HISTORIC STRUCTURE SURVEY

BROAD RUN TRUNK

CHESAPEAKE AND OHIO CANAL NATIONAL HISTORICAL PARK

MD.–D.C.–W.VA.

Edwin M. Dale, Superintendent
John F. Luzader, Park Historian
Charles H. Blake, Park Engineer

September 1961
Karen M. Gray, Ph.D., Editor, August 2008

DENVER SERVICE CENTER
HISTORIC PRESERVATION DIVISION
NATIONAL PARK SERVICE
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ADMINISTRATIVE SECTION

Edwin M. Dale
Superintendent
September, 1961

From a review of the historical data, evidence of the remains of the last trunk structure used during canal operation and the report of the Park Engineer, the following is recommended:

1. That the utilitarian bridge built by NPS forces in 1961 on the site of the mule bridge be continued in general service until restoration of the canal, towpath and structures between Edwards Ferry and Whites Ferry are completed and until access to the towpath at some intermediate point is available.

The bridge referred to is not a reproduction or facsimile of any bridge structure known to have existed during the operating life of the canal. Bridging of this break in towpath continuity was necessary for visitor use of the towpath and for maintenance and construction operations.

2. Historically, Broad Run was originally spanned by a stone masonry culvert which was carried away by high water. The first “trunk” was used 5 years before rebuilding. It is probable that there were additional major alterations made before the final structure was built, remains of which are still in place. It also seems probable that photographs or other evidence will be found before it becomes necessary to rebuild for conveyance of water. It also appears probable that the final structure was quite similar to the first.

Therefore it is recommended that final determination of the details of reconstruction be held in abeyance until watering is imminent and that at that time the trunk be rebuilt to the latest specifications available, including consideration of the Fisk specifications and sketches very recently discovered by the Park Historian, if they are the only specifications available.

3. That efforts consistent with the historical value of the structure be made to preserve the remaining portion of the trunk and that suitable fencing or barricades be erected to prevent use of the old “trunk” by man or beast.

HISTORIC STRUCTURE SURVEY

BROAD RUN TRUNK

C & O CANAL NATIONAL MONUMENT

HISTORIC DATA SECTION

John F. Luzader
Park Historian
September, 1961

The structure that spans Broad Run is the only one of its type on the Chesapeake and Ohio Canal that is constructed of wood, and as such, it poses some problems peculiar to itself and is worthy of restoration and interpretation.

This report presents all of the documentary information that has been collected and studied concerning the subject structure.

Before discussing the physical history of the trunk it might be well to identify the function of this structure. The trunk and its predecessor, the culvert, served to carry the line of the canal across the tributary stream, Broad Run. Its role was identical to that of a bridge in that it conveyed the route of the line over an obstacle. In brief, a culvert, a trunk and an aqueduct served identical purposes. Their designation depended upon the length of span and, to a certain degree, upon arbitrary terminology.

One problem that immediately became apparent was concerned with the identification of the structure. Identified as an aqueduct in all current comments, and conforming to that classification in its structural and functional nature, the search for information was directed accordingly.

Noting that the aqueduct over Seneca Creek was the first on the system and that the records of the C & O Canal Company so identified it, the next step was to identify the next aqueduct upstream, i.e., the Broad Run structure as Aqueduct No. 2. It was at this point that the confusion of identification became apparent.

In searching for data concerning Aqueduct No. 2, it was noted that the contractors for the construction of that structure was Hovey and Legg.[1] Doubt concerning the identification of the structure resulted when it was noted in a letter written by President Mercer that implied that the contract was for a span across Monocacy River.[2]

The record of the December 7, 1829, meeting of the President and Directors contains the following entry:

> The Engineer-in-Chief reported that Alfred Hovey, the contractor for Aqueduct No. 2, had abandoned his contract and left the work.

The following Preamble and Resolutions were then adopted:

> It having been reported to the Board by the Engineer-in-Chief and by the Inspector of Masonry, that the execution of the work on the Monocacy Aqueduct was in many parts unfaithfully done,

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1 *Journal of the President and Directors*, C & O Canal Co., National Archives.
2 *Ibid*., September 25, 1829.

> notwithstanding repeated remonstrances made by them to the contractor, Mr. Hovey, and also, it being reported that said Hovey has since abandoned the work and gone off.[3]

From the above information, it was apparent that Aqueduct No. 2 was the Monocacy Aqueduct. If this was so, what was the structure at Broad Run? The answer seemed to be that it was a culvert. While this deduction helped to solve the problem of identification, it remained necessary to determine the Company's designation of the Structure. There were many culverts, and they were usually identified by either number or by the construction section on which they are located.

After an effort to determine the number of the culvert had failed to result in a positive identification, a search of the reference to construction contracts was made. This resulted in finding that a contract was let to Albert Hovey, one of the contractors for the Monocacy Aqueduct, the one who had abandoned that contract, for the construction of a culvert over Broad Run on Section 53 on October 1, 1829.[4]

While the contract for the culvert was let in the autumn of 1829, construction apparently did not begin until sometime in 1831. This may have been due, in part, to Hovey's financial difficulties, which resulted in his leaving the partnership of Hovey and Legg.[5] Another contributing factor was the scarcity of labor, especially skilled, which operated to delay construction along the entire line.[6] The procurement and transportation of stone and hydraulic mortar were time consuming; and the fact that the contractor was engaged in the construction of other works contributed to the delay.

Hovey's withdrawal from the construction work on the canal probably left the work on the structure at Broad Run to his erstwhile partner, Legg.

While no information has been located giving the date on which operations were begun at Broad Run, the report of Colonels John J. Abert and James Kearney of the Engineers, U. S. Army, indicates that the work was well advanced when they made their inspection during the first half of 1831. Their report stated, "About one mile beyond Lock No. 26 [25], there is constructing an arched stone culvert, for the delivery of Broad Run. It will have a span of sixteen feet. The masonry of the abutments is completed, and ready to receive the skewbacks. The abutments appeared to be well laid, and the stone used equally well selected."[7]

Work did not progress very rapidly during the summer of 1831, and in November President Mercer wrote to the Resident Engineer, Albert Cruger, urging him to expedite the construction of the culvert over Broad Run.[8] However, this letter, in itself, does not necessarily mean that the construction was proceeding with undue tardiness. President Mercer frequently visited the line, interfered with construction, and was a constant source of irritation to the engineers and contractors. It required all of Chief Engineer Wright's tact to preserve a reasonable degree of harmony between the Canal Company and its employees.[9] Mercer was devotedly interested in the welfare of the Canal, but he was also an annoying busy-body. In December, Mercer was pessimistic about the prospects of completing the culvert during the winter of 1831–2.[10]

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3 *Ibid*., Dec. 7, 1829.
4 *Ibid*., Oct. 10, 1829.
5 *Ibid*., Dec. 7, 1829.
6 Every contractor and engineer complained of the paucity of labor and the quality of that which was available.
7 *Report on Condition of the Chesapeake and Ohio Canal*, Lt. Cols. J. J. Abert & J. Kearney, June 13, 1831, Military Records, National Archives.
8 Letter, Mercer to Cruger, Nov. 25, 1831, Records of the C & O Canal Co, National Archives.
9 Numerous entries, Engineer's Letter Book, 1828–1832, Records, C & O Canal Co., National Archives.
10 Letter, Mercer to Matthews, Dec. 3, 1831, Records of the C & O Canal Co, National Archives

The Records of the Canal Company do not contain any further direct reference concerning the progress of construction of the Broad Run Culvert. Whether the cholera epidemic of 1832 affected the building of the structure is not clear. The fifth annual report of the Canal Company stated that, "All the works, under contract, were more or less retarded by this epidemic, which spread alarm in every direction."[11] If the structure was completed by the end of autumn of 1832, as seems probable, the epidemic was not a factor. However, if the work continued into the autumn, the sickness probably slowed construction.

The culvert was certainly completed by the middle of 1833, because the fifth annual report declared, "By the 1st of July, a boat will be able to enter the canal from the mouth of the Shenandoah, in the midst of Harpers Ferry falls, and from the bed of the Potomac, at the head of these falls, which have hitherto constituted the most formidable obstruction above the mouth of the Seneca to the navigation of the river."[12] This conclusion is supported by Captain William Gibbs McNeill's report in which he described in the "32 culverts on the first 22 miles contiguous to and below the Point of Rocks" as including "1 of 2 arches of 16 feet span each." This culvert was the one spanning Broad Run.[13] He noted that "The masonry of one of the above culverts (that of two arches of 16 feet span each), containing 1,100 perches, cost $5,807; the stone of which were boated 8 miles, and hauled nearly half a mile. . . "[14]

Canal Company records are silent on the subject of the Broad Run Culvert until 1846, a period of thirteen years. 1846 was a year of "freshets." There were five such floods, occurring on the following dates: March 12; May 10; May 17; July 1 and November 2. These accounted for a total of sixty-nine days of interrupted navigation from March 10 to December 1.[15]

The most serious of these was that taking place on July 1, which interrupted navigation for the entire month of July. The reason for this stoppage was the destruction of the culvert at Broad Run. The first information reported was sent by William Elgin, the Superintendent of the First and Second Divisions, to President J. M. Coale:

> ….The heavy rain and high water have done considerable damage on the level between Lock No. 25 & 26. 1st the Broad Run Culvert, of 2 arches of 16 feet span each, have been from appearances entirely swept out and . . . Taken a boat laden with Flour and Whiskey out with it. Embrey of Wms Port Boat a Total Loss some of the laden saved But much damaged.[16]

Upon receipt of the above, Coale wrote to Charles Fisk, the Resident Engineer, as follows:

> I have received reports from Mr. Elgin. The canal has suffered considerably from the recent freshet but not so badly as I feared it would. . . . The Broad Run Culvert, 2 arches 16 feet span, between Locks 25 & 26 has been destroyed. . . [17]

Before Fisk received Coale's letter, he wrote to the President reporting the damage and suggesting a repair, saying:

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11 *Fifth Annual Report* (1833), C & O Canal Co, National Archives

12 *Ibid*.

13 *Report of Capt. Wm. G. McNeill on the Condition of the C & O Canal*, Dec. 1, 1833, Military Records, National Archives.

14 Letter, Coale to Fisk, July 5, 1846, C & O Canal Co., Records, National Archives.

15 Letter, Stone to Fisk, C & O Canal Co. Records, National Archives.

16 Letter, Elgin to Coale, July 2, 1845, Records of the C & O Canal Co., National Archives.

17 Letter, Coale to Fisk, July 5, 1846, Same Source.

> . . . . The Broad Run Culvert of two arches, 16 feet span each, is entirely carried away. It is possible that some portions of the abutments may be left, but it is doubtful. The arches are wholly gone. The towpath and berm and the whole width of the canal for about 70 feet at the culvert is entirely washed away. A wooden trunk must be put in, which may be done I think in three weeks after the river falls.[18]

Embrey, whose boat and its cargo were lost when the culvert collapsed, described the event in the two letters quoted below:

> To the Board of Directors, Chesapeake and Ohio
> Canal, Company
>
> Gentlemen:
>
> The petition of the undersigned respectfully represents that on the 29th of July 1846 he left this port with his boat laden with Flour and Whiskey destined for the District Cities. That he passed on his way through the rain for two days. That on the second day whilst approaching the Lock near Edwards Ferry he discovered that the current on the canal was getting rapid but supposed that (on account of the fullness of water in the level) the Lock Keeper was drawing off water he kept his course and when near the culvert discovered that there was a break ahead. He stopped the horses immediately, as soon as he could he cast the boat ashore, got out and with his lines and all the force he could command endeavored to stop the Boat but finding nothing to which he could attach our lines we were unable to check her in the least. The Boat went on until she came to a large break in the Tow path of the canal out of which she passed rapidly and came in contact with a tree and was broken asunder. . . . [19]

In a letter to Fisk, Embrey added:

> . . . . the matter (compensation to Embrey for his loss) seemed already settled in your minds that I was entitled to nothing, and went on to give the reasons why, as follows that I was warned of danger and still would persevere. I at once said false every word of it, he asked me if there was not a boat ahead of me at Mr. Getthers Lock, that the said Boat should not go on the level for fear of danger. I told him we passed the Henry Clay of Washington at Monocacy, which was the Boat I supposed he alluded, that we saw nothing more of the Boat after we passed Walters Lock until we returned to Fethers Lock on our way home, where we saw the Boat referred to, he asked me if I was not informed that there was a break in the canal, I told him I was informed of a break at Wheelers Culvert but after stopping the Boat and examining the break I thought I could pass it with safety and done so, but had no information from any source of the break which proved to be the destructive one. . . .[20]

The destruction of the culvert was complete, and occurring as it did, in mid-summer, the resultant stoppage was serious. The Company officials were, therefore, interested in restoring navigation as quickly as possible. To that end, both Elgin and Fisk recommended that the culvert be replaced with a wooden trunk.[21] This was immediately undertaken; and Canal Company records

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[18] Letter, Fisk to Coale, July 6, 1846, Same source.
[19] Letter, Embrey to president and Directors, n.d., Records of the C & O Canal Co., National Archives.
[20] Letter, Embrey to Fisk, Oct. 19, 1846, Same Source.
[21] Letter, Coale to Fisk, July 5, 1846, Same Source; Letter, Ringgold to President and Directors, n.d., Same Source.

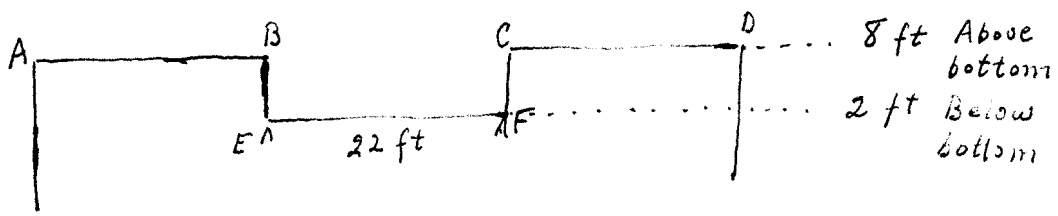
contain no details of the plan for the substitute structure, which was apparently intended to be a temporary expedient. The timber and lumber of the Trunk cost approximately $2,000.[22] No data has been preserved regarding the masonry, which constituted the most difficult and expensive part of the work. New wing walls were constructed, probably of stone salvaged from the wrecked stone culvert.

The work was accomplished with considerable speed, and navigation was resumed on August 1.[23]

The new trunk served to carry the canal over the stream until October 1851. On the 20th of that month, Superintendent Elgin wrote to Chief Engineer Fisk from Broad Run:

> "On the evening of the 23rd the Trunk at this place gave away and the east end, as far as the Truseling, has broken down. On the night of the 22nd, some boat passing up ran against the berm of the east wing and set it to leaking quite heavy. But on Thursday morning, the leakage was stopped, and remained so until the evening about 4 o'clock; at which time, it suddenly gave way, and in the course of 15 minutes was a total wreck. I was at Seneca myself at the time of this occurrence and did not learn of it until sometime during the night; as the Packet came up soon after, I went right up in it; and looking at it in the dark I was of the opinion the navigation could be restored in 10 days from this time. But since removing the wreck; & as I shall take this opportunity to put up the wall under the trunk permanently, I do not low think I shall be able to restore the navigation before the 7th or 8th of next month. . . .[24]

The rebuilding of the trunk was commenced within a few days. After clearing the site of the wreckage of the collapsed structure, the construction of the masonry was undertaken. The following "longitudinal vertical section" of the stone work was drafted by Chief Engineer Fisk:



AB and CD should be equal, say 31 feet each, making 86 feet in all.[25]

Timber was ordered for the trunk in the following quantities:

52 pieces x	10 inches x	6 inches x	40 feet
4 pieces x	9 inches x	6 inches x	40 feet
10 pieces x	8 inches x	6 inches x	40 feet
4 pieces x	7 inches x	6 inches x	40 feet[26]

22 Letter, Elgin to Coale, Aug. 18, 1846, Same Source.
23 Letters, Stone to Fisk, n.d., Records of the C & O Canal Co, National Archives
24 Letter, Elgin to Fisk, October 26, 1851, Records of the C & O Canal Co, National Archives
25 Letter, Fisk to Elgin, November 19, 1851, Records of the C & O Canal Co, National Archives
26 Letter, C. B. Fisk to J. Lambie, November 18, 1851, Records of the C & O Canal Co, National Archives

A detailed plan was prepared by Fisk and sent to Elgin. This plan, which is reproduced and accompanies this report [see Appendix A], is the only one concerning the structure at Broad Run that has been located.[27]

For the next decade, the temporary wooden trunk continued to serve well enough that no references to it were made on the records of the Company. However, by 1856 the structure had deteriorated to such a point that maintenance was no longer feasible. Accordingly, it was decided to rebuild the structure, as a wooden trunk, while navigation was suspended during the winter months of 1856–7.[28]

Work on the new culvert was begun early in the winter, and by January 17, 1857, Wade, the Superintendent for the Division reported to Ringgold, the Company's treasurer, that:

> By this you will learn that about one third of the masonry at this place is now done. The water-tables are completed and the front and rear sills are laid out and ready for the reception of the floor of the Trunk.
>
> So far our progress is very satisfying. I regret to say that there may (necessarily) be some delay in getting the castings for the braces on account of the inclemency of the weather. Should this turn out to be true, I will so engage the mechanics as to lose but little time.[29]

On January 20, Wade described the mule bridge for the new trunk as being built with an inverted truss "tied to the center bottom Timber of the Trunk", with a rail thirty-nine inches high.[30]

Four days later, Wade reported to Ringgold:

> Since my last report, very little has been done owing to the inclemency of the weather.
>
> Only about two days were suitable for working at the masonry at Broad Run and also of all other points of operations. The removal of sand bars & the carpenters work being much retarded. I may here remark that the castings at Broad Run were not ready as soon as expected. I have however, with much difficulty, opened the road & hauled a portion of them & also the timber for braces in the trunk. The balance will be in place by the middle to next week.
>
> You will bear in mind that the above mentioned materials were not needed under the <u>original plan</u> as understood or they should have been in place before the close of navigation.[31]

Although the weather continued to retard the work on the new trunk, Wade was able to report to Ringgold that the work was complete on March 9.[32]

While a plan for the new structure was prepared, it has not been preserved in the Canal Company records. It was probably used in the field and never returned to the Company office. This was the case in many of the canal projects. Reproduction was difficult and costly, and the original copy was often the only one prepared.

No other reference has been located in the canal company papers relating to the trunk at Broad Run. Repairs were, undoubtedly, made over the years, but no substantial work seems to have been undertaken between 1857 and the suspension of navigation in 1924.

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27 Records of the C & O Canal Co, National Archives
28 Letter, Ringgold to President and Directors, n.d., same source.
29 Letter, Wade to Ringgold, Jan. 17, 1857.
30 Letter, Wade to Ringgold, Jan. 20, 1857, same source.
31 Letter, Wade to Ringgold, Jan. 24, 1857.
32 Letters, Wade to Ringgold, Feb. 26, 1857 & Mar. 9, 1857; Stake to President and Directors, Mar. 1, 1857.

The trunk in now in a ruinous condition. Much of the flume is gone; and the mule bridge has disappeared. The accompanying photos will illustrate its current appearance and give some idea of its historic character [see Appendix B].

Recommendation

Because the only detailed description of the Broad Run Trunk that has been preserved is the plan for the 1851 structure, the writer recommends that the Trunk be restored to the period 1851. While the structure of that period represents neither the earliest nor the latest years; the fact that we have the above plan justifies the reconstruction of the 1851 trunk.

The reconstruction will serve to illustrate a stage in the Company's development and the expedients employed in the repair and maintenance of the Canal system.

Bibliographical Note

Except for the two reports of the U. S. Army Engineers' Lt. Col. J. J. Abert and Jas. Kearney, *Report on Condition of the Chesapeake and Ohio Canal*, June 13, 1831, and Capt. Wm. G. McNeill, *Report of Capt. Wm. G. McNeill on the Condition of the Chesapeake and Ohio Canal*, December 1, 1833, which are in the Military Records of the National Archives, all of the sources in this report are from the *Records of the Chesapeake and Ohio Canal Company*, located in the Interior Section of the National Archives.

Promising sources in the Library of Congress and the writings of travelers were also consulted, without finding information that shed light upon the nature and appearance of the structure at Broad Run.

Four former employees of the Chesapeake and Ohio Canal Company: Captain Raleigh Bender and Mr. Ray Bender of Sharpsburg, Md., and Mr. and Mrs. Harvey A. Brant, of Williamsport, Md., were also questioned about the appearance of the subject Trunk. Their memories were too vague to be useful.

HISTORIC STRUCTURE SURVEY

BROAD RUN TRUNK

C & O CANAL NATIONAL MONUMENT

ENGINEERING DATA SECTION

Charles H. Blake
Park Engineer
September, 1961

Original construction of structure at Broad Run Trunk is vague and there has not been uncovered a great deal of factual information regarding it. However, it is believed by the writer that this structure was originally a culvert consisting of two sixteen foot arch spans built in 1833. Subsequently in 1846 severe freshets washed out this structure almost entirely, proving its inadequacy in calculating the run-off and carrying capacity of the original designed culvert structure. To bridge the entire span by an aqueduct (trunk) would to some measure correct the deficiency in opening, by increasing the water-way by at least one third more carrying capacity. Seemingly this has been sufficient as it has not been washed out since its 1857 rebuilding.

The original wooden trunk (aqueduct) built in 1846 was constructed in such a hurry that it did not last long since a later report shows that it had deteriorated beyond repair and a new one had to be built in 1857, and if this is the present one now occupying the site it surprises me for timbers exposed to last over 100 years. The photographs show, and it is evident on the site, that these timbers are not the type to last and it only follows that since no preservative was used this structure had periodic, possibly annually when shut down for the winter, repairs and rehabilitation jobs done on it.

The present condition of the wooden structure is in a dangerously dilapidated condition, beyond repair with no parts useful for its rehabilitation or reconstruction.

It is recommended that research be made and drawings prepared so that a facsimile of its nearest approach to usefulness of the original structure be made before it is rebuilt. I suggest that the superstructure be modified from timber to steel and covered with timber that has been through a preservation treatment for longer lasting service. This will require a structure at least fifty (50) feet long to span the creek and utilize the abutments now in place.

Nomenclature of Some of the Terms Used

Trunk—Consists of a structure open at both ends for the purpose of allowing something to pass through, over, or along it, such as a flume and/or and aqueduct. (Therefore Broad Run Trunk becomes an aqueduct.)

Flume—An open channel for conveying water for some special purpose, such as waterpower. Frequently constructed of lumber having boards placed in the direction parallel to the flow, often planed on the wetted side, also constructed of concrete, brick, stone, etc.

Aqueduct (Viaduct)—Terminology used at C & O Canal is of the grade open flow type of artificial conduit built to carry water at atmospheric pressures on a normal hydraulic gradient and resting on multiple arches when spanning valleys or streams.

Arch—Is a curved beam as used in structures on the C & O Canal and is made of stone block (called voussoir), brick, concrete, steel, whose supports are able to exert lateral as well as vertical forces to resist the action of any applied loads. These lateral forces are in the nature of thrusts which act inwardly toward the center of the arch span. The curvature of the beam must be in an upward direction in order to develop lateral reaction forces which will act in the required direction. A tied arch is a structure in which the lateral forces are applied by means of an horizontal tension-member (tie-rod) connecting the ends of the arch.

Tie Rod—Is a slender structural rod capable of carrying tensile loads only and is usually used to supplement a bent which is designed to carry lateral as well as vertical loads and is a transverse frame that forms an integral part of a structural unit or that supports another structural unit. They can be made of wood or structural steel.

Canal—Is a navigable waterway built primarily for the purpose of conveying water from one point to another, by-passing portions of the Potomac River, which cannot be navigated by barge and is generally known as a hybrid type composed partly of artificial canal and partly canalized river. Where the profile is on a gradient, locks are employed to divide the waterways up into a number of adjacent steps, and the lock is a short section, just large enough to accommodate the longest boat. By means of gates the lock section may be shut off from both adjoining sections of the canal. Valves control the inlet of water to the locks; the operation of which is as follows: A boat proceeding upstream in the canal approaches a lock. The water level in the lock being the same as that in the section containing the boat, so then the gates between the boat and the lock are opened, permitting the boat to enter the lock at the lower water level. The gates are then closed, and water is admitted through the valves from the higher level. As the water rises in the lock it carries or raises the boat with it. When the water level in the lock equals that in the adjacent canal section the gates are opened on that end and the boat is then free to proceed along the canal at the higher level. (The adverse is true when descending.)

This canal was built by simply excavating earth and rock, and having little or no water movement within except where sudden flows of water are made by opening of lock gates when a boat passes through. In this case rip-rap or dry-laid stone revetment walls are placed to reduce erosion. Canals of the earth and stone type are subject to extreme erosion if the flow of water exceeds a critical velocity. On the other hand, should the water flow too slowly there may be silting up of the canal by earth material released from suspension. There is a critical velocity however at which neither silting nor erosion will occur. This may be calculated by the use of empirical formula, and velocities from one to four feet per second are employed, depending upon the nature of the soil, although usually the movement of the boats is sufficient to give the required velocity in this trapezoidal shape.

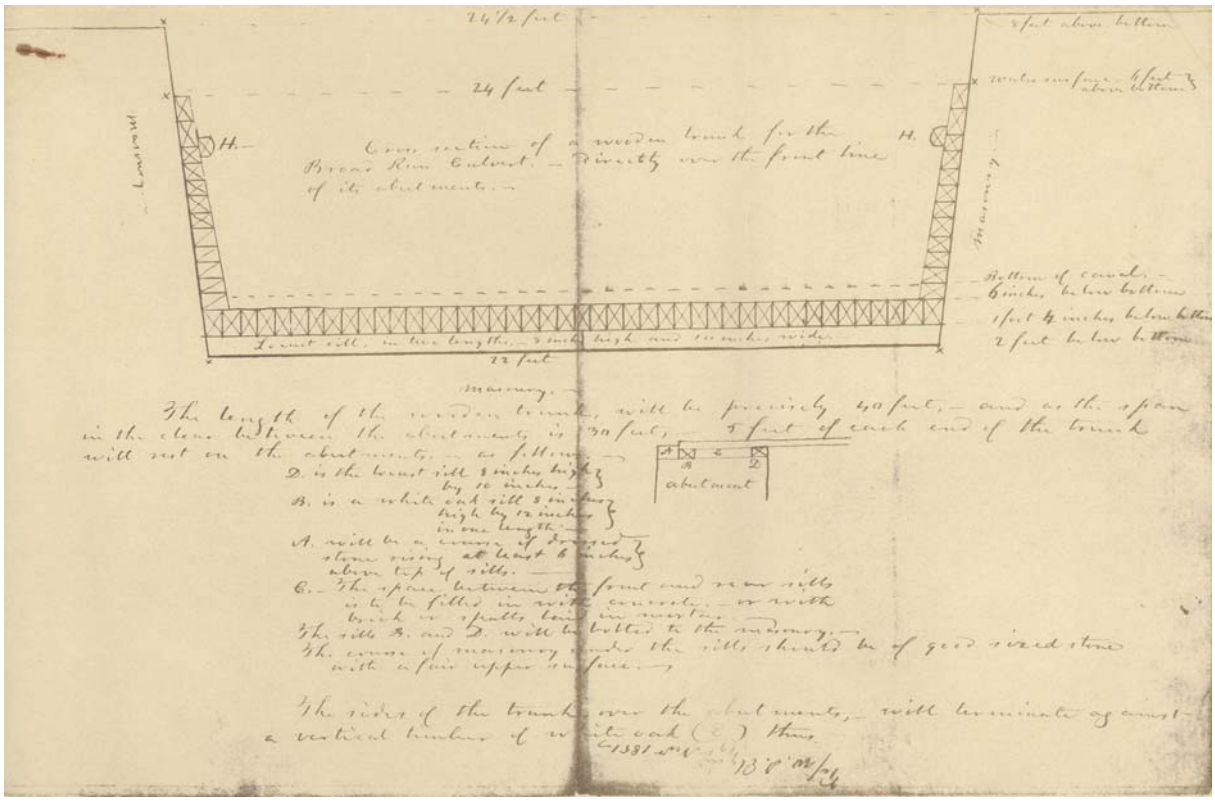
Culvert—Is an artificial waterway for carrying water under an obstruction and is composed of a barrel completely enclosed and covered by a fill, and headwalls at the ends of the barrel. The headwalls prevent erosion of the soil adjacent to the culvert and divert the water into this barrel. They can be round, rectangular, or arched over a curved invert.

APPENDIX A

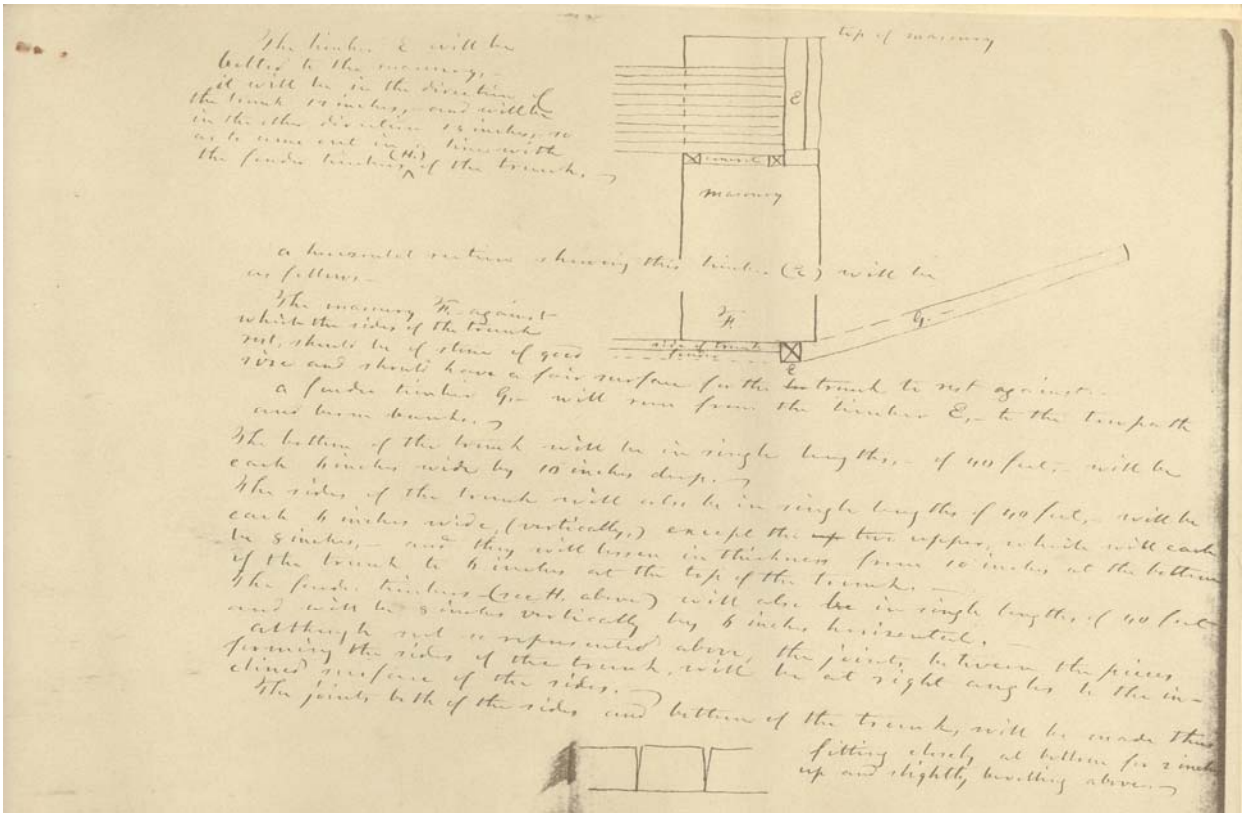
Detail Plan for Wooden, Broad Run Trunk

By Charles M. Fisk, Chief Engineer, Nov. 19, 1851

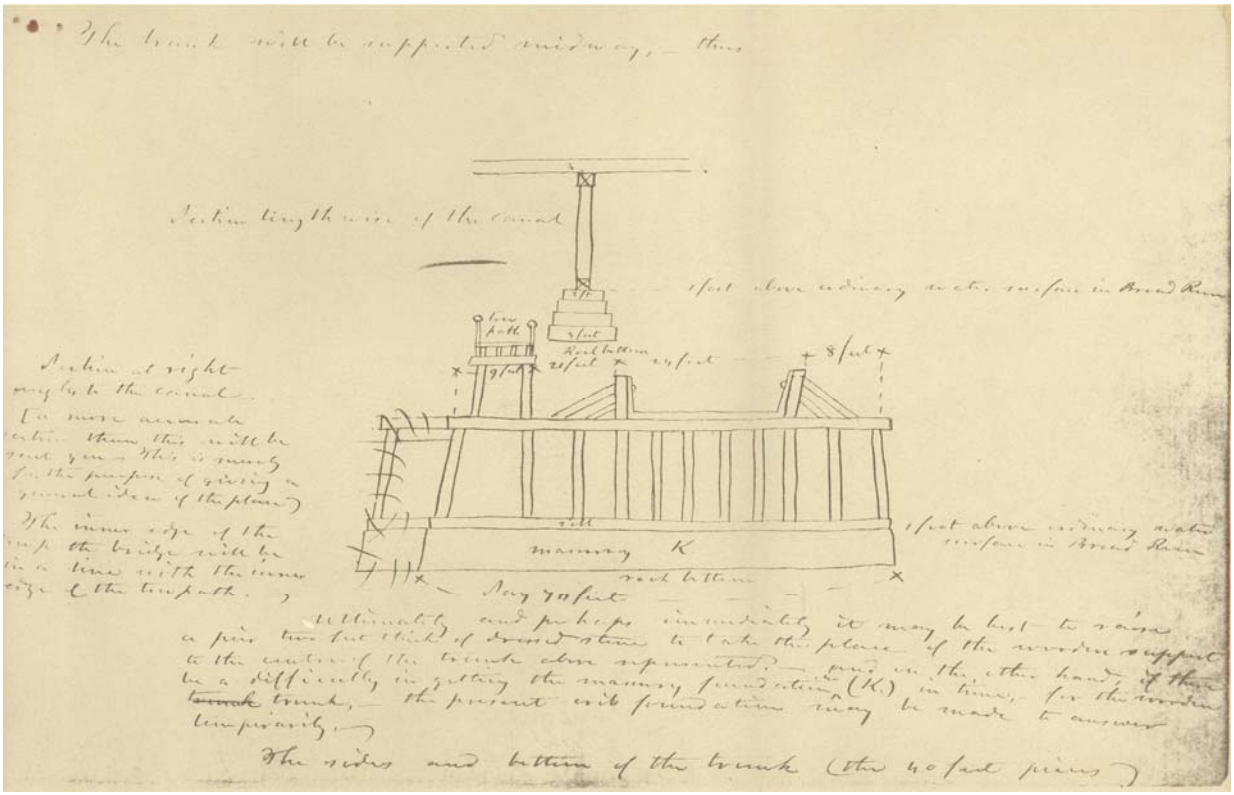
Sheet 1 of 4



Sheet 2 of 4



Sheet 3 of 4



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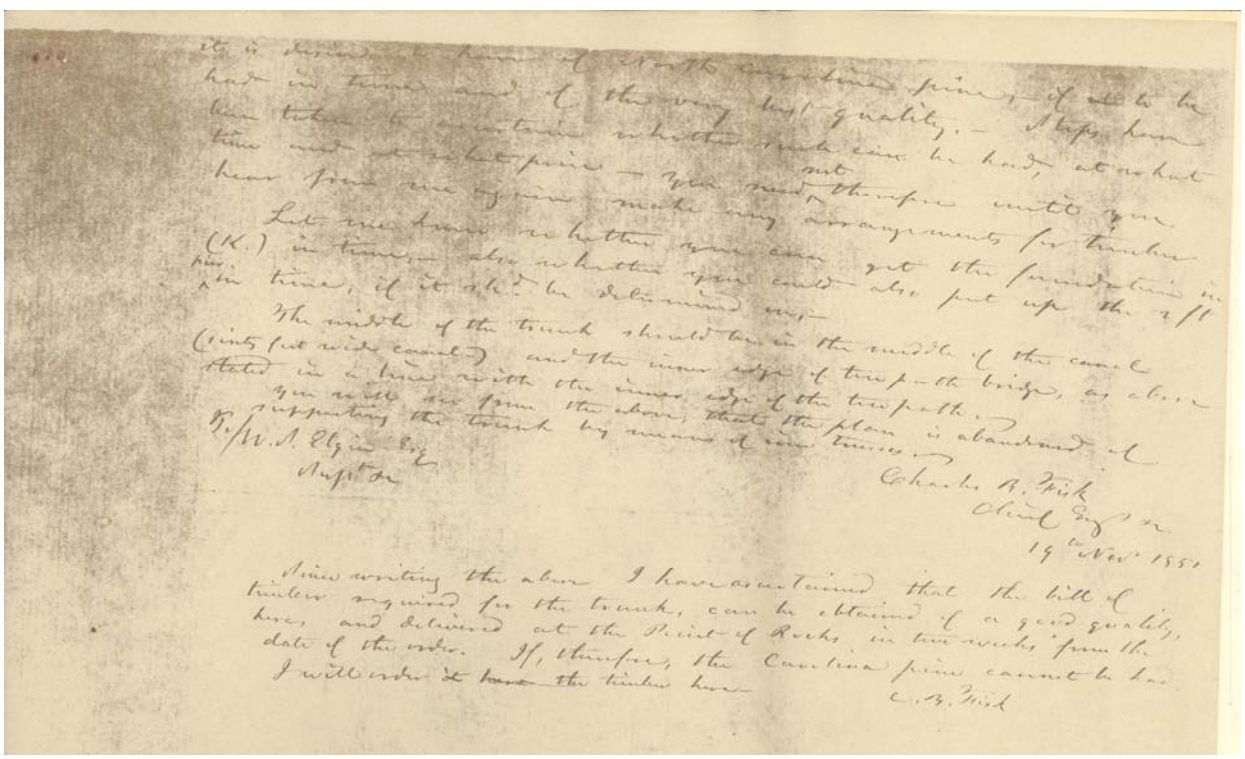


Appendix B

Photo documentation of Broad Run Trunk

By John F. Luzader, Park Historian.

Photo #1: This photograph was taken from downstream of Broad Run, looking upstream at the towpath side of the trunk. The mule bridge spanned the stream on this side of the flume. Note the masonry, laid in 1857, and the inverted truss that supports the Trunk.

Photo #2: This photograph was taken from upstream of Broad Run, looking downstream at the berm side of the Trunk. Note, again, the masonry and the inverted truss.

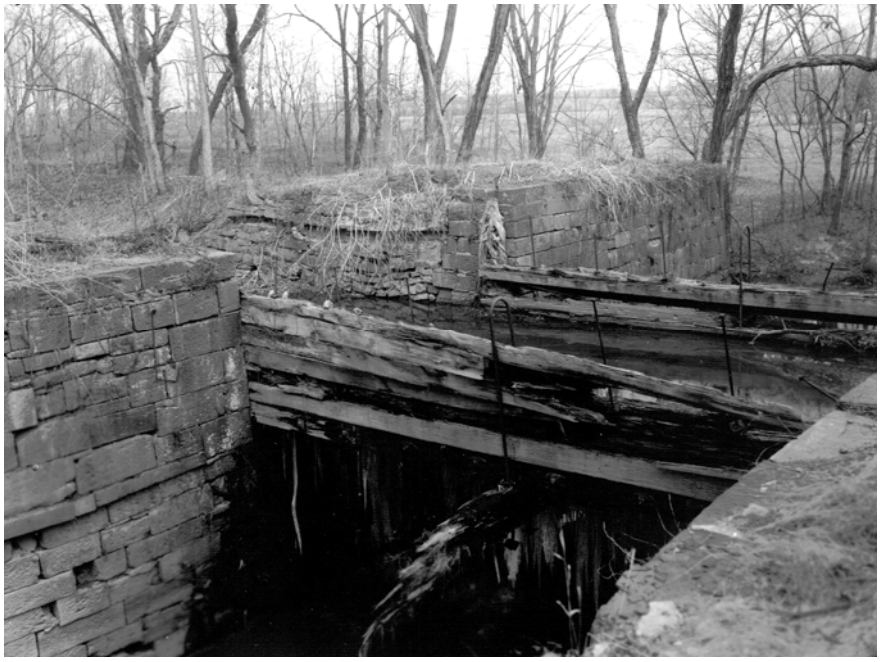


Photo #3 (above) and #4 (below): These are view showing the flume or Trunk from the towpath side. Note the metal work and the protruding center timber, to which the inverted truss of the mule bridge was tied.

Photo #5: This scene shows the Trunk from the berm side. Note the center timber, one end of which protrudes on the towpath side, as seen in Photos #3 and 4.

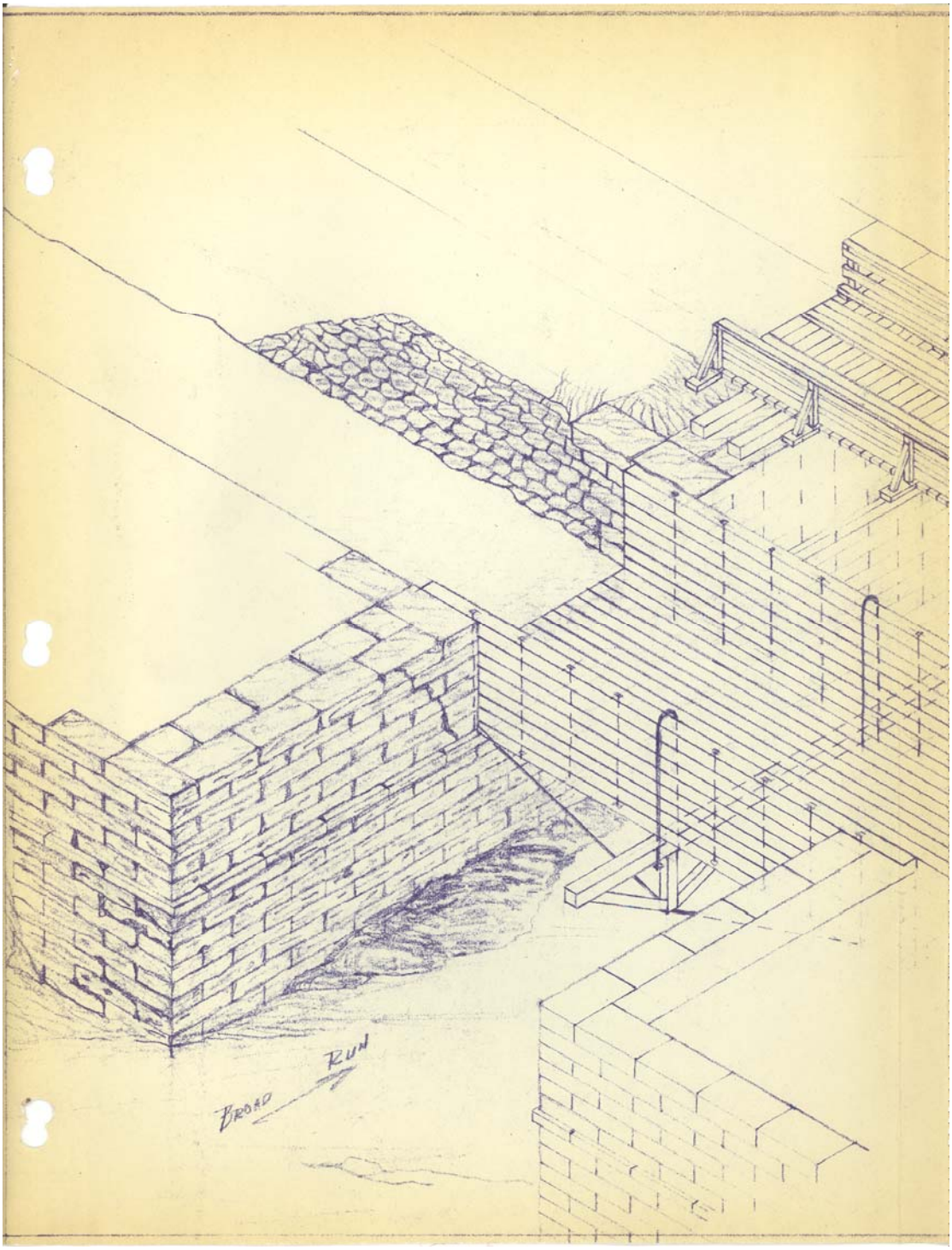
Photo #6: This view is looking downstream of the Canal, through the flume of the Trunk.

Photo #7: This view is looking upstream of the Canal, looking through the flume of the Trunk.

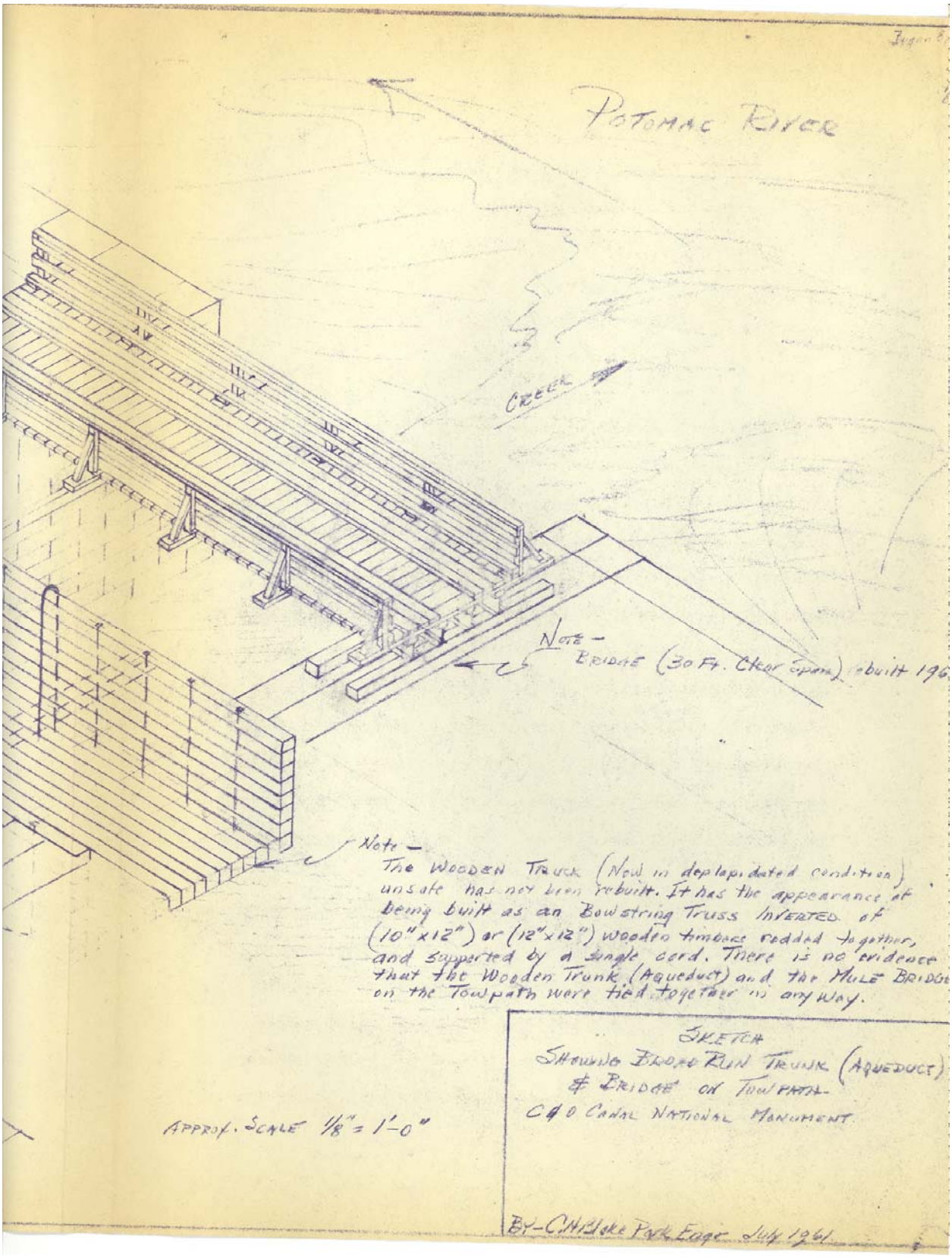
Appendix C

Sketch Showing Broad Run Trunk (Aqueduct) & Bridge on Towpath
By Charles H. Blake, Park Engineer, July, 1961

LEFT PORTION



RIGHT PORTION



Appendix D

Available NPS Memos on Broad Run Trunk Report Submissions

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
Region Five
143 South Third Street
Philadelphia 6, Pa.

IN REPLY REFER TO:
H30

January 5, 1962

CANDO		
	INF	ACT
SUPT	1/8	
SECY		
RGR		
~~[illegible]~~	1/19/62	
HIST	1/8	

file

Memorandum

To: Superintendent, C&O Canal

From: Assistant Regional Director

Subject: Historic Structures Report, Part I, Broad Run Trunk

Inasmuch as the subject of this report - a temporary utility-type bridge across Broad Run for visitor and maintenance use until such time as the original is reconstructed - is not an historic structure nor a reconstruction of one, and since this temporary or interim bridge had already been constructed at the time the report was submitted, it was not properly the subject for an Historic Structures Report.

Accordingly, we are not acting on it and are supplying copies of it to the Washington Office and EODC for information only.

Assistant Regional Director

In duplicate

Copy to: Director, w/c report
Chief, EODC, w/c report

C & O CANAL NATIONAL MONUMENT
479 North Potomac Street
Hagerstown, Maryland

H30

September 15, 1961

Memorandum

To: Regional Director

From: Superintendent, C & O Canal NM

Subject: Historic Structures Report, Part I, Broad Run Trunk

Herewith are 5 copies of the subject report.

The Historic Data Section is revised to reflect the recent fortunate discovery by Mr. Lusader of the Fisk specifications of 1851. The Administrative Section also reflects that find. We assume that the HABS drawings made during the summer of 1961 will be made available for inclusion as a part of the Survey Report. A drawing with explanation has been prepared by Park Engineer Blake for inclusion with the Engineering Data Section.

Without prejudice, it seems proper to state that I do not "read" details of the evidence observable in the remains of the trunk in the same way as expressed by the engineer. It does appear that the midline transverse timber was extended to function as a part of the mule bridge and that this timber was supported by some type of bent. The structure though of sturdy dimensions would be under stress with a dead weight loading of 890 plus or minus tons, augmented by wave action created by passage of boats which set up moments of motion and which the bowstring truss would tend to stabilize. However, until details are revealed it's anybodys guess as to how it was built.

Historic Data Section on the towpath will follow shortly. Photographs accompanying first submission of Historical Data Section should be appended to new submission.

Edwin M. Dale

In duplicate

Attachment (5)

C & O CANAL NATIONAL MONUMENT
479 North Potomac Street
Hagerstown, Maryland

H30

September 13, 1961

Memorandum

To: Regional Director

From: Superintendent, C & O Canal NM

Subject: Historic Structures Report, Broad Run Trunk

This is to advise you that the subject report is in process of being typed and will be submitted as soon as possible. The submission will include an Administrative Data Section, an Engineering Data Section, and a revised Historic Data Section. The last named has been substantially altered to include not only your recommendations, but to incorporate documentary data and plans located by Mr. Luzader a few days ago.

Edwin M. Dale

In duplicate

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
Region Five
143 South Third Street
Philadelphia 6, Pa.

IN REPLY REFER TO:
H30

August 29, 1961

CANDO		
	INF	ACT
SUPT	8/30	
SECY		
RGR		
		9/11
HIST		

"No bents are in evidence or that there ever were bents.

Memorandum

To: Superintendent, C&O Canal

From: Acting Regional Director

Subject: Historic Structures Report, Part I, Broad Run Trunk

Reference is made to our memorandum of July 24 (file D30), subject "Bicycle Trail, Seneca to Cumberland." Please submit the desired Historic Structures Report, in accordance with the provisions of our memorandum of May 15, by September 13.

Acting Regional Director

In duplicate

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
Region Five
143 South Third Street
Philadelphia 6, Pa.

IN REPLY REFER TO:
H30
X 112215

May 15, 1961

CADO		
	INF	ACT
SUPT		
SECY		
RGR		
~~CHR~~		
HIST		

Memorandum

To: Superintendent, C&O Canal

From: Acting Regional Director

Subject: Historic Structures Report, Part I, Broad Run Trunk, C&O Canal

The Historical Data Section for the subject report has been reviewed by the Division of Interpretation, which has only two suggestions to make concerning it: (1) that the purpose of the structure and how it worked be made more explicit (for the benefit of those of us who are not conversant with canal terminology), and (2) the "present condition" and "recommendations section" on pp. 11 and 12, respectively, be subheadings to facilitate reference use. It should be bound on the side, also; if you wish, this Office will be glad to do it and put covers on it. Otherwise, it is a clearly written and very interesting report.

Both copies of the Historical Data Section are returned herewith for the revisions suggested above and for incorporation in the complete Historic Structures Report.

The complete Historic Structures Report, Part I, should contain the usual sections: Administrative, Historical, and (we note that such is in preparation) Engineering. By copy of this memorandum to the EODC, we are inquiring as to whether it thinks an Architectural Section is advisable and if Architect Franzen, Harpers Ferry, can undertake it.

In order to have this project ready to move when funds for it become available, it would be well to have the Historic Structures Report, Part I, completed and approved well in advance. Please advise us when the completed report (with perhaps the exception of the Architectural Data Section) will be ready for review distribution.

Acting Regional Director

In duplicate

Attachments

Copy to: Chief, EODC
Architect Franzen, Harpers Ferry

C &O CANAL NATIONAL MONUMENT
479 North Potomac Street
Hagerstown, Maryland

H2215

May 9, 1961

Memorandum

To: Regional Director, Region Five

From: Superintendent, C & O Canal NM

Subject: Historic Data Section, Historic Structure Survey Report, Broad Run Trunk

Attached in duplicate is the Historic Data Section of the Historic Structure Survey Report, Broad Run Trunk, prepared by Historian John F. Luzader. This is Project C & O - 2 of the Annual Research Program.

Edwin M. Dale

In duplicate

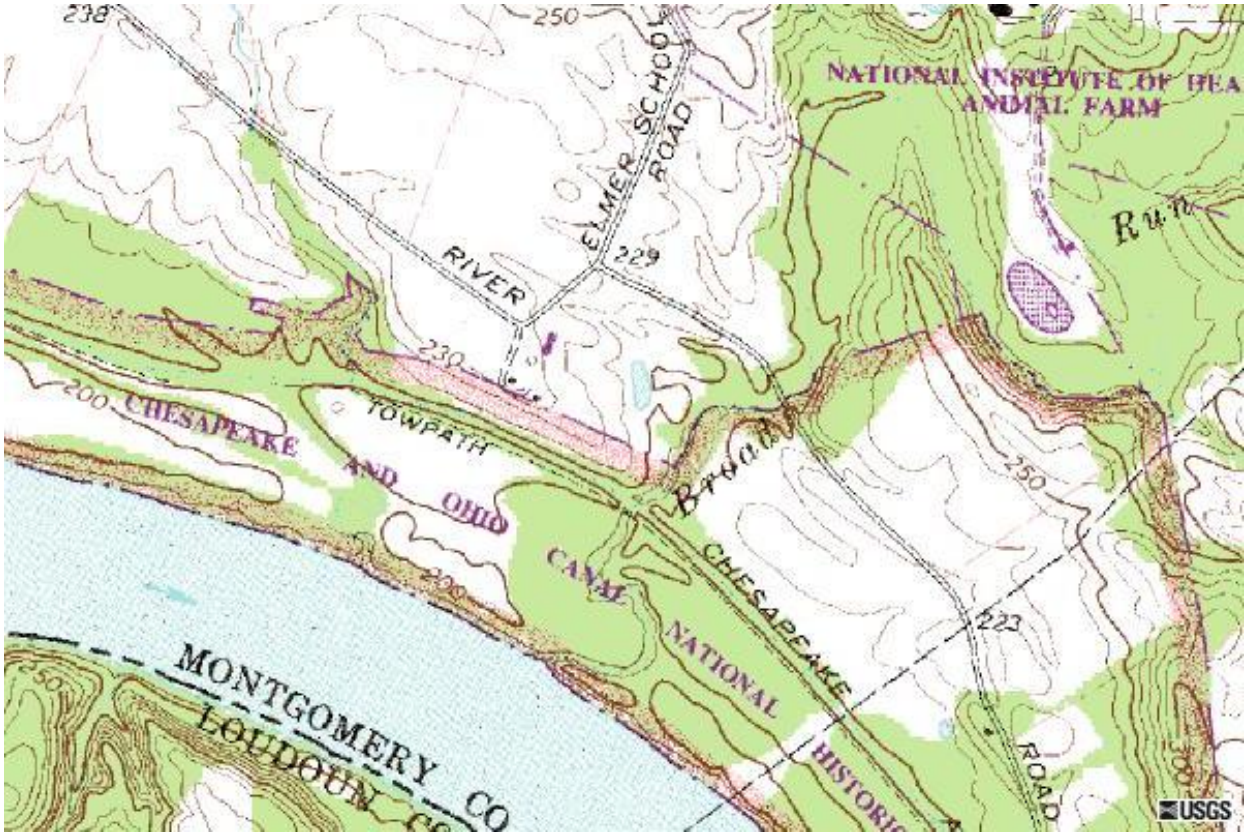
Copy to: Mr. Franzen, Harpers Ferry
Mr. Blake, C & O Canal NM

Appendix E

Maps and Aerial Photographs of the Broad Run Trunk Location

HABS Sectional Drawings

This topographical map from the U. S. Geodetic Service (USGS) locates Broad Run Trunk in relation to the environs.

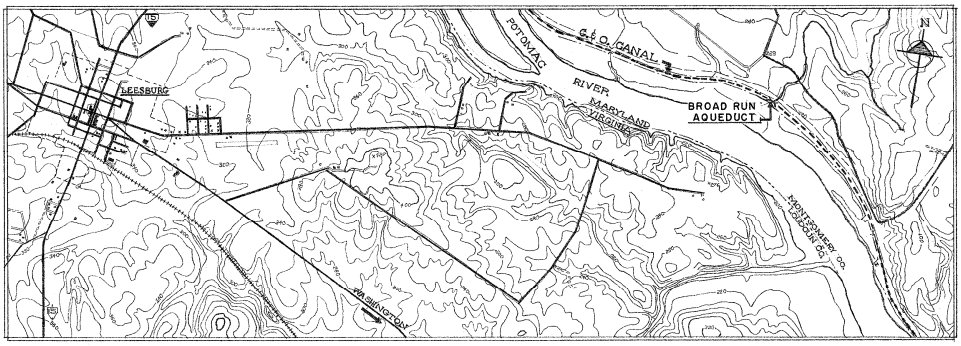


This aerial photograph from the U. S. Geological Survey (USGS) shows the same geographical area and feature as are on the previous topographical map.

This urban area photograph from the U. S. Geological Survey (USGS) shows the same geographical area and features as are shown on the previous aerial photograph and topographical map.

This Site Plan for the Broad Run Aqueduct was developed by Historic American Buildings Survey (HABS), August, 1961, Sheet 1 of 4.

CHESAPEAKE AND OHIO CANAL



MAP TAKEN FROM EODC MASTER PLAN, C&O CANAL NM

AQUEDUCT OVER BROAD RUN CREEK

31.9 MILES ABOVE TIDEWATER - MARTINSBURG VICINITY - MONTGOMERY COUNTY - MARYLAND

THE PRESENT AQUEDUCT OVER BROAD RUN CREEK IS THE ONLY AQUEDUCT WITH A WOODEN FLUME STILL IN EXISTENCE ALONG THE CHESAPEAKE AND OHIO CANAL. THE EXISTING STRUCTURE WAS BUILT DURING THE WINTER MONTHS OF 1856-7 BY THE CANAL COMPANY; IT REPLACED AN EARLIER TEMPORARY FLUME. THE ORIGINAL TWO SPAN MASONRY AQUEDUCT WAS DESTROYED BY A FLOOD IN JULY OF 1846. THE AQUEDUCT SERVES TO ILLUSTRATE A STAGE IN THE CANAL'S DEVELOPMENT AND THE MEANS RESORTED TO IN THE REPAIR AND MAINTENANCE OF THE SYSTEM.

THIS PROJECT WAS FINANCED FROM FUNDS OF THE "MISSION 66" PROGRAM OF THE NATIONAL PARK SERVICE. IT WAS MEASURED AND DRAWN JULY, 1961, UNDER THE DIRECTION OF CHARLES E. PETERSON, SUPERVISING ARCHITECT, HISTORIC STRUCTURES AND A.W. FRANZEN, RESIDENT ARCHITECT.
PROJECT SUPERVISOR ARCHITECT, RUSSEL V. KEUNE (NATIONAL PARK SERVICE)
STUDENT ASSISTANT ARCHITECTS: MICHAEL L. BOBROW (COLUMBIA UNIVERSITY)
DONN CARTER (CARNEGIE INST. OF TECHNOLOGY)
JOHN H. HANNA (COLUMBIA UNIVERSITY)
WILLIAM T. HARRIS (NORTH CAROLINA STATE COLLEGE)
ALAN R. McDONALD (OHIO STATE UNIVERSITY)
C. GUSTAVE WORMUTH (LOUISIANA STATE UNIVERSITY)

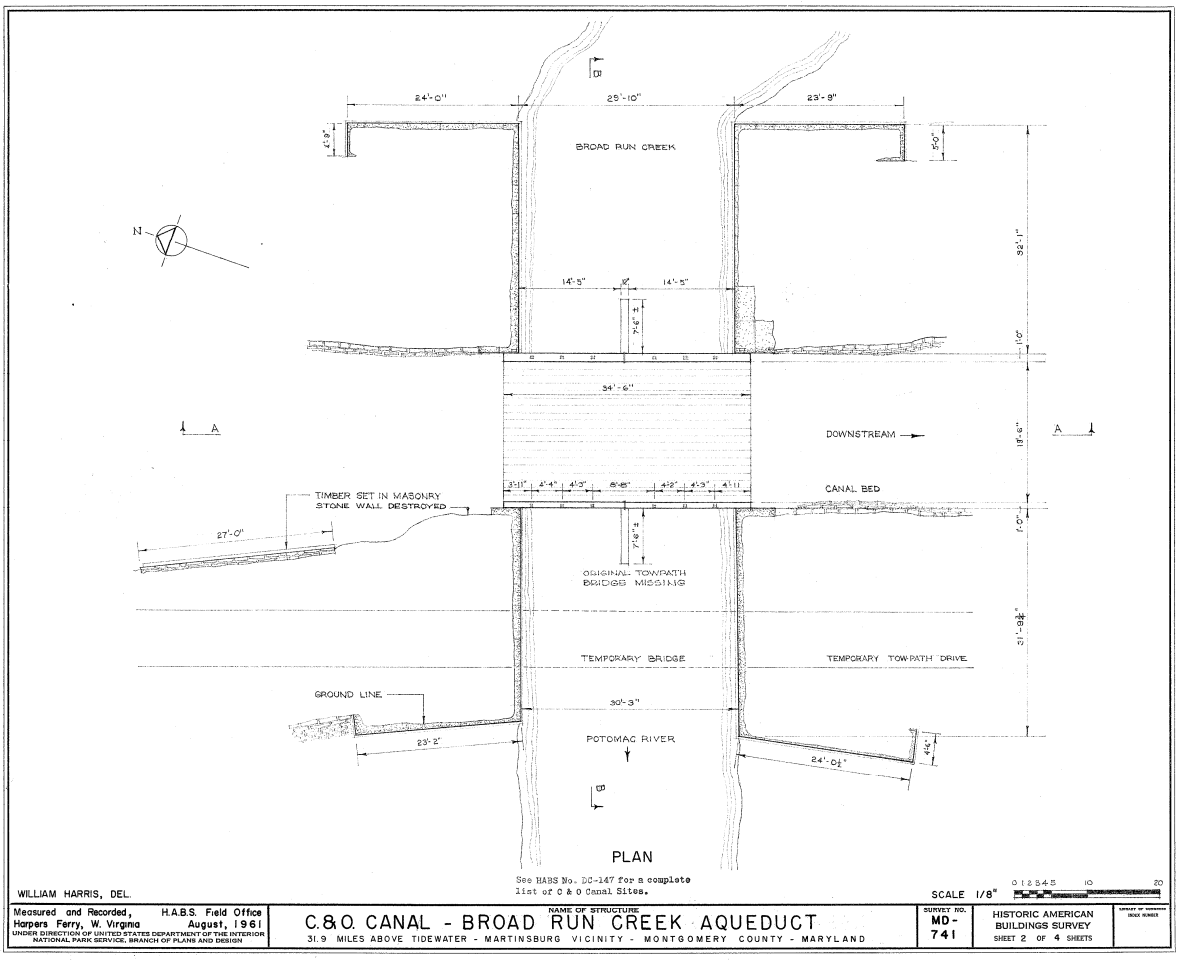
RECORDED BY THE NATIONAL PARK SERVICE

See HABS No. DC-147 for a complete list of C & O Canal Sites.

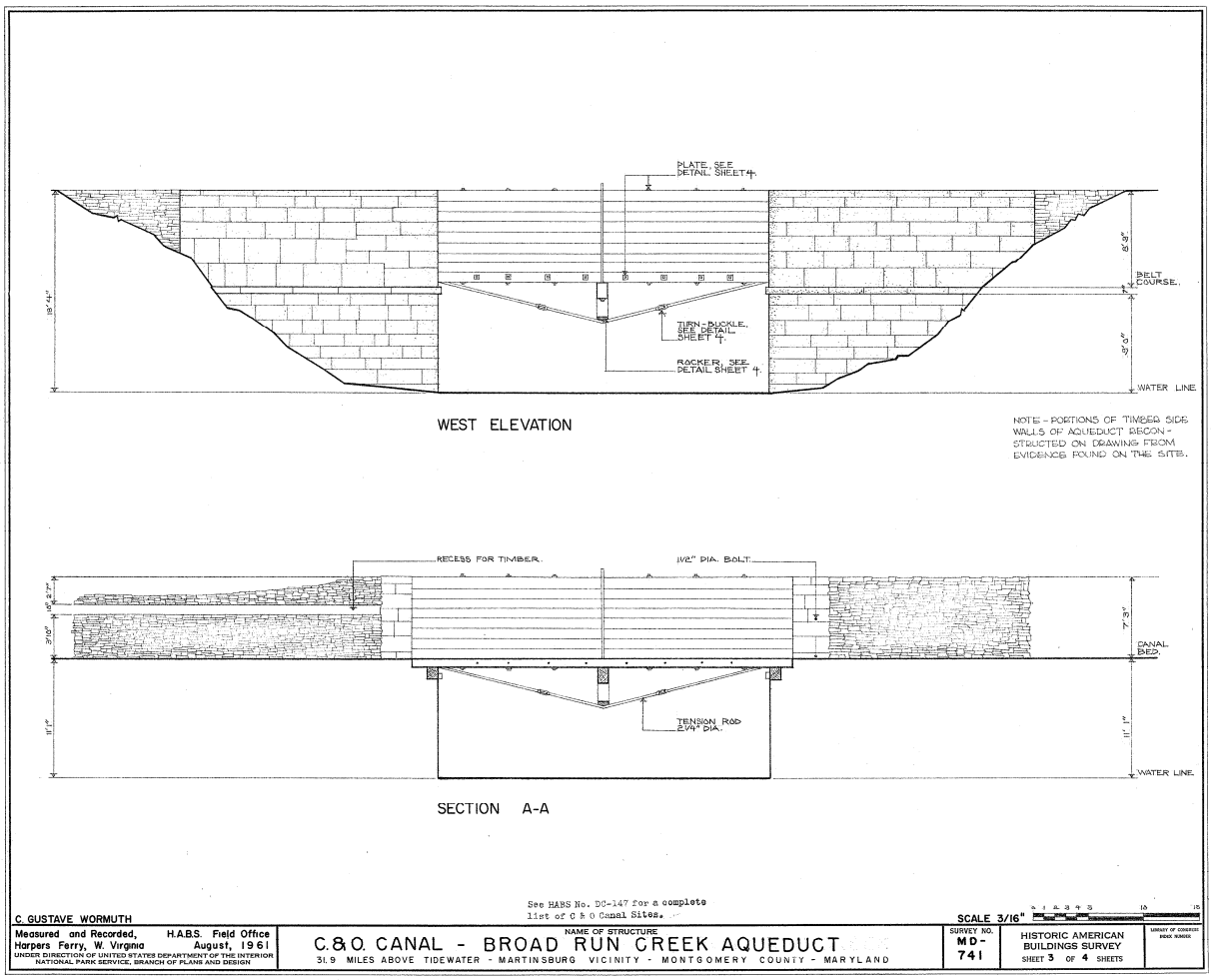
C. GUSTAVE WORMUTH, DEL.

Measured and Recorded, H.A.B.S. Field Office Harpers Ferry, W. Virginia Aug. 1961 UNDER DIRECTION OF UNITED STATES DEPARTMENT OF THE INTERIOR NATIONAL PARK SERVICE, BRANCH OF PLANS AND DESIGN	NAME OF STRUCTURE C.&O. CANAL - BROAD RUN CREEK AQUEDUCT 31.9 MILES ABOVE TIDEWATER - MARTINSBURG VICINITY - MONTGOMERY COUNTY - MARYLAND	SURVEY NO. MD-741	HISTORIC AMERICAN BUILDINGS SURVEY SHEET 1 OF 4 SHEETS

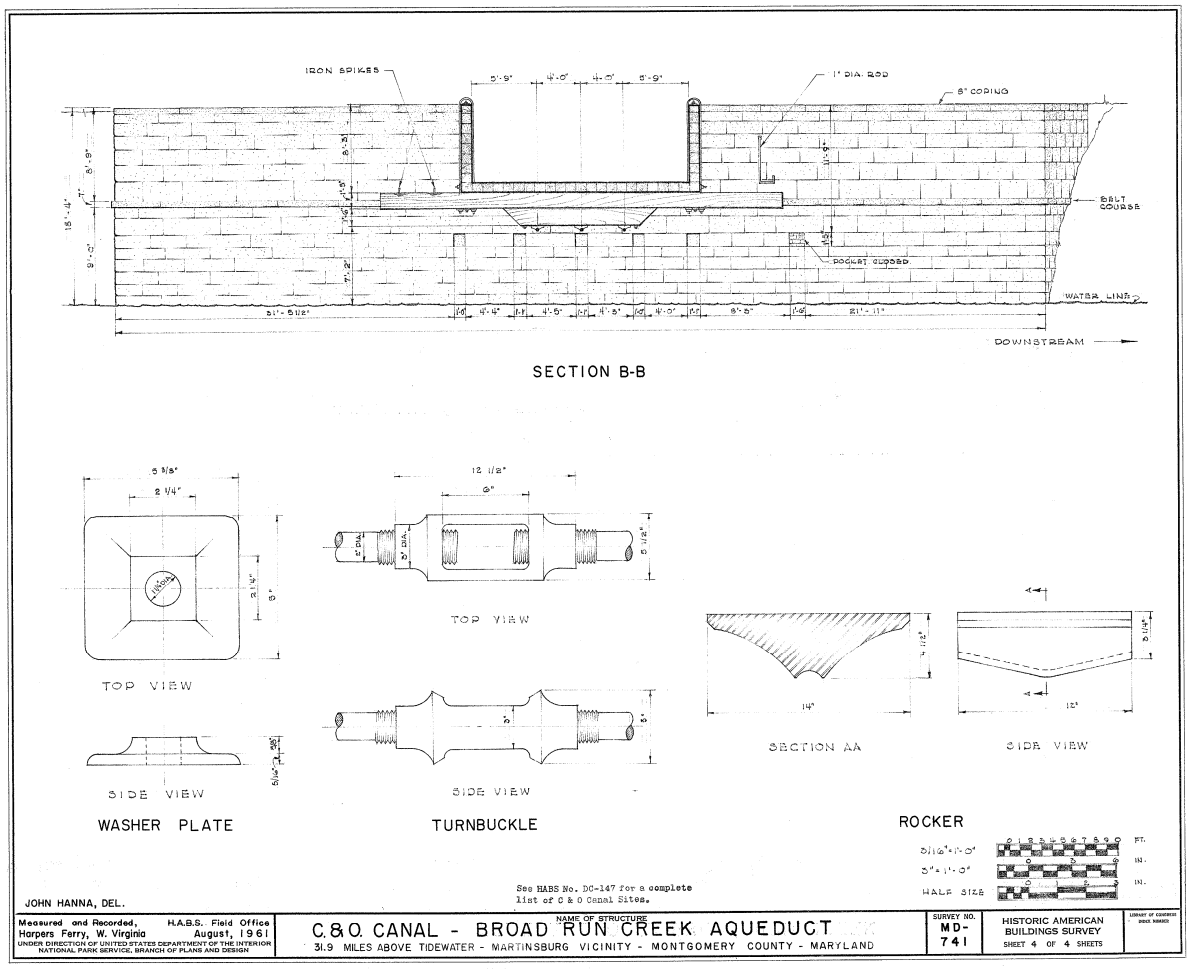
This HABS aerial view shows the Trunk and abutments, Sheet 2 of 4.



This drawing, HABS Sheet 3 of 4, shows an elevation from the towpath side and then a longitudinal sectional view of Broad Run Aqueduct.



This drawing, HABS Sheet 4 of 4, shows a cross sectional view of Broad Run Aqueduct, and some of the iron parts.



Appendix F

Photo documentation of Broad Run Aqueduct

By Jack E. Boucher, Photographer, HABS, 1959–1960

Photo #1: This is a view of the western wing walls.

Photo #2: This is a view of the western wing walls and the western wall of the aqueduct.

Photo #3: This is a general view of the canal [trunk] bed, looking north.

Photo #4: This is a view of the canal [trunk] bed, notice the detail of the wooden flooring.

Photo #5: This is a view of the detail of the eastern wall of the aqueduct.

Photo # 6: This photograph is a detail of the canal wall north of the aqueduct, showing a timber set into the masonry. Look on the HABS drawing, Sheet 2 of 4, left hand side, about half way up, to locate this wall with relation to the Trunk.