

Rangitata Diversion Race.—After a period of eighteen months, during which work was practically stopped on account of the transfer of men and materials to defence works, the construction of this 42-mile canal has during the last nine months been pushed on vigorously. Approximately 550 men were employed towards the latter end of the year.

Practically all the earthwork is completed, the few remaining structures being well in hand, and the only major work remaining at the end of the year was that of seasoning and testing.

It is anticipated that water will be available for power generation at Highbank in August and for irrigation of the Ashburton-Lyndhurst Scheme next summer.

Canterbury Irrigation Investigations.—The regular observation of rainfall, runoff, and meteorological phenomena has been continued on a minimum basis, but increased activity has been possible in the study of ground-water levels and flow in the mid-Canterbury district. Extension of this important work will be effected as soon as circumstances permit.

CONSTRUCTION AND IMPROVEMENTS OF ROADS

The conditions limiting the construction and improvement of roads have not materially altered since last year. Activity has therefore been greatly restricted, and confined mainly to the completion of existing works. The opportunity has been taken to make surveys and investigations where staff has been available, with a view to implementing a systematic plan of work when the supply of man-power and materials permits.

The work done during the year is summarized as follows : formation, 40 miles ; metalling, 105 miles ; bridging, 650 lineal feet ; culverting, 2,000 lineal feet.

HYDRO-ELECTRIC DEVELOPMENT : CONSTRUCTION WORKS

Karapiro Development.—General : In view of the serious shortage of electrical energy, everything possible has been done to speed the completion of this scheme. During the year the number of men employed has increased from 200 to 700, and the speed of the work is now controlled by the limited number of artisans available.

Diversion Tunnel : The diversion tunnel was completed, the coffer dams removed, and the river successfully diverted on 12th September. Shortly afterwards a 20,000-cusec flood was safely taken by the tunnel.

Excavation for the arch dam and gravity abutments is proceeding. The river-bed portion and left abutment requires 90,000 cubic yards to complete, but the right abutment excavation is completed and concreting is in hand. Total excavation to date 420,000 cubic yards.

Power-house : Excavation is well in hand. Fabrication of the steel penstocks has been commenced, and it is expected that the concreting of the power-house foundations will commence shortly.

Concreting has been commenced on several small sections of the dam, and some 5,000 cubic yards have been placed to date. Concreting supplies and equipment are ready for expansion to full placing rate in the near future.

Developments on Waikato River.—Investigations are proceeding as conditions permit of other possible developments on the Waikato River following the completion of Karapiro.

Waikaremoana Lower Development.—This work is now substantially complete. The second generating set is now in operation. The remaining man-power engaged on construction has been transferred to the Upper Development works.

Waikaremoana Upper Development.—It has been possible greatly to accelerate activity on this work during the year. Some 2½ miles of access roads have been formed and metalled. Extensive site preparation was carried out in the intake area to enable grouting to be carried out above the lines of the intake tunnels.

The most important feature of the construction at this stage is the boring and grouting of the subterranean rocks to reduce the movement of the underground water. This is being done on a large scale in the area along the site of the curtain wall and in the vicinity of the headgate shafts. During the year a total of 45,000 ft. of boring has been done and some 2,500 cubic yards of grout pumped. This work is now approximately 50 per cent. completed.

A start was made on the construction of the twin tunnels in December, and a length of about 200 ft. has been driven. Very difficult tunnelling conditions have been encountered, but the ingenuity of the Engineers and tunnellers has brought them under control, and it is expected that progress will shortly improve.

Good progress has also been made in the excavation for the penstock and for the power-house foundations.

Cobb River.—The initial phase of this work was practically completed during the year and is now in operation. Investigations in connection with the second phase of the work—namely, the dam—were continued, and accelerated towards the end of the year.

Highbank.—The steel portion of the penstock has been completed and tested, and the forebay and concrete sections were 50 per cent. complete by the end of the year. The erection of plant has kept pace with overseas deliveries.

Tekapo.—This work was at a standstill again during the year, but preliminary steps towards the recommencement of construction were taken during February and March.

Hororata Substation.—A contract for the construction of outdoor transformer foundations was completed.

HOUSING SERVICES CONSTRUCTION

Towards the end of the year work was commenced on a considerable scale on the preparation of house-sites and on the construction of streets and footpaths, kerbing and channelling, sewerage and stormwater drainage services, and electricity reticulation. As was the case with other works, progress was limited by the supply of man-power and materials. Nevertheless, fair results were achieved, as is indicated by the following table of progress : area cleared, 800 acres ; street-formation, 14 miles ; kerbing and channelling, 16½ miles ; stormwater drains, 8 miles ; sewer drains, 7½ miles ; water mains and services, 6 miles.