

From his report I gather that the most serious engineering difficulties exist between the Mohaka and the table land of Taupo, consisting of a deep gorge 15 miles in length, with precipitous rocky sides, which for six miles are covered with bush.

The avoidance of this gorge could be secured by carrying the road at a higher level; but it appears this course would necessitate the introduction of steep gradients, and, from the needfulness of heading the numerous side streams, materially lengthen the road.

There only remains to consider the track by Pohue and the Waipunga Valley, along which the telegraph is erected, and the various Constabulary stations established.

This line is practicable for drays to Titiokura, and no striking difficulties are met with up to Oruakaka, about one mile past Tarawera, to which place a bullock dray has been driven. The Mohaka is the only river to be crossed, and it is spanned by a wire cable, on which a self-acting canoe works, convertible at a small expense into a punt capable of ferrying over drays, should occasion demand. The distance from Titiokura to Tarawera is about 20 miles, and the works principally required are a few small bridges, some three miles of bush clearing, and with one exception shallow sidings—the exception is at the Mohaka, where the approach to the ferry will involve a heavy cutting for a length of about a half mile.

The best approach to Titiokura from Napier is, in my opinion, along the line diverging from the road near Puketapu, passing Warerangi thence along the low easy sloped range which separates the Mangaone and Mangakopikopiko Streams to Rongomaipapa, then joining the dray road from Petane, which, with some inconsiderable improvements and minor deviations, would be generally followed to Titiokura.

The advantages this line offers over those of either Petane or Peka Peka and Inangatahi are palpable. In the former instance the crossing of the harbour (which in the absence of a bridge is a drawback) is avoided, as well as the very many fords of the Petane River.

The unsuitableness of the Inangatahi route I discovered on a recent occasion when exploring that stream.

I have also inspected the Peka Peka route, with a view to cross from Waipuna to Pohue. The Mangaone gulch, however, forms an insurmountable barrier to the formation of a dray road by this line, and cannot be successfully dealt with except by the erection of a suspension bridge of long span. This road is used by the Commissariat contractors, who, with the aid of a small subsidy, have made it passable for drays from Waipuna to Mangaone, from which place they pack.

The work already executed has been of great utility to the transport, and the contractors have it in contemplation to sling their goods across by means of wire cable stretched over the chasm.

Reverting to the road beyond Titiokura; the three miles of bush mentioned extends from Te Haroto to Te Purupuru. Between these places a deviation has been surveyed which shortens the track about a mile, and overcomes what was formerly considered to be one of the great objections to the Waipunga route, viz., the hill Turangakumu. The deviation is laid out along an even ridge, and descends Turangakumu by inclines and curves practicable for drays. At present a bridle-track only is constructed in the open portions, but arrangements have been made with the native owners of the land for the construction of the bush portion. The sections of road which have hitherto been constructed, although at present only passable for pack-animals, are so laid out that by simply widening they become convertible into dray-tracks.

The portion of the Waipunga route offering the greatest difficulty lies between Tarawera and Runanga (the commencement of the plains). Between these places must be encountered the same belt of broken country which obstructs the Ripia route, with the difference that on the Waipunga line the obstacle is less, the total length of rough country intervening being only about eight miles, four of which are wooded. The heaviest expenditure on the whole route will be incurred in getting over this section with a dray road.

To add to the complexity of the matter, no less than three alternative routes present themselves, each possessing advantages and disadvantages so evenly balanced that without track lines cut through no approximate estimate of cost can be made.

The three alternatives just named are divergent from a point near Tarawera, and the course of each is delineated on the sketch accompanying this report.

The first of the alternative lines crosses the Waipunga about one and a half miles north of Tarawera Fort. At this crossing is required a bridge of 100 feet span, at a sufficiently high level to be clear of snags and trees in time of floods. The line keeps then the left bank of the river, and courses near the present bridle-track for a distance of seven to eight miles, crossing transversely the numerous deep side streams and rivulets feeding the Waipunga.

Near Runanga the river is re-crossed at a place where a second bridge is requisite of 35 feet span.

The chief drawbacks to the line by the present track are the inclines, which are unavoidably steep and severe, and, although answering for a bridle-track, would be impracticable for drays.

To secure gradients of less inclination, heavy cuttings through basalt rock become necessary.

A number of lines, deviating from the track in what I considered the worst places, have been cut, in order, if possible, to utilise the present track, but none prove practicable except at great cost.

The next line is that keeping on the proper right bank of the Waipunga, and of which I have made an examination and sketch.

A line was commenced on this side, contouring the hills on an easy gradient, with a view of constructing a bridle track to be afterwards converted into a dray road; on a more minute survey it was discovered that the side streams run much further back than on first inspection appeared likely, and it was deemed advisable to suspend operations, pending the examination of a third route up the Waipunga Gorge itself, suggested by Mr. Rochfort, the Provincial Engineer, with whom I considered it necessary to solicit a consultation on this important question.

Without doubt, the easiest gradients could be procured by following up this line, but at what expense