

APPENDIX G.

ANNUAL REPORT ON ELECTRICAL WORK AND POWER SUPPLY UNDERTAKINGS BY
THE ELECTRICAL ENGINEER.

The ELECTRICAL ENGINEER to the Hon. MINISTER OF PUBLIC WORKS.

SIR,— Public Works Department, Wellington, 15th September, 1913.

I have the honour to submit the following report on the various works entrusted to me during the past year:—

LAKE COLERIDGE POWER WORKS.

The works are designed to utilize the head of water or energy due to the difference in level between the surface of Lake Coleridge—viz., 1,667 ft.—and the Rakaia River—viz., 1,173 ft.—a difference of 494 ft.

The works now under construction provide for headworks and buildings for supplying 10,000 h.p., whilst the plant now on order consists of three turbine generator sets, each of 2,000 h.p. capacity, making a total of 6,000 h.p., of which two units giving 4,000 h.p. will be available for supply purposes, leaving the third unit as spare. Transforming plant is being provided in duplicate for transforming up from 6,600 volts to 66,000 volts pressure, suitable for transmission throughout the Canterbury Province. The transmission-lines between Coleridge and Christchurch will also be in duplicate, and erected for the most part along separate routes, thus providing for the greatest possible immunity from interruptions due to atmospheric influences. A substation building is being erected in Addington, which will contain the transforming plant, which is also in duplicate. This plant is designed for transforming the pressure from 66,000 volts, at which the current will be transmitted from Coleridge, to 11,000 volts, suitable for distribution to Christchurch and for a radius of twenty miles from Addington. It is proposed further to provide a stand-by plant in this substation, consisting of oil-engines driving three-phase generators, which will enable the supply to be partly maintained in the event of failure of the transmission-line or generating plant.

A list of contracts entered into for plant and works is shown in Table No. 1 annexed hereto—a total of forty-two contracts, amounting to £167,686.

In addition to the above contracts the Department is carrying out by direct labour or co-operative contracts the following works:—

- Inlet works for establishing communication between the tunnel and the lake.
- Outlet works for connecting the tunnel to the pipe lines.
- Foundation to pipe lines.
- Excavating for power-house foundations.
- Excavations for tail-race.
- Maintenance of roads between Coalgate and headworks.
- Transportation and erection of plant.

Reviewing the works as they now stand—first, as regards the tunnel, a shaft was driven from the surface approximately midway between the two ends, and the work of excavating the tunnel was carried out from the two outer faces inwards, and from the two inner faces outwards. The tunnel was driven through between the centre shaft and the outlet end on the 24th July, and the work of lining this portion is being proceeded with. The work of excavating the other portion of the tunnel between the centre shaft and the lake has been slower, as part of the excavation is in rock and 15 chains of tunnel remains to be excavated, which should be completed in ten weeks' time. It is estimated that the whole of the tunnel will be completed by the end of March.

The pipe-line contract is in a very unsatisfactory state, and the contractors will require to double their rate of progress in order to complete in time to enable the Department to fulfil its obligations. Strenuous efforts are being made to expedite this portion of the work.

The power-house buildings are also very much behind, and considerable improvement must be made with this work also. The substation buildings are approaching completion.

With regard to the plant, two of the turbines and the whole of the transformers have already arrived in the Dominion; the remaining turbine and generators, together with switch gear, will be shipped very shortly, and it is anticipated that the whole of the plant will be delivered by the end of December, when the work of erection will be vigorously proceeded with.

With regard to the transmission-line, the conductors, the insulators, and other accessories have arrived, also 1,000 out of 1,750 poles—sufficient, in fact, to complete one transmission-line—and a contract has been placed for carting and erecting the poles and insulators.

The underground cables for connecting the substation in Addington to the municipal electricity works of Christchurch have come to hand, and arrangements are being made for laying the same.

A quantity of material for serving the districts surrounding Christchurch has arrived, and will be erected when more definite arrangements for the supply of power to these districts have been made.

The maintenance of the roads between Coalgate and Coleridge is costing a good deal more than anticipated: some £4,500 has already been spent, and £1,500 more will be required. The