

equipment and steel structures are complete, and the erection of the steel structures themselves is almost complete. The pipe and cable trenches and the floor slab have been concreted. The cable-tunnel has been excavated and concreted, and the cable-house at the top of the tunnel has been built.

Electrical Equipment.—The following plant has arrived at the site: 3 generators, 2 turbines, 3 Larner-Johnson valves, 10 5,900 kv.a. transformers, 4 4,700 kv.a. transformers, 4 150 kv.a. service transformers, 6 110,000-volt oil-switches (less tanks), 7 110,000-volt isolating-switches, all 50,000-volt switch-gear, all 11,000-volt switch-gear, and all switchboards. The 50,000-volt oil and isolating switches are erected, and also 7 110,000-volt isolating-switches. The oil purifying and testing plant has been erected and tested. Oil-pipes to the transformers are now being installed. 925 drums of transformer and switch oil have arrived.

WAIKAREMOANA.

The first stage of the above power development involves the diverting of the Waikaretaheke River, which is itself formed by the overflow from Lake Waikaremoana into Lake Kaitawa, whence it will be conveyed by tunnel and pipe-lines to the generating-station at Whakamarino. The principal features of the work are the intake race which will convey the water from the Waikaretaheke to Lake Kaitawa, the approach canal from Lake Kaitawa to the tunnel, the tunnel itself, the dam at the southern end of Lake Kaitawa, the surge-chamber, pipe-line, and power-house.

Before work could be started in earnest on the above items it was necessary to metal and extend access roads to the main generating-station site at Whakamarino and the headworks at Kaitawa. The capacity of the original generating-station had to be increased to cover the additional demand due to the construction plant as well as to the increasing requirements of the Power Board. This was accomplished by installing a 1,000 kv.a. unit with an additional pipe-line 4,446 ft. in length and with a head of 650 ft.

Accommodation for workmen and service buildings have been erected at Whakamarino and Kaitawa. At each camp a social hall has been built and placed under the direction of a Church Army officer. In addition to the regular service buildings, sheds, workshops, &c., the main office, temporary staff quarters, and married workman's quarters have been built.

The intake race which will convey the water of the Waikaretaheke to Lake Kaitawa was commenced in July last, but progress was necessarily slow owing to the swampy nature of the country. The excavation, trimming of batters, and concreting have now been completed. Considerable difficulty was caused by the presence of springs on the upper side of the race, but this was dealt with by means of drains laid with open joints in crushed metal. Where not concreted, the walls have been protected by stone pitching and a toe of heavy spalls.

As the design provides for the raising of the level of Lake Kaitawa 10 ft. above the original level, it is necessary to construct an earth dam at the south end of the lake. To achieve this a strata of porous pumice at the dam-site has been removed and a pug-core wall carried down to reach as nearly as possible an impervious layer. The completion of the dam and the final raising of the lake-level will be carried out later.

The excavation of the approach canal leading from Lake Kaitawa to the tunnel was commenced in February last by hand-labour, but later a mechanical excavator has been operating satisfactorily at this point, and work is well in hand. During the period, 205 ft. of completed tunnel and 74 ft. of bottom heading from the Kaitawa basin to the head of the pipe-line have been driven. In order to enable the tunnelling to be carried out independently of the surge-chamber, an adit 110 ft. in length was driven to intersect the tunnel clear of the surge-chamber workings, and later a start was made from the intake end of the tunnel.

Excavation of the surge-chamber was commenced in January and completed in May, 10,894 cub. yd. having been taken out. Concreting was then put in hand and has continued steadily since, except for a short period when work was held up on account of slips.

The excavation of the pipe-line bench has been completed, the work being carried out by means of ploughs and scoops, 51,830 cub. yd. of material being shifted. The pipe-line is being built under contract, and the contractor is now carrying out his preparatory work, erecting workshops and plant for fabricating the pipe on the site. The pipe-line tramway has been laid; No. 3 anchor block has been concreted to invert level, and work is now proceeding on No. 2 anchor block and pedestals above it.

The foundations for the main generating-station at Whakamarino Flat are in hand. Considerable difficulty has been experienced in this work, due largely to the level of the column-foundations being below the water-level of the Kahutangaroa Stream, this involving continuous pumping in order to keep the workings sufficiently free from water. To date 2,690 cub. yd. of concrete and 26½ tons of steel have been placed in the power-house building.

The provision of accommodation for the permanent operating staff has been put in hand. A contract has been let for six five-roomed cottages and is nearing completion. A septic tank, drainage, and water system have been installed for this permanent village.

The fine aggregate for concrete is obtained from the Waikaretaheke River at Mitchell's turn-off, 7 m. from the power-house, by means of a drag-line scoop which was installed for the purpose; the coarse aggregate for concrete and for road-metal is quarried and crushed at Kaitawa and Tuai. Another crushing plant is being installed at the Mangaone Creek to supply road-metal for the portion of road between Terapatiki and Kaitawa.

In order to provide timber for its many operations, the Department purchased a sawmill formerly owned by the Wairoa Timber Co. Approximately 1½ million feet of timber have been turned out by the Department since taking over.

An unloading-store equipped with a 30-ton crane is now in course of erection at the Wairoa station-yard. Material and plant will be unloaded at the Port of Waikokopu, where another 30-ton crane is being provided, and then railed to Wairoa, where it will be stored until required at the works.