

It has been suggested that an opening, bridged by a viaduct, might be left between the coast line and the inner end of the western mole, with a view, I presume, of promoting tidal circulation within the area under the lee of the work, and so to prevent silting. A viaduct spanning an opening of this kind would prove a constant trouble and source of anxiety, and would necessitate raising its roadway to a much higher level than would be desirable along the solid work, hence requiring an inclined approach to connect with the road on the mole, and consequently interfering with traffic. Moreover, by dealing with the sand-drift in the manner hereinafter described, the necessity for the opening would be removed; and under the altered conditions it would certainly do more harm than good.

An extension of the west breakwater from *B* to *C* for a length of 1,050 feet in a N.E. by E. direction, in prolongation of the outer arm before described, is shown by red crossed lines on the drawings. The execution of this work in the same manner as the mole shown on the annexed cross-section would form the first instalment of extended harbour accommodation, when the requirements of the port shall have outgrown the facilities which would be afforded by the breakwater and jetties previously described. The second extension, also shown by red crossed lines, should consist of an eastern arm, commencing near high-water mark at the point *D* on Drawing No. 2, about 450 yards to the eastward of Bayly Road, and extending thence in a N.W. by N. direction for a length of 2,430 feet, terminating with a kant, W. by N. $\frac{1}{2}$ N. and 655 feet long, so as to leave an opening or entrance of 500 feet in width, measured to the low-water edge of the harbour slope of the western mole. It will be seen that a most extensive harbour, having an area of 130 acres outside the one fathom contour line, would thus be formed. The shore end from *D* to *E* would consist of a rubble embankment, but from *E* to the outer end, at the point *F*, the work would be formed of blocks of concrete, set as masonry, and adapted for berthing vessels along the inner face.

The following table gives the acreages, depths, and lengths of berthage afforded by this design when fully completed:—

Areas Within the Harbour.

At low-water spring tides	...	...	...	162 acres.
One fathom and upwards at low water	...	...	...	130 "
Two fathoms and upwards at low water	...	...	...	98 "
Three fathoms and upwards at low water	...	...	...	46 "
Four fathoms and upwards at low water	...	...	...	20 "
Five fathoms and upwards at low water	...	...	...	5 $\frac{1}{2}$ "

Berthage.

West breakwater—				
No. 1 jetty	...	...	...	1,000 lineal feet.
No. 2 jetty	...	...	...	1,000 "
No. 3 jetty	...	...	...	1,000 "
				3,000 "
East breakwater pier—				
Inner face, <i>E</i> to <i>F</i>...	...	...	...	1,800 "
Total berthage				4,800 "

Although I have described the works necessary for the full completion of Design A, I have not done so with a view to recommending them for adoption now, nor indeed for many years to come, seeing that their cost would be altogether beyond the sum now available for works at New Plymouth. My object has been merely to indicate the character of the extensions, and the order in which they should be undertaken, as and when required.

Design B.

In the early stages of my consideration of this subject, it appeared to me that some saving in first cost might possibly result from the adoption of a work commencing just to the westward of the whaling station, and extending into 3 fathoms at low water, which, if thoroughly sheltered, would have been sufficient for the accommodation of the local trade, hence it was that Design B was framed, and sections and estimates prepared for comparison with those of Design A.

On Drawing No. 2, Design B is shown by brown colour and lines, the portion which corresponds with the western mole and jetties of Design A being tinted, whilst the extensions are etched. It will be seen that the western arm of this proposal would commence on the foreshore at the north end of Barrett's Road, marked *G*, and extend N. $\frac{1}{2}$ W. for 1,300 feet, thence N.E. by N. $\frac{1}{2}$ N. for 600 feet, and again N.E. $\frac{1}{2}$ E. for 800 feet, making together a work of 2,700 feet from the starting-point. At 100 feet back from the extreme end there would be a jetty 270 feet in length, at a right angle to the protecting work, to prevent "run" or undulation along the harbour face. From *G* to *H* the shore end would be formed of rubble-stone deposited as an embankment, but the remainder, from *H* to *J*, and also the jetty, would consist of blocks formed of Portland-cement concrete, built as masonry, the former being a solid structure set off the end by means of a "Hercules," or special setting machine, whilst the jetty, which would be sheltered, would be formed with main and cross walls filled in with a hearting of rubble-stone. The whole of the masonry face would be available as quayage, alongside which vessels could be berthed. The extensions of Design B should be undertaken simultaneously. They would consist of the prolongation of the outer kant of the western arm from *J* to *K* (on Drawing No. 2) for a length of 200 feet, and the construction of an eastern arm, commencing at the point *L* on the foreshore 300 yards eastward of Bayly Road, proceeding from thence as a rubble embankment in a N.W. by N. direction 1,225 feet, and thence as a masonry work from *M* to *N* in a W. by N. direction for a further length of 700 feet, terminating at a point 300 feet distant from the south-west end of the jetty, so as to form an entrance to the harbour of that width.