

for 119 working days was 26,392 cubic yards. The average daily output was 222 cubic yards, and the unit cost, including cost of extensive renewals, was 13·05d. Twenty-two chains of river-channel enlargement were completed from 13 miles 15 chains to 13 miles 37 chains.

No. 23 steam dipper dredge worked only eighteen days in May, 1934, cleaning up a section of the Elstow Canal and removing a temporary dam used to control the water-level during dredging-operations. After a lapse of a period of time to allow the peat land through which the Elstow Canal is excavated to consolidate, the canal will again be deepened, and in the meantime the plant is laid up. While working, the dredge traversed 70 chains of canal and removed 5,520 cubic yards of material at a cost of 7·37d. per cubic yard.

No. 24 steam dipper dredge was, at the beginning of the year covered by this report, moored in the Maukoro Canal at Waitakaruru, having completed the Pouarua Canal in March, 1934. In May the dredge was towed across the Hauraki Gulf and up the Piako River to Kerepeehi, where it is now laid up. The passage down the Maukoro Canal necessitated the removal and replacement of the middle span of the main highway bridge over the canal.

Details of the principal works carried out during the year in the several districts are given below:—

KEREPEEHI-AWAITI DISTRICT.

Activities in the Kerepeehi district have been centred principally on the drainage and development of the Kerepeehi Block, an area of 4,700 acres of Crown land lying between the Awaiti Canal and Piako River. The northern portion of this block, comprising 2,300 acres, is subdivided into thirty-five sections, all of which have been occupied for a period of five years or more, and are now productive farms. There is some peat on portion of this area, and when this disappears the surface-level of the land will be generally about high-spring-tide level. Permanent stop-banks along the Piako River and Awaiti Canal and a temporary stop-bank along the Reservoir Canal, forming the southern boundary of this area, protect it from flood overflow and a gravity-drainage system discharges through flood-gates into the Piako River. The middle portion of the block, comprising 1,700 acres, will, when the shallow-surface peat now covering portion of the area disappears, have a surface-level of approximately high-spring-tide level.

Permanent flood-protection is provided by the continuation of the stop-banks along the Awaiti Canal and Piako River, and by another stop-bank along the southern boundary connecting the canal and river stop-banks. When these banks are completed the middle and northern area will be surrounded by one stop-bank system, and the temporary stop-bank at present dividing them will not be required. The middle area has an independent gravity-drainage system discharging into the Awaiti Canal through flood-gates in the foundations of the drainage-pumping station now being erected on the outlet of the Reservoir Canal. The southern area of 700 acres lies inside the Awaiti Canal stop-bank, but is not surrounded by stop-banks because the present level of the peat between the Awaiti Canal and Piako River protects the land from river-overflow. As future subsidence of the peat may possibly cause flooding of this portion of the block it is separated from the permanently protected area by an inland stop-bank. It has an independent gravity-drainage system which will normally discharge through flood-gates into the Awaiti Canal, but can be connected with the drainage pump through the middle-area drainage system by means of sluice-gates. Allowing for subsidence of the peat, the final level of the southern area will vary between high-spring-tide level and 3 ft. below high-spring-tide level. During floods the water-level of the canal and river may be above ground-level for several days, and, to provide drainage at high stages of the river, a large drainage pump is being installed at the junction of the Awaiti and Reservoir Canals. The pumping-station will serve the whole of the Kerepeehi Block of 4,700 acres, and possibly an additional area of 1,000 acres.

As the middle and southern areas of the Kerepeehi Block will require more pumping than the northern area, the latter can be disconnected from the pumping-station by sluice-gates and the amount of pumping reduced to a minimum.

The pump now being installed is a 33 in. Tangye centrifugal pump capable of discharging 31,500 gallons per minute against a 4 ft. static head. This discharge is equivalent to a run-off of half an inch in twenty-four hours from the permanently protected area of 4,000 acres. The pump will be operated by a 90 h.p. electric motor, and a 3 h.p. motor is provided for operating an air-exhauster for priming. The plant is housed in a steel-frame building erected on substantial concrete foundations. As the ground at the site of the pumping-station is soft alluvial deposit, extending to a considerable depth, and having little bearing value and resistance to hydrostatic pressure, extra precautions were necessary to ensure watertight and stable foundations. For economy, the foundations of a road bridge and two large flood-gate culverts are incorporated in the pump-house foundations, and provision is made in the pump-house foundations for the future installation of another pump. The foundation slab is supported on 230 piles, driven 40 ft., and two 45 ft. cut-offs of tongue-and-groove timber sheet piling, 20 ft. long, are driven under the outer edge of the intake and outlet aprons. Four hundred and ninety cubic yards of concrete were required for the pump-house foundations, bridge, and culverts, and at the end of March, 1935, the concreting had been completed and the erection of the pump-house building and installation of the machinery were proceeding.

In March, 1934, a camp was established on the Kerepeehi Block to accommodate twenty-five men to be employed on drainage and clearing of the middle portion of the Kerepeehi Block in preparation for settlement. As the camp has been considerably below strength for