

During the year $1\frac{1}{2}$ miles of two-way access road to the quarry have been formed and metalled. The quarry-site was stripped and tunnelled for blasting. Four tons of explosive were fired in the quarry and brought down 27,000 cubic yards of rock.

Progress has been made with the erection of construction buildings. One 126 ft. by 30 ft. office, one 60 ft. by 20 ft. store, one 20 ft. by 20 ft. fuel-store, one 50 ft. by 25 ft. fitting-shop, one 50 ft. by 18 ft. compressor-shed, 34 cottages, 200 single men's huts, a staff mess, and 2 bathhouses (one 132 ft. by 20 ft.) have been built. All buildings except one have been obtained from other works for re-erection.

Consideration was given to the question of augmenting the water available for power-production at the existing power-house during periods of low river. Survey showed that there was a suitable site for an earth dam 2 miles up-stream from the proposed main dam and that 51,000,000 cubic feet of storage would be available from which water could be released as required. Construction of a dam 750 ft. long and 31 ft. maximum height was authorized in August, and the dam was finished in December, complete with spillway and sluice culvert for controlling release of the water. The work included 50,000 cubic yards of earth fill, 5,000 cubic yards of boulder protection on the up-stream face, and the placing of 176 lineal feet of 5-ft.-diameter reinforced-concrete sluice culvert and control gate.

An average of 60 men has been employed throughout the year.

Lake Tekapo Development.—While the main effort has been concentrated on the tunnel, progress has also been made at the power-house site and on the tailrace.

At the south end of the tunnel 1,444 lineal feet have been excavated and lined with concrete blocks during the year, and at the north end 1,255 lineal feet. Up to the end of March, 18,335 reinforced-concrete tunnel-lining blocks had been produced at the concrete factory.

Excavation below power-house-floor level for the draught-tube is now complete and some preliminary concrete has been placed in the bottom. The shingle country is very permeable and, because the base of the excavation is well below river-level, heavy inflow of water has made the job difficult.

The bulk of the tailrace excavation has been completed.

Thirty-seven cottages, 36 single men's huts, and a staff mess and quarters have been erected during the past year. By March, 300 departmental employees and 22 contractor's men were engaged on the works.

Lake Pukaki Control.—Following excavation of the site, construction was started in April, 1947, of the five-barrelled reinforced-concrete sluice structure with gates for controlling outflow from the lake. The structure was finished in October. Excavation of the inlet and outlet channels amounting to 120,000 cubic yards has been completed behind coffer-dams comprising 35,000 cubic yards of fill. Compacted and stabilized back-filling placed round the sluice structure amounted to 9,000 cubic yards.

On completion of the sluices, coffer-dams were built up-stream and down-stream of the dam-site, the up-stream coffer-dam serving the purpose of closing off the natural lake outlet, raising the lake, and so providing storage water for power-production at Waitaki Power-station and also of diverting lake flow through the sluices. One hundred and twenty thousand cubic yards of fill have been placed in the up-stream coffer-dam and 30,000 cubic yards in the down-stream coffer-dam. The river closure was made last January, and the up-stream coffer-dam had been raised to the height required for winter storage by February.

Stripping of the dam-site to the extent of 50,000 cubic yards has been done, and 6,000 cubic yards of compacted fill have been placed in the dam. On the site of the spillway, 80,000 cubic yards have been excavated.

The highway bridge at the lake outlet, which fouled the dam construction, has been removed, and in its place a temporary highway traverses the coffer-dam. About 5 miles of highway deviations round the lake have been completed.