HYDRO-ELECTRIC DEVELOPMENT: INVESTIGATION, DESIGN, AND CONSTRUCTION

The responsibility for investigation, design, and construction of civil engineering structures for the State Hydro-electric Department was taken over on 1st April, 1948, but close liaison with that Department is still maintained.

INVESTIGATION

During the year civil engineering investigations were carried out for hydro-electric development on the Waikato River, in the Bay of Plenty area, at Lakes Rotoiti and Rotoroa in the South Island, at Benmore on the Waitaki River, and on the Clutha River in Central Otago.

The most noteworthy of these investigations were those into the Roxburgh Gorge proposal on the Clutha River involving the production of an exhaustive and detailed preliminary report, and the site investigation at Whakamaru on the Waikato River.

A technical staff of 8 engineers and draughtsmen was employed in the Wellington Head Office, and the average field force of engineers, surveyors, geologists, drilling contractors, and associated labour was 160 men.

The total footage of borehole drilling was 24,211. 1,014 ft. of investigation tunnels were excavated, together with 591 ft. of vertical-shaft excavation.

Major and detailed reports were prepared in respect of the Roxburgh project and the proposed development at Whakamaru.

A brief account of the investigations carried out is as follows:—

Bay of Islands.—A hydrological study and reconnaissance of a site on the Punakitere River was made in connection with a local body scheme.

Waikato River.—Investigations at Whakamaru covered three possible sites and was of a particularly complex nature involving a very extensive drilling programme. This year investigations were concentrated on the site finally chosen and were completed. Layouts for the scheme were drafted.

At the Atiamuri site the preliminary stage of the investigations was completed, although the final layout has yet to be planned.

At Waipapa, between Maraetai and Arapuni, investigations are in hand in most complex country. Four sites were investigated, and at the first three it has been established that the country rock is not continuous over the bed of the river. The fourth site is now under active investigation and the work is about 40 per cent. completed.

Bay of Plenty.—Reconnaissance surveys of the Kaituna and Rangitaiki Rivers have been made, and several tentative proposals for the development of the Upper Rangitaiki have been examined. The Whakatane River has been photographed from the air for future study.

Lakes Rotoiti and Rotoroa.—A reconnaissance survey has been made of an alternative proposal to develop power between the two lakes by means of a series of short tunnels connected by races, instead of a single 8-mile tunnel as originally proposed. The aerial survey of the surrounding country is now in hand and investigation is proceeding.

Lake Coleridge.—A scheme for increasing the capacity of the race connecting Lake Coleridge and the Harper River has been studied and reported on.

Pukaki.—Preliminary investigations and designs for an initial development of 25,000 kW. and an ultimate development of 100,000 kW. were made and estimates prepared.

Pukaki-Tekapo.—Preliminary investigations and aerial reconnaissance were made into a scheme utilizing the potential head between the tailrace at Tekapo and the Pukaki Lake.