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REPORT

OF

THE WATERING COMMITTEE,

RELATIVE TO

REPAIRING FAIR MOUNT DAM.

ADDRESSED TO

THE SELECT AND COMMON COUNCILS.

PHILADELPHIA:
LYDIA R. BAILEY, PRINTER.
1841.

REPORT.

To the Presidents and Members of the Select and Common Councils of the City of Philadelphia.

GENTLEMEN:

The Watering Committee beg leave to report on the necessity of Re-building Fair Mount Dam from low-water mark.

This structure was commenced on the 19th of April, 1819, and finished on the 22d of July, 1821. Its repairs for upwards of twenty years have been merely incidental. Its strength has been fully tested, and its durability proven all and more than was anticipated at its construction.

But after giving this subject the most careful examination, supported by the Report of Frederick Erdmann and M. Towers, Esqrs., herewith submitted, and by the opinion of Frederick Graff, Esq.—the Committee are satisfied that the time has arrived, when the interests of the City and adjoining Districts, require that the Dam should be re-built from low-water mark, early next year. It will be seen by the enclosed Report, that the estimated cost will be about sixty thousand dollars.

As the timber necessary for the work should not be cut later than the month of January, the Committee are induced to come to Councils at this early period for

authority to contract for all materials necessary for re-building the dam, and they submit the enclosed draft of a Resolution accordingly.

Resolved, That the Watering Committee be and they are hereby instructed, to contract forthwith for all the materials necessary for Re-building the Fair Mount Dam.

They also beg leave to report, that they had a conference with the Trustees of the Bank of the United States, relative to the purchase of the Lemon-Hill Estate, and were informed, that they would sell the same to the City for one hundred and thirty thousand dollars, and did not feel themselves authorized to dispose of it at private sale for less:

They respectfully submit the matter for the consideration of Councils.

JOHN PRICE WETHERILL,

Chairman.

ATTEST.—SAMUEL W. RUSH,

Register and Secretary.

November 11, 1841.

REPORT OF THE STATE OF THE DAM IN 1839.

To the Select and Common Councils of the City of Philadelphia.

GENTLEMEN:

Agreeably to the Resolution, passed April 11th, authorizing the Watering Committee to solicit the services of Henry Campbell, Daniel Groves, Josiah White, and Frederick Erdmann, Esqrs., to make a regular survey, and to examine the actual condition and stability of the Dam at Fair Mount, I am requested by said Committee to present their Report, agreeably to said Resolution.

JOHN PRICE WETHERILL,
Chairman of Watering Committee.

Philadelphia, September 12th, 1839.

REPORT.

To the Watering Committee of the City of Philadelphia.

GENTLEMEN:

The undersigned, appointed by the Select and Common Councils to examine the Fair Mount Dam, in conjunction with the Superintendent of the Fair Mount Water Works, and under the notice of the Watering Committee, beg leave to report:—

That we have made the examinations as minutely as the high stage of water would permit, and find the general condition of the dam to be sound and substantial, except the sheet-planks on the southern slope or roof of the dam, and some of the timbers in its southern face or breast, ranging between mean high-water mark and the come or top of the dam, which exhibit the only decay that can be observed in any part of the work. This portion of the dam, from its frequent exposure to the atmosphere, by reason of a low stage of water, and liability to injury from freshets and floating ice, will of course be first to fail and to require repairs.

The undersigned do not apprehend danger of immediate failure or necessity of repairs, beyond the replacing of planks, removed from the roof of the dam by freshets or otherwise. The great importance of this work to the City and Districts, however, should prevent any risk of failure for want of timely repairs, and on this account the undersigned recommend that the roof and upper part of the dam, within the triangle above the line *a b* in the annexed Figure 1, be renewed within the years 1840 or 1841. These repairs can readily be made, at small expense, without disturbing the main body of the dam, or causing inconvenience or risk, by renewing sections of one or two hundred feet at a time.

The dam has settled in the deep sections of the river some inches below its original level, by the compression of the timber of which it is constructed, and the great weight it sustains. No danger is to be apprehended from this fact, but it has been necessary to maintain the proper head of water in the dam, by raising the rubble backing above the present come of the dam. This rubble is liable to removal in times of freshets. By the

repairs proposed, the original level of the dam can be restored, and the work rendered permanent and secure for many years to come.

The present shape of the roof, or upper section of the dam, is represented in the accompanying Figure 1. It is suggested by the undersigned to change the form of this section to that represented by the Figure 2. By this change less surface will be exposed to decay in low stages of water, and less liability to accident and violence from ice or other floating bodies passing over the dam.

It may be necessary at some future day to strengthen the dam by additional cribs in front of the present structure, to be filled with stone, and united to the present dam, as suggested by Mr. Frederick Graff, the present engineer of the Works. When this addition is made, it is recommended that the sectional shape, represented in Figure 2, shall be preserved, as preferable to the shape of Figure 1. The undersigned do not deem this precaution necessary now, or so long as the lower timbers remain sound. If constructed now, the operation of decay would commence long before such an addition would be necessary. The undersigned do not deem any general repairs necessary, beyond those suggested, for many years to come.

It does not appear that the dam has sustained any injury from the great ice-freshet of last winter, beyond the removal of a few sheet-planks, which have been left off until the present time to facilitate the present examination.

All of which is respectfully submitted.

H. R. CAMPBELL,
 JOSIAH WHITE,
 DANIEL GROVES,
 F. ERDMANN.

Phila., September 12th, 1839.

Fig. 1.

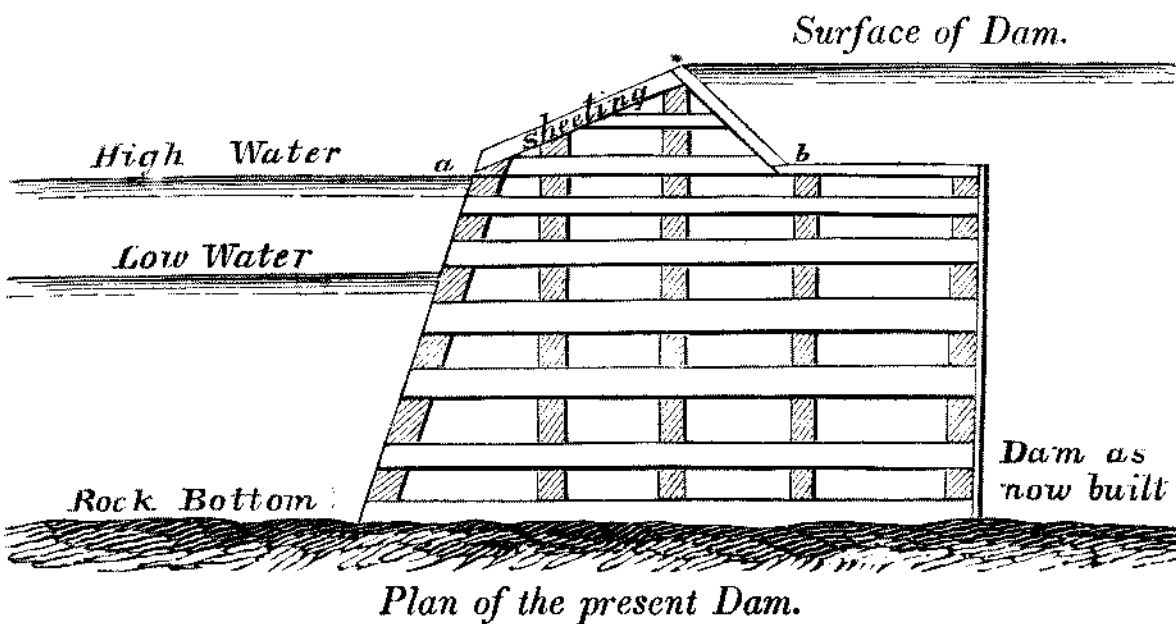
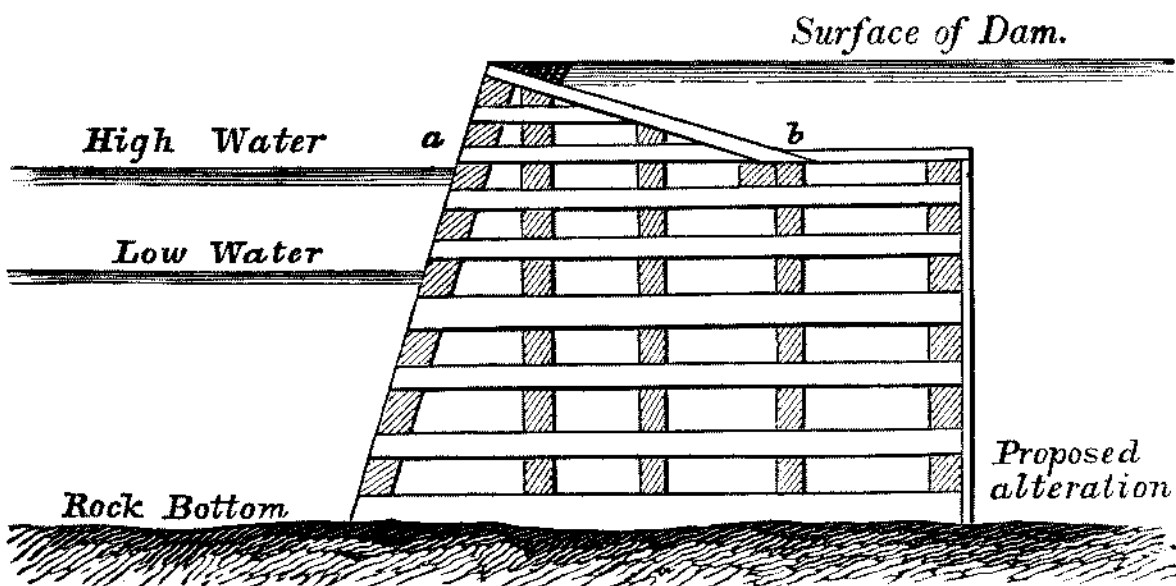


Fig. 2.



Plan approved by Messrs. Erdmann and Towers in their Report.
That part which is coloured they propose to be re-built of white pine timber, with a roofing of white oak.

REPORT OF 1841.

To the Gentlemen of the Watering Committee.

In compliance with your orders to have an examination of the present state of the dam by competent persons, for the purpose of ascertaining the repairs requisite for its being put into a perfect condition, and also to obtain from them an estimate of the probable cost, I appointed Mr. F. Erdmann and Mr. Michael Towers, who have carefully attended to the subject. The questions submitted to those gentlemen, together with their report, are herewith annexed.

In relation to the capacity of these gentlemen, I will observe, that Mr. Erdmann was engaged in the erection of the mill-buildings at Fair Mount, in 1820 and 1821, at which time he planked the front facing of the dam; in 1830, he re-planked the top surface or roof of the dam, which was decayed; since then, he has with other gentlemen made several examinations of its condition; consequently, he is fully acquainted with its structure from its first erection to the present time.

Mr. Towers erected a new dam at Flat-Rock, in 1840, and previously one at Norristown; these, with the successful erection of the new lock at Fair Mount, and other work done for the Schuylkill Navigation Company, give entire satisfaction.

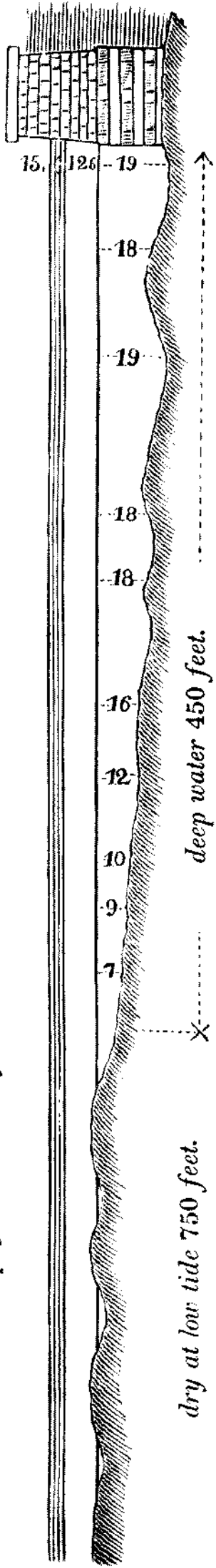
Your humble servant,

FREDERICK GRAFF.

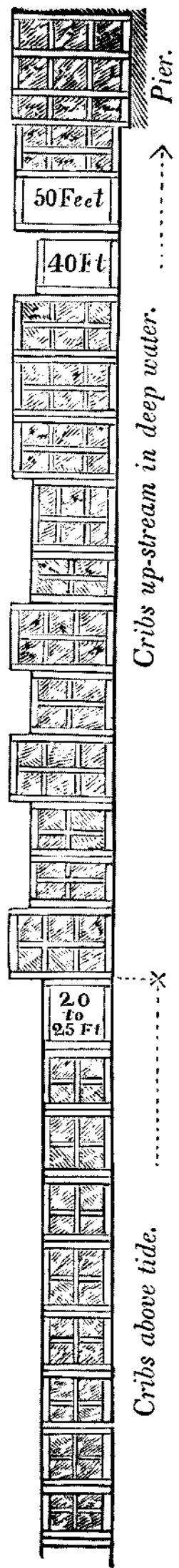
November 3d, 1841.

Top of the Dam 12 feet 6 inches above low tide.

Section.



Plan.



Explanations and Questions handed to Messrs. Erdmann and Towers.

The dam is 1200 feet long, and the whole is built on the rock bottom, 450 feet of which is in deep water; it averages below low-tide about 14 feet 3 inches in depth, and from low-tide to the top or coming of the dam 12 feet 6 inches, making the average height of the dam from bottom to top in deep water, 31 feet 6 inches.

From the deep water line, the dam westward is dry at low-tide, the highest part from the rock bottom is about 12 feet 6 inches, and the lowest about 10 feet, making an average of this part of the dam of 11 feet 3 inches high, and about 750 feet long.

The cribs in the deep sections of the river run up stream varying from 40 to 50 feet, and in the shoal part of the river from 20 to 25 feet. They are built of hemlock, and filled with stone, planked over on the top and up stream front with 3 inches hemlock joist. The whole is then backed and covered over to the top surface of the dam with stone, rubble, and gravel.

The crib-work below the tide, from various examinations, is supposed to be firm and sound; above tide, the timber appears also to be good, say half-tide or 3 feet up; from thence, to the roofing or top of the dam, the timber framing is in a decayed or decaying condition; near the top it is rotten, and has become soft, except where the timber was unusually hearty.

The above is believed to be the true state of the dam, which, with the examinations you have made, will enable you to give an opinion in what manner it can best be repaired or re-built—with an estimate of the probable cost of putting it in perfect order with the best materials.

Also please state the plan you would adopt in case of repairing the old dam; as to the distances or sections that should be done at a time, and the manner of security that would be necessary to guard the work from injury by freshets, when a section would be taken asunder; and what method will be preferable for the western end of the dam, whether to repair the old part, or build a new structure in front of it.

Should you deem any other plan preferable to that of repairing the present dam, you will please suggest it, with the probable cost and manner you would recommend it to be done.

Your early attention to the above will confer a great favour on

Yours, respectfully,

FREDERICK GRAFF.

October 11, 1841.

Philadelphia, Nov. 3d, 1841.

FREDERICK GRAFF, ESQ.

Superintendent of the Philadelphia Water Works.

DEAR SIR:

Agreeable to your request, the undersigned beg leave to return the following in answers to the questions proposed by you in relation to repairing or re-building the Fair Mount Dam.

From our recent examination as well as a prior knowledge of the dam, the undersigned are led to the opinion, that the present superstructure from low-water up to the top, could not be repaired without the erection of coffer-dams, thereby incurring the same expense in pre-

paring for the work as in re-building that portion of the dam; and when finished, should there be any of the old hemlock timber remaining above low-water, it must reasonably be expected, that it will decay long before that in the new work, particularly should it be repaired with a more durable material.

The undersigned believing the dam below the range of low tide to be perfectly sound, they are of the opinion that the only plan which should be pursued, is to rebuild the whole of the dam from low-water up; should that be determined on, the undersigned beg leave to recommend the white pine timber, as being the most durable for all work of the kind above low-water, excepting the sheeting or upper planking, which should be of oak 10 inches thick at the comeing, and reduced to 5 inches at the up-stream end.

The plan of dam as proposed in Figure 2, in the report on the dam of September, 1839, we conceive to be best calculated to preserve the timber, as it presents less surface for decay; we therefore recommend the adoption of that plan when the dam is renewed.

The plan we would recommend for the operation of coffer-daming, is to dam in two sections of 150 feet each, that two sets of hands may work alternately; we are further of the opinion, that 300 feet is as much of the overfall as should be occupied at one time during the progress of the work.

We would propose constructing the coffer-dams of the backing and stone-filling of the present superstructure, by removing the backing up stream, and raising it from 5 to 6 feet above the present height of the water, forming an angle on the down stream side of degrees, to low-water line based upon the rock, and in the deep

water upon the deck of the long cribs, and firmly secured at the bottom with timber, and planking up the angle of the bank, and built in with a slope dry wall of 4 to 5 feet thick, made with the stone in the present superstructure; this would not only make a safe barrier against freshets, but would relieve the work whilst in progress of that material, which can be returned when the new work is ready to receive it.

In relation to the western angle or section of the dam, we are of the opinion, that that portion of the old dam should be let remain, and a new section erected in front of it, and connected with the main line of the dam when it is rebuilt, and also to build an abutment in rear and connected with the old pier; this would be the cheapest and most ready mode of finishing that portion of the work, without interfering with the navigation of the canal.

Should it be deemed necessary at any future period, or on taking down the old dam should any defect be discovered which would require additional security to be given to that portion of the dam remaining below low-water, the undersigned would recommend a range of strong crib-work being sunk in front of the old dam, filled with stone, and decked over with a strong log-sheeting, at low-water, as being the only mode of adding permanent strength to that portion of the dam, as it will always remain sound, and stop the action of the undertow against the face of that part of the old work.

After taking a full and deliberate view of the whole matter, both as regards the importance of security to the City, as well as the necessity of guarding against all failure in the operation of the work, and the cost of the whole, the undersigned believe they have now said all that

is necessary on the subject; and as regards the manner the proposed work should be done, whether by contract for the whole, by measurement as per wharf-builders, or by the day, the undersigned beg leave to say, that the nature of the work does not admit of being measured by any rule of wharf-builders' measurement; and in taking into view the variety of work contracted for in the public improvements of this State, and the amount of bad work done, leads the undersigned to believe, that in the present case, where so much depends on proper management and construction of the work, that it would not be good policy to let it on contract; but are fully satisfied, that all public work done by the day under proper superintendence, has given more satisfaction; we would therefore recommend the latter plan as the best in this particular case.

The whole of which we respectfully submit, together with the following estimate of the cost, which includes all work and materials, except the proposed crib-work in front of the dam below low-water, which amount is \$60,498 36.

Signed,

F. ERDMANN,
MICHAEL TOWERS.

Opinion of Mr. Frederick Erdmann, in relation to delaying the proposed repairs to Fair Mount Dam.

DEAR SIR:

As you have lately examined the state of the Dam at Fair Mount, and know its present condition, allow me to ask if you think it might be relied upon *as it now stands*, for another year?

Yours, respectfully,

FREDERICK GRAFF.

November 9, 1841.

MR. FREDERICK ERDMANN.

FREDERICK GRAFF, ESQ.

DEAR SIR:

On my return this evening in the cars from Schuylkill Haven, I received your note of yesterday. Your question in relation to the dam, is of too much importance to the City to permit me to give an opinion in favour of delaying the repairs. It will require two seasons to accomplish the work after being commenced; a delay of one year in commencing, would leave the last portion of the dam nearly three years standing from the present time (*embracing the breaking-up of two winters*). Permit me therefore, to say, I am of the opinion the repairs should not be left over another year before being commenced. Should, however, it be found on taking down the first section that its situation would warrant delay, it could then be deferred.

I am, with great respect,

Yours, &c.,

F. ERDMANN.

November 10th, 1841.

*To the Watering Committee.**Water Office, Cherry Street, Dec'r. 1, 1841.*

GENTLEMEN:—In answer to the Resolution of the Watering Committee of November 23, requesting me to give an opinion in relation to the present state of the Dam at Fair Mount, and the best manner it could be repaired, I have only to say, I approve of the plan of repairs that has been suggested by Messrs. Erdmann and Towers in their Report of November 3, which has been handed to the Committee, and laid before Councils.

By reference to the printed Reports made by a number of gentlemen on the state of the dam, in September, 1828, one will be found made by me; since that time, my observations on the wear and tear of the structure, have not changed my opinion as to the manner it should be repaired.

In relation to the Report on the Dam made by Messrs. Campbell, White, Groves, and Erdmann, in September, 1839, they recommended what may be considered a partial repair, "which" they say, "can be readily made at a small expense;" but under all considerations, would it be prudent to make such repair, by building as they recommend, "the roof and upper part of the dam" on a hemlock base which has stood exposed to wind and weather between the tides, subject to the freshets, ever since the year 1821? when by a reasonable additional expense and labour in taking down the hemlock face to low-tide, the dam may be made more permanent and secure than it ever was, owing to the old logs having been framed so far asunder as to cause the necessity of planking the front, to prevent the stone-filling from washing out from between them.

Your humble servant,

FREDERICK GRAFF.