Heartland Corridor, Walton Virginia to Columbus Ohio

Preliminary Engineering Phase Report

Eggleston #2 Tunnel – MP N317.02

October 14, 2005, Rev.2

Hatch Mott MacDonald

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Norfolk Southern Railway
Heartland Corridor, Walton VA to Columbus OH

Eggleston No. 2 Tunnel – MP N317.02

Statistics: Virginia Division
Double-width Tunnel for Main #1
Length = 1,195'
Concrete walls and crown
Degree of Curvature = 8.6 LT (per Track Chart)
Superelevation = 3.5" (per Track Chart)

1. EXISTING CONDITIONS

1.1 Background

Based on the Valuation Map (V-10VA/32) information:

- Some ROW on the line was acquired in 1875; therefore the original railroad through the valley was probably built then.
- The parcels containing a tunnel east of the present tunnel were acquired in 1881 & 1882. It is therefore suspected that the tunnel was constructed in 1882 or shortly afterwards.
- Parcels for a present tunnel to the west were acquired in 1902. It is therefore suspected that the tunnel was constructed in 1902 or shortly afterwards.
- The EB main track was retired in 1961. The 1882 tunnel was apparently abandoned.

Additional information on this tunnel was obtained from various sources such as topographic maps, aerial photos, inspection reports, track charts, and field investigations that were performed on March 8 and June 8, 2005.

1.2 General Area

The tunnel is located in a sparsely populated area with access along the right of way to both the east and west portals. Right of way access to Eggleston No. 2 is through Eggleston No. 1 Tunnel on the east and Pembroke Tunnel on the west.

Access to the east and west portals is via the unnamed gravel service road that parallels the track and roadbed. This road can be accessed near the Pembroke Tunnel at the intersection of Giles County Route 623 and Rocky Hollow Road or near the Eggleston No. 1 Tunnel at the intersection of Eggleston and River Roads in Eggleston.

1.3 Structural Conditions

The tunnel is 1,195’ long with a concrete lining and a nominal width of 30’. It was apparently originally constructed for 2 tracks. A slide fence circuit is mounted on the south wall.

The footing of the tunnel liner is not visible along the right of way road. A small portion of the tunnel invert material was excavated to expose the base of the tunnel liner footing. The footing thickness was found to be 17”. The vertical distance from the top of rail to the base of the footing was measured at 64”.

1.4 Track

The track is of conventional design with wooden crossties and a stone ballast section. The ballast is slightly fouled.

1.5 Geotechnical

The Virginia Division tunnels are located in the Valley and Ridge Physiographic Province, a region characterized by linear ridges and valleys formed by differential weathering of the rock. The description of the site geology is based on our observations of the rockmass at the portals and adjacent cuts and two Virginia Geologic Survey geologic reports: *Geologic Map of Giles* County, Virginia and Geology of the Appalachian Valley in Virginia. The tunnels themselves are lined and no rock was exposed.

The tunnel is excavated through thin- and thick-bedded dolomite of the Honaker Formation and the argillaceous (muddy) dolomite of the Nolichucky Formation. The rockmass of the bluffs above the tunnel, especially at the "east" portal are comprised of the dolomite of the "Lower Ordovician and Upper Cambrian Rocks". The beds dip 5 to 25 degrees to east and southeast and the strike is sub-parallel with the tunnel axis. The height of the cliffs and cuts near the "west" portal are lower than at the "east" portal and the slopes are cut back further and at shallower grades.

The geoprobes within the tunnel indicate that the top of rock is located between 4.1' to 5.0' (averaging about 4.8') below the top of ballast throughout the tunnel. Top of ballast is typically about 0.8' below top of low rail. Geoprobes were also taken at 100' increments for 1000' outside of each portal. East and west of the tunnel, each probe reached a depth of 5.0' below the top of low rail without reaching refusal.

1.6 Clearances

The laser car measurements indicate that the existing tunnel has adequate horizontal clearances for the composite design template but that the vertical clearance is deficient by an average of 17". The template encroaches the tunnel most significantly at the 1 o'clock position throughout the tunnel with additional encroachments at the 11 and 12 o'clock position.

Distance (ft) from East Portal	Maximum Encroachment (inches)
0	24
90	11
190	11
288	14
390	15
490	20
588	17
690	17
790	16
888	15
989	18
1090	19
1139	20

2. CLEARANCE IMPROVEMENT ALTERNATIVES

Given the magnitude of the vertical clearance deficiency, there are four general alternatives that can be used to obtain the clearance; replacing the lining, notching the lining, lowering the track, or undercutting the track.

2.1 Liner Replacement

To obtain the desired clearance, the concrete roof must be demolished, the native rock excavated to the clearance limits plus the new liner thickness, and a new concrete liner installed. This alternative would be necessary for the majority of the tunnel if a more cost effective solution could not be found.

2.2 Notching the Crown

The encroachment at some portions of the tunnel may be of a magnitude to allow for deep notching, but this alternative may be more costly than a track lowering alternative.

2.3 Lowering the Track

Excavation would involve removing the track and using conventional earth moving equipment to remove the ballast and subgrade materials. The entire operation would require approximately a 4-day outage and continuous work to remove the track, excavate the subgrade, and restore the track. The double track width of the tunnel will allow trucks to pass each other. New drainage installation and subgrade stabilization could be accomplished from the subgrade directly. The resulting track structure would be completely new (except for the rail).

2.4 Track Undercutting

Either a mainline track undercutter or switch undercutter could accomplish undercutting. The undercutter could either discharge into trucks or be equipped with a conveyor and air dump cars or over the course of 1-2 days of 8-hour work windows. The existing right of way road would be excavated using conventional methods, and should be scheduled prior to the track undercutting to allow efficient undercutting and to prevent spoil form the excavation from fouling the clean ballast in t the under cut track. The run-in and run-out of the undercut area would need to be surfaced daily to accommodate the trains.

1 to 2 days of prep work will be required to plug and spike the exiting ties to keep them from falling off of the rail behind the undercutter bar. Geotextile could be placed in sections with overlap directly behind the undercutter bar from the right of way roadway. Alternately, plate-boys with modifications to the jacks could be used to lift the track to allow geotextile to be installed under the skeletonized track.

3. PREFERRED ALTERNATIVE

The clearance can be best accomplished using the Track Undercutting methodology. There are no significant impediments to the undercutting procedure.

The Geoprobes did not meet refusal to at least 5' below the top of the grade rail, indicating that the necessary ~2' of additional clearance can be obtained with a standard track section.

3.1 Preliminary Design

The preliminary design combines undercutting and track shifting. The existing track is located adjacent to the north wall of the tunnel. The track profile through the tunnel exhibits a sag with the low point near the middle of the tunnel.

3.1.1 Horizontal Geometry

The track shift will require shifting 2,541' of the existing track southward up to 4'–3". The track shift places the centerline of the track approximately under the centerline of the tunnel crown. The clearances achieved by the shift would provide adequate running clearances. The actual limiting clearance is at the 1 o'clock position and is approximately 21'-3". This clearance would limit the amount of future maintenance in the tunnel.

The new curvature in the tunnel is a 7° 58' 49" curve to the left. The track chart indicates that there is a permanent speed restriction on this curve of 30 mph and that the curve has 4" of superelevation. The new curve can achieve the 30 mph speed with 4" of super elevation at an under balance of 1.5".

The spirals are sized to provide a minimum elevation runoff of ½" per 31', or a minimum length of 248'. The shortest spiral is at the east tunnel portal. The spiral is 251' long and exceeds the minimum length.

The track shift ties to the existing right hand curve near MP 319 on the east end, and into the existing tangent west of the tunnel.

3.1.2 Vertical Alignment

The proposed undercutting operation was designed to restore a uniform track profile through the tunnel that parallels the crown of the tunnel. The proposed profile also extends the vertical tangent beyond the portals of the tunnels a minimum of 100' (112' at the east portal and 105' at the west portal). The extended vertical tangent serves two purposes: to provide a uniform grade of at least 1 car length outside of the tunnel to allow any car bounce to dampen, and to provide space for running out future track surfacing without affecting the clearance at the tunnel.

The vertical tangents are connected by vertical curves based on the new AREMA procedures. The new procedures do not use different rates of changes for crest and sag

curves, resulting in vertical curves of similar lengths. All of the vertical curves exceed the minimum recommended lengths.

The undercutter is assumed to have air dump cars fitted with a conveyor system to remove the spoil from the tunnel. The material outside of the tunnel can be cast to the side, however proper grading is essential to prevent the material from being washed into the new tack structure.

3.1.3 Other Construction

Proper drainage is vital to maintaining the track structure. A new trench drain is proposed in the tunnel. This drain will carry any water in the tunnel out to surface drainage along the tracks.

Lowering the track will place it below the existing ground surface. To allow drainage from beneath the track structure, the ground surface adjacent to the track must be excavated to provide new longitudinal ditches along the track. Likewise, the existing material on the tunnel invert must be lowered to the bottom of the ballast section and sloped to the trench drain.

Two twenty foot wide crossings will carry the access roadway across the track to the abandoned right of way.

3.2 Schedule

The estimated schedule for completing improvements on this tunnel is ten (10) weeks from mobilization to demobilization.

3.2.1 Proposed Construction Phasing

Phase I

The trench drain will be installed in the tunnel under the first phase of construction. Constructing the trench drain first will allow the work to take place on the existing right of way road without fouling the existing track with the equipment. The site grading will also be done in the first phase. Excavating at this time will reduce the potential for fouling the new ballast during the excavation.

All of the Phase I work can be accomplished under daily track windows.

Phase II

The track will be shifted to its new alignment in preparation for undercutting. The track will then be undercut, ballasted, and surfaced. The turnout will be replaced with conventional track panels to allow a continuous undercutting operation. At the completion of the under cutting the turnout will be installed in its final location.

Phase II will require shutting down the track while the track is shifted, undercut, and surfaced. Five 10 hour days are anticipated to accomplish this work. Working multiple shifts and having the undercutter working overnight after the track swings could reduce this duration.

Phase III

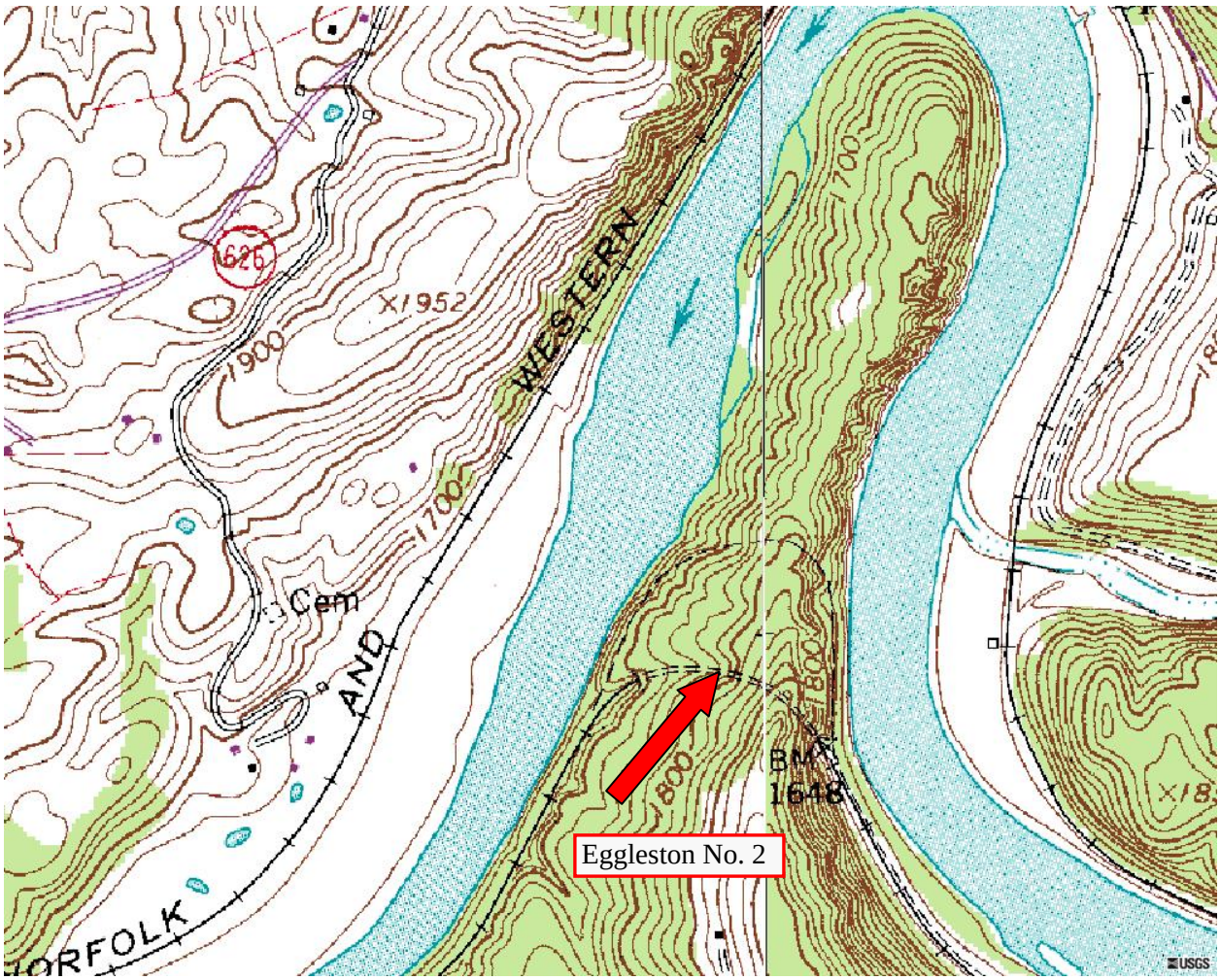
After the final site grading to remove the material under and adjacent to the original alignment, the track is re-welded and equalized in this phase. The grade crossings are also installed in this phase after the rail is welded and equalized.

All of the Phase III work can be accomplished under daily track windows.

3.3 Estimate

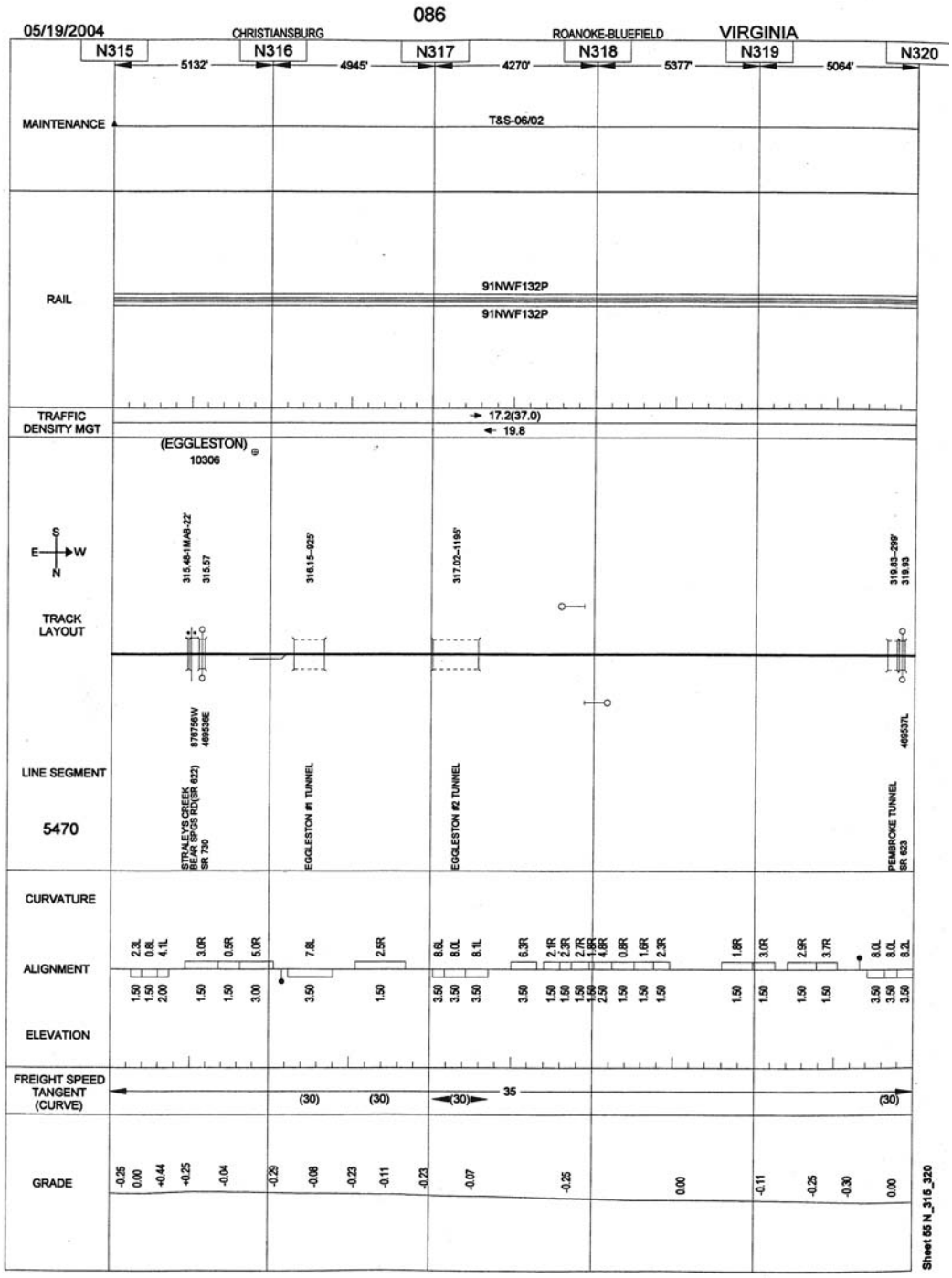
The total estimated cost for achieving clearance at this location is $1.35 million (2005 rates) or $1,131 per foot of tunnel. The work items include mobilization, surveying, track lowering, track shifting, rock cut for drainage trench, tunnel drainage system, and demobilization. The total cost is made up of tunnel, track, signal, and site work items at $908,368 plus a 20% construction contingency, a 10% engineering allowance, and a 14% construction management allowance.

4. USGS TOPOGRAPHIC MAP



5. AERIAL PHOTO

6. TRACK CHART



7. PHOTOS

Photo 1. West portal.

Photo 2. Typical tunnel crown.

8. ESTIMATE

Eggleston No. 2

Tunnel Length	1195	ft
Tunnel Width	29.75	ft
# of Tracks	1	

	Contractor		Railroad	
Work Window	10	hrs	10	hrs
Setup & Demobilization Allowance	2	hrs	2	hrs
Production Time	8	hrs	8	hrs

Tunnel Work Items	UOM	Quantity	Unit Rate	Total
Mobilization	%	5%		$15,880.64
Rock Cut Drainage Trench	LF	1695	$168.78	$286,089.60
Tunnel Drainage	LF	1695	$16.66	$28,240.07
Demobilization	DY	1	$3,283.20	$3,283.20
Total Tunnel Work Items	**LF**	**1195**	**$279.07**	**$333,493.51**

Trackwork Items	UOM	Quantity	Unit Rate	Total
Mobilization	DY	1	$3,110.32	$3,110.32
Surveying	DY	2	$1,300.00	$2,600.00
Track Preparation/Restoration	DY	2	$3,431.32	$6,862.64
Undercutting	PF	4800	$16.27	$78,089.16
Install Steel Ties	EA			
Track Shift < 8' & > 1'	TF	1950	$9.22	$17,987.12
Track Shift > 8'	TF			
New Track	TF			
Saw Cuts	EA	8	$5,719.72	$45,757.76
Panel Track	TF			
Remove Track	TF			
Field Welds	EA	8	$2,523.78	$20,190.25
Surfacing & Lining	PF	10000	$2.06	$20,608.13
Ballasting Track	TN	4800	$37.39	$179,462.64
Equalizing rail	DY	1	$6,701.14	$6,701.14
Elastomeric Flangeway Crossing	EA	2	$18,089.47	$36,178.94
Demobilization	DY			
Total Trackwork Items				**$417,548.11**

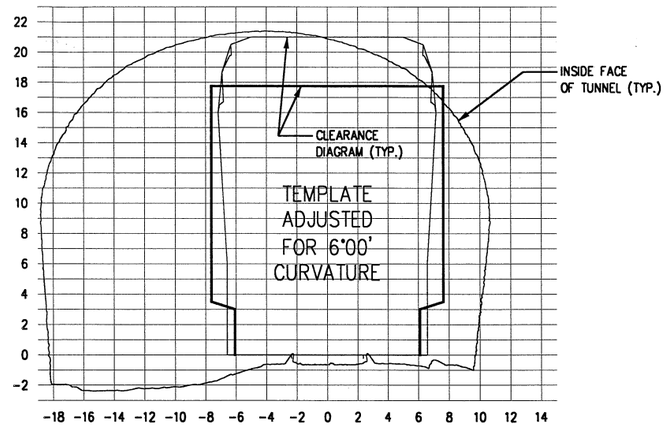
Signal Items	UOM	Quantity	Unit Rate	Total
Mobilization	DY			
Relocate Cables / Track Leads	LF	100	$33.23	$3,322.59
Demobilization	DY			
Total Signal Items				**$3,322.59**

Site Items	UOM	Quantity	Unit Rate	Total
Mobilization	DY	1	$2,483.60	$2,483.60
Erosion & Sedimentation Control	EA	1	$11,958.80	$11,958.80
Site Grading	CY	4800	$20.52	$98,486.68
Rock Excavation	CY			
Sub-Ballast	CY			
Drainage	LF			
Demobilization	DY			
Total Site Items				**$112,929.08**

Special Items	UOM	Quantity	Unit Rate	Total
Mobilization	DY			
Flagging	DY	50	$821.50	$41,075.00
Demobilization	DY			
Total Specialty Items				**$41,075.00**

Subtotal All Items		**$908,368.29**
Construction Contingency	**20%**	**$181,673.66**
Engineering Allowance	**10%**	**$109,004.19**
Construction Management Allowance	**14%**	**$152,605.87**
Total		**$1,351,652.02**

9. DRAWINGS



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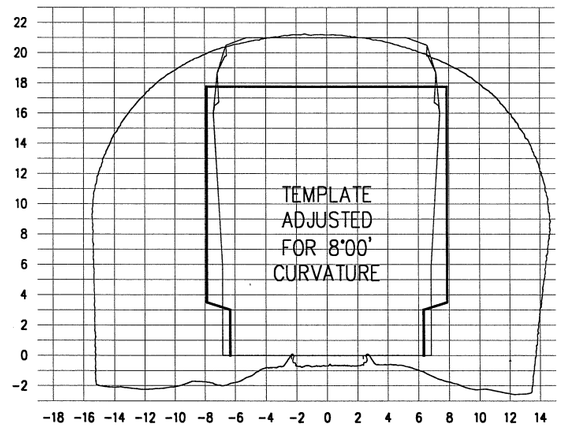

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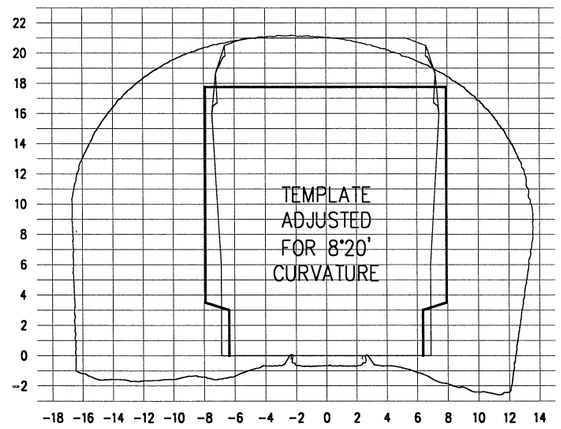

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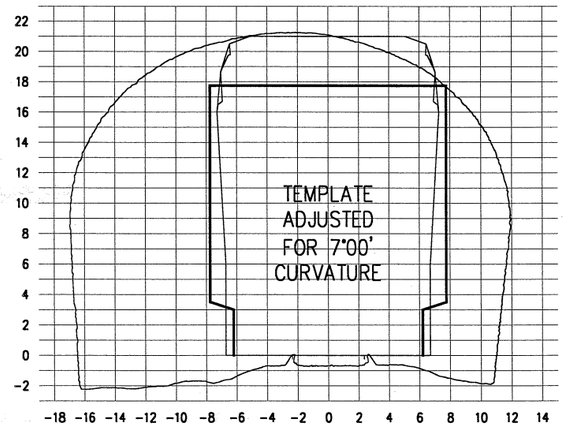

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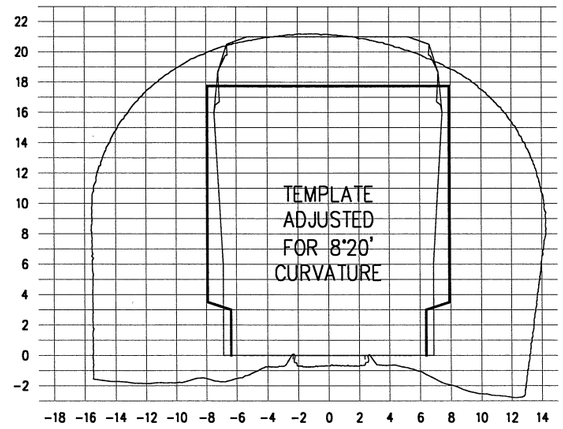

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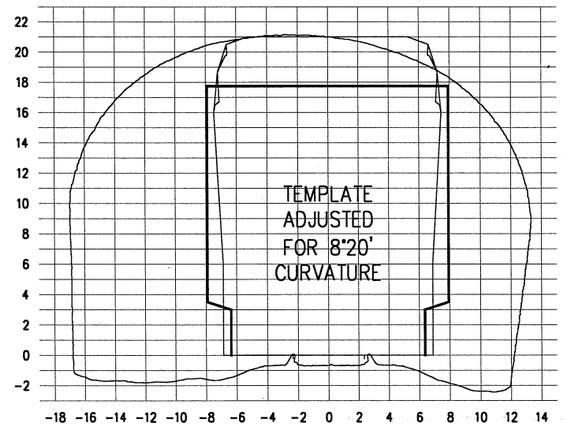

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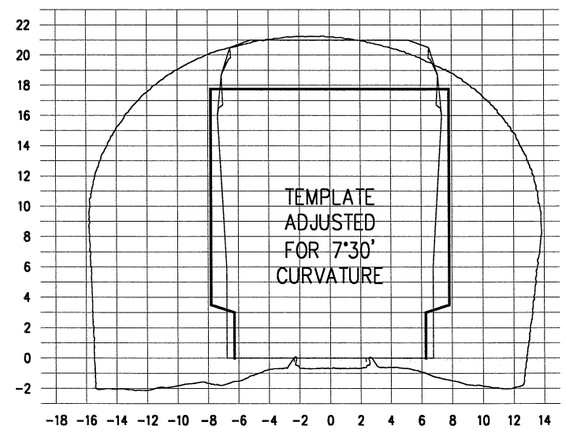

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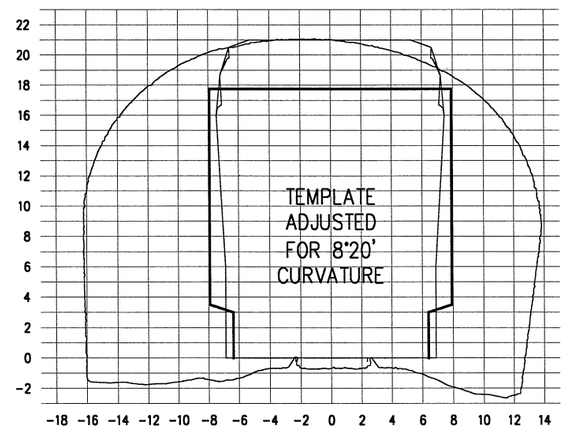

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NOTES:

1. HORIZONTAL DATUM IS PARALLEL TO TRACK. WHERE TRACK IS SUPERELEVATED, DATUM IS NOT PARALLEL WITH GROUND.
2. CROSS SECTION GIVEN FOR STA. 0+00 IS A COMPOSITE FOR THE TUNNEL FROM STA. 0+00 THROUGH 0+50. ALL OF THE SECTIONS FOLLOW THIS CONVENTION.

NOT FOR CONSTRUCTION

SCALE: 1" = 100'

50 0 100 200 300

Hatch Mott MacDonald

NORFOLK SOUTHERN

OWNING COMPANY
VIRGINIA
OPERATING DIVISION
OFFICE OF THE CHIEF ENGINEER - DESIGN AND CONSTRUCTION - ATLANTA, GA.

REV	BY	DATE	DESCRIPTION
P1	DJL	8/5/05	PRELIMINARY ENGINEERING PHASE REPORT

LOCATION: EGGLESTON NO. 2, EGGLESTON, VA.

TITLE: TUNNEL CLEARANCE CROSS SECTIONS – 1 OF 3

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CHK	DATE APRIL 1, 2005		

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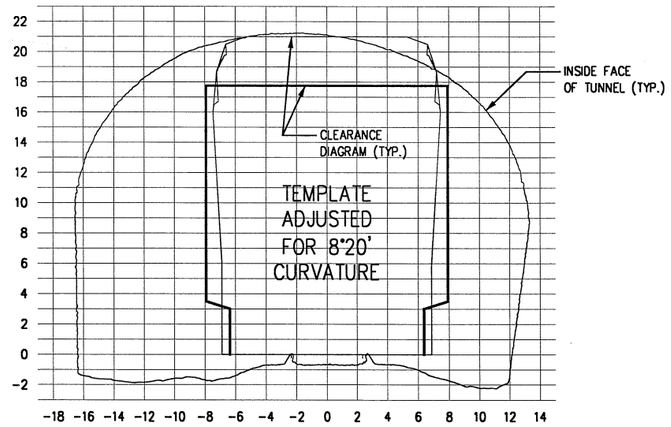

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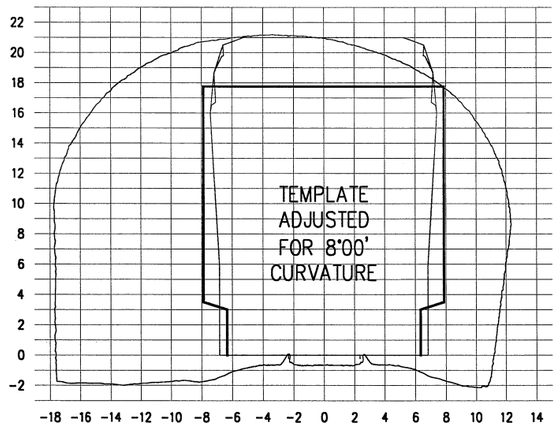

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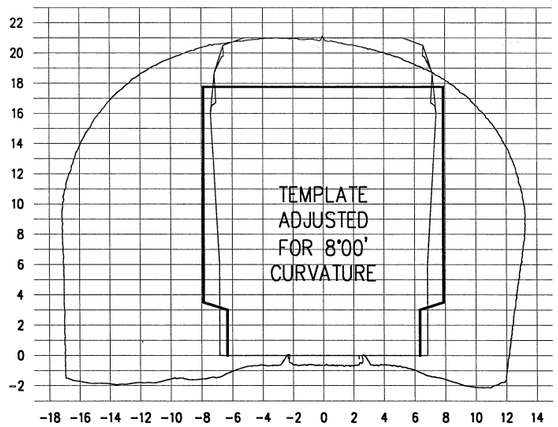

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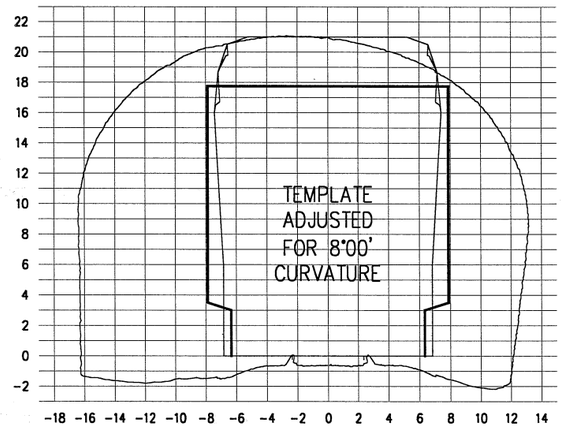

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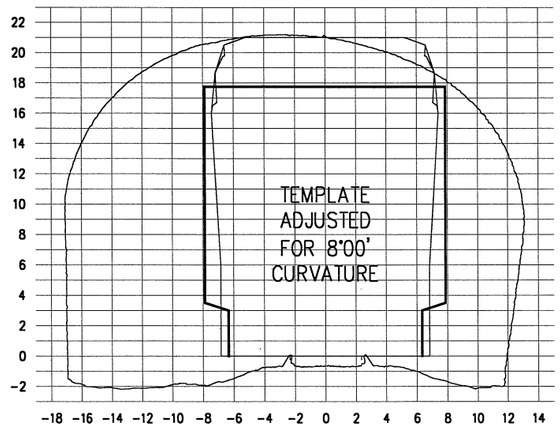

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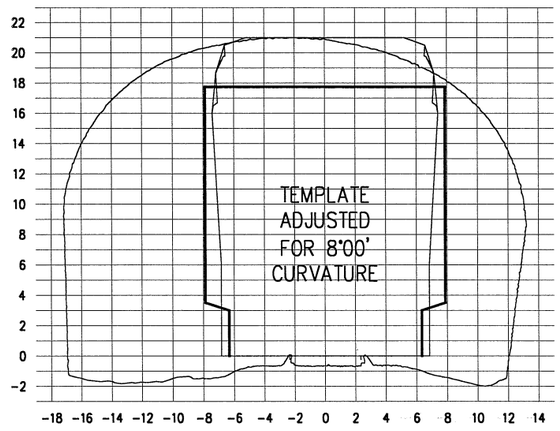

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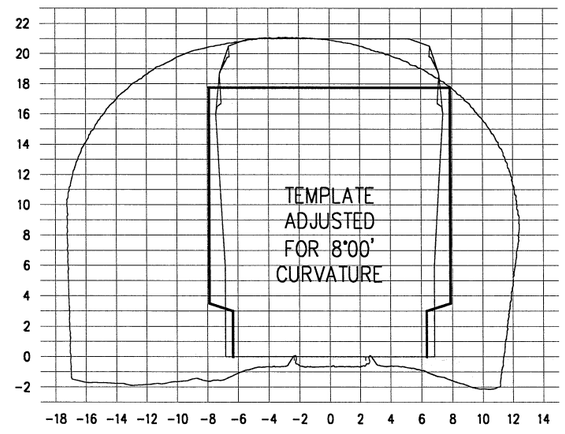

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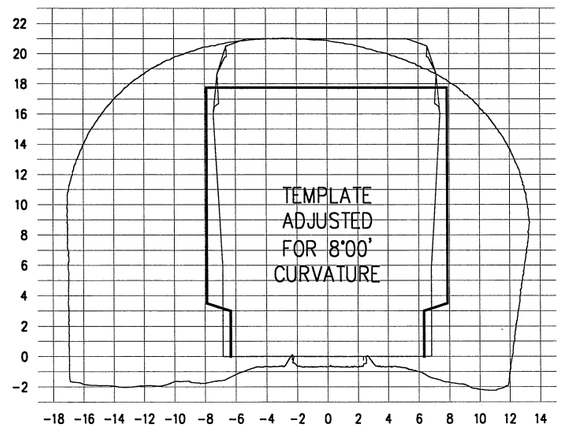

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SCALE: 1" = 100'

50 0 100 200 300

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REV	BY	DATE	DESCRIPTION
P1	DJL	8.5.05	PRELIMINARY ENGINEERING PHASE REPORT

LOCATION: EGGLESTON NO. 2, EGGLESTON, VA.

TITLE: TUNNEL CLEARANCE CROSS SECTIONS – 2 OF 3

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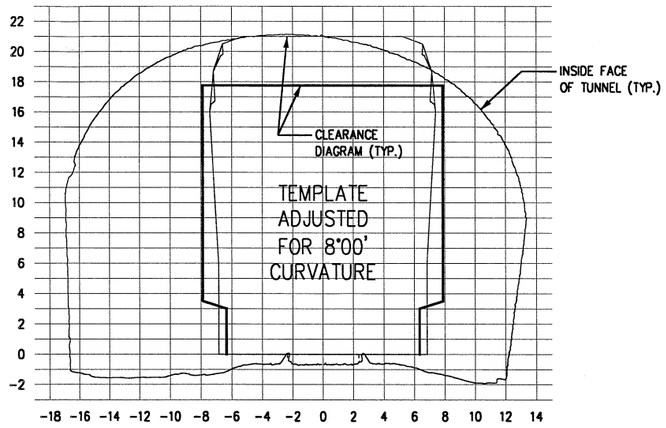

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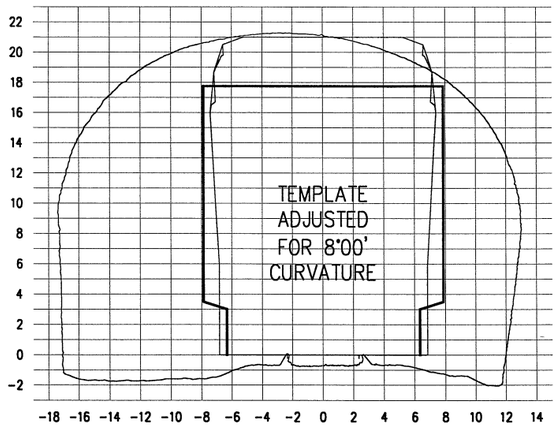

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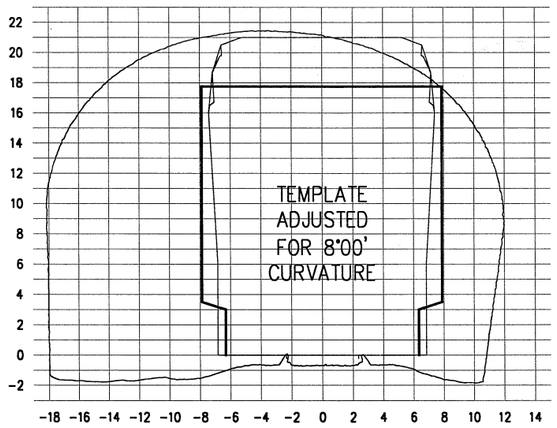

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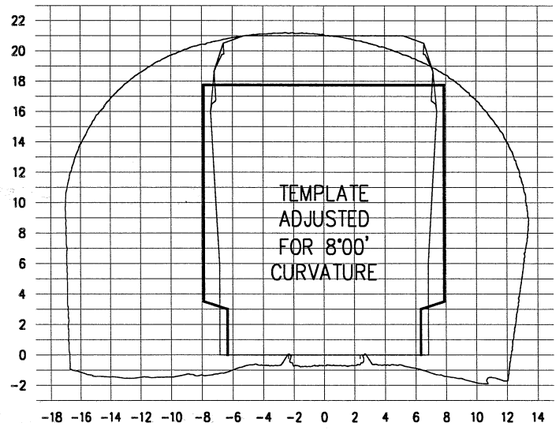

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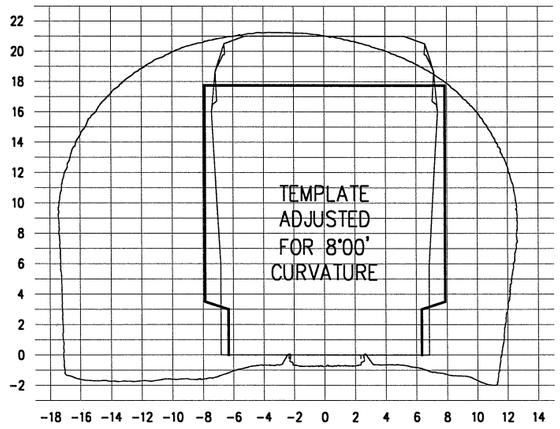

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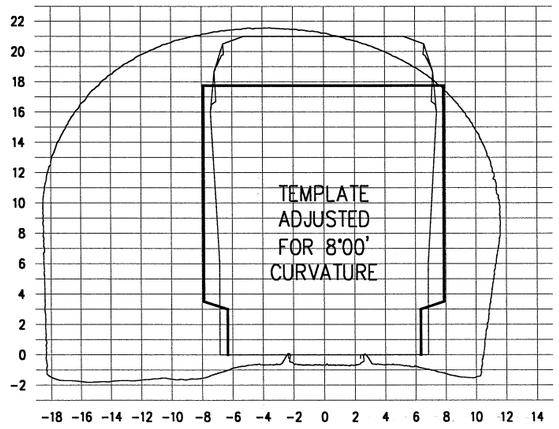

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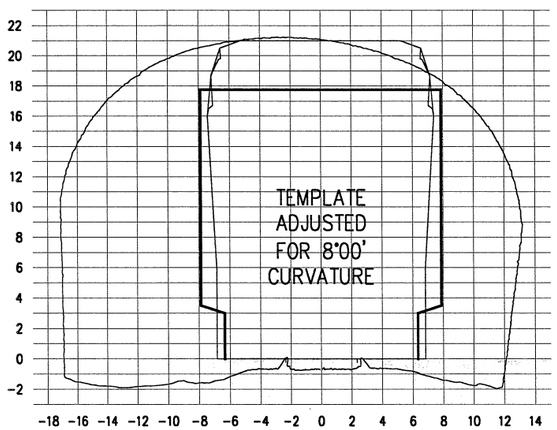

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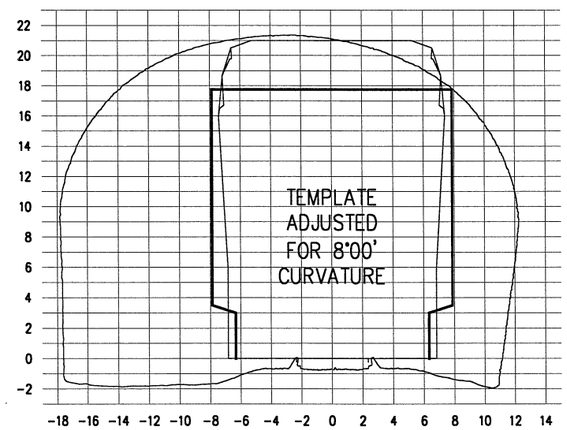

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NOTES:

1. HORIZONTAL DATUM IS PARALLEL TO TRACK. WHERE TRACK IS SUPERELEVATED, DATUM IS NOT PARALLEL WITH GROUND.
2. CROSS SECTION GIVEN FOR STA. 0+00 IS A COMPOSITE FOR THE TUNNEL FROM STA. 0+00 THROUGH 0+50. ALL OF THE SECTIONS FOLLOW THIS CONVENTION.

NOT FOR CONSTRUCTION

SCALE: 1" = 100'

50 0 100 200 300

Hatch Mott MacDonald

NORFOLK SOUTHERN

OWNING COMPANY
VIRGINIA
OPERATING DIVISION
OFFICE OF THE CHIEF ENGINEER - DESIGN AND CONSTRUCTION - ATLANTA, GA.

REV	BY	DATE	DESCRIPTION
PT	DJL	8/5/05	PRELIMINARY ENGINEERING PHASE REPORT

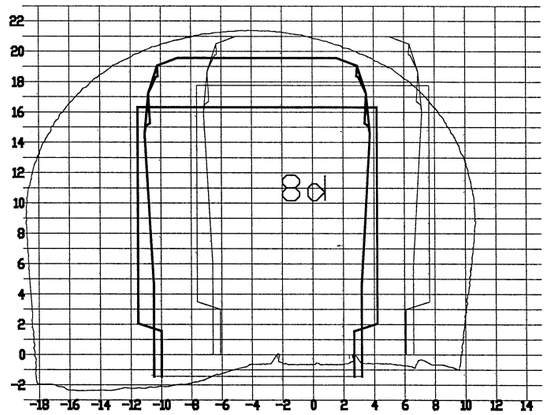
LOCATION: EGGLESTON NO. 2, EGGLESTON, VA.

TITLE: TUNNEL CLEARANCE CROSS SECTIONS - 3 OF 3

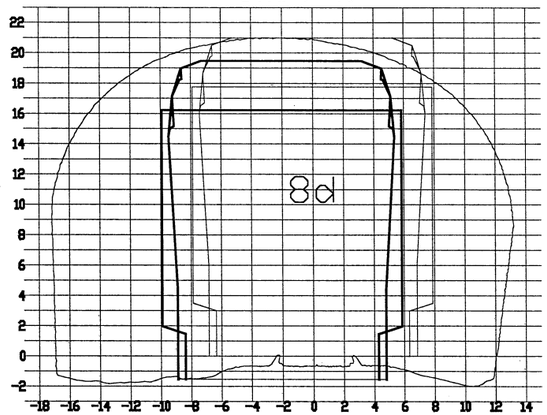
DGN	PID No.		VRN	15433	MILE POST N-317.02
DWN	FILE No.				DRAWING NUMBER
CHK	DATE	APRIL 1, 2005			

FILE NAME = $FILE$
DATE/TIME = $DATE$ $TIME$

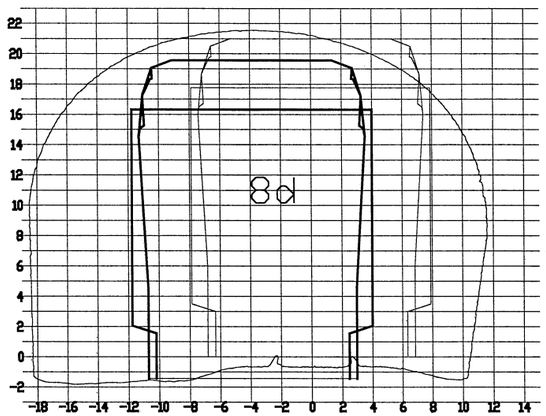
STA. 0+00



STA. 7+40



STA. 11+39



NOT FOR CONSTRUCTION

SCALE: 1" = 100'

50 0 100 200 300

Hatch Mott MacDonald

NORFOLK SOUTHERN

OWNING COMPANY
VIRGINIA
OPERATING DIVISION
OFFICE OF THE CHIEF ENGINEER - DESIGN AND CONSTRUCTION - ATLANTA, GA.

REV	BY	DATE	DESCRIPTION
			PI YARD 8505 PRELIMINARY ENGINEERING PHASE REPORT

LOCATION: EGGLESTON NO. 2, EGGLESTON, VA

TITLE: PROPOSED TUNNEL CLEARANCE CROSS SECTIONS

DGN	PID No.		VRN	15433	MILE POST 317.02
DWN	FILE No.				DRAWING NUMBER
CHK	DATE	APRIL 1, 2005			

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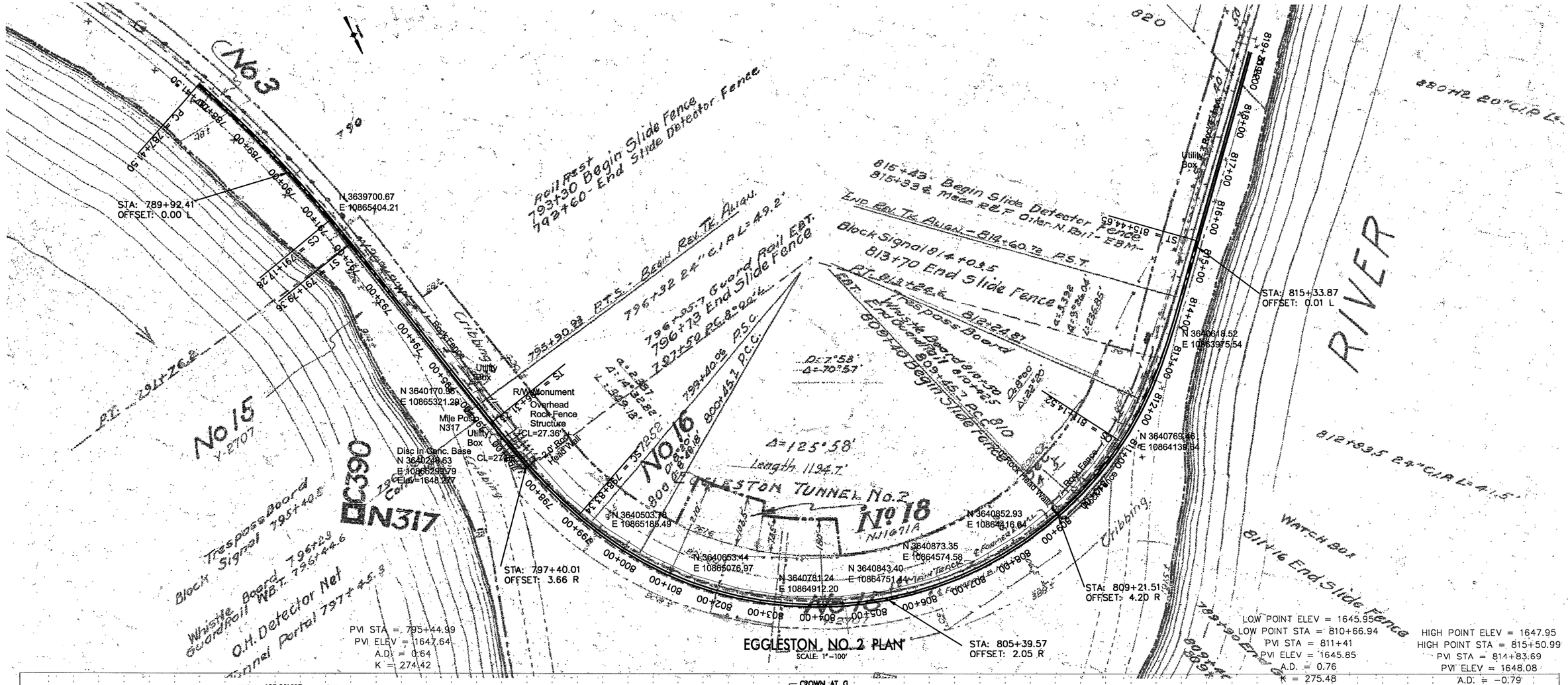
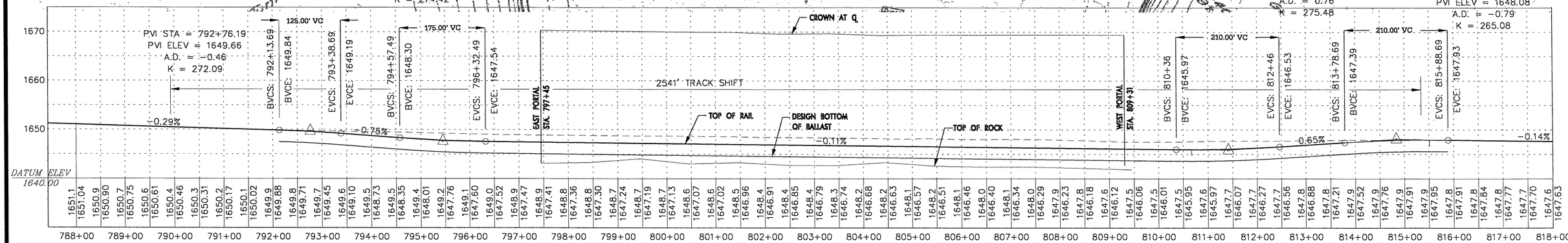
DATE/TIME = $DATE$ $TIME$



EGGLESTON NO. 2 PLAN

SCALE: 1"=100'



EGGLESTON NO. 2 PROFILE

SCALE: 1"=100' HORIZ.
1"=10' VERT.

NOT FOR CONSTRUCTION

SCALE: 1"=100'

50 0 100 200 300

REV	BY	DATE	DESCRIPTION
P2	DJL	10/4/05	PRELIMINARY ENGINEERING PHASE REPORT
P1	MJL	9/6/05	PRELIMINARY ENGINEERING PHASE REPORT

Hatch Mott MacDonald

NORFOLK SOUTHERN

OWNING COMPANY
VIRGINIA
OPERATING DIVISION
OFFICE OF THE CHIEF ENGINEER - DESIGN AND CONSTRUCTION - ATLANTA, GA.

LOCATION: EGGLESTON NO. 2, EGGLESTON, VA

TITLE: PLAN AND PROFILE

DGN	PID No.	VRN 15433	MILE POST 317.02
DWN	FILE No.	DRAWING NUMBER	
CHK	DATE APRIL 1, 2005		

FILE NAME = P:\NSR\29399\CAD\survey info\317.02 Eggleston No.2\EGGLESTON-2.dgn
DATE/TIME = 10/12/2005 02:14:59 PM

Horizontal Alignment Station and Curve Report.
Alignment: egg-2
Desc: Eggleston #2 Revised Align 4' in

Desc.	Station	Spiral/Curve Data			Northing	Easting
PI	787+41.50				3639355.6994	10865538.3353
	Length:	204.34	Course:	N 23-49-20.0 W		
PI	789+45.84				3639542.6318	10865455.8016
	Length:	2221.06	Course:	N 13-39-47.9 W		
	Delta:	10-09-32.1				
		Circular Curve Data				
PC	787+41.50				3639355.6994	10865538.3353
RP					3640282.4272	10867637.3022
SC	791+17.28				3639710.3281	10865415.3235
	Delta:	09-23-01.4	Type:	RIGHT		
	Radius:	2294.45	DOC:	02-29-49.7		
	Length:	375.78	Tangent:	188.31		
	Mid-Ord:	7.69	External:	7.71		
	Chord:	375.36	Course:	N 19-07-49.3 W		
	Es:	9.08				
		Spiral Curve Data: CLOTHOID				
SC	791+17.28				3639710.3281	10865415.3235
SPI					3639730.3702	10865410.1632
PC	791+79.36				3639770.5899	10865400.3860
	Length:	62.09	L Tan:	41.39		
	Radius:	2294.45	S Tan:	20.70		
	Theta:	0-46-30.7	P:	0.07		
	X:	62.08	K:	31.04		
	Y:	0.28	A:	377.43		
	Chord:	62.09	Course:	N 13-55-18.2 W		
	Ts:	234.60				
PI	811+65.82				3641700.8347	10864931.1523
	Length:	2009.79	Course:	S 40-52-54.0 W		
	Delta:	125-27-18.0				
		Tangent Data				
	791+79.36				3639770.5899	10865400.3860
	796+31.73				3640210.1527	10865293.5303
	Length:	452.36	Course:	N 13-39-47.9 W		
		Spiral Curve Data: CLOTHOID				
TS	796+31.73				3640210.1527	10865293.5303
SPI					3640373.4086	10865253.8435
SC	798+83.34				3640450.4287	10865220.0293
	Length:	251.61	L Tan:	168.01		
	Radius:	717.96	S Tan:	84.12		
	Theta:	10-02-22.7	P:	3.67		
	X:	250.84	K:	125.68		
	Y:	14.66	A:	425.03		
	Chord:	251.27	Course:	N 17-00-32.4 W		
	Ts:	1534.10				
		Circular Curve Data				
SC	798+83.34				3640450.4287	10865220.0293
RP					3640161.8112	10864562.6327
SC	811+14.52				3640770.9750	10864182.6461
	Delta:	98-15-08.3	Type:	LEFT		
	Radius:	717.96	DOC:	07-58-49.2		
	Length:	1231.18	Tangent:	829.60		
	Mid-Ord:	248.13	External:	379.18		
	Chord:	1085.78	Course:	N 72-49-44.8 W		
	Es:	864.57				
		Spiral Curve Data: CLOTHOID				
SC	811+14.52				3640770.9750	10864182.6461
SPI					3640694.4366	10864059.9460
PC	815+44.65				3640476.6031	10863871.3745
	Length:	430.13	L Tan:	288.12		
	Radius:	717.96	S Tan:	144.61		
	Theta:	17-09-47.0	P:	10.70		
	X:	426.29	K:	214.43		
	Y:	42.67	A:	555.72		
	Chord:	428.42	Course:	S 46-35-54.0 W		
	Ts:	1619.22				
PI	819+35.22				3640181.3073	10863615.7465
		Tangent Data				
	815+44.65				3640476.6031	10863871.3745
	819+35.22				3640181.3073	10863615.7465
	Length:	390.57	Course:	S 40-52-54.0 W		

PVI	Station	Elevation	Grade Out (%)	Curve Length
	1787+41.50	1651.21	-0.29	
	2792+76.19	1649.66	-0.75	125.00

Vertical Curve Information: (crest curve)
PVC Station: 792+13.69 Elevation: 1649.84
PVI Station: 792+76.19 Elevation: 1649.66
PVT Station: 793+38.69 Elevation: 1649.19
Grade in (%): -0.29 Grade out (%): -0.75 Change (%): 0.46
Curve Length: 125.00

3795+44.99 1647.64 -0.11 175.00

Vertical Curve Information: (sag curve)
PVC Station: 794+57.49 Elevation: 1648.30
PVI Station: 795+44.99 Elevation: 1647.64
PVT Station: 796+32.49 Elevation: 1647.54
Grade in (%): -0.75 Grade out (%): -0.11 Change (%): 0.64
Curve Length: 175.00

4811+41 1645.85 0.65 210.00

Vertical Curve Information: (sag curve)
PVC Station: 810+36 Elevation: 1645.97
PVI Station: 811+41 Elevation: 1645.85
PVT Station: 812+46 Elevation: 1646.53
Grade in (%): -0.11 Grade out (%): 0.65 Change (%): 0.76
Curve Length: 210.00

5814+83.69 1648.08 -0.14 210.00

Vertical Curve Information: (crest curve)
PVC Station: 813+78.69 Elevation: 1647.39
PVI Station: 814+83.69 Elevation: 1648.08
PVT Station: 815+88.69 Elevation: 1647.93
Grade in (%): 0.65 Grade out (%): -0.14 Change (%): 0.79
Curve Length: 210.00

FILE NAME = P:\NSN\209399\CAD\survey info\317.02 Eggleston No.2\317CURVE DATA.dgn
DATE/TIME = 10/12/2005 06:05:27 PM

NOT FOR CONSTRUCTION

SCALE: 1" = 100'

50 0 100 200 300

Hatch Mott MacDonald

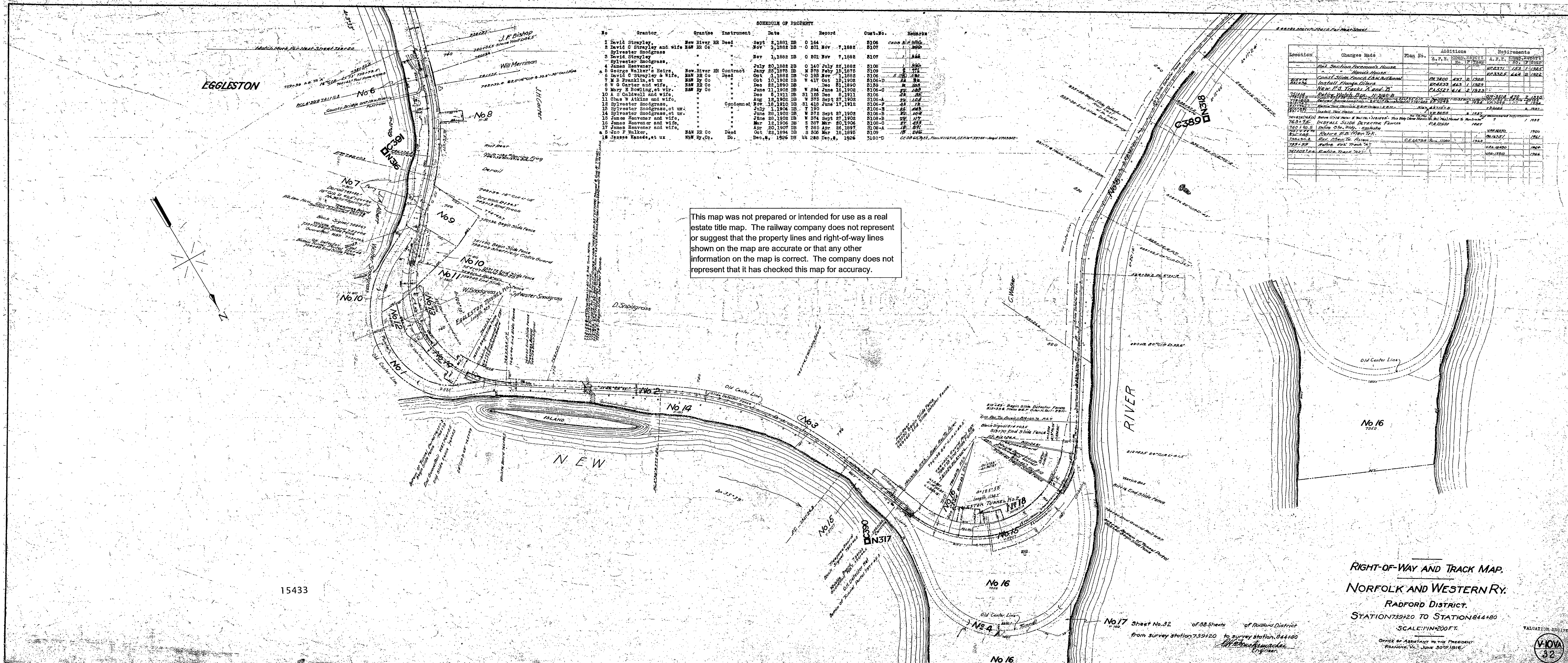
NORFOLK SOUTHERN

OWNING COMPANY
VIRGINIA
OPERATING DIVISION
OFFICE OF THE CHIEF ENGINEER - DESIGN AND CONSTRUCTION - ATLANTA, GA.

REV.	BY	DATE	DESCRIPTION
P1	MJL	8/5/05	PRELIMINARY ENGINEERING PHASE REPORT

LOCATION: EGGLESTON NO. 2, EGGLESTON, VA
TITLE: CURVE DATA

DGN	PID No.	VRN 15433	MILE POST	317.02
DWN	FILE No.		DRAWING NUMBER	
CHK	DATE APRIL 1, 2005			



SCHEDULE OF PROPERTY

No	Grantor	Grantee	Instrument	Date		Record	Cust. No.	Remarks
1	David Strayley,	New River RR	Deed	Sept 2,1881	DB	O 164	3106	CEDB [illegible]
2	David C Strayley and wife Sylvester Snodgrass	N&W RR Co	"	Nov 1,1882	DB	O 201 Nov 7,1882	3107	[illegible]
3	David Strayley Sylvester Snodgrass,	"	"	Nov 1,1882	DB	O 201 Nov 7,1882	3107	[illegible]
4	James Heavener,	"	"	July 20,1882	DB	O 140 July 22,1882	3108	[illegible]
a 5	George Walker's Heirs,	New River RR	Contract	Jany 23,1875	DB	M 378 Feby 15,1875	3109	[illegible]
6	David C Strayley & Wife,	N&W RR Co	Deed	Oct 1,1882	DB	O 193 Nov 1,1882	3106	[illegible]
7	M B Franklin, et ux	N&W Ry Co	"	Oct 10,1902	DB	W 417 Oct 13,1902	3106-D	[illegible]
8	W G Carter and wife,	N&W RR Co	"	Dec 22,1890	DB	Dec 31,1890	3138	108
9	Mary E Bowling, et vir.	N&W Ry Co	"	June 11,1902	DB	W 294 June 16,1902	3106-C	140
10	A S Caldwell and wife,	"	"	Dec 5,1911	DB	31 125 Dec 8,1911	3106	43 85
11	Chas W Atkins and wife,	"	"	Aug 12,1902	DB	W 375 Sept 27,1902	3106-A	108
12	Sylvester Snodgrass,	"	Condemned	Nov 18,1910	DB	31 418 June 17,1912	3106-F	43 13
13	Sylvester Snodgrass, et ux.	"	"	July 1,1904	DB	Y 190	3106-E	25 [illegible]
14	Sylvester Snodgrass, et ux.	"	"	June 28,1902	DB	W 372 Sept 27,1902	3106-B	104
15	James Heavener and wife,	"	"	June 28,1902	DB	W 374 Sept 27,1902	3108-B	117
16	James Heavener and wife,	"	"	Mar 12,1906	DB	Z 387 Mar 20,1906	3108-C	27 233
17	James Heavener and wife,	"	"	Apr 20,1907	DB	T 385 Apr 26,1897	3108-A	18 891
a 5	Jno F Walker,	N&W RR Co	Deed	Oct 22,1894	DB	S 305 Mar 18,1895	3109	15 246
18	Jessee Kanode, et ux	N&W Ry. Co.	Do.	Dec. 8, 1926	DB	44 288 Dec. 8, 1926	3108-D	CE-DB 65, P.22, Plan N11671A, CE File #59744 — Acqd. VPA3342 —

Location	Changes Made	Plan No.	Additions				Retirements			
			A.F.E.	Comp. Report No.	P	Year	A.F.E.	Comp. Report No.	P	Year
	Ret. Section Foreman's House						VP.2371	153	1	1925
	" " Hand's House						VP.3325	664	2	1926
815+74	Const. Slide Fence E&W Port Tunnel		PA.7400	497	2	1928				
831+96	Install Flange Oilers		VP.4533	463	1	1929				
	New P.S. Tracks "A" and "B"		P.A.5527	616	2	1923				
751+14	Retire Watch Box. N-3160-B						GM-3514	470	2	1930
772+22.6 / 772+60.3	Install 40' of 42" Conc. Pipe Culvt. Replacing 36' of 24" C.I.P. — See MW85 1-10-35 With Letter OVP 1-11-35 In C.E. File #25722. Retired Same Location — 24" C.I.P. Reinstalled At 772+60.3		V.P. 7092		2	1934	V.P. 7092		2	1934
815+74 / 831+96	Retire Two Derrick R&F Oilers - EBM -		[illegible]				V.P. 8469		2	1937
815+33 / 831+71	Install Two Maco " " "		V.P. 8450		2	1937				
741+67.5 (16' Lt.)	Retire 11'x14' Meter & Tool Ho. N8159B - This Bldg (Later Shown On Val. Map) Moved To Pembroke And Renumbered	See C.E. Map					?		1	1938
763+75	INSTALL SLIDE DETECTOR FENCES		P.A. 12520			1947				
740+90.5	Retire Sta. Bldg. - Eggleston									
701+88 to 775+29	Retire E.B. Main Trk.						VPA 16070			1960
							PA 16751			1961
795+90.2	Rev. Main Tk. Align.	C.E. 66795	Eng. 11000			1962				
799+99	Retire 502' Track "A"						V.P.A. 18490			1964
747+09.3 P.S.	Retire Track "A2"						VPA-19910			1966

This map was not prepared or intended for use as a real estate title map. The railway company does not represent or suggest that the property lines and right-of-way lines shown on the map are accurate or that any other information on the map is correct. The company does not represent that it has checked this map for accuracy.

15433

No 17 Sheet No. 32 of 88 Sheets of Radford District
from survey station 739+20 to survey station 844+80
C.H. Frankmacher
Engineer.

RIGHT-OF-WAY AND TRACK MAP.

NORFOLK AND WESTERN RY.

RADFORD DISTRICT.

STATION 739+20 TO STATION 844+80

SCALE: 1" IN = 200 FT.

OFFICE OF ASSISTANT TO THE PRESIDENT
ROANOKE, VA., JUNE 30TH 1916.

VALUATION ENGINEER
V-10VA
32