

The port is situated at the mouth of the Jacob's River, and may be described as a small bar harbour. Vessels drawing from 9 to 10 feet can freely enter at high water.

Regarded as a small harbour, the port is in all respects very good indeed. The bar is protected from prevailing winds by Howard Point and several outlying islands, under the shelter of which vessels can anchor while waiting for water to take the bar. Once inside, there is a considerable basin where vessels can lie, but, as it is a short distance below the business part of the town, it is not much used; there is another smaller basin opposite the town, which is not large enough for more than one or two small craft to lie in without grounding at low water, and they have to swing on two anchors; still, this is, on account of its nearness to the town, the ground usually chosen for anchoring.

In its present state the port is capable of accommodating a very considerable trade, certainly very much larger than it has at present or is likely to have for some years. It was, when I visited it, very deficient in wharf accommodation, as there was only one small jetty, and this was placed at a part of the river which was nearly dry at low water, so that vessels could only come up to or leave the jetty on the top of the tide; a very serious inconvenience, which has, I believe, done more to injure the reputation of the port than all other causes combined. I believe the Provincial Government have since built a jetty in deep water.

There would be no engineering difficulty in considerably improving the port. A solid pier run out from the east bank of the river would be required so as to guide the flood and tide waters, and give them greater power to act on the bar than they have at present. In the absence of plans showing the depth of water in the roadstead outside the bar, any estimate of the additional depth of water which would be gained by this means must be taken as only approximate, but I believe  $2\frac{1}{2}$  feet to 3 feet would be gained.

There would be very little use in getting this extra depth on the bar unless at the same time the interior of the harbour were improved. The effect of the greater depth would be to increase the height of the waves which would enter the harbour, and the lower basin would become on this account less serviceable than it is at present, while the upper basin is too small even for ships of the size now using the port. A new basin would therefore have to be dredged, and this could only be done above the bridge on the west side of the lake, and out of the reach of shingle brought down by Jacob's River. There is already a considerable depth of water at this point, and the necessary amount of dredging would not be great. I have, however, no plans showing the depth of water. The cost of the improvements suggested would be about £25,000, as nearly as I can estimate in the absence of proper surveys.

The Hon. the Minister for Public Works.

JOHN CARRUTHERS,  
Engineer-in-Chief.

## Enclosure No. 2.

REPORT ON SURVEY OF RAILWAY LINE, FOXHILL TO BRUNNERTON, BY MR. J. ROCHFORD.

Mr. J. ROCHFORD, Engineer, to the ENGINEER-IN-CHIEF.

SIR,—

Wellington, 1st August, 1874.

I have the honor to report on the Foxhill and Brunnerton trial railway survey, plans and estimates of which I recently handed to you.

The line is  $142\frac{3}{4}$  miles in length, and the whole distance from Nelson to Greymouth, including the two ends in course of construction, is about 168 miles. This line is unusually costly, owing partly to the difficulty of getting out of the Waimea into the Buller, and partly to the great height to which the floods rise in the latter river (60 feet); the effect of which is to magnify insignificant gullies into obstacles requiring high and costly viaducts, and many short tunnels. On a more detailed survey, doubtless these features may be lessened. Speaking roughly, one-half the distance is favourable for railway work.

On leaving the Waimea, Spooner's Range is crossed by a rather steep grade, and a tunnel 997 yards in length (through gravel); thence down Norris' Gully, and, crossing the Motueka about a mile above its confluence with the Motupiko River, follows up the last river to the Clarke; thence up the Clarke, and through the low range dividing it from the Hope by another tunnel (also through gravel), 663 yards long; thence down the Hope to the Buller. The line then follows down the north side of the Buller to a mile above the confluence of the Mangles. Here the Buller is crossed, and the line continued down the south side to the Inangahua River; thence up the eastern side of the latter nearly to Reefton. The Inangahua is crossed here, and the line runs through the valley now traversed by the coach road, and crosses the watershed by a tunnel 345 yards long (gravel) into a branch of the Mawhera-iti, and crosses the Grey River just above its junction with the Little Grey; thence along Totara Flat, and, skirting the high terrace beyond, crosses the Ahaura River near the present ferry. The line still runs along the lower flat, and skirts the terrace nearly to Nelson Creek, where it passes over a low terrace, and then follows near the present line of road to Brunnerton.

The route was chosen *via* the Hope for the following reasons:—The distance is about 19 miles shorter than by way of the Wai-iti, Roundell, and Upper Buller Valley. The proposed line falls into the Buller Valley at the mouth of the Hope, thereby avoiding 5 miles of extremely difficult and expensive country, known by the name of "The Devil's Grip." This portion consists of a steep hill face, with sharp bays and points, falling abruptly into the Buller; much of this would have to be put into tunnel. It has long been shunned, though badly wanted, for a dray road; excepting this the Buller Valley above is open, and favourable for railway construction.

A third objection is, that between the Wai-iti and Roundell the Motueka River has to be crossed. The line would first have to descend into it from the watershed of the Wai-iti, and then have to rise to the level of the country approaching the Roundell; the depth of the Motueka being about