1933.

NEW ZEALAND.

PUBLIC WORKS STATEMENT

(BY THE HON. J. BITCHENER, MINISTER OF PUBLIC WORKS).

MR. SPEAKER,—

The recent activities of the Public Works Department have been influenced not only by the factor of reduced finance and the consideration of the economic value of works under review from time to time, but by the continued need for the opening-up of avenues of employment. The last-mentioned consideration—the necessity of providing for those who have lost their usual occupations—has required that public-works construction should be regarded in a somewhat different light from that in which it was viewed in former years. More so than in the past it has been necessary to weigh expenditure upon works classed as definitely and immediately or shortly productive (but where the proportion spent in wages would be relatively low) against expenditure on works which are of less economic value (in that a return for the outlay would be inadequate or deferred) but which are capable of absorbing a greater number of men. It has been my endeavour to hold a fair balance between the demand for the one and the need for the other, and accordingly all proposals for new works are closely examined from all angles before any decision is made to proceed. I am making it my business, and, where necessary, by personal acquaintance by inspection, to see that the reduced, though still large, sum of loan-money voted for public works is spent to the best advantage. The contacts I have had with local bodies during such visits of inspection have been most helpful in coming to an understanding of their problems.

It is a pleasure to me to be able to record that my efforts to acquaint myself as quickly and as fully as possible with the Department's work have been greatly assisted by the loyal help I have received from all members of the staff of the Department.

The co-operation of the Minister of Employment and the Unemployment Board has been of considerable help in determining the works that are most suitable as unemployment-relief works. It will be realized by honourable members that

limitations of finance precluded the institution and completion within any one financial year of any series of major works, and in the expenditure of loan-money this year the effort has been to apportion the allocation of approximately £3,000,000 over as wide a field as possible. This has led to the institution of a number of more or less modest schemes affording employment in various parts of the country for the greatest possible number. The practice has been to employ relief workers as far as possible on a co-operative contract basis. This has my full endorsement, as I believe it tends to promote a more healthy and contented spirit amongst the men. With assistance from the Unemployment Board it is proposed to extend the system of work under co-operative contract as far as can be done—that is, whilst the need remains for works of this kind.

It may be thought by some that there has been an undue reduction in public-works expenditure from loan-moneys, but, with regard to this, I would express the belief that the increase of £700,000 over last year was as far as we could go in the light of the very real need for keeping expenditure from loan-moneys as low as possible. It is probable, and this would have been in full accord with my own views, that the expenditure could have been kept at the lower figure of the previous year but for the necessity of creating useful work for unemployed men.

Although public-works expenditure is at a necessarily low figure, the lower cost of materials, coupled with financial assistance from the Unemployment Board, has checked to some extent the fall in the volume of work; in other words, the country has obtained relatively more work for its loan-money than it has in the past.

It will be recalled that in relation to the public-works policy the Government recently decided to further the Unemployment Board's effort to stimulate the languishing building and allied trades and thereby, among other things, to reinstate artisans and others in their accustomed occupations by proceeding with such deferred works as the Wellington Railway-station and the Dunedin Post-office. The former involves expenditure under the Railways Improvement vote, but the acceptance of a tender for the erection of the Dunedin Post-office absorbs portion of this year's allocation for the erection of public buildings.

The proposed expenditure of public-works loan-money for this year may be grouped under four headings which indicate their general purpose, namely:—

	£
(1) Improvement of lines of communication and transport (railways, roads and highways, harbour-works, &c.)	1,049,000
(2) Development of electric power	675,000
(3) Erection of public buildings	196,100
(4) Land-development (including settlement of unemployed workers)	954,900

Railway-construction, which a year or two ago was the principal activity of the Public Works Department, has now become a very small part of its work. The only railway-construction works carried on last year were the Stratford Main Trunk line and the deviation of the Wellington–Tawa Flat Railway. The former has now been completed, and handed over to the Railway Department to operate. Work on the Wellington–Tawa Flat deviation, with the exception of rail laying and ballasting, which will be done by the Railway Department, will be completed by the end of December.

There is an increase in the proposed expenditure on hydro-electric development for the present year. This is accounted for chiefly by the necessity for an early completion of the Waitaki River scheme in South Canterbury. Although the building of the dam in the Waitaki River is well advanced, it is now at one of the most dangerous stages from the point of view of flood-damage risk, and should therefore be pushed on to completion as quickly as possible. The number of men employed on this work was therefore increased recently from 530 to 880.

Another division of the Department's work for which I have thought it wise to ask for an increased appropriation this year is the construction of roads and bridges. Last year the vote had to be curtailed considerably, and the completion of many roads necessary to settlers could not be undertaken; but, notwithstanding this, the Public Works Department, assisted by the Unemployment Board, had more men engaged on metalling of settlement roads than in any other period of its existence. This year the Unemployment Board is again giving assistance to the Public Works Department towards the labour-costs in metalling roads to backblock settlers, and I am doing all I can to provide money for metal and other materials required for this purpose. Every proposal is well investigated before work is started, and I am quite satisfied that such work provides one of the most fruitful returns we can obtain from the expenditure of loan-money.

During visits of inspection, particularly in parts of the North Island, I have been impressed with the numbers of settlers, many of whom have been established for considerable periods, who are dependent on unmetalled roads for access to their holdings. The difficulty of carrying on farming operations with indifferent access needs no mention, and it is my desire to continue the policy of my predecessor by assisting such isolated and established settlers as much as possible. Even a thin coating of metal of 9 ft. or 10 ft. width would afford considerable relief, and on those side roads which serve perhaps only two or three settlers, and where traffic is light, such relief could by this means be given at a considerably lesser cost than would be occasioned by the construction of the full-width metalled road of standard depth, and available roading funds thus be made to go much further than at present. Every effort will be made in this direction, but full regard must be given to the general circumstances of the road and extent and weight of traffic likely to use it.

On main highways it was not practicable to spend more than £159,323 on construction, and this was financed mainly by a transfer of £100,000 from the Revenue Fund. This year it is proposed to provide a sum of £260,000. On account of the advanced state of deterioration of a great many bridges on main highways the Main Highways Board desires to carry out a more energetic programme of bridge renewals. The safety of the travelling public is more important than the improvement of existing highways, and the greater portion of the finance provided for construction of main highways will, therefore, be spent on bridge erection.

The expenditure of £90,568 last year on public buildings was exceptionally low. The greater part of it was absorbed by school buildings and mental hospitals. More activity is proposed this year in the erection of school and mental hospital buildings.

A considerable number of land-drainage and flood-protection schemes are in hand, as well as work in connection with the clearing of land. On this work it has been found that camps for unemployed single men are very suitable, and 1,500 men are now in camp engaged in these operations. In addition to this, there are 1,200 married unemployed men on land-development. When arranging work for unemployed men preference has been given wherever possible to land improvement and development. Several camps were also established for the clearing of willows, which had so obstructed the flow of certain streams that continual flooding of the adjoining lands was occurring. Good work has been done in this direction, and local bodies are urged not to overlook the necessity of maintaining these streams in their improved condition, and so ensure that full value is obtained for the expenditure. Money provided under the "Settlement of Unemployed Workers" vote has been expended under the supervision of the Public Works Department principally on the erection of cottages and farm buildings, but some smaller amounts were utilized for fencing, drainage, provision of implements and fertilizers. With the setting-up of the Small Farms Board it is expected that a greater amount of work will be done this year in the settling of suitable workers on the land.

EXPENDITURE.

The total net expenditure under votes and accounts appearing on the public works estimates for the financial year ended 31st March, 1933, was £1,727,070. Of this sum £1,058,861 was expended out of General Purposes Account, and the balance, £668,209, out of special accounts.

A brief summary of this expenditure, as well as the total expenditure since the inception of the public works policy to the 31st March last, follows in tabular form :—

Class of Work.	Expenditure for Year ended 31st March, 1933.	Total Expenditure to 31st March, 1933.
Railways—	£	£
New construction	69,603	39,733,322
Improvements and additions to open lines	91,250	17,318,007
Payment to Midland Railway bondholders	..	150,000
Roads	396,559	21,811,852*
Public buildings	90,568	11,625,429
Immigration	..	3,314,323
Purchase of Native lands	..	2,061,147
Settlement of unemployed workers	118,722	118,722
Lighthouses, harbour-works and harbour defences	*Cr.* 4,589	1,299,261
Tourist and Health resorts	14,454	677,809
Telegraph extension	99,999	11,280,446
Development of mining	..	881,015
Defence works (general)	..	1,401,924
Departmental	104,904	2,910,560
Irrigation and water-supply	53,290	1,059,686
Lands-improvement	38,906	738,267
Swamp land drainage	14,807	14,807
Minor works and services	..	312,607
Plant, material and stores	*Cr.* 41,704	126,158
Quarries (acquisition and operation)	*Cr.* 3,780	5,963
Timber-supply and sawmills for Public Works Department	21	*Cr.* 3,875
Motor-transport services	..	33,635
Cost and discount, raising loans, &c.	15,851	3,827,693
Total, General Purposes Account	1,058,861†	120,698,758†
Aid to Water-power Works and Electric Supply Account	508,886‖	12,063,151‖
Waihou and Ohinemuri Rivers Improvement Account	..	709,740‡
Total, Public Works Fund	1,567,747	133,471,649
Main Highways Account–Construction Fund	159,323§	5,026,693§
Wellington–Hutt Railway, &c.—		
Railway	..	228,373
Road	..	101,658
Railways Improvement Account	..	641,275
Railways Improvement Authorization Act 1914 Account	..	8,690,815
Loans to Local Bodies Account—Roads to open up Crown lands	..	697,408
Opening up Crown Lands for Settlement Account—Roads to open up Crown lands	..	206,626
Lands for Settlement Account—Roads to open up Crown lands	..	590,025
National Endowment Account	..	53,401
Education Loans Account	..	4,678,965
Hauraki Plains Settlement Account	..	922,183
Rangitaiki Land Drainage Account	..	587,944
Swamp Land Drainage Account	..	556,714
	1,727,070¶	156,453,729¶

* Includes £4,500 expended under section 16, subsection (1), Native Land Amendment and Native Land Claims Adjustment Act, 1923. † Does not include expenditure under the Ellesmere Land Drainage Act, 1905, or £1,226,000 transferred to Main Highways Construction Fund. ‡ Excludes interest during construction and loan charges. § As per annual accounts in Appendix E. ‖ Capital expenditure as per commercial accounts in Table 6, below. ¶ Excludes Main Highways Revenue Fund and Consolidated Fund votes.

WAYS AND MEANS.

	£
On the 1st April, 1932, the available ways and means for public-works purposes were	1,783,034
Additional funds were received as follows:—	
(*a*) Under Finance Act, 1931 (No. 4), section 2 (public works) ..	500,000
(*b*) Balances transferred from separate accounts now closed ..	19,851
(*c*) Recoveries on account of expenditure of previous years ..	74,416
(*d*) Ellesmere and Forsyth Reclamation and Akaroa Railway Trust Account receipts	1,551
(*e*) Proceeds from sale of lands subject to Hauraki Plains Act, 1926	1,497
	£2,380,349

	£
The net expenditure on works and services against the General Purposes Account for the year was—	
(*a*) Under appropriations	1,043,009
(*b*) Under Lake Ellesmere Land Drainage Act, 1905	439
(*c*) Under Lake Ellesmere and Akaroa Railway Trust Account ..	79
(*d*) Charges and expenses of raising loans	15,851
Making a total of	£1,059,378
This left a credit balance in the account for general purposes at 31st March, 1933, of	£1,320,971

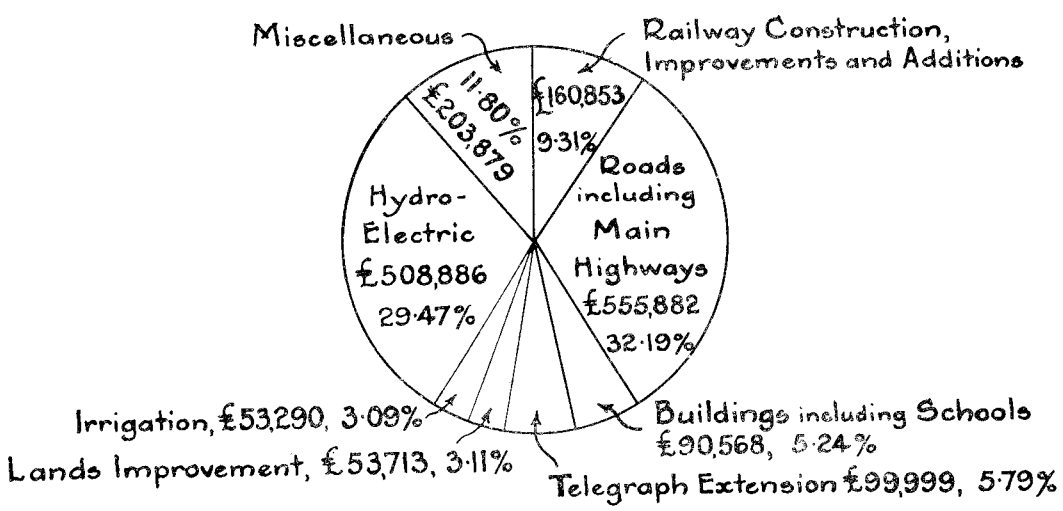
The estimated expenditure under the account for the current financial year is £2,322,915, and arrangements are being made with the Minister of Finance to provide the necessary funds.

The gross cash expenditure on works and services under the direct supervision or control of the Public Works Department itself was £3,195,409. This includes expenditure from the Public Works Fund, Consolidated Fund, Main Highways Account, Electric Supply Account, and various other accounts.

The Department also actually received a total of £842,808 as revenue from electric-supply and from irrigation undertakings. The total, therefore, of gross cash expenditure and receipts for the year 1932–33 was £4,038,217. This figure is exclusive of interest and loan charges, subsidies on rates, and sundry relatively minor items of revenue, and gives some indication of the volume of work handled by the Department's staff.

RATIO OF EXPENDITURE, 1932–33.

The ratio which the various classes of expenditure on works bear to the whole is indicated graphically in the diagram below.



IRRIGATION.

The continued failure of a large number of irrigators to pay either arrears of rates for past years or the rates due for last season is bringing irrigation farming into disrepute that, from the actual results of irrigation in Central Otago over a good number of years, it does not justly deserve.

In the Public Works Statement presented by the Right Hon. J. G. Coates in 1931 figures and graphs were given showing the decided benefits resulting to the Otago Central district from irrigation over the ten-year period from 1920 to 1930. Since the depression, however, there has been a tendency to undervalue the benefits of irrigation because farmers have been in many cases unable to pay their water rates, and in other cases have been unwilling to pay them. This, of course, is what happens to almost every progressive policy in times of financial depression, and irrigation has to take its share with the rest.

However, I have faith in the eventual recovery of the schemes now in operation, and do not consider it desirable to abandon proposals for future extension of irrigation. The Government has done everything in reason to assist irrigators to overcome their difficulties. The Otago Land Board was commissioned to inquire into cases of hardship, and remitted amounts to the extent of 30 per cent. of outstanding rates; a rebate of 12½ per cent. was given last year on all rates paid on the due date; and, finally—in spite of the fact that the Government had determined, as announced in the last Public Works Statement, that no water would be given to those in arrears unless the current year's rates were paid in advance—many cases of hardship were considered and this condition waived. None of these concessions seems to have had much effect, and the debt to the Government now stands at £27,476, or about £5,000 more than it was last year.

At the end of last year, through the representations of many concerned in the matter, it was agreed to allow the local Mortgagors Relief Committee to investigate all cases of arrears in water rates. This Committee has reported, and although from the private nature of the inquiry the report must be held as confidential, it is apparent that in many cases the Government is being flouted. It is therefore proposed to take legal action against certain irrigators who have persisted in this attitude, and it is hoped this will have a salutory effect in reducing the amount of outstanding debts of those who are able to pay.

The Committee found, of course, that there are a good many irrigators who are quite unable at present to pay their debts, but as long as the Department is satisfied that they are trying to reduce the amount of arrears due, any recommendation from the Committee for leniency will be favourably considered.

With regard to the coming season's rates, it is again proposed to give a 12½ per cent. rebate to those who pay on the due date, but it is also proposed that no water shall be given to those in arrears unless it is paid for in advance.

If better prices prevail for this year's farm-products it is hoped that decided improvements will be seen when next year's Statement is presented.

As an indication of the satisfactory results obtained before the present depression so adversely affected the position, I may mention that ten years previous to 1931 over 95 per cent. of the annual water rates were collected.

Notwithstanding the present position of unpaid rates, I still propose to take advantage of the assistance towards labour-costs given by the Unemployment Board for irrigation works, and, as will be seen from the estimates, I propose to increase the irrigation vote this year from £70,000 to £80,000.

The bulk of the expenditure will be upon the Omakau irrigation scheme, which comprises an area of 8,000 acres of good land in the Upper Manuherikia Valley. There are at present 210 men engaged on this scheme.

The rock-fill dam across the Manuherikia River at the Falls, which will give a reservoir of 8,220 acre-feet capacity, is now well under way. Rock is being obtained for the dam from two quarries, one on each side of the river, immediately adjacent to either end of the dam. A tunnel to divert the water of the river during the construction of the dam has been completed. This tunnel is 17 ft. in diameter, and is lined with concrete. The concrete cut-off wall below the dam is practically completed. The construction of the main race, 30 miles in length, is now well advanced, about 70 per cent. of the work being completed. A tunnel 1,088 ft. long has been

driven to carry the race past a steep sidelying piece of country near Lauder. Contracts have been let for the supply of all concrete pipes required for the siphons and road-crossings along the line of the race.

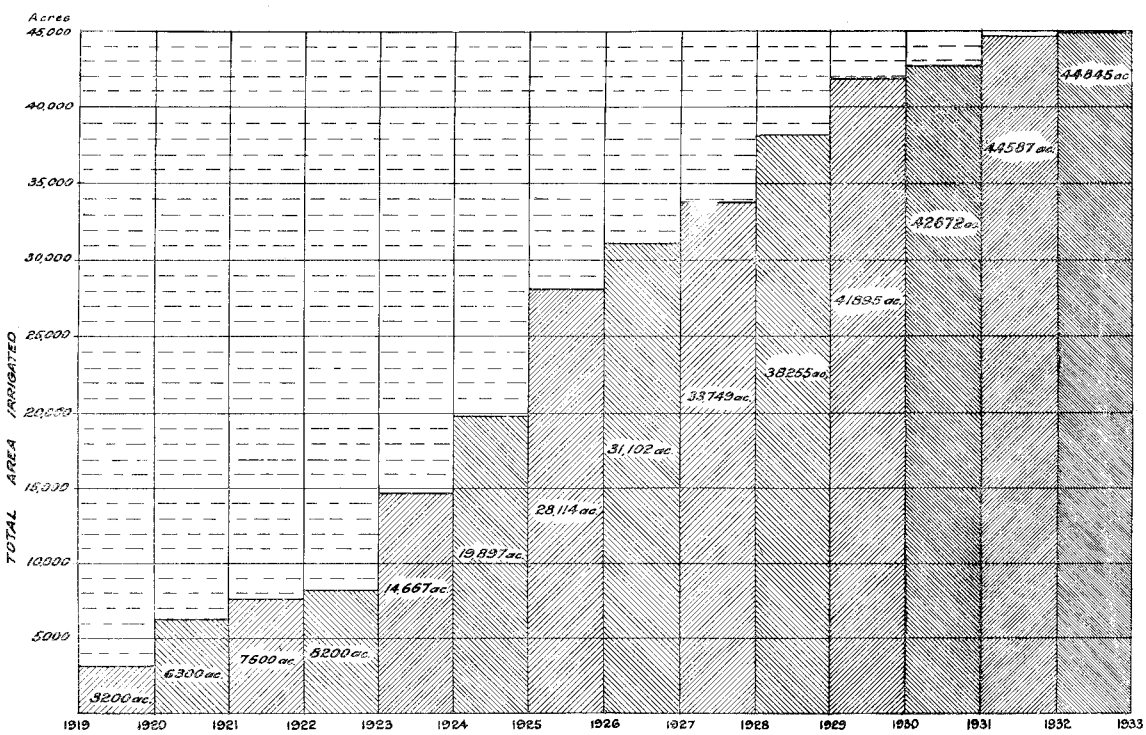
In addition to the new work on the Omakau scheme the following works to improve existing schemes are in hand, or have been completed during the year:

A concrete arch dam in the Manorburn Stream is under construction, and is about one-third completed. This will enable an additional 300 acres to be irrigated under the Galloway scheme. A race to divert water from the Totara Creek into the Poolburn Dam was well under way, but had to be stopped when two-thirds completed on account of the early winter conditions. This race will augment the supply of water to Ida Valley scheme, and in face of the severe drought experienced this year is badly needed. The reservoir at Lake Onslow, which serves the Teviot irrigation scheme, was increased in capacity by raising the dam at its outlet by 3 ft. The strengthening with rock on the downstream face of the Eweburn Dam is well under way, and should be completed in six months.

During last season 39,903 acres of land were irrigated by four hundred irrigators. This is about 5,000 acres less than was irrigated the previous season, because, owing to the system of payment in advance for irrigators in arrears of rates, some did not take their full supplies of water.

The schemes now in operation on a trading basis are Ardgour, Arrow, Bengerburn, Earnscleugh, Galloway, Hawkdun, Idaburn, Ida Valley, Last Chance, Manuherikia, Tarras, and Teviot. All schemes have been well maintained, and a full supply of water was available wherever required throughout the past season.

The following graph shows the growth of irrigation under Government schemes in the last fourteen years:—



Surveys have been completed for the proposal to irrigate the Maniototo Plains in Central Otago. Much time has been devoted by the Department's Engineers to determining the best design and outlay for this scheme, and various alternatives were investigated in detail. The best scheme proves to be one that combines irrigation by gravitation and by pumping, the power for pumping being obtained from the fall available near the head of the main race. Under the scheme recommended 57,073 acres would be irrigated by gravitation and 33,067 acres by pumping, making a total area of 90,140 acres.

Surveys were also completed for the suggested irrigation of about 30,000 acres near Glenavy. Investigations indicated that water could be conveyed to these lands from the Waitaki River at a very low initial cost, but as it was doubtful

if such a large area would be likely to demand irrigation, schemes for irrigating smaller areas nearer the source of supply were investigated, and these are now under consideration.

During my period of office I have received numerous and repeated requests to investigate irrigation possibilities in Canterbury. So far irrigation in that district has not been undertaken, the existing races being merely for the purpose of supplying water for stock, but there is now a widespread feeling in the province that irrigation on a larger scale could be carried on with advantage. There may not be any immediate necessity to commence any comprehensive scheme for irrigating large areas of land in that province, and probably if abundant irrigation water were made available immediately there would be no great demand for it.

Nevertheless, the areas have a much greater productivity if they have a sufficient and dependable supply of water in the growing seasons. I realize, therefore, that it is becoming more apparent in the district that at least a thorough investigation should be made into the economic possibilities of irrigation in Canterbury, and of the cost of supplying water for that purpose.

In every new country, on account of the rapidly changing conditions and lack of past experience upon which to base investigations, the undertaking of works without proper preliminary investigation both from a financial and from an engineering point of view is unavoidable. We have now, however, reached the stage of being able to devote more time to investigation and research, which will tend towards the elimination of unnecessary expenditure and of ill-judged opinions upon the economic value of public works. In other countries a good deal of money is now being expended for this purpose, much of it, of course, with a view to finding employment for the workless.

I have decided, therefore, that before I will recommend for the consideration of the Government any very comprehensive scheme for irrigation in Canterbury, or elsewhere in New Zealand, all the information possible shall be obtained and be available for a close study of the problem.

The experience gained by the Engineers of the Public Works Department and the experts of the Agriculture Department upon irrigation schemes already completed and in operation in Otago will be extremely valuable, but, as anything like a comprehensive scheme of irrigation for Canterbury will undoubtedly embrace problems that have been successfully overcome in other countries, it is felt that a somewhat wider knowledge of the work than has been obtained so far in this country should be brought to bear on the proposals. The Public Works Department has on its staff Mr. T. G. Beck, an Engineer who has just returned from a course of two years' intensive study of irrigation and irrigation problems over a large number of States in the United States of America. It is proposed that Mr. Beck should be placed in charge of the investigations into the future possibilities of irrigation in Canterbury.

These investigations cover a wide range, involving not only large engineering problems, but a close study of soil conditions and farming methods in Canterbury, and therefore it is proposed to associate with Mr. Beck officers of the Agriculture and other Departments.

One of the first and most important lines of investigation is the sources and the amount of water available and the cost of delivering the water to the land. Extensive surveys will be necessary to estimate the amount of water available and the cost of delivering it on to the land. Then, if a sufficient quantity of water is not available for dry seasons, careful investigation must be made into the cost of impounding it, because once irrigation is started there must be no sudden reduction in water at the periods when it is most needed. Many promising schemes have been partially spoiled for just this reason. Further close investigation must be made into the cost of spreading the water over the lands after it has been delivered to the farmer. The nature of some areas makes this a simple and inexpensive matter, but in other cases the land needs so much preparation before it can be successfully irrigated that the cost becomes prohibitive. It must always be borne in mind, however, that the cost of some preparation of land is generally more than compensated for by the increased productivity obtained. This phase of an irrigation scheme needs careful study in conjunction with the estimates for supplying the water to the land.

Then the "duty" of the water—that is to say, the amount of water required to irrigate the crops and pasture—must be estimated as closely as possible. Here it becomes necessary to make preliminary soil surveys, and this is a matter for agricultural experts to advise upon, because until this is determined the correct quantity of water that must be diverted from the source of supply cannot be decided. The co-ordination of the work throughout all stages of the investigations is therefore essential, and this will be done as soon as the survey work has been put in hand.

A start on the actual survey work will be made immediately. Information regarding climate, irrigable land areas, and existing water-supplies in Canterbury is at present being obtained.

HYDRO-ELECTRIC DEVELOPMENT.

The various electrical developments controlled by the Government have had a fairly successful year. The prevailing economic conditions have resulted in a comparatively small increase in demand, but there are some indications in the first quarter of the current year that the rate of increase is improving. The general financial position is summarized in the following table:—

—	Average Operating Capital.	Gross Revenue.	Working-expenses.	Net Balance.	Percentage Net Balance to Operating Capital.
	£	£	£	£	
Horahora-Arapuni	4,376,722	337,641	47,740	289,901	6·62
Mangahao-Waikaremoana ..	3,651,073	313,342	53,907	259,435	7·11
Lake Coleridge	2,028,636	213,345	57,780	155,565	7·67
Total	10,056,431	864,328	159,427	704,901	7·01

The State Supply of Electricity Act requires that each scheme, after paying net working-expenses, shall be charged with interest on the capital in operation, and with depreciation at the rate of 2 per cent. on the capital invested in depreciable assets. It also requires that, out of profits remaining, the schemes shall pay 1 per cent. to a sinking fund, and any further balance to a General Reserve Fund.

The general position to date is that the Electric Supply Account has been able to meet all operating and interest charges, has provided £339,983 towards the statutory requirement of £947,946 for depreciation, and, in addition, has provided £284,533 to sinking fund and £195,475 to General Reserve from profits made from time to time on Lake Coleridge and Horahora Power-stations. In other words, the electric-supply system has paid interest and operating-charges and provided £819,991 in reserves, of which £160,110 has already been utilized by Treasury for the paying-off of loans which formed part of the original capital.

The position of the separate accounts is as follows:—

Horahora-Arapuni System.—The Arapuni plant resumed operation early in April, 1932, and from that date the capital investment has been transferred back from the construction account and considered as in operation. The position is as follows:—

	£	£
Capital investment at end of year ..		4,680,484
Revenue	337,641	
Operating-expenses	47,740	
Balance	£289,901	

This balance has been used in paying interest charges and the Department's share of the capital charges on the King's Wharf generating-plant of the Auckland Electric-power Board, but is £41,487 short of being able to provide the full statutory contribution to depreciation.

To date the reserve accounts established in connection with this scheme show that £283,823 has been credited to depreciation and £61,705 to sinking fund, from which £49,768 has been utilized in the redemption of loans.

Mangahao-Waikaremoana System.—Practically no construction work beyond minor extensions and alterations has been carried out in connection with this scheme, and operation has been of routine nature. The revenue shows a slight increase over that of the previous year.

The result of the year's operations was as follows:—

	£	£
Capital investment at end of year		3,690,475
Revenue	313,342	
Operating-expenses	53,907	
Balance	£259,435	

The balance has been used in payment of interest, and allowed a payment of £52,645 to depreciation. This is £2,986 short of the statutory requirement for the year.

Lake Coleridge System.—The year was one of low rainfall, in consequence of which it was necessary to run the Lyttelton Diesel Station from August until the end of the year. This, combined with a drop of £4,850 in revenue, with somewhat reduced loading, has resulted in the scheme not showing as large a profit as in previous years.

The year's operations resulted as under:—

	£	£
Capital investment at end of year		2,053,883
Revenue	213,345	
Operating-expenses	57,780	
Balance	£155,565	

The balance has been in payment of interest, £29,552 has been paid to depreciation, £20,539 to sinking fund, and the balance of £21,225 to General Reserve.

Hydro-electric Construction Work.—Most of the construction work during the year has been in connection with the new development on the Waitaki River. As money available was restricted during the year, a considerable reduction had to be made in the number of men employed, and the work of closing the gap across the Otago half of the river was not attempted during the year. A considerable amount of preparation for this important stage of the work was carried out, and as soon as the river-flow decreased at the beginning of the present winter the work was put in hand. As indicated earlier, it has been found possible to provide a somewhat increased vote for this work, so that the number of men has been increased and the work generally speeded up again. At time of writing, concrete has been placed in the bottom across the whole length of the dam, and it is hoped to be able to bring it above summer flood-level by the end of the year.

Apart from the dam proper, work in the power-station is well on towards completion, although, of course, a large amount of detail work remains, much of which cannot be completed until water is available to drive the machines.

Apart from the Waitaki scheme, the major construction work has been the erection of a main transmission-line interconnecting the Horahora-Arapuni system in the north with the Mangahao-Waikaremoana system in the south. This line will run from the Arapuni Power-station direct via Taranaki to the Stratford substation, and should be completed early in the coming year.

GENERAL.

Although the various electric-supply authorities throughout New Zealand have not made the expansion that was customary two or three years ago, most of them report, at least, some expansion of business. The prevailing economic conditions have undoubtedly caused some consumers to reduce their consumption of power, but a supply of electricity is now becoming such an essential to all classes that increases, particularly in domestic consumption, have more than counterbalanced the slight reduction due to curtailment of industry.

In a business in which capital charges on plant represent such a large proportion of the total cost, the recent legislation reducing the rate of interest on internal loans has been of very material assistance to many of the supply authorities. It is estimated that during the past year interest charges on electricity loans have been reduced by £61,000, and it is anticipated that during the current year there will be a reduction of £74,600 as compared with what would have been payable on the 1931 basis. This reduction, although it does not come from the revenues of the Government Electric Supply Account, has enabled supply authorities to reduce prices or improve their general position.

There has been considerable agitation, particularly by the smaller Power Boards, that the Government should make some reduction in its bulk-supply charges. So far it has not been found possible to comply with this request. The Government's schemes have been designed on comprehensive lines and have cost large sums of money on which capital charges must be paid, and as the loans which have financed these schemes have all been raised abroad the Public Works Department has not secured any of the advantages of interest-reduction which have been available to most of the supply authorities. Prices have been such that in the earlier years of operation the various schemes, though paying net interest and operating expenses, have accumulated considerable deficiencies in the reserve accounts which are essential to the financial success of a business of this nature. Until these deficiencies have been reduced considerably I am afraid that it will not be possible to make reductions in the bulk-supply charges. Although a reduction in the price of electricity supplied to the consumers may be much desired, it might be well to point out that the average revenue per unit received from the actual consumers of electricity is only 1·28d., and from the ordinary domestic and farming consumers connected to the Government schemes the average revenue received per unit is only 1·143d. These are figures which will compare more than favourably with the revenue per unit received by authorities operating in much more thickly populated areas in other parts of the world.

RELIEF-OF-UNEMPLOYMENT WORKS.

As indicated earlier, there has been close co-operation between the Public Works Department and the Unemployment Board in providing useful and productive work for unemployed; and the combined efforts of the two organizations have resulted in large numbers of men being placed under the control of my Department on metalling of roads to provide improved access to settlers in outlying districts and on land-reclamation, including irrigation, drainage, flood protection, rivers-improvement, stumping and logging, scrub-cutting, &c. Most of the married men employed on these country works are either paid wages at the rate of 10s. per day for a full working-week or, as is usually the case, let co-operative contracts based on that rate of pay.

The Public Works Department has also, at the request of the Unemployment Board, arranged for the employment of men under the No. 5 Scheme, mostly near the main towns. In these cases the No. 5 Scheme was adopted to enable assistance to be given to as many men as possible, and also because the prosecution of some of the works would not in ordinary course have been entrusted to or have been a function of the Department.

The number of men employed by the Public Works Department under financial arrangements made with the Unemployment Board increased gradually from 853 in January, 1932, to 5,690 at the end of June last, the weekly average for the eighteen months being 3,260; and the following schedule of some of the work accomplished during that period may, I venture to say, be regarded as conclusive evidence of the careful consideration given to placing the men in useful employment:—

Dray-road—	
Formed	90 miles.
Widened	153 miles.
Metalled	307 miles.
Stumping and logging—	
Heavy	1,624 acres.
Light	1,044 acres.
Scrub-cutting	10,955 acres.
Bushfelling	347 acres.
Fireblight protection: Hawthorn-hedge cutting	69 miles.
Sand-dune reclamation: Marram-grass planting	6,276 acres.
Farm lands cleared of boulders	812 acres.
Land-levelling	135 acres.
Land cleared of noxious weeds	6,325 acres.
Fencing	15 miles.
River-control works—	
Channel improvement excavation	103,491 cub. yd.
Stop-banking	6 miles.
Willow-clearing	41 miles.
Land-drainage: Excavation of drains	117 miles.
Tree-planting	250 acres.
Gold-prospecting—	
Water-race constructed	4 miles.
Fluming erected	11 chains.
Irrigation works—	
Dams for reservoirs—	
Rock quarried	200 cub. yd.
Rock excavated	7,700 cub. yd.
Concrete placed	510 cub. yd.
Race construction and widening	30 miles.

RAILWAY CONSTRUCTION.

The net expenditure for the current year was £69,603, being £882,785 less than that of the previous year, due to the fact that construction work was stopped on all lines except the Stratford–Main Trunk Railway. Sales of workers' hut accommodation, surplus plant, and stocks realized £66,858. The total lengths of all lines under construction over which goods and passenger traffic has been carried was 85 miles, and these services have been well maintained.

The work of the year on the several lines in the course of construction as fully set out in the Engineer-in-Chief's report—Appendix B—may be summarized as follows:—

North Auckland Main Trunk Railway, Okaihau Northwards.—Owing to suspension of construction works in January, 1931, the work carried out on this railway consisted mainly of overhauling machinery and plant and the disposal of surplus stores, material, and temporary buildings.

Dargaville Branch Railway.—The work on this line between Kirikopuni and Tangowahine consisted chiefly of maintenance of permanent-way, repairs to workers' dwellings, water-supply and sanitary services, and the operation of goods and passenger services over a distance of 10 miles 10 chains. The services were well patronized, a large quantity of stock being carried.

Stratford–Main Trunk Railway.—Good progress was made with the construction of this railway. All tunnels were completed, bridges finally attended to and painted in readiness for handing over to the Railway Department. The rails were joined up on the 7th November, 1932. On the 12th December last the Railway Department commenced to run through goods-trains daily between Stratford and Taumarunui. These services carried up to 500 tons per trip, necessitating the use of two engines. On the 22nd March last exceptional floods were experienced on 6 miles of this line near Okahukura end, stopping all train services until the 15th May. The Okahukura Tunnel, which is on this length, suffered badly, being filled with debris and slush for its entire length (76 chains). The line from Tahora to the Main Trunk Railway, a distance of 41½ miles, was finally handed over to the Railway Department for operation of passenger and goods services on the 3rd September, 1933.

Te Wera Quarry.—The plant has been operating continuously during the year and has functioned well, little repair being required. The financial result has been most satisfactory, the working showing a net profit of £1,879 over the working-costs. The total output for the year was 13,644 cubic yards, and the average number of men employed was 18.

Westport–Inangahua Railway.—The final piers for the Cascade Creek Bridge were completed, and the cylinder-sinking plant has been dismantled and the site cleaned up. Three miles eight chains in length was ready to hand over, but, after inspection, the Railway Department refused to either take over the section or the responsibility of full maintenance. However, it has agreed to provide two or three of its regular staff to maintain the line so that trains can transport coal from Cascade Coal Company's mine to Westport.

RAILWAYS IMPROVEMENT AND ADDITIONS TO OPEN LINES.

The net expenditure out of the Public Works Fund for the year ended 31st March, 1933, amounted to £410,393. Of this amount the sum of £323,423 was provided from railway revenue to renew worn-out assets, and only £91,250 was provided from the Public Works Fund for new capital works. The expenditure on rolling-stock totalled £167,243, while the Tawa Flat Deviation absorbed an amount of £118,042. Of the balance (£125,108) the main items were bridge-strengthening £47,754, signalling, telegraph, and telephone facilities £20,750, and motor-buses £10,108, the remainder being made up of miscellaneous small works.

Tawa Flat Deviation.—During the year the sea-wall and embankment have been completed. The chief work undertaken was the enlargement and concreting of No. 2 Tunnel. This has been extended for a distance of 55 chains for the year. It is expected that the tunnel will be completed in December.

HARBOURS.

The expenditure on harbour works has been exceptionally small. At Westport the suction dredge was engaged in clearing the bar, fairway, and berthages. The whole of the trestling erected for a breakwater extension has been dismantled, as it was damaged by the heavy westerly weather. The wharf at Whitianga was completed early in the year and is now in service. The construction of a wharf at Pitt Island is in hand, the materials being on the site. The contract for the erection of a wharf at Waitangi (Chatham Islands) has proceeded satisfactorily. The wharf when completed will be 202 ft. long, 26 ft. wide, with an approach 385 ft. long and a goods-shed 97 ft. by 30 ft.

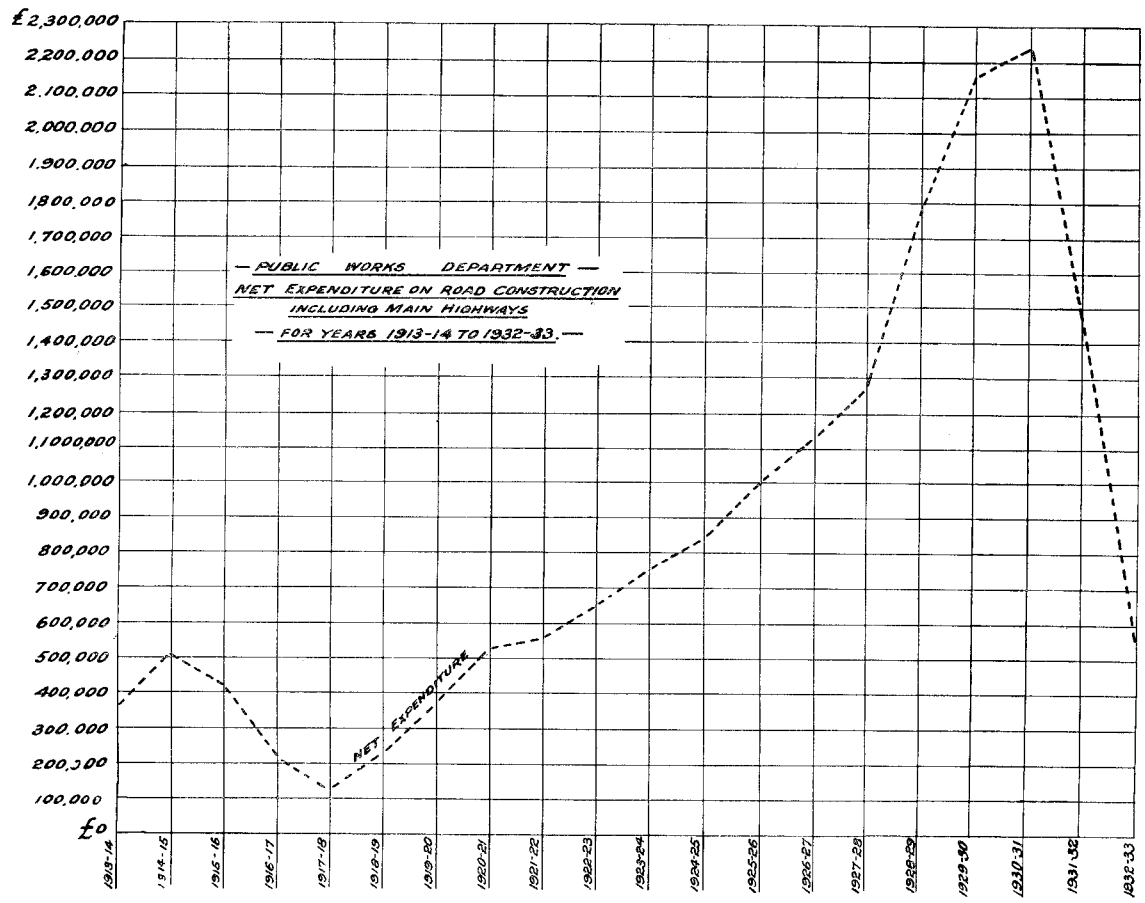
LIGHTHOUSES.

The net expenditure on lighthouses for the year was only £688, and it consisted of completing the automatic light, Akaroa Peninsula (Le Bon Bay), and planting and fencing at Baring Head.

The light at Godley Head was also completed, and is now an automatic-burning type.

ROAD CONSTRUCTION AND METALLING.

Expenditure during the year on roads and highways from capital funds allocated to my Department accounted for a total sum of £555,882, as against £1,465,355 for the preceding year. Of this amount the expenditure on roads was £396,559, and on main highways £159,323, compared with £1,082,210 and £384,145 respectively for the preceding year.



PUBLIC BUILDINGS.

General Departmental Buildings.

At Stratford the back portion of the section on which the departmental buildings is erected was levelled so that plant and stores from the various works could be stored. At Wellington final inspection of the central-heating systems in the Printing Office and Main Government Buildings was made and final payments made to the contractors. An earthquake-proof vault was erected at the District Office, and a new bulk store was provided for the Printing and Stationery Department. The total net expenditure under the vote was £2,107.

Courthouses.

Structural alterations and extensive additions were made to the Dargaville Courthouse; materials for improving the grounds around the new Hamilton Courthouse were provided; and an additional room was provided at New Plymouth Courthouse. The total net expenditure under the vote for the year was £970.

Prison Buildings and Works.

Following the policy of the Prisons Department in 1926 merely to complete the new prisons then under construction to ease expenditure of loan-moneys, the expenditure last year was reduced to £2,026. This was principally confined to improvements to the Invercargill Reclamation, which is now rapidly drawing to completion in conformity with the Government's recently modified arrangement with the Invercargill City Council. This enterprise has proved costly since it started in 1911, but very little funds are now required to finish the works in hand.

The remaining expenditure was confined mainly to various minor works at Waikeria Borstal Institution, Te Awamutu, which covered the erection of thirty additional cubicles to meet the urgent necessity of providing accommodation for increased numbers and the erection of a fourth dairy.

The following shows the total annual expenditure on erection of prison and borstal buildings and works since 1922.

Year ended	Amount. £	Year ended	Amount. £
31st March, 1923	23,148	31st March, 1929	12,572
„ 1924	27,259	„ 1930	8,205
„ 1925	25,279	„ 1931	2,504
„ 1926	24,196	„ 1932	2,621
„ 1927	22,812	„ 1933	2,026
„ 1928	22,359		

Police-stations.

The net capital expenditure on police-stations for the year amounted to £1,022. Lock-up accommodation was provided at Paekakariki and Westport, and offices at Tangowahine and Tuatapere. Sites for police-stations were acquired at Tikitiki and Waitotara.

Post and Telegraph Buildings.

The Post and Telegraph Department's building programme continues to be greatly restricted. No new buildings are under construction, nor are any additions or alterations to existing buildings in progress, the inactivity being enforced by the abnormal financial conditions that prevail. The amount available for maintenance has been greatly restricted, and has been sufficient to provide for the most urgent cases only.

The following is a complete review of the activities engaged in during the year:—

The erection of new post-office buildings at High Street (Christchurch), and Westport; the reconditioning of the Chief Post-office building at Napier; and the reconstruction of the Hastings Post-office building, were completed. The second floor of the Napier building was adapted for occupation by the Department of Lands and Survey and the Lands and Deeds and Stamp Duties Departments, the portions occupied by the two last-mentioned Departments being made fireproof by the provision of a concrete floor and steel partitions, &c.

The clock-towers on the Chief Post-office buildings at Gisborne and Timaru were found to be defective; and, as they constituted an earthquake hazard, they were removed. The clock-tower on the Masterton Post-office building was strengthened.

The old post-office building at Courtenay Place, Wellington, was converted into shops and offices and leased to a private tenant.

The post-office buildings at Papahaoa, St. Bathan's, and Wellington North were no longer required, and were disposed of.

The remaining buildings on the former radio-station site at Awanui have now been disposed of. The station itself was closed in 1929; and the Engineer's residence was sold for removal in 1931.

Areas of land were acquired as follows: Clydevale, site for post-office building; Mataura, extension of post-office site; Ngatea, extension of storage site.

Areas of land no longer required at the following places were disposed of: Ahaura, Awanui, Buckland, Clydevale, Gorge Road, Napier, Owaka, Patetonga, St. Albans (street-widening), St. Bathan's, Sydenham (street-widening), Wellington North, and Whatawhata.

A contract has been let for the erection of the Dunedin Post-office.

Mental Hospitals.

The net capital expenditure for the year on mental-hospital buildings amounted to £28,756, being £17,182 less than that of the previous year. It is proposed to expend £80,000 for the current year, and plans and specifications are being prepared for further urgent works estimated to cost an additional £60,000.

The following is a summary showing the position of the works that were completed or were in hand at 31st March, 1933.

Auckland: The change-over to bulk supply of electric current was completed and the hot-water system completely reorganized.

Puhitahi: Villas Nos. 3 and 4 were completed, and furnishings and equipment are now being installed. A contract is in hand for the erection of two more villas, Nos. 12 and 13, to accommodate 100 patients.

Tokanui: Two steam boilers in boiler-house were replaced, carpenters' workshops erected, in which woodworking machinery and electric light and power were installed.

Interior plaster in the main building was renovated, and additional ventilation arranged for single rooms.

Septic tanks generally were cleaned out, and a comprehensive system for sewerage digestion is under review.

A new 250,000-gallon reinforced concrete reservoir was built and connected, and water-supply improved generally.

Porirua: Verandas to two male villas were enclosed with glass, a new barn was erected, and portion of main-drive surface sealed.

Nelson: General improvements were effected to water services and sanitary accommodation.

Ngawhatu: Drainage and water-services, &c., were connected to three new villas. It is proposed to erect a new laundry, tenders for which will be invited shortly. A commencement was made with a new villa for women.

Christchurch: At the reception home Sunnyside a new dormitory was erected, having accommodation for twelve patients.

Improvements were effected to sanitary and hot-water services to the various institutions in the district, and painting and renovations carried out generally.

The veranda at North House was glassed in to accommodate six additional patients.

At Templeton a new villa (No. 4) for backward children was erected.

Seacliff: Repairs and renovations generally were carried out.

Waitati: New sinks and hot-water service were installed.

Hokitika: A new villa in wood is under construction, and it is proposed to call tenders for another villa.

Health and Hospital Institutions.

Practically no capital expenditure was incurred on buildings under the above heading. The work to be undertaken this year is the completion of the new nurses' home at St. Helens Hospital, Christchurch, and it is proposed to provide additional bedrooms for nurses at St. Helens Hospital, Wellington.

Education.

The expenditure on the erection of school buildings, additions, and residences, and the purchase of sites amounted during the year to £52,623, compared with £259,148 for the financial year ended 31st March, 1932.

The larger works completed during the year included the new intermediate school at Napier, new workshops and a dormitory at the Napier Boys' High School, the first portion of the new Napier Girls' High School, and the new school building at Napier Central. Additional accommodation has been added to the Otahuhu Junior High School, and a final payment made in connection with the erection of the Nelson Boys' College Hostel. A payment of £3,500 was made to reimburse the Wanganui Education Board, which had raised loans some years previously for the purchase of sites and erection of public schools.

A large public school is in course of erection at Parnell, Auckland, and at intermediate school is being built at Albany Street, Dunedin. Old buildings are being replaced at Invercargill North, and a new school is under construction at Dairy Flat, Auckland.

During the year the sum of £6,394 was spent out of the Government Fire Insurance Fund for the restoration of schools destroyed or damaged by fire.

During the period under review the sum of £4,505 was provided from the Consolidated Fund to cover the cost of works under £200.

The following table shows for the last two years the amount expended out of the Public Works Fund on new buildings, additions, sites, and teachers' residences :—

	1932–33.	1931–32.
	£	£
Public schools	33,631	126,778
Secondary schools	21,754	65,030
Technical schools	3,584	44,507
Training colleges	..	1,228
Native schools	704	14,433
Schools for mentally backward	..	199
Child-welfare Institutions	..	714
Kindergartens	..	54
Massey Agricultural College	..	9,622
Gross total	59,673	262,565
Less credits-in-aid	7,050	3,417
	£52,623	£259,148

Tourist and Health Resorts.

The net expenditure for the year amounted to £14,455, as against £87,609 for the previous year. This latter amount included payment for the Chateau, Tongariro.

The principal works undertaken during the year were the reconstruction of the Blue Bath House and further extensions to the electrical systems at Rotorua; improvements to tourist tracks in South Westland; hot drying-rooms on Milford Track; and preliminary work in connection with the hydro-electric scheme at the Tongariro National Park.

During next financial year it is proposed to complete the work on the Blue Bath and the hydro-electric scheme at the Chateau, Tongariro.

TELEGRAPH EXTENSION.

The expenditure for telegraph extension by the Post and Telegraph Department for the financial year in extending and improving the telephone, telegraph, and wireless facilities throughout the Dominion amounted to £99,999, as against £249,946 for the year ended the 31st March, 1932.

In view of the small amount of capital available, every effort was made to keep expenditure on new assets down to a minimum, but at the same time to effect essential or desirable improvements in the telegraph and toll services by concentrating on improving existing facilities wherever practicable. This was accomplished in some cases by rearranging lines and in others by undertaking general reconstruction work. In a few cases requirements could not be met except by the erection of new lines, and in these cases the necessary work was proceeded with.

Owing to the depressing effects of the economic situation, the development of the local telephone-exchange systems throughout the Dominion, which was such a feature of prosperous years, has, in common with other businesses of a like nature, received a temporary setback. It is anticipated, however, that with the return to better conditions the plant now available will be fully utilized for the purpose of connecting subscribers, and that further additions will be necessary.

No extensions of any importance were made to departmental radio-telegraph and radio-telephone stations, which continued to function efficiently and to meet all the demands made upon them.

SETTLEMENT OF UNEMPLOYED WORKERS.

A new vote was taken last year under the above heading, and the following is a summary of the operations :—

Number of share milkers' cottages and sheds erected	238
Number of tenants established or being established	435
Expenditure on share milkers' cottages and sheds	£45,690
Expenditure in establishing small farms	£73,032
	£118,722

PLANT AND MECHANICAL EQUIPMENT.

Although the use of construction plant upon public works has been considerably reduced since the necessity arose for keeping large numbers of men employed upon relief works, it has been found necessary in many cases to introduce power-driven plant upon work in wet places and upon laborious jobs outside the scope of man-power or in cases wherein it would have been unreasonable to apply relief labour.

A considerable quantity of construction plant has also been utilized upon standard works in hand during the year, the capital cost of the whole of the construction plant in use, including that used upon relief works and road maintenance works this year being approximately £456,000.

The major construction works upon which plant has been used during the year are: Waitaki hydro-electric works; Oturehua and Omakau irrigation works; New Balclutha River Bridge; Tawa Flat Railway Deviation works; Arapuni hydro-electric works; and the Wairoa River Bridge, Hawke's Bay.

No new plant items other than a few replacement motor-vehicles have been purchased for the use of the Department during the year, but a considerable quantity of surplus plant available from the Department's closed works has been sold, the total price realized for this being £6,559 13s. 6d., which is a very satisfactory figure.

As a result of co-operation with other Government Departments, arrangements have been made to transfer a number of surplus plant items, thus preventing some expenditure of Government funds upon new plant required by those Departments.

The closest control has been maintained over the cost and use of motor-vehicles, both cars and light runabout trucks, for departmental purposes. The number of vehicles in commission has been reduced by fourteen to a total of 297, and the total annual expenditure on this service has decreased by £6,837 compared with the previous year.

Plant of all descriptions has been hired during the year to local bodies, and to small syndicates and co-operative parties operating upon mining ventures and petty contracts that have tended to ease the drain upon unemployment-relief funds, due encouragement by way of reasonable hire rates having been given by the Department in all cases.

Annual mechanical inspections have been made of all passenger-carrying motor-vehicles throughout New Zealand for the Transport Department, and when all of the conditions provided for protection the safety of the travelling public were met certificates of fitness were supplied to enable the issue of licenses.

Mechanical work of an advisory nature has been done for local bodies and for a number of Government Departments, including Stores Control Board, Native Department, Naval Department, Lands Department, Mental Hospital Department, Department of Agriculture, Scientific and Industrial Research Department, Cook Islands, and Samoan Administration.

As appendices to this statement honourable members will find full details of the principal works carried out by the Department, together with reports of the Engineer-in-Chief, the Chief Electrical Engineer, the Government Architect, and the Main Highways Board.

PUBLIC WORKS STATEMENT, 1933.

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TABLES.

APPENDICES.

TABLE No. 1.

SUMMARY SHOWING THE TOTAL EXPENDITURE ON PUBLIC WORKS AND OTHER SERVICES OUT OF PUBLIC WORKS FUND (GENERAL PURPOSES ACCOUNT) TO 31ST MARCH, 1933, AND THE LIABILITIES ON THAT DATE.

Number of Table containing Details.	Works.	Total Net Expenditure to 31st March, 1932.	Expenditure during Twelve Months ended 31st March, 1933.	Recoveries on Account of Services of Previous Years.	Total Net Expenditure to 31st March, 1933.	Liabilities on 31st March, 1933.	Total Net Expenditure and Liabilities.	Works.
		£	£	£	£	£	£	
3	Railways*..	56,899,532	160,853	9,056	57,051,329	42,660	57,093,989	Railways.*
..	Payment to Midland Railway bond-holders	150,000	..	..	150,000	..	150,000	Payment to Midland Railway bond-holders.
..	Roads†	21,416,463	396,559	1,171	21,811,852	38,510	21,850,362	Roads.†
..	Development of mining	831,065	..	50	831,015	..	831,015	Development of mining.
..	Telegraphs	11,180,447	99,999	..	11,280,446	17,114	11,297,560	Telegraphs.
5	Public buildings‡	11,543,773	90,568	8,911	11,625,429	10,537	11,635,966	Public buildings.‡
..	Lighthouses, harbour-works, and harbour-defences	1,303,850	*Cr.* 4,589	..	1,299,261	128	1,299,389	Lighthouses, harbour-works, and harbour-defences.
..	Departmental	2,858,296	104,904	52,639	2,910,560	2,999	2,913,559	Departmental.
10 of 1878	Coal-exploration and mine-development	10,835	..	..	10,835	..	10,835	Coal-exploration and mine-development.
11 of 1877	Aiding works on Thames goldfields ..	50,000	..	..	50,000	..	50,000	Aiding works on Thames goldfields.
..	Immigration	3,314,905	..	583	3,314,323	..	3,314,323	Immigration.
..	Purchase of Native lands	2,061,147	..	..	2,061,147	..	2,061,147	Purchase of Native lands.
..	Settlement of unemployed workers ..	..	118,722	..	118,722	..	118,722	Settlement of unemployed workers.
..	Defence	1,402,548	..	624	1,401,924	..	1,401,924	Defence.
..	Charges and expenses of raising loans ..	3,811,842	15,851	..	3,827,693	..	3,827,693	Charges and expenses of raising loans.
..	Interest and sinking fund	218,500	..	..	218,500	..	218,500	Interest and sinking fund.
..	Rates on Native lands	68,672	..	..	68,672	..	68,672	Rates on Native lands.
..	Thermal springs	14,600	..	..	14,600	..	14,600	Thermal springs.
..	Tourist and health resorts	664,232	14,454	877	677,809	489	678,298	Tourist and health resorts.
..	Lands improvement§	699,609	38,906	248	738,267	6,659	744,926	Lands improvement.§
..	Swamp land drainage	..	14,807	..	14,807	1,699	16,506	Swamp land drainage.
..	Irrigation and water-supply‖.. ..	1,006,492	53,290	96	1,059,686	4,729	1,064,415	Irrigation and water-supply.‖
..	Plant, material, and stores	168,005	*Cr.* 41,704	143	126,158	1,530	127,688	Plant, material, and stores.
..	Quarries (acquisition and operation) ..	9,743	*Cr.* 3,780	..	5,963	784	6,747	Quarries (acquisition and operation).
..	Timber-supply and sawmills for Public Works Department	*Cr.* 3,877	21	18	*Cr.* 3,875	..	*Cr.* 3,875	Timber-supply and sawmills for Public Works Department.
..	Motor transport services	33,635	..	..	33,635	..	33,635	Motor transport services.
..	Transfer to Main Highways Account, Construction Fund	1,226,000	..	..	1,226,000	..	1,226,000	Transfer to Main Highways Account, Construction Fund.
	Totals	120,940,314	1,058,861	74,416	121,924,758	127,838	122,052,596	Totals.

* Exclusive of expenditure on Hutt Railway and Road Improvement and Railways Improvement Accounts. † Includes £4,500 expended under section 16 (1) Native Land Amendment and Native Land Claims Adjustment Act, 1923. ‡ Includes £12,500 expended under Finance Act, 1929, section 32. § £6,727 previously expended on irrigation under this item now transferred to Irrigation and Water-supply. ‖ Includes £115,000 previously expended under Irrigation and Water-supply Account, 1911–12 to 1915–16 and part 1917–18, now included in Public Works Fund; also £6,727 previously expended on irrigation under Lands Improvement now transferred to Irrigation and Water-supply.

TABLE No. 2.

GENERAL SUMMARY.

Showing NET YEARLY EXPENDITURE out of PUBLIC WORKS FUND (GENERAL PURPOSES ACCOUNT), 1911–1912 to 1932–33.

N.B.—The figures in italics, prefixed by "*Cr.*," are either recoveries on account of services of previous years or receipts-in-aid applied in reduction of expenditure.

Description of Services.	Total Net Expenditure to 31st March, 1911.	Expenditure.									
		1911–12.	1912–13.	1913–14.	1914–15.	1915–16.	1916–17.	1917–18.	1918–19.	1919–20.	1920–21.	1921–22.
	£	£	£	£	£	£	£	£	£	£	£	£
Immigration	2,228,232	11,681	14,694	33,914	33,219	10,010 *Cr. 10*	6,533	3,856	*Cr. 12,018*	*Cr. 62,561*	*Cr. 7,806*	247,528
Public Works, Departmental	676,806	49,864	57,426	66,650	100,719	111,489	131,701	127,962 *Cr. 2,662*	115,419 *Cr. 4,119*	121,677	143,280 *Cr. 6,281*	128,002 *Cr. 525*
Irrigation and Water-supply	1,562	2,794	14,689	40,329	32,090	29,874	20,794	11,650	13,665	34,115	55,344	82,713
Railways	27,560,996	1,125,905 *Cr. 6,987*	1,148,832 *Cr. 29,528*	1,104,897 *Cr. 5,485*	2,146,753† *Cr. 6,022*	1,065,171 *Cr. 4,633*	620,947 *Cr. 4,845*	495,771 *Cr. 110*	387,923 *Cr. 4,924*	748,649 *Cr. 105,196*	1,365,466 *Cr. 388*	3,133,200 *Cr. 751*
Payment to Midland Railway Bondholders	150,000	..	..	..	..	..	..	..	..	..	..	..
Roads:—												
Miscellaneous Roads and Bridges	7,712,709	383,511	337,584	353,836 *Cr. 515*	484,365	400,062	203,746	128,730 *Cr. 600*	221,887 *Cr. 997*	376,097 *Cr. 603*	527,854 *Cr. 81*	552,895 *Cr. 197*
Roads on Goldfields..	895,280	41,067	36,761	24,143	30,065	24,432	17,099	6,912	4,186	12,465	11,050	11,264
Development of Thermal Springs and Natural Scenery ..	16,023	..	..	..	..	..	..	..	..	..	..	..
Lands Improvement Account*	300,930	..	..	..	..	..	..	..	..	..	..	..
Total, Roads	8,924,942	424,578	374,345	377,464	514,430	424,494	220,845	135,042	225,076	387,959	538,823	563,962
Development of Mining	846,958	21,244 *Cr. 30*	10,644 *Cr. 1,015*	4,889	2,384 *Cr. 255*	6,602	4,592	27 *Cr. 6,545*	518 *Cr. 1,000*	1,173 *Cr. 7,008*	2,153 *Cr. 1,606*	2,130 *Cr. 51*
Purchase of Native Lands	1,577,124	*Cr. 2,466*	*Cr. 917*	*Cr. 857*	*Cr. 1,060*	*Cr. 972*	*Cr. 868*	*Cr. 57*	..	*Cr. 57*	*Cr. 57*	*Cr. 52*
Native Lands Purchase Account	491,980	..	..	..	..	..	..	..	..	..	..	..
Total, Land Purchases	2,069,104	*Cr. 2,466*	*Cr. 917*	*Cr. 857*	*Cr. 1,060*	*Cr. 972*	*Cr. 868*	*Cr. 57*	..	*Cr. 57*	*Cr. 57*	*Cr. 52*
Telegraph Extension	1,878,058	147,692	251,375	392,648	288,395	249,554	203,311	213,955	198,611	249,379	336,468	590,981

* Subsequent expenditure under separate class "Lands Improvement," see next page.

† Includes £1,000,000 expended 1908–9 and 1909–10 under Wellington–Manawatu Railway Purchase Account.

[*Continued on page 6.*

TABLE No. 2—*continued.*

GENERAL SUMMARY—*continued.*

Showing Net Yearly Expenditure out of Public Works Fund (General Purposes Account), 1911–1912 to 1932–33—*continued.*

Description of Services.	Total Net Expenditure to 31st March, 1911.	Expenditure.										
		1911–12.	1912–13.	1913–14.	1914–15.	1915–16.	1916–17.	1917–18.	1918–19.	1919–20.	1920–21.	1921–22.
	£	£	£	£	£	£	£	£	£	£	£	£
Public Buildings.												
General (including Miscellaneous)	443,803	34,721	44,719	43,199	52,239	22,050	12,648	11,646 *Cr. 15,067*	43,168	64,207	39,504	87,057
Parliamentary	76,055	2,004	18,806	23,612	31,478	17,133	22,586	37,233	..	..	..	..
Judicial { Courthouses	682,280	14,556	20,097	9,423	5,171	4,902	299	21	..	868	1,400	4,358
Judicial { Prisons		9,760	6,911	4,928	14,515	17,786	15,685	13,195	16,299	20,981	30,038 *Cr. 800*	41,740
Judicial { Police-stations		19,817	18,423	14,094	19,122	25,484	21,147	18,814	6,157	24,944	36,843	22,544
Post and Telegraph	777,012	130,815	122,999	78,815	60,838	35,258	22,744	33,525	26,072	66,543	93,364 *Cr. 560*	112,906 *Cr. 675*
Customs	49,440	..	..	..	..	..	..	..	..	..	..	..
Quarantine Stations	6,865	..	..	..	..	..	..	..	..	35,490	15,529	4,581
Mental Hospitals	597,634	8,809	46,181	26,001	53,996	54,898 *Cr. 15*	44,602	26,502	14,640	18,277	27,368	41,838
Public Health	32,489	..	376	..	..	..	..	..	..	..	..	..
Health and Hospital Institutions	115,236	12,745	8,750	1,435	998	1,426	7,570	4,080	2,332	8,484	4,099	26,131
School Buildings	1,879,815	90,535	105,000	121,954	122,940	97,972	70,367	63,082	115,656	195,500	244,722	2,469 *Cr. 9,255*
Agricultural	31,314	3,684	6,475	4,398	2,428 *Cr. 34*	2,972	3,046	5,685	4,229	7,227	9,345	1,115
Workers' Dwellings	..	22,644	46,455	41,741	68,275	55,893	35,437	15,505	7,293	26,674	..	..
Total, Public Buildings	4,691,943	350,090	445,192	369,600	431,966	335,759	256,131	214,221	235,846	469,195	500,851	334,809
Lighthouses, Harbour-works, and Harbour-defences :—												
Lighthouses..	179,985	5,428	9,031	5,174	3,887	1,415	449	561	1,663	253	758	16,350
Harbour-works	349,202	6,004	7,415	3,346 *Cr. 1,462*	12,563	9,355	2,280	2,359	3,729	3,245	4,080	2,424
Harbour-defences	539,659	1,144	339	539 *Cr. 300*	681	2,903	1,038	56	..	..	..	..
Total, Lighthouses, &c.	1,068,846	12,576	16,785	7,297	17,131	13,673	3,767	2,976	5,392	3,498	4,838	18,774
Rates on Native Lands	68,672	..	..	..	..	..	..	..	..	..	..	..

[*Continued on page 7.*

TABLE No. 2—*continued.*

GENERAL SUMMARY—*continued.*

Showing Net Yearly Expenditure out of Public Works Fund (General Purposes Account), 1911–1912 to 1932–33—*continued.*

Description of Services.	Total Net Expenditure to 31st March, 1911.	Expenditure.										
		1911–12.	1912–13.	1913–14.	1914–15.	1915–16.	1916–17.	1917–18.	1918–19.	1919–20.	1920–21.	1921–22.
	£	£	£	£	£	£	£	£	£	£	£	£
Contingent Defence	909,982	10,437	23,790	30,186	15,221	37,619	9,742	6,714	8,809 *Cr. 922*	10,187	8,701	15,586
Tourist and Health Resorts	203,273	13,361	12,906	14,989	8,232 *Cr. 12*	5,167 *Cr. 500*	1,094	931	1,620	6,194	19,041	17,996 *Cr. 110*
Lands Improvement*	62,152	20,394	22,550 *Cr. 383*	10,269 *Cr. 432*	13,810 *Cr. 522*	5,936	*Cr. 2,731*	1,838	*Cr. 4,268*	2,964	2,064	17,478
Charges and Expenses of raising Loans	1,241,907	67,470 *Cr. 66,954*	72,950 *Cr. 71,681*	105,449 *Cr. 96,741*	35,495 *Cr. 34,865*	5,037 *Cr. 5,030*	35	1	..	..	184	174,280
Interest and Sinking Funds	218,500	..	..	..	..	..	..	..	..	..	..	..
Coal-exploration and Mine-development	10,835	..	..	..	..	..	..	..	..	..	..	..
Thermal Springs	14,600	..	..	..	..	..	..	..	..	..	..	..
Plant, Material, and Stores	..	..	..	..	..	74,418	9,778	6,811	20,638 *Cr. 31*	47,682	169,910	106,432
Timber-supply and Sawmills for Public Works Department	..	..	..	..	..	..	..	..	..	..	..	16,369
Total Ways and Means Credits	..	*10,530*	*103,524*	*105,792*	*43,400*	*11,160*	*5,713*	*43,492*	*11,993*	*112,864*	*19,627*	*11,616*
Grand Total—Net Expenditure	52,836,735	2,190,731	2,347,965	2,455,066	2,597,109	2,363,658	1,502,588	1,237,422	1,207,482	2,020,714	3,121,131	5,449,351

* For previous expenditure see Roads Class.

[*Continued on page 8.*

TABLE No. 2—*continued.*

GENERAL SUMMARY—*continued.*

Showing Net Yearly Expenditure out of Public Works Fund (General Purposes Account), 1911–1912 to 1932–33—*continued.*

Description of Services.	Expenditure.											Total Net Expenditure to 31st March, 1933.
	1922–23.	1923–24.	1924–25.	1925–26.	1926–27.	1927–28.	1928–29.	1929–30.	1930–31.	1931–32.	1932–33.	
	£	£	£	£	£	£	£	£	£	£	£	£
Immigration	90,611 *Cr. 140*	92,600 *Cr. 1,267*	136,353 *Cr 16*	107,521 *Cr. 443*	184,918	67,157	50,266 *Cr. 283*	41,756	33,544	5,265 *Cr. 210*	.. *Cr. 583*	3,314,323
Public Works, Departmental	111,367 *Cr. 131*	110,445 *Cr. 69*	127,556 *Cr. 19*	126,596 *Cr. 129*	115,866 *Cr. 35,948*	130,951 *Cr. 13,328*	142,252 *Cr. 88,499*	132,783 *Cr. 51,671*	131,816 *Cr. 16,381*	151,377 *Cr. 33,947*	104,904 *Cr. 52,639*	2,910,560
Irrigation and Water-supply*	58,131	95,467	127,995	56,227 *Cr. 31*	56,937	49,735 *Cr. 2,798*	55,198 *Cr. 8*	69,657	62,614	37,749	53,290 *Cr. 96*	1,059,686
Railways	2,110,859 *Cr. 3,171*	1,776,413 *Cr. 1,167*	1,878,729 *Cr. 37,924*	1,988,614 *Cr. 16,875*	1,480,807 *Cr. 95,647*	1,141,822 *Cr. 1,699*	1,216,277 *Cr. 2,595*	1,812,521 *Cr. 1,296*	1,987,196 *Cr. 792*	952,388 *Cr. 20,568*	160,853 *Cr. 9,056*	57,051,329
Payment to Midland Railway Bondholders	..	..	..	..	..	..	..	..	..	..	..	150,000
Roads:—												
Miscellaneous Roads and Bridges	643,156 *Cr. 244*	751,370 *Cr. 188*	603,968 *Cr. 231*	564,694 *Cr. 4,810*	575,898 *Cr. 981*	669,833 *Cr. 540*	780,990 *Cr. 330*	1,005,330 *Cr. 415*	1,379,810 *Cr. 472*	1,078,270 *Cr. 564*	396,559 *Cr. 1,171*	..
Roads to give access to Outlying Districts	..	..	..	..	..	33,642	51,582	53,693	91,126	3,940	..	..
Roads on Goldfields	4,850	2,867	2,755	3,934	2,230	2,330 *Cr. 467*	1,005	1,885	4,586	..	..	..
Development of Thermal Springs and Natural Scenery	..	..	..	..	..	..	..	..	..	..	..	..
Lands Improvement Account	..	..	..	..	..	..	..	..	..	..	..	..
Total, Roads	647,762	754,049	606,492	563,818	577,147	704,798	833,247	1,060,493	1,475,050	1,081,646	395,388	21,811,852
Development of Mining	*Cr. 98* *Cr. 1,785*	1,363 *Cr. 2,310*	..	..	..	.. *Cr. 1,130*	.. *Cr. 260*	.. *Cr. 260*	.. *Cr. 260*	..	.. *Cr. 50*	831,015
Purchase of Native Lands	..	..	..	..	*Cr. 535*	*Cr. 56*	..	..	..	..	..	..
Native Lands Purchase Account	..	..	..	..	..	..	..	..	..	..	..	..
Total, Land Purchases	..	..	..	..	*Cr. 535*	*Cr. 56*	..	..	..	..	..	2,061,147
Settlement of Unemployed Workers	..	..	..	..	..	..	..	..	..	..	118,722	118,722
Telegraph Extension	512,657 *Cr. 11,082*	717,409	957,294	931,661	558,042	625,540	624,414	594,383	419,756	249,978 *Cr. 32*	99,999	11,280,446

* £6,727 previously included under Lands Improvement now transferred to Irrigation and Water-supply.

TABLE No. 2—*continued.*

GENERAL SUMMARY—*continued.*

Showing NET YEARLY EXPENDITURE out of PUBLIC WORKS FUND (GENERAL PURPOSES ACCOUNT), 1911–1912 to 1932–33—*continued.*

Description of Services.	Expenditure.											Total Net Expenditure to 31st March, 1933.
	1922–23.	1923–24.	1924–25.	1925–26.	1926–27.	1927–28.	1928–29.	1929–30.	1930–31.	1931–32.	1932–33.	
	£	£	£	£	£	£	£		£	£	£	£
Public Buildings :—												
General (including Miscellaneous)	113,553	8,160	30,791	29,369	119,864	42,553	4,272	14,106*	85,204	33,189	2,107	..
			Cr. 35	*Cr. 345*	*Cr. 429*	*Cr. 1,065*	*Cr. 420*	*Cr. 3,156*	*Cr. 55*	*Cr. 4,231*	*Cr. 1,341*	
Parliamentary	..	..	..	..	..	..	35	27,142	15,723	37	..	..
Judicial — Courthouses	2,018	2,448	5,363	7,209	1,261	7,531	8,387	15,765	19,572	3,513	970	..
	Cr. 13		*Cr. 19*		*Cr. 13*	..	*Cr. 95*	*Cr. 29*	*Cr. 16,403*	*Cr. 529*	*Cr. 222*	
Judicial — Prisons	23,313	26,484	25,279	24,196	22,812	22,359	12,573	18,814	2,504	2,621	2,026	..
		Cr. 2,568	*Cr. 86*		*Cr. 908*	*Cr. 524*	*Cr. 321*	*Cr. 285*	*Cr. 134*	*Cr. 67*	*Cr. 71*	
Judicial — Police-stations	6,298	12,838	18,553	16,594	7,411	5,561	6,925	8,442	8,360	2,535	1,022	..
				Cr. 102	*Cr. 13*	*Cr. 970*	*Cr. 605*	*Cr. 319*	*Cr. 54*	*Cr. 91*	*Cr. 80*	
Post and Telegraph	77,211	108,395	65,917	89,865	86,052	77,194	62,087	104,157	138,671	104,505	2,763	..
	Cr. 69		*Cr. 210*	*Cr. 453*	*Cr. 1,114*	*Cr. 834*	*Cr. 1,980*	*Cr. 197*	*Cr. 1,391*	*Cr. 1,379*	*Cr. 5,549*	..
Customs	..	..	..	..	..	..	..	..	..	..	..	..
Quarantine Stations	154	171	284	..	..	..	..	..	..	..	..	..
Mental Hospitals	13,852	26,541	68,438	77,835	68,635	51,119	96,782	152,096	134,140	45,938	28,756	..
				Cr. 283		*Cr. 3,600*				*Cr. 860*		
Public Health	..	..	..	..	..	..	..	..	..	..	..	..
Health and Hospital Institutions	20,981	7,420	27,951	31,177	15,840	14,361	19,637	16,651	17,338	3,316	301	..
	Cr. 1,399			*Cr. 300*		*Cr. 310*				*Cr. 1*	*Cr. 113*	
School Buildings	..	..	..	..	..	..	..	..	..	259,149	52,623	..
	Cr. 367	*Cr. 1,090*	*Cr. 905*	*Cr. 1,050*	*Cr. 7,953*		*Cr. 2,428*		*Cr. 1,110*	*Cr. 40*		
Agricultural	514	282	3,242	7,932	4,164	2,863	2,808	2,963	2,509	..	..	..
	Cr. 27	*Cr. 171*	*Cr. 686*	*Cr. 865*	*Cr. 310*		*Cr. 2,395*	*Cr. 1,721*	*Cr. 194*	*Cr. 1,927*		
Workers' Dwellings	..	..	..	..	..	..	..	..	..	..	..	..
Total, Public Buildings	255,818	188,910	243,877	280,780	315,299	216,237	205,262	354,429	403,680	443,878	81,657	11,625,429
Lighthouses, Harbour-works, and Harbour-defences :—												
Lighthouses	3,260	4,473	2,850	5,690	5,758	7,979	2,637	4,460	4,103	5,046	688	..
				Cr. 750				*Cr. 500*				
Harbour-works	6,524	6,324	423	3,717	13,263	15,891	14,425	10,736	6,742	6,987	*Cr. 5,277*	..
				Cr. 131	*Cr. 204*	*Cr. 165*						
Harbour-defences	..	..	..	..	..	..	..	..	..	..	..	..
	Cr. 1,235	*Cr. 16*										
Total, Lighthouses, &c.	8,549	10,791	3,273	8,526	18,817	23,705	17,062	14,696	10,845	12,033	*Cr. 4,589*	1,299,261
Rates on Native Lands	..	..	..	..	..		..	..	..	..	..	68,672

* Includes £12,500 expended under Finance Act, 1929, section 32.

TABLE No. 2—*continued.*

GENERAL SUMMARY—*continued.*

Showing Net Yearly Expenditure out of Public Works Fund (General Purposes Account), 1911–1912 to 1932–33—*continued.*

Description of Services.	Expenditure.											Total Net Expenditure to 31st March, 1933.
	1922–23.	1923–24.	1924–25.	1925–26.	1926–27.	1927–28.	1928–29.	1929–30.	1930–31.	1931–32.	1932–33.	
	£	£	£	£	£	£	£	£	£	£	£	£
Contingent Defence	1,702 *Cr. 463*	4,931 *Cr. 280*	27,133 *Cr. 580*	89,670 *Cr. 33*	34,014 *Cr. 751*	39,986 *Cr. 465*	67,652 *Cr. 648*	46,766 *Cr. 1,325*	13,812 *Cr. 586*	.. *Cr. 4,039*	.. *Cr. 624*	1,401,924
Tourist and Health Resorts	5,435	27,264	12,343 *Cr. 81*	43,486	31,981	36,673 *Cr. 516*	39,254 *Cr. 440*	20,547 *Cr. 1,213*	60,288 *Cr. 2,494*	87,609 *Cr. 85*	14,454 *Cr. 877*	677,809
Lands Improvement*	26,204	18,182	34,172	70,493 *Cr. 19*	56,267 *Cr. 135*	72,898 *Cr. 2,574*	85,861 *Cr. 87*	79,454 *Cr. 112*	70,534 *Cr. 1,041*	38,899 *Cr. 506*	38,906 *Cr. 248*	738,267
Swamp Land Drainage	..	..	..	..	..	..	..	..	..	..	14,807	14,807
Charges and Expenses of raising Loans	62,399	311,905	241,930	297,180	155,373	100,297	438,238 *Cr. 3,811*	518,158	164,535	98,098	15,851	3,827,693
Interest and Sinking Funds	..	..	..	..	..	..	..	..	..	..	..	218,500
Coal-exploration and Mine-development	..	..	..	..	..	..	..	..	..	..	..	10,835
Thermal Springs	..	..	..	..	..	..	..	..	..	..	..	14,600
Plant, Material, and Stores	*Cr. 19,708*	*Cr. 52,788*	*Cr. 12,229* *Cr. 1*	34,471 *Cr. 751*	*Cr. 24,148* *Cr. 1,992*	*Cr. 1,288* *Cr. 8,985*	4,595 *Cr. 1,042*	*Cr. 31,813* *Cr. 335*	*Cr. 44,772* *Cr. 216*	*Cr. 105,690* *Cr. 938*	*Cr. 41,704* *Cr. 143*	126,158
Quarries (acquisition and operation)	..	..	1,815	12,351	6,302	*Cr. 9,325*	*Cr. 6,030*	329 *Cr. 25*	4,219	107	*Cr. 3,780*	5,963
Timber-supply and Sawmills for Public Works Department	14,725	3,613	*Cr. 20,537*	*Cr. 9,892* *Cr. 104*	8,512	*Cr. 6,997*	*Cr. 5,116* *Cr. 182*	*Cr. 3,608*	*Cr. 2,271*	2,012 *Cr. 400*	21 *Cr. 18*	*Cr. 3,875*
Motor Transport Service	22,679	962	5,000	4,994	..	..	..	..	..	..	..	33,635
Transfer to Main Highways Account:— Construction Fund	..	..	226,000	..	400,000	200,000	200,000	200,000	..	..	..	1,226,000
Total Ways and Means Credits	*20,127*	*61,914*	*73,559*	*27,474*	*146,933*	*40,026*	*106,429*	*62,859*	*41,583*	*72,215*	*74,416*	..
Grand Total—Net Expenditure	3,892,320	4,056,423	4,632,134	4,615,585	3,988,059	3,400,664	3,977,006	4,917,173†	4,810,659	3,066,839	1,058,861	121,924,758

* Expenditure on Irrigation and Water-supply—1905–6, £22; 1906–7, £750; 1907–8, £1,554; 1908–9, £1,966; 1909–10, £2,435, now transferred to Irrigation and Water-supply. † Includes £12,500 expended under Finance Act, 1929, section 32.

TABLE No. 3.

Expenditure on Railways to 31st March, 1933.

Lines of Railway.	Mileage opened for Traffic.	Total Expenditure by General Government to 31st March, 1932.	Recoveries on Account of Expenditure of Previous Years.	Expenditure out of Public Works Fund during Year 1932–33: New Works.		Total Expenditure by General Government to 31st March, 1933.	Valuation of Works constructed by Provinces and Midland Railway Company.
				Construction and Surveys.	Railways Improvement and Works on Open Lines.		
	M. ch.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Kaihu Valley	24 32	180,779 3 0	..	..	*Cr.* 1,614 14 4	179,164 8 8	..
Opua Wharf to Whangarei and Onerahi	58 06	608,258 15 7	..	..	..	608,258 15 7	..
Otiria to Ngapuhi	13 45	127,370 15 6	..	..	..	127,370 15 6	..
Whangarei Branch (Kioreroa to Waiotira)	19 79	420,493 1 0	10 0 0	..	..	420,483 1 0	..
North Auckland Main Trunk—							
Ngapuhi Northwards	11 00	888,029 9 4	..	*Cr.* 1,825 11 5	..	886,203 17 11	..
Helensville Northwards	83 39	2,988,203 3 10	..	*Cr.* 1,022 0 0	2,228 18 2	2,989,410 2 0	..
North Auckland Main Trunk to Dargaville	..	454,209 0 6	..	3,410 2 7	..	457,619 3 1	..
Helensville to Te Awamutu	148 67	6,023,908 6 3	26 0 0	..	2,904 6 4	6,026,786 12 7	..
Waiuku Branch (Paerata to Waiuku)	12 69	208,909 9 6	..	..	..	208,909 9 6	..
Huntly to Awaroa	8 75	184,379 5 0	..	..	..	184,379 5 0	..
Waikokowai Branch	..	3,442 0 0	..	..	..	3,442 0 0	..
Frankton to Thames	62 58	503,705 17 4	..	..	2,359 9 8	506,065 7 0	..
Cambridge Branch (Ruakura Junction to Cambridge)	12 02	61,831 17 3	..	..	..	61,831 17 3	..
Morrinsville to Rotorua	69 33	432,469 13 5	..	..	1,776 11 10	434,246 5 3	..
Marton to Te Awamutu	209 69	3,107,517 12 4	..	..	16,335 13 4	3,123,853 5 8	..
Waipa Gravel Access Branch	..	114 0 0	..	..	..	114 0 0	..
Raetihi Branch	8 50	89,452 2 1	..	..	..	89,452 2 1	..
Rotorua to Taupo	..	37,862 13 11	..	..	..	37,862 13 11	..
Paeroa to Pokeno	..	22,890 1 8	..	..	..	22,890 1 8	..
Paeroa to Tauranga	50 65	1,250,217 4 7	..	754 5 11	*Cr.* 621 7 1	1,250,350 3 5	..
Tauranga to Taneatua, including Te Maunga to Maunganui Branch	59 17	1,497,333 7 10	..	741 10 4	..	1,498,074 18 2	..
Gisborne to Motu	49 32	625,149 18 8	5 0 0	..	*Cr.* 69 11 11	625,075 6 9	..
Gisborne to Ormond Tramway	..	4,975 1 7	..	..	..	4,975 1 7	..
Napier to Gisborne—							
Gisborne Southwards	11 51	285,950 8 6	11 0 0	12 4 7	..	285,951 13 1	..
Waikokopu Northwards	..	564,738 14 0	..	*Cr.* 2,236 19 8	..	562,501 14 4	..
Wairoa Northwards	..	20,684 10 0	..	*Cr.* 2 17 6	..	20,681 12 6	..
Napier Northwards	38 62	2,384,586 19 10	..	9,700 8 11	..	2,394,287 8 9	..
Waikokopu Branch	..	626,712 17 4	..	1,570 19 1	..	628,283 16 5	..
Wellington to Napier—							
Napier to Woodville and Palmerston North	114 06	1,167,726 17 6	..	..	10,268 18 2	1,177,995 15 8	..
Wellington to Woodville, including Te Aro Extension	121 70	3,252,067 14 3	6,391 12 9	..	10,815 16 6	3,256,491 18 0	..
Featherston to Martinborough	..	399 0 0	..	..	..	399 0 0	..
Wellington to Waitara—							
Wellington to Longburn	83 37	2,783,484 0 2	..	..	161,571 19 4	2,945,055 19 6	..
Foxton to Waitara and Moturoa	196 22	2,097,048 5 1	10 0 0	..	14,533 5 10	2,111,571 10 11	..
Mount Egmont Branch	6 00	70,536 1 6	..	..	..	70,536 1 6	..
Moturoa to Opunake	..	3,105 0 0	..	..	..	3,105 0 0	..
Opunake Branch (Te Roti to Opunake)	22 63	447,982 3 6	..	..	..	447,982 3 6	..
Manaia Branch (Kapuni to Manaia)	..	9,648 6 0	165 0 0	..	..	9,483 6 0	..
Rangitikei River Quarry Line	..	206 0 0	..	..	..	206 0 0	..

TABLE No. 3—*continued.*

EXPENDITURE ON RAILWAYS TO 31ST MARCH, 1933—*continued.*

Lines of Railway.	Mileage opened for Traffic.	Total Expenditure by General Government to 31st March, 1932.	Recoveries on Account of Expenditure of Previous Years.	Expenditure out of Public Works Fund during Year 1932–33: New Works.		Total Expenditure by General Government to 31st March, 1933.	Valuation of Works constructed by Provinces and Midland Railway Company.
				Construction and Surveys.	Railways Improvement and Works on Open Lines.		
	M. ch.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Stratford to Okahukura (East End)	..	1,391,965 7 11	..	48,395 13 4	..	1,440,361 1 3	..
Stratford to Okahukura (West End)	47 40	1,567,140 10 9	..	32,681 16 3	5,854 14 7	1,605,677 1 7	..
Nelson to Greymouth—							
Nelson to Inangahua	64 47	724,102 8 2	..	*Cr.* 2,408 18 3	..	721,693 9 11	78,307 0 0
Stillwater to Inangahua	57 32	226,190 16 11	..	..	411 19 8	226,602 16 7	279,685 0 0
Ngahere to Blackball	3 40	147,881 12 11	..	..	..	147,881 12 11	..
Westport to Ngakawau	19 56	209,996 5 11	..	..	*Cr.* 68 10 7	209,927 15 4	..
Ngakawau to Mokihinui	7 12	*	..	..	..	*	..
Mokihinui to Colliery Line	3 69	†	..	..	..	†	..
Westport to Cape Foulwind	7 00	‡	..	..	..	‡	..
Westport to Inangahua	5 74	646,990 5 0	1,594 0 0	6,821 15 7	..	652,218 0 7	..
Greymouth to Rewanui	2 44	259,987 10 2	..	..	*Cr.* 172 0 0	259,815 10 2	..
Point Elizabeth Branch	8 70	74,363 10 11	..	..	..	74,363 10 11	..
Greymouth to Ross and Mikonui	38 68	431,651 3 10	..	..	..	431,651 3 10	..
Picton to Waipara—							
Picton Southwards	56 06	971,991 13 7	5 0 0	*Cr.* 3,064 3 6	..	968,922 10 1	..
Waipara Northwards	44 14	622,610 4 7	..	*Cr.* 2,743 12 6	..	619,866 12 1	..
Christchurch to Greymouth—							
Rolleston to Bealey	73 07	1,012,030 12 4	..	..	..	1,012,030 12 4	61,579 0 0
Whitecliffs Branch	11 38	25,021 0 0	..	..	..	25,021 0 0	..
Greymouth to Bealey	58 12	1,979,360 8 9	..	..	*Cr.* 711 6 10	1,978,649 1 11	263,889 0 0
Hurunui to Waitaki—							
Main Line (Waiau to Waitaki)	219 07	2,751,886 13 8	3 0 0	..	*Cr.* 50,046 12 10	2,701,837 0 10	316,135 0 0
Oxford Branch (Rangiora to Oxford West)	21 76	53,072 8 2	..	..	..	53,072 8 2	..
Eyreton Branch (Kaiapoi to Bennett's)	20 07	44,277 0 0	..	..	..	44,277 0 0	..
Lyttelton Branch	6 26	230,493 18 4	..	..	..	230,493 18 4	340,500 0 0
Southbridge Branch (Hornby to Southbridge)	25 31	92,402 19 11	..	..	*Cr.* 221 15 3	92,181 4 8	..
Little River Branch (Lincoln to Little River)	22 46	110,852 18 10	..	..	1,087 8 11	111,940 7 9	..
Rakaia to Methven	22 20	77,087 9 8	..	..	..	77,087 9 8	..
Ashburton to Springburn	27 29	64,025 11 3	..	..	..	64,025 11 3	..
Orari to Geraldine	..	321 0 0	..	..	..	321 0 0	..
Fairlie Branch (Washdyke Junction to Fairlie)	36 05	70,423 14 1	..	..	182 16 7	70,606 10 8	75,124 0 0
Waimate Branch	12 63	80,862 4 6	..	..	..	80,862 4 6	..
Canterbury Interior Main Line—							
Oxford to Malvern	11 44	54,248 0 0	..	*Cr.* 8,000 0 0	..	46,248 0 0	..
Whitecliffs to Rakaia	..	542 0 0	..	..	..	542 0 0	..
Temuka to Rangitata	..	5,152 0 0	..	..	..	5,152 0 0	..
Waitaki to Bluff—							
Main Line, including Port Chalmers Branch	252 71	4,160,631 0 5	60 0 0	..	*Cr.* 530 2 7	4,160,040 17 10	82,259 0 0
Duntroon Branch (Pukeuri to Kurow)	37 33	86,564 14 6	..	..	..	86,564 14 6	37,500 0 0
Ngapara Branch (Waiareka Junction to Ngapara)	14 76	25,238 2 0	..	..	..	25,238 2 0	58,009 0 0

* The funds for this extension—namely, **£35,501 2s. 11d.**—were provided by the Westport Harbour Board. † The funds for purchase of this line—namely, £15,745—were provided by the Harbour Board. ‡ The funds for this line—**namely, £93,450**—were provided by the Westport Harbour Board.

TABLE No. 3—*continued.*

Expenditure on Railways to 31st March, 1933—*continued.*

Lines of Railway.	Mileage opened for Traffic.	Total Expenditure by General Government to 31st March, 1932.	Recoveries on Account of Expenditure of Previous Years.	Expenditure out of Public Works Fund during Year 1932–33: New Works.		Total Expenditure by General Government to 31st March, 1933.	Valuation of Works constructed by Provinces and Midland Railway Company.
				Construction and Surveys.	Railways Improvement and Works on Open Lines.		
Waitaki to Bluff—*continued.*	M. ch.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Livingstone Branch (Windsor to Tokarahi)	11 75	83,623 4 11	..	..	..	83,623 4 11	..
Waihemo Branch (Palmerston to Dunback)	8 55	33,531 8 11	..	..	*Cr.* 620 0 0	32,911 8 11	..
Fernhill Railway	1 60	1,415 0 0	..	..	..	1,415 0 0	..
Brighton Road Branch	..	6,474 0 0	..	..	..	6,474 0 0	12,829 0 0
Outram Branch (Mosgiel to Outram)	8 78	12,051 0 7	..	..	..	12,051 0 7	29,691 0 0
Lawrence Branch	58 67	718,258 17 1	..	..	..	718,258 17 1	..
Balclutha to Tuapeka Mouth	..	2,489 0 0	..	..	..	2,489 0 0	..
Catlin's River Branch (Balclutha to Tahakopa)	42 67	463,909 6 3	..	..	..	463,909 6 3	..
Heriotburn Branch (Waipahi to Edievale)	26 23	124,808 4 5	..	..	..	124,808 4 5	..
Waikaka Branch (McNab to Waikaka)	12 65	68,423 0 0	..	..	..	68,423 0 0	..
Gore to Lumsden	36 39	112,344 3 2	..	..	..	112,344 3 2	..
Edendale to Glenham	9 36	53,613 3 7	..	..	*Cr.* 19 8 9	53,593 14 10	..
Riversdale to Switzers	13 70	82,285 4 0	..	..	..	82,285 4 0	..
Seaward Bush to Catlin's (Appleby to Tokanui)	32 79	185,229 5 5	..	..	..	185,229 5 5	..
Otago Central (Wingatui to Cromwell)	147 27	1,452,728 12 1	..	..	1,107 17 0	1,453,836 9 1	..
Invercargill to Kingston—							
Main Line	87 04	369,335 13 3	..	..	*Cr.* 36 6 7	369,299 6 8	91,937 0 0
Mararoa Branch (Lumsden to Mossburn)	10 40	27,508 4 4	..	..	..	27,508 4 4	..
Winton to Heddon Bush	..	140 0 0	..	..	..	140 0 0	..
Makarewa to Orepuki and Waiau	56 34	360,289 14 7	..	.	*Cr.* 213 16 2	360,075 18 5	37,097 0 0
Thornbury to Wairio	22 15	106,213 18 5	..	..	*Cr.* 2,387 0 4	103,826 18 1	23,200 0 0
Forest Hill (Winton to Hedgehope)	12 40	23,337 0 0	..	..	..	23,337 0 0	..
Expenses of Railway Commissions and other Expenditure not chargeable to Individual Lines	..	10,337 0 0	..	..	..	10,337 0 0	..
Surveys of New Lines—							
North Island	..	31,126 13 1	..	108 17 0	..	31,235 10 1	..
South Island	..	5,763 0 0	..	..	..	5,763 0 0	..
Rolling-stock	..	11,759,927 12 11	..	..	217,392 5 0	11,977,319 17 11	..
Motor-omnibus Service, Wellington	..	55,596 2 4	..	..	4,974 19 7	60,571 1 11	..
General	..	14,076 12 9	..	..	..	14,076 12 9	..
Depreciation provided for out of Railway Revenue and actually repaid to Public Works Fund	..	*Cr.* 439,189 16 8	..	..	*Cr.* 323,422 12 8	*Cr.* 762,612 9 4	..
Stock of Permanent-way Materials	..	5,287 13 10	..	*Cr.* 532 17 8	..	4,754 16 2	..
Totals	3,339 46	67,366,677 4 2*	8,280 12 9†	82,360 13 1	73,051 14 7	67,513,808 19 1	1,787,741 0 0‡

* The £10,400,000 accrued depreciation of assets referred to in section 23 (2), Government Railways Amendment Act, 1931, not deducted. † Excludes £775 apportioned by Railways Department to Railways improvement and additions. ‡ Includes value for £150,000 paid to debenture-holders under the Midland Railway Petitions Settlement Act Amendment Act, 1903.

TABLE No. 4.

EXPENDITURE OUT OF SEPARATE ACCOUNTS ON WORKS UNDER THE CONTROL OF THE PUBLIC WORKS DEPARTMENT.

Year.	Loans to Local Bodies Account. Roads to open up Crown Lands.	Opening up Crown Lands for Settlement Account. Roads to open up Crown Lands.	Land for Settlements Account. Opening up Crown Lands for Settlement Account. Roads to open up Crown Lands	National Endowment Account. Roads to open up National-endowment Lands.	Land for Settlements Account. Roads to open up Land for Settlements.	Waihou and Ohinemuri Rivers Improvement Account. Waihou and Ohinemuri Rivers Improvement.
	£	£	£	£	£	£
1890–91	25,000					
1891–92	64,000					
1892–93	800					
	89,800*					
1891 92	8,000†					
1892–93	29,833†					
1893–94	30,000†					
1894–95	6,114†					
1894–95	42,971‡					
1895–96	30,057‡					
1896–97	31,017					
1897–98	18,770					
1898–99	16,972					
1899–1900	31,363					
1900–1	37,390					
1901–2	31,979					
1902–3	18,578					
1903–4	25,753					
1904–5	28,895					
1905–6	38,801					
1906–7	47,371					
1907–8	38,524					
1908–9	54,713					
1909–10	40,507	..	..	4,975	..	..
	607,608§					
1910–11	..	45,691	..	5,619	..	..
1911–12	..	49,739	..	6,554	..	3,769
1912–13	..	47,951	..	2,689	..	9,555
1913–14	..	63,245	..	4,282	..	9,633
1914–15	..	..	92,975	9,151	..	10,004
1915–16	..	..	47,974	13,344	..	9,225
1916–17	..	..	24,730	6,787	..	10,407
1917–18	..	..	..	..	43,996	12,025
1918–19	..	..	..	..	51,355	27,402
1919–20	..	..	..	..	61,692	34,806
1920–21	..	..	..	..	28,920	62,249
1921–22	..	..	..	..	51,471	54,379
1922–23	..	..	..	..	78,350	66,708
1923–24	..	..	..	..	49,186	70,533
1924–25	..	..	..	..	23,144	53,887
1925–26	..	..	..	..	17,181	47,908
1926–27	..	..	..	..	12,714	65,855
1927–28	..	..	..	..	6,337	59,644
1928–29	..	..	..	..	..	52,310
1929–30	..	..	..	..	..	27,361
1930–31	..	..	..	..	..	22,080
1931–32 onwards	(No further expenditure—all these accounts closed.)					
	697,408	206,626	165,679	53,401	424,346	709,740

* Payment to the Public Works Fund under section 31 of the Government Loans to Local Bodies Act, 1886, in reduction of expenditure under Class "Roads."
† Paid into the Public Works Fund, reducing the expenditure under Class "Roads."
‡ Paid into the Lands Improvement Account (now included in Public Works Fund under Class "Roads"), reducing the expenditure on roads.
§ Expenditure under the Government Loans to Local Bodies Act Amendment Act, 1891.

TABLE No. 5.

EXPENDITURE ON PUBLIC BUILDINGS OUT OF PUBLIC WORKS FUND TO THE 31ST MARCH, 1933, AND THE LIABILITIES ON THAT DATE.

—	Total Expenditure to 31st March, 1932.	Expenditure for Year ended 31st March, 1933.	Total Expenditure to 31st March, 1933.	Liabilities on Authorities, Contracts, &c., 31st March, 1933.	Total Expenditure and Liabilities.
	£	£	£	£	£
Judicial*	1,484,996	3,645	1,488,641	87	1,488,728
Postal and telegraph	2,479,278	*Cr.* 2,786	2,476,492	194	2,476,686
Customs	49,441	..	49,441	..	49,441
Offices for public Departments†	933,255	766	934,021	678	934,699
Mental hospitals	1,691,365	28,756	1,720,121	5,616	1,725,737
Alexandra Depot, Wellington‡	8,084	..	8,084	..	8,084
School buildings	3,344,964	52,623	3,397,587	3,922	3,401,509
Health and Hospital Institutions§	399,421	188	399,609	40	399,649
Quarantine-stations	62,464	..	62,464	..	62,464
Parliament Buildings (old buildings) ..	76,553	..	76,553	..	76,553
Parliament Buildings (new buildings) ..	393,625	..	393,625	..	393,625
Parliament Buildings (alterations to streets surrounding grounds, and purchase of land)	57,089	..	57,089	..	57,089
Government House, Wellington (land and new building)	72,645	..	72,645	..	72,645
Agricultural	99,864	*Cr.* 1,535	98,329	..	98,329
Workers' dwellings	319,916	..	319,916	..	319,916
Miscellaneous	70,813	..	70,813	..	70,813
Totals	11,543,773	81,657	11,625,429	10,537	11,635,966

* Includes Courthouses, prisons, and police-stations. † Includes £12,500 expended under Finance Act, 1929, section 32.
‡ Expenditure *re* Defence requirements only. Other expenditure included in "Judicial" class. § Includes £32,754 previously shown under "Public Health."

TABLE No. 6

ELECTRIC SUPPLY ACCOUNT.

STATEMENT OF ACCOUNTS AT THE 31st MARCH, 1933.

General Balance-sheet at 31st March, 1933, compared with Position at 31st March, 1932.

1931–32.	*Liabilities.*	1932–33.		1931–32.	*Assets.*	1932–33.	
£ s. d.		£ s. d.	£ s. d.	£ s. d.		£ s. d.	£ s. d.
	Aid to Water-power Works and Electric Supply Accounts—			1,867,821 1 9	Lake Coleridge scheme—		
	Debentures Stock issued—			65,598 8 11	Assets as per separate balance-sheet ..	2,101,233 16 3	
15,000 0 0	At 4 per cent. interest	1,700 0 0			Investments, Sinking Fund	91,947 4 11	
2,651,413 18 0	At 4½ per cent. interest	2,649,713 18 0		1,933,419 10 8			2,193,171 1 2
4,373,639 6 10	At 5 per cent. interest	4,873,439 6 10					
739,480 0 0	At 5¼ per cent. interest	739,480 0 0			Horahora–Arapuni scheme—		
1,171,800 0 0	At 5½ per cent. interest	1,171,800 0 0		4,592,897 2 1	Assets as per separate balance-sheet ..	4,764,065 10 2	
1,884,642 6 3	At 6 per cent. interest	1,884,642 6 3		9,491 13 11	Investments, Sinking Fund	11,937 7 9	
			11,320,775 11 1	78,866 12 7	Profit and Loss Account—Loss to date ..	120,353 17 3	
10,835,975 11 1				4,681,255 8 7			4,896,356 15 2
					Mangahao–Waikaremoana scheme—		
				3,788,385 11 3	Assets as per separate balance-sheet ..	3,824,534 8 2	
	Waihi Gold-mining Co., Ltd.—			484,623 19 1	Profit and Loss Account—Loss to date ..	487,609 5 7	
212,500 0 0	Purchase of Horahora works—Deed of security at 5 per cent. interest. (Due 1/11/1934) ..		212,500 0 0	4,273,009 10 4			4,312,143 13 9
					Waitaki River scheme—		
				404,068 2 2	Headworks	577,718 15 0	
				448,954 11 3	Power-house, machinery, &c.	538,484 17 3	
				51,397 13 10	Accommodation of workmen	36,049 18 7	
				222,186 12 7	Transmission-lines and substations ..	26,588 6 11	
	Consolidated Fund—			247,879 4 10	Service-line, roads, land, staff village, &c.	177,952 2 11	
113,220 5 2	Interest accrued on loans to 31st March, 1933	119,323 1 8		206,195 18 7	Interest and loan charges	270,140 15 10	
897 7 4	Sundry creditors for interest unclaimed ..	590 0 8		53,207 9 11	Stocks	39,737 6 5	
			119,913 2 4	644 19 7	Sundry debtors	489 7 0	
114,117 12 6				1,634,536 12 9			1,667,161 9 11
					Other schemes, surveys, &c.—		
				4,346 7 8	North Island	4,559 3 3	
	Electric Supply Sinking Fund Account—			11,347 15 2	South Island	11,291 2 0	
12,290 1 3	Amount due under section 23, Finance Act, 1928 ..		19,522 19 1	15,694 2 10		15,850 5 3	
				120 0 0	Material on hand	100 0 0	
				15,814 2 10			15,950 5 3
28,496 2 9	Amount set aside as reserve to cover difference between interest payable on loans raised and interest earned from their temporary investment pending use ..		21,674 3 10				
11,203,379 7 7	Carried forward	..	11,694,385 16 4	12,538,035 5 2	Carried forward	..	13,084,783 5 3

TABLE No. 6—*continued.*

ELECTRIC SUPPLY ACCOUNT—*continued.*

STATEMENT OF ACCOUNTS AT THE 31st MARCH, 1933—*continued.*

GENERAL BALANCE-SHEET AT 31st MARCH, 1933, AS COMPARED WITH POSITION AT 31st MARCH, 1932—*continued.*

1931–32.	*Liabilities.*	1932–33.		1931–32.	*Assets.*	1932–33.	
£ s. d.		£ s. d.	£ s. d.	£ s. d.		£ s. d.	£ s. d.
11,203,379 7 7	Brought forward	..	11,694,385 16 4	12,538,035 5 2	Brought forward	..	13,084,783 5 3
	Sundry Creditors—				Balance in Electric Supply Account at the end of year—		
78,906 0 4	Horahora–Arapuni scheme	57,194 10 9					
12,964 3 11	Lake Coleridge scheme	12,611 15 1		466 10 6	Cash in Public Account	128,295 11 4	
17,860 3 8	Mangahao–Waikaremoana scheme ..	9,054 14 11		8,216 19 9	In hands of Government officers in New Zealand	22 12 2	
28,765 1 2	Waitaki scheme	18,083 9 9					
0 6 6	South Island surveys	..		541 6 5	In hands of Government officers in London	1,111 8 0	
138,495 15 7			96,944 10 6	9,224 16 8			129,429 11 6
	Depreciation Reserve—						
211,609 10 2	Horahora–Arapuni scheme	283,822 17 2					
211,752 8 2	Lake Coleridge scheme	244,866 17 11					
355,122 9 9	Mangahao–Waikaremoana scheme ..	419,256 8 5					
778,484 8 1			947,946 3 6	..	Investment Account (funds invested until actually required for use)	..	4,000 0 0
	Writings-off in Suspense—						
..	Lake Coleridge scheme	17 17 9					
..	Mangahao–Waikaremoana scheme ..	2 18 7					
			20 16 4				
	Sinking Fund Reserve—						
159,910 0 0	Amount utilized for redemption of loans	160,110 0 0					
93,115 2 3	Available for further redemptions ..	124,423 9 4					
253,025 2 3			284,533 9 4				
				373 19 5	Interest accrued on investments to 31st March, 1933	21 8 10	
	Reserve Fund—			..	Sundry debtors for interest due but unpaid..	1,071 12 7	
172,249 7 9	Lake Coleridge scheme	..	195,475 2 2	373 19 5			1,093 1 5
£12,547,634 1 3	Total	..	£13,219,305 18 2	£12,547,634 1 3	Total	..	£13,219,305 18 2

E. L. GREENSMITH, Assistant Accountant, Public Works Department.

I hereby certify that the General Balance-sheet has been duly compared with the relative books and documents submitted for audit, and correctly states the position as disclosed thereby, subject to the comment: That no charge for the cost of exchange on payments made in London is included in the account.—G. F. C. CAMPBELL, Controller and Auditor-General.

TABLE No. 6—*continued.*

ELCCTRIC SUPPLY ACCOUNT—*continued.*

LAKE COLERIDGE HYDRO-ELECTRIC-POWER SUPPLY.

PROFIT AND LOSS ACCOUNT FOR YEAR ENDED 31ST MARCH, 1933, COMPARED WITH YEAR ENDED 31ST MARCH, 1932.

Gross Revenue Account.

1931–32.	——	1932–33.		1931–32.	——	1932–33.	
£ s. d.		£ s. d.	£ s. d.	£ s. d.		£ s. d.	£ s. d.
8,712 15 0	To Generating expenses, headworks, and power-house ..	..	7,930 3 11	216,345 18 4	By Sale of energy—		
				36 7 1	Wholesale	211,083 16 3	
5,753 0 9	Transmission-lines, maintenance, &c. ..	..	9,934 7 4		Retail	33 5 3	
3,187 12 11	Substation, Addington, operation and maintenance	..	3,359 15 0	216,382 5 5			211,117 1 6
6,054 11 11	Distribution	..	6,891 14 3				
2,802 11 0	Power purchased in bulk	..	..	6 15 10	Discounts forfeited, fines, &c.	29 5 5	
3,752 19 1	Stand-by provision	..	20,803 18 6		*Less*—Writings-off in suspense ..	17 17 9	
6,981 5 10	Management and general expenses ..	..	8,859 13 7				11 7 8
					Rents—		
37,244 16 6			57,779 12 7	1,282 3 0	Land and buildings	1,620 8 8	
180,951 4 7	Balance, to Net Revenue Account ..	..	155,565 4 3	185 1 6	Electric lines	190 14 9	
				181 13 8	Electric plant	270 12 5	
							2,081 15 10
				1,648 18 2			
				158 1 8	Fees for testing and repairing electrical appliances and earnings of motor-vehicles	..	134 11 10
£218,196 1 1			£213,344 16 10	£218,196 1 1			£213,344 16 10

Net Revenue Account.

£ s. d.		£ s. d.	£ s. d.		£ s. d.	£ s. d.
12,500 5 7	To Depreciation on completed work	29,552 2 8	180,951 4 7	By Balance from Gross Revenue Account ..	..	155,565 4 3
73,484 10 9	Interest for year ended 31st March	84,248 10 6				
94,966 8 3	Balance, to Profit and Loss Appropriation Account ..	41,764 11 1				
£180,951 4 7		£155,565 4 3	£180,951 4 7			£155,565 4 3

TABLE No. 6—*continued.*

ELECTRIC SUPPLY ACCOUNT—*continued.*

LAKE COLERIDGE HYDRO-ELECTRIC-POWER SUPPLY—*continued.*

Profit and Loss Appropriation Account.

1931-32.		1932-33.	1931-32.		1932-33.
£ s. d.	——	£ s. d.	£ s. d.	——	£ s. d.
18,061 15 10	To Sinking Fund Reserve Account	20,538 16 8	94,966 8 3	By Balance from Net Revenue Account	41,764 11 1
76,904 12 5	General Reserve Account	21,225 14 5			
£94,966 8 3		£41,764 11 1	£94,966 8 3		£41,764 11 1

Depreciation Reserve Account.

£ s. d.		£ s. d.	£ s. d.		£ s. d.
6,280 3 0	To Replacements, Renewals, &c.	4,907 14 10	197,627 3 10	By Balance from previous year's statement..	211,752 8 2
211,752 8 2	Balance	244,866 17 11	7,905 1 9	Interest at 4 per cent. per annum	8,470 1 11
			12,500 5 7	Amount set aside as per Net Revenue Account	29,552 2 8
£218,032 11 2		£249,774 12 9	£218,032 11 2		£249,774 12 9

Sinking Fund Reserve Account.

£ s. d.		£ s. d.	£ s. d.		£ s. d.
193,865 8 4	To Balance	222,828 1 7	168,463 12 5	By Balance at close of previous year	193,865 8 4
			18,061 15 10	Amount set aside as per Profit and Loss Appropriation Account	20,538 16 8
			7,340 0 1	Interest	8,423 16 7
£193,865 8 4		£222,828 1 7	£193,865 8 4		£222,828 1 7

General Reserve Account.

£ s. d.		£ s. d.	£ s. d.		£ s. d.
174,249 7 9	To Balance	195,475 2 2	97,344 15 4	By Balance at close of previous year	174,249 7 9
			76,904 12 5	Amount set aside as per Profit and Loss Appropriation Account	21,225 14 5
£174,249 7 9		£195,475 2 2	£174,249 7 9		£195,475 2 2

TABLE No. 6—*continued.*

ELECTRIC SUPPLY ACCOUNT—*continued.*

LAKE COLERIDGE HYDRO-ELECTRIC-POWER SUPPLY—*continued.*

BALANCE-SHEET AT 31ST MARCH, 1933.

1931–32.	*Liabilities.*	1932–33.		1931–32.	*Assets.*	1932–33.	
£ s. d.		£ s. d.	£ s. d.	£ s. d.		£ s. d.	£ s. d.
211,752 8 2	Depreciation Reserve	..	244,866 17 11	784,252 16 1	Works at Lake Coleridge— Headworks, power-house machinery, buildings, &c.	..	784,652 11 7
174,249 7 9	Reserve Fund	..	195,475 2 2				
				391,434 0 0	Transmission-lines	..	540,554 16 6
	Sinking Fund Reserve—						
110,242 0 0	Amount utilized for redemption of loans ..	110,342 0 0					
83,623 8 4	Available for further redemptions ..	112,486 1 7		113,625 5 5	Substation, Addington	..	131,840 7 11
193,865 8 4			222,828 1 7	97,264 12 10	Diesel station, Lyttelton	..	97,439 8 5
				168,132 10 9	Distribution	..	218,740 10 6
				7,810 18 4	Service transformers and meters	..	9,393 2 6
				27,237 16 8	Plant, equipment, &c.	..	27,232 5 9
	Sundry creditors—			109,685 5 3	Salaries, and engineering, office, and general expenses on preliminary surveys and construction	..	113,842 15 2
5,995 15 7	Public Works Department	7,881 5 8					
345 4 11	Other Government Departments ..	491 0 4					
6,623 3 5	Non-departmental	4,239 9 1		33,616 0 0	Cost of raising loans	..	43,347 5 3
12,964 3 11			12,611 15 1	69,437 15 3	Interest during construction	..	86,840 6 2
				1,802,497 0 7			2,053,883 9 9
..	Writings-off in suspense	..	17 17 9				
				20,285 6 1	Stocks of material	..	21,237 3 9
	Balance carried to general balance-sheet—						
1,933,419 10 8	Total assets as *per contra*	2,193,171 1 2		44,998 0 3	Sundry debtors	..	26,061 19 2
592,831 8 2	*Less* total liabilities as above ..	675,799 14 6		40 14 10	Payments in advance	..	41 3 7
1,340,588 2 6			1,517,371 6 8	65,598 8 11	Sinking-fund investments	..	91,947 4 11
1,933,419 10 8			2,193,171 1 2	1,933,419 10 8		..	2,193,171 1 2

I hereby certify that the Balance-sheet and accompanying accounts have been duly examined and compared with the relative books and documents submitted for audit and correctly state the position as disclosed thereby.—G. F. C. CAMPBELL, Controller and Auditor-General.

TABLE No. 6—*continued.*

ELECTRIC SUPPLY ACCOUNT—*continued.*

MANGAHAO–WAIKAREMOANA ELECTRIC-POWER SUPPLY.

PROFIT AND LOSS ACCOUNT FOR THE YEAR ENDED 31ST MARCH, 1933, COMPARED WITH YEAR ENDED 31ST MARCH, 1932.

Gross Revenue Account.

1931–32.		1932–33.		1931–32.		1932–33.	
£ s. d.	——	£ s. d.	£ s. d.	£ s. d.	——	£ s. d.	£ s. d.
	To Generating-expenses, headworks, and power-house—				By Sales of energy—		
6,560 16 5	Mangahao	7,100 1 1		295,077 15 2	Wholesale consumers	308,848 1 8	
7,252 6 9	Waikaremoana	7,388 19 5		756 15 10	Retail consumers	758 5 4	
			14,489 0 6	295,834 11 0			309,606 7 0
13,813 3 2							
15,238 16 9	Transmission-lines, patrol maintenance, &c.	..	14,528 3 3	3,499 12 4	Rents—		
					Cottages, &c.	3,068 1 10	
5,894 17 1	Substations — Operating maintenance, &c.	..	8,403 18 10	233 7 9	Poles, land, and plant	187 13 6	
				3,733 0 1			3,255 15 4
	Management and general—						
13,952 15 0	Salaries, office expenses, accident, sick, and holiday pay, postages, &c.	..	16,485 10 7				
				15 7 10	Tests and inspections	..	40 6 1
				439 7 6	Penalties	..	440 0 0
48,899 12 0			53,906 13 2				
251,122 14 5	Balance, to Net Revenue Account ..	..	259,435 15 3				
£300,022 6 5			£313,342 8 5	£300,022 6 5			£313,342 8 5

Net Revenue Account.

£ s. d.		£ s. d.	£ s. d.		£ s. d.
65,681 16 5	To Depreciation on completed works	52,645 9 9	251,122 14 5	By Balance from Gross Revenue Account	259,435 15 3
202,775 3 9	Interest for year ended 31st March, 1933	209,775 12 0	17,334 5 9	Loss for year	2,985 6 6
£268,457 0 2		£262,421 1 9	£268,457 0 2		£262,421 1 9

Profit and Loss Appropriation Account.

£ s. d.		£ s. d.	£ s. d.		£ s. d.
467,289 13 4	To Balance from previous year	484,623 19 1	484,623 19 1	By Balance	487,609 5 7
17,334 5 9	Balance from Net Revenue Account	2,985 6 6			
£484,623 19 1		£487,609 5 7	£484,623 19 1		£487,609 5 7

TABLE No. 6—*continued.*

ELECTRIC SUPPLY ACCOUNT—*continued.*

MANGAHAO-WAIKAREMOANA ELECTRIC-POWER SUPPLY—*continued.*

PROFIT AND LOSS ACCOUNT FOR THE YEAR ENDED 31ST MARCH, 1933, COMPARED WITH YEAR ENDED 31ST MARCH, 1932—*continued.*

Depreciation Reserve Account.

1931–32.		1932–33.	1931–32.		1932–33.
£ s. d.	——	£ s. d.	£ s. d.	——	£ s. d.
6,884 6 0	To Replacements, renewals, &c.	4,239 9 1	284,965 15 2	By Balance at close of previous year	355,122 9 9
355,122 9 9	Balance	419,256 8 5	11,359 4 2	Interest at 4 per cent. per annum	14,204 18 0
			65,681 16 5	Amount set aside as per Net Revenue Account ..	52,645 9 9
			..	Depreciation Fund taken over from Arapuni	1,523 0 0
£362,006 15 9		£423,495 17 6	£362,006 15 9		£423,495 17 6

BALANCE-SHEET AS AT 31ST MARCH, 1933.

1931–32.	*Liabilities.*		1932–33.		1931–32.	*Assets.*		1932–33.	
£ s. d.		£ s. d.	£ s. d.		£ s. d.		£ s. d.		£ s. d.
355,122 9 9	Depreciation Reserve	..	419,256 8 5		1,202,526 0 3	Works at Mangahao—Headworks, power-house, machinery, &c.	1,204,932 11 5		
17,860 3 8	Sundry creditors	..	9,054 14 11						
..	Bad debt in Suspense	..	2 18 7		518,618 8 9	Works at Waikaremoana — Headworks, power-house, machinery, &c.	518,571 1 3		
					1,721,144 9 0			1,723,503 12 8	
	Balance carried to General Balance-sheet—								
4,273,009 10 4	Total assets as *per contra*	4,312,143 13 9			752,561 19 1	Transmission-lines	..	751,877 16 6	
372,982 13 5	*Less* total liabilities as above ..	428,314 1 11			435,117 10 2	Substations	..	459,309 8 6	
			3,883,829 11 10		14,941 7 8	Plant, motor-vehicles, construction tools, &c.	..	14,152 11 5	
3,900,026 16 11					98,022 19 4	Service buildings, workmen's accommodation, &c.	..	97,870 14 2	
					39,729 17 0	Temporary development, Waikaremoana ..	..	39,241 9 10	
					3,792 4 7	Harbour facilities, Waikokopu	..	3,841 6 7	
					218,163 12 5	Salaries and expenses of Engineers and others on surveys and during construction	..	222,338 13 9	
					77,178 19 6	Cost of raising loans	..	79,285 19 6	
					298,651 3 0	Interest during construction	..	299,053 1 8	
					3,659,304 1 9			3,690,474 14 7	
					47,078 19 6	Stocks on hand	..	47,941 1 0	
					82,002 10 0	Sundry debtors, payments in advance, &c.	..	86,115 14 0	
					484,623 19 1	Accumulated loss to date	..	487,609 5 7	
					..	Sundry debtors in Suspense	..	2 18 7	
£4,273,009 10 4			£4,312,143 13 9		£4,273,009 10 4			£4,312,143 13 9	

I hereby certify that the Balance-sheet and accompanying accounts have been duly examined and compared with the relative books and documents submitted for audit and correctly state the position as disclosed thereby.—G. F. C. CAMPBELL, Controller and Auditor-General.

TABLE No. 6—*continued.*

ELECTRIC SUPPLY ACCOUNT—*continued.*

WAIKATO ELECTRIC-POWER SUPPLY.—HORAHORA–ARAPUNI SCHEME.

PROFIT AND LOSS ACCOUNT FOR YEAR ENDED 31ST MARCH, 1933, COMPARED WITH YEAR ENDED 31ST MARCH, 1932.

Gross Revenue Account.

1931–32.		1932–33.		1931–32.		1932–33.	
£ s. d.	To Generating expenses, headworks, and power-house—	£ s. d.	£ s. d.	£ s. d.	By Sales of electrical energy to wholesale consumers	£ s. d	£ s. d.
8,317 0 7	Horahora	3,491 12 6		158,196 11 1		333,669 3 3	
2,073 9 11	Arapuni	8,347 3 5		13 5 2	*Less* discounts and rebates	25 17 7	
			11,838 15 11				333,643 5 8
10,390 10 6				158,183 5 11			
	Operation and maintenance of—						
6,308 6 11	Waihi Grand Junction steam-plant ..	34 19 9					
8,969 0 6	Diesel Station, Penrose	1,351 14 6		7 10 0	Hire of plant	7 10 0	
12,394 4 8	Huntly Steam Station	717 16 8		778 11 0	Rent of lines	771 10 0	
22,514 10 8	Power purchased in bulk	6,128 16 4		2,536 5 6	Miscellaneous rents	2,645 8 6	
25,972 14 6	Half additional net costs King's Wharf Station	2,639 15 7		3,322 6 6			3,424 8 6
			10,873 2 10				
76,158 17 3							
7,642 18 4	Operation and maintenance of main transmission-lines	..	6,002 19 7	332 18 6	Testing, oil-drying, and repairs for consumers	..	521 5 5
7,453 1 6	Operation and maintenance of main substations	..	6,849 18 8				
19 2 0	Operation and maintenance of distribution substations	..	22 2 11	45 3 0	Fees for inspection of lines and testing of instruments	..	52 10 3
334 6 6	Operation and maintenance of distribution-lines (11,000-volt)	..	386 6 7				
72 15 6	Live-line testing and changing of insulators	..	80 18 8				
2,645 17 7	General supervision and management of transmission and distributing systems	..	2,719 1 7				
	Management and general—						
10,285 6 0	Salaries, rent, postages, insurances, &c.	..	8,967 0 8				
115,002 15 2			47,740 7 5				
46,880 18 9	Balance to Net Revenue Account ..	..	289,901 2 5				
£161,883 13 11			£337,641 9 10	£161,883 13 11			£337,641 9 10

TABLE No. 6—*continued.*

ELECTRIC SUPPLY ACCOUNT—*continued.*

WAIKATO ELECTRIC-POWER SUPPLY.—HORAHORA-ARAPUNI SCHEME—*continued.*

PROFIT AND LOSS ACCOUNT FOR YEAR ENDED 31ST MARCH, 1933, COMPARED WITH YEAR ENDED 31ST MARCH, 1932—*continued.*

Net Revenue Account.

1931–32.		1932–33.	1931–32.		1932–33.
£ s. d.	——	£ s. d.	£ s. d.	——	£ s. d.
62,523 12 8	To Interest on purchase-money for plant purchased from Waihi Gold-mining Co., Ltd., and on advances from Treasury	218,847 15 7	46,880 18 9	By Balance from Gross Revenue Account	289,901 2 5
			40,554 3 11	Balance to Profit and Loss Appropriation Account ..	41,487 4 8
24,911 10 0	Depreciation on completed works (2 per cent.) and on stocks	75,951 0 9			
..	King's Wharf Station, half capital charges thereon ..	36,589 10 9			
£87,435 2 8		£331,388 7 1	£87,435 2 8		£331,388 7 1

PROFIT AND LOSS APPROPRIATION ACCOUNT FOR YEAR ENDED 31ST MARCH, 1933, COMPARED WITH YEAR ENDED 31ST MARCH, 1932.

£ s. d.		£ s. d.	£ s. d.		£ s. d.
38,312 8 8	To Balance at close of previous year	78,866 12 7	78,866 12 7	By Balance to general balance-sheet	120,353 17 3
40,554 3 11	Balance from Net Revenue Account	41,487 4 8			
£78,866 12 7		£120,353 17 3	£78,866 12 7		£120,353 17 3

DEPRECIATION RESERVE ACCOUNT.

£ s. d.		£ s. d.	£ s. d.		£ s. d.
8,378 15 3	To Replacements, renewals, &c.	10,679 1 4	187,573 16 5	By Balance at close of previous year	211,609 10 2
..	Amount transferred, Mangahao-Waikaremoana scheme ..	1,523 0 0	7,502 19 0	Interest for year	8,464 7 7
211,609 10 2	Balance to general balance-sheet	283,822 17 2	24,911 10 0	Amount set aside as per Net Revenue Account	75,951 0 9
£219,988 5 5		£296,024 18 6	£219,988 5 5		£296,024 18 6

TABLE No. 6—*continued.*

ELECTRIC SUPPLY ACCOUNT—*continued.*

WAIKATO ELECTRIC-POWER SUPPLY.—HORAHORA-ARAPUNI SCHEME—*continued.*

SINKING FUND ACCOUNT.

1931–32.	——	1932–33.	1931–32.	——	1932–33.
£ s. d.		£ s. d.	£ s. d.		£ s. d.
59,159 13 11	To Balance	61,705 7 9	56,740 2 7	By Balance at close of previous year	59,159 13 11
			2,419 11 4	Interest	2,545 13 10
£59,159 13 11		£61,705 7 9	£59,159 13 11		£61,705 7 9

BALANCE-SHEET AT 31ST MARCH, 1933.

1931–32.	*Liabilities.*	1932–33.		1931–32.	*Assets.*	1932–33.	
£ s. d.		£ s. d.	£ s. d.	£ s. d.		£ s. d.	£ s. d.
211,609 10 2	Depreciation reserve	..	283,822 17 2	306,272 3 4	Works at Horahora— Headworks, generating station, transformer buildings, and machinery, &c.	..	310,956 3 9
	Sinking Fund—						
49,668 0 0	Utilized for redemption of loans ..	49,768 0 0					
9,491 13 11	Amount available for further redemptions	11,937 7 9					
59,159 13 11			61,705 7 9				
	Sundry creditors—						
22,906 7 0	Public Works Department	11,241 10 8					
2,233 7 3	Other Government Departments ..	147 19 3					
53,766 6 1	Non-departmental	45,805 0 10					
78,906 0 4			57,194 10 9				
				2,016,934 17 2	Works at Arapuni— Headworks and tail-race, machinery, transformers and switch-gear, buildings, &c.	..	2,074,540 2 3
	Balance carried to general balance-sheet—				Auxiliary plants—		
4,681,255 8 7	Total assets as *per contra*	4,896,356 15 2		9,139 9 4	Waihi Grand Junction steam-plant ..	9,127 9 4	
349,675 4 5	*Less* liabilities as above	402,722 15 8		61,814 9 5	Diesel station, Penrose .. .	61,814 9 5	
4,331,580 4 2			4,493,633 19 6	10,855 14 1	Huntly steam-plant	10,814 1 11	
				81,809 12 10			81,756 0 8
4,681,255 8 7	Carried forward	..	4,896,356 15 2	2,405,016 13 4	Carried forward	..	2,467,252 6 8

TABLE No. 6—*continued.*

ELECTRIC SUPPLY ACCOUNT—*continued.*

WAIKATO ELECTRIC-POWER SUPPLY.—HORAHORA-ARAPUNI SCHEME—*continued.*

BALANCE-SHEET AT 31ST MARCH, 1933—*continued.*

1931-32.	*Liabilities.*	1932-33.		1931-32.	*Assets.*	1932-33.	
£ s. d.		£ s. d.	£ s. d.	£ s. d.		£ s. d.	£ s. d.
4,681,255 8 7	Brought forward	..	4,896,356 15 2	2,405,016 13 4	Brought forward	..	2,467,252 6 8
				637,762 17 2	Transmission-lines	..	690,134 17 11
				419,052 13 11	Substations	..	409,446 15 5
				40,852 19 9	Distribution-lines	..	33,193 3 1
					Distribution substations, 11,000 kv.—		
				8,642 18 6	Waihi Grand Junction	8,642 18 6	
				2,187 12 3	Taps for consumers	2,187 12 3	
							10,830 10 9
				..	Hamilton Area—Land at Ruakura, stores, buildings, staff residences, &c.	..	18,181 12 9
				19,233 15 1	Loose tools and equipment, motor-lorries, cars, &c.	..	19,428 14 5
				178,516 16 10	Salaries of officers, engineering office, and general expenses on surveys and on construction	..	187,340 5 3
				612,625 5 1	Interest during construction	..	627,280 10 7
				148,600 12 4	Cost of raising loans	..	154,696 12 4
				23,594 16 8	Stocks of spares, &c., on hand	..	23,155 15 4
				4,496,087 0 11			4,640,941 4 6
				57,216 19 4	Stocks of material on hand	..	39,542 4 9
					Debtors—		
				39,593 1 10	For electricity and sales of materials ..	..	83,582 0 11
				9,491 13 11	Sinking-fund investments	..	11,937 7 9
				78,866 12 7	Net loss	..	120,353 17 3
£4,681,255 8 7			£4,896,356 15 2	£4,681,255 8 7			£4,896,356 15 2

I hereby certify that the Balance-sheet and accompanying accounts have been duly examined and compared with the relative books and documents submitted for audit and correctly state the position as disclosed thereby.—G. F. C. CAMPBELL, Controller and Auditor-General.

TABLE No. 7.

IRRIGATION AND WATER-SUPPLY.

SCHEDULE OF SCHEMES COMPLETED OR UNDER CONSTRUCTION.

Scheme.	Source of Supply.	River Discharge (Minimum).	Main Canal Discharge (Maximum).		Average Rainfall from Records available.	Rainfall, 1932.	Area commanded (Gross).	Area irrigated at Present.	Works authorized.		Works completed.		Expenditure to 31st March, 1933.	Remarks.
			As per Design.	During 1932–33.					Main Canals.	Distributaries.	Main Canals.	Distributaries.		
		Cusecs.	Cusecs.	Cusecs.	Inches.	Inches.	Acres.	Acres.	M. ch.	M. ch.	M. ch.	M. ch.	£	
Steward Settlement	Waitaki River ..	..	110	..	20·29 (Steward Settlement)	21·14	18,000	..	14 60	50 31	14 60	50 31	12,115	Completed.
Otekaike	Otekaike River ..	9	15	..	21·48 (Duntroon)	21·38	1,500	800	14 37	3 47	14 37	3 47	3,631	Completed. Used only on west side of river.
Ida Valley ..	Manorburn, Poolburn, and Moa Creek. (Storage Manorburn Dam)	..	110	97	16·01 (Moa Creek)	15·47	14,000	11,286	73 0	54 0	73 0	29 50	273,630	Completed. Additional storage now furnished by Poolburn Dam.
Galloway	Manorburn Dam ..	..	30	29	13·97 (Galloway)	12·01	3,450	2,503	10 50	10 7	10 50	10 7		
Manuherikia – Alexandra–Clyde No. 1	Manuherikia River	77	100	86	14·90 (Alexandra, Ophir, and Clyde)	11·78	7,000	5,405	23 0	46 20	23 0	46 20	233,049	Completed.
Ardgour	Lindis River ..	35	20	21	19·13 (Tarras)	14·31	2,000	1,462	13 0	2 40	13 0	2 40	33,507	Completed.
Arrow River ..	Arrow River ..	40	50	30·25	26·79 (Arrowtown and Frankton)	22·12	6,536	2,794	..	..	9 18	24 2	140,219	Completed.
Hawkdun (formerly Mount Ida)	Tributaries of Manuherikia River and Eweburn Reservoir	..	60	22	24·09 (Naseby and Naseby Plantation)	20·05	10,000	8,196	66 0	101 0	66 0	90 12	67,885	Completed.
Earnscleugh (Fraser River)	Fraser River ..	10	47 (all races)	63·75	14·58 (Earnscleugh)	13·23	2,743	2,053	11 30	17 60	11 30	17 60	10,398	Completed.
Last Chance (Fruitlands and Earnscleugh Tops)	Shingle, Coal Gorge, and Butcher's Creek	8	20	14	15·62 (Earnscleugh and Roxburgh East)	16·65	4,300	2,915	22 0	5 70	20 78	5 70	28,796	Completed.
Tarras	Lindis River ..	35	70	36	19·13 (Tarras)	14·31	6,000	2,831	21 70	17 55	21 70	17 55	136,710	Completed.
Bengerburn ..	Bengerburn ..	1	4	4	..	..	1,000	144	2 6	..	2 6	..	690	Completed.
Teviot River ..	Teviot River and Lake Onslow Dam	40	80	57	16·66 (Roxburgh East)	20·08	3,300	3,841	16 51	10 55	16 51	10 55	55,361	Completed and serving all land requiring water.
Teviot River Extension	Ditto	40	80	57	16·66 (Roxburgh East)		2,000		3 77	4 2	3 77	4 2		Completed.
Idaburn	Idaburn Dam ..	3	8	6	22·93 (Moa Creek, Blackstone Hill)	19·85	2,500	615	10 0	0 40	7 26	0 40	6,701	Main scheme completed. Small extension to be made this year.
Omakau	Manuherikia River and Storage Dam and Thompson's Creek	36 / 7	65 / 15	..	20·26 (Clyde, Ophir, and Blackstone Hill)	16·68	10,800 (irrigable)	..	42 0	50 0	11 1	..	78,698	8,000 acres to be supplied from main race and 2,800 acres from Thompson's and adjacent creeks.

TABLE No. 7—*continued.*

IRRIGATION AND WATER-SUPPLY—*continued.*

SCHEDULE OF SCHEMES UNDER INVESTIGATION.

Scheme.	Source of Supply.	River Discharge (Minimum).	Main Canals Discharge (Maximum), as per Design.	Average Rainfall from Records available.	Rainfall, 1931.	Area commanded (Gross).	Length of Main Canal.	Length of Distributaries.	Expenditure to 31st March, 1933.	Remarks.
		Cusecs.	Cusecs.	Inches.	Inches.	Acres.	Miles.	Miles.	£	
Maniototo (Upper Taieri)	Taieri River and storage dam	25	500	17·23 (Waipiata)	17·13	100,000	60	..	9,059	Modified scheme for complete irrigation of 5,000 acres is possible without storage, or for reasonable partial irrigation of 15,000 acres. Surveys practically complete for scheme to irrigate 100,000 acres.
Cromwell Flat and Lowburn (Roaring Meg)	Hydro-electric development of Roaring Meg and pumping from Clutha and Kawarau Rivers	29 (Roaring Meg)	..	20·75 (Luggate)	22·81	..	..	..	3,774	Hydro-electric scheme under investigation. Power would be available for pumping irrigation supplies to 8,000 acres in Upper Clutha Valley. Portion of this area could be supplied from Hawera River power and pumping scheme.
Upper Clutha Valley (including Hawea Flats)	Hawea and Clutha Rivers (pumping) with power-station at outlet of Lake Hawea	580 (Hawea R.) 3,000 (Clutha R.)	..	20·8 (Hawea Flat, Luggate, and Tarras)	24·6	..	..	..	..	Investigations have been made for a hydro-electric power development at the outlet of Lake Hawea. Sufficient power would be available to pump water from the Hawea and Clutha Rivers to 13,700 acres in the Upper Clutha Valley.
Upper Manuherikia (extension of Omakau Scheme)	Manuherikia River and storage dam at Manuherikia Falls	36 (at dam-site)	..	20·51 (Clyde, Ophir, and (Blackstone Hill)	20·75	16,000	58	60	6,553	Surveys and investigations have been made for the extension of the Omakau scheme (now under construction) to supply lands between Tiger Hill and Clyde. Irrigable area, 12,000 acres.
Chapman's Gully ..	Conroy's Creek and storage dam	3	..	14·05 (Alexandra)	14·14	580	..	..	..	Portion now served by private races.
Teviot River Extension*	Teviot River and Lake Onslow Dam	40	57	16·35 (Roxburgh East)	22·93	2,300	..	..	207	To irrigate a limited area in the vicinity of Ettrick, on west side of Clutha River.
Scandinavian	Tributaries of Manuherikia River	..	20	31·19 (St. Bathan's)	25·61	..	..	..	..	For lands about St. Bathan's. To bear £15,000 towards cost of Falls dam, Upper Manuherikia scheme. Irrigable area, 3,000 acres.
Investigation of proposed schemes	..	..	..	..	..	..	..	..	7,387	Includes the reading of river and rain gauges.

* Put under Teviot River scheme with which it will be ultimately amalgamated.

APPENDICES TO THE PUBLIC WORKS STATEMENT, 1933.

APPENDIX A.

AUDITED STATEMENT OF EXPENDITURE ON PUBLIC WORKS OUT OF THE PUBLIC WORKS FUND FOR THE YEAR 1932–33.

Prepared in compliance with Section 8 of the Public Works Act, 1928.

SIR,— Public Works Department, Wellington, 6th July, 1933.

In compliance with the 8th section of the Public Works Act, 1928, I enclose a statement of the expenditure during the preceding financial year on all works and services chargeable to the Public Works Fund.

I have, &c.,
JOHN BITCHENER,
Minister of Public Works.

The Controller and Auditor-General, Wellington.

STATEMENT OF NET EXPENDITURE ON ALL WORKS AND SERVICES CHARGEABLE TO THE PUBLIC WORKS FUND FOR THE YEAR 1932–33.

Vote No.	Summary.	Appropriation.	Gross Expenditure.	Credits in Aid.	Net Expenditure.
	General Purposes Account—	£	£ s. d.	£ s. d.	£ s. d.
37	Public Works, Departmental	110,309	198,060 4 6	93,156 5 6	104,903 19 0
38, 39	Railways	210,000	555,783 16 1	394,930 19 7	160,852 16 6
40–47	Public Buildings	174,004	125,200 1 3	34,632 9 4	90,567 11 11
48	Timber-supply and Sawmills, &c., for Public Works Department	300	21 0 0	0 5 0	20 15 0
49	Acquisition and Operation of Quarries for Public Works Department	2,000	7,320 18 8	11,101 0 10	*Cr.* 3,780 2 2
50, 51	Lighthouses and Harbour-works	4,000	2,149 12 2	6,739 2 7	*Cr.* 4,589 10 5
52	Development of Tourist Resorts	21,000	14,651 1 5	196 8 7	14,454 12 10
53	Roads, Bridges, and other Public Works ..	497,034	478,931 15 8	82,372 19 1	396,558 16 7
54	Telegraph Extension	100,000	147,402 14 5	47,403 19 5	99,998 15 0
55	Lands, Miscellaneous	114,000	67,834 9 1	28,928 12 5	38,905 16 8
56	Irrigation, Water-supply, and Drainage ..	70,000	55,342 10 7	2,051 19 6	53,290 11 1
57	Swamp Land Drainage	23,400	20,249 17 6	5,442 13 1	14,807 4 5
58	Plant, Material, and Stores	20,000	24,611 6 6	66,315 12 6	*Cr.* 41,704 6 0
59	Settlement of Unemployed Workers ..	500,000	119,292 19 7	571 5 6	118,721 14 1
	Totals, General Purposes Account ..	1,846,047	1,816,852 7 5	773,843 12 11	1,043,008 14 6
	Electric Supply Account—				
60	Development of Water-power	612,000	581,130 18 3	19,569 12 1	561,561 6 2
	Unauthorized—Services not provided for ..	..	27,500 0 0	..	27,500 0 0
	Totals, Public Works Fund ..	2,458,047	2,425,483 5 8	793,413 5 0	1,632,070 0 8

APPENDIX A—*continued.*

Vote No.	Name of Vote.	Appropriation.	Gross Expenditure.	Credits in Aid.	Net Expenditure.
	PUBLIC WORKS FUND.				
	General Purposes Account—	£	£ s. d.	£ s. d.	£ s. d.
37	Public Works, Departmental	110,309	198,060 4 6	93,156 5 6	104,903 19 0
	Railways—				
38	Railway-construction	100,000	136,460 8 3	66,857 15 2	69,602 13 1
39	Railways Improvement and Additions to Open Lines	110,000	419,323 7 10	328,073 4 5	91,250 3 5
	Public Buildings—				
40	General	2,432	2,111 7 5	4 0 0	2,107 7 5
41	Courthouses	1,512	969 13 2	..	969 13 2
42	Education Buildings	100,000	59,672 18 7	7,049 18 7	52,623 0 0
43	Prison Buildings and Works	4,000	2,153 17 3	128 2 1	2,025 15 2
44	Police-stations	1,500	1,021 17 0	..	1,021 17 0
45	Postal and Telegraph	12,000	30,198 0 4	27,434 13 8	2,763 6 8
46	Mental Hospital Buildings	50,560	28,771 18 10	15 15 0	28,756 3 10
47	Health and Hospital Institutions ..	2,000	300 8 8	..	300 8 8
48	Timber-supply and Sawmills, &c., for Public Works Department	300	21 0 0	0 5 0	20 15 0
49	Acquisition and Operation of Quarries for Public Works Department	2,000	7,320 18 8	11,101 0 10	*Cr.* 3,780 2 2
	Lighthouses and Harbour-works—				
50	Lighthouses	1,200	687 13 1	..	687 13 1
51	Harbour-works	2,800	1,461 19 1	6,739 2 7	*Cr.* 5,277 3 6
52	Development of Tourist Resorts	21,000	14,651 1 5	196 8 7	14,454 12 10
53	Roads, &c.	497,034	478,931 15 8	82,372 19 1	396,558 16 7
54	Telegraph Extension	100,000	147,402 14 5	47,403 19 5	99,998 15 0
55	Lands, Miscellaneous	114,000	67,834 9 1	28,928 12 5	38,905 16 8
56	Irrigation, Water-supply, and Drainage ..	70,000	55,342 10 7	2,051 19 6	53,290 11 1
57	Swamp Land Drainage	23,400	20,249 17 6	5,442 13 1	14,807 4 5
58	Plant, Material, and Stores	20,000	24,611 6 6	66,315 12 6	*Cr.* 41,704 6 0
59	Settlement of Unemployed Workers ..	500,000	119,292 19 7	571 5 6	118,721 14 1
	Totals, General Purposes Account ..	1,846,047	1,816,852 7 5	773,843 12 11	1,043,008 14 6
	Electric Supply Account—				
60	Development of Water-power	612,000	581,130 18 3	19,569 12 1	561,561 6 2
	Unauthorized—Services not provided for ..	..	27,500 0 0	..	27,500 0 0
	Totals, Public Works Fund ..	2,458,047	2,425,483 5 8	793,413 5 0	1,632,070 0 8

NOTE.—This statement includes only the expenditure on works, and does not include expenditure such as interest, sinking funds, and charges and expenses of loans.

J. J. GIBSON,
Accountant.

C. J. MCKENZIE,
Engineer-in-Chief and Under-Secretary.

Examined and found correct, subject to the foregoing Departmental note.—G. F. C. CAMPBELL, Controller and Auditor-General.

APPENDIX B.

ANNUAL REPORT ON PUBLIC WORKS BY THE ENGINEER-IN-CHIEF.

The Engineer-in-Chief to the Hon. Minister of Public Works.

Sir,—

I have the honour to submit the following report upon the various works under my control completed and in progress throughout the Dominion during the period from 1st July, 1932, to the 30th June, 1933.

Table No. 3 (pages 9–11) shows the expenditure on Government railways in New Zealand up to the 31st March, 1933, and also the mileage opened for traffic.

RAILWAYS.

North Auckland Main Trunk Railway.—Okaihau Northwards: Rangiahua Section.

Owing to the suspension of construction work in January, 1931, work done on the above railway during the past year has consisted mainly of overhauling machinery and plant, and of the sorting-up and disposal of unused stores, materials, and buildings.

General maintenance work has also been carried out in connection with the workers' accommodation and other temporary buildings which are still in use. The drainage and water-supply systems serving portions of camps still occupied by ex Public Works Department workers have also been maintained.

Dargaville Branch Railway.

The work done on this branch, Kirikopuni to Tangowahine, has consisted chiefly of maintenance of the permanent-way for the passenger and goods traffic, and of repairs to workers' dwellings, water-supply, and sanitary services. In the Tangowahine Workshop running-repairs to locomotives used in maintaining the service have been carried out, and also reconditioning effected on plant items used on general district work.

During the year the passenger and goods service carried 4,876 passengers, 2,734 tons of general goods, 87,500 super feet of timber, 796 bales of wool, 32,600 head of stock of all classes, and 5,000 cubic yards of road-metal.

Tauraroa Quarry.

This quarry was reopened in October, 1932, to supply metal in connection with a road-metalling scheme. The total output for the period was 21,574 cubic yards of crushed metal and 150 cubic yards of spalls of which 20,180 cubic yards were used on roadworks, 300 cubic yards on the Dargaville Branch Railway, and 1,245 cubic yards sold to Whangarei and Otamatea County Councils.

A new road access is being provided to enable road-vehicles to obtain metal direct from the quarry.

Napier–Gisborne Railway.—Waikokopu–Gisborne Section.

No work has been done on this railway during the year, except that the service roads have been kept open. Stores and plant have been cared for during the year, and a substantial quantity of this surplus material disposed of by sale in that interval.

Napier–Gisborne Railway.—Napier–Wairoa Section.

Putorino Section.—Restoration work was put in hand by the Department at the beginning of the year, but was discontinued before completion. The work of strengthening the foundations at the Matahoura Viaduct, north side, was completed.

Wairoa Section (length 33 m. 32 ch.).—No construction work on this section has been done; the small maintenance programme includes the protection of structural steel and repair of plant. The Mohaka Viaduct steelwork has been cleaned, and has received two coats of paint. Maintenance of earthwork has taken the form of keeping water-tables open, and the approaches to culverts free.

The length from Mohaka Station-yard to Wairoa has been kept open for traffic and used for the transport of the Department's material and Native land-development material.

Stores and plant have been cared for during the year, and a substantial amount of surplus material and workmen's accommodation disposed of by sale.

Waikokopu Branch Railway.

This line, 24 m. 30 ch. in length, has been maintained to a sufficient standard to allow goods traffic to be continued.

Repairs to the Waikokopu Breakwater to make good damage caused by storms have been in hand, 173 cubic yards of massive concrete blocks being cast in position.

The goods service has been maintained throughout the year, the revenue showing a surplus over working-expenses.

Stratford Main Trunk Railway (East End).

By arrangement with the Railway Department, work was organized to enable the line to be handed over on the 31st March, 1933. However, ten days prior to this date a heavy flood was experienced, causing great damage. In particular, the approach cuttings to the Okahukura Tunnel were filled with slip material and timber off the hillsides, and large quantities of debris and slurry carried into the tunnel for the whole of its length of 76 chains. This flood damage completely suspended traffic and necessitated several months' additional work cleaning up and repairs to the track. Details of the work done during the year are as follow:—

Matiere Section (0 m. to 10 m.).—Four bridges have been resleepered, and all steel bridges except the Ongarue River Bridge repainted. Timber bridges have been overhauled. The flood damage already referred to was particularly severe on the Matiere Section. The line was sufficiently restored to allow through goods service to resume on 15th May. At end of the year the section was in first-class condition.

Ohura Section (10 m. to 19 m. 10 ch.)—Bridges have been painted and overhauled, and full maintenance on the section carried out during the year.

Tokirima Section (19 m. 10 ch. to 29 m. 70 ch.).—Ballasting of the section was completed. Various details of work involved in completing work have been done, including such items as painting bridges, fixing creep straps on bridges, metalling private crossing, laying extra siding in Tokirima Yard. The re-erection of two platelayers' cottages at Mangaparo, transferred from Matiere, is in hand.

Heao Section (29 m. 70 ch. to 55 m. 40 ch. on chainage from western end; length, 3 m. 50 ch.).—On this section platelaying, ballasting, and fencing have been completed. The Heao Stream bridges were completed and guard-rails and creep straps fitted.

The Mangatete Tunnel is complete, 8 chains of excavation and lining being done during the year.

Traffic.—Throughout the year, except during the six weeks that the line was blocked by slips, the Department carried out its passenger, goods, and ballast services. On the 7th November, 1932, the Right Hon. the Prime Minister performed the ceremony of driving the last spike, and declared the line open. On the 12th December the Railway Department commenced a regular through goods service between Taumarunui and Stratford, and this has been maintained except for the period of six weeks already referred to when line was blocked. At the end of the year it appeared that all works would be complete and the line ready for handing over to the Railway Department by about the beginning of September.

Stratford Main Trunk Railway (West End).

Raekohua Section (47 m. 40 ch. to 50 m. 60 ch.).—Work on this section has consisted of cleaning-up and finishing operations. A large slip at 49 m. 46 ch. has been cleared, and a stone wall built at the toe. The papa batters above tunnel portal at 50 m. 3 ch., and in adjoining cutting have been trimmed back, and spoil used for formation purposes. Various finishing details of work have been done to five railway bridges and two overbridges. Ballasting was completed at Tangarakau Station Yard, and the station buildings and usual station facilities have been erected or provided.

Heao Section (50 m. 60 ch. to 55 m. 46 ch.).—A substantial quantity of earthwork, trimming batters, and removing slips has been done and stone walls built for protection purposes. The culvert-work was completed.

No. 4 tunnel was completed early in the year, side drains at once laid, and tunnel cleaned out for platelaying and ballasting. Rail-heads were joined up in October, and at end of year very little ballast remained to complete.

Some deterioration in the lining of No. 3 tunnel under the action of sulphur fumes from engine smoke-stacks becoming apparent, it was decided to protect a length of 50 chains of this tunnel with cement grout applied by gunite machine. This work was put in hand and by 30th June, 11 chains had been completed.

The Department maintained a tri-weekly goods and passenger service till the Railway Department's through goods service was inaugurated on 12th December.

Te Wera Quarry.—The Te Wera quarry was successfully operated throughout the year, the output of metal of all grades being 13,643 cubic yards; of this quantity 11,000 cubic yards were for railway purposes, mostly for ballast.

By the time the end of the year had approached, the works were almost complete, and were in good order.

Wellington – Tawa Flat Railway Deviation.

Progress on this work has been satisfactory throughout the year, considering the reduction that it was necessary to make in the number of men employed. The average number for the year was 230, of whom 185 were engaged on tunnel-work and 45 on formation, seawall, bridges, culverts, and stream-diversions.

Tunnel No. 2.—This tunnel, which is 2 m. 53 ch. in length, is now very near completion. The heading was finished during the previous year, and 73 chains of enlargement were then left to complete. During this year 55 chains, out of the 73 chains, were excavated and concrete-lined. From the south end 30 chains were completed, and 25 chains from the north end. It is anticipated that the whole tunnel will be finished in December. A band of very hard greywacke rock was encountered, and several falls that had occurred when driving the heading had to be passed through and packed up. There has been no trouble with water since the heading was completed. With the exception of the hard band above referred to, this tunnel has been driven through only moderately hard greywacke, faulty and badly fractured for the greater part, and in some places ground to pug where faulting has occurred. Timbering, generally fairly light in character but very heavy in places, has been necessary right throughout the tunnel excavation. The average thickness of concrete lining has been 2 ft.

Seawall and Embankment.—The sea protection of the embankment, which extends from Kaiwarra Station to the entrance of No. 1 tunnel, has now been finished. During the year 5½ chains were completed.

The protection consists of a revetment of heavy stone strengthened by a layer of large concrete blocks where the wave action of the sea is greatest. The embankment along the sea front has been completed. Surplus rock from the tunnel is now being utilized to fill in between the railway bank and the Hutt Main Highway between 1 m. 69 ch. and 2 m. 13 ch., reclaiming thereby a valuable piece of land.

All the culverts required throughout the deviation have now been built. Two 24-in.-diameter pipes at 1 m. 76·74 ch. and 1 m. 65·20 ch., and one 15-in.-diameter pipe culvert at 2 m. 0·03 ch. were completed during the year.

Several groynes were erected in the Porirua Stream to protect the formation work.

Two bridges were cleaned and painted, at 2 m. 41 ch. and at 7 m. 37 ch.

Westport–Inangahua Railway.

Cascade Section (5 m. 70 ch. to 8 m. 78 ch.; length, 3 m. 8 ch.).—This section was cleaned up and completed in accordance with the requirements of the Railway Department, but as that Department did not wish to take over the section, maintenance has been carried out by the Public Works Department. The supervision of the work is now, however, under the regular maintenance men of the Railway Department.

Traffic over the line amounts to one or two coal trains per week, and the revenue is collected by the Railway Department.

Hawk's Crag Section (8 m. 78 ch. to 18 m.; length, 9 m. 2 ch.).—As stated in my last report, it was decided that before closing down work on this section the sinking of the cylinders for the Cascade Creek bridge at 9 m. should be completed. There are nine cylinders in the bridge, and this year the final three required were sunk to a depth of 60 ft. through shingle to a rock foundation. All the bridge plant has now been dismantled, and the bridge-site cleaned up.

South Island Main Trunk Railway.

The only work done on this railway, which was closed down last year, was the maintenance of some river-protection works, and the repair of plant and workmen's cottages and huts that are being transferred to other works.

CONSTRUCTION AND MAINTENANCE OF ROADS AND BRIDGES.

Whangarei District.

Kaikou–Opahi (Bay of Islands County).—7 m. of road was formed 16 ft. wide and culverted. 2 m. 20 ch. was metalled to a width of 10 ft. by 6 in. Two bridges, totalling 175 ft., were erected in rolled-steel joists, mixed Australian hardwoods, and New Zealand timbers.

Owae Valley Road (Bay of Islands County).—1 m. 11 ch. of road was formed 14 ft. wide, culverted, and metalled 9 ft. by 6 in.

Upper Owae Valley Road (Bay of Islands County).—2 m. 5 ch. of road was formed 12 ft. wide, culverted, and metalled.

Beattie's Bridge (Hobson County).—This bridge of four 40 ft. spans was erected in rolled-steel joists and New Zealand timbers. 30 ch. of approach road was metalled 9 ft. by 6 in.

Donnelly's Crossing – Mangatu (Hobson County).—4 m. 7 ch. of metalling 9 ft. by 6 in. has completed the road.

Tangowahine Valley Road (Hobson County).—5 m. 35 ch. of road was metalled 9 ft. by 6 in., completing the roading of the settlement. Formation was raised where required.

Whatoro–Opouteke (Hobson County).—1 m. 17 ch. of base-course and 3 m. 60 ch. of top course were laid. One 30 ft. bridge was erected in New Zealand timbers.

Mangakino–Huahua (Hokianga County).—A length of 4 m. 16 ch. was metalled 9 ft. by 6 in. and culverts placed in first mile.

West Coast Road (Tapuwae–Whakarapa) (Hokianga County).—A length of 5 m. 21 ch. was metalled 10 ft. by 6 in.

Whakarapa – West Coast (Hokianga County).—2 m. 20 ch. was formed to a width of 16 ft. and 3 m. 43 ch. was metalled 9 ft. by 6 in. Four bridges were erected in rolled-steel joists and New Zealand timbers—three each of one 40 ft. span and one of one 25 ft. span.

Kaingaroa–Fairburn's (Mangonui County).—5¾ m. of road was metalled 9 ft. by 6 in.

Lake Ohia – Merita (Mangonui County).—1 m. of road was re-formed 30 ft. wide and 3½ m. metalled 9 ft. by 6 in.

Oruru – Fern Flat – Mangamuka (Mangonui County).—2 m. 60 ch. of road was metalled 9 ft. by 9 in.

Bull's Road (Whangarei County).—2 m. 18 ch. of road was metalled 9 ft. by 6 in.

Mangakahia Footbridges (Whangarei County).—Three suspension bridges, of a total length of 928 ft., were erected over the Mangakahia Stream.

Puketoitoi Block Road (Whangarei County).—2 m. 62 ch. of road was metalled 10 ft. by 6 in.

Tauraroa–Omana (Whangarei County).—3 m. of road was resurfaced 9 ft. by 3 in.

Tokatoka–Mangapai (Whangarei County).—A bridge of six 40 ft. spans was erected in rolled-steel joists and reinforced concrete. Okahu Bridge of one 30 ft. span was erected in rolled-steel joists and mixed Australian hardwoods. 11 m. 24 ch. of road was metalled 10 ft. by 6 in.

Waiotira–Ararua Road (Whangarei County).—4 m. 60 ch. of road was metalled 10 ft. by 6 in.

Iwitaua Road (Whangarei County).—One bridge was erected in one 80 ft. truss and two 25 ft. approach spans. 6 m. 50 ch. of road was metalled 8 ft. by 6 in.

Waiare to Okaihau (Whangarei and Bay of Islands Counties).—Two bridges, one 35 ft. and one 30 ft. spans, were erected. Bitumen deck was placed on five bridges.

AUCKLAND DISTRICT.

McLean's Access Road (Coromandel County).—This access road was re-formed and metalled over a length of 1 m. 59 ch.

Kaimarama to Coroglen (Coromandel County).—During the period 5 m. 20 ch. of road was surfaced by the County Council.

Coromandel–Whangapoua Road (Coromandel County).—90 ch. of re-formation and metalling was completed.

Ararimu Main Road (Franklin County).—62 ch. of road was metalled 9 ft. by 6 in.

Paparimu–Mangatawhiri Road (Franklin County).—3 m. 13 ch. of road was gravelled.

Waiuku – Manukau Heads Road (Franklin County).—3 m. 56 ch. of road was shelled.

Blind Bay Harbour Road (Great Barrier Island County).—3 m. 20 ch. of road has been widened and metalled.

Blind Bay – Kaitoke Road (Great Barrier Island County).—1 m. 20 ch. has been widened and metalled.

Tryphena Harbour Road (Great Barrier Island County).—2 m. 13 ch. of 14 ft. formation has been carried out.

Waitakaruru – Miranda Back Road (Hauraki Plains County).—Formation of 1 m. 7 ch. was completed and 2 m. 20 ch. has been metalled.

Awaroa–Mahoe Road (Kawhia County).—121 ch. of road was resurfaced by the Public Works Department and 100 ch. by the Kawhia County Council.

Awaroa–Waiharakeke Road (Kawhia County).—159 ch. of road was metalled and 272 lin. ft. of pipes placed by the County Council.

Oparau Block Road (Kawhia County).—107 ch. of road was metalled 9 ft. by 8 in. by the County Council.

Ounu Road (Kawhia County).—171 ch. of road was metalled 9 ft. by 6 in.

Clevedon–Takanini (Manukau County).—1 m. 70 ch. of road was metalled 9 ft. by 6 in.

Buckland Road (Matamata County).—5 m. 27 ch. of foundation-course 9 ft. wide was placed. Top course of crushed chips is now being laid.

Matai Road (Matamata County).—91 ch. of road was metalled 10 ft. by 8 in. by the County Council.

Arohena Settlement Roads (Otorohanga County).—Work in this settlement, the development of which has been considerably retarded by lack of adequate facilities, has comprised the metalling of various portions of the Aotea-roa North, Aotea-roa South, Kahorekau, Pukewhau, Wairahei, Mangare, Arohena, Taupaki, and Waipari Roads. A total length of 20 m. 41 ch. was metalled, and already a very distinct improvement is noticeable in the settlement.

Mangati Road (Otorohanga County).—255 ch. of road was metalled 9 ft. by 6 in.

Pukekawa Riding Roads (Raglan County).—Pukekawa–Rangiriri Road: 5 m. 8 ch. of this road has been laid with base-course. Rangiriri–Glenmurray: A length of 5 m. 60 ch. of road has been laid with base-course and the placing of top course is in hand.

Waikaretu-Bothwell's Road (Raglan County).—6 m. 45 ch. of road was metalled and in addition 2 m. of base-course was laid, and the laying of the top course is in hand.

Waikaretu – Port Waikato Road (Raglan County).—8 m. 62 ch. of road was remetalled and 40 ch. top-dressed with gravel.

Glenmurray to Waimai via Naike Road (Raglan County).—3 m. 23 ch. of road has been metalled and work is continuing.

Waihi–Whangamata (Ohinemuri County).—2 m. 40 ch. of metalling has been completed and 3 m. has been laid with rough metal. 40 ch. of road has been top-dressed with sandstone and river-shingle.

Ahuroa–Araparera Road (Rodney County).—3 m. of widening, general improvement of alignment and formation, and the placing of 600 lin. ft. of culverts were completed during the year. 5½ m. of sandstone base-course 9 ft. by 6 in. was laid and surfaced with shingle.

Pakiri Block Roads (Rodney County).—On the Main Block Road 2 m. 51 ch. of new formation has been completed to a minimum width of 18 ft. Three pile bridges with 10 ft. 6 in. roadways and built of New Zealand timbers have been constructed. A total of fifty-three concrete pipe culverts of an aggregate length of 1,533 ft. have been laid during the year. Metalling operations have been confined to the Main Block Road, a length of 4 m. 49 ch. of new formation having been surfaced with 3 in. sandstone 10 ft. wide by 6 in. deep, and of this length 3 m. 70 ch. has been blinded and rolled.

Tapu to Coroglen (Thames County).—6 m. 35 ch. has been metalled, completing the road.

Kopuku Settlement Road (Waikato County).—75 ch. of road was metalled 9 ft. by 8 in. by the Waikato County Council.

Kopuku to Whangamarino Falls Road (Waikato County).—Grade improvements over a length of 2 m. and metalling of 56 ch. were carried out by the Waikato County Council.

Whangamarino Island Block: Mercer to Mardon (Waikato County).—111 ch. of road was metalled 9 ft. by 6 in., and 17 ch. of base-course 9 ft. by 4 in. was laid.

Whangamarino Falls Road (Waikato County).—6 m. 46 ch. of road was metalled.

Taiapa–Oaia Road (Waitemata County).—2 m. 44 ch. of road was metalled with sandstone from Motutara Block.

Waitakere River Bridge (Waitemata County).—One 44-ft.-span reinforced-concrete bridge was completed by the Waitemata County Council.

Albany–Paremoremo Road (Waitemata County).—2 m. 47 ch. of road was metalled 9 ft. by 6 in.

Duck Creek Road (Waitemata County).—The Department has carried out the metalling of 230 ch. of this road.

Makarau–Tahekeroa Road (Waitemata County).—3 m. of metalling has been completed on this road.

Wairere and Horseman's Roads (Waitemata County).—During the period 97 ch. of formation was widened and straightened. 178 lin. ft. of 12 in. pipes was laid and 94 ch. of road metalled.

Tauranga District.

Raukokore Bridge (Opotiki County).—A low-level bridge, 175 ft. long, comprising seven spans each of 25 ft. by 10 ft. 6 in. wide, was erected over the Raukokore Stream. During the course of erection one flood rose 8 ft. over the deck, but the structure withstood this severe test quite creditably.

Te Kaha - Orete (Opotiki County).—6 m. 7 ch. of new formation has been completed and 4 m. 52 ch. of road metalled.

Takaputahi Road (Opotiki County).—2 m. 31 ch. of this road has been metalled 10 ft. by 5 in.

Waiaua Block Access (Opotiki County).—84 ch. of road has been metalled to a minimum width of 9 ft.

Waiotahi Valley Road (Opotiki County).—2 m. 20 ch. of road has been metalled 9 ft. wide by 4 in. deep and 78 ft. of 12 in. concrete pipes have been placed.

Tahunaatara Stream Bridge (Rotorua County).—A new bridge, consisting of three spans, two each of 24 ft. and one rolled-steel-joist span of 40 ft., was completed under contract. 6 ch. of approaches 16 ft. wide have been formed.

Ohauiti and Skinner's Roads (Tauranga County).—2 m. 77 ch. of road has been metalled 10 ft. by 9 in.

Te Puna and Apata Parishes Block (Tauranga County).—8 m. 11 ch. of road has been formed to a width of 14 ft., 35 ch. has been surfaced, forty-six culverts of a total length of 811 ft. have been placed, and a bridge of one 40 ft. rolled-steel-joist span with timber superstructure on ironbark piles erected over Waipapa Stream.

Waitao Road (Tauranga County).—150 ch. of road has been metalled 10 ft. by 9 in.

Galatea Estate Road (Whakatane County).—A bridge over the Mangamate Stream was completed under contract, inclusive of 7 ch. of approaches 20 ft. wide, of which 6 ch. was metalled 10 ft. by 9 in. The bridge is one 40 ft. rolled-steel-joist span on pile foundations with timber superstructure.

Galatea Estate Internal Roading (Whakatane County).—The internal roading was completed last year, with the exception of the two bridges over the Horomanga Stream. These have now been built in rolled-steel-joist spans, one being of one 40 ft. span and the other of two spans each 35 ft. A 5-ft.-diameter concrete culvert, 48 ft. long, has also been laid.

Stanley Road (Whakatane County).— The metalling of 2 m. 16 ch. 10 ft. by 6 in. has been completed.

Te Teko - Waiohau - Galatea (Whakatane County).—The formation completed last year has been metalled 10 ft. by 9 in. over a length of 12 m. 71 ch. During the year 572 cub. yd. of slips was cleared.

Te Whaiti to Ruatahuna (Whakatane County).—3 m. 45 ch. of road has been formed to a width of 8 ft. and 5,091 cub. yd. of slips cleared during construction. 1 m. 70 ch. of road has been metalled 10 ft. by 9 in. and 48 ft. of 18 in. concrete pipes has been laid as culverts.

Taumarunui District.

Mangaohae Road (Kaitieke County).—2 m. of re-formation and metalling has been completed.

Oio No. 2 Road (Kaitieke County).—6 m. 50 ch. of road was surfaced with crushed metal.

Kopuha North Road (Ohura County).—2 m. 38 ch. of road was metalled with river shingle.

Ohura–Mokau Road (Ohura County).—Several slips have been cleared from this road, and general preparations have been made for the metalling of 6 m. next season. A considerable quantity of spalls was stacked for crushing.

Kururau Road (Taumarunui County).—5 m. 75 ch. of road was metalled.

Taumarunui–Tokaanu Road (Taumarunui County).—7 m. of bush-work, 3 m. 33 ch. of first-class formation, 65 ch. of metalling, and placing of 54 culverts, totalling 1,611 lin. ft., have been completed this year.

Fullerton's Road (Waitomo County).—2 m. 50 ch. of road was formed and metalled with crushed limestone.

Haurua Road (Waitomo County).—1 m. 75 ch. of formation and metalling with limestone has been completed.

Mokauiti North Road (Waitomo County).—1 m. 27 ch. of formation and surfacing with river shingle was carried out.

Totoro Road: Mokau River Bridge (Waitomo County).—A suspension bridge of 150 ft. span with a 7 ft. roadway was constructed on concrete piles with abutments.

STRATFORD DISTRICT.

Makino Road (Clifton County).—61 ch. of 12 ft. road was formed during the year.

Mohakatino Road (Clifton County).—Formation of 61 ch. of access road, opening-up of a quarry, and metalling of 1 m. 19 ch. of road were completed.

Otaraoa Road (Clifton County).—2 m. 20 ch. of road was widened and 3 m. 75 ch. of metal laid.

Arawhata Road Group (Egmont County).—Formation over a length of 2 m. 1 ch. of road, including placing of 144 lin. ft. of culverts, was completed, and 79 ch. of metal laid.

Kaweora Road Group (Egmont County).—75 ch. of road was cleared and formed while 1 m. 72 ch. of road was metalled.

Huiroa Block Roads (Inglewood and Stratford Counties).—2 m. 63 ch. of road was formed and 2 m. 10 ch. metalled.

Makakaho Road (Patea County).—This is a road giving access to backblock settlers whose position has been consolidated, with improved access resultant on widening 4 m. 1 ch. of road and metalling 2 m. 70 ch.

Waitotara Valley Road (Patea County).—In the fertile Waitotara Valley the settlers have been hampered considerably through not having all-weather access. During the year the position was rectified to the extent that re-formation was carried out over a length of 3 m. 42 ch., while 9 m. 36 ch. of metal was laid.

Mangaoapa Road (Stratford County).—1 m. 20 ch. of road was widened and 52 ch. of metal laid.

Matau Road (Stratford County).—1 m. 47 ch. of road was widened and 1 m. 10 ch. of metal laid.

Carrington Road Group (Taranaki County).—Good work was done on this group of roads by concentrating on the formation of 1 m. 70 ch. on one of the main arterial ones and the metalling of 3 m. of road in the group. This has helped to consolidate the position of those settlers who have already taken up land, and should inspire them with renewed confidence.

Makakahi Road Bridges (Waimarino County).—Two bridges were built over troublesome streams, one consisting of a 40 ft. rolled-steel-joist span and the other a 30 ft. built-up-beam span. Both structures are now in commission.

Mangaetoroa Road South (Waimarino County).—Metalling was completed over a length of 4 m. 5 ch. of this road.

Mangatiti East Road (Waimarino County).—1 m. 5 ch. of road was metalled.

Wanganui River Road Metalling (Wanganui and Waimarino Counties).—This road already provides access to large Native settlements and to a number of European owned properties. It follows the bank of the Wanganui River from the Gentle Annie Hill to Pipiriki where it junctions with the No. 49 Main Highway to Raetihi. With the metalling of 6½ m. this year the position of the resident settlers will be greatly improved and a prospective scenic route will be made more readily available to the travelling public.

Kohuratahi and Whitianga Road Group (Whangamomona County).—3 m. 77 ch. of road was re-formed and 3 m. 45 ch. of metal laid.

Okara, Tahunaroa, and Whangamomona Roads (Whangamomona County).—Work of vital interest to the settlers served by this group of roads was commenced during the year and the operations to date have accounted for the re-formation of 1 m. 11 ch. and metalling of 1 m. 31 ch.

Whangamomona Stream Bridge, Poarangi Road (Whangamomona County).—The erection of a bridge consisting of one 60 ft. converted railway-truss span and three platform spans was completed.

GISBORNE DISTRICT.

Mangapoike Valley Road (Cook County).—During September, 1932, considerable damage was done to this road by a severe earthquake, and large slips brought down as the result of earth tremors blocked the road over a considerable portion of its length. The work of restoration, which has been financed largely by the Unemployment Board, has provided employment for quite a number of men. Communication, of course, was re-established as soon as could be possibly arranged, but widening and metalling operations in the interest of settlers and other road users are being continued. A large amount of useful development work has already been done.

Waimata-Riverside Road (Donners), (Cook County).—On this road, which gives access to the country on the western side of the Waimata River, metalling operations during the year accounted for a total distance of roughly 8½ miles of road. This completes all-weather access to the last homestead.

Potaka-Waikura Road (Matakaoa County).—37 ch. of formation was completed on this road to avoid two bad river crossings at the head of the Oweka Stream.

Mangatokerau Road (Uawa County).—25 ch. of metalling was completed on this road, and this completes metalling over a length of 5 m. from the junction with the Tauwhareparae Main Highway.

Tauwhareparae Road (Uawa County).—This road is the main inland route in the Uawa County. 102 ch. was regraded and widened and 235 ch. of metalling completed. Most of this work was financed by the Unemployment Board. Its assistance in this direction is appreciated by both the settlers and the Department.

Poroporo Road (Waiapu County).—This is an access road to the Poroporo Block recently subdivided. The successful settlement of the block has been considerably enhanced by the metalling of a length of 60 ch. which work was carried out during the year.

Jerusalem-Whareponga Road (Waiapu County).—This road, which is a branch off the Gisborne–Opotiki via Coast Main Highway, has progressed into the back country for a distance of 5 m. and has resulted in the opening-up of further land for settlement purposes.

Armstrong Road (Waikohu County).—90 ch. of metalling was completed on this road and there is now an all-weather outlet for the settlers served from the junction with the Puha–Mangatu Main Highway to the Waipaoa River, a distance of 13 m.

NAPIER DISTRICT.

Mangamaire Road (Dannevirke County).—The County Council satisfactorily completed the metalling of 66¼ ch. of this road from its junction with the Pokokomuka Road.

Mangaone Stream Bridge (Hawke's Bay County).—This work consisted of reconstructing three spans of the above-mentioned bridge and entirely rebuilding four spans, also dismantling one span and clearing away abutment, &c. The total length of the bridge is six 40 ft. spans and one 20 ft. span, consisting of rolled-steel joists, concrete deck, and concrete piles and piers.

Long Range Road (Patangata County).—2 m. 20 ch. of road was metalled.

Kakariki Block Access Road (Wairoa County).—The purpose of this road is to give access to a large area of Crown land in the Kakariki Block, which is to be thrown open for settlement. The work of road formation is now complete, this year's work comprising the building of a bridge of two rolled-steel-joist spans of a total length of 61 ft.

Mangapoike Road (Wairoa County).—1 m. 52 ch. of metalling was completed during the year.

Mangapoike Valley Road: Frasertown–Tukemokihi (Wairoa County).—10 m. of restoration of earthquake damage was carried out. Three bridges, of a total length of 134 ft., and three culverts, totalling 48 ft. in length, were completed.

Putere Block Roads (Wairoa County).—The work on this road, which carried a subsidy from the Unemployment Board, was completed during the year, and the block, which is to be thrown open for settlement, is now served by a road 12 ft. wide and approximately 7½ m. long. The more shady portions of the road have already been metalled, the total work done during the year approximating 1½ m.

Waikaremoana Lake House to Hopuruahine Road (Wairoa County).—Widening on this road on the Lake House to Hopuruahine section in the Mokau Gorge was continued during the year, a total of 1 m. 14 ch. being widened, trimmed, canted, reculverted, and metalled with local sandstone.

Saddle Hill Road (Woodville County).—Under Government grant the County Council erected over a stream which has caused inconvenience in the past a low reinforced-concrete rolled-steel-joist bridge of three 20 ft. spans without handrails, the deck width being 11 ft. 4 in. between wheel-guards. Five 65 lb. rails were driven between each of the abutments and piers. The concrete deck is carried on four 12 in. by 5 in. by 30 lb. rolled-steel joists.

WELLINGTON DISTRICT.

Akaroa Road (Akitio County).—3 m. 9 ch. of road formation was completed during the year.

Range and Cross Roads (Akitio County).—Work during the year consisted of the metalling of a length of 1 m. 28 ch. of this road.

Ngakonui–Summerhill Road (Featherston County).—With assistance from the Unemployment Board the Department has been able to form 1 m. 2 ch. of this road and to metal a length of 1 m. 16 ch. In addition, 92 lin. ft. of large size culverts was placed in position and a small timber bridge with concrete abutments was erected to give improved access over a stream.

White Rock and Cape River Roads (Featherston County).—These roads give access to large tracts of good sheep country, the development of which in the past was retarded owing to difficulty experienced in getting on to the property. Most of the work carried out during the year consisted of widening throughout the whole length of the road and clearing back running slips. Much good work has already been done, and it is hoped soon to have good vehicular access into this area.

Korokoro Road (Hutt County).—This road serves an area close to the Borough of Petone which is gradually becoming a part of the city itself. There is already evidence of considerable settlement and with improved access settlement should intensify. The necessary work involves the construction of a wide road approximately 1 m. in length. The formation of 75 per cent. of the road is already completed, and metalling over this section is in hand.

Horokiwi Road (Makara County).—Heavy widening work was completed over a distance of 40 ch., while work is in hand over a further 60 ch.

NELSON DISTRICT.

Patarau River Bridge (Collingwood County).—Plans for the construction of a bridge of five 40 ft. rolled-steel-joist spans with 7 ft. 6 in. roadway on timber-pile piers have been approved. All material for the permanent structure is on the ground and tenders have been invited for labour contracts covering the erection of the bridge.

Wairoa River to Mangarakau (Collingwood County).—The engineering trial survey of this road, covering a distance of 4 m. 48 ch., has been completed. The whole of the route has been graded through, and is ready for permanent pegging. Permanent pegging, levelling, and cross-sectioning have been completed over a distance of 3 m. 37 ch.

Mahakipawa Hill, Havelock to Picton Road (Marlborough County).—With a subsidy from the Unemployment Board the Department was able, during the year, to continue work on this road, and widening of 2 m. 50 ch. was completed. This made a total of 5 m. 10 ch. since the commencement of the work. The road has now been handed over to the County Council for maintenance purposes.

Blackwater Bridge, Mangles Valley Road (Murchison County).—The reconstruction of this bridge was carried out during the year. It consists of one 40 ft. main span and one 20 ft. and one 15 ft. end spans. The work comprised strengthening and repairs to piers, replacing timber stringers with four rolled-steel joists on main span, renewal of stringers on the 20 ft. span, eliminating the 15 ft. span, and redecking throughout.

Shenandoah Road (Murchison County).—Departmental funds which have been subsidized by the Unemployment Board were used in the extension of formation on this road. The formation completed during the year amounted to approximately 3½ m. On this length five small bridges were also erected.

Takaka Hill – Canaan Road (Takaka and Waimea Counties).—1 m. 56 ch. of 12 ft. formation completed.

Restoration of Bridges: Pelorus River (2), Tunakino River (2), Rai River (1), (Marlborough County).—Two suspension footbridges over the Pelorus River—viz., Dalton's 384 ft. span and Rutland's 320 ft. span—were completed under contract during the year.

Greymouth District.

Earthquake Damage (Buller County).—The repair of damage caused by the 1929 earthquake is now nearing completion. During the year the following works were carried out: Raising a portion of Oparara Road, 18 ch. in length; the formation of approaches to Orowaiti Bridge, and the construction of a bridge consisting of four 26 ft. and one 20 ft. spans over New Creek near Lyell.

Break Creek Bridge, Karamea – Collingwood Road (Buller County).—A bridge 120 ft. in length made up of four 25 ft. and one 20 ft. spans, was erected over this stream.

Karamea – Collingwood Road: Oparara – Kohaihai Section (Buller County).—The formation of this road has been completed to the Kohaihai River, a distance of over 8 m., 5 m. 30 ch. of which was carried out during the year.

Haupiri Junction to Haupiri (Grey County).—This road which provides access to the Kopara Settlement is now complete to near the Ahaura River. Work carried out during the year comprised the construction and metalling of 2 m. 26 ch. of road, the construction of six small bridges of a total length of 198 lin. ft., and the placing of thirty-four culverts of a total length of 680 ft.

Access to Heaphy's (Grey County).—This road, which forms part of the access roading of the Kopara Settlement, has been formed over a length of 1 m. 66 ch., which is as far as the road is to be taken at present. One bridge, three 25 ft. spans, has been erected, and seven culverts have been placed. The metalling of the road is now nearing completion.

Access to Mallison's (Grey County).—1 m. 25 ch. of road was formed and metalling is nearing completion.

Haupiri River Bridge (Grey County).—This bridge was completed and is 200 ft. in length, made up of four 50 ft. rolled-steel-joist spans on concrete piles and piers with abutments, and forms the most important link in providing access to the Kopara Settlement.

Brown Creek to Alexander Mine via Snowy River (Inangahua County).—The formation of this access track 6 ft. wide was completed, the total length of formation involved being 3 m. 63 ch.

La Fontaine Bridge (Westland County).—The construction of a bridge consisting of two 40 ft. rolled-steel-joist spans on timber piles was completed.

Waiho to Weheka (Westland County).—Work carried out on this road during the year included the formation of a deviation 1 m. 15 ch. in length. Two new timber bridges, one a 30 ft. span and one a 20 ft. span, were also constructed. In addition, seventy-nine culverts, of a total length of 1,580 ft., were placed.

Waitaha South Bank Road (Westland County).—Construction of this road was in progress during the year, the formation work completed totalling 220 ch. Metal was also placed on approximately $2\frac{1}{2}$ m. of road.

Franz Josef Glacier (Westland County).—This is a tourist route and during the year 4 m. of track was constructed to give access to advantage point known as Alex Knob.

Christchurch District.

Purau – Camp Bay Road (Akaroa County).—Formation of 2 m. 60 ch. of road completed.

McAutcheons Road (Geraldine County).—1 m. 37 ch. of formation was completed.

Purau – Charteris Bay Road (Mount Herbert County).—Improvements on this road, necessitating several deviations of a total length of 1 m., were completed.

Lewis Pass Road (Amuri County).—This work is being financed by the Unemployment Board. The road from the junction with the Culverden-Hanmer Highway to Glen Wye Homestead, a distance of 16 m., was cleared of slips, transport being provided by the Amuri County. Formation was completed from 13 m. 40 ch. to 19 m. 40 ch., a distance of 6 m. Of this 6 m., a length of 1 m. 20 ch. was widened from 18 ft. to 20 ft. and metalled. A length of 1 m. 30 ch. was formed to 20 ft. wide and metalled in fairly heavy sideling cutting, and a length of 3 m. 30 ch. formed 24 ft. wide and metalled in light surface formation. A temporary track 1 m. 10 ch. in length from 19 m. to the existing ford over the Hope River was formed to a width of 9 ft. A bridge 88 ft. in length was constructed out of local timber over the Kakapo Stream at 15 m. 60 ch. Work on this road is still continuing.

Dunedin District.

Taieri Mouth – Milton Road (Bruce County).—With funds provided by the Department and the Unemployment Board, a deviation to avoid the hill between Big Creek and the Akatore Schoolhouse, 13 m. from Milton, was constructed. Metal was also placed over a distance of 1 m. 70 ch.

Aurora Creek Road (Clutha County).—228 ch. of second-class metal surfacing completed.

Clinton–Wyndham (Clutha County).—1 m. of road constructed.

Milford – Lake Wakatipu Track via Hollyford (Lake County).—Approved work on this track was completed early in the year, and a 6 ft. track is now available to the Cleddau River Suspension Bridge at 3 m. 40 ch.

Upper Shotover Valley Road (Lake County).—2 m. 31 ch. of formation 11 ft. wide was completed.

Whare Flat Road (Taieri County).—This work was completed to a total length of 7 m. 63 ch. of first-class formation and surfacing. Work carried out during the year was 2 m. 57 ch. of surfacing.

INVERCARGILL DISTRICT.

Creighton Road, Waimahaka (Southland County).—Formation 47 ch. completed, and 194 lin. ft. of culverts placed. In addition, 63·5 ch. of gravelling was completed. This work was in the hands of the County Council.

Gorge Road Loan Block (Southland County).—1 m. 76 ch. of gravelling completed by contract under departmental supervision.

Hokonui School Road (Southland County).—1 m. 9 ch. of formation completed and 927 lin. ft. of culverting placed. The Southland County Council supervised this work.

Irthing Road, Five Rivers (Southland County).—The local body supervised the formation of 115 ch. of road, 6·5 ch. of gravelling, and placing of 64 lin. ft. of culverts.

Waikawa – Curio Bay Road (Southland County).—1 m. 46 ch. formation clayed over a width of 14 ft.

Pourakino Block (Wallace County).—Five small timber bridges were erected over difficult streams which cross the road giving access to this block.

Te Anau – Milford Sound Road (Wallace County).—This work is being carried out on co-operative contract with assistance from the Unemployment Board. During the year the following work was completed: Formation, 3 m. 14 ch.; gravelling, 1 m. 52 ch.; culverting, 1,779 lin. ft.; and bridges, 59 lin. ft. Fifty men are still employed in the continuation of this work. It will open up one of the finest tourists resorts in the South Island.

ROADS ON GOLDFIELDS.

The separate vote for "Roads on Goldfields" having been abolished as from the 31st March, 1931, the sum of £2,756 was voted in the ordinary "Roads" vote for expenditure on roads on goldfields for the current year.

The balance of the unexpended authorities at the 31st March, 1932, and those issued during the year, amounted to £1,783, of which the sum of £1,032 was expended.

As usual, all applications for assistance in this direction were carefully investigated, and assistance was granted in those cases where the results of the investigations showed that it was fully warranted.

LANDS IMPROVEMENTS.

The net capital expenditure under this vote was £38,906. The following are the particulars of the work completed or in hand at the end of the period.

WHANGAREI DISTRICT.

Tidal or Mangrove Flat Reclamation Work.—Detailed engineering surveys of tidal flats suitable for settlement purposes have been carried out in Whangarei, Whangaroa, Mangonui, and Hokianga Harbours. Some of these proposals are now under the consideration of the Small Farms Board. Construction work has been put in hand on four areas in the Hokianga Harbour, and progress has been made as follows:—

Kelly's area: 96 chains of stop-bank was completed.

Tulloch's area: 77 chains of half stop-bank completed, except for three creek gaps. Excavation for flood-gates and outlet drains completed.

Omanaia left bank: 68½ chains of half stop-bank completed.

Motutoa area: 45 chains of half stop-bank completed.

Sand-dune Reclamation Work was undertaken in the winter season of 1932 on two areas on the west coast where the drifting sand has caused a serious menace for many years. The work consists of planting marram-grass to be assisted by the introduction of lupin as opportunity offers. It is anticipated that work will have to be carried out over a number of seasons. Progress made during the planting season is as follows:—

Te Kopuru sand reclamation: A total area of 504 acres was planted in marram-grass.

Kaitaia sand reclamation: A total area of 1,340 acres was planted in marram-grass.

On the East Coast further planting was carried out on the Ruakaka sand-dunes, where work had been done previously over a number of years. The area planted during the season amounted to 230 acres.

Nukutawhiti Land Clearing and Improvement.—60 acres of swamp was stumped and provided with heavy drains, 50 acres flat drained, stumped, and cleared of rushes, 140 acres of hill country scrubbed and logged; 70 chains heavy drain, 20 chains access road, 80 chains dray-track, and 80 chains of fencing completed during the year.

Austin's Drain.—49 chains of drain with bottom width of 3 ft. was constructed.

Ruakaka Block Drainage.—3 m. 2 ch. draining was completed and 3 m. of road constructed 20 ft. wide.

AUCKLAND DISTRICT.

Arohena Settlement.—A land-clearing programme has been in progress during the year to enable settlers to cultivate lands previously covered with stumps, logs, or scrub. A total area of 1,002 acres has been attended to, and, in addition, 121 chains of formed tracks have been constructed. 158 chains of fence-line clearing has been done and four farm bridges have been erected.

Taupiri Drainage Scheme.—This work is a major work, and involves the improvement and enlargement of practically the whole of the drainage system in the amalgamated drainage districts now known as the Taupiri River and Drainage District. After considerable negotiation the work is being undertaken by the Government on behalf of the local authority, the Unemployment Board and the local authority contributing towards its cost. Three survey parties are employed in connection with this work. Contracts were let for widening and deepening 5 m. 28 ch. of Paranui Drain, 2 m. 50 ch. of which has been completed. A further 32 m. 22 ch. of survey and 5 m. 41 ch. of plans have been wholly completed, 6 m. 76 ch. traversed and pegged, 3 m. 77 ch. traversed, 4 m. 42 ch. featured, and a possible diversion of "Ten-foot" drain has been pegged and levelled over a distance of 5 m. 32 ch. Plans over 16 m. 18 ch. are in course of preparation, and excavation is in hand on a length of 1 m. 70 ch. over Sludge Creek, 4 chains of which has been completed.

Kaipara River Improvements.—This work of river-improvement involves an expenditure of £8,000, and is being undertaken on behalf of the local authority. The Unemployment Board and the local authority are contributing to its cost. The work which involves the clearing of willows and the removal of snags and growth which impeded the free flow of water has during the year been practically completed for a length of 12 miles of the river within the Board's district. As part of the scheme, machine-dredging work is being done over a length of 381 chains, the work being complete over two-thirds of its distance. The works have already made a very big improvement to the stream, and floods have been materially reduced.

Mangaonua Stream Improvements.—1 m. 58·70 ch. of this stream, between Matanga–Tauwhare Road Bridge down stream, was cleared of willows and deepened to improve flow of water. The result has been quite satisfactory.

Ruawaro Drainage District.—An additional 4 m. 23·13 ch. of drains was constructed during the year, and the work was completed. Work done this year and in former years amounts to a total mileage of 8 m. 71·13 ch.

Sand-dune Reclamation Works.

Moving sand-dune areas on the west coast of the Auckland Province have been a serious menace for many years. Commencing with the 1932 winter season the Department has undertaken extensive works of control. The work that has been done on the several areas in question is detailed as follow :—

Woodhill–Helensville Sand-dune Reclamation.—The reclamation of sand-dunes in this area was pushed on when weather was suitable. A total of 2,219 acres was planted in marram-grass during the year, and, in addition, a considerable quantity of lupin-seed was sown in suitable places. A considerable amount of brush wind-break fencing has been erected to prevent blow-outs. Generally speaking, good results have been achieved, and the marram planted last winter is in excellent condition and is growing well. Some 3 m. 52 ch. of standard seven-wire fence has been erected where sand areas have been handed over to the Crown by settlers. This work is still in hand.

Waikato Heads Sand-dune Reclamation.—During the planting season, which ended in October, 1932, 1,227 acres of sand hills was planted with marram-grass. Of this area 384 acres, mainly of the latest planted portions, was damaged by storms and had to be replanted. Including this area, this season's planting totals 546 acres, making a total for the undertaking to date of 1,289 acres, after allowing for the 384 acres above.

About 35 chains of breaks in the foredune has been closed as a result of the erection of sand arresting fences. Although there has been a smaller proportion than usual of westerly wind this year, the sand has built up in the breaks to heights varying from 6 ft. to 15 ft. The general height of the foredune is 25 ft. Lupin-seed was gathered in the season, and about half a ton of it was sown in suitable places. Besides this, some of the lupin areas were extended by the spreading and shaking of seed from branches. A quantity of pinus seed is being procured and an area is being prepared for the growing of seedlings.

Property owners on the fringes of the sand areas have given great assistance to the undertaking, and have expressed satisfaction at the results of the work done by the Department.

Kaipara South Head Sand-dune Reclamation.—Fair progress has been made with this work, which involves planting of marram-grass to deal with the sand nuisance. A total of 187 acres was planted by the end of the construction year.

Waihou and Ohinemuri River Improvement (Construction Works).—Tirohia–Ngahina : The borrow-pit on the left bank has been trimmed from 3 m. 5 ch. to 4 m. 26 ch., 4 m. 56 ch. to 5 m. 66 ch., and from 6 m. 5 ch. to 6 m. 8 ch.

Ngahina–Netherton : The topping-up of the left bank and trimming of berm from 0 m. 0 ch. to 0 m. 16 ch., 5 m. 70 ch. to 5 m. 76 ch., 10 m. 16 ch. to 10 m. 18 ch., and 10 m. 60 ch. to 10 m. 77 ch. have been completed.

These works are the last works to be undertaken on this river-improvement scheme. The construction work is now finished and has been closed down.

Waihou and Ohinemuri Rivers Improvement Maintenance.—Single relief workers cleared the river from Mangaiti to Ngahina in the Upper Waihou Valley and were also engaged on land-improvement works on Silcock's property at Waitoki, constructing 1 m. 46 ch. of drain through heavy timber. It is proposed to undertake clearing of all growth or berm and to carry out improvements to stop-banks and other important work in the Ohinemuri River with the same organization immediately the Waihou River work is completed.

Waihou River (clearing Willows between Te Aroha and Gordonton Settlement).—With the assistance of a steam log-hauler, workmen during the year cleared 2½ miles of river-bank immediately upstream from Te Aroha Borough. Heavy snags were also removed from the river-channel. The pulling has

been particularly heavy, but a wonderful improvement has been effected. On completion of this work the camp was removed to Manawaru and the men were engaged ring-barking the willows on the bank, 4½ miles of river-bank being treated in this way by the close of the financial year.

Waitoa River (clearing Willows).—72 chains of the river has been snagged of willow-growth and 60 chains of willow on both banks have been ring-barked, giving a complete job from the Ohine Creek up to Mellin's Road Bridge. In addition, three major deviations have been dug 20 ft. by 14 chains, 30 ft. by 15 chains, and 30 ft. by 10 chains. The work has lowered the normal water-level at the upstream end by 2 ft. to 3 ft.

Ohine Stream.—Work has been continued during the year, and this drain is now cut 16 ft. wide for 3 m. 20 ch. to an average depth of 3 ft. to 4 ft. Very heavy timber was encountered, including willows and kahikateas.

Akaaka Swamp Drainage.—With assistance from the Unemployment Board the widening and deepening of drains in the Akaaka Swamp has progressed considerably during the year. Plans of approximately 10 miles of drains were submitted by the Drainage Board, and of this length 3 miles has been completed and a further 5 miles widened and deepened to such level as the height of the tide in the drains permitted. In addition, six bridges have been extended or rebuilt to suit the greater width of the drains.

Te Kawa Drainage Scheme.—Wet weather interfered greatly with this construction work, but, nevertheless, a total of 408 chains has been carried out on five drains.

Land Clearing.—Under arrangements with the owner and the Labour Department, representing the Unemployment Board, a relief-work camp was established, and the men housed therein have to date cleared 136 acres of scrub and have also completed 18 chains of fencing. On two other farms 203 acres of land has been stumped and cleared.

Tauranga District.

Judea Swamp Drainage.—Drainage work carried out during the year consisted of deepening 147 chains of existing drain, constructing 269 chains of new drain, and clearing and widening 37 chains of the main drain. The Priestman Dredge was engaged on this work, the excavation work being very heavy owing to the considerable network of timber encountered in the bottom of the main drain.

Tarawera River Stop-bank.—The work entailed under this scheme consisted of the erection of stop-banks along an area of river-front to prevent flooding of low-lying land by the Tarawera River. At first the land most subject to floods was dealt with by partially forming the bank for 65 chains, leaving this section practically completed, and requiring only topping off by the dredge on the return journey downstream. Working from the top end of the job, the stop-bank has been completed for 72 chains, inclusive of very heavy filling along 35 chains of low-lying country, and the progress now being made is such that the entire scheme is approaching completion. A total of 1 m. 30 ch. of drains 6 ft. wide by 4 ft. deep has been cut to date to carry the water from the low-lying portions of the awamp into the railway drains.

Tauranga A. and P. Association (Showgrounds at Judea).—Work is proceeding with unemployed labour, much better progress resulting from the recent change to co-operative contract. Completion of 15 chains of stop-bank and 35 chains of new drains has caused the actual "Show Area" to dry up materially and allow the ground to be stumped and cleared. Filling and levelling of this "Show Area" is in hand, spoil for depressions being obtained from the construction of two roads leading to and from the "Parking area." Across the foothill drain two bridges have been built to give access to the ground. To date 2,900 cubic yards of spoil has been handled in excavating the completed roads. Five 2 ft.-6 in.-diameter concrete pipes have been laid at the flood-gate, and 1¾ chains of outlet drain 5 ft. by 3 ft. has been cut between the flood-gate and the edge of the swamp.

Gisborne District.

In the Gisborne district a large quantity of farm improvement and reconstruction work has been carried out by the Department on behalf of the Unemployment Board. Practically the whole of the work has been done on the co-operative contract basis, the rates being based on wage scale fixed by the Unemployment Board. The work done is tabulated as follows:—

Hangaroa-Tahora Land-improvement.—Improvement and clearing work has been carried out on a considerable number of farms where under prevailing conditions deterioration had taken place. 1,210 acres of heavy scrub and 4,106 acres of light scrub were cleared during the year. In addition a length of 422 chains of draining has been done, and a length of 1,227 chains of fences repaired and re-erected. Also 669 chains of new fencing has been erected. Improvements to the bed of the Waikura Stream, mainly the clearing of logs, vegetation, debris, &c., over a distance of 143 chains were also carried out.

Te Karaka - Whatatutu Farm-improvement.—151 acres of heavy scrub, 1,350 acres of medium scrub, and 659 acres of light scrub were cut during the year.

Waerengaokuri-Tiniroto Land-improvement.—On this area 1,150 acres of scrub was cut during the year. Some rush-clearing and a small amount of bush-felling were also done, and 110 chains of new fencing has been erected.

Repongaere Soldiers' Settlement-improvement.—On this group of farms an area of 971 acres of scrub has been cleared. 6 chains of heavy drainage work was also completed.

Ngatapa Drainage.—This drain, which serves the farms of the locality and also the Ngatapa Railway-station, had become silted up. Work is in hand redigging it to full dimensions, and the work already done has been of substantial benefit to the locality.

Napier District.

Kumeti Drain.—During the year, work to strengthen and repair the series of thirteen boulder and wire-net weirs has been sucessfully carried out. In addition, a reinforced-concrete chute and drop weir combined was constructed just below Thorburn's Bridge at the head of this drain to carry the water over a drop of about 20 ft. in the level of the stream, and thus prevent the stream further cutting back. This work is complete, and is acting satisfactorily.

Otawhao Block Water-supply.—A rough survey was made embracing 4,500 acres of the Otawhao Block. Plans and estimates were then prepared for a scheme to supply 142 farms with water.

Scrub-cutting.—Labourers from the Waipatiki Special Relief Camp were employed cutting scrub on three farms in the district, the total area cleared being 385 acres. The farmers contributed towards the cost of the work, which was carried out to their satisfaction.

Taumarunui District.

A large quantity of work has been successfully carried out in the Taumarunui district by means of the special single men's relief camps which have been set up. Practically all the work has been done on areas already settled or farmed where the work of logging and stumping had in the past not made much progress at the hands of the settlers, it apparently being rather beyond their financial resources. The work done is proving of immense advantage to the district, and will largely increase the productivity of the areas improved. Particulars of work done are as follow :—

Ongarue Land-clearing.—122 acres of land stumped and prepared ready for the plough.

Oio Land-clearing.—307 acres stumped and cleared, and 10 chains of drain dug.

Owhango Land-clearing.—294 acres stumped and cleared, 1,576 acres of ragwort cut and poisoned, and 16 chains of fencing erected.

Otunui Land-clearing.—210 acres stumped and cleared, 130 acres of scrub cut, 211 chains of fencing erected, and 100 chains of stock-tracks formed.

Tapuwae Land-clearing.—112 acres stumped and cleared, 576 chains of fence lines cut through bush, 1,000 chains of stock-tracks formed, and 376 chains of tram-lines widened to road width.

Tangitu Land-clearing.—Work here has not been in hand very long. One mile of road formation has been completed, and 13 acres of settlers' lands stumped and cleared.

Mokau Willow-clearing.—The growth of willows in the Mokau River from the Wairere Falls to the Eight-mile peg on the Te Kuiti - Awakino Road has been a menace for years, causing extensive flooding. A single men's camp has been established here, and, so far, 5 miles of the river has been cleared, the resulting improvement being very marked.

Stratford District.

Makotuku Logging Camp.—The work carried out during the year consisted of 87 acres of stumping, 51 acres of clearing, 20½ acres of scrub-cutting, 30 chains of fencing, and 44½ chains of draining. This land will soon be available for the plough, and will help settlers to increase production from their properties.

Wellington District.

Eastbourne Water and Sewerage Scheme.—This work was originally designed by the Lower Hutt Borough Council. It consists of a water-supply from three artesian wells in the Hutt Valley pumped into a 250,000 gallon reservoir 380 ft. above sea-level erected at Point Howard.

This Department has carried out the work of reticulation from the reservoir and at the end of the period had completed the water-supply system, which consisted of 3,947 ft. of 7 in., 9,100 ft. of 6 in., 34,247 ft. of 4 in. steel mains and 9,000 ft. of 2 in. galvanized-iron supplementary main. A ¾ in. service pipe is laid to the boundary of each allotment.

The sewerage will be on a separate system. Owing to the flat nature of the Borough of Eastbourne it is necessary to divide the system into three areas with a lifting station in each area.

The septic tank will be located at the southern boundary of the borough. There will be 36,820 ft. of sewers of sizes ranging from 6 in. to 12 in. diameter. The excavation for the septic tank has been completed and under-tank sludge-pipes are being laid.

No. 1 pumping-station has also been completed and the sinking of cylinder for No. 2 is nearly completed. A contract for the supply of pumps and motors has been let. 3,000 ft. of sewers over 10 ft. in depth, 1,600 ft. of 6 ft. to 10 ft. and 5,000 ft. under 6 ft. in depth have been laid complete with 4 in. branches to section boundaries.

The material met has been mostly water-bearing gravel requiring constant pumping, but No. 1 lifting-station and 1,200 ft. of sewer leading to it are in rock.

Tangimoana Sand-dune Reclamation.—This work comprised the planting of marram-grass and the erection of wind-breaks, fences, &c., to deal with the sand nuisance in this district. The work was completed during the year.

Hutt Valley Settlement Roading.—This heading includes Gracefield Estate roading, drainage, &c.; Hall-Jones Settlement tarring and sanding of footpaths; Awamotu flood-protection and reclamation; and filling and levelling thirty low-lying sections north of White's Line. All the work was completed during the year.

Beach Road and Soldiers Road.—The work done by the men employed in these localities has been in the nature of constructing, widening, and clearing drains, also back-filling old drains. In addition, wells have been bored, and land has been cleared of stumps, scrub, lupin, blackberry, and rushes. Fences and break-winds have been erected, while several farm roads have also been constructed.

Coley's Bend, Manawatu River Improvement.—This work consisted of making a cut to divert the Manawatu River at a bad bend. A total of 27,692 cubic yards of soil was shifted during the year, which brought the work to within an easy stage of completion.

Makowhai Stream Improvements.—Straightening, widening, and deepening, involving the excavation of 42,407 cubic yards of spoil over a length of 1 mile of stream, were completed during the year. Further improvements in the stream-bed are being carried out.

Land-clearing at Te Horo.—The work required is mainly clearing land of boulders. For the period under review 812 acres was cleared, and from off this area approximately 50,000 cubic yards of stone was removed.

Turanganui River Diversion.—The cut has progressed to the extent that 9,000 cubic yards of spoil has been excavated, all of this material being utilized for the completing of stop-banks. The men have also been engaged digging side drains, willow-planting, and erecting fences. Work is now in full swing, and good progress is being made.

Nelson District.

Cutting Hawthorn Hedges.—This work has been confined to the Riwaka, Richmond, and Spring Grove Districts. Hedges covering a total length of 62 miles 22 chains were dealt with during the year.

Greymouth District.

Waitangi River Erosion, Protective Works.—Work in connection with this protective stop-bank was commenced fairly late in the season, and by the end of the financial year a total of 6,600 cubic yards of filling had been placed.

North Beach Subdivision, Westport.—Survey and formation of 47 chains of streets, together with 25 chains of metalling and the laying of a water-supply have been completed.

Christchurch District.

Wigram Aerodrome Levelling.—This work was started under the Unemployment Board's No. 5 Scheme in June, 1932, absorbing 200 men on two shifts of three days per week. The work is carried out under the co-operative contract system, and to date good progress has been made in levelling, turfing, and grading runways, some 180 acres having been dealt with, involving the excavation of 160,000 cubic yards and the surface treatment of 800,000 square yards. Clear runways on gradients flatter than 1 in 120 have been constructed to suit prevailing winds.

Dunedin District.

Wairuna Drainage.—The drainage of the Wairuna Swamp, which was carried out during the year, involved the straightening of the Wairuna Stream, which previously followed a very tortuous course through the swamp. In all 26 chains of new channel was cut and 20 chains of heavy willow clearing carried out. In addition to this, 160 chains of side drains was dug through the swamp. The result of these activities is that we now have an area of 400 acres of drained land.

Steward Settlement.—24½ miles of races was repaired and cleaned out. The main race was widened to 12 ft. at the intake, where it is now capable of carrying 60 cusecs. At the lower end and along most of the distributaries the race was made capable of carrying 5 cusecs. On completion of the race-work two plots of ground, one of 5 acres and the other 2½ acres, were prepared for the border-dyke system of irrigation.

Invercargill District.

Kapuka Drainage Scheme.—Since July, 1932, fifty men have been employed on this scheme, their wages being a charge against funds provided by the Unemployment Board. The following work was completed during the year:—

Armstrong Creek: Bushwork, 1 mile 53 chains; excavation, 72 chains.

Wilson's Channel: 5 ft. by 3 ft. drain completed for 33 chains.

Maher Creek: Bushwork, 10 chains completed; channel, 24 in. wide, 10·5 chains completed, channel, 10 in. wide, 20·5 chains completed; outfall drains, 1 mile 52 chains completed.

Waimatua (Duck Creek) Drainage Scheme.—The work consists of widening, deepening, and straightening the existing creek over a distance of 2 m. 7 ch., whilst during flood periods the cutting of smaller outfall ditches has been undertaken over a distance of 20 miles.

HYDRO-ELECTRIC WORKS.

Arapuni Power Development.

At the commencement of the year covered by this report, the Arapuni Station had just been brought into service after the completion of all the restoration works recommended by Professor Hornell, except for the installation of the emergency gate in the diversion tunnel. The steel for this had arrived, and preparatory work in the tunnel was in hand.

In July, 1932, a leak developed in the flexible lining of the headrace, which demanded immediate remedial measures. The leakage was located near the cut-off wall at the upstream end of the lining. After lowering the level of the lake and headrace 10 ft., the source of the trouble was located immediately over one of the 9 in. earthenware pipes carrying storm-water from behind the side banks to the porous layers under the flexible lining. This drain had taken an excessive flow during a storm, in consequence disturbing the porous layers and causing a subsidence in the lining, which led to a break.

To enable repairs to be made, a coffer-dam was built of timber cribs, loaded with sand-bags, and sealed with canvas. When dewatered it enabled repairs to be carried out to the area of floor and side lining that had suffered damage, and when this work was complete, the tunnel-gates were closed, to allow the normal lake-level to be restored, the lake having been maintained 10 ft. below normal during the repairs. Normal lake-level was reached by the 11th September.

On the 20th September further leakage developed. Investigation disclosed that this was coming from the floor of the headrace from a point outside the area that had been covered by the coffer-dam, and had been due to the previous leakage disturbing the drainage-pipe system and undermining the floor lining, allowing it to subside and crack. This leak was temporarily staunched with tarpaulins and eventually sealed by grouting the porous layers round the damaged section. All these repairs were completed by the end of January, 1933.

To prevent a recurrence of this trouble, side drains have been cut on both sides of the headrace behind the lined banks. These drains will carry off any heavy flow of water during rainstorms, so that the system of 9 in. drains cannot be overtaxed.

Diversion Tunnel.—Work in the diversion tunnel in connection with the gate installation was resumed after January of this year. The plate work on the down-stream face of the existing gates was strengthened by the addition of heavier angles, extra anchor bolts, and welding. All construction joints in the concrete tunnel lining up to the springing of the arch have been sandblasted and cement-grouted with the guniting machine.

The installation of the emergency gate as part of the works recommended in the Hornell report was commenced in March, 1933. The work involved breaking out 226 cubic yards of old concrete, and the placing of 800 cubic yards of new concrete, in addition to the erection of gate and frame. The frame, the lining downstream of the gate, and the lifting-gear at the head of the shaft were all in place by the end of June, and a start had been made with the erection of the gate itself. The total weight of steel involved is 300 tons, of which 200 tons had been erected by that date.

Relief Work.—During the year relief work with funds provided by the Unemployment Board was undertaken to give employment to sixty men. Some 20,000 cubic yards of batter trimming, adjoining the headrace, was done, as well as the formation of 2 miles of 6-ft.-wide walking-roads. In addition, 100,000 trees have been planted on an area of 250 acres of the Government land at Arapuni.

Horahora Power Scheme.—The work of protecting the old river-channel below the spillway weirs and gates was resumed in January last. The work, which involved 2,270 cubic yards of excavation and the placing of 1,530 cubic yards of concrete, was completed during the rest of the year.

Waitaki River Power Development.

Dam.—The most important work now in connection with the completion of the dam is the building of that portion in the river on the Otago bank. To enable this to be done a coffer-dam similar to that erected on the Canterbury bank has to be built. It would have been of considerable benefit to the progress of the whole scheme if this coffer-dam could have been built during the winter of 1932, but the necessary restriction of financial appropriation made this impossible. In March of this year, however, a start was made upon this coffer-dam. A succession of small floods has somewhat delayed the work, making the driving of the sheet piling in the deep swiftly-running water a matter of considerable difficulty. By the middle of June, however, the coffer-dam was closed and pumping out was commenced. Excavation of the foundation is now in full swing. The coffer-dam on the Canterbury side was entirely dismantled to increase the available waterway and minimize the risk of flood damage. The capacity of the temporary sluices in the Canterbury section of the dam is insufficient, however, to pass the usual floods anticipated in the autumn without overtopping the Otago coffer-dam, and therefore every effort will be made to complete the latter section of the dam before the season of peak flood. At the same time, all the remaining work in the dam and power-house that is liable to be submerged by high floods will be pushed on to completion before the Otago coffer-dam is dismantled.

As mentioned in my last annual report, the cut-off wall in the river on the Otago side was commenced by tunnelling methods under the river. Working from a shaft near the Otago river-bank tunnels were driven, one above the other, to meet similarly excavated tunnels from the Canterbury side. The concreting was done in successive "lifts" of about 6 ft., and the last lift was built to a level as close to the bottom of the river as was deemed expedient and consistent with safety. Now that the coffer-dam is built, the concreting of the cut-off wall should be completed by the end of August to the floor of the inspection gallery. The lowest levels of the cut-off wall in the river section are 80 ft. below the ordinary river-level.

By a combination of tunnelling and open-trench methods the cut-off wall along the power-house and Otago end of the dam has been completed to the gallery-floor level, with the exception of a length of about 30 ft., which should be finished by the end of August.

The walls and roof of the inspection gallery have been constructed for a length of 235 ft., and a further 280 ft. is expected to be finished by the end of September. The 260 ft. length that lies in the Otago coffer-dam will be concreted in conjunction with the concreting of the dam.

The total excavation for cut-off wall to date amounts to 17,760 cubic yards, of which 8,000 were taken out during the year. The total concrete in the cut-off wall placed to date is 7,300 cubic yards, and of this 4,900 were placed this year.

All the concrete placed in the dam proper this year has been in the spillway section between the Otago riverbank and the power-house. A length of 400 ft. has been concreted to within 20 ft. of the crest. By October it should be finished to crest-level.

The concreting programme on the dam for the year had to be limited to suit the financial provision, but owing to a reduction in unit cost it was possible to place more concrete than had been anticipated. The amount placed for the year was 39,740 cubic yards. A total quantity of 104,300 cubic yards has now been put into the dam.

The total excavations for the dam to date amount to 303,950 cubic yards, of which 40,850 cubic yards were excavated this year.

In the tail-race a total of 144,000 cubic yards has been excavated, and of this 8,000 cubic yards was taken out during the year.

Power-house.—Only sufficient men have been employed on the power-house to keep pace with the erection of electrical plant. The annexe building has been virtually completed, and in March the erection staff was able to commence erecting switch-gear in the control-room. At the end of June the annexe offices were practically ready for occupation, and there now only remains to complete the annexe a small amount of finishing work and the concreting of the cable-shelves in the northern airduct.

Concreting of the intake structure has proceeded along with that of the annexe, and, except for the final work on the auxiliary intakes, is now completed.

The runway for the gantry crane has been completed from the south end of the annexe to the auxiliary units, and the crane itself has been erected.

All but one of the tie-beams between the west wall of the generator-room and the intake structure have been concreted.

Work on the scroll cases of units 3, 4, and 5 was recommenced towards the end of the year, and the formwork is now all in place, the fixing of steel is well advanced, and concrete in units 3 and 4 has reached elevation 693 ft., and in No. 5 unit elevation 698 ft.

All windows have now been fixed and glazed; stairway and ladder access to the annexe has been completed; penthouse and the 120-ton crane erected, and the intake screens and girders partly erected.

The floors of the generator-room and annexe building have been given a finishing coat of plaster, and two-thirds of the plastering of the stop-log platform is completed.

The retaining-wall at the south-east corner of the building was extended a further 15 ft. The final bay of the retaining-wall will be built when it is convenient to proceed with the final excavation in the tail-race.

Towards the end of the year concreting the two permanent sluiceways was recommenced, and a considerable area of the floors of both sluiceways was completed. Installation of the sluice-gate frames is under way, and excavations are in hand for foundation of the downstream end of the sluiceway floors. The average number of men engaged on the power-house throughout the year has been about forty.

The following shows the present position with regard to the quantity of concrete placed and the amounts of steel reinforcement and timber boxing used on the power-house:—

	During the Year.	Total to Date.
Concrete placed (cubic yards)	4,512	46,212
Reinforcing steel fixed (tons)	176	1,606
Timber for formwork (superficial feet)	42,807	1,649,637
Forms erected (square feet)	82,550	482,550

General.—Since coming into operation, the light railway from Kurow terminus to the works has transported 48,497 tons of materials and goods and 3,777,290 superficial feet of timber.

The bridge over the Waitaki at Wharekuri was completed during the year, and was open to traffic in January last. It has received two coats of paint, and will receive a third one in the spring. The bridge consists of one 210 ft. steel-truss span, six 60 ft. plate-girder spans, and two short rolled-steel-joist spans. The long span was erected during the lowest stages of the river, and no floods were experienced during its erection.

In June, 1932, the total number of men on the Waitaki River electric-power works was 532. The number remained about the same until April, 1933, when it was decided to increase it by another 400 men on a relief-work basis. At June, 1933, the number employed was 734. This will be increased to about 900 in the spring, when the work in the Otago coffer-dam will be at a maximum amount.

IRRIGATION.—OTAGO CENTRAL.

Operation of Completed Irrigation Schemes.

The past irrigation season was even dryer than the preceding one, which was considered to be an unusually dry one; in fact, it was easily the worst that has been experienced for low rainfall and stream yield since irrigation was commenced by the Government in Central Otago. The reservoir at Manorburn, which serves the Ida Valley and Galloway schemes, was practically emptied, and a serious shortage would have occurred had the Poolburn Reservoir not been in operation.

Generally speaking, however, there was sufficient water for all requirements, as a fair number of irrigators who were in arrears with their rates and could not meet the enforced condition of payment in advance for water were not able to take their usual full supply. Very little distribution trouble or interruption to service was experienced.

The area irrigated in all Government schemes was 39,903 acres, with 400 irrigators, as against 44,867 acres with 423 irrigators last season. The drop is due to the fact that 44 irrigators with 3,862 acres were cut off from supplies owing to non-payment of water rates and to a reduction in the area under the Arrow scheme.

The schemes in operation on a trading basis, with the area irrigated last season under each and the number of irrigators in each, are shown in the following table :—

Scheme.	Number of Irrigators.	Acres under Irrigation.	Scheme.	Number of Irrigators.	Acres under Irrigation.
Ardgour	11	1,430	Ida Valley ..	49	11,266
Arrow	40	2,794	Last Chance ..	23	1,730
Bengerburn ..	13	114	Manuherikia ..	74	5,180
Earnscleugh ..	42	1,966	Tarras ..	17	2,681
Galloway	21	2,467	Teviot ..	54	3,580
Hawkdun	48	6,130			
Idaburn	8	565		400	39,903

The actual number of acres that could have been irrigated was 43,585.

The revenue that should have been collected for the year was £17,994, but so far only £6,288 has been received.

The working-expenses for the year amounted to £11,143.

Outstanding debts for sale of irrigation water amount at the present time to £27,476.

New Schemes.

Omakau Scheme.—As mentioned in my previous report, this scheme necessitates a dam for a reservoir on the Manuherikia River at the Falls. This dam is of the rock-filled type, with a reinforced-concrete impervious facing on the upstream slope. The tunnel, 17 ft. in diameter, required to divert the river past the dam was completed during the year. It is 600 ft. in length and 440 ft. were driven, and concrete lined during the year. The tunnel was driven through very hard greywacke rock for the whole distance. It will serve as a spillway tunnel when the dam is completed, and the branch to the foot of the spillway shaft has been completed. Approaches in rock to the tunnel were also completed, and the river turned through the tunnel in June last.

Two quarries are in operation, one on each side of the river, for the rock fill, and to date 44,700 cubic yards of selected stone has been placed in the dam, being tipped in from each end.

A cut-off wall at the foot of the concrete facing in the up-stream slope of the dam was commenced during the year. So far, all the excavation has been completed and 387 ft. of the wall has been finished, in which 1,254 cubic yards of concrete was placed.

The Diesel electric-power plant has operated satisfactorily since it was started, and has supplied ample power for all the work.

The main race conveying water to the scheme has been fully manned along practically its whole length of 30 miles. Up to date 12½ miles have been completed along the portion of the race with the highest capacity, so that the race is really about 70 per cent. completed. The total quantity excavated to date from the race is 133,000 cubic yards, of which 97,000 cubic yards were taken out during the year.

A concrete-lined water-drive 1,088 ft. long was constructed to avoid a race on steep side lying country. No other structures were put in hand, but tenders have been called for the supply of several miles of reinforced-concrete pipe for siphons and road-crossings.

At the present time 210 men, including 35 in a single men's relief camp, are employed on this scheme.

Additions to Schemes in Operation.

Galloway Scheme.—A concrete arch dam in the Manorburn Stream is being built to enable another 300 acres to be irrigated under this scheme. The work is now about 30 per cent. completed. The foundation excavation is finished, and 510 cubic yards of concrete has been placed ; 15 chains of race from the dam was constructed to convey water to the lower end of the Galloway Flat.

Ida Valley Scheme.—A commencement was made to cut a race to divert water from the Totara Creek into the Poolburn Reservoir to augment the supply from the dam during dry seasons. The early winter conditions made it impossible, however, to complete the work, and it will be finished next summer. Approximately 2 miles was completed out of the 3-mile race required.

Hawkdun Scheme.—The strengthening of the Eweburn dam, with an addition of rock on the down-stream face, has been continued throughout the year with a few relief workers. This work should be completed in six months' time.

Teviot Scheme.—The extremely dry summer caused the Lake Onslow reservoir to become nearly depleted, and to guard against a recurrence of this the crest of the existing dam was raised 3 ft. by means of a timber structure. This will add 2,800 acre-feet to the storage capacity.

Surveys and Investigations.

Maniototo Scheme.—The survey of this scheme was completed last year, and, with the information obtained from the surveys, various alternatives for irrigating the Maniototo Plains have been investigated in detail. It has been found that a combined gravitation and pumping scheme should prove the best and most economical. The power for pumping will be obtained from the fall available in the main supply race. Under the proposed scheme 57,073 acres would be irrigated by gravity and 33,067 acres by pumping, making a total of 90,140 acres.

Glenavy-Morven Scheme.—Complete surveys and estimates were made for an irrigation scheme in the vicinity of Glenavy and Morven in South Canterbury. The water would be obtained by gravitation from the Waitaki River. Modified schemes were also surveyed, and plans were prepared of all possible schemes.

MARINE.

Harbour-works.

Westport Harbour.—No further construction work has been carried out on this harbour for the year. Owing to the heavy westerly weather damaging the piles, the whole of the trestling erected for breakwater extension has been dismantled.

The mean depth of water over the bar at the end of the year was practically the same as it was at the end of each of the two previous years, but the average working-depth at high water was about 1 ft. less this year than last year. The depth on the bar has during the year been very erratic owing to numerous freshes in the river and to strong easterly sets. The suction dredge "Eileen Ward" removed a total quantity of 440,335 cubic yards from the bar, 81,365 cubic yards from the fairway and berthages in the river, and 9,350 cubic yards from the floating basin. The average working-depth in the river was maintained at practically the same as last year. A considerable shoaling which had taken place in the berthages was removed, but average depths were slightly less throughout the year than during the previous year.

The "Eileen Ward" was laid up for about ten weeks during the year for overhaul. Only 50 per cent. of the working year was taken up with dredging operations owing to bad weather, repairs, and overhaul. The rainfall for the year was 66·99 in., as against 114·55 in. last year.

Work on the dredges and other plant kept the workshops staff fully employed. The overhaul of the dredge "Eileen Ward" was carried out at Westport instead of at Wellington.

The signal-stations, beacons, and harbour lights were all kept in good order.

Extensive willow-planting was carried out with unemployed labour along the river-banks during the year. Fencing was renewed and extended where necessary.

Karamea Harbour.—This harbour has not been worked by shipping since November, 1931. The Oparara Quarry and training-wall works were closed down at the beginning of the year, and the plant has been dismantled and overhauled. No works were carried out in connection with the port during the year.

The entrance to the harbour is now very bad, the river-mouth having worked so far to the northwards that the river has very little scouring-effect on the entrance. Added to this drawback is the fact that nearly 80 per cent. of the water of the river escapes into the Otumahana Lagoon, which again reduces the effect of scour, and results in the water on the bar being very shallow.

Large quantities of debris shaken down by the earthquake are still being carried down by the river and deposited in the tidal reaches. Until this action is very much reduced it is of very little use to attempt to improve the working-conditions of the harbour.

Little Wanganui.—Owing to the unsatisfactory condition of the Karamea Harbour, the Port of Little Wanganui has become the only sea outlet for the produce of the district once served by the two harbours.

The earthquake has, however, had a deleterious effect on this harbour also, and a large sand-and-shingle bank formed at the entrance, making navigation very difficult. Recently the river has cut through the bank, and the entrance is now a most favourable one.

Surveys were made with a view to constructing works that would improve the harbour, but the flood of February last so improved the entrance, as above stated, that no work is at present necessary It may be necessary at some time to try and fix the mouth in its present most favourable position, but expenditure in this direction at the present time is out of the question.

The Karamea Shipping Co.'s a.s. "Fairburn" called at this port thirty-one times during the year.

Waikokopu.—No further construction work was carried out at this Harbour during the year, but several blocks of concrete were placed in the breakwater to strengthen it and prevent loss of stone. Maintenance work was attended to as required on the wharf and breakwater.

Waitangi Wharf, Chatham Islands.—A contract for the erection of this wharf and the approach road was let to the Rope Construction Co. Work was started just prior to the 31st March, 1933. Timber is on the way for the wharf from Australia. Thirty-nine holes have been bored for piles for the timber protection-work to the approach road.

Pitt Island Wharf.—The timber is on the site for this wharf, but no construction has yet been done on it.

Tikinui Wharf.—The approach road to this wharf was completed during the year.

Whitianga Wharf.—This wharf was completed early in the year, and is now in service. A shed 40 ft. by 30 ft. was erected, and an approach road with a cattle-race.

Rotoroa Island.—During the month of November the hull of the old s.s. "Rimu" was sunk near the jetty on Rotoroa Island to provide shelter from the prevailing rough weather.

Lighthouses.

Very little new work has been done on lighthouses during the year. Maintenance and improvements have been carried out where necessary.

Baring Head.—The reserve at this lighthouse was fenced in during the year, and a double scrub fence was constructed to enclose the plantation surrounding the reserve. A number of native trees were also planted.

Puysegur Point.—The outer boarding of two bays in the tower of this lighthouse was completed. Other miscellaneous repairs were also effected.

Cape Maria Van Diemen.—Repairs were made to the main tower and outbuildings, and rails, sleepers, &c., were sent forward for the renewal of the tram-line.

Godley Head.—The apparatus for converting the light from a fixed to a flashing one was installed during the year.

Akaroa.—A new lightning-arrester was fixed on this lighthouse.

Farewell Spit.—Repairs to the bracing and stairway were effected, and the whole structure cleaned down and given three coats of paint.

A number of minor repairs have been effected at various stations, and all buildings have been properly maintained.

GENERAL.

A number of applications have been received from local bodies and private individuals for the approval of works involving marine interests. Among the various applications were the following :—

Foreshore Licenses.—Arthur Point, Eastbourne, Wellington Harbour; Waiaro, Coromandel Peninsula.

Wharves and Jetties.—Pupuke River, Whangaroa; Te Rawa, Pelorus Sound; Paritu Point, Coromandel; Seal Island, Woodpecker Bay; Matiatia Bay, Waiheke Island; Westhaven Harbour; Menzies Bay, Banks Peninsula; Lyttelton Harbour; Bluff Harbour; Collingwood, Nelson; Motuihi Island, Auckland; Kutarere, Bay of Plenty; Parkeston, Westhaven Inlet; Onekaka River, Golden Bay.

Boat Sheds and Skids.—Rotokakahi River, Whangape Harbour; Sloan's Beach, Herne Bay, Auckland Harbour; Whakatakataka (Hobson) Bay, Auckland Harbour; Meola Creek, Auckland Harbour.

Bridge.—Kaeo River, Whangaroa.

Retaining-walls and Stop-banks.—Rewarewa Creek, Auckland Harbour.

Harbour Works: Moorings and Timber Dolphins.—Floating Dock, Wellington Harbour; Bluff Harbour.

Reclamation.—Mussel Bay, Otago Harbour.

SMALL FARMS SCHEME.

During the year 437 cottages and farm buildings were erected in connection with this scheme on land acquired for the settlement of unemployed workers, making a total of 725 buildings erected to date.

The average cost of the cottages has been in the vicinity of £170. On the appointment of the Small Farms Board a few months ago authority was obtained for the erection of an improved type of cottage, and six alternate designs costing up to £300 each have been approved by the Board.

In addition to erecting cottages and farm buildings the Department is also providing road access, internal roading, water-supply, fencing, and other preliminary work on several large blocks of land recently acquired under the Act. For this work unemployed labour, including the prospective settlers, has been utilized.

The capital expenditure under the vote "Settlement of Unemployed Workers" for the financial year was £118,722.

TRAMWAYS.

Auckland.—Two new tram-cars were inspected and passed as ready for service. Ten tram-cars were inspected after accidents.

New Plymouth.—Two four-wheel bogie cars were converted to one-man control and fitted with compressed-air emergency-service brakes, and automatically air-operated folding-doors. These cars were inspected and passed.

Wanganui.—One four-wheel bogie car purchased from the Takapuna Tramways and Ferry Co. has been reconditioned, converted to one-man control, fitted with compressed-air emergency-service brakes, and automatically air-operated folding-doors. The car was duly inspected and passed. The whole of the Wanganui service is now a one-man-operated service. Four miles and a quarter of track from the Chief Post-office to Aramoho Park has been reconditioned.

Wellington.—The only works requiring the Department's inspection during the year have been three minor additions to the tramway-tracks. The work was carried out, inspected, and passed.

Christchurch.—During the year twelve cars were converted to one-man-operated cars and inspected and passed for service. A balloon loop, a Y loop, and a passing-loop were constructed in different parts of the track system, and passed for service.

Dunedin and *Invercargill.*—Both systems had no new construction or equipment calling for inspection.

PLANT AND MECHANICAL EQUIPMENT.

Although the number of major construction works in hand by the Department shows a substantial decrease compared with previous years, nevertheless it has been necessary to maintain a large quantity of plant and mechanical equipment in commission. Such works as the Waitaki and Arapuni hydro-electric works, the Stratford Main Trunk railway and Tawa Flat Railway Deviation works, the Balclutha and Wairoa River Bridges, the Tauraroa and Motutara Island Quarries in particular have required the use of complete and up-to-date power plant. Considerable sections of main highways are under the direct control of the Public Works Department, on behalf of the Main Highways Board, for construction and maintenance. These works are fully equipped with appropriate road plant of all descriptions.

The plant thus in use is maintained in good order and at a high standard of efficiency. As certain works have closed down, in particular certain railway works, a large quantity of valuable plant has been thrown out of commission. This plant, except such as has been disposed of by sale or by transfer to other works, has been laid up securely to safeguard it against damage from the weather, all bright parts, as well as cylinder bores being well coated with suitable waterproof compositions and the whole either boxed in the field or housed in existing buildings.

Inspection of Passenger Motor-vehicles.—The Department has carried out at the various centres on behalf of the Transport Department critical inspections of passenger motor-vehicles, and certificates of fitness or permits to run have been issued after the Department's requirements have been complied with. The number of certificates or permits thus issued during the year in the various districts are as follows: Whangarei, 103; Auckland, 289; Tauranga, 225; Taumarunui, 24; Gisborne, 83; Napier, 200; Stratford, 175; Wellington, 280; Nelson, 93; Christchurch, 132; Greymouth, 99; Dunedin, 135; Invercargill, 111: total, 1,949.

Motor-vehicle operation.—At the beginning of the year from the 1st July, 1932, to the 30th June, 1933, the Public Works Department operated a motor-vehicle fleet of 311 vehicles. By the end of the year this number was reduced to 297. Details are as follow:—

——	At 1st July, 1932.	Bought.	Sold.	At 30th June, 1933.
Cars	131	4	11	124
Light delivery-trucks (10 cwt.) ..	95	1	3	93
Trucks (1 ton and over)	85	1	6	80
Total	311	6	20	297

NOTE.—Light delivery-trucks are car chassis fitted with tray bodies and having accommodation for three passengers. These vehicles are used by surveyors, overseers, linesmen, &c., and serve the Department more or less as do cars.

Twenty vehicles, as shown above, reached the end of their economic lives during the year and were sold to the highest bidders, after tenders had been called by advertisement in the local press. In addition, four vehicles not in service at 1st July, 1932 (and therefore not included in the above schedule), were disposed of in the same way. The amount realized on these twenty-four vehicles was £441, which is regarded as a very satisfactory total. These twenty-four include one truck transferred to another Department at a nominal value.

The cost of operating the Public Works Department motor-vehicle fleet for the last year is shown below, together with the costs for the two previous years for comparison. These costs comprise:—

Running-charges.—Tires, tubes, petrol, oil and grease, repairs, and maintenance.

Standing-charges.—Interest at 5 per centum per annum, depreciation ranging from 20 per cent. to 40 per cent., garage charges at £13 per annum, registration, &c.

Vehicles.	Total Cost.	Total Mileage.	Cost per Mile.
	£		d.
Year 1930–31.			
Cars and light delivery combined	46,650	2,304,710	4·86
Trucks	34,840	850,280	9·83
All vehicles	81,490	3,154,990	6·20
Year 1931–32.			
Cars and light delivery combined	42,020	2,863,500	3·52
Trucks	20,930	790,370	6·36
All vehicles	62,950	3,653,870	4·13
Year 1932–33.			
Cars and light delivery combined	36,430	2,262,130	3·87
Trucks	16,800	557,400	7·23
All vehicles	53,230	2,819,530	4·53

The increase in cost per mile for the year 1932–33 is due to a reduction of 23 per cent. in mileage offset by a reduction of 16 per cent. in cost. The running-charges against a vehicle are roughly proportional to the mileage over a given period, but the standing-charges are constant for each vehicle. Thus reduced mileage decreases the total cost, but increases the cost per mile.

The above data, with a suitable recommendation, was submitted to the Public Service Commissioner. As a result of this, together with, it is understood, similar data submitted by the Post and Telegraph Department, the Commissioner made a substantial reduction in the mileage allowance paid to officers in all Government Departments for running their own cars on Government work.

The amount paid to officers of this Department for the use of their own cars on departmental work during the year covered by this report, together with amounts paid during two previous years is as follows:—

Year.	Total Allowance. £ s. d.
1930–31	7,023 17 9
1931–32	4,472 0 6
1932–33	1,612 16 10

The reduction in the total mileage allowance thus paid to officers for last year compared with the previous year 1931–32 is due to the following factors: A reduction of 50 per cent. in the mileage actually run, and the reduction in the unit mileage allowance paid, this latter factor over nine months of the year having effected a saving of some £612 in the Public Works Department alone.

A saving proportional to the mileage run would, no doubt, be effected in every other Department also.

General.

Garages.—As an economy measure this Department's mechanical workshops were reduced during the year to the equivalent of running-sheds, equipped and staffed just sufficiently to make only running repairs to plant.

The policy of placing as much work with private firms on best tendered price is now being generally adopted.

Public Works Department Plant hired.—During the year the following plant was hired to various parties, including local bodies, contractors, small mining syndicates, and co-operative parties: One steam-boiler; 2 oil-engines; 1 stone-crusher; 2 motor-graders; 1 bitumen heater and sprayer; 2 electric motors; 1 road-planer; 2 pumps; 1 air-receiver; 1 road-roller; 1 winch; 1 launch; 1 crane; 1 air-compressor; and 1 airlock.

Plant-hire agreements were drawn up and registered in the Supreme Court in all cases, and the Government's interests, both regarding the care of plant and the obtaining of hire payments, have been generally watched.

Public Works Department Plant sold or written off during the Year.—During the year a substantial quantity of plant no longer required for Government purposes was disposed of during the year by sale. The items sold realized the sum of £6,559 13s. 6d. This total is regarded as very satisfactory.

It is pointed out here that every effort is made to sell surplus plant by getting in touch with likely users and by advertising in the public press and appropriate machinery periodicals.

Every encouragement is given to likely buyers, and payment is accepted with a reasonable deposit and the balance divided up over a period of up to two years in major cases with interest at 5 per cent. per annum upon all amounts owing from time to time. Hire-purchase agreements properly drawn up and registered are used in all such cases to protect the Government's interests.

PUBLIC BUILDINGS.—MAINTENANCE.

The maintenance of public buildings has been carried out by the District Engineers and their staffs in accordance with proposals and reports prepared in district offices. Maintenance work is, for more ready reference, included with public-building work reported on by the Government Architect.

PUBLIC-BUILDING WORKS AND ELECTRICAL OPERATIONS.

For details of the public-building works and of the operations of hydro-electric enterprises, please see separate reports by the Government Architect and the Chief Electrical Engineer.

C. J. McKenzie, A.M.Inst.C.E.,
Engineer-in-Chief.

APPENDIX C.

ANNUAL REPORT OF BUILDINGS BY THE GOVERNMENT ARCHITECT.

The Government Architect to the Hon. Minister of Public Works.

Sir,—

I have the honour to submit the following report on the activities of the Department for the year ended 30th June, 1933.

During the period plans were prepared for twenty-two new works, of a total estimated value of £71,729, of which thirteen contracts to the amount of £31,233 have been let. In addition, nine contracts, amounting to £39,037, for buildings designed prior to the 30th June, 1932, have also been let, making the total value completed or under construction £70,270. The latter total includes £9,355 10s. for secondary-school buildings and £1,649 for hospitals.

The above figures do not include work for the Government Life Insurance building, the preparation of plans for which has been steadily proceeded with, special attention being paid to earthquake resistance.

The policy of specifying building-materials of New Zealand origin wherever possible has been adhered to, imported material being used only when all sources of local supply have been exhaustively considered. New Zealand manufacturers continue to show improvements in their standards of workmanship and at prices comparable with overseas. The drop in prices of materials and reduction of labour-costs have been satisfactorily reflected in Government contracts.

The financial stringency has reduced work to a minimum, and only the most urgent works have been put in hand as funds became available.

Vice-regal Residences.

Auckland.—General maintenance was carried out.

Parliament Buildings.

Renovations were effected to corridors on the second floor; a suite of offices formed and renovated for the Hon. Minister of Employment.

Post-offices.

Whangarei.—Renovations and repairs were effected to twelve post-offices.

Auckland.—Extensive alterations were made to the second floor of the Chief Post-office to provide for Stores Branch, luncheon-room, and kitchen. At the garage in Stanley Street a new office, luncheon-room, and night-watchman's room were provided. The exterior of the Stanley Street store was painted. Renovations and repairs were effected to forty-two post-offices and residences.

Taumarunui.—Minor repairs were effected to twelve post-offices and extensive repairs carried out to one post-office. Exterior renovations were made to three post-offices and drainage extensions to two post-offices.

Tauranga.—Alterations, renovations, and repairs were made to Rotorua Post-office. Renovations and repairs were effected to eight post-offices.

Gisborne.—Consequent from damage by earthquake, the clock-tower and gables of the Chief Post-office were demolished and the building repaired and strengthened. Renovations and repairs were effected to six post-offices.

Stratford.—A hot-water system was installed in the Marton Exchange. Defective steel sashes in Patea Post-office were replaced by wooden sashes. Alterations and additions were made to the Chief Post-office, New Plymouth, and repairs and renovations were effected to fifteen post-offices.

Napier.—The Chief Post-office at Napier, having been restored, was opened to the public on the 16th August, 1932, and the top floor subdivided for the Lands and Survey and Land and Deeds Departments. The additions to the Hastings Post-office were completed, and the building opened to the public on the 10th October, 1932. Repairs and renovations were carried out to seven post-offices.

Wellington.—The old Courtenay Place Post-office was converted into shops, the telephone exchange at the same place was fitted with boilers for an air-conditioning plant, and the windows reglazed with wired glass. Alterations were made to the mail-room of the General Post Office to provide a new cart-dock. The chimneys and coping of the Wellington South Post-office were removed, and the tower of the Masterton Post-office strengthened. Boiler-rooms and air-conditioning plant were fitted up in the Miramar and Lower Hutt automatic-telephone exchanges. Painting and repairs were carried out to four post-offices and residences.

Nelson.—The automatic-telephone exchange at Blenheim was reroofed and a pumping-plant installed in the Postmaster's residence. Repairs and renovations were effected to nine post-offices.

Christchurch.—The clock-tower of the Timaru Post-office was demolished, the clock reverting to the Borough Council. Renovations and repairs were carried out to fifteen post-offices and residences.

Dunedin.—A new strong-room was erected in the Chief Post-office, Invercargill, for the State Fire Office. Renovations and repairs were effected to twenty-three post-offices.

Greymouth.—All outbuildings and fencing at the new post-office at Westport were completed. Renovations and repairs were made to fifteen post-offices and residences.

Courthouses.

Whangarei.—A new courthouse was erected at Dargaville, and renovations and repairs carried out to the old portion.

Auckland.—The walls of the Magistrate's Court-room at Hamilton were draped to improve the acoustics, and minor repairs effected to the heating, lighting, and plumbing. Electric lighting was installed at Huntly, an additional room was erected to the office of the Official Assignee at Hamilton, and renovations and repairs were effected to three courthouses.

Taumarunui.—Minor repairs were carried out to Taumarunui Courthouse.

Tauranga.—Repairs and renovations were effected to two courthouses.

Stratford.—An additional room was built at the New Plymouth Courthouse, and maintenance repairs effected to six others.

Wellington.—Exterior renovations were made to the Levin Courthouse and fences repaired.

Nelson.—Minor maintenance and repairs were carried out to four courthouses.

Christchurch.—Repairs and renovations were effected to four courthouses.

Dunedin.—Alterations were made to one courthouse and renovations and repairs carried out to four courthouses.

Greymouth.—Maintenance was attended to in three courthouses.

Police Stations and Gaols.

Whangarei.—An office was erected at Dargaville, new drains were installed at Hikurangi, and renovations and repairs were made to seven police stations and residences.

Auckland.—The fire appliances at Mount Eden Gaol were tested, repairs made to baker's oven, and a new chimney erected to the cookhouse. At Waikeria a new cell-range, implement and manure shed, and a tobacco-drying shed were erected in wood, and a benzine-store in concrete blocks. Alterations were made to the Superintendent's residence and the staff cottages renovated. Extensions were made to the hot-water service at the Auckland Central Police-station, and a concrete retaining wall was built at the Sub-Inspector's residence. Repairs and renovations were effected to six stations and residences.

Taumarunui.—Minor repairs were carried out to six police-stations and roof renovations to one police-station.

Tauranga.—Maintenance, repairs, and renovations were effected to five police-stations.

Gisborne.—Repairs and renovations were effected to seven police stations and residences.

Stratford.—Major maintenance repairs were carried out to two police-stations and minor repairs to ten others.

Napier.—Repairs and renovations were made to six police stations and residences.

Wellington.—A new lock-up was erected at Paekakariki. The old Wellington North Post-office was renovated and converted into a police-station. Repairs and renovations were carried out to four police-stations.

Nelson.—Repairs were effected to two gaols, and repairs and renovations made to five police-stations.

Christchurch.—The leaking roofs at the Paparua Prison cell-ranges were attended to and the old wooden cell-range, formerly used for farm-produce, was repaired and renovated to provide for the increased population. Repairs and renovations were effected to twelve police stations and residences and one gaol.

Dunedin.—Reclamation and drainage works were proceeded with at the Invercargill Borstal Institution, a garage was erected at Anderson's Bay, and renovations and repairs were effected to eighteen police stations and residences.

Greymouth.—A new sanitary block was erected at the Reefton Police-station, and renovations and repairs were carried out to eighteen police stations, gaols, and residences.

Mental Hospitals.

Auckland.—At Auckland the change-over to bulk supply of electric current was completed, overhead lines being erected to Wolf Home, engineer's residence, nurses' home, doctor's residence, laundry, nurses' unit, Gray Lodge, and main building. Alterations and renovations were made to the installation as required by the Auckland Electric-power Board. The hot-water system was also completely reorganized, lavatory accommodation provided to the nurses' home, and a new roof built over landing above main entrance.

At Kingseat a new floor was installed in the summer camp and the erection of two villas (Nos. 3 and 4) was completed.

At Tokanui two steam-boilers in boiler-house were replaced, a carpenter's workshop erected, in which woodworking machinery, electric light, and power were installed. Attention was given to the interior plaster of the main building and additional ventilation provided for single rooms. All septic tanks, except to artisans' quarters, were cleaned out, and a comprehensive system for sewerage digestion is under review. A new 250,000 gallon reinforced-concrete reservoir was built and connected, fire-service mains extended, 4 in. mains at villas replaced by 6 in., and a pump-house for booster pump erected.

Wellington.—The veranda to male villas "Somerset" and "Kamatua" were closed in with glass. A new boiler and cylinder were installed in the nurses' home, a fence erected around the building, and tennis-courts constructed. The water-supply was extended in the vegetable garden, a new barn erected, portion of the main drive surface-sealed, and repairs and renovations generally attended to.

Nelson.—Additional sanitary accommodation was provided to the male ward and office quarters, and extra bathrooms fitted up. Lights were renewed in the drive, electric pumping-plant installed, fire service extended, and material supplied for reroofing spring reservoir and for painting.

At Ngawhatu (formerly called Stoke) storm-water drainage, water, and fire services were connected to three villas, and the erection of a new villa (No. 1) for women was commenced. General maintenance was dealt with, the yard sealed, and materials provided for painting. Flood-damage to the Poorman's water-supply was made good and a fence erected between Price's property and the reserve.

Christchurch.—At Sunnyside at the reception home for females a new dormitory was erected, having a glass front, and providing accommodation for twelve additional patients; also iron on stores and lavatories was renewed. A similar veranda, giving accommodation for six patients, was erected at North House. A new villa (No. 4), giving accommodation for forty-eight backward children, was erected at Templeton. Heating and hot-water services were improved and extended at Hornby Lodge, Annexe Ward, and at wash-places, &c., and a new boiler installed at No. 2 Ward. Additional sanitary accommodation was provided at North House and at No. 1 yard, and the kitchen and main yards were concreted. Tanks at Sunnyside were cleaned, cement-washed inside, and repaired, and a lock-up cycle-stand erected at the nurses' home. No. 3 attic (female), three kitchens at Templeton Villas, the laundry, and the Medical Superintendent's house were painted, and extensive repairs made to the roof of Annexe Ward.

Dunedin.—Repairs and renovations generally were made to the main building at Waitati, male ward, main tower, F. 1 and F. 4 Wards, furnishing equipment and painting materials provided, and repairs made to the main sewer. New sinks and hot-water service were installed.

Greymouth.—A new villa in wood is under construction at Hokitika, and the manufacture of furniture is in hand.

Education Department.

Whangarei.—Renovations and repairs were carried out to eleven Native schools, new outbuildings erected and repairs executed to two Native schools, and two Native schools were removed and re-erected. Repairs and renovations were attended to at Whangarei High School.

Taumarunui.—Minor additions were made to one Native school.

Tauranga.—Renovations and repairs were dealt with at twelve Native schools and additional outhouse accommodation provided to two Native schools.

Gisborne.—Repairs and renovations were executed to the Gisborne High School buildings and strengthening measures adopted by means of buttresses, &c. Repairs and renovations were effected to five Native schools.

Stratford.—Portion of the Wanganui Girls' College was strengthened, and at the Wanganui Technical College a wooden building from the old hostel was divided, both portions removed to different sites and re-erected. The residence at the Pipiriki Native School was completely remodelled, and repairs and renovations carried out to all buildings.

Napier.—The new Napier Girls' High School in wood was completed. New workshops were built at the Napier Boys' High School, the central building and wings overhauled, strengthened, and renovated, and new sewers laid throughout. The Hastings Street School, used by the Post and Telegraph Department during the earthquake period, was restored and handed over to the Education Department. Maintenance was attended to at three Native schools.

Wellington.—A new roof was erected over the annexe to the assembly hall at Palmerston North Technical School.

Christchurch.—Additional accommodation was provided at Parnassus School, and emergency exits made to the Timaru Girls' High School.

Dunedin.—Repairs and renovations were rendered to two buildings.

Health Department.

Auckland.—Renovations and repairs and general maintenance were effected and fire appliances overhauled at Motuihi Quarantine Station and St. Helens Hospital.

Gisborne.—Repairs and renovations were carried out and earthquake damage restored at St. Helens Hospital. A new sewing-room was erected at the Cook Hospital and alterations were made to form matron's quarters.

Stratford.—Renovations and repairs were dealt with at the St. Helens Hospital, Wanganui.

Wellington.—Renovations and repairs were executed to the doctor's residence at the Otaki Sanatorium.

Christchurch.—A new nurses' home was erected at St. Helens Hospital to replace that destroyed by fire.

Dunedin.—Alterations and additions were made to the St. Helens Hospital, Invercargill.

Defence Department.

Auckland.—The electric-lighting system at Huntly was modernized; repairs and renovations were dealt with at Narrow Neck and Waikato.

Tauranga.—Repairs and renovations were made to the Rotorua Drill-hall.

Stratford.—A section of the markers' gallery at New Plymouth was reconstructed in reinforced concrete and repairs effected to roof.

Nelson.—Minor maintenance was attended to at Nelson and Blenheim.

Christchurch.—Three windows were installed at King Edward Barracks, Christchurch. The floor of the Timaru Drill-hall was relaid in bitumen and extensive roof repairs were carried out.

Dunedin.—The roof of the Kensington Drill-hall was repaired.

Greymouth.—Maintenance repairs were dealt with at three drill-halls.

Tourist Department.

Taumarunui.—Repairs, laundry installation, and work for a hydro-electric plant were accomplished at the Chateau Tongariro. Minor repairs were made to the Waitomo Caves Hostel.

Tauranga.—The juvenile swimming-pool of the Blue Baths, Rotorua, was tiled, the main pool, cubicles, &c., completed, except for tiling, and a commencement made with the entrance, offices, lounge, tea-kiosk, &c. The completion of the electric-lighting system was dealt with. A concrete pump-house with motor boosting-pump was installed on the main-supply line from Whakarewarewa to the Blue Baths.

Dunedin.—The new bathhouse at Quinton Huts was completed, and improvements were made to the dining-room and kitchen at the Milford Sounds Hostel.

Soldiers' Graves.

A large number of soldiers' graves has been attended to, headstones and concrete surrounds being fixed as required.

Miscellaneous.

Auckland.—Two coke-heating stoves and electric light were installed in the Labour Bureau. The lease by the Lands and Survey Department of Waitemata Chambers was terminated and the officers transferred to the Customs Building. Two new offices were provided in the Custom Building for the Sales Tax Branch. New office accommodation for the State Advances was provided in the Law-courts Building, High Street. Repairs and renovations were effected to the Government Life Building, Auckland, and to the oyster depot of the Marine Department. The Public Works Office at Hamilton was transferred from Everybody's Theatre to the State Fire Insurance Building. Alterations were made to departmental buildings at Hamilton.

Taumarunui.—Minor repairs and alterations were made to the Public Works Office to accommodate officers of the Lands and Agriculture Departments. Alterations were made to the hot-water service in the District Engineer's residence.

Gisborne.—Repairs of earthquake damage were carried out to the Native Land Court and the building restored and strengthened. The brick parapets of the Government Buildings were demolished and the boiler-house chimney was razed and re-erected in iron. Renovations and repairs were effected to a residence for the State Advances Department and two cottages were shifted in connection with the Waikaremoana power scheme.

Stratford.—Renovations and repairs were carried out to four dwellings for the State Advances Department and to the New Plymouth departmental buildings. Dangerous portions of the chimneys of the Public Works Office, Stratford, were removed. Extensive repairs and strengthening were carried out to the Wanganui Native Land Court, and alterations and repairs were effected to the Government Life Insurance Building, Wanganui. At Hawera and New Plymouth office accommodation was arranged for five Departments.

Napier.—Six Departments were shifted to more suitable buildings and additional accommodation provided for the Labour Department. The Customs building at Port Ahuriri was painted outside. Renovations, repairs, and strengthening were effected to five houses, including one shifted from a dangerous position and re-erected. Improvements were made to the Morere Baths. Four hundred and twenty-four houses, damaged by earthquakes, were rehabilitated and estimates prepared for thirteen more. The shops in Clive Square, Napier, have been demolished.

Wellington.—The contractor for demolishing the Government Life Insurance Building was unable to carry out the job and it was finished by the Department. Alterations, repairs, and renovations were carried out to offices of nine Government Departments. Repairs and renovations were effected to several residences for the State Advances Department and several large retaining walls built.

Nelson.—At Appleby additions were made to the staff quarters of the Scientific and Industrial Research Department. Minor repairs were effected to four buildings.

Christchurch.—Two houses were erected and additions and alterations made to a third in connection with the discharged soldiers' settlement scheme. Additional housing for instruments was provided at Amberley Observatory, and a building was transferred from Christchurch. The Weights and Measures Branch of the Labour Department was transferred to new quarters, the electrical installation in the Canterbury Provincial Buildings was overhauled, and the lift in the new Government Buildings repaired.

Dunedin.—Alterations were made to the Government Life Insurance Building and repairs made to two buildings for the Internal Affairs Department. A detonator magazine was erected at the explosives magazine, Invercargill. Alterations were made to the Government Buildings, Invercargill, to accommodate Departments formerly in private suites.

Greymouth.—Repairs and renovations were carried out to the Public Works Office, Westport, and electric light was installed in the custodian's residence at Hokitika.

In conclusion, I desire to place on record my appreciation of the co-operation of district officers and the efficient and loyal manner in which the architectural staff carried out their duties.

John T. Mair, A.R.I.B.A.,
Government Architect.

APPENDIX D.

ANNUAL REPORT OF THE CHIEF ELECTRICAL ENGINEER.

THE CHIEF ELECTRICAL ENGINEER to the Hon. MINISTER OF PUBLIC WORKS.

SIR,—I beg to report on the position of the development of electric power in the Dominion for the past year as follows:—

GOVERNMENT SCHEMES IN OPERATION.

ARAPUNI-HORAHORA ELECTRIC-POWER SUPPLY.

1. CAPITAL OUTLAY.

The total capital outlay at the end of the year, as shown in Table II herewith, was £4,640,941, an increase during the year of £144,854. The principal items of increase were £57,605 at Arapuni, £51,794 on construction of the Arapuni–Stratford line, and £12,627 on construction of the new 110 kv. substation at Hamilton.

Table I shows assets in operation at the end of the year as totalling £4,522,152, and assets not in operation £158,332. The latter total includes £87,837 expenditure on the Arapuni–Stratford line, and other amounts on the new gates at Arapuni, Hamilton 110 kv. substation, and stocks in hand, principally for these new works.

2. FINANCIAL RESULTS OF OPERATION.

The gross profit for the year—*i.e.*, total revenue, £337,641 less working-expenses, £47,740—was £289,901, equal to 6·62 per cent. of the average total of assets in operation during the year.

The loss for the year, after making provision for interest and depreciation, was £41,487. Capital charges include an item of £36,590 as a payment of part of the capital charges of King's Wharf station, so that on the working of the Department's system alone the loss for the year was less than £5,000, or about $\frac{1}{8}$ per cent. of the capital outlay.

The results of operation for the past four years are shown in Table I herewith, and show the following points:—

Increase in gross revenue from £161,884 to £337,641 for the past year. £171,747 of this increase is in the revenue from the Auckland Power Board, which was supplied from Arapuni for all but fifteen days of the year, and took practically no supply from the Department in the previous year. All other electric supply authorities, except Thames Valley Power Board, show increases.

Increase in capital charges from £87,435 to £333,737, due to the fact that this year's accounts include interest and depreciation on the capital cost of Arapuni, and half the capital charges on King's Wharf steam plant, for almost a full year.

Reduction in working-expenses, analysed in Table III, from £115,003 to £47,740. This is wholly accounted for by reductions of £25,566 in the cost of operating fuel plants, £15,261 in power purchased, and £24,457 in the item standby provision (principally payment of portion of the costs of operating King's Wharf steam plant.).

Table III shows a reduction in operating costs of Horahora of £2,073, which is due to reduction in wages, salaries, and stores, owing to the reduced demand on the station, and a reduction in transmission-line costs of £1,678, which is due to reduction in salary and pay rates, and also to a reduction in the amount of general maintenance work which was necessary during the year.

For the past four years working-costs per unit sold have been as follows: 0·087d., 0·187d., 0·242d., and 0·045d., the respective amounts being determined mainly by the relative proportion of units from water-power and from steam plants.

Power purchased during the year totalled 6,395,886 units, as compared with 15,994,315 in the previous year. This was all supplied by Auckland and Tauranga respectively, the latter supplying power under its contract until 27th October, 1932.

3. EXTENSIONS DURING THE YEAR.

(*a*) *General.*

There were no additional bulk consumers during the year. The connected load, shown in Table IV herewith, increased from 296,225 kw. to 302,026 kw.

The number of milking-machines supplied in the district was 6,606, an increase of 531, the number of electric ranges of all sizes 8,868, an increase of 524, and of water-heaters 20,084, an increase of 1,142.

The system maximum load for the four years past has been as follows: 41,520, 49,520, 18,710, and 54,020, but as only the last of these figures includes a full year's operation with the whole of the load supplied by Arapuni and Horahora they do not give an accurate idea of the growth of load in the area, which actually has averaged about 2,000 kw. a year in the past three years.

The demand factor (ratio of maximum load to connected load) for the year was 17·9 per cent.

(*b*) *Power-stations.*

Arapuni.—Construction work at Arapuni during the year included the completion of No. 4 unit, and of the two auxiliary units (each consisting of one 550 h.p. turbine, one 450 kv.a. A.C. generator, and one 120 kw. D.C. generator, with an exciter for the A.C. generator mounted on the same shaft), the installation of one set of 50 kv. potential transformers for synchronizing, and of a 50 kv. neutral earthing transformer for the 110/50 kv. transformer-bank. Of these, No. 4 unit was placed in service on 16th May, No. 1 auxiliary set in June, and No. 2 in August. Improvements were made to the outdoor station earth.

Horahora.—Improvements were carried out by the Arapuni Office to the concrete work below the weir, to repair the results of erosion and prevent further erosion. New 50 kv. line protection equipment was installed.

(*c*) *Transmission-lines.*

110,000-volt Arapuni–Stratford Line.—This line will be about 123¼ miles long, with conductors of 19/·101 copper cable, carried on wood-pole structures for 78¾ miles from Arapuni to Tatu, thence for 40½ miles on steel towers from Tatu to Toko, through the rough country near Tangarakau and Whangamomona, and to about four miles from Stratford substation, where, owing to the more level nature of the country, the wood-pole type of construction is again used.

A telephone line parallels the transmission-line for its whole length.

The erection work was commenced on the 15th October, 1931, but owing to the financial position it has not been possible or necessary to push it urgently, and the proposed date of completion now is April, 1934. At the end of the year the position was as follows:—

Arapuni–Tatu Wood-pole Section: Of a total of 543 pole structures on this section, 518 have been erected and 494 wired. The telephone line (1,305 25 ft. poles) is complete.

Tatu–Toko Steel Tower Section: Of a total of 191 towers on this section, 14 have been completed, the stubs and bottom sections of an additional 26, and the special "rock" stubs of 13 others, have been erected. Of a total of 582 telephone poles, 114 have been erected and 112 have been wired.

Work has not yet been commenced on the Toko–Stratford section.

Bush-felling and Track Construction: The bush-felling and burning required for the line has been done, and a total length of 8 miles 78½ chains of 6 ft. track for cartage of material by tractor, and 1 mile 22½ chains of 4 ft. track in the Tangarakau district has been completed.

(*d*) *Substations.*

Bombay.—The original layout of this substation included only one 50/11 kv. transformer-bank of 1,500 kv.a. capacity, and when the load on this bank was exceeded a second bank was put into service in a temporary position, and the steelwork for it in its permanent position was erected last year.

Hamilton No. 2.—This substation, as well as Arapuni, Penrose, and Bombay, will be a point of transformation from 110 kv. to 50 kv., and for that purpose a 10,000 kv.a. bank of transformers (3 single-phase and 1 spare) is being installed, together with the necessary steelwork and switchgear, including 110 kv. potential transformers and 110 kv. line protective equipment.

Waikino.—Two boosting-transformers for boosting the 11 kv. voltage were installed and are adjusted so that the synchronous condenser can automatically maintain constant voltage. New protective equipment was installed on the two line O.C.B.'s.

Takapuna.—The new 2,250 kv.a. transformer-bank, steel structure, and bus-work was completed and put into service.

Kerepeehi, Waihou, Matamata.—A new 50 kv. line O.C.B. and new 50 kv. line-protective equipment were installed and put into service at each of these three substations.

4. Operation and Maintenance.

(*a*) *Power-stations.*

Arapuni (Generators, 60,000 kw. capacity; transformers, 11/110 kv. 72,000 kv.a., and 110/50 kv. 12,000 kv.a.).—After completion of repairs to the headrace, and of work in the overflow-channel and falls, a start was made to fill the lake on the 24th March, and water flowed over the spillway on the 6th April, 1932. Nos. 1, 2, and 3 units were started up on the 3rd April, and, after the necessary drying-out, the station took load again on the 10th April.

Maintenance work during the year was as follows:—

Turbines: A considerable amount of erosion was found on the runner-blades and shroud ring of Nos. 2 and 3 units, caused by cavitation. The governor drive-gears have given a good deal of trouble during the year. Arrangements are being made to substitute electrical drive for this gear drive. Under conditions of varying load and varying vacuum in the draft-tube it was found that in the water-catcher over the labyrinth there was sometimes pressure and sometimes a partial vacuum. Pressure tended to force water into the oil-catcher, and vacuum tended to draw oil down the draft-tube. A great improvement was made by providing vents (1 in. holes) in the water-catcher, so that the interior would always be at atmospheric pressure, thus preventing both of the above troubles. Alterations were found necessary to the roller thrust bearings of the auxiliary units.

Generators: The leads from the exciter and to the generator field were originally taken through a pipe through the thrust-bearing housing, and a very slight leak of oil into this pipe caused the insulation on these leads to perish. The leads were replaced with new leads, taken up outside the bearing housing. To minimize suction of oil down around the shaft above the rotor, air-hole vents were drilled below the upper oil-catcher on No. 1 unit.

Transformers: The 11 kv. bushings on almost all the main transformers had been found to be leaking and allowing the compound in them to drop down into the transformers, necessitating cleaning of the tops of the transformer-cores and filtering of the oil This work, and alteration of the bushings to prevent it, carried on into the present year.

Switch-gear: There were four cases of failure of 110 kv. insulators on air-break switches. Five other similar insulators were damaged by the flying pieces of porcelain.

110 kv. condenser bushings on oil circuit-breakers failed in three cases.

One 50 kv. bus-support failed.

No. 1 Unit—Vibration: No. 1 unit was tried early in April and was found to have the same vibration on load as before. A number of measurements were made of the frequency and amplitude of the vibration, the most striking result being that wear on the pivot ring indicated that the lower shroud of the runner under vibration was displaced or was whipping as much as 7 mm. from its central position. This, however, was very much greater than any bending that could be observed in the shaft, and tended to confirm previous opinions that the trouble was in the waterwheel itself. The frequency of vibration was 455 to 465 per minute. It was then decided to try the runner of No. 3 unit on No. 1, depending on the other two machines to carry the load. No. 1 unit was dismantled and the runner removed between the 16th and 29th January. The pivot ring, which had been badly worn due to vibration and rubbing of the runner on it, was built up by welding and turned to its proper dimensions, and No. 3 unit was dismantled, the runner fitted to No. 1, and No. 1 unit was assembled in the week ending 12th February. No. 1 unit was then tested with No. 3 runner on the 15th February, was found to be free from any trace of dangerous vibration, and was put on commercial load. No. 1 runner was tested for balance, although as a whole it was approximately correct, and it was found that the lower shroud ring near the bottom of the runner was out of balance, whereas the balancing-weight was in the top of the runner. When run at speed the effect of this out-of-balance on the greater diameter was sufficient to offset the balancing done at no speed on the smaller diameter. This original balancing-weight (about 129 lb.) was removed, and plates of the right weight (totalling about 114 lb.) were cut, shaped, and welded on the inside of the lower shroud ring to balance it. No. 3 unit was assembled with No. 1 runner on it, from the 6th April to the 15th April, and dried out. A newly metalled upper guide bearing was installed during the assembly. It was tested on the 26th April, and ran without trace of dangerous vibration.

No. 4 Unit—Tests: Tests were carried out to find the efficiency of the turbine at various loads. The flow of water was measured by twelve Ott water-meters in the penstock, mounted on a bar which was first vertical and then rotated to 60° on either side of the vertical, thus giving velocity at thirty-six points in the pipe. Five-minute runs were taken at each position of the bar, each meter recording separately on a chr nograph. The efficiencies thus found were as follow:—

	Horse-power.	Per Cent.
Quarter-load	5,250	65
Half-load	10,500	80
Three-quarter load	15,750	90
Full load	21,000	92·8
Overload	25,000	85

With no load on the generator the turbine takes about 180 cubic feet of water per second, and at full load about 1,110 cubic feet of water per second.

Horahora (Generators, 10,300 kw. capacity; transformers, 5/50 kv. 11,880 kv.a., 5/11 kv. 2,501 kv.a.).—For part of the year Horahora was run on reduced load, with parts of the station shut down in rotation, but it was found that considerable difficulty resulted on account of condensation of moisture on the windings.

Turbines: Two upstream guide castings on No. 1 unit were replaced with reconditioned castings, and two upstream runners and guide castings on No. 2 were replaced with new runners and castings.

Generators: In April Nos. 1 and 2 exciter motor stators both broke down and were repaired. On the 16th September No. 8 generator stator broke down and was repaired later.

Switch-gear: Two condenser bushings broke down. The local service transformer (100 kv.a.) broke down, due to damage caused by lightning.

Grand Junction Steam Plant (1,640 kw. Turbine and Generator).—This plant has not been run during the year.

Huntly Steam Plant (1,500 kw. Turbine and Generator).—This plant was shut down on the 14th April, after which a considerable amount of work was done to prevent deterioration of the plant while not in use.

Penrose Diesel Plant (3 1,250 kw. units).—This plant was shut down on the 9th April, and was then overhauled. The plant is now given a short run weekly to keep it in order.

(*b*) *Transmission-lines.*

There were two cases of breakdown in service of insulators during the year, as compared with two last year and four the year before. 395 defective pin insulators and 15 strain or suspension units were located by live-line testing or otherwise and replaced, as compared with 326 pin insulators and 29 suspension-type units in the previous year. In addition, 552 50 kv. pin insulators of an old type were replaced by new ones.

A total of 42 defective wood poles was replaced, as compared with 65 and 92 respectively in the two previous years.

On all lines during the year there was a total of 33 accidental interruptions, due to faults on lines (21) and unknown causes (12), involving outages of the lines on which they occurred of a total time of

26 hours 5 minutes, compared with 17 interruptions and 32 hours 8 minutes the previous year and 29 interruptions and 26 hours 58½ minutes for the year before that. In all but 3 cases the interruptions to consumers this year from this cause were only momentary, as supply was given over an alternative line.

During the year the usual work of live-line testing of insulators, sap-testing, scrub and tree cutting, and improvements to access were continued.

To prevent future trouble a considerable number of "span-breaking" telephone-poles were erected on spans exceeding 9 chains in length.

(*c*) *Substations.*

Penrose (Capacity: 110/22 kv. 60,000 kv.a., 22/50 kv. 5,000 kv.a.).—Switch-gear: Several of the corona shields on 110 kv. O.C.B.s were found displaced, and all of them were secured in position with stronger screws and lock washers.

A 22 kv. potential transformer developed an earth in the H.T. winding, and was replaced with a spare.

Synchronous Condenser: The condenser stator broke down on the 15th September. It was repaired and put back into service on the 16th November. On the 15th February it broke down again in a similar way, but at the opposite end.

Bombay (Capacity: 110/50 kv. 5,000 kv.a., 50/11 kv. 3,000 kv.a.).—A 110 kv. condenser bushing on O.C.B. 12 broke down. A new porcelain shield was fitted to it, and it and other similar bushings were refilled with thinner compound. An 11 kv. cable-box connecting the three-core cable from the switchroom to the three single-core cables at the transformers, on being opened, was found to have voids and water in the compound. The box was dried and made watertight.

Matamata (Capacity: 50/11 kv. 2,250 kv.a.).—Alterations were made to prevent creeping of oil from the current-transformer chamber to the bus-bar chamber of the compound-filled switch-gear.

Waihou (Capacity: 50/11 kv. 2,250 kv.a.).—A breakdown occurred in an 11 kv. outdoor, vertical type, single-core, cable-sealing box.

Waikino (Capacity: 50/11 kv. 6,000 kv.a.).—A ½ in. brass bolt on a 50 kv. transformer lead broke and caused an interruption. A mouse caused a flash-over on No. 2 11 kv. O.C.B., causing the 50 kv. line O.C.B. to open.

Hangatiki (Capacity: 50/11 kv. 750 kv.a.).—Two 50 k.v. transformer bushings were found cracked and were replaced.

Huntly (Capacity: 50/11 kv. 1,500 kv.a.).—Alterations were made to prevent creeping of oil from the current-transformer chamber to the bus-bar chamber of the compound-filled switch-gear.

Ngongotaha (Capacity: 50/6·6 kv. 750 kv.a.).—An additional 6·6 kv. feeder to Rotorua was connected in by the Tourist Department.

Other 50/11 kv. Substations as follows: Takapuna (2,250 kv.a.), Hamilton (3,000 kv.a.), Te Awamutu (1,500 kv.a.), Kerepeehi (2,250 kv.a.), Mamaku (150 kv.a.), Edgecumbe (750 kv.a.), Waiotahi (750 kv.a.).—Nothing to report.

5. General.

Table VIII herewith—Gross Financial Results of Distribution for the Year—shows that the Department and supply authorities combined made a profit of £45,475, as compared with £12,161 and £4,674 in the two previous years. In the three years 1931, 1932, and 1933 the Department's losses were £35,694, £40,554, and £43,836, while the profits of the combined local supply authorities were £40,368, £52,715, and £88,850.

The improvement is due largely to the substitution of water-power from Arapuni for power obtained from the various fuel plants in the district, the saving in connection with the Auckland Power Board and King's Wharf plant being in excess of £40,000 per annum, as compared with the increase in total profit above of £36,135.

The total revenue from sales of electrical energy to consumers amounted to £1,094,849, and the Department's total revenue amounted to £337,641. The Department's loss of £43,836 is equal to 4 per cent. and 13 per cent. respectively of these amounts, and is equal to a loss of 0·041d., or about one twenty-fifth of a penny per unit sold, the average revenue per unit sold being 0·315d.

MANGAHAO-WAIKAREMOANA ELECTRIC-POWER SUPPLY.

I. Financial Results.

At the close of the year 1932–33 the capital outlay amounted to £3,690,475. The net revenue for the year was £313,342, and working-expenses £53,907. After paying interest, totalling £209,776, a net surplus of £49,659 was shown. Depreciation charges amount to £52,645, which is the amount required to bring the reserve up to one-eighth of the value of the assets in operation. The loss on the year's working is £2,986.

The financial results and load records are analysed in Table VIII, whilst Tables IX and X give an analysis of the capital outlay and working-expenses. The gross financial results of the system are given in Table XII.

II. Operation and Maintenance.

Mangahao Power-house and Headworks.—This portion of the scheme operated quite satisfactorily throughout the year, the water-level in all the dams being well maintained by an abundant rainfall. This heavy rainfall necessitated considerable expenditure on the maintenance of the access roads in removing slips, &c. At the upper Mangahao Dam the parapet was raised 18 in., so that abnormal floods will flow only over the automatic crests.

Tail-race.—A survey was made to determine the erosion of private property bordering the tail-race, brought about by the installation of the Mangahao scheme, and a final settlement made with the owners.

Supply to Horowhenua Electric-power Board.—Only one accidental interruption, of a duration of one minute, occurred during the year.

Waikaremoana Power-house and Headworks.—The operation of this portion of the scheme was quite satisfactory during the year.

The runners of both machines have now been replaced by new ones, giving a considerable increase in their overload capacity. The relief valves in both units have also been adjusted, and are now operating satisfactorily.

All leads to the 110,000-volt terminals of the transformers have been provided with slip joints to release the leads in the event of earthquakes occurring.

Substations.

Khandallah.—From this substation power is supplied to the Wellington City Council, the Hutt Valley Power Board, the New Zealand Railways Department, and the Wellington Meat Export Co., Ltd.

During the year there were six total accidental interruptions to supply, of an aggregate duration of 10 minutes.

Early in the year the repairs to the synchronous condenser were completed and the machine placed back in service.

Melling.—From this substation supply is given to the Hutt Valley Electric-power Board in addition to the supply given from Khandallah.

There were eight interruptions to supply during the year, of a total duration of 19 minutes, of which five, totalling 16 minutes, were due to failure of supply at Khandallah.

Bunnythorpe.—From this station power is supplied to the Manawatu-Oroua Electric-power Board. During the year there were three interruptions to supply, of a total duration of 16 minutes. The maintenance of the substation necessitated one shutdown of 2 hours 23 minutes to Marton, Wanganui, Hawera, and New Plymouth substations.

Marton.—From this substation power is supplied to the Wanganui-Rangitikei Electric-power Board, the transformer here normally being in parallel with those at Wanganui Substation through the Power Board 11,000-volt lines.

During the year there were five accidental interruptions to supply, of a total duration of 49 minutes.

Wanganui.—The Wanganui-Rangitikei Electric-power Board takes its main supply from this substation. During the year there were six accidental interruptions to supply, of a total duration of 45 minutes.

Hawera.—From this substation supply is given to the South Taranaki Electric-power Board, there being twelve accidental interruptions during the year, totalling 2 hours 52 minutes.

All apparatus has operated satisfactorily throughout the year.

Stratford.—At this substation the voltage is reduced from 110,000 to 50,000 and power transmitted at this latter voltage to New Plymouth Substation.

One interruption to this supply was caused by the high-tension lead to one of the transformers slipping from a clamp, the duration of the interruption being 49 minutes. Three interruptions, totalling 25 minutes, occurred through failure of the 110,000-volt supply, due to faults on other parts of the system.

New Plymouth.—From this substation supply is given to the New Plymouth Borough Council at 11,000 volts, the substation itself being supplied at 50,000 volts from Stratford, where the voltage is reduced from 110,000 volts.

During the year there were ten accidental interruptions to supply, of a total duration of 1 hour 37 minutes.

Masterton.—This substation, in conjunction with the Kourarau Hdyro-electric plant, supplies power to the Wairarapa Electric-power Board. The Kourarau plant, though owned by the Power Board, is regarded under the supply agreement as part of the Mangahao-Waikaremoana system.

Interruptions to supply numbered eighteen, of a total duration of 4 hours 42 minutes.

The cable connecting the transformer to the 11,000-volt switch-gear broke down in January of this year, and considerable damage was done to the transformer and 11,000-volt switch-gear. The actual interruption to supply was only 55 minutes, as supply was instituted from Kourarau after that period. The damaged transformer has since been repaired and placed in service. Material for the replacement of the damaged switch-gear has been ordered, and when it comes to hand the permanent arrangement of the transformers, cables, and switch-gear will be completed. In the meantime the temporary arrangement is operating satisfactorily.

Mangamaire.—From this substation power is supplied to the Tararua Electric-power Board. There were eight accidental interruptions to supply, totalling 34 minutes.

Woodville Switching-station.—All apparatus has functioned satisfactorily during the year.

Dannevirke.—From this substation supply is given to the Dannevirke Electric-power Board. Five accidental interruptions, of a total duration of 45 minutes, occurred to this supply.

Waipukurau.—Supply is given at this substation to the Central Hawke's Bay Electric-power Board. Interruptions to supply numbered eight, of a total duration of 58 minutes.

Napier.—From this substation supply is given to the Hawke's Bay Electric-power Board. There were seven accidental interruptions to supply during the year, of a total duration of 42 minutes. One interruption of 20 minutes was due to an earthquake.

All apparatus has functioned satisfactorily throughout the year.

Gisborne.—Supply is given at this substation to the Poverty Bay Electric-power Board, there being seven interruptions during the year, of a total duration of 40 minutes.

The deposition of mineral matter as a scale on the inside of the transformer cooling-tubes has occasioned a considerable amount of work in removing the deposit. Investigations are now in hand to determine the feasibility of installing an air-cooling system on these transformers in place of the water-cooling system at present in operation.

Wairoa.—The Wairoa Electric-power Board takes supply from this substation, and during the year there were five interruptions to supply, of a total duration of 5 hours 46 minutes. The earthquake of the 16th September last was responsible for one interruption of 5 hours 18 minutes. Another shock during the following month interrupted supply once for a period of 25 minutes.

Substations, General.—Indicating lamps have been fitted in the potential circuits to the 110,000-volt relay equipment at all stations to indicate definitely the blowing of potential fuses.

At all substations platforms have been installed for the attendants to stand on when operating switches, in order to provide a definite safeguard under all conditions of operation.

The routine maintenance of the substation apparatus is being carried out according to a schedule. This ensures that all apparatus is regularly inspected, that fire-extinguishers are in good condition, and first-aid outfits fully stocked.

Transmission-lines (110,000 Volt).

Mangaore–Khandallah Duplicate Line.—Power is transmitted over this line to Khandallah and Melling Substations, and this supply was well maintained throughout the year, only two outages having occurred, neither of which were due to line defects.

Khandallah–Melling Line.—This line operated satisfactorily throughout the year.

Mangaore–Bunnythorpe Duplicate Line.—This line gave no trouble during the year. Two outages occurred during the year, neither of which caused any interruption to supply, and neither of which were due to line defects.

Bunnythorpe–Marton–Wanganui Line.—This line caused no interruptions to supply at any of the substations it supplies, though it was necessary to shut it down on several occasions for maintenance work.

Wanganui–Hawera–Stratford Line.—This line gave very good service during the year, having caused no interruptions to supply.

Bunnythorpe–Woodville–Dannevirke Line.—The only trouble experienced on this line during the year occurred close to Dannevirke Substation at a point where a long jumper to one of the substations switches was connected to the line.

Woodville–Mangamaire–Masterton Line.—There were four outages on this line during the year, of a total duration of 15 hours 19 minutes. The greater part of this time was accounted for by one outage of 14 hours 32 minutes, when two poles on the Mangamaire–Masterton Section broke off during a gale.

Owing to risk of damage to one of the poles in the Mangatainoka River during floods, arrangements have been made to have it reinforced with piles.

Dannevirke–Waipukurau–Napier.—The breaking of a pole on this line during a gale caused two interruptions to supply at Waipukurau substation, totalling 17 minutes, and the Dannevirke–Waipukurau Section of the line to be shut down for repairs for a period of 15 hours 5 minutes.

During a heavy flood in the Avoca River near Waipukurau several telephone-poles were washed out and some of the main line poles endangered, and to make them safe against future floods all the poles in the river-bed were reinforced with piles.

Tuai–Napier Duplicate Line.—The line operated very well during the year, the only outages being due to lightning storms. There were three of these outages, but no interruption to supply was caused through any of them.

Transmission-lines (50,000 Volt).

Stratford–New Plymouth Line.—The only outages on this line were due to lightning, there being two such outages, totalling 11 minutes, both of which interrupted supply to New Plymouth. The resultant flash-over due to one of the above lightning storms caused one of the poles to be shattered to such an extent that it was necessary to replace it. A considerable number of breaks have occurred in the telephone line due to vibration, and experiments have been carried out with a view to developing a damper which will eliminate these effects.

Tuai–Gisborne Line.—Two outages on this line occurred during the year, one of 2 minutes due to lightning. The other outage occurred during the earthquake of 16th September, 1932, when the line was severely shaken, as evidenced by the disturbance of the earth and the leaning of many of the poles. Power was again available at Gisborne almost immediately after the first heavy shock.

Tuai–Wairoa Line.—The operation of this line during the year has been quite satisfactory, there having been no outages due to line-failures. During the earthquake of the 16th September, 1932, many of the poles were thrown out of alignment. These were jacked back into place and re-rammed.

Transmission-lines (11,000 Volt).

Mangaore–Shannon Line.—This line is operated and maintained by the Horowhenua Electric-power Board, and has given very good service throughout the year.

Khandallah–Hutt Valley Power Board Duplicate Line.—Power is supplied over this line to the Hutt Valley Electric-power Board. Three interruptions, totalling 9 hours 55 minutes, occurred during the year, involving the outage of both circuits, two of these, totalling 9 hours 54 minutes, being due to a severe fault on the Power Board's section of the lines and a coincident fault on the direct-current supply to the relay system.

Khandallah – New Zealand Railways Duplicate Line.—There were five accidental outages on this line during the year, of a total duration of 1 hour 31 minutes, two of which, totalling 1 hour 28 minutes, were due to damage following a fault on the Hutt Valley Electric-power Board's lines.

Khandallah – Wellington Meat Export Co., Ltd., Line.—During the year there were six outages on this line, of a total duration of 14 hours 19 minutes, three of which, totalling 14 hours 7 minutes, were due to a fractured trifurcating box at Khandallah.

Transmission-lines (General).

During the year there were thirty-four lightning storms, only seven of which affected the operation of the system. New Plymouth Substation suffered two interruptions, totalling 11 minutes; Gisborne Substation, one of 2 minutes; Waipukurau, one of 11 minutes; and Dannevirke, one of 10 minutes; the one at Dannevirke being coincident with that at Waipukurau.

The Mangaore – Bunnythorpe East line was put out of service on one occasion, and the Tuai–Napier lines on two occasions, without affecting supply.

All strain and suspension insulators on the system, including those on the substation structures, have been tested by means of the buzz stick, and all defective units changed.

Sap tests and inspection of poles have been carried out over the whole system, and weak poles scheduled for replacement. In August of last year during an exceptionally heavy gale three of these weak poles were broken, unfortunately not long before they would normally have been replaced according to schedule.

The work of changing weak poles and defective insulators has been carried out by a special gang trained in "live-line" work, and practically all this work has been done with the line alive. This gang has also assisted with the usual routine maintenance of the lines in cleaning insulators, &c. Development work is being carried out on methods for cleaning insulators under "live-line" conditions, but so far no completely satisfactory method has been evolved.

All linesmen were given a refresher course in buzz-stick testing in association with the special "live-line" gang.

Earthquakes.

Following experience gained during the earthquake in the Hawke's Bay and Gisborne districts on the 3rd February, 1931, precautions have been taken at all substations and at the power-houses to prevent any extensive damage to apparatus due to earthquakes. It was found that the only apparatus likely to sustain any extensive damage during earthquakes are transformers and batteries. Transformers have been bolted down to their foundation block and release joints provided in the 110,000-volt connections to prevent damage being done to the bushings. All batteries installed since February, 1931, have been mounted on stands specially designed to hold the cells in place during earthquakes and to prevent any major damage being done to them.

During the year three major earthquakes occurred. On the 5th May, 1932, a severe shock was felt in the Hawke's Bay District, but very little damage was done. The release joints in the 110,000-volt transformer connections operated, and prevented damage to the bushings. An interruption of 20 minutes was caused to supply at Napier Substation and one of 13 minutes to Waipukurau and Dannevirke Substations. On the 16th September, 1932, a particularly severe earthquake occurred, which was felt over a wide area, though damage was confined almost entirely to the Gisborne and Wairoa districts. Damage was particularly severe in and around Wairoa, where many buildings were destroyed and considerable property loss sustained. The Department's apparatus remained intact, though the building was somewhat strained and the release clamps in the transformer leads were pulled off. These were replaced and power was available at the substation 5 hours 18 minutes after the first shake, though normal supply was not resumed till four days afterwards on account of the damage done to the Power Board's apparatus and lines.

At Gisborne the departmental cottage chimneys were shaken down, and the pipes conveying the cooling water to the main transformers were broken. Power was available at the substation a few minutes after the shake, but owing to the absence of telephonic communication with the Power Board staff it was not until 19 minutes after the shake that power was again restored to the Power Board's consumers.

The 50,000-volt lines from Waikaremoana to Wairoa and Gisborne were severely shaken, but the damage done was slight, consisting chiefly of the loosening of the earth round the poles. Telephone communication was interrupted for some time owing to the wires being badly twisted. Communication with Gisborne was re-established at 10.30 a.m. on the 16th, approximately 9 hours after the shake. The line to Wairoa suffered more severely, and it was not till 10 a.m. on the following day that the Department's line was again in operation. In the meantime all messages between Waikaremoana and Wairoa were relayed through Napier over the Post and Telegraph Department's line. Direct communication over the Post and Telegraph lines was again restored at 3 p.m. on the 17th.

A further earthquake occurred at Wairoa on the 19th October, 1932, but very little damage was done. Injury to the transformer bushings was again prevented by the release clamps pulling off.

III. Construction.

Mangahao Power-house and Headworks.—In order to measure the water lost during floods a waste-water recorder was installed at No. 2 dam. During the Christmas - New Year period new gates were installed in the surge-chamber to replace the old ones.

Substations.

Melling.—Owing to the growth of load in the Hutt Valley district it was necessary to provide for a new bank of transformers at Melling. The Department had available a 15,000 kv.a. bank which was removed from service at Penrose. Although the bank was considerably larger than was called for by the immediate requirements at Melling, it was nevertheless decided to utilize it rather than embark on new capital expenditure.

The transport presented some unusual features. Owing to the dimensions exceeding the railway gauge it was necessary to ship the transformers from Auckland to Wellington by sea. At the Wellington end the main Hutt Valley Road could not be used on account of the low overbridges. The transformers were therefore transported across the harbour. The operation was contingent on the weather, but this held good throughout, and allowed of the four transformers being shipped across on three consecutive days.

Bunnythorpe.—A new panel with the protective equipment and operating-switches for the oil-circuit breakers controlling the transformer-banks was installed.

Hawera.—The construction of the substation buildings, which was commenced late last year, has been completed and the 11,000-volt switch-gear and other necessary equipment installed.

Masterton.—Owing to the rapid increase in the load taken by the Wairarapa Electric-power Board, it was necessary to install additional transformer capacity at this station during the year.

Woodville.—During the year synchronizing equipment was installed at this station to enable Mangahao and Tuai stations to be paralleled without interrupting supply to Mangamaire and Masterton.

Dannevirke and Waipukurau.—The new relay equipment installed at these substations last year was tested and the portion giving protection against earth-faults was put into service.

Napier.—The damage sustained by the substation buildings during the earthquake of February, 1931, has now been made good, so that all apparatus and buildings at this station, except the synchronous condenser, are now back to normal. The condenser suffered no serious damage, and it is intended in the near future to transfer it to Stratford, so repairs have been deferred in the meantime.

IV. General.

Practically all the construction work done during the year has been the completion of work commenced last year.

The operation of the system has been improved considerably, due to the new relay system installed last year, the erection of synchronizing-gear at Woodville, and by the work of the live-line gang.

It was necessary to call on the standby plants only on three occasions. During these periods the Wellington City Council plant supplied 101,427 units and the New Plymouth Borough Council plant 47,254 units to the system.

The maximum load on the system was 47,980 kw., and the units output during the year was 241,969,796. The annual load factor was 57·6.

The results of the year's operations are analysed in Table VIII and the connected load in Table XI.

LAKE COLERIDGE ELECTRIC-POWER SUPPLY.

The year ending 31st March, 1933, marks the 18th year of operation of the Lake Coleridge undertaking and again the financial results are very satisfactory despite the general economic depression.

Annual Results.

The capital outlay of the scheme at the end of the year was £2,053,883, being an increase of £251,386 on that of the previous year, this increase including lines and equipment built in anticipation of the Waitaki scheme and now being supplied with power from Lake Coleridge.

The total revenue for the year was £213,345, as against £218,196 for 1931–32, representing a decrease of £4,851, and being the first occasion on which such a decrease has occurred. After payment of all charges including interest and depreciation, the net profit for the year amounted to £41,764, this amount being allocated to sinking fund and General Reserve Fund, the respective amounts being £20,539 and £21,225.

Table XV gives particulars of financial results and load records, and Table XVI shows the analysis of capital outlay for years 1931–32 and 1932–33.

The total cost per unit generated and purchased was 0·310d., an increase of 0·083d. on that of the previous year, this being due to increase of interest on capital and depreciation of 0·048d. and of 0·036d. in operating-expenses. The actual increase in operating expenses is £20,535, of which £14,249 is represented by the cost of operation of the Diesel standby plant, and £4,181, representing additional cost of overhauling and maintaining transmission-lines. The details of operating-expenses are shown in Table XVII.

Table XIX gives details of gross financial results of the distribution of energy for the Lake Coleridge scheme and of those supply authorities and consumers supplied by the scheme.

Connected Load.

The total connected load as shown in Table XVIII was 218,539 kw. at the end of the year, being an increase of 3 per cent. over the previous year's figures, but representing a further drop in the percentage annual increase.

Diesel Standby Plant.

Although there was no anxiety regarding shortage of water in Lake Coleridge, it was deemed advisable to operate the standby plant in order to safeguard the water-supply for the winter of 1933, and the plant was put into operation on the 1st August, 1932, and continued throughout the financial year, being closed down on 16th May, 1933, owing to the rapid recovery of the lake. The plant operated only sixteen hours per day and six days per week, and up to 31st March the units generated and distributed were 12,529,350.

The plant operated with every satisfaction during the whole of the above period without any breakdown; and, after shutting down, the machines were given a complete overhaul so as to be available for immediate operation.

Survey and Easements.

During the year the layout of the new steelwork and buildings at Addington Substation was located. Preliminary surveys were carried out in connection with the proposed replacement of the existing wood-pole lines between Addington and Sockburn with steel gantries. Compensation claims and way-leave and transmission-line plants were all dealt with.

Maximum Demands and Load-factors.

The Lake Coleridge Power-house maximum half-hourly output for the year was 30,140 kw. on 13th June, 1932, a decrease of 200 kw. on that of the year previous. The maximum recorded at this station was 30,800 kw. on 9th June, 1930. The maximum half-hourly demand for the year at the Lyttelton Diesel Station was 5,740 kw. on 30th August, 1932, as compared with 4,480 kw. for the year ending 31st March, 1932. The maximum half-hourly demand for the whole system for year ending 31st March, 1933, was 30,140 kw. on 13th June.

The annual load-factor for the system was 50·4 per cent., as against 49·0 per cent. for the previous year. While the annual load-factor for the Lake Coleridge Power-house was 45·5 per cent. for the year under review, and 48·7 per cent. for the year ending 31st March, 1932; the respective figures for the Lyttelton Diesel Station were 68·6 per cent. for 1932–33, and 31·6 per cent. for 1931–32.

During the period 1st April to 30th June, 1933, the maximum half-hourly loads were 30,640 kw. at Lake Coleridge Power-house on the 6th June, 4,660 kw. at Lyttelton Diesel Station on 3rd April, and 30,640 kw. for the system on 6th June.

The maximum number of units supplied during the year to the system in any one day was 432,720 on 10th June, the previous maximum recorded being 453,710 on 6th June, 1930. On 28th June, 1933, the number of units generated amounted to 451,940.

Transmission and Distribution.

The period during which the annual overhaul is undertaken covers the latter portion of the year under review and the beginning of the present financial year. Up to 31st March all the 110 kv., 66 kv., and 33 kv. insulators were tested under "live-line" conditions, and 304 insulators on the 66 kv. lines, and 42 on the 33 kv. lines were located as defective by the buzz-stick method out of a total of 59,897 and 615 insulators tested respectively on the 66 kv. and 33 kv. lines. In addition to the above defectives, 22 insulators were noted visually as defective during the "live-line testing" and 7 as cracked during the overhaul, and all these 29 were located on the lines operating at 66 kv.

During the year ending 31st March the total number of all insulators discarded from all the lines was 718. The total number for the previous year for the whole system was 943. No 11 kv. insulators were tested or replaced during the year ending 31st March, 1933.

In addition to the testing of 60,512 insulators under "live-line" conditions, the following were replaced with the lines alive—two 66 kv. poles, four 33 kv. poles, twelve 11 kv. poles, three 33 kv. cross-arms, and 148 insulators on the 33 kv. lines.

During the overhaul of the 110 kv. and 66 kv. lines 61 poles were changed, 16,800 anti-vibration jumpers were fitted, 144 splices were made in the 7/14 copper line between the Point Switching Station and Timaru Substation.

Structural alterations were carried out at Addington, Ashburton, Horarata, Stoddart's Corner, Barrington Street Substations. The distribution telephone-lines on the Woolston, Southern, and Northern 11 kv. feeders were renewed.

Methods of working on live lines were demonstrated to departmental officers from the North Island and to the Engineers of Waitaki, Malvern, and Springs-Ellesmere Power Boards.

Headworks and Pipe-lines.

Repairs to No. 3 gate and spillway of the Harper Diversion inlet were completed.

Heavy rainfalls necessitated constant maintenance work on the temporary dam near the Harper gates. A sliding gate with operating equipment was installed on the Acheron Diversion dam, and some protective work was undertaken near Murchison's flume. The painting of interior of No. 6 pipe-line, and the scraping and painting of rust spots on all pipe-lines were carried out, while No. 7 pipe-line was drained out for inspection and overhaul. A pressure-gauge was fitted on No. 7 pipe-line near the turbine.

Lake Coleridge Power-house.

No. 9 unit was completely overhauled between May and July. The safety devices on all turbine governors, except No. 9, were tested. The vibration that occurred when the 42 in. main valve of No. 1 unit was operated has been eliminated by fitting a 5 in. by-pass valve.

Number-plates have been fitted to all 66 kv. O.C.B.s and air-break switches in accordance with the previously approved arrangement.

Addington Substation.

Considerable structural alterations have been carried out at this substation. The wooden poles and cross-arms have been replaced by a modern type of steel structure designed to accommodate four 66/11 kv. transformer-banks of a total capacity of 80,000 kv.a., as compared with the existing three banks of a combined capacity of 36,000 kv.a. The 66/11 kv. transformer-banks have not yet been transferred from inside the substation building to their permanent position outside in conjunction with the steel structure.

A new relay board for the 66 kv. lines was erected and placed in commission. Complete mimic bus panels were designed and made up, and the main switchboard was altered. Control cables for the 10,000 kv.a. synchronous condenser which arrived during the year were laid and the set will be dried out and tested under running conditions when the new switch-gear is installed.

A new type of brush gear for the 6,000 kv.a. synchronous condenser slip rings was designed and fitted, and in operation is a distinct improvement upon that supplied by the makers.

A new E.H.T. telephone-room was equipped with the necessary apparatus and all the transmission-line telephone-lines were deviated to enter the substation building on the north side.

During the year the station storage battery showed signs of rapid deterioration, and arrangements were made to effect a replacement of the complete battery in the present financial year. This work has been satisfactorily carried out by the installation of twenty 6-volt car type batteries with fifteen plates per cell of the heavy-duty type.

Point Substation.

Beyond the renumbering of the O.C.B.s and air-break switches no alterations were carried out at this substation during the year.

Hororata Substation.

Structural alterations that had been commenced the previous year were proceeded with.

The E.H.T. telephone equipment at this substation was completely reconstructed, with marked improvement in operating conditions.

Ashburton Substation.

Structural alterations were completed during the year.

Timaru Substation.

With the exception of the drying-out of the 66/11 kv. potential transformers, and the alteration of a 66 kv. O.C.B. from non-automatic to automatic operation, no construction work was carried out pending a decision as to the final choice of a site for the erection of the permanent and redesigned substation.

Glenavy Switching-station.

This substation was transferred to the Lake Coleridge scheme during the year, and is now in operation.

Oamaru Substation.

A new telephone-line from the Weston Railway-station to this substation was erected on 30th May. The telephone-line connecting the Timaru and Oamaru Substations was tested on 30th June, and placed in commission.

Interruptions to 66 kv. Supply, excluding all Prearranged Shutdowns.

(*a*) *Powerhouse Supply.*—During the year there was only one outage—viz., one of 7 minutes' duration which affected the whole system, the cause being an accidental flash-over at the power-house.

(*b*) *Addington, Point, and Hororata Supply.*—There was only one interruption during the year affecting the supply from these substations, and this outage corresponded with that at the power-house.

(*c*) *Ashburton Supply.*—The total number of outages was three, and the total period of interruption was 13½ minutes, the longest being one of 12½ minutes and due to a magpie.

(*d*) *Timaru Supply.*—The number of interruptions totalled six, the longest being 18 minutes, and due to the same cause that affected the Ashburton supply, and the total period 53½ minutes.

(*e*) *Glenavy Supply.*—The number of outages was six, the longest being 18 minutes and due to the magpie which affected all the stations including and south of Ashburton. The total period for the year was 53 minutes.

(*f*) *Oamaru Supply and Waitaki Hydro Supply.*—The interruptions at these two substations were similar in every respect to those at Glenavy Substation.

With the exception of one outage, which was due to the failure of an insulator and caused only a partial interruption of the supply for 7 minutes from Addington Substation, not one of the above outages was due to the failure of an insulator on the overhead lines, the systematic testing of insulators under live-line conditions tending to eliminate this source of trouble.

Testing.

During the year ending 31st March the number of tests and investigations that had been placed on record amounted to 141. The average frequency of the system has improved in stability and the difference between the master clock at the power-house and the time-signals from the Radio Station ZLY has not exceeded two seconds.

Electrical accidents at Ashburton and Woolston were investigated. A new type of portable telephone was constructed.

General.

During the year under review arrangements were made to lay an additional underground cable from Addington Substation to cope with an increased demand in the supply to Christchurch, and since the beginning of the present financial year, Armagh No. 5 feeder has been laid to the city boundary and a kiosk has been installed as a sectionalizing unit.

Arrangements have been made to install during the present year an extension of the Department's transmission-line telephone-lines from Addington Substation to the District Office in Christchurch, which will enable direct communication to be established between the office and any point in the system.

An induction voltage regulator has been installed at the 33 kv. substation at Stoddarts Corner.

During the year nothing further has been done to provide a supply to Hurunui Power Board.

With the operation of the Waitaki hydro plant shortly the rupturing capacity of the existing ironclad switch-gear at Addington will be insufficient and new switch-gear has been purchased of adequate rupturing capacity. The replaced switch-gear will be overhauled and reinstalled in Timaru Substation.

Weather and Rainfall.

The annual rainfall over the lake area and at the power-house for the past three calendar years was—

Calendar Year.	Average on Lake Area.	At Power-house.
1932	26·36	21·39
1931	41·45	34·91
1930	25·18	22·05

The average annual rainfall recorded at Lake Coleridge Power-house for the period 1914–30 was 31·52. A new record of minimum rainfall of 21·39 for the power-house was established last year. During the winter of 1932 the number of consecutive frosts recorded was thirty-nine, which accounted for the low flow readings of the lake feeders. It is of interest to note that although the average rainfall on the lake area was practically the same as in 1930 (the year of water-shortage) the lake-level did not reach the low level recorded in 1930. With the standby plant operating from 1st August, 1932, the lowest lake-level recorded was 1661·8. If the standby plant had not been running the level would have fallen to 1660·8, or 2·3 ft. above the lowest level recorded in 1930. It will be seen that the position regarding water-supply in 1932 would have been quite satisfactory even without the standby plant. During the calendar year of 1932 the lake-level has been so well maintained that it was found advisable to shut down the standby plant on 16th May, 1933, and since that date to 31st July the lake, after falling to 1668·7, has risen again to nearly the same level; the level on 16th May being 1669·95 and at 31st July 1669·88—an unusual state of affairs.

It is interesting to note that while during the odd years for some time past the rainfall and Harper flow have been normal, the even years have shown a decrease from normal.

WAITAKI RIVER SCHEME (ELECTRICAL SECTION).

Due to the prevailing financial conditions progress has been curtailed during the past year to conform with the rate of construction of the major sections of this development.

Main Transmission-line – Power-house – Glenavy.

This line has been in service at 66,000 volts since 28th June, 1931, as a main supply from the Coleridge system, and is completed with the exception of one span from the power-house to the Outdoor Station, the erection of this span being held over until a convenient opportunity presents itself.

The insulators on the line were "live-line" tested in May last and were found to be in good order.

Routine maintenance and patrols have also been carried out.

Main Transmission Telephone-line.

This line has given good service during the year, with the exception of breaks in the cadmium-copper conductors due to vibration. Experimental spans with binders and sleeves of special "damper" design were erected and no failures occurred in these particular spans. Special material has been ordered and it is anticipated that the trouble will now be overcome.

Timaru–Oamaru Transmission-line.

The construction of the new second line between Timaru and Oamaru Substations was completed in May, 1932, with the exception of the proposed tower section at the Timaru end, and supply changed over from the old line of 3/0 A.C.S.R. to the new 19/13 copper line on 15th May, 1932.

Timaru–Oamaru Transmission Telephone-line.

On the 15th May, 1932, Glenavy Substation was connected in on this new telephone-line on completion of its construction, thus linking up the Waitaki scheme with the Lake Coleridge telephone system.

Glenavy Substation.

The substation buildings were completed in May, 1932, and the switch-gear moved into the building and the telephone exchange erected in its permanent position.

The work done during last year at the substation has been reduced to a minimum.

There still remains to be completed the following work :—

Installation of the benchboard and 400 v. main panel.
Laying of cables for main control system.
Installation of oil-tanks and oil-piping system.
Lighting of steel structures.
Levelling of site of steelwork and the planting of hedges and erection of fences.

Oamaru Substation.

The initial construction of this substation was completed last year and practically no construction work has been carried out this year.

Outdoor Station at Works.

During the year the two remaining 3,000-gallon oil-storage tanks were placed on temporary pads and filled with transformer oil from drums. These two tanks will be moved alongside the three permanent tanks when clearance from the temporary rail track is possible.

The oil-switch tanks have been bolted to their foundations for protection against earthquakes. The work remaining consists of the installation of the oil system and oil-house, installation of lightning-arresters and potential transformers, control wiring and fencing and lighting of structures.

Transformer Station at Power-house.

The steel structures and erection of switch-gear has been completed, and the transformers taken to site. Water-cooling pipes and discharge-pipes have been completed, and conservators and breathers installed on the main transformers.

Work still remaining for completion consists of the following :—

Drying-out of transformers and bushings.
Fitting of bushings and connections.
Filtering oil and filling transformers.
Painting of transformers.

Main Turbines.

During the period under review the two main turbines have been completely erected, with the exception of a few small details.

Main Generators.

Both main generators together with exciters and sub-exciters are now completely assembled.

Auxiliary Generating-units.

These two sets are completely assembled.

Switch-gear.

The control switch-gear and switchboards have been erected in position in the control-room and wiring of same is proceeding.

A commencement has been made on erecting cleats for the main cable laying, which will shortly be started in the power-house.

Headgates, Gantry Crane, and Winches.

The gantry crane has been erected and wiring completed. Headgates-winches are stowed on intake platform.

HYDRAULIC DESIGN OFFICE.

A feature of the year's work has been the amount of testing and investigation work carried out.

Tests at Mangahao were carried out with a view to reducing the hydraulic losses in the pipe system leading to the turbines. As a result, proposals have been outlined which should improve the efficiency and output of the station as now operating. The alterations will be carried out as opportunity offers.

As usual, statistics of river-flow have been collected and charted. Growth of load has been somewhat tardy, and the various stations have had no difficulty in carrying the load, though the Mangahao-Waikaremoana system has had very little to spare.

A comprehensive study of existing flow records was carried out to ascertain the probability of destructive floods and serious droughts occurring in any of our supply systems. Some useful pointers have come from the studies, none of which suggest that adequate precautions have not been taken in design. The studies have, however, emphasized the fact that records over much longer periods are necessary before anything like definite probabilities can be calculated.

Waitaki.—Routine work has been done in connection with the Waitaki dam. Also studies of sedimentation and the control of floods during the most critical stage of the undertaking, while the river channel is being closed.

Chateau Tongariro, National Park.—In order to provide adequate lighting, cooking, and power for the Chateau Tongariro, and to save heavy expense in the purchase, cartage, and handling of fuel, a hydro-electric set of 100 kilowatts rated capacity was designed to be placed in the Whakapapanui Stream. The headworks of this are now complete, and work is in hand on the power-house to be in readiness for the plant, which is due early in September.

A comprehensive investigation and survey to determine the remaining power resources of the Waikato River is now in progress. There is no doubt that the Waikato has great and valuable potentialities for the development of power, but it is not yet possible to say just how they should be developed.

ELECTRICAL DESIGN OFFICE.

As the construction programme for the year was smaller than for several preceding years, being largely restricted to extensions to existing works and the carrying-out of new works already in course of construction, the amount of design work involved was less than that executed in the preceding year, and the staff has been correspondingly reduced.

Lake Coleridge System.

The extensive alterations and additions to buildings and equipment at Addington involved a considerable amount of design work during the year. The building-space in the main substation which the large transformers and their oil-circuit breakers formerly occupied is being used for the new 11,000-volt switch-gear which has been ordered for the main circuits. This switch-gear has a rupturing capacity of 500,000 kv.a. to meet the exacting service required of it when Waitaki and Waipori generating-units and other synchronous machines are connected to the system, whilst its current-carrying capacity provides for a large increase in the substation load.

The following design work was carried out for this system :—

Addington Substation—

First section workshop, testing and office building, also specification.
Balance of workshop, testing and office building, also specification.
Oil-filter house, lubricating-oil store, and pump-house.
Reinforced-concrete floor for new 11,000-volt switch-gear.
Foundations for 30-ton turntable.
Foundations for oil-storage tanks.
Oil and water piping.
Layout of power and control cables.
30-ton turntable, also specification.
Oil-storage tanks, also specification.
Layout of new 11,000-volt switch-gear.
Phasing diagrams.

Timaru Substation—

Layout drawing of site.
Design for proposed new substation building.

Mangahao-Waikaremoana System.

The installation of increased transformer capacity at Masterton Substation, together with its controlling switch-gear, involved design work for foundation details.

Short-circuit calculations were carried out for the earthing-system at Mangahao Power-station. The following design was carried out for this system :—

Masterton—

Foundations for second transformer and extensions to outdoor switch-gear and steelwork.

Melling—

Foundations for steelwork and transformers.

Stratford—

Layout of switch-gear and transformer for Power Board supply.
Foundations for 110,000/11,000-volt transformers and metering cubicle.
Foundations for turntables.
Design and specification for 10-ft.-diameter turntable.

Hawera—

Drawings and specifications for cottage and single men's quarters.

Arapuni-Horahora Scheme.

Preliminary design work was carried out in connection with the proposed extensions to Arapuni Power-station, which provide for four additional main generating-units with associated transformers and switch-gear. A preliminary diagram of connections for the ultimate development was prepared.

Waitaki Power Development.

The building design work for the Waitaki Power-station was completed, the work done including concrete details, reinforcing details, interior partitions, doors, and other joinery, details of water-supply and drainage, and steel bending schedules.

Transmission-lines.

Arapuni–Stratford 110 kv. Line.—Contract let for the supply of 200 steel towers for the southern end of the line. Manufacturers' foundation and erection drawings of towers checked and issued. Investigation of foundations for towers on papa and sandstone sites. Location of towers and preparation of plans for a line deviation near Pohukura. Plans supplied in connection with compensation claims. Telephone-line investigation for long spans on Tangarakau Bush section.

Waitaki–Glenavy 110 kv. Line.—Sag tables prepared for end spans of conductor and earth wire. Drawings of insulator weights and sundry fittings.

Addington Transmission-lines.—Preparation of detail drawings for steel gantry structures to replace existing wood-pole supports and provide for future lines on the same right-of-way. Line sags and tensions, insulators, and foundations investigated.

General.

The main-line diagram for the North Island system recording the more important features of the various transmission-lines was prepared.

The fusing and annealing effects of short circuiting currents on overhead line conductors were investigated.

An improved design of road magnet for collecting nails, &c., from roads was prepared for the Main Highways Board.

Specifications were prepared for the electrical equipment for hydro-electric plant at the Chateau Tongariro, National Park.

Testing steelwork at Melling Substation, checking strength of water-tower at Addington Substation, and tests on spun concrete poles were amongst other routine work carried out.

ELECTRIC-POWER BOARDS.

There are now forty-five districts constituted, and forty actually carrying out the distribution and sale of electrical energy (August, 1933). The total area covered is 70,995 square miles, or 67 per cent. of the total area of the Dominion; the total population concerned is 985,879, or 65 per cent. of the total population of the Dominion; and the unimproved value of the land included in the electric-power districts and outer areas is £252,915,005, or 76 per cent. of the total unimproved value of the Dominion.

So far only one of the four main cities—viz., Auckland—has been included in the inner area of a power district, but of the secondary centres the cities of Wanganui, Palmerston North, and Invercargill, and the boroughs of Timaru, Napier, Hastings, Blenheim, Greymouth, Gisborne, and Oamaru, are included. The advantage of Power Board organization is more obvious to rural than to urban ratepayers, and yet the above position indicates that some of the more important centres have realized that it is to their advantage generally to be associated with the country in undertaking the work of reticulation of electric power on a comprehensive scale.

Table XXII gives details of the date of constitution, the area, population, and rateable value of each of forty-five power districts already formed, also the amounts of the loans already authorized, and the voting on each poll taken. The total amount of the loans authorized by the forty districts which have taken their polls is £13,419,176. The population of the districts concerned is 980,379, so that the loans authorized amount to £13·79 per head of population, as compared with £13·78 last year. The unimproved valuation of the districts is £223,988,359, the loans authorized amounting to 6 per cent. of the unimproved rateable value of the lands pledged as security for the loans. The voting at the polls totalled 68,960 to 12,387.

Table XXIII shows the capital outlay incurred by each Board up to the end of the financial year 1932–33, the revenue and annual expenditure, and the amount of rates struck and collected.

The total capital outlay by the thirty-nine Boards which are in operation is £14,026,320, practically all of which is on works in service. The gross revenue from the sale of electricity by these Boards was £2,248,663. The general result is a profit over the whole business of the Power Boards of £48,822 for appropriation to reserve funds, &c., after paying capital charges for interest, sinking fund, and depreciation.

During the last year four of the Boards struck a general rate, which was collected in all cases, and one of the Boards struck special rates for the security for loans, which were collected in this case.

In December, 1932, an adjustment of boundaries was made between Tauranga Electric-power District and Thames Valley Electric-power District, whereby the whole of Waihi Beach area was

placed under the jurisdiction of the latter Power Board. In June, 1933, the Waimea Electric-power Board successfully launched the loan proposals for the acquisition of the assets of the Motueka Borough Council and of the Waimea Electric-supply Co. respectively.

LOCAL ELECTRIC-SUPPLY SYSTEMS.

Including the Government plants, there are now (31st March, 1933) thirty-six public electric-power stations operating in the Dominion, as compared with forty last year. The decrease is due to Auckland Power Board plant being reclassified as "standby" for Arapuni, and to the closing-down of the following plants—viz., Mataura and Patea—and to South Taranaki Power Board becoming a bulk consumer of Mangahao-Waikaremoana system.

In December, 1932, the Mataura Borough Council area of supply was absorbed by the Southland Power Board; and, as the result of polls taken in June, 1933, the identity of the Motueka Borough Council and of the Waimea Electric-supply Co. will disappear when control of these two systems is assumed by the Waimea Electric-power Board. The Halswell County Council license has been assigned to the Christchurch City Council.

The total installed capacity (excluding standby plant) has increased during the year by 12,289 kw., or 6·39 per cent., from 191,133 kw. to 203,422 kw. The increase in installed capacity is mainly due to Arapuni resuming operations during the year and to the completion of new hydro station for the Grey Power Board at Kaimata. The 1,000 kw. steam station previously operated at Dobson by the Grey Power Board has been dismantled and sold, and the generating-plant of Auckland Power Board (41,160 kw.) shown as "main plant" in last year's figures is now classified as "standby."

The proportion of installed plant is now as follows:—

	Stations.	Kilowatts.	Proportion per Cent.
Water-power	30	202,387	99·500
Steam-power (excluding standby plants at Portland (3,190 kw.), Auckland (41,160 kw.), Wanganui (1,500 kw.), Wellington (10,000 kw.), Invercargill (1,975 kw.), Gisborne (350 kw.), Waihi (1,640 kw.), Huntly (1,500 kw.), Dunedin (1,875 kw.), Christchurch (1,900 kw.); totalling 65,090 kw.)	1	750	0·370
Gas-power (excluding standby plant, Palmerston North (1,020 kw.))	2	89	0·034
Oil-power (excluding standby plants at Penrose (3,750 kw.), Lyttelton (5,760 kw.), Dunedin (860 kw.), Blenheim (420 kw.), Hastings (1,087 kw.), Gisborne (980 kw.), Ashburton (160 kw.), Napier (400 kw.), Rotorua (150 kw.), Opunake (148 kw.), Ohakune (113 kw.), Hawera (502 kw.), Oamaru (192 kw.), New Plymouth (300 kw.); totalling 14,822 kw.)	3	196	0·096
	36	203,422	100·000

The number of consumers supplied has increased from 309,360 to 322,997, an increase of 13,637, or 4·42 per cent., for the year.

The total population included in the various areas of electric-supply is 1,407,927, or 93 per cent. of the total population of the Dominion, so that the ideal of a supply being available to every home in the Dominion is well on the way to realization.

The basis of analysis and compilation adopted this year for ascertaining the number of units sold is slightly different from that of previous years, and the 1932 comparative figures quoted herein have since been corrected to the same basis.

The units sold per head of population supplied were 452, as compared with 440 last year, the difference being mainly due to the increased number of consumers.

The total length of distribution-line is 20,585 route-miles, as compared with 20,257 last year, an increase of 328 miles, or 1·62 per cent. The number of consumers per route-mile is 15·7, as compared with 15·2 last year. These increases are due to extensions of country lines and to additional consumers being connected to the extra mileage of new lines erected during the previous year, to which lines the full number of services were not then connected.

The sales per route-mile of line were 30,900 units, and the revenue £218. The units are more than last year (30,400), and there is an increase in revenue as against £211 last year.

The maximum demand per head of population in the areas supplied is nearing the allocation of 0·15 kw., or 0·2 h.p., per head of population, the basis of the design of the Government schemes.

Out of the ninety-eight distributing authorities, seventy-two showed a profit for the year amounting to £398,729, and twenty-six showed a loss amounting to £100,159. The gross revenue (excluding rates) was £4,480,716, and the general result is a profit for the whole Dominion of £298,570 after paying working-costs (£1,948,583) and capital (interest, sinking fund, and depreciation) charges (£2,233,563) at the rate of 7·18 per cent. on the total capital outlay of £31,118,614. This shows a profit of 0·95 per cent., as compared with 2·15 per cent. last year. The business on the whole is thus a thoroughly sound and remunerative one as well as supplying a public necessity to 93 per cent. of the population of the Dominion. It should be pointed out that depreciation charges included this year were not included in last year's summary, which showed 2·15 per cent. return.

The following table summarizes the results of the year's operations in connection with electric supply throughout the Dominion, and Table XXIX shows in condensed form the financial statistics for each supply authority. It should be noted that the method of compilation and computation adopted for the following table is slightly different to that of previous years.

—	—	Water.	Steam.	Gas.	Oil.	Total.
1. Number of stations	No.	30	1	2	3	36
2. Installed capacity (main plant)	Kw.	202,387	750	89	196	203,422
3. Installed capacity (standby plant)	Kw.	80,932	500	..	..	81,432
4. Number of consumers	No.	319,348	2,652	505	492	322,997
5. Connected load	Kw.	1,100,305	6,913	371	642	1,108,231
6. Units generated	No.	826,833,713	2,145,040	117,989	188,029	829,284,771
7. Units sold to consumers (Table XXIV)	No.	635,049,868	1,634,275	94,841	136,207	636,915,191
8. Percentage of non-productive units	%	23·15	19·57	19·63	27·60	23·20
9. Total operative capital (including distribution systems and standby plant)	£	30,950,339	112,890	26,804	28,581	31,118,614
10. Total capital per kilowatt installed (including distribution systems, &c.)	£	109	91	300	146	101
11. Annual working-costs	£	1,018,860*	11,830*	3,111	3,202	1,037,003*
12. Annual working-cost per unit under section 7	d.	0·385	1·75	7·91	5·7	0·391
13. Annual capital costs (interest, sinking fund, and depreciation)	£	2,219,166	7,927	2,447	4,023	2,233,563
14. Annual capital cost per unit under section 7	d.	0·84	1·16	6·2	7·1	0·84
15. Annual capital costs as percentage of capital	%	7·18	7·02	9·13	14·07	7·18
16. Total annual costs (section 11 plus section 13)	£	3,238,026	19,757	5,558	7,225	3,270,566
17. Total annual cost per unit under section 7	d.	1·225	2·91	14·11	12·80	1·231
18. Total annual revenue (excluding rates and bulk sales) from consumers	£	3,536,088	24,417	3,971	4,660	3,569,136
19. Average revenue per unit† under section 7 (Table XXV)	d.	1·27	3·57	9·73	7·93	1·28
20. Net profit (section 18, less sections 11 and 13)	£	298,062	4,660	−1,587	−2,565	298,570
21. Ratio working-costs to revenue (section 11 and section 18)	%	29·0	48·5	78·30	68·7	29·20

* After deducting revenue derived from bulk sales (Table XXV). † From retail sale of electricity.

GROWTH OF LOAD.

The total connected load at end of the year under review was 1,108,231 kw., compared with 1,100,849 for 1932.

Statistics pertaining to the increasing use of electric ranges, electric water-heaters, and milking-machines have been collected and scheduled for some years past, and from the following table it will be seen that during the period 1925 to 1933 the growth has been phenomenal:—

Year.	Consumers.	Electric Ranges.	Electric Water-heaters.	Electrified Milking-machines.
	Number.	Number.	Number.	Number.
1925	148,699	1,526	..	3,581
1926	192,392	4,671	6,654	4,856
1927	228,345	9,511	14,160	6,738
1928	243,795	15,766	21,513	8,514
1929	266,306	20,254	29,257	10,161
1930	284,235	25,997	37,564	11,922
1931	300,809	29,480	42,803	13,656
1932	309,360	31,973	45,796	14,163
1933	322,997	33,723	47,772	15,913

See Table XXVII for details for year ended 31st March, 1933.

BROKEN WIRES AND POLES.

During the year ending 31st March, 1933, there were 1,407 broken wires reported by electric-supply authorities, with 98,068 miles of conductor erected. The corresponding figures for the previous year were 1,574 broken wires, and 94,014 miles of conductor in use.

Falling trees were again the principal cause of the breaks, and accounted for 22·5 per cent. of the total, as against 21·75 per cent. for 1932.

As regards broken poles, 500 instances were reported for the year, of which 391 were New Zealand blue-gum. For 1932 the total number of broken poles reported was 291, and it is still evident that electric-supply authorities who experimented with New Zealand blue-gum and nondescript Australian "hardwoods" are now being called upon to make replacements after approximately five to seven years of pole-life.

ACTUAL MILEAGES AND SIZES OF OVERHEAD CONDUCTORS IN USE AT 31ST MARCH, 1933.

Size of Conductors (S.W.G.).	Copper: Miles.	Failures reported.	Aluminium: Miles.	Failures reported.	Galvanized Steel: Miles.	Failures reported.	Galvanized Iron: Miles.	Failures reported.	Copper-weld: Miles.	Failures reported.	Steel-cored Aluminium: Miles.	Failures reported.	Bronze: Miles.	Failures reported.	Total.
7/20 ..	6,424	362	..	..	1	..	..	..	..	..	..	..	..	..	362
7/18 ..	10,063	217	..	..	..	..	..	..	..	..	..	..	..	..	217
7/17 ..	2,029	8	..	..	..	..	..	..	..	..	..	..	..	..	8
7/16 ..	17,198	164	22	1	49	..	98	..	..	..	153	..	..	..	165
7/15 ..	219	..	..	..	..	..	..	..	..	..	70	..	..	..	..
7/14 ..	10,092	32	70	1	50	..	..	..	2	..	606	..	..	..	33
7/13 ..	1,022	..	..	..	26	..	..	..	..	..	..	..	..	..	..
7/12 ..	400	1	148	1	2	..	..	..	3	..	..	..	..	..	2
7/11 ..	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..
7/10 ..	40	..	25	..	..	..	..	..	2	..	50	..	..	..	..
7/9 ..	76	..	15	..	5	..	..	..	..	..	..	..	..	..	..
7/8 ..	..	..	1	..	..	..	..	..	..	..	3	3	..	..	3
7/7 ..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..
19/18 ..	338	5	..	..	..	..	..	..	..	..	..	..	..	..	5
19/17 ..	533	2	..	..	..	..	..	..	..	..	..	..	..	..	2
19/16 ..	1,503	2	..	..	..	..	..	..	..	..	..	..	..	..	2
19/15 ..	154	..	1	..	..	..	..	..	..	..	..	..	..	..	..
19/14 ..	564	1	..	..	..	..	..	..	..	..	..	..	..	..	1
19/13 ..	2,245	4	..	..	..	..	..	..	..	..	..	..	..	..	4
19/12 ..	128	..	..	..	2	..	..	..	..	..	..	..	..	..	..
19/10 ..	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..
37/16 ..	53	..	..	..	..	..	..	..	..	..	..	..	..	..	..
37/15 ..	394	..	..	..	..	..	..	..	..	..	..	..	..	..	..
37/14 ..	95	..	..	..	..	..	..	..	..	..	..	..	..	..	..
37/13 ..	23	..	..	..	..	..	..	..	..	..	..	..	..	..	..
37/12 ..	73	..	185	..	..	..	..	..	..	..	227	..	..	..	..
66/13 ..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12 ..	2,791	73	..	..	2	..	101	2	105	..	..	..	..	..	75
11 ..	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..
10 ..	10,609	248	..	..	180	2	803	..	723	1	..	..	30	..	251
8 ..	12,524	175	..	..	3,725	42	5,789	42	597	2	..	..	..	..	261
7 ..	778	1	..	..	..	..	137	..	91	..	..	..	..	..	1
6 ..	305	..	..	..	34	1	17	..	174	1	..	..	..	..	2
4 ..	602	..	..	..	..	..	..	..	79	..	..	..	..	..	..
2 ..	66	..	..	..	..	..	..	..	..	..	..	..	..	..	..
0 ..	78	..	..	..	2	..	..	..	..	..	..	..	..	..	..
2/0 ..	..	..	11	6	..	..	..	..	..	..	59	..	..	..	6
3/0 ..	..	..	..	..	..	..	..	..	..	..	830	..	..	..	..
3/13 ..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..
3/12 ..	119	2	28	..	..	..	..	..	..	..	..	..	..	..	2
3/11 ..	..	..	5	..	..	..	..	..	..	..	..	..	..	..	..
3/10 ..	24	..	1	..	..	..	..	..	..	..	..	..	..	..	..
3/9 ..	..	..	10	..	..	..	..	..	..	..	..	..	..	..	..
3/8 ..	..	..	9	..	..	..	..	..	..	..	..	..	..	..	..
4/16 ..	13	..	..	..	..	..	..	..	..	..	..	..	..	..	..
4/14 ..	..	..	..	..	268	..	..	..	..	..	..	..	..	..	..
5/14 ..	..	..	..	..	164	..	..	..	..	..	..	..	..	..	..
2/10 ..	33	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6/·144 ..	..	..	..	..	..	..	..	..	..	..	19	..	..	..	..
7/·186 ..	..	..	..	..	..	..	..	..	..	..	41	..	..	..	..
7/·135 ..	..	..	..	..	..	..	..	..	..	..	411	..	..	..	..
7/·0834 ..	..	..	..	..	..	..	..	..	..	..	37	..	..	..	..
7/·0743 ..	..	..	..	..	..	..	..	..	..	..	104	..	..	..	..
7/·062 steel and 6/·186 aluminium	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..
7/·112 ..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..
Miscellaneous	1	5*	39	..	..	..	..	..	..	..	..	..	..	..	5
	81,615 miles.	1,302	578 miles.	9	4,510 miles.	45	6,945 miles.	44	1,776 miles.	4	2,614 miles.	3	30 miles.	..	1,407 failures.

* Includes breakages in underground cables.

Grand total, 98,068 miles.

No returns received from Auckland, Christchurch, and Halswell.

ELECTRICAL SUPPLY AND ELECTRIAL WIRING REGULATIONS.

The Electrical Supply and Electrical Wiring Regulations, which were gazetted in 1927 with the intention of reviewing same after two years' trial, are now being revised. It is expected that this work of revision will be completed during the early part of 1934.

INSPECTION OF ELECTRIC LINES, ALSO PRIVATE GENERATING-PLANTS.

During the year under review the additions to existing lines have been less than in previous years, due to the prevailing economic conditions, consequently there has not been the necessity or opportunity for the amount of inspection hitherto carried out. Inspections are now being resumed, and it is hoped to find that the standard of maintenance demanded by the regulations has not been relaxed to any appreciable extent since previous inspections. The inspection activities in the past have undoubtedly tended towards the maintaining of a high standard, coupled with a general willingness on the part of the supply authorities to co-operate with this Department in bringing electric lines up to requirements.

The following supply authorities have notified extensions to electric lines in their respective districts during the year:—

Power Boards—
- Ashburton
- Banks Peninsula.
- Central.
- Dannevirke.
- Franklin.
- Golden Bay.
- Horowhenua.
- Hutt
- Malvern.
- Manawatu-Oroua.
- Marlborough.
- North Canterbury.
- Opunake.
- Otago.
- South Canterbury.
- Southland.
- South Taranaki.
- Springs-Ellesmere.

Power Boards—*continued.*
- Taranaki.
- Tararua.
- Tauranga.
- Te Awamutu.
- Thames Valley.
- Wairarapa.
- Wairere.
- Waitaki.
- Waitemata.
- Waitomo.
- Wanganui-Rangitikei.

Cities—
- Dunedin.
- Nelson.
- Palmerston North.

Boroughs—
- Bluff.
- Hamilton.

Boroughs—*continued.*
- Napier.
- New Plymouth.
- Ohakune.
- Patea.
- Taumarunui.
- Westport.
- Whakatane.
- Whangarei.

Town District—
- Te Puke.

County Council—
- Waimairi.

Companies—
- Wilson's Cement.
- Waimea Electric-supply.
- Blackball.

It is not generally known that under the Electrical Wiremen's Registration Amendment Act, 1928, it is mandatory to give notice of the installation of private electric plants, and provision is made for the inspection of these plants before same are placed in service. During the year a number of such installations came under notice, the existence of some of which was not previously known, and this has occasioned a good deal of routine work.

LICENSES ISSUED.

The following water-power and electric-line licenses and permits have been issued during the period from July, 1932, to July, 1933: Licenses (43)—Kauri Timber Co. (revocation); W. Jacentho, Oruru (assignment); M. Ball, Omakau; H. S. Glass, Pembroke (assignment); E. R. Dymock, Fern Flat (revocation); N. A. Harvey, Havelock; L. H. Daveney, Oruru (revocation); F. W. Fitzpatrick, Waipiro Bay; Inglewood Borough Council (revocation); Stratford Borough Council (revocation); L. J. G. Hamilton, Tokoroa (revocation); A. Jones, Waipipi (revocation); Butler Bros., Ruatapu; J. M. Faulks, Pembroke; D. J. McKay, Mangonui; M. M. Farley, Karekare; M. W. Wallis, Okete; T. W. Collins, Warkworth (2); D. Simpson, Karamea; Wallace Supplies, Ltd., Ruawai; L. Keys, Kohukohu; A. Clark, Maheno; W. J. Lusty, Te Uku; Golden Terrace Extended Gold-mining Co., (assignment); A. J. Harris, Rere; R. Jopp, Moutere; A. S. Cambridge, Omarama; Northland Pictures, Kaikohe; A. C. Pease, Mangatoki; F. Archer, Tuna Bay; Maniototo Hospital Board (revocation); W. H. Harvey, Manaroa; Gillespie's Beach Gold-dredging Co.; Waipiata Hall Co., Waipiata (2); Harbour Board, Tolaga Bay; Amalgamated Theatres, Ltd., Dargaville; Taumarunui Borough Council; Tokomaru Sheep-farmers' Co. (assignment); W. Reid and Sons, Arrowtown; E. S. Parker, Blenheim (revocation); W. G. McMillan, Cromwell. Permits (17)—L. W. Potter, Kuriwao; G. Richmond, Takaka; A. Clark, Maheno; A. Taylor, Alexandra; A. T. Young, Kamo; C. B. Brereton, Motueka; Auckland Farmers' Freezing Co., Moerewa; P. R. Sargood, Pembroke; Murdoch and Kean, Middlemarch; H. H. Steedman, Tokaanu; T. Raven, Okato; T. G. Simcox, Puketitiri; S. Knight, Ongarue; M. Harte, Rai Valley; D. Cameron, Hinakura; W. M. Turner, Mayfield; Borthwicks Ltd., Waitara.

ELECTRICAL APPLIANCES BOARD.

An opportunity to submit the draft Bill to give effect to the Electrical Supply Authorities' representations regarding the sale and use of unsafe electrical appliances has not presented itself during the past year.

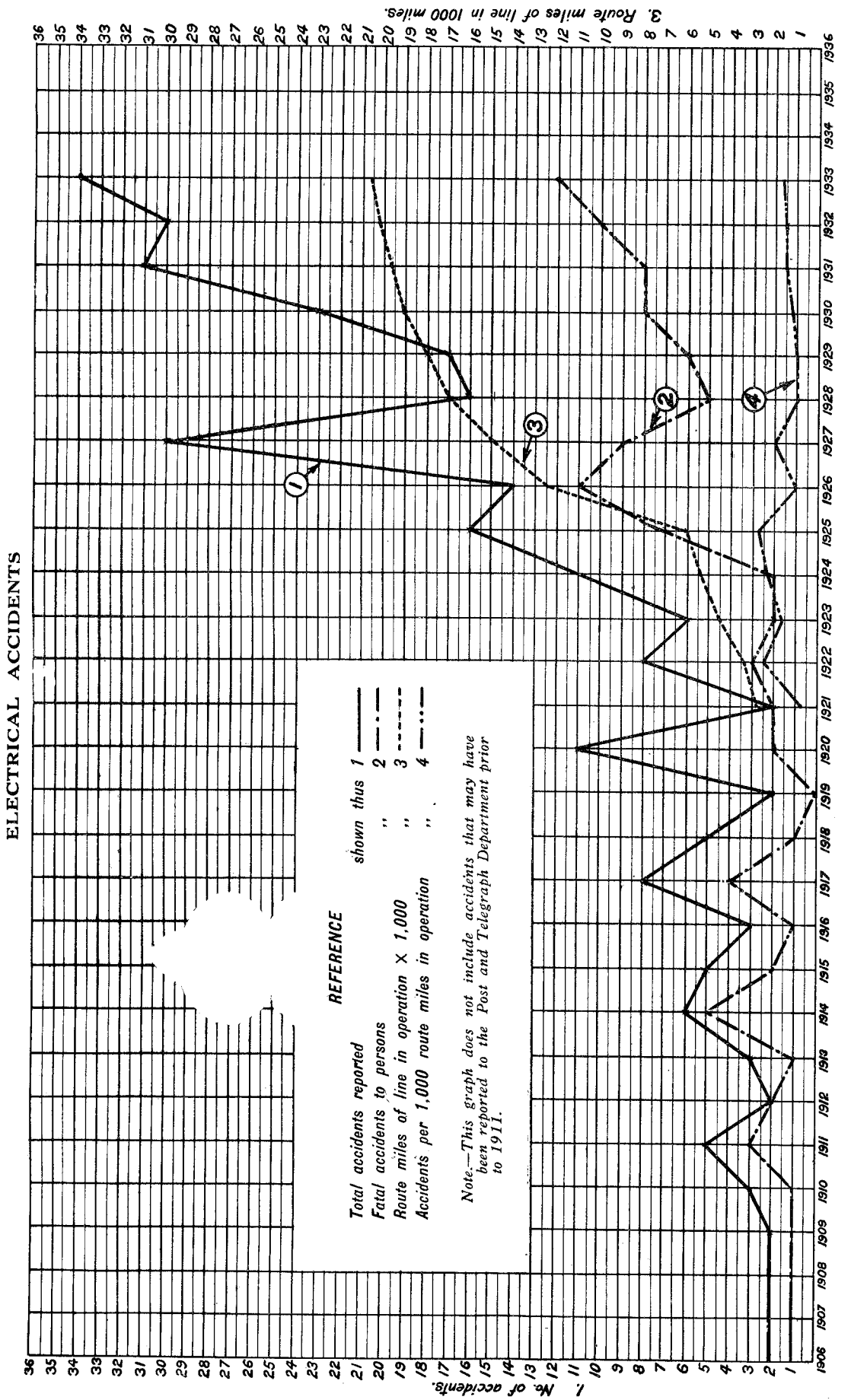
ELECTRICAL ACCIDENTS.

During the year there were reported to the Department thirty-four electrical accidents, involving the loss of human life in twelve instances. Corresponding figures for 1932 were thirty and ten respectively.

This year's electrical accidents resulted in injuries (fatal and otherwise) to the following:—

Electrical employees	15
Other tradesmen	9
General public	7
Stock	8
Total	39

The graph below has been prepared to show the number of electrical accidents reported up to 31st March, 1933. Although the annual total accidents shows an increase which is to be regretted, curve No. 4 has been plotted to indicate that, on the basis of an increasing number of route-miles of line in operation, the incidence of accidents is not increasing at the rate curve No. 1 would seem to imply.



ELECTRICAL FIRES.

During the year there were thirteen fires attributed to electrical causes and reported to the Department by electrical-supply authorities as per list below. The corresponding figures for 1932 and 1931 were sixteen and twenty-three respectively.

The sources of this year's electrical fires included the following:—

Electric irons	4
,, radiators	2
,, radios	1
Other electrical appliances	2
Defective installations	4
Total	13

REGISTRATION OF ELECTRICAL WIREMEN.

For the year ending 30th June, 1933, forty-nine reports of breaches of the Act and nineteen reports of defective work were received. There were at the 30th June, 1933, forty-five current endorsements for defective work, and the Board decided during the year that four endorsements be removed.

During the year there were two appeals lodged against the decision of the Board, one being for endorsing certificates and the other for cancelling registration. In both cases the Board's decision was upheld.

There has been further evidence during the year of the dangers incurred by work carried out by unskilled and unregistered persons. One fatal accident occurred in which the work carried out by an unskilled person was the direct cause, and in connection with another fatal accident it was found that the fuse-link had been replaced with a wire of about five times too large a carrying-capacity. There have been cases of shock and of fire from work done by unqualified persons.

In an endeavour to see that all wiring in theatres was being carried out in accordance with the Act a letter was sent to all theatre-proprietors in 1926, and, as a result of reports indicating defective wiring in some cases, a further letter was prepared in 1933; supplies were forwarded to the supply authorities and they were requested to deliver a copy to the proprietor of each theatre in their respective areas. Copies were forwarded direct to all theatres outside the areas covered by the supply authorities.

The introduction of mains-operated radio receiving sets presented a difficult problem in that a class of experts had grown up in the radio trade during the time battery-operated sets had been in use, and the number of registered electrical wiremen who were conversant with the radio side of the set was comparatively small. In the interests of public safety it was necessary to see that the small amount of electrical-wiring work associated with a radio set was carried out properly, and the only apparent way in which this could be done without causing considerable inconvenience to the user of the radio set was to grant registration to carry out such work. The facilities placed at the disposal of the radio trade whereby limited registration is granted to persons who pass an examination have been very fully availed of during the year. The large number of candidates who failed to answer satisfactorily the simple practical wiring questions, together with the reports received of sets having been improperly installed, shows the necessity for the examination and registration. The limited registration which is granted covers the following:—

(1) The installation and connecting of any earthing conductor used for any radio apparatus.
(2) The connecting of a flexible cord to any radio apparatus, or to any plug-top, ceiling-rose, or other connecter used between the fixed wiring and such apparatus.
(3) The replacement of any flexible cord used for supplying electrical energy to any radio apparatus and used between the fixed wiring and such apparatus.
(4) The replacement of a fuse-link on any subcircuit used to supply electrical energy to any radio apparatus.
(5) The removal and/or replacement of any radio apparatus as a whole or in part and which is connected to the fixed wiring by means of a flexible cord.

The qualifications necessary for this limited registration are that the applicant must be not less than nineteen years of age, must have passed an approved examination, and must prove to the satisfaction of the Registration Board that he has had not less than three years' experience in such work. There have been 974 candidates and of these 584 failed. To assist the supply authorities in the difficult task of regulating the installation of radio sets a list of men to whom limited registration had been granted was prepared and circulated in April, 1933.

Examinations for wiremen were held in September, 1932, and March, 1933. The number of candidates sitting for the examination continues to show a decrease from the maximum in September, 1929. The results in the written part show a marked improvement in the last examination, but up to then they had been very unsatisfactory. The results in the practical part have remained practically steady for the last four examinations and are equal to the average percentage of passes for all examinations.

Provision was made in the 1928 Amendment to the Act for all wiring done for any Department of State to be inspected, tested, and approved by a person directed in that behalf by the Chief Electrical Engineer of the Public Works Department. The Inspectors of the supply authorities were appointed to undertake this work, and, in addition, several qualified persons were appointed to undertake the work on behalf of the Government Railways and the Public Works Department. The appointments on behalf of the Railways and the Public Works were necessary because in the former case there is a considerable amount of special apparatus not found in other installations, and every care has to be

taken to see that there is no interference with the running of the trains, and, in the latter case, because on certain construction work, more especially tunnelling, a considerable amount of temporary wiring is used, and the nature of some of the work, such as blasting, demands constant supervision and inspection to safeguard the men employed on the works. The duties of the Inspectors appointed on behalf of the Railways and Public Works do not involve the inspection of any other Government buildings nor the inspection of any permanent dwellings, but the inspections made take the place of the inspections by the supply authority. They do not, however, relieve either body from compliance with the requirements of the Electrical Wiremen's Registration Act and the Electrical Supply and Electrical Wiring Regulations.

Some doubt appears to exist as to when it is necessary to employ registered wiremen, when notice has to be given to the supply authority, and whether appliances may be connected to the supply before inspection and test. Regarding the employment of registered wiremen, the Act applies only to electrical wiring work as defined in Regulation 8 of the Electrical Wiremen's Registration Regulations, 1929, and where such work is carried out in connection with the repair or assembly of apparatus on premises other than those on which the apparatus will be used—for example, assembly in a factory or repairs in a workshop—the work can be done by the general employees, but it must then be inspected and tested by a registered wireman before it is put into use.

Notice has to be given to the supply authority in all cases where electrical wiring work is to be carried out, the notice must be given by the person undertaking the work, and it must be given prior to the work being commenced.

The provision regarding the connecting-up of appliances appears to be too wide for practical application, and it is proposed to clarify the matter at an early date. At present it would appear that no apparatus may be connected up without the permission of the supply authority, and it is obvious that a consumer will not bother to obtain permission for all the appliances he may purchase from time to time such as radiators, toasters, irons, and standard lamps. It is proposed to limit the provision to such appliances and situations where the use of an appliance may introduce a hazard.

The proposed minor amendments to the regulations have not yet been finalized, but it is expected that this work will be completed in a very short time.

Further endeavours have been made to reduce the expenditure to an absolute minimum consistent with the importance of the work in securing the safety of consumers and property. The Act is mainly in the interest of the consumers, and it is only reasonable that each consumer should contribute towards the cost of administration. The cost per consumer, is so small, that it is not practicable to collect this sum direct from the individual consumers and recourse has therefore been made to collecting it through the supply authorities. The Public Works Department pays a large proportion of the cost. The amount to be collected through the supply authorities this year is equal to 0·72d. per consumer; this shows a decrease of 28 per cent. from the maximum amount which was approximately 1d. per consumer. As an insurance against defective work, the premium cannot be considered excessive. The number of ordinary centres where examinations would be held if there were five or more candidates was reduced in September, 1933, from twenty-five to twelve, and it is anticipated this will effect a further reduction in expenditure. Registration fees have increased by £85, examination fees have decreased by £105, but, as an offset to this, the costs of examination show a decrease of £55, and this will be further reduced in future. The fees paid to Board members have decreased by £30, but office expenses have increased by £90, due to a charge now being made for accounting and record services. The total expenditure for the year ended 30th March, 1933, has decreased by £38.

It is not possible to compare the cost of administering the Act with the cost to the supply authorities of licensing wiremen prior to the Act coming into force, because there are no figures available in the latter case. The number of consumers has increased from 192,392 in 1926 to 322,997 in 1933, an increase of 68 per cent. The class of work now carried out is of a higher standard than that which existed prior to the Act coming into force, and the standard is much more uniform throughout the country. From a safety and economic standpoint the Act has adequately justified its existence.

The summarized results of the two electrical wiremen's examinations held during the current year were as follows:—

	Entered.	Passed.
Written Part	341	132
Practical Part	236	110

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Chief Electrical Engineer.

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TABLE I.—WAIKATO ELECTRIC-POWER SUPPLY: ARAPUNI-HORAHORA SCHEME.—RESULTS OF OPERATION, ETC.

—	Tenth Year, March, 1930.	Eleventh Year, March, 1931.	Twelfth Year, March, 1932.	Thirteenth Year, March, 1933.
Capital outlay—	£	£	£	£
Horahora—Assets in operation	624,117	..	..	..
Arapuni—Assets in operation	2,705,894	..	..	..
Total assets in operation	3,330,011	1,286,667	1,322,190	4,522,152
Assets not in operation	330,416	2,657,170	3,231,114	158,332
Costs—				
Working-costs	62,702	101,889	115,003	47,740
Capital costs—				
Interest	135,622	85,389	62,524	218,848
Depreciation	60,127	33,009	24,911	75,951
Sinking fund	..	..	..	..
King's Wharf capital charges	..	..	..	36,590
	258,451	220,287	202,438	379,129
Revenue	225,683	184,593	161,884	337,641
Profit	*Dr.* 32,768	*Dr.* 35,694	*Dr.* 40,554	*Dr.* 41,487
Accumulated surplus	*Dr.* 2,618	*Dr.* 38,312	*Dr.* 78,867	*Dr.* 120,354
Accumulated Depreciation Fund	165,757	186,405	211,610	283,823
Accumulated Sinking Fund	54,445	7,072*	9,491	11,937
Maximum load (kilowatts)—				
System for year	41,520	49,520	18,710	54,020
Arapuni Power-station for year	33,900	38,400	..	46,800
Horahora Power-station for year	10,200	11,300	12,200	12,500
Arapuni Power-station, average weekly	24,731	35,927	..	38,290
Horahora Power-station, average weekly	7,752	9,804	11,194	9,830
Units output—				
Arapuni Power-station, total generated	121,084,986	40,898,950	..	222,253,140
Horahora Power-station, total generated	56,648,365	80,075,210	92,602,600	55,111,780
Grand Junction Power-station, total generated	2,682,100	6,368,600	1,746,600	..
Penrose Diesel Power-station, total generated	2,608,248	7,524,620	4,896,540	255,200
Huntly Steam Power-station, total generated	..	..	8,288,930	462,000
Units purchased (McLaren's Falls, Auckland Power Board, and New Zealand Dairy Factory)	7,706,548	8,226,397	15,994,315	6,395,886
Total units generated and purchased	190,710,247	143,093,777	123,528,985	284,478,006
(1) Units used for station auxiliaries, &c.	2,478,395	2,070,723	1,938,758	1,290,370
(2) Units available for outgoing lines	188,231,852	141,023,054	121,582,526	283,187,636
(3) Units sold	173,003,373	131,013,550	114,082,352	257,109,806
(4) Total losses	15,228,479	10,009,504	7,500,174	26,077,830
(5) Losses as a percentage of units available	8·09	7·09	6·17	9·20
Units sold—				
1. Auckland Power Board	72,593,366	26,393,208	1,155,815	138,883,116
2. Waitemata Power Board, Henderson	4,168,327	5,033,780	5,471,100	5,843,720
.. Waitemata Power Board, Takapuna	6,695,120	7,417,888	7,895,104	8,383,360
3. Thames Valley Power Board—				
Horahora	5,203,223	487,008	330,516	207,682
Matamata	3,950,613	8,071,510	8,255,133	8,023,434
Waihou	9,785,568	8,410,924	8,816,262	10,309,740
Waikino	4,082,987	3,267,015	2,810,946	2,901,567
Kerepeehi	5,018,567	4,396,194	4,738,252	5,240,540
Sum	28,040,958	24,632,651	24,951,109	26,682,963
4. Waihi Gold-mining Co.	19,730,740	20,068,989	20,588,073	20,160,752
5. Waihi Grand Junction Gold Co.	77,600	166,820	284,634	323,326
6. Franklin Power Board	7,825,134	9,431,176	10,497,828	11,644,796
7. Central Power Board, Hamilton	7,438,722	5,907,180	6,718,610	7,047,740
.. Central Power Board, Huntly	1,700,753	4,497,935	5,701,305	5,927,710
8. Hamilton Borough Council	3,811,465	4,430,420	4,654,970	4,984,900
9. New Zealand Railways, Frankton Junction	279,120	383,391	319,623	316,222
10. Cambridge Power Board	3,976,400	4,405,130	4,587,520	4,812,480
11. Te Awamutu Power Board	5,166,686	6,001,872	6,277,200	6,499,056
12. Waitomo Power Board	2,166,774	2,669,288	2,945,600	3,186,234
13. Arapuni Construction	9,532	5,552	1,912,100	63,164
14. Tourist Department, Mamaku	42,811	54,311	53,072	62,278
.. Tourist Department, Rotorua	1,528,365	1,112,950	969,740	2,291,906
15. Bay of Plenty Power Board, Edgecumbe	3,215,375	3,780,625	4,382,500	4,731,375
.. Bay of Plenty Power Board, Waiotahi	2,881,887	3,805,810	4,226,475	4,413,875
16. Other consumers	1,654,238	814,574	489,974	850,833
Total units sold	173,003,373	131,013,550	114,082,352	257,109,806

* £49,768 utilized for redemption of loans.

TABLE I.—WAIKATO ELECTRIC-POWER SUPPLY: ARAPUNI-HORAHORA SCHEME.—RESULTS OF OPERATIONS, ETC.—*continued.*

—	Tenth Year, March, 1930.	Eleventh Year, March, 1931.	Twelfth Year, March, 1932.	Thirteenth Year, March, 1933.
Load-factor, annual (per cent.)—				
System	52·4	33·0	75·36	60·12
Power-house, Arapuni	40·8	60·9*	..	55·61*
Power-house, Horahora	63·4	80·9	86·64	50·34
Working-costs	(£62,702)	(£101,889)	(£115,003)	(£47,740)
Per kilowatt (system annual maximum)	£1·51	£2·06	£6·15	£0·884
Per unit generated and purchased	0·079d.	0·171d.	0·224d.	0·040d.
Per unit sold	0·087d.	0·187d.	0·242d.	0·045d.
Capital costs	(£195,749)	(£118,398)	(£87,435)	(£333,737)
Per kilowatt (system annual maximum)	£4·71	£2·39	£4·67	£6·176
Per unit generated and purchased	0·246d.	0·199d.	0·170d.	0·281d.
Per unit sold	0·261d.	0·217d.	0·184d.	0·312d.
Total costs on system	(£258,451)	(£220,287)	(£202,438)	(£381,477)
Per kilowatt (system annual maximum)	£6·22	£4·45	£10·82	£7·062
Per unit generated and purchased	0·325d.	0·369d.	0·394d.	0·322d.
Per unit sold	0·348d.	0·403d.	0·426d.	0·357d.
(NOTE.—Capital costs do not include Sinking Fund.)				
Revenue	(£225,683)	(£184,593)	(£161,884)	(£337,641)
Per kilowatt (system annual maximum)	£5·42	£3·73	£8·64	£6·248
Per unit generated and purchased	0·284d.	0·310d.	0·314d.	0·285d.
Per unit sold	0·313d.	0·338d.	0·340d.	0·315d.

* Load factor for period of operation.

TABLE II.—WAIKATO ELECTRIC-POWER SUPPLY: ARAPUNI-HORAHORA SCHEME.—ANALYSIS OF CAPITAL OUTLAY.

—	1932.	1933.	Expenditure during Year.	
			Dr.	*Cr.*
	£	£	£	£
Arapuni—				
Land, roading, and fencing	37,026	37,026	..	..
General charges	21,975	50,434	28,459	..
Headworks and tailrace	930,843	933,457	2,614	..
Generating-station, transformers, and machinery	634,385	636,728	2,343	..
Village	49,162	49,204	42	..
Remedial works	343,544	367,691	24,147	..
	2,016,935	2,074,540	57,605	..
Horahora—				
Land, roading, and fencing	3,208	3,208	..	..
Headworks and tailrace	145,495	150,124	4,629	..
Generating-station, transformers, and machinery	144,891	144,946	55	..
Staff, village	12,678	12,678	..	..
	306,272	310,956	4,684	..
Auxiliary plants—				
Waihi Grand Junction plant	9,139	9,128	..	11
Penrose Diesel plant	61,814	61,814	..	..
Huntly steam plant	10,856	10,814	..	42
	81,809	81,756	..	53
Transmission-lines (50 kv.)	244,931	245,149	218	..
Transmission-lines (110 kv.)	392,832	444,986	52,154	..
Substations (50 kv.)	177,521	178,071	929	379
Substations (110 kv.)	223,350	231,376	18,742	10,716
Distribution-lines (11 kv.)	40,853	33,193	..	7,660
Distribution substations	10,831	10,831	..	..
General—				
Land, stores, and railway siding, Ruakura	13,809	13,809	..	..
Staff residences	4,372	4,372	..	..
Hamilton (office furniture, loose tools and equipment, and motor-vehicles)	19,234	19,429	195	..
Engineering office and general expenses on surveys and on construction	178,517	187,340	8,823	..
Interest during construction	612,625	627,280	14,655	..
Cost of raising loans	148,601	154,697	6,096	..
Stocks of spares at substations, &c.	23,595	23,156	..	439
	1,000,753	1,030,083	29,769	439
Total	4,496,087	4,640,941*	164,101	19,247

* Excluding unissued stocks, £39,542.

TABLE III.—WAIKATO ELECTRIC-POWER SUPPLY: ARAPUNI-HORAHORA SCHEME.—OPERATING OR WORKING COSTS.

	1929–30.		1930–31.		1931–32.		1932–33.	
	Cost.	Per Unit generated.	Cost.	Per Unit generated.	Cost.	Per Unit generated.	Cost.	Per Unit generated
Generating—	£	d.	£	d.	£	d.	£	d.
Horahora	7,018	0·032	7,430	0·022	8,317*	0·022	3,492*	0·015
Arapuni	4,410	0·009	3,737	0·022	2,074	..	8,347	0·009
Grand Junction	10,972	0·982	20,651	0·778	6,308	0·868	35	..
Penrose Diesels	4,791	0·441	12,861	0·410	8,969	0·439	1,352	1·272
Huntly	..	..	..	..	12,394	0·359	718	0·373
Sum	27,191	..	44,679	..	38,062	..	13,944	..
		Per Unit sold.		Per Unit sold.		Per Unit sold.		Per Unit sold.
Transmission-lines (110, 50, and 11 kv.)	12,331	0·017	11,850	0·022	9,417	0·020	7,739	0·007
Main substations (110 and 50 kv.) ..	9,016	0·012	9,252	0·017	8,752	0·018	8,322	0·008
Management and general	6,216	0·009	6,100	0·011	10,285	0·021	8,966	0·008
Total	54,754	0·076	71,881	0·132	66,516	0·139	38,971	0·036
Power purchased	7,777	..	9,271	..	22,514	..	7,253	..
Standby provision	171	..	20,737	..	25,973	..	1,516	..
Total	62,702	0·087	101,889	0·187	115,003	0·242	47,740	0·044

Total units sold: 1929–30, 173,003,373; 1930–31, 131,013,550; 1931–32, 114,082,352; 1932–33, 257,109,806.

* The amount of £8,317 includes £1,374 for additions to weir, which was transferred to capital in the following year. The actual working-costs of Horahora were thus £6,941 for 1931–32 and £4,868 for 1932–33.

TABLE IV.—WAIKATO ELECTRIC-POWER SUPPLY: ARAPUNI-HORAHORA SCHEME.—CONNECTED LOAD, IN KILOWATTS, AT 31ST MARCH, 1933.

	1930.	1931.	1932.	1933.
1. Auckland Electric-power Board	171,000	182,069	188,650	185,403
2. Waitemata Electric-power Board	16,456	18,615	20,585	23,252
3. Thames Valley Electric-power Board	20,205	22,081	23,150	25,502
4. Waihi Gold-mining Co.	4,570	5,403	5,403	5,406
5. Waihi Grand Junction Co.	2,528	620	620	620
6. Franklin Electric-power Board	6,917	8,301	9,272	10,194
7. Central Electric-power Board	9,350	10,965	13,491	14,422
8. Hamilton Borough Council	7,813	9,169	9,473	10,159
9. New Zealand Railways, Frankton	936	98	774	774
10. New Zealand Co-operative Dairy Co., Frankton	828	902	954	1,004
11. State Farm, Ruakura	16	16	16	16
12. Cambridge Electric-power Board	2,694	2,833	3,000	3,075
13. Cambridge Co-operative Dairy Co.	307	175	111	159
14. Te Awamutu Electric-power Board	4,848	5,482	5,787	6,192
15. Waitomo Electric-power Board	2,334	2,649	3,420	3,514
16. Tourist Department, Rotorua	3,681	4,229	4,492	4,739
17. Bay of Plenty Power Board	5,150	6,097	6,320	6,553
18. Public Works Department, Horahora ..	151	151	151	151
19. Public Works Department, Arapuni	557	1,372	373	708
20. Public Works Department, Hamilton ..	56	56	56	56
21. Public Works Department, Penrose	127	127	127	127
Total connected load	260,524	281,410	296,225	302,026

TABLE V.—WAIKATO ELECTRIC-POWER SUPPLY: ARAPUNI-HORAHORA SCHEME.—ROUTE-MILES OF DEPARTMENT'S LINES IN OPERATION AT 31ST MARCH, 1933.

Line.	Supports.	Size of Wire.	Miles.
110,000 volt double circuit—			
Arapuni – Hamilton No. 2	Steel towers	19/13	29.21
Hamilton No. 2 – Bombay	Steel towers	19/13	46.32
Bombay–Penrose	Steel towers	19/13	24.20
110,000 volt single circuit—			
Arapuni–Penrose	2·68 miles steel towers 96·56 miles wood poles	19/13	99·24
Total route-miles of 110,000-volt lines			198·97
50,000 volt double circuit—			
Penrose–Henderson	17·60 miles steel towers 1·15 miles duplicate wood pole line	7/14	18·75
Henderson–Takapuna	2·15 miles steel tower line 7·78 miles duplicate wood-pole line	7/14	9·93
50,000 volt single circuit—			
Arapuni–Mamaku	Wood poles	7/14	25·13
Mamaku–Ngongotaha	Wood poles	7/14	7·36
Ngongotaha–Edgecumbe	Wood poles	7/14	38·93
Edgecumbe–Waiotahi	Wood poles	7/14	21·08
Arapuni–Horahora	Wood poles	7/12	6·71
Horahora–Matamata	Steel towers	No. 0	14·74
Matamata–Waihou	9·25 miles steel towers 11·23 miles wood poles	No. 0 7/12	.. 20·48
Waihou–Paeroa	Wood poles	19/16	12·27
Bombay–Kerepeehi	Wood poles	19/16	35·30
Kerepeehi–Paeroa	Wood poles	19/16	10·11
Paeroa–Waikino	Wood poles	19/16	5·38
Waikino–Aoangatete (Department's part of McLaren's Falls line)	Wood poles	7/14	17·31
Horahora – Mystery Creek	Wood poles	7/12	20·70
Mystery Creek – Hamilton No. 1	Wood poles	7/12	6·54
Hamilton No. 1 – Huntly	0·53 miles steel towers 18·53 miles wood poles	19/16	19·06
Mystery Creek – Te Awamutu	Wood poles	7/14	9·50
Te Awamutu – Hangatiki	Wood poles	7/14	19·50
Total route-miles of 50,000-volt lines			318·78
11,000-volt lines—			
Double circuits—			
Horahora–Leamington	Wood poles	7/14	12·54
Hamilton No. 1 – Hautapu	Wood poles	7/16	6·61
Single circuits—			
Waikino–Waihi	Steel towers	37/13	5·77
Waihi – Grand Junction	Wood poles	7/12	0·75
Also Hamilton No. 1 – Frankton—			
Quadruple circuit	2·86 miles wood poles	7/16	3·95
Triple circuit	0·55 miles wood poles 0·17 miles underground cables	7/16 7/16	
Double circuit	0·37 miles wood poles	7/16	
Total route-miles of 11,000-volt lines			29·62
Grand total of all lines			547·37

[*Continued on next page.*

NOTE.—The Leamington–Hautapu 11 kv. section (9¼ miles) was sold in March, 1933.

TABLE V—*continued.*

ROUTE-MILES OF DEPARTMENT'S LINES ERECTED AT 31ST MARCH, 1933.

Line.	Supports.	Circuits.	Miles.
110,000 volt	Steel towers	Double	99·73
110,000 volt	Steel towers	Single	2·68
110,000 volt	Wood poles	Single	167·06
50,000 volt	Steel towers	Double	19·75
50,000 volt	Steel towers	Single	24·52
50,000 volt	Wood poles	Single	276·51*
11,000 volt	Steel towers	Single	5·77
11,000 volt	Wood poles	Quadruple	2·86
11,000 volt	Wood poles	Triple	0·55
11,000 volt	Wood poles	Double	19·52
11,000 volt	Wood poles	Single	0·75
11,000 volt	Underground cables	Three single circuits ..	0·17
Total route-miles..	..	..	619·87

* Includes 8·93 miles of duplicate pole-line.

CIRCUIT-MILES OF DEPARTMENT'S LINES ERECTED AT 31ST MARCH, 1933.

Size of wire	7/16	7/14	7/12	19/16	19/13	19/·101	No. 0	37/13	Underground cable.
Miles	27·05	223·25	45·93	82·12	298·7	70·5	23·99	5·77	0·51

Total circuit miles, 777·82.

All circuits are three-phase, and all wires are of copper.

TABLE VI.—WAIKATO ELECTRIC-POWER SUPPLY: ARAPUNI–HORAHORA SCHEME.—ROUTE-MILES OF POWER BOARD LINES AT 31ST MARCH, 1933.

Voltage	11,000.			6,600.		3,000.		400.		Total Route-miles.
Number of Circuits	1.	2.	4.	1.	2.	1.	2.	1.	2.	
Auckland Electric-power Board ..	137·25	..	..	127·75	..	..	..	597·50	25·50	888·00(*a*)
Waitemata Electric-power Board ..	164·05	5·45	..	..	..	0·40	..	313·00	..	482·90(*b*)
Thames Valley Electric-power Board	469·06	84·50	..	..	..	54·18	..	164·14	..	771·88(*c*)
Franklin Electric-power Board ..	353·00	7·00	..	..	..	..	..	143·00	..	503·00(*d*)
Central Electric-power Board ..	226·48	15·83	0·67	..	..	95·27	..	216·05	..	554·30(*e*)
Cambridge Electric-power Board ..	..	..	..	..	..	113·00	..	73·00	..	186·00(*f*)
Te Awamutu Electric-power Board	58·63	12·00	..	..	..	158·65	4·75	78·59	..	312·62(*g*)
Waitomo Electric-power Board ..	72·50	7·00	..	..	..	..	..	20·25	0·50	100·25(*h*)
Bay of Plenty Electric-power Board	218·37	..	..	..	..	..	..	28·46	..	246·83(*i*)
Tourist Department, Rotorua ..	..	..	..	29·73	5·00	10·12	..	16·00	0·50	61·35(*j*)
Hamilton Borough Council ..	..	..	..	..	..	..	..	48·02	..	48·02(*k*)
Totals	1,699·34	131·78	0·67	157·48	5·00	431·62	4·75	1,698·01	26·50	4,155·15

(*a*) Also 172 miles of underground cable.

(*b*) Also 110·25 miles of 400 v. lines under 11 kv. lines; 0·3 mile of 400 v. lines under 3,300 v. lines, and 1·33 miles of 11 kv. and 400 v. underground cable.

(*c*) Also 350·77 miles of 400 v. lines under 11 kv. lines; 54·62 miles of 400 v. lines under 3,300 v. lines, and 1 mile of 11 kv. underground cable.

(*d*) Also 210 miles of 400 v. lines under 11 kv. lines, and 0·5 mile of 11 kv. underground cable.

(*e*) Also 2·5 miles of 3,300 v. lines and 119·94 miles of 400 v. lines under 11 kv. lines; 57 miles of 400 v. lines under 3,300 v. lines, and 0·25 mile of underground cable.

(*f*) Also 57 miles of 400 v. lines under 3,300 v. lines.

(*g*) Also 16·8 miles of 3,300 v. lines and 24 miles of 400 v. lines under 11 kv. lines, and 129·55 miles of 400 v. lines under 3,300 v. lines.

(*h*) Also 26 miles of 400 v. lines under 11 kv. lines.

(*i*) Also 71·66 miles of 400 v. lines under 11 kv. lines, and 0·155 mile of 11 kv. underground cable.

(*j*) Also 1·1 miles of 3,300 v. lines and 12·54 miles of 400 v. lines under 6,600 v. lines; 4·27 miles of 400 v. lines under 3,300 v. lines; and 0·5 mile of 3,300 v. underground cable.

(*k*) Also 6·74 miles of 11 kv. underground cable.

TABLE VII.—WAIKATO ELECTRIC-POWER SUPPLY: ARAPUNI-HORAHORA SCHEME.—GROSS FINANCIAL RESULTS OF DISTRIBUTION OF ENERGY FOR THE YEAR ENDED 31ST MARCH, 1933.

Distributing Authority.	Number of Consumers.	Capital Outlay.	Revenue.					Expenditure.							Balance.		
			From Sales of Electrical Energy.		Trading Account.	Other Sources.	Total.	Paid for Electrical Energy.	Working-costs and Management.	Interest.	Depreciation.	Sinking Fund.	Other Expenditure.	Total.	Profit.		Loss.
			Retail.	Bulk (for Resale).											Appropriated to Reserves.	Unappropriated.	
		£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
Public Works Department ..	19	4,680,483	19,859*	313,784	521	3,477	337,641	6,129	35,371	218,848	75,951	..	†42,829	379,128	..	..	41,487
Auckland Electric-power Board (*a*)	49,115	3,406,366	616,184*	5,100	..	15,496	636,780	172,951	148,094‡	126,642	64,952	55,315	15,160	583,114	18,881	34,785	..
Bay of Plenty Electric-power Board	1,392	209,089	36,822	..	1,587	894	39,303	12,033	9,341	10,839	1,837	2,420	284	36,754	3,294	..	745
Cambridge Electric-power Board ..	1,439	110,324	19,090	..	52	781	19,923	6,185	6,041	5,654	..	1,286	..	19,166	250	507	..
Central Electric-power Board ..	4,337	348,204	56,780*	57	202	2,579	59,618	17,959	9,710	18,888	4,097	3,089	2,301	56,044	770	2,804	..
Franklin Electric-power Board ..	3,383	288,790	45,381	..	730	4,014	50,125	17,170	7,883	15,516	1,491	3,070	293	45,423	3,860	842	..
Te Awamutu Electric-power Board	1,776	186,023	29,287*	32	43	1,127	30,489	8,814	4,994	9,974	974	930	644	26,330	547	3,612	..
Waitemata Electric-power Board ..	9,079	397,524	72,696	..	..	3,493	76,189	21,534	18,738	22,183	3,125	7,370	158	73,108	7,937	..	4,856
Waitomo Electric-power Board ..	1,199	100,210	18,738	..	18	30	18,786	5,855	4,215	5,278	159	1,215	..	16,722	1,156	908	..
Thames Valley Electric-power Board	6,577	825,634	112,121*	5,197	12	3,360	120,690	35,587	23,460	49,657	1,157	9,744	1,257	120,862	..	..	172
Thames Borough Council.. ..	1,147	24,156	8,854	..	12	375	9,241	3,141	2,653	266	518	77	93	6,748	1,524	969	..
Te Aroha Borough Council ..	720	25,896	7,444	..	..	71	7,515	2,056	3,163	515	350	95	60	6,239	1,276	..	..
Hamilton Borough Council ..	4,191	76,511	33,764	..	..	234	33,998	10,151	6,624	3,254	2,130	1,645	502	24,306	8,200	1,492	..
Tourist Department	1,941	76,150	17,829	..	..	620	18,449	5,632	3,929	3,807	1,523	1,523	404	16,818	1,631	..	..
Totals	86,315	10,755,360	1,094,849	324,170	3,177	36,551	1,458,747	325,197	284,216	491,321	158,264	87,779	63,985	1,410,762	49,326	45,919	47,260
															95,245		

* After deducting amount of sales to other distribution authorities. † Includes £36,590, half capital charges, King's Wharf station, paid by Department. ‡ After deducting amount due by Department for half additional net operating-costs of King's Wharf and for costs of operating during interruptions.

NOTE.—(*a*) Figures shown for Auckland Power Board subject to final adjustment.

Net profit, £47,985.

TABLE VIII.—MANGAHAO-WAIKAREMOANA ELECTRIC-POWER SUPPLY.—RESULTS OF OPERATIONS.

—	First Year, 1930.	Second Year, 1931.	Third Year, 1932.	Fourth Year, 1933.
	£	£	£	£
Capital outlay	3,426,901	3,498,840	3,659,304	3,690,475
Costs—				
Working-costs	59,235*	59,476†	48,900	53,907
Interest	191,288	196,206	202,775	209,776
Depreciation	62,205	63,850	65,681	52,645
Total costs	312,728	319,532	317,356	316,328
Revenue	259,461‡	283,017	300,022	313,342
Loss	53,267	36,515	17,334	2,986
Accumulated Depreciation Fund	223,257	284,996	355,122	419,256
Maximum load (kilowatts)—				
Combined power-houses	37,880	44,660	45,980	47,980
Wellington City Corporation	15,424	18,528	18,536	17,736
Hutt Valley Electric-power Board—				
Khandallah	4,180	5,028	5,435	1,980
Melling	..	..	..	3,168
Wellington Meat Export Co., Ltd.	429	461	493	486
Railway Department	1,440	1,737	1,350	1,160
Horowhenua Electric-power Board	2,142	1,670	1,764	1,924
Manawatu-Oroua Electric-power Board	3,465	3,660	4,020	3,780
Dannevirke Electric-power Board	617	708	775	773
Tararua Electric-power Board	607	655	677	659
Wairarapa Electric-power Board	1,044	1,339	1,526	1,754
Wanganui-Rangitikei Electric-power Board	3,441	3,970	4,115	4,129
Central Hawke's Bay Electric-power Board	694	806	842	806
Hawke's Bay Electric-power Board	3,048	3,504	3,912	4,128
Wairoa Electric-power Board	804	816	768	744
Poverty Bay Electric-power Board	1,330	1,158	1,218	1,704
South Taranaki Electric-power Board	..	..	565	648
New Plymouth Borough Council	..	..	1,476	1,032
Units output—				
Generated (power-house totals)	182,148,043	210,373,650	224,267,160	241,969,796
Purchased	66,340	1,597,742	25,885	148,681
Total units (generated and purchased)	182,214,383	211,971,392	224,293,045	242,118,477
Units sold—				
Wellington City Council	50,192,540	56,672,369	56,160,500	56,482,600
Wellington Meat Export Co., Ltd.	1,673,450	1,664,900	1,735,100	1,367,500
Horowhenua Electric-power Board	8,468,472	8,591,177	9,217,629	9,936,412
Hutt Valley Electric-power Board	20,086,060	24,612,820	23,852,916	23,048,790
Wairarapa Electric-power Board	3,549,797	5,273,654	7,859,699	9,400,350
Tararua Electric-power Board	3,090,220	3,490,764	3,663,427	3,615,293
Dannevirke Electric-power Board	2,987,845	3,718,552	3,950,388	4,136,929
Central Hawke's Bay Electric-power Board	3,487,202	4,148,254	4,385,304	4,368,742
Hawke's Bay Electric-power Board	15,401,308	16,009,755	20,206,903	22,235,621
Manawatu-Oroua Electric-power Board	20,266,997	23,437,239	24,391,835	24,746,075
Wanganui-Rangitikei Electric-power Board	17,026,540	20,598,638	21,156,518	21,524,933
Railway Department	3,136,540	5,142,720	3,709,920	4,473,460
Wairoa Electric-power Board	3,209,344	3,436,891	3,258,328	3,250,894
Poverty Bay Electric-power Board	4,981,845	6,456,441	7,225,326	8,380,846
South Taranaki Electric-power Board	..	..	485,624	2,254,821
New Plymouth Borough Council	..	..	883,608	4,400,300
Retail consumers	1,454,571	916,700	1,400,247	1,758,342
Total units sold	159,012,731	184,170,874	193,543,272	205,381,908
Operating consumption	3,090,320	3,451,150	3,674,356	2,671,094
Losses—				
Total losses (units)	20,111,332	24,349,368	27,075,417	34,065,475
Percentage	11·04	11·5	12·04	14·1
System load-factor (per cent.)—				
Annual	54·9	54·2	55·8	57·6
Average weekly	65·2	65·7	68·2	69·8
Working-costs (less power purchased)—				
Per kilowatt (system maximum)	£1·56	£1·23	£1·063	£1·123
Per unit generated	0·078d.	0·062d.	0·052d.	0·053d.
Per unit sold	0·089d.	0·072d.	0·061d.	0·063d.
Capital charges—				
Per kilowatt (system annual maximum)	£6·71	£5·82	£5·838	£5·469
Per unit generated	0·333d.	0·294d.	0·287d.	0·260d.
Per unit sold	0·381d.	0·339d.	0·333d.	0·307d.
Total costs—				
Per kilowatt (system annual maximum)	£8·27	£7·15	£6·902	£6·593
Per unit generated	0·411d.	0·362d.	0·340d.	0·314d.
Per unit sold	0·470d.	0·416d.	0·393d.	0·370d.
Revenue—				
Per kilowatt (system maximum)	£6·78	£6·36	£6·52	£6·531
Per unit generated	0·342d.	0·322d.	0·321d.	0·311d.
Per unit sold	0·390d.	0·370d.	0·372d.	0·366d.

* Does not include £233 for power purchased. † Includes £4,441 for power purchased. ‡ Gross revenue, £259,668.

TABLE IX.—MANGAHAO - WAIKAREMOANA ELECTRIC-POWER SUPPLY.—ANALYSIS OF CAPITAL OUTLAY.

—	Expenditure to 31st March, 1931.	Expenditure to 31st March, 1932.	Expenditure to 31st March, 1933.
	£	£	£
Land, roading, tram-lines, and fencing	150,775	161,986	162,492
Headworks	953,037	940,870	945,870
Generating-stations and machinery	609,897	612,289	614,862
Transmission-lines	703,911	752,562	751,878
Main substations	333,746	435,117	459,310
Service buildings and workmen's accommodation	105,550	98,023	97,871
Vehicles and loose construction tools	5,837	3,121	3,380
Surveys, expenses, and salaries	246,134	261,686	265,421
Construction plant and equipment	22,589	11,820	11,052
Interest during construction	293,879	298,651	299,053
Cost and expenses of raising loans	73,215	77,179	79,286
Totals	3,498,840	3,659,304	3,690,475

TABLE X.—MANGAHAO-WAIKAREMOANA ELECTRIC-POWER SUPPLY.—OPERATING OR WORKING COSTS.

—	1931.		1932.		1933.	
	Cost.	Per Unit sold.	Cost.	Per Unit sold.	Cost.	Per Unit sold.
	£	d.	£	d.	£	d.
Generating	16,026	0·021	13,813	0·017	14,489	0·017
Transmission	16,908	0·022	15,239	0·019	14,528	0·017
Substations	5,997	0·008	5,895	0·007	8,404	0·013
Management and general	16,104	0·021	13,953	0·018	16,485	0·019
Totals	55,035	0·072	48,900	0·061	53,907	0·066

Units sold—1931, 184,170,874; 1932, 193,543,272; 1933, 205,381,908.

TABLE XI.—MANGAHAO-WAIKAREMOANA ELECTRIC-POWER SUPPLY.—CONNECTED LOAD IN KILOWATTS AT THE 31ST MARCH, 1933.

—	Street-lighting.	General Lighting, Heating, and Cooking.	Power.	Totals.
Public Works Department	4	1,140	579	1,723
Central Hawke's Bay Electric-power Board	24	3,818	650	4,492
Dannevirke Electric-power Board	34	5,657	1,030	6,721
Hawke's Bay Electric-power Board	150	24,398	5,941	29,662
Horowhenua Electric-power Board	38	8,915	2,950	11,903
Hutt Valley Electric-power Board	96	33,011	7,893	41,000
Manawatu-Oroua Electric-power Board	185	29,572	6,300	36,056
New Plymouth Borough Council	68	19,131	5,716	22,651
Poverty Bay Electric-power Board	24	13,188	3,146	16,358
Railway Department	..	542	5,407	5,949
South Taranaki Electric-power Board	35	4,158	2,064	6,257
Tararua Electric-power Board	12	4,436	955	5,403
Wairarapa Electric-power Board	44	13,291	3,471	16,806
Wairoa Electric-power Board	13	3,152	615	3,780
Wanganui-Rangitikei Electric-power Board	97	27,858	6,747	34,702
Wellington City Council	382	105,927	32,542	138,851
Wellington Meat Export Co., Ltd.	..	97	937	1,034
Totals (kilowatts)	1,206	298,291	86,943	383,348

TABLE XII.—MANGAHAO-WAIKAREMOANA ELECTRIC-POWER SUPPLY.—GROSS FINANCIAL RESULTS OF DISTRIBUTION OF ENERGY FOR THE YEAR ENDED 31ST MARCH, 1933.

Distributing Authority.	Number of Consumers.	Capital Outlay.	Revenue.						Expenditure.							Balance.		
			From Sale of Electrical Energy.		Rates.	Trading Account.	Other Sources.	Total.	Paid for Electrical Energy.	Working-cost and Management.	Interest.	Depreciation.	Sinking Fund.	Other Expenditure.	Total.	Profit.		Loss.
			Retail.	Bulk (for Resale).												Appropriated to Reserves.	Unappropriated.	
		£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
Public Works Department	106	3,690,475	762	309,262	..	..	3,318	313,342	414	53,493	209,776	52,645	..	..	316,328	..	..	2,986
Central Hawke's Bay Electric-power Board	1,593	138,344	21,350	..	..	..	1,350	22,700	6,988	4,418	7,867	860	1,720	1,123	22,976	..	..	276
Dannevirke Electric-power Board ..	2,502	213,820	28,038	..	..	..	1,971	30,009	6,664	5,579	12,449	2,105	2,810	354	29,961	..	48	..
Hawke's Bay Electric-power Board ..	2,498	221,055	36,155*	25,519	..	209	1,433	63,316	32,872	6,818	13,245	2,500	2,511	1,083	59,029	..	4,287	..
Hutt Valley Electric-power Board ..	11,192	386,414	99,704	..	..	320	2,693	102,717	42,144	20,493	21,535	9,374	4,020	1,164	98,730	..	3,987	..
Horowhenua Electric-power Board ..	3,956	212,293	43,496	..	..	..	2,228	45,724	17,321	8,783	12,060	3,485	2,386	816	44,851	200	673	..
Hastings Borough Council	3,426	118,791	26,960	..	..	..	60	27,020	9,632	6,525	3,690	963	2,343	237	23,390	..	3,630	..
Havelock North Town Board	299	24,074	3,284	..	..	..	7	3,291	786	885	1,256	..	475	4	3,406	..	..	115
Inglewood Borough Council	413	12,644	3,911	..	..	799	..	4,710	1,651	677	605	402	400	629	4,364	..	346	..
Manawatu-Oroua Electric-power Board ..	4,515	512,150	60,097*	14,851	..	283	2,391	77,622	31,780	12,622	27,771	3,056	5,424	565	81,218	..	..	3,596
Mangaweka Town Board	111	5,710	826	..	159	290	40	1,315	335	364	104	..	22	353	1,178	..	137	..
Napier Borough Council	4,470	170,932	42,404	..	..	..	248	42,652	15,100	6,454	7,366	4,206	1,339	402	34,867	..	7,785	..
New Plymouth Borough Council ..	6,055	441,487	67,192*	3,725	..	521	1,428	72,866	8,255	18,207	20,271	..	12,833	2,211	61,777	250	10,839	..
Opunake Electric-power Board	1,500	108,994	12,479	..	..	..	259	12,738	683	3,807	5,326	150	2,053	175	12,194	..	544	..
Palmerston North City Council	5,780	220,127	56,598	..	..	..	55	56,653	14,851	9,739	9,570	5,455	1,829	1,121	42,565	500	13,588	..
Patea Borough Council	358	17,229	4,035	..	..	27	78	4,140	1,292	1,927	479	147	163	..	4,008	132	..	..
Poverty Bay Electric-power Board ..	4,745	331,474	53,566	..	..	187	899	54,652	13,208	12,088	15,514	1,920	6,431	2,763	51,924	1,750	978	..
South Taranaki Electric-power Board ..	2,891	196,031	26,836*	1,292	..	569	521	29,218	4,181	6,194	9,597	822	3,702	1,368	25,864	..	3,354	..
Tararua Electric-power Board	1,595	164,559	22,069	..	..	290	864	23,223	5,858	4,398	8,043	2,215	1,682	942	23,138	..	85	..
Wairarapa Electric-power Board ..	4,503	359,291	52,492	..	..	..	3,283	55,775	9,122	11,466	20,557	2,948	4,822	2,612	51,527	366	3,882	..
Wanganui-Rangitikei Electric-power Board	10,013	562,841	93,971*	330	..	23	4,213	98,357	32,678	17,299	31,024	7,734	8,219	536	97,490	..	867	..
Wairoa Electric-power Board	352	62,461	5,796*	4,233	95	..	619	10,743	6,495	2,132	3,574	934	1,163	966	15,264	..	..	4,521
Wairoa Borough Council	618	12,589	8,056	..	..	..	55	8,111	4,272	1,783	878	373	247	..	7,553	..	558	..
Waitara Borough Council	482	12,655	3,766	..	535	50	225	4,576	1,392	660	720	183	180	22	3,157	..	1,419	..
Wellington City Corporation	35,444	1,193,035	312,637	..	..	..	9,411	322,048	77,399	70,216	27,220	22,239†	6,905	17,731	221,710	22,239	78,099	..
Totals	109,417	9,089,455	1,086,300	359,212	789	3,568	37,649	1,487,518	345,373	287,027	470,497	124,716	73,679	37,177	1,338,469	25,437	135,106	11,494

* After deducting sales to other distributing bodies. † Renewal Fund.

Gross profit, £149,049; rates collected, £789; net profit, £148,260.

TABLE XIII.—MANGAHAO-WAIKAREMOANA ELECTRIC-POWER SUPPLY.—ROUTE-MILES OF POWER BOARD LINES AT 31ST MARCH, 1933.

Voltage	11,000 Volts.				6,600 Volts.		3,300 Volts.		400 Volts.	Total Route-miles.
Circuits	4.	3.	2.	1.	2.	1.	2.	1.	1.	
Power Boards, &c.—										
(*a*) Central Hawke's Bay	..	..	1·50	120·50	..	25·75	..	1·00	41·00	189·75
(*b*) Dannevirke	..	1·50	3·00	24·30	0·5	207·80	..	..	81·70	318·80
(*c*) Hawke's Bay	..	..	15·00	169·75	..	..	..	6·25	84·25	275·25
(*d*) Horowhenua	..	..	6·50	167·85	..	..	..	..	36·95	211·30
(*e*) Hutt Valley	..	..	21·90	6·04	18·5	67·15	..	..	198·70	312·29
(*f*) Manawatu-Oroua	1·50	..	33·00	260·00	..	..	163·0	..	148·75	606·25
(*g*) Tararua	..	..	12·31	48·94	..	..	107·0	..	48·50	216·75
(*h*) Wairarapa	..	1·25	27·25	241·00	..	..	..	9·00	77·00	355·50
(*i*) Wairoa	..	..	22·00	44·20	..	..	1·7	13·00	13·20	94·10
(*j*) Wanganui-Rangitikei	..	..	25·00	209·00	..	190·00	..	2·00	281·00	707·00
(*k*) Poverty Bay	..	..	11·60	34·50	4·9	139·10	..	..	58·90	249·00
(*l*) South Taranaki	..	..	7·05	129·00	..	..	..	..	40·67	176·72
(*m*) New Plymouth Borough Council	2·00	..	16·00	232·00	..	..	..	..	47·50	297·50
Total	3·50	2·75	202·11	1687·08	23·9	629·80	271·7	31·25	1158·12	4,010·21

(*a*) Also 28 miles of 400-volt lines on the same poles as 11,000-volt lines; 4·25 miles of 400-volt lines on the same poles as 6,600-volt lines; and 3·25 miles of 400-volt lines on the same poles as 3,300-volt lines.
(*b*) Also 0·9 mile of 11,000-volt underground cable.
(*c*) Also 71·5 miles of 400-volt lines on the same poles as 11,000-volt lines, and 4·75 miles of 400-volt lines on the same poles as 3,300-volt lines; also 0·25 mile of 11,000-volt underground cable.
(*d*) Also 106·54 miles of 400-volt lines on the same poles as 11,000-volt lines.
(*e*) Also 12·5 miles of 6,600/400-volt lines, 5·44 miles of 6,600-volt lines, and 4 miles of 400-volt lines on the same poles as 11,000-volt lines; and 63·71 miles of 400-volt lines on the same poles as 6,600-volt lines.
(*f*) Also 14 miles of 3,300/400-volt lines, 4 miles of 3,300-volt lines, and 220 miles of 400-volt lines on the same poles as 11,000-volt lines; and 120 miles of 400-volt lines on the same poles as 3,300-volt lines.
(*g*) Also 33 miles of 3,300-volt lines and 96 miles of 400-volt lines on the same poles as lines of a higher voltage.
(*h*) Also 2 miles of 11,000-volt underground cable, 163·5 miles of 400-volt lines under 11,000-volt lines, 4·5 miles of 400-volt lines under 3,300-volt lines, and 54 miles of series street-lighting circuits under 400-volt lines.
(*i*) Also 43·1 miles of 400-volt lines on the same poles as 11,000-volt lines and 9·1 miles of 400-volt lines on the same poles as 3,300-volt lines.
(*j*) Also 20 miles of 6,600-volt lines, 2 miles of 3,300-volt lines, and 193 miles of 400-volt lines on the same poles as lines of a higher voltage; and 3 miles of 11,000-volt underground cable.
(*k*) Also 2·33 miles of 6,600/400-volt lines, 5·79 miles of 6,600-volt lines, and 7·95 miles of 400-volt lines on the same poles as 11,000-volt lines; 70·18 miles of 400-volt lines on the same poles as 6,600-volt lines; and 0·31 mile of 11,000-volt and 0·51 mile of 6,600-volt underground cable.
(*l*) Also 40·79 miles of 400-volt lines on the same poles as 11,000-volt lines, and 0·1 mile of 11,000-volt underground cable.
(*m*) Also 250 miles of 400-volt lines on the same poles as 11,000-volt lines, and 47·34 miles of 400-volt lines on the same poles as 3,300-volt lines.

TABLE XIV.—MANGAHAO-WAIKAREMOANA ELECTRIC-POWER SUPPLY.—ROUTE-MILES OF DEPARTMENT'S LINES IN OPERATION AT 31ST MARCH, 1933.

——	Size of Wire.	Miles.
110,000-volt lines (double circuit)—		
Mangaore–Khandallah	19/·092 Cu.	61·10
Mangaore–Bunnythorpe	7/·167 A.C.S.R.	25·44
Tuai–Taradale	37/·072 Cu.	59·86
110,000-volt lines (single circuit)—		
Bunnythorpe–Wanganui	7/·167 A.C.S.R.	39·34
Bunnythorpe–Woodville	7/·167 A.C.S.R.	12·44
Woodville–Masterton	7/·167 A.C.S.R.	51·50
Woodville–Taradale	7/·167 A.C.S.R.	76·00
Khandallah–Melling	19/·062 Cu.	7·38
Wanganui–Stratford	19/·062 Cu.	67·76
50,000-volt lines (single circuit)—		
Stratford – New Plymouth	7/·104 Cu.	20·95
Tuai–Wairoa	19/·064 Cu.	23·07
Tuai–Gisborne	7/·167 A.C.S.R.	46·45
11,000-volt lines (quadruple circuit)—		
Khandallah–Petone	19/·064 Cu.	3·81
11,000-volt lines (double circuit)—		
Mangaore–Shannon	19/·064 Cu.	3·00
11,000-volt lines (single circuit)—		
Khandallah – Wellington Meat Export Co., Ltd.	19/·064 Cu.	0·63
Total	..	498·73

TABLE XV.—LAKE COLERIDGE ELECTRIC-POWER SUPPLY.—RESULTS OF OPERATION.

Results of Operation.	Fifteenth Year, 1930.	Sixteenth Year, 1931.	Seventeenth Year, 1932.	Eighteenth Year, 1933.
	£	£	£	£
Capital outlay	1,622,199	1,712,555	1,802,497	2,053,883
Costs—				
Working-costs	36,808	57,033*	37,245†	57,780
Interest	76,354	77,226	73,485	84,249
Depreciation, 2 per cent.	15,315	13,290	12,500	29,552
Total costs	128,477	147,549	123,230	171,581
Accumulated Depreciation Reserve	188,294	197,627	211,752	244,867
Accumulated General Reserve	44,388	97,345	174,249	195,475‡
Sinking Fund Reserve	144,557	168,464	193,865	112,486§
Revenue	196,648	217,632	218,196	213,345
Maximum load (kilowatts)—				
Power-house	27,540	30,800	30,340	30,140
Lyttelton Diesel Station	..	..	4,480	5,740
System	27,540	30,800	30,340	30,140
Average load (kilowatts)—				
Power-house	14,210	13,790	14,775	13,700
Lyttelton Diesel Station	..	..	1,420	3,932
System	14,210	13,790	14,850	15,175
Units output—				
Power-house	124,375,245	120,687,377	129,627,220	119,915,190
Lyttelton Diesel Station	..	..	652,587	12,891,290
Units purchased (Christchurch Tramway Board)	..	1,729,441	282,736	..
System	124,375,245	122,416,818	130,562,543	132,806,480
Units distributed—				
Units sold	112,600,950	111,953,880	119,538,961	121,471,889
Power-house and substations local consumption (unsold)	2,569,583	2,316,735	2,017,339	2,359,685
Total units distributed	115,170,533	114,270,615	121,556,300	123,831,574
Losses—				
Transmission-line losses	7,888,536	5,972,483	7,262,072	5,769,595
Percentage	6·42	5·0	5·65	4·85
Distribution losses	1,316,176	1,173,720	1,744,171	3,205,311
Percentage	1·14	1·865	1·415	2·53
Average load-factor (per cent.)—				
Power-house	51·6	44·8	48·7	45·5
Lyttelton Diesel Station	..	..	31·6	68·6
System	51·6	44·8	49·0	50·4
Working-costs—				
Per kilowatt (system maximum)	£1·338	£1·852	£1·228	£1·917
Per unit generated and purchased	0·07d.	0·112d.	0·068d.	0·104d.
Per unit sold	0·078d.	0·122d.	0·075d.	0·114d.
Capital charges (interest plus depreciation)—				
Per kilowatt (system maximum)	£3·326	£2·94	£2·83	£3·775
Per unit generated and purchased	0·18d.	0·178d.	0·158d.	0·206d.
Per unit sold	0·192d.	0·194d.	0·173d.	0·225d.
Total cost—				
Per kilowatt (system maximum)	£4·664	£4·79	£4·06	£5·692
Per unit generated and purchased	0·25d.	0·289d.	0·227d.	0·310d.
Per unit distributed	0·268d.	0·309d.	0·244d.	0·333d.
Per unit sold	0·275d.	0·316d.	0·248d.	0·339d.
Revenue—				
Per kilowatt (system maximum)	£7·262	£7·060	£7·19	£7·078
Per unit generated and purchased	0·39d.	0·427d.	0·401d.	0·385d.
Per unit sold	0·42d.	0·466d.	0·440d.	0·418d.
Per unit sold (city)	0·33d.	0·408d.	0·362d.	0·349d.
Per unit sold (trams)	0·45d.	0·450d.	0·450d.	0·450d.
Per unit sold (wholesale consumers)	0·52d.	0·515d.	0·500d.	0·481d.
Per unit sold (retail consumers)	2·49d.	3·400d.	3·310d.	3·852d.

* Includes £21,170 for power purchased. † Includes £2,802 for power purchased. ‡ Payment into fund for year ended 31st March, 1933, £21,226. § Excluding £110,342 utilized for redemption of loans.

TABLE XVI.—LAKE COLERIDGE ELECTRIC-POWER SUPPLY.—ANALYSIS OF CAPITAL OUTLAY.

Item.	Total Expenditure to 31st March, 1932.	Total Expenditure to 31st March, 1933.	Difference in Expenditure during Year 1932–33.
	£	£	£
Land, roading, and fencing	24,583	24,583	..
Harper diversion	23,359	23,359	..
Acheron diversion	19,105	19,105	..
Headworks (second tunnel)	236,882	236,882	..
Headworks	230,562	230,555	*Cr.* 7
Power-house machinery, &c.	224,965	225,372	407
Staff village	24,797	24,797	..
Transmission-lines	391,434	540,555	149,121*
Addington Substation	113,625	131,840	18,215
Lyttelton Diesel Station	97,265	97,439	174
Primary distribution	129,085	176,583	47,498*
Secondary distribution	39,047	42,158	3,111
Service transformers and meters	7,811	9,393	1,582
Vehicles and loose tools	25,019	25,013	*Cr.* 6
Telephone-lines	1,891	1,891	..
Office furniture	328	328	..
Surveys, preliminary expenses, &c.	143,301	157,190	13,889*
Interest during construction	69,438	86,840	17,402*
Total	1,802,497	2,053,883	251,386

* Includes transfers from Waitaki scheme, £224,083.

TABLE XVII.—LAKE COLERIDGE ELECTRIC-POWER SUPPLY.—OPERATING OR WORKING COSTS.

Item.	1932. Cost.	1932. Cost per Unit distributed.	1933. Cost.	1933. Cost per Unit distributed.
	£	d.	£	d.
Harper diversion	1,084	0·0021	783	0·0015
Acheron diversion	271	0·0005	125	0·0002
Generating	7,358	0·0146	7,022	0·0136
Transmission-line	5,753	0·0113	9,934	0·0193
Main distribution	3,188	0·0063	3,360	0·0065
H.T. distribution	2,108	0·0041	2,194	0·0043
L.T. distribution	3,947	0·0078	4,698	0·0091
Standby	6,555	0·0130	20,804	0·0403
Management	6,981	0·0138	8,860	0·0172
	37,245	0·0735	57,780	0·1120
Units distributed	121,556,300		123,831,574	
Units sold	119,538,961		121,471,889	

TABLE XVIII.—LAKE COLERIDGE ELECTRIC-POWER SUPPLY.—TOTAL CONNECTED LOAD FOR YEAR ENDED 31ST MARCH, 1933.

Consumer.	Connected Load.				Maximum Kilowatts.	Maximum Kilovolt-amperes.
	Light.	Heat.	Power.	Total.		
Distributing authorities (14)—	Kw.	Kw.	Kw.	Kw.		
Ashburton Power Board	1,726·75	10,055·09	2,130·19	13,912·03	1,340·00	1,355·00
Banks Peninsula Board	414·64	3,292·32	299·51	4,006·47	360·00	..
Christchurch City Council	..	..	..	113,452·00*	14,082·00	..
Halswell County Council	86·84	341·81	87·67	516·32	..	170·00
Heathcote County Council	568·91	4,279·08	219·56	5,067·55	647·20	697·90
Lyttelton Borough Council	423·37	1,474·79	830·25	2,728·41	232·80	236·00
Malvern Power Board	338·23	1,947·76	266·11	2,552·10	212·40	274·32
North Canterbury Power Board ..	1,161·86	5,474·39	1,768·69	8,404·94	960·00	987·20
Riccarton Borough Council	684·74	3,911·12	481·81	5,077·67	537·00	561·00
South Canterbury Power Board ..	4,188·40	14,911·14	3,712·79	22,812·33	2,743·00	3,048·00
Springs-Ellesmere Power Board ..	1,208·26	4,981·63	2,600·02	8,789·91	1,280·00	1,380·00
Sumner Borough Council	364·88	1,495·77	256·10	2,116·75	321·60	339·20
Waimairi County Council (Hillmorten)	102·22	256·25	30·14	388·61	..	..
Waitaki Power Board	1,813·10	6,915·33	1,635·97	10,364·40	921·60	963·20
	13,082·20	59,336·48	14,318·81	200,189·49	..	..
Direct consumers (45)	1,083·41	2,135·41	14,546·48	17,765·30	..	..
Total	14,165·61	61,471·89	28,865·29	217,954·79	..	..
Substations (7)—						
Addington (condenser and local) ..	20·50	75·00	62·00	157·50†	..	..
Point	1·68	9·50	2·24	13·42	..	..
Hororata	1·74	21·60	0·37	23·71	..	..
Ashburton	1·21	17·25	4·17	22·63	..	..
Timaru (condenser and local) ..	3·34	36·51	6·90	46·75†	..	..
Oamaru	1·50	10·64	6·66	18·80	..	..
Glenavy	2·00	25·00	0·20	27·20	..	..
	31·97	195·50	82·54	310·01	..	..
Power-house (1)	36·30	66·50	171·25	274·05	..	..
Diesel Station (1)	..	..	..	..	..	..
Grand total	14,233·88	61,733·89	29,119·08	218,538·85	..	..

* Includes Woolston Borough Council and part Waimairi County Council. † Excludes synchronous condenser.

Cost per unit distributed, 0·333d.; cost per unit sold, 0·339d.
Connected loads: 1930, 181,310; 1931, 200,535; 1932, 212,156; 1933, 218,539.

TABLE XIX.—LAKE COLERIDGE ELECTRIC-POWER SUPPLY.—GROSS FINANCIAL RESULTS OF DISTRIBUTION OF ENERGY FOR YEAR ENDED 31ST MARCH, 1933.

Distribution Authority.	Number of Consumers.	Capital Outlay.	Revenue.						Expenditure.						Total.	Balance	
			From Sale of Electrical Energy.		Rates.	Trading Account.	Other Sources.	Total.	Paid for Electrical Energy.	Working-costs and Management.	Interest.	Depreciation.	Sinking Fund.	Other Expenditure.		Profit.	Loss.
			Retail.	Bulk (for Resale).													
		£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
Public Works Department	59	2,053,883	46,498*	164,619	..	135	2,093	213,345	..	57,780	84,248	29,552	20,539†	..	213,345	21,226	..
Ashburton Power Board	3,611	357,784	43,044	..	..	..	776	43,820	10,990	8,110	18,784	10	3,962	..	41,856	1,964	..
Banks Peninsula Power Board	974	103,187	11,095	..	3,150	3	520	14,768	3,110	4,092	6,287	303	1,283	561	15,636	..	868
Christchurch City Council	28,159	808,996	200,141*	7,678	..	..	6,425	214,244	83,000	61,062	16,399	30,889	194	441	191,985	22,259	..
Halswell County Council	275	6,956	2,163	..	..	..	..	2,163	919	441	263	..	50	..	1,673	490	..
Heathcote County Council	1,503	36,648	10,722	..	..	191	63	10,976	5,694	2,039	1,392	..	801	..	10,218	1,050	..
Kaiapoi Borough Council	462	10,701	3,212	..	..	..	43	3,255	1,207	555	641	158	253	43	2,857	398	..
Lyttelton Borough Council	767	10,990	5,896	..	..	..	..	5,896	2,215	1,293	304	141	175	..	4,128	1,768	..
Malvern Power Board	656	65,098	7,111	..	2,000	9	767	9,887	2,412	2,529	3,799	..	670	431	9,841	46	..
North Canterbury Electric-power Board	1,645	143,122	20,503*	3,022	..	3	1,240	24,768	7,738	5,330	7,578	571	1,926	1,025	24,168	600	..
Riccarton Borough Council	1,360	23,927	10,018	..	..	325	47	10,390	4,408	2,200	606	675	220	..	8,109	2,281	..
Rangiora Borough Council	600	12,862	4,431	..	..	..	13	4,444	1,792	1,474	335	487	75	65	4,228	216	..
South Canterbury Power Board	3,678	325,565	41,502*	12,273	..	185	2,687	56,647	23,400	6,245	18,032	4,345	3,268	87	55,377	1,270	..
Springs-Ellesmere Power Board	2,433	156,085	28,915	..	..	..	177	29,092	9,821	5,079	7,630	..	2,202	1,935	27,007	2,425	..
Sumner Borough Council	1,011	16,975	5,414	..	..	..	20	5,434	2,806	1,600	430	..	81	28	4,945	489	..
Timaru Borough Council	3,777	135,390	33,215	..	..	341	344	33,900	12,273	8,143	4,934	..	4,283	..	29,633	4,267	..
Waimairi County Council	3,280	84,610	22,156*	34	89	19	62	22,360	8,042	3,278	2,159	3,722	1,478	..	19,332	3,681	..
Waitaki Electric-power Board	3,396	179,341	28,127	..	..	137	660	28,924	7,805	8,462	8,585	2,450	1,355	424	29,695	..	155
Totals	57,646	4,530,120	524,163	187,626	5,239	1,348	15,937	734,313	187,632	179,712	182,406	73,303	42,813	5,040	694,033	64,430	1,023

* After deducting sales to other distributing bodies.

† Paid out of profit pursuant to section 12 of State Supply of Electrical Energy Act, 1917.

	£
Gross profit	63,407
Raised by rates	5,239
Net profit	£58,168

TABLE XX.—LAKE COLERIDGE ELECTRIC-POWER SUPPLY.—ROUTE-MILES OF SUPPLY AUTHORITY LINES AT 31ST MARCH, 1933.

Voltage	11,000 Volts.				6,600 Volts.		3,300 Volts.		400 Volts.		Total Route-miles.
Number of Circuits	1	2	3	4	1	2	1	2	1	2	
Ashburton Power Board	76·320	19·00	0·70	0·62	692·500	2·10	..	..	78·040	..	870·280 (*a*)
Banks Peninsula Power Board	25·000	..	..	..	55·360	4·00	38·875	..	56·000	..	201·235 (*b*)
Christchurch City Council	8·070	..	..	..	..	..	3·900	..	247·970	..	322·390 (*c*)
Halswell County Council	..	..	..	..	..	..	7·000	..	15·000	..	22·000 (*d*)
Heathcote County Council	7·625	..	..	..	..	..	1·625	..	21·250	..	31·250 (*e*)
Kaiapoi Borough Council	..	..	..	..	..	..	1·250	..	14·750	..	16·000 (*f*)
Lyttelton Borough Council	1·800	..	..	..	..	..	..	..	8·280	..	10·080 (*g*)
Malvern Power Board	..	..	..	..	169·750	..	..	..	12·000	..	182·250 (*h*)
North Canterbury Power Board	199·830	14·16	..	..	49·860	..	25·100	..	64·430	..	353·640 (*i*)
Rangiora Borough Council	..	..	..	..	..	..	2·700	..	10·570	..	13·360 (*j*)
Riccarton Borough Council	..	..	..	..	..	..	..	3·50	14·750	..	18·250 (*k*)
South Canterbury Power Board	29·625	83·50	..	..	525·502	3·50	..	..	84·213	0·50	728·440 (*l*)
Springs-Ellesmere Power Board	27·000	6·50	..	..	38·620	..	127·000	..	108·000	..	307·570 (*m*)
Sumner Borough Council	1·000	..	..	..	..	..	3·250	..	5·250	..	9·500 (*n*)
Timaru Borough Council	1·190	..	..	..	..	..	4·200	3·60	46·700	..	58·440 (*o*)
Waitaki Power Board	103·300	0·70	..	..	175·200	..	3·200	..	84·200	..	366·600 (*p*)
Waimairi County Council	..	..	..	..	35·750	1·00	23·000	..	63·500	..	142·750 (*q*)
Totals	480·760	123·86	0·70	0·62	1,742·540	10·60	241·100	7·10	934·900	0·50	3,654·030

(*a*) Also 0·82 mile 6,600-volt double-circuit line under 11,000-volt lines; 15·50 miles 6,600-volt and 400-volt single-circuit line under 11,000-volt line; 48·42 miles 6,600-volt single-circuit line under 11,000-volt line; 3·44 miles 400-volt single-circuit line under 11,000-volt line; 65·50 miles 400-volt single-circuit line under 6,600-volt line. Includes 0·5 mile 11,000-volt and 0·5 mile 6,600-volt underground cable.

(*b*) Includes 22 miles 33,000-volt line. Also 12 miles 3,300-volt line under 33,000-volt line; 7·16 miles 400-volt line under 11,000-volt line; 17·25 miles 400-volt line under 6,600-volt line; and 8·65 miles 400-volt line under 3,300-volt line.

(*c*) Also 4 miles 400-volt line under 11,000-volt line, and 3·9 miles 400-volt line under 3,300-volt line. Includes 52·20 miles 11,000-volt underground cable and 6·5 miles 3,000-volt street-lighting cable. Includes also 3·75 miles 400-volt underground cable not previously listed.

(*d*) Also 1·5 miles 400-volt line under 3,300-volt line.

(*e*) Also 4·375 miles 400-volt line under 11,000-volt lines, and 1·5 miles 400-volt line under 3,300-volt lines. Includes 0·75 mile 11,000-volt underground cable not previously listed.

(*f*) Also 0·25 mile 400-volt line under 3,300-volt line.

(*g*) Also 1·8 miles 400-volt line under single-circuit 11,000-volt line.

(*h*) Also 30 miles 400-volt line under 6,600-volt line. Includes 0·5 mile 6,600-volt underground cable.

(*i*) Also 60·52 miles 400-volt line under single-circuit 11,000-volt line; 4·36 miles 400-volt line under double-circuit 11,000-volt line; 14·54 miles 400-volt line under single-circuit 6,600-volt line; 9·63 miles 400-volt line under single-circuit 3,300-volt line; and 0·04 mile 400-volt and 3,300-volt line under 11,000-volt line. Includes 0·26 mile underground cable.

(*j*) Also 2·70 miles 400-volt line under 3,300-volt line. Includes 0·09 mile underground cable.

(*k*) Also 2·50 miles 400-volt line under 3,300-volt line.

(*l*) Also 16 miles 6,600-volt line under double-circuit 11,000-volt line; 4 miles 400-volt line under single-circuit 6,600-volt line and double-circuit 11,000-volt line; 0·75 mile 400-volt line under double-circuit 11,000-volt line; 52 miles 6,600-volt line under single-circuit 11,000-volt line; 18 miles 400-volt line under single-circuit 6,600-volt line and single-circuit 11,000-volt line; 202·35 miles 400-volt line under single-circuit 6,600-volt line; 3·5 miles 400-volt line under double-circuit 6,600-volt line. Includes 0·725 mile 11,000-volt, 0·238 mile 6,600-volt, and 0·637 mile 400-volt underground cable.

(*m*) Also 7·2 miles 3,300-volt line under 33,000-volt line; 11·3 miles 3,300-volt line and 4·31 miles 400-volt line under 11,000-volt line; 13·48 miles 400-volt line under 6,600-volt line; and 57·07 miles 400-volt line under 3,300-volt line. Includes 0·45 mile underground cable 400 volt.

(*n*) Also 2·5 miles 400-volt line under 3,300-volt line.

(*o*) Also 0·75 mile 400-volt line under 11,000-volt line; 4·2 miles 400-volt line under single-circuit 3,300-volt line; and 3·6 miles 400-volt line under double-circuit 3,300-volt line. Includes 2·75 miles 11,000-volt underground cable.

(*p*) Also 10·3 miles 6,600-volt line under 11,000-volt line; 4·2 miles 6,600-volt line and 400-volt line under 11,000-volt line; 22·9 miles 400-volt line under 11,000-volt line; 0·4 mile 3,300-volt line and 400-volt line under 6,600-volt line; 45·5 miles 400-volt line under 6,600-volt line; and 3 miles 400-volt line under 3,300-volt line.

(*q*) Also 28 miles 400-volt or 230-volt line under 6,600-volt line; and 25 miles 400-volt or 230-volt line under 3,300-volt line. Includes 19 miles 230-volt line and 0·50 mile 11,000-volt cable.

TABLE XXI.—LAKE COLERIDGE ELECTRIC-POWER SUPPLY.—TRANSMISSION AND DISTRIBUTION LINES.

Route Miles, 31st March, 1933.

Voltage.	Line.	Miles.	Total Miles.
66 kv.	Lake Coleridge to Christchurch—		
	North—Power-house–Glentunnel–Hororata–Homebush–Christchurch ..	67·5	
	Middle—Power-house–Hororata–Christchurch	61·5	
	South—Power-house–Hororata–Christchurch	61·5	
	Point – Timaru T line	84·4	
	Hororata – Timaru U line	79·0	
	Timaru – Oamaru V line	60·2	
	Timaru – Oamaru W line (59·9 miles, less 2·5 miles unfinished)	57·4	
	Glenavy to Waitaki	37·8	
			509·3
33 kv.	Stoddart's Corner to Motukarara	8·5	
	North Canterbury line (under 11 kv. pressure)	22·4	
			30·9
11 kv.	Northern feeder	10·4	
	Southern and western feeders	14·5	
	Woolston and Lyttelton feeders and branches	14·8	
	Montreal Street and tramways feeders	0·8	
	Point to Phillips Farm	1·7	
	Point to Snowdon	4·3	
	Underground—	Ch.	
	Tramway 1 and 2, Montreal 1 and 2	5	
	Northern No. 1, Fendalton 1 and 2	8	
	Southern 1 and 2, Steelworks 1 and 2	9	
	Lyttelton 1 and 2	9	
	Colombo Street and Lincoln Road	12	
	Montreal Street and tramways feeders	146	
	Armagh 1 and 2 feeders	180	
	Armagh 4 feeder	41	
	Local 1 and 2 feeders	40	
	Power-house	3	
	Milton Street feeder	50	
	Distribution substations (various)	29	
		6·6	
			53·1
6·6 kv.	Murchisons and intake	5·9	
			5·9
3 kv.	Southern feeder	0·4	
	Addington – Christchurch Railway	2·1	
	(Underground) Railway	0·3	
			2·8
L.T.	Lake Coleridge	1·3	
	Addington	1·0	
	(Underground)	0·1	
			2·4
			604·4

—	Route-miles of Lines.			
	Erected during Current Year.	Total Erected to 31st March, 1933.	Sold or Dismantled during Year.	Balance at 31st March, 1933.
(*a*) Transmission (overhead lines) ..	..	540·2	..	540·2
(*b*) Distribution (overhead lines) ..	..	57·2	..	57·2
(*c*) Underground cables	..	7·0	..	7·0
Totals	..	604·4	..	604·4

[*Continued on next page.*

TABLE XXI—*continued.*

Actual Mileages and Sizes of Overhead Conductors in Use at 31st March, 1933.

Size of Conductors.	Copper.	Aluminium.	Galvanized Steel.	Galvanized Iron.	Copperweld.	Steel-cored Aluminium.	Total.
S.W.G.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.
7/20	0·4	..	..	..	..	..	0·4
7/18	0·8	..	..	..	..	..	0·8
7/16	82·9	1·5	..	..	..	..	84·4
7/14	241·3	48·0	..	..	..	..	289·3
7/12	0·5	13·0	..	..	..	..	13·5
7/10	14·0	..	..	..	..	..	14·0
19/12	0·5	..	..	..	..	..	0·5
19/13	743·7	..	..	..	..	..	743·7
19/14	1·3	..	..	..	..	..	1·3
19/16	1·3	..	..	..	..	..	1·3
8	10·1	..	..	194·8	17·9	..	222·8
6	0·7	..	..	..	12·0	..	12·7
3/0	..	..	..	..	..	411·2	411·2
7/·135	..	184·9	..	..	..	..	184·9
37/·102	..	..	..	..	..	226·8	226·8
19/·101	26·1	..	..	..	..	..	26·1
Totals ..	1,123·6	247·4	..	194·8	29·9	638·0	2,233·7

Table XXII.—Electric-power Boards of New Zealand as constituted at 31st March, 1933.

Name of Board.	Proclamation constituting Power Board Area gazetted.	Members on Board.	Approximate Area.		Population.		Value of Rateable Property.			Valuation Basis used for Rating Purposes.	Amount of Loan authorized.	Voting for Loan Poll.	
							Used as Rating Basis.	Unimproved.					
			District.	Outer Area.	District.	Outer Area.	District.	District.	Outer Area.			For.	Against
		Number.	Sq. Miles.	Sq. Miles.	Number.	Number.	£	£	£		£	Number.	Number.
Ashburton	17/11/21	12	1,193	1,271	18,200	550	11,500,000	8,314,594	700,000	Capital	411,150	2,999	706
Auckland	1/4/22	12	325	..	225,000	..	73,537,262	50,491,865	..	Capital	2,438,100	11,004	1,367
Banks Peninsula	8/1/20	7	387	..	4,050	..	4,228,528	3,545,448	..	Capital	114,680	658	113
Bay of Plenty	20/8/25	8	460	2,615	8,700	3,100	1,769,657	1,769,657	450,000	Unimproved	206,000	654	153
Buller	11/5/22	5	1,987	..	9,197	..	696,374	696,374	..	Unimproved	Poll not yet taken.		
Cambridge	8/1/20	8	137	..	6,000	..	2,559,567	1,550,262	..	Capital	122,836	749	123
Central	8/7/20	10	985	..	19,010	..	9,038,577	4,838,071	..	Capital	347,000	1,423	131
Central Hawke's Bay	19/10/22	9	1,300	..	11,500	..	6,839,951	6,839,951	..	Unimproved	150,000	543	41
Dannevirke	11/8/21	10	578	118	12,188	426	4,275,674	4,275,674	487,019	Unimproved	224,000	1,584	330
Franklin	29/6/25	9	628	58	16,695	406	7,761,397	4,926,883	..	Capital	329,820	2,471	478
Golden Bay	18/6/25	5	51	..	1,200	..	479,726	248,871	..	Capital	28,000	393	98
Grey	26/10/22	9	640	810	13,250	1,750	2,163,986	645,047	117,700	Capital	296,800	2,337	805
Hawke's Bay	19/6/24	11	1,682	2	45,652	1,100	18,742,764	11,135,473	127,901	Capital	304,000	681	68
Horowhenua	1/12/21	9	630	..	17,150	..	6,898,987	3,403,255	..	Capital	260,000	973	26
Hurunui	31/10/29	7	..	..	5,443	537	..	1,330,629	64,421	Unimproved	Poll not yet taken.		
Hutt Valley	6/7/22, 11/12/24	11	530	..	44,100	..	5,923,460	5,923,460	..	Unimproved	390,000	2,333	343
Malvern	28/6/23	6	308	1,833	3,550	1,500	2,212,392	2,226,780	1,426,740	Capital	65,000	508	33
Manawatu-Oroua	1/12/21	12	1,301	..	40,000	..	12,918,565	12,918,565	..	Unimproved	550,000	1,144	96
Marlborough	25/10/23	8	3,218*	..	14,530*	..	7,715,134	4,360,458*	..	Capital	327,500	1,334	300
North Auckland	29/3/23	12	2,218	..	22,619	..	4,058,081	4,058,081	..	Unimproved	Poll not yet taken.		
North Canterbury	3/3/27	8	858	200	9,064	4,021	6,591,030	5,503,803	1,451,124	Capital	173,700	447	95
Opunake	9/3/21, 11/3/22	7	197	5	4,250	50	1,728,168	916,111	..	Capital	95,000	504	107
Otago Central	26/10/22	9	306	2,378	3,585	1,585	742,782	296,380	727,447	Capital	87,000	430	31
Otago	18/10/23, 31/12/26, 1/11/28, 26/4/30	9	1,391	890	17,931	6,251	4,797,713	3,061,588	1,634,860	Capital	256,500	1,358	196
Poverty Bay	12/6/24	11	1,747	1,344	24,440	8,610	14,461,734	6,140,499	3,110,233	Capital	379,750	2,319	530
Reefton	30/6/21	4	24	..	1,639	..	178,055	38,504	..	Capital	Poll not yet taken.		
South Canterbury	3/7/24	12	1,673	3,579	35,618	6,980	15,096,516	12,946,839	2,640,530	Capital	380,220	1,919	587
South Taranaki	30/4/25, 5/2/31	10	434	46	16,280	1,220	9,059,095	5,296,444	79,442	Capital	227,500	1,237	300
Southland	13/11/19, 19/11/19	12	7,918	3,035	68,000	30	11,957,390	11,957,390	110,000	Unimproved	1,650,000	6,516	415
Springs-Ellesmere	1/7/20	5	519	5	12,330	..	7,856,719	5,678,061	23,000	Capital	166,520	1,352	105

* Includes outer area.

TABLE XXII.—ELECTRIC-POWER BOARDS OF NEW ZEALAND AS CONSTITUTED AT 31ST MARCH, 1933—*continued*.

Name of Board.	Proclamation constituting Power Board Area gazetted.	Members on Board.	Approximate Area.		Population.		Value of Rateable Property.			Valuation Basis used for Rating Purposes.	Amount of Loan authorized.	Voting for Loan Poll.	
							Used as Rating Basis.	Unimproved.					
			District.	Outer Area.	District.	Outer Area.	District.	District.	Outer Area.			For.	Against
		Number.	Sq. Miles.	Sq. Miles.	Number.	Number.	£	£	£		£	Number.	Number.
Taranaki	18/5/22 6/5/26 20/5/26	8	355	1,333	13,985	8,015	6,141,672	2,865,396	3,109,336	Capital	435,000	1,026	252
Tararua	23/3/22	10	700	524	8,115	1,805	2,815,000	2,815,000	1,262,581	Unimproved ..	200,000	714	83
Tauranga	14/6/23	7	646	3	8,490	4,100	1,004,966	1,004,966	477,045	Unimproved ..	144,500	1,192	417
Te Awamutu	8/1/20	8	270	..	7,650	..	3,699,132	2,353,948	..	Capital	178,000	757	146
Teviot	22/7/22	7	102	..	1,800	..	176,839	255,661	..	Unimproved ..	55,500	280	32
Thames Valley	8/1/19	12	2,295	6	38,700	3,150	14,785,086	7,709,621	43,047	Capital	850,000	3,210	988
Waimea	1/5/29	7	434	1,126	9,870	13,500	3,136,175	2,131,185	..	Capital	79,000	1,184	279
Wairarapa	25/3/20	9	606	1,390	19,650	4,350	9,683,051	5,465,547	2,753,453	Capital	330,600	2,295	312
Wairere	9/10/24 4/11/26 21/3/29	7	382	25	2,500	200	696,621	696,621	163,379	Unimproved ..	45,850	94	8
Wairoa	29/7/20	10	1,354	..	5,520	..	3,961,443	1,758,663	..	Capital*	100,000	504	31
Waitaki	9/8/23	9	520	1,853	17,000	2,500	6,735,789	4,406,970	239,322	Capital	145,650	1,286	124
Waitemata	18/10/23 27/11/24 26/8/26 7/3/29	12	627	..	40,485	..	12,741,615	5,678,451	..	Capital	380,000	6,676	1,834
Waitomo	6/3/24	7	160	1,100	5,000	3,000	1,066,361	1,066,361	..	Unimproved ..	119,000	557	90
Wanganui-Rangitikei ..	1/12/21	12	1,648	972	52,000	3,000	22,099,617	6,568,540	1,408,210	Capital	375,000	1,315	214
Westland†	28/10/20	9	750	..	3,272	..	196,268	196,268	..	Unimproved ..	Poll not yet taken.		
Totals, 1932–33 ..	..	401	44,474	26,521	965,208	81,736	344,728,919	230,308,215	22,606,790	..	13,419,176	68,960	12,387
Totals, 1931–32 ..	..	401	44,015	25,395	942,399	67,086	345,260,228	230,370,604	22,621,315	..	13,195,148	66,291	12,349

* "Unimproved" basis in Wairoa Borough. † License delegated to Westland Power, Ltd.

Table XXIII.—Electric-power Boards.—Financial Statistics for the Year ended 31st March, 1933.

Name of Board.	Main Supply commenced.	Capital Outlay.	Revenue.					Expenditure.				Profit.	Loss.	Rates.					
			Sale of Electricity.		Sale of Materials (Profit).	General.	Total (not including Rates).	Power.†	General.	Capital Charges.*	Total Annual Costs.			General Rate.		Availability Rate.		Special Rates.	
			Bulk.	Retail.										Levied.	Collected.	Levied.	Collected.	Levied.	Collected.
		£	£	£	£	£	£	£	£	£	£	£	£	d.	£	d.	£	d.	£
1. Ashburton ..	1923	357,784	..	43,044	..	776	43,820	15,742	3,358	22,756	41,856	1,964	..	..	..	..	..	..	..
2. Auckland	1908	3,406,366	3,105	618,179	..	53,338	674,622	278,504	46,633	299,555	624,692	49,930	..	..	..	..	..	..	..
3. Banks Peninsula ..	1921	103,187	..	11,095	3	520	11,618	6,032	1,731	7,873	15,636	..	4,018	$\frac{1}{30}$ and $\frac{4}{25}$	3,150[1]	..	..	..	..
4. Bay of Plenty ..	1928	209,089	..	36,822	1,587	894	39,303	17,311	4,347	15,096	36,754	2,549	..	..	..	..	..	..	..
5. Buller‡	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6. Cambridge ..	1921	110,324	..	19,090	52	781	19,923	10,149	2,077	6,940	19,166	757	..	..	..	..	..	..	..
7. Central	1921	348,204	56	56,781	202	2,579	59,618	24,136	5,653	26,255	56,044	3,574	..	..	..	..	..	..	..
8. Central Hawke's Bay	1925	138,344	..	21,429	..	1,271	22,700	10,069	2,460	10,447	22,976	..	276	..	..	..	..	..	..
9. Dannevirke ..	1925	213,820	..	28,038	..	1,971	30,009	9,462	3,135	17,364	29,961	48	..	..	..	..	..	..	..
10. Franklin	1925	288,790	..	45,381	730	4,014	50,125	20,325	5,021	20,077	45,423	4,702	..	..	..	..	..	..	..
11. Golden Bay ..	1929	25,788	..	3,674	67	174	3,915	557	962	2,284	3,803	112	..	..	..	..	..	..	15[2]
12. Grey	1926	283,579	..	31,702	197	2,221	34,120	7,681	6,280	19,689	33,650	470	..	..	..	..	..	..	..
13. Hawke's Bay ..	1927	221,055	25,519	36,155	209	1,433	63,316	36,037	4,736	18,256	59,029	4,287	..	..	..	..	..	..	..
14. Horowhenua ..	1924	212,293	..	43,496	..	2,228	45,724	22,746	4,174	17,931	44,851	873	..	..	..	..	..	..	..
15. Hurunui‡	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16. Hutt Valley ..	1925	386,414	..	99,704	320	2,693	102,717	54,514	9,287	34,929	98,730	3,987	..	..	..	..	..	..	..
17. Malvern	1925	65,098	..	7,111	9	767	7,887	3,891	1,481	4,469	9,841	..	1,954	$\frac{1}{4}$	2,000	..	..	..	..
18. Manawatu-Oroua ..	1924	512,150	14,851	60,097	283	2,391	77,622	39,400	5,567	36,251	81,218	..	3,596	..	..	..	..	..	..
19. Marlborough ..	1927	322,537	..	29,607	..	480	30,087	5,004	2,902	22,821	30,727	..	640	..	..	..	2,928[2]	..	..
20. North Auckland‡ ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21. North Canterbury ..	1928	143,122	2,998	20,527	3	1,240	24,768	9,744	4,349	10,075	24,168	600	..	..	..	..	..	..	..
22. Opunake	1924	108,994	..	12,479	..	259	12,738	3,029	1,636	7,529	12,194	544	..	..	..	..	..	..	..
23. Otago Central ..	1925	89,433	..	9,536	42	177	9,755	1,975	1,614	6,219	9,808	..	53	..	..	..	..	..	..
24. Otago	1926	283,712	..	38,973	..	24	38,997	13,999	5,109	20,317	39,425	..	428	$\frac{1}{20}$	242[1]	..	..	$\frac{13}{20}$, $\frac{7}{10}$, $\frac{3}{4}$	8,654[1]
25. Poverty Bay ..	1912	331,474	..	53,566	187	899	54,652	20,596	7,463	23,865	51,924	2,728	..	..	..	..	..	..	..
26. Reefton‡	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
27. South Canterbury ..	1925	325,565	11,044	42,731	185	2,687	56,647	26,604	3,128	25,645	55,377	1,270	..	..	..	..	..	..	..
28. South Taranaki ..	1929	196,031	1,292	26,836	569	521	29,218	6,864	4,879	14,121	25,864	3,354	..	..	..	..	..	..	..
29. Southland	1925	1,660,102	18,689	99,965	41	15,206	133,901	30,177	8,643	124,697	163,517	..	29,616	$\frac{3}{4}$ and $\frac{3}{16}$	37,286[1]	..	..	..	..
30. Springs-Ellesmere ..	1922	156,085	..	28,915	..	177	29,092	12,956	3,879	10,172	27,007	2,085	..	..	..	..	..	..	..
31. Taranaki	1927	456,941	4,754	35,275	..	3,286	43,315	7,028	5,301	34,986	47,315	..	4,000	..	..	..	2,350[2]	..	..
32. Tararua	1925	164,559	..	22,069	290	864	23,223	8,345	2,853	11,940	23,138	85	..	..	..	..	..	..	..
33. Tauranga	1926	132,191	..	22,520	..	1,109	23,629	10,223	2,088	9,774	22,085	1,544	..	..	..	..	..	..	..
34. Te Awamutu ..	1921	186,023	..	29,319	43	1,127	30,489	12,173	2,279	11,878	26,330	4,159	..	..	..	..	..	..	..
35. Teviot	1924	57,958	1,090	4,673	..	374	6,137	1,170	1,022	4,461	6,653	..	516	..	1[2]	..	..	..	..

* Includes interest, sinking-fund, and depreciation payments.

† Includes wages, stores, and fuel (if any).

‡ Not yet actively functioning.

[1] Includes arrears for previous years.

[2] Arrears only.

TABLE XXIII.—ELECTRIC-POWER BOARDS.—FINANCIAL STATISTICS FOR THE YEAR ENDED 31ST MARCH, 1933—*continued.*

Name of Board.	Main Supply commenced.	Capital Outlay.	Revenue.					Expenditure.				Profit.	Loss.	Rates.					
			Sale of Electricity.		Sale of Materials (Profit).	General.	Total (not including Rates).	Power.†	General.	Capital Charges.*	Total Annual Costs.			General Rate.		Availability Rate.		Special Rates	
			Bulk.	Retail.										Levied.	Collected.	Levied.	Collected.	Levied.	Collected.
		£	£	£	£	£	£	£	£	£	£	£	£	d.	£	d.	£	d.	£
36. Thames Valley ..	1921	825,634	7,946	109,372	12	3,360	120,690	50,266	10,038	60,558	120,862	..	172	..	..	..	..	..	..
37. Waimea‡	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
38. Wairarapa ..	1923	359,291	..	52,492	..	3,283	55,775	13,062	10,138	28,327	51,527	4,248	..	..	..	..	..	..	..
39. Wairere	1925	42,006	..	4,989	..	618	5,607	1,092	1,632	3,287	6,011	..	404	..	..	..	..	..	..
40. Wairoa	1923	62,461	4,233	5,796	..	619	10,648	7,493	2,100	5,671	15,264	..	4,616	..	..	..	..	..	95[2]
41. Waitaki	1926	179,341	..	28,127	137	660	28,924	13,992	2,699	13,004	29,695	..	771	..	..	..	..	..	..
42. Waitemata ..	1926	397,524	..	72,696	..	3,493	76,189	31,774	8,656	32,678	73,108	3,081	..	..	..	..	..	..	..
43. Waitomo	1926	100,210	..	18,738	18	30	18,786	8,404	1,666	6,652	16,722	2,064	..	..	..	..	..	..	..
44. Wanganui-Rangitikei	1924	562,841	330	93,791	23	4,213	98,357	43,802	6,711	46,977	97,490	867	..	..	..	..	..	..	..
45. Westland§	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Totals, 1932–33 ..	..	14,026,320	95,907	2,024,790	5,209	122,757	2,248,663	896,328	207,687	1,095,826	2,199,841	99,882	51,060	..	..	..	..	..	..
Totals, 1931–32 ..	..	13,847,760	108,335	2,020,857	4,555	69,738	2,203,485	908,116	223,838	944,868	2,076,822	181,109	54,446	..	..	..	..	..	..

* Includes interest, sinking-fund, and depreciation payments. † Includes wages, stores, and fuel (if any). ‡ Not yet actively functioning. § License delegated to Westland Power Co. [2] Arrears only.

Table XXIV.—Electric-supply Stations of New Zealand at 31st March, 1933.

Title.	Supply commenced.	Population included in Area of Supply.	Number of Consumers.	Rated Capacity. Main Plant.		Rated Capacity. Standby Plant.		Maximum Load.	Connected Load. Including Bulk Supply.	Connected Load. Excluding Bulk Supply.	Demand Factor.	Units. Generated.	Purchased.	Total generated and purchased.	Sold. Including Bulk Supply for Resale.	Sold. To Consumers.	Non-productive.	Percentage Non-productive.	Annual Load Factor.	Average Units sold (excluding Sales in Bulk) per Consumer.	Average Units sold (excluding Sales in Bulk) per Capita of Population.	System of Supply.	Supply Voltage.	Route-miles of Lines.	Static Head.
				Kw.	Kv.a.	Kw.	Kv.a.	Kw.	Kw.	Kw.	Per Cent.	No.	No.	No.	No.	No.	No.	Per Cent.	Per Cent.	No.	No.			Miles ch.	Ft.
Steam Station.																									
1. Nelson City Council	1923	11,500	2,652	750	937	500	625	800	..	6,913	11·57	2,145,040	..	2,145,040	1,725,220	1,634,275	419,820	19·57	30·61	616	142	A.C.	400/230	47 50	..
Totals, steam station	..	11,500	2,652	750	937	500	625	..	..	6,913	11·57	2,145,040	..	2,145,040	1,725,220	1,634,275	419,820	19·57	30·61	616	142	..	..	47 50	..
Gas Stations.																									
1. Kaikoura County Council	1922	630	148	37	47	..	..	30	..	115	26·07	42,970	..	42,970	..	35,100	7,870	18·30	16·35	237	56	A.C.	400/230	5 0	..
2. Motueka Borough Council	1922	1,750	357	52	65	..	..	54	..	256	21·10	75,019	..	75,019	..	59,741	15,278	20·40	15·85	167	34	A.C.	400/230	11 56	..
Totals, gas stations	..	2,380	505	89	112	..	..	..	..	371	..	117,989	..	117,989	..	94,841	23,148	19·63	..	..	..	..	..	16 56	..
Oil Stations.																									
1. Picton Borough Council	1917	1,300	344	141	D.C.	..	..	72	..	521	13·80	155,470	..	155,470	..	109,531	45,939	29·50	24·65	318	84	D.C.	460/230	10 10	279
2. Spender, Paul (Rawene)	1926	300	53	25	D.C.	20	D.C.	14	..	60	23·44	13,006	..	13,006	..	12,886	120	0·92	10·60	243	43	D.C.	230	0 70	..
3. Uawa County Council	1925	400	95	30	D.C.	..	..	13	..	61	21·85	19,553	..	19,553	..	13,790	5,763	29·50	16·66	145	35	D.C.	230	3 0	..
Totals, oil stations	..	2,000	492	196	..	..	..	..	..	642	..	188,029	..	188,029	..	136,207	51,822	27·60	..	..	..	..	..	14 0	..
Hydro Stations.																									
1. Alderton Utility Co.	1930	280	40	90	110	..	..	76	..	199	38·10	270,760	..	270,760	..	230,760	40,000	14·77	40·75	5,769	824	A.C.	230	8 56	123
2. Arapuni-Horahora (Public Works Dept.)	1921	(397,600)	..	70,600	83,810	5,250	6,564	54,020	302,026	9,021	17·90	278,082,120	6,395,886	284,478,006	257,109,806	21,714,297	27,368,200	9·62	60·10	..	..	A.C.	400/230	619 70	A.175/ H.27
Auckland Power Board	1908	225,000	49,115	..	..	41,160[1]	44,437	(31,512)	..	185,403	17·00	9,554,590	137,531,600	147,086,190	125,527,959	123,579,831	21,558,231	14·65	52·60	2,150	549	A.C./D.C.	400/230/460	1,085 40	..
Bay of Plenty Power Board ..	1928	8,700	1,392	..	..	..	..	(1,383)	..	6,553	21·10	..	9,145,250	9,145,250	..	8,016,601	1,128,649	12·35	75·50	5,750	921	A.C.	400/230	246 65	..
Cambridge Power Board ..	1921	6,000	1,439	..	..	..	..	(744)	..	3,075	24·20	..	4,812,480	4,812,480	..	3,922,170	890,310	18·50	73·90	2,730	654	A.C.	400/230	186 0	..
Central Power Board	1921	19,010	4,336	..	..	..	..	(2,238)	..	14,422	15·52	..	12,975,450	12,975,450	10,220,750	10,196,525	2,754,700	21·20	66·20	2,345	535	A.C.	400/230	554 44	..
Franklin Power Board	1925	17,101	3,383	..	..	187	220	(2,016)	..	10,194	19·78	..	11,644,796	11,644,796	..	9,880,244	1,764,552	15·15	65·94	2,921	578	A.C.	400/230	502 38	..
Hamilton Borough Council ..	1913	15,500	4,191	..	..	..	..	(1,452)	..	10,159	14·29	..	4,984,900	4,984,900	..	4,450,151	534,749	10·73	39·19	1,062	287	A.C.	400/230	54 60	..
North Auckland Power Board[11] ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Rotorua Tourist (Department) ..	1901	5,500	1,941	..	..	350	438	(634)	..	4,739	13·37	403,473	2,354,184	2,757,657	..	1,929,917	827,740	30·00	49·65	994	351	A.C.	400/230, 200/115	61 60	14
Te Awamutu Power Board ..	1921	7,650	1,776	..	..	..	..	(1,162)	..	6,192	18·80	..	6,499,056	6,499,056	5,515,620	5,509,112	983,436	15·13	63·80	3,105	721	A.C.	400/230	312 50	..
Thames Valley Power Board ..	1921	34,685	6,575	..	..	..	..	(4,186)	25,502	21,808	16·41	..	26,707,188	26,707,188	23,446,505	20,124,419	3,260,683	12·21	72·83	3,061	580	A.C.	400/230	773 38	..
Thames Borough Council ..	1914	4,750	1,147	..	..	205	D.C.	(309)	..	1,652	18·70	55,000	1,184,390	1,239,390	..	961,824	277,566	22·40	45·80	838	202	A.C./D.C.	400/230/460	21 40	130
Te Aroha Borough Council ..	1906	2,550	720	..	..	120	158	(229)	..	2,042	11·22	192,080	817,420	1,009,500	..	885,052	124,448	12·34	50·30	1,230	347	A.C.	400/230	15 49	600
Waitemata Power Board ..	1926	40,485	9,079	..	..	..	..	(2,861)	..	23,252	12·30	..	14,227,080	14,227,080	..	12,122,930	2,104,150	14·75	56·80	1,335	300	A.C.	400/230	483 45	..
Waitomo Power Board	1926	8,000	1,199	..	..	..	..	(749)	..	3,514	21·31	..	3,192,742	3,192,742	..	2,633,521	559,221	17·52	48·67	2,196	329	A.C.	400/230	100 20	..
3. Coleridge (Public Works Dept.)	1915	..	..	34,500	40,640	5,760	7,200	30,140	217,955	18,062	13·83	132,806,480	..	132,806,480	121,471,889	20,472,503	11,334,591	8·54	50·30	..	..	A.C.	400/230	604 32	480
Ashburton Power Board ..	1923	18,200	3,611	..	..	160	200	(1,437)	..	14,012	10·25	16,037	6,316,083	6,332,120	..	4,780,878	1,551,242	24·57	50·30	1,326	263	A.C.	400/230	870 23	..
Banks Peninsula Power Board ..	1921	4,050	974	..	..	72[2]	90	(390)	..	4,006	9·73	57,223	1,730,500	1,787,723	..	1,214,944	572,779	32·00	52·40	1,248	300	A.C.	400/230	201 28	310
Christchurch City Council ..	1904	95,000	28,158	..	..	400	D.C.	(14,082)	113,452	100,180	12·40	..	57,016,042	57,016,042	50,453,090	45,224,341	6,562,952	11·50	46·25	1,607	476	A.C./D.C.	400/230/460	322 47	..
Waimairi County Council ..	1916	13,000	3,280	..	..	..	..	(1,137)	..	13,272	8·56	..	5,312,190	5,312,190	4,780,971	4,776,516	531,219	10·00	53·30	1,459	368	A.C.	400/230	142 60	..
Halswell County Council* ..	1919	1,850	275	..	..	..	..	(142)	..	516	27·50	..	566,622	566,622	..	480,000	86,622	15·28	45·60	1,744	260	A.C.	400/230	22 0	..
Heathcote County Council ..	1914	6,000	1,503	..	..	..	..	(647)	..	5,068	12·75	..	2,281,233	2,281,233	..	2,000,400	280,833	12·30	40·25	1,330	333	A.C.	400/230	31 20	..
Hurunui Power Board[11] ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10 6	..
Lyttelton Borough Council ..	1918	3,710	767	..	..	..	..	(234)	..	2,728	8·58	..	890,898	890,898	..	718,418	172,480	19·35	43·50	937	194	A.C.	400/230	182 18	..
Malvern Power Board	1925	5,050	656	..	..	..	..	(212)	..	2,552	8·33	..	873,000	873,000	..	551,511	321,489	36·80	46·90	840	109	A.C.	400/230	353 55	..
North Canterbury Power Board ..	1928	9,064	1,642	..	..	..	..	(960)	8,398	6,061	11·41	..	4,412,533	4,412,533	3,913,024	3,122,390	499,509	11·32	52·50	1,900	345	A.C.	400/230	16 0	..
Kaiapoi Borough Council ..	1917	1,700	462	..	..	..	..	(122)	..	736	16·58	..	333,180	333,180	..	302,650	30,530	9·16	31·10	655	178	A.C.	400/230	13 29	..
Rangiora Borough Council ..	1919	2,100	600	..	..	..	..	(190)	..	1,601	11·86	..	460,000	460,000	..	443,724	16,276	3·54	27·60	740	211	A.C.	400/230	18 20	..
Riccarton Borough Council ..	1916	5,500	1,360	..	..	..	..	(537)	..	5,078	10·58	..	2,488,360	2,488,360	..	2,225,000	263,360	10·58	52·90	1,636	404	A.C.	400/230	728 35	66
South Canterbury Power Board ..	1925	24,598	3,677	..	..	29	36	(2,743)	22,812	11,222	12·03	26,820	13,257,382	13,284,152	11,808,211	6,269,977	1,475,941	11·10	55·30	1,703	255	A.C.	400/230	58 35	..
Timaru Borough Council ..	1908	18,000	3,777	..	..	..	..	(1,287)	..	11,590	11·10	..	5,538,234	5,538,234	..	4,881,920	656,314	11·85	49·10	1,293	271	A.C.	400/230	307 45	..
Springs-Ellesmere Power Board ..	1922	12,330	2,433	..	..	..	..	(1,280)	..	8,790	14·57	..	5,586,563	5,586,563	..	4,527,047	1,059,516	18·94	49·80	1,860	367	A.C.	400/230	9 40	..
Sumner Borough Council ..	1918	3,500	1,011	..	..	..	..	(322)	..	2,117	15·20	..	1,355,950	1,355,950	..	1,208,187	147,763	10·90	48·20	1,194	345	A.C.	400/230	9 40	..
Waitaki Power Board	1926	19,500	3,396	..	..	312	390	(1,300)	..	10,364	12·53	226,257	5,668,347	5,894,604	..	4,717,648	1,176,956	20·00	51·70	1,388	242	A.C.	400/230	366 53	250
4. Dunedin City Council	1907	92,000	25,439	17,000	21,250	2,735[3]	2,340	(14,527)	81,999	70,825	17·70	62,360,570	..	62,360,570	51,201,576	45,352,151	11,158,994	17·82	49·00	1,595	493	A.C./D.C.	400/230/500	542 26	700
Otago Power Board	1926	17,931	3,877	..	..	..	..	(1,402)	..	11,174	12·55	..	5,849,425	5,849,425	..	4,908,155	941,270	16·08	47·60	1,265	274	A.C.	400/230	604 0	..
5. Golden Bay Power Board	1929	1,200	330	175	250	..	..	189	..	848	22·29	633,860	688	634,548	..	489,215	145,333	22·90	38·33	1,482	408	A.C.	400/230	58 20	330
6. Grey Power Board	1926	13,250	2,764	3,060	3,600	..	..	1,400	..	8,232	17·00	6,438,117	..	6,438,117	..	5,020,743	1,417,374	22·00	52·50	1,815	379	A.C.	400/230	142 42	36

* Since taken over by Christchurch City Council. [1] 5,610 kw. D.C. [2] Limited to 30 kw. by Pelton-wheel capacity. [3] 860 kw. D.C. [11] Not yet operating.

Table XXIV.—Electric-supply Stations of New Zealand at 31st March, 1933—*continued.*

Title.	Supply commenced.	Population included in Area of Supply.	Number of Consumers.	Rated Capacity. Main Plant.		Rated Capacity. Standby Plant.		Rated Capacity. Maximum Load.	Connected Load. Including Bulk Supply.	Connected Load. Excluding Bulk Supply.	Demand Factor.	Units. Generated.	Purchased.	Total generated and purchased.	Sold. Including Bulk Supply for Resale.	Sold. To Consumers.	Non-productive.	Percentage Non-productive.	Annual Load Factor.	Average Units sold (excluding Sales in Bulk) per Consumer.	Average Units sold (excluding Sales in Bulk) per Capita of Population.	System of Supply.	Supply Voltage.	Route-miles of Lines.	Static Head.
HYDRO STATIONS—*continued.*		No.	No.	Kw.	Kv.a.	Kw.	Kv.a.	Kw.	Kw.	Kw.	Per Cent.	No.	No.	No.	No.	No.	No.	Per Cent.	Per Cent.	No.	No.			Miles ch.	Ft.
7. Havelock North Town Board ..	1916	1,163	299	144	160	..	..	126	..	827	15·23	313,800	146,099	459,899	..	418,407	41,492	9·02	41·70	1,400	360	A.C.	400/230	16 46	50
8. Kanieri Electric, Ltd. ..	1921	2,500	629	1,280	1,600	150	187	710	..	1,659	42·80	4,625,700	..	4,625,700	..	3,779,054	846,646	18·30	74·37	6,008*	1,512	A.C.	400/230	24 42	250/110
9. Kaponga Town Board	1916	1,200	365	141[4]	120	..	..	205	..	705	29·05	656,129	51,300	707,429	..	508,321	199,108	22·20	39·40	1,390	424	A.C./D.C.	400/230/460	51 60	58/31
10. Mangahao - Waikaremoana (Public Works Dept.)	1925	..	..	52,000	65,000	..	..	47,980	360,697	8,706	12·40	241,969,796	148,681	242,118,477	205,381,908	7,599,302	36,736,569	15·16	57·65	..	..	A.C.	400/230	504 65	M.896/ W.676
Central Hawke's Bay Power Board	1925	11,500	1,593	..	..	..	..	(785)	..	4,492	17·48	..	4,368,742	4,368,742	..	3,801,254	567,488	12·98	63·50	2,380	330	A.C.	400/230	224 5	..
Dannevirke Power Board ..	1925	12,614	2,502	..	..	..	..	(646)	..	6,721	9·60	..	4,136,929	4,136,929	..	3,743,722	393,207	9·50	73·20	1,497	297	A.C.	400/230	319 74	..
Hawke's Bay Power Board ..	1927	13,675	2,498	..	..	..	..	(4,104)	29,662	12,341	13·68	..	22,235,621	22,235,621	20,687,418	8,806,059	1,548,203	6·96	61·90	3,340	612	A.C.	400/230	275 20	..
Hastings Borough Council ..	1912	12,713	3,426	..	..	1,087[5]	650	(1,122)	..	8,531	13·15	17,440	3,525,660	3,543,100	..	2,879,911	663,189	18·70	36·10	842	227	A.C./D.C.	400/230/460	57 13	..
Napier Borough Council ..	1913	18,000	4,470	..	..	400	500	(1,682)	..	8,790	9·07	129	8,209,600	8,209,729	..	7,464,937	744,792	9·07	55·70	1,670	415	A.C.	400/230	35 79	..
Horowhenua Power Board ..	1924	17,150	3,956	..	..	..	..	(1,904)	..	11,903	16·00	..	9,936,412	9,936,412	..	8,596,602	1,339,810	13·48	59·50	2,170	500	A.C.	400/230	317 67	..
Hutt Valley Power Board ..	1925	44,100	11,192	..	..	..	..	(5,130)	..	41,000	12·50	..	23,048,790	23,048,790	..	19,953,843	3,094,947	13·40	51·25	1,782	452	A.C	400/230	294 64	..
Manawatu-Oroua Power Board ..	1924	39,011	4,515	..	..	..	..	(3,720)	36,056	17,666	10·32	..	24,746,075	24,746,075	22,108,628	10,045,428	2,637,447	10·65	76·00	2,220	258	A.C.	400/230	606 20	..
Palmerston North City Council	1924	22,850	5,780	..	..	1,020	1,275	(2,639)	..	18,390	14·35	467,362	12,063,200	12,530,562	..	11,230,708	1,299,854	10·37	54·20	1,940	491	A.C.	400/230	81 39	..
Poverty Bay Power Board ..	1912	24,440	4,745	..	..	1,330[6]	850	(1,880)	..	16,358	11·20	46,952	8,380,846	8,427,798	..	6,719,207	1,708,591	20·30	52·50	1,416	275	A.C./D.C.	400/230/460	365 24	..
South Taranaki Power Board ..	1929	16,280	2,891	..	..	1,067	1,269	(945)	6,257	5,807	15·10	1,428,480	2,254,821	3,683,301	2,990,881	2,625,679	692,420	18·78	44·50	923	164	A.C.	400/230	177 31	57
Patea Borough Council ..	1901	1,800	358	..	..	152	190	(140)	..	450	31·10	131,489	365,202	496,691	..	437,629	59,062	11·90	40·50	1,223	243	A.C.	400/230	13 60	78
Tararua Power Board	1925	8,115	1,595	..	..	..	..	(641)	..	5,403	11·86	..	3,615,293	3,615,293	..	3,076,531	538,762	14·90	64·50	1,930	379	A.C.	400/230	209 72	..
Wairarapa Power Board ..	1923	19,500	4,503	..	..	837	1,188	(1,754)	..	16,806	10·43	(2,304,725)[8]	9,400,350[9]	9,400,350	..	8,044,718	1,355,632	14·40	62·20	1,785	412	A.C.	400/230	510 0	429/290
Wairoa Power Board	1923	5,520	352	..	..	..	..	(768)	3,780	1,317	20·32	..	3,250,894	3,250,894	2,685,207	739,156	565,687	17·40	48·30	2,100	134	A.C.	400/230	94 8	..
Wairoa Borough Council ..	1913	2,400	618	..	..	..	..	(355)	..	2,463	14·40	..	1,827,230	1,827,230	..	1,654,085	173,145	9·47	58·75	2,680	690	A.C.	400/230	13 64	..
Wanganui-Rangitikei Power Board	1924	52,000	10,013	..	..	1,500	1,875	(4,036)	34,702	34,456	11·70	28,884	21,524,933	21,553,817	17,445,325	17,315,325	4,108,492	19·08	61·00	1,617	33	A.C.	400/230	706 0	..
Mangaweka Town Board ..	1913	415	111	..	..	32	40	(33)	..	246	13·40	..	137,303	137,303	..	113,066	24,237	17·65	47·50	1,020	272	A.C.	400/230	10 0	37
Wellington City Council..	1907	110,000	35,444	..	..	10,000[7]	11,250	(17,736)	..	138,851	12·77	101,427	56,482,600	56,584,027	..	48,997,381	7,586,646	13·40	36·40	1,100	445	A.C./D.C.	400/230/500	305 77	..
11. Marlborough Power Board ..	1927	14,530	2,616	1,000	1,250	420	530	960	..	8,714	11·02	5,664,750	..	5,664,750	..	4,297,783	1,366,967	24·13	67·36	1,643	296	A.C.	400/230	275 0	100
12. Mataura Borough Council[12] ..	1913	1,300	373	60	75	..	..	74	..	355	20·85	..	107,820	107,820	..	80,370	27,450	25·46	16·63	216	62	A.C.	400/230	9 0	22
13. Murchison County Council ..	1922	500	131	80	100	..	..	88	..	303	29·00	254,090	..	254,090	..	143,630	110,460	43·50	33·00	1,097	287	A.C.	400/230	15 60	105
14. New Plymouth Borough Council ..	1905	21,000	6,055	4,250	5,300	300	350	3,600	22,651	20,475	16·17	12,048,169	4,400,300	16,448,469	13,743,017	12,448,383	2,705,452	16·44	52·20	1,980	605	A.C./D.C.	400/230/500	297 27	120/240
Inglewood Borough Council ..	1905	1,300	413	..	..	..	..	(150)	..	1,331	11·27	..	574,677	574,677	..	515,639	59,038	10·28	43·70	1,248	396	A.C.	400/230	8 10	..
Waitara Borough Council ..	1905	1,850	482	..	..	..	..	(128)	..	845	15·15	..	421,480	421,480	..	370,385	51,095	12·10	37·60	770	200	A.C.	400/230	12 70	..
15. Ohakune Borough Council ..	1914	1,940	454	90	120	113	141	106	..	701	15·12	269,600	56,700	326,300	..	269,376	56,924	17·44	35·10	594	139	A.C.	400/230	15 40	42
16. Opunake Power Board ..	1924	6,000	1,500	314	450	148	185	470	..	2,264	20·73	1,562,200	298,477	1,860,677	..	1,444,318	416,359	22·40	45·20	963	241	A.C.	400/230	152 0	47
17. Queenstown Borough Council ..	1924	845	232	48	60	..	..	80	..	337	23·75	130,010	..	130,010	..	106,144	23,866	18·35	18·55	458	126	A.C.	400/230	6 0	510
18. Raetihi Borough Council ..	1917	4,500	389	280	350	96	120	220	..	845	26·04	492,430	..	492,430	459,853	403,153	32,577	6·62	25·55	1,036	90	A.C.	400/230	28 0	380
19. Reefton (Company) ..	1887	1,300	310	86	D.C.	86	D.C.	115	..	186	61·80	116,000	..	116,000	..	86,000	30,000	25·85	11·50	277	66	D.C.	230	7 20	27
20. Southland Power Board ..	1925	48,250	9,299	6,000	7,050	..	..	6,340	47,136	32,116	13·44	24,595,900	32,894	24,628,794	17,719,907	12,073,465	6,908,887	28·00	44·40	1,300	250	A.C.	400/230	2,395 10	154
Bluff Borough Council ..	1903	1,700	445	..	..	..	..	(265)	..	1,300	20·38	..	414,342	414,342	..	339,517	74,825	18·06	17·85	763	200	A.C.	400/230	9 51	..
Invercargill City Council ..	1914	21,000	5,229	..	..	1,975[10]	2,320	(1,728)	..	13,720	12·59	4,100	5,232,100	5,236,200	..	4,509,616	726,584	13·88	34·59	749	215	A.C.	400/230	79 5	..
21. Taranaki Power Board ..	1927	13,985	2,197	3,200	3,600	..	..	1,882	9,541	7,236	19·73	10,558,200	..	10,558,200	7,998,248	5,648,648	2,559,952	24·25	64·10	2,570	404	A.C.	400/230	319 9	300
Stratford Borough Council ..	1898	3,500	1,042	..	..	..	..	(450)	..	2,305	19·50	..	2,298,300	2,298,300	..	1,923,667	374,633	16·30	58·35	1,846	550	A.C.	400/230	16 0	..
22. Taihape Borough Council ..	1913	2,450	622	150	D.C.	125	D.C.	185	..	1,035	17·87	494,540	..	494,540	..	462,862	31,678	6·40	30·50	745	189	A.C./D.C.	400/230/460	10 25	30
23. Taumarunui Borough Council ..	1924	4,000	809	424	500	..	..	320	1,778	1,656	17·95	872,555	..	872,555	706,555	677,297	166,000	19·00	31·10	837	169	A.C.	400/230	12 40	25
Manunui Town Board ..	1929	850	160	..	..	..	..	(25)	..	122	20·50	..	29,258	29,258	..	26,988	2,270	7·76	13·35	169	32	A.C.	400/230	4 68	..
24. Tauranga Borough Council ..	1915	2,850	985	3,040	3,500	640	800	3,480	7,375	2,683	46·80	11,919,956	..	11,919,956	9,726,684	2,385,669	2,193,272	18·40	39·20	2,420	837	A.C.	400/230	64 20	110/80
Tauranga Power Board ..	1926	8,490	1,084	..	..	..	..	N.A.	..	3,906	..	..	3,631,430	3,631,430	..	3,631,430	N.A.	..	..	3,350	428	A.C.	400/230	336 21	..
Te Puke Town Board ..	1921	980	296	..	..	..	..	(132)	..	786	16·73	..	603,675	603,675	..	529,879	73,796	12·23	52·40	1,790	540	A.C.	400/230	11 37	..
25. Teviot Power Board ..	1924	1,800	402	750	930	..	..	740	3,220	1,131	23·00	3,905,142	..	3,905,142	3,352,424	1,301,584	552,718	14·14	60·30	3,240	723	A.C.	400/230	68 0	380
Otago Central Power Board	1925	2,537	906	..	..	..	..	(398)	..	2,089	19·04	..	2,050,840	2,050,840	..	1,820,540	230,300	11·23	58·80	2,010	718	A.C.	400/230	164 0	..
26. Waimea Electric Co. ..	1912	4,000	791	80	100	32	40	121	..	1,306	9·27	166,912	91,663	258,575	..	204,575	54,000	20·85	24·40	260	51	A.C.	400/230	39 40	11/15
27. Wairua (Wilson's Cement Co.) ..	1916	510	71	2,000	2,500	3,190	3,750	2,200	11,585	5,660	19·00	8,519,750	..	8,519,750	7,610,407	5,283,867	909,343	10·68	44·20	1,613	225	A.C.	400/230	43 33	130
Whangarei Borough Council ..	1915	7,790	2,092	..	..	..	..	(645)	5,925	5,663	10·89	..	2,326,540	2,326,540	1,947,021	1,900,214	379,519	16·30	41·20	908	244	A.C.	400/230	33 43	..
Kamo Town Board	1923	600	115	..	..	..	..	(60)	..	262	22·90	..	46,807	46,807	..	46,807	N.A.	..	8·91	407	78	A.C.	400/230	4 70	..
28. Wairere Power Board ..	1925	2,000	320	336	480	..	..	307	..	1,602	19·15	1,307,290	..	1,307,290	..	1,190,994	116,296	8·90	48·60	3,720	596	A.C.	400/230	112 31	65
29. Westland Power, Ltd. ..	1928	4,200	130	619	688	360	438	360	..	1,194	30·10	1,193,300	..	1,193,300	..	1,026,238	167,062	14·00	37·90	7,890*	244	A.C.	400/230	52 31	260/105
30. Westport Borough Council ..	1925	4,000	737	200	250	56	70	240	..	1,591	15·08	697,844	..	697,844	..	622,280	75,564	10·83	33·19	844	156	A.C.	400/230	19 2	..
31. Whakatane Borough Council ..	1922	1,800	481	390	531	..	..	320	..	1,439	22·20	1,150,000	..	1,150,000	883,223	882,553	266,777	23·20	41·00	1,835	490	A.C.	400/230	34 31	258
Totals, hydro stations ..	..	1,392,047	319,348	202,387	244,383	81,856	90,091	..	..	1,100,305	..	826,833,713	604,883,486	1,431,717,199	..	635,049,868	191,399,062	23·15	..	1,990	456	..	..	20,506 73	..
Totals, all stations	..	1,407,927	322,997	203,422	245,432	82,276	90,716	..	..	1,108,231	..	829,284,771	604,883,486	1,434,168,257	..	636,915,191	191,893,852	23·20	..	1,970	452	..	..	20,585 19	..

[4] 45 kw. D.C. [5] 567 kw. D.C. [6] 650 kw. D.C. [7] 1,000 kw. D.C. [8] Included in units generated by Mangahao-Waikaremoana. [9] Includes units generated (Kourarau Plant). [10] 450 kw. D.C. [12] Taken over by Southland Power Board in December, 1932.

* Principal consumers gold-mining companies.

Table XXV.—Summary of Returns of Operating Results for the Year ended 31st March, 1933.

Title.	Capital Outlay as at 31st March, 1933. (Total Expenditure—Depreciation not deducted.)	Value of Assets at 31st March, 1933. (Total Expenditure less Total Allowance for Depreciation.)	Revenue.				Working-expenses.[1]		Capital Charges.					Total Annual Costs.	Net Results.		Revenue and Expenditure Comparisons.							
			Sale of Electricity.		Other Sources (not including Rates).	Total.	Total.	Per Cent. of Revenue.	Interest.	Sinking Fund.	Depreciation.	Total.	Per Cent. of Capital Outlay.		Profit.	Loss.	Average Revenue from Sale of Energy.		Working-costs.[1]		Capital Charges.		Total Costs.	
			Retail.	Bulk (for Resale).													Per Unit sold.	Per Kw. of Max.	Per Unit sold.	Per Kw. of Max.	Per Unit sold.	Per Kw. of Max.	Per Unit sold.	Per Kw. of Max.
Steam Station.	£	£	£	£	£	£	£		£	£	£	£		£	£	£	d.	£	d.	£	d.	£	d.	£
1. Nelson City Council	112,890	90,545	24,291	1,359	126	25,776	13,189	51·17	3,952[3]	1,108	2,867	7,927	7·02	21,116	4,660	..	3·57	32·06	1·84	16·49	1·10	9·91	2·94	26·40
Totals, steam station	112,890	90,545	24,291	1,359	126	25,776	13,189	51·17	3,952	1,108	2,867	7,927	7·02	21,116	4,660	..	3·57	32·06	1·84	16·49	1·10	9·91	2·94	..
Gas Stations.																								
1. Kaikoura County Council	10,107	8,716	1,562	..	33	1,595	1,269	79·50	636	354[4]	245	1,235	12·22	2,504	..	909	10·69	52·07	8·68	42·30	8·44	41·17	17·12	83·47
2. Motueka Borough Council	16,697	10,078	2,285	..	91	2,376	1,842	77·50	808	154	250	1,212	7·26	3,054	..	678	9·20	42·25	7·40	34·10	4·87	22·43	12·27	56·53
Totals, gas stations	26,804	18,794	3,847	..	124	3,971	3,111	78·30	1,444	508	495	2,447	9·13	5,558	..	1,587	9·73	..	7·87	..	6·19	..	14·06	..
Oil Stations.																								
1. Picton Borough Council	19,380	14,809	3,011	..	65	3,076	1,984	64·50	935	1,773[4]	400	3,108	16·05	5,092	..	2,016	6·60	41·80	4·35	27·55	6·81	43·20	11·16	70·75
2. Spender, Paul (Rawene)	2,926	2,926	537	..	26	563	722	128·24	..	..	..	..	..	722	..	159	10·00	38·36	13·45	51·57	..	..	13·45	51·57
3. Uawa County Council	6,275	3,591	954	..	67	1,021	496	48·50	343	278	294	915	14·58	1,411	..	390	16·60	71·20	8·63	37·00	15·92	68·25	24·55	105·25
Totals, oil stations	28,581	21,326	4,502	..	158	4,660	3,202	68·70	1,278	2,051	694	4,023	14·07	7,225	..	2,565	7·93	..	5·64	..	7·08	..	12·72	..
Hydro Stations.																								
1. Alderton Utility Co.	5,439	5,277	609	..	..	609	502	82·40	172	..	37	209	3·84	711	..	102	0·63	8·02	0·52	6·60	0·22	2·75	0·74	9·35
2. Arapuni-Horahora (Public Works Dept.)	4,734,635*	4,396,660	19,859	313,784	3,998	337,641	47,740	14·13	218,848	..	112,540[2]	331,388[2]	7·13	379,128	..	41,487	0·31	6·17	0·04	0·88	0·31	6·18	0·35	7·06
Auckland Power Board	3,406,366	2,836,042	618,179	3,105	53,338[2]	674,622[2]	325,137	48·20	163,140[3]	63,313	73,102	299,555	8·80	624,692	49,930	..	1·20	19·62	0·62	10·32	0·57	9·51	1·19	19·83
Bay of Plenty Power Board	209,089	203,702	36,822	..	2,481	39,303	21,658	55·00	10,839	2,420	1,837	15,096	7·22	36,754	2,549	..	1·10	26·60	0·65	15·65	0·45	10·90	1·10	26·55
Cambridge Power Board	110,324	108,816	19,090	..	833	19,923	12,226	61·30	5,654	1,286	..	6,940	6·30	19,166	757	..	1·17	25·70	0·75	16·42	0·42	9·33	1·17	25·75
Central Power Board	348,204	315,669	56,781	56	2,781	59,618	29,789	50·00	18,888	3,270[4]	4,097	26,255	7·54	56,044	3,574	..	1·33	25·40	0·70	13·30	0·62	11·70	1·32	25·00
Franklin Power Board	288,790	234,728	45,381	..	4,744	50,125	25,346	50·57	15,516	3,070	1,491	20,077	6·95	45,423	4,702	..	1·10	22·51	0·61	12·57	0·49	9·96	1·10	22·53
Hamilton Borough Council	76,511[7]	41,547	33,764	..	234	33,998	17,277	50·82	3,254	1,645	2,130	7,029	9·20	24,306	9,692	..	1·82	23·25	0·93	11·90	0·38	4·84	1·31	16·74
North Auckland[5]	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Rotorua	76,150	61,253	17,829	..	620	18,449	9,965	54·00	3,807	1,523	1,523	6,853	9·00	16,818	1,631	..	2·22	28·10	1·24	15·72	0·85	10·81	2·09	26·53
Te Awamutu Power Board	186,023	181,865	29,319	..	1,170	30,489	14,452	47·30	9,974	1,904[4]	..	11,878	6·38	26,330	4,159	..	1·28	25·20	0·63	12·43	0·52	10·21	1·15	22·64
Thames Valley Power Board	825,634	805,200	109,372	7,946	3,372	120,690	60,304	49·97	49,657[3]	9,744[4]	1,157	60,558	7·33	120,862	..	172	1·20	28·03	0·62	14·40	0·62	14·47	1·24	28·87
Thames Borough Council	24,156	13,055	8,854	..	387	9,241	5,887	63·70	266	77	518	861	3·56	6,748	2,493	..	2·21	28·62	1·47	19·03	0·21	2·78	1·68	21·81
Te Aroha Borough Council	25,896	14,024	7,444	..	71	7,515	5,279	70·30	515	95	350	960	3·71	6,239	1,276	..	2·02	32·50	1·43	23·06	0·26	4·19	1·69	27·25
Waitemata Power Board	397,524	382,120	72,696	..	3,493	76,189	40,430	53·10	22,183	7,370	3,125	32,678	8·22	73,108	3,081	..	1·44	25·40	0·80	14·13	0·65	11·41	1·45	25·54
Waitomo Power Board	100,210	98,210	18,738	..	48	18,786	10,070	53·60	5,278	1,215	159	6,652	6·64	16,722	2,064	..	1·71	25·02	0·92	13·45	0·61	8·88	1·53	22·33
3. Coleridge (Public Works Dept.)	2,195,112*	1,830,253	46,506	164,611	2,228	213,345	57,780	27·10	84,248	20,539	29,552	134,339	6·12	192,119	21,226	..	0·42	7·08	0·11	1·92	0·27	4·45	0·38	6·37
Ashburton Power Board	357,784	335,331	43,044	..	776	43,820	19,100	43·60	18,784	3,962	10	22,756	6·35	41,856	1,964	..	2·16	29·93	0·96	13·28	1·14	15·82	2·10	29·10
Banks Peninsula Power Board	103,187	98,243	11,095	..	523	11,618	7,763	66·80	6,287	1,283	303	7,873	7·62	15,636	..	4,018	2·19	28·42	1·53	19·80	1·56	20·20	3·09	40·00
Christchurch City Council	808,996	363,441	200,172	7,647	6,425	214,244	144,062	67·20	16,840[3]	194	30,889	47,923	5·93	191,985	22,259	..	0·99	14·76	0·68	10·23	0·23	3·40	0·91	13·63
Waimairi County Council	84,610	52,445	22,190	..	81	22,271	11,320	50·80	2,159	2,131[4]	3,722	8,012	9·47	19,332	2,939	..	1·11	19·50	0·57	9·95	0·40	7·05	0·97	17·00
Halswell County Council†	6,956	3,366	2,163	..	..	2,163	1,360	62·85	263	50	..	313	4·50	1,673	490	..	1·08	15·24	0·68	9·58	0·16	2·20	0·84	11·78
Heathcote County Council	36,648	24,508	10,722	..	254	10,976	7,733	70·50	1,392	1,093[4]	..	2,485	6·78	10,218	758	..	1·29	16·60	0·93	11·95	0·30	3·85	1·23	15·80
Hurunui Power Board[5]	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Lyttelton Borough Council	10,990	10,422	5,896	..	..	5,896	3,508	59·50	304	175	141	620	5·64	4,128	1,768	..	1·97	25·20	1·17	15·00	0·21	2·65	1·38	17·65
Malvern Power Board	65,098	60,603	7,111	..	776	7,887	5,372	68·10	3,799	670	..	4,469	6·86	9,841	..	1,954	3·10	33·45	2·34	25·30	1·95	21·00	4·29	46·30
North Canterbury Power Board	143,122	136,293	20,527	2,998	1,243	24,768	14,093	56·80	7,578	1,926	571	10,075	7·04	24,168	600	..	1·44	24·50	0·86	14·67	0·62	10·50	1·48	25·17
Kaiapoi Borough Council	10,701	7,242	3,212	..	43	3,255	1,805	55·50	641	253	158	1,052	9·83	2,857	398	..	2·55	26·30	1·43	14·78	0·83	8·62	2·26	23·40
Rangiora Borough Council	12,862	9,293	4,444	..	..	4,444	3,331	75·00	335	75	487	897	6·97	4,228	216	..	2·40	23·37	1·80	17·51	0·49	4·72	2·29	22·23
Riccarton Borough Council	23,927	18,099	10,018	..	372	10,390	6,608	63·60	606	220	675	1,501	6·27	8,109	2,281	..	1·08	18·66	0·71	12·30	0·16	2·80	0·87	15·10
South Canterbury Power Board	325,565	285,757	42,731	11,044	2,872	56,647	29,732	52·50	18,032	3,268	4,345	25,645	7·88	55,377	1,270	..	1·09	19·60	0·60	10·84	0·52	9·35	1·12	20·19
Timaru Borough Council	135,390	97,547	33,215	..	685	33,900	20,416	60·20	4,934	4,283	..	9,217	6·80	29,633	4,267	..	1·63	25·80	1·01	15·85	0·45	7·15	1·46	23·00
Springs-Ellesmere Power Board	156,085	148,906	28,915	..	177	29,092	16,835	57·85	7,630	2,542[4]	..	10,172	6·52	27,007	2,085	..	1·53	22·60	0·89	13·14	0·54	7·95	1·43	21·09
Sumner Borough Council	16,975	13,674	5,414	..	20	5,434	4,434	81·60	430	81	..	511	3·01	4,945	489	..	1·08	16·83	0·88	13·78	0·10	1·59	0·98	15·37
Waitaki Power Board	179,341	152,944	28,127	..	797	28,924	16,691	57·70	8,585	1,969[4]	2,450	13,004	7·25	29,695	..	771	1·43	21·63	0·85	12·83	0·66	10·00	1·51	22·83
4. Dunedin City Council	1,710,617	1,588,497	203,343	9,371	2,261	214,975	54,066	25·10	75,230[3]	23,310	25,806	124,346	7·27	178,412	36,563	..	1·00	14·64	0·26	3·72	0·58	8·56	0·84	12·28
Otago Power Board	283,712	262,378	38,973	..	24	38,997	19,108	49·00	16,313	4,904[4]	..	20,317	7·16	39,425	..	428	1·90	27·80	0·94	13·63	0·99	14·48	1·93	28·11
5. Golden Bay Power Board	25,788	23,710	3,674	..	241	3,915	1,519	38·80	1,442	475[4]	367	2,284	8·86	3,803	112	..	1·80	19·44	0·75	8·04	1·12	12·08	1·87	20·12
6. Grey Power Board	282,579	265,815	31,702	..	2,418	34,120	13,961	41·00	14,764	3,893[4]	1,032	19,689	6·95	33,650	470	..	1·52	22·65	0·67	9·97	0·94	14·06	1·61	24·03
7. Havelock North Town Board	24,074	24,074	3,284	..	7	3,291	1,675	51·00	1,256	475	..	1,731	7·20	3,406	..	115	1·88	26·07	0·96	13·30	0·99	13·73	1·95	27·03
8. Kanieri Electric, Ltd.	97,335	83,128	10,302	..	341	10,643	6,299	59·18	2,804	..	1,430[6]	4,234	4·35	10,533	110	..	0·65	14·51	0·40	8·87	0·27	5·96	0·67	14·83
9. Kaponga Town Board	24,507	23,052	5,057	..	68	5,125	2,936	57·25	1,225	660[4]	..	1,885	7·70	4,821	304	..	2·39	24·62	1·39	14·31	0·89	9·19	2·28	23·50

[1] Includes cost of powepurchased (if any).
[2] Includes Government contribution towards capital charges on standby plant.
[3] Includexchange on overseas interest payments.
[4] Includes repayment of portion of principal.
[5] Not yet functioning.
[6] Includes alsoscellaneousr capital charges.
[7] Includes £16,152 written off and not shown in 1932 statement.
* Includes stocks and amounts written off.
† License assigned to Christchurch City Council, August, 1933.

Table XXV.—Summary of Returns of Operating Results for the Year ended 31st March, 1933—*continued.*

Title.	Capital Outlay as at 31st March, 1933. (Total Expenditure—Depreciation not deducted).	Value of Assets at 31st March, 1933. (Total Expenditure less Total Allowance for Depreciation.)	Revenue.				Working-expenses.[1]		Capital Charges.					Total Annual Costs.	Net Results.		Revenue and Expenditure Comparisons.							
			Sale of Electricity.		Other Sources (not including Rates).	Total.	Total.	Per Cent. of Revenue.	Interest.	Sinking Fund.	Depreciation.	Total.	Per Cent. of Capital Outlay.		Profit.	Loss.	Average Revenue from Sale of Energy.		Working-costs.[1]		Capital Charges.		Total Costs.	
			Retail.	Bulk (for Resale).													Per Unit sold.	Per Kw. of Max.	Per Unit sold.	Per Kw. of Max.	Per Unit sold.	Per Kw. of Max.	Per Unit sold.	Per Kw. of Max.
	£	£	£	£	£	£	£		£	£	£	£		£	£	£	d.	£	d.	£	d.	£	d.	£
Hydro Stations—*continued.*																								
10. Mangahao - Waikaremoana (Public Works Dept.)	3,690,475	3,689,214	12,581	297,025	3,736	313,342	53,907	17·34	209,776	..	52,645	262,421	7·12	316,328	..	2,986	0·37	6·45	0·06	1·12	0·31	5·47	0·37	6·59
Central Hawke's Bay Power Board	138,344	127,530	21,429	..	1,271	22,700	12,529	55·20	7,867	1,720[4]	860	10,447	7·55	22,976	..	276	1·35	27·30	0·79	15·95	0·66	13·31	1·45	29·26
Dannevirke Power Board ..	213,820	203,150	28,038	..	1,971	30,009	12,597	42·00	12,449	2,810[4]	2,105	17,364	8·12	29,961	48	..	1·80	43·50	0·81	19·52	1·11	26·90	1·92	46·42
Hawke's Bay Power Board ..	221,055	215,600	36,155	25,519	1,642	63,316	40,773	64·40	13,245	2,511[4]	2,500	18,256	8·26	59,029	4,287	..	0·69	15·02	0·46	9·94	0·20	4·45	0·66	14·39
Hastings Borough Council ..	118,791	114,242	26,960	..	60	27,020	16,394	60·70	3,690	2,343[4]	963	6,996	5·89	23,390	3,630	..	2·24	24·00	1·37	14·60	0·58	6·23	1·95	20·83
Napier Borough Council ..	170,932	146,588	42,404	..	248	42,652	21,956	51·50	7,366	1,339[4]	4,206	12,911	7·55	34,867	7,785	..	1·36	25·20	0·70	13·03	0·42	7·67	1·12	20·70
Horowhenua Power Board ..	212,293	189,781	43,496	..	2,228	45,724	26,920	58·75	12,060	2,386[4]	3,485	17,931	8·45	44,851	873	..	1·22	22·83	0·75	14·12	0·50	9·41	1·25	23·53
Hutt Valley Power Board ..	386,414	328,479	99,704	..	3,013	102,717	63,801	62·20	21,535	4,020[4]	9,374	34,929	9·03	98,730	3,987	..	1·20	19·43	0·77	12·43	0·42	6·80	1·19	19·23
Manawatu-Oroua Power Board ..	512,150	482,943	60,097	14,851	2,674	77,622	44,967	57·90	27,771	5,424[4]	3,056	36,251	7·08	81,218	..	3,596	0·81	20·13	0·49	12·08	0·39	9·73	0·88	21·81
Palmerston North City Council..	220,127	193,417	56,598	..	55	56,653	25,711	45·40	9,570	1,829	5,455	16,854	7·65	42,565	14,088	..	1·21	21·45	0·55	9·73	0·36	6·39	0·91	16·12
Poverty Bay Power Board ..	331,474	318,728	53,566	..	1,086	54,652	28,059	51·30	15,514	6,431[4]	1,920	23,865	7·20	51,924	2,728	..	1·91	29·27	1·00	15·32	0·85	13·03	1·85	28·35
South Taranaki Power Board ..	196,031	181,667	26,836	1,292	1,090	29,218	11,743	40·20	9,597	3,702[4]	822	14,121	7·20	25,864	3,354	..	2·26	29·80	0·94	12·43	1·13	14·94	2·07	27·37
Patea Borough Council ..	17,229	16,957	4,035	..	105	4,140	3,219	77·75	479	163	147	789	4·58	4,008	132	..	2·21	28·85	1·77	23·00	0·43	5·63	2·20	28·63
Tararua Power Board	164,559	150,901	22,069	..	1,154	23,223	11,198	48·20	8,043	1,682[4]	2,215	11,940	7·26	23,138	85	..	1·72	34·42	0·87	17·48	0·93	18·63	1·80	36·11
Wairarapa Power Board ..	359,291	343,808	52,492	..	3,283	55,775	23,200	41·55	20,557	4,822[4]	2,948	28,327	7·89	51,527	4,248	..	1·57	29·93	0·69	13·22	0·85	16·14	1·54	29·36
Wairoa Power Board	62,461	57,292	5,796	4,233	619	10,648	9,593	90·00	3,574	1,163[4]	934	5,671	9·08	15,264	..	4,616	0·90	13·05	0·86	12·49	0·51	7·38	1·37	19·87
Wairoa Borough Council ..	12,589	11,403	8,056	..	55	8,111	6,055	74·70	878	247[4]	373	1,498	11·90	7,553	558	..	1·17	22·70	0·88	17·03	0·22	4·22	1·10	21·25
Wanganui-Rangitikei Power Board	562,841	469,434	93,791	330	4,236	98,357	50,513	51·50	31,024	8,219[4]	7,734	46,977	8·34	97,490	867	..	1·29	23·30	0·70	12·51	0·65	11·63	1·35	24·14
Mangaweka Town Board ..	5,710	5,710	826	..	330	1,156	1,052	91·10	104	22	..	126	2·20	1,178	..	22	1·75	25·00	2·24	31·90	0·27	3·82	2·51	35·72
Wellington City Council ..	1,193,035	1,193,035	312,637	..	9,411	322,048	165,346	51·30	27,220[3]	6,905[4]	22,239†	56,364	4·73	221,710	100,338	..	1·53	17·62	0·81	9·32	0·28	3·18	1·09	12·50
11. Marlborough Power Board	322,537	307,094	29,607	..	480	30,087	7,906	26·28	16,284	3,412	3,125	22,821	7·08	30,727	..	640	1·65	30·84	0·44	8·24	1·28	23·77	1·72	32·01
12. Mataura Borough Council*.. ..	4,366	4,041	1,540	..	134	1,674	1,264	75·51	157	55	107	319	7·31	1,583	91	..	4·60	20·81	3·78	17·08	0·95	4·31	4·73	21·39
13. Murchison County Council	13,925	13,925	1,947	..	305	2,252	1,436	63·70	825	140	..	965	6·92	2,401	..	149	3·25	22·13	2·40	16·32	1·61	10·96	4·01	27·28
14. New Plymouth Borough Council ..	441,487	351,110	67,192	3,725	1,949	72,866	28,673	39·35	20,271	12,833	..	33,104	7·50	61,777	11,089	..	1·24	19·70	0·50	7·97	0·58	9·20	1·08	17·17
Inglewood Borough Council ..	12,644	7,322	3,911	..	799	4,710	2,957	62·80	605	400	402	1,407	11·12	4,364	346	..	1·82	26·05	1·38	19·70	0·65	9·38	2·03	29·08
Waitara Borough Council ..	12,655	5,809	3,766	..	275	4,041	2,074	51·40	720	180	183	1,083	8·56	3,157	884	..	2·44	29·40	1·35	16·20	0·70	8·46	2·05	24·66
15. Ohakune Borough Council	18,674	6,592	3,596	..	24	3,620	1,815	50·20	841	228	..	1,069	5·72	2,884	736	..	3·20	33·90	1·62	17·13	0·95	10·08	2·57	27·21
16. Opunake Power Board	108,994	108,169	12,479	..	259	12,738	4,665	36·60	5,326	2,053	150	7,529	6·91	12,194	544	..	2·07	26·55	0·77	9·92	1·25	16·01	2·02	25·93
17. Queenstown Borough Council ..	12,870	12,504	1,464	..	84	1,548	474	30·60	481	307[4]	117	905	7·03	1,379	169	..	3·31	18·30	1·07	5·93	2·04	11·31	3·11	17·24
18. Raetihi Borough Council	37,636	21,556	3,427	411	216	4,054	2,038	50·27	1620	292	190	2,102	5·59	4,140	..	86	2·00	17·45	1·06	9·26	1·10	9·56	2·16	18·82
19. Reefton Electric Light Co., Ltd. ..	5,848	5,556	3,226	..	285	3,511	3,343	95·20	..	..	..	..	..	3,343	168	..	9·00	28·05	9·33	29·07	..	..	9·33	29·07
20. Southland Power Board	1,660,102	1,641,888	99,965	18,689	15,247	133,901	38,820	28·97	100,697[2 8]	24,000	..	124,697	7·51	163,517	..	29,616	1·61	18·70	0·53	6·12	1·69	19·68	2·22	25·80
Bluff Borough Council	10,810	9,130	3,702	..	258	3,960	2,895	73·11	462	280	..	742	6·86	3,637	323	..	2·62	13·97	2·05	10·92	0·52	2·80	2·57	13·72
Invercargill City Council ..	176,256	146,749	43,740	..	2,075	45,815	23,304	50·87	7,151	2,259	562	9,972	5·66	33,276	12,539	..	2·33	25·31	1·24	13·49	0·53	5·77	1·77	19·26
21. Taranaki Power Board	456,941	414,881	35,275	4,754	3,286	43,315	12,329	28·45	27,402	4,873[4]	2,711	34,986	7·66	47,315	..	4,000	1·20	21·25	0·37	6·55	1·05	18·56	1·42	25·11
Stratford Borough Council ..	27,843	26,784	11,999	..	..	11,999	6,349	52·90	2,885	505	250	3,640	13·06	9,989	2,010	..	1·50	26·65	0·79	14·11	0·46	8·09	1·25	22·20
22. Taihape Borough Council	18,924	8,127	4,508	..	..	4,508	2,265	50·25	877	172	508	1,557	8·23	3,822	686	..	2·34	24·40	1·17	12·23	0·81	8·42	1·98	20·65
23. Taumarunui Borough Council ..	62,219	57,911	7,529	393	692	8,614	2,299	26·70	3,259	854[4]	400	4,513	7·25	6,812	1,802	..	2·69	24·72	0·78	7·19	1·53	14·10	2·31	21·29
Manunui Town Board	3,290	3,290	881	..	..	881	555	63·00	210	40	..	250	7·60	805	76	..	7·83	35·20	4·93	22·20	2·22	10·00	7·15	32·20
24. Tauranga Borough Council ..	155,367	152,981	10,050	10,256	1,127	21,433	6,962	32·45	6,817	1,478	..	8,295	5·34	15,257	6,176	..	0·50	5·83	0·17	2·00	0·21	2·38	0·38	4·38
Tauranga Power Board ..	132,191	122,217	22,520	..	1,109	23,629	12,311	52·10	6,970	1,804[4]	1,000	9,774	7·39	22,085	1,554	..	1·49	..	0·81	..	0·65	..	1·46	..
Te Puke Town Board	12,384	6,215	3,287	..	95	3,382	1,709	50·50	473	90	250	813	6·57	2,522	860	..	1·49	25·00	0·77	13·00	0·37	6·17	1·14	19·17
25. Teviot Power Board	57,958	54,954	4,673	1,090	374	6,137	2,192	35·70	3,281	1,110	70	4,461	7·70	6,653	..	516	0·41	7·78	0·16	2·97	0·32	6·03	0·48	9·00
Otago Central Power Board ..	89,433	83,681	9,536	..	219	9,755	3,589	36·80	4,450	1,769[4]	..	6,219	6·96	9,808	..	53	1·26	24·00	0·47	9·03	0·82	15·60	1·29	24·63
26. Waimea Electric Supply Co. ..	22,823	18,206	5,138	..	467	5,605	3,475	62·00	324	..	..	324	1·42	3,799	1,806	..	6·03	42·40	4·08	28·70	0·38	2·68	4·46	31·38
27. Wairua (Wilson's Cement Co.) ..	92,133	25,514	6,601	6,182	348	13,131	3,482	26·50	..	..	..	..	..	3,482	9,649	..	0·40	5·80	0·11	1·58	..	..	0·11	1·58
Whangarei Borough Council ..	68,072	62,741	16,056	906	1,687	18,649	11,045	59·25	1,517	626	..	2,143	3·15	13,188	5,461	..	2·09	26·30	1·36	17·13	0·26	3·32	1·62	20·45
Kamo Town Board	3,579	2,500	906	..	28	934	612	65·52	154	96[4]	..	250	7·00	862	72	..	4·65	15·10	3·14	10·20	1·28	4·17	4·42	14·37
28. Wairere Power Board	42,006	39,275	4,989	..	618	5,607	2,724	48·60	2,756	531	..	3,287	7·82	6,011	..	404	1·01	16·25	0·55	8·87	0·66	10·70	1·21	19·57
29. Westland Power, Ltd.	69,300	65,972	3,949	..	946	4,895	4,578	93·60	..	..	..	..	..	4,578	317	..	0·92	10·98	1·07	12·71	..	..	1·07	12·71
30. Westport Borough Council ..	31,716	27,455	6,689	..	40	6,729	1,888	28·06	1,728	576	304	2,608	8·22	4,496	2,233	..	2·58	27·87	0·73	7·87	1·00	10·87	1·73	18·74
31. Whakatane Borough Council ..	37,823	36,817	5,881	3	24	5,908	1,951	33·00	2,436	518[4]	..	2,954	7·82	4,905	1,003	..	1·60	18·40	0·53	6·10	0·80	9·23	1·33	15·33
Totals, hydro stations.. ..	30,950,339	27,907,996	3,364,169	910,221	171,919	4,446,309	1,929,081	29·00‡	1,487,170	293,682	438,314	2,219,166	7·18	4,148,247	394,069	96,007	1·27‡	..	0·385‡	..	0·84	..	1·225	..
Totals, all stations	31,118,614	28,038,661	3,396,809	911,580	172,327	4,480,716	1,948,583	29·20‡	1,493,844	297,349	442,370	2,233,563	7·18	4,182,146	398,729	100,159	1·28‡	..	0·391‡	..	0·84	..	1·231	..

[1] Includes cost of power purchased (if any). [3] Includes exchange on overseas interest payments. [4] Includes repayment of portion of principal. [8] Includes interest and overdraft on temporary loan; also miscellaneous capital charges.

* Taken over by Southland Power Board in December, 1932. † Renewal Reserve Fund. ‡ After deducting revenue derived from bulk sales.

TABLE XXVI.—ELECTRIC-SUPPLY STATIONS.—APPROPRIATIONS FOR THE YEAR ENDED 31ST MARCH, 1933.

Title.	Ownership.	Supply commenced.	Appropriations.									Accumulated Funds.					
												Depreciation.				Reserves.	
			Renewal Fund.[1]	General Reserve Fund.	Accident Insurance Fund.	Relief of Rates (Local Authorities)	Payment of Dividends.	Capital Expenditure (out of Revenue).	Miscellaneous Payments.	Unappropriated Surplus.	Total.	Reserve.	Funded.	Renewal.[2]	Sinking.	General.[2]	Net Surplus Unappropriated.
STEAM STATION.			£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
1. Nelson	City Council ..	1923	..	..	..	2,000	..	4,079	..	..	6,079	16,345	6,000	..	1,178	14,600	..
Totals, steam station ..	..	..	..	..	..	2,000	..	4,079	..	..	6,079	16,345	6,000	..	1,178	14,600	..
GAS STATIONS.																	
1. Kaikoura	County Council ..	1922	..	..	..	..	..	..	..	..	..	..	..	..	1,347	..	..
2. Motueka	Borough Council ..	1922	250	..	..	100	..	..	..	..	350	..	250	500[3]	2,321	..	..
Totals, gas stations ..	..	..	250	..	..	100	..	..	..	..	350	..	250	500	3,668	..	..
OIL STATIONS.																	
1. Picton	Borough Council ..	1917	..	..	..	..	..	..	..	..	..	..	1,308	..	2,659	..	..
2. Uawa (Tolaga Bay) ..	County Council ..	1925	..	..	..	..	..	..	..	..	..	2,684	..	..	2,809	..	..
Totals, oil stations ..	..	..	..	..	..	..	..	..	..	..	..	2,684	1,308	..	5,468	..	..
HYDRO STATIONS.																	
1. Alderton Utility Co. (Kerikeri)	Company ..	1930	..	..	..	..	..	..	..	..	..	162	..	..	..	..	..
2. Arapuni-Horahora ..	Public Works Dept.	1921	..	..	..	..	..	..	..	..	..	283,823	..	..	61,705†	..	..
Auckland	Power Board ..	1908	..	691	..	..	..	..	18,190	31,049	49,930	458,179	..	19,098	667,331	340,850	52,892
Bay of Plenty	Power Board ..	1928	..	500	..	..	..	2,794	..	..	3,294	5,387	..	..	12,501	900	..
Cambridge	Power Board ..	1921	..	..	..	..	..	..	250	507	757	..	1,508	..	16,702	1,350	3,494
Central	Power Board ..	1921	..	..	..	..	..	..	770	2,804	3,574	4,097	15,340	5,292	28,918	11,733	9,887
Franklin	Power Board ..	1925	..	..	..	..	..	1,249	2,611	842	4,702	30,712[5]	23,350	..	18,533	8,977[3]	3,179
Hamilton	Borough Council ..	1913	..	1,500	..	6,413	..	287	..	1,492	9,692	..	15,952	..	24,721	11,384	..
North Auckland* ..	Power Board ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Rotorua	Tourist Dept. ..	1901	..	1,631	..	..	..	..	..	..	1,631	14,897	..	..	16,260	1,631	..
Te Awamutu	Power Board ..	1921	120	..	..	..	..	..	427	3,612	4,159	120	4,038	..	17,653	1,086	11,359
Thames Valley	Power Board ..	1921	..	..	..	..	..	..	..	..	..	1,157	19,278	..	119,768	10,793	..
Thames	Borough Council ..	1914	524	..	..	1,000	..	..	..	969	2,493	10,811	2,244	..	84	..	..
Te Aroha	Borough Council ..	1906	..	..	..	944	..	332	..	..	1,276	6,842	1,495	..	2,130	..	..
Waitemata	Power Board ..	1926	..	..	..	..	..	..	7,937	..	7,937	15,404	..	..	56,830	21,000[6]	13,333
Waitomo	Power Board ..	1926	..	1,000	..	..	..	..	156	908	2,064	1,372	628	..	7,845	1,000	908

[1] As distinct from Depreciation Fund. [2] Not funded except where otherwise indicated. [3] Funded. [5] Amounts written off. [6] £10,000 of this general reserve funds, balance discount reserve and miscellaneous. * Not yet functioning.
† Includes £49,768 utilized for redemption of loans.

TABLE XXVI.—ELECTRIC-SUPPLY STATIONS.—APPROPRIATIONS FOR THE YEAR ENDED 31ST MARCH, 1933—*continued.*

Title.	Ownership.	Supply commenced.	Appropriations.									Accumulated Funds.					
			Renewal Fund.[1]	General Reserve Fund.	Accident Insurance Fund.	Relief of Rates (Local Authorities)	Payment of Dividends.	Capital Expenditure (out of Revenue).	Miscellaneous Payments.	Unappropriated Surplus.	Total.	Depreciation.		Renewal.[2]	Sinking	Reserves.	
												Reserve.	Funded.			General.[2]	Net Surplus Unappropriated.
HYDRO STATIONS—*continued.*			£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
3. Coleridge	Public Works Dept.	1915	..	21,226	..	..	..	..	..	..	21,226	244,867	..	..	222,828*	195,475	..
Ashburton	Power Board	1923	1,729	100	..	..	..	..	62	73	1,964	8,713	685	3,100[3]	32,132	100	..
Banks Peninsula	Power Board	1921	..	..	..	..	..	..	..	..	..	..	4,944	..	11,320	..	3,812
Christchurch	City Council	1904	15,000†	..	..	20,769‡	..	..	..	1,490	37,259	445,555	..	..	153,601	246,314	..
Waimairi	County Council	1916	..	288	..	..	..	2,651	..	..	2,939	5,674	..	..	4,435	24,933	..
Halswell	County Council	1919	..	..	..	..	..	10	..	480	490	..	..	..	..	..	..
Heathcote	County Council	1914	..	..	..	..	..	212	..	546	758	..	..	..	5,152	..	..
Hurunui§	Power Board	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Lyttelton	Borough Council	1917	141	..	..	..	..	140	..	1,487	1,768	141	427	..	763	..	..
Malvern	Power Board	1925	..	..	..	..	..	..	..	..	..	2,623	..	..	5,709	..	..
North Canterbury	Power Board	1928	..	..	..	..	..	..	349	251	600	5,099	1,322	..	6,372	6,850	2,642
Kaiapoi	Borough Council	1916	..	..	..	..	..	..	114	284	398	2,548	911	..	1,728	..	..
Rangiora	Borough Council	1919	..	..	..	..	..	25	..	191	216	3,569	346	..	1,404	..	..
Riccarton	Borough Council	1916	..	..	..	..	..	56	..	2,225	2,281	..	1,467	..	1,256	8,532	..
South Canterbury	Power Board	1925	..	..	..	..	..	..	..	1,270	1,270	10,774	..	..	33,113	..	4,312
Timaru	Borough Council	1908	..	..	..	2,000	..	5,214	..	..	7,214	..	..	..	42,634	..	..
Springs-Ellesmere	Power Board	1922	..	..	..	..	..	..	..	2,085	2,085	..	7,262	..	7,483	5,500	5,330
Sumner	Borough Council	1918	..	..	..	830	..	..	..	..	830	..	870	..	1,733	..	..
Waitaki	Power Board	1926	..	..	200	..	..	..	..	..	200	..	14,229	..	18,684	12,193	6,515
4. Dunedin	City Council	1907	32,303	..	..	21,865	..	..	..	..	54,168	152,508	..	219,927[3]	174,367	..	..
Otago	Power Board	1926	..	..	..	..	..	..	..	..	..	18,396	..	..	22,989	..	..
5. Golden Bay	Power Board	1929	..	..	..	..	..	112	..	..	112	942	..	..	1,069	..	..
6. Grey	Power Board	1926	..	..	..	..	..	..	..	470	470	3,793	1,073	..	23,020	3,060[3]	430
7. Havelock North	Town Board	1916	..	..	..	..	..	..	..	..	..	..	..	..	7,412	..	..
8. Kanieri Electric, Ltd.	Company	1921	..	..	..	..	..	110	..	..	110	14,207	..	..	..	..	..
9. Kaponga	Town Board	1916	..	..	..	..	..	..	..	304	304	..	..	..	3,764	..	..
10. Mangahao-Waikaremoana	Public Works Dept.	1925	..	..	..	..	..	..	..	..	..	419,256	..	..	..	..	..
Central Hawke's Bay	Power Board	1925	..	..	..	..	..	..	13	..	13	4,691	10,214	1,149	2,497	..	1,401
Dannevirke	Power Board	1925	..	..	..	..	..	14	..	34	48	2,105	9,387	..	18,861	3,226	3,126
Hawke's Bay	Power Board	1927	..	..	..	..	..	..	..	4,287	4,287	..	5,455	..	16,290	1,284	5,656
Hastings	Borough Council	1912	..	..	..	..	..	3,879	..	..	3,879	..	4,549	..	17,506	..	..
Napier	Borough Council	1913	..	..	..	..	..	..	67	7,718	7,785	10,683	24,374	..	11,198	9,107[3]	..
Horowhenua	Power Board	1924	..	..	200	..	..	..	15	658	873	..	22,512	..	13,150	13,000[3]	8,456
Hutt Valley	Power Board	1925	..	..	..	..	..	1,000	..	2,987	3,987	6,159	47,776	5,394	21,868	2,317	13,239
Manawatu-Oroua	Power Board	1924	..	..	..	..	..	..	..	..	..	14,183	10,356	..	62,141	6,577	..
Palmerston North	City Council	1924	..	..	..	6,000	..	6,038	559	1,491	14,088	..	26,710	..	23,438	500	..
Poverty Bay	Power Board	1912	..	750	..	..	..	..	1,229	749	2,728	11,091	2,029	..	25,359	3,909	8,729
South Taranaki	Power Board	1929	..	..	..	..	..	1,230	81	2,043	3,354	..	3,940	619	11,918	6,012	2,046
Patea	Borough Council	1901	..	132	..	..	..	..	..	..	132	147	125	..	509	3,362	..
Tararua	Power Board	1925	..	..	..	..	..	..	13	72	85	10,228	1,826	564	17,729	2,138	..

[1] As distinct from Depreciation Fund. [2] Not funded except where otherwise indicated. [3] Funded. * Includes £110,342 utilized for the redemption of loans. † Extra appropriation to Depreciation Fund. ‡ Includes £13,511 from 1932 profits. § Not yet functioning.

TABLE XXVI.—ELECTRIC-SUPPLY STATIONS.—APPROPRIATIONS FOR THE YEAR ENDED 31ST MARCH, 1933—*continued.*

Title.	Ownership.	Supply commenced.	Appropriations.									Accumulated Funds.					
			Renewal Fund.[1]	General Reserve Fund.	Accident Insurance Fund.	Relief of Rates (Local Authorities)	Payment of Dividends.	Capital Expenditure (out of Revenue).	Miscellaneous Payments.	Unappropriated Surplus.	Total.	Depreciation.		Renewal.[2]	Sinking.	Reserves.	
												Reserve.	Funded.			General.[2]	Net Surplus Unappropriated.
HYDRO STATIONS—*continued.*			£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
10. Mangahao - Waikaremoana—*continued.*																	
Wairarapa	Power Board ..	1923	..	..	..	..	..	1,100	366	2,782	4,248	6,604	5,632	..	24,561	788	15,127
Wairoa	Power Board ..	1923	..	..	..	..	..	..	..	..	..	3,315	1,854	..	6,696	2,570	..
Wairoa	Borough Council ..	1913	..	..	..	..	..	..	..	558	558	408	778	..	1,202	..	..
Wanganui-Rangitikei ..	Power Board ..	1924	..	..	..	..	..	..	1,096	..	1,096	20,044	3,900	..	12,679	..	9,241
Mangaweka	Town Board ..	1913	..	..	..	..	..	..	..	..	..	..	..	..	676	..	..
Wellington	City Council ..	1907	..	22,239	..	..	..	..	71,929	6,170	100,338	..	..	139,872	60,217	151,478	..
11. Marlborough	Power Board ..	1927	..	..	..	..	..	..	..	..	..	15,443	..	..	27,180	..	..
12. Mataura	Borough Council ..	1913	..	..	..	..	..	..	91	..	91	..	325	..	279	..	..
13. Murchison	County Council ..	1922	..	..	..	..	..	..	..	..	..	..	..	..	2,288	..	..
14. New Plymouth	Borough Council ..	1905	..	250	..	..	..	..	..	10,839	11,089	76,653	13,735	..	92,134	510	..
Inglewood	Borough Council ..	1905	..	..	..	346	..	..	..	..	346	5,321	..	..	4,185	..	..
Waitara	Borough Council ..	1907	..	..	..	840	..	44	..	..	884	..	486	..	6,047	..	..
15. Ohakune	Borough Council ..	1914	181	..	..	498	..	57	..	..	736	..	..	..	3,738	..	..
16. Opunake	Power Board ..	1924	..	..	..	..	..	..	..	544	544	570	255	..	3,680	..	..
17. Queenstown	Borough Council ..	1924	..	..	..	169	..	..	..	..	169	..	366	..	931	..	..
18. Raetihi	Borough Council ..	1917	..	..	..	..	..	246	47	..	293	190	579	..	5,430	..	..
19. Reefton Electric Co. ..	Company ..	1887	..	..	..	..	168	..	..	..	168	..	..	..	..	659	30
20. Southland	Power Board ..	1925	..	..	..	..	..	753	67	..	820	13,845	..	..	311,054	1,291	..
Bluff	Borough Council ..	1903	..	..	..	..	..	169	500	..	669	..	1,680	..	680	..	..
Invercargill	City Council ..	1914	..	..	..	7,173	..	2,106	3,600	..	12,879	..	29,507	..	21,481	..	..
21. Taranaki	Power Board ..	1927	..	..	..	517	..	..	47	..	564	13,272	813	..	31,102	..	307
Stratford	Borough Council ..	1898	..	..	..	2,010	..	..	..	..	2,010	..	1,059	..	7,796	..	..
22. Taihape	Borough Council ..	1913	..	..	..	225	..	..	..	461	686	..	2,014	..	4,550	2,564	..
23. Taumarunui	Borough Council ..	1924	..	..	..	1,133	..	958	..	..	2,091	..	4,108	..	3,924	574	..
Manunui	Town Board ..	1929	..	..	..	..	..	..	..	76	76	..	..	..	..	..	..
24. Tauranga	Borough Council ..	1915	..	5,082	..	..	..	1,094	..	..	6,176	..	2,386	..	21,125	9,535[7]	..
Tauranga	Power Board ..	1926	..	1,000	..	..	..	422	206	..	1,628	2,082	4,616	..	11,087	2,592	126
Te Puke	Town Board ..	1921	75	..	..	929	..	..	10	..	1,014	..	2,772	533	1,484	3,781	..
25. Teviot	Power Board ..	1924	..	..	..	..	..	..	..	..	..	2,094	910	..	6,532	..	2,241
Otago Central	Power Board ..	1925	..	..	..	..	..	..	..	..	..	2,348	..	..	2,528	..	..
26. Waimea Electric Co. ..	Company ..	1912	..	..	..	..	684	824	..	298	1,806	..	..	..	..	..	..
27. Wairua (Wilson's Cement Co.)	Company ..	1916	..	..	..	..	..	..	..	9,649[8]	9,649	..	..	..	..	..	..
Whangarei	Borough	1915	1,666	..	..	..	..	..	457	3,338	5,461	..	5,230	..	5,975	..	..
Kamo	Town Board ..	1923	..	..	..	..	..	..	..	72	72	..	..	..	44	..	..
28. Wairere	Power Board ..	1925	..	..	..	..	..	..	..	..	..	1,710	1,020	..	1,587	..	125
29. Westland Power, Ltd. ..	Company ..	1928	..	317	..	..	..	..	..	..	317	..	..	..	..	..	..
30. Westport	Borough Council ..	1925	260	..	..	1,000	..	383	..	590	2,233	965	2,381	2,528	5,634	..	..
31. Whakatane	Borough Council ..	1922	..	..	..	..	..	567	633	..	1,200	..	..	..	4,806	..	..
Totals, hydro stations ..	..	..	51,999	56,706	400	74,661	852	34,076	111,892	108,927	439,513	2,395,779	373,028	398,076	2,769,725	1,141,435	187,943
Totals, all stations ..	..	..	52,249	56,706	400	76,761	852	38,155	111,892	108,927	445,942	2,414,808	380,586	398,576	2,780,039	1,156,035	187,943

[1] As distinct from Depreciation Fund. [2] Not funded except where otherwise indicated. [7] Partly funded. [8] Transferred to General Profit and Loss Account.

TABLE XXVII.—RETURN OF ELECTRIC RANGES, WATER-HEATERS, AND MILKING-MACHINES.

Table showing the Number of Electric Ranges, Water-heaters, and Milking-machines connected to Electric-supply Systems as at 31st March, 1933.

Licensee.	Number of Consumers.	Ranges.				Water-heaters.			Milking-machines.		
		2 to 5 Kilowatts.	5 Kilowatts and over.	Total.	Percentage of Number of Consumers.	Number.	Total Kilowatts.	Percentage of Number of Consumers.	Number.	Horse-power	Not yet electrified.
Alderton Utility Co.	40	4	14	18	45·0	22	14	55·0	1	2	1
Arapuni-Horahora (Public Works Department)	..	..	57	57	..	69	72	..	..	..	..
Ashburton Power Board	3,611	49	773	822	22·80	467	919	12·92	68	103	36
Auckland Power Board	49,115	..	4,730	4,730	9·64	10,690	7,197	21·80	248	..	..
Banks Peninsula Power Board	974	57	152	209	21·46	185	270	19·0	199	169	..
Bluff Borough Council	445	5	2	7	1·57	1	2	0·22	..	..	..
Bay of Plenty Power Board	1,392	44	456	500	35·90	1,016	740	73·0	556	930	..
Cambridge Power Board	1,439	12	150	162	11·25	481	365	33·45	328	517	14
Central Hawke's Bay Power Board	1,593	5	172	177	11·10	250	250	15·70	84	125	..
Central Power Board	4,336	39	290	329	7·58	1,287	804	29·70	1,166	2,114	424†
Christchurch City Council	28,158	..	4,389	4,389	15·60	4,688	4,837	16·65	1	0·5	..
Coleridge (Public Works Department)	..	33	44	77	..	90	97	..	2	6	..
Dannevirke Power Board	2,502	2	184	186	7·45	470	325	18·80	357	520	..
Dunedin City Council	25,439	..	1,136	1,136	4·46	1,813	1,845	7·14	176	339	..
Franklin Power Board	3,383	140	497	637	18·83	1,349	801	39·88	1,380	1,541	..
Golden Bay Power Board	330	15	22	37	11·21	46	36	13·94	66	90	10
Grey Power Board	2,764	29	160	189	6·83	132	136	4·77	5	8	..
Halswell County Council	275	18	17	35	12·73	20	16	7·27	17	30	5
Hamilton Borough Council	4,191	7	107	114	2·72	184	135	4·39	..	..	..
Hastings Borough Council	3,426	11	127	138	4·03	48	31	1·40	..	..	..
Havelock North Town Board	299	53	4	57	19·0	18	12	6·0	..	..	..
Hawke's Bay Power Board	2,498	..	457	457	18·30	511	337	20·40	159	141	..
Heathcote County Council	1,503	85	290	375	25·0	285	265	19·0	3	7	..
Horowhenua Power Board	3,956	..	568	568	14·35	1,000	628	25·30	855	941	..
Hurunui Power Board*	..	..	..	..	..	..	..	..	..	..	..
Hutt Valley Power Board	11,192	100	1,392	1,492	13·32	1,362	1,506	12·18	68	130	..
Inglewood Borough Council	413	3	25	28	6·78	22	21	5·32	1	2	..
Invercargill City Council	5,229	10	103	113	2·16	1	1	0·02	1	2	..
Kaiapoi Borough Council	462	32	16	48	10·40	7	7	1·52	..	..	..
Kaikoura County Council	148	..	..	..	..	..	..	..	..	..	..
Kamo Town Board	115	1	..	1	0·87	..	..	..	..	..	..
Kanieri Electric, Ltd.	629	4	35	39	6·20	20	21	3·18	..	..	..
Kaponga Town Board	365	9	12	21	5·75	42	26	11·50	100	190	31
Lyttelton Borough Council	767	7	50	57	7·43	32	37	4·17	1	3	..
Malvern Power Board	656	12	126	138	21·0	67	115	10·20	6	11	..
Manawatu-Oroua Power Board	4,515	..	789	789	17·50	1,477	914	32·70	1,036	1,798	..
Mangahao-Waikaremoana (Public Works Department)	..	..	61	61	..	63	63	..	..	..	..
Mangaweka Town Board	111	2	10	12	10·80	13	7	11·70	4	7	..
Manunui Town Board	160	..	..	..	..	..	..	..	1	1·5	..

* Not yet actively functioning. † First time scheduled.

TABLE XXVII.—RETURN OF ELECTRIC RANGES, WATER-HEATERS, AND MILKING-MACHINES—*continued.*

Table showing the Number of Electric Ranges, Water-heaters, and Milking-machines connected to Electric-supply Systems as at 31st March, 1933—continued.

Licensee.	Number of Consumers.	Ranges.				Water-heaters.			Milking-machines.		
		2 to 5 Kilowatts.	5 Kilowatts and over.	Total.	Percentage of Number of Consumers.	Number.	Total Kilowatts.	Percentage of Number of Consumers.	Number.	Horse-power.	Not yet electrified.
Marlborough Power Board	2,616	97	243	340	13·00	307	146	11·74	93	133	10
Mataura Borough Council	373	2	16	18	4·83	1	1	0·27	4	12	..
Motueka Borough Council	357	..	..	..	..	..	..	..	..	..	..
Murchison County Council	131	5	4	9	6·87	12	9	9·17	20	32	..
Napier Borough Council	4,470	21	142	163	3·64	547	345	12·23	..	..	..
Nelson City Council	2,652	..	..	..	..	3	4	0·11	..	..	..
New Plymouth Borough Council	6,055	191	730	921	15·20	972	608	16·05	380	690	..
North Auckland Power Board*	..	..	..	..	..	..	..	..	..	..	..
North Canterbury Power Board	1,642	43	199	242	14·72	173	291	10·53	77	136	..
Ohakune Borough Council	454	8	12	20	4·40	15	11	3·30	3	5	..
Opunake Power Board	1,500	..	83	83	5·53	154	100	10·26	266	400	..
Otago Central Power Board	906	14	120	134	14·80	157	163	17·32	31	51	..
Otago Power Board	3,877	9	339	348	8·98	300	263	7·75	68	328	..
Palmerston North City Council	5,780	42	544	586	10·13	1,232	787	21·30	3	6	..
Patea Borough Council	358	11	20	31	8·66	22	14	6·15	5	7	5
Picton Borough Council	344	2	..	2	0·58	..	..	..	..	..	..
Poverty Bay Power Board	4,745	..	869	869	18·30	446	331	9·40	115	127	..
Queenstown Borough Council	232	3	9	12	5·17	..	..	..	..	..	..
Raetihi Borough Council	389	2	9	11	2·83	24	18	6·17	12	32	..
Rangiora Borough Council	600	3	46	49	8·16	40	52	6·67	..	..	..
Rawene (P. Spender)	53	..	..	..	..	..	..	..	..	..	..
Reefton Electric Light and Power Co., Ltd.	310	..	..	..	..	1	1·5	0·32	..	..	..
Riccarton Borough Council	1,360	27	248	275	20·22	297	278	21·84	..	..	..
Rotorua (Tourist Department)	1,941	75	113	188	9·68	236	204	12·16	58	101	..
South Canterbury Power Board	3,677	64	554	618	16·80	428	569	11·63	140	212	..
South Taranaki Power Board	2,891	..	126	126	4·36	243	156	8·41	314	513	316
Southland Power Board	9,299	..	1,486	1,486	16·0	547	738	5·88	1,155	2,605	..
Springs-Ellesmere Power Board	2,433	20	220	240	9·87	139	164	5·71	139	250	..
Stratford Borough Council	1,042	7	160	167	16·0	160	140	15·35	1	2	..
Sumner Borough Council	1,011	40	91	131	12·96	75	79	7·42	1	3	..
Taihape Borough Council	622	1	9	10	1·61	15	15	2·41	1	5	..
Taranaki Power Board	2,197	6	306	312	14·20	864	526	39·30	837	1,584	154
Tararua Power Board	1,595	51	196	247	15·50	408	269	25·60	325	490	..
Taumarunui Borough Council	809	4	22	26	3·21	32	25	3·96	8	16	..
Tauranga Borough Council	985	87	205	292	29·65	366	145	37·20	..	..	..
Tauranga Power Board	1,084	29	194	223	20·57	535	320	49·30	422	744	67
Te Aroha Borough Council	720	4	40	44	6·11	56	37	7·78	7	15	..
Te Awamutu Power Board	1,776	31	201	232	13·06	578	392	32·50	709	986	30
Te Puke Town Board	296	7	27	34	11·50	50	30	16·87	6	9	..
Teviot Power Board	402	4	119	123	30·60	100	88	24·90	..	..	..

* Not yet actively functioning.

TABLE XXVII.—RETURN OF ELECTRIC RANGES, WATER-HEATERS, AND MILKING-MACHINES—*continued.*

Table showing the Number of Electric Ranges, Water-heaters, and Milking-machines connected to Electric-supply Systems as at 31st March, 1933—continued.

Licensee.	Number of Consumers.	Ranges.				Water-heaters.			Milking-machines.		
		2 to 5 Kilowatts.	5 Kilowatts and over.	Total.	Percentage of Number of Consumers.	Number.	Total Kilowatts.	Percentage of Number of Consumers.	Number.	Horse-power.	Not yet electrified.
Thames Borough Council	1,147	3	17	20	1·74	38	23	3·31	..	..	..
Thames Valley Power Board	6,575	80	560	640	9·73	2,446	1,609	37·20	2,234	4,223	60
Timaru Borough Council	3,777	..	363	363	9·60	266	248	7·04	..	..	..
Uawa County Council	95	..	..	..	..	..	..	..	..	..	..
Waimairi County Council	3,280	44	640	684	20·85	704	656	21·45	15	23	..
Waimea Electric Supply Co.	791	..	..	..	..	2	2	0·25	1	1	..
Wairarapa Power Board	4,503	47	374	421	9·35	639	541	14·20	414	731	64
Waircre Power Board	320	3	88	91	28·40	146	82	45·60	80	109	..
Wairoa Borough Council	618	12	137	149	24·10	160	82	25·90	..	..	..
Wairoa Power Board	352	34	86	120	34·0	112	58	31·80	73	124	2
Wairua (Wilson's)	71	..	..	..	..	1	1	1·41	21	56	..
Waitaki Power Board	3,396	27	402	429	12·63	413	609	12·17	29	43	..
Waitara Borough Council	482	6	31	37	7·69	26	20	5·40	1	2	..
Waitemata Power Board	9,079	56	1,121	1,177	13·0	1,548	1,001	17·0	255	319	..
Waitomo Power Board	1,199	28	108	136	11·34	237	150	19·77	142	241	..
Wanganui-Rangitikei Power Board	10,013	..	1,092	1,092	10·90	1,391	1,038	13·90	522	788	..
Wellington City Council	35,444	143	1,384	1,527	4·31	1,911	2,626	5·40	..	..	..
Westland Power, Ltd.	130	..	17	17	13·10	32	42	24·60	20	40	100
Westport Borough Council	737	1	11	12	1·63	28	24	3·80	1	2	1
Whakatane Borough Council	481	10	70	80	16·63	83	53	17·25	5	6	..
Whangarei Borough Council	2,092	33	153	186	8·90	124	75	5·93	11	23	..
Totals, 1933	322,997	2,198	31,525	33,723	10·43	47,772	38,832	14·80	15,913	25,953	1,330*
Totals, 1932	309,360	2,054	29,919	31,973	10·35	45,796	37,444	14·83	14,163	25,220	1,046
„ 1931	300,809	1,838	27,642	29,480	9·81	42,803	34,757	14·30	13,656	24,205	840
„ 1930	284,327	1,307	24,690	25,997	9·14	37,564	29,887	13·12	11,922	22,087	923
„ 1929	266,306	1,036	19,218	20,254	7·60	29,257	23,100	10·98	10,161	19,654	..

* Includes 424 not previously scheduled by Central Power Board.

TABLE XXVIII.—RETURN SHOWING AVERAGE REVENUE PER CONSUMER, PER CAPITA, PER ROUTE-MILE OF LINE, ETC., FOR THE YEAR ENDED 31ST MARCH, 1933.

Licensee.	Ratio of Consumers to Population.	Average Revenue per Consumer.[1]	Average Revenue *Per Capita.*[3]	Per Route-mile of Line.		Capital Outlay *Per Capita.*	Retail Selling-rates.		
				Revenue.[2]	Consumers.		Lighting.	Heating.	Power.
	%	£	£	£	No.	£	d.	d.	d.
Alderton Utility Co.	14·28	15·22	2·18	70·00	4·60	19·42	Meters not installed.	Charges according to installed capacity.	
Ashburton Power Board	19·82	11·92	2·41	49·50	4·15	19·67	8 to 1	3 to 1	3 to $\frac{3}{4}$
Auckland Power Board	21·80	11·20	2·98	572·00	45·20	15·13	5 to 1 (less 5% domestic; less 10% commercial)	$4\frac{1}{2}$ to $\frac{1}{2}$ (less 5%)	$2\frac{1}{2}$ to 1 (less 10%)
Banks Peninsula Power Board	24·00	11·40	2·87	55·20	4·85	25·50	10 to $1\frac{1}{2}$ (less 5%)	3 to $\frac{3}{8}$ (less 5%)	3 to $1\frac{1}{2}$ (less 5%)
Bay of Plenty Power Board	16·00	26·40	4·52	149·00	5·64	24·00	10 to $1\frac{1}{2}$	4 to $1\frac{1}{2}$	3 to 2
Bluff Borough Council	26·18	8·32	2·33	384·12	46·00	6·36	7 to 4	2	3 to $1\frac{7}{8}$
Cambridge Power Board	24·00	13·27	3·32	102·60	7·73	18·38	$7\frac{1}{2}$ to $3\frac{3}{4}$	3 to $\frac{3}{4}$	3 to $\frac{1}{2}$
Central Power Board	22·80	13·10	3·13	102·50	7·82	18·30	$6\frac{1}{2}$	$1\frac{1}{2}$	3 to $1\frac{1}{2}$
Central Hawke's Bay Power Board	13·85	13·45	1·98	95·70	7·12	12·02	8 to $1\frac{1}{2}$ (domestic); 8 (commercial)	3 to 1	3 to 1
Christchurch City Council	29·63	7·10	2·18	645·00	87·30	8·52	4 to $\frac{3}{4}$ (domestic); 5 to 1 (commercial)	$\frac{3}{4}$ (domestic); 2 (commercial)	$1\frac{1}{4}$ to $\frac{1}{2}$
Dannevirke Power Board	19·83	11·20	2·38	87·50	7·82	16·95	$7\frac{1}{2}$ to $6\frac{1}{2}$	3 to $1\frac{1}{2}$	3 to 1
Dunedin City Council	27·70	7·55	2·24	392·00	46·90	18·60	5 to $\frac{3}{4}$	2 to $\frac{3}{4}$	2 to $\frac{1}{6}$
Franklin Power Board	19·78	13·41	2·93	90·31	6·73	16·89	5·1	1·275	2·55 to 1·7
Golden Bay Power Board	27·50	11·13	3·26	63·07	5·67	21·49	9	$4\frac{1}{2}$ to 2	$4\frac{1}{2}$ to $1\frac{1}{2}$
Grey Power Board	20·85	11·47	2·58	222·50	19·40	21·40	7	$1\frac{1}{2}$ to 1	2 to $1\frac{1}{2}$
Halswell County Council	14·87	7·86	1·17	98·30	12·50	3·76	Flat Rates.	Public Works Department's Schedule.	
Hamilton Borough Council	27·04	8·06	2·19	616·69	76·55	4·94	5 to $3\frac{1}{2}$	2	2 to $\frac{1}{2}$
Hastings Borough Council	26·95	7·88	2·12	472·00	60·00	9·33	8 to $1\frac{1}{2}$ (less $12\frac{1}{2}$%)	4 to $1\frac{1}{2}$ (less $12\frac{1}{2}$%)	3 to $1\frac{1}{4}$ (less $12\frac{1}{2}$%)
Havelock North Town Board	25·70	10·98	2·83	198·00	18·00	20·70	7	2	2
Hawke's Bay Power Board	18·27	14·45	2·76	224·00	9·10	16·16	8 to $1\frac{1}{2}$ (domestic); 8 to 4 (commercial)	8 to $1\frac{1}{2}$ (domestic); 4 to $1\frac{1}{2}$ (commercial)	3 to $1\frac{1}{2}$
Heathcote County Council	25·03	7·14	1·83	343·00	47·00	6·11	6 to 4	1	3 to 1
Horowhenua Power Board	23·00	11·00	2·67	137·00	12·45	12·40	6	4 and $1\frac{3}{8}$	3 to $\frac{1}{2}$
Hurunui Power Board[4]	..	..	..	..	..	..	..	..	..
Hutt Valley Power Board	25·40	8·91	2·33	338·00	38·00	8·76	6 and 4 (less $12\frac{1}{2}$%)	3 to $1\frac{1}{2}$ (less $12\frac{1}{2}$%)	3 to $1\frac{1}{2}$ (less $12\frac{1}{2}$%)
Inglewood Borough Council	31·80	9·47	3·62	481·50	51·00	9·72	6	2 to $1\frac{3}{4}$	2 to $1\frac{1}{2}$
Invercargill City Council	24·90	7·99	2·18	553·00	66·20	8·39	$6\frac{1}{2}$ to $1\frac{1}{2}$	3 to $1\frac{1}{8}$	3 to $1\frac{1}{8}$
Kaiapoi Borough Council	27·20	6·95	1·92	200·50	28·80	6·30	6	$1\frac{1}{2}$ to 1	3 to 1
Kaikoura County Council	23·50	10·55	2·53	312·40	29·60	16·05	12	12	6
Kamo Town Board	19·17	7·88	1·56	184·90	23·47	5·97	$8\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$ to $2\frac{1}{2}$
Kanieri Electric, Ltd.	25·16	16·38	4·26	420·49	25·67	38·93	6	1	3
Kaponga Town Board	30·40	13·84	4·27	97·70	7·05	20·42	10 to 9	4 to 1	5 to 2
Lyttelton Borough Council	20·70	7·69	1·59	585·00	76·20	2·96	$4\frac{1}{2}$	1	3 to 1
Malvern Power Board	13·00	10·84	1·56	39·00	3·60	12·90	9 to 1[5]	9 to 1[5]	3[5]
Manawatu-Oroua Power Board	11·59	13·30	1·61	123·60	7·45	13·12	7	$3\frac{1}{2}$ to $1\frac{1}{2}$	$3\frac{1}{2}$ to $1\frac{3}{4}$
Mangaweka Town Board	26·75	7·45	2·78	82·60	11·10	13·77	8	$2\frac{1}{2}$ to $1\frac{1}{2}$	4 to 3
Manunui Town Board	18·83	5·50	1·04	181·70	33·00	3·87	9	$4\frac{1}{2}$	$4\frac{1}{2}$
Marlborough Power Board	18·00	11·32	2·07	107·66	9·51	22·20	9 to $1\frac{1}{2}$	3 to $1\frac{1}{2}$	$4\frac{1}{2}$ to $1\frac{1}{2}$
Mataura Borough Council	28·69	4·13	1·29	171·11	41·44	3·36	6	$2\frac{1}{2}$	$2\frac{1}{2}$ to $1\frac{1}{2}$

For notes see page 107.

TABLE XXVIII.—RETURN SHOWING AVERAGE REVENUE PER CONSUMER, PER CAPITA, PER ROUTE-MILE OF LINE, ETC., FOR THE YEAR ENDED 31ST MARCH, 1933—*continued*.

Licensee.	Ratio of Consumers to Population.	Average Revenue per Consumer.[1]	Average Revenue *Per Capita*.[3]	Per Route-mile of Line.		Capital Outlay *Per Capita*.	Retail Selling-rates.		
				Revenue.[2]	Consumers.		Lighting.	Heating.	Power.
	%	£	£	£	No.	£	d.	d.	d.
Motueka Borough Council	20·40	6·40	1·36	195·30	30·50	9·54	12	4	4
Murchison County Council	26·20	14·86	4·50	123·50	8·32	27·85	8 to 3	3 to 1	3 to 2
Napier Borough Council	24·80	9·49	2·37	1,177·00	124·00	9·49	6 to 1½ (domestic); 6 to 4 (commercial)	6 to 1½ (domestic); 3 to 1½ (commercial)	3 to 1½
Nelson City Council	23·06	9·16	2·12	538·00	55·70	9·82	6	4 to 2	3 to 1½
New Plymouth Borough Council	28·80	10·75	3·29	238·50	20·40	21·00	7 to 6	2 to 1	2 to 1
North Auckland Power Board[4]	..	..	..	..	..	..	..	..	..
North Canterbury Power Board	18·12	12·48	2·40	66·50	4·65	15·80	8 to 2	3 to ¼	3 to ½
Ohakune Borough Council	23·40	7·93	1·87	232·00	29·30	9·63	9	3 to 1	4 to 2
Opunake Power Board	25·00	8·33	2·12	82·00	9·87	18·14	10 to 2 (less 10%)	2 to 1½ (less 10%)	6 to 2 (less 10%)
Otago Central Power Board	35·70	10·52	3·84	58·20	5·52	35·20	£10 per kw. per annum, plus 4d. to 1d. per unit	£1 per kw. per annum of maximum demand	£2 per h.p. per annum, plus 4d. to 1d. per unit
Otago Power Board	21·60	10·04	2·18	64·50	6·42	15·83	9	4 to 1½	4 to ¼
Palmerston North City Council	25·30	9·80	2·48	695·00	71·00	9·64	6 (less 10%)	1½ (less 10%)	3 to 1¾ (less 10%)
Patea Borough Council	19·90	11·28	2·30	294·00	26·00	9·58	7 to 6	4 to 1¾	3·8
Picton Borough Council	26·47	8·75	2·36	297·50	34·00	14·90	9 to 8	4 to 2	4
Poverty Bay Power Board	19·40	11·30	2·23	146·70	13·00	13·56	8 to 6	4 to 1½	4 to 2¼
Queenstown Borough Council	27·45	6·30	1·83	244·00	38·66	15·23	6	6	3
Raetihi Borough Council	8·64	8·81	0·81	137·07	13·89	8·36	8 to 3	2 to 1	3 to 1½
Rangiora Borough Council	28·60	7·40	2·11	332·50	45·00	6·12	6 to 2 (less 7%)	2½ to 1½ (less 7%)	3 to ½ (less 7%)
Rawene (Spender, Paul)	17·67	10·13	1·88	613·71	61·00	9·75	15	..	12
Rotorua (Tourist Department)	35·30	9·18	3·36	288·50	31·40	13·83	6½ to 5	3 to 1	4 to 1
Reefton Light and Power Co., Ltd.	23·83	10·40	2·70	445·00	42·80	4·50	9	4	4
Riccarton Borough Council	24·73	7·37	1·89	548·93	74·52	4·35	6 to ⅞	⅞	1½
South Canterbury Power Board	14·95	11·61	1·85	73·90	5·05	13·23	8 to 1	3 to 1	3 to ¾
South Taranaki Power Board	17·76	9·29	1·72	158·50	16·30	12·03	5¾	3·35 to 1·20	3·12 to 1·20
Southland Power Board	19·27	10·75	2·39	49·50	3·88	34·40	7 to 1½	7 to ½	7 to 1½
Springs-Ellesmere Power Board	19·73	11·88	2·36	94·00	7·92	12·65	8 to 2 (domestic); 7 (commercial)	3 to ½	3 to ½
Stratford Borough Council	29·80	11·50	3·43	750·00	65·20	7·95	8 to 2	2 to 1	4 to 1
Sumner Borough Council	28·90	5·35	1·55	570·00	106·40	4·85	4	1 to ½	1 to ½
Taihape Borough Council	25·40	7·25	1·84	437·00	60·30	7·72	7·2	1½	2
Taranaki Power Board	15·70	16·03	2·76	125·50	6·90	32·65	7	3½ to 1½	4½ to 1
Tararua Power Board	19·67	13·82	2·86	105·00	7·60	20·30	8	1½ to 1	4 to 0·4
Taumarunui Borough Council	20·20	9·32	2·06	633·00	64·70	15·55	8 to 7	3 to 1½	3 to 0·9
Tauranga Borough Council	34·55	10·20	3·92	316·00	15·33	54·50	5	1	2 to 1
Tauranga Power Board	12·76	20·80	2·78	67·00	3·23	15·58	8 to 1	6 to 1½	3⅜ to 1½
Te Aroha Borough Council	28·20	10·33	2·94	476·00	46·00	10·16	6½ to 5	3 to ½	3 to ½
Te Awamutu Power Board	23·20	16·50	3·99	93·75	5·68	24·30	6	2 to 1½	3 to 1½
Te Puke Town Board	30·20	11·10	3·46	297·00	25·80	12·63	7	2½ to 1	3 to 1¼
Teviot Power Board	22·30	11·62	2·80	84·75	5·92	32·20	£10 per kw., plus 3d. to ½d. per unit	10s. per kw., plus 3d. to ½d. per unit	£1 13s. per h.p. per year, plus 3d. to 1d. per unit over 99 units

For notes see page 107.

TABLE XXVIII.—RETURN SHOWING AVERAGE REVENUE PER CONSUMER, PER CAPITA, PER ROUTE-MILE OF LINE, ETC., FOR THE YEAR ENDED 31ST MARCH, 1933—*continued.*

Licensee.	Ratio of Consumers to Population.	Average Revenue per Consumer.[1]	Average Revenue *Per Capita.*[3]	Per Route-mile of Line.		Capital Outlay. *Per Capita.*	Retail Selling-rates.		
				Revenue.[2]	Consumers.		Lighting.	Heating.	Power.
	%	£	£	£	No.	£	d.	d.	d.
Thames Borough Council	24·20	7·72	1·95	412·00	53·40	5·09	8	3 to 1½	3 to ½
Thames Valley Power Board	18·96	16·63	3·25	151·67	8·50	23·80	7½	3 to 1	3 to 0·4
Timaru Borough Council	21·00	8·80	1·88	569·00	64·70	7·52	7 to 4 (less 10%)	3 to 1½ (less 10%)	2½ to 0·6 (less 10%)
Uawa County Council	23·80	10·03	2·55	318·00	31·70	15·69	17	11	11
Waimairi County Council	25·20	6·77	1·71	155·50	23·00	6·50	4 to 1½	5 to 1	2 to ⅓
Waimea Electric Supply Co., Ltd.	19·77	6·50	1·40	130·00	20·00	5·71	10	3½	3½
Wairarapa Power Board	23·10	11·66	2·86	103·00	8·82	18·40	6½ to 3	3¼ to 1¼	3½ to 2
Wairere Power Board	16·00	15·60	2·80	44·40	2·85	21·00	9	4½	5s. per h.p. per month, plus 3d. to 1d. per unit.
Wairoa Borough Council	25·73	13·03	3·38	584·00	44·80	5·25	5	3 to 1	3 to 1½
Wairoa Power Board	6·38	16·47	1·16	106·60	3·74	11·30	9 to 1	9 to 1	3 to 1½
Wairua (Wilson's Cement Co.)	13·92[6]	13·62[7]	2·68[7]	294·50	1·64	10·35	5½ to 5	1½	3 to 2½
Waitaki Power Board	17·40	8·28	1·48	76·70	9·25	9·20	4·8 to 1·2	1·6 to 0·8	2·4 to 0·267
Waitara Borough Council	26·05	7·82	2·18	292·00	37·40	6·84	8	3·2 to 1	3 to 1
Waitemata Power Board	22·40	8·00	1·88	150·30	18·77	9·83	6 (less 20%)	3 to 1¾ (less 20%)	3 to 1¾ (less 20%)
Waitomo Power Board	15·00	15·63	2·35	186·91	11·96	12·53	8	3 to 1	3 to 1½
Wanganui-Rangitikei Power Board	19·25	9·10	1·89	133·30	14·17	10·82	5 to 3	2 to 1½	3 to ½
Wellington City Council	32·20	7·87	2·93	1,020·00	116·00	10·84	5 to 2	2 to 1	2½ to ¾
Westland Power, Ltd.	3·10	30·40[8]	1·16	75·40	2·48	16·50	12 and 9 (less 25%)	3 to 1½ (less 25%)	4 to 2 (less 25%)
Westport Borough Council	18·43	9·08	1·68	351·59	39·00	7·93	8 to 7	3 to 1	3 to 2
Whakatane Borough Council	26·70	12·22	3·28	171·00	14·00	21·00	9	1⅓	3 to 1
Whangarei Borough Council	26·85	7·68	2·28	506·00	62·40	8·75	5	1½	3 to 2
Average for reticulation areas in New Zealand, 1933	22·95	(*a*) 10·50[1]	2·54	218·00	15·7	22·10	..	..	..
Average for 1932	22·08	11·63	2·56	..	..	21·68	..	..	..
„ 1931	21·47	12·20	2·62	..	..	20·84	..	..	..
„ 1930	20·74	12·39	2·58			17·68			

[1] Revenue from retail sale of energy only. [2] Gross revenue, not including rates. [3] Gross revenue, excluding rates and bulk supply for resale. [4] Not yet actively functioning. [5] Less 10 per cent. to 15 per cent. cash discounts. [6] Population of Whangarei and Kamo not included in computing this ratio. [7] Revenue from Portland load and bulk supply to Whangarei not included in computing these figures. [8] Principally gold-mining companies. (*a*) Owing to adoption of different basis of compilation this figure is not strictly comparable with those of previous years.

Gross revenue as per Table XXVIII	£4,480,716	
Revenue from bulk sales as per Table XXVIII	£911,580	(Govt., £775,420)
Revenue from retail sales as per Table XXVIII	£3,396,809	
Revenue from other sources (excluding rates) as per Table XXVIII	£172,327	
Population of supply areas, Table XXVII	1,407,927	
Number of consumers, Table XXVII	322,977	
Route-miles of line, Table XXVII	20,585	

Table XXIX.—Condensed Financial Statistics for Year ended 31st March, 1933.

Supply Authority.	Capital Investment.		Total Revenue, excluding Rates.	Total Working-expenses.	Interest and Sinking Fund Payments.	Amount Credited to Depreciation Reserve.	Other Capital Charges.[1]	Result of Year's Working.		Accumulated Sinking Funds.	Depreciation Account.		Accumulated Funds other than Sinking and Depreciation.	Amount Collected by Rates to make up Deficiencies.	Actual Accumulated Losses to 31st March, 1933.
	Total Outlay to Date.	Present Book Value.						Debit.	Credit.		Amount at Credit not Invested Separately.	Amount Invested Separately as Fund.			
	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
Arapuni-Horahora	4,734,635	4,396,660	337,641	47,740	218,848	75,951	36,590[6]	41,487	..	61,705‡	283,823	..	..	..	120,354
Ashburton	357,784	335,331	43,820	19,100	22,746	10	..	..	1,964	32,132	8,713	685	3,100	..	7,281
Auckland	3,406,366	2,836,042	674,622	325,137	205,609	73,102	20,844[2]	..	49,930	667,331	458,179	..	..	..	..
Banks Peninsula	103,187	98,243	11,618	7,763	7,570	303	..	4,018	..	11,320	..	4,944	..	3,150[3]	..
Bluff	10,810	9,130	3,960	2,895	742	..	..	..	323	680	..	1,680	..	..	346
Bay of Plenty	209,089	203,702	39,303	21,658	13,259	1,837	..	..	2,549	12,501	5,387	..	..	..	3,369
Cambridge	110,324	108,816	19,923	12,226	6,940	..	..	..	757	16,702	..	1,508	..	..	..
Central Hawke's Bay	138,344	127,530	22,700	12,529	8,102	860	1,485	276	..	2,497	4,691	10,214	1,149	..	1,400
Central	348,204	315,669	59,618	29,789	21,977	4,097	181	..	3,574	28,918	4,097	15,340	15,179	..	..
Christchurch	808,996	363,441	214,244	144,062	16,593	30,889	441[2]	..	22,259	153,601	445,555	..	..	..	..
Coleridge	2,195,112[4]	1,830,253	213,345	57,780	104,787	29,552	..	..	21,226	222,828†	244,867	..	195,475	..	..
Dannevirke	213,820	203,150	30,009	12,597	14,859	2,105	400	..	48	18,861	2,105	9,387	..	..	..
Dunedin	1,710,617	1,588,497	214,975	54,066	96,988	25,806	1,552[2]	..	36,563	174,367	152,508	..	219,927	..	..
Franklin	288,790	234,728	50,125	25,346	18,586	1,491	..	..	4,702	18,533	30,712[5]	23,350	12,156	..	..
Grey	283,579	265,815	34,120	13,961	17,793	1,032	864	..	470	23,020	3,793	1,073	3,060	..	..
Golden Bay	25,788	23,710	3,915	1,519	1,717	367	200	..	112	1,069	942	..	..	15[8]	..
Halswell§	6,956	3,366	2,163	1,360	313	..	..	..	490	..	..	..	..	..	..
Hamilton	76,511	41,547	33,998	17,277	4,899	2,130	..	..	9,692	24,721	..	15,952	11,384	..	..
Hastings	118,791	114,242	27,020	16,394	5,808	963	225	..	3,630	17,506	..	4,549	..	..	..
Havelock North	24,074	24,074	3,291	1,675	1,731	..	..	115	..	7,412	..	..	..	..	..
Hawke's Bay	221,055	215,600	63,316	40,773	15,445	2,500	311	..	4,287	16,290	..	5,455	..	..	..
Heathcote	36,648	24,508	10,976	7,733	2,193	..	292	..	758	5,152	..	..	..	..	..
Horowhenua	212,293	189,781	45,724	26,920	13,223	3,485	1,223	..	873	13,150	..	22,512	13,000	..	..
Hurunui*	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Hutt Valley	386,414	328,479	102,717	63,801	23,675	9,374	1,880	..	3,987	21,868	6,159	47,776	5,394	..	..
Inglewood	12,644	7,322	4,710	2,957	1,005	402	..	..	346	4,185	5,321	..	..	..	..
Invercargill	176,256	146,749	45,815	23,304	9,410	562	..	..	12,539	21,481	..	29,507	..	..	..
Kaikoura	10,107	8,716	1,595	1,269	740	245	250	909	..	1,347	..	..	..	542	..
Kaiapoi	10,701	7,242	3,255	1,805	894	158	..	..	398	1,728	2,548	911	..	..	91
Kamo	3,579	2,500	934	612	210	..	40	..	72	44	..	..	..	114	..
Kanieri Electric, Ltd., Hokitika ..	97,335	83,128	10,643	6,299	2,804	1,321	109[7]	..	110	..	14,207	..	..	..	..
Kaponga	24,507	23,052	5,125	2,936	1,873	..	12	..	304	3,764	..	..	..	251	2,943
Kerikeri (Alderton Utility Co.) ..	5,439	5,277	609	502	172	37	..	102	..	..	162	..	..	..	75
Lyttelton	10,990	10,422	5,896	3,508	479	141	..	..	1,768	763	141	427	..	..	..
Malvern	65,098	60,603	7,887	5,372	4,469	..	..	1,954	..	5,709	2,623	..	..	2,000[3]	4,502
Manawatu-Oroua	512,150	482,943	77,622	44,967	32,938	3,056	257	3,596	..	62,141	14,183	10,356	730	..	10,312
Mangahao-Waikaremoana	3,690,475	3,689,214	313,342	53,907	209,776	52,645	..	2,986‖	..	..	419,256	..	..	..	487,609
Mangaweka	5,710	5,710	1,156	1,052	126	..	..	22	..	676	..	..	..	..	..
Manunui	3,290	3,290	881	555	250	..	..	..	76	..	..	..	..	..	..

[1] Amounts in this column are for annual instalment of principal repayment, except where otherwise noted. [2] Exchange on overseas interest payments. [3] Includes arrears for previous years. [4] Includes stocks and amounts written off. [5] Amounts written off. [6] Half capital charges, Auckland Power Board's standby plant. [7] Miscellaneous capital expenditure. [8] Arrears for previous years. * Not yet functioning. † Includes £110,342 utilized for redemption of loans. ‡ £49,768 utilized for redemption of loans. § License assigned to Christchurch City Council, August, 1933.

TABLE XXIX.—CONDENSED FINANCIAL STATISTICS FOR YEAR ENDED 31ST MARCH, 1933—*continued.*

Supply Authority.	Capital Investment.		Total Revenue, excluding Rates.	Total Working-expenses.	Interest and Sinking Fund Payments.	Amount Credited to Depreciation Reserve.	Other Capital Charges.[1]	Result of Year's Working.		Accumulated Sinking Funds.	Depreciation Account.		Accumulated Funds other than Sinking and Depreciation.	Amount Collected by Rates to make up Deficiencies.	Actual Accumulated Losses to 31st March, 1933.
	Total Outlay to Date.	Present Book Value.						Debit.	Credit.		Amount at Credit not Invested Separately.	Amount Invested Separately as Fund.			
	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
Marlborough	322,537	307,094	30,087	7,906	19,696	3,125	..	640	..	27,180	15,443	..	..	2,928[8]	13,401
Mataura*	4,366	4,041	1,674	1,264	212	107	..	..	91	279	..	325	..	194	..
Motueka	16,697	10,078	2,376	1,842	962	250	..	678	..	2,321	..	250	500	901	..
Murchison	13,925	13,925	2,252	1,436	965	..	..	149	..	2,288	..	..	..	..	..
Napier	170,932	146,558	42,652	21,956	8,154	4,206	551	..	7,785	11,198	10,683	24,374	9,107	..	..
Nelson	112,890	90,545	25,776	13,189	4,593	2,867	467[2]	..	4,660	1,178	16,345	6,000	..	1	..
New Plymouth	441,487	351,110	72,866	28,673	32,733	..	371[2]	..	11,089	92,134	76,653	13,735	510	..	..
North Auckland†	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
North Canterbury	143,122	136,293	24,768	14,093	9,504	571	..	..	600	6,372	5,099	1,322	..	..	..
Ohakune	18,674	6,592	3,620	1,815	1,069	..	..	..	736	3,738	..	..	..	..	..
Opunake	108,994	108,169	12,738	4,665	7,379	150	..	..	544	3,680	570	255	..	..	..
Otago Central	89,433	83,681	9,755	3,589	4,863	..	1,356	53	..	2,528	2,348	..	..	..	3,423
Otago	283,712	262,378	38,997	19,108	19,716	..	601	428	..	22,989	18,396	..	..	8,896[3]	22,640
Palmerston North	220,127	193,417	56,653	25,711	11,399	5,455	..	..	14,088	23,438	..	26,710	..	..	..
Patea	17,229	16,957	4,140	3,219	562	147	80	..	132	509	147	125	..	..	..
Picton	19,380	14,809	3,076	1,984	1,208	400	1,500	2,016	..	2,659	..	1,308	..	1,308	..
Poverty Bay	331,474	318,728	54,652	28,059	20,691	1,920	1,254	..	2,728	25,359	11,091	2,029	..	..	..
Queenstown	12,870	12,504	1,548	474	563	117	225	..	169	931	..	366	..	..	..
Raetihi	37,636	21,556	4,054	2,038	1,912	190	..	86	..	5,430	190	579	..	..	7,103
Rangiora	12,862	9,293	4,444	3,331	410	487	..	..	216	1,404	3,569	346	..	..	..
Rawene (P. Spender)	2,926	2,926	563	722	..	..	..	159	..	..	..	..	..	..	..
Reefton Electric Light and Power Co., Ltd.	5,848	5,556	3,511	3,343	..	..	..	..	168	..	..	..	..	..	..
Riccarton	23,927	18,099	10,390	6,608	826	675	..	..	2,281	1,256	..	1,467	..	..	..
Rotorua	76,150	61,253	18,499	9,965	5,330	1,523	..	..	1,631	16,260	14,897	..	..	..	..
South Canterbury	325,565	285,757	56,647	29,732	21,300	4,345	..	..	1,270	33,113	10,774	..	..	..	..
South Taranaki	196,031	181,667	29,218	11,743	12,827	822	472	..	3,354	11,918	..	3,940	6,012	..	..
Southland	1,660,102	1,641,888	133,901	38,820	116,574	..	7,838[2] / 285[7]	29,616	..	311,054	13,845	..	..	37,286[3]	24,913
Springs-Ellesmere	156,085	148,906	29,092	16,835	9,832	..	340	..	2,085	7,483	..	7,262	..	..	..
Stratford	27,843	26,784	11,999	6,349	3,390	250	..	..	2,010	7,796	..	1,059	..	..	..
Sumner	16,975	13,674	5,434	4,434	511	..	..	..	489	1,733	..	870	..	..	..
Taihape	18,924	8,127	4,508	2,265	1,049	508	..	..	686	4,550	..	2,014	..	..	..
Taranaki	456,941	414,881	43,315	12,329	31,052	2,711	1,223	4,000	..	31,102	13,272	813	..	2,350	..
Tararua	164,559	150,901	23,223	11,198	9,620	2,215	105	..	85	17,729	10,228	1,826	564	..	989
Taumarunui	62,219	57,911	8,614	2,299	3,643	400	470	..	1,802	3,924	..	4,108	..	..	..
Tauranga Power Board	132,191	122,217	23,629	12,311	8,465	1,000	309	..	1,544	11,087	2,082	4,616	2,183	..	..
Tauranga Borough	155,367	152,981	21,433	6,962	8,295	..	..	..	6,176	21,125	..	2,386	6,035	..	..
Te Aroha	25,896	14,024	7,515	5,279	610	350	..	..	1,276	2,130	6,842	1,495	..	..	..
Te Awamutu	186,023	181,865	30,489	14,452	10,904	..	974	..	4,159	17,653	120	4,038	..	..	..
Teviot	57,958	54,954	6,137	2,192	4,391	70	..	516	..	6,532	2,094	910	..	1[8]	..

[2] Exchange on overseas interest payments. [3] Includes arrears for previous years. [7] Miscellaneous capital expenditure. [8] Arrears for previous years.
* Taken over by Southland Power Board in December 1932. † Not yet functioning.

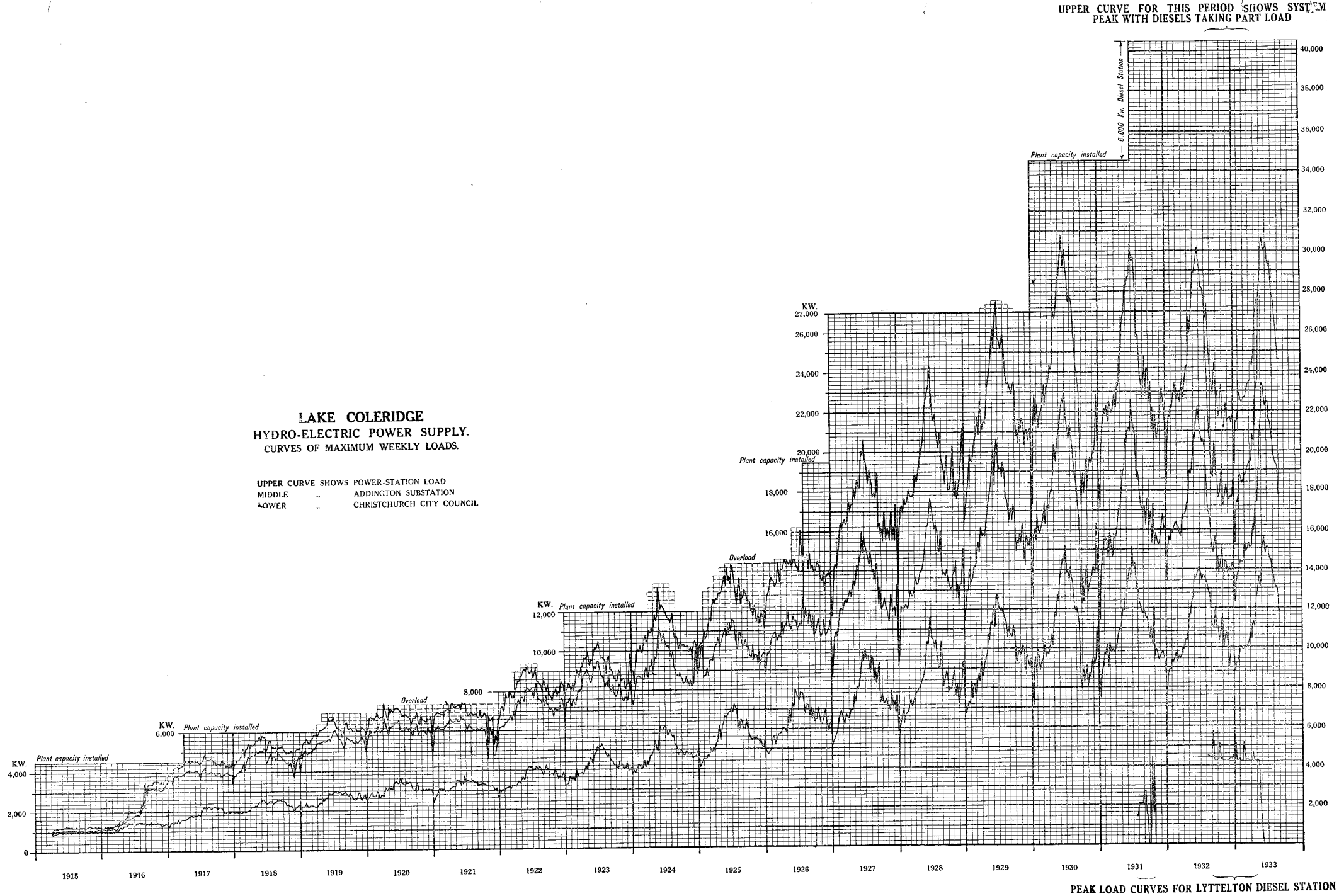
TABLE XXIX.—CONDENSED FINANCIAL STATISTICS FOR YEAR ENDED 31ST MARCH, 1933—*continued.*

Supply Authority.	Capital Investment.		Total Revenue, excluding Rates.	Total Working-expenses.	Interest and Sinking Fund Payments.	Amount Credited to Depreciation Reserve.	Other Capital Charges.[1]	Result of Year's Working.		Accumulated Sinking Funds.	Depreciation Account.		Accumulated Funds other than Sinking and Depreciation.	Amount Collected by Rates to make up Deficiencies.	Actual Accumulated Losses to 31st March, 1933.
	Total Outlay to Date.	Present Book Value.						Debit.	Credit.		Amount at Credit not Invested Separately.	Amount Invested Separately as Fund.			
	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
Te Puke	12,384	6,215	3,382	1,709	563	250	..	..	860	1,484	..	2,772	..	..	..
Thames Borough	24,156	13,055	9,241	5,887	343	518	..	..	2,493	84	10,811	2,244	..	..	..
Thames Valley	825,634	805,200	120,690	60,304	54,743	1,157	3,570[2] + 1,088	172	..	119,768	1,157	19,278	..	..	4,489
Timaru	135,390	97,547	33,900	20,416	9,217	..	..	..	4,267	42,634	..	..	..	..	..
Uawa (Tolaga Bay)	6,275	3,591	1,021	496	621	294	..	390	..	2,809	2,684	..	..	..	82
Waimairi	84,610	52,445	22,271	11,320	3,637	3,722	653	..	2,939	4,435	5,674	..	..	89	..
Waimea Electric Co.	22,823	18,206	5,605	3,475	324	..	..	..	1,806	..	..	..	..	..	..
Wairarapa	359,291	343,808	55,775	23,200	23,954	2,948	1,425	..	4,248	24,561	6,604	5,632	..	..	..
Wairere	42,006	39,275	5,607	2,724	3,287	..	..	404	..	1,587	1,710	1,020	..	..	..
Wairua	92,133	25,514	13,131	3,482	..	..	..	..	9,649	..	..	..	..	..	..
Wairoa Borough	12,589	11,403	8,111	6,055	1,105	373	20	..	558	1,202	408	778	..	..	..
Wairoa Power Board	62,461	57,292	10,648	9,593	4,543	934	194	4,616	..	6,696	3,315	1,854	..	95	14,947
Waitaki	179,341	152,944	28,924	16,691	9,938	2,450	616	771	..	18,684	..	14,229	12,193	..	..
Waitara	12,655	5,809	4,041	2,074	900	183	..	..	884	6,047	..	486	..	535	..
Waitemata	397,524	382,120	76,189	40,430	29,553	3,125	..	..	3,081	56,830	15,404	..	10,000	..	..
Waitomo	100,210	98,210	18,786	10,070	6,493	159	..	..	2,064	7,845	1,372	628	..	..	..
Wanganui-Rangitikei	562,841	469,434	98,357	50,513	34,186	7,734	5,057	..	867	12,679	20,044	3,900	..	..	..
Wellington	1,193,035	1,193,035	322,048	165,346	31,743	22,239[3]	2,219[2] + 163	..	100,338	60,217	..	..	191,271	..	..
Westport	31,716	27,455	6,729	1,888	2,304	304	..	..	2,233	5,634	965	2,381	..	3	..
Westland	69,300	65,972	4,895	4,578	..	..	..	..	317	..	..	..	..	..	..
Whakatane	37,823	36,817	5,908	1,951	2,782	..	172	..	1,003	4,086	..	..	..	56	..
Whangarei	68,072	62,741	18,649	11,045	2,143	..	..	..	5,461	5,975	..	5,230	..	..	..
Totals	31,118,614	28,038,661	4,480,716	1,948,583	1,727,138	405,672	100,753	100,159	398,729	2,780,039	2,414,808	380,586	718,929	60,445	732,618

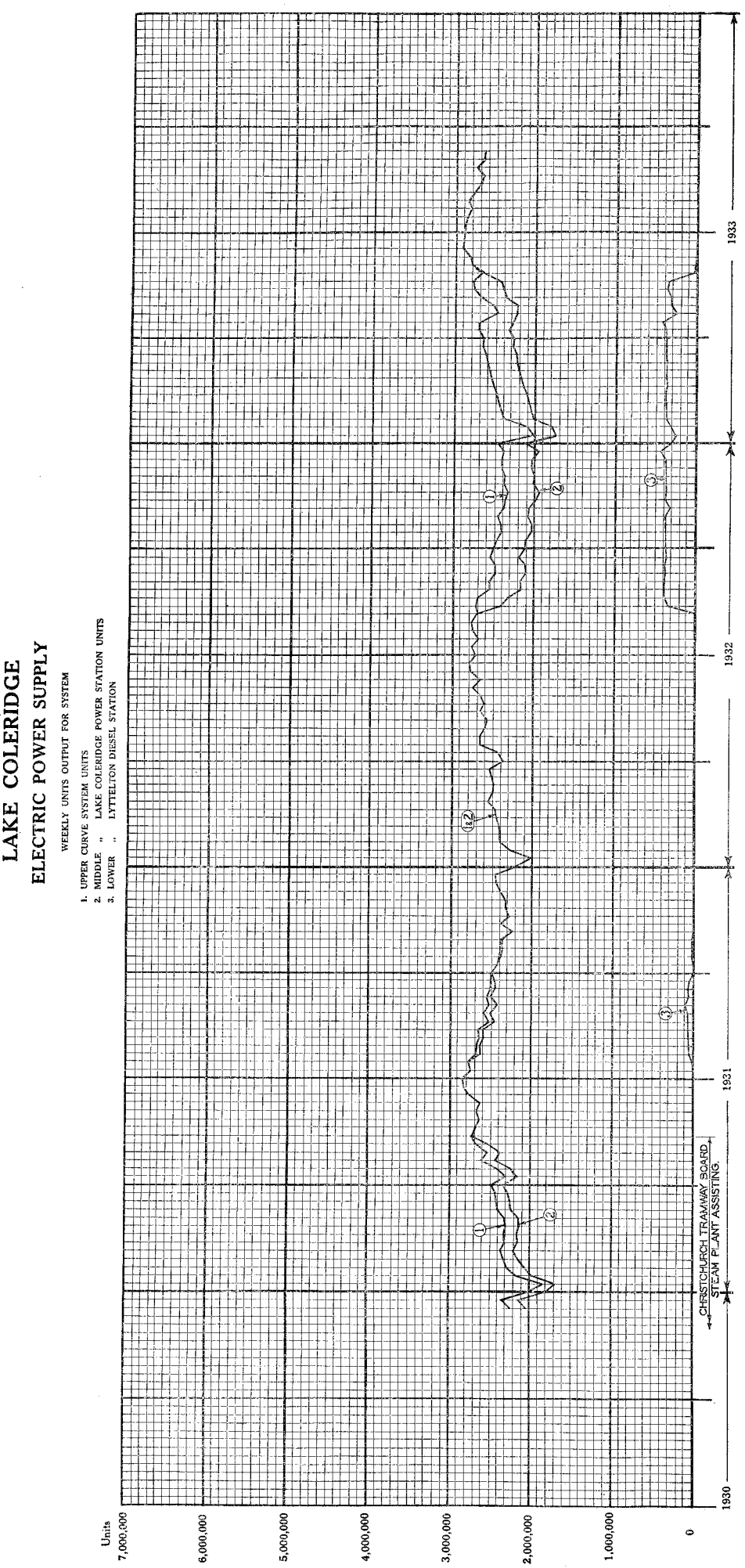
[2] Exchange on overseas interest payments. [3] Renewal reserve.

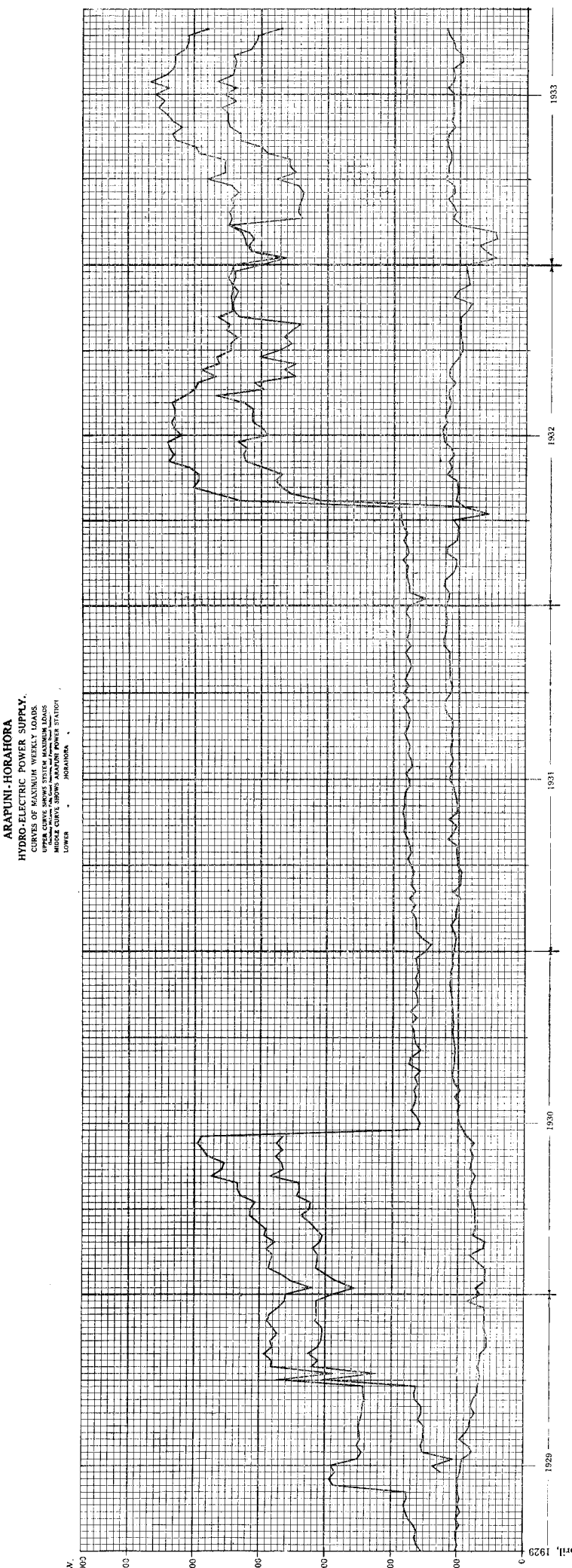
LAKE COLERIDGE
HYDRO-ELECTRIC POWER SUPPLY.
CURVES OF MAXIMUM WEEKLY LOADS.

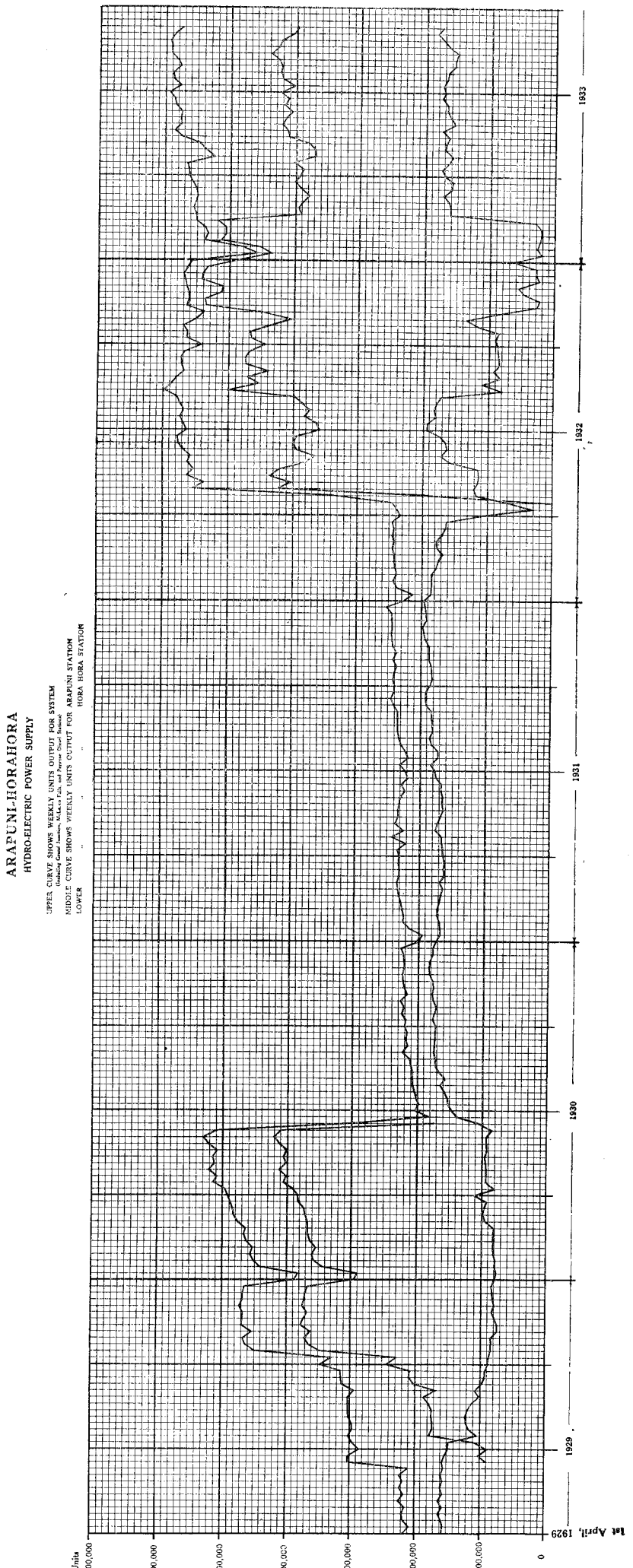
UPPER CURVE SHOWS POWER-STATION LOAD
MIDDLE " ADDINGTON SUBSTATION
LOWER " CHRISTCHURCH CITY COUNCIL

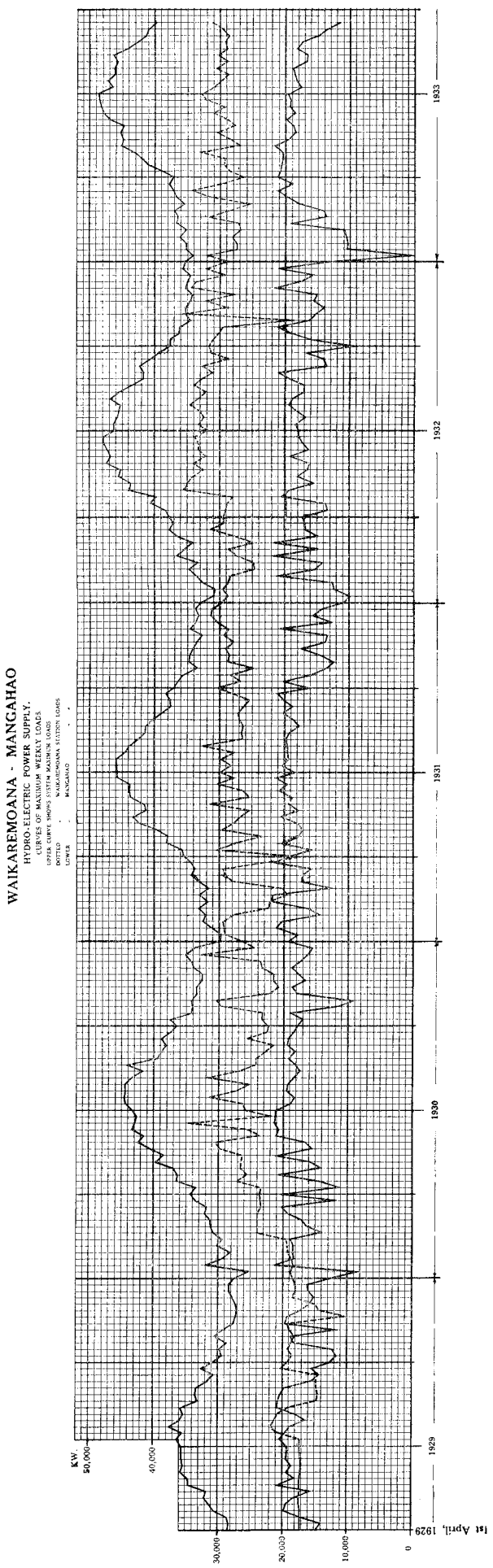


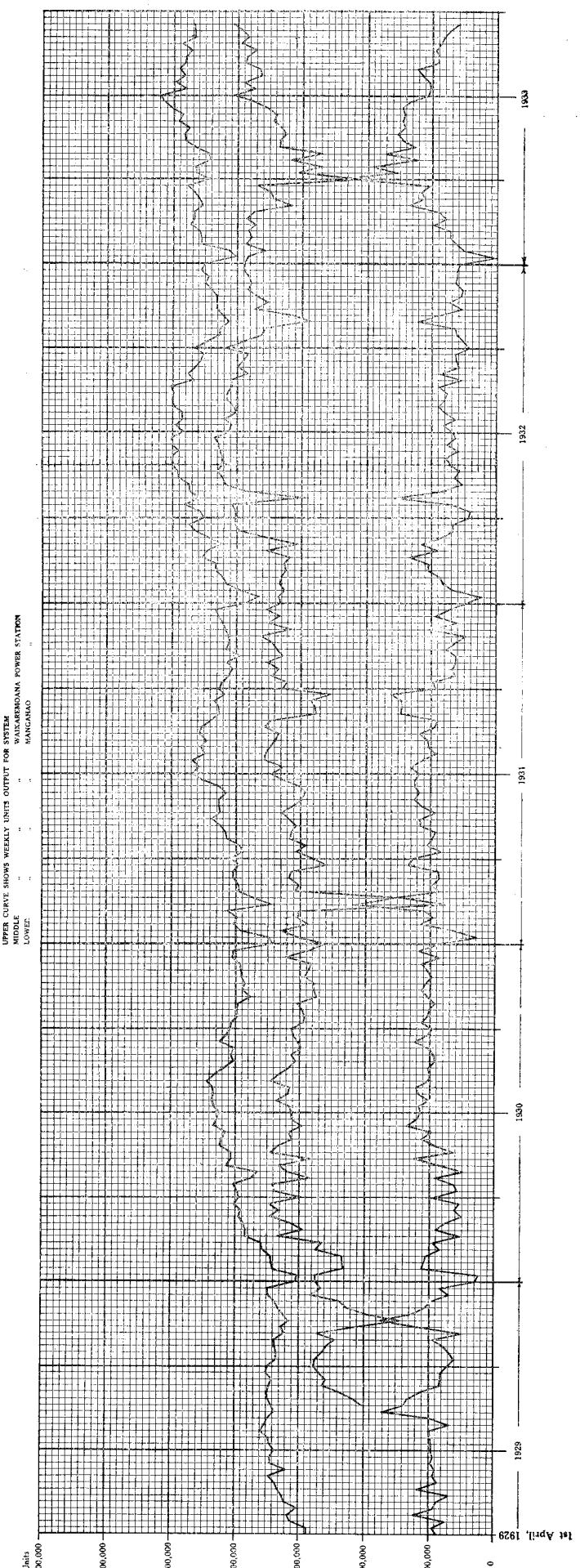
PEAK LOAD CURVES FOR LYTTELTON DIESEL STATION


LAKE COLERIDGE
ELECTRIC POWER SUPPLY
WEEKLY UNITS OUTPUT FOR SYSTEM
1. UPPER CURVE SYSTEM UNITS
2. MIDDLE " LAKE COLERIDGE POWER STATION UNITS
3. LOWER " LYTTELTON DIESEL STATION
Units
7,000,000
6,000,000
5,000,000
4,000,000
3,000,000
2,000,000
1,000,000
0
1930
1931
1932
1933
CHRISTCHURCH TRAMWAY BOARD STEAM PLANT ASSISTING.


ARAPUNI-HORAHORA
HYDRO-ELECTRIC POWER SUPPLY.
CURVES OF MAXIMUM WEEKLY LOADS.
UPPER CURVE SHOWS SYSTEM MAXIMUM LOADS
MIDDLE CURVE SHOWS ARAPUNI POWER STATION
LOWER " HORAHORA "
KW.
67,000
60,000
50,000
40,000
30,000
20,000
10,000
0
1933
1932
1931
1930
1929
1st April, 1929


ARAPUNI-HORAHORA
HYDRO-ELECTRIC POWER SUPPLY
UPPER CURVE SHOWS WEEKLY UNITS OUTPUT FOR SYSTEM
MIDDLE CURVE SHOWS WEEKLY UNITS OUTPUT FOR ARAPUNI STATION
LOWER " " " HORA HORA STATION
Units
7,000,000
6,000,000
5,000,000
4,000,000
3,000,000
2,000,000
1,000,000
0
1st April, 1929
1929
1930
1931
1932
1933


WAIKAREMOANA - MANGAHAO
HYDRO-ELECTRIC POWER SUPPLY.
CURVES OF MAXIMUM WEEKLY LOADS
UPPER CURVE SHOWS SYSTEM MAXIMUM LOADS
DOTTED - WAIKAREMOANA STATION LOADS
LOWER - MANGAHAO
KW.
50,000
40,000
30,000
20,000
10,000
0
1929
1930
1931
1932
1933
1st April, 1929


WAIKAREMOANA-MANGAHAO
UPPER CURVE SHOWS WEEKLY UNITS OUTPUT FOR SYSTEM
MIDDLE " " " WAIKAREMOANA POWER STATION
LOWER " " " MANGAHAO
Units
7,000,000
6,000,000
5,000,000
4,000,000
3,000,000
2,000,000
1,000,000
0
1st April, 1929
1929
1930
1931
1932
1933

APPENDIX E.

NINTH ANNUAL REPORT OF THE MAIN HIGHWAYS BOARD.

THE MAIN HIGHWAYS BOARD TO THE MINISTER OF PUBLIC WORKS, WELLINGTON.

SIR,—

In accordance with the provisions of section 24 of the Main Highways Act, 1922, the Main Highways Board has the honour to submit its ninth annual report for presentation to Parliament through the Hon. the Minister.

The report covers the period from the 1st April, 1932, to the 31st March, 1933, though a number of matters referred to are carried beyond the latter date for convenience and completeness of record.

GENERAL.

The total expenditure from both funds for the year amounted to £1,345,023, compared with £2,086,029 for the previous year. The expenditure from the Revenue Fund was £1,185,700, as compared with £1,701,884 for 1931–32 and £1,386,140 for 1930–31. These figures, however, are not truly indicative of the attention which has been devoted to the highways during the years mentioned, as a number of extraneous charges were imposed on the Revenue Fund by the operation of the various Finance Acts of 1930 and 1931. The money expended from the Revenue Fund on actual maintenance of the roads (including earthquake damage and flood restoration) during the past four years has shown a substantial reduction, the amounts being £1,049,249 for 1929–30, £872,577 for 1930–31, £849,734 for 1931–32, and £600,324 for 1932–33. The reduction in total expenditure on the maintenance of the highways has been greater than these figures signify, in view of the fact that for the last two years the Board's normal subsidy has been £3 for £1, whereas for the previous two years it was £2 for £1. Another point which has the effect of obscuring the full extent of the actual reduction is that the mileage of highways has been gradually increasing from year to year.

The present length of road, the maintenance of which is subsidized by the Main Highways Board, is 10,878 miles, of which 6,691 miles are regarded as primary highways and 4,187 miles secondary highways.

The expenditure from the Construction Fund for the year was £159,323, as compared with £384,145 for 1931–32, £711,250 for 1930–31, and £1,071,417 for 1929–30. These figures give a fair idea of the enormous reduction in construction activities. The work accomplished during the year included 56 miles 21 chains of formation and widening, 44 miles 47 chains of gravelling and metalling, and 81 miles 12 chains of dustless surfaces such as tar, bitumen, and concrete. A length of 3,178 lineal feet of bridging was completed, and engineering surveys have been undertaken over a length of 65 miles 73 chains of the highway system.

With the exception of a substantial increase in the cost of construction of the new Wairoa Bridge, the expenditure on earthquake restoration has been inappreciable during the past year, and it was not thought necessary to continue segregating such expenditure from the cost of ordinary maintenance work. The Wairoa Bridge, which was commenced as soon as possible after the Napier earthquake of the 3rd February, 1931, was seriously damaged in its partly constructed state by a further heavy earthquake shock on the 16th September, 1932. The additional cost of the structure as a result of this latter misfortune is estimated to have been approximately £3,000.

PERSONNEL.

By reason of his retirement from the position of permanent head of the Public Works Department, Mr. F. W. Furkert relinquished his seat on the Board and the office of Chairman on the 6th December, 1932. On the same date Mr. C. J. McKenzie was appointed Chairman, Mr. J. Wood a member, and Mr. A. J. Baker an acting-member of the Board.

Mr. Furkert was one of the original members of the Board, having been appointed Chairman upon its inauguration on the 12th June, 1923. Upon Mr. Furkert's retirement the Board recorded in its minutes its great appreciation of the valuable services rendered by him during his long period of office.

LEGISLATION.

The following legislation affecting main-highways administration was passed by Parliament during the financial year :—

Section 7 of the Finance Act, 1932–33 (No. 2), extended the provisions of section 37 of the Finance Act, 1932, to apply in respect of the financial year ending 31st March, 1934—that is to say, authority was taken to retain in the Consolidated Fund for the financial year 1933–34 a sum up to £500,000 from the net revenue derived under the Motor-spirits Taxation Act, 1927, and which normally would be credited to the Main Highways Revenue Fund.

Section 18 of the Finance Act, 1932–33 (No. 2), amended subsection (1) of section 8 of the Motor-spirits Taxation Act, 1927, with reference to refunds of petrol-tax.

Section 19 of the same Act prescribed a special tax on (*a*) motor-vehicles, the motive power of which is not wholly derived from motor-spirits, and (*b*) trackless trolly omnibuses, and specified the manner in which the revenue from such taxation was to be disbursed.

The full text of section 19 is as follows :—

"(1) In this section the term motor-vehicle means—

"(*a*) A motor-vehicle within the meaning of the Motor-vehicles Act, 1924 (not being a motor-vehicle exempted by subsection two of section eleven of that Act from payment of annual license fees, or a traction engine), the motive power of which is not wholly derived from motor-spirits within the meaning of the Motor-spirits Taxation Act, 1927 ; and

"(*b*) A trackless trolly-omnibus as defined by section two of the Transport Licensing Act, 1931,—

and all other terms used in this section shall, unless the context otherwise requires, have the meanings assigned to them respectively by the said Motor-vehicles Act, 1924.

"(2) Not later than the seventh day of every month beginning with the month of April, nineteen hundred and thirty-three, every owner of a motor-vehicle shall lodge with any Deputy Registrar a declaration in the prescribed form as to the total number of miles of public highway over which the motor-vehicle was used during the month immediately preceding that in which such declaration is required to be lodged, and as to such other matters as may be prescribed.

"(3) There shall be paid by the owner to the Deputy Registrar by way of tax in respect of the total number of miles stated in every such declaration an amount computed as prescribed by the Schedule to this Act. Such amount shall become due and payable on the last day of the period within which such declaration is required to be lodged as aforesaid. There shall also be paid by the owner to the Deputy Registrar a penalty of one pound for each week or part of a week by which, in lodging such declaration or paying such tax, he exceeds the period allowed for lodging such declaration or the day on which such tax became payable.

"(4) All moneys payable to a Deputy Registrar under the last preceding subsection shall constitute a debt due to the Crown, and shall be recoverable accordingly in any Court of competent jurisdiction.

"(5) From every amount paid or recovered under the foregoing provisions of this section there shall be deducted and paid into the Post Office Account for expenses of administration of this section an amount equal to five per centum thereof. The remainder shall be paid into the Public Account, and shall be dealt with as follows :—

"(*a*) So much thereof as was paid in respect of motor-vehicles using electricity as their main motive power shall be dealt with as provided by section nine of the Motor-spirits Taxation Act, 1927 :

"(*b*) So much thereof as was paid in respect of all other motor-vehicles shall be divided into as many equal portions as, at the beginning of the month in which the tax became due and payable, there were full pennies of Customs duty (exclusive of primage duty or surtax) payable on motor-spirits imported into New Zealand. Six of such portions shall be dealt with as provided by section nine of the Motor-spirits Taxation Act, 1927, and the residue shall be credited to the Consolidated Fund.

"(6) On or before the first day of April, nineteen hundred and thirty-three, every person who is the owner of a motor-vehicle within the meaning of this section shall, in the prescribed form, notify the Registrar to that effect, and after that date every owner or other person who imports such a motor-vehicle into New Zealand or converts any vehicle into such a motor-vehicle shall, within fourteen days after such importation or conversion, make a like notification.

"(7) The Governor-General may from time to time, by Order in Council, make such regulations as he deems necessary for the purpose of giving full effect to this section.

"(8) Every person who fails to comply with any of the requirements of this section, or who makes any declaration or furnishes any information required by this section knowing the same to be false in any particular, commits an offence, and is liable on summary conviction to a fine of one hundred pounds. Conviction for any such offence shall not relieve the offender from payment of any other penalty imposed by this section."

Annual Review of Main Highways.

The provisions of section 11 of the Main Highways Act, 1922, require that an annual review of highways shall be made by District Highways Councils, and, in turn, by the Board. Applications were received from local authorities for additional main highways totalling approximately 605 miles, and the Board recommended for declaration a length of 45 miles 20 chains, the roads involved being as follow :—

No. 1 Highway District.—Mangamuka – Victoria Valley Main Highway : A length of 16 miles 60 chains was declared. Kaukapakapa – Port Albert (via Glorit and Tauhoa) Main Highway : A length of 12 miles 11 chains was redeclared, after having been revoked on the 21st January, 1932.

No. 2 Highway District.—Kaukapakapa–Port Albert (via Glorit and Tauhoa) Main Highway: A length of 6 miles 69 chains was redeclared, after having been revoked on the 21st January, 1932.

No. 8 Highway District.—Waitetara Valley Main Highway: A length of 9 miles 40 chains was declared.

Between 1st April, 1933, and 30th June, 1933, a further length of 52 miles 9 chains of highway was declared and a length of 16 miles 73 chains revoked.

The Board's financial position, which is outlined in the following sections, has precluded the recommendation for declaration as highways of any extensive mileage of rural roads.

Finance.

The actual contributions to the Board's Revenue Fund from external sources for the year 1932–33 amounted to £1,061,595. The tabulation below shows how this amount is made up. The income from similar sources during the previous eight years is also shown:—

	1924–25.	1925–26.	1926–27.	1927–28.	1928–29.	1929–30.	1930–31.	1931–32.	1932–33.
	£	£	£	£	£	£	£	£	£
Transfer from Consolidated Fund ..	35,000	35,000	35,000	35,000	35,000	35,000	..	..	..
Proceeds of tax on tires and tubes collected through the Customs Department	161,986	223,699	188,450	219,658	196,747	155,722	129,188	84,649	63,253
Registration and license fees of motor-vehicles	268,178	78,038*	283,963	303,861	341,017	378,135	397,139	372,224	354,216
Motor-spirits tax	..	..	..	130,461	730,414	873,369	1,219,209	1,231,202	644,126
Totals	465,164	336,737	507,413	688,980	1,303,178	1,442,226	1,745,536	1,688,075	1,061,595

* This low figure was due to delay in the issue of number-plates for motor-vehicles.

Once again it is observed that the return from the Customs tax on tires and tubes is substantially below that for the previous year. Whereas the tire-tax in 1924–25 amounted to £1 12s. 5d. per motor-vehicle, at the present time it is only about 6s. 6d. per motor-vehicle per annum. The heavy reduction shown in the proceeds from the motor-spirits tax is principally due to the effect of section 37 of the Finance Act, 1932, which authorized the retention in the Consolidated Fund for the financial year ended 31st March, 1933, of a sum not exceeding £500,000 from the net revenue derived under the Motor-spirits Taxation Act, 1927, which would normally be payable into the Main Highways Revenue Fund. The full amount of £500,000 was actually retained under the aforesaid statutory authority. The amount shown as being received from the motor-spirits tax for 1930–31 represents 92 per cent. of the net proceeds of a tax amounting to 6d. per imperial gallon. The same tax in 1932–33 produced £1,144,126, of which £500,000 was retained in the Consolidated Fund and £644,126 credited to the Main Highways Revenue Fund. It should also be mentioned that no portion of the proceeds of the additional 4d. petrol-tax imposed in 1931 and 1932 is paid into the Highways Fund.

The amount of petrol imported into the country is probably the most reliable index of the volume of the Dominion's motor traffic. The gross importations of motor spirit since 1926 are as follows:—

	Gallons.		Gallons.
1926	44,800,000	1930	68,300,000
1927	48,000,000	1931	61,800,000
1928	54,500,000	1932	58,400,000
1929	62,400,000		

For the year ended 31st March, 1933, the expenditure under the Revenue Fund was as follows:—

	Expenditure. £
North Island (maintenance)	375,728
South Island (maintenance)	224,596
Administration charges	29,870
Commission paid to Post and Telegraph Department for collection of motor-registration and license fees and registration of change of ownership	18,783
Subsidies on rates to local authorities (Finance Act, 1930)	181,906
Special relief camps for single men (gross cost)	52,693
Miscellaneous payments including recoupment of interest on loans to Consolidated Fund and reserve for redemption of main highways securities	302,124
Total	£1,185,700

An analysis of the expenditure by the Board and by local authorities on actual maintenance, as distinct from interest on loans and other overhead charges, is shown in the tabulation below. The tabulation has been subdivided to show the expenditure on the primary and secondary systems :—

—	Board's Contribution.	Local Authorities' Contribution.	Total.	Percentage Board's Contribution to Total.	Percentage Local Authorities' Contribution to Total.
(1) Primary system—	£	£	£		
North Island	281,550	79,955	361,505	77·88	22·12
South Island	165,942	43,123	209,065	79·37	20·63
	447,492	123,078	570,570	78·43	21·57
(2) Secondary system—					
North Island	94,178	26,445	120,623	78·08	21·92
South Island	58,654	18,943	77,597	75·59	24·41
	152,832	45,388	198,220	77·10	22·90
(3) Complete system—					
North Island	375,728	106,400	482,128	77·93	22·07
South Island	224,596	62,066	286,662	78·35	21·65
Total	600,324	168,466	768,790	78·09	21·91

The following tabulation shows the amount which has been provided by the Board and the local authorities for expenditure on both maintenance and construction during the nine years the Board has been in active operation :—

—	1924–25.	1925–26.	1926–27.	1927–28.	1928–29.	1929–30.	1930–31.	1931–32.	1932–33.
	£	£	£	£	£	£	£	£	£
Maintenance by Board ..	123,675	279,404	438,762	523,581	756,399	1,049,249	872,577	849,734	600,324
Maintenance by local authorities	110,001	185,015	276,349	269,065	284,526	375,849	317,839	215,568	168,466
Construction by Board	222,422	421,880	540,362	449,904	936,148	1,007,957	667,902	361,969	159,323
Construction by local authorities	80,000	142,761	255,860	262,538	214,155	203,148	150,984	94,973	43,181
Totals	536,098	1,029,060	1,511,333	1,505,088	2,191,228	2,636,203	2,009,302	1,522,244	971,294

The maintenance figures in the above table exclude indirect charges such as supervision, interest, &c., but include the cost of earthquake restoration. The outstanding feature disclosed above is that the expenditure during 1932–33 on a highways system 10,878 miles in length is less than the expenditure in 1925–26 on a system 6,272 miles in length in spite of the fact that the average intensity of traffic is at the present time nearly double the intensity seven years ago. The reduction in the contributions of the local authorities towards the cost of both maintenance and construction is most marked since 1929–30, the figure having dropped from a total in that year of £578,997 to the sum of £211,647 for the year under review. In other words, the local authorities are at the present time contributing to the highways system only 36½ per cent. of what they were contributing three years ago.

An analysis of the actual expenditure on maintenance by the Board in each Island, as compared with the number of motor-vehicles in each Island, at the 31st March of each year since the inception of the main highways scheme gives the following results, expressed in percentages of the Dominion totals :—

—	1924–25.	1925–26.	1926–27.	1927–28.	1928–29.	1929–30.	1930–31.	1931–32.	1932–33.
North Island—									
Maintenance expenditure ..	64·49	65·27	64·86	67·51	66·13	62·30	59·23	62·31	62·84
Motor-vehicles	60·90	61·41	61·86	62·19	63·08	63·63	63·84	63·77	63·78
South Island—									
Maintenance expenditure ..	35·51	34·73	35·14	32·49	33·87	37·70	40·77	37·69	37·16
Motor-vehicles	39·10	38·59	38·14	37·81	36·92	36·37	36·16	36·23	36·22

In previous years it has been the Board's practice to submit in its annual report a statement apportioning the revenue received and the expenditure incurred by the Board in each Island. On account of the large diversions from the Board's funds authorized by Parliament, this course is not now practicable. The position was explained in detail in the Eighth Annual Report for the year 1931–32. The Board's future policy, however, will be to control its works in such a manner that as far as possible the total expenditure in each Island will be in the ratio of the total revenue derived from motor-taxation in each Island.

The following statement shows the total expenditure from both funds in each Island for the financial year ended 31st March, 1933. The figures include administration charges:—

—	Expenditure on Maintenance.	Expenditure on Construction.	Total Expenditure on Works.	Percentage of Expenditure in each Island.	Percentage of Motor-taxation derived from each Island.
	£	£	£		
North Island	394,424	134,054	528,478	66·9	66·4
South Island	235,770	25,269	261,039	33·1	33·6
Total	630,194	159,323	789,517	100·0	100·0

An analysis of the Board's expenditure, excluding overhead charges and the expenditure by local authorities under the Construction Fund, shows the following position:—

—	Board's Contribution.	Local Authorities' Contribution.	Total.	Percentage of Board's Contribution to Total.	Percentage of Local Authorities' Contribution to Total.
	(1) *Primary Highways.*				
	£	£	£		
North Island	101,466	27,778	129,244	78·51	21·49
South Island	20,963	6,161	27,124	77·29	22·71
Totals	122,429	33,939	156,368	78·30	21·70
	(2) *Secondary Highways.*				
North Island	24,359	7,642	32,001	76·12	23·88
South Island	2,456	1,600	4,056	60·55	39·45
Totals	26,815	9,242	36,057	74·37	25·63
	(3) *Complete System.*				
North Island	125,825	35,420	161,245	78·03	21·97
South Island	23,419	7,761	31,180	75·11	24·89
Totals	149,244	43,181	192,425	77·56	22·44

Maintenance.

It is necessary again to repeat the statement in the last annual report that in the Board's opinion the main highways have not been adequately maintained during the past two years. Maintenance expenditure is in normal times roughly proportionate to traffic. Compared with the position in 1929–30, the volume of motor traffic has decreased about 10 per cent., whilst the rate of expenditure on highways maintenance has dropped 45 per cent. Reduced costs account for a portion of the discrepancy, but there is ample evidence that in many places the thickness of the road crusts has been diminished to an alarming extent, as a result of curtailment of maintenance expenditure to a degree quite unwarranted by the reductions in traffic and roading-costs.

Not only gravel and macadam roads, however, are showing the effects of false economy.

Bituminous and concrete pavements are in a number of cases noticeably deteriorating, due largely to curtailment in the attention given to surface drainage and to shouldering.

New Zealand is not alone in these troubles, as will be realized by perusing the following extract from an English technical journal:—

"For the past two years so-called economies have been effected in road maintenance by cutting down maintenance expenditure. The result of these 'economies' is now becoming evident in all parts of the country, and, unless this restricted policy is not checked, resurfacing costs, and in many instances reconstruction costs, will run into very huge figures, in order to bring the road surfaces back to their previous high standard. All highway engineers are continually impressing on their Councils the undesirability of a continuance of this restricted maintenance expenditure. In the United States there has been proposed similar restriction in maintenance expenditure, and in this connection Mr. Thomas H. MacDonald, Chief Engineer, United States Bureau of Public Roads, has made the following pertinent comment:—

> "'Such contemplated reductions are serious enough to endanger both our large capital investments in highway construction and the technical organization of our highway departments. These organizations must be protected to hold what progress we have made. Our whole improved road-mileage is absolutely dependent for its existence upon the day-by-day highly organized maintenance operations under experienced supervision and control.

"'The public has no conception of the fragile character measured by time durability of perhaps 75 per cent. of our surfaced mileage. The fragile character of this mileage may be realized by my estimate that the lack of adequate maintenance would be seriously noticed on 75 per cent. of our road-mileages within thirty days; within six months we would be losing money so fast (through depreciation and drops in gas-tax revenues) that we would soon not have enough money to take care of the fixed charges and maintenance alone—to say nothing about ruining our chances of even approximating the upwards of a billion dollars' income from the road-user taxes obtained last year from adequately maintained roads.

"'This is a nationally vital concern. It is impossible to overstress the hazard to the public's interests in any breakdown of maintenance and technical control by highway departments.'"

The average cost of maintenance per mile per annum since 1924 on the primary and secondary highways and on the whole highway system is shown in the following table:—

Year.	Primary Highways.	Secondary Highways.	Complete System.
	£	£	£
1924–25	51·7	..	51·7
1925–26	73·2	..	73·2
1926–27	111·9	..	111·9
1927–28	119·9	..	119·9
1928–29	125·2	55·5	100·1
1929–30	151·2	88·5	128·6
1930–31	121·4	71·0	103·1
1931–32	115·6	55·3	92·5
1932–33	85·3	47·3	70·7

Construction.

The expenditure on construction for the year 1932–33 was less than 15 per cent. of the expenditure on similar purposes in 1929–30.

The following table shows the extent and type of work accomplished by the Board and the local authorities on the highway system since the Board commenced active operation in 1924:—

Year.	Formation and Widening.	Gravelling and Metalling.	Tar and Bituminous Sealing.	Bituminous Macadam (Penetration).	Bituminous Concrete.	Portland-cement Concrete.	Bridges.
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Ft.
1924–25	19	63	6	6	..	..	2,434
1925–26	45	88	16	45	4	6	5,168
1926–27	174	151	35	38	12	16	6,408
1927–28	173	133	83	34	..	6	7,760
1928–29	224	185	122	51	14	11	9,482
1929–30	173	179	133	39	31	12	7,547
1930–31	130	128	95	41	14	9	11,175
1931–32	139	69	129	32	9	3	4,062
1932–33	56	45	72	8	..	..	3,178
Totals	1,133	1,041	691	294	84	63	57,214

The most serious problem in connection with highway construction is the renewal of old and inadequate bridges. Improvements to the highways may be postponed, but replacements of bridges cannot be avoided. Seventy-six per cent. of the bridging in New Zealand is of timber, and consequently bridge-depreciation is a heavy item.

The Board's policy has been to renew as many of such structures as possible in more permanent materials. During the year under review only 10 per cent. of new highway bridging was constructed in timber, the balance being in steel and reinforced concrete.

As mentioned in last year's report, it has been found that bridge replacements per annum on the highway system should total 9,000 lineal feet. The figures for the past two years have been 4,062 and 3,178 lineal feet respectively. It will be seen, therefore, that the programme is over 10,000 lineal feet behind safe requirements.

Most of the construction funds available for 1933–34 will be devoted to bridge renewals, but the amount will be quite inadequate to enable any leeway to be made up, and indeed will be insufficient to meet the normal annual necessary programme.

The financial situation of some of the local authorities, and the unwillingness of others which are financial, to embark at the present time on large works are, of course, also partially responsible for the curtailment in bridge-construction.

The following are the most important structures built during the year :—

Mangawara Bridge.—This reinforced-concrete bridge, situated on the main route between Auckland and Hamilton, replaced an obsolete wooden structure with very dangerous approaches. The problem of the alignment for the new bridge was difficult on account of the road being confined to a very narrow strip of land between the railway and the Waikato River. It was finally solved by building the whole structure on a curve of 6 chains radius. There are 5 spans each of 40 ft., with a carriage-way 24 ft. in width and a footpath. The deck of the bridge is super-elevated at the rate of 1 in. to the foot. The cost was £5,187.

Tuakau Bridge.—This bridge over the Waikato River on the Pukekohe–Glenmurray (via Tuakau) Main Highway consists of six reinforced-concrete bowstring-truss spans, each 110 ft. in length, and one 35 ft. beam span. The roadway is 18 ft. in width ; and the cost of the structure was £27,925.

Wairoa River Bridge.—This bridge, situated in the Borough of Wairoa, consists of ten 60 ft. and two 40 ft. plate-girder spans with reinforced-concrete deck. It was seriously damaged during construction by the second earthquake of the 16th September, 1932. Several of the piers were affected to such an extent that the pier-tops were as much as 6 ft. out of position. Two completed spans were dropped off their piers. The distance between the abutments was shortened by 13½ in., necessitating cutting of the girders already fabricated. The work was finally completed and opened for traffic on the 31st May, 1933. The cost returns are not yet complete, but it is estimated that the total expenditure will be about £42,000.

Mangatainoka Bridge.—This is a reinforced-concrete bowstring-truss bridge, situated on the road between Pahiatua and Pahiatua Railway-station. It consists of seven spans of 68 ft. and has a 20 ft. roadway with two 4 ft. 6 ft. footpaths. The cost was £13,638.

Contracts have recently been let for two other large reinforced-concrete structures. The Fitzherbert Bridge over the Manawatu River at Palmerston North consists of four 112 ft. bowstring-truss spans and seven 55 ft. beam spans. The carriage-way is 22 ft. in width, and, in addition, one footpath and a pipeway are provided. The lowest tender for the bridge was £30,517, and in addition £3,335 will be required for approaches, &c., making a total anticipated cost of £33,852.

The Balclutha Bridge, situated in the Balclutha Borough on the Dunedin–Invercargill Main Highway, comprises six 124 ft. reinforced-concrete bowstring-truss spans with a carriage-way of 22 ft. and two 4 ft. footpaths. The contract price is £39,379.

An interesting and important work practically completed during the year and opened to traffic on the 1st April, 1933, is the Dashwood Deviation on the Picton–Bluff Main Highway, south of Blenheim. This deviation reduces the length of the main road by 4½ miles.

Railway-crossing Elimination and Protection.

The elimination of railway-crossings is a work which has been financed in the past jointly by the Railways Department, the Main Highways Board, and local authorities. On account of the financial stringency, no works of this nature were undertaken during the year.

Advances to Local Authorities.

The Main Highways Amendment Act, 1926, as amended by the Main Highways Amendment Act of 1928 confers upon the Board the power of advancing to local authorities their shares of the cost of works upon Main Highways, and under the provisions of this legislation the Board during the financial year under review advanced a total sum of £10,836 13s. 1d. Of this amount £5,958 5s. 10d. was advanced to North Island authorities and £4,877 7s. 3d. to South Island authorities. The rate of interest for such advances was reduced to 4¼ per cent. in compliance with recent legislation for general interest reduction. The total amount of principal outstanding at the 31st March, 1933, in respect of past advances was £78,377 16s. 7d.

Traffic-control.

As explained in previous reports, the Board has encouraged local authorities to form into groups for the purpose of appointing full-time Traffic Inspectors with a view to more efficient administration of the traffic regulations. The wages and travelling-expenses of Inspectors operating under such approved schemes are subsidized by the Board on the basis of £2 for £1, except in special circumstances. During the past year two additional group schemes have been inaugurated, and the Thames Group has been extended to include the Coromandel County. The following list shows the group traffic schemes which are now in operation :—

Otamatea Group, including Otamatea, Whangarei, and Hobson Counties.

Waikato Group, including Waikato, Waipa, and Raglan Counties and Ngaruawahia and Huntly Boroughs.

Thames Group, including Thames, Ohinemuri, and Coromandel Counties.

Rotorua Group, including Rotorua and Taupo Counties and Rotorua Borough.

Cook Group, including Cook, Waikohu, Uawa, and Waiapu Counties.

Hawke's Bay Group, including Hawke's Bay, Woodville, Weber, Dannevirke, Waipukurau, Patangata, and Waipawa Counties.

Taumarunui Group, including Taumarunui, Ohura, and Kaitieke Counties, Taumarunui Borough, and Manunui Town District.

Wanganui Group, including Wanganui, Patea, and Waitotara Counties.

Rangitikei Group, including Rangitikei County, Taihape Borough, Marton Borough, Bulls Town District, Hunterville Town District, and Mangaweka Town District.

Manawatu Group, including Manawatu, Oroua, Kairanga, Pohangina, and Kiwitea Counties.

Masterton Group, including Masterton, Wairarapa South, Featherston, Eketahuna, Pahiatua, Akitio, Mauriceville, and Castlepoint Counties.

Blenheim Group, including Awatere and Marlborough Counties and Blenheim Borough.

Waimea Group, including Waimea County and Richmond and Motueka Boroughs.

Waimairi Group, including Waimairi and Paparua Counties.

South Canterbury Group, including Mackenzie, Geraldine, Levels, and Waimate Counties, Geraldine, Temuka, and Waimate Boroughs, and Pleasant Point Town District.

Waitaki Group, including Waitaki, Waihemo, Waikouaiti, Maniototo, Vincent, and Lake Counties, and Palmerston and Waikouaiti Boroughs.

Southland Group, including Southland and Wallace Counties.

In addition to the seventeen subsidized group schemes, the Board itself employs three full-time Traffic Inspectors as well as a number of part-time officers.

Signposting and Centre-line Marking.

The Board has continued to subsidize signposting and centre-line marking at the same rate as is applicable to ordinary general maintenance—namely, £3 for £1. Most of the signposting is efficiently undertaken by Automobile Associations. The marking of centre-lines has not yet been taken up very widely by local authorities, but the advantages of this procedure are so outstanding that it is hoped that much more work of this nature will be undertaken in future.

Purchase of Plant.

The purchasing and hiring of plant to local authorities on the hire-purchase system has been continued, but, as is only to be expected, the transactions have shown an enormous reduction during the past two years. In 1932–33 the total value of plant purchased under the scheme was only £1,117, compared with £2,815 for the previous year and £15,878 in 1930–31.

The items purchased for the year under review were: One light motor-truck and one caterpillar tractor and grader.

The total value of plant purchased for local authorities since the scheme was inaugurated is £159,626 of which sum only £18,041 was outstanding on the 31st March, 1933.

In addition to plant purchased for sale to local authorities, the Board bought for its own use the following items at a total cost of £1,833: Motor-cars, 3; electric-generating set, 1; orange-peel grab, 1; motor-grader, 1; motor-lorry, 1; testing-machine, 1; road-planers, 2; tractors, 2.

Testing of Highway Materials.

The Petrological Laboratory has continued to carry out the standard tests on roadmaking materials. The testing of samples of tar, road-oil, bitumen, tar and bituminous emulsions, and bituminous mixtures was efficiently undertaken as usual by the Dominion Analyst, Wellington. The reduction in construction work has been reflected, of course, in a reduction in the amount of testing-work undertaken.

Examination of Foremen and Overseers employed on Road Construction.

Since December, 1925, the Board has at approximately yearly intervals conducted examinations for the issue of certificates of competency to road foremen and overseers. The examination comprises two papers, one on general road construction and maintenance and the other dealing with tar, bituminous and concrete road construction. In addition to requiring candidates to pass in both of these papers, the Board imposes the condition that examinees shall have a reasonable amount of practical experience before a certificate is issued. The seventh examination was held on the 1st November, 1932, when sixty-seven candidates presented themselves. Six candidates passed the full examination, while nine completed a pass, having obtained credit in one subject previously. Eleven candidates obtained partial passes. Only ten certificates, however, were issued during the year, and the cases of the candidates to whom certificates have not been granted will be reviewed when these men can produce evidence of adequate practical experience.

The following is a complete list of persons who have passed the full examination. The numbers preceding the names refer to the serial numbers of the certificates issued, and those names which are not preceded by numbers relate to examinees who have passed the two papers, but to whom certificates have not yet been awarded for the reasons mentioned above :—

No.	Name.	No.	Name.	No.	Name.
13	Annabel, S.	58	Grahame, V. W.	10	McIvor, J. G.
26	Avery, G.	38	Grant, E.	61	McKenzie, B.
27	Bagnall, V. L.	1	Hawkes, W. J.	..	McLean, K. G.
36	Baldwin, D.	59	Hazeldine-Barber, E.	67	McLeod, L. M.
28	Bastin, F. H.	..	Henry, A. S.	19	Neill, J. V.
55	Batten, M.	17	Hermans, F.	44	Newman, R. H.
25	Bean, J. W.	2	Hewison, O. G.	45	Newton, R. F.
56	Beere, G. T.	31	Hickey, T. J.	20	Oldham, L.
..	Billinghurst, E. G.	32	Houlihan, M. G.	51	Page, W.
15	Bond, H. V.	39	Howell, R. G.	21	Price, R. B.
57	Bowden, W. J.	40	Hutton, T. R.	46	Revill, E. M. B.
65	Brayshay, D.	60	Jack, E. D.	22	Robinson, S. G. H.
16	Brown, D. E.	41	Jenkins, W. J.	73	Savage, E. H.
..	Cadigan, W. J.	52	Jenkins, W. J. E.	64	Scott, D. J.
..	Chappell, H.	66	Johnson, G. C.	47	Shields, J. I.
..	Conradson, S. J.	7	Kendall, J. H.	48	Smart, H. B.
29	Cottrell, W. E.	70	Lacey, A.	..	Smith, F. B.
..	Crompton, F.	12	Lankshear, R. M.	74	Smith, H. A.
..	Darling, A. M.	8	Larson, B. L.	54	Smith, T. G.
..	Davis, A. H.	71	Leigh, A. J.	49	Sneddon, T. R.
30	Dennison, J. G.	42	Lysnar, R. G.	23	Stockley, S. G.
69	Donnelley, L. S.	3	Mahood, J. G.	24	Stringer, J.
..	Drew, G. L. K.	9	Marshall, O. R.	50	Thomson, C. B.
..	Earle, L. E.	..	Mascull, G.	..	Wall, A. K.
35	Ferguson, E. J.	4	Maynard, F. F.	62	Wallwork, P. A.
6	Finlayson, P. S.	33	Mays, J. E.	..	Weaver, J. W.
..	Flower, W. S.	43	Molesworth, C. D.	68	Wesley, A. C.
63	Forbes, J.	53	Monfries, J. I.	34	Westbrook, R. H.
..	Gardiner, W. I.	5	Muggeridge, F.	14	Williams, J. A.
37	Gibbs, G. E.	72	McCall, A. N.	11	Wotten, H. J. L.
..	Glass, E. C.	18	McDonald, H. N.	..	Wylde, H. P.

Magnetic Truck.

In 1931 the Board authorized the construction of a special magnetic truck to remove nails and other metal fragments from the road surfaces. During the past year the truck has continued to operate and collected 6,866 lb. of metal from 2,464 miles of highway. Between the 1st April, 1933, and the 26th September, 1933, the truck collected 2,737 lb. of metal from 1,261 miles of highway. Since the truck commenced operations on the 23rd October, 1931, and up to the 26th September, 1933, a period of under two years, the total weight of metal recovered was 12,811 lb., the length of highway swept being 5,670 miles. The average amount collected per mile is therefore 2·26 lb.

Main Highway Maps.

During the year the main-highway maps were revised and reprinted. Owing to the increase in the number of highways, it was found necessary to enlarge the scale of the map to 16 miles to the inch.

Progress Report.

The following statement shows the more important construction work carried out under the control of the Main Highways Board during the year ended 31st March, 1933 :—

Waipapakauri – Victoria Valley.—Waihou Deviation : The metalling of a length of 55 ch. on the new formation was put in hand.

Broadwood–Kaitaia :—

Onetoke – Awaroa Bridge Section : 1 m. 40 ch. was widened and culverted, and 1 m. of metal laid.

Awaroa Bridge – Herekino Section : A contract was let for metalling this reconstructed section, and a length of 67 ch. has been completed.

Waimate-Kaeo-Mangonui :—

Kaeo River Bridge : Piles have been fabricated and a contract let for the erection of this structure.

Kahoe Bridge : The southern approach embankment has been completed.

White Hills Bridge : The erection of this 40 ft. span bridge in steel and concrete, with its approaches, has been completed.

Whangarei–Kawakawa.—Otonga – County Boundary Section : 2 m. 52 ch. of base-course and 3 m. 10 ch. of top-course metal were laid, thus closing the unmetalled gap on this highway. The raising of the formation above flood-level north of Hukerenui is in hand.

Te Hana – Tomorata and Wayby–Mangawai.—The laying of base-course metal on a clay gap of 3½ m. on the two highways has been put in hand.

Auckland–Maungaturoto :—

Puhoi–Warkworth Section : 4 m. of first-coat sealing was carried out and tenders were invited for the first-coat sealing of a further 7 m. and the second-coat sealing of the above 4 m.

Warkworth–Dome Section : The formation was completed between 17 m. 35 ch. and 19 m. 10 ch. Base-course metalling 10 ft. wide was connected up, to be later widened to the standard width.

Dome Hill – Wayby Section : Formation was completed between 19 m. 55 ch. and 19 m. 62 ch., and base-course metal placed on the intervening gaps ; 3,000 cubic yards of top-course metal was placed.

Wayby–Wellsford–Topuni Section : Tenders were invited for the construction of Litten's Bridge, and a commencement made with the excavation for Vipond's culvert. Second-coat sealing was carried out over a length of 7 m. 25 ch.

Great South Road :—

Franklin County Section : The reconditioning of this section is in hand.

A contract was let for the formation and metalling of Wright's Deviation, and work is in progress.

During the year the metalling and first-coat tar-sealing of the Bombay Hills Deviation was completed. The trimming and metalling of a second deviation between Pokeno and Mercer has been commenced.

Mercer Town District : The roadway has been reshaped and bituminous penetration surfacing applied over a length of 1 m. 24 ch.

Waikato County Section : Mangawara Stream Bridge—This structure, consisting of five 40 ft. reinforced-concrete spans on a 6 ch. curve, was completed, replacing a narrow bridge with dangerous approaches.

Takapuna to Junction with No. 1 Main Highway.—This highway is being reconstructed on improved alignment in preparation for metalling.

Auckland–Helensville–Waiwera :—

New Lynn Borough : Whau Bridge—The construction of the approaches to the new bridge was completed.

Waitemata County Section : A contract was completed for the construction of a large concrete box culvert and approaches, at Vercoe's on the Henderson–Helensville length. On the Helensville–Waiwera section a contract was let for the construction of Becher's Bridge, a reinforced-concrete structure of 24 ft. span. The work is almost completed, and formation of approaches is in hand.

Henderson Town District : Oratia Stream Bridge—A new bridge 51 ft. long in reinforced concrete has been erected over this stream.

Kumeu–Albany.—The alignment of this highway has been improved by cutting back corners.

Pokeno–Waihi :—

Franklin County Section : Mangatawhiri Stream Diversion—This work was continued during the year.

Hauraki Plains County Section : Three-coat bituminous sealing was carried out over a length of 8 m. 68 ch.

Ohinemuri County Section : A length of 75·35 ch. between Hauraki Plains County boundary and the Paeroa Borough boundary was sealed in three coats. Widening was continued through the Karangahake Gorge, 2 m. 7 ch. being carried out during the year. The total length widened is 3 m. 15 ch.

Paeroa Borough : A sealing coat was applied on a length of 15 ch. and the shoulders strengthened.

Waihi Borough : A length of 9 ch. at the western end of the borough was reconstructed and sealed in three coats to improve the alignment to the Waitete Bridge approach.

Pipiroa–Coromandel :—

Thames County Section : Widening at Te Mata has been continued, a length of 60 ch. being completed during the year. 160 ft. of stone wall was also constructed.

Thames Borough : The coastal section has been widened and improved.

Kopu–Raglan :—

Ohinemuri County Section : A length of 3 m. north of Paeroa has been reshaped and widened. Widening has also been carried out on the filling from Mill Road to Cadman Road.

Piako County Section : A contract has been let for the reconstruction and two-coat sealing of a length of 5 m. between Te Aroha and the Waitoa Stream. The bridge over the latter stream was reconstructed and widened to 20 ft.

Hamilton–Rotorua :—

Waikato County Section : Poplar Hill—A length of 16¾ ch. was tar-sealed.

Matamata County Section : Tirau–Tapapa—10 ch. of formation and 86 ch. of metalling were carried out.

Matamata–Tauranga.—Matamata County Section : A short deviation with a concrete-pipe culvert was constructed on the Kaimai Hills, avoiding the replacement of two defective bridges.

Tahuna–Ohinewai.—Waikato County Section : A contract has been let for the reconstruction of the Mangatea Stream Bridge, a 30 ft. reinforced-concrete structure, and the work is in hand.

Mount Albert – Royal Oak.—Mount Roskill Road Board : The concrete paving of the length between Sandringham Road and Vincent Road was completed.

Pukekohe - Glen Murray, via Tuakau.—Raglan County Section: Waikato River Bridge - Tuakau—The erection of this bridge, a reinforced-concrete bowstring-truss structure, 695 ft. long, was practically completed by the end of the year.

Cambridge–Eureka.—Waikato County Section: 25 ch. of tar-sealing was carried out near the Hautapu Factory.

Parkhurst Highway.—A contract for the reconstruction and sealing of 1¼ m. of this highway was completed.

Waikumete - West Coast.—Glen Eden Town District: The reconstruction of Kearon's Bridge, a single 40 ft. reinforced-concrete span, was completed, and the approaches metalled.

Howick–Manurewa.—Manukau County Section: Cemetery Bridge—The erection of a new bridge was put in hand.

Ngatea–Waharoa, via Morrinsville.—Piako County Section: A length of 1 m. 72 ch. south of Tahuna Township was sealed in bitumen.

Gisborne–Whakatane, via Motu (No. 3 Highway District):—

Whakatane Borough: 28 ch. was sealed in one coat of bitumen.

Whakatane County Section: The construction of a 10 ft. by 8 ft. reinforced-concrete culvert to replace Ball's Bridge has been commenced.

Tauranga–Whakatane.—Tauranga County Section: Te Puke - Tauranga—1 m. at the Long Swamp was sealed with three coats of bitumen, and the contract for the three-coat sealing of 9 m. 30 ch. was carried to completion.

Waihi–Tauranga:—

Tauranga County Section: A deflecting groyne was erected at the Judea Bridge, and sheet-piling driven to prevent erosion at the western abutment.

1 m. of two-coat sealing was carried out at the Judea Hill.

Matamata–Tauranga.—Tauranga County Section: White's Bridge—The old timber bridge was replaced with a reinforced-concrete box culvert.

Rotorua–Whakatane:—

Whakatane County Section: At the Tamurenui Stream a deviation 15 ch. in length with a concrete-pipe culvert was constructed, replacing an old bridge and improving the alignment.

Whakatane Borough: 30 ch. was sealed with one coat of bitumen.

Rotorua County Section: Embankments and curves have been built up and 242 ft. of guard fencing erected.

Gisborne–Opotiki, via Waioeka:—

Waioeka Pa - County Boundary Section: Owhiritoa Bridge—This bridge, consisting of one 40 ft. rolled-steel-joist span and two 20 ft. hardwood spans, was completed.

Arthur's Bridge: A 32 ft. rolled-steel-joist span on reinforced-concrete abutments was completed. 2½ ch. of concrete retaining-wall, and 22½ ch. of guard fence were erected.

Papamoa - Mount Maunganui.—40 ch. of metalling has been completed.

Wainui Highway.—A two-span bridge 45 ft. long, in hardwood, has been erected to replace the old bridge over the Wainui Stream.

Gisborne–Opotiki, via Coast:—

Uawa County Section: A contract was let for the reconstruction and bituminous surfacing of a length of 6 m. The work is in progress, 3 m. having been widened and the foundation course reshaped and strengthened.

Waiapu County Section: Shepherd's Bridge at 53·1 m.—This reinforced-concrete bridge of 26 ft. span was completed.

A contract has been let for the construction of stone groynes to protect the approach to the Rotokautuku Bridge.

Gisborne–Wairoa, via Morere (No. 4 Highway District).—Cook County Section: 98 ch. of bituminous surfacing was completed on the deviation at Muriwai. Tenders have been called for the erection of a 120 ft. bridge with 10 ch. of approaches to replace an old timber structure at 17½ m.

Gisborne–Opotiki, via Motu (No. 4 Highway District).—Waikohu County Section: A contract for four steel-and-concrete bridges between 28·7 m. and 34·6 m., aggregating 336 ft. in length, with 47 ch. of approaches, was entered into, and the work carried well towards completion.

Rotokautuku–Waiomatatini.—Wairoa Stream Bridge: The construction of this bridge and 32 ch. of approaches was completed.

Matawai–Koranga.—Between 2 m. and 5 m., 2 m. was widened and metalled in continuation of the improvement of the alternative route to Opotiki.

Kanakanaia Highway.—A contract has been let for the erection of a four-span bridge at the No. 1 crossing of the Waihora Stream to replace the structure destroyed by flood.

Gisborne–Wairoa, via Hangaroa (No. 4 Highway District).—Cook County Section: A new road has been constructed over a large slip at 30½ m. caused by the earthquake of 16th September, 1932. A bituminous sealing coat has been applied over a length of 1 m.

Patutahi–Rere.—Cook County Section: Flood damage necessitated the reconstruction of a length of 27 ch., and the bridge at 5 m. was replaced with a 4 ft. diameter twin-pipe culvert.

Napier–Gisborne, via Wairoa (No. 5 Highway District):—

Hawke's Bay County Section: Napier Borough Boundary to Te Ngaru Crossing—A length of 12 ch. between the borough boundary and the Westshore embankment was reconstructed and sealed with two coats of bitumen.

Te Ngaru Crossing to Tutira Homestead Gate—A length of 1 m. was widened and metalled, and 23 ch. of drain 20 ft. wide excavated to eliminate flooding caused by the uplifting of the lands in the Tangoio Valley.

Tutira Homestead Gate to Waikare River—Several sharp corners were widened, and the highway through the Matahoura Gorge was fenced for a distance of 85 ch.

Wairoa Borough: Wairoa River Bridge—The construction of this bridge was interrupted by the earthquake of September, 1932, when extensive damage was suffered by the partially completed structure, three piers on the north side and two piers on the south side with their superimposed spans being badly displaced. Restoration work, consisting of the straightening and reconditioning of the piers and abutments and the replacement of the spans, was put in hand, the central spans erected, and the bridge carried well towards completion by the end of the year. It has since been completed, and was opened for traffic on the 31st May. The bridge consists of ten 60 ft. plate-girder spans and two 40 ft. rolled-steel-joist end spans, with a reinforced-concrete deck providing a 22 ft. carriage-way, and two 4 ft. footways. The piers consist of reinforced-concrete cylinders enclosing nests of piles.

Napier–Wellington, via Wairarapa (No. 5 Highway District):—

Dannevirke County Section: Stone gabion groynes were placed at the north abutment of the Mangatewainui Bridge.

The Mangatewainui Deviation, 94 ch. in length, was reconditioned and sealed in two coats.

Woodville County Section: Lengths of 20 ch. of two-coat sealing near Papatawa and 182 ch. between Papatawa Railway-crossing and Matahiwi were completed.

Woodville Borough: 49 ch. was sealed in two coats.

Petane–Taupo.—Hawke's Bay County Section: A large pipe culvert was installed between Dillon's and Lucky Hill to replace a damaged bridge.

Gisborne–Wairoa, via Hangaroa (No. 5 Highway District).—Wairoa County Section: At the boundary between the Wairoa and Cook Counties a 4 ft. pipe was installed to replace an old bridge. The stringers and decking of the Opoiti Bridge were renewed.

Napier – Tuki Tuki, via Omahu:—

Hawke's Bay County Section: A contract has been let for the erection of a new reinforced-concrete bridge over the Tutaekuri River at Redclyffe.

A concrete-pipe culvert was installed to replace a small wooden bridge at Waima.

Havelock North Town District: An old bridge of inadequate width was replaced by a 5 ft. 3 in. concrete-pipe culvert, 70 ft. long.

Farndon–Hastings.—The fillings at the Karamu Bridge were built up in preparation for concrete paving.

Dannevirke–Waipukurau, via Porangahau:—

Dannevirke County Section: A considerable amount of widening was carried out between 12 m. and 15 m.

Weber County Section: Waipatiki–Kereru Deviation—Formation was put in hand on the Kereru side of the hill, and a 7 ft. 6 in. by 5 ft. 6 in. concrete culvert, 100 ft. long, built at the Kereru Stream.

Woodville – Palmerston North (No. 5 Highway District).—Woodville Borough: 38 ch. of two-coat sealing was applied, completing the sealing of this section.

Weber–Eketahuna.—Weber County Section: An old timber bridge at 12 m. was replaced with a pipe culvert.

Waipawa–Pourere.—Patangata County Section: A small bridge was replaced by a 5-ft.-pipe culvert and a filling made to raise the road above flood-level.

Woodville–Tamaki.—Dannevirke County Section: Stone gabion groynes were installed at the south abutment of the Rakai Whana Stream Bridge.

Hastings–Pakipaki:—

The whole length of this highway is being re-formed; the section between the Hastings Borough boundary and Longlands Railway-station was completed and a contract let for the metalling.

Auckland–Wellington, via Taranaki (No. 6 Highway District):—

Otorohanga–Hangatiki Deviation: 60 ch. of base-course and 1 m. 60 ch. of top-course metal were laid.

Mangapu Stream Bridge No. 2: This bridge, 70 ft. long, in steel and concrete construction, was completed.

13 ch. of first-coat and 55 ch. of second-coat sealing have been completed near Mahoenui.

Kawhia–Wharepuhunga, via Kawa:—

Kawhia to Oparau River Bridge: A section of the Puti Hill has been widened and drained. A length of the stone wall along the sea-front was rebuilt and strengthened.

Wharepuhunga Section: Some widening has been undertaken.

Caves – Lemon Point:—

Hangatiki – County Boundary Section: The cutting-back of corners and reconditioning were carried out over a length of 1 m. 20 ch.

County Boundary – Lemon Point Section: A bad corner on the Kinohaku Hill was considerably improved.

Te Kuiti – Bulls, via Taumarunui (No. 6 Highway District):—

Tangitu–Taumarunui–Raurimu Sections: Excessive rains in March caused considerable damage on this and other highways in the district, and restoration works are in hand.

Kakahi Stream Bridge: The metalling of the approaches was completed.

Patua culvert: This 6-ft.-diameter concrete culvert was completed, together with filling and metalling.

Raurimu – County Boundary Section: A bad corner in the Makatote Gorge was cut back and a 5 ft. by 5 ft. concrete culvert installed below the Erua crossing.

Stratford–Taumarunui (No. 6 Highway District) :—

Paparata Saddle – County Boundary Section : 18 ch. of metalling was completed between Tokirima and the county boundary.

County Boundary – Taumarunui Section : The Otunui Stream Bridge was carried away by flood, and a temporary low-level bridge with approaches was constructed.

Raurimu–Wade's Landing.—Moronui Stream Bridge : This bridge, 85 ft. long, in steel and hardwood, was completed.

Piopio–Tatu.—Wairere – County Boundary Section : Paro Road—2 m. 70 ch. of metalling was completed.

National Park – Taupo.—Otukou Deviation : 3 m. 36 ch. of formation was completed.

Te Maire – Mangaohutu.—The cutting-back of corners and improvements of the alignment were undertaken.

Te Kumi – Te Anga.—Mangaohae – County Boundary Section : Bell's Bridge—This bridge, 80 ft. long, in steel and timber, was completed.

Kumara–Paraheka.—49½ ch. of metal was laid, completing the metalling of this highway.

Tokirima Highway.—81½ ch. of re-formation and 112½ ch. of metalling were completed.

Manunui–Owhango.—Re-formation and metalling of the 2 m. clay section near Owhango are in hand.

Otunui Highway.—Heavy rains caused considerable damage, three bridges being completely washed away. Temporary bridges were erected.

Bruce Highway.—The Whakapapanui Stream Bridge near the Chateau was carried away, and a temporary structure erected in its place.

Auckland–Wellington, via Taranaki (No. 7 Highway District).—Taranaki County Section : The approaches to the railway overbridge near Waitara, 9 ch. in length, have been surfaced with a bituminous penetration course ; this completes the elimination of the level crossing.

Lepperton Junction – Hawera, via Opunake :—

The Timaru Hill Deviation, 31 ch. in length, and the Oeo Deviation of 18 ch., have been surfaced with bitumen.

1 m. of bituminous surfacing west of Inaha Road has been widened to 18 ft.

New Plymouth – Kaimata.—Between New Plymouth and the Waiwakaiho Stream 30 ch. of bituminous surfacing has been widened to 18 ft.

Pukearuhe Highway.—The old bridge over the Papatiki Stream has been replaced with a rolled-steel joist bridge of 25 ft. span.

Egmont Highway.—A small deviation eliminating a sharp reverse curve at Peter's Corner has been put in hand.

Skeet Highway.—Hawera County Section : The replacement of the old bridge over the Waingongoro Stream with a second-hand railway truss of 70 ft. span is under way.

Stratford–Taumarunui (No. 7 Highway District).—Strathmore–Paparata Saddle : The Pukaki Stream Bridge has been replaced with twin 4-ft.-diameter concrete pipes.

Toko Highway.—A second coat of bitumen has been applied over a length of 1 m. 50 ch.

Normanby–Manaia – Mount Egmont Main Highway.—60 ch. of the bituminous surfacing has been widened to 16 ft.

Auckland–Wellington, via Taranaki (No. 8 Highway District) :—

Patea County Section : 1 m. 20 ch. of widening of the bituminous pavement was completed, making a total of 13¼ m. since the commencement of this work, and foundation metal for similar widening has been laid on a further length of 45 ch.

Waitotara County Section : 31 ch. was reconstructed and 47 ch. metalled on the Waitotara Hill, and 1 m. 66 ch. sealed with one coat of tar.

Rangitikei County Section : 5 m. 15 ch. of reconstruction and metalling was carried out between Turakina and Bulls, 70 ch. sealed with one coat of tar, and a contract let for the sealing of several sections totalling 14 m. between Wangaehu and Bulls, of which 4 m. 70 ch. of second-coat work has been completed.

The re-formation of 28 ch. on McQuarries' Hill, south of Turakina, is in hand.

Te Kuiti – Bulls, via Taumarunui (No. 8 Highway District) :—

Rangitikei County Section : The formation, metalling, and fencing of 21 ch. of the approaches to the Hautapu River Bridge, Taihape, and the reconstruction and metalling of a deviation 18 ch. in length at Anderson's Bend, Winiata, have been carried out.

Waimarino County Section : The metalling of the Tohanga Road Deviation, 2 m. 30 ch. in length, has been completed, and contracts let for the construction of the Makotuku Stream Bridge and Haeremaiea Stream culvert.

Heads–Mosstown.—32 ch. has been reconstructed and metalled.

Kohi Highway.—A length of 13 ch. has been metalled.

Kaharoa Highway.—44 ch. of metalling was carried out.

Raetihi–Ohakune :—

Waimarino County Section : A reinforced-concrete arch culvert, replacing a wooden bridge, was constructed over the Makaranui Stream.

Raetihi Borough : 4 ch. of the approaches to the Makotuku Stream Bridge has been surfaced with bitumen.

Turakina Cliff Road, via Marton.—Rangitikei County Section : The reconstruction of Gower's Hill has been advanced to a stage enabling traffic to be diverted over the new filling.

Wanganui–Horopito.—Improvements of this highway have been continued ; 2 m. 50 ch. of widening and metalling has been completed, and a further length of 1 m. is in hand ; a 20 ft. by 10 ft. water-tunnel, 444 ft. in length, has been driven at the Kakatahi Stream. A length of 60 ft. of McLean's water-tunnel has been lined with concrete.

Wellington–Auckland, via Taranaki (No. 9 Highway District) :—

Makara County Section : 7 ch. of two-coat and 26 ch. of first-coat sealing have been carried out.

Hutt County Section : Paekakariki Hill—2 m. 49 ch. of second-coat sealing was completed. Five concrete crib walls and fourteen stone gabion walls have been constructed in repairing flood-damage.

Horowhenua County Section : The Whirokino Deviation, 39 ch. in length, was surfaced with a bituminous penetration course.

Manawatu County Section : The main drain flood-gate between the Manawatu River Bridge and Foxton was widened 25 ft. by the addition of three new gates, thus providing a substantially improved get-away for flood-waters.

Wellington–Napier, via Wairarapa (No. 9 Highway District).—Hutt County Section : Akatarawa–Rimutaka Summit—Second-coat sealing was carried out over a length of 62 ch.

Awahuri–Mangaweka, via Kimbolton.—Oroua County Section : Between Feilding and Cheltenham 1 m. of second- and third-coat sealing was carried out, completing the sealing of this section.

Greatford–Woodville (No. 9 Highway District).—Aorangi Bridge at Feilding : The approaches to this bridge, 20 ch. in length, were sealed in three coats.

Himatangi–Ashhurst, via Palmerston North.—Manawatu County Section : An experimental length of 1 m. of two-course bituminous surfacing was carried out. The lower course was mixed in place, while the top course consisted of low-cost plant mix.

Foxton–Shannon.—Shannon Borough : A length of 20 ch. was prepared and sealed in two coats of bitumen.

Levin – Palmerston North, via Shannon :—

Shannon Borough : A length of 41 ch. was sealed in two coats.

Kairanga County Section : Kahuterawa Bridge—This 80 ft. reinforced-concrete bridge with 14 ch. of approaches was completed.

Fitzherbert Bridge, Manawatu River, Palmerston North : A contract was let for the erection of this reinforced-concrete bridge, which comprises four 112 ft. bowstring spans and seven 55 ft. beam spans, with a 22 ft. roadway and 5 ft. footway, and the work has been commenced. The formation of 7 ch. of the southern approach has been completed.

Upper Hutt – Waikanae.—Widening at Akatarawa : Widening was carried out over a length of 1 m. 26 ch.

Bunnythorpe–Kairanga.—1 m. of second- and third-coat sealing was completed.

Feilding–Hunterville.—Kiwitea County Section : Jamieson's Bridge—A contract was let and work commenced on the construction of this reinforced-concrete bridge, which consists of two 28 ft. and one 38 ft. spans.

Pahautanui–Plimmerton.—40 ch. of this highway was widened.

Porirua – Titahi Bay.—Bituminous sealing was applied over a length of 2 m. 67 ch., and a stone-faced seawall erected over a length of 1 m. 14 ch.

Wellington–Napier, via Wairarapa (No. 10 Highway District) :—

Featherston County Section : Rimutaka Summit – Featherston—A concrete crib wall 90 ft. long by 30 ft. high was erected at 6 m. 44 ch. in repairing flood damage.

Wairarapa South County Section : Waiohine Bridge—Protective works are being carried out above the bridge to divert the river from the abutment.

Pahiatua County Section : In the Konini Gorge 40 ch. of widening was carried out, with marked improvement to alignment and visibility.

Masterton–Weber, via Alfredton :—

Masterton County Section : 40 ch. of heavy widening has been completed.

Waiohine Stream Bridge : A contract was let and work commenced on the erection of this bridge, comprising one 27 ft. reinforced concrete-beam span.

Masterton–Castlepoint, via Tinui.—Masterton County Section : Devil's Elbow Deviation—The earthwork of this deviation has been almost completed, 40 ch. of formation being carried out during the year.

Masterton–Stronvar, via Weraiti.—Widening was undertaken over a length of 1 m. 40 ch.

Martinborough–Masterton, via Gladstone.—Martinborough Borough : The bituminous sealing of this section was completed by the application of a second coat over a length of 60 ch.

Tupurupuru – Te Wharau.—Jackson's Creek Bridge : An existing ford was eliminated by the erection of this bridge, comprising one 24 ft. and two 16 ft. timber spans.

Greytown – Bidwills Cutting.—Featherston County Section : 2 m. 40 ch. of this highway was sealed with one coat of bitumen.

Martinborough–Otaraia :—

Martinborough Borough : The bituminous surfacing of this section was completed by the application of a second coat over a length of 60 ch.

Featherston County Section : Perry's Culvert No. 3—This concrete culvert, 5 ft. by 4 ft. and 48 ft. in length, was completed.

Pahiatua Station Highway.—Mangatainoka River Bridge : This concrete bridge, 476 ft. long, with a 20 ft. roadway and two footways, was completed.

Dreyers Rock Highway.—Dreyers Rock Culvert : This concrete culvert, 4 ft. by 4 ft. and 70 ft. in length, replacing an old timber-truss bridge, was completed.

Westmere Highway :—

Masterton County Section : Mangatepopo Bridge—The construction of this reinforced-concrete bridge, consisting of one 27 ft. span, was commenced.

Waioterangi Bridge : The erection of this bridge, comprising one 42 ft. concrete span, was almost completed at the end of the year.

Picton–Bluff (No. 11 Highway District) :—

Marlborough County Section : Aubrey's Culvert, consisting of twin 3 ft. pipes encased in concrete, has been completed.

Dashwood Pass Deviation: This deviation, although not quite completed, was opened for traffic on 1st April, 1933. The following portions of the work were completed during the year: Formation: 50 ch., consisting chiefly of bridge approaches and junctions with existing roads. Metalling: 3 m. 74 ch. Fencing: 10 m. 18 ch.

The following bridges on the deviation, all having a roadway 20 ft. in width, were also completed: Overbridge at 0 m. 18 ch., comprising two 30 ft. rolled-steel-joist spans on concrete piers and abutments.

Seventeen Valley Stream Bridge, comprising two 40 ft. rolled-steel-joist spans on concrete piers and abutments. The south approach banks were protected with stone crates.

Puka Puka Stream Bridge, consisting of one 30 ft. rolled-steel-joist span on concrete abutments.

Overbridge at 4 m. 28 ch., comprising three 25 ft. rolled-steel-joist spans on concrete pile piers and abutments.

Overbridge at 5 m. 16 ch., comprising four 20 ft. reinforced-concrete slab spans on reinforced-concrete abutments and column piers.

Bridge at 6 m. 74 ch., consisting of one 25 ft. rolled-steel-joist span on concrete-pile abutments.

Bridge at 7 m. 37 ch., consisting of one 30 ft. rolled-steel-joist span on concrete-pile abutments.

Stafford Creek Bridge, consisting of one 35 ft. rolled-steel-joist span on concrete piles and reinforced-concrete cantilever abutments.

Blenheim–Nelson.—Marlborough County Section: Improvements have been undertaken on the Rai Hill; 46 ch. has been widened, regraded, and culverted, and 60 ch. of metal laid.

Nelson – Inangahua Junction (No. 11 Highway District).—Waimea County Section: Improvements on the Hope Saddle are in hand. 43 ch. has been widened and culverted, and 46 ch. surfaced with granite sand.

Richmond–Collingwood.—Waimea County Section: Thompson's Bridge, comprising one 20 ft. span in reinforced concrete, was completed.

Wakefield–Woodstock:—

Brandy Creek Bridge: The existing structure having been washed away by floods, a contract was let for the construction of a new bridge consisting of two 35 ft. rolled-steel-joist spans, and the work is in hand.

Dove River Bridge: A contract was let for the construction of this bridge, which will consist of two 40 ft. and one 30 ft. rolled-steel-joist spans.

A 6 ft. by 6 ft. reinforced-concrete box culvert was completed at Inwoods.

Westport–Karamea:—

Mokihinui–Karamea Section: A 5 ft. by 3 ft. concrete box culvert and several smaller culverts have been installed.

Tidal Creek Bridge No. 3: The construction of this bridge, which consists of two 40 ft. and one 30 ft. rolled-steel-joist spans on ironbark-pile piers and abutments, has been completed.

Westport–Mokihinui Section: Bridges at 7 m. 8 ch. and 7 m. 13 ch.—The superstructures of these bridges have been rebuilt in timber.

Bridge at 13 m.: This small bridge has been replaced by a 4-ft.-pipe culvert.

Rapid Creek Bridge: The approaches to this bridge have been completed.

Improvements: Between 11 m. 40 ch. and 15 m. 40 ch. two short lengths of the highway have been widened and raised above swamp-level.

Inangahua Junction – Westport:—

Westport–Inangahua Section: A considerable amount of culverting has been carried out on this section.

A washout near Stitt's Bluff necessitated the construction of a 14 ft. span half-bridge.

Coal Creek Bridge: A new bridge consisting of two 40 ft. steel-joist spans on ironbark piers has been built.

Inangahua Junction – Weheka:—

Ross–Waiho Section: Culvert near McDonald's Creek—A 3 ft. concrete-pipe culvert has been installed, and improvement of the alignment of the adjacent section of road is in hand.

Inangahua Junction – Reefton Section: Mile Creek Bridge—The construction of this bridge has been completed.

Reefton – Big Grey Section: Casolis Creek Bridge—A temporary bridge 100 ft. in length was erected.

Snowy Creek Bridge: A new bridge, consisting of two 40 ft. and two 30 ft. rolled-steel-joist spans on concrete piers, together with approaches, has been completed.

Big Grey – Taramakau Section: A 9 ft. span reinforced-concrete slab culvert and five large pipe culverts have been installed.

Taramakau–Ross Section: Groyne protective works were constructed at the Waimea Creek Bridge at Stafford.

Goldsborough Bridge: The superstructure of this bridge, 49 ft. in length, has been rebuilt.

Ross–Waiho Section: Flood protection-works, consisting principally of concrete blocks and stone crate-work, have been placed at the O'Neill's Creek, Little Wanganui River, Waitangi River, and Dry Creek Bridges.

Arthurs Pass – Kumara.—Flood damage: Floods causing serious and extensive damage occurred in July, August, January, and February, necessitating the closing of the highway until restoration work, now in progress, has been completed.

Westport – Greymouth Coast Road:—

Four Mile – Charleston Section: Improvements, 12 m. to 17 m.—These works, comprising reformation and metalling, have been continued during the year.

Charleston – Fox's River Section: Widening, straightening, and culverting on this narrow section have been continued.

Runanga Borough: A 4 ft. concrete-pipe culvert has been constructed at the corner of Seddon Street.

Ahaura–Haupiri.—A considerable amount of culverting, comprising concrete pipes up to 3 ft. 6 in. diameter, has been carried out.

Picton–Bluff (No. 13 Highway District) :—

Kaikoura Town District : 72 ch. of first-coat tar-sealing was carried out.

Waipara County Section : 3 m. of first-coat and 6 m. of second-coat sealing were completed.

Motunau – Motunau Beach.—The formation and metalling of 70 ch. was carried out during the year, making a total of 1 m. 44 ch.

Upper Riccarton – Arthurs Pass.—Paparua County Section : Two-coat sealing in tar and bitumen was carried out on a length of 1 m. 68 ch.

Christchurch–Chaneys, via Marshlands.—A length of 19·4 ch. of two-coat sealing has been carried out at Chaney's Corner.

Christchurch – Russley Road Junction, via Burnside Road.—64·5 ch. of two-coat sealing has been completed.

Marshlands – New Brighton.—Buxton's Corner to Racecourse Road : 2 m. 48 ch. of two-coat sealing has been completed.

Hilltop Junction – Akaroa, via Long Bay Saddle.—15 m. 40 ch. of this highway has been widened.

Picton–Bluff (No. 15 Highway District) :—

Ashburton County Section : Rakaia–Dromore—The contract for the reconstruction and three-coat sealing of 9 m. 6 ch. was completed.

Levels County Section : A further 5 ch. of three-coat sealing was carried out between the Timaru Borough boundary and Arowhenua Bridge.

Timaru–Queenstown, via Tekapo and Lindis Pass (No. 15 Highway District).—Mackenzie County Section : A bridge of one 40 ft. and two 35 ft. spans, in steel and concrete, has been built over the Twizel River, and a reinforced-concrete culvert of 13 ft. span in the same locality.

Deep Creek – Waihao Downs – Dip Creek.—Deep Creek – Waimate : 2 m. was re-formed, on improved alignment where necessary, and a small bridge widened.

Arowhenua–Fairlie.—Levels County Section : The superstructure of the bridge over the Te Ngawai River, consisting of fourteen 40 ft. and one 18 ft. span, has been completely renewed in steel and timber.

Picton–Bluff (No. 16 Highway District) :—

Waitati–Merton Section : A seal coat and considerable repair work were undertaken on this section over a length of 7 m. 49 ch. A dry-stone retaining-wall was built near Merton Church.

Merton–Palmerston Section : Reshaping and widening were carried out over a length of 1 m. 30 ch.

Herbert–Maheno Section : The two-coat bituminous sealing of this section, of a total length of 4 m. 64 ch., was completed.

Timaru–Queenstown, via Tekapo and Lindis Pass (No. 16 Highway District).—Widening and gravelling in the vicinity of Lindis Pass were completed during the year, the total length dealt with being 1 m. 22 ch. A culvert and stone retaining-wall were constructed at the Black Pinch.

Alexandra–Clyde.—A contract was let for the renewal of the Clyde Bridge over the Molyneux River, and the steelwork is in course of fabrication.

Dunedin – Port Chalmers.—1 m. 70 ch. of tar-sealing was completed, making the total length sealed 3 m. 48 ch.

Ida Valley Railway Station – Moa Creek School.—Spain's Bridge, a single 20 ft. span in reinforced concrete, together with its approaches, was completed.

Dunedin–Waitati, via Leith Valley.—A contract was let for the renewal of a 22 ft. span bridge over Williams' Creek.

Picton–Bluff (No. 17 Highway District) :—

Taieri County Section : A seal coat was applied to a length of 5 m. 67 ch. of bituminous concrete pavement from Hope Hill to the Taieri River Bridge. Near Otokia a length of 60 ch. of unsatisfactory pavement was strengthened with a bituminous penetration course.

Balclutha Bridge : A contract was let and work commenced on the six-span reinforced-concrete bowstring-truss bridge over the Clutha River. The excavation and concreting of abutments and the casting and sinking of reinforced-concrete cylinders for piers are in hand.

Clutha County Section : Widening and improvement works between Waipahi and Arthurton are being carried out over a length of two miles.

Mosgiel Junction – Middlemarch :—

Taieri County Section : 22 ch. adjoining Mosgiel Borough was sealed with one coat of tar.

The Deep Stream Deviation, of a total length of 1 m. 53 ch., was completed, and metalled.

Clarksville–Springvale :—

Tuapeka County Section : A deviation 6 ch. in length at the Round Hill Railway-crossing has effected a material improvement.

A contract was let for the reconstruction of Shingle Creek Bridge.

Widening and reconstruction between Rae's Junction and Island Block have been put in hand, a length of 62 ch. being completed, including two heavy rock cuttings.

Dunedin–Portobello (Low Road).—Reconstruction on this highway was completed to Portobello, a length of 2 m. 22 ch. of metalling being carried out during the year. 5 m. 71 ch. was sealed in one coat of tar.

Riverton–Orepuki.—Riverton–Roundhill Section : A deviation, 1 m. 11 ch. in length, was formed and 26 ch. metalled.

Signed on behalf of the Main Highways Board,

C. J. McKenzie,
Chairman.

TABLE 1.—MAIN HIGHWAYS ACCOUNT.

REVENUE FUND.

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31ST MARCH, 1933, AND TOTAL TO DATE

EXPENDITURE.	Total for Year 1932–33.	Total since Inception of Main Highways Act, 1922, to 31/3/33.
	£ s. d.	£ s. d.
To Net expenditure on ordinary maintenance of main highways :—		
Highway District—		
No. 1	40,308 2 1	358,536 7 2
No. 2	79,946 16 11	663,330 4 10
No. 3	34,885 13 8	270,090 8 5
No. 4	25,270 16 4	225,675 10 8
No. 5	39,403 9 0	434,432 5 3
No. 6	29,764 9 4	245,464 14 9
No. 7	28,736 8 2	332,542 8 4
No. 8	23,927 17 1	260,078 5 11
No. 9	41,416 15 0	389,524 2 2
No. 10	32,067 13 9	289,967 11 10
Totals for North Island	375,728 1 4	3,469,641 19 4
No. 11	27,751 15 4	300,173 7 7
No. 12	46,731 11 3	575,507 9 4
No. 13	15,905 5 3	150,187 5 2
No. 14	24,583 13 0	211,754 1 3
No. 15	35,122 3 8	274,111 6 9
No. 16	25,052 14 4	139,083 4 0
No. 17	24,393 10 11	178,265 16 4
No. 18	25,055 1 6	194,951 0 9
Totals for Dominion	600,323 16 7	5,493,675 10 6
Relief camps for single men	52,693 6 5	87,013 1 11
Maintenance and construction of roads giving access to outlying areas (Finance Act (No. 3), 1931)	785 7 7	45,918 8 8
Abolition of toll-gates (section 20, Finance Act, 1925)	1,603 19 4	19,176 13 11
Accident compensation	2,269 19 11	7,478 14 6
Administration and supervision expenses (including salaries and expenses of Public Works officers), printing, stationery, postages, and miscellaneous expenses	29,869 15 4	253,546 5 10
Charges and expenses of raising loans, management charges of Consolidated Stock on account of Construction Fund, &c.	184 18 7	47,703 7 1
Commission on collection of motor-registration fees by Postal Department	14,742 16 0	103,219 19 4
Commission on registration of change of ownership	4,040 3 6	29,908 8 6
Depreciation of furniture, fittings, &c.	90 6 11	473 7 10
Carried forward	706,604 10 2	6,088,113 18 1

INCOME.		Total for Year 1932–33.	Total since Inception of Main Highways Act, 1922, to 31/3/33.
		£ s. d.	£ s. d.
By Income from—			
Interest from investments of—	£ s. d.		
Construction Fund	982 12 11		
Revenue Fund	2,848 17 7	3,831 10 6	207,779 3 11
Interest from local authorities on plant purchased on their behalf		1,428 3 9	18,936 4 4
Interest on advances to local authorities		3,628 6 11	12,233 16 1
Miscellaneous receipts		372 2 11	962 10 2
Motor-registration licenses, fees, and fines (section 24, Motor-vehicles Act, 1924)		354,215 11 8	2,776,771 12 3
Motor-spirits tax (section 9, Motor-spirits Taxation Act, 1927)		644,126 1 7	4,828,780 19 3
Rent of and tolls from ferries		..	2,081 10 6
Tire-tax (sections 13 and 14, Main Highways Act, 1922)		63,252 18 9	1,673,261 1 11
Transfer from Consolidated Fund (section 14, Main Highways Act, 1922)		..	210,000 0 0
Grants from Unemployment Fund towards relief camps for single men		54,911 3 3	67,530 7 7
		1,125,765 19 4	
Balance, being excess of expenditure over income, carried to general balance-sheet		159,934 5 4	..
Carried forward		1,285,700 4 8	9,798,337 6 0

TABLE 1.—MAIN HIGHWAYS ACCOUNT—*continued.*

REVENUE FUND—*continued.*

EXPENDITURE.	Total for Year 1932-33.	Total since Inception of Main Highways Act, 1922, to 31/3/33.	INCOME.	Total for Year 1932-33.	Total since Inception of Main Highways Act, 1922, to 31/3/33.
	£ s. d.	£ s. d.		£ s. d.	£ s. d.
Brought forward	706,604 10 2	6,088,113 18 1	Brought forward	1,285,700 4 8	9,798,337 6 0
To Net expenditure on maintenance of main highways—*continued.*					
Expenses of District Councillors attending District Council meetings and conference	67 16 8	680 2 1			
Fees and travelling-expenses of members of the Main Highways Board other than Government members	736 2 8	11,683 4 2			
Finance Act, 1930, section 37 (1), subsidies on rates,—					
Subsidies to municipalities	23,958 14 8	80,274 8 7			
Subsidies to County Councils and other local authorities	157,947 3 9	512,152 18 11			
Finance Act (No. 4), 1931, section 45,—					
Subsidies to County Councils for rebate to ratepayers	..	253,892 12 1			
Hutt Road annual charges—Finance Act, 1927 (No. 2), section 33 ..	23,549 10 1	107,331 16 7			
Interest on amount appropriated out of Public Works Fund and paid into Main Highways Account Construction Fund	61,300 0 0	183,900 0 0			
Interest on loans, recoupment to Consolidated Fund (section 4, Finance Act, 1919)	114,773 16 4	497,766 9 11			
Level crossings, Alarm-signals at	432 4 4	2,574 12 3			
Maintenance, &c., of combined road and railway bridges	19,335 1 2	28,710 0 10			
Miscellaneous expenses,—					
Advertising, maps, rent of halls, traffic tallies, transport of samples, &c.	137 4 8	4,177 6 11			
Compensation under section 3, Public Works Amendment Act, 1925 ..	..	1,015 1 6			
Petrological laboratory and other experimental work, Expenses of ..	1,652 1 4	3,625 19 2			
Reserve for redemption of main highway securities	67,807 0 0	269,061 0 0			
Signposts, Erection of	1,864 1 9	6,932 2 8			
Traffic inspection	5,534 17 1	12,070 10 1			
	1,185,700 4 8	8,063,962 3 10			
Transfers to Construction Fund	100,000 0 0	1,500,000 0 0			
	1,285,700 4 8	9,563,962 3 10			
Balance, being excess of income over expenditure, carried to general balance-sheet	..	234,375 2 2			
	1,285,700 4 8	9,798,337 6 0		1,285,700 4 8	9,798,337 6 0

TABLE 1.—MAIN HIGHWAYS ACCOUNT—*continued.*

CONSTRUCTION FUND.

INCOME AND EXPENDITURE ON CAPITAL ACCOUNT FOR THE YEAR ENDED 31ST MARCH, 1933, AND TOTAL TO DATE.

EXPENDITURE.	Total for Year 1932–33.	Total since Declaration of Main Highways (9/6/24).
	£ s. d.	£ s. d.
To Net expenditure on construction and improvement of main highways, including cost of administration by Public Works Department and accident compensation—		
Highway District—		
No. 1	18,547 3 3	579,796 7 5
No. 2	33,835 18 2	722,840 17 1
No. 3	1,651 2 0	170,924 6 9
No. 4	17,526 4 3	341,771 1 10
No. 5	23,297 3 3	251,767 4 0
No. 6	9,556 7 1	316,837 5 1
No. 7	1,518 16 0	328,970 18 6
No. 8	11,822 7 7	183,088 6 3
No. 9	4,995 3 9	532,553 15 11
No. 10	11,304 2 9	197,885 18 5
Totals for North Island	134,054 8 1	3,626,436 1 3
No. 11	13,280 14 9	147,931 5 10
No. 12	304 5 4	135,361 18 5
No. 13	2,052 11 7	159,340 13 8
No. 14	521 9 0	238,011 8 7
No. 15	1,340 5 6	146,627 5 3
No. 16	3,438 4 11	147,881 12 5
No. 17	3,792 19 6	328,468 15 5
No. 18	538 5 10	96,633 16 11
Totals for Dominion	159,323 4 6	5,026,692 17 9
Balance, being excess of income over expenditure, carried to general balance-sheet	..	50,914 16 3
	159,323 4 6	5,077,607 14 0

INCOME.	Total for Year 1932–33.	Total since Declaration of Main Highways (9/6/24).
	£ s. d.	£ s. d.
By Loans raised under Main Highways Act, 1922—		
Stock and Debentures issued—		
At 4 per cent. interest	..	100,000 0 0
At 4½ per cent. interest	..	592,004 10 10
At 5 per cent. interest	..	25,750 0 0
At 5⅛ per cent. interest	..	207,150 0 0
At 5¼ per cent. interest	..	251,550 0 0
At 5½ per cent. interest	..	1,175,150 0 0
		2,351,604 10 10
Receipts under section 15, Finance Act, 1923, from Public Works Fund, General Purposes Account (at 5 per cent. interest)	..	1,226,000 0 0
Transfer from Revenue Fund	100,000 0 0	1,500,000 0 0
Charges and expenses of raising loans (adjustment)	..	3 3 2
Balance, being excess of expenditure over income, carried to general balance-sheet	59,323 4 6	
	159,323 4 6	5,077,607 14 0

TABLE 1.—MAIN HIGHWAYS ACCOUNT—*continued.*

General Balance-sheet as at 31st March, 1933.

LIABILITIES.	Revenue Fund.	Construction Fund.	Total.
	£ s. d.	£ s. d.	£ s. d.
Accumulated Revenue Fund—			
Balance at 31/3/32	394,309 7 6		
Less excess of expenditure over income for 1932–33	159,934 5 4		
	234,375 2 2	..	234,375 2 2
Construction Fund—			
Balance at 31/3/32	..	109,504 6 9	
Recoveries on account of expenditure of previous years	..	733 14 0	
		110,238 0 9	
Less excess of expenditure over income for 1932–33	..	59,323 4 6	
		50,914 16 3	50,914 16 3
Sundry creditors—			
Public Works Department	18,693 17 6	1,207 1 3	19,900 18 9
Other Government Departments	1,114 3 7	272 9 8	1,386 13 3
Non-departmental	44,149 6 0	18,957 3 5	63,106 9 5
Interest accrued on loans	14,932 13 11	..	14,932 13 11
Motor-registration fees paid in advance	61,614 0 0	..	61,614 0 0
Writings-off in Suspense	184 7 0	5 6 0	189 13 0
Reserve for redemption of securities	284,709 11 8	..	284,709 11 8
	659,773 1 10	71,356 16 7	731,129 18 5

ASSETS.		Revenue Fund.	Construction Fund.	Total.
		£ s. d.	£ s. d.	£ s. d.
Cash in Public Account—				
At call		204,891 9 1	57,786 11 6	262,678 0 7
Sundry debtors—				
Public Works Department		802 2 2	561 8 3	1,363 10 5
Other Government Departments		5,072 2 3	122 7 10	5,194 10 1
Non-departmental		7,715 15 4	1,621 16 4	9,337 11 8
Advances to local authorities (Main Highways Amendment Act, 1926, section 2)		78,377 16 7	..	78,377 16 7
Advance on subsidies (Finance Act, 1930, sections 37 and 39, and Finance Act, 1932, section 36)		1,608 15 0	..	1,608 15 0
Motor-registration fees in hands of Postal Department		2,228 18 4	..	2,228 18 4
Interest due and accrued		2,388 2 8	..	2,388 2 8
Stocks of materials, tools, &c.		17,733 13 10	9,225 18 2	26,959 12 0
Stocks, deficits account		184 7 0	5 6 0	189 13 0
Roadmen's cottages, huts, and road buildings generally		6,199 2 0	2,033 8 6	8,232 10 6
Furniture, fittings, &c.	£ s. d.			
Expenditure to 31/3/33	1,202 16 8			
Less depreciation to 31/3/33	473 7 10			
		729 8 10	..	729 8 10
Plant and equipment—				
For Main Highways Board—				
Expenditure to 31/3/33	93,057 17 10			
Less depreciation charged to works	63,967 1 11			
		29,090 15 11	..	29,090 15 11
Purchased for local authorities—				
Expenditure to 31/3/33	159,625 6 0			
Less repayments of principal	141,584 4 10			
		18,041 1 2	..	18,041 1 2
Amount transferred to Loans Redemption Account	287,217 13 5			
Interest accrued to 31/3/33	2,491 18 3			
	289,709 11 8			
Less amount utilized for redemption of securities	5,000 0 0			
		284,709 11 8	..	284,709 11 8
		659,773 1 10	71,356 16 7	731,129 18 5

J. J. Gibson, Accountant, Public Works Department.

C. J. McKenzie, Chairman, Main Highways Board.

I hereby certify that the Income and Expenditure Accounts and Balance Sheet have been duly examined and compared with the relative books and documents submitted for audit, and correctly state the position as disclosed thereby. The following comments are appended: (1) A reserve of £287,217 13s. 5d. for redemption of securities has been set up and paid over to Loans Redemption Account, but only £5,000 has been applied to the redemption of securities. (2) No charge for the cost of exchange on payments made in London is included in the account.—G. F. C. Campbell, Controller and Auditor-General.

TABLE 2.—LENGTHS OF MAIN HIGHWAYS AT 31ST MARCH, 1933.

Number and Name of Highway District.	Primary Highways.	Secondary Highways.	Total.
	M. ch.	M. ch.	M. ch.
1. Auckland North	526 6	315 74	842 0
2. Auckland South	557 24	463 1	1,020 25
3. Tauranga	436 49	228 63	665 32
4. Gisborne	254 78	108 12	363 10
5. Napier	460 64	212 54	673 38
6. King-country	350 20	306 60	657 0
7. Taranaki	308 23	129 35	437 58
8. Wanganui	324 58	163 40	488 18
9. Wellington West	314 54	143 48	458 22
10. Wellington East	339 3	126 2	465 5
Totals, North Island ..	3,872 59	2,197 69	6,070 48
11. Nelson	305 13	228 70	534 3
12. West Coast	348 30	162 28	510 58
13. Canterbury North	312 20	103 26	415 46
14. Canterbury Central	406 61	264 77	671 58
15. Canterbury South	346 53	353 16	699 69
16. Otago Central	340 18	363 29	703 47
17. Otago South	295 21	154 48	449 69
18. Southland	463 52	358 30	822 2
Totals, South Island ..	2,818 28	1,989 4	4,807 32
Totals for Dominion ..	6,691 7	4,186 73	10,878 0

TABLE 3.—CONSTRUCTION WORK COMPLETED DURING YEAR 1932–33.

Number and Name of Highway District.	Formation and Widening.	Gravelling and Metalling.	Tar and Bituminous Sealing.	Bituminous Macadam (Penetration).	Bituminous Concrete.	Portland Cement Concrete.	Bridges.	Engineering Surveys.	
								Surveys completed.	Plans completed.
	M. ch.	M. ch.	M. ch.	M. ch.	M. ch.	M. ch.	Ft.	M. ch.	M. ch.
1. Auckland North	0 78	5 9	5 5	0 7	..	..	40	..	..
2. Auckland South	0 10	6 66	7 54	1 24	..	0 32	288	7 72	7 72
3. Tauranga	..	1 40	6 8	3 30	..	..	160	..	..
4. Gisborne	6 67	7 58	..	1 18	..	..	106	3 22	3 22
5. Napier	..	..	6 23	..	..	..	24	13 0	13 0
6. King-country	3 39	6 20	1 41	..	..	..	235	..	..
7. Taranaki	..	..	3 48	0 58	..	..	25	..	..
8. Wanganui	9 7	3 7	2 59	0 4	..	..	..	..	7 40
9. Wellington West ..	5 55	0 21	4 21	1 39	..	..	80	..	..
10. Wellington East	3 0	..	2 40	..	..	..	532	..	..
11. Nelson	0 50	3 74	..	..	..	..	435	9 6	8 70
12. West Coast	3 20	2 20	..	..	..	..	373	3 28	2 42
13. Canterbury North ..	0 70	0 70	9 72	..	..	..	..	..	..
14. Canterbury Central ..	15 40	..	5 40	..	..	..	..	20 19	20 19
15. Canterbury South ..	2 0	..	9 11	0 4	..	..	701	9 6	9 6
16. Otago Central	1 33	2 27	1 70	..	..	..	44	..	..
17. Otago South	2 21	4 9	6 13	..	..	..	..	..	..
18. Southland	1 11	0 26	0 11	..	..	..	135	..	5 61
Totals	56 21	44 47	72 36	8 24	..	0 32	3,178	65 73	78 12

TABLE 4.—APPROPRIATIONS AND EXPENDITURE FOR THE YEAR ENDED 31ST MARCH, 1933.

Number and Name of Highway District.	Construction.		Maintenance.	
	Available for Authorization.	Expenditure.	Available for Authorization.	Expenditure.
	£	£	£	£
1. Auckland North	20,352	18,547	46,555	40,308
2. Auckland South	42,790	33,836	92,425	79,947
3. Tauranga	5,755	1,651	37,000	34,886
4. Gisborne	22,395	17,526	35,279	25,271
5. Napier	39,995	23,298	49,664	39,403
6. King-country	9,866	9,556	35,413	29,764
7. Taranaki	5,269	1,519	36,549	28,736
8. Wanganui	15,287	11,822	27,895	23,928
9. Wellington West ..	7,850	4,995	40,826	41,417
10. Wellington East	12,416	11,304	35,439	32,068
11. Nelson	18,366	13,281	34,398	27,752
12. West Coast	1,160	304	48,394	46,732
13. Canterbury North ..	4,249	2,053	17,364	15,905
14. Canterbury Central ..	2,672	522	25,058	24,584
15. Canterbury South ..	7,660	1,340	45,069	35,122
16. Otago Central	9,321	3,438	27,369	25,053
17. Otago South	11,722	3,793	25,746	24,393
18. Southland	3,442	538	27,360	25,055
Totals for Dominion ..	240,567	159,323	687,803	600,324
Totals for North Island	181,975	134,054	437,045	375,728
Totals for South Island	58,592	25,269	250,758	224,596

TABLE 5.—MAINTENANCE OF MAIN HIGHWAYS (INCLUDING BRIDGES).

Number and Name of Highway District.	Length Maintained.	Expenditure.												
		Board.	Local Authorities.	Total.	Average per Mile per Annum.									
					1932–33.	1931–32.	1930–31.	1929–30.	1928–29.	1927–28.	1926–27.	1925–26.	1924–25.
					Primary System.									
	M. ch.	£	£	£	£	£	£	£	£	£	£	£	£	£
1. Auckland North ..	526 6	30,396	8,103	38,499	73·18	92·41	93·29	125·34	102·28	103·6	65·6	56·1	77·0
2. Auckland South ..	557 24	56,949	18,014	74,963	134·51	199·03	210·10	218·87	233·82	203·3	181·0	85·1	53·5
3. Tauranga	436 49	25,349	4,602	29,951	68·60	90·53	93·70	110·47	90·59	80·3	69·1	48·6	28·1
4. Gisborne	254 78	18,882	7,236	26,118	102·43	145·81	183·37	218·70	146·40	104·3	152·7	93·9	59·5
5. Napier	460 64	32,647	9,746	42,393	92·00	93·09	147·57	187·03	158·72	170·0	169·4	104·5	73·4
6. King-country	350 20	22,713	5,507	28,220	80·57	101·64	113·83	170·63	90·18	56·2	69·8	55·4	58·5
7. Taranaki	308 23	20,232	5,193	25,425	82·47	133·20	133·55	189·83	182·93	195·7	198·8	105·0	67·1
8. Wanganui	324 58	17,246	5,451	22,697	69·90	109·52	141·63	193·86	96·12	145·3	167·6	88·9	54·4
9. Wellington West ..	314 54	29,204	7,122	36,326	115·44	181·93	215·70	270·58	228·91	228·9	166·3	120·2	91·7
10. Wellington East ..	339 3	27,932	8,981	36,913	108·88	150·58	158·75	177·48	158·02	138·8	138·0	104·7	77·7
Totals, North Island	3,872 59	281,550	79,955	361,505	93·35	129·21	145·47	180·38	147·29	141·2	131·6	82·9	62·9
11. Nelson	305 13	21,835	5,729	27,564	90·33	139·95	106·17	153·18	121·31	102·1	119·9	63·9	48·1
12. West Coast	348 30	36,253	3,237	39,490	113·36	138·05	109·70	154·06	158·56	118·3	114·2	94·6	61·6
13. Canterbury North ..	312 20	13,528	3,822	17,350	55·56	62·40	79·49	111·63	94·06	90·1	79·5	47·7	37·7
14. Canterbury Central ..	406 61	14,322	5,071	19,393	47·68	93·04	89·98	77·74	77·85	87·3	81·4	46·1	52·2
15. Canterbury South ..	346 53	24,872	8,067	32,939	95·02	116·49	107·50	128·43	95·69	105·0	79·5	73·9	39·7
16. Otago Central	340 18	16,990	4,241	21,231	62·40	71·14	38·92	84·86	61·25	77·2	49·3	26·1	12·6
17. Otago South	295 21	19,988	6,750	26,738	90·56	120·83	106·59	124·24	88·96	90·5	81·7	54·2	22·5
18. Southland	463 52	18,154	6,206	24,360	52·54	53·70	74·46	70·62	67·13	63·4	76·0	56·6	24·6
Totals, South Island	2,818 28	165,942	43,123	209,065	74·18	97·31	88·48	111·19	94·96	91·4	85·4	59·6	38·5
Totals, Dominion ..	6,691 7	447,492	123,078	570,570	85·27	115·65	121·42	151·20	125·19	119·9	119·9	73·2	51·7

TABLE 5.—MAINTENANCE OF MAIN HIGHWAYS (INCLUDING BRIDGES)—*continued.*

Number and Name of Highway District.	Length Maintained.	Expenditure.							
		Board.	Local Authorities.	Total.	Average per Mile per Annum.				
					1932–33.	1931–32.	1930–31.	1929–30.	1928–29.
				Secondary System.					
	M. ch.	£	£	£	£	£	£	£	£
1. Auckland North ..	315 74	9,912	3,009	12,921	40·90	56·93	65·57	98·84	68·85
2. Auckland South ..	463 1	22,998	7,893	30,891	66·72	80·61	126·36	207·63	109·12
3. Tauranga	228 63	9,537	1,127	10,664	46·61	33·87	49·27	38·87	32·23
4. Gisborne	108 12	6,389	2,106	8,495	78·55	54·87	108·85	109·45	67·79
5. Napier	212 54	6,756	2,207	8,963	42·14	42·01	69·31	68·65	45·97
6. King-country ..	306 60	7,051	1,433	8,484	27·66	33·97	53·84	54·09	29·17
7. Taranaki	129 35	8,504	2,893	11,397	88·05	106·22	142·38	129·53	87·91
8. Wanganui	163 40	6,682	2,227	8,909	54·49	82·91	93·55	136·68	71·64
9. Wellington West ..	143 48	12,213	2,171	14,384	100·17	79·14	86·97	105·12	74·18
10. Wellington East ..	126 2	4,136	1,379	5,515	43·76	69·54	90·50	104·00	80·04
Totals, North Island	2,197 69	94,178	26,445	120,623	54·88	61·44	84·66	107·70	66·20
11. Nelson	228 70	5,917	1,805	7,722	33·74	45·96	43·96	49·08	37·14
12. West Coast.. ..	162 28	10,479	3,074	13,553	83·48	133·75	152·81	196·99	111·98
13. Canterbury North ..	103 26	2,377	730	3,107	30·07	34·28	48·69	58·54	36·31
14. Canterbury Central ..	264 77	10,262	3,688	13,950	52·65	50·08	50·40	76·58	54·05
15. Canterbury South ..	353 16	10,250	3,256	13,506	38·24	41·38	66·71	49·78	36·23
16. Otago Central ..	363 29	8,063	2,642	10,705	29·46	35·55	33·99	61·19	31·95
17. Otago South ..	154 48	4,405	1,469	5,874	37·99	58·64	58·58	75·09	52·62
18. Southland	358 30	6,901	2,279	9,180	25·62	29·66	36·78	40·30	26·07
Totals, South Island	1,989 4	58,654	18,943	77,597	39·01	48·48	55·93	67·42	43·79
Totals, Dominion..	4,186 73	152,832	45,388	198,220	47·32	55·35	71·00	88·51	55·51
				Complete Highway System.					
1. Auckland North ..	842 0	40,308	11,112	51,420	61·07	79·20	83·37	115·66	90·26
2. Auckland South ..	1,020 25	79,947	25,907	105,854	103·75	145·28	175·83	214·30	182·99
3. Tauranga	665 32	34,886	5,729	40,615	61·04	70·72	80·38	90·73	74·50
4. Gisborne	363 10	25,271	9,342	34,613	95·32	117·29	163·47	189·52	124·91
5. Napier	673 38	39,403	11,953	51,356	76·25	75·87	121·18	146·72	120·35
6. King-country ..	657 0	29,764	6,940	36,704	55·86	70·04	85·82	115·75	61·44
7. Taranaki	437 58	28,736	8,086	36,822	84·12	125·24	136·04	172·85	155·92
8. Wanganui	488 18	23,928	7,678	31,606	64·74	100·96	126·70	176·13	88·53
9. Wellington West ..	458 22	41,417	9,293	50,710	110·65	149·72	179·00	224·31	185·63
10. Wellington East ..	465 5	32,068	10,360	42,428	91·23	128·62	141·56	158·96	138·38
Totals, North Island	6,070 48	375,728	106,400	482,128	79·42	104·51	124·76	155·78	119·87
11. Nelson	534 3	27,752	7,534	35,286	66·07	103·59	82·05	112·83	88·69
12. West Coast.. ..	510 58	46,732	6,311	53,043	103·86	136·68	122·37	166·76	144·87
13. Canterbury North ..	415 46	15,905	4,552	20,457	49·22	55·41	72·65	99·69	81·07
14. Canterbury Central ..	671 58	24,584	8,759	33,343	49·64	76·54	75·16	77·29	68·85
15. Canterbury South ..	699 69	35,122	11,323	46,445	66·35	78·70	87·96	89·58	66·32
16. Otago Central ..	703 47	25,053	6,883	31,936	45·39	52·76	36·45	73·89	47·67
17. Otago South ..	449 69	24,393	8,219	32,612	72·49	99·46	90·82	108·15	77·06
18. Southland	822 2	25,055	8,485	33,540	40·80	43·22	58·66	57·90	49·90
Totals, South Island	4,807 32	224,596	62,066	286,662	59·63	77·39	75·77	94·12	75·04
Totals, Dominion	10,878 0	600,324	168,466	768,790	70·67	92·52	103·14	128·57	100·06

TABLE 6.—TESTS OF STONE COMPLETED DURING THE YEAR ENDING 31ST MARCH, 1933.

No.	Locality.	Weight in Pounds per Cubic Foot.	Absorption of Water in Pounds per Cubic Foot.	Abrasion.		Hardness.	Toughness.	Geological Classification
				Percentage of Wear.	French Coefficient.			
224	Tuapiro Quarry, Tauranga ..	156·7	0·11	5·80	6·90	19·21	12·0	Hornblende andesite.
225	Ongaroto, Atiamuri	164·0	0·70	8·40	4·80	18·10	15·5	Basalt.
228	Manuherikia Falls Tunnel ..	171·0	..	..	..	18·88	47·7	Greywacke.
229	Tawa Flat Tunnel, Wellington	167·5	..	..	..	18·40	35·5	Greywacke.
230	Motuhora Quarry, Waikohu County	170·0	0·20	2·65	15·10	17·40	18·0	Greywacke.
231	Motuhora Quarry, Waikohu County	167·8	0·11	3·16	12·60	17·65	19·0	Greywacke.
232	Motuhora Quarry, Waikohu County	170·0	0·20	2·65	15·10	17·40	18·0	Greywacke.
233	Sheldon's Quarry, Tomarata ..	149·6	1·39	4·92	8·10	16·70	8·5	Volcanic tuff.
234	Petrie's Quarry, Whangaripo ..	170·2	0·13	4·08	9·80	18·82	26·5	Argillite.
235	Moore's, Paremata, Tolaga Bay	161·2	0·85	8·50	4·90	11·70	6·5	Polyzoal limestone.
236	Mangatainoka River, Nireaha ..	..	..	5·10	7·80	..	..	Greywacke gravel.
237	Makakahi River, Eketahuna ..	162·7	0·22	..	..	17·32	13·5	Greywacke boulder.
238	Motueka Borough Quarry, Takaka Hill	163·3	0·59	3·78	10·60	19·53	19·5	Quartzite.
239	Motueka Borough Pit, Hursthouse Street	..	..	10·47	3·80	..	..	Gravel.
240	Motueka River, at bridge ..	162·4	0·44	..	..	18·42	15·0	Granite boulder.
241	Motueka River, at bridge ..	168·4	0·58	..	..	18·01	17·0	Greywacke boulder.
242	Motueka River, at bridge ..	164·6	0·71	..	..	17·64	22·0	Greywacke.
243	Motueka River, at bridge ..	176·0	0·68	..	..	18·19	19·5	Greywacke.
244	Motueka River, at bridge ..	176·5	0·32	..	..	18·58	38·5	Green conglomerate boulder.
245	Motueka River, at bridge ..	192·1	0·41	..	..	18·88	17·0	Diorite boulder.
246	Motueka River, at bridge ..	..	..	3·86	10·30	..	..	Broken boulders.
247	Kina Beach, Motueka ..	..	..	7·75	5·10	..	..	Gravel.
248	Motueka River	..	..	6·50	5·80	..	..	Gravel.
249	Whangara Island	146·0	1·26	6·99	5·72	15·20	10·5	Glauconitic limestone.
250	Ohiro Bay, Wellington ..	167·5	..	4·08	9·80	19·90	39·5	Greywacke.
251	Waiwetu Quarry, Wellington ..	168·0	..	2·56	15·60	19·40	46·0	Greywacke.
252	Bayliss Quarry, Island Bay ..	168·5	..	4·84	8·26	18·94	38·5	Greywacke.
253	Branda Quarry, Wellington ..	167·5	..	3·81	10·50	18·88	16·5	Greywacke.
254	Excelsior Quarry, Hutt Road	163·5	..	5·89	6·80	16·95	11·5	Greywacke.
255	Horokiwi Quarry, Hutt Road..	167·5	..	1·90	21·00	19·42	32·0	Greywacke.

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