

Readings on the gauges installed on the Awanui River ranged from 54.90 to 70.75 at Foster's Bridge, and from 66.20 to 80.00 at Church Road Bridge. The water-level at Kaitaia was lower than previously experienced, due mainly to the dredging of the river. The lowest readings were in January and the highest in October. The heaviest flood of the year occurred on the 1st October, following 4.45 in. of rain within forty-eight hours. At the maximum readings of the gauges as shown above the Awanui River overflowed its banks at many points, and a large area of low-lying country was inundated to a depth of several feet, showing the urgent necessity for the Whangatane spillway and other works to increase the channel-capacity for run-off from this watershed. The work already completed, however, enabled the flood-waters to quickly disperse from the upper end of the swamp, so that in twenty-four hours from the flood reaching its height the level had dropped 5 ft., and the river was confined to its channel, except where the banks are very low, mainly in the vicinity of Awanui, where the inundation continued for some days.

*Awanui River.*—Dredging of this river has been carried on throughout the year, the old channel being widened, deepened, and straightened. Eight diversions were cut through to straighten the river, and a total distance of 118.26 chains dredged, bringing the improved channel to a point below cut No. 12. Some 67,542 cubic yards of spoil were removed, consisting of sand and hard clay, which required blasting in some cases to facilitate work with the grab. A large quantity of heavy timber was also removed from the river-bed. Some snagging was done in the vicinity of Kaitaia, where scouring and erosion has taken place, thus undermining trees growing along the banks. Thirty chains of the river was cleared of willows along the stretch cut off by cut No. 30, so as to keep open the channel for outlet from Church Gully. All timber snagged last year was burnt off in the dry season and banks cleaned up. Piles were driven in cut No. 30 for a bridge with 12 ft. roadway, and a temporary footbridge thrown across there to carry foot traffic till the permanent structure is erected.

*Whangatane Spillway.*—Dredging of this channel was carried on with the Bay City dipper dredge, working from the upper end, an old *munga* being followed with cuts through high clay ridges to straighten the channel; 92.50 chains of this spillway was excavated 30 ft. wide, the depth ranging from 15 ft. in the highest country to 6 ft. in the lowest ground cut through; 39,980 cubic yards of spoil were removed by the dredge, and also some heavy timber, but this has not been encountered in any great quantity so far. Very hard clay was dredged in places, and this entailed much blasting before it could be expeditiously handled by the machine. In addition to the dredging 11,000 cubic yards of spoil was removed from the spillway with plough and scoop, this being necessary to allow the dredge to excavate to the required depth in the high country. Scooping was done mostly by bullock teams working on contract, the contract price being 1s. 3d. per cubic yard. Three bridges were erected over the new channel excavated—one on Donald's road, for general traffic, and two on the properties severed, to take stock and light loads.

*Waihoe Channel.*—The erection of a Priestman grab dredge for this work was completed in August, 1922, and excavation commenced in the middle of the month, working from the Awanui River towards Lake Tangonge. Following the channel constructed by hand, a new cutting was made, 35 ft. wide and averaging 8 ft. deep, throughout the portion now completed. A distance of 52.50 chains has been dredged, and 31,722 cubic yards of spoil removed, consisting of peat and soft clay with timber intermingled. Slips occurred as this new cutting was made in this soft country, therefore a dam was built in the lower end to maintain an even water-level, and this has prevented a recurrence of the trouble caused by the country closing in behind dredge. The lake was tapped in March with excavation to the full depth available for this channel. The unwatering of the depression in which the lake was formed will not, however, be fully accomplished until the dredge has reached the deeper part and the dam is removed, but flood-waters can now run off more quickly, and benefit is derived in this area.

*Dredges.*—Three dredges have been working within the area on the works described above; two have worked throughout the year, while dredger No. 10 commenced excavating in August. The following is a comparison of dredge costs for the last two years: 1921–22—Spoil removed, 61,309 cubic yards; cost per cubic yard, 10.2d. 1922–23—Spoil removed, 138,900 cubic yards; cost per cubic yard, 10.47d.

*Drains and Roads.*—As the opening of the outfalls to be constructed by hand was practically completed last year, little work of this nature was carried out during this year, and until completion of dredged channels the deepening and establishment of final grades cannot be carried out on many drains. 101 chains of new drain was constructed. The maintenance of drains was attended to, and 10 miles 68 chains of drain cleared of growth and slips. This work again proved expensive, as, owing to the drains being unfenced, a great amount of clearing was entailed through stock tramping in the sides. The road leading to Crown land via the Waihoe was fenced, road-drains constructed, and bridges erected over same, but the portion through peat country will require ballasting before it can carry traffic.

*Stop-banks.*—103 chains of new bank were constructed along the Awanui River, with drain alongside graded to flood-gates installed near low-tide level, and eight flood-gates were placed in position. 122 chains of banks were enlarged and brought up to standard height, with drain alongside graded to flood-gates. The banks previously constructed, totalling six miles and a half, were maintained, also repaired and enlarged at certain points as required.

*Bridges.*—Eleven bridges were constructed during the year—three pile bridges over the Whangatane spillway, and the remainder being sill bridges over drains crossing roads and severing properties.

*Buildings, Plants, &c.*—In addition to building of pontoon for No. 10 dredge, the following plant, &c., was constructed on the works: Two pontoons, one 35 ft. by 10 ft. by 3 ft., and one 27 ft. by 10 ft. by 2 ft.; one pile-driver frame; three dinghys; one three-roomed cottage; and bunk-house, storeroom, &c.