

HYDRO-ELECTRIC DEVELOPMENT

Special priority has again been given to hydro-electric development, though construction has been hampered extensively by present-day difficulties in obtaining suitable workmen and materials.

At Waikaremoana Upper Development, construction is now so far advanced that the first unit is expected to be running in September. The main portion of the work yet to be completed is the intake channel leading from deep water in the lake-bed to the tunnel entrance. Some 80,000 cubic yards of clay and rock have to be excavated to form the intake channel to a depth of 53 ft. below normal lake-level, a difficult task that may take an appreciable time. However, the work has been planned in such a manner that water for the new station will be available as soon as the turbines are ready to operate.

Lake Waikaremoana has been very low during the year and the three $\frac{1}{4}$ ft. siphons installed at Onepoto last year have proved invaluable in maintaining the water-supply for Tuai and Piripaua Stations. On the other hand, the low lake-level has permitted a considerable amount of the intake channel to be excavated in the dry.

Work on the Karapiro Development had reached such a stage by the end of last year that the lake was filled at the beginning of April, 1947, when No. 1 unit commenced generating. As part of the road-deviation work made necessary by the filling of Karapiro Lake, a notable steel-girder bridge with concrete deck—the Maungatautari Bridge over the Waikato River—has been built to replace an old low-level timber structure.

As construction work at Karapiro drew towards a conclusion staff and workmen were transferred to Mangakino, farther up the Waikato. At this site, which will serve as headquarters for constructing Maraetai and two other projects, a model town is now rising from the bare plain to house over two thousand workers and their families. Mangakino Village is necessary because further power projects on the Waikato River are isolated from existing settlements, and, therefore, the village will be equipped with all the amenities of a small town, such as shops, bus terminal, public garage, recreation-halls, churches, sports-grounds, &c.

The Maraetai project is now taking shape. Much preliminary work has been done; works buildings, including a sawmill, are well under way. Of the permanent work, the diversion tunnel is being pushed ahead, and 100 lineal feet had been fully excavated by the end of the year.

Investigation of the foundation conditions at Cobb River have reached a point where a decision has been made to build a concrete gravity-type dam, and construction has been authorized. The Cobb Valley has most unusual geological features, being sited high up on mountains, and the dam-site has required more than usual engineering and geological examination.

Progress on the Lake Tekapo tunnel has shown a marked improvement, especially since the shield at the south end has penetrated beyond the old exploratory drive that held up work in the early stages. The tunnel is now being driven from both ends.

At Lake Pukaki outlet an earth dam is to be built to provide storage of spring floods. Control of the lake outflow will be by means of a reinforced-concrete culvert through the dam having five 10 ft. by 10 ft. barrels, each regulated by a sluice-gate; the water will be released in such a way that the flow in the Waitaki River will be increased during the dry winter period.

Investigation work has been proceeding at alternative dam-sites on the Clutha River at Coal Creek with a view to starting construction there as soon as possible.

MAIN HIGHWAYS

As indicated in last year's Budget, legislation was passed during the year whereby the Main Highways Board was relieved of any liability with regard to either interest or principal on an amount of £1,226,000 advanced by way of loan in 1930. In addition