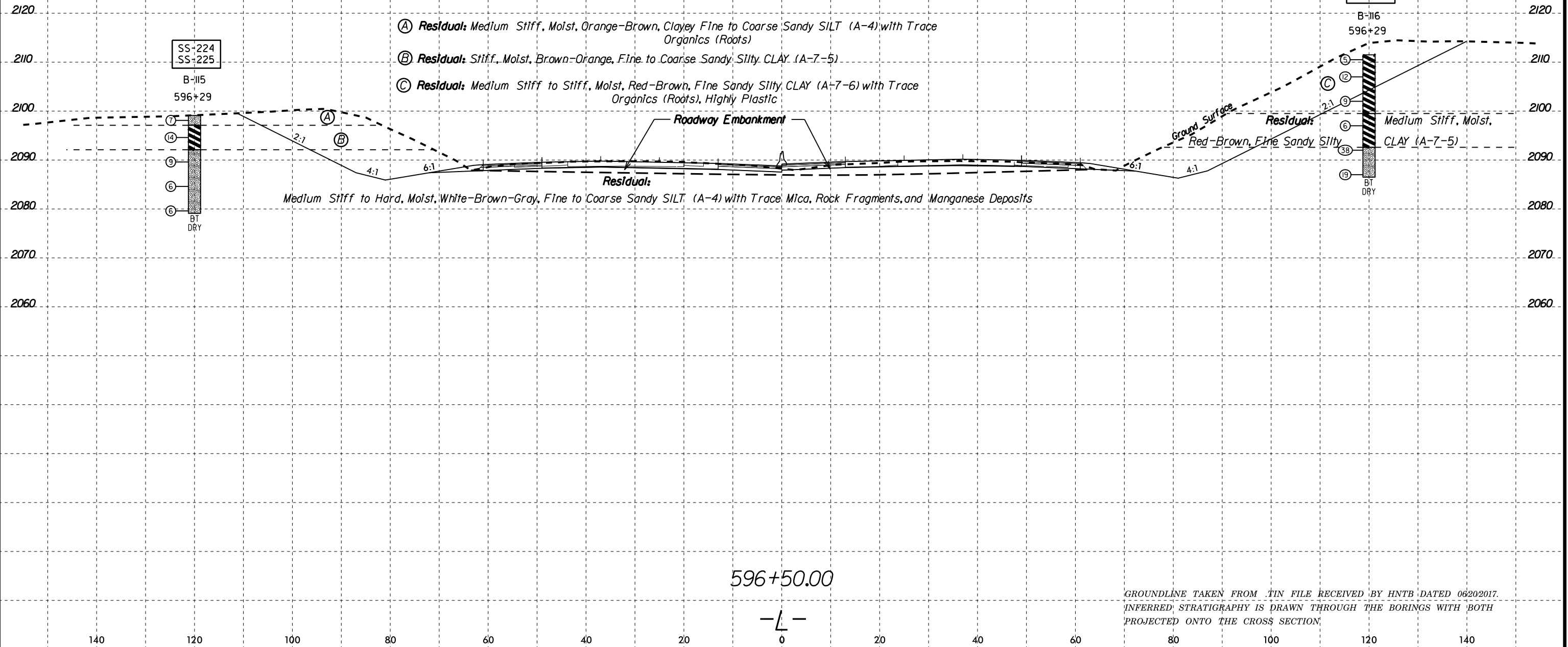
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140

6/23/16

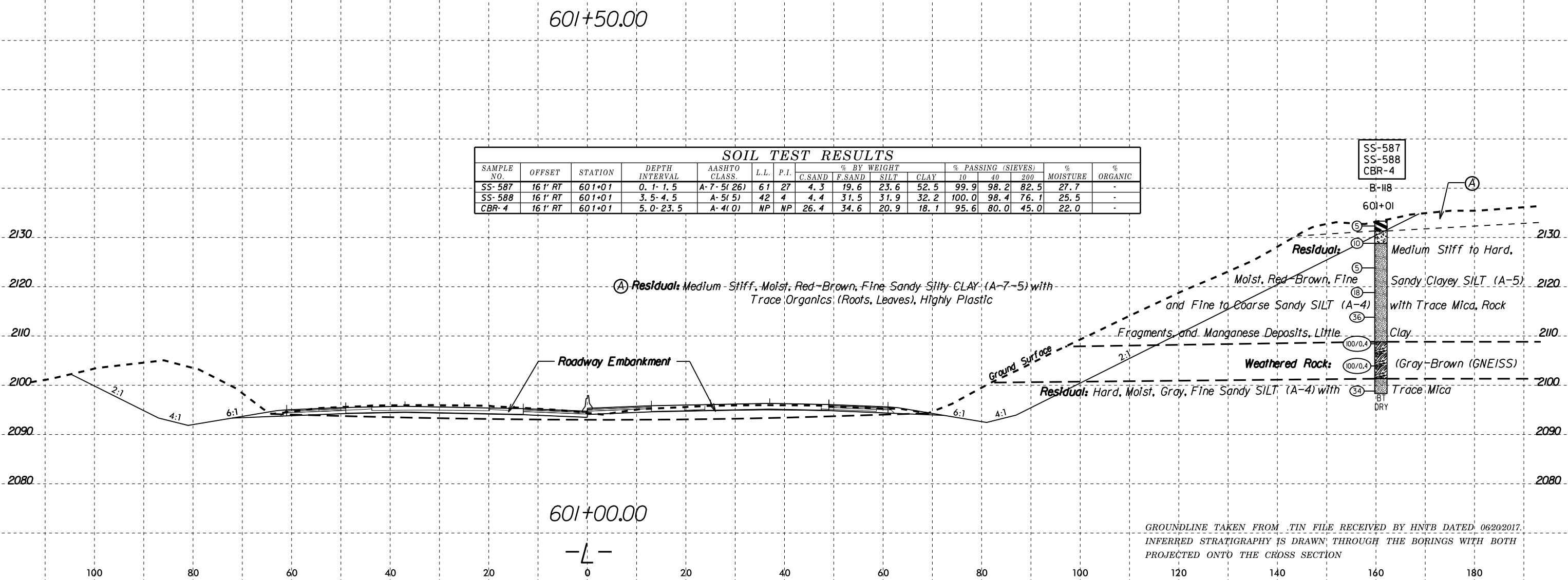
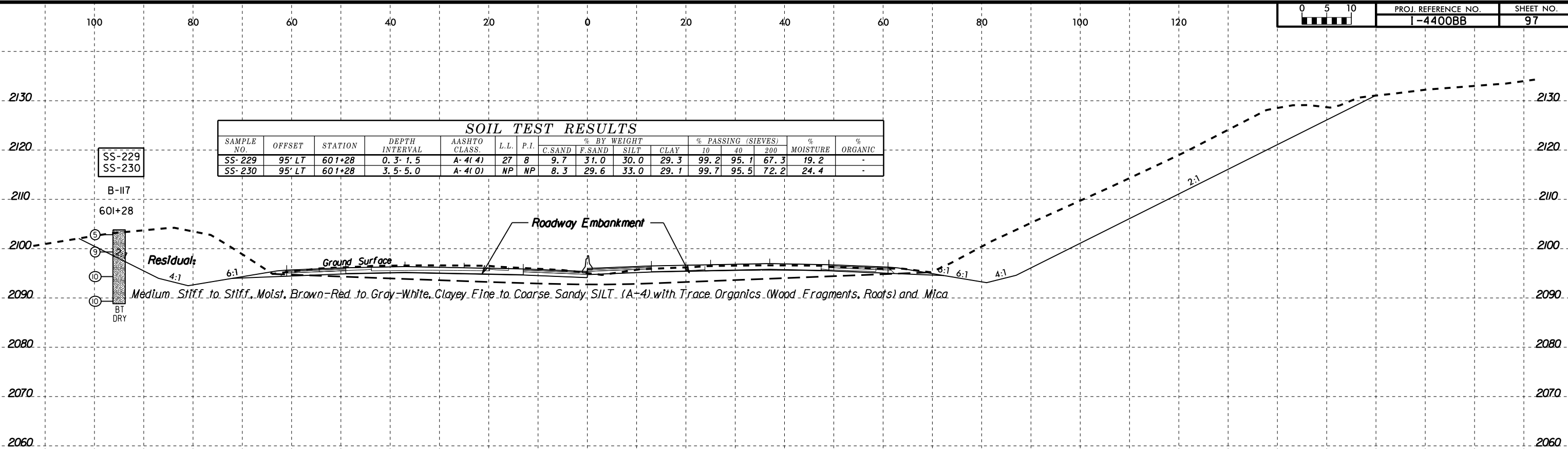


SAMPLE No.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-224	120' LT	596+29	0.1-1.5	A-4(1)	23	6	8.3	35.6	28.0	28.1	99.2	95.3	66.7	14.2	-
SS-225	120' LT	596+29	3.5-5.0	A-7-5(14)	46	16	5.0	23.8	26.4	44.8	99.3	97.0	79.3	22.7	-
SS-594	120' RT	596+29	0.2-1.5	A-7-6(25)	54	27	3.5	20.0	21.9	54.6	100.0	98.3	84.0	24.4	-
SS-595	120' RT	596+29	13.5-15.0	A-7-5(20)	58	20	3.4	22.3	26.8	47.5	99.7	97.9	82.9	35.3	-



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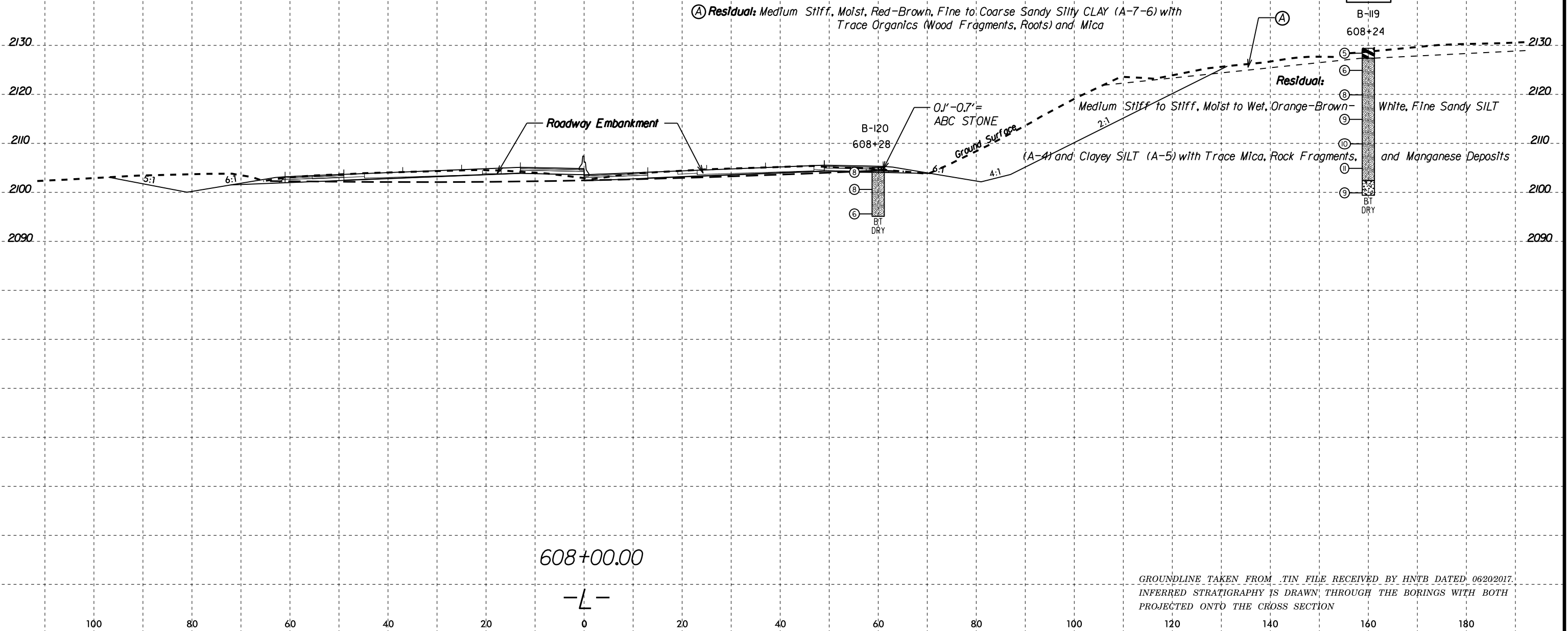


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 T.Walker

GROUNDLINE TAKEN FROM TIN FILE RECEIVED BY HNTB DATED 06/20/2017.
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
 PROJECTED ONTO THE CROSS SECTION

100 80 60 40 20 0 20 40 60 80 100 120

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-591	160' RT	608+24	0.1-1.5	A-7-6(19)	51	23	8.8	20.2	19.8	51.2	99.8	95.3	76.3	26.1	-
CBR-5	160' RT	608+24	3.5-25.0	A-4(0)	NP	NP	6.7	37.9	33.9	21.5	99.9	97.7	67.1	25.4	-



GROUNDLINE TAKEN FROM TIN FILE RECEIVED BY HNTB DATED 06/20/2017. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION

27-JUN-2018 08:45 F:\Projects\66166V-0174\NCDDOT-1-4400B Henderson Co.\1-4400B.GEO\RDWY\CADD\GEO\TECH\sec\14400B_geo_xsi.L -2.dgn Walker-A 66026102

140

120

100

80

60

40

20

0

20

40

60

80

2120 (A) Alluvial: Soft to Medium Stiff, Moist, Black and Brown, Fine Sandy SILT (A-4) and Fine Sandy Clayey SILT (A-5) with Trace Organics (Roots)

2110

2100

2090

2080

2070

B-166
610+75

Ground Surface



Residual:

Medium Stiff to Very Stiff, Moist to Wet, Brown-Gray-Orange, Fine to Coarse Sandy Clayey SILT (A-5) with Trace Mica

2:1

Roadway Embankment

6:1

611+00.00



GROUNDLINE TAKEN FROM .TIN FILE RECEIVED BY HNTB DATED 06/20/2017. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION

140

120

100

80

60

40

20

0

20

40

60

80

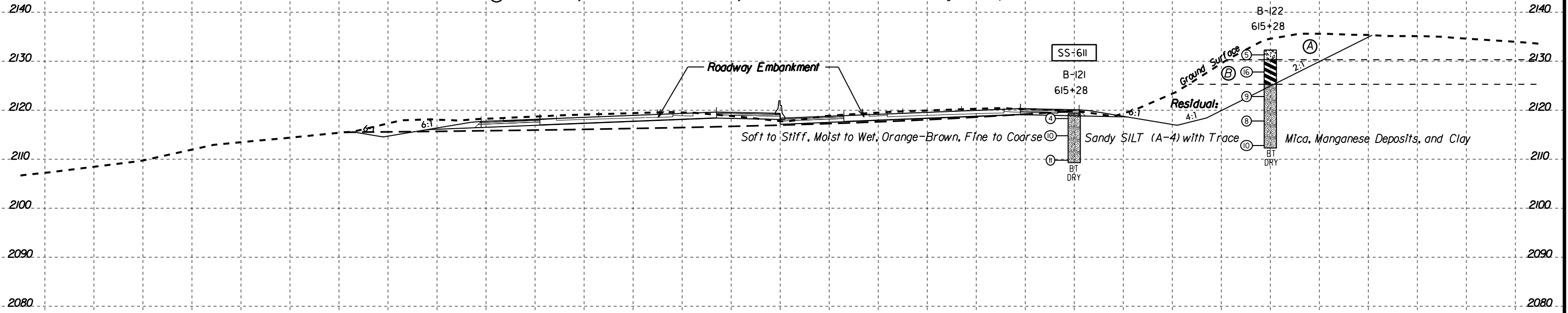
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120

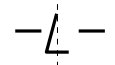
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SOIL TEST RESULTS															
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							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-611	60' RT	615+28	0.1-1.5	A-4(0)	NP	NP	11.6	54.9	23.5	10.0	100.0	96.4	46.0	30.5	-

- Ⓐ *Residual: Medium Stiff, Moist, Gray-Red-Brown, Fine Sandy Clayey SILT (A-5) with Trace Organics (Roots); Manganese Deposits, and Mica*
- Ⓑ *Residual: Very Stiff, Moist, Red-Brown, Silty CLAY (A-7) with Trace Mica and Manganese Deposits*

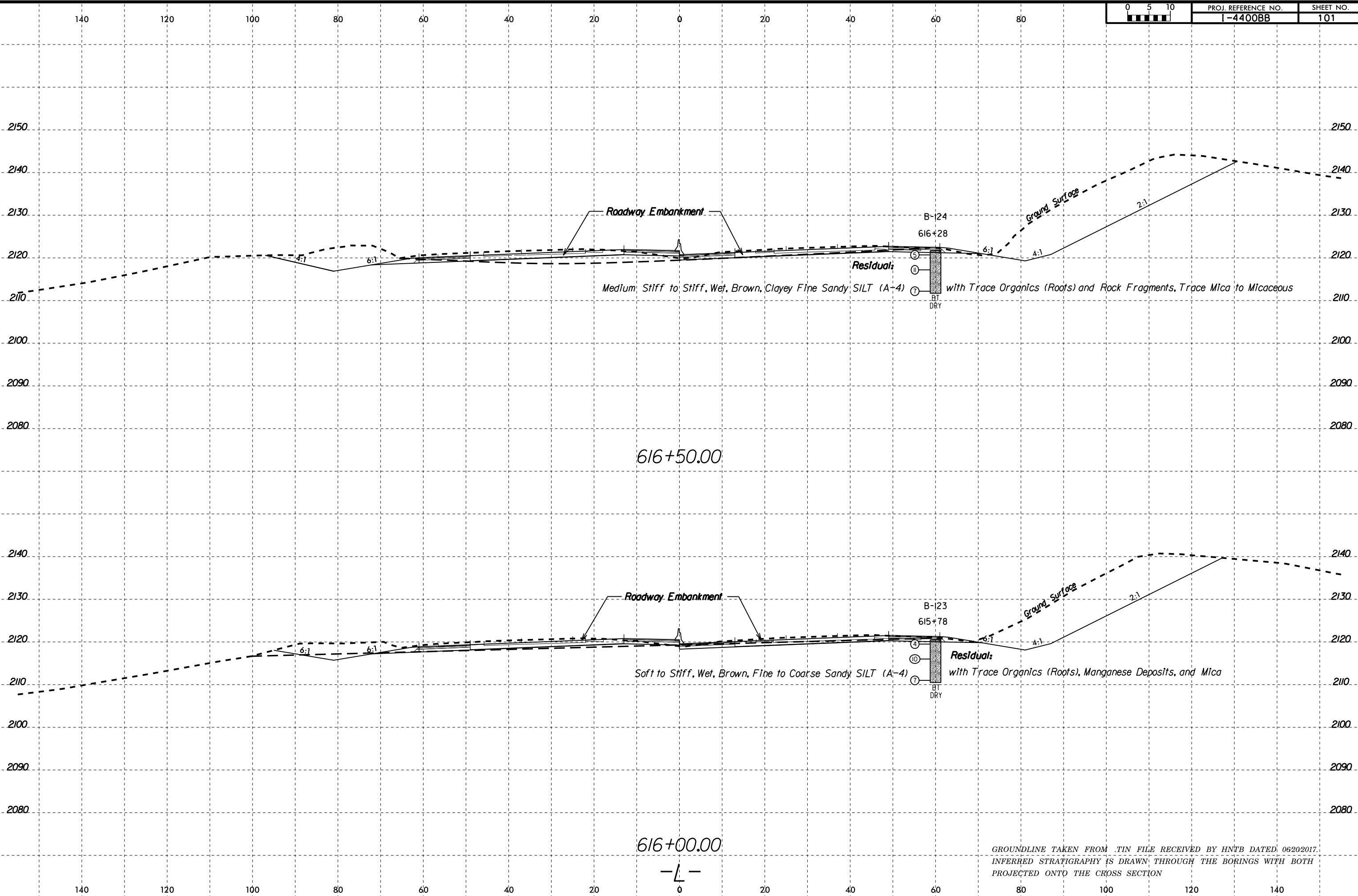


615+50.00



GROUNDLINE TAKEN FROM TIN FILE RECEIVED BY HNTB DATED 06/20/2017.
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
 PROJECTED ONTO THE CROSS SECTION

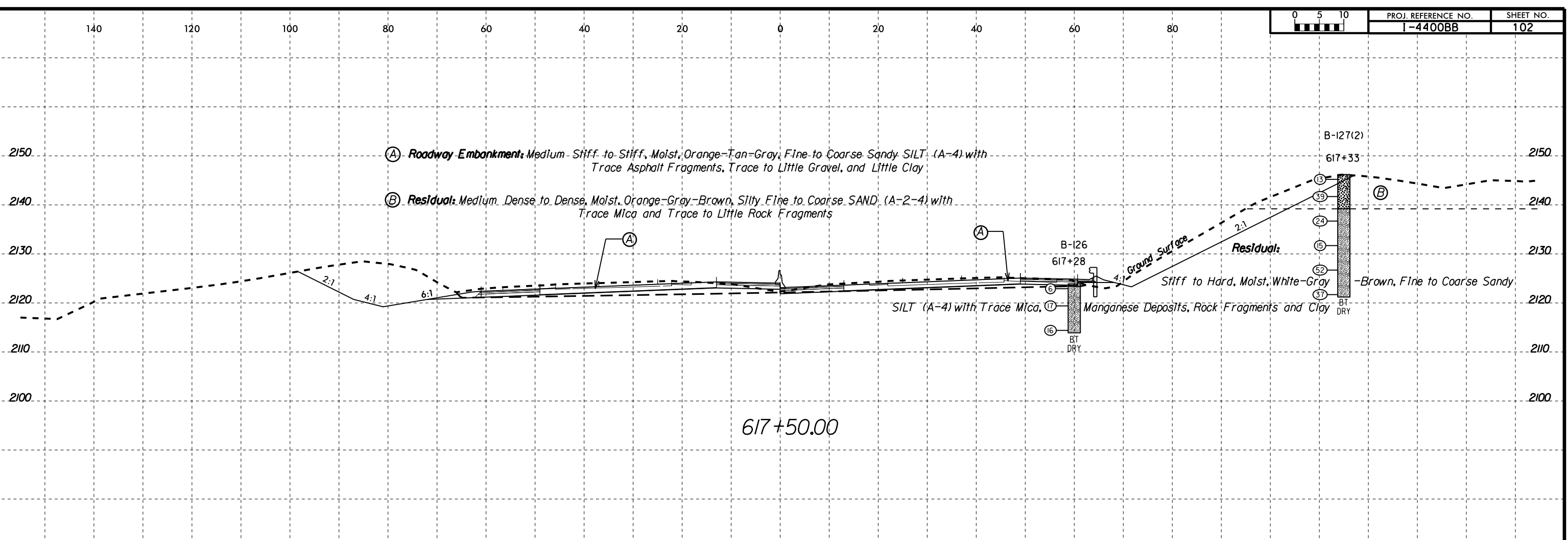
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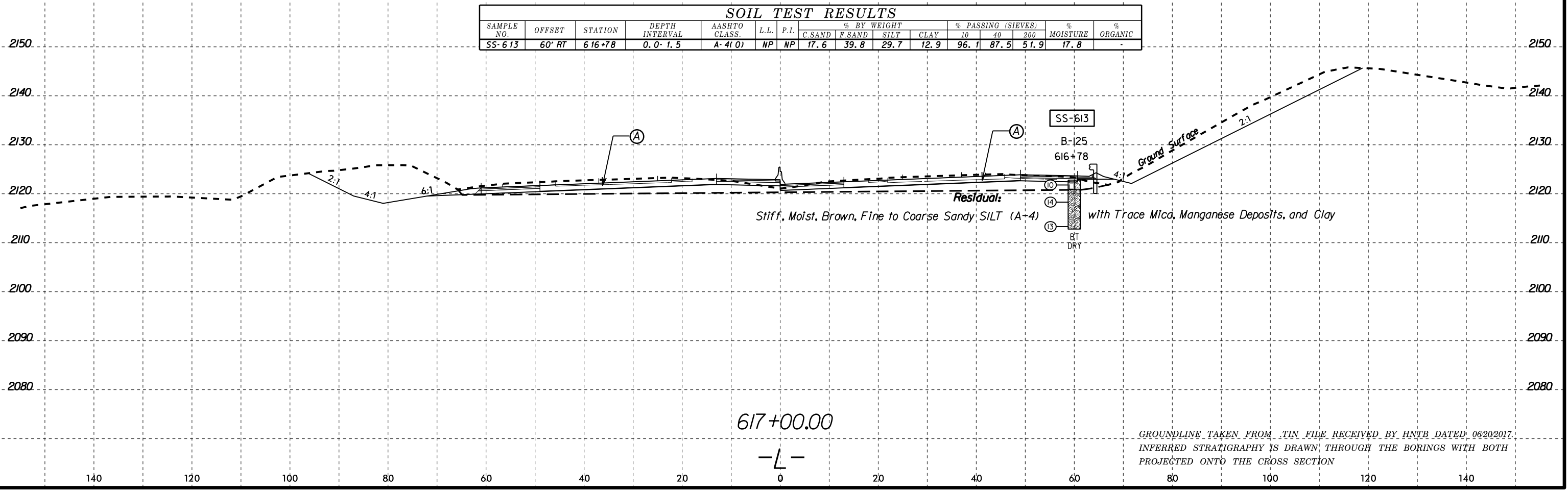
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Walker-A 66026102

GROUNDLINE TAKEN FROM .TIN FILE RECEIVED BY HNTB DATED 06/20/2017.
INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
PROJECTED ONTO THE CROSS SECTION

6/23/16
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 Walker-A 66026102

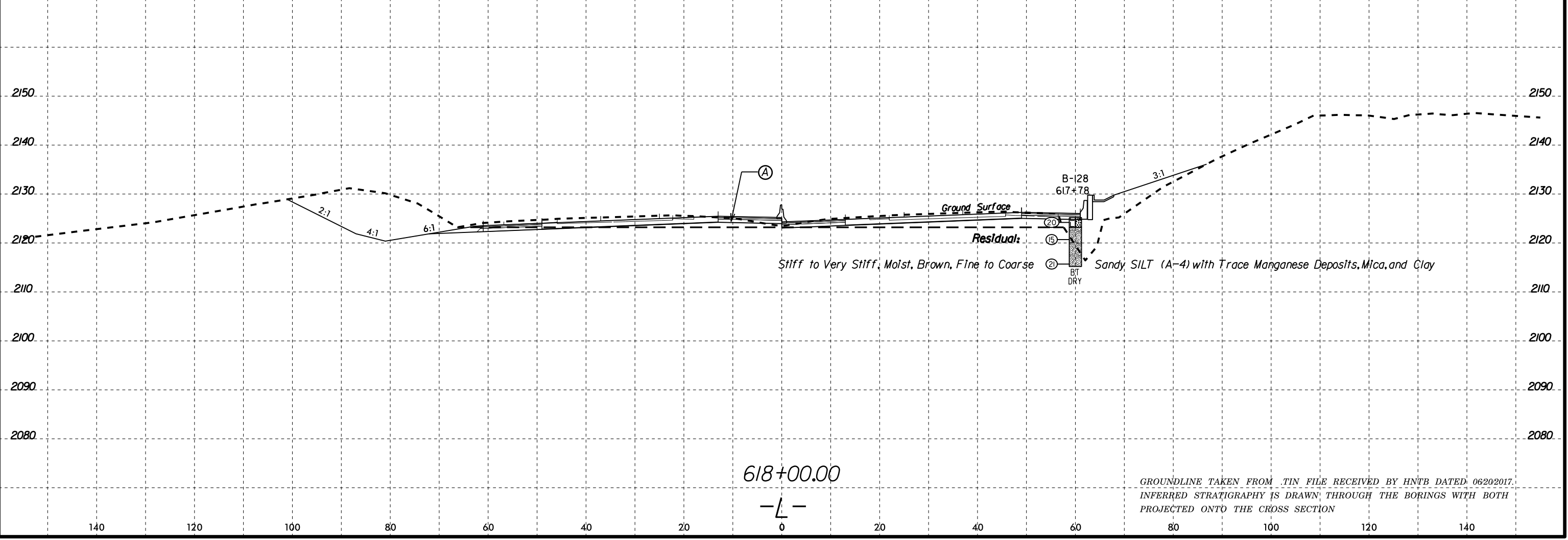
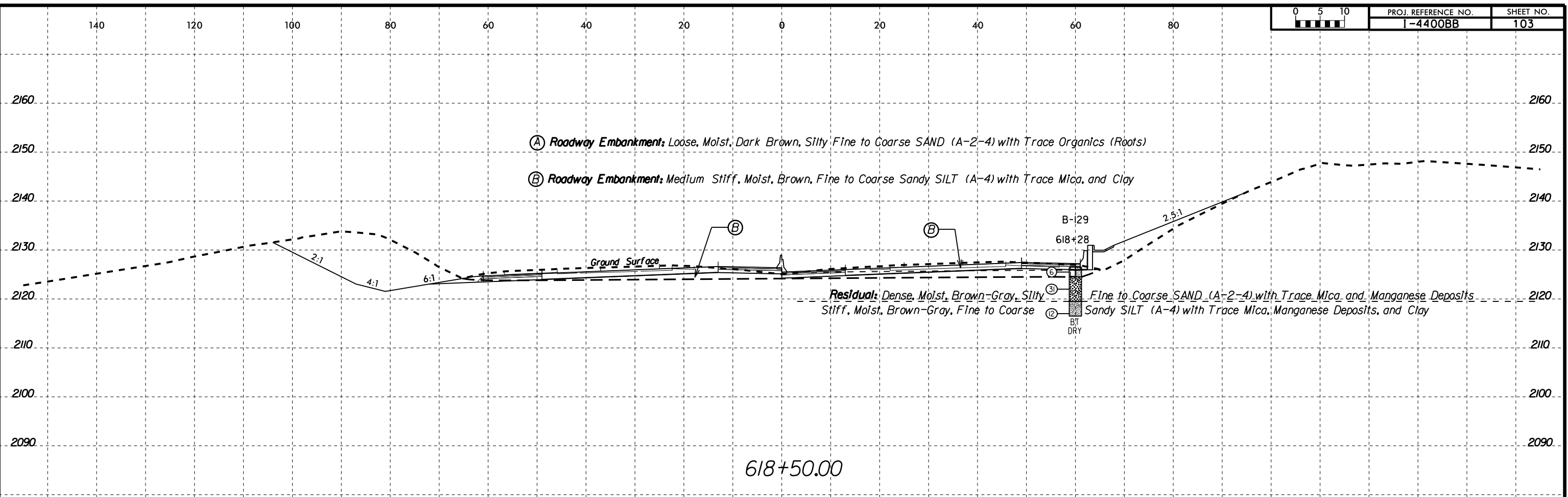
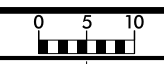


SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-613	60' RT	616+78	0.0-1.5	A-4(O)	NP	NP	17.6	39.8	29.7	12.9	96.1	87.5	51.9	17.8	-



GROUNDLINE TAKEN FROM TIN FILE RECEIVED BY HNTB DATED 06/20/2017.
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
 PROJECTED ONTO THE CROSS SECTION

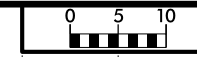
6/23/16



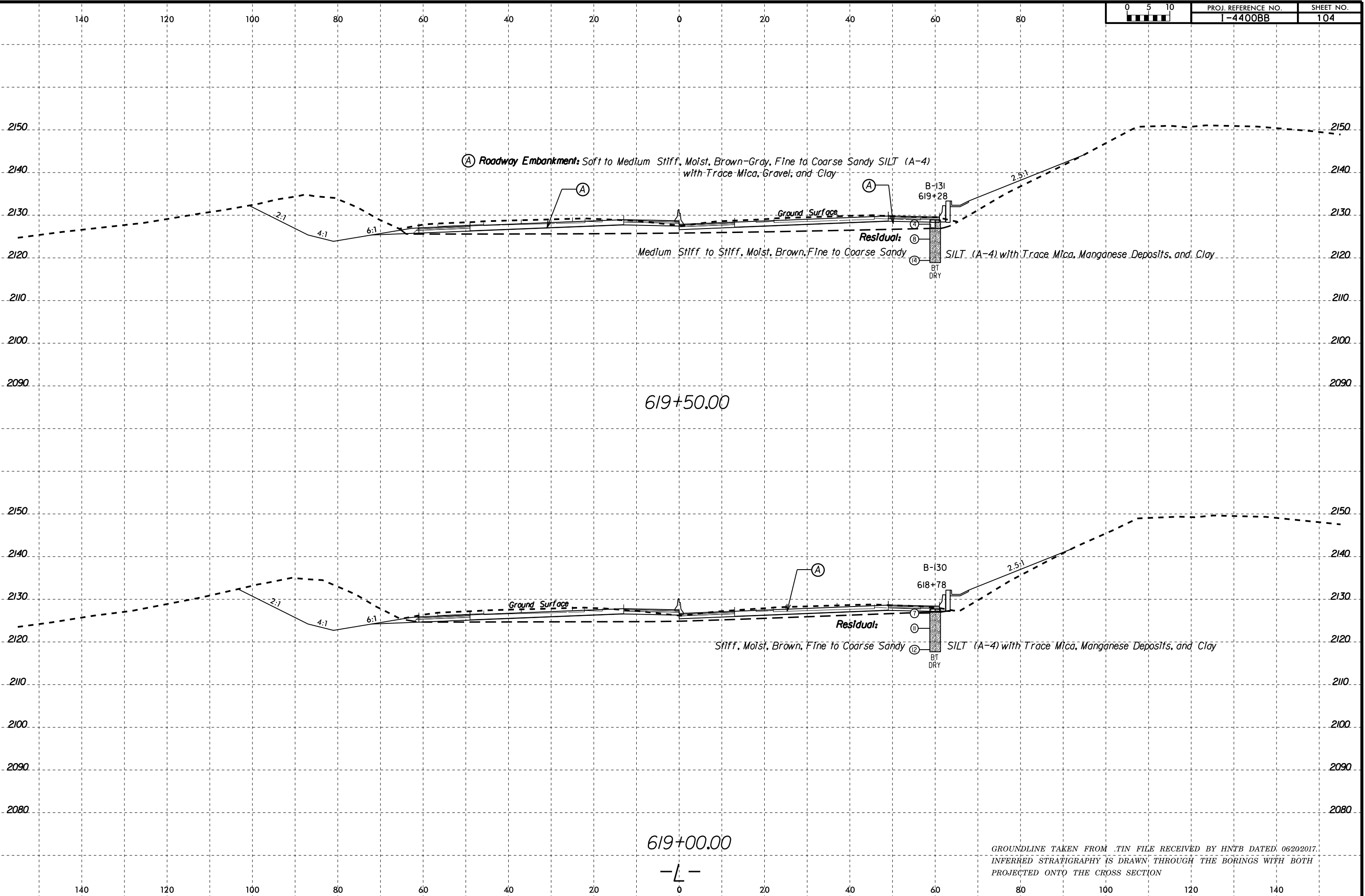
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 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
 PROJECTED ONTO THE CROSS SECTION

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 User: jw
 Plotter:

6/23/16



PROJ. REFERENCE NO.	SHEET NO.
I-4400BB	104



(A) **Roadway Embankment:** Soft to Medium Stiff, Moist, Brown-Gray, Fine to Coarse Sandy SILT (A-4) with Trace Mica, Gravel, and Clay

Residual: Medium Stiff to Stiff, Moist, Brown, Fine to Coarse Sandy SILT (A-4) with Trace Mica, Manganese Deposits, and Clay

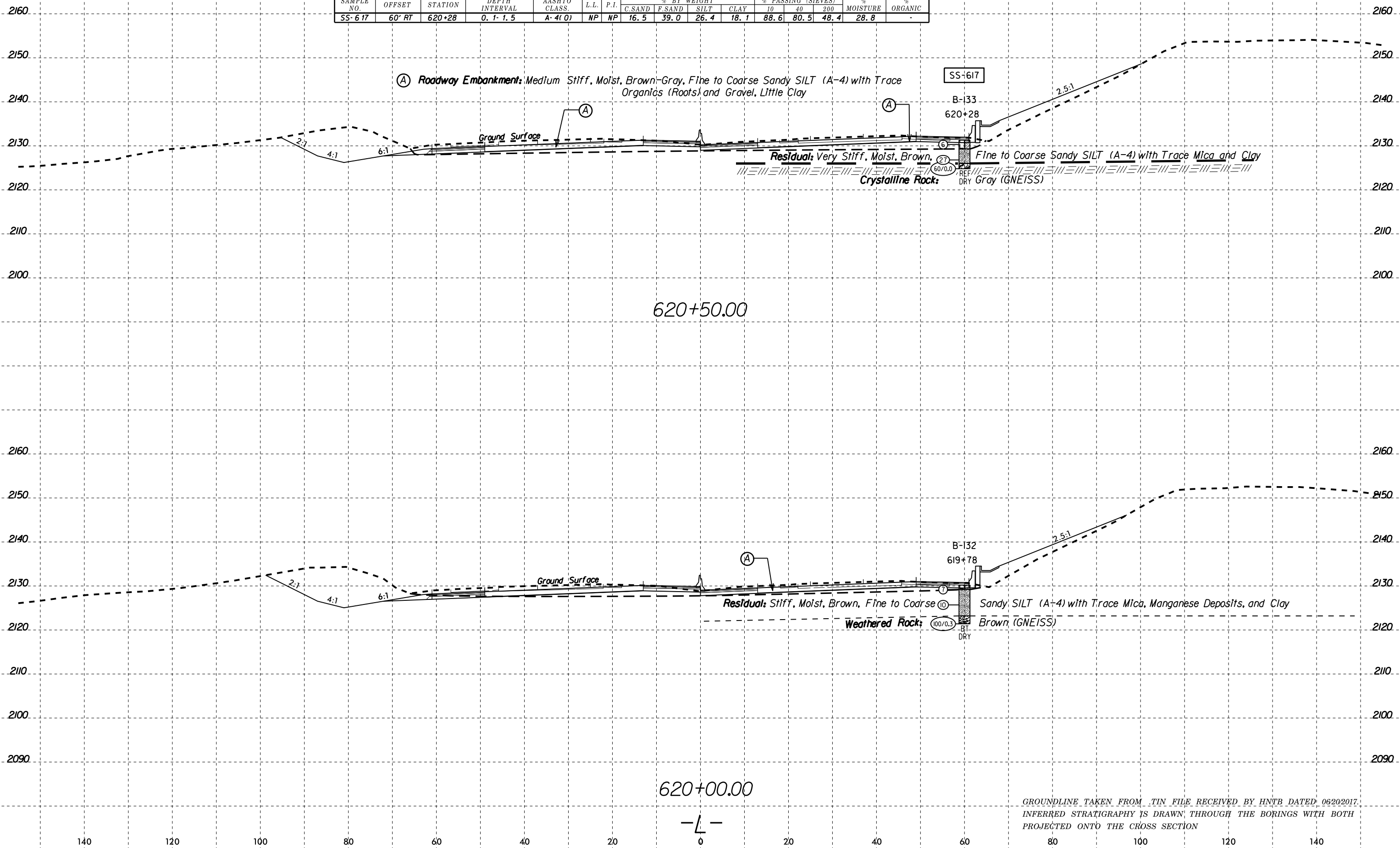
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619+00.00

GROUNDLINE TAKEN FROM .TIN FILE RECEIVED BY HNTB DATED 06/20/2017.
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
 PROJECTED ONTO THE CROSS SECTION

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 Walker, A. 66026102

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-617	60' RT	620+28	0.1-1.5	A-4(O)	NP	NP	16.5	39.0	26.4	18.1	88.6	80.5	48.4	28.8	-

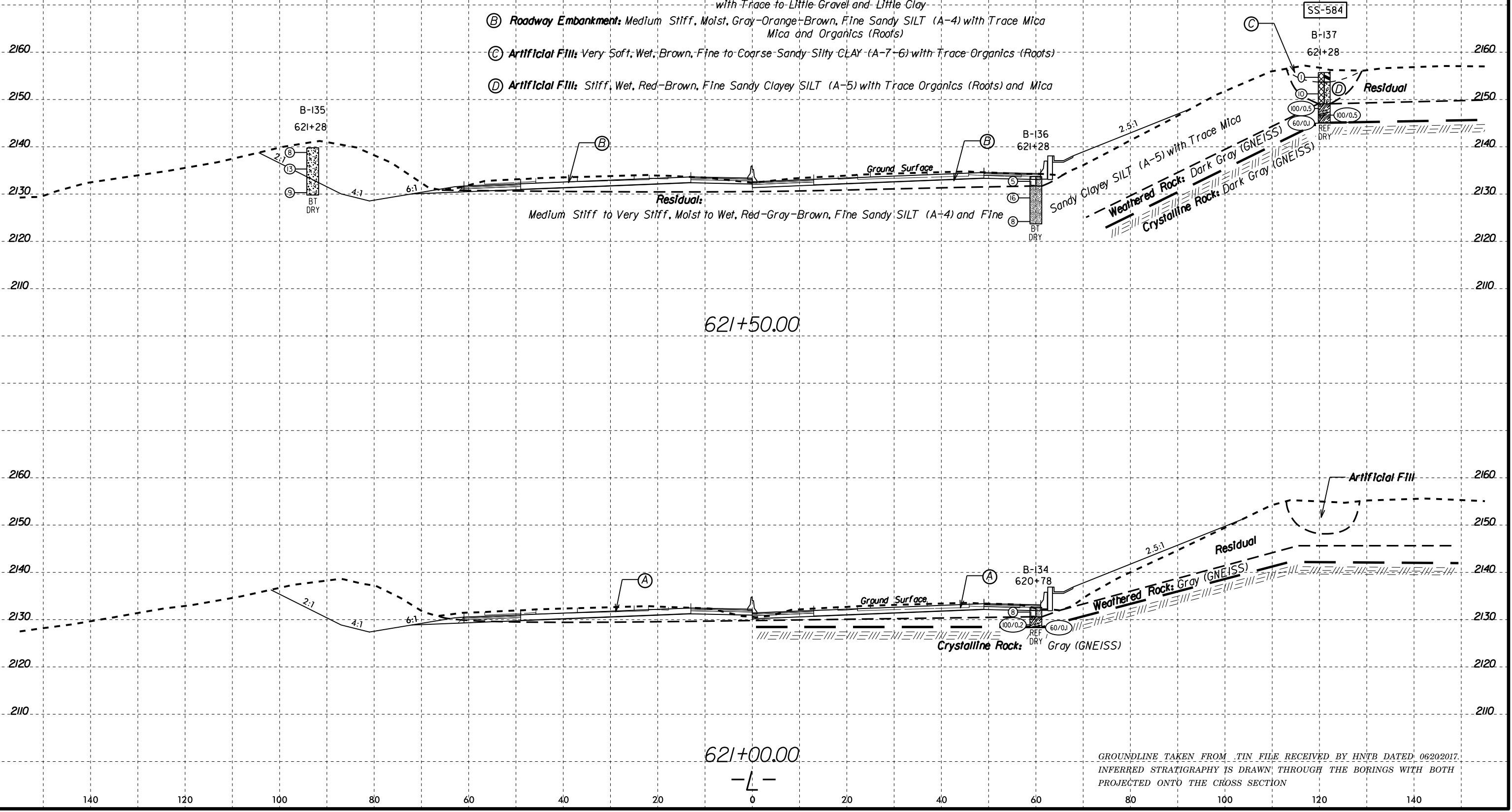


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GROUNDLINE TAKEN FROM TIN FILE RECEIVED BY HNTB DATED 06/20/2017. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION

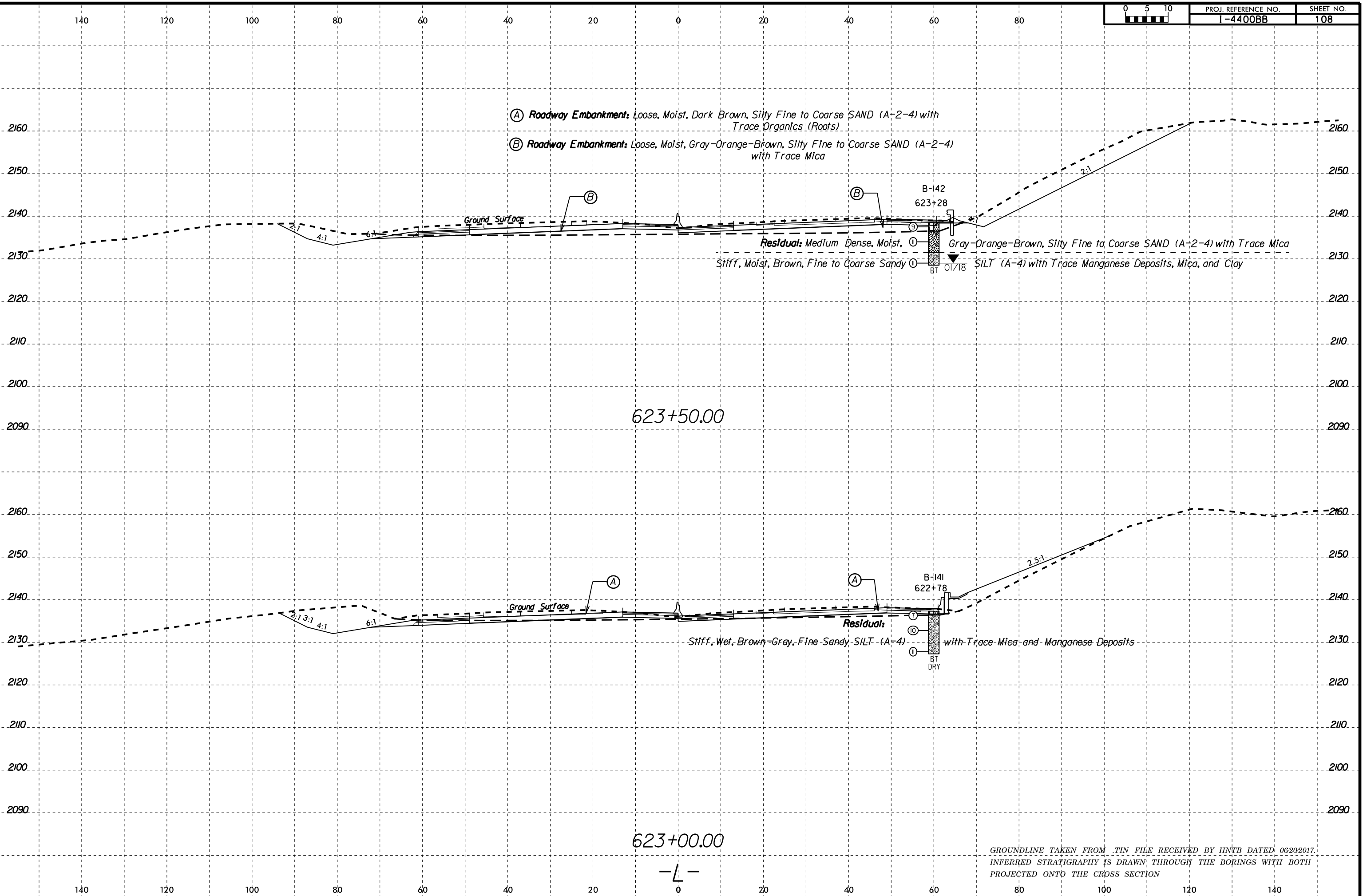
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SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-584	12' RT	534+00	0.1-1.5	A-7-6(9)	41	14	8.2	27.8	23.5	40.5	97.1	93.1	70.1	32.2	-

- (A) Roadway Embankment: Medium Stiff to Stiff, Moist, Brown-Gray, Fine to Coarse Sandy SILT (A-4) with Trace to Little Gravel and Little Clay
- (B) Roadway Embankment: Medium Stiff, Moist, Gray-Orange-Brown, Fine Sandy SILT (A-4) with Trace Mica and Organics (Roots)
- (C) Artificial Fill: Very Soft, Wet, Brown, Fine to Coarse Sandy Silty CLAY (A-7-6) with Trace Organics (Roots)
- (D) Artificial Fill: Stiff, Wet, Red-Brown, Fine Sandy Clayey SILT (A-5) with Trace Organics (Roots) and Mica



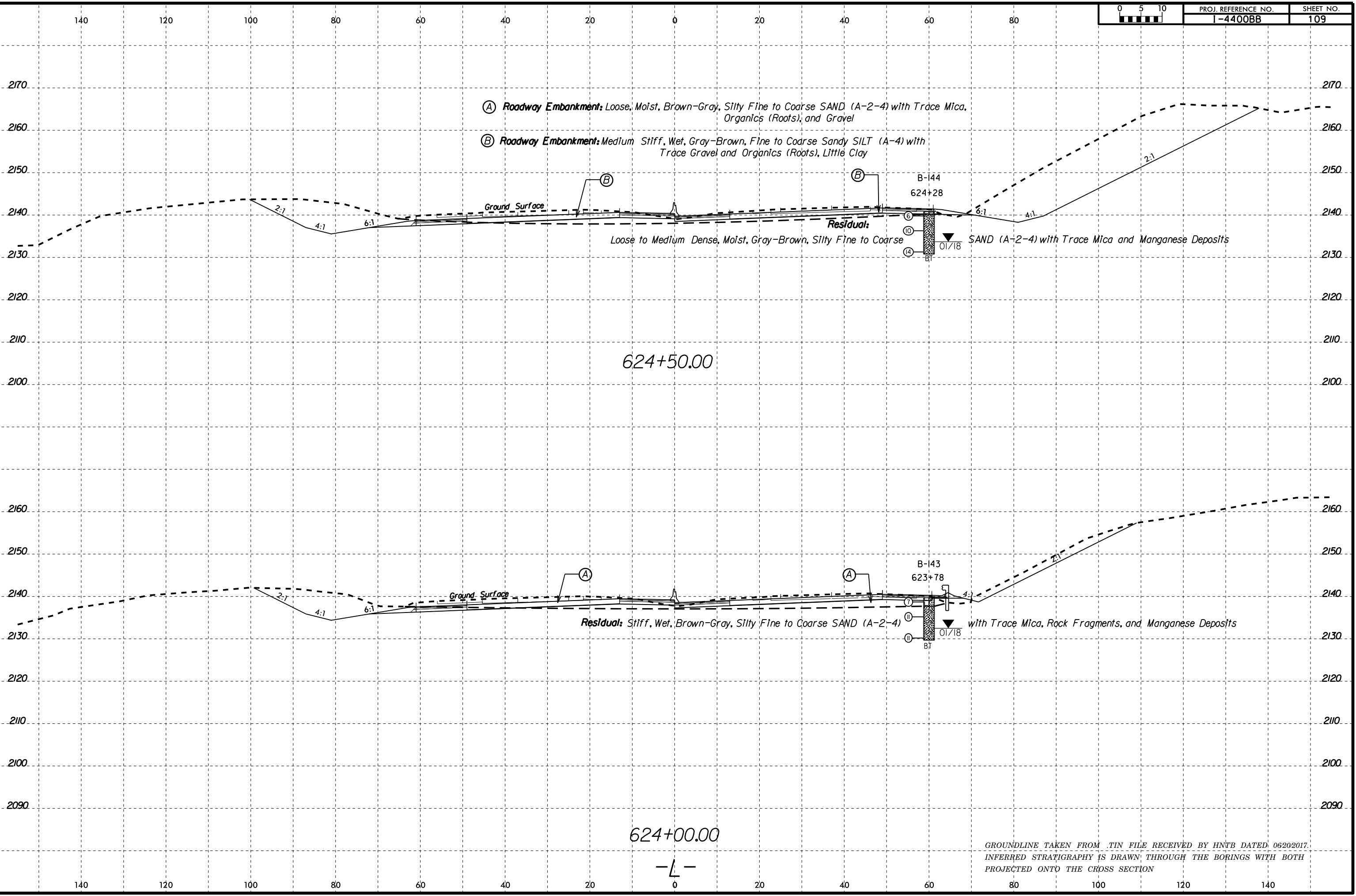
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 Walker-A 66026102

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 Walker-A 66026102



GROUNDLINE TAKEN FROM .TIN FILE RECEIVED BY HNTB DATED 06/20/2017.
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
 PROJECTED ONTO THE CROSS SECTION

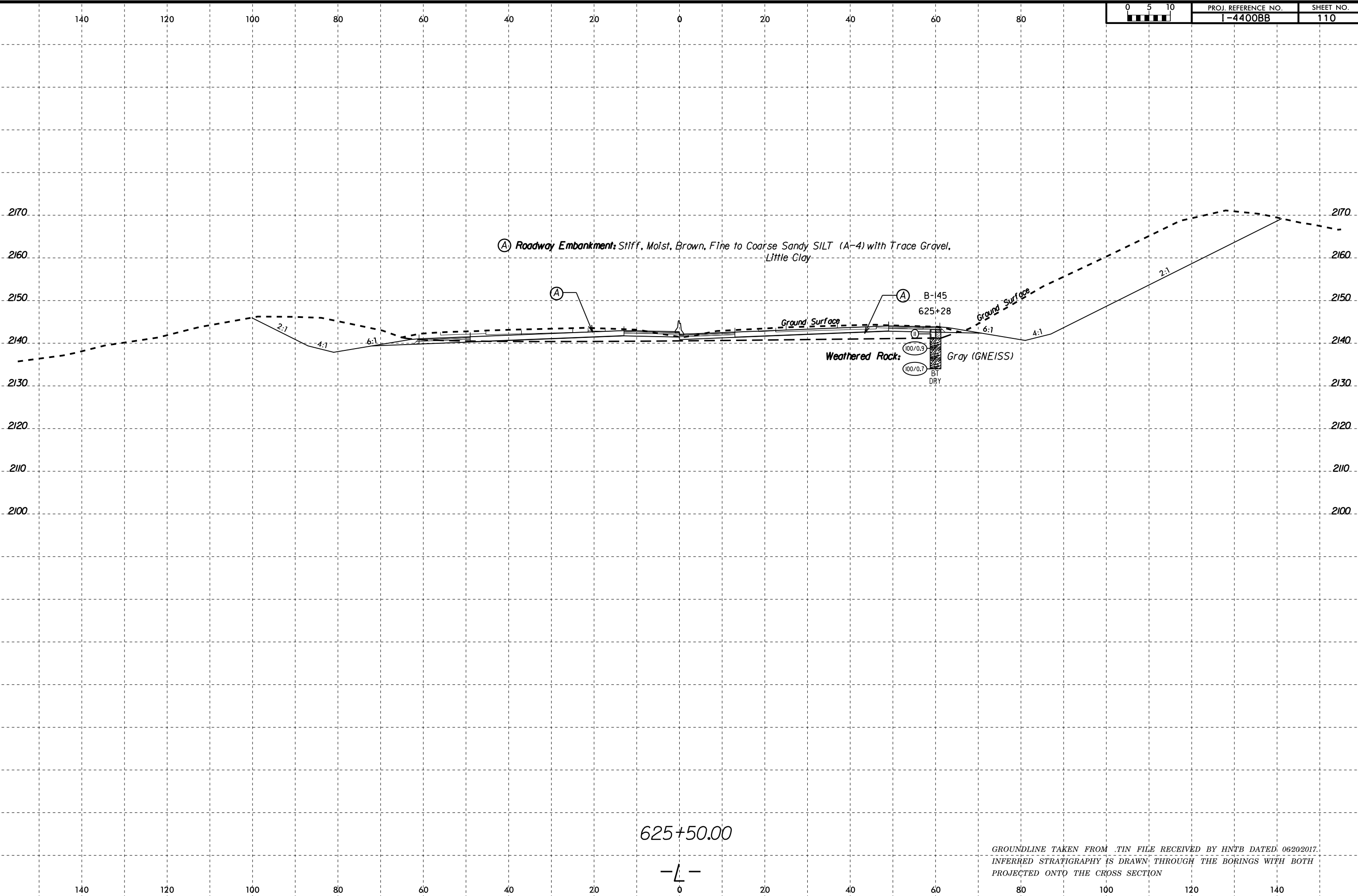
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Walker-A 66026102



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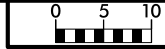
PROJ. REFERENCE NO.	SHEET NO.
I-4400BB	110



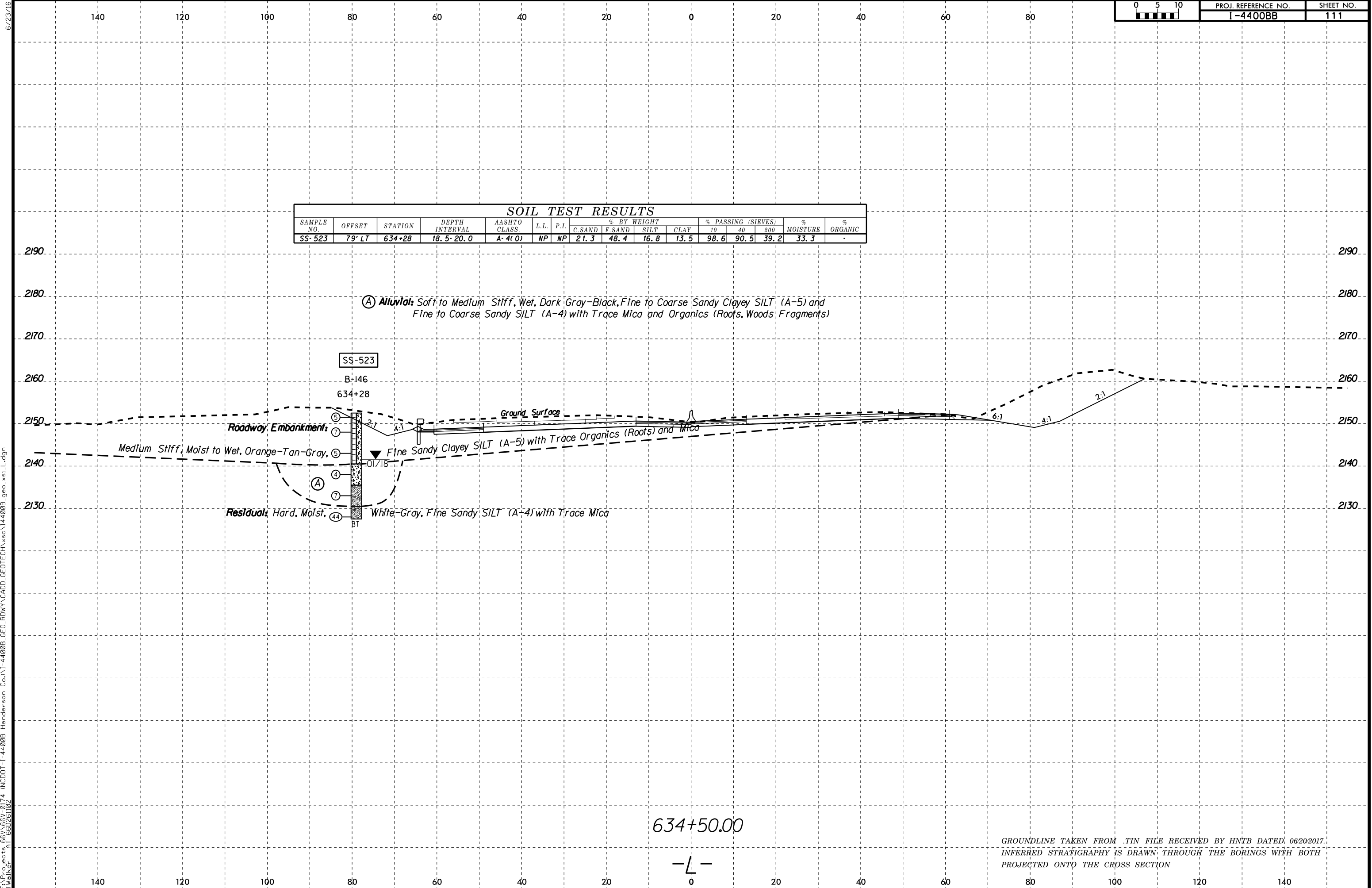
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 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
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 Walker-A 66026102

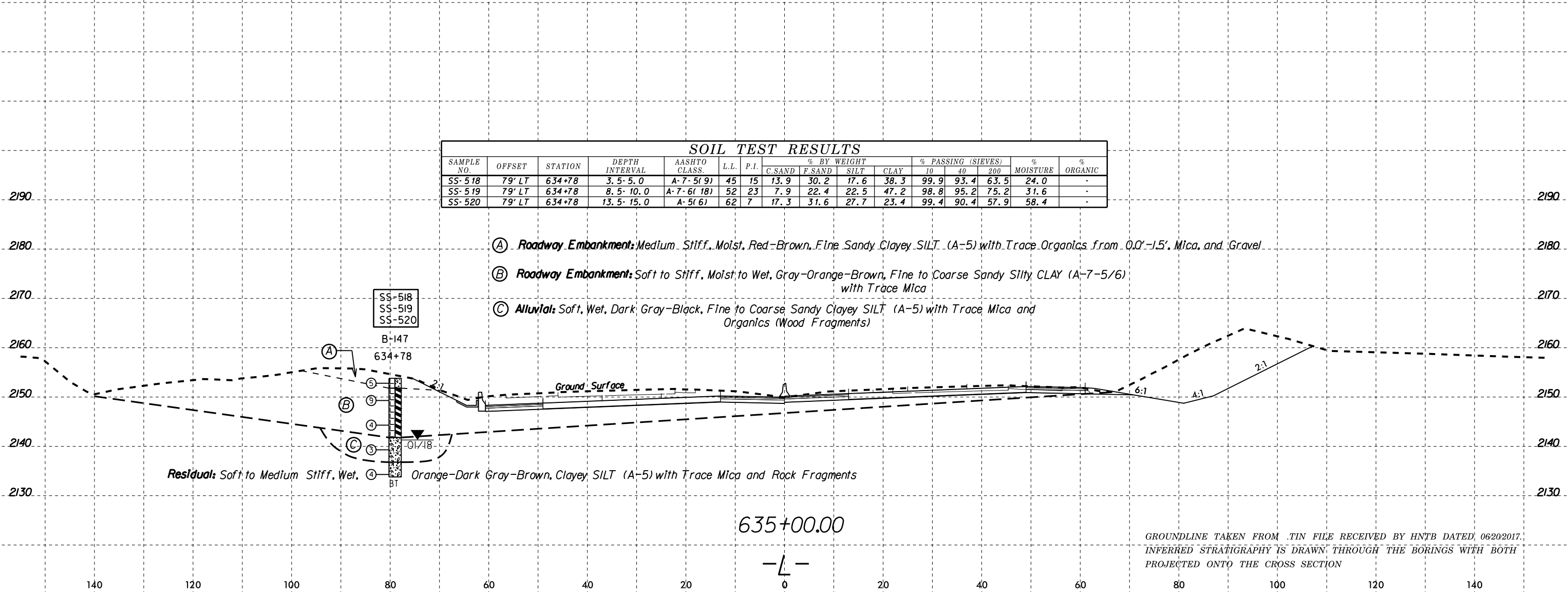
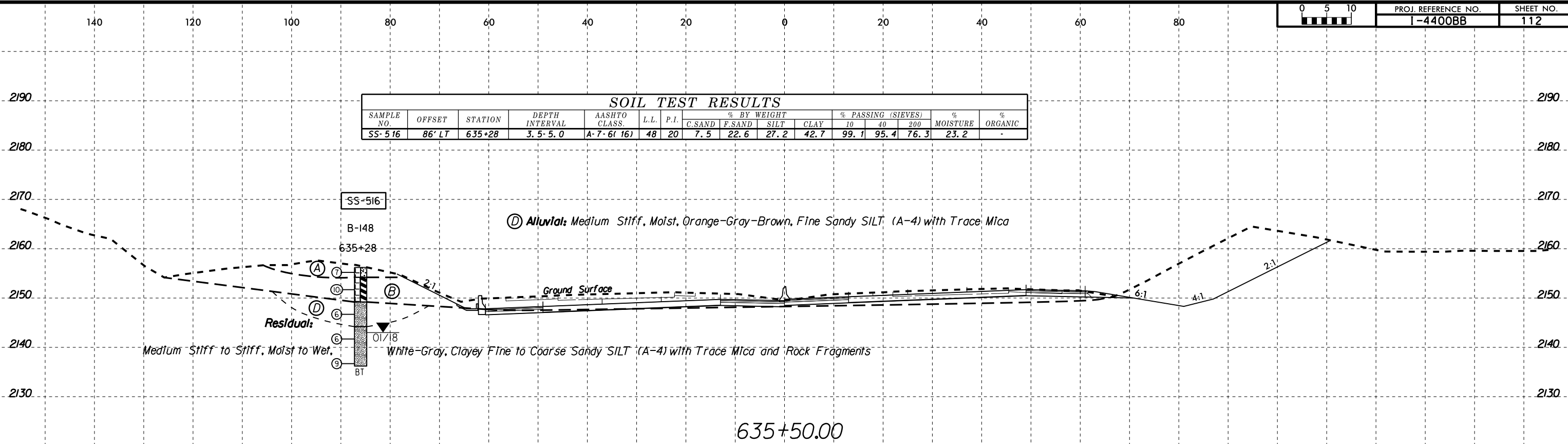
6/23/16



PROJ. REFERENCE NO. I-4400BB SHEET NO. 111



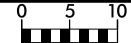
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GROUNDLINE TAKEN FROM .TIN FILE RECEIVED BY HNTB DATED 06/20/2017. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION

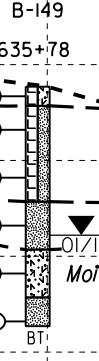
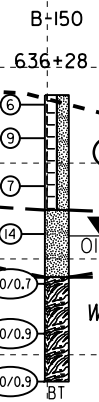
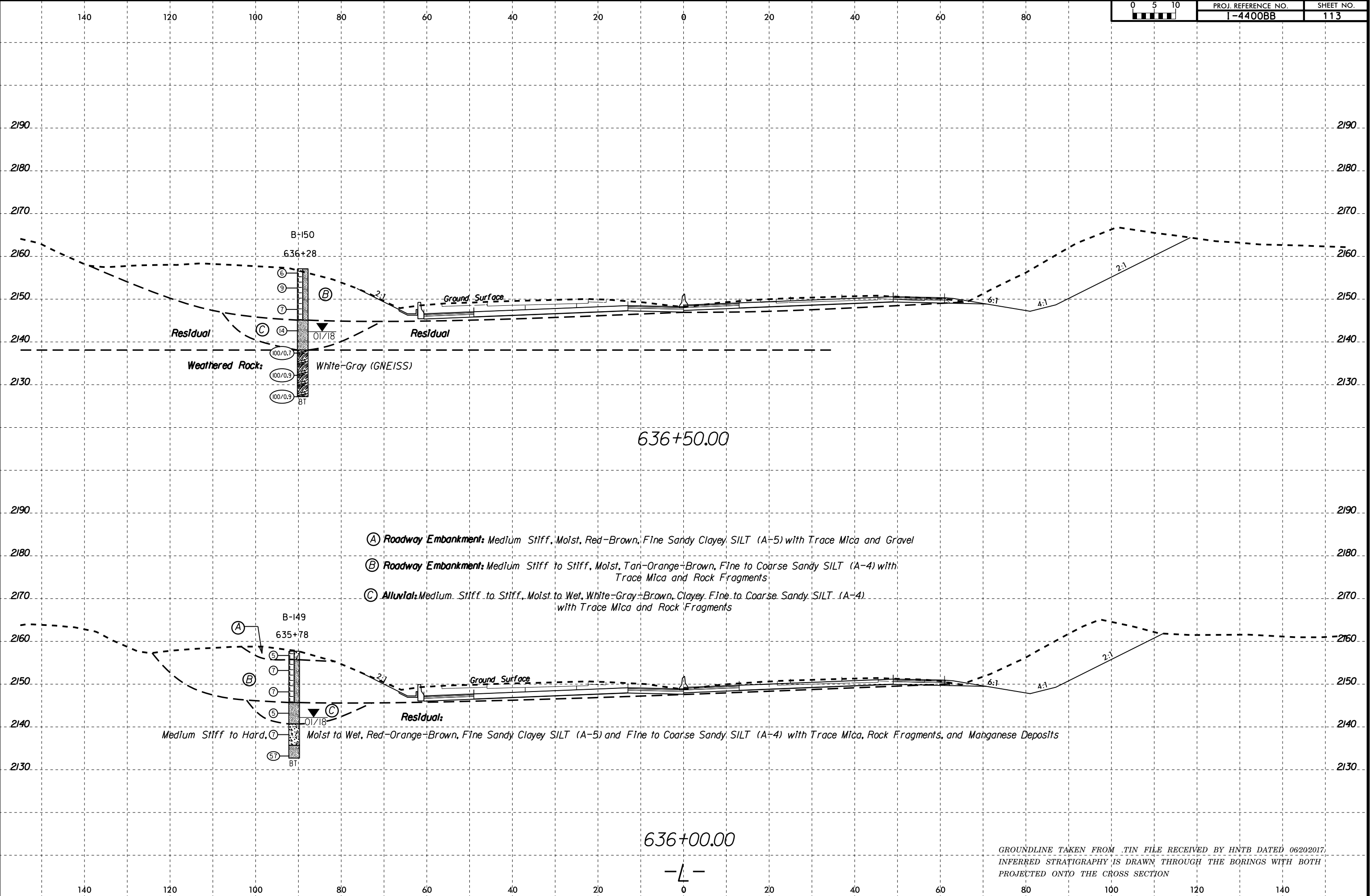
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6/23/16



PROJ. REFERENCE NO. I-4400BB

SHEET NO. 113



- (A) **Roadway Embankment:** Medium Stiff, Moist, Red-Brown, Fine Sandy Clayey SILT (A-5) with Trace Mica and Gravel
- (B) **Roadway Embankment:** Medium Stiff to Stiff, Moist, Tan-Orange-Brown, Fine to Coarse Sandy SILT (A-4) with Trace Mica and Rock Fragments
- (C) **Alluvial:** Medium Stiff to Stiff, Moist to Wet, White-Gray-Brown, Clayey Fine to Coarse Sandy SILT (A-4) with Trace Mica and Rock Fragments

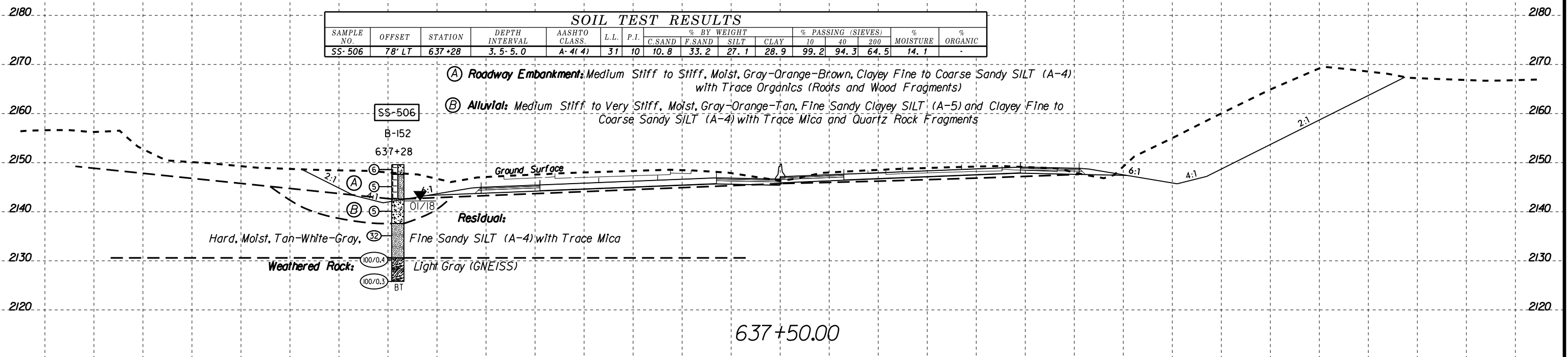
Medium Stiff to Hard, Moist to Wet, Red-Orange-Brown, Fine Sandy Clayey SILT (A-5) and Fine to Coarse Sandy SILT (A-4) with Trace Mica, Rock Fragments, and Manganese Deposits

GROUNDLINE TAKEN FROM TIN FILE RECEIVED BY HNTB DATED 06/20/2017. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION

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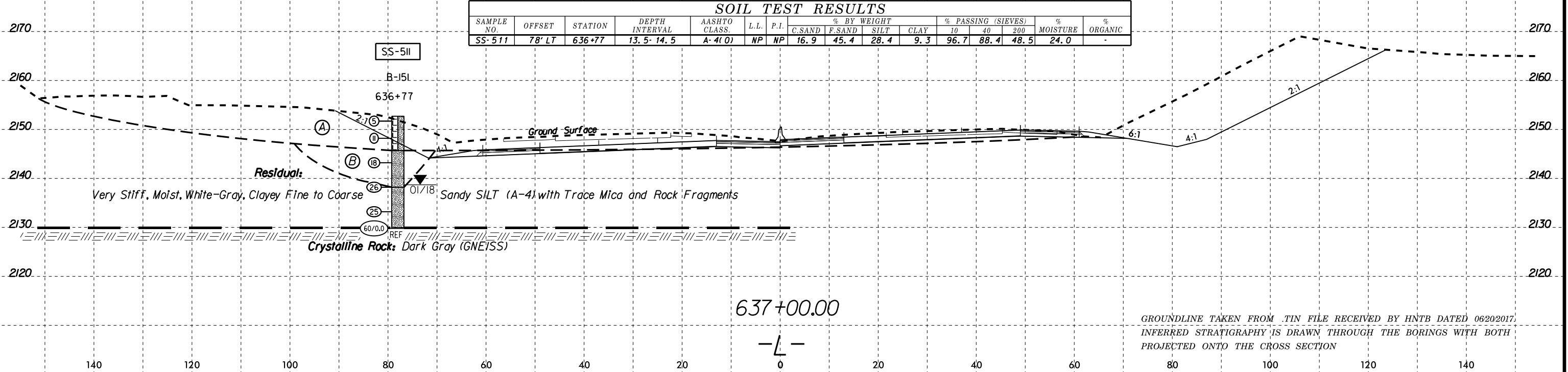
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-506	78' LT	637+28	3.5-5.0	A-4(4)	31	10	10.8	33.2	27.1	28.9	99.2	94.3	64.5	14.1	-



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-511	78' LT	636+77	13.5-14.5	A-4(1)	NP	NP	16.9	45.4	28.4	9.3	96.7	88.4	48.5	24.0	-

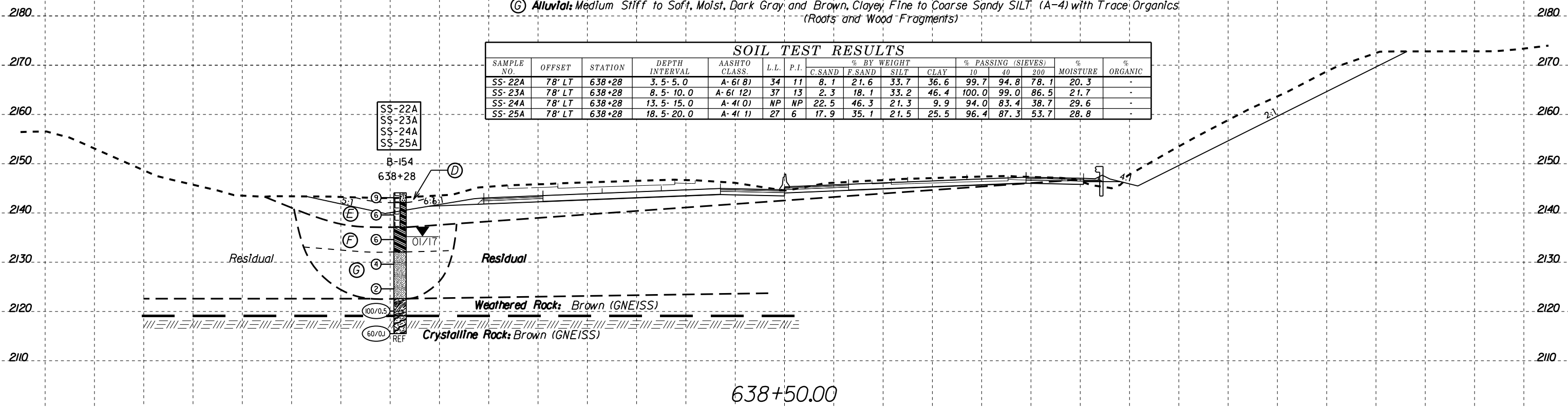


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PROJECTED ONTO THE CROSS SECTION

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Walker A 660261102

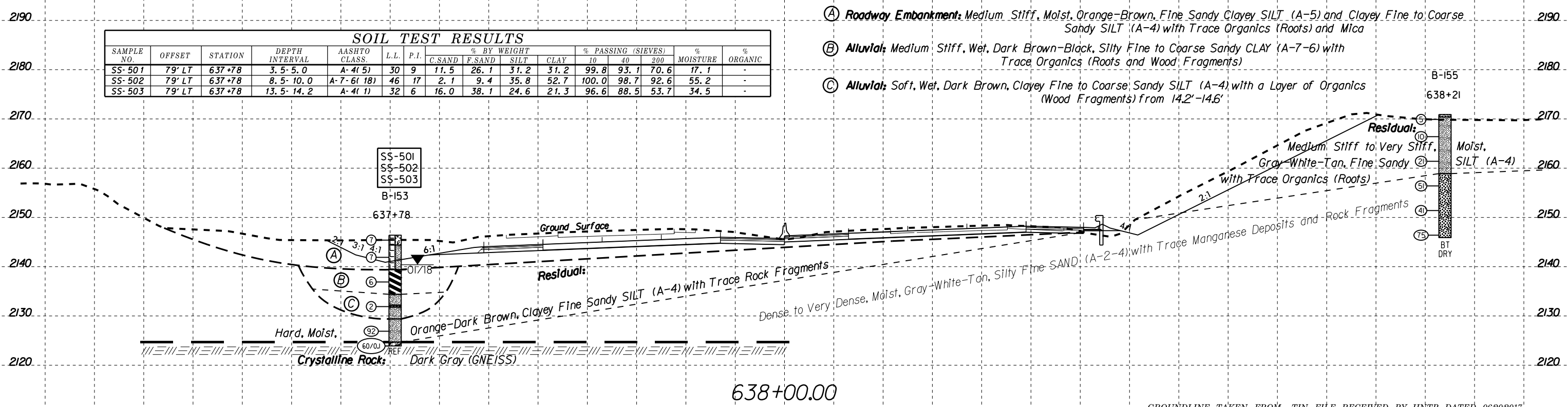
- (D) Roadway Embankment: Loose, Moist, Brown, Silty Fine to Coarse SAND (A-2-4) with Trace Organics (Roots) and Gravel
- (E) Roadway Embankment: Medium Stiff, Moist, Brown, Silty Fine to Coarse Sandy CLAY (A-6) with Trace Organics (Roots)
- (F) Alluvial: Medium Stiff, Moist, Gray, Silty Fine to Coarse Sandy CLAY (A-6) with Trace Organics (Roots)
- (G) Alluvial: Medium Stiff to Soft, Moist, Dark Gray and Brown, Clayey Fine to Coarse Sandy SILT (A-4) with Trace Organics (Roots) and Wood Fragments

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-22A	78' LT	638+28	3.5-5.0	A-6(8)	34	11	8.1	21.6	33.7	36.6	99.7	94.8	78.1	20.3	-
SS-23A	78' LT	638+28	8.5-10.0	A-6(12)	37	13	2.3	18.1	33.2	46.4	100.0	99.0	86.5	21.7	-
SS-24A	78' LT	638+28	13.5-15.0	A-4(0)	NP	NP	22.5	46.3	21.3	9.9	94.0	83.4	38.7	29.6	-
SS-25A	78' LT	638+28	18.5-20.0	A-4(1)	27	6	17.9	35.1	21.5	25.5	96.4	87.3	53.7	28.8	-

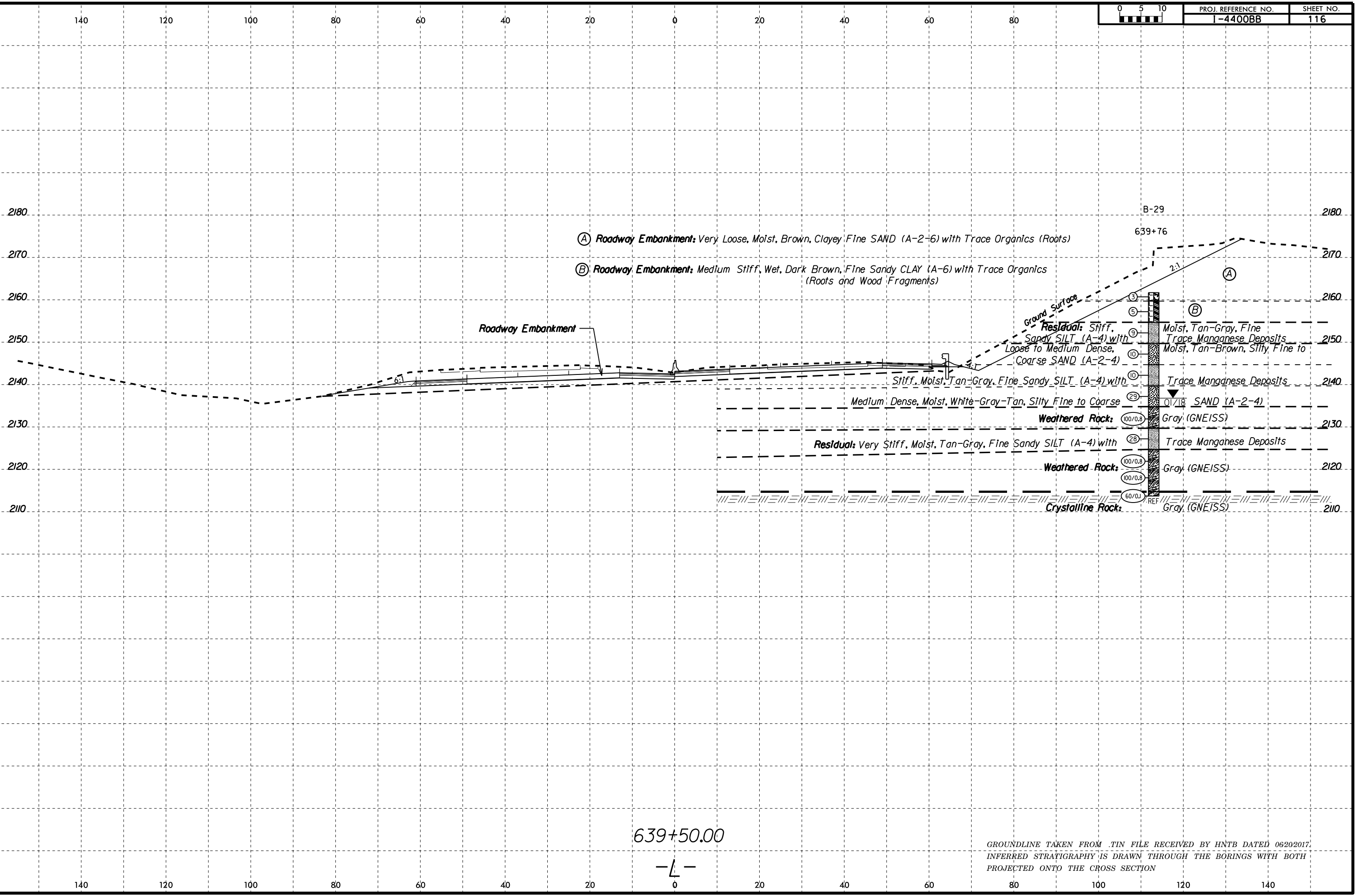


SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-501	79' LT	637+78	3.5-5.0	A-4(5)	30	9	11.5	26.1	31.2	31.2	99.8	93.1	70.6	17.1	-
SS-502	79' LT	637+78	8.5-10.0	A-7-6(18)	46	17	2.1	9.4	35.8	52.7	100.0	98.7	92.6	55.2	-
SS-503	79' LT	637+78	13.5-14.2	A-4(1)	32	6	16.0	38.1	24.6	21.3	96.6	88.5	53.7	34.5	-

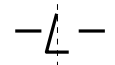
- (A) Roadway Embankment: Medium Stiff, Moist, Orange-Brown, Fine Sandy Clayey SILT (A-5) and Clayey Fine to Coarse Sandy SILT (A-4) with Trace Organics (Roots) and Mica
- (B) Alluvial: Medium Stiff, Wet, Dark Brown-Black, Silty Fine to Coarse Sandy CLAY (A-7-6) with Trace Organics (Roots and Wood Fragments)
- (C) Alluvial: Soft, Wet, Dark Brown, Clayey Fine to Coarse Sandy SILT (A-4) with a Layer of Organics (Wood Fragments) from 14.2'-14.6'



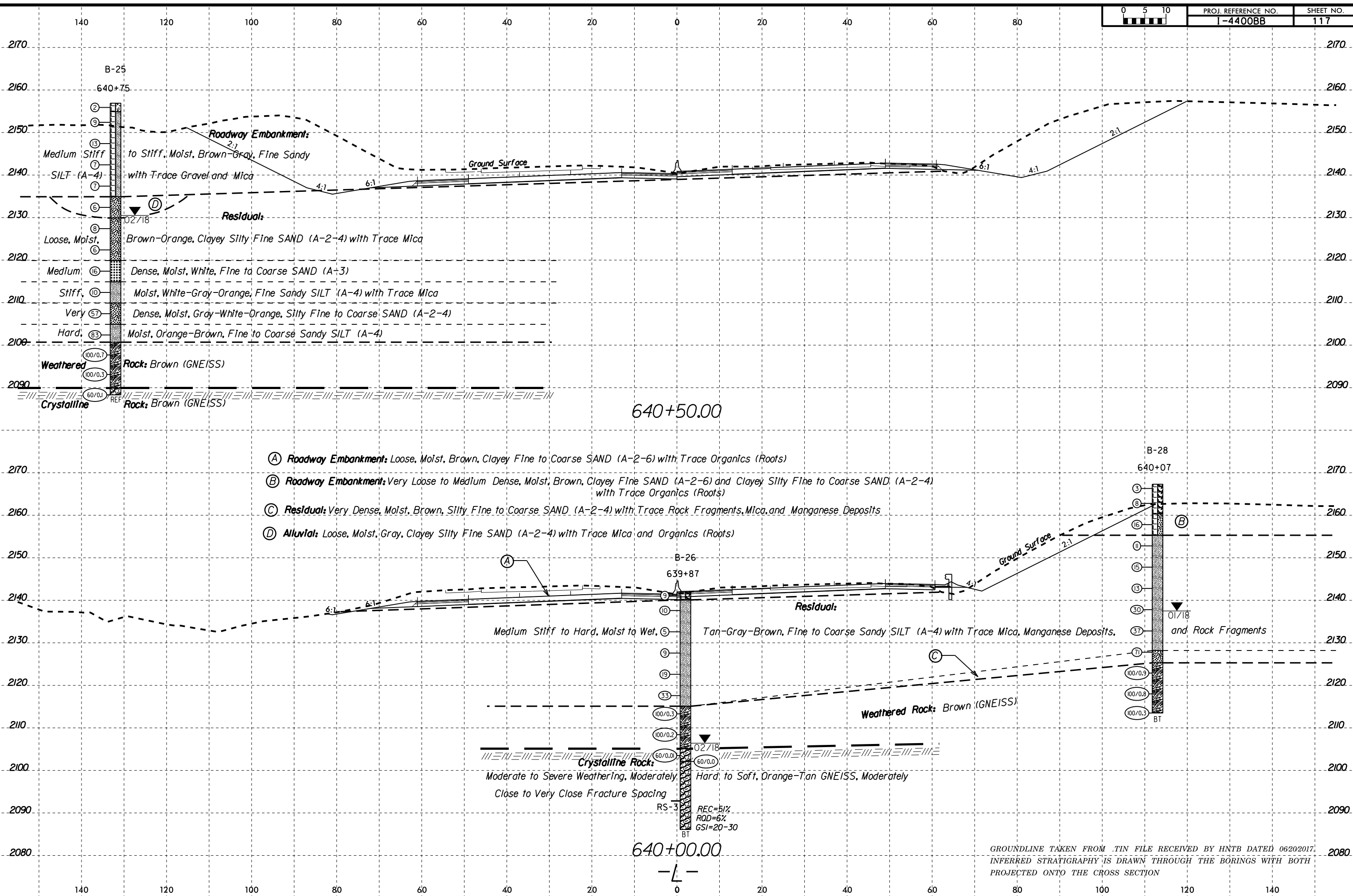
GROUNDLINE TAKEN FROM TIN FILE RECEIVED BY HNTB DATED 06/20/2017.
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
 PROJECTED ONTO THE CROSS SECTION



639+50.00



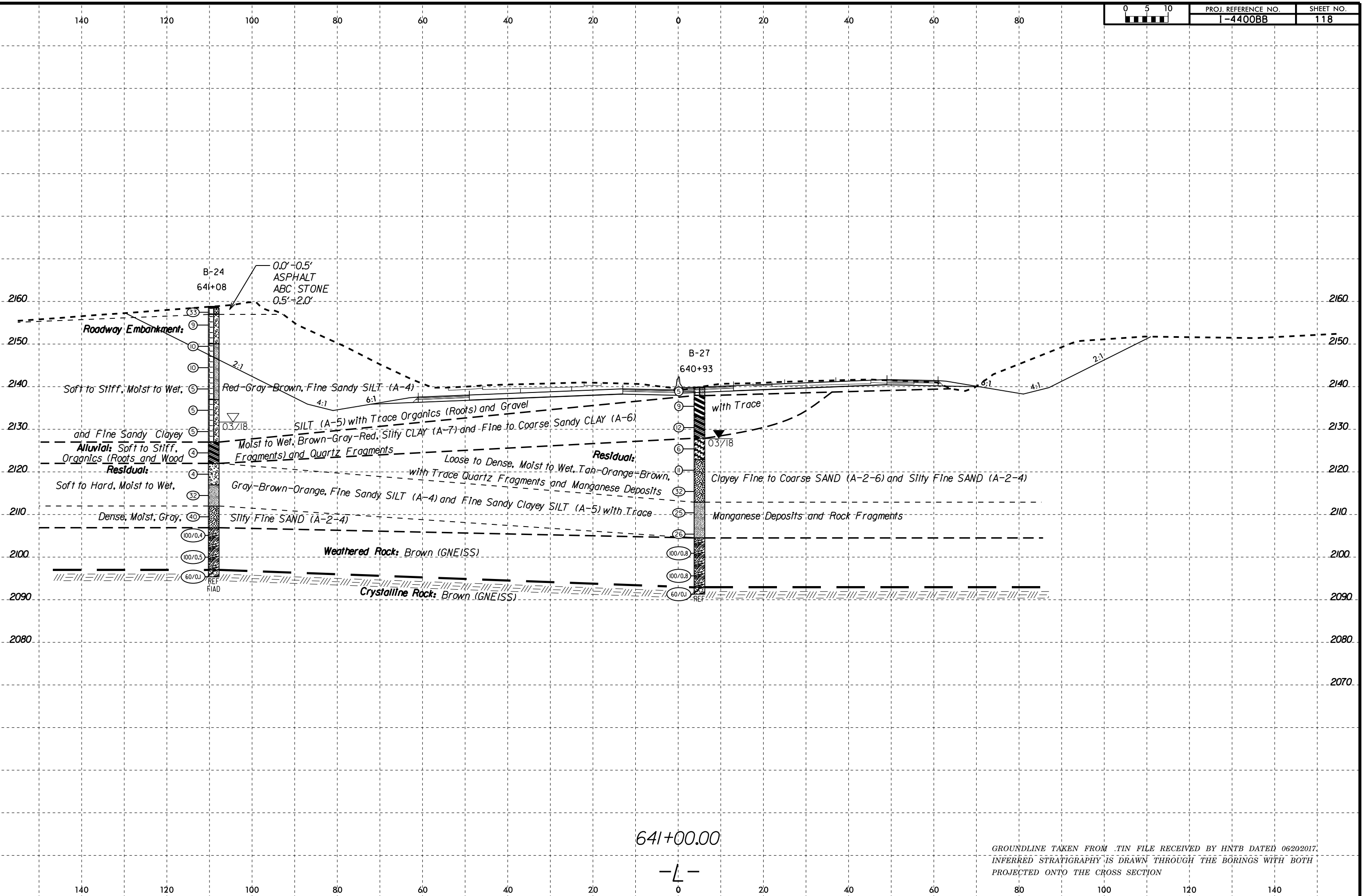
GROUNDLINE TAKEN FROM TIN FILE RECEIVED BY HNTB DATED 06/20/2017.
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
 PROJECTED ONTO THE CROSS SECTION



- Ⓐ **Roadway Embankment:** Loose, Moist, Brown, Clayey Fine to Coarse SAND (A-2-6) with Trace Organics (Roots)
- Ⓑ **Roadway Embankment:** Very Loose to Medium Dense, Moist, Brown, Clayey Fine SAND (A-2-6) and Clayey Silty Fine to Coarse SAND (A-2-4) with Trace Organics (Roots)
- Ⓒ **Residual:** Very Dense, Moist, Brown, Silty Fine to Coarse SAND (A-2-4) with Trace Rock Fragments, Mica, and Manganese Deposits
- Ⓓ **Alluvial:** Loose, Moist, Gray, Clayey Silty Fine SAND (A-2-4) with Trace Mica and Organics (Roots)

GROUNDLINE TAKEN FROM TIN FILE RECEIVED BY HNTB DATED 06/20/2017.
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
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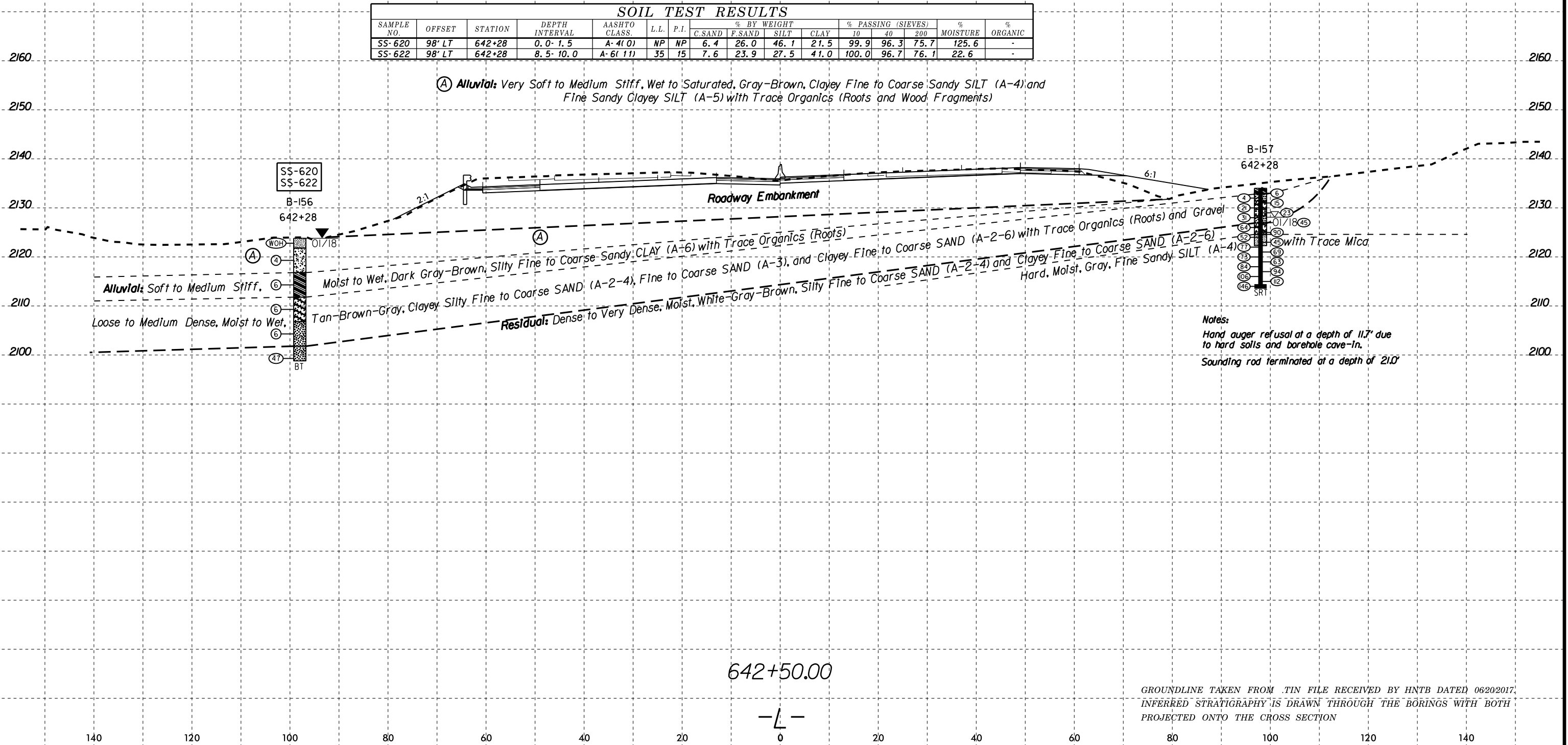
6/23/16
27-JUN-2019 08:42
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Walker-A 66026102



GROUNDLINE TAKEN FROM .TIN FILE RECEIVED BY HNTB DATED 06/20/2017.
INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
PROJECTED ONTO THE CROSS SECTION

25-JUN-2019 15:39
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 TWalker

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-620	98' LT	642+28	0.0- 1.5	A-4(0)	NP	NP	6.4	26.0	46.1	21.5	99.9	96.3	75.7	125.6	-
SS-622	98' LT	642+28	8.5- 10.0	A-6(11)	35	15	7.6	23.9	27.5	41.0	100.0	96.7	76.1	22.6	-



(A) **Alluvial:** Very Soft to Medium Stiff, Wet to Saturated, Gray-Brown, Clayey Fine to Coarse Sandy SILT (A-4) and Fine Sandy Clayey SILT (A-5) with Trace Organics (Roots and Wood Fragments)

(A) **Alluvial:** Soft to Medium Stiff, Moist to Wet, Dark Gray-Brown, Silty Fine to Coarse Sandy CLAY (A-6) with Trace Organics (Roots)

(A) **Alluvial:** Loose to Medium Dense, Moist to Wet, Tan-Brown-Gray, Clayey Silty Fine to Coarse SAND (A-2-4), Fine to Coarse SAND (A-3), and Clayey Fine to Coarse SAND (A-2-6) with Trace Organics (Roots) and Gravel

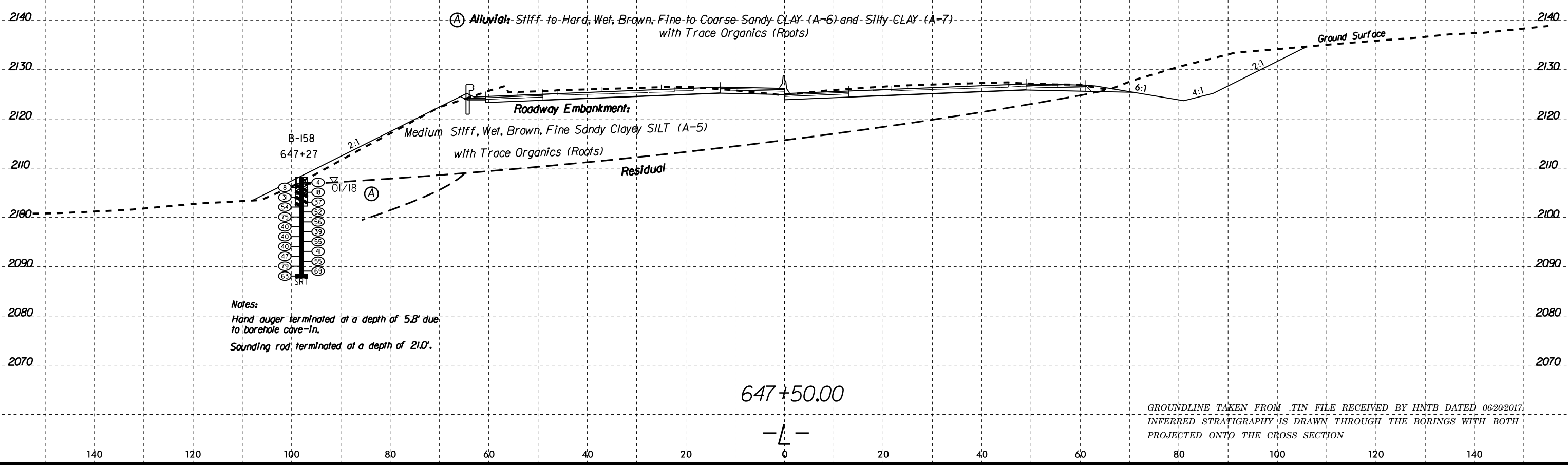
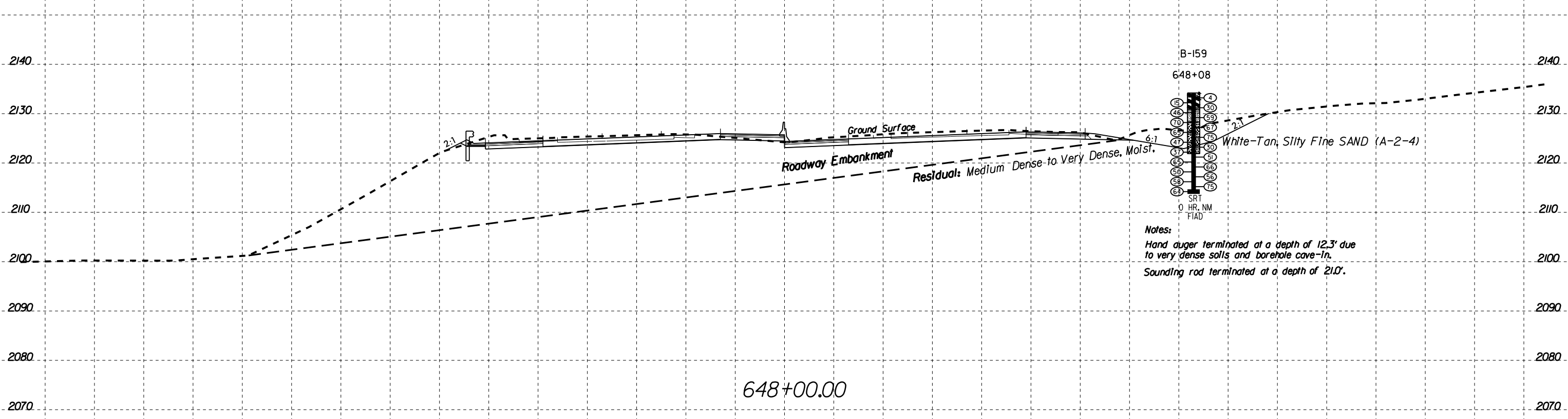
Residual: Dense to Very Dense, Moist, White-Gray-Brown, Silty Fine to Coarse SAND (A-2-4) and Clayey Fine to Coarse SAND (A-2-6) with Trace Mica

Hard, Moist, Gray, Fine Sandy SILT (A-4)

Notes:
 Hand auger refusal at a depth of 11.7' due to hard soils and borehole cave-in.
 Sounding rod terminated at a depth of 21.0'

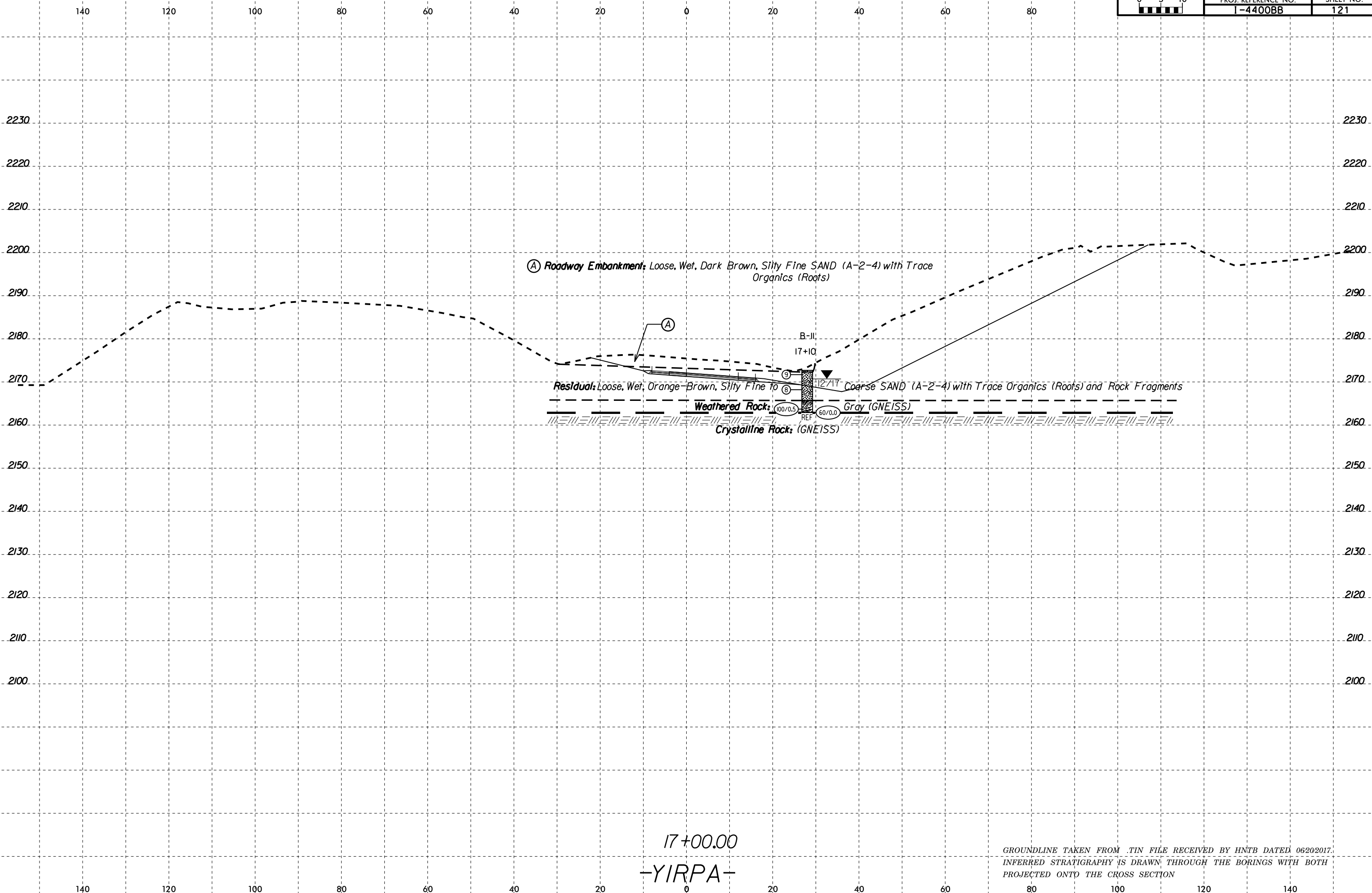
642+50.00

GROUNDLINE TAKEN FROM .TIN FILE RECEIVED BY HNTB DATED 06/20/2017.
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
 PROJECTED ONTO THE CROSS SECTION



GROUNDLINE TAKEN FROM TIN FILE RECEIVED BY HNTB DATED 06202017.
INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
PROJECTED ONTO THE CROSS SECTION

6/23/16

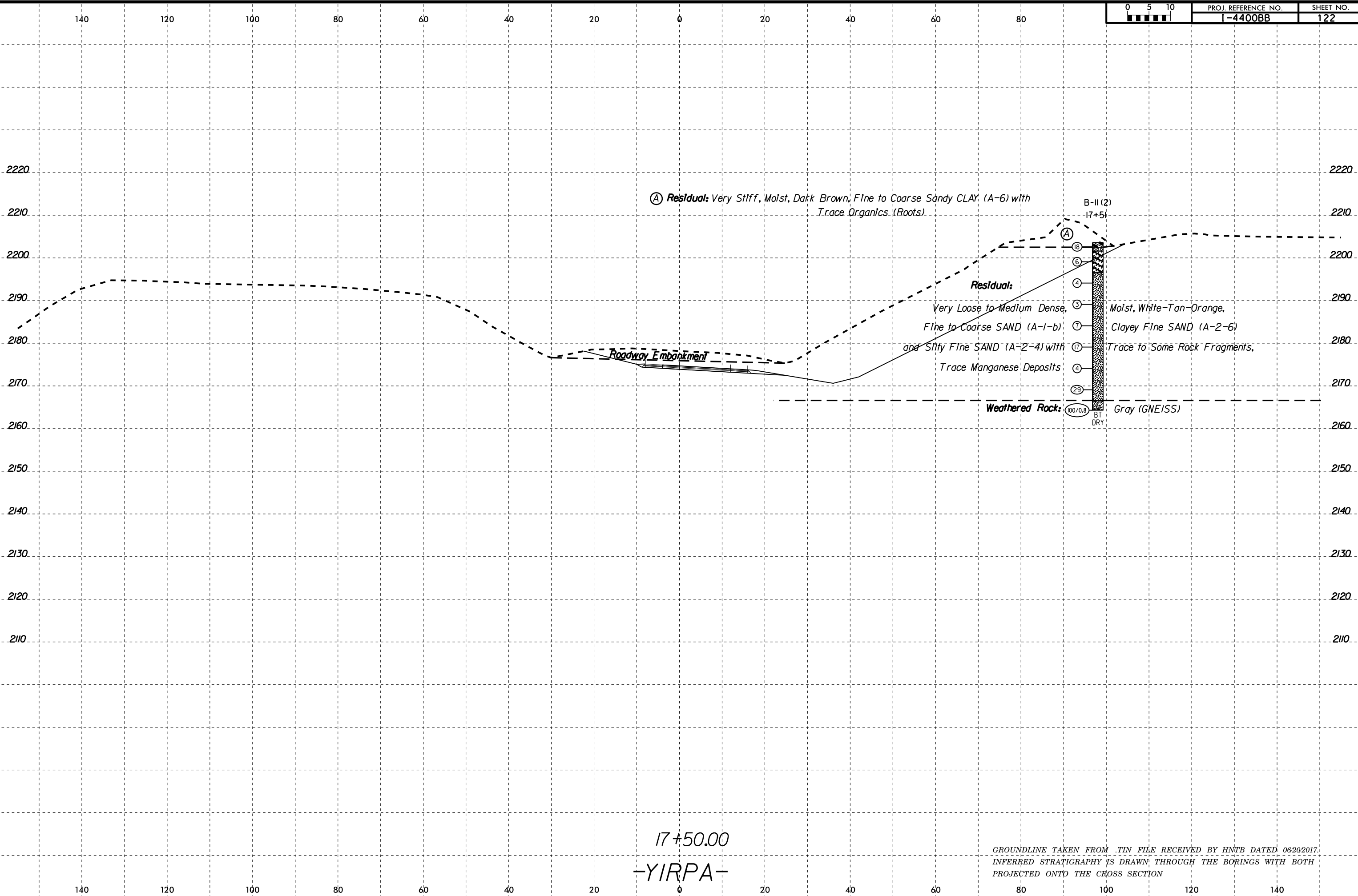


17+00.00
-YIRPA-

GROUNDLINE TAKEN FROM .TIN FILE RECEIVED BY HNTB DATED 06/20/2017.
INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
PROJECTED ONTO THE CROSS SECTION

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T Walker

6/23/16



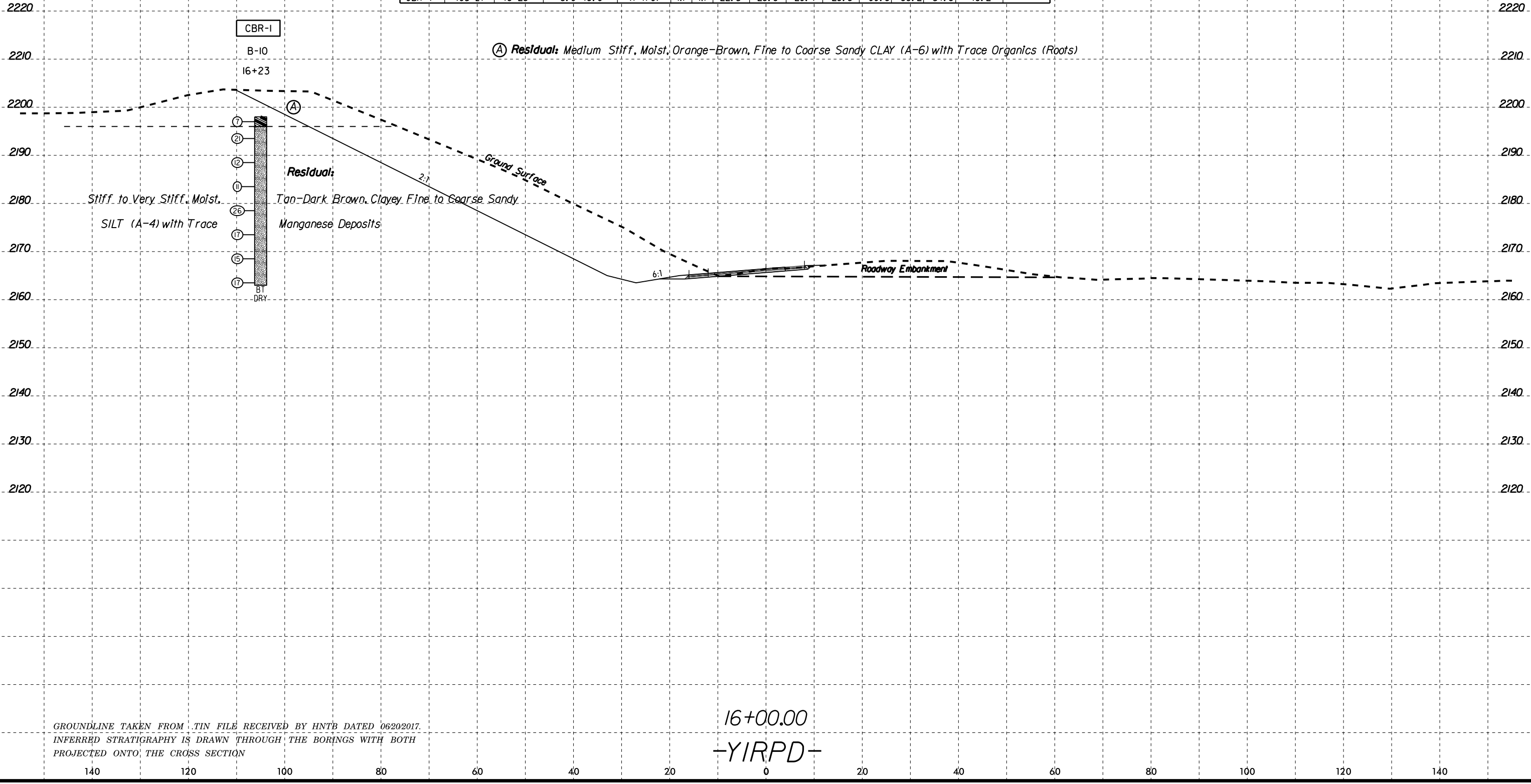
17+50.00
-YIRPA-

GROUNDLINE TAKEN FROM TIN FILE RECEIVED BY HNTB DATED 06/20/2017.
INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
PROJECTED ONTO THE CROSS SECTION

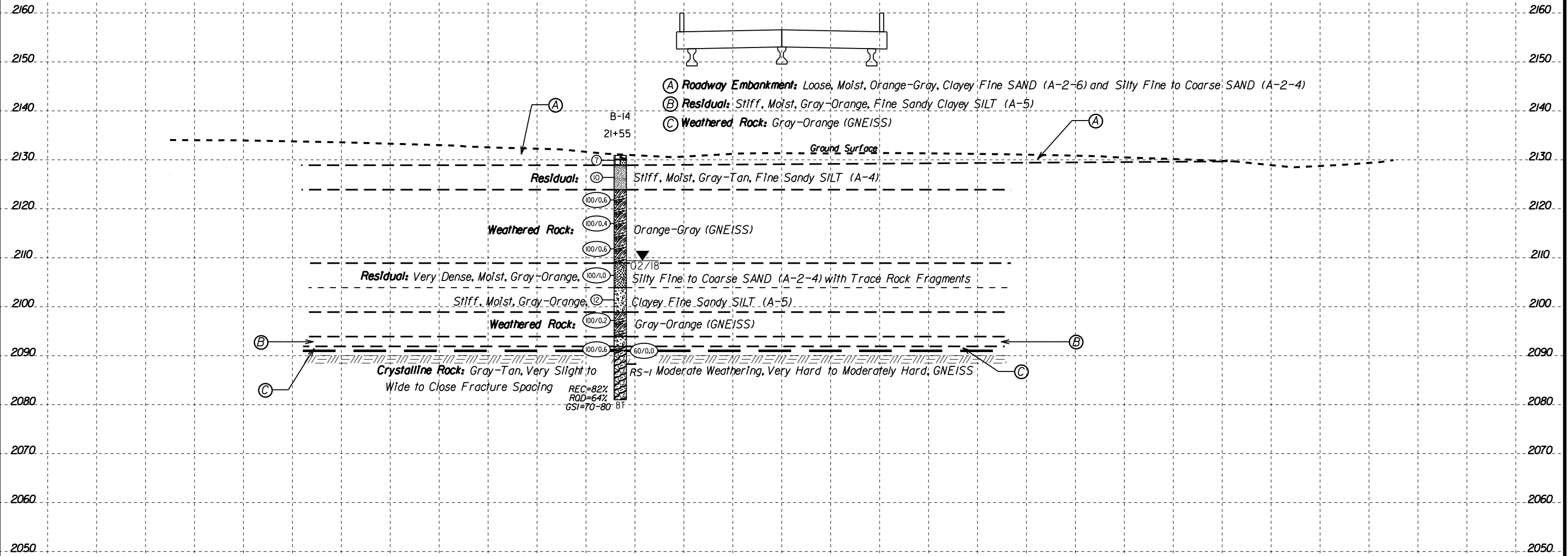
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Walker

6/23/16
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SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
CBR-1	105' LT	16+23	3.0-18.0	A-4(0)	NP	NP	22.5	28.6	20.1	28.8	99.8	86.2	54.8	16.2	-



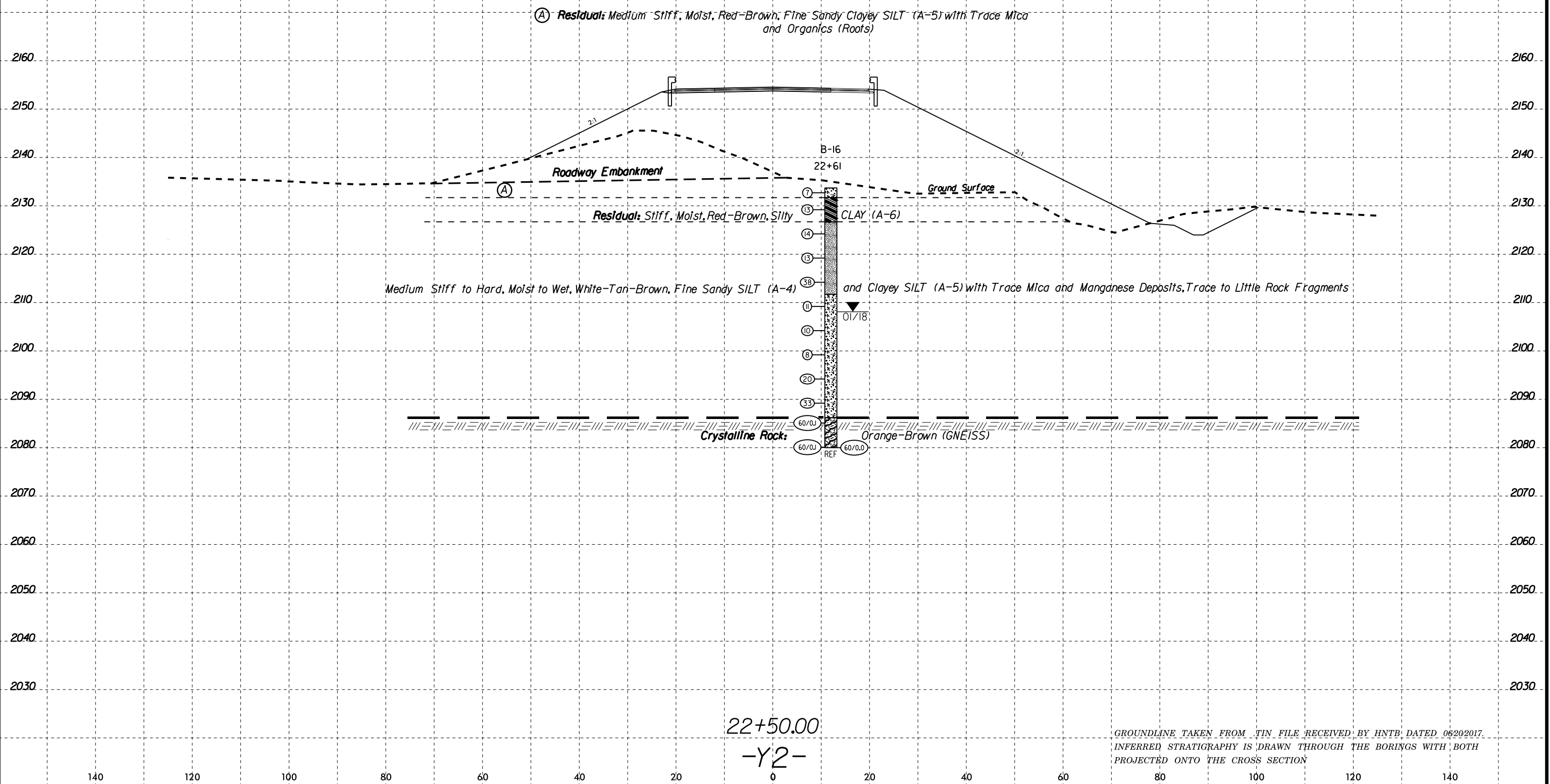
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21+50.00
-Y2-

GROUNDLINE TAKEN FROM TIN FILE RECEIVED BY HNTB DATED 06/20/2017.
INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
PROJECTED ONTO THE CROSS SECTION

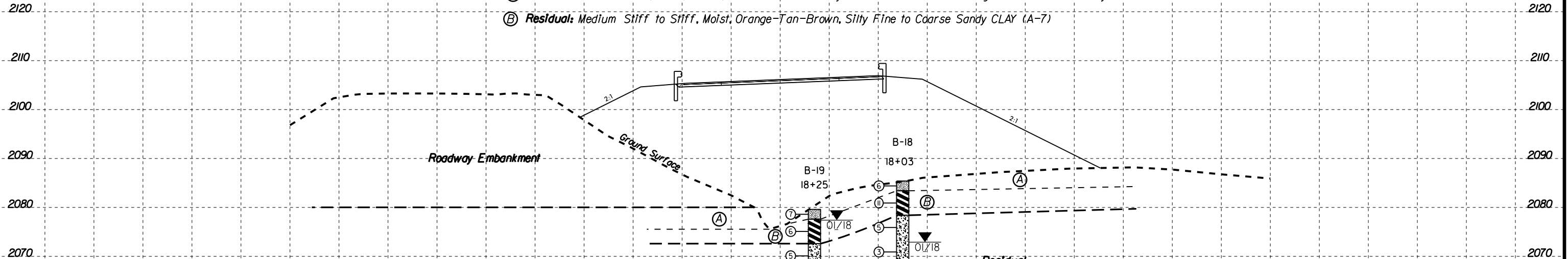
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6/23/16



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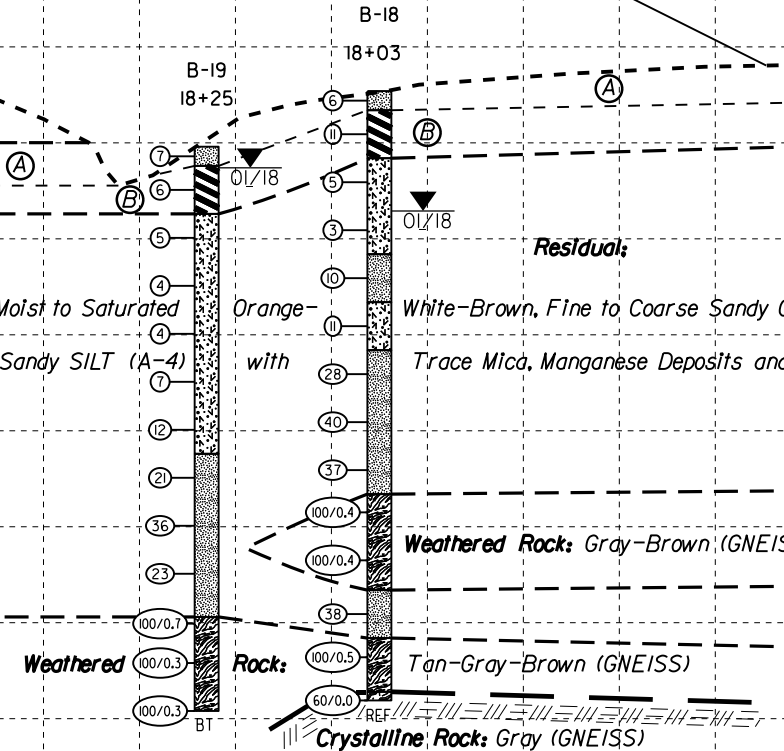


- (A) Residual: Medium Stiff, Moist, Brown, Fine to Coarse Sandy SILT (A-4) with Trace Organics (Roots) and Clay
- (B) Residual: Medium Stiff to Stiff, Moist, Orange-Tan-Brown, Silty Fine to Coarse Sandy CLAY (A-7)

Roadway Embankment

Soft to Hard, Moist to Saturated
Fine to Coarse Sandy SILT (A-4)

Orange-
with
White-Brown, Fine to Coarse Sandy Clayey SILT (A-5) and
Trace Mica, Manganese Deposits and Rock Fragments



Weathered Rock: Gray-Brown (GNEISS)

Rock: Tan-Gray-Brown (GNEISS)

Crystalline Rock: Gray (GNEISS)

18+00.00
-Y5-

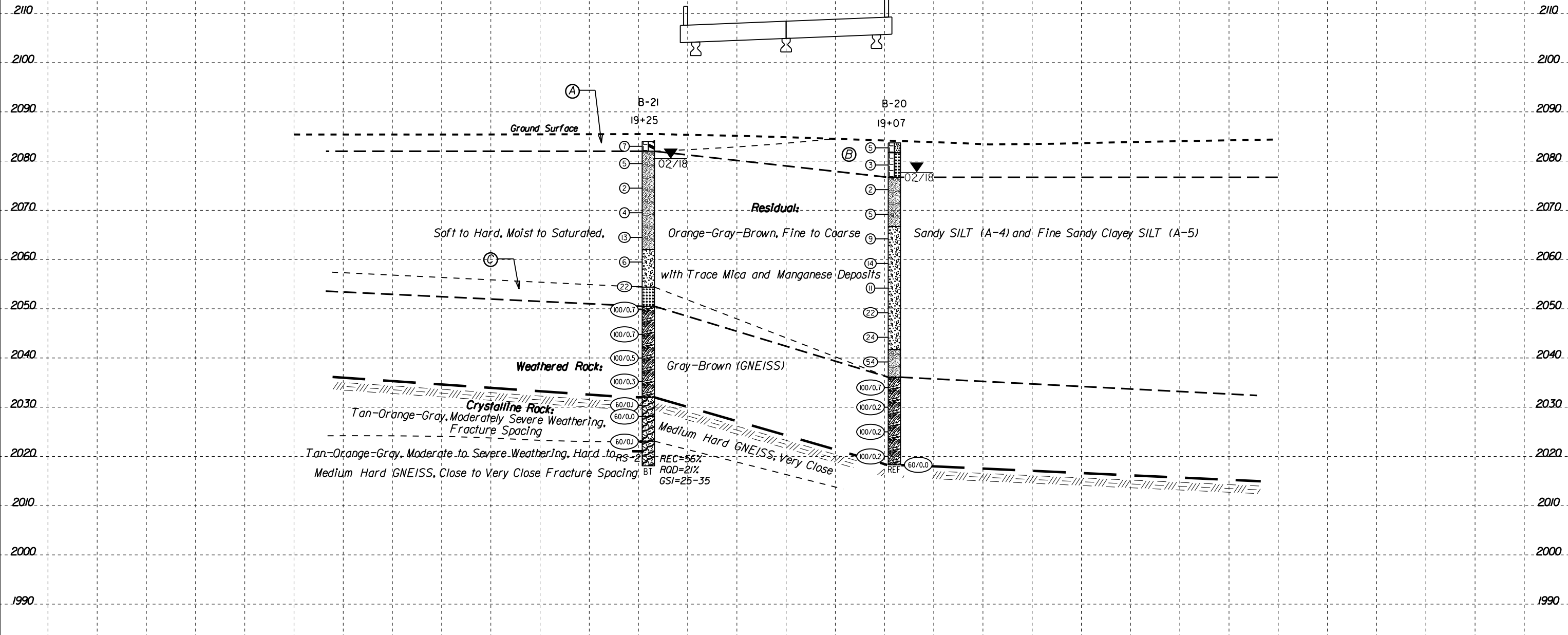
GROUNDLINE TAKEN FROM .TIN FILE RECEIVED BY HNTB DATED 06/20/2017.
INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
PROJECTED ONTO THE CROSS SECTION

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Walker-A 66026102

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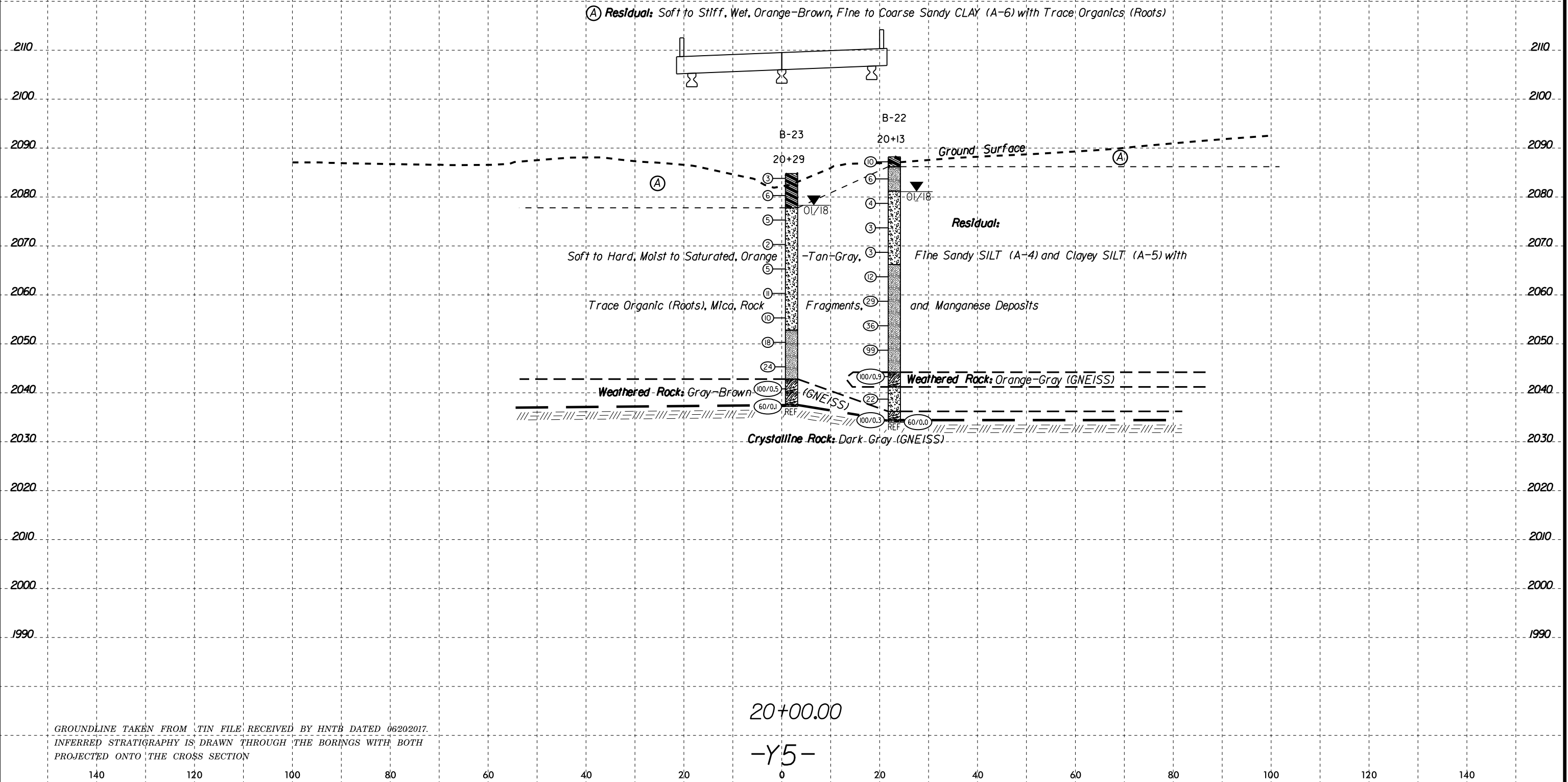
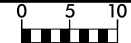
- (A) **Roadway Embankment:** Medium Stiff, Moist, Orange, Fine Sandy Silty CLAY (A-7)
- (B) **Roadway Embankment:** Very Loose to Loose, Moist, Brown and Tan, Clayey Silty Fine to Coarse SAND (A-2-4) and Fine to Coarse SAND (A-3) with Trace Organics (Roots)
- (C) **Residual:** Medium Dense, Wet, White, Coarse SAND (A-3) with Trace Rock Fragments



GROUNDLINE TAKEN FROM TIN FILE RECEIVED BY HNTB DATED 06202017.
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
 PROJECTED ONTO THE CROSS SECTION

19+00.00
 -Y5-

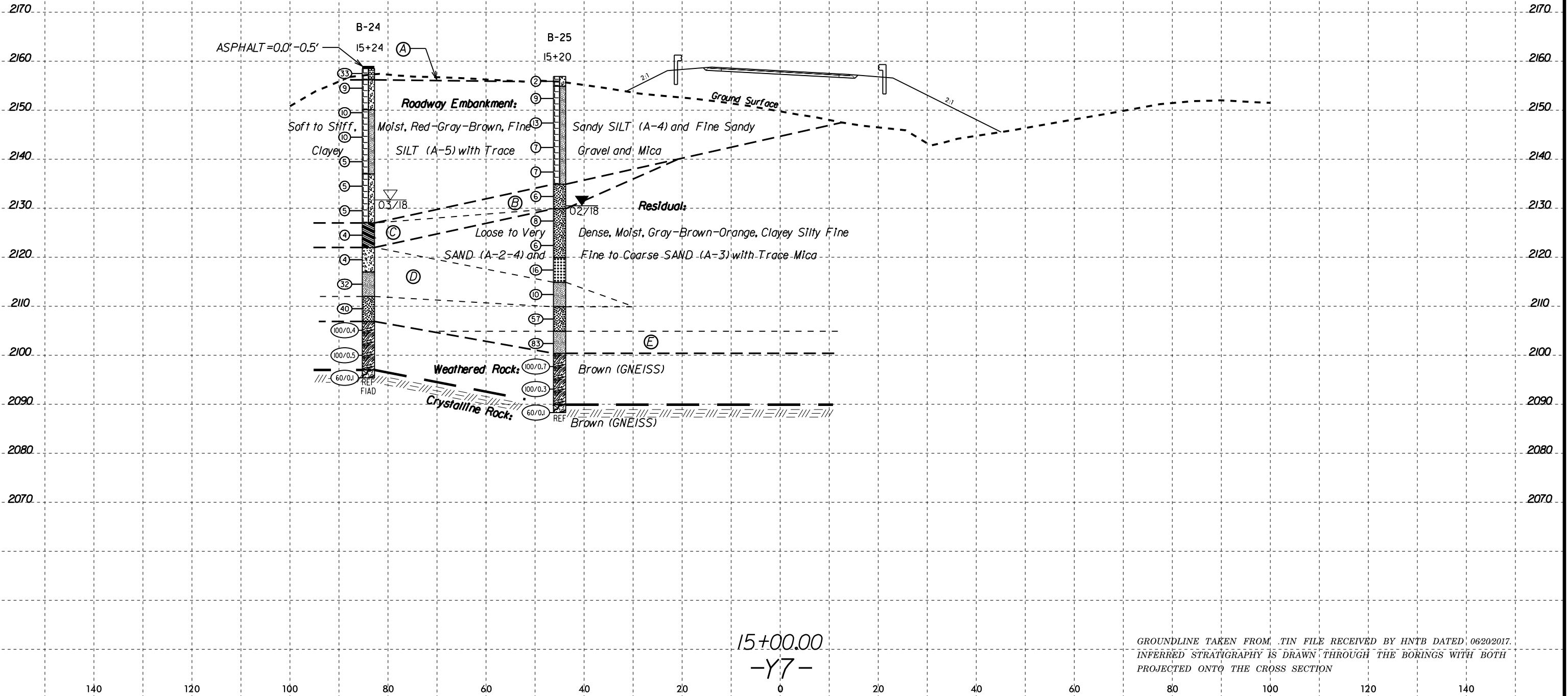
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GROUNDLINE TAKEN FROM TIN FILE RECEIVED BY HNTB DATED 06202017.
INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
PROJECTED ONTO THE CROSS SECTION

20+00.00
-Y5-

- (A) **Roadway Embankment:** (ABC STONE)
- (B) **Alluvial:** Loose, Moist, Gray, Clayey Silty Fine SAND (A-2-4) with Trace Mica and Organics (Roots)
- (C) **Alluvial:** Soft to Medium Stiff, Wet, Gray, Fine Sandy CLAY (A-6) with Trace Organics (Roots and Wood Fragments)
- (D) **Residual:** Soft to Hard, Moist to Wet, White-Gray, Fine Sandy Clayey SILT (A-5) and Fine Sandy SILT (A-4) with Trace Mica
- (E) **Residual:** Hard, Moist, Orange-Brown, Fine to Coarse Sandy SILT (A-4)



GROUNDLINE TAKEN FROM .TIN FILE RECEIVED BY HNTB DATED 06/20/2017.
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
 PROJECTED ONTO THE CROSS SECTION

6/23/16



140

120

100

80

60

40

20

0

20

40

60

80

2170

2160

2150

2140

2130

2120

2110

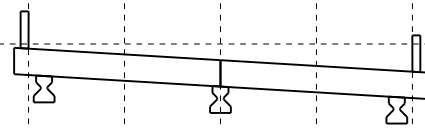
2100

2090

2080

2070

(A) Roadway Embankment: Loose, Moist, Brown, Clayey Fine to Coarse SAND (A-2-6) with Trace Organics (Roots) and Manganese Deposits



2170

2160

2150

2140

2130

2120

2110

2100

2090

2080

2070

B-26
16+71

Ground Surface

Residual:

Medium-Stiff to Hard, Moist to Wet, Brown, Fine Sandy SILT (A-4) with Trace Mica, Manganese Deposits, and Rock Fragments

Weathered Rock: Brown (GNEISS)

Crystalline Rock: Moderate to Severe Orange-Tan, GNEISS, Weathering, Moderately Hard to Soft, Close to Very Close Fracture Spacing

RS-3
REC=5%
ROD=6%
GSI=20-30

(9)

(10)

(5)

(9)

(19)

(33)

(100/0.3)

(100/0.2)

(60/0.1)

(60/0.0)

02/18

BT

16+50.00

-Y7-

GROUNDLINE TAKEN FROM .TIN FILE RECEIVED BY HNTB DATED 06/20/2017.
INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
PROJECTED ONTO THE CROSS SECTION

140

120

100

80

60

40

20

0

20

40

60

80

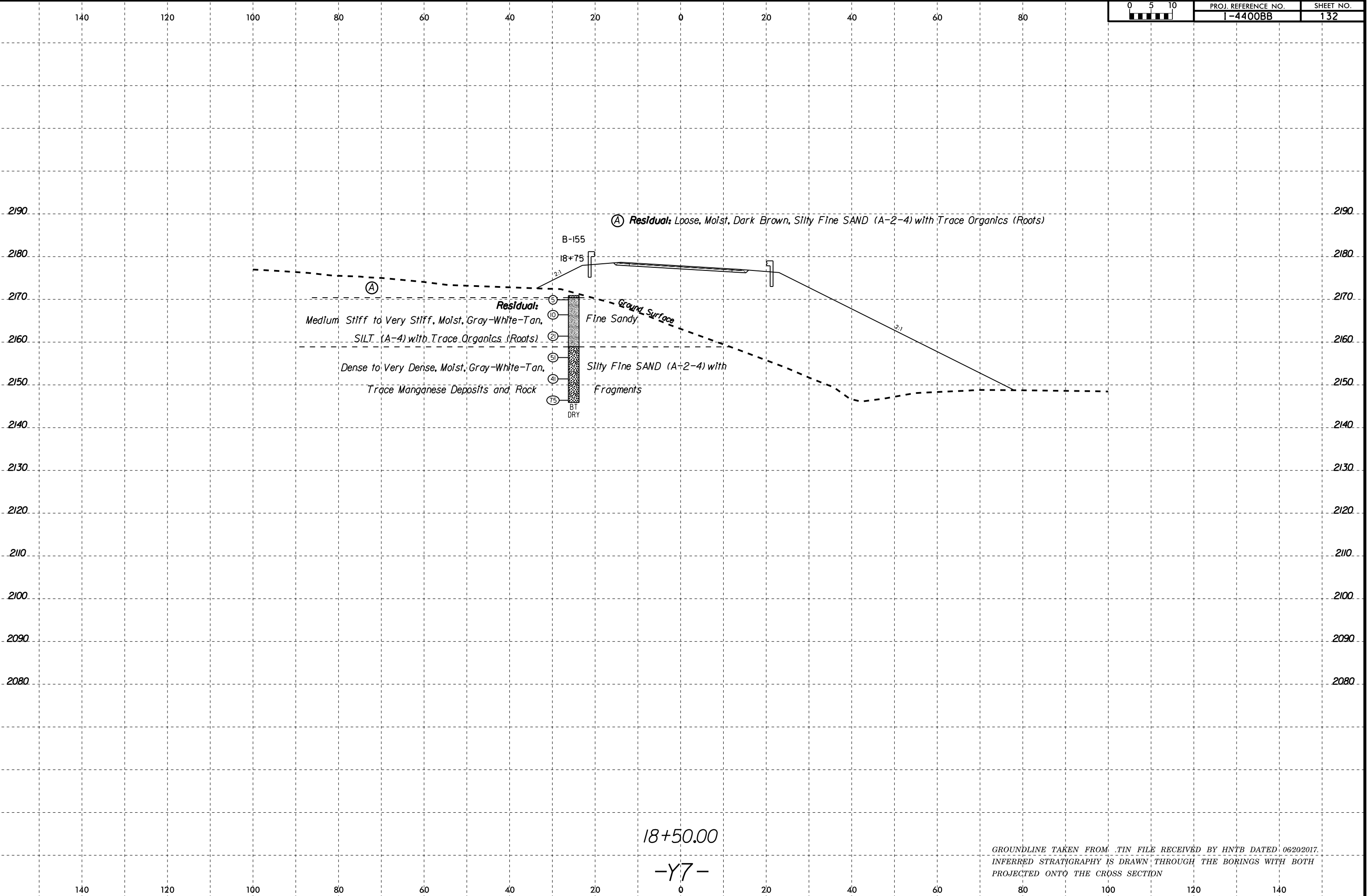
100

120

140

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Walker-A 66026102

6/23/16



18+50.00

-Y7-

GROUNDLINE TAKEN FROM .TIN FILE RECEIVED BY HNTB DATED 06/20/2017.
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
 PROJECTED ONTO THE CROSS SECTION

27-JUN-2019 08:48
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 Walker-A 66026102

6/23/16
27 JUN 2019 13:17
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Mark

140

120

100

80

60

40

20

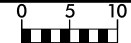
0

20

40

60

80



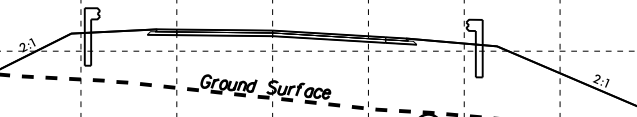
PROJ. REFERENCE NO.
I-4400BB

SHEET NO.
133

2210
2200
2190
2180
2170
2160
2150
2140
2130
2120

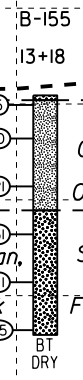
2210
2200
2190
2180
2170
2160
2150
2140
2130
2120

(A) Residual: Loose, Moist, Dark Brown, Silty Fine SAND (A-2-4) with Trace Organics (Roots)



(A) Residual:
Medium Stiff to Very Stiff, Moist,
SILT (A-4) with Trace

Dense to Very Dense, Moist, Gray-White-Tan,
Trace Manganese Deposits and Rock



Gray-White-Tan, Fine Sandy
Organics (Roots)

Silty Fine SAND (A-2-4) with
Fragments

13+00.00

-Y9-

GROUNDLINE TAKEN FROM TIN FILE RECEIVED BY HNTB DATED 06/20/2017.
INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
PROJECTED ONTO THE CROSS SECTION

140

120

100

80

60

40

20

0

20

40

60

80

100

120

140

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34232.1.3		TIP I-4400BB		COUNTY HENDERSON		GEOLOGIST M. Arnold										
SITE DESCRIPTION I-26 from US 64 (Exit 49) to US 25 Business (Exit 44)							GROUND WTR (ft)									
BORING NO. B-1		STATION N/A		OFFSET N/A		ALIGNMENT N/A										
COLLAR ELEV. 2,175.9 ft		TOTAL DEPTH 15.0 ft		NORTHING 595,931		EASTING 974,716										
DRILL RIG/HAMMER EFF./DATE F&R2175 CME-55 88% 02/11/2017				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER S. Davis		START DATE 01/07/18		COMP. DATE 01/07/18		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						
2180																
2175	2,175.9	0.0	4	2	3							SS-535	20%		2,175.9	0.0
2170	2,172.4	3.5	4	5	6							SS-536	26%		2,173.9	2.0
2165	2,167.4	8.5	5	5	8								M			
	2,162.4	13.5	3	5	7								M		2,160.9	15.0
Boring Terminated at Elevation 2,160.9 ft in SILT (Residual) Notes: 1. 0.0'-0.1' = SURFICIAL ORGANIC SOILS 2. Filled Immediately After Drilling 3. Boring located outside of project limits																

WBS 34232.1.3		TIP I-4400BB		COUNTY HENDERSON		GEOLOGIST M. Arnold										
SITE DESCRIPTION I-26 from US 64 (Exit 49) to US 25 Business (Exit 44)							GROUND WTR (ft)									
BORING NO. B-2		STATION N/A		OFFSET N/A		ALIGNMENT N/A										
COLLAR ELEV. 2,176.0 ft		TOTAL DEPTH 15.0 ft		NORTHING 595,960		EASTING 974,701										
DRILL RIG/HAMMER EFF./DATE F&R2175 CME-55 88% 02/11/2017				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER S. Davis		START DATE 01/07/18		COMP. DATE 01/07/18		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						
2180																
2175	2,176.0	0.0	2	2	3								M		2,176.0	0.0
2170	2,172.5	3.5	3	6	17								M		2,174.0	2.0
2165	2,167.5	8.5	6	6	7								M			
	2,162.5	13.5	4	10	11								M		2,161.0	15.0
Boring Terminated at Elevation 2,161.0 ft in SILT (Residual) Notes: 1. 0.0'-0.1' = SURFICIAL ORGANIC SOILS 2. Filled Immediately After Drilling 3. Boring located outside of project limits																

NCDOT BORE DOUBLE I4400B_GEO_BH_RDWY.GPJ NC_DOT.GDT 6/27/19

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34232.1.3		TIP I-4400BB		COUNTY HENDERSON		GEOLOGIST M. Arnold									
SITE DESCRIPTION I-26 from US 64 (Exit 49) to US 25 Business (Exit 44)							GROUND WTR (ft)								
BORING NO. B-3		STATION N/A		OFFSET N/A		ALIGNMENT N/A									
COLLAR ELEV. 2,176.1 ft		TOTAL DEPTH 15.0 ft		NORTHING 595,994		EASTING 974,667									
DRILL RIG/HAMMER EFF./DATE F&R2175 CME-55 88% 02/11/2017				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER S. Davis		START DATE 01/07/18		COMP. DATE 01/07/18		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					
2180															
2175	2,176.1	0.0	3	3	4								M	2,176.1 GROUND SURFACE	0.0
														RESIDUAL	
	2,172.6	3.5	3	3	5								M	2,174.1 White-Tan-Brown, Fine to Coarse Sandy SILT (A-4) with Trace Mica, Organics (Roots), and Clay	2.0
2170													M	White-Gray-Brown, Fine to Coarse Sandy Clayey SILT (A-5) with Trace Mica, Manganese Deposits, and Rock Fragments	
	2,167.6	8.5	5	5	4								M		
2165													M		
	2,162.6	13.5	4	7	7								M		
													M	2,161.1	15.0
Boring Terminated at Elevation 2,161.1 ft in SILT (Residual)															
Notes: 1. 0.0'-0.1' = SURFICIAL ORGANIC SOILS 2. Filled Immediately After Drilling 3. Boring located outside of project limits															

WBS 34232.1.3		TIP I-4400BB		COUNTY HENDERSON		GEOLOGIST M. Arnold									
SITE DESCRIPTION I-26 from US 64 (Exit 49) to US 25 Business (Exit 44)							GROUND WTR (ft)								
BORING NO. B-4		STATION N/A		OFFSET N/A		ALIGNMENT N/A									
COLLAR ELEV. 2,176.2 ft		TOTAL DEPTH 15.0 ft		NORTHING 596,025		EASTING 974,631									
DRILL RIG/HAMMER EFF./DATE F&R2175 CME-55 88% 02/11/2017				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER S. Davis		START DATE 01/07/18		COMP. DATE 01/07/18		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					
2180															
2175	2,176.2	0.0	7	3	3								M	2,176.2 GROUND SURFACE	0.0
														RESIDUAL	
	2,172.7	3.5	4	3	5								M	2,174.2 Brown, Fine to Coarse Sandy SILT (A-4) with Trace Mica and Organics (Roots)	2.0
2170													M	White-Tan-Brown, Fine to Coarse Sandy Clayey SILT (A-5) with Trace Mica, Manganese Deposits, and Rock Fragments	
	2,167.7	8.5	3	5	5								M		
2165													M		
	2,162.7	13.5	4	5	6								M		
													M	2,161.2	15.0
Boring Terminated at Elevation 2,161.2 ft in SILT (Residual)															
Notes: 1. 0.0'-0.1' = SURFICIAL ORGANIC SOILS 2. Filled Immediately After Drilling 3. Boring located outside of project limits															

NCDOT BORE DOUBLE I4400B_GEO_BH_RDWY.GPJ NC_DOT.GDT 6/27/19

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34232.1.3		TIP I-4400BB		COUNTY HENDERSON		GEOLOGIST M. Arnold									
SITE DESCRIPTION I-26 from US 64 (Exit 49) to US 25 Business (Exit 44)							GROUND WTR (ft)								
BORING NO. B-5		STATION N/A		OFFSET N/A		ALIGNMENT N/A									
COLLAR ELEV. 2,175.7 ft		TOTAL DEPTH 15.0 ft		NORTHING 596,054		EASTING 974,594									
DRILL RIG/HAMMER EFF./DATE F&R2175 CME-55 88% 02/11/2017				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER S. Davis		START DATE 01/07/18		COMP. DATE 01/07/18		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					
2180															
2175	2,175.7	0.0	2	4	6									2,175.7	0.0
														2,174.6	1.1
	2,172.2	3.5	3	3	4									2,173.7	2.0
2170														2,168.7	7.0
	2,167.2	8.5	3	3	5									2,163.7	12.0
2165														2,160.7	15.0
	2,162.2	13.5	3	4	3										
Notes: 1. 0.0'-0.1' = SURFICIAL ORGANIC SOILS 2. Filled Immediately After Drilling 3. Boring located outside of project limits															

WBS 34232.1.3		TIP I-4400BB		COUNTY HENDERSON		GEOLOGIST M. Arnold									
SITE DESCRIPTION I-26 from US 64 (Exit 49) to US 25 Business (Exit 44)							GROUND WTR (ft)								
BORING NO. B-6		STATION N/A		OFFSET N/A		ALIGNMENT N/A									
COLLAR ELEV. 2,171.5 ft		TOTAL DEPTH 15.0 ft		NORTHING 596,080		EASTING 974,554									
DRILL RIG/HAMMER EFF./DATE F&R2175 CME-55 88% 02/11/2017				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER S. Davis		START DATE 01/07/18		COMP. DATE 01/07/18		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					
2175															
	2,171.5	0.0												2,171.5	0.0
2170			4	1	1										
	2,168.0	3.5	1	2	3									2,167.3	4.2
2165														2,164.5	7.0
	2,163.0	8.5	2	2	4									2,159.5	12.0
2160														2,156.5	15.0
	2,158.0	13.5	3	3	5										
Notes: 1. 0.0'-0.1' = SURFICIAL ORGANIC SOILS 2. Filled Immediately After Drilling 3. Boring located outside of project limits															

NCDOT BORE DOUBLE I4400B_GEO_BH_RDWY.GPJ NC_DOT.GDT 6/27/19

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34232.1.3		TIP I-4400BB		COUNTY HENDERSON		GEOLOGIST M. Arnold									
SITE DESCRIPTION I-26 from US 64 (Exit 49) to US 25 Business (Exit 44)							GROUND WTR (ft)								
BORING NO. B-7		STATION N/A		OFFSET N/A		ALIGNMENT N/A									
COLLAR ELEV. 2,170.3 ft		TOTAL DEPTH 25.0 ft		NORTHING 596,090		EASTING 974,516									
DRILL RIG/HAMMER EFF./DATE F&R2175 CME-55 88% 02/11/2017			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic									
DRILLER S. Davis		START DATE 01/07/18		COMP. DATE 01/07/18		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					
2175															
2170	2,170.3	0.0	4	5	4									GROUND SURFACE	0.0
2165	2,166.8	3.5	4	5	8									ARTIFICIAL FILL Dark Brown, Fine to Coarse Sandy Clayey SILT (A-5) with Trace Organics (Roots) and Mica	2.0
2160	2,161.8	8.5	2	2	2									RESIDUAL Red-Brown, Silty Fine to Coarse Sandy CLAY (A-7-5) with Trace Mica	7.0
2155	2,156.8	13.5	1	1	2									White-Gray-Brown, Clayey Silty Fine to Coarse SAND (A-2-4) with Trace Mica	
2150	2,151.8	18.5	1	0	2									Gray-Brown, Fine Sandy SILT (A-4) with Trace Mica, Manganese Deposits, and Clay	17.0
	2,146.8	23.5	9	12	8									Boring Terminated at Elevation 2,145.3 ft in SILT (Residual)	25.0

WBS 34232.1.3		TIP I-4400BB		COUNTY HENDERSON		GEOLOGIST M. Arnold									
SITE DESCRIPTION I-26 from US 64 (Exit 49) to US 25 Business (Exit 44)							GROUND WTR (ft)								
BORING NO. B-8		STATION N/A		OFFSET N/A		ALIGNMENT N/A									
COLLAR ELEV. 2,168.9 ft		TOTAL DEPTH 15.0 ft		NORTHING 596,098		EASTING 974,490									
DRILL RIG/HAMMER EFF./DATE F&R2175 CME-55 88% 02/11/2017			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic									
DRILLER S. Davis		START DATE 01/07/18		COMP. DATE 01/07/18		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					
2170	2,168.9	0.0	6	4	5									GROUND SURFACE	0.0
2165	2,165.4	3.5	5	7	9									ARTIFICIAL FILL Dark Brown, Fine to Coarse Sandy Clayey SILT (A-5) with Trace Organics (Roots)	2.0
2160	2,160.4	8.5	2	2	2									RESIDUAL Red-Brown, Silty Fine to Coarse Sandy CLAY (A-7-5) with Trace Mica and Rock Fragments	7.0
2155	2,155.4	13.5	1	1	1									Tan-Gray, Fine Sandy SILT (A-4) with Trace Mica and Rock Fragments	12.0
														White-Gray, Clayey Silty Fine to Coarse SAND (A-2-4) with Trace Mica	15.0

NCDOT BORE DOUBLE I4400B_GEO_BH_RDWY.GPJ NC_DOT.GDT 6/27/19

Notes:
1. 0.0'-0.1' = SURFICIAL ORGANIC SOILS
2. Boring located outside of project limits

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34232.1.3		TIP I-4400BB		COUNTY HENDERSON		GEOLOGIST M. Arnold											
SITE DESCRIPTION I-26 from US 64 (Exit 49) to US 25 Business (Exit 44)							GROUND WTR (ft)										
BORING NO. B-9		STATION N/A		OFFSET N/A		ALIGNMENT N/A											
COLLAR ELEV. 2,169.4 ft		TOTAL DEPTH 15.0 ft		NORTHING 596,116		EASTING 974,436											
DRILL RIG/HAMMER EFF./DATE F&R2175 CME-55 88% 02/11/2017		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic													
DRILLER S. Davis		START DATE 01/07/18		COMP. DATE 01/07/18		SURFACE WATER DEPTH N/A											
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						ELEV. (ft)	
2170	2,169.4	0.0													2,169.4	GROUND SURFACE	0.0
			2	3	3	6							M	X	2,167.4	ARTIFICIAL FILL Brown, Fine to Coarse Sandy Clayey SILT (A-5) with Trace Gravel and Organics (Roots)	2.0
2165	2,165.9	3.5	3	5	8	13							M			RESIDUAL Red-Brown, Silty Fine to Coarse Sandy CLAY (A-7-5) with Trace Mica and Organics (Roots)	7.0
2160	2,160.9	8.5	2	5	5	10							M			Red-Brown to Tan-Gray, Fine Sandy SILT (A-4) with Trace Mica, Manganese Deposits, and Rock Fragments	12.0
2155	2,155.9	13.5	2	1	2	3							W		2,157.4	White-Gray, Clayey Silty Fine to Coarse SAND (A-2-4) with Trace Mica	15.0
															2,154.4	Boring Terminated at Elevation 2,154.4 ft in SAND (Residual)	

Notes:
 1. 0.0'-0.1' = SURFICIAL ORGANIC SOILS
 2. Boring located outside of project limits

NCDOT BORE DOUBLE I4400B_GEO_BH_RDWY.GPJ NC_DOT.GDT 6/27/19

GEOTECHNICAL BORING REPORT BORE LOG

GEOTECHNICAL BORING REPORT CORE LOG

WBS 34232.1.3		TIP I-4400BB		COUNTY HENDERSON		GEOLOGIST M. Durway						
SITE DESCRIPTION I-26 from US 64 (Exit 49) to US 25 Business (Exit 44)							GROUND WTR (ft)					
BORING NO. B-14		STATION 21+55		OFFSET 33 ft LT		ALIGNMENT -Y2-						
COLLAR ELEV. 2,130.9 ft		TOTAL DEPTH 49.9 ft		NORTHING 601,570		EASTING 969,876						
DRILL RIG/HAMMER EFF/DATE F&R2175 CME-55 88% 02/11/2017		DRILL METHOD SPT Core Boring		HAMMER TYPE Automatic								
DRILLER S. Davis		START DATE 02/14/18		COMP. DATE 02/14/18		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
2135												
2130	2,130.9	0.0	1	2	5						2,130.9	0.0
											2,128.9	0.9
											2,128.9	2.0
	2,127.4	3.5	2	5	5							
2125												
	2,122.4	8.5	95	5/0.1								
2120												
	2,117.4	13.5	100/0.4									
2115												
	2,112.4	18.5	71	29/0.1								
2110												
	2,107.4	23.5	54	46/0.5								
2105												
	2,102.4	28.5	6	5	7							
2100												
	2,097.4	33.5	100/0.2									
2095												
	2,092.4	38.5	10	39	61/0.1							
2090												
	2,091.0	39.9	60/0.0									
2085												

WBS 34232.1.3		TIP I-4400BB		COUNTY HENDERSON		GEOLOGIST M. Durway	
SITE DESCRIPTION I-26 from US 64 (Exit 49) to US 25 Business (Exit 44)							GROUND WTR (ft)
BORING NO. B-14		STATION 21+55		OFFSET 33 ft LT		ALIGNMENT -Y2-	
COLLAR ELEV. 2,130.9 ft		TOTAL DEPTH 49.9 ft		NORTHING 601,570		EASTING 969,876	
DRILL RIG/HAMMER EFF/DATE F&R2175 CME-55 88% 02/11/2017		DRILL METHOD SPT Core Boring		HAMMER TYPE Automatic			
DRILLER S. Davis		START DATE 02/14/18		COMP. DATE 02/14/18		SURFACE WATER DEPTH N/A	
CORE SIZE N		TOTAL RUN 10.0 ft					
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %		SAMP. NO.
					RQD (ft) %	STRATA REC. (ft) %	LOG
							ELEV. (ft)
2091							
2090	2,091.0	39.9	5.0	1:27/1.0 1:22/1.0 2:23/1.0 2:45/1.0 3:00/1.0	(4.1) 82%	(3.2) 64%	
	2,086.0	44.9	5.0	3:12/1.0 3:43/1.0 3:15/1.0 1:29/1.0 1:53/1.0	(4.1) 82%	(3.3) 66%	
2085							
	2,081.0	49.9					

Begin Coring @ 39.9 ft

CRYSTALLINE ROCK
Gray-Tan, Very Slight to Moderate Weathering, Very Hard to Moderately Hard GNEISS, Wide to Close Fracture Spacing
RS-1: 42.5'-42.8', qu=7,698 psi, GSI=70-80

Boring Terminated at Elevation 2,081.0 ft in GNEISS (Crystalline Rock)

Notes:
1. 0.0'-0.3' = SURFICIAL ORGANIC SOILS
2. Auger refusal at 39.9', began coring
3. 0 hr. water not measured due to water introduced for coring

NCDOT BORE DOUBLE I4400B_GEO_BH_RDWY.GPJ NC_DOT.GDT 6/27/19

NCDOT BORE DOUBLE I4400B_GEO_BH_RDWY.GPJ NC_DOT.GDT 6/27/19



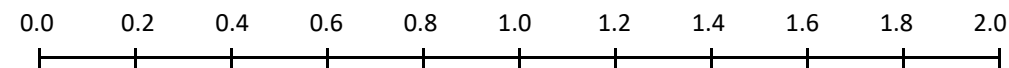
**CORE PHOTOGRAPH:
34232.1.3 I-4400BB
B-14: -Y2- Station 21+55, 33' Lt.**

**Begin Run 1
39.9 feet**



**End Run 1 &
Begin Run 2
44.9 feet**

**End Run 2
49.9 feet**



SCALE IN FEET

GEOTECHNICAL BORING REPORT BORE LOG

GEOTECHNICAL BORING REPORT CORE LOG

WBS 34232.1.3		TIP I-4400BB		COUNTY HENDERSON		GEOLOGIST M. Durway										
SITE DESCRIPTION I-26 from US 64 (Exit 49) to US 25 Business (Exit 44)						GROUND WTR (ft)										
BORING NO. B-21		STATION 19+25		OFFSET 28 ft LT		ALIGNMENT -Y5-										
COLLAR ELEV. 2,084.0 ft		TOTAL DEPTH 65.9 ft		NORTHING 609,750		EASTING 964,137										
DRILL RIG/HAMMER EFF./DATE F&R2175 CME-55 88% 02/11/2017				DRILL METHOD SPT Core Boring		HAMMER TYPE Automatic										
DRILLER S. Davis		START DATE 02/12/18		COMP. DATE 02/14/18		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)	
2085	2,084.0	0.0	1	3	4							M		2,084.0	0.0	GROUND SURFACE
												M		2,082.0	2.9	ROADWAY EMBANKMENT Orange, Fine Sandy Silty CLAY (A-7)
2080	2,080.5	3.5	2	2	3							M				RESIDUAL Orange-Gray-Brown, Fine Sandy SILT (A-4) with Trace Mica
2075	2,075.5	8.5	1	1	1							M				
2070	2,070.5	13.5	1	2	2							M				
2065	2,065.5	18.5	4	6	7							M				
2060	2,060.5	23.5	1	3	3							W		2,062.0	22.9	Orange-Brown, Fine Sandy Clayey SILT (A-5) with Trace Mica
2055	2,055.5	28.5	14	11	11							W		2,054.4	29.6	White, Coarse SAND (A-3) with Trace Rock Fragments
2050	2,050.5	33.5	45	55/0.2						100/0.7				2,050.5	33.5	WEATHERED ROCK Gray-Brown (GNEISS)
2045	2,045.5	38.5	48	52/0.2						100/0.7						
2040	2,040.5	43.5	100/0.5							100/0.5						
2035	2,035.5	48.5	100/0.3							100/0.3						
2030	2,030.5	53.5	60/0.1							60/0.1				2,032.0	52.0	CRYSTALLINE ROCK Tan-Orange-Gray (GNEISS)
2025	2,028.1	55.9	60/0.0							60/0.0				2,028.1	55.9	
2020	2,023.1	60.9	60/0.1							60/0.1				2,023.1	60.9	
														2,018.1	65.9	Boring Terminated at Elevation 2,018.1 ft in GNEISS (Crystalline Rock)

NCDOT BORE DOUBLE I4400B_GEO_BH_RDWY.GPJ NC_DOT.GDT 6/27/19

WBS 34232.1.3		TIP I-4400BB		COUNTY HENDERSON		GEOLOGIST M. Durway	
SITE DESCRIPTION I-26 from US 64 (Exit 49) to US 25 Business (Exit 44)						GROUND WTR (ft)	
BORING NO. B-21		STATION 19+25		OFFSET 28 ft LT		ALIGNMENT -Y5-	
COLLAR ELEV. 2,084.0 ft		TOTAL DEPTH 65.9 ft		NORTHING 609,750		EASTING 964,137	
DRILL RIG/HAMMER EFF./DATE F&R2175 CME-55 88% 02/11/2017				DRILL METHOD SPT Core Boring		HAMMER TYPE Automatic	
DRILLER S. Davis		START DATE 02/12/18		COMP. DATE 02/14/18		SURFACE WATER DEPTH N/A	
CORE SIZE N		TOTAL RUN 9.9 ft					
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	RQD (ft) %	SAMP. NO.
2028.1	2,028.1	55.9	5.0	1:00/1.0	(0.9) 18%	(0.0) 0%	
2025	2,023.1	60.9		0:57/1.0			
	2,023.0	61.0	4.9	0:49/1.0			
2020	2,023.1	60.9		0:54/1.0			
	2,023.0	61.0		1:15/1.0			
				RS-2	(4.8) 98%	(2.1) 43%	RS-2
	2,018.1	65.9		0:47/1.0			
				0:50/0.9			

Begin Coring @ 55.9 ft

2,028.1 Tan-Orange-Gray, Moderately Severe Weathering, Medium Hard GNEISS, Very Close Fracture Spacing

2,023.1 Tan-Orange-Gray, Moderate Weathering, Hard to Medium Hard GNEISS, Close to Very Close Fracture Spacing
RS-2: 62.7'-63.1', qu=1,257 psi, GSI=25-35

2,018.1 Boring Terminated at Elevation 2,018.1 ft in GNEISS (Crystalline Rock)

Notes:
1. 0.0'-0.2' = SURFICIAL ORGANIC SOILS
2. 0 hr. water measured before coring
3. Auger Refusal at 55.9', began coring

NCDOT BORE DOUBLE I4400B_GEO_BH_RDWY.GPJ NC_DOT.GDT 6/27/19



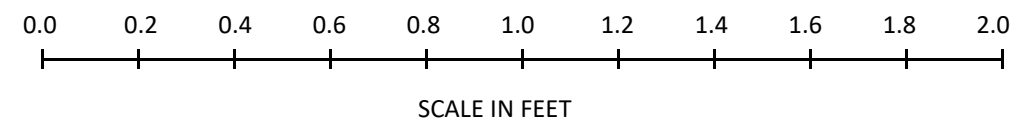
**CORE PHOTOGRAPH:
34232.1.3 I-4400BB
B-21: -Y5- Station 19+25, 28' Lt.**

Begin Run 1
55.9 feet



End Run 1
60.9 feet
Begin Run 2
61.0 feet

End Run 2
65.9 feet



GEOTECHNICAL BORING REPORT

BORE LOG

GEOTECHNICAL BORING REPORT

CORE LOG

WBS 34232.1.3			TIP I-4400BB			COUNTY HENDERSON			GEOLOGIST S. Woods						
SITE DESCRIPTION I-26 from US 64 (Exit 49) to US 25 Business (Exit 44)								GROUND WTR (ft)							
BORING NO. B-26			STATION 16+71			OFFSET 49 ft LT			ALIGNMENT -Y7-			0 HR. NM			
COLLAR ELEV. 2,142.1 ft			TOTAL DEPTH 56.0 ft			NORTHING 617,271			EASTING 957,969			24 HR. 35.7			
DRILL RIG/HAMMER EFF./DATE F&R2175 CME-55 88% 02/11/2017					DRILL METHOD SPT Core Boring			HAMMER TYPE Automatic							
DRILLER S. Davis			START DATE 02/06/18			COMP. DATE 02/06/18			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					
2145															
	2,142.1	0.0	WOH	4	5								M	2,142.1	0.0
2140	2,138.6	3.5											M	2,140.1	2.0
													M		
2135	2,133.6	8.5											W		
2130	2,128.6	13.5											M		
2125	2,123.6	18.5											M		
2120	2,118.6	23.5											M		
2115	2,113.6	28.5											M	2,115.1	27.0
2110	2,108.6	33.5	100/0.3												
2105	2,103.6	38.5	100/0.2											2,105.1	37.0
	2,102.1	40.0	60/0.1											2,102.1	40.0
2095			60/0.0												
2090															

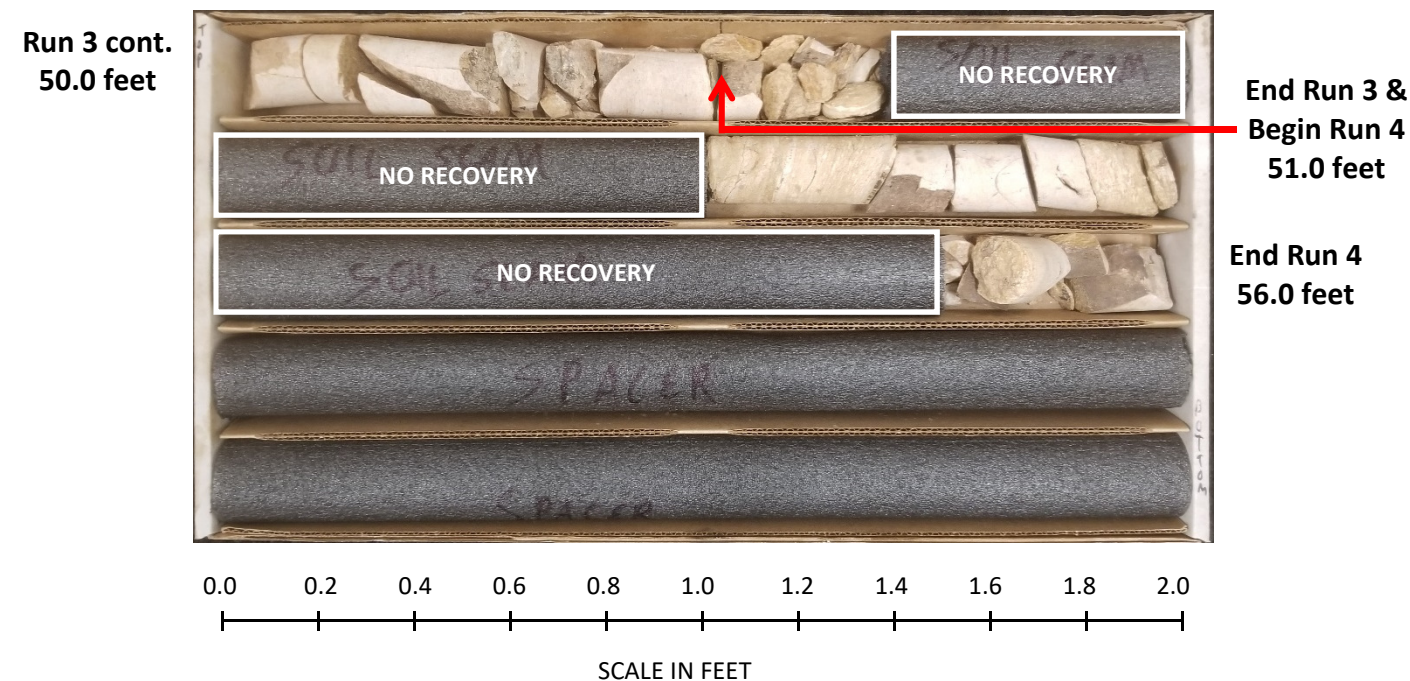
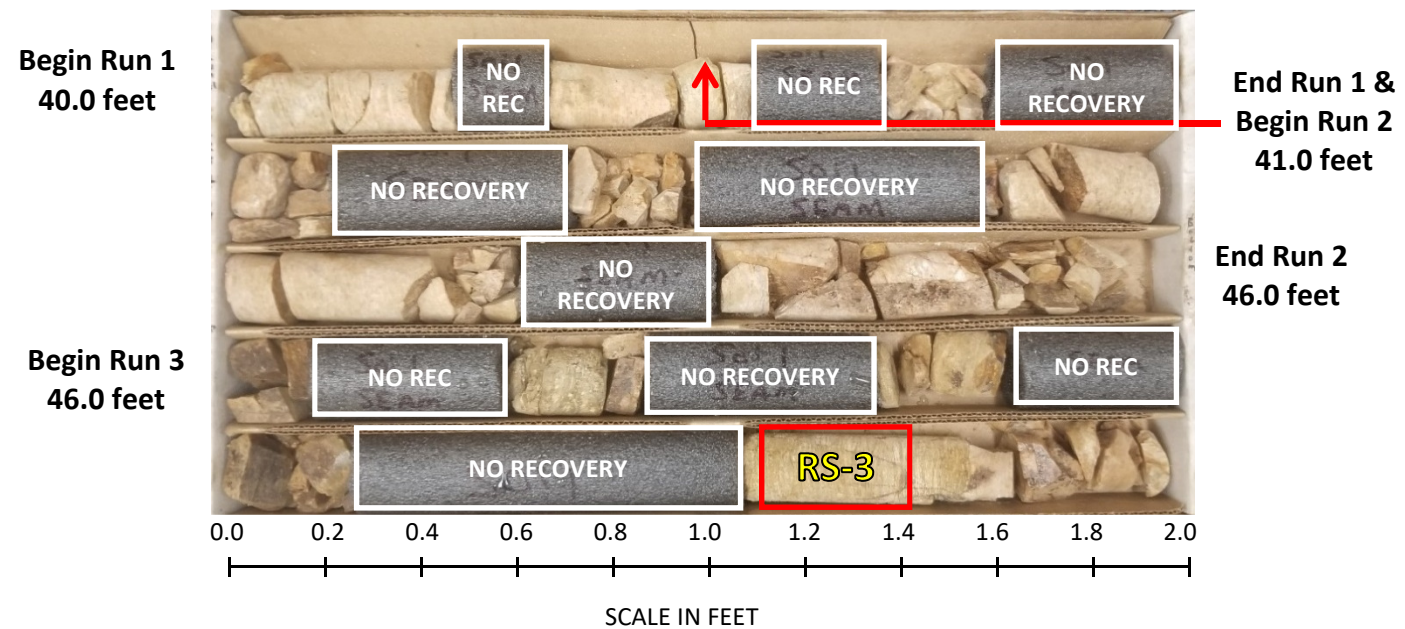
NCDOT BORE DOUBLE I4400B_GEO_BH_RDWY.GPJ NC_DOT_GDT 6/27/19

WBS 34232.1.3			TIP I-4400BB			COUNTY HENDERSON			GEOLOGIST S. Woods			
SITE DESCRIPTION I-26 from US 64 (Exit 49) to US 25 Business (Exit 44)								GROUND WTR (ft)				
BORING NO. B-26			STATION 16+71			OFFSET 49 ft LT			ALIGNMENT -Y7-			0 HR. NM
COLLAR ELEV. 2,142.1 ft			TOTAL DEPTH 56.0 ft			NORTHING 617,271			EASTING 957,969			24 HR. 35.7
DRILL RIG/HAMMER EFF./DATE F&R2175 CME-55 88% 02/11/2017					DRILL METHOD SPT Core Boring			HAMMER TYPE Automatic				
DRILLER S. Davis			START DATE 02/06/18			COMP. DATE 02/06/18			SURFACE WATER DEPTH N/A			
CORE SIZE N					TOTAL RUN 16.0 ft					LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	RQD (ft) %	SAMP. NO.	REC. (ft) %	RQD (ft) %			
2102.1												
	2,102.1	40.0	1.0	N=60/0.0	(0.7)	(0.0)		(8.2)	(0.9)		2,102.1	40.0
2100	2,101.1	41.0	5.0	2:54/1.0	67%	0%		51%	6%			
				1:26/1.0	(2.8)	(0.0)						
				1:20/1.0								
				1:44/1.0	56%	0%						
				1:15/1.0								
				1:55/1.0								
2095	2,096.1	46.0	5.0	2:12/1.0	(3.0)	(0.5)						
				1:58/1.0	60%	10%						
				1:30/1.0								
				1:27/1.0			RS-3					
2090	2,091.1	51.0	5.0	2:03/1.0	(1.7)	(0.4)						
				1:14/1.0	33%	8%						
				1:36/1.0								
				1:54/1.0								
				1:36/1.0								
	2,086.1	56.0		1:42/1.0							2,086.1	56.0
Boring Terminated at Elevation 2,086.1 ft in GNEISS (Crystalline Rock)												
Notes:												
1. 0 hr. water not measured due to water introduced for coring												
2. Auger Refusal at 40.0', began coring												

NCDOT BORE DOUBLE I4400B_GEO_BH_RDWY.GPJ NC_DOT_GDT 6/27/19



**CORE PHOTOGRAPH:
34232.1.3 I-4400BB
B-26: -Y7- Station 16+71, 49' Lt.**



GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34232.1.3		TIP I-4400BB		COUNTY HENDERSON		GEOLOGIST S. Woods										
SITE DESCRIPTION I-26 from US 64 (Exit 49) to US 25 Business (Exit 44)							GROUND WTR (ft)									
BORING NO. B-71		STATION 457+37		OFFSET 142 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 2,151.8 ft		TOTAL DEPTH 3.1 ft		NORTHING 603,172		EASTING 969,091										
DRILL RIG/HAMMER EFF./DATE F&R2175 CME-55 88% 02/11/2017			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER S. Davis		START DATE 12/12/17		COMP. DATE 12/12/17		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						
2155																
	2,151.8	0.0													2,151.8	0.0
			3	5	6											
2150	2,148.8	3.0													2,148.8	3.0
			60/0.1												60/0.1	

GROUND SURFACE

ROADWAY EMBANKMENT

Orange-Tan, Clayey Fine to Coarse Sandy SILT (A-4) with Trace Organics (Roots) and Gravel

PROBABLE BOULDER

Boring Terminated with Standard Penetration Test Refusal at Elevation 2,148.7 ft in PROBABLE BOULDER (Roadway Embankment)

Notes:

1. Auger Refusal on Probable Boulder
2. Offset to B-71(2)

WBS 34232.1.3		TIP I-4400BB		COUNTY HENDERSON		GEOLOGIST S. Woods										
SITE DESCRIPTION I-26 from US 64 (Exit 49) to US 25 Business (Exit 44)							GROUND WTR (ft)									
BORING NO. B-72		STATION 457+96		OFFSET 125 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 2,156.2 ft		TOTAL DEPTH 2.5 ft		NORTHING 603,233		EASTING 969,084										
DRILL RIG/HAMMER EFF./DATE F&R2175 CME-55 88% 02/11/2017			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER S. Davis		START DATE 12/12/17		COMP. DATE 12/12/17		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						
2160																
	2,156.2	0.0													2,156.2	0.0
2155	2,153.7	2.5													2,153.7	2.5
			2	15	32											
			60/0.0												60/0.0	

GROUND SURFACE

ROADWAY EMBANKMENT

Orange-Tan, Clayey Fine to Coarse Sandy SILT (A-4) with Trace Organics (Roots) and Gravel

Gray, Silty Fine to Coarse SAND (A-2-4) with Little Rock Fragments

Boring Terminated with Standard Penetration Test Refusal at Elevation 2,153.7 ft on PROBABLE BOULDER (Roadway Embankment)

Notes:

1. 0.0'-0.1' = SURFICIAL ORGANIC SOILS
2. Auger Refusal on Probable Boulder
3. Offset to B-72(2)

NCDOT BORE DOUBLE I4400B_GEO_BH_RDWY.GPJ NC_DOT.GDT 6/27/19

GEOTECHNICAL BORING REPORT BORE LOG

WBS 34232.1.3	TIP I-4400BB	COUNTY HENDERSON	GEOLOGIST S. Woods
SITE DESCRIPTION I-26 from US 64 (Exit 49) to US 25 Business (Exit 44)			GROUND WTR (ft)
BORING NO. B-75	STATION 459+40	OFFSET 116 ft LT	ALIGNMENT -L-
COLLAR ELEV. 2,164.3 ft	TOTAL DEPTH 4.1 ft	NORTHING 603,365	EASTING 969,037
DRILL RIG/HAMMER EFF./DATE F&R2175 CME-55 88% 02/11/2017		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER S. Davis	START DATE 12/12/17	COMP. DATE 12/12/17	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			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)		
2165	2,164.3	0.0													2,164.3	0.0	GROUND SURFACE
	2,160.8	3.5													2,160.8	3.5	ROADWAY EMBANKMENT Orange-Brown, Clayey Fine to Coarse Sandy SILT (A-4) with Trace Organics (Roots)
			70	30/0.1											2,160.2	4.1	WEATHERED ROCK Probable Boulder Boring Terminated at Elevation 2,160.2 ft WEATHERED ROCK (Probable Boulder)
																	Notes: 1. 0.0'-0.1' = SURFICIAL ORGANIC SOILS 2. Auger become Crooked After 3.5' 3. Offset to B-75(2)

WBS 34232.1.3	TIP I-4400BB	COUNTY HENDERSON	GEOLOGIST M. Arnold
SITE DESCRIPTION I-26 from US 64 (Exit 49) to US 25 Business (Exit 44)			GROUND WTR (ft)
BORING NO. B-127	STATION 617+28	OFFSET 115 ft RT	ALIGNMENT -L-
COLLAR ELEV. 2,146.2 ft	TOTAL DEPTH 3.0 ft	NORTHING 615,794	EASTING 959,694
DRILL RIG/HAMMER EFF./DATE F&R2175 CME-55 88% 02/11/2017		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER S. Davis	START DATE 01/10/18	COMP. DATE 01/10/18	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			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)		
2150																	GROUND SURFACE
	2,146.2	0.0													2,146.2	0.0	GROUND SURFACE
2145															2,143.2	3.0	RESIDUAL Gray-Brown, Silty Fine to Coarse SAND (A-2-4) with Little Rock Fragments and Trace Mica Boring Terminated at Elevation 2,143.2 ft in SAND (Residual)
																	Notes: 1. 0.0'-0.1' = SURFICIAL ORGANIC SOILS 2. Filled Immediately After Drilling 3. Augers skewed at 2.5', offset to B-127(2)

NCDOT BORE DOUBLE I4400B_GEO_BH_RDWY.GPJ NC_DOT.GDT 6/27/19

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34232.1.3		TIP I-4400BB		COUNTY HENDERSON		GEOLOGIST M. Arnold									
SITE DESCRIPTION I-26 from US 64 (Exit 49) to US 25 Business (Exit 44)							GROUND WTR (ft)								
BORING NO. B-137(2)		STATION 621+33		OFFSET 124 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 2,155.8 ft		TOTAL DEPTH 4.0 ft		NORTHING 616,128		EASTING 959,450									
DRILL RIG/HAMMER EFF./DATE F&R2175 CME-55 88% 02/11/2017			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic									
DRILLER S. Davis		START DATE 01/15/18		COMP. DATE 01/15/18		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
2160															
2155	2,155.8	0.0	1	1	1								M	GROUND SURFACE	0.0
													W	ARTIFICIAL FILL Brown, Fine Sandy Clayey SILT (A-5) with Trace Organics (Roots) and Mica	4.0
Boring Terminated at Elevation 2,151.8 ft in SILT (Artificial Fill)															
Notes: 1. 0.0'-0.1' = SURFICIAL ORGANIC SOILS 2. Boring terminated due to struck utility															

WBS 34232.1.3		TIP I-4400BB		COUNTY HENDERSON		GEOLOGIST S. Woods									
SITE DESCRIPTION I-26 from US 64 (Exit 49) to US 25 Business (Exit 44)							GROUND WTR (ft)								
BORING NO. B-162		STATION N/A		OFFSET N/A		ALIGNMENT N/A									
COLLAR ELEV. 2,104.6 ft		TOTAL DEPTH 20.0 ft		NORTHING 618,507		EASTING 954,978									
DRILL RIG/HAMMER EFF./DATE F&R2175 CME-55 88% 02/11/2017			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic									
DRILLER S. Davis		START DATE 01/04/18		COMP. DATE 01/04/18		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
2105	2,104.6	0.0	9	5	5										
	2,104.6												M	GROUND SURFACE	0.0
	2,102.6												M	ROADWAY EMBANKMENT Brown, Clayey Silty Fine SAND (A-2-4) with Trace Organics (Roots)	2.0
	2,101.1	3.5	14	9	6								M	RESIDUAL Orange-Brown, Clayey Fine Sandy SILT (A-4)	
2100															
2095	2,096.1	8.5	3	5	7								M		
	2,092.6												M	Orange-Brown, Fine Sandy Clayey SILT (A-5) with Trace Manganese Deposits	12.0
2090	2,091.1	13.5	3	3	4										
	2,086.6												W	Boring Terminated at Elevation 2,084.6 ft in SILT (Residual)	20.0
2085	2,086.1	18.5	2	2	4										
Note: 1. Boring located outside of project limits															

NCDOT BORE DOUBLE I4400B_GEO_BH_RDWY.GPJ NC_DOT.GDT 6/27/19

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34232.1.3		TIP I-4400BB		COUNTY HENDERSON		GEOLOGIST S. Woods										
SITE DESCRIPTION I-26 from US 64 (Exit 49) to US 25 Business (Exit 44)							GROUND WTR (ft)									
BORING NO. B-163		STATION N/A		OFFSET N/A		ALIGNMENT N/A										
COLLAR ELEV. 2,107.0 ft		TOTAL DEPTH 20.0 ft		NORTHING 618,709		EASTING 955,064										
DRILL RIG/HAMMER EFF./DATE F&R2175 CME-55 88% 02/11/2017			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER S. Davis		START DATE 01/03/18		COMP. DATE 01/03/18		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						
2110																
	2,107.0	0.0	1	3	24									2,107.0	0.0	GROUND SURFACE
2105														2,105.0	2.0	ROADWAY EMBANKMENT
	2,103.5	3.5	7	5	4									2,105.0	2.0	Brown, Clayey Silty Fine to Coarse SAND (A-2-4) with Trace Organics (Roots) and Gravel
2100																RESIDUAL
	2,098.5	8.5	4	6	7											Dark Brown, Clayey Fine Sandy SILT (A-4) with Trace Rock Fragments and Organics (Roots)
2095																
	2,093.5	13.5	2	8	15									2,095.0	12.0	Brown-Gray, Silty Fine to Coarse SAND (A-2-4) with Trace Rock Fragments, Mica, and Manganese Deposits
2090																
	2,088.5	18.5	9	23	19									2,090.0	17.0	Dark Brown, Fine Sandy SILT (A-4) with Trace Rock Fragments and Manganese Deposits, Micaceous
														2,087.0	20.0	Boring Terminated at Elevation 2,087.0 ft in SILT (Residual)
																Notes: 1. 0.0'-0.2' = SURFICIAL ORGANIC SOILS 2. Boring located outside of project limits

WBS 34232.1.3		TIP I-4400BB		COUNTY HENDERSON		GEOLOGIST S. Woods										
SITE DESCRIPTION I-26 from US 64 (Exit 49) to US 25 Business (Exit 44)							GROUND WTR (ft)									
BORING NO. B-164		STATION N/A		OFFSET N/A		ALIGNMENT N/A										
COLLAR ELEV. 2,089.0 ft		TOTAL DEPTH 20.0 ft		NORTHING 618,818		EASTING 954,328										
DRILL RIG/HAMMER EFF./DATE F&R2175 CME-55 88% 02/11/2017			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER S. Davis		START DATE 01/03/18		COMP. DATE 01/03/18		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						
2090																
	2,089.0	0.0	3	4	5									2,089.0	0.0	GROUND SURFACE
2085														2,087.0	2.0	ROADWAY EMBANKMENT
	2,085.5	3.5	5	10	9									2,087.0	2.0	Orange, Clayey Silty Fine to Coarse SAND (A-2-4) with Trace Organics (Roots)
2080																RESIDUAL
	2,080.5	8.5	1	3	4											Orange-Red, Fine Sandy SILT (A-4) with Trace Manganese Deposits
2075																
	2,075.5	13.5	2	3	4									2,077.0	12.0	Pink-Orange, Clayey SILT (A-5) with Trace Manganese Deposits
2070																
	2,070.5	18.5	3	6	12									2,072.0	17.0	Orange-Red, Fine Sandy SILT (A-4) with Trace Manganese Deposits
														2,069.0	20.0	Boring Terminated at Elevation 2,069.0 ft in SILT (Residual)
																Notes: 1. 0.0'-0.1' = SURFICIAL ORGANIC SOILS 2. Boring located outside of project limits

NCDOT BORE DOUBLE I4400B_GEO_BH_RDWY.GPJ NC_DOT.GDT 6/27/19

GEOTECHNICAL BORING REPORT BORE LOG

WBS 34232.1.3		TIP I-4400BB		COUNTY HENDERSON		GEOLOGIST S. Woods										
SITE DESCRIPTION I-26 from US 64 (Exit 49) to US 25 Business (Exit 44)							GROUND WTR (ft)									
BORING NO. B-165		STATION N/A		OFFSET N/A		ALIGNMENT N/A										
COLLAR ELEV. 2,095.2 ft		TOTAL DEPTH 25.0 ft		NORTHING 619,177		EASTING 954,218										
DRILL RIG/HAMMER EFF/DATE F&R2175 CME-55 88% 02/11/2017		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic												
DRILLER S. Davis		START DATE 01/03/18		COMP. DATE 01/03/18		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					ELEV. (ft)	
2100																
2095	2,095.2	0.0												2,095.2	GROUND SURFACE	0.0
2090	2,091.7	3.5	1	2	3	5	5	5	5	5		M	ROADWAY EMBANKMENT	2.0		
	2,086.7	8.5	2	3	4	5	5	5	5	5	SS-14B	32%	Brown, Clayey Fine Sandy SILT (A-4) with Trace Organics (Roots)	7.0		
2085	2,081.7	13.5	3	3	4	5	5	5	5	5			Orange-Brown, Fine to Coarse Sandy Silty CLAY (A-7-5)	7.0		
	2,076.7	18.5	3	3	4	5	5	5	5	5			Brown, Fine to Coarse Sandy SILT (A-4) with Trace Mica and Manganese Deposits	13.9		
2080	2,071.7	23.5	5	3	5	5	5	5	5	5	SS-16B	24%	ALLUVIAL	13.9		
	2,076.7	18.5	3	3	4	5	5	5	5	5		M	Gray, Fine to Coarse Sandy Silty CLAY (A-7-6) with Trace Organics (Roots)	25.0		
2075	2,071.7	23.5	1	2	2	5	5	5	5	5		W		25.0		
														2,070.2	Boring Terminated at Elevation 2,070.2 ft in CLAY (Alluvial)	25.0
<p style="text-align: center;">Notes:</p> <p style="text-align: center;">1. 0.0'-0.1' = SURFICIAL ORGANIC SOILS</p> <p style="text-align: center;">2. Boring located outside of project limits</p>																

NCDOT BORE DOUBLE I4400B_GEO_BH_RDWY.GPJ_NC_DOT.GDT 6/27/19



LABORATORY SUMMARY SHEET FOR ROCK CORE SAMPLES

PROJECT NO.: 34232.1.3 (I-4400BB)
 COUNTY: Henderson

Sample #	Boring #	Alignment	Station	Offset	Depth (ft)	Rock Type	Geologic Map Unit	Run RQD	Length (in)	Diameter (in)	Unit Weight (PCF)	Unconfined Compressive Strength (psi)	GSI
RS-1	B-14	-Y2-	21+55	33' LT.	42.5-42.8	Gneiss	Zatm	64%	4.17	1.76	161.8	7,698	70-80
RS-2	B-21	-Y5-	19+25	28' LT.	62.7-63.1	Gneiss	Zatm	43%	4.08	1.76	149.6	1,257	25-35
RS-3	B-26	-Y7-	16+71	49' LT.	49.1-49.4	Gneiss	Zatm	10%	4.06	1.74	151.3	966	20-30

Lab Technician: Saja Alkhafaji 4/15/2019

**North Carolina Department of Transportation
Division of Highways
Materials and Test Unit
Soils Laboratory**

T.I.P. ID NO.: I-4400B
DESCRIPTION: I-26 from US 64 (Exit 49) to US 25 Business (Exit 44)

REPORT ON SAMPLES OF: SOIL FOR QUALITY

F&R PROJECT #: 66V-0174
DATE SAMPLED: 12/17-1/18
SAMPLED FROM: Various
SUBMITTED BY: D. Racey

COUNTY: Henderson
RECEIVED: 2/15/18
REPORTED: 3/9/18
BY: D. Council
Certification No.: 101-02-0603

TEST RESULTS

PROJ. SAMPLE NO.	SS-535	SS-536	SS-549	SS-12	SS-14B	SS-16B								
BORING NO.	B-1	B-1	B-7	B-71	B-165	B-165								
Retained #4 Sieve %	1.9	0.0	0.0	5.9	0.1	2.3								
Passing #10 Sieve %	97.1	100.0	99.5	92.0	99.4	96.7								
Passing #40 Sieve %	84.2	88.9	91.0	73.8	94.7	90.7								
Passing #200 Sieve %	44.8	51.2	69.3	35.5	80.3	78.8								

SOIL MORTAR - 100%														
Coarse Sand Ret - #60 %	22.7	20.3	14.0	31.5	8.2	9.9								
Fine Sand Ret - #270 %	41.1	39.3	20.9	37.3	15.7	11.7								
Silt 0.053 - 0.010 mm %	27.8	30.6	7.5	16.2	34.6	31.9								
Clay < 0.010 mm %	8.4	9.8	57.6	15.0	41.5	46.5								
L.L.	37	41	69	NP	44	41								
P.L.	NP	NP	50	NP	33	27								
P.I.	NP	NP	19	NP	11	14								
AASHTO Classification	A-4(0)	A-5(0)	A-7-5(17)	A-4(0)	A-7-5(11)	A-7-6(12)								
Station	N/A	N/A	N/A	457+37	N/A	N/A								
Offset	N/A	N/A	N/A	142' LT.	N/A	N/A								
Depth (ft)	0.1	3.5	3.5	0.1	3.5	13.9								
to	1.5	5.0	5.0	1.5	5.0	15.0								
Alignment	N/A	N/A	N/A	-L-	N/A	N/A								
Moisture Content (%)	20.2	26.1	29.4	18.3	32.1	23.5								
Organic Content (%)	NT	NT	NT	NT	NT	NT								

NP = Not plastic
NT = Not tested
ND = Not Determined
CL = Centerline

W.P. Alton, P.E.
Soils Engineer