ALPO 2
013032

HISTORIC STRUCTURE REPORT
Historical Data Section

ALLEGHENY PORTAGE RAILROAD NATIONAL HISTORIC SITE
PENNSYLVANIA

by
Sharon A. Brown

U.S. Department of the Interior / National Park Service

TABLE OF CONTENTS

PREFACE

INTRODUCTION

I. OVERVIEW

II. CONSTRUCTION HISTORY
- A. Engine Houses
  1. Incline 6
  2. Incline 9
  3. Incline 10
- B. Culverts

  Index to List of Culverts
  1. Three at Summit Level
  2. One near Skew Arch Bridge
  3. One at Incline 7
  4. At Level 8
  5. Two at Incline 8
  6. Two at Level 9
  7. Five at Level 10
  8. One at Incline 10
- C. Hitching Sheds
  1. Incline 8
  2. Incline 9
- D. Skew Arch
- E. Grade of Incline 9
- F. Lemon Coal Mine Entrance
- G. Historic Foundations
- H. Portage Railroad Survey

III. LEMON HOUSE SOUTH PORCH

CONCLUSION

RECOMMENDATIONS FOR FURTHER RESEARCH

LIST OF ILLUSTRATIONS

LIST OF APPENDICES

APPENDICES

PERSONS CONSULTED DURING RESEARCH

INSTITUTIONS VISITED DURING RESEARCH

SOURCES INVESTIGATED AT PENNSYLVANIA HISTORICAL AND MUSEUM COMMISSION, DIVISION OF ARCHIVES AND MANUSCRIPTS, HARRISBURG, PENNSYLVANIA

ANNOTATED BIBLIOGRAPHY

PREFACE

The Allegheny Portage Railroad, in operation by 1834 and abandoned by the Commonwealth of Pennsylvania in 1855, functioned as a vital part of the commonwealth's canal and railroad transportation system. Built to compete with New York's Erie Canal, Pennsylvania's canal system crossed the state from Philadelphia to Pittsburgh. The Allegheny Portage Railroad, as a part of this system, crossed Allegheny Mountain between Hollidaysburg and Johnstown, Pennsylvania by a series of levels and inclined planes. For over twenty years the railroad's locomotives, rope, stationary steam engines, track, horses and human workers transported both passengers and cargo over the mountain on their journeys east and west. The remaining structures, scattered throughout the Pennsylvania forest, are mute reminders of the people whose lives were lived within sight and sound of one of the most celebrated engineering accomplishments of its day. The National Park Service interprets the human and engineering aspects of the railroad's history at Planes 6, 8, 9, and 10.

INTRODUCTION

Allegheny Portage Railroad National Historic Site was authorized for inclusion in the National Park System on August 31, 1964 (78 Stat. 752). The site is located along Planes 6, 8, 9 and 10 of the railroad at the summit and east side of Allegheny Mountain. Park headquarters are located at the Samuel Lemon House at Cresson, Pennsylvania, about 20 miles southwest of Altoona and 80 miles east of Pittsburgh, Pennsylvania.

This historic structure report has been prepared to satisfy the research needs as stated in the task directive approved by Mid-Atlantic Regional Director James W. Coleman Jr. on September 16, 1983. Data from this report will be used to plan the preservation/restoration of cultural resources at the park. Emphasis in research and writing was placed on specific construction data relating to the various extant structures located along the railroad trace. This report is not a detailed history of the railroad as other National Park Service (NPS) publications and secondary source writings have addressed that topic.

Since its establishment, the Allegheny Portage Railroad National Historic Site has been the subject of several historical, archeological and historic architectural studies. Anna Coxe Toogood's "Historic Resource Study, Allegheny Portage Railroad National Historic Site, Pennsylvania" (1973) is an authoritative and exhausting study of the Allegheny Portage Railroad. The Lemon House has been scrutinized in a historic structure report with historic, archeological and historic architectural sections.[1]

---

1. See: "Historic Structure Report. The Lemon House. Allegheny Portage Railroad National Historic Site, Pennsylvania. Archeological Data Section," by Kathleen Fiero, Denver, 1983; "Historic Structure Report. The Lemon House. Allegheny Portage Railroad National Historic Site, Pennsylvania. Architectural Data Section," by Penelope Hartshorne Batcheler, Denver, 1982; and "Historic Structure Report. The Lemon House. Allegheny Portage Railroad National Historic Site, Pennsylvania. Historical Data Section," by Anna Coxe Toogood. "Architectural Data Section," by Norman M. Souder, Denver, July 1972. Toogood's HSR was printed in Denver, May 1973.

This historic structure report focuses on specific extant structures located along the railroad line which require preservation treatment in accordance with legislative mandate and NPS policies.

Anna Coxe Toogood's comments in the historic resource study concerning her efforts to uncover original drawings, sketches, or specifications for railroad structures proved true 11 years later. Very little further evidence of accurate descriptions of buildings, culverts or bridges, was located and no original specifications were found at the Pennsylvania state archives in Record Group 17. Apparently the standard repositories do not have the original documents. There are good reasons to believe that many have been lost or destroyed as will be discussed below.

Record Group 17 is a significant collection of documents which is vital to the study of the Allegheny Portage Railroad. After the Pennsylvania Board of Canal Commissioners (1825-1858) ceased to exist, its records were placed in the Bureau of Land Records. The records fell into three categories: the board's records and papers; the superintendency papers kept by the superintendents of the different divisions; and the map books for each division of the canal, drawn by engineers and cartographers. In 1959 a guide to the materials was published and in 1961 a recognition of the historical value of the records spurred their transfer from the Bureau of Land Records to the state archives. The collection of records was thus kept intact and is a very complete source of primary documents for the Allegheny Portage Railroad conception, construction and operation.

Any new material presented in this report should be considered as supplemental to Toogood's historic resource study and her historical data section of the Lemon House historic structure report. A relative lack of new documentary evidence has to be taken into account when considering the historical data section of this historic structure report. On a more positive note, previously unpublished photographs of the portage railroad trace and structures, ca. 1910 and 1922, were discovered in Harrisburg. (See illustrations 11, 25-26, 28-37.)

Research for the historical data section of this report was conducted during two field trips to Pennsylvania in February and July 1984. Most of the research material was found at the Pennsylvania Historical and Museum Commission's Division of Archives and Manuscripts and at the State Library of Pennsylvania, both in Harrisburg, Pennsylvania, but research was conducted elsewhere, as well. (See the lists of people and institutions consulted during research.) The author would like to thank the staffs at the Harrisburg institutions for their assistance. Superintendent Randy Cooley and his staff provided orientation and interpretation at the park as well as direction for the research. Anna Coxe Toogood graciously offered not only assistance but new avenues to pursue in the search for the engineering/architectural drawings. Supervisory Historian Ronald W. Johnson provided invaluable guidance for this project when the author was in St. Louis and in Denver. Thanks also goes to Deborah Drew for typing the manuscript.

Sharon A. Brown
August 1984

I. OVERVIEW

The origins of the Allegheny Portage Railroad can be traced to the engineering wonder the state of New York presented to the nation in the form of the Erie Canal, completed in 1825. The efficiency, speed and indeed, romance, of travel offered by the canal served to attract both the interest of west-bound pioneers and the envy of neighboring state governments. In Pennsylvania, turnpikes such as the Huntingdon, Cambria and Indiana or "Great Northern Route" carried travelers across the countryside, but the Erie Canal was a vision of the future.

The Commonwealth of Pennsylvania responded by appointing a three-man Board of Canal Commissioners in March 1824, which subsequently ordered surveys for the Pennsylvania Main Line, including possible routes over Allegheny Mountain. Plans changed several times (a plan for a tunnel at the mountain's summit was dropped) before the governor provided authorization for the board to proceed with construction contracts in March 1831. Surveys made by Moncure Robinson, Lieutenant Colonel Stephen H. Long and Major John Wilson were adopted as the railroad route between Hollidaysburg and Johnstown, a length of 36 miles. Samuel Jones, superintendent of the Western Division of the canal system, now was in charge of the railroad too.

An engineering corps was chosen to oversee the construction work. Sylvester Welch was the principal engineer for the line. He had three able assistants--Edward Miller was in charge of machinery, Solomon W. Roberts took charge of the western division, and William Milnor Roberts oversaw the eastern division. In early 1831 these men pitched their tents in the snow on the mountainside, slept under buffalo robes and commenced working. Solomon W. Roberts located and supervised construction of Planes 1 and 2. Planes 3 through 10 were located and their construction supervised by William Milnor Roberts. Assisted by subassistants Thomas Gorton, Thomas J. Power, James E. Day and Curtis F. Dixon, in addition to surveying targetmen, chainmen and axemen, the engineers continued their work in the Pennsylvania forests throughout 1831, 1832 and 1833.

Clearing, grubbing, grading and masonry work was just the beginning. Embankments protected by slope walls were needed as well as ditches, viaducts, culverts and drains. The very first railroad tunnel in America was built - the 901-foot long Staple Bend. Bridges of masonry crossed the Conemaugh and Juniata rivers. The Conemaugh Viaduct was considered the "most perfectly constructed arch in the United States." And, as if in a concerted effort to blend the past with the future, the Skew Arch Bridge carried the old "Northern" turnpike over the new inclined railroad. Rails were laid - a single track on the level sections and a year later, a double track. Engine houses were built, their stationary engines assembled; and hemp ropes were purchased to be used in hauling cargo and passengers up and down the inclines.

The engineers and their contracted construction crews worked on 11 levels and 10 inclined planes. Several of the levels earned local names: the "Johnstown" level was four miles long from Johnstown to the foot of Plane 1; the "Long" level of 14 miles ran from the head of Plane 1 to the foot of Plane 2; the "Summit," from the head of Plane 5 to the head of Plane 6 ran two miles; the "Short" level was one-quarter mile from the foot of Plane 6 to the head of Plane 7; and the "Hollidaysburg" level ran 4 miles from the foot of Plane 10 to the town. The other levels did not acquire local names, as far as is known. Steam locomotives were purchased to haul on the levels, an immediate technological improvement over the heretofore considered (and for a short time, used) horse power.

Auxillary structures such as hitching sheds and housing for the engine tenders and riggers were built. In Hollidaysburg and Johnstown construction continued on basin slips and warehouses. By the spring of 1834 the alleged superiority of a railroad and canal system was ready to be tested.

The Allegheny Portage Railroad opened for business on March 18, 1834. All was confusion at first as individuals and transportation companies, who supplied their own horse power and railroad cars and were used to the "laws and independence" of turnpike travel, ran according to their own time schedules. Twenty-five cars were in use at

the road's opening. This number increased to 50 by April and to 80 by April 15. The canal commissioners were authorized by mid-April to use locomotive engines and to regulate the railroad traffic by means of agents and schedules. The railroad's effect on the cost of transportation was immediate. The cost of moving merchandise the distance of 53 miles from Hollidaysburg to Blairsville fell from $12.00 to $16.00 per ton to less than $4.00 a ton.

The railroad also opened to much critical acclaim. Engineers and local newspaper writers alike described both the wonder of modern engineering technology and the scenic beauty of a trip across Allegheny Mountain. As years passed, however, more emphasis was placed on the railroad's shortcomings and maintenance problems rather than its technological splendor.

Maintenance was a constant concern during the 20 years of operation. Harsh winters took their toll on the railroad's structural components. Freeze and thaw cycles resulted in spreading tracks. Pine timber under the rails rotted and had to be replaced by ties of locust and oak. Torrential rains submerged track, clogged drains and washed out viaducts. Wooden water pipes froze and broke. Engine house foundations cracked and boilers exploded. The hempen ropes caused endless problems for they stretched and broke and had short life spans. Even two technological advancements, John Dougherty's introduction of sectioned canal boats in 1843 which were carried whole on the railroad cars, thereby avoiding the labor intensive loading and unloading of cargo, and the use of John Roebling's wire rope on the inclined planes by 1849 as a substitute for the hemp, failed to stop the Allehgeny Portage Railroad's structural and technological decline.

The commonwealth began searching for alternatives. Unwilling to pay the cost of upkeep on a deteriorating system; and in an attempt to compete with the Pennsylvania Railroad Company which was building a track from nearby Altoona to Johnstown, a line without inclined planes, the commonwealth authorized new surveys for routes to avoid the use of planes in 1850. The result was a new railroad, the New Allegheny

Portage Railroad, which went into operation in July 1855. Debts increased, however, and the commonwealth decided to give up. The entire Pennsylvania Main Line was sold to the Pennsylvania Railroad Company for $7.5 million on July 31, 1857.

Newer technology, in the forms of railroad locomotive engines which could make the mountain's grade and improved rail systems, had added to the portage railroad's demise. To travel the entire length of the old road had required changing power 33 times in 36 miles. According to William Bender Wilson:

> To move a section boat over the road from the basin at Johnstown to Hollidaysburg involved calling into requisition 12 stationary engines, 12 different teams of horses, and 9 locomotives. The minimum number of men to handle this was 12 engineers and 12 firemen at the stationary engines, 9 engineers and 9 firemen for the locomotives, and 12 drivers of the teams--making 54 persons in all."[2]

Improvement on this system was inevitable.

People's lives were changed by the Allegheny Portage Railroad. Travelers could traverse Allegheny Mountain much more easily. Frontier businessmen shipped cargo faster and cheaper, which aided western settlement and development. Whole towns sprung up along the line. Local people, such as Samuel Lemon, who not only supplied coal, water and horses to the railroad but built a stone house on the mountain summit to service travelers with food and drink, centered their livelihoods around the railroad during its years of operation. The Allegheny Portage Railroad left a legacy, not only in the remaining structures standing

---

2. William Bender Wilson, "The Evolution, Decadence and Abandonment of the Allegheny Portage Railroad," in Mahlon J. Baumgardner and Floyd G. Hoenstine, The Allegheny Old Portage Railroad 1834-1854 (n.p.: Published by the authors, 1952), p. 68. Wilson's text is a good, general history of the railroad.

along its trace, but in the imaginations of nineteenth and twentieth century peoples.[3]

---

3. Several primary and secondary sources were consulted for this general overview. See Wilson, mentioned above, pp. 36-83; R.K. Large, The Old Portage, The Original New Portage and Their Relation to the Present New Portage, (n.p.: n.d.), n. p.; William Hasell Wilson, Notes on the internal improvements of Pennsylvania, (Philadelphia: Railway World, 1879), pp. 41-44; Harry A. Jacobs, The Juniata Canal and Old Portage Railroad, (Hollidaysburg, Pennsylvania: Blair County Historical Society, 1941, reprint., 1969), pp. 231. J. Elfreth Watkins, "History of the Pennsylvania State Canals and Railroads and the Consolidated System East and West of Pittsburgh," vol. 1 (n.p.: Pennsylvania Railroad Company, 1896), 1: 150-185. This text is unpublished and in galley form. S.W. Roberts, An Account of the Portage Railroad over the Allegheny Mountain, in Pennsylvania, (Philadelphia: Nathan Kite, 1836), pp. 312.

II. CONSTRUCTION HISTORY

As stated in the introduction, no drawings or specifications for structures along the Allegheny Portage Railroad have been found in the Board of Canal Commissioners papers (RG-17) in Harrisburg despite repeated visits and investigations by National Park Service researchers and others interested in the railroad's history. Only one drawing has been found, that of the Hollidaysburg Skew-Viaduct, drawn by William Milnor Roberts (See Toogood, HRS, p. 214).

Roberts, who worked directly under Sylvester Welch, was the engineer responsible for supervising construction on Planes 3 through 10. Roberts himself provided a clue as to the likely disposition of his papers. In 1878, while speaking about the Allegheny Portage Railroad and earlier inclined planes at Maunch Chunk on the Lehigh River to the American Society of Civil Engineers, Roberts briefly stated: "Having long ago unfortunately lost my notes and drawings of this early railroad, [the Maunch Chunk] its cars, machinery, etc., as used in 1827, I can now only refer to them in a somewhat general way from recollection."[4] If Roberts lost his papers from the late 1820s it is possible he also lost his notes and drawings of the Allegheny Portage Railroad. Why the Hollidaysburg Skew-Viaduct drawing survived and how it found its way into the Map Books in RG-17 in Harrisburg is, literally, anyone's guess. It is unlikely, at this point, that William Milnor Roberts' Allegheny Portage Railroad drawings are extant.

In a report to the Board of Canal Commissioners Sylvester Welch, chief engineer on the railroad, described in detail the physical characteristics of each road section from one through 35. At the end of his report Welch wrote, "The maps and profiles of the line, and plans for

---

4. W[illiam] Milnor Roberts, "Reminiscences and Experiences of Early Engineering Operations on Railroads, with Especial Reference to Steep Inclines," American Society of Civil Engineers Transactions VII (August 1878): 198.

all the viaducts, culverts, etc. acquired, are herewith communicated for the examination of the Board."[5] Unfortunately, none of Welch's plans or maps have been located despite diligent efforts in a number of repositories.

Other drawings of turnpike and canal structures from the same era do exist and these drawings can be studied for comparative data. In November 1824 the Pennsylvania Society for the Promotion of Internal Improvement was organized and supported by "gentlemen" interested in lobbying for Pennsylvania transportation improvements. This was an action taken as a direct response to the competing Erie Canal. The society appointed William Strickland as its agent.

Strickland sailed to England to observe and learn about that nation's vastly superior transportation systems. His reports were published in 1826 in Philadelphia and he included 72 measured drawings, executed by Samuel H. Kneass, of locks, aqueducts, locomotives, turnpike roads and culverts. American engineers, and especially those in Pennsylvania, used the Strickland manual as a guidebook. Drains and culverts used on the English canals, Strickland reported, were the same in design and application as those used on turnpike roads. His verbal description stated:

> The best roads are cross-drained under the foot-paths, by arched, square, or triangular culverts. The arched culverts may be of course be made of any desirable magnitude; but the square are seldom more than fifteen inches on the top, and the traingular of about the same capacity. The water is conducted from the gutters of the road to the culverts, by drains, of masonry, which are generally covered with an iron grating. Sometimes . . . the drains are formed through the face of the curb at its lowest part, resembling the openings into the curb

---

5. Reports & Misc. Documents, 1829-43, box 8, vol. 1, item 58. Allegheny Portage Records (Div. Rec.), Board of Canal Commissioners Records (BCC), Record Group-17 (RG-17), Division of Archives and Manuscripts, Pennsylvania Historical and Museum Commission (PHMC).

over the sewers of the city of Philadelphia, and pass under the footways into the side ditches.[6]

The Pennsylvania Main Line benefitted from William Strickland's knowledge. A portion of the 1827 route survey was completed by George T. Olmstead under Strickland's directions. Both Strickland and Samuel H. Kneass were chief engineers and worked at different times during construction on the Susquehanna River section of the main line.[7]

It is probable that William Strickland's sample culvert designs served as models for those built on the Allegheny Portage Railroad. (See illustration 1 for culvert drawings.)

William Hasell Wilson produced designs and cost estimates for structures located on the Pennsylvania Railway, Philadelphia and Columbia Railway and Philadelphia and Reading Railway in 1831. His drawings of railroad structures, especially culverts, may also have served as models for those built on the Allegheny Portage Railroad in 1832-33. Wilson's notebook contains sketches of timber and masonry bridges, tunnels, railway trackwork, road work and other structures.[8] (See figures F-I and illustrations 2-10 for culvert descriptions and drawings.)

---

6. William Strickland, Reports on Canals, Railways, Roads, and Other Subjects made to "The Pennsylvania Society For the Promotion of Internal Improvement," (Philadelphia: H.C. Carey & I. Lea, 1826), p. 20. A copy of this text was included in the records of the Board of Canal Commissioners.

7. William Hasell Wilson, Notes on the internal improvements, p. 41; William Bender Wilson, The Evolution, Decadence and Abandonment, p. 38.

8. W[illiam] H[asell] Wilson, "Notebook, Designs and Costs for Structures, 1831," unpublished manuscript, Division of Mechanical and Civil Engineering, National Museum of American History, Smithsonian Institution.

A. Engine Houses

1. Incline 6

On April 1, 1833 James Stackpole, William Woodburn and H. Simonton won a contract to build "An Engine House and Road Shed at the Head of the Plane, and a Road Shed at the foot of the plane together with all the Masonry Excavation & Connected with the Same."[9] The contractors were also required to build the framework required for the machinery at Plane 6, to hang and fit the engine sheaves, to excavate a 15-foot deep well for the use of the stationary steam engines, and to do any other work as deemed necessary by the principal engineer.

All of the construction was to be finished "agreeably" according 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. . . . "[10]

An extant Allegheny Portage Railroad business journal provides data on the railroad's construction. The engine house at Plane 6 was completed by May 30, 1834, with the following work being done:

860.77 c. yds. Ex^{n} at head of plane
273.33 Perches Masonry in Walls supporting Engine & mach^{y}
46.08 Perches Masonry in foundation walls at head of plane
12.00 Perches Masonry in foundation walls at foot of plane
57.28 c. yds Excav^{n} at foot of plane
303.00 ft lineal in frame supporting & connected with mach^{y}
Digging & Walling Well 15 ft. deep
Building Engine House & Shed
Building Shed at foot of plane
234.00 Sheaves hung & fitted
Hanging and fitting large Sheave at foot of plane
633.33 ft. lineal frame work connected with it
Furnishing materials and constructing movable car at head
Work not included in contract
Digging & boring Well 106.25 ft.
Boring 14.85 ft.

---

9. Contracts, 1851-1855, box 2, vol. 4, item 139, APRR, Div. Rec., BCC, RG-17, PHMC.

10. Ibid.

Costs were also included in the journal entry.[11]

A contract for a second engine house, store room and coal shed at the head of Plane 6 was awarded on June 23, 1834.[12] The contractors, James Stackpole, Casper Dull and Hiram Willis executed the following work by May 23, 1835:

104.39 c. yds of Excavation
144.44 c. yds of Hard pan
12.00 c. yds of Solid Rock
95.78 perches of Rubble wall
86.75 perches of Dressed wall
304 ft. linear Timber for Cylinder beds
Engine house complete
25,000 Brick in stack furnace
48.75 c. yds of Embankment
Furnishing & putting up tin pipes & Gutters
Work not included in contract[13]

No further construction information has been found. A sample specification for a locomotive engine house is in Toogood (HRS, pp. 159-163). Surveys of the lots at the head and foot of Plane 6 have been located in engineering records in RG-17, but they provide no information regarding lot relationship to the plane.[14] (See illustration 14 for Plane No. 6 surveys.)

---

11. Journal 1831-1835, 1 vol., p. 338, MG-2, PHMC. A perch is any defined unit of measure in masonry. In this case, the historic literature identifies the measure as 25 cubic feet. The movable care at the plane head was part of the machinery in the engine house which held a 9'7" sheave. For a description of the movable car's function, see Sylvester Welch's Report on the Allegheny Portage Railroad 1833 (York, Pennsylvania: American Canal and Transportation Center, 1975), pamphlet, 22 pp., pp. 11-12.

12. Contracts, 1851-1855, box 2, vol. 4, item 138, APRR, Div. Rec., BCC, RG-17, PHMC.

13. Journal 1831-1835, 1 vol., p. 387, MG-2, PHMC.

14. Engineering Records, 1842-1847, box 2, 1 vol., APRR, Div. Rec., BCC, RG-17, PHMC. No date was on the locomotive engine house specifications.

2. Incline 9

Patrick Smith won the contract to build the engine house and road shed at the head, and the road shed at the foot, of Plane 9 on April 1, 1833. A little over a year later, on June 23, 1834, William Robson and David Borrers were contracted to build the second engine house and a coal shed and store room at the plane head.[15] These contracts provide specific information concerning rates of pay for work done, i.e., for common excavation, detached rock, solid rock and masonry, but no details of construction for the structures are included in them.

The railroad construction journal provides the following data on the two engine houses, completed by May 20, 1834 and May 23, 1835 respectively:

First Engine House

1084.93 c. yds Excav^{n} at head of plane
271.92 Per. Mas^{y} in Walls sup^{g} & connected with Mach^{y}
58.40 Per. Mas^{y} in found^{n} walls, head of plane
16.45 Per. Mas^{y} in found^{n} walls, foot of plane
48.96 c. yds Excav^{n} at foot of plane
303.00 ft. lineal timber in frames sup and con^{d} with mach^{y}
240.00 Sheaves hung & fitted on plane
Hanging & fitting large sheaves at foot of plane
633.33 ft. lineal timber in frames con^{d} with said sheaves
Digging & Walling Well 15 feet deep
Materials & workmanship in Moveable Carriage at head of Inclined plane
Building Engine House and Shed at head
Building Road Shed at foot of plane
Work not included in contract[16]

15. Contracts, 1851-1855, box 2, vol. 4, items 144, 145, APRR, Div. Rec., BCC, RG-17, PHMC. Another name, Hemperly, was on the contract, but was crossed out. "Smith & Hemperly Cont." was found, however, in the construction journal entry for work completed on Plane 9.

16. Journal 1831-1835, 1 vol., p. 337, MG-2, PHMC.

Second Engine House

115.00 c. yds of com. Excavation
310.00 c. yds of Slate
183.93 c. yds of Hard Pan
200.00 c. yds of Solid Rock
90.58 perches of Rubble Wall
86.75 perches of Dressed Wall
304.00 ft. lineal of Timber for cylinder beds
Engine house complete
22,500 Brick in Stack furnace
163.15 c. yds of Embankment
Furnishing & putting up tin Pipes & Gutters
Work not included in contract[17]

Surveys of lots at the head and foot of Plane 9 were located in engineering records.[18] (See illustration 16 for Plane No. 9 surveys). Another survey of a house and lot at the head of Plane 9 clearly shows the engine house on the railroad tracks. This survey (along with surveys of Planes 8 and 10) was found in damage claim records filed by contractors seeking relief from the Board of Canal Commissioners. The surveys provide directional orientation, lot size, distance from the center of the railroad, configuration of structures, topographical information and scale.[19] (See illustration 20 for Survey of House and Lot at Head of Inclined Plane No. 9.)

3. Incline 10

George Grier and Henry Keely built the engine house, road shed and engine tender's dwelling at the head of Plane 10 and a road shed and small dwelling house at the foot of the plane under the provisions of a contract awarded April 1, 1833. The second engine house

---

17. Ibid., p. 387.

18. Engineering Records, 1842-1847, box 2, 1 vol., items 151, 156, APRR, Div. Rec., BCC, RG-17, PHMC.

19. Damage Claims Contractors for Relief, box 5, vol 1, B-W, item 80, APRR, Div. Rec., BCC, RG-17, PHMC.

at the plane head, and a store room and coal shed, were built by Jesse Woodcock and David S. Rhule under a contract dated June 23, 1834.[20]

The contracts were standard forms, with information pertaining to individual contractors entered, signed by both the contractor and Samuel Jones as superintendent. Therefore, like the contracts for the engine houses at Planes 6 and 9, the Plane 10 engine house contract offered no details of construction.

Some data was provided in the construction journal concerning work completed on the first engine house by May 20, 1834 and on the second engine house by May 23, 1835:

First Engine House

867.91 c. yds Excav^{n} at head of plane
273.04 Perches Mas^{y} in Walls for support of Engine & Mach^{y}
71.13 Perches Mas^{y} in found^{n} Walls head of Inc^{d} plane
90.00 Perches Mas^{y} in found^{n} Walls foot of Inc^{d} plane
108.06 c. yds. Excav^{n} at foot of plane
247.00 ft. lineal timber in frames supporting and connected with machinery at head
Digging and Walling Well 15 ft. deep
Building Engine House & Road shed at head of plane
Building Shed at foot of plane
200.00 Sheaves hung & fitted on Inclined Plane
Hanging and fitting large Sheave foot of Inc^{d} plane
647.16 ft lineal timber in frame connected with said Sheave
Furnishing Materials and constructing moveable carriage at head of Inclined Plane
Building Dwelling House at head of plane
Building Dwelling House at foot of plane
Work not included in Contract in house at foot of plane
Work not included in Contract[21]

20. Contracts, 1851-1855, box 2, vol. 4, items 146, 147, APRR, Div. Rec., BCC, RG-17, PHMC.

21. Journal 1831-1835, 1 vol., p. 336, MG-2, PHMC.

Second Engine House

16.67 c. yds of com Excavation
136.25 c. yds of Slate
151.82 perches of Rubble Wall
86.75 perches of Dressed Wall
304.00 ft lineal of Timber for cylinder beds
Engine House complete
22500 Brick in Stack furnace
76.93 c. yds. of Embankment
Furnishing & putting up tin pipes & Gutters
Work not included in contract[22]

Any further data on the engine houses at Planes 6, 9 and 10, other than dates of construction or alterations, could not be found in the Board of Canal Commissioners records. Paintings of the engine house at Plane 6 exist, as well as three photographs ca. 1845, 1884-87, 1890. (See Toogood, HSR, illustrations 2, 47, 48; Toogood, HRS, illustration 11, p. 216; Fiero, HSR, figure 4, p. 6.) These can be examined for construction details not available from written sources. Additionally, Philip Hoffman, an artist and engineer, has executed several drawings of engine house machinery. Sylvester Welch's reports provided the data for the Hoffman drawings. Fred R. Connacher also executed drawings of the engine house at Plane 6.[23] A preservation shelter for the engine house foundations at Plane 6, recreating the historic structure in scale and mass, will have to be based on these sketches, photographs and written specifications, and not on any extant architectural drawings.

Surveys of the lots at the head and foot of Plane 10 were found in the engineering records.[24] (See illustration 17 for Plane No. 10 surveys). The damage claim survey of the lot at the head of Plane 10

---

22. Ibid., p. 388.

23. See Toogood, HRS, p. 216 and HSR, illustrations 2, 47, 48. See back inside cover of Sylvester Welch's Report. Welch's text contains much valuable detail concerning the engine houses, machinery, ropes and operation of the railroad.

24. Engineering Records, 1842-1847, box 2, 1 vol., item 151, APRR, Div. Rec., BCC, RG-17, PHMC.

shows the location of the engine house (See figure 22 for Survey of House and Lot at head of Inclined Plane No. 10).[25]

In October 1834 Sylvester Welch reported to the Board of Canal Commissioners on the estimated cost of the engine houses, along with the other structures built along the line.[26] (See figure N for descriptions of the work done on Planes 6-10.)

B. Culverts

The historical record does not provide much data concerning culverts and drains located along the Allegheny Portage Railroad. There were discrepancies, possibly because of changing design decisions, among the engineers on the line as to the exact number of culverts. Superintendent Samuel Jones referred to 72 in 1831, but to 68 in 1832. Sylvester Welch reported 68 culverts in 1833. Drains numbered 87.[27] In 1836 Solomon W. Roberts wrote: "Sixty-eight culverts of masonry laid in mortar, the sum of the spans of which is 494 feet, pass under the rail-road, besides 85 drains of dry masonry, of from 2 to 3 feet span." William H. Wilson wrote of the railroad in 1879: ". . . there were 68 arched culverts with spans varying from 3 to 25 feet, and 87 drains or

---

25. Damage Claims Contractors for Relief, box 5, vol. 1, B-W item 82, APRR, Div. Rec., BCC, RG-17, PHMC.

26. "Report of Sylvester Welch, Engineer," Appendix to Vol. II of the Journal of the House of Representatives 1833-34 Containing the Canal Commissioners Report and Accompanying Documents (PHJ, App. to Vol. II), p. 91.

27. "Report of S. Jones, Superintendent," Journal of the Forty Second House of Representatives of the Commonwealth of Pennsylvania, Vol II, (Harrisburg: Printed by Henry Welsh 1831 '32) p. 184 (PHJ, Vol II); "Report of Sylvester Welch, Engineer" PHJ, App. to Vol. II, 1833-1834, pp. 80-81; "Report of the Board of Canal Commissioners" Appendix to Vol. II of the Journal of the House of Representatives, 1832-33 Containing the Canal Commissioners Report, and Accompanying Documents, (PHJ App to Vol II) p. 8. Culverts are passages under roads or railway embankments which allow water to flow. Culverts on the Allegheny Portage Railroad were made of masonry, and were a type of drain. The railroad's drains were designed to carry away storm water.

box culverts of from 2 to 3 feet span; making a total of 159 passages for water under the railroad."[28]

An engineer's estimate, dated August 2, 1831, provides data for culverts on sections 36 through 45 regarding shape, diameter, amounts of wood and stone needed for construction, and the contractor. (See figure B for Allotment Culverts upon Allegheny Portage Railroad.) Sylvester Welch provided a list of culverts for sections one through 35 and a general discription of the culverts on the entire line. (See Toogood HRS, pp. 128-129, 142; See figure C for road section description, sections 35-45).

These lists do not agree with remains left along the railroad. Extant culverts along level 9, for example, are not included in the culvert descriptions. Perhaps these were built after initial construction of the line.

Index to List of Culverts

This index will help identify the culverts in two ways: (1) their citation in the historic literature, and (2) their location along the railroad. In the primary sources the culverts were identified both by section of the railroad and by the number of culverts on that section: hence culvert 42C is the third culvert on section 42. The station numbers provide location on drawing number 423/3001. Each of the 10 planes on the railroad contained a level and an incline, and this designation is also applied to the culverts.

---

28. Roberts, An Account of the Portage Railroad, p. 7; William Hasell Wilson, Notes on the internal improvements, p. 42.

Culverts

1. Three (3) at Summit Level (Plane 6)

Culvert 35A - station 1342

Possible drain - station 1356. Very little primary source information on the drains has been located. There were 85-87 drains located along the entire length of the railway; their spans ran two to three feet; and they were flat, or boxed in shape.

Culvert 36A - station 1382

2. One (1) Near Skew Arch Bridge

This culvert is modern and located at station 1422. It is not culvert 36B, which is buried at station 1428.

3. One (1) at Incline No. 7

The outlet of this culvert was found but the inlet is buried.
Culvert 37B - station 1464.

4. At Level No. 8

This culvert may be a drain at station 1490. If so, no documentation on drains has been found.

5. Two (2) at Incline No. 8

Culvert 38A-station 1503
Culvert 38B-station 1529 has been destroyed.

6. Two (2) at Level No. 9

The culvert at station 1532 is not identifiable in the primary source literature.

The culvert at station 1586 is also not identifiable in the original construction accounts. Culvert 39A is buried.

7. Five (5) at Level No. 10

Culvert 40A - station 1624

Culvert 41A - station 1635

Culvert 41B - station 1656

Culvert 42A - station 1692

Culvert 42B - station 1697

8. One (1) at Incline No. 10

This culvert at station 1733 is not identifiable in the railroad construction accounts.

1. Three at Summit Level

Culvert 35A was built by Andrew Colvin and Andrew Fitzpatrick under a contract dated May 10, 1832. They were paid $2.56 for the stone work and three cents per foot board measure for the carpentry work, including materials, provided the foundation was not solid rock.[29]

Philip Haley entered a contract with Samuel Jones on August 4, 1831 to "perform all the labor necessary to construct and finish in every respect, in the most substantial and workmanlike manner, 2 Culverts which will be required under the Rail Road, on the following section, viz: Number Thirty Six being marked A. & B. on Said Section."[30] Haley was

29. Contracts, 1851-1855, box 2, vol. 4, item 210, APRR, Div. Rec., BCC, RG-17, PHMC.

30. Contracts, 1851-1855, box 2, vol. 4, item 212, APRR, Div. Rec., BCC, RG-17, PHMC.

to be paid "Two dollars & twelve & a half cents" for stone work, per perch of twenty-five cubic feet, including the materials. For the carpentry work, including materials, "provided the foundation is not solid rock, and has to be made with timber," Haley was paid two cents per foot board measure.[31]

2. One near Skew Arch Bridge - see index

3. One at Incline 7

William Groves, William Pollard and Alex W.K. Groves built culvert "A" on section 37 under a contract dated October 13, 1831. The contractors were paid $2.35 for the stonework, per perch of 25 cubic feet; three cents per foot board measure for carpentry work; and "For Excavation of all Kinds of material, except Solid Rock, 25 cents per cubic yard For Solid Rock, 75 Cents per Cubic yard."[32]

4. At Level 8 - see Index

5. Two at Incline 8

Culvert "A" on section 38 was built by William Groves, William Pollard and Alex W.K. Groves under a contract dated October 13, 1831. James Stewart, W.W. Fenlon and B. Ford built culvert "B" on section 38, as well as culvert "A" on section 39, under their contract with Samuel Jones dated August 4, 1831. The rate of pay Groves, Pollard and Groves earned was the same as their pay for culvert "A" on section 37. Stewart, Fenlon and Ford received $2.75 for stone work, per perch of 25 cubic feet; one cent per foot board measure for carpentry; and 15 cents per cubic yard for excavating foundations.[33]

---

31. Ibid.

32. Contracts, 1851-1855, box 2, vol. 4, item 213, APRR, Div. Rec., BCC. RG-17, PHMC.

33. Contracts, 1851-1855, box 2, vol. 4, items 213 and 214, APRR, Div. Rec., BCC, RG-17, PHMC.

6. Two at Level 9

Culvert "A" on section 40 was built by James Stewart, W.W. Fenlon and B. Ford under a contract dated August 4, 1831. William Robson built culverts "A" and "B" on section 41 under a contract dated the same day. Stewart, Fenlon and Ford were paid the same wages as for their work on culvert "A" on section 39. Robson received $2.80 for stone work, per perch of 25 cubic feet; and three and one half cents per foot board measure.[34]

7. Five at Level 10

Construction of the culverts on Plane 10 was split between five contractors. G.W. Henry and John Dougherty contracted for culverts "A" and "B" on section 42 (date of contract - August 4, 1831) and were paid $2.20 for the stone work; and two and one half cents for the carpentry work, provided the foundation was not solid rock and had to be made with timber. Henry and Dougherty also built culverts "C" and "D" on section 42, (August 4, 1831; September 5, 1831), but at different prices: for "C", $2.10 for stone work and two and one half cents for carpentry; and for "D", $2.50 for stone work and two cents for carpentry.[35]

William Groves and Alex W.K. Groves, under a contract dated August 4, 1831, built two culverts, "A" and "B" on section 43. They were paid $2.48 per perch of 25 cubic feet for the stone work, and three cents per foot board of timber for carpentry.[36]

Construction of two culverts, "A" and "B" on section 44 were started by Jacob Snyder under a contract dated August 4, 1831 but the

---

34. Contracts, 1851-1855, box 2, vol. 4, items 214, 215, APRR, Div. Rec., BCC, RG-17. PHMC.

35. Contracts, 1851-1855, box 2, vol. 4, items 216, 217, 218, APRR, Div. Rec., BCC, RG-17, PHMC.

36. Ibid., item 219.

work was completed by James OConnor and William Griffin after October 1, 1831. These contractors were paid $2.39 per perch of twenty-five cubic feet of stone work, and one and three-fourths cents per foot board measure for carpentry work.[37]

On August 4, 1831 a contract was let with William Robson to build culvert "A" on section 45. He was paid the same price for this culvert as he was for building the two culverts on section 41.[38] (Further information on work done on the railroad, costs of grading and masonry, details of culvert construction and cost can be found in figures A, D, E, J, K, L, M, O.)

8. One at Incline 10 - see index

C. Hitching Sheds

1. Incline 8

The hitching shed (or road shed) at the foot of Plane 8 was built under a contract dated July 15, 1833 by George Greer (Grier) and Henry Keely.[39]

No other construction data is known. Generalized surveys of Plane 8 were in RG-17 engineering records. (See illustration 15 for Plane No. 8 surveys.) Another undated survey found in damage claim records features a drawing of the hitching shed. (See illustrations 18, 19, 24 for Survey of House and Lot at Foot and Head of Inclined Plane No. 8, and sketch of brickyard at foot of Plane 8.)[40]

---

37. Ibid, items 220, 221.

38. Ibid, item 215.

39. Contracts, 1851-1855, box 2, vol. 4, item 141, APRR, Div. Rec., BCC, RG-17, PHMC.

40. Engineering Records, 1842-1847, box 2, 1 vol., item 156, APRR, Div. Rec., BCC, RG-17, PHMC. Damage Claims Contractors for Relief, box 5, vol. 1, B-W, items 77, 78, APRR, Div. Rec., BCC, RG-17, PHMC.

2. Incline 9

Patrick Smith built the hitching shed at the foot of Plane 9 under a contract dated April 1, 1833. No other construction data is known. The damage claim survey of the plane foot shows the location of the hitching shed.[41]

Sketches of Planes 8 and 9 which clearly depict the hitching sheds can be seen in William Bender Wilson's text on the Allegheny Portage Railroad.[42]

D. Skew Arch

On July 15, 1832 J. Fenlon, A. and J. Darlin, and R. Kininmouth won the contract to build "A Stone Bridge which will be required for the passage of the Turnpike road over the Rail Way on Section No. 36 of the Portage." The bridge was to be built according to specifications which were attached to the contract and considered part of the contract.[43]

According to the railroad construction journal, the following work was done on the Skew Arch:

October 1, 1832 - 85 perches masonry
October 25, 1832 - 260 perches masonry
December 10, 1832 - 540 perches masonry FINAL
May 21, 1833 - 611.14 perches masonry
31.11 cubic yards broken stone[44]

The bridge design was changed in 1833 to accommodate a bend in the turnpike road, hence the skewed arch. The construction journal duly

---

41. Contracts, 1851-1855, box 2, vol. 4, item 145, APRR, Div. Rec., BCC, RG-17, PHMC. Damage Claims Contractors for Relief, box 5, vol. 1, B-W, item 79, APRR, Div. Rec., BCC, RG-17, PHMC.

42. William Bender Wilson, "The Evolution, Decadence and Abandonment," pp. 63, 66.

43. Contracts, 1851-1855, box 3, vol. 6, item 58, APRR, Div. Rec., BCC, RG-17, PHMC.

44. Journal 1831-1835, 1 vol., pp. 196, 213, 132, 277, MG-2, PHMC.

noted on May 21, 1833 the expense of "Taking up & relaying masonry in consequence of alteration in place."[45]

No specifications for the Skew Arch Bridge were found in the Board of Canal Commissioners records. Archeological testing in the area will determine grade based on the existence of historic wooden rail supports located just east of the bridge. (See illustrations 25-26 for photographs of the Skew Arch Bridge ca. 1910.)

E. Grade of Incline 9

Few specific mentions of the grade of Incline 9 have been found in the extant literature. In 1878 Solomon Roberts remembered that "The inclination of these planes varied from about 8 to 10¼ per cent except No. 9, which was 7¼ percent."[46] Sylvester Welch reported to the Board of Canal Commissioners in 1832 that Inclined Plane 9, from station 1595 to 1622, was 0.51 miles long; was 30.72 miles from Johnstown; and was 1041.90 feet in descent from the summit. (See figure 27 for Welch's table of grades and a profile of grades on the entire line; see also Toogood, HRS, p. 137 for distances and elevations of inclined planes.) Welch offered the same information on the Incline 9 grade to the board in 1833, adding the fact that the incline's descent per 100 feet was 7.25 feet.[47]

Further determination of Incline 9 grade restoration will be accomplished by archeological testing.

F. Lemon Coal Mine Entrance

Very little new historical evidence concerning the entrance to Samuel Lemon's coal mine, from which he supplied coal for the portage

---

45. Ibid., p. 277.

46. Roberts, "Reminiscences," p. 200.

47. "Report of Sylvester Welch, Engineer," PHJ, App. to Vol. II, 1832-33, pp. 80-81; "Report of Sylvester Welch, Engineer," PHJ, App. to Vol. II, 1833-1834, p. 77.

railroad from 1839 to 1850, has been uncovered. An 1840 map and 1878 sketch of the grounds reveal Lemon's coal mine and coal wharf to be across the railroad track to the north of the Lemon House. (See Toogood, HSR, "The Lemon House," pp. 9, 25-30).

The 1875 Second Geological Survey of Pennsylvania provided only limited data. Samuel Lemon opened two diggings on the outcrop line of Bed E, Upper Freeport, near the head of Plane 6. He dug on an outcrop south of the railroad and sank a shaft measuring 60 feet deep. "The mouth of the shaft was a few hundred yards west of the head of the plane."[48]

The following dimensions are the thickness of the coal bed in this vicinity:

Coal	2'10"
Slate	0' 1"
Coal	1' 4"
Slate	0' 3"
Coal	0' 6"[49]

Dip from 2° to 3° to N.W.

G. Historic Foundations and Sites

H. Portage Railroad Survey

The research required for locating and recording historic foundations; identifying use, ownership and dates of construction and destruction; and delineating boundaries of the portage trace can be incorporated into Dr. James W. Mueller's archeological "systems" approach at a later date. The quantity of research needed to locate and identify any or all of the structures built along the railroad line is beyond the

---

48. F. and W.G. Platt, Report of Progress in the Cambria and Somerset District of the Bituminous Coal-Fields of Western Pennsylvania, Second Geological Survey of Pennsylvania 1875 Part I. Cambria (Harrisburg: Board of Commissioners, 1877) p. 23.

49. Ibid., p. 24.

scope of this historic structure report. Anna Coxe Toogood has done preliminary work towards this end when she identified structures, townsites and other features located along the railroad. (See Toogood, HRS, historic base maps 1-7, p. 230.)

III. LEMON HOUSE SOUTH PORCH

The Lemon House, built by Samuel Lemon around 1831, was a landmark on the Allegheny Portage Railroad. Samuel Lemon and his family lived in the house and, for the 20 years the railroad was used, serviced both the railroad operation and the passengers who traveled on the line. The house was located at the head of Plane 6, and Samuel Lemon operated a tavern and presumably managed his coal mining operation from within its walls. After the Allegheny Portage Railroad began to decline Samuel Lemon and his family moved to nearby Hollidaysburg in 1847, although the family continued to own the house until 1907. (See illustration 11 for ca. 1910 photograph of Lemon House.)

The National Park Service has conducted historical, archeological and architectural research on the Lemon House in the past. (See Toogood, 1972; Fiero, 1983; Batcheler, 1982; Souder, 1972.) It has been ascertained that soon after the house was built in 1831, both a south and east porch were added. By the late 1800s a larger east porch had been built but the south porch no longer existed. No photographs of the Lemon House which depict this south porch have been found despite exhaustive research into this subject.

Comparative data is thus needed for a reconstruction of the Lemon House south porch. Further archeological and architectural data will be obtained under the provisions of Package 104. In 1982 architect Penelope Hartshorne Batcheler (architectural data section - HSR, pp. 144-149) drew a basic outline for further comparative research. She identified seven porch styles found on structures throughout southeast and central Pennsylvania, along with three different railing types. Batcheler also identified two publications containing further information on porch types.

Charles Morse Stotz's The Architectural Heritage of Early Western Pennsylvania (1936, 1966) is a documentary record evolving out of the Western Pennsylvania Architectural Survey, conducted in 1932-1935. This survey preceded the Historic American Buildings Survey by 18 months. Its purpose was to locate buildings built in western Pennsylvania before 1860; to compile and collect pictures, drawings and historical information on the buildings, extant or not; and to make measured drawings and photographs of representative buildings for publication.[50]

Representative porch types in the Stotz text can be found in the following photographs:

page 46
The Alexander McConnell House near Bishop
Built 1805 Washington County

page 47
A House near West Brownsville
Date Unknown Washington County

pages 50-51
The John Frew House in Crafton
Built before 1800 Allegheny County

page 73
The Richard Hill House near Upper Middletown
Built about 1820 Fayette County

pages 84-85
"Kingston House," the Alexander Johnston House near Latrobe
Built 1815 Westmoreland County

page 88
The Joshua Wright House near Finleyville
Built About 1821 Washington County

page 92
The Hiram Smith House in Centerville
Built 1830 Washington County

pages 98-101
The Daniel Royer House near Williamsburg
Built about 1815 Blair County

---

50. Charles Morse Stotz, The Architectural Heritage of Early Western Pennsylvania A Record of Building Before 1860, (Pittsburgh, University of Pittsburgh Press, 1936, reprint ed., 1966), p. 280.

"Porches were seldom used on the original Georgian houses. The first porches in western Pennsylvania, introduced late in the Post-Colonial period, were of the type seen on the . . . Royer house(s).[51]

page 184
"Compass Inn" in Laughlintown
Built 1799 Westmoreland County

page 184
The Defibaugh Tavern near Everett
Date Unknown Bedford County

page 184
The Moxley Tavern near Searights
Built 1818 Fayette County

page 184
The Ling Tavern at Claysburg
Built 1838 Blair County

The Ling Tavern is an obvious choice for a comparative study with the Lemon House. It is located in the same county, it served as a tavern, it is constructed of stone with a two-story wooden porch, and it was built only seven years after the Lemon House. (See illustration 13 for a photograph of the Ling Tavern.)

Additional research in 1984 in the Western Pennsylvania Architectural Survey collection in the Music and Art Department at the Carnegie Library in Pittsburgh uncovered two more structures located in Blair and Cambria counties which may be compared to the Lemon House. These structures were not illustrated in the Stotz text.

Stone House Scotch Valley 5 miles northeast of Hollidaysburg
n.d. Blair County Frankstown Township
owner (date of survey) Richard Schultz

Riffles Tavern "Summithouse" Summit House, Cresson
n.d. Frame Cambria County Cresson Township
owner (date of survey) Mrs. Bertha Fisher

This structure is, of course, the "Summithouse" which stood at the head of Plane 5 on the Allegheny Portage Railroad. It was probably built by James Riffle and was servicing railroad guests by 1837. The structure has a two-story porch. (See illustration 12 for a photograph of the Riffles Tavern.)

---

51. Ibid., p. 45.

Charles Morse Stotz offers further general information on porches:

> Porches were not common in early Georgian architecture in America and, except for the taverns, were almost never seen in western Pennsylvania before 1815. Many houses, in later times, have been disfigured by the addition of porches, with little or no regard for the original design. . . . The two-story gallery porch probably originated with the tavern, where it served as a second-floor corridor to private rooms and was reached by an outside stair (see Defibaugh Tavern). . . . The two-story porch of the Royer House is typical of the later farmhouses in the eastern district.[52]

Eleanor Raymond's Early Domestic Architecture of Pennsylvania (1931) features structures in the eastern part of the state. There is no accompanying text for the 158 photographs which feature religious buildings, schools, houses, farm outbuildings, barns and other structures and details. The value of the photographs is diminished by the lack of explanatory text and construction dates.

Representative porch types found in the Raymond photographs are as follows:

plate 58 House at Brandywine Manor, Chester County
one story lean-to, with crawl space and pilaster support

plate 61 Mount Pleasant at Bulltown, Chester County
one story porch on grade, heavy timber framing

plate 62 House at Compass, Chester County
two story walkout porch on basement level

plate 66 House Between Martindale and Hinkletown, Lancaster County
two story porch, front and back veranda, with first floor raised on pilaster piers
Old Bull House at Elverson, Chester County
two story porch, veranda on grade

plate 67 Darrah House near Manatawny Creek, Berks County
first story brick pilasters, wood columns, three rail balustrade

---

52. Ibid., p. 144.

plate 67 Old Trexler House, Trexlertown, Berks County
two story porch with balustrade

plate 71 House on the Old York Road, York County
two story, second floor, four railing balustrade

plate 72 House on Horseshoe Pike near Downingtown, Chester County
(formerly a Toll-Gate House)
cantilevered porch

plate 78 House near Martinville, Lancaster County
two story, heavy timber on first floor

plate 79 House near Downingtown, Chester County
one story porch with turned columns, rails across columns[53]

A third publication featuring Pennsylvania structures is Survey of Chester County, Pennsylvania, Architecture 17th, 18th and 19th Centuries by Margaret Berwind Schiffer (1976). Most of the structures featured in the Schiffer text predate the Lemon House by almost 100 years, yet they can be examined for the information provided on the evolution of porch styles. Construction styles were often copied and transmitted to different geographical areas. Styles from Chester County may have served as models for porches built in Blair and Cambria counties.

Schiffer's text features the following porches:

page 24
Barnes Brinton House Pennsbury Township
Built Between 1704-1715
one story porch, takes shape at beltcourse

page 26 Chadds House Birmingham Township
Built around 1702
one story porch on columns, possible extension of basement wall

page 30 Temple House West Bradford Township
Built 1714
one story porch

---

53. See: Eleanor Raymond, Early Domestic Architecture of Pennsylvania, (New York: William Helburn Inc., 1931).

page 33 Parke House Caln Township
Built before 1725
one story porch with turned columns, four columns on grade

page 41 Plumstock Willistown Township
Built early eighteenth century
one story porch, two engaged columns at wall surface, two heavy timber columns in front

page 50 Marshallton Blacksmith Shop West Bradford Township
Built mid-eighteenth century
one story porch, heavy timber columns with braces

page 51 Ashbridge House East Caln Township
Built early eighteenth century
one story porch at grade

page 78 Center Chimney House London Grove Township
Built about 1763
one story porch raised on piers

page 81 House of Nathan Sharpless
n.d.
one story wrap around porch with flat roof

page 100 Allen House Pocopson Township
Built 1780 or 1781
two story porch with four columns

page 105 Milltown Hickman Plank House East Goshen Township
Built ca. 1800
one story porch raised on piers with single rail[54]

No photographs of the Lemon House showing the south porch have been found, but the above comparative data on porch styles, when combined with further archeological and architectural data, can provide needed basic information for a conjectural reconstruction of the porch.

---

54. See: Margaret Berwind Schiffer, Survey of Chester County, Pennsylvania, Architecture 17th, 18th, and 19th Centuries. (Exton, Pennsylvania: Schiffer Publishing LTD, 1976).

CONCLUSION

The Allegheny Portage Railroad was the engineering wonder of its day. Many records concerning the railroad's construction, use, employees and expenses have survived. Nevertheless, only three photographs (c. 1845, 1884-87, 1890) of the engine house at Plane 6 have been found despite exhaustive investigations by several National Park Service historians; perhaps no other contemporary photographs of any railroad structures exist. The same situation is true for architectural drawings of structures; only one drawing has been found. The same is also true for the Lemon House; no photographs or descriptions have been found of the south porch.

Because of the lack of this type of hard evidence, reconstruction of the Lemon House porch or the engine houses will have to be based on conjecture, comparative data and/or limited construction data.

RECOMMENDATIONS FOR FURTHER RESEARCH

While searching for the whereabouts of any surveying drawings of William Milnor Roberts or Solomon W. Roberts, the author learned of the existence of the Pennsylvania Railroad records. Stored until recently in a Philadelphia warehouse, the collection measures 300,000 cubic feet, and in 1984 several institutions were involved in the decision-making process over how to handle the papers and where to deposit them. Dr. Michael Nash, Hagley Museum and Archives, Wilmington, Delaware, is in charge of the project. He stated there are "five or six rooms of drawings" alone, that the "drawings are a rat's nest," and that it would be a "long time before we can get into them." Dr. Nash did not believe that an inventory of the drawings would be available until the end of the project.[55]

On July 24, 1984, the author was able to go through several boxes of Pennsylvania Railroad drawings which had, just that week, arrived at the archives in Harrisburg. These drawings and other materials were to be deposited at the archives because they were obviously related to Pennsylvania. Associate Archivist Harry Parker pulled a box marked "Allegheny" and another with the name "Robert Faries" on a map. The maps and drawings, both blueprints and tracings, were in no order and some were drawings of structures in states other than Pennsylvania. The author found no maps dating earlier than 1890.

Obviously, much more work on this collection needs to be done by those professionals involved with the project. Harry Parker estimated that his archive's portion of the collection could be ready for public use within two years. Future research in the Pennsylvania Railroad records is highly recommended whenever they are usable, in hopes that drawings of the Allegheny Portage Railroad, which was a predecessor line to the Pennsylvania Railroad, may be found.

---

55. Interview with Dr. Michael Nash, Hagley Museum and Archives, Wilmington, Delaware, telephone, June 27, 1984.

Also located in the state archives at Harrisburg are some records from the Railroad Museum of Pennsylvania, Strasburg (Manuscript Group - 199). These records are being organized by archive staffers and then shipped back to Strasburg. Only a general index exists at this point for the collection. Assistant Archivist Harry Parker again assisted the author with looking through various historical files. Again, further research is recommended once this collection is organized and back in Strasburg.

Further research for data on historic foundations in the vicinity of the railroad; their construction, demolition and use can be an entire project in itself. This type of research, including identifying portage railroad employees and describing life styles, would be an integral component of an interdisciplinary "systems" approach to the Allegheny Portage Railroad's history.

LIST OF ILLUSTRATIONS

1. Plate 41 "Turnpike Roads. Section of an Embankment, showing the Discharge of the Road Drains into a Culvert. Section of a Culvert - triangular Drain formed of Slabs - and Square Drain."

   William Strickland, Reports on Canals, Railways, Roads, and Other Subjects Made to "The Pennsylvania Society for the Promotion of Internal Improvement," Philadelphia: H.C. Carey & I. Lea, 1826), p. 49.

2. Culvert on Section 60. W[illiam] H[asell] Wilson, "Notebook, 1831."

3. Pennsylvania Railway Sections. Wilson.

4. Culvert No. 2 on Section 59. Wilson.

5. Culvert No. 20 on Section 48. Wilson.

6. Culvert No. 22 on Section 60. Wilson.

7. Culverts. Wilson.

8. Culvert No. 26 on Section 65. Wilson.

9. Culvert. Wilson.

10. Culvert No. 24 on Section 62. Wilson.

11. Summit House [Lemon House] ca. 1910. Ira J. Stouffer Collection.

12. Riffles Tavern "Summit House" WPA survey.

13. Ling Tavern, WPA Survey.

14. Plane No. 6 survey. Engineering Records, RG-17.

15. Plane No. 8 survey. Engineering Records, RG-17.

16. Plane No. 9 survey. Engineering Records, RG-17.

17. Plane No. 10 survey. Engineering Records, RG-17.

18. Survey of House and Lot at Foot of Inclined Plane No. 8. Damage Claims, RG-17.

19. Survey of House and Lot at Head of Inclined Plane No. 8. Damage Claims, RG-17.

20. Survey of House and Lot at Foot of Inclined Plane No. 9. Damage Claims, RG-17.

21. Survey of House and Lot at Head of Inclined Plane No. 9. Damage Claims, RG-17.

22. Survey of House and Lot at Head of Inclined Plane No. 10. Damage Claims, RG-17.

23. Plane No. 6, Portage Railroad, 1842, in J. Elfrith Watkins, History of the Pennsylvania Railroad Company, p. 173.

24. Brickyard at foot of Plane 8. Reports and Miscellaneous Documents, box 10, vol. 2, item 86, APRR, Div. Rec., BCC, RG-17, PHMC.

25. Plane No. 6 Old Portage RR ca. 1910, MG-327, Ira J. Stouffer Collection.

26. Skew Arch ca. 1910, MG-327, Ira J. Stouffer Collection.

27. Profile Showing Grades of the Old Portage R.R., the new Portage R.R. and the Pennsylvania R.R. at the Crossing of the Allegheny Mountains Between Johnstown and Altoona and Hollidaysburg, in J. Elfrith Watkins, History of the Pennsylvania Railroad Company, p. 158.

28. Stone Sleepers, Summit Level, ca. 1910, Ira J. Stouffer Collection.

29. Stone Sleepers, Looking East from Summit, ca. 1910, Ira J. Stouffer Collection.

30. Summit Level, ca. 1910, Ira J. Stouffer Collection.

31. Level #7, ca. 1910, Ira J. Stouffer Collection.

32. Plane 8, ca. 1910, Ira J. Stouffer Collection.

33. Plane 9, ca. 1910, Ira J. Stouffer Collection.

34. Plane 10, Looking Towards Duncansville, ca. 1910, Ira J. Stouffer Collection.

35. Level #6, half-way on summit, 7/16/22, George A. Richardson Collection.

36. Plane No. 6 down to Hollidaysburg, taken from Lemon Homestead, 7/16/22, George A. Richardson Collection.

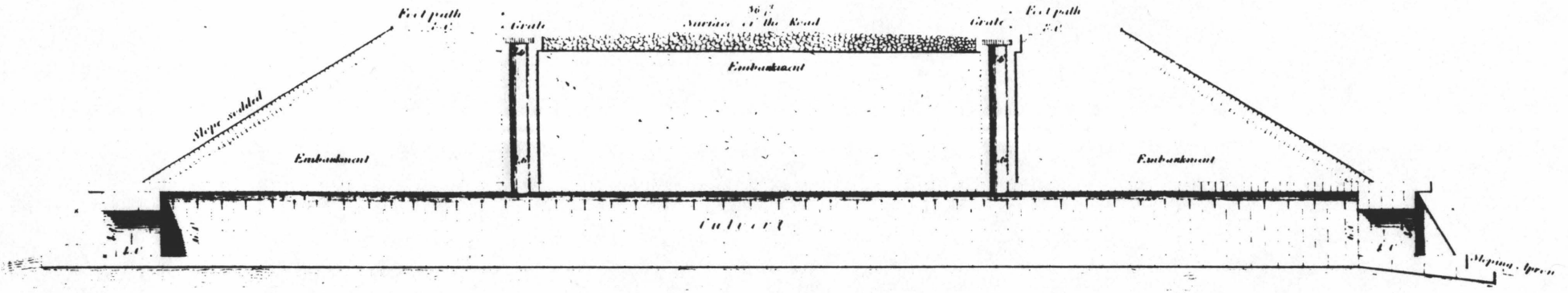
37. Old Engine House Foundation - Head of Plane 7 just beyond Penn Highway, 7/16/22, George A. Richardson Collection.

1. Plate 41 "Turnpike Roads. Section of an Embankment, showing the Discharge of the Road Drains into a Culvert. Section of a Culvert, - triangular Drain formed of Slabs, - and Square Drain."

   William Strickland, Reports on Canals, Railways, Roads, and Other Subjects Made to "The Pennsylvania Society for the Promotion of Internal Improvement," Philadelphia: H.C. Carey & I. Lea, 1826), p. 49.

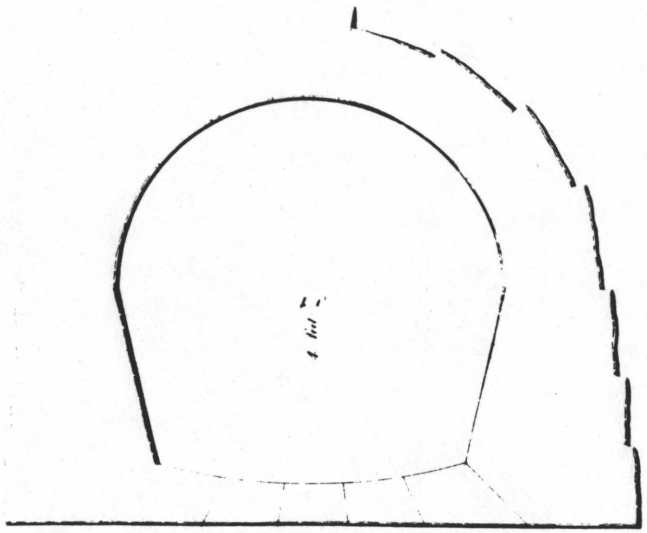
SECTION OF AN EMBANKMENT,

Shewing the discharge of the Road drains into a Culvert.



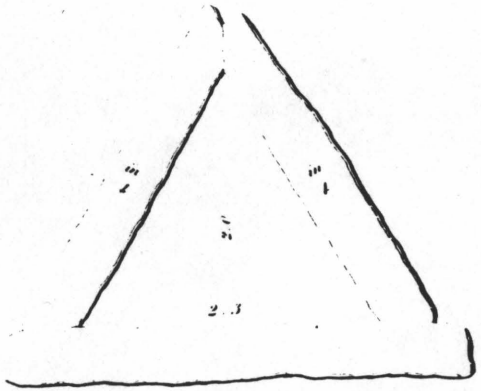
Scale ½ of an Inch to the foot

SECTION OF A CULVERT

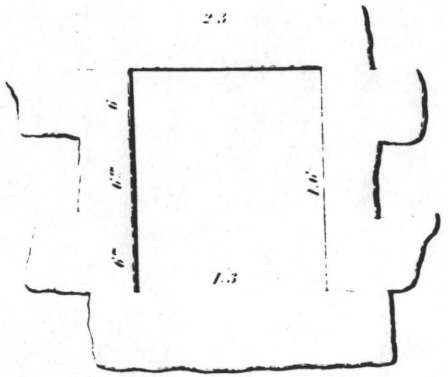


TRIANGULAR DRAIN

formed of Slabs



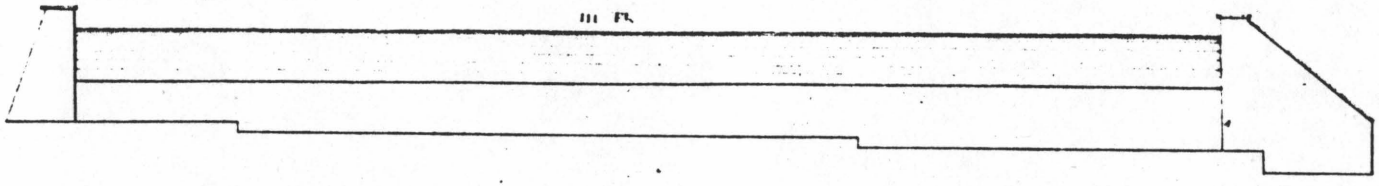
SQUARE DRAIN



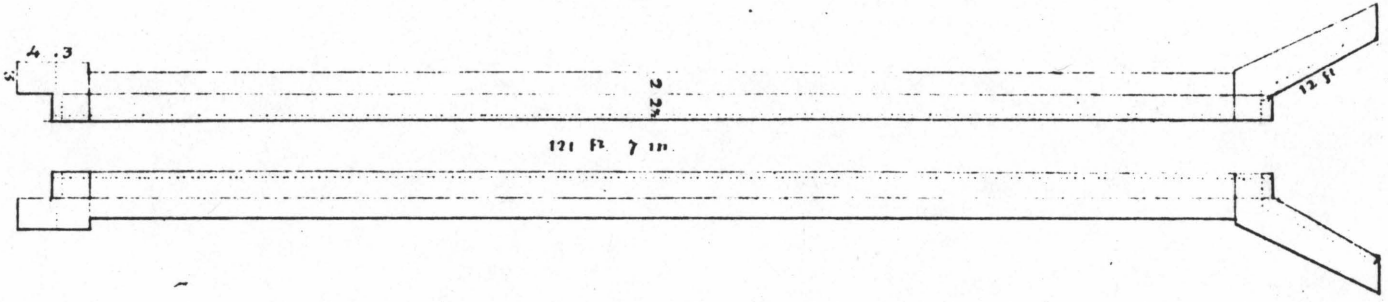
B.Lauver Sc.

2. Culvert on Section 60. W[illiam] H[asell] Wilson, "Notebook, 1831."

ELEVATION.



PLAN.

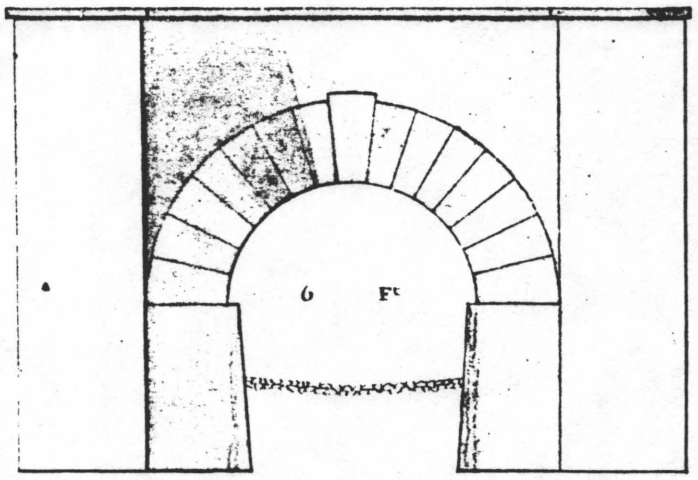


Scale 20 ft to an inch.

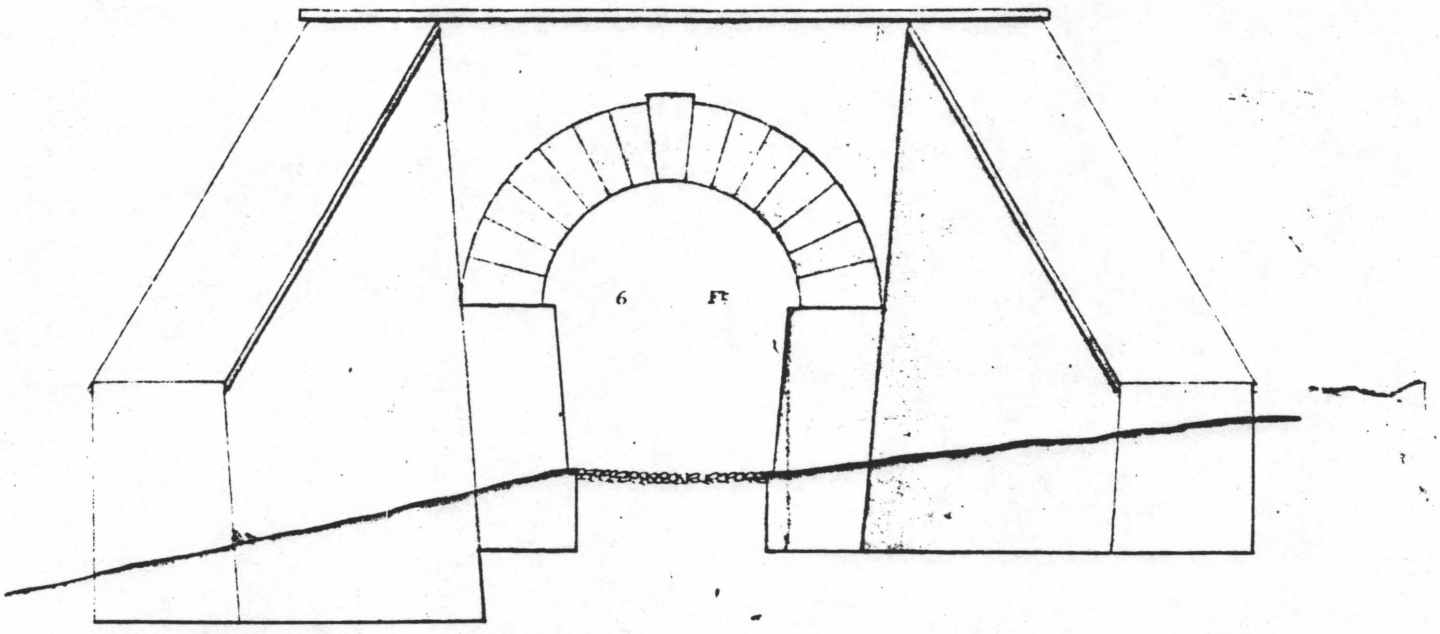
Culvert on Section 60.

3. Pennsylvania Railway Sections. Wilson.

Pennsylvania Railway.



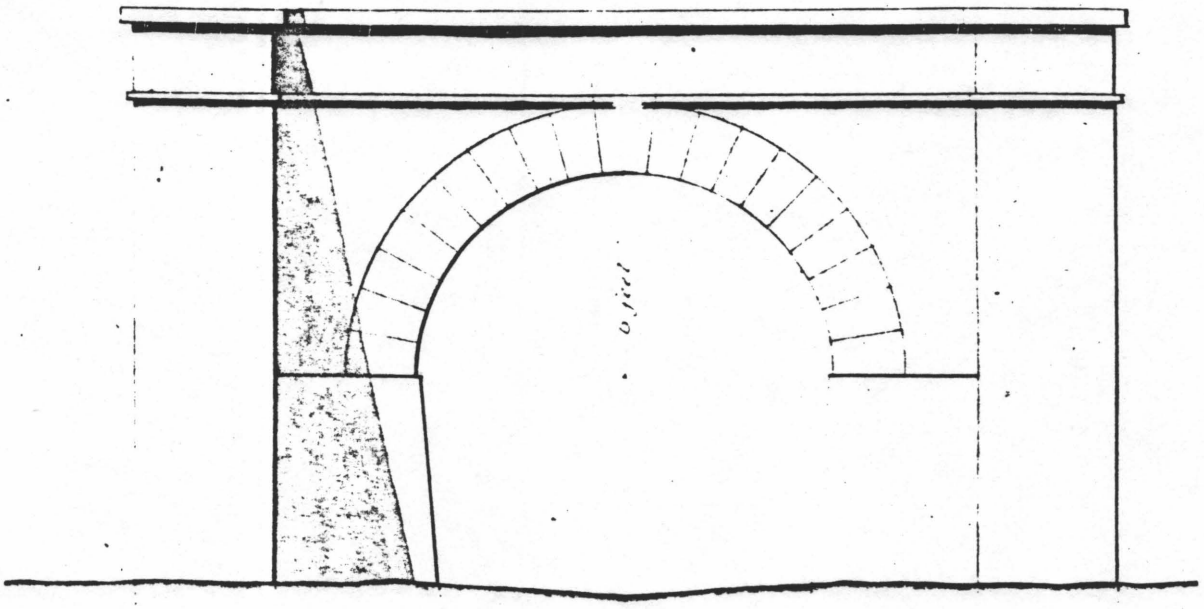
SECTIONS.



Scale 5 ft to an inch.

4. Culvert No. 2 on Section 59. Wilson.

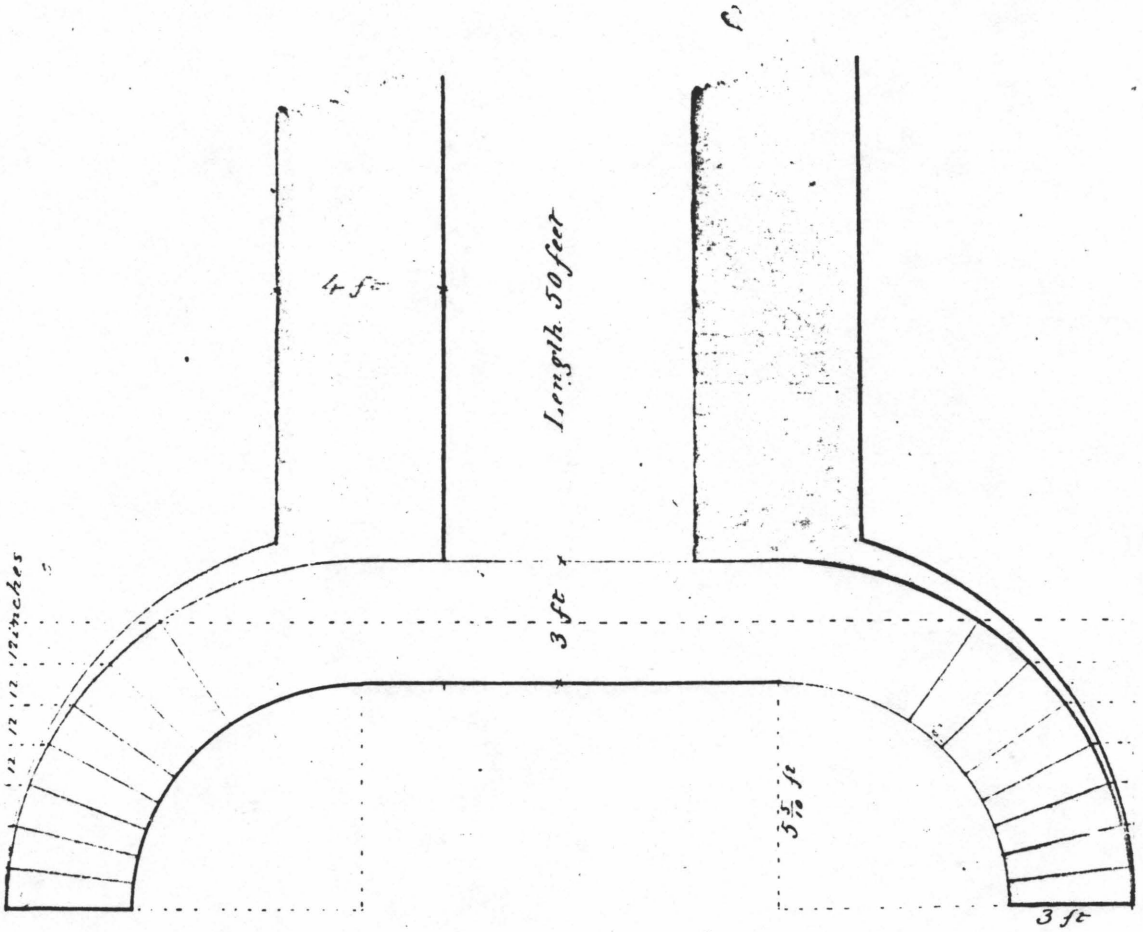
Culvert N° 2 on Sect. 59.

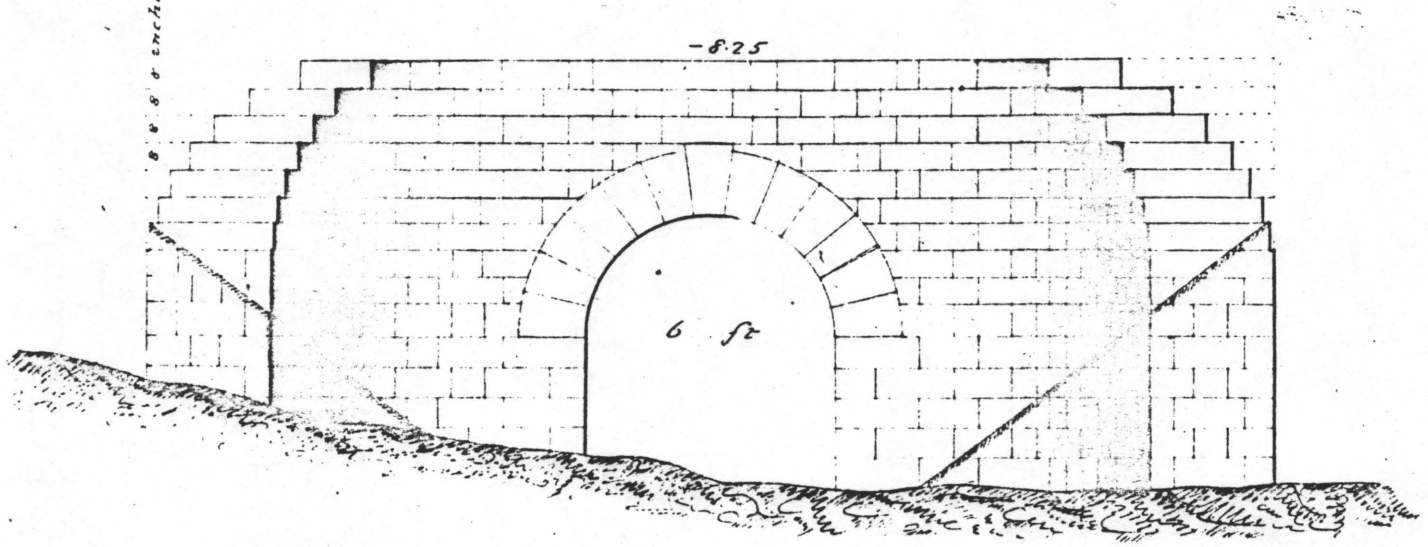


Scale 6 feet to an inch

5. Culvert No. 20 on Section 48. Wilson.

Culvert N° 20 on Section 18.

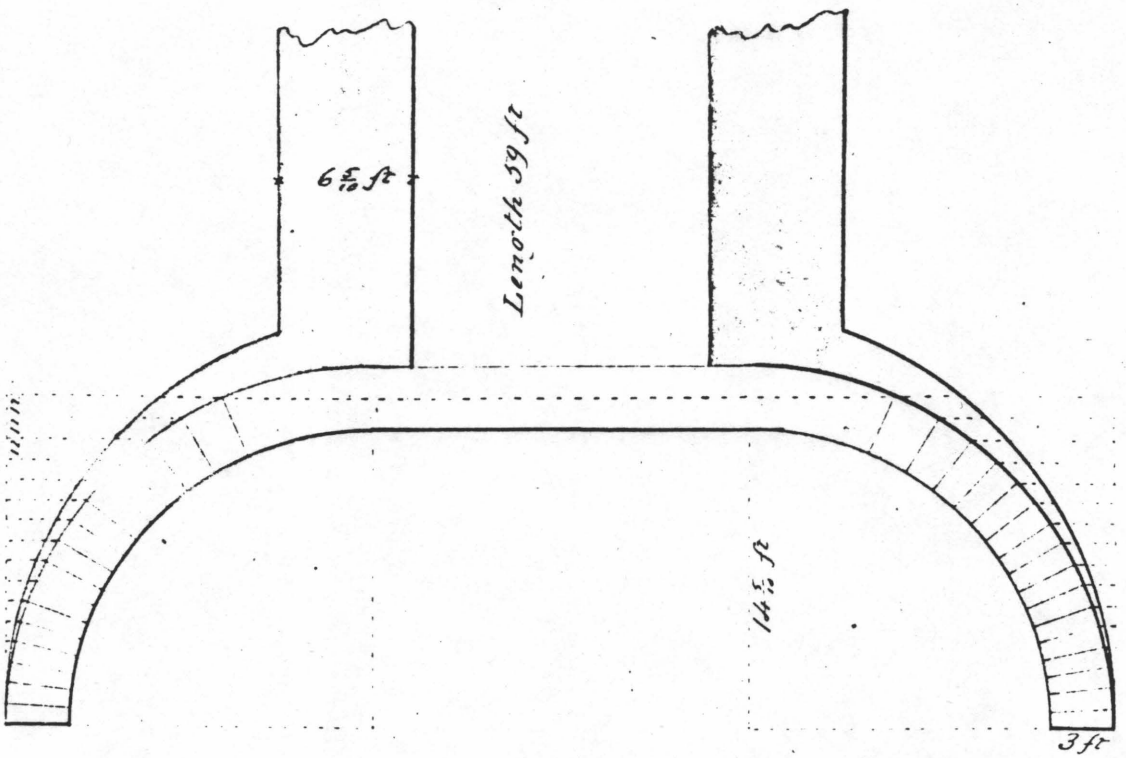




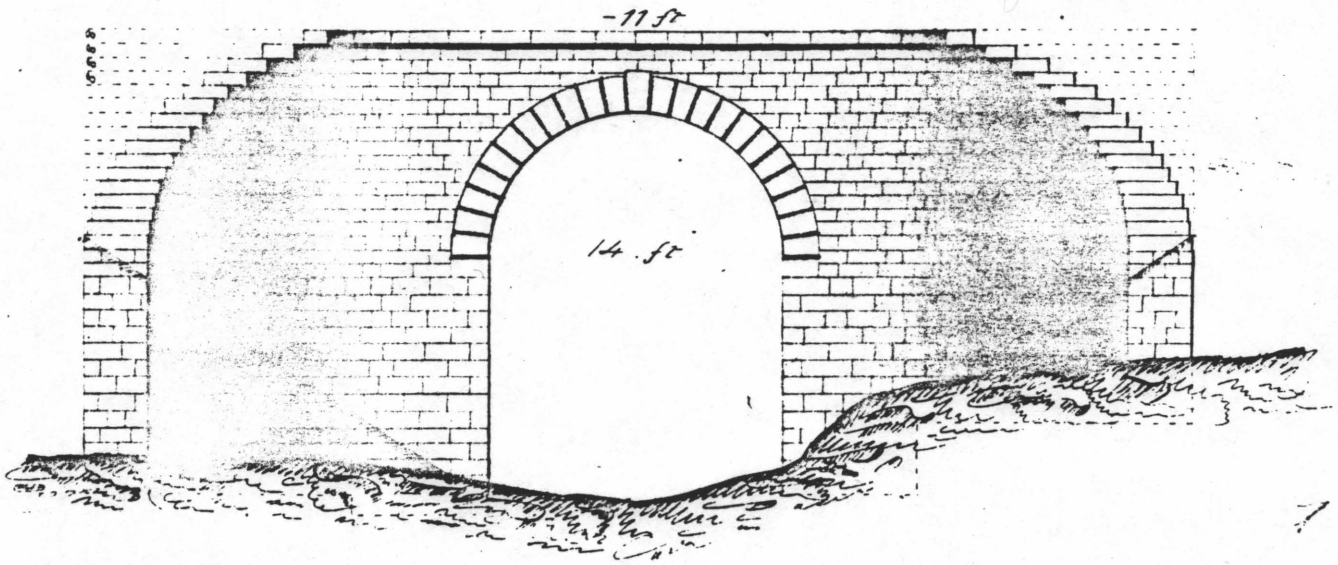
Scale 5 feet to an inch

6. Culvert No. 22 on Section 60. Wilson.

Culvert No 22 on Section 60.



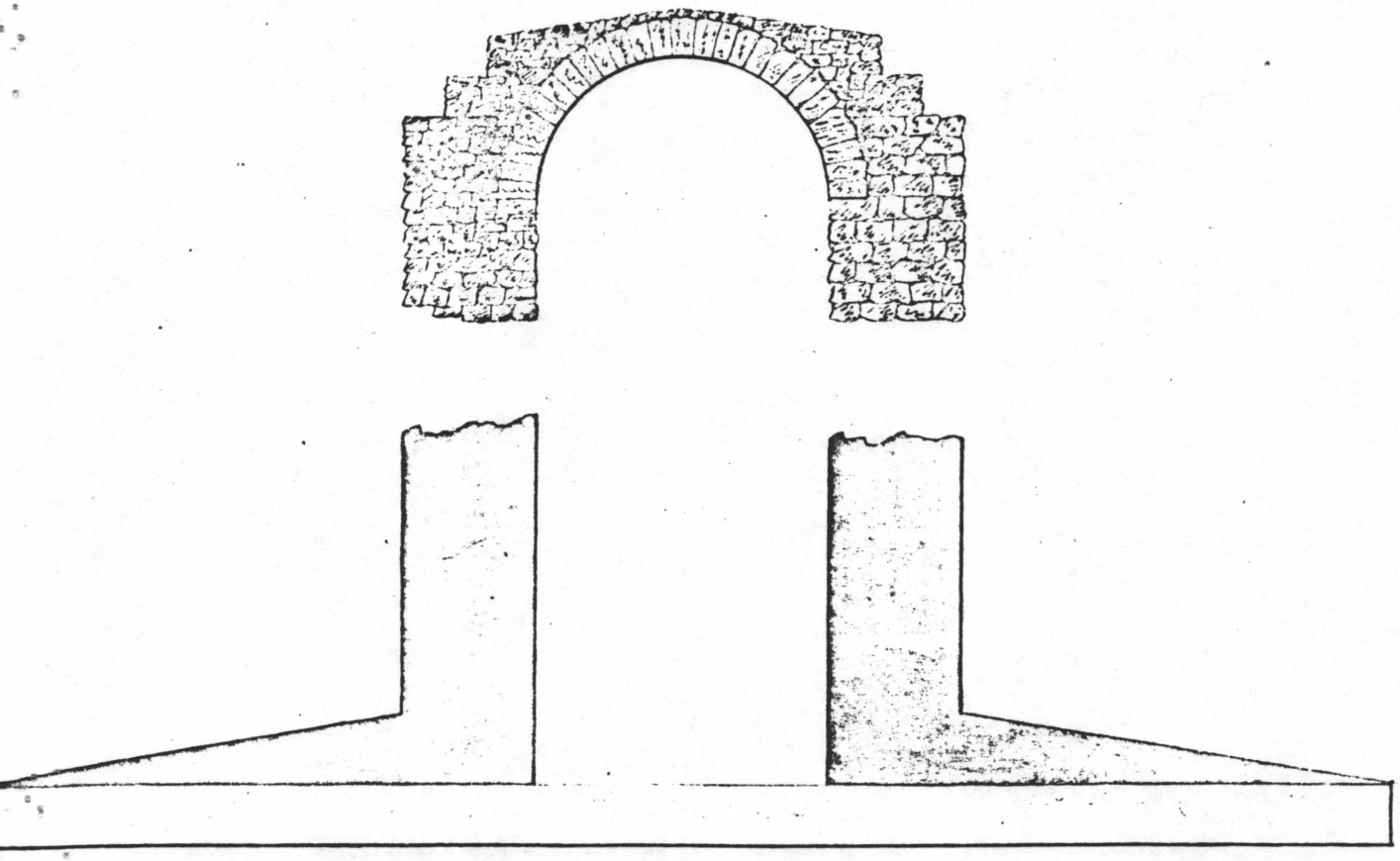
Lower end

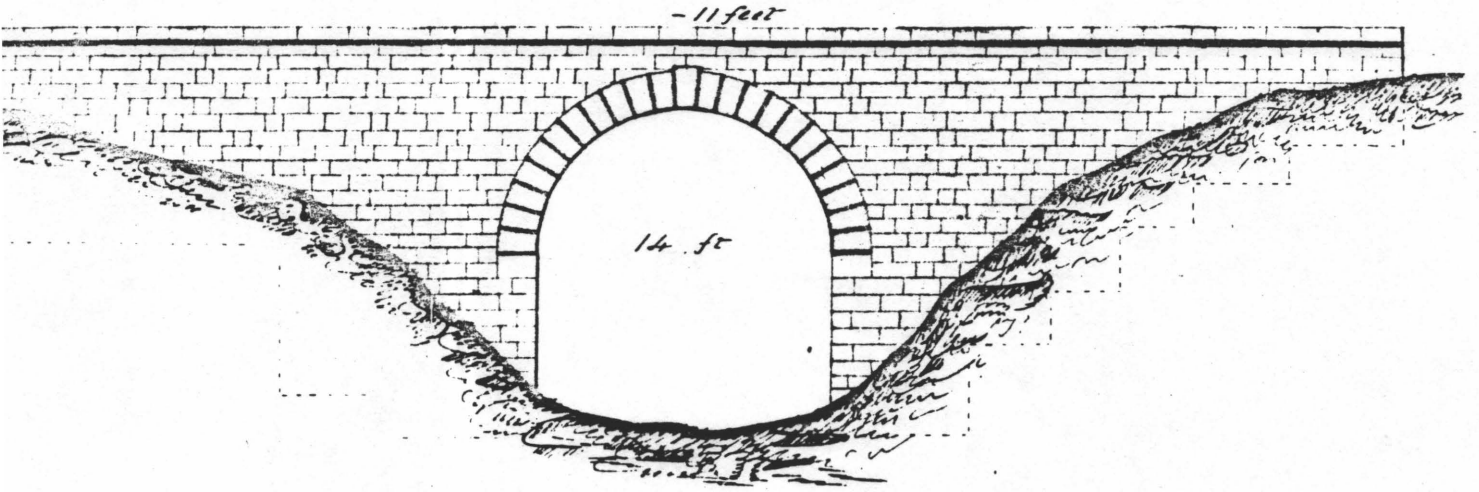


Scale 10 ft to an inch

7. Culverts. Wilson.

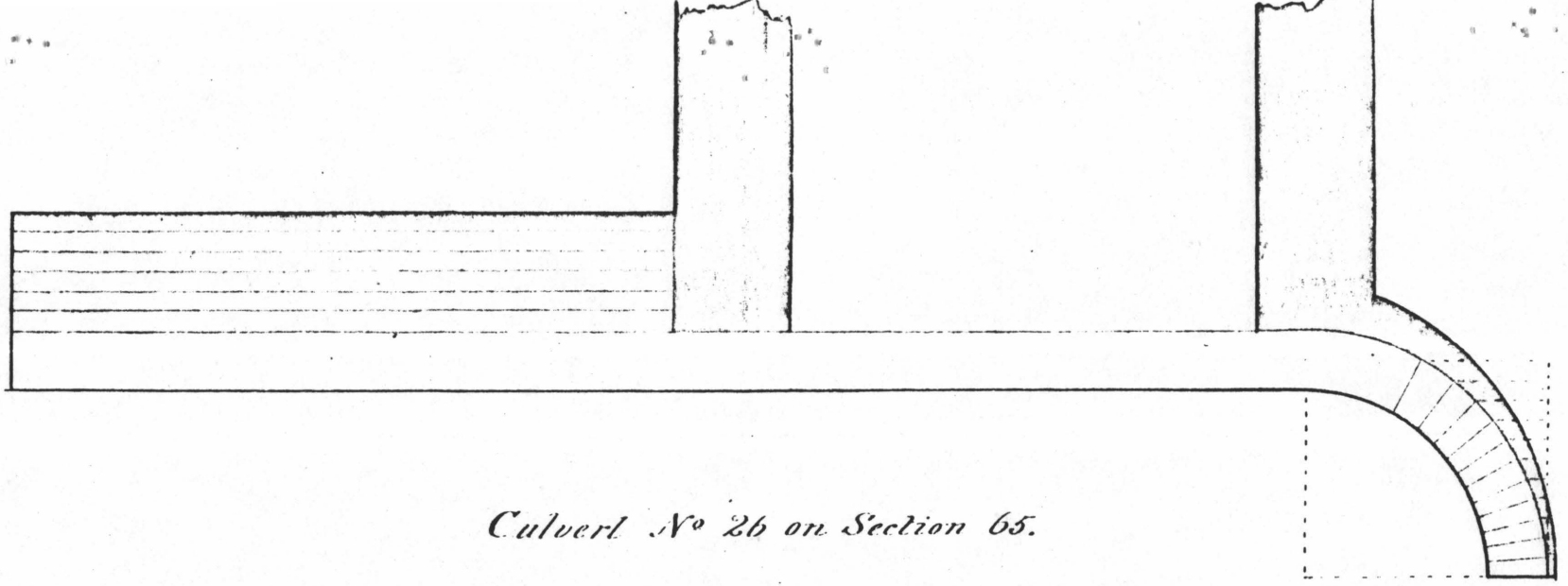
Upper end



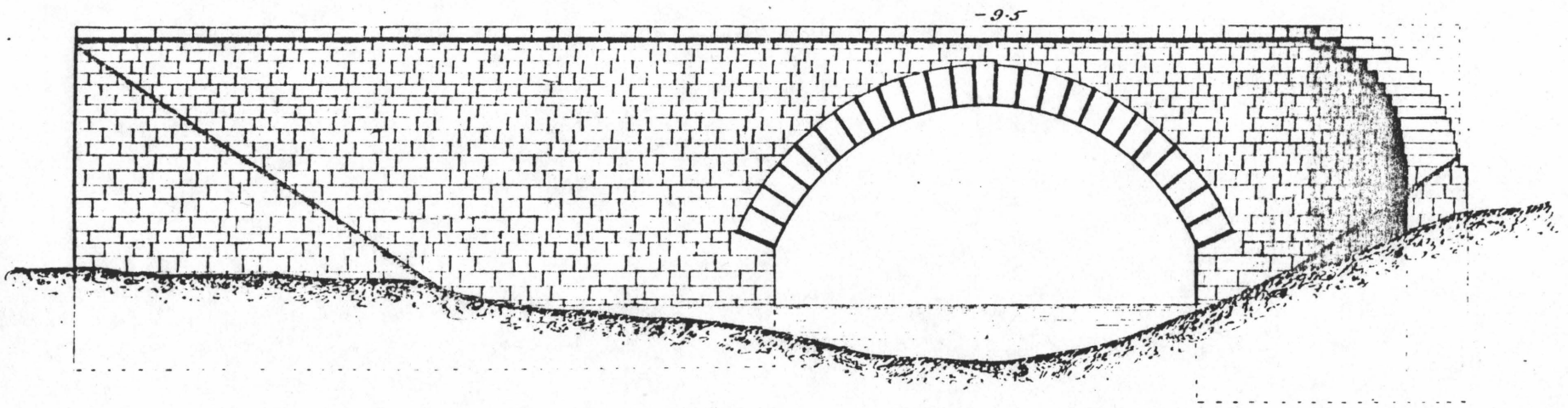


Scale 10 ft to an inch

8. Culvert No. 26 on Section 65. Wilson.

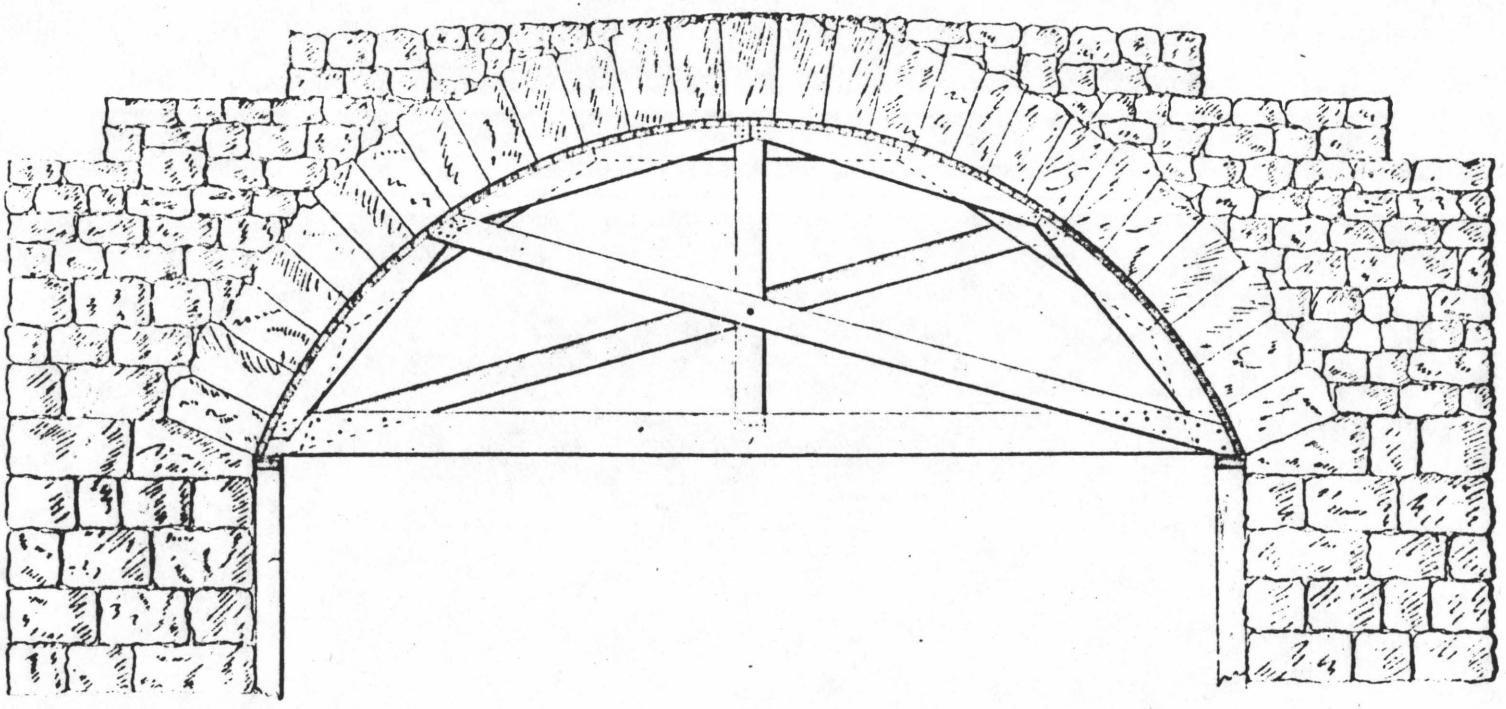


Culvert № 26 on Section 65.



Scale 10 feet to an inch

9. Culvert. Wilson.



Scale 5 ft to an inch

10. Culvert No. 24 on Section 62. Wilson.

Culvert No 24 on Section 62.

Scale 20 feet to an inch

11. Summit House [Lemon House] ca. 1910. Ira J. Stouffer Collection.


SUMMIT HOUSE OLD PORTAGE R.R.

12. Riffles Tavern "Summit House" WPA survey.



C1-11a



C1-11b

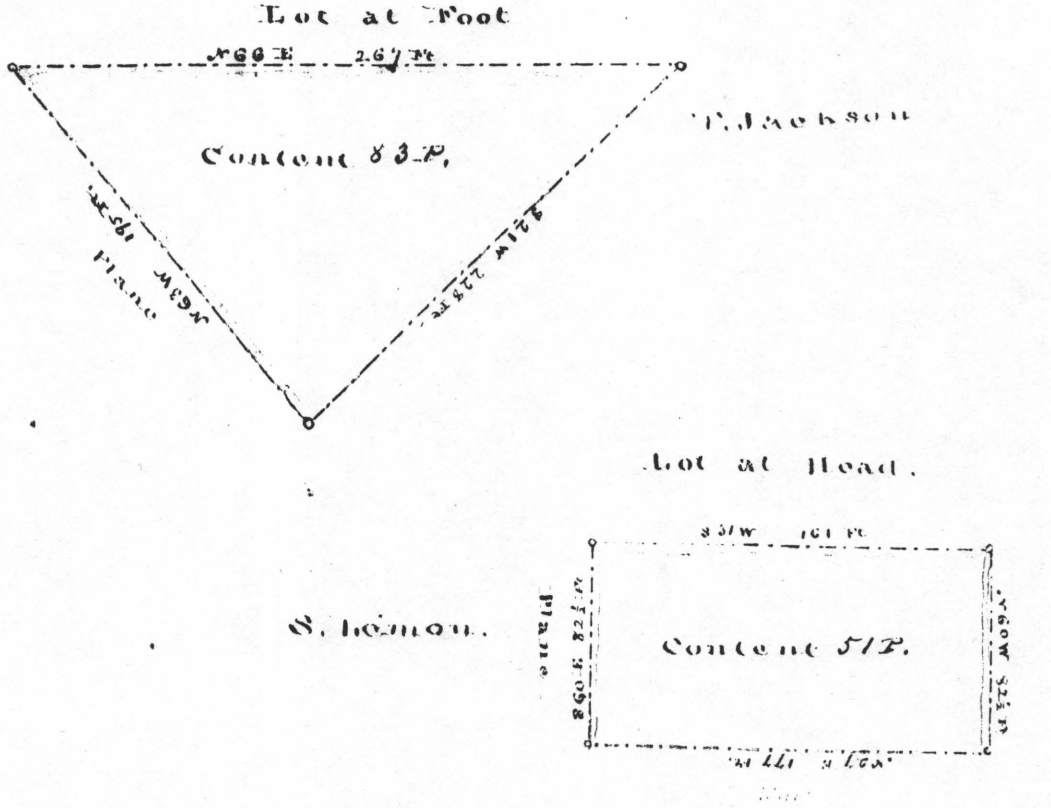
13. Ling Tavern, WPA Survey.



Carnegie Library of Pittsburgh
Music and Art Department

14. Plane No. 6 survey. Engineering Records, RG-17.

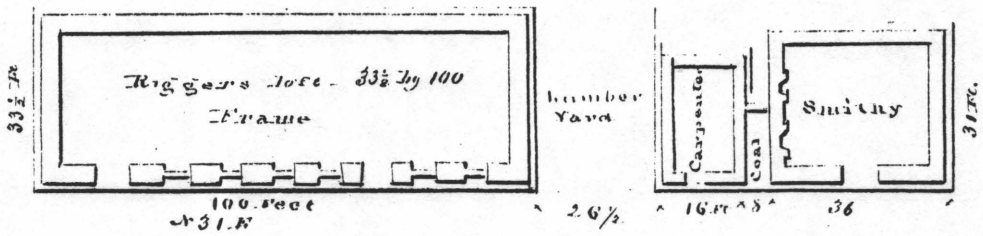
Plans No. 6.



Summit

Inc

Riggers' Shop, loft &c.



The front of Buildings is 50 feet from Centre of Rail Road

15. Plane No. 8 survey. Engineering Records, RG-17.

16. Plane No. 9 survey. Engineering Records, RG-17.

156

Plane No. 9.

Lot at Head.

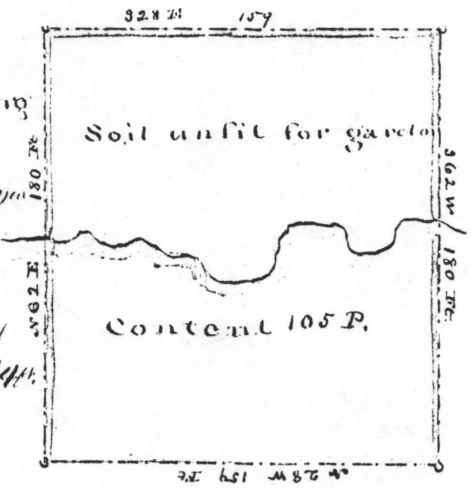


Chas. Gaily.

From centre of R. R. to point of starting is 15 feet.

Plane No 8.

Lot at Foot.



Dr. Shoenberger

Fence destroyed by Freshet.

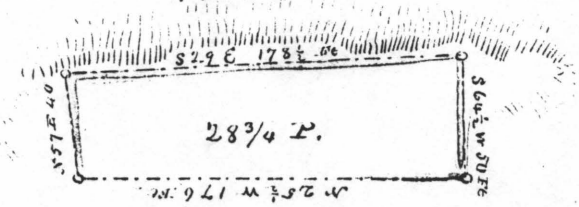
From Centre of R. R. & Line 34 ft.

Dr Shoenberger

Barren

Precipice

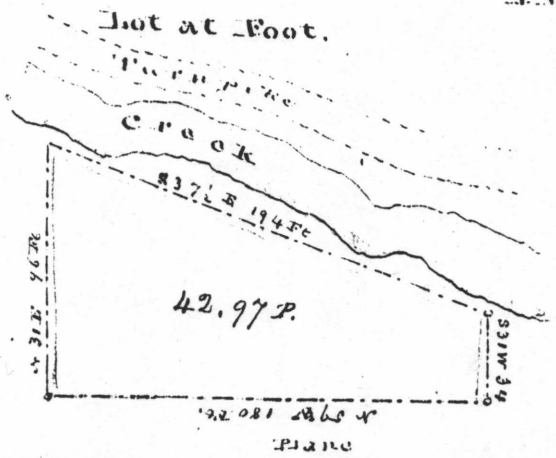
From Centre of R. R. & Line is 18 feet

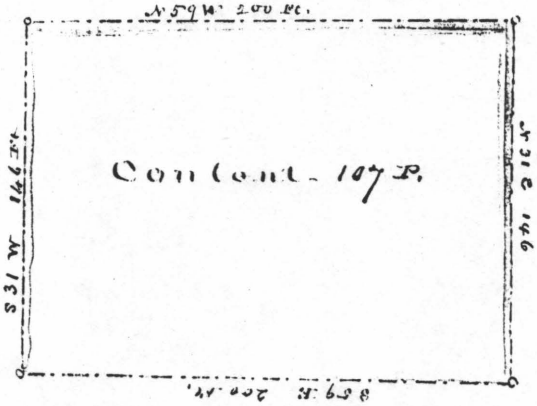


Plane No 7

Lot at Foot.

Lot at head.



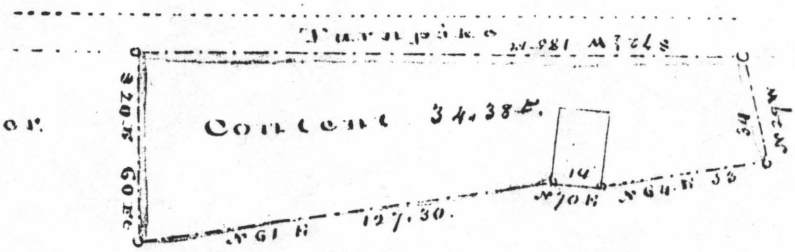


From Centre of R. R. & Line 26 ft.

17. Plane No. 10 survey. Engineering Records, RG-17.

Plane No 10 (4 Miles from Hollidaysburg)

Lot at Foot.



F. Gardner

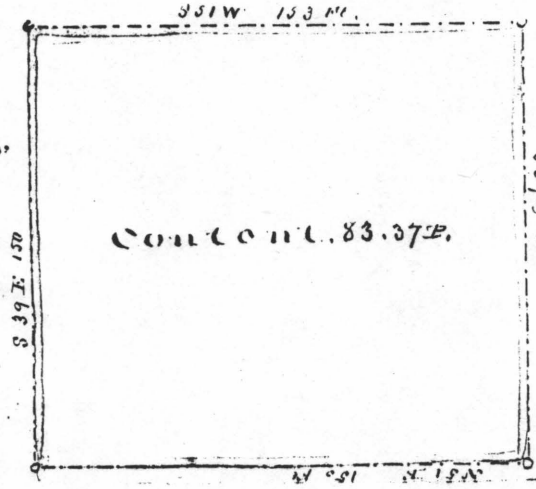
Lot at Head.



Gardner

Plane No 9

Lot at foot.

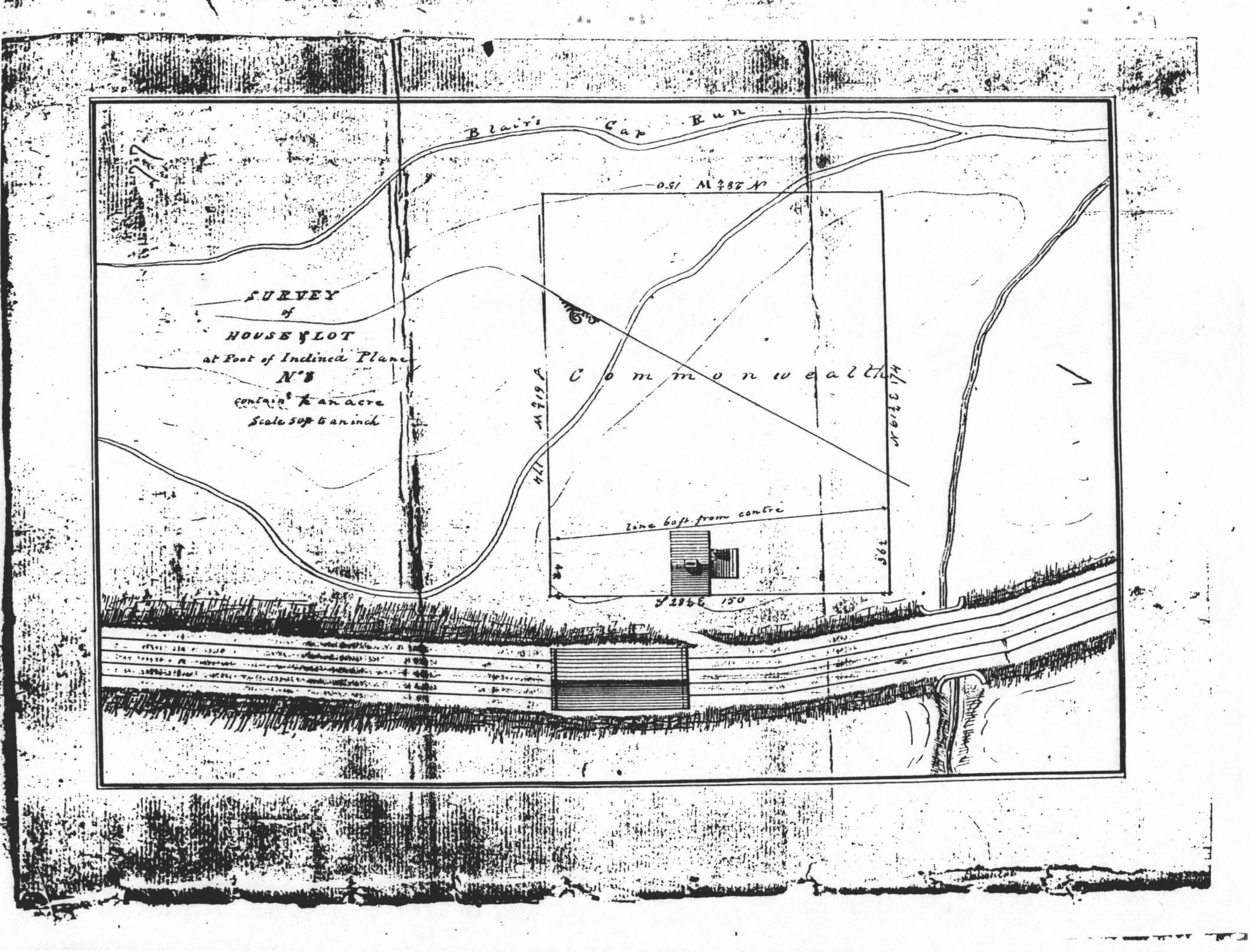


Dr. Shoenberger

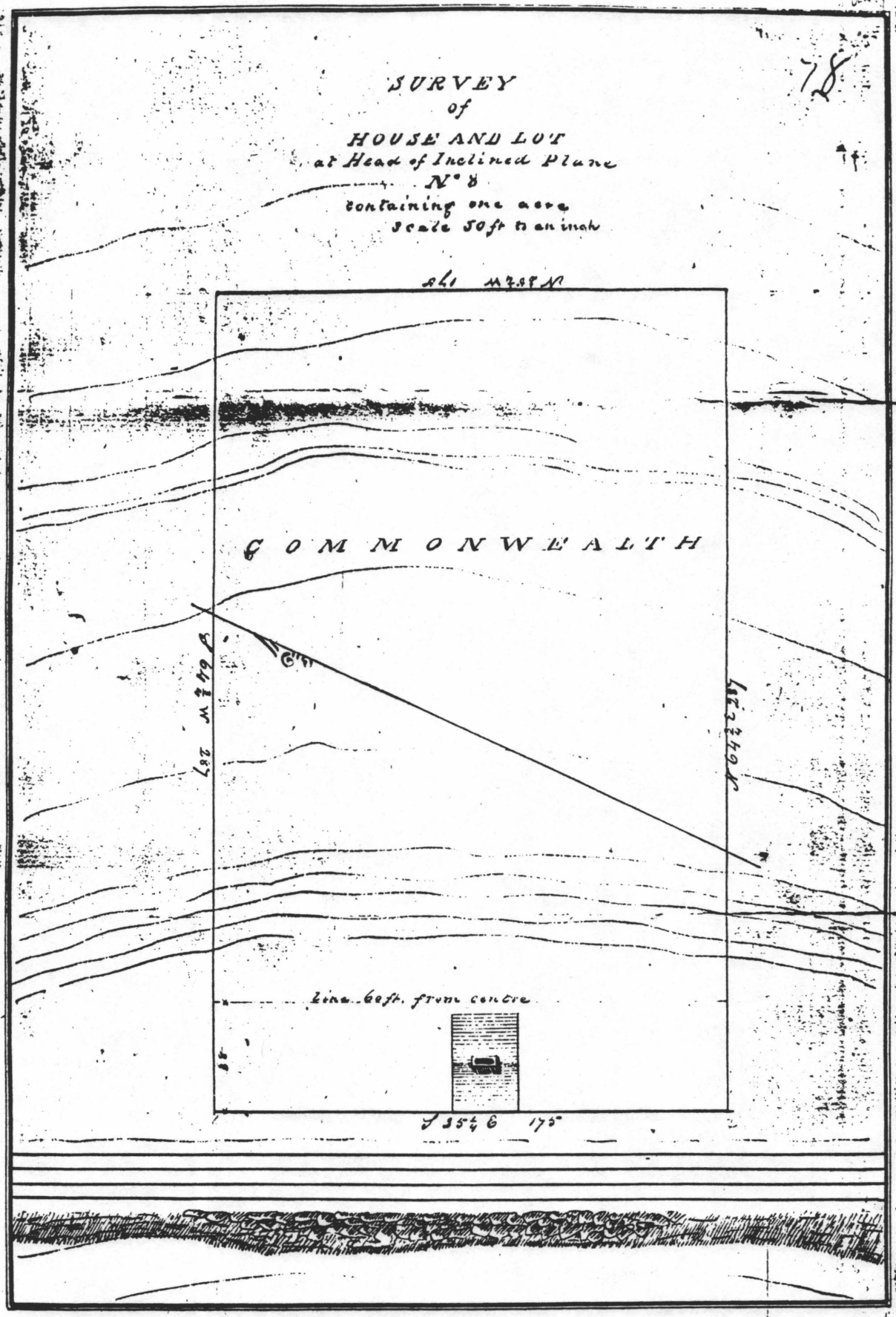
From Centre of R.R. to Line at right angle is 55 feet

Wm. Walker

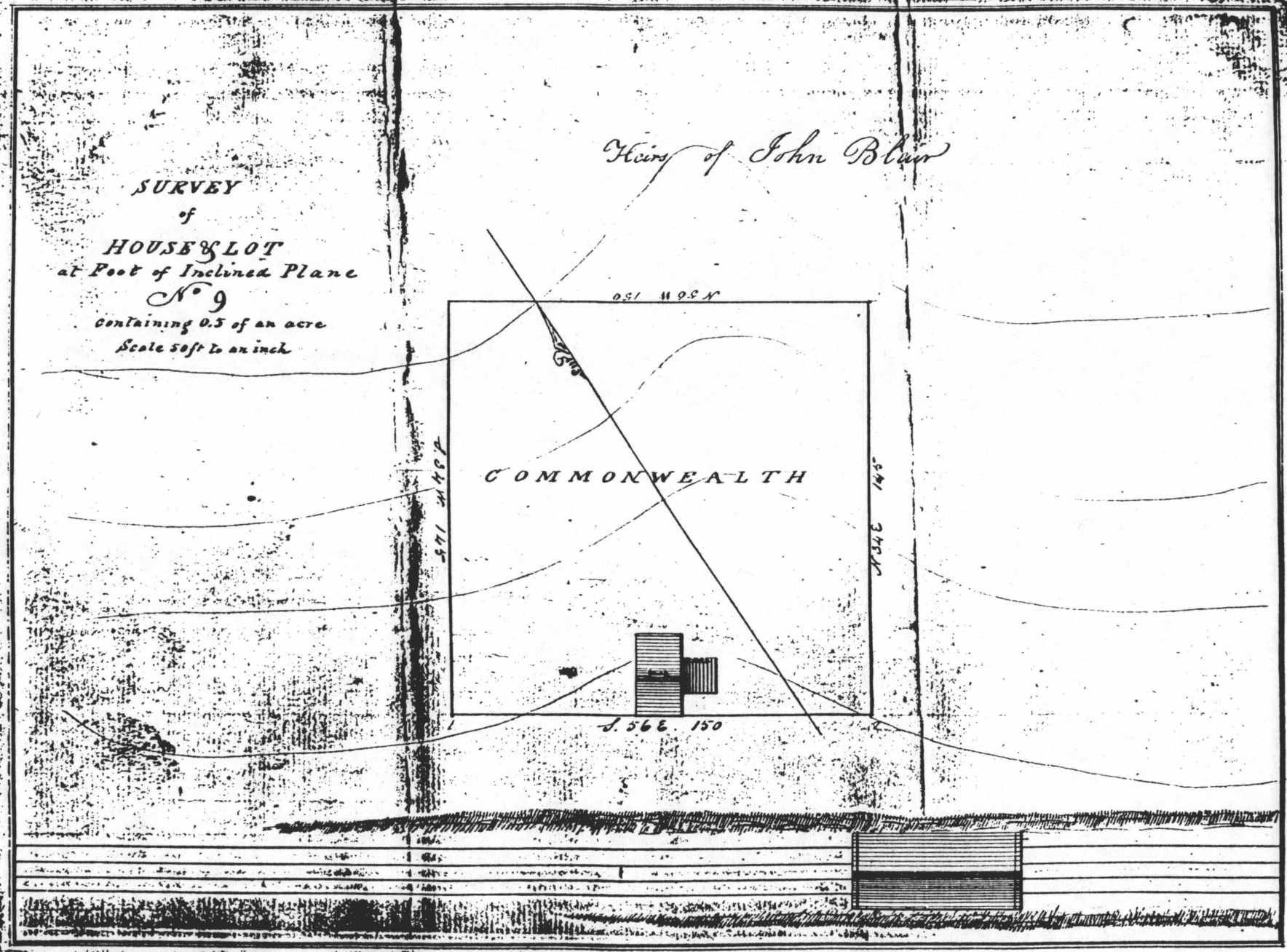
18. Survey of House and Lot at Foot of Inclined Plane No. 8. Damage Claims, RG-17.


Blair's Cap Run
SURVEY
of
HOUSE & LOT
at Foot of Inclined Plane
N°8
contains ¼ an acre
Scale 50ft to an inch
Commonwealth
Line 60ft from centre
150

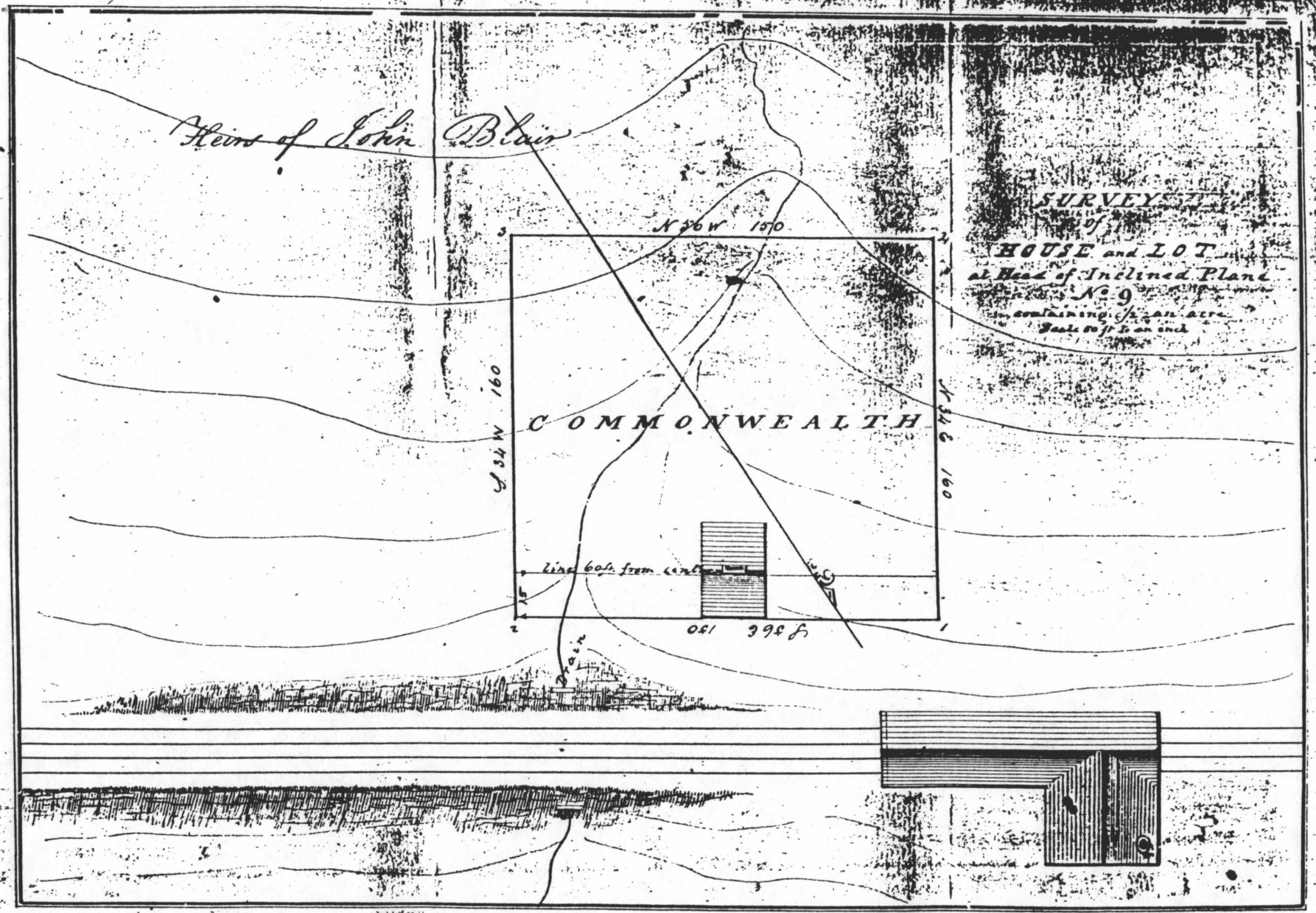
19. Survey of House and Lot at Head of Inclined Plane No. 8. Damage Claims, RG-17.


SURVEY
of
HOUSE AND LOT
at Head of Inclined Plane
N° 8
containing one acre
Scale 50 ft to an inch
COMMONWEALTH
Line 6 ft. from centre

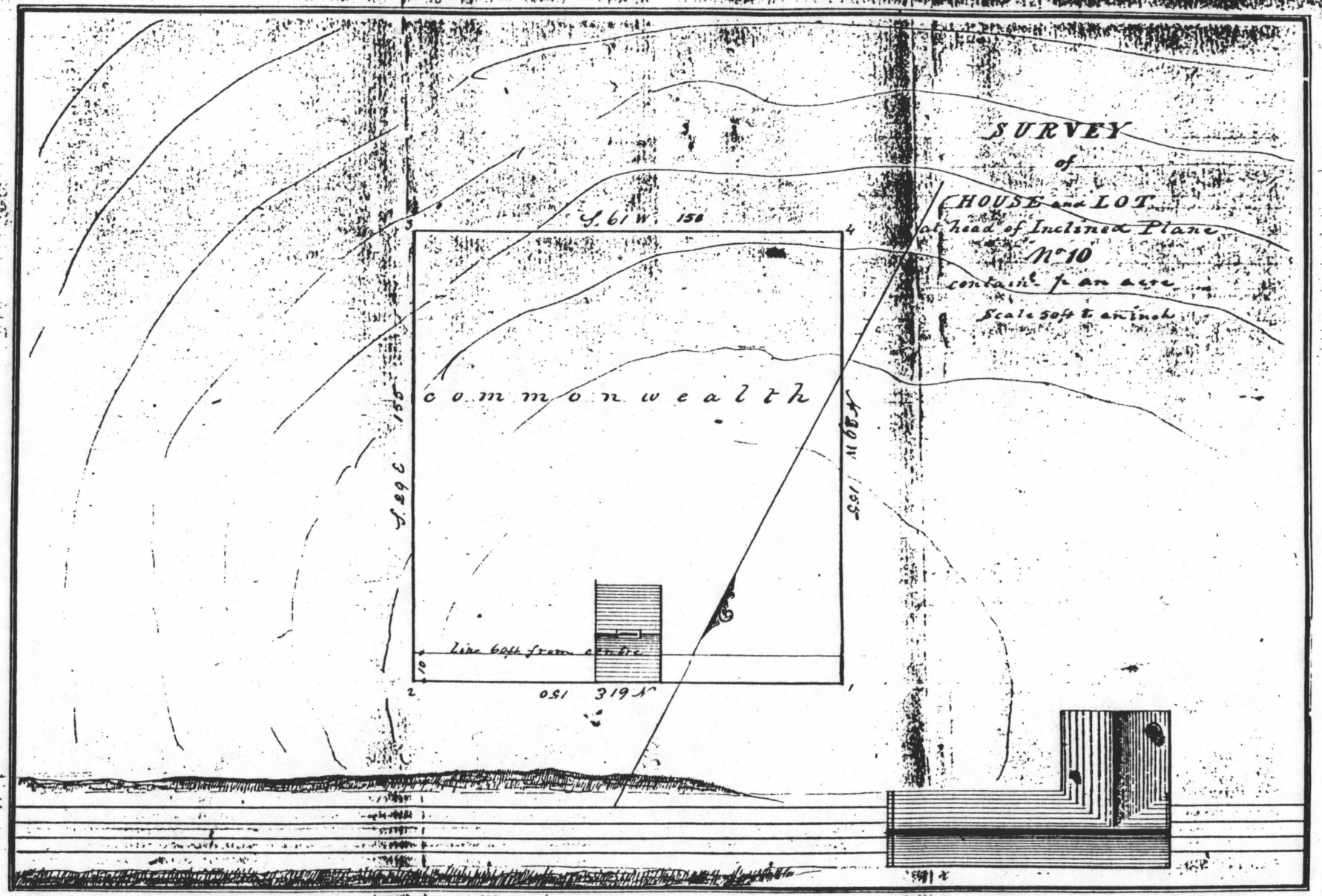
20. Survey of House and Lot at Foot of Inclined Plane No. 9. Damage Claims, RG-17.


SURVEY
of
HOUSE & LOT
at Foot of Inclined Plane
No 9
Containing 0.5 of an acre
Scale 50ft to an inch
Heirs of John Blair
COMMONWEALTH
N 56 W 150
N 34 E 145
S 34 W 145
S. 56 E. 150

21. Survey of House and Lot at Head of Inclined Plane No. 9. Damage Claims, RG-17.


Heirs of John Blair
SURVEY
of
HOUSE and LOT
at Head of Inclined Plane
No. 9
containing ... an acre
Scale 60 ft to an inch
N 76 W 150
COMMONWEALTH
S 34 W 160
N 34 E 160
Line 60 ft from cent
15
S 56 E 150
Drain

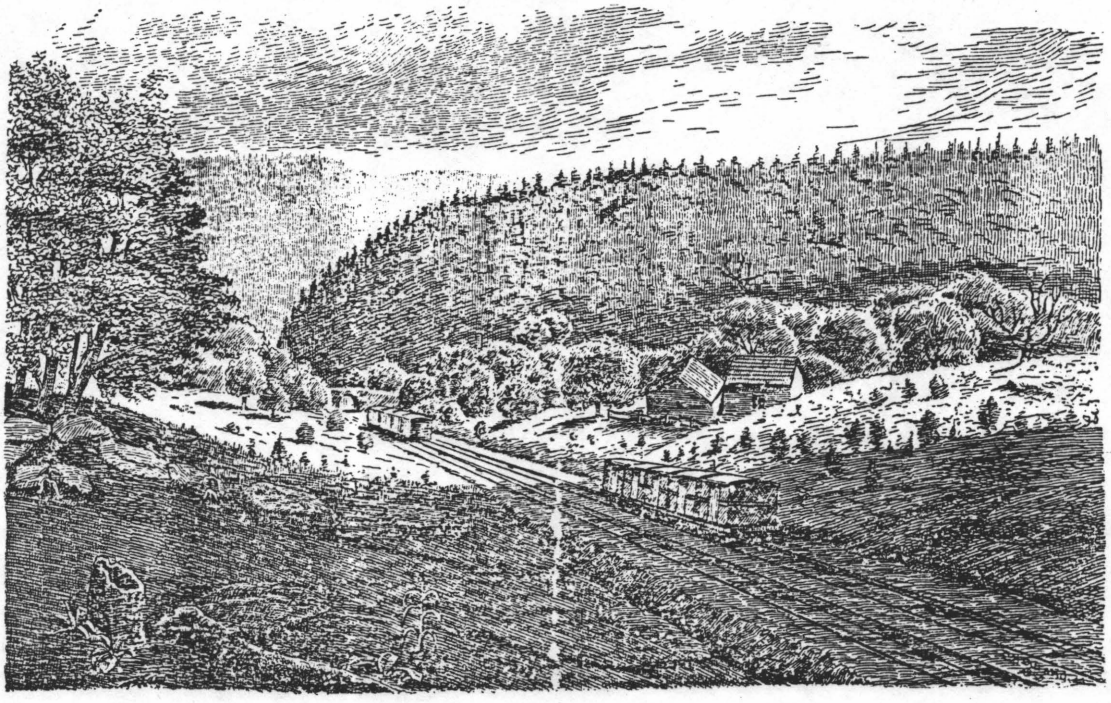
22. Survey of House and Lot at Head of Inclined Plane No. 10. Damage Claims, RG-17.


SURVEY
of
HOUSE and LOT
at head of Inclined Plane
No 10
contain. ¼ an acre
Scale 50 ft to an inch
S. 61 W. 150
commonwealth
S 29 E 105
N 29 W 105
Line 60ft from centre
10
S 61 E 150
N 61 W 150
1
2
3
4

23. Plane No. 6, Portage Railroad, 1842, in J. Elfrith Watkins, History of the Pennsylvania Railroad company, p. 173.

railroad service" in transporting section boats. In the same year the canal companies were relieved of Sabbath penalties by act of the Legislature, and resolutions relating to the construction of a macadam road from Pittsburgh to Erie were passed.

Peter McTammany, an old employee of the Portage Railroad, a few weeks before his death by accident at Altoona in 1892 wrote out his following recollections for this work:



PLANE No. 6, PORTAGE RAILROAD, 1842

On November 26, 1833, the first car passed over the entire road. On March 18, 1834, the road was opened as a public highway; that is to say, it was opened to the public. Anybody could run cars on the line that chose to do so, and even run the cars with their own motive power on the levels, and the State furnished the power on the planes. The traffic westward was dry goods and iron; eastward, whiskey, bacon and flour. Coal cars were sometimes pulled by oxen on the main line. The method of mining coal was to drive a shaft into the side of the mountain to strike the coal, just as now, then they loaded the miners' coal by the wagon, twenty-five bushels on a wagon, and four of these wagons loaded a car. Four hundred bushels was a carload. They burned coal in the stationary engines to furnish steam, and burned wood in all of the locomotives. Some of those locomotives were made by Norris, and by Baldwin, and one was built in Pittsburgh by George W. Glass. Mr. Glass was Master Mechanic of the Ohio and Pennsylvania Road, and latterly of the Allegheny Valley Railroad, and had charge of the car shops at Rochester in the meantime. The name of the locomotive was *Kentucky*. This engine was a small single driver engine, with no connecting rods or cab. The *Virginia* engine was another. This was a Baldwin engine, and ran on the Columbia road and was pronounced a fast engine. It ran away on the Portage road one Sunday morning, from the foot of No. 8 to the head of No. 9, and there jumped the track and landed in the ditch. When they commenced increasing the size of the engines on the Portage road they used the larger ones between Hollidaysburg and Johnstown and on the long levels. They took engines from one level to another, but always had to assist them up the planes. A locomotive could run up plane No. 9, where the grade was about seven and one-quarter feet in a hundred. Plane No. 8 was a steep plane.

The cars were all four-wheel cars, built with hooks on the truck at each end, to couple and attach them

24. Brickyard at foot of Plane 8. Reports and Miscellaneous Documents, box 10, vol. 2, item 86, APRR, Div. Rec., BCC, RG-17, PHMC.

Siding
R.R.R.
Thomas J. Power
Report

86

Brick Yard & Kiln

Foot of Plane

Inclined Plane No 8

Head of foot of Plain

Switch

Proposed Siding

Switch

To the Board of C. C.

Gentlemen

I have examined the Site for the Siding asked for by the Proprietors of the Fire Brick establishment at the foot of Plane No 8: And find that the Siding can be made, by using the Switch now used at the Crossing near the foot of the Plane, at the point Marked A on the annexed Sketch: this Can be done without interfering with the business of the Road, or trespassing upon the rights of others.

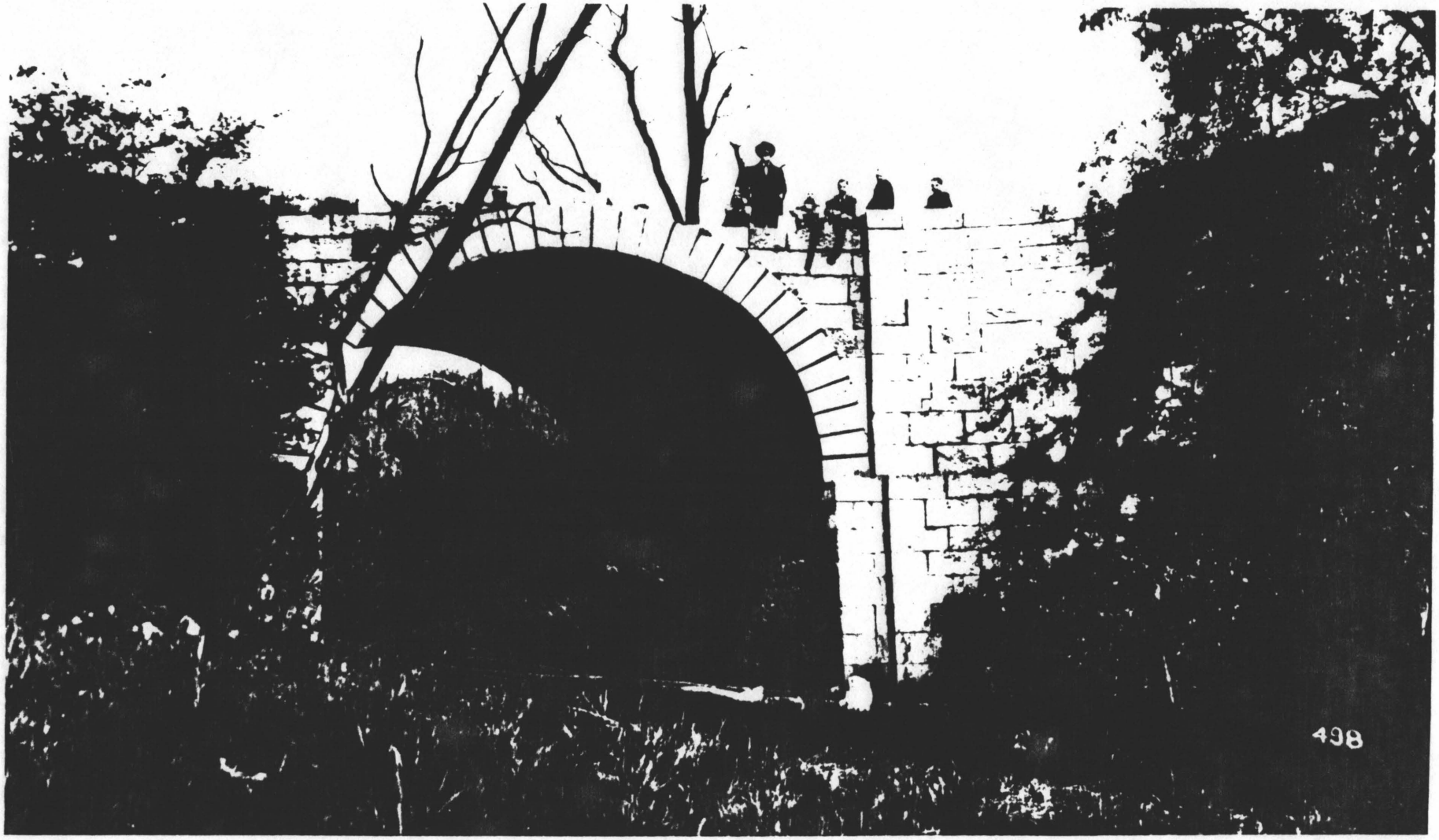
I would therefore recommend that the prayer of the Petitioners be granted

May 12th 1848 Thos J. Power Supt. R.R.R.

25. Plane No. 6 Old Portage RR ca. 1910, MG-327, Ira J. Stouffer Collection.


PLANE #6 OLD PORTAGE RR
200

26. Skew Arch ca. 1910, MG-327, Ira J. Stouffer Collection.


498

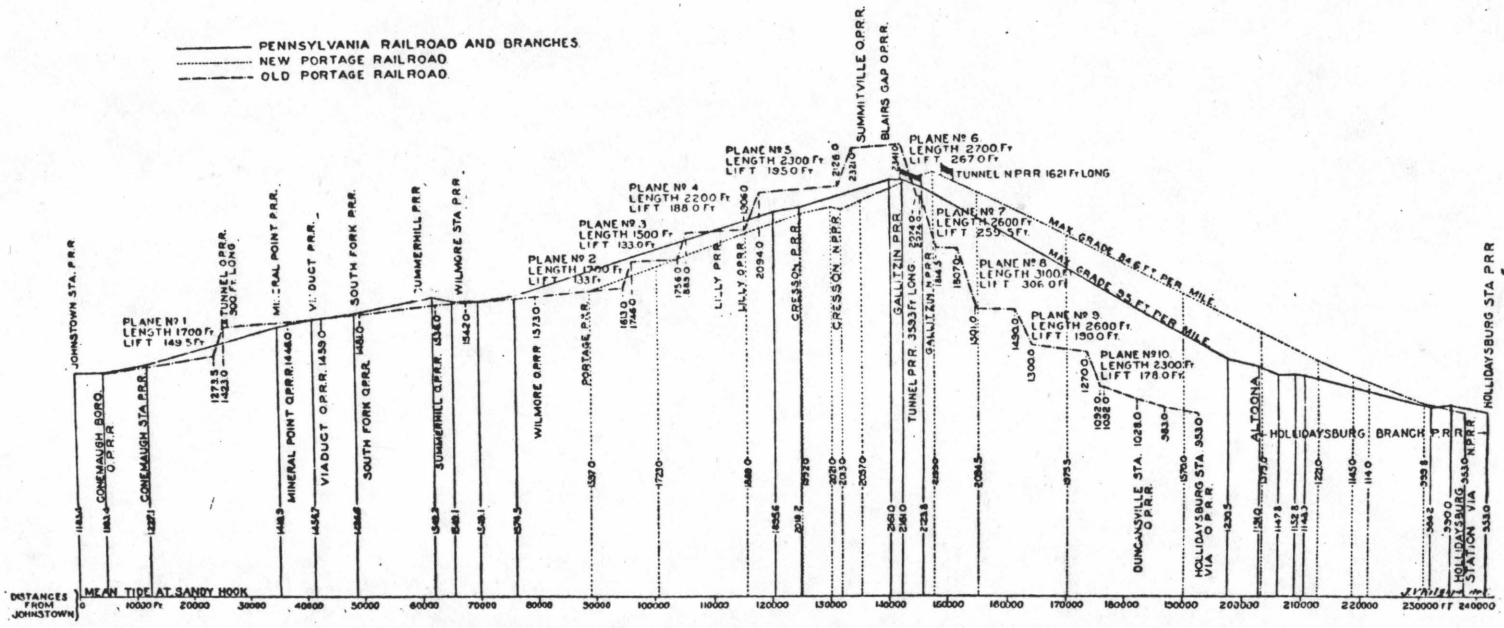
27. Profile Showing Grades of the Old Portage R.R., the new Portage R.R. and the Pennsylvania R.R. at the Crossing of the Allegheny Mountains Between Johnstown and Altoona and Hollidaysburg, in J. Elfrith Watkins, History of the Pennsylvania Railroad Company, p. 158.

PROFILE SHOWING GRADES

OF THE

OLD PORTAGE R.R. THE NEW PORTAGE R.R. AND THE PENNSYLVANIA R.R.

AT THE CROSSING OF THE ALLEGHENY MOUNTAINS BETWEEN JOHNSTOWN AND ALTOONA AND HOLLIDAYSBURG.



FROM JOHNSTOWN STATION P.R.R. TO HOLLIDAYSBURG STATION P.R.R. VIA THE OLD PORTAGE R.R. 36.46 MILES.
FROM JOHNSTOWN STATION P.R.R. TO HOLLIDAYSBURG STATION P.R.R. VIA THE ROUTE USED IN CONNECTION WITH THE NEW PORTAGE R.R. 45.0 MILES.
FROM JOHNSTOWN STATION P.R.R. TO HOLLIDAYSBURG STATION P.R.R. VIA THE PENNSYLVANIA R.R. AND THE HOLLIDAYSBURG BRANCH 45.72 MILES.

OFFICE ENGR Rt OF WAY P.R.R. BLAIRSVILLE PA. 1937.

ANTES SNYDER ENGR. Rt OF WAY P.R.R.

PROFILE OF GRADES ON THE PORTAGE RAILROAD

28. Stone Sleepers, Summit Level, ca. 1910, Ira J. Stouffer Collection.


STONE TIES
OLD PORTAGE R.R.
202

29. Stone Sleepers, Looking East from Summit, ca. 1910, Ira J. Stouffer Collection.


90

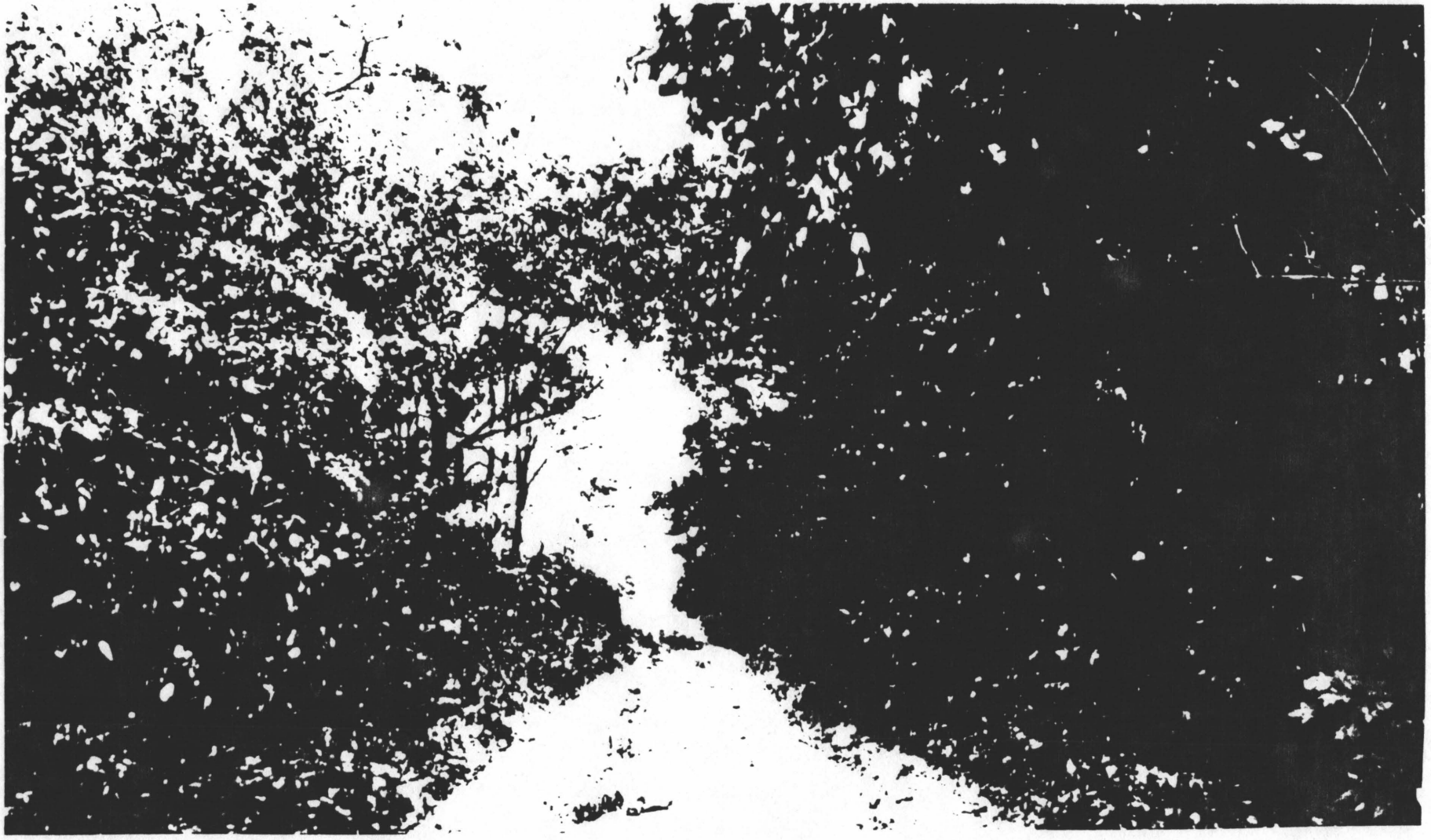
30. Summit Level, ca. 1910, Ira J. Stouffer Collection.


SUMMIT LEVEL
OLD PORTAGE R.R.
203

31. Level #7, ca. 1910, Ira J. Stouffer Collection.


LEVEL #2 OLD PORTAGE R.R.
139

32. Plane 8, ca. 1910, Ira J. Stouffer Collection.



33. Plane 9, ca. 1910, Ira J. Stouffer Collection.


PLANE-9-OLD PORTAGE R.R.
198

34. Plane 10, Looking Towards Duncansville, ca. 1910, Ira J. Stouffer Collection.


196
OLD PORTAGE R.R.

35. Level #6, half-way on summit, 7/16/22, George A. Richardson Collection.



36. Plane No. 6 down to Hollidaysburg, taken from Lemon Homestead, 7/16/22, George A. Richardson Collection.



37. Old Engine House Foundation - Head of Plane 7 just beyond Penn Highway, 7/16/22, George A. Richardson Collection.

LIST OF APPENDICES

A. Abstract of the value of work done upon the Allegheny Portage Railroad, 1832.

B. Allotment Culverts upon Allegheny Portage Railroad, August 2, 1831.

C. Description of Road Sections.

D. Revised Estimate of the Cost of Grading and Masonry, May 16, 1832.

E. Journal 1831-1835 (provides details of culvert construction).

F. Culverts on 2d Division, W[illiam] H[asell] Wilson, "Notebook, 1831."

G. Culvert No. 24 on Section No. 62 P & R Railway over Valley Creek. Wilson.

H. Culvert No. 26 on Section No. 65 Phil & Reading Railway over Abbey or Millcreek. Wilson.

I. Philadelphia and Reading Railway Culverts [Specifications]. Wilson.

J. Table exhibiting the length, span, quantity of materials, price, and the estimated cost, of each of the culverts and viaducts on the line.

K. List of Culverts 1832-1833.

L. Table of Grades 1832-1833.

M. Tabular statement of labor done and money paid on culverts. . . . Allegheny Portage Railway, Nov. 1, 1832.

N. A statement showing the estimated cost of engine houses, and sheds for machinery, dwelling houses for Engine tender, hanging sheaves, digging wells, laying water pipes, &c &c.; also, the estimated amount of work done. 1833-1834.

O. Tabular statement of labor done and moneys paid on Culverts, with original estimates, &c. - Allegheny Portage Railroad. 1834.

APPENDIX A

Abstract of the value of work done upon the Allegheny Portage Rail Road, agreeably to Estimates of Engineers made 4th April 1832--also the amount paid to the severall Contractors and the percentage retained by the Superintendent.

Number of Culvert	Names of Contractors	Amt of Estimates	Amt Paid	Amt Retained
Culvert B on Sec 36	Philip Haley	212.50	180.00	32.50
" A " 37	Groves, Pollard & Groves	408.50	350.00	58.50
" B " 38	Stewart, Fenlon & Ford	81.00	70.00	11.00
" A " 39	" " " "	217.50	185.00	32.50
" A " 40	" " " "	500.00	425.00	75.00
" A " 41	William Robson	427.00	365.00	62.00
" B " 41	" " " "	196.00	165.00	31.00
" A " 42	Henry & Dougherty	462.00	395.00	67.00
" B " 42	" " " "	154.00	130.00	24.00
" C " 42	" " " "	1632.00	1390.00	242.00
" D " 42	" " " "	370.00	310.00	60.00
" A " 43	Wm & A. K. Groves	682.00	575.00	107.00
" B " 43	" " " "	657.00	560.00	97.00
" A " 44	Jacob Snyder	75.25	50.00	25.25
" B " 44	" " " "	95.60	80.00	15.60
" A " 45	William Robson	182.00	155.00	27.00

Reports and Misc. Documents, 1829-1843, box 8, vol. 1, item 59, APRR, Div. Rec., BCC, RG-17, PHMC.

APPENDIX B

RG-17, Allegheny Portage RR, Allied Records, Engineers' Accounts Estimates, Box 35.

Estimate work Culverts Additional Culverts upon Alleghany Portage Rail road Aug. 2. 1831

Culverts	on tuture	Diam	Form	Wood.		Perches	Names of Contractors	Masonry	Trench	Excav.	Slate R	Slate A
A.	36	2 H.	Semi. circl.	400 H. B. M.	Plank	94	Philip Haley	2.12½	2 Cts			
B	36	12 H.	do	15000 do.	Timb & Plank	320	do do	2. 12½	2 Cts			
A.	37	3 H.	do	400. do	Plank	147	Thomas Collins	2.35	3.	25		75
A.	38	2 H.	do	400 "	do	137	Thomas Collins	2.35	3	25		75
B	38	18 H.	do	14000 "	Timb & Pl.	400	Sergeant W. W. Fenton & Foreb	2. 70	1.	15		
A.	39	4. H.	do	500 "	do	260	do do do	2. 70	1.	15		
A	40	16 H.	Elliptical	12900 "	"	220	do do	2. 70	1.	15		
A	41	14 H.	Sem. Circ.	8600 "	"	260	William Robson	2. 80	3Z			
B	41	4 H.	do	500 "	Plank	45	do do	2. 80	3Z			
A.	42	6. H.	do	600 "	do	245	D. Dougherty & G. W. Henry	2. 20	2Z			
B.	42	4. H.	do	500 "	"	140	do do	2. 21	2Z			
C	42	25. H.	do	18700 "	Sem & Pl.	460	do do	2. 10	2Z			
A.	43	25. H.	Elliptical	19000 "	"	410	Wm & Alex. Graves	2. 48	3.			
B.	43	14. H.	do	4000.	"	220	do do	2. 48	3			
A.	44	20 H.	do	14.900	"	360	Wm Robson & J. Snyder	2. 39	1¾			
B.	44	4 H.	Sem. Circ.	500.	Plank	95	do do	2. 34	1¾			
A	45	3. H.	do	400.	do	80	William Robson	2. 80	3Z			

			Academy	Masonry	Trench	Excav	Arch	Slate
Stone Shoe Board	Short	10.000 pcs	Leslie Swayne & Brenno	4. 20	1 Ct.	25.	60	35
Bridge Sam Branch at Holliday		1600 "	Henry Hays Parker & Miller	4. 75	1 C.	62Z	-	-

RG-17 Alleghany Portage R.R. Allied Records Engineers' Accounts Estimates box 35

APPENDIX C

Description of Road Sections

Section No. 30--3600 feet long

The line passes over sloping ground favourable for the constructing of the road 900 feet to Beav Rock Creek.--There over a low flat 300 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--then 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 &c
1 Culvert
4 Drains

Section No 31--4400 feet long

The line passes over ground favorable for the road along the whole length of the section--very large timber. The work will consist of

Embankment
Common Excavation
Grubbing
Solid rock
4 Drains
1 Culvert

Section No. 32--4900 feet long

The line passes over ground, very favourable for the road.Very large timber. The work will consist of

Common Excavation
Embankment
Grubbing
9 Drains
4 Culverts

Section No. 33--3400 feet long

The line passes over ground highly favourable for the road. The angle of inclination of the surface is from 1 to 3 degrees--very large timber. The work will consist of

Common Excavation
Embankment
Grubbing
Detatched rock, small quantity
5 Drains
3 Culverts

Section No. 34--4300 feet long

The line passes over level ground 400 feet, whence across the valley of Adams Run 300 feet.--to the foot of Inclined Plane No. 5 then obliguely up the hill on the north side of Adams Run 2500 feet to the end of the plane--thence over ground nearly level. 1000 feet to the end of the Section. The line crosses the turnpike at this point. The work will consist of

Embankment
Common Excavation
Grubbing
Solid rock
1 Drain
1 Culvert

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
Grubbing
Solid rock
4 Drains
1 Culvert

Reports and Misc. Documents 1829-1843 box 8, vol. 1, item 58, W2-f16, APRR, Div. Rec., BCC, RG-17, PHMC. Description of sections 29-35 (missing from Toogood, HRS, p. 127).

APPENDIX D

Engineers Office, Portage Rail Road May 16th, 1832

To James Clarke Esq. President of the Board of Canal Commissioners of Pennsylvania

Sir--in compliance with two resolutions of the Board of Canal Commissioners dated April 11th, 1832 directing the the [sic1] Engineer of the Portage Rail Road "as soon as practicable, to report to the Board an estimate in detail of the amount of money that will be required to complete the several contracts now existing on the said Portage Road, ". . . . I have the honor to transmit the required estimates,. . ."

Revised Estimate of the Cost of Grading and Masonry including all contracts made prior to the 5th of March 1832

. . .

Section No. 36.	11250	C. yds	Excav.	@ 11c	1237.50
	21700	" "	Emb.	" 13	2821.00
	3450	" "	Slate	" 20	690.00
	950	" "	Rock	" 50c	475.00
	27870	" "	H. Pav.	" 16	4459.20
	1800	per	Wall in Drains	130	129.00
			Grub? & Clearing	200	200.00
			Add Est? cost of done by O'Hanlan & McCarth.		1735.75 12647.45
					356.434 35/4

			Brought forward		356.434 35/4
Section No. 37.	8010	C. yds	Excav.	@ 10c	801.00
	15490	" "	Emb.	" 16	2478.40
	11080	" "	Slate	" 20	2216.00
	8320	" "	Rock	" 40	3328.00
	11790	" "	H. Pav.	" 16	1886.40
	6440	per	Slope Wall	" 50	3220.00
	140	"	Wall in drains	" 150	210.00
			Grub? & Clearing	" 200	200.00
			Add Cost of work done by Gibbons Daly &co.		3521.32 22961.12

Section No. 38.	3470	C. yds	Excav.	a	60	208.20	
	31320	"	" Em.	,	8	2,761.60	
	17970	"	" Hale	,	15	2,695.50	
	12100	"	" Rock	,	28	3388.00	
	4850	"	" H. Pan	,	13	630.50	
	3500	per.	Hose wall	,	49	2695.00	
	141	"	Wall in Drains	,	150	210.00	
			Gub? & Clearing	,	1755	775 30	13.664.30
Section No. 39.	11360	C. yds.	Excav.	a	90	1016.40	
	44300	"	" Em.	,	9	4006.00	
	5260	"	" Hale	,	30	1578.00	
	6200	"	" Rock	,	40	2480.00	
	10300	"	" H. Pan.	,	25	2575.00	
	2300	per.	Hose wall	,	35	805.00	
	1100	"	Vertical wall	,	45	1195.00	
	180	"	Wall in Drains	,	150	270.00	
			Gub? & Clear?	,	900.	900 00	14.108 40
Section No. 40.	8850	C. yds	Excav.	a	110	973.50	
	17500	"	" Em.	,	8	1400.00	
	6300	"	" Hale	,	17	1071.00	
	2700	"	" Rock	,	40	1080.00	
	8360	"	" H. Pan.	,	14	1170 40	
	140	per.	Wall in Drains	,	150	210.00	
			Gub? & Clearing	,	225.	225.00	6.129.90
							413.338 07½

Section No. 41.	9880	c. yds	Excav.	@	8½c	864.50	
	8660	" "	Em.	"	10¾	930.95	
	9530	" "	Slate	"	19¾	1882.17½	
	2690	" "	Rock	"	44	1183.60	
	12000	" "	H. Pan	"	15	1800.00	
	250	Per.	Slope wall	"	30	125.00	
	3400	"	Vertical wall	"	45	1530.00	
			Grub'g & Clear'g		199+150	349.00	8.665.22½
Section No. 42.	7525	c. yds	Excav.	@	7c	526.75	
	45760	" "	Em.	"	12	5491.20	
	14960	" "	Slate	"	18	2692.80	
	7170	" "	Rock	"	30	2151.00	
	7230	" "	H. Pan	"	18	1305.00	
	2200	per.	Slope wall	"	32	704.00	
	50	"	Wall in Drains	"	150	75.00	
			Grub'g & Clear'g	"	800	800.00	13.645.75
Section No. 43.	6900	c. yds	Excav.	@	8c	552.00	
	19180	" "	Em.	"	13	2493.40	
	100	" "	Slate	"	17	17.00	
	12800	" "	H. Pan	"	14	1792.00	
	100	per.	Wall in Drains		162½	162.50	
			Grub'g & Clear'g		70.	70.00	5.086.90
Section No. 44.	3200	c. yds	Excav.	@	8c	256.00	
	28800	" "	Em.	"	17c	4896.00	
	1100	" "	H. Pan	"	10c	110.00	
	40	per.	Wall in Drains	"	162½	65.00	
			Grub'g & Clear'g	"	75.	75.00	5.402.00
Section No. 45.	3600	c. yds	Excav.	"	8c	448.00	
	42270	" "	Em	"	8	3381.60	
	6130	" "	Slate	"	17	1042.10	
	3500	" "	Rock	"	45	1575.00	
	7050	" "	H. Pan	"	17	1198.50	
	40	per.	Wall in Drains	"	150	60.00	
			Grub'g & Clear'g	"	230.	230.00	7.935.20
							454.093.14

Brought Forward 454.093.14¾

Section No. 46.

1180	c. yds	Excav.	a	9c	1106 20
14750	"	" Exc.	"	18c	2655.00
160	"	" Slate	"	20,	32.00
190	"	" M. Pave	"	15,	28.50
130	lin.	Wall in drains	"	150,	195.00
		Exc. & Clear.		20,	20.00
					911.91 3948.61

Add cost of work done by Wm. Bradley 458041.75¾

Culvert A } 100 Pr. Masonry a 2.12½ 212.50
See. No. 36. } 480 feet B.M. Sills & Plank " 2c 9.60 222.10

Culvert B. } 370 Per. Masonry a 2.12½ 786.25
See. No. 36. } 17500 feet B.M. Sills & Plank " 2c 350.00 1136.25

480.370.06¾

Culvert A.	150	per.	Masonry	a 2.30	345.00	
Sect. No 37.	300	feet	B.M. timber & plank	3c	9.00	
	500	C. yds	Ex. in pit	@ 25c	125.00	
	60	"	" Solid Rock in do	" 75c	45.00	5 31 60
Culvert A.	130	per.	Masonry	a 2.35	305.50	
Sect. No. 38.	300	feet	B.M. timber & Plank	a 3c	9.00	
	550	C. yds	Ex. in Pit	a 25c	137.50	
	50	"	" Solid Rock	a 75c	37.50	489.50
Culvert B	360	Per.	Masonry	@ 2.70	972 00	
Sect. No. 38	13.500	ft.	B.M. Timber & Plank	1c	135.00	
	350	C. Yds	Ex. in Pit	15c	52.50	1159.50
Culvert A.	220	Per.	Masonry	a 2.70	594.00	
Sect. No 39.	300	feet	B.M. Timber & Plank	1c	3.00	
	300	C. Yds	Ex. in Pit	@ 15	45.00	642.00
Culvert A	220	Per.	Masonry	@ 270c	594 00	
Sect. No. 40	11000	feet	B.M. Timber & Plank	a 1c	110.00	704.00
Culvert A.	270	Per.	Masonry	a 2.80	756.00	
Sect. No 41.	11.000	feet	Plank & Timber B.M.	3½	385.00	1141.00
Culvert B.						
Sect. No 41	104.77	Per.	Masonry	@ 2.80	293.35½	293.35½
Culvert A.	220	Per.	Masonry	@ 220	484.00	
Sect. No. 42	400	ft.	B.M. Timber & Plank	2½	10 00	494.00
Culvert B	125	Per	Masonry	a 2.20	275.00	
Sect. No. 42	300	ft.	B.M. timber & Plank	2½c	7.50	282.50
Culvert C.	360	per.	Masonry	a 2.80	1176.00	
Sect. No. 42	33.850	ft.	B.M. Timber & Plank	2½	846 25	2.022.25
						488 120 67½

			Brought forward			488.129. 67½
Culvert D.	110	Per.	Masonry	@	2.50	275.00
on Sec. No. 42	9.500	ft.	B.M. Timber & Plank	2c	190 10	465.00
Culvert A.	452	Per.	Masonry	@	2.48	1120.96
on Sec. No. 43	34.000	ft.	B.M. Timber & Plank	3c	1020.00	2140.96
Culvt B	190	per.	Masonry	a	2.48	471.20
on Sec. No. 43	11.000	feet	B.M. Timber & Plank	a	3c 330.00	801.20
Culvert A.	270	per.	Masonry	a	2.39	645.30
on Sec. No 44	20.000	ft.	B.M. Timber & Plank	@	1¾	350.00
			Add cost of work done by said Sugar		75.25	1070.55
Culvert B	75	per.	Masonry	a	2.39	179.25
on Sec. No. 44	300	ft.	B.M. Timber & Plank	1¾	5.25	184.50
Culvert A.						
on Sec. No. 45	65.26	per.	Masonry	a	2.80	182.73
	240	feet	B.M. Plank		3¢ 8.40	191.13

MASONRY

Culverts.	Estimated Cost.	Estimated Amt. of work done = 150 for each day 10th 1832.	Amount required to complete.
Brought up	20,628.16	8485.95	12,142.21
a on 35	341.80	——	341.80
a on 36	222.10	95.62½	126.47½
b on 36	1136.25	297.50	838.75
a on 37	531.50	408.50	123.00
a on 38	489.50	161.25	328.25
b on 38	1159.50	81.00	1078.50
a on 39	642.00	474.00	168.00
a on 40	704.00	500.00	204.00
a on 41	1141.00	651.00	490.00
b on 41	293.33½	293.33½	——
a on 42	496.00	464.00	32.00
b on 42	282.50	154.00	128.50
c on 42	2022.25	1779.00	243.25
d on 42	465.00	370.00	95.00
a on 43	2140.90	682.00	1458.90
b on 43	801.20	706.00	95.20
a on 44	1070.55	620.25	450.30
b on 44	184.50	95.60	88.90
a on 45	191.13	191.13	——

All which is respectfully submitted.

Sylvester Welch
Engineer

Reports and Misc. Documents, 18291843, box 8, vol. 1, item 60, APRR, Div. Rec., BCC, RG-17, PHMC.

APPENDIX E

Journal 1831-1835

Date	Culvert	Work Done	Contractor
August 3, 1832	Culvert A on Section 35	Work done and materials materials furnished Equal 110 Perches Masonry	Colvin & Fitzpatrick
September 1, 1832	" " "	728 ft. B.M. of Plank 122.65 Perches of Masonry	" " " FINAL
May 10, 1832	Culvert A on Section 36	Work done and materials furnished equal 45 Perches masonry	Philip Haley
June 7, 1832	" " "	Work done and materials furnished equal 80 Per masonry	" " "
August 3, 1832	" " "	102.15 Perches Masonry digging ditch for Sheet-piling 320 ft. B.M. Plank for Sheet piling	" " " FINAL
February 1, 1831 [1832?]	Culvert B on Section No. 36	Work done and materials furnished, equal 50 per. of masonry	Philip Haley
March 7, 1832	" " "	Work done and materials 70 Perches of masonry	" " "
April 4, [1832]	" " "	Work done and materials furnished equal to 100 Per Masonry	" " "
May 10, 1832	" " "	Work done and materials furnished equal 140 Perches Masonry	" " "
August 3, 1832	" " "	Work done and materials furnished Equal 216 Perches masonry	" " "
September 1, 1832	" " "	13,500 ft. B.M. Timber and Plank Work done and materials furnished equal to 170 Perches of Masonry	" " "

Date	Culvert	Work Done	Contractor
October 1, 1832	Culvert B on Section No. 36	14,100 Ft. Bd Timber and plank Work done and materials furnished equal 290 Perches Masy	Philip Haley
October 25, 1832	" " "	14,100 feet B.M. Timber and plank laid Work done and materials furnished equal to 350 Perches Masonry	" " "
December 10, 1832	" " "	409.40 Perches of Masonry 17,132 ft. B.M. of Plank	" " " CONTRACT COMPLETED
December 31, 1831	Culvert A on Section 37	290 c.y. Excavation 30 c.y. Solid Rock	Groves Pollard & Groves
April 4, [1832]	" " "	450 c yds Excav 50 " " Solid Rock Work done and material furnished equal to 100 Per masonry	" " "
September 1, 1832	" " "	469.72 c yds of Excavation 60.00 c yds Rock 154.19 Perches Masonry	" " " FINAL
April 4, [1832]	Culvert B Section 37	450 c yds Excav 50 c yds Solid Rock Work done and materials furnished equal to 100 Per masonry	Groves Pollard & Groves
May 10, 1832	Culvert A on Section 38	350 c. yds Excav 20 c. yds Solid Rock Work done and materials furnished equal 25 Perches masonry	Groves, Pollard & Groves
June 7, 1832	Culvert A on Section 38	520 c. yds. Excav. 30 " " Solid Rock Work done and materials furnished equal 25 Per masonry	Groves, Pollard & Groves

Date	Culvert	Work Done	Contractor
July 5, 1832	" " "	650 c. yds. Excavtion 50 " " S. Rock Work done and materials furnished equal to 95 Perches masonry	" " "
August 3, 1832	" " "	650 c. yds. Excavation 50 " " Solid Rock Work done and materials furnished Equal 120 Perches Masonry	" " "
September 1, 1832	" " "	124.45 Perches of Masonry 653.89 c. yds. of Excavation 74.00 c. yds. of Rock	" " " FINAL
December 1, 1831	Culvert B on Section 38	Work done and materials, equal 30 perches of masonry	Stewart, Fenlon & Co.
June 7, 1832	" " "	350 c. yds Excavation Work done and materials furnished equal 30 Per Mas Y	" " "
July 5, 1832	" " "	460 c. yds. Excavation Work done and materials furnished equal 20 perches mas Y 11.500 ft. B.M. Timber and Plank	" " "
September 1, 1832	" " "	13000 ft. B.M. Timber and Plank Work done and materials furnished equal to 90 Perches of Masonry 460 c. yds of Excavation	" " "
October 25, 1832	Culvert B on section 38	13000 feet B.M. Timber and Plank Work done and materials furnished equal to 290 Perches Masonry 460 c. yds. Excavation	Stewart, Fenlon & Co.
December 10, 1832	" " "	345.00 Perches of Masonry 13327 ft B.M. Timber and Plank 467.53 c. yds. Excavation in Pit	" " " CONTRACT COMPLETED

Date	Culvert	Work Done	Contractor
March 7, 1832	Culvert A on Section 39	280 c. yds. Excavation Work done and materials furnished 63 Perches of masonry	Stewart, Fenlon & Co.
May 10, 1832	" " "	280 c. yds. Excav. Work done and materials furnished equal 160 Perches masonry	" " "
June 7, 1832	" " "	301.29 c. yds. Excav. 217.57 Per masonry 216 ft. B.M. Timber and Plank	" " "
			FINAL
November 1, 1831	Culvert A on Section 40	Work done and materials furnished equal 52 perches of masonry 4.100 feet B.M. Timber and plank	Stewart, Fenlon & Ford
December 1, 1831	" " "	Work done and materials equal 120 perches of masonry 9500 ft. B.M. Timber and plank	" " "
December 31, 1831	" " "	9500 ft Board Measure Timber and plank laid Work done and Material Furnished Equal 150 per Masonry	" " "
June 7, 1832	Culvert A on Section 40	Work done and materials furnished equal 190 Per ms 9500 ft B.Ms Timber and Plank	Stewart, Fenlon & Ford
July 5, 1832	" " "	202.13 Perches Masonry 10355.33 ft B.M. Timber Plank laid	" " "
November 1, 1831	Culvert A on Section 41	Work done and materials furnished equal 50 perches of masonry	William Robson
December 1, 1831	" " "	Work done and materials, equal 7,500 feet B.M. Timber and plank	" " "

Date	Culvert	Work Done	Contractor
February 1, 1831 [1832]	" " "	9,000 ft. B.M. Timber and plank laid Work done and materials, equal 40 per of masonry	" " "
July 5, 1832	" " "	248.11 Perches Mas Y 10659.33 ft. B.M. Timber and Plank 7 Per broken Stone	" " "
April 4, [1832]	Culvert B on Section 41	Work done and material furnished equal to 70 Perches masonry	William Robson
May 10, 1832	" " "	104.77 Per masonry laid	" " " FINAL
November 1, 1831	Culvert A on Section 42	Work done and materials furnished equal 60 perches of masonry	Henry Dougherty
December 1, 1831	" " "	Work done and materials furnished, equal 180 perches of masonry	" " "
December 31, 1831	Culvert A on Section 42	Work done and mats furnished equal 210 per Masonry	Henry Dougherty
June 7, 1832	" " "	257.78 Perches Masonry 288 ft. B.Ms Timber and plank	" " " FINAL
April 4, [1832]	Culvert B on Section 42	Work done and materials furnished equal to 70 Perches masonry	Henry & Dougherty
June 7, 1832	" " "	123.04 Per. masy 216 ft. Bd ms Timber and Plank	" " " FINAL
September 1, 1831	Culvert C on Section 42	Work done and materials furnished equal 20 perches of masonry	Henry & Dougherty
October 1, 1831	" " "	Work done and Materials furnished equal 40 perches of Masonry 30.000 ft. B.M. Timber in foundation	" " "

Date	Culvert	Work Done	Contractor
November 1, 1831	" " "	Work done and materials furnished equal 245 perches of masonry 30.000 ft. B.M. Timber and Plank	" " "
December 1, 1831	" " "	Work done and materials furnished equal 330 perches of masonry 30,000 ft. B.M. timber of plank	" " "
March 7, 1832	" " "	Work done and materials furnished equal to 420 Perches of Masonry 30,000 Feet Board measure of timber and Plank	" " "
May 10, 1832	Culvert C on Section 42	30.000 ft. B.M. Timber and Plank laid Work done and materials furnished equal 490 Perches masonry	Henry & Dougherty
June 7, 1832	" " "	Work done and materials furnished equal 510 Per masy 30000 ft. B.Ms Timb and Plank	" " "
August 3, 1832	" " "	550 30 Perches Masonry 32018 ft. B.M. Timber and Plank	" " " FINAL
November 1, 1831	Culvert D on Section 42	Work done and materials furnished equal 30 perches of masonry 8,500 ft B.M. Timber and plank	Henry & Dougherty
December 1, 1831	" " "	Work done and materials furnished, equal 80 per of masonry 8,500 feet B.M. Timber and plank	" " "
September 1, 1832 p. 182	" " "	8124.58 ft B.M. Timber and Plank 112.15 Perches of Masonry	" " " FINAL

Date	Culvert	Work Done	Contractor
October 1, 1831	Culvert A on Section 43	Work done and Material furnished equal 40 perches of Masonry	Wm & AMcK Groves
November 1, 1831	" " "	Work done and materials furnished equal 190 perches of Masonry	" " "
February 1, 1831 [1832?]	" " "	Work done and materials, equal to 275 perches of masonry	" " "
October 1, 1832	Culvert A on Section 43	30300 ft. Bd Ms timber and plank Work done and materials furnished equal 175 Perches Masonry	Wm & AMcK Groves
October 25, 1832	" " "	30500 feet B.M. Tim. and plank Work done and materials furnish'd equal to 350 per Masonry	" " "
December 10, 1832	" " "	30500 ft. B.M. Timber and Plank Work done and materials furnished equal to 410 Perches Masonry	" " "
November 1, 1831	Culvert B on Section 43	Work done and materials furnished equal 80 perches of masonry 9500 feet B.M. Timber and plank	Wm & AMcK Groves
December 1, 1831	" " "	Work done and materials furnished, equal 150 perches of masonry 9,500 ft. B.M. timber and plank	" " "
May 10, 1832	" " "	9,500 ft. Bo Ms Timber and Plank Work done and materials furnished equal 170 Perches masonry	" " "
August 3, 1832	" " "	194.00 Perches Masonry 10083 ft. B.M. Timber and Plank	" " "

FINAL

Date	Culvert	Work Done	Contractor
September 1, 1831	Culvert A on Section 44	Work done and Materials furnished equal 25 perches of masonry	Snyder & Robson
October 1, 1831	" " "	Work done and Materials furnished equal 31.44 Perches Masonry	Jacob Snyder
November 1, 1831	Culvert A on Section 44	Work done and materials furnished 38 perches of Masonry 10,000 ft. B.M. Timber and Plank	O Connor & Griffin
December 1, 1831	" " "	Work done and materials furnished, equal 100 perches of masonry 17,500 ft. B.M. Timber and plank	" " "
July 5, 1832	" " "	18,000 ft. B.M. Timber and Plank laid Work done and materials furnished equal 140 Per Masonry	" " "
August 3, 1832	" " "	18000 ft B.M. Timber and Plank Work done and materials furnished Equal 220 Perches Masonry	" " "
September 1, 1832	" " "	19500 ft. B.M. Timber and Plank Work done and materials furnished equal to 240 Perches of Masonry	" " "
October 1, 1832	" " "	29975 Ft. Bd Ms Timber and Plank 256.19 Perches Masy	" " " FINAL
April 4, [1832]	Culvert B on Section 44	Work done and materials furnished equal to 40 Per Masy	O Connor & Griffin
October 1, 1832	" " "	63.67 Perches Masy	" " " FINAL
December 1, 1831	Culvert A on Section 45	Work done and materials furnished, equal 50 perches of masonry	Wm Robson

Date	Culvert	Work Done	Contractor
April 4, [1832]	" " "	Work done and materials furnished equal to 65 Per masonry	" " "
May 10, 1832	" " "	65.26 Perches Masonry 240.00 feet B.M. Plank sheet piling	" " "

FINAL

Journal 1831-1835, 1 vol., MG-2, PHMC.

APPENDIX F

Wilson, "Notebook, 1831"

Culverts on 2d Division

No of Culvert	No of Section	Length	Span	Versed Sine	Height of Embankt on crown of arch	Thickness of ring
20	58	50 feet	6 feet	3 feet	10·25 ft	1·58 ft
21	56	79 "	6 "	3 "	19·25 "	1·58 "
22	60	59 "	14 "	7 "	13· "	1·83 "
23	61	68 "	14 "	7 "	16· "	1·83 "
24	62·	60 "	50 "	14 "	14·85 "	2·50 "
25	64	56 "	12 "	6 "	12· "	1·83 "
26	65	54 "	24 "	8 "	11·50 "	2·25 "

APPENDIX G

Wilson, "Notebook, 1831"

Culvert No 34 on Section No 62 P&R Railway
over Valley creek.

Grade of face - - 50 feet
Curved Line - - 14 "
Radius - - - - 29.32 "
Angle of obliquity 117°
Number of ringstone 42
Height of Header - 39.8 feet
Extrados - - 64.98 "
Length of ringstone on face 2.5 feet
Length of Rapstone " " 2.75 "
Width of ringstone allowing 1/8 ft for joint. 1.264 & 1.372
Depth of Header - - 4.16 ft
Depth of Stretcher - 2.50 "
Spring of arch 31 6/10 ft below grade
Spring of 10 ft arch 21.78 ft below grade
Radius of rings at lower end 31 6/10 ft.
" " " " upper end 11 5/10 ft

10 ft Arch

Length on Intrados 15.708 ft
Number of Ringstone 21
Length of Ringstone on face 1.75
" " Rapstone " " 1.93
Depth of Header - - 2.92
" " Stretcher. 1.75
Length of Culvert 60 feet.

Stone used for large arch chamfered on each corner 1 inch on face and 2 inch on bed, Rock face. Stone of small arch chamfered 2 1/2 inch on face and 1 1/2 inch on bed, Rock face. Stone used for small arch chamfered 2 inch on face.

APPENDIX H

Wilson, "Notebook, 1831"

Culvert No 26 on Section No 65. Phil.a & Reading Railway over Moby or Mill creek.

Skew of face 24 feet
Normal same 8 "
Radius 13 .
Angle of Inclination 134°46'
Number of ring stone 25
Length on face of ring stone 2.25 feet
Length on face of key stone 2.50
Intrados 32.58
Extrados 35.87
Width of ring stone allowing $\frac{1}{100}$ ft. for joint = 1.213 & 1.421
Depth of Header 3.75 feet
" " Stretcher 2.25 "
Spring of arch 22 ft below grade
Top of parapet 0 $\frac{5}{10}$ " " "
Radius of curved wing 9 $\frac{5}{10}$ ft
Other face wings straight
Thickness abutment 6 ft
Length from out to out 54 feet

APPENDIX I

Philadelphia and Reading Railway Culverts
[Specifications]. Wilson

Wilson, "Notebook, 1831"

Philadelphia and Reading Railway
Culverts

Specification. The masonry of culverts to be laid in mortar and well bonded; the face work to have good and close joints free from spalls, and to be neatly pointed. The foundations to be prepared in such manner as the Engineer shall direct; the mortar to be of the best quick lime and clean sand, in such proportions as the Engineer may require, and prepared on a plank bed, with the least quantity of water necessary to reduce the same to a proper consistency. Such portions of the face work as may not be covered by the slope of the bank to be hammer dressed rangework. The wing stones to be of the shape and dimensions shown in the plan, and to have in all cases a bed equal at least to the depth on face, and each alternate stone to have a bed equal to once and two thirds the depth on face. The meeting stone to be of good shape, to break joint, and in no case to be less in depth than the wing stone. The steps on the wings to be each a single stone of regular inclination in the rear, and in all culverts of more than 10 ft span to project 2 inches. The coping of parapets to be equal in thickness, and in culverts of more than 10 ft span to project 2 inches. In culverts of more than 10 ft span the wing stone are chamfered and projected 1½ or 2 inches on bed, and 1 inch on face at each corner.
The contractor to furnish centres, and all materials. The company only to pay for masonry laid.

APPENDIX J

The length, span, quantity of materials, price, and the estimated cost of each of the culverts and viaducts on the line.

Section.	Letter.	Span.	Length.	Perches.	Price.	Ft. B. M. timber & plank.	Price.	Cub. yds. excavation.	Price.	Cub. yds. slate.	Price.	Cub. yds. rock.	Price.	Cost of culvert.
33	a	Sft.	31ft.	71	$2 45	480	1½c							$181 15
33	b	5	31	90	2 45	670	1½							230 55
33	c	5	31	71	2 45	480	1½							181 15
34	a	16	31	220	2 45	11000	1½							704 00
35	a	5	94	150	2 45	480	1½							325 70
36	a	3	64	100	2 12½	480	2							222 10
36	b	12	76	360	2 12½	17000	2							1105 00
37	a	3	80	116	2 35	480	3	800	25c					362 00
38	a	3	86	150	2 85	480	3	850	25					407 40
38	b	18	31	364	2 70	13500	1	500	15					1192 80
39	a	4	135	200	2 70	550	1	450	15					612 80
40	a	16	31	220	2 70	11000	1							704 00
41	a	14	87	270	2 80	11000	3¼							1141 00
41	b	4	86	90	2 80	550	3¼							270 55
42	a	6	93	250	2 20	740	2¼							568 50
42	b	4	63	120	2 20	550	2¼							277 25
42	c	25	31	580	2 10	88850	2¼							2064 25
42	d	5	62	110	2 50	9000	2							465 00
43	a	25	31	452	2 48	84000	3							2140 96
43	b	14	31	199	2 48	11000	3							823 52
44	a	20	31	307	2 39	20000	1¾							1088 73
44	b	4	31	80	2 39	550	1¾							200 47½
45	a	3	31	71	2 80	480	3¼							215 60
		506	319450	11755		289,060								$34546 98½

PHJ Vol II, 1831-32, p. 190.

APPENDIX K

List of Culverts 1832-1833

Culvert Marked	On Section	Present Estimated Cost	Original Estimated Cost	
A	35	317 82	325 70	
A	36	226 47	222 10	
B	36	1,210 00	1,105 00	
A	37	524 78	562 00	
A	38	511 43	407 40	
B	38	1,192 80	1,192 80	
A	39	634 79	612 80	
A	40	649 35½	704 00	
A	41	1,077 54	1,141 00	
B	41	293 55½	270 55	
A	42	554 32	568 50	
B	42	276 09	277 25	
C	42	1,956 08	2,064 25	
D	42	442 86½	465 00	
A	43	2,140 96	2,140 05	
B	43	783 63	823 52	
A	44	1,212 10	1,083 73	
B	44	1,156 95	200 47½	
A	45	191 13	215 60	
		$34,486 62½	33,782 23½	
Bridge on Section 36		2,057 05	764 65	Culv'ts not built.
		36,543 62½	34,546 88½	
Add for contingences on work not done 7 per cent.		2,558 00	2,418 28	Contingencies 7 per cent.
			36,965 16½	Original estimate.
			1,284 00	Bridge on Sec. no. 36
Present estimated cost of culverts and bridges		39,101 67½	38,249 16½	Culverts & bridges.

PHJ, App to Vol II, 183233, p. 78.

APPENDIX L

TABLE OF GRADES.

From station No. to	No.	Ascent per 100 feet.	Ascent per mile.	Distance in miles.	Distance from Johnstown.	Ascent from Johnstown.	Remarks.
1	9	0.00	0.00	0.19	0.19	0.00	
9	138	0.50	26.40	2.44	2.63	64 50	
138	215	0.48	25.344	1.46	4.09	101.46	
215	217	0.00	0.00	0.04	4.13	101.46	Level.
217	233			0.30	4.43	251.46	Inclined plane No. 1.
233	234	0.00	0.00	0.02	4.45	251.46	Level.
234	409	0.20	10.560	3.31	7.76	286 46	
409	602	0.40	21.120	3.66	11.42	363.66	
602	676	0.15	7.920	1.40	12.82	374.76	
676	897	0.28	14.784	4.19	17.01	436.64	
897	919	0.20	10.560	0.42	17.43	441.04	
919	922	0.00	0.000	0.06	17.49	441 04	Level.
922	939½			0 35	17·82	573.44	Inclined plane No. 2.
939½	942½	0.00	0·00	0.06	17·88	573.44	Level.
942½	1015	0.20	10.56	1.37	19·25	587.94	
1015	1018	0.00	0.00	0.06	19·31	587.94	Level.
1018	1033			0.28	19·59	718.44	Inclined plane No. 3.
1033	1036	0.00	0.00	0.06	19.65	718.44	Level.
1036	1130	0.20	10.56	1.78	21·43	737.24	
1130	1133	0.00	0.00	0.06	21·49	737.24	Level.
1133	1155			0.42	21·91	925.10	Inclined plane No. 4.
1155	1158	0.00	0.00	0.06	21·97	925.10	Level.
1158	1287	0.20	10.56	2.44	24·41	950.90	
1287	1290	0.00	0.00	0.06	24·47	950.90	Level.
1290	1316			0.49	24·96	1152.54	Inclined plane No. 5.
1316	1319	0.00	0.00	0.06	25.02	1152.54	Level.
1319	1387	0.28	14.784	1.29	26·31	1171 58	
1387	1401	0.00	0.00	0.27	26·58	1171.58	*Summit Level.*

TABLE OF GRADES.

From station No. to	No.	Descent per 100 feet	Descent per mile.	Distance in miles	Distance from Johnstown.	Descent from Summit.	Remarks.
1401	1428			0·51	27·09	266·50	Inclined plane No. 6.
1428	1436	0·00	0·00	0·15	27 24	266·50	Level.
1436	1463			0·51	27·75	527·00	Inclined plane No. 7.
1463	1466	0·00	0·00	0·06	27·81	527·00	Level.
1466	1495	0·20	10·56	0.51	28·32	532.40	
1495	1498	0·00	0·00	0·06	28·38	532.40	Level.
1498	1529			0·5	28·90	840.40	Inclined plane No. 8.
1529	1532	0·00	0·00	0·06	28·96	840.40	Level.
1532	1592	0·20	10·56	1·13	30.15	852.40	
1592	1595	0·00	0·00	0·06	30·21	852.40	Level.
1595	1622			0·51	30.72	1041.90	Inclined plane No. 9.
1622	1625	0·00	0·00	0·06	30·78	1041.90	Level.
1625	1712	0·54	17·952	1·61	32.42	1071.48	
1712	1715	0·00	0·00	0·06	32.48	1071.48	Level.
1715	1738			0·43	32·91	1252·00	Inclined plane No. 10.
1738	1741	0 00	0·00	0·06	32·97	1252·00	Level.
1741	1836	1·00	52·80	1·80	34·77	1346·00	
1836	1902	1·67	3 ·376	1·25	36·02	1390·22	
1902	1907	0·00	0·00	0·09	36·10	1390·22	Level.
1907	1920	0·67	35.376	0·25	36·36	1398·71	
1920	1935	0·00	0·00	0·29	36·65	1398·71	Level.

PHJ, App to Vol II, 1832-33, pp. 80-81.

APPENDIX M

Tabular statement of labor done and money paid on culverts. . .
Allegheny Portage Railway, November 1, 1832

	Contractors Names	Masonry Perches	Price	Feet B.M. Timber & Plank	Price		Total Value
35	Colvin & Pitzpatrick	122 65	2 36	128	3	Completed.	317 32
36	Philip Haley	102 15	2 12½	320	2	Completed—Excavation for sheet piling at $3,	226 47
37	Philip Haley	350	2 12½	14100	2		1025 75
37	Groves, Pollard & Groves	154 19	2 35			Completed.—469,72 c. yards excavation, at 25 cents; 50 c. yards rock, at 75 cents,	524 78
38	Groves, Pollard & Groves	124 45	2 35			Completed.—553,39 c. yards excavation, at 25 cents; do do at 75	511 43
38	Stewart, Fenlon & Ford	290	2 70	13000	1	460 do do at 15	982
39	Stewart, Fenlon & Ford	217 57	2 70	216	1	Completed.—301,29 c. yards excavation, at 15 cents.	634 79
40	Stewart, Fenlon & Ford	202 15	2 70	10333,33	1	Completed.	640 35
41	William Robson	248 11	2 30	10333,33	3½	Completed.—7 perches broken stone at 75 cts; digging ditches for sheet piling, $4 50,	1077 54
42	William Robson	104 77	2 80			Completed.	293 33½
42	Henry & Dougherty	217 78	2 20	288	2½	Completed.	574 32
43	Henry & Dougherty	123 04	2 20	216	2½	Completed.	276 09
43	Henry & Dougherty	550 30	2 10	32018	2½	Completed.	1956 08
43	Wm. & A. M'K. Groves	112 15	2 50	8124,58	2	Completed.	443 36½
43	Wm. & A. M'K. Groves	350	2 43	30500	5		1783
44	L. Snyder	194 01	2 43	10083	5	Completed.	783 63
44	O'Connor & Griffin	31 44	2 39				75 25
44	O'Connor & Griffin	256 19	2 39	29975	1½	Completed.	1136 85
45	William Robson	65 67	2 59			Completed.	156 95
		65 26	2 30	240	3½	Completed.	191 13
							$13,733 31½

Table 2 PHJ App to Vol II, 1832-33, p. 88.

APPENDIX N

Table 10, PHJ, App to Vol II, 1833-34, p. 91.

Engine tender, hanging sheaves, digging wells, laying water pipes, &c. &c.; also, the estimated amount of work done.

Contract price.	Hanging large sheaves at 100 of plans.	Hanging small sheaves.	Price.	Digging and walling well per ft. in depth.	Price.	Laying water pipes by the foot in length	Price.	Boring well per ft. in depth	Price.	Incidental work.	Estimated cost	Estimated value of work done.	Estimated Value of work to be done.	Amount paid.	Amount of per centage retained.	Amount yet required.
											$1100	$5691 85	$3220	$2471 85	$2820	$400	$2871 85
85		142	75			600		10		Ditches, dams, &c.	170	230		230			230
											1100	3852 25	2050	1802 25	1875	175	1977 25
5		150	75									1029	740	289	635	105	324
												1476	1476		1476		
						4079½		10		Ditches, dams, &c.	1068 05	6027 48	$722 75	2304 68	$190	532 75	2857 48
											1100	$49	100	249			549
5		182	94														
								100	2 49	Tubes, reservoirs, &c.	100	5359 85	2895 25	2443 60	2465	481 25	2874 85
10		195	1 50	15	2 00			155	2 50		1250	4105 38	2155 20	2010 18	1855	500 20	2510 38
6		223	75								1100	1400	1150	270	1000	150	400
																81 50	238 10
				12	2 74							658 10	501 50	156 60	420	297	2401 60
								190	2 49	Tubes, reservoirs, &c.	185	4196 60	2092	2104 60	1795	200	400
1		236	75	26	2 12½			124	2 12½		1260	1400	1200	200	1000	347 50	3170 80
												5270 80	2447 50	2823 30	2100	552 55	2460 59
10		280	1 50			1500		08			1280	4805 50	2697 55	2107 95	2345	165	290
4	25	268	90								1100	1410	1285	125	1120	41	565
												1115	791	324	750	541 99	2775 80
						4700		15		Ditches, dams, &c.	410	4050 80	1816 99	2233 81	1275	135	275
5		236	1 25								1120	1125	985	140	850	59 50	401
												656	814 50	341 50	255	463	2562 85
				10	2 33			170	2 80	Tubes, reservoirs, &c.	180	5997 85	3898	2099 85	3435	60	270
4	34	200	91								1140	770	560	210	500		
				5	2 33			200	2 80	Tubes, reservoirs, &c.	210						
												$61,016 41	$36,079 24	$24,937 17	$31161	$4,818 24	$29,855 41
												Includ'd in above	568 50		568 50		
												Do. $640.	600	40 00	580	20 00	Deduct 1148 00
															$32,309 50	$4,838 24	$28,706 91

Table 10, PHJ, App to Vol II, 1833-34, p. 91.

No. 10.—A Statement shewing the estimated cost of Engine houses, and [illegible] for inclined planes for Engine tender, hang-

Numbering	Names of Contractors.	Per lin. y. excav. at the head of the plane.	Price.	Per lin. y. excav. at the foot of the plane.	Price.	Per lin. of wall to support engine and machinery.	Price.	Engine house and shed.	Per lin. of wall in found'n of engine house and shed.	Price.	Per lin. of wall in found'n of shed at foot of plane.	Price.	Engine house & shed at head plane, contract price.	Shed at head plane, contract price.	Dwel'g house at head of plane, contract price.	Dwel'g house at foot of plane, contract price.	Well at head of plane for weights Contract price.	Well at head of plane, school plane, chim'y frames	Number in the head of plane.	Price.	Number on the foot of plane.	Price.	Lin. ft. of timber in each lay'r on inclin'd plane.	Price.	Hanging large sheaves at foot of plane. Contract price.	Hanging small sheaves.	Hanging and fitting small sheaves.	Price.	Sinking well per ft. in depth.
1	Cooper & Ingerson, Kerr & Bro.	850	10 c.	160	20	270	3 90	95	$1 75		50	$1 87	8760	$320	$340	$550	$45		270	20	470	20 c.	85		142	75		
2	Richardson & M'Komie, David Campbell, Kean & Ille,	1225	90	90	25	265	2 75	90	1 70		80	1 70	500	250	680	340	40		270	20	470	20	5		150	75		
3	Burk. Hammond & Burchfield J. & D. Anderson,	2200	39	90	25	270	2 85	70	1 66		35	1 49	810	375	950	600	60		270	25	470	25	5		182	94		
4	Brown & Sawyer,	850	25	180	25	514	2 75	90	2 75		50	2 75	500	200	650	400	$3 75		270	25	470	18	10		192	1 50		1
5	D. & S. S. & H. H. Easton, Ray & Devlin, J. & D. Anderson,	1500	33	120	31	270	2 89	70	2 51		30	2 31	800	324	850	550	45		270	22	470	18	6		228	75		1
6	Stackpole, Woodburn & Co. Ray & Devlin,	800	35	80	14	260	2 25	60	1 50		25	1 50	817	310	850	550	60		270	27	470	37½	1		236	75		2
7	Brown & Sawyer,	950	37½	110	37	260	2 87½	60	2 87½		30	2 87	545	340	695	440	33 75		270	25	470	25	10		280	1 50		
8	Grier & Keely, Patterson, Dicky & Clark, J. & D. Anderson,	1000	70	90	20	274	3 95	120	1 76		45	1 80	798	365	850	560	45 75		270	22	470	20	4	25	268	90		
9	Smith & Hemperly, Riddle & Buchannan, Anderson & Deen,	1080	30	170	15	265	2 74	80	1 50		30	1 48	825	375	850	525	37		270	17	470	18	5		230	1 25		10
10	Grier & Keely, Anderson & Deen,	900	75	230	21	265	4 00	100	1 80		30	1 85	795	570	890	560	48		270	22	470	21	4	34	200	91		5

Add John Foster, furnishing iron screw bolts, for engine cylinder beds, for inclined planes Nos. 1, 2, 3, 4 & 5, 5,085 lbs. at 10 cts.
Do John Conforr, do do 6, 7, 8, 9 & 10, 8,000 at 10,

Table

No. 3.—Tabular statement of labor done and moneys paid on Culverts, with original estimates, &c.—Allegheny Portage Rail-road.

No. Section	CONTRACTORS' NAMES.	Feet Span	Masonry, Perches	Price	Feet B. M. tim. & plank	Price	MISCELLANEOUS.	Total value	Total amount paid	Am't of Forfeiture	Original estimated cost
A 35	Calvin & Fitzpatrick,	3	122.65	2 56	198.	3		317 82	317 82		325 70
A 36	Philip Haley,	3	109.15	2 [illegible]	590.	2	Excavation for sheet piling $30	226 47	226 47		222 10
B "	Do.	12	409.40	2 [illegible]	17132.	2		1212 62	1212 62		1105
A 37	Groves, Pollard & Groves,	3	154.19	2 85			469.63 c. yds. com. ex. at 25 cts., 60 c. y. rock at 75	524 78	524 78		362
A 38	Do. Do. Do.	3	124.45	2 35			453.89 " at 25, 74 " at 75	511 43	511 43		407 40
B "	Stewart, Fenlon & Ford,	18	345.01	2 70	13397.	1	467.53 c. yds. excavation at 15 cents.	1134 93	1134 93		1192 80
A 39	Do. Do. Do.	4	217.37	2 70	216.	1	301.29 " at 15 "	634 79	634 79		612 80
A 40	Do. Do. Do.	16	202.15	2 70	10355.33	1		649 35½	649 35½		704
A 41	William Robson,	14	248.11	2 80	10659.33	33	7 perches broken stone at 75 cts.	1077 54	1077 54		1141
B "	Do.	4	104.77	2 80				293 35½	293 35½		270 55
A 42	Henry & Dougherty,	6	257.78	2 90	288.	24		374 32	374 32		568 50
B "	Do. Do.	4	123.04	2 20	216.	24		276 09	276 09		277 85
B "	Do. Do.	25	550.30	2 10	32018.	29		1956 08	1956 08		2064 25
B "	Do. Do.	5	112.15	2 50	9124.58	2		442 86½	442 86½		465
A 43	William & M'K. Groves,	25	459.18	2 43	43826.	3		2153 55	2153 55		2140 06
B "	Do. Do.	14	194.00	2 49	10083.	3		783 63	783 63		823 52
A 44	J. Snyder,	20	31.14	2 59			Forfeited.	75 25	50	25 25	
A "	O'Connor & Griffin,	20	256.19	2 30	20075.	13		1136 85	1136 85		1083 75
B "	Do. Do.	4	65.67	2 30				156 95	156 95		200 87½
A 45	William Robson,	3	65.26	2 80	240.	33		191 13	191 13		215 60
		~~506~~	~~11,755.00~~		~~197,060.00~~			~~$24,919 89~~	~~$24,894 64~~	~~$75 10~~	~~$24,946 80~~
36	Skew Bridge. Fenlon, Burlings & Co.,	20	611.14	3 74	—		up & relaying mas'y. in consequence of alt. in plan, $20 31.11 c. y. broken stone in found'n $21 78, taking MASONRY COMPLETED.	$2,327 44	$2,327 44		$1,284 00

Table 3, PHJ App to Vol II, 1834-35, p. 69.

PERSONS CONSULTED DURING RESEARCH

Diana Alten, Manuscripts Librarian, Haverford College Library, Haverford, Pennsylvania

Penelope H. Batcheler, Historical Architect, National Park Service, Philadelphia, Pennsylvania

Sandy Blust, Librarian, Bureau of Topographic and Geologic Survey, Harrisburg, Pennsylvania

Henry Bown, Associate Archivist, Pennsylvania State Archives, Harrisburg, Pennsylvania

Beth Carroll, American Philosophical Society, Philadelphia, Pennsylvania

John Coleman, Professor, St. Francis College, Loretto, Pennsylvania

Grant Talbot Dean, Associate Librarian, Chicago Historical Society, Chicago, Illinois

Sylva Emerson, Blair County Historical Society, Baker Mansion, Altoona, Pennsylvania

Jeff Flannery, Archivist, Archive of Industrial Society, University of Pittsburgh, Pittsburgh, Pennsylvania

Ken Fones-Wolf, Archivist, Temple University, Philadelphia, Pennsylvania

Amy Harding, Historical Society of Pennsylvania, Philadelphia, Pennsylvania

Bob Ilisevich, Meadville, Pennsylvania

David Kimball National Park Service, Philadelphia, Pennsylvania

Charles Mann, Archivist, Pennsylvania State University, State College, Pennsylvania

Lance Metz, Center for Canal History and Technology, Easton, Pennsylvania

Anne Mott, Librarian, Engineering Society Library, New York City, New York

Edward Mountz, Librarian, Carnegie-Mellon University, Pittsburgh, Pennsylvania

Dr. Michael Nash, Hagley Museum and Archives, Wilmington, Delaware

Harry Parker, Associate Archivist, Pennsylvania State Archives, Harrisburg, Pennsylvania

Beth Pelle, Librarian, Jervis Public Library, Rome, New York

H. Benjamin Powell, Professor, Bloomsburg State University, Bloomsburg, Pennsylvania

Ruth Reed, Archivist, Historical Society of Western Pennsylvnaia, Pittsburgh, Pennsylvania

Linda Ries, Associate Archivist, Pennsylvania State Archives, Harrisburg, Pennsylvania

Donald Sayenga, Bethleham Wire Rope Works, Williamsport, Pennsylvania

William Shank, American Canal and Transporation Center, York, Pennsylvania

John Shelly, Associate Archivist, Pennsylvania State Archives, Harrisburg, Pennsylvania

Martha Simonetti, Harrisburg, Pennsylvania

David Snell, Curator, Earth and Mineral Sciences Museum, Pennsylvania State University, State College, Pennsylvania

Joel Tarr, Professor, Carnegie-Mellon University, Pittsburgh, Pennsylvania

Anne Coxe Toogood, Historian, Independence National Historical Park, Philadelphia, Pennsylvania, National Park Service

William Trimble, Journal Editor, Historical Society of Western Pennsylvania, Pittsburgh, Pennsylvania

Robert Vogel, Curator, Division of Mechanical and Civil Engineering, National Museum of American History, Smithsonian Institution, Washington, D.C.

Kristine Waldron, Library Assistant, Institute Archives and Department of Special Collections, Rensselaer Polytechnic Institute, Troy, New York

John White, curator, Division of Transportation, National Museum of American History, Smithsonian Institution, Washington, D.C.

William E. Worthington Jr., Musuem Specialist, Division of Mechanical and Civil Engineering, National Museum of American History, Smithsonian Institution, Washington, D.C.

INSTITUTIONS VISITED DURING RESEARCH

Carnegie Library of Pittsburgh, Music and Art Department, Pittsburgh, Pennsylvania

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

State Library of Pennsylvania, Harrisburg, Pennsylvania

SOURCES INVESTIGATED AT PENNSYLVANIA HISTORICAL AND MUSEUM COMMISSION, DIVISION OF ARCHIVES AND MANUSCRIPTS, HARRISBURG, PENNSYLVANIA

Record Group (RG)-17 Records of the Bureau of Land Records, Board of Canal Commissioners.

Board Records and Papers

Reports and Resolutions 1819-1858, 1 box,
Strickland Report 1826

General Correspondence and Surveys, 1825-60, 4 boxes
Surveys and Correspondence, 1825-29, 2 volumes
Miscellaneous Papers, Reports, Documents, 7 volumes

Engineering Records, 1825-52, 2 boxes

Damage Claim Records 1827-59, 4 boxes

RG-17 Records of the Bureau of Land Records, Board of Canal Commissioners, Divisional Records, Allegheny Portage Railroad

Contracts, 1851-55, 6 volumes

Damage Claims, 1831-68, 10 volumes

Reports and Miscellaneous Documents, 1829-57, 7 volumes

Allied Records (incorporated into RG-17)

Pennsylvania Railroad Blue Print Maps of the Pennsylvania Canal

Pennsylvania Canal Records
Engineer's Accounts, Estimates, Work Receipts, 1830-36, boxes 1 and 35

Map Books

Manuscript Group (MG)-2 Business Records Collection 1681-1963

C. Transportation Accounts, 1795-1923
Allegheny Portage Railroad (Pennsylvania Canal) 1831-52
Journals 1831-52
1831-35, 1 volume
1849-51, 1 volume
185051, 1 volume
Ledger 1850

MG-11 Map Collection

MG-110 Schuylkill Navigation Company Records
Solomon Roberts Correspondence in Various 1815-1940, Box 3

MG-163 Dr. Hubertis M. Cummings Collection, 1929-1957
Author's Manuscripts
The Pennsylvania Canal (Short Form) 1954-55, Unpublished
MSS Maps

MG-199 Railroad Museum of Pennsylvania Collections, ca. 1830-1974

(The author was able to look through a portion of the historical material in this collection. The collection itself is split between the archives and the museum in Strasburg, Pennsylvania. Eventually all the material will be returned to Strasburg.)

MG-218 General Photograph Collection
II Transportation
B. Railroads

MG-213 Postcard Collection
Blair County
Cambria County

MG-263 George A. Richardson Collection, 1869-1974
book (album) #5

MG-285 Pennsylvania Railroad Photograph Collection, Allegheny Portage Railroad

MG-327 Ira J. Stouffer Photographs, ca. 1910.

Pennsylvania Railroad Records

Sources Searched at the State Library of Pennsylvania

Pennsylvania House Journals
1831-1832, volume 2
1831-1832, volume 3
1832-1833, Appendix to volume 2
1833-1834, Appendix to volume 2
1834-1835, Appendix to volume 2

ANNOTATED BIBLIOGRAPHY

MANUSCRIPT MATERIAL

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

A second search of Record Group 17, Land Records, again failed to produce any of the original architectural drawings or engineering specifications for structures located along the portage railroad, with the exception of William M. Roberts' rendition of the Hollidaysburg Skew Arch Viaduct.

Records utilized for this report include:

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

Contracts, 1851-1855, six volumes in boxes 1-3

These contracts were between the superintendent of the Western Division of the Pennsylvania Canal and Portage Railroad, Samuel Jones, and the many contractors providing construction, repair, Supply and other services for the railroad. The contracts contained the contractor's name, date of agreement, prices for work done and very general and brief descriptions of the service rendered.

Damage Claims, 1831-1868, 10 volumes in boxes 4-7.

Several sketches of portions of the railroad line were found in these claims filed by contractors seeking monetary compensation for extra work or damage to property. The drawings of lots at Planes 8, 9 and 10 were found in these claims.

Reports and Miscellaneous Documents, 1829-1857, seven volumes in boxes 8-10.

Descriptions of the road sections and limited information on culvert construction were found in these documents.

Accounts, Allotments and Bids, 1831-32, box 35

A listing and description of culverts on sections 36-45 was found in these accounts.

Reports and Resolutions, 1819-1858, box 1

The William Strickland text was located under this listing.

Engineering Records, 1825-1852 in box 2
Surveys of Property, 1842-1847, 1 vol.

These surveys depicted the size and shape of lots located at the head and foot of several of the planes.

Manuscript Group - 2 Business Records Collection, 1681-1963

C. Transportation Accounts, 1795-1923
Allegheny Portage
Journal 1831-1835

This journal provided data on the railroad's construction. Names of contractors, the section where work was being done, description of work and costs were entered month by month for the years 1831-1835.

Manuscript Group - 263. George A. Richardson Collection, 1869-1974, Book #5.

These photographs of the railroad trace were taken in 1922.

Manuscript Group 327. Ira J. Stouffer Photographs, ca. 1910.

The Stouffer collection contains views of the railroad from Planes 1-10.

Smithsonian Institution
Division of Mechanical and Civil Engineering
National Museum of American History

Watkins, J. Elfreth. "History of the Pennsylvania Railroad Company 1846-1896 In Its Relation to the Pennsylvania State Canals and Railroads and the Consolidated System East and West of Pittsburgh." Vol. 1. Published by the Pennsylvania Railroad Company 1896. This text was never printed; galley sheets can be found at the Smithsonian Institution.

Wilson, W[illiam] H[asell]. "Notebook, Designs & Costs for Structures, 1831." The Wilson text is a handwritten, unpublished manuscript.

State Library of Pennsylvania

Harrisburg, Pennsylvania
Pennsylvania House Journals (PHJ)

Journal of the Forty-Second House of Representatives of the Commonwealth of Pennsylvania, Vol. II, (Harrisburg, Printed by Henry Welsh 1831-32).

Journal of the Forty-Second House of Representatives of the Commonwealth of Pennsylvania, Vol. III, (Harrisburg, Printed by Henry Welsh, 1831-32).

Appendix to Vol. II of the Journal of the House of Representatives, 1832-33 Containing the Canal Commissioners Report, and Accompanying Documents.

Appendix to Vol. II of the Journal of the House of Representatives, 1833-1834 Containing the Canal Commissioners Report and Accompanying Documents.

Appendix to Vol. II of the Journal of the House of Representatives, 1834-35, Containing the Canal Commissioners Report and Accompanying Documents.

PUBLISHED MATERIAL

Books

Baumgardner, Mahlon J., and Hoenstine, Floyd G. The Allegheny Old Portage Railroad 1834-1854 Building, Operation and Travel between Hollidaysburg and Johnstown Pennsylvania. Published by the authors, 1952.

Jacobs, Harry A. The Juniata Canal and Old Portage Railroad. Hollidaysburg, Pennsylvania: Blair County Historical Society, September 20, 1941; reprint ed., 1969.

Platt, F. and W.G. Report of Progress in the Cambria and Somerset District of the Bituminous Coal Fields of Western Pennsylvania. Second Geological Survey of Pennsylvania 1875. Part I Cambria. Harrisburg, Pennsylvania: Board of Commissioners, 1877.

Raymond, Eleanor. Early Domestic Architecture of Pennsylvania. New York: William Helburn Inc., 1931.

Roberts, S.W. An Account of the Portage Railroad over the Allegheny Mountain in Pennsylvania. Philadelphia: Nathan Kite, 1836.

_____. Reminiscences of the First Railroad Over the Allegheny Mountain. Read Before the Historical Society of Pennsylvania, April 8, 1878. Philadelphia: Railway World, 1879.

Rogers, Henry Darwin. The Geology of Pennsylvania. 2 vols. Philadelphia: J.B. Lippincott & Co., 1858.

Schiffer, Margaret Berwind. Survey of Chester County, Pennsylvania, Architecture 17th, 18th and 19th Centuries. Exton, Pennsylvania: Schiffer Publishing LTD, 1976.

Charles Morse Stotz. The Architectural Heritage of Early Western Pennsylvania A Record of Building Before 1860. Pittsburgh: University of Pittsburgh Press, 1936; reprint ed., 1966.

Wilson, William Hasell. Notes on the internal improvements of Pennsylvania. Philadelphia: Railway World, 1879.

Wilson, William Bender. History of the Pennsylvania Railroad Company. Vol. 1. Philadelphia: Henry T. Coates & Co., 1895.

Wilson, William Bender. "The Evolution, Decadence and Abandonment of the Allegheny Portage Railroad." In Baumgardner, Mahlon J., and Hoenstine, Floyd G. The Allegheny Old Portage Railroad 1834-1854. . . . Published by the authors, 1952.

Articles

Roberts, W. Milnor. "Reminiscences and Experiences of Early Engineering Operations on Railroads with Especial Reference to Steep Inclines." American Society of Civil Engineers Transactions VII (August 1878): 197-215.

Pamphlet

Welch, Sylvester. Sylvester Welch's Report on the Allegheny Portage Railroad 1833, (York, Pennsylvania: American Canal and Transportation Center, 1975), 22 pp.

Reports

U.S. Department of the Interior, National Park Service. "Historic Resource Study Allegheny Portage Railroad National Historic Site, Pennsylvania," by Anna Coxe Toogood. Denver, May 1973.

_____. "Historic Structure Report. The Lemon House. Allegheny Portage Railroad National Historic Site, Pennsylvania. Archeological Data Section," by Kathleen Fiero. Denver, 1983.

_____. "Historic Structure Report. The Lemon House. Allegheny Portage Railroad National Historic Site, Pennsylvania. Architectural Data Section," by Penelope Hartshorne Batcheler. Denver, 1982.

_____. "Historic Structure Report. The Lemon House. Allegheny Portage Railroad National Historic Site, Pennsylvania. Historical Data Section." by Anna Coxe Toogood. "Architectural Data Section," by Norman M. Souder. Denver, July 1972.

The Mahlon J. Baumgardner and Floyd G. Hoenstine text is a good overview of the portage railroad's history. It contains information on the Summit Hotel, located on Plane 5 and reprints William Bender Wilson's history of the railroad.

J. Elfreth Watkins and William Bender Wilson's accounts of the Pennsylvania Railroad Company provided chapters on the portage railroad as an antecedent to the Pennsylvania Railroad system. Harry A. Jacobs provided an overview history of the portage railroad in relation to the canal system. The Welch text is a reprint of Sylvester Welch's primary source accounts of the railroad construction in 1833.

The geological surveys of Henry Darwin Rogers and F. and W.G. Platt did not provide detailed descriptions of the Lemon coal mine as hoped. These texts do provide general descriptions of the geology of Blair and Cambria counties.

Accounts of the portage railroad written by the engineers involved with its construction provided some construction information. Solomon W. Roberts' and William M. Wilson's writings in the 1830s and 1870s are excellent first-hand accounts.

The Eleanor Raymond, Margaret Berwind Schiffer and Charles Morse Stotz texts all provided comparative data for the Lemon House porch. Of these, the Stotz text was the most useful because it provided construction dates and other information concering western Pennsylvania architecture. The Raymond book contained photographs but no text.