

channel at present in use by steamers. If the floating-basin is to be carried out, this training-wall is necessary to keep the deep-water channel near the basin and divert it from its present position on the opposite side of the river

*New Beacon Channel.*—Consequently the new channel must be dredged before the training-wall is erected, so as not to interrupt the traffic by building the wall across the channel at present in use, which lies close alongside the west breakwater. This new channel would have to be cut through a shallow shingle-bank on which the boulders and gravel are so packed that I doubt if the natural scour would have much effect until it was dredged.

*Dredging to be carried on.*—The dredging for this proposed channel of 250ft. wide, extending from the upper wharf to the west breakwater, should, I think, be commenced at once, and carried on simultaneously with the construction of the training-wall, for the reason that the channel is wanted now, and it is impossible to tell whether the training-wall will do the work by scour without the assistance of dredging. The construction of the training-wall will take about two years, and it would not do to wait until it is finished to see what effect it will have on the navigable channel.

*Cost of Dredging.*—Under this proposition the total amount of dredging to be done would apparently be about 314,000 cubic yards, and the cost would be about £14,500. It is found, however, that when the hard surface is removed the effect of floods is to scour away the sand and small gravel, so that a portion of the above estimated quantity will probably be removed by scour. Your Engineer is at present dredging a channel along the berthage of staiths and wharf, which is to be 18ft. deep at low water for a width of 70ft. from the line of the wharves, and 10ft. deep for a width of 210ft. from the line of wharves. This will be a very serviceable channel for steamers to lie and turn in, and is much wanted at the present time. It would also form part of the total dredging-work suggested above.

*Branch Line for Construction.*—To build the training-wall it is necessary to make a branch line of railway from the main-quarry line to the training-wall. This branch was commenced by your late Engineer, Mr F W Martin. It leaves the main line 30 chains from the Buller Bridge, and, curving round, crosses the by-wash of the river above Martin's Island. The by-wash is crossed by twenty-eight spans of 13ft. each.

*Blocked by Driftwood.*—This is subject to the inconvenience of being blocked with driftwood brought down by floods.

*Claims for Damage.*—Mr. John Martin, who owns the island, has set up a claim for damages, on the alleged ground that the work has caused part of his land to be washed away. I could not see any reason for this claim, as the head of his island has been washing away by every flood for many years, and the branch line across the by-wash should, when completed, rather have the effect of protecting the head of his island than of assisting to damage it. The blocking of the bridge over the by-wash by drift-timber is an inconvenience that must be endured. In any case it is a trifle that is easily remedied after every flood, and will be to some extent abated when the training-wall is carried past the opening, as it will arrest or divert down the main river most of the driftwood. It is now seen, however, that it would have been better to have laid out the branch line along the bank of the river above the by-wash, and not cross it at all, and so avoid the inconvenience caused by the floods and the plea for damage set up by Mr Martin.

*Extension of Wharves.*—On the subject of further extension of the merchandise wharf, I am informed that your Board can do nothing without the concurrence of the Railway Commissioners, to whose approval all plans are subject, and who, I understand, insist on making their own plans for all extensions. Under such circumstances it is to be hoped that your Board may always see its way to agreeing with the proposals of the Commissioners for works which the Board find the money for. Your Engineer has prepared a plan for extending the merchandise wharf as far as the staiths. The necessity for this extension has long been felt, and the Board gave me instructions to prepare plans for its construction in 1886.

*Cost of It.*—The estimated cost of this extension is £5,100.

*Loading Coal by 25-ton Crane.*—Besides being of use for the traffic of merchandise, which requires more room than is afforded by the present wharf, it would be practical to load coal from it by the 25-ton cranes, the present goods-sheds being shifted to allow of the necessary siding. The loading of coal from this extension would offer no more inconvenience than is experienced at Greymouth, where all coal-trains traverse the passenger-wharves.

*Capabilities of 25-ton Cranes.*—Your Engineer has given me an estimate of the capabilities of the 25-ton cranes for loading coal, taken from its performance on stone, from which it appears that each crane can load into ships about 100 tons per hour, at a cost, including crane expenses, attendance, shunting, interest, and depreciation, of 2d. per ton of coal loaded.

*Capabilities of Hydraulic Cranes.*—According to Mr Rawson, the Engineer to the Board, the hydraulic cranes at Greymouth load coal at a cost, for working-expenses, with interest and depreciation, of 2½d. per ton. When, however, a number of cranes are worked at once this cost would be less—probably about 2d. per ton of coal. Under favourable circumstances the hydraulic cranes can load 100 tons per hour.

*Capabilities of Staiths.*—The loading-capacity of the staiths is about 250 tons per hour at the upper shoots, when the rest of the staiths is occupied by a train of coal for these shoots only, but the average performance is a little over 100 tons per hour, varying, however with the size of the ship and the height of the tide. The cost, including handling, shunting, interest, and depreciation, is about 2¾d. per ton of coal for 100 tons per hour, but less per ton of coal if more than 100 tons per hour is loaded.

*Steam-crane loads cheapest.*—The above figures go to prove that the steam-crane is at least as economical as the staiths or the hydraulic cranes, which is possible, seeing how much cheaper it is than either of the other two.