ALLEGHENY PORTAGE RAILROAD

NATIONAL HISTORIC SITE / PENNSYLVANIA
HISTORIC RESOURCE STUDY

ALLEGHENY PORTAGE RAILROAD NATIONAL HISTORIC SITE

PENNSYLVANIA

Prepared by
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ABSTRACT

The Allegheny Portage Railroad (1834-1855) furnished an important link in the development of transportation in America, and a major route in the migration west to the Mississippi Valley. The planning, surveys, construction, operation, maintenance, and ultimate replacement of the whole length of the railroad have been documented in this report. The railroad, with its ten inclined planes, ran for 26 miles, and operated for over twenty years; consequently, numerous structures were erected by the Commonwealth as well as by private interests to serve the needs of the railroad and to take advantage of this route of transportation. While some contemporary maps and documentation illuminate the type and location of buildings along the route, the information available for the historical base map did not permit a pinpointing of the location of every structure mentioned or alluded to in this report. Nevertheless, the major themes, the general location of principal structures, and the extent of growth along the road do take shape to provide the interpretation of the three planes under National Park Service ownership: Planes 6, 8, and 10.
## FOOTNOTE ABBREVIATIONS

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<th>Abbreviation</th>
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<tr>
<td>A.P.R.R.</td>
<td>Allegheny Portage Rail Road</td>
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<td>BCC</td>
<td>Board of Canal Commissioners</td>
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<tr>
<td>Coll. &amp; Supr. Rep.</td>
<td>Collectors and Supervisors Reports</td>
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<td>Div. Rec.</td>
<td>Divisional Records</td>
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<tr>
<td>J of BCC or CCJ</td>
<td>Journal of the Board of Canal Commissioners, or Canal Commissioners' Journal</td>
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<td>MB &amp; I</td>
<td>Minute Books and Indexes</td>
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<td>PHJ</td>
<td>Pennsylvania House Journal</td>
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<td>PSJ</td>
<td>Pennsylvania Senate Journal</td>
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INTRODUCTION

The history of and contribution made by the Allegheny Portage Railroad between Hollidaysburg and Johnstown, Pennsylvania, over the Allegheny Mountains, had nearly been forgotten when, in August 1964, Congress passed a bill designating the railroad a National Historic Site. In that year, the National Park Service authorized a six-month study by Historian Earl P. Heydinger of Hopewell Village to gather as much historical information as possible on the Allegheny Portage Railroad. Mr. Heydinger's research notes filled three 5 x 8 index boxes, and provided this writer with helpful sources, as well as information which would have been absent from this report on account of the limited time allowed for research.

The vast amount of material included in this report was found in the Pennsylvania State Archives and Library in Harrisburg, Pennsylvania. At the Archives, Archivist Martha Simonetti contributed many hours of her time, and invaluable assistance with the Land Records concerning the Allegheny Portage Railroad. Her enthusiasm, cooperation, and knowledge greatly facilitated the research through a voluminous collection of material, and I am very greateful and indebted to her for this support.

For the research among the published government reports at the State Librarv it was not necessary to request personal assistance, but for the xeroxing and photostating of a majority of annual reports and tables, I received considerable cooperation and assistance from the staff, for which I would like to extend my appreciation.

During nearly a year of intermittent research and writing on two projects for the Allegheny Portage Railroad, Ron Wilson, historian at the park, provided me with repeated assistance in gathering sources, photographs, and maps used in this report. In addition, he guided me along most of the trace of the road from Hollidaysburg to Johnstown. I would like to express my special appreciation for his dependable aid throughout the year.

Many other individuals in the National Park Service offered their assistance, advice, and time in the writing of this report. I would like especially to thank Dorothy Junkin in Park History, OAHP, Washington Office, for answering my requests for material in the History Library; Historian Ross Holland for his advice and comments, in particular on the photographs and maps; Barry Macintosh of Park History, OAHP, Washington Office, for wading through this report with a fine editorial eye; and, Linda Wedel, for typing the report, as considerable perseverance was needed to decipher some of the xeroxed materials handwritten from the 19th Century.
A few comments deserve to be made here about the contents of this report. Efforts to uncover original drawings, sketches, or specifications for the structures along the road in the Land Records of the Pennsylvania Archives did not prove as productive as hoped. Only one set of specifications were found, and no other evidence to provide accurate descriptions of the railroad buildings could be located. A few period photographs and sketches, however, do give an impression of the engine houses and sheds. The paucity of iconographic information on the railroad buildings, however, would make reconstruction at Planes 6, 8, and 10, the areas owned by the National Park Service, a conjectural matter. Nonetheless, archeological remains of the buildings and road do provide a visual interpretive aid, and efforts being made at the park to promote a working reconstruction at Plane 6 have some merit, considering the only existing period photograph of the railroad shows Engine House 6, and, one of the best examples of railroad superstructure, the Skew Arch bridge, still stands mid-way down the plane.
CHAPTER I
EXPERIMENT IN TRANSPORTATION, 1831-52

Preliminary Plans and Surveys, 1824-30

Adventure and opportunity awaited the easterner of the early 19th century at his decision to head west to the frontier lands. The migration westward, however, was hampered by poor roads and facilities to accommodate travelers. In 1817 New York State set out to improve its transportation system by building the Erie Canal, which, at its completion in 1825, threatened to drain away revenue from the bordering states. Sensitive to the imminent competition, the Commonwealth of Pennsylvania hastened in 1824 to establish its own Board of Canal Commissioners, and to plan a canal system across the state of Pennsylvania from Philadelphia to Pittsburgh, a distance of 394 miles. By March of the first year of organization, the Board had already authorized surveys for the Pennsylvania Main Line, or Public Works.¹

Pennsylvania, however, faced a natural barrier not present in New York: the Allegheny Mountains which divided the rolling, green Commonwealth into east and west. Most of the forested mountains measured over a half mile high, and their eastern slopes presented a steep and formidable obstacle, even for the wagoners who were traveling west by the Northern Turnpike. Despite the obvious problems which such a mountain range created for the canal engineers, only one member of the 3-man Board realized the full implications of the geography. While two Commissioners concluded that the canal could easily be carried over the mountain with the construction of a tunnel near the summit, Charles Treziyulney argued that:

¹ William Bender Wilson, "The Evolution, Decadence, and Abandonment of the Allegheny Portage Railroad," Annual Report of the Secretary of Internal Affairs of the Commonwealth of Pennsylvania, 1898-99, Part IV: Railroad, Canal, Navigation, Telegraph and Telephone Companies ([Harrisburg] 1900), xlii. As early as 1816 Walter B. Hudson and Jno. Morrison executed a map of Cambria County, PA, which indicated that the state already was contemplating a canal system. They noted that,"Canal tracts have not (we believe) been sufficiently examined in this country. We should not despair of connecting the waters of Conemaugh and Juniata rivers." A copy of this map can be found in the illustrations, and in Henry Wilson Storey, History of Cambria County, Pennsylvania, 1, (New York and Chicago, 1907), 37.
In short, the whole country, from the upper forks of the Juniata to the forks of the South Branch of the Conemaugh, is mountainous; mountain rising after mountain in quick succession. The main one where the proposed tunnel is to pass is hemmed in and surrounded by narrow ravines and presenting no favorable situation for canaling, either by lockage or tunneling. Here nature has refused to make her usual kind advances to aid the exertions of man; mountains thrown together as if to defy human ingenuity, and baffle the skill of the engineer.2

Despite Treziyulney's wise prediction, surveys for and debates about the best canal route over the mountain continued until 1826, when the Board received its first surveyor's recommendation that a portage be contemplated "by a rail road of five inclined planes separated by short levels." The same year the Board sent out Canvass White Esq. to make the first survey for a suitable overland passage.3

Restricted by time, White and his team of engineers were only able to provide general information on a location for a portage railway, giving the distance and elevation over the mountain. In addition, White made the suggestion that a good turnpike road might be adequate as a portage until the transportation demand required a railroad, a suggestion which, although undermining to the railroad on the short run, clearly assumed the superiority of a railroad to serve the needs of mass transportation.4

Two years elapsed before another portage survey was authorized; in the meantime, the Canal Commissioners busied themselves with the affairs of constructing the Main Line east from Philadelphia and west from Johnstown. For the first ninety miles from Philadelphia to Columbia the Board decided on a horse-drawn railroad instead of a canal. The Board's plan was for the canal boats to be drawn out of Philadelphia on train cars, then pulled by a stationary steam engine up a 2,805 foot hill on an inclined plane, and, finally, pulled by horsepower again to Columbia, where they were to be transferred to

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2. All three commissioners, Jacob Holgate, James Clark, and Treziyulney, submitted their reports in February 1825. As quoted in Wilson, p.xliii. See also illustrations for the 1824 survey map.


the canal basin. The boats then were to travel via canal the 172 miles west to Hollidaysburg. At Johnstown, after having been portaged over the mountains, the boats were to proceed again by canal to Pittsburgh.

The canal itself was to be four feet deep, forty feet wide at the top, and twenty-eight feet wide at the bottom, and was to have 108 locks, one almost every mile and a half. Such an ambitious program of construction delayed the final surveys and directives for the most difficult section of the Main Line, the stretch over the mountains from Hollidaysburg to Johnstown.5

With the digging of the canal well under way, the Canal Commissioners once again in 1828 turned their attention to finding the best portage route over the mountains. They appointed a noted engineer, Nathan S. Roberts, to survey, and although he submitted that same year an extensive report on his findings, the Board felt that the results were "not so conclusive as to justify a decision," and they determined that further investigations would have to be made for the portage route.6

Since Nathan Roberts meanwhile had already accepted another position of employment, the Canal Commissioners appointed Moncure Robinson, "an engineer of high reputation," to carry out a survey of the mountain with a view to either the construction of a railway with lifts and levels or a macadamized road of easy gradation between the two canal basins. Robinson's report to the Board in 1829 proposed a portage by railway with stationary steam power and a system of


planes and levels. The outstanding feature of his recommendations, and the one which aroused considerable objection, was his suggestion that the summit level be overcome by a mile-long tunnel.

So controversial was Robinson's report that the Canal Commissioners in March of 1830 appointed a Board of Engineers to investigate and confirm or reject his scheme. The three-man Board, composed of Moncure Robinson, Lt. Co. Stephen H. Long, and Major John Wilson, proceeded to the summit of the Allegheny Mountains, where they surveyed about 14 miles of the crest line, and studied first hand the technical problems of the portage. In their reports to the Commissioners the three came to an agreement on two of Robinson's earlier proposals: that the portage be a railroad and not a macadamized road, and that the preferred route for the portage cross the summit at Blair's Gap just north of Samuel Lemon's tavern. But a falling out both on a business and personal level occurred between Robinson and the remaining two engineers over the practicality of a summit tunnel. By the end of 1830, when the Board of Canal Commissioners submitted their annual report to the Legislature, still no final decision had been reached either on the type of portage over the mountain, or the route it should take.

So many surveys, reports, and rebuttals had passed before the Board of Canal Commissioners in a period of six years concerning the passage over the Allegheny Mountains, that by March 21, 1831, when the Governor finally approved an act authorizing the Board to contract for a portage railroad of 36 miles between Johnstown and

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Hollidaysburg, the Commissioners and legislators alike no doubt gave a deep sign of relief. The plan adopted by the Board incorporated the main points of Moncure Robinson's proposals with the exception of the summit tunnel. Indeed, Robinson was placed as consulting engineer to work with both the well-known and accomplished Principal Engineer, Sylvester Welch, and the Superintendent of the Western Division, Samuel Jones. Within a few weeks the surveys to locate the exact route of the Allegheny Portage Railroad had already commenced.9

**Surveys and Railway Superstructure, 1831-32**

By the end of July 1831—only 4-1/2 months after the act to construct the Portage Railroad had been passed—the line had already been surveyed and the contracts let for the grubbing and clearing of 46 sections of railroad right-of-way. In addition, Sylvester Welch had been assigned two principal engineers, W. Milnor Roberts, who located eight of the ten inclined planes and supervised their construction, and, Solomon W. Roberts, who had charge of Planes 1 and 2 on the western division of the railroad.10

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9. Wilson, p. xlix-1; "Journal of the Board of Canal Commissioners," March 30 and 31, 1831, in PSJ 1831-32, 2, 209, herein sited, J of BCC. "Report of the Canal Commissioners . . . submitted December 1831," Hazard, 8, (1831), 427. Sylvester Welch had received his training and experience as assistant to Principal Engineer Canvass White on the Union or Erie Canal in 1824-25, as assistant to William Strickland at the canal in Harrisburg in 1826-27, and as Principal Engineer for a few years on the Conemaugh line of the Western Division of the Pennsylvania Canal. Reports and Misc. Docs., 1829-43, Box 8, Vol. 1, Index, A.P.R.R., Div. Rec., BCC, RG 17, Pa. A. According to his assistant for more than eight years, "Sylvester Welch was a man of great ability and integrity, and of untiring industry." Solomon W. Roberts, "Reminiscences of the First Railroad Over the Allegheny Mountain," Pennsylvania Magazine of History and Biography 2, 372.

10. Altogether, the Board of Canal Commissioners approved twelve positions for the construction of the railroad—6 engineer assistants, one surveyor, and 5 target men. J of BCC, March 30 and 31, 1831, in Pa. PSJ 1831-32, 2, 210. The Board approved the western half of the route and the contracts for its 35 sections on May 25, 1831, and the eastern half with its 11 sections on July 30, 1831. J of BCC for above dates in Ibid, pp. 273 and 304. See Appendix B for Sylvester Welch's reports describing the survey route, and illustrations for his mapping of the line. For background information on the two Roberts engineers, see Roberts, pp. 371-72, and 376-77.
The location of the line generally adhered to Moncure Robinson's survey, running across the mountain at Blair's Gap, and winding along the Laurel Run and Conemaugh River southwestwardly to Johnstown. The route chosen reflected the geographical influences and obstacles of a rugged and unsettled mountainous area. No doubt for the practical purpose of facilitating the delivery of the needed supplies and laborers, the railroad route closely followed the Northern Turnpike from Hollidaysburg to the Blair's Gap summit. Thereafter, it proceeded southwestwardly, passing directly by the few scattered landmarks on the western slope of the mountain—Lilly's mill, Litzinger's saw mill, Pringle's barn, and Croyle's mill. Several of these local industries most likely aided in the construction of the railroad by supplying their products and their wagon roads to the nearest towns. By wagon road to the west of the mills was the burgeoning river town of Conemaugh or Johnstown, and to the north was Ebensburg, the expanding county seat and the location of the principal engineer's office.

The Portage Road also remained in close proximity to streams, runs, and rivers, and to the few coal mines already developed on the mountain, no doubt so that these natural resources could be conveniently exploited for the railroad's stationary engines. At the same time, the engineers directed the road away from the deep cuttings and high embankments characteristic of the eastern slope of the mountain, with the aim to maintain an incline that rose no steeper than 10-1/4 feet in a hundred, and a line that provided the maximum straightness for the road.  

11. Roberts, pp. 373 and 377; Wilson, p. liii. See illustrations for 1831 map showing natural and structural features along the route. See Appendix C for Welch's description of the terrain. A general description of Cambria and Huntingdon (later Blair) counties for 1831 can be found in Thomas F. Gordon, A Gazetteer of the State of Pennsylvania (Philadelphia, 1832). Welch's 1831 report specifically noted, "The bituminous coal, which exists in abundance in the vicinity of all the planes on the western side of the mountain, also near the summit and not far from the line, on the eastern slope, will insure an inexhaustible supply of fuel for steam engines." He also predicted that, "Coal from the summit of the Allegheny mountain, will probably constitute a considerable item in the amount of transportation from that point eastward." PHJ 1831-32, 2, 211. In one case, at least, the railroad ran so close to a coal bank that it caused damage to the mining operations. In 1832 John Murray filed a petition "praying for the construction of a road to his Coal Bank which has been destroyed by the construction of the Allegheny Portage Road." J of BCC, 2, 891, Minute Books and Indexes, Box 2, BCC, RG 17, Pa. A. Herein cited, MB & I.
Even though Welch and his team of engineers had access to Robinson's survey report as a guide to locating the railroad route, they still confronted frustrating obstacles to their completion of the final survey. During the first months of surveying, the cold weather, snow, wind, and rugged terrain made progress difficult. When the warm weather arrived, the surveyors faced an army of gnats and the danger of rattlesnakes, which then, as well as today, thrived in the mountainous terrain. They also found their efforts to walk the line frustrated by quantities of fallen timber, and heavily forested landscapes. To make matters worse, they labored under the impediment of having inadequate instruments for surveying running curves. Had they not been so inexperienced in the demands of a railroad, moreover, and had they not been so rushed to complete their task by an impatient public, the final route may have avoided some of the difficulties which developed as soon as the railroad began operation.12

Many of the same difficulties faced during the four months of surveying continued to plague the engineers once the contractors for the clearing and grubbing of the line began their work. The heavy forest of spruce or hemlock, many of which stood 100 feet high or more, posed an obstacle to the clearing of the specified 120 feet of width all along the line. Once toppled, the giant hemlock were difficult and expensive to dispose of because the green timber burned poorly. Finally, the contractors found it necessary to roll many of the trees down the hill, where they were left to decay.13

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12. Roberts, pp. 373-75; from the first surveys in 1825 the mountain had posed a greater obstacle than had been expected. Even Col. Long, having the hindsight of five years of documented surveys to familiarize himself with the terrain, wrote to the Secretary of the Board of Canal Commissioners in July of 1830 that "[I] . . . find the mountains much more rugged and bushy than I had anticipated." "First Report of the Canal Commissioners . . . submitted Dec. 30, 1825," in Hazard, 4 (1829), 234; Long to R. Shunk, Esq., July 31, 1839, Reports and Misc. Docs., 1829-43, Box 8, Vol. 1, p. 15, A.P.R.R., Div., Rec., BCC, RG 17, Pa. Archives.

13. "Report of Sylvester Welch, Engineer, to Samuel Jones . . November 21, 1831," PSJ 1831-32, 2, 186; Roberts, p. 377; "Annual Report of the Board of Canal Commissioners, 1831," this report it is explained that, "It was necessary to clear off the tall heavy timber of the mountain, for at least 60 feet on each side of the centre of the road, and hereafter the incalculable trade of the Mississippi basin and the lakes, will require an additional number of tracks over the mountain; hence, prudence seemed to dictate the propriety of appropriating to the use of the state, as much ground as may hereafter be required, while it is, as at present, of very little value."
The severe winter of 1831 did much to hamper the progress of the Portage Road. Despite an initial work force of some two thousand on the road, many of the contractors found the dreary, cold solitude of the mountain overbearing, and abandoned their contracts. Besides the unusual portion of bad weather, Engineer Welch reported, "the high price of labor, and scarcity of laborers" contributed to the unexpected delay on the clearing of the roadbed. In addition, the original cost and work estimates called for revision because the contractors found "the excavation along the whole line . . . to be much more difficult and expensive than was expected when the work was put under contract." 14

Subsequent to, and in close conjunction with, the clearing and grubbing of the section beds, was the work required to prepare the road for proper drainage. In addition to over 80 drains along the length of the road, the engineer contracted out for 72 culverts and 4 viaducts, all to be of permanent stone masonry. During the summer and fall of 1831, considerable progress had been made on the construction of the culverts, but almost none had been made on two of the viaducts, because the first contractors had abandoned their contracts with the Commonwealth. 15

Despite such delays and obstacles, however, Engineer Welch continued to assure the Board that the contractors were making substantial headway on the road. To be sure, by the end of 1831, surveys and maps had been drawn up and approved for the basin landings at Johnstown and Hollidaysburg, and recommendations submitted for the laying of a single track on the levels and inclines of the railroad. In fact, so encouraged was the principal engineer by the work accomplished that he optimistically predicted,

The portage railroad can be completed with ordinary exertion, by the first of October, 1833; and if the season proves favorable and the work is prosecuted with vigor, a single track may be completed on its whole length, on or before the first of December, 1832. 16


Welch's speculations, however, foundered over his conditionals. The winter of 1832 proved unusually severe, and during the latter part of the summer and fall progress on the road slowed considerably on account of a labor shortage. Often, too, work on the road came to a grinding halt when contractors walked out on their jobs, justifiably claiming that the pay was inadequate, or, when the contractors found themselves unable to lay the track because the delivery of iron rails from England had been delayed. So the close of 1832 left the road with only 13 of the 46 sections of superstructure completed, 16 near completion, and 17 several months from completion.17

But work on the drains, culverts, and viaducts during 1832 showed good progress, and by the year's end nearly all of the total 157 passages for water under the road were finished. In addition, the 900-foot Staple Bend tunnel had reached 75% completion and it already promised to be one of the wonders of the railroad.18

Although deadlines as hoped could not be met in 1832, considerable groundwork for the railroad construction did get accomplished. In January the Board approved the appointment of Edward Miller, who had passed the summer and fall of 1831 in England and Scotland studying their railways, as principal assistant engineer in charge of machinery. Miller provided Sylvester Welch with valuable information, which together with additional information from other sources, induced the principal engineer "to change the form of the rail, and increase the weight to thirty-nine and a half pounds to the yard in length," instead of the previously proposed 28 pounds to the yard.19 Besides contributing to better tracks for the Portage, Edward Miller also designed

17. "Report of . . . Welch, Nov. 1, 1832," PHJ 1832-33, Appendix to Vol. 2, pp. 73 and 83. Superintendent Jones did allow that "a much less number of contracts have been abandoned than was anticipated at the time of lettings." He also explained that, "For the supply of the required quantity of iron, with the exception of 61,000 cast chairs which have been contracted for in this country, I have made an arrangement with Messrs. A & G Ralston of Philadelphia, who have entered into a contract with Messrs. Harfords, Davis & Co. Manufacturers of Wales." Report of S. Jones . . . Nov. 1, 1832," in Ibid., p. 67.

18. Annual Report of the Canal Commissioners, 1832, in Ibid., pp. 8-9. See Appendix E for Welch's description of the viaducts, culverts, and drains as set down in his 1832 report in Ibid., pp. 75-76.

the machinery for the stationary steam engines. It may have been to display his initial plans that the Canal Board approved a contract in November 1832 "for making models and patterns."\textsuperscript{20}

Having established the specifications for preparing materials and laying the rails by the spring of 1832, moreover, Welch from May through November let contracts for furnishing and transporting stone blocks, iron rails, pins, wedges, and cast iron chairs for the railroad, and for laying a single track, along with a double track on the inclined planes, with necessary turnouts. At the same time, contracts were let for removing obstructive buildings along the line, and still others were relet to complete the sections, culverts, and bridges.\textsuperscript{21}

But it took another full year of work before the Board learned that the superstructure of the Allegheny Portage Railroad had been nearly completed. "The remaining to be done," S. Welch explained to the President of the Board of Canal Commissioners in December 1833, "consists of forming a part as of the horse path, laying a part of the second track on two of the planes, and, putting in a part of the turnouts." With the tracks nearing completion, the Engineer directed his attention to the construction of the railroad's architectural features and their coincidental requirements. At the same time, he urged the President to authorize a means to protect the superstructure "from persons driving over it, with wagons etc.," which, he felt, caused daily damage to the road.\textsuperscript{22}

\textsuperscript{20} Roberts, p. 378; J of BCC, Jan. 28, 1832, in PSJ 1832-33, 2 and App., 204.

\textsuperscript{21} J of BCC for 1832 gives the dates and contractors for each contract approved in Ibid, pp. 220, 237, 243, 303, 310, 333, 337.

\textsuperscript{22} Welch to James Clarke Esq., December 10, 1833, Reports and Misc. Docs., 1829-43, Box 8, Vol. 1, p. 93, A.P.R.R., Div. Rec., BCC, RG17, Pa. A. The delay in completing the track was due to a shortage of iron rail and chairs. Of 7 ships that set sail from England with the needed iron supplies, only 2 arrived in Philadelphia. "Annual Report of the BCC," PHJ 1833-34, Appendix to Vol. 2, p. 22. In his report to the Board Samuel Jones explained that this shortage had prompted him to suspend a greater portion of the turnouts in order to save the available iron for the unfinished parts of the single track. His decision, he realized, would mean that "the cars passing and re-passing each other, must be retarded and diminished." "Report of . . . Jones, Nov. 1, 1833," PHJ 1833-34, App. to Vol. 2, p. 64.
Final Contracts for Completion of the Railroad, 1833-34

As Superintendent Jones explained in his report for 1833: "The principal contracts which have been entered into upon the Portage railway, since the last annual report, have been for the construction of the stationary steam engines and the machinery connected with them, and for the engine houses, road sheds, dwelling houses for the engine tenders, and the incidental work." The year opened on a positive note for the railroad when the Board resolved in January that estimates should be made for the cost of steam engines, ropes, and other machinery so that contracts could be entered into immediately after the legislature voted to provide funds. By mid-March the Board had already authorized these contracts be let, and had turned its attention to preparing the basins for the canal and railroad connections.

In the summer months of June and July 1833 the Board concentrated its efforts on approving contracts for structures at the head and foot of the inclined planes to house the engines, machinery, and engineers, and for digging wells and laying pipes to supply the engines with water. In August the Board appointed a principal rigger to take charge of the ropes and riggings for the railroad, and resolved that

23. "Report of . . . Jones. . . . Nov. 1, 1833," PHJ 1833-34, App. to Vol. 2, p. 63. On May 20, 1833, the Board approved the following contracts for steam engines: Linton Rogers for steam engines at Planes 1 & 2; Smith & Minis for same at Planes 3 & 4; Boyle and Johnston for same at Planes 5 & 6; McClurg Pratt & Wade for same at Planes 7 & 8; and Stackhouse Tomlinson & Co. for same at Planes 9 & 10. J of BCC, 2, 1144; Minute Books and Indexes, Box 2, BCC, RG 17, Pa. A.

24. January 31, March 18 and 29, 1833, J of BCC, 2, 1011, 1047, 1060; Minute Books and Indexes (herein cited as MB & I), Box 2, BCC, RG 17, Pa. A. The Board's resolution about the canal basins said the owner of property adjoining the public basins should "for public convenience . . . erect wharves and slips . . . under the principal engineer" of the railroad. For the specified measurements of these wharves and slips see the next section.

25. Contracts for all structures along the railroad were found in Contracts 1851-55, Box 2, vol. 4, and Box 3, vol. 6, A.P.R.R., Div. Rec. BCC, RG 17, Pa. A. See Appendix G for sample contracts. The contracts for structures at the planes included digging a 15-foot well at the head of the plane. The laying of pipes, however, fell under separate contracts, which were scattered throughout 1833-34.
a riggers loft be built "at the Summit level or some other suitable place." Three months later, a contract with Arnold Downing was sealed, and the large frame loft begun near the head of Plane 5, which was at the summit of the railroad. By that time, too, ten steam engines had been constructed and were in the process of being set up, ropes had been purchased and delivered to Hollidaysburg, the houses and sheds for the protection of the machinery and engines had all nearly been finished, the dwelling houses along the road were in the process of construction, and several basin slips and warehouses at Conemaugh and Hollidaysburg had already been completed.

So near completion was the Portage Railroad by the close of 1833, moreover, that both the superintendent and engineer anticipated the opening of the road with the recommendation that the Board approve the construction of a second track from Hollidaysburg to Johnstown. The Board, acknowledging their suggestions, inserted in its annual report to the Governor:

It is believed to be unnecessary to adduce arguments for proving the utility and necessity of a second track of rails on this road, to accommodate the incalculable amount of trade that will pass between the basin of the Mississippi valley, and the seaboard within a few years after the public works of the state are finished; should the legislature invest the Canal Commissioners with power to enter into contracts for iron, the second track of the rail-way may be completed over the mountain in three months after the iron is delivered.

Such an optimistic projection of the railroad's public reception no doubt was encouraged by the rather grand role which the first superintendent anticipated for the Allegheny Portage:

26. August 31, 1833, J of BCC, 2, 1226-7, and 1242, MB & I, Box 2, BCC, RG 17, Pa. A.


The trade of 1834, will be one of novelty and experiment; but it will be a year productive of important consequences to Pennsylvania, as it will lay the foundation of that great revenue which her heavy investments require, and which the main line as an integral part of our system of internal improvement is so well calculated to produce. Even now the jealousy of two neighboring states is awakened, and their interests are alarmed. Prodigious exertions are making and will be made to divert the trade from us, and to effect this the most flattering inducements have been held out.29

Both the Board and the railroad officials indeed predicted correctly: the articles about and traffic over the Allegheny Portage during its opening years spoke convincingly of the enthusiastic public response to the railroad.

The Portage Arouses Widespread Acclaim

Even though the Superintendent and engineer in February 1834 wrote concerned letters to the Board of Canal Commissioners warning them of several urgent problems they faced in completing and promoting the railroad, the Portage had aroused sufficient public awareness and admiration to assure its prompt and successful opening by March 18, 1834.30 A concerned public had begun to hear about the wonders of the Portage Railroad nearly a year before the official opening ceremonies, and had, no doubt, shown some impatience to see the works in operation. A gentleman writing for the Ebensburg Sky during the summer of 1833 graphically exhibited his approval of the progress made on the road as follows:


30. S. Jones wrote James Clark, President of the Board, on February 8, cautioning that, "the want of funds must and will paralyze our efforts [to finish the road]. It is very difficult to get men to work on the mountain at this season of the year; but is still more so when they are aware that there are no funds provided to pay them." Reports and Misc. Docs., 1829-43, Box 8, Vol. 1, p. 127, A.P.R.R., Div. Rec., BCC, RG 17, Pa. A. Welch wrote to Clark on Feb. 15 remarking again on the contractors demand for pay, and adding, "People are unwilling to build cars--an impression exists that the transportation will be carried on by a company which by the by is the most unpopular of the plans that have been suggested." Ibid., Vol. 2, p. 3.
We have lately viewed that part of the Allegheny Portage Rail Road, which lies between Croyle's Mills and the borough of Conemaugh, and were much pleased with the appearance. It would be worth a three days ride to any person to see the excellent manner in which skill, industry and science, aided by money . . . overcome the difficulties . . . and broke through the obstructions . . . in a rough and rugged section of country.

A few miles below Croyle's Mills the Conemaugh river bends to the south, and after traversing a sinuous course of more than three miles, is again seen across a narrow hill at the distance of about three hundred feet from its place of departure. At this point the road is cut through the hill and carried over the river on a viaduct supported on a strong and neatly built semicircular stone arch of eighty feet span, rising from the abutments at the height of twenty feet above the river. The whole distance from the water to the arch being sixty feet. The arch is now complete and the centres removed. It presents a grand and bold appearance. . . .

The viaduct is connected with a hill at the west end of an immense embankment, some parts of which are seventy feet in height. The vicinity of this viaduct will be ere long the site of extensive water works. . . .

A few miles below the viaduct the road passes through a tunnel nine hundred feet in length, the greater part of which has been excavated out of a solid rock. About one hundred feet at each end of the tunnel, is handsomely arched with cut stone, and the entrances will be ornamented with columns of the same.31

And just days before the opening of the railroad another reporter for the Ebensburg Sky visited the summit level and offered his preview observations with considerable enthusiasm:

We have had an opportunity of seeing the engine at plane number six, near Lemmon's tavern in full operation. This engine is placed at the highest summit, and has attached to it an endless rope of five thousand nine hundred and fifty feet, by which the cars are to be raised up from and let

down, along the incline plane, to the level below. . . .
If . . . [the traveler] has passed over the mountain at that
place a few years since . . . [he will be] astonished at the
contrast. Then the mountain was surmounted with great diffi-
culty by a steep and rugged road. . . . Then, the heavy
teams labored long and arduously to bring up a light load,
now immense burdens can glide swiftly up under the almost
magical influence of steam.32

One of the favorite stories to circulate about the railroad
once it had opened on March 18, 1834, concerned Jesse Christman,
who set out for Illinois by way of the Pennsylvania Main Line. In
October 1834, he arrived by canal boat in Hollidaysburg and found,
to his wonder and delight, that he did not need to sell his boat,
but, rather, that it could be set upon a railroad truck and carried
over the mountain with everything in tact--his boat, family, live-
stock, and personal belongings--and let afloat again in the basin
at Johnstown.33

By the next summer transportation on the railroad had reason
to be even more impressive, as the second track had been completed,
as well as much of the railroad depots in Hollidaysburg and Johnstown.
Without so many annoying delays of a one-track system with turnouts,
the traveler could no doubt better enjoy the spectacular scenery
along the railroad.34 At least this appears to be the case for the


33. The story of Jesse Christman was printed in at least three
Pennsylvania newspapers, The Casket, the Hollidaysburg Aurora, and
the Blairsville Record, and recorded in Hazard, 16 (1835), 70-74;
Hazard, 14 (1834), 284-5.

34. The construction during 1835 at the two depots is docu-
mented by S. Welch in his annual report. PHJ 1835-36, App. to Vol. 2,
p. 76-7. Solomon Roberts in his reminiscenses describes with some
color the exasperations of traveling on a single track: "When the
road had but a single track between the turnouts, a large post, called
a centre post, was set up half way between two turnouts, and the rule
was made that when two drivers met on the single track, with their
cars, the one that had gone beyond the centre post had the right to
go on, and the other that had not reached it must go back to the
turnout which he had left. The road was in many places very crooked,
and a man could not see far ahead. The way the rule worked was this:
passenger from Newport, Rhode Island, whose impressions of the railroad could only be described as glowing:

the portage surpasses every thing of the kind in the United States, and I believe in the world! There are ten inclined planes, five of which are ascending and five descending. There is a tunnel of more than nine hundred feet in length, extending through Laurel Hill, under which we pass, majestic in appearance and wonderful in effect. There is also a viaduct, over the Little Conemaugh, of unparalleled beauty, the superstructure of which is grand, far beyond any description of my pen. The captains of the cars generally stop here, and invite the passengers to get out and examine for themselves this wonderful work, which never fails to excite the admiration and applause of every beholder. The workmanship of the tunnel commands equal acknowledgements, and indeed the whole pass across the Allegheny, uniting with the canals at each end, produces universal approbation [sic].

Yet another traveler found that the railroad not only elevated his spirits but also tickled his imagination. To him, the stationary steam engines appeared "like fairy castles seated on the tops of lofty hills, and shaded and surrounded by towering oaks and hemlocks." He as well felt stirred by the solitude of the mountain: "all is still, silent, and wild, but sublime and grand beyond anything we know or imagine at home." 36

Not all the enthusiastic reports on the Allegheny Portage Railroad, however, were written by anonymous persons for newspaper circulation. American tourists as well as international engineers

When a man left a turnout, he could drive very slowly, fearing that he might have to turn back; and, as he approached the centre post, he would drive faster and faster, to try to get beyond it, and thus to drive back any cars that he might meet, and in this way cars have been driven together and a man killed by being crushed between them." Roberts, pp. 380-81.


and writers left record of their admiration for the Pennsylvania Portage in their travelogues, scholarly works, diaries, and books. In a classic and rare travelogue of this period entitled, A Pleasant Perigination Through the Prettiest Parts of Pennsylvania Performed by Peregrine Prolix, dated 1835, there is a passage describing his delight with the westward from Johnstown:

The level has an ascent of one hundred and one feet, and we passed over it in horse-drawn cars with the speed of six miles an hour. This is a very interesting part of the route, not only on account of the wildness and beauty of the scenery, but also of the excitement mingled with vague apprehension, which takes possession of every body in approaching the great wonder of the internal improvements of Pennsylvania. In six hours the cars and passengers were to be raised eleven hundred and seventy-two feet of perpendicular height, and to be lowered fourteen hundred feet, of perpendicular descent, by complicated, powerful and frangible machinery, and were to pass a mountain, to overcome which, with a similar weight, three years ago, would have required the space of three days. The idea of rising so rapidly in the world, particularly by steam or a rope, is very agitating to the simple minds of those who have always walked in humble paths.37

If travelers of "simple minds" found the Portage Railroad awe-inspiring, so also did persons schooled in the latest technological developments. In 1838, David Stevenson, a noted English Civil Engineer, marveled, in his work on world engineering, that in the United States there now numbers among its many wonderful artificial lines of communication, a mountain railway, which, in boldness of design, and difficulty of execution, I can compare to no modern work I have ever seen, excepting perhaps the passes

of Simplon, and Mont Cenis, in Sardinia; but even these remarkable passes, viewed as engineering works, did not strike me as being more wonderful than the Allegheny Railway in the United States.38

Such publicity for the experimental railroad perhaps aroused the curiosity of Charles Dickens, who, on his six-month tour of America in 1842, traveled over the Allegheny Portage Railroad. While favorably impressed by the safety and operation of the railroad, Dickens' tone seemed to reflect the evolution of public sentiment during the eight years since its opening: instead of showing awe and admiration for the wonders of technology, Dickens, with a few typically select words, was inclined to give a light and comic twist to his descriptions. Thus he depicted his journey from the summit with:

It was amusing, too, when we had dined and rattled down a steep pass, having no other moving power than the weight of the carriage themselves, to see the engine released, long after us, come buzzing down alone, like a great insect, its black of green and gold so shining in the sun, that if it had spread a pair of wings and soared away, no one would have had occasion, as I fancied, for the least surprise. But it stopped short of us in a very business-like manner when we reached the canal, and before we left the wharf, went panting up this hill again, with the passengers who had waited our arrival for the means of traversing the road by which we had come.39

As the years stretched on after the opening of the railroad, the excitement about the works did, indeed, wear thin. As early as 1837, in fact, Congress initiated a proposal and study to replace the Portage Railroad with one which would avoid the inclined planes, and, in 1843, Sherman Day reflected the shift in public response

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to the railroad when he wrote, "The trip of a boat over the mountain is now no novel sight. . . . Since this road was constructed such improvements have been made in the construction of locomotives, that a project has been suggested for relocating the whole road."40

Generally speaking, however, public opinion was at this time leaning more towards improving the railroad, than towards abolishing it. In 1841 the superintendent explained in his annual report that,

In the public mind there is much anxiety to devise means by which our improvements shall be rendered more productive, to be better able to compete with rival routes, and secure in themselves, a larger share of the commerce of the "Western World." Some demand new channels of communication--others that the capacity of the present be enlarged. Many ask for the reduction of toll, whilst some advocate improvements in the mode of transportation, and urge the introduction into general use of the "portable boats." That individual competition may be thus admitted, where only heavy companies at present offer to be carriers.41

Sensitive to this growing public dissatisfaction, the Commonwealth in 1843, introduced state-owned passenger cars baggage cars, and trucks for newly patented sectional boats, and then set their rates below these of the private transportation companies which,


41. "Annual Report of William E. Morris, Engineer. . . . Nov. 30, 1841" PHJ 1842, App. to Vol. 2, p. 106. An investigation of the letters received by the Canal Commissioners revealed that starting in 1839 local citizens submitted several formal petitions to the Board requesting improvements along the line. For example, one group wanted better track facilities at the Hollidaysburg basin, and another wanted protection from the fire hazard presented by the combustible materials surrounding the railroad structures at the Johnstown basin. Francis McGrath to the Board of Canal Commissioners May 6, 1839, and Citizens to the Board, Johnstown, Feb. 21, 1840, Reports and Misc. Docs., 1829-43, Box 8, Vol. 2, pp. 80 and 132, A.P.R.R., Box 8, Div. Rec., BCC, RG 17, Pa. A.
to that date, had enjoyed a monopoly of the business on the road. The State anticipated that their decision would encourage smaller businessmen to compete for the transporting trade on the road, and would, too, allow a greater number of the poorer westward-bound immigrants to afford the trip by section boats over the mountain. Their supposition proved correct, and the railroad during the 1840s and 50s not only increased its business but also gained a more popular base of support.42

Technological advances, however, combined with mounting obstacles to the maintenance and operation of the railroad, eventually brought the demise of the railroad as well as an outcry of public disdain. In 1852, the year the Commonwealth decided to disband the Portage Railroad, Eli Bowen epitomized the inversion of popular sentiment when he exclaimed, upon arriving by train in Johnstown:

At this place the western division of the Pennsylvania canal commences, and the miserable Portage Railroad, with its short splintery rails and curvatures, its stationary steam engines and abominable inclined planes, terminates. The traveller, who has crossed the mountain over it, will not regret to leave it, but will thank the stars that a better road will soon supercede it.43

42. Wilson, pp. lxxxi-lxxxiii; Storey, 1, 354-5. For additional information on the history and construction of the section boats, and their use on the Pennsylvania Canal and Portage Railroad, see J. Snowden Bell, The Portable Boats of Early Railroad Practice (Philadelphia, 1920), pp. 4-11; and Jesse L. Hartman, "John Dougherty and the Rise of the Section Boat," Pennsylvania Magazine of History and Biography 69 (1945), pp. 294-312. The article by Bell was printed privately by the Baldwin Locomotive Works and kindly lent to this author by Gordon Chapelle of The Colorado Railroad Museum. Possibly anticipating a resistance from the Legislature for funding the changes needed, the Board of Canal Commissioners had made a strong pitch for state loyalty: "At a period when the States to the north and south of us are making gigantic efforts to secure to themselves the vast trade and travel between the east and west, it is no more than a wise and judicious policy on the part of the authorities of Pennsylvania, to make her improvements as perfect as possible, especially, when the objects to be accomplished will add to the resources of the Treasury, and lessen the burthen imposed upon the people for the support of government." Annual Report of the Board of Canal Commissioners, 1840, PHJ, 1841, App. to Vol. 2, p. 25.

So the Allegheny Portage Railroad ran its complete cycle of public popularity, finally succumbing to the overwhelming problems which had been plaguing the operation of the railroad since its opening in 1834.

Innovation to Elimination: Maintenance and Operational Problems, 1834-52.

Although the Allegheny Portage Railroad initially provided Pennsylvania and the nation with a widely-admired technological innovation, the state planners and supervisors of the road were never able to correct the persistent problems plaguing the maintenance and operation of the railroad. It seemed that on every front the railroad suffered: from its rugged geographic setting, from its exposure to severe inclement weather, from its poorly conceived mechanical and structural features, from inept, irresponsible, or corrupt members of its staff, and from its limited economic provisions. Extensive repairs starting in the late 1830s became a constant requirement for the railroad's operation. Finally, in 1851, the state officials realized the fruitlessness of trying to revive a dying concern. While submitting their recommendations for a route to avoid the inclined planes, Robert Faries and Edward Gay, surveyors, also paid their respect to the Old Portage with a brief eulogy:

The old Portage, once the wonder of the age in which it was constructed has done its work, and sound policy as well as true economy, dictate that the Commonwealth should, without the unnecessary delay of a single day, apply the most radical and perfect remedy. . . . We, therefore, respectfully, but earnestly, recommend the adoption of and speedy commencement of operations on the line traced from the foot of plane No. 5 to Hollidaysburg, avoiding all the planes.44

Problems with the Superstructure

Obviously, the smooth operation of the railroad depended on the condition of its superstructure--its tracks, culverts, and bridges--and never, in the twenty-one years of railroad service, was the superstructure without the need for repair. The most consistent problem lay in the track, for it fell victim to climatic and geographic influences, to the severe winters, heavy rains, numerous springs, shifting soil, and steep embankments of the Allegheny Mountains. In

44. As quoted in Wilson, pp. xcii-xciv.
addition, the track suffered from its own structural design which proved through the years to be inadequate to support the continuous traffic over the road.

Probably the single greatest obstacle to the maintenance of the Allegheny Portage, as it had been for the construction, too, was the severity of the winters. As Engineer Welch so well explained it in 1835:

Last winter, the frost penetrated far below the foundation, raised the railway and produced derangement to an extent that required a large amount of labor and expense to put it in a condition for use, and to keep it so during the spring months. When the frost left the ground in the spring, the outsides of the road bed became soft, before the middle part was affected by the warm weather, and the outside line of blocks in each track settled, while the inside lines maintained their position in the frozen ground. This caused the two lines of rail which form each track to separate so much, that it was deemed necessary to put in locust cross-ties between the stone block to bind the two rails together. This has been done on both the first and second tracks to a considerable degree.45

In 1836 the new superintendent, Mark Graham, enlarged on the subject, pointing out a different series of obstacles and their effect on the road:

In order to put the road in a condition to accommodate the opening spring trade, I was compelled to have the snow and ice removed from those parts of the road which lay on the northern sides of hills; ... The frost during the last winter having penetrated to an unusual depth, and many of the through cuts and side cuts, in the original formation of the road, having been left with steep banks, when the ground thawed in the spring, immense quantities of earth were detached from the banks, and fell into the bed of the road. The ditches on side drains, too, were nearly all filled, which caused the road to be flooded and saturated with water during every fall of rain, and consequently to be much injured. At this time an extensive business had

commenced upon the road, before the earth became, in any degree, settled, after being loosened by the frost; which, with the natural settling of embankments, together with the want of a sufficient number of ties, caused the road to spread in many places, until the cars would fall in between the tracks. 46

Graham also made reference to the first structural defects to hamper the operation of the railroad. The stone blocks or ties had been placed nine feet apart but on short curves they tended to spread, causing the rails to bend and the cars to fall through the track. A more distressing problem, however, was the inadequacy of the rail along the planes. By 1836, only two years after the opening of the road, the pine timber laid under the flat bar had become so decayed that the superintendent had made arrangements for locust ties and oak timber of six by eight inches to be cut to replace the rotten wood under the rails. 47 But until the last years of the Portage Railroad, the timber foundation of the track on the planes continued to figure as a major repair factor.

With the passage of time, the combination of structural weaknesses and natural hazards took increasing toll on the road. In 1838 W. Milnor Roberts reported that repairs were needed on two viaducts—the one at the Mountain Branch of the Conemaugh which had settled 3-4 inches, and the one at the Hollidaysburg viaduct which had lost a portion of one wing and had suffered considerable damage to one parapet when a flood ravaged the area in June of the year. 48

In 1839, the new engineer, William E. Morris, explained that it had been necessary to keep a heavy force of hands employed to clean out drains, remove hill slips, adjust the superstructure, renew decayed timber, and introduce additional cross ties. Part of the problem, as he saw it, could be corrected by changing structural defects. The poorly selected oak and pine rails under the plate bar on the inclined planes had decayed to such an extent that when the ground was soft and the timber wet, the rails yielded from


47. Ibid., pp. 68 and 69.

1/2 to 2-1/2 inches at many points under the pressure of the car wheels. In addition, the cast iron chairs imported from England had proved to be too light, and the metal "high and brittle," so that at least one half the chairs had by 1839, required replacement by heavier ones of far better quality domestic metal.49

On the other hand, Morris also saw the inevitability of some of the repair: "the adjustment of the track," he explained to the Canal Commissioners, "is in fact an annual charge, and one unavoidable upon this road, from the nature of the soil, the great number of springs, and the severity of the winters."50

After witnessing the deterioration of the track for two more years, the engineer in 1841 emphatically reiterated a formerly made recommendation that a permanent superstructure with iron rail replace the original wooden rail and flat bar on all the inclined planes. For several years, the Canal Commissioners ignored this recommendation and instead condoned the heavy repairs on the old track. But in 1846, traffic on the road was suspended three times when remarkably heavy rains left the track submerged underwater, and the track, ditches, and culverts filled with dirt and stone deposits from the steep embankments. By 1847, the track was so rundown that it made it difficult for the cars to pass over the road with any degree of safety or at a sufficient speed to facilitate business. Moreover, funds were so low that rails for repairs had, for several years, been taken from the tracks and sidings at the lower end of the basins at Johnstown and Hollidaysburg.51


50. Ibid., p. 125. In his report to the Canal Commissioners, William G. Moorhead, Supervisor of the railroad, explained that, "the nature of the soil through some of the deep cuts, is such as to preclude the possibility (without artificial means) of preventing its slipping during and after heavy rains, and not only filling up the ditches, but often times covering part of the railway, the clearing and removing of which was a constant expense." His solution to the problem was to erect timber batting or wharfs. Ibid., p. 139.

51. In 1839 Supervisor Moorhead made the first allusion to the T rail as a substitute track on the inclined planes when he wrote, "The system of repairs heretofore pursued in regard to the planes, seems to have been with a view to abandon the present flat bar, and
Realizing the urgent conditions of the Allegheny Portage Railroad in 1847, the Canal Commissioners began to acknowledge and support the railroad officials recommendations, only to find their hands tied by financial strings. Expenses were exceptionally high that year because a flood on the Conemaugh River had washed away two of the viaducts and had left the third, the "Large Viaduct" at the Horse Shoe Bend, in critical condition. The Legislature, however, concerned over the debts that were accumulating for the public works, turned a deaf ear to the Commissioners' appeal for even greater expenditures for the Portage Railroad. Nonetheless, the Canal Commissioners pursued the issue, especially in relation on the tracks. In March 1849 they wrote, "The Board would again call the attention of the Legislature to their repeated recommendations in relation to the condition of the tracks of the Allegheny Portage railroad. These tracks should be relaid with T rail."\(^{52}\)

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52. By 1845 the Legislature not only was requesting reports on the receipts and expenditures of the public works, but it also had heard a report relative to the sale of the main line prepared by the state's Committee of Ways and Means. In that year, the Committee "deemed it inexpedient to interfere with the subject at the present time." PHJ 1845, 2, 210 and 544. In 1847 there was a bill before the House authorizing the Canal Commissioners to receive proposals for the sale of the canal and railroads belonging to the Commonwealth. PHJ 1847, 1, 203. It was no wonder, then, that the legislators were reluctant to appropriate extraordinary funds to relay the track of the Portage in 1849, when all the signs already were pointing to the abandonment of the railroad. Instead, the Canal Commissioners were being hard pressed by the House to show what the debts and expenses of the railroad had been for the past few years. "Communication from the Board of Canal Commissioners showing the Receipts and Expenditures of the Allegheny Portage Railroad, . . . Read Feb. 9, 1849," and, "Communication from the Board of Canal Commissioners Relative to the Amount due on the Public Works on the 1st December last. Read March 25, 1849," PHJ 1849, 2, 331 and 653-54.
But the Legislature again refused to cooperate, so that by the end of the year the supervisor of repairs had reached the conclusion that it would be a "suicidal policy" not to relay the decayed track on Plane 7 with heavier rail. In addition, he made it quite clear that without a hefty financial outlay, the road would not withstand the traffic for 1850:

The decayed state of the timber superstructure of the track, the dilapidated condition of the Inclined Planes (which are laid with a light flat rail,) and the worn out state of a large amount of the edge rail on the levels, all make it imperative, that a heavy expenditure be made. It would require 880 Tons of iron (of 60 pounds per yard) to replace the defective rails, there being 29,330 yards lineal of worn out barns now on the Road, all of which must be replaced in a year or two. A considerable amount must be procured next year, to keep the track in a passable condition, for the ordinary business.53

Problems with Structures, Ropes, and Water Supplies

The track, however, was not the only feature of the railroad to suffer damage from natural conditions and structural deterioration during the 1840s. In 1840 heavy snows actually destroyed the frame hitching sheds at the foot of planes 10 and 5, the weight of the snow causing the roofs to collapse.54

The heavy rain and snow falls on the mountain also caused recurring damage to the hemp ropes which pulled up or let down the cars on the inclined planes. In 1839, both the engineer and the supervisor of the road concluded that the effect of the

53. Thomas J. Power to the Board of Canal Commissioners, October 19, and December 1, 1849, Collectors and Supervisors Reports, 1845-57, 1849, Box 3, No. 121, p. 2, and No. 104, p. 5, BCC, RG 17, Pa. A. herein cited, Coll. and Sup'rs. Rep. Power also indicated how technologically out-of-date the Portage Railroad track had become when he wrote, "The Planes were originally laid with a light plate rail, placed upon string timber, (a kind of road that is expensive to keep in repair, extremely dangerous, and now almost obsolete.)" Ibid., p. 12.

heavy rain and ice coating on the ropes was great enough to justify the construction of sheds the entire length of the inclined planes to keep the ropes dry. In their opinion, the expense of the sheds would be defrayed by the doubled durability of the ropes. The Canal Commissioners, however, did not heed this suggestion, and continued to struggle with the problem for another decade, for it took them another seven years after they first authorized the purchase of one Roebling wire rope in 1842, to be satisfied that the wire rope was, indeed, an improvement over the hemp rope.55

Ironically enough, while the operation of the railroad was impaired by heavy rainfall and floods, it was also hampered by a constant need for water to supply the stationary engines at the heads of planes, and the locomotive engines which were increasingly used on the levels of the road. Initially the Canal Commissioners authorized the boring of wells at most of the plane heads. In 1836, the first major water problem occurred at Plane 6 when defective well water destroyed the engine house boilers. To provide a new water source the well was replaced in 1837 by wooden pipes running from the engine house to a nearby spring. Within the next three years, the same solution was required and implemented at all planes, which temporarily improved the water system except at planes 4 and 5 where the water supply regularly failed in dry weather.56

This new system of providing water to the engine houses also proved defective. The wooden pipes rapidly decayed and, because they were laid near the ground surface, usually froze up each spring just at the opening of the road. Moreover, the labor required every season to haul water to the engines and to open up the pipes became


a laborious and expensive endeavor. And, finally the pipes became liable to leakage due to the injuries they received from being bored and moved so often. In his report for 1840, the engineer concluded that the water pipes should be made of cast iron.\(^{57}\)

Although the Canal Commissioners passed on the recommendation to replace the wooden pipes with more durable iron ones, they again failed to get financial backing from the Legislature. In 1849, the Supervisor of the road resubmitted the recommendation, and in 1851, the Canal Commissioners made a compromise by authorizing the repair of all the old pipes and the laying of some five miles of new pipes.\(^{58}\)

But by 1851, the Allegheny Portage Railroad had proved itself a deteriorated, impractical, and unpopular means of transportation. From the first years of the railroad the engine houses and their equipment had required constant attention. Most frequently their foundations had needed rebuilding, their stacks or boilers had needed replacement with new ones, or their sidewalls and flues had needed repair. On occasion, the whole structure had been destroyed by an accidental explosion or fire, and had needed reconstruction. By 1849 all the engine houses, the superintendent reported, required considerable repairs, to put them in such order, as to shield the machinery from the effects of the weather, many of them being in such a condition, as to afford but little protection from the storms.\(^{59}\)


\(^{59}\). In every engineer's report from 1835, repairs were needed on the engine house, engines, boilers, or foundations, etc. In 1849 an explosion at the engine house at Plane 10 required rebuilding of the structure. In 1852 an explosion of the north boiler called for extensive repair. Power to Board, Dec. 1, 1849, same as in ft. nt. 56, pp. 4 & 6. Annual Report of the Canal Commissioners, 1852, Pa. Exec. Docs., 1852, p. 4. In 1841 Superintendent Snodgrass explained why the foundations of the engines were in such bad condition: "The masonry has been laid on timber, which is in many instances so
Also, the sheds at the foot of the inclines had for so long been left to decay that in 1849, according to Superintendent Power, there were "no sheds at the foot of the Planes to cover the hitching ground," so that "the men employed at these points [were] . . . much exposed, at inclement seasons of the year." In obvious disagreement with the Commissioners prior policy of neglect, the superintendent continued, "This evil should be remedied, especially if the Road is to be worked in the winter season, which must be done, after the accomplishment of the contemplated connection of the Central with the Portage Rail Road."60

Problems with Competition and Staff

The Central or Pennsylvania Railroad to which Power referred played a significant role in the eventual public disenchantment with and state abandonment of the Allegheny Portage Railroad. Started in 1847 by the private Pennsylvania Railroad Company as a cross-state railroad to connect Philadelphia with Pittsburg, the Central was surveyed to avoid the inclined planes of the Portage, which, by the late 1840s, presented the main obstacle to a fast and dependable rail transportation over the mountain. An agreement had been reached by the latter part of 1848 that the Central could send its passengers over the Portage Road until its own line across the Allegheny Mountains was completed.61

Evidently the idea of a road to avoid the inclined planes—which had been introduced to the House as early as 1837—had gained considerable support by the late 1840s, not only with the merchants who had been accustomed to trading on the Pennsylvania public works, but with the state officials as well. In 1849 Superintendent Power much decayed as not to retain the bolts by which the machinery is attached to it. This has caused several of the engines to break some of the more valuable portions of their machinery, which necessity compelled to be immediately supplied, cost what it would, or else the transportation be stopped. "Report of . . . Snodgrass," PHJ 1842, 3, 109-10.

60. Power to Board, same as ft. nt. 56, p. 6

61. Wilson, p. lxxxix; Roberts, "Reminiscences," pp. 388-390. In 1854 the Pennsylvania Railroad discontinued the use of the Allegheny Portage Railroad, as its road over the mountain had been completed. The effect on the business over the Portage Road was shattering. Wilson, p. xciv.
assessed the condition of the Portage Road and recommended that the state avoid the inclined planes on the western side of the mountain. Power's timing must have been right, for within the next year the House ordered 500 copies of his report for distribution among its members, and the Governor of Pennsylvania, William F. Johnstown, emphatically presented the same recommendation in a message to the Legislature. At another level, citizen groups in Cambria County had begun to organize to petition the House in support of the idea. And by 1851, merchant groups in Philadelphia had also taken a political stand, not only in support of avoiding the western side of the mountain, but avoiding all the inclined planes.62

On a lesser and more subdued scale, public disenchantment with the Portage Railroad had also developed from rumors of questionable dealings and graft among the state officials. On the one hand, the railroad superintendents and engineers had frequently complained that they had no funds to pay the laborers on the road, and that the Commonwealth's credit was in very poor standing in the area. On the other, one could readily observe that several of the long-standing railroad appointees--Sylvester Welch, Engineer S. Jones, Superintendent, Peter Levergood, Canal Commissioner, John Dougherty, Supervisor, and John Snodgrass, Superintendent--all had become wealthy landowners and merchants as a result of their business related to the road.63

62. Wilson's article, pp. lxxxvi-lxxxviii, gives a detailed account of the various state surveys conducted in the 1830s and 40s to locate a route which would avoid the inclined planes. While not all the surveys related directly to the Allegheny Portage Railroad, they no doubt helped to stimulate interest in the possibility of improving the public works. Power to the Board, Dec. 1, 1849, p. 47, see ft. nt. 56 for full citation. For the resolution to print 500 copies and the Cambria Co. citizen petitions, see PHJ 1840, 1, 292, 301, 325, 358, 377, 416. The Governor's 1850 message is quoted in Wilson, p. lxxxix. The petition of the Philadelphia merchants can be found in PHJ 1851, p. 343.

63. In 1839 the superintendent of the road wrote the President of the Board of Canal Commissioners, "I am so much in debt, that it will be extremely difficult to get along." W. G. Moorhead to James Clarke, Oct. 30, 1839, Reports and Misc. Docs., 1829-43, Box 8, Vol. 2, p. 37, A.P.R.R., Div. Records, BCC, RG 17, Pa. A. According to Engineer Morris, however, it was the common laborer who suffered the greatest burden when the railroad went into debt: "There has been no money, or very little, paid for work done upon this road.
Although time did not allow a thorough search of the Pennsylvania state records to determine the extent of public protest to this phenomenon, one incident did show up in evidence to citizen discontent. In 1845 inhabitants of Cambria County submitted two petitions to the

since the 1st of November 1840. There are many who have labored thus long for the Commonwealth, who find it impossible with the earnings of a year due them, and the credit that there being employed gives them, to procure a barrel of flour. There must inevitably occur much distress among the labourers when the severity of winter comes on, and [the small amount of credit they now possess] shall be cut off by loss of employment. It is to be hoped, that among the first acts of the Legislature, provision shall be made to pay the debts of the Commonwealth." "Annual Report of William E. Morris, Engineer, Nov. 30, 1841," PHJ 1842, 3, 104-5. From the benefit of hindsight, it seems clear that several of the railroad officials also had a personal interest in the operation of the road. Samuel Jones and Sylvester Welch, the first superintendent and engineer for the railroad, owned a large portion of the land surrounding the Johnstown basin, in particular, "the Island," where many of the warehouses along the basin stood, and, some of the land purchased by the Commonwealth for the state depot. For further details, see Storey, 1, 337-8. Welch and Jones jointly sold one acre and 878 thousandths of an acre to the Commonwealth in October, 1834 for the depot of a sum of $400. J of BCC, Oct. 24, 1834, MB & I, Box 3, Vol. 1, p. 1619, BCC, RG 11, Pa. A. S. Jones also had a lot and turnaround on the railroad in Hollidaysburg. Peter Levergood also profited from the railroad's construction. In July 1834 he sold the Commonwealth 1 1/2 acres of land for $500 at the east and west ends of the basin for a weigh lock and weigh masters house at one end, and for a weigh master's house at the other for the railroad. One month later he was granted permission to connect a sidewalk to the road at the head of the basin, which indicates he had reason to do some heavy trade by the railroad. Two years had passed, and no doubt his affairs with the railroad had expanded, when he was appointed one of the Canal Commissioners by Governor Ritner. The original indenture, dated July 14, 1834 was found in Map Book 37, p. 36, RG 17, Pa. A. J of BCC, Aug. 27, 1834, MB & I, Box 3, Vol. 1, p. 1601, BCC, RG 17, Pa. A.; Storey, 1, 357. In 1841 John Dougherty filed a report to the Board of Canal Commissioners as the Supervisor of the road. In 1840 Dougherty had erected one of the principal hotels in Hollidaysburg to serve the railroad, the U. S. Hotel at Juanita and Wayne Streets. In 1842 Dougherty contracted for the maintenance and
House for the appointment of a committee to investigate the official conduct of Superintendent Snodgrass in his manner of letting contracts. The Committee discharged the case, no doubt leaving suspicions to grow among the protestors.64

One undocumented account of the railroad's demise went so far as to say, "the project never approached even remotely, a self-sustaining basis, due to the gross mismanagement and rampant graft that marked the construction and operation of the line by the state." While it is difficult to determine from the present research whether this account by an anonymous writer of the 1930s can be verified, it does, nevertheless, further suggest that the public at large by the late 1840s was finding increasing reason to replace the Portage Railroad with a more efficient system of transportation.65

At least some of the public discontent with the railroad employees was directed toward the lower paid persons who operated the machinery on the road. It appears from the recommendation of the Superintendent of Motive Power and Transportation in 1836, who emphasized in italics that six locomotives be placed on the road, "under the management of competent and careful engineers," that problems with accidents due to human error were quick to arise. During the 1840s, moreover,

repair of part of the road. Throughout the 1830s and 1840s, moreover, he was acting as the agent for the Reliance Line, one of the larger forwarding companies conducting business on the railroad. PHJ 1842, 3, 136. "Report of John Snodgrass, Superintendent..." Pa. Exec. Docs. 1843, p. 52. J. Simpson Africa, History of Huntingdon and Blair Counties, (Philadelphia, 1883) pp. 63-4, 70. In the case of John Snodgrass, the correlation between his position and his personal benefits from the railroad business are less transparent. See next footnote for a specific example of a situation which threatened to develop into a public scandal.

64. John Snodgrass worked for the A.P.R.R. from 1839-1845. In 1845 petitions from citizens of Cambria County were presented to the House requesting an investigation of the manner in which Snodgrass made contracts. Snodgrass' name was cleared by the committee, but the feeling of distrust no doubt lingered. For reference to the investigation, see PHJ 1845, 1, 284, 360, 452.

claims against the Commonwealth for damage to personal property by the railroad steadily mounted. Undoubtedly, a careful search of these claims would reveal numerous complaints about the lower level management of the road.66

Probably a fairly typical reflection of the public unhappiness with the railroad personnel during this period appeared in a damage claim of Samuel Lemon's—one of the most prominent coal merchants of Cambria County, and the owner of the Lemon tavern at the head of Plane 6—which, although submitted in 1853, after the Legislature had already decided to replace the Portage Road with a new one to avoid the inclined planes, no doubt listed some of the very arguments laid out by citizen groups for abandoning the old road. According to the testimony of James Higgins, who was in charge of Lemon's train of cars when seven were destroyed in an accident at Plane 8, "The level was badly managed and the drivers were nearly always drunk. They kept their own liquor in bottles on the level and drank very freely." Describing another incident where four of Lemon's cars were destroyed, Harry Hannum swore that the locomotive engine of the Commonwealth, which was pushing Lemon's cars from behind, pushed too far, so that "the cars ran over the brow of the plane and were smashed to atoms [sic]."67

Clearly, the pressures from the private and state sectors alike to improve the public works during the latter 1840s prompted the Legislators to authorize in May 1850 a survey to locate a road to avoid the inclined planes on the western slope of the mountain. By the spring of 1851 the Congress had voted to approve the appropriation for this section of the road. In May 1852 the Legislature authorized a survey of the eastern slope from the foot of Plane 4 to Hollidaysburg; in July, contracts for the construction of this part of the road were let. The next year the Canal Commissioners unceremoniously approved the first sale of the Portage Railroad bar, flat bar, wrought iron scraps and castings, and several stationary engines with their foundations, boilers, and fixtures. Finally in


1855, the New Portage Railroad was completed, and the Old Portage abandoned. Even though an experiment had failed, it nevertheless had provided an important link, not only in the great movement westward, but also in the technological and engineering advancement of 19th century America.68

68. With the May 10 Act as their authority, the Canal Commissioners appointed Robert Faries and Edward Gay as surveyors for the new road. Wilson, p. lxxxix: "Communication of the Canal Commissioners relative to the work done on the railroad to avoid the inclined planes, Read Feb. 11, 1852," PHJ 1852, 2, 407; Wilson, p. xc: J of BCC, April 7, 1853, Exec. Docs., 1853, p. 72. On July 1, 1855 the Old Portage Railroad officially ceased to exist with the opening of the new road. Wilson, p. xcv.
CHAPTER II
CONSTRUCTION OF THE ALLEGHENY PORTAGE RAILROAD

Road Measurements

The road surveyed for the Allegheny Portage Railroad covered 36 miles and 208 perches, and overcame a rise and fall of 2570 feet, by ten inclined planes, five on each side of the mountain. From Hollidaysburg the rise to the summit was 1,398 1/100 feet, and from Johnstown to the summit, 1, 171 58/100 feet. The planes covered only about five miles of the road, while the eleven levels between the planes ran over 31 miles. In order to facilitate the construction of the first track, Engineer Welch divided the road into 46 sections, each between 2,600 to 5,600 feet long.1

Road Construction

Grubbing and Clearing, Slopes and Embankments

In May 1831 the Board of Canal Commissioners approved the first contracts for the construction of the Portage Railroad. The contractors were responsible for the grubbing and clearing of their sections of the road as well as for the construction of embankments and slopes where required.2

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2. J of BCC, May 25, 1831, PSJ 1831-32, 2, 274-5 gives a list of all the original contractors. Due to the many problems met in the first years of construction (see Chapter I), the names of contractors, and the amount of work accomplished on each section varied. See Table 1, PHJ 1834-35, App. to Vol. 2, p. 69, for a progress report on the grubbing and clearing, making of slopes and embankments, as well as the miscellaneous work done on the road by November 1834. See Appendix B for Welch's original assessment of the type of work required for each of the sections. See Appendix D for description of the slopes. The road was cleared 120 feet in width the length of the road to allow room for two tracks when trade volume increased. "Report of the BCC," PHJ 1831-32, 2, 114-115.
Culverts, Viaducts, Drains, Bridge

At the same time, separate contracts were let for the construction of culverts and viaducts, and for the one land bridge on the line at Plane No. 6. While the four viaducts—over the Juniata River at Hollidaysburg, over the Ebensburg Branch and the Mountain Branch of the Conemaugh River, and over the Little Conemaugh at the Horse Shoe Bend—remained where located by Welch in his original 1831 survey, the culverts, their number, and possibly their location, altered from one year to another. In 1831, Superintendent Jones reported 72 culverts for the road, while the next year the number had dropped to 68. Finally, in the report for 1834, a table of work done on the culverts listed 73 culverts of varying spans on the road, most of which had been completed.³

What all the culverts had in common, however, was their construction of permanent stone masonry. As Welch described them in 1832, they were "built of good stone laid in common lime mortar. The faces of the walls at the ends of each culvert are built of hammered stone, laid in courses. The coping and steps and the vossoirs that form the arch, are smoothly cut."⁴

Besides the culverts and viaducts, the railroad also had 85 drains or square culverts two to three feet wide, with walls made of stone, but laid without mortar. These were built by the contractors for grading the sections, and together with the viaducts and culverts, made up 157 passages for water under the road.⁵

First and Second Tracks

By the summer of 1832 work had begun on a single track of edge rail on the levels, and a double track of wooden rail and flat bar iron on the planes. The progress was slow, but the bulk of the


track totaling 44 miles and 314 perches, and the necessary horse path along side, had been laid by the end of 1833.  

In the summer of 1834, contracts for the second track of the railroad were sealed, and by the end of 1835 that track too had been completed, all of it laid on stone blocks.

Crossings, Sidings, Turnarounds, and Lateral Railways

Also in 1835 the Commonwealth let contracts for the construction of crossings at the head and foot of the planes and at such other points as the Engineer or Supervisor might designate. The location of the crossings between the planes most likely came where roads intersected the tracks, or where mines or industries required a right of way across the tracks.

Sidings, lateral railways, and turnarounds were also planned along the road both for the use of the Portage Railroad locomotives, and for the use of private interests. As the trade and traffic along the road grew through the years, the number of these side tracks correspondingly increased. In the basin areas, they, for the most part, joined either the railroad depots or the large private warehouses with the main tracks.

6. J of BCC, April 12, and August 7 and 30, 1832, PSJ 1832-33, 2 and Appendix, 237, 303, 310; "Report of the BCC," PHJ 1833-34, App. to Vol. 2, p. 21. See Appendix F for Specifications for Preparing and Laying the Track. Table 4 in PHJ 1834-35, App. to Vol. 2, p. 69, gives the details on the work done and materials provided by the 10 contractors for laying the rails. Tables 5 & 6 and 16 in the same location, give the names of suppliers for the stone blocks, timber, edge rails, wedges and pins used for the first track.


8. Contracts, 1851-55, Box 3, Vol. 6, pp. 42-46, A.P.R.R., Div. Rec., BCC, RG 17, Pa. A., lists four contracts, one with James Wilson for all the crossings at the head and foot of planes 1 and 3, with William McLean for the same at Plane 4, with Isaac Hildebram for the same at plane 2, and with Peter Lakin and Joseph Purse for the same at planes 5-10. All contracts were dated Dec. 22, 1835.
On the mountain, they generally gave the numerous coal mines or timber mills, which often provided the railroad with its needed supplies, easy access to the road.\(^9\)

**Basin Layouts**

While the first tracks between Hollidaysburg and Johnstown were being constructed in 1833, the engineer of the road was also laying out the physical format for the two basin areas. S. Welch explained:

The rail-way at Hollidaysburg, and at Conemaugh, (Johnstown) passes along parallel with the side of the basins, and distant from them one hundred feet. The space between the rail-way and the basins is to be formed into slips and piers. The former will be eighty feet deep or they will extend from the basin towards the rail-way eighty feet, and thirty-one feet wide. The pier between every two slips will be about fifty six feet wide, and will extend from the railway to the basin. A branch ran-way is to be laid along the side of each slip, on the pier. They will be connected with the main rail-way by turning platforms. Two boats can load and unload in each slip, each one upon the pier along side of which it lies. The cars when receiving and discharging their load, will stand upon the branch rail-ways, along side of the boats, and the load will be transformed from the cars to the boats, or visa versa, with the aid of cranes. Most of the piers owned by individuals will have ware-houses upon them. The cranes can be so arranged, as to place loading from either cars or boats into the doors of the ware-houses.\(^{10}\)

This conceptualization of the basins was the first large-scale plan to be presented after the original setting aside of land for the Commonwealth at the two railroad terminals in 1831. At that date, the engineer surveyed 100 feet at the west end and 200 feet at the east end of the Johnstown basin, and 150 feet at the west end and 200 feet at the east end of the Hollidaysburg basin to connect the

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9. See Appendix L for list of sideways, lateral railways, and turnarounds approved for private interests by the Canal Commissioners.

railroad with the canal system. With their operational scheme developed for the basins, the Canal Commissioners began their plans for railroad depots and weigh scales to be constructed at each locale.11

Road Structures

Research in the Pennsylvania records on the Allegheny Portage Railroad did not uncover the specifications for the construction of any buildings other than those for a depot complex, and, therefore, the information on the exact measurements, materials, and configuration of the railroad structures has been limited to a few detached references in contracts and cost accounts, to one period photograph, a few post-period drawings, and to the archeological evidence uncovered at the head of two inclined planes. On a few occasions, the contracts specifically called for brick as the construction material, but, all other evidence points to the fact that the other structures were frame. In 1833 incidental payments were made for lofts for "depot and engine houses, etc."12

11. J of BCC, Sept. 13, 1831, PSJ 1831-32, 2, 333. The Canal Commissioners also gave a series of directives to the owners of basin lots at the two towns during 1833 and 1834. In 1833 they made it a requirement that the owners of property adjoining the public basins improve their property for the public convenience by erecting wharves and slips. In 1834 they further specified that the owners of basin lots "erect wharves at the ends of such lots not to exceed eight feet in width beyond any store house which is now built or hereafter be erected for the sole purpose of passing cars round such store houses." J of BCC, March 29, 1833, PSJ 1833-34, App. to Vol. 2, p. 259; J of BCC, April 22, 1834, MB & I, Box 2, Vol. 1, p. 1339.

12. See Appendix I for specifications for the railroad depot. The illustrations show the photograph of the engine house at Plane 6. A series of paintings of the planes executed by George Storm can be found at the park. Storm grew up in the Johnstown area and as a boy traveled over the mountain on the Portage Railroad a number of times. He made a concerted effort to draw his structures with historical accuracy, one article on him reported in the Altoona Tribune. (The article was clipped from the newspaper without retaining the date or page number. It was lent to this author by Joseph Giford, great, great grandson of Samuel Lemon, the owner of a tavern at plane 6 during the railroad's boom years.)
Engine Houses, Dwelling Houses, Sheds, etc.

On April 1, 1833, contracts were sealed for all the engine houses, road sheds, and dwelling houses at the head of the ten planes, and for the dwelling houses, and sheds at the foot of the planes. In addition, the contracts required the construction of all the machinery framework, the hanging and fitting of all the small and large sheaves, and the digging of 15-foot wells to supply water for the stationary engines at each plane head. On June 23, 1834, the Commonwealth let the contracts for a second engine house at each of the inclined planes. The 1834 contracts also called for the addition of a store room and coal shed at each of the stationary engine houses.13

On May 24, 1834, the Commonwealth let contracts for the grubbing, clearing, and fencing of the half-acre dwelling lots set aside for the engineers and their assistants at the head and foot of the planes. As a rule, these lots enclosed a garden, but in some cases, as at Plane 8, the ground was so rocky, or on such a steep incline, as to make it useless to the occupant. The type of fence construction for the dwelling lots cannot be determined from the contracts, but it might have been similar to the "good substantial posts and rails" used in fences along other sections of the road.14

In 1967 the National Park Service contracted with Temple University for archeological surveys which were carried out during the summers of 1968 and 1969, and the fall and spring of 1969 and 1970. The report was written by Jacob W. Gruber, and entitled, The Allegheny Portage Railroad, Cresson, Pennsylvania. Most of the work was done at the engine house at plane 6, with some also carried out at plane 8. "Report of S. Jones," PHJ 1834-5, App. to Vol. 2, p. 53.

13. The 1833 and 1834 contracts for structures at the head and foot of the planes can be found in Contracts, 1851-55, Box 2, Vol. 4, pp. 130-147, Div. Rec., BCC, RG 17, Pa. A. See Tables 7 & 12, PHJ 1834-35, App. to Vol. 2, p. 69, for an account of work done at the planes, head and foot, as of Nov. 1, 1834, and Table 4, PHJ 1835-36, App. to Vol. 2, p. 67, for an aggregate cost of the second set of engine houses. See Appendix G for sample contracts for structures at the head and foot of planes.

In August 1834, the Canal Commissioners resolved that the engineer survey and lay off a suitable lot of ground at or near the upper basin at Hollidaysburg, and at or near the upper end of the basin at Johnstown for the erection of houses for the locomotive engines, machine shops, and necessary fixtures, sideways, and yards. Since locomotive engines were scheduled to run the levels between Planes 1 and 2 and 2 and 3, the superintendent let the contracts for the Johnstown depot complex first. In October 1834, the engineer authorized the construction of a depot or locomotive engine house, a machine shop, a blacksmith shop, and a brick carpenters shop in Johnstown. In January 1835 contracts were let to construct a depot, machine shop, engine room, coal house, smith shop, and brick carpenter's shop in Hollidaysburg. That month, too, the superintendent let contracts for water stations at both points to provide the locomotive engines with their required water supply.

The water stations in Johnstown and Hollidaysburg had their construction in common. Both contracts repeated the same requirements for digging and wailing a well, putting in a pump, and furnishing and putting up a wooden water tank. In 1835 two other water stations followed, at the foot of Plane 2 and at the tunnel, to serve the locomotives traveling over the 13-mile long level, and the level between Planes 1 and 2. Both these water stations called for a

17, 19, 20, 42, 43, and 44. Contracts, 1851-55, Box 2, Vol. 4, pp. 71-82; 88, same as above. Table 14, PHJ 1834-35, App. to Vol. 2, p. 69, gives a statement showing the estimated cost of grubbing and clearing and fencing the lots, including the number of rods of fence at each plane. In 1835 S. Jones reported in Table 6 of his summary what the aggregate cost of this work had been. Table 6, PHJ 1835-36, App. to Vol. 2, p. 69.

15. J of BCC, Aug. 23, 1831, MB & I, Box 3, Vol. 1, p. 1576, BCC, RG 17, Pa. A. S. Jones in his 1834 report explained, "It being intended that the locomotives now constructing, should be used upon the levels adjacent to Johnstown, buildings for their protection and repair etc., have been contracted for, at that place. Buildings of a similar character will also be erected at Hollidaysburg, and ground for the purpose has been purchased." PHJ 1834-35, App. to Vol. 2, p. 47. The contracts for the two depot complexes and their water stations can be found in Contracts, 1851-55, Box 2, Vol. 4, pp. 153-54, 163, 166, Div. Rec. BCC, RG 17, Pa. A. See Appendix I for specifications for a railroad depot complex.
wooden tank like those at the two basins, but the station at the north end of the tunnel seems to have been a bit more elaborate, as it also had masonry work both in its foundation and its superstructure.16

Maintenance and repair shops similar to those at Johnstown and Hollidaysburg were also located at the summit, near the head of Plane 5, between 1833-35. Specifically the buildings and depot included a riggers loft, carpenter's shop, blacksmith and machine shop, and lumber yard. When business expanded, the summit complex did also, and in 1850 a new carpenters shop and locomotive shed were erected.17

In addition to planning for the operational needs of the railroad, the Canal Commissioners also authorized the construction of weigh stations at each end of the line, just to the east and west of the basin areas, for the collection of railroad duties. The weighscales, constructed for $500 each, by E. T. Fairbanks Co. of Pittsburg, were designed to suspend four cars at one time, with a gross weight between 18 and 20 tons.18

In both basin areas, the weighscales stood to the south of the track and connected with the main line by necessary sideways with gates; and both weighscales had sheds over them for their protection.19


19. On May 24, 1834, two contracts were let to construct a shed for the weighscale, weigh room, gate and side railway in Hollidaysburg and Johnstown. Contracts, 1851-55, Box 2, Vol. 4, pp. 127 and 149, A.P.R.R., Div. Rec., BCC, RG 17, Pa. A. See Appendix H for sample contract.
From conception, the position of weighmaster carried political prestige. The Canal Commissioners made this clear by ordering in May 1834 the construction of a brick dwelling house "Suitable for the Weigh Master" at each of the weighscales. Additional contracts for a stable and a fence with vertical boards and palings on the Johnstown weighmaster's lot reflected the importance of this railroad official's position.20

CHAPTER III

OPERATION AND REPAIR OF THE ALLEGHENY PORTAGE RAILROAD

Road Operation

As mentioned earlier, the Allegheny Portage Railroad when first operated dazzled and impressed even the most sophisticated traveler. In an era when roads and canals were the most common and expeditious means of overland transportation, the railroad, which overcame a mountain of 1898 feet, presented a novel technological feat.

In today's terms, the operation of the Portage Railroad did not present too complex a system. The canal boats docked at one of the numerous basin piers and the cargo was unloaded by crane to a freight car awaiting operation on a branch railway which connected with the main railway by a turning platform. After 1843 the Commonwealth introduced another method of transferring the shipments from canal to railroad with adoption of canal section boats which could be separated into four parts and then loaded separately by section on an 8-wheeled flat car or truck for the trip over the mountain. Stationary engines pulled the section or portable boats from the water at boat slips, the location of which appear on the Hollidaysburg and Johnstown basin maps.¹

During the earliest years horses drew the train cars—passenger and freight—along the levels of the road to the hitching shed at the foot of the plane, or to the engine house at the head of the plane. In 1835 the first locomotive was placed on the road to pull the trains across the thirteen miles of the Long Level. By 1841 twenty locomotives had been placed on the road at different times, a few of which were built like the Norris engine depicted in the illustrations. In 1850 locomotive power finally replaced animal power at all the levels.²


The ascent or descent of the train cars put into action the engineers and car tenders at both ends of the inclined plane. The engineers made sure that the two stationary engines, which depended on a steady water and coal supply, ran smoothly, when needed, to pull the cars up the incline by means of an endless hemp or wire rope. The car tenders connected by hand the train car to the endless rope and safety car, and kept the large and small sheaves through which the rope passed in good running order.³

The engine power of the railroad, both locomotive and stationary, generally did not change in character or form from 1834-35 through 1855. The locomotives, first contracted in 1835 from firms such as the Mill Dam Foundry Co. in Boston, the Edward A.G. Young Co. of Newcastle, Delaware, and later, from the McClurg, Wade & Co. of Pittsburgh, were scheduled to carry twelve loaded cars, or about sixty tons of cargo over the levels. An engine built by the Milldam Foundry, called the "Boston," weighed without its water and fuel, eight and a half tons, and performed the labor every day of eighteen horses during its first year of operation.

³ Engineer Welch gives an explanation by plane of the water sources tapped for the stationary engines. PHJ 1835-36, App. to Vol. 2, pp. 75-76. Coal was already found to be abundant on the mountain before the railroad was conceived, and a number of mines were in operation, ready to be tapped for coal supplies when the railroad opened in March 1834. The Journals of the Canal Commissioners list the coal contractors. See Appendix J for a description of the original hemp ropes introduced on the planes. Beginning in 1854 Roebling wire began to replace hemp type, but not until 1849 did all planes have wire ropes. See Chapter I for further details. In his 1835 report S. Welch explained, "The use of the safety car which was introduced last spring, will, I think . . . prevent the occurrence of accidents . . . when they are renewed their form should be a little changed, and an iron fork with a spring and catch should be added, to give greater security." PHJ 1835-36, App. to Vol. 2, p. 93. In his reminiscences, Solomon Roberts explained, "The [safety] cars were attached to the endless ropes by small ones called stopper ropes . . . the safety car prevented any serious accident, by acting as a brake-shoe or drag, so as to stop the cars." Roberts, p. 385.
Although most of the early locomotives required extensive repair, and continued to be of debatable use on the short levels as late as 1840, they eventually gained the approval of the railroad administrators.4

In 1833 Sylvester Welch described in specific detail the size, dimensions, and operation of the stationary engines and their machinery, including the sheaves, cylinders, and boilers. He explained that the engines were to be set on a cast iron frame, instead of a wood frame, and that water cylinders were to be adopted for regulating the velocity of the descending cars. The engines themselves were to vary between 30 and 35 horsepower, and were to be geared to pull three train cars up the inclines in five minutes at approximately four miles per hour. When the cars were descending the incline or when the weight of the cars descending exceeded those ascending, then the engines were set to disengage automatically, thereby putting the pulley principle into effect.5

At first the Commonwealth only hired engineers, car tenders, and firemen to operate the machinery at the inclined planes, leaving the actual transportation to private companies and individuals who


provided their own horses and train cars. Forwarding companies like Western Transportation Co., Pittsburg Transportation Co., Western Dispatch, and Reliance Co., all competed for the trade over the railroad. Gradually, however, the Commonwealth realized the need for and assumed greater management of the road, first by taking over complete control of the motive power, and then, in 1843, by providing state-owned passenger cars and trucks for hauling section boats, and by lowering the price for passenger travel.6

Although the Commonwealth levied tolls for transporation over the Portage, the railroad fees dramatically cut the cost of transporting merchandise from Hollidaysburg west to Blairsville, a distance of 53 miles. Before the Portage Railroad went into operation, the tolls along the highway amounted to from $12 to $16 per ton between the two points, while, with the use of the railroad, they fell below $4.00 a ton.

The passenger cars had their own toll prices. Each car held an average of eleven people, each passenger paying an average of 2c per mile for the ride.7

Scheduling the trains at first presented an operational problem, especially the first year when only one track had been completed, and regulations allowed only daytime travel. With the completion of the second track in 1835, traffic, especially in the line of freight, picked up, giving in its wake an economic boost to the several locations along the road which provided regular room and/or board facilities. Thus Croyles Mill grew into the "Halfway House," (as it was about half way along the Long Level), which today is called Summerhill.

6. A list of the railroad workers at the inclined planes in 1834 can be found in, "Report of S. Jones," PHJ 1834-35, App. to Vol. 2, p. 54. Of course, other employees were hired to work at the weigh stations, the summit and at the basins. "Report of S. Welch," PHJ 1834-35, App. to Vol. 2, p. 66; the State provided horsepower on the levels beginning in 1836, "Report of S. Welch," PHJ 1835-36, App. to Vol. 2, pp. 82-3. Wilson, p. lxxx; Africa, pp. 63-64. In his 1842 report, J. Snodgrass explained, "I have commenced building two eight-wheeled passenger cars, together with the necessary number of smaller ones, and baggage cars . . . to convey all passengers over the road." PHJ 1843, 2, 156.

7. Wilson, pp. lxvi-ii, and lxxv.
Litzinger's Mill, a little further east on the Long Level, developed into the busy town of Jefferson, today called Wilmore. Many trains also stopped over at the foot of Plane 2 on account of the several popular hotels there, and eventually this spot incorporated into the town of Portage. Similar occurrences took place at the foot of Plane 4 and near the head of Plane 5, where Lilly and the Summit emerged during the 1840s.8

Although first received with admiration for its ease and facility at crossing the Allegheny Mountain, the Portage Railroad fell behind technological advances, and fell victim to its own consistent state of disrepair, until eventually the delays or latenesses made the journey over the road a slow and tedious one. The Commonwealth's program of maintenance and repair of its public works left the Portage Railroad a miserable competitor against the development of locomotives able to cross the Alleghenys without inclined planes.

Road Repair

Year in and year out the railroad track, engines, machinery, and structures called for repair or rebuilding. The heavy expense of maintenance and repair increasingly irritated the financially-pressed Legislatures until they agreed that an entirely new road would be a wiser investment for the Commonwealth. For nearly two decades, however, the Portage Railroad officials reported similar shortcomings.

8. See Appendix 0 for train regulations signed by S. Welch, c.1834, when the railroad had only one track. See Illustrations for Welch's 1834 survey map and for the map to avoid inclined planes, 1851, which by comparison show the growth of towns and villages along the railroad route. Storey, 1, 99-100, 354-55. The Lemon House, at the head of Plane 6, was also a favorite stopping place. See, The Lemon House, Historic Structure Report (D.C., 1972) by Norm Souder and this writer for further details. In 1835 there were 400 freight cars and only 9 passenger cars traveling over the road. The principle merchandise shipped over the mountain was coal, iron, and lumber. "Report of S. Welch," PHJ 1835-36, App. to Vol. 2, p. 93; "Report of J. Weistling," PSJ 1836-37, App. to Vol. 2, p. 78. Not until the winter of 1851-52, when the Pennsylvania Railroad Co. purchased the Portage passenger cars from the Commonwealth, did the trains begin to run at night, Wilson lxxviii.
The Tracks

Originally laid with pine and oak rails under a flat bar surface, the tracks on the planes tended to expand in wet weather, causing trains to derail. Although the second track received more stone blocks to keep the rails at the proper width, even that improvement did not solve the road disrepair. Patch-work remedies, such as placing locust cross-ties along the line, and replacing the rotting pine rails with harder oak rails, only kept the track open, but rarely meeting its capabilities.

As early as 1839 the Canal Commissioners submitted their first appeal for iron T rails. Their formal requests for this heavier railing grew more urgent as another decade of sub-standard conditions for the track slipped by without attention. Ironically enough, while the road received much repair, the Legislators did not authorize any new tracks until 1851, the year they also voted to replace the inclined planes with a road over Sugar Run Gap to the north. And the new tracks only were laid on the levels of the road, between planes 2 and 3, 3 and 4, 4 and 5, 5 and 6, 8 and 9, 9 and 10, and the Hollidaysburg level. When it was decided to replace the Old Portage with the New Portage, some or all the rails of the former were sold outright for scrap iron, or taken up for use on part of the new track. Scavengers of various sorts descended on the area for several generations after, so that today, the only remains of the Allegheny Portage Railroad tracks are some stone blocks visible between the mud and weeds along the trace.9

Engines and Machinery

The stationary engines and their related machinery and parts generally suffered from one or another characteristic ailment: the foundations, furnaces, boilers, stacks or flues of the stationary engines with regularity needed renewing or replacement at one or more of the planes.

In 1837 the engine foundations "were discovered inadequate to sustain the pressure and action of the engines," and were all renewed for the sum of $6,000. The next year, twenty new stationary engines replaced the old ones. The improvements made in the arrangement of their steam chests and side pipes and in the enlargement of their

9. "Report of the Board of Canal Commissioners," Pa. Exec.Docs. 1851, p. 13. Repair on the road, as indicated earlier, was a constant necessity. The specifications for the maintenance and repair of the road as drafted by Superintendent Snodgrass in 1843, have been preserved in Map Book 50, p. 52, RG 17, in the Pa. Archives. See Chapter I for further details and sources.
boilers, proved the new engines to be decidedly superior. Eleven years later the Canal Commissioners also authorized new boilers for planes 1-7, and 10. These boilers contained one third greater steam room than the old ones which consequently increased the power of the stationary steam engines as well.\textsuperscript{10}

The stacks of the engines, Engineer Morris explained in 1840, "were constructed in the first instance, in too light a manner, their walls too thin, and not of sufficient height." The flues suffered from their construction of common brick, which in the most exposed parts, could not resist the intense heat produced by coal fires. Finally in 1848, the Canal Commissioners authorized fire-brick, first recommended eight years earlier, to line all the furnaces at the ten planes.\textsuperscript{11}

The machinery at the planes and at the weigh scales also frequently required mending. After years of small repairs, the superintendent of the road in 1850 informed the Canal Commissioners that the machinery needed extensive repair. Most likely seeing the end of the Portage Railroad in sight, no measures were taken, so that in 1853 Superintendent Campbell reported that the machinery was falling into rapid decay.\textsuperscript{12}

In 1841 the weigh scales received an overhauling "when the pivot points and all places of bearing were dressed," which gave them increased correctness. At the same time, the official warned, "It will not be long before the levers of those scales and the whole wooden frame must be renewed to secure accuracy in their weighing, these timbers should be thoroughly seasoned and ought to be got out during the ensuring winter."\textsuperscript{13}


\textsuperscript{13} "Report of W. Morris," PHJ 1842, 3, 104.
The locomotive engines on the road had need for a more consistent and complicated repair, so that shops equipped with lathes, tools and even stationary engines were set up in Johnstown, Hollidaysburg, and on the Summit specifically to see to their upkeep. At the same time, new locomotives were regularly authorized for the road, in contrast to the level of treatment for the structures along the line.14

The Structures

In 1839, only five years after the opening of the road, the Superintendent reported "renewing head of planes," and, "renewing hitching ground." Two years later Engineer Morris observed that the engine houses at the head of planes had become very leaky and required repair. Nonetheless, the needed maintenance on the structures had still not been reported by 1845, when the annual railroad report noted that the riggers loft and the stationary engine houses had become much decayed and would require extensive repairs.15

By 1847 the engine sheds had fallen into such bad order that they would not protect the engines and machinery from the weather. In that same year, the Superintendent reported that the dwellings at the head and foot of the planes would also need repair.16

14. In 1839, the engineer of the road reported that three locomotives were introduced on the Portage in 1835, five in 1836, and seven in 1837. By 1839, however, many of them had become "worn and shattered," three had been entirely rebuilt, and one had become useless. "Report of W. Morris," PHJ 1840, App. to Vol. 2, p. 128. The need for major repairs on the locomotives no doubt prompted the conversion of one of the locomotive engines into a stationary engine at the Hollidaysburg shop in 1841. "Report of W. Morris," PHJ 1842, 3, 107-8.


Regardless of the shabby condition of the road structures, their needed repair was not authorized until 1851, again in the year that the Legislators voted to replace the Allegheny Portage Railroad. Typical of the railroad's history in general, the structures had suffered a slow and steady decay, without the proper attention and financial support necessary to maintain a transportation system.  

17. Actually, it is conjectural to say that the repairs in 1851 were made, for the report only said, "materials furnished for repairing sheds and state houses at all planes." "Report of the Canal Commissioners," Pa. Exec. Docs. 1851, p. 14.
CHAPTER IV
HISTORICAL BASE MAP

The information uncovered on the location, formation, and alterations of the structures along the railroad proved generally to be inadequate for the needs of an historical base map. Following is a brief survey of the material that seemed pertinent enough to include in this section of the report.

Plane No. 1 (Section 7)

Construction at the Head and Foot of the Plane

On April 1, 1833 Philo Ingerson and J. Cooper signed a contract to erect the engine house, road shed, and dwelling house for the engine tender, all at the head of the plane, and a road shed and dwelling house at the foot. The contracted price for the engine house and shed at the head of the plane was $760; for the shed at the foot, $320; for the dwelling house at the head $840; and the dwelling house at the foot $550.

On June 23, 1835, William Wandell won a contract to build the second engine house with an adjoining coal shed and store room. The estimated cost was $1,398.07, but the aggregate cost in 1835 turned out to be $2020.33.

The only mention of specific location for any of these structures was found in the engineer's surveys of 1842-47 which noted that the 70-perch lot for the car tender or hitcher stood to the south of the Conemaugh River, half-way up Plane No. 1.

1. Contracts, 1851-55, Box 2, Vol. 4, pp. 133 and 164, A.P.R.R., Div. Rec., BCC, RG 17, Pa. A., Report of S. Welch, "PHJ 1834-35, App. to Vol. 2, Table 7, p. 69. Table 7 also gives the total cost for all the work at the head and foot of each plane as of November, 1834, breaking the expenses down into categories. The total cost for Plane 1 was $6,453.33.

2. "Report of S. Jones," PHJ 1835-36, App. to Vol. 2, Table 4, p. 67. Table 5 in the same location, gives the contractors and cost for the second engine. At plane 1 the contractor was Smith and Minis, the estimated cost, $3,820.

3. Surveys and Property 1842-47, p. 164, Engineers Records, Box 2, BCC, RG 17, Pa. A.
In addition to the standard structures at Plane 1, the Canal Commissioners also authorized a turnout at the foot of the plane which cost the state $400; and 1,263 feet of permanent wood pipe to supply water to the engine house; and 76 rods of fence to enclose the lots at the head and foot of the plane.  

The water supply for Plane 1 proved not to be permanent in 1837, and new pipes were laid to the engine house. This water system lasted for another decade, when new side pipes for the east engine were required. Finally, as at all planes, a new cistern was installed in 1851.

The culvert under Plane 1 which directed water away from the railroad, required repair in 1838; in 1839, the supervisor of the road explained, "one end of the culvert on plane No. 1, has settled about twenty-two inches, and will require repairing. The span of the culvert is ten feet, and the embankment over it very heavy." He estimated the cost of repair to be $500. In 1847 the culvert collapsed, and had to be rebuilt.

The engine house at Plane 1 underwent the greatest number of changes. The stack of the engine house, for one, frequently fell into disrepair. In 1839, the brick layers worked a total of 62 1/2 days applying 700 brick with lime and sandstone to provide the extensive repair needed. In 1841, the superintendent of repairs noted that the stack had to be rebuilt; in 1848-49, the superintendent noted that the stack had to be replaced with a new one; and, in 1850, the Canal Commissioners reported that a new stack had been built at plane 1.

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The boilers for Plane 1 engines endured the strain in better order. In the winter of 1849-50 new boilers of one third greater steam room replaced the old ones, as was the case at nearly all ten planes.\(^8\)

The structural protections for the stationary engines began to reflect the wear and tear from the traffic in 1840. In that year the foundation of the old engine was permanently rebuilt with cut stone. In 1841, Engineer Morris reported that all engine houses had become very leaky and needed repair. In 1844-45, the foundation of the stationary engines again needed rebuilding. In 1852, Plane 1 was avoided by the new road.\(^9\)

The Long Level (Sections 7-23)

Section 7 The Tunnel and Environs

Between the head of Plane 1 and the foot of Plane 2, commonly known as the Long Level, the majority of the large engineering features of the railroad were erected. The famous Staple Bend Tunnel stood on Section 7 of the road, only yards north of the head of Plane 1, and around it a complex of structures arose. The tunnel, contracted by J & E Appleton, began construction some time in 1831. According to the engineer of the road, the tunnel was to measure 20 feet in width, and 19 feet in height. In the report for 1832 the tunnel was described:

Section 7, about 19 miles west of the rest of the mountain, comprises an inclined plane, requiring a heavy embankment, and also a tunnel about 900 feet long, at the head of the plane; the ends of the tunnel will be arched with cut stone; the rock through which it is made, is so solid as to render arching the whole distance unnecessary.\(^10\)

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\(^10\) The original contract for the tunnel did not appear among the other contracts, but Earl Heydinger made a note to its appearance in Map Book 19-k in the Land Office when he did his research in 1966. The records pertaining to the A.P.R.R. have been removed from the Land Office, and now are in the Pa. Archives. "Report of S. Welch," PHJ 1831-32, 2, 187; "Report of the Canal Commissioners," PHJ 1832-33, App. to Vol. 2, p. 9.
Oddly enough, the tunnel received few official comments or progress reports after 1832. The best descriptions of its completed state come from period newspapers and geographies. The Pittsburgh Gazette in November 1834 explained that the tunnel only required 75-100 feet of lining at each end, and that the entrances were embellished by entablatures supported by Tuscan pilasters of dressed sandstone. In 1847 Daniel Rupp, in his history and topography of several middle-Pennsylvania counties, explained that the entrances of the tunnel had ornamental facades of cut stone. According to a third-hand reference, the cost of the tunnel, including the ornamental facades, amounted to $35,498.55.\(^\text{11}\)

The cutting through of the tunnel, the Ebensburg Sky noted in 1832, proceeded from both sides of the hillside, and on December 20, 1832, the two teams of workmen joined at the breakthrough point. On January 8, 1833, one hundred citizens celebrated the occasion at the north end of the tunnel. The contractors, however, no doubt finding the expenses of such a momentous labor greater than they had anticipated, found themselves in difficult financial straights, and in May petitioned the Commissioners for relief.\(^\text{12}\)

\(^\text{11}\). All the following references from the newspapers and from Rupp have been taken from the research notes of Earl P. Heydinger: Pittsburgh Gazette, Nov. 12, 1834, p. 2, c. 2.; Daniel Rupp, History and Topography of Northumberland, Huntingdon, Mifflin, Centre, Union, Colombia, Juniata and Clinton Counties (Lancaster, 1847), p. 210: Heydinger explained that the article giving the cost of the tunnel was in the Johnstown Daily Tribune for July 13, 1935 which quoted from the Johnstown Mountain Echo of September 30, 1851. Heydinger's original source was from an article at the Pennsylvania Historical Society, (call no. vb 4789) entitled, "Construction of the Allegheny Portage Rail road," (no date, page, or location,), by Catherine Saylor.

\(^\text{12}\). Ebensburg Sky Dec. 27, 1832, and Jan. 3, 1833, n.p.: J of BCC, May 2, 1833, PSJ 1833-34, App. to Vol. 2, p. 301. The Commissioners authorized the superintendent to pay the contractors "such portion of the retained percentage of their work as he may deem expedient." Ibid., p. 320. W. Milnor Roberts, engineer in charge of the work on section 7, gave description of the tunnel in 1878. "At the staple bend of the Conemaugh, four miles from Johnstown, a tunnel was made through a spur of the Allegheny, near which the stream makes a bend of two miles and a half. The length of the tunnel was 901 feet, and it was twenty feet wide, and 19 feet high within the arch; 150 feet at each end being arched with cut stone. Its cost was about $37,500." Roberts, p. 377.
The maintenance of so many workers at the tunnel undoubtedly occasioned the construction of the large new store reported in the February 23 issue of the Ebensburg Sky. The store apparently served the needs of the local inhabitants as well, for a March edition of the Sky advertised a plough for sale.13

In 1833 the engineer ordered the construction of a water station at the north end of the tunnel to provide water for the locomotive engines scheduled to run the long level, and an engine shed at the same location to give the locomotives shelter. The former, contracted by Kininimonth & Co., had an estimated cost of $479.33; the latter, contracted by Barr, Taylor & Co., had an estimated cost of $1,521.82. Both were reported completed by the end of 1835. The only information of a specific nature about these structures turned up in a cost account for the water station: $9.00 paid for putting in a pump, and $15.00 for furnishing and putting up a water tank of wood.14

In addition to the water station itself, the State paid hundreds of dollars to install 1000 feet of lead water pipes to the station, 1,263 feet of wooden pipes to the engine house, and, in 1836, a reservoir near the west end of the tunnel which was "of rubble stone masonry, of forty-five feet square, and six feet deep, for the purpose of collecting, through the night, a supply of water for the locomotives, at that station, as well as for the stationary engine at plane No. 1." The next year, however, this masonry reservoir was left uncompleted, on account of a lack of hydraulic cement needed for its construction.15

13. Ebensburg Sky, February 23, 1832, p. 4, c. 3; and March 23, 1833, p. 3, c. 5. An original series of this newspaper can be found at the Cambria County Historical Society in Ebensburg, and on microfilm at the Pennsylvania State Archives in Harrisburg.


At the north end of the tunnel several structures were authorized to fill the needs of the railroad workers. In 1836 Superintendent Graham reported that "a small shed for a smith shop has been erected, so that a set of tools can be kept there for the purpose of making small repairs to the locomotives, and thereby prevent the necessity of removing them to the depot on all occasions." The State paid George Murray $35.35 for timber and labor, and Almy Lewis another $11.04 for timber for this small shop.16

The Canal Commissioners the same year authorized the construction of a back building (outhouse?) for the house at the tunnel, and a fence around the house. Almy Lewis received $11.35 for timber, Charles Stewart $12.25 for carpentry work, and Joseph Burgoon $4.50 for shingles.17

The land for the house at the tunnel might well have been Adam Ross' for in June 1839 he filed a damage claim "for a house built at the east end of the Tunnell."18

In 1837 the water source for Plane 1 and the tunnel station failed, causing the engineer to redesign the pipe system. The lead pipe which had been carrying water from a weak spring was taken up, and laid through the tunnel, and attached to the wooden line at the west end. The lead and wood line, measuring 1,600 feet, then supplied both the stationary engines and the locomotives.19

In 1840 the layout of the east or north end of the tunnel changed considerably with the removal of the engine house and water station "to situations more convenient of access," wherever that might have been. At the same time, the engineer ordered a new turn-table for the locomotives be constructed at this location.20

17. Ibid., p. 72.
18. J of BCC, June 29, 1839, MB & I, Box 4, Vol. 1, P. 2713, BCC, RG 17, Pa. A.
19. Heydinger research note: PSJ 1837-38, App. to Vol. 2, p. 112. This volume of the Senate and House Journals could not be located by this researcher.
In 1848 Superintendent Power indicated that a "turn-round" had to be constructed at the tunnel that winter; there is no verification whether in fact it was built. In 1850, however, the Canal Commissioners reported that a new turnaround had been constructed at the tunnel.21

None of the structures that stood at the tunnel remain today, but the stone ties for the track are still visible. The tunnel itself still stands, although its east or south face has lost its entablatures, removed "for building purposes," one later account explained. According to an interview in 1966 between Earl Heydinger and P. J. Hoffman, the Bethlehem Steel Co. has laid three lines of concrete pipes through the tunnel, and removed, at one time, the existing 48" wooden pipes which, more than likely, remained from the historical period.22

The Horse Shoe Bend Viaduct (Section 11)

On August 4, 1831, Jonathon Leslie, John O. Snodgrass, and John Durno contracted to construct a viaduct over the Conemaugh River at the Horse Shoe Bend. This viaduct was the largest of the four built for the railroad, and it soon acquired the popular title of "The Large Viaduct."23

As with all the engineering features, Engineer Welch provided specifications for the construction of this viaduct, but they did not appear in the research materials. The best contemporary description of this 80 foot span viaduct, however, comes from Engineer Welch's own description of it in his 1832 report, which can be found in Appendix E of this report.

The viaduct reached completion some time in 1833, and did not require any repair until 1845, when both tracks across the viaduct sank 18 inches, and were permanently raised to their original position for a distance of 650 feet.24

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21. Power also noted that the heavy embankment at the north end of the tunnel had settled so much that it had been necessary to take up and relay both tracks, for a distance of about 1000 feet. Pa. Exec. Docs. 1848, p. 6; "Allegheny Portage Report," Pa. Exec. Docs. 1850, p. 18.

22. Two Heydinger research notes: W. F. Cleaver, History of the Old and New Portage Railroad of Pennsylvania (no date, no location), at the Johnstown Public Library and interview, April 25, 1966. The Mr. Hoffman remains unidentified by this writer.


In 1848 the Large Viaduct suffered damage from a flood on the Conemaugh. The superintendent of the road reported:

The "Large Viaduct" at the "Horse Shoe Bend of the Conemaugh," was found to be in a much more critical condition than was at first apprehended. The bed of the stream was washed out below the foundations of the structure. A dam was built across the stream below the viaduct, for the purpose of breaking the force of the water; the hole was carefully filled with brush and stone. It is believed this work is perfectly secure.25

The Large Viaduct lasted for three decades after the abandonment of the railroad. In 1878 Solomon Roberts retained a vivid recollection of this viaduct which had helped to give him prominence in the world of engineering:

When we reached the Horse-shoe-bend of the Conemaugh, about eight miles from Johnstown, I was in charge of the locating party. The line was made to cross the stream, and cut across the bend, so as to save distance, which made a high bridge necessary. The Horse-shoe-bend, or Conemaugh viaduct, is still standing, and is used by the Pennsylvania Railroad Company as part of its main line; and it is I believe almost the only structure of the old Portage Railroad now in use. It is a substantial and imposing piece of masonry, about seventy feet high, and with a semi-circular arch of eighty feet span. The chief engineer had prepared a plan for a bridge of two arches, each of fifty feet span, but afterwards adopted the plan of the present structure. It was designed and its erection superintended by me, and the work was done by an honest Scotch stone-mason, named John Durno, . . . The arch is three and a half feet thick at the springing line, and three feet at the crown; the arch stones are of light-colored sandstone, and the backing of silicious limestone, found near the spot. The sandstone was split from erratic blocks, often of great size, which were found lying in the woods, on the surface of the ground. The contract price for the masonry was $4.20 per perch of twenty-five cubic feet, and the work was remarkably well done. The face stones were laid in mortar from the silicious limestone, without the addition of any sand.

The cost of the viaduct was about fifty-five thousand dollars, and by building it a lateral bend of about two miles was avoided. The embankment at the end of the viaduct was sixty-four feet high.26

The Horse Shoe Bend Viaduct was used by the Pennsylvania Railroad Company for its double track until the famous Johnstown Flood swept it completely away in 1889, leaving not a vestige of the structure. 

Croyle's Mill or the Halfway House (Section 16)

Halfway on the long level stood Croyle's Mill, one of the major landmarks along the Little Conemaugh River in 1831. Thomas Croyle evidently had constructed the sawmill on the site around 1801, and had erected a bridge across the river and a road to connect with the Frankstown road. Another road, ordered by the State to be opened in 1808, connected Croyle's mill with the growing village of Ebensburg to the north. No doubt during 1831-32, when the tracks for the Portage Railroad were under construction, Croyle's mill provided lumber for the Commonwealth, but, in 1833, the State contracted with Thomas Croyle himself to remove his sawmill "in order to enable the contractor to procure a sufficient foundation for the slope wall."

In the process of accomplishing this task, Croyle had found it necessary to open the dam to drain off the water from the pool above, which in turn had suspended his gristmill. Croyle consequently not only collected a fee to remove his sawmill, but later won a damage claim for the disruption to his extensive operations along the river.

Planned as a refueling location for the locomotives, the Commonwealth contracted for a wood shed and water station at Croyle's. In 1836 the State paid Allen Rose $20.00 for boring and laying 650 feet of wooden pipes to the water station, and George Murray $336.24 for erecting the water station and wood shed.

27. Storey, 1, 361. Storey also noted that in its day it had one of the highest single-span arches known. He also explained that the term, an 80 foot arch, meant 80 feet across at water level, 80 feet from water level to the top of the arch, and eight feet to the tracks. Supposedly, Storey continued, the water had risen 79 feet behind the viaduct before it collapsed.


29. "Report of M. Graham," PSJ 1836-37, App. to Vol. 2, pp. 69 and 71. In this report Supt. Graham noted that the locomotives originally were supplied water from a well but that the source had been judged insufficient.
In 1839 John Snodgrass, Superintendent of Motive Power, referred to the station at Croyle's as the Halfway House, a term which gained popular acceptance in the area. Only one reference turned up in the railroad records to indicate a structural change at the Halfway House: in 1839 Superintendent Moorhead noted that "At the wood shed, 'half way' on the long level, I found it necessary, for the accommodation of the motive power in furnishing wood, to lay a lateral road around the shed." Evidently Summerhill, the town now located at the original Croyle site, first developed into a community during the period when the Allegheny Portage Railroad stopped at its halfway house on the long level.30

Ebensburg Branch Viaduct (Section 20)

Litzinger's mill had been operating for several years and was serving as a local landmark when S. Welch located section 20 just north of the mill. Like Croyle's, Litzinger's stood alongside one of the area's few county roads, one which branched north to Ebensburg and Munster, and it, like Croyle's, no doubt provided lumber for the railroad. At least nine other structures stood in close proximity to the railroad, the county road, and to Litzingers. Although the mill did not share the fate of Croyle's, it received no further mention in the railroad records or maps. Instead, by 1852, the town of Jefferson had developed on the location, undoubtedly because after the railroad went into operation, the favored route from Johnstown to Ebensburg was by railroad to Jefferson--now Wilmore--and then north by coach, wagon, or horseback, to Ebensburg.31

The significant railroad feature planned for section 20 was the Ebensburg Branch Viaduct, which was contracted to William Palmer on September 10, 1831. The only existing descriptions of this viaduct were written by Engineer Welch, one of which can be found in Appendix E. The original estimate cost, including 7% for contingencies, amounted to $9,079.80, but the final cost was only $8,828.05 1/2.32


31. See 1831 and 1852 maps of the railroad. Storey, 1, 100.

The October 7, 1847 flood on the Conemaugh River washed away the viaduct and caused a one week suspension of business. The superintendent erected a temporary viaduct, and reported that a new bridge near Jefferson would cost an estimated $6,500. In 1848 the superintendent described the new bridge as one with cut stone abutments and wooden superstructure, built "in the most substantial manner." Instead of a 40-foot span, which had proved insufficient to vent the water, the superintendent had designed an arch and truss of a 70-foot span.33

No record has been found to indicate how long this bridge stood after the sale of the public works in 1857.

Mountain Branch Viaduct (Section 23)

On Section 23, near the end of the long level, and near the foot of Plane No. 2, Engineer Welch designed a viaduct to cross the Mountain Branch of the Conemaugh. On May 30, 1831, Solomon McCullough, John Anderson, and John Hamilton won the contract, giving an estimate of $6,624.50 to erect the 40-foot span viaduct. A description of the viaduct can be found in Appendix E.34

In 1838 W. Roberts noted that the arch and parapets had settled between 3 and 4 inches. In 1839 Superintendent Moorhead reported that the viaduct had settled about nine inches and that the arch, originally constructed too flat, appeared to be failing. He explained that in May of 1839 he had "suspended a timber superstructure over the arch, supporting it on the abutments on either side," which, he felt, would no doubt stand for several years. He further estimated the cost for repairing the bridge in a substantial manner to be $1,200. Engineer Morris also offered his observations on the bridge's condition, suggesting that the arch needed rebuilding to repair it permanently.35


Oddly enough, no further mention was made in the annual reports whether or not the arch was rebuilt, but it seems likely that it was so that the trains could run across the viaduct safely. The Mountain Branch Viaduct, like the Ebensburg Branch Viaduct, was swept away in the October 1847 flood, and immediately rebuilt with a temporary viaduct. The next year the new bridge, estimated to cost $5,500, replaced the make-shift one. Its construction matched that at the Ebensburg Branch—a substantial bridge with cut stone abutments, wooden superstructure, and a 70-foot span arch and truss. The date of the destruction of this viaduct has not been determined, but it seems possible it, too, fell when the 1889 Johnstown Flood ravaged the banks of the Conemaugh.36

Plane No. 2 (Section 24)

Railroad Structures at the Head and Foot

On April 1, 1833 Holland Richardson, John Richardson, and John Mackenzie contracted to construct the engine house, road shed, and 15-foot well at the head of the plane, and the road shed at the foot. At completion in 1834 the contractors had met to the cent their estimated construction cost of $3,862.14.37

On the same day, David Campbell contracted to build both the dwelling houses at the head and foot, the former estimated to cost $680, and the latter, $349.38

On June 23, 1834 James Eliot & Co. won the contract for the second engine house, with a store room, and coal shed, at the head of the plane. This structure cost the State $1,523.99.39

36. See Footnote 33 for sources.


38. Contracts, 1851-55, Ibid., p. 130.

In 1835 David Speilman was paid $357.20 to fence the lots at the head and foot of the planes. In the same year, Barr, Taylor and Co. completed a locomotive engine shed at the foot of the plane, and Ferguson and Tawney finished a water station nearby. These structures matched in type and function those at the tunnel at the other end of the 13-mile long level.\textsuperscript{40}

In 1834 the engineer mentioned the need for a turnout at the foot of Plane 2, which, no doubt, was the 700-foot siding completed in 1836. Also in 1836 the superintendent of the road reported, "At the foot of inclined Plane 2, I have laid a line of pipes 2,000 feet, to obtain water for the locomotives, which had formerly been supplied from a well, by pumping, but was insufficient during dry seasons." These wooden pipes were considered part of the water station at the foot of plane 2.\textsuperscript{41}

Two years after all the facilities at the head and foot of the plane reached completion, repairs on the structures already were in demand. In 1838, the engine house foundations needed repair, and its stacks, having cracked, required partial rebuilding. The next year the superintendent reported that one of the stacks at Plane 2 had been rebuilt with 195 bushels of lime sand and 27,000 bricks. To achieve the work two bricklayers had worked a total of 89 days and an undetermined number of laborers had been on the job for 96-1/2 days. The total cost of repair amounted to $476.07.\textsuperscript{42}

Also in 1839 Superintendent Moorhead noted another problem with the engine house:

Several of the engine houses are situated in deep cuts, to which a sufficient slope had not been given; and the slipping of the hill, particularly at Nos. 2 and 3, greatly endangered the building and machinery. Hands are now employed in removing the earth, and so increasing the slope as to prevent further difficulties.\textsuperscript{43}

\textsuperscript{40} Table 6, and Table 1, Ibid. "Report of S. Welch," PHJ 1835-36, App. to Vol. 2, p. 76. In 1840 the superintendent referred to a wood shed at the site, which must have been part of the engine shed, as no separate contracts were located for it. "Report of J. Snodgrass," PHJ 1840, App. to Vol. 2, p. 131.


The decade of the 1840's reported numerous similar repairs. The engine house roof had become very leaky, and the stacks again needed rebuilding by 1841; the foundations again were rebuilt in the winter of 1844; the boilers and engines were respectively replaced or repaired in 1847, and the former were replaced again in 1849, when all planes received boilers of one-third greater steam power. Finally, in 1850, the boilers once more were replaced with repaired old boilers.44

In 1850 the Commonwealth paid $650 for a new Y at the foot of Plane 2 to turn the locomotives. The next year a new cistern was installed at the head of the plane, and materials furnished for repairing all the plane structures. No records confirm, however, whether the repair work was ever done on the plane structures.45

In 1852 the Canal Commissioners reported that Plane 2 had been avoided.46

**Portage**

In 1847 Superintendent Power wrote to the Board of Canal Commissioners, "The house intended for the hitcher [car tender] at the foot of Plane No. 2 was built upon a lot taken from the land of Edward Burk... a village has sprung up here and his value has enhanced in value at least 70 fold." The most noted Cambria County historian, Henry W. Storey, explained that the passenger trains usually left Johnstown between six and seven in the morning and ran to Plane 2, where the favorite hotels were, and where the passengers took breakfast. At another point, Storey noted that the foot of Plane 2


had two or three hotels, and that it was a very important place for the management of the road. The village with its hotels eventually became known as Portage, as it was so marked on the 1852 map to avoid the inclined planes. Today it still bears the name.47

In the Sesquicentennial of Cambria County the old Portage of railroad days was described in terms of 1954 geography:

Ascending cars stopped at a dock, now the cement bridge over the Little Conemaugh River on Route 53. The unloading spot was the highway junk yard, with lodging at the McGloughan House, no longer standing.48

Route 53 generally follows the trace of the Portage Railroad from Summerhill east to Lilly. The road crosses the Conemaugh on the site of the Ebensburgh Branch Viaduct.

Plane No. 3 (Section 27)

On April 1, 1833, Daniel Burk, John Hammond, and Aquila Burchfield & Co. contracted to build all the structures—engine house, sheds, and dwellings—at the head and foot of Inclined Plane No. 3. The contract included digging a 15-foot well, and installing a moveable carriage at the head of the plane.49

On June 23, 1834, William Palmer won the contract to erect the second engine house with its store room and coal shed. In 1835 the State also contracted with J & D Anderson to bore and deepen the well which had not yet provided adequate water for the stationary engines. The same year William Brown received $329 for the grubbing, clearing, and fencing of the dwelling lots at the plane.50


In 1835 the construction work at the plane had been completed, and the State authorized the Canal Commissioners to pay the contractors their accumulated fees. The next year opened with the need for a better water system for the plane, and so to replace the well the superintendent laid upwards of 4,000 feet of wooden pipe at a cost of over $500.51

As at Plane 2, the engine house itself faced certain structural difficulties on account of the geography. Because it was situated in a deep cut with an insufficient slope, the hill tended to slip down and endanger the building and machinery. In 1839 the superintendent reported this particular problem, and explained that laborers were employed to remove the earth and increase the slope to obviate the problem for the future. Apparently his methods proved successful, for the only other structural weaknesses reported during the remaining years were those due to leaking roofs, and overall repair work. Both in 1841 and 1851 the railroad officials noted that these repairs were necessary but in neither case was a specific statement made relating the accomplishment of the improvements. More than likely the 1841 repairs were made, but those in 1851, so close to the avoidance of Plane 3, seem questionable.52

At Plane 3 the railroad officials faced numerous problems with the foundations, stacks, boilers, and machinery of the engine houses. Starting in 1838 the Canal Commissioners received notice that the foundations and stacks needed repair and rebuilding. Presumably, the work did not get done that year, for in 1839 the superintendent again reported that one of the stacks, and two of the foundation walls which confined the engines should be rebuilt, the latter to be of cut stone.


Again in 1841 the stacks at Plane 3 required rebuilding, and in 1843 the foundations of the machinery were rebuilt on account of the introduction that year of the first experimental Roebling wire rope for the planes. The next year the foundations of the engines, J. Snodgrass reported, would be rebuilt during the winter. In 1845 the same comment was made that the foundations would be rebuilt during the spring, which might indicate that the 1844 repairs never were accomplished.53

In 1847 attention was again paid to the engines and their foundations: an engine was taken up for repair, and a new bed of timbers laid under them. The engine house received a new stack in 1848, and in 1849 a new machinery pit was dug at the foot of the plane, and a new boiler expected to be installed in the winter. The boiler and a cistern constructed at the head of the plane in 1851 were the last improvements made at the plane before the new road avoided Plane 3 in 1852.54

Even after the new road to avoid the inclined planes replaced the original Portage track, the community which had developed at the foot of Plane 3, the workers and hotel keepers, still could depend on a railroad trade, for the old and new roads intersected at this point. Here in 1853 a new turntable for the locomotives was erected, probably indicating that the traffic flowed well into the foot of Plane 3.55


Limestone Run Culvert (Section 29)

Only on a rare occasion did any of the numerous culverts along the road receive specific mention. In 1839, however, Supervisor Moorhead reported:

The culvert over Limestone run, which is thirteen feet span, and under a very heavy embankment, gave way in early spring, in consequence of the workmanship being very defective, which I repaired by turning a brick arch, (based on cut stone), under the original. It was a job of considerable magnitude, and was executed in a most substantial manner.

Later in his report the supervisor provided the following information:56

<p>| Turning the arch under Large culvert, over Limestone run |</p>
<table>
<thead>
<tr>
<th>Days</th>
<th>Per Day</th>
<th>Whole Amt.</th>
<th>Materials &amp; Cost</th>
<th>Sum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laboring</td>
<td>74-3/4</td>
<td>1.00</td>
<td>74.75</td>
<td>259.87</td>
</tr>
<tr>
<td>Whole amt. of brick laying,</td>
<td></td>
<td></td>
<td>298.00</td>
<td>52,500 brick 367.50</td>
</tr>
<tr>
<td>stone cutting,</td>
<td></td>
<td></td>
<td>566.50</td>
<td>130 bhs lime 19.50</td>
</tr>
<tr>
<td>Laborers</td>
<td>191-3/4</td>
<td>1.00</td>
<td>171.75</td>
<td>340 do 72.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>300'lumber 30.00</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>sand 40.00</td>
</tr>
</tbody>
</table>

This was the only mention made of the Limestone Run culvert in the annual reports to the Board of Canal Commissioners.

Plane No. 4 (Section 30)

Railroad Structures at the Head and Foot

William Brown and Merick Sawyer won the April 1, 1833 contract to construct the engine house, sheds, and dwellings at the head and foot of the plane, and also to bore, dig, excavate and wall the 15-foot well.57


In 1834 the State contracted with William Brown alone to erect the second engine house, at a cost of $1,523.99, and to do the necessary grubbing, clearing, and fencing of the dwelling lots at the head and foot of the plane, at a cost of $329. The plane required no other attention for another four years. 58

By 1839 a wood shed had been erected at the plane to provide for the locomotive engine fuel. No information was uncovered as to its construction date or contractor. Its location undoubtedly was at the foot of the plane, the eastern terminus of the third level. 59

Also in 1839 "the only engine which had never been supplied through pipes, was obliged to pump continually, to the serious injury of the engine." Because the water proved so injurious to the boilers and machinery, the railroad supervisor had 4,350 feet of pipes laid to the engine house, which, with the digging and covering, cost $460. And even with this improvement, the water for Plane 4 still failed in dry weather. 60

Repairs at Plane 4 seemed modest compared to those at other planes. Some general repair work was done in 1839, a new stack put up in 1840, some roof repair on the engine house planned in 1842, and new boilers with one-third greater steam power installed in 1850. 61


In 1849 and 1851 the plane received a few additional structures or features. In the former year, Superintendent Power reported that a new side track and locomotive shed had been erected at the head of Plane 4; in the latter year, a new cistern was constructed at the head of the plane.62

Early in 1853 the new road avoided the old Plane 4, but the two tracks crossed, as at Plane 3, at the foot of the plane. In 1853 at the foot of the new Plane 4, several railroad features were constructed, the ruins of which might some day be confused with the remains of the Old Portage. John Ross reported that year that where the old and new tracks crossed new switches had been installed, and at the foot of the plane a water station, wood station, locomotive shed, and coal station, or 4-foot high wharf 150 feet long and 12 feet across, with a floor and partial roof, all had been constructed to meet the needs of the new road. And estimates had been received for building side tracks to the locomotive shed and water station.63

Lilly Borough

The Sesquicentennial of Cambria County mentioned twice the community which developed at the foot of Plane 4. Writing about Washington Township, the anonymous author noted that the village at the foot of Plane 4 had developed on account of the railroad trade, and that during the days of the Old Portage Richard and Alexander White were operating a large lumbering company and coal mine near the village. When describing Lilly Borough itself, the writer explained:

Before the building of the Portage Railroad, the 332 acres were divided and James Conrad bought a saw mill and sixty acres of land for $2,000. It was on this mill, first water-powered and then by steam, that a large amount of timber was cut for the Portage Railroad with Richard and Alex White doing much of the cutting.

With the wood cutting, much of it hemlock and oak, the settlement took on quite an odor and it was suggested the town be called Hemlock. For a time

the post office did bear that name. . . . when the Pennsylvania Railroad was going through in 1853-54, the Conrads built an 80-foot platform at their sawmill . . . and it was here trains stopped to take on wood and passengers.64

Plane No. 5 and The Summit (Section 34)

Railroad Structures at the Head and Foot

The construction work for the head and foot of Plane 5 was divided between two contractors. On April 1, 1833 D. & S. S. and H. H. Easton won the contract to dig the 15-foot well, and to build the engine house and road shed at the head, and the road shed at the foot of Plane 5, and James Ray and John Devlin won the contract to erect the two dwelling houses, at the head and foot of the plane.65

On June 24, 1834 the contract for the second engine house at the head of Plane 5 went to John Fisher, S. S. Easton, and Emery Easton. In the same year a separate contract was let with I. & D. Anderson to dig and bore another well. And in May 1834 the contract for grubbing, clearing, and fencing the dwelling lots was let to William Brown.66

The water system at Plane 5 was expanded in 1837 to include a water station at the foot with 1,300 feet of wooden pipe to serve the needs of the locomotives running the level. In 1838 the inadequate source of water at the head of the plane prompted the engineer to order 3,000 feet of wooden pipe be laid to the engine house, but even this supply could not be counted on in dry weather.67

64. Cambria County Historical Society, n.p.


66. Ibid., p. 165. For further information on the construction work, see Tables, 4, 5, and 6, PHJ 1835-36, App. to Vol. 2, p. 67.

The frame construction material used in the engine house and sheds caused more frequent problems at Plane 5 than at other planes. In 1836 the foundations under the old engines were in a shattered and dangerous condition, and needed to be taken up and laid anew. In 1840 the shed at the foot of the plane collapsed under the weight of the snow, and wasn't rebuilt. By 1841, like at all planes, the roof of the engine house had become leaky and required repair. In 1847 a new bed of timbers was needed under the engines, a repair which might not have been accomplished before the engine house burned down in September of 1848. The fire seriously injured the machinery and stone foundations, but within a week the building and machinery had been partially repaired with an engine relaid on one old foundation, and the foundation, stack, and boilers of the other engine renewed. When rebuilding the engine house, moreover, the workers removed the old walls and stack.68

In the winter of 1849-50 the foundation of the machinery pits had again a need for renewal, and in the report for 1849 it was evident that all the structures at the plane stood in a dilapidated condition. Judging from the superintendent's statement, the shed at the foot of the plane had never been rebuilt.69

The stacks, boilers, and engines at the Plane 5 stationary engine house weathered the years better than those at most other planes. In 1839 the engines required some extraordinary repair, and in 1840, the sidewalls and flues received repair, but not until the engine house burned


69. T. Power to BCC, Dec. 1, 1849, Coll. & Sup'r. Rep., 1845-47, 49, Box 3, No. 104, p. 5, BCC, RG 17, Pa. A. Power commented in reference to the condition of the plane structures, that none of the sheds at the foot of the planes were standing in 1849.
in 1848 was any major improvement required at the plane head. In addition to the new stack and boilers in 1848, and 1849, however, a new set of boilers with one-third greater steam room were introduced at Plane 5 in 1851, and the machinery much repaired. Finally, in 1852, the engine house received a new stack.70

Only minor changes were made to Plane 5 after 1850, one of which was the standard addition of a cistern at the head of the plane in 1851, and the other, the addition in 1853, of 250 feet of side track at the foot of the plane to run to the water station.71

The Summit

The structures at the head of Plane 5 stood at the highest elevation overcome by the railroad. In contrast to those buildings associated with the operation of Plane 5, the structures erected near the head of the plane which were intended for the maintenance and repair of the railroad equipment, officially were located "at the Summit." This name also became attached to the community which developed around the crossroads of the Northern Turnpike and the Portage Railroad.

The railroad complex at the Summit began in October 1833 when a contract was let to Arnold Downing to construct a frame riggers loft for the care of the ropes used on the inclined planes. When completed in 1834, the riggers loft cost $1,339.25, and stood 32-1/2 feet by 100 feet.72


In April 1834, the Canal Commissioners resolved that the superintendent "Procure a lot of ground on the Summit at or near the Rigger's loft and erect thereon a Machine Shop and furnish it with such engine tools and fixtures as may be necessary for repairing stationary and locomotive engines, tenders and cars." In October 1834 a contract was let with S. S. Easton to construct a brick blacksmith shop on the Summit, and by the end of the year, Engineer Welch reported, the blacksmith shop had been completed, and was in use. (The terminology of blacksmith shop and machine shop in this case seemed to be interchangeable.) The final product cost the Commonwealth approximately $747.76.73

At some point prior to 1847 a carpenter shop was constructed alongside the blacksmith shop on the summit, but apparently was not documented in the annual reports. Its size and location in relation to the blacksmith shop showed up in the Engineer's surveys of property, 1842-47. It appears that the carpenter shop also suffered an unknown fate, for in 1850 the Board reported that a new carpenter shop and a locomotive shed had been constructed that year on the summit.74

The three earlier structures—the rigger's loft, blacksmith and carpenter shops—all stood facing the railroad track and fifty feet from its center line. Presumably the structures stood relatively close to the engine house at the head of Plane 5, for at least one description noted that the blacksmith shop was near Inclined Plane 5.75

Besides the specific mention of a new carpenter shop, locomotive shed, turn-round, and side track at the summit in 1850, the only other change mentioned for this site was


the renewal of the roof and foundation of the riggers loft in 1849. But while the Commonwealth was not expanding the railroad depot at any rapid pace, the village of Summit was developing and prospering during these years of railroad traffic.

A comparison of the map by Strickland Kneuffs in 1840 and that of 1850 by Robert Faries provides an immediate conceptualization of the growth that took place at Summit in one decade. Even before the railroad went into operation the location boasted a few structures which served the trade of the Northern Turnpike across the state. William Denlinger, for one, had a tavern at the summit where the Canal Commissioners met in December 1833 to discuss the opening of the road. That year, too, a post office had been established at the Summit.

By the opening of the railroad in 1834, Jones and Thompson had started operating a "spacious house" on the Allegheny Portage Road and the Pittsburgh and Philadelphia Turnpike, the dining room of which served such wild native game as woodcock, partridge, bear, deer, squirrel, and trout. Writing for the Pittsburgh Gazette, J. H. B. described it as "a large and commodious hotel . . . at the point where the northern turnpike is crossed by the railway . . . in the midst of this solitude." Denlinger's tavern and the Jones-Thompson hotel must have boarded many passengers overnight once the Portage opened, for until the winter of 1851-52, no trains operated after sunset. Also in 1834, the summit of the mountain was dotted by two warehouses owned by Peter Dougherty and James Campbell. By 1837 Dougherty also owned a store at Summit, as did a man named Ivory. And with the mining and shipping of coal from the mountain during the 1830s and 1840s, the community was expanding to absorb the needs of the newcomers.


By 1843 the community at the summit had grown into a small village described by Sherman Day as containing a post office, taverns, stores, and about 100 inhabitants. The Summit House was among the busiest hotels on the summit. Research on the hotel by Mahlon J. Baumgardner indicates that James Riffle, whose name appeared several times in the Commonwealth records, first owned the hotel and, most likely, constructed it. The hotel was serving railroad guests as early as 1837, and further research in period newspapers might reveal an even earlier date. Some of its guests might well have been such prominent figures as Charles Dickens, Louis Kossuth, David Stevenson, and Michel Chevalier, all of whom traveled over the Alleghenies by the Portage Railroad.  

The "Summit Mansion House," as the hotel was called in 1852, still carried on a good business in that year according to the hotel's register. The 42-room frame structure still stands along Route 22 as one of the few remaining reminders of the Allegheny Portage Railroad period.  

After the Portage Railroad was abandoned, Summitville at first was drained of people, then flourished for a period as a fashionable summer resort, but, eventually, 

79. Day, p. 184; Mahlon J. Baumgardner and Floyd G. Hoenstine, The Allegheny Old Portage Railroad, 1834-54, (1952), pp. 9-10; Heydinger note: Hollidaysburg Register, Nov. 8, 1837, p. 3, c. 2, which stated that the passenger cars traveled over the road in nine hours, and stopped at the Summit House to dine. According to an article in the Altoona Tribune, Jan. 15, 1916, section 3, p. 8, "Where the old Portage crossed the National Turnpike which was the main street of the town, there stood a hotel known as the Summit Inn . . . [which sheltered] . . . Charles Dickens, Louis Kossuth, William H. Harrison, who were entertained here for three days on their way to the inauguration of the latter as President of the United States." This information has not been verified by this researcher. The location of the Summit House at the railroad and turnpike crossroads, suggests it might be the same structure that J. H. B. de­scribed in 1834.  

80. Baumgardner and Hoenstine, pp. 22-35, show a photographic copy of the register, just for the month of June. The original is held by the Blair Co. Historical Soc. in Hollidaysburg.
with the development of transportation, the town—now called Cresson—experienced a decline in population from which it has never recovered.  

Plane No. 6 (Section 36)

The Skew Arch Bridge

As part of the superstructure of the road, Engineer Welch approved a stone bridge for section 36 to allow the turnpike to cross over the railroad. In July 1832 a contract was let with J. Fenlon, A. & J. Darlin, and R. Kininmouth to construct this, the only bridge built along the railroad purposely for a road. Some time in 1833 the bridge design was altered to a skew arch in order to avoid an inconvenient bend in the turnpike road on the steep hill from the head to the foot of Plane 6. The Commonwealth also authorized a necessary change in the turnpike alignment where it crossed the railway, thereby cutting off Thomas Lloyd's coal mine access and destroying his platform and fixtures for the delivery of coal, presumably to contracted wagoneers. This bridge, completed by 1833, still stands, in good condition, about a half mile down from the head of the plane. The only repair to the bridge during its twenty odd years of service was to the wing, which, in 1849 was rebuilt because it had given way.

The Railroad Structures

As at Plane 5, James Ray and John Devlin on April 1, 1833 won the bid to build both dwelling houses at Plane 6, at the head and foot, the former to cost $850, and the

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81. The Borough of Summitville was organized in 1851 and approved that year by the General Assembly of Pa. Baumgardner and Hoenstine, p. 12. In his The Valley of the Conemaugh, published in 1865, T. Chapman noted that Summitville stood decayed since the sale of the railroad. Heydinger note: The Altoona Tribune of Sept. 19, 1895, p. 5, referred to Cresson Springs as a summer retreat.

latter, $540. On the same date a contract was let with James Stackpole, William Woodburn, and H. Simonton to erect the engine house and road shed at the head, and the road shed at the foot of the plane. The contract included a 15-foot well to direct water to the engine house. 83

On May 24, 1834, the Commonwealth contracted with James Ray to grub, clear, and fence the two dwelling house lots, and by the end of 1835, had paid Ray $177 for the job. In June of 1834 James Stackpole, Casper Dull, and Hiram Willis won the contract for the second engine house, store room, and coal shed at the head of the plane, and were paid $1,589.49 for their work. 84

Within the first two years of operation the structural and mechanical features of the engine house began to prove faulty, due in part to a poor water supply at the head of the plane, and also to the steep incline of the plane. In 1836 the water caused such injury to the boilers of the engine house that a contract had to be let with Samuel Lemon to construct 1,800 feet of pipes from his stream south of the Lemon Mansion House to the engine house. 85

Moreover, that year the superintendent of motive power and transportation realized that at Plane 6, as at Planes 5, 7, and 8, the steam generated by the boilers was not sufficient to do the work without delay, and that at these exceptionally long and heavy grades a fourth boiler was needed for each engine. To compound the problem further, the foundations under the old engine at Plane 6 were, in 1836, in a shattered and dangerous condition, and had to be taken up and laid anew; in the process, it was necessary to bind the pit walls together with strong timbers and bolts. 86


84. Ibid., pp. 84 and 138; Table 6, PHJ 1835-36, App. to Vol. 2, p. 67; McClurg Wade & Co. built the second engine for the plane at a cost of $3,825. Table 5, same as above.


These extensive repairs on the engine house, its machinery and water supply in 1836 seemed to be sufficient for two brief years, after which the supervisor of repairs noted that the foundations again needed repair, and that the stacks had cracked and needed partial rebuilding. The cost of repair on the foundations, with masons working 28 days, and laborers 40 days, amounted to $99.05. In 1839 the engines themselves required some extraordinary repair. 87

In 1840, after Engineer Morris had noted the deficiencies of the engine house stacks along the road, the sidewall and flues at Plane 6 engine house received repair. By 1841 the stacks needed rebuilding and the leaking engine house roof some repair. By 1844 the engine foundations also needed rebuilding, and in 1846 one of the engines was taken up for repair. In 1849 new boilers were installed and two new smokestacks of brick were constructed on the engine house. In 1850 a new shed and engine houses were erected at the plane, and the next year, new foundations were laid for the north engine, and new boilers erected. 88

In 1852 the stationary engine on the north side exploded, causing the death of three men, and material damage to the shed and machinery. A new set of boilers costing $3,780 was installed, as well as new stacks. No other major repairs were reported for the engine house before the road was closed in 1855. 89


Repairs on other structures or features, as well as additions to Plane 6 were also noted in the annual reports. In 1840 workers had to rebuild the wall that fell upon the Plane 6 embankment, and in 1841 one of the culverts received repair. Six years later the culvert at the foot of the plane gave way and was permanently repaired. Also in 1847, the dwelling house at the head of the plane received a new foundation to prevent the house from falling.  

Additions to the plane did not get reported until 1851, when a new cistern was installed at the head of the plane, and materials were furnished for a large shed; however, there is no evidence of the shed's ultimate construction.

The Lemon Tavern and Coal Mine

Research has already been completed on the tavern and coal mine at the head of Plane 6 which Samuel Lemon built, owned, and operated to his great profit during the 1830s and 40s. Suffice it to say that Lemon's 2-story stone tavern, without the stone wing, dates to c. 1831-32, and that Lemon was selling coal from his coal bank across the tracks, north of his tavern, as early as 1839. By 1840 Lemon had constructed a wharf along the north side of the track, about five hundred yards west of the engine house, to convey his coal by freight cars to Hollidaysburg, as well as to the engine houses he had contracted with the Commonwealth to supply. In 1837 a contract with Samuel Lemon to supply water by pipe from his spring mentioned another structure on the Lemon grounds, that of a spring house somewhere south of the "Mansion House." The location of the spring and house has not yet been determined.

By the mid-1840s Lemon was one of Cambria County's wealthiest citizens. In 1848 he owned a carriage, several horses, and several head of cattle, which he undoubtedly housed somewhere near the tavern. Specific information on Lemon's stables and/or barn has not been uncovered, but if it stood near the house, it may have been one of the three unidentified structures on the Robert Faries map of 1850.

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Lemon no doubt also built a structure or structures for his mining operations, one of which might have been depicted as the unidentified log house diagonally across from the Lemon House and north of the track in one of George Storm's paintings.°

The remains of what has been identified as an abandoned stone quarry stands in the woods about a quarter mile to the northeast of the Lemon House. Historical research, however, did not uncover any mention of a stone quarry on the premises, nor did Lemon's name appear among the contracted suppliers of stone blocks for the railroad. There is a likelihood that Lemon did use the local stone, which often lay naturally in blocks, to construct his tavern.°

Plane No. 7 (Section 37)

All the major construction work at Plane 7—the engine house, sheds, and dwelling houses at the head and foot—went to William Brown and Merick Sawyer on April 1, 1833. In addition, they laid 1,116 feet of wooden water pipes to the engine house. Despite $15 deducted for bad work, the contractors received $5,883 in payment.°

In May 1834 James Stackpole was contracted to do the grubbing, clearing, and fencing of the two dwelling house lots, and received for this task $422.97—higher wages than

92. See, The Lemon House, Historic Structure Report (Feb. 1972) by this writer. The maps, contracts, tax assessments, and illustrations supporting the above information can all be found in that report.


any other of the contractors for such work at other planes. In June 1834 A. & W. Burchfield won the contract for the second engine house, store room, and coal shed, and in 1835, was paid $2,237.87. 95

The high prices for work at this plane reflect the difficult terrain of the east side of the mountain. As at planes 5, 6, and 8, the long and heavy grade impaired the operation of the railroad, and put a strain on the engine house. In the winter of 1836-7, the shattered and dangerous foundations were taken up and laid anew, after the pit walls had been bound together with strong timbers and bolts. In addition, a fourth boiler was proposed for the engine house to provide the needed steam power at the plane head. 96

The operational problems at Plane 7 engine house repeat for the most part, those at Plane 6. In 1840 the sidewalls and flues were repaired; in 1842 the leaking roof was repaired; in 1847 a new set of cylinders were required, and one of the engines taken up for repair; in 1849 a new foundation was put under a portion of one engine; in 1850, new boilers and stacks were installed; in 1851 another new stack was added; and in 1852 the engine house burned down and both engines were badly damaged. Consequently, the foundation on the north side was rebuilt and the engine on the south side repaired for a sum of $6,493. After 1851, when a new cistern was installed at the head of the plane, no other additions or repair work were mentioned at the plane, no doubt because the railroad laborers were concentrating their efforts on the new road to avoid the inclined planes. 97

95. Contracts, Ibid., pp. 86 and 159; McClurg Wade & Co. provided the second engine for $3,829. Tables 4, 5, and 6, PHJ 1835-36, App. to Vol. 2, p. 67.


Plane 8 (Section 38)

Railroad Construction

The construction and development of Plane 8 from 1833-35 was divided among five contractors: in 1833, George Greer and Henry Kirby agreed to build the engine house and shed at the head, and the shed at the foot of the plane, and H. S. Patterson, James Dickey, and Joseph Clark signed a contract to construct the dwelling houses at the head and the foot. In 1834 I. & D. Anderson contracted to lay 4,530 feet of water pipes to the engine house, the longest pipe line along the road; James Stackpole contracted to fence the dwelling houses, and Aquila and William Burchfield won the contract to erect the second engine house, store room, and coal shed.

As at the other east slope planes, Plane 8 suffered many problems with the engine house. The foundations under the old engine were taken up and laid anew, after the pit walls had been bound together with strong timbers and bolts, in 1836-7; but only two years passed before the foundations again needed repair. In 1840 the sidewalls and flues received repair, and the next year the stacks had to be rebuilt. Also in 1841 the water supply for the engine house failed because the pipes leaked so much, and 3,600 feet of pipes had to be relaid. The roof of the engine house received repair that winter, also because of leakage. In 1845 a new boiler was installed, and in 1847 an engine was taken up for repair. In 1848 the engine house received four new boilers, a new stack, and new foundations for the boilers and furnace. The superintendent explained that the old foundation had been constructed upon an embankment, on a steep mountain side, which was sliding. It had become necessary to sink the pits for the new foundation about thirty feet in depth to obtain a permanent foundation. The

98. Contracts, 1851-55, Box 2, Vol. 4, pp. 86, 141-143, A.P.R.R., Div. Rec., BCC, RG 17, Pa. A.; Table 7, PHJ 1834-35, App. to Vol. 2, p. 69; this table shows that miscellaneous expenses accrued by I. & D. Anderson were for ditches, boxes, etc. The work expenses on this plain were the second highest on the road. See also Tables 4 and 6, PHJ 1835-36, App. to Vol. 2, p. 67.
justification for such an elaborate scheme was based on the fact that since Plane 8 had the longest and steepest plane, it was good policy to do repairs in the most substantial manner. 99

More repair work was needed in 1849-50; in the former year new machinery pits were dug at the foot of the plane, and in the latter year, new boilers and stacks were installed in the engine house. In 1851 new foundations were again laid under the south engine, and new stacks erected. No other mention after 1851 was made to work at the plane. Only one other addition to the plane was noted, and that was a cistern in 1851. 100

The Brick Yard

Peter Shoenberger's brick yard somewhere near the foot of Plane 8 appears on a sketch found in the Pennsylvania Archives. See illustrations for the location of the brick yard and siding.

Plane No. 9 (Section 40)

On April 1, 1833 contracts were let with Patrick Smith and Hemperly to construct the engine house and road sheds at the head and foot of the plane, and with Samuel S. Riddle and John B. Buchanan to erect the dwelling houses at the head and foot of Plane 9. In May and June of 1834 contracts were let with Charles Gailey to grub, clear, and fence the dwelling lots, and with William Robson and David Borrers to


build the second engine house, store room, and coal shed. Also in 1834, Anderson and Dean dug a well 185 feet deep, and in 1836, 6,940 feet of wooden pipe were laid to the engine house. 101

By 1839 locomotive engines had been introduced to the level between Planes 9 and 10, and to store their fuel, a wood shed had been constructed. In the same year, Supervisor Moorhead reported he had begun construction of an engine shed at the head of Plane 10 to protect the locomotives. The next year Engineer Morris reported that "the engine house between nine and ten" had been completed. 102

As at other planes, repair work for the stationary engine house was almost a perennial expense. In 1839 it took a brick layer and a laborer 3 days to repair the stack at Plane 9 with brick and limestone. By 1841, however, the stack needed rebuilding, and the roof of the engine house needed repair to stop the leakage. In 1845 a new boiler was installed; in 1847 an engine was taken up for repair, and the bed of timbers under it renewed. In 1850 and 1852 the engine house again received new boilers, and in the latter year a new stack was also added. The only addition to the plane was in 1851 with a new cistern. 103


Railroad Structures

On April 1, 1833 all the major construction work for Plane 10 went to George Greer and Henry Kerby; they put up the engine house and shed, a dwelling house at the head of the plane, and the shed to protect the machinery and sheaves at the foot of the plane. The dwelling lots at the head and foot of the plane were cleared, grubbed, and fenced by William Arbel in 1834, and the second engine house, with its store room, and coal shed, was constructed by Jesse Woodcock and Davis S. Rhule in 1834. In order to provide adequate water for the engine house, a separate contract was let with Anderson Deen, to bore a well. Samuel Anderson deepened the well and laid 9,550 feet of wooden pipe to the engine house in 1835, for $3,099. In 1837 a water station, two turnabouts, and a large wood station were constructed at the foot of the plane to provide adequate supplies and facilities for the locomotive engines running from Hollidaysburg to the foot of the plane. The water station required 1,200 feet of wooden pipes to connect it with the water source, which has not been identified. 104

The plane lost one structure and gained another in 1840: the shed at the foot of the plane broke down under the weight of the snow and the superintendent decided not to rebuild, as a wooden platform served the purpose of protecting the machinery and sheave pit adequately; and, at the head of the plane, a locomotive engine shed was constructed at a cost of $375. The only other addition to the plane was a cistern in 1851.105

The stationary engine house at the head of the plane seemed to have exceptional problems with its stacks and boilers. In 1838 a stack cracked and required extensive repairs which were carried out in 1839 by the labor of bricklayers, who worked a total of 91-1/2 days, and of


laborers, who worked a total of 122-1/2 days, at a sum cost of $512. Altogether, 23,000 bricks and 187 bushels of lime were used for the stack repair. And only two years later, in 1841, the stack again required rebuilding.  

Both in 1845 and 1846 the engine house received a new boiler; they lasted until 1846, when one of them, attached to the south side stationary engine, exploded, entirely destroying the engine house, furnace, and stacks on that side of the road. The repair estimate included four new boilers, for $1,500, building a new stack and foundation wall for $600, setting boilers and repairing the engine machinery for $300, and building the engine house, including the materials, for $400.  

Even though the engine house received new boilers in 1849, the next year the Canal Commissioners reported that repaired old ones had been set at the plane. By 1852, moreover, the engine house not only received new boilers, it also had its machinery much repaired, and new stacks added. Except for the addition of a cistern in 1851, these were the last improvements made at Plane 10.  


The Tan Yard

Among the contracts for 1834 was one to David Robinson for "supplying water pipes to tan yard" on section 42, or Plane No. 10. No other report ever made reference to this tan yard.109

Hollidaysburg Level

The Mountain House

In the stretch from the foot of Plane 10 to Hollidaysburg, one of the major features along the road was the Mountain House, "a spacious and showy hotel," situated about one mile west of Hollidaysburg, and six miles south of Altoona. It was here at the "y switches" that the New Road until 1855, and the Pennsylvania Railroad until 1854, met the Old Portage to cross the mountains by the inclined planes. In 1853 the Canal Commissioners ordered that all the express cars crossing the mountains, going east or west, be weighed at the Mountain House scales, and the fees returned to the proper collector at Hollidaysburg.110

The Mountain House was a large frame building, two stories high in the central part, with two wings each three stories high. A verandah, with supporting ornamental cast iron columns, stretched across the front and east end of the structure, and broad steps brought the visitors up to the porch.111

The Mountain House apparently was the scene of many memorable receptions and social functions. One such occasion occurred on Jan. 17, 1852, when the Hungarian revolutionary hero, Louis Kossuth, and his suite were received at the Mountain House en route over the Alleghenies. After the Portage Railroad was abandoned, the popular hotel was razed and the material taken to Summitville, where the hotel was rebuilt on its original form. Today the hotel no longer exists, and research has not uncovered its fate.112


111. Blair County's First Hundred Years, p. 165; see Illustrations.

Duncansville

In 1833-34 Samuel Duncan and Thomas McNamara built the "Portage Iron Works" just west of Hollidaysburg, on the site around which Duncansville developed. Their rolling mill in 1833 had a daily capacity of fifty tons of finished iron, and employed about 140 men. Shortly after completing their mill, these two individuals also built a nail factory near to the Iron Works, and alongside the railroad. A sketch of the Portage Iron Works found among the official records in the State Archives reveals that dwelling houses also were located near these manufacturing establishments.¹¹³

Other industries also grew up in the area: George R. McFarlane built along Blair's Creek, a little west of what became known as Duncansville. His foundry produced the first car wheels of the Portage Railroad cars. In 1842 Alexander McKinney constructed yet another foundry in Duncansville which apparently only operated from 1848 to 1851, under the ownership of John M. Gibbony. As these industries grew, Duncansville emerged as a community with its own post office and its own identity.¹¹⁴

¹¹³. Africa, p. 33; Blair County's First Hundred Years, pp. 384-5. See Illustrations.

¹¹⁴. Ibid.
CHAPTER V

HISTORICAL BASE MAP: HOLLIDAYSBURG AND JOHNSTOWN

Hollidaysburg

The Hollidaysburg Viaduct

With the decision that Hollidaysburg would be the eastern terminus of the railroad, it was necessary to construct a viaduct over the Beaver Dam branch of the Juniata River before the railroad traffic could pass westward to the inclined planes. Sylvester Welch described the viaduct in his report of 1832, and an engineer's drawing of it has survived in the map collection of the Pennsylvania Archives. Period maps and paintings also show the general location of the bridge, just south of the one used for the turnpike traffic.¹

On June 19, 1838, a flood on the river carried away a portion of one wing, shattered a parapet, and injured the foundation of the viaduct. The problem, railroad officials explained to the Board in 1839 and 1840, was that the viaduct needed more water passages in order to discharge extreme floods. "Justice to the people of Gaysport and the safety of the public works equally demand an enlargement in the water way," Engineer Morris insisted in 1839. His estimated cost for such alterations came to $1,000.²

The bridge continued in operation without any alterations, however, for Engineer Morris noted in 1840 that the viaduct had received no attention since the big flood of 1838, and that floods since that date had only confirmed his opinion that the viaduct needed a third span. Construction could easily be done, he added, on the eastern end of the viaduct, where the bottom of the stream was solid rock.³

¹. See Appendix E and Illustrations.
Although in 1841 John Dougherty once more repeated the request for another water passage, it is very unlikely that the necessary funds were ever released by the Canal Commissioners, for in 1846, citizens of Gaysport, on the southwest bank of the Juniata, submitted a petition saying that the viaduct presented a constant danger to the community because its passages, which were not large enough to allow water and ice to pass freely, blocked up and caused overflows in the town. Furthermore, the petition added, the walls of the viaduct were giving way and the viaduct itself shook "very much with the train going over." Oddly enough, no other mention of the viaduct could be found to indicate whether the construction of the bridge was ever altered during the last six years of the Portage's operation out of Hollidaysburg.\(^4\)

**The Railroad Structures**

1. Depot and Workshop

Although no specific description was given of the location of the railroad depot with its machine shop, side railway, turnouts, and turning platform, the available information indicated that it was constructed in Gaysport, just to the south of the track and west of the Hollidaysburg viaduct. The report of 1835 notes that Thomas Jackson received $600 for the depot lot; this information coincides with the surveys of 1842-47 which state that the Commonwealth purchased lots 22-24, and 65-68 in Gaysport, all from T. Jackson. The property involved bordered on Railroad Street to the north, Potters Alley to the south, and Jackson Alley to the east. In addition, a contract let in 1837 to complete the depot specifically mentions Gaysport as the location. Finally, a town map of Hollidaysburg dated 1851, locates the CRR Depot (Central Railroad Depot) at this site.\(^5\)


\(^5\) "Report of S. Welch," PHJ 1834-35, App. to Vol. 2, p. 64; Table 1, PHJ 1835-36, App. to Vol. 2, p. 67; Surveys of Property 1842-47, p. 76, Engineering Records, Box 2, BCC, RG 17, Pa. A.; Contracts 1851-55, Box 2, Vol. 4, p. 152, Div. Rec., BCC, RG 17, Pa. A. See illustrations. No satisfactory explanation has been found for why the depot on the 1851 map was labeled Central Railroad, as that name commonly referred to the privately operated Pennsylvania Railroad.
The first contract for the depot complex, let to H. L. Patterson and John Lowe in January of 1835, included a depot, machine shop, engine room, coal house, blacksmith shop, and branch railway. The work required varied from masonry in the foundations, to stone work in the base courses and steps, casing for the yard walls, brick work for the caps and bases of the pilasters, (to be of cut stone), and, carpentry work. Specifications for constructing this type of complex were located in the railroad records, and included in the appendices of this report.6

The depot complex also included a brick carpenter shop and a water station, both of which received separate contracts on January 10, 1835. The former went to John Barr, Jacob Taylor, Henry Kring, and John Hetherington, and the latter went to John Lythe, whose work included digging and walling a well, putting in a pump, and furnishing and installing a wooden water tank.7

By the end of 1835, construction on the depot, machine shop, and carpenter shop had only been completed to the foundations, (which carried up to the level of the railway), when work was suspended for lack of funds. In his report for 1836 Superintendent Graham suggested that construction be completed on the depot or engine shop because since the work had been discontinued, it had been left in an exposed condition and was subject to injury, and because if locomotives were intended for the Hollidaysburg level, it would be practical to have it ready for use.8

Patterson and Lowe, however, proved to be unsatisfactory contractors, and after an inspection of the work which they had done up to the spring of 1837, the Canal Commissioners approved a second contract with George Murray and John Ferguson to complete the depot. This contract contained different and more specific information than the original one. They were to construct a brick depot or

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6. Contracts, Ibid., p. 153; see Appendix I for specifications.
house for locomotive steam engines, a machine shop, a blacksmith shop, coal house, yard, walls, and a carpenter's shop in Gaysport, near Hollidaysburg. Alterations from the original plan included dispensing with the ornamental work in front of the depot, and omitting the turn rounds in front of the building.ι

By the next year, the depot and smith shop had been completed and were in good condition, but poorly supplied with tools. In his annual report for 1838, W. Roberts not only suggested that the blacksmith shop have a small steam engine for heavy work on engines, but that the depot be either floored or paved. The former suggestion wasn't acted upon until 1841, when one of the locomotive engines on the road was converted into a stationary engine to drive the lathe, drill, and other machinery of the shop. The latter suggestion was included among the repair work for the depot reported for 1839.ι0

In 1841, Engineer Morris recommended an extra shed for the Hollidaysburg depot so that all the locomotives and tenders used on that end of the road could be properly housed during the winter. Although no specific reference was made to its construction, it is probable that such a functional structure would have been funded.ι1

In 1850 the Canal Commissioners reported that a new shed for passenger cars and for the repair of boat trucks had been erected at the depot; in 1851, that new foundations had been put under the large shed at the depot; and, in 1852, that a new depot had been constructed for the locomotive engines. No further information has been found on these later structures.ι2

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Describing the railroad structures in terms of 1946 features in Hollidaysburg, the Blair County Historical Society wrote:

The Portage engine shed at Hollidaysburg was located a short distance west of the present Pennsylvania Railroad passenger station and was of frame construction. The repair shops were located on the site now occupied by the foundry of McLanahan and Stone Corporation. The passenger station, or depot, as it was then called, was on the site now occupied by the freight warehouse. The weigh scales of the Portage were located at Gaysport, on the south side of the track, near the engine shed. The weighmaster lived in a brick house at the west end of Wall Street. The Canal and Portage office was in the "Smoothing Iron" building, which stood at the intersection of Blair and Juniata Streets.¹³

None of the features described in the 1946 account can be pinpointed on more recent maps, and should a 1940s map be located--efforts have already been made by Historian Ronald Wilson at the park--it would clarify the location of the structures discussed above.

2. Weighscales and Weighmaster's House

The weighscales and weighmaster's house at the two terminal towns have already been discussed in general terms in Chapter II. At Hollidaysburg the shed over the weighscale was constructed in 1834 by William Greer. Although the specifications for constructing the shed for the weighscale and weighroom, and the gate and sidewalk, have not been located, portions of Greer's contract, as shown in Appendix H, give some indication of the construction materials used, at least in the foundations. The shed itself undoubtedly was of frame construction. Its location west of the Hollidaysburg viaduct is given on the 1851 map of Hollidaysburg.¹⁴

¹³. Blair County's First Hundred Years, 1846-1946, p. 163. See map of 1851 for street locations. In 1883 Simpson Africa noted, p. 51, that Michael Kelly and J. C. McLanahan began business as founders and machinists, and that they erected new buildings on the site of the old Portage Railroad station. This seems to verify in part the information provided by the Blair County Historical Society about the McLanahan and Stone foundry.

Almost nothing other than the construction material is known about the weighmaster's house. The house and depot structures were the only ones on the line to be built of brick, no doubt to symbolize the permanency and grandeur of the public works and the prestige of the weighmaster. John Lythe won the contract to construct the dwelling in May of 1834, and for his work he received $1,178.78. The next year the house lot was fenced by Robert Bond.15

According to the annual reports, the only changes made at the weighscales occurred in 1852 and '53, when new weighscales were ordered, and a new office was constructed.16

The Basin Slips and Tracks

To give adequate provision for the expanding traffic and for the changes made on the Portage Road, the slips and tracks planned for the Hollidaysburg basin were added to several times between 1833 and 1852. In Chapter II the general layout of the slips, piers, branch railways, and Commonwealth lots at the Hollidaysburg basin, as described by Sylvester Welch in his 1833 report, has already been given. It appears from a period map of 1834 that the State originally provided only two tracks along the north side of the lower basin; but, by 1838, according to a report of that year, there were four tracks, laid with plate iron on a wooden superstructure, opposite the lower basin.17

15. Ibid., p. 148; CCJ, June 11, 1835, MB & I, Box 3, Vol. 1, p. 1718, BCC, RG 17, Pa. A.
17. "Report of W. Roberts," PSJ 1838-39, App. to Vol. 2, p. 399; see map in Illustrations. The Blair County Historical Society gave this description of the basin which was taken from Blair County's First Hundred Years, 1846-1946, p. 164: "The canal basin at Hollidaysburg was 1,695 feet long and 120 feet wide, extending along south Juniata Street from Montgomery to Jones Streets. The upper basin . . . was formed by damming the waters of the Beaver Dam Branch of the Juniata River. It was about 1,100 feet long and 120 feet wide. The two basins were connected by a canal about 600 feet long."
Even with four tracks, however, traffic and trade had increased so by 1839 that one citizen complained, "There are at present four tracks, here, two of which for the whole length of the Basin is constantly occupied with old or idle cars belonging to the different Forwarding Houses at the upper end of the Basin to the great hindrance of those at the lower end." He urged that the Board authorize a new track. Instead, the Board resolved in 1841 to keep the outside track along the basin open for public use and to construct one or two crossings at such points as the engineer designated.  

Perhaps the boat plane constructed at the head of the basin in 1842 to transfer the new section boats from the canal to the railroad tracks, helped to alleviate the congestion at the lower basin, for this plane, or inclined track, apparently connected with the main tracks from the upper basin via a branch railway on Bedford Street, in Gaysport. At least no other mention was made about additions or changes to the tracks and slips at the basin until 1847, when the superintendent admitted that the tracks from the lower end of the basin had, for several years, been taken up to be used for the repair of other sections of the road.  

18. Francis McGrath to the Board, May 19, 1839, Reports and Misc. Docs. 1829-43, Box 8, Vol. 2, p. 80, A.P.R.R., Div. Rec., BCC, RG 17, Pa. A.; J of BCC, Mar. 24, 1841, PSJ 1842, 3, 414; perhaps one of the crossings was at Bingham's Warehouse, where Superintendent Snodgrass suggested one be placed in 1839, to help channel traffic to the lower end of the basin. John Snodgrass to James Clarke, Esq., May 18, 1839, Reports and Misc. Docs., Ibid., p. 89.  

19. "Report of J. Snodgrass," PHJ 1843, 2, 156; Blair County's First Hundred Years, 1846-1946, p. 164; "Report of T. Power," Pa. Exec. Docs. 1847, p. 7. There seems to be a conflict in reporting, for, in the same year, the Canal Commissioners authorized to contract with John Dougherty for the purchase of his slip or double track plane, including all the apparatus and fixtures, as well as necessary real estate for the use of the plane for transferring section boats from the basin to the railroad. J of BCC, Aug. 16, 1842, PHJ 1843, 2, 594. Perhaps having bought Dougherty's plane, the railroad officials made additions to it, thus reporting that the boat plane was in construction at the end of the year. The map of 1851 shows a boat plane in the described location.
Finally, in 1850, the Board authorized the last recorded change to the basin: new side tracks at the depot and packing landing.20

Since the financial success and support of the railroad depended largely on the commercial exchange developed, the Board often granted permission to private interests to construct lateral railways, sideways, and turnrounds from the main tracks. A list of these additions to the road have been incorporated in Appendix L of this report.

The Town, Its Growth from the Railroad

Hollidaysburg in 1831, before the canal and railroad had been constructed at its southern end, was a small village of only 72 inhabitants. A gazetteer of the state published in 1832 listed only 30 houses, four taverns, four stores, and two blacksmith shops constituting the village; the commercial interests no doubt served the traffic passing over the Northern Turnpike, which passed through Hollidaysburg on its way west to Pittsburgh.21

Hand in hand with the construction of the canal, basin, and railroad in Hollidaysburg, went the erection of hotels, taverns, warehouses, forwarding houses, stores, and newspapers to meet the demands of the anticipated transportation center. By 1835, Hollidaysburg was described as "a neat, thriving town." The town newspaper that year commented that the population had swelled to 1,209, and that there were more good houses going up in Gaysport than Hollidaysburg, but that they both in reality, were the same town, as they were only separated by the upper basin. By 1837 the prosperity of the town could be realized by the fourteen transportation companies which had set up operations out of Hollidaysburg.22

22. "Tour in Pennsylvania," Poulson's American Daily Advertiser, July 18, 1835, as printed in Hazard, 16 (July 1835), 59; Africa, pp. 63-4; the newspaper cited by Africa was the Hollidaysburg Sentinel and Huntington, Cambria, and Bedford County Democrat. Africa lists 11 of the Hollidaysburg transportation companies, and their agents on p. 64. Among the better known were the Reliance Co., the Union Line, and the Pennsylvania and Ohio Line.
None of the maps or illustrations that have been found of Hollidaysburg pre-date 1850, but Sherman Day gave a picturesque description of the town in his published work of 1843:

Now the two boroughs of Hollidaysburg and Gaysport, separated only by a small branch of the Juniata, have the appearance of one town, and are said to contain, together with the environs, upwards of 3,000 inhabitants. Hollidaysburg borough alone contained 1,896 by the census of 1840. It is the centre of a fruitful country, now rapidly opening to cultivation, and teeming with abundant resources both mineral and vegetable. . . . There are at this place Presbyterian, Methodist, Lutheran, Baptist, Catholic, and African Churches; six public schools, one classical school. . . . There are also several foundries and machine shops, a large steam flour-mill, a screw dock, a marine railway; ten or eleven forwarding houses, with immense warehouses; and several spacious hotels.  

At the time of this description at least ten hotels had set up business in Gaysport and Hollidaysburg, for in 1843 that many had listed themselves prepared to take in boarders for the military encampment coming to town.  

As would be expected, forwarding companies constructed their warehouses beside the piers and slips, and foundries and factories cropped up on or near the basin edge, to benefit from the trade facilities of railroad and canal. A map of Hollidaysburg and Gaysport in 1851 labels the structures around the two basins, but does not necessarily reflect Hollidaysburg's basin area at its peak, for by


24. Africa gives a list of the hotels and their proprietors, p. 70. While some information as to the location of the hotels can be found in the maps and drawings of Hollidaysburg in Illustrations, a more complete listing could be made by inspecting deeds for the hotel keepers' names, or by searching the local newspapers for period advertisements.
that date a bill in Congress was near passage to disband the old route of the railroad, and to seek a new portage without inclined planes. The burgeoning town of Altoona by 1851 was already beginning to supercede Hollidaysburg as a railroad-trade center.

The only other pictorial evidence of Hollidaysburg when the Portage Railroad was still in operation is a sketch of the town from Chimney Rocks, in 1854. While not in perspective or proportion, the drawing gives some visual configuration to the structures which the map only indicates by location. The scene was painted in the last year that the Allegheny Portage Railroad ran out of Hollidaysburg. Today several decaying brick structures along the north side of Juniata Street stand as reminders of the days when the Portage trains rattled over the tracks between the basin and Juniata Street.25

Johnstown

The Railroad Bridge

On October 15, 1834, the Commonwealth contracted with Robert Rankin and John Charters for a bridge across the upper end of the Johnstown basin, and for a branch railway from the main track, across the bridge, to the depot. Apparently, the specifications called for a drawbridge, for that was how it was referred to by S. Welch in 1833, before the contract had even been let. At the end of 1835 the bridge and branch railway had been completed and their cost estimated at $3,810.06, all of which had been paid to the contractors by October of the year.26

25. See maps and sketch in Illustrations. Both the New Portage and the Pennsylvania Railroad passed through Altoona, several miles to the north.

The only other mention of the bridge appeared in 1847, when the superintendent reported that a flood on the Conemaug River had washed it away and the State would need about $400 to rebuild the bridge. The location of the bridge shows clearly in the 1854 T. Doran map of Johnstown.27

The Railroad Structures

1. The Depot Complex

On the same day Rankin and Charters received a contract for the railroad bridge, Adam and Thomas Darling won the contract to construct a depot or locomotive engine house, machine shop, and blacksmith shop, together with yards, walls, and gates; and William McQuown, Robert Crighton, John Snodgrass, and James Millinger won the contract to erect a brick carpenter shop. The final contract for the depot complex was let in January 1835, again to Adam and Thomas Darling, to build a water station similar to the one contracted for at the Hollidaysburg basin.28

The land for the depot was purchased from S. Welch and S. Jones, as part of their property north of the basin and south of the Conemaugh River, known as "the Island." The nearly two acres cost the Commonwealth $400, while the estimated expense for the depot complex, as reported in 1835 amounted to $7,708. All the construction on the site was nearly completed by the end of that year, with exception to the carpenter shop.29

27. T. Powell to BCC, Oct. 30, 1847, Coll. & Sup'r. Rep. 1845-47, 49, Box 3, p. 97, BCC, RG 17, Pa. A.


While there seem to be no surviving photographs or drawings of the railroad depot, the 1854 map of Johnstown shows the layout of the buildings, and their comparative size with others along the basin. According to the annual reports, no structures were added to the complex, but some additions were made. In 1839 the depot received a wood floor, and in 1840 the depot was enlarged by adding another story to the smithshop. In 1850 the locomotive shed was added to, and the next year it was given new foundations.  

With preparations for the new road to avoid the inclined planes, Johnstown received in 1853 a new locomotive shed, new turntable, and siding, the location of which have not been established. It seems likely, however, that the Canal Commissioners would have retained the old depot and simply have built the additions for the new road around the standing structures.

The Johnstown water station in 1839 received 1,210 feet of permanent wooden pipes which supplied water to the weighmaster's house, and were also capable of providing water for the locomotives on the level. The exact location of neither the water station nor the weighmaster's house has been determined, but the 1,210 feet of pipe most likely indicates the approximate distance between the depot complex and the weigh area.

2. Weighscales and Weighmaster's House and Stables

No map identification or contemporary written description has been found for the Johnstown weighscales, weighmaster's house, and their associated features, but Storey


explains, "The weightscales . . . were on the south side of the road, just below the graveyard." The graveyard no doubt bordered the Catholic Church just east of the basin area.

The information included in the contract for the weightscale shed at Hollidaysburg pertains as well at the Johnstown scales. The same holds true about the contract for the brick weighmaster's house. The contracts for both the former and latter structures in Johnstown were let to Arnold Downing in May 1834, at an estimated cost, for the house, of $1,125. In 1836 the last details of the house were still being paid for: John Shaffer received $18 for making steps, finding materials for banisters for the steps, and for making the door and its frame. Jacob Fuller also received $1.50 for capping the chimney.

In July 1835, Christopher Denlinger received the contract to fence the weighmaster's lot, and the specific instructions, written into his contract, required him to build the fence "to consist of good Locust Posts and Pine or hemlock board and the boards to be placed vertically and fastened with nails to horizontal timbers let into the posts, such parts or side of the lot to be composed of palings as the Superintendent or Engineer may direct."33

Also in 1836 stables for the weighmaster's house were constructed, J. C. Graham supplying $44 worth of timber, and Jacob Young $5.62 worth of shingles for the roof.34

No doubt to service the new road, Johnstown received in 1852 and 1853 new weightscales and a new weightscale office; where they were located has not been ascertained, but it seems likely they were in the vicinity of the old weightscales and weighmaster's house.35


3. The Woodyard

According to Storey's History of Cambria County (1907), the woodyard stood on the north side of the railroad, opposite the old Catholic graveyard. The 1854 map of Johnstown shows a Catholic Church to the south of the road, just east of the basin area; this presumably, was the location of the Catholic graveyard to which Storey referred. Nothing more is known about the woodyard, but one might guess that the yard either had a fence around it, or a shed to protect the cut wood used for the locomotives.\(^\text{36}\)

4. Unidentified Structures

A study of the T. Doran 1854 map of Johnstown indicates that six unidentified structures at that date stood to the west of the "Five Points", near the head of the basin and the section boat boat slip. The map labels the area as the boat yard, but none of the annual reports of the railroad officials explain these buildings.\(^\text{37}\)

The Basin Slips and Tracks

As noted in Chapter II, the Canal Commissioners by the end of 1833 had laid out the Johnstown basin, and required from the private interests the construction of slips and piers according to specific measurements. The engineer reported that year: "The pier and slips are constructed and ready for use, except the branch railway, which is not yet laid down." By 1838, there were four tracks opposite the basin laid with plate iron on a wooden superstructure. In 1843, Sherman described the basin area:

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36. Storey, 1, 355.

37. Storey, 1, 333, explains that the "Five Points" defined the area where Portage, Railroad, Church, and Depot (today, Fenton) Streets converged with the Portage Railroad, and where the land and water systems connected.
In the centre of the town, a large basin is formed by damming the Conemaugh, to accommodate the great fleet of canal-boats plying between this place and Pittsburg. The basin is surrounded by Warehouses, boat-yards, and other conveniences for receiving and delivering goods. Some eight or ten have forwarding houses here, and during the summer it is a stirring, busy place.\(^{38}\)

County historian Storey related that the four tracks between Railroad Street and the basin consisted of 5" x 8" ties, with strap iron spiked to a wood rail. Most of the warehouses that lined the south side of the basin had two sidings, one on either side, and a turntable to set the cars on and off the main tracks.

The track between the north side of the basin and Portage Street was built and owned by individuals, and at its end, near the waste weir, was a packet slip.\(^{39}\)

As far as the records indicate, few additions were made to the basin slips and tracks, except in 1845, when 650 feet of tracks were laid at the depot, and in 1842 when a boat plane was purchased by the Commonwealth for the use of the section boats.\(^{40}\)

The Town

Recollecting his earliest impressions of Johnstown, Solomon Roberts, surveyor and engineer for the Portage Railroad, wrote, "when I first saw the place . . . [it] was a very quiet village, with tall elder bushes growing in the streets." About the same time, Thomas Gordon was collecting information on Pennsylvania for his Gazetteer,


\(^{39}\) Storey, 1, 355. At the same time Storey explained that the packet slip remained in use for about 13 years, and that the main passenger boats were from the Express, Pioneer, Good Intent, and Leech lines.

which was published in 1832. He noted that Johnstown or Conemaugh was a post town in the southwest corner of Cambria County. "The village contains about five hundred inhabitants," he wrote, about sixty dwelling-houses, seven taverns, six stores, one mill, and a large forge. A basin for the western division of the Pennsylvania canal, in the heart of town has occasioned a rapid rise in the value of property here. The town is regularly laid out, on a plot of upwards of two hundred acres of ground, completely surrounded by mountains.41

The next contemporary account of Johnstown reflects the development which the public works brought to the quiet village in less than a decade. Well-built dwelling houses had gone up, many of them of brick; four churches—Catholic, Presbyterian, Methodist, and Lutheran—had been erected, all to serve the total of 1,377 residents of the borough and its extension. In stark and tragic contrast to the industrial town of 1972, Day’s description of Johnstown included, "No place can boast of purer water, and few of more salubrious mountain air."42

Clearly familiar with Johnstown and its Portage Railroad history, Storey elaborated in some detail about the town and the prominent citizens involved in the railroad and canal affairs. His account of the basin area, with its numerous warehouses, its railroad improvements, foundrys, stores, offices, hotels, and residences, fills in some of the business and social history related to the development of the railroad. Finally, the 1854 T. Doran map of Johnstown helps to conceptualize the railroad town as it stood after twenty years of growth and development promoted, in large, by the traffic across the Allegheny Portage Railroad.43


42. Day, p. 182.

43. See Storey, 1, 332-339 for further information on the transportation lines and their warehouse locations; on the hotels and their proprietors; on "the Island," and its development; on "the Five Points," where the railroad tracks and four town thoroughfares converged, and where much of the railroad traffic linked with the canal traffic.
RECOMMENDATIONS

Because there was such a plethora of official records at the Pennsylvania Archives, this writer was unable to spend any time in the collections of local newspapers carefully preserved by the Cambria and Blair County Historical Societies. It would greatly enrich and augment this research material to follow the development of the railroad through the eye-witness reports, the advertisements, and the editorials featuring the business transacted in relation to the road. The Cambria County Historical Society in Ebensburg, Pa., has a bound collection of the Ebensburg Sky, from which several of the better articles found in Hazard's Register were taken. The Blair County Historical Society in Altoona has a number of period newspapers which are spotty chronologically, but would provide a good insight on the public response to the railroad in Hollidaysburg, and may well contain pertinent information about the layout of the basin, which still remains relatively conjectural. From my knowledge, no historians, local or otherwise, have as yet taken on this type of project, despite the fact that several individuals in the historical societies have become enamored with the Allegheny Portage Railroad, and have written several articles on the subject.

While the park boundaries obviously cannot include the entire 36-mile trace of the Allegheny Portage Railroad from Hollidaysburg to Johnstown, recommendations for the preservation of the railroad's historic remains will concern the entire line.

1. In Hollidaysburg several structures along the north side of Juniata Street date to the peak years of the railroad, and some effort should be made to cooperate with the Cambria County Historical Society not only to study the historic use of these structures, but also to preserve and restore them to the historic period. To this writer's knowledge, the buildings have not as yet been considered for historic preservation.

2. Although the Hollidaysburg basin was drained and filled in at some date after the close of the Portage Railroad, its outline can still be discerned. Despite the visual distraction of the Pennsylvania Railroad's tracks running into the basin area, interpretive markers could assist the visitor to imagine the location of the basin slips and piers.
3. Within the park boundaries, along the trace of Planes 6-10, several of the railroad culverts still stand but are in a dilapidated condition. Steps should be taken to repair and maintain these historic structures, as they represent vestiges of the expertise applied to the masonry work of the railroad superstructure.

4. The interpretive story of the planes on the steep eastern slope of the Allegheny Mountains presents one of the most dynamic chapters of the railroad's history. The innumerable problems faced and overcome at these rocky, narrow plane heads, both with the human needs as well as with the mechanical needs, speak for the ingenuity and perseverance of the railroad personnel. The archeological diggings already completed at the head of Plane 8 have exposed the deep foundations of the engine house; efforts should be made to preserve these remains, to leave them protected but exposed, and to explain the unique struggle to keep the railroad in operation at these eastern planes.

5. Recommendations have already been submitted by this writer for the historic preservation at the head of Plane 6, where the railroad overcame its highest point, and where Samuel Lemon operated a successful tavern and coal mine. My initial proposal to restore the engine house, so that a live demonstration of the operation of an inclined plane could be achieved, must be modified. Because the research for this project did not uncover architectural drawings or detailed measurements for any of the engine houses, restoration of the building cannot, according to present policy regarding restoration of historic structures, be recommended. Having completed considerable research on the Allegheny Portage, it seems questionable that any such drawings or descriptions could be found at the Pennsylvania Archives, the Cambria County Historical Society, or the Blair County Historical Society. Nevertheless, the park historian maintains that engineers who have read the specifications for the machinery and engines of the engine houses, who have studied the archeological remains, and have seen the existing 1895 photographs of the engine house at Plane No. 6, assure him that a faithful reconstruction of the engine house can be made. If confirmation of their claims can be made to satisfy National Park Service standards, I strongly support the recommendation to rebuild the structure.

6. The Summit Hotel in Cresson represents one of the earliest and only remaining hotels still standing
along the railroad trace. Some research has already been done by Floyd Baumgardner on this hotel, but inquiries into the historic and present ownership and the future plans for the building would initiate measures to preserve this relic of the railroad period.

7. The Staple Bend Tunnel today is an inholding in the park belonging to Bethlehem Steel Company. The park has a cooperative agreement with the company to maintain the tunnel, but no arrangements have been made to open the area for public visitation. Negotiations with Bethlehem Steel have been in tandem ever since the creation of the park, but no significant progress has been made to provide for the interpretation of the access road with the residual stone ties of the portage and the tunnel itself. The significance of this inholding justifies a concerted effort to persuade Bethlehem Steel to sell the land. If the purchase of the tunnel cannot be achieved, then efforts should be made to arrange walking access to the tunnel along the old road bed. Interpretive measures should also include the opening of the tunnel, and the exposure of the stone ties on the eastern approach to the tunnel.

8. The interpretation of the system of inclined planes for the Allegheny Portage Railroad has certain limitations due to the fact that the park boundaries do not include any plane foot. The foot of Plane No. 8 and all of Plane No. 9 stand in forest land accessible for acquisition, and unchanged by human development since the abandonment of the road. If the remaining trace were purchased on the eastern slope, it would create an excellent walking trail and interpretive continuity for the railroad history.
APPENDIX A

A Map of Cambria County

by

Walter B. Hudson
and
Jno Morrison
(1816)

Cambria County

Area in Square Miles 681.63
Ditto in acres 436,241.76
No. of inhabitants 3,000
Acres of land cleared and cultivated 8,000
Ditto first rate land say one twelfth of the whole
country 30,000
Ditto land susceptible of cultivation say one third of
the whole country 145,000

Principal Towns & Villages

Ebensburgh the seat of Justice, No. of inhabitants 150
Johnstown 60
Muster [sic.] 80

This tract of country is covered with a thick heavy
growth of excellent timber and from its elevated situation
(being about as high as the summit of the Allegheny) partakes
of the nature and appearance of Mountain land, but there
are many fine tracts entirely clear of stone, and near
Ebansburgh where quarries of stone are opened they are
easily worked and excellent for building being a soft
granite of a grey colour interspersed with glistening par­
ticles of a metallic appearance.--Fall grain is raised by
the Farmers but not to so good purpose as east of the moun­
tain but potatoes turnips and all kinds of spring grain
(except corn) do extremely well. This country is all con­
sidered excellent for grazing. The principal timber is
wild cherry, poplar, chestnut, ash, oak, Sugar maple,
Cucumber [?] pine and hickory but birch, hemlock bush and
laurel abound in the marshy lands.

The minerals are Iron, Stone, Coal and Marl.
The Conemaugh river is navigable for boats three or four months in the spring season, has a fine channel free from obstructions. All the streams in the County have sufficient falls for mills etc. and do not fail so much in dry seasons as most of the Western waters. Canal tracts have not (we believe) been sufficiently examined in this country. We should not dispair [sic.] of connecting the waters of Conemaugh and Juniata rivers the Poplar run could be easily connected with Bobbs creek, the heads of which do interlock with those of the Conemaugh & this will be much the shortest route from Harrisburg to Pittsburgh. The Conemaugh would be easily connected with either the Clearfield or Chest creeks between Ebensburgh and Munster and even this route would be shorter and better than to connect with any of the higher branches of the Allegheny River.
APPENDIX B

Description of Road Sections

Johnstown to Summit
May 1831

Ebensburg May 25, 1831

To the Board of canal Com.
of Pennsylvania---

Gentlemen

* * * * *

The part of the line prepared for contract, extends from Johnstown to the summit of the Allegheny Mountain—a distance of 26 miles——

The line, commencing at the lower end of the Basin at Johnstown (now Borough of Conemaugh) passes up the right or Southeast bank of the Little Conemaugh, 7 miles and 3540 feet to the Horse Shoe bends, where it crosses at an elevation of 70 feet above the surface of low water of the river,—thence along the left or northwest bank, 6 miles 3720 feet to the confluence of the Ebensburg and Mountain Branches: the former of which it crosses at an elevation of 24 feet above the plane of low water.—Thence along the left or northwest side of the Mountain Branch to the mouth of the Beaver Dam Creek 2 miles 3240 feet. Here the line crosses the Conemaugh at an elevation of 14 feet above the surface of low water.—Thence up the right or Southeast side of the Conemaugh and Laurel Run, to the Summit of the Mountains, at a point about 1000 feet North of the turnpike, at Samuel Lemons taverns.

The line is divided into Stations of 100 feet in length, each,—and again into Sections the lengths of which vary from 2600 feet to 5900 feet.

* * * * *

Description of Sections

Section No 1 commences at the lower end of the Basin at Johnstown, the line passes over level ground
parallel to the Basin, and distant from it about 100 feet, --1800 feet Easy excavation,--Embankment on the lower end light--thence 600 feet--deep cutting medium digging--thence to the end of the Section, the line passes along the foot of a bluff in the last part of the Section there will be about 1200 feet in length of slope wall,--The work will consist of common Excavation
Slope-Wall
Embankment
Grubbing
Slate Lock

Section No 2. the line continues along the foot of the bluff about 2000 feet, thence on a low flat to the end of the Section. The appearance of the face of the bluff indicates danger from hill slips.--A slope-wall will be required along the bluff part of the section--The work will consist of
Embankment
Slope wall
Common Excavation
Grubbing
Drain

Section No 3. The line continues on level ground to the end of the Section. It crosses several small runs.--The work will consist of
Grubbing
Common Excavation
Embankment
4 Culverts
3 Drains

Section No. 4.--2600 feet long
The line continues along the flat or level ground 400 feet; thence 1500 feet along a low bluff, thence along a narrow flat, thickly covered with Laurels and large timber to the end of the section. The work will consist of
Common Excavation
Embankment
Slope Wall
Grubbing
6 Drains
1 Culvert

Section No 5.--3000 feet long
The line passes over a flat or bottom land, on the whole length of this Section; the work will consist of
Embankment
Excavations
Grubbing
3 Drains

Section No 6—5900 feet long.
The line continues on level ground 300 feet, thence along a projecting point of rocks about 300 feet, thence along the foot of a steep side hill 5300 feet to the end of the Section. The rock excavation will amount to about 1200 cubic yards, at the point above mentioned; There will be some rock at several points along the remaining part of the bluff. A slope wall will be required on about 4700 feet to protect the road from the floods of the creek. Hill slips may possibly occur on a part of this—The work on this Section will consist of
Slope wall
Embankment
Common Excavation
Solid rock
Grubbing
6 Drains

Section No 7—3600 feet long
The line leaves the creek at the beginning of the section (foot of incline plane No 1) It passes along the inclined surface of the hill 1300 feet,--to Deep Run Hollow, thence crosses the hollow, 400 feet, to the south end of the projected Tunnel--On the last mentioned distance the embankment will be deep at one point, it will equal 50 feet-- The materials to form it will be taken principally from the Tunnel and from the deep cutting at the end of it.

The Tunnel is to be 900 feet long. Its transverse section to equal a prism 16 by 20 feet. The width at bottom to be 20 feet. At the ends of the Tunnel, some masonry will be required, but appearances indicate that the rock is sufficiently hard and strong within, not to require arching.

The form of the roof on top of the Vault, will be determined by the character of the rock. The hill at the summit is 195.77 feet above the floor or the tunnel, or grade of the road.

From the north end of the Tunnel, the line continues along the side of a hill to the end of the section. A heavy embankment will be required on about 400 feet. Materials to be taken partly from the tunnel. The work will consist of
Excavation of the Tunnel
Embankment
Common Excavation
Masonry of Tunnel
Grubbing
Slope wall

Section No 8--4000 feet long
The line continues along the side of the hill, the inclination of which varies from 4 to 18 degrees. The surface of the ground on a part of this section is covered with rocks varying in size, from a cubic foot or less, to 20 or 30 cubic yards. The work will consist of
Common Excavation
Grubbing
Solid rock
Embankment
Perhaps some Hard pan
6 Drains
1 Culvert

Section No 9--3800 feet long
The line continues along the side of the hill to the end of the section.--The loose stones that lie upon the surface of the ground are generally large but not numerous.--The slope of the hill on "part of the distance is between 25 and 30 degrees. On this part a vertical wall will be required.--Timber very large.--
The work will consist of
Common Excavation
Vertical Wall
Embankment
Grubbing
Solid rock
Hard pan
4 Drains
2 Culverts

Section No 10--5100 feet long.
The line continues along the side of the hill to the end of the section. The inclination on the steeper parts, varies from 15 to 25 degrees--From 1000 to 1500 feet in length of vertical wall will be required to support the embankment of the roads on a part of the distance the surface of the ground is covered with loose rocks of various sizes.
The work will consist of
Common Excavation
Embankment

120
Vertical wall
Grubbing
Solid rock
7 Drains

Section No 11--3800 feet long.
The line continues along the side hill 1600 feet, the slope varies from 20 to 30 degrees. A vertical wall will be required to support the embankment on the lower side of the road. Thence 700 feet across the valley of the Conemaugh. The depth of the surface below the grade of the road will be as follows 0.90 Below 20.17 do 43.35 do 62.72 do 61.23 do 64.19 do 66.47 do 33.30 do 14.80 above the road. A viaduct will be required at this place,--plans for which are prepared for examination by the board.--At the end of the embankment there is a ridge about 80 feet long and 18 feet high at the apex. The line passes over a low flat on the remainder of the section,--Heavy embankment, on this portion of it

Section No 12--3900 feet long--The line passes along the foot of the hill 1500 feet. The surface of the ground is covered with loose rocks varying in size, from a cubic foot to several cubic yards, on a part of this distance a slope wall will be required to protect the road embankment from the floods of the creek. The line passes along a low flat, at the foot of the hill 900 feet, thence along the foot of a bluff.--bank of creek 400 feet; Thence over low flat--foot of hill to the end of section--The work on this section will consist of

Common Excavation
Slope wall
Solid rock
Embankment
Grubbing
3 Drains
1 Culvert

Section No 13--3100 feet long
The line passes along the foot of the hill, through the whole length of the section. The work will consist of

Common Excavation
Embankment
Grubbing
Solid rock
3 Drains
1 Culvert
Section No 14—4600 feet long—
The line passes along the foot of the uplands about 1000 feet, thence along the top of a low bluff 1200 feet. Thence over a low flat 400 feet—thence along the foot of the hill to the end of the section. On the last mentioned distance—Indications of hill slips appear along the face of the hill.

The work will consist of
Common Excavation
Embankment
Grubbing
Solid rock
Hard pan
7 Drains
4 Culverts

Section No 15—5900 feet long
The line passes over ground covered with loose rocks 300 feet, thence along the bank of the creek, at the foot of a steep bluff 2000 feet, thence over a low flat 800 feet, thence over ground nearly level to the end of the section. The work will consist of
Embankment
Slope wall
Solid rock
Common Excavation
Grubbing
3 Culverts
5 Drains

Section No 16—4100 feet long.
The line passes over ground nearly level 1500 ft. It crosses in this distance, Croyles Sawmill race. The water will be cut off from the mill, unless an expense, in conveying it under the road, is incurred, greater than the value of the mill—Thence along the bank of Croyles Mill pond at the foot of a hill, the slope of which varies from 5 to 20 degrees, to the end of the section; about 1700 feet in length of slope wall will be required along the mill pond—

The work will consist of
Common Excavation
Slope wall
Embankment
Solid rock
Grubbing
2 Drains
3 Culverts
Section No 17--2700 feet long
The lines passes along a narrow flat, 700 feet; thence across Pringles Point--700 feet; thence along the foot of a low bluff to the end of the section.--On the last mentioned distance, some slope wall will be required, to protect the embankment of the road from the floods of the creek--
The work will consist of
Common Excavation
Embankment
Solid rock
Slope wall
Slate rock
Hard pan
Grubbing

Section No 18--3800 feet long
The line continues along the foot of the bluff 2200 feet, on a part of this distance the creek will wash the outside of the road embankment and a slope wall will be required--Thence to the end of the section the line passes over a low flat, along the foot of the hill--Hill slips will occur on this part of the section, if excavations, to a great extent are made in the hill.--The work will consist of
Common Excavation
Embankment
Slope wall
Grubbing
Solid rock
4 Drains
2 Culverts

Section No 19--3200 feet long.
The line passes along the foot of the upland, through cultivated fields, to the end of the section. It passes near a log barn belonging to John Pringle, which it will be necessary to remove.--The work will consist of
Common Excavation
Embankment
Solid rock--small quantity
Grubbing
3 Culverts
Removing a Barn

Section No 20--3500 feet long.
A bluff commences near the beginning of the Section along the side of which the line passes on a distance of about 300 feet, thence across a low flat--about 600 feet.--thence along the side of a bluff 1300
feet to the Ebensburg Branch of the Conemaugh creek, thence over a low flat, where a deep embankment will be required—to the end of the section. A viaduct of 40 feet span will be required for the passage of the creek—

The work will consist of:
- Viaduct of 40 feet span
- Embankment
- Common Excavation
- Solid rock
- Slate rock—
- Grubbing
- 1 Drain

Section No 21—4700 feet long
The line passes along the foot of the upland, from 3 to 8 feet above the low bottom lands—through the whole length of the section. A slope wall will be required on a distance of 600 feet, near the upper end, to protect the road from the floods of the creek. The work will consist of:
- Common excavation
- Embankment
- Slope wall
- Grubbing
- Solid rock
- 3 Drains
- 1 Culvert

Section No 22—5600 feet long
The ground on the first 3100 feet is favourable. The line passes along the foot of the uplands, the excavation will be easy and the embankment light.—Thence along a steep rock bluff 2500 feet to the end of the section. A slope wall will be required on the whole of this distance. There will be a good deal of rock excavation along the bluff.

The work will consist of:
- Common excavation
- Slope wall
- Embankment
- Solid rock
- Grubbing
- Slate rock
- 4 Drains
- 3 Culverts

Section No 23—3400 feet long
On the first 1300 feet the line passes over a low flat—wet grounds—thence 600 feet over a projecting point
of higher ground—excavation from 1 to 9 feet deep—thence over a low flat, and across the mountain branch of the Conemaugh 1500 feet to the end of the section—a viaduct of a single span of 40 feet, will be required for the passage of the Rail Road over this branch of the Conemaugh.

The work will consist of
- 1 Viaduct of 40 feet span
- Embankment
- Common Excavation
- Grubbing
- Slate rock
- 3 Culverts

Section No 24—3400 feet long
On the first 1600 feet, the line passes through low wet ground, thickly covered with spruce, fir or Hemlock timber. The surface on a part of it is soft to the depth of from 3 to 6 feet.—The remainder of the section, 1800 feet, includes Inclined plane No 2.—The length of the plane is 1700 feet,—height or apex 132.40 feet.—The labour of grading this plane will not much exceed that of making the same length of level road.

The work will consist of
- Embankment
- Common Excavation
- Grubbing
- Vertical wall
- 1 Culvert

Section No 25—2700 feet long
The line on this section passes along ground sloping toward the creek from one to four degrees—very [sic.] large timber—

The work will consist of
- Grubbing
- Common Excavation
- Embankment
- 2 Drains
- 1 Culvert

Section No 26—4300 feet long
The line continues along the sloping ground 800 feet—thence across a ravine 400 feet—thence 600 feet across a projecting point of high ground, thence along the side of a hill—inclination from 6 to 18 degrees—to the end of the section, on the last mentioned distance, the surface of the ground is partially covered with loose rocks, from the size of a cubic foot, to several cubic yards.

The work will consist of
Section No 27--3700 feet long
The line passes over ground nearly level 800 feet to the foot of Inclined plane No 3 (Bens Creek) thence obliquely up the hill 1500 feet to the head of the plane, thence across a projecting point, curving with a radius of 440 feet, 600 feet--thence along the side of the hill to the end of the section. The inclined plane on this section is more expensive than any other between Johnstown and the summit of the mountain. The quantity of embankment, which exceeds 70,000 cubic yards, cannot be reduced without increasing the inclination of the plane. The ascent is 9 feet to every 100 feet in length, except 200 feet of the lower end. The formation of the ground at the head of the plane will not admit of any alteration at that point, which will reduce the embankment below--

The work will consist of
- Embankment
- Common Excavation
- Solid rock
- Grubbing
- Hard-pan
- 1 Culvert

Section No 28--3100 feet long
The line continues along the side of the hill, through the section the slope or inclination of the hill on the first 800 feet is about 15 degrees, the average inclination of the remaining part will be about 6 degrees. The surface of the ground on a part of the distance is covered with loose stones--generally small--very large timber. The work will consist of
- Embankment
- Common Excavation
- Grubbing
- Solid rock
- 7 Drains
- Loose rock

Section No 29--4200 feet long
The line passes over the ravine of Limestone Run, 400 feet,--heavy embankment--thence 400 feet across
a projecting point--deep cutting--then along the side of a steep bluff 900 feet, thence over sideling grounds--inclination about 12 degrees,--to the end of the section. The work will consist of

Common Excavation
Embankment
Solid rock
Grubbing
Vertical wall
Slate rock
1 Culvert
3 Drains

Section No 30--3600 feet long
The line passes over sloping ground favourable for the constructing of the road 900 feet, to Bear Rock Creek,--thence over a low flat 500 feet to the foot of Inclined plane No 4--then up the hill nearly at right angles to the direction of its base, at this point 2100 feet to the head of the plane--thence over level ground 100 feet to the end of the section. The work will consist of

Embankment
Common Excavation
Hard pan
Solid rock
Grubbing
Slate rock
1 Culvert
4 Drains

* * * * *

[Sections No. 31-34 Missing]

* * * * *

Section No 35--5100 feet long
The section commences at the north side of the turnpike road. The line passes over ground the transverse slope of which is from 2 to 4 degrees 1600 feet--then 200 feet over a deep ravine--then to the end of the section, over ground the transverse slope of which is from 10 to 15 degrees.--

The work will consist of

Embankment
Common Excavation

127
Grubbing
Solid rock
4 Drains
1 Culvert

The maps and profiles of the line, and plans for all the viaducts, culverts etc. acquired, are herewith communicated for the examination of the Board.

All which is respectfully submitted

Sylvester Welch
Engineer

List of Culverts

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Viaducts

No 1 Horse-Shoe Bend

2 Ebensburg Branch

3 Mountain Branch
The surveys and examinations of the country, from the Summit of the Allegheny Mountains down the valley of Blairs Gap Run to the Basin at Hollidaysburgh, were commenced immediately after that part of the line between the Summit of the mountain and Johnstown was put under contract.

Examinations were first made along the north side of the Run, from the Summit to the junction of the north and south branches, a distance of about three miles.

It was found that Inclined planes horizontally direct, and the inclination of which would not exceed six degrees, could not be formed on this side, without encountering deep cuttings and high embankments, that would far exceed in expense [sic.], any portion of the line of equal length, that had as yet been located. Examinations were made along the south side of the Run, and the country was found to be,
so far as regards the general direction of the face of the hills, exceedingly favourably to the location of straight planes.--

The descent from the Summit to the junction of the north and south branches is 840-1/2 feet.--of this height, 834-1/2 feet is overcome by three Inclined planes.--The remaining 6 feet, of descent, is included in the grade lines between the planes.--

A line was then carried along the South side of the valley, to a point about half a mile below the Blairs Gap Inn.--The descent in this distance is 411-1/2 feet.--370 feet of which is overcome by two Inclined planes.--the remaining 41-1/2 feet is distributed in the Grade line between the planes, the descent per mile being nearly 18 feet. The ground is equally favourable with that on the north side, for the construction of a Railroad.--very advantageous sites are obtained for the location of the planes.--

The lowest Inclined plane on the line passing down the south side of the valley is 58-1/2 feet lower than the foot of the corresponding plane on the north line.

The country over which either line must pass, from the foot of the first (?) planes from the Summit to Hollidaysburgh is exceedingly unfavourable on account of its rapid descent for the construction of a Railroad. The surface of ground on the north line, commencing at the foot of the plane, descends in the direction of the line about two feet in a hundred, on a distance of three thousand feet; an inclination, too great for the advantageous application of progressive power, and too small to employ, with advantage, stationary power. The descent on the remaining part of this line, in each one hundred feet, is from one foot to nine inches, on the south line, the surface of the ground descends, in the direction of the line, about one foot in each one hundred feet, on a distance of nine thousand seven hundred feet. The descent on the remaining portion of this line, is about eight inches in each one hundred feet.

In comparing the two lines, that on the south side appears to possess, in a high degree superior advantages.

From the Summit to the junction of the north and south branches, the north side presents obstacles, almost insurmountable, to the location of straight planes and the line must necessarily be carried over to the south side.
From the junction of the N. & S. branches, to the foot of the plane near the Blairs Gap Inn (Walkers Tavern) the two lines present nearly equal facilities of construction, and favourable sites are found on each, for the location of the planes. The distance, between corresponding points on the two lines, will be about, twelve hundred feet up, by that on north side.

But the abrupt curves in the latter, will more than counterbalance its advantages in distance. Between the foot of the fifth plane, from the summit on the south line, and the Basin at Hollidaysburg, the steepest grade will be, one foot in a hundred, or fifty two and eight tenths feet in a mile.

On the north line there will be an additional plane, three thousand feet long, with a descent of two feet to every one hundred feet in length, upon this plane, when the trade becomes exclusive, stationary power would be required. The descent from the foot of this plane to the Basin crosses ponds very nearly with that on the south side.

The south line is divided into Stations of one hundred feet in length and into Sections, varying in length from four thousand one hundred, to five thousand seven hundred feet. The Sections are numbered from thirty six to forty six. The Inclined planes are numbered from from six to ten.

Discription [sic.] of Sections

Section No 36. The line passes over sideling ground one thousand feet. Embankment average depth about five feet; thence fifteen hundred feet across the Summit or highest part of the Mountain. Average depth of cutting about ten feet, deepest part twelve feet.—Thence over ground descending about six degrees, twenty four hundred feet, thence across the ravine of Blair's Gap Run five hundred feet to the end of the Section. The inclined plane No 6. is included in the two last mentioned distances. Its length will be twenty seven hundred feet, and the descent or difference of level between the head and foot of the plane two hundred and sixty six and a half feet. The turnpike road crosses the line near the lower end of the inclined plane. The turnpike will pass over the Railroad by a bridge. A heavy embankment will be required to cross the ravine of Blairs Gap Run. The items of work will
consist of grubbing on the greatest part of the distance, 
Two culverts, one bridge, and two Drains, Common excavation, 
embankment, Slate, Hard-pan, Solid rock, Slope wall, & 
vertical wall. Length of Section 5400 feet.

Section No 37. The line passes along the side of a steep 
hill. Six hundred feet to the head of Inclined plane 
No 7 thence obliquely down the side of the hill twenty 
seven hundred feet to the foot of the plane. Length of 
plane, twenty seven hundred feet, descent, or difference 
of level, between the head and foot of the plane two hundred 
sixty and a half feet. Thence along the side of a steep 
hill twelve hundred feet to the end of the Section. A large 
proportion of solid rock, and Slate will be found in the 
excavation. A heavy embankment will be required on a part 
of the plane, and about eighteen hundred feet in length 
of slope wall to support the high embankment. The items 
of work will consist of heavy Grubbing on the whole Section, 
One Culvert and three drains, Common excavation, Embankment, 
Solid rock, Slate, Hard pan, Slope wall, and vertical wall. 
Length of Section 4500 feet.

Section No 38. The line continues along the side of the 
hill twenty three hundred feet to the head of Inclined 
plane No 8; Thence obliquely down the side of the hill 
thirty one hundred feet, to the South fork of Blairs Gap 
Run and foot of the plane. Length of the Inclined plane 
thirty one hundred feet, descent, or difference of level, 
between the head and foot of the plane, three hundred 
and seven and six tenths feet, thence three hundred feet 
over level ground to the end of the section. Along the 
steep parts of the hill, a large proportion of solid rock, 
and Slate, will occur in the excavation. Considerable 
embankment will be required to form the plane. The whole 
section is covered with heavy timber. The items of work 
will consist of Grubbing and clearing, two culverts and 
two drains, common excavation, Embankment, Solid rock, 
Slate, Hard pan, Slope wall and vertical wall. Length of 
Section 5700 feet.

Section No 39. The steep side hill again commences at the 
beginning of this Section, along which the line passes 
two thousand feet, thence thirty one hundred feet over 
ground, inclined from four to eight degrees, thence six 
hundred feet across a ravine, to the end of the Section. 
The deepest part of the Embankment in the ravine will be 
fifty six feet. Embankment will be the heaviest item of 
work on this Section. Solid rock and Hard pan will ocur [sic.]
in considerable quantities in the excavation. The whole Section is covered with heavy timber. Length of Section 5,700 feet. The items of work will consist of Grubbing and clearing on the whole distance, one culvert and four drains, common excavation, embankment, Solid rock, Slate, Hard pan, Slope wall, and vertical wall.

Section No 40. The line passes over sideling ground Six hundred feet to the head of Incline plane No 9; thence across and obliquely down the south side of the ridge that separates [sic.] the valleys of the Blair's Gap and Millstone Runs, twenty seven hundred feet to the foot of the plane, thence across the valley of Millstone Run eight hundred feet to the end of the Section. The Inclined plane is twenty seven hundred feet long and the descent or difference of level between the head and foot is one hundred and eighty nine feet and a half. The ground upon which it is located is favourable for the formation of a plane, from the lower end to the end of the Section the ground is also favourable for the construction of a roadway. There will be but little grubbing on this Section. The items of work will consist of Grubbing and clearing, one culvert and two drains, common excavation, embankment, Solid rock, Slate, Hard pan, and vertical wall. Length of Section 4100 feet.

Section No 41. The line passes over ground nearly level Seven hundred feet, it crosses in this distance a large Run and a common road. The road may be so arranged that carriages may pass through the culvert, the span of which will be fourteen feet and the height ten feet, or by making a slight change in the location of the road it may be made to cross the Railroad on a level with the Surface of the rails. Thence along the side of the hill the slope of which varies from nine to twenty five degrees, four thousand eight hundred feet. Solid rock and Slate will occur in considerable quantities in the excavation. On this part of the Section about nineteen hundred feet in length of wall will be required along the side hill. The whole Section is covered with timber. Length 5500 feet. The items of work will consist of Grubbing and Clearing two culverts, four drains, common excavation, embankment, Solid rock, Slate, Hard pan, Slope wall, and vertical wall.

Section No 42. The line continues along the steep side hill Six hundred feet, thence across a deep ravine four hundred feet, deepest part of embankment will be forty feet. Thence sixteen hundred feet along the hill the
Slope of which varies from three to ten degrees. Thence four hundred feet along the top of a ridge to the head of Inclined plane No 10. Thence down a projecting point of the ridge eighteen hundred feet to Blairs Gap Run. Thence over level ground and along the channel of the Run six hundred feet to the end of the Section. The plane is in length twenty four hundred feet, and the descent or difference of level between the head and foot is one hundred eighty and a half feet. About two thousand feet of the upper end of the Section is covered with timber. A new channel will be required for the Run in length about seven hundred feet, opposite the lower end of the Inclined plane. Length of Section 5400 feet. The items of work will consist of Grubbing and clearing four culverts and two drains, common excavation, embankment, Solid rock, Slate, Hard pan, Slope wall and vertical wall.

Section No 43. The line passes over ground descending in the direction of the road a little more than one foot on a distance of one hundred feet, through the whole length of the Section. The principal item of work on nineteen hundred feet of the upper end will be excavation, deepest part about nine feet. An embankment averaging about six feet deep will be required on the remainder of the Section. The line crosses Blairs Gap Run about one thousand feet from the lower end. There will be but little Grubbing on the Section. A House and an Old Distillery Stand upon the ground that will be occupied by the road. It will be necessary to remove them. The items of work will consist of Grubbing and clearing, Two Culverts, Common Excavation, Embankment, and Hard pan. Length of Section 5100.

Section No 44. The line continues nearly parallel to the turnpike and passes over ground descending in the direction of the road about one foot in every hundred feet in length. The Railroad will be raised above the Common Surface of the ground on the whole of this Section. The average depth of the Embankment will be about five and a half feet. On about one thousand feet of the lower end, the depth of the Embankment will be reduced to less than one foot. There is but little Grubbing on the Section. Length of Section 4900 ft. The items of work will consist of Grubbing and Clearing Two Culverts, two drains, Common Excavation in ditches and culvert pits, Embankment, Hard pan or Gravel in culvert pits vertical wall in drains 4 [?].
Section No 45. The line passes over level ground parallel to the turnpike, Sixteen hundred feet, thence through a projecting point of high ground six hundred feet, deepest cutting twenty one feet, thence over level ground and parallel to the turnpike twenty seven hundred feet to the end of the Section. On the last mentioned distance the depth of Embankment will average about ten and a half feet. The work through the point of the ridge and the upper part of the Section will consist of Common Excavation, Rock Slate and Hard pan. Three hundred feet of the upper and twenty three hundred feet of the lower end of the Section is covered with timber. Length of Section 4900 feet. The items of work will consist of Grubbing and clearing, One Culvert, Common Excavation Embankment, Solid rock, Slate & Hard pan.

Section No 46. The line continues parallel with the turnpike, eighteen hundred feet to the Beaver Dam Branch of Juniata, thence across this Stream and over a low flat thirteen hundred feet to the upper end of the Basin at Hollidaysburg, thence parallel with the north Side of the Basin and distant from it one hundred feet, Sixteen hundred and fifty feet to a point opposite to the lower end of the Basin. It is proposed to cross the Beaver Dam Branch of the Juniata with a stone viaduct with two arches placed obliquely across the stream. The Span of each arch will measure at right angles to its axes, thirty three feet, and in the direction of the axis of the viaduct forty and three tenths feet. The average depth of Embankment on the upper part of the Section will be about six feet. Between the viaduct and the Basin the principal item of work will be Embankment. Along the Basin the Excavation and Embankment will be light. Twelve hundred feet of the upper end and eight hundred feet of the lower end, is covered or partially covered with timber. The items of work will consist of Grubbing and clearing, one viaduct, four drains, common Excavation, Embankment, Slate, Hard pan, Slope wall, and vertical wall.--

All which is respectfully Submitted

Sylvester Welch
Engineer

From: Reports & Misc. Docs., 1829-43, Box 3, Vol. 1, p. 44,
A.P.R.R., Div. Rec., BCC, RG 17, Pa. A.
APPENDIX C

Distances and Elevations of Inclined Planes

A table showing the inclination, the length measured horizontally, the length measured on the planes, the ascent or descent per one hundred feet; and the height or difference of level, between the head and foot of the inclined planes.

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<td>260.50</td>
<td>10.25</td>
<td>5°51' 9&quot;</td>
</tr>
<tr>
<td>8</td>
<td>38</td>
<td>3101.49</td>
<td>3116.92</td>
<td>307.00</td>
<td>10.25</td>
<td>5°51' 9&quot;</td>
</tr>
<tr>
<td>9</td>
<td>40</td>
<td>2714.05</td>
<td>2720.80</td>
<td>189.50</td>
<td>7.25</td>
<td>4° 8' 48&quot;</td>
</tr>
<tr>
<td>10</td>
<td>42</td>
<td>2288.46</td>
<td>2295.61</td>
<td>180.52</td>
<td>8.25</td>
<td>4°42' 58&quot;</td>
</tr>
</tbody>
</table>


The following table will show the length of each plane, and the elevation overcome by the use of stationary steam power:

<table>
<thead>
<tr>
<th>No. of Plane</th>
<th>Length in feet</th>
<th>Elevation Overcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plane No. 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;</td>
<td>1607.74</td>
<td>150.00</td>
</tr>
<tr>
<td>&quot; 2</td>
<td>1760.43</td>
<td>132.40</td>
</tr>
<tr>
<td>&quot; 3</td>
<td>1480.25</td>
<td>130.50</td>
</tr>
<tr>
<td>&quot; 4</td>
<td>2194.93</td>
<td>187.86</td>
</tr>
<tr>
<td>&quot; 5</td>
<td>2628.60</td>
<td>201.64</td>
</tr>
<tr>
<td>&quot; 6</td>
<td>2713.85</td>
<td>266.50</td>
</tr>
<tr>
<td>&quot; 7</td>
<td>2655.01</td>
<td>260.50</td>
</tr>
<tr>
<td>&quot; 8</td>
<td>3116.92</td>
<td>307.60</td>
</tr>
<tr>
<td>&quot; 9</td>
<td>2720.80</td>
<td>189.50</td>
</tr>
<tr>
<td>&quot; 10</td>
<td>2295.61</td>
<td>180.52</td>
</tr>
</tbody>
</table>

137
The following table will show the length of each section of the road, and elevation overcome by the use of motive power:

<table>
<thead>
<tr>
<th>From Johnstown to foot of plane No. 1</th>
<th>Dis.miles</th>
<th>Eleva'n overcome in feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>head of plane No. 1 to foot of plane No. 2</td>
<td>4.13</td>
<td>101.46</td>
</tr>
<tr>
<td>&quot; head of plane No. 1 to foot of plane No. 2</td>
<td>13.06</td>
<td>189.58</td>
</tr>
<tr>
<td>&quot; head of plane No. 3</td>
<td>1.43</td>
<td>15.80</td>
</tr>
<tr>
<td>&quot; head of plane No. 4</td>
<td>1.90</td>
<td>18.80</td>
</tr>
<tr>
<td>&quot; head of plane No. 5</td>
<td>2.56</td>
<td>25.80</td>
</tr>
<tr>
<td>&quot; &quot; to head of plane No. 6</td>
<td>1.62</td>
<td>19.04</td>
</tr>
</tbody>
</table>

Descending.

<table>
<thead>
<tr>
<th>From foot of plane No. 6 to head of plane No. 7</th>
<th>Dis.miles</th>
<th>Eleva'n overcome in feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot; &quot; to head of plane No. 7</td>
<td>0.15</td>
<td>level</td>
</tr>
<tr>
<td>&quot; &quot; to head of plane No. 8</td>
<td>0.61</td>
<td>5.40</td>
</tr>
<tr>
<td>&quot; &quot; to head of plane No. 9</td>
<td>1.18</td>
<td>12.00</td>
</tr>
<tr>
<td>&quot;-plane No. 10</td>
<td>1.70</td>
<td>29.58</td>
</tr>
<tr>
<td>&quot;-plane No. 10 to Hollidaysburg,</td>
<td>3.72</td>
<td>146.71</td>
</tr>
</tbody>
</table>

APPENDIX D

Description of Slopes

When the excavations required for grading the railroad were made, such slopes were given to the banks as the character of the earth seemed to require. In loam, gravel, and common clay, the banks were cut to such a slope as to give a base of one and a half feet to every foot rise, or the inclination with the horizon was about thirty-three and two-third degrees. Where the material removed consisted of slate and sandstone, the slopes were cut so as to give a base of about four inches to every foot rise. The line, for a large proportion of the distance, passes along the sides of hills, the slopes of which have an inclination with the horizon of from fifteen to forty-five degrees. The bed of the railroad, along this portion of the distance, is cut, either altogether or in part, out of the sides of the hills. Where these are composed of rock, the slopes given to the banks were the same as those in the rock excavations in the thorough cuts, but the material excavated along the greater part of this portion of the railroad was what was denominated in the contracts, hard pan. It consisted of hard clay mixed with gravel, and generally so tenacious that a bank of the height of fifteen or twenty feet would stand, when left with a vertical face, until loosened by the action of frost. The slopes given to the banks in this hard pan excavation, were generally such as to give a base of a little more than one foot to every foot rise, or an inclination of a little less than forty-five degrees with the horizon.

APPENDIX E

Description of Viaducts, Culverts, and Drains

Horse Shoe Bend Viaduct:

The viaduct over the Little Conemaugh river, at the Horse Shoe Bend, has a semi-circular arch of eighty feet span: the height of the abutment walls, from the foundation to the springing line of the arch, is twenty-nine feet, and the height from low water to the springing line, twenty feet; rise of the arch, forty feet: thence to the top of the parapets, nine and a half feet; making the whole height of the walls above the foundation, seventy-eight and a half feet, or sixty nine and a half above the surface of low water of the river. The width of the viaduct, at the top of the parapets, is twenty eight feet, and the width at the foundation, or the length of the face of the abutments, is forty feet. The masonry is of the most substantial kind. The stones that form the face of the walls, contain from twelve to twenty five cubic feet each; the beds and joints are well cut and fitted together.

Ebensburg Branch Viaduct:

The viaduct over the Ebensburg Branch of the Conemaugh, has a single span of forty feet; rise of the arch, ten feet; height of the walls, from the foundation to the top of the parapets, thirty one and a half feet; and from the surface of low water, twenty-seven feet: width of the viaduct at the top of the parapets, twenty five feet ten inches.

Mountain Branch Viaduct:

The viaduct over the mountain branch of the Conemaugh, has a single span of forty feet, height of the walls from the foundation to the top of the parapets twenty three and a half feet, and from the surface of low water, seventeen feet, width twenty five feet ten inches.
Beaver Dam Branch Viaduct:

... the viaduct over the Beaver dam branch of the Juniata, has two oblique arches, the spans, measured on the 'skew face, are each forty feet three and a half inches, and thirty three feet measured at right angles [sic.] to the axis of the vault, rise of arch ten and a half feet, height of wall from the foundation to the top of the parapets twenty feet;

Culverts:

Culverts, there are sixty eight culverts; the spans vary from three to twenty five feet. (See schedule marked No. 2,) of these fifty seven are completed, and the remaining eleven are nearly finished. The culverts are built of good stone laid in common lime mortar. The faces of the walls at the ends of each culvert are built of hammered stone, laid in courses. The coping and steps and the voussoirs that form the heads of the arch, are smoothly cut.

Drains:

Drains; There are 85 drains or square culverts of from two to three feet span. These are built by the contractors for grading the sections, the walls are laid without mortar; seventy-six of the drains are finished, the remaining nine will be completed before the first of December next. These together, with the four viaducts make one hundred and fifty seven passages for water under the rail-road.

APPENDIX F

Part A

Specifications of the Manner of Preparing Materials and Laying the Rails on the Allegheny Portage Rail Road.

The width of the track, or the distance between the rails, will be four feet nine inches, and the distance between the tracks including the width of the inner rail of each track, five feet.

The level parts of the Railway (technically levels) are to be formed of edge rails of malleable iron, of the form represented in the drawings hereunto annexed, and marked B. These rails are to be secured to blocks of stone, marked in the drawings A, by cast iron chairs marked C, where the ground is solid, and to pieces of timber marked E, on the recently formed embankment.

The Railway on the inclined planes is to be formed of timbers, six inches wide and eight inches deep, covered with bars of iron two and a fourth inches wide and five-eighths of an inch thick, (to be called plate rails.) These timbers will rest upon, and be secured to other pieces of timber placed crosswise of the track, at intervals of four feet.

The Railway on the inclined planes will be horizontally straight, and the ascent or descent, from the head of the plane, to a point two hundred feet from the foot of it, will be regular, or the ascent or descent will be equal, on equal distances. On the remaining two hundred feet in length, the ascent or descent will be the same as that upon any distance of one hundred feet, upon the regular part of the plane. This part of each inclined plane will form, vertically, an arc of a circle, to which the regular part of the plane, and the level part of the Railway, below it, will be tangents.

The Railway between the planes is to be laid so as to correspond, vertically, with the grade adopted for the road, and it must in all cases be laid so as to form, horizontally, arcs of circles or their tangents.
In all places where stone blocks are used, and a permanent Railway laid down, a ditch is to be excavated under the line of each rail, two and a half feet wide, and eighteen inches deep. These ditches are to be connected at intervals of fifteen feet by cross ditches one foot wide and one foot nine inches deep. The side ditches are to extend to the side of the road bed in all places where the surface of the ground immediately adjoining is two feet below the surface of the road bed. But where the surface of the ground on both sides of the Railroad, is less than two feet below the surface of the road bed, a ditch is to be cut along the centre of the road, between the tracks, two and a half feet wide, and two feet deep, and the cross ditches are to be so cut as to communicate with a drain to be placed in the centre ditch, and all communication with the side ditches of the road is to be cut off.

Stones of such quality as may be directed by the Engineer, are to be finely broken, at some point or points not on the bed of the road, so that the largest pieces shall not exceed in weight six avoirdupoise ounces. The stones are to be placed in the ditches under the lines of the rail, in layers of four inches thick, or deep, to the depth of one foot, each layer is to be well packed with a ram or mall before a succeeding layer is put on. The cross ditches are to be filled with broken stone to the depth of one foot, but without packing. The centre drain, wherever required, is to be constructed in the manner represented in the drawing hereunto annexed.

The stone blocks (marked A in the drawings) are to be one foot deep, two feet long and one foot nine inches wide. They are to be formed of strong sand stone or lime stone, or such other strong stone as shall be approved of by the Engineer, and they are to be dressed and prepared for the reception of the chairs, in the manner represented by the model, now exhibited, and to be kept at the Engineer's office.

The wooden pins (marked a in the drawing) are to be made of seasoned Locust timber, each pin is to be six inches long and one inch and a half in diameter. They are to be turned smooth, and each pin is to be pierced in the direction of its length, through the centre, with a hole one third of an inch in diameter. They are to be driven firmly into the stones.
The cast iron chairs (marked C in the drawings) are to be secured to the stone blocks, each by two spikes (marked c in the drawings) driven firmly into the pins a. The spikes c are to be half an inch in diameter, and six inches long, exclusive of the head. They are in other respects to be made in the manner represented by the model in the Engineer's office.

The chairs, and the wedges to fasten the rails in the chairs, are to have the form and dimensions represented by the model in the Engineer's office. The chairs are to be made of cast iron of the best quality, and the wedges or keys are to be made of malleable iron. The spikes for securing the chairs to the stone blocks, also those for securing the plate rails to the wood sleepers or rails, are to be made of the best quality of malleable iron.

The stone blocks are to be placed upon the broken stone in the ditches under each rail, at intervals of three feet, measuring from centre to centre of each stone. They are to be placed with the longest side crosswise of the road. The upper surface of each stone shall be horizontal, and the bed upon which it rests shall be raised or depressed, until it shall correspond with the levels given for the grade of the Railway. The rails are to be secured to the chairs by wedges, as represented by the models and drawings.

After the stone blocks are placed and the rails secured, broken stone is to be placed around the blocks and upon the surface of the road until the whole is raised to a level with the top of the stone blocks. The broken stone is to be packed with a ram or mall, in the same manner as those placed in the ditches. The whole surface of the road is to be made smooth and the side ditches are to be kept clean.

On the newly formed embankment the road is to be made even, and where necessary, a ditch is to be made and a line of timber is to be placed under each line of rail. These timbers are to be placed, wherever directed by the Engineer, upon a bed of broken stone. Cross pieces of timber, six inches wide and eight inches deep, are to be notched on the longitudinal timbers, as represented in the drawings (cross piece marked E) at intervals of three feet, and secured to them by a locust pin, one inch in diameter and one foot long, at each point of contact. The cast iron chairs are to be spiked to these cross pieces, and the rails are secured in the same manner as upon the permanent part of the road. A horse path be-
tween the rails, is then to be formed, of gravel or of broken stone, in such manner as may be directed by the Engineer.

Turnouts are to be made at the points indicated upon the plan or map of the road, at which the contractor will leave the necessary space; and will leave, at such other points as the Engineer may direct, spaces of sufficient length for putting in turnouts.

The plate rails for the planes are to be not less than fifteen feet long, the holes through which the spikes are driven to secure them to the timbers are to be elliptical, they are to be three-eighths of an inch wide and five-eighths of an inch long, the hole at each end is to be one inch from the end of the bar, and the intervening holes are not to be more than eighteen inches apart. The upperside of each hole is to be cut away or enlarged so as to receive the head of the spike.

The spikes are to be four inches long, and three-eighths of an inch in diameter, the head is to have the form represented by the model in the Engineer's office.

On the solid parts of the inclined planes a ditch is to be excavated, eighteen inches wide and one foot deep, under the line of each rail. This ditch is to be filled with broken stone put in, in the same manner as the stones are put into the ditches on the level parts of the Railway. The cross pieces (marked in the drawings E) are to be notched to receive the wood rail, and placed across each track at intervals of four feet, measuring from centre to centre of each piece. The wood rails (marked in the drawings F) are then to be placed in the notches, and chamfered on the inner side and secured by wedges as represented in the drawing. The plate rails are to be secured to the wood rails by a spike driven through each hole firmly into the timber. On the newly made embankments on the planes, the railway is to be laid down without the foundation of broken stone, but on the heavy embankments the cross pieces are to be laid with their ends resting upon a longitudinal timber, wherever directed by the Engineer: before the railway is laid down, the road is to be covered with broken stone, gravel or sand, in such manner as may be directed by the Engineer.

A plate of malleable iron, three by four inches square and one-sixteenth of an inch in thickness, is to be placed on the wood rails under the ends of the plate rails, and
secured in such manner as the Engineer may direct. The spikes that secure the ends of the plate rails will pass through these plates. Both the plate rails and the edge rails, when laid, shall have a space left between the ends, the width of which will be regulated by the Engineer; it will vary with the temperature of the atmosphere, from zero to one-sixteenth of an inch. The spikes are to be driven through the plate rails in such manner as to allow of the expansion and contraction of the iron.

All materials used in the construction of the railway are to be examined by the Engineer, or some person appointed by him and approved of before they are used. All the mechanical work is to be done in the best manner, and any mechanic who performs his work imperfectly will be immediately dismissed.


Part B

The following specification, shews [sic.] the manner of constructing the second track of the rail-road:

The width of the track, or the distance between the rails will be four feet nine inches, and the distance between the tracks, including the width of the inner rail of each track, five feet.

The level parts of the rail-way (technically levels,) are to be formed of edge rails formed of malleable iron. These rails are to be eighteen feet long, they are to be secured to blocks of stone marked in the drawing A, by cast iron chairs marked C, except on the high embankments on sections Nos. 11, 29, 39 and 42.

On the high embankments the chairs are to be secured to pieces of timber (locust,) placed cross-wise of the track, supported either by broken stone or by other pieces of timber placed longitudinally.

The turnouts are to be formed of timber (white oak,) six inches wide and eight inches deep, covered with bars.
of iron two and a fourth inches wide and five-eighths of an inch thick, to be called plate rails. These timbers are to be placed upon and secured to pieces of locust timber placed cross-wise of the track at intervals of four feet.

The rail-way between the planes is to be laid so as to correspond vertically with the grade adopted for the road, and it must in all cases be laid so as to form horizontally arcs of circles or their tangents.

In all places where stone blocks are used and permanent rail-way laid down, a ditch is to be excavated under the line of each rail, two and a half feet wide and eighteen inches deep. These ditches are to be connected at intervals of fifteen feet by cross-ditches one foot wide and one foot nine inches deep.

The side ditches are to extend to the side of the road bed in all places where the surface of the ground immediately adjoining is two feet below the surface of the road bed. But where the surface of the ground on both sides of the rail-road is less than two feet below the surface of the road bed, a ditch is to be cut along the centre of the road, between the tracks, two and a half feet wide and two feet deep, and the cross ditches are to be so cut as to communicate with a drain to be placed in the centre ditch, and all communication with the side ditches of the road is to be cut off.

Stones of such quality as may be directed by the engineer are to be finely broken at some point or points not on the bed of the road, so that the largest pieces shall not exceed three and a half cubic inches, or weigh over six avoirdupois ounces. The stones are to be placed in the ditches under the lines of the rail in layers of four inches thick or deep, to the depth of one foot; each layer is to be well packed with a ram or maul before the succeeding layer is put on; the cross ditches are to be filled with broken stone to the depth of one foot, but without packing. The centre drain, wherever required, is to be constructed in the manner represented in the drawing.

The ditches under the lines of rail are to be made even on the sides and bottom; they are to be excavated in parts not less than four hundred feet long; and before any stone is put in, the engineer or assistant engineer shall examine them, and if found of sufficient depth and width, the contractor shall put in the first layer of four
inches of broken stone on the whole length of the ditch
so excavated; and pack it down as required above; the
second layer shall also be put in on the whole length of
the portion of the ditch excavated and packed down before
any portion of the third layer is put in.

The stone blocks (marked A in the drawings) are to
be one foot deep, two feet long, and one foot nine inches
wide; those marked X are to be one foot thick, and one
foot six inches wide, and seven feet long. They are to
be formed of strong sand stone or lime stone, or such
other strong stone as shall be approved of by the engineer;
they are to be dressed with the hammer and pick, so that
the sides shall be at right angles to and parallel with
each other. The portion of the upper surface of each
block upon which the chair rests, is to be cut smooth,
so that the base of the chair shall rest with its whole
surface upon the stone. The holes for the locust pins
are to be six inches deep, and one and a half inches in
diameter.

The wooden pins (marked A in the drawing) are to
be made of seasoned locust timber; each pin is to be six
inches long and one and a half inches in diameter; they
are to be turned smooth, and each pin is to be pierced
in the direction of its length, through the centre, with
a hole one third of an inch in diameter: they are to be
driven firmly into the stones.

The cast iron chairs (marked C in the drawings) are to
be secured to the stone blocks, each by two spikes (marked
C in the drawings) driven firmly into the pins A. The
spikes C are to conform in every respect to the model now
exhibited, and to be kept in the engineer's office; also
in the office of the superintendent. They are to be made
of the best quality of Juniata iron.

The chairs, and wedges to fasten the rails in the
chairs, are to have the form and dimensions represented
by the model in the engineer's office. The chairs are
to be made at a foundry of the best quality of cast iron.
The wedges for the inner side of the rail are to be made
of malleable iron; those on the outer side of the rail are
to be made of seasoned locust timber.

The contractor for furnishing chairs shall deliver
his pigs at the foundry in quantities of not less than
twenty tons, and the pigs so delivered shall be examined
by the engineer, or by some person appointed by him, and
approved of before they are used. The chairs will be
examined at the foundry before they are delivered to the
Commonwealth, and if found to be in any respect imperfect,
they will not be received. The pins and iron wedges will
also be examined at the manufactory by the engineer, or
by some person appointed by him, and approved of before
they are received by the agent of the Commonwealth.

The stone blocks (A) are to be placed upon the broken
stone in the ditches, under each line of rail, at intervals
of three feet, measuring from centre to centre of blocks,
in the straight parts of the road, and in all curves whose
radius exceeds 955 feet. In curves of less radius than
955 feet, a long block (X) is to be placed across the
track at every nine feet; blocks (A) are to be placed
between these in the same manner as upon other parts of
the road.

All the blocks are to be placed with the longest
side across the road. The upper surface of each stone
shall be parallel to a plane corresponding with the grade
of the rail-way; and the bed upon which it rests shall be
raised or depressed accordingly. The rails are to be
secured in the chairs by wedges, as represented by the
models and drawings.

After the stone blocks are placed, and the rails
secured, broken stone is to be placed around the blocks,
and upon the surface of the road, until the whole is
raised to a level with the top of the stone blocks; the
broken stone to be packed with a ram or maul, in the
same manner as those placed in the ditches. The whole
surface of the road is to be made smooth; and the side
ditches are to be kept clean at the expense of the con­
tractor, unless in case of large slips.

On the high embankments on the sections above
mentioned, the graded surface of the road is to be
raised, where necessary, by the addition of new embank­
ment, which the contractor for laying the rail-way will
be required to put on. A line of timber, if required by
the engineer, is to be placed in a ditch under each rail,
to support the cross timbers (marked E.) The cross
pieces are to be locust timber, six inches wide and eight
inches deep and seven feet long. They are to be placed
at intervals of three feet, either upon the timbers above
mentioned, or upon the ground; if upon timbers, they are
to be secured at each end with a locust pin one inch in
diameter.---The cast iron chairs are to be spiked to these
cross pieces, and the rails are to be secured in the same
manner as upon the permanent part of the road. A horse path is then to be formed of gravel or of broken stone, in such manner as may be directed by the engineer. Turnouts are to be made from both tracks, at such points as the engineer may direct. They are to be made in the manner described above. The castings for the crossings will be furnished by the Commonwealth. The contractor will be required to fit them, by chipping, filing or grinding, so that they may work smoothly, and fit the parts of the rail-way with which they connect.

The plate rails for the turn-outs and for the rail-way along the basins are to be not less than fifteen feet long. The holes through which the spikes are driven to secure them to the timbers, are to be elliptical; they are to be three-eighths of an inch wide and five-eighths of an inch long. The hole at each end is to be one inch from the end of the bar, and the intervening holes are to be not more than eighteen inches apart. The upper side of each hole is to be cut away or enlarged, so as to receive the head of the spike. The spikes are to be three-eighths of an inch in diameter, and four inches long. A plate of malleable iron, of the size and form heretofore used on the Portage rail-road, is to be put under the ends of the rails. The spikes that secure the ends of the plate rails are to pass through the holes in the small plates. Both the plate and the edge rails when laid are to have a space between the ends, to be regulated by the engineer: it will vary with the temperature of the atmosphere, from zero to one-eighth of an inch. The spikes are to be driven through the plate rails in such manner as to allow for the expansion and contraction of the iron. Two tracks are to be laid along the basins at Hollidaysburg and Johnstown. The rail-way is to be formed in the same manner as that for turnouts and sidings, viz: White oak rails laid upon locust cross sills, and covered with plate rails; the cross sills are to be laid upon broken stone, if directed by the engineer. All the materials used in the construction of the rail-way are to be examined by the engineer, or some person appointed by him, and approved of before they are used. All the mechanical work is to be done in the best manner; and any mechanic, or other person, who performs his work imperfectly, will be immediately dismissed. Materials delivered at or near the rail-road, for the use of the same, which may be deemed unfit for the purposes for which they were delivered or procured, shall be removed, if ordered by the engineer, to such distance as he may deem requisite, to prevent their being put into the work in his
absence. And no estimate will be made for the work done by any contractor, who shall refuse or neglect to remove such condemned materials, until the requisition shall be complied with, or the contract forfeited.

APPENDIX G

Articles of Agreement

Entered into this first day of April one thousand eight hundred and thirty three by and between the Commonwealth of Pennsylvania, by Samuel Jones, Superintendent of the Western Div. Pennsylvania Canal, and Portage Rail Road, of the one part, and Daniel Burk, John Hammon and Aquila Burchfield of the other part:

Witnesseth, That the said Burk, Hammon & Burchfield do covenant and agree that they will furnish all the materials that shall be of a quality approved of by the Engineer, and perform all labor necessary to construct in the most substantial and workman-like manner—at Inclined Plane No. 3 of the Portage Railway, the following work an Engine House and Road Shed and a Dwelling house for the Engine Tender at the Head of the Plane, and a Road Shed and Small Dwelling House at the foot of the Plane, together with all the Masonry, Excavation etc., etc. connected with the Same, To construct all the frame work required for the Machinery and to hang and fit all the Small and large Sheaves upon the Said inclined plane, and to Excavate a mill fifteen feet deep for the regulating weight and to do all the work necessary to complete this Contract, according to the true intent & meaning thereof and agreeably to the direction of the principal Engineer & his assistants—

The Said House Sheds and other work in every respect, to be built, constructed and finished agreeably to a plan in the Engineer's Office, and the specifications thereunto annexed, which are to be considered and taken as part of this contract, subject however at all times to such variations, alterations and directions as may be given by the Engineer; and if any variation or alteration proposed by the Engineer, should be considered by him unfavorable to the interest of said contractor, or on the other hand, should diminish the amount of labor or expense required by the plan and specifications, then, and in either case, such additions shall be made to, or reductions from, the sum hereafter mentioned to be paid, as the Engineer shall deem just and equitable. And the said contractor shall be paid, viz:

For Excavation at head of plane, including all material, per cubic yard, Thirty nine cents
For Mason-work, supporting Engine and Machinery, per perch of 25 cubic feet, Two Dollars & Eighty five cents
For Mason-work in foundations of Engine-House and Road-Shed, per perch of 25 cubic feet, one Dollar & Sixty five cents

For building Engine-House and Road-Shed, including all work above foundations, Eight hundred and ten Dollars
For frames supporting and connected with Machinery, per foot lineal, Twenty five cents
For digging and walling Well 15 feet deep, for regulating weight, Sixty Dollars
For building House for Engine Tender at head of plane, Nine hundred and fifty Dollars
For building House at foot of plane, Six hundred Dollars
For building Shed over Machinery at foot of plane, including all work above foundations, three hundred & seventy five Dollars
For Excavation at foot of plane, including all material, per cubic yard, Twenty five cents
For Masonry at foot of plane, per perch of 25 cubic feet, one Dollar & fifty nine cents
For hanging and fitting Sheaves on inclined plane, per Sheave, Ninety four cents
For hanging and fitting large Sheave at foot of inclined plane, five Dollars
For constructing all frame-work connected with said Sheave, per foot lineal, Twenty five cents

Articles of Agreement,

Entered into this 23 day of June one thousand eight hundred and thirty four by and between the Commonwealth of Pennsylvania, by Samuel Jones, Superintendednt of the Western Div. Pennsylvania Canal, and Portage Rail Road, of the one part, and James Stackpole, Casper Dull [?] & Hiram Willis--of the other part:

Witnesseth, That the said Stackpole Dull & Willis covenant and agree that they will furnish all the materials that shall be of a quality approved of by the Engineer, and perform all labor necessary to construct in the most substantial and workman-like manner—an Engine House, Store room & coal Shed, at the head of Inclined Plane No. 6 of
the Allegheny Portage together with the necessary walls
of rubble and dressed [?] masonry connected with the
same—and further to furnish all the materials to all the
brick work required in & about the furnace & Stack & to
furnish dressed [?] and ready for use the timber required
for the Cylinder beds and to do all the Excavation and
Embarkment and other work that may be necessary to complete
this contract—

The whole of the works
in every respect, to be constructed and finished
agreeably to a plan in the Engineer's Office, and the
specifications thereunto annexed, which are to be considered
and taken as part of this contract, subject however at
all times to such variations, alterations and directions as
may be given by the Engineer; and if any variation or altera-
tion proposed by the Engineer, should be considered by him
unfavorable to the interest of said contractors, or on the
other hand, should diminish the amount of labor or expense
required by the plan and specifications, then, and in
either case, such additions shall be made to, or reductions
from, the sum hereafter mentioned to be paid, as the
Engineer shall deem just and equitable. And the said con-
tractors shall be paid, viz:

For Common Excavation per Cubic Yard Twelve & an
half cents. For Embankment twenty cents per cubic yard.
For Slate or detached [?] rock per cubic yard forty cents.
For hard pan per cubic Yard thirty cents. For Solid rock
per cubic yard twenty five cents. For rubble wall in
foundations & for stone work about the furnace per perch
of twenty five cubic feet One Dollar Sixty two & an half
cents. For wall of dressed masonry to include putting in
of the bolts [?] per perch of 25 cubic feet three Dollars
& fifty cents. For timber for Cylinder bed [?] etc.
through which the bolts pass per foot lineal twenty five
cents. For the Engine House according to the Specifications
& bill of timber including coal House & store room Six
hundred & twenty Dollars. For Brick work in furnace &
stack including cast iron bars for supporting one side of
the Stack over the flue, Nine Dollars per thousand.

From: Contracts, 1851-55, Box 2, Vol. 4, A.P.R.R.,
Div. Rec., BCC, RG 17, Pa. A.
APPENDIX H

Notes from Contract for Shed for Weighscales and Weigh Room

Contract let on May 24, 1834 with William Greer to construct a Shed for the weigh scale, weigh room, Gate and Side Railway together with all the excavation, embankment, and masonry connected with its construction according to the specifications, including iron, painting, etc.

$1.50 for mason work in foundation of shed and weigh room, per perch of 25 cubic feet

$2.00 for mason work in inner wall, including all stone or stone work per perch of 25 cubic feet

25¢ for excavation of all kinds per cubic yard

18¢ for embankment per cubic yard

16¢ for white oak or pine rails and cross ties per foot lineal

Engineer's estimate for broken stones per cubic yard

28¢ for laying side Railwaying putting on plate rails, furnishing wedges and pins of seasoned locust, or white oak, forming horse path, and completing the siding per yard in length of each line of rail

$110 for furnishing materials and doing all the work necessary to complete the Gate according to the plans and specifications

12¢ for iron for Gate per pound

$450 for building shed and weigh room, furnishing materials and doing the work complete according to the plans and specifications, including . . . painting.

APPENDIX I

Specification

of the manner of building a Locomotive Engine House, Machine Shop, Smith Shop, Coal House and Boiler Shed, yard walls, etc.

The pits are to be dug for all the foundation walls to such depth as the Engineer may deem necessary to obtain a good foundation. They will generally be from two to three feet below the surface of the ground. The pits in the Locomotive Engine House are to be dug to the depth represented in the drawing marked No 1. The Excavation for all the foundations will be paid for by the cubic yard.

The foundation walls for the Locomotive engine house, Machine Shop, smith shop, boiler shed and coal house & yard wall are all to be two feet thick. They are to be of the kind and quality called uncoursed Rubble Masonry, except a course 1 foot thick on the top which is to be cut smooth on the face. The Stones for the wall are to be of good form & of large size. After the wall is built the joints are to be pointed with mortar made of white lime and sand. The Stones which form the upper course (ashlar) are to have at least one foot bed. The walls which surround the Locomotive Engine pits are to be two feet thick, and are to be built in the same manner as the foundation walls, except that no ashlar will be required. The foundation walls, pit walls, etc., are all to be laid in mortar. They will be measured & paid for by the perch, each perch to contain 25 cubick [sic.] feet of masonry.

The dimensions of each building, wall, etc., are marked upon the drawings, all the walls (Brick Walls) are to be of the same thickness, viz equal to the length and half the length of a brick, or thirteen inches. The pilasters and cornice on the front of the Locomotive Engine House, and the pilasters and pediment at the end of the Locomotive Engine House & of the Machine Shop which front the main track of the Railway, are to be made of brick laid up with the main wall, except the capitals of the pilasters which are to be of Sand Stone. The key of the arch over each door in the Locomotive engine house & over the large door in the machine shop is to be made of sand stone.
There are to be four doors in the front of the Locomotive Engine House of the dimensions represented in the drawings and one door of the same dimensions in the back of the building through which the branch Railway will pass into the enclosed yard.

There are to be three windows in the side of the Engine House fronting the enclosed yard at the points represented in the plan, each with 24 lights of 10 by 12 inch glass. There will be four windows in each end of the building of the form represented in the end view on the drawing No. 2 each lower window will have 24 lights of 10 by 12 inch glass & each upper window will have 12 lights of 10 by 12 inch glass.

The Roof will be supported with 6 pair of principal Rafters, purlines for the support of the common Rafters will be notched into these at the points shown in the drawings.

The Common Rafters will be 4 by 5 inches square and they will be placed in the roof at intervals of two feet and a half measuring from centre to centre. The ends of tie-beams are to rest upon the wall plates Z. The lower end of the Common Rafters are to be supported by the pole plates Y, which rest upon and are to be secured to the tie-beams N. The common rafters are to be covered with inch white pine boards laid close together and well nailed to the Rafters. The boards are to be of a quality suitable to receive a tin or copper covering for the roof. The Shingles are to be white or yellow pine, and jointed at the edges: They are to be laid in courses of not more than four inches. A gutter is to be formed along the lower part of the roof on each side to convey the water to the spouts on each corner of the building. The gutters will descend from the middle of the house towards each end. The Spouts and gutters are to be made of thick tin, painted.

Scantling 3 by 10 inches square are to run length-wise of the building, are to be placed between the end walls and the contiguous tie beams--and between the remaining tie beams, at intervals of not more than two feet from centre to centre, the end of these scantling are to be framed into the tie beams with a tenon.

The Engine room is to be well plastered with three coats of the best quality of common plastering mortar, the lath for the ceiling shall be at least half an inch
thick. A Chimney of Sheet-iron, to be furnished by the Commonwealth, is to be placed over the centre of each of the two middle pits.

The pilasters, the Cornice in front, and the pediment at each end of the building, are to be covered with Stucco made of such materials as the Engineer may direct to be furnished by the Commonwealth. The Stucco is to be mixed and put on by an experienced workman, and is to be finished in the best manner.

The pits in the Engine room will be four feet deep measured from the top of the sail. The steps at each end will be of sand stone cut smooth, or of such other strong stone as the Engineer may approve. They will be of the size and form represented in the drawing, the bottom of the pits will be paved with bricks. The timbers alongside of the pits and upon which the iron plate rails are fastened are to be 12 by 12 inches square and forty five feet long. They are to be white or yellow pine.

The wall between the Locomotive engine house and the Machine Shop is to be coped with sand stone cut smooth. The coping will project on each side four inches. The thickness at each edge will be four inches and in the middle 7 inches. The gate-way in the wall is to be nine feet wide. The gates will be made of 1-1/2 inch pine plank placed double and rivitted [sic.] together. They are to be hung with strong strap hinges. They will be fastened by a bar placed horizontally across the middle of the gates and secured in such manner as the Engineer may direct.

The machine shop will be divided into two stories. The frame for supporting the lower floor will be made with three girders 10 by 10 inches placed so as to divide the spaces between the ends of the building into four equal parts. Joists 3 by 10 inches square placed lengthwise of the building are to be framed into the building at intervals of two feet or less, measuring from centre to centre, except over the part occupied by the pit. The floor is to be made of white oak or white ash plank 1-1/2 inches thick and not more than eight inches wide. They are to be jointed at the edges. Short joists are to be put in between the girders and the timber to which the plate rail is fastened.

Each girder is to be supported in the middle by a pillar of stone or brick wall. The frame for second
floor will consist of 3 girders 10 by 10 inches placed across the building as in the frame of the lower floor into these—joists to run in the same direction as in the lower floor are to be framed. They are to be placed at intervals of two feet measuring from centre to centre. The floor is to be made of plank white oak or white ash 1-1/2 inches thick, they are to be jointed at the edges and put together with a tongue and groove. A post 10 by 10 inches is to be placed under the middle of each girder. It will stand upon the lower girder and over the pillar which supports it. The frame will consist of the tie beams of the three pair of principal Rafters, which will serve as girders. Two timbers 5 by 10 inches square are to be framed in between & into each end wall and the contiguous tie & between and into each two tie beams—These timbers are to be placed each one foot from the centre of the tie beams. Joists 3 by 10 inches are to be placed between and parallel to the tie beams of the principal Rafters. These joists will be placed at intervals of not more than two feet measuring from centre to centre, one end of these joists will be framed into the 5 by 10 in. timber, the end will rest upon the wall plates.

The board for the other floor (garret floor) may be either pine or oak one inch thick, they are to be jointed and put together with a tongue & groove.

The Roof is to be supported by three pair of principal rafters placed so as to divide the building lengthwise into four equal spaces. In each of the spaces there are to be five pair of Common Rafters supported at the foot and resting upon the 3 by 10 inch joists. These rafters are to be 4 by 6 inches square at the foot and 4 by 4 inches square at the top. The rafters are to be covered with inch pine or hemloc [sic.] board laid close. The shingles are to be of pine jointed at the edge and laid in courses of not more than 4 inches.

The Sidewalls of both stories are to be well plastered.

The windows and door are to be of the dimensions represented in the drawings. There is to be a window in the second story over each window or door in the lower story the glass will be of the same size as those of the Engine House. The pit is to be of the same depth as those in the locomotive Engine house. It will have step at one end of cut stone--
The Blacksmiths Shop, Coal House, & Boiler Shed will be under one roof, this will be a shed roof. The water will be turned from the yard. The Rafters will be 4 by 6 inches square. These will be covered with inch pine or hemloc [sic.] board upon which the shingles are to be laid. The Shingles are to be of pine jointed at the edges and laid in courses of not more than four inches. For the number and size of the doors & windows (see the drawings).

The partitions which separate the smiths shop Coal House and boiler house are to be made of bricks the walls to be nine inches thick. The Stack of the boiler furnace will be about 20 ft. high. It will have the form and dimensions represented in the drawings.

The yard will be filled with Embankment to the height of the floor of the locomotive Engine house, it will be finished so as to be level and smooth. The Embankment will be paid for by the cubic yard.

Description of Ropes for Inclined Planes

The ropes provided for the inclined planes are of various lengths, from three thousand six hundred and sixteen, to six thousand six hundred and thirty-two feet, seven of them, including one extra rope, are each seven inches in circumference, and five including one extra rope, are each six and a fourth inches in circumference. The ropes are shroud laid; those of seven inches in circumference, contain each about four hundred and fifty yarns, and those of six and a fourth inches in circumference, contain about three hundred and sixty yards. Four of these ropes are made each in one piece; the others are made in pieces, and are to be spliced together. They are made, a part of them of Italian, and a part of Russian hemp.


Ropes Used at Planes in 1833:

Table of lengths, &c. of Ropes.

<table>
<thead>
<tr>
<th>No. of plane</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
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<th>10</th>
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<tbody>
<tr>
<td>Circumference of rope</td>
<td>7</td>
<td>6-1/4</td>
<td>7</td>
<td>7</td>
<td>6-1/4</td>
<td>7</td>
<td>6-1/4</td>
<td>6-1/4</td>
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<td></td>
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<tr>
<td>Length of rope</td>
<td>3616</td>
<td>3920</td>
<td>3360</td>
<td>4790</td>
<td>5657</td>
<td>5828</td>
<td>5710</td>
<td>6632</td>
<td>5842</td>
<td>4992</td>
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<tr>
<td>Weight of ropes</td>
<td>7608</td>
<td>6044</td>
<td>6935</td>
<td>8304</td>
<td>8001</td>
<td>11668</td>
<td>11281</td>
<td>13221</td>
<td>9240</td>
<td>9499</td>
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<tr>
<td>Working strain of rope</td>
<td>9800</td>
<td>7812</td>
<td>9800</td>
<td>9800</td>
<td>7812</td>
<td>9800</td>
<td>9800</td>
<td>9800</td>
<td>7812</td>
<td>7812</td>
</tr>
<tr>
<td>No. of yards.</td>
<td>449 358 449 449 358 449 449 449 358 358</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>--------------</td>
<td>----------------------------------------</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pounds raised 352 ft. per minute</td>
<td>6562 5625 6562 6562 5625 6562 6562 5625 5625</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pounds raised by single engine.</td>
<td>3281 2812 3281 3281 2812 3281 3281 3281 2812 2812</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Horse power of engine.</td>
<td>35 30 35 35 30 35 35 35 30 30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

APPENDIX K

Description of Machinery, Sheaves, and Engines for Inclined Planes

The machinery for working the rope is placed in a pit, under the rail-way, at the head of the inclined plane. The cast iron sheaves or wheels, that give motion to the rope, are placed, the one 91-1/2 feet, and the other 87-1/2 feet from the head of the plane, or the point where the road begins to descend. These sheaves are 8 feet in diameter, at the bottom of the groove, and 8-1/2 feet in diameter, at the extremity of the flanges; after they are cast they are put into a lathe, and the grooves turned out so as to fit the rope intended for each plane, and to give both sheaves the same diameter. These sheaves are placed vertically, and revolve in opposite directions. The end of the shaft of each sheave opposite the engine which works it, has a cog-wheel four feet in diameter, strongly secured upon it. The teeth of these wheels work into each other, and regulate the motion of the vertical sheaves. A cast iron sheave, nine feet seven inches in diameter, in the bottom of the groove, is fixed on a moveable carriage between the vertical wheels and the commencement of the descent of the plane. The groove in this sheave is also turned smooth and true, but it is longer than the rope. The moveable carriage may be drawn backwards and forwards about fifteen feet, but it is intended generally to be kept at the end of the pit nearest to the inclined plane, by a weight connected with it by a chain. The weight is suspended in a well; the chain with which it is connected with the carriage passes over a small sheave at the top of the well, which allows it to ascend and descend as the carriage is drawn backward and forward. The short distance which this sheave and carriage is permitted to move, would not be a sufficient allowance for the contraction and expansion of the rope, but the sheave at the foot of the plane, around which the rope passes, is also placed in a carriage fixed upon ways, and can be moved backwards and forwards upwards of fifty feet. The ascending side of the rope passes over and around one of the vertical sheaves; then through an opening in the wall that separates the pits, and around the large horizontal sheave; then back through another
opening in the wall, and under and around the other vertical sheave; then down the plane. The rope is pressed into a little more than one half of the groove of each vertical sheave. The groove at the bottom is a little smaller than the rope, so that when the rope is drawn into the groove, it is pressed by the sides and the bottom. The machinery is designed for two engines—one on each side of the railroad.

Each vertical sheave has a cast iron shaft eight inches in diameter, to the end of which, the crank by which the engine communicates motion to the machinery is affixed. A second crank is connected by a short shaft, with this, which works at right angles to it. The shafts of the vertical sheaves are in two parts, so that by removing a coupling box, which is moved backwards and forwards by a lever, the sheaves may move when the engine is at rest, or the engine may be put in motion when the sheaves are at rest.

The engines are of the high pressure kind; they have each two cylinders, the pistons of which work the cranks above mentioned.

Those for inclined planes No. 1, 3, 4, 6, 7 and 8, have cylinders of fourteen inches in diameter, and the stroke or distance which the piston moves, is five feet. The engines for inclined planes No. 2, 5, 9 and 10, have cylinders of thirteen inches in diameter, and the stroke or distance which the piston moves, is five feet. The number of revolutions required, to produce a velocity for the ascending cars of four miles per hour, will be about fourteen, and with this number, when the engine works under a pressure of steam of about seventy pounds to the inch. The power of the larger engines, computed in the common way, would be that of about thirty-five horses; and the power of the smaller ones, that of about thirty horses.--But as the power of the engines depends upon the quantity of steam produced, and the degree to which it is heated, they might, by increasing the quantity and elastic power of the steam, be made to do the work of forty, fifty, or sixty horses each, without injury to the engines. This would produce a corresponding increase in the velocity of the ascending cars, or admit of an increase in the load. Each of the large engines have three cylindrical boilers, each thirty inches in diameter and twenty feet long. Each of the smaller engines have three cylindrical boilers, thirty inches in diameter, and eighteen feet long—all the boilers are made of rolled iron, one-fourth of an inch thick.

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The engines have no fly-wheel; the second cylinder, which works a crank at right angles to the main crank, and connected with it, supplies the place of a fly-wheel, in regulating the motion of the machinery. With a fly-wheel, if a car is thrown off the rail-way, or if any derangement takes place with the rope that will cause it to stop, the machinery or the rope must break, before the fly-wheel can be stopped; and when this takes place, all the cars upon the plane will run down, and be injured or entirely destroyed. Without the fly-wheel, the rope is strong enough to stop the engine without danger of being broken.

Whenever the descending train of cars preponderates in weight, over the ascending train, sufficiently to overcome the resistance by friction of the machinery, rope, &c. or when there is no ascending train, the coupling boxes upon the shafts of the vertical wheels are thrown back, by which the engine is disengaged, and the sheaves and rope are put in motion, by the gravity of the descending load. The velocity of the descending train of cars, is regulated in the following manner. A cylinder fourteen inches in diameter and about six feet long, with a small air vessel upon each end, and a pipe upon one side, is placed upon a cast iron frame, secured to the walls, between the engine and the large sheaves. The cylinder is filled with water, and the piston which works in the same manner as the piston of a steam cylinder, and which is connected by gearing [sic.] with the shafts of the vertical sheaves, drives the water backwards and forwards through the side pipe. In the centre of the side pipe, a sliding valve is fixed, by which the engine tender can regulate the size of the aperture through which the water must pass, and by this regulate the velocity of the cars. When the vertical or working sheaves are driven by the engine, the machinery connected with the water cylinder is disengaged from the other machinery by the aid of a clutch. When the inclined plane is used as a self acting plane, the train of cars are stopped, when they arrive at the head or foot of the plane by a friction wheel fixed upon the shaft, by which the water cylinder is worked. When the machinery is worked by the engine, the cars are stopped by letting steam into the end of the cylinder, towards which the piston is moving.

## APPENDIX L

**Sidings, Turnrounds, Lateral Railways**

<table>
<thead>
<tr>
<th>Date Authorized</th>
<th>Contractor's Name</th>
<th>Location Description</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug. 20, 1834</td>
<td>William Brown</td>
<td>Sideway &amp; turnout on or near Section 28--connecting with coal bank (4th level)</td>
<td>CCJ, Vol. 1, pp. 1566-29--connecting with 1568 coal mine (4th level)</td>
</tr>
<tr>
<td></td>
<td>Irwin &amp; McDowell</td>
<td>Sideway &amp; turnout on or near Section 28--connecting with coal bank (4th level)</td>
<td>Minute Books &amp; Indexes Box 3, BCC, RG 17, Pa. A.</td>
</tr>
<tr>
<td></td>
<td>Jos. Kempf &amp; Co.</td>
<td>Sideway on/near Section 37 (Plane 7)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C. Garber, T. Jackson</td>
<td>Lateral railway along street which runs parallel to basin &amp; west of basin lots in Gaysport</td>
<td></td>
</tr>
<tr>
<td></td>
<td>John Gibbony</td>
<td>Sideway at Duncansville</td>
<td></td>
</tr>
<tr>
<td></td>
<td>G.W. Henry</td>
<td>Sideway--below foot of Plane 10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Murry &amp; Mullen</td>
<td>Sideway &amp; Platform--c. 1/2 mile east of Johnstown basin</td>
<td></td>
</tr>
<tr>
<td></td>
<td>John Durno</td>
<td>Sideway &amp; Chute--between Planes 3 &amp; 4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>John Durno</td>
<td>Sideway east of &amp; near to Clapboard Run</td>
<td></td>
</tr>
<tr>
<td>Date Authorized</td>
<td>Contractor's Name</td>
<td>Contractor's Location</td>
<td>Source</td>
</tr>
<tr>
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<td>-------------------</td>
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<tr>
<td>Aug. 25, 1834</td>
<td>Henry Denlinger</td>
<td>Sideway at his tavern--Summit</td>
<td>CCJ, Vol. 1, p. 1578 Minute Books &amp; Indexes Box 3, BCC, RG 17, Pa. A.</td>
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<tr>
<td></td>
<td>William Palmer</td>
<td>Sideway at/near town of Jefferson</td>
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</tr>
<tr>
<td>Aug. 27, 1834</td>
<td>Peter Levergood</td>
<td>Sideway 240 feet below weighscale at Johnstown</td>
<td>CCJ, Vol. 1, p. 1601 Minute Books &amp; Indexes Box 3, BCC, RG 17, Pa. A.</td>
</tr>
<tr>
<td>Mar. 16, 1835</td>
<td>James Speer</td>
<td>Sideway--at his warehouse at Johnstown</td>
<td>CCJ, Vol. 1, p. 1662 Ibid.</td>
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<tr>
<td>April 17, 1835</td>
<td>Chauncy, Biddle &amp; Moore</td>
<td>2 Turnrounds--opposite their lot at Hollidaysburg</td>
<td>CCJ, Vol. 1, p. 1682 Ibid.</td>
</tr>
<tr>
<td></td>
<td>Edward Miller</td>
<td>4 Turnrounds--opposite his lot at Hollidaysburg</td>
<td></td>
</tr>
<tr>
<td></td>
<td>S. Jones</td>
<td>4 Turnrounds--opposite his lot at Hollidaysburg</td>
<td></td>
</tr>
<tr>
<td></td>
<td>John Walker, Jr.</td>
<td>4 Turnrounds--opposite his lot at Hollidaysburg</td>
<td></td>
</tr>
<tr>
<td>Date Authorized</td>
<td>Contractor's Name</td>
<td>Location</td>
<td>Source</td>
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<tr>
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<tr>
<td>Jan. 26, 1839</td>
<td>H.L. Patterson</td>
<td>Sideway--at his Warehouse near Hollidaysburg</td>
<td>CCJ, Vol. 1, p. 2452 Minute Books &amp; Indexes, Box 4, BCC, RG 17, Pa. A.</td>
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<tr>
<td>June 10, 1839</td>
<td>Edward Bell</td>
<td>Sideway--upon his ground in Henrysburg</td>
<td>CCJ, Vol. 1, p. 2187, Ibid.</td>
</tr>
<tr>
<td>June 28, 1839</td>
<td>John Ivey</td>
<td>Sideway at or near turnpike crossing at Summit</td>
<td>CCJ, Vol. 1, p. 2187, Ibid.</td>
</tr>
<tr>
<td>&quot;</td>
<td>George Mulhollen</td>
<td>Siding--head of Plane 7</td>
<td>CCJ, Pa. Exec. Docs. 1846, pp. 92 &amp; 100</td>
</tr>
</tbody>
</table>
Table of Horsepower on Levels, 1834-5

<table>
<thead>
<tr>
<th>Levels on which horses are used.</th>
<th>Length of each level.</th>
<th>Distance traveled by each horse per day.</th>
<th>Number of horses for a train of four cars.</th>
<th>Gross weight of four loaded cars.</th>
<th>Average number of horses this season on each level.</th>
<th>Power exerted by each horse in ascending the grade, in pounds.</th>
<th>Power exerted by each horse in descending the grade, in pounds.</th>
<th>Average exertion by each horse, if loaded in both directions.</th>
<th>Mean grade distance, in which the road rises one foot.</th>
</tr>
</thead>
<tbody>
<tr>
<td>From Johnstown to plane No. 1.</td>
<td>4 miles.</td>
<td>20 ms.</td>
<td>3</td>
<td>40,000</td>
<td>24</td>
<td>133-1/2</td>
<td>0</td>
<td>66-2/3</td>
<td>200</td>
</tr>
<tr>
<td>Long level, - - - -</td>
<td>13 miles.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>From plane No. 2 to 3.</td>
<td>1-6/10 miles.</td>
<td>22-4/10</td>
<td>2</td>
<td>40,000</td>
<td>6</td>
<td>140</td>
<td>60</td>
<td>100</td>
<td>500</td>
</tr>
<tr>
<td>Between planes 3 and 4.</td>
<td>1-9/10 miles.</td>
<td>26-6/10</td>
<td>2</td>
<td>40,000</td>
<td>7</td>
<td>140</td>
<td>60</td>
<td>100</td>
<td>500</td>
</tr>
<tr>
<td>Between planes 4 and 5.</td>
<td>2-1/2 miles.</td>
<td>20</td>
<td>2</td>
<td>40,000</td>
<td>11</td>
<td>140</td>
<td>60</td>
<td>100</td>
<td>500</td>
</tr>
<tr>
<td>Between planes 5 and 6.</td>
<td>1-1/2 miles.</td>
<td>21</td>
<td>2</td>
<td>40,000</td>
<td>7</td>
<td>148</td>
<td>5</td>
<td>100</td>
<td>417</td>
</tr>
<tr>
<td>Between planes 6 and 7.</td>
<td>16/100</td>
<td>6-3/4</td>
<td>1</td>
<td>40,000</td>
<td>1</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>Infinite</td>
</tr>
<tr>
<td>Between planes 7 and 8.</td>
<td>63/100</td>
<td>20-16/10</td>
<td>2</td>
<td>40,000</td>
<td>4</td>
<td>140</td>
<td>60</td>
<td>100</td>
<td>500</td>
</tr>
<tr>
<td>Between planes 8 and 9.</td>
<td>1-1/4 miles.</td>
<td>22-1/2</td>
<td>2</td>
<td>40,000</td>
<td>6</td>
<td>140</td>
<td>60</td>
<td>100</td>
<td>500</td>
</tr>
<tr>
<td>Between planes 9 and 10.</td>
<td>1-3/4 miles.</td>
<td>21</td>
<td>3</td>
<td>40,000</td>
<td>9</td>
<td>112</td>
<td>21</td>
<td>66-1/2</td>
<td>294</td>
</tr>
<tr>
<td>From plane No. 10 to Hollidaysburg,</td>
<td>3 miles.</td>
<td>21</td>
<td>4</td>
<td>40,000</td>
<td>24</td>
<td>137</td>
<td>0</td>
<td>68-1/2</td>
<td>115</td>
</tr>
</tbody>
</table>


Sum, 1001-2/3
Average, 100,17 lbs.
## APPENDIX N

### List of Locomotive Engines

**1839 and 1840**

### 1839

#### STATEMENT NO. 7, LOCOMOTIVES.

<table>
<thead>
<tr>
<th>Names of Engines</th>
<th>Names of Makers</th>
<th>When commenced running</th>
<th>First cost</th>
<th>Present state</th>
<th>Days' of Service</th>
<th>State of the Engines</th>
<th>Days of use</th>
<th>State of the Engines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bush Hill,</td>
<td>1 William Norris</td>
<td>April 17, 1837</td>
<td>$7,500</td>
<td>under repairs</td>
<td>183</td>
<td>in good order.</td>
<td>183</td>
<td>in good order.</td>
</tr>
<tr>
<td>George Washington</td>
<td>3</td>
<td>July 13, 1836</td>
<td>6,300</td>
<td>in service</td>
<td>160</td>
<td>do</td>
<td>160</td>
<td>do</td>
</tr>
<tr>
<td>Independence,</td>
<td>1</td>
<td>July 4, 1837</td>
<td>7,500</td>
<td>do</td>
<td>222</td>
<td>do</td>
<td>222</td>
<td>do</td>
</tr>
<tr>
<td>Benjamin Franklin</td>
<td>3</td>
<td>Aug. 19, 1836</td>
<td>6,300 used as a reserve</td>
<td>195</td>
<td>in running order.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Robert Morris,</td>
<td>3</td>
<td>May 12, 1836</td>
<td>6,300</td>
<td>in service</td>
<td>212</td>
<td>do</td>
<td>212</td>
<td>do</td>
</tr>
<tr>
<td>James Madison,</td>
<td>2</td>
<td>March 21, 1837</td>
<td>6,950</td>
<td>do</td>
<td>210</td>
<td>do</td>
<td>210</td>
<td>do</td>
</tr>
<tr>
<td>La Fayette,</td>
<td>3</td>
<td>March 21, 1837</td>
<td>6,500</td>
<td>do</td>
<td>211</td>
<td>do</td>
<td>211</td>
<td>do</td>
</tr>
<tr>
<td>United States,</td>
<td>1</td>
<td>May 22, 1837</td>
<td>7,500</td>
<td>do</td>
<td>222</td>
<td>do</td>
<td>222</td>
<td>do</td>
</tr>
<tr>
<td>Constitution,</td>
<td>1</td>
<td>June 12, 1837</td>
<td>7,500</td>
<td>do</td>
<td>222</td>
<td>do</td>
<td>222</td>
<td>do</td>
</tr>
<tr>
<td>Mountaineer,</td>
<td>2 M'Clurg, Wade, &amp;c.</td>
<td>March 29, 1837</td>
<td>6,250 under repair</td>
<td>required rebuilding.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pennsylvania,</td>
<td>2</td>
<td>not known</td>
<td>4,000 used as a reserve</td>
<td>75</td>
<td>do</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pittsburg,</td>
<td>3</td>
<td>Sept. 3, 1835</td>
<td>4,500</td>
<td>in service</td>
<td>205</td>
<td>in very bad order.</td>
<td>205</td>
<td>in very bad order.</td>
</tr>
<tr>
<td>Back Woodman,</td>
<td>2</td>
<td>Nov. 18, 1836</td>
<td>6,250</td>
<td>do</td>
<td>225</td>
<td>do</td>
<td>225</td>
<td>do</td>
</tr>
<tr>
<td>Allegheny,</td>
<td>2 E.A.G. Young.</td>
<td>May 10, 1835</td>
<td>5,700 under repairs</td>
<td>required rebuilding.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tennessee,</td>
<td>2</td>
<td>May 10, 1835</td>
<td>5,700 used as a reserve</td>
<td>45</td>
<td>do</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comet,</td>
<td>2</td>
<td>July 16, 1836</td>
<td>6,500</td>
<td>in service</td>
<td>173</td>
<td>in very bad order.</td>
<td>173</td>
<td>in very bad order.</td>
</tr>
<tr>
<td>Boston,</td>
<td>3 R.M. Houten.</td>
<td>May 10, 1835</td>
<td>8,000 used as a reserve</td>
<td>15</td>
<td>do</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: Days of Service and State of the Engines are subject to change depending on various factors.*
List of Locomotive Engines
1839 and 1840

1840

STATEMENT NO. 7, LOCOMOTIVES.

<table>
<thead>
<tr>
<th>Names of Engines</th>
<th>Names of Makers</th>
<th>When commenced running.</th>
<th>First cost.</th>
<th>Present Ac'l value</th>
<th>Days' of Service</th>
<th>Present State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bush Hill,</td>
<td>1 William Norris,</td>
<td>April 17, 1837</td>
<td>$7,500</td>
<td>$4,500</td>
<td>116</td>
<td>In service,</td>
</tr>
<tr>
<td>George Washington</td>
<td>3 do</td>
<td>July 13, 1836</td>
<td>6,300</td>
<td>2,500</td>
<td>225</td>
<td>do</td>
</tr>
<tr>
<td>Independence</td>
<td>1 do</td>
<td>July 4, 1837</td>
<td>7,500</td>
<td>5,000</td>
<td>170</td>
<td>Wants new tire,</td>
</tr>
<tr>
<td>Benjamin Franklin</td>
<td>3 do</td>
<td>Aug. 19, 1836</td>
<td>6,300</td>
<td>2,500</td>
<td>198</td>
<td>In service,</td>
</tr>
<tr>
<td>Robert Morris,</td>
<td>3 do</td>
<td>May 12, 1836</td>
<td>6,300</td>
<td>2,500</td>
<td>207</td>
<td>do</td>
</tr>
<tr>
<td>James Madison,</td>
<td>2 do</td>
<td>March 21, 1837</td>
<td>6,950</td>
<td>4,000</td>
<td>140</td>
<td>Wants new tire,</td>
</tr>
<tr>
<td>La Fayette</td>
<td>3 do</td>
<td>March 21, 1837</td>
<td>6,500</td>
<td>4,000</td>
<td>154</td>
<td>Used as a reserve,</td>
</tr>
<tr>
<td>United States,</td>
<td>1 do</td>
<td>May 22, 1837</td>
<td>7,500</td>
<td>5,500</td>
<td>150</td>
<td>Wants new tire,</td>
</tr>
<tr>
<td>Constitution,</td>
<td>1 do</td>
<td>June 12, 1837</td>
<td>7,500</td>
<td>5,500</td>
<td>275</td>
<td>In service,</td>
</tr>
<tr>
<td>Mountaineer,</td>
<td>2 M'Clurg, Wade &amp; Co</td>
<td>March 29, 1837</td>
<td>6,250</td>
<td>1,500</td>
<td>none</td>
<td>Rebuilding,</td>
</tr>
<tr>
<td>Pennsylvania,</td>
<td>2 do</td>
<td>Not known</td>
<td>4,000</td>
<td>3,500</td>
<td>117</td>
<td>Under repair,</td>
</tr>
<tr>
<td>Pittsburgh,</td>
<td>3 do</td>
<td>Sept. 3, 1835</td>
<td>4,500</td>
<td>3,000</td>
<td>43</td>
<td>do</td>
</tr>
<tr>
<td>Back Woodsman,</td>
<td>2 do</td>
<td>Nov. 18, 1836</td>
<td>6,250</td>
<td>4,500</td>
<td>232</td>
<td>In service,</td>
</tr>
<tr>
<td>Allegheny,</td>
<td>2 E.A.G. Young,</td>
<td>May 10, 1835</td>
<td>5,700</td>
<td>300</td>
<td>none</td>
<td>A shop eng.Hol'g dpt</td>
</tr>
<tr>
<td>Tennessee,</td>
<td>2 do</td>
<td>May 10, 1833</td>
<td>5,700</td>
<td>2,000</td>
<td>98</td>
<td>Used as a reserve,</td>
</tr>
<tr>
<td>Comet,</td>
<td>2 do</td>
<td>July 16, 1836</td>
<td>6,500</td>
<td>4,000</td>
<td>113</td>
<td>Under repair,</td>
</tr>
<tr>
<td>Boston,</td>
<td>3 R.M. Houton</td>
<td>May 10, 1835</td>
<td>8,000</td>
<td>4,000</td>
<td>125</td>
<td>In service,</td>
</tr>
<tr>
<td>James Clarke,</td>
<td>1 D.H. Dotterer &amp; Co</td>
<td>July 10, 1840</td>
<td>7,500</td>
<td>7,000</td>
<td>70</td>
<td>do</td>
</tr>
<tr>
<td>David R. Porter,</td>
<td>1 do</td>
<td>June 12, 1840</td>
<td>7,500</td>
<td>7,000</td>
<td>100</td>
<td>do</td>
</tr>
</tbody>
</table>

"The Engineer shall determine the time or times for the starting of cars--the speed of motive power--the places where cars shall meet and pass each other, and shall have "the general care, direction, and superintendence of the trade "and travel upon the Railway."

In conformity with the provision of the above regulation, the following are fixed as the periods for starting with burthen cars, from Johnstown, Hollidaysburg, and the intermediate points: the rate at which they will travel, and the times and places at which they will meet and pass trains of cars going in the opposite directions.

Each train will consist of four cars, where such an arrangement is practicable for the transporter.

Trains of cars going from Johnstown, eastward toward the summit level, will travel at a rate of not less than three miles per hour: fifteen minutes will be allowed for time lost at each inclined plane. From the summit level to Hollidaysburg, trains of cars will travel at a rate of not less than four nor more than five miles per hour, and fifteen minutes will be allowed for time lost at each plane.

Trains of cars going from Hollidaysburg, westward toward the summit level, will travel at a rate of not less than three miles per hour: fifteen minutes will be allowed for time lost at each inclined plane. From the summit level to Johnstown, trains of cars will travel at a rate of not less than four nor more than five miles per hour: fifteen minutes will be allowed for time lost at each inclined plane.

The first trains of cars which leave Johnstown in the morning, will start at 5 o'clock and 30 minutes: the second at 5 o'clock and 45 minutes: the third at 6 o'clock: the fourth at 6 o'clock and 15 minutes: the fifth at 6 o'clock and 30 minutes: the sixth at 6 o'clock and 45 minutes: the seventh at 7 o'clock. These will be denominated the morning trains going eastward, and they will proceed in the following order:
The first trains will reach the foot of inclined plane No. 1, at or before 6 o'clock and 50 minutes: the other trains will follow at intervals of 15 minutes, or less, and the last or seventh train will reach the foot of the inclined plane, at or before half past eight o'clock. The cars which stop at Croyl's mill for the night, will meet the morning trains from Johnstown at this inclined plane, and descend while those eastward are ascending. From the head of the inclined plane the trains will proceed in regular order to the turnout at the viaduct at the Horse Shoe Bend, where they will meet and pass the cars which stop for the night at Jefferson. The first train going eastward, will leave this turnout at 8 o'clock and 15 minutes, and proceed to the turnout at Jefferson, where it will meet and pass the cars which stop for the night on the summit level of the Railroad. The other trains will follow in regular order, and the last will arrive at the turnout, at or before 12 o'clock M., and will leave there at 12 o'clock and 15 minutes. The four leading trains will proceed to the turnout on section No. 29, (near Limestone Run) where they will remain on the right hand track, till the four leading morning trains from Hollidaysburg shall have passed them. They will then go on to inclined plane No. 4, which they will ascend, and remain at the head till the last of the morning trains from Hollidaysburg shall have passed them. The remaining trains going eastward will stop at the head of inclined plane No. 3, till the four leading trains going westward arrive, when they will proceed to and stop at the turnout on section No. 29, till the remaining trains going westward shall have passed. The first train going eastward will arrive at this turnout at or before 1 o'clock, P. M., and the three remaining trains will follow at intervals of not more than 15 minutes. The first morning train going eastward will arrive at the head of inclined plane No. 7, where it will meet the noon trains going westward from Hollidaysburg, at 4 o'clock, P. M., The other trains, which do not stop on the summit for the night, will follow at regular intervals of 15 minutes or less. The cars going westward will ascend the inclined plane, and the cars going eastward will descend at the same time. The first train going eastward will remain at the foot of the plane, till the last train going westward shall have passed, and the first train going westward will remain at the head of the plane till the last train going eastward shall have passed it. The first train going eastward will arrive at the foot of inclined plane No. 10, at 6 o'clock and 20 minutes, and at Hollidaysburg at 7 o'clock.
The first train of cars which leaves Johnstown in the middle of the day will start at 11 o'clock; the second at 11 o'clock and 15 minutes; the third at 11 o'clock and 30 minutes; the fourth at 11 o'clock and 45 minutes; the fifth at 12 o'clock; the sixth at 12 o'clock and 15 minutes; and the seventh at 12 o'clock and 30 minutes. These will be denominated the **noon trains going eastward.**

The first train will arrive at the turnout at the viaduct at the Horse Shoe Bend, at 1 o'clock and 45 minutes, where it will meet the cars which leave the summit in the morning, and remain till the last of the trains going westward shall have passed. The first, second, and third trains will proceed to the turnout at Jefferson, provided the last of them can reach it at or before three o'clock and 50 minutes, and remain there till the last of the morning trains from Hollidaysburg shall have passed. The remaining trains will stop at the turnout at Croyl's mill, till the last of the morning trains from Hollidaysburg shall have passed. Such of the noon trains from Johnstown, going eastward, as it is intended to have reach the summit before sunset, can travel, after they leave Jefferson, at any rate between three and five miles per hour, and if they reach the foot of inclined plane No. 4 before sunset, they can pass up and proceed to the foot of inclined plane No. 5, will entitle them to a place in the class of morning trains going eastward from the summit of the Railroad. Cars which do not reach the foot of plane No. 5 in the evening will take their places on the following day with cars which leave Jefferson in the morning, and will be regulated in meeting other cars accordingly.

Cars going eastward which stop for the night on the summit level, will start in the morning as follows: The first train will descend inclined plane No. 6 at 6 o'clock; the second train at 6 o'clock and 15 minutes; the third train at 6 o'clock and 30 minutes; the fourth train at 6 o'clock and 45 minutes; the fifth train at 7 o'clock, &c. The cars will meet the morning trains from Hollidaysburg at inclined plane No. 8, which they will descend while the cars going westward are ascending. No car will leave the foot of this plane until the last of the morning trains shall have passed. They will then leave it and proceed to Hollidaysburg without interruption, provided they reach there at or before 12 o'clock, M. No car will leave the foot of inclined plane No. 10 after 11 o'clock and 25 minutes; such as are detained after that time, will remain till the last of the noon trains going westward shall have passed.
Cars which stop for the night at Jefferson will be at the foot of inclined plane No. 2 at 6 o'clock, A.M., ready to ascend the plane; those which stop for the night at Croyl's mill or at any point between Croyl's mill and inclined plane No. 1, will be at the foot of inclined plane No. 2 at or before 7 o'clock. These cars will stop at the turnout on section No. 29 till the last of the trains which leave the summit in the morning shall have passed them; they will proceed to the foot of inclined plane No. 5, provided the last can arrive at or before 11 o'clock. These cars will not leave the turnout at the head of the plane till the last of the morning trains from Hollidaysburg shall have passed it. They will proceed thence to inclined plane No. 9 which they will descend while the noon trains from Hollidaysburg are ascending. No car will leave the turnout at the foot of the plane till the last of the trains going westward shall have passed. From the foot of plane No. 9, this class of cars will pass on to Hollidaysburg, unobstructed.

The first train of cars which leave Hollidaysburg, in the morning, will start at 5 o'clock and 30 minutes--the second at 5 o'clock and 45 minutes; the third at 6 o'clock; the fourth at 6 o'clock and 15 minutes; the fifth at 6 o'clock and 30 minutes; the sixth at 6 o'clock and 45 minutes; the seventh at 7 o'clock. These will be denominated the morning trains going westward.

The morning trains from Hollidaysburg will meet the cars which stop for the night on the Summit at Inclined Plane, No. 8. The cars going westward will pass up, while those going eastward pass down the plane. No car going westward will pass the turnout at the head of the plane till the last of those going eastward shall have passed it. The morning trains from Hollidaysburg will meet and pass the cars which leave Jefferson and Croyl's Mill in the morning, at Inclined Plane No. 5. They will meet and pass the morning trains from Johnstown as follows:--The four leading trains will proceed to the turnout on Section No. 29, where they will remain till the four leading trains from Johnstown shall have passed them--they will then pass on and descend Plane No. 3: at the foot of which they will remain till the last of the morning trains from Johnstown shall have passed them. The remaining trains will stop at the foot of Plane No. 4, till the four leading trains going eastward shall have passed them, when they shall proceed to the turnout on Section No. 29, where they will remain till the last of the morning trains from Johnstown shall have passed them.
They will proceed thence to the turnout at Jefferson, where the first trains will arrive at or before 3 o'clock and 40 minutes. The leading noon trains from Johnstown will meet and pass them at this place. The leading train going westward will leave the turnout at 3 o'clock and 50 minutes. They will pass the remaining trains going eastward at the turnout at Croyl's Mill, and proceed thence without interruption to Johnstown.

Cars going westward, which stop for the night at the Summit level of the rail road; will start at 6 o'clock in the morning, and descend the inclined plane No. 5, as soon as possible—they will stop for and pass the trains which leave Croyl's Mill and Jefferson, at the turnout on Section No. 29: No car going westward will pass this turnout till the last of the trains from Croyl's and Jefferson have passed—they will proceed thence to the turnout at Jefferson, when they will meet and pass the morning trains from Johnstown. No car going westward will leave this turnout, before the last of the trains going eastward shall have passed; provided the last mentioned cars arrive at or before the time above specified. They will proceed thence to the turnout at the Viaduct at Horse Shoe Bend, which the last train will arrive at, before two o'clock. No car going westward will leave this turnout before the last train going eastward shall have passed. The trains from the Summit will proceed thence to Johnstown without interruption.

Cars going westward, which stop for the night at Jefferson, will leave there in the morning in time for the last train to reach the turnout at the Viaduct at the horse shoe bend, at or before 8 o'clock A.M. No car going westward will leave the turnout at this place before the last of the morning trains from Johnstown shall have passed. The trains from Jefferson will proceed thence to the head of plane No. 1. Those which can descend the plane, and be ready to start from the turnout at 10 o'clock and 15 minutes can proceed to Johnstown; the remaining trains will stop at the foot of the plane till the last of the noon trains from Johnstown shall have passed: they will travel at the rate of from 4 to 5 miles per hour. Cars going westward which stop for the night at Croyl's mill will leave there in time for the last train to reach the head of Inclined Plane No. 1, at or before 7 o'clock A.M.—Where they will meet the morning trains from Johnstown; the cars going westward will descend the Inclined Plane at the time the cars going eastward are passing up it.—
No car will leave the turnout at the foot of the Inclined plane before the last of the trains from Johnstown shall have passed it.--The cars will proceed from thence to Johnstown without interruption.

Cars or trains of cars, starting from any place or places along the Rail Road, not described above, and going in either direction, will follow immediately after the regular trains, travel at the same rate of speed, and stop at the same times and places for the purpose of allowing trains of cars going in the opposite direction to pass.

Cars employed upon the Rail Road which do not belong to, or accompany the regular trains except passenger cars, will on the approach of a regular train or trains, proceed with all possible despatch [sic.] to the nearest turnout in advance of the said regular train or trains, or to such other place as will enable the conductor to remove the said car or cars from the main track, and any car or cars which by standing or remaining on the main track is such manner as to obstruct or interfere with the passage of the regular trains, will be considered as an obstruction.

No car will be permitted to travel along the Basins, at Johnstown and Hollidaysburg, at a rate exceeding three miles per hour.

SYLVESTER WELCH, Engineer.

## APPENDIX P

### The Footage and Prominent Features of the Road Sections

<table>
<thead>
<tr>
<th>Sections</th>
<th>Feet</th>
<th>Plane</th>
<th>Prominent Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4300</td>
<td></td>
<td>Johnstown</td>
</tr>
<tr>
<td>2</td>
<td>2600</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>3500</td>
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<td></td>
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<tr>
<td>4</td>
<td>2600</td>
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<tr>
<td>5</td>
<td>3000</td>
<td></td>
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</tr>
<tr>
<td>6</td>
<td>5300</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>4200</td>
<td>1</td>
<td>The Staple Bend Tunnel</td>
</tr>
<tr>
<td>8</td>
<td>4000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>3800</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>5100</td>
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<td>11</td>
<td>3800</td>
<td></td>
<td>Horshoe Bend Viaduct</td>
</tr>
<tr>
<td>12</td>
<td>3900</td>
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<td></td>
</tr>
<tr>
<td>13</td>
<td>3000</td>
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<tr>
<td>14</td>
<td>4700</td>
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<tr>
<td>15</td>
<td>5900</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>4100</td>
<td></td>
<td>Croyle's Mill/Halfway Station/Summerhill</td>
</tr>
<tr>
<td>17</td>
<td>2700</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>3800</td>
<td></td>
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<tr>
<td>19</td>
<td>3200</td>
<td></td>
<td>Pringle's</td>
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<td>20</td>
<td>3500</td>
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<td>Ebensburg Branch Viaduct</td>
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<td></td>
<td>Litzinger's Mill</td>
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<tr>
<td></td>
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<td>Jefferson/Wilmore</td>
</tr>
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<td>21</td>
<td>4700</td>
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<td>Mountain Branch Viaduct</td>
</tr>
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<td>5600</td>
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<tr>
<td>23</td>
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<td></td>
</tr>
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<td>24</td>
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<td>Hotels at foot of plane/Portage</td>
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<tr>
<td>26</td>
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<td>Sections</td>
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<td>Plane</td>
<td>Prominent Features</td>
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<tr>
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<tr>
<td>30</td>
<td>3600</td>
<td>4</td>
<td>Lilly</td>
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<tr>
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<td>4400</td>
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<td></td>
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<tr>
<td>32</td>
<td>4900</td>
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<td>33</td>
<td>3400</td>
<td></td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>4300</td>
<td>5</td>
<td>Summit/Summitville/Cresson</td>
</tr>
<tr>
<td>35</td>
<td>5000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>5400</td>
<td>6</td>
<td>Lemon's Tavern Skew Arch Bridge</td>
</tr>
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<td>37</td>
<td>4500</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>5700</td>
<td>8</td>
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<tr>
<td>39</td>
<td>5900</td>
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<td>3900</td>
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<tr>
<td>41</td>
<td>5500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>5400</td>
<td>10</td>
<td>Mountain House Duncansville</td>
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<tr>
<td>43</td>
<td>5100</td>
<td></td>
<td>Hollidaysburg</td>
</tr>
<tr>
<td>44</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>4700</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1. Manuscript Material

Pennsylvania Historical and Museum Commission, Division of Archives and Manuscripts, Harrisburg, Pennsylvania.

Record Group 17, Land Records, at the Pennsylvania Archives, contains a large portion of the original papers related to the construction and development of the Allegheny Portage Railroad. While the collection includes contracts, annual reports, canal commissioners' journals, as well as sporadic correspondence, survey maps, specifications, regulations, work receipts, estimates, check rolls, and some engineers' drawings, the collection failed to produce any of the original architectural drawings for the engine houses, sheds, dwellings, shops, stations, and depots which appeared along the 36 miles of road. The following records were investigated and selectively used for this report:

RG 17, Board of Canal Commissioners
Divisional Records, Allegheny Portage Railroad

1. Contracts, 1851-55, six volumes in three boxes, (Boxes 1-3)

The label here is misleading, as boxes 2 and 3 contain the original contracts for the Portage Railroad.

2. Damage Claims, 1831-68, ten volumes in four boxes, (Boxes 4-7)

These volumes were indexed by name of claimant, and the only name checked during the research was Samuel Lemon. Considerable information might yet be culled from a more detailed search in these damage claims.

3. Reports and Miscellaneous Documents, 1829-1857, seven volumes in three boxes, (Boxes 8-10)

The material in Box 8 (1829-43), and Box 9 (1844-57), includes examples
of letters, construction specifications, and railroad regulations, all from the early years of the railroad.

Minute Books and Indexes
Canal Commissioners' Journals, Boxes 2, 3, and 4

Having inspected several of the handwritten volumes, I began to work from the published editions in the State Senate and House Journals.

Engineering Records, Box 2
Surveys of Property, 1842-47

These surveys show the acreage and shape of the lots at the head and foot of the planes, but they do not reveal where the lots stood in relation to the plane sites, nor do they indicate if and where structures on the lots stood, with exception of the summit surveys.

Map Books

#3, c 11: Middle Route No. 11" Map Exhibiting the Summit, Surveyed under the Direction of Chas. L. Schlatter. S. Moylan Fox, Principal Assistant, 1840. Drawn by Strickland Kneass, 1840, 12 sections.

#3, d : "Map and Profile of the Routes run to avoid the Inclined Planes on the Portage Rail Road from Hollidaysburg to Johnstown," Chas. De Hass, Eng'r. 1837.

#13a,b,c: "Map of Road to Avoid Inclined Planes," 14 panels.

#19, b : [Map of Gaysport], n.d.

#19, a : "Hollidaysburg and Gaysport, 1840."

#19, h : "Lateral Railway of Garber, Jackson & others, along the Basin at Gaysport," John Roebling, August, 1834.
"Plan and Profile of the Alleghany Mountain between the head waters of Blair's Creek, a branch of the Juniata, and the mountain branch of the Conemaugh with the proposed tunnel line connecting the two streams; and the Reservoir and Feeders. State of Pennsylvania, 1824." Delineated by Charles Treziyulny.

"Connection with the Portage Railroad," n.d. This was not used or copied as it showed no structures. It did, however, label Gaysport, Hollidaysburg, Basin, Turnpike to Pittsburg, Waltersburg, and Duncansville.

"Plans Shewing the Division of the Road into Sections," [of Allegheny Portage Railroad, by Sylvester Welch, 1831]. This collection of survey drawings only indicate the main features along the road trace, such as Lemon's, Litzinger's, Conemaugh River. It is useful as the only map of the route which locates the culverts, turnouts, viaducts, tunnel and section divisions.

Index to Deeds of Persons to the Commonwealth

This contained several deeds showing the sale of land to the Commonwealth for the Allegheny Portage Railroad. The list is anything but complete, however, and the properties now part of the park, at planes 6, 8, & 10 were not included.

"Plan and Elevation of the Skew Viaduct of Hollidaysburg," n.d. This is one of the only engineer's drawings remaining on the structures of the Portage Railroad, and would, therefore, be instructive for the other viaducts built on the western side of the mountain.
Beginning in 1830, the Pennsylvania House and Senate Journals each began publication of the annual reports submitted to the Governor by the Canal Commissioners concerning the year's progress on the public works. Also printed with the Canal Commissioners' summary comments were detailed accounts from the superintendents, engineers, and supervisors on the separate divisions of the main line. While the Canal Commissioners' comments presented the significant developments on the Allegheny Portage Railroad, the reports of the railroad officials gave the specific information needed to follow its construction, expansion, maintenance, and repair from its survey in 1831, to its abandonment in 1855. The reports contributed a major portion of the information for this historical resource study. The reports referred to in this text are as follows:

**PHJ 1830-31, 2**

**PHJ 1831-32, 2**


"Report of Sylvester Welch, Engineer to Samuel Jones Esq., . . .," pp. 186-211.

**PHJ 1831-32, 3, Tables**
"No. 3, Tabular Statement of Labor Done, Monies Paid, Per centage retained, and estimate of work on the Allegheny Portage Rail Road,"

"No. 4, Schedules of Payments to Engineers, etc., . . ."

"No. 5, Amount of Miscellaneous Expenditures, . . ."

"No. 6, Schedule of Engineers, etc. employed . . ."
PHJ 1832-33, App. to Vol. 2,
"Report of the Canal Commissioners . . .," pp. 8-12.

"Report of Samuel Jones, Superintendent, to James Clark, Esq., President of the Board of Canal Commissioners, . . .," pp. 66-73.

"Report of Sylvester Welch, Engineer to Samuel Jones . . .," pp. 73-88.

PHJ 1833-34, App. to Vol. 2,


"Report of Sylvester Welch, Engineer, . . .," pp. 74-91.

PHJ 1833-34, App. to Vol. 2,
"Report of the Canal Commissioners . . .," pp. 11-12.


"Report of Sylvester Welch, Engineer, . . .," pp. 72-75.

[This volume of the Journal bound together two separate annual reports, for 1833 and 1834, thus explaining the repetition of pagination.]

PHJ 1834-35, App. to Vol. 2,


PHJ 1835-36, App. to Vol. 2,


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"Report of Sylvester Welch, Principal Engineer, . . .," pp. 72-80.

"Report of S. Welch, Principal Engineer, upon Motive Power, . . .," pp. 81-93.


PHJ 1836-37, App. to Vol. 2,


PHJ 1838-39, App. to Vol. 2,


PHJ 1840, App. to Vol. 2,


PHJ 1841, App. to Vol. 2,


PHJ 1842, 3,

"Report of the Canal Commissioners, . . .," pp. 11-12.
"Report of William E. Morris, Engineer, . . .," pp. 102-08.


Pa. Exec. Docs. 1843,

"Report of the Superintendent of the Portage Railway, . . .," pp. 35-60.

Pa. Exec. Docs. 1844,

"Report of John Snodgrass, Superintendent of Motive Power and Supervisor of Repairs, . . .," pp. 3-11.


Pa. Exec. Docs. 1845,


Pa. Exec. Docs. 1846,

"Report of John Ferguson, Superintendent of Motive Power and Supervisor of Repairs, . . .," pp. 3-16.

Pa. Exec. Docs. 1847,

"Report of the Canal Commissioners, . . .," pp. 7-8.

"Report of John Ferguson, Superintendent of Motive Power and Supervisor of Repairs, . . .," pp. 3-16.

Pa. Exec. Docs. 1848,


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Pa. Exec. Docs. 1850,

Pa. Exec. Docs. 1851,

Pa. Exec. Docs. 1852,
"Report of Francis R. West, Superintendent of Motive Power and Supervisor of Repairs, . . .," pp. 3-16.
"Reports of the Engineers, . . .," pp. 3-10.

Pa. Exec. Docs. 1853,
"Report of John Ross, Superintendent of Motive Power and Supervisor of Repairs, . . .," pp. 3-16.
"Report of the Engineer for the Road to Avoid the Inclined Planes, . . .," pp. 3-11.

Pa. Exec. Docs. 1854,
"Report of the Engineer and Superintendent of the Road to Avoid the Inclined Planes, . . .," pp. 3-7.
Pa. Exec. Docs. 1855,

"Report of John Ross, Superintendent, . . .," pp. 3-8.

"Report of the Engineer and Superintendent of the Road to Avoid the Inclined Planes, . . .," pp. 3-5.

The Journal of the Board of Canal Commissioners was also published annually in the Senate and House Journals. The following sources all reflect the Canal Commissioners' Journal reprints used for this report:

PSJ 1831-32, 2, 204-411.


PSJ 1835-36, 3, 114-263.

PHJ 1840, App. to Vol. 2, pp. 341-616.

PSJ 1842, 3, 369-571.

PHJ 1843, 2, 439-465.

Pa. Exec. Docs. 1846, pp. 3-123.


These Journals were more time-consuming to research, as there was no division in the minutes in accordance with the divisions of the canal system. Consequently, all the years were not covered for this report, but the information in the minutes usually was also reflected in the reports of the superintendents and their assistants.

2. Published Materials


Baumgardner, Mahlon J., and Floyd J. Hoenstine, The Allegheny Portage Old Portage Railroad 1834-1854, Published by authors, 1952. A copy of this booklet had, until recently, been sold at the Lemon House, the present headquarters of the park.

Bell, J. Snowden, The Portable Boats of Early Railroad Practice, Philadelphia, The Baldwin Locomotive Works, 1920. This booklet was lent to this writer by Gordon Chapelle, compliments of the Colorado Railroad Museum.


Blair County Historical Society, Blair County’s First Hundred Years, 1846-1946, Altoona, Mirror Press, 1945.

Cambria County Historical Society, Sesquicentennial of Cambria County, 1804-1954, no city or publisher, 1954.

Chevalier, Michel, Histoire et description des voies de communication aux Etats-Unis et des travaux d’art qui en dependent, 1, Paris, C. Gosselin, 1840.

Communication from the Governor Accompanied with a Communication from the Board of Canal Commissioners Transmitting the Reports of Charles T. Whippo and Charles De Hass . . . And to Avoid the Inclined Planes Over the Allegheny Mountain to Pittsburg, Read in the House of Representatives, January 20, 1837, Harrisburg, Samuel D. Patterson, 1837.


Nicklin, Philip Holbrook, A Pleasant Peregrination Through the Prettiest Parts of Pennsylvania, Performed by Peregrine Prolix, Philadelphia, Grigg and Elliot, 1836.


Rupp, Daniel, The History of Topography of Dauphin, Cumberland, Franklin, Bedford, Adams, Perry, Somerset, Cambria and Indiana Counties, Lancaster City, Pa., Gilbert Hills, Proprietor and Publisher, 1848.


Wilson, William Bender, "The Evolution, Decadence, and Abandonment of the Allegheny Portage Railroad," Annual Report of the Secretary of Internal Affairs of the Commonwealth of Pennsylvania, 1898-99, Part IV: Railroad, Canal, Navigation, Telegraph and Telephone Companies, [Harrisburg], State Printer, 1900, xxxix-xxvi. This was an especially helpful article, as it provided the series of George Storm paintings which have been relied upon for many of the scenes along the road, and it quoted extensively from sources which this author would not have had time to investigate. A xerox copy of the report and prints of the article's illustrations have all been collected at the park.

3. Maps

"Map of the Borough of Hollidaysburg and Gaysport, Blair County, Pennsylvania," from Record and Surveys by Cuppridge and Bridgens, 215 No. 6th Street, Philadelphia, Pa., 1851. A photographic copy of this map can be found in the park files, and the original in the Borough Offices, Hollidaysburg, Pa.
"Hollidaysburg Taken from the Chimney Rock," Wegner and Braun, Lith., 60 Market Street, Pittsburg, Pa., 1854, Drawn by E. Schellhorn. A print and blowup of this map can also be found at the park.

"Plan of the Boroughs of Johnstown and Conemaugh, Together with Cambria Iron works, Cambria, & Prospect, Cambria Co., Penna.," Surveyed, Drawn, & Published by T. Doran, 1854. This map has been copied for the park files. The original is apparently in the Pennsylvania Archives, #125, according to a notation on the park map. The record group, however, is unknown by this writer.

"Map of Pennsylvania," published by B. Tanner, Engraver, Philadelphia, June 7, 1832. This can be found in the Library of Congress map collection at Suitland, Virginia.

"Map of Pennsylvania, 1849," by R. L. Barnes, Philadelphia, 1848. This is also in the Suitland map collection of the Library of Congress.

4. Miscellaneous

I am very grateful for the use of Earl P. Heydinger's research notes on the Allegheny Portage Railroad which are in a collection both at the park and at the History Division library in Washington, D. C. His six-month research on the railroad took him to repositories I was unable to visit, and his notes covered volumes in the state journals I was unable to locate in the libraries in Harrisburg and Washington, D. C.

The survey, Storey relates, was authorized by the State in 1816. The description on the map has been recopied in Appendix A of this report.

Photo from Storey, History of Cambria County, I, 37.
2. "Plan and Profile of the Allegany Mountain between the head waters of Blair's Creek, a branch of the Juniata, and the mountain branch of the Conemaugh with the proposed Tunnel Line connecting the two streams; and the Reservoir and Feeders," State of Pennsylvania, 1824.

The Canal Commissioners, Charles Trczynulny, Jacob Holgate, and James Clarke, authorized this first survey to find a canal route over the Allegheny Mountains. Note the major features in the area, such as Croyle's, Lilly's, and Litzinger's saw mill.

Map Book 19, i, RG 17, Pennsylvania State Archives, Harrisburg, Pa.

One of the earliest state maps to show the railroad between Johnstown and Hollidaysburg. The map gives an overall view of roads and towns developed before the opening of the Portage.

Map Collection, Library of Congress, Suitland, Maryland.

Note the development of towns--Summerhill, Jefferson, Summit--in the fifteen years of Allegheny Portage Railroad operation.

Map Collection, Library of Congress, Suitland, Maryland.

This map is the most reliable source of information on the structures and layout of the Hollidaysburg basin. There is no evidence of whether this reflects the peak years in the 1840s. By 1851 the proposal to have the inclined planes replaned by a new road had nearly been authorized.

Photographic copies of the map are in the park files. Historian Ron Wilson at the park located the original in the Borough offices in Hollidaysburg.

While obviously out of proportion, this sketch of the Hollidaysburg basin gives the only available picture of the size and shapes of the structures.

Photo copies and an enlargement at the park.

7a-b. "Plan of the Boroughs of Johnstown and Conemaugh, Together with Cambria Ironworks, Cambria & Prospect, Cambria County, Penna.," Surveyed, Drawn and Published by T. Doran, 1854.

This is the only map uncovered showing the layout of the Johnstown basin. In 1854 changes in the basin were already well underway to accommodate the new road to avoid the inclined planes.

The detail of the canal basin in the bottom photograph shows the location of the State depot and boat slip, as well as some of the warehouses and landowners in the vicinity.

Photo copies at the park; original apparently in the Pennsylvania Archives, but not seen by this writer.
8. Staple Bend Tunnel, western entrance, with entablatures, c. 1890.

The engine house for Plane No. 1 stood in the foreground. The entablatures have been removed from the eastern face of the tunnel.

Negative in park files.


This viaduct, along with the tunnel, represented two of the most remarkable engineering features of the railroad for travelers of the period.

Negative in park files.

In the right-hand corner of this "Plan and Elevation of the Skew-Viaduct at Hollidaysburg," are the initials, WMR, which undoubtedly represent those of William Milnor Roberts, a principal engineer for the Portage Railroad.

Map Book 50, page 80, RG 17, Pa. A.
11. Engine House, Plane No. 6, c. 1890.

The engine house was converted to a barn after the abandonment of the railroad. Only one other photograph of this engine house is known to exist, and it apparently was taken c. 1845. (A copy of the 1845 photo can be found in the park files, as well as in the Historic Structure Report for the Lemon House).

A copy can be found at the park.

12. Engine House, floor plan, no date.

13. Engine House, cross section, no date.

These two drawings illustrate the main features of the engine houses—the engines, boilers, and stacks. The artist, an engineer who has done several drawings for the park, claims the information for his illustrations came from the writings of Sylvester Welch, the first principal engineer on the road. No specifications, however, were located for the engine houses.

Photo copies in park files.

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14. Plane No. 8, Brick Yard, no date.

This drawing evidently was made to illustrate the property dispute between Schoenberger and Wilson.

15. Portage Iron Works, Hollidaysburg level, no date.

The Portage Ironworks was an early supplier for the Allegheny Portage Railroad.

Portage Iron Works.

Length of land occupied 640 feet
Area Width - 60.35 feet
Taken for Embank, beyond Road 55 Per.
Total Area 4 A. 18 P.

This hotel became a busy railroad center for the Pennsylvania Railroad and the Allegheny Portage Railroad for the first years of the 1850s. It stood at the "Y switches," where the two railroads met to cross the mountain to Johnstown by the inclined planes.

Photo from Eli Bowen, Pictorial Sketch Book of Pennsylvania, p. 141.

17. Locomotive Engine, built by William Norris, c. 1840.

"All the locomotives built for the State by William Norris and his successors up to the year 1840, or thereabouts, were of the 4-2-0 type, and were, in all essential particular, similar to that shown in Fig. 11, which represents one of a lot of seventeen constructed by him for the Birmingham & Gloucester Railway, England. They did not materially vary in dimensions from the "William Penn," the weight of which was 23,560 pounds, of which 14,600 pounds were on the driving wheels; cylinders, 10 x 20 inches; driving wheels, 4 feet diameter; boiler, about 14 feet long and 36 inches diameter; grate area, about 9 square feet."

The Commonwealth contracted with William Norris for many of the early locomotives on the Railroad. The above quotation describes the main features of the locomotives running the Hollidaysburg and Johnstown Levels.

THE BALDWIN LOCOMOTIVE WORKS

Fig. 11

The source of this drawing was not given by Historian William Bender Wilson when he provided the Commonwealth with a thorough report on the history of the Allegheny Portage Railroad. The sketch does not appear to depict an 8-wheeled car which the State introduced on the road in 1843. This passenger car might, then, represent one of the earlier models on the road.

Wilson, p. lxxiv.

19. One Section of a Section Boat at Merchant's Exchange in Philadelphia.

Sections such as this traveled over land on train cars and when they were set afloat on the canals, the sections were brought together to make section boats.

Negative in park files.
OLD PASSENGER CAR, PORTAGE RAILROAD.
20. Track Construction, Inclined Planes, no date.

21. Track Construction, Levels, no date.

These drawings were also executed by Engineer Hoffman for the park's use. The specifications, however, for laying a rail on the inclined planes and on the levels did turn up in Engineer Welch's annual reports, and have been included as an appendix to this report.
PORTAGE R.R.
TRACK CONSTRUCTION ON PLANE

- 2" x 5 1/2" W.I. STRAP NAILED TO STRINGER

- K STRINGER 6" x 8"

- 8" x 7 ft TIE PLACED IN STONE BED 3 ft CENTERS

- WOOD WEDGE EACH

STONE TIE
2" x 2" x 1 FT

A 9 GAUGE

- W.I. RAIL 0.75/yard
- C.1. CHAIR SPIKED TO STONE TIE SPACED AGT. 3 FT CENTER

- HOLE FOR SPIKE HOLES IN STONE FILLED WITH WOOD PLUG

- WOOD WEDGE - ONE ON EACH SIDE OF RAIL

PORTAGE R.R.
STONE TIE & RAIL SUPPORT FOR TRACK ON LEVELS

PEAKS 18 FT IN


These two surviving culverts along the road reflect the sturdy stone masonry used in construction, as well as the individuality allowed between the different contractors for various sections of the road.

Photos from the park files.
Historic Base Maps
Allegheny Portage Railroad
National Historic Site

7 Sheets
Nomination Forms

National Register of Historic Places Inventory

for

Allegheny Portage Railroad National Historic Site
Lemon House District

Nomination
1. NAME

COMMON:
Lemon House District

AND OR HISTORIC:

2. LOCATION

STREET AND NUMBER:

CITY OR TOWN:
Cresson

3. CLASSIFICATION

CATEGORY (Check One)

- District
- Site
- Structure
- Object

OWNERSHIP
- Public
- Private
- Both

STATUS
- Occupied
- Unoccupied
- Preservation work in progress

ACCESSIBLE TO THE PUBLIC
- Yes: ☑
- Restricted
- Unrestricted

PRESENT USE: (Check One or More as Appropriate)
- Agricultural
- Government
- Park
- Religious
- Other (Specify)

4. OWNER OF PROPERTY

OWNER'S NAME:

STREET AND NUMBER:

CITY OR TOWN:

5. LOCATION OF LEGAL DESCRIPTION

COURTHOUSE, REGISTRY OF DEEDS, ETC:

STREET AND NUMBER:

CITY OR TOWN:

6. REPRESENTATION IN EXISTING SURVEYS

TITLE OF SURVEY:

DATE OF SURVEY:
- Federal
- State
- County
- Local

DEPOSITORY FOR SURVEY RECORDS:

STREET AND NUMBER:

CITY OR TOWN:
1a. Lemon House:
   Proposed Treatment: Partial Restoration on interior; Full Restoration on exterior.
   The Lemon House was built c. 1832 as a two-story, eight-roomed stone tavern and residence of Samuel Lemon, a pioneer to the summit of the Alleghenies near Blair's Gap. Sometime after 1860 and before 1878 the Lemon family added a 2-1/2 story wing on the west side. Later owners of the house added two porches, a garage, and an extra entrance-way to the building. Alterations were also made to windows and doors, and to the second floor, where three of the four original rooms were divided up into smaller ones. Today measures have already been started to restore the exterior to its historic appearance.

1b. Lemon Coal Mine:
   Proposed Treatment: Partial Restoration.
   The Lemon coal mine entrance stood across the tracks to the north of the Lemon house. Today the mine has been covered over, and the coal wharf which ran several yards along the tracks has disappeared. The exposure of the mine shaft would be fundamental to the interpretation of the Lemon mining activities.

1c. Stone Quarry:
   Proposed Treatment: Preservation
   The stone quarry lies in scattered order in the woods to the northeast of the Lemon house. Several of the remaining stone boulders show drill marks. The impression in the ground and the boulders should be preserved as they stand.

1d. Barn Foundations:
   Proposed Treatment: Preservation
   The stone foundations under the present modern barn may prove, with investigation, to have supported the frame engineer's dwelling house constructed at the plane head. In such a case, these foundations should be preserved.
LEMON HOUSE DISTRICT

Order of Significance: 1

The Lemon House District stands on its own as an historic area of the 19th century closely related and contributing to the national migrations to the west, and to the development of engineering, commerce, and transportation in this country.

Located at the summit of the Allegheny Portage Railroad, the Lemon tavern, constructed c. 1832, helped foster trade between the eastern centers and the frontier territories west of Pittsburgh. The Lemon House was, and has remained, an architectural landmark in the area.

Lemon struck a coal mine so substantial and of such high quality that it has been referred to locally as the Lemon vein. The Lemon coal mine provided coal both for the eastern markets and for the Allegheny Portage Railroad stationary engines.

The stone quarry nearby provided stone for the Lemon tavern, the railroad ties, or for both. Research did not establish what use the stone from this quarry had, but local tradition holds that it supplied the stone ties.

The stone foundations under the present barn may turn out to be the ones under the dwelling for the engineer who operated the engines which pulled the trains up Inclined Plane No. 6. The engineer's dwelling was a standard structure at each of the ten inclined plane heads, so that its representation at the scene would be basic to the theme of the Portage Railroad.
## 9. Major Bibliographical References

## 10. Geographical Data

### Latitude and Longitude Coordinates

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List all States and Counties for properties overlapping State or County boundaries:

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## 11. Form Prepared By

**Name and Title:**

Anna Coxe Toogood

**Organization:**

Historic Preservation Team, Denver Service Center

**Street and Number:**

Denver

**State:**

Colorado

**National Register Verification**

As the designated State Liaison Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service. The recommended level of significance of this nomination is:

- National [ ]
- State [ ]
- Local [ ]

Name: ____________________________

Title: ____________________________

Date: ____________________________

I hereby certify that this property is included in the National Register.

Chief, Office of Archeology and Historic Preservation

ATTEST:

Keeper of The National Register

Date: ____________________________
Inclined Planes, Levels, and Engine Houses,  
Allegheny Portage Railroad  
Nomination
**NATIONAL REGISTER OF HISTORIC PLACES**
**INVENTORY – NOMINATION FORM**

*(Type all entries – complete applicable sections)*

**1. NAME**

| COMMON: | Inclined Planes, Levels, and Engine Houses, Allegheny Portage Railroad |

**2. LOCATION**

| STREET AND NUMBER: | |
| CITY OR TOWN: | |

**3. CLASSIFICATION**

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<tr>
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**4. OWNER OF PROPERTY**

| OWNER’S NAME: | |
| STREET AND NUMBER: | |
| CITY OR TOWN: | |

**5. LOCATION OF LEGAL DESCRIPTION**

| Courthouse, Registry of Deeds, Etc.: | |
| STREET AND NUMBER: | |
| CITY OR TOWN: | |

**6. REPRESENTATION IN EXISTING SURVEYS**

| TITLE OF SURVEY: | |
| DATE OF SURVEY: | Federal State County Local |
| Depository for Survey Records: | |
| STREET AND NUMBER: | |
| CITY OR TOWN: | |

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*See Instructions*
INCLINED PLANES, LEVELS, AND ENGINE HOUSES:

1a. Plane No. 6:
Proposed Treatment: Partial Restoration
Inclined Plane No. 6 of the Allegheny Portage Railroad covered the last 2,713.85 feet up the eastern slope of the mountain to the highest point on the summit level. The plane had a right-of-way of 120 feet, and overcame an elevation of 266.50 feet, with a rise per hundred feet of 10.25. In 1831-32 contractors laid two sets of track five feet apart on the incline. The rails were formed by placing plate iron bars 2-1/4 inches wide and 5/8 of an inch thick on timbers six inches wide and eight inches deep. The rails were held four feet, nine inches apart by wooden cross-ties laid every four feet.

The National Park Service owns only the top half of the inclined plane, from its head to Highway 22, which obliterated the lower portion of the trace. The trace has been cleared of the brush, rubbish, and ground cover which had accumulated since the 1855 abandonment of the road. As an interpretive aid, the tracks should be relaid according to the original specifications recorded by the railroad's principal engineer, Sylvester Welch, in 1831.

1b. Summit Level:
Proposed Treatment: Partial Restoration
The Summit Level ran 1.62 miles from the head of Plane No. 6 west to the head of Plane No. 5, and overcame an elevation of 19.04 feet. As at all levels of the road, the tracks at the summit were laid with malleable iron rails secured by cast iron chairs to limestone or sandstone blocks spaced every three feet of track. As well, a path was built alongside the tracks so that horses could pull the cars over the level.

At the western end of the level, near the head of Plane No. 5, a town of Summit developed around the crossroads of the railroad and the Northern Turnpike. Summit contained a residential population of about 100 people during the peak years of the railroad, and featured hotels, taverns, and one of the maintenance and repair centers for the railroad. At the eastern end, near the head of Plane No. 6, stood Samuel Lemon's tavern and coal mine.

The National Park Service has acquired the eastern 1/2-mile of trace; while the western portion has been destroyed by Highway 22 and the growth of Cresson, formerly Summit. Some of the original stone ties can be seen along the trace. To restore the tracks and horsepath on all or part of the residual trace, which has been cleared as on the adjacent inclined plane, would enhance the contrasting stories behind the levels and planes of the Allegheny Portage Railroad.

1c. Engine House, Plane No. 6:
Proposed Treatment: Reconstruction
As at all ten plane heads, the frame engine house at Plane No. 6 sheltered two engines and the machinery for the ropes which together controlled the ascent and descent of train cars. The
lc. Engine House, Plane No. 6:
railroad tracks ran directly through the middle of the barn-like structure, and on either side a 35 horsepower engine connected with the cast iron sheaves which were set in pits 87 to 91 feet from the head of the plane. Each engine had three cylindrical boilers, each 30 inches in diameter and 20 feet long. The physical components in the engine house at this plane were similar to those at Planes 1, 3, 4, 7, and 8, the steeper or longer inclines on the road.

The train cars hitched to the endless ropes either at the shed at the foot of the plane, or at the engine house at the head. The stationary engines automatically disengaged when cars descending outweighed those ascending, or when there was no ascending train.

Archaeological digs have been completed to uncover the foundations and machinery pits of the engine house. The remains stand exposed and thus are deteriorating. The staff on the site have received professional assistance from local engineers interested in the railroad; it is their consensus that with the available historical specifications, archeological remains, and the 1895 photograph, that the engine house and its machinery can be accurately reconstructed. Without its reconstruction the historical scene based on the operation of the Portage Railroad, would not come to life for park visitors.

ld. Inclined Plane No. 8:
Proposed Treatment: Preservation
Inclined Plane No. 8 was the longest and steepest along the railroad. It stood 3,116.92 feet in length and overcame an elevation of 307.60 feet. The plane ran between two steep embankments, one ascending and one descending, which presented a geographical impediment for the engineers and railroad staff living at the plane head. The tracts were similar to those laid on Plane No. 6 (see above).

The National Park Service owns the top half of the plane and has cleared the trace. Its preservation is recommended.

le. Engine House, Inclined Plane No. 8:
Proposed Treatment: Preservation
Because the grade of the mountain was so steep, the foundations of the engine house were replaced several times, and, in 1848, the pits for the foundations were dug again 30 feet into the ground in order to find a secure foundation on a sliding mountainside. The engines and machinery protected by the engine house were built like those at Plane No. 6 (see above).

The deep foundations of the engine house have been uncovered by National Park Service archeological contractors, and their exposure causes deterioration to the well preserved remains. Immediate measures to protect these ruins should be enacted.
7. DESCRIPTION (cont. p. 2)

1f. Inclined Plane No. 10:
   Proposed Treatment: Preservation
   The first plane up the eastern slope of the mountain, Inclined Plane No. 10 covered 2,295.61 feet in length and overcame an elevation of 180.52 feet. The incline was designed and the tracks laid on the same principles exhibited at Planes 6 and 8 (see above). The land acquired for the park encompasses the top part of the incline, as the bottom half of the trace has been obliterated. Already cleared, the trace should be preserved as it stands.

1g. Engine House, Inclined Plane No. 10:
   Proposed Treatment: Preservation
   The engine house at Plane No. 10 structurally resembled the frame barn-like protections at the other planes mentioned above, but the engines within were only 30 horsepower with cylindrical boilers 30 inches in diameter, and 18 feet long. The functioning of the machinery and engines was the same as at other planes.

   No surface evidence of the engine house exists today, and no archaeological plans have been made to expose them. If funding such a dig would be feasible, it would make a good comparison with the other planes. If not the plane head should be preserved in its present state.
INCLINED PLANES, LEVELS, AND ENGINE HOUSES
Order of Significance: 1

The inclined planes, levels, and stationary engine houses formed the backbone and muscle of the Allegheny Portage Railroad during its operation from 1834 to 1855. The technological experiment in transportation won widespread and enthusiastic acclaim, both nationally and internationally. The speed and ease with which the trains crossed over the imposing Allegheny Mountain range impressed even advanced engineers. The engineering plans applied to compute the grades, length, and elevation of the planes facilitated the immediate success of the railroad.

What was spectacular in 1834 at the opening of the road had lost its glitter by the decade of the '40s. While the railroad continued to function, while commerce, industry, and westward migration continued to grow and expand with the operation of the Portage Railroad, improvements in technology by 1855 overshadowed this pioneer in transportation systems.
9. MAJOR BIBLIOGRAPHICAL REFERENCES

10. GEOGRAPHICAL DATA

LATITUDE AND LONGITUDE COORDINATES
DEFINING A RECTANGLE LOCATING THE PROPERTY

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LATITUDE AND LONGITUDE COORDINATES
DEFINING THE CENTER POINT OF A PROPERTY
OF LESS THAN TEN ACRES

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APPROXIMATE ACREAGE OF NOMINATED PROPERTY:

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

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11. FORM PREPARED BY

NAME AND TITLE:
Anna Coxe Toogood

ORGANIZATION:
Historic Preservation Team, Denver Service Center

STREET AND NUMBER:

CITY OR TOWN:
Denver

STATE: Colorado

12. STATE LIAISON OFFICER CERTIFICATION

As the designated State Liaison Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service. The recommended level of significance of this nomination is:

National [ ] State [ ] Local [ ]

I hereby certify that this property is included in the National Register.

____________________________________
Chief, Office of Archeology and Historic Preservation

Date ____________________________

ATTEST:

____________________________________
Keeper of The National Register

Date ____________________________
Culverts and the Skew Arch Bridge,
Allegheny Portage Railroad, NHS

Nomination
**1. NAME**

**COMMON:**
Culverts and the Skew Arch Bridge, Allegheny Portage Railroad NHS

**AND/OR HISTORIC:**

**2. LOCATION**

**STREET AND NUMBER:**

**CITY OR TOWN:**

**STATE CODE COUNTY:**

3. **CLASSIFICATION**

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**PRESENT USE** (Check One or More as Appropriate)

- Agricultural
- Commercial
- Educational
- Entertainment
- Government
- Industrial
- Military
- Park
- Private Residence
- Religious
- Scientific
- Transportation
- Other (Specify)
- Other (Specify)

4. **OWNER OF PROPERTY**

**OWNER'S NAME:**

**STREET AND NUMBER:**

**CITY OR TOWN:**

**STATE CODE:**

5. **LOCATION OF LEGAL DESCRIPTION**

**COURTHOUSE, REGISTRY OF DEEDS, ETC:**

**STREET AND NUMBER:**

**CITY OR TOWN:**

**STATE CODE:**

6. **REPRESENTATION IN EXISTING SURVEYS**

**TITLE OF SURVEY:**

**DATE OF SURVEY:**

- Federal
- State
- County
- Local

**DEPOSITORY FOR SURVEY RECORDS:**

**STREET AND NUMBER:**

**CITY OR TOWN:**

**STATE CODE:**

---

249
### Culverts and the Skew Arch Bridge:

1a. Culvert, Summit Level:  
   Proposed Treatment: Preservation  
   One of 72 culverts required along the 36 miles of the Allegheny Portage Railroad to allow water flow to pass under the tracks, this summit level culvert was built in the arched stone masonry construction typical of all the culverts. Instead of mortar to keep the structure together, the laborer applied keystones between the cut stones.  
   Today this three-foot spanned culvert requires only maintenance and preservation.

1b. Culvert, Plane No. 10:  
   Proposed Treatment: Preservation  
   This culvert at the foot of the existing trace of Plane No. 10 has the same physical characteristics of the culvert described above, except its arch span is greater. It, too, needs maintenance work for its preservation.

1c. Skew Arch Bridge, Plane No. 6:  
   Proposed Treatment: Preservation  
   The Skew Arch Bridge was constructed in 1832-33 so that the turnpike traffic could pass over the railroad tracks. Built by local contractors of stone masonry without mortar, but with diagonal stones held firmly together by keystones, the Skew Arch Bridge supported the highway traffic until well into the 20th century. Its construction with a skew arch occurred as a modification of the original design in order to avoid an inconvenient bend in the road alignment.

   The Skew Arch Bridge stands midway on the trace of Inclined Plane No. 6. Highway 22, which crosses the mountain approximately on the roadbed of the historic Northern Turnpike, passes on either side of the bridge. Since the abandonment of the railroad, the bridge has remained in excellent preservation, with no changes to its original design.
### 8. SIGNIFICANCE

#### PERIOD (Check One or More as Appropriate)

- [ ] Pre-Columbian
- [ ] 16th Century
- [ ] 18th Century
- [ ] 20th Century
- [X] 19th Century
- [ ] 17th Century

#### SPECIFIC DATE(S) (If Applicable and Known)

#### AREAS OF SIGNIFICANCE (Check One or More as Appropriate)

- [ ] Aboriginal
- [ ] Prehistoric
- [ ] Historic
- [ ] Agriculture
- [ ] Architecture
- [X] Art
- [ ] Commerce
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- [ ] Conservation
- [ ] Education
- [ ] Engineering
- [ ] Industry
- [ ] Invention
- [ ] Landscape
- [ ] Literature
- [ ] Military
- [ ] Music
- [ ] Political
- [ ] Religion/Philosophy
- [ ] Science
- [ ] Sculpture
- [ ] Social/Humanitarian
- [ ] Theater
- [X] Transportation
- [ ] Urban Planning
- [ ] Other (Specify)

#### STATEMENT OF SIGNIFICANCE

**CULVERTS AND THE SKEW ARCH BRIDGE**

**Order of Significance: 1**

On the eastern slope and summit of the Allegheny Mountains, between Hollidaysburg to the east and Cresson, Pennsylvania, to the west, the Skew Arch Bridge and two stone culverts stand as structural vestiges of the Allegheny Portage Railroad, one of the earliest and most spectacular experiments in railroad transportation in this country, and part of one of the nation's first principal thoroughfares to the west. That these stone culverts and bridge have remained in good preservation since their construction in 1831-33 speak for the engineering and labor skills applied at the time.
## GEOGRAPHICAL DATA

### LATITUDE AND LONGITUDE COORDINATES DEFINING A RECTANGLE LOCATING THE PROPERTY

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### LATITUDE AND LONGITUDE COORDINATES DEFINING THE CENTER POINT OF A PROPERTY OF LESS THAN TEN ACRES

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### APPROXIMATE ACREAGE OF NOMINATED PROPERTY:

- **Summit Level Culvert:** 22 ft
- **Skew Arch Bridge Culvert:** Plane 10

### LIST OF STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

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  - **County:**

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  - **Code:**
  - **County:**

  - **State:**
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  - **County:**

  - **State:**
  - **Code:**
  - **County:**

### FORM PREPARED BY

**Name and Title:**

Anna Coxe Toogood

**Organization:**

Historic Preservation Team, Denver Service Center

**Street and Number:**

**City or Town:**

Denver

**State:**

Colorado

### STATE LIAISON OFFICER CERTIFICATION

As the designated State Liaison Officer for the National Historic Preservation Act of 1966 (Public Law 89-905), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service. The recommended level of significance of this nomination is:

- **National**
- **State**
- **Local**

I hereby certify that this property is included in the National Register.

**Chief, Office of Archeology and Historic Preservation**

**Date**

**ATTEST:**

**Keeper of The National Register**

**Date**