

entering the headrace in December of last year, as the lake was being filled. The gates for intakes Nos. 1, 2, 3, and 4 have been erected, and the automatic screen-cleaner has been placed in position. The spillway was completed by the concreting-up of the 20 ft. gap, which had been left open for the purpose of access to works, and by the erection of the inspection bridge across the spillway.

In anticipation of trouble with the screens at Horahora, following the diversion of the river, all scrub and vegetation in the headrace and overflow-channel, and on the Waiteti Flat, was cut and burned, and logs were removed and two constrictions in the Waiteti Channel were reduced.

The diversion-tunnel gates were closed on the 2nd December last, so that the lake commenced to fill, and by 11.30 p.m. on the 31st December water commenced to flow over the spillway, and since then the river has flowed by its new channel over the Waiteti Flat.

*No. 2 Section of Contract.*—My report of last year indicated that the contractors had made no progress at the power-house site. That condition remained unchanged as far as the contractors were concerned during the year under review, no work being done by them on the excavation for the power-house foundations. In December last an agreement was reached between the Government and the contractors under which the latter were relieved from further work on No. 2 section of the contract.

At the end of January the Department commenced work on No. 2 section with its workmen and staff. Efforts were specially concentrated on the power-house construction. It had been hoped that the diversion of the Waikato River would so lower the water-level in the old channel at the power-house site that difficulties due to the inflow of water into the foundations would largely disappear. Owing, however, to the raising of the Waikato River bed at the Waiteti Stream junction by the deposit of material eroded by the diverted river, these anticipations were realized to a comparatively small extent only, in that the water-level was only lowered 7 ft., and there was substantially as much trouble with inflow of water as before. To overcome this, very extensive use was made of cement grout, this being pumped in under pressure, through a series of drilled holes, into the coffer-dam which had been built by the contractors. This proved effective in so reducing the inflow of water, and in strengthening the coffer-dam, so that work could be prosecuted with vigour. No departure from the power-house site or scheme of works as required by the contract was found necessary.

Concentrating on the foundations for Nos. 3 and 4 units, the concreting for these was commenced on the 22nd April, and concreting at units 1 and 2 begun on the 8th June. During June a commencement was made with the erection of No. 3 turbine; and the steel draft-tube, with foundation ring, has been assembled, riveted, and placed on the concrete foundation. A commencement has also been made with the assembling and riveting of steel columns, roof-trusses, and bracing for the power-house.

It is, I think, clear from the foregoing that the difficulties that confronted the Department at the power-house site in January last were satisfactorily and quickly overcome, and that the work is now proceeding with vigour.

At the penstock-tunnels the riveting and placing of the steel linings and the placing of the concrete behind the steel linings were completed last December. The cable-tunnel is complete except for 14 ft. at the lower end. The outdoor station is complete except for the erection of fence, and the pump-house is complete except for floor and window-glazing.

The tail-race excavation presented difficulty by reason of the high water-level, due to the raised condition of the Waikato River bed already referred to. However, as a bank of sand and pumice had been created at the lower end of the tail-race by the river on diversion, it was considered possible, by installing a pumping plant, to dewater the old river-bed and deal with the normal flow of 12 cub. ft. per second therefrom. A pumping plant has been installed and water-level was reduced by the end of June by a depth of 10.5 ft. Excavation work is now being successfully carried out, 3,700 cub. yd. having been moved by the end of June.

The dewatering of the tail-race disclosed that the work of clearing and enlarging it has been greatly increased by the very large quantity of rhyolite rock excavated by the contractors from above the power-house site and dumped into the river. A large proportion of this had not been carried away by the current, and now must be moved by the Department.

*Erection of Electrical Equipment.*—Practically the whole of the permanent equipment required by the contract as part of the installation of three 15,000 kw. units is on the site, and the position in respect to the erection is shortly summarized as follows:—

50 kv. switching-station: The erection of this equipment is complete as required for the present installation—namely, for 14,000 kv.a., 50 kv. to 110 kv., Horahora tie transformer-bank, Rotorua line; and 750 kv.a., 50 kv. to 11 kv. transformer-bank; but no operating-cables have been installed.

110 kv. switching-station: The erection of the 110 kv. and 11kv. outdoor switch-gear for transformer-banks Nos. 1, 2, and 3, and the Horahora tie bank is complete, but no operating-cables have been installed.

Main transformers: The erection work on the main transformers is complete. Painting of transformers and oil-switches still to be done.

Oil circulating, pumping, and testing system: This is complete, save for some piping connections.

Transformer water-cooling system: The installation of this system is well advanced.

Minor items: Pumping for village water-supply is complete and in service. For the operating-gear for penstock-gates, the automatic screen-cleaning machine, and the water-rheostat the electrical installation is practically completely erected. In the cable-tunnel seventy-eight angle-iron cable-racks have been erected. A grounding-system at outdoor station, consisting of a ground bus of 19/083 bare copper cable, has been run round the station and connections made to transformer-tanks, oil-switches, and steel structures. A commencement has been made with the erection of the permanent lighting equipment at outdoor station building, steel structures, &c.

Adequate attention has been given to the temporary storage, the unpacking, and care of such items of permanent equipment as required it.