

At 57½ miles the line commences to ascend by a 1 in 50 grade to 59½ miles, and then by a flatter grade to the saddle in the Tangarakau Range at 60½ miles.

At 57½ miles the line enters a small creek-gorge, which rises rapidly to 59½ miles, the sides being very steep, which will make the work heavy.

From 59½ to 60½ miles the creek runs slowly, the sides being much flatter, and the work of construction will consequently be very much easier. In consequence of the creek falling so slowly at the top, it will be impossible to cut off any more of the rise than can be done by a cutting.

From 60½ to 63½ miles the descent into the Eao Valley occurs by a 1 in 50 grade. The work of construction along this grade will be very heavy.

From 63½ to 66½ miles the line passes up the Eao Valley with easy grades and work to a saddle at the head of the Mahorahora; it then descends by a 1 in 50 grade, with moderate work, to the Mangaroa Valley at 68½ miles (this grade may probably be flattened); then up the Mangaroa Valley to 72 miles; then crossing into the Ohura Valley on a very low saddle with an easy grade; then up the Ohura and Waikaka valleys to 85 miles with easy grades. The work of construction to 81 miles will be easy, then to 83 miles it will be a little heavier, and from 83 to 85 miles it will be heavy, requiring a short tunnel at 84 miles to cut off a bend in the river. Between 85 and 87½ miles the ascent to the saddle in the Wanganui-Mokau watershed is made by a 1 in 50 grade, the work of construction being moderate.

From 87½ to 91½ miles the line descends by a 1 in 50 grade. The work of construction along this grade will be very heavy, including one tunnel 10 chains long through a cross spur: in fact, I consider this the worst portion of the whole line.

Before proceeding further, I might state that, from a view I had of the country, I think the line between 63 and 71 miles may be straightened considerably. I was unable to examine this part as thoroughly as I wished, on account of provisions running short.

From 91½ to 93½ miles the line passes over open flat country, the construction-works required being easy.

Between 94½ and 97½ miles the line rises by a 1 in 50 grade, and descends by a 1 in 55 grade to cross the low hills between the Mokau-iti and Mokau rivers; work moderate.

From 97½ to 109½ miles the line runs up the Mokau Valley, with flat grades and easy work, the large bends in the river being cut off by passing over saddles in the low hills in the valley.

Between 109½ and 112 miles the line descends by a 1 in 50 grade into the Mangapu Valley. Two lines for this grade are shown on the plan, as a trial line must be run on both to decide which is the better. The work on both will be very heavy on account of steep sidelings, cross gullies, and tunnel.

From 112 to 123 miles the line follows down the Mangapu Valley to Mr. Rochfort's line near the confluence of the Mangapu and Mangakewa creeks; work easy.

The Tangarakau Range, which is crossed by the line at 60½ miles, extends from thence in a northerly and south-westerly direction, the country towards the east being a great deal lower than that towards the west. The country on east side consists of valleys varying in width from 20 to 100 chains, with low hills on each side varying in height from 200ft. to about 400ft.; while the Tangarakau Range stands out like a wall, the top being very straight, with very few peaks, and reaches an extreme elevation of about 1,100ft. above the Ohura Valley. The valleys narrow in again at about 83 miles, near where the line commences to ascend to the saddle in a branch of the Tangarakau Range, which forms the Mokau-Wanganui watershed, and continues narrow to 90 miles; there being no flat land in them: the hills on each side are very steep.

At 90 miles the line is in open country, comparatively flat, which is drained by the Hinoteko, a tributary of the Mokau-iti: both these rivers are crossed at about 94 miles, they being situated very close together. From there to 100 miles, in crossing from the Mokau-iti to the Mokau, the country is rather broken.

From 100 miles to Te Awamutu the valleys are altogether wider, and covered (with very few exceptions) with dense fern. At 94 miles the line enters the limestone country. This stone will form a suitable material for building culverts, as slabs varying in thickness from 1 to 6 inches can be obtained without any quarrying or dressing, which would suit well for the floors and roofs of 9in. to 18in. drains.

The Wairere Falls, in the Mokau River, near 98 miles, are formed by a mass of stone of the same description as that in the hills round Wellington: this is covered above the river-level with a cap of limestone horizontally stratified.

A seam of coal, about 5ft. thick, is exposed to view on each side of the Tangarakau River at 55 miles, and is similar in character to that now being worked about twenty-four miles from the sea up the Mokau River.

The maximum length of the bridge required to cross any of the rivers, on the square, will be 80ft., with the usual end-spans according to height of approaches.

Before finally adopting this line, I consider it advisable to explore the country to find whether a line could be run from 42 miles in an easterly direction to the Eao, and up that river until the line already explored is reached: this would avoid the rough and valueless country in the Tangarakau Gorge, and would open more effectively the good country said to exist in the lower part of the Eao Valley. This line was not examined because time was short, and, having found a practicable route, I did not consider it advisable to waste time and money in trying to improve the line already obtained, as it could be done to better advantage while running the trial line.

From 61 to 74 miles an alternative line was explored as shown on plan, which is not an improvement, as it runs out of the direction, and lengthens the line, and is no saving in cost.

A line was also explored from 77 miles up the Ohura Valley, across a very low saddle, to join Mr. Rochfort's line in the Ongarue Valley. The grades would be easy to the saddle; from thence a drop of 200ft. occurs, which would require a 1 in 50 grade. At 87 miles this