

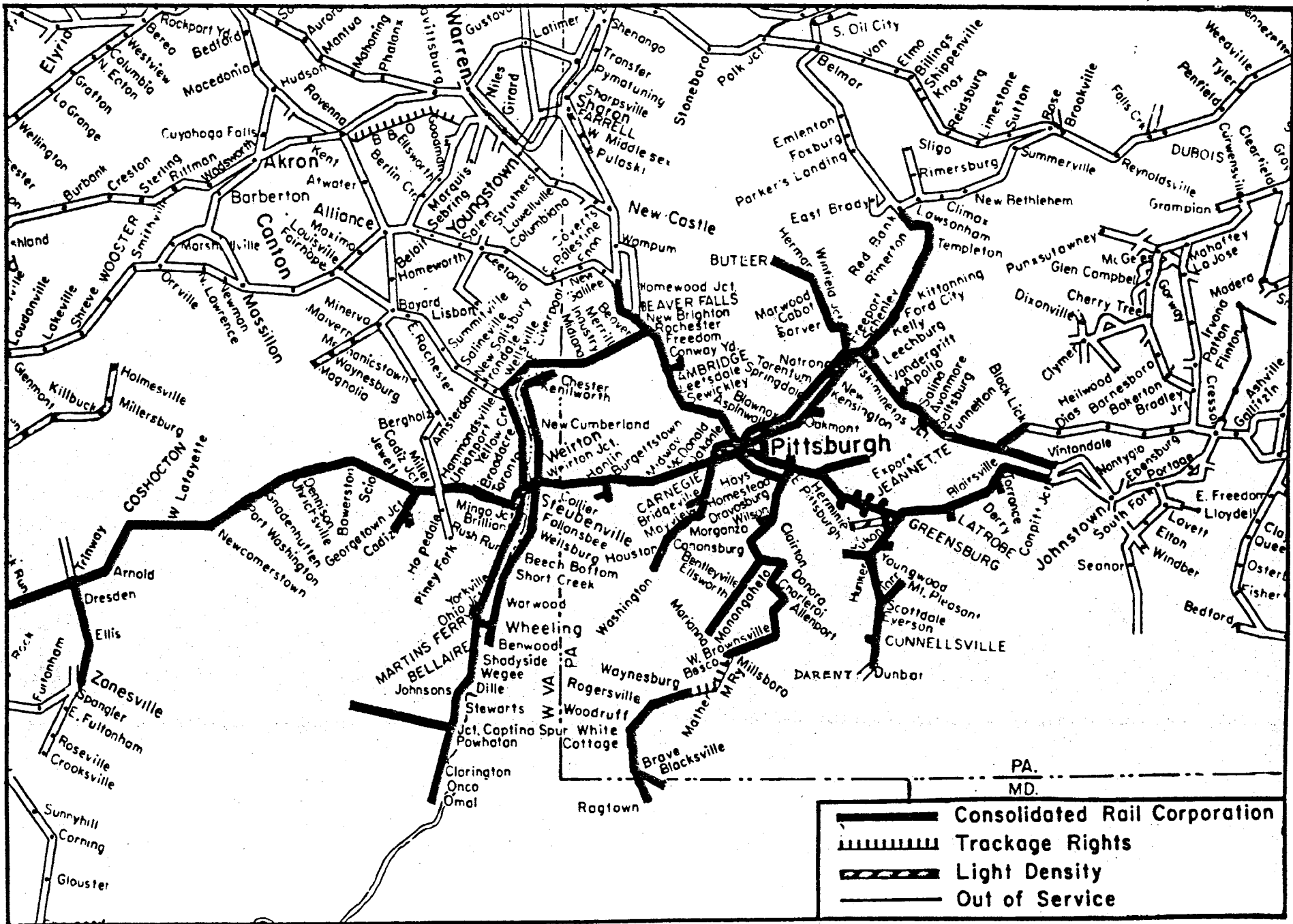
CENTRAL REGION

PITTSBURGH , PA.
TO
HARRISBURG, PA.

PITTSBURGH LINE

APRIL 21, 1985





GRINDING		82			
SURFACING		82	78T	82	83
TIES			77		83
UNDERCUTTING					
RAIL		32-80			
BAL CLEAN			78T		
TONNAGE (MGT)			21.3		
T T SPEED	40/30/30	40/30/30	40/30/30		15/15/15
UG. CABLE			5-10		

001

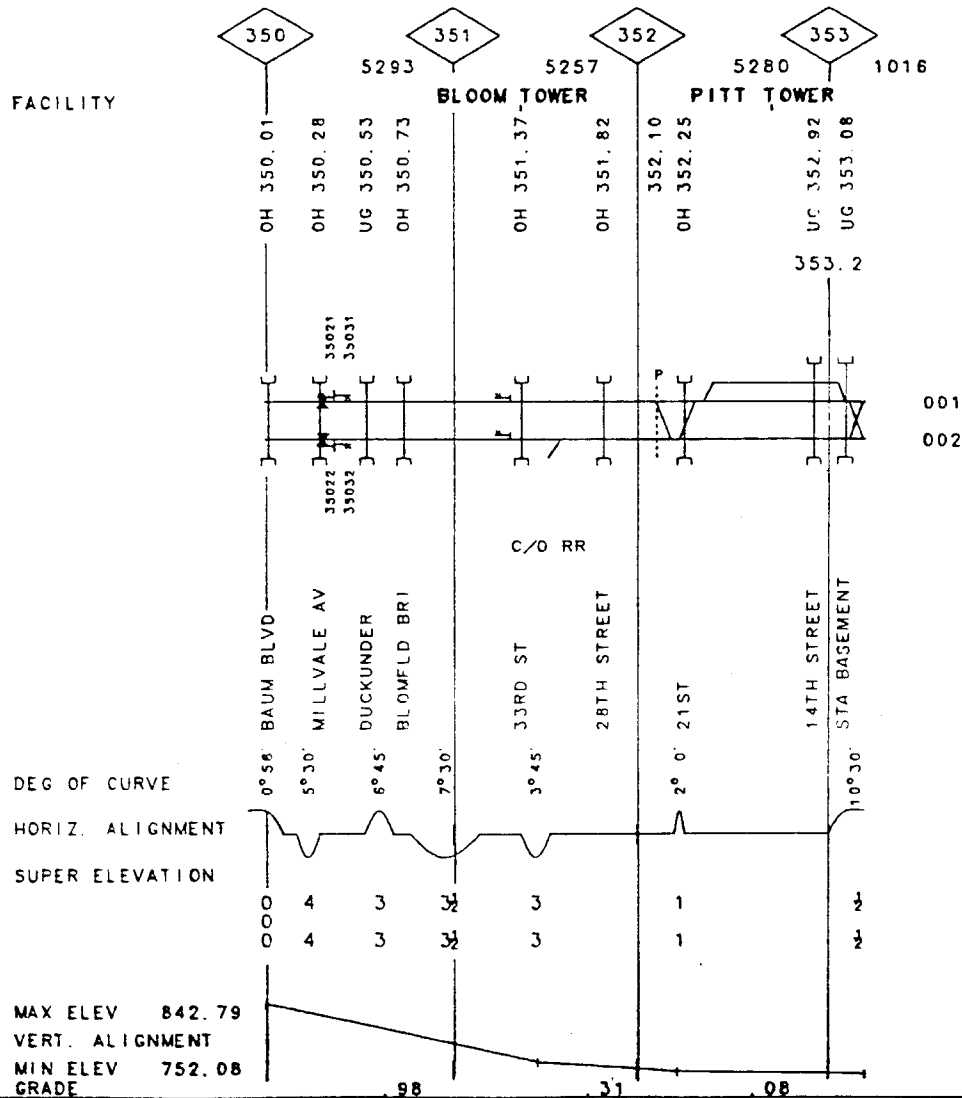
GRINDING		84			
SURFACING		82			83
TIES			77		83
UNDERCUTTING					
RAIL		32-80			
BAL CLEAN			78T		45
TONNAGE (MGT)			21.3		
T T SPEED	40/30/30	40/30/30	40/30/30		15/15/15
UG. CABLE					

002

VALUATION
TOWN

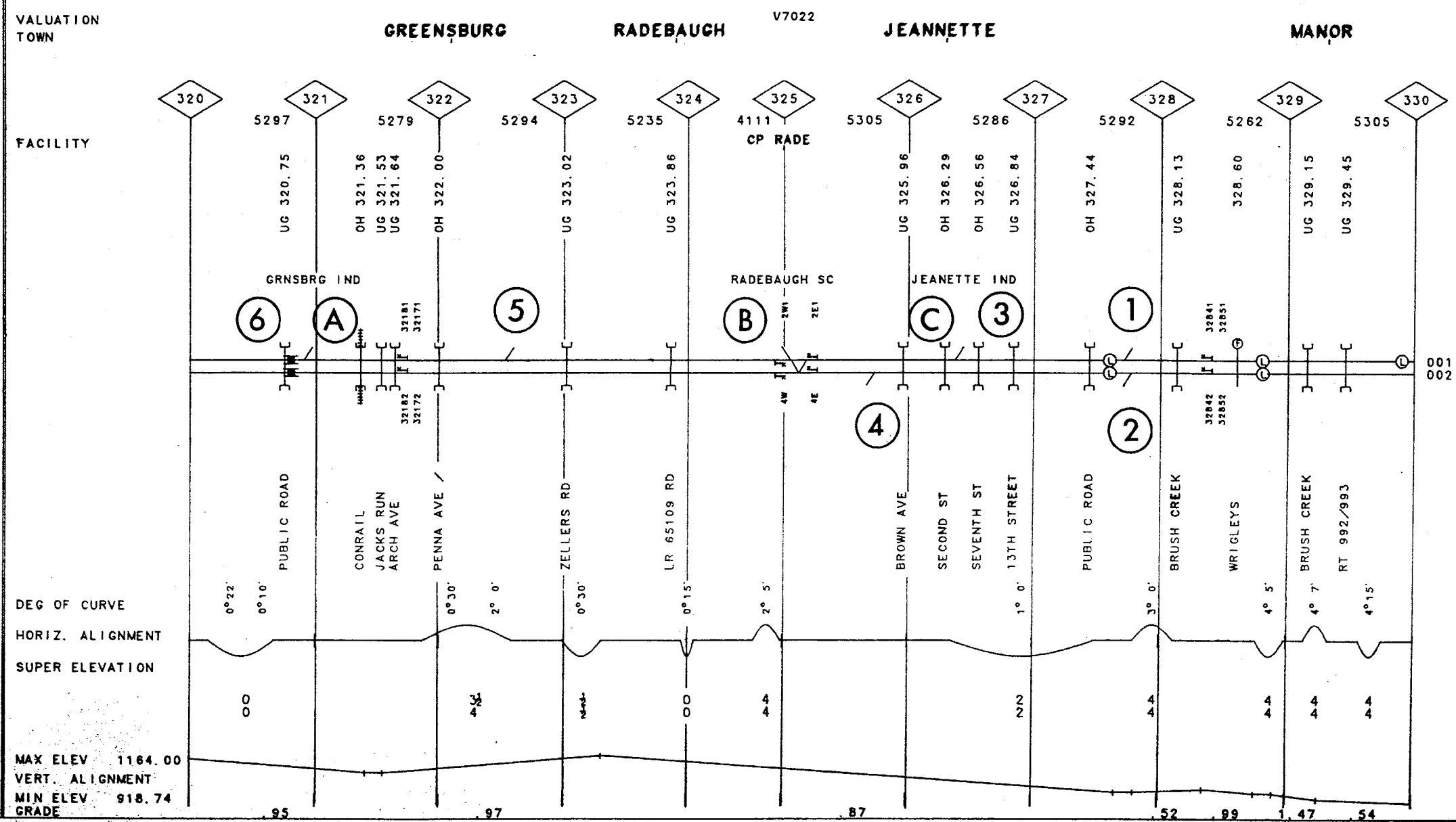
V7022

PITTSBURGH



GRINDING	82		83		83	
SURFACING	83		83		83	
TIES	83		83		83	
UNDERCUTTING	83		83		83	
RAIL	40-68		40-70		52-18	
BAL CLEAN	81		81		81	
TONNAGE (MGT)	21.3		21.3		21.3	
T T SPEED	70/60/50		60/60/50		70/50/50	
UG. CABLE	70/60/50		60/60/50		70/60/50	

GRINDING	82		83		83	
SURFACING	83		83		83	
TIES	83		83		83	
UNDERCUTTING	83		83		83	
RAIL	40-68		40-70		40-67	
BAL CLEAN	81		81		81	
TONNAGE (MGT)	21.3		21.3		21.3	
T T SPEED	70/60/50		70/50/50		70/60/50	
UG. CABLE	70/60/50		70/50/50		70/60/50	



GRINDING	
SURFACING	80E
TIES	78 76
UNDERCUTTING	
RAIL	55-50 // 31F80 // 40-49
BAL CLEAN	
TONNAGE (MGT)	
T SPEED	30
UG. CABLE	

GRINDING	63	63	63	62	62	83
SURFACING	61	78	83	62	83	83
TIES						
UNDERCUTTING						
RAIL	32-78			32-80		
BAL CLEAN	76			81		
TONNAGE (MGT)				21.3		
T SPEED				70/60/50		
UG. CABLE						

GRINDING	82	83	83	81	82	83
SURFACING	80	83	83	78	83	83
TIES						
UNDERCUTTING						
RAIL	40-75	32-78		40-83		
BAL CLEAN	81	76		81		
TONNAGE (MGT)				21.3		
T SPEED				70/60/50		
UG. CABLE						

SCS

001

002

3

MP 310.00-MP 320.00 PA

REV. 01/84

22-2202 PITTSBURGH LINE

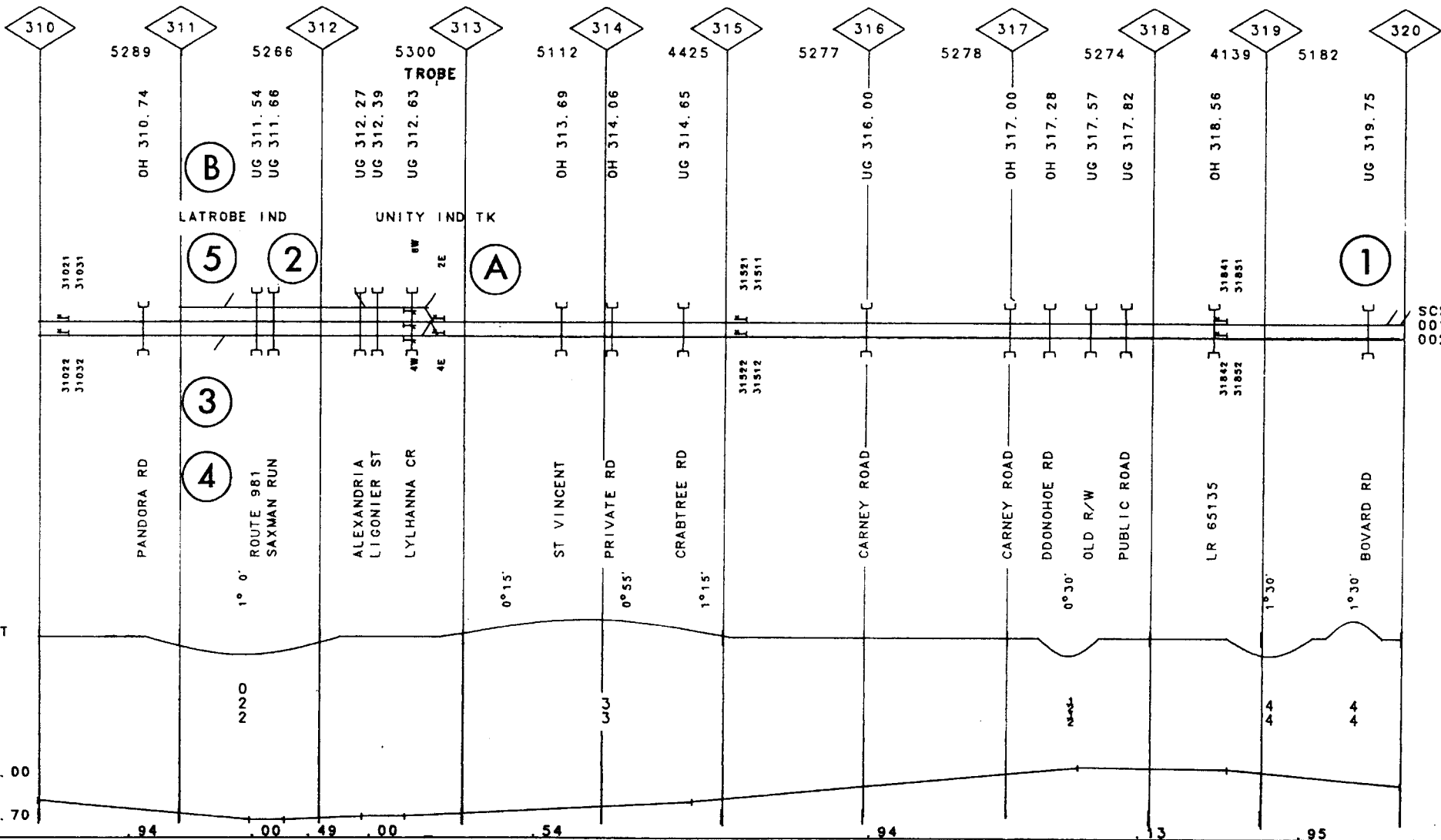
VALUATION TOWN

LATROBE

BEATTY V7022

DONOHUE

FACILITY



DEG OF CURVE
HORIZ. ALIGNMENT
SUPER ELEVATION

MAX ELEV 1213.00
VERT. ALIGNMENT
MIN ELEV 1008.70
GRADE

SCS
001
002

GRINDING									83
SURFACING									83
TIES									83
UNDERCUTTING									
RAIL	40-75								32-78
BAL CLEAN									81
TONNAGE (MGY)	50/50/50		70/60/50		70/60/50		21.3		76
T T SPEED	50/50/50		70/60/50		70/60/50		60/60/50		70/60/50
UG. CABLE									

GRINDING									83
SURFACING									82
TIES									80
UNDERCUTTING									
RAIL	40-76		40-75		31F70		40-75		
BAL CLEAN									81
TONNAGE (MGY)	50/50/50		70/60/50		70/60/50		21.3		76
T T SPEED	50/50/50		70/60/50		70/60/50		60/60/50		70/60/50
UG. CABLE									

VALUATION TOWN

HILLSIDE RIDGEVIEW V7022

DERRY

BRADENVILLE

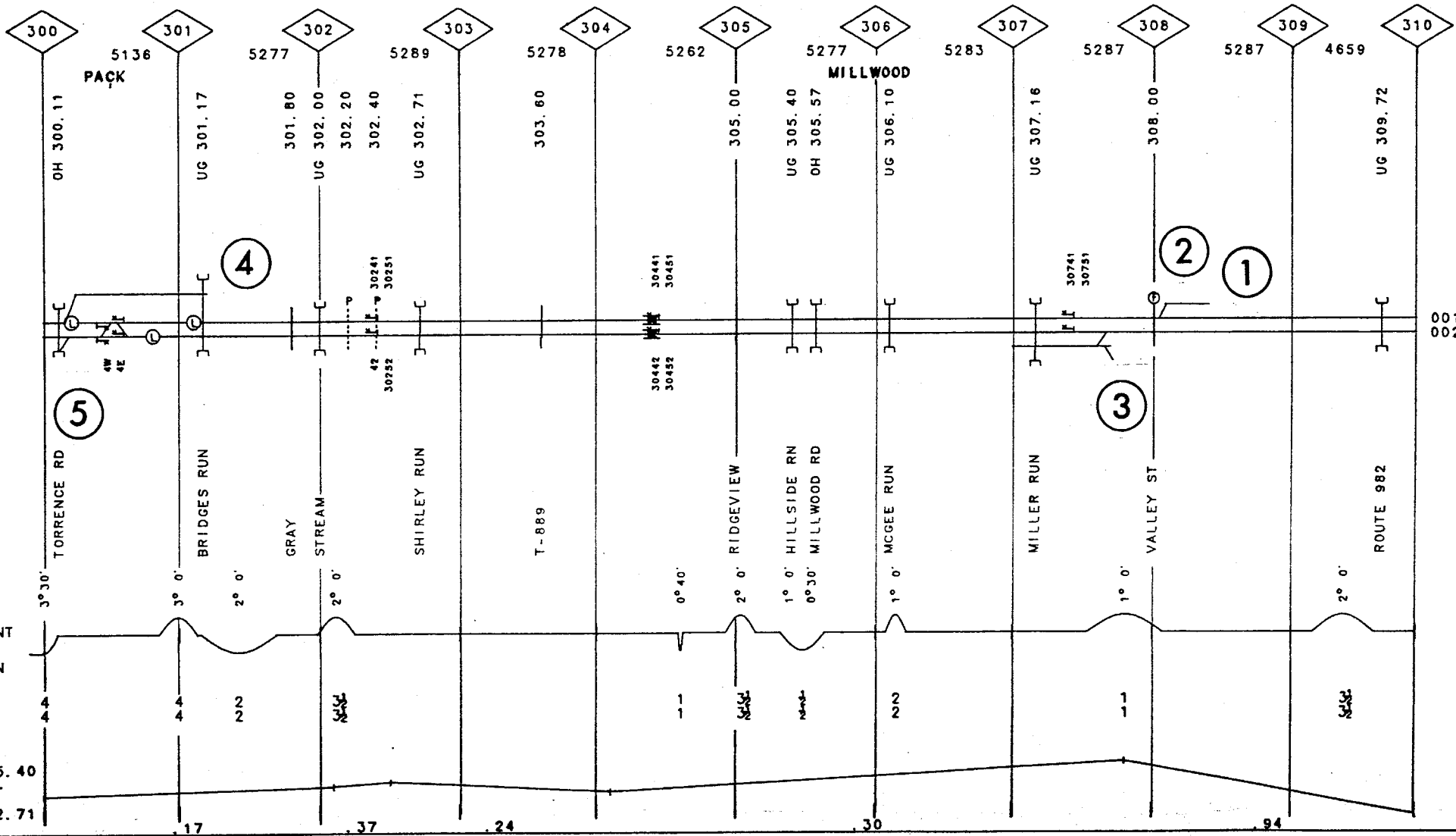
FACILITY

DEG OF CURVE

HORIZ. ALIGNMENT

SUPER ELEVATION

MAX ELEV 1185.40
 VERT. ALIGNMENT
 MIN ELEV 1082.71
 GRADE



GRINDING								
SURFACING	83				83			83
TIES	761			76				83
UNDERCUTTING								
RAIL	40-15							
BAL CLEAN								
TONNAGE (MGT)	21 3							
T T SPEED	70/60/50	60/60/50	50/50/50	60/60/50	45/45/45	70/60/50	45/45/45	50/50/50
UG. CABLE								

GRINDING								
SURFACING	83				81			82
TIES					81			
UNDERCUTTING								
RAIL	40-15							
BAL CLEAN								
TONNAGE (MGT)	21 3							
T T SPEED	70/60/50	60/60/50	50/50/50	60/60/50	45/45/45	70/60/50	45/45/45	50/50/50
UG. CABLE								

001

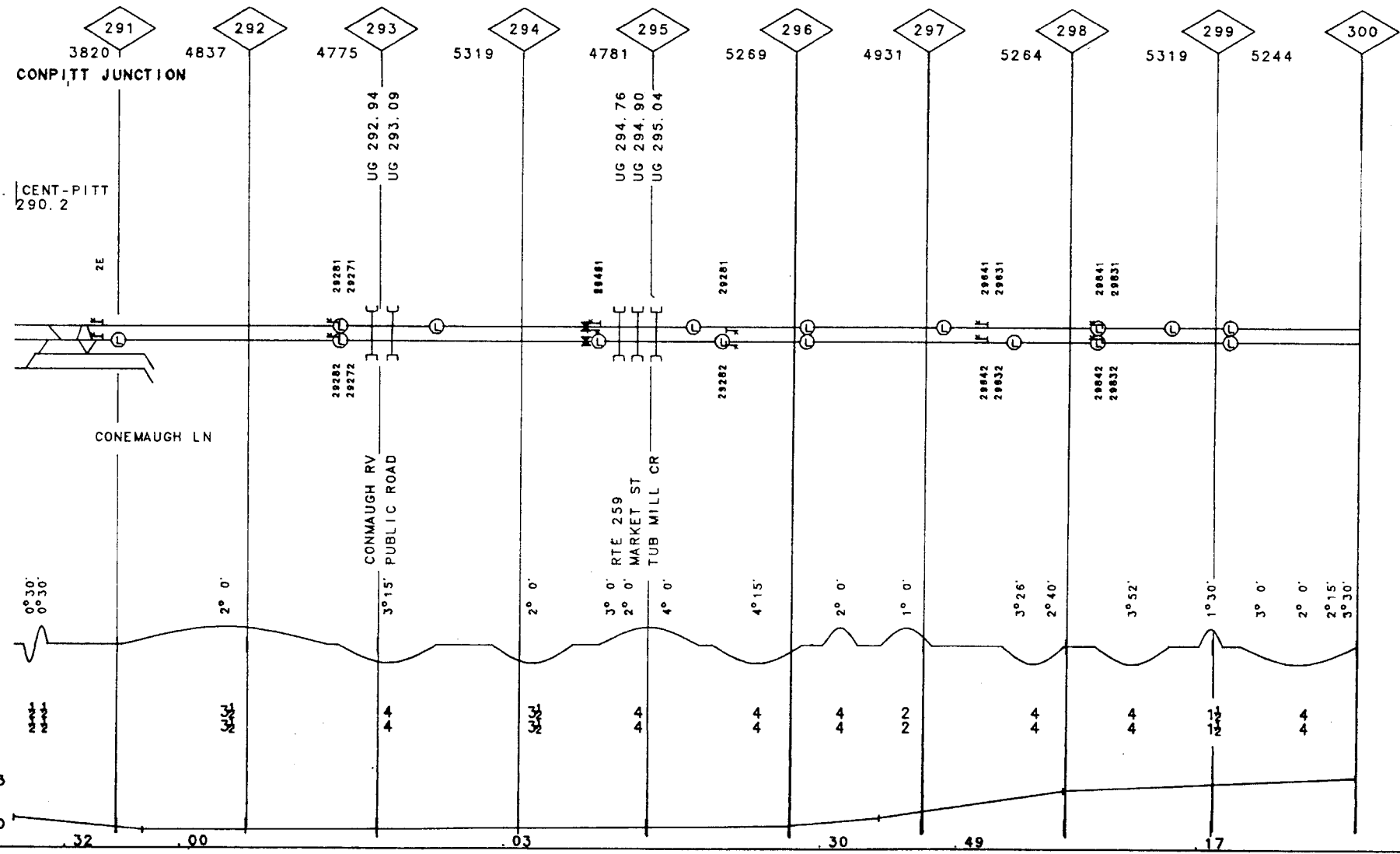
002

VALUATION
TOWN

LOCKPORT BOLIYAR V7022

TORRANCE

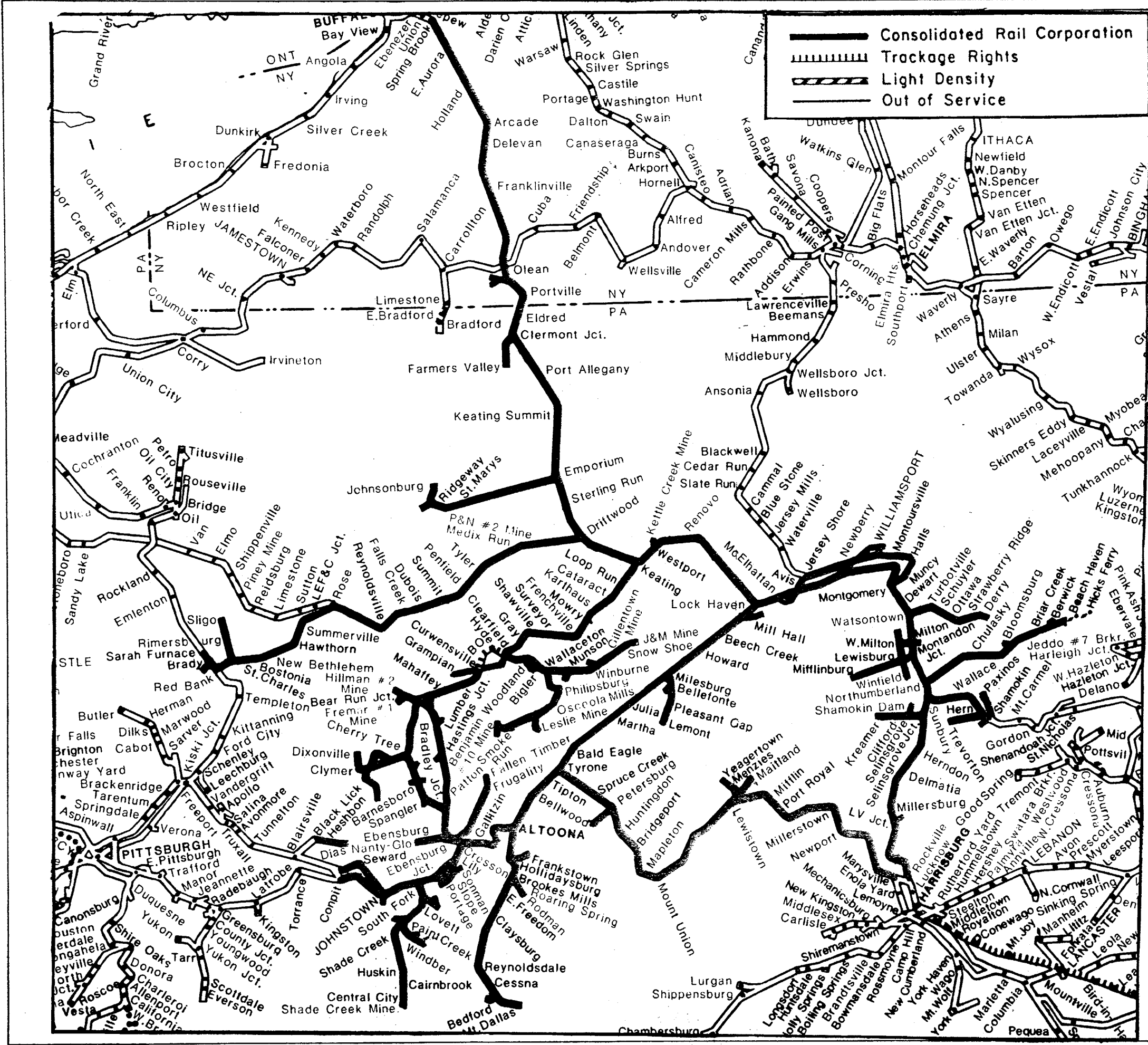
FACILITY



DEG OF CURVE
HORIZ. ALIGNMENT
SUPER ELEVATION

MAX ELEV 1121.53
VERT. ALIGNMENT
MIN ELEV 1055.00
GRADE

001
002



Consolidated Rail Corporation
Trackage Rights
Light Density
Out of Service

MAP ALLEGHENY DIVISION CENTRAL REGION 1984 CHART

GRINDING	
SURFACING	
TIES	
UNDERCUTTING	
RAIL	///
BAL CLEAN	
TONNAGE(MGT)	
T T SPEED	
UG. CABLE	

001

GRINDING	
SURFACING	
TIES	
UNDERCUTTING	
RAIL	
BAL CLEAN	
TONNAGE(MGT)	
T T SPEED	
UG. CABLE	

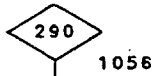
002

GRINDING	
SURFACING	
TIES	
UNDERCUTTING	
RAIL	///
BAL CLEAN	
TONNAGE(MGT)	
T T SPEED	
UG. CABLE	

003

VALUATION V7022
TOWN

FACILITY



CENT-ALL. A | CENT-PITT
290.2

001
002
003

DEG OF CURVE
HORIZ. ALIGNMENT
SUPER ELEVATION

MAX ELEV 1072.27
VERT. ALIGNMENT
MIN ELEV 1070.00
GRADE

GRINDING									
SURFACING									
TIES									
UNDERCUTTING									
RAIL	52C67	40-16				52C62			
BAL. CLEAN	82		70B			82			
TONNAGE (MGT)						35.3			
T. T. SPEED	50/50/50					70/60/50			
UG. CABLE									

001

GRINDING									
SURFACING									
TIES									
UNDERCUTTING									
RAIL	40-51								
BAL. CLEAN	35.3								
TONNAGE (MGT)									
T. T. SPEED	70/50/50								
UG. CABLE									

001

GRINDING									
SURFACING									
TIES									
UNDERCUTTING									
RAIL	40-71				52N82		40-56		40-56
BAL. CLEAN									
TONNAGE (MGT)					22.7				
T. T. SPEED	70/50/50		50/50/50				70/60/50		
UG. CABLE									

002

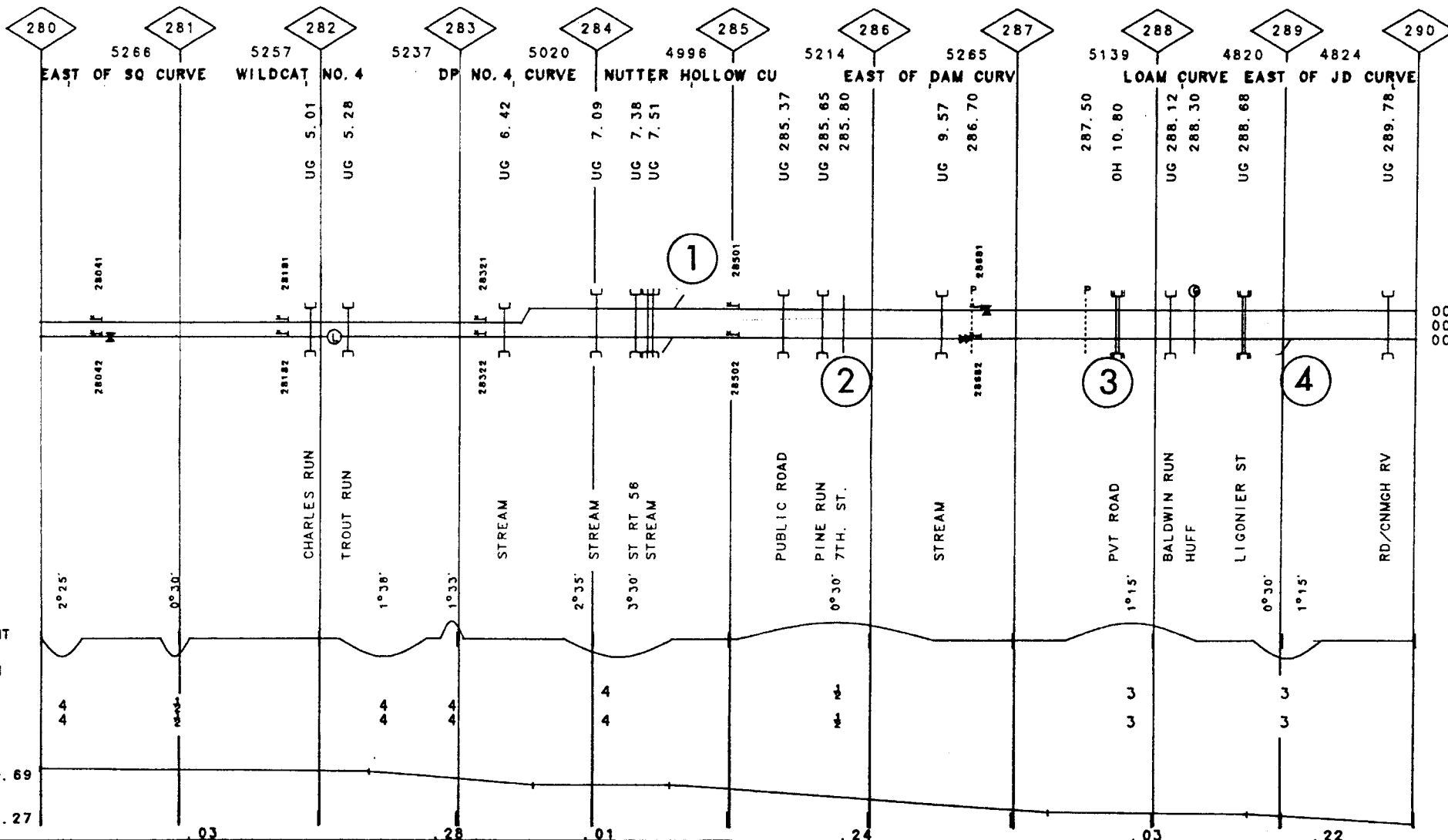
VALUATION TOWN

SQ

17022 SEWARD

NEW FLORENCE

FACILITY



001
001
002

DEG OF CURVE
HORIZ. ALIGNMENT
SUPER ELEVATION

MAX ELEV 1140.69
VERT. ALIGNMENT
MIN ELEV 1072.27
GRADE

20

MP 270.00-PA 280.00 PA

REV. 01/84

21-2102 PITTSBURGH LINE

GRINDING	00
SURFACING	
TIES	
UNDERCUTTING	
RAIL	
BAL CLEAN	
TONNAGE (MGT)	
T T SPEED	
UG. CABLE	

GRINDING	001
SURFACING	
TIES	
UNDERCUTTING	
RAIL	
BAL CLEAN	
TONNAGE (MGT)	
T T SPEED	
UG. CABLE	

GRINDING	001
SURFACING	
TIES	
UNDERCUTTING	
RAIL	
BAL CLEAN	
TONNAGE (MGT)	
T T SPEED	
UG. CABLE	

GRINDING	001
SURFACING	
TIES	
UNDERCUTTING	
RAIL	
BAL CLEAN	
TONNAGE (MGT)	
T T SPEED	
UG. CABLE	

GRINDING	
SURFACING	
TIES	
UNDERCUTTING	
RAIL	
BAL CLEAN	
TONNAGE (MGT)	
T T SPEED	
UG. CABLE	

GRINDING	
SURFACING	
TIES	
UNDERCUTTING	
RAIL	
BAL CLEAN	
TONNAGE (MGT)	
T T SPEED	
UG. CABLE	

VALUATION TOWN

CONEMAUGH

JOHNSTOWN

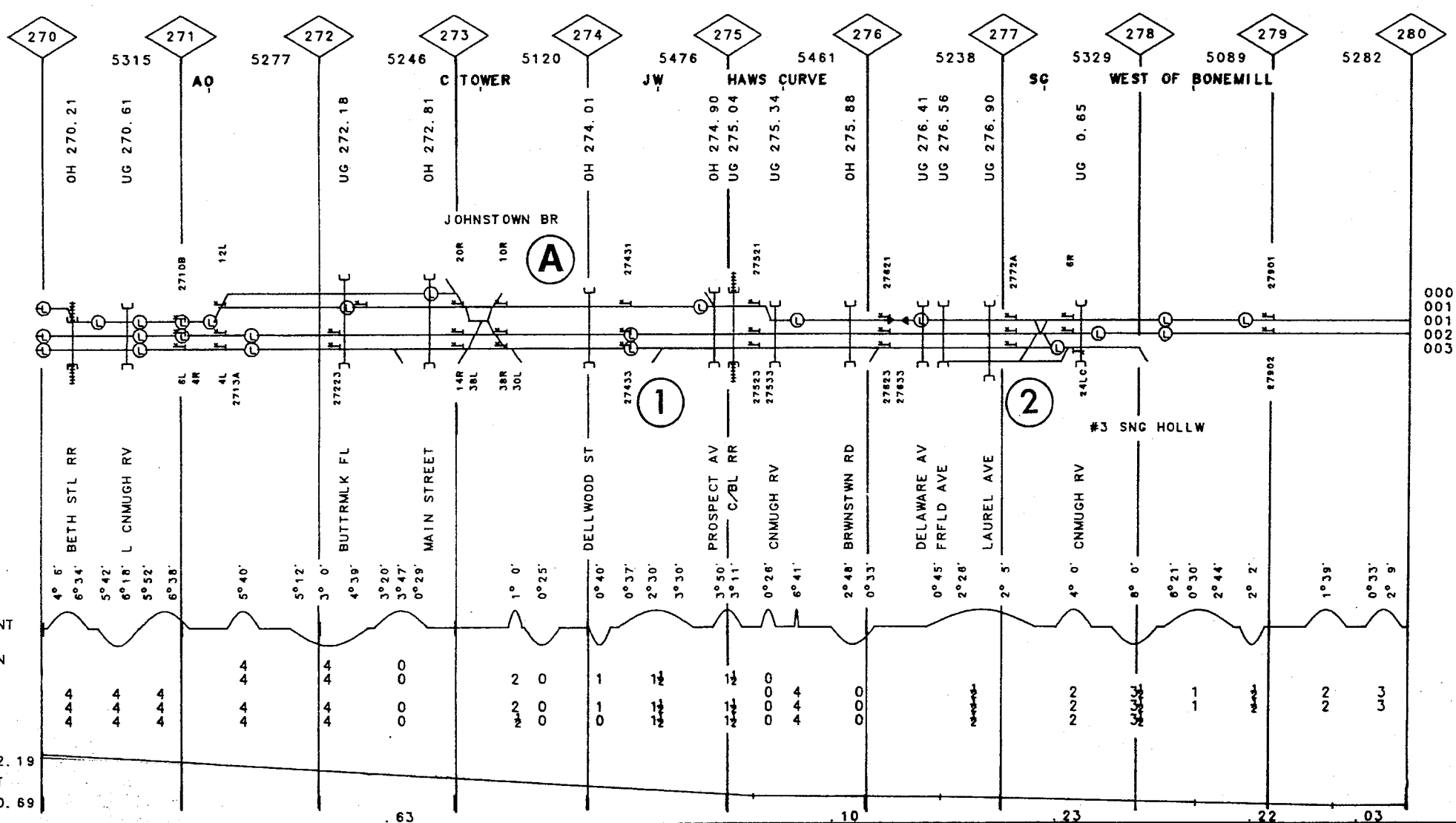
FACILITY

DEG OF CURVE

HORIZ. ALIGNMENT

SUPER ELEVATION

MAX ELEV 1352.19
 VERT. ALIGNMENT
 MIN ELEV 1140.69
 GRADE



000
001
002
003

21-2102 PITTSBURGH LINE

REV. 01/84

MP 270.00-MP 280.00 PA

20

21-2102 PITTSBURGH LINE
 REV. 01/84
 MP 220.00-MP 230.00 PA
 13

GRINDING SURFACING	82	83	83	82
TIES			78	82
UNDERCUTTING				
RAIL	40-76	40-64	52F64	52-18
BAL CLEAN	765	805	85	85
TONNAGE (MGT)	36.5	24.3	24.4	36.6
T Y SPEED	35/35/35			50/50/50
UG. CABLE				

GRINDING SURFACING	82	83	83	82
TIES			78	82
UNDERCUTTING				
RAIL	55C65	40-76		52-78
BAL CLEAN		805	81	805
TONNAGE (MGT)	19.7	24.3	24.4	19.8
T Y SPEED	35/35/35		70/50/50	60/60/50
UG. CABLE				70/50/50

GRINDING SURFACING	81	83	83	82
TIES			77	82
UNDERCUTTING				
RAIL		40-76		40-70
BAL CLEAN		175		
TONNAGE (MGT)	22.7	15		22.7
T Y SPEED	35/35/35		70/50/50	60/60/50
UG. CABLE				70/45/45

GRINDING SURFACING	79E
TIES	79
UNDERCUTTING	
RAIL	30-42C
BAL CLEAN	
TONNAGE (MGT)	15.1
T Y SPEED	30
UG. CABLE	

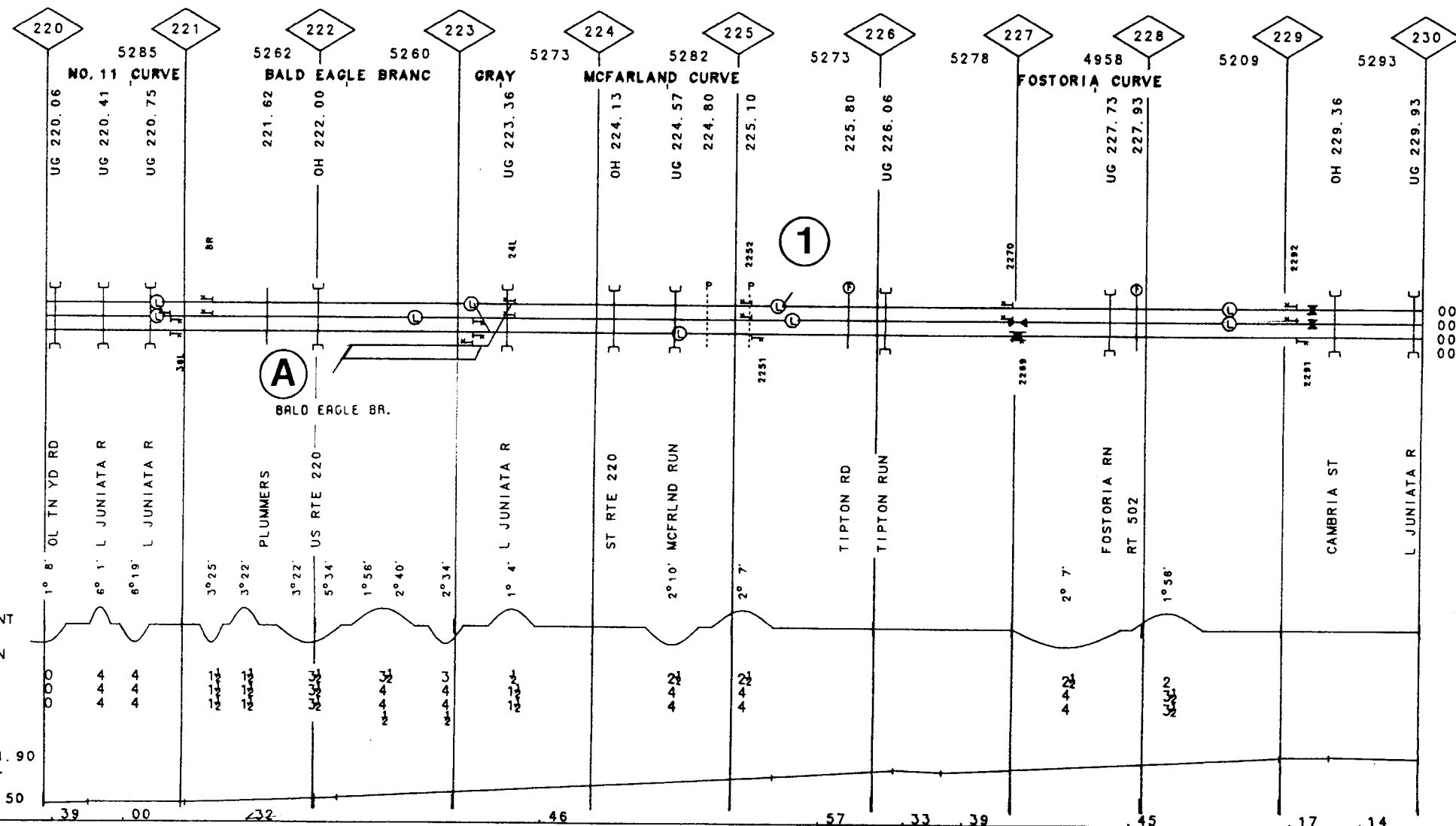
VALUATION TOWN

TYRONE

V7012 TIPTON

BELLWOOD

FACILITY



DEG OF CURVE
 HORIZ. ALIGNMENT
 SUPER ELEVATION

MAX ELEV 1061.90
 VERT. ALIGNMENT
 MIN ELEV 884.50
 GRADE

001
 002
 003
 005

21-2102 PITTSBURGH LINE
 REV. 01/84
 MP 220.00-MP 230.00 PA
 13

GRINDING									
SURFACING	82		83	82	83			82	
TIES		79						78	
UNDERCUTTING									
RAIL	40-75								
BAL CLEAN									
TONNAGE(MGT)	38.5			48.7				36.5	
T T SPEED	70/60/50			40/40/40				35/35/35	
UG. CABLE									

001

GRINDING									
SURFACING	82							82	
TIES		78						78	
UNDERCUTTING									
RAIL	32-78								
BAL CLEAN									
TONNAGE(MGT)	19.7								
T T SPEED	70/60/50								
UG. CABLE									

002

GRINDING									
SURFACING									
TIES									
UNDERCUTTING									
RAIL	32-78								
BAL CLEAN									
TONNAGE(MGT)									
T T SPEED									
UG. CABLE									

002

GRINDING									
SURFACING									
TIES									
UNDERCUTTING									
RAIL	40-69								
BAL CLEAN									
TONNAGE(MGT)	30.2								
T T SPEED	50/50/50								
UG. CABLE									

002

GRINDING									
SURFACING									
TIES									
UNDERCUTTING									
RAIL	40-62								
BAL CLEAN									
TONNAGE(MGT)	22.7								
T T SPEED	70/60/50								
UG. CABLE									

003

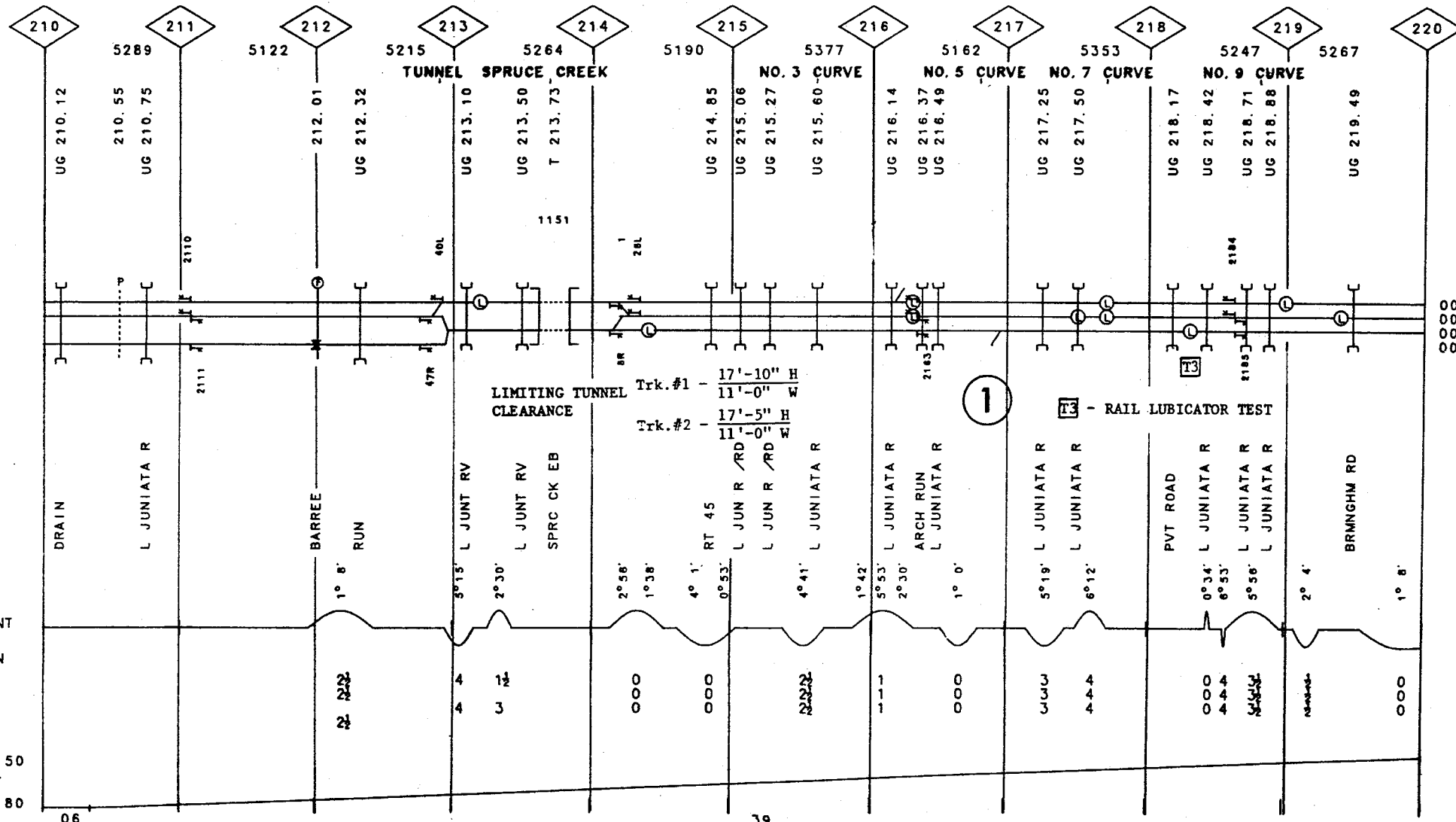
VALUATION TOWN

SPRUCE CREEK

V7012

UNION FURNACE

FACILITY



001
002
003

DEG OF CURVE
HORIZ. ALIGNMENT
SUPER ELEVATION

MAX ELEV 884.50
VERT. ALIGNMENT
MIN ELEV 689.80
GRADE

06

39

10

MP 200.00-MP 210.00 PA

REV. 01/84

21-2102 PITTSBURGH LINE

GRINDING									
SURFACING	81		83			82			83
TIES		79				78			79
UNDERCUTTING									
RAIL	40-69		55-53		40-67		40-76		40-76
BAL CLEAN									
TONNAGE(MGT)	70/60/50		55/50/50		36.5		50/50/50		55/50/50
TY SPEED	70/60/50		55/50/50		36.5		50/50/50		55/50/50
UG. CABLE	70/60/50		55/50/50		36.5		50/50/50		55/50/50

001

10

GRINDING									
SURFACING	81		83			82			83
TIES		81				78			83
UNDERCUTTING									
RAIL	40-76		52-78		52-65CV		52-78		52-78
BAL CLEAN									
TONNAGE(MGT)	70/60/50		55/50/50		19.7		50/50/50		55/50/50
TY SPEED	70/60/50		55/50/50		19.7		50/50/50		55/50/50
UG. CABLE	70/60/50		55/50/50		19.7		50/50/50		55/50/50

002

GRINDING									
SURFACING									
TIES		80				78			
UNDERCUTTING									
RAIL	40-52		55-52		40-50		40-47		
BAL CLEAN									
TONNAGE(MGT)	70/60/50		55/50/50		22.7		50/50/50		55/50/50
TY SPEED	70/60/50		55/50/50		22.7		50/50/50		55/50/50
UG. CABLE	70/60/50		55/50/50		22.7		50/50/50		55/50/50

003

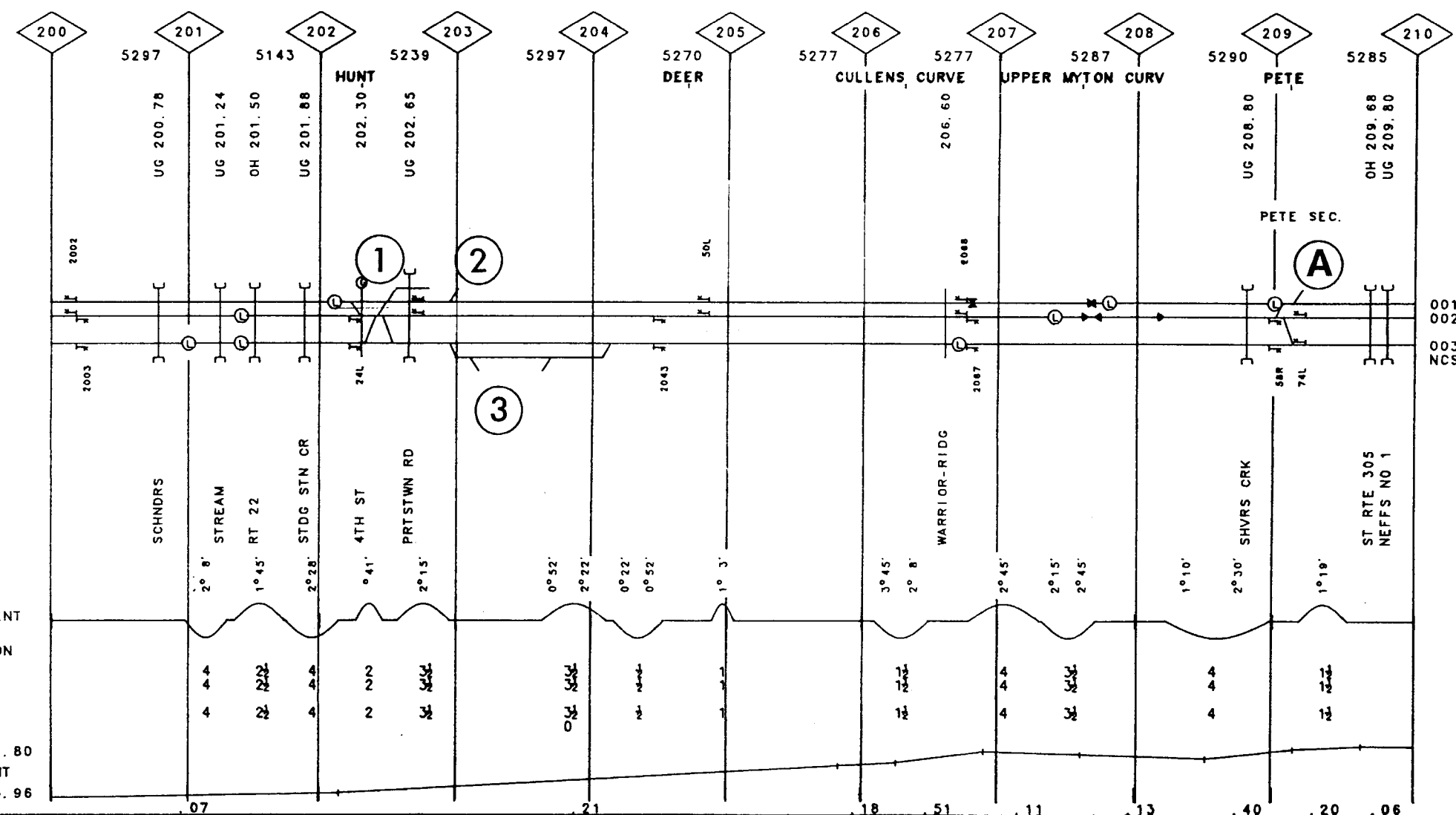
VALUATION TOWN

HUNTINGDON

~7012

PETERSBURG

FACILITY



MAX ELEV 691.80
 VERT. ALIGNMENT
 MIN ELEV 613.96
 GRADE

REV. 01/84

21-2102 PITTSBURGH LINE

MP 200.00-MP 210.00 PA

S
 MP 150.00-MP 160.00 PA
 REV. 07/84
 21-2102 PITTSBURGH LINE

GRINDING SURFACING	82										83										80E										77										82																																																	
TIES	78										78										76										77										82																																																	
UNDERCUTTING RAIL	52-79										40-69										55-50										55-49																																																											
BAL CLEAN	38.7										24.5										38.7										38.7																																																											
TONNAGE(MGT)	70/60/50										70/60/50										150/50										140/40										45/45/45										65/50/50										70/50/50										70/50/50										70/60/50									
T T SPEED	70/60/50										70/60/50										150/50										140/40										45/45/45										65/50/50										70/50/50										70/50/50										70/60/50									
UG. CABLE																																																			45/45/45																																							

GRINDING SURFACING	81										83										81										82																																																											
TIES	79										78										76										82																																																											
UNDERCUTTING RAIL	40-14										40-16										40-15																																																																					
BAL CLEAN	19.8										16.5										24.5										19.8																																																											
TONNAGE(MGT)	70/60/50										70/60/50										150/50										140/40										45/45/45										65/50/50										70/50/50										70/50/50										70/60/50									
T T SPEED	70/60/50										70/60/50										150/50										140/40										45/45/45										65/50/50										70/50/50										70/50/50										70/60/50									
UG. CABLE																																									45/45/45																																																	

GRINDING SURFACING	83										83										83										83																																																											
TIES	79										78										83										83																																																											
UNDERCUTTING RAIL	40-77										40-63										40-77																																																																					
BAL CLEAN	22.7										15.1										22.7										22.7																																																											
TONNAGE(MGT)	70/60/50										70/60/50										150/50										140/40										45/45/45										65/50/50										70/50/50										70/50/50										70/60/50									
T T SPEED	70/60/50										70/60/50										150/50										140/40										45/45/45										65/50/50										70/50/50										70/50/50										70/60/50									
UG. CABLE																																									45/45/45																																																	

GRINDING SURFACING	81										80E																													
TIES	77										77																													
UNDERCUTTING RAIL	40-77										52-45C										55F79										52-52C									
BAL CLEAN	82										82																													
TONNAGE(MGT)	30										30																													
T T SPEED	30										30																													
UG. CABLE																																								

VALUATION TOWN

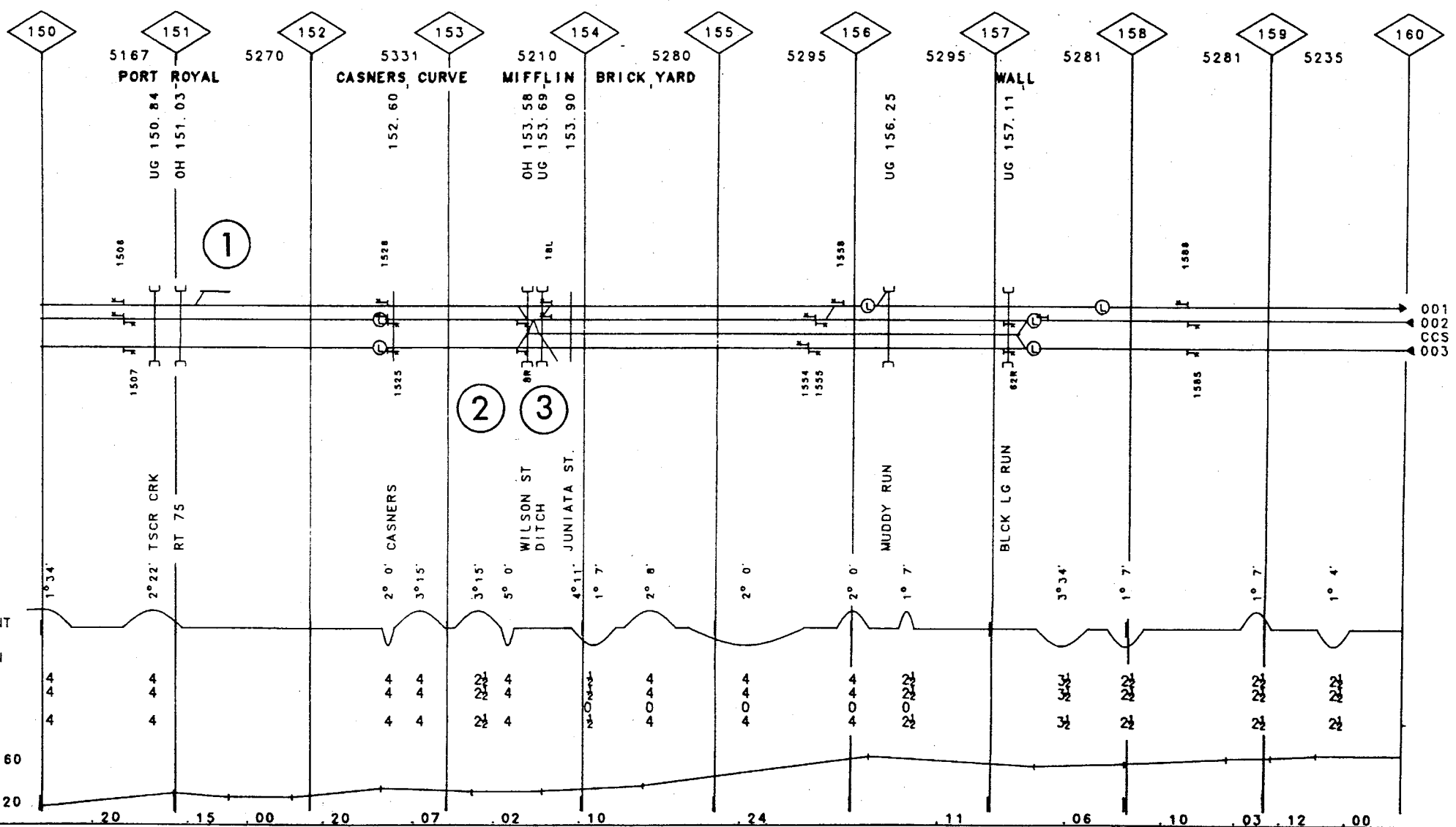
PORT ROYAL

MIFFLIN

Y7012

DENHOLM

FACILITY



DEG OF CURVE
 HORIZ. ALIGNMENT
 SUPER ELEVATION

MAX ELEV 470.60
 VERT. ALIGNMENT
 MIN ELEV 433.20
 GRADE

001
 002
 CCS
 003
 MP 150.00-MP 160.00 PA
 REV. 07/84
 21-2102 PITTSBURGH LINE

GRINDING									
SURFACING									
TIES	82		83		83		78	80E	
UNDERCUTTING									
RAIL	40-76								
BAL. CLEAN									
TONNAGE(MGT)					36.7				
T T SPEED	60/60/50		70/50/50				70/60/50	150/50	70/60/50
UG. CABLE									

GRINDING									
SURFACING									
TIES	63		63		63		82	82	
UNDERCUTTING									
RAIL	52-78								
BAL. CLEAN									
TONNAGE(MGT)					19.8				
T T SPEED	60/60/50		70/50/50				70/60/50	150/50	70/60/50
UG. CABLE									

GRINDING									
SURFACING									
TIES									
UNDERCUTTING									
RAIL	40-66								
BAL. CLEAN									
TONNAGE(MGT)					22.7				
T T SPEED	60/60/50		70/50/50				70/60/50	150/50	70/60/50
UG. CABLE									

VALUATION TOWN

NEWPORT

V7012

MILLERSTOWN

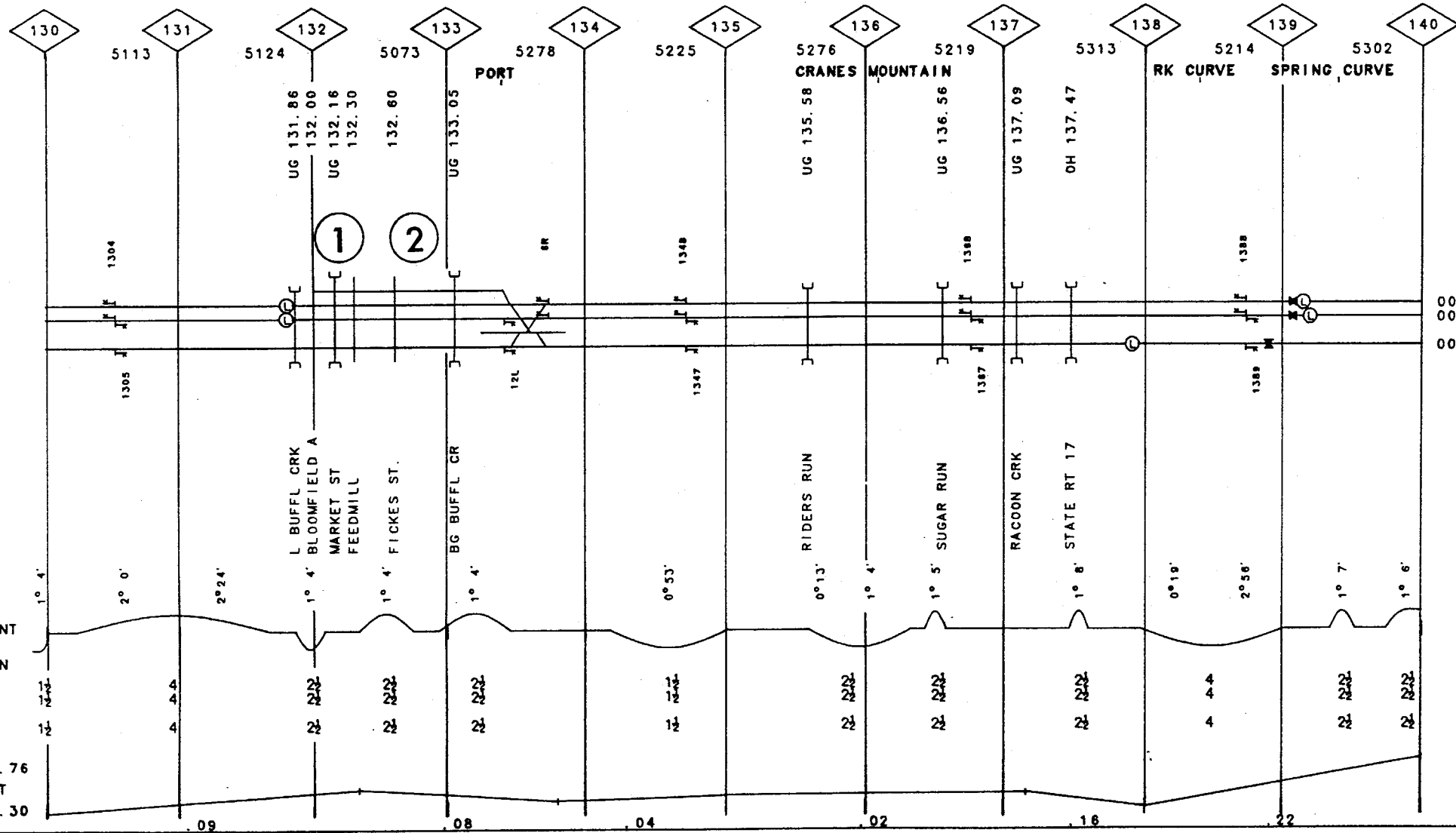
FACILITY

DEG OF CURVE

HORIZ. ALIGNMENT

SUPER ELEVATION

MAX ELEV 422.76
 VERT. ALIGNMENT
 MIN ELEV 398.30
 GRADE



2

MP 120.00-MP 130.00 PA

REV. 07/84

21-2102 PITTSBURGH LINE

GRINDING									
SURFACING	79E		80E				82		
TIES	79					80			72
UNDERCUTTING									
RAIL	32-79		40-76			32-79			40-76
BAL CLEAN									
TONNAGE(MGT)					36.7		65/60/50		60/60/50
T T SPEED									
UG. CABLE									

GRINDING									
SURFACING			82		78			81	83
TIES									
UNDERCUTTING									
RAIL	52F66			32-78			52F66		32-78
BAL CLEAN	79L		75L			79L		82	
TONNAGE(MGT)					19.8		65/60/50		60/60/50
T T SPEED									
UG. CABLE									

GRINDING									
SURFACING				83					82
TIES						80			
UNDERCUTTING									
RAIL		40-76				40-57			40-66
BAL CLEAN				79L					
TONNAGE(MGT)					22.7		65/60/50		60/60/50
T T SPEED									
UG. CABLE									

001

002

003

2

MP 120.00-MP 130.00 PA

REV. 07/84

21-2102 PITTSBURGH LINE

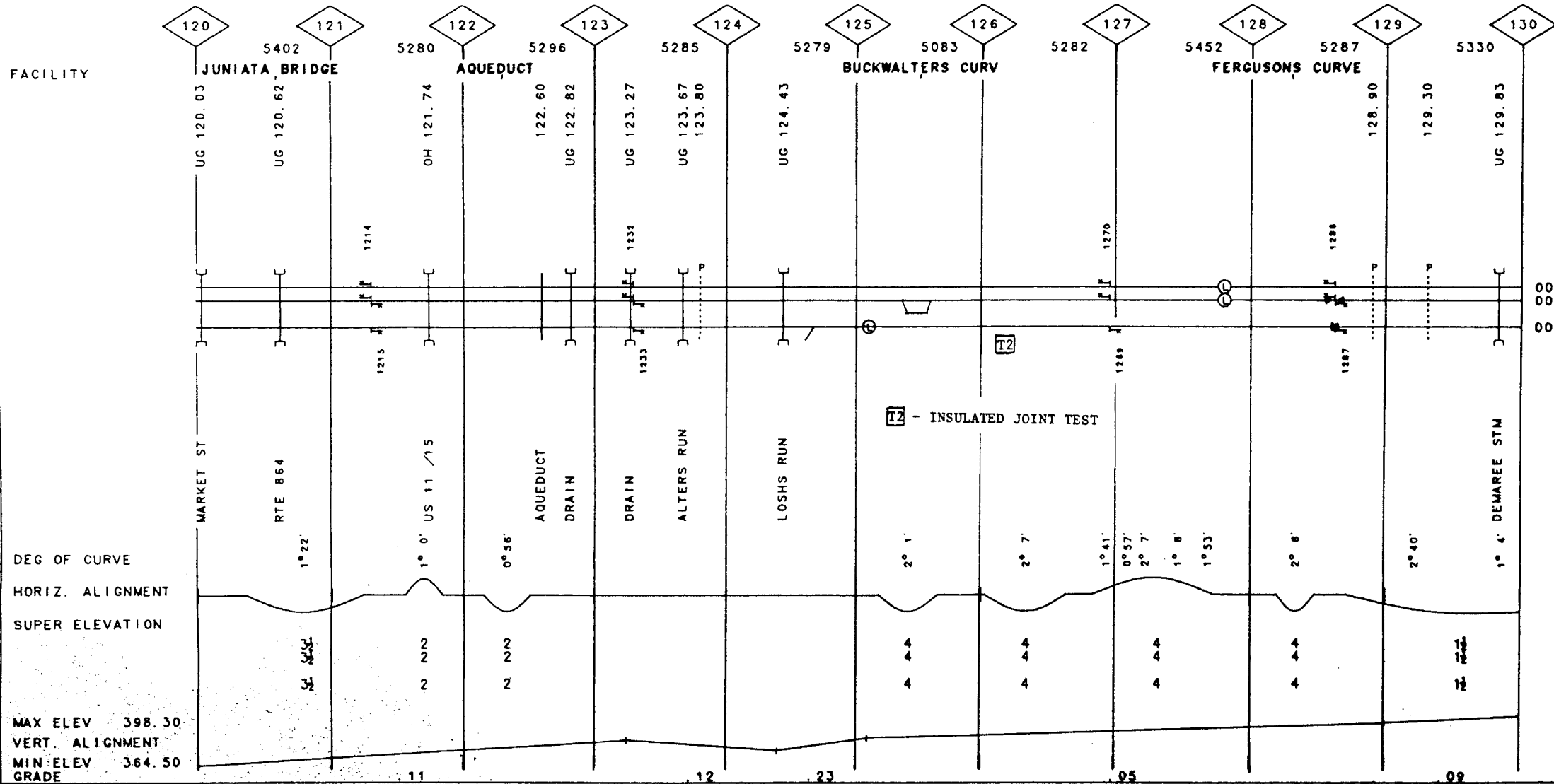
001
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VALUATION TOWN

V7012

IROQUOIS

BAILEY



MAX ELEV 398.30
VERT. ALIGNMENT
MIN ELEV 364.50
GRADE

MP 113.40-MP 120.00 PA

REV. 07/84

21-2102 PITTSBURGH LINE

GRINDING	81	83		
SURFACING				
TIES				
UNDERCUTTING				
RAIL				
BAL CLEAN				
TONNAGE(MGT)				
T T SPEED	50/50/50		35/35	65/50/50
UG. CABLE				

001

GRINDING	83			
SURFACING				
TIES				
UNDERCUTTING				
RAIL				
BAL CLEAN				
TONNAGE(MGT)				
T T SPEED	65/50/50			
UG. CABLE				

002

GRINDING				
SURFACING				
TIES				
UNDERCUTTING				
RAIL				
BAL CLEAN				
TONNAGE(MGT)				
T T SPEED	50/50/50		35/35	
UG. CABLE				

002

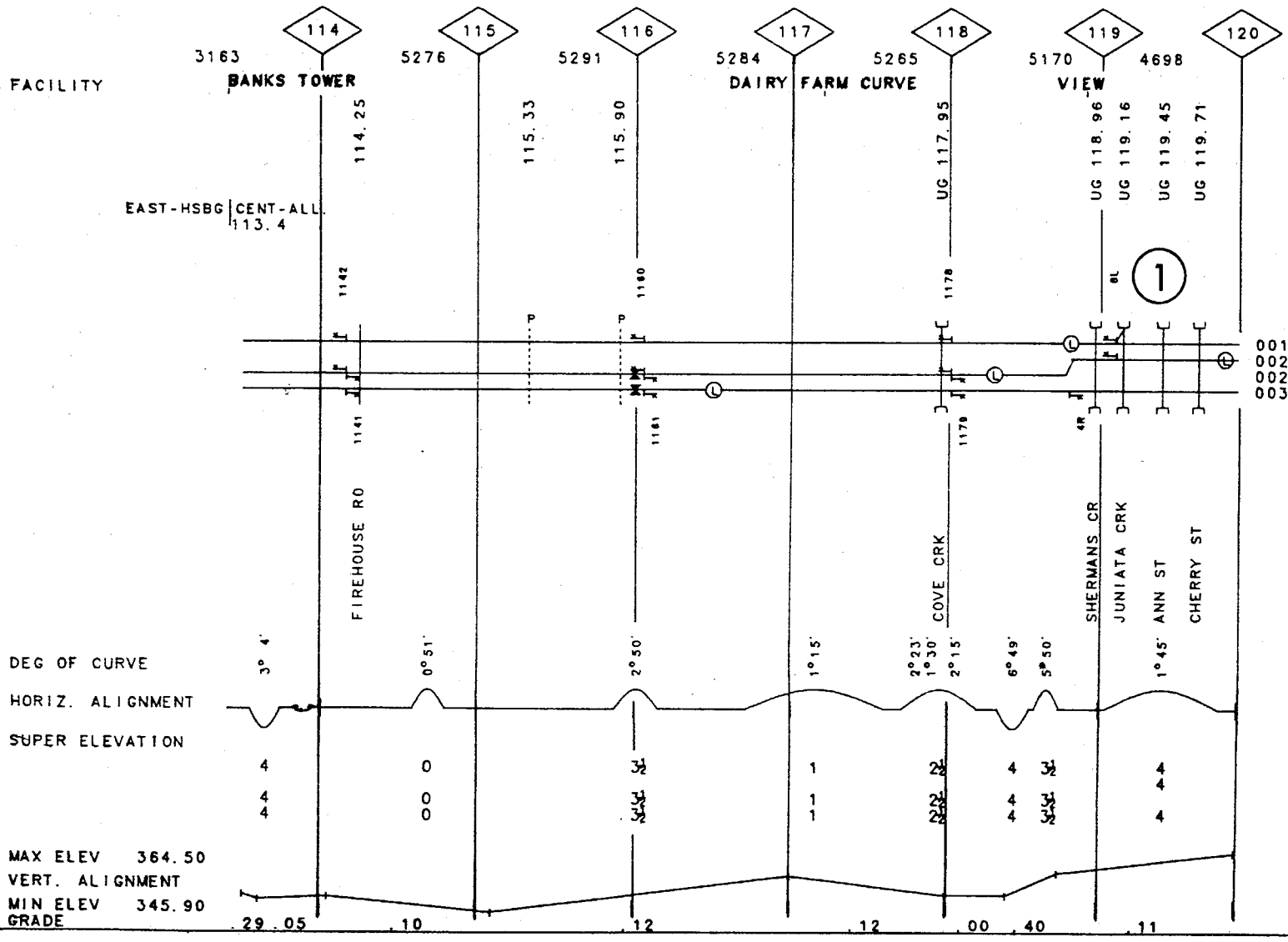
GRINDING				
SURFACING				
TIES				
UNDERCUTTING				
RAIL				
BAL CLEAN				
TONNAGE(MGT)				
T T SPEED	50/50/50		35/35	65/50/50
UG. CABLE				

003

VALUATION TOWN

V7012

DUNCANNON

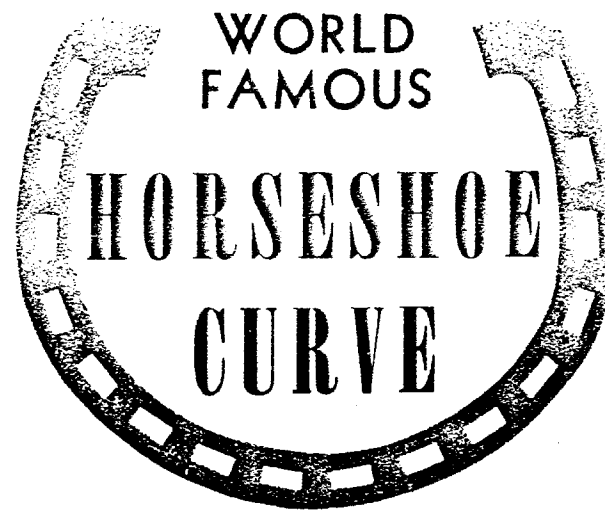


001
002
003

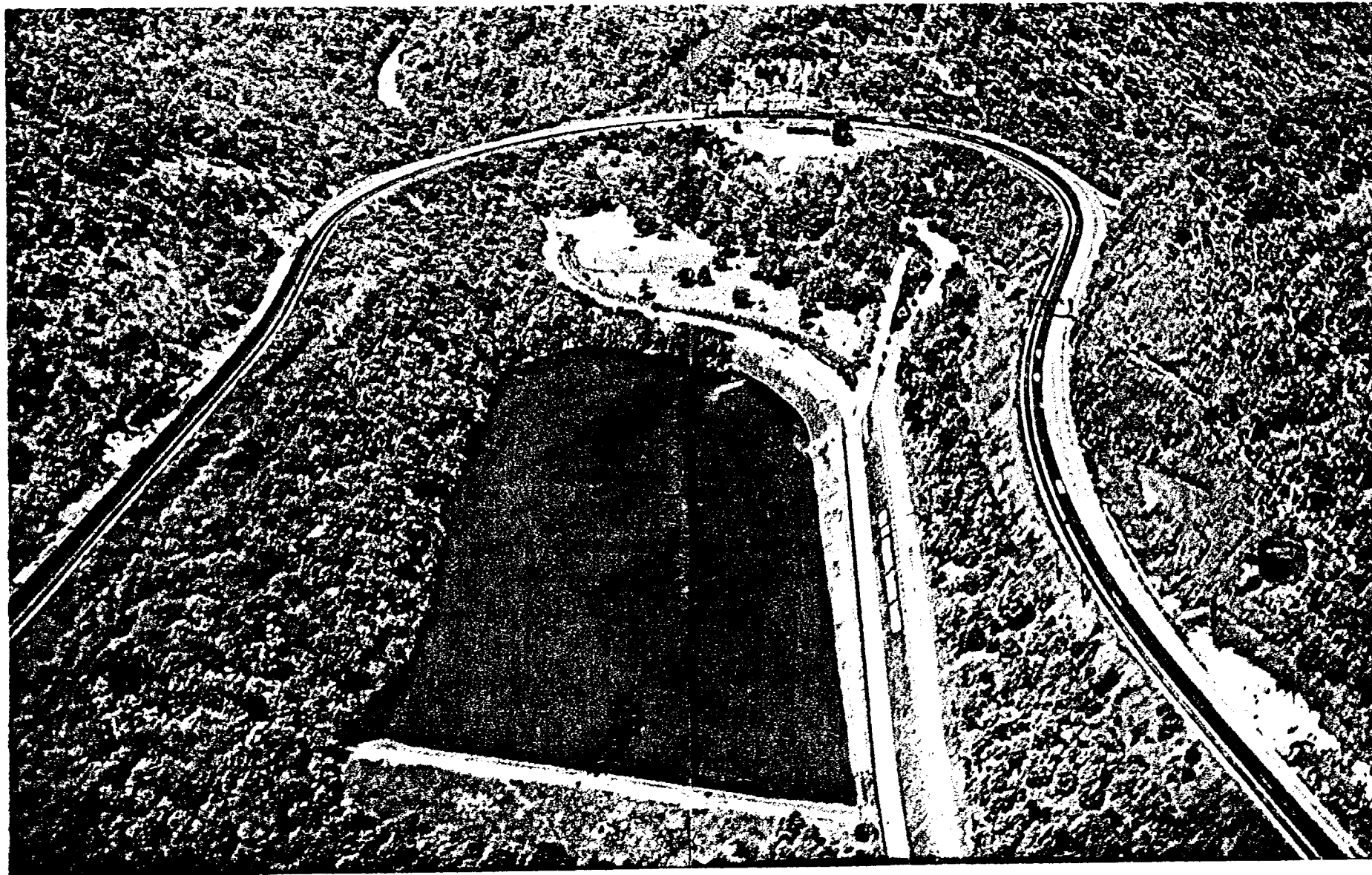
MP 113.40-MP 120.00 PA

REV. 07/84

21-2102 PITTSBURGH LINE



ALTOONA IN BLAIR CO. PA.



The World Famous Horseshoe Curve

The old ballads tell about Casey Jones who drove his engine to the Promised Land; and brave Kate Shelley who ran through a storm to flag the midnight limited before it ran onto ruined Honey Creek Bridge; and John Henry, the mighty tunnel-digger.

However, their devotion to railroading didn't exceed that of Jim Marks, and someday there may be a ballad about this PRR man who so loved the Horseshoe Curve he requested that his mortal remains be added to its fill.

Jim was a locomotive "doctor" . . . chunky and wide, with arms and hands like the driving rods on the mighty K4 locomotive, and he could fix anything. He worked in several sections of the country, but he never got over his love at first sight of the sweeping grandeur of Horseshoe Curve. His fellow employees don't recall him ever discussing it, but some remember that whenever he visited Altoona he'd go to the Curve to watch the trains go round it.

When Jim Marks died, in 1941, his will specified that his body be cremated and the ashes scattered around the Curve. Several PRR officials accompanied his widow in a business car for this sad rite, and his remains became mingled forever with the Pennsylvania Railroad's most famous landmark.

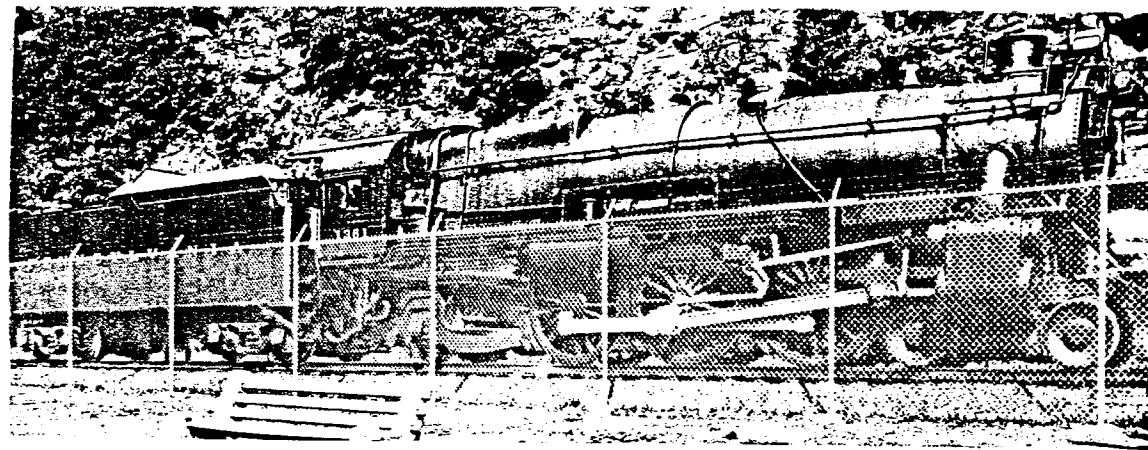
A SIGHT TO BEHOLD

The fascination of Horseshoe Curve for both railroad men and the public is an old story—more than a hundred years old. From the day the Curve was opened to traffic, February 15, 1854, people have been thrilled by the sight of trains circling this great amphitheatre high in the Alleghenies.

A railroad guide book published 1862 told the passengers that here was the "grandest view on the whole route. A vast extent of landscape is spread out before the eye . . . This horseshoe bend is one of the greatest engineering triumphs of the age."

It early became a custom for passengers to crowd to the windows as the trains rounded the Curve. Soon sightseers began getting off the

train at Kittanning Point, on the north side of the Horseshoe, for a few hours of train-watching. Others came to the spot from Altoona by an old dirt road, once an Indian trail. In 1925, the PRR built a decorative stone horseshoe, 34 feet long, in the side of the hill leading up from the Altoona municipal reservoir to the tracks. A trip to the Curve became even more popular when the Commonwealth of Pennsylvania hard-surfaced the road in 1932. Eight years later, the Railroad gave the City of Altoona a permit to use part of the land near the Curve for the accommodation of visitors. The Civilian Conservation Corps built a rest house of stone, quarried from the surrounding hills, and this became a refreshment and souvenir shop.



THE K-4 LOCOMOTIVE #1361 is on display at the "Curve" beside the main line of the Penn Central Railroad at an elevation of 1623 feet. It is a permanent monument depicting the harmonious partnership between the community and the railroad. This appropriate memorial salutes the City of Altoona where five generations of skilled workmen built a total of 6,783 steam locomotives for the PRR. Number 1361 rolled up 2,469,000 miles before it was retired. The Horseshoe Curve was designated a National Historic Landmark in 1966.

With the outbreak of World War II, the PRR closed Horseshoe Curve to the public, and, together with the Gallitzin tunnels, put it under 24-hour guard for this spot was vitally important to the defense of our nation.

DESIGNATED FOR DESTRUCTION

Dramatic proof of the wisdom of the security precautions came very soon. On the night of June 13, 1942, a Nazi submarine landed four highly-trained saboteurs at Amagansett, Long Island. Four nights later, four more were landed near Jacksonville, Florida. The eight men, all of whom had lived at some time in the United States, were caught. They had large supplies of

explosives, \$170,000 in cash, and plans for two years of sabotage. Marked for immediate demolition were 12 key industrial and transportation installations. One of them was Horseshoe Curve.

After the war, Horseshoe Curve was promptly reopened for sightseers. Since then the number of visitors has increased year by year. The operator of the refreshment-souvenir shop, estimates that last year the Horseshoe Curve had 260,000 visitors. They came from throughout Pennsylvania, all 50 States, 7 provinces of Canada, and 48 other countries of the five continents.

HOW IT ALL BEGAN

Various engineers had been dreaming for two decades on how to conquer the Alleghenies, the biggest obstacle in the Westward March of the Pennsylvania Railroad. The first attempt was the Allegheny Portage Railroad, built by the Commonwealth of Pennsylvania and opened in 1834. This was a series of steep inclines which the cars were hauled up by ropes connected to a stationary hoisting engine.

Nobody was satisfied with this slow and cumbersome method. In 1839, the Commonwealth commissioned Col. Charles L. Schlatter, an engineer, to survey a direct route without inclined planes. He produced three plans—a northern, a southern, and a middle route, but the State took no action on his proposals. However, when

J. Edgar Thomson was appointed chief engineer of the PRR in 1847, a year after the Company was founded, he re-surveyed and improved the middle route, following the valley of the Juniata River.

This provided a good, level route all the way to the foot of the Alleghenies. From here . . . what is now Altoona . . . Mr. Thomson's aides pushed out into the wilderness to find a route across the mountains that would not exceed a grade of 1.8% . . . that is, a rise of 1.8 feet in 100 feet of distance. They crossed some low ridges southwest of Altoona, then came to a lovely valley that ran westward. They followed the ridge that paralleled this valley, and found they could lay rails there with 1.75% grade.

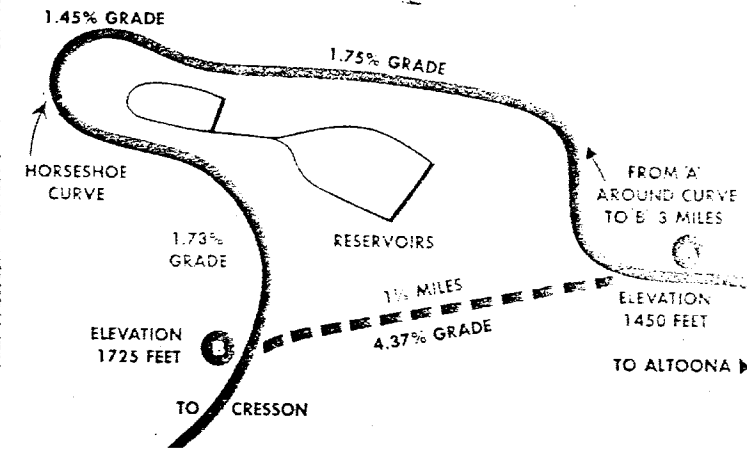
But 5½ miles from Altoona they encountered trouble. The valley ran abruptly into a mountain side and split into two deep ravines.

Slightly to the left, southwest across the valley, they saw another mountain ridge which they later found would carry their rails at a satisfactory 1.73% grade. It ran southward for a short distance and then westward again up the mountain-side to a spot near Gallitzin, where they had determined to tunnel.

But how could they get the tracks to that ridge? To go directly across the valley would have meant building a bridge with a 4.37% grade. That was far too steep for practical rail operations.

Mr. Thomson and his aides then turned back to those twin ravines and devised what might be called a detour. They would route their tracks directly westward to the first ravine . . . Kittanning Run . . . and build a huge fill to take the tracks across it. Then they would slice off the face of the mountain so the tracks would make a big semi-circle, and, moving almost due east now, they would go across the second ravine . . . Burgoon's Run . . . by means of another great fill. That would put them on the ridge they wanted to reach. The big semi-circle became, of course, Horseshoe Curve.

DIAGRAM shows why it wasn't practical to bypass Horseshoe Curve: A bridge (at the dotted line) would have been too steep a grade.



This suggests the answer to a question that has been asked by thousands of passengers on trains visitors at the Curve, and rail fans. Why didn't the PRR cut directly across the valley and bypass Horseshoe Curve? In establishing the "round-about-way" . . . an additional 1-4/5 miles . . . they "stretched out" a steep grade until it became sufficiently flat for practical operation.

On the grade as it is now, a freight train with the usual 3-unit Diesel haulers and 3-unit pushers used can go up the slope with 5,400 tons . . . or 125 cars, figuring 43 tons as an average for the typical mixed train of loads and empties. If the train had to operate across the valley on a 4.37% grade, the maximum load could be only 43 cars.

THE CURVE OF CURVES

Horseshoe Curve has won and kept the admiration of the entire engineering world for the ingenuity of its conception, for the skillful designing of its details, and for the engineers' courage in undertaking such a huge construction task before the day of the bulldozer and the steamshovel. It was built entirely by men with picks, shovels, horses, and drags.

The Horseshoe Curve has become a scenic wonder and should be on everyone's list of historic and wondrous sites to see in Pennsylvania.

CENTRAL REGION
 TRAIN HANDLING METHODS
MOUNTAIN TERRITORY

EAST SLOPE

AR (MP 248 to Altoona (MP 236) - 12 miles

Maximum grade - No. 1 track - 2.36%

No. 2 track - 1.73%

No. 3 track - 1.73%

Maximum curvature - 9°25" (MP 242)

TRACK SPEED

<u>Track Number</u>	<u>Between</u>	<u>MPH</u>	<u>Minimum Running Time</u>
1 - 2 - 3	AR to Bridge 241.6	30	
	Bridge 241.6 to Slope	35	21 minutes

FREIGHT TRAIN SPEED - EASTWARD DESCENDING

100 Ton or less per operative brake

1 - 2 - 3	AR to SF	12	
	SF to MG	20	
	MG to Slope	23	32 minutes

Over 100 Ton per operative brake

1 - 2 - 3	AR to SF	8	
	SF to Slope	15	47 minutes

HORSEPOWER PER TON

Westbound ascending

2.3 HP/T - Drag tonnage

2.9 HP/T - TV and 60 MPH scheduled trains

MAXIMUM PERMISSIBLE TRACTION MOTORS

Eastbound/Westbound

Hauling - 24

Pushing - 12

Pushing Mineral - 24

Dynamic Brake

Front - 24

Rear - 24

A. EASTBOUND DESCENDING

1. Balancing grade method of braking used when we have 800 tons per traction motor dynamic brake valve, operative pressure maintaining feature, as described in Item B-1.
2. Trains non-equipped or with an inoperative dynamic brake and/or Pressure Maintaining feature must have retaining valves set in high pressure position on 50% of cars in train starting at front of train and cycle braking method of braking will be used between AR - UN and Slope

WEST SLOPE

C (MP 273) to (MP 251) - 22 miles

Maximum grade - No. 1 - 2 - 3 track - 1.20%

Maximum curvature - 7°19" (MP 267)

MO (MP 251) to AR (MP 248) - 3 miles

Maximum grade - No. 1 - 2 tracks - 1.44%

No. 3 - 4 tracks - 1.00%

Maximum curvature - 5°05" (MP 249.5 - No. 3 and No. 4 tracks)

TRACK SPEED

<u>Track Number</u>	<u>Between</u>	<u>MPH</u>
1 - 2 - 3	C (MP 273.2) to AO (MP 271.2)	40
1 - 2 - 3	AO (MP 271.2) to SO (MP 266.1)	35
1	SO (MP 266.1) to	45/45
2	MO (MP 251.0)	70/50
3		60/50
1	MO (MP 251.0) to	45/45
2	AR (MP 248.0)	60/45
3 - 4		35/35

HORSEPOWER PER TON

Eastbound ascending

2.0 HP/T - Drag tonnage

2.9 HP/T - TV and 60 MPH scheduled trains

MAXIMUM PERMISSIBLE TRACTION MOTORS

Eastbound/Westbound

Hauling - 24
Pushing - 12
Pushing Mineral - 24

Dynamic Brake

Front - 24
Rear - 24

- B. 1. Freight trains with helper on rear are required to utilize dynamic brake on both hauler and rear helper on descending grades east from AR - UN (MP 248) to Altoona (MP 236) 12 miles, and west from AR - UN (MP 248) to C (MP 273.2) 25 miles.

As descent is started, dynamic is used on front to bunch slack and stabilize speed until rear helper nears or starts descent where rear helper then starts in dynamic braking.

As speed on descent necessitates, automatic brake is used with minimum service reduction, and speed of train is then regulated by hauler engineer with manipulation of dynamic brake.

Additional light application of automatic brake may be used to maintain a constant speed, if necessary. Total automatic brake reduction of 8 to 12 lbs. with dynamic brake being used on front and rear will handle most eastbound freight trains.

Radio communication between hauler and helper engineers are required, when possible, to coordinate good train handling.

2. In the absence of or failure of dynamic brake and/or pressure maintaining feature, or insufficient dynamic brake (800 tons per traction motor required), Timetable Special Instructions will govern on East Slope.

(a) Retaining valves must be set in HIGH pressure position on 50% of cars in train beginning at front of train and cycle braking method of train handling will be used.

C. A speed monitoring safety device is installed on No. 1 track between MP 247 and MP 246, built into the track circuitry in conjunction with Signal System (Cab Signals and Wayside).

Warning HORNS are installed at intervals between MP 247 and Benny Interlocking.

An Esterline Tape Recorder located in AR Tower records the speed of trains over this portion of track.

Detailed instructions are printed in current Timetable, Special Instruction 1156-A10.

D. Engineer qualifications for handling eastward freight trains of various consists between UN - AR and Altoona are determined by Road Foremen riding and instructing each individual engineer until it is determined that he meets the qualification requirements.

#

HORSESHOE CURVE
ALLEGHENY DIVISION

Length	2,375 feet
Degree of curvature	9°15'
Central Angle	200°
Elevation	1,594' above Sea Level
Ruling Grade	East Slope - 2.1% West Slope - 1.59%
Maximum Curvature	East Slope - 9°25' West Slope - 7°19'
H.P. Per Ton Ratio	Eastbound - 1.6 Westbound - 2.3

HELPERS

20 Pool Crews Assigned (Home Terminal Altoona)
16 Units Assigned (6 axle 3600 H.P. SD 40/45)

	<u>EAST</u>	<u>WEST</u>	<u>TOTAL</u>
Trains	22.7	22.5	45.2
Assists	14.0	15.5	26.5
Percent	62%	69%	66%