

HISTORIC STRUCTURE REPORT
SINGLE-SPAN AQUEDUCTS

HISTORICAL DATA

CHESAPEAKE AND OHIO CANAL NATIONAL HISTORICAL PARK

MD.-D.C.-W.VA

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PREFACE

This report has been prepared to satisfy in part the research needs for the preservation/stabilization of Aqueducts Nos. 6, 8, 9 and 11 on the Chesapeake and Ohio Canal. Altogether 11 aqueducts were built by the canal company to span the major tributaries of the Potomac River. Of these, six were single-span aqueducts located on the waterway above Dam No. 5. Previous to this report, Edwin C. Bearss did historic structure reports on Aqueduct No. 7 (June 1967) and Aqueduct No. 10 (February 1966). The purpose of this present study is to complete the historical research on the single-span aqueducts above Dam No. 5. Because of the common histories of these structures, an effort has been made to deal with them in a comprehensive manner while at the same time pointing out their distinctive characteristics.

A number of persons have assisted in the preparation of this report. Thanks are due to Park Ranger Ellwood Wineholt for assistance at the park headquarters; to Maria Joy and Robert Xvasnicka of the National Archives, who were especially helpful in suggesting and locating unpublished documents; and Dr. Harry Pfanz and Barry Mackintosh of Park Historic Preservation (WASO), Superintendent William R. Failor of C & O Canal NHP, Supervisory Historian John F. Luzader, Historical Architect Thomas N. Crellin, and Editor Linda Greene for reading the manuscript and providing editorial assistance.

Harlan D. Unrau
April 16, 1974

ADMINISTRATIVE SECTIONS

Statement of Historical Significance

The study of the single-span aqueducts on the Chesapeake and Ohio Canal is basic to an understanding of the functioning of the waterway. It was necessary to build masonry aqueducts in order to carry the canal across the larger tributaries that flow into the Potomac River. At the time of their construction, the aqueducts represented major engineering accomplishments.

Altogether, 11 aqueducts were built by the Canal Company to span the major tributaries of the Potomac. Of these structures, 6 were single-span aqueducts located on the canal above Dam No. 5. This report focuses on four of these single-span aqueducts: No. 6 at Licking Creek, No. 8 at Sideling Hill Creek, No. 9 at Fifteen Mile Creek and No. 11 at Evitts Creek

Administrative Data

Name of Structure

Aqueduct No. 6 (Licking Creek), Aqueduct No. 8 (Sideling Hill Creek), Aqueduct No. 9 (Fifteen Mile Creek) and Aqueduct No. 11 (Evitts Creek), Chesapeake and Ohio Canal National Historical Park, Washington and Allegany counties, Maryland.

Proposed use of Structures and Justification for Such Use

The list of Classified Structures has not been completed yet for the canal. Therefore, the Order of Significance of the above-named aqueducts has not been established, nor has the level of treatment been determined. Since the single-span aqueducts were basic to the functioning of the waterway and are considered major engineering accomplishments of the period, they will undoubtedly figure prominently among the historic resources of the canal.

Accordingly, it is recommended that appropriate preservation/stabilization treatment be given immediately to Aqueducts Nos. 6, 8, 9 and 11 to prevent further deterioration of the structures. In view of the limited access to their remote locations, little development is contemplated for the sites of Aqueducts Nos. 6, 8 and 9. However, because the draft master plan proposes to rewater the canal from the terminus in Cumberland to North Branch

—the section of the waterway on which Aqueduct No. 11 is located—it is proposed that future consideration be given to the full restoration of this structure.

Provision for Operating Structures

Aqueducts Nos. 6, 8, 9 and 11 should be used as historic structure exhibits in-place to interpret the construction, maintenance and operation of the canal.

Cooperative Agreement, if any, Executed or Proposed for Operating Structures

There are no cooperative agreements or other documents bearing on the management, operation or use of these structures.

Description of Proposed Construction Activity

A definitive description of proposed construction activity cannot be made until the structures are fully studied. However, it is imperative that appropriate preservation/stabilization treatment be given immediately to Aqueducts Nos. 6, 8, 9 and 11 to prevent their further deterioration.

Recommendations

The records pertaining to the Chesapeake and Ohio Canal Company in the National Archives, the Library of Congress, the Maryland State Archives at Annapolis, and the Maryland State Historical Society at Baltimore have been thoroughly investigated for this report. Therefore, it is the opinion of the author that no further historical research needs to be done on Aqueducts Nos. 6, 8, 9, and 11.

I. THE CONSTRUCTION OF AQUEDUCT NO. 6: 1835–1839

The year 1835, in which bids were opened for construction of the 27 miles of waterway between Dam No. 5 and the Cacapon River, was a trying one for the Chesapeake and Ohio Canal Company. When the financial condition of the company became desperate in the early months of 1835, the directors sought aid from Congress and the States. After Congress refused to grant the requested aid, the board made an unsuccessful attempt to obtain \$500,000 from the dividend of the Bank of the United States, offering in return perpetual release from tolls for government business on the canal. Even this proposal failed to pass the Senate.¹

The failure of Congress to support the canal placed the future of the work in the hands of the district cities and the interested States. The former were financially hard-pressed and incapable of offering further aid, and the latter, except Maryland, were no longer interested. The company brought great pressure to bear on the Maryland legislature to pass a bill to loan the entire \$2,000,000 required to complete the eastern section of the waterway up to Cumberland. The Maryland Assembly eventually passed the act authorizing the loan, support for the measure stemming from the hope that future revenues of the canal would provide sizeable financial returns to the State later on. The stockholders formally accepted the loan and authorized the mortgage at a special meeting on April 22, 1835.²

Immediately upon acceptance of the loan, the canal engineers were directed to plan the entire line to Cumberland with the objective of placing it under contract. Charles B. Fisk, the Chief Engineer, was asked by the board to prepare a detailed study of the line of the canal from Dam No. 5 to the mouth of the Cacapon. This division, about 27 ½ miles in length, had been previously surveyed in the spring of 1834 by Engineer Alfred Cruger, who estimated the work to cost \$663,676.³ Fisk was instructed to review Cruger's estimates and the specifications for locks, culverts and aqueducts to see what economies could be effected. In his report submitted to the board on June 16, he revised Cruger's estimate to \$1,022,534 on the basis of work actually done.⁴

In reference to the two aqueducts, that were slated to be built in this section, Fisk reported:

¹ Walter S. Sanderlin, *The Great National Project: A History of the Chesapeake and Ohio Canal* (Baltimore, 1946), pp.103–5.

² *Seventh Annual Report* (1835), C & O Co., pp. 3–4. Also see *Proceedings of the President and Board of Directors*, D, p. 283. All manuscript materials referred to in this report are deposited in the Department of Interior files at the National Archives and are designated Record Group 79.

³ *Sixth Annual Report* (1834), C & O Co., pp. 3–5.

⁴ *Eighth Annual Report* (1836), C & O Co., pp. 3–4.

It is proposed to have all the work of rubble masonry, except the sheeting, which must necessarily be cut; and the water table coping, which I propose should be scabbled masonry. The rubble masonry is as good as cut work, where we propose to use it, as it is not subject to any sort of injury.

And as to the scabbled work, the same remark may be made on the subject, as those used when speaking of the locks. Particular care has been taken in the planning of the backs of the abutments, and of the wing walls, so that it shall be impossible that any difficulty shall occur by breeches or otherwise.⁵

Turning to a request by the board that he report on the expediency of substituting wood for stone in the locks and aqueducts on this portion of the canal, Fisk observed that there were to be built 12 locks and two aqueducts between Dam No. 5 and the Cacapon River. Contrary to reports that had reached the board, Fisk found what he described as “good limestone quarries” within short hauling distances of most of the projected locks. At Licking Creek there was a limestone quarry within three-quarters of a mile of the place where the aqueduct was to be built. Fisk related that at first he had been fearful that “there would be difficulty in obtaining stone for his work,” but after a closer survey he had located this quarry. To satisfy himself of the quality of this stone, he had employed men to open the quarry under the direction of the Superintendent of Masonry. While he could not give a full report of their findings, he assured the board that “the stone will answer for every part of the work except the sheeting.” This sheeting, according to Fisk, could be brought “from the quarry near Prather’s Neck” on river transportation “by taking advantage of a favourable height of water.”⁶

When all factors were taken into consideration, Fisk reported that there was no section of the canal where stone could be secured at less cost. If the board wanted to “lessen the disadvantages resulting from a scarcity of stone,” it would be unnecessary to pursue the subject further.⁷

Before proposals for the construction of the aqueduct across Licking Creek could be invited, land for the right of way had to be purchased. Land on the east side of Licking Creek from which the company would have to purchase a right of way was owned by Anthony Snyder, while that on the west bank belonged to the heirs of John Snyder. On July 22, 1835, Anthony Snyder sold his parcel of land, consisting of “5 acres, 2 rods and 67 perches,” to the company for \$800. The company did not make payment on the purchase

⁵ Fisk to Bender, June 16, 1835, Ltrs. Recd., C & O Co. In speaking of the scabbled work on the locks, Fisk said: “The present estimate is for a description of work, equal in strength and tightness to good cut work, tho a little somewhat inferior to it in smoothness of finish. I speak of scabbled work, in dimensions as to beds and joints, the same as cut work, the difference consists in the stone not receiving, after it has first been dressed, that smoothness of surface that constitutes cut work—require work of this kind with specifications the same as for cut work in every other respect.”

⁶ *Ibid.*

⁷ *Ibid.* See Appendix B for the estimate of Aqueduct No. 6 by Fisk on his survey of the “27 ½ miles” on June 16, 1835.

until September 28, 1838, at which time the board agreed to pay him an additional \$550 “in lieu of a ferry” that he claimed had been promised him in the original transaction.⁸

When the heirs of John Snyder refused to sell their land to the company, the board asked for an injunction on November 6, 1835. The results of the inquiry were affirmed by the Washington County Court on April 6, 1836. By the terms of the agreement, the company paid \$400 for a parcel of “4 acres, 2 rods and 15 perches.”⁹

Meanwhile, at a meeting held on June 17, the Board of Directors ordered the clerk to advertise for proposals for the construction of the sections and masonry works “as may be reported by Chief Engineer Fisk, to be ready for contract between Dam No. 5 and the Cacapon.” The time limit for completion of the masonry works was to be October 1, 1836, and for the other works, November 1.¹⁰

Three days later a notice appeared in the *National Intelligencer* announcing that proposals for these works would be received at the canal company’s office in Washington until 10:00 A.M. on June 29. Included in this advertisement were requests for proposals:

for the construction of twenty of the most difficult sections of the canal, upon the line located between Dam No. 5 and the Great Cacapon, on the Potomac River; for an aqueduct across Licking Creek, and one more across the Great Tonoloway; for nine lift locks and one guard lock, and for the culverts necessary upon the above line; and also for a Dam across the river Potomac at the mouth of the Cacapon, or at some suitable point above that place.

Specifications will be furnished, and further information given at this office, after Wednesday, the 24th.

In receiving the proposals the Board of Directors reserves the right of exercising discretion such as may be approved.¹¹

By the time the board of directors held its July 1 meeting, a number of proposals had been received. Before they adjourned, the bids had been abstracted. Two days later, the board, having determined that Richard Holdsworth had submitted the low bid, awarded him the contract for the construction of Aqueduct No. 6 across Licking Creek.¹²

The aqueduct was to be built according to the following general specification that had been drawn up by the Canal Company engineers:

The centre of the water way of the aqueduct will be 4 ½ feet on the towpath side of the centre of the canal, of 30 feet bottom and 54 feet water surface.

⁸ *Reference Book Concerning Land Titles, 1829–1868*, C & O Co. Also see *Report of Lands Acquired to June 30, 1836*, Land Records, C & O Co.

⁹ *Ibid.*

¹⁰ *Proceedings of the President and Board of Directors*, D, p 341.

¹¹ *National Intelligencer* (Washington D.C.), June 20, 1835.

¹² *Proceedings of the President and Board of Directors*, D, p. 360.

The foundation of the abutments and of all masonry to the very end of the wings, will be rock, taken down by blasting to a level one foot lower than the adjoining firm rock. The foundation, if not an entire level, shall be in level offsets, such as the Engineer shall approve of.

The dimensions of the abutments measured on a level with the spring of the arch will be in length $33 \frac{1}{4}$ feet, with the addition of one inch batter to the foot at each end of the abutments, for the height of water line of the canal above the spring of the arch; and the thickness of the abutments on the same level will be twelve feet.

The front of the abutments will be plumb—the ends will batter one inch to the foot; and the back of the abutments will batter six inches to the foot. In addition to the above dimensions, there will be an offset around the front ends of the abutments of one foot at the level of low water of the river.

From a point twelve feet back of the front line of the abutments at the level of the canal water line, shall commence the splay of the wings. The splay shall be two feet at right angles, to one foot in the direction of the canal. This splay on the berm side of the canal shall continue out (on the same level—of canal water line.) to a point $38 \frac{1}{2}$ feet from the centre of the abutment, and on the towpath side $41 \frac{1}{2}$ feet out; at these two points, viz: $38 \frac{1}{2}$ feet and $41 \frac{1}{2}$ feet from the centre of the abutments, the direction of the wings shall change into lines parallel to the direction of the canal—the top outer edges of these parallel wings at the level of canal water line being eighty feet apart.

The termination of the wings, on the same level as above spoken of (viz: the water line of canal) will generally be 45 feet from the front line of the abutments.

The angles formed by the wings and the ends of the abutments at the point where the splay of the wings commences, shall be filled in with masonry battering one inch to the foot, so as at the level of the canal water line to be embraced within two straight lines, each four feet in length, and at right angles to each other, one being at right angles and the other, of course, parallel to the aqueduct.

The width of the wings at the level of canal water line shall be five feet; they shall have a batter of two inches to the foot on the inside and at their ends, and on the outside they shall have a batter of one inch to the foot:—corresponding to the one foot projection of the front and ends of the abutments, the same projection of one foot shall be carried around the angles of masonry at the commencement of the splay of the wings, and along the splay of the wings, and still further along to the termination of the wings.

ARCH

The arch for a span of *seventy feet, and for a rise of fourteen feet*, will be three feet at the spring and two feet eight inches at the crown; and for other spans will be proportional.

The top of the arch at the intrados shall be five feet below the bottom of the canal.

The arch from out to out at the intrados of the top of the arch shall be, exclusive of the rustication, thirty-four feet ten inches.

The ends of the arch shall have a batter of one inch to the foot.

The arch will be formed of stone perfectly cut throughout; the beds of the sheeting must be as true and as accurately cut back to the line of the extrados as in any other part; the joints shall be full and even, and shall fill the square back to the extrados; the extrados of the arch shall be hammered to a true surface. It will be understood, therefore, that the extrados, the end joints and the beds of all the sheeting, will, in every point, fill the space necessary to make the whole arch as compact and solid as though it were of one stone. The skewbacks, also, shall be as well cut as the sheeting, and will be of the size deemed necessary by the Engineer. The ring-stones shall be alternately long and short. The length of the short one shall not be less than two feet, and of the long one not less than four feet. The sheeting shall not be less than three feet, with no break less than eighteen inches. The sheeting shall all be numbered, so that the place of each stone may be known immediately upon its being cut.

The inner arris and the outer arris¹³ of the sheeting will have a half-inch taken off and carried through the arch.

The patterns for the ring-stones shall be made subject to the approval of the Engineer, at the cost of the Contractor.

The ring-stones shall have a rustication of one and a half inch; which rustication shall project outside of the spandrel walls.

The sheeting for an arch of *seventy feet span* may be in courses between two feet and fourteen and a half inches in thickness, (and in proportion for other spans,) so arranged, as the Engineer shall approve of after the opening of the quarry.

No checking of the sheeting will be allowed.

SPANDREL WALLS

The towpath and berm spandrel walls, at bottom of the canal, shall each be seven and a half feet wide. They will have on the outside a batter of one inch to the foot—conforming to the end batter of the arch and abutments. They shall each batter on the inside three inches to the foot down to the solid filling in, or backing in over the arch; which backing in of the arch will now be more particularly described, viz:

From the level of the spring of the arch, where the abutments are twelve feet wide, the six inch batter of the back of the abutments will be changed to a two inch batter, which will be continued up between the wings and spandrel walls to within six feet of canal bottom—the batter will then change from two inches to the foot, to a foot to the foot, up to within four feet of canal bottom—this level of four feet below canal bottom shall be the height of the back part of the filling in over the arch; from this back part the top surface of the filling in shall have such an inclination that, at the point where it meets the extrados of the arch, it shall be five feet below canal bottom.

PARAPETS

The towpath parapet shall be seven feet six inches wide, and the berm parapet shall be five feet six inches wide at canal bottom—they shall be plumb on the inside, and shall

¹³ Arris is an architectural term that describes the sharp edge formed by the intersection of two surfaces, such as the corner of a masonry unit.

batter on the outside one inch to the foot; this will make the towpath parapet seven feet wide and the berm parapet five feet wide at canal water line.

COPING

The parapets shall be covered with coping one foot in thickness—the bottom of the coping being placed on a level with canal water line. The coping will be well scabbled on its lower and upper surfaces, and shall have full joints, *well cut*, the inner edge, also, of the coping shall be well cut, the outer edge shall be scabbled. The coping shall project outside of the parapets one foot, and shall extend over the whole breadth of the parapets, from end to end. The coping over the towpath parapet may be alternately in two and three pieces and on the berm side in one and two pieces; so arranged as to dimensions as shall, in the opinion of the Engineer, form the best bond. The wing coping, including the one-foot projection will be three and a half feet wide.

Each piece of coping shall be connected to each other piece against which it lies by a two inch square dowel, six inches in length, let down diagonally in the joints between the stones, and leaded.

WATER TABLE

It shall extend from end to end of the wings. It shall run back into the wall two feet; shall project eight inches, and shall be in thickness nine inches; beveled off on its upper surface so as to face only seven and a half inches—this bevel of one and a half inch to be made in the outer seven inches.

The water table shall be full in all its dimensions, beds and joints, and shall be well scabbled except the joints, which shall be truly cut back the full depth of the stone.

The upper surface of the water table will be level with the bottom of canal.

The inside of the *parapets* shall be well and truly cut. The dimensions of the headers and stretchers for which, and their relative number, shall be the same as is required for the ashlar in the lock specifications for the lock about to be put under contract, (in August, 1837,) on this canal. The only difference being that for the inside of the parapets, the stone are to be *cut* while the lock ashlars are to be scabbled.

CUT WORK

The *coping*, the *water table*, the *sheeting*, the skewbacks, and *two feet in depth of the inside of the parapets*, will be considered and paid for as *cut work*.

All the rest of the masonry will be of *good rubble masonry*, well bound together, with the corners of the abutments and the angles of the wings formed of large and well-scabbled stones.

The front and back of all masonry will be laid in full beds of mortar, and the interior will be grouted; and the mortar and grout, and everything connected with the cement and sand, shall be the same as is required in the lock specifications; and the transportation of cement shall in like manner be paid for by the Company.

The back of all the masonry against or over which the embankment will rest shall present a smooth and even surface, well plastered over.

It is understood that the regulations as to embanking in against the abutments, and as regards the puddling, will be precisely the same as in the lock specification that has been referred to.

The centers shall be upon a plan approved of by the Engineer.¹⁴

It was early September before Holdsworth had his men at work on the Licking Creek Aqueduct. Reports reaching Commissioner George Bender's Hancock headquarters during that month indicated that Holdsworth and his men were making headway. On October 14 Holdsworth was paid \$1,994.53 on the basis of September estimates of work done on the aqueduct. On the work estimate arrived at by Chief Engineer Fisk is the following breakdown of Holdsworth's work:

	Dollars	Cents
1308 Cubic yards excavation of materials other than Rock at 25 cts	327	00
133 Cubic yards excavation of Rock at \$1.25	166	25
368 Perches of stone delivered at the aqueduct at \$1.50	552	00
338 Perches of masonry at \$4.50	1521	00
Bailing & Cofferdams in part	<u>150</u>	<u>00</u>
	2716	25
Deduct one fifth retained in compliance With the Contract	<u>543</u>	<u>25</u>
	2173	00
Deduct for 713.63 Bushels of Cement received from Mr. James Hook at 25 cts	<u>178</u>	<u>47</u>
	1994	53 ¹⁵

Cement for Aqueduct No. 6 came from George Shafer's mills at Williamsport and Funktown. On October 15 Holdsworth received the following items from Shafer:

	Dollars	Cents
For 153 Bushels of 47/70 of a Bushel of Cement delivered at Williamsport to R. Holdsworth per my Contract of 4 June 1835 at 22 cts	33	80
For 177 Bushels of 64/70 of Same delivered at Funktown to same person at the reduced price of 17 cts per Bushel	<u>30</u>	<u>24</u>
	64	04

¹⁴ *Specification for Aqueducts of One Arch-Segment of a Circle, on the Chesapeake and Ohio Canal* (Drawings and Other Records Concerning Construction, C & O Co.). A copy of this specification may also be seen in Appendix A. While it was printed for distribution in 1837, there is documentary evidence that it was used for all the single-span aqueducts above Dam No.5. A thorough search of the C & O Co. records at the National Archives failed to turn up detailed plans or specifications for Aqueduct No. 6.

¹⁵ Estimate of Work Done, Oct. 14, 1835, *Estimates of Work Done in the 1st Residency of the 3rd Division*. See Appendix C for the list of payments made by the company to contractors for the construction of Aqueduct No. 6.

Retain one fifth retained in compliance

With the Contract	<u>12</u>	<u>80</u>
	\$51	24 ¹⁶

During November, Holdsworth received 742 bushels of cement at a cost of \$185.50 from Captain Hook's mill, located on the south bank of the Potomac across the river from Hancock.¹⁷

At times the contractors were hindered by cement shortages. In mid-March 1836, Hook's mill shut down for an undetermined reason. Burning was resumed in the last week of March, and Hook was able to notify the contractors that he was ready to resume grinding.¹⁸

On December 9 Holdsworth was paid \$1,970.50 for work done on Aqueduct No. 6 during the month of November.¹⁹

The mid-1830s were years of inflation. Prices for construction materials rose rapidly, and the level of wages on the canal rose from \$8 to \$10 per month to \$1.18-3/4 and \$1.20 a day.²⁰ Builders who had secured contracts for the masonry works on the canal between Dam No. 5 and the Cacapon suffered. Many contractors involved registered complaints with the company, while some were forced to abandon their projects.

Holdsworth was one who had serious financial difficulties by mid-December. On December 21 he wrote to J. P. Ingle, the clerk of the company, complaining about the poor quality of his labor force and requesting "an advance of some portion of the retained money."²¹ Ingle replied 2 days later that he could not encourage Holdsworth "to hope for a relinquishment of the 20 percent retained," but he promised to take the matter up with the board.²²

Because of sickness, financial difficulties and the poor quality of his work force, Holdsworth made slow progress during December. On January 16, 1836, he was paid \$792.80 for work done during the month of December.²³

After waiting a month for a reply from the board regarding his request, Holdsworth again appealed to Ingle on January 26. He described his financial situation as worse than it had been in December, and he indicated that he might have to abandon his contract unless he

¹⁶ Voucher No. 168, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal*. Several years later, in 1837, Shafer began cement plant operations at Roundtop Hill, about 3 1/2 miles west of Hancock.

¹⁷ Estimate of Work Done, Dec 9, 1835, *Estimates of Work Done in the 1st Residency of the 3rd Division*.

¹⁸ Williams to Fisk, Mar. 26, 1836, Ltrs. Recd., Chief Engineer.

¹⁹ Estimate of Work Done, Dec 9, 1835, *Estimates of Work Done in the 1st Residency of the 3rd Division*

²⁰ Sanderlin, *The Great National Project*, pp. 125–26.

²¹ Holdsworth to Ingle, Dec. 21, 1835, Ltrs. Recd., C & O Co.

²² Ingle to Holdsworth, Dec. 23, 1835, Ltrs. Sent, C & O Co.

²³ Estimate of Work Done, Jan 16, 1836, *Estimates of Work Done in the 1st Residency of the 3rd Division*

received immediate assistance. If the company so desired, Holdsworth said he would be glad to offer security for the loan.²⁴

Holdsworth's critical financial situation forced him to suspend his construction operations in January. Therefore, he requested that Ellwood Morris, the assistant engineer responsible for overseeing the construction of the canal between Licking Creek and Oldtown, not give him an estimate for the month.²⁵

On February 3 Clerk Ingle wrote to Holdsworth informing him that his petitions had been read before the board. The board decided not to make any advances of money on the contracts. However, the board had confidence in Holdsworth and was willing to aid him if it could be done. In the event the board might determine to loan Holdsworth some money, Ingle had been instructed to ask him how much money he needed to meet his current obligations and what security he had to offer as collateral. Since the board did not want to be put in the position of loaning to other contractors, Holdsworth was asked to keep the board's communication a secret.²⁶

Holdsworth replied to the board's inquiry on February 11, stating that his immediate need totaled \$1,200. For security on the loan, James N. Allnut of Poolesville, an acquaintance of President George C. Washington, would sign a joint note for the amount.²⁷

On February 29 Holdsworth reported to Ingle that Allnut had been sick in bed with rheumatism since January 7 and had been unable to endorse his note. However, Allnut had promised that he would sign the note as soon as he was able and send it to the board.²⁸

The board of directors took up consideration of Holdsworth's loan application on March 5. It authorized the loan to be made "with the understanding that it may at any time be charged up to the account of said Holdsworth, on account of his contract."²⁹

Three days later, on March 8, Clerk Ingle informed Holdsworth of the board's decision. Because it was a new policy for the board to lend money, the directors authorized it on the condition that it could be done without upsetting their books. Ingle therefore, proposed to implement the loan, as soon as Allnut's note arrived, by taking from the Corporation of Washington the company's notes in payment of interest due the canal company and giving \$1,200 of these notes to Holdsworth for 8 months without charging interest. The company could obtain 96¢ on the dollar for these notes, equaling the sum Holdsworth's note would produce if discounted.³⁰

²⁴ Holdsworth to Ingle, Jan. 26, 1836, Ltrs. Recd., C & O Co

²⁵ Estimate of Work Done, Feb 1, 1836, *Estimates of Work Done in the 1st Residency of the 3rd Division*

²⁶ Ingle to Holdsworth, Feb. 3, 1836, Ltrs. Sent, C & O Co.

²⁷ Holdsworth to Ingle, Feb. 11, 1836, Ltrs. Recd., C & O Co.

²⁸ Holdsworth to Ingle, Feb. 29, 1836, Ltrs. Recd., C & O Co

²⁹ *Proceedings of the President and Board of Directors*, E, p. 26.

³⁰ Ingle to Holdsworth, Mar. 8, 1836, Ltrs. Sent., C & O Co

Four days later, on March 12, Holdsworth accepted this proposal. He also agreed that the board could charge the note to his contract at any time, but he hoped that “there will be no cause for so doing under eight months.”³¹

By March 18 Allnut had recovered the use of his right hand well enough to endorse the joint note.³² Upon receiving the note, Ingle sold the notes he had taken back from the Corporation of Washington to Mr. Prout for \$1,164, taking his check on the Fowler Bank in Baltimore “at twenty days in payment.” By this means, the company got 97¢ on the dollar instead of 96¢. Holdsworth was notified that he could draw on the company “at sight” for \$1,164.³³

That same day, Ingle reported the transaction to Commissioner Bender, stating that the loan would be charged against Holdsworth on the settlement of his final account. Again the clerk underscored the need for secrecy in this matter.³⁴

On March 21 Holdsworth notified Ingle that he was sending David Ridenour to pick up the check for \$1,164.³⁵

With this financial assistance, Holdsworth resumed work on Aqueduct No. 6 during the last week of March. On April 2 he was paid \$444 for work done during the month of March.³⁶ By mid-April he was again in full operation, receiving a payment of \$754 on May 1 for work done since the April 1 estimate.³⁷ For the month of May he was paid \$1,796.40 on June 6.³⁸

On May 27 Holdsworth again appealed to the canal board for assistance, saying that without further aid he would be unable to continue his work on Aqueduct No. 6. Although in May the board had raised the prices of a perch of rubble masonry by 25¢ and a square foot of sheeting by 15¢, Holdsworth informed them that this was not sufficient to meet his obligations. After considering this latest petition, the board authorized another loan to Holdsworth upon personal security “if the Commissioner and Resident Engineer shall recommend that as best calculated to secure the interest of the Company.”³⁹

Several days later, Holdsworth sent a joint note signed by himself and Enos Childs, who had been assisting him in the construction of the aqueduct, to the board for \$2,000. Upon Commissioner Bender’s recommendation, the directors ordered that an advance of \$2,000 be made to Holdsworth on the joint note.⁴⁰

³¹ Holdsworth to Ingle, Mar. 12, 1836, Ltrs. Recd., C & O Co

³² Allnut to Ingle, Mar. 18, 1836, Ltrs. Recd., C & O Co.

³³ Ingle to Holdsworth, Mar. 19, 1836, Ltrs. Sent, C & O Co

³⁴ Ingle to Bender, Mar. 19, 1836, Ltrs. Sent, C & O Co.

³⁵ Holdsworth to Ingle, Mar. 21, 1836, Ltrs. Recd., C & O Co

³⁶ Estimate of Work Done, Apr. 1, 1836, *Estimates of Work Done in the 1st Residency of the 3rd Division.*

³⁷ Estimate of Work Done, May. 1, 1836, *Estimates of Work Done in the 1st Residency of the 3rd Division.*

³⁸ Estimate of Work Done, Jun. 4, 1836, *Estimates of Work Done in the 1st Residency of the 3rd Division.*

³⁹ *Proceedings of the President and Board of Directors*, E, p. 65

⁴⁰ *Ibid.*, p. 73

This additional aid enabled Holdsworth to continue his operations during the early summer months. For his work during the Months of June and July he was paid, respectively, \$1,583.15 and \$1,648.90.⁴¹

On August 20, Holdsworth and other contractors on the stretch of canal between Dam No. 5 and the Cacapon complained to the board that they were unable “to prosecute their work under the present high rate of labour and provisions” at their contract prices. In the months since July 1835 when Holdsworth had received his contract, laborers’ wages had risen from 75¢ to \$1.10 per day and the wages of masons and stonecutters had risen from \$1.50 to \$2 per day.⁴²

To cope with this situation and afford a measure of relief to the contractors, the board asked Chief Engineer Fisk to submit a report stating what percentages on the contract price of work accomplished prior to October 1, 1835, would enable the contractors “to complete each of these contracts by the 1st day of September 1837.” In addition Fisk was to determine the number of men necessary “to complete each of these contracts” by that date. At the same meeting, the board ordered the Commissioner to advance Holdsworth \$1,000 “out of the money retained on the work done by him on Aqueduct No. 6.”⁴³

Fisk, in his report filed on August 22, recommended, “relief be granted to the persons herein named in the manner set forth.” It was recommended that the company pay to Richard Holdsworth all but 10 percent of the money due, whenever the project engineer certified that Holdsworth had a sufficient force on the job to complete the aqueduct by the designated date. Thereafter, the company would retain only 10 percent, provided the contractor continued to make satisfactory progress. If the project engineer certified that the arch had been turned and the centers safely removed by the end of the present working season, Holdsworth was to receive an additional \$2,500. Should the aqueduct be finished before August 1, 1837, Fisk recommended that Holdsworth receive \$2,500 “over and above his contract price.” In the event that Holdsworth failed to turn the arch that season, the board should pay all but 5 percent of the money due, and thereafter retain “only at the rate upon the Engineer’s certificate as before mentioned that the force employed is sufficient to complete the work by Sept. 1st, 1837.” Holdsworth was to be paid \$5,000 above his contract price if the final settlement were made “on or before that day.”⁴⁴

Because of this proposed relief to the contractors, Fisk felt certain that “we may fill the Canal to the Cacapon by the last of next year.” If no relief were granted, however, he feared that the projects would be abandoned and the laborers would leave the line. The contracts would then have to be relet at a higher figure.⁴⁵

⁴¹ Estimate of Work Done, Jul. 1, 1836, and Estimate of Work Done, Aug. 4, 1836, *Estimates of Work Done in the 1st Residency of the 3rd Division*

⁴² *Proceedings of the President and Board of Directors*, E, pp. 126–28. Also see Superintendent’s Return of Force for July 1836, *Estimates of Work Done in the 1st Residency of the 3rd Division*.

⁴³ *Proceedings of the President and Board of Directors*, E, pp. 126–28

⁴⁴ Fisk to Bender, Aug. 22, 1836, Ltrs. Recd., C & O Co.

⁴⁵ *Ibid.*

Commissioner Bender believed the plan proposed by Fisk would afford necessary relief to the contractors, while “the inducement to prosecute their works to completion would be equally as great as it would have been under the conditions of their contracts if prices” had not skyrocketed. Moreover, the 5 to 10 percent that Fisk proposed the company retain and the increased price for the projects would be made contingent on completion.⁴⁶

Under the Fisk plan, Holdsworth would be entitled to \$1,440 on the contract for Aqueduct No. 6. This figure was determined by calculating the ratio of work done between August 1, 1835 and January 1, 1836, to work remaining to be completed on August 1.⁴⁷

On September 8 Holdsworth was paid \$1,620.90 for work done on Aqueduct No. 6 since the August 4 estimate.⁴⁸

On September 10, Superintendent of Masonry A. B. MacFarland inspected the Licking Creek Aqueduct. After his survey, he reported to Fisk:

After having examined Mr. Holdsworth’s foundation for the support of the ribs of his centres I found 3 of them in which the rock has not been cleared. The foundation of the first bent from the west abutment is on top of the loose earth and slate excavated from the abutment and the contractor himself admits that the foundations of the 2 bents in the stream are partly on rock and partly on gravel.

The Assistant Engineer [Morris] thinks this arrangement perfectly safe, but while I have every disposition to treat him with deference & respect, I must take occasion to differ with him in opinion on the subject of these foundations, believing that the solid rock is indispensable for every bearing point.

While he would adhere to his “present opinion,” MacFarland told Fisk that he would abide by any course of action the Chief Engineer felt proper.⁴⁹

On October 8 Holdsworth was paid \$1,123.40 for his work done through the month of September, and on November 10 he was paid \$1,502.25 for work done during October.⁵⁰ During these 2 months, the consolidated semi-monthly returns of force, filled out by Assistant Engineer Morris, stated that the crew employed by Holdsworth was not sufficient to finish the aqueduct by the expected date of completion.⁵¹

On December 12 Holdsworth complained to Fisk that the company was unfairly withholding his December 1 estimate. He claimed that he had been delayed in measuring the lengths of the bracing planks for Aqueduct No. 6 and therefore had not placed an order for them at a nearby mill until November 8. The mill had not delivered the planks until December 1, despite its promise to deliver them immediately. Because of the delay in

⁴⁶ Bender to Board of Directors, Aug. 23, 1836, Ltrs. Recd., C & O Co.

⁴⁷ Fisk to Bender, Aug. 22, 1836, Ltrs. Recd., C & O Co.

⁴⁸ Estimate of Work Done, Sept. 8, 1836, *Estimates of Work Done in the 1st Residency of the 3rd Division*

⁴⁹ McFarland to Fisk, Sept. 10, 1836, Ltrs. Recd., Chief Engineer.

⁵⁰ *Ledger Book A*, C & O Co.

⁵¹ Consolidated Semi-Monthly Returns of Force, October and November, 1836, *Estimates of Work Done in the 1st Residency of the 3rd Division*

getting the bracing planks, Holdsworth said he had stopped putting stone on the centers for fear of weighting them down too heavily. When Assistant Engineer Morris found out that Holdsworth had stopped this operation, he had sent him a note ordering him to put on more stone “on penalty of withholding the estimate.” Holdsworth said he was willing to comply with the order now that the bracing planks had arrived, but the withholding of payment on his November estimate was hurting his financial situation.⁵²

In late January 1837, Holdsworth became very sick. Three days before he died on the 29th, he had his friend James N. Allnut draw up a settlement between himself and Enos Childs, who had assisted him in work on the aqueduct. In the settlement, the aqueduct was indebted to Childs for the amount of \$3,269.80, subject to certain assets from Holdsworth for articles furnished for the project and not charged to the firm. In addition Childs agreed to sell a house and some stone that the firm owned, with the proceeds to be divided evenly. Childs also would divide the January 1 estimate of work done with Holdsworth’s estate.⁵³

Several weeks later, on February 10, Assistant Engineer Morris inspected the Licking Creek Aqueduct because of reports of ice problems in the vicinity. After his survey, Morris informed Fisk that he had ordered “the creek chopped out from the mouth to the Bridge, and all the ice floated out into a large air hole which very fortunately had been formed opposite the creek’s mouth.” To prevent serious damage to the unfinished aqueduct, he had two “40-ft. fenders fixed over the 2 bents most exposed.” In case an ice dam formed against the center, he left instructions with the work force “to endeavor to destroy it by throwing over on the upper side all the rubble loading at the site.” Should this fail, he had ordered the workers to “clear the center of weight and cut the middle bent away.” Morris concluded his report by saying that “if the center remains safe, we should I think (weather permitting) start the masonry on the arch in the month of March.”⁵⁴

Four day later, Enos Childs, who had continued the work at the aqueduct after the death of Holdsworth, was paid \$110 for chopping the ice in Licking Creek and fixing the two fenders of the aqueduct.⁵⁵

On February 24 the board received word of the death of Holdsworth. At the same time, Assistant Engineer Morris reported that the force employed at Aqueduct No. 6 was not sufficient to complete it by the designated date. He therefore recommended that the contract be declared abandoned, and the board approved this action.⁵⁶

Previous to the February 24 board meeting, Enos Childs had written a letter to the company proposing “upon certain terms and conditions” to complete the construction of the aqueduct. The board now accepted his proposal and authorized the Commissioner to ad-

⁵² Holdsworth to Fisk, Dec. 12, 1836, Ltrs. Recd., C & O Co.

⁵³ Allnut to Fisk, Nov. 10, 1838, Ltrs. Recd., Chief Engineer.

⁵⁴ Morris to Fisk, Feb. 10, 1837, Ltrs. Recd., Chief Engineer.

⁵⁵ Voucher No. 1445, Feb. 14, 1837, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal*.

⁵⁶ *Proceedings of the President and Board of Directors*, E, p. 213.

vance \$1,500 to Childs on his contract to enable him “to prosecute his work with greater energy.” The proposal was given to Childs with the “understanding” that Fisk would indicate what the services of Childs were worth. After these services were deducted from the settlement that Allnut had arranged between Childs and Holdsworth, the balance “was to be equally divided between Childs and Mrs. Holdsworth.”⁵⁷

After Childs’s proposal was approved, A. B. MacFarland visited the site of Aqueduct No. 6 to take an inventory of the materials delivered at the aqueduct as well as those still at the quarry. On March 6 he reported the results to Assistant Engineer Morris:

Materials Delivered At Aqueduct No. 6

2432 Supl. ft. sheeting including
 309 in heads of Ring Stone
 1704 Supl. ft. coping
 687 Supl. ft. ashlar
 89 linear ft. water table
 1200 perches of rubble stone. There are 1050 Supl. ft. of this lot of rubble stone dressed.
 7 pieces or 30 Supl. ft of condemned sheeting, which will make 24 Supl. ft of Ashlar
 2 pieces or 12 Supl. ft. Sheeting, half finished
 2 pieces or 10 ½ Supl. ft. water table, half finished
 13 pieces or 66 Supl. ft. Ashlar, half finished
 177 lineal or 189 Supl. ft. Ashlar, one bed to finish. They were cut previous to the height of the courses being fixed, and has now to be reduced, to regular courses.
 1 key stone or 2 ½ lineal ft., half finished
 3 Pieces rough stone fit for water table and 6 pieces rough stone fit for Ashlar, or 54 cub. ft. fit for cutting.
 58 bus. cement
 1300 bus. sand

Materials in the Licking Quarry

48 Supl. ft. coping, finished
 10 Supl. ft. Ashlar, finished
 5 Supl. ft. sheeting, finished
 72 Supl. ft. coping, half finished
 10 Supl. ft. key stone, one bed to finish
 111 cub. ft. rough stone, fit for cutting
 50 Supl. ft. dressed rubble stone
 30 perches rubble stone⁵⁸

On March 7 Childs asked the company to pay him the amount of any unpaid estimates of work done on the aqueduct before the contract with Holdsworth was declared abandoned. The company refused on the basis that they did not owe Childs any unpaid estimates for the work done prior to their acceptance of his proposal to continue the work. To prove his

⁵⁷ *Ibid.* Also see Allnut to Fisk, Nov. 10, 1838, Ltrs. Recd., Chief Engineer.

⁵⁸ MacFarland to Morris, Mar. 6, 1837, *Estimated of Work Done in the 1st Residency of the 3rd Division*

right to the unpaid money, Childs sent a number of certificates to the board verifying that a co-partnership had existed between him and Holdsworth since the beginning of construction, although his name had not appeared on the contract. These certificates were signed by Mrs. Holdsworth, James N. Allnut and suppliers who stated that business with their firms had always been transacted in the name of Holdsworth and Childs.⁵⁹

Six days later, on March 13, Childs informed the board that James N. Allnut, who had just taken out papers as administrator of Richard Holdsworth's estate in Montgomery County, had told him that Commissioner Bender had been ordered to pay Childs the unpaid estimates of work done in December and January. After traveling to Hancock to draw the money, Childs discovered that no order had been given. He informed the board that he had commenced laying the sheeting on the aqueduct but that he could not continue the work without the money. Because of misunderstandings with Allnut, he wanted to be sure the money was paid directly to him.⁶⁰

Two days later the board reviewed Childs's petition. Upon recognizing him "as the surviving partner of the late Richard Holdsworth," the directors ordered the Commissioner "to pay as such the amount of any estimates made upon it for work done before said contract was declared abandoned."⁶¹

Earlier, on February 22, Commissioner Bender had written to President Washington that he feared that there would be a shortage of "hands, particularly masons and stone cutters," on the canal during the year. Each contractor seemed afraid that if he exerted himself to hire artisans and laborers, the others would drag their feet and reap the benefits of his efforts. Bender felt that it might be wise to send MacFarland to New York, Philadelphia and New England to recruit artisans by offering such inducements as the board might authorize.⁶²

The board liked Bender's suggestion, and MacFarland left Hancock for New York on March 20.⁶³

On May 9 Childs was paid \$2,327.26 for work done on Aqueduct No. 6 during April.⁶⁴

By late May, Childs was again experiencing financial difficulties. Chief Engineer Fisk recommended to the board that \$1,000 be advanced to Childs with the understanding that it "shall be charged against his estimate of the 1st of July next." The Board approved the advance upon reading Fisk's recommendation.⁶⁵

⁵⁹ Childs to Ingle, Mar. 7, 1837, Ltrs. Recd., C & O Co.

⁶⁰ Childs to Board of Directors, Mar. 13, 1837, Ltrs. Recd., C & O Co.

⁶¹ *Proceedings of the President and Board of Directors*, E, p. 221

⁶² Bender to Washington, Feb. 22, 1837, Ltrs. Recd., C & O Co.

⁶³ Bender to Ingle, Mar. 20, 1837, Ltrs. Recd., C & O Co.

⁶⁴ *Ledger Book A*, C & O Co.

⁶⁵ Fisk to Bender, May 26, 1837, Ltrs. Recd., C & O Co. Also see *Proceedings of the President and Board of Directors*, E, pp. 263–64.

At the ninth meeting of the stockholders on June 12, Fisk reported on the progress of the work between Dam No. 5 and the Cacapon:

The masonry on this line has been executed in a workmanlike manner, and of excellent materials, chiefly of limestone. At one time fears were entertained that suitable stone could not be obtained, but we have been agreeably disappointed, good quarries having been found at several points, although in some instances, the stone is hauled a considerable distance. Between Dam No. 5 and Cacapon, beside numerous culverts of from four to twelve feet span, and one over Little Tonoloway of forty feet span, there are ten locks of eight feet lift each, including the guard lock at Dam No. 6, and two aqueducts crossing Licking Creek and Great Tonoloway. The first is an arch of ninety feet span, the second of sixty-five feet between the abutments—the arches of both being turned. The materials on all are of the most improved kind, and the workmanship cannot be surpassed.

On all these constructions, strength and durability have been the desideratum with the board, and all unnecessary ornament, which would enhance their cost, has been dispensed with.⁶⁶

A severe drought gripped the upper Potomac Valley during the early summer, causing the river level at Hancock to drop so dramatically that it was impossible to keep Hook's cement mill running more than 12 hours out of every 24. In order to supply cement to the contractors along the canal above and below Hancock, plans were made to haul supplies from Boteler's mill at Shepherdstown and Shafer's mill at Roundtop Hill, 3 miles west of Hancock.⁶⁷ Shortages of cement continued to plague the contractors into the fall. As late as October 2, Assistant Engineer Morris informed Fisk that work on Aqueduct No. 6 might have to stop because of the lack of cement.⁶⁸

After disturbances erupted at Paw Paw Tunnel in October, Chief Engineer Fisk directed many of the contractors to fire employees who had been involved in the disorders. On October 25 word reached the board that Childs had disobeyed Fisk's orders by refusing to discharge one of his employees. The board thereupon ordered that the contract with Childs be declared abandoned.⁶⁹

On November 8 Childs wrote to President Washington explaining the conditions under which he continued to employ the laborer. The board was satisfied with Childs's reply and restored the contract to him.⁷⁰

Assistant Engineer Morris, on January 1, 1838, notified Fisk that Holdsworth and Childs had done \$45,766.05 worth of work on Aqueduct No. 6 up to December 15, 1837. Ac-

⁶⁶ *Proceedings of the Stockholders*, B, pp. 94–95

⁶⁷ McFarland to Fisk, July 9, 1837, Ltrs. Recd., Chief Engineer.

⁶⁸ Morris to Fisk, Oct. 2, 1837, Ltrs. Recd., Chief Engineer.

⁶⁹ *Proceedings of the President and Board of Directors*, E, p. 328.

⁷⁰ *Ibid.*, p. 334. A thorough search of the C & O Co. records has failed to turn up this letter.

ording to estimates recently submitted, Childs was entitled to \$732.69 for work done in November.⁷¹

Several days before Christmas, Childs had written Fisk asking for instructions concerning the entrance walls that would be built after completion of the aqueduct.⁷² Fisk replied on December 30 that Morris could supply Childs with the necessary information and encouraged him to submit a proposal.⁷³ On January 24, the board accepted Childs's proposal for "a wall of rubble masonry at both ends of Aqueduct No. 6," despite Morris' objection that it was 50¢ per perch too high.⁷⁴

On April 3, MacFarland reported to Fisk concerning his examination of the walling at Aqueduct No. 6. He said that the coping had been laid improperly. The end joints had been pointed up at the bottom, excluding the grout entirely so that each piece was hollow underneath. Most of the coping had been laid except for about 10 feet on each side, which were the only places he could inspect. He had no doubt, however, that these were a fair sample of the work throughout the entire length. There were also many pieces of coping used that were not more than 2 feet by 2 feet in area. MacFarland said he knew of no remedy other than taking the masonry up and relaying it.⁷⁵

On April 18 Childs was paid \$500 for work done on the entrance walls in February and \$160 for work done in March.⁷⁶

At the end of April, Fisk wrote the Board of Directors that John Uhler, one of the contractors for the iron railing at Aqueduct No. 5, had offered to erect railings on Aqueducts Nos. 6 and 7 at prices somewhat higher than had been paid for those at Aqueducts Nos. 4 and 5. This increase Uhler attributed to the current high price of iron. Fisk recommended that the board authorize a contract to be signed with Uhler at a price not to exceed what "a fair addition to prices heretofore paid caused by a difference in the cost of iron would make."⁷⁷

By the later part of May, Morris was about to prepare a final estimate on Aqueduct No. 6. Anticipating some problems in regard to the calculation of the final settlement, Childs wrote to Morris on May 22 claiming extra money for building thicker abutments and wing walls than were required in the specifications. Childs insisted that the increased thickness had been made as the result of an understanding between Fisk and Holdsworth that the abutments were "rather light to sustain the weight of the arch & that said Holdsworth might enlarge them not to exceed a foot." This problem was important to Childs because one of the engineers had told him that the conversation between Fisk and

⁷¹ Morris to Fisk, Jan. 1, 1838, Ltrs. Recd., Chief Engineer. Morris estimated that only \$3,051.76 worth of work was still needed to complete Aqueduct No. 6.

⁷² Childs to Fisk, Dec. 21, 1837, Ltrs. Recd., Chief Engineer.

⁷³ Fisk to Childs, Dec. 30, 1837, Ltrs. Sent, Chief Engineer.

⁷⁴ *Proceedings of the President and Board of Directors*, E, p. 359. Also see Morris to Fisk, Jan. 16, 1838, Ltrs. Recd., Chief Engineer. See Appendix D: "Entrance Walls of Aqueducts No. 6 & 7."

⁷⁵ MacFarland to Fisk, Apr. 3, 1838, Ltrs. Recd., Chief Engineer.

⁷⁶ *Ledger Book A*, C & O Co.

⁷⁷ Fisk to Board of Directors, Apr. 30, 1838, Ltrs. Recd., C & O Co.

Holdsworth had grown “out of a mistake in laying out the foundation of the abutments which increased the thickness about a foot.” and that Fisk had approved this change.⁷⁸

Two days later, on the 24th, Childs sent Morris a list of the extra work for which he was demanding payment. The list contained the following items:

No. 1	Securing the work from Frost	\$121.37-1/2
No. 2	Extra Braces on Center both of Wood and Iron	150.70
No. 3	Hands watching the Center	10.00
No. 4	Rounding Angles of the Trunk	56.00
No. 5	Loss on Splay Coping	39.00
No. 6	Pointing	102.00
No. 7	Excavating 273 yards of Rock	296.25
No. 8	Grubbing the Parapets	<u>60.00</u>
		\$835.32-1/2

In addition, Childs asked that Morris add to this sum what he thought was a fair price for the use of his tools.⁷⁹

That same day, Chief Engineer Fisk reviewed Childs’s list of extras. Concerning the claim for extra thickness of the abutments, Fisk denied the assertion by Childs on the grounds “that neither directly or indirectly has there ever been any thing said or done by me going in the least to authorize an increase of the thickness of the walls referred to.” He felt that Childs had misunderstood Holdsworth in regard to the foundation course. Fisk said that the course had been “buried perhaps a foot in the slate or rock foundation, and with a view to a connection of the back of that course with the rock for parts of its length, Mr. Holdsworth was directed to build up against it.”⁸⁰

On May 25 Childs submitted a bill for the transportation of 23,398 30/70 bushels of cement that had been used to build the aqueduct. The price per bushel of the cement, which included the costs of loading and ferriage, was 12 ½ ¢, bringing the total bill to \$1,549.80.⁸¹

Two days later, on the 27th, Morris notified Fisk that he was allowing extra pay to Childs for 10 perches in the foundation. He was hoping that this compromise would help speed a final settlement. However, he intended to insert the following statement with the extra allowance: “for walls made thicker than ordered by the Engr. which benefits the work but to which strictly the contractor lays no claim.”⁸²

On May 28 Fisk wrote to Morris at length concerning Childs’s claims for extra work. He felt that Childs was justified in his claims for hands watching the center, for rounding the

⁷⁸ Childs to Morris, May 22, 1838, Ltrs. Recd., Morris.

⁷⁹ Childs to Morris, May 24, 1838, Ltrs. Recd., Morris.

⁸⁰ Fisk to Morris, May 24, 1838, Ltrs. Recd. Morris.

⁸¹ Unnumbered Voucher, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal*.

⁸² Morris to Fisk, May 27, 1838, Ltrs. Recd., Chief Engineer.

angles of the trunk, for grubbing the parapets and for the loss on the splay coping. As to Childs's claim for extra braces on the center, the Chief Engineer recommended that the company only should pay costs arising after the engineer deemed insufficient the plan he had previously approved. Concerning Childs's claim for extra money for rock excavation not in the foundation of the aqueduct, Fisk urged that no allowance be made, since Childs had excavated only to obtain earth for puddling. There were no grounds for the claims for securing the work from frost or for repairing the pointing.⁸³

On June 1 Morris sent copies of a summary of the final disposition of Childs's extra claims to both Fisk and Childs. A total of \$315.70 was allowed for his claims for braces on the center, for hands watching the center, for rounding the angles of the trunk, for the loss on the splay coping and for grubbing the parapets. In addition, a sum of \$51.14 was allowed for the costs of superintendence, making a total of \$366.84.⁸⁴

Three of Childs's claims for extra work were rejected. The claim for securing the work from frost damage with straw was disallowed, since Childs had taken this action to save himself from the alternative specified in his contract that required him to lift and re-lay every spring the top courses that had been exposed to the frost. Childs's claim for repairing the pointing was turned down, because it was the duty of the contractor to have his work completely pointed by the time of the final estimate. According to Morris, if any pointing previously done had given away before the completion of the work, it was the duty of the contractor to restore it without charge. The claim for excavating 237 cubic yards of rock not in the aqueduct's foundation was rejected, because Morris found that Childs had merely removed earth from the stone for puddling. Most of the rock had been left in the canal trunk to be blasted and removed by McLaughlin, the contractor for Section No. 222.⁸⁵

On June 2, Assistant Engineer Morris sent the final estimate of work done on Aqueduct No. 6 to Fisk. The totals were:

Total final estimate	\$45,033.65
Amount estimated on February 28, 1837, as work done prior to death of Richard Holdsworth	\$25,587.75
Amount estimated as work done by Enos Childs subsequent to death of Richard Holdsworth	\$19,445.90

Along with the final estimate, Morris enclosed a revised accounting of Childs's bill for cement. According to Morris, Childs now claimed that he had used 12,999 bushels of cement at 11 ¼ ¢ per bushel, bringing the final total to \$1,528.25. This total included the hauling of nearly 300 bushels, which had been condemned after deliver to the aqueduct. The total also included the hauling of 149 bushels borrowed from another contractor who had received an extra supply from Hook's mill at Hancock.⁸⁶

⁸³ Fisk to Morris, May 28, 1838, Ltrs. Recd., Morris

⁸⁴ Morris to Fisk, June 1, 1838, Ltrs. Recd., Chief Engineer.

⁸⁵ *Ibid.*

⁸⁶ Morris to Fisk, June 2, 1838, Ltrs. Recd., Chief Engineer.

On June 10 Childs wrote to Morris protesting that his claims for extra work had been unfairly rejected. His claims to protect the work from frost and repair the pointing had resulted from expenses incurred when the company had declared his contract abandoned on October 25, 1837. He had been forced to suspend operations, which had kept him from completing the work that season. Childs insisted that the company had no legal right to tell him how he should protect his work from frost. His claim for rock excavation also was valid, since his contract stated that he was entitled to claim extra payment for “all mucking and of all puddle ditches.” Unless these rejected claims were restored, Childs said he would sue the company.⁸⁷

On June 19 Childs notified Fisk that the entrance walls of Aqueduct No. 6 were finished. He wished to have them estimated soon so that he could settle his accounts with his laborers. Because he felt that the final estimate on the aqueduct was incorrect, he had drawn up his own final estimate for Fisk to inspect.⁸⁸

Two days later, on the 21st, Morris made a final estimate on the entrance walls of Aqueduct No. 6. The estimate contained the following elements:

557 perches of masonry laid at \$5.00	\$2,785.00
335 cu. yds. excavation of earth at 20¢	67.00
Cutting a battery on the face stone not contemplated in the original plan	\$244.37
Putting some temporary props between the two Eastern Walls during the puddling	<u>\$5.00</u>
	\$3,101.37 ⁸⁹

On the same day that Morris was making the final estimate on the entrance walls, Fisk showed Childs the final estimate on the aqueduct. Childs complained that there was a great discrepancy between his estimate and that of Morris. He therefore requested that Morris examine his figures relating to cut and rubble masonry, excavation of pits, embankment and puddling.⁹⁰

When Morris had not answered his letter a week later, Childs appealed to Fisk, expressing his displeasure that the Assistant Engineer had not “condescended” to answer his petition. He asked for an immediate review of his final estimate and claims for extra work, because he was being harassed by his creditors and his hands were “getting very uneasy about their money.”⁹¹

⁸⁷ Childs to Morris, June 10, 1838, Ltrs. Recd., Morris

⁸⁸ Childs to Fisk, June 19, 1838, Ltrs. Recd., Chief Engineer.

⁸⁹ *Final Estimate on Entrance Wall of Aqueduct No. 6*, June 21, 1838, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal*.

⁹⁰ Childs to Morris, June 21, 1838, Ltrs. Recd., Morris.

⁹¹ Childs to Fisk, June 29, 1838, Ltrs. Recd., Chief Engineer.

In answer to a request by Chief Engineer Fisk, Childs submitted a statement on July 6 showing the advances made during the construction of Aqueduct No. 6 both by himself and Holdsworth. According to Childs's accounts, Holdsworth, before his death, had advanced one hand truck, one face hammer, and five or six stone picks, totaling \$44. Childs had put forth in money, horses and canal tools a sum of \$3,668.02-3/4⁹²

The following day, Childs sent a statement to Fisk showing his own financial situation and that of Holdsworth at the time of his death. His books showed that Holdsworth was in debt to the amount of \$1,463.67 1/2 at his death in January 1837. Since Childs had taken over the contract for Aqueduct No. 6, his own debts had decreased from \$3,668.02-3/4 to \$1,460.00. Despite the improvement of his finances, Childs reported that his continuing debts were deeply affecting his family.⁹³

Along with this statement, Childs enclosed another bill for extra work and for hauling cement for the entrance walls. He claimed \$212.50 for changing the batten of the west walls and \$109.50 for loading and hauling cement from McCoy's mill at Hancock.⁹⁴

On July 9 Childs appealed to Thomas Fillebroun, Jr., the Acting Commissioner, for immediate attention to his previous requests for a reexamination of his final estimate and extra work claims. Again he stressed his pressing obligations and the uneasiness of his workers about their money. He warned that "delay in this matter might prove dangerous, both to the work & myself."⁹⁵

That same day, Fisk submitted to Fillebroun the revised final estimate for Aqueduct No. 6, amounting to \$46,264.65. This sum did not include the transportation of cement which cost 11¼¢ per bushel or the allowance of \$71.25 for ferriage from Hook's mill. Fisk informed Fillebroun that he had taken back the estimate that he had submitted several weeks before, in order to make the necessary inquiries desired by Childs. The Chief Engineer promised that a report on his conclusions would soon be forthcoming.⁹⁶

While the Chief Engineer was reconsidering the final estimate on Aqueduct No. 6, he also apparently reached an agreement with Uhler on his own to build the iron railings on Aqueducts Nos. 6 and 7. Although the board did not finally authorize Fisk to enter into a contract with Uhler until September 7, Uhler was at work on the railings by early July.⁹⁷ On August 6 Uhler received his first estimate for work done during July and was paid \$597.60⁹⁸ Four days after the board authorized the contract, Morris forwarded to his superior the final estimates on the railings for the two aqueducts. The final estimate for the railings on Aqueduct No. 6 contained the following items:

⁹² Childs to Fisk, July 6, 1838, Ltrs. Recd., Chief Engineer.

⁹³ Childs to Fisk, July 7, 1838, Ltrs. Recd., Chief Engineer.

⁹⁴ *Ibid.* The bill was attached to the letter.

⁹⁵ Childs to Fillebroun, July 9, 1838, Ltrs. Recd., Chief Engineer.

⁹⁶ Fisk to Fillebroun, July 9, 1838, Ltrs. Sent, Chief Engineer.

⁹⁷ *Proceedings of the President and Board of Directors*, E, pp. 485–86. When the board had first considered the contract with Uhler in early May, he had proposed to supply the railings at 10¢ per pound. This figure, which the board approved on September 7, included the cost of placing them, with customary prices for lead and drilling. Also see Fisk to Board of Directors, Sept. 7, 1838, Ltrs. Recd., C & O Co.

⁹⁸ *LedgerBook A*, C & O Co.

6505 lbs. of iron at 10¢	\$650.50
440 lbs, of lead at 10½¢	46.20
331 holes drilled 6 in. deep in the coping, making 1986 inches at 2¢	39.72
Cost of oil & workmanship in oiling the railing	<u>12.00</u>
	\$748.42

The contractor, Morris reported, had completed the railings to his “entire satisfaction.”⁹⁹

The Chief Engineer also took steps during the summer of 1838 to seal Aqueducts No. 6 and 7 with cement. Time had shown that the aqueducts between Dam No. 5 and Georgetown leaked to some extent. After lengthy consideration of the problem, Fisk contacted Thomas Coyle of Baltimore on May 10 about undertaking this sealing project using his patented “American Cement.”¹⁰⁰

On May 14 Coyle informed Fisk that an order of “American Cement” would be shipped to Hancock. However, he wished to know the quantity needed to seal the aqueducts.¹⁰¹ The people in Baltimore with whom Coyle dealt refused to send any cement until they learned what price they would receive. Coyle accordingly priced his cement at 75¢ per bushel, with the canal company to pay the freight and cost of “application.” One-half this amount was to be paid in cash and the balance in 12 months.¹⁰²

Coyle notified Fisk on July 6 that he planned to be at Aqueduct No. 6 within a week with his cement and equipment. If the Chief Engineer had any additional instructions relative to the sections of the aqueducts to which he was to apply his cement, he was to write Coyle at Frederick.¹⁰³

Assistant Engineer Morris saw Coyle in mid-July and gave him his instructions. Aqueducts Nos. 6 and 7 were to be covered with cement, the “Spandril Backing 3 deep, the Arch 1 ½ & the Rubble sides of the parapet up to the bed of the lower course of Ashlar 1 ½ (mean thickness).” Coyle had argued, successfully, that the “thicknesses” of the depth proposed would be sufficient to prevent leaking and would begin to harden within 24 hours. When the trunks of the aqueducts had been finished as high as the cut work, the trunks were to be “completely enveloped” with a coating of “American Cement.”¹⁰⁴

By July 19 Coyle had unloaded and set up his 100-gallon kettles at Licking Creek, and his laborers had started applying cement to Aqueduct No. 6.¹⁰⁵

⁹⁹ Morris to Fisk, Sept. 11, 1838, Ltrs. Recd., Chief Engineer.

¹⁰⁰ Fisk to Coyle, May 10, 1838, Ltrs. Sent, Chief Engineer. See also Edwin C. Bearss, *HSR, Tonoloway Aqueduct, Chesapeake and Ohio Canal* (Washington, D.C.: NPS, June 30, 1967). In his report, Bearss deals extensively with the use of “American Cement” on Aqueducts Nos. 6 and 7. For that reason, this report will summarize his findings and deal specifically with Aqueduct No. 6.

¹⁰¹ Coyle to Fisk, May 14, 1838, Ltrs. Recd., Chief Engineer.

¹⁰² *Ibid.*, June 11, 1838, Ltrs. Recd., Chief Engineer.

¹⁰³ *Ibid.*, July 6, 1838, Ltrs. Recd., Chief Engineer.

¹⁰⁴ Morris to Fisk, July 16, 1838, Ltrs. Recd., Chief Engineer.

¹⁰⁵ *Ibid.*, July 19, 1838, Ltrs. Recd., Chief Engineer.

On the 20th Fisk advised Morris that he wished the plan carried out that had been proposed for applying the “American Cement.” Other reasons besides a desire to make the trunks watertight had influenced his decision. The intervals between the stone would be solidly cemented to a height of 1-½ feet from the bottom of the canal. Above that point, the uncut masonry remaining exposed could be mortared over. Care would be taken to ensure that the bottom of the spandrel filling was preserved at both ends, having first made one offset of 3 feet.

The rubble used to fill the span, probably round fieldstone which Childs had offered to furnish at 80¢ per perch, was to be sealed with “American Cement.” Before any cement was poured, Morris was to see that the rubble was closely packed, reducing the amount of cement required.¹⁰⁶

After receiving these instructions, Morris contacted Coyle and directed him to run his “cement among the rubble stones . . . so as to fill, if practicable, every crevice.” When completed, he wanted the grouting to “present as nearly as may be an entirely solid mass of stone and cement, the latter filling all the space not occupied by the former.”¹⁰⁷

On August 13 Coyle reported to Fisk concerning the progress of his work on Aqueduct No. 6. To date he had “spread the cement 2 inches thick over the bottom of the aqueduct.” One-fourth of the stones had been grouted, and one-fourth of the upright walls were finished. For this work he had used 147 barrels of cement, which would cost the company \$447.47 including freight and labor. In addition he was expecting 200 barrels of resin and 600 barrels of clay from Frederick. This shipment, together with 200 barrels of clay that he already had at Licking Creek, would make 1,000 barrels of cement. It would take about 500 barrels to finish Aqueduct No. 6.¹⁰⁸

Five days later, Fisk informed Coyle that he should proceed with the delivery from Frederick. Coyle was to continue applying the cement as he had done “except that the stone should be more closely packed.” Fisk wanted Coyle to apply the cement “equally on both sides so that if we should consider as the work progresses, not to raise to the full height first contemplated, we may apply the balance with lime.”¹⁰⁹

On September 14 Morris visited Licking Creek and saw that Coyle would complete his cementing at Aqueduct No. 6 by the middle of the following week. Reporting this to Fisk, Morris observed that more “examinations & a comparison of the amount of cement used & space filled” would be needed to satisfy the engineer as to the “solidity of the mass of filling in the aqueduct.” In any event, Aqueduct No. 6 would be given a thorough coating, “which should prevent leaking.”¹¹⁰

¹⁰⁶ Fisk to Morris, July 20, 1838, Ltrs. Sent, Chief Engineer.

¹⁰⁷ Morris to Coyle, Aug. 8, 1838, Ltrs. Sent, Morris.

¹⁰⁸ Coyle to Fisk, Aug. 13, 1838, Ltrs. Recd., Chief Engineer.

¹⁰⁹ Fisk to Coyle, Aug. 18, 1838, Ltrs. Sent, Chief Engineer.

¹¹⁰ Morris to Fisk, Sept. 15, 1838, Ltrs. Recd., Chief Engineer.

Because the board had not yet authorized the use of “American Cement” on Aqueducts Nos. 6 and 7, Fisk had to proceed carefully. On October 8, he notified the directors that the aqueducts below Dam No. 5 were “filled up over the arch, with masonry, to the level of the canal bottom.” A problem had now arisen in regard to Aqueducts Nos. 6 and 7. As required in the specifications, the masonry had been “left lower than the bottom of the canal from 2 to 4 feet, for the purpose of enabling us by a different kind of filling than usual to endeavor at least to make the aqueducts watertight.” At Aqueduct No. 6, the company had been filling “the space with small stones grouted full with the ‘American Cement,’ specimens of which have been seen by the Board.” While the “American Cement” was slightly more expensive than the usual masonry filling, Fisk felt that it was “as good in the place it is used as hydraulic cement.” If the board followed his advice and used the cement on Aqueduct No. 7, he believed that in the construction of Aqueducts Nos. 8–11 “we should employ hydraulic cement” to within 1 foot of the canal bottom, and over this place a thin coat of “American Cement.”¹¹¹

Again, on October 17, Fisk urged the board to approve this project. Fisk proposed to “cover the arches of Aqueducts Nos. 6 and 7 with ‘American Cement’ and to employ Thomas C. Coyle, the patentee to execute the work.”¹¹² The board concurred with its chief engineer’s suggestion and “authorized a separate account to be made out in favor of Thomas C. Coyle.”¹¹³

On November 6 Coyle asked to be paid \$1,772.08 for the cement applied to Aqueduct No. 6, because he needed money to pay his creditors. According to his bill, Coyle had used 992 barrels of cement to cover “the whole length & breadth of the bottom of the trunk of the aqueduct, filling a space equal to 152 perches.” In addition, Coyle had applied “a thickness of from 4 to 7 inches on each side of the trunk, sufficiently high to bind upon the cutwork of the inside of the parapets.” The board ordered payment of the bill on November 12,¹¹⁴

Meanwhile, Childs had continued to press the company for a favorable final settlement on the aqueduct. On August 29 Childs had written to Fisk reminding him that he had not heard from the board for nearly 2 months. The money for the aqueduct was due, and “the matter must be soon settled in some way as I am tired of such delays, & fair promises.”¹¹⁵

The following day, on the 30th, James N. Allnut, the administrator of Holdsworth’s estate, wrote to Fisk demanding that a settlement be made on Aqueduct No. 6. Allnut reminded Fisk that he had promised in June to report through Clerk Ingle concerning the agreements between Childs and Fisk. Childs and George W. Marsh, who were now partners in the construction of Aqueduct No. 9, had gone to Baltimore and purchased goods amounting to \$11,000; they had reportedly stated that they had \$2,000 left over. If this money

¹¹¹ Fisk to Board of Directors, Oct. 8, 1838, Ltrs. Recd. C & O Co.

¹¹² *Proceedings of the President and Board of Directors*, E, p. 504.

¹¹³ Ingle to Sprigg, Oct. 17, 1838, Ltrs. Sent, C & O Co.

¹¹⁴ Voucher No. 3878, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal*. Because Coyle had increased his price from 75¢ to \$1 per barrel for the cement, the company decided not to use it on Aqueduct No. 7.

¹¹⁵ Childs to Fisk, Aug. 29, 1838, Ltrs. Recd. Chief Engineer.

had been paid to Childs for his work on Aqueduct No. 6, Allnut wanted to know what Holdsworth's prospects for remuneration were. Mrs. Holdsworth had been living off him for 15 months, unable "to get one dollar to purchase clothes for herself or her children," and he was becoming financially pinched.¹¹⁶

On September 18 Fisk sent the final estimate on the entrance walls of Aqueduct No. 6 to M. C. Sprigg, the treasurer of the company. The amount was \$3,101.37, to which was to be added the cost of transportation of the cement. On September 26 the board ordered the estimate to be paid to Childs.¹¹⁷

In mid-October Childs again appealed to Fisk to adjust the final estimate on Aqueduct No. 6 "in a way that may seem to you right together with the filling of the truth of the Law." Unless this were done soon, his property "must be sacrificed and his family would face hardship."¹¹⁸

On October 15 Fisk informed Allnut that "owing to objections to the final estimate by Mr. Childs, it is still in my possession never yet having been acted upon by the board." According to what Childs had told him, Fisk informed Allnut that "instead of a profit to be divided between him & Mr. Holdsworth's estate, there is a considerable loss." As the accounts were "too complicated to be understood by correspondence," Fisk urged Allnut to visit Childs at Fifteen Mile Creek to examine the statements himself.¹¹⁹

Two days later, on the 17th, Allnut requested of President Washington that a settlement be speedily made with Childs "so as to ascertain whether under existing agreements the widow of the late R. H. Holdsworth is to receive any money from the said Childs." Allnut reminded the canal company president that Childs had gone to Washington after the death of Holdsworth to urge the company to declare the contract abandoned. This had been done with the understanding that Childs would finish the work. The Chief Engineer had agreed to determine the value of Childs's services, and the net proceeds from the final settlement were to be equally divided between Childs and Mrs. Holdsworth.¹²⁰

On October 20, Engineer Barnard notified Fisk that the company had overpaid Childs by \$99.25 for the entrance walls on Aqueduct No. 6. The Chief Engineer had failed to deduct for the 397 bushels of cement that Childs had used on the job. If the final settlement

¹¹⁶ Allnut to Fisk, Aug. 30, 1838, Ltrs. Recd., Chief Engineer.

¹¹⁷ Fisk to Sprigg, Sept. 18, 1838, Ltrs. Sent, Chief Engineer. Also see *Proceedings of the President and Board of Directors*, E, p. 495. One of the primary reasons that Childs had objected to the final estimate on the entrance walls was that the "wagoning" of cement for their construction had been done when the cost of hiring a team was \$5 per day. The bulk of the cement for the aqueduct had been hauled by teams at a cost of \$4 per day, and the price of 11-¼¢ per bushel of cement for the entrance walls had been based on this lower cost.

¹¹⁸ Childs to Fisk, Oct. 12, 1838, Ltrs. Recd., Chief Engineer.

¹¹⁹ Fisk to Allnut, Oct. 15, 1838, Ltrs. Sent, Chief Engineer.

¹²⁰ Allnut to Washington, Oct. 15, 1838, Ltrs. Recd., C & O Co. Also see *Proceedings of the President and Board of Directors*, E, p 507

had not yet been made on the aqueduct, this sum should be subtracted from the final estimate.¹²¹

Finally, on November 14, the board of directors ordered Chief Engineer Fisk to make the final estimate on Aqueduct No. 6 if the structure was completed.¹²² At the meeting of the board on December 5, the final estimate was presented, which included the following items:

	Advances of August 1836	\$1,440.00
1.	738 perches of cut masonry at \$19.25	14,206.50
2.	1995 perches of rubble masonry at \$4.50	8,977.50
	2667 perches of rubble masonry at \$6.75	18,002.25
3.	245 cu. yds. of excavation of rock at \$1.25	306.25
4.	3295 cu. yds of excavation of other materials at 25¢	823.75
5.	2748 cu. yds. of embankment at 22¢	604.56
6.	2748 cu. yds. of puddling at 15¢	412.20
7.	Bailing and coffer dams	300.00
8.	152 perches of stone for “American Cement” at \$1.37½	209.00
	Extras	
1.	Gravelling &c done by the day	638.20
2.	Protecting the center against ice	186.60
3.	Extra labor of every other kind	<u>366.84</u>
		\$46,473.65
	add transportation of cement	<u>1,549.80</u>
		\$48,023.45
	deduct previous payments	<u>\$41,445.69</u>
		6,577.76
	deduct for 12,398 30/70 bushels of cement	<u>3,099.61</u>
		due \$3,478.15

After consideration of the final estimate, the board deducted the August 1836 advance and ordered the remaining sum to be paid to Childs.¹²³

On December 14, Allnut wrote to Fisk asking that the Chief Engineer use his influence to get Childs to pay Mrs. Holdsworth her rightful share of the final settlement.¹²⁴

Fisk responded to this letter by informing the board on January 23, 1839, that in his opinion no profit had been realized upon the work. Therefore, Mrs. Holdsworth was not entitled to a share of the profit according to the terms of Childs’s proposal for Aqueduct No.

¹²¹ Barnard to Fisk, Oct. 20, 1838, Ltrs. Recd., Chief Engineer.

¹²² *Proceedings of the President and Board of Directors*, E. p. 518.

¹²³ *Ibid.*, p. 350. Also see Voucher No. 4193, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal*.

¹²⁴ Allnut to Fisk, Dec. 14, 1838, Ltrs. Recd., Chief Engineer.

6. After receiving this report, the board directed the Commissioner to pay Childs the sum of \$1,440 that it had deducted from the final estimate on December 5.¹²⁵

When Aqueduct No. 6 was nearly completed, the company made arrangements to build a road under the structure for Joseph Chambers. On April 11, 1837, at the time of the condemnation of his land through which Sections Nos. 219–221 of the canal were to pass just east of Licking Creek, a verbal agreement was made before the jury that the company would construct a road for his use.¹²⁶ In late June 1838, J. Irons, an assistant engineer, was ordered by Fisk to estimate the amount of money and work needed to build the road.¹²⁷

After concluding his survey, Irons estimated the cost to be \$305. The excavation would be generally a side cut, and the riprapping would “principally be to excavate just opposite where it will be used.” Much of the riprapping could be done with the stone already lying around. The road would be located on the level of the offset in the abutment, which was 3 feet above the present water surface.¹²⁸

Four days later, on the 29th, Joseph Chambers, who had indicated an interest in building the road himself, informed Engineer Joshua Gore that the \$300 estimate was an unfair price. Two contractors he had contacted had estimated the cost of the road to be between \$700 and \$1,000. Chambers also complained that he had not been adequately compensated for the “injury” done to him by the company. According to his understanding of the agreement, the company was legally obligated to build the road immediately after the condemnation proceedings, but nothing had been done for over a year.¹²⁹

On September 3, Fisk replied to Chambers, informing him that Gore had recently put the road under a conditional contract. As soon as Doyle had finished sealing the aqueduct with “American Cement,” he would build the road.¹³⁰

Less than two weeks later, Fisk reported to the board that Gore had received a proposal from Patrick Driskell, who agreed to construct the road for \$300. Upon the recommendation of the Chief Engineer, the board authorized the contract on October 17.¹³¹

Under the terms of the contract, Driskell built the farm road “from the turnpike road near Licking Creek Bridge down the east bank of said creek under the Licking Creek Aqueduct to that part of the farm of Joseph Chambers which lies below the Ches. & Ohio Canal.” The road was “at least twelve feet wide in the clear in all places and of such grade as the Engineer requires.” Along the bluff between the aqueduct and the turnpike, the

¹²⁵ *Proceedings of the President and Board of Directors*, F, p. 11.

¹²⁶ *Reference Book Concerning Land Titles, 1829–1868*, C & O Co.

¹²⁷ Irons to Fisk, June 25, 1838, Ltrs. Recd., Chief Engineer.

¹²⁸ *Ibid.*

¹²⁹ Chamber to Gore, June 29, 1838, Ltrs. Recd., Chief Engineer.

¹³⁰ Fisk to Chambers, Sept. 3, 1838, Ltrs. Sent, Chief Engineer.

¹³¹ Fisk to Board of Directors, Sept. 14, 1838, Ltrs. Sent, Chief Engineer. Also see *Proceedings of the President and Board of Directors*, E, p. 509.

roadway was “well protected on the outside” with “stone suited to the purpose.” The portion of the road under the aqueduct was constructed entirely of stone.¹³²

On January 16, 1839, Driskell reported to the board that the road was completed. The directors thereupon ordered the he be paid \$300.¹³³

Work along the entire Hancock level was finally completed on April 1, 1839, and the hands laid off. By April 15, water had been admitted into the recently completed levels of the canal between Dam Nos. 5 and 6, with 3 ½ feet of water in the Hancock level. Now 136 miles of the Chesapeake and Ohio Canal from Georgetown to the Cacapon were open to navigation.¹³⁴

On the 24th, an article appeared in the *Washington National Intelligencer* announcing that water had been “admitted into the twenty-seven miles of this Canal lately finished, and that the boats are now navigating that, as well as the older portions of the line.” Only 50 miles were left to be completed “in order to connect the town of Cumberland with the tide-water, by the most perfect canal navigation which the country can boast of.” A great increase in canal trade was expected, because the canal was now connected with the National Road at Hancock. Because of the unseasonably low level of the Potomac, river navigation between Cumberland and Dam. No. 6 was extremely hazardous. Such a situation, the editor observed, should underscore to the people of Maryland just how important it was for them that the last 50 miles of the canal be completed and opened to navigation.¹³⁵

The Board of Directors reported in June 1839 that water had been in the newly opened sections for almost 2 months. Since then there had been no interruptions to navigation. Except for erecting three lockhouses, completing the deposit of gravel at Dam No. 6, and finishing some light work, the canal between Dam Nos. 5 and 6 was finished.¹³⁶

The stockholders learned from a report by the General Committee on August 5, 1839, that:

Continuing along this 14 miles level, we pass over a road culvert and several smaller culverts, and reach Licking Creek at a distance of about eight miles above Lock No. 50. Over this creek is an aqueduct of 90 feet span, and 15 feet rise, a segment of a circle. This is one of the longest, if not the longest, aqueduct arch which has been constructed in the United States. The masonry of this aqueduct is composed entirely of rubble stone, with the exception of the arch, the inside of the parapets, the coping and the water table, which are of cut masonry. The abutments rest upon a solid rock foundation, as do also the wings throughout their entire length. The wings spread out from

¹³² Voucher No. 4200, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal*.

¹³³ *Proceedings of the President and Board of Directors*, F, p. 9.

¹³⁴ Byers to Fisk, Apr. 15, 1839, Ltrs. Recd., Chief Engineer. Also see *Proceedings of the Stockholders*, B, p. 210.

¹³⁵ *National Intelligencer*, (Washington D.C.), Apr. 24, 1839.

¹³⁶ *Eleventh Annual Report*, (1839), C & O Co., p. 9.

a point a few feet back of the face of the abutment, (six inches in the direction of the canal, to one foot at right angles to it,) until they are sufficiently extended to give the regular canal width, they can then run at that width 45 feet back from the face of the abutment. The back and ends of the wings, as well as their face, are laid with an even and regular batten, to allow of the puddling to settle close to the masonry. This plan of construction is now pursued in all the masonry on the line of the canal.¹³⁷

¹³⁷ *Proceedings of the Stockholders*, B. pp. 237–38.

II. PREPARATIONS FOR LETTING THE CONTRACTS FOR THE “FIFTY-MILE SECTION”: 1835–1837

On January 16, 1835, the Board of Directors determined to suspend the letting of all contracts along the line between the Cacapon River and Cumberland, except for the Paw Paw Tunnel and the heavy sections (Nos. 333 and 334) at Oldtown, until adequate resources were secured to assure their early completion.¹³⁸ With the receipt of the first installment of the \$2,000,000 loan from the State of Maryland in June 1835, construction on the canal from Cacapon to Cumberland resumed with increased vigor. The board ordered the route to be resurveyed in order to determine the final location of the line preparatory to putting this final stretch of the eastern section of canal under contract. George Bender, a member of the board of directors, was appointed to fill the new office of Commissioner, which was created to provide supervision of the construction. The work had moved so far westward that it was no longer possible for the directors, meeting in Washington, to maintain adequate control of operations. The Commissioner was given authority over the lesser officials, the acquisition of land, the use of the company property, and the reletting of abandoned contracts. The board reserved to itself the first letting of contracts and the right to review all the acts of the Commissioner.¹³⁹

The extension of the canal from Cacapon to Cumberland raised a series of new problems. The first of these was the resurveying of the line. Assistant Engineer Ellwood Morris was placed in charge of the survey in September.¹⁴⁰

Meanwhile, A. B. MacFarland, the Superintendent of Masonry, was dispatched by Fisk to inspect the area above Dam No. 6 for prospective sources of good building stone. As he went up the Potomac Valley, MacFarland found much of the strata composed of friable red sandstone, much of it already rotten. Good building limestone was discovered at scattered points on both side of the Potomac, but at some distance from the river.¹⁴¹

On March 24, 1836, the board, after studying MacFarland’s report on sources of stone above Cacapon, determined that his survey had been done with too much haste. Since it was likely that this “50-mile section” might be put under contract at an early date, it recommended that Commissioner Bender have MacFarland make a more thorough investigation.¹⁴²

Clerk John P. Ingle, on May 9, wrote Commissioner Bender that, in accordance with a request from MacFarland, he was forwarding copies of the specifications for the four aq-

¹³⁸ Ingle to Bender, Jan. 16, 1835, Ltrs. Sent, C & O Co.

¹³⁹ *Proceedings of the President and Board of Directors*, D, pp. 294–301, p. 342

¹⁴⁰ Morris to Fisk, Sept. 15, 1835, Ltrs. Recd., C & O Co.

¹⁴¹ MacFarland to Bender, Jan. 2, 1836, Ltrs. Recd., C & O Co.

¹⁴² Ingle to Bender, Mar. 24, 1836, Ltrs. Sent, C & O Co.

ueducts to be built on the canal between Dam No. 6 and Cumberland. MacFarland had written that he needed the specifications to enable him to judge if the stone he had located on his recent survey was satisfactory.¹⁴³

Four months earlier, on January 27, Commissioner Bender had submitted to the board an estimate prepared by Chief Engineer Fisk of the cost of constructing the canal from Cacapon to the South Branch. Fisk calculated the cost of the three aqueducts (No. 8–10), the culverts, and the waste weirs needed along this section of the canal at \$189,621.¹⁴⁴

The bonds issued by the State of Maryland to cover the \$2,000,000 loan of 1835 had found a ready market and caused the canal company few problems. But the bonds issued as part of the Eight Million Dollar Bill to provide the \$3,000,000 subscription in 1836 involved the company in an increasingly precarious financial situation. It encountered trouble at the very start in obtaining the bonds or the proceeds from their sale. Maryland politics had caused delays in putting the bill into effect and in appointing state commissioners to negotiate the sale of the bonds. The economic depression that was spreading across the nation also made the sale of the bonds more difficult. Consequently, the company had insufficient capital to call for bids for the construction of the canal above Cacapon. By the end of March 1837, the board had decided to purchase the bonds on behalf of the company if the state agents in Europe were unable to market them. A provisional contract was drawn up.¹⁴⁵

In preparation for starting construction as soon as capital became available, Commissioner Bender on February 22, 1837, wrote President George C. Washington concerning the need for recruiting skilled craftsmen. Fearing that there would be a shortage of laborers, “particularly masons and stone cutters,” on the canal that season, Bender felt that it would be wise to dispatch MacFarland to Philadelphia, New York, and Boston to see if he could bring skilled laborers to the Potomac Valley by “holding out such inducements” as the board might authorize.¹⁴⁶

On March 1 the board authorized MacFarland’s recruiting trip. MacFarland, however, was cautioned not to “bind the Canal Company to the payment of any money to hands” whom he might bring to the line “nor to security for wages of any” who might come.¹⁴⁷

Because of his other duties relating to supervision of the masonry works, MacFarland was unable to leave the line of the canal until March 20.¹⁴⁸ After spending several weeks in New York City, MacFarland reported to Fisk that he was having some success in “obtaining laborers and mechanics.” Some of the men recruited had already started for the canal.¹⁴⁹

¹⁴³ Ingle to Bender, May 9, 1836, Ltrs. Sent. C & O Co. A copy of the aqueduct specifications may be found as Appendix A.

¹⁴⁴ Bender to Board of Directors, Jan. 27, 1836, Ltrs. Recd., C & O Co.

¹⁴⁵ Sanderlin, *The Great National Project*, pp. 129–30.

¹⁴⁶ Bender to Washington, Feb. 22, 1837, Ltrs. Recd., C & O Co.

¹⁴⁷ Ingle to Bender, Mar. 1, 1837, Ltrs. Sent, C & O Co.

¹⁴⁸ Bender to Ingle, Mar. 20, 1837, Ltrs. Recd., C & O Co.

¹⁴⁹ Fisk to Bender, Apr. 19, 1837, Ltrs. Recd., C & O Co.

While MacFarland was absent recruiting laborers, Fisk notified Commissioner Bender on May 1 that when the board was able “to put more work under contract,” he would recommend the letting of the entire line from Cacapon to Cumberland. If the board would approve his suggestion, Fisk would recommend that Assistant Engineer Morris, with A. H. Williams as his rodman, be left in charge of the division from Licking Creek to Hancock. In addition, Morris would have supervision of the line from Section No. 288 to Section No. 323, just east of the area where Charles H. Randolph had jurisdiction. This section would include the Paw Paw Tunnel, over which Morris already had general superintendence through Assistant Engineer Henry H. Dugan. Fisk felt that Dugan ought to continue to oversee work at the tunnel. At the same time, Randolph would have charge of the new line (from Section No. 324 to Section No. 349), which was below Joshua Gore’s division.¹⁵⁰

After studying the Chief Engineer’s recommendations, the board, on June 15, informed Bender of its decision to let contracts in August “embracing all the line between Cumberland and the Narrows, a distance of ten miles.” Temporary locks could be placed at the Narrows to accommodate navigation from Cumberland one year earlier than would be possible with a continuous canal. The most difficult sections between the Narrows and Dam No. 6, the cost of which had been estimated as exceeding \$20,000 each, and those less difficult sections that Fisk believed necessary would be put up for bid. Earlier Fisk had told the board that 58 sections would be involved. At the same time, proposals would be invited for the remaining locks, culverts, and aqueducts.¹⁵¹

Three days before, at the company’s ninth annual meeting, the stockholders were informed that four aqueducts with a 50- to 75-foot span would be constructed. The streams to be crossed by these structures were Sideling Hill, Fifteen Mile Creek, Town Creek, and Evitts Creek.¹⁵²

In view of the decision to let contracts for the line of the canal above the Cacapon, many of the engineers who could be spared from other duties were put to work “revising the line and setting stakes,” many of which had been displaced since the original survey. Fisk assured the board in mid-June that all “preparations will be made, so that the letting may be had by August 1.”¹⁵³

On June 14, the company had an announcement published in the area’s newspapers:

At the office of the Commissioner of the Canal at Hancock until the 2nd day of August, and at this office until the 3rd day of August next, inclusive proposals will be re-

¹⁵⁰ Fisk to Bender, May 1, 1837, Ltrs. Recd., C & O Co.

¹⁵¹ Ingle to Bender, June 15, 1837, Ltrs. Sent, C & O Co. Because the pool behind Dam No. 6 would back into Sideling Hill Creek, Aqueduct No. 8 was put under contract on June 12. Its masonry, as well as that of the culverts that opened into the pool, was to be raised above the high-water mark before the dam was erected.

¹⁵² *Ninth Annual Report* (1837), C & O Co., p. 9

¹⁵³ *Ibid.*

ceived for constructing fifty-eight sections of the Chesapeake and Ohio Canal, three aqueducts, twenty locks of 8 feet lift each, and seventy culverts on the line thereof.¹⁵⁴

This work covered about 29 of the 50 miles between the Cacapon and Cumberland. The sections would be staked out and the line ready for examination by July 1. The total cost of the work was estimated to be in excess of \$2,000,000, and the “general health of the country through which it is to pass” was reportedly as “good” as that of any other line of public works currently in progress.¹⁵⁵

¹⁵⁴ *Proceedings of the President and Board of Directors*, Advertisement No. 58.

¹⁵⁵ *Ibid.*

III. THE CONSTRUCTION OF AQUEDUCT NO. 8: 1837–1842

Unlike the other aqueducts above the Cacapon River, Aqueduct No. 8 over Sideling Hill Creek was put under contract on June 12 rather than in the fall. The aqueduct was about 2 ½ miles west of the site of Dam No. 6, and the canal engineers wanted to avoid the inconvenience that had been experienced when the water backed up for miles during the building of Dams Nos. 4 and 5. The backing of water behind these two works had rendered the construction of any works above them within the influence of their pools both costly and difficult. The board therefore took steps to place under contract the section above the dam, Aqueduct No. 8, and those culverts that opened to the pool. The masonry of these works was to be raised above the high-water mark before the dam was erected.¹⁵⁶

One year earlier, in the spring of 1836, Commissioner Bender had moved to secure title to the land needed by the company at Sideling Hill Creek. Here the canal right-of-way would cross property owned by John O’Ferrall. On June 6, the company acquired by purchase “51 acres, 2 rods and 2 perches” of land for \$2,500. Sections Nos. 260–262, totaling 7,670 feet of the line of the canal, would cross this plot of ground.¹⁵⁷

The board, on April 1, 1837, received a proposal from John Cameron of Shepherdstown for constructing Aqueduct No. 8. Although Cameron did not enclose specifications for the work with his bid, the board agreed, under the peculiar circumstances of the case, to accept his proposal. However, the board accepted the contract with the proviso that the work could “be terminated when the abutments shall have been carried up one foot above the apex of Dam No. 6.”¹⁵⁸

Because of the board’s desire to have the work begun immediately, Cameron began to quarry limestone at Sideling Hill on the Virginia side of the river even before he signed the contract. During the month of April he delivered 400 perches of rubble stone to the site of the aqueduct, for which he was paid \$400 on May 10.¹⁵⁹

Before beginning actual construction, Cameron, on April 10, submitted to the board specifications for his work as well as his proposed prices. He intended to charge the following amounts for the materials necessary for the construction of the aqueduct:

¹⁵⁶ *Ninth Annual Report*, (1837), C & O Co., p. 7.

¹⁵⁷ *Report of Lands Acquired to June 30, 1836*, Land Records, C & O Co. Also see *Reference Book Concerning Land Titles, 1829–1868*, C & O Co.

¹⁵⁸ *Proceedings of the President and Board of Directors*, E, p. 230.

¹⁵⁹ *Ledger Book B*, C & O Co. Also see Voucher No. 1717, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal*. See Appendix C for a list of the payments made to Cameron for the construction of Aqueduct No. 8.

For excavation of Rock for foundation	\$1 per cubic yard
For excavation of all other materials	30¢ per cubic yard
For masonry of cut sandstone generally	\$22 per perch of 25 cubic feet
Or if the cut work shall be of limestone	\$23 per perch of 25 cubic feet
For all other masonry laid in cement	\$6.50 per perch of 25 cubic feet
For the coffer dam for the western abutment, and all bailing of water at that abutment	\$600

If the coffer dam and bailing shall be required for the eastern abutment, it shall be paid for at the estimate of the Engineer, as shall also, any trimming for the rock abutment on the East¹⁶⁰

On May 31, Clerk Ingle notified Commissioner Bender that the board had accepted the bid as submitted by Cameron on April 10 with conditions as suggested by Fisk instead of with the proviso it had attached at its April 1 meeting. The board thereupon authorized the Commissioner to enter into the contract with Cameron.¹⁶¹

The contract for Aqueduct No. 8 was signed by Cameron on June 12. The work which had already begun was to be completed by June 1, 1839. According to the terms of the agreement, cement to be used in the construction of the aqueduct was to be furnished by the canal company “at the same price & under all the conditions as to keeping & paying for the same as are set forth in the specifications for the locks now under contract between Dam No. 5 & the ‘Capon.’”

The conditions that had been attached to the contract at the recommendation of Chief Engineer Fisk in place of the original proviso by the board reflected the peculiar circumstances of the work as well as the financial condition of the company:

It being also understood that all of the masonry & work herein contracted for that is below a level one foot higher than the comb of Dam No. 6 (that is below a level 16-3/10 ft. below canal bottom) shall be so carried on to completion to that level, to prevent the interruption from flooding of said Dam during its construction with the ordinary flow of the Potomac, it being supposed that said Dam will be complete this season. The contract therefore requiring its completion this season.

And it is also understood that if upon the completion of the masonry & work to said level 16-3/10 feet below canal bottom, the Canal Company shall have determined not to prosecute to early completion the balance of the work upon the Canal between ‘Capon & Cumberland, then said Company shall have the right to suspend all further operations under this contract & to consider it as void, said Company however paying what the Engineer shall adjudge to be fair & proportional value, under the contract prices, of the work done compared with the whole work. The Canal Company also to have the right, at any time, before the masonry & work shall have

¹⁶⁰ Contract for Aqueduct No. 8, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal*. A copy of the contract, specifications, and price proposals for Aqueduct No. 8 may be found in Appendix E.

¹⁶¹ *Proceedings of the President and Board of Directors*, E, pp. 266–67.

reached that height, to say that the preparation of materials for the masonry above that level shall be suspended, in view of the contingency mentioned.¹⁶²

During the month of May, Cameron continued to quarry rubble stone at Sideling Hill, delivering 500 perches to the site of the aqueduct. At the same time, he began excavation. For these efforts Cameron was paid \$1,054.00 on June 13.¹⁶³

On July 12 Cameron was paid \$600 for work done during June, which included the construction of a coffer dam.¹⁶⁴

By July Cameron was nearly ready to begin laying the foundation. During the month he lay 125 perches of rubble masonry in addition to delivering another 500 perches of rubble stone to the construction site, for which he was paid \$1,009.86 on August 9. Cameron also received 260 40/70 bushels of cement from Shafer's mill at Roundtop Hill.¹⁶⁵

The following month Cameron continued work on the foundation, laying nearly 300 perches of rubble masonry. His shipment of cement from Shafer's mill in that month totaled 667 33/70 bushels. Cameron, on September 14, was paid \$1,564.53 for work done since his August 1 estimate.¹⁶⁶

During the months of September and October Cameron continued to lay rubble masonry, for which he was paid \$647.92 on October 16 and \$825.95 on November 13. Cameron received 605 7/70 bushels of cement in September and 585 54/70 bushels in October from Shafer's mill.¹⁶⁷

In the latter part of 1837, with the masonry work well underway, Cameron turned his attention to his quarries at Sideling Hill. On December 20, Cameron was paid \$1,015.77 for completing the following quarry work:

400	sup. ft. of ashlar quarried and cut
135	sup. ft. intrados of sheeting quarried and cut
50	lineal ft. of water table quarried and scabbled
15	lineal ft. of towpath coping quarried and scabbled
15	lineal ft. of berm coping quarried and scabbled

¹⁶² Contract for Aqueduct No. 8, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal*.

¹⁶³ *Ledger Book B, C & O Co.* Also see Voucher No. 1831, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal*.

¹⁶⁴ *Ledger Book B, C & O Co.* Also see Voucher No. 1910, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal*.

¹⁶⁵ *Ledger Book B, C & O Co.* Also see Voucher No. 2030, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal*.

¹⁶⁶ *Ledger Book B, C & O Co.* Also see Voucher No. 2193, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal*.

¹⁶⁷ *Ledger Book B, C & O Co.* Also see Vouchers No. 2314 and 2388, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal*.

Because of the drought that gripped the upper Potomac Valley during the summer months of 1837, the river level at Hancock had dropped to such a degree that it was impossible to operate the mills on a fulltime basis. The resultant shortage of cement along the line lasted well into autumn. By November Shafer's mill could not meet Cameron's needs, so plans were made to haul cement from Hook's mill at Hancock.¹⁶⁸

During the winter months work on Aqueduct No. 8 slowed. On February 3, 1838, Cameron was paid \$794.40 for work done during December, which consisted primarily of excavating 700 cubic yards of rock.¹⁶⁹

On April 18 Cameron was paid \$446.40 for work done on the aqueduct in February. That same day he was paid \$763.92 for work done in March, which consisted mostly of excavating 500 cubic yards of rock and delivering and cutting 228 superficial feet intrados of sheeting.¹⁷⁰

The board on April 12 received a recommendation from Chief Engineer Fisk that a contract be made with John Cameron to construct a roadway over Sideling Hill Creek. After considering the various proposals, the board accepted Cameron's bid for the work.¹⁷¹

After putting this road under contract, Fisk, on April 28, received a letter from Richard Caton, a civil engineer in Washington, recommending that a bridge be built across Sideling Hill Creek instead of a roadway. According to Caton, the road could not be secured unless the creek were filled in with stone to build a passage "20 ft. wide on the surface, 30 at the base, and 8 ft. high." A bridge with stone abutments would be less costly and would better meet the needs of public transportation. Because Sideling Hill Creek was a convenient place of deposit for supplies and coal from Pennsylvania via the Raystown Branch of the Juniata River, a bridge was needed to insure proper connections between the canal and the Baltimore and Ohio Railroad.¹⁷²

On May 12 Cameron was paid \$2,105.36 for work done in April. Much of this work comprised of the delivery and cutting of 178 superficial feet of ashlar and 545 superficial feet intrados of sheeting. Cameron also laid 266 perches of rubble masonry and began work on the centers of the aqueduct.¹⁷³

¹⁶⁸ *Ledger Book B, C & O Co.* Also see Voucher No. 2581, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal.*

¹⁶⁹ *Ledger Book B, C & O Co.* Also see Voucher No. 2678, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal.*

¹⁷⁰ *Ledger Book B, C & O Co.* Also see Vouchers No. 2865 and 2866, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal.*

¹⁷¹ *Proceedings of the President and Board of Directors*, E, p. 387.

¹⁷² Caton to Fisk, Apr. 28, 1838, Ltrs. Recd., Chief Engineer.

¹⁷³ *Ledger Book B, C & O Co.* Also see Voucher No. 3009, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal.*

During the month of May, Cameron continued working on the centers and laying rubble masonry. For this month's estimate he was paid \$862.94.¹⁷⁴

When the board of directors issued its *Tenth Annual Report* in June, the stockholders were informed that contracts had been made with "responsible and generally experienced men," who had commenced "their operations with great spirit." The board optimistically forecast that the "entire canal from [the] Cacapon to Cumberland will be opened simultaneously by the close of the year 1839, or, at the farthest, in time for the spring trade of 1840."¹⁷⁵

For his work on Aqueduct No. 8 in July, Cameron was paid \$2,013.28 on July 13 and \$818.28 on August 14. Much of the work involved laying of cut and rubble masonry, for which Cameron received shipments totaling 1,458 46/70 bushels of cement from Shafer's mill.¹⁷⁶

On August 7 Fisk informed Richard Caton that he would be spending several weeks at Sideling Hill Creek that month. The Chief Engineer was eager to consult with Caton "about the most acceptable mode of getting a Bridge across the creek." A causeway "of rubble stones" was "out of the question," according to Fisk, because the "creek must be unobstructed for rafts and boats." A person had asked Fisk to lease a plot of ground for a boatyard where he intended to build canal boats. When Fisk visited the area, he wanted to consult with the neighboring residents to get their views on the use of the creek. If they desired a bridge, Fisk promised to take the matter up with the board.¹⁷⁷

Unlike many of the contractors on the line of the canal, Cameron progressed in his work without requesting advances of funds throughout the late summer months. On September 15, he was paid \$1,182.28 for work done on the aqueduct in August.¹⁷⁸ For work done during September, which consisted mainly of the delivery and scabbling of 700 superficial feet of stone, Cameron received \$594.77 on October 12.¹⁷⁹

Because of a drought that again gripped the upper Potomac Valley in the late summer, there was a shortage of cement for the contractors on the line of the canal. Cameron, who had been getting his cement from Shafer's mill, made arrangements in October to be supplied by Leopard's mill near Lock No. 53. Consequently, the progress of his work slowed down, his major activity being the delivery and scabbling of 500 superficial feet of stone in October and an additional 540 superficial feet in November. Based on his estimates of

¹⁷⁴ *Ledger Book B, C & O Co.* Also see Voucher No. 3102, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal.*

¹⁷⁵ *Tenth Annual Report* (1838), C & O Co., pp. 3–5

¹⁷⁶ *Ledger Book B, C & O Co.* Also see Vouchers No. 3272 and 3407, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal.*

¹⁷⁷ Fisk to Caton, Aug. 7, 1838, Ltrs. Sent, Chief Engineer.

¹⁷⁸ *Ledger Book B, C & O Co.* Also see Voucher No. 3560, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal.*

¹⁷⁹ *Ibid.*

work done during these 2 months, Cameron was paid \$371.44 on November 13 and \$263.68 on December 11.¹⁸⁰

M. C. Sprigg, who had replaced Bender as Commissioner on July 16, presented the final estimate on Cameron's roadway across Sideling Hill Creek to the board on January 5, 1839. The board thereupon ordered that Cameron be paid \$634 for "quarrying, transporting & placing at \$1.00" 634 perches of stone.¹⁸¹

Work on Aqueduct No. 8 continued to be slow in the early winter months of 1839. Based on his estimates of work done in January and February, Cameron was paid \$159.20 on February 14 and \$353.76 on March 14.¹⁸²

Assistant Engineer John A. Byers, on March 7, reported to Fisk concerning his recent inspection of Cameron's work on Lock No. 56 and Aqueduct No. 8. He had found "a great deficiency in the stone which were accepted by [Engineer] Lawn, both on the ashlar for the lock and sheeting for the aqueduct." The ashlar were "principally deficient in not having parallel beds and sufficient joints," and the sheeting were "deficient in not being full in all their dimensions and in not making the required bond." Byers said that he had warned Cameron when he began to lay the masonry that "unless he altered these stone to comply with the respective specifications," he would reject them. At that time Cameron had observed that "if such was the fact . . . he must be paid" or "he must stop his work," since the stone had been approved by Engineer Lawn. Despite Cameron's earlier feelings, Byers informed the Chief Engineer that the contractor was "going on slowly with the work and making the alterations required."¹⁸³

Cameron continued to make progress in laying the masonry on Aqueduct No. 8, despite the alterations that he was forced to make in the stone. Based on his estimates of work done in March and April, he was paid \$718.08 and \$1,381.72 on May 23. For work done in May, he received \$1,111.52 on June 18, and on July 15 he was paid \$1,095.20 for work accomplished the preceding month.¹⁸⁴

At the eleventh annual meeting of the stockholders held on June 3, the board reported that on the "50-mile line progress has been as rapid as the means of the Company would justify, with a force varying from 2,500 to 3,000 laborers. A number of sections had been fin-

¹⁸⁰ *Ledger Book B, C & O Co.* Also see Vouchers No. 3786 and 3892, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal.*

¹⁸¹ *Proceedings of the President and Board of Directors*, F, p. 5. Also see Voucher No. 4086, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal.* Bender, who submitted a letter of resignation on May 3, turned over his books on May 31 to Thomas Fillebroun. Fillebroun acted as commissioner until July 16, when M. C. Sprigg of Allegany County was named commissioner. Ingle to Bender, May 9, and Ingle to Fillebroun, July 16, 1838, *Ltrs. Sent, C & O Co.*

¹⁸² *Ledger Book B, C & O Co.* Also see Vouchers No. 4177 and 4294, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal.*

¹⁸³ Byers to Fisk, Mar. 7, 1839, *Ltrs. Recd., Chief Engineer.*

¹⁸⁴ *Ledger Book B, C & O Co.* Also see Vouchers No. 4418, 4419, 4519, and 4679, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal.*

ished, while others were nearly completed.” Better yet, most of the “heavy sections were in good progress.”¹⁸⁵

Fisk in mid-June had requested Byers to provide him with “an accurate statement of the distance in miles and feet” from the masonry works between Dam No. 6 to the upper end of Section No. 287 to the cement mills. This data was to be used in ascertaining the distance of the river line over the canal line. The company at this time was paying 1¼¢ per mile per bushel for the transportation of cement by the river line. If the canal line were less, an effort would be made to get the people hauling cement to use that figure in computing costs.¹⁸⁶

On July 13 Byers replied to Fisk’s letter, giving him the distances by the canal line. In a few days he would send the Chief Engineer the distances by the river line. The distance from Aqueduct No. 8 to Shafer’s mill at Roundtop Hill was 9 miles and 998 feet, while the distance to Leopard’s mill at Hancock was 5 miles and 4,333 feet.¹⁸⁷

In August the General Committee of Stockholders reported on the progress of the work at Aqueduct No. 8:

At the distance of half a mile we cross Sideling Hill Creek, by an aqueduct (No. 8), which furnishes a water way for the creek of 50 feet. This aqueduct, like that over the Big Tonoloway has a natural abutment of rock on the lower side of the creek from which an arch is sprung from a level several feet higher than the level of the opposite masonry abutment. The span of the entire segment, of which a part is thus cut off by the rock abutment, is 70 feet, with a rise of 12 feet. Considerable progress has been made in the construction of this aqueduct, the arch being more than half turned. The cut stone for the arch, the inside of the parapets, the coping, and the water table, are obtained from the limestone quarry in Virginia, near Dam No. 6. The residue of the stone is from sand stone quarries at a short distance on the side of Sideling Hill Mountain, through which mountain the Potomac breaks its way directly below the aqueduct. The wings of this aqueduct, and, indeed, of all the aqueducts above Dam No. 5, are constructed upon the same general plan as those of the Licking aqueduct. In short, the general plan and character of the work is the same. Through and connected with the lower berm wing of the aqueduct, will be a waste and waste weir.¹⁸⁸

Cameron made steady progress on Aqueduct No. 8 during the rest of the year. Based on his estimates of work done, he was paid the following sums:

¹⁸⁵ *Eleventh Annual Report*, (1839), C & O Co., pp. 3–5.

¹⁸⁶ Fisk to Byers, June 10, 1839, Ltrs. Sent, Chief Engineer.

¹⁸⁷ Byers to Fisk, July 13, 1839, Ltrs. Recd., Chief Engineer. The letter from Byers giving the distances by river line could not be found.

¹⁸⁸ *Proceedings of the Stockholders*, B, pp. 245–46.

August 18	\$1,031.83	(for July)
September 18	\$757.15	(for August)
November 14	\$1,710.72	(for September)
November 14	\$858.78	(for October)
December 18	\$672.00	(for November) ¹⁸⁹

Assistant Engineer Byers, on December 17, wrote to Fisk asking for approval of instructions that he had given to Cameron concerning the paving of the waste on Aqueduct No. 8. After Cameron had commenced with ordinary paving, Byers had directed him to have the vertical joints of the paving of the waste scabbled.¹⁹⁰

In a statement of work done on Aqueducts Nos. 8–11 through November 30, 1839, submitted to Fisk on December 18, Engineer William H. Bryan reported that Cameron had done \$38,129.50 worth of work on the Sideling Hill Creek Aqueduct.¹⁹¹

On December 28 Cameron wrote to the board of directors requesting that he be advanced \$4,000 of his retained money to enable him to “pay in part the claims” that were “hanging” over him. In his opinion he was entitled to this consideration, because the aqueduct was finished except for the entrance wall, which needed only “three days work” in the spring. He asked that the matter be referred to Chief Engineer Fisk, because he was best “acquainted with the situation of my work.”¹⁹²

Byers reported to Fisk on January 25 that 2 weeks earlier an ice freshet from the South Branch and the Cacapon swept into the pool behind Dam No. 6, “carrying away the Bridges in its course and gathering up all the grubbing of the Canal and Railroad until the river for several miles looks like a fallen forest.” The ice in the pool had “broken up just far enough down to destroy Mr. Mann’s bridge of boats and of course Mr. Gorman’s.” Along “Sections 268 & 269” the ice had dammed up to raise “the water about 16 feet.”¹⁹³

Although very few bridges or boats could be saved, Byers took precautions to protect Aqueduct No. 8 and Dam No. 6. Accordingly, he had instructed Mann “to throw a bank across the Canal on the upper end of Section No. 263” in the event that “the ice should form another dam somewhere below this, and throw the water into the canal above the Aqueduct” at Sideling Hill Creek. Such a current, in the opinion of Byers, “would carry away the embankment from around the wings.” To save the dam from a similar problem, Byers had directed that a bank be placed “across the Canal on the lower end of Section No. 259 and to put in the stop plank at Lock No. 55.”¹⁹⁴

On May 6, in reply to a request by Assistant Engineer Dickinson, Cameron submitted a list of extra work done on Aqueduct No. 8. The list contained the following claims:

¹⁸⁹ *Ledger Book B, C & O Co.* Also see Vouchers Nos. 4983, 4984, 4898, 4899 and 5789, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal.*

¹⁹⁰ Byers to Fisk, Dec. 17, 1839, Ltrs. Recd., Chief Engineer.

¹⁹¹ Bryan to Fisk, Dec. 18, 1839, Ltrs. Recd., Chief Engineer.

¹⁹² Cameron to Board of Directors, Dec. 28, 1839, Ltrs. Recd., C & O Co.

¹⁹³ Byers to Fisk, Jan. 25, 1840, Ltrs. Recd., Chief Engineer.

¹⁹⁴ *Ibid.*

Eastern Abutment (trimming and bailing)	\$50
Grubbing Eastern Abutment	\$40
Grubbing Western Abutment	\$25
300 yds. of riprapping @ .75	\$225
Cutting down end of abutment	\$17
Extra cement used on Arch	\$35
Altering Centres	\$10
Extra Work on Waste	\$150
350 yds. of sand which Mr. Byers said I should be paid for	\$175
Extra price for changing the face of the work from rubble to scabbled work	<u>\$3,500</u>
	\$4,227 ¹⁹⁵

Two days later, Dickinson referred this bill of extras to Chief Engineer Fisk for his review. Dickinson suggested that when he made the final estimate in the near future, he would leave “the estimate for extras” blank and send Fisk the bill with his “opinion on the several items after having conferred with Mr. Byers upon the subject.”¹⁹⁶

Dickinson, on May 16, made the final estimate on Aqueduct No. 8 and Lock No. 56 and forwarded them to Fisk. According to Dickinson, there was still some work to be done, but it could all be accomplished within a week. Cameron had left stones lying about near Lock No. 56, but he had assured Dickinson that he would remove them within several days. Some pointing still had to be done on the aqueduct, but this would require only “about a day’s labor of a mason.”¹⁹⁷

In the estimate on Aqueduct No. 8, Dickinson submitted the following terms for a final settlement:

1. 22 ½ perches of cut masonry of sandstone at \$22.00	\$488.40
2. 478 perches of cut masonry of limestone at \$23.00	\$10,994.00
3. 3,248-1/3 perches of rubble masonry at \$6.50	\$21,114.17
4. 4,240 cu. yds. of excavation of rock at \$1.00	\$4,240.00
5. 550 cu. yds. of excavation of all other materials at \$.30	\$165.00
6. Bailing and coffer dam	\$600.00
7. Extras	<u>\$438.00</u>
	\$38,039.57 ¹⁹⁸

After consulting with Assistant Engineer Byers, Dickinson reported to Fisk concerning their recommendations on Cameron’s claims for extra work. He approved his claim for \$50 to construct the eastern abutment. The claim of \$40 for grubbing on the eastern abutment was too high, and since the cost of grubbing on this abutment should not cost

¹⁹⁵ Cameron to Dickinson, May 6, 1840, Ltrs. Recd., Chief Engineer.

¹⁹⁶ Dickinson to Fisk, May 8, 1840, Ltrs. Recd., Chief Engineer.

¹⁹⁷ Dickinson to Fisk, May 16, 1840, Ltrs. Recd., Chief Engineer

¹⁹⁸ Voucher No. 5129, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal*.

more than that on the western abutment, for which Cameron claimed \$25, he was allowing a total of \$50 for both these items.

Cameron's claim of \$225 for 300 yards of riprapping was much too high, in the opinion of Dickinson. The material had been "transported over the creek and placed on the lower part of the embankment on the western side." The stone had been "obtained from the quarry on the eastern side," and he considered 40¢ per yard a sufficient price for this extra labor.

Dickinson allowed the claim of \$17 "for taking off a portion of the end of the [eastern] abutment after it had been raised 8 or 10 ft. in height." At that point it had been "found not to correspond with the Abut. on the other side," although the engineers thought they had given measurements "for its commencement" with "the greatest exactness." Nevertheless, this "could not be proved beyond a doubt."

The claim of \$35 "for using a greater proportion of cement in laying the arch than was required by the contract" was allowed by Dickinson. According to Cameron, this additional cement had been used on the orders of A. B. MacFarland, the Superintendent of Masonry. The amount of extra cement, in the estimate of the contractor, had been "1/2 bushel per perch."

Dickinson felt that Cameron was entitled to his claim for \$10 for altering the centers. When the centers had been almost finished, Assistant Engineer Byers had ordered that the ribs be "altered so as to give a greater elevation at the centre of the arch."

Dickinson reduced the claim of \$150 for extra work on the waste to \$106. Cameron had been directed to scabble "both sides of the berm wing and a portion of the waste instead of one." Therefore, he should be allowed extra pay for the cost of dressing one side. Dickinson calculated this work at 31¢ per superficial foot, which Cameron had told him was the actual cost, although the contractor was now attempting to charge "over 40 cents."

At the urging of Byers, Dickinson decided to reduce Cameron's claim for extra sand from \$175 to \$35. Although the contractor insisted that Engineer Lawn had approved this sand, it was found, upon examination, to contain too much loam. Byers had thereupon given Cameron written orders to wash his sand before using it. Cameron preferred getting other sand and had hauled 350 cubic yards without approval. Later Byers informed the contractor that he should use the sand for puddling. Because Cameron had used 70 cubic yards of sand for this purpose, Dickinson allowed him 50¢ per cubic yard for the sand so used

Cameron's claim for \$3,500 to change the face of the aqueduct from rubble to scabbled work was "of such a nature and amount" that Dickinson did "nothing with it." Instead, he proposed that Fisk permit Cameron to take the matter to the board. Cameron had already voiced his intention to urge the board to refer the matter "to two men, one chosen by the Board and one by himself and if they cannot agree, he would allow to appoint a third

man,” with the award of this panel to be “final and conclusive.” If the board did not accede to this proposal, Cameron intended to sue the company.¹⁹⁹

The board of directors, on June 1, informed the stockholders that work on the “50-mile section” appeared to be in “charge of energetic and active contractors, and to be pressed with as much vigor as the finances of the Company will allow.”²⁰⁰

On June 4 Dickinson wrote to Fisk notifying him that Cameron had been “rather dilatory in finishing the work which he had to do” to complete Lock No. 56 and Aqueduct No. 8. However, he finished the pointing on the aqueduct, which entitled him to a final settlement on the structure.

When Cameron had seen the recommendation concerning his claims for extra pay, he was dissatisfied with some of the items and particularly with the price at which the dressed rubble for the waste weir had been estimated. Cameron had also informed Dickinson that he had forgotten to include in his bill “a charge for breaking stone which were intended to be put upon the arch and grouted.” The contractor now intended to claim additional payment “for some puddling done at the end of the Eastern towpath wing.” According to his own inspection, Dickinson, however, informed the Chief Engineer that “a small quantity of earth” had been “put in at that place” and Cameron had merely “pretended to puddle it.”²⁰¹

In the report sent to Fisk on June 30, Engineer William H. Bryan estimated the “work done” and “work to be done” on the “50-mile section” as of June 1. On December 28, 1839, the company engineers had estimated the total cost of Aqueduct No. 8 at \$48,707. Work done on the aqueduct up to June 1 amounted to \$38,130, with the remaining work to be done totaling \$10,577.²⁰²

Chief Engineer Fisk on July 9 reviewed the final estimate on Aqueduct No. 8. While he accepted the figures sent him by Assistant Engineer Dickinson, he added the following items for extra work:

Grubbing on the east side of the creek	\$15.00
Add 22 ½ cents to the yard on the cubic yards of riprapping	67.50
Add to the extra work on the waste	44.00
For the breaking of stone for the intrados of the arch	30.00
Add for the excavation of rock not included in measurement	<u>20.00</u>
	\$176.50

The total final estimate, after these additions, comprised the following:

¹⁹⁹ Dickinson to Fisk, May 16, 1840, Ltrs. Recd., Chief Engineer.

²⁰⁰ *Twelfth Annual Report* (1840), C & O Co., p. 3.

²⁰¹ Dickinson to Fisk, June 4, 1840, Ltrs. Recd., Chief Engineer.

²⁰² Bryan to Fisk, June 30, 1840, Ltrs. Recd., Chief Engineer.

\$38,216.07	
<u>834.00</u>	(transportation of cement)
39,050.07	
<u>38,129.80</u>	(deduct former estimates)
920.27	
<u>7,624.89</u>	(add hitherto retained)
8,545.16 ²⁰³	

The Chief Engineer forwarded the final estimate on Aqueduct No. 8 to the board on July 9 with an appended note:

The western entrance walls of this aqueduct cannot be built until, or near the time of completion of section No. 262. There is also other work, small in amount, that has not been done, but which can readily be executed whenever the entrance walls referred to, shall be built. As the contract for section No. 262 was abandoned last December, and as the contract (Cameron's) for Lock No. 56 was at the same time abandoned, I have said to Mr. Cameron (his masons & c having left him) that I would recommend to the Board to consider this as a final estimate. The interests of the Company will not suffer by this arrangement.²⁰⁴

After considering the final estimate on Aqueduct No. 8 submitted by the Chief Engineer, the board, on July 15, ordered “that \$8,545.16 be paid in Scrip to said Cameron.”²⁰⁵

On the same day, Cameron wrote to the board appealing for further consideration of his claim for \$3,500 to change the face of the work from rubble to scabbled work. In the letter, Cameron informed the directors that if they approved his claim “it will be all that I shall make on the work.” If he made a profit on the aqueduct, he assured them that he would have been satisfied without this sum.²⁰⁶

One month later, on August 14, Cameron sent a memorial to the board of directors repeating his earlier request for consideration of his claim for \$3,500. The petition demonstrated with the use of several affidavits “that there is a wide difference between rubble stone and scabbled-stone, the cost of preparing the latter being much greater than in preparing the first.” The attached affidavits verified his assertion “that he was positively required by the Assistant Superintendent of the work, Duncan Grant, to scabble all the stone used in the walls of the said Aqueduct No.8” and that Grant had indicated to Cameron that he had been “ordered by the Engineer to receive no other kind of work if they [the company] had to pay extra for it.”

Cameron answered the charge that a clause in the contract required all claims for extra work “to be forwarded on a written order of the Engineer’ by arguing that this rule worked a hardship on the laboring man by forcing him to “work with his contract in his

²⁰³ Voucher No. 5139, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal*.

²⁰⁴ *Ibid.*

²⁰⁵ *Proceedings of the President and Board of Directors*, F, p. 247

²⁰⁶ Cameron to Board of Directors, July 15, 1840, Ltrs. Recd., C & O Co.

hand ever ready to scan it with the eyes of a lawyer.” He contended that “however binding this clause might have been in the first instance,” it had been “waived by the Company” when he had been allowed in his monthly estimates “a large portion of this wall stone as scabbled-stone, thus making it extra to the requisitions of the contract.” After this “virtual encouragement” that he would be paid for this extra work, Cameron said that “it would be gross injustice to turn round with your final estimate and repudiate the items successively in the monthly estimates.”

Cameron also countered Fisk’s argument that the stone had been estimated as scabbled, but only before its being worked in masonry. According to his understanding, when stone was estimated prior to being worked into masonry, the estimate was “placed on the quarrying and dressing of the stone.” Subsequently, when it was worked into masonry, the masonry alone remained “to be estimated.”

The contractor capped his memorial with the contention that his contract gave the Superintendent “the power of deciding upon and approving the work.” If the workmanship was not approved, an officer of the company could order it “to be pulled down and altered at the expense of the contractor.” With this severe penalty hanging over his head, Cameron wanted to know how a contractor could be expected to question the authority of the Superintendent.²⁰⁷

After consideration of the memorial, the board determined that no further allowance be made to Cameron for Aqueduct No. 8.²⁰⁸

Following this action by the board, Cameron took the company to court in November 1840, basing his case primarily on the contentions listed in his memorial. As a result of the lengthy trial, Cameron recovered nearly all he had asked for. In the final settlement he received \$11,866.84 with interest from November 19, 1840, a sum that included the final estimate that the board had ordered be paid on July 15, 1840.²⁰⁹

Burdened by other court suits and deteriorating finances, the company felt that the trial had been unfair. According to Fisk, the board was planning to make a motion for a new trial because “the opinion of mechanics residing in the city who had never seen the work, was given in evidence.”²¹⁰

²⁰⁷ Memorial of John Cameron to the Board of Directors, Aug. 14, 1840, Ltrs. Recd., C & O Co.

²⁰⁸ *Proceedings of the President and Board of Directors*, E, pp. 252–53.

²⁰⁹ Fisk to Sprigg, May 9, 1842, Ltrs. Recd., C & O Co.

²¹⁰ *Ibid.* A thorough search of the C & O Co. records failed to turn up evidence of a second trial.

VI. THE CONSTRUCTION OF AQUEDUCT NO. 9: 1837–1842

Before the bids were opened for the “50-mile section”, Commissioner Bender moved to secure title to the land needed by the company at Fifteen Mile Creek. Land on the east side of the creek was owned by James King, while that on the west bank was owned by the heirs of Isaac Osman.

When King refused to accept Bender’s offer, the case was thrown into the courts. On August 9, 1837, an inquisition was taken and damages were assessed at \$306 on a plot of ground encompassing “41 acres, 2 rods, 35 perches.” King objected to the award by pleading that he had not received a formal legal notice of the intentions of the company. To induce King to accept the award, Bender increased the amount to \$1,000 and took King’s written acceptance of the award.²¹¹

The heirs of Isaac Osman also refused to accept Bender’s offer. When the case went to court, an inquisition also taken on August 9 assessed damages at \$66 for a parcel of land comprising “3 acres, 2 rods, 26 perches.” After the announcement of the court’s findings, the heirs of Osman immediately settled with the Commissioner.²¹²

The Committee on Contracts reported on September 29 that the successful proposals for the construction of Aqueducts Nos. 9 and 10 were William Pratt’s, whose bids were \$29,800 and \$41,000 respectively.²¹³ The next day, the board of directors notified Pratt that his bids had been accepted. But since the company had not finalized its negotiations for the sale of the \$3,000,000 worth of 6 percent bonds of the State of Maryland (the proceeds of which were designed to finance the new work), no money could be disbursed to the contractors. Until the bonds were sold, the company would be unable to make payments on estimates, except through the issuance of notes.²¹⁴

Twelve days later, on October 11, Frederick Pratt of Fayetteville, New York, wrote Congressman William Taylor requesting that he visit the Georgetown offices of the canal company and secure copies of the “propositions for Aqueducts Nos. 9 & 10, also for Locks 69, 70 and 71.” His brother William Pratt, he explained, had acted as his agent in filing the low bids for these masonry works. It would also be appreciated if Representative Taylor would pick up the specifications and plans for these aqueducts and locks.²¹⁵

²¹¹ *Report of Lands Acquired in Allegany County up to August 15, 1837*, Land Records, C & O Co. Also see *Reference Book Concerning Land Titles, 1829–1868*, C & O Co.

²¹² *Ibid.*

²¹³ *Proceedings of the President and Board of Directors*, E, p. 320. Company engineers had estimated the cost of Aqueducts Nos. 9 and 10 at \$33,000 and \$46,715 respectively. Abert to Board of Directors, Sept. 29, 1837, Ltrs. Recd., C & O Co.

²¹⁴ Ingle to W. Pratt, Sept. 30, 1837, Ltrs. Sent, C & O Co.

²¹⁵ F. Pratt to Taylor, Oct. 11, 1837, Ltrs. Recd., C & O Co.

Because he expected to be leaving Washington immediately, Taylor wrote President Washington asking him to mail the requested documents to his home at Manlius, New York.²¹⁶

Frederick Pratt, on October 18, sent a letter to Fisk inquiring about the “condition of work on the Chesapeake and Ohio Canal.” In addition, he desired to know if all the heavy “rock sections” had been let. If not, he wanted to know if the company had any “rock sections” it could let to a private contract, provided he put on the project such manpower as Fisk named. He promised to begin work soon on Aqueducts Nos. 9 and 10.²¹⁷

Because of the deteriorating financial conditions of the company, none of the contractors who had filed successful bids were in a hurry to begin construction. In mid-December, Assistant Engineer Morris complained that “none of the contractors to whom work in the Tunnel District” had been let had reported to “any of the corps of engineers connected with me.” As yet, Frederick Pratt had not been “seen or heard from.”²¹⁸

Contractor Pratt in February 1838 determined that it would not be in his best interests to undertake the construction of the Town Creek Aqueduct. Willis Hatch, the contractor for Section No. 323, agreed to assume Pratt’s obligations. On February 24, Clerk Ingle informed Hatch that a power of attorney had been received from Frederick Pratt, authorizing him to enter into a contract on his behalf for Aqueduct No. 10. Commissioner Bender was directed to prepare a contract for Hatch’s signature.²¹⁹

On May 1 Assistant Engineer E. H. Randolph reported to Fisk on the status of the work above the Cacapon. During his survey he had met Mr. Star, a partner of Pratt, who told him that Pratt and his family had arrived in Oldtown the previous evening. Star assured the engineer that Pratt would soon commence work on Aqueduct No. 9.²²⁰

Within 3 weeks, Pratt decided not to undertake the work and left for his home in New York. The board declared his contract abandoned in mid-May. After taking up “for consideration the proposals received” for the “construction of sundry works upon the line of the Canal” on May 23, the bid of Enos Childs for Aqueduct No. 9 was accepted.²²¹

When the board of directors issued its *Tenth Annual Report* in early June, it optimistically announced that contracts had been made with “responsible and generally experienced men, who are commencing their operations with great spirit.” It was forecast that the “entire canal from [the] Cacapon to Cumberland will be opened simultaneously by the close of the year 1839, or, at the farthest, in time for the spring trade of 1840.”²²²

²¹⁶ Taylor to Washington, Oct. 16, 1837, Ltrs. Recd., C & O Co.

²¹⁷ F. Pratt to Fisk, Oct. 18, 1837, Ltrs. Recd., Chief Engineer.

²¹⁸ Morris to Fisk, Dec. 17, 1837, Ltrs. Recd., Chief Engineer.

²¹⁹ Ingle to Hatch, Feb. 24, 1838, Ltrs. Sent. C & O Co.

²²⁰ Randolph to Fisk, May 1, 1838, Ltrs. Sent, Engineer’s Office of Cumberland.

²²¹ *Proceedings of the President and Board of Directors*, E, p. 423.

²²² *Tenth Annual Report* (1838), C & O Co., pp. 3–5.

Childs did not proceed to the site of Aqueduct No. 9 until late August, because of his efforts to finish Aqueduct No. 6 during the summer. When he did arrive at Fifteen Mile Creek, Childs informed Fisk that he would sign the contract only on the condition that he “be paid an extra price for the transportation of stone” over a “distance of two miles.” On September 8 Clerk Ingle responded to this demand by informing Childs that the company had “furnished printed forms for proposals for this Aqueduct” and had “always disclaimed all modifications on conditions added thereto by persons proposing.” Ingle regretted that Childs had “proceeded to the work without first having executed a contract” as this “would have obviated all difficulty.”²²³

One week later Childs wrote to President Washington asking that he bring to the board’s attention the matter of extra pay “for additional transportation of stone” required to build Aqueduct No. 9. Childs insisted that his proposal, which the board accepted, included “the two miles transportation & the excess of distance to be paid for, in proportion, or estimate of Chief Engineer without any reserve or condition.” Because he had recently commenced the work with a large force in order to “get the abutment in this fall if possible,” Childs had gone to Cumberland on September 13 to sign his contract. But Fisk refused to add this condition to the articles of agreement, and Childs therefore could not obtain the amount of his monthly estimate.²²⁴

On October 12 Childs wrote to Fisk asking that he bring the matter of his contract for Aqueduct No. 9 to the board’s attention, since he had not received a reply from President Washington. Childs begged the Chief Engineer to make arrangements for his contract so that he could receive his monthly estimates. At the same time he desired that a quick adjustment be made on his final settlement on Aqueduct No.6 so that he could pay his debts. Unless he received money soon for his work on the two aqueducts, Childs said that his “property must be sacrificed” and that his family would suffer.²²⁵

Five days later, on the 17th, Clerk Ingle notified Commissioner M. C. Sprigg that the board had examined the original proposal by Childs for Aqueduct No. 9. The directors agreed to make the contract with the condition “for transportation of stone beyond two miles of distance.” Even with this addition, Childs’s bid was lower than any other proposal for the work. This fact had not been brought to the attention of the board at the time of the letting, due to an oversight. However, the company, according to Ingle, had “lost nothing by the error.”²²⁶

On October 23 Childs signed the contract for Aqueduct No. 9 and was paid \$238 for work done during September.²²⁷

²²³ Ingle to Childs, Sept. 8, 1838, Ltrs. Sent, C & O Co.

²²⁴ Childs to Washington, Sept. 15, 1838, Ltrs. Recd., C & O Co.

²²⁵ Childs to Fisk, Oct. 12, 1838, Ltrs. Recd. Chief Engineer.

²²⁶ Ingle to Sprigg, Oct. 17, 1838, Ltrs. Sent, C & O Co.

²²⁷ *Ledger Book B*, C & O Co. According to the terms of the contract, work was to be completed by December 15, 1839. See Appendix C for a list of the payments made to the contractors for Aqueduct No. 9.

Assistant Engineer Byers, on November 12, informed Fisk that “none of the contractors above Sideling Hill Creek will be able to lay any stone this season.” According to Byers, the most they could do was “to excavate the foundations and prepare materials for next season.” Most of the contractors were engaged in this effort with the exception of the construction for Lock No. 59 and Culvert No. 204.²²⁸

Based on his estimates of work done during October, Childs was paid \$268.21 on November 17.²²⁹

During the month of November Childs began work in earnest on Aqueduct No. 9. He built a cement house near the site of the aqueduct. In order to transport stone from quarries at Sideling Hill in Virginia, Childs built 1 mile of road to connect his aqueduct to the river road. On December 1 Byers estimated the work done in November, and on December 12 Childs was paid \$1,048.00.²³⁰

Before he was paid his monthly estimate, Childs complained unsuccessfully to Byers that the allowance was too low. He felt that the price of rubble stone at \$3.50 per perch for quarrying and delivery was not high enough to cover the rising costs of construction. Childs countered Byers’s estimate of \$1,000 for the construction of 1 mile of road by submitting a bill of the actual cost to him

744 days labor at \$1.25	\$930.00
Powder, tools, management	<u>\$136.00</u>
	\$1,066.00

The customary allowance of \$125 for the cement house was, according to Childs, not in keeping with the rapid inflation.²³¹

In early December Fisk had asked Byers to submit a report on the distances from Aqueduct No. 9 to the quarries on Sideling Hill in Virginia. On December 10 Byers sent the following statement to Fisk

By the river road along Phelan’s Section	feet	miles
From the aqueduct to the 1 st quarry	13768	2.60
do do 2 nd do	14718	2.78
do do 3 rd do	16468	3.12

²²⁸ Byers to Fisk, Nov. 12, 1838, Ltrs. Recd., Chief Engineer.

²²⁹ *Ledger Book B, C & O Co.* Also see Voucher No. 3829, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal.*

²³⁰ *Ledger Book B, C & O Co.* Also see Voucher No. 3903, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal.*

²³¹ Byers to Fisk, Dec. 10, 1838, Ltrs. Recd., Chief Engineer.

By the field road crossing the river below 15 mile creek				feet	miles
From the aqueduct to the 1 st		quarry		12350	2.34
do	do	2 nd	do	13300	2.50
do	do	3 rd	do	15050	2.85
Difference in favour of the field road is				1418	0.27 ²³²

On January 1, 1839, Byers made an estimate for work done in December. The estimate, for which Childs received \$1,127.17 on January 29, included the following materials “measured & lying at the quarry in Virginia:”

176	supl. feet of ashlar quarried and cut at 90¢	\$158.40
17	lineal ft. towpath coping quarried and cut at \$4.85	82.45
90	lineal ft. water table quarried and cut at 95¢	85.50
800	supl. ft. of ashlar and sheeting quarried at 33-1/3¢	266.67
385	supl. ft. rubble quarried and scabbled at 63¢	242.55
600	perches of rubble backing quarried at 75¢	<u>450.00</u>
		\$1,285.57

A note written by Chief Engineer Fisk and appended to the estimate stated that Childs would be entitled to this sum as well as to the estimate for the road to the quarry upon showing the Commissioner “that the ground upon which the stone are lying” and “the ground upon which the mile of road next to the quarry is made” have been “properly secured to the Company.”²³³

Inflation was seriously affecting the work along the line of the canal in the early months of 1839, forcing some contractors to abandon their projects and causing others to appeal for more money. Childs, on March 4, appealed to Chief Engineer Fisk informing him of what was “absolutely necessary to enable me to carry on this work for Aqueduct No. 9.” First, the centers for the aqueduct “should be furnished forthwith.” Second, he asked that the scale of prices be raised to the following figures for stone still at the quarry:

Skewbacks per lineal foot	\$9.00
Coping per lineal foot	\$6.00
Water table per lineal foot	\$1.00
Sheeting per sup. foot	\$1.90
Ashlar per sup. foot	\$.87½
Scabbled rubble stone per sup. foot	\$.65
Rubble stone per perch	\$1.25

²³² *Ibid.*

²³³ *Ledger Book B, C & O Co.* Also see Voucher No. 4137, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal.*

In addition to these increases, Childs desired that the scale of prices also be raised on stone already cut and delivered to Aqueduct No. 9:

Skewbacks per lineal foot	\$11.00
Coping per lineal foot	\$7.56
Water table per lineal foot	\$1.48
Sheeting per sup. foot	\$2.90
Ashlar per sup. foot	\$ 1.85½
Scabbled face stone per sup. foot	\$1.25
Rubble stone per perch	\$4.50
Prices to include \$1 per perch for extra transportation	

Besides the problem of money, Childs's chief complaint concerned the change of plans for the aqueduct. When he had commenced quarrying, Byers had informed him that the sheeting on the aqueduct "would rise at the Spring 2 ft. 10 in. and at the Crown 2 ft. 6 in." Consequently, he had blocked out the sheeting to meet the prescribed sizes. Now, after much of the quarrying and cutting had been finished, the plans for the aqueduct had been changed by reducing the sheeting "at the Spring to 2 ft. 6 in. and at the Crown 2 ft. 3 in." The loss incurred on the stone already cut, the cost of the labor necessary to reduce the sheeting sizes in accordance with the new plans, and the reduced number of perches in the cutwork would make a difference in the stone estimate of about \$1,200.

Childs went on to detail the frustrations he had experienced in constructing Aqueduct No. 9. When he had begun operations, he had been unable to get the pits laid "out for 6 or 8 weeks." Once the pits had been laid out, there was "a fuss about the extra transportation which retarded the progress of the work. He had been at the work "more than seven months with a good force." More than two-thirds of the stone necessary to construct Aqueduct No. 9 had been quarried, scabbled, and cut, but "on all this work we have received the pitiful sum" of \$2,681.37. Childs warned Fisk that the treatment he had received from the company was about "to break up and drive away contractors on the line of the Canal."²³⁴

On March 16 Childs was paid \$1,624.56 based on his monthly estimate of work done during February, most of which consisted of quarrying and cutting stone at Sideling Hill.²³⁵

Within a week, Fisk referred the lengthy communication from Childs to Assistant Engineer Byers for his evaluation. On March 24 Byers informed the Chief Engineer that he would "make a definite scale of prices for the next estimate."²³⁶

²³⁴ Childs to Fisk, Mar. 4, 1839, Ltrs. Recd., Chief Engineer. A thorough search of the C & O Co. records failed to turn up any additional information on the change of plans for Aqueduct No. 9.

²³⁵ *Ledger Book B*, C & O Co. Also see Voucher No. 4309, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal*.

²³⁶ Byers to Fisk, Mar. 24, 1839, Ltrs. Recd., Chief Engineer.

During March and April, work on Aqueduct No. 9 progressed very slowly. Based on his monthly estimates, Childs received \$268.38 for March and \$392.40 for April.²³⁷

Childs, on June 18, was paid \$680.14 for work accomplished during May. On this monthly estimate, most of the prices allowed Childs were revised downward as a result of the continuing financial difficulties of the company. The prices were altered as follows:

Ashlar per sup. ft. delivered and cut	\$1.12 to \$1.05
Water table per lineal ft., delivered and scabbled	\$1.20 to \$1.12
Rubble stone per perch, delivered	\$3.50 to \$3.00
Rubble stone per sup. ft., delivered and scabbled	\$.63 to \$.69
Materials measured and lying at Quarry	
Ashlar per sup. ft., quarried and cut	\$.90 to \$.84
Towpath coping per lineal ft., quarried and cut	\$4.85 to \$4.70
Water table per lineal ft., quarried and cut	\$.95 to \$.90
Ashlar per sup. ft., quarried	\$.33-1/3 to \$.32
Rubble stone per sup. ft., quarried and scabbled	\$.63 to \$.49
Rubble stone per perch, quarried	\$1.25 to \$1.15
Skewbacks per lineal ft., quarried and cut	\$9.37 to \$8.02
Sheeting per sup. ft., quarried and cut	\$1.75 to \$1.71 ²³⁸

In early June Fisk had asked Superintendent Stone to provide him with “an accurate statement of the distance in miles and feet” from the “guard Lock at Dam No. 6” to the “upper end of Section No. 287.” This data was to be used in ascertaining the length of the river line as compared to that of the canal line. The company at this time was paying 1¼¢ per mile per bushel for the transportation of cement by the river line. If the canal line were less, an effort would be made to get people hauling cement to use that figure in computing costs.²³⁹

Assistant Engineer Byers submitted the “distances on the Canal of the several pieces of masonry from the cement mills” on July 13. The distance from Aqueduct No. 9 to Shaffer’s mill at Roundtop Hill was 13 miles and 2,773 feet, while the distance between the aqueduct and Leopard’s mill near Lock No. 53 was 10 miles and 728 feet.²⁴⁰

The General Committee of Stockholders reported on August 5 concerning a recent survey of the progress of the work on the “50-mile section.” Regarding the condition of the work at Aqueduct No. 9, they remarked:

²³⁷ *Ledger Book B, C & O Co.*

²³⁸ *Ibid.* Also see Voucher No. 4577, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal.*

²³⁹ Fisk to Stone, July 5, 1839, Ltrs. Sent, Chief Engineer. Although Childs had not begun construction of Aqueduct No. 9, he had received several shipments of cement from Leopard’s mill near Lock No. 53.

²⁴⁰ Byers to Fisk, July 13, 1839, Ltrs. Recd., Chief Engineer. This writer was unable to locate the data concerning the distances on the river line that Byers had promised to send Fisk in several days.

Two miles above the lower end of this level [from Lock No. 57 to Lock No. 58] is aqueduct No. 9, over Fifteen mile creek; the span of which is 50 feet, and the rise 12 ½ feet. The materials employed in this aqueduct are derived from a quarry of hard sandstone in Virginia, 3 miles distant, and are only in part got out. The construction has not commenced.²⁴¹

Childs was paid \$662.20 on September 18 based on his estimate of work done in the month of August.²⁴²

On the same day that he received his estimate, Childs, who was becoming desperate for money, sent a list of additional claims to Fisk. In the statement he specified the cutwork on the aqueduct for which he wished to receive additional money - - “the difference between cutting hard land, or flint, and that of limestone.” The list was as follows:

Intrados of Sheeting	1709 ft. @ 50¢	854.50
Tow Path Coping	208 “ “ 50¢	104.00
Wing Coping		54.50
Berm Coping	760 “ “ 50¢	80.00
Do Wing Coping		49.50
Ashlar	1044 “ “ 25¢	261.00
Water Table Linear ft	348 “ “ 12½¢	43.50
Skewbacks do	73½ “ “ \$2	<u>147.00</u>
		1594.00

Besides these claims, Childs wished to be paid \$6,429 to haul 4,286 perch of stone from the Sideling Hill quarries to Fifteen Mile Creek.²⁴³

The board, at its meeting on September 25, agreed to assist Childs. The clerk was directed “to accept his draft at 4 months after date for One Thousand Dollars on account of money retained under his contracts with the Company.” However, in response to his most recent claims for more money, the board refused to increase any contract prices. Nevertheless, the directors agreed to adopt the recommendation of the Chief Engineer, by paying one dollar & fifty cents per perch for the extra transportation of stone, making of roads and all other charges incidental to the said transportation in place of leaving the value thereof to be estimated by the Engineer, as is now provided for by contract; but with the stipulation that in no case shall materials be estimated in the quarry to an amount exceeding Fifteen hundred dollars at one time.²⁴⁴

Because of the death of Ingle’s brother, Fisk informed Childs on October 12 that he had not gotten the recently approved acceptance arranged.. Fisk therefore gave Childs a form

²⁴¹ *Proceedings of the Stockholders*, B, p. 247.

²⁴² *Ledger Book B, C & O Co.* Also see Voucher No. 4886, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal.*

²⁴³ Childs to Fisk, Sept. 18, 1839, Ltrs. Recd., Chief Engineer. Also see Childs to Board of Directors, Sept. 25, 1839, Ltrs. Recd., C & O Co.

²⁴⁴ *Proceedings of the President and Board of Directors*, F, pp. 109–10.

to forward to Ingle who would endorse it as accepted and forward it on to Commissioner Sprigg at Cumberland.²⁴⁵

Five weeks later, on November 12, Childs again wrote to Francis Thomas, the recently installed president, asking for a further advance of \$3,000. After the assistance he had received in October, Childs thought that he “would be able to glide along smoothly” with his work. But as soon as he arrived at Fifteen Mile Creek, many of his creditors showed up to press their claims against him. While he had put them off for a short time, he could no longer do so. As security, Childs offered to give the company a mortgage on his property. Unless this request was met immediately, Childs warned that he would lose his property and abandon the work.²⁴⁶

On November 28 Childs wrote to Fisk asking that he urge the board to take immediate action on this request. Since he only had \$520.29 in cash after paying his most pressing bills, he could not carry on his work much longer. Because the retained money on all of his contracts with the company totaled \$5,332, Childs felt that his request was reasonable.²⁴⁷

On November 30, Byers reported to Fisk on the progress of the masonry works above the Cacapon River. George S. Marsh, a partner of Childs in the construction of Aqueduct No. 9, had informed the Assistant Engineer that Fisk had ordered them to level off and grout up the eastern abutment. During his inspection of the structure, Byers found that the thickness of the gravel behind the abutment was less than he had directed. But Marsh told him that their work on the aqueduct had been done in accordance with instructions from Fisk. In the event that similar misunderstandings arose in the future, Byers wanted Fisk to clarify his directions in regard to the construction of Aqueduct No. 9.²⁴⁸

Childs, on December 19, was paid \$1,109.47 based on his estimate of work done during November.²⁴⁹

The board, on December 7, determined upon the following course of action in regard to contracts that had not been completed by their date of expiration:

Ordered, that when the time shall expire which has been limited for the completion of any contract for work upon the line of the Canal, and such work shall not be completed according to the terms of such contract, the Chief Engineer shall immediately thereupon report to the Board the fact, that such work has not been so completed.²⁵⁰

In accordance with this order, Chief Engineer Fisk, on December 28, reported to the board that the contract for Aqueduct No. 9 had expired on December 15. Furthermore,

²⁴⁵ Childs to Ingle, Oct. 12, 1839, Ltrs. Recd., C & O Co.

²⁴⁶ Childs to Thomas, Nov. 23, 1839, Ltrs. Recd., C & O Co.

²⁴⁷ Childs to Fisk, Nov. 28, 1839, Ltrs. Recd., Chief Engineer.

²⁴⁸ Byers to Fisk, Nov. 30, 1839, Ltrs. Recd., Chief Engineer.

²⁴⁹ *Ledger Book B*, C & O Co. Also see Voucher No. 5798, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal*.

²⁵⁰ Ingle to Fisk, Dec. 7, 1839, Ltrs. Recd., Chief Engineer.

Childs had only done \$13,749.18 worth of work on the structure through the end of November. The board therefore declared the contract with Childs for Aqueduct No. 9 abandoned.²⁵¹

After the board made this decision, Clerk Ingle instructed Commissioner Sprigg to notify the contractors “immediately of the fact, that their contracts have been declared abandoned.”²⁵²

On the same day that his contract was declared abandoned, Childs sent a letter to the board calling their attention “to a former communication” made to them “on the subject of relief.”²⁵³

Fisk, on January 15, asked the board to approve an agreement he had made with Childs concerning the stone at Sideling Hill quarries in Virginia. Since the company had paid Childs for the stone in his monthly estimates, the object of the agreement was “to resume the Company’s property in the stone” amounting to more than \$4,000. The stone was to be taken from Sideling Hill to Fifteen Mile Creek, “where they will be on the ground of the Company.” Fisk urged the board to give the matter urgent consideration, because “the stone can now be hauled in sleds and over the Potomac on the ice at very considerably less cost than at any other time in wagons.” Before its adjournment that day, the board confirmed the agreement.²⁵⁴

Six days later, on the 21st, Fisk, acting in response to an order by the board, submitted a report to the directors detailing the work done on the abandoned contracts as of January 1, 1840. According to the statement, Childs had done \$14,249 worth of work, while \$39,324 still remained to be done on Aqueduct No. 9. The amount of retained money on the contract amounted to \$2,849.84.²⁵⁵

The board of directors, on January 24, determined that the following policy should apply for the settlement of the contracts that had been declared abandoned on December 28:

Ordered, that the Chief Engineer and the Commissioner of the Canal, be authorized and empowered to make settlement with those of the contractors whose contracts were declared abandoned on the 28th ulto., as may be willing to settle their accounts for the abandoned work, upon terms which they, (the Chief Engineer and Commissioner) may deem reasonable; making report of their proceedings to the Board as early as practicable; and also making report of the terms demanded by those with whom they not make settlement.²⁵⁶

²⁵¹ *Proceedings of the President and Board of Directors*, F, pp. 137–38. Also see Sprigg to Fisk, Dec 13, 1839, and Bryan to Fisk, Dec. 18, 1839, Ltrs. Recd., Chief Engineer.

²⁵² Ingle to Sprigg, Dec. 28, 1839, Ltrs. Sent, C & O Co.

²⁵³ Childs to Board of Directors, Dec 28, 1839, Ltrs. Recd., C & O Co.

²⁵⁴ Fisk to Board of Directors, Jan. 15, 1840, Ltrs. Recd., C & O Co. Also see *Proceedings of the President and Board of Directors*, F, p. 148.

²⁵⁵ Fisk to Board of Directors, Jan. 21, 1840, Ltrs. Recd., C & O Co.

²⁵⁶ *Proceedings of the President and Board of Directors*, F, p. 158.

More than a month later, Assistant Engineer Bryan reported to Fisk on the problems of making final settlements with the contractors whose contracts had been declared abandoned. He feared that Childs would not make settlement, because he had gone home after taking depositions on his works for possible court action. The referees who had been designated to negotiate with Childs and his partner George S. Marsh wanted to discuss the problem with both men present, since both men had cost accounts but not vouchers.²⁵⁷

On March 12 Childs wrote to Fisk inquiring about his final settlement. Since vouchers were required for all the claims he and Marsh made, it would take some time to procure them. Marsh was not cooperating with him, and he had recently received receipts totaling \$658 from his partner that were not entered on his cost account. Childs described his financial condition as so ruinous that he had drawn a draft on a friend for \$1,200 that would be payable on March 29. Unless the company would aid him, his credit would be completely gone. In the event that the final settlement was not closed before this draft was due, Childs wondered if Fisk could work out some arrangements with the company. Regarding the agreement to haul the stone from Sideling Hill to Fifteen Mile Creek, Childs favored it but could not provide the wagons because of lack of funds. In conclusion, Childs hoped “that the Company will recollect that I have been a long time in their employ” and will “make some provision for my relief.”²⁵⁸

In preparation for the final settlement with Childs, Fisk, in early April, dispatched MacFarland to study the cost of quarrying, cutting, and hauling stone for Aqueduct No. 9. On April 17 MacFarland reported his findings to the Chief Engineer. The price of \$1.75 per superficial foot that Childs had charged for the cutting and quarrying of sheeting was much too high. As for the cost of quarrying and cutting ashlar, MacFarland felt that Childs should be paid between 75¢ and 87 ½ ¢ per superficial foot. While the flintstone at Sideling Hill was more difficult to cut than limestone, the quarrying was “less expensive than any other we have ever had opened on this canal.” MacFarland also considered high the price of \$3 per perch that Childs wanted to charge for quarrying the cutwork. He felt that the allowance for dressing rubble stones should be about 20¢ per superficial foot, while the cost of quarrying and cutting the water table and coping “will not vary much from the price of the same elsewhere.” To transport the stone to the site of the aqueduct, teams could be hired for \$5 per day.²⁵⁹

Childs, on May 30, notified Fisk that his friend John N. Hilliary, on whom he had recently drawn a draft for \$1,200, had been threatened with a lawsuit for that amount. Childs had gotten Mr. Payne to delay commencing the suit until Fisk had explained the problem of his final settlement with the company. The draft was renewed until June 8, by which time he hoped arrangements for his final settlement with the company would be completed.²⁶⁰

²⁵⁷ Bryan to Fisk, Feb. 27, 1840, Ltrs. Recd., Chief Engineer.

²⁵⁸ Childs to Fisk, Mar. 12, 1840, Ltrs. Recd., Chief Engineer.

²⁵⁹ MacFarland to Fisk, Apr. 17, 1840, Ltrs. Recd., Chief Engineer.

²⁶⁰ Childs to Fisk, May 30, 1840, Ltrs. Recd., Chief Engineer.

Fisk, on June 10, submitted to the board for confirmation an agreement that had been arranged on April 18 with Childs and Marsh. According to its terms, Childs assigned all his rights and interests in the original contracts for Aqueduct No. 9 and Section No. 272 to Marsh. At the same time, the board received a letter from Marsh claiming allowances not covered by the original contracts. The board confirmed the April 18 agreement and, in addition, ordered that \$700 be allowed the two contractors to satisfy all their claims against the company. Childs and Marsh were required to “execute a written acknowledgement that such settlement is satisfactory to them.” For payment, they would receive canal scrip “payable at nine months after date with Interest, allowing to the Company for so much of said Interest as shall be just having reference to the provisions of the agreement.”²⁶¹

For his part in agreeing to the provisions of the final settlement, Marsh was paid \$250 on June 11 on order of the board.²⁶²

In mid-July, Fisk reported to Clement Cox, Chairman of the Committee of the Stockholder, on “the character of the unfinished 50 miles of canal.” Concerning Aqueduct No. 9, the Chief Engineer said that it was

Rather more than one-fourth done. The work has been suspended, but arrangement have been made for its resumption. The aqueduct ought easily to be finished in two seasons.²⁶³

Marsh, on July 15, visited Assistant Engineer Dickinson at Orleans to inform him that he intended to commence laying masonry the following week. Because he had no cement at the present time, Marsh estimated that he would need 2,000 bushels of cement for the season. Dickinson thereupon contacted Fisk for instructions to carry out this order.²⁶⁴

On July 21 Assistant Engineer Morris notified Fisk that Marsh had “begun the rock excavation necessary for Aqueduct No. 9 and proposes now to begin the masonry.” When the question of estimating this work arose, Morris wanted to know if it was to be done under the terms of Childs’s old contract.²⁶⁵

Two days later, Fisk responded to this letter by notifying Morris that the contract for Aqueduct No. 9 and Section No. 272 had “been conditionally revised, but with the understanding that Mr. Marsh shall be substituted as contractor in place of Mr. Childs.” There was still some paperwork to be handled between the two parties “that may perhaps be regarded almost as a mere matter of form.” In the meantime, Fisk had no objection to the continuation of the work by Marsh. But no estimate was to be made until Morris was “officially appraised of the necessary papers & c having been signed.” George Shafer, the

²⁶¹ *Proceedings of the President and Board of Directors*, F, pp. 227–28.

²⁶² *Ibid.*, p. 231.

²⁶³ Fisk to Cox, July 17, 1840, Ltrs. Sent, Chief Engineer.

²⁶⁴ Dickinson to Fisk, July 15, 1840, Ltrs. Recd., Chief Engineer.

²⁶⁵ Morris to Fisk, July 21, 1840, Ltrs. Recd., Chief Engineer.

owner of the cement mill at Roundtop Hill, had been directed to deliver 1,000 bushels of cement to Marsh whenever the contractor ordered it.²⁶⁶

On August 4 Morris reported to Fisk that his estimate of work done on Aqueduct No. 9 during July was:

500 cu. yds., excavation of rock at \$1.25	625
75 cu. yds., excavation of all other materials at 25¢	<u>17.85</u>
	\$643.75

When Assistant Engineer Bryan saw this estimate 3 days later in the Cumberland office, he quickly wrote to Fisk asking if Morris had received official notification of the signing of the proper papers.²⁶⁷

Finally, on September 21, the details of the final settlement on Aqueduct No. 9 and Section No. 272 were completed. As part of the agreement, Childs received the sum of \$8,000 for his services on these projects.²⁶⁸

Marsh, on September 23, was paid \$1,244.57, based on his estimate of work done during August.²⁶⁹

During the latter months of 1840, Marsh kept a large force at work laying masonry and quarrying stone at Sideling Hill. Based on his monthly estimates of work done, Marsh was paid \$1,341.60 for September, \$631.88 for October, and \$1,670.55 for December.²⁷⁰

On January 6 Michael P. Smith, who had been assigned as the trustee of Childs and Marsh for the benefit of their creditors by the Circuit Court of the District of Columbia in November 1839, was paid \$450 by the company. This amount was the total sum held by the company as a guarantee for Childs and Marsh.²⁷¹

Although the articles of agreement for the final settlement with Childs on Aqueduct No. 9 had been completed, Childs complained to the board on March 26 that Marsh still had not fulfilled his obligations. According to Childs, Marsh had “refused to settle the claims vs. said firm of Marsh & Childs according to the true intent and meaning of said Articles.”²⁷²

As the financial condition of the company worsened in the spring and early summer of 1841, work along the line of the canal continued spasmodically as the board prepared to

²⁶⁶ Fisk to Morris, July 23, 1840, Ltrs. Sent, C & O Co.

²⁶⁷ Morris to Fisk, Aug. 4, 1840, and Bryan to Fisk, Aug. 7, 1840, Ltrs. Recd., Chief Engineer.

²⁶⁸ Voucher NO. 6373, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal*.

²⁶⁹ *Ledger Book B, C & O Co.* Also see Voucher No. 6392, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal*

²⁷⁰ *Ledger Book B, C & O Co.* Also see Vouchers Nos. 6482 and 6538, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal*

²⁷¹ Voucher No. 6534, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal*

²⁷² Childs to Board of Directors, Mar. 26, 1841, Ltrs. Recd., C & O Co.

suspend operations. On July 15 Marsh was paid \$500 for work done on Aqueduct No. 9 and Section No. 272.²⁷³

Although the board had repeatedly asked the contractors to transport the stone from Sideling Hill quarry to Fifteen Mile Creek, neither Childs nor Marsh had done so. Byers, on August 2, notified Fisk that the firm of Clark & Bauman, which was associated with the Western Maryland Railroad, had “seized upon the stone prepared for Aqueduct No. 9” still lying at the quarry. He had been told by persons in the area that the railroad men intended to sell the stone. But when he had visited Fifteen Mile Creek, Marsh had said nothing about it. Byers intended to warn area residents not to purchase the stone if a sale was held, but he wanted instructions from the Chief Engineer as to how he should proceed.²⁷⁴

By mid-August, the financial resources of the company were nearly exhausted. Earlier in March, the board had reversed its former policy by forbidding the issuance of more scrip until means were provided to repay it.²⁷⁵ During August, the board authorized final suspensions, although it agreed to accept drafts on the company by the contractors in order to encourage them to continue the work on their own until further aid was forthcoming.²⁷⁶

Under these desperate conditions, Marsh carried the work on at Aqueduct No. 9. On September 16, the board directed the clerk to accept the following drafts by Marsh to be “payable 12 months after date” and to be charged against him for work done under his contracts:

DATE	AMOUNT	DRAWEE
May 26	\$700.00	Israel Dickinson
August 12	\$235.89	Jacob Bragonier
August 19	\$361.72	John Moore
September 1	\$163.20	Jonathan Wite
September 1	\$1,605.12	P. Fitzgerald & Co.
September 14	\$1,000.00	P. Fitzgerald & Co. ²⁷⁷

The board, on November 5, directed the clerk to accept a draft drawn upon the company by Marsh in favor of Lloyd Lowe & Co. for \$1,319.25.²⁷⁸

Assistant Engineer Byers, on December 23, reported to Fisk that the estimate for work done for November was incorrect. He had misunderstood MacFarland concerning the rubble backing on the aqueduct. Assistant Engineer Dungan had estimated that 400 perches of rubble backing had been delivered to the aqueduct by January 1, 1841. Byers knew personally that 320 perches had been delivered during the last building season.

²⁷³ *Proceedings of the President and Board of Directors*, F, p. 358.

²⁷⁴ Byers to Fisk, Aug. 2, 1841, Ltrs. Recd., Chief Engineer.

²⁷⁵ *Proceedings of the President and Board of Directors*, F, p. 297.

²⁷⁶ *Ibid.*, pp. 377–78, 381.

²⁷⁷ *Ibid.*, p. 384.

²⁷⁸ *Ibid.*, pp. 402–3.

Therefore, the two totals should be added, making 720 perches of rubble backing at \$4 instead of the 320 perches on the work estimate.²⁷⁹

Work proceeded slowly on Aqueduct No. 9 from the early months of 1842 until Marsh suspended his operation in mid-April. While the work was still in progress, the following drafts were drawn upon the company by Marsh:

DATE	AMOUNT	DRAWEE
Sept. 21, 1841	\$122.81	Anthony Loftus
Sept. 21, 1841	\$100.00	Anthony Loftus
Dec. 8, 1841	\$200.00	G. W. Clabough
Jan. 4, 1842	\$390.00	Thomas Clarke
Apr. 22, 1842	\$486.00	William Shaw ²⁸⁰

²⁷⁹ Byers to Fisk, Dec. 23, 1841, Ltrs. Recd., Chief Engineer.

²⁸⁰ *Proceedings of the President and Board of Directors*, F, pp. 425–26, 460.

IV. THE CONSTRUCTION OF AQUEDUCT NO. 11: 1837–1842

Before the bid were opened for the works above the Cacapon, Commissioner Bender moved to secure title to the land at Evitts Creek, some 5 miles east of Cumberland, needed by the Company for Aqueduct No. 11. Here the canal right-of-way would cross property owned by William L. Lamar. On March 21, 1837, a deed was executed whereby the company purchased “28 acres, 3 rods, 18 perches” for \$906. Through this land would pass Sections 358–361 of the canal, amounting to 7,930 feet of the waterway.²⁸¹

The Committee on Contracts reported on September 29 that the successful proposal for the construction of Aqueduct No. 11 across Evitts Creek was that of George G. Johnson, who bid \$47,053.²⁸² The next day, the board of directors wrote Johnson that his bids had been accepted. But they warned him, as they had William Pratt, whose bids had been accepted for Aqueducts No. 9 and 10 on the same day, that the company had not completed its negotiations for the sale of the \$3,000,000 worth of 6 percent bonds of the State of Maryland. Until the bonds were sold, the company would be unable to make payments on estimates, except through use of notes about to be issued.²⁸³

After receiving notification that his proposal for Aqueduct No. 11 had been accepted, Johnson, on October 6, informed the board that he was very “anxious to commence the work immediately.” Since some of his men lived at a distance from his home in Palatine Bridge, New York, it would require a few days before he could get everyone together. Despite the company’s financial difficulties, Johnson thought that their pay would “warrant us in commencing the work as soon as we can make the necessary arrangements.” Because he had such a large force, he wondered whether his firm “could have some of the culverts in the neighborhood of our work, or some heavy section.”²⁸⁴

Johnson, on October 17, notified Chief Engineer Fisk that he and his associates intended to leave Palatine Bridge on November 7 to begin the work allotted to them. Because Fisk had informed Johnson earlier that the company engineers were exploring the quality of the stone in the Evitts Creek quarries, the contractor desired to know if anything had been done in this respect.²⁸⁵

²⁸¹ *Reference Book Concerning Land Titles, 1829–1868*, C & O Co. Also see *Report of Lands Acquired in Allegany County up to August 15, 1837*, Land Records, C & O Co.

²⁸² Abert to Board of Directors, Sept. 29, 1837, Ltrs. Recd., C & O Co. The cost of Aqueduct No. 11 had been estimated at \$48,975 by the company engineers.

²⁸³ Ingle to Johnson, Sept. 30, 1837, Ltrs. Sent, C & O Co. At the same time, Johnson was informed that his bids for Locks Nos. 73–75 and Sections No. 350–351 and 354 had been accepted.

²⁸⁴ Johnson to Board of Directors, Oct. 6, 1837, Ltrs. Recd., C & O Co. On June 25, 1838, Johnson was awarded contracts for Culverts Nos. 234–241.

²⁸⁵ Johnson to Fisk, Oct. 17, 1837, Ltrs. Recd., Chief Engineer.

Upon arriving at Evitts Creek in early December, Johnson immediately began preparations for commencing work on Sections Nos. 350 and 351 and Aqueduct No. 11. Within 2 weeks he had opened the quarry at Lamar's, and he reported to Assistant Engineer Patterson that he had "split out a stone with 4 edges about 18 feet long, 3 feet thick by 4 ft." In forwarding this good news to Joshua Gore, Patterson concluded that "the quarry will turn out well."²⁸⁶

On December 23 Johnson informed Fisk that he and his partners had been at Evitts Creek for over 2 weeks, "waiting the arrival of yourself or some person qualified to set us at work." During their time at the site of Aqueduct No. 11, they had opened the Evitts Creek quarries and found "the stone beautiful, of good quality, and in great abundance." However, according to Johnson, the stone would "be rather hard to cut, and somewhat difficult to quarry."

In the letter, Johnson reminded Fisk of a conversation they had had the previous summer on estimating dressed stone in the quarry. The contractor repeated his earlier opinion that he had no objection to this procedure providing "the stone was in proper manner secured to the Company."

Johnson informed Fisk that he was considering the construction of a railroad from the quarry to the aqueduct for transporting the stone. But before he could complete the railroad, he would "undoubtedly have a large amount of stone dressed." Therefore, he would "require estimates on them, as well as on timber and plank for the Locks" before he could deliver them to his construction site.²⁸⁷

Fisk replied on Christmas Day to Johnson's inquires. MacFarland and Fisk were planning to leave Washington for Cumberland on horseback the following Wednesday, and Joshua Gore was planning to go up by stage at about the same time. Johnson could see all three of them at the engineer's office at Cumberland when they arrived on Thursday.²⁸⁸

In the meeting at Cumberland on December 30, Johnson announced that he had "bargained for his plank at \$1.37 ½, for all his timber delivered on the bank at the site of [the] locks rough & hewn at 10 cts.—and stone from Lamar at 6 cts. with the privilege of a road."²⁸⁹

On January 29, 1838, Johnson and Daniel Houck, the owners of the Evitts Creek quarry, made arrangements in regard to the rights of the canal company to stone at the quarry and ground rents. The certificate signed at Cumberland stated:

I hereby certify that arrangements have been made by me with George G. Johnson, Contractor for Aqueduct No. 11 and for Locks No. 73, 74 & 75 on the Chesapeake &

²⁸⁶ Patterson to Gore, Dec. 18, 1837, Ltrs. Recd., Chief Engineer. Stone for Locks Nos. 73–75 was also taken from these quarries.

²⁸⁷ Johnson to Fisk, Dec. 23, 1837, Ltrs. Recd., Chief Engineer.

²⁸⁸ Fisk to Johnson, Dec. 25, 1837, Ltrs. Sent, Chief Engineer

²⁸⁹ Johnson to Fisk, Dec.30, 1837, Ltrs. Recd., Chief Engineer

Ohio Canal Company shall be allowed to let remain without charge, on the stone yard around the quarry or anywhere on my land which said Johnson is now working, any materials that said Company may estimate and pay for to said Johnson for the use of the above Aqueduct & Locks that said stone may remain if it should be necessary until they are needed to be put into said works without charge.

It shall be understood however that the above shall apply only to estimates made out previous to January 1840 inclusive, and that it shall not be understood as giving permission for stone to remain on said ground longer than the completion of said Aqueduct & Locks. I also certify that I look to said Johnson for quarry rent and ground rent without any lien on any stone that may be estimated as above.²⁹⁰

Two weeks later, on February 12, Joshua Gore reported to Fisk on the progress of work on Aqueduct No. 11. Gore had located Johnson's railroad, which was nearly completed. According to Gore, the descent of the rails was "upwards of 300 ft." The quarry at Evitts Creek was doing very well, and Johnson appeared to be a conscientious contractor.

Gore also informed the Chief Engineer of the statistics he had formulated concerning the ring stones needed for the arch of Aqueduct No. 11. He had fixed the number needed at 51: the first stone would be 21 inches thick at the intrado, with each successive stone varying "1/4 of an inch," the 24th one being 15 inches thick. The keystone "on the intrado measures 21 inches allowing 1/8 of an inch for joints." Gore was considering making each of the 48 ring stones "1/2 of an 1/8 less than these dimensions that the key may be 24 instead [of] 21 inches." The key rises 5 inches above, and projects 2 inches below, the ring. These thicknesses, according to Gore, would suit the quarry very well.²⁹¹

Johnson, on March 9, was paid \$400 based on his first monthly estimate of work done in January. This payment, according to the estimate, was for "200 perches ashlar quarried & scabbled."²⁹²

Because of excessively cold weather in February, Johnson was unable to prosecute the work at Aqueduct No. 11 with as much vigor as he had earlier. However, when the weather became warmer in March, he resumed work at his quarry and on his railroad. On April 16 he was paid \$660 for work done since the March 1 estimate. This payment covered the following work accomplished during March:

110	perches of scabbled ashlar
68	sup. ft of cut ashlar
75	sup. ft. of sheeting
60	perches of backing
	Railroad from quarry to aqueduct partly done ²⁹³

²⁹⁰ Certificate of Daniel Houck, Jan. 29, 1838, *Drawings and Other Records Concerning Construction*.

²⁹¹ Gore to Fisk, Feb. 12, 1838, Ltrs. Recd., Chief Engineer. A thorough

²⁹² *Ledger Book B, C & O Co.* Also see Voucher No. 2757, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal*. See Appendix C for a list of the payments made to Johnson for the construction of Aqueduct No. 11.

Assistant Engineer Irons, on May 10, submitted his monthly estimate of work done on Aqueduct No. 11 to Fisk. Because he did not know the prices allowed at present for the various items, Irons asked Fisk to forward these figures to him. Since Johnson had nearly completed his railroad, Irons felt that his allowance for this work should be raised from \$300 to \$500.²⁹⁴

Johnson, on May 17, was paid \$2,214.40 for work done during April.²⁹⁵

By mid-May, Johnson had a full force working on Aqueduct No. 11, with 65 men and one boy on his payroll. The breakdown in “man days of work” and the cost of labor was as follows:

	MAN DAYS	AVG. COST
Drillers and Blasters	140	\$1.25
Masons Laying Wall	239	\$2.25
Blacksmiths	30	\$2.00
Carpenters	151	\$2.00
Drags	13	\$3.00
Horses	48	\$1.50
100 lbs. of gunpowder used, delivered and cost - \$4.25 per keg of 25 lbs. ²⁹⁶		

When the board of directors issued its *Tenth Annual Report* in June, the stockholders were delighted to learn that contracts had been made with “responsible and generally experienced men, who are commencing their operations with great spirit.” It was forecast by the board that the “entire canal from [the] Cacapon to Cumberland will be opened simultaneously by the close of the year 1839, or, at the farthest, in time for the spring trade of 1840.”²⁹⁷

Following a slow month of work in May, for which he was paid \$371.40, Johnson received \$936.40 for work accomplished in June.²⁹⁸

In August Gore reported to Fisk that Johnson was keeping in his employ a man named White whom he had been ordered to discharge. According to Gore, White had put “him-

²⁹³ Gore to Fisk, Feb. 12, 1838, Ltrs. Recd., Chief Engineer. A thorough search of the C & O Canal Co. records failed to turn up any plans or specifications for Johnson’s railroad. However, a plan drawn up on June 21, 1838, for a similar railroad at Athys Hollow was found, and appears in Appendix F.

²⁹⁴ Irons to Fisk, May 10, 1838, Ltrs. Recd., Chief Engineer.

²⁹⁵ *Ledger Book B, C & O Co.* See also Voucher No. 3054, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal.*

²⁹⁶ *Semi-Monthly Return of the Force, May 16–31, 1838, Vouchers and Receipts for Disbursements by the Commissioner of the Canal.*

²⁹⁷ *Tenth Annual Report* (1838), C & O Co., pp. 3 -5/

²⁹⁸ *Ledger book B, C & O Co.* Also see Voucher No. 3262, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal.*

self in a threatening attitude towards the superintendent of construction whilst engaged in the discharge of duties that I had assigned him at their work.” Under the circumstances, Gore felt that “the authority of the Assistant Engineer” was at stake in enforcing the order.

On a recent inspection of Aqueduct No. 11, Assistant Engineer Patterson had seen White drive a wagon up to the railway at Evitts Creek and assist in unloading stone. Patterson had also heard that White had “been in the quarries” and “working upon the railway car.” When Johnson was confronted with the order to discharge White, he had let it be known along the line that he would not comply with it.²⁹⁹

After receiving this report, Fisk immediately notified Johnson that he deemed “it of the utmost importance that the orders of the Engineer” shall not be “disregarded either directly or indirectly.” If Johnson would fire White, it would “save the necessity of any further action by me in the matter.”³⁰⁰

On August 13 Johnson was paid \$801.76 for work done on Aqueduct No. 11 in July. During that month he had concentrated his activities on excavating 2,100 cubic yards of material for the abutments of the structure.³⁰¹

Low water caused by a late summer drought brought the manufacture of cement at Lynn’s mill in Cumberland to a stop. By September 1 the cement shortage had become so acute that Johnson was hard-pressed to keep his force employed.

On September 20, Fisk sent an order to Johnson for “one thousand bushels of approved cement to be put in barrels” from George Shafer at Roundtop Hill near Hancock. This order was to be used only in the event that Lynn failed to supply him with enough cement. Before Johnson ordered the cement from Shafer, he was to notify Lynn so that Lynn could either increase his production or transport the cement from Shafer’s mill himself. If Lynn did not increase his supply or want to transport the cement from Roundtop Hill, Johnson was authorized to hire teams and haul the cement himself, keeping accurate accounts of the expense.³⁰²

Gore, on September 28, reported to Fisk that he had discovered a problem in the “distance of the outside of the wings of the aqueduct.” The towpath measured “41 ½ & the berm 38 ½ [feet] from the center of the abutment.” Thinking that these measurements may have been transposed, Gore informed the Chief Engineer that this problem would “throw the outside of the towpath wing at top water line 47 feet from center of canal - - the outside of this towpath bank being 43 feet from center.”

²⁹⁹ Gore to Fisk, Aug. 6, 1838, Ltrs. Recd., Chief Engineer.

³⁰⁰ Fisk to Johnson, Aug. 6, 1838, Ltrs. Sent, Chief Engineer.

³⁰¹ *Ledger Book B, C & O Co.* Also see Voucher No. 3382, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal.*

³⁰² Fisk to Johnson, Sept. 20, 1838, Ltrs. Sent, Chief Engineer.

Because Johnson was planning to begin his masonry the next morning, Gore was anxious to get instructions from Fisk on this matter. Johnson had about 100 bushels of cement at the work. Lynn, who was determined to do what he could under the circumstances, had about 150 bushels at his mill, grinding from 30 to 50 bushels per day.³⁰³

Four days later, on October 2, Fisk urged assistant Engineer Byers to keep pressing Lynn for higher productivity. At the same time, he reminded Byers not to “let Johnson omit sending to Hancock if necessary to keep up the supply.”³⁰⁴

During the month of October, Johnson made rapid progress on Aqueduct No. 11. On October 22, Gore informed Fisk that “Johnson’s abutment is up to the offset 3 feet below the spring of the arch.”³⁰⁵

Based on his estimate of work done during October, Johnson was paid \$1,953.64 on November 16. This amount included an allowance of \$125 for the construction of a cement house at the site of the aqueduct.³⁰⁶

Until mid-December, Johnson had done better financially than most contractors on the “50-mile section.” But inflation and problems with his creditors finally caught up with him. On December 26 he asked Fisk to bring his case before the board at its next meeting. To enable him to “weather the storm,” Johnson requested an “instrument that would run four months before maturity for Three thousand Dollars.”³⁰⁷

Johnson, on January 15, was paid \$1,335.50 for work done in December, and on February 19 he received \$1,376.12 for work accomplished in January.³⁰⁸

When Johnson had not heard from Fisk concerning his request for financial help by early March, he again wrote to the Chief Engineer. He feared that Fisk might forget his case “in the multitude of business.” If he did not receive help this month, Johnson could see that the “Ides of March” were coming.³⁰⁹

Two days later, Clerk Ingle wrote to Johnson telling him that he had conferred with Commissioner Sprigg about his request. Unfortunately, there was no possible way by which he could “be accommodated with an advance of money from the Canal Company at that time.” In the letter, Ingle elaborated on the financial difficulties of the company:

We make every sacrifice to pay our monthly estimates, punctually, and the Finals when they are due—none can be done at this time—and it depends upon the Legisla-

³⁰³ Gore to Fisk, Sept. 28, 1838, Ltrs. Recd., Chief Engineer.

³⁰⁴ Fisk to Byers, Oct. 2, 1838, Ltrs. Sent, Chief Engineer.

³⁰⁵ Gore to Fisk, Oct. 22, 1838, Ltrs. Recd., Chief Engineer

³⁰⁶ *Ledger Book B, C & O Co.* Also see Voucher No. 3823, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal.*

³⁰⁷ Johnson to Fisk, Dec. 26, 1838, Ltrs. Recd., Chief Engineer.

³⁰⁸ *Ledger Book B, C & O Co.* Also see Vouchers Nos. 4046 and 4235, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal*

³⁰⁹ Johnson to Fisk, Mar. 5, 1839, Ltrs. Recd., Chief Engineer

ture of Maryland whether more can be done after they rise. When this event takes place we shall be able to speak with more certainty as to the future.

His request, Ingle assured Johnson, would “be laid before the Board as with many others already received on the same subject” as soon as the company was in a position to deal with them.³¹⁰

Despite this rejection of his request, Johnson continued to make progress on Aqueduct No. 11. During the spring months he was paid \$400 for work done in February, \$1,056 for March, \$1,616.37 for April, and \$2,770.63 for May.³¹¹

At the eleventh annual meeting of the stockholders held on June 3, 1839, the board reported that “progress has been made as rapid” on the “50-mile section” as the “means of the Company would justify, with a force varying from 2,500 to 3,000 laborers.” Many sections had been completed, while others were nearly finished. Better yet, most of the “heavy sections were in good progress.”³¹²

The board, on July 10, received another letter from Johnson requesting “a part of the money retained on work done by him.” Again, the letter was laid on the table because of the financial condition of the company.³¹³

On the same day that his latest appeal for an advance was rejected, all the contractors above Cacapon were directed not to employ Peter Broun and Thomas Sennet. Both men had taken part in the recent disturbances at Paw Paw Tunnel and had been dismissed from their jobs and blacklisted by the company. At the time of their dismissal, Broun had been working at McCubbin’s Quarry and Sennet was engaged at Johnson’s Quarry on Evitts Creek.³¹⁴

Following an inspection of the progress of work on the “50-mile section,” the general committee of stockholders reported on August 5:

There are seven culverts upon this level [from Lock No. 75 to Guard Lock No. 8 in Cumberland] all of which are under contract to the same individual to whom are let the locks Nos. 73, 74 & 75. Several of these culverts have been commenced, and preparations for all are going on. The same party is also the contractor for aqueduct No. 11, over Evitts creek, three miles below Cumberland. This aqueduct has a span of 70 feet, and a rise of 14 feet. This work is so far advanced, that it is nearly in readiness for the turning of the arch.

The stone is brought from a quarry up the creek which has already been mentioned. It is a compact limestone or rather marble in some parts densely filled with

³¹⁰ Ingle to Johnson, Mar. 7, 1839, Ltrs. Sent, C & O Co.

³¹¹ *Ledger Book B*, C & O Co. Also see Vouchers Nos. 4326 and 4586, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal*

³¹² *Eleventh Annual Report* (1839), C & O Co., pp. 3–5.

³¹³ *Proceedings of the President and Board of Directors*, F, p. 87.

³¹⁴ Dodge to Patterson, July 10, 1839, Ltrs. Sent, Engineer’s Office at Cumberland.

marine shells, and when polished, presents a very interesting object, and is quite admirably adopted for ornamental work. It is brought from the quarry, upon a temporary wooden railway, a mile and a half in length, to the aqueduct. The same quarry, as has been stated, furnishes material for the locks immediately below.³¹⁵

During the summer of 1839, the upper Potomac Valley again experienced a severe drought that hindered work along the “50-mile section” because of a shortage of cement. A. B. MacFarland, on August 8, notified Fisk that work on Aqueduct No. 11 was stopped “after the foundation was laid out by Mr. Gore.” Altogether 10 ½ days of work had been lost between July 25 and August 8. Despite the work stoppage, Johnson had been able to employ a small force of “3 masons, 6 tenders and one superintendent” throughout this period.³¹⁶

Four days later Johnson informed the board of directors that he was in debt “for about \$5,000.” Of this sum, \$4,800 was in business paper, which he had to pay immediately. This amount was over and above his expenses for the last month, and because of the short supply of cement, his estimate for work in July would not be large enough for him to pay his creditors. If the company would give him an advance on his retained money, he would work out arrangements with the Cumberland Bank to pay his creditors.³¹⁷

At its meeting on August 28, the board ordered Clerk Ingle to “accept the drafts of Geo. G. Johnson at the like date for such sum as will leave ten thousand dollars of his retained money in the hands of the Company.”³¹⁸

On the same day that the board granted him this measure of relief, Johnson wrote out a draft against the company for \$3,687 payable at 4 months.³¹⁹ One week later, on September 5, Johnson wrote another draft for \$608.³²⁰

Early in September Johnson had gone to Washington to make arrangements with the board for the shipment of blasting powder from Georgetown to his projects. Johnson was to receive 100 kegs at the rate of \$3 each, “provided the powder was to be found good.” Should the shipment of powder be of good quality, Johnson promised to order an additional “winter supply so as to get it while the navigation is good.”³²¹

Johnson, on September 18, was paid \$1,490.14 for work done on Aqueduct No. 11 during August. By the middle of this month, the problems resulting from the shortage of cement were met by a shipment of 620 bushels of cement from Lynn’s mill on Wills Creek in Cumberland.³²²

³¹⁵ *Proceedings of the Stockholders*, B, pp. 260–61.

³¹⁶ MacFarland to Fisk, Aug. 8, 1839, Ltrs. Recd., Chief Engineer.

³¹⁷ Johnson to Board of Directors, Aug. 12, 1839, Ltrs. Recd., C & O Co.

³¹⁸ *Proceedings of the President and Board of Directors*, F, pp. 96–97

³¹⁹ Johnson to Ingle, Aug. 28, 1839, Ltrs. Recd., C & O Co.

³²⁰ Ingle to Johnson, Sept. 7, 1839, Ltrs. Sent., C & O Co.

³²¹ Johnson to Ingle, Sept. 16, 1839, Ltrs. Recd., C & O Co.

³²² *Ledger Book B*, C & O Co. Also see Voucher No. 4889, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal*

On September 20 Johnson returned the acceptance for \$3,687 to the board, because he could not get the money on it. Since his financial resources were so bad, he felt compelled “to ask the Canal Company to do something” for him “in some shape” so that he could “realize the money.”³²³

The following day Johnson notified the board that he had sent the acceptance “to Baltimore to try to get it discounted.” If he failed in this effort, he hoped that the board would raise “a part of the money if [it was] not convenient for the whole.” In the event that no money could be paid on this acceptance, Johnson requested that the board let him write smaller drafts, including “one of \$1,000, one of \$687 and the remaining two thousand in sums of \$500 each so that I may turn them out to my creditors.” Johnson informed the directors that he had about \$12,000 due him on retained money, from which he wanted \$3,000 in “notes or acceptances at four months” to settle with his creditors. As he was “much harassed and troubled for this amount,” he urged the company to consider his case immediately.³²⁴

Johnson, on September 22, wrote Frisk advising him of his request to the board. If the board asked the Chief Engineer about his financial situation, Fisk should inform them of Johnson’s losses from “the want of cement” and his expenses “in opening quarries and making fixtures” for his numerous masonry works.³²⁵

The board, on September 25, directed Clerk Ingle to accept Johnson’s drafts according to the proposal that he had sent them.³²⁶ On September 30 Ingle notified Johnson that he had been authorized “to accept your drafts at not less than four months after date, for three thousand dollars, in sums not less than five hundred dollars each.” These drafts were to be “chargeable against such of your work as the Board may at time decide.”³²⁷

Following Johnson’s receipt of the acceptances totaling \$3,000, he resumed work on Aqueduct No. 11 with a full force. Based on his estimates of work done during October and November he was paid \$2,304.73 and \$777.93 respectively.³²⁸

The board, on December 7, determined that when a contract for work on the line of the canal expired, the Chief Engineer was to report the fact to them.³²⁹ Accordingly Commissioner Sprigg informed Fisk on the 13th that Johnson’s contract for Aqueduct No. 11 had expired on November 1, 1839.³³⁰ Five days later Assistant Engineer Bryan notified Fisk that his estimate of work done on the Evitts Creek Aqueduct through November 30 totaled \$36,459.50.³³¹

³²³ Johnson to Ingle, Sept. 20, 1839, Ltrs. Recd., C & O Co

³²⁴ Johnson to Board of Directors, Sept. 21, 1839, Ltrs. Recd., C & O Co

³²⁵ Johnson to Fisk, Sept. 22, 1839, Ltrs. Recd., Chief Engineer.

³²⁶ *Proceedings of the President and Board of Directors*, F, p. 109.

³²⁷ Ingle to Johnson, Sept. 30, 1839, Ltrs. Sent., C & O Co

³²⁸ *Ledger Book B*, C & O Co. Also see Voucher No. 5658, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal*.

³²⁹ Ingle to Fisk, Dec. 7, 1839, Ltrs. Recd., Chief Engineer.

³³⁰ Sprigg to Fisk, Dec. 13, 1839, Ltrs. Recd., Chief Engineer

³³¹ Bryan to Fisk, Dec. 18, 1839, Ltrs. Recd., Chief Engineer

On December 28 Chief Engineer Fisk forwarded this information on Aqueduct No. 11 to the board. After considering the progress of the work on the aqueduct, the board declared the contract abandoned, as well as Johnson’s contracts for Section No. 350, Locks Nos. 73–75, and Culverts Nos. 234–241.³³² Although these contracts were declared abandoned, the board directed Fisk to inform Johnson that it was willing to continue the construction of Aqueduct No. 11 and Locks Nos. 73–74 “provided satisfactory arrangements can be made between the contractor and the Company for such continuance.”³³³

On the 30th Clerk Ingle sent further instructions to Fisk regarding these arrangements for the continuance of the works that had been declared abandoned. The board would receive propositions from the contractors “as to the time and manner of making payments to them.” If any of the contractors had claims against the company that had not been liquidated, Fisk was to urge the contractors to send these requests directly to the board.³³⁴

Assistant Engineer Bryan, on January 10, sent a statement of the amount of work done through December 31 on those structures in his division whose contracts had been declared abandoned. His report for Aqueduct No. 11 was as follows:

1.	172 perches of cut masonry at \$21.00	\$3,612.00
2.	2,610 perches of rubble masonry at \$6.50	16,965.00
3.	500 cu. yds., excavation of rock at \$1.25	625.00
4.	4,720 cu. yds., excavation of earth at 35¢	1,652.00
5.	975 cu. yds., filling and puddling at 80¢	780.00
6.	Bailing and coffer dams	950.00
7.	910 sup. ft. of ashlar cut and delivered in part at \$1.00	910.00
8.	2,160 sup. ft. of sheeting at \$1.75	3,780.00
9.	82 ringstones at \$1.75	143.50
10.	4 lineal ft., towpath coping quarried and cut at \$5.00	20.00
11.	80 lineal ft. of water table at 90¢	72.00
12.	Centres in part	1,600.00
13.	1,200 bushels of cement delivered at 25¢	300.00
14.	800 bushels of sand delivered at 5¢	40.00
15.	1,800 perches of rubble stone quarried at \$1.75	3,150.00
16.	1,500 perches of rubble stone dressed at 50¢	750.00
17.	100 perches of rubble stone delivered at 75¢	75.00
18.	Cement House	125.00
19.	Transportation	<u>1,100.00</u>
		\$36,649.50 ³³⁵

Fisk, on January 21, informed the board of the status of work on the abandoned contracts. In December Johnson had done \$190 worth of work, bringing his total amount of work done to \$36,650. Of this sum, \$7,329.90 had been retained by the company. According to

³³² *Proceedings of the President and Board of Directors*, F, pp. 137–38.

³³³ *Ibid.*, p. 138.

³³⁴ Ingle to Fisk, Dec. 30, 1839, Ltrs. Recd., Chief Engineer

³³⁵ Bryan to Fisk, Jan. 10, 1840, Ltrs. Recd., Chief Engineer

the most recent estimates, Fisk predicted that \$21,920 worth of work still needed to be done to complete the structure.³³⁶

Two days later, on the 21st, Johnson sent a letter to the board proposing terms for the continuance of the work on Aqueduct No. 11, Locks Nos. 73–74, and Section No. 350. Upon consideration of his proposal, the board agreed

that the said Johnson may continue the work upon the Locks & Aqueduct, and upon so much of the Section as must be excavated for the more advantageous construction of the Locks, the Company paying three fifths of the amount of the monthly estimates, in the Scrip of the Company, and allowing interest on one-fifth of such amount until paid, reserving the right at any time to stop the whole work after giving thirty days notice of intention to do, and paying for all the work then done. No account to be taken of cement furnished, until the respective works shall be finished.³³⁷

Although work resumed on Aqueduct No. 11 in February, progress was slow. Base on his monthly estimates of work done, Johnson was paid \$152.00 for February, \$323.16 for March, and \$193.02 for April.³³⁸

The board of directors, on June 1, notified the stockholders that on the “50-mile section” the work in progress appeared to be in “charge of energetic and active contractors, and to be pressed with as much vigor as the finances of the Company will allow.”³³⁹

Johnson, on June 3, informed the board that his debts were again forcing him to ask for an advance of money. To enable him to meet some demands by his creditors, he needed “about Four thousand dollars, a part in acceptances at nine months and a part in scrip when issued.” Because his new contract allowed the company to retain 40 percent of his monthly estimates, Johnson felt that he should “be entitled to a little more money than those who have 20 percent.”³⁴⁰

One week later, the board agreed to accept the drafts by Johnson for \$4,000, “payable without interest at nine months.” When the final settlement was made, if it appeared “that according to [the] contract any portion of said acceptance should have borne interest, such interest shall then be paid to him.”³⁴¹

³³⁶ Fisk to Board of Directors, Jan. 21, 1840, Ltrs. Recd., C & O Co.

³³⁷ *Proceedings of the President and Board of Directors*, F, p. 156. On February 27, 1840, Johnson made a final settlement with the company on the contract for Culverts Nos. 234–241, all of which were still unfinished.

³³⁸ *Ledger Book B*, C & O Co. Also see Bryan to Fisk, Apr. 20, 1840, Ltrs. Recd., Chief Engineer; and Voucher No. 6084, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal*.

³³⁹ *Twelfth Annual Report* (1840), C & O Co., pp. 3–5.

³⁴⁰ Johnson to Board of Directors, June 3, 1840, Ltrs. Recd., C & O Co.

³⁴¹ *Proceedings of the President and Board of Directors*, F, pp. 226–27. See also Ingle to Johnson, June 12, 1840, Ltrs. Sent, C & O Co.

Johnson, on June 24, wrote to the board asking that he be given scrip for the \$4,000 instead of the acceptances, because his creditors preferred the scrip.³⁴²

On June 30 Assistant Engineer Bryan reported to Fisk concerning the progress of the work on the “50-mile section” up until June 1. The amount of work that had been done on Aqueduct No. 11 was \$39,777, while the work required to finish the structure was \$18,793.³⁴³

In response to Johnson’s request for canal scrip in lieu of acceptances for \$4,000, the board determined on July 7 to make the payments in scrip, provided that he “agree to be charged with the interest therefrom for nine months.”³⁴⁴

Chief Engineer Fisk, who had just returned from the field, reported on July 17 to Clement Cox, Chairman of the Committee of the Stockholders, that Aqueduct No. 11 was “three-fourths done” and would “easily be finished this season.”

At the moment, the sections on the 10-½ miles from Section No. 347 to No. 367 were nearly three-fourths done. The four locks, one aqueduct, seven culverts, and Dam No. 8 on these sections were estimated to cost \$264,338 when completed. Fisk estimated that 3,000 men “in constant employ” would be needed to complete the canal in 2 years. Currently, there were about one-half that number at work. As for the construction of the masonry works, the stockholders must realize that “there are from four to five months of the year during which the operations” are suspended to a considerable extent.³⁴⁵

On August 7 Assistant Engineer Patterson informed Fisk that Johnson had done \$1,780 worth of work on Aqueduct No. 11 since the May 1 estimate.³⁴⁶

Thereafter, work on the aqueduct proceeded at a steady pace. Based on his estimates of work done, Johnson received \$836 for the month of August, \$708.60 for September, and \$422.40 for October.³⁴⁷

By the end of October, work on Aqueduct No. 11 was nearly finished. According to the estimate of work done, drawn up on November 15, the following work had been accomplished:

1.	524 perches of cut masonry at \$2	\$11,004
2.	4,210 perches of rubble masonry at \$6.50	27,365
3.	500 cu. yds., excavation of rock at \$1.25	625
4.	4,720 cu. yds., of excavation of all other materials at 35¢	1,652

³⁴² Johnson to Board of Directors, June 24, 1840, Ltrs. Recd., C & O Co.

³⁴³ Bryan to Fisk, June 30, 1840, Ltrs. Recd., Chief Engineer.

³⁴⁴ *Proceedings of the President and Board of Directors*, F, p. 243. Also see Ingle to Johnson, July 9, 1840, Ltrs. Sent, C & O Co

³⁴⁵ Fisk to Cox, July 17, 1840, Ltrs. Sent, Chief Engineer.

³⁴⁶ Patterson to Fisk, Aug. 7, 1840, Ltrs. Recd., Chief Engineer.

³⁴⁷ *Ledger Book B*, C & O Co. Also see Vouchers Nos. 6391 and 6475, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal*.

5.	1,500 cu. yds., of excavation of puddling at 80¢	1,200
6.	Bailing and coffer dams	950
7.	Extra work of various kinds	100
8.	157 lineal ft. of towpath coping delivered and scabbled at \$5	785
9.	Cement House	125
10.	170 lineal ft. of wing coping delivered and scabbled at \$3	510
11.	1,200 bushels of cement delivered at 25¢	300
12.	800 bushels of sand delivered at 5¢	40
13.	540 perches of rubble stone quarried at \$1.75	945
14.	100 perches of rubble stone delivered at 75¢	75
15.	Centres	100
16.	160 days work, preparing for puddling etc. at \$1.31¼	<u>210</u>
		\$45,986 ³⁴⁸

At Johnson's request, Patterson reported to Morris on November 29 on the progress of the work on Aqueduct No. 11. With the exception of extra puddling that Morris had ordered to render "the work more water-tight," the structure was nearly completed.

According to Patterson, Johnson was anxious to obtain a further advance of retained money, which at the time amounted to \$11,035, from his contract on Aqueduct No. 11.

Because the last monthly estimate had not included an allowance for his railroad, Johnson wanted Morris to know "that Mr. Fisk in making out a scale of prices for the aqueduct and locks had put down the railroad, from the quarry to Oldtown road, at \$2,000 viz. \$1,400 for the aqueduct and \$200 each for the three locks."³⁴⁹

Finally, on December 3, the board advanced Johnson \$4,000 in scrip that had been issued on October 9. The advance was to be deducted from the retained money on his contracts for Aqueduct No. 11, Locks 73–75, and Section No. 350.³⁵⁰

Engineer Morris, on December 30, reported to the board of directors that "Section 360 at Evitts Creek was left unfinished by Thos. Maccubbin, the contractor, on account of Aqueduct No. 11 not being completed."³⁵¹

Pressured by his mounting obligations, Johnson wrote to the board on March 8, 1841, asking for an advance of \$10,000, enclosing with his request several letters from his creditors. Following a lengthy discussion of the merits of this matter, the board agreed to pay Johnson \$10,000 in scrip that had been issued on February 9.³⁵²

³⁴⁸ Voucher No. 6475, *Vouchers and Receipts for Disbursements by the Commissioner of the Canal*.

³⁴⁹ Patterson to Morris, Nov. 29, 1840, Ltrs. Recd., C & O Co.

³⁵⁰ *Proceedings of the President and Board of Directors*, F, p. 266.

³⁵¹ Morris to Board of Directors, Dec. 30, 1840, Ltrs. Recd., C & O Co.

³⁵² *Proceedings of the President and Board of Directors*, F, pp. 291–92

On March 15 Johnson submitted a claim for extra work on Aqueduct No. 11 to the board. The claim, which was accompanied by supporting affidavits, was referred to Chief Engineer Fisk for his recommendations.³⁵³

On May 8 Patterson reported to the board that only \$405 worth of work had been done on Aqueduct No. 11 since November 1. To complete the structure, work estimated at \$6,254 still needed to be done. The final cost of the aqueduct, according to the most recent estimates, would be \$52,645.³⁵⁴

Patterson, on June 1, filed a separate estimate in the Chief Engineer's office, detailing work done on the Evitts Creek aqueduct by Thomas Maccubbin, the contractor for Section No. 360. This estimate, which amounted to \$37.43-3/4, was charged against the work on Aqueduct No. 11 since Maccubbin had cleared up the spalls around the structure. This work was necessary in the construction of Section No. 360, and, because Johnson had neglected the work, Fisk had ordered Maccubbin to do it.³⁵⁵

As the financial condition of the company worsened in the spring of 1841, work ground to a halt on the "50-mile section." When the company ran out of funds to keep the work going, Johnson returned to his home in Palatine Bridge, New York, to await developments. On June 9 he inquired of Chief Engineer Fisk whether the canal company would soon resume construction operations. If work was to remain suspended, he was anxious to make arrangements for a final settlement. Since he was unable to engage in other work until he had closed his business with the company, he desired that an immediate decision be made upon his projects. Until he heard from Fisk, he would stay with his family in Palatine Bridge, where living expenses were cheaper than in Cumberland.³⁵⁶

On his way to western New York in mid-October, Fisk visited Johnson and informed him that his work would be suspended by the board on November 1. When he heard this news, Johnson wrote to the board notifying them that he wished to finish his works "as soon as the Company should be in funds to enable me to do so."³⁵⁷

³⁵³ *Proceedings of the President and Board of Directors*, F, p. 295. A thorough search of the C & O Canal Co. records failed to turn up this list of extra claims.

³⁵⁴ Patterson to Board of Directors, May 8, 1841, Ltrs. Recd., C & O Co.

³⁵⁵ *Ledger Book B*, C & O Co.

³⁵⁶ Johnson to Fisk, June 9, 1841, Ltrs. Recd., Chief Engineer.

³⁵⁷ Johnson to Board of Directors, Oct. 23, 1841, Ltrs. Recd., C & O Co.

VI. THE COMPLETION OF THE AQUEDUCTS: 1842–1850

After construction halted following the exhaustion of the company's immediate resources, the State of Maryland paused in its promotion of the project to review the condition of the canal. By 1842 the waterway had been completed as far as Dam No. 6, a distance of 135 miles from Georgetown. Work done thus far had been accomplished under the most trying circumstances. A succession of problems had marred the construction, delayed the completion, and increased the cost of the project beyond the original estimates. Over \$10,000,000 had been disbursed for the construction of the canal. In supplying the major share of this sum, the State of Maryland had acquired control of the company's affairs.³⁵⁸

The section of the line from Dam No. 6 to Cumberland, which had not yet been completed, was referred to as "the fifty miles." While this region included some of the most rugged country in the Potomac Valley, it lacked good building stone. Thus, both excavation and masonry work promised to be expensive. Although all but 18 miles of the section had been completed, the unfinished parts were dispersed over the entire 50 miles and included most of the heaviest work—the Paw Paw Tunnel, the Oldtown deep cut, and Aqueducts Nos. 8–11. Chief Engineer Fisk estimated that \$1,545,000 would be required to complete the 18 miles. Great difficulty, however, would be faced in acquiring the funds and recruiting the necessary working force.³⁵⁹

By mid-1842 the financial condition of the company was deplorable. Company officials publicly acknowledged debts of \$1,196,400 above all means. Most of the company's resources were tied up in the few remaining 5 percent bonds it owned.³⁶⁰

The resumption of work on the canal was impossible without additional help, but the straitened financial condition of the State of Maryland, resulting from the nationwide depression of the late 1830s, made it an unlikely source of further aid. Many legislators saw little need to extend the canal, because the Baltimore & Ohio Railroad had recently been completed to Cumberland.³⁶¹ Thus, 3 years were to pass before means were provided to resume work on the waterway. During this period the Baltimore & Ohio Railroad, being in a stronger economic position, was able to continue with the construction of its line toward the Ohio River.

Early in May 1843, the canal company board established guidelines under which a contract for the completion of the waterway could be negotiated.³⁶² The contractor was to re-

³⁵⁸ *Thirteenth Annual Report* (1841), C & O Co., p. 26.

³⁵⁹ Fisk to Board of Directors, Dec. 1, 1842, Ltrs. Recd., C & O Co.

³⁶⁰ Sanderlin, *The Great National Project*, p. 139.

³⁶¹ *Ibid.*, pp. 139–40.

³⁶² *Proceedings of the President and Board of Directors*, G, pp. 38–40.

ceive company bonds maturing in 20 years, bearing 6 percent interest payable semi-annually. Work was to commence in 60 days, and the period allowed for the completion of the canal would be 2 years. The maximum cost at which the contract was negotiated was Chief Engineer Fisk's estimate of \$1,545,000. As security for the repayment of the bonds, the company offered a pledge of all revenues, subject to existing mortgages.³⁶³

When the State of Maryland refused to waive its sizeable prior liens, the board in 1843 and 1844 devoted considerable attention to a campaign designed to secure legislative approval of a waiver by the State. Following the 1844 elections, which saw the victory of many members to the new Assembly who were friendly to the canal, a bill was introduced in the legislature. After a bitter fight in which the canal bill was at first defeated, it was passed by the slim margin of 38 to 37 in the House of Delegates. The bill provided that the canal company could issue \$1,700,000 worth of preferred construction bonds on the mortgage of its revenues when it received guarantees from interested parties for 195,000 tons of trade annually for 5 years.³⁶⁴

The canal company promptly moved to secure the guarantees required and to receive the full benefits of the act. President James M. Coale traveled to Boston and New York to confer with officials of the Cumberland coal companies.³⁶⁵ Friends of the canal were active along the Potomac, holding public meetings in Allegany County to enlist support for the completion of the waterway.³⁶⁶

Twenty-eight instruments, including both personal and corporate ones, were eventually signed and delivered for 225,000 tons of trade. Governor Pratt formally accepted the guarantees and certified approval in August 1845.³⁶⁷

After the guarantees were approved, the board proceeded to the letting of the contract. It rejected the first proposals of prospective contractors in August 1845 and granted a 10-day delay for the submission of new offers.³⁶⁸

On September 23, 1845, the board accepted the bid of Walter Gwynn, William Thompson, James Hunter, and Walter Cunningham. Agents for the State gave their approval, and the contract was drawn up. The additional mortgage to the State of Maryland, required by the legislature, was signed on January 5, 1846.³⁶⁹

By terms of the contract, Messrs. Gwynn & Co. agreed to provide materials of the required quality according to the specifications of Chief Engineer Fisk. Work was to begin within 30 days, and the date of completion was set at November 1, 1847. The contractors promised to raise \$100,000 for the use of the company to pay its contingent expenses,

³⁶³ Sanderlin, *The Great National Project*, p. 148.

³⁶⁴ Mandeville to Price, Oct. 5, 1844, Ltrs. Recd., C & O Co. Also see Sanderlin, *The Great National Project*, p. 152.

³⁶⁵ *Proceedings of the President and Board of Directors*, G, p. 228.

³⁶⁶ Coale to Allen, May 8, 1845, and May 13, 1845, Ltrs. Sent, C & O Co.

³⁶⁷ Sanderlin, *The Great National Project*, p. 154.

³⁶⁸ *Eighteenth Annual Report* (1846), C & O Co., pp. 8–9.

³⁶⁹ *Proceedings of the President and Board of Directors*, G, pp. 317–18, 320–23, 353–54.

and to cash the bonds of the canal company at par, paying the interest on them until January 1, 1848. The price to be paid Messrs. Gwynn & Co. for the work was fixed at \$1,625,000 in canal bonds.³⁷⁰

With the contract about to be signed with Gwynn & Co., Fisk began to beef up his engineer corps. A number of former employees, who had been laid off and were interested in returning to work, were recalled.³⁷¹

On October 12, H> M> Dungan, who had succeeded Ellwood Morris as assistant engineer in charge of the Tunnel Division, wrote Fisk that he had encountered little difficulty in recruiting hands for his engineering force at 75¢ a day. By the following spring, however, he doubted whether he could acquire an adequate number of laborers “for less the \$1 per working day.”³⁷²

Meanwhile, Superintendent of Masonry MacFarland had visited the quarries in the area to measure the stone that had been cut and was on hand for use on the “works of art.” On the 4th he reported that the “prevailing Epidemic has proved most disastrous in the measurement of the stones.” At the moment, he was recovering from a “virulent attack of sickness.”³⁷³

Although Gwynn & Co. had subcontracted a number of projects along the “50-mile section,” many of the subcontractors were slow to get their forces organized. Gwynn & Co. had signed a contract with Gonder, Brayton & Co. for the completion of Aqueducts Nos. 8, 9, and 10, Sections Nos. 323, 330, 331 and 332, and Locks Nos. 68–71. But by December 1845 only a small force of 12 laborers was working on these projects.³⁷⁴

President Coale, on March 25, 1846, notified Fisk that at the next annual meeting of the stockholders he would expect a report on the condition of the waterway then in operation as well as on “the progress made toward the completion under contract.”³⁷⁵

Three weeks later MacFarland complained to Fisk that “progress is miserably slow” as to scarcely deserve notice. The people from Gonder, Brayton & Co. had been unable to make any “new discoveries in the way of good quarries.”³⁷⁶

The stockholders learned in June that work on the “fifty-mile section” had been resumed in November. Although the initial spirit of the subcontractors had engendered strong hopes that the work would be prosecuted with vigor, the expectations of the board had been shattered. While there was no way of “ascertaining the actual expenditure,” only

³⁷⁰ *Eighteenth Annual Report* (1846), C & O Co., pp. 8–9

³⁷¹ Fisk to Patterson, Sept. 29, 1845, Ltrs. Sent, Chief Engineer.

³⁷² Dungan to Fisk, Oct. 12, 1845, Ltrs. Recd., Chief Engineer.

³⁷³ MacFarland to Fisk, Oct. 4, 1845, Ltrs. Recd., Chief Engineer.

³⁷⁴ Dungan to Fisk, Dec. 8, 1845 Ltrs. Recd., Chief Engineer. Also see *Proceedings of the President and Board of Directors*, G, pp. 285–86.

³⁷⁵ Coale to Fisk, Mar. 25, 1846, Ltrs. Recd., Chief Engineer.

³⁷⁶ MacFarland to Fisk, Apr. 13, 1846, Ltrs. Recd., Chief Engineer.

\$55,384 had been paid out on estimates filed by Fisk up to May 1. Of this sum, less than \$4,000 had been disbursed for work on the Paw Paw Tunnel and masonry structures.

Along the “50-mile section,” the number of employees from November until April had not exceeded 300 mechanics and laborers and 100 carts. Since May 1, this force had been “gradually lessening,” and when Fisk had left the canal several days before, there were only 40 men at work.

On May 19 Fisk had notified Gwynn & Co. that they were to have at work by the end of the month at least 500 laborers and mechanics, by the end of June 1,000, by the end of July 1,500, and by the last day of August 2,000 workers. At the same time, they were to have as many carts and teams as necessary to keep the mechanics and laborers fully employed.³⁷⁷ Despite this order, Gwynn & Co. suspended all operations about June 1, 1846.

Heavy rains in the upper Potomac Valley in late June caused the river to surge upward. It crested at a point 1 foot below the flood line of April 1843. None of the aqueducts was seriously damaged, although water, which backed up from the river at Evitts Creek, “was up to the keystone of the arch of the aqueduct, at the last perches two feet lower.”³⁷⁸

Negotiations for the sale of the bonds had been underway since before the formal signing of the contract with Gwynn & Co. Efforts of Senator Daniel Webster and of the company itself to effect a loan in Great Britain failed when the House of Baring declined to have any part of it.³⁷⁹

After plans to interest London merchants and local capitalists also failed, a year passed before negotiations again reached a stage that gave some promise of success.³⁸⁰ By this time, several events had improved the prospects affecting the sale of the bonds. The State of Maryland had finally provided for payment of the arrears on its debt and for the prompt payment of the semi-annual interest in the future. This measure helped the credit of both the State and the canal company. The Virginia Assembly now authorized the state treasurer to guarantee \$300,000 worth of canal bonds. In April the corporations of Washington and Georgetown had authorized loans of \$50,000 and \$25,000 respectively to the contractors in exchange for canal bonds, while the citizens of Alexandria took up a private subscription for \$25,000.

Thus, when another attempt was made to negotiate the sale of the preferred construction bonds, some of the quotas had been guaranteed. Tentative arrangements provided for the distribution of the entire sum of \$1,100,000 in cash needed to finish the waterway among Virginia (\$300,000), the District cities (\$100,000), Boston interests (\$200,000), the Barings (\$300,000), and the contractors.³⁸¹

³⁷⁷ *Eighteenth Annual Report* (1846), C & O Co., pp. 25–27.

³⁷⁸ Patterson to Fisk, July 13, 1846, Ltrs. Recd., Chief Engineer.

³⁷⁹ *Proceedings of the President and Board of Directors*, G, p. 311.

³⁸⁰ *Eighteenth Annual Report* (1846), C & O Co., p. 11.

³⁸¹ *Nineteenth Annual Report* (1847), C & O Co., pp. 4–5.

These arrangements were temporarily threatened by the withdrawal of the Barings because of the tightness of the international money market, but it was anticipated that by this time local capitalists could be persuaded to step into the breach. Agents for the contractors were finally able to carry the negotiations to a successful conclusion in early July.³⁸²

The board, on September 29, drew up and executed the mortgage of the company's revenue. Phineas Janney of Alexandria, W.W. Corcoran of Washington, David Henshaw and George Morey of Boston, and Horatio Allen of New York were named by the board as representatives of the 29 New York, Boston, and Washington capitalists who had undertaken the sale of the bonds. According to the final agreement, the financiers agreed to take \$500,000 of the bonds and the subcontractors \$200,000, in addition to the \$400,000 already pledged by the State of Virginia and the District Cities.³⁸³

Work on the canal resumed on November 18, 1847, under a modified contract. The old company was reorganized, and a new one succeeded to its contract with the canal company. Gwynn and Cunningham retired, but the remaining partners, Hunter and Thompson, continued, with the addition of a third partner, Thomas Harris.³⁸⁴

Cement for masonry along the "50-mile section" would be supplied by Hunter, Harris & Co. A contract was signed by the company with George Shafer, who ran the mill at Roundtop Hill below Dam No. 6, "to burn, grind, and deliver at the mill 120,000 bushels [of cement] at the rate of 12,000 bushels per month, if required." A second contract was negotiated with Franklin Reynolds of Cumberland for 60,000 bushels at the rate of 6,000 bushels per month.³⁸⁵

Upon the resumption of operations in November, Gonder, Brayton & Co. were committed elsewhere, so the firm determined to sublet its work on the canal. The board raised no objection to this action, provided that the "security for the completion of the work was undiminished" and that the payments in the form of estimates while the work was in progress, were to be made to the parties undertaking its execution. Accordingly, Gonder, Brayton & Co. sublet their canal projects to Fraser & Co.³⁸⁶

By the end of the first week of 1848, many of the sub contractors had started work. However, Fraser & Co., to whom Gonder, Brayton & Co. had sublet their contracts for Aqueducts Nos. 8 and 10, Sections Nos. 323,330, 331, and 332, and Locks Nos. 68–71, did not get started as promptly as some of the other contractors. Thomas Bell, who had received the subcontract for Aqueduct No. 9, was also delayed in beginning his work.³⁸⁷

³⁸² *Proceedings of the President and Board of Directors*, H, pp. 92 & 95.

³⁸³ *Twentieth Annual Report* (1848), C & O Co., pp. 5–6.

³⁸⁴ *Ibid.*, pp. 7–8.

³⁸⁵ *Ibid.*, p. 20.

³⁸⁶ *Proceedings of the President and Board of Directors*, G, pp. 285–86. Because of the great amount of work that still needed to be done on Aqueduct No. 9, a separate contract for its completion was sublet to Thomas Bell.

³⁸⁷ Harris to Fisk, Jan. 1, 1848, Ltrs. Recd., Chief Engineer.

When he inspected the “50-mile section” at the end of March, Fisk was disappointed by the “smallness” of the force at work. Writing to the trustees on the 27th, he reported:

the masonry particularly, and more especially that of the Oldtown Locks and Town Creek Aqueduct has been, and is now, going on at a rate that will render it impossible to complete the Canal by the time required in the Contract, unless very energetic and efficient steps are at once taken to increase largely the number of mechanics and laborers employed.

The Chief Engineer trusted that this warning would “relieve me from the necessity of naming a force that must be kept at work at different points along the line by a designated day.”³⁸⁸

On April 11 the trustees reported to the canal company board on the condition of the three unfinished aqueducts. The Sideling Hill Creek Aqueduct was “so nearly finished as only to require less than 300 perches of rubble masonry.” The abutment of Aqueduct No. 9 was {“laid ready to the arch.” Nearly “all the cut stone & a part of the backing” were prepared and delivered to the site of the aqueduct at Fifteen Mile Creek. Thomas Bell, who had been busily engaged in preparing for the construction, would “commence laying the arch in three weeks.” As to Aqueduct No. 10, which required more attention than the other works on the “50-mile section,” one of the abutments had been laid and the foundations of the other abutment could be obtained at very small cost.³⁸⁹

Because the board had decided to use the same type of railings on the aqueducts on the “50-mile section” as those on Aqueduct No. 7, Chief Engineer Fisk asked Superintendent Stone for a description. Stone replied on December 19, 1848, that the number of rails between each post on Aqueduct No. 7 was 13.³⁹⁰

On May 7, 1849, Fisk asked Assistant Engineer Byers to send him “the distances by measurement from angular point to angular point” for the railings to be placed on Aqueduct Nos. 8 and 9. This was necessary so that the exact number of posts and their proper spacing could be determined for these structures.³⁹¹

Byers, on May 16, forwarded to Chief Engineer Fisk a sketch of the railings on Aqueduct No. 7. On studying these railings Fisk found there was considerable variation in the scrolls and the length of the rods along the rail. The round rods were 8 inches from center to center, with some variation, while the scrolls were “quite irregular.”³⁹²

³⁸⁸ Fisk to Trustees, Mar. 27, 1848, Ltrs. Sent, Chief Engineer.

³⁸⁹ *Twentieth Annual Report* (1848), C & O Co., p. 19. Although Aqueduct No. 11 was also unfinished, the trustees, for some unexplained reason, overlooked this structure in their report.

³⁹⁰ Stone to Fisk, Dec. 19, 1848, Ltrs. Recd., Chief Engineer.

³⁹¹ Fisk to Byres, May 7, 1849, Ltrs. Sent, Chief Engineer.

³⁹² Byers to Fisk, May 16, 1849, Ltrs. Recd., Chief Engineer.

In the same letter, Byers complained about the poor quality of the cement coming from Shafer's mill. He had found it to be "nearly $\frac{1}{4}$ sand and not sufficiently burned." Since the mortar would not set as it should, he had found it necessary to use a ratio of "1 $\frac{1}{2}$ cement to 1 of sand." Upon being notified of the problem, Shafer had promised to correct the situation immediately.³⁹³

After reading Fisk's letter of May 7 more closely, Byers concluded that Fisk had asked for drawings of Aqueducts Nos. 8 and 9 instead of for the sketch of Aqueduct No. 7. Accordingly, on May 17 and 20 he sent drawings of these two aqueducts to Fisk.³⁹⁴

Based on these drawings, Fisk drew up an estimate of iron for the railings of Aqueducts Nos. 8–11, which he sent to Messrs. Hunter, Harris & Co. on May 21. The estimate for Aqueduct No. 8 was as follows:

- 244 small posts, 1 inch round iron, 4 $\frac{1}{2}$ ft. long
- 21 large posts, 1 $\frac{1}{4}$ inch square iron, 4 $\frac{1}{4}$ ft. long
- 19 supports or brass for posts, 1 in. square iron, 7 feet long
- 21 cast cups, for large posts
- 181 lineal ft. of flat iron bar, 3 in. x $\frac{5}{8}$ in.
- 21 pieces, 5 in. x 3 in. x $\frac{1}{4}$ in.

Although the number of posts in Aqueduct Nos. 9 and 10 could not be given precisely, Fisk informed Messrs. Hunter, Harris & Co. that they would not vary much from the following:

- 491 small posts, 1 inch round iron, 4 $\frac{1}{2}$ ft. long
- 43 large posts, 1 $\frac{1}{4}$ inch square iron, 4 $\frac{1}{2}$ ft. long
- 39 supports or brass for posts, 1 in. square iron, 7 feet long
- 43 cast cups, for large posts
- 358 lineal ft. of flat iron bar, 3 in. x $\frac{5}{8}$ in.
- 43 pieces, 5 in. x 3 in. x $\frac{1}{4}$ in.

The estimate for Aqueduct No. 11 was as follows:

- 268 small posts, 1 inch round iron, 4 $\frac{1}{2}$ ft. long
- 23 large posts, 1 $\frac{1}{4}$ inch square iron, 4 $\frac{1}{4}$ ft. long
- 21 supports or brass for posts, 1 in. square iron, 7 feet long
- 23 cast cups, for large posts
- 194 lineal ft. of flat iron bar, 3 in. x $\frac{5}{8}$ in.
- 23 pieces, 5 in. x 3 in. x $\frac{1}{4}$ in.³⁹⁵

³⁹³ *Ibid.*

³⁹⁴ Byers to Fisk, May 17 and 20, 1849, Ltrs. Recd., Chief Engineer. Copies of these drawings can be found as Appendices G and H.

³⁹⁵ Fisk to Hunter, Harris & Co., May 21, 1849, Ltrs. Sent, Chief Engineer. A thorough search of the C & O Canal Co. records did not turn up the exact date or terms of the contract for the railings of Aqueduct Nos. 8–11. According to Bearss's historic structure report on the Town Creek Aqueduct, the contract was signed before June 1.

At the 21st annual meeting of the stockholders on June 4, Fisk reported that there were employed on the unfinished sections of the canal:

77 bosses, 39 blacksmiths; 51 carpenters; 75 drillers and blasters; 107 quarry-men; 59 stonecutters; 73 masons; 112 mason's tenders; 6 brick-moulders; 50 others engaged in making bricks; 16 brick-layers; 19 brick-layer's tenders; and 760 laborers. Total number of all classes of laborers and workmen, 1,447—Also, 233 driver; 562 horses; 26 mules and 6 oxen, employed in driving and working—285 carts, 20 scoops, 13 ploughs, 11 two-horse wagons, 3 three-horse wagons, 28 four-horse wagons, 1 six-horse wagon, 5 one-horse railroad cars, 14 two-horse railroad cars, 10 three-horse railroad cars, 14 drags, 4 brick-moulding machines and sundry cranes.

Concerning the use of railroad cars, Fisk informed the stockholders that:

The Railroad cars are used upon temporary railroads in removing rock and transporting bricks and other materials at the Tunnel and in the transportation of stone from various quarries, to Lock No. 58, the four Locks near the Tunnel, the four Locks at and near Oldtown, the Town Creek aqueduct and several other structures of masonry. The total length of these temporary railways is nearly nine miles. They greatly aid in the prosecution of the work by materially lessening the number of horses, of which there has been a scarcity, needed for the transportation of materials, and enabling the contractors to carry on their work much more economically than if the usual mode of transportation over the common roads of the country were solely relied upon.

During the past year \$30,337 worth of work had been done on Aqueducts Nos. 8, 9 and 10, while an estimated \$41,370 had yet to be done on these “works of art.”³⁹⁶

As had happened so often, expectations that the “50-mile section” would be opened for navigation by October 1, 1849, were dashed. Supporters of the canal now hoped that the contractors would be finished by Christmas. On October 8 Chief Engineer Fisk notified Hunter, Harris & Co. that if water were to be admitted to the “50-mile section” by December 25, they would have to increase their force to 9 masons on Lock No. 58 and Aqueduct No. 9, 17 masons on Aqueduct No. 10, and 5 masons on Aqueduct No. 11 and Locks Nos. 72–75.

Because the number of masons at work on September 25 had to be more than doubled, so did the number of tenders, quarrymen, laborers, and teams engaged in furnishing stone and materials for the masonry. This was especially true in regard to quarrymen, because for some time there had not been enough to keep the masons supplied with stone.³⁹⁷

Despite delays in recruiting workers, Hunter, Harris & Co. had a large number of hands at work by February 1850 in an effort to make up for lost time. The winter of 1849–50, however, was very severe in the mountains of western Maryland, and valuable time was

³⁹⁶ *Twenty-First Annual Report* (1849), C & O Co., pp. 24–25.

³⁹⁷ Fisk to Hunter, Harris & Co., Oct. 8, 1849, Ltrs. Sent, Chief Engineer.

lost in construction. Thus, the board agreed to extend the deadline for finishing the canal from December 25 to April 1.³⁹⁸

On April 1, Hunter, Harris & Co. reported to Chief Engineer Fisk on the progress of the work on Aqueducts Nos. 8, 9, and 11. As of that date, the following amounts of work still needed to be done:

Aqueduct No. 8	\$192
Aqueduct No. 9	\$1,176
Aqueduct No. 11	\$1,404 ³⁹⁹

Compounding the difficulties, Hunter, Harris & Co. ran out of money in early April. Many of the artisans and laborers had not received their full pay since January 1, and, when there was no money to pay them in April, they began a general strike. Assistant Engineer Dungan, on April 9, was notified that all hands from Cumberland to Town Creek had ceased work and were determined to “prevent the completion of the canal till” they had received their back pay. The strike soon spread as workers at Paw Paw Tunnel and Lock No. 61 joined in the work shutdown. By April 22 Dungan warned Fisk that if the men were not paid by the end of the month there would be a strike that would put a stop to all work along his division.⁴⁰⁰

To get the strikers back to work, the trustees took over the contract on assignment from Hunter, Harris & Co. and resumed operations. Fisk, who had earlier complained to the trustees about the failure of Hunter, Harris & Co. to carry the work through to completion according to the contract, now estimated that water could be let into the upper 10 miles of the canal by May 15. An additional 18 miles could be watered by June 1, and the entire “50-mile section” could be in use by June 15.⁴⁰¹

A succession of snow, sleet, and rainstorms prevented the fulfillment of these predictions. On June 3 the stockholders were informed that:

There were upon the work, at the date of the last semi-monthly return of force, the 25th of last month,—37 bosses, 7 blacksmiths, 70 carpenters, 22 quarrymen, 10 stonecutters, 20 masons, 33 masons’ tenders and 413 laborers. Total of all classes, 613.—Also, 104 drivers and 215 horses,—with 147 carts, 14 two-horse railroad cars, 4 three-horse railroad cars and sundry wagons, ploughs, &c.

In one week from this time, at the present rate of working, the water may be admitted into the upper ten miles of the Canal. In three to four weeks, it ought to be admitted for an additional distance of twenty miles; and by increasing the present force fifty percent, all the work necessary for the admission of water into the entire line of the unfinished Canal, may be done by the first of next month,—but without an increase in force, it cannot be accomplished earlier than the middle of that month.⁴⁰²

³⁹⁸ Sanderlin, *The Great National Project*, p. 161.

³⁹⁹ Hunter & Co. to Fisk, Apr. 1, 1850, Ltrs. Recd., Chief Engineer.

⁴⁰⁰ Dungan to Fisk, Apr. 10, 13, and 22, 1850, Ltrs. Recd., Chief Engineer.

⁴⁰¹ Fisk to Trustees, Apr. 15, 1850, *Proceedings of the President and Board of Directors*.

⁴⁰² *Twenty-Second Annual Report* (1850), C & O Co., p. 15.

Assistant Engineer Byers, on June 22, reported to Fisk that several carpenters were working on the waste gates at Aqueducts Nos. 8 and 9. These structures, in his opinion, would be finished within 10 days except for the painting of the railing.⁴⁰³

Fisk, about this time, notified President Coale that the following work still needed to be done on Aqueduct Nos. 8, 9, and 11 before water could be admitted:

Aqueduct No. 8:

Painting the iron railing

Aqueduct No. 9:

1 ½ perches of cut coping
300 lineal ft. of timber in entrance walls
30 lineal ft. of timber in wing walls
5 days labor finishing adjoining waste weir
Painting the iron railing

Aqueduct No. 11:

100 Barrels [of cement] to secure the coping
Coping on the entrance walls to be rounded
Painting the iron railing
4 Lineal ft. of entrance wall coping⁴⁰⁴

Meanwhile, the time limit for the completion of the canal had been extended to July 1 and then to August 1. In July, however, the trustees' resources had been exhausted and work again halted. The board promptly declared the contract abandoned and negotiated a new one with Michael Byrne of Frederick County providing for the completion of the canal for \$3,000 cash and \$21,000 in bonds.⁴⁰⁵

By August 31, water was admitted into the sections of the Tunnel Division.⁴⁰⁶ At this time the only "works of art" not completed on the "50-mile section" were those in Seven-mile Bottom: Locks Nos. 58–60 and the waste weirs on Sections Nos. 282 and 288.⁴⁰⁷ On September 26 Dungan notified Fisk that the Seven-mile Bottom section of the canal was ready for water, but it was October 8 before this line of the canal was watered.⁴⁰⁸

⁴⁰³ Byers to Fisk, June 22, 1850, Ltrs. Recd., Chief Engineer.

⁴⁰⁴ Fisk to Coale, undated, Ltrs. Sent, Chief Engineer.

⁴⁰⁵ *Report to the Stockholders on the Completion of the Chesapeake & Ohio Canal to Cumberland, with a sketch of the Potomac Company, and a General Outline of the History of the Chesapeake & Ohio Canal Co., from its origin to February 1851* (Frederick, 1851), pp. 3–4.

⁴⁰⁶ Dungan to Fisk, Sept. 1, 1850, Ltrs. Recd., Chief Engineer.

⁴⁰⁷ Bender to Fisk, Sept. 10, 1850, Ltrs. Recd., Chief Engineer.

⁴⁰⁸ Dungan to Fisk, Sept. 26, 1850, and Bender to Fisk, Oct. 8, 1850, Ltrs. Recd., Chief Engineer.

The eastern portion of the Chesapeake and Ohio Canal, the only part to be completed, was formally opened to trade at Cumberland on October 10, 1850. On that day gala ceremonies were held to celebrate the beginning of operations on the entire length of the canal, which now stretched 185 miles above Georgetown.⁴⁰⁹

⁴⁰⁹ *Report to the Stockholders on the Completion of the Canal*, pp. 3–4.

VII. THE AQUEDUCTS IN OPERATION: 1850–1950

All the aqueducts were giving good service on June 1, 1853, when T. L. Patterson, Engineer and General Superintendent, informed the stockholders that the “aqueducts are in good condition, and require no repairs.”⁴¹⁰

Lloyd Lowe, who was engineer in charge of the Cumberland Division, notified General Superintendent A. K. Stake on May 12, 1856, that “we will commence on Monday (the 12th) to put the railing at the Aqueducts.”⁴¹¹

Stake, on June 15, reported that the “railing has been put on the Town Creek Aqueduct, this week that at Evitts Creek will be put on and the necessary timber will soon be ready for Licking Creek and Fifteen Mile Aqueducts.”⁴¹²

On June 25 Superintendent Stake wrote to the board that during the past summer orders had been given “to have railings, of a cheap character, placed upon the inner edge of the coping of the different Aqueducts on the line.” This order had been carried out upon most of the aqueducts of the division, and arrangements had been made to have it carried out upon them all. The new railings, in the opinion of Stake, were “a decided improvement” and contributed “both to the appearance of the work and to the security of passing teams.”⁴¹³

Unlike several of the company’s “works of art,” Aqueducts Nos. 6, 8, 9, and 11 suffered no damage during the Civil War. According to the board of directors in June 1866, the masonry of the aqueducts, culverts, and locks was “both substantial and in good repair.” The only exception was Aqueduct No. 5 spanning the Conococheague River, which had been wantonly and most seriously injured” by the Confederates.⁴¹⁴

Three years later, the canal stockholders were advised:

During the past ten years little or nothing had been done towards repairing and improving lock-houses, bridges, culverts, aqueducts, locks, lock-gates, and waste weirs of the Company; many of them had become entirely unfit for use and were becoming worthless, rendering it absolutely essential to the requirements of the Company to have them repaired. This the Board have done, and, although at heavy cost, they now present a comfortable and substantial condition, and the fact may now be confidentially stated that the condition of the canal in all its departments is such as to justify a

⁴¹⁰ *Twenty-Fifth Annual Report* (1853), C & O Co., p. 9.

⁴¹¹ Lowe to Stake, May 12, 1856, Ltrs Recd., C & O Co.

⁴¹² Stake to Ringgold, June 15, 1856, Ltrs. Recd., C & O Co.

⁴¹³ Stake to Board of Directors, June 25, 1856, Ltrs. Recd., C & O Co.

⁴¹⁴ *Thirty-Eighth Annual Report* (1866), C & O Co., pp. 7–8.

largely decreased expenditure during the current year, unless overtaken by unforeseen and unexpected disaster.⁴¹⁵

In November 1869 the board of directors inspected the entire line of the canal from Georgetown to Cumberland, and the following June they reported to the stockholders:

the masonry, we regret to say was mostly in very bad condition, caused principally by keeping water in the canal, late in the season, after the freezing weather had commenced. The ice thus forming in the cracks of the works, expands and breaks the bonds of the cement, leaving the structure more like a pile of loose stone than a duct for conveying water; besides, when the ice is permitted to form on the surface of the water in aqueducts, the expansion pushes out the wall on the berm side, which is only five feet in thickness, and therefore more liable to yield than the towing path side, which is from seven to eight feet thick.⁴¹⁶

Chief Engineer William R. Hutton, in May 1870, undertook an extensive survey of the condition of the waterway. In his report that was submitted to the stockholders in June, he observed that Aqueduct No. 6 was “tolerably good.” The structure had “several leaks, and a large crack appears in the arch which calls for the introduction of iron clamps or ties.”

Aqueduct No. 8 was “in good condition, excepting some leakage.”

Although Aqueduct No. 9 was “tolerably good,” its “leakage is considerable and some repair is needed to the coping of the berm parapet.”

Except for leaks, Aqueduct No. 11 was “also in good condition.”⁴¹⁷

In 1873 Engineer T. L. Patterson, after making a survey of the canal, found that “most of the aqueducts have been leaking more or less for years past; the consequences of which, owing to the freezing of water in the interior of the walls, has been a greater or less injury to their berm parapets and spandrills.”⁴¹⁸

Engineer Lewis G. Stanhope, on September 13, 1874, informed President A. P. Gorman that “the Licking Creek Aqueduct is leaking very badly.”⁴¹⁹

Because it had been determined to replace the berm parapet on Aqueduct No. 6 with a wooden trunk, Stanhope, as the engineer in charge, laid plans for this work after the canal was drained for the winter. On January 29 he notified Gorman that bad weather had prevented the completion of this task. At the same time, he was “not yet half done,” and he

⁴¹⁵ *Forty-First Annual Report* (1869), C & O Co., pp. 4–5.

⁴¹⁶ *Forty-Second Annual Report* (1870), C & O Co., pp. 3–4.

⁴¹⁷ *Ibid.*, pp. 34–35.

⁴¹⁸ *Forty-Fifth Annual Report* (1873), C & O Co., p. 28.

⁴¹⁹ Stanhope to Gorman, Sept. 13, 1874, Ltrs. Recd., C & O Co.

was “fearful if the weather continues much longer as it has I shall not be able to do anything to the Licking Creek Aqueduct.”⁴²⁰

Eleven years later, on January 1, 1886, Superintendent E. S. Mulvany reported to the board that on the 2nd Division “the masonry work at many places is in need of repair.” Most of the aqueducts were badly cracked, “with mortar worked out of the joints,” and there was “considerable leakage which will have to be attended to during the suspension of navigation.”

On March 28, 1885, the wooden trunk at Sideling Hill Aqueduct had given “way in the berm side.” However, it “was at once rebuilt at a cost of almost \$300.”⁴²¹

Mulvany, on December 24, 1887, again complained that all the aqueducts on his division leaked considerable, while some of the walls were very “much bulged and cracked.” In fact, the berm masonry parapet walls on Aqueduct Nos. 7 and 8 had collapsed several years before and had been replaced by wooden trunks, which had “answered a good purpose so far.” These wooden trunks, however, would have to be “overhauled and repaired in the near future.”⁴²²

After the flood of 1924 provided the Baltimore and Ohio Railroad with an opportunity to relieve itself of the expense of operating the canal, the waterway fell into disrepair. When a study of the canal was made for the 81st Congress to determine the feasibility of constructing a parkway along the canal, the investigators reported the following on Aqueducts Nos. 6, 8, 9, and 11:

Licking Creek aqueduct.—this is a single-span arch structure. The upstream spandrel has fallen out. The arch barrel and the downstream spandrel appear to be in good condition and require only nominal repair. New stone will be required for the upstream spandrel.

Sideling Creek aqueduct.—This is another single-span arch. Most of the upstream spandrel has collapsed. The downstream, however, is in good condition. The arch barrel appears sound except for a longitudinal crack under the downstream spandrel. The upstream spandrel will require complete reconstruction and reinforced concrete cross ties should be installed to connect the two spandrels.

Fifteen Mile Creek aqueduct at Little Orleans.—This is also a single-span arch. The upstream spandrel bows out and should be rebuilt. The downstream spandrel and arch barrel are in good condition and require only repointing.

Evitts Creek aqueduct.—This is likewise a single-span arch. The stone in the structure appears sound, but many of the spandrel stones have become dislodged and

⁴²⁰ Stanhope to Gorman, Jan. 29, 1875, Ltrs. Recd., C & O Co. Although no records could be found to document the completion of this work, it is logical to assume that it was finished by the time water was let into the canal in spring.

⁴²¹ *Forty-Eighth Annual Report* (1886), C & O Co., pp. 25–26. No other records could be found detailing the construction of the wooden trunk in Aqueduct No. 8. However, it can be surmised that it was done during the winter of 1873–74, when a wooden trunk was put in on Aqueduct No. 7, or in the winter of 1874–75, when one was put in on Aqueduct No. 6. See Edwin Bearss, *HSR, Tonoloway Aqueduct*, pp. 48–50.

⁴²² *Sixtieth Annual Report* (1888), C & O Co., p. 30.

the spandrel stones should be relaid. The arch barrel is in generally good condition except for longitudinal cracks. Reinforced concrete cross ties should be installed to connect the new spandrels.⁴²³

⁴²³ U.S. Congress, House, *Chesapeake and Ohio Canal Report*, H. Doc. 687, 81st Cong., 2nd sess. (Washington, 1950), pp71–72.

APPENDIXES

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APPENDIX A

1837

SPECIFICATION FOR AQUEDUCTS OF ONE ARCH.-SEGMENT OF A CIRCLE, *On the Chesapeake and Ohio Canal.*

The center of the waterway of the aqueduct will be $4\frac{1}{2}$ feet on the towpath side of the center of the canal, of 30 feet bottom and 54 feet water surface.

The foundation of the abutments and of all masonry to the very end of the wings, will be rock, taken down by blasting to a level one foot lower than the adjoining firm rock. The foundation, if not an entire level, shall be in level offsets, such as the Engineer shall approve of.

The dimensions of the abutments measured on a level with the spring of the arch will be in length $33\frac{1}{4}$ feet, with the addition of one inch batter to the foot at each end of the abutments, for the height of water line of the canal above the spring of the arch, and the thickness of the abutments on the same level will be twelve feet.

The front of the abutments will be plumb—the ends will batter one inch to the foot; and the back of the abutments will batter six inches to the foot. In addition to the above dimensions, there will be an offset around the front and ends of the abutments of one foot at the level of low water of the river.

From a point twelve feet back of the front line of the abutments at the level of the canal water line, shall commence the splay of the wings. The splay shall be two feet at right angles, to one foot in the direction of the canal. This splay on the berm side of the canal shall continue out (on the same level—of canal water line,) to a point $38\frac{1}{2}$ feet from the center of the abutment, and on the towpath side $41\frac{1}{2}$ feet out; at these two points, viz: $38\frac{1}{2}$ feet and $41\frac{1}{2}$ feet from the center of the abutments, the direction of the wings shall change into lines parallel to the direction of the canal—the top outer edges of these parallel wings at the level of the canal water line being eighty feet apart.

The termination of the wings, on the same level as above spoken of (viz: the water line of canal) will generally be 45 feet from the front line of the abutments.

The angles formed by the wings and the ends of the abutments at the point where the splay of the wings commences, shall be filled in with masonry battering one inch to the

foot, so as at the level of canal water line to be embraced within two straight lines, each four feet in length, and at right angles to each other, one being at right angles and the other, of course, parallel to the aqueduct.

The width of the wings at the level of canal water line shall be five feet; they shall have a batter of two inches to the foot on the inside and at their ends, and on the outside they shall have a batter of one inch to the foot:—corresponding to the one foot projection of the front and ends of the abutments, the same projection of one foot shall be carried around the angles of masonry at the commencement of the splay of the wings, and along the splay of the wings, and still further along to the termination of the wings.

ARCH

The arch for a span of *seventy feet, and for a rise of fourteen feet*, will be three feet at the spring and two feet eight inches at the crown; and for other spans will be proportional.

The top of the arch at the intrados shall be five feet below the bottom of the canal.

The arch from out to out at the intrados of the top of the arch shall be, exclusive of the rustication, thirty-four feet ten inches.

The ends of the arch shall have a batter of one inch to the foot.

The arch will be formed of stone perfectly cut throughout; the beds of the sheeting must be true and as accurately cut back to the line of the extrados as in any other part; the joints shall be full and even, and shall fill the square back to the extrados; the extrados of the arch shall be hammered to a true surface. It will be understood, therefore, that the intrados, the end joints, and the bed of all the sheeting will, in every point, fill the space necessary to make the whole arch as compact and solid as though it were of one stone. The skewbacks, also, shall be as well cut as the sheeting, and will be of the size deemed necessary by the Engineer. The ring-stones shall be alternately long and short. The length of the short one shall not be less than two feet, and of the long one not less than four feet. The sheeting shall not be less than three feet, with no break less than eighteen inches. The sheeting shall all be numbered, so that the place of each stone may be known immediately upon its being cut.

The inner arris and the outer arris of the sheeting will have a half inch taken off and carried through the arch.

The patterns for the ring-stones shall be made subject to the approval of the Engineer, at the cost of the Contractor.

The ring-stones shall have a rustication of one and a half inch; which rustication shall project outside the spandrel walls.

The sheeting for an arch of *seventy feet span* may be in courses between two feet and fourteen and a half inches in thickness, (and in proportion for other spans,) so arranged as the Engineer shall approve of after the opening of the quarry.

No checking of the sheeting is allowed.

SPANDREL WALLS.

The towpath and berm spandrel walls, at bottom of the canal, shall each be seven and a half feet wide. They will have on the outside a batter of one inch to the foot—conforming to the end batter of the arch and abutments. They shall each batter on the inside three inches to the foot down to the solid filling in, or backing in over the arch; which backing in of the arch will now be more particularly described, viz:

From the level of the spring of the arch, where the abutments are twelve feet wide, the six inch batter of the back of the abutments will be changed to a two inch batter, which will be continued up between the wings and spandrel walls to within six feet of canal bottom—the batter will then change from two inches to the foot, to a foot to the foot, up to within four feet of canal bottom—this level of four feet below canal bottom shall be the height of the back part of the filling in over the arch; from this back part the top surface of the filling in shall have no inclination that, at the point where it meets the extrados of the arch, it shall be five feet below canal bottom.

PARAPETS.

The towpath parapet shall be seven feet six inches wide, and the berm parapet shall be five feet six inches wide at canal bottom—they shall be plumb on the inside, and shall batter on the outside one inch to the foot; this will make the towpath parapet seven feet wide and the berm parapet five feet wide at canal water line.

COPING.

The parapets shall be covered with coping one foot in thickness—the bottom of the coping being placed on a level with canal water line. The coping will be well scabbled on its lower and upper surfaces, and shall have full joints, *well cut*, the inner edge, also, of the coping shall be well cut, the outer edge shall be scabbled. The coping shall project outside of the parapets one foot, and shall extend over the whole breadth of the parapets, from end to end. The coping over the towpath parapet may be alternately in two and three pieces, and on the berm side in one and two pieces; so arranged as to dimensions as shall, in the opinion of the Engineer, form the best bond. The wing coping, including the one foot projection, will be three and a half feet wide.

Each piece of coping shall be connected to each other piece against which it lies by a two inch square dowel, six inches in length, let down diagonally in the joints between the stones, and leaded.

WATER TABLE.

It shall extend from end to end of the wings. It shall run back into the wall two feet; shall project eight inches, and shall be in thickness nine inches; beveled off on its upper surface so as to face only seven and a half inches—this bevel of one and a half inch to be made in the outer seven inches.

The water table shall be full in all its dimensions, beds, and joints, and shall be well scabbled except the joints, which shall be truly cut back the full depth of the stone. The upper surface of the water table will be level with the bottom of canal.

The inside of the *parapets* shall be well and truly cut. The dimensions of the headers and stretchers for which, and their relative number, shall be the same as is required for the ashlar in the lock specifications for the locks about to be put under contract, (in August 1837,) on this canal. The only difference being that for the inside of the parapets the stone are to be *cut* while the lock ashlar are to be scabbled.

CUT WORK.

The *coping*, the *water table*, the *sheeting*, the *skewbacks*, and *two feet in depth of the inside of the parapets* will be considered and paid for as *cut work*.

All the rest of the masonry will be of *good rubble masonry*, well bound together, with the corners of the abutments and the angles of the wings formed of large and well scabbled stones.

The front and back of all the masonry will be laid in full beds of mortar, and the interior will be grouted; and the mortar and grout, and everything connected with the cement and sand, shall be the same as is required in the lock specifications; and the transportation of cement shall in like manner be paid for by the Company.

The back of all the masonry against or over which the embankment will rest shall present a smooth and even surface, well plastered over.

It is understood that the regulations as to embanking in against the abutments, and as regards the puddling will be precisely the same as in the lock specification that has been referred to.

The centers shall be upon a plan approved of by the Engineer.

PROPOSAL

I propose to construct Aqueduct No. 11 over Evitts Creek, 70 feet span, according to the foregoing specification, and to furnish all the materials necessary therefore at the following prices:

1. For the cut masonry, including the centers per perch of twenty-five cubic feet \$22.00

- | | | |
|----|---|-----------|
| 2. | For all other masonry laid in cement, per perch of twenty-five cubic feet | \$8.50 |
| 3. | For coffer dam and bailing, a gross sum of | \$1200.00 |

EXCAVATION

- | | | |
|----|---------------------------|--------|
| 4. | Of earth, per cubic yard, | \$0.50 |
| 5. | Of slate, do. | \$1.50 |
| 6. | Of rock, do. | \$2.00 |

Work not specially mentioned will be at the estimate of the Engineer.

Signed this Eleventh day of September 1837, George G. Johnson*

* Note.—A strict compliance with the terms of this proposal will be required in every instance. No contracts will be made to more than one individual.

APPENDIX B*

Estimate of the Cost of All the Masonry From Licking Creek to Little Tonoloway Creek Inclusive, On Section No. 222—The Licking Creek Aqueduct.

Cost of the rubble work (stone from the Licking Quarry)

Perch quarried, loaded at the quarry & unloaded at the work	100¢
do. Transported $\frac{3}{4}$ of a mile	50¢
do. Laying in full mortar	100¢
Cement and sand for 1 perch	100¢
Profit & contingency	<u>50¢</u>
Cost of one perch laid and measured in the wall	400¢

The cut work will cost \$15 per perch delivered & laid

		\$	cts
{ viz }	{ 4200 perches }		
3480	Perches of rubble work at 400¢	13920	00
520	do. Cut work if got on the Licking at \$15 (being the arch & skewbacks)	7800	00
200	Perches of cut work got at Prather's Neck at \$19 (being the coping & water table)	3800	00
	Coffer dams, centering, pumping & bailing, excavating Foundations, puddling up the aqueduct, supplying A railing of locust & all other contingencies	2100	00
	Contingent if all the cut work be got at Prather's Neck = 520 perches at 400¢	2080	00
		29700	00

* Estimate of Aqueduct No. 6, by Charles B. Fisk, June 13, 1835

APPENDIX C

PAYMENTS MADE BY THE COMPANY FOR THE CONSTRUCTION OF AQUEDUCTS NOS. 6, 8, 9, AND 11

Payments for the construction of Aqueduct No. 6

Richard Holdsworth

<u>Debits</u>			<u>Credits</u>		
<u>1835</u>			<u>1835</u>		
Oct. 14	to Geo Bender	\$1,994.53	Oct. 1	For Const.	\$2,716.25
Nov. 3	to Geo Bender	661.71	Nov. 1	For Const	1,208.25
	to Cement	304.89	Dec. 1	For Const	2,695.00
	to Cement	178.47			
Dec. 9	to Geo Bender	1,970.50			
	to Cement	185.50			
 <u>1836</u>			 <u>1836</u>		
Jan 16	to Geo Bender	792.80	Jan. 1	For Const.	991.00
Mar 8	to Geo Bender	970.80	Mar 1	For Const	1,213.50
Mar 18	to Geo Bender	1,200.00	Apr 1	For Const	555.00
Apr 2	to Geo Bender	444.00	May 1	For Const	1,192.50
May 8	to Geo Bender	754.00	June 1	For Const	2,245.50
June 6	to Geo Bender	1,796.40	July 1	For Const	2,246.75
July 8	to Geo Bender	1,583.15	Aug 1	For Const	2,168.00
	to Geo Bender	2,000.00	Sep 1	For Const	2,269.25
	to Cement	214.25	Oct 1	For Const	1,404.25
Aug 4	to Geo Bender	1,648.90	Nov 1	For Const	1,904.00
Aug 25	to Geo Bender	1,000.00	Dec 1	For Const	805.00
	to Cement	85.50			
Sept 8	to Cement	194.50			
	to Geo Bender	1,620.90			
Oct 13	to Geo Bender	1,123.40			
Nov 10	to Geo Bender	1,502.25			
	to Cement	49.75			
Dec 16	to Geo Bender	570.00			
	to Cement	74.00			
 <u>1837</u>			 <u>1837</u>		
Jan 13	to Geo Bender	459.20	Jan. 1	For Const.	574.00

Enos Childs

Mar 13	to Geo Bender	1,439.88	Mar 1	For Const.	2,083.50
	to Geo Bender	1,500.00	Apr 1	For Const	786.40
Apr 6	to Geo Bender	616.85	May 1	For Const	2,785.15
	to Cement	72.25	June 1	For Const	1,821.65
May 9	to Cement	109.75	July 1	For Const	2,232.85
	to Geo Bender	2,327.26	Aug 1	For Const	2,817.50
June 12	to Geo Bender	1,479.20	Sept 1	For Const	2,862.25
	to Geo Bender	1,000.00	Oct 1	For Const	3,772.50
	to Cement	114.75	Nov 1	For Const	1,489.50
July 12	to Geo Bender	1,676.75	Dec 1	For Const	890.50
Aug 11	to Geo Bender	1,969.56			
	to Cement	772.75			
Sept 11	to Geo Bender	2,291.47			
	to Cement	213.00			
Oct 12	to Geo Bender	3,066.69			
	to Cement	234.25			
Nov 14	to Geo Bender	1,052.80			
	to Cement	249.50			
Dec 19	to Geo Bender	732.69			
	to Cement	46.50			
<u>1838</u>			<u>1838</u>		
Feb 14	to Geo Bender	<u>3,478.15</u>	June 1	For Const.	<u>2,257.40</u>
		\$48,023.45			\$48,023.45

Entrance Walls to Aqueduct No. 6

Enos ChildsDebits1838

Apr 18	to Geo Bender	500.00
	to Geo Bender	160.00
May 10	to Geo Bender	560.75
	to Cement	99.25
June 13	to Thos. Fillebroun	420.00
Sept 14	T M. C. Sprigg	<u>1,460.62</u>
		\$3,200.62

Credits1838

Mar 1	For Const.	625.00
Apr 1	For Const	200.00
May 1	For Const	825.00
June 1	For Const	525.00
Sept 1	For Const	925.37
<u>1841</u>		
Apr 1	For Const	<u>99.25</u>
		\$3,200.62

Roadway Under Aqueduct No. 6

Enos Childs

<u>Debits</u>			<u>Credits</u>	
<u>1838</u>				
Dec 14	to M. C. Sprigg	500.00		
<u>1839</u>				
Feb 6	to M. C. Sprigg	<u>300.00</u>		
		\$800.00	<u>1840</u>	
			For Const.	\$800.00

Railings for Aqueducts Nos. 6 and 7

John Uhler

<u>Debits</u>			<u>Credits</u>	
<u>1838</u>				
Aug 13	to M. C. Sprigg	\$597.60		
Dec 15	to M. C. Sprigg	495.23		
<u>1839</u>				
Mar 20	to M. C. Sprigg	<u>273.21</u>	<u>1839</u>	
		\$1,366.04	Mar 31	For Const. <u>\$1,366.04</u>
				\$1,366.04

Payments for the construction of Aqueduct No. 8

John Cameron

<u>Debits</u>			<u>Credits</u>		
<u>1837</u>			<u>1837</u>		
May 10	to Geo Bender	\$400.00	May 1	For Const.	\$500.00
June 13	to Geo Bender	1,054.00	June 1	For Const	1,320.00
July 12	to Geo Bender	600.00	July 1	For Const	750.00
Aug 9	to Geo Bender	1,009.86	Aug 1	For Const	1,343.75
	to Cement	65.14	Sept 1	For Const	2,164.25
Sept 14	to Cement	166.87	Oct 1	For Const	999.00
	to Geo Bender	1,564.53	Nov 1	For Const	1,215.50
Oct 16	to Geo Bender	647.92	Dec 1	For Const	1,389.50
	to Cement	151.28			
Nov 13	to Geo Bender	825.95			
	to Cement	146.45			
Dec 20	to Geo Bender	1,015.77			
	to Cement	95.83			
<u>1838</u>			<u>1838</u>		
Feb 3	to Geo Bender	794.40	Jan. 1	For Const.	993.00
Mar 5	to Geo Bender	617.28	Feb 1	For Const	771.60
Apr 18	to Geo Bender	446.40	Mar 1	For Const	558.00
	to Geo Bender	763.92	Apr 1	For Const	954.90
May 12	to Geo Bender	2,015.36	May 1	For Const	2,799.04
	to Cement	133.87	June 1	For Const	1,234.92
June 12	to Thos. Fillebroun	862.94	July 1	For Const	2,863.64
	to Cement	125.00	Aug 1	For Const	1,131.60
July 13	to Thos. Fillebroun	2,013.28	Sept 1	For Const	1,477.85
Aug 14	to M. C. Sprigg	818.28	Nov 1	For Const	490.15
	to Cement	87.00	Dec 1	For Const	329.60
Sept 15	to M. C. Sprigg	1,182.28			
Oct 12	to M. C. Sprigg	594.77			
	to Cement	147.47			
Nov 13	to M. C. Sprigg	371.44			
	to Cement	20.68			
Dec 11	to M. C. Sprigg	263.68			

<u>1839</u>			<u>1839</u>		
Jan 14	to M. C. Sprigg	131.68	Jan. 1	For Const.	164.60
Feb 14	to M. C. Sprigg	159.20	Feb 1	For Const	199.00
Mar 14	to M. C. Sprigg	353.76	Mar 1	For Const	442.20
May 23	to M. C. Sprigg	718.08	Apr 1	For Const	897.60
	to M. C. Sprigg	1,381.72	May 1	For Const	1,727.15
June 18	to M. C. Sprigg	1,111.52	June 1	For Const	1,652.45
	to Cement	213.44	July 1	For Const	1,369.00
July 15	to M. C. Sprigg	1,095.20	Aug 1	For Const	1,560.50
Aug 18	to M. C. Sprigg	1,031.83	Sept 1	For Const	1,339.15
Sept 18	to M. C. Sprigg	757.15	Oct 1	For Const	2,427.15
	to Cement	531.04	Nov 1	For Const	1,296.60
Nov 14	to M. C. Sprigg	1,710.72	Dec 1	For Const	840.00
	to Cement	231.00			
	to M. C. Sprigg	858.78			
	to Cement	178.50			
Dec 18	to M. C. Sprigg	672.00			
 <u>1840</u>			 <u>1840</u>		
Jun	to Cement	12.65		By Balance	8,532.51
	to Balance	<u>8,532.51</u>			
		\$39,050.07			
 <u>1850</u>			 <u>1841</u>		
Jan 1	to Balance	8,532.51	Apr 1	For Const	<u>920.57</u>
					\$39,050.07

Roadway Across Sideling Hill Creek

John Cameron

<u>Debits</u>			<u>Credits</u>		
<u>1838</u>			<u>1838</u>		
July 13	to Thos Fillebroun	\$320.00	June 1	For Const.	\$400.00
Sept 15	to M. C. Sprigg	80.00	Sept 1	For Const	100.00
Nov 13	to M. C. Sprigg	107.20	Nov 1	For Const	<u>134.00</u>
					\$634.00
 <u>1839</u>					
Jan 14	to M. C. Sprigg	<u>126.80</u>			
		\$634.00			

Payments for the construction of Aqueduct No. 9

Enos ChildsDebits1838

Oct 23	to M. C. Sprigg	\$238.00
Nov 17	to M. C. Sprigg	268.21
	to Cement	9.79
Dec 12	to M. C. Sprigg	1,048.00

1839

Jan 29	to M. C. Sprigg	1,127.17
Mar 16	to M. C. Sprigg	1,624.56
May 24	to M. C. Sprigg	268.38
	to M. C. Sprigg	392.40
June 18	to M. C. Sprigg	680.14
July 15	to M. C. Sprigg	838.86
Aug 14	to M. C. Sprigg	603.22
	to Cement	190.87
Sept 18	to M. C. Sprigg	662.20
Nov 27	to M. C. Sprigg	775.31
	to Cement	349.10
	to M. C. Sprigg	815.68
Dec 19	to M. C. Sprigg	1,109.47

1840

June 11	to W. H. Bryan	250.00
Sept 21	to Wm. Matthews	5,394.29

1841

Jan 6	to S. M. Simms	<u>550.00</u>
		\$17,193.65

Credits1838

Oct 1	For Const.	297.50
Nov 1	For Const	347.50
Dec 1	For Const	1,310.00

1839

Jan 1	For Const	1,408.96
Mar 1	For Const	2,030.70
Apr 1	For Const	335.47
May 1	For Const	490.49
June 1	For Const	850.18
July 1	For Const	1,046.07
Aug 1	For Const	992.61
Sept 1	For Const	827.75
Oct 1	For Const	1,405.51
Nov 1	For Const	1,019.60
Dec 1	For Const	1,386.84

1840

June 10	For Const	2,644.47
Aug 19	by G. Marsh	250.00

1841

Dec 20	By G. Marsh	<u>550.00</u>
		\$17,193.65

George S. Marsh

<u>Debits</u>			<u>Credits</u>		
<u>1840</u>			<u>1840</u>		
Aug 9	to Wm. Matthews	515.00	Aug 1	For Const.	643.75
Sept 23		1,244.57	Sept 1	For Const	2,071.75
	to Cement	412.83	Oct 1	For Const	1,677.00
Oct 14	to Wm. Matthews	1,341.60	Nov 1		789.85
Nov 27	to Wm. Matthews	631.88			
 <u>1841</u>			 <u>1841</u>		
Jan 18	to S. M. Simms	1,670.55	Jan 1	For Const	2,088.19
	to E. Childs	250.00	Dec 1	For Const	<u>3,655.32</u>
Dec 20	to E. Childs	550.00			\$10,925.86
 <u>1847</u>					
Sep	to G. S. Marsh				
	Gen. Acct	<u>4,309.43</u>			
		\$10,925.86			

Payments for the construction of Aqueduct No. 11

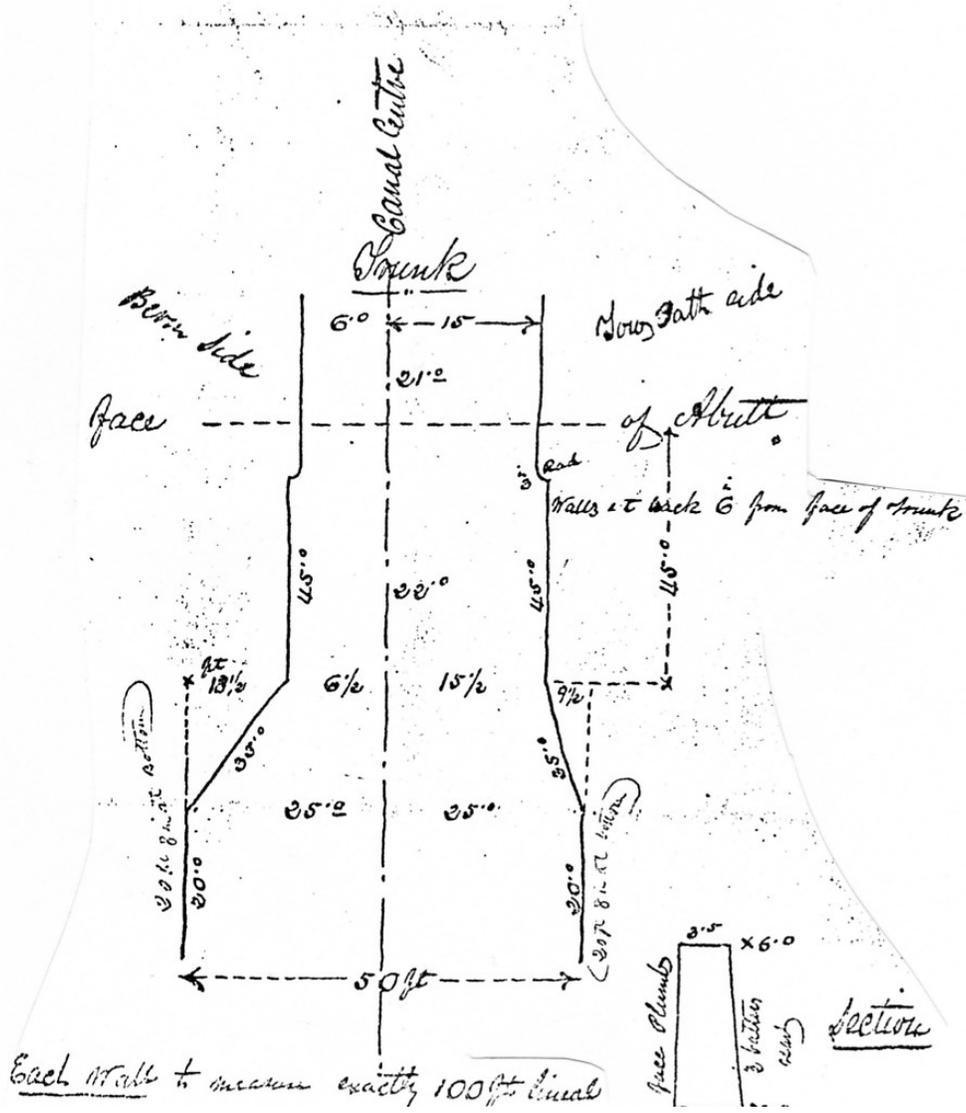
George G. Johnson

<u>Debits</u>			<u>Credits</u>		
<u>1838</u>			<u>1838</u>		
Mar 9	to Geo. Bender	400.00	Feb 1	For Const.	500.00
Apr 16	to Geo. Bender	660.00	Apr 1	For Const	825.00
May 16	to T. Fillebroun	2,214.40	May 1	For Const	2,768.00
June 21	to T. Fillebroun	371.60	Jun 1	For Const	464.50
July 12	to T. Fillebroun	936.40	July 1	For Const	1,170.50
Aug 13	to M. C. Sprigg	801.76	Aug 1	For Const	1,002.20
Sept 18	to M. C. Sprigg	755.48	Sept 1	For Const	944.35
Oct 15	to M. C. Sprigg	1,412.47	Oct 1	For Const	1,928.40
	to Cement	130.25	Nov 1	For Const	2,720.00
Nov 6	to M. C. Sprigg	1,953.64	Dec 1	For Const	832.75
	to Cement	222.36			
Dec 21	to M. C. Sprigg	651.84			
	to Cement	8.36			

<u>1839</u>			<u>1839</u>		
Jan 15	to M. C. Sprigg	1,335.50	Jan 1	For Const.	1,823.75
	to Cement	123.50	Feb 1	For Const	1,720.15
Feb 19	to M. C. Sprigg	1,376.12	Mar 1	For Const	500.00
Mar 15	to M. C. Sprigg	400.00	Apr 1	For Const	1,320.00
May 24	to M. C. Sprigg	1,056.00	May 1	For Const	2,210.00
	to M. C. Sprigg	1,616.37	June 1	For Const	3,718.15
	to Cement	151.63	July 1	For Const	2,839.75
June 20	to M. C. Sprigg	2,770.63	Aug 1	For Const	1,257.75
	to Cement	203.89	Sept 1	For Const	2,056.50
Aug 15	to M. C. Sprigg	847.07	Oct 1	For Const	1,760.25
	to Cement	159.13	Nov 1		3,018.50
Aug 28	to Acceptances	4,295.00	Dec 1		1,079.00
Sept 18	to M. C. Sprigg	1,490.14			
	to Cement	155.06			
July 18	to M. C. Sprigg	2,032.25			
	to Cement	239.55			
Nov 18	to M. C. Sprigg	2,304.73			
	to Cement	197.20			
Nov 27	to M. C. Sprigg	1,311.00			
	to Cement	110.07			
Dec 16	to M. C. Sprigg	777.93			
	to Cement	85.27			
 <u>1840</u>			 <u>1840</u>		
Mar 27	to W. H. Bryan	88.20	Jan 1		147.00
Apr 27	to W. H. Bryan	323.16	Mar 1		538.60
Mar 18	to M. C. Sprigg	152.00	Apr 1		190.00
May 14	to W. H. Bryan	193.02	May 1		321.70
Sept 23	to Wm. Matthews	428.64	Sept 1		714.40
Sept 24	to Wm. Matthews	836.00	Oct 1		1,181.00
Oct 10	to Wm. Matthews	708.60			5,729.80
	to Wm. Matthews	3,437.88	Nov 1		<u>704.00</u>
	to Cement	542.57			\$45,986.00
	to Cement	124.86			
	to Cement	208.16			
Nov	to Wm. Matthews	<u>422.40</u>			
		\$40,928.09			

APPENDIX D

Entrance Walls of Aqueducts
 No 687.



APPENDIX E

CONTRACT, SPECIFICATIONS, AND PRICE PROPOSALS FOR AQUEDUCT NO. 8

CONTRACT FOR AQUEDUCT NO. 8

ARTICLES OF AGREEMENT,

Entered into this twelfth day of June in the year 1837 between the Chesapeake and Ohio Canal Company, by the President thereof, of the one part, and John Cameron of Shepherdstown of the State of Virginia of the other part.

Witnesseth, That the said John Cameron promises and agrees to construct in a substantial and workmanlike manner, on the two hundred and ninety second section of the Chesapeake and Ohio Canal, Aqueduct No. 8, in conformity with the annexed specification, and with the plan of said aqueduct as exhibited by the Canal Company, and with such alterations thereof, as may hereafter be adopted by the President and Directors of the said Canal Company, and to furnish all the materials which may be necessary or proper therefor according to the specification, of such quality as an Engineer of the Canal Company may approve.

Some Assistant Engineer in the employ of the Chesapeake and Ohio Canal Company shall, as soon as practicable after the end of each month, make out an estimate of the quantity and value of each species of work done pursuant to this contract, at the prices contained in the annexed proposal, according to a scale to be made out for the purpose by the Engineer, which scale shall provide for estimating the proportional value of any materials procured for the aqueduct and the Assistant Engineer shall include in such monthly estimate, all suitable materials which may have been delivered upon the land of the Canal Company, near the site for the aqueduct, or at other places if properly secured to the Canal Company. He shall also include the value of any extra work done in consequence of any alteration of the plan of the aqueduct which may have been adopted by the President and Directors of the Canal Company, or of the materials required for its construction when such alteration shall have caused an increased expense to the Contractor, and where any such alteration shall have caused a saving of expense to the Contractor, the Engineer shall make a reasonable deduction therefore from the estimate so made; and if the Resident Engineer shall approve such estimate, he shall sign the same and forward it to the Commissioner. And it is mutually agreed between the contracting parties, that any estimate mad and approved as aforesaid shall be final and conclusive, unless objected to before payment, and within twenty days after it shall have been returned to the Commissioner, in which case the party objecting shall give notice to the other party in writing, stating the grounds of objection; and the Commissioner shall thereupon return the objec-

tions so made, together with the estimate, to the Resident Engineer, who shall immediately consider the matters of complaint and make his report to the Commissioner in writing. And if upon report being made, the parties shall be content therewith, it shall be taken as final, but if the parties shall not be satisfied with such report, the Commissioner of the Canal, or in his absence some other person appointed by the Canal Company to act in his place, shall examine the subject and make out an estimate which shall be binding upon both parties without further appeal; and the making and receiving payment of any estimate to which objection may have been offered, shall be taken as evidence that such objections have been waived; and in like manner shall be conclusive, the decision of the Commissioner upon any question that may arise as to the meaning of this agreement.

Within ten days after the return of any monthly estimate to the Commissioner, four-fifths of the sum appearing to be due for work performed, and materials furnished since the preceding estimate, shall be paid to the Contractor in the mode in which payments are made by the regulations of this Company, and no portion of the remaining fifth part shall, under any circumstances, be paid until this contract is fulfilled.

Within thirty days after this aqueduct shall have been completed according to the true intent and meaning of this contract; a final estimate therefore shall be made and approved in the manner provide for making and approving monthly estimates, and any objections thereto which may arise, shall be disposed of and finally settled, as in the case of monthly estimates, and within thirty days after the adjustment of the final estimate, the balance due thereon shall be paid.

The works shall always be open to examination during their progress, by the President and Directors, their Commissioner, Engineers, or any person they may depute for that purpose, and the Contractor shall at all times keep open at his expense, a horse path-way, along side of the aqueduct, so that the above mentioned persons may readily pass by the same work above or below it.

At the expiration of every two weeks work, a report shall be made by the contractor to the assistant Engineer having charge of this section, of the average force of men, carts, &c. employed upon the aqueduct for the preceding two weeks, according to such forms as shall be provided by the Engineer.

It is mutually agreed between the parties to this contract, that the work on the aforesaid aqueduct shall be commenced within thirty days from this date—if the Canal Company shall so soon acquire the right to the land necessary for the aqueduct, or as soon thereafter as the right shall be acquired; that it shall be steadily prosecuted without intermission, with such force as shall in the opinion of the resident Engineer, secure its final completion by the first day of June in the year 1839 at which time it shall be fully completed and delivered up; and it is further agreed that in the event that the said work shall not be so commenced, or prosecuted and completed; or, if the contractor on being required thereto by the resident Engineer, shall fail or refuse to increase the force employed on the aqueduct to such an extent as in the opinion of the Engineer shall be necessary to ensure its completion in the stipulated time; or in case the contractor shall disobey any of the writ-

ten orders of the resident Engineer, or shall violate any of the express conditions of this agreement—then on a certificate of the fact by the resident Engineer, having charge of the work, either the President, or the President and Directors of the Chesapeake and Ohio Canal Company may declare this contract abandoned, and the said Canal Company shall thereupon be exonerated from every obligation thence arising; and the reserved percentage on the contract price, as well as all materials furnished, and work performed, and upon which no estimate or payment may have been made shall be forfeited to, and become the right and property of the Chesapeake and Ohio Canal Company; and the said Company by its proper officer, may therefore agree with any other person for the execution of the unfinished work, in the same manner as if this contract had never been made.

The contractor for this aqueduct shall neither give nor sell to the men employed by him, nor suffer to be given or sold by others, if in his power to prevent it, any spirituous liquor.—He shall not knowingly employ any man either as overseer or laborer who shall have been dismissed from any other work for bad workmanship, intemperance or disorderly conduct. Nor shall he continue to employ any man, who shall be declared by the Engineer to be either disorderly, habitually intemperate or a bad workman.

The contractor shall give his personal attendance to the excavation of the work hereby contracted for, and it is mutually agreed that this contract shall not be let or assigned in whole or in part to any other person—and it is further agreed, that no draft shall be drawn upon or accepted by the Commissioner of the Canal, or the President and Directors of the Canal Company, unless such draft shall be drawn upon some particular estimate, after the contractor shall have certified on the back of said estimate, that he is satisfied of its correctness.

All the materials of stone or earth removed or loosened in the excavation for the aqueduct, as well as the fallen timber shall be the property of the Canal Company, and after supplying such part thereof as may be required in the construction of the aqueduct, and the necessary fuel for the Contractor, and timber for the construction of his shanties, the President and Directors may empower any other Contractor, or persons, to work up, or remove or in any other way dispose of such surplus material, and every facility for the removal thereof shall be afforded by the Contractor for the aqueduct, provided he shall not thereby incur any additional expense without proportional compensation, to be fixed by the Engineer.

All buildings or fences on the line of the Canal shall be preserved, in such manner as the Engineer may direct by the Contractor—who shall protect them from injury by his hands, and so far as practicable by any other persons.

The Engineer shall have power to prescribe the manner of preparing for, beginning and conducting every species of work to be done under this agreement, with reference to its purpose, and the durability of such work, and his instructions shall be promptly obeyed, and if he shall disapprove of the quality of any work, it shall be the duty of the Contractor to take down at his own expense, and rebuild so much thereof as shall be disapproved of,

and if the Contractor shall neglect or refuse to take down and rebuild work so disapproved of, the Engineer shall cause the same to be done at his cost.

It is understood and agreed, that all orders, given by an Engineer, and which shall cause an increase or diminution in the quality or value of the work to be performed—shall be given in writing, and that when any claim shall be made by the contractor, for extra compensation, for work performed under such orders—the order shall be produced.

It is further agreed, that in case of death, resignation or absence of the resident Engineer, the President and Directors may depute any other Engineer to act in his place.

And it is mutually agreed between the parties to this Contract, that all the terms and conditions therein expressed, as well as the terms and conditions contained in the annexed Specifications and proposal, which are deemed and taken to be a part of this Contract, shall be binding upon the parties respectively, according to their true intent and meaning.

It being understood that the cement to be used in the construction of said aqueduct is to be furnished by the Canal Company at the same price & under all the conditions as to keeping & paying for the same as are set forth in the specifications for the locks now under contract between Dam No. 5 & the 'Capon.

It being also understood that all of the masonry & work herein contracted for that is below a level one foot higher than the comb of Dam No. 6. (that is below a level 16 3/10 ft. below canal bottom) shall be so carried on to completion to that level, to prevent the interruption from flooding of said Dam during its construction with the ordinary flow of the Potomac, it being supposed that the said Dam will be complete this season. The contract therefore requiring its completion this season.

And it is also understood that if upon the completion of the masonry & work to said level 16 3/10 feet below canal bottom, the Canal Company shall have determined not to prosecute to early completion the balance of the work upon the Canal between 'Capon & Cumberland, then the said Company shall have the right to suspend all further operations under this contract & to consider it as void, said Company however paying what the Engineer shall adjudge to be the fair & proportional value, under the contract prices, of the work done compared with the whole work. The Canal Company also to have the right, at any time, before the masonry & work shall have reached that height, to say that the preparation of materials for the masonry above that level shall be suspended, in view of the contingency mentioned.

(signed) G. A. Washington
 President of the Chesapeake and Ohio Canal Company,
 by order of the President and Directors,
 in behalf of the Company.

Witness, W. E. Howard
 To the signature of G. Washington

(signed) John Cameron [seal]
 Charles Miser in witness to signature of
 John Cameron

Note—It is expressly declared by the President and Directors that no increase of the prices agreed upon in this contract, will be allowed under any circumstances whatsoever; nor will they consider any application that may be made for that purpose

See Journal of 1st April and 1st June 1837 J. P. J. dc

Aqueduct No. 8 Over Sideling Hill Creek

One arch, part of a segment of a circle, the span of the whole segment being 70 feet with a rise of 12 feet.

The foundation of the abutment and of all the masonry to the end of the wing will be on rock taken down by blasting to a level one foot lower than the adjoining firm rock. The foundations, if not an entire level, shall be in level offsets such as the Engineer shall approve of. The top of the abutments will be seventeen and one half feet below the bottom of the Canal. The dimensions of the abutments measured on a level with the spring of the arch are 35 $\frac{1}{4}$ feet in length and 12 feet in thickness, their height will probably be 12 feet, the front of the abutment will be plumb and the ends will batter back to the splay of the wings one inch to the foot, around the front and ends of the abutments there will be a projection of one foot down to the foundations from a level 5 feet below their top. The back of the abutments from the top will batter six inches to the foot their whole height. The wings will splay out (the angle formed by the abutment and the wing being filled in as represented on the plan) until they are 80 feet apart on their top and outer edge.

From these points the two wings will turn parallel to each other and to the Canal to their termination, which will be on top 45 feet from the front line of the abutment, the width of these wings on top will be 5 feet, and they will have such a width, on bottom throughout their entire length, as a batter of two inches to the foot on the inside and a batter of one inch on the outside will make, both these batters being carried down to the rock. Corresponding to the additional thickness given to the bottom of the front and the ends of the abutment, there will be a similar addition on the same level of one foot down to the rock and extending along the whole front of the wings to their ends. The ends of the wings will also batter two inches to the foot, the general splay of the wings will be six inches measured in the direction of the Aqueduct, to one foot measured at right angles. The oblique length on the two sides of the Aqueduct will vary in consequence of the center of the water way of the Aqueduct being 4 $\frac{1}{2}$ feet on the towpath of the center of the 50 feet Canal at water surface, and 32 feet Canal at bottom and also the outer line of the straight part of the wing at the top being 4 feet outside of the outer edge of the towpath, while the corresponding part of the opposite wing is in line with the outer edge of the berm bank.

The arch will be two feet eight inches in depth at the crown and three feet at the spring, it will be formed of stone perfectly cut throughout. The beds of sheeting must be as true and as accurately cut back to the line of the extrados as in any other part; the joints shall

be full and even and shall fill the square back to the extrados, the extrados of the arch throughout shall be hammered to true surface.

It will be understood, therefore that the intrados, the end joints, and the beds, of all the sheeting will in every point fill the space necessary to make the whole arch as compact and solid as though it were one stone.

The skewback shall also be as well cut as the sheeting and will be of the size deemed necessary by the Engineer.

The length of the short size stone shall not be less than 2 feet and the long one not less than four feet. The sheeting shall not be less than 3 feet with no break less than eighteen inches, the sheeting shall all be numbered so that the place of each stone will be known in the arch immediately upon its being cut.

Above the level of the spring of the arches where the abutment is 12 feet in width the 6 inch batter on the back of the abutment shall be changed into a two inch batter, which will be continued up between the wings to within 3 feet of the bottom of the canal, at that level, viz. 3 feet below the bottom of the canal, the width of the masonry shall be 5 feet and said masonry on its side opposite to that of which we have described as having a two inch batter, shall have the same two inch batter down to a level 8 feet below canal bottom, up to which level of 8 feet below canal bottom, the spandrels shall be filled in level. The spaces thus left vacant below canal bottom and between the spandrel walls are left for puddling.

These spandrel walls at bottom of canal will be on each side 7 feet thick at canal bottom, they will each batter on the inside 3 inches to the foot to 3 feet below bottom where there will be an offset of 2 feet on the inside, below this there will be a two inch batter carried down to the 8 feet below bottom where the spandrels are filled up level.

The towpath parapet will be 7 feet 3 inches wide at canal bottom, and rise including the coping to 7 feet above canal bottom plumb on the inside and battering $\frac{1}{2}$ inch to the foot on the outside. The berm parapet will be the same, except that it will be $5\frac{1}{4}$ feet wide at canal bottom instead of $7\frac{1}{4}$ feet. There will be a well scabbled water table extending from end to end of the wings, with cut end joints, the upper surface of which will be level with the bottom of the canal, its thickness 9 inches, to project 8 inches, to be beveled on the upper side within the 8 inch projection $1\frac{1}{2}$ inches, so as to face $7\frac{1}{2}$ inches thick, the water table will run back into the wall, with well scabbled, and parallel beds, and full joints, 2 feet. The coping will be one foot in thickness, well scabbled on its lower and upper surface, and full joints, well cut, the inner edge also of the coping to be cut, and the outer edge scabbled, it shall project outside the parapet 1 foot, it shall extend over the whole breadth of the parapet from end to end.

On the wings, the coping, including the projection, will be $3\frac{1}{2}$ feet, the coping over the towpath parapet may be alternately in two and three pieces, so arranged as to dimensions as shall in the opinion of the Engineer form the best bonds. The length of the coping shall

not be less than 3 feet on berm side, the coping may be alternately in one and two pieces, each piece of coping shall be connected to every other piece against which it lies by a 2 inch square dowel 6 inches in length, let down diagonally into the joints between the stones and leaded.

Except the coping, the water table, the sheeting, the inside of the parapets, and the skew-backs, all the rest of the masonry will be of good rubble masonry, well bound together, with the corners of the abutments and the angles of the wings formed of large and well scabbled stones.

The character of the cut work and of the scabbled work will be the same as that required in the lock specifications for the locks now under contract from Dam No. 5 to 'Capon.

The front and backs of all the masonry will be laid in full beds of mortar, and the interior will be well grouted, and the mortar, and grout and everything connected with the cement and sand shall be the same as is required in the lock specifications.

The sheeting may be in courses, between 2 feet and fourteen and one half inches, in thickness, so arranged as the Engineer will approve of after the opening of the quarry. The greater thickness being at the spring and diminishing to the crown. No checking of the sheeting will be allowed.

The back of all the masonry against or over which the embankment, will rest, shall present a smooth and even surface, well plastered over, the ring stone will project equal to the rustication, which will be 6 ½ inches, the inner arris and the outer arris of the sheeting will have ½ inch taken off, carried through the arch.

From outside to outside of the parapets, on a level 6 feet above canal bottom shall be 33 feet, up to which level from the top of the abutments, the spandrels, the end of the rings, and the parapets shall have a batter of ½ inch to the foot, the trunk will be 21 feet in width. The inside of the parapets will be cut work of dimensions as to headers and stretchers, the same as is required in the lock specifications for the scabbled stone. The centers shall be upon a plan approved by the Engineer.

It is understood that the regulations as to filling back of the aqueduct and the puddling, will be precisely the same as in the lock specifications above referred to, the Company reserving also the same privilege of employing some other person to do the work.

The description of the ground plan of the wings in the specification applies more particularly to those at the western end of the aqueduct, the ground plan of the eastern wings, it is understood, will be changed if necessary to suit the foundation, it is also understood the eastern abutment will be a natural abutment of solid rock from which the arch will spring at a higher point than it does from the abutment of masonry. The water way left between the natural abutment of rock and the one of masonry will be about 50 feet.

Proposals

I propose to construct Aqueduct No. 8 over Sideling Hill Creek, according to the foregoing specifications and to furnish all the materials necessary therefore at the following prices, viz:

For excavation of rock for foundation per cubic yard	\$1.00
For excavation of all other materials per cubic yard	\$0.30
For masonry of cut sandstone generally per perch of 25 cubic feet	\$22.00
Or if the cut work be of limestone per perch of 25 cubic feet	\$23.00
For all other masonry laid in cement per perch of 25 cubic feet	\$6.50
For the coffer dam for the western abutment and for bailing of water at that abutment	\$600.00

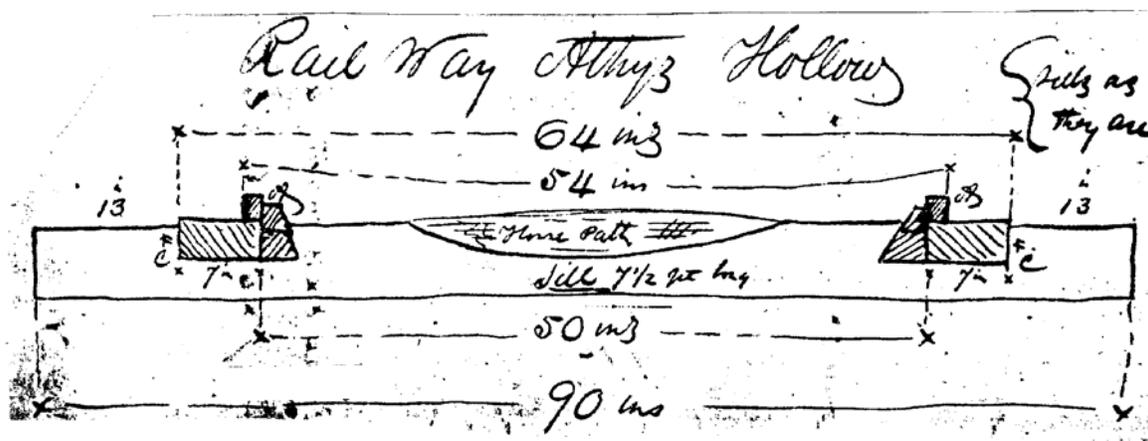
If a coffer dam and bailing shall be required for the eastern abutment, it shall be paid for at the estimate of the Engineer, as shall also, any trimming for a rock abutment on the east.

Signed this 10th day of April 1837
John Cameron

APPENDIX F

RAILWAY FOR DEEP CUT ATHEYS HOLLOW

June 21, 1838



AA Strips 2 in. wide & 3 in. high spiked on to keep the cart wheels in place, braced over every sill by putting in a high wedge coming within an inch of the top of the strip.

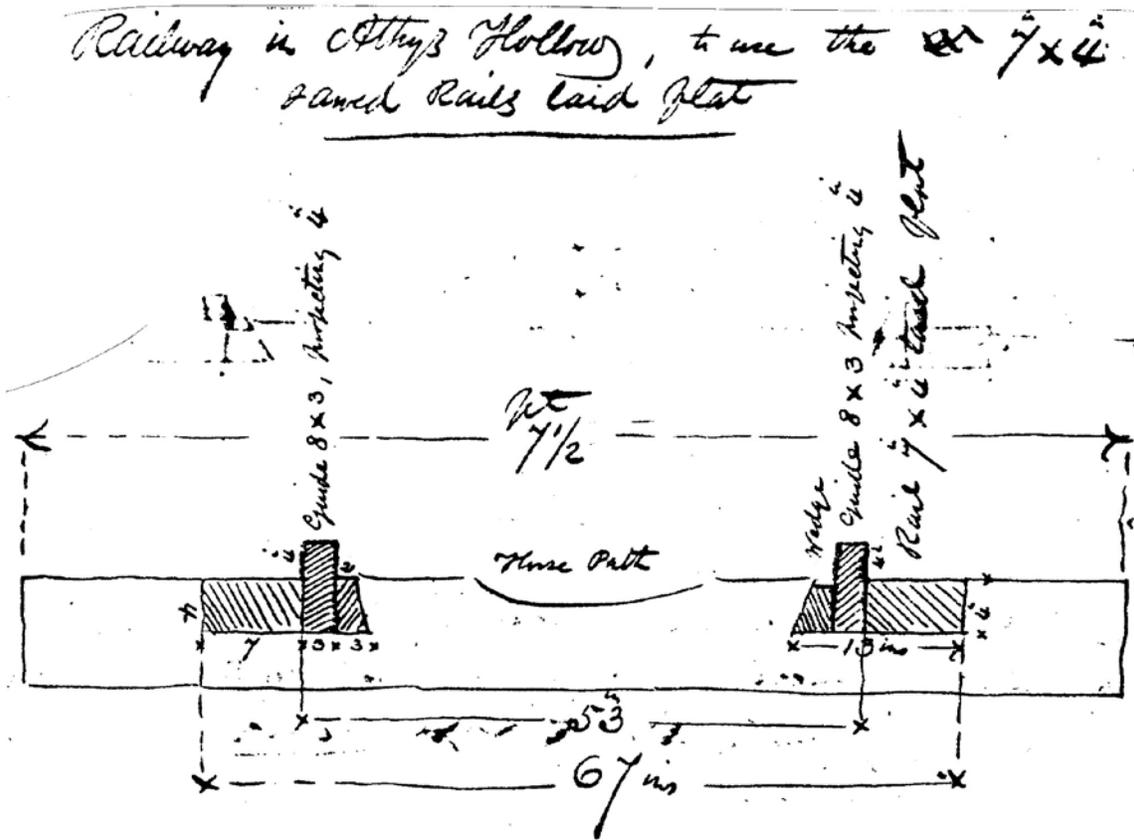
As it is found that some carts are only 4 ft. 6 (or 54 ins.) clear inside between the wheels on the ground & as a strip of 2 in. wide for a guide is rather light, it would perhaps be best to put in a piece of 1 1/2 in. plank against the shoulders C, C on both sides.

And make the width across from out to out of the guides = 53 in. instead of 54 & make the guides themselves 2 1/2 in. x 3 in.

Finally, take the view

Minimum wheel width	= 4' 6"
Maximum do	= 4' 9"
diff	3"
Play	1"
Tire	2 1/2"
Total	6 1/2"

A trend of the Rail of 6 1/2 ins. Is necessary to accommodate carts of all sizes such as are now running in Athys Hollow.



The sills now made must be widened in the notch to 67 in. from shoulder to shoulder; and widened too in the wedge side to receive a 3 in. oak guide 8 in. deep which will be wedged in with the Rails by sufficient wedges.

Sills to be placed 6 ft. apart—center to center.

Such of the Rails as are of greater size will be wrought 7 in. x 4 in. at the bearings, by the usual process of boxing out.

The sills were higher than the Rails outside of the shoulder, will be adzed down, so as to come flush or nearly so with the top surface of the Rails.

A Railway on this Plan without much alteration will answer as the Railway of the Bottoming of the Tunnel.

APPENDIX G

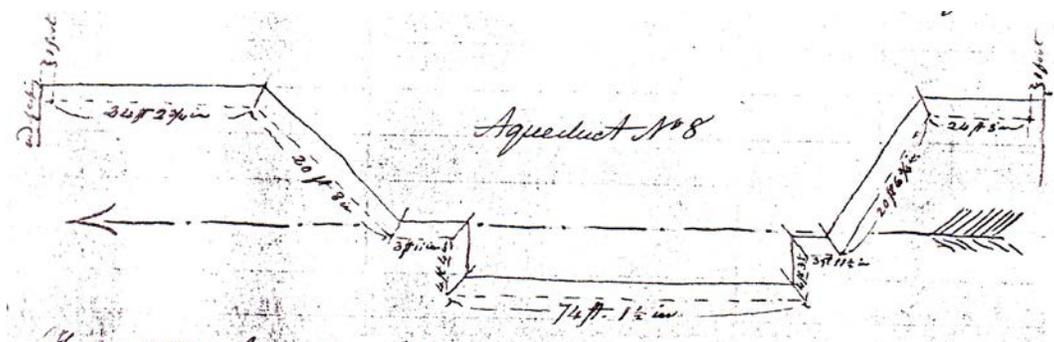
RAILINGS OF AQUEDUCT NO. 8

Dam No. 6 May 17th 1849

To: Charles B. Fisk, Esq.

Sir,

In reading your letter over last night I discovered that it was the lines of Aqueduct No. 8 you wished to have, as Aqueduct No. 7 had been spoken of I carelessly supposed your letter only referred to it. Below are the accurate dimensions as required.



The dotted line is measured parallel to and 13 1/2 inches from the edge of the coping. We have received a load of new cement. It is much better burned and ground than the last. There is no iron for the mitre sill yet.

Respectfully
(signed) John A. Byers
Asst. Eng.

APPENDIX H

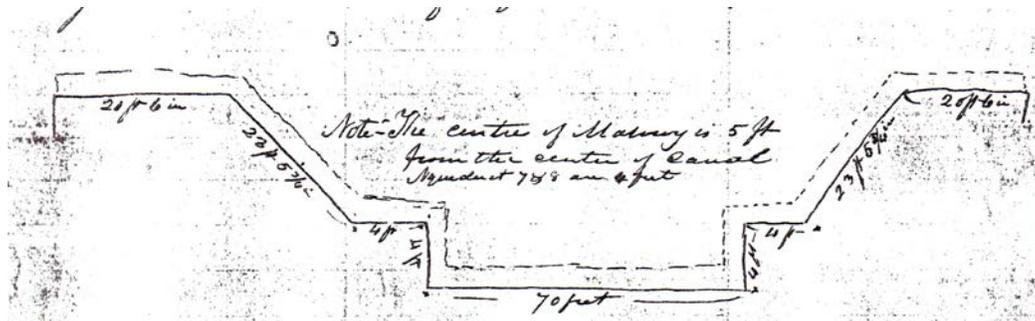
RAILINGS OF AQUEDUCT NO. 9

Little Orleans, May 20th 1849

To Charles B. Fisk, Esq.

Sir,

This is a sketch of the length of Aqueduct No. 9 (by the plan) taken at 6.00 A. which is a line 1 foot within the edge of the coping, as the parapets are not carried up this length may slightly vary in the manner of Aqueduct No. 7 & 8.



(signed)

Respectfully
John A. Byers
Asst.. Eng.

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1. Licking Creek Aqueduct, towpath side, 1961.
Photograph by Jack Boucher, C & O Canal NHP files.



2. Great Tonoloway Creek Aqueduct and waste weir, downstream end, berm side.
Note missing wooden parapet replacing the masonry parapet.



3. Great Tonoloway Creek Aqueduct, berm side, berm side.
Note that the upstream parapet is intact and the cabin of boat can be seen above it.



4. Great Tonoloway Creek Aqueduct and waste weir from downstream towpath.
Note that both parapets are missing.



5. Great Tonoloway Creek Aqueduct, berm side, 1965.
Note both parapets are missing.



6. Great Tonoloway Creek Aqueduct, downstream (river) side, 1965.
Note both parapets are missing.



7. Sideling Hill Creek Aqueduct with pedestrian bridge, late operating period.
C&O Canal NHP files.



8. Sideling Hill Creek Aqueduct complex, 1956.
Photograph by Abbie Rowe. Courtesy, National Park Service.



9. Sideling Hill Creek Aqueduct, downstream side, 1960.
Photograph by Jack Boucher. Historic American Buildings Survey Files



10. Sideling Hill Creek Aqueduct looking northwest from towpath with guardrail, 1960.
Photograph by Jack Boucher. Historic American Buildings Survey Files



11. Sideling Hill Creek Aqueduct looking southeast, towpath in foreground, 1960.
Photograph by Jack Boucher. Historic American Buildings Survey Files.



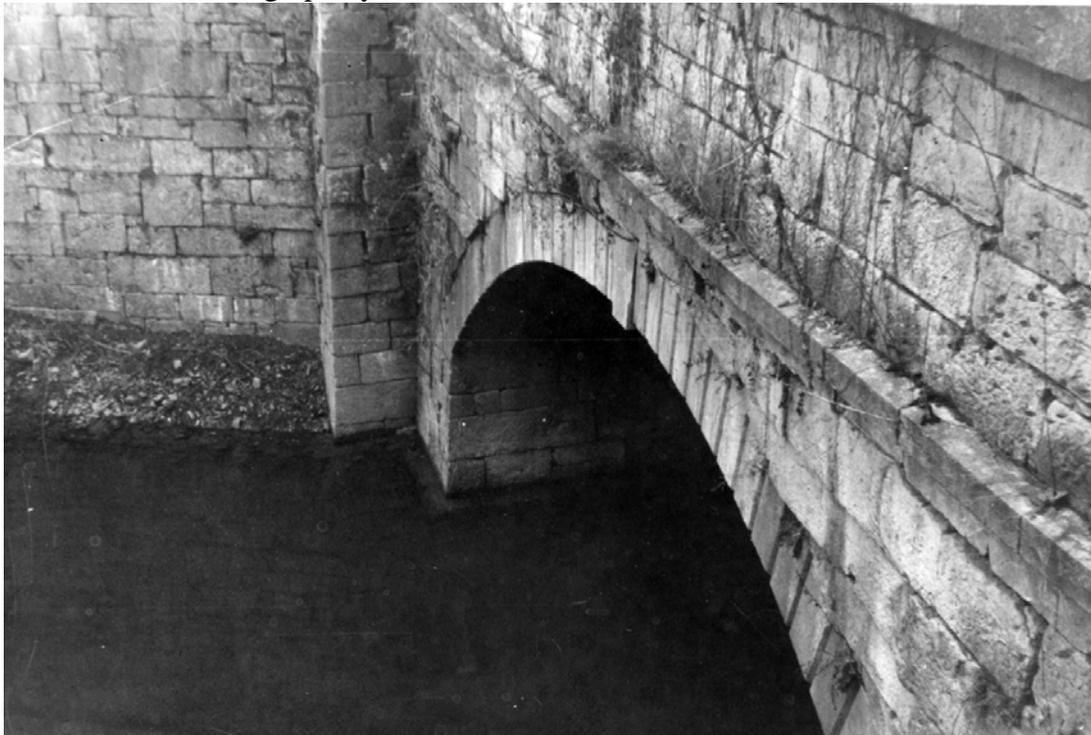
12. Fifteen Mile Creek Aqueduct, towpath side, railroad viaduct in background, 1965.
Photograph by C. R. Parkinson. C & O Canal NHP files.



13. Fifteen Mile Creek Aqueduct, berm side, 1965.
Photograph by C. R. Parkinson. C & O Canal NHP files.



14. Fifteen Mile Cr. Aqueduct, towpath side (close-up of arch) 1965.
Photograph by C. R. Parkinson. C & O Canal NHP files.



15. Fifteen Mile Creek Aqueduct with Potomac River in Background.
Photograph by Jack Rotier and Sam Hower.



16. Town Creek Aqueduct, berm side.
Photograph by Jack Rotier and Sam Hower



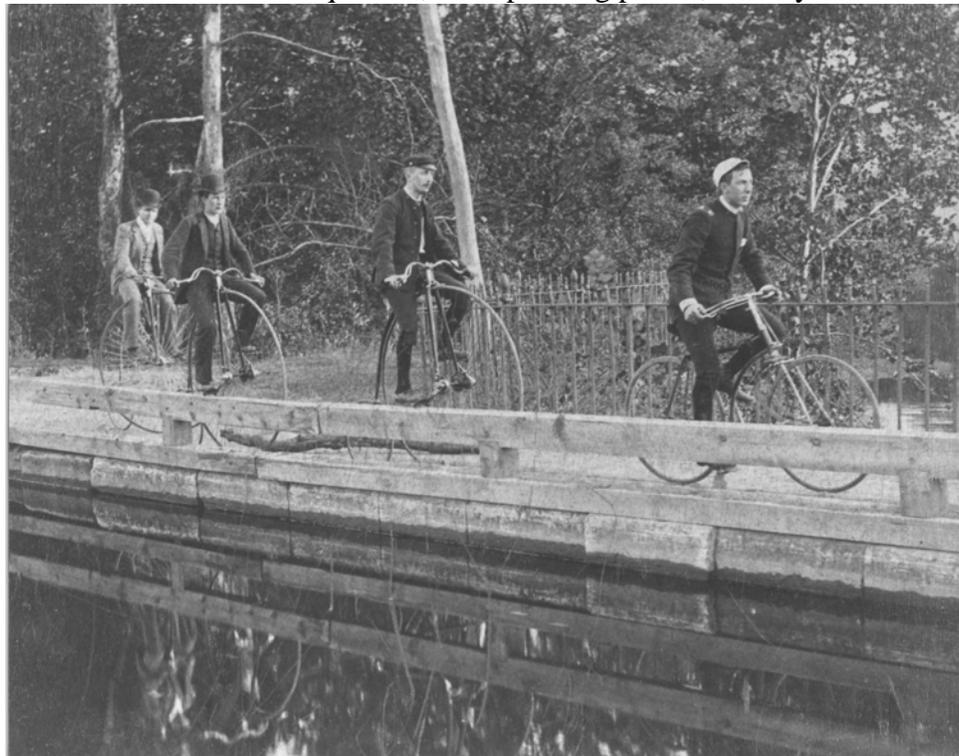
17. Town Creek Aqueduct, downstream (river) side.



18. Evitts Creek Aqueduct, late operating period.
Herman Miller Collection. C&O Canal NHP.



19. Evitts Creek Aqueduct, late operating period, with cyclists.



20. Evitts Creek Aqueduct, berm side, downstream end, 1960.
Photograph by John Boucher. Historic American Buildings Survey Files.



21. Evitts Creek Aqueduct, berm side, upstream end, 1960.
Photograph by John Boucher. Historic American Buildings Survey Files.



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