

Overlap of Breakwater.—Sir John Coode intended that the south breakwater should overlap the north one by 120ft. only. The overlap at present is 500ft., and the Board has decided to increase it to 1,000ft. Sir John Coode intended the width between the breakwaters to be 400ft., they are constructed at 450ft. at low-water line, and are found to be dangerously narrow for steamers coming in with a heavy swell. The great overlap of the south over the north end of the breakwaters was suggested by shipmasters as a remedy for the difficulties of entering the river in rough weather. I should not have thought that this overlap would improve the depth on the bar, and I shall watch the result with much interest, if, however, it causes any serious shoaling of the entrance, the north breakwater must also be extended, and the entrance will then be in a better position than it is now, as the further seaward the breakwaters are the greater will be the average depth of the entrance. One effect of the projection of the south breakwater beyond the north one is seen in the considerably greater depth which the section taken across from wall to wall at the end of north wall has over the section taken from the end of south wall square across towards the north. The contour-lines I have drawn from my soundings show these effects very plainly, and I think it would be useful as a guide in future operations if a thorough marine survey were made from time to time of the water all round outside the breakwaters.

Depth of Bar.—In spite of the long absence of floods, I find that the depth of water on the bar not only holds its own, but continually improves. The following table shows that in 1881 the usual depths were from 10ft. to 13ft.; in 1891, the usual depths were 16ft. to 23ft. at low-water spring-tides, and 1891–92 shows a slight improvement over 1890–91.

TABLE showing the Number of Days each Year the Available Depths for Navigation at High-water Spring-tides over the Greymouth Bar have been as under for Twelve Years ending the 31st March, 1892.

	1880-1	1881-2	1882-3	1883-4	1884-5	1885-6	1886-7	1887-8	1888-9	1889-90	1890-1	1891-2
Under 10ft.	165	130	16	27	13	14			..			
10ft., under 12ft.	140	143	78	85	44	75	5					
12ft., " 14ft.	57	90	230	134	144	91	57	6	1	..		
14ft., " 16ft.	3	2	40	100	124	119	230	108	11	44	20	13
16ft., " 18ft.			1	30	40	64	65	105	60	92	59	51
18ft., " 20ft.						2	8	119	146	133	94	123
20ft., " 22ft.								28	99	69	88	112
22ft., " 24ft.			..						33	27	80	49
24ft. and over.									15		24	18

Cost of Works.—The expenditure on the Greymouth Harbour works is so mixed up with the expenditure by the Public Works Department that it is difficult to ascertain the total cost of the works. The cost incurred by the Harbour Board on account of harbour-works from 1884 to 1892 is as follows :—

	£
North breakwater	45,719
South breakwaker	56,236
Training-walls	21,575
Wharves	26,931
Dredging ..	6,570
Raising flood-wall ..	1,232
Plant ..	11,989
Brunner Railway and rolling-stock	20,773
Cobden Bridge	1,079
Land	2,242
Office and furniture ..	2,227
Sundries	1,550
	£198,123

Work still to be done.—The works remaining to be done consist of extending the south breakwater 500ft., the extension of the Coal Creek training-wall which I have recommended, dredging to an uncertain amount, but as may be necessary from time to time, a cradle to repair the dredging-plant, and the cost of supervision. Sir John Coode's plan shows extension of the training-bank above the bridge, but the construction of the bridge has entirely altered the circumstances under which his plan was designed, and I do not see the necessity for any works above the bridge.

List of works yet to be done—	£
Extension of south breakwater (500ft.)	26,532
Extension of Coal Creek training-wall	4,200
Dredging (say)	4,000
Dredging in channel to Karoro Lagoon	4,180
Cradle for repairing plant	300
Supervision and contingencies ..	1,758
	£40,970

The total cost of the works when completed will therefore be £239,093. From this must be deducted the sum paid towards improvements and extra rolling-stock on the Brunner Railway,