They have been prepared on a journey-time of fifteen minutes for a stopping passenger-train between Christchurch and Lyttelton, and ten minutes for a through train. The times of the goods-train will remain as at present.

The average speeds are, passenger-trains, thirty miles per hour; goods-trains, thirteen miles per hour.

A. *Table showing Electrical Energy required on the Basis of a Ton-mile Calculation.*

Trains.	Number of Trains per Day.	Average Weight of Trains in Tons.	Tonnage per Day.	Tonnage per Annum.	Total.
Passenger	36	112	4,032	1,262,016	...
„ Sundays ...	13	112	1,456	75,712	...
Goods	19	320	6,080	1,903,040	
					3,240,768
Specials (add about 5 per cent.)	...	...	...	...	159,232
Total	...	...	...	...	3,400,000

Total Tonnage.	Length of Line, Miles.	Ton-miles.	Electrical Energy consumed.	
			Watt-hours per Ton-mile.	Kilowatts per Annum.
3,400,000	6·5	22,119,500	82	1,812,200

B. *Table showing Electrical Energy required on the Basis of Speed of Trains and Horse-power.*

Trains.	Average Weight: Tons.	Average Speed: Miles per Hour.	Average Estimated Horse-power.	Coefficient of Energy for Starting.	Horse-power Total.	Average Electric Kilowatts required per Train.	Trains per Annum.	Electric Kilowatts, Total.
Passenger ...	112	30	268	3	804	75	11,944	895,800
Goods	320	13	352	3	1,056	150	5,947	892,050
								1,787,850
Add for special trains 5 per cent.	...	...	...	...	...	...	...	89,392
Total ...	...	...	...	...	...	...	...	1,877,242

Estimated Cost of Installation.

(a.) The estimated amount of current required would therefore be 1,900,000 units. To supply this energy and to meet the maximum possible load with two goods and one passenger trains on both up and down roads at the same time, a 3,000-kilowatt plant would be wanted, together with a 1,000-ampere-hour booster battery with necessary duplicate parts, including buildings.

(b.) To run the goods service five electric locomotives would be necessary, four in regular use and one for emergencies.

The electric locomotive would also be used to run the Dunedin express or special trains of ordinary carriages between Christchurch and Lyttelton.

(c.) To run the ordinary passenger service, allowance has been made for three- and five-car trains made up as follows :—

Motor-cars, with compartment for guard and luggage, at each end of train, with one first, one second, and first and second composite smoking trailing cars between. The cost of these trains would be almost £8,000 each—£2,500 each for the motor-cars and £1,000 for the trailers.

(d.) The Lyttelton Tunnel would require the adoption of special methods for overhead equipment; but a fair estimate to allow for the whole section would be £5,000 per mile of double track.

The cost of installing electric traction would therefore be about as follows :—

		£
(a.) Power plant		60,000
(b.) Electric locomotives for goods traffic: five, at £3,500 each ...		17,500
(c.) Three passenger-trains at £8,000 each		24,000
(d.) Overhead equipment, 6½ miles, at £5,000		32,500
		134,000
Contingencies, 10 per cent.		13,400
Total		147,400