

portion of the bank cut off by the connecting wall continued after the connecting wall was built, when the water was withdrawn from the coffer-dam, as any bank would move which had not a sufficient slope.

My reason for mentioning the movement of the bank in the report quoted in the contractors' letter was that the necessity for my acting under the authority given me in clause 172, page 9, of the specification, and requiring the coffer-dam to be filled with water when I did, had been spoken of, and I was desirous of putting on record a fact which, under other circumstances, might have escaped notice.

The fifth clause, which argues that the mention of cribwork as a possible means of forming the inside portion of a coffer-dam is an evidence of the character of the bottom being unknown, appears hardly necessary to be met after what has already been said on that point were it not for the manifest unfairness of such an argument being advanced by any one who was in the least familiar with the locality, or who had studied the specification as the contractors should do.

The reference to cribwork was supposed to apply to the west side of coffer-dam, where abundance of room and comparatively shoal water made such a style of coffer-dam feasible.

The 6th clause says "the present dams have failed because the ground on which they were seated was not firm enough to remain in its place when the counterpoise of the water and of some ten feet of earth under it was removed so near to the base of the dams.

After the coffer-dams had been unwatered, the contractors sunk a pump pit so close to the side of the piles, and in consequence of the piles not being long enough, so near to the point of the piles, that the piles, having practically nothing to support their points naturally came in.

To attribute this to want of experience in building coffer-dams is the least objectionable manner in which I can express it.

On the other portions of the coffer-dams, the points of the shut piles remain where they were driven, except what slight movement has been consequent on their tops being forced in (as represented by photographs already forwarded) for want of any sufficient attempt to keep them out.

In other respects the reply to clause 3rd applies here also.

The 7th, 8th and 9th clauses propose that new dams should be constructed entirely outside the present ones, that they should be constructed of the longest and strongest piles that can reasonably be obtained and driven, that they should depend more upon length and strength of pile, rather than upon width of base, and also upon showing between opposite sides of dam to the fullest extent practicable, &c., &c., and that the old dams will afford very great protection to the inward movement of the new; that the piles should be hewn oak, 45 feet in length and 14 inches deep, driven close, and to stand 6 feet above water (what stage is not mentioned), and to 12 feet below bottom of excavation, and be secured against spreading in the most efficient manner.

In the last clause on the sixth page of the specification for section No. 27, Welland Canal, as form of coffer-dam is outlined and piles "at least 13 inches square" are recommended.

The contractors brought upon the ground culled timber 12 by 12 for piles, some of which were driven, but eventually some better pine timber 12 by 12 was obtained, they now recommend the strongest oak timber 14 inches deep, which comes nearer the "at least 13 inches square" piles recommended by the specification.

The same clause in the specification also recommends a puddle space at least 6 feet wide; the contractors built some portions about 6 feet wide, which have stood fairly, other portions built wider have failed, and they now recommend a puddle space of 7 feet 8 inches, which again comes near to the recommendation. The same clause in the specification also recommends that the sides of the coffer-dam should be mutually supported by "skeleton framework, &c., &c." The contractors were frequently recommended to adopt this method, but did not; they now, however, in clause 7, recommend that that course should be adopted to the fullest extent.