

EXHIBIT No. 3.

NORTH AUCKLAND RAILWAY.—SURVEY OF ALTERNATIVE LINE NEAR WAIKIEKIE.

Public Works Office, Whangarei, 9th May, 1911.

Memorandum for Resident Engineer, Public Works, Whangarei.

THE alternative route leaves the western trial survey at 5 miles 4,417.2 (Norris's mileage from McCarroll's) and joins the same survey again at 18 miles 6,805.0. The route is as follows: Otamatea County—Block III, Matakoho, Sections 22, 21, 20, 28, 93; Whangarei County—Block XV, Tangihua, Sections 63, 1, 59, 60, 49, 58, 57, 54, 55, 56, 13, 16, 14; Block XIV, Tangihua, Sections 14, 15, 17, 21, 18, 19, 20, 163, 87, 88; Block X, Tangihua, Sections 88, 96, 94, 93; Block VII, Tangihua, Sections 92, 144 (E.R.), 143 (E.R.), 2A; Hobson County—Block VII, Tangihua, Sections 1A, 3; Block XII, Maungaru, Section 3, joining Norris's survey on eastern side of Tauroa River.

Taking the survey of "alternative" mile by mile as marked on lithograph, the first mile is on a grade of 1 in 60 to saddle at road, with 20-ft. cutting on top, easy sidling, with light formation, and curves of radius 12 chains. The second mile is on grade of 1 in 50 on steeper sidling, and fairly heavy work, with a good limestone quarry having about 150,000 cubic yards of stone in sight at 2 miles. The third mile has also some 1-in-50 grade from creek crossing up to tunnel-site, with fairly heavy sidling-work and 12-chains-radius curves. At about $3\frac{1}{4}$ miles, at road, a tunnel of 12 chains is required through ridge: the country will probably be sandstone in tunnel, and the ridge is wet and may slip. The fourth mile is on a grade of 1 in 50, along easier sidling, with similar curves. The fifth mile is still on 1-in-50 grade on similar ground for half-way, with room for a station-ground near junction of roads at about 5 miles, also allowing a line to run off towards Whangarei as indicated by line running towards the north-east on lithograph. The sixth and seventh miles are heavy, running along steep gullies on 1-in-50 grades with a tunnel of 22 chains through ridge at Tokatoka Road near 6 miles 30 chains. The eighth mile is still on 1-in-50 grade, and will require perhaps 9-chains-radius curves in steep country. The ninth mile is partly on 1-in-50 grade with heavy work and sharp curves, and partly on the easier country with 1-in-70 grade and lighter work. The tenth mile is on easy country, with room for a station-yard on south side of Tauraroa River. A bridge of 120 ft. in length will probably do for river here, with a four-span bridge, 80 ft. long, for the Piki Wahine Stream. The eleventh mile is in heavy work on a 1-in-50 grade. The twelfth mile is particularly heavy, with a short tunnel of 8 chains at $11\frac{1}{4}$ miles. The thirteenth mile is easy work on easy grade. The first $1\frac{1}{2}$ miles are on sandstone country, good grazing; from $1\frac{1}{2}$ to 3 miles the country is limestone and still good grazing; from 3 to 12 miles the line is on sandstone, and very good grazing, especially from 6 to 12 miles; from 12 to 13 miles is first-class grazing-country, with a lot of river-flat good for cultivation.

The length of the line is apparently identical with western line as surveyed by Mr. Norris. The length of 1-in-50 grading is greater than that on western line, the valleys being shorter and apparently steeper. The tunnelling is longer than on Norris's line. The formation will be somewhat similar to Norris's corresponding length, perhaps a little heavier; the bridging should be similar to that on Norris's line, perhaps shorter; the curves will be similar on both lines.

The quarry at 2 miles seems a good one: samples of stone taken from site are sent to you with report.

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