

WAIKAREMOANA.

The preliminary plant which was installed to supply Wairoa and district has been in operation satisfactorily during the period, and the Wairoa Power Board has added 18½ miles of distribution-line to their system. The workshop at the power-house has been completed, and the transmission-line to the Waikaremoana Hostel has been surveyed and is under construction. The work of the major scheme has been wholly confined to the survey and boring for alternative pipe-lines. Foundations at the intake and the power-house are being tested.

MANGAHAO.

This scheme was officially opened by the late Right Hon. W. F. Massey on the 3rd November, 1924. Between the end of the previous period and that date a very strenuous construction programme was carried out, and the general finishing-off and final details had still to be completed after that date.

The lining of No. 1 and No. 2 tunnels was completed. The concreting of the control shafts in the by-pass tunnel and No. 2 tunnel was finished, and the Stoney sluice-gates and operating mechanism installed and housed. Similar work was completed at the intake to the No. 2 tunnel and the outlet from the surge-chamber, where in each case two independently operated screens and gates were installed. The grillage at the entrance to No. 1 tunnel and the outlet portal of No. 1 tunnel were built, and cement grouting was systematically carried out at the outlet end of No. 2 tunnel. The slipjoints in the tunnel pipes leading from the surge-chamber were electrically welded as an additional precaution against leaks, and an examination of the tunnels after a full head test disclosed no evidence of any weakness.

The concreting of the central gap in the Mangahao dam, which had been purposely left as an opening, necessitated by local construction conditions, was commenced in July, and by the end of August the concrete level was sufficiently high to enable water to be supplied to the power-house; this was made possible by an accumulated reserve of 8,000 cubic yards of crushed aggregate and sand. Prior to filling in the gap referred to, all plant, material, construction lines, and buildings on the up-stream side were removed, together with a multiple-cable suspension bridge. A lighter bridge was erected across the gorge slightly below the dam. Of a total of 21,848 square yards of concrete in the dam, the balance carried to completion during the year was 5,829 cubic yards. This included two automatic tilting-gates, each 64 ft. wide and 10 ft. high, from the pivot-line axis, with associated siphon-chambers, water-ports, lower operating chambers and tunnels, counter-weights, and sill slabs. Various floods were experienced during the completion of this work, but fortunately very little material loss occurred. 6,716 cubic yards of selective filling was placed in the earth-fill part of the dam during the year, giving a completed volume of 13,450 cubic yards.

The Tokomaru dam was completed in August, and of the total concrete volume (22,600 cubic yards), 3,900 cubic yards were placed after the 30th June. Other works included a reinforced hand-railing on each side of the top, extending full length, together with concrete steps near the east and west abutments. Back filling at the retaining-walls on the west abutment was also completed, and all plant, buildings, and material removed from the reservoir area.

General finishing-work on the surge-chamber was carried out, which involved 30 yards of concrete.

During July and August, 919 ft. of pipe-line was completed, being the balance of a total length of 4,366 ft. placed under contract by the Dunedin Engineering Company. Repainting and caulking were also carried out over the full length. A concrete portal was erected where the pipe-lines emerged from the hillside. Other work included the completion of 264 pedestals, and the placing of a balance of 84 cubic yards in the anchor-blocks. The ground surface under the pipe-lines was graded, and trimmed and sown in grass, and cross-drains provided to prevent scour on the steep slopes.

At the power-station various minor works were completed, including the roof balustrades, internal partitions, floor-plastering, entrance steps, stairways, interior painting, and the laying-down of a waterproof roofing-material.

The major part of the substation building was carried out during the present year. Main substations at Bunnythorpe, Dannevirke, Mangamaire, and Masterton, were completed, also the switching-station at Woodville. A cottage and stable were erected at Otaki. The substation at Waipukurau is nearing completion, while preparations are being made for commencing those at Wanganui and Napier. The substations include switch-room, workshop, garage, stable, and oil-store in brick or concrete, together with staff cottages in timber.

Upper Mangahao Dam.—The construction of an additional dam higher up the river forms an essential part of the completed development, and it has been considered advisable to proceed with this work now. A considerable amount of exploration and survey has been carried out in order to decide the most convenient location for the access road to this upper dam. The work involved the construction of 3½ miles of road, the first mile of which has now been formed and metalled, while the formation of the balance is nearing completion.

For the preliminary work of roading and general construction at the upper dam, advantage has been taken of the 2 miles of waterway formed by the reservoir of the No. 1 dam, for the transport of workmen, plant, and material, a tram-line, on road formation level, having been constructed and ballasted from the head of this reservoir to the upper dam.

The geological formation at the upper-dam site is being thoroughly investigated by means of a Keystone drill. Extensive contour surveys of the upper-dam basin and of the dam-site have been completed, and the bush has been felled and cleared in order that the erection of the workers' accommodation, service buildings, and cookhouse (which are now in hand) might proceed. The bush is also being cleared on the line of the permanent transmission and telephone line, and from the dam-site and general layout.

A light access suspension bridge and a ropeway for the transport of material across the Mangahao River has been completed. A considerable amount of repair work has been carried out to miscellaneous articles of plant, stores, &c., which have been transferred to other districts.