

BREAKWATER HARBOUR FROM NAVIGATIONAL STANDPOINT.

At the Breakwater Harbour there are at present two berths at which vessels of 26 ft. draught can be berthed, and also one berth suitable under fair-weather conditions for vessels drawing 18 ft. These berths are protected from the heaviest seas by a breakwater 2,830 ft. in length and having a general height of 6 ft. above high water. To complete the harbour the new works require one new pier for cargo-sheds. Then there is necessary the extension of the breakwater to the Auckland Rock, some 1,500 ft., and the construction of the western mole, about 4,000 ft. in length. There would then be necessary the dredging required to deepen the new berths to, say, 30 ft. This dredging would not be difficult work, and could proceed for the greater part of the year without interruption.

The approach to the Breakwater Harbour does not now require any dredging for vessels drawing 26 ft., nor will the approach require any dredging when the harbour is completed. It may, however, be anticipated that in the future some maintenance dredging would be required on the end of the breakwater.

The navigating witnesses were almost unanimous in the opinion that, when completed, this harbour could be entered with ease at almost any time of the day or night except when heavy weather was being experienced.

SUMMARY OF NAVIGATIONAL EVIDENCE.

Summarizing the navigational evidence as it related to both harbours, we would set out the result as follows: The points to be considered are—

(a) *Practicability of entering either Harbour when completed, at any State of the Tide, under Fair or Moderate Weather Conditions.*—Under this heading the balance of evidence is overwhelmingly in favour of the Breakwater Harbour. The navigating witnesses were almost unanimous in the opinion that in the event of the proposed channel to the Inner Harbour being constructed and dredged to 34 ft. it could only be safely navigated by vessels drawing 26 ft. at high-water slack in moderately calm water and with the assistance of a tug, and that only one vessel could make use of the channel during any one period of slack water. With regard to the breakwater, overseas and coastal vessels drawing up to 26 ft. could make use of low-water slack for entering the harbour, whilst vessels of greater draught could enter as soon as the tide had risen sufficiently, and would not be hindered by tidal currents.

(b) *Practicability of entering or departing from either Harbour (when completed) at Night.*—Under this heading the balance of evidence is overwhelmingly in favour of the Breakwater Harbour.

(c) *Liability of Damage to Vessel or Interference with Working Cargo, due to Range.*—The evidence satisfies us at the present time that the class of vessels using the Inner Harbour are whilst in that harbour less liable to interference by range than are the class of vessels using the Breakwater Harbour while berthed in that harbour. In considering this point it must be remembered that the breakwater is in an unfinished state. Practically all the engineering and navigational witnesses were agreed that when the breakwater is completed out to the Auckland Rock, and the enclosure of the harbour-basin made complete by the building of the western mole, the trouble from range would be very greatly diminished. On the other hand there is strong evidence to the effect that if the entrance channel to the Inner Harbour were widened and deepened as proposed, and the sand-spit (which now forms a natural submarine breakwater) removed, there would be a considerable increase in the amount of range admitted to the Inner Harbour basin. Looking at each harbour as it would be if completed according to these plans, and comparing them in the matter of liability to range, we are of opinion that then the balance of evidence is in favour of the Breakwater Harbour on this point also.

(d) *Shelter afforded to Vessels when berthed.*—Here it is clear that the balance of evidence distinctly favours the Inner Harbour. Of two vessels of equal size safely berthed at, say, the suggested new pier in the Breakwater Harbour on the one hand, or one of the proposed new overseas berths in the Inner Harbour on the other hand, we think it is clear that the vessel in the Inner Harbour would be in more protected surroundings. This advantage in favour of the Inner Harbour must be taken into account, but it is of course obvious that the advantages attaching to a berth within a harbour are not attainable, while the disadvantages of the entrance channel tend to keep vessels out of that harbour. Furthermore, there still remains the question of range, considered in the immediately preceding paragraph.

USE OF TUG.

If a tug is required we are satisfied from the evidence that towage charges will be an appreciable addition to the charges of the port. This question was put to most of the navigating witnesses, and their evidence shows that in regard to the Inner Harbour only one expressed the opinion that a tug would not be required. In relation to the Breakwater Harbour only two witnesses testified that they would require the services of a tug.

INNER OR BREAKWATER HARBOUR FROM ECONOMIC POINT OF VIEW.

Our conclusion on this matter, broadly stated, is that there is a great deal of difference from the economic point of view between the two harbours. The question of the cost of constructing, and the consequential annual interest charge, enters into this aspect of the question, and is dealt with in detail under the next succeeding paragraph, dealing with the question of whether or not the construction of the recommended harbour can be justified. We may say here briefly that we accept and agree with Cullen and Keele's conclusion that the Breakwater Harbour is to be recommended as requiring a smaller initial capital outlay and a smaller annual cost of maintenance. As to those economic considerations that are based on or related to such factors as transport facilities and the proximity of shore adjuncts, the balance of advantage lies at the present time in favour of the Inner