

## HYDRO-ELECTRIC WORKS.

## ARAPUNI.

A considerable amount of preliminary survey and investigation has been carried out on the site of these works. Preliminary surveys have been made for access roads from Putaruru. Exploration work near Pukeatua has been carried out, and drives put in to test the various outcrops of greywacke, and after a good deal of work suitable sites have been found for a permanent quarry to supply rock for the construction-work at Arapuni and for road-metalling.

Alternative bridge-sites for bridging the gorge and head-race at Arapuni have been selected. Test-pits were sunk in the country on the spillway side, and information is being gathered in order to enable the Department to decide the best site for the power-house.

Alternative plans have been prepared for a gravity arched dam, but the design cannot be finally settled until the talus has been excavated from the site.

Regular gauge-readings were taken throughout the period under review, and further gauges were installed at the power-house site and at various points down-stream, in order to enable the tail-race levels to be investigated. Tests were made of the flow of the Waikato River, and calibrated with the readings on the gauge.

A preliminary location for transmission-line from Arapuni to Te Kuiti was also carried out.

## ROTORUA ELECTRIC SUPPLY.

Data were obtained and drawings made for alterations and extensions to the existing power-house and flume. A survey was also made for an alternative hydro-electric-power scheme to supply about 1,000 kilowatts. Exploration surveys were made between Whakarewarewa and Ngongotaha, in order to determine a site for power-house in which the motive power would be a Diesel engine which has been procured. A transmission-line route was also explored from Okere Falls to Rotorua.

## HORAHORA.

*Ruakura.*—A new railway-siding has been laid at Ruakura to give access to the main substation, this, with the work inside the grounds, being done by this Department, whilst the Railway Department carried out the portion on their land. A transformer-house, test-room, and cottages Nos. 1 and 2 have been erected; also new store, 30 ft. by 90 ft., with the necessary internal fittings, and a garage, 26 ft. by 46 ft., all in concrete.

*Te Awamutu.*—The erection of the substation, 40 ft. by 20 ft., in concrete, is completed.

*Waihou.*—A transformer-house, 30 ft. by 20 ft., has been erected.

*Horahora Headworks.*—A considerable amount of work has been carried out at the generating-station, principally in the direction of extending the crib-log and rock weir across the full width of the rapids. In addition to the actual work in the river, a considerable amount of work was involved in the provision and erection of the necessary plant. A tramway had to be constructed, and a bridge, 87 ft. span, erected to bring up the stone to fill the cribs, which were constructed from timber grown a short distance away, floated into position, and then loaded. This crib-log weir, like the original portion constructed by the Waihi Company, is merely of a temporary nature, and under its shelter the permanent concrete weir will be constructed when the river is low, probably during the coming summer season.

Surveys have been made of the existing lay-out. New gauges were installed, and the zeros of all gauges checked.

## WAIKAREMOANA HYDRO-ELECTRIC SCHEME.

The surveys of the construction pipe-line have been completed. Trial pits and borings have been sunk on the power-house site and at the main dam, and bearing-values determined. A detailed survey of the Waikare-Taheke River at the site of the proposed dam was also carried out. An engineering survey of the main Waikaremoana Road, and a land-plan survey of both access road reserves, were completed, and the proposed tram-line from the forest reserve to the main power-house laid out. The fencing of the southern boundary, extending from the Waikare-Taheke River to the Kahutangaroa Stream, was completed.

Continuous gaugings of the lake-levels have been kept since May, 1921, and tests were undertaken to endeavour to ascertain the sources of the various subterranean streams flowing from the lake, but with not very great success. A measuring-weir was constructed at the lake-outlet, and a record of the discharge is being kept and compared with the rainfall records.

The excavation for the pipe-line has been completed, and about two-thirds of the pipe-line have been laid and tested.

The site of the power-house has been excavated and cleared, the foundations and all concrete-work have been finished, and, except for a few small matters, the power-house building is complete. A start has been made with the erection of the power-house bridge, the two main piers and south abutment having been constructed. A ropeway was erected at the end of the intake road for the transportation of the 24 in. pipes and other materials. A store and two temporary shelter-sheds have been built for housing stores and machinery. Two cookhouses have been erected.