

the canal-works at each end, including five carriages or cradles and three electric locomotives, with the necessary electric cables, but not including any share of the cost of providing power, amounts to £300,000.

Taking interest and sinking fund at  $7\frac{1}{2}$  per cent. there would be required a sum of £22,500 per annum to meet those items, over and above the cost of maintenance and working-expenses. We are of opinion that the traffic would not for many years to come exceed 100,000 tons per annum, and as a rate of 4s. 6d. per ton would be required on such a basis to provide for the standing charges only, without allowing for working-expenses, we are reluctantly compelled to advise that the time is not yet ripe for this proposal. It is possible, however, that the time will come when the construction of the canal may be justified, and we recommend that steps should be taken to prevent any building being erected upon any lands that might be required in the future for canal or barge-railway, and that any works to be carried out should be considered in relation to these proposals.

If it should be determined that the canal or barge-railway is to be proceeded with, we judge that, as Auckland is interested to the greatest possible extent in obtaining access to the trade of the Waikato River district, and as the Auckland Harbour Board has control of the Manukau Harbour and will be the controlling authority of the Tamaki barge-canal, that body should be empowered to undertake the construction and management of any works for the connection of the Manukau and the Waikato. As the efficiency and success of such canal schemes must be largely locked up with the navigation of the Waikato River, we deem it to be desirable that as soon as the Waiuku connection is started the Auckland Harbour Board should have representation upon any body having control of works affecting that river.

As the utility of the Waiuku canal depends wholly upon the possibility of so improving the Waikato River as to make it navigable at all seasons for any vessels using the Waiuku canal or railway, we recommend that no steps be taken in furtherance of such a scheme until it is definitely certain that improvements in the Waikato River can be permanently effected.

#### MANGAWARA-PIAKO CANAL.

For many years the idea has been entertained that a canal could be constructed between the upper portion of the Piako River and the Mangawara Creek, which discharges into the Waikato River at Taupiri. If such a canal were constructed of a suitable size, direct communication by means of small coastal steamers could be obtained via the Thames Gulf between Auckland and the Waikato. Above the junction of the Mangawara Creek with the Waikato, that river, with its tributary the Waipa, is for many miles navigable by vessels of moderate draft, without shoals or other difficulties.

This scheme having been brought under our notice, we visited the locality, and were sufficiently and favourably impressed by our observations as to cause us to investigate the proposal in detail. Plans and sections of the Mangawara Creek from Littlewood's Landing—about 5 miles up the creek—to a point 15 miles farther up have been prepared by Mr. H. R. Young, Assoc.M.Inst.C.E., for the drainage scheme of the Mangawara River Board. These plans have kindly been placed at our disposal by that River Board, and copies accompany this report, marked M.D. 5354/D [not printed].

Mr. J. B. Thompson, Chief Drainage Engineer of the Lands Department, on request made to him, had the levels continued over the watershed and down on its eastern side to connect with the River Piako near Tahuna, and he has kindly supplied us with a plan and section, which are attached hereto, marked M.D. 5354/C [not printed], thus enabling a tentative scheme for a canal and system of lockage to be prepared, upon which an approximate estimate of the cost has been made.

The result of the investigation has proved to be somewhat disappointing, as the saddle, in a length of some  $2\frac{1}{2}$  miles, rises to a height of about 180 ft. above the ordinary water-level in the Piako River where the canal would junction with it; but the inquiry shows that, although costly, the proposal is quite feasible, and worthy of consideration as an alternative to the construction of the Waiuku canal