

The cost of extracting willow-stumps along 50 chains of river-bank was £2 10s. per chain.

No. 11 Kingston dredge was in commission during nine months of the year, deepening the Awaitei Canal and raising the stop-banks. Two shifts were worked during three months. Trouble due to bank caving in this canal is now less than formerly, as the water-level was controlled by means of dam and sluice-gates; but to prevent the stop-banks from slipping or sinking into their mud foundations it is necessary to raise them gradually. This dredge handled 39,076 cubic yards of material, at unit cost of 7.45d.

No. 15 Bucyrus drag-line was building stop-bank and road on the left bank of the Piako River near Kaihere during April and May, and was engaged on similar work on the Awaitei Canal during the following three months. After complete overhaul, carried out at the Kerepehi workshop, this machine was used to build the approaches for the Awaitei Canal Bridge and the Kaihere Ferry, and in January commenced the construction of stop-bank along the lower Elstow Canal, which forms the southern boundary of the Kerepehi Block. The foundation on which this embankment is being built has a surface covering of 3 ft. to 4 ft. of peat, and to reduce the seepage under the finished bank a trench is being excavated through the peat by the dredge on the centre-line of the embankment. This trench is then filled with the material used for the embankment, forming a bond with the clay substratum. When working conditions have been suitable for night-work two shifts have been employed. 85,777 cubic yards of material was excavated, at a cost of 8d. per cubic yard.

No. 16 Bucyrus drag-line, operating on the left bank of the Piako River, completed the raising of the stop-banks of the Puhanga Island Block with spoil obtained by widening the river-channel. In August this machine was transported by barge to the 6 m. 40 ch. peg, and carried out similar work on the left bank of the river for a distance of 2 miles 48 chains to Ngatea Bridge. Special methods were adopted for widening and deepening the waterway under the Ngatea Bridge, a steam-winch on a barge being used to haul the Page bucket between the bridge-piers. At the end of February the machine was taken 2 miles 35 chains up the Awaitei Canal, and is now widening the canal and constructing stop-bank and road on left bank of the canal from this point southwards. Working two shifts, 107,937 cubic yards of material was moved during the year, at unit cost of 6.8d. per cubic yard.

No. 23 steam dipper dredge excavated 3 miles of the upper Elstow Canal through exceptionally soft fibrous peat country. Dredging in this type of peat material presents some peculiar features. Various expedients must be adopted to refloat the dredge when stranded by upheaval of the canal-bottom, or release it from the grip of the collapsed canal-banks. A floating mass of fibrous material behind the dredge makes coaling difficult. After a shallow channel has been excavated through this material, time must be allowed for the peat to consolidate before attempting to deepen the channel. In excavating 3 miles of canal the dredge removed 107,731 cubic yards of material, at unit cost of 4.84d. per cubic yard.

No. 24 steam dipper dredge commenced the construction of the Waitoa Drainage Canal in the Tahuna district in May of last year. It has completed this canal, 3 miles in length, and returned to Kerepehi at the end of March after removing some shoals in the river *en route*. As the land through which the canal passes rises considerable above summer water-level of the Waitoa River, into which it discharges, two dams were required to raise the dredge as the canal advanced. The dredge worked two shifts to the 21st November, when the upper end of the canal at the Whakahoro Road had been reached. While returning, the primary cut was enlarged to the required canal section and one shift was employed. The plant excavated 155,988 cubic yards during the year, at cost of 6.08d. per cubic yard.

PIPIROA-WAITAKARURU DISTRICT.

This district now includes part of the Hauraki West Drainage District. The principal activities of the Department were construction work on the Waitakaruru-Maukoro Canal, cleaning 41 miles 34 chains of main drains, and widening and deepening 5 miles 43 chains of drain, requiring 10,855 cubic yards of excavation. A short deviation of the road on the eastern side of the canal has been made preparatory to the dredging of a drainage canal along the southern boundaries of Sections 8 to 12, Block X, Wharekawa Survey District, and southwards on the Pouarua Road Reserve.

The peat land along the Waitakaruru-Maukoro Canal is responding to the improved drainage conditions, and shows good prospects for future development.

CENTRAL DISTRICT.

The usual maintenance work has been carried out in this district. Drains of a total length of 13 miles 47 chains were cleaned, and 10,731 cubic yards of spoil excavated in widening and deepening 3 miles 63 chains of drain. In 3 miles of new drain-construction 7,636 cubic yards of material was excavated. Roadwork includes 2 miles 78 chains of formation on the Ngatea-Kaihere Road and metalling 1 mile 77 chains of this road, formation and metalling 37 chains of the Kerepehi-Kaihere Road, formation of 40 chains of new road on southern boundary of the Kerepehi Block, and 35 chains at Kaihere. Some 620 cubic yards of clay was delivered by tramway to raise embankment near Kaihere.

A bridge across the Awaitei Canal at Kerepehi was completed in November, when a ferry was also installed on the Piako River at Kaihere, providing a connection through the Kerepehi Block. As the 2½ miles of road through this block is metalled it provides an outlet for the Kaihere and Patetonga districts which will be appreciated in the winter.

To provide relief for unemployment special works were undertaken this year, and over a period of six months ninety-two workmen were employed planting flax, felling 278 acres of scrub, sowing 551 acres with grass-seed, and also on road and drainage work. The area planted with flax was 568 acres of low-lying land near Kaihere Wharf which cannot be economically protected from flooding.