

year, it was moored in the Waitakaruru-Maukoro Canal above the main-highway bridge awaiting favourable conditions for crossing the Hauraki Gulf.

No. 23 American Steam Dipper Dredge worked during part of January and February, 1934, in the Upper Elstow Canal. This canal is excavated through very soft peat country, and, to bring about a gradual consolidation of the land, the canal water-level, which is controlled by a temporary dam, is being gradually lowered. As frequently happens in this class of land, there has been a certain amount of bank-caving, and the canal-bottom has risen in places after the water pressure has been reduced, and the dredge has been engaged in cleaning up the canal. In thirty-one working-days the dredge traversed 250 chains of canal and excavated approximately 8,300 cubic yards of material. The average daily output was 267·7 cubic yards and the unit-cost 11·69d. Possibly another clean up of the canal will be required before all control of the canal water-level is removed, and this will complete the Elstow-Awaiti Drainage scheme, an undertaking comprising main drainage for a catchment area of 31,500 acres and flood-protection, roading, and subsidiary drainage for about half the area.

No. 16 Bucyrus Excavator worked during April, 1933, filling gaps that had been left in the Awaiti Canal stop-banks during construction. Only 560 cubic yards were placed with the machine, and it was then laid up until February, 1934, when it was moved to the site of the pumping-station to excavate the foundations for the building and to be used as a crane. Guides have been suspended from the top of the 50 ft. boom, and the plant is now being used for pile-driving.

Details of the principal works carried out during the year in each district are given below :—

#### KEREPEEHI-AWAITI DISTRICT.

A party of eight to fourteen men has been engaged since February, 1933, constructing a new drain known as Bancroft's Drain between the intercepting canal and the Tirohia-Otway Road; 250 chains of this drain was completed during the year, the quantity of excavation being 15,879 cubic yards. On completion of this work in March last the eight remaining men of the working party were transferred to a camp established on the Kerepeehi Block Extension, where they will be employed on the drainage and clearing of Crown land in preparation for permanent settlement. Another working party of fifteen to twenty-five men are camped at the Kaihere Ferry and engaged on the eradication of black-berry and noxious weeds on flax plantations and other Crown land. There were cleaned 1,609 chains of drains, and some widening and deepening of drains was carried out and 59 chains of new drains constructed. Two areas have been developed for small farms by draining, clearing, cultivating, and sowing with grass-seed. A milking-shed was erected on one farm, also fencing and other development work carried out. Maintenance of roads on the Kerepeehi Block has been attended to, and the formation of 32 chains of new road completed. During the year tenders were invited for a large land-drainage pump for the Kerepeehi Block. Twenty-one tenders were received, and the plant selected is a 33 in. Tangye centrifugal pump having a guaranteed capacity of 31,000 gallons per minute at 4 ft. head. The pump will be operated by a 90 h.p. electric motor. Pile-driving for the foundations of a pump-house have been commenced, and two large double-barrel road culverts, with sluice-gates for controlling the flow to the pumps, have been completed. Two hundred and fifty 40 ft. piles required for the pump-house foundations and fifty additional logs for general-construction requirements were cut, hauled to the Waitoa River, and shipped to Kerepeehi. The staff in the workshops and depot at Kerepeehi has been considerably reduced, and the extra work entailed by the establishment of several relief-work camps, together with the issue of stores, general-construction work, and the maintenance and repair of machinery and plant has kept the depleted staff working at high pressure throughout the year. A party of twenty-four men has been transported daily from Thames to the Orongo Settlement, and has been engaged on the following works: Cleaning drains, 6 miles 42 chains; widening and deepening drains, 8 miles 65 chains (11,858 cubic yards excavation); constructing new drains, 23 chains (1,012 cubic yards excavation); raising stop-banks (wheelbarrow work), 1 mile 36 chains (9,732 cubic yards material placed).

#### WAITAKARURU DISTRICT.

In May, 1933, the Miranda Drainage Scheme was completed. This scheme commenced in November, 1931, and was carried out by the Department for the Hauraki Plains County Council to provide drainage for an area of 4,700 acres of rich low-lying littoral swamp lying to the west of the Waitakaruru Township. To secure a subsidy from the Unemployment Board, the work was carried out by manual labour on the co-operative contract principle, and this necessitated the adoption of somewhat unusual construction methods, including the excavation of a canal 27 ft. wide with shovels and barrows. The complete scheme comprised the construction of 14½ miles of drain and 3 miles of foreshore stopbank, also several bridges and outlet structures. The total quantity of material excavated by manual labour was 108,404 cubic yards. An exceptionally high storm tide in the Hauraki Gulf in December last caused some damage to the stopbanks exposed to wave action, and a working party of from six to eight men has since been engaged repairing the damage and raising the stopbanks of the Kairito Canal. On the completion of the Miranda Scheme, the existing camp at Waitakaruru was taken over by the Department and enlarged to accommodate sixty men to be employed widening the Waitakaruru Stream Canal and raising the stopbanks. Actually, this camp has never been brought up to full strength, and the number employed on the work