

Mangahao dam: The foundations on the line of spillway as at first set out proved on testing not to be what was expected, and further test-pits have been sunk on another line.

Tokomaru dam: The same remarks as above apply to the foundations of this dam.

Pipe-line: Fair progress has been made with the excavation, 3,100 ft. having been formed. The tram-line by means of which the pipes and cement, &c., will be conveyed is also nearly completed.

Surge-chamber: A start was made with the excavation of the top portion in April; progress to date, 1,404 cubic yards.

Power-house: Fair progress has been made with the excavation; progress to date, 2,833 cubic yards.

Transmission-line: Poles have been delivered at the railway-stations between Shannon and Wellington for the main transmission-lines.

Construction plant, Mangaore: A 250 kw. steam set supplied by two Babcock and Wilcox boilers has been in operation since the end of May. The work was delayed by the fact that the generator did not arrive from England until the 2nd May. An air-compressor of 600 cubic feet per minute displacement has been installed to supply air to the works in that vicinity and as far as the second adit of the Arapeti Tunnel. A workshop has been erected and fitted with various machine tools for the purpose of keeping the plant in running-order.

A transmission-line has been erected from Mangaore via the surge-chamber and Arapeti to Mangahao. The necessary transformers have been provided, so that practically all the machines will eventually be driven by electricity.

Owing to the delay in obtaining the machinery for the main power-house it was necessary, in order to get a start with the Mangahao Tunnel, to install a 60-h.p.-boiler Marshall engine, and air-compressor of 300 cubic feet displacement, at the bottom of the gorge. Considerable difficulty was experienced in getting this heavy plant into such an out-of-the-way locality. A jig-line with a fall of 460 ft. and an average inclination of about 40° was erected for the purpose of lowering material into the gorge. The Marshall engine has now been replaced by a 60 h.p. motor, and the boiler is being used to provide steam for drying-rooms, showers, &c.

Staff accommodation: Four permanent cottages, a bachelors' quarters, and an office have been built, and a sewerage system installed, to which the above buildings have been connected.

Workmen's accommodation: The following have been built: Drying-rooms at Arapeti and Mangahao; cookhouses at Mangahao, sawmill, and Arapeti; recreation-hall at Arapeti; married men's cottages—Nine at Arapeti, eight at Mangaore, and seven under construction, also one at sawmill; single men's huts—Nine eight-men huts at Arapeti and two at Mangaore, also two four-men huts and two two-men huts at Arapeti, and eight two-men huts at the sawmill.

Service buildings: In addition to the buildings housing the plant, a large bulk store has been built at Mangaore, and a smaller one at Arapeti. A garage for six lorries at Mangaore and an explosives magazine at Arapeti have been built.

Sawmill: The output of the mill for several months was very costly and poor, but now better bush has been opened up, and costs should show a rapid decline. For the twelve months 651,505 superficial feet of timber was cut. A total of 142 chains of tram-lines have been formed to enable logs to be got from the bush to the mill.

The average number of men employed on the works has been 201-673.

#### WAIKAREMOANA POWER SCHEME.

A considerable amount of widening and metalling has been done on the main road from Wairoa to Waikaremoana in anticipation of the heavy traffic anticipated in connection with the construction of this scheme. Material has been ordered, and preparations are being made for rebuilding most of the smaller bridges on this road. The formation of roads to give access to the power-house and to the headworks has been completed, and material for two bridges over the Waikaretaheke River has been ordered. Contracts have been let for the supply of the pipe-lines and machines for two 500 kw. units, which will supply power for construction purposes on the main scheme, and also supply power to the Wairoa Power Board in the meantime. The delivery of this material is expected about the end of 1921, and it is hoped to have it in operation before the end of 1922.

#### LAKE COLERIDGE POWER SCHEME.

During the year further deepening was carried out in the lake at the tunnel intake. A start was made with the work of diverting a portion of the Harper River into the lake, and a channel, 1½ miles long, from the Harper River to the lake was excavated, and the water was turned into the channel in March, 1921. Preparation is now being made for the construction of a large groyne in the river-bed to permanently divert the river on to the bank from which the channel leads to the lake.

The fifth unit (3,000 kw.) was completed during the year, but the machine could not be put into operation until the third pipe-line was completed. This work is now well in hand, and it is anticipated that this machine will be in operation shortly.

As part of the scheme for transmission of power to Timaru, the poles have been erected from the power-house to the Point, a distance of about 12 miles, and the material for the balance of the line to Timaru has been ordered, and work on the erection will commence at an early date.

A further length of 4 miles of 11,000-volt distribution-line has been erected in the North Canterbury district.

#### ARAPUNI POWER SCHEME.

A series of drives on the sides of the gorge under the river and along the line of the proposed diversion-channel have been completed. A considerable amount of prospecting and excavation for possible quarry-sites in the neighbourhood has been carried out. The question of the feasibility of erecting a dam of the dimensions required at the site in question was referred to a committee of engineers and geologists, who visited the site and examined all excavations and data and reported favourably. This scheme has now been definitely adopted as the main running-power for the northern portion of the North Island.