

It was necessary to cut away quite a number of trees from the line, and to fix up cages across the Waikaretaheke River. So as to facilitate patrol, three telephone-huts were installed alongside the Tuai-Wairoa Road and the telephones connected on to the main P. and T. line between the power-station and Wairoa Exchange.

SUBSTATIONS.

Gisborne Substation (Patutahi).

Work on this station was rapidly pushed ahead, the outdoor steelwork, lightning-arresters, 50 kv. switch-gear erected, and a 1,205 kv.a. bank of transformers from the Hamilton district being placed in position, and connected up ready for service. The 11 kv. switch-gear and regulator, together with the earthing-reactor, were installed and connected up ready for service. The oil-tanks and oil-purifying system were installed in the building provided for same, and connections run out to the 50 kv. transformers and O.C.B., also into the main station.

Two wells were sunk to provide water for the cooling of the transformers, also a water-tank erected to give two hours reserve supply of water in case of trouble with the water-pump.

Two linesmen's cottages were erected on the substation-site and are connected directly with the power-station by telephone during the night. The substation building also houses the switching-cubicles of the Poverty Bay Power Board, besides being equipped with a 15-ton crane and workshop for repairing the station-transformer and equipment.

This station was placed into service on the 18th February, 1929, and, except for minor troubles, the equipment has functioned satisfactorily.

Wairoa Substation.

This station consists of one bank of three 500 kv.a. transformers, total capacity 1,500 kv.a., stepping down from 50 kv. to 11 kv., together with a suitable air-break switch and 50 kv. lightning-arresters, the control of this station being from Tuai. The 11 kv. side of the transformers feed directly through the Department's metering equipment to the Wairoa Power Board's substation.

Work on the erection of this station was commenced in October, 1928, and by the end of February, 1929, was ready for service, though at this time the Power Board was not ready for the change-over, the station finally going into service on the 6th April, 1929.

INTERRUPTIONS.

The following were the interruptions for the period 29th January to 30th June, 1929 :—

Section.	Total.		Prearranged.	
	Number.	Duration.	Number.	Duration.
On 110,000-volt lines—		Hrs. min.		Hrs. min.
Power-house, Napier West	14	128 24	1	0 33
On 50,000-volt lines—				
Power-house, Gisborne	34	93 10	4	20 20
Power-house, Wairoa	3	4 27½	2	3 21
Stations—				
Power-house—				
Whole load	13	127 51	..	..
Only 110 kv. load	1	3 10	1	3 10
Gisborne—Whole load	26	96 37	4	20 37
Wairoa—Whole load	3	4 35	2	3 21

WAITAKI DEVELOPMENT.—DESIGN WORK.

Drawings showing the general arrangement of the power-station building have been prepared by the electrical design office, and the detail drawings for this building are being prepared as required. The design and layout of the high-tension outdoor switching equipment have been finalized. Layout drawings for the main generating-machines, together with detail constructional plans, are to be prepared as soon as the necessary certified particulars are received from the manufacturers. Details of the design of the dam and the method of construction have been prepared.

Drawings and specifications covering the supply and delivery of two 600 h.p. auxiliary hydro sets have been prepared and tenders invited for same.

The arrangement of the village layout has been fixed, and specifications and drawings for the permanent-staff cottages, single men's quarters, and the hostel are now being prepared.

Interconnected Transmission-Lines.

A large amount of investigation into the electrical and mechanical characteristics of the interconnected Waitaki-Coleridge transmission-lines has been carried out, and arrangements made for suitable equipment to meet the position. To carry out this and similar investigation work a short-circuit calculating-table has been procured. This apparatus forms a very useful adjunct to the electrical design office, and enables electrical problems of the field to be reproduced in miniature in the office and results obtained which could only be otherwise obtained by long and laborious calculations.