

HYDRO-ELECTRIC DEVELOPMENT: CONSTRUCTION WORKS AND INVESTIGATIONS

Otahuhu Substation.—Work has been started at the site. Forty-six chains of road formation and metalling have been done; 6,500 cubic yards have been excavated in levelling operations; and 5,593 ft. of pipes have been laid for the storm-water and sewerage systems. A contract has been let for the foundations of the main substation building, and 86 reinforced-concrete piles, 18 in. square and 70 ft. long, have been cast.

Karapiro Development.—The diversion-tunnel gate was lowered on 4th April, 1947, and the lake started to form; this marked the end of a major phase of construction.

The first 30,000 kW. generator was under load in April, 1947, and the second was generating power in September. The third machine was started up in May of this year.

After the filling of the lake, 2,000 cubic yards of rock were excavated from the tail-race. An area of about 2 acres has been levelled adjacent to the left abutment of the dam, involving the shifting of 10,000 cubic yards of spoil. Two thousand cubic yards of rock have been placed to protect the up-stream face of the core wall at the left abutment. At the right abutment 4,500 cubic yards of back-filling have been placed on the down-stream side.

Formation of the high-level road to the dam is now complete, 10,300 cubic yards having been excavated. Stone pitching of the batter adjacent to the siphon spillway is complete: 700 square yards were pitched. The pipe handrails to the staircase at the spillway are finished, and the concrete handrail over the dam is also complete. The lamp standards on the dam have been placed and reticulated.

Nos. 2 and 3 machines have been concreted in, 2,330 cubic yards of concrete having been placed; and the scroll cases have been sand-blasted and painted with five coats of special coal-tar paint. The generators have also been painted. The galleries round Nos. 1, 2, and 3 machines have been painted. Pump chambers have been grouted and sealed. Interior finishing work and rubber floor-covering for office block in the power-house has been completed, and the air-conditioning plant installed.

Concreting of the auxiliary-pump house at the left abutment is complete and the pump is assembled. Cable trench covers to the extent of 830 lineal feet have been placed.

In the village $2\frac{1}{4}$ acres have been levelled, top-soiled, and grassed; and 4,500 square yards of batters in the village and near the dam have been turfed. The water reticulation is now complete and tested to 120 lb. per square inch: 900 ft. of 6 in. main were laid during the year. Storm-water drainage has been installed during the year to the extent of 310 ft. of 6 in. and 320 ft. of 9 in. pipe complete with sumps and gratings. The village substation is finished.

Roads, kerbing, and channelling at the outdoor station are in hand. Fourteen chains of 24 ft. road between the Public Works Office and the dam and $25\frac{1}{2}$ chains of 18 ft. road in the village have been shaped, metalled, and sealed.

On the Hauoira Deviation, 1,500 cubic yards of rock fill have been placed for wave protection, and 1,200 cubic yards were excavated on the Pairere Deviation in regrading a 10 chain length. Both deviations have been maintained, 1,080 cubic yards of metal being placed. As additional wave protection at the outlet of the Hauoira culvert, ten 3-ton concrete blocks have been placed. Falsework and shuttering on the Maungatautari Bridge have been removed, the steel girders painted, and 1,650 ft. of concrete handrail erected.

The surface of the deviation of the Hamilton-Rotorua State Highway in the Maungatautari Gorge was maintained until completion of sealing, and 78 chains of safety fence have been erected.

All construction buildings at Karapiro have now been dismantled and transported to Mangakino with the exception of the fitting-shop and two mill buildings.