

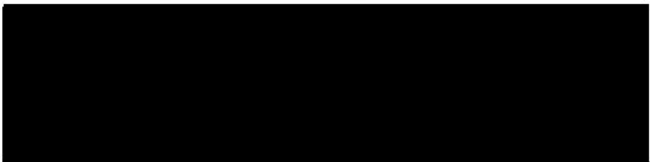


Southeastern Pennsylvania Transportation Authority

Safety • Service • Continuous Improvement

TO: John Manutes	cc:
FROM: Vincent J DeSilvis	D. Stump
SUBJECT: Derailment on 7/27/2023	D. Montvydas
DATE: 7/31/2023	

Thursday July 27th a Trolley lost control and rolled out of Elmwood depot. It continued to travel North bound in the Southbound Track. Island ave has a 4.1% grade where the trolley comes out of the Depot and it gradually tapers down to .7% at Woodland ave. This grade caused the trolley to pick up speed and when it made it to the special work on Woodland ave it derailed. The derailment was caused by the excessive speed when traveling through the Turnout. The Turnout is where the trolley derailed had a curve of 39.90 foot radius. At this radius, the moves through the curve are rated for 5MPH which the trolley was traveling well beyond, causing it to derail. Post derailment we inspected the area of concern and found no contributing factors other than speed to which caused the trolley to derail.



Director of Maintenance

7-31-2023

Date

TABLE 213.57 C
 LIGHT RAIL LINES - SUPERELEVATION TABLE
 MAXIMUM CURVE SPEEDS 4-1/2" UNDERBALANCE

Mid-ord in Feet	Inches	0	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6
	Feet	0	.04	.08	.12	.17	.21	.25	.29	.33	.38	.42	.46	0.5
31' Chord	Radius	MPH												
0.04	2984	54	57	60	63	65	68	70	72	74	77	79	81	83
0.06	1989	44	47	49	51	53	55	57	59	61	63	64	66	68
0.08	1492	38	40	42	44	46	48	49	51	53	54	56	57	58
0.10	1194	34	36	38	40	41	43	44	46	47	48	50	51	52
0.12	995	31	33	35	36	38	39	40	42	43	44	45	47	48
0.14	853	29	30	32	33	35	36	37	39	40	41	42	43	44
0.19	628	25	26	27	29	30	31	32	33	34	35	36	37	38
0.29	412	20	21	22	23	24	25	26	27	28	28	29	30	31
0.43	278	17	17	18	19	20	21	21	22	23	23	24	25	25
0.57	209	14	15	16	17	17	18	19	19	20	20	21	21	22
0.67	178	13	14	15	15	16	16	17	18	18	19	19	20	20
0.72	166	13	13	14	15	15	16	16	17	18	18	19	19	19
0.80	149	12	13	13	14	15	15	16	16	17	17	18	18	18
0.86	139	12	12	13	13	14	15	15	16	16	17	17	17	18
1.00	119	11	11	12	13	13	14	14	14	15	15	16	16	17
1.09	110	10	11	11	12	12	13	13	14	14	15	15	15	16
1.20	99	10	10	11	11	12	12	13	13	14	14	14	15	15
1.33	90	9	10	10	11	11	12	12	13	13	13	14	14	14
1.67	71	8	9	9	10	10	10	11	11	12	12	12	12	13
2.00	60	8	8	8	9	9	10	10	10	11	11	11	11	12
2.31	52	7	8	8	8	9	9	9	9	10	10	10	11	11
2.67	45	7	7	7	8	8	8	9	9	9	9	10	10	10
3.00	40	6	7	7	7	8	8	8	8	9	9	9	9	10



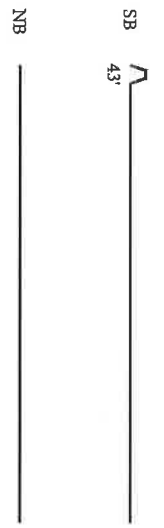
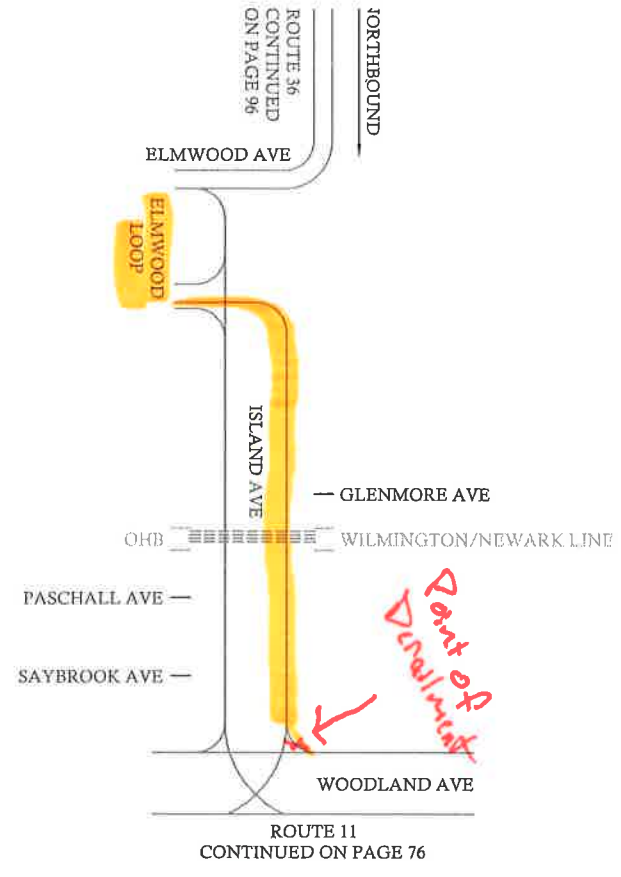
Radius at point of Derailment.

SB	RAIL	115E 2019
	PAVING	BRONKHORSE-2019
NB	RAIL	
	PAVING	



ISLAND AVE CUTBACK

GEOMETRY CAR TRACK CHARTS
 DRAWINGS BY C. RITZER
 REV - 1/2020



12/17/04

NOTE: SEE A99-83601 SH.2 FOR GEOMETRY OF NON-STANDARD SPIRALS "A" & "B"

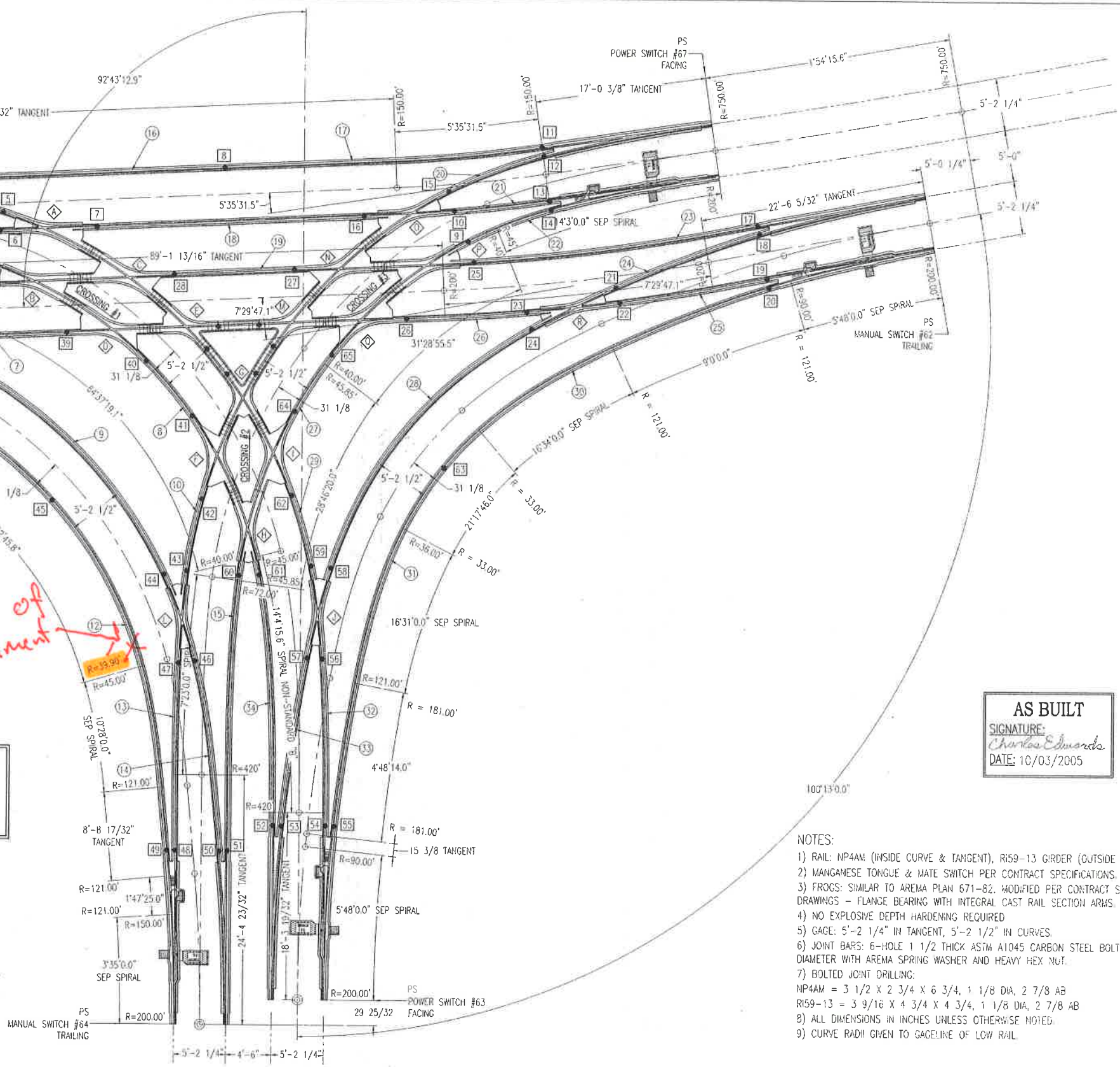
NOTE: NUMBERS IN BUBBLES ARE RAIL IDENTIFIERS NOT NUMBERS FOR BILL OF MATERIAL ITEMS

BILL OF MATERIAL			
ITEM	DESCRIPTION	QTY.	PRODUCT No.
1	TURNOUT #62	1	A10-84002
2	TURNOUT #63	1	A10-84003
3	TURNOUT #64	1	A10-84004
4	TURNOUT #65	1	A10-84005
5	TURNOUT #66	1	A10-84007
6	TURNOUT #67	1	A10-84006
	RAIL LENGTH (FINISHED LENGTH)		
7	THREE CROSSING ASSEMBLY	1	A40-30100
8	NP4AM RAIL #3	1	L40-04927
9	NP4AM RAIL #4	1	L40-04928
10	NP4AM RAIL #7	1	L40-04923
11	R159-13 RAIL #9	1	L40-04915
12	R159-13 RAIL #10	1	L40-04929
13	NP4AM RAIL #11	1	L40-04913
14	NP4AM RAIL #12	1	L40-04914
15	NP4AM RAIL #15	1	L40-04930
16	NP4AM RAIL #16	1	L40-04919
17	NP4AM RAIL #17	1	L40-04920
18	NP4AM RAIL #18	1	L40-04921
19	NP4AM RAIL #22	1	L40-04931
20	NP4AM RAIL #23	1	L40-04932
21	R159-13 RAIL #26	1	L40-04924
22	R159-13 RAIL #28	1	L40-04916
23	R159-13 RAIL #29	1	L40-04933
24	NP4AM RAIL #30	1	L40-04917
25	NP4AM RAIL #31	1	L40-04918
26	NP4AM RAIL #34	1	L40-04934
27	NP4AM CURVED JOINT ASSEMBLY	2	B20-20302
28	NP4AM STRAIGHT JOINT ASSEMBLY	1	B20-20300
29	SWITCH HEATER 15' ACTIVE 600VDC	3	R82-10193

NOTE: ITEMS NOT SHOWN IN THIS BILL OF MATERIAL ARE LISTED IN BILLS ON COMPONENT DRAWINGS

Point of Derailment

JOINT LEGEND	
●	BOLTED JOINT (1/8" GAP)
XX	JOINT NUMBER



AS BUILT
SIGNATURE: *Charles Edwards*
DATE: 10/03/2005

- NOTES:
- 1) RAIL: NP4AM (INSIDE CURVE & TANGENT), R159-13 GIRDER (OUTSIDE CURVE)
 - 2) MANGANESE TONGUE & MATE SWITCH PER CONTRACT SPECIFICATIONS.
 - 3) FROGS: SIMILAR TO AREMA PLAN 671-82. MODIFIED PER CONTRACT SPECIFICATIONS AND DRAWINGS - FLANGE BEARING WITH INTEGRAL CAST RAIL SECTION ARMS.
 - 4) NO EXPLOSIVE DEPTH HARDENING REQUIRED
 - 5) GAGE: 5'-2 1/4" IN TANGENT, 5'-2 1/2" IN CURVES.
 - 6) JOINT BARS: 6-HOLE 1 1/2 THICK ASTM A1045 CARBON STEEL BOLTS SHALL BE 1" DIAMETER WITH AREMA SPRING WASHER AND HEAVY HEX NUT.
 - 7) BOLTED JOINT DRILLING:
NP4AM = 3 1/2 X 2 3/4 X 6 3/4, 1 1/8 DIA, 2 7/8 AB
R159-13 = 3 9/16 X 4 3/4 X 4 3/4, 1 1/8 DIA, 2 7/8 AB
 - 8) ALL DIMENSIONS IN INCHES UNLESS OTHERWISE NOTED.
 - 9) CURVE RADIi GIVEN TO GAGELINE OF LOW RAIL



This drawing and the objects represented in it are the exclusive property of VAE Nortrak Associated Companies. Reproduction, copying or distribution of this drawing or of the objects is not permitted without our written consent. This drawing may not be used to call for tenders and may not be made available for review by parties other than the recipient.

© 2004, VAE Nortrak Associated Companies

SPECIAL TRACKWORK
ISLAND ROAD & WOODLAND AVE.
HALF GRAND UNION

REFERENCES:

DRAWN BY: CE	SCALE: 1=64	1st PRED.:
CHECKED BY: EA	WEIGHT: (Lbs.)	2nd PRED.:
APPROVED BY: CE	CUSTOMER CODE	REV
DATE: 12/1/2004	A99-83601	