design marked "*Animo et fide*" was accepted, subject to "some very considerable modifications in the details, position, and extent of the several works."

In his report of 30th November, 1877, Mr. Blackett properly described the natural balance of the forces, when undisturbed by heavy floods, as tending to keep the entrance where it was at that time. I may here remark that this is practically the position I have adopted (*see* accompanying Drawing No. 1) as being decidedly the best, having regard to all the circumstances of the case.

Mr. Blackett recommended the construction of a dam from the south bank of the river, so placed as to prevent the water from passing behind Wadeson's Island. He approved of the proposal to construct a training work, nearly a mile in length, on the south side of the channel, extending from a little above Old Racecourse Island to a point about opposite to Brittan Street, considering the necessity for a training work westward of that point as problematical. I fully concur in the proposal to form a dam between the south bank of the river and Wadeson's Island, regarding this as a work of necessity, but would recommend a somewhat different line from that proposed by Mr. Blackett. I am of opinion, however, that such a great length of training work on the south side of the channel is unnecessary. The width of entrance proposed in the accepted design was 726 feet.

At the time of my visit to Hokitika (17th to 19th April of last year), tenders had been invited for certain portions of the then approved works, and I understand that in the latter part of May, the offer of Mr. William Smith, of Kanieri, was accepted. His contract included a training work 1,950 feet long, from the wing-dam opposite Revell Street to the north-east side of the entrance, and a similar work, 800 feet long, on the inside of the spit on the south-west side of the entrance. The contract also comprehended a length of 50 feet at the commencement, or inner end, of each breakwater. The contract amount for these works was £27,593.

As will be seen by reference to Drawing No. 3, the character of construction which I have to put forward for adoption differs materially from that shown upon the contract drawings above referred to.

Recommendations.

The works I have to recommend for the improvement of the entrance at Hokitika are shown by red colour on Drawing No. 1. They have been designed with a view to fixing the outfall permanently in a position about midway between the limits within which the channel has from time to time been formed by the influence of the freshes and wave-action; it is so placed that the whole of the scouring agency due to the tidal and fresh-water discharge may be utilized to the fullest practicable extent in the maintenance of a navigable approach to the river.

Two points which have received my especial attention are, the width of the entrance and the direction in which it should point seaward. With regard to the first, the enormous differences between the discharges in times of flood and under ordinary conditions render the determination of the width at the entrance a matter of unusual difficulty, and one, in fact, upon which it is impossible to pronounce an opinion with absolute certainty. After careful calculation and consideration, I have arrived at the conclusion that a waterway of 600 feet will, on the whole, produce the best results, for, whilst an opening of this size would admit of the discharge of the flood-waters without the creation of such a "gorge" as would unduly scoop out the materials in the bed of the channel, and thereby endanger the stability of the piers, it would, nevertheless, be sufficiently contracted to insure the generation of a current of nearly one mile per hour during a portion of the ebb under ordinary conditions. I should have preferred, had it been practicable, still further to have curtailed the width of the opening. With the data before me as to the enormous occasional flood discharges, I have not considered it prudent to adopt a less width than 600 feet, but if in carrying out the works experience should show that the piers might with safety converge somewhat closer than I have shown in Drawing No. 1, then I would certainly recommend that the entrance be reduced accordingly; the curved lines I have adopted for the guide-piers admit of this being done up to a certain point during progress.

With reference to the second point—namely, as to the direction of the entrance, I am enabled to express a very positive opinion to the effect that it should point seawards west-north-west, as laid down on Drawing No. 1, so as to insure the discharge of the effluent waters practically at right angles to the beach, and directly opposed to the waves impinging on the coast. Experience in similar cases has shown me that no benefit would be derived by any attempt in this instance to shelter the entrance by changing the direction of the piers, or by creating an abnormal overlap of one work by the other.

I now come to a description of the works I have to recommend, the positions of which are indicated on Drawing No 1, and full details of their construction shown on Drawing No. 3.

Commencing at the point *A*, on the north side of the river near the old wing-dam, and extending from thence to *B*, a length of 1,520 feet, I have shown a facing of piling and planking upon the line laid down in a memorandum framed at the time of my visit to Hokitika dated 24th April of last year. [See Appendix.] At the south-west end of the piled facing before described (marked *B* on the plan) I propose to commence an east pier, extending from thence by a curve of 550 feet radius until it attains a length of 660 feet, when it would terminate at the point *C*. This pier would consist of two rows of continuous whole-timber sheeting of squared totara timber, driven close, with cross bulkheads, likewise of close piling, at intervals of 20 feet. The sand and shingle within the compartments thus formed would be excavated to the required depth, and the whole filled in solid and capped with Portland-cement concrete, in the manner shown on Figures 9 and 10, Drawing No. 3. A light would be exhibited from the outer end of this pier, a permanent gangway being provided, as shown, to admit of access by the lightkeeper. On the south-west side the training works would commence at the point *D*, a facing running therefrom on a curve of 400 feet radius to *E*, a distance of 680 feet. For the details of this face see Figures 2 and 3, Drawing No. 3.

From the point *E* to *F*, a length of 500 feet, I propose to construct a western pier, extending in a west-north-west direction, and forming with the east pier before described a permanent entrance of 600 feet in width. This western pier would consist of two rows of round totara piles, with bulkheads 60 feet apart, the main piles carried to 13 feet above high water, and the intermediate piles terminating at about half-tide, above which level the sides of the pier would be planked longitudinally, and the