

Careful consideration convinced me that the valley of the Otara, which leads from near Motu to Opotiki in a comparatively direct course, offered the fewest objections and certainly the shortest distance, and I determined to explore and examine in some detail a route leading from Motu to the nearest head of the Pakihi, which, by its junction with the Waiti, forms the Otara. I therefore moved my camp to Motu, and explored the ridge to the west of the valley, eventually fixing on the Hiwi Marie saddle as the most suitable crossing-place.

This saddle is about 2,180 ft. above the sea, and it would be quite possible to grade upwards from the Motu and top this ridge without a tunnel; but, as that would entail two miles more of length of line, I do not advise it. The tunnel, of which I append a section, is only 14·2 chains long, and it saves a height of 210 ft. The grade from the Motu to this saddle is 1 in 56.

The down-grade towards Opotiki is of very much the same character as Section 2 of the Wharekopae—Ruatahuna route; some parts are very precipitous, and the branch ravines close and narrow, as before described. This down-grade is equivalent to an average of 1 in 60 for a length of twenty miles from Hiwi Marie to Parekowhai. The total length of the line I estimate at ninety-eight miles, being fourteen miles shorter than the Gisborne—Opotiki Road. For comparison with the other route, the length from Opotiki to Rotorua may be taken as eighty-five miles, making 183 miles *via* Opotiki as against 180 by the Urewera country.

The route is shown on the accompanying sheet No. 5 of the published maps, along with the Urewera route. The same conditions as to curvature exist on this line as described for the other, and apply particularly to the length between Poututu to the entrance on the Opotiki flats, a distance of about sixty miles.

A diagrammatic section appended shows a most favourable comparison, from an engineering point of view, with the other route. The summit height is 1,000 ft. lower, and there are only 14 chains of tunnelling through main ridges, as against 74 chains in the other case.

The country from Gisborne right up to the summit, at forty-eight miles, is of papa and limestone formation. The papa slopes seem here to be, in a degree more than usual, given to slipping. This extends as far up as the crossing of the Rangiriri; above that, and to the summit, the ground is more stable, and the harder limestone is found. Although no calcareous formation was observed north of the main summit, the country there seems to be as rich in grass as on the southern side. At Motu the valley attains a width of several miles, and there is scope for large settlement west of the river and up its valley to the southward. The bush is of the ordinary mixed character, principally tawa. The soil is chocolate-coloured, heavy, and moist. The rocks of Hiwi Marie ridge and down the Pakihi and Otara are clay-slate, loose on the surface, and in all respects similar to those in the Okahu and Whirinaki Valleys on the other route.

Comparing the amount of settled country traversed by the two routes, the existing traffic, and the possibilities of future settlement, there seems to be as great a preponderance in favour of the Opotiki route on commercial and social grounds as there is in engineering.

Appended is a tabulated list of bridges on this route, including, so far as I know, all waterways requiring more than 10 ft. span.

Trusting the above particulars, as the result of my investigations, will meet the present requirements of the Government.

The Under-Secretary, Public Works.

I have, &c.,

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ABSTRACT OF BRIDGES ABOVE 10 FT. OF WATERWAY.—WHAREKOPAE—RUATAHUNA ROUTE.

Bridges.	Spans.		Total Length.	
	No.	Length.	Beam.	Truss.
		Ft.	Ft.	Ft.
Sundry, eight	24	20	480	...
" four	24	20	480	...
Waipaoa	6	80	...	480
"	6	20	120	...
Waikohu	4	60	...	240
"	4	20	80	...
Totangi	1	40	...	40
"	2	20	40	...
Ngutuwera	3	80	...	240
"	2	60	...	120
"	4	40	...	160
Anini	1	80	...	80
"	6	20	120	...
Owhakarotu	1	40	...	40
"	4	20	80	...
Mimiha	3	20	60	...
Rangitaiki	1	80	...	80
"	2	60	...	120
"	2	40	...	80
Mangakokonoku	3	20	60	...
In Waipa Valley	9	20	180	...
Puarenga	6	20	120	...
Totals			1,820	1,680