

Waikouaiti County: Waitati Road.—About 45 chains of this road have been gravelled, the work still being in progress.

Tairi County: Otakia.—A timber pile-bridge of eleven 30ft. spans, opposite Section 41, Block IV., Maungatara, has been constructed, under the supervision of Mr. R. Hay, C.E.; the cost of construction being £1,497 3s. Roadworks in Block III., Nenthorn, of over two miles in length, are under construction, at a cost of £452 5s. 2d., and when opened will improve 9,600 acres of surveyed land.

Tuapeka County.—2 miles 66 chains of roading in this county have been constructed, and several culverts built. Two punts for river use have been built, at a cost of £60. The work has cost £614 18s. 6d. These roads give access to 850 acres of surveyed land and 13,900 acres of unsurveyed land.

Clutha County.—11 miles 27 chains of road have in parts been cleared of bush, formed, bridged, and provided with culverts. The area of land opened up is 3,120 acres of surveyed and 7,000 acres of unsurveyed land.

Waihemo County.—Thirty-three chains of road through Block I., Hawkesbury, were made, at a cost of £10. Seventy-five acres of surveyed land were benefited by this road.

Catlin's-Waikawa Road.—This is the most important road under construction in this district. The whole of the formation, bridges, and culverts are completed from Catlin's River to Tautuku Bay, with two exceptions—viz., about a chain of rock-cutting on the road down to Taupuku Beach, and about 15 chains of swamp on the other side of the Taupuku River. As most of the formation is through clay, and the climate wet, the road as formed will be readily cut up by horse or wheeled traffic.

Catlin's Valley Road.—This road is completed for four miles up the river from Catlin's Bridge, with the exception of a few chains now under construction.

Taupuku Valley Road.—Five miles of this road have been cleared of timber, and culverts are now being built, together with sufficient formation to form approaches thereto.

C. W. ADAMS, Chief Surveyor.

ROADS TO OPEN UP MARUWENUA SMALL GRAZING-RUNS.

The total length of road opened is 12½ miles, made up as follows:—Maruwenua Pass Road, 8½ miles; road from Livingstone towards Kakanui through Gardener's run, 3 miles; road to top of ridge between branches of Maruwenua, 1 mile. The total cost has been £7,503, of which amount £6,700 has been spent on Pass Road.

As to value of work done, I may say that my estimate, prepared for the County Council some time ago for the formation of the portion of the Pass Road which has just been formed was £5,400. This was on the supposition that the work would be done by contract. On the whole, the ground has turned out more difficult than I calculated upon, almost all the excavation having been more or less rock, and on some very steep faces where I had expected sound rock, and consequently little excavation, the material on being opened out proved to be so much shaken as to require long slopes. Owing to difficulties with Howe's race, too, the line had to be shifted, causing extra excavation and increased cost in taking it out on account of risk of damaging race; but some saving was made by shifting line at other places. The necessity for finding employment for so many men before the first portion of road was passable added considerably to cost. Taking everything into consideration, I do not think the difference between cost and estimate excessive. Some excess above contract rates, I think, there always will be in working upon this system, even when men are capable and work well, and the amount will depend upon the character of the country. Where the excavation is heavy, and in rock or cemented shingle where horses cannot be employed, men do the work at a fair contract price, but on ground suitable for plough and scoop the cost of work done by pick and shovel and barrow is far greater—in some cases double. Another reason for excess of cost, even on suitable ground, is the difficulty of fixing price. Where the material is of a uniform nature, the cost can usually be estimated with a fair amount of accuracy; but where it varies much, consisting, say, of hard and loose rock shingle and clay, in varying proportions, the difficulty is very great. Giving different prices for different materials does not get over the difficulty, even where it is possible to measure them separately, as the cost per cubic yard, after taking out rock, depends so much on quantity and position. In doing work by contract, this difficulty does not come in, as, although it may not be possible to estimate the cost of each few chains, a fair estimate can be made of average cost. There is, indeed, more uncertainty than in uniform material; but mistakes affect both sides alike, sometimes contractor gaining, sometimes losing. Now, in letting to gangs of men, if material turns out much worse than expected, and, consequently, price fixed so low that good men cannot make good wages, it must be raised; but if, on the other hand, material turns out better, the price cannot be lowered, so that mistakes tend to increase cost. Raising the prices after letting the work has a very bad effect, and it has only been done here in a few cases, but trying to avoid the necessity tends also to increased price. The men nearly all worked well, and, in most cases, very long hours. This was especially the case when they thought they had a good price. The average wage earned by them was 7s. 6d. per day worked, no allowance being made for overtime.

With regard to the value of work in opening up land, the roads now formed are all that are required to completely open the runs now being surveyed, with the exception of a small extension of Pass Track, which may be necessary, and would cost about £50, and a road up Livingstone Ridge, which would cost about £250 if formed for the whole length; but I do not think more than half will be required.

The Pass Road also opens up the Ben Lomond Run, between the Maruwenua and Otekaikē Rivers.

CHAS. BANKS, Engineer.