

land being small and the flood being never likely to rise far above the existing banks, a very small levee will be sufficient.

(f.) At all points on Inch-Clutha where the natural banks or the existing levees fall below the proposed new grade, levees should be raised to the levels shown, 6 ft. wide on top, and with side slopes of 2 to 1. These and all other levees should be constructed of the best material obtainable in their immediate vicinity, and should be constructed in such a way as to give the maximum of consolidation.

The levee following the right bank of the Matau Branch will, of course, follow the proposed new cuts, and in addition will run across the long bend which exists at Section 7, Block IV, Inch-Clutha. In this locality it may be desirable to raise the road to act as a levee. This is a matter which can be best decided by mutual arrangement with landowners when the work is put in hand.

On the left bank of the Koau Branch, where the existing levees are so close to the river as to be threatened by the erosion of the banks, they should be removed to a safe distance before being raised in a similar way, to the grades and levels shown.

(g.) The existing levee which now connects the high land in the vicinity of Mr. Telford's residence with the railway-bank at the Waitepeka Canal should be raised to the level shown, joining the railway on its new grade (see next paragraph). From this point onwards a levee must be carried down towards the sea under the same conditions as the others—that is, to the levels given, in the approximate location shown.

(h.) The Catlin's Branch Railway, where it passes over the Waitepeka Canal, must be raised so as to be safe from inundation by a flood at the probable new heights.

(i.) All drains now discharging into the river at such levels as would provide a channel for invasion of the adjacent lands by the floods must be provided with flood-gates.

(k.) The levees at present protecting Barnego should be raised and made continuous, to the grades and levels shown.

All the levels given are in terms of the Tuapeka Railway survey datum.

With the height of the levees given on the plans it will be seen that the road-bridge over the Matau Branch at Stirling is not sufficiently high. The Commission has not recommended raising it, in view of the fact that it is now a very old bridge, and because, in the opinion of your Commissioners, the community will be justified in accepting the risk of its destruction until such time as it requires rebuilding. When rebuilt it must be constructed at a high-enough level to allow reasonable clearance above the probable maximum flood-slope. If carried away before it is rebuilt it will not jeopardize the other bridge farther down, as owing to the cut at the Balloon Loop the main current of the river, if not the whole of it, will be diverted from that bridge.

Your Commissioners consider that all the land lying between parallel stop-banks, or between any stop-bank and the edge of the river, should be acquired by the controlling authority. This will obviate claims for compensation by the owners of farms in the bends which are to be cut off, while the controlling authority will be able to lease the lands when the works are constructed, probably at very little less than the interest on the cost of their acquisition.

Before any work is put in hand the controlling authority must make a complete survey to enable the levees to be constructed on the best lines, in such a way as to minimize the cost and reduce the flood-levels as much as possible. The flood-levels shown on the plans accompanying this report are based on a limited number of cross-sections; and on the detail survey being made it may appear that by increasing the distances between levees, or by removing some obstruction in the actual channel, a slight lowering of the flood-slope could be obtained. Alternatively, the surveys may result in it being found necessary to raise the levees higher than the grades indicated, but your Commissioners think that the latter is not at all likely.

Provision must be made to absolutely exclude rabbits from the levees around Balclutha, and eternal vigilance must be exercised throughout the district to prevent any of the levees becoming a harbour for rabbits. Otherwise a sense of false security will be engendered.