

ALLEGHENY LIFT LOCK NO. 4 AND WEIGH LOCK
North shore of Allegheny River, 0.25 mile
northeast of 9th Street Bridge
Pittsburgh
Allegheny County
Pennsylvania

HAER No. PA-106

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HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
Department of the Interior
Midatlantic Support Office
U.S. Custom House
200 Chestnut Street
Philadelphia, PA 19106

Addendum to:
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PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

~~REDUCED COPIES OF MEASURED DRAWINGS~~

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Addendum to
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AND WEIGH LOCK

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Location: North Shore of Allegheny River, 0.25
mile northeast of 9th Street Bridge
Pittsburgh
Allegheny County
Pennsylvania
UTM: 17.584940.4478120
Quad: Pittsburgh East

Date of Construction: 1828. Altered 1833

Present Owner: Pennsylvania Department of Transportation,
Harrisburg, Pennsylvania

Present Use: None.

Significance: The Allegheny Locks were among the few
canal-related structures surviving in
Pittsburgh. The locks are near the western
terminus of the Pennsylvania Canal which
has been determined to be of national sig-
nificance by the Pennsylvania Historic and
Museum Commission for its role in the
history of American transportation.

Project Information: This documentation was undertaken in May,
1987 in accordance with an agreement
between the Pennsylvania Historic and
Museum Commission, the Federal Highway
Administration and the Pennsylvania
Department of Transportation as a mitiga-
tive measure prior to the construction of
Interstate 279/579.

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THE PENNSYLVANIA MAIN LINE CANAL IN ALLEGHENY AND PITTSBURGH

The completion of the Erie canal in 1825 caused alarm among Pennsylvania merchants who now saw New York City ascending above both Philadelphia and Baltimore as busiest American port. Philadelphia merchants formed the Pennsylvania Improvement Society to study British canal building technology and to develop specific recommendations for proposal to the Pennsylvania legislature. Pittsburgh was represented at a convention at Harrisburg on August 4, 1826 to discuss internal improvements. Western Pennsylvanians lobbied for a canal system joining the Ohio River and Great Lakes with the Delaware tidewater via a connection joining the Allegheny and Susquehanna rivers. Legislative acts of 1824, 1825, and 1826 promoted consideration and surveys of possible routes between the two rivers¹. In January, 1827, four delegates were appointed to represent Pittsburgh's interest in Harrisburg, and later that year, a general canal law was passed by the legislature. Surveys of proposed routes were conducted between Pittsburgh and Philadelphia, and the surveying engineers reported that the northern side of the Allegheny River was the only feasible route for the canal in Pittsburgh².

The Route of the Canal

An old sketch map from the state archives (RG 17, Map Book, Box 18; date unknown) depicts the canal route along the northern bank of the Allegheny River. The selection of the northern side of the Allegheny valley for the canal route posed a dilemma for Pittsburgh promoters of the canal. The location of the western terminus of the Pennsylvania Canal was a matter of heated debate among the citizens of Pittsburgh and the town of Allegheny³. The simpler scheme would have had the canal terminate in Allegheny Town, north of the Allegheny River. Pittsburghers, however, insisted on a route through Pittsburgh to the Monongahela River and eventually, they hoped the canal would be connected with the planned Chesapeake and Ohio Canal. A compromise planned for the construction of an expensive aqueduct over the Allegheny River and the excavation of a tunnel through Grant's Hill to carry the canal south to the Monongahela River.

The canal aqueduct over the Allegheny River entered Pittsburgh at Washington (now 11th) Street. A series of four locks was required both in Pittsburgh and in Allegheny Town to raise and lower the canal boats from and to the level of the rivers. The level of the canal in Pittsburgh was above the Allegheny River and it therefore dictated the elevation of the canal in Allegheny Town. To a large degree it controlled the routing on the northern side of the Allegheny River. Had the canal route closely followed the northern bank of the Allegheny River, it would have been necessary to construct locks to lift the boats to the level of the aqueduct across the river. The problem was solved by routing the canal in Allegheny Town along higher ground

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AND WEIGH LOCK
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well to the north of the river and extending the Pittsburgh branch canal on an earthen ramp south to its convection with the aqueduct over the river. This route also resulted in the creation of a single level that extended for a distance of 4.75 miles between Lock 4 in Allegheny Town and Lock 5, east of Pine Creek in lower Etna.

The Canal Locks in Allegheny Town

In the Board of Canal Commissioners Records in the Pennsylvania State Archives is a document (RG 17-W-2-b 24:8) entitled, "Specifications of the Dimensions and Manner of Building Locks on the Pennsylvania canal from Pittsburgh to Kiskiminnetas." These specifications provide precise details regarding the construction of the typical canal lock including the dimensions of the lock-pit, spacing and size of foundation timbers, floor planking, lock dimensions (90 feet by 15 feet from quoin to quoin 138 feet overall length), upper and lower lock configurations and architecture, shaping of the stone, iron-work coping, quality of the grouting, extent of the puddle bank surrounding the lock, the width of the landing (embankment) outside the puddle, etc. These specifications presumably predate the actual construction of the Kiskiminnetas to Pittsburgh section of the canal and therefore should date to 1826-27.

The configuration of Locks 3 and 4 and the associated weighlock are portrayed in another drawing, entitled "Locks No. 3 & 4, Alleghenytown & Collector's Office (date unknown)," also from the the State Archives (RG 17-W2-b 34:220). This drawing depicts Liftlocks 3 and 4 on either end of an intervening basin. On this same drawing, a weighlock is located parallel to and a few feet south of Lock No. 4. In this early drawing, the canal and locks seem to have been supported by earthen ramps, represented by hatching on the figures. In form and size, Lock 4 and the weighlock are similar, except the latter is closed and without quoins at its western end. (It also has a rectangular form portrayed over the chamber, possibly a structure for housing the weighing mechanism.)

Apparently associated with the operation of the canal locks are two buildings depicted in close proximity to the basin which separates the two lift locks. The smaller of these structures is apparently the collector's office identified in the title of the drawing; it is closest to the southern towpath that borders the basin between the two locks. The second building is positioned at an angle to the first, probably because it fronts on an alley (the future Hope Street). The lot enclosing the two buildings is very precisely drawn and its boundaries are labeled with their exact measurements (to the hundredths of a foot) and azimuths (i.e., degrees east or west of North).

Another drawing, probably copied from the previous drawing, shows the same configuration for the locks, buildings, and lot. It is entitled, "Lot at Locks Nos 3 & 4 in Allegheny Town," and is from the Record of the Land Office, Records of the Board of Canal Commissioners' Survey of Property (W2A26; date unknown). It differs from the original in that the word "Commonwealth" is printed across the lot that encloses the two buildings. Also depicted are a North-pointing arrow and the label, "Borough (sic) of Allegheny." This version probably dates from between 1828,

when Allegheny became a borough, and 1840, when Allegheny was incorporated as a third-class city.

Discrepancies between Early Drawings and Maps of 1830 and 1852

The Jean Barbeau and Lewis Morgan 1830 map (Pennsylvania State Archives, MG 11, Map Collection, #193-1 and #193-2) shows the Pennsylvania Canal lock complex in Allegheny Town and the Pittsburgh branch and aqueduct. The branch to Pittsburgh is stated and shown by shading to have been supported by an embankment. The main canal east of the Pittsburgh branch is depicted as occupying elevated ground, perhaps a cut-and-fill construction in a low bluff that extends east of Saw Mill Run. Liftlocks 3 & 4 are depicted, but no separate weighlock appears in this rendering. West of Lock 3, the canal route departs from the bluff-line that seems to mark the southern boundary of the Southern Commons of Allegheny Town and descends to a lower elevation, the difference representing the lifts in Locks 3 and 4 (approximately 19 to 20 feet). The embankment supporting the Pittsburgh branch terminated in a substantial masonry structure that supported the northern end of the aqueduct. This structure, in fact, is depicted in the 1832 painting by Russell Smith and appears to contain an archway for passage of the river road. The five-story Hope Factory or mill, located west of the Pittsburgh branch on the 1830 map, is clearly depicted in Smith's painting along with its chimney and smaller structures. Labeling on the 1830 map indicates that the aqueduct was constructed 35 feet above the low water mark, probably the height of the bottom above the water. The four liftlocks in Allegheny raised and lowered the canal about 39 feet. The two buildings shown on the drawing with the canal locks are not present on the 1830 map although the lot is clearly displayed. Most of the outlots (Nos. 42, 43, 45-47, 133, 138) north and south of the canal between the Butler Turnpike (present East Ohio Street) and the Allegheny River were owned by Voegtly according to this map, and no developments (i.e., platted lots, structures) are shown on these lots.

The 1852 McGowin map (State Archives MG 11 Map #69-2) depicts Liftlocks 3 and 4, but no weighlock. The Commonwealth's lot is shown, but not the Collector's Office or adjacent building. An unnamed structure is shown snuggled into the corner made by the Pittsburgh branch and the basin east of Lock 4. The Hope Mill, erected by Peter Schoenberger and John F. Wrenshall in 1828, is still present on Hope Street south of Lacock Street and this street is shown as extending east to, and perhaps through the Pittsburgh branch canal embankment. The cluster of tenements along Hope Street north of Lacock is not depicted in this map. East of the Pittsburgh canal branch, the above numbered outlots between the river and the canal are all platted and have streets. Both north and south of the Pennsylvania canal, the orientation of the streets in this area differs from that west of the Pittsburgh canal branch, reflecting, perhaps, the influence exerted by the coming of the canal on local settlements patterns.

The impact of the coming of the canal to Allegheny can probably be partly measured by the increase in population that occurred between 1830 and 1840. The area around Federal Street and Robison Street was well developed between 1830 and 1835. Manchester was laid out in 1832 and settled by English, Scot, and Irish decendants. In 1835, the town called Chatham was laid out on 150 acres east of Ferry Lane by Stephen Colwell, Charles Bradford, and others; it was eventually absorbed by Manchester and Allegheny. In 1840, Allegheny, with a population of 10,089, was chartered as a third class city⁴. Pittsburgh's population in that year was 21,515⁵. Between 1830 and 1840, Allegheny's population increased 360 percent compared with Pittsburgh's 171 percent increase.

RAILROADS COME TO PITTSBURGH AND ALLEGHENY

The coming of the railroads to Pittsburgh and Allegheny marked the beginning of the end of canal service. The Pennsylvania Railroad had initiated rail and horse-drawn coach service between Pittsburgh and Johnstown in September, 1851, and a year later offered complete rail service to Philadelphia⁶. The area of the canal basins between Penn and Liberty avenues and either side of 11th Street became the original center of railroad passenger and freight stations in Pittsburgh⁷. These include the first Pennsylvania RR station (1851-1854), first Union station (1854), original terminal of the Allegheny Valley RR (1856), temporary terminal for the Ohio & Pennsylvania RR (1857) and the second Union station (1865) at its present location. The original O. & P. RR terminal which opened in 1851 was in Allegheny City next to the canal.

The Pennsylvania Main Line Canal was purchased by the Pennsylvania Railroad in 1857 for \$7,500,000 after several years of negotiations with the Commonwealth over the sale price. The \$25,000,000 canal was thus sold for less than a third of its original cost. The canal must have continued to serve Pittsburgh and Allegheny for some time, but when the aqueduct burst in 1861 leaving several canal boats stranded in the Pittsburgh basins it was not repaired.

A venerable painting in the Duquesne Club in Pittsburgh shows a bird's-eye view of part of Pittsburgh and Allegheny, ca. 1858. It depicts the canal, the aqueduct and the Ft. Wayne railroad bridge, the elevated railroad alongside the canal in Allegheny, and the Hope Mill. However, Locks 3 and 4 are not portrayed, although two buildings, possibly the Lock Tender's quarters and the Collector's Office, are shown next to the canal.

The next map, entitled "Pittsburgh and Vicinity", dates from 1861 (Pennsylvania State Archives, MG 11, Map #30-10). This map depicts the canal and the aqueduct, but detail is lacking about Locks 3 and 4. In 1851, the Ohio and Pittsburgh Railroad (subsequently named the Pittsburgh, Fort Wayne, and Chicago Railroad)

with tracks along the City of Allegheny's south commons opened for service, and by September, 1857, it was extended into Pittsburgh on a wooden bridge that spanned the Allegheny River west of the aqueduct⁸. In the 1861 map, this railroad was situated adjacent to and immediately north of the canal between Lock 3 and Federal Street. Locks 1 and 2 and the canal basin at the 90-degree turn of the canal are adequately displayed. If these were still in operation, Locks 3 and 4 were obviously still functioning. Exactly when the canal ceased operating in Allegheny is not known, but the Western Pennsylvania RR laid its tracks on the canal right-of-way by 1865. The Pennsylvania RR had conveyed the canal from Freeport to Allegheny to the Western Pennsylvania RR in 1865.

Further use of the former canal property is revealed in the 1872 Sanborn Atlas. The Pittsburgh branch is missing and the ramp that supported it is occupied by an engine house and a turntable. The canal locks are not depicted, and the former canal right-of-way is occupied by two sets of tracks of the Western Pennsylvania Railroad. The WPRR Co. is shown as owner of the property between Hope Street, Voegtly Street, Lacock Street and the railroad tracks on the north. Interestingly, the Pennsylvania RR then owned the property west of Hope Street up to the Pittsburgh, Ft. Wayne, & Chicago tracks. Some of the tenement housing along Hope Street north of Lacock seems still to be present at the time this map was made. The Hope Cotton Mill is depicted in its regular location south of Lacock and east of Hope Street. A single railroad spur extends south from the WPRR tracks east of the engine house and behind (west of) a series of narrow properties and structures that front on Voegtly Street.

Street maps from the Allegheny City street records of the 1870s employed a base map that reveals an interesting, perhaps important aspect of Lock 4. Located right at the northern end of Hope Street, the lock complex comprises the double-gated lift lock which is separated by an islandlike bar from an unclosed sluiceway to the south. Liftlock 3 to the west features only one gate on this drawing. The canal is labeled, "Old Pennsylvania Canal," as if it had long been out of use. The right-of-way for the Pittsburgh, Fort Wayne, and Chicago RR is depicted as is the beginning of the branch canal leading to Pittsburgh. The base map may postdate 1857 and predates 1865 when the WPRRCo tracks were laid over the locks. No other features or buildings are depicted in the blocks north of Lacock Street between Grantham Street and Voegtly Street on this map.

The final map to be considered here is the 1882 Sanborn map. Like the 1872 map, it shows the turntable and engine house and the spur to Lacock Street behind the properties along Voegtly Street. The Hope Factory is labeled "chair factory" with Jas. M. Childs the owner of the property. "M. Voegtly" (sic) is printed across the lots either side of Voegtly Street north of Lacock. The Western Pennsylvania RR occupies the old canal

route, and, of course, there is no vestige of the Pittsburgh branch depicted. Only the names of North Canal Street and Canal Street remind us of the location of the canal.

SYNOPSIS

The Pennsylvania Canal came to Allegheny in 1828 and to Pittsburgh a year later. Its construction was a major engineering achievement, especially the erection of the aqueduct over the Allegheny River. Completion of the Pennsylvania Main Line Canal and Portage Railroad system over the mountains insured that Pittsburgh would remain an important transportation center west of the mountains and that the Commonwealth would continue to share in the western trade. The canal contributed directly to the development and prosperity of Pittsburgh and Allegheny, moreso the latter. The four locks in Allegheny were fully functioning, while those in Pittsburgh may never have served their intended mission.

Railroads replaced the canal system in Pittsburgh and Allegheny, actually using some of the canal right-of-way. In so doing, remnants of the canal, locks, and associated buildings have been partially preserved in Old Allegheny. These fragments of this once important complex are all that remain to inform present and future generations of the physical configuration and operational functioning of the liftlock and weighlock system in Pittsburgh. Since this was one of the earliest, if not the first, major hydrological engineering project in Western Pennsylvania, it is a significant historical resource.

Notes: ¹Erasmus Wilson, Standard History of Pittsburgh (1898), p. 117f; and Robert McCollough and Walter Leuba, The Pennsylvania Main Line Canal (Martinsburg, 1973), pp. 16-17.

²Wilson, op. cit., p. 119.

³McCollough and Leuba, op. cit., p. 49.

⁴Verna L. Cowin, Pittsburgh Archaeological Resources and National Register Survey (Pittsburgh, 1985), p. 304.

⁵Stefan Lorant, Pittsburgh: Story of an American City, (Pittsburgh, 1980) p. 601.

⁶Lorant, op. cit., p. 602.

⁷William P. McHugh, Archaeological and Historical Investigations at the Liberty Center Site, Pittsburgh, Pennsylvania (Monroeville, 1982).

⁸Lorant, op. cit., p. 603.

Part I - Historical Information

A. Physical History

1. Dates of Construction: 1828; Weigh Lock Added, 1833

2. Engineer: Nathan S. Roberts

3. Original and subsequent owners:

State of Pennsylvania	1828
Pennsylvania Railroad	1857
Pennsylvania Department of Transportation to date	1986

4. Builder: State of Pennsylvania

5. Alterations:

1833: Weigh lock was added parallel to south side of lift lock

6. Historical Context:

The Pennsylvania Main Line Canal System was authorized by the Pennsylvania legislature in a series of three acts passed between 1824 and 1826. The decade following the War of 1812 had left Pittsburgh in a state of economic depression following the cessation of the wartime demand for manufactured goods. Hard on the heels of already trying economic affairs came two events which seriously threatened Pittsburgh's supremacy as an entrepot between east and west. The opening and subsequent success of New York's Erie Canal had a tremendous psychological effect in goading the Pennsylvania legislature to act. The decision by Congress to extend the National Road across the Ohio River at Wheeling rather than Pittsburgh had, however, a greater economic impact.

Pennsylvania's first response was to incorporate several turnpike companies and by 1818 a road was completed from Philadelphia to Ohio. The roads were difficult and expensive to maintain and uncomfortable to travel. As a result, a powerful lobby of Pennsylvania business men convinced the legislature to begin the construction of the Main Line Canal.

The canal was completed at a time when the future supremacy of the railroad was already foreshadowed. Portions of the system, in fact, depended upon moving the canal boats, dismantled in sections, by rail. The canal system as a whole soon fell prey to the superior economic benefits of moving goods and people by steam railroad.

Part II - Architectural Information

A. General Statement:

The Allegheny Lift Lock incorporated technology which was first developed in England and was in use in the lock systems of other canals in the United States, most notably the Erie Canal in New York. The weigh lock would have contained an enormous cradle and balance beam mechanism; a good example of the engineering skills available at the time.

1. Architectural character: Linear
2. Condition of Fabric: Deteriorated but stable at time of excavation

B. Description of structure:

Lift lock: The lift lock consists of two parallel stone walls constructed on a foundation of perpendicular oak sleepers. The floor and interior walls are planked with a double thickness of overlapping pine boards. The two open ends are closed by two sets of double mitre gates. Water intake and exhaust was accomplished by means of small paddle or "wicket" gates in the mitre gates.

Weigh lock: The weigh lock is parallel to and south of the lift lock. It is constructed in a similar manner with the exception that it is open at only the east end. During operations this opening would have been closed by a single gate. The distal end of gate was supported by a wheel running along an iron track.

1. Overall dimensions:

Length of lift lock: 138 feet
Interior width of lift lock: 15 feet 4 inches
Depth of Lift: 6 feet
Length of weigh lock: 129 feet 6 inches
Width of weigh lock: 18 feet 4 inches

2. Structural system: sandstone and wood

C. Site

Entire system: Philadelphia to Pittsburgh, Pennsylvania
Project site: North side of Pittsburgh, parallel to South Canal Street between Anderson Street and Madison Avenue, just north of East Lacock Street.

1. General Setting and Orientation:

Allegheny Lift Lock No. 4 and the Weigh Lock are situated in a major transportation corridor, the construction of

which has necessitated its removal and this HAER documentation. Construction plans call for the erection of an elevated railroad bridge paralleling the weigh lock with access ramps feeding from Interstate 279/579 between the bridge piers which would traverse the entire lock complex. Portions of the lock structure were removed for preservation off site and the rest will be demolished during construction.

Part III - Sources of Information

A. Maps

"Sketch map of the Pennsylvania Main Line Canal," Pennsylvania State Archives (PSA), Record Group (RG) 17, Map Book, Box 18

"Locks No. 3 & 4, Alleghenytown and Collector's Office," PSA RG 17-WZ=b 34:220.

"Lot at Locks Nos 3 & 4 in Allegheny Town," Record of the Land office, Records of the Board of Canal Commissioners' Survey of Property (W2A26).

"Jean Barbeau and Lewis Morgan 1830 map," PSA, MG 11, Map Collection, #193-1 &193-2.

"McGowin 1852 map," PSA, MG 11, Map #30-10

"Pittsburgh and Vicinity (1861)," PSA, MG 11, Map #30-10.

Sanborn Atlas (1872), Western Pennsylvania Historical Society.

"Allegheny Street Map," Western Pennsylvania Historical Society.

2. Documents

"Specifications of the dimensions and manner of building locks on the Pennsylvania Canal from Pittsburgh to Kiskiminetas," PSA, RG 17-W-2-6 24:8

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