1932.

NEW ZEALAND.

PUBLIC WORKS STATEMENT

(BY THE HON. C. E. MACMILLAN, ACTING MINISTER OF PUBLIC WORKS).

MR. SPEAKER,—

As honourable members are aware, the control of the Public Works Department was placed in my hands during the absence of the Right Hon. the Minister of Public Works at the Ottawa Conference, and to enable my colleague on his return to New Zealand to give undivided attention to finalization of the many matters arising out of the Conference I have continued in an acting capacity. I have, however, during this short period given a good deal of attention to the work and administration of the Department in all its branches, and in my efforts I have had the willing assistance of all members of the staff.

As predicted in last year's Public Works Statement, it has been necessary, on account of the present difficult period, for the Government to provide as much work as possible, but I have made it my object to look very carefully into the expenditure of all loan-money for the purpose of reducing it to the lowest possible limit and of ensuring that it is spent to the best advantage.

The rate of public-works expenditure until the year 1930–31 had been steadily increasing, and last year the brake had to be vigorously applied, even though so much work had to be provided for those thrown out of employment by the depression in industry and trade.

It was certain that much the greater proportion of this work could not any longer be met by the expenditure of borrowed money. In consequence of this, as will be seen under the heading of "Expenditure" following these opening remarks, the expenditure has dropped from £8,388,529 in the financial year 1930–31 to £4,815,542 last year, and for the current year provision will be made for £2,634,700, or a little more than half last year's expenditure.

These figures apply almost entirely to the expenditure of borrowed money, and do not give the total sum expended under the control of the Public Works Department; but they do indicate that borrowing of money for public works is being reduced as rapidly as is consistent with all existing circumstances.

The activity of the Department itself, however, has not decreased in direct proportion to the reduction in loan expenditure. This is shown by the fact that although the proposed loan expenditure for the present financial year is only little more than one half of last year's, and under one-third of the previous year's, the gross cash expenditure for this year will be approximately £4,000,000, as compared with £5,787,771 last year and £8,098,301 for the previous year.

This decrease in total expenditure must, of course, necessitate a decrease in the staff employed by the Department. A reduction of nearly 40 per cent. has been made in its members, which is approaching a rate proportional to the expenditure-reduction. A careful search into the possibility of further staff reorganization is well in hand.

Quite a noticeable feature of my present Statement is the great reduction in railway expenditure as compared with the Statements of former years. Last year £590,543 was spent on new construction, and this year will not exceed £100,000. The Stratford Main Trunk Railway is now the only railway work in hand as a charge against the Public Works Fund, and it should be completed by the 31st March, 1933. The Wellington – Tawa Flat Railway Deviation is still under construction by the Public Works Department, but the allocation for this work will be reduced to less than half of what it was last year, as only a sum of £110,000 can be provided under the vote for improvements and additions to open lines.

Hydro-electric development this year will undergo overhaul and curtailment. It is anticipated that about one-third of last year's expenditure will be incurred. The large portion of this will be required for the construction of the dam on the Waitaki River, a work which it would be most unwise not to carry on at a sufficient rate to ensure its safety from floods.

It will be seen under the heading "Expenditure" that there was still a fairly large sum of money expended last year on roads and bridges. Local bodies have been able to employ a considerable number of men on roadwork who would otherwise have been thrown on to the lists of unemployed. The Department also carried a fairly large number of men on its road relief works, which again reduced the number of unemployed, but this year it is not possible to continue this policy, and the Government has had perforce to reduce the Road vote this year to less than half of what it was last year.

Similarly with respect to construction work on main highways carried out under the control of the Department, heavy reductions must be made in the year's expenditure, although all urgent works, such as the repair or renewal of badly deteriorated bridges, will be undertaken where there is danger to the public.

Generally it may be said that the expenditure on roads and highways has as far as possible been limited to works that will tend to increase the country's productivity, or to works that must be undertaken to ensure public safety. Any expenditure of loan-money apart from these principles has had to be incurred to relieve the distress of unemployment until such time as the revenue of the Unemployment Board could be made available for this purpose.

One class of work which I have not hesitated so much to undertake, and which will be more particularly referred to later on, is that of irrigation of land. Expenditure in this direction is such as will result in an ultimate increase in economic farm production, even though it may not immediately bear fruit, and I have therefore endeavoured to keep a fair number of men employed in this way.

The erection of public buildings in times of financial depression must be restricted, and activity in this respect will be no more than a third of what it was last year, and will be confined to cases of absolute necessity.

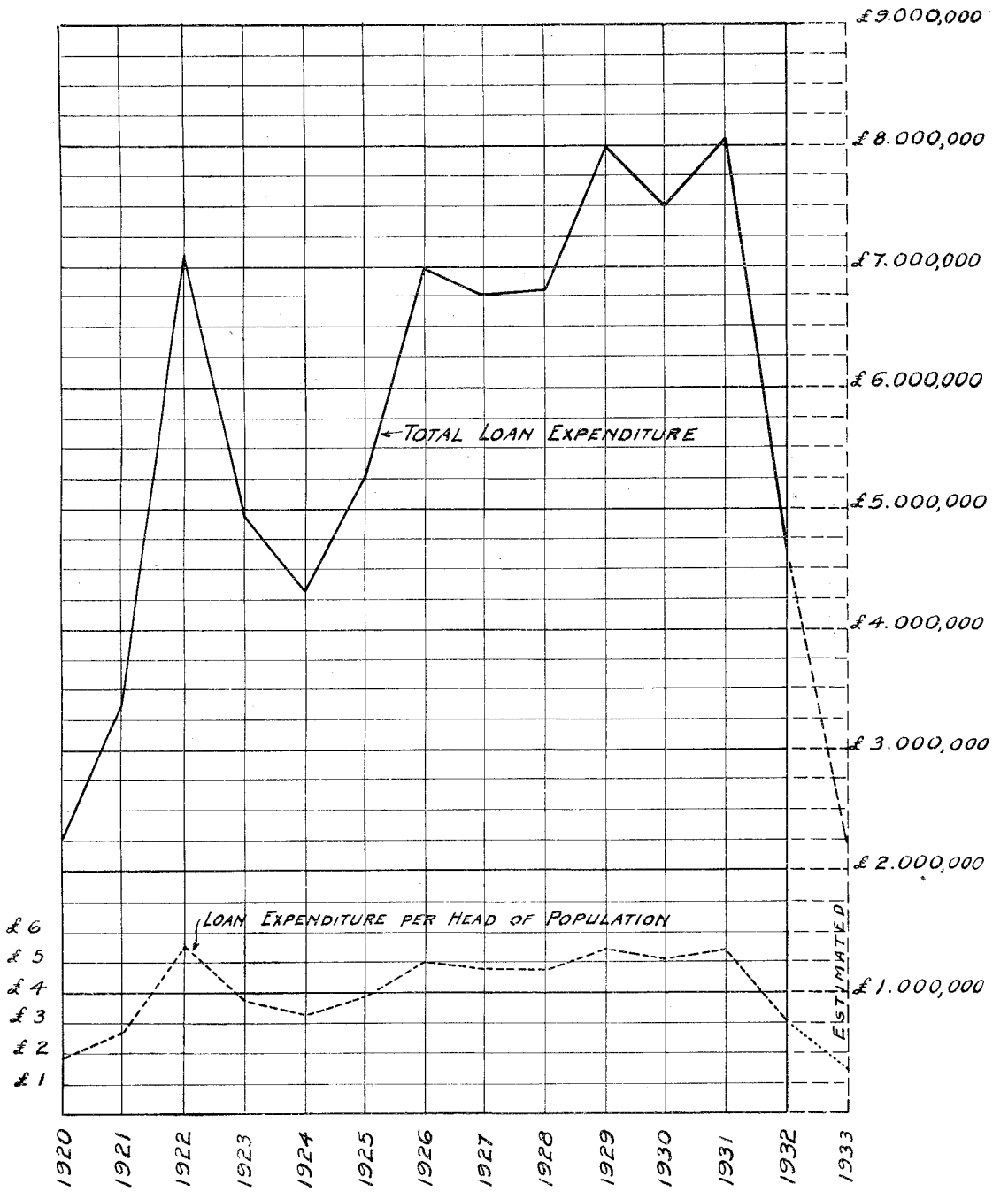
There is no need for me to refer here to other votes under the Public Works Fund, details of which are given in full in the following pages. It is sufficient to note that proportionate reductions will be made under all votes.

The Public Works Department is undertaking the building of the greater portion of the small cottages which are being erected on the 10-acre plots of land acquired for unemployed workers. To date 288 cottages have been built by the Department on 10-acre plots, at a cost of approximately £49,000.

The Unemployment Board is also entrusting to the Department the expenditure of a small part of its funds for relief of unemployment. This money has until recently been expended mostly on road-construction, but a proportion of the funds is now being used for the reclamation of land, chiefly on drainage-works and on land-clearing. Out of a total of 3,421 men employed by the Department with monetary assistance from the Unemployment Board, more than half are now engaged on land development.

Considerable widening and improvement of roads was carried out in the early stages, but it was decided that much more beneficial results would be obtained if this money could be used to metal roads to backblock farms. This proposal was agreed to by the Unemployment Board, and the greater portion of the relief workers now on roads are employed on metalling schemes.

ANNUAL PUBLIC WORKS LOAN EXPENDITURE AND EXPENDITURE PER HEAD OF POPULATION, 1920 TO 1932.



The included graph shows the annual public-works loan expenditure and the expenditure per head of population from 1920 to 1932. The estimated loan expenditure for the year 1932–33 has been added to show the continued drop from the year 1931. This graph shows that loan expenditure, after climbing from £2,250,000 in 1920 to over £8,000,000 in 1931, will this year drop below the 1920 figure, and that the expenditure per head of population has dropped from £5 7s. 6d. in 1931 to an estimate of £1 9s. 2d. for this year.

EXPENDITURE.

The total net expenditure under votes and accounts appearing on the public works estimates for the financial year ended 31st March, 1932, was £4,815,542. Of this sum £3,066,839 was expended out of General Purposes Account, and the balance, £1,748,703, 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, 1932.	Total Expenditure to 31st March, 1932.
	£	£
Railways—		
New construction	590,543	39,671,929
Improvements and additions to open lines	361,845	17,227,603
Payment to Midland Railway bondholders	..	150,000
Roads	1,082,210	21,416,463*
Public buildings	454,804	11,543,773
Immigration	5,265	3,314,905
Purchase of Native lands	..	2,061,147
Lighthouses, harbour-works, and harbour defences	12,033	1,303,850
Tourist and Health resorts	87,609	664,232
Telegraph extension	249,978	11,180,447
Development of mining	..	881,065
Defence works (general)	..	1,402,548
Departmental	151,377	2,858,296
Irrigation and water-supply	37,749	1,006,492
Lands-improvement	38,899	699,609
Minor works and services	..	312,607
Plant, material, and stores	*Cr.* 105,690	168,005
Quarries (acquisition and operation)	107	9,743
Timber-supply and sawmills for Public Works Department	2,012	*Cr.* 3,877
Motor-transport services	..	33,635
Cost and discount, raising loans, &c.	98,098	3,811,842
Total General Purposes Account	3,066,839†	119,714,314†
Aid to Water-power Works and Electric Supply Account	1,323,630‖	11,554,265‖
Waihou and Ohinemuri Rivers Improvement Account	..	709,740‡
Total Public Works Fund	4,390,469	131,978,319
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
Main Highways Account–Construction Fund	384,145§	4,868,103§
Hauraki Plains Settlement Account	22,600	964,695
Rangitaiki Land Drainage Account	4,265	504,200
Swamp Land Drainage Account	14,063	552,689
	4,815,542¶	154,756,552¶

* 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, *infra*. ¶ Excludes Main Highways Revenue Fund and Consolidated Fund votes.

WAYS AND MEANS.

	£
On the 1st April, 1931, the available ways and means for public-works purposes were	1,340,036
Additional funds were received as follows :—	
(*a*) Under Finance Act, 1930, section 2 (public works)	3,000,000
(*b*) Balances transferred from separate accounts now closed ..	439,170
(*c*) Recoveries on account of expenditure of previous years ..	72,215
(*d*) Ellesmere and Forsyth Reclamation and Akaroa Railway Trust Account receipts	1,646
	£4,853,067

The net expenditure on works and services against the General Purposes Account for the year was—	£
(*a*) Under appropriations	2,968,742
(*b*) Under Lake Ellesmere Land Drainage Act, 1905	439
(*c*) Under Lake Ellesmere and Akaroa Railway Trust Account ..	2,754
(*d*) Charges and expenses of raising loans	98,098
Making a total of	£3,070,033
This left a credit balance in the account for general purposes at 31st March, 1932, of	£1,783,034

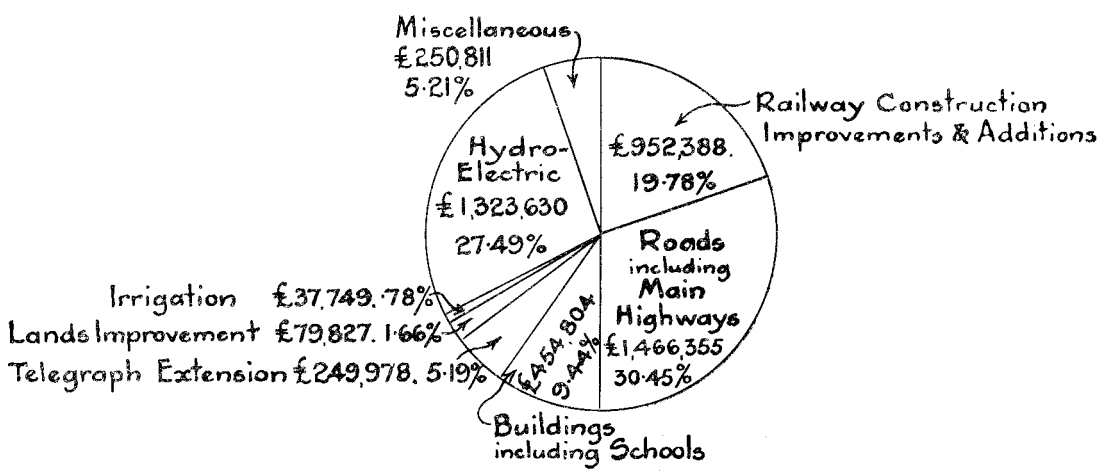
The estimated expenditure under the account for the current financial year is £1,786,700, and arrangements are being made with the Minister of Finance to provide the necessary funds.

The gross cash expenditure on works and services under the direct supervision or control of the Public Works Department itself was £5,787,771. This includes expenditure from the Public Works Fund, Consolidated Fund, Main Highways Account, Electric Supply Account, and various other accounts.

The Department also collected in cash a total of £664,071 as revenue from electric-supply and irrigation undertakings. The total, therefore, of gross cash expenditure and revenue for the year was £6,451,842. This figure is exclusive of interest and loan charges, credits-in-aid for works of various kinds, 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, 1931–32.

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



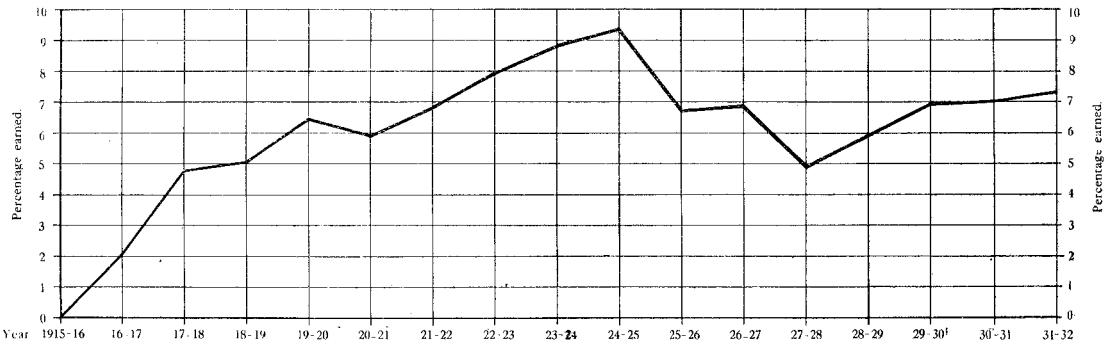
HYDRO-ELECTRIC OPERATIONS.

Hydro-electric development and operation has throughout the year again been one of the most important functions of the Department. Capital expenditure has been mainly concentrated on the remedial works at Arapuni and on continuation of construction works at Waitaki. The operating works have to some extent felt the effects of the prevailing depression in that there has not been the same increase in loading during the year as has been usual for some time. In the North Island systems the loading for the year shows a small percentage increase for the year, but in the South Island the loading has been slightly below that of the previous year.

The general financial position of the operating accounts shows a small improvement on that of last year, the percentage over net operating expenses being 7·28 as against 7 per cent. last year. The figures for the year are as follows :—

PERCENTAGE EARNED ON OPERATING CAPITAL AFTER PAYING OPERATING EXPENSES.

——	Average Operating Capital.	Gross Revenue.	Working Expenses.	Net Balance.	Percentage Net Balance to Operating Capital.
	£	£	£	£	£
Horahora–Arapuni	1,310,081	161,884	115,003	46,881	3·58
Mangahao–Waikaremoana ..	3,532,879	300,022	48,900	251,122	7·11
Lake Coleridge	1,734,544	218,196	37,245	180,951	10·43
Totals	6,577,504	680,102	201,148	478,954	7·28



PERCENTAGE EARNED ON OPERATING CAPITAL AFTER PAYING NET OPERATING EXPENSES.

The general result of the operation of the Department's electric-supply system to date has been that the schemes have paid all operating expenses and interest, and, in addition, have been able to provide £642,267 towards reserves for depreciation and sinking-fund purposes.

ARAPUNI WORKS.

Work on all sections of the remedial measures decided upon, following the report of Professor Hornell, who was called in to advise the Government in 1930, was continued throughout the year. The programme set was well maintained, and it was possible to raise water in the dam and headrace at the end of March last. Some time was necessary to recondition the machinery, which had been idle for over eighteen months, but the station was able to go into commercial operation again on the 10th April, 1932. The works carried out appear to have been quite successful in preventing any further movement in the block of country, the tilting of which was the prime cause of the station going out of action in 1930.

Since the close of the period a leak developed through the lining of the headrace into the porous drainage system below, but it was possible to locate it and effect repairs without closing down the station. It was, however, deemed advisable to run the Auckland Power Board's plant in terms of the agreement with that Board for a short period each day to facilitate work on repairs.

Waikaremoana Power Scheme.

No new development work was done during the year, but a considerable amount of investigation work was carried out to ascertain the nature of the barrier forming the lake and to locate and measure the leakage-paths therein in anticipation of detailed designs for the next stage of development.

The transmission-lines of the Mangahao–Waikaremoana system were completed into the Taranaki area during the year, and supply given to the South Taranaki Power Board and to New Plymouth. At the same time work has been continued from the northern end on the line which will connect this system with Arapuni between Stratford and Arapuni.

Lake Coleridge System.

Following the long drought in the spring of 1930, the following year had a plentiful rainfall and there was thus no need to operate the Diesel station which had been provided to meet the overload or water-shortage conditions. Since the close of the present financial year, however, there has again been a period of low rainfall, and the Diesel plant has been operated on two shifts per day since the beginning of August. There is now no prospect of difficulties occurring such as occurred in 1930, but with the present loading on the system it will probably be necessary to run the Diesel plant for a portion of the year in any but a very wet year until the Waitaki plant is completed.

Waitaki Development.

Work was continued without interruption, though, particularly since the end of the financial year, it has been necessary to make some curtailment in the rate of expenditure in order to keep within the funds available. Though this will mean some delay in the date of completion, it will not necessarily mean any great inconvenience to power-users, as in the area to be supplied there has been a small reduction in the amount of power used rather than an increase. Most of the work done during the year has been on the Otago side of the river and in the power-station. Unfortunately, the rock in a section on the Otago half of the river has turned out to be rather poor on one section, with the result that excavation has had to go somewhat deeper than originally contemplated, with consequent increase in concrete quantities and costs.

Electric-supply Operating Accounts.

Horahora–Arapuni.—As was mentioned in last year's Statement, the Arapuni plant has been considered as under construction during the year, and the operating account has been charged with interest for the year only on such of the lines and substations as were in operation conveying or using power from Horahora or other power-stations connected to the system.

The financial position may be summarized as under :—

	£
Capital investment (total) at end of year	4,496,087
Revenue	161,884
Operating-expenses	115,003
Balance	£46,881

The balance has been used in paying interest charges, but, not being sufficient for this purpose, leaves a deficit of £40,554 on the year's operations after providing for depreciation. The reserve accounts established in connection with the scheme now show that £211,610 has been credited to depreciation and £59,160 to sinking fund.

Lake Coleridge.—Although the revenue does not show the customary increase over that of the preceding year, it was not necessary to operate the Diesel plant during the year, with the result that the financial results for the year are again very satisfactory.

	£
Capital investment at end of year	1,802,497
Revenue	218,196
Operating-expenses	37,245
Balance	£180,951

The balance has been used in payment of interest, £12,500 has been paid to Depreciation Account, £18,062 to Sinking Fund, and £76,905 to General Reserve. The scheme has now an accumulated Depreciation Reserve of £211,752, a Sinking Fund of £193,865 (of which £110,242 has been used in redemption of loans), and a General Reserve of £174,249.

Mangahao–Waikaremoana.—Despite the depression the scheme continues to show some small improvement in its financial position.

	£
Capital investment at end of year	3,659,304
Revenue	300,022
Operating-expenses	48,900
Balance	£251,122

The balance has been used in payment of interest, and has, in addition, allowed a payment of £48,347, or £17,334 short of the statutory provision, to the Depreciation Account.

General.

Throughout the year at various times the Department has been asked to make reductions on the price of power supplied in bulk, particularly to the smaller Power Boards, so that they should obtain the same rates as are applicable to the main centres. Although the Government is anxious to do everything possible to bring down the cost of living, it is regretted that it has not been possible to comply with this request. Government action in other directions has, however, enabled Power Boards to effect economies in many cases by reductions in interest rates and in wages, which have been passed on to the actual consumers. It has to be remembered that by far the greatest part of the cost to the Government of supplying electricity in bulk is made up of capital charges on its investment, and, as the money has practically all been raised abroad, it has not itself obtained any benefit from reduction on interest rates. Power has, moreover, been supplied in the past at such reasonable rates that the actual retailers of electricity have, on the average, been able to bring their own financial positions into a better condition than is that represented by the Government's own Electric Supply Account. In the general cry for reduction the fact is often overlooked that since Government schemes come into operation very considerable reductions have already been made in the average price per unit paid by the consumers. As an example, the following figures have been taken out for a few supply authorities which previously generated their own power, but which now obtain supply from the Government system :—

Supply Authority.	Total Annual Cost per Unit Sold.		
	Last Year, prior to Government Supply.		Under Government Supply 1932.
	Year.	Pence per Unit.	Pence per Unit.
No. 1	1927	3·02	1·12
No. 2	1927	2·51	2·10
No. 3	1925	5·00	0·82
No. 4	1921	7·94	1·23
No. 5	1923	6·00	1·57
No. 6	1924	3·22	1·88
No. 7	1923	4·53	1·78
No. 8	1922	9·65	1·07

Where there is in all cases one supply authority, and in many cases two supply authorities, between the Government system and the actual consumer of electricity, a uniform price for power supplied in bulk by the Government does not by any means necessarily mean that the actual consumers are all going to obtain power at the same price. Some authorities have existing plants on which they still have to pay capital charges, the cost of distribution per consumer and per unit sold varies quite considerably in different localities, and some authorities

have different ideas from others as to the reserves they should establish or as to the methods they should adopt in disposing of any profits made. The present system may not be absolutely equitable, but it can reasonably be claimed that it has been successful. As compared with conditions existing before the advent of the Government scheme, it has brought down the price of electricity in all places where electricity was previously used, and it has made electricity available at a reasonable cost to thousands of consumers who otherwise could not possibly have availed themselves of its benefits.

IRRIGATION.

It was indicated in the Statement of last year that the financial position with regard to irrigation in Otago Central was very far from satisfactory, owing to the large amount of water rates that had not been paid.

The amount of outstanding rates before last season's irrigation season commenced was £12,012.

The Otago Land Board was asked to investigate the circumstances of those settlers who had not paid their rates, and to make a recommendation to the Government as to whether or not any remission of rates should be made to those who, owing to the prevailing depression, were unable to meet their liabilities. They recommended remissions to the extent of £3,846, or about 30 per cent. of the total amount outstanding. The Government adopted the recommendation of the Land Board, and irrigators who were in arrears were advised that if payments of the balance were made the remissions recommended by the Land Board would be granted. This liberal treatment had, I regret to say, very little effect in inducing the defaulters to pay their debts to the Government—so little effect, indeed, that at the present time the amount owing to the Government has increased to £22,504. This indicates that not only has the promise of the remission of portion of their rates not encouraged many irrigators to pay their past debts, but has actually had the effect of prompting them to withhold payment of their last season's rates, and of undoubtedly influencing those who were not in arrears to take the same course of action, probably with the hope of receiving similar concessions.

The revenue that should have been collected in irrigation rates last season was £20,604, but of this amount a little over 30 per cent. has been paid, leaving the total debt to the Government at the present time, as I have stated above, £22,504.

It can reasonably be assumed that the Land Board's recommendations, after the careful inquiries it made, were in accordance with the ability of each settler to pay the balance he owed after allowing remissions, and when it is found that out of the total balance of £8,166 owing only £13 is paid some effective means of enforcing payment must be adopted.

Knowing well the great difficulty that farmers were still in owing to the continued low price-levels, I was not inclined to take extreme measures, but, considering the disappointing results that were the outcome of the Government's desire to be fair to those in difficulties, it was necessary to seek some way of protecting the Government's interests and preventing further loss to the State. It was therefore decided that those who were in arrears with their rates would not be supplied next season with water for irrigation until they had paid a portion of their arrears equal to the next season's rates. This has the effect of, at least, not allowing the debt to the Government to grow any larger than it is at present. It is not intended, of course, that the remaining debts shall be cancelled, and something additional will be asked for at a later date, but it is felt that at the present time the above procedure is meeting the settlers in a very lenient spirit.

When it is remembered that those supplied with irrigation water are only paying, in addition to maintenance and operation costs, interest on one-quarter of the cost of the works to the Government, it must be admitted that exceedingly favourable terms are being given to the farmers in Central Otago.

Previous to the last two years of depression the Department had very little difficulty in collecting the money due for water rates, and, as indicated by the graphs in my last statement, greatly increased production was following in the wake of irrigation.

The fact that the Government has given to the owners of irrigated land a subsidy that is equivalent to £3 for £1 may perhaps be thought to be unduly liberal treatment, but it is a good deal in line with that given by Governments in other countries, and, provided payment of water rates is rigidly enforced, may not be out of proportion to the indirect benefits that the Government receives by way of taxation and additional railway revenue from lands upon which productivity has been increased three or four fold.

There is no clearly defined measure of the full enhancement to a country's well-being that comes from the turning of arid lands into fertile, highly productive farms, but there is no method of land-improvement that can so quickly show the benefits for money spent upon it as that of irrigation.

At the present time, when it is so important to be sure that money is not spent upon useless work, I feel that we are more than justified in giving a full share of what money may be available to the improving of the lands of the Dominion in this way. We can rest assured that, whatever the future of the country may be, this form of expenditure will never be looked upon as wasteful.

I have, therefore, felt justified in carrying on this year with the expenditure of loan-moneys upon further irrigation schemes in Central Otago, and in asking that this work be continued throughout the times of depression, so that further land may be brought into a state of potentially high productivity when better times come.

If there is one part of the supply of irrigation water more than another upon which it is justifiable to expend public money, it is the construction of reservoirs to conserve water for use in times of scarcity. Such works, if well constructed, are assets of great value for all time to a country depending upon farming as its primary industry. I have, on this account, given particular attention to schemes involving the necessity of the construction of new reservoirs, or of increasing the capacity of existing reservoirs.

A start has been made upon a dam, 153 ft. in height, across the Manuherikia River, near St. Bathan's, which is known as the Falls Dam. This dam will form a reservoir that will conserve 40,000 acre-feet of water for irrigation, in the Manuherikia Valley, of land lying between Lauder and Omakau. At the present time about a hundred men are engaged in its construction. The dam is of the rock-fill type, with a concrete impervious up-stream face. This type was chosen as one that is simple and economical to increase in height at a later date, and one in which much the greater part of the expenditure is upon labour, so that men put off other public works could obtain employment and not help to swell the ranks of the unemployed. The base of the dam is being made only sufficiently wide at present for a dam 103 ft. in height, but the other works are of such dimensions as to allow for a dam 153 ft. high if experience shows that it will be profitable to extend the area irrigated.

A diversion-tunnel 600 ft. in length and 17 ft. in diameter is needed to dewater the foundations, and the driving of this tunnel is now well advanced. The clearing of the dam-foundation is completed, and two quarries for rock have been opened up, and a start made on the rock-filling of the dam. Electric power generated from Diesel engines is used for the plant required on the works.

To coincide with the completion of the dam, a sufficient number of men are engaged upon race-construction between Lauder and Omakau, so that it will be possible to irrigate 8,000 acres here immediately the dam is ready to supply water. There are thirty miles of main race to make, and 3 miles are completed. In addition to ninety-eight married relief workers, forty-four single men are employed in race-cutting under the Unemployment Board's scheme of camps for single men.

It is proposed to start immediately upon the construction of an arched concrete dam, 65 ft. high, in the Manorburn Stream, near Galloway, to impound sufficient water to irrigate 400 acres on the lower end of the Galloway Flats. This will release water from the main Manorburn reservoir to irrigate additional land of a similar area in the Ida Valley. The dam and races are to cost £7,000, and the wages of the men will be paid out of unemployment funds.

The Eweburn Dam, an old dam built by the Mines Department, which now stores water for the Hawkdun irrigation scheme, is now being strengthened, so that more water may be stored for use on that scheme.

During the year a small concrete dam across the Idaburn at Oturehua was completed, and water from the reservoir was utilized during last season for the irrigation of 600 acres immediately below the dam.

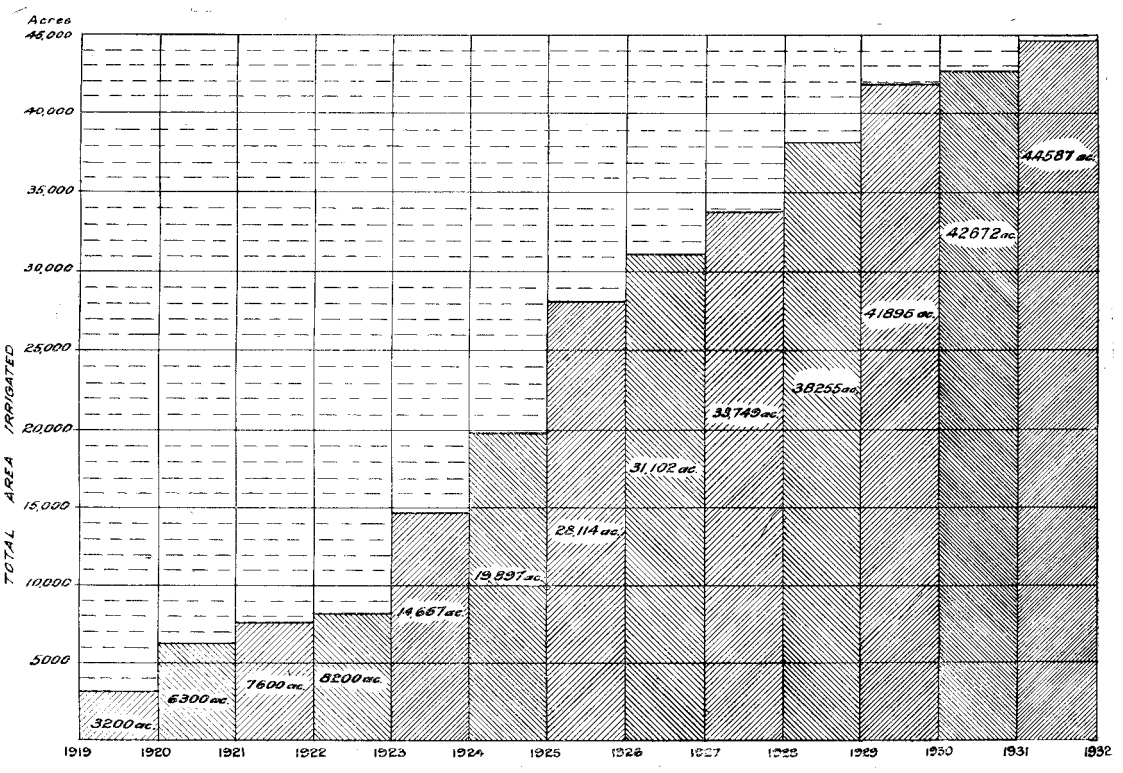
A single men's unemployed camp has been set up, and forty men are employed in cleaning out the races on the Steward Settlement irrigation scheme.

During last season twelve schemes were in operation and 44,587 acres of land were irrigated, water being supplied to 425 irrigators.

The schemes 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 adequately maintained, and supplies of water have been uninterrupted throughout the season. In Ardgour scheme 1,650 ft. of main pipeline were dismantled, and the pipes were recoated inside and out with bitumen, and replaced in position.

The following graph shows the growth of irrigation under Government schemes for the last thirteen years :—



Future Proposals.

The amount proposed to be made available this year for the development of irrigation is £80,000. So far, irrigation by the Government has chiefly been confined to lands in Central Otago, but many requests have been made during the year for the investigation of schemes in Canterbury and other parts of Otago.

In compliance with representations by settlers in South Canterbury, a survey is now being carried out to ascertain the possibility of economically irrigating from the Waitaki River an area of approximately 30,000 acres of good land along the north side of the Waitaki River, and the coast lands between Glenavy and Morven. Preliminary investigations indicate that water could be supplied to this area at a very much less cost per acre than the average cost of irrigation per acre in Central Otago. It is anticipated that the survey and a report on the scheme will be completed in two months' time. It may be found necessary to carry out a good deal of work on the actual farms in the way of building borders, &c., to obviate unequal watering or heavy expenses in levelling.

A survey was made for a scheme to take water for irrigation purposes from the Waitaki hydro-electric supply dam when completed. The land proposed to be irrigated lies in a long strip on the south side of the Waitaki River down-stream

from the dam. After full investigation it was ascertained that, on account of the long length of race required to supply a limited area of land, the scheme was not economically sound.

As mentioned in last year's Statement, full investigations were to be made into the scheme for irrigating the Maniototo Plain, in Central Otago, an area of 120,000 acres lying most favourably for irrigation. A thorough and fully detailed survey of this area has been completed, and a comprehensive scheme is now being designed.

This scheme presents many favourable aspects, not the least of which is the possibility of impounding 235,000 acre-feet of water with a dam only 45 ft. in height. There are many combinations in design, however, that require to be worked out before the most favourable and most economical scheme can be ascertained, and it will take some time yet to completely develop the proposals.

Surveys and investigations were made for the construction of dams in the Fraser River and Conroy's Gully.

At present no further surveys for irrigation in Central Otago are in hand, but I think it is well worth while that investigations for such work be carried on in a time of depression, so that information may be available when prosperity again demands, as it has in the past, that fuller development of the valuable resources of water-supply in this country be undertaken.

RAILWAY CONSTRUCTION.

The net expenditure as shown on graph was £952,388 being £2,053,423 less than that of the previous year, due to the fact that it was decided to stop construction work on practically all lines. The total length of all lines under construction over which goods and passenger traffic has been run during the year was 65 miles, and these services have been well maintained.

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

North Auckland Main Trunk Railway.—The construction work on the Rangiahua Section of this railway was closed down in January, 1931, and since then the plant and materials have been collected and stored at the main depot at Okaihau. A gang of four men has been employed throughout the year in maintaining the Rangiahua Section. The Okaihau Quarry, which supplied the ballast, has also been closed.

Dargaville Branch Railway.—Operations on this railway for the year consisted chiefly of the maintenance of the permanent-way and the running of the goods and passenger services between Kirikopuni and Tangowahine, a distance of 10 miles 10 chains. The average number of men employed was eighteen.

Gisborne–Napier Railway.—The Putorino Section of this railway was considerably damaged by the earthquake of February, 1931, and was to a large extent restored by the Public Works Department to facilitate transport of ballast to the Wairoa Section. The Matahoura Viaduct was also repaired. This section had previous to the earthquake been handed over to the Railway Department, and, although train running was suspended for a period, traffic can now be operated between Eskdale and Putorino.

Wairoa Section.—The work on this section was proceeded with expeditiously until October, 1931, when, in accordance with the Railway Board's report, work was stopped. The formation was finished, and rails could have been laid over the whole section. The only large works which remained to be completed were Kotemaori Tunnel and the Mohaka Viaduct.

The Kotemaori Tunnel has since been completed, except the portal at south end, which is in good country and unlikely to slip.

The foundations for the Mohaka Viaduct were completed during the year. All iron and steel work were fabricated at the Department's workshops, Tauranga, transported to site, and stacked. The Maungaturanga Viaduct has been completed. The plant and machinery on this railway has been collected and suitably housed.

Stratford – Main Trunk Railway.—The construction work on both ends of this line has proceeded satisfactorily. The bulk of the work was concentrated on the

Heao Section. Three plate-girder span bridges totalling 465 ft. over the Heao Stream are practically complete. The Mangatete Tunnel has been completed, and the Heao No. 1 Tunnel, which marks the last large work, is making good progress and should be completed shortly. The bottom heading has been pierced and only 3 chains of tunnel remains to be lined.

On the eastern end traffic has been operated between Okahukura and Tokirima the whole year, and on the 9th May last was extended to Heao.

On the western end the tri-weekly passenger and goods service was continued throughout the year between Tahora and Tangarakau, and the daily service hauling coal from the Egmont Colliery Siding handled 19,064 tons of coal, the revenue from this source being £970.

It is anticipated that there will be a rush of goods traffic as soon as the rails are connected up, judging from the many inquiries that are being made.

Te Wera Quarry.—The plant has functioned well throughout the year, requiring little repair and causing no delays. The total output was 9,060 cubic yards of ballast, of which 7,348 cubic yards was used on the Heao Section of the Stratford - Main Trunk Railway.

Wellington - Tawa Flat Deviation.—During the year the seawall between Kaiwarra and Wellington has been extended for a further 16 chains, the wall being now completed for about 54 chains back from the Hutt Road crossing. The embankment has been further extended, widened, and raised, being now almost complete for a distance of approximately half a mile from the Hutt Road Bridge.

The main heading of No. 2 Tunnel was completed during the year, the headings from each end meeting in August, 1931. The holing through of the tunnel showed that the headings had been driven very accurately, there being practically no error in alignments, levels, or distance.

Following the necessary enlargement, 39 chains were concreted on the southern section and 34 chains at the northern end, a total for the year of 73 chains, leaving about 77 chains to be enlarged and concreted to complete the tunnel.

Westport–Inangahua Railway.—As a result of the Railway Board's report construction work on this line ceased on the 21st October, 1931, with the exception of the sinking of cylinders for the Cascade Bridge. As the plant had been assembled and the staging was in readiness, the Government decided to complete sinking all the cylinders. Two sets have been placed in position, and the third and last set is almost down to the required level. The heading of the tunnel on the Hawk's Crag Section at 13 miles 41 chains was driven a further 362 ft., making the total driven to date 543 ft. A substantial reinforced-concrete bridge of three 20 ft. spans was erected at 26 miles 27 chains on the Orikaka Section. Since October all plant and machinery has been overhauled and satisfactorily housed.

The Public Works Department has maintained the railway to 9 miles, so that the Railway Department could transport coal from the Cascade Coal Co.'s mine to Westport.

South Island Main Trunk Railway.—At the north end of this line the work was pushed on vigorously until October, 1931. The formation on the Clarence Section a distance of 20 miles was completed, except that portion known as the Blue Slip, about 29 chains long. Five bridges were in course of erection over Waima, Deadman's, Kekerangu, Woodbank, and Washdyke Streams, when the works were closed down.

The formation and culverting on the Kaikoura Section, 10 miles in length, was proceeding rapidly when work was stopped last October. The plant and machinery has been overhauled and placed under cover.

At the southern end formation was progressing satisfactorily on the Conway section when works were closed down in October last. The major formation undertaken was the excavation of the Hawkswood Saddle cutting 52 chains long, to obviate the necessity of a 26 chain tunnel.

On the Oaro section formation work was in hand over 4 miles, of which $2\frac{1}{2}$ miles has been completed through the easier portion of the route. The heavier cuttings have been opened up, but were not far advanced.

RAILWAYS IMPROVEMENT AND ADDITIONS TO OPENED LINES.

The net expenditure out of the Public Works Fund for the year ended 31st March, 1932, was £810,434, which excludes a special credit of £439,190 for depreciation. Expenditure on the construction of rolling-stock totalled £374,085. The sum of £194,522 was expended on Tawa Flat Deviation. The cost of strengthening and renewing bridges was £95,700, and £37,752 was spent on the signalling, telephone, and train-control extensions. Improvements at terminals and miscellaneous small works cost £108,375, and administration charges and the cost of raising loans amounted to £15,439.

HARBOURS.

The expenditure on harbour-works has been comparatively small during the past year. At Westport the substantial drop in coal-export figures has rendered it necessary to exercise the most rigid economy and curtail staff wherever possible.

All work on the training-walls extension has been stopped and the quarry closed. Dredging has also been restricted as much as possible consistently with the necessity to maintain an adequate depth on the bar, in the channel, and at the berthages.

At Karamea work was completed on the restoration of the old training-wall and the work closed up. Unfortunately, the deposition of earthquake debris in the harbour still continues, and at present the position as regards the reopening of the port is not very hopeful. In the meantime timber and stores are being shipped from Little Wanganui, where minor works have been carried out. Plans and specifications were prepared for a large wharf at the Chatham Islands, and tenders called, but were declined. A few other works were carried out in various localities, but generally on a much reduced scale.

LIGHTHOUSES.

Since the estimates for the current year were prepared it has been found necessary, for financial reasons, to curtail the programme of new works contained therein.

In accordance with the altered conditions, the only works of any magnitude completed were the installation of a new automatic light at East Head on Akaroa Peninsula and the conversion of Godley Head from a fixed oil-burning light to an automatic flashing one with an incandescent burner using compressed acetylene. In both these cases the apparatus had been ordered during the previous period, and only the installation was involved.

At Baring Head a new road was constructed to give access to the station. Plans were prepared for the new tower, keepers' houses, fog-signal building, &c., but it was deemed advisable to allow the purchase of the light apparatus and the erection of the buildings to stand over.

The need for economy in expenditure has been reflected in the works carried out during the year under the above heading.

ROAD-CONSTRUCTION.

In the development of any young Dominion an important adjunct, if not the most important, is the construction of a complete network of roads to bring all land into production and within easy reach of the market. The past financial year saw this desirable goal brought a step nearer.

Several areas of new land were made available for settlement by the construction of new roads, and the position of settlers on partly developed land improved by metalling existing roads.

A total sum of £1,465,237 was expended during the year on the construction of roads and highways, as against £2,233,428 for the preceding year. Of this amount roads other than main highways accounted for £1,082,210 and main highways £383,027, compared with £1,475,522 and £757,906 for 1930–31.

It would not be out of place to state here that great benefit was derived from an allocation of £50,000 appropriated out of petrol-tax funds and expended on the metalling of backblock roads.

During the year the unemployment situation became increasingly difficult, and a large amount of development work was carried out by relief workers. The reduction of costs resulted in the completion of a proportionately larger amount of work than is revealed by a comparison of this year's expenditure with that of former years.

The restoration of earthquake damage necessitated considerable expenditure on roads, and, where possible, unemployed relief workers have been engaged on this work. There is still a considerable amount of work to be done in providing metalled access to all occupied lands, and early completion has been hampered by the unprecedented financial conditions.

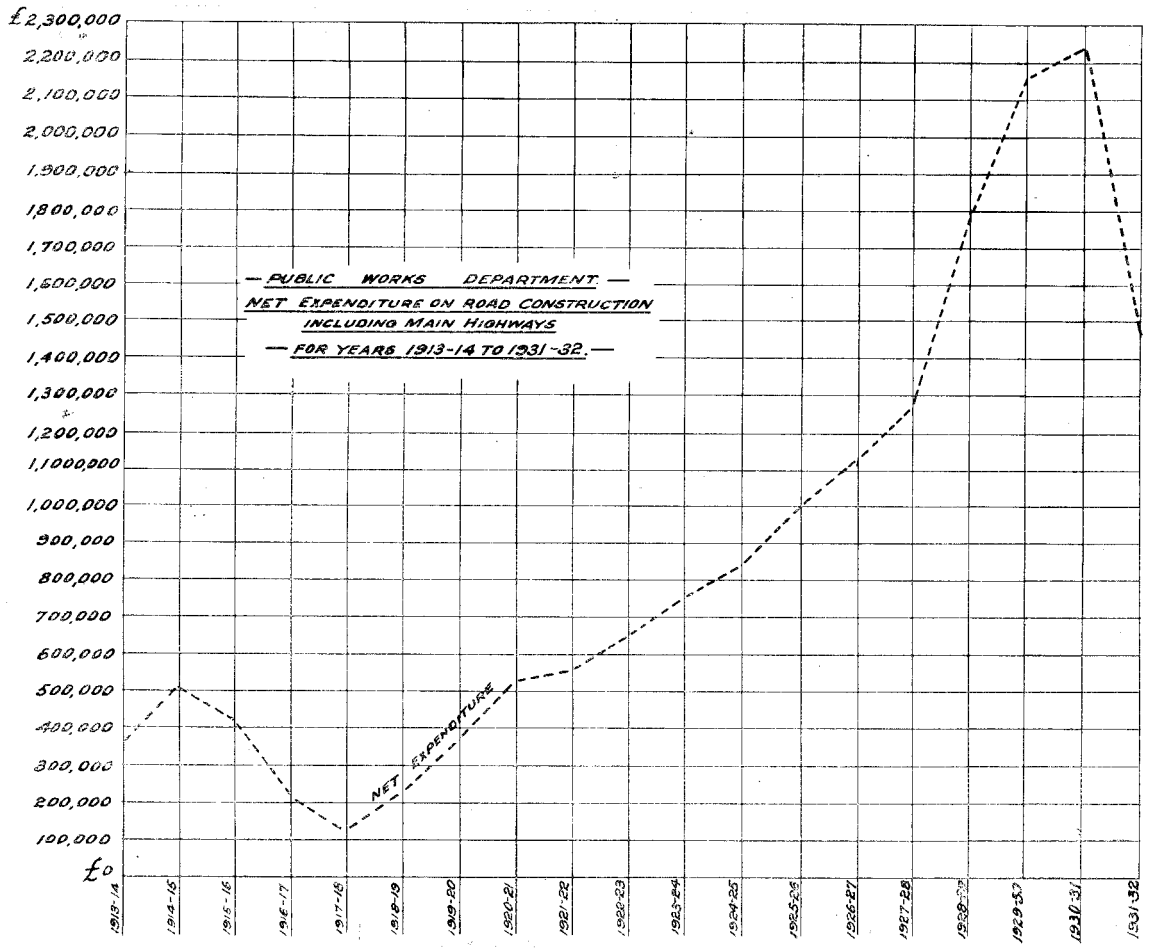
Local bodies have had their revenue decreased in sympathy with the serious drop in the prices of our primary products, being affected in at least two ways, firstly, in an endeavour to assist their ratepayers they have reduced their rates, and secondly, the rates even when so reduced have not been paid in a considerable proportion of the cases.

The result of the drop in revenue has been that less money is available for spending in the upkeep of the roads and highways. However, I think it can be fairly said that the local bodies have carried on as efficient maintenance of the roads under their control as the lesser amount of finance would permit.

The separate vote for roads on goldfields was abolished as from the 31st March, 1931, but the sum of £4,498 was voted in the ordinary Roads vote for expenditure on roads on goldfields for the current year.

The balances of the unexpended authorities at the 31st March, 1931, and those issued during the year amounted to £2,752, of which the sum of £2,487 was expended.

As usual, all applications for assistance in this direction were carefully investigated, and, having regard to the necessity for curtailing expenditure as far as possible, assistance was granted in those cases where the results of the investigations warranted it.



PUBLIC BUILDINGS.

General Departmental Buildings.

At Napier temporary office accommodation was provided for departmental offices owing to the Government Buildings being destroyed by earthquake and fire.

At Wellington the installation of a central heating system in the Government Printing Office was completed, and a similar heating system has been installed in the main Government Buildings, thus doing away with the cost of electric radiators and open fireplaces and greatly reducing the fire risk. An instalment of £3,031 was made towards the cost of the new Museum building and Carillon at Mount Cook, Wellington.

The hostel for cadets in Fitzherbert Terrace was purchased from the Railway Department for office-accommodation purposes, and this building is now occupied by the Correspondence School, a branch of the Education Department.

The total net expenditure under this vote was £33,226, which includes an amount of £14,218 paid for the rescission of sale of lease of 415 The Strand, London.

Courthouses.

During the year no new Courthouses were erected. The net expenditure under the vote was £3,513, and represented the final payments on the contract for the erection of the Hamilton Courthouse. The laying-out of the grounds is receiving attention.

Prison Buildings and Works.

Very little new construction work on prison buildings or works was undertaken during the year, the major part of the £2,621 expended being confined to completing works already in progress. At Hautu Prison £585 was expended on portable huts ments, kitchen, office, and storeroom in establishing a No. 2 camp to accommodate forty additional prisoners and necessary staff. On account of the pressing need to relieve congested accommodation in all the city and town prisons owing to a sustained increase in numbers, this camp was an urgent matter. Erection was both expeditious and economical, being completed within a few weeks of commence ment. The total completed cost did not exceed £14 per head. Considering the location of the camp, fifty miles from National Park Station, this is satisfactory. It is estimated that the establishment will enable development of Hautu pumice lands to be increased by a further 300 to 400 acres per year.

At Wellington Prison duplication of the existing water-supply by a further 50,000-gallon storage-capacity was commenced and completed at a cost of £302. Concurrent with this work the Department was able to effect a permanent saving of £25 per annum in electric power for water-pumping, which adequately defrays all the interest and depreciation on the expenditure.

At Invercargill the draining and roading of the Waihopai Estuary was proceeded with, at a cost of £892 for the year, in terms of the 1919 agreement with the Invercargill City Council, under which the Government received the freehold of 748 acres and free rental of 1,600 acres for varying terms up to 1942. This agreement was reviewed during the year, and, in conjunction with a proposal by the City Council that a portion of the leasehold area be handed back before due date for aerodrome purposes, several of the uncompleted undertakings of the 1919 agreement were considerably modified, to the satisfaction of the Council and the Department, in view of the restricted finances available. A final and definite estimate of £2,500 has now been made of the total expenditure required to be borne by the Department to complete the terms of the amended agreement. This will be spread over the next few years.

The following summarizes the general nature of the net capital expenditure on all prison works during the year :—

	1931–32.	1930–31.	1929–30.
	£	£	£
Erection and extension of buildings ..	703	535	1,791
Water-supply and sanitary drainage ..	606	217	612
Officers' cottages and quarters	6	389	2,460
Completion of access road (Wellington) ..	..	390	747
Farm buildings	131	315	894
Estuary-reclamation (Invercargill)	892	534	1,399
Quarry and laundry plant..	283	124	302
	£2,621	£2,504	£8,205

Police-stations.

The capital expenditure on police-stations for the year amounted to £2,535 out of an allocation of £8,000.

The only new police-station erected was that at Te Araroa.

A new office and lock-up was provided at Opotiki and a lock-up at Tolaga Bay.

Land was purchased for a site for a constable's residence at Paeroa.

Post and Telegraph Buildings.

Owing to the adverse economic position, the Post and Telegraph Department's building programme has been greatly restricted. Although authority was obtained for the erection of several large buildings, it was found necessary, for financial reasons, to defer the works. This was the case with the proposed new chief post-office at Dunedin. The call for tenders which had been made was cancelled before the date fixed for their receipt. The question of proceeding with the work will be considered as the financial position improves.

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

New post-office buildings were erected at Palmerston (Otago), Ruatoria, Upper Symonds Street (Auckland), Urenui, Waitara, Wellington East, and High Street (Christchurch). A residence for the Postmaster was erected at Ruatoria, and an automatic telephone exchange was completed at Lower Hutt.

The most important post-office erected was that at Wellington East, a building eight stories high on concrete-raft foundations. It was opened for official business in February last, and accommodates on the ground floor the former Courtenay Place Post-office and two branches of the Accountant's staff (Head Office).

The next important building completed was that at High Street, Christchurch, a building of four stories on concrete-raft foundations. The contract for erection was completed on the 10th June, 1932, and the building will be ready for occupation shortly.

A substantial addition was made to the Masterton Post-office building, and the Hampden Courthouse was converted into a post-office at very little cost.

The position of the postal buildings damaged in the earthquake regions is as follows :—

Extensive repairs were effected at Dannevirke, Waipukurau, and Wairoa. The Westport Post-office has been rebuilt, and was opened for postal business on the 17th June, 1932.

The reconditioning of the Napier and Hastings Post-offices is progressing satisfactorily. The former was reopened on the 5th August, 1932, and the latter will be ready by the end of September.

Owing to the possibility of danger from future earthquakes, the clock-towers at Cambridge and Wanganui have been removed.

Areas of land were acquired for departmental purposes as follows : Hampden, site for post-office building ; Hastings, extension of post-office site ; Mamaku, extension of post-office site ; Naumai, new site for post-office building ; New Plymouth, site for line-depot ; Thornbury, site for post-office building.

Areas of departmental land were disposed of as follows : Blenheim, portion of storage site (for street purposes) ; Cheviot, departmental land ; Kamo, portion of post-office site ; Rotorua, portion of post-office site ; Tangitu, old post-office site ; Urenui, old post-office site ; Waiuku, additional portion of old post-office site.

Mental Hospitals.

The net capital expenditure for the year on mental hospitals amounted to £45,938, being £88,202 less than that of the previous year. The following is a summary showing the position of the works completed :—

Avondale : The residence formerly occupied by the doctor has been converted into a receiving-home.

Puhitahi : Two brick villas were completed. Permanent power and light mains were installed to buildings and roadways, and a permanent transformer substation erected. A temporary laundry has been erected and fitted up.

Tokanui : The Nurses' Home has been completely furnished and occupied. A private exchange telephone system has been installed. A radio installation has been extended to wards and a new set placed in the Nurses' Home. Alterations, repairs, and renovations were carried out to the main buildings.

Porirua: General renovations throughout were undertaken. Various concrete and cement roof-ornaments were removed as a precaution against earthquake.

Nelson: New cow-byres erected.

Stoke: Transmission-line completed. Poorman's Valley water-supply scheme completed and connected to 2 in. main supply to buildings. New villas completed.

Sunnyside: Several verandas were glassed in, thus increasing the sleeping-accommodation.

Hokitika: A new villa was erected in wood, and will accommodate thirty-eight patients. Electric light was extended to the farm buildings, water-service pipes were extended and additional fire-hydrants installed.

Seacliff: The old kitchen was converted into a bathhouse, and other alterations were carried out.

Waitati: Sundry repairs were carried out.

Health and Hospital Institutions.

The net capital expenditure under this heading was £3,316, being a reduction of £14,022 on the previous year. The children's health camp at Raukawa was completed, and is now occupied.

The sum of £1,646 was expended on demolishing Napier Hospital, damaged by earthquake, and clearing the site.

It is proposed to rebuild and equip the Nurses' Home at St. Helens, Christchurch, which was destroyed by fire in May last.

Education.

The expenditure on the erection of school buildings, additions, sites, and teachers' residences was considerably reduced during the year, the expenditure for the financial year being £259,149, as against £501,344 for the year ended 31st March, 1931. Owing to the limited funds available, only the most urgent requirements are being considered, and no doubt when the Dominion returns to normal there will be increased demands to overtake arrears of work.

A summary of the more important works carried out is as follows:—

The rebuilding of the Wellington Boys' College, Te Aro Main School (Wellington), Takaka and Nelson Central (Nelson), and Blackball (Canterbury) was completed, and additional accommodation has been provided at Christchurch West (Canterbury), Greymouth, and Feilding Technical Schools. Hostels were completed at the Nelson Boys' College and the Wanganui Technical School, and further accommodation was erected at the New Plymouth Boys' High School Hostel.

Large works are in progress at New Plymouth Central (destroyed by fire); additions at Kurow (Otago), Oxford (Canterbury), Palmerston Central (Wanganui). Rangiora High School, Nelson Girls' College, Takapuna Grammar School, Otahuhu Junior High School, and at the Petone Technical School.

Progress has been made with the restoration of schools damaged in the Hawke's Bay earthquake, schools having been rebuilt in wood at Hastings West, Napier Central, and Nelson Park. The reconditioning and strengthening of the Hastings High School was completed.

During the year under review the sum of £7,770 was spent out of the Government Fire Insurance Fund to replace and repair school buildings and residences destroyed or damaged by fire.

The following table shows for the year ended 31st March, 1932, the net amount expended on new buildings, additions, sites, and teachers' residences:—

	£
Public schools	124,944
Secondary schools	63,649
Technical schools	44,306
Training colleges	1,228
Native schools	14,433
Schools for mentally backward	199
Child-welfare institutions	714
Kindergartens	54
Massey Agricultural College	9,622
Total	£259,149

Tourist and Health Resorts.

The expenditure during the year amounted to £87,609, which included an amount of £58,925, being the repayment of a loan made to the Tongariro National Park Co., Ltd., by the Public Trust Office and guaranteed by the Government.

The main work carried out during the year was the erection of the juvenile portion of the new Blue Bath.

Other works completed were the erection of Malte Brun Hut at Mount Cook, improvements to reserve at Rotorua, erection of wharves at Golden Bay and Ulva Island (Stewart Island), and the electrical works and telephone-line were extended at Rotorua.

During the next financial year it is proposed to proceed with the erection of the new Blue Bath at Rotorua and complete other works commenced during the period under review.

TELEGRAPH EXTENSION.

The expenditure for the financial year in extending and improving the telephone, telegraph, and wireless facilities throughout the Dominion amounted to £249,946, against £419,756 for the year ended the 31st March, 1931. Due to the tapering off in funds, activity in telegraph, telephone, and wireless development has necessarily been somewhat restricted.

A summary of the more important works upon which capital expenditure was incurred during the year is as follows: The erection or provision of new metallic circuits between Tauranga and Matamata, Hamilton and Morrinsville, Carterton and Masterton, and Gore and Lumsden; the reconstruction of 270 miles of toll and telegraph pole-line, which involved the replacement of 560 miles of wire; the conversion of the manual telephone exchanges at Hastings and Marton to automatic working; the extension of the switching equipment at six automatic telephone exchanges and eight manual telephone exchanges; the installation of twenty-one public call offices (coin-in-the-slot telephones); the laying of 22 miles of underground cable-ducts; the laying or erecting of 91 miles of lead-covered cable containing 33,589 miles of wire for telephone-exchange subscribers' circuits; and the erection of 164 miles of pole-line and 2,282 miles of open aerial wire for telephone-exchange subscribers' circuits.

The further extension of the long-distance telephone network within the Dominion has been temporarily suspended, and in the meantime attention has been directed to investigational work designed to provide additional carrier-current telephone channels over the existing Cook Strait telegraph-cables.

The prevailing economic depression has had the effect of retarding to some extent the development of the local telephone-exchange systems throughout the Dominion. The falling-off in subscribers has, however, not been appreciable, and it is expected that the reconnection of those subscribers who have relinquished their telephones will be one of the first indications of a return to prosperity. Owing to the fact that new subscribers to the telephone system have not been forthcoming as freely as heretofore, the expenditure of capital in extending telephone-exchange plant has been proportionately reduced.

The working of the Department's radio-stations has proceeded smoothly during the year; but, in view of the necessity for restricting expenditure as much as possible, there has been little work of a developmental nature undertaken. Additional aerials for short-wave working to the Pacific islands have been erected at Wellington Radio with a view to making greater use of directive transmission. At the Mount Crawford (Wellington) radio-telephone receiving-station the temporary receiving-apparatus previously in use has been replaced by new apparatus designed to give the highest possible grade of service. This equipment is specially designed to eliminate interfering noises of all descriptions, with a consequent improvement in the clarity of the received speech.

PLANT AND MECHANICAL APPARATUS.

The major works upon which plant was used during the year were Stratford Main Trunk Railway; Waitaki hydro-electric works; Wairoa River Bridge; Omakau irrigation works; Tawa Flat Railway Deviation works; Mohaka Viaduct foundations; Waihou and Ohinemuri River improvement works; and the Arapuni hydro-electric scheme, as well as the hydro-electric schemes already functioning at Mangahao, Waikaremoana, and Lake Coleridge. In addition, a quantity of plant was used for construction and maintenance of, and providing metal for, main highways and roads generally all over New Zealand.

The capital cost of the construction plant actually in use during the year amounts to approximately £600,000.

A quantity of more or less obsolete plant, and plant not further required by the Department has been sold, efforts in that direction having been made by utilizing the services of merchants, also by getting in touch with probable users and by newspaper advertisements.

The total sum realized for registered plant items sold during the year was approximately £5,023.

During the year thirty-five motor-vehicles reached the end of their economic lives, and were sold to the highest bidders after calling for public tenders in the newspapers circulating in the locality of each, the total amount realized on these being £436 12s.

Useable plant, consisting principally of steam-shovels and light locomotives, rendered idle after the last closing-down of railway-construction works, was laid up securely during the year on the various works to safeguard them against the weather, all bright parts, as well as cylinder-bores, being well coated with suitable weatherproof compositions, and the whole, wherever economically possible, was brought into depots at accessible places on the works to allow of easy transport should a sale be effected or future transfer required.

New plant items (being principally replacements) as follows were purchased by public tender during the year for use by the Department—viz., one air-lock, one electric hoist, eight motor-cars, six motor-trucks, one pump, and two road-maintainers.

A good deal of plant was hired during the year, principally to small syndicates operating upon mining ventures and to co-operative parties carrying out small contracts.

District Plant Inspectors have been kept going at high pressure in coping with the additional work involved in making inspections and issuing certificates of fitness of motor-omnibuses under the Transport Licensing Act of the 11th November, 1931.

Mechanical work of an advisory nature and involving the purchase of plant has been carried out for other Government Departments, including the Cook Islands and Samoan Administration, as well as for local bodies that have obtained plant upon hire-purchase agreement through the Main Highways Board.

HAWKE'S BAY EARTHQUAKE.—OPERATIONS IN CONNECTION WITH EARTHQUAKE DAMAGE.

The bulk of work of restoration of private houses damaged by the earthquake of the 3rd February, 1931, was completed by the 10th December, 1931. After that date the Public Works Department, on behalf of the Relief Committee, inspected hundreds of houses in the Hawke's Bay, Waipukurau, Waipawa, Wairoa, and Patangata Counties; also in the Hastings, Waipawa, Waipukurau, and Wairoa Boroughs.

These inspections were for the purposes of checking claims on the relief funds by property-owners who had undertaken their own repairs. These inspections were completed by the 22nd April last.

The number of private houses actually repaired by the Public Works Department was as under:—

Napier Borough	965
Hastings Borough	1,330
Wairoa Borough	470
Hawke's Bay County (including Havelock and Taradale Town Boards)	1,005
Wairoa County	54
Total	3,824

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, 1932.

INDEX.

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, 1932, AND THE LIABILITIES ON THAT DATE.

Number of Table containing Details.	Works.	Total Net Expenditure to 31st March, 1931.	Expenditure during Twelve Months ended 31st March, 1932.	Recoveries on Account of Services of Previous Years.	Total Net Expenditure to 31st March, 1932.	Liabilities on 31st March, 1932.	Total Net Expenditure and Liabilities.	Works.
		£	£	£	£	£	£	
3	Railways*..	55,967,712	952,388	20,568	56,899,532	66,957	56,966,489	Railways.*
..	Payment to Midland Railway bond-holders	150,000	..	..	150,000	..	150,000	Payment to Midland Railway bond-holders.
..	Roads†	20,334,817	1,082,210	564	21,416,463	51,261	21,467,724	Roads.†
..	Development of mining	831,065	..	..	831,065	..	831,065	Development of mining.
..	Telegraphs	10,930,501	249,978	32	11,180,447	22,761	11,203,208	Telegraphs.
..	Public buildings‡	11,099,895	454,804	10,926	11,543,773	13,716	11,557,489	Public buildings.‡
..	Lighthouses, harbour-works, and harbour-defences	1,291,817	12,033	..	1,303,850	604	1,304,454	Lighthouses, harbour-works, and harbour-defences.
..	Departmental	2,740,866	151,377	33,947	2,858,296	2,523	2,860,819	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	3,309,850	5,265	210	3,314,905	..	3,314,905	Immigration.
..	Purchase of Native lands	2,061,147	..	..	2,061,147	..	2,061,147	Purchase of Native lands.
..	Defence	1,406,587	..	4,039	1,402,548	..	1,402,548	Defence.
..	Charges and expenses of raising loans ..	3,713,744	98,098	..	3,811,842	..	3,811,842	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	576,708	87,609	85	664,232	1,293	665,525	Tourist and health resorts.
..	Lands improvement§	661,216	38,899	506	699,609	1,929	701,538	Lands improvement.§
..	Irrigation and water-supply‖	968,743	37,749	..	1,006,492	2,727	1,009,219	Irrigation and water-supply.‖
..	Plant, material, and stores	274,633	*Cr.* 105,690	938	168,005	1,966	169,971	Plant, material, and stores.
..	Quarries (acquisition and operation) ..	9,636	107	..	9,743	49	9,792	Quarries (acquisition and operation).
..	Timber-supply and sawmills for Public Works Department	*Cr.* 5,489	2,012	400	*Cr.* 3,877	..	*Cr.* 3,877	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	117,945,690	3,066,839	72,215	120,940,314	165,786	121,106,100	Totals.

* Exclusive of expenditure on Hutt Railway and Road Improvement and Railways Improvement Accounts and Native Land Claims Adjustment Act, 1923. ‡ Includes £12,500 expended under Finance Act, 1929, section 32. † Includes £4,500 expended under section 16 (1) Native Land Amendment Act, 1929. § £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), 1910–1911 to 1931–32.

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, 1910.	Expenditure.										
		1910–11.	1911–12.	1912–13.	1913–14.	1914–15.	1915–16.	1916–17.	1917–18.	1918–19.	1919–20.	1920–21.
	£	£	£	£	£	£	£	£	£	£	£	£
Immigration	2,218,791	9,441	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*
Public Works, Departmental	634,074	42,733	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*
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
Railways	26,457,578	1,104,071	1,125,905	1,148,832	1,104,897	2,146,753†	1,065,171	620,947	495,771	387,923	748,649	1,365,466
Payment to Midland Railway Bondholders	150,000	*Cr. 652* ..	*Cr. 6,987* ..	*Cr. 29,528* ..	*Cr. 5,485* ..	*Cr. 6,022* ..	*Cr. 4,633* ..	*Cr. 4,845* ..	*Cr. 110* ..	*Cr. 4,924* ..	*Cr. 105,196* ..	*Cr. 388* ..
Roads:—												
Miscellaneous Roads and Bridges	7,483,173	229,537	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*
Roads on Goldfields..	869,656	25,626	41,067	36,761	24,143	30,065	24,432	17,099	6,912	4,186	12,465	11,050
Development of Thermal Springs and Natural Scenery ..	16,023	..	..	..	..	..	..	..	..	..	..	..
Lands Improvement Account*	300,930	..	..	..	..	..	..	..	..	..	..	..
Total, Roads	8,669,782	255,163	424,578	374,345	377,464	514,430	424,494	220,845	135,042	225,076	387,959	538,823
Development of Mining	837,114	10,845 *Cr. 1,000*	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*
Purchase of Native Lands	1,576,434	2,976 *Cr. 2,286*	*Cr. 2,466*	*Cr. 917*	*Cr. 857*	*Cr. 1,060*	*Cr. 972*	*Cr. 868*	*Cr. 57*	..	*Cr. 57*	*Cr. 57*
Native Lands Purchase Account	491,980	..	..	..	..	..	..	..	..	..	..	..
Total, Land Purchases	2,068,414	690	*Cr. 2,456*	*Cr. 917*	*Cr. 857*	*Cr. 1,060*	*Cr. 972*	*Cr. 868*	*Cr. 57*	..	*Cr. 57*	*Cr. 57*
Telegraph Extension	1,766,190	111,867	147,692	251,375	392,648	288,395	249,554	203,311	213,955	198,611	249,379	336,468
Public Buildings:—												
General (including Miscellaneous)	399,657	44,044	34,721	44,719	43,199	52,239	22,050	12,648	11,646 *Cr. 15,067*	43,168	64,207	39,504
Parliamentary	75,818	237	2,004	18,806	23,612	31,478	17,133	22,586	37,233	..	..	..
Judicial { Courthouses		5,759	14,556	20,097	9,423	5,171	4,902	299	21	..	868	1,400
Judicial { Prisons	659,986	7,506	9,760	6,911	4,928	14,515	17,786	15,685	13,195	16,299	20,981	30,038
Judicial { Police-stations		9,030	19,817	18,423	14,094	19,122	25,484	21,147	18,814	6,157	24,944	*Cr. 800* 36,843

* 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 4.*

TABLE No. 2—*continued.*

GENERAL SUMMARY—*continued.*

Showing NET YEARLY EXPENDITURE out of PUBLIC WORKS FUND (GENERAL PURPOSES ACCOUNT), 1910–1911 to 1931–32—*continued.*

Description of Services.	Total Net Expenditure to 31st March, 1910.	Expenditure.									
		1910–11.	1911–12.	1912–13.	1913–14.	1914–15.	1915–16.	1916–17.	1917–18.	1918–19.	1919–20.	1920–21.
Public Buildings—*continued.*	£	£	£	£	£	£	£	£	£	£	£	£
Post and Telegraph	659,195	117,815	130,815	122,999	78,815	60,838	35,258	22,744	33,525	26,072	66,543	93,364
												Cr. 560
Customs	49,439	..	..	..	..	..	..	..	..	..	..	..
Quarantine Stations	6,865	..	..	..	..	..	..	..	..	..	35,490	15,529
Mental Hospitals	584,929	12,707	8,809	46,181	26,001	53,996	54,898	44,602	26,502	14,640	18,277	27,368
							Cr. 15					
Public Health	32,489	..	..	376	..	..	..	..	..	..	..	..
Health and Hospital Institutions	113,752	1,484	12,745	8,750	1,435	998	1,426	7,570	4,080	2,332	8,484	4,099
School Buildings	1,754,889	124,926	90,535	105,000	121,954	122,940	97,972	70,367	63,082	115,656	195,500	244,722
Agricultural	30,154	1,160	3,684	6,475	4,398	2,428	2,972	3,046	5,685	4,229	7,227	9,345
						Cr. 34						
Workers' Dwellings	..	..	22,644	46,455	41,741	68,275	55,893	35,437	15,505	7,293	26,674	..
Total, Public Buildings	4,367,173	324,668	350,090	445,192	369,600	431,966	335,759	256,131	214,221	235,846	469,195	500,851
Lighthouses, Harbour-works, and Harbour-defences:—												
Lighthouses	178,515	1,470	5,428	9,031	5,174	3,887	1,415	449	561	1,663	253	758
Harbour-works	345,110	4,092	6,004	7,415	3,346	12,563	9,355	2,280	2,359	3,729	3,245	4,080
					Cr. 1,462							
Harbour-defences	536,794	2,865	1,144	339	539	681	2,903	1,038	56	..	..	..
					Cr. 300							
Total, Lighthouses, &c.	1,060,419	8,427	12,576	16,785	7,297	17,131	13,673	3,767	2,976	5,392	3,498	4,838
Rates on Native Lands	68,672	..	..	..	..	..	..	..	..	..	..	..
Contingent Defence	903,911	6,071	10,437	23,790	30,186	15,221	37,619	9,742	6,714	8,809	10,187	8,701
										Cr. 922		
Tourist and Health Resorts	197,360	5,912	13,361	12,906	14,989	8,232	5,167	1,094	931	1,620	6,194	19,041
						Cr. 12	*Cr. 500*					
Lands Improvement*	51,027	11,125	20,394	22,550	10,269	13,810	5,936	*Cr. 2,731*	1,838	*Cr. 4,268*	2,964	2,064
				Cr. 383	*Cr. 432*	*Cr. 522*						
Charges and Expenses of raising Loans	1,241,932	66,367	67,470	72,950	105,449	35,495	5,037	35	1	..	..	184
		Cr. 66,392	*Cr. 66,954*	*Cr. 71,681*	*Cr. 96,741*	*Cr. 34,865*	*Cr. 5,030*					
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	47,682	169,910
										Cr. 31		
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*
Grand Total—Net Expenditure	51,116,372	1,891,918	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

* For previous expenditure see Roads Class.

[*Continued on page 5.*

TABLE No. 2—*continued.*

GENERAL SUMMARY—*continued.*

Showing NET YEARLY EXPENDITURE out of PUBLIC WORKS FUND (GENERAL PURPOSES ACCOUNT), 1910–1911 to 1931–32—*continued.*

Description of Services.	Expenditure.											Total Net Expenditure to 31st March, 1932.
	1921–22.	1922–23.	1923–24.	1924–25.	1925–26.	1926–27.	1927–28.	1928–29.	1929–30.	1930–31.	1931–32.	
	£	£	£	£	£	£	£	£	£	£	£	
Immigration	247,528	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*	3,314,905
Public Works, Departmental	128,002 *Cr. 525*	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*	2,858,296
Irrigation and Water-supply*	82,713	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	1,006,492
Railways	3,133,200 *Cr. 751*	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*	56,899,532
Payment to Midland Railway Bondholders	..	..	..	..	..	..	..	..	..	..	..	150,000
Roads :—												
Miscellaneous Roads and Bridges	552,895 *Cr. 197*	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*	..
Roads to give access to Outlying Districts	..	..	..	..	..	..	33,642	51,582	53,693	91,126	3,940	..
Roads on Goldfields	11,264	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	563,962	647,762	754,049	606,492	563,818	577,147	704,798	833,247	1,060,493	1,475,050	1,081,646	21,416,463
Development of Mining	2,130 *Cr. 51*	*Cr. 98* *Cr. 1,785*	1,363 *Cr. 2,310*	..	..	..	..	..	..	..	..	831,065
							Cr. 1,130	*Cr. 260*	*Cr. 260*	*Cr. 260*		
Purchase of Native Lands	*Cr. 52*	..	..	..	..	*Cr. 535*	*Cr. 56*	..	..	..	..	..
Native Lands Purchase Account	..	..	..	..	..	..	..	..	..	..	..	..
Total, Land Purchases	*Cr. 52*	..	..	..	..	*Cr. 535*	*Cr. 56*	..	..	..	..	2,061,147
Telegraph Extension	590,981	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*	11,180,447
Public Buildings :—												
General (including Miscellaneous)	87,057	113,553	8,160	30,791 *Cr. 35*	29,369 *Cr. 345*	119,864 *Cr. 429*	42,553 *Cr. 1,065*	4,272 *Cr. 420*	14,106† *Cr. 3,156*	85,204 *Cr. 55*	33,189 *Cr. 4,231*	..
Parliamentary	..	..	..	..	..	..	..	35	27,142	15,723	37	..
Judicial — Courthouses	4,358	2,018 *Cr. 13*	2,448	5,363 *Cr. 19*	7,209	1,261 *Cr. 13*	7,531 ..	8,387 *Cr. 95*	15,765 *Cr. 29*	19,572 *Cr. 16,403*	3,513 *Cr. 529*	..
Judicial — Prisons	41,740	23,313	26,484 *Cr. 2,568*	25,279 *Cr. 86*	24,196	22,812 *Cr. 908*	22,359 *Cr. 524*	12,573 *Cr. 321*	18,814 *Cr. 285*	2,504 *Cr. 134*	2,621 *Cr. 67*	..
Judicial — Police-stations	22,544	6,298	12,838	18,553	16,594 *Cr. 102*	7,411 *Cr. 13*	5,561 *Cr. 970*	6,925 *Cr. 605*	8,442 *Cr. 319*	8,360 *Cr. 54*	2,535 *Cr. 91*	..

* £6,727 previously included under Lands Improvement now transferred to Irrigation and Water-supply. † Includes £12,500 expended under Finance Act, 1929, section 32. [*Cntd. on page 6*

TABLE No 2—*continued.*

GENERAL SUMMARY—*continued.*

Showing NET YEARLY EXPENDITURE out of PUBLIC WORKS FUND (GENERAL PURPOSES ACCOUNT), 1910–1911 to 1931–32—*continued.*

Description of Services.	Expenditure.											Total Net Expenditure to 31st March, 1932.
	1921–22.	1922–23.	1923–24.	1924–25.	1925–26.	1926–27.	1927–28.	1928–29.	1929–30.	1930–31.	1931–32.	
Public Buildings—*continued.*	£	£	£	£	£	£	£	£	£	£	£	£
Post and Telegraph	112,906 *Cr. 675*	77,211 *Cr. 69*	108,395	65,917 *Cr. 210*	89,865 *Cr. 453*	86,052 *Cr. 1,114*	77,194 *Cr. 834*	62,087 *Cr. 1,980*	104,157 *Cr. 197*	138,671 *Cr. 1,391*	104,505 *Cr. 3,179*	..
Customs	..	..	..	..	..	..	..	..	..	..	..	..
Quarantine Stations	4,581	154	171	284	..	..	..	..	..	..	..	..
Mental Hospitals	41,838	13,852	26,541	68,438	77,835 *Cr. 283*	68,635	51,119 *Cr. 3,600*	96,782	152.096	134,140	45,938 *Cr. 860*	..
Public Health	..	..	..	..	..	..	..	..	..	..	..	..
Health and Hospital Institutions	26,131	20,981 *Cr. 1,399*	7,420	27,951	31,177 *Cr. 300*	15,840	14,361 *Cr. 310*	19,637	16,651	17,338	3,316 *Cr. 1*	..
School Buildings	2,469 *Cr. 9,255*	.. *Cr. 367*	.. *Cr. 1,090*	.. *Cr. 905*	.. *Cr. 1,050*	.. *Cr. 7,953*	..	.. *Cr. 2,428*	..	.. *Cr. 1,110*	259,149 *Cr. 40*	..
Agricultural	1,115	514 *Cr. 27*	282 *Cr. 171*	3,242 *Cr. 686*	7,932 *Cr. 865*	4,164 *Cr. 310*	2,863	2,808 *Cr. 2,395*	2,963 *Cr. 1,721*	2,509 *Cr. 194*	.. *Cr. 1,927*	..
Workers' Dwellings	..	..	..	..	..	..	..	..	..	..	..	..
Total, Public Buildings	334,809	255,818	188,910	243,877	280,780	315,299	216,237	205,262	354,429	403,680	443,878	11,543,773
Lighthouses, Harbour-works, and Harbour-defences:—												
Lighthouses	16,350	3,260	4,473	2,850	5,690 *Cr. 750*	5,758	7,979	2,637	4,460 *Cr. 500*	4,103	5,046	..
Harbour-works	2,424	6,524	6,334	423	3,717 *Cr. 131*	13,263 *Cr. 204*	15,891 *Cr. 165*	14,425	10,736	6,742	6,987	..
Harbour-defences	..	.. *Cr. 1,235*	.. *Cr. 16*	..	..	..	..	..	..	..	..	..
Total, Lighthouses, &c.	18,774	8,549	10,791	3,273	8,526	18,817	23,705	17,062	14,696	10,845	12,033	1,303,850
Rates on Native Lands	..	..	..	..	..	..		..	..	..	..	68,672
Contingent Defence	15,586	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*	1,402,548
Tourist and Health Resorts	17,996 *Cr. 110*	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*	664,232
Lands Improvement*	17,478	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*	699,609
Charges and Expenses of raising Loans	174,280	62,399	311,905	241,930	297,180	155,373	100,297	438,238 *Cr. 3,811*	518,158	164,535	98,098	3,811,842
Interest and Sinking Funds	..	..	..	..	..	..	..	..	..	..	..	218,500
Coal-exploration and Mine-development	..	..	..	..	..	..	..	..	..	..	..	10,835
Thermal Springs	..	..	..	..	..	..	..	..	..	..	..	14,600
Plant, Material, and Stores	106,432	*Cr. 19,708*	*Cr. 52,788*	.. *Cr. 12,230*	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*	168,005
Quarries (acquisition and operation)	..	..	..	1,815	12,351	6,302	*Cr. 9,325*	*Cr. 6,030*	329 *Cr. 25*	4,219	107	9,743
Timber-supply and Sawmills for Public Works Department	16,369	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*	*Cr. 3,877*
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	*11,616*	*20,127*	*61,914*	*73,559*	*27,474*	*146,933*	*40,026*	*106,429*	*62,859*	*41,583*	*72,215*	..
Grand Total—Net Expenditure	5,449,351	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	120,940,314

* 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, 1932.

Lines of Railway.	Mileage opened for Traffic.	Total Expenditure by General Government to 31st March, 1931.	Recoveries on Account of Expenditure of Previous Years.	Expenditure out of Public Works Fund during Year 1931-32: New Works.		Total Expenditure by General Government to 31st March, 1932.	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	180,133 0 7	100 0 0	..	746 2 5	180,779 3 0	..
Opua Wharf to Whangarei and Onerahi	58 06	608,288 4 0	..	..	*Cr.* 29 8 5	608,258 15 7	..
Otiria to Ngapuhi	13 45	127,370 15 6	..	..	..	127,370 15 6	..
Whangarei Branch (Kioreroa to Waiotira)	19 79	420,533 1 0	75 0 0	35 0 0	..	420,493 1 0	..
North Auckland Main Trunk—							
Ngapuhi Northwards	11 00	879,831 7 0	..	8,198 2 4	..	888,029 9 4	..
Helensville Northwards	83 39	2,982,992 5 5	..	408 0 0	4,802 18 5	2,988,203 3 10	..
North Auckland Main Trunk to Dargaville	..	444,439 4 5	..	9,769 16 1	..	454,209 0 6	..
Helensville to Te Awamutu	148 67	5,986,731 0 2	..	..	37,177 6 1	6,023,908 6 3	..
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	501,857 7 9	10 0 0	..	1,858 9 7	503,705 17 4	..
Cambridge Branch (Ruakura Junction to Cambridge)	12 02	61,831 17 3	..	..	..	61,831 17 3	..
Morrinsville to Rotorua	69 33	431,039 17 5	..	..	1,429 16 0	432,469 13 5	..
Marton to Te Awamutu	209 69	3,077,846 18 3	..	..	29,670 14 1	3,107,517 12 4	..
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	..	38,210 16 1	..	*Cr.* 348 2 2	..	37,862 13 11	..
Paeroa to Pokeno	..	22,890 1 8	..	..	..	22,890 1 8	..
Paeroa to Tauranga	50 65	1,246,893 3 7	..	3,322 14 4	1 6 8	1,250,217 4 7	..
Tauranga to Taneatua, including Te Maunga to Maunganui Branch	59 17	1,493,585 1 11	..	3,748 5 11	..	1,497,333 7 10	..
Gisborne to Motu	49 32	625,086 8 10	..	..	63 9 10	625,149 18 8	..
Gisborne to Ormond Tramway	..	4,975 1 7	..	..	..	4,975 1 7	..
Napier to Gisborne—							
Gisborne Southwards	11 51	285,280 12 5	97 9 6	767 5 7	..	285,950 8 6	..
Waikokopu Northwards	..	571,437 10 4	..	*Cr.* 6,698 16 4	..	564,738 14 0	..
Wairoa Northwards	..	20,684 10 0	..	..	..	20,684 10 0	..
Napier Northwards	38 62	2,220,518 1 9	..	164,068 18 1	..	2,384,586 19 10	..
Waikokopu Branch	..	615,259 7 7	..	11,453 9 9	..	626,712 17 4	..
Wellington to Napier—							
Napier to Woodville and Palmerston North	114 06	1,154,089 19 2	..	..	13,636 18 4	1,167,726 17 6	..
Wellington to Woodville, including Te Aro Extension	121 70	3,247,366 6 0	..	..	4,701 8 3	3,252,067 14 3	..
Featherston to Martinborough	..	399 0 0	..	..	..	399 0 0	..
Wellington to Waitara—							
Wellington to Longburn	83 37	2,565,294 15 7	6,050 0 0	..	224,239 4 7	2,783,484 0 2	..
Foxton to Waitara and Moturoa	196 22	2,069,895 7 0	..	..	27,152 18 1	2,097,048 5 1	..
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	442,442 15 3	..	469 0 0	5,070 8 3	447,982 3 6	..
Manaia Branch (Kapuni to Manaia)	..	9,648 6 0	..	..	..	9,648 6 0	..
Rangitikei River Quarry Line	..	206 0 0	..	..	..	206 0 0	..

TABLE No. 3—*continued.*

Expenditure on Railways to 31st March, 1932—*continued.*

Lines of Railway.	Mileage opened for Traffic.	Total Expenditure by General Government to 31st March, 1931.	Recoveries on Account of Expenditure of Previous Years.	Expenditure out of Public Works Fund during Year 1931–32: New Works.		Total Expenditure by General Government to 31st March, 1932.	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)	..	1,200,727 3 0	..	43,614 16 9	..	1,244,341 19 9	..
Stratford to Okahukura (West End)	47 40	1,581,998 18 4	1,736 0 0	133,529 8 2	971 12 5	1,714,763 18 11	..
Nelson to Greymouth—							
Nelson to Inangahua	64 47	734,094 0 2	..	*Cr.*10,002 18 9	11 6 9	724,102 8 2	78,307 0 0
Stillwater to Inangahua	57 32	223,532 17 3	..	..	2,657 19 8	226,190 16 11	279,685 0 0
Ngahere to Blackball	3 40	147,881 12 11	..	..	..	147,881 12 11	..
Westport to Ngakawau	19 56	209,022 14 9	..	..	973 11 2	209,996 5 11	..
Ngakawau to Mokihinui	7 12	..	..	..	..	*	..
Mokihinui to Colliery Line	3 69	..	..	..	..	†	..
Westport to Cape Foulwind	7 00	..	..	..	..	‡	..
Westport to Inangahua	5 74	554,939 8 11	..	92,050 16 1	..	646,990 5 0	..
Greymouth to Rewanui	2 44	259,987 10 2	..	..	..	259,987 10 2	..
Point Elizabeth Branch	8 70	74,363 10 11	..	..	..	74,363 10 11	..
Greymouth to Ross and Mikonui	38 68	423,158 2 2	..	..	8,493 1 8	431,651 3 10	..
Picton to Waipara—							
Picton Southwards	56 06	884,503 19 8	..	87,458 4 8	29 9 3	971,991 13 7	..
Waipara Northwards	44 14	525,711 19 11	..	96,989 4 8	..	622,610 4 7	..
Christchurch to Greymouth—							
Rolleston to Bealey	73 07	1,011,974 17 9	..	..	55 14 7	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	1,979,125 12 10	..	..	234 15 11	1,979,360 8 9	263,889 0 0
Hurunui to Waitaki—							
Main Line (Waiau to Waitaki)	219 07	2,724,390 6 11	..	..	27,496 6 9	2,751,886 13 8	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	..	..	..	92,402 19 11	..
Little River Branch (Lincoln to Little River)	22 46	110,852 18 10	..	..	..	110,852 18 10	..
Rakaia to Methven	22 20	77,233 19 4	..	..	*Cr.* 146 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	..	..	..	70,423 14 1	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	..	..	..	54,248 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	253 71	4,156,589 18 2	..	..	4,041 2 3	4,160,631 0 5	82,259 0 0
Duntroon Branch (Pukeuri to Kurow)	37 33	99,064 14 6	12,500 0 0	..	..	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 Westport 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, 1932—*continued.*

Lines of Railway.	Mileage opened for Traffic.	Total Expenditure by General Government to 31st March, 1931.	Recoveries on Account of Expenditure of Previous Years.	Expenditure out of Public Works Fund during Year 1931–32: New Works.		Total Expenditure by General Government to 31st March, 1932.	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	..	..	..	33,531 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	718,008 19 5	..	249 17 8	..	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	..	..	..	53,613 3 7	..
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	1,447,712 16 10	..	..	5,015 15 3	1,452,728 12 1	..
Invercargill to Kingston—							
Main Line	87 04	369,141 16 4	..	..	193 16 11	369,335 13 3	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	360,224 14 7	..	65 0 0	..	360,289 14 7	37,097 0 0
Thornbury to Wairio	22 15	104,691 2 3	..	..	1,522 16 2	106,213 18 5	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	..	30,500 13 4	..	625 19 9	..	31,126 13 1	..
Middle Island	..	5,763 0 0	..	..	..	5,763 0 0	..
Rolling-stock	..	11,413,039 18 9	..	..	358,055 10 9	11,771,095 9 6	..
Motor-omnibus Service, Wellington	..	55,596 2 4	..	..	..	55,596 2 4	..
General	..	14,076 12 9	..	..	..	14,076 12 9	..
Miscellaneous works, R.I.A.	..	*Cr.* 11,167 16 7	..	..	..	*Cr.* 11,167 16 7	..
Depreciation provided for out of Railway Revenue and actually repaid to Public Works Fund	..	..	..	..	*Cr.* 439,189 16 8	*Cr.* 439,189 16 8	..
Stock of Permanent-way Materials	..	1,477 12 2	..	3,810 1 8	..	5,287 13 10	..
Totals	3,339 46	66,422,814 4 1	20,568 9 6	643,493 4 3	320,938 5 4	67,366,677 4 2*	1,787,741 0 0†

* Excludes the £10,400,000 accrued depreciation of assets referred to in section 23 (2), Government Railways Amendment Act, 1931.

† 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	..	..	..	..	..	..
	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, 1932, AND THE LIABILITIES ON THAT DATE.

—	Total Expenditure to 31st March, 1931.	Expenditure for Year ended 31st March, 1932.	Total Expenditure to 31st March, 1932.	Liabilities on Authorities, Contracts, &c., 31st March, 1932.	Total Expenditure and Liabilities.
	£	£	£	£	£
Judicial*	1,477,014	7,982	1,484,996	103	1,485,099
Postal and telegraph	2,377,952	101,326	2,479,278	7,648	2,486,926
Customs	49,441	..	49,441	..	49,441
Offices for public Departments†	904,298	28,957	933,255	874	934,129
Mental hospitals	1,646,286	45,079	1,691,365	984	1,692,349
Alexandra Depot, Wellington‡	8,084	..	8,084	..	8,084
School buildings	3,085,855	259,109	3,344,964	4,107	3,349,071
Health and Hospital Institutions§	396,106	3,315	399,421	..	399,421
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)	57,052	37	57,089	..	57,089
Government House, Wellington (land and new building)	72,645	..	72,645	..	72,645
Agricultural	101,791	*Cr.* 1,927	99,864	..	99,864
Workers' dwellings	319,916	..	319,916	..	319,916
Miscellaneous	70,813	..	70,813	..	70,813
Totals	11,099,895	443,878	11,543,773	13,716	11,557,489

* 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, 1932.

GENERAL BALANCE-SHEET AT 31st MARCH, 1932, COMPARED WITH POSITION AT 31st MARCH, 1931.

1930–31.	*Liabilities.*	1931–32.		1930–31.	*Assets.*	1931–32.	
£ s. d.		£ s. d.	£ s. d.	£ s. d.		£ s. d.	£ s. d.
	Aid to Water-power Works and Electric Supply Accounts—			1,784,315 4 11	Lake Coleridge scheme—		
	Debentures Stock issued—			41,195 12 5	Assets as per separate balance-sheet ..	1,867,821 1 9	
..	At 4 per cent. interest	15,000 0 0			Investments, Sinking Fund	65,598 8 11	
2,651,413 18 0	At 4½ per cent. interest	2,651,413 18 0		1,825,510 17 4			1,933,419 10 8
3,937,539 6 10	At 5 per cent. interest	4,373,639 6 10					
739,480 0 0	At 5¼ per cent. interest	739,480 0 0			Horahora–Arapuni scheme—		
608,000 0 0	At 5½ per cent. interest	1,171,800 0 0		4,027,610 12 7	Assets as per separate balance-sheet ..	4,592,897 2 1	
1,884,642 6 3	At 6 per cent. interest	1,884,642 6 3		7,072 2 7	Investments, Sinking Fund	9,491 13 11	
			10,835,975 11 1	38,312 8 8	Profit and Loss Account—Loss to date ..	78,866 12 7	
9,821,075 11 1				4,072,995 3 10			4,681,255 8 7
					Mangahao–Waikaremoana scheme—		
				3,640,166 0 3	Assets as per separate balance-sheet ..	3,788,385 11 3	
	Waihi Gold-mining Co., Ltd.—			467,289 13 4	Profit and Loss Account—Loss to date ..	484,623 19 1	
212,500 0 0	Purchase of Horahora works—Deed of security at 5 per cent. interest. (Due 1/11/1934)	..	212,500 0 0	4,107,455 13 7			4,273,009 10 4
					Waitaki River scheme—		
				236,599 4 10	Headworks	404,068 2 2	
				303,619 5 9	Power-house, machinery, &c.	448,954 11 3	
				66,655 14 0	Accommodation of workmen	51,397 13 10	
	Consolidated Fund—			120,665 2 9	Transmission-lines and substations ..	222,186 12 7	
102,581 17 5	Interest accrued on loans to 31st March, 1932	113,220 5 2		216,294 9 0	Service-line, roads, land, staff village, &c.	247,879 4 10	
				120,651 6 4	Interest and loan charges	206,195 18 7	
182 9 8	Sundry creditors for interest unclaimed ..	897 7 4		63,389 0 3	Stocks	53,207 9 11	
			114,117 12 6	1,562 8 10	Sundry debtors	644 19 7	
102,764 7 1				1,129,436 11 9			1,634,536 12 9
					Other schemes, surveys, &c.—		
	Electric Supply Sinking Fund Account—			4,269 7 0	North Island	4,346 7 8	
5,094 6 6	Amount due under section 23, Finance Act, 1928	..	12,290 1 3	11,364 4 3	South Island	11,347 15 2	
				15,633 11 3		15,694 2 10	
				140 0 0	Material on hand	120 0 0	
				15,773 11 3			15,814 2 10
30,995 4 4	Amount set aside as reserve to cover difference between interest payable on loans raised and interest earned from their temporary investment pending use	..	28,496 2 9				
10,172,429 9 0	Carried forward	..	11,203,379 7 7	11,151,171 17 9	Carried forward	..	12,538,035 5 2

TABLE No. 6—*continued.*

ELECTRIC SUPPLY ACCOUNT—*continued.*

STATEMENT OF ACCOUNTS AT THE 31ST MARCH, 1932—*continued.*

GENERAL BALANCE-SHEET AT 31ST MARCH, 1932, AS COMPARED WITH POSITION AT 31ST MARCH, 1931—*continued.*

1930–31.	*Liabilities.*	1931–32.		1930–31.	*Assets.*	1931–32.	
£ s. d.		£ s. d.	£ s. d.	£ s. d.		£ s. d.	£ s. d.
10,172,429 9 0	Brought forward	..	11,203,379 7 7	11,151,171 17 9	Brought forward	..	12,538,035 5 2
	Sundry Creditors—				Balance in Electric Supply Account at the end of year—		
69,215 3 6	Horahora–Arapuni scheme	78,906 0 4					
14,535 11 5	Lake Coleridge scheme	12,964 3 11		89,808 7 1	Cash in Public Account	466 10 6	
15,699 18 10	Mangahao–Waikaremoana scheme ..	17,860 3 8		1,149 6 3	In hands of Government officers in New Zealand	8,216 19 9	
37,837 14 11	Waitaki scheme	28,765 1 2					
12 0 0	South Island surveys	0 6 6		50,731 0 0	In hands of Government officers in London	541 6 5	
137,300 8 8			138,495 15 7	141,688 13 4			9,224 16 8
	Depreciation Reserve—						
187,573 16 5	Horahora–Arapuni scheme	211,609 10 2					
197,627 3 10	Lake Coleridge scheme	211,752 8 2					
284,965 15 2	Mangahao–Waikaremoana scheme ..	355,122 9 9					
670,166 15 5			778,484 8 1	8,320 0 0	Investment Account (funds invested until actually required for use)	..	..
	Sinking Fund Reserve—						
159,810 0 0	Amount utilized for redemption of loans	159,910 0 0					
65,393 15 0	Available for further redemptions ..	93,115 2 3					
225,203 15 0			253,025 2 3	1,056 19 3	Interest accrued on investments to 31st March, 1932	373 19 5	
				207 13 1	Sundry debtors for interest due but unpaid..	..	
	Reserve Fund—						373 19 5
97,344 15 4	Lake Coleridge scheme	..	174,249 7 9	1,264 12 4			
£11,302,445 3 5	Total	..	£12,547,634 1 3	£11,302,445 3 5	Total	..	£12,547,634 1 3

J. J. GIBSON, 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 state the position as disclosed thereby.—J. H. FOWLER, Deputy Controller and Auditor-General.

TABLE No. 6—*continued.*

LAKE COLERIDGE HYDRO-ELECTRIC-POWER SUPPLY.

PROFIT AND LOSS ACCOUNT FOR YEAR ENDED 31ST MARCH, 1932, COMPARED WITH YEAR ENDED 31ST MARCH, 1931.

Gross Revenue Account.

1930–31.	——	1931–32.		1930–31.	——	1931–32.	
£ s. d.		£ s. d.	£ s. d.	£ s. d.		£ s. d.	£ s. d.
11,170 4 2	To Generating expenses, headworks, and power-house ..	..	8,712 15 0	215,311 15 7	By Sale of energy—		
				41 13 0	Wholesale	216,345 18 4	
5,848 6 9	Transmission-lines, maintenance, &c. ..	..	5,753 0 9		Retail	36 7 1	
3,399 4 2	Substation, Addington, operation and maintenance	..	3,187 12 11	215,353 8 7			216,382 5 5
8,166 13 2	Distribution	..	6,054 11 11				
21,169 16 4	Power purchased in bulk	..	2,802 11 0	..	Discounts forfeited, &c.	..	6 15 10
..	Stand-by provision	..	3,752 19 1				
7,278 14 2	Management and general expenses ..	..	6,981 5 10				
					Rents—		
57,032 18 9			37,244 16 6	1,266 7 10	Land and buildings	1,282 3 0	
160,599 4 4	Balance, to Net Revenue Account ..	..	180,951 4 7	284 12 6	Electric lines	185 1 6	
				395 4 1	Electric plant	181 13 8	
							1,648 18 2
				1,946 4 5			
				332 10 1	Fees for testing and repairing electrical appliances and earnings of motor-vehicles	..	158 1 8
£217,632 3 1			£218,196 1 1	217,632 3 1		..	£218,196 1 1

Net Revenue Account.

£ s. d.		£ s. d.	£ s. d.	£ s. d.		£ s. d.	£ s. d.
13,289 16 5	To Depreciation on completed work		12,500 5 7	160,599 4 4	By Balance from Gross Revenue Account ..	..	180,951 4 7
77,226 8 9	Interest for year ended 31st March		73,484 10 9				
70,082 19 2	Balance, to Profit and Loss Appropriation Account ..		94,966 8 3				
£160,599 4 4			£180,951 4 7	£160,599 4 4			£180,951 4 7

TABLE No. 6—*continued.*

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

Profit and Loss Appropriation Account.

1930-31.	——	1931-32.	1930-31.	——	1931-32.
£ s. d.		£ s. d.	£ s. d.		£ s. d.
17,126 0 0	To Sinking Fund Reserve Account	18,061 15 10	70,082 19 2	By Balance from Net Revenue Account	94,966 8 3
52,956 19 2	General Reserve Account	76,904 12 5			
£70,082 19 2		£94,966 8 3	£70,082 19 2		£94,966 8 3

Depreciation Reserve Account.

£ s. d.		£ s. d.	£ s. d.		£ s. d.
	To Amounts written off—		188,293 18 9	By Balance from previous year's statement..	197,627 3 10
11,488 6 6	Motor-vehicles, tools, plant, &c.	6,280 3 0	7,531 15 2	Interest at 4 per cent. per annum	7,905 1 9
197,627 3 10	Balance	211,752 8 2	13,289 16 5	Amount set aside as per Net Revenue Account	12,500 5 7
£209,115 10 4		£218,032 11 2	£209,115 10 4		£218,032 11 2

Sinking Fund Reserve Account.

£ s. d.		£ s. d.	£ s. d.		£ s. d.
11 11 7	To Cost of exchange on cash remitted to London for investment	..	144,557 1 5	By Balance at close of previous year	168,463 12 5
168,463 12 5	Balance	193,865 8 4	17,126 0 0	Amount set aside as per Profit and Loss Appropriation Account	18,061 15 10
			6,792 2 7	Interest	7,340 0 1
£168,475 4 0		£193,865 8 4	£168,475 4 0		£193,865 8 4

General Reserve Account.

£ s. d.		£ s. d.	£ s. d.		£ s. d.
97,344 15 4	To Balance	174,249 7 9	44,387 16 2	By Balance at close of previous year	97,344 15 4
			52,956 19 2	Amount set aside as per Profit and Loss Appropriation Account	76,904 12 5
£97,344 15 4		£174,249 7 9	£97,344 15 4		£174,249 7 9

TABLE No. 6—*continued.*

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

BALANCE-SHEET AT 31ST MARCH, 1932.

1930–31.	*Liabilities.*	1931–32.		1930–31.	*Assets.*	1931–32.	
£ s. d.		£ s. d.	£ s. d.	£ s. d.		£ s. d.	£ s. d.
197,627 3 10	Depreciation Reserve	..	211,752 8 2	780,488 19 6	Works at Lake Coleridge— Headworks, power-house machinery, buildings, &c.	..	784,252 16 1
97,344 15 4	Reserve Fund	..	174,249 7 9				
				390,144 12 5	Transmission-lines	..	391,434 0 0
	Sinking Fund Reserve—			96,356 9 2	Substation, Addington	..	113,625 5 5
110,142 0 0	Amount utilized for redemption of loans ..	110,242 0 0		48,164 4 2	Diesel station, Lyttelton	..	97,264 12 10
58,321 12 5	Available for further redemptions ..	83,623 8 4		161,586 18 4	Distribution	..	168,132 10 9
168,463 12 5			193,865 8 4	8,629 12 10	Service transformers and meters	..	7,810 18 4
				26,787 7 2	Plant, equipment, &c.	..	27,237 16 8
				102,944 7 6	Salaries, and engineering, office, and general expenses on preliminary surveys and construction	..	109,685 5 3
	Sundry creditors—						
2,978 10 3	Public Works Department	5,995 15 7		30,632 0 0	Cost of raising loans	..	33,616 0 0
1,206 9 0	Other Government Departments ..	345 4 11		66,820 0 2	Interest during construction	..	69,437 15 3
10,350 12 2	Non-departmental	6,623 3 5					
14,535 11 5			12,964 3 11	1,712,554 11 3			1,802,497 0 7
				19,183 17 3	Stocks of material	..	20,285 6 1
	Balance carried to general balance-sheet—						
1,825,510 17 4	Total assets as *per contra*	1,933,419 10 8		52,534 18 11	Sundry debtors	..	44,998 0 3
477,971 3 0	*Less* total liabilities as above ..	592,831 8 2		41 17 6	Payments in advance	..	40 14 10
1,347,539 14 4			1,340,588 2 6	41,195 12 5	Sinking-fund investments	..	65,598 8 11
1,825,510 17 4		..	1,933,419 10 8	1,825,510 17 4		..	1,933,419 10 8

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.—J. H. FOWLER, Deputy Controllor 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, 1932, COMPARED WITH YEAR ENDED 31ST MARCH, 1931.

Gross Revenue Account.

1930-31.		1931-32.		1930-31.		1931-32.	
£ s. d.	To Generating-expenses, headworks, and power-house—	£ s. d.	£ s. d.	£ s. d.	By Sales of energy—	£ s. d.	£ s. d.
7,843 11 4	Mangahao	6,560 16 5		277,872 6 9	Wholesale consumers	295,077 15 2	
8,182 9 4	Waikaremoana	7,252 6 9		746 16 3	Retail consumers	756 15 10	
			13,813 3 2				295,83 11 0
16,026 0 8				278,619 3 0			
16,907 14 9	Transmission-lines, patrol maintenance, &c.	..	15,238 16 9				
				3,898 19 8	Rents—		
5,996 18 0	Substations — Operating maintenance, &c.	..	5,894 17 1	265 0 1	Cottages, &c.	3,499 12 4	
4,441 8 8	Power purchased in bulk	..	..		Poles, land, and plant	233 7 9	
				4,163 19 9			3,733 0 1
16,103 12 8	Management and general— Salaries, office expenses, accident, sick, and holiday pay, postages, &c.	..	13,952 15 0	50 2 10	Tests and inspections	..	15 7 10
				163 17 11	Penalties	..	439 7 6
59,475 14 9			48,899 12 0	19 9 8	Refunds from local bodies	..	..
223,540 18 5	Balance, to Net Revenue Account ..	..	251,122 14 5				
£283,016 13 2			£300,022 6 5	£283,016 13 2			£300,022 6 5

Net Revenue Account.

£ s. d.			£ s. d.	£ s. d.		£ s. d.
63,850 6 9	To Depreciation on completed works		65,681 16 5	223,540 18 5	By Balance from Gross Revenue Account	251,122 14 5
196,205 13 9	Interest for year ended 31st March, 1932		202,775 3 9	36,515 2 1	Loss for year	17,334 5 9
£260,056 0 6			£268,457 0 2	£260,056 0 6		£268,457 0 2

Profit and Loss Appropriation Account.

£ s. d.			£ s. d.	£ s. d.		£ s. d.
430,774 11 3	To Balance from previous year		467,289 13 4	467,289 13 4	By Balance	484,623 19 1
36,515 2 1	Balance from Net Revenue Account		17,334 5 9			
£467,289 13 4			£484,623 19 1	£467,289 13 4		£484,623 19 1

TABLE No. 6—*continued.*

ELECTRIC SUPPLY ACCOUNT—*continued.*

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

PROFIT AND LOSS ACCOUNT FOR THE YEAR ENDED 31ST MARCH, 1932, COMPARED WITH YEAR ENDED 31ST MARCH, 1931—*continued.*

Depreciation Reserve Account.

1930–31.		1931–32.	1930–31.		1931–32.
£ s. d.		£ s. d.	£ s. d.		£ s. d.
11,066 19 0	To Replacements, renewals, &c.	6,884 6 0	223,257 6 8	By Balance at close of previous year	284,965 15 2
284,965 15 2	Balance	355,122 9 9	8,925 0 9	Interest at 4 per cent. per annum	11,359 4 2
			63,850 6 9	Amount set aside as per Net Revenue Account ..	65,681 16 5
£296,032 14 2		£362,006 15 9	£296,032 14 2		£362,006 15 9

BALANCE-SHEET AS AT 31ST MARCH, 1932.

1930–31.	*Liabilities.*	1931–32.			1930–31.	*Assets.*	1931–32		
£ s. d.		£ s. d.	£ s. d.		£ s. d.		£ s. d.	£ s. d.	
284,965 15 2	Depreciation Reserve	..	355,122 9 9		1,197,189 4 8	Works at Mangahao—Headworks, power-house, machinery, &c.	1,202,526 0 3		
15,699 18 10	Sundry creditors	..	17,860 3 8		516,520 6 8	Works at Waikaremoana — Headworks, power-house, machinery, &c.	518,618 8 9		
	Balance carried to General Balance-sheet—				1,713,709 11 4			1,721,144 9 0	
4,107,455 13 7	Total assets as *per contra*	4,273,009 10 4			703,910 18 10	Transmission-lines	..	752,561 19 1	
300,665 14 0	*Less* total liabilities as above ..	372,982 13 5			333,746 0 10	Substations	..	435,117 10 2	
3,806.789 19 7			3,900,026 16 11		28,695 9 2	Plant, motor-vehicles, construction tools, &c.	..	14,941 7 8	
					105,550 7 10	Service buildings, workmen's accommodation, &c.	..	98,022 19 4	
					39,682 9 10	Temporary development, Waikaremoana ..	..	39,729 17 0	
					3,768 4 7	Harbour facilities, Waikokopu	..	3,792 4 7	
					202,683 6 4	Salaries and expenses of Engineers and others on surveys and during construction	..	218,163 12 5	
					73,214 19 6	Cost of raising loans	..	77,178 19 6	
					293,878 14 3	Interest during construction	..	298,651 3 0	
					3,498,840 2 6			3,659,304 1 9	
					76,657 19 5	Stocks on hand	..	47,078 19 6	
					64,667 18 4	Sundry debtors, payments in advance, &c.	..	82,002 10 0	
					467,289 13 4	Accumulated loss to date	..	484,623 19 1	
£4,107,455 13 7			£4,273,009 10 4		£4,107,455 13 7			£4,273,009 10 4	

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.—J. H. FOWLER, Deputy Controller and Auditor-General, 25/7/32.

TABLE No. 6—*continued.*

ELECTRIC SUPPLY ACCOUNT—*continued.*

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

PROFIT AND LOSS ACCOUNT FOR YEAR ENDED 31ST MARCH, 1932, COMPARED WITH YEAR ENDED 31ST MARCH, 1931.

Gross Revenue Account.

1930-31.		1931-32.		1930-31.		1931-32.	
£ 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.
7,429 11 0	Horahora	8,317 0 7		180,940 1 11		158,196 11 1	
3,737 5 9	Arapuni	2,073 9 11		11 1 5	*Less* discounts and rebates	13 5 2	
			10,390 10 6				158,183 5 11
11,166 16 9				180,929 0 6			
	Operation and maintenance of—						
20,650 15 3	Waihi Grand Junction steam-plant ..	6,308 6 11					
12,861 5 8	Diesel Station, Penrose	8,969 0 6		17 16 6	Hire of plant	7 10 0	
..	Huntly Steam Station	12,394 4 8		778 11 0	Rent of lines	778 11 0	
30,008 8 3	Power purchased in bulk	22,514 10 8		2,474 5 11	Miscellaneous rents	2,536 5 6	
..	Half additional net costs King's Wharf Station	25,972 14 6		3,270 13 5			3,322 6 6
			76,158 17 3				
63,520 9 2							
9,188 14 3	Operation and maintenance of main transmission-lines	..	7,642 18 4	341 14 4	Testing, oil-drying, and repairs for consumers	..	332 18 6
7,600 9 3	Operation and maintenance of main sub-stations	..	7,453 1 6				
33 11 6	Operation and maintenance of distribution substations	..	19 2 0	46 14 6	Fees for inspection of lines and testing of instruments	..	45 3 0
510 9 2	Operation and maintenance of distribution-lines (11,000-volt)	..	334 6 6				
393 12 8	Live-line testing and changing of insulators	..	72 15 6	5 0 0	Penalties	..	..
3,375 2 3	General supervision and management of transmission and distributing systems	..	2,645 17 7				
	Management and general—						
6,100 1 11	Salaries, rent, postages, insurances, &c.	..	10,285 6 0				
101,889 6 11			115,002 15 2				
82,703 15 10	Balance to Net Revenue Account ..	..	46,880 18 9				
£184,593 2 9			£161,883 13 11	£184,593 2 9			£161,883 13 11

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, 1932, COMPARED WITH YEAR ENDED 31ST MARCH, 1931—*continued.*

Net Revenue Account.

1930–31.		1931–32.	1930–31.		1931–32.
£ s. d.	——	£ s. d.	£ s. d.	——	£ s. d.
85,388 19 6	To Interest on purchase-money for plant purchased from Waihi Gold-mining Co., Ltd., and on advances from Treasury	62,523 12 8	82,703 15 10	By Balance from Gross Revenue Account	46,880 18 9
33,009 9 3	Depreciation on completed works (2 per cent.) and on stocks	24,911 10 0	35,694 12 11	Balance to Profit and Loss Appropriation Account ..	40,554 3 11
£118,398 8 9		£87,435 2 8	£118,398 8 9		£87,435 2 8

PROFIT AND LOSS APPROPRIATION ACCOUNT FOR YEAR ENDED 31ST MARCH, 1932, COMPARED WITH YEAR ENDED 31ST MARCH, 1931.

£ s. d.		£ s. d.	£ s. d.		£ s. d.
2,617 15 9	To Balance at close of previous year	38,312 8 8	38,312 8 8	By Balance to general balance-sheet	78,866 12 7
35,694 12 11	Balance from Net Revenue Account	40,554 3 11			
£38,312 8 8		£78,866 12 7	£38,312 8 8		£78,866 12 7

DEPRECIATION RESERVE ACCOUNT.

£ s. d.		£ s. d.	£ s. d.		£ s. d.
17,823 14 5	To Replacements, renewals, &c.	8,378 15 3	165,757 15 4	By Balance at close of previous year	187,573 16 5
187,573 16 5	Balance to general balance-sheet	211,609 10 2	6,630 6 3	Interest for year	7,502 19 0
			33,009 9 3	Amount set aside as per Net Revenue Account	24,911 10 0
£205,397 10 10		£219,988 5 5	£205,397 10 10		£219,988 5 5

TABLE No. 6—*continued.*

ELECTRIC SUPPLY ACCOUNT—*continued.*

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

SINKING FUND ACCOUNT.

1930-31.		1931-32.	1930-31.		1931-32.
£ s. d.	——	£ s. d.	£ s. d.	——	£ s. d.
56,740 2 7	To Balance	59,159 13 11	54,445 6 5	By Balance at close of previous year	56,740 2 7
			2,294 16 2	Interest	2,419 11 4
£56,740 2 7		£59,159 13 11	£56,740 2 7		£59,159 13 11

BALANCE-SHEET AT 31ST MARCH, 1932.

1930-31.	*Liabilities.*	1931-32.		1930-31.	*Assets.*	1931-32.	
£ s. d.		£ s. d.	£ s. d.	£ s. d.		£ s. d.	£ s. d.
187,573 16 5	Depreciation reserve	..	211,609 10 2	305,665 3 1	Works at Horahora— Headworks, generating station, transformer buildings, and machinery, &c.	..	306,272 3 4
	Sinking Fund—						
49,668 0 0	Utilized for redemption of loans ..	49,668 0 0					
7,072 2 7	Amount available for further redemptions	9,491 13 11	59,159 13 11				
56,740 2 7							
	Sundry creditors—						
6,606 1 11	Public Works Department	22,906 7 0					
1,591 11 10	Other Government Departments ..	2,233 7 3					
61,017 9 9	Non-departmental	53,766 6 1	78,906 0 4				
69,215 3 6				1,696,040 14 5	Works at Arapuni— Headworks and tail-race, machinery, transformers and switch-gear, buildings, &c.	..	2,016,934 17 2
	Balance carried to general balance-sheet—				Auxiliary plants—		
4,072,995 3 10	Total assets as *per contra*	4,681,255 8 7		9,139 9 4	Waihi Grand Junction steam-plant ..	9,139 9 4	
313,529 2 6	*Less* liabilities as above	349,675 4 5	4,331,580 4 2	61,770 10 7	Diesel station, Penrose	61,814 9 5	
3,759,466 1 4				11,169 15 6	Huntly steam-plant	10,855 14 1	
				82,079 15 5			81,809 12 10
4,072,995 3 10	Carried forward	..	4,681,255 8 7	2,083,785 12 11	Carried forward	..	2,405,016 13 4

TABLE No. 6—*continued.*

ELECTRIC SUPPLY ACCOUNT—*continued.*

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

BALANCE-SHEET AT 31ST MARCH, 1932—*continued.*

1930-31.	*Liabilities.*	1931-32.	1930-31.	*Assets.*	1931-32.
£ s. d.		£ s. d. £ s. d.	£ s. d.		£ s. d. £ s. d.
4,072,995 3 10	Brought forward	.. 4,681,255 8 7	2,083,785 12 11	Brought forward	.. 2,405,016 13 4
			606,605 1 9	Transmission-lines	.. 637,762 17 2
			386,555 19 7	Substations	.. 419,052 13 11
			40,867 19 9	Distribution-lines	.. 40,852 19 9
				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		10,830 10 9
			19,020 11 1	Hamilton Area—Land at Ruakura, stores, buildings, staff residences, &c.	.. ..
			16,718 6 6	Loose tools and equipment, motor-lorries, cars, &c.	.. 19,233 15 1
			158,784 6 0	Salaries of officers, engineering office, and general expenses on surveys and on construction	.. 178,516 16 10
			459,952 10 4	Interest during construction	.. 612,625 5 1
			135,790 12 4	Cost of raising loans	.. 148,600 12 4
			20,210 14 6	Stocks of spares, &c., on hand	.. 23,594 16 8
			3,939,122 5 6		4,496,087 0 11
			53,918 12 11	Stocks of material on hand	.. 57,216 19 4
				Debtors—	
			34,569 14 2	For electricity and sales of materials ..	.. 39,593 1 10
			7,072 2 7	Sinking-fund Investments	.. 9,491 13 11
			38,312 8 8	Net loss	.. 78,866 12 7
£4,072,995 3 10		£4,681,255 8 7	£4,072,995 3 10		£4,681,255 8 7

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.—(Sgd.) J. H. FOWLER, Acting 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, 1931.	Area commanded (Gross).	Area irrigated at Present.	Works authorized.		Works completed.		Expenditure to 31st March, 1932.	Remarks.
			As per Design.	During 1931–32.					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	..	20·23 (Stewart Settlement)	13·87	18,000	..	14 60	50 31	14 60	50 31	12,115	Completed.
Otekaike	Otekaike River ..	9	15	..	21·50 (Duntroon)	15·67	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	100	16·04 (Moa Creek)	19·46	14,000	11,251	73 0	54 0	73 0	29 50	272,245	Completed. Additional storage now furnished by Poolburn Dam.
Galloway	Manorburn Dam ..	..	30	31	14·16 (Galloway)	17·30	3,450	2,503	10 50	10 7	10 50	10 7		
Manuherikia – Alexandra–Clyde No. 1	Manuherikia River	77	100	86	15·11 (Alexandra, Ophir, and Clyde)	15·41	7,000	5,385	23 0	46 20	23 0	46 20	232,158	Completed.
Ardgour	Lindis River ..	35	20	20	19·67 (Tarras)	24·53	2,000	1,462	13 0	2 40	13 0	2 40	33,507	Completed.
Arrow River ..	Arrow River ..	40	50	26	27·50 (Arrowtown and Frankton)	33·53	6,536	4,077	..	..	9 18	23 2	139,172	Completed.
Hawkdun (formerly Mount Ida)	Tributaries of Manuherikia River and Eweburn Reservoir	..	60	29·5	24·37 (Naseby and Naseby Plantation)	23·37	10,000	8,096	66 0	101 0	66 0	90 12	67,592	Completed.
Earnscleugh (Fraser River)	Fraser River ..	10	47 (all races)	61	14·68 (Earnscleugh)	19·04	2,743	2,053	11 30	17 60	11 30	17 60	10,488	Completed.
Last Chance (Fruitlands and Earnscleugh Tops)	Shingle, Coal, Gorge, and Butcher's Creek	8	20	15·75	15·51 (Earnscleugh and Roxburgh East)	20·98	4,300	2,915	22 0	5 70	20 78	5 70	28,765	Completed.
Tarras	Lindis River ..	35	70	40	19·67 (Tarras)	24·53	6,000	2,860	21 70	17 55	21 70	17 55	136,045	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	56	16·35 (Roxburgh East)	22·93	3,300	3,841	16 51	10 55	16 51	10 55	54,690	Completed and serving all land requiring water.
Teviot River Extension	Ditto	40	80	56	16·35 (Roxburgh East)		2,000		3 77	4 2	3 77	4 2		Completed.
Idaburn	Idaburn Dam ..	3	8	6	23·13 (Moa Creek, Blackstone Hill)	24·81	2,500	280	10 0	0 40	7 26	0 40	6,690	Nearly completed.
Omakau	Manuherikia River and Storage Dam	36	65	..	20·51 (Clyde, Ophir, and Blackstone Hill)	20·75	10,800 (irrigable)	..	42 0	50 0	1 0	..	28,140	8,000 acres to be supplied from main race and 2,800 acres from Thompson's and adjacent creeks.
	and Thompson's Creek	7	15											

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, 1932.	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	..	2,729	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	6,467	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	80	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	..	..	..	..	..	..	..	..	..	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, 1932.

APPENDIX A.

AUDITED STATEMENT OF EXPENDITURE ON PUBLIC WORKS OUT OF THE PUBLIC WORKS FUND FOR THE YEAR 1931-32.

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

SIR,— Public Works Department, Wellington, 11th August, 1932.

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.,
CHAS. E. MACMILLAN,
Acting 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 1931-32.

Vote.	Summary.	Appropriation.	Gross Expenditure.	Credits in Aid.	Net Expenditure.
	General Purposes Account—	£	£ s. d.	£ s. d.	£ s. d.
38	Public Works, Departmental	150,000	265,791 4 0	114,414 13 9	151,376 10 3
39, 40	Railways	1,720,000	1,462,832 4 2	510,443 19 10	952,388 4 4
41-49	Public Buildings	680,600	470,171 10 0	15,367 12 3	454,803 17 9
50	Timber-supply and Sawmills, &c., for Public Works Department	2,400	2,019 12 11	8 0 0	2,011 12 11
51	Acquisition and Operation of Quarries for Public Works Department	5,000	5,601 12 7	5,494 13 6	106 19 1
52, 53	Lighthouses and Harbour-works	25,000	12,264 18 9	231 9 9	12,033 9 0
54	Development of Tourist Resorts	110,000	88,074 3 10	465 9 5	87,608 14 5
55	Department of Immigration	10,000	15,227 18 0	9,962 7 5	5,265 10 7
56, 57	Roads, Bridges, and other Public Works ..	1,325,000	1,122,323 4 5	40,113 1 8	1,082,210 2 9
58	Telegraph Extension	250,000	311,336 17 0	61,358 13 1	249,978 3 11
59	Lands, Miscellaneous	100,000	45,328 2 0	6,428 10 10	38,899 11 2
60	Irrigation, Water-supply, and Drainage ..	75,000	40,844 7 9	3,095 16 5	37,748 11 4
61	Plant, Material, and Stores	20,000	39,630 3 11	145,320 3 5	*Cr.*105,689 19 6
..	Unauthorized—Services not provided for ..	..	471 19 5	471 19 5	..
	Totals, General Purposes Account ..	4,473,000	3,881,917 18 9	913,176 10 9	2,968,741 8 0
62	*Electric Supply Account*—	1,374,000	1,258,476 11 1	16,680 0 7	1,241,796 10 6
	Totals, Public Works Fund ..	5,847,000	5,140,394 9 10	929,856 11 4	4,210,537 18 6

APPENDIX A—*continued.*

	Name of Vote.	Appropriation.	Gross Expenditure.	Credits in Aid.	Net Expenditure.
	PUBLIC WORKS FUND.	£	£ s. d.	£ s. d.	£ s. d.
	General Purposes Account—				
38	Public Works, Departmental	150,000	265,791 4 0	114,414 13 9	151,376 10 3
	Railways—				
39	Railway-construction	700,000	651,672 4 0	61,128 19 9	590,543 4 3
40	Railways Improvement and Additions to Open Lines	1,020,000	811,160 0 2	449,315 0 1	361,845 0 1
	Public Buildings—				
41	General	70,400	33,329 17 1	104 4 6	33,225 12 7
42	Courthouses	8,000	3,540 16 4	27 11 9	3,513 4 7
44	Prison Buildings and Works	5,000	2,993 3 6	372 0 1	2,621 3 5
45	Police-stations	8,000	2,592 9 5	57 6 6	2,535 2 11
46	Postal and Telegraph	140,000	115,184 9 7	10,678 19 11	104,505 9 8
47	Agricultural	2,200	..	..	..
48	Mental Hospital Buildings	90,000	46,606 16 7	668 8 8	45,938 7 11
49	Health and Hospital Institutions ..	7,000	3,358 11 0	42 10 0	3,316 1 0
43	Education Buildings	350,000	262,565 6 6	3,416 10 10	259,148 15 8
50	Timber-supply and Sawmills, &c., for Public Works Department	2,400	2,019 12 11	8 0 0	2,011 12 11
51	Acquisition and Operation of Quarries for Public Works Department	5,000	5,601 12 7	5,494 13 6	106 19 1
	Lighthouses and Harbour-works—				
52	Lighthouses	10,000	5,060 8 9	14 4 6	5,046 4 3
53	Harbour-works	15,000	7,204 10 0	217 5 3	6,987 4 9
54	Development of Tourist Resorts	110,000	88,074 3 10	465 9 5	87,608 14 5
55	Department of Immigration	10,000	15,227 18 0	9,962 7 5	5,265 10 7
	Construction and Maintenance of Roads, Bridges, and other Public Works—				
56	Roads, &c.	1,300,000	1,118,383 12 1	40,113 1 8	1,078,270 10 5
57	Roads to give access to Outlying Districts	25,000	3,939 12 4	..	3,939 12 4
58	Telegraph Extension	250,000	311,336 17 0	61,358 13 1	249,978 3 11
59	Lands, Miscellaneous	100,000	45,328 2 0	6,428 10 10	38,899 11 2
60	Irrigation, Water-supply, and Drainage ..	75,000	40,844 7 9	3,095 16 5	37,748 11 4
61	Plant, Material, and Stores	20,000	39,630 3 11	145,320 3 5	*Cr.*105,689 19 6
..	Unauthorized—Services not provided for ..	..	471 19 5	471 19 5	..
	Totals, General Purposes Account ..	4,473,000	3,881,917 18 9	913,176 10 9	2,968,741 8 0
	Electric Supply Account—				
62	Development of Water-power	1,374,000	1,258,476 11 1	16,680 0 7	1,241,796 10 6
	Totals, Public Works Fund ..	5,847,000	5,140,394 9 10	929,856 11 4	4,210,537 18 6

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.

F. W. FURKERT,
Engineer-in-Chief and Under-Secretary.

Examined and found correct, subject to the foregoing Departmental note.—J. H. FOWLER, Deputy Controller and Auditor-General.

APPENDIX B.

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

SIR,— The ENGINEER-IN-CHIEF to the Hon. MINISTER OF PUBLIC WORKS.

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 the 1st July, 1931, to the 30th June, 1932.

Table 3 above shows the expenditure on Government railways in New Zealand up to the 31st March, 1932, and also the mileage opened for traffic.

RAILWAYS.

NORTH AUCKLAND MAIN TRUNK RAILWAY.

Owing to the suspension of construction in January, 1931, the work done during the year under review has consisted mainly of clearing up and maintenance. All unused materials have been collected and brought into the main depot at Okaihau. All items of portable plant have been similarly dealt with, and these have also been overhauled and repaired. These items comprise five steam shovels, seven locomotives, fifty wagons, and twenty oil-engines; pumps, crushers, and other minor plant items.

A gang of four men has been employed throughout the year in maintaining the Rangiahua Section of this railway. The greater part of its time has been occupied, so far, in maintaining the 30 miles of fencing which encloses the railway works. A considerable part of this fencing is through slipping country and on this account demands continual repair and maintenance, in order to protect new earthworks from damage by straying stock. Inlets and outlets to culverts have been kept open, and general maintenance has also been carried out in connection with workers' accommodation, drainage, and water-supply.

TAURAROA QUARRY.

During the year no operations were carried on at this quarry. All the elevator belts and buckets have been dismantled, the buckets painted, and the belts stored under cover. Screens and outside ironwork have been painted, ropes tarred, and all plant thoroughly oiled and greased to protect it from weather, &c.

DARGAVILLE BRANCH RAILWAY.

As construction work closed down during the preceding year, operations for the year covered by this report consisted of the maintenance of the permanent-way, Kirikopuni to Tangowahine, the running of the goods service over the same length, and work involved in reconditioning plant and of looking after and disposing of stores, material, &c.

Twenty-one workmen's married quarters and nine single men's huts were disposed of by sale.

NAPIER–GISBORNE RAILWAY.—WAIKOKOPU–GISBORNE.

Construction work on this railway had ceased at the end of the year 1930. Owing to the difficulties regarding finding other employment and other accommodation, the married men previously employed were allowed to retain the use of the cottages and hutments in the construction camps. Certain social services, such as medical attention and supply of firewood, were maintained in these camps till December, 1931, when they were withdrawn.

Some work was done during the year overhauling plant and some items transferred after reconditioning. A quantity of construction material has also been transferred or sold locally.

NAPIER–GISBORNE RAILWAY.—NAPIER–WAIROA SECTION.

Putorino Section (10 m. 56 ch. to 37 m. 35 ch; length 26 m. 59 ch.).—This section, though under the control of the Railway Department, was partly restored after the earthquake of the 3rd February, 1931, by this Department for the purpose of running ballast from Waikoau to the Wairoa Section. The balance of the line from Waikoau to Eskdale was sufficiently restored to allow a works train to operate.

In addition repairs and restoration were carried out on a fairly large scale on the Matahoura Viaduct at the request of the Railway authorities. The foundation of one of the piers of this structure was endangered by earthquake cracks in the previously solid country. Careful exploration was carried out on the northern face of the gorge about this pier by sinking shafts and piercing drives so that the nature of the cracks in the country could be ascertained and recorded. These drives were afterwards filled with reinforced concrete so that the various portions of the solid country would be firmly tied together.

Cement grout was forced into the cracks and the locality thus well strengthened.

Wairoa Section (37 m. 35 ch. to 70 m. 67 ch.; length 33 m. 32 ch.).—This section was proceeded with expeditiously up to early in October, 1931, when in accordance with the Railway Board's report, Parliament decided works were to cease. At this stage all the earthwork on the section was in such

a state that rails could have been laid over the whole section. The only large works which remained to be completed were Kotemaori Tunnel and Mohaka Viaduct.

Rails had reached 41 m. 75·50 ch. at the south end and 49 m. 53 ch. on the northern end, and rails and sleepers were in hand for the gap of 7 m. 58 ch. remaining, trimming of formation of this remaining length being well in hand.

The following details show the construction work carried out during the year until the works were closed down: 7 m. 13 ch. of fencing was erected, the fencing on the section being now practically complete. Three water-drives were lined with concrete, and six 18 in. concrete-pipe culverts were installed. The formation carried out has consisted mainly of increasing widths in cuttings and banks which had already been made, but some new work was carried out between the Mohaka Station yard and the Maungaturanga Viaduct; there is still one bank, however, which requires widening to bring it to full width. At the northern end of the Waihua Tunnel the country is unsatisfactory and is slipping over a considerable area, and to overcome this trouble some extensive work is likely to be required when the completion of the railway is put in hand.

Kotemaori Tunnel.—During the year 7½ chains of enlargement and lining were completed, and this work is complete, except for the construction of the southern portal where the ground is of good standing quality. When the works generally were closed down the tunnel work was continued as the ground was wet and unsatisfactory and collapse would have occurred if excavation had been left unfinished.

Mohaka Tunnel.—The northern portal was completed early in the year.

A good deal of trimming of formation was done in readiness for platelaying, but owing to stoppage of works this work will lose its value; 2½ miles of platelaying was done, including laying of rails into the Mohaka Station yard from the Wairoa end, and the laying of some of its sidings. Rails for the 7½-mile gap in the permanent-way were bent for curvature, and the sleepers adzed in readiness for platelaying. Good progress was made with ballasting, the work done being 2½ miles of first lift, 24½ miles of second lift, and 6 miles of third lift.

Waikare Viaduct.—This work had been completed, but suffered some minor damage and displacement during the earthquake of February, 1931. Complete restoration was effected. The southern abutment was strengthened by concreting, and all cracks grouted. At the southern end three steel spans had been pushed over by the abutment 2½ in. in the direction of tower F. This steel was moved to its correct position, and the holding-down bolts repaired and tightened up.

Mohaka Viaduct (at 49 m. 35 ch.).—Foundations for this structure were completed during the year. This represents a very considerable volume of work, the river piers having been sunk 60 ft. to 70 ft. below the river-bed to rock foundations, and the piers on the gorge sides having been very carefully constructed to solid foundations. At the time of the closedown everything was in order for the erection of steel which would have been erected within eight months. Large towers for the erection cableway were erected at each bank and cables were on the site ready to be slung, while foundations for the machinery were concreted, as were the anchor-blocks for the large cables.

The fabrication of the steel, in hand at the Public Works Workshop at Tauranga, was completed towards the close of the year. As completed it was shipped to Waikokopu and railed, the greater part to the site and some to Wairoa Station yard. Cleaning and painting of this steel is in hand. The work is essential to the preservation of the steel during the time it is stacked awaiting being put into use. The machinery for erection is now housed at Maungaturanga, and the wire ropes and cables are suitably housed for protection from the weather.

Maungaturanga Viaduct (57 m. 45 ch.).—During the year the erection of the steel piers and girders of this viaduct was carried out, the steel having been fabricated at Tauranga Workshops, shipped to Waikokopu, and railed to site and then erected by means of the Henderson 7½-ton duplex cableway. This work was carried out very expeditiously and at very satisfactory cost. After erection the structure was painted, so that every part of it has had at least three coats of paint. The permanent sleepers and rails for the running top have yet to be laid, traffic in the meantime using temporary rails and sleepers.

Subway (at 44 m. 30 ch.), consisting of steel spans erected on concrete and timber piers, was completed.

Buildings.—At Mohaka Station yard, a goods-shed, loading-bank, and 60,000-gallon water-vat were erected. Maintenance painting to cottages at Wairoa was carried out. No steps have been taken to restore the concrete-block cottages that suffered considerable damage during the earthquake.

Considerable sales have taken place during the year of huts and cottages built for workmen's accommodation. Material and plant, which is not required, is being disposed of by sale as opportunity offers.

Waikokopu Branch Railway.

The Waikokopu Section, 24 m. 30 ch. long, has been maintained to a sufficient standard to allow goods traffic to be continued.

The revenue, however, being small, it has been necessary to severely curtail the number of maintenance men employed so that it has not been possible to keep the track in the usual first-class order. Weeds grow prolifically on this section and blackberries are a very serious menace, so that the control of these growths more than keep the few maintenance men fully occupied. An attempt is being made to control these by spraying.

A goods service has been maintained throughout the year, which returned a surplus over working-expenses.

STRATFORD MAIN TRUNK RAILWAY.—EAST END.

Matiere Section (0 m. to 0 m. 10 ch.).—This section has now been completed for some time, but general maintenance has been attended to. There has been considerable traffic.

Ohura Section (10 m. to 19 m. 10 ch.; length, 9 m. 10 ch.).—This section has also been completed and maintained. A regular passenger, goods, and mail service has been run between Okahukura and Ohura, and in May of this year was extended to Heao when the work was sufficiently far advanced to enable this to be done.

Tokirima Section (19 m. 10 ch. to 29 m. 70 ch.; length, 10 m. 20 ch.).—Some two miles of fencing and 250 lin. ft. of culverts, varying in size from 1 ft. to 3 ft. have been completed. Two small railway and three road overbridges have been erected.

The formation of all station-yards has been completed, together with road-deviations, including the metalling of access roads to station-yards.

Platelaying and ballasting has also been completed.

At Mangaparo and Tokirima Station yards, shelter-sheds, goods-sheds, loading-banks, and stock-yards have been erected.

Heao Section (29 m. 70 ch. to 55 m. 40 ch. on chainage from Western end; length, 3 m. 50 ch.).—The formation generally, with the exception of tunnelling, has been practically completed, and the remaining culverting has been carried out; the total length of all culverting being 133 ft., and the sizes varying from 1 ft. to 4 ft. In addition to this, concrete fronts have been placed on the culverts which had been built during the previous period.

Three bridges over the Heao Stream are practically complete; these bridges consist of plate girder spans on concrete abutments, and the total length of the three bridges is 465 ft.

Tunnel-work, which included the completion of the Heao No. 1 and the vigorous prosecution of the eastern end of the Mangatiti, provided a heavy programme particularly during the early part of the year. The latter tunnel is being worked from both ends, and there is only a very short distance to go before the headings are pierced, and this will then only leave 3 or 4 chains to line. The completion of this tunnel will remove the last obstacle to the connection of both ends of the line, and will then enable platelaying to be completed and through traffic instituted.

In the Mangatiti Tunnel the lining is completed to 55 m. 48·32 ch. and the bottom heading to 55 m. 46 ch.

A retaining-wall 3·25 chains long and 7 ft. high has been constructed in stream-diversion left of 31 m. 27 ch. with a weir across the lower end to restrict velocity of flow.

The railhead has been pushed forward to 31 m. 55 ch., thus leaving $1\frac{3}{4}$ miles to complete to 55 m. 46 ch. on the western end, which marks the junction between the activities on the east and west ends respectively.

Ballasting is well forward, the first lift being close up to the railhead, and the second and third lifts some half a mile farther back, a total of 4 m. 54 ch. of first lift, 5 m. 10 ch. of second lift, and 5 m. 30 ch. of third lift.

The station buildings at Heao are in hand, and the ballasting of Heao and Tokirima Station yards has been completed.

Provided no unforeseen contingencies occur, it is anticipated that the Department will be able to handle through traffic in November, and the work should be finally completed about 31st March, 1933.

The average number of men employed has been 230. At the beginning of the year it was 341, but the numbers have dropped as the work approaches completion, the present number employed being 120.

A number of hutments and cottages occupied by the men has been disposed of as they became vacant, some to settlers and others in conjunction with the Government's scheme for the settlement of unemployed on small farms.

All plant has been maintained in good order and items not required have been overhauled and stored.

STRATFORD MAIN TRUNK RAILWAY (WEST END).

Raekohua Section (47 m. 40 ch. to 50 m. 60 ch.; length 3 m. 20 ch.).—With the exception of trimming batters in the Tangarakau Station yard, all earthwork was completed on this section.

The bridge at 50 m. 54 ch. over the Tangarakau River was completed. The main girders were successfully launched without building temporary staging. This bridge consisted of one 25 ft., one 30 ft., two 60 ft., and one 80 ft. girder spans on concrete piers.

Grids were built at the intakes of the 8 ft. culverts at 48 m. 50 ch. and 50 m. 25 ch. and at the 4 ft. culvert at 48 m. 35 ch.

Platelaying, including all the sidings in the station-yard was completed, and the section was maintained and kept in good order. Ballasting was carried through the Tangarakau Station yard to the end of the section, and stone and field-pipe drains laid across the station-yard every chain for drainage purposes.

The Tangarakau Station yard at 50 m. 50 ch. has been practically completed, and the approach road on the left from 50 m. 49 ch. to 54 m. put in.

A tri-weekly passenger and goods service was maintained between Tangarakau and Tahora as well as the daily service hauling coal from the Egmont Colliery Siding to Tahora.

The Te Wera Quarry was operated for the supply of ballast and for concrete material throughout the period, and 7,348 cubic yards was hauled from Te Wera to Tangarakau.

Heao Section (50 m. 60 ch. to 55 m. 46 ch.; length, 4 m. 66 ch.).—Last year the Heao Section finished, as far as the western end was concerned, at 55 m. 40 ch., but owing to this end being further ahead with No. 4 tunnel construction than the eastern end, 6 chains extra was taken in hand, bringing the end of the section now to 55 m. 46 ch.

All earthwork on the section was completed. From 52 m. 68 ch. to 52 m. 75 ch. a deviation was made taking the permanent line round the large pug slip, which has caused serious trouble, and which threatened much more unless isolated altogether. A stone wall 8 ft. by 8 ft. 2 chains long, was built here to retain the toe, while the batter on the right was stone-pitched. Slips were cleared throughout, the heaviest being at 54 m. 72 ch. to 54 m. 74 ch. and at 55 m. 3 ch. to 55 m. 8 ch. An 8 ft. by 8 ft. retaining-wall of boulders 5 chains long was built at 55 m. 3 ch. to 55 m. 8 ch. at the toe of a bad pug slip.

Construction of No. 4 tunnel was completed from the portal 55 m. 16 ch. to 55 m. 40 ch. by the end of March, 1932. As there was then about 12 chains between lining-faces a further 6 chains was taken over by the west-end party. The completed face of No. 4 tunnel has been advanced from 55 m. 24·45 ch. to 55m. 43·50 ch., while the bottom heading advanced from 55 m. 38·77 ch. to 55 m. 44·39 ch. The lining-face at the east end advanced to 55 m. 48·32 ch. and the bottom heading to 55 m. 46 ch. Very heavy ground has been met with, slowing up progress. Considerable stone has also been encountered, especially in the top heading and in the footings, but the tunnel should be completed early in September.

The spillway over No. 4 tunnel at 55 m. 20·50 ch. was completed and the creek turned over it.

Seven culverts, varying from 1 ft. 6 in. to 6 ft. were constructed, with an approximate length of 160 ft.

To protect the inlets of deep culverts or water-drives from danger of being blocked up by debris, grids were built at the mouth of five culverts and water-drives.

The bridge at 54 m. 40 ch. over the Mangatete Stream, which consists of one 20 ft., one 25 ft., one 30 ft., and one 50 ft. girder spans on concrete piers was completed.

The laying of the permanent-way was completed from 50 m. 60 ch. to 54 m. 45 ch., while from 54 m. 45 ch. to 55 m. 10 ch. is in hand. Owing to the permanent formation being used for forward transport, platelaying has been difficult, and could only be done in short lengths so as not to hold up traffic.

The first lift of ballast was completed from 50 m. 60 ch. through to 54 m. 40 ch. The second lift was completed from 51 m. 0 ch. to 52 m. 64 ch.; and from 53 m. 10 ch. to 54 m. 30 ch., while the third lift was completed from 51 m. 0 ch. to 52 m. 61 ch., and from 53 m. 20 ch. to 54 m. 30 ch.

The power-house at Tangarakau operated satisfactorily, and supplied power for three electric locos, one at No. 4 tunnel, one on transport between No. 3 and No. 4 tunnels, and one on earthwork at the 53 m. deviation, also for driving the compressor unit which supplied air for the various drills, picks, and breakers operating on the job. The multitubular boiler was retubed and transferred.

As the work approached completion hands were shortened down from 190 at the beginning to 84 at the completion of the period.

It is anticipated that if no unforeseen contingencies arise we shall be able to arrange for through traffic in November next, and hope to complete the work finally by the end of the ensuing financial year.

Wellington – Tawa Flat Railway Deviation.

During the year it became necessary to considerably reduce the rate of progress on this work, so that expenditure might be kept within the limits fixed. Instead of excavating four faces in the enlargement of the long tunnel only two are now being worked, and the average number of men employed has been reduced from 435 to 230, and these are working short time.

Sea-wall and Embankment.—The sea-wall protecting the embankment from Kaiwarra Station to the commencement of the No. 1 tunnel has been completed during the year to a height of 5 ft. above high-water mark from 2 m. 0 ch. to 1 m. 64 ch., a distance of 16 chains.

The embankment to a height of 3 ft. above high-water mark was made from 1 m. 59 ch. to 1 m. 73 ch., a distance of 14 chains, and has been completed up to formation-level to half its full width, from 1 m. 69 ch. to 2 m. 5 ch., a distance of 16 chains; this bank has also been widened to full width from 1 m. 69 ch. to 2 m. 21 ch.

No. 2 Tunnel (length, 2 m. 53 ch.).—At the date of my last report there remained 14 chains of heading to drive in this tunnel, and this has been completed during the year. The pioneer heading was completed also over the remaining distance of 21½ chains. Four connections were made between the main heading and the pioneer heading. Full enlargement and lining were completed for a distance of 39 chains from the south end and 31 chains from the north end of the tunnel, also 3 chains were completed from the shaft, making a total distance of 73 chains completed for the year. There are now 73 chains remaining to finish this tunnel. At the present greatly decreased rate of expenditure it cannot now be completed for another two years.

With the exception of a small gap at 8 m. 35 ch., formation is completed up to and including Tawa Flat Station yard—that is, to the end of the deviation.

All bridges have been completed. Concrete culverts to a total length of 400 ft. were completed, comprising 184 ft. of 2-ft.-diameter pipe, and 216 ft. of 2-ft.-6-in.-diameter pipe.

Creek diversions at 8 m. 30 ch. and 8 m. 60 ch. were completed, and protective works were constructed in diversions of the Porirua Stream at 6 m. 72 ch. and 8 m. 15 ch.

A gravity water-supply was installed for settlers whose natural water supplies had drained away after the driving of the long tunnel. This involved the construction of a small dam, 2¼ miles of main pipe-line, a service reservoir, and about 1½ miles of pipe reticulation.

Westport–Inangahua Railway.

In accordance with the Railway Commission's finding, construction work on this line ceased on the 21st October, 1931, and, with the exception of the cylinder-sinking at the Cascade Bridge to achieve safety of work in progress, the only work since that date has been the dismantling, overhauling, and storage of construction plant and materials. The following work was carried out, however, during the period under review :—

Cascade Section (5 m. 70 ch. to 8 m. 78 ch. ; length, 3 m. 8 ch.).—Although this section is completed, the Department has maintained it in order to enable the Railway Department to transport the Cascade Coal Co.'s coal from Cascade to Westport.

Hawk's Crag Section (8 m. 78 ch. to 18 m. ; length, 9 m. 2 ch.).—Up to the time of cessation of work 28,769 cubic yards of material had been excavated in general formation work and much of this had to be led some distance by petrol locomotives to large fillings which had been under construction for some time. These, together with the cuttings from which the spoil was excavated, were the only remaining earthwork sections which had not been formed. At one of these places, 11 m. 10 ch. to 11 m. 50 ch., several cuttings were linked up by service tram run round the steep sidlings and over temporary bridges, and work was illuminated at night so that by working two shifts delay caused by these remaining cuttings and fillings could be reduced to a minimum.

In the tunnel at 13 m. 41 ch. a further 362 ft. of heading had been driven, making the total length 543 ft.

Arrangements were well in hand for the supply of gravel for the concrete lining, transporting of the necessary cement across the Buller River, and the making and placing of same in the tunnel as soon as possible after the enlargement of the heading to full dimensions.

A further three culverts were constructed during the short period work was in progress at places where shingle for concrete was available in the vicinity. One of the difficulties in the way of both culvert and bridge construction was the inaccessibility of sources of supplies of good concrete aggregate. At the time the work was suspended a comprehensive arrangement for the carrying-out of concrete work was planned.

The bridge of greatest magnitude on this section, and one which held up the advancement of the railhead, is the five 80 ft. and one 40 ft. steel-girder-span bridge on a 7½ chain curve at Cascade Creek, 9 m. 0 ch. Upon the closing-down of the works, as a considerable amount of plant had been assembled for the sinking of the nine cylinders in the piers, and as all the temporary-stage work was in readiness, it was decided that the sinking of the cylinders should be completed. At the end of last year one of the mass concrete piers had been completed, and another well advanced, while cylinder sinking on one of the three triangular-shaped piers was nearing completion. The second mass concrete pier has now been completed, two of the three sets of cylinders have been sunk to suitable foundations, and the third and last set is almost down to the required level.

The whole of the steel for this bridge was delivered in sections, but as it was not intended to proceed with its assembly, all surfaces were carefully painted to prevent corrosion and the several spans were stacked in a manner best suited to resist weather conditions.

While work was proceeding at Cascade Bridge in the early part of the year materials were transported over a temporary bridge to 10 m. 24 ch., where the construction of a three 30-ft.-span steel-girder bridge was under way. The completion of the first abutment was as far as this bridge was allowed to proceed. Numerous other bridges had been designed for spanning creeks ahead of the rails and for several of these, steel girders have been fabricated on contract. These have not been delivered, but have been stored in Auckland where the contract was carried out.

Between 9 m. and the railhead at 10 m. 26 ch. a start was made with ballasting and the spreading of 1,000 cubic yards of ballast enabled one lift to be made along this length.

Orikaka Section (18 m. to 27 m. 34 ch. ; length, 9 m. 34 ch.).—The rate of progress of formation work at the end of last year was maintained up to the time construction work ceased. In that period 54,502 cubic yards of material were excavated and a large proportion went into the fillings of banks at 20 m., 21 m. 62 ch., and 26 m. 60 ch. What remains to be done in these large fillings, together with some heavy sidling cuts near 24 m. 12 ch. forms the bulk of the remaining earthwork on this section.

A suspension bridge, 540 ft. long, was erected at 19 m. in the early part of last year to give access to the railway works. Two concrete culverts were also constructed in this locality at the same time.

What would have been the largest undertaking on this section was the construction of the bridge across the Buller River at 25 m. 42 ch. Plans had already been prepared and tenders invited for the manufacture of special plant and the delivery of materials.

The undermining of the Nelson–Inangahua Junction Main Highway at Inangahua necessitated the construction of an overhead bridge to carry the road over the railway cutting at 26 m. 27 ch. Here a substantial three 20-ft.-span reinforced-concrete structure was completed.

Access to the work across the Buller River from the camps was obtained by means of the suspension foot-bridges which proved invaluable when it was decided to introduce shift work into some of the operations, particularly as the river is subject to rapid rising in wet weather, and would not be safe for ferry work at night. Rainfall for the past twelve months in the Buller Gorge has been 175·34 in.

Prior to works closing down in October, 1931, the workshop at Tiroroa, 12 m., was kept steadily employed on the repairs to vehicles and items of plant as well as the making-up of ironwork for bridges and general construction use. Subsequent to the cessation of construction operations the staff has been kept very busy overhauling plant thrown out of commission.

The average number of men employed during the four-monthly period when the work was fully manned was 350, but including those 33 men who are working at Cascade Bridge the total number of men now employed on the railway is 40.

SOUTH ISLAND MAIN TRUNK RAILWAY.—NORTH END.

The work on this line was being pushed on vigorously and very good progress was being made when instructions were received in October last to close down construction.

All single men were dispensed with, but sufficient married men were retained for about another three months to complete various essential works, and to deal with the dismantling and reconditioning of plant and the sorting, stacking, or storing of all material. However, the following work was carried out during the period between the end of June, 1931, and the closing-down of the works.

Clarence Section (56 m. to 76 m.; length, 20 miles).—All formation work on this section has been completed with the exception of the section at the Blue Slip from 60 m. 61 ch. to 61 m. 8 ch. Work was proceeding vigorously at this point and good progress had been made when the works closed down; two steam-shovels being engaged in excavating the spoil, which was being taken away by means of muck-trains and used to clothe the batters of the various sand embankments throughout the section.

The main highway has been transferred to the bench which has been excavated for the railway, and there is a risk that leaving the work in an incomplete state may endanger the highway if the slip continues to move forward. Arrangements have been made, therefore, to leave the steam-shovels adjacent to either end so that in an emergency they may be made use of.

At Waimea Stream Bridge at 56 m. 50 ch. all piles have been cast.

Deadman's Stream Bridge (67 m. 37 ch.): At this bridge, consisting of five 30 ft. plate-girder spans, the concrete piled piers and abutments have been completed and a temporary top was erected to enable traffic to use it.

Kekerangu Stream Bridge, at 63 m. 15 ch., consisting of five 50 ft. and one 25 ft. plate-girder spans on concrete piers, was completed as far as the piers and abutments were concerned, and a temporary superstructure was also provided.

Woodbank Stream Bridge, at 68 m. 66 ch.: All piles for three 25 ft. plate-girder spans have been driven and capped, and a temporary superstructure of 55 lb. rails erected.

Washdyke Stream Bridge, at 69 m. 71 ch.: Piles have been driven and capped for four 30 ft. plate-girder spans, a temporary top being put on to facilitate platelaying.

Protective works at the approaches to the Kekerangu and Woodbank Stream Bridges were completed.

Road deviations were completed from 64 m. 2 ch. to 64 m. 10 ch.; 69 m. 63 ch. to 69 m. 77 ch., and the overbridge approach at 64 m. 66 ch., was well in hand when the works closed down.

Platelaying was completed to 70 m. 2 ch., a first lift of ballast was completed to 68 m. 16 ch., and all permanent track that was unballasted was boxed in with a covering of ballast to protect the sleepers and formation.

Fencing is practically complete to 61 m. 3 ch. on the right, and to 64 m. 15 ch. on the left.

Kaikoura Section (76 m. onwards).—The majority of the bushfelling and clearing has been completed to 88 m.

The formation on this section generally is very heavy, particularly between 82 m. and 89 m. From 77 m. 25 ch. to 82 m. the formation is practically complete, and from 82 m. to 84 m. it is complete, with the exception of cuttings 82 m. 2 ch. to 82 m. 6 ch., 82 m. 63 ch. to 82 m. 67 ch., 83 m. 40 ch. to 83 m. 42 ch., and 83 m. 73 ch. to 83 m. 78 ch.

From 84 m. to 86 m. a number of cuttings have been opened up, but very little work has been done.

The culverting programme was pushed ahead very vigorously in the early part of the year, and twenty culverts, varying from 1 ft. 6 in. to 10 ft., with a total aggregate length of 945 ft. were completed.

A temporary bridge was erected at Ohau Stream, 84 m. 29 ch., consisting of three 20 ft. timber spans to enable the tunnel face to be opened up.

Several road-deviations which were in hand when the works closed down were completed and metalled. Railway cuttings were back-filled where necessary, and the road generally was put in good order and made safe for traffic.

An extensive system of marram-grass planting to hold the sandy country between 77 m. and 82 m. was well in hand when work ceased.

The whole of the field-work for the survey was completed to 97 m. and recorded, and trial-line location completed to 103 m. 48 ch. The survey of the Hapuka River bed at 92 m. 40 ch. has been completed and plotted.

During the period June–October an average of 378 men were employed.

SOUTH ISLAND MAIN TRUNK RAILWAY.—SOUTH END.

Owing to the closing-down of the work in October last nothing has been done in the latter part of the period other than the collection of gear, clearing up, completion of necessary fencing, and protection of works already carried out on a maintenance basis. A great deal of the material, accommodation, &c., has been sold and transferred to other works. During the year six shovels, one convertible shovel and drag-line, one 1½-cubic-yard steam drag-line, one Barber-Greene excavator, one 30 h.p. Cletrac tractor scoop train, two 2-ton caterpillar tractors with equipment, and nine locomotives have been in constant use.

Up to the date of closing down, the earthwork shifted for the year consisted of 175,830 cubic yards, an average of approximately 44,000 cubic yards per month for the four months that the works were in progress.

Conway Section (44 m. 20 ch. to 56 m.; length, 12 m.).—The major formation work undertaken involved the excavation of the Hawkswood Saddle cutting. This cutting, which is 52 chains long, was originally designed as two approach cuts of 26 chains and a 26-chain tunnel, this arrangement

being considerably cheaper than an open cut undertaken by any methods that had up to this time been used by the Department. However, boring tests revealed the ground to be of a most suitable nature for earthworks on a large scale, and this, combined with the level nature of the country under which the tunnel passed, led to the examination of the problem from an entirely new angle. As time was a vital factor and the removal of some 400,000 cubic yards of spoil was involved, some novel methods of spoil removal were obviously necessary if the earthworks were to be considered in preference to a tunnel. After full consideration, it was decided to remove the spoil from this extremely large cutting in three lifts working from both ends. On the bottom lifts three power shovels were employed and the materials hauled away by trains to form embankments. On the top lifts two 1½-yard drag-lines were to be used working in tandem to handle the spoil back to a safe distance from the edge of the cut, while a small ¾-yard oil drag-line was employed for trimming the side slopes. By this arrangement of plant, it was anticipated that a monthly output of between 50,000 and 60,000 cubic yards would easily be reached and that the total time involved would not exceed nine months as against fifteen months for the fastest methods of completing the approach cuts and tunnel. Up to the time of closing down, the excavation at the southern end of the cut had just been organized on an efficient basis in the first and second lifts with two shovels, and even by these means the estimated monthly production allowed in the estimate for these units has been greatly exceeded, and so favourably did the country prove to lend itself to this method of attack that it is more than certain that a considerable saving over the tunnelling method would have been achieved.

The deviation to avoid bluffs on the originally surveyed line between 54 m. and 55 m. was completed chiefly by the aid of a large power drag-line excavator in quick time and at reduced cost.

The programme of culverting was curtailed during the year owing to the uncertainty of the work proceeding, and owing to very little new formation being opened up. The main work in addition to minor pipe culverts was a 11 ft. by 9 ft. water-drive 140 ft. long at 55 m. 40 ch. Other major works completed were a 6 ft. by 5 ft. water-drive, 98 ft. long, at 44 m. 73 ch., and an 8 ft. by 6 ft. water-drive 90 ft. long, at 55 m. 17 ch.

The road overbridge at 47 m. 45 ch. was completed, being a skew arch in mass concrete.

Approximately 7 miles of permanent fencing, both sides, was completed.

A considerable amount of groyning work between 52 m. 30 ch., and 55 m. 30 ch. was carried out during the period, twenty-one groynes being built.

Oaro Section (56 m. onward).—Formation work has been in hand over 4 miles of this section, about 2½ miles have been completed, but this comprises the easier portion, the heavier cuttings being all opened up, but not very far advanced.

The culvert and fencing work is well in hand.

An average number of 310 men was maintained during the period.

CONSTRUCTION AND MAINTENANCE OF ROADS AND BRIDGES.

Whangarei District.

Huehue–Waimatenui Road (Bay of Islands County).—This road has been widened to 18 ft. for a further mile and culverted. 2 m. was metalled 12 ft. by 6 in., and top course placed over whole length of 11 m. Numerous slips were cleared throughout.

Kaikou–Opahi (Bay of Islands County).—3 m. 48 ch. was formed 16 ft. wide, and 3 m. 40 ch. metalled 9 ft. by 6 in. Relief workers were engaged on the work.

Motatau to Maromaku (Bay of Islands County).—1 m. 68 ch. of road was formed 14 ft. wide and metalled 9 ft. by 9 in.

Owae Valley Road (Bay of Islands County).—Relief workers formed 1 m. 11 ch. to a width of 14 ft. and metalled new formation.

Preston Road (Bay of Islands County).—5 m. 5 ch. of 12 ft. formation was completed by relief workers.

Tokawhero Road (Bay of Islands County).—2 m. 33 ch. 16 ft. formation, 5 m. 11 ch. bottom-course metalling 9 ft. by 6 in., and top course 9 ft. by 3 in. were completed. Two bridges, totalling 80 ft., in rolled-steel joists and New Zealand timbers were erected.

Waikare to Kawakawa (Bay of Islands County).—Three bridges, totalling 265 ft., in rolled-steel joists and mixed Australian hardwood were erected. Slips were cleared from 7 m. of road, and base-course metalling 9 ft. by 6 in. was placed on approximately 10 m. of road.

Donnelly's Crossing–Tutamoe–Waimatenui (Hobson County).—6 m. of road was widened to 18 ft. and culverted. Base-course metalling was completed on whole length of 13 m. to a width of 10 ft. by 6 in., and top course 10 ft. by 3 in. is within 40 ch. of completion. Relief workers were engaged on this work.

Te Kopuru to Poutu (Hobson County).—1 m. 23 ch. of road was formed 16 ft. wide.

Te Kuri Block (Hobson County).—4 m. 77 ch. of road was formed 16 ft. wide and culverted.

Whatoro–Opouteke Road (Hobson County).—5½ m. of road was widened to 18 ft., culverted, and provided with stone drains. 7 m. 43 ch. of bottom-course metalling was completed 9 ft. by 6 in. and 7 m. top course placed 9 ft. by 3 in.

Donnelly's Crossing–Mangatu–Awatuna (Hobson County).—1 m. 72 ch. of road was metalled 10 ft. by 9 in.

Giles Road (Hokianga County).—Relief workers formed 4 m. 23 ch. of road 16 ft. wide and cleared slips over 5 m. of road. Motukiore Bridge, consisting of two 35 ft. spans in rolled-steel joists and mixed Australian hardwood, was erected by contract.

Jensen's Road (Hokianga County).—4 m. 40 ch. of road was surfaced with sandstone to a width of 9 ft. by 6 in.

Mohuiti–Broadwood (Hokianga County).—3 m. 56 ch. of road was widened to 18 ft. and base-course metalling 12 ft. by 6 in. laid over new formation.

Motuti Road (Hokianga County).—1 m. 38 ch. of road was formed 18 ft. wide and metalled 9 ft. by 9 in. Bridge consisting of two 30 ft. spans in rolled-steel joists and mixed Australian hardwood was erected.

Omahuta Block (Hokianga County).—Two bridges were erected each one 40 ft. and one 20 ft. spans in rolled-steel joists and mixed Australian hardwoods. 2 m. 70 ch. of road was metalled 9 ft. by 9 in. Slips were cleared on whole length of road.

Horeke–Taheke Road (Hokianga County).—5 m. of road was metalled 9 ft. by 6 in.

Whakarapa–West Coast (Hokianga County).—Relief workers formed 4 m. of road 16 ft. wide and metalled 56 ch. 10 ft. by 6 in. during the year.

Garton's Road (Mangonui County).—Frear's, Garton's, and Hihi Bridges, each of two 30 ft. spans in rolled-steel joists and mixed Australian hardwood, were erected and approaches formed. 1 m. 30 ch. of road was formed 14 ft. wide.

Herekino–Whangape Road (Mangonui County).—4 m. of road was metalled 10 ft. by 9 in., Natives providing 50 per cent. of free labour.

Kohumaru Road (Mangonui County).—7 m. of road was widened to 18 ft., 6 m. 61 ch. metalled 10 ft. by 9 in., and light metal placed for a distance of 2 m. 56 ch. All work was carried out by relief workers. Three small bridges, totalling 95 ft., in rolled-steel joists, concrete piles and superstructure, were erected.

Lake Ohia to Merita (Mangonui County).—2¼ m. of road was formed 12 ft. wide.

Oruru Fern Flat to Mangamuka Road (Mangonui County).—4 m. of road was surfaced 9 ft. by 6 in. with limestone and top-dressed with shingle 9 ft. by 3 in.

Takahue River Bridge (Mangonui County).—This bridge was lengthened by 65 ft. to provide increased floodway. It consisted of rolled-steel joists, mixed Australian hardwood, and puriri.

Te Hapua Road (Mangonui County).—6 m. of road was formed 15 ft. wide and culverted, Natives supplying 50 per cent. of labour free. Two bridges, each one 25 ft. span in rolled-steel joists and New Zealand timbers, were erected.

Diggers Valley Road (Mangonui County).—60 ch. of road was formed and culverted, and 8 m. metalled 7 ft. by 6 in.

Parahi Road (Otamatea County).—3 m. 40 ch. of road was widened to 16 ft. and culverted. 1 m. 19 ch. was surfaced with limestone 9 ft. by 6 in.

Topuni–Opekepeka (Otamatea County).—2 m. 4 ch. of road was surfaced with limestone 9 ft. by 6 in.

Matapouri to Marua (Whangarei County).—Three bridges were erected, totalling 110 ft., in rolled-steel joists and reinforced concrete with bituminous decking. Slips were cleared from over 4 m. of road.

Ngunguru–Tutukaka (Whangarei County).—3 m. 2 ch. of road was metalled, and slips were cleared from over 2 m. of road.

Otaika Block Road (Whangarei County).—3 m. 34 ch. of road was formed 12 ft. wide and culverted, and one bridge 20 ft. long erected. 3 m. 34 ch. of road was also metalled 10 ft. by 9 in.

Puketoitoi Block Road (Whangarei County).—12 m. 42 ch. of road was formed 16 ft. wide and culverted, and 8 m. 58 ch. metalled 10 ft. by 6 in. Four bridges, totalling 108 lin. ft. in rolled-steel joists and mixed Australian hardwood, were erected.

Tauraroa–Omana Road (Whangarei County).—1 m. 60 ch. of road was formed 16 ft. wide and culverted. 3 m. 25 ch. was surfaced 10 ft. by 6 in. with limestone. The work was carried out by relief workers.

Tokatoka–Mangapai Road (Whangarei County).—2 m. 36 ch. of road was widened to 18 ft. and culverted, and 1 m. 8 ch. metalled 10 ft. by 6 in. A bridge over Mangonui River consisting of six 40 ft. spans in rolled-steel joists and reinforced concrete was nearing completion.

Tutukaka–Matapouri (Whangarei County).—39 ch. of road was widened to 18 ft. and culverted, and 4 m. 19 ch. metalled 12 ft. by 8 in.

Waipu Post-office – Waipu Gorge (Whangarei County).—62 ch. of road was widened to 24 ft. and 1 m. 10 ch. metalled.

Wharekohe Block Roads (Whangarei County).—5 m. 11 ch. of road was formed 20 ft. wide and culverted. Two bridges each of one 30 ft. span in rolled-steel joists and New Zealand timbers were erected. A base course of metal 10 ft. by 6 in. was laid over 6 m. 31 ch. and top course of shingle 10 ft. by 3 in. on 4 m. 75 ch. of road.

Stead's Road (Whangarei County).—50 ch. of road was formed 14 ft. wide and culverted, and 2 m. 60 ch. metalled 9 ft. by 6 in.

Keay's Deviation (Otamatea and Whangarei Counties).—1 m. 38 ch. of road was formed 16 ft. wide and culverted, and 1 m. 24 ch. metalled 10 ft. by 9 in.

Akatere Block Roads (Whangaroa County).—5 m. 25 ch. of road was formed 16 ft. wide and culverted, and 4 m. 14 ch. metalled 10 ft. by 6 in.

Mangapa Road (Whangaroa County).—5 m. of road was widened to 18 ft. and culverted, 4 m. 79 ch. metalled 10 ft. by 9 in., and light strip of metal placed over 1 m. 31 ch.

Matangirau–Wainui (Whangaroa County).—4 m. 69 ch. of road was formed 16 ft. wide and culverted, Natives contributing 50 per cent. of labour free. 5 m. 29 ch. was metalled 10 ft. by 6 in., and one bridge of two 40 ft. spans in rolled-steel joists completed.

Waiare-Okaihau (Whangaroa County).—The following works were carried out: 1 m. 35 ch. formed 18 ft. wide. 7 m. 38 ch. metalled 10 ft. by 9 in. Erection Kaco Bridge (three 40 ft. and two 20 ft.), Inumia (two 40 ft.), and bridge at 8 m. 70 ch. (two 40 ft.) in rolled-steel joists and reinforced concrete completed. Two further bridges, one at 8 m. 22 ch. and another at 20 m. 52 ch., are well in hand.

Waiare–Okaihau (Whangaroa County).—1 m. 60 ch. of road was formed 14 ft. wide and culverted.

Brindle's Road (Whangaroa County).—2 m. 16 ch. of road was formed 16 ft. wide and culverted, Natives supplying 50 per cent. of labour free.

Auckland District.

Kaimarama–Coroglen (Coromandel County).—During the year a length of 1 m. 60 ch. of this road was metalled by relief workers.

Kuaotunu to Opito Road (Coromandel County).—The formation of this road to a width of 10 ft. was continued, and during the year 1 m. 60 ch. was completed.

Mercury Bay – Whenuakite (Coromandel County).—This work, involving the re-formation of 3 m. 46 ch. of road, has been completed.

Brooks Road (Franklin County).—Formation on this road to a width of 18 ft. has been carried out for a distance of 1 m.

Clark's Road (Franklin County).—84 ch. of formation 24 ft. wide and 3 m. 18 ch. of metalling 9 ft. by 6 in. were completed.

Givens and Cemetery Roads (Franklin County).—These new roads were formed during the year, the distance involved being 1 m. 69 ch.

Hunua – Happy Valley and Bombay–Paparata Roads (Franklin County).—About 2 m. of the first-named road has been widened and the alignment improved. 100 ch. of formation on the second-named road has been completed with the necessary culverts. Relief workers were engaged on this work.

New Brighton to County North Boundary (Franklin County).—This section of the Clevedon–Miranda Road has now been completed. It involved the formation of 188 ch. of road 20 ft. wide, one 25 ft. and one 100 ft. bridge.

Waiuku–Drury: Brown's Gully (Franklin County).—A further length of 45 ch. of this road was formed to a width of 18 ft. One culvert of dimensions 8 ft. by 96 ft. was installed.

Waiuku–Manukau Heads: Pollock to Awhitu (Franklin County).—This road for a length of 4 m. 8 ch. was surfaced with shell during the season.

Whangarata–Pokeno Road (Franklin County).—2 m. 45 ch. formation 24 ft. wide was completed by relief workers.

Tryphena Harbour Road (Great Barrier Island County).—Widening from 4 ft. track to 14 ft. dray-road is in hand and about 1 m. has been completed.

Mangatarata Bridges and Road (Hauraki Plains County).—Metalling operations on this road were continued during the year, and 5 m. 48 ch. was treated. Two bridges, one of 10 ft. span and one of 55 ft. span, were erected.

Miranda–Waitakaruru Road (Hauraki Plains County).—The metalling of 2 m. 4 ch. on this road was completed during the year.

Awaroa–Mahoe Road (Kawhia County).—A length of 5 m. 52 ch. of this road was widened to 14 ft. and 16 ft. and a further section of 7 m. 10 ch. was widened and resurfaced with metal.

Kawaroa Road (Kawhia County).—A camp to accommodate married relief workers was established on this road, and 4 m. 3 ch. was widened to 16 ft., and 21 ch. was metalled 10 ft. by 8 in.

Taumatatotara Block Access Road (Kawhia County).—A relief camp for married men was established on this road and in addition to widening 2 m. 10 ch. to a width of 16 ft., a section 3 m. 28 ch. long was metalled 10 ft. by 8 in.

Te Kauri Road (Kawhia County).—Metalling over a length of 2 m. 20 ch. to a width of 10 ft. and a depth of 8 in. was carried out during the year, and a second course of metal 10 ft. by 3 in. was laid over a section of 1 m. 40 ch.

Waiharakeke to Kinohaku (Kawhia County).—A stone retaining-wall 55 ch. in length was constructed. A first course of metal 10 ft. by 5 in. was laid over a length of 180 ch. and a second course 10 ft. by 3 in. over a length of 80 ch.

Clevedon–Miranda Road: Kawakawa–Matingarahi Section (Manukau County).—The widening to 16 ft. of this road and new formation for 2 m. is now complete.

Puketurua to Uraura (Matamata County).—A relief camp for married men was established on this road and widening to 16 ft. and 18 ft. was carried out over a length of 8 m. 37 ch. The metalling to a width of 10 ft. and depth 8 in. of a section of 7 m. 52 ch. was also completed.

Puketurua–Waotu–Huihuitaha Road (Matamata County).—During the year the formation and widening to 16 ft. and 18 ft. over a length of 4 m. 32 ch. was completed. Metalling was also carried out to a width of 10 ft. and a depth of 8 in. for a distance of 4 m. 56 ch.

Waihi to Whangamata (South End) Road (Ohinemuri County).—Formation and metalling, totalling 1 m. 28 ch., was carried out as a relief work during the year.

Aotearoa Road (Otorohanga County).—The re-formation and widening of a length of 5 m. was completed to a width of 16 ft., and 8 m. 7 ch. was metalled.

Mangati Road (Otorohanga County).—Utilizing ordinary relief labour, the re-formation and widening of this road to a width of 16 ft. over a section of 5 m. was completed.

Orahiri Access Road (Otorohanga County).—A relief camp was established on this road, and 1 m. 73 ch. of formation 16 ft. wide was completed.

Kiwitahi – Te Aroha Road (Piako County).—During the year a further section of 3 m. 49 ch. of this road was metalled.

McKinnon's Road (Raglan County).—112 ch. of this road was formed during the year to a width averaging between 16 ft. and 18 ft. The newly formed section was also metalled to a width of 10 ft. and a depth of 9 in.

Rotowaro–Pukemiro Road (Raglan County).—Formation of a length of 1 m. 65 ch. of road was completed and the same section was surfaced with a first course of metal.

Te Maire Road (Raglan County).—The widening to 16 ft. of a length of 2 m. 6 ch. and metalling 10 ft. by 9 in. over a section of 4 m. 35 ch. of this road were completed during the year.

Waikaretu to Port Waikato Road (Raglan County).—A relief camp for married men was established on this road, and approximately 1 m. 22 ch. of new formation 16 ft. wide and 3 m. 27 ch. of metalling 10 ft. wide by 8 in. deep were completed.

Pakiri to Whangaripo (Rodney County).—1 m. of this road was widened and regraded and 324 ch. of metalling has been done during the year.

Tauhoa–Wellsford Road (Rodney County).—108 ch. of widening and new formation were done during the year. 44 ch. of sandstone was also laid.

Te Arai Point Road (Rodney County).—The metalling of 258 ch. of this road has been completed.

Tomarata Valley Road (Rodney County).—4¼ m. of metalling was completed during the year. This road is now complete throughout to its junction with the Tomarata–Whangaripo Road.

Hikuai to Tairua Road (Thames County).—A length of 145 ch. of this road was metalled during the year.

Pokeno–Miranda Road to Maramarua (Waikato County).—The County Council completed the metalling of 3 m. 36 ch. of this road the width of the metal being 9 ft. and depth 8 in. Formation of approximately 250 ch. of new road was also completed.

Whangamarino Island Block, Mercer to Mardon Road (Waikato County).—A relief camp for married men was established on this road and during the year 4 m. 28 ch. of formation was completed to widths averaging between 16 ft. and 18 ft.

Monckton's Road (Waipa County).—Formation 20 ft. wide was carried out over a length of 1 m. 72 ch.

Waiteti Road (Waipa County).—A bridge, consisting of one 34 ft. and one 39 ft. rolled-steel-joist spans on mixed Australian hardwood piles, was erected over the Waiteti Stream.

Brooklyn–Huia Road (Waitemata County).—A relief camp was established on this road and 5 m. 50 ch. of widening, averaging between 14 ft. and 16 ft., was completed.

Kahikatea – White Hills – Silverdale Road (Waitemata County).—The widening and re-forming of 1 m. 17 ch. of this road, also the metalling of 2 m. 66 ch., were carried out.

Kanohi–Makarau Road (Waitemata County).—Relief workers completed the re-formation of 2 m. 63 ch. of this road during the year.

Silverdale to Wainui Road (Waitemata County).—The work carried out on this road includes the spreading of 2 m. 20 ch. of bottom-course metal and laying a top course of metal over a length of 3 m. 6 ch.

Wainui–Tahekeroa Road (Waitemata County).—The formation of 1 m. 26 ch. of this road and the surfacing with metal over a length of 2 m. was carried out.

Kaukapakapa–Tauhoa Road (Waitemata and Rodney Counties).—6 m. 62 ch. of this road was surfaced with metal to a width of 9 ft. and a depth of 6 in.

Lemon Point – Te Maika and Whakapirau Valley Roads (Kawhia County).—Utilizing the services of relief labourers, 48 ch. of the above roads was widened to 14 ft. and 16 ft. and 5 m. 5 ch. was metalled to a width of 10 ft. and a depth of 6 in.

Pakiri Block Roads (Rodney County).—3 m. 25 ch. of the main road through this block has been formed, also 3 m. 1 ch. of secondary roads and 2½ m. of side drains. Two bridges have been built, one 72 ft. long and one 30 ft. long, and forty-two culverts have been laid. The work has been done from two single men's camps.

Tauranga District.

Opotiki to East Cape Road: Motu River to Te Kaha (Opotiki County).—Metalling to a width of 9 ft. and a depth of 6 in. was carried out over a distance of 7 m. 10 ch.

Pirikaraka Bridge at 11 m. 18 ch. (Opotiki County).—This bridge, which consists of one 40 ft. rolled-steel-joist span and two hardwood-timber spans each 10 ft. 6 in. long with ironbark stringers, is now complete.

Taurangaroa Bridge at 3 m. 18 ch. (Opotiki County).—The erection of this bridge, consisting of two 25 ft. spans in hardwood and one 40 ft. rolled-steel-joist span, was carried out during the year.

Te Kaha to Orete (Opotiki County).—Formation to a width of 14 ft. over a length of 1 m. 40 ch. is now complete, and metal was laid during the year for a total distance of 15 m., the width of the metal being 10 ft. and depth 5 in.

Te Kopua Bridge at 2 m. 20 ch. (Opotiki County).—This bridge, which consists of one 15 ft. hardwood span, one 25 ft. hardwood span, and one 40 ft. rolled-steel-joist span, was erected during the year.

Whanarua Bridge at 7 m. 36 ch. (Opotiki County).—This bridge, comprising two spans each 25 ft. long in hardwood with ironbark stringers and one 40 ft. span in rolled steel is now available for traffic.

Opotiki to Matawai via Waioeka (Opotiki County).—The widening of this road from 10 ft. to 18 ft. over a length of 3 m. 20 ch. and metalling to a width of 12 ft. and a depth of 9 in. over a length of 7 m. 29 ch. were completed during the year. 6 ch. of concrete retaining-wall and 30 ft. of stone-filled wire groyne were also constructed.

Armstrong's Bridge (Opotiki County).—The erection of this bridge, which consists of two 40 ft. rolled-steel-joist spans on a hardwood-pile pier and pile abutment at one end and concrete abutment at the other, was completed.

Bridge at 32 ch. No. 2 Deviation (Opotiki County).—This bridge consists of three 35 ft. rolled-steel-joist spans, one end supported on a concrete abutment with hardwood-pile piers and the other end on a pile abutment, and is now open for traffic.

Bridge at 60 ch. No. 2 Deviation (Opotiki County).—This bridge, which is completed, consists of two 25 ft. timber spans and one 35 ft. rolled-steel-joist span, one end on concrete abutment with hardwood pile piers and a pile abutment at the other end.

Opato Bridge (Opotiki County).—The erection of an 80 ft. bridge in hardwood of the truss-span type supported by concrete abutments is complete.

Takaputahi Road (Opotiki County).—This road was reformed and widened for a distance of 11 m., and 6 m. 75 ch. were metalled to a width of 10 ft. and a depth of 6 in.

Upper Otara Road (Opotiki County).—Reforming and trimming 4 m. of this road together with the metalling of 3 m. 67 ch. to a width of 10 ft. and a depth of 4 in. were completed by relief workers.

Ngakuru No. 2 Block Roads (Rotorua County).—Road-construction within the block was carried to completion with relief labour, the work done comprising 15 m. 60 ch. of formation 16 ft. wide, 2 m. 4 ch. clearing of road-line, 12 m. 74 ch. surfacing with pumice, and the laying of 5,367 lin. ft. of culverts.

Okataina Road (Rotorua County).—A further length of 26 ch. of this road was formed to a width of 16 ft. and 2 m. 20 ch. were surfaced to a width of 12 ft. and a depth of 6 in.

Rotowaro to Murupara (Rotorua County).—On this road formation to a width of 18 ft. was carried out over a length of 8 m. 44 ch. 3 m. 16 ch. was surfaced with metal to a width of 12 ft. and a depth of 6 in.

Rotorua to Taupo (Rotorua and Taupo Counties).—Formation on this road to a width averaging 20 ft. and 26 ft. was continued for a further length of 1 m. 49 ch., 11½ m. were pumiced to a width of 18 ft. and a depth of 8 in., 400 lin. ft. of culverting was placed, and a small 40 ft. rolled-steel-joist span bridge was erected.

Murupara to Te Whaiti Road (Taupo County).—This road was widened from 12 ft. to 18 ft. over a distance of 5 m. 7 ch. and surfaced with metal 10 ft. wide by 6 in. deep for a length of 142 ch., 1,825 lin. ft. of culverting was placed and 7,730 cubic yards of slips removed.

Crown Land in Te Puna and Apata Parishes (Tauranga County).—Formation on the road giving access to this land was carried out during the year, and to date 2 m. 38 ch. has been completed, the width of the road averaging 14 ft.

Te Matai Road (Tauranga County).—The metalling of a 196 ch. section of this road was carried out during the year, the width and depth of the metal strip being 10 ft. by 9 in.

Whakamarama Road (Tauranga County).—96 ch. of this road was metalled during the year, the metal strip being 10 ft. wide and 9 in. deep.

Galatea Estate Main Road (Whakatane County).—The roads in the estate are now almost complete, the exception being the bridging of the Mangamate Stream. During the year 37 ch. of road was formed to a width of 26 ft. and 7 m. 20 ch. was metalled to a width of 10 ft. and a depth of 9 in.

Access to Whirinaki Bridge from Murupara–Te Whaiti Road (Whakatane County).—Light formation 26 ft. wide over a length of 57 ch. was completed during the year and 102 ch. of metal was laid, the metal strip being 10 ft. wide and 9 in. deep.

Galatea Estate Internal Roading (Whakatane County).—All the internal roads are now complete, the only work remaining being the erection of several small bridges. To date 28¼ m. of road-formation 26 ft. wide, 3 m. 26 ch. metalling 10 ft. wide by 9 in. deep, 260 ch. side drains 6 ft. by 4 ft., and 1,128 lin. ft. of culverts have been completed.

McCracken's Road (Whakatane County).—The metalling of a length of 110 ch. to a width of 10 ft. and a depth of 6 in. was completed during the year.

Ruatahuna to Waikaremoana (Whakatane County).—The following work was completed during the year: 34 ch. of heavy bush clearing, 3 m. 58 ch. of road-formation 16 ft. wide, 42 ch. of metalling 10 ft. wide by 9 in. deep, and 281 lin. ft. of culverting.

Te Teko–Waiohau–Galatea (Whakatane County).—Relief workers completed 9 m. 32 ch. of formation 26 ft. wide, 239 ch. of metalling, 135 ch. pumicing, and 135 lin. ft. of culverting during the year. Slips totalling 2,476 cub. yds. were also cleared, and three small road-bridges were erected by contract.

Whirinaki Bridge (Whakatane County).—The erection of this bridge, which consists of three 35 ft. rolled-steel-joist spans on concrete-pile piers and concrete abutments, was completed.

Te Whaiti to Ruatahuna (Whakatane County).—During the year 2 m. 25 ch. of road was formed and 135 ch. surfaced with gravel.

Stanley Road (Whakatane County).—A length of 2 m. on this road was constructed and 260 ch. was metalled.

Taumarunui District.

Kawautahi Road (Kaitieke County).—The formation of 1 m. of this road was completed and the metalling to a width of 10 ft. and a depth of 6 in. over a distance of 4½ m. was carried out during the year.

Makokomiko Road (Kaitieke County).—Extensive widening was carried out over a distance of 4 m. 66 ch., and a strip of metal was laid on a length of 3 m.

Oio No. 2 Road (Kaitieke County).—During the year relief workers formed 3 m. 66 ch. of new road and placed 468 lin. ft. of culverts.

Wanganui River Road: Mangaohutu to Retaruke (Kaitieke County).—The erection of a steel suspension bridge 190 ft. long is well in hand.

Wanganui River Road: Hikumutu to Te Maire (Kaitieke County).—On this road formation of a further length of 3 m. 2 ch. was completed and 2½ m. was surfaced. In addition a small bridge 66 ft. long was erected.

Tongaporutu-Mangaroa Road (Ohura County).—General improvements were carried out over a engtli of 3 m. of this road, and 1 m. 65 ch. was metalled.

Otuiti Road (Taumarunui County).—A metal strip 9 ft. by 6 in. was laid on this road for a distance of 2 m. 69 ch.

Kururau Road (Taumarunui County).—During the year 2 m. 25 ch. of this road was surfaced, the metal strip being 9 ft. wide by 6 in. deep.

Taumarunui-Taupo Road: Taringamotu-Mangakahu Section (Taumarunui County).—3 m. of formation and 1 m. 20 ch. of pumicing were completed by relief workers, and, in addition, a small rolled-steel-joist bridge 30 ft. long resting on concrete abutments was completed.

Taumarunui-Tokaanu Road: Manunui-Puketapu Section (Taumarunui County).—The following work was completed during the year. Formation, 18 ft. wide 3 m. 77 ch.; culverts placed, 1,511 lin. ft.

Waimiha Stream Road (Taumarunui County).—Relief workers were employed on this road and during the period 2 m. 28 ch. was formed and the necessary culverts, totalling 230 lin. ft. were laid.

Kakara Road (Waitomo County).—Formation and culverting of this road over a length of 3 m. 40 ch. were completed during the year.

Mahorehore Road (Waitomo County).—Relief workers formed a further length of 2 m. 20 ch. on this road during the period.

Mapara South Road (Waitomo County).—1 m. of second-class formation, including the placing of 591 lin. ft. of culverts, was completed during the year.

Papakauri Road (Waitomo County).—The existing road was widened out to a width of 16 ft. for a distance of 3 m., thus effecting considerable improvement to the road.

Pungarehu Road (Waitomo County).—This road, previously of bad alignment, has been considerably improved throughout, and bad corners have been cut back over a total length of 7 m.

Te Kuiti-Taumarunui Road: Waimiha-Poro-o-tarao Section (Waitomo County).—During the year 1 m. 18 ch. of new formation was completed and 3 m. 45 ch. of base-course metalling was laid.

Totoro Road (Waitomo County).—2 m. 74 ch. of formation and 400 lin. ft. of culverting were completed during the period.

STRATFORD DISTRICT.

Rerekino Road (Clifton County).—The old track that previously gave access to settlers along the route, was widened out to 12 ft. for a distance of 2 m. 14 ch.

Bedford Road (Inglewood County).—Formation of a length of 79 ch. to a width of 14 ft. and metalling 4 m. 26 ch. were completed during the year.

Makakaho Road (Patea County).—Formation of 1 m. 10 ch. of road and the metalling of 34 ch. were completed during the period.

Hallewells Stream Bridge, Mangapurua Valley Road (Waimarino County).—This bridge, which consists of one 76-ft. understrutted span was erected, and is now open to traffic.

Mangapurua Valley Road (Waimarino County).—The road round Battleship Bluff, which involved heavy formation, has been completed; this year's programme involving the construction of 15 ch. of very heavy formation.

Oruakukuru-Karioi Road (Waimarino County).—The road-line was cleared of bush for a distance of 3 m. 3 ch., and formation, including the placing of 1,461 lin. ft. of culverts, was completed over a length of 4 m. 37 ch.

Rakautangi Stream Bridge, Rakautangi-Kohura Road (Waimarino County).—This stock suspension bridge of 120-ft. span was completed during the year, and is now open to traffic.

Waipapa Valley Road (Waimarino County).—1 m. 20 ch. of road was formed during the year, and the road is now complete from its junction with the Mangatiti East Road to the junction with Mangapurua Valley Road.

Taunoka Road (Waitotara County).—The formation of 1 m. 43 ch. on this settler's access road was carried out during the year.

Watershed Road (Waitotara County).—Another settlers' access road on which formation is now complete, 3 m. 70 ch. being carried out during the year.

Field's Track to Rangiwaea (Wanganui County).—A connecting-road between the Parapara Road and Wangaehu Valley Road, 3 m. 50 ch. of which was metalled during the year.

Parihauhau Road (Wanganui County).—Formation was carried out during the year over a length of 4 m. 4 ch.

Wangaehu Valley Road (Wanganui County).—This road, which was widened last year, can now be regarded as an all-weather road. 3 m. 3 ch. of metal was placed during the season.

Wanganui River Road: Jerusalem to Ranana (Wanganui County).—Heavy slips, the result of fretting on new formation, were cleared, and maintenance carried out over 3 m. of this road.

Wanganui River Road: Ranana-Pitangi (Wanganui County).—On this section of the river road heavy slips, the result of fretting new formation, were cleared, and general maintenance was carried out over a distance of 8 m.

Wanganui River Road: Gentle Annie to Pipiriki (Wanganui and Waimarino Counties).—40 ch. of this road was formed, and 1 m. 60 ch. of road metalled, in addition to which 3 m. of pumice base-course has been laid, and 2 m. of upper course metalled.

Okara-Tahunaroa and Whangamomona Roads (Whangamomona County).—Metalling of these roads over a distance of 2 m. 60 ch. was completed during the year.

Gisborne Road District.

Hangaroa–Waikaremoana Road (Cook County).—Relief workers were employed on this road during the year, and the work done included widening over a distance of 3 m., together with metalling of the same section.

Waimata–Arakihi Road (Cook County).—On this road 1 m. 26 ch. of metalling was completed, and the road is now practically an all-weather route throughout.

Waimata–Riverside Road (Cook County).—On this road, which junctions with the Waimata–Arakihi Road at the 47 m. peg, 2 m. of metalling was completed.

Kokomuku Road (Matakaoa County).—Relief workers were engaged on this road, and formation over a length of 6 m. 21 ch. was completed. 2 m. 60 ch. of metalling was also carried out.

Potaka Junction to Whangaparaoa Road (Matakaoa County).—Formation of a further 1 m. 25 ch. on this road was completed during the year.

Karakatuwhero Valley Road (Matakaoa County).—Late in the season relief works were commenced on this road, 3 m. 58 ch. of re-forming and metalling being completed.

Tauwhareparae Road (Uawa County).—Relief works put in hand the previous year were continued. 60 ch. of formation was completed, and a length of 2 m. metalled.

Jerusalem–Whareponga Road (Waiapu County).—The work put in hand the previous year with unemployed Native labour was continued, a further length of 1 m. 72 ch. of formation being completed.

Makarika – Horehore Road (Waiapu County).—During the year 57 ch. of track was completed, and 1 m. 53 ch. of dray-road was formed.

Mata River Suspension Bridge (Waiapu County).—The construction of a 495 ft. span suspension bridge at the Mata Crossing on the Makarika Road was completed, and the bridge is now open to traffic.

Matawai–Hangaroa Road (Waikohu County).—70 ch. of bottom-course metalling and 100 ch. of top course were laid during the year. Formation for a further 32 ch. of road was also completed.

Napier District.

Mangatoro Stream Bridge (Dannevirke County).—Reinforced-concrete bridge having centre span of 50 ft. and landing span 36 ft., and making provision for a 12 ft. roadway between wheel-guards, was erected.

Earthquake Damage, Hawke's Bay (Hawke's Bay County).—Repairs were carried out on the following roads extensively damaged by earthquake: Big Hill Road, Mill Road, Mangatutu Road, Flagrange Road, Whanawhana Road, Glengarry Road, Waipunga Road, Service Road, Dartmoor Road, Springfield Road, Greenmeadows–Apley Road, Waikare Inland Road, Tongoio Settlement Road, Kaiwaka South Road, Arapawanui Road, and Brookfield's Bridge.

Kakariki Block Access (Hawke's Bay County).—2 m. 74 ch. road formation was completed by relief workers.

Tutaekuri Bridge (Meanee), (Hawke's Bay County).—A bridge completely damaged by earthquake was replaced with new hardwood structure with rolled-steel joists consisting of four 40 ft. and one 20 ft. spans, four hardwood piles per pier, 10 ft. 6 in. wide deck.

Tutira–Pohokura (Hawke's Bay County).—The clearing of extensive slips, the aftermath of earthquake, over distance of 23 m. was completed.

Ngamahanga Block (Wairoa County).—Formation of this road, 12 ft. wide, 5 m. 53 ch. long, was completed, except for culverts. One small bridge consisting of one 30 ft. and one 50 ft. rolled-steel-joist span with pile abutment one end and concrete abutment the other was erected.

Waikaremoana – Lake House to Hopuruahine (Wairoa County).—28 m. 28 ch. was maintained throughout the year, and relief workers were engaged widening narrow places to 16 ft.

Waikaremoana to Hangaroa (Wairoa County).—1 m. 70 ch. formation, including placing 1,284 lin. ft. of culverts, was completed by relief workers.

Wellington District.

Aohanga Road (Akitio County).—The metalling of a length of 3 m. on this road was completed during the year.

Soldiers Settlement Road (Akitio County).—Metalling of a section of 2 m. 36 ch. of road was completed during the year.

Towai Road (Akitio County).—During the year metal was laid over a length of 2 m. 12 ch.

Waiohanga Stream Bridge (Horowhenua County).—A suspension bridge of 225 ft. span and 8 ft. between wheel-guards was erected over the Waiohanga Stream, and is now open to traffic.

Heights Road (Horowhenua County).—2 m. 40 ch. of metalling was completed.

Korokoro Road (Hutt County).—Widening and metalling of 56 ch. on the old Korokoro Road was completed, and 6 ch. new road formed. On Singer's and Mungareke Roads 90 ch. was metalled.

Wainuiomata Road (Hutt County).—Relief workers were employed on this road during the year. Corners were cut back, and road improved over a length of 10 m.

Mangaparuparu Road (Masterton County).—The metalling of a length of 3 m. 60 ch. was completed during the period.

Kaitawa Bridge (Pahiatua County).—The erection of this bridge, comprising two 100 ft. steel-truss spans on concrete piers and abutments, and having a concrete deck providing for 12 ft. roadway, is now complete and bridge is open to traffic.

NELSON DISTRICT.

Mahakipawa Hill, Havelock–Picton Road (Marlborough County).—Extensive widening to 17 ft. for a distance of 4 m. 73 ch. was completed.

Ronga Valley to Croixelles (Marlborough County).—5 m. 50 ch. of metalling 8 ft. wide was completed, 500 cub. yd. of slips removed, and road trimmed up generally.

Earthquake Damage (Murchison County).—Maruia River Bridge: Bridge of one 100 ft. truss span, one 22 ft., two 20 ft., and one 18 ft. stringer spans was erected during the year. Approach formation connecting bridge with main road was completed. Matiri River Bridge: Heavy-traffic suspension bridge of one 198 ft. span, 10 ft. 6 in. roadway, with structural steel-deck system, carrying a hardwood-timber deck, together with necessary approach roads, was completed.

Shenandoah Road (Murchison County).—75 ch. of new road was formed, 3 m. 5 ch. of road-line was cleared of bush, bridges were erected over Shenandoah River and Sailor Creek, and work is in hand on five other small bridges on the route. Formation and clearing were carried out by relief workers.

Manson's to McShane's, Takaka County.—1 m. 64 ch. 12 ft. road was formed.

Terakohe–Wainui: Ligar Bay to Wainui (Takaka County).—3 m. 19 ch. of formation was completed.

Royds Road (Takaka County).—1 m. 12 ch. of road was formed.

Canaan Road (Waimea and Takaka Counties).—5 m. 8 ch. of road was widened from 6 ft. to dray width.

Wangapeka River Bridge, Faulkners (Waimea County).—Bridge, consisting of one 80 ft. truss span and one 40 ft. rolled-steel-joist span on mass concrete piers and abutments, providing 6 ft. roadway, was completed.

GREYMOUTH DISTRICT.

Karamea–Collingwood Road: Karamea Kohaihai Section (Buller County).—Work on this road consisted of the formation of 3 m. 70 ch., and metalling of a short length of 7 ch.

Kiwi Road (Buller County).—A length of 1 m. 20 ch. of this road was re-formed and metalled.

Smith's Track (Buller County).—A track 6 ft. wide has been formed through earthquake-shattered country for a distance of 1 m. 17 ch. to give access to several isolated settlers.

Grey Valley to Maruia: Upper Grey Track (Grey County).—During the year 1 m. 2 ch. of 7 ft. formation was completed, and a metalled strip 5 ft. wide was placed over a length of 3 m. 13 ch. of road.

Grey Valley to Taramakau (Grey County).—Small bridges were erected over Camp Creek, Gin Creek, and Jones Creek, and 98 ch. of metalling was completed on the Lake Brunner – Inchbonnie Section. A 65 ft. truss span bridge was also erected over the Little Hohonu River on the Kumara – Lake Brunner Section.

Haupiri Junction to Haupiri (Grey County).—Relief workers have formed a further length of 6 m. of road, and metalling has been carried out over a total length of 5 m. A bridge over the Haupiri River, consisting of four 50 ft. rolled-steel-joist spans on concrete-pile piers and abutments, is well in hand.

Murchison – Maruia Hot Springs: Springlands Junction to Hot Springs (Inangahua County).—On this well patronized tourist route a length of 1 m. 60 ch. was metalled during the year.

Kumara Junction to Chesterfield (Westland County).—On this road the work carried out during the year consisted in the main of the reconditioning of 110 ch. of old road. 8 ch. of new formation and 1 m. 21 ch. of metalling were also completed.

Main South Road (Westland County).—Considerable widening and improvement to that section of the road between Waiho and Weheka, including a deviation 96 ch. long, was completed during the year. Two small bridges were also erected on the route.

Roto Bridge to Wataroa Flat Road (Westland County).—The surfacing of this road for a length of 1 m. 13 ch. was completed.

Waitaha South Bank Road (Westland County).—Formation of 1 m. 70 ch. and metalling 1 m. 40 ch. were completed during the year.

Fox Glacier (Westland County).—Formation of a track 1½ m. long to a popular vantage point at Cone Rock was completed, and a small suspension bridge over an alpine stream was erected.

Franz Josef Glacier (Westland County).—Another popular tourist route. 2 m. of track to a point known as Alex's Knob was formed, and provides one of the finest views of its kind in the South.

CHRISTCHURCH DISTRICT.

Okain's Bay – Little Akaloa Road (Akaroa County).—This formerly narrow road has been widened over a length of 4 m. 20 ch.

Purau Camp Bay Road (Akaroa County).—The work completed on this road consisted of 2 m. 10 ch. of new formation.

McAutcheons Road (Geraldine County).—On this road 1 m. 30 ch. of new formation was completed, and metal was placed over the whole length.

Purau – Charteris Bay Road (Mount Herbert County).—The work completed on this road during the period consisted of the formation of a length of 4 m. 52 ch. The formation of deviation 60 ch. long is well in hand.

DUNEDIN DISTRICT.

Long Point Road (Clutha County).—A settlers' access road, on which metal was placed over a length of 1 m. 52 ch.

Melton's Road (Clutha County).—This road also gives access to settlement, and metalling of 1 m. 42 ch. was completed during the year.

Pomahaka River Access Road (Clutha County).—A further length of 2 m. 33 ch. of this road was metalled during the period.

Snushells Road (Clutha County).—The following work was carried out on this road during the year: 66 ch. of 11 ft. formation and 66 ch. of metalling.

Milford to Lake Wakatipu via Hollyford–Gertrude Saddle (Lake County).—A popular tourist resort, access to which is by tourist track 6 ft. wide, 3¼ m. being formed this year. A bridge 120 ft. long was also erected.

Pembroke to West Wanaka (Lake County).—Formation to 16 ft. was completed over a length of 72½ ch., and 76 ch. was metalled.

Routeburn to Lake Howden (Lake County).—Another popular tourist track, on which construction 4 ft. wide over a length of 3½ m. was completed during the year.

Devon Road (Maniototo County).—A length of 2 m. 60 ch. on this settlers' access road was metalled during the year.

Maniototo Station Road (Maniototo County).—Metal was placed on this road over a distance of 1 m. 55 ch.

Scott's Lane (Maniototo County).—Considerable improvement to this settlers' access road was effected by metalling a length of 127 ch.

Gimmerburn–Wedderburn Road (Maniototo County).—130 ch. of metal was placed on this road.

Portobello to Harrington Point (Peninsula County).—This road was surfaced with metal over a length 4 m. 30 ch.

Whare Flat Road (Taieri County).—This road, which is a popular drive for residents of Dunedin City, received attention during the year, 3 m. 46 ch. of new formation and 5 m. 6 ch. of metalling being completed.

Timaburn Road (Tuapeka County).—3 m. 2 ch. of 14 ft. formation and 65 ch. of metalling were completed during the year.

Three Brothers Road (Tuapeka County).—1 m. 64 ch. of metalling was completed.

Access to Mead's Run (Vincent County).—New formation on this road to a width of 14 ft. for a length of 5 m. was carried out by relief workers.

Hawea to West Coast via Haast Pass (Vincent County).—During the year 85 ch. of new road was formed, 270 ch. of gravelling and 277 ch. of second-course surfacing were completed.

Purakanui–Township Road (Waikouaiti County).—Work on this road consisted of the formation and metalling of approximately 80 ch.

Maitland River Bridge (Waitaki County).—On the road leading up to this bridge 2 m. 47 ch. of new formation was completed, and 1 m. 41 ch. was metalled. The bridge, which is 160 ft. long, was also erected.

Invercargill District.

Crighton Park Road (Southland County).—Formation over a length of 59 ch. on this road was carried out during the year.

Hedley and Wright Roads (Southland County).—On this settlers' access road a length of 74 ch. was formed to a width averaging 16 ft.

Waikawa Curio Bay Road (Southland County).—Before formation could be carried out on this road heavy bush clearing was necessary, and this work, together with the work of formation of a road 16 ft. wide, was completed during the year. A small 18 ft. span bridge was also erected.

Pourakino Block Road (Wallace County).—This new block of Crown land is being opened up for settlement, and during the year 5 m. 58 ch. of access road 16 ft. wide was formed. Five small bridges of a total length of 177 lin. ft. are in course of erection.

Te Anau–Milford Sound Road (Wallace County).—This new access road, which will also open up a magnificant tourist resort, is now well in hand, and during the year 14 m. 35 ch. of formation, 14 m. 10 ch. of gravelling, and 558 lin. ft. of bridging were completed.

Ward Road (Wallace County).—On this road, which gives access to Aparima No. 4 Loan Block, 3 m. 6 ch. of road-formation, and 1 m. 18 ch. of metalling was completed.

HYDRO-ELECTRIC WORKS.

Arapuni Power Development.

At the commencement of the year covered by this report, the Arapuni Station was, of course, out of service. The restoration works on the lines recommended in the Hornell report had been commenced in the previous December and good progress had been made. In addition to the restoration work the concreting of the falls and work on the foundations of the 4th unit for the station were also in hand.

At the time that the restoration works were commenced, it was anticipated that the station could be brought into service about the end of June, 1932, and a programme was mapped out accordingly. As the work proceeded it was seen that it could be finished somewhat earlier, and without extra expense, so the end of March was then fixed as the date of completion of all that part which had to be finished before the lake was filled. Anticipations were realized, and a start was made with the filling of the lake on 24th March. On this date the gates of the diversion tunnel were almost closed, and only sufficient of the river flow was passed for the water-supply of Hamilton. This meant that the

Horahora Power Station was out of commission and the Auckland Power Board took over the Horahora load on their steam plant. Thanks to the co-operation of the Hamilton Borough Council and the Auckland Power Board, the filling of the lake was carried out without a hitch, and the water topped the spillway on 6th April, thirteen days from the time when the tunnel-gates were first closed down.

As soon as the water was available in the headrace, drying-out of the generators was commenced, and on the 10th April, 1932, the station commenced to take part of the commercial load of the system, after having been idle since 11th June, 1930.

While the restoration work was being done the installation of No. 4 unit and the auxiliary units was also completed, No. 4 unit first going on to commercial load on 16th May, and one of the auxiliaries at the end of June.

The position, then, at the close of the year is that the station is again in service, while work is proceeding on the installation of the emergency tunnel-gate, which could not be done while the river-flow was passing through the tunnel. The only other work still to be done is the finishing of a few small jobs about the power-house building, the concreting of a drainage drive from under the falls structure, and the clearing-up of material and housing of plant about the works.

Details of the work done on the restoration measures are as follows :—

Dam.—A considerable amount of grouting was done at each abutment of the dam, to obviate the possibility of water percolating in these areas. The junction line between the natural rock of the gorge and the concrete of the dam was plugged with bitumen to provide a seal as the dam deflects under full pressure. To reduce the possibility of leakage into the country generally, the walls of the gorge above the dam were for some distance coated with gunite. The area so covered being 14,660 square yards.

Diversion Tunnel.—The shaft to accommodate the new emergency gate was excavated and concreted prior to the filling of the lake. The country round the shaft had been thoroughly tightened by pressure grouting before excavation commenced. After the lake was filled a start was made with the breaking-out of the concrete of the tunnel-lining to make room for the valve-chamber and anchorages, and this work is now in hand. The gate, believed to be the largest heavily loaded gate either built or contemplated, which with the frame and lifting-gear weighs about 300 tons, was manufactured in England and was delivered in Auckland and transported to Arapuni in June. A start has been made on the painting of the sections.

The damage to the existing tunnel-gates, caused by the forced passage of masses of rock when the lake was being emptied at the time of the close-down of the station in 1930, was repaired, and the gates were operated successfully at the full head when the lake was being filled.

After the lake was filled and the full flow of the river directed over the "falls," the tunnel was carefully examined for any signs of wear or any weaknesses in the concrete. In spite of the fact that the river had been by-passed for about two years, the tunnel-lining was in excellent condition. It was considered advisable, however, to concrete in some holes eroded in the country at the outlet end of the tunnel. This is completed, and required about 110 cubic yards of concrete. It is also considered advisable to gunite the construction joints in the concrete lining, and this will be commenced shortly.

Drainage and Inspection Tunnels.—The system of drainage tunnels was completed in January. Excluding the drainage system under the falls structure, which is included under the Falls Section, the system consists of six small tunnels driven at right angles to the river below the headrace and forebay, all being interconnected. Beneath the top end of the lined section of the headrace there is a series of three galleries at different levels, connected at the ends by shafts to one of the drainage tunnels. All the shafts and parts of the gallery system have been lined with concrete, and other sections of the drainage system have been provided with a concrete invert. The trench which runs up the floor of the headrace beneath the lining, and in which is an open-jointed 2 ft. concrete pipe surrounded by spalls and broken rock, is also connected to the drainage system by a shaft. The function of this trench is to provide an outlet to the porous layers beneath the headrace lining. The drives were all excavated 6 ft. by 3 ft., and the shafts 6 ft. by 4 ft. This section of the work includes 9,581 ft. of drives and 564 ft. of shaft.

Repairs to Penstocks and Grouting of Crack in Headrace.—This work consisted of drilling a series of grout-holes where any cracks or fractures had occurred and pumping liquid cement in under pressure. Where the grout-holes intersected the line of a crack, reinforcing steel was placed in them, before grouting, to tie the fractured parts together. After the main crack, which opened on the 7th June, 1930, had been grouted, as a further precaution it was sealed with a plug of bitumen. The section of the headrace between the dam and the upstream end of the lining was cleaned and any joint planes found in the country rock treated with concrete and bitumen.

Headrace and Forebay Lining.—At the start of the year preparatory work for the laying of the "Hornell" lining had been completed and the construction of the side banks was well in hand. Work on the side banks was continued, and, in spite of a wet winter, was completed in October. These banks involved the moving of 116,546 cubic yards of material. As a section was finished and trimmed, it was covered with a porous layer of shingle 4 in. thick on the water face.

The porous layers on the bottom of the race, consisting of two layers of broken stone and one of shingle, totalling 10 in. in thickness, were completed in August.

In the meanwhile, two contracts had been let—one for the manufacture of the hexagonal concrete slabs for the lining of the side banks, and the other for the supply of bitumen, the laying of the lining of bituminous mastic and bituminous-protected sheet iron, and the laying and grouting with bitumen of the top course of slabs on the sides.

The contractors who were manufacturing the concrete slabs erected a plant on the site and commenced to deliver slabs early in September. The bottom course of concrete slabs 2 in. in thickness was laid on the sides by the Department as the slabs were finished and cured. The contractors for the bituminous lining commenced operations in October on the floor, and in November on the sides. As the bituminous lining on the floor was laid the Department followed up with the laying of a concrete covering, while the contractors themselves covered the bituminous lining of the sides with 3 in. concrete slabs and grouted the joints. The whole of the lining was completed by the end of March.

The area of the lining done was 35,940 square yards, or nearly 7½ acres. The work included the casting of 5,900 cubic yards of concrete, including over 100,000 hexagonal pre-cast slabs, and the use of 950 tons of bitumen.

Overflow Channel.—The major or lower section of the work in the overflow channel, extending from the drop weir to the upper section of the waterfall structure, was completed during the year, the channel being lined with 1 ft. thickness of reinforced concrete for a width of 150 ft. and a length of 960 ft., the average side-wall height being 9 ft. To date of completion the total quantity of work entailed consists of 11,911 cubic yards of excavation, 17,210 cubic yards of back-filling, 9,179 cubic yards of concrete, 2,649 ft. of porous drains, and 189 tons of steel reinforcement.

Protection of Waterfall.—This section of the work was carried on during the year on three shifts, and was completed simultaneously with the remedial measures. The excavation of the site was completed and the whole structure built of reinforced concrete varying in thickness, according to position, from 10 ft. to 3 ft. At the end of the structure on the downstream side, a concrete cut-off wall was placed, carried down to the solid country at a depth of 74 ft., the wall extending for a width of 200 ft., and having a minimum thickness of 5 ft. The quantity of rock excavation involved in this work was 55,783 cubic yards, and the amount of concrete placed was 23,098 cubic yards. A large amount of cement grouting work, coupled with the use of reinforcing steel in the grouting holes, was done for the purpose of tightening the country rock and tying the whole together.

The channel and waterfall structures were brought into service on the 6th April, 1932.

Observations, &c.—During the year a precise survey was made, covering the whole of the area occupied by the works; and permanent stations and benchmarks were established.

Since the start of the filling of the lake the dam and drainage tunnels have been kept under continual observation and careful records made of all discharges from porous drains, galleries, &c.

Power-house Extension.—During the year the steel lining of No. 4 penstock tunnel, the concreting between the lining and the country, and the installation of No. 4 unit were completed. The concrete used in lining the tunnel amounted to 1,542 cubic yards, and in the foundations of the unit 1,020 cubic yards.

The pipe-line and headgate and the installation of the two auxiliary units were also completed. This involved the excavation and removal by cableway of 15,225 cubic yards of rock from above river-level, and 437 cubic yards from below. The concrete in the foundations amounted to 643 cubic yards. To accommodate the units the end wall of the power-house had to be underpinned and carried on temporary trestles, which will remain in position until the building is extended, when further major units are installed.

General.—The greatest number of men employed during the year was 810, the average number being 482. Now that the remedial works are practically complete the number has dropped to 67 men. To relieve distress in the district 68 men have been employed during the last two months in planting trees and clearing up and improving the reserves owned by the Department round Arapuni. These men are working under the No. 5 Unemployment Relief Scheme, the work being supervised by the Department.

Horahora Power Scheme.—A certain amount of erosion of the river-channel has been going on below the spillway weirs and gates across the river, and during the year it was decided to cover the country in front of each of the three gates by a protecting slab of concrete. This work is now in hand.

Waitaki River Power Development.

Dam.—In my last annual report it is noted that the extension of the base of the dam by an apron 25 ft. downstream for the full length of the north cofferdam had just been completed. Immediately on completion of the apron the pumps were removed from the downstream to the upstream section of this cofferdam, and the construction of the deep cut-off wall and external inspection gallery was commenced.

The cut-off wall extends on an average to a depth of 25 ft. below the original rock surface immediately upstream of the dam, and upon it is built the inspection gallery in the form of a concrete arch. The lower levels of the cut-off wall were excavated partly as tunnels and partly as open trenches 3 ft. to 4 ft. in width. Concrete was placed in lifts of about 6 ft., and the cut-off wall is now completed from the middle of the river to the original north river-bank, a length of 240 ft.

As it had not been possible, for reasons given in last year's report, to commence the cofferdam for the construction of the river section of the dam adjoining the Otago bank, it was decided to place the cut-off wall in position along this length of the dam by tunnelling under the river.

From a shaft on the Otago bank a heading has been driven with its bottom at the full depth of the cut-off wall. This heading is 6 ft. high, and it is intended to place the concrete in the cut-off wall by successive lifts 6 ft. in height by driving headings above those already concreted. By this means it is hoped to complete the cut-off wall to within a few feet of the bed of the river, thus reducing the amount of work to be done when the Otago section of the river bed is unwatered.

From the original Canterbury bank of the river—that is, north of the section of the dam in the river built up to summer river-level within the north cofferdam—the dam has been completed to its

north abutment. This section consists of 140 ft. of spillway, 54 ft. of bulk head, and a core wall 64 ft. in length. These have all been completed to full height, together with a massive concrete retaining-wall on the downstream side of the dam. A relatively small area of the base of the spillway section remains to be concreted to form a protective apron, the design of which is now being determined by experiments with models.

Simultaneously with the work on the cut-off wall in the river sections and the completion of the dam on the Canterbury Section, excavation has been in progress between the Otago river-bank and the power-house. This is called the Otago Section, and consists of 487 ft. of spillway, and a 50 ft. non-overflow block, containing two permanent steel sluice-gates. This portion of the dam is now the chief work in progress, and the main purpose of the current year's work is to complete it to a level that will give a safe margin above floods. It is being constructed in blocks or monoliths, ten in number, 54 ft. to 57 ft. in length, and separated from one another by bitumen expansion joints. The present position is that one monolith has been completed to the full height, six others are concreted to various levels, and, for the remaining, three excavations for the foundations are in progress.

The cut-off wall has been in progress along the Otago Section and power-house at points where it was convenient to get access to it for excavating or for concreting. In front of the power-house three vertical shafts were sunk, and from the bottom of these horizontal headings have been driven and filled with concrete. Two complete lengths 6 ft. high have been excavated and concreted, whilst a third lift is now being excavated. A heading in front of the spillway of the Otago section of the dam has been driven northwards from the north-west corner of the power-house, whilst another heading has been driven southwards from a shaft on the river-bank to meet it, there being a gap of 200 ft. between them at present.

The total concrete now placed in the dam is 67,277 cubic yards, of which amount 40,000 cubic yards were placed during the past year.

The total quantity of earth and rock excavated for the dam, exclusive of that in the cofferdam, is, to date, 221,000 cubic yards.

Tail-race.—As stated in my last report, excavations for the tail-race have, as far as possible, been carried out by hand-labour in order to give employment to a fair number of men. A relatively small amount of pumping has allowed the excavation to be carried out in this way to finished floor-level (about 15 ft. below river water-level) at a cost which compares favourably with mechanical methods. Practically the whole of the aggregates required for the dam and power-house has been derived from excavations essential for other purposes, and of these the tail-race has been the chief source of supply. The supply of shingle from the tail-race is now, however, almost exhausted, and a cableway drag scoop is being installed to excavate future requirements from the river.

The quantity of rock, gravel, and earth excavated from the tail-race to date is 136,000 cubic yards.

Power-house.—The most urgent work in the power-house construction was the completion of the generator-room, in order to allow work to be carried out on the installation of the turbines, generators, and other equipment. The virtual completion of this room after the roof was fixed in position was attained in February last. Direct railway access to allow heavy parts of the machines weighing upwards of 20 tons, to be brought right to the power-house was completed, and the 120-ton overhead-travelling crane required to handle these parts was erected on its runways, which are supported on the columns of the power-house. Once this important stage of the work was reached there was less urgency to complete the remainder of the power-house, and for the last six months the number of men employed thereon has been reduced to about one hundred, or one-third of the total employed last year.

Work is in progress on the intake structure, and the annexe building. The present position on the former is that opposite units 4 and 5, form work is completed, and concrete is poured to within 5 ft. of the top, leaving one lift to complete; opposite units 2 and 3 concrete is completed to within 9 ft. and form work to within 5 ft. of the finished level; unit 1 is concreted to within 17 ft. and form work fixed to within 13 ft. of the finished level. The auxiliary units intake is completed practically to the level of the invert of the openings. In the annexe building the concreting of the battery-room floor has just been completed and form work is being erected for the pouring of the cable-room floor. Other important work completed during the year includes the transformer-platform, with concrete pads, railway, and turntable. A length of the retaining-wall which supports the tail-race batter at its junction with the power-house was completed sufficiently far to allow railway access to the power-house.

The whole of the accessible area of the exterior of the walls of the generator-room has received a first coat of special cement wash, which is applied after the marks of the form work have been removed.

The total excavation required for the power-house amounted to 65,000 cubic yards. To date 41,700 cubic yards of concrete have been placed, 1,292 tons of reinforcing-steel have been bent, and 1,430 tons fixed in position. In the profiling and false work 1,607,000 superficial feet of timber has been used.

General.—During the year six 9-ton and one 20-ton locomotives have been in continuous operation, some of them on three shifts, transporting material from Kurow to the works, and distributing materials throughout the work. Since the railway service commenced from Kurow in December, 1928, it has handled 38,000 tons of materials and goods, and 3,750,000 superficial feet of timber.

The bridge over the Waitaki River at Wharekuri, mentioned in my last report as necessary to give access to properties cut off by the reservoir, was delayed to some extent by non-delivery of the steel central span on the due date under the contract. The concrete piers and road approaches are

completed. The three 60 ft. girder spans at the Otago end have been launched into position, and the steel for the 210 ft. central-truss span is now being assembled, riveted, and erected.

Advantage was taken of a favourable transport price to complete the metalling of a second section of the deviation of the Kurow-Omarama Highway, $1\frac{3}{4}$ miles in length. Although the road deviation is not required immediately, it requires only a small expenditure on fencing to make it ready to hand over to the control of the local body.

Electric power is now received directly from the Government power-lines from Lake Coleridge at 66,000 volts, and is reticulated to all parts of the works at 400 volts for all plant that can utilize electric power economically, such as pumps, air-compressors, inclined tramways, concrete-mixers, machine tools, drills, &c. The consumption averages over 200,000 units per month, and the maximum monthly load varies between 400 and 500 kw.

Contracts were let and completed for the various buildings comprising the Glenavy switching-station. These include two residences of concrete-block construction, a reinforced concrete building containing switchroom, workshop, and battery-room, a garage, and oil-filter house.

To assist in the relief of unemployment manual labour is being utilized where practicable, and reasonably economical, in preference to excavating machinery. Special attention is paid to the safety and well-being of the workmen by equipping all parties with electrically or pneumatically driven equipment, at the same time ensuring a good output at a reasonable rate. Serious accidents have been few, and in those that have happened it has been established that neither the plant nor the methods have been at fault.

At the date of my last report, 1,080 men, including permanent staff, were employed at the works. This number gradually diminished to 927 in last March. Owing to financial considerations the number was reduced in April to 620. At the present time the number engaged is 532, and it is anticipated that this number will be retained for the remainder of the financial year.

Continuous observations of the Waitaki River flow have been taken near the dam from which to obtain a complete hydrograph. Automatic water-level recorders have been installed at the three lakes, Ohau, Pukaki, and Tekapo, which will enable complete hydrographic analyses of the drainage area to be compiled.

IRRIGATION.—CENTRAL OTAGO.

Operation of Completed Irrigation Schemes.

An unusually dry period was experienced during the latter part of the irrigation season, but, in spite of this, with the exception of the Hawkdun and the extension of the Last Chance schemes, ample water-supplies were available during the period. All lands requiring water were regularly supplied, the only interruption to continuity of supply being caused by a heavy thunderstorm, which damaged portions of the Galloway and Hawkdun races shortly before Christmas. A week's work effected all necessary repairs to the damaged races.

The schemes in operation on a trading basis are as follows: Arrow, Ardgour, Bengerburn, Earnscleugh, Galloway, Hawkdun, Ida Valley, Last Chance, Manuherikia, Tarras, and Teviot.

Accounts for water have been rendered for £20,604, and working-expenses amount to £13,196. The amount of anticipated revenue from sale of water has increased by £6,484 over the season before, chiefly on account of the higher grades reached on the deferred scale of payment in some schemes. Working-expenses are somewhat less than they were last year, and will decrease further under the reduced rate of wages now in force.

This year should have shown a profit on working of £7,408, but, unfortunately, only 30 per cent. of the season's accounts have so far been paid. The low prices received for farm-produce for the last two years have been given by defaulters as the chief cause in this untoward delay in payment of rates.

The number of irrigators and the total areas irrigated on all Government schemes for the past season are as set out in the following table:—

Scheme.	Number of Irrigators.	Acres under Irrigation.	Scheme.	Number of Irrigators.	Acres under Irrigation.
Ardgour	12	1,462	Last Chance ..	26	2,915
Arrow	37	4,077	Manuherikia ..	78	5,385
Bengerburn ..	14	144	Tarras ..	19	2,860
Earnscleugh ..	46	2,053	Teviot ..	59	3,841
Galloway	22	2,503			
Hawkdun	62	8,096		425	44,587
Ida Valley	50	11,251			

For the previous year the totals were 408 irrigators and 42,672 acres.

Owing to the completion of the Poolburn Dam last year, it was possible to give a full supply of water under the Ida Valley and Galloway schemes last season without pumping from the Manuherikia River. It is proposed with the anticipated additional water that will be stored in this dam to extend the area under irrigation in Ida Valley, but the filling up of the reservoir has been so slow, owing to the dry season, that this matter is held in abeyance until the yield of the spring of this year is ascertained.

Last year reference was made to the seriousness of the position in respect to the amount of outstanding water rates and the necessity for some immediate action on the part of the Government. The Otago Land Board was requested to investigate the affairs of those irrigators who were in arrears, and report to the Public Works Department on their ability to pay. As a result of the report from the Land Board, a total reduction of 32 per cent. was made upon the amount of rates outstanding. Although the irrigators who were in arrears with their payments were relieved to this extent, this concession has not had the effect of inducing them to pay the balance of the overdue rates, nor to pay the current season's rates, and it is therefore proposed to withhold the supply of water this season to those in arrears until they have paid off a portion of the arrears equivalent to the coming season's water rates.

So far only 30 per cent. of the past season's water rates have been paid.

In connection with the supply of irrigation water, the percentage of each month's supply to the total supplied for the season has been almost the same during the past season as the average over the last three seasons, and is as follows: September, 1 per cent.; October, 9 per cent.; November, 16 per cent.; December, 14 per cent.; January, 18 per cent.; February, 15 per cent.; March, 20 per cent.; April, 7 per cent. This shows that the demand is greatest in the month of March just when the yield from the rivers is generally at its lowest, and indicates why it is necessary to resort to storage under some of the schemes.

New Schemes.

Idaburn Scheme.—This is a small scheme to supply water to eight settlers, and work was commenced on it in June, 1931. A concrete arch dam 35 ft. high was built across the Idaburn near Oturehua Railway-station. From this dam 7¾ miles of races have been constructed, including 35 chains of pipe siphons and flumes. The whole scheme was completed during December of last year, and water was supplied during the past season to an area of 280 acres.

Omakau Scheme.—Work on this scheme, which is to supply irrigation water to an area of 14,000 acres in the Manuherikia Valley in the vicinity of Lauder and Omakau, was commenced in November last. As nearly the whole of the yield of the Manuherikia River during periods of lowest flow is required for the present Manuherikia irrigation scheme, it was necessary to have a storage reservoir. A site just above the falls in the Manuherikia River near St. Bathans was chosen, and it was decided to construct here a dam of the rock-fill type with a reinforced concrete impervious facing on the upstream slope. It is necessary to divert the river during the construction of the dam, and a diversion tunnel of 17 ft. diameter and 600 ft. in length is proposed.

Work on this tunnel has commenced at both ends, and to date 160 ft. has been completed.

Power for this work, as well as for quarrying stone and other work, is obtained from two Diesel-engine electric-generating sets transferred from the Poolburn Dam. All construction plant, partly from that source also and partly from other works, is now erected at the site and in operation.

Two quarries for rock for the dam have been opened up, one on each side of the river, and a start has been made to fill in the rock where the foundation of the dam is above flood-level.

The stripping of the foundation of the dam is finished. This work necessitated the removal of 23,000 yards of materials unsuitable for the rock filling.

An access road, 3 miles in length, has been formed and metalled to the dam from the main road. In addition to the power-house, two staff cottages, a works office, a cookhouse, and camps for the men have been erected. A foot suspension-bridge and a traffic bridge have been built across the river at the dam site to give access to the quarry on the right bank and to the works generally.

The main race, which lifts the water from the Manuherikia River, 11 miles below the dam, is approximately 30 miles in length, and the excavation of this race was commenced early in January. To date 3 miles have been completed, entailing the excavation of 36,000 yards of clay and rock.

Two permanent racemen's cottages, a works office and camps for 120 men have been erected near Lauder. At the present time there are 240 men on the Omakau irrigation scheme, 98 at the dam and 142 on race construction.

Additions to Schemes in Operation.

Hawkdun Scheme.—The strengthening of the Mines Department's old Eweburn dam with a backing of rock is now in progress on this scheme, and about 15 men have been employed thereon.

Ardgour Scheme.—Special work in addition to maintenance was carried out. This consisted of the dismantling of the main pipe-line, 1,650 ft. long, the recoating of the pipes both inside and out, and the reconstruction of the pipe-line.

Surveys and Investigations.

Maniototo Scheme.—The survey party which commenced work on the investigation and survey of this scheme last year has now completed the survey work. A complete contour plan of the 100,000 acres of land under this scheme has been made. Investigations into and the general design of the scheme are now being carried out, and should be completed by the end of the year.

Storage Dams.—Surveys for storage dams in the Manorburn Stream near Galloway, on the Fraser River at Shepherds Flat and on Conroy's Creek, have been completed.

Automatic water-level recorders have been installed at Lake Wanaka, Lake Hawea, Poolburn Dam, and Teviot River.

RIVER IMPROVEMENT AND PROTECTIVE WORKS AND DRAINAGE WORKS.

Waihou and Ohinemuri Rivers Improvement.

During the year the work of raising and strengthening the Upper Waihou system of stop-banks has been continued, and is approaching completion. This work has been carried on with two large Ruston drag-lines. The sections Mangaiti–Tirohia, left bank, and Tirohia–Ngahina, right bank, are complete. The section Tirohia–Ngahina, left bank, is well advanced.

On the Lower Waihou River sags in the stop-banks due to settlements in the ground have been made good, and stop-banks brought up to final grade at all points.

On the Ohinemuri River substantial maintenance raising of the stop-banks has been carried out. The drainage system in the Rotokohu area has been much improved by drag-line operations, the work being done under agreement with the local Drainage Board.

General maintenance work, including repairs to fractured outlet culverts, repairs to stop-banks and cutting of noxious weeds, was carried out.

Plant has been overhauled and maintained in good condition.

Kaihu Valley Drainage, North Auckland.

In cut No. 2A, extensive slips had occurred, and these were removed by power-operated winches during the period December to April. The bridge over the cutting has been repaired and restored to line and level, which were disturbed by slip. The spoil-banks were trimmed and left in good condition.

Kumeti Drain.

Protection work has been carried out in the deeply and widely eroded Kumeti Drain near Dannevirke. The protection work consists of a series of boulder and wire-net gabion weirs, constructed to retain and retard the travel of shingle which has been moving on a large scale. Material has been supplied to enable settlers to erect access bridges across the deteriorated creek.

Ruamahanga River.

Considerable willow and fascine river-bank protection work has been carried out at the Tawaha and Ahiaruhe Settlements on the Ruamahanga River. The work has comprised 70 chains of bank-protection, a river-diversion cut and weir, and two pile groynes 100 ft. long each.

MARINE.

Lighthouses.

During the past year there has been less activity in the installation of new lights and the improvement of existing ones, due to the reduction in available finance, and several works which it was anticipated would be put in hand this year have had to stand over.

Akaroa Peninsula–East Head.—The apparatus for this light, which consists of an automatic open-flame flashing signal with a 75 litre burner in an 800 mm. catadioptric lens was received and duly erected. The light, which is fitted with a sun-valve for automatic operation should be of great assistance to shipmasters trading between southern and northern ports, and will supplement the Godley Head light, which is being altered to a more modern type.

Godley Head.—The necessary apparatus for converting this lighthouse from a fixed to a flashing characteristic has been received, and the work of installation is in hand. The range of this light is being slightly reduced since with the installation of the light on East Head that on Godley Head becomes more a harbour light and less a coastal light.

Baring Head.—This light, which is situated about three miles seaward of Pencarrow, is intended to take the place of the high-level light at the latter place, and being on a distinctive headland is more truly a coastal light. The necessary land has been acquired, an access road has been formed, and a bridge built across the Wainuiomata Stream. Arrangements were being made to order the apparatus and let a contract for the tower and necessary buildings, keepers' houses, &c., but it has been decided to defer the work until conditions improve. In the meantime shelter-belts and fencing are being completed.

Jackson's Head.—The range of this light, which is an automatic acetylene outfit, has been increased by providing a new burner which is twice the candle-power of the original.

Kahurangi Point.—The lens at this station, which was recently damaged by a secondary earthquake, was sent Home to England for repair, and has now been reinstated. It was anticipated that a new keeper's house would have been erected this year, but that has also had to stand over.

The Brothers.—Extensive repairs were carried out at this station, new foundations being put under the tower, a new crane and tramway erected, and all buildings were given a thorough overhaul.

A number of minor repairs have been effected at various stations, and the buildings, &c., have been well maintained at all stations during the period.

Harbour-works.

Westport Harbour.—During the previous financial year an active policy of breakwater-construction was being proceeded with, but, unfortunately, early in the present period the drop in harbour revenue due to the general slackness in the shipping business and the industrial depression throughout the country necessitated the observance of rigid economy. In order to effect this, all breakwater-

construction was suspended, and work in the quarries was stopped; dredging was reduced as much as possible consistent with the necessity to maintain the necessary depths, on the bar and in the channel, and all expenditure was reduced to a minimum. The average mean depths at the entrance and in the river have been maintained at the same figure as last year, and the maximum and minimum depths also compare favourably with the previous period.

The suction dredger "Eileen Ward" removed a total quantity of 392,654 cubic yards from the bar on which it was employed for 83 per cent. of its time, and the "Maui" was employed in the river and at the berthages till about half-way through the year, since when it has been laid up. Generally speaking, the total amount of dredging carried out shows a decrease of 111,070 cubic yards as compared with 1931.

The year was an exceptionally wet one, the rainfall totalling 114·55 in., and the number of wet days 178.

When work was discontinued at the breakwater, approximately 120 ft. of the projected 300 ft. extension had been raised above high-water level, but subsequent heavy seas have caused a slight flattening out of the batters; 7,751 tons of stone was quarried and tipped up to the time work was stopped, which, with the amount put in previously, gives a total amount placed in the western breakwater since recommencing of 30,148 tons.

A length of river-bank above the existing plantation which suffered erosion by the flood in April has been planted with willows and fenced off, while any gaps in the existing plantations have been made good.

All plant and material has been maintained, and the signal station, beacons, and harbour lights have all been painted.

Karamea Harbour.—I regret that the unfavourable state of the fairway has persisted during the year. Enormous quantities of fine earthquake debris are still being brought down by the river, and deposited in the tidal areas. A serious flood occurred on 3rd April, 1931, which considerably altered conditions in the harbour. Whereas previously approximately 60 per cent. of the water flowed over the Karamea bar, the remainder finding its way to the Otumahana Lagoon, after the flood only 20 per cent. flowed over the bar.

An attempt was made to encourage the river to return to its original course by means of a pile and netting wall at Bessies Straits, but this after a short period of usefulness, was breached by a flood. At times the river would appear to be clearing itself and the channel deepening, but such improvements were only of a temporary nature.

The rubble wall replacing the old timber-pile training-wall was completed to full height, and heavy stone was tipped at the end to take care of any scour and to enable it to stand up to heavy seas if required. A total of 10,960 tons of stone was quarried and tipped during the period.

Sufficient stone was quarried at Oparara to complete the training-wall when the quarry was closed down, and the plant is being overhauled.

The large accumulations of earthquake-debris which have been deposited at the lower reaches rendered the original wharf high and dry at low tide, so a temporary wharf was built at the outlet to the overflow channel.

The large shed at the Karamea Wharf, which was undermined and collapsed during the April flood was re-erected at the temporary wharf and an access road formed along the foreshore. Generally speaking, there has been sufficient depth for boats to work this wharf at spring tides, but the channel has been uncertain, and it has had practically no real use.

Little Wanganui.—Owing to the difficulty in working Karamea, the majority of the shipping for the surrounding districts has had to be dealt with at Little Wanganui, although since the loss of the "Kotiti" there has only been the one boat working the port.

The erosion of a large earthquake slip situated about a quarter of a mile above the wharf has been causing the formation of a sandbank at the upstream end of the wharf.

In order to turn the river on to the sandbank a permeable type timber groyne 114 ft. long was built, and this has had a beneficial effect in preventing further accretion.

Waikokopu.—The breakwater, which has been in course of erection during the past two years, has been completed, 7,506 tons of large stone having been deposited during the period. This breakwater has been very effective in stilling the range at the wharf, and it is now only very occasionally that boats cannot work the wharf.

The approach to the wharf has been protected with limestone rock, and the port facilities generally have been adequately maintained.

Shipping has been less this year than usual as the burning of the Wairoa Freezing-works, which have not yet been rebuilt, meant the loss of the frozen-sheep trade. At the same time considerable use was made of the port for the transport of fat sheep to the Hawke's Bay Freezing-works during the summer.

Matiotitawa Wharf.—The approach to this wharf has been metalled with limestone.

Tikinui Wharf.—A new wharf, 118 ft. long, has been constructed in hardwood and approach work is in hand.

Ivydale Ramp.—A complete survey and investigation of this proposal has been carried out.

Whitianga Wharf.—A contract for the erection of this wharf was let by the Coromandel County Council during the year, and the structure was almost completed at the end of the period. This wharf is of hardwood construction with turpentine-pile foundation, and is provided with a wharf-shed and also a cattle-run.

Waitangi Wharf, Chatham Islands.—Plans and specifications were prepared for the erection of a wharf at Waitangi. Tenders were called, but, owing to the financial position, the tenders were declined, and the matter has been held over until conditions improve.

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.—Taipa Village, Mangonui ; Opononi, Hokianga, Kopuku Landing, Maramarua Survey District ; Kaimanawa, Waihou River ; Uwhiroa Creek ; Pounawea, Otago ; Tikinui, Wairoa River ; Port Fitzroy, Great Barrier Island ; Motukaraka, Hokianga Harbour ; Dargaville, Wairoa River ; Rawene, Hokianga Harbour ; Horeke, Waihou River, Hokianga Harbour ; Port Craig ; Bucklands Beach, Tamaki ; Paremata ; Ferrymead, Heathcote River ; Woodpecker Bay, Seal Island ; Narrows, Hokianga Harbour ; Tamaki Strait ; Mapua, Waimea River ; Aoroa, Wairoa River, Kaipara Harbour ; Mercury Bay, Coromandel ; Paradise Estate, Northern Wairoa ; Te Hapua, Parengarenga Harbour ; Whangarei Harbour ; Mapuna, Northern Wairoa River ; Taikata Creek, Auckland Harbour.

Wharves and Jetties.—Tikinui, Wairoa River ; Pitt Island, Chathams ; Woodpecker Bay, Seal Island ; Huntly ; Taupiri, Hamilton ; Mercury Bay, Coromandel ; Oyster Wharf, Bluff Harbour ; Miranda, Thames ; Mercer ; Whangarei Harbour ; Thorndon Breastwork, Wellington ; Hataitai, Wellington.

Boat Sheds and Skids.—Lowry Bay, Wellington Harbour ; Evans Bay, Wellington ; Jervois Quay, Wellington ; Whakatakataka Bay, Auckland Harbour ; Worser Bay, Wellington.

Bridges.—Radly Street, Princes Street, Sheldon Street, Heathcote River, Christchurch.

Retaining-walls and Stop-banks.—Kohimarama, Auckland Harbour ; Blockhouse Bay, Manukau Harbour ; Mahurangi River ; Rangaunu Bay, Awanui, Wharewharekauri, Hokianga Harbour ; Horahora River ; Waihou River, Hokianga Harbour ; Waima River, Hokianga Harbour ; Oruru River, Mangonui Harbour ; Whangaroa Harbour ; Onehunga, Manukau Harbour.

Transmission-lines.—Lake Rotoiti ; Churchill, Waikato River ; Waikato River, Taupiri.

River-improvement.—Waimakariri River.

Harbour-works.—Otago Harbour ; Quarantine Island, Otago Harbour ; Motueka Harbour ; New Plymouth ; Miranda, Thames.

Reclamations.—St. Mary's Bay, Auckland Harbour ; Wairoa River, Kaipara, Onepoto Basin, Shoal Bay, Auckland Harbour ; Blockhouse Bay, Auckland Harbour ; Paihia, Bay of Islands ; Bluff Harbour ; Taruheru River, Gisborne.

TRAMWAYS.

Auckland.—During the year the Auckland Transport Board constructed 122·5 chains of double line, Mount Albert - Avondale, which was duly inspected and approved. Six new tram-cars which had been constructed by them were tested.

New Plymouth.—One car was converted to one-man control, and fitted with compressed air, emergency, service, and rheostatic brakes, and automatically air-operated folding doors. This was inspected and passed.

Wanganui.—One four-wheel bogie car purchased from Takapuna Tramways and Ferry Co. was reconditioned and converted to one-man control, fitted with compressed air, emergency, service, and rheostatic brakes, and automatically air-operated folding doors. This car was inspected and passed.

Wellington.—The following new works were carried out and approved : Lang Street, Miramar, 19·5 chains duplication ; Tinakori Road and Glenmore Street, 106·06 chains of relocation and duplication. One car was inspected and tested.

Christchurch.—No new lines were constructed, but 36 chains of the existing line between Hereford Street and Madras Street was relaid. The portion of the North Beach line extending from the junction of New Brighton and Marshlands Road to the junction of New Brighton Road and Francis Street, a distance of 1 mile 41 chains, was removed, and this route is now served by a trolly-bus. The line in Manchester Street from Lichfield Street to Moorhouse Avenue was removed, traffic now proceeding to the railway via Colombo Street.

GENERAL.

The percentage which the cost of supervision bears to the total expenditure shows an increase for the past year, but this was inevitable in view, particularly, of three conditions—

(1) The reduction in the total amount of money spent.
(2) The change from large works where hundreds of men were concentrated to small and scattered works.
(3) The considerable numbers of men who were supervised on behalf of the Unemployment Board. Large numbers of these men were paid 10s. a week, plus food, and were quite inexperienced, and the amount of direction and supervision which their employment involved was probably twice as great as would have been the case with men employed at twice the cost per man under the ordinary piecework system.

Many works throughout this year have been selected for execution principally on the grounds that they did not involve any great expenditure for material. Such a consideration must carry with it an increased cost of supervision.

Furthermore, there has this year been more investigation of schemes which were not proceeded with than usual. The cost of all these investigations cannot be charged against the cost of works which do not proceed, and therefore tend to raise the supervision costs on the works which do proceed.

I would like to acknowledge here the loyal assistance and support I have received throughout the year from the staff as a whole. It has been a hard year, and the necessity for selecting for dismissal hundreds of officers, many of whom I have been associated with almost for life, has been very distasteful. In making the reductions efficiency has been the first consideration, but, amongst others, such questions as family responsibilities, eligibility for superannuation or otherwise, have been given due weight.

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.

F. W. FURKERT, C.M.G.,
M.Inst.C.E., M.I.Mech.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, 1932.

During the period plans were prepared for thirty-eight new works, of a total estimated value of £122,324, of which fifteen contracts, to the amount of £21,085, have been let. In addition, fifteen contracts, to the amount of £81,957, for buildings designed prior to the 30th June, 1931, have also been let, making the total works completed or under construction £103,042. The latter total includes £18,366 for secondary-school buildings, £2,832 10s. for hospital buildings, and £22,000 for reconditioning the Napier Post-office, which work was done by day labour.

Tenders were also received for three buildings of a total value of £21,431 10s., but acceptance has been deferred in the meantime.

In addition to the above totals for buildings designed in Head Office, a large amount of minor additions, alterations, and repairs, and general maintenance of public buildings has been carried out by District Engineers, and a considerable quantity of furniture and fittings has been manufactured in the Public Works workshops for various Government Departments.

Buildings generally have been thoroughly examined and wherever practicable or desirable have been strengthened with steel and concrete to minimize future earthquake damage.

Competition for Government contracts has been keen, and the effect of the general curtailment of private building has been reflected in reduced prices, but not to the extent reported as observable in domestic work. New Zealand manufacturers of building materials have maintained a satisfactory standard, and local materials have been specified, exclusively, except where the use of imported material was unavoidable.

Owing to the reduction in building expenditure the personnel of the architectural staff has been reduced by 50 per cent. during the year.

Vice-regal Residences.

Auckland.—General maintenance was carried out and the wiring of the building was brought up to the standard required by the Power Board's regulations.

Parliament Buildings.

General maintenance work was attended to during the year.

Post-offices.

Whangarei District.—A post-office workman's hut was provided at Te Hapua. An air-conditioning plant was installed in the Whangarei Post-office and sundry alterations carried out. Renovations and repairs were carried out to six other offices.

Auckland District.—The new post-office in Upper Symonds Street was completed during the year; electric lighting and power were installed by this Department. Sundry alterations were carried out to the Chief Post-office. The clock and tower of the Cambridge Post-office have been removed, and the roof restored. Alterations, repairs, and renovations were carried out as required to twenty-one post-offices and residences, and in seven postal buildings the electric installations have been altered to comply with the Power Board's regulations.

Taumarunui District.—Minor repairs and renovations were carried out to six offices.

Tauranga District.—Repairs and renovations were carried out to six offices.

Gisborne District.—Repairs and renovations were carried out to seven offices and residences.

Stratford District.—At Wanganui the tower and other dangerous features have been removed, and certain strengthening effected to resist earthquake shocks. Repairs and renovations were carried out to twelve other offices and residences.

Napier District.—Napier Chief Post-office building was restored and opened to the public on the 6th August, 1932. Extensive rebuilding in steel and reinforced concrete and restoration to the Hastings Post-office is nearing completion. The reconstruction of Wairoa Post-office was completed, the tower being completely removed. Repairs and renovations were carried out to seven other post-offices.

Wellington.—The Wellington East Post-office was completed in March, 1932. The additions and alterations to Masterton Post-office were completed. The new automatic telephone exchange at Lower Hutt was completed in February, 1932.

Nelson District.—Repairs and renovations were carried out to eight post-offices and residences.

Christchurch District.—In High Street, Christchurch, a new four-storied post-office has been built in steel frame and reinforced concrete. Alterations, repairs, and renovations were carried out to eight other offices and residences.

Dunedin District.—Alterations, repairs, and renovations were carried out to thirteen offices and residences.

Greymouth District.—At Westport a new post-office in steel frame and concrete was erected to replace that destroyed in the 1929 earthquake, and was opened for public business on the 17th June.

Repairs and renovations were carried out to sixteen offices and residences.

Courthouses.

Whangarei District.—The courthouse at Russell was renovated.

Auckland District.—In conjunction with the courthouse at Hamilton a bicycle-shelter was erected and an electric bell system installed. The Clerk of Court's office at Putaruru has been transferred to other quarters and refitted. Repairs and renovations were carried out to three other courthouses.

Taumarunui District.—Minor repairs have been carried out at the Magistrate's courthouse, Taumarunui.

Gisborne District.—At the Gisborne courthouse all chimneys were pulled down to underside of rafters and rebuilt. General maintenance and repairs were carried out.

Stratford District.—Minor repairs were carried out at two courthouses.

Napier District.—The Napier courthouse was renovated throughout and maintenance work attended to.

Nelson District.—Minor repairs were effected to the courthouses at Nelson and Blenheim, and ballot-boxes were reconditioned.

Christchurch District.—General maintenance, repairs, and renovations were carried out to five courthouses.

Dunedin District.—Minor repairs were carried out to courthouses at Dunedin, Gore, and Half-moon Bay.

Greymouth District.—Maintenance works were carried out to three courthouses.

Police-stations and Gaols.

Whangarei District.—Renovations and repairs were carried out to seven police stations and residences.

Auckland District.—General repairs and minor alterations or renovations were effected to twenty police stations and residences; in four buildings the electric installation was altered to meet Power Board's requirements. A new dairy and yards were erected and equipped at Waikeria Borstal Institute.

Taumarunui District.—Minor repairs were effected to five police stations.

Tauranga District.—Additions, repairs, and renovations were carried out to five police stations and residences.

Gisborne District.—A new building and garage were completed at Te Araroa. The old cells were demolished and a new two-cell lock-up erected at Tolaga Bay. Repairs and renovations were effected to five other buildings.

Stratford District.—At the Wanganui Prison the electric light installation was reconditioned to comply with the 1927 wiring regulations. Repairs and renovations were carried out to fourteen police stations.

Napier District.—The Police Inspector's residence, Napier, was shifted back from the face of the hill. Maintenance work was attended to at three other police stations.

Nelson District.—Repairs and renovations were effected to six buildings.

Christchurch District.—Repairs and renovations were effected to sixteen police stations and residences. General maintenance, repairs, and renovations were effected at Paparua Prison.

Dunedin District.—A new office was erected at Tuatapere. Repairs and renovations were effected to eighteen police stations and residences and to the Borstal Institute, Invercargill.

Greymouth District.—Repairs and renovations were effected to twelve police stations, three residences, and one gaol. A new four-cell lock-up is in course of erection at Westport.

Mental Hospitals.

Avondale.—The conversion of the doctor's former residence into a receiving-home has been completed, involving extensive alterations and renovations to the entire building. A telephone service has been installed in the main building.

Puhitahi.—Two brick villas were completed, electricity installed, and furniture supplied from the Public Works workshops. Permanent electric mains were erected at all buildings and roadways, and a permanent transformer substation erected. Additions were made to patients' quarters, and a temporary laundry erected and fitted up.

Tokanui.—Further access roads were made to the Nurses' Home, and the building was completely furnished and is now in occupation. Several new floors have been laid in main buildings, and alterations and drains are practically complete. Repairs were made to main water-supply, a room converted for male staff sitting room and a boiling-down house for piggery was extended.

A private exchange telephone system was installed, also a radio installation was extended to wards and Nurses' Home.

The electrical change-over to 230 v. supply was completed, road lighting and rewiring throughout was completed. A potato peeling machine and motors for sewing machines were installed.

Porirua.—General renovations and repairs were effected throughout. Various concrete and cement roof ornaments were removed as a precaution against earthquakes.

Nelson and Stoke.—New cow-byres were erected. El Nido kitchen block was rearranged. Fire-fighting equipment was installed, also material supplied for extension to Braemar Lodge. The entire Poorman's Valley water-supply original scheme was completed, and temporarily connected to 2 in.

main supply to buildings. New villas were furnished, and extra lights installed. General maintenance, repairs, and renovations were undertaken.

Sunnyside.—The verandas of the reception home (female) and annex ward were fitted with "Whitney" windows, thereby increasing the sleeping accommodation. A scullery was erected on the female side of the dining hall. General maintenance, repairs, and renovations were undertaken.

Seacliff.—The old kitchen block was converted into accommodation for patients. Workshop, &c., was rebuilt. Alterations, renovations, and repairs were carried out.

Waitati.—Repairs and maintenance generally were carried out.

Hokitika.—A new villa in wood was completed during the year and furniture and fittings for same supplied. Electric lighting services were installed at the farm buildings and a new hay store erected. Water service pipes were extended and additional fire hydrants installed.

Education Department.

Whangarei District.—Renovations and repairs were effected to six Native schools.

Auckland District.—An additional story was erected on the Seddon Memorial Technical College to provide cloak-rooms, &c., and electrical services rearranged for domestic cooking by electricity. The Parawera Native school, teacher's residence, and outbuildings were removed to a new site, reconditioned, and renovated. The damage caused by fire to the receiving-home, Hamilton, has been rectified. General maintenance work was also effected.

Taumarunui District.—Minor repairs were effected at Otukou Native School.

Tauranga District.—At Ruatoki West (now named Tawera) the new Native school and residence were completed. A new class-room and shelter-shed were provided at Te Whaiti Native school, and existing buildings were repaired and renovated. Repairs and renovations were effected to thirteen Native schools and residences, &c.

Gisborne District.—An emergency stairway to the first floor of the Gisborne High School was erected; also general repairs and renovations were effected. New residences were erected in connection with Native schools at Waiomatatini and Tokomaru Bay. Renovations and repairs were effected at three Native schools which included reconstruction of the chimneys.

Stratford District.—At the Wanganui Technical College a hostel was erected in reinforced concrete and brick. Minor repairs and renovations were effected at two Native schools Wanganui River.

Napier District.—Extensive reconstruction and restoration of the Boys' High School, Napier, is approaching completion, and new workshops are being erected in the grounds. At the Girls' High School, Napier, new wooden class-rooms are being erected on the old foundations. Hastings High School has been completely reconditioned and additional class-rooms and a workshop have been erected in timber. Repairs were effected at two Native schools. Maintenance was attended to at Greenmeadows Receiving-home.

Wellington District.—New class-rooms, including workshops, and art and cooking rooms were erected at Feilding Technical High School. The Palmerston North Technical School and the Wairarapa High School were strengthened against earthquake risk. A new workshop was erected at Petone Technical School.

Nelson District.—New class-rooms were erected at Nelson Girls' College. At Nelson Boys' College the old building was reconditioned. Alterations, renovations, and repairs were effected at three other schools.

Christchurch District.—Extensive alterations were made to Ashburton High School and Hostel, and a new teachers' room and girls' cloak-room erected. Renovations and repairs were effected to five other buildings.

Dunedin District.—Repairs were effected at two homes.

Greymouth District.—Assistance was given to the Nelson Education Board in strengthening the Westport State School as a result of earthquake damage.

Health Department.

Auckland District.—Extensive remodelling and renovation of the nurses' quarters, Lister House, at the St. Helen's Hospital were carried out, the additional accommodation thus gained enabling the release of the rented cottage at No. 25, Pitt Street.

Gisborne District.—Maintenance repairs were effected at St. Helen's Hospital.

Napier District.—At Wairoa Hospital a new nurses' home was commenced.

Wellington District.—Renovations and improvements were effected at Otaki Sanatorium.

Christchurch District.—Repairs and renovations were effected to St. Helen's Hospital, Christchurch.

Dunedin District.—Sundry alterations and repairs were effected at St. Helen's Hospital, Dunedin.

Defence Department.

Auckland District.—General repairs were effected to six drill-halls and camps. At three buildings the electric light system was brought up to the Board's requirements.

Gisborne District.—A fence was erected on the Garrison Hall section.

Napier District.—Maintenance work at Napier and Hastings drill-halls was attended to.

Nelson District.—Minor repairs were effected at Blenheim.

Christchurch District.—A heating-system was installed in the stores hangar at Wigram Aerodrome; in addition, small maintenance repairs were effected here and also at King Edward Barracks.

Dunedin District.—Repairs were effected at St. Clair Magazine and to Kensington Hall.

Greymouth District.—Maintenance repairs were carried out to three drill-halls.

Tourist Department.

Taumarunui District.—A new drainage system was installed to the Chateau, National Park, with extensions to huts and staff quarters. A new concrete intake and settling-tank were erected and connected to water-supply. Repairs were effected to main building, huts, and staff quarters and new heating-stoves fixed. Minor repairs were effected at the Waitomo Caves Hostel.

Tauranga District.—The juvenile section of the Blue Baths, Rotorua, was completed and handed over to the Tourist Department in time for the Christmas holidays. Steady progress has been maintained with the construction of the main pool and cubicles. The electrical portion of the work was done by the Auckland District Office.

Greymouth District.—The tourist hut, one mile north of the Blue River on the Waiho–Haast track, was completed.

Dunedin District.—New bathhouse and washhouse have been erected at Quintin Huts, several minor items were left uncompleted owing to the oncoming of winter snows compelling the men to leave. Sundry minor additions were made to the Milford Sound Hostel.

Agriculture Department.

Whangarei District.—A cottage was erected at Dargaville in connection with the small-farm scheme.

Auckland District.—General repairs were effected at the fumigating building, Auckland, and at the Ruakura Farm. Ten cottages for the small-farm scheme were manufactured in our workshops, nine of which are being erected. A further sixteen cottages are in course of construction.

Tauranga District.—The Tauranga office has been moved into the Government Buildings, thereby effecting a saving through non-renewal of lease of rented premises. Tenders were being called for three cottages for the small-farm scheme.

Stratford District.—The Stock Inspector at Waitara has been provided with accommodation in the old post-office building.

Wellington District.—The offices at Palmerston North were transferred from Clarendon Buildings to the National Mutual Buildings. At Wallaceville Laboratory a chemistry-room was fitted up.

Nelson District.—Railway huts were erected in connection with the small-farm scheme.

Dunedin District.—Renovations and repairs were effected to six buildings.

Soldiers' Graves.

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

Miscellaneous.

Auckland.—Extensive alterations were effected to the Customs Building, Auckland, to accommodate the Land Drainage Branch.

Alterations were effected to the Law-court Buildings to accommodate the Official Assignee.

Tauranga.—Several offices were transferred to Government-owned buildings, thus effecting economy through non-renewal of leases of rented premises. The presence of artisans and staff with plant at Bath Buildings, Rotorua, was taken advantage of to economically carry out repairs and renovations in Rotorua area.

Wellington.—A hot water heating-service was installed in the Government Printing Office. The chimneys of the Government Buildings were removed to third-floor-ceiling level, and a hot water heating-service installed throughout. An emergency earthquake-proof depot was constructed in Sydney Street and stocked with emergency tools and equipment. The old Government Life Insurance Building is in course of being demolished.

Nelson.—Quarters for the Research Staff, Scientific and Industrial Research Department, were erected at Appleby.

Christchurch.—A new store for the Public Works Department was completed at Addington. Two cottages were erected, and repairs, renovations, and additions effected to two residences for the Lands and Survey Department.

Dunedin.—Cottages were erected at Lauder. Alterations were made to the Pensions Office, Invercargill.

Booths.—Screens, ballot-boxes, &c., were provided and booths fitted up for the general election.

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 the electric power in the Dominion for the past year as follows:—

GOVERNMENT SCHEMES IN OPERATION.

HORAHORA-ARAPUNI ELECTRIC-POWER SUPPLY.

1. CAPITAL OUTLAY.

The total capital outlay at the end of the year, as shown in Table II herewith, was £4,496,087, an increase during the year of £552,250. The main items of increase were £296,000 on remedial works at Arapuni, and £152,673 on interest during construction. Assets in operation at the end of the year totalled £1,322,190. Assets not in operation totalled £3,231,114, which is almost entirely accounted for by the cost of Arapuni, and the 110 kv. lines and substation equipment rendered idle by the shut-down of Arapuni, and interest charges on those assets.

2. FINANCIAL RESULTS OF OPERATION AND FUTURE PROSPECTS.

The gross profit for the year—*i.e.*, total revenue, £161,884, less working-costs £115,003—was £46,881, or 3·59 per cent. of the capital outlay on the average value of assets in operation, as compared with £82,704 last year.

Working-costs include an amount of £25,973 "stand-by provision" paid to the Auckland Power Board as a contribution to their costs of running King's Wharf station, so that the true gross profit earned by sale of power was £72,854, or 5·59 per cent. on capital outlay, as compared with £103,441 or 5·99 per cent. last year.

The net loss for the year, after provision for interest and depreciation, was £40,554, as compared with £35,694 the previous year, or after allowing for the payments to be Auck and Power Board already mentioned, the true net loss was £14,581 compared with £14,957.

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

Reduction in total revenue by £22,709, as compared with the previous year, due to the fact that the previous year included seventy-two days in which supply was given from Arapuni to the Auckland Power Board. The returns from all Power Boards, with the exception of Auckland and Thames Valley, show an increase in revenue in each case.

Reduction in capital charges (interest and depreciation) by £30,963, due to the fact that this year's figures do not include capital charges on Arapuni.

Increase in working-costs by £13,114, which is practically equivalent to the increase of £13,243 in the cost of power purchased.

Working-costs, as analysed in Table III herewith, show a total of 0·240d. per unit sold, as compared with 0·187d. and 0·087d. for the two previous years, the increase being caused by the greater proportion of units produced from fuel plants and purchased units, and the smaller number of units sold. The Department's fuel plants, Grand Junction Steam Plant, Penrose Diesel plant, and Huntly steam plant generated a total of 14,932,070 units for working-costs of £27,671, as compared with 13,893,220 units for £33,512, the improvement being due to the low operating-costs of the Huntly plant. The Junction and Diesel plants both generated less units than in the previous year, and this is the principal reason for their higher operating-costs per unit.

Power purchased (from Auckland and Tauranga, with a small amount from the large dairy factories) increased from 8,164,437 units for £9,271 to 15,994,315 units for £22,514, due to the larger amount purchased from Auckland.

The increased loss this year, and the losses of the past four years, result inevitably from the fact that, to supply the increasing needs of our consumers, we have been forced to generate or purchase power from steam or other fuel plants, at costs which are greater than the revenue we receive from the sale of the power so purchased.

The units output during the past year totalled 123,521,284 as against 143,093,777 for 1931, the decrease being principally due to Auckland Electric-power Board supplying its own load whilst Arapuni was out of commission.

The annual load factor for the system was 75·36 per cent. as against 32·9 per cent. for 1931.

The gross financial results of distribution of energy are summarized in Table VIII.

3. EXTENSIONS DURING THE YEAR AND FUTURE EXTENSIONS.

(*a*) *General, Additional Consumers, and Connected Load.*

There were no additional consumers during the year. The connected load increased from 99,341 kw. to 106,868 kw., not including Auckland figures, and from 281,410 kw. to 296,225 kw., including Auckland (Table IV).

The number of milking-machines supplied increased from 5,493 to 5,868 (Table VII), electric ranges from 3,420 to 3,824, and electric water-heaters from 8,229 to 8,593. These are exclusive of Auckland figures.

The system maximum load (exclusive of Auckland) has increased from 17,600 kw. to 18,710 kw. The demand factor for the year was 17·5 per cent.

(*b*) *Power-stations.*

Arapuni.—Construction work at Arapuni during the year included the installation of No. 4 unit, No. 4 bank of transformers, two units (each consisting of turbine, A.C. generator, and D.C. generator) for auxiliary power-supply, and the necessary switch-gear for these different items. Of these, No. 4 bank of transformers was completed in July, 1931. No. 4 unit erection was started in June, 1931, and completed, except for some details, in March, and the auxiliary units were placed in the power-house ready for assembling in March.

Earthing-switches were installed on the outgoing 110 kv. lines.

Horahora.—An induction regulator was installed to regulate the voltage on the 11 kv. line to Cambridge.

Huntly Steam Plant (1,500 kw.).—This plant was put into regular service on the 6th April, 1931.

(*c*) *Transmission-lines.*

Survey work was continued on the Arapuni–Edgecumbe, Henderson – North Auckland lines up to the end of May, when these surveys were stopped and staff was concentrated on completion of survey work on the Arapuni–Stratford line.

This latter line is to be of wood-pole construction from Arapuni to Tatu, near Ohura, and of steel-tower construction in the rough country between Ohura and Stratford. A contract for cartage of poles was let in June, 1931, but work had to be suspended in August, and it was started again in October.

Pole fitting and erection was started on 15th October, 1931, and main-line wiring and telephone erection in January, 1932, and at the end of March, 229 structures out of a total of 540 on the Arapuni–Tatu wood-pole section had been erected, and 122 wired, and about 220 telephone-poles, out of approximately 1,200, had been erected and wired.

(*d*) *Substations.*

Penrose (Capacity: 110/22 kv. 60,000 kv.a., 22/50 kv. 5,000 kv.a.).—Installation of three new 22 kv. switch-gear panels was completed in August.

Installation of Merz-Price protective relays on the main transformer-banks was completed.

Bombay (Capacity: 110/50 kv. 5,000 kv.a., 50/11 kv. 3,000 kv.a.).—The new steelwork required for the second bank of transformers was erected, and alterations were made to the existing steelwork to allow of the installation of four 50 kv. O.C.B.s.

Takapuna (Capacity: 50/11 kv. 2,000 kv.a.). — Four new 750 kv.a. single-phase transformers were dried out and made ready for emergency service if required.

Te Awamutu (Capacity: 50/11 kv. 1,500 kv.a.).—The new switchgear controlling the Hangatiki line, &c., was installed.

4. Operation and Maintenance.

(*a*) *Power-stations.*

Arapuni.—Except for transmission of power through the 50 kv. gear from Horahora to the Bay of Plenty line, this station was not in service during the year.

The flange of the foundation ring of No. 1 turbine was chipped to give slightly larger clearance for the runner while this unit was dismantled. Other maintenance work of a routine nature was carried on during the year.

Horahora.—Maintenance work included the following: Mechanical: Overhaul and replacement of all runners on No. 4 unit and of runners and guide castings on No. 6 unit. Installation of some new sections of screen of an improved type.

Owing to loss of station excitation on several occasions due to stoppage of motor-generator exciter sets from low voltage during line troubles, the six original generators were run on their own exciters as from November, 1931.

Penrose Diesel Plant.—This plant operated successfully during the year.

Grand Junction Plant.—The remaining unit of this plant was run regularly in April, May, and June, and was finally closed down in July, 1931; after which a good deal of work was done on overhaul of the boilers and preparing the plant against deterioration while not in use.

Huntly Steam Plant.—Failure of the L.P. labyrinth caused a shut-down of this plant for ten days, a new labyrinth having to be made locally for replacement.

(*b*) *Transmission-lines.*

There were only two cases of breakdown of insulators in service during the year, both of these being pin insulators, as compared with four last year; 326 defective pin insulators and 29 strain or suspension units were located by live-line testing or otherwise and replaced, as compared with 330 and 97 the previous year.

A total of 65 wood poles was replaced (by 62 poles) during the year, compared with 92 the previous year.

On all lines during the year there were a total of seventeen accidental interruptions, involving outages of the lines on which they occurred of a total time of 32 hours 48 minutes, compared with twenty-nine interruptions and 26 hours 58½ minutes for the previous year.

Arapuni–Penrose 110 kv. Pole Line.—A 60 ft. tower was erected at Maungatautari, to provide greater clearance from earth and at the 50 kv. line crossing.

Waihou–Waikino 50 kv. Line.—This line being no longer necessary since the completion of the Waihou–Paeroa Section, it was partly dismantled, and maintenance work on it was stopped in June, 1931.

On other lines the usual live-line testing, sap-testing, scrub and tree cutting, and improvements to access by means of tracks and bridges were continued.

(*c*) *Substations (110 kv. and 50 kv.).*

Penrose (Capacity: 110/22 kv. 60,000 kv.a., 22/50 kv. 5,000 kv.a.).—"Earthquake stops" were fitted to the transformers to prevent movement in case of an earthquake.

Henderson (Capacity: 50/11 kv. 1,000 kv.a.).—New guide-pieces supplied by the manufacturers, to replace guide-pieces which were liable to damage from electrical leakage, were fitted.

Matamata (Capacity: 50/11 kv. 2,250 kv.a.).—The cable-boxes on the transformers were provided with oil-drains.

Waihou (Capacity: 50/11 kv. 2,250 kv.a.)—A porcelain bushing in a single-core cable sealing-box at the transformers broke down on 19th May. The solid-copper rod-connections from these bushings to the transformers were replaced with stranded copper, to obviate undue stresses.

Waikino (Capacity: 50/11 kv. 6,000 kv.a.).—A mouse caused a flash-over on No. 4 11 kv. O.C.B.

Bombay (Capacity: 110/50 kv. 5,000 kv.a., 50/11 kv. 3,000 kv.a.).—Bushing current-transformers on the O.C.B.s were rewound for a different ratio.

Hamilton (Capacity: 50/11 kv. 3,000 kv.a.).—An 11,000 v. current-transformer on No. 2 feeder broke down.

Te Awamutu (Capacity: 50/11 kv. 1,500 kv.a.).—A cracked porcelain cone in the 50 kv. O.C.B. was replaced, also a potential transformer that had broken down. Two cracked 11 kv. bushings on the main transformers were replaced.

Hangatiki (Capacity: 50/11 kv. 750 kv.a.).—Telephone-code-ringing relays were installed. An 11 kv. trifurcating-box at the main transformers broke down.

Mamaku (Capacity: 50/11 kv. 150 kv.a.).—A rat came into contact with an 11 kv. transformer (50/11 kv.) terminal, and caused the 50 kv. fuses to blow.

Ngongotaha (Capacity: 50/6·6 kv. 750 kv.a.).—Wooden operating-handles were provided for the 50 kv. A.B. switches. A Landis and Gyr maxigraph was installed to record maximum demand.

Edgecumbe (Capacity: 50/11 kv. 750 kv.a.).—Telephone-code-ringing relays were installed. Cable-box compound in which a slight noise of arcing, due apparently to cracks in the compound, was replaced by softer compound.

Waiotahi (Capacity: 50/11 kv. 750 kv.a.).—Telephone-code-ringing relays were installed.

Takapuna, Kerepeehi, Huntly.—Nothing to report.

(*d*) *11,000 v. Lines and Substations.*

A total of twenty-one 35 ft. poles have been found defective on these lines, and have been replaced during the year. Service generally has been satisfactory.

(*e*) *Restoration of Arapuni and Operation up to the 30th June, 1932.*

The filling of the lake at Arapuni was commenced on 24th March, and completed on 6th April.

During the filling period King's Wharf supplied a total of about 3,200,000 units, with a maximum of 14,680 kw., and the Diesel plant about 250,000 units, with a maximum of 3,460 kw., and over the same period the Horahora output was about 2,650,000 units less than normal.

Nos. 1, 2, and 3 units were all started up on 3rd April, 1932, and were run on short circuit for drying out until the 10th, when Nos. 2 and 3 were put on load, supplying with Horahora all the system except Auckland, until the 15th April, on which date Auckland recommenced taking power, but continued to run King's Wharf station to give assistance at peak-load periods. No. 4 unit was put in service on 16th May, and King's Wharf station ceased supply on 27th May, 1932.

The restoration of Arapuni to service enabled the Penrose Diesel and Huntly steam plants to be shut down.

MANGAHAO–WAIKAREMOANA ELECTRIC-POWER SUPPLY.

I. Financial Results.

At the close of the year 1931–32 the capital outlay amounted to £3,659,304. The net revenue for the year was £300,022, and working-expenses, £48,900. After paying interest, totalling £202,775, a net surplus of £48,347 was shown. Depreciation charges amount to £65,681, which leaves a deficiency on the year's working of £17,334.

The financial results and load records are analysed in Table IX, whilst Tables X and XI give an analysis of the capital outlay and working-expenses. The gross financial results of the system are given in Table XIII.

II. Operation and Maintenance.

The operation of the Mangahao portion of the scheme was quite satisfactory throughout the year.

The generators and turbines have operated well, and at no time was a unit under repair while in demand.

Supply to Horowhenua Electric-power Board.—This supply is given at 11,000 volts over a double-circuit line from Mangahao Power-station, the line being maintained by the Horowhenua Electric-power Board. Two accidental interruptions, totalling 3 minutes, occurred during the year.

Waikaremoana Power-house and Headworks.—The operation of this portion of the scheme was quite satisfactory throughout the year.

Heavy rain early in the year caused considerable damage to the tail-race spillway weir, but this was repaired without affecting continuity of supply, temporary measures being taken to maintain the water-level at the draught tubes while the damage was being made good.

The pipe-lines were thoroughly inspected during the year and the interior surfaces found to be in very good order. The whole of the exterior of the pipes has been painted.

As the turbines have been unable to deliver the guaranteed output, the manufacturers have agreed to supply new runners for both machines. One of these has come to hand and has been installed on No. 2 unit. Owing to the necessity of supplying power, it was not possible to carry out efficiency tests on the machine after the installation of the new runner, but its output is now quite satisfactory.

Heavy rain during the year caused numerous slips in the pipe-lines and roads and at the outdoor station. Ice-plants and other similar vegetation have been planted to make the batters more stable.

General repairs to the cottages and staff quarters have been carried out, and the grounds grassed.

Substations.

Khandallah.—From this substation power is supplied to the Wellington City Council, Hutt Valley Electric-power Board, New Zealand Railway Department, and the Wellington Meat Export Co., Ltd.

During the year there were eight total interruptions to supply, totalling 18 minutes, none of which were prearranged.

Due to bad joints on the rotor of the synchronous condenser, one of the joint plates became loose and damaged the stator coils. This necessitated the dismantling of the machine, and a considerable amount of work had to be done. The machine is now being reassembled, and will be in service again shortly.

The earthing system was overhauled and, to improve its reliability, all soldered connections were replaced by mechanical joints.

A considerable number of insulators have been tested during the year, including those indicated as defective by the buzz stick and those held as spare insulators at substations and telephone huts. A number of tests on special insulators have also been carried out.

Melling.—This substation was put into service in August, 1931, and has since been giving supply to the Hutt Valley Electric-power Board. All apparatus has operated well during the time the substation has been in service, and every interruption to supply was due to external causes.

Bunnythorpe.—From this substation supply is given to the Manawatu-Oroua Electric-power Board. During the year nine accidental interruptions to supply, of a total duration of 57 minutes, occurred.

The prearranged shutdowns numbered eleven, and totalled 4 hours 3 minutes. Seven of these, of a duration of 3 hours 58 minutes, were occasioned by the reconstruction work carried out at this substation during the year. The remaining four, of five minutes, were required for paralleling Mangahao and Tuai after shutdowns.

Marton.—This substation supplies power to the Wanganui-Rangitikei Electric-power Board, and is normally in parallel with Wanganui Substation on the low-tension side—*i.e.*, through the Power Board's lines.

During the year there were ten accidental interruptions to supply, of a duration of 42 hours 7 minutes. The greater part of this time is made up by one interruption of 40 hours 48 minutes, caused by the failure of a bushing in the low-tension switch-gear. The actual interruption to supply at Marton was only 1 minute.

Of the prearranged shutdowns, numbering nine and totalling 35 hours 39 minutes, five, of 12 hours 24 minutes, were required for work on the lines; one, of 4 hours 48 minutes, for the changing of the current-transformers on incoming and outgoing feeders, necessitated by the increase in load; and the remaining three, of 19 hours 7 minutes, were required for repairs to the metering current-transformer chamber, necessitated by the failure of a bushing.

Wanganui.—This substation, in conjunction with Marton, supplies power to the Wanganui-Rangitikei Electric-power Board, and all apparatus has functioned very well throughout the year.

During the year there were thirteen accidental interruptions to supply, of a total duration of 1 hour 26 minutes.

Of the nine prearranged shutdowns, totalling 22 hours 5 minutes, six, of 14 hours 48 minutes, were required for line maintenance; two, of 4 hours 8 minutes, for substation maintenance; and the remaining one, of 3 hours 9 minutes, was necessitated by construction work.

During four of the prearranged shutdowns, totalling 8 hours 36 minutes, supply was maintained by means of Power Board's steam plant and from Marton Substation, and during the remainder, essential load was carried by the Power Board's steam plant.

While construction was in progress, the wiring for the telephones and alarm-bells to the cottages was remodelled.

Hawera.—The construction of this substation was sufficiently far advanced by November, 1931, to enable a temporary supply to be given to the South Taranaki Electric-power Board and, pending the construction of Stratford Substation, to New Plymouth Borough Council at 11,000 volts, temporary measures being adopted to by-pass the structure at Stratford during this period.

This supply was given at the request of the respective local authorities, on account of shortage of water at their power-stations, and it was necessarily frequently interrupted to enable construction work to be carried on. Towards the end of February, 1932, the gear used to give temporary supply to New Plymouth was dismantled, and early in March permanent supply was given to South Taranaki Electric-power Board.

Since the permanent supply was inaugurated there were two accidental interruptions to supply, totalling 53 minutes, which were due to trouble on the Power Board's system. Two prearranged shutdowns, totalling 3 hours 17 minutes, took place, one of these, of 58 minutes, being at the request of the Power Board. The remaining one, of 2 hours 19 minutes, was required for work on the structure.

All apparatus has given good service.

Stratford.—At this substation power is reduced from 110,000 volts to 50,000 volts, and supplied to the New Plymouth substation at the latter voltage.

One prearranged shutdown, of 2 hours 11 minutes, was required during the year for work on the structure and connecting in the 50,000/230 volt local service transformer.

New Plymouth.—At this substation all apparatus is erected at the power-house of the New Plymouth Borough Council, the only consumer fed from this source.

As the Borough Council maintains its own staff for power-house operation, it has been arranged that this staff also carries out any necessary switching-operations on our apparatus, thus obviating the necessity for a special attendant.

Periodical inspection is carried out by the attendant from Stratford Substation.

Since the supply commenced, one prearranged shutdown, of 2 hours 11 minutes, occurred, which was required for work at Stratford.

Masterton.—From this substation power is supplied to the Wairarapa Electric-power Board. Under the new contract with the Wairarapa Power Board their Kourarau plant is now used solely as a standby.

During the year there were twenty accidental interruptions, totalling 15 hours 6 minutes, of which nine interruptions, of 2 hours 17 minutes, were due to the failure of a coach-screw in the stay on a pole near Masterton. Coach-screws in cross-arm stays are now being replaced by through bolts on all lines, during their annual overhaul.

During the year there were thirteen prearranged shutdowns, totalling 18 hours 45 minutes, of which ten, of 16 hours 32 minutes, were required for line-maintenance and one, of 13 minutes, for altering main transformer-tappings. The remaining two, of 2 hours, were at the request of the Power Board. These prearranged shutdowns took place at times when the Board's plant could carry all the load.

Mangamaire.—From this substation power is supplied to the Tararua Electric-power Board. There were seventeen accidental interruptions during the year, totalling 2 hours 30 minutes.

There were twenty-one prearranged shutdowns during the year, of a total time of 34 hours 30 minutes, twelve of these, totalling 26 hours 52 minutes, being required for line-maintenance. Two shutdowns were due to connecting up a temporary supply of power for drying out the condenser. Two shutdowns, of 4 minutes, were required to parallel Mangahao and Tuai after interruptions for work on other sections of line. One shutdown, of 2 hours 18 minutes, was required for changing the current-transformers in the metering-cubicle and making alterations to the relays on the main 11,000 volt O.C.B., and two, of 5 minutes, for carrying out the acceptance tests on the new relays at Woodville.

There was a breakdown on the synchronous condenser during the year. The protective apparatus saved the machine from serious damage. The cause of the breakdown was undoubtedly due to condensation of moisture during idle periods. Special doors have now been fitted on the inlet and outlet ducts and heaters installed to keep the machine dry.

Woodville Switching-station.—All apparatus functioned satisfactorily throughout the year.

Two prearranged shutdowns, of 5 minutes, were caused to Mangamaire supply to enable acceptance tests to be carried out on the new relays.

Early in the coming year it is proposed to install synchronizing equipment at this station so that Mangahao and Tuai can be paralleled here without causing interruptions to Mangamaire and Masterton Substations.

Dannevirke.—From this substation supply is given to the Dannevirke Electric-power Board.

During the year there were four accidental interruptions, totalling 7 minutes, none of these being due to faults in the substation apparatus.

Of the prearranged shutdowns, numbering eleven and totalling 13 hours 27 minutes, three, of 4 hours 15 minutes, were required for substation maintenance; five, of 2 hours 24 minutes, for line-maintenance; two, of 4 hours 37 minutes, for construction work; and one, of 2 hours 11 minutes, was at the request of the Power Board.

Owing to the failure of the insulation in the synchronous condenser at Mangamaire, due to the collection of moisture in the windings, the synchronous condenser at Dannevirke Substation has been dried out, and precautions taken to prevent the condensation of moisture on the windings.

Waipukurau.—From this substation power is supplied to the Central Hawke's Bay Electric-power Board.

Six accidental interruptions to supply, totalling 12 minutes, occurred during the year.

Of the eight prearranged shutdowns, totalling 14 hours 54 minutes, three, of 6 hours 59 minutes, were required for substation maintenance; one, of 1 minute, for Mangahao and Tuai to parallel after insulator-changing operations; and four, of 7 hours 54 minutes, for construction work.

All apparatus has functioned well during the year.

Napier.—From this substation power is supplied to the Hawke's Bay Electric-power Board. Five interruptions to supply, totalling 9 minutes, occurred during the year.

Of the prearranged shutdowns, numbering twelve and totalling 7 hours 20 minutes, four, of 4 hours 14 minutes, were required for construction work; three, of 3 hours 1 minute, for substation maintenance; and five, of 5 minutes, for Mangahao and Tuai to parallel after shutdowns on other portions of the line.

A start has been made on the repairs of the earthquake damage to the buildings. The reconditioning of the synchronous condenser will be carried out when the building has been repaired.

Gisborne.—From this substation power is supplied to the Poverty Bay Electric-power Board, and the operation of equipment has been satisfactory during the year.

During the year there were twelve accidental interruptions to supply, totalling 21 minutes.

Of the prearranged shutdowns, numbering six and totalling 24 hours 50 minutes, two, of 16 hours 57 minutes, were required for insulator cleaning; one, of 1 hour, for repairing the isolating-switch at Tiniroto; one, of 4 hours 5 minutes, for replacing a faulty insulator and oil-switch bushing at the substation; and two, of 2 hours 47 minutes for changing transformers.

Trouble was experienced with the water-cooled transformer, due to the deposit of lime in the cooling-coils. This was removed and the transformers are now in good order.

Wairoa.—From this substation power is supplied to the Wairoa Electric-power Board, and there were only two accidental interruptions to supply, totalling 2 minutes, during the year.

The prearranged shutdowns numbered five and totalled 16 hours 17 minutes. Of these, three, of 10 hours 43 minutes, were required for line-maintenance and the remaining two, of 5 hours 35 minutes, were at the request of the Power Board.

A worker's hut was shifted from Tuai and converted into an oil-filtering shed, to enable the oil in the transformers to be filtered in any weather.

All apparatus is in good order.

General.—The main transformers at all substations have been bolted down to their pads, and special clamps fitted in the high-tension leads, to eliminate the risk of damage in the event of earthquakes occurring. Since this work was carried out, a sufficiently severe earthquake occurred at Napier to test the effectiveness of these precautions and the result was quite satisfactory. No apparatus was damaged, and only a short interruption took place.

At most of the substations where the lines are of aluminium, the span between the structure and the first strain pole has been changed from aluminium to copper, to obviate the breaks in the cable from electrolytic action. The joint between copper and aluminium is made in the jumper on the strain pole, so that the harmful effects of electrolysis are reduced to a minimum. This work is being done as a matter of general policy, and is being carried out only when circumstances are favourable—*i.e.*, at times when new switch-gear is being put into service, &c.

Trenches have been dug round transformer and oil circuit-breaker pads and filled with coarse shingle, to minimize the fire risk due to oil-leaks.

Alterations are being made to the transformer connections at the substations, to make them conform to the B.E.S.A. Standard Specification.

Transmission-lines (110 Kv.).

Mangaore–Khandallah Duplicate Line.—During the year two interruptions to supply, totalling 4 minutes, occurred on this line, both of which were due to earth wire falling on the lines.

Mangaore–Bunnythorpe Duplicate Line.—This line gave no trouble during the year.

The overhaul of the telephone-line, and the change-over to cadmium copper, between Mangaore and the Manawatu River, have been completed.

Bunnythorpe–Marton–Wanganui Line.—Two accidental interruptions occurred through trouble on this line, causing Wanganui to be without power for 8 minutes, and Bunnythorpe for 2 minutes. Both interruptions were due to the same cause—a gorse fire under the line near Turakina.

Four prearranged shutdowns were required during the year for the maintenance of this line, the total time of interruption to Wanganui supply being 12 hours 25 minutes. Only two of these shutdowns affected Marton, the total time being 8 hours 20 minutes.

A deviation has been made in the telephone-line near Wanganui substation.

Wanganui–Hawera–Stratford Line.—This line was put into service in November, 1931, and has since given good service.

Streams have been bridged and tracks cut where necessary for patrol purposes.

Bunnythorpe–Woodville–Dannevirke Line.—This line has given good service during the year.

Woodville–Mangamaire–Masterton Line.—A house on fire near the line, at Solway, caused an interruption to supply of 12 minutes at Mangamaire, and one of 2 minutes to supply at Masterton, the Kourarau plant being called on to supply the Wairarapa Electric-power load until the line was repaired.

Line maintenance accounted for six prearranged shutdowns, required for the changing and cleaning of insulators. When this work is done by live line methods, prearranged shutdowns will be considerably reduced.

Dannevirke–Waipukurau–Napier Line.—This line has operated very well during the year, having caused no interruptions to supply at any of the substations, except short prearranged shutdowns to enable Mangahao and Tuai to parallel after insulator cleaning and changing operations.

Tuai–Napier Double Circuit.—This line has operated well during the year.

Owing to the proved reliability of this line, the patrol point at Waikoau was dispensed with, and the linesmen transferred elsewhere.

Transmission-lines (50 Kv.).

Stratford–New Plymouth Line.—This line has given good service since installation. Some trouble has been experienced with the telephone-line, due to breaks in the conductors. The cause of this is being investigated.

Tuai–Gisborne Line.—There were three prearranged shutdowns, totalling 17 hours 58 minutes, of which two, of 16 hours 58 minutes, were required for insulator cleaning, and one, of 1 hour, for repairing the isolating-switch at Tiniroto, which had developed sparking at the contacts.

Tuai-Wairoa Line.—This line has given very good service during the year, having caused no interruptions to supply. Three prearranged shutdowns, totalling 10 hours 42 minutes, were required for cleaning insulators and overhauling the line.

Transmission-lines (11 Kv.).

Mangaore–Shannon.—During the year this line has been operated and maintained by the Horowhenua Electric-power Board.

During the year, as the Horowhenua Power Board wished to overhaul this line, temporary arrangements were made whereby the Department supplied power at 11 kv. over one of the power-house–Khandallah 110 kv. lines to a point near Levin, where the Power Board line was connected in. This enabled the Board to carry out their necessary work without cutting off supply to their consumers, except for the short times necessary to make the above change-over and to restore the normal connections.

Khandallah–Hutt Valley Power Board: Duplicate Circuit.—Two prearranged shutdowns, totalling 2 hours 27 minutes, were required during the year, one of these, of 41 minutes, being at the request of the Power Board. The other shutdown, of 1 hour 46 minutes, was required for replacing a faulty jumper on an air-break switch, and involved only one of the two circuits.

Khandallah–New Zealand Railways: Duplicate Circuit.—Fourteen prearranged shutdowns, totalling 106 hours 37 minutes, were required during the year, of which four, of 15 hours 4 minutes, were required for line maintenance; nine, of 83 hours 9 minutes, were at the Railway Department's request; and one, of 8 hours 24 minutes, was required for work on the Power Board lines.

Khandallah–Wellington Meat Export Co., Ltd.—Two prearranged shutdowns, totalling 8 hours 11 minutes, occurred. One of these, of 15 minutes, was required in order to remove a piece of wire which had been thrown on to the line; and the other, of 7 hours 56 minutes, occurred at the request of the Hutt Valley Electric-power Board.

General.—During the year the usual maintenance work has been carried out on all transmission-lines. This includes the annual cleaning and testing of all insulators, examination of poles for sap, and general tightening up. In addition to the above, a special gang has been engaged in desapping poles, shortening weak poles or stubbing them, and replacing defective poles. To date, the lines from Wellington to Bunnythorpe have been thus thoroughly overhauled and reconditioned. In addition, on all other sections, weak poles have been specially examined and, where dangerous, have been replaced. On sections of the lines where vibration breaks are liable to occur, the wire has been examined at each insulator and partial breaks repaired.

As a result of the special attention given to the transmission-lines, there were only five faults on the whole of the 110 kv. lines during the year. This represents 0·8 fault per 100 miles of line.

A large amount of this maintenance work is carried out with the line alive; but it has been necessary to have a considerable number of shutdowns for such work as the cleaning and changing of insulators and the renewal of poles and crossarms. With a view to reducing these shutdowns to a minimum, two officers are being specially trained in "live line" work. They will, in turn, train a special gang of men and it is thereby hoped to carry out practically all operations with the power still on.

There were twenty-three lightning storms recorded during the year.

III. Construction.

Mangahao Power-station.—The new relay equipment has been installed, tested, and placed in service. The new battery has been received and is now being installed.

Waikaremoana Power-station.—The new relay equipment has been finally tested and placed in service.

Four new cottages have been erected, and a worker's cottage transferred from Waikoau and reassembled.

Upper Developmental Survey, Waikaremoana.—During the past year further work has been carried out in tracing the various leaks through the barrier by means of dyes. A diver has also been employed on this work and, as a result, practically all the leaks have been located and their connection traced with the outlets.

Khandallah Substation.—The installation of the new relay system has been completed.

Melling Substation.—The permanent buildings have been completed and the low-tension switch-gear has been installed and put into service.

Bunnythorpe Substation.—The reconstruction of this substation, necessitated by the fire, has been completed. In addition to this work, a new transformer-bank has been installed to meet the growing load, and a new relay system has been put into operation.

Wanganui Substation.—The only construction work which has been done at this substation during the year is the installation of the necessary gear for the control of the new line to Taranaki, comprising the H.T. switch-gear, control-panels, battery, and charging-equipment.

A new telephone board was installed and the wiring of the telephones and alarm-bells in the substation was altered to suit the new conditions.

Hawera Substation.—During the year the 110 kv. apparatus was erected, and has since operated well.

Stratford Substation.—The 110 kv. structure and transformer-bank have been completely erected and put into service.

New Plymouth.—The 50,000 volt outdoor structure and transformer-bank have been erected close to the power-house of the New Plymouth Borough Council, and metering-apparatus has been installed in the power-house building. The substation has now been completed.

Masterton Substation.—A new 11,000 volt oil-circuit-breaker cubicle was erected to control supply from Kourarau Power-station.

Dannevirke Substation.—The new relay equipment has been installed, but not yet put into service.

Waipukurau Substation.—The new relay equipment has now been installed, but is not yet in service.

Napier Substation.—To meet the growing demand of the Power Board, an additional bank of transformers and the necessary switch-gear have been installed.

A new 11,000 volt cubicle has been installed to control the supply from the new transformer-bank.

Repairs to the synchronous condenser switch-gear, damaged by the earthquake, have been completed, but the condenser itself has not yet been repaired on account of the condition of the building.

The new battery has been installed and put into service.

Transmission-lines (110 kv.).

Wanganui–Stratford Line.—This line was erected during the year, and is now in service.

A new type of structure is being used on this line, and the result on operation is being looked forward to with interest.

Khandallah–Melling Line.—This line is carried on steel towers, and is the first section of the proposed Khandallah–Masterton line. The erection was completed early in the year, and the line is now in service.

Transmission-line (50 kv.).

Stratford – New Plymouth Line.—This line was completed and put into service during the year, and has since operated well.

IV. General.

During the past year the system has been extended considerably. A 110 kv. transmission-line has been built from Wanganui to Stratford, and a 50 kv. line completed from Stratford to New Plymouth. Substations have been built at Hawera and Stratford, and outdoor substation equipment erected at the New Plymouth Borough Council's power-house. Power supply in this area has been given to the South Taranaki Electric-power Board at Hawera, and to the New Plymouth Borough Council at the Borough's power-house. Stratford Substation will be the point at which the line from Arapuni (now under construction) will join the Mangahao–Waikaremoana system.

A 110 kv. transmission-line has been built from Khandallah to Melling, and a substation built at Melling for the purpose of giving the Hutt Valley Electric-power Board a point of supply close to the centre of their load.

A new relay system has also been installed during the year. This will enable faults on one section of line or substation to be cleared without affecting the remainder of the system.

The installation of a second bank of transformers at Napier has enabled paralleling between the two power-houses to be carried out without interrupting the supply to Napier Substation.

Throughout the year the two power-houses have operated satisfactorily in parallel.

The maximum load on the system was 45,980 kw., and the units output during the year 224,293,045, the corresponding figures for 1931 being 44,660 and 211,971,392 respectively. The annual load factor for the system was 55·8 per cent., as against 54·2 per cent. for 1931.

The result of the year's operation are analysed in Table IX, and the connected load in Table XII.

LAKE COLERIDGE ELECTRIC-POWER SUPPLY.

The Lake Coleridge undertaking has been in operation for seventeen years at the close of the year ending 31st March, 1932. Despite restricted conditions of supply and the general depression, the undertaking shows very satisfactory results financially.

Financial.

At the end of the year the capital outlay was £1,802,497, an increase of £89,942 on that of the previous year—viz., £1,712,555. The total revenue showed a slight increase from £217,632 to £218,196, and after deducting all charges, including interest and depreciation, the net profit was £94,966. This amount has been allocated as follows: £18,062 to sinking fund, and £76,904 to General Reserve Fund.

Table XVII shows particulars of financial results and load records, while Table XVIII gives an analysis of capital outlay for the years 1931 and 1932.

The total cost per unit generated and purchased was 0·227d., a decrease of 0·062d. on that of the previous year, the decrease being due to the increased output of units, combined with a decrease in the total cost of operation.

Operating costs have decreased by £19,788, due chiefly to a decrease in the amount of payment made towards the purchase of power from £21,170 for the previous year to £2,803 for the year under review.

Details of operating-costs are shown in Table XIX, while Table XXI shows the gross financial results of distribution of energy for the year ending 31st March, 1932, with particular reference to each of the supply authorities and other consumers connected to the Lake Coleridge system.

Connected Load.

The total connected load is shown in Table XX, and at the end of the year was £212,156 kw., being an increase of 5·67 per cent. over the previous year's figure of 200,535 kw.

Restricted Supply.

The restricted supply referred to in the annual report for the year ending 31st March, 1931, was continued during the present financial year until 2nd May, at which date the water-storage situation was such that the restrictions were removed and the assistance of the Christchurch Tramway Board's stand-by plant no longer made use of. The Board's plant supplied 282,736 units for the period 1st April to 2nd May, 1931, as against 1,729,441 units for the year ending 31st March, 1931.

System Load and Operation.

The power-house maximum half-hourly output for the year was 30,340 kw. on the 23rd June, a decrease of 460 kw. on that of the year previous. The units output, however, show an increase of 6·6 per cent., the respective figures being 122,416,818 and 130,562,543 for 1931 and 1932.

The annual load-factor for the system was 49 per cent., as against 44·8 per cent. for the previous year.

The maximum number of units supplied to the system in any one day was 447,870 on the 23rd June, 1931, as against 453,710 on the 6th June, 1930.

During the period 1st April to 30th June, 1932, the maximum half-hourly load at the power-house was 30,140 kw. on 13th June. This load is 200 kw. less than the maximum recorded for the year ending 31st March, 1932, and 660 kw. less than the record for the station which was observed on the 9th June, 1930.

Lyttelton Diesel Station.

The first trial run of a completely assembled set was carried out on the 4th June, 1931, and the station was placed in commission from the 14th July to the 18th September to enable the plant to be thoroughly tried out.

All main and auxiliary sets are given a trial run each week, and the whole plant is maintained in such a condition that the plant can be brought into service in a minimum of time. Provision has been made for starting up the plant even if a total failure occurred of all electrical supply.

Survey and Easements.

The following surveys were carried out during the year: Pegging and stub-setting was completed on the Waitaki–Glenavy steel-tower line. The survey and setting-out of the second Timaru–Oamaru 110 kv. line was completed from a point about two miles south of Timaru Substation. Glenavy, Oamaru, and Addington Substations were set out, and preliminary work was undertaken for Timaru Substation. Further work was carried out in the preparation of final plans and in the settlement of compensation claims.

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 the 31st March all insulators throughout the system were tested under live-line conditions and the defectives observed were 354 on the 110 kv. and 66 kv. lines, 40 on the 33 kv., and 64 on the 11 kv., making a total of 458 insulators, of which the 40 on the 33 kv. line were replaced under live-line methods, while the 64 on the 11 kv. and 232 on the main lines were replaced during the overhaul up to the 31st March.

Besides the 354 defectives observed on the main lines during the buzz-stick inspection, 177 insulators were noted as cracked during the overhaul, making a total of 531 defectives on the main lines alone. The cracked insulators are of a make which is gradually being replaced.

In addition to the 232 defectives that were replaced on the main lines during the overhaul, the linesmen changed 153 pin-type and 453 strain-type units on the lines operating at 66 kv. The total number of insulators changed during the year ending 31st March throughout the Lake Coleridge system amounted to 943.

Three 33 kv. and four 11 kv. poles were replaced under live-line methods, and 40 main-line poles during the overhaul up to the 31st March, besides 269 crossarms.

Repairs to the telephone-lines have resulted in improved operating conditions.

Anti-vibration jumpers were fitted over a distance of 10 miles on the 110 kv. A.C.S.R. conductors up to the 31st March. This work is proceeding.

Two 90 ft. steel suspension towers with a span of 28 chains and wood terminal structures were erected for the 33 kv. crossing over the Waimakariri River.

The four Diesel electric sets, auxiliaries, and switch-board were erected satisfactorily, and new 11 kv. feeders of larger capacity were installed to cope with the load that the Lyttelton Diesel Station might be called upon to feed into the system.

The electrical installation at the Wigram Aerodrome was overhauled and brought into line with the wiring regulations.

Structural alterations were carried out at Hororata and Ashburton Substations, while preparations were made at Addington for the erection of an outdoor steel structure, and to date most of the concrete foundation and the traverser trackway has been laid, while seventeen out of thirty towers have been erected, as well as some of the girders.

Headworks and Pipelines.

Additional groynes were constructed on both banks of the Harper to prevent erosion. Repairs were carried out to the steelwork protection at the gateways of the Harper inlet. The bridge on the Lake Lyndon Road giving access to the Acheron diversion works was reconstructed with an additional span. The original fluming which provided a supply of water for Murchison's woolscour was replaced with an inverted syphon arrangement.

An extension of approximately 67 chains is being added to the Harper Road by means of a co-operative contract, utilizing unemployed relief workers under the supervision of the General Branch. While the Glenthorne Sheep-station will benefit principally by this provision of better roadway facilities, access to the Harper diversion works will be improved.

A detailed inspection of all the pipe-lines was carried out and the ladders into Nos. 1, 2, and 3 pipe-lines were stiffened as vibration caused by the water was responsible for the displacement of a number of the rungs. Rust spots on Nos. 1, 2, and 3 pipe-lines were painted.

Power-house.

The "hunting" experienced in No. 1 governor was rectified after investigation. Both efficiency and heating tests were carried out on the No. 1 unit. All the four 1,500 kw. units now have the new type of liner rings fitted to their main valves. New shaft glands were fitted to Nos. 2 and 3 units, as the original type provided proved unsatisfactory. Considerable cavitation was observed in the bronze runners of Nos. 2 and 3 turbines, and the runner of No. 5 turbine was welded where cavitation had taken place.

Due to lightning on the 10th October extensive damage was done to Nos. 2 and 3 alternators. After repairs, which were carried out in shifts, No. 2 unit was replaced in service after seventeen days, and No. 3 unit was not ready for recommissioning for forty-five days. To assist in the repairs assistance was obtained from the North Island in the matter of additional armature winders.

A new ironclad switch for testing purposes was added to the 6·6 kv. switch-gear, and the water rheostat, after alterations had been effected, was permanently connected up.

Repairs were carried out to the station storage-battery, and included the removal and straightening of all the positive plates.

New control and meter connections were made between the new 66 kv. line O.C.B.s and the switch-board, and the old line panels were replaced with a new set made up by the Testing Department, Addington, incorporating mimic bus system. The new system of relay protection was put into service in September, and the 66 kv. outdoor equipment has been fenced in.

Addington Substation.

The new 12,000 kv.a. bank of 66/11 kv. transformers was connected to the system on the 23rd May, and, as a consequence, the capacity of this station was increased from 29,000 kv.a. to 36,000 kv.a.

A two-bay extension to the building was commenced and completed during the year, and erection of the new 10,000 kv.a. synchronous condenser and its control-board was immediately put in hand and completed early in April, 1932. Connecting cables for this condenser have not yet arrived, and the machine will not be ready for service for some time yet. The original 5,300 kv.a. south transformer-bank has been altered from indoor to outdoor type for erection at Timaru Substation.

A 150 kv.a. transformer was rewired for Lyttelton Diesel Station, and repairs were carried out on a current-transformer for a 110 kv. O.C.B. for Glenavy Substation. The earthing reactor was rewound for the 33 kv. substation at Stoddart's Corner for the second time.

Since the beginning of the present financial year considerable progress has been made in the erection of the outdoor steel-work structure which, when completed, will bring this substation into line with the modern type adopted and erected in recent years by the Department.

Additional work has been carried out on the layout of railway sidings which have been utilized extensively and advantageously.

Point Substation.

No alterations were carried out at this substation during the year.

Hororata Substation.

Structural alterations, consisting of increasing the number of O.C.B.s from four to seven, replacing the stick-operated isolating switches with gang-operated type, and the independently operated earthing devices with a simpler method of grounding the lines, and providing a potential transformer-bank and a complete set of relay protection equipment, which had been commenced in February, 1931, and stopped temporarily to enable the construction gang to concentrate on the early completion of the Lyttelton Diesel Station and its feeders, were recommenced and completed satisfactorily during the year. This important station should now function more satisfactorily until the extensions of the system necessitate steelwork replacing the wood-pole structures.

Ashburton Substation.

Extensive alterations were commenced at this substation, and to date have practically been completed. Previously the station was provided with two O.C.B.s. It now has five O.C.B.s, gang-operated isolating switches of the latest type, a potential transformer-bank, an induction-voltage regulator, and a complete set of relay protection equipment. The earthing system has not yet been finalized, and the old type of earthing device for grounding the four sections of the transmission-lines has been retained. This station now operates efficiently.

Timaru Substation.

Beyond the placing of the auto-transformers on their foundations, the removal and re-erection of the two staff cottages, the acquisition and fencing-in of a larger area to accommodate the new steel structure and the substation building, no construction was undertaken pending the receipt of definite and final decision as to the permanent location of the redesigned substation, the material for which has already arrived and has been sorted out ready for assembling and placing in commission.

Oamaru Substation.

The building of the steelwork structure was commenced and completed during the year, and the original wood structure was dismantled. Provision has been made in the new structure for two trunk lines to connect the Lake Coleridge system with the Waipori system.

Waitaki Hydro Substation.

Up to the 28th June, 1931, power was supplied to the Waitaki Hydro Works by the Waitaki Electric-power Board from the Lake Coleridge Power-house. The replacing of the overloaded 750 kv.a. and 300 kv.a. 66/11 kv. transformer-banks at Oamaru Substation with a 5,300 kv.a. transformer-bank rendered the construction of a 750 kv.a. Substation at Waitaki Hydro a feasible and sound proposition, and as a result over 2¼ million units were delivered direct to the General Branch between the 28th June, 1931, and the 31st March, 1932.

Glenavy Switching-station.

The Glenavy and Waitaki Hydro Stations were connected to the Lake Coleridge system on the 28th June, 1931. A supply to the staff cottages is given through a special transformer from the potential transformer-bank.

Interruptions to Supply.

(a) Power-house Supply.

There were only three outages, and these affected the whole system, the total period being 19½ minutes, and the longest interruption being 13 minutes. This latter was due to damage to equipment on the 6,600-volt switch-gear and to two 7,500 kw. alternators by a heavy lightning storm.

(b) Addington, Point, and Hororata Supply.

The total number of interruptions during the year corresponded with those at the power-house, being only three in number.

(c) Ashburton Supply.

The total number of outages was six, excluding those that had been prearranged, and the total period was 32 minutes. The longest period corresponded to that at the power-house, being 15½ minutes.

(d) Timaru Supply.

The number of interruptions totalled eight, the longest being 15½ minutes, and the total period 34½ minutes.

(e) Oamaru Supply.

Excluding all shutdowns that had been prearranged, the number of outages for the year was ten, the total period being 1 hour 17½ minutes, and the longest interruption was one of 43 minutes' duration when South Canterbury Power Board's 6·6 kv. lines fouled the Department's 66 kv. line at Glenavy. Apart from the one trouble mentioned above, there were no interruptions on the section of line between Timaru and Oamaru.

Not one of the above interruptions to supply 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. Out of 35,250 insulator units tested under live-line methods 531 were located as defective on the 66 kv. lines. This represents a percentage of 1·54 defective to total number in commission.

Testing.

During the year ending 31st March the number of tests and investigations that had been placed on record amounted to 148, including the test on No. 1 alternator at Lake Coleridge Power-house.

Due to careful adjustment and checking of the master clock at the power-house the frequency of the system has improved in stability, and the variation from standard time as received from Wellington Observatory per 2YA does not exceed ten seconds at any time.

New relay equipment has been installed at Lake Coleridge Power-house, Addington, Hororata, Woolston, and Lyttelton Diesel Station, and is being installed at Ashburton Substation.

The breakdown of the switch-gear and No. 2 and No. 3 alternators at Lake Coleridge Power-house, due to a severe thunder and lightning storm, involved a considerable amount of testing and investigating before repairs were commenced.

General.

During the year a store to serve the General and Hydro-electric Branches was built at Addington, the existing store buildings were dismantled, and the site they had occupied was cleared for the erection of the new steelwork structure.

Since the beginning of the present financial year the main transmission-line telephone circuits which entered the Addington Substation building at the southern end were deviated to the northern end, where a telephone-room had been provided in the construction of a two-bay extension to the substation building.

Arrangements are in train for the installation of an induction voltage regulator at the 33 kv. Substation at Stoddart's Corner.

Since the commencement of supply from Lake Coleridge Power-house serious breakdowns of the main telephone-lines have been experienced due to snowstorms. The inconvenience due to lack of inter-communication between stations was given prominence during the earthquake in the North Island, and, as a result, a set of wave lengths was decided upon for the electrical districts in both Islands, with the view of installing wireless stations. A test was carried out at and near the power-house at Lake Coleridge to determine the amount of interference experienced during reception, and the result of this preliminary test revealed that while satisfactory reception was impossible with the receiving-set used in or on the power-house building, reception was good at a distance of a quarter of a mile from the building.

To prevent outages and surges caused by branches of trees being too near the transmission-lines periodical inspection has been carried out. With the exception of two extensive plantations, the lines may be considered free from likely interference due to trees requiring attention.

The Springs–Ellesmere Power Board took over the Tai Tapu Dairy Co.'s reticulation on the 1st July, and the Tai Tapu, Lincoln, and the 3 kv. company's supplies from Stoddart's Corner Substation were transferred to the Power Board on Sunday, 12th July, 1931.

Weather and Rainfall.

The average rainfall over the lake area was 41·45 in. for the calendar year 1931, as compared with 25·18 in. for 1930.

At the power-house itself the rainfall for the calendar year 1931 was 34·91 in., while the fall for the previous year was only 22·05 in.

There was a heavy snowstorm on the 8th July, and the roads to the Harper, Acheron, and intake were impassable for several days. The snowstorm was followed by exceptional low temperatures. On the 12th July the amount of frost registered was 26·5 degrees, the lowest temperature recorded being 5·5° F.

WAITAKI RIVER SCHEME (ELECTRICAL SECTION).

The principal works which have been put in hand or completed during the year comprise the following :—

(a) Power-house Plant and Equipment.

(1) Erection of two 23,000 b.h.p. Francis turbines.
(2) Preparation for erection of two 16,666 kv.a. generators.
(3) Erection of 120-ton electric overhead-travelling crane.
(4) Completion of outdoor switching-station.
(5) Construction of transformer station and erection of associated switch gear.
(6) Erection of 7½-ton hand-operated stop log crane.
(7) Installation of auxiliary turbines 600 b.h.p.

(b) Transmission-lines and Substations.

(1) Completion of power-house–Glenavy main transmission-line.
(2) Power-house – Glenavy telephone-line.
(3) Construction of Timaru–Oamaru 110 kv. main transmission-line.
(4) Construction of Glenavy switching-station, including substation building.
(5) Extensions to Oamaru Substation, including installation of 110 kv. switch-gear and steelwork.

Lake Coleridge – Waitaki Interconnection.

Interconnection with Lake Coleridge supply was effected on the 28th June, 1931. The only maintenance work carried out during the year has been on the patrol of this power-house–Glenavy 110 kv. transmission-line (at present being operated at 66 kv.), and on the telephone-line which parallels it practically all the way from Waitaki to Glenavy.

Waitaki River Crossing.

The special crossing over the Waitaki River was completed and livened up in April, 1931.

Severe resonant vibration of the copper-weld conductors appeared on this crossing shortly after completion. These vibrations were most noticeable during periods of light transverse winds, particularly about sunrise and sunset, and during the night, and at times were sufficiently severe to vibrate the tower members to a very marked extent. Arrangements were then made for fitting of dampers on all six conductors, and periodical observations have been made for any further signs of vibrations, but no trouble has been experienced comparable with the severity of those which took place prior to the fitting of the dampers. Although vibration is still present to a slight extent, its destructive nature has been effectively checked. It is not possible to now detect the vibrations in the tower members.

ELECTRICAL DESIGN OFFICE WORK.

During the year under review a large amount of detail design-work was carried out in connection with new developments and extensions to existing developments.

Although the damage resulting from the recent Hawke's Bay earthquake to the Mangahao-Waikaremoana system in the affected area was comparatively slight considering the magnitude of the shake, the necessity was shown for taking every precaution against the effects of possible earthquake forces in design-work, if power systems are to withstand and maintain continuity of supply during earthquakes of this magnitude.

The possible effects of these forces on buildings and equipment were fully investigated and taken into account in all subsequent design-work.

In connection with equipment already erected, arrangements were made for power and potential transformers and oil circuit-breakers to be securely fixed to their foundations where this had not already been done.

(*a*) Lake Coleridge System.

The following design-work was carried out for this system :—

Lyttelton Diesel Station.—Layout and foundation details for the 11,000-volt switch-gear. Pipe-work details.

Addington Substation.—Drawings and specifications for the building contract for the extensions to the main substation building to house No. 2 11,000-volt synchronous condenser (10,000 kv.a.), including the foundations for the condenser. Drawings for proposed new test-room, workshop, and office building.

Layout and foundation drawings for 66 kv. and 33 kv. switch-gear and 66/33 kv. and 66/11 kv. transformers.

Design of 30-ton traverser-truck for transformers.

Preliminary layout and diagram of connections for proposed new 11,000-volt switch-gear for tendering purposes.

Timaru Substation.—Layout drawing of new 110 kv. and 66 kv. switch-gear and steelwork and proposed new buildings on site.

Foundation drawings for 110 kv. and 66 kv. switch-gear, steelwork, and transformers.

(*b*) Mangahao-Waikaremoana System.

In connection with the new substations at Melling, Hawera, Stratford, and New Plymouth preliminary drawings showing the layout of buildings and equipment had already been prepared, but much detail design-work remained to be done, which for the most part had to be held over until the details of the machinery and equipment ordered came to hand. This work was completed for the initial development except for a few minor details.

The installation of increased transformer capacity at Napier and Bunnythorpe, together with its controlling switch-gear, involved design-work for foundation details.

Alternative proposals for the repair of earthquake damage to Napier Substation building were investigated, and drawings and specifications prepared for the field.

Short-circuit calculations and calculations to determine the voltage regulation and carrying-capacity with and without synchronous condensers were carried out for the Arapuni–Stratford–Bunnythorpe Tie-line. A proposed protective system was drawn up for this line and intermediate stations.

(*c*) Arapuni–Horahora Scheme.

Calculations were made for the Arapuni–Penrose lines to determine the carrying-capacity with increased synchronous condenser capacity.

The following design-work was carried out for this system :—

Arapuni Power-station.—Draught tube for No. 4 unit with provision for alteration to cross-section.

Hamilton No. 2 Substation (110/50 kv.).—Layout of extensions to 110 kv. switch-gear, steelwork, and relay-house. Preliminary drawings of extensions to 110 kv. switch-gear and steelwork for tendering purposes, 25-ton traverser-truck for transformers, gantry for 15-ton chain block. Foundations for 110 kv. transformers and oil circuit-breaker.

Hamilton No. 1 Substation (50/11 kv.).—Foundations for 50 kv. switch-gear, steelwork, and transformers, 12-ton traverser-truck for transformers ; details of temporary 11 kv. connections.

Bombay Substation.—Drawings and specifications for store and extensions to switch-room. Specification for additional steelwork for 110 kv. and 50 kv. switch-gear.

Taumarunui.—Preliminary layout on site for proposed substation.

General.—Foundations for additional 50 kv. oil circuit-breakers for protective scheme.

(*d*) Waitaki Power Development.

Throughout the year a large amount of design-work was carried out in connection with Waitaki Power-station.

In a hydro-electric station of this magnitude the building itself and most of the machinery and equipment are of special design. The greater part of the time for delivery of the machinery from the makers' works is spent on the design thereof, and the full details reach the Department only a short time before its arrival on site. To avoid undue delay in the erection on site, the design and construction of the building, and the layout of the machinery must be gone on with before the full details of the latter are received. As a result, amendments to the design are inevitable, but this course is

much more economical than delaying the construction of the building until the full details of the machinery are known, which would result in a large amount of capital spent on machinery lying idle for a considerable time.

The decision to provide for a horizontal acceleration of 1/6 g. in the design of the power-station building as a precaution against possible earthquakes necessitated checking a large amount of the design-work already done, and, where found advisable, providing additional bracing or supports, or making other structural alterations. These alterations involved amendments to the majority of the drawings, amounting in some cases to redrawing.

In connection with the supply of power to the Dunedin City Corporation in the near future preliminary drawings were prepared for a substation at Half-way Bush. The rupturing duties for oil circuit-breakers were calculated and the ratio and tappings for main transformers determined.

(*e*) General.

All interruptions of supply to consumers on the various systems were checked and investigated to ascertain as far as possible the cause in each case. This involved the checking and investigation of the operation of protective relays.

The plotting of operating data for the various systems, including lake-level and river-flow data, maximum loads, and weekly outputs for generating-stations, maximum demands and consumption of energy for local supply authorities and other major consumers was continued throughout the year. A design was prepared for an automatic releasing-clamp for connections to transformers to prevent undue strain on transformer bushings or controlling switch-gear during earthquake disturbances.

A road magnet for picking up nails and other scrap-iron from highways was designed for the Main Highways Board.

(*f*) Transmission-lines.

Arapuni–Stratford 110 kv. Line.—Drawings and specifications prepared for the steel towers required on the portion of this line between Taumarunui and Stratford. Tendered designs of towers analysed and checked. Also route plans prepared showing location of the steel structures. Data sheets and sag curves supplied for the wood-pole line between Arapuni and Taumarunui, also drawings of the various types of pole-supports.

Arapuni–Edgecumbe Line.—Deviation of route to avoid the sulphur springs in the Tikitere district. Location of supports for a portion of the line on which steel-cored aluminium conductors are to be used, and drawing prepared for the special crossing over Lake Roto-iti.

Wanganui–Stratford Line.—Investigation made of conductor stringing in Hawera district.

Waikaremoana–Gisborne Line.—Interference between telephone-wires and power-conductors investigated.

Khandallah–Melling Line.—Sundry plans and drawings supplied in connection with a proposed deviation at Normandale.

Waimakariri River Crossing.—Investigation of yielding of foundations of special strain structure, and of possibility of stringing telephone-wires under power-conductors.

Addington Transmission-lines.—Design of steel gantry structures to support existing power circuits and provide for future extensions.

Waitaki–Glenavy 110 kv. Line.—Sags and tensions calculated for the conductors and earth-wire, and tables compiled for use when stringing same. Vibration breaks in cadmium-copper telephone-wire investigated.

Timaru–Oamaru Line Duplication.—Conductor-stringing data and tower-erection drawings supplied. Investigation of conductor vibration at Waitaki River Crossing.

HYDRAULIC DESIGN OFFICE.

Arapuni–Horahora.—Along with the lining of the headrace and the protection of the falls at Arapuni the installation of an emergency gate in the diversion-tunnel has claimed a good deal of attention in the preparation of the shaft and collaboration with the designers who are also the makers of the gate. The gate is now at the site and ready to be installed.

Considerable erosion had taken place in the tufa rock below the control weir at Horahora, which, if allowed to continue, would in time have endangered the whole structure. Protective work was designed, and is now being carried out.

Mangahao.—The surge-chamber gates and hydraulic controls, which through corrosion have ceased to give satisfactory service, are being remodelled to a form which should prove less susceptible to trouble from further corrosion. Tests have been made and further tests are being prepared to determine hydraulic losses in this scheme, with a view to getting the utmost possible from the station.

Waikaremoana.—Superficial investigation for the upper development were continued during the year. These comprised contouring, tracing underground flow with salt and dyes, searching the lake-bottom with a diver to locate leaks; also temperature and other tests. A great deal of useful information has been obtained, but no further activity is warranted unless sufficient funds are available for exploratory excavations to verify and supplement the conclusions drawn. Work has therefore ceased for the time being.

Waitaki.—Detail plans have been prepared for the permanent sluices and for the Canterbury abutment. The shape of the dam itself has been adapted to the changing foundation levels and conditions.

Statistics.—Records of growth of load and of stream flow have been kept and graphs made to show the relation of demand to existing plant and contemplated additions. From these it would appear that the ability of Mangahao and Waikaremoana to meet the demand, unaided, during the winter of 1933 will depend on a fairly prolific precipitation.

Investigation.—Preparatory to a general investigation of the power resources of the Waikato River a preliminary geological examination has been made of the river basin from Cambridge to Lake Taupo.

ELECTRIC-POWER BOARDS.

There are now forty-five districts constituted, and forty actually carrying out the distribution and sale of electrical energy (August, 1932). The total area covered is 69,410 square miles, or 67 per cent. of the total area of the Dominion; the total population concerned is 1,009,485, or 67 per cent. of the total population of the Dominion; and the unimproved value of the land included in the electric-power districts and outer area is £252,991,919, 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 XXV 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 thirty-nine districts which have taken their polls is £13,195,148. The population of the districts concerned is 954,498, so that the loans authorized amount to £13·78 per head of population as compared with £13·75 last year. The unimproved valuation of the districts is £223,359,733, the loans authorized amounting to 5·9 per cent. of the unimproved rateable value of the lands pledged as security for the loans. The voting at the polls totalled 66,291 to 12,349—*i.e.*, a majority of 68·5 per cent.

Table XXVI shows the capital outlay incurred by each Board up to the end of the financial year 1931–32, the revenue and annual expenditure, and the amount of rates struck and collected.

The total capital outlay by the thirty-nine Boards which have started construction is £13,847,760, a small proportion of which is on works not yet in service. The gross revenue from the sale of electricity by the thirty-nine Boards which have commenced supply was £2,203,485, of which 29·5 per cent. was received by the Auckland Power Board. The general result is a profit over the whole business of the Power Boards of £126,663 for appropriation to depreciation and reserve funds, &c.

During the last year two of the Boards struck a general rate, which was collected in all cases, and three of the Boards struck special rates for the security for loans, which were collected in two cases.

LOCAL ELECTRIC-SUPPLY SYSTEMS.

Including the Government plants, there are now (31st March, 1932) forty public electric-power stations in the Dominion, as compared with forty last year.

During the year the Tai Tapu Dairy Co.'s area of supply was absorbed by the Springs-Ellesmere Power Board.

The total installed capacity (excluding standby plant) has increased during the year by 765 kw., or 0·397 per cent. (from 190,368 kw. to 191,133 kw.), while the sum of the maximum loads has decreased by 8,517 kw., or 4·7 per cent.(from 181,228 kw. to 172,711 kw.). The increase in installed capacity is mainly due to a new hydro station (the Kanieri Electric, Ltd.) going into commission during the year.

The proportion of installed plant is now as follows:—

	Stations.	Kilowatts.	Proportion per Cent.
Water-power	32	153,735	80·4
Steam-power (excluding hydro standby plants at Wellington (10,000 kw.), Invercargill (2,450 kw.), Waihi (1,500 kw.), Huntly (1,000 kw.), Dunedin (1,872 kw.))	3	37,100	19·6
Gas-power	2	112	..
Oil-power (excluding hydro standby plants at Penrose (3,750 kw.), Lyttelton (5,760 kw.) Dunedin (860 kw.), Marlborough (485 kw.))	3	186	..
	40	191,133	100·0

The number of consumers supplied has increased from 300,809 to 309,360, an increase of 8,551, or 2·85 per cent., for the year.

The total population included in the various areas of electric-supply is 1,400,589, 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 maximum demand per head of population in the areas supplied is 0·124 kw., which 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. The units sold per head of population supplied were 495, as compared with 489 last year.

The total length of distribution-line is 20,251 route-miles, as compared with 19,636 last year, an increase of 615 miles, or 3·12 per cent. The number of consumers per route-mile is 15·2 as compared with 14·5 last year, the increase being due to additional consumers being connected to the extra mileage of new lines erected during the previous year to which the full number of services were not then connected, and to the increased proportion of country lines.

The maximum power-demand per route-mile is now 8·51 kw., the sales 34,250 units, and the revenue £211. The units are more than last year (33,000), and there is a slight increase in revenue as against £210 last year, but there is a decrease to the corresponding maximum demand of 8·76 kw. last year.

The revenue per kilowatt of maximum load of all stations was £24·75, as compared with £24 last year. The water-power stations show a revenue of £26·4 per kilowatt, steam stations of £19·15 per kilowatt, oil stations of £49·8 per kilowatt, and gas stations of £46·75 per kilowatt. These are valuable figures for use in forecasting the revenue from systems of various descriptions. The water-power systems include the greatest proportion of large consumers, and the gas-engine stations the greatest proportion of small consumers.

Out of the ninety-eight distributing authorities, eighty-one showed a profit for the year amounting to £725,027, and seventeen showed a loss amounting to £72,311. The general result is a net profit for the whole Dominion of £652,716, after paying working-costs (£2,030,967), and capital (interest and sinking fund only) charges (£1,608,414) at the rate of 5·31 per cent. on the total capital outlay of £30,370,747. This shows a net profit of 2·15 per cent. as compared with 2·38 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.

The following table summarizes the results of the year's operations in connection with electric supply throughout the Dominion, and Table XXXII shows in condensed form the financial statistics for each supply authority.

—		Water.	Steam.	Gas.	Oil.	Total.
Number of stations	No.	32	3	2	3	40
Installed capacity, main plant only	Kw.	153,735*	37,100	112	186	191,133*
Average capacity	Kw.	4,810	12,367	56	62	4,780
Number of consumers	No.	255,310	53,035	506	509	309,360
Connected load	Kw.	897,439	202,440	330	640	1,100,849
Maximum load	Kw.	135,371	37,156	83	101	172,711
Units generated	No.	630,084,807	157,413,830	108,313	174,321	787,781,271
Annual load-factor	%	53·25	48·57	14·86	19·58	52·25
Units sold	No.	561,835,569	132,530,062	83,695	127,128	694,576,424
Total capital outlay in operation, including distribution systems	£	26,577,910†	3,738,418	25,998	28,421	30,370,747†
Total capital outlay per kilowatt installed, including distribution systems	£	173	100	231	152	158
Total annual working-costs	£	1,647,191	376,965	3,503	3,308	2,030,967
Total annual working-costs per unit sold	d.	0·708	0·681	10·0	6·26	0·705
Total annual working-costs per kilowatt (maximum demand)	£	12·18	10·10	42·25	32·60	11·74
Total annual capital charges (interest and sinking fund)	£	1,371,567	233,252	1,708	1,887	1,608,414
Total annual capital charges per unit sold	d.	0·587	0·424	4·90	3·55	0·557
Total annual capital charges per kilowatt (maximum demand)	£	10·10	6·31	20·60	18·60	9·38
Total annual capital charges as percentage of capital outlay	%	5·19	6·28	6·61	6·68	5·30
Total annual costs	£	3,018,758	610,217	5,211	5,195	3,639,381
Total annual costs per unit sold	d.	1·295	1·105	14·90	9·81	1·262
Total annual costs per kilowatt (maximum demand)	£	22·28	16·41	62·85	51·20	21·12
Total annual revenue, not including rates	£	3,571,301	711,885	3,858	5,053	4,292,097
Total annual revenue per unit sold	d.	1·52	1·29	11·00	9·56	1·45
Total annual revenue per kilowatt (maximum demand)	£	26·38	19·15	46·51	49·91	24·75
Net profit (before deducting depreciation charges)	£	552,379	101,668	−1,353	−142	652,716
Ratio of working-costs to revenue	%	46·25	52·98	91·12	66·00	47·41

* Does not include Arapuni, 60,000 kw.

† Includes £3,231,114 Arapuni assets temporarily out of commission (60,000 kw.).

BROKEN WIRES AND POLES.

During the year ending 31st March, 1932, there were 898 instances (1,574 broken wires) reported by electric-supply authorities, with 94,014 miles of conductor erected. The corresponding figures for the previous year were 1,019 broken wires, and 93,121 miles of conductor in use.

Falling trees were again the principal cause of the breaks, and accounted for 21·75 per cent. of the total, as against 25·4 per cent. for 1931.

As regards broken poles, 291 instances were reported for the year, of which 238 were New Zealand blue-gum. For 1931 the total number of broken poles reported was 450, 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 early replacements after approximately five to seven years of pole-life.

ACTUAL MILEAGES AND SIZES OF OVERHEAD CONDUCTORS IN USE AT 31ST MARCH, 1932.

Size of Conductors (S.W.G.).	Copper.	Failures.	Aluminium.	Failures.	Galvanized Steel.	Failures.	Galvanized Iron.	Failures.	Copper-weld.	Failures.	Steel-cored Aluminium.	Failures.	Bronze.	Failures.	Total Failures.
7/20 ..	6,187	364	..	..	..	..	..	..	..	..	..	..	..	..	364
7/18 ..	9,749	319	..	..	..	..	..	..	..	..	..	..	..	..	319
7/17 ..	1,995	24	..	..	..	..	..	..	..	..	..	..	..	..	24
7/16 ..	16,142	156	17	..	48	..	85	..	..	..	199	..	..	..	156
7/15 ..	264	..	2	..	..	..	..	..	..	..	..	..	..	..	..
7/14 ..	9,817	50	72	..	46	..	..	..	..	..	239	6	..	..	56
7/13 ..	1,102	..	..	..	38	..	..	..	3	..	..	..	..	..	..
7/12 ..	405	10	13	..	2	..	..	..	..	..	..	..	..	..	10
7/10 ..	19	..	..	..	..	..	..	..	10	..	..	..	..	..	..
7/9 ..	76	..	15	..	4	..	..	..	..	..	..	..	..	..	..
19/18 ..	378	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19/17 ..	470	3	..	..	..	..	..	..	..	..	..	..	..	..	3
19/16 ..	1,449	2	..	..	..	..	..	..	..	..	..	..	..	..	2
19/15 ..	156	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19/14 ..	576	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19/13 ..	2,215	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19/12 ..	42	..	..	..	2	..	..	..	..	..	..	..	..	..	..
37/16 ..	54	..	..	..	..	..	..	..	..	..	..	..	..	..	..
37/15 ..	391	..	..	..	..	..	..	..	..	..	..	..	..	..	..
37/14 ..	90	..	..	..	..	..	..	..	..	..	..	..	..	..	..
37/13 ..	22	..	..	..	..	..	..	..	..	..	..	..	..	..	..
37/12 ..	4	..	..	..	..	..	..	..	..	..	113	..	..	..	..
61/13 ..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12 ..	2,897	145	..	..	..	..	94	..	70	..	..	..	..	..	145
10 ..	10,547	254	..	..	179	..	290	..	482	..	..	..	30	..	254
8 ..	11,997	180	..	..	3,587	..	5,753	43	579	..	..	..	..	..	223
7 ..	775	6	..	..	..	..	125	..	92	..	..	..	..	..	6
6 ..	291	4	..	..	34	..	15	..	199	1	3	..	..	..	5
4 ..	602	3	..	..	..	..	..	..	78	..	..	..	..	..	3
2 ..	66	..	..	..	..	..	..	..	..	..	..	..	..	..	..
0 ..	83	..	..	..	..	..	..	..	..	..	..	..	..	..	..
00 ..	..	..	11	4	..	..	..	..	..	..	59	..	..	..	4
3/0 ..	..	..	..	..	..	..	..	..	..	..	1,240	..	..	..	..
6/·144 ..	..	..	..	..	..	..	..	..	..	..	19	..	..	..	..
6/·186 ..	..	..	..	..	2	..	..	..	..	..	42	..	..	..	..
7/·135 ..	..	..	185	..	..	..	..	..	..	..	..	..	..	..	..
7/·122 ..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..
7/·083 ..	..	..	..	..	..	..	..	..	..	..	203	..	..	..	..
7/·074 ..	..	..	..	..	..	..	..	..	..	..	180	..	..	..	..
3/8 ..	..	..	9	..	..	..	..	..	..	..	..	..	..	..	..
3/10 ..	24	..	1	..	..	..	..	..	..	..	..	..	..	..	..
3/12 ..	103	..	17	..	..	..	..	..	..	..	..	..	..	..	..
5/14 ..	..	..	..	..	165	..	..	..	..	..	..	..	..	..	..
4/14 ..	..	..	..	..	290	..	..	..	..	..	..	..	..	..	..
4/16 ..	13	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2/10 ..	8	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Miscellaneous	..	..	57	..	..	..	..	..	..	..	3	..	..	..	..
	79,011	1,520	399	4	4,397	..	6,362	43	1,513	1	2,302	6	30	..	1,574

Grand total, 94,014 miles.

No returns received from Auckland, Christchurch, Halswell, and Rangiora.

GROWTH OF LOAD.

The total connected load at end of the year under review was 1,100,849 kw.

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 1932 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
	Per Cent.	Per Cent.	Per Cent.	Per Cent.
Increase over seven-year period ..	108	2,150	589*	296

* Six years only.

See Table XXX for details for year ended 31st March, 1932.

ELECTRICAL SUPPLY AND ELECTRICAL 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 the work of revision will be completed during the early part of 1933.

INSPECTION OF ELECTRIC LINES AND 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. When the present depression passes and inspections are resumed 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 by the electric supply authorities, coupled with a general willingness 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 :—

Ashburton Power Board.
Bluff Borough Council.
Banks Peninsula Power Board.
Dannevirke Power Board.
Heathcote County Council.
Horowhenua Power Board.
Hutt Valley Power Board.
Kaponga Town Board.
Malvern Power Board.
Manawatu-Oroua Power Board.
New Plymouth Borough Council.
North Canterbury Power Board.
Napier Borough Council.
Ohakune Borough Council.
Opunake Power Board.
Palmerston North City Council.
Patea Borough Council.
Rangiora Borough Council.
Riccarton Borough Council.
Southland Power Board.
South Taranaki Power Board.
Taumarunui Borough Council.
Tararua Power Board.
Taranaki Power Board.
Tauranga Power Board.
Wairarapa Power Board.
Waitemata Power Board.
Waimairi County Council.
Wanganui - Rangitikei Power Board.
Wilsons' Portland Cement, Ltd.
Waitomo Power Board.
Westport Borough Council.

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 inspection of these plants is also called for before same are placed in service. During the year a large number of such installations came under notice, the existence of which was not previously known, and this has occasioned a good deal of additional work.

The plants dealt with totalled 243, of which 125 are located in the North Auckland District and the balance scattered throughout other parts of the Dominion.

LICENSES ISSUED.

The following water-power and electric-line licenses and permits have been issued during the period from July, 1931, to July, 1932: Licenses—Springs-Ellesmere Power Board (extensions); Patea Borough Council (revocation); Patea Borough Council (amendment); Tai Tapu Dairy Co. (revocation); Kanieri Electric Co. (consolidation); Westport Borough Council (revocation); New Plymouth Borough Council (extensions); M. King, Kingston; Tourist Department, Rotorua; Taumarunui Borough Council (amendment); McNabb Bros., Collingwood; T. Feather, Te Oka; Bignell and Holmes, Tokomaru Bay; Inglewood Borough Council (revocation); Fitzgerald Bros., Wainihinihi; Bay of Islands Harbour Board; Trembath Bros., Waitaha; J. Douglas, Waitaha; D. H. Rutherford, Makuri (amendment); Kauri Timber Co., Moerawa (revocation); W. Jacentho, Oruru (assignment); M. Ball, Omakau; H. S. Glass, Pembroke (assignment). Permits—Lyceum Theatre, Timaru; W. H. Cochrane, Rahotu; A. Macallan, Rakauroa; L. P. Haycock, Pokororo; W. B. Fussell, Inglewood; W B. Fussel, Inglewood (amendment); W. Scott, Kaikoura; S. Hall, Little River; E. P. H. Burbury, Culverden; D. S. Middleton, Cromwell; A. Rittson-Thomas, Tirohanga; A. Drummond, Wangapeka; H. Hibberd, Whangamoa; J. Hutchinson, Otoko; H. Morrison, Pori; C. C. V. Davies, Otakeho; J. P. Tylee, Makuri; P. M. Anderson, Gibbston; Hokianga Dairy Co., Motukaraka; P. T. Shand, Port Ligar; W. H. Moore, Hickory Bay.

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.

Pressure is still being brought to bear on the Department by the supply authorities, supported by the Electrical Traders' Federation.

ELECTRICAL ACCIDENTS.

During the year there were reported to the Department thirty electrical accidents of which ten were fatal. Corresponding figures for 1931 were thirty-one and eight respectively.

(1) 11/4/31. Man electrocuted through contact with wire netting around tennis-court livened up by chafed service-lines passing through netting (Christchurch City Council).

(2) 12/4/31. Man electrocuted. Climbed power pole and made accidental contact with live H.T. (Banks Peninsula Power Board).

(3) 21/4/31. Man received shock and burns to hand from the three-cored C.T.S. of an electric drill. The C.T.S. had been accidentally bared by contact with a grinder (Wellington City Council).

(4) 12/5/31. Boy had narrow escape from electrocution through kite-string contacting with 6·6 kv. line. Line burnt through (New Plymouth).

(5) 15/5/31. Employee, Otahuhu Railway Workshops, received shock while working on crane; traverser trolly-wire burnt through, circuit-breaker being reclosed (Auckland Power Board).

(6) 23/5/31. Four men received severe shock and burns through wireless mast which they were erecting coming into contact with power-lines (Central Power Board).

(7) 26/5/31. Post and Telegraph linesman electrocuted through bare telephone wire which he was stringing kicking up and contacting with 11 kv. line (Hastings).

(8) 1/6/31. Man received severe shock from portable hand-lamp with E.S.B. lamps when in contact with earth at the same time (reported by Auckland Harbour Board).

(9) 18/6/31. Man electrocuted while running temporary light across yard to shed (Wellington City Council).

(10) 22/6/31. Two cows electrocuted by contact with fallen 3,300 v. line (Springs-Ellesmere Power Board).

(11) 30/7/31. A man received slight shock from wire assumed to be in contact with power-line and fence (Auckland Power Board).

(12) 2/8/31. Substation employee died from burns received by contact with live E.H.T. (Public Works Department, Hamilton).

(13) 11/8/31. Man electrocuted through contact with fallen 3,000 v. lines (Dunedin City Council).

(14) 11/8/31. Two boys received shock through drawing plug from electric kettle and placing fingers on contacts (Bay of Plenty Power Board).

(15) 20/8/31. Linesman received shock and fall from pole and bruises to hip through neglecting to deaden phase wire before joining neutral of service line (Te Puke Town Board).

(16) 3/10/31. Power-house attendant received shock and burns through contact with 3,300 v. bushings while painting transformer (Whakatane Borough Council).

(17) 19/10/31. Consumer received shock and burns while interfering with time-switch. He was using a 4 in. nail which dropped inside the time-switch and in recovering the nail he touched a live contact (Franklin Power Board).

(18) 2/11/31. Linesman received fatal shock while working on H.T. telephone-line through wire kicking up and contacting with E.H.T. power-line (Public Works Department, Hamilton).

(19) 4/11/31. Linesman received burns on both arms while leaning over 6 kv. lines (Dunedin City Council).

(20) 4/12/31. Eleven cows killed by contact with broken 50 kv. line.

(21) 9/12/31. Linesman electrocuted while working on pole through slipping and contacting with live wires (Auckland Power Board).

(22) 16/12/31. Linesman received burns and shock while working on pole substation through slipping and contacting with live line above (Otago Power Board).

(23) 23/12/31. Youth electrocuted through connecting wireless crystal set to power-switch and sitting in bath with phones on his head (Wellington City Council).

(24) 7/1/32. Youth electrocuted through contact with defective portable electric lamp while shaving in bath (Dunedin City Council).

(25) 15/1/32. Woman received severe shock at Eltham when attempting to operate washing-machine fitted with three-core flex connected to lamp-holder adapter (Taranaki Power Board).

(26) 20/1/32. Linesman received shock and burns while working on live L.T. Contact made through hole in coat-sleeve. Body-belt saved fall from pole and possible serious injury (Waitaki Power Board).

(27) 27/1/32. A woman received shock and burns while attempting to repair iron plug with the current switched on (Christchurch City Council).

(28) 19/2/32. Power-house employee received burns and shock through step-ladder on which he was standing slipping and bringing him into contact with live H.T. (Christchurch Tramway Board).

(29) 23/2/32. A man received shock from iron due to faulty flex (Wellington City Council).

(30) 11/3/32. A workman received shock from a portable electric drill due to defectively connected lamp-adapter (Government Buildings, Wellington).

Total, 30; fatal, 10.

ELECTRICAL FIRES.

During the year there were sixteen fires attributed to electrical causes and reported to the Department by electrical supply authorities as per list below. The corresponding figure for 1931 was twenty-three fires.

(1) 31/5/31. Partition of wall damaged by fire, probably caused by loose terminal in switch (Hastings Borough Council).

(2) 4/6/31. House damaged by fire through electric iron being left switched on (Taihape Borough Council).

(3) 4/7/31. Fire caused by electric iron being left switched on (Dunedin City Council).

(4) 9/7/31. Shop and room gutted by fire through electric iron being left switched on (Wellington City Council).

(5) 9/7/31. Part of floors and room damaged by fire through radiator being left on near combustible material (Wellington City Council).

(6) 20/7/31. Portion of kitchen wall damaged by fire caused through electric iron being left switched on (Wellington City Council).

(7) 11/8/31. Wiring behind switchboard burnt through old wiring being disturbed by installation of additional points (Hastings Borough Council).

(8) 14/8/31. Ceiling, hall, and bedroom damaged by fire through defective insulation causing arc from conduit to compo gas-pipe in contact with conduit (Invercargill City Council).

(9) 23/9/31. Approximately £15 damage caused by fire through cables at termination of heating-point being pinched by dented conduit (South Taranaki Power Board).

(10) 1/10/31. Top floor destroyed by fire, but there is some doubt as to whether the fire was caused by electricity (Wanganui-Rangitikei Power Board).

(11) 3/10/31. Walls damaged by fire through electric iron being left switched on (Wellington City Council).

(12) 10/11/31. House damaged by fire through electric iron being left switched on (Waitemata Power Board).

(13) 18/12/31. Slight damage to cupboard by fire caused through sawdust lagging of water-heater getting wet and insulation of unprotected V.I.R. breaking down (Stratford Borough Council).

(14) 18/12/31. Slight damage to building caused through electric iron being left switched on (Wellington City Council).

(15) 22/1/32. Walls damaged by fire through electric iron being left switched on (Wellington City Council).

(16) 2/2/32. Paper and scrim damaged by fire caused by electric iron being left switched on (Wellington City Council).

REGISTRATION OF ELECTRICAL WIREMEN.

The Electrical Wiremen's Registration Act completed its sixth year of operation in March, and in accordance with the Act a new Board has been elected. A total of fourteen whole-day meetings were held during the year ended the 30th June, 1932.

Up to the end of June, 1932, there have been registered 392 Inspectors of Electrical Wiring, 3,131 wiremen with full registration, and 151 wiremen with limited registration; in addition 707 provisional licenses have been issued.

Provision is made in the Act for the removal from the register of the name of an Inspector when he ceases to be so employed and the name of an electrical wireman for various causes. From the commencement of the Act the names of 85 Inspectors and 242 wiremen have been removed; of the latter 200 were removed as the result of the 1929 purging of the registers and of these 112 have since been reinstated.

Twelve examinations have been held, and there has been a total of 3,074 candidates for the written part of the examination and 2,627 for the practical part. The maximum number of candidates at any one examination being in September, 1929, when there were 318 for the written part and 282 for the practical part; the average number for all examinations being 256 and 219 respectively.

The highest marks gained were ninety-one in the written part and ninety-six in the practical part out of a possible 100 in each case. The average percentage of passes for all examinations is 33 per cent. in the written part and 46 per cent. in the practical part.

The percentage of passes still remains low, although every inducement is made to encourage candidates in their work. Prizes are offered in both parts of the examination for the candidates who secure the highest marks, candidates who apply for information as to their weak points are given every assistance by means of an analysis of the marks awarded, and the Examiners carefully peruse the questions used by other examining bodies, notably the Australian registration authorities, in an endeavour to keep the standard comparable with similar examinations.

Sixty-nine wiremen have had their registration certificates endorsed for defective work, fourteen being during the current year. Twenty-two endorsements have been removed, seven being during the current year.

There have been thirteen appeals against the decision of the Registration Board, three being during the current year, and of these two were dismissed and one allowed.

One hundred and twelve registration certificates have been reported as having been lost, stolen, or destroyed.

Defective-work reports to a total of 294 have been received since the Act came into force, and breach of Act reports to a total of 401 have been received during the same period.

The action taken with regard to the defective-work reports received during the year ended 30th June, 1932, is as follows: Cautioned, 10; censured, 15; endorsed, 12; action pending, 1; insufficient evidence, 4.

Details of the prosecutions taken during the year ended 30th June, 1932, are as follows: Failure to notify supply authority of intention to commence work, 6; connecting wiring and apparatus before inspection, test, and approval, 5; radio salesmen doing wiring-work, 5; employing or permitting an unregistered person to do wiring-work, 2; employing apprentices and improvers to do wiring-work without a wireman being present, 2; working outside the bounds of limited registration, 1; carpenter altering wiring-work, 1; consumer doing wiring-work, 2; salesman changing a motor, 1; washing-machine salesman doing wiring-work, 1.

As difficulty was being experienced in obtaining particulars of the installation of private plants the electrical contractors were circularized and their attention drawn to certain requirements of the Act, including notification before commencement, inspection before connection, and that the work must be carried out in compliance with the safety regulations.

One Inspector of Electrical Wiring was reported during the year for alleged unfair inspections, but careful investigation failed to substantiate the charge.

The question of granting registration for the purpose of carrying out any electrical wiring-work which may be necessary when installing, maintaining, or repairing a mains-operated radio set received further consideration and a satisfactory arrangement was arrived at whereby limited registration is granted to any applicant who complies with the requirements of the Act for such registration and who has passed an examination approved by the Registration Board. The passing of the examination entails a knowledge of the electrical wiring regulations, and it is confidently anticipated that the method of installing radio sets will show considerable improvement and safety requirements will be observed. Two examinations had been held by the end of June, and limited registration has been granted to forty-three applicants.

Several minor amendments to the Registration Regulations are under consideration, the principal being the exclusion of pressures up to 20 volts, the inclusion of vacuum and inert-gas tube electric

lighting, and the exclusion of the erection and removal of meters and time switches, and minor repair work by an employee of an electrical supply authority.

The difficult times through which the industry is passing has resulted in considerable price-cutting with its accompanying temptation to reduce the standard of work and material. This means that the inspection work of the electrical supply authorities is considerably increased in relation to the number of installations.

A large number of portable appliances and radio sets have been installed by unqualified persons and without notice to the electrical supply authorities. Reports indicate that much of this work has been carried out with a total disregard of safety regulations, and the active co-operation of the consumers should be secured so as to avoid the possibility of any serious accidents. Every one having electrical work done should ascertain, by seeing his registration certificate, that the person doing the work is registered.

Electrical Wiremen's Examination Results.

—	September, 1929.			March, 1930.			September, 1930.			March, 1931.			September, 1931.			March, 1932.		
	Entered.	Passed.	Percentage.	Entered.	Passed.	Percentage.	Entered.	Passed.	Percentage.	Entered.	Passed.	Percentage.	Entered.	Passed.	Percentage.	Entered.	Passed.	Percentage.
Written Part.																		
Alexandra	..	..	..	..	..	..	3	Nil	..	..	..	..	..	..	..	..	..	..
Auckland	69	12	17	59	16	27	56	10	18	41	8	20	45	8	18	37	12	32
Christchurch	42	12	29	25	7	28	36	13	36	25	8	32	20	8	40	16	4	25
Dunedin	25	4	16	22	6	27	28	5	18	23	1	4	26	4	15	19	5	26
Gisborne	4	Nil	..	5	2	40	10	2	20	10	1	10	9	1	11	10	1	10
Greymouth	5	Nil	..	10	1	10	7	1	14	8	1	13	9	1	11	6	2	33
Hamilton	13	2	15	16	3	19	24	4	17	15	6	40	13	2	15	11	3	27
Hawera	7	Nil	..	4	3	75	..	..	..	..	..	..	..	..	..	..	..	..
Invercargill	9	Nil	..	9	5	56	12	3	25	3	1	33	4	1	25	2	Nil	..
Kurow	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	Nil	..
Masterton	6	Nil	..	2	2	100	3	Nil	..	5	Nil	..	7	Nil	..	6	2	33
Napier	12	Nil	..	8	1	13	13	2	15	12	Nil	..	12	1	8	8	1	13
Nelson	4	1	25	1	Nil	..	7	2	29	3	1	33	6	2	33	..	..	..
New Plymouth	8	2	25	11	3	27	5	Nil	..	6	1	17	13	1	8	14	6	43
Oamaru	3	1	33	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Opotiki	..	..	..	..	..	..	..	..	..	2	Nil	..	2	1	50	2	1	50
Paeroa	4	Nil	..	7	Nil	..	6	Nil	..	3	1	33	11	4	36	8	4	50
Palmerston North	17	Nil	..	17	6	35	13	5	38	9	Nil	..	11	1	9	9	1	11
Petone	..	..	..	..	..	..	5	1	20	3	2	67	..	..	..	..	..	..
Taumarunui	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	100
Tauranga	8	1	13	8	2	25	7	Nil	..	3	1	33	..	..	..	4	Nil	..
Timaru	1	Nil	..	3	Nil	..	8	2	25	6	1	17	10	3	30	6	3	50
Wanganui	9	Nil	..	9	2	22	9	4	44	9	1	11	7	2	29	..	..	..
Wellington	72	15	21	61	13	21	55	10	18	42	15	36	36	5	14	21	11	52
Westport	..	..	..	2	Nil	..	2	Nil	..	2	Nil	..	3	Nil	..	2	2	100
Whangarei	..	..	..	..	..	..	1	Nil	..	3	Nil	..	5	Nil	..	4	2	50
Total	318	50	16	279	72	26	310	64	21	233	49	21	249	45	18	187	61	33
Highest marks obtained	87			83			77			78			77			84		
Practical Part.																		
Alexandra	..	..	..	..	..	..	2	1	50	..	..	..	..	..	..	..	..	..
Auckland	62	7	11	66	36	55	51	7	14	38	8	21	40	22	55	26	9	35
Christchurch	39	2	5	37	13	35	38	15	40	28	10	36	20	7	35	24	14	58
Dunedin	19	Nil	..	18	10	56	21	3	14	20	7	35	18	6	33	11	4	36
Gisborne	4	1	25	4	2	50	11	4	36	7	3	43	5	Nil	..	4	2	50
Greymouth	5	Nil	..	7	2	29	6	Nil	..	5	Nil	..	6	4	67	2	Nil	..
Hamilton	19	Nil	..	22	10	46	20	7	35	10	2	20	12	7	58	6	3	50
Hawera	4	Nil	..	3	3	100	..	..	..	..	..	..	..	..	..	..	..	..
Invercargill	8	Nil	..	7	1	14	14	1	7	7	1	14	7	2	29	4	2	50
Kurow	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	2	50
Masterton	7	Nil	..	4	3	75	2	2	100	5	2	40	5	4	80	1	1	100
Napier	9	Nil	..	8	5	63	10	6	60	6	2	33	5	2	40	3	1	33
Nelson	2	Nil	..	1	1	100	6	2	33	4	1	25	8	5	63	..	..	..
New Plymouth	6	1	17	9	4	44	4	Nil	..	6	1	17	7	3	43	8	1	13
Oamaru	4	Nil	..	3	2	67	..	..	..	..	..	..	..	..	..	..	..	..
Opotiki	..	..	..	..	..	..	..	..	..	3	2	67	3	2	67	1	1	100
Paeroa	5	Nil	..	7	3	43	4	Nil	..	2	1	50	8	1	13	8	3	38
Palmerston North	13	Nil	..	13	9	69	8	3	38	5	2	40	8	4	50	1	1	100
Petone	..	..	..	..	..	..	3	1	33	2	1	50	..	..	..	..	..	..
Taumarunui	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2	100
Tauranga	12	2	17	9	4	44	6	2	33	2	Nil	..	..	..	..	2	1	50
Timaru	1	1	100	1	1	100	5	Nil	..	7	3	43	8	4	50	2	Nil	..
Wanganui	5	Nil	..	3	2	67	5	3	60	5	3	60	2	1	50	..	..	..
Wellington	54	25	46	31	12	39	35	15	43	25	10	40	22	9	41	13	5	38
Westport	..	..	..	2	2	100	1	Nil	..	1	1	100	1	Nil	..	1	1	100
Whangarei	4	Nil	..	5	2	40	3	Nil	..	4	2	50	3	2	67	1	Nil	..
Total	282	39	14	260	127	49	255	72	28	192	62	32	188	85	45	124	53	43
Highest marks obtained	85			84			82			79			85			84		

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Chief Electrical Engineer.

INDEX TO TABLES.

TABLE I.—WAIKATO ELECTRIC-POWER SUPPLY: HORAHORA-ARAPUNI SCHEME.—RESULTS OF OPERATION, ETC.

—	Ninth Year, March, 1929.	Tenth Year, March, 1930.	Eleventh Year, March, 1931.	Twelfth Year, March, 1932.
Capital outlay—	£	£	£	£
Horahora—Assets in operation	617,725	624,117	..	..
Arapuni—Assets in operation	524,621	2,705,894	..	..
Total assets in operation	1,142,346	3,330,011	1,286,667	1,322,190
Assets not in operation	..	330,416	2,657,170	3,231,114
Costs—				
Working-costs	76,231	62,702	101,889	115,003
Capital costs—				
Interest	53,044	135,622	85,389	62,524
Depreciation	21,527	60,127	33,009	24,911
Sinking Fund	..	..	..	..
	150,802	258,451	220,287	202,438
Revenue	135,511	225,683	184,593	161,884
Profit	*Dr.* 15,291	*Dr.* 32,768	*Dr.* 35,694	*Dr.* 40,554
Accumulated surplus	32,415	*Dr.* 2,618	*Dr.* 38,312	*Dr.* 78,867
Accumulated Depreciation Fund	103,187	165,757	186,405	211,610
Accumulated Sinking Fund	52,164	54,445	7,072 49,668*	..
Maximum load (kilowatts)—				
System for year	15,900	41,520	49,520	18,710
Arapuni Power-station for year	..	33,900	38,400	..
Horahora Power-station for year	10,300	10,200	11,300	12,200
Arapuni Power-station, average weekly	..	24,731	35,927	..
Horahora Power-station, average weekly	9,702	7,752	9,804	11,194
Units output—				
Arapuni Power-station, total generated	..	121,084,986	40,898,950	..
Horahora Power-station, total generated	79,298,740	56,648,365	80,075,210	92,602,600
Grand Junction Power-station, total generated	5,846,740	2,682,100	6,368,600	1,746,600
Penrose Diesel Power-station, total generated	7,070,912	2,608,248	7,524,620	4,896,540
Huntly Steam Power-station, total generated	..	..	..	8,288,930
Units purchased (McLaren's Falls, Auckland Power Board)	12,776,370	7,706,548	8,226,397	15,986,614†
Total units generated and purchased	104,992,762	190,710,247	143,093,777	123,521,284†
(1) Units used for station auxiliaries, &c.	1,348,175	2,478,395	2,070,723	1,938,758
(2) Units available for outgoing lines	103,644,587	188,231,852	141,023,054	121,582,526
(3) Units sold	92,707,271	173,003,373	131,013,550	115,082,352
(4) Total losses	10,937,316	15,228,479	10,009,504	6,500,174
(5) Percentage of units non-productive	10·58	8·1	7·09	5·35
Load-factor, annual (per cent.)—				
System	75·5	54·1	32·9	75·36
Power-house—				
Arapuni	..	40·8	60·9	..
Horahora	87·8	63·4	80·9	86·64
Working-costs	(£76,231)	(£62,702)	(£101,889)	(£115,003)
Per kilowatt (system annual maximum)	£4·79	£1·51	£2·06	£6·15
Per unit generated and purchased	0·174d.	0·079d.	0·171d.	0·224d.
Per unit sold	0·197d.	0·087d.	0·187d.	0·240d.
Capital costs	(£74,571)	(£195,749)	(£118,398)	(£87,435)
Per kilowatt (system annual maximum)	£4·70	£4·71	£2·39	£4·67
Per unit generated and purchased	0·171d.	0·246d.	0·199d.	0·170d.
Per unit sold	0·194d.	0·261d.	0·217d.	0·182d.
Total costs on system	(£150,802)	(£258,451)	(£220,287)	(£202,438)
Per kilowatt (system annual maximum)	£9·49	£6·22	£4·45	£10·82
Per unit generated and purchased	0·345d.	0·325d.	0·369d.	0·394d.
Per unit sold	0·391d.	0·348d.	0·403d.	0·423d.
(NOTE.—Capital costs do not include Sinking Fund.)				
Revenue	(£135,511)	(£225,683)	(£184,595)	(£161,884)
Per kilowatt (system annual maximum)	£8·53	£5·42	£3·73	£8·64
Per unit generated and purchased	0·31d.	0·284d.	0·310d.	0·314d.
Per unit sold	0·351d.	0·313d.	0·338d.	0·338d.

* Utilized for redemption of loans.

† Excluding 7,701 units purchased from dairy factory.

TABLE II. — WAIKATO ELECTRIC-POWER SUPPLY: HORAHORA-ARAPUNI SCHEME. — ANALYSIS OF CAPITAL OUTLAY.

—	1931.	1932.	Expenditure during Year.	
			Dr.	*Cr.*
Arapuni—	£	£	£	£
Land, roading, and fencing	37,026	37,026	..	..
General charges	..	21,975	21,975	..
Headworks and tailrace	951,309	930,843	..	20,466
Generating-station, transformers, and machinery	617,543	634,385	16,842	..
Village	48,503	49,162	659	..
Remedial works	47,544	343,544	296,000	..
	1,701,925	2,016,935	315,010	..
Horahora—				
Land, roading, and fencing	3,208	3,208	..	..
Headworks and tailrace	178,636	145,495	..	33,141
Generating-station, transformers, and machinery	111,143	144,891	33,748	..
Staff, village	12,678	12,678	..	..
	305,665	306,272	607	..
Auxiliary plants—				
Waihi Grand Junction plant	9,139	9,139	..	..
Penrose Diesel plant	61,771	61,814	43	..
Huntly steam plant	11,170	10,856	..	314
	82,080	81,809	..	271
Transmission-lines (50 kv.)	245,791	244,931	..	860
Transmission-lines (110 kv.)	360,814	392,832	32,018	..
Substations (50 kv.)	170,293	177,521	7,228	..
Substations (110 kv.)	216,263	223,350	7,087	..
Distribution-lines (11 kv.)	40,868	40,853	..	15
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)	839	19,234	2,846	..
Loose tools and equipment and motor-vehicles	15,549			
Engineering office and general expenses on surveys and on construction	158,784	178,517	19,733	..
Interest during construction	459,952	612,625	152,673	..
Cost of raising loans	135,791	148,601	12,810	..
Stocks of spares at substations, &c.	20,211	23,595	3,384	..
	809,307	1,000,753	191,446	..
Total	3,943,837	4,496,087	552,250	..

TABLE III.—WAIKATO ELECTRIC-POWER SUPPLY: HORAHORA-ARAPUNI SCHEME.—OPERATING OR WORKING COSTS.

—	1928–29.		1929–30.		1930–31.		1931–32.	
	Cost.	Per Unit generated.	Cost.	Per Unit generated.	Cost.	Per Unit generated.	Cost.	Per Unit generated
Generating—	£	d.	£	d.	£	d.	£	d.
Horahora	6,453	0·019	7,018	0·032	7,430	0·022	8,317	0·022
Arapuni	..	..	4,410	0·009	3,737	0·022	2,074	..
Grand Junction	17,836	0·732	10,972	0·982	20,651	0·778	6,308	0·868
Penrose Diesels	14,930	0·507	4,791	0·441	12,861	0·410	8,969	0·439
Huntly	..	..	..	..	..	..	12,394	0·359
Sum	39,219	..	27,191	..	44,679	..	38,062	..
		Per Unit sold.		Per Unit sold.		Per Unit sold.		Per Unit sold.
Transmission-lines (110, 50, and 11 kv.)	7,995	0·021	12,331	0·017	11,850	0·022	9,417	0·020
Main substations (110 and 50 kv.)	6,165	0·015	9,016	0·012	9,252	0·017	8,752	0·018
Management and general	6,210	0·016	6,216	0·009	6,100	0·011	10,285	0·021
Total	59,589	0·154	54,754	0·076	71,881	0·132	66,516	0·139
Power purchased	15,964	..	7,777	..	9,271	..	22,514	..
Stand-by provision	240	..	171	..	20,737	..	25,973	..
Total	75,793	0·196	62,702	0·087	101,889	0·187	115,003	0·240

Total units sold: 1928–29, 92,707,271; 1929–30, 173,003,373; 1930–31, 131,013,550; 1931–32, 115,082,352.

TABLE IV.—WAIKATO ELECTRIC-POWER SUPPLY.—CONNECTED LOAD IN KILOWATTS AT 31ST MARCH, 1932.

——	1929.	1930.	1931.	1932.
1. Waitemata Electric-power Board	13,159	16,456	18,615	20,585
2. Thames Valley Electric-power Board	18,192	20,205	22,081	23,150
3. Waihi Gold-mining Co.	4,545	4,570	5,403	5,403
4. Waihi Grand Junction Co.	2,528	2,528	620	620
5. Franklin Electric-power Board	5,808	6,917	8,301	9,272
6. Central Electric-power Board	7,992	9,350	10,965	13,491
7. Hamilton Borough Council	6,843	7,813	9,169	9,473
8. New Zealand Railways, Frankton	936	936	98	774
9. New Zealand Co-operative Dairy Co., Frankton	828	828	902	954
10. State Farm, Ruakura	16	16	16	16
11. Cambridge Electric-power Board	2,461	2,694	2,833	3,000
12. Cambridge Co-operative Dairy Co.	411	307	175	111
13. Te Awamutu Electric-power Board	4,117	4,848	5,482	5,787
14. Waitomo Electric-power Board	1,790	2,334	2,649	3,420
15. Tourist Department, Rotorua	3,194	3,681	4,229	4,492
16. Bay of Plenty Power Board	3,664	5,150	6,097	6,320
17. Public Works Department, Horahora	151	151	151	151
18. Public Works Department, Arapuni	303	557	1,372	373
19. Public Works Department, Hamilton	56	56	56	56
20. Public Works Department, Penrose	127	127	127	127
Sum	77,121	89,524	99,341	106,868
21. Auckland Electric-power Board	..	171,000	182,069	188,650
Total connected load	77,121	260,524	281,410	296,225

TABLE V.—WAIKATO ELECTRIC-POWER SUPPLY.—ROUTE-MILES OF DEPARTMENT'S LINES IN OPERATION AT 31ST MARCH, 1932.

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 towers; 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	No. 0	20·48
	11·23 miles wood poles	7/12	
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–Aongatete (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
Horahora tap on Arapuni–Penrose line (temporary)	Wood poles	7/14	2·00
Total route-miles of 50,000-volt. lines	..	..	320·78
11,000-volt lines—			
Single circuits—			
Waikino–Waihi	Steel towers	37/13	5·77
Waihi – Grand Junction	Wood poles	7/12	0·75
Double circuits—			
Horahora–Leamington	Wood poles	7/14	12·54
Leamington – Hamilton No. 1	Wood poles	7/16	15·86
Hamilton–Frankton—			
Quadruple circuit	2·86 miles wood poles	7/16	3·95
Triple circuit	0·72 mile (0·55 mile wood poles and 0·17 mile underground cables)	7/16	
Double circuit	0·37 mile wood poles	7/16	
Total route-miles of 11,000-volt lines	..	..	38·87
Grand totals of all lines	..	..	558·62

TABLE V—*continued.*

ROUTE-MILES OF TRANSMISSION-LINES ERECTED AT 31ST MARCH, 1932.

—	How supported.	Circuit.	Miles.
110,000 volt ..	Steel supported	Double	99·73
110,000 volt ..	Steel supported	Single	2·68
50,000 volt ..	Steel pole supported	Double	19·75
110,000 volt ..	Wood pole supported	Single	96·56
50,000 volt ..	Steel supported	Single	24·52
50,000 volt ..	Wood pole supported	Single	285·44*
11,000 volt ..	Steel supported	Single	5·77
11,000 volt ..	Wood pole supported	Single	0·75
11,000 volt ..	Wood pole supported	Double	28·77
11,000 volt ..	Wood pole supported	Triple	0·55
11,000 volt ..	Wood pole supported	Quadruple	2·86
	Underground cables	Three single	0·17
Total route-miles..	..	..	567·55*

* NOTE. — The Penrose-Henderson-Takapuna line contains 8·93 miles of duplicate pole-line and this is counted as 17·86 miles of erected single-circuit line.

CIRCUIT-MILES OF TRANSMISSION-LINES ERECTED AT 31ST MARCH, 1932.

Size of wire	7/16	7/14	7/12	19/16	19/13	No. 0.	37/13	Underground cable.
Miles	45·55	223·25	45·93	82·12	298·70	23·99	5·77	0·51

Total circuit mileage, 725·82.

All circuits are three-phase, and all wires are of copper.

TABLE VI.—WAIKATO ELECTRIC-POWER SUPPLY.—ROUTE-MILES OF POWER BOARD LINES AT 31ST MARCH, 1932.

Voltage	11,000.			6,600.		3,000.		400.		Total Route-miles.
Number of Circuits	1.	2.	4.	1.	2.	1.	2.	1.	2.	
Auckland Power Board ..	135·00	..	..	127·5	..	..	..	593·25	25·5	881·25(*a*)
Waitemata Power Board	150·05	5·45	..	..	..	0·40	..	290·00	..	445·90(*b*)
Thames Valley Power Board	455·09	84·5	..	..	..	59·56	..	158·30	..	757·45(*c*)
Franklin Power Board ..	342·00	7·00	..	..	..	..	..	130·00	..	479·00(*d*)
Central Power Board ..	201·98	6·58	0·67	..	..	93·52	..	205·05	..	507·80(*e*)
Hamilton Borough Council	..	..	..	..	..	..	..	47·30	..	47·3(*f*)
Cambridge Power Board	..	..	..	..	..	112·00	..	72·00	..	184·00(*g*)
Te Awamutu Power Board	58·63	12·00	..	..	..	158·65	4·75	76·79	..	310·82(*h*)
Waitomo Power Board ..	72·25	7·00	..	..	..	..	..	20·25	0·5	100·00(*i*)
Tourist Department, Rotorua	..	..	..	22·5*	5·5*	9·00	..	13·50	..	50·50(*j*)
Bay of Plenty Power Board	215·65	..	..	..	..	..	..	27·00	..	242·65(*k*)
Totals ..	1,630·65	122·53	0·67	127·5 22·5	5·5	433·13	4·75	1,633·44	26·0	4,006·67

* 6,000 volts.

(*a*) Also 172 miles of underground cable.

(*b*) Also 107 miles of 400 v. lines on 11 kv. poles; 0·67 miles of 11 kv. underground cable, and 0·3 miles of 400 v. underground cable.

(*c*) Also 336·64 miles of 400 v. lines on 11 kv. poles; 60 miles of 400 v. lines on 3,000 v. poles, and 1 mile of 11 kv. underground cable.

(*d*) Also 201 miles of 400 v. lines on 11 kv. poles.

(*e*) Also 2·5 miles of 3,000 v. lines and 109·68 miles of 400 v. lines on 11 kv. poles; 55·5 miles of 400 v. lines on 3,000 v. poles and 0·25 mile of 11 kv. underground cable.

(*f*) Also 6·74 miles of 11 kv. underground cable.

(*g*) Also 56 miles of 400 v. lines on 3,000 v. poles.

(*h*) Also 16·8 miles of 3,000 v. lines and 21·73 miles of 400 v. lines on 11 kv. poles, and 127·73 miles of 400 v. lines on 3,000 v. poles.

(*i*) Also 25 miles of 400 v. lines on 11 kv. poles.

(*j*) Also 1 mile of 3,000 v. lines and 9 miles of 200 v. and 400 v. lines on 6,000 v. poles; 4·5 miles of 200 v. and 400 v. lines on 3,000 v. poles; and 0·5 mile of 3,000 v. underground cable.

(*k*) Also 68 miles of 400 v. lines on 11 kv. poles and 0·155 mile of 11 kv. underground cable.

TABLE VII.—WAIKATO ELECTRIC-POWER SUPPLY.—MILKING-MACHINES AND FARM MOTORS CONNECTED AT 31ST MARCH, 1932.

—	Milking-machines.														Separator-motors.		Pump-motors.	
	½ h.p.		¾ h.p.		1 h.p.		1½ h.p.		2 h.p.		3 h.p.		Totals.					
	Number.	H.p.	Number.	H.p.	Number.	H.p.	Number.	H.p.	Number.	H.p.	Number.	H.p.	Number.	H.p.	Number.	H.p.	Number.	H.p
Auckland Power Board* ..													207	..	..	..	..	..
Waitemata Power Board ..	40	20	11	8¼	24	24	17	25½	102	204	3	9	197	290¾	10	2¼	..	..
Thames Valley Power Board ..	9	4½	2	1½	80	80	192	283	1,723	3,446	100	300	2,106	4,115	..	..	849	367½
Franklin Power Board	113	56½	2	1½	83	83	497	745½	212	424	2	6	909	1,316½	199	49¾	367	163¼†
Central Power Board	9	4½	1	¾	86	86	129	193½	837	1,674	16	48	1,078	2,006¾	74	19	523	206
Cambridge Power Board ..	4	2	..	..	66	66	123	184½	123	246	3	9	319	507½	6	1½	123	57
Te Awamutu Power Board ..	7	3½	1	¾	64	64	198	297	281	562	1	3	552	930¼	91	22¾	248	124
Waitomo Power Board	4	2	3	2¼	13	13	16	24	98	196	..	..	134	237¼	20	5	43	17
Bay of Plenty Power Board ..	..	..	..	..	45	45	224	336	250	500	7	21	526	902	129	35	166	152
Tourist Department, Rotorua ..	1	½	..	..	5	5	8	12	25	50	8	24	47	91½	11	2¾	12	6½
Totals (less Auckland), 1931–32..	187	93½	20	15	466	466	1,404	2,101	3,651	7,302	140	420	5,868	10,397½	540	138	2,331	1,093¼
Totals (less Auckland), 1930–31..	141	..	19	..	312	..	1,249	..	3,669	..	103	..	5,493	9,907¼	..	..	..	..
Increase (less Auckland) ..	46	..	1	..	154	..	155	..	—18	..	37	..	375	490¼	..	..	..	..
Increase (including Auckland) ..	..	..	..	..	..	..	..	..	..	..	..	..	419	..	..	..	..	..

* Details not available. † Also 40 swamp-pump motors, totalling 109½ h.p.

TABLE VIII.—WAIKATO ELECTRIC-POWER SUPPLY.—GROSS FINANCIAL RESULTS OF DISTRIBUTION OF ENERGY FOR THE YEAR ENDED 31ST MARCH, 1932.

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 ..	18	4,496,087	23,618*	134,565	..	3,701	161,884	22,514	59,882	62,524	24,911	..	32,607	202,438	..	..	40,554
Auckland Electric-power Board ..	48,058	3,371,959	621,409*	22,514	..	7,915	651,838	1,204	346,611†	147,406	62,503	64,437	..	622,161	26,065	3,612	..
Bay of Plenty Electric-power Board	1,338	206,610	34,947	..	868	1,096	36,911	11,831	10,550	11,978	1,783	2,420	..	38,562	..	..	1,651
Cambridge Electric-power Board ..	1,401	109,633	19,164	..	38	1,147	20,349	5,947	5,411	6,396	..	1,226	..	18,980	500	869	..
Central Electric-power Board ..	4,169	332,490	56,667	..	152	1,116	57,935	17,586	10,214	19,156	4,005	3,495	2,781	57,237	..	698	..
Franklin Electric-power Board ..	3,241	278,458	45,648	..	1,078	2,997	49,723	15,827	7,618	14,999	3,334	2,887	850	45,515	4,029	179	..
Te Awamutu Electric-power Board	1,699	182,505	29,518	..	29	143	29,690	8,476	5,927	10,061	1,000	1,851	742	28,057	268	1,365	..
Waitemata Electric-power Board ..	8,534	389,866	69,264	..	..	3,417	72,681	19,739	17,162	21,758	3,994	7,370	1,491	71,514	..	1,167	..
Waitomo Electric-power Board ..	1,175	99,963	18,341	..	..	218	18,559	4,996	4,279	5,768	..	1,212	173	16,428	..	2,131	..
Thames Valley Electric-power Board	6,197	811,192	106,613*	5,183	321	8,538	120,655	35,839	26,616	48,237	4,310	9,685	284	124,971	..	..	4,316
Thames Borough Council.. ..	1,142	33,600	8,844	..	3	105	8,952	3,110	2,890	1,058	518	209	86	7,871	..	1,081	..
Te Aroha Borough Council ..	716	24,813	7,643*	56	..	87	7,786	2,073	3,658	515	350	95	78	6,769	..	1,017	..
Hamilton Borough Council ..	4,103	60,234	34,020	..	..	182	34,202	9,791	6,664	3,254	..	1,645	102	21,456	..	12,746	..
Tourist Department, Rotorua ..	1,878	73,768	18,222	..	..	557	18,779	3,417	5,769	3,688	1,475	1,475	..	15,824	2,955	..	..
Totals	83,669	10,471,178	1,093,918	162,318	2,489	31,219	1,289,944	162,350	513,251	356,798	108,183	98,007	39,194	1,277,783	33,817	24,865	46,521
															58,682		

* After deducting amount of sales to other distributing authorities.

† After deducting amount due by Department for half additional net operating-costs of King's Wharf, £25,973, including £4,114 for the previous year.

Net profit, £12,161.

TABLE IX.—MANGAHAO-WAIKAREMOANA ELECTRIC-POWER SUPPLY.—RESULTS OF OPERATIONS.

—	First Year, 31st March, 1930.	Second Year, 31st March, 1931.	Third Year, 31st March, 1932.
	£	£	£
Capital outlay	3,426,901	3,498,840	3,659,304
Costs—			
Working-costs	59,235*	59,476†	48,900
Interest	191,288	196,206	202,775
Depreciation	62,205	63,850	65,681
Total costs	312,728	319,532	317,356
Revenue	259,461‡	283,017	300,022
Loss	53,267	36,515	17,334
Accumulated Depreciation Fund	223,257	284,996	355,122
Maximum load (kilowatts)—			
Combined power-houses	37,880	44,660	45,980
Khandallah	20,000	24,600	24,420
Wellington City Corporation	15,424	18,528	18,536
Hutt Valley Electric-power Board	4,180	5,028	5,435
Wellington Meat Export Co., Ltd.	429	461	493
Railway Department	1,440	1,737	1,350
Horowhenua Electric-power Board	2,142	1,670	1,764
Manawatu-Oroua Electric-power Board	3,465	3,660	4,020
Dannevirke Electric-power Board	617	708	775
Tararua Electric-power Board	607	655	677
Wairarapa Electric-power Board	1,044	1,339	1,526
Wanganui-Rangitikei Electric-power Board	3,441	3,970	4,115
Central Hawke's Bay Electric-power Board	694	806	842
Hawke's Bay Electric-power Board	3,048	3,504	3,912
Wairoa Electric-power Board	804	816	768
Poverty Bay Electric-power Board	1,330	1,158	1,218
South Taranaki Electric-power Board	..	..	565
New Plymouth Borough Council	..	..	1,476
Units output—			
Generated—Power-house totals	182,148,043	210,373,650	224,267,160
Purchased—			
Wellington City Council	65,040	1,465,602	18,535
Wanganui-Rangitikei Electric-power Board	..	51,980	..
Hastings Borough Council	1,300	80,160	..
New Plymouth Borough Council	..	..	7,350
Total units generated and purchased	182,214,383	211,971,392	224,293,045
Units sold—			
Wellington City Council	50,192,540	56,672,369	56,160,500
Wellington Meat Export Co., Ltd.	1,673,450	1,664,900	1,735,100
Horowhenua Electric-power Board	8,468,472	8,591,177	9,217,629
Hutt Valley Electric-power Board	20,086,060	24,612,820	23,852,916
Wairarapa Electric-power Board	3,549,797	5,273,654	7,859,699
Tararua Electric-power Board	3,090,220	3,490,764	3,663,427
Dannevirke Electric-power Board	2,987,845	3,718,552	3,950,388
Central Hawke's Bay Electric-power Board	3,487,202	4,148,254	4,385,304
Hawke's Bay Electric-power Board	15,401,308	16,009,755	20,206,903
Manawatu-Oroua Electric-power Board	20,266,997	23,437,239	24,391,835
Wanganui-Rangitikei Electric-power Board	17,026,540	20,598,638	21,156,518
Railway Department	3,136,540	5,142,720	3,709,920
Wairoa Electric-power Board	3,209,344	3,436,891	3,258,328
Poverty Bay Electric-power Board	4,981,845	6,456,441	7,225,326
South Taranaki Electric-power Board	..	..	485,624
New Plymouth Borough Council	..	..	883,608
Retail consumers	1,454,571	916,700	1,400,247
Total units sold	159,012,731	184,170,874	193,543,272
Operating consumption	3,090,320	3,451,150	3,674,356
Losses—			
Total losses (units)	20,111,332	24,349,368	27,075,417
Percentage	11·04	11·5	12·04
Load-factor (per cent.)—			
System (annual)	54·9	54·2	55·8
System (average weekly)	65·2	65·7	68·2
Working-costs (less power purchased)—			
Per kilowatt (system maximum)	£1·56	£1·23	£1·063
Per unit generated	0·078d.	0·062d.	0·052d.
Per unit sold	0·089d.	0·072d.	0·061d.
Capital charges—			
Per kilowatt (system annual maximum)	£6·71	£5·82	£5·838
Per unit generated	0·333d.	0·294d.	0·287d.
Per unit sold	0·381d.	0·339d.	0·333d.
Total costs—			
Per kilowatt (system annual maximum)	£8·27	£7·15	£6·902
Per unit generated	0·411d.	0·362d.	0·340d.
Per unit sold	0·470d.	0·416d.	0·393d.
Revenue—			
Per kilowatt (system maximum)	£6·78	£6·36	£6·52
Per unit generated	0·342d.	0·322d.	0·321d.
Per unit sold	0·390d.	0·370d.	0·372d.

* Does not include £233 for power purchased. † Includes £4,441 for power purchased. ‡ Gross revenue, £259,668.

TABLE X.—MANGAHAO-WAIKAREMOANA ELECTRIC-POWER SUPPLY.—ANALYSIS OF CAPITAL OUTLAY.

——	Expenditure to 31st March, 1930.	Expenditure to 31st March, 1931.	Expenditure to 31st March, 1932.
	£	£	£
Land, roading, tram-lines, and fencing	150,643	150,775	161,986
Headworks	952,034	953,037	940,870
Generating-stations and machinery	609,784	609,897	612,289
Transmission-lines	675,585	703,911	752,562
Main substations	305,226	333,746	435,117
Service buildings and workmen' accommodation	104,455	105,550	98,023
Vehicles and loose construction tools	7,310	5,837	3,121
Surveys, expenses, and salaries	241,353	246,134	261,686
Construction plant and equipment	18,505	22,589	11,820
Interest during construction	289,926	293,879	298,651
Cost and expenses of raising loans	71,481	73,215	77,179
Office furniture	599	..	..
Totals	3,426,901	3,498,840	3,659,304

TABLE XI.—MANGAHAO-WAIKAREMOANA ELECTRIC-POWER SUPPLY.—OPERATING OR WORKING COSTS.

——	1931.		1932.	
	Cost.	Per Unit sold.	Cost.	Per Unit sold.
	£	d.	£	d.
Generating	16,026	0·021	13,813	0·017
Transmission	16,908	0·022	15,239	0·019
Substations	5,997	0·008	5,895	0·007
Management and general	16,104	0·021	13,953	0·018
Totals	55,035	0·072	48,900	0·061

Units sold—1931, 184,170,874; 1932, 193,543,272.

TABLE XII.—MANGAHAO-WAIKAREMOANA ELECTRIC-POWER SUPPLY.—CONNECTED LOAD IN KILOWATTS AT THE 31ST MARCH, 1932.

——	Street-lighting.	General Lighting, Heating, and Cooking.	Power.	Totals.
Public Works Department	4	1,125	579	1,708
Central Hawke's Bay Electric-power Board	24	3,867	621	4,512
Dannevirke Electric-power Board ..	18	6,042	1,227	7,287
Hawke's Bay Electric-power Board ..	151	21,443	5,970	27,564
Horowhenua Electric-power Board ..	37	8,312	3,013	11,362
Hutt Valley Electric-power Board ..	101	32,426	7,441	39,968
Manawatu-Oroua Electric-power Board ..	158	28,797	5,693	34,648
New Plymouth Borough Council	67	18,126	5,556	23,749
Poverty Bay Electric-power Board ..	24	10,828	2,819	13,671
Railway Department	..	1,983	3,850	5,833
South Taranaki Electric-power Board ..	33	3,904	1,754	5,691
Tararua Electric-power Board	12	4,293	922	5,227
Wairarapa Electric-power Board ..	31	13,303	2,165	15,499
Wairoa Electric-power Board	13	3,143	591	3,747
Wanganui-Rangitikei Electric-power Board	112	24,960	5,761	30,833
Wellington City Corporation	372	96,676	33,959	131,001
Wellington Meat Export Co., Ltd. ..	..	97	937	1,034
Total	..	..	..	363,334

TABLE XIII.—MANGAHAO-WAIKAREMOANA ELECTRIC-POWER SUPPLY.—GROSS FINANCIAL RESULTS OF DISTRIBUTION OF ENERGY FOR THE YEAR ENDING 31ST MARCH, 1932.

—	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.	Reserve Fund, &c.	Other Expenditure.	Total.	Profit.	Loss.
			Retail.	Bulk (for Resale).														
		£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
Public Works Department	106	3,659,304	757*	295,078	..	..	4,187	300,022	..	48,900	202,775	65,681	..	..	..	317,356	..	17,334
Central Hawke's Bay Electric-power Board	1,573	139,086	22,550	..	..	..	355	22,905	7,264	3,300	7,906	1,812	1,636	..	1,113	23,031	..	126
Dannevirke Electric-power Board ..	2,395	214,481	28,198	..	..	..	714	28,912	6,592	5,582	12,150	2,130	2,690	..	191	29,335	..	423
Hawke's Bay Electric-power Board ..	2,466	221,038	32,782*	22,580	..	277	2,784	58,423	31,024	7,256	13,274	3,240	2,294	..	235	57,323	1,100	..
Hutt Valley Electric-power Board ..	10,890	386,931	101,565	..	..	..	2,330	103,895	40,685	23,026	21,641	6,076	3,915	1,000	3,594	99,937	3,958	..
Horowhenua Electric-power Board ..	3,795	214,108	41,243	..	..	57	1,147	42,447	15,314	8,767	12,059	3,077	2,413	..	1,003	42,633	..	186
Hastings Borough Council	3,336	114,911	24,615	..	..	..	58	24,673	8,506	7,777	3,851	679	2,335	..	1,525	24,673	..	..
Havelock North Town Board	291	24,074	3,229	..	..	..	13	3,242	564	875	1,256	..	537	..	4	3,236	6	..
Manawatu-Oroua Electric-power Board ..	4,530	511,442	60,657*	16,183	..	228	3,982	81,050	31,460	12,134	28,057	1,187	5,410	..	4,283	82,531	..	1,481
Mangaweka Town Board	108	5,613	1,003	..	..	188	36	1,227	328	534	108	..	21	..	221	1,212	15	..
Napier Borough Council	4,384	156,513	37,481	..	..	..	622	38,103	13,510	8,063	8,048	..	1,443	..	252	31,316	6,787	..
Palmerston North City Council	5,643	249,420	58,965	..	..	211	62	59,238	16,183	7,738	10,219	5,455	1,829	..	3,020	44,444	14,794	..
Poverty Bay Electric-power Board ..	4,651	320,609	51,724	..	..	32	1,128	52,884	10,336	14,455	16,518	511	6,935	1,000	2,199	51,954	930	..
Tararua Electric-power Board	1,579	164,769	23,170	..	..	100	860	24,130	6,131	4,244	8,870	2,483	1,559	550	181	24,018	112	..
Wairarapa Electric-power Board ..	4,377	358,164	52,994	..	..	68	1,501	54,563	7,699	11,463	20,674	2,318	4,734	423	3,235	50,546	4,017	..
Wanganui-Rangitikei Electric-power Board	9,739	557,578	95,524*	328	..	..	2,945	98,797	31,869	21,088	27,162	8,651	9,296	..	2,597	100,663	..	1,866
Wairoa Electric-power Board	490	62,349	6,796*	4,195	328	65	161	11,217	6,367	2,362	3,848	930	900	..	54	14,461	..	3,244
Wairoa Borough Council	680	20,995	8,142	..	..	3	71	8,216	4,195	1,236	1,130	410	284	..	119	7,374	842	..
Wellington City Corporation	29,200	1,180,464	330,440	..	..	..	4,036	334,476	81,942	69,022	32,634	8,000	7,701	43,982	63,172	306,453	28,023	..
Totals	89,743	8,561,849	981,835	338,364	328	1,229	26,992	1,348,420	319,969	257,822	432,180	112,640	55,932	46,955	86,998	1,312,496	60,584	24,660

* After deducting sales to other distributing bodies.

Gross profit, £35,924; rates collected, £328; net profit, £35,596.

TABLE XIV.—MANGAHAO-WAIKAREMOANA ELECTRIC-POWER SUPPLY.—MILKING-MACHINE MOTORS CONNECTED AT 31ST MARCH, 1932.

Power Board.	¼ h.p.		½ h.p.		¾ h.p.		1 h.p.		1½ h.p.		1¾ h.p.		2 h.p.		2½ h.p.		3 h.p.		Totals.	
	Number.	H.p.	Number.	H.p.	Number.	H.p.	Number.	H.p.	Number.	H.p.	Number.	H.p.	Number.	H.p.	Number.	H.p.	Number.	H.p.	Number.	H.p.
Central Hawke's Bay Electric-power Board*	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	82	123·0
Dannevirke Electric-power Board ..	1	0·25	21	10·5	2	1·5	68	68	173	259·5	..	..	118	236	..	..	1	3	384	578·75
Hawke's Bay Electric-power Board ..	4	1·0	37	18·5	..	..	27	27	42	63·0	..	..	30	60	..	..	6	18	146	187·5
Horowhenua Electric-power Board ..	202	50·5	58	29·0	3	2·25	99	99	119	178·5	..	..	265	530	..	..	..	..	746	889·25
Hutt Valley Electric-power Board ..	..	..	..	..	..	..	5	5	30	45·0	..	..	31	62	1	2·5	1	3	68	117·5
Manawatu-Oroua Electric-power Board ..	2	0·5	56	28·0	..	..	120	120	32	48·0	..	..	758	1,516	..	..	7	21	975	1,733·5
New Plymouth Borough Council ..	..	..	14	7·0	20	15·0	23	23	..	..	..	..	294	588	..	..	..	..	351	633·0
Poverty Bay Electric-power Board ..	..	..	14	7·0	..	..	50	50	13	19·5	1	1·75	19	38	..	..	1	3	108	119·0
South Taranaki Electric-power Board ..	..	..	..	..	..	..	..	..	178	267·0	..	..	82	164	..	..	9	27	269	458·0
Tararua Electric-power Board	..	..	6	3·0	..	..	14	14	56	84·0	..	..	138	276	1	2·5	1	3	216	382·5
Wairarapa Electric-power Board ..	..	..	14	7·0	1	0·75	55	55	7	10·5	..	..	309	618	..	..	8	24	394	715·25
Wairoa Electric-power Board*	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	73	133·0
Wanganui-Rangitikei Electric-power Board*	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	491	817·0
Total	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4,303	6,587·25

* Figures for full analysis not available.

TABLE XV.—MANGAHAO-WAIKAREMOANA ELECTRIC-POWER SUPPLY.—ROUTE-MILEAGE OF POWER BOARD LINES AT 31ST MARCH, 1932.

Number of Circuits.	11,000 Volts.				6,600 Volts.		3,000 Volts.		400 Volts.	Total Route-miles.
	4.	3.	2.	1.	2.	1.	2.	1.	1.	
Central Hawke's Bay Electric-power Board	..	..	1·500	119·50	..	25·75	..	1·00	38·50	186·25(*a*)
Dannevirke Electric-power Board	..	1·500	3·000	22·75	0·50	207·00	..	..	80·00	315·25(*b*)
Hawke's Bay Electric-power Board	..	..	15·000	169·75	..	..	..	6·25	70·25	261·25(*c*)
Horowhenua Electric-power Board	..	0·625	2·875	166·25	..	..	..	..	141·70	311·45(*d*)
Hutt Valley Electric-power Board	..	..	21·000	8·00	16·00	68·00	..	..	181·00	294·00(*e*)
Manawatu-Oroua Electric-power Board	1·5	..	33·000	256·50	..	..	..	163·00	146·00	600·00(*f*)
Tararua Electric-power Board	..	..	12·250	48·75	..	..	..	106·75	47·75	215·50(*g*)
Wairarapa Electric-power Board	..	1·250	27·250	241·00	..	..	..	9·00	76·00	354·50(*h*)
Wairoa Electric-power Board	..	..	22·000	55·00	..	..	1·75	13·00	29·30	130·05(*i*)
Wanganui-Rangitikei Electric-power Board	..	..	25·000	196·00	..	188·00	..	2·00	277·00	688·00
Poverty Bay Electric-power Board	..	..	11·810	39·81	6·94	146·17	..	..	140·36	345·09
New Plymouth Borough Council	..	..	12·000	150·00	..	..	..	..	133·00	295·00
South Taranaki Electric-power Board	..	..	7·050	104·00	..	..	..	..	35·40	146·45

(*a*) Also 33·5 miles of 400 v. lines on the same poles as lines of a higher voltage.
(*b*) Also 0·5 mile of 11,000 v. underground cable, and 19·25 miles of 6,600 v. and 94·75 miles of 400 v. lines on the same poles as lines of higher voltage.
(*c*) Also 103·275 miles of 400 v. lines on same poles as 11,000 v. lines.
(*d*) Also 17 miles of 6,600 v. lines and 63 miles of 400 v. lines on the same poles as lines of a higher voltage.
(*e*) Also 320 miles of lines on the same poles as lines of a higher voltage.
(*f*) Also 33 miles of 3,300 v. lines and 93·73 miles of 400 v. lines on the same poles as lines of a higher voltage.
(*g*) Also 2 miles of 11,000 v. underground cable, 163·125 miles of 400/230 v. lines under 11,000 v. lines, 53·75 miles of series street-lighting circuits on the same poles as 400 v. lines.
(*h*) Also 3 miles of 11,000 v. and 4·5 miles of 3,300 v. lines on the same poles as the Department's 50,000 v. lines.
(*i*) Also 2·25 miles of underground cable and 21·5 miles of 6,600 v. lines, 2 miles of 3,300 v. lines, and 189 miles of 400 v. lines on the same poles as lines of a higher voltage.

TABLE XVI.—MANGAHAO-WAIKAREMOANA ELECTRIC-POWER SUPPLY.—ROUTE-MILEAGE OF DEPARTMENT'S LINES IN OPERATION AT 31ST MARCH, 1932.

——	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.	59·76
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/·092 Cu.	7·38
Wanganui–Stratford	19/·092 Cu.	68·50*
50,000-volt lines (single circuit)—		
Stratford – New Plymouth	7/·104 Cu.	20·95
Tuai–Wairoa	19/·064 Cu.	22·70
Tuai–Gisborne	7/·167 A.C.S.R.	46·47
11,000-volt lines (double circuit)—		
Khandallah–Petone	19/·064 Cu.	3·81
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 route-miles in operation	..	499·02

* Final checked figures not yet available.

TABLE XVII.—LAKE COLERIDGE ELECTRIC-POWER SUPPLY.—RESULTS OF OPERATION.

Results of Operation.	Fourteenth Year, 1929.	Fifteenth Year, 1930.	Sixteenth Year, 1931.	Seventeenth Year, 1932.
	£	£	£	£
Capital outlay	1,581,262	1,622,199	1,712,555	1,802,497
Costs—				
Working-costs	30,130	36,808	57,033*	37,245†
Interest	76,612	76,354	77,226	73,485
Depreciation, 2 per cent.	29,847	15,315	13,290	12,500
Total costs	136,589	128,477	147,549	123,230
Accumulated Depreciation Reserve	192,359	188,294	197,627	211,752
Accumulated General Reserve	..	44,388	97,345	174,249‡
Sinking Fund Reserve	115,770	144,557	168,464	193,865§
Revenue—				
City Council	70,344‖	70,169	88,814	82,909
Tramways	16,215	16,435	9,121	13,881
Wholesale consumers	97,817	107,677	117,376	119,556
Miscellaneous	2,442	2,317	2,279	1,814
Retail consumers	145	50	42	36
Total revenue	186,963	196,648	217,632	218,196
Maximum load (kilowatts)—				
Power-house	24,370	27,540	30,800	30,340
Lyttelton Diesel Station	..	..	..	4,480
System	24,370	27,540	30,800	30,340
Substations—				
Addington	17,610	20,792	23,582	22,568
Timaru	2,247	2,395	2,685	2,745
Ashburton	1,402	1,370	1,450	1,410
Oamaru	869	1,061	1,392	1,440
Hororata	264	275	289	265
Point	21	37	32	34
Waitaki Hydro	..	..	..	592
Glenavy	..	..	..	15
Total substations (66 kv. and 110 kv.)	21,772	25,574	29,275	28,398
Christchurch City Council	11,624‖	12,944	15,145	15,125
Average load (kilowatts)—				
Power-house	12,370	14,210	13,790	14,775
Lyttelton Diesel Station	..	..	..	1,420
System	12,370	14,210	13,790	14,850
Substations (66 kv. and 110 kv.)	11,120	13,120	13,150	13,880
Christchurch City Council	5,140‖	6,060‖	5,960	6,251
Units output (kilowatts)—				
Power-house	108,011,955	124,375,245	120,687,377	129,627,220
Lyttelton Diesel Station	..	..	..	652,587
Units purchased (Christchurch Tramway Board)	..	..	1,729,441	282,736
System	108,011,955	124,375,245	122,416,818	130,562,543
Substations (66 kv. and 110 kv.)	97,765,686	114,971,933	113,393,072	121,937,831
Units distributed—				
Christchurch City Council (sold)	45,058,656‖	54,124,965	52,325,987	54,934,719
Tramways (sold)	8,648,400	8,764,860	4,864,657	7,403,266
Wholesale consumers and local bodies (sold)	42,195,004	49,706,308	54,760,271	57,198,357
Retail consumers (sold)	24,147	4,817	2,965	2,619
Power-house and substations local consumption (unsold)	2,118,757	2,569,583	2,316,735	2,017,339
Total units distributed	98,044,964	115,170,533	114,270,615	121,556,300¶
Losses—				
Transmission-line losses	8,823,371	7,888,536	5,972,483	7,262,072
Percentage	8·28	6·42	5·0	5·65
Distribution losses	1,143,620	1,316,176	1,173,720	1,744,171
Percentage	1·15	1·14	1·865	1·415
Average load-factor (per cent)—				
Power-house	50·7	51·6	44·8	48·7
Lyttelton Diesel Station	..	..	..	31·6
System	50·7	51·6	44·8	49·0
Substations (66 kv. and 110 kv.)	51·2	51·4	44·9	48·8
Christchurch City Council	44·3‖	46·7‖	39·3	41·5
Working-costs—				
Per kilowatt (system maximum)	£1·236	£1·338	£1·85	£1·23
Per unit generated and purchased	0·067d.	0·070d.	0·112d.	0·068d.
Per unit sold¶	0·074d.	0·077d.	0·120d.	0·075d.
Capital charges (interest plus depreciation)**—				
Per kilowatt (system maximum)	£4·368	£3·326	£2·94	£2·83
Per unit generated and purchased	0·236d.	0·18d.	0·178d.	0·158d.
Per unit sold¶	0·261d.	0·19d.	0·190d.	0·173d.
Total cost—				
Per kilowatt (system maximum)	£5·605	£4·664	£4·79	£4·06
Per unit generated and purchased	0·303d.	0·250d.	0·289d.	0·227d.
Per unit sold¶	0·334d.	0·267d.	0·309d.	0·248d.
Revenue—				
Per kilowatt (system maximum)	£7·672	£7·262	£7·060	£7·19
Per unit generated and purchased	0·416d.	0·39d.	0·427d.	0·401d.
Per unit sold	0·457d.	0·42d.	0·457d.	0·432d.
Per unit sold (city)	0·375d.	0·33d.	0·408d.	0·362d.
Per unit sold (trams)	0·449d.	0·45d.	0·450d.	0·450d.
Per unit sold (wholesale consumers)	0·556d.	0·52d.	0·515d.	0·500d.
Per unit sold (retail consumers)	1·441d.	2·49d.	3·400d.	3·310d.

* Includes £21,170 for power purchased. † Includes £2,802 for power purchased. ‡ Payment into fund for year ended 31st March, 1932, £76,904. § Payment into fund for year ended 31st March, 1932, £18,062. ‖ Excludes Woolston Borough Council. ¶ Total units sold for year ended 31st March, 1932, 119,538,961. ** Table XXVIII computed on Interest plus Sinking Fund.

TABLE XVIII.—LAKE COLERIDGE ELECTRIC-POWER SUPPLY.—ANALYSIS OF CAPITAL OUTLAY.

Item.	Total Expenditure to 31st March,		Difference in Expenditure during Year 1931–32.
	1932.	1931.	
	£	£	£
Land, roading, and fencing	24,583	24,583	..
Harper diversion	23,359	23,158	201
Acheron diversion	19,105	18,704	401
Headworks (second tunnel)	236,882	236,914	*Cr.* 32
Headworks	230,562	230,565	*Cr.* 3
Power-house machinery, &c.	224,965	221,771	3,194
Staff village	24,797	24,795	2
Transmission-lines	391,434	390,145	1,289
Addington Substation	113,625	96,356	17,269
Lyttelton Diesel Station	97,265	48,164	49,101
Primary distribution	129,085	119,371	9,714
Secondary distribution	39,047	42,216	*Cr.* 3,169
Service transformers and meters	7,811	8,630	*Cr.* 819
Vehicles and loose tools	25,019	24,574	445
Telephone-lines	1,891	1,891	..
Office furniture	328	322	6
Surveys, preliminary expenses, &c.	143,301	133,576	9,725
Interest during construction	69,438	66,820	2,618
Total	1,802,497	1,712,555	89,942

TABLE XIX.—LAKE COLERIDGE ELECTRIC-POWER SUPPLY.—OPERATING OR WORKING COSTS.

Item.	1931.		1932.	
	Cost.	Cost per Unit distributed.	Cost.	Cost per Unit distributed.
	£	d.	£	d.
Harper diversion	1,123	0·0024	1,084	0·0021
Generating	10,047	0·0211	7,629	0·0151
Transmission-line	5,848	0·0123	5,753	0·0113
Main distribution	3,399	0·0071	3,188	0·0063
H.T. distribution	3,724	0·0078	2,108	0·0041
L.T. distribution	4,443	0·0093	3,947	0·0078
Standby	21,170	0·0444	6,555	0·0130
Management	7,279	0·0153	6,981	0·0138
	57,033	0·1197	37,245	0·0735
Units distributed	114,270,615		121,556,300	
Units sold	111,953,880		119,538,961	

TABLE XX.—LAKE COLERIDGE ELECTRIC-POWER SUPPLY.—TOTAL CONNECTED LOAD, TOTAL UNITS, AND MAXIMUM DEMANDS FOR YEAR ENDED 31ST MARCH, 1932.

Consumer.	Connected Load.				Maximum Kilowatts.	Maximum Kilovolt-amperes.
	Light.	Heat.	Power.	Total.		
Distributing authorities (15)—	Kw.	Kw.	Kw.	Kw.		
Ashburton Power Board	1,686·000	9,647·000	2,126·000	13,459·000	1,400·00	1,406·60
Banks Peninsula Board	411·580	3,194·487	315·555	3,921·622	400·00	..
Christchurch City Council	..	..	..	111,029·000*	15,125·00	..
Halswell County Council	85·145	319·710	84·870	489·725	..	183·00
Heathcote County Council	558·060	4,079·060	213·408	4,850·528	..	750·00
Lyttelton Borough Council	409·009	1,335·769	804·623	2,549·401	296·00	300·00
Malvern Power Board	333·810	1,929·640	262·380	2,525·830	235·80	281·88
North Canterbury Power Board	1,125·330	5,210·696	1,719·192	8,055·218	944·00	985·60
Riccarton Borough Council	680·470	3,689·186	471·076	4,840·732	501·00	535·20
South Canterbury Power Board	4,117·030	14,140·769	3,554·597	21,812·396	2,700·00	3,196·00
Springs-Ellesmere Power Board	1,182·425	4,759·000	2,662·055	8,603·480	1,209·60	1,368·00
Sumner Borough Council	358·061	1,401·329	205·371	1,964·761	324·00	345·20
Tai Tapu Dairy Co., Ltd.	..	..	..	..	200·00†	..
Waimairi County Council (Hillmorton)	101·410	232·000	28·396	361·806	..	..
Waitaki Power Board	1,730·871	6,463·150	1,426·160	9,620·181	1,392·00	1,588·00
	12,779·201	56,401·796	13,873·683	194,083·680	..	..
Direct consumers (44)	997·060	2,015·060	14,355·420	17,367·540	..	..
Total	13,776·260	58,416·860	28,229·100	211,451·220	..	..
Substations (7)—						
Addington (condenser and local)	19·000	68·000	56·000	143·000‡	..	..
Point	1·680	9·500	2·240	13·420	..	..
Hororata	1·680	21·600	0·370	23·650	..	..
Ashburton	1·320	16·820	..	18·140	..	..
Timaru (condenser and local)	2·500	20·600	1·860	24·960‡	..	..
Oamaru	1·500	10·000	1·490	12·990	..	..
Glenavy	2·000	20·000	10·000	32·000	..	..
	29·680	166·520	71·960	268·160	..	..
Power-house (1)	..	..	..	437·000	..	..
Grand total	13,805·940	58,583·380	28,301·060	212,156·380	..	..

* Includes Woolston Borough Council and part Waimairi County Council. † Taken over by Springs-Ellesmere Power Board on 1st July, 1931. ‡ Excludes synchronous condenser.

Cost per unit distributed, 0·244d.; cost per unit sold, 0·248d.
Connected loads: 1929, 157,399; 1930, 181,310; 1931, 200,535; 1932, 212,156.

TABLE XXI.—LAKE COLERIDGE ELECTRIC-POWER SUPPLY.—GROSS FINANCIAL RESULTS OF DISTRIBUTION OF ENERGY FOR YEAR ENDED 31ST MARCH, 1932.

Distributing Authority.	Number of Consumers.	Capital Outlay.	Revenue.						Expenditure.						Other 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 Funds.			Profit.	Loss.
			Retail.	Bulk (for Resale).														
		£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
Public Works Department ..	59	1,802,497	48,144*	168,238	..	116	1,698	218,196	2,802	34,443	73,485	12,500	18,062	76,904	..	218,196	..	..
Ashburton Power Board ..	3,539	354,852	43,270	..	..	..	516	43,786	11,020	8,784	19,758	..	3,862	..	52	43,476	310	..
Banks Peninsula Power Board ..	965	103,172	12,216	..	3,580	147	273	16,216	3,430	4,064	6,608	..	1,146	..	538	15,786	430	..
Christchurch City Council ..	27,000	789,332	211,663*	8,221	..	..	9,234	229,118	83,077	52,780	19,565	31,843	4,405	..	..	191,670	37,448	..
Halswell County Council ..	251	6,946	2,155	..	..	..	4	2,159	928	558	263	..	50	..	..	1,799	360	..
Heathcote County Council ..	1,870	36,404	10,644	..	..	105	68	10,817	5,794	1,399	1,563	..	1,138	..	..	9,894	923	..
Kaiapoi Borough Council ..	458	10,664	3,248	..	..	..	..	3,248	966	705	777	872	253	..	..	3,573	..	325
Lyttelton Borough Council ..	730	10,850	6,132	..	..	183	..	6,315	2,540	1,784	304	250	375	1,062	..	6,315	..	..
Malvern Power Board	665	63,748	7,143	..	1,177	55	512	7,710	2,573	2,972	3,753	..	650	..	383	10,331	..	2,621
North Canterbury Electric-power Board	1,588	142,208	20,246*	2,736	..	..	771	23,753	7,590	7,282	7,862	..	1,504	848	..	25,086	..	1,333
Riccarton Borough Council ..	1,340	23,734	10,097	..	..	288	21	10,406	4,400	2,604	820	675	220	..	15	8,734	1,672	..
Rangiora Borough Council ..	574	13,490	4,790	..	..	..	9	4,799	1,745	1,592	349	326	75	..	65	4,152	647	..
South Canterbury Power Board ..	3,596	322,327	42,689*	12,305	..	..	617	55,611	24,288	6,390	17,979	4,241	3,265	..	81	56,244	..	633
Springs-Ellesmere Power Board ..	2,376	154,885	28,018	..	..	44	175	28,237	9,639	4,236	8,583	1,547	1,722	..	1,443	27,170	1,067	..
Sumner Borough Council ..	993	16,955	6,347	..	..	..	26	6,373	2,766	2,333	430	..	81	..	28	5,638	735	..
Tai Tapu Dairy Co.†	248	10,582	1,021	..	..	..	3	1,024	465	281	82	94	..	..	..	922	102	..
Timaru Borough Council ..	3,618	132,413	32,155	..	..	29	266	32,450	12,305	7,480	5,246	..	4,231	..	..	29,262	3,188	..
Waimairi County Council ..	3,226	85,438	21,837*	51	100	44	261	22,293	8,557	3,992	2,186	3,753	1,238	2,467	..	22,193	100	..
Waitaki Electric-power Board ..	3,303	183,497	29,325	..	..	196	1,077	30,598	9,481	8,656	9,638	2,175	1,935	200	969	33,054	..	2,456
Totals	56,399	4,263,994	541,140	191,551	4,857	1,207	15,531	753,109	194,366	152,335	179,251	58,276	44,212	81,481	3,574	713,495	46,982	7,368

* After deducting sales to other distributing bodies. † Taken over by Springs-Ellesmere Power Board, 1st July, 1931.

	£
Gross profit	39,614
Raised by rates	4,857
Net profit	£44,471

TABLE XXII.—LAKE COLERIDGE ELECTRIC-POWER SUPPLY.—MILKING-MACHINES CONNECTED AT 31ST MARCH, 1932.

Supply Authority.	½ h.p.		1 h.p.		1½ h.p.		2 h.p.		3 h.p.		Total.	
	Number.	H.p.	Number.	H.p.	Number.	H.p.	Number.	H.p.	Number.	H.p.	Number.	H.p.
Ashburton Power Board ..	3	1·5	6	6	28	42	25	50	..	..	63*	99·75*
Banks Peninsula Power Board ..	20	10	75	75	..	..	38	76	2	6	199†	183·5†
Christchurch City Council ..	1	0·5	..	..	..	..	..	..	..	..	1	0·5
Halswell County Council ..	2	1	..	..	1	1·5	7	14	9	27	19	43·5
Heathcote County Council ..	..	..	..	..	..	..	2	4	1	3	3	7
Kaiapoi Borough Council ..	..	..	..	..	..	..	..	..	..	..	..	..
Lyttelton Borough Council ..	..	..	..	..	..	..	..	..	1	3	1	3
Malvern Power Board ..	..	..	1	1	..	..	5	10	..	..	6	11
North Canterbury Power Board	6	3	14	14	8	12	28	56	19	57	75	142
Rangiora Borough Council ..	..	..	..	..	..	..	..	..	..	..	..	..
Riccarton Borough Council ..	..	..	..	..	..	..	..	..	..	..	..	..
South Canterbury Power Board	12	6	16	16	43	64·5	46	92	6	18	130‡	201·25‡
Springs-Ellesmere Power Board	5	2·5	24	24	1	1·5	80	160	15	45	129§	242§
Sumner Borough Council ..	..	..	..	..	..	..	..	..	1	3	1	3
Timaru Borough Council ..	..	..	..	..	..	..	..	..	..	..	..	..
Waimairi County Council ..	..	..	1	1	3	4·5	5	10	5	15	14	30·5
Waitaki Power Board ..	3	1·5	5	5	6	9	11	22	..	..	25	37·5
Totals	52	26	142	142	90	135	247	494	59	177	666	1,004·5

* Includes one 0·25 h.p. † Includes one 0·75 h.p. and sixty-three 0·25 h.p. ‡ Includes one 0·25 h.p. and six 0·75 h.p.
§ Includes two 0·75 h.p., one 2·5 h.p., and one 5 h.p.

TABLE XXIII.—LAKE COLERIDGE ELECTRIC-POWER SUPPLY.—ROUTE-MILES OF POWER BOARD LINES AT 31ST MARCH, 1932.

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 ..	76·630	19·00	0·70	0·62	692·30	2·10	..	..	77·730	..	869·080 (*a*)
Banks Peninsula Power Board ..	25·000	..	..	..	56·00	4·00	38·000	..	56·000	..	201·000 (*b*)
Christchurch City Council ..	8·070	..	..	..	..	..	3·900	..	242·050	..	311·220 (*c*)
Halswell County Council ..	..	..	..	..	..	..	7·000	..	15·000	..	22·000 (*d*)
Heathcote County Council ..	7·625	..	..	..	..	..	1·625	..	21·250	..	30·500 (*e*)
Kaiapoi Borough Council ..	..	..	..	..	..	..	1·250	..	14·750	..	16·000 (*f*)
Lyttelton Harbour Board ..	..	..	..	..	..	..	..	..	3·000	..	3·000
Lyttelton Borough Council ..	1·800	..	..	..	..	..	..	..	8·280	..	10·080 (*g*)
Malvern Power Board	..	..	..	..	169·75	..	..	..	11·750	..	181·500 (*h*)
North Canterbury Power Board	199·830	14·16	..	..	49·84	..	24·650	..	58·210	..	346·690 (*i*)
Rangiora Borough Council ..	..	..	..	..	..	..	3·290	..	10·280	..	13·570 (*j*)
Riccarton Borough Council ..	..	..	..	..	..	..	0·500	3·00	14·750	..	18·250 (*k*)
South Canterbury Power Board..	30·250	83·50	..	..	525·90	3·00	..	..	82·250	0·50	725·400 (*l*)
Springs-Ellesmere Power Board	26·000	6·50	..	..	40·00	..	125·000	..	108·350	..	305·850 (*m*)
Sumner Borough Council ..	1·000	..	..	..	..	..	3·250	..	5·250	..	9·500 (*n*)
Timaru Borough Council ..	1·150	..	..	..	..	..	4·200	3·60	46·985	..	56·675 (*o*)
Waitaki Power Board	103·300	0·70	..	..	174·10	..	3·200	..	83·700	..	365·000 (*p*)
Waimairi County Council ..	..	..	..	..	35·75	1·00	23·000	..	62·750	..	141·500 (*q*)
Totals	480·655	123·86	0·70	0·62	1,743·64	10·10	238·865	6·60	922·335	0·50	3,626·815

(*a*) Also 0·82 miles 6,600-volt double-circuit line under 11,000-volt line; 48·42 miles 6,600-volt and 18·80 miles 400-volt single-circuit line under 11,000-volt line; and 65·53 miles 400-volt single-circuit line under 6,600-volt line.
(*b*) Includes 22 miles 33,000-volt lines. Also 12 miles 3,300-volt lines under 33,000-volt lines; 7 miles 400-volt lines under 11,000-volt lines; 18·5 miles 400-volt lines under 6,600-volt lines; and 8·5 miles 400-volt lines under 3,300-volt lines.
(*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 50·70 miles 11,000-volt underground cable and 6·5 miles 11,000-volt underground street-lighting cable.
(*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.
(*f*) Also 0·25 miles 400-volt lines 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.
(*i*) Also 60·28 miles 400-volt line under single-circuit 11,000-volt line; 4·36 miles 400-volt line under double-circuit 11,000-volt line; 14·44 miles 400-volt line under single-circuit 6,600-volt line; and 9·50 miles 400-volt line under single-circuit 3,300-volt line.
(*j*) Also 3·29 miles 400-volt line under 3,300-volt line.
(*k*) Also 1·75 miles 400-volt line under 3,300-volt line.
(*l*) Also 16 miles 6,600-volt line and 4 miles 400-volt line under double-circuit 11,000-volt line; 18·5 miles 400-volt line and 52 miles 6,600-volt line under single-circuit 11,000-volt line; 204 miles and 0·5 miles 400-volt line under single-circuit 6,600-volt line.
(*m*) Also 7·2 miles 3,300-volt line under 33,000-volt line; 11·3 miles 3,300-volt, 4·6 miles 6,600-volt, and 3·2 miles 400-volt line under 11,000-volt line; 14·85 miles 400-volt line under 6,600-volt line; and 55·7 miles 400-volt line under 3,300-volt line.
(*n*) Also 2·5 miles 400-volt line under 3,300-volt line.
(*o*) Also 3·6 miles 400-volt line under double-circuit 3,300-volt line and 4·2 miles 400-volt line under single-circuit 3,300-volt line. Includes 0·74 miles 11,000-volt underground cable.
(*p*) Also 17·3 miles 6,600-volt and 22·5 miles 400-volt line under 11,000-volt line; 0·4 miles 3,300-volt and 45·2 miles 400-volt line under 6,600-volt line; and 3·0 miles 400-volt line under 3,300-volt line.
(*q*) Includes 19 miles 230-volt line. Also 26·75 miles 400-volt and 230-volt line under 6,600-volt line; and 24·5 miles 400-volt and 230-volt line under 3,300-volt line.

TABLE XXIV.—LAKE COLERIDGE ELECTRIC POWER-SUPPLY.—TRANSMISSION AND DISTRIBUTING LINES.

Route Miles, 31st March, 1932.

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 to Timaru—T line	84·4	
	Hororata to Timaru—U line	79·0	
	Timaru to Oamaru—		
	V line	60·2	
	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	
	Lyttelton feeder and branches	14·8	
	Montreal	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 1 and 2, 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	146	
	Armagh 1 and 2	180	
	Local 1 and 2	40	
	Armagh 4	41	
	Power-house	3	
	Milton Street feeder	50	
	Distribution substations (various)	29	
		6·6	
			53·1
6·6 kv.	Murchisons and Intake, &c.	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
			699·6

—	Route-miles of Lines.			
	Erected during Current Year.	Total Erected to 31st March, 1932.	Sold or Dismantled during year.	Balance at 31st March, 1932.
(*a*) Transmission (overhead lines) ..	95·2	540·2	..	540·2
(*b*) Distribution (overhead lines) ..	0·6	57·2	4·0	57·2
(*c*) Underground cables	..	7·0	..	7·0
Totals	95·8	604·4	4·0	604·4

Table XXV.—Electric-power Boards of New Zealand as constituted at 31st March, 1932.

Name of Board.	Proclamation constituting Power Board Area gazetted.	Members on Board.	Approximate Area.		Population.		Value of Rateable Property.			Valuation Basis.	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	17,925	550	11,500,000	9,264,661	700,181	Capital	411,150	2,999	706
Auckland	1/4/22	12	300	..	200,000	..	73,537,262	50,491,865	..	Capital	2,318,000	11,004	1,367
Banks Peninsula	8/1/20	7	387	..	4,050	..	4,478,618	3,545,448	..	Capital	114,680	658	113
Bay of Plenty	20/8/25	8	460	2,615	8,650	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	16,359	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	13,000	700	2,163,986	645,047	117,700	Capital	271,800	2,073	665
Hawke's Bay	19/6/24	11	1,682	2	47,418	1,100	18,660,807	11,433,431	127,901	Capital	304,000	681	68
Horowhenua	1/12/21	9	630	..	17,000	..	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	..	41,500	..	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	..	13,846,231	13,846,231	..	Unimproved ..	550,000	1,144	96
Marlborough	25/10/23	8	3,218*	..	14,530*	..	8,642,190	5,809,209*	..	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	13,577,705	13,577,705	110,000	Unimproved ..	1,650,000	6,516	415
Springs-Ellesmere	1/7/20	5	519	5	12,330	..	7,846,719	5,678,061	32,000	Capital	166,520	1,352	105

* Includes outer area.

TABLE XXV.—ELECTRIC-POWER BOARDS OF NEW ZEALAND AS CONSTITUTED AT 31ST MARCH, 1932—*continued.*

Name of Board.	Proclamation constituting Power Board Area gazetted.	Members on Board.	Approximate Area.		Population.		Value of Rateable Property.			Valuation Basis.	Amount of Loan authorized.	Voting for Loan Poll.	
			District.	Outer Area.	District.	Outer Area.	Used as Rating Basis. District.	Unimproved. District.	Unimproved. 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	8,486	4,000	931,283	931,283	482,389	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	1,707	960
Waimea	1/5/29	7	..	..	12,280	..	..	1,624,185	..	..	Nil	282	409
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	..	7,700	..	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	..	39,985	..	12,849,612	5,810,650	..	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, 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
Totals, 1930–31 ..	..	398	43,991	25,303	937,855	66,226	342,619,342	234,471,518	22,713,356	..	13,047,156	65,160	12,155

* Includes outer area. † License delegated to Westland Power, Ltd.

Table XXVI.—Electric-power Boards.—Financial Statistics for the Year ended 31st March, 1932.

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.	£
Ashburton	1923	354,852	..	43,270	..	516	43,786	16,219	3,637	23,620	43,476	310	..	..	..	..	..	..	..
Auckland	1908	3,371,959	15,630	628,293	..	7,915	651,838	291,256[1]	56,559	211,843	559,658	92,180	..	..	..	..	..	..	..
Banks Peninsula ..	1921	103,172	..	12,216	147	273	12,636	6,303	1,729	7,754	15,786	..	3,150	$\frac{1}{15}$, $\frac{4}{23}$	3,850[2]	..	..	..	..
Bay of Plenty ..	1928	206,610	..	34,947	868	1,096	36,911	17,046	5,335	14,398	36,779	132	..	..	..	..	..	..	..
Buller†	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Cambridge	1921	109,633	..	19,164	38	1,147	20,349	9,111	2,247	7,622	18,980	1,369	..	..	..	..	..	..	..
Central	1921	332,490	72	56,595	152	1,116	57,935	23,848	6,733	22,651	53,232	4,703	..	..	..	..	..	..	..
Central Hawke's Bay ..	1925	139,086	..	22,550	..	355	22,905	9,401	2,276	9,542	21,219	1,686	..	..	..	..	..	..	..
Dannevirke	1925	214,481	..	28,198	..	714	28,912	9,045	3,320	14,840	27,205	1,707	..	..	..	..	..	..	..
Franklin	1925	278,458	..	45,648	1,078	2,997	49,723	18,678	5,616	17,886	42,180	7,543	..	..	..	..	..	..	..
Golden Bay	1929	25,473	..	3,560	82	..	3,642	732	872	1,687	3,291	351	..	..	..	..	..	..	110[3]
Grey	1926	256,582	..	30,133	88	1,896	32,117	10,016	5,210	16,085	31,311	806	..	..	..	..	..	..	..
Hawke's Bay	1927	221,038	22,612	32,750	277	2,784	58,423	34,543	3,972	15,568	54,083	4,340	..	..	..	..	..	..	..
Horowhenua	1924	214,108	..	41,243	57	1,147	42,447	20,940	3,944	14,472	39,356	3,091	..	..	..	..	..	..	..
Hurunui†	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Hutt Valley	1925	386,931	..	101,565	..	2,330	103,895	54,913	12,392	25,556	92,861	11,034	..	..	..	..	..	..	..
Malvern	1925	63,748	..	7,143	55	512	7,710	4,349	1,579	4,403	10,331	..	2,621	..	..	..	..	$\frac{1}{7}$	1,177[4]
Manawatu-Oroua ..	1924	511,442	16,183	60,657	228	3,982	81,050	38,408	6,149	33,467	78,024	3,026	..	..	..	..	..	..	..
Marlborough	1927	316,856	..	29,899	57	385	30,341	5,582	2,720	21,992	30,294	47	..	..	..	..	998[5]	..	..
North Auckland† ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
North Canterbury ..	1928	142,208	2,756	20,226	..	771	23,753	11,971	2,901	9,366	24,238	..	485	..	..	..	..	..	..
Opunake	1924	108,735	..	13,375	..	72	13,447	3,042	1,514	8,339	12,895	552	..	..	..	..	..	..	..
Otago Central ..	1925	85,864	..	9,662	78	231	9,971	2,056	1,784	6,458	10,298	..	327	..	..	..	..	..	..
Otago	1926	281,628	..	36,468	..	38	36,506	14,942	5,191	21,122	41,255	..	4,749	0·05	980	..	..	·65,·7,·75	8,150
Poverty Bay	1912	320,609	..	51,724	32	1,128	52,884	19,973	6,038	23,453	49,464	3,420	..	..	..	..	..	..	..
Reefton†	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
South Canterbury ..	1925	322,327	12,080	42,914	..	617	55,611	27,315	3,444	21,244	52,003	3,608	..	..	..	..	..	..	..
South Taranaki ..	1929	182,278	62	27,515	401	639	28,617	5,003	4,018	12,631	21,652	6,965	..	..	..	..	..	..	..
Southland	1925	1,651,558	18,590	96,318	94	15,886	130,888	32,216	9,599	125,277	167,092	..	36,204	..	47,502[6]	..	..	$\frac{3}{10}$, $\frac{1}{5}$, $\frac{7}{20}$, $\frac{7}{30}$	..
Springs-Ellesmere ..	1922	154,885	..	28,018	44	175	28,237	12,017	3,301	10,305	25,623	2,614	..	..	..	..	..	..	..
Taranaki	1927	456,699	5,675	35,841	..	433	41,949	8,455	5,779	32,224	46,458	..	4,509	..	..	..	..	..	..
Tararua	1925	164,769	..	23,170	100	860	24,130	8,131	2,413	10,429	20,973	3,157	..	..	..	..	..	..	..
Tauranga	1926	125,024	..	23,375	..	1,535	24,910	9,616	3,146	9,428	22,190	2,720	..	..	..	..	..	..	..
Te Awamutu	1921	182,505	..	29,518	29	143	29,690	12,742	2,403	11,912	27,057	2,633	..	..	..	..	..	..	..
Teviot	1924	57,201	1,289	4,568	..	53	5,910	844	987	3,767	5,598	312	..	..	..	..	..	..	..

* Include interest and sinking-fund payments only. † Not yet actively functioning. [1] After adjustment of Public Works Department subsidy (£25,973). [2] Includes arrears, £259. [3] Arrears only. [4] Includes arrears, £189.
[5] Arrears only. [6] Includes arrears, £10,408.

TABLE XXVI.—ELECTRIC-POWER BOARDS.—FINANCIAL STATISTICS FOR THE YEAR ENDED 31ST MARCH, 1932.—*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.	£
Thames Valley ..	1921	811,192	4,602	107,194	321	8,538	120,655	53,364	9,375	57,922	120,661	..	6	..	..	..	..	..	..
Waimea†	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Wairarapa	1923	358,164	1,890	51,104	68	1,501	54,563	11,627	10,770	25,408	47,805	6,758	..	..	..	..	..	..	..
Wairere	1925	41,942	..	5,157	..	135	5,292	504	1,062	3,310	4,876	416	..	..	..	..	..	..	..
Wairoa	1923	62,349	4,612	6,379	65	161	11,217	7,723	1,060	4,748	13,531	..	2,314	..	..	..	..	..	328[1]
Waitaki	1926	183,497	1,947	27,378	196	1,077	30,598	15,692	3,414	11,573	30,679	..	81	..	..	..	..	..	..
Waitemata	1926	389,866	..	69,264	..	3,417	72,681	28,410	9,982	29,128	67,520	5,161	..	..	..	..	..	..	..
Waitomo	1926	99,963	..	18,341	..	218	18,559	7,190	2,258	6,980	16,428	2,131	..	..	..	..	..	..	..
Wanganui-Rangitikei ..	1924	557,578	335	95,517	..	2,945	98,797	44,893	9,109	36,458	90,460	8,337	..	..	..	..	..	..	..
Westland‡	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
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	..	52,332	..	998	..	10,745
Totals, 1930–31 ..	..	13,637,177	96,078	2,061,150	10,976	55,675	2,223,879	667,527	471,451	905,479	2,044,457	236,423	57,001	..	50,131	..	11,716	..	11,254

* Includes interest and sinking-fund payments only. † Not yet actively functioning. ‡ License delegated to Westland Power, Ltd. [1] Arrears only.

Table XXVII.—Electric-supply Stations of New Zealand at 31st March, 1932.

Title.	Supply commenced.	Population included in Area of Supply.	Number of Consumers.	Capacity.			Connected Load.	Demand Factor.	Units.						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.
				Main Plant.	Standby Plant.	Maximum Load.			Generated.	Purchased.	Total generated and purchased.	Sold (including Sales in Bulk).	Non-productive.	Percentage Non-productive.							
Steam Stations.																					
1. Auckland Power Board ..	1908	No. 200,000	No. 48,058	Kv.a. 41,500	Kv.a. ..	Kw. 34,976	Kw. 188,650	Per Cent. 18·41	No. 149,602,640	No. 1,155,815	No. 150,758,455	No. 126,427,783	No. 24,330,672	Per Cent. 16·14	Per Cent. 49·21	No. 2,067	No. 495	A.C./D.C.	400/230	Miles ch. 1,127 61	Ft. ..
2. Grey Power Board	1926	13,250	2,596	1,250	..	1,400	7,022	19·94	5,626,140	..	5,626,140	4,338,088	1,288,052	22·89	45·88	1,671	327	A.C.	460/230 400/230	109 8	..
3. Nelson City Council	1923	11,500	2,381	937	624	780	6,768	11·52	2,185,050	..	2,185,050	1,764,191	420,859	19·26	31·98	740	153	A.C.	400/230	47 45	..
Totals, steam stations ..	..	224,750	53,035	43,687	624	37,156	202,440	16·98	157,413,830	1,155,815	158,569,645	132,530,062	26,039,583	16·42	48·57	1,980	469	..	..	1,284 34	..
Gas Stations.																					
1. Kaikoura County Council ..	1922	630	152	47	..	30	115	26·09	43,110	..	43,110	31,432	11,678	27·09	16·40	206	49	A.C.	400/230	5 0	..
2. Motueka Borough Council ..	1922	1,600	354	65	..	53	215	24·58	65,203	..	65,203	52,233	12,970	19·89	14·04	147	32	A.C.	400/230	11 56	..
Totals, gas stations ..	..	2,230	506	112	..	83	330	25·15	108,313	..	108,313	83,665	24,648	22·75	14·86	165	37	..	..	16 56	..
Oil Stations.																					
1. Picton Borough Council ..	1917	1,350	359	141*†	..	66	519	12·91	137,490	..	137,490	104,765	32,725	23·80	23·72	292	77	D.C.	460/230	10 10	279
2. Spender, Paul (Rawene) ..	1926	300	52	25*	20*	14	59	23·39	14,151	..	14,151	8,143	6,008	42·55	11·51	156	27	D.C.	230	0 70	..
3. Uawa County Council	1925	400	98	30*	..	21	62	21·66	22,680	..	22,680	14,220	8,460	37·20	12·41	145	35	D.C.	230	3 0	..
Totals, oil stations ..	..	2,050	509	196	20	101	640	14·53	174,321	..	174,321	127,128	47,193	26·98	19·58	251	62	..	..	14 0	..
Hydro Stations.																					
1. Alderton Utility Co. (Kerikeri) ..	1930	250	32	110	..	41	169	24·26	184,800	..	184,800	157,500	27,300	14·77	51·45	4,922	630	A.C.	230	7 19	123
2. Coleridge (Public Works Dept.) ..	1915	..	59	40,580	7,200	30,340	211,451	14·35	130,279,807	282,736	130,562,543	119,538,961	11,023,582	8·44	49·12	..	..	A.C.	400/230	699 48	480
Ashburton Power Board ..	1923	17,925	3,539	..	200	(1,545)	(13,459)	11·48	13,372	6,190,742	6,204,114	(4,744,642)	1,459,472	23·52	45·84	1,340	264	A.C.	400/230	869 3	..
Banks Peninsula Power Board	1921	4,050	965	..	90	(430)	(3,922)	10·96	55,767	1,822,400	1,878,167	(1,325,607)	552,560	29·42	49·68	1,373	327	A.C.	400/230	201 9	310
Christchurch City Council ..	1904	94,320	27,000	..	400*	(15,125)	(111,029)	13·62	..	54,934,719	54,934,719	(49,100,557)	5,834,162	10·62	41·46	1,666	478	A.C./D.C.	460/400/230	311 11	4
Waimairi County Council ..	1916	13,000	3,226	..	..	(1,178)	(12,632)	9·33	..	5,198,289	5,198,289	(4,678,461)	519,828	10·00	50·37	1,450	359	A.C.	400/230	141 40	..
Halswell County Council ..	1919	1,850	251	..	..	(153)	(490)	31·24	..	528,989	528,989	(448,989)	80,000	15·12	39·47	1,788	242	A.C.	400/230	22 0	.
Heathcote County Council ..	1914	6,000	1,870	..	..	(640)	(4,850)	13·21	..	2,336,948	2,336,948	(2,035,422)	301,526	12·90	41·49	1,088	339	A.C.	400/230	30 40	.
Hurunui Power Board† ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.. ..	..
Lyttelton Borough Council ..	1918	3,710	730	..	..	(296)	(2,549)	11·61	..	940,728	940,728	(749,644)	191,084	20·31	36·28	1,026	202	A.C.	400/230	10 6	..
Malvern Power Board ..	1925	5,050	665	..	..	(235)	(2,526)	9·34	..	951,840	951,840	(617,505)	334,335	35·12	46·17	930	122	A.C.	400/230	181 43	..
North Canterbury Power Board	1928	9,064	1,588	..	..	(944)	(8,056)	11·72	..	4,290,795	4,290,795	(3,905,443)	385,352	8·98	51·89	2,025	354	A.C.	400/230	346 78	..
Kaiapoi Borough Council ..	1917	1,700	458	..	..	(91)	(697)	13·06	..	319,200	319,200	(294,864)	24,336	7·62	40·04	643	173	A.C.	400/230	20 0	..
Rangiora Borough Council ..	1919	2,100	574	..	..	(159)	(1,533)	10·41	..	457,200	457,200	(379,745)	77,455	16·94	32·75	661	180	A.C.	400/230	13 45	..
Riccarton Borough Council ..	1916	5,500	1,340	..	..	(501)	(4,841)	10·35	..	2,449,230	2,449,230	(2,185,872)	263,358	10·75	55·81	1,631	397	A.C.	400/230	18 20	..
South Canterbury Power Board	1925	42,598	3,596	40	..	(2,740)	(21,812)	12·55	79,685	12,696,996	12,776,681	(11,472,625)	1,304,056	10·20	52·94	1,950	128	A.C.	400/230	725 32	..
Timaru Borough Council ..	1908	18,000	3,618	..	..	(1,585)	(10,883)	14·56	..	5,105,934	5,105,934	(4,467,692)	638,242	12·50	36·77	1,235	248	A.C.	400/230	55 79	..
Springs-Ellesmere Power Board	1922	12,330	2,376	..	..	(1,209)	(8,603)	14·06	..	5,198,382	5,198,382	(4,347,371)	851,011	16·37	49·06	1,829	352	A.C.	400/230	306 41	..
Sumner Borough Council ..	1918	3,500	993	..	..	(345)	(1,965)	17·56	..	1,292,228	1,292,228	(1,167,310)	124,918	9·67	42·76	1,170	333	A.C.	400/230	9 40	..
Waitaki Power Board ..	1926	19,500	3,303	150	240	(1,720)	(10,826)	15·89	340,644	6,071,500	6,412,144	(5,195,607)	1,216,537	18·95	42·56	1,572	266	A.C.	400/230	365 0	250
3. Dunedin City Council ..	1907	92,000	24,737	23,125	2,340 860*	15,063	78,962	19·08	62,593,020	..	62,593,020	52,686,534	9,906,486	15·83	47·44	1,700	458	A.C.	400/230	539 67	700
Otago Power Board ..	1926	17,931	3,817	..	..	(1,403)	(10,784)	13·01	..	6,165,092	6,165,092	(4,766,039)	1,399,053	22·69	50·16	1,242	265	A.C.	400/230	587 40	..

(For notes see page 99.)

TABLE XXVII.—ELECTRIC-SUPPLY STATIONS OF NEW ZEALAND AT 31ST MARCH, 1932—*continued.*

	Supply commenced.	Population included in Area of Supply.	Number of Consumers.	Capacity.			Connected Load.	Demand Factor.	Units.						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.
				Main Plant.	Standby Plant.	Maximum Load.			Generated.	Purchased.	Total generated and purchased.	Sold (including Sales in Bulk).	Non-productive.	Percentage Non-productive.							
HYDRO STATIONS—*continued.*		No.	No.	Kv.a.	Kv.a.	Kw.	Kw.	Per Cent.	No.	No.	No.	No.	No.	Per Cent.	Per Cent.	No.	No.			Miles ch.	Ft.
4. Golden Bay Power Board ..	1929	1,200	322	250	..	186	785	23·69	612,930	11,830	624,760	493,160	131,600	21·06	38·34	1,531	410	A.C.	400/230	57 0	330
5. Havelock North Town Board ..	1916	1,150	291	180	..	109	821	13·21	348,600	104,351	452,951	411,469	41,482	9·16	47·49	1,412	357	A.C.	400/230	16 40	50
6. Horahora-Arapuni (Public Works Department)	1921	..	18	12,860	8,614	18,710	106,868	17·51	107,534,670	15,986,614	123,521,284	115,082,352	8,438,932	6·83	75·36	..	..	..	..	558 50	27H, 175A
Bay of Plenty Power Board ..	1928	8,650	1,338	..	..	(1,305)	(6,220)	20·65	..	8,609,544	8,609,544	(7,550,660)	1,058,884	12·30	75·91	5,643	872	A.C.	400/230	242 52	..
Cambridge Power Board ..	1921	6,000	1,401	..	..	(715)	(3,000)	23·83	..	4,587,520	4,587,520	(3,596,620)	990,900	21·60	73·24	2,567	599	A.C.	400/230	157 0	..
Central Power Board ..	1921	19,010	4,168	..	..	(2,154)	(13,491)	15·97	..	13,419,915	13,419,915	(10,560,025)	2,859,890	21·31	71·12	2,553	555	A.C.	400/230	520 65	..
Franklin Power Board ..	1925	16,765	3,241	..	220	(1,818)	(9,272)	19·61	..	10,497,828	10,497,828	(8,552,684)	1,945,144	18·53	65·92	2,638	510	A.C.	400/230	479 38	..
Hamilton Borough Council ..	1913	15,000	4,103	..	..	(1,332)	(9,472)	14·06	..	4,654,970	4,654,970	(4,197,083)	457,887	9·84	39·89	1,020	279	A.C.	400/230	54 3	..
North Auckland Power Board	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.. ..	..
Te Awamutu Power Board ..	1921	7,650	1,699	..	..	(1,114)	(5,787)	19·25	..	6,279,000	6,279,000	(5,178,233)	1,100,767	17·53	64·34	3,048	678	A.C.	400/230	310 66	..
Thames Valley Power Board	1921	34,685	6,195	..	..	(3,904)	(23,150)	16·86	..	25,042,109	25,042,109	(21,671,631)	3,370,478	13·46	73·22	3,525	630	A.C.	400/230	759 4	..
Thames Borough Council ..	1914	4,750	1,142	100	105	(323)	(1,642)	22·11	45,700	1,192,020	1,237,720	(937,922)	299,798	24·22	43·41	821	196	A.C./D.C.	460/400/230	21 40	130
Te Aroha Borough Council	1906	2,500	716	150	..	(259)	(1,958)	13·23	185,978	806,820	992,798	(863,298)	129,500	13·04	43·76	1,205	345	A.C.	400/230	15 49	600
Tourist Department, Rotorua	1901	5,500	1,878	200	187	(575)	(4,492)	12·80	1,579,370	1,013,297	2,592,667	(1,798,957)	793,710	30·61	51·47	957	327	A.C.	400/230, 200/115	57 40	14
Waitemata Power Board ..	1926	39,985	8,534	..	..	(2,553)	(20,585)	12·40	..	13,368,024	13,368,024	(11,338,156)	2,029,868	15·18	59·75	1,328	283	A.C.	400/230	446 13	..
Waitomo Power Board ..	1926	8,000	1,175	..	..	(590)	(3,420)	17·25	..	2,945,600	2,945,600	(2,442,823)	502,777	17·07	56·99	2,078	305	A.C.	400/230	100 0	..
7. Kanieri Electric, Ltd.	1921	2,500	606	1,250	700	770	1,500	51·12	3,022,170	..	3,022,170	2,288,330	733,840	24·28	44·80	594	144	A.C.	400/230	21 2	250/110
8. Kaponga Town Board	1916	1,200	365	165	..	212	700	30·29	602,790	77,960	680,750	500,932	179,818	26·41	36·66	1,372	417	A.C./D.C.	400/230	56 60	58/31
9. Mangahao-Waikaremoana (Public Works Department)	1925	..	..	65,000	..	45,980	365,042	12·60	224,267,160	25,885	224,293,045	193,543,272	30,749,773	13·71	55·69	..	..	A.C.	400/230	504 63	896M, 676W
Central Hawke's Bay Power Bd.	1925	11,500	1,575	..	..	(842)	(4,511)	18·67	..	4,385,304	4,385,304	(3,902,949)	482,355	11·00	59·45	2,475	338	A.C.	400/230	224 5	..
Dannevirke Power Board ..	1925	12,614	2,395	..	..	(775)	(7,287)	10·64	..	3,950,388	3,950,388	(3,422,219)	528,169	13·37	58·19	1,428	271	A.C.	400/230	316 13	..
Hawke's Bay Power Board ..	1927	16,025	2,466	..	..	(3,912)	(26,626)	14·70	..	20,206,903	20,206,903	(19,175,070)	1,031,833	5·11	58·97	4,070	625	A.C.	400/230	274 5	..
Hastings Borough Council..	1912	12,713	3,336	..	1,175	(972)	(7,856)	12·37	79,200	3,159,000	3,238,200	(2,618,294)	619,906	19·14	38·03	784	205	A.C./D.C.	460/400/230	55 53	..
Napier Borough Council ..	1913	18,680	4,382	..	500	(1,559)	(7,533)	20·70	5,566	7,589,700	7,595,266	(6,686,712)	908,554	11·96	55·62	1,525	357	A.C.	400/230	34 6	..
Horowhenua Power Board ..	1924	17,000	3,795	..	..	(1,764)	(11,362)	15·53	..	9,217,629	9,217,629	(7,721,071)	1,496,558	16·24	59·65	2,034	450	A.C.	400/230	311 18	..
Hutt Valley Power Board ..	1925	41,500	10,879	..	500	(5,435)	(39,968)	13·60	..	23,852,916	23,852,916	(20,340,620)	3,512,296	14·72	50·10	1,870	490	A.C.	400/230	293 63	..
Manawatu-Oroua Power Board	1924	39,011	4,529	..	..	(4,020)	(19,766)	20·34	..	24,391,835	24,391,835	(21,928,507)	2,463,328	10·10	69·27	2,438	283	A.C.	400/230	600 0	..
Palmerston N. City Council	1924	22,730	5,643	..	1,250	(2,700)	(16,595)	16·27	161,496	12,099,700	12,261,196	(10,613,100)	1,648,096	13·44	51·84	1,880	467	A.C.	400/230	79 4	..
Poverty Bay Power Board ..	1912	24,440	4,651	..	1,500	(1,807)	(13,671)	13·22	151,630	7,225,326	7,376,956	(5,942,519)	1,434,437	19·44	46·60	1,277	243	A.C.	400/230	351 64	..
Tararua Power Board ..	1925	8,115	1,579	..	..	(676)	(5,226)	12·95	..	3,667,188	3,667,188	(3,181,589)	485,599	13·24	61·85	2,020	392	A.C.	400/230	218 67	..
Wairarapa Power Board ..	1923	19,500	4,377	..	887	(1,526)	(15,499)	9·85	1,801,642	6,280,119	8,081,761	(6,578,001)	1,503,760	18·61	60·46	1,502	337	A.C.	400/230	502 2	429/290
Wairoa Power Board ..	1923	5,500	489	..	..	(768)	(4,742)	16·20	..	3,258,328	3,258,328	(2,788,234)	470,094	14·43	48·43	3,060	273	A.C.	400/230	93 6	..
Wairoa Borough Council ..	1913	2,410	680	..	..	(367)	(2,447)	15·00	..	1,730,920	1,730,920	(1,560,171)	170,749	9·86	53·84	2,294	647	A.C.	400/230	13 64	..
Wanganui-Rangitikei Power Bd.	1924	52,000	9,738	..	1,650	(4,040)	(30,620)	13·19	36,280	21,156,518	21,192,798	(16,954,238)	4,238,560	20·00	59·88	1,740	323	A.C.	400/230	643 0	..
Mangaweka Town Board ..	1913	405	108	..	40	(35)	(246)	14·23	..	130,615	130,615	(104,090)	26,525	20·31	42·60	963	257	A.C.	400/230	9 0	37
Wellington City Council ..	1907	110,000	29,200	8,000	1,650	(18,536)	(131,001)	14·15	18,535	56,160,500	56,179,035	(47,833,176)	8,345,859	14·86	34·60	1,260	336	A.C.	400/230	288 0	..
10. Marlborough Power Board ..	1927	14,530	2,573	1,250	570	960	8,495	11·30	5,771,805	..	5,771,805	4,451,196	1,320,609	22·80	68·63	1,729	305	A.C.	400/230	274 40	100
11. Matatura Borough Council ..	1913	1,300	358	75	..	75	355	21·13	131,242	..	131,242	101,369	29,873	22·76	19·98	283	77	A.C.	400/230	9 0	22
12. Murchison County Council ..	1922	500	117	96	..	85	270	31·48	228,120	..	228,120	122,555	105,565	46·28	30·64	1,047	245	A.C.	400/230	15 40	105
13. New Plymouth Borough Council	1905	21,000	5,864	4,700	300	3,500	20,557	17·03	14,949,365	955,005	15,904,370	13,232,571	2,671,799	16·80	51·87	1,980	552	A.C.	400/230	295 0	240/120
Inglewood Borough Council ..	1905	1,300	419	..	..	(138)	(1,303)	10·59	..	511,338	511,338	(429,056)	82,282	16·09	42·30	1,024	330	A.C.	400/230	8 10	..
Waitara Borough Council ..	1905	1,825	464	..	..	(110)	(762)	14·42	..	389,066	389,066	(341,932)	47,134	12·11	40·38	736	187	A.C.	400/230	12 70	..

(For notes see page 99.)

TABLE XXVII.—ELECTRIC-SUPPLY STATIONS OF NEW ZEALAND AT 31ST MARCH, 1932—*continued.*

Title.	Supply commenced.	Population included in Area of Supply.	Number of Consumers.	Capacity.			Connected Load.	Demand Factor.	Units.						Annual Load Factor.	Average Units sold (excluding Sales in Bulk) per Consumer.	Average Units sold (exluding Sales in Bulk) per Capita of Population.	System of Supply.	Supply Voltage.	Route-miles of Lines.	Static Head.
				Main Plant.	Standby Plant.	Maximum Load.			Generated.	Purchased.	Total generated and purchased.	Sold (including Sales in Bulk).	Non-productive.	Percentage Non-productive.							
HYDRO STATIONS—*continued.*		No.	No.	Kv.a.	Kv.a.	Kw.	Kw.	Per Cent.	No.	No.	No.	No.	No.	Per Cent.	Per Cent.	No.	No.			Miles ch.	Ft.
14. Ohakune Borough Council ..	1914	1,940	492	120	141	108	683	16·37	317,383	54,300	371,683	311,870	59,813	16·09	39·41	636	160	A.C.	400/230	15 29	42
15. Opunake Power Board ..	1924	6,000	1,511	375	160	470	2,127	22·10	1,566,450	237,931	1,804,381	1,448,954	355,427	19·70	43·83	958	241	A.C.	400/230	151 0	47
16. Patea Borough Council ..	1901	1,800	356	88	82	110	420	26·19	405,277	19,822	425,099	389,099	36,000	8·47	44·11	1,092	216	A.C.	400/230/100	13 60	78
17. Queenstown Borough Council ..	1924	845	231	60	..	75	348	21·55	188,280	..	188,280	134,103	54,177	28·77	28·66	580	158	A.C.	400/230	6 0	510
18. Raetihi Borough Council ..	1917	4,500	386	350	120	190	812	23·40	479,150	..	479,150	450,164	28,986	6·05	28·79	1,162	100	A.C.	400/230	28 0	380
19. Reefton (Company)	1887	1,200	278	86*	86*	86	181	47·51	115,000	..	115,000	86,250	28,750	25·00	15·26	310	71	D.C.	230	7 20	27
20. Southland Power Board ..	1925	47,000	9,203	7,050	..	6,180	45,414	13·61	23,971,960	..	23,971,960	17,320,983	6,650,977	27·74	44·28	1,410	277	A.C.	400/230	2,394 10	154
Bluff Borough Council ..	1903	1,695	433	..	..	(281)	(1,226)	22·92	..	373,442	373,442	(303,885)	69,557	18·63	15·17	701	179	A.C.	400/230	9 51	..
Invercargill City Council ..	1914	21,000	5,064	..	2,450	(1,764)	(13,210)	13·35	3,400	5,245,000	5,248,400	(4,470,061)	778,339	14·83	33·96	882	212	A.C.	400/230	78 24	..
21. South Taranaki Power Board ..	1929	16,280	2,829	615	605	927	5,341	17·36	2,419,290	485,634	2,904,924	2,507,430	397,494	13·68	35·77	889	154	A.C.	400/230	146 32	57
22. Taranaki Power Board ..	1927	12,285	2,154	3,600	..	2,628	8,898	29·53	10,768,500	4,545	10,773,045	8,068,782	2,704,263	25·10	46·80	2,780	490	A.C.	400/230	311 53	300
Stratford Borough Council ..	1898	3,500	1,036	..	..	(472)	(2,265)	20·97	..	2,226,600	2,226,600	(1,900,894)	325,706	14·63	53·85	1,840	543	A.C.	400/230	15 0	..
23. Taihape Borough Council ..	1913	2,450	633	150	75	198	1,018	19·45	482,370	..	482,370	337,343	145,027	30·07	27·81	532	137	D.C.	460/230	10 20	30
24. Taumarunui Borough Council ..	1924	4,000	813	500	..	320	1,772	18·06	956,531	..	956,531	727,149	229,382	23·98	34·12	895	181	A.C.	400/230	16 60	25
Manunui Town Board ..	1929	890	159	..	..	(25)	(121)	20·66	..	28,038	28,038	(25,717)	2,321	8·28	12·80	161	29	A.C.	400/230	4 68	..
25. Tauranga Borough Council ..	1915	2,750	968	4,300	..	3,780	7,287	51·87	16,620,626	..	16,620,626	13,353,319	3,267,307	19·66	50·19	2,070	730	A.C.	400/230	64 20	110/80
Tauranga Power Board ..	1926	8,486	1,035	..	..	(3,823)	..	..	..	3,544,175	3,544,175	(3,544,175)‖	..	..	..	3,424	417	A.C.	400/230	322 67	..
Te Puke Town Board ..	1921	980	287	..	..	(144)	(751)	19·31	..	589,773	589,773	(489,719)	100,054	16·96	46·43	1,706	499	A.C.	400/230	11 37	..
26. Teviot Power Board	1924	1,800	414	750	..	780	3,356	23·24	3,730,010	..	3,730,010	2,984,008	746,002	20·00	54·59	2,660	612	A.C.	400/250	83 0	380
Otago Central Power Board ..	1925	2,537	903	..	..	(425)	(2,071)	20·52	..	2,160,520	2,160,520	(1,891,739)	268,781	12·44	58·03	2,094	745	A.C.	400/230	163 5	..
27. Waimea Electric Co.	1912	4,000	760	100	40	112	1,266	8·81	148,366	80,272	228,638	182,911	45,727	20·00	23·30	300	57	A.C.	400/230	37 0	11/14
28. Wairua (Wilson's Cement Co.) ..	1916	16,500	72	2,500	..	2,200	11,116	19·79	8,179,500	..	8,179,500	7,231,329	948,171	11·59	42·44	6,995	302	A.C.	400/230	37 12	130
Whangarei Borough Council ..	1915	7,000	2,069	..	..	(735)	(5,476)	13·42	..	2,520,400	2,520,400	(2,205,496)	314,904	12·49	39·15	1,065	315	A.C.	2200/400/230	32 52	..
Kamo Town Board ..	1923	600	115	..	..	(56)	(249)	22·41	..	52,752	52,752	(52,752)	..	..	10·61	458	87	A.C.	2200/400/230	4 60	..
29. Wairere Power Board	1925	2,000	312	480	..	316	1,569	20·19	1,388,890	..	1,388,890	1,170,124	218,766	15·71	49·81	3,750	585	A.C.	400/230	111 6	65
30. Westland Power, Ltd. ..	1928	4,200	130	820	300	300	1,194	25·13	1,251,880	..	1,251,880	1,064,098	187,782	15·00	47·64	8,185	253	A.C.	400/230	52 31	260/105
31. Westport Borough Council ..	1925	4,000	692	250	75	250	1,464	17·08	698,960	..	698,960	594,490	104,470	14·95	31·92	859	148	A.C.	400/230	22 42	430
32. Whakatane Borough Council ..	1922	1,800	444	390	..	310	1,473	21·04	1,311,640	..	1,311,640	862,962	448,678	34·21	48·30	1,949	479	A.C.	400/230	22 0	258
Totals, hydro stations ..	..	1,171,559	255,310	180,865	35,262	135,371 (100,825)	897,439 (704,534)	15·27	630,084,807	453,798,737	1,083,883,544	561,835,569 (377,577,473)	144,470,502	13·32	53·25	2,205	479	..	..	18,935 53	..
,, all stations ..	..	1,400,589	309,360	224,860§	35,946¶	172,711	1,100,849	15·60	787,781,271	454,954,552	1,242,735,823	694,576,424	170,581,926	14·80	52·50	2,250	495	..	..	20,250 63	..

* Kw. † Hurunui Electric-power Board not yet operating. ‡ Includes 18 Kw. Hydro. ‖ Units metered on consumers' premises; loss borne by Tauranga Borough Council. § 191,133 Kw. at 0·85 power factor. ¶ 30,554 Kw. at 0·85 power factor.
NOTE.—Figures in brackets are included in the totals of the respective generating-stations furnishing the bulk supply.

SUMMARY.

Units generated	787,781,271	Total units generated and purchased ..	1,242,735,823
Units sold (excluding re-sales)	694,576,424	Total units sold (including re-sales) ..	1,072,153,897
Non-productive	93,204,847	Non-productive	170,581,926
Percentage non-productive	11·65	Percentage non-productive	14·80

Table XXVIII.—Summary of Returns of Operating Results for the Year ended 31st March, 1932.

Title.	Capital Outlay as at 31st March, 1932. (Total Expenditure—Depreciation not deducted.)	Value of Assets at 31st March, 1932. (Total Expenditure, less Total Allowance for Depreciation.)	Total Revenue (not including Rates).	Working-expenses.		Capital Charges, &c.*		Total Annual Costs.	Net Results.†		Revenue and Expenditure Comparisons.								Retail Selling-rates.		
											Average Revenue from Sale of Energy.		Working-costs.		Capital Charges.		Total Costs.				
				Total.	Per Cent. of Revenue	Total.	Per Cent. of Capital Outlay.		Profit.	Loss.	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.	Lighting.	Heating.	Power.
Steam Stations.	£	£	£	£		£		£	£	£	d.	£	d.	£	d.	£	d.	£	d.	d.	d.
1. Auckland Power Board ..	3,371,959	2,868,816	651,838	347,815‡	53·30	211,843	6·28	559,658	92,180	..	1·22	20·00	0·66	9·90	0·40	6·58	1·06	16·48	5 to 2	4½	2½ to ⅝
																			Less 10 per cent.		
2. Grey Power Board	256,582	250,950	32,117	15,226	47·40	16,085	6·26	31,311	806	..	1·67	21·52	0·84	10·88	0·89	11·49	1·73	22·37	7	1½ to 1	2 to 1½
3. Nelson City Council	109,877	90,399	27,930	13,924	49·85	5,324	4·84	19,248	8,682	..	3·75	35·36	1·89	17·85	0·73	6·83	2·62	24·68	7	4 to 2	4 to 2
Totals, steam stations ..	3,738,418	3,210,165	711,885	376,965	52·75	233,252	6·23	610,217	101,668	..	1·28	20·7	0·68	10·94	0·42	6·78	1·10	17·72	..	..	..
Gas Stations.																					
1. Kaikoura County Council ..	9,839	8,693	1,608	1,474	91·66	746	7·59	2,220	..	612	12·00	52·40	11·25	49·13	5·70	24·87	16·95	74·00	12	12	6
2. Motueka Borough Council ..	16,159	11,912	2,250	2,029	90·17	962	5·95	2,991	..	741	10·00	41·06	9·32	38·28	4·42	18·15	13·74	56·43	12	4	4
Totals, gas stations ..	25,998	20,605	3,858	3,503	90·79	1,708	6·56	5,211	..	1,353	11·06	46·48	10·04	42·20	4·89	20·57	14·93	62·77	..	..	..
Oil Stations.																					
1. Picton Borough Council ..	19,220	15,049	3,392	1,914	56·42	1,249	6·49	3,163	229	..	7·39	48·16	4·38	28·57	2·86	18·64	7·24	47·21	10	4 to 2	4
2. Spender, Paul (Rawene) ..	2,926	2,926	530	747	140·94	..	..	747	..	217	8·62	36·52	12·78	54·13	..	..	12·78	54·13	Flat rates: 1 at 3s., 2 at 5s., 3 at 7s. 6d. per month.		
3. Uawa County Council ..	6,275	3,885	1,131	647	57·20	638	10·16	1,285	..	154	17·05	48·00	10·92	30·60	10·77	30·20	21·69	60·80	17	11	11
Totals, oil stations ..	28,421	21,860	5,053	3,308	65·46	1,887	6·63	5,195	229	371	9·11	54·33	5·96	35·56	3·40	20·29	9·36	55·85	..	..	..
Hydro Stations.																					
1. Alderton Utility Co., Kerikeri	5,053	5,053	465	185	39·78	216	4·27	401	64	..	0·71	11·34	0·28	4·51	0·33	5·27	0·61	9·78	No meters installed. Fixed charges according to installed capacity.		
2. Coleridge (Public Works Dept.)	1,937,866	1,822,782§	218,196	37,245	17·06	91,547	4·72	128,792	89,404	..	0·43	7·19	0·08	1·23	0·18	3·02	0·26	4·25	..	..	..
Ashburton Power Board ..	354,852	337,007	43,786	19,856	45·34	23,620	6·65	43,476	310	..	2·19	28·01	1·00	12·85	1·20	15·29	2·20	28·14	8 to 1	3 to 1	3 to $\frac{9}{10}$
Banks Peninsula Power Board	103,172	98,743	12,636	8,032	63·56	7,754	7·51	15,786	..	3,150	2·21	28·41	1·45	18·68	1·40	18·03	2·85	36·71	10 to 1½	3 to ¾	3 to 1½
Christchurch City Council ..	789,332	374,666	229,118	135,857	59·29	23,970	3·03	159,827	69,291	..	1·07	14·54	0·66	8·98	0·12	1·59	0·78	10·57	5 to ⅝	2 to ⅝	1½ to ⅔
Waimairi County Council	85,438	55,507	22,193	12,549	56·54	3,424	4·00	15,973	6,220	..	1·12	18·58	0·64	10·65	0·18	2·91	0·82	13·56	4 to 1½	2 to 1	2 to ¼
Halswell County Council ..	6,946	3,896	2,159	1,486	68·82	313	4·50	1,799	360	..	1·15	14·08	0·79	9·71	0·17	2·05	0·96	11·76	Flat rate.	P.W.D. Schedule.	
Heathcote County Council ..	36,404	26,654	10,817	7,193	66·49	2,701	7·41	9,894	923	..	1·26	16·70	0·85	11·20	0·32	4·24	1·17	15·64	6 to 4	1 to 1½	3 to 1
Hurunui Power Board (*a*) ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Lyttelton Borough Council ..	10,850	10,650	6,315	4,324	68·47	679	6·25	5,003	1,312	..	1·96	20·72	1·38	14·61	0·22	2·29	1·60	16·90	4½	1	3 to 1
Malvern Power Board ..	63,748	61,459	7,710	5,928	76·99	4,403	6·91	10,331	..	2,621	2·78	30·27	2·30	25·12	1·71	18·66	4·01	43·78	9 to 1	6	3
North Canterbury Power Board	142,208	136,355	23,753	14,872	62·61	9,366	6·58	24,238	..	485	1·41	24·35	0·91	15·75	0·58	9·92	1·49	25·67	8 to 2	3 to ¼	3 to $\frac{2}{10}$
Kaiapoi Borough Council ..	10,664	7,244	3,248	1,671	51·44	1,030	9·65	2,701	547	..	2·64	35·69	1·36	18·34	0·84	11·31	2·20	29·65	6	1	1
Rangiora Borough Council	13,490	9,322	4,799	3,402	70·88	424	3·14	3,826	973	..	3·03	30·00	2·15	21·30	0·27	2·66	2·42	23·96	6 to 2	2½ to 1½	3 to ½
Riccarton Borough Council	23,734	18,912	10,406	7,019	67·45	1,040	4·40	8,059	2,347	..	1·11	20·15	0·77	14·01	0·11	2·08	0·88	16·09	6 to ⅞	⅞	1½
South Canterbury Power Board	322,327	289,762	55,611	30,759	55·31	21,244	6·59	52,003	3,608	..	1·15	20·00	0·64	11·20	0·45	7·78	1·09	18·98	8 to 1	3 to 1	3 to ¾
Timaru Borough Council ..	132,413	94,570	32,450	19,785	60·97	9,477	7·15	29,262	3,188	..	1·73	20·29	1·06	12·48	0·51	5·98	1·57	18·46	7 to 6	3 to 1½	2½ to 6
Springs-Ellesmere Power Bd.	154,885	147,988	28,237	15,318	54·24	10,305	6·65	25,623	2·614	..	1·55	23·16	0·84	12·66	0·57	8·52	1·41	21·18	8 to 2	3 to ½	3 to ½
Sumner Borough Council ..	16,955	13,923	6,373	5,127	80·44	511	3·01	5,638	735	..	1·30	18·40	1·05	14·86	0·11	1·48	1·16	16·34	4½	1 to ½	1 to ½
Waitaki Power Board ..	183,497	169,640	30,598	19,106	62·44	11,573	6·30	30,679	..	81	1·35	17·05	0·88	11·11	0·54	6·73	1·42	17·84	6 to 1½	2 to ⅜	2 to ⅜
3. Dunedin City Council ..	1,685,864	1,628,383	219,003	58,214	26·58	94,625	5·61	152,839	66,164	..	0·99	14·40	0·27	3·87	0·43	6·28	0·70	10·15	6 to 1	2 to ½	2 to ⅛
Otago Power Board ..	281,628	264,907	36,506	20,133	55·14	21,122	7·49	41,255	..	4,749	1·84	25·99	1·02	14·35	1·06	15·05	2·08	29·40	9	4 to 1½	4 to 1½
4. Golden Bay Power Board ..	25,473	24,056	3,642	1,604	44·04	1,687	6·62	3,291	351	..	1·73	19·14	0·78	8·62	0·82	9·07	1·60	17·69	9	4½ to 1	4½ to 1½
5. Havelock North Town Board	24,074	24,074	3,242	1,443	44·50	1,793	7·44	3,236	6	..	1·88	26·91	0·84	12·03	1·05	14·94	1·89	26·97	7	2	2
6. Horahora-Arapuni (Public Works Dept.)	4,553,304	4,341,695	161,884	115,003	71·04	62,524¶	1·37	177,527	..	15,643	0·33	8·45	0·24	6·15	0·13	3·34	0·37	9·49	..	..	..
Bay of Plenty Power Board	206,610	202,861	36,911	22,381	60·63	14,398	6·96	36,779	132	..	1·11	26·78	0·71	17·15	0·46	11·03	1·17	28·18	10 to 1½	4 to 1½	4 to 1½
Cambridge Power Board ..	109,633	108,246	20,349	11,358	55·81	7,622	6·95	18,980	1,369	..	1·28	26·80	0·76	15·89	0·51	10·66	1·27	26·55	7½ to 7	3 to ¾	3 to ¾
Central Power Board ..	332,490	307,620	57,935	30,581	52·78	22,651	6·81	53,232	4,703	..	1·29	26·31	0·70	14·20	0·51	10·51	1·21	24·71	7	1½	3
Franklin Power Board ..	278,458	229,287	49,723	24,294	48·85	17,886	6·42	42,180	7,543	..	1·28	25·11	0·68	13·36	0·50	9·84	1·18	23·20	6½	1½	3 to 2
Hamilton Borough Council ..	60,234	59,891	34,202	16,557	48·40	4,899	8·13	21,456	12,746	..	1·95	25·54	0·95	12·43	0·28	3·68	1·23	16·11	5 to 3½	2	2 to ½
North Auckland Power Bd. (*a*)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Te Awamutu Power Board ..	182,505	178,613	29,690	15,145	51·01	11,912	6·52	27,057	2,633	..	1·37	26·50	0·70	13·60	0·55	10·69	1·25	24·29	7	2 to 1½	3 to 1½
Thames Valley Power Board	811,192	792,252	120,655	62,739	51·99	57,922	7·14	120,661	..	6	1·24	28·64	0·69	16·07	0·64	14·84	1·33	30·91	..	..	..
Thames Borough Council ..	33,600	23,017	8,952	6,086	67·98	1,267	3·77	7,353	1,599	..	2·26	27·30	1·56	18·76	0·32	3·92	1·88	22·68	8	3 to 1½	5 to 3
Te Aroha Borough Council	24,813	13,966	7,786	5,809	74·60	610	2·45	6,419	1,367	..	2·14	29·73	1·61	22·43	0·17	2·35	1·78	24·78	7 to 5	3 to ½	3 to ½
Tourist Dept. (Rotorua) ..	73,768	60,394	18,779	9,186	48·91	5,163	6·99	14,349	4,430	..	2·43	31·69	1·22	15·97	0·69	8·98	1·91	24·95	7 to 6	3 to 1½	3 to 1

* Interest and Sinking Fund only. † Before depreciation charges brought to account. ‡ After deducting Public Works Department subsidy (£25,973). § Includes £20,285 for stocks held in suspense. Value of assets in operation, £1,802,497.
‖ Table XVII figures use interest and depreciation basis. ¶ Interest only. (*a*) Not yet functioning.

TABLE XXVIII.—SUMMARY OF RETURNS OF OPERATING RESULTS FOR THE YEAR ENDED 31ST MARCH, 1932—*continued.*

Title.	Capital Outlay as at 31st March, 1932. (Total Expenditure—Depreciation not deducted).	Value of Assets at 31st March, 1932. (Total Expenditure, less Total Allowance for Depreciation.)	Total Revenue (not including Rates).	Working-expenses.		Capital Charges, &c.*		Total Annual Costs.	Net Results.†		Revenue and Expenditure Comparisons.								Retail Selling-rates.		
											Average Revenue from Sale of Energy.		Working-costs.		Capital Charges.		Total Costs.				
				Total.	Per Cent. of Revenue	Total.	Per Cent. of Capital Outlay.		Profit.	Loss.	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.	Lighting.	Heating.	Power.
HYDRO STATIONS—*continued.*																					
6. Horahora-Arapuni—*continued.*	£	£	£	£		£		£	£	£	d.	£	d.	£	d.	£	d.	£	d.	d.	d.
Waitemata Power Board ..	389,866	375,733	72,681	38,392	52·82	29,128	7·47	67,520	5,161	..	1·47	27·12	0·81	15·03	0·62	11·40	1·43	26·43	5⅝	3	1¾
Waitomo Power Board ..	99,963	97,968	18,559	9,448	50·90	6,980	6·98	16,428	2,131	..	1·78	31·09	0·93	16·01	0·68	11·83	1·61	27·84	9½	3 to 1	3 to 1½
7. Kanieri Electric, Ltd. ..	94,816	81,930	8,375	5,974	71·33	509	0·53	6,483	1,892	..	0·84	10·40	0·63	8·92	0·05	0·76	0·68	9·68	6	1	4 to 2
8. Kaponga Town Board ..	24,507	23,052	5,161	3,420	66·26	1,738	7·09	5,158	3	..	2·44	24·05	1·64	16·13	0·83	8·20	2·47	24·33	9	4 to 1	5 to 2
9. Mangahao-Waikaremoana (Public Works Dept.)	3,659,304	3,272,854	300,022	48,900	16·48	202,775‡	5·56	251,675	48,347	..	0·37	6·52	0·06	1·06	0·25	4·43	0·31	5·50	8	3 to 1½	3 to ⅞
Central Hawke's Bay Power Board	139,086	122,166	22,905	11,677	50·98	9,542	6·86	21,219	1,686	..	1·39	26·78	0·72	13·87	0·58	11·33	1·30	25·20	9 to 3	3 to 1	3 to 1¼
Dannevirke Power Board ..	214,481	205,916	28,912	12,365	42·76	14,840	6·91	27,205	1,707	..	1·98	36·38	0·87	15·95	1·04	19·15	1·91	35·10	7½ to 6½	3 to 1½	3 to 1
Hawke's Bay Power Board ..	221,038	209,858	58,423	38,515	65·92	15,568	7·04	54,083	4,340	..	0·69	14·15	0·48	9·84	0·20	3·98	0·68	13·82	8 to 1½	8 to 1½	3 to 1¼
Hastings Borough Council	114,911	111,276	24,673	16,699	67·68	6,186	5·38	22,885	1,788	..	2·26	25·32	1·53	17·18	0·57	6·36	2·10	23·54	8 to 1½	4 to 1½	3 to 1½
Napier Borough Council ..	156,513	134,620	38,103	21,749	57·07	9,491	6·06	31,240	6,863	..	1·35	24·04	0·78	13·95	0·34	6·09	1·12	20·04	6 to 1½	3 to 1½	3 to 1⅝
Horowhenua Power Board ..	214,108	195,807	42,447	24,884	58·62	14,472	6·75	39,356	3,091	..	1·28	23·38	0·77	14·11	0·45	8·20	1·22	22·31	6	4 to 1½	3 to 1⅛
Hutt Valley Power Board ..	386,931	337,942	103,895	67,305	64·78	25,556	6·60	92,861	11,034	..	1·20	18·69	0·79	12·38	0·30	4·70	1·09	17·08	6 to 4	3 to 1	3 to 1
Manawatu-Oroua Power Bd.	511,442	485,256	81,050	44,557	54·97	33,467	6·54	78,024	3,026	..	0·84	19·11	0·49	11·08	0·36	8·33	0·85	19·41	7	3½ to 1½	3½ to 1¾
Palmerston N. City Council	249,420	212,798	59,238	24,150	40·76	12,048	4·83	36,198	23,040	..	1·33	21·84	0·55	8·94	0·27	4·46	0·82	13·40	6	1½	3 to 1⅝
Poverty Bay Power Board ..	320,609	309,783	52,884	26,011	49·18	23,453	7·31	49,464	3,420	..	2·09	28·62	1·05	14·39	0·95	12·98	2·00	27·37	8 to 6	4 to 1½	4 to 2¼
Tararua Power Board ..	164,769	153,352	24,130	10,544	43·69	10,429	6·32	20,973	3,157	..	1·75	34·23	0·80	15·68	0·79	15·58	1·59	31·26	8	2 to 1	4 to $\frac{4}{10}$
Wairarapa Power Board ..	358,164	348,262	54,563	22,397	41·04	25,408	7·09	47,805	6,758	..	1·93	34·73	0·82	14·68	0·93	16·65	1·75	31·33	7 to 5	5 to ¾	2 to 1
Wairoa Power Board ..	62,349	58,181	11,217	8,783	78·30	4,748	7·61	13,531	..	2,314	0·95	14·31	0·76	11·44	0·41	6·18	1·17	17·62	9 to 1	..	3 to 1½
Wairoa Borough Council ..	20,995	12,260	8,216	5,550	67·55	1,414	6·73	6,964	1,252	..	1·25	22·19	0·85	15·12	0·22	3·85	1·07	18·97	5	3 to 1	3 to 1½
Wanganui-Rangitikei Power Board	557,578	471,797	98,797	54,002	54·65	36,458	6·53	90,460	8,337	..	1·36	23·72	0·76	13·37	0·52	9·02	1·28	22·39	5 to 3	2½ to 1½	3 to ½
Mangaweka Town Board	5,613	5,613	1,227	1,083	88·26	129	2·29	1,212	15	..	2·31	28·66	2·50	30·94	0·30	3·69	2·80	34·63	9	3 to 2	4 to 3
Wellington City Council ..	1,180,464	1,180,464	334,476	168,526	50·38	40,335	3·41	208,861	125,615	..	1·66	17·83	0·85	9·09	0·20	2·18	1·05	11·27	5 to 1	5 to 1	2½ to ¾
10. Marlborough Power Board ..	323,439	311,151	30,341	8,302	27·36	21,992	6·79	30,294	47	..	1·61	31·14	0·45	8·65	1·19	22·91	1·64	31·56	9 to 1½	3 to ½	4½ to 1½
11. Mataura Borough Council ..	5,017	4,119	1,785	1,660	92·99	212	4·23	1,872	..	87	3·67	20·67	3·93	22·13	0·50	2·83	4·43	24·96	6	2½	2½ to 1½
12. Murchison County Council ..	13,925	13,925	1,992	1,427	71·63	976	7·00	2,403	..	411	3·39	20·38	2·79	16·79	1·91	11·45	4·70	28·24	4	3	3 to 2
13. New Plymouth Borough Council	417,209	367,162	74,248	39,324	52·96	26,521	6·35	65,845	8,403	..	1·33	20·91	0·71	11·23	0·48	7·58	1·19	18·81	7 to 5	2 to 1	2 to ½
Ingiewood Borough Council	12,644	7,725	4,115	2,806	68·18	1,005	7·94	3,811	304	..	2·17	28·17	1·57	20·33	0·56	7·28	2·13	27·61	6	2 to 1½	2 to 1½
Waitara Borough Council ..	12,566	6,206	4,177	2,136	51·13	900	7·16	3,036	1,141	..	2·74	35·43	1·50	19·42	0·63	8·18	2·13	27·60	8½	3 to 1	3 to 1
14. Ohakune Borough Council ..	18,617	8,892	3,718	1,908	51·31	1,069	5·74	2,977	741	..	2·86	33·20	1·47	17·04	0·82	9·54	2·29	26·58	9 to 6	5 to 1	4 to 2
15. Opunake Power Board ..	108,735	108,063	13,447	4,556	33·88	8,339	7·66	12,895	552	..	2·22	28·46	0·75	9·69	1·38	17·74	2·13	27·43	4 to 3	2	2
16. Patea Borough Council ..	15,625	15,571	4,482	2,720	60·68	607	3·88	3,327	1,155	..	2·74	40·32	1·68	24·72	0·37	5·52	2·05	30·24	8½ to 6½	4 to 2	3⅘ to 1
17. Queenstown Borough Council	12,894	12,668	1,544	475	30·76	816	6·32	1,291	253	..	2·62	19·40	0·85	6·33	1·46	10·88	2·31	17·21	6	6	3
18. Raetihi Borough Council ..	21,663	21,106	4,558	2,428	53·26	1,922	8·87	4,350	208	..	2·25	22·19	1·29	12·78	1·02	10·12	2·31	22·90	10 to 3	1	3 to 1½
19. Reefton Electric Light Co., Ltd.	6,953	5,844	3,743	3,630	96·98	..	..	3,630	113	..	8·83	36·88	10·10	42·21	..	..	10·10	42·21	9	4	4
20. Southland Power Board ..	1,651,558	1,633,351	130,888	41,815	31·94	125,277	7·58	167,092	..	36,204	1·59	18·59	0·58	6·77	1·74	20·27	2·32	27·04	7 to 1	7 to 1	7 to 1
Bluff Borough Council ..	10,641	8,934	4,060	2,772	68·27	801	7·52	3,573	487	..	2·91	13·13	2·19	9·86	0·63	2·85	2·82	12·71	7 to 6	2	3 to 1⅔
Invercargill City Council ..	174,186	154,150	47,246	24,899	52·70	10,093	5·79	34,992	12,254	..	2·44	25·77	1·34	14·12	0·54	5·72	1·88	19·84	7 to 1½	..	3 to 1½
21. South Taranaki Power Board	182,278	172,069	28,617	9,021	31·52	12,631	6·92	21,652	6,965	..	2·64	29·75	0·86	9·73	1·21	13·63	2·07	23·36	6½	2 to 1⅜	3⅜ to 2¼
22. Taranaki Power Board ..	456,699	439,934	41,949	14,234	33·93	32,224	7·05	46,458	..	4,509	1·24	15·80	0·42	5·42	0·96	12·26	1·38	17·68	6	4½ to 1½	4½ to 1
Stratford Borough Council ..	28,351	27,569	12,370	6,357	51·39	3,426	12·08	9,783	2,587	..	1·56	26·17	0·80	13·47	0·43	7·26	1·23	20·73	8 to 4	2 to 1	4 to 1
23. Taihape Borough Council ..	18,804	8,512	4,819	2,537	52·64	1,081	5·74	3,618	1,201	..	3·43	24·34	1·80	12·81	0·77	5·46	2·57	18·27	7 to 2	1⅛	2
24. Taumarunui Borough Council	61,032	57,367	9,254	2,415	26·09	4,422	7·24	6,837	2,417	..	2·75	26·01	0·80	7·55	1·46	13·82	2·26	21·37	8 to 7	3 to 1⅓	3 to $\frac{3}{10}$
Manunui Town Board ..	3,268	3,268	883	541	61·26	250	7·64	791	92	..	8·24	35·32	5·05	21·64	2·33	10·00	7·38	31·64	9	4½	4½
25. Tauranga Borough Council ..	154,273	152,090	24,864	5,745	23·10	9,653	6·25	15,398	9,466	..	0·44	6·43	0·10	1·52	0·17	2·55	0·27	4·07	6	1½ to 1	2 to 1
Tauranga Power Board ..	125,024	119,534	24,910	12,762	51·23	9,428	7·54	22,190	2,720	..	1·58	..	0·86	..	0·64	..	1·50	..	9	3 to 1	4½ to 1½
Te Puke Town Board ..	11,739	6,133	3,236	1,766	54·57	562	4·78	2,328	908	..	1·55	21·74	0·87	12·15	0·27	3·88	1·14	16·03	7	2½ to 1	2½ to 1½
26. Teviot Power Board ..	57,201	56,050	5,910	1,831	30·98	3,767	6·58	5,598	312	..	0·47	7·51	0·15	2·35	0·30	4·83	0·45	7·18	3 to ½	3 to ½	3 to 1
Otago Central Power Board	85,864	83,919	9,971	3,840	38·51	6,458	7·52	10,298	..	327	1·23	22·73	0·49	9·03	0·82	15·20	1·31	24·23	8 to 1	8 to 2	6
27. Waimea Electric Supply Co. ..	22,069	18,017	5,285	3,663	69·30	316	1·43	3,979	1,306	..	6·45	43·86	4·81	32·71	0·41	2·82	5·22	35·53	11	4	4
28. Wairua (Wilson's Cement Co.)	91,859	29,805	16,266	3,952	24·29	..	..	3,952	12,314	..	0·53	7·21	0·13	1·80	..	..	0·13	1·80	5½ to 5	1½	3 to 1½
Whangarei Borough Council	67,300	66,635	18,437	11,794	63·96	2,143	3·18	13,937	4,500	..	1·98	24·73	1·28	16·05	0·23	2·91	1·51	18·96	5½ to 5	1½	3 to 2
Kamo Town Board ..	3,574	2,500	1,057	630	59·60	235	6·57	865	192	..	4·62	18·19	2·87	11·20	1·07	4·20	3·94	15·40	8½	3½ to 2½	3½ to 2½
29. Wairere Power Board ..	41,942	39,032	5,292	1,566	29·75	3,310	7·89	4,876	416	..	1·06	16·28	0·32	4·94	0·68	10·45	1·00	15·39	9	4½	1
30. Westland Power, Ltd. ..	68,331	67,168	5,528	4,431	80·15	..	..	4,431	1,097	..	1·12	16·49	1·00	14·77	..	..	1·00	14·77	12	3 to 1½	4 to 2
31. Westport Borough Council ..	31,362	27,405	7,182	2,106	29·32	2,304	7·34	4,410	2,772	..	2·89	28·62	0·85	8·42	0·93	9·22	1·78	17·64	9	3 to 1	3 to 1½
32. Whakatane Borough Council ..	36,861	35,855	7,044	1,964	27·88	4,475	12·14	6,439	605	..	1·95	22·56	0·55	6·34	1·24	14·43	1·79	20·77	9	1½	3 to 1
Totals, hydro stations ..	26,577,910	24,342,012	3,571,301	1,647,191	46·16	1,371,567	5·15	3,018,758	623,130	70,751	0·91	15·08	0·42	6·96	0·35	5·79	0·77	12·75	..	..	..
Totals, all stations ..	30,370,747	27,594,642	4,292,097	2,030,967	47·41	1,608,414	5·31	3,639,381	725,027	72,311	0·97	15·78	0·46	7·50	0·36	5·92	0·82	13·42	..	..	..

* Interest and Sinking Fund only. † Before depreciation charges brought to account. ‡ Interest only.

Table XXIX.—Electric-supply Stations.—Appropriations for the Year ended 31st March, 1932.

Title.	Ownership.	Supply commenced.	Appropriations.									Accumulated Funds.					
			To Depreciation.	Renewal Fund.	General Reserve Fund.	Accident Insurance Fund.	Relief of Rates (Local Authorities)	Payment of Dividends.	Capital Expenditure (out of Revenue).	Unappropriated Surplus.	Total.	Depreciation.		Renewal.	Sinking.	Reserves.	
												Reserve.	Funded.			General.	Net Surplus Unappropriated.
Steam Stations.			£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
1. Auckland	Power Board	1908	62,503	6,250	17,417* / 2,398*	..	..	..	..	755	89,323	391,308	..	17,527	580,784	474,138	..
2. Grey	Power Board	1926	1,733	..	144*	..	..	..	..	..	1,877	5,353	1,060	..	19,162	3,060	..
3. Nelson	City Council	1923	2,563	..	3,387*	..	1,500	..	2,298	..	9,748	19,478	..	..	14,670	..	..
Totals, steam stations	..	..	66,799	6,250	23,346	..	1,500	..	2,298	755	100,948	416,139	1,060	17,527	614,616	477,198	..
Gas Stations.																	
1. Kaikoura	County Council	1922	..	..	..	..	..	..	..	..	..	1,146	..	..	1,192	..	..
2. Motueka	Borough Council	1922	..	250	..	..	..	..	29	..	279	4,247	..	250	2,092	..	..
Totals, gas stations	..	..	..	250	..	..	..	..	29	..	279	5,393	..	250	3,234	..	..
Oil Stations.																	
1. Picton	Borough Council	1917	400	..	..	..	..	..	..	..	400	..	818	..	2,290	..	..
2. Spender, Paul (Rawene)	Private individual	1926	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3. Uawa (Tolaga Bay)	County Council	1925	..	..	..	..	..	..	..	..	..	..	..	..	2,389	..	..
Totals, oil stations	..	..	400	..	..	..	..	..	..	..	400	..	818	..	4,679	..	..
Hydro Stations.																	
1. Alderton Utility Co. (Kerikeri)	Company	1930	..	..	..	..	..	..	64	..	64	..	..	..	..	..	..
2. Coleridge	Public Works Dept.	1915	12,500	..	76,904	..	..	..	..	..	89,404	211,752	..	..	193,865	174,250	..
Ashburton	Power Board	1923	..	..	210*	..	..	..	..	100	310	9,373	..	5,700	26,827	..	..
Banks Peninsula	Power Board	1921	..	..	..	..	..	..	..	..	..	..	4,429	..	11,737	..	..
Christchurch	City Council	1904	31,843	..	..	..	500	..	..	36,948	69,291	414,666	..	3,000	117,164	286,899	..
Waimairi	County Council	1916	3,753	..	2,339 / 128*	..	..	..	..	..	6,220	3,493	..	..	3,067	18,636	..
Halswell	County Council	1919	..	..	..	..	..	..	6	354	360	..	..	..	833	..	..
Heathcote	County Council	1914	..	..	..	..	..	..	..	923	923	..	..	..	7,108	..	..
Hurunui	Power Board	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Lyttelton	Borough Council	1917	250	..	1,062	..	..	..	..	..	1,312	..	400	..	585	..	..
Malvern	Power Board	1925	..	..	..	..	..	..	..	..	..	2,265	..	..	4,815	..	..
North Canterbury	Power Board	1928	..	..	848 / 18*	..	..	..	..	..	866	5,799	1,271	..	7,711	4,850	..
Kaiapoi	Borough Council	1916	872	..	..	..	..	..	..	..	872	3,273	724	..	1,526	..	..
Rangiora	Borough Council	1919	326	..	..	..	..	..	646	..	972	3,827	662	..	1,207	..	..
Riccarton	Borough Council	1916	675	..	..	..	950	..	78	644	2,347	1,420	745	..	986	4,212	..
South Canterbury	Power Board	1925	4,241	..	..	..	..	..	..	..	4,241	9,368	..	..	28,692	..	..

* Miscellaneous payments.

TABLE XXIX.—ELECTRIC-SUPPLY STATIONS.—APPROPRIATIONS FOR THE YEAR ENDED 31ST MARCH, 1932—*continued.*

Title.	Ownership.	Supply commenced.	Appropriations.									Accumulated Funds.					
			To Depreciation.	Renewal Fund.	General Reserve Fund.	Accident Insurance Fund.	Relief of Rates (Local Authorities)	Payment of Dividends.	Capital Expenditure (out of Revenue).	Unappropriated Surplus.	Total.	Depreciation.		Renewal.	Sinking	Reserves.	
												Reserve.	Funded.			General.	Net Surplus Unappropriated.
HYDRO STATIONS—*continued.*			£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
2. Coleridge—*continued.*																	
Timaru	Borough Council ..	1908	..	..	..	..	1,000	..	2,101	87	3,188	..	..	..	35,261	..	..
Springs-Ellesmere ..	Power Board ..	1922	1,547	..	100*	..	..	..	20	947	2,614	6,897	6,384	..	6,982	5,200	..
Sumner	Borough Council ..	1918	..	..	21*	..	150	..	..	564	735	..	836	..	1,587	2,089	..
Waitaki	Power Board ..	1926	2,175	..	..	200	..	..	..	..	2,375	..	11,327	..	16,651	14,040	..
3. Dunedin	City Council ..	1907	25,172	34,824	..	..	25,847	..	..	..	85,843	177,324	..	190,280	168,202	..	..
Otago	Power Board ..	1926	4,557	..	..	..	..	..	..	192	4,749	14,452	..	..	23,721	..	..
4. Golden Bay	Power Board ..	1929	..	..	..	..	..	..	261	90	351	751	..	..	758	..	..
5. Havelock North ..	Town Board ..	1916	..	..	..	..	..	..	..	6	6	..	..	..	8,220	..	..
6. Horahora-Arapuni ..	Public Works Dept.	1921	24,911	..	..	..	..	..	..	..	24,911	211,610	..	..	..	..	..
Bay of Plenty ..	Power Board ..	1928	1,783	..	..	..	..	..	2,000	..	3,783	3,749	..	..	9,654	..	..
Cambridge	Power Board ..	1921	..	..	500	..	..	..	..	869	1,369	..	1,386	..	14,169	1,400	..
Central	Power Board ..	1921	4,005	..	..	..	..	..	10	688	4,703	14,776	10,771	5,274	30,968	17,784	..
Franklin	Power Board ..	1925	7,363	..	..	..	..	..	..	180	7,543	28,390	20,780	..	14,783	8,511	..
Hamilton	Borough Council ..	1913	..	..	..	..	6,547	..	3,275	2,924	12,746	..	13,290	..	22,234	9,504	..
North Auckland ..	Power Board ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Te Awamutu ..	Power Board ..	1921	1,000	..	268*	..	..	..	..	1,365	2,633	3,892	2,892	..	15,266	906	..
Thames Valley ..	Power Board ..	1921	4,310	..	..	..	..	..	..	..	4,310	18,941	14,630	..	110,884	10,863	..
Thames	Borough Council ..	1914	560	..	..	..	..	..	138	901	1,599	1,656	..	..	5,880	..	..
Te Aroha	Borough Council ..	1906	350	..	..	..	..	..	582	435	1,367	6,842	1,102	..	1,954	..	..
Tourist Dept. ..	Public Works Dept.	1901	1,475	..	2,955	..	..	..	..	..	4,430	13,374	..	..	14,737	..	..
Waitemata	Power Board ..	1926	3,994	..	..	..	..	..	965	202	5,161	14,133	..	..	47,171	10,000	..
Waitomo	Power Board ..	1926	..	..	..	..	..	..	..	2,131	2,131	1,819	319	..	6,346	..	..
7. Kanieri Electric, Ltd. ..	Company ..	1921	1,556	..	32	..	..	..	304	..	1,892	..	..	..	..	..	..
8. Kaponga	Town Board ..	1916	..	..	3*	..	..	..	..	..	3	..	..	..	2,987	..	..
9. Mangahao-Waikaremoana	Public Works Dept.	1925	65,681	..	..	..	..	..	..	..	65,681	385,113	..	..	..	..	..
Central Hawke's Bay ..	Power Board ..	1925	1,812	..	26*	..	..	..	..	..	1,838	15,458	9,815	..	2,168	7,046	..
Dannevirke	Power Board ..	1925	2,130	..	..	..	..	..	15	..	2,145	9,054	6,925	..	15,783	2,873	..
Hawke's Bay ..	Power Board ..	1927	3,240	..	..	..	..	..	..	1,100	4,340	..	1,202	..	13,734	1,100	..
Hastings	Borough Council ..	1912	679	..	..	..	..	..	1,109	..	1,788	..	3,635	..	14,747	..	..
Napier	Borough Council ..	1913	..	..	76*	..	..	..	..	6,787	6,863	21,893	15,801	10,683	13,549	11,565	..
Horowhenua ..	Power Board ..	1924	3,077	..	..	200	..	..	..	..	3,277	18,301	15,224	..	11,333	13,500	..
Hutt Valley ..	Power Board ..	1925	6,076	1,000	3,218*	..	..	..	1,000	..	11,294	45,989	39,913	5,195	26,825	1,026	..
Manawatu-Oroua ..	Power Board ..	1924	1,187	..	..	..	..	..	3,320	..	4,507	12,127	8,967	..	54,741	390	..
Palmerston North ..	City Council ..	1924	5,455	..	2,791*		9,550	..	..	5,244	23,040	..	20,661	..	20,740	..	..
Poverty Bay ..	Power Board ..	1912	511	..	979* 1,000	..	..	..	..	930	3,420	11,116	1,890	..	19,276	3,085	..
Tararua	Power Board ..	1925	2,483	456	12* 94	..	..	..	..	112	3,157	9,766	779	543	15,657	1,147	..
Wairarapa	Power Board ..	1923	2,318	..	423*	..	..	..	1,000	3,017	6,758	8,960	2,618	..	22,751	..	..
Wairoa	Power Board ..	1923	930	..	..	..	..	..	..	..	930	2,951	..	..	5,389	538	..
Wairoa	Borough Council ..	1913	410	..	..	..	..	..	1,196	..	1,606	782	372	..	1,872	..	..
Wanganui-Rangitikei ..	Power Board ..	1924	8,651	..	1,552*	..	..	..	..	..	10,203	18,931	3,000	..	9,096	..	..

* Miscellaneous payments.

TABLE XXIX.—ELECTRIC-SUPPLY STATIONS.—APPROPRIATIONS FOR THE YEAR ENDED 31ST MARCH, 1932—*continued.*

Title.	Ownership.	Supply commenced.	Appropriations.									Accumulated Funds.					
			To Depreciation.	Renewal Fund.	General Reserve Fund.	Accident Insurance Fund.	Relief of Rates (Local Authorities)	Payment of Dividends.	Capital Expenditure (out of Revenue).	Unappropriated Surplus.	Total.	Depreciation.		Renewal.	Sinking.	Reserves.	
												Reserve.	Funded.			General.	Net Surplus Unappropriated.
HYDRO STATIONS—*continued.*			£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
9. Mangahao - Waikaremoana —*continued.*																	
Mangaweka ..	Town Board ..	1913	..	..	..	..	..	..	..	..	..	..	..	..	655	..	..
Wellington	City Council ..	1907	8,000	21,991	21,991	..	20,000	..	45,770	..	125,615	..	..	117,633	195,475	176,509	..
10. Marlborough	Power Board ..	1927	2,910	..	7,863*	..	..	..	..	..	2,910	12,288	..	..	22,748	..	..
11. Mataura	Borough Council ..	1913	..	..	..	..	..	..	..	..	..	..	207	..	214	..	..
12. Murchison	County Council ..	1922	..	..	..	..	..	..	..	..	..	..	..	..	2,502	..	..
13. New Plymouth ..	Borough Council ..	1905	..	..	1,262* / 250	..	..	..	9,005	..	10,517	..	13,084	..	74,915	250	..
Inglewood	Borough Council ..	1905	..	..	..	..	304	..	..	..	304	13	..	..	3,634	..	..
Waitara	Borough Council ..	1907	143	..	..	..	..	..	60	938	1,141	..	285	..	2,763	..	..
14. Ohakune	Borough Council ..	1914	168	..	..	..	716	..	125	..	1,001	380	..	..	3,443	..	..
15. Opunake	Power Board ..	1924	150	..	..	..	..	..	..	402	552	672	52	..	18,930	..	..
16. Patea	Borough Council ..	1901	64	..	..	..	1,015	..	76	..	1,155	120	57	..	409	3,887	..
17. Queenstown	Borough Council ..	1924	226	27	..	..	..	..	..	..	253	..	226	244	782	..	..
18. Raetihi	Borough Council ..	1917	120	..	47*	..	..	..	536	..	703	557	438	..	4,933	..	..
19. Reefton Electric Co. ..	Company ..	1887	..	..	190*	..	..	750	..	..	940	..	..	..	..	1,285	..
20. Southland	Power Board ..	1925	..	..	44*	..	..	..	347	..	391	13,845	..	..	275,693	..	..
Bluff	Borough Council ..	1903	..	..	294*	..	..	..	128	65	487	1,616	..	..	272	..	..
Invercargill	City Council ..	1914	720	..	3,600*	..	7,178	..	1,570	..	13,068	..	27,879	..	19,304	..	..
21. South Taranaki ..	Power Board ..	1929	1,415	300	250* / 1,500	..	..	..	2,500	1,000	6,965	3,000	1,585	300	8,114	6,148	..
22. Taranaki	Power Board ..	1927	3,080	..	..	..	..	..	..	..	3,080	11,799	..	..	26,261	5,145	..
Stratford	Borough Council ..	1898	250	..	..	..	..	..	..	2,337	2,587	..	782	..	7,000	5,895	..
23. Taihape	Borough Council ..	1913	508	..	..	..	..	..	9	684	1,201	1,939	1,431	..	4,378	..	..
24. Taumarunui	Borough Council ..	1924	600	..	..	..	1,300	..	216	301	2,417	..	3,565	..	3,399	4,230	..
Manunui	Town Board ..	1929	..	..	..	..	..	..	..	92	92	..	..	..	227	..	..
25. Tauranga	Borough Council ..	1915	..	..	..	..	2,264	..	1,743	5,459	9,466	2,294	..	..	21,764	9,303	..
Tauranga	Power Board ..	1926	1,000	..	16* / 1,200	500	..	..	..	4	2,720	5,490	2,667	..	9,790	2,016	..
Te Puke	Town Board ..	1921	250	75	20*	..	..	..	..	563	908	..	2,425	534	1,338	648	..
26. Teviot	Power Board ..	1924	..	..	..	..	..	..	..	312	312	2,327	..	..	5,191	..	..
Otago Central ..	Power Board ..	1925	..	..	..	..	..	..	..	..	..	1,945	..	..	7,039	..	..
27. Waimea Electric Co. ..	Company ..	1912	869	..	..	..	..	370	..	67	1,306	4,052	..	..	..	..	..
28. Wairua (Wilson's Cement Co.)	Company ..	1916	..	..	..	..	..	12,314	..	..	12,314	..	..	..	..	..	..
Whangarei	Borough	1915	1,605	..	..	..	315	..	2,563	17	4,500	..	4,601	..	5,137	..	..
Kamo	Town Board ..	1923	..	..	..	..	..	..	135	57	192	..	..	..	795	..	..
29. Wairere	Power Board ..	1925	..	..	..	..	..	..	..	416	416	3,008	981	..	2,911	..	..
30. Westland Power, Ltd. ..	Company ..	1928	..	..	..	..	..	..	..	1,097	1,097	..	..	..	..	..	..
31. Westport	Borough Council ..	1925	974	..	..	..	1,000	..	1,755	..	3,729	1,939	..	1,913	4,847	2,889	..
32. Whakatane	Borough Council ..	1922	..	..	561*	..	..	..	..	44	605	..	..	..	8,987	..	..
Totals, hydro stations..	..	..	266,910	58,673	134,587	900	78,636	13,434	84,628	81,595	719,423	1,811,567	283,015	351,299	1,956,049	829,619	..

* Miscellaneous payments.

Table XXX.—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, 1932.

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.	32	2	11	13	40·63	17	10	53·13	1	2	1
Ashburton Power Board	3,539	43	755	798	22·55	446	880	12·60	63	99	41
Auckland Power Board	48,058	..	4,520	4,520	9·41	10,382	6,978	21·60	207	..	..
Banks Peninsula Power Board	965	56	152	208	21·55	188	273	19·48	199	183	..
Bluff Borough Council	433	1	1	2	0·46	..	..	..	..	..	..
Bay of Plenty Power Board	1,338	44	449	493	36·85	974	708	72·80	526	902	37
Cambridge Power Board	1,401	12	144	156	11·13	472	358	33·69	..	508	..
Central Hawke's Bay Power Board	1,575	6	170	176	11·17	248	248	15·74	82	123	..
Central Power Board	4,168	35	278	313	7·51	1,222	762	29·32	1,078	2,006	120*
Christchurch City Council	27,000	..	4,173	4,173	15·46	4,481	4,630	16·60	..	..	..
Coleridge (Public Works Department)	44	35	44	79	..	82	101	..	2	..	..
Dannevirke Power Board	2,395	..	189	189	7·89	453	304	18·91	380	518	60
Dunedin City Council	24,737	..	1,078	1,078	4·36	1,701	1,674	6·88	168	332	..
Franklin Power Board	3,241	120	462	582	17·96	1,229	729	37·92	1,108	1,366	..
Golden Bay Power Board	322	15	22	37	11·49	38	33	11·80	53	75	10
Grey Power Board	2,596	24	136	160	6·16	124	127	4·78	5	8	..
Halswell County Council	251	18	14	32	12·75	15	11	5·98	19	44	1*
Hamilton Borough Council	4,103	9	95	104	2·53	165	106	4·02	..	..	..
Hastings Borough Council	3,336	9	125	134	4·02	46	30	1·38	..	..	..
Havelock North Town Board	291	50	4	54	18·56	18	12	6·19	..	..	..
Hawke's Bay Power Board	2,466	..	440	440	17·84	482	318	19·54	146	185	..
Heathcote County Council	1,870	75	280	355	18·98	275	250	14·71	3	7	..
Horowhenua Power Board	3,795	..	540	540	14·20	940	3,392	24·76	746	888	..
Hurunui Power Board	..	..	..	..	..	..	..	..	..	..	..
Hutt Valley Power Board	10,879	96	1,330	1,426	13·10	1,267	1,413	11·64	68	130	..
Inglewood Borough Council	419	3	25	28	6·68	22	21	5·25	1	2	..
Invercargill City Council	5,064	10	109	119	2·35	2	4	0·03	1	2	..
Kaiapoi Borough Council	458	29	15	44	9·16	7	7	1·53	..	..	..
Kaikoura County Council	152	..	..	..	..	..	..	..	..	..	..
Kamo Town Board	115	1	..	1	0·87	..	..	..	..	..	..
Kanieri Electric Light, Ltd.	606	4	13	17	2·81	14	13	2·31	..	..	..
Kaponga Town Board	365	7	14	21	5·75	48	29	13·15	108	216	32
Lyttelton Borough Council	730	7	47	54	7·40	28	31	3·84	1	3	..
Malvern Power Board	665	19	127	146	21·95	68	116	10·23	6	11	..
Manawatu-Oroua Power Board	4,529	..	753	753	16·62	1,415	876	31·24	975	1,764	..
Mangahao (Public Works Department)	..	..	59	59	..	61	61	..	..	..	..
Mangaweka Town Board	108	1	9	10	9·26	10	5	9·26	4	8	..
Manunui Town Board	159	..	..	..	..	..	..	..	1	2	..
Marlborough Power Board	2,573	97	350	447	17·38	383	268	14·89	93	133	13
Mataura Borough Council	358	1	15	16	4·47	1	1	0·28	4	12	..

TABLE XXX.—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, 1932—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.
Motueka Borough Council	354	..	..	..	..	..	..	..	..	..	..
Murchison County Council	117	5	3	8	6·84	15	12	12·82	17	30	4
Napier Borough Council	4,382	10	132	142	3·24	520	331	11·86	..	..	..
Nelson City Council	2,381	..	..	..	..	3	4	0·01	..	..	..
New Plymouth Borough Council	5,864	186	703	889	15·16	917	566	15·63	351	632	..
North Auckland Power Board	..	..	..	..	..	..	..	..	..	..	..
North Canterbury Power Board	1,588	39	191	230	14·48	166	280	10·45	75	142	..
Ohakune Borough Council	492	8	13	21	4·27	17	13	3·46	4	8	..
Opunake Power Board	1,511	..	80	80	5·29	150	90	9·93	..	251	..
Otago Central Power Board	903	11	117	128	14·17	147	156	16·28	21	36	..
Otago Power Board	3,817	9	338	347	9·09	319	322	8·36	65	105	..
Palmerston North City Council	5,643	37	517	554	9·81	1,149	735	20·36	3	6	..
Patea Borough Council	356	15	3	18	5·06	16	10	4·49	3	5	5
Picton Borough Council	359	2	..	2	0·56	..	..	..	..	..	..
Poverty Bay Power Board	4,651	..	519	519	11·16	399	309	8·58	100	121	..
Queenstown Borough Council	231	4	2	6	2·59	..	..	..	..	..	..
Raetihi Borough Council	386	1	9	10	2·59	24	18	6·21	11	29	..
Rangiora Borough Council	574	3	44	47	..	39	40	..	..	..	..
Reefton Electric Light and Power Co., Ltd.	278	..	..	..	..	2	6	0·72	..	..	..
Riccarton Borough Council	1,340	19	236	255	19·03	280	266	20·90	..	..	..
Rotorua (Tourist Department)	1,878	72	110	182	9·69	216	187	11·50	47	91	..
South Canterbury Power Board	3,596	59	546	605	16·82	421	561	11·71	130	201	..
South Taranaki Power Board	2,828	..	71	71	2·51	170	111	6·01	269	629	361
Southland Power Board	9,203	..	1,461	1,461	15·88	620	837	6·74	1,070	2,485	..
Springs-Ellesmere Power Board	2,376	19	212	231	..	136	161	..	129	242	..
Stratford Borough Council	1,036	7	154	161	15·54	140	112	13·51	1	2	..
Sumner Borough Council	993	40	89	129	12·99	85	76	8·56	1	3	..
Taihape Borough Council	633	..	9	9	1·42	13	12	2·05	1	3	..
Taranaki Power Board	2,154	6	247	253	10·81	800	517	37·14	802	1,537	..
Tararua Power Board	1,579	50	206	256	16·21	401	264	25·39	316	482	..
Taumarunui Borough Council	813	4	20	24	2·96	20	16	2·46	..	..	..
Tauranga Borough Council	968	81	190	271	28·00	344	136	35·54	..	..	..
Tauranga Power Board	1,035	30	180	210	20·29	504	396	48·70	398	718	73
Te Aroha Borough Council	716	4	36	40	5·59	52	34	7·26	6	15	..
Te Awamutu Power Board	1,699	26	188	214	12·59	565	385	33·25	643	953	30*
Te Puke Town Board	287	11	19	30	10·45	46	27	16·03	4	8	1
Teviot Power Board	414	8	119	127	30·68	112	81	27·05	..	..	..
Thames Borough Council	1,142	1	16	17	1·49	34	21	2·98	..	..	..
Thames Valley Power Board	6,195	75	444	519	8·38	2,227	1,495	36·75	2,106	4,110	50
Timaru Borough Council	3,618	..	341	341	9·43	243	232	6·72	..	..	..

TABLE XXX.—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, 1932—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.
Uawa County Council	98	..	..	..	..	..	..	..	..	..	..
Waikato (Horahora-Arapuni)	18	..	57	57	..	69	72	..	..	..	..
Waimairi County Council	3,226	37	598	635	19·68	682	635	21·14	14	30	..
Waimea Electric Supply Co.	760	..	..	..	..	2	2	0·28	1	1	..
Wairarapa Power Board	4,375	34	369	403	9·21	616	520	14·08	394	715	87
Wairere Power Board	312	3	89	92	29·49	145	81	46·47	77	106	..
Wairoa Borough Council	680	9	135	144	21·18	154	80	22·65	1	1	..
Wairoa Power Board	489	34	86	120	24·53	122	61	24·95	73	133	..
Wairua (Wilson's)	72	..	..	..	..	1	1	1·58	23	67	..
Waitaki Power Board	3,303	17	396	413	12·50	403	629	12·20	25	38	..
Waitara Borough Council	464	6	28	34	7·33	24	18	5·17	1	2	..
Waitemata Power Board	8,534	56	1,053	1,109	13·00	1,447	940	16·96	197	290	..
Waitomo Power Board	1,175	27	103	130	11·06	230	145	19·57	134	237	20
Wanganui-Rangitikei Power Board	9,738	..	1,047	1,047	10·75	1,340	998	13·76	570	1,160	..
Wellington City Council	29,200	117	1,200	1,317	4·51	1,647	2,278	5·64	..	..	..
Westland Power, Ltd.	130	..	17	17	..	32	55	..	20	40	100*
Westport Borough Council	692	1	10	11	1·59	25	22	3·61	1	2	..
Whakatane Borough Council	444	10	68	78	17·57	79	51	17·79	3	5	..
Whangarei Borough Council	2,069	32	150	182	8·80	142	86	6·86	8	20	..
Totals, 1932	309,360	2,054	29,919	31,973	10·35	45,796	40,272	14·83	14,163	25,220	1,046
Totals, 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	..

*First time scheduled.

TABLE XXXI.—RETURN SHOWING AVERAGE REVENUE PER CONSUMER AND PER CAPITA FOR THE YEAR ENDING 31ST MARCH, 1932.

Licensee.	Ratio of Consumers to Population.	Average Revenue per Consumer.	Average Revenue *per Capita.*	Capital Outlay *per Capita.*
	Per Cent.	£	£	£
Alderton Utility Co., Kerikeri	12·80	14·53	1·86	20·21
Ashburton Power Board	19·78	12·37	2·44	19·72
Auckland Power Board	24·00	13·56	3·25	16·85
Banks Peninsula Power Board	23·80	13·10	3·12	25·47
Bay of Plenty Power Board	15·41	27·60	4·27	24·00
Bluff Borough Council	25·54	9·42	2·39	6·27
Cambridge Power Board	23·34	14·42	3·39	18·27
Central Power Board	21·92	13·89	3·04	17·49
Central Hawke's Bay Power Board	13·78	14·54	1·99	12·20
Christchurch City Council	28·51	8·49	2·43	8·48
Dannevirke Power Board	18·99	12·07	2·28	17·01
Dunedin City Council	26·77	8·85	2·38	18·32
Franklin Power Board	19·33	15·38	2·96	16·60
Golden Bay Power Board	26·83	11·31	3·03	21·22
Grey Power Board	19·59	12·36	2·42	19·36
Halswell County Council	13·51	8·60	1·15	3·75
Hamilton Borough Council	27·35	8·33	2·27	4·01
Hastings Borough Council	26·24	7·39	1·94	9·10
Havelock North Town Board	25·30	11·14	2·82	20·95
Hawke's Bay Power Board	15·38	23·69	3·64	13·79
Heathcote County Council	31·15	5·80	1·80	6·10
Horowhenua Power Board	22·32	11·18	2·49	12·59
Hurunui Power Board*	..	..	..	..
Hutt Valley Power Board	26·21	9·53	2·50	9·32
Inglewood Borough Council	32·23	9·82	3·16	9·72
Invercargill City Council	24·11	9·33	2·24	8·29
Kaiapoi Borough Council	26·90	7·11	1·91	6·28
Kaikoura County Council	24·17	10·52	2·55	15·62
Kamo Town Board	19·16	9·16	1·76	5·95
Kanieri Electric Light, Ltd.	24·24	13·82	3·34	37·92
Kaponga Town Board	30·41	14·13	4·30	20·41
Lyttelton Borough Council	19·68	8·66	1·70	2·93
Malvern Power Board	13·15	11·60	1·53	12·62
Manawatu-Oroua Power Board	11·66	17·89	2·07	13·11
Mangaweka Town Board	26·66	11·36	3·03	13·85
Manunui Town Board	17·86	5·55	0·99	3·67
Marlborough Power Board	17·77	11·81	2·08	22·26
Mataura Borough Council	27·54	4·98	1·37	3·86
Motueka Borough Council	22·06	6·35	1·40	10·04
Murchison County Council	23·40	17·01	3·98	27·85
Napier Borough Council	23·45	8·69	2·04	8·38
Nelson City Council	20·70	11·73	2·42	9·55
New Plymouth Borough Council	27·92	12·66	3·53	19·90
North Auckland Power Board*	..	..	..	..
North Canterbury Power Board	17·50	14·98	2·61	15·56
Ohakune Borough Council	25·38	7·54	1·91	9·62
Opunake Power Board	25·22	8·92	2·22	18·08
Otago Central Power Board	35·55	11·03	3·93	33·84
Otago Power Board	21·22	9·58	2·08	15·65
Palmerston North City Council	24·82	10·50	2·61	10·97
Patea Borough Council	19·77	12·59	2·49	8·68
Picton Borough Council	26·59	9·44	2·51	14·23
Poverty Bay Power Board	19·06	11·38	2·16	13·15
Queenstown Borough Council	27·34	6·68	1·82	15·25
Raetihi Borough Council	8·58	11·81	1·01	4·81
Rangiora Borough Council	27·30	8·38	2·28	6·42
Reefton Light and Power Co., Ltd.	23·16	13·45	3·11	5·79
Riccarton Borough Council	24·20	7·80	1·86	4·32
South Canterbury Power Board	8·44	15·42	1·30	7·57
South Taranaki Power Board	17·37	10·11	1·75	11·19
Southland Power Board	19·58	14·22	2·77	35·14
Spender, Paul (Rawene)	17·32	10·18	1·76	9·78
Springs-Ellesmere Power Board	19·20	11·92	2·28	12·51
Stratford Borough Council	29·60	11·94	3·53	8·10
Sumner Borough Council	28·38	6·42	1·82	4·84
Taihape Borough Council	25·79	7·62	1·96	7·74
Taranaki Power Board	17·53	19·42	3·40	37·15
Tararua Power Board	19·45	15·27	2·97	20·30
Taumarunui Borough Council	20·30	11·39	2·31	15·25
Tauranga Borough Council	35·20	24·84	9·50	56·25
Tauranga Power Board	12·28	24·20	2·94	14·78
Te Aroha Borough Council	28·64	10·87	3·11	9·96
Te Awamutu Power Board	22·21	17·41	3·89	23·86
Te Puke Town Board	29·30	11·22	3·30	11·88
Teviot Power Board	22·94	14·31	3·28	31·78
Thames Borough Council	24·15	7·86	1·88	7·10
Thames Valley Power Board	17·86	19·48	3·47	23·38
Timaru Borough Council	20·10	8·97	1·79	7·35
Tourist Department (Rotorua)	34·18	9·96	3·41	13·40
Uawa County Council	24·50	11·52	2·84	15·68
Waimairi County Council	24·81	6·88	1·70	6·57

* Not yet functioning.

TABLE XXXI.—RETURN SHOWING AVERAGE REVENUE PER CONSUMER AND PER CAPITA FOR THE YEAR ENDING 31ST MARCH, 1932—*continued.*

Licensee.	Ratio of Consumers to Population.	Average Revenue per Consumer.	Average Revenue *per Capita.*	Capital Outlay *per Capita.*
	Per Cent.	£	£	£
Waimea Electric Supply Co., Ltd.	19·00	6·95	1·32	5·51
Wairarapa Power Board	22·44	12·49	2·79	18·38
Wairere Power Board	15·60	16·92	2·64	20·97
Wairoa Borough Council	28·21	12·06	3·41	8·69
Wairoa Power Board	8·88	23·10	2·03	11·31
Wairua (Wilson's Cement Co.)	0·44	11·11	0·97	5·56
Waitaki Power Board	16·95	9·25	1·56	9·41
Waitara Borough Council	25·42	9·00	2·28	6·88
Waitemata Power Board	21·19	8·52	1·82	9·76
Waitomo Power Board	14·68	15·79	2·31	12·49
Wanganui-Rangitikei Power Board	18·68	10·11	1·89	10·71
Wellington City Council	26·45	11·42	3·04	10·72
Westland Power, Ltd.	3·10	42·50	1·31	16·28
Westport Borough Council	17·25	10·37	1·79	7·84
Whakatane Borough Council	24·42	15·85	3·91	20·47
Whangarei Borough Council	29·55	8·91	2·63	9·61
Average for reticulation areas in New Zealand, 1932	22·08	11·63*	2·56*	21·68
Average for 1931	21·47	12·20*	2·62*	20·84
,, 1930	20·74	12·39*	2·58*	17·68
,, 1929	19·43	12·10*	2·38*	17·27
,, 1928	17·80	12·00*	2·06*	14·80

* After deducting Government revenue received from bulk sales.

Table XXXII.—Condensed Financial Statistics for Year ending 31st March, 1932.

Supply Authority.	Capital Investment.		Total Revenue, excluding Rates.	Total Working-expenses.	Interest and Sinking Fund Payments.	Other Capital Charges.	Amount Credited to Depreciation Reserve.	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, 1932.
	Total Outlay to Date.	Present Book Value.						Debit.	Credit.		Amount at Credit not Invested Separately.	Amount Invested Separately as Fund.			
	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
Alderton Utility Co., Kerikeri ..	5,053	5,053	465	185	216	..	..	..	64	..	..	..	..	..	..
Ashburton	354,852	337,007	43,786	19,856	23,620	..	..	..	310	26,827	9,373	..	5,700	..	4,856
Auckland	3,371,959	2,868,816	651,838	347,815*	211,843	..	62,503	..	29,677	580,784	391,308	..	474,138	..	..
Banks Peninsula	103,172	98,743	12,636	8,032	7,754	..	..	3,150	..	11,737	..	4,429	..	3,580	..
Bluff	10,641	8,934	4,060	2,772	801	..	..	..	487	272	1,616	..	..	..	..
Bay of Plenty	206,610	202,861	36,911	22,381	14,398	..	1,783	1,651	..	9,654	3,749	..	..	..	..
Cambridge	109,633	108,246	20,349	11,358	7,622	..	..	..	1,369	14,169	..	1,386	1,400	..	..
Central Hawke's Bay	139,086	122,166	22,905	11,677	9,542	..	1,812	126	..	2,168	15,458	9,815	8,151	..	..
Central	332,490	307,620	57,935	30,581	22,651	..	4,005	..	698	30,968	14,776	10,771	23,058	..	..
Christchurch	789,332	374,666	229,118	135,857	23,970	..	31,843	..	37,448	117,164	414,666	..	289,899	..	..
Coleridge	1,937,866	1,822,782†	218,196	37,245	91,547	..	12,500	..	76,904	193,865	211,752	..	174,250	..	..
Dannevirke	214,481	205,916	28,912	12,365	14,840	..	2,130	423	..	15,783	9,054	6,925	2,873	..	..
Dunedin (Waipori)	1,685,864	1,628,383	219,003	58,214	94,625	..	25,172	..	40,992	168,202	177,324	..	190,280	..	..
Franklin	278,458	229,287	49,723	24,294	17,886	..	7,363	..	180	14,783	28,390	20,780	8,511	..	..
Grey	256,582	250,950	32,117	15,226	16,085	..	1,733	927	..	19,162	5,353	1,060	3,060	..	40
Golden Bay	25,473	24,056	3,642	1,604	1,687	..	..	..	351	758	751	..	..	110	..
Halswell	6,946	3,896	2,159	1,486	313	..	..	..	360	833	..	..	..	..	..
Hamilton	60,234	59,891	34,202	16,557	4,899	..	..	..	12,746	22,234	..	13,290	9,504	..	..
Hastings	114,911	111,276	24,673	16,699	6,186	..	679	..	1,109	14,747	..	3,635	..	..	..
Havelock North	24,074	24,074	3,242	1,443	1,793	..	..	..	6	8,220	..	..	..	..	..
Hawke's Bay	221,038	209,858	58,423	38,515	15,568	..	3,240	..	1,100	13,734	..	1,202	1,100	..	..
Heathcote	36,404	26,654	10,817	7,193	2,701	..	..	..	923	7,108	..	..	..	..	..
Horahora-Arapuni	4,553,304	4,341,695	161,884	115,003	62,524	..	24,911	40,554	..	..	211,610	..	..	..	78,867
Horowhenua	214,108	195,807	42,447	24,884	14,472	..	3,077	..	14	11,333	18,301	15,224	13,500	..	..
Hurunui	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Hutt Valley	386,931	337,942	103,895	67,305	25,556	..	6,076	..	4,958	26,825	45,989	39,913	6,221	..	..
Inglewood	12,644	7,725	4,115	2,806	1,005	..	..	..	304	3,634	13	..	..	..	..
Invercargill	174,186	154,150	47,246	24,899	10,093	..	720	..	11,534	19,304	..	27,879	..	..	..
Kaikoura	9,839	8,693	1,608	1,474	746	..	..	612	..	1,192	1,146	..	..	608	..
Kaiapoi	10,664	7,244	3,248	1,671	1,030	..	872	325	..	1,526	3,273	724	..	..	..
Kamo	3,574	2,500	1,057	630	235	..	..	..	192	795	..	..	..	126	..
Kanieri Electric, Ltd., Hokitika ..	94,816	81,930	8,375	5,974	509	..	1,556	..	336	..	..	..	..	..	..
Kaponga	24,507	23,052	5,161	3,420	1,738	..	..	..	3	2,987	..	..	..	233	3,205
Lyttelton	10,850	10,650	6,315	4,324	679	..	250	..	1,062	585	..	400	..	..	..
Malvern	63,748	61,459	7,710	5,928	4,403	..	..	2,621	..	4,815	2,265	..	..	1,177	5,051
Manawatu-Oroua	511,442	485,256	81,050	44,557	33,467	..	1,187	..	1,839	54,741	12,127	8,967	390	..	6,716
Mangahao	3,659,304	3,272,854	300,022	48,900	202,775	..	65,681	17,334	..	..	385,113	..	..	..	486,140
Mangaweka	5,613	5,613	1,227	1,083	129	..	..	..	15	655	..	..	..	146	..
Manunui	3,268	3,268	883	541	250	..	..	..	92	227	..	..	..	..	..

* After deducting Public Works Department subsidy amounting to £25,973

† Includes £20,285 for stocks held in suspense. Value of assets in operation, £1,802,497.

TABLE XXXII.—CONDENSED FINANCIAL STATISTICS FOR YEAR ENDING 31ST MARCH, 1932—*continued.*

Supply Authority.	Capital Investment.		Total Revenue, excluding Rates.	Total Working-expenses.	Interest and Sinking Fund Payments.	Other Capital Charges.	Amount Credited to Depreciation Reserve.	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, 1932.
	Total Outlay to Date.	Present Book Value.						Debit.	Credit.		Amount at Credit not Invested Separately.	Amount Invested Separately as Fund.			
	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
Marlborough	323,439	311,151	30,341	8,302	21,992	..	2,910	2,863	..	22,748	12,288	..	..	998	12,747
Mataura	5,017	4,119	1,785	1,660	212	..	..	87	..	214	..	207	..	231	87
Motueka	16,159	11,912	2,250	2,029	962	..	..	741	..	2,092	4,247	..	250	910	..
Murchison	13,925	13,925	1,992	1,427	976	..	..	411	..	2,502	..	..	..	..	2,906
Napier	156,513	134,620	38,103	21,749	9,491	..	..	..	6,863	13,549	21,893	15,801	22,248	..	..
Nelson	109,877	90,399	27,930	13,924	5,324	..	2,563	..	6,119	14,670	19,478	..	..	11	..
New Plymouth	417,209	367,162	74,248	39,324	26,521	..	..	..	8,403	74,915	..	13,084	250	..	..
North Auckland	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
North Canterbury	142,208	136,355	23,753	14,872	9,366	..	..	485	..	7,711	5,799	1,271	4,850	..	..
Ohakune	18,617	8,892	3,718	1,908	1,069	..	168	..	573	3,443	380	..	..	268	..
Opunake	108,735	108,063	13,447	4,556	8,339	..	150	..	402	18,930	672	52	..	..	..
Otago Central	85,864	83,919	9,971	3,840	6,458	..	..	327	..	7,039	1,945	..	..	..	2,969
Otago	281,628	264,907	36,506	20,133	21,122	..	4,557	9,306	..	23,721	14,452	..	..	9,130	9,227
Palmerston North	249,420	212,798	59,238	24,150	12,048	..	5,455	..	17,585	20,740	..	20,661	..	..	..
Patea	15,625	15,571	4,482	2,720	607	..	64	..	1,091	409	120	57	3,887	..	..
Picton	19,220	15,049	3,392	1,914	1,249	..	400	171	..	2,290	..	818	..	..	..
Poverty Bay	320,609	309,783	52,884	26,011	23,453	..	511	..	2,909	19,276	11,116	1,890	3,085	..	..
Queenstown	12,894	12,668	1,544	475	816	..	226	..	27	782	..	226	244	..	..
Raetihi	21,663	21,106	4,558	2,428	1,922	..	120	..	88	4,933	557	438	..	136	6,970
Rangiora	13,490	9,322	4,799	3,402	424	..	326	..	647	1,207	3,827	662	..	..	..
Reefton Electric Light and Power Co., Ltd.	6,953	5,844	3,743	3,630	..	..	..	..	113	..	..	..	..	..	..
Riccarton	23,734	18,912	10,406	7,019	1,040	..	675	..	1,672	986	1,420	745	4,212	..	..
South Canterbury	322,327	289,762	55,611	30,759	21,244	..	4,241	633	..	28,692	9,368	..	..	..	..
South Taranaki	182,278	172,069	28,617	9,021	12,631	..	1,415	..	5,550	8,114	3,000	1,585	6,448	..	..
Southland (Monowai)	1,651,558	1,633,351	130,888	41,815	125,277	..	..	36,204	..	275,693	13,845	..	..	47,502	31,276
Spender, P. (Rawene)	2,926	2,926	530	747	..	..	..	217	..	..	..	..	..	..	..
Springs-Ellesmere	154,885	147,988	28,237	15,318	10,305	..	1,547	..	1,067	6,982	6,897	6,384	5,200	..	..
Stratford	28,351	27,569	12,370	6,357	3,426	..	250	..	2,337	7,000	..	782	5,895	..	..
Sumner	16,955	13,923	6,373	5,127	511	..	..	..	735	1,587	..	836	2,089	..	..
Taihape	18,804	8,512	4,819	2,537	1,081	..	508	..	693	4,378	1,939	1,431	..	..	..
Taranaki	456,699	439,934	41,949	14,234	32,224	..	3,080	7,589	..	26,261	11,799	..	5,145	3,173	..
Tararua	164,769	153,352	24,130	10,544	10,429	..	2,483	..	674	15,657	9,766	779	1,690	..	1,052
Taumarunui	61,032	57,367	9,254	2,415	4,422	..	600	..	1,817	3,399	..	3,565	4,230	..	..
Tauranga Power Board	125,024	119,534	24,910	12,762	9,428	..	1,000	..	1,720	9,790	5,490	2,667	2,016	..	..
Tauranga Borough Council ..	154,273	152,090	24,864	5,745	9,653	..	..	..	9,466	21,764	2,294	..	9,303	..	..
Te Aroha	24,813	13,966	7,786	5,809	610	..	350	..	1,017	1,954	6,842	1,102	..	..	..
Te Awamutu	182,505	178,613	29,690	15,145	11,912	..	1,000	..	1,633	15,266	3,892	2,892	906	..	..
Teviot	57,201	56,050	5,910	1,831	3,767	..	..	..	312	5,191	2,327	..	..	3	..
Te Puke	11,739	6,133	3,236	1,766	562	..	250	..	658	1,338	..	2,425	1,182	..	..

TABLE XXXII.—CONDENSED FINANCIAL STATISTICS FOR YEAR ENDING 31ST MARCH, 1932—*continued.*

Supply Authority.	Capital Investment.		Total Revenue, excluding Rates.	Total Working-expenses.	Interest and Sinking Fund Payments.	Other Capital Charges.	Amount Credited to Depreciation Reserve.	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, 1932.
	Total Outlay to Date.	Present Book Value.						Debit.	Credit.		Amount at Credit not Invested Separately.	Amount Invested Separately as Fund.			
	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
Thames Borough Council	33,600	23,017	8,952	6,086	1,267	..	560	..	1,039	5,880	1,656	..	..	..	..
Thames Valley	811,192	792,252	120,655	62,739	57,922	..	4,310	4,316	..	110,884	18,941	14,630	10,863	..	..
Timaru	132,413	94,570	32,450	19,785	9,477	..	..	..	3,188	35,261	..	..	..	..	..
Tourist Department (Rotorua) ..	73,768	60,394	18,779	9,186	5,163	..	1,475	..	2,955	14,737	13,374	..	..	..	..
Uawa (Tolaga Bay)	6,275	3,885	1,131	647	638	..	..	154	..	2,389	..	..	..	100	..
Waimairi	85,438	55,507	22,193	12,549	3,424	..	3,753	..	2,467	3,067	3,493	..	18,636	100	..
Waimea Electric Co.	22,069	18,017	5,285	3,663	316	..	869	..	437	..	4,052	..	..	..	..
Wairarapa	358,164	348,262	54,563	22,397	25,408	..	2,318	..	4,440	22,751	8,960	2,618	..	..	..
Wairere	41,942	39,032	5,292	1,566	3,310	..	..	..	416	2,911	3,008	981	..	..	4,235
Wairua	91,859	29,805	16,266	3,952	..	..	..	..	12,314	..	..	..	..	..	..
Wairoa Borough Council	20,995	12,260	8,216	5,550	1,414	..	410	..	842	1,872	782	372	..	..	357
Wairoa Power Board	62,349	58,181	11,217	8,783	4,748	..	930	3,244	..	5,389	2,951	..	538	328	8,837
Waitaki..	183,497	169,640	30,598	19,106	11,573	..	2,175	2,256	..	16,651	..	11,327	14,040	..	..
Waitara	12,566	6,206	4,177	2,136	900	..	143	..	998	2,763	..	285	..	519	..
Waitemata	389,866	375,733	72,681	38,392	29,128	..	3,994	..	1,167	47,171	14,133	..	10,000	..	..
Waitomo	99,963	97,968	18,559	9,448	6,980	..	..	..	2,131	6,346	1,819	319	..	..	156
Wanganui-Rangitikei	557,578	471,797	98,797	54,002	36,458	..	8,651	314	..	9,096	18,931	3,000	..	..	..
Wellington	1,180,464	1,180,464	334,476	168,526	40,335	..	8,000	..	117,615	195,475	..	..	168,330	..	..
Westport	31,362	27,405	7,182	2,106	2,304	..	974	..	1,798	4,847	1,939	..	4,802	..	..
Westland	68,331	67,168	5,528	4,431	..	..	..	..	1,097	..	..	..	..	..	..
Whakatane	36,861	35,855	7,044	1,964	4,475	..	..	..	605	8,987	..	..	..	48	..
Whangarei	67,300	66,635	18,437	11,794	2,143	..	1,605	..	2,895	5,137	..	4,601	..	..	..
Totals	30,370,747	27,594,642	4,292,097	2,030,967	1,608,414	..	334,109	137,041	455,648	2,578,628	2,233,099	284,893	1,522,374	69,437	665,674

APPENDIX E.

EIGHTH 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 eighth annual report for presentation to Parliament through the Hon. the Minister.

The report covers the period from the 1st April, 1931, to the 31st March, 1932, 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 £2,086,029, compared with £2,097,390 for the previous year. The expenditure from the Revenue Fund was £1,701,884, as compared with £1,386,140 for 1930–31 and £1,246,027 for 1929–30. The substantial increases in the expenditure from the Revenue Fund disclosed in the past two years have not been due to any expansion of the Board's activities, but have been brought about by the operation of the various Finance Acts of 1930 and 1931, which imposed a number of extraneous charges on the fund. The money expended from the Revenue Fund on actual maintenance of the roads (including earthquake damage) during the three years in question has shown a substantial reduction, the amounts being £1,049,249 for 1929–30, £872,577 for 1930–31, and £849,734 for 1931–32. 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 year the Board's normal subsidy was £3 for £1, whereas for the previous two years it was £2 for £1.

The principal extraneous charges imposed by Parliament were the Government subsidies on rates to local authorities, which for the year under review amounted to £191,206, and the rebate on rates to rural ratepayers granted under section 45 of the Finance Act, 1931 (No. 4), which amounted to £253,893, or a total of £445,099. As mentioned in last year's report, with the object of enabling certain of the additional charges on the Highway Funds to be met without seriously disorganizing the Board's operations, the Government on 22nd July, 1930, imposed a further Customs tax of 2d. per imperial gallon on motor-spirits.

Operations under the Revenue Fund included the payment of subsidies on the maintenance of 10,846 miles of main highway, of which 6,685 miles are regarded as primary highways and 4,161 miles secondary highways.

The expenditure from the Construction Fund for the year was £384,145, as compared with £711,250 for 1930–31 and £1,071,417 for 1929–30. From these figures it is obvious that construction operations have been most severely curtailed. The expenditure from the Construction Fund resulted in 138 miles 53 chains being formed or widened, 69 miles 15 chains gravelled and metalled, and 172 miles 28 chains surfaced with tar, bituminous materials, or concrete. In addition to this work, bridge-construction to the extent of 4,062 lineal feet has been completed and engineering surveys have been carried out over a length of 218 miles 51 chains of the highway system.

During the year a total sum of £73,946 was expended by the Board in the restoration of earthquake damage in the Nelson and West Coast districts and in the Hawke's Bay area. The total cost to the Board of the Murchison earthquake up to the 31st March, 1932, was £223,393, while the Board's expenditure to the same date in respect of the Hawke's Bay earthquake was £53,224. In addition to the latter sum, the local authorities in the Hawke's Bay area have found £2,798. Practically the whole cost to the Main Highways Board of these disasters has so far been met from revenue and not from borrowed money. Further details concerning earthquake damage appear later in this report.

LEGISLATION.

The legislation passed by Parliament during the financial year contains a number of clauses having a very far-reaching effect on main-highway finance and administration, as may be seen from the extracts appearing in Appendix A to this report.

There is no need to comment on section 2 of the Finance Act (No. 3), 1931, as it was merely a time extension clause and was repealed in the Finance Act, 1932.

Section 45 of the Finance Act (No. 4), 1931, authorized a subsidy to be paid from the Main Highways Revenue Fund to County Councils and Road Boards, to be used by those bodies in giving a rebate on rates to the extent of 2s. 6d. in the £1 to ratepayers. The subsidy applied only to the financial year 1931–32, and the total charge against the Main Highways Revenue Fund as a result of this clause was £253,893.

Section 36 of the Finance Act, 1932, perpetuates the following statutory provisions for certain financial adjustments which were previously of a temporary nature:—

(*a*) The transfer of £35,000 annually from the Consolidated Fund to the Main Highways Revenue Fund to cease.

(*b*) The transfer of £200,000 per annum from the Public Works Fund to the Main Highways Construction Fund to cease.

(*c*) Interest at the rate of 5 per cent. to be payable from the Main Highways Revenue Fund to the Consolidated Fund in respect of the total sum of £1,226,000 transferred from the Public Works Fund to the Main Highways Construction Fund under the authority of the original Main Highways Act, 1922.

(*d*) The annual subsidies granted by the Government on the general rates of local authorities to remain a charge against the Main Highways Revenue Fund, the charge involved being approximately £200,000 per annum.

(*e*) There may be appropriated a portion of the Main Highways Revenue Fund for the metalling of backblock roads other than main highways, subject to certain limitations.

Section 37 of the Finance Act, 1932, authorizes the retention in the Consolidated Fund for the financial year ending the 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.

Section 39 extends the benefits of section 45 of the Finance Act (No. 4), 1931, in the case of those counties into which any Road Board was merged prior to the 31st March, 1931, and also extended the time for paying a subsidy under the said section 45 to ratepayers in counties and road districts.

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 1,107 miles, and the Board recommended for declaration a length of 410 miles and for revocation a length of 37 miles. A number of the new declarations were brought about on account of the completion by the Public Works Department of certain through roads which under ordinary circumstances would have been handed to local authorities for maintenance purposes. It was obvious, however, that local authorities in most cases could not have financed reasonable maintenance without assistance from the Main Highways Board.

The adjustments and additions made to the highways system during the year are indicated in Appendix B to this report.

Finance.

The actual contributions to the Board's Revenue Fund from external sources for the year 1931–32 amounted to £1,688,075. The tabulation below shows how this amount is made up. The income from similar sources during the previous seven years is also shown:—

——	1924–25.	1925–26.	1926–27.	1927–28.	1928–29.	1929–30.	1930–31.	1931–32.
	£	£	£	£	£	£	£	£
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
Registration and license fees of motor-vehicles	268,178	78,038	283,963	303,861	341,017	378,135	397,139	372,224
Motor-spirits tax	..	..	..	130,461	730,414	873,369	1,219,209	1,231,202
Totals	465,164	336,737	507,413	688,980	1,303,178	1,442,226	1,745,536	1,688,075

It will be noted that the proceeds of the Customs tax on tires and tubes again show a very large reduction. It should be mentioned that the amount shown as motor-spirits tax is actually 92 per cent. of the net proceeds of a tax amounting to 6d. per imperial gallon. The proceeds of the additional 2d. petrol-tax imposed in 1931 are not paid into the Main Highways Revenue Fund.

For the year ending 31st March, 1932, the expenditure under the Revenue Fund was as follows:—

	Expenditure. £
North Island (Maintenance)	529,393
South Island (Maintenance)	320,341
Administration charges	37,965
Commission paid to Post and Telegraph Department for collection of motor-registration and license fees and registration of change of ownership	19,556
Subsidies on rates to local authorities (Finance Act, 1930)	191,206
Rebate on rates to rural ratepayers (Finance Act, 1931 (No. 4)) ..	253,893
Metalling backblock roads (Finance Act, 1931 (No. 3))	45,133
Special relief camps for single men (net cost to Main Highways Board)	21,701
Miscellaneous payments, including recoupment of interest on loans to Consolidated Fund and reserve for redemption of main-highways securities	282,696
Total	£1,701,884

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	424,502	104,585	529,087	80·23	19·77
South Island	246,667	57,647	304,314	81·05	18·95
	671,169	162,232	833,401	80·53	19·47
(2) Secondary system—					
North Island	104,892	31,907	136,799	76·68	23·32
South Island	73,673	21,429	95,102	77·47	22·53
	178,565	53,336	231,901	77·00	23·00
(3) Complete system—					
North Island	529,394	136,492	665,886	79·50	20·50
South Island	320,340	79,076	399,416	80·20	19·80
	849,734	215,568	1,065,302	79·76	20·24

An examination of the contributions of local authorities towards the cost of maintenance of main highways shows that there have been very large reductions in the past two years.

For the year 1930–31 the local authorities found about £58,000 less than for the year 1929–30. In 1931–32 the contribution of the local authorities was further reduced by £102,271, making a total reduction in two years of over £160,000 in spite of the fact that the mileage of highways has been slightly increased in the meantime. The total contribution by local authorities towards the cost of the maintenance of the primary highways for the year under review is £162,232, as compared with £235,688 for 1930–31. In the case of the secondary highways the contribution was £53,336, compared with the sum of £82,151 for the previous year. The contribution of the local authorities to the complete highway system was therefore reduced from £317,839 to £215,568.

In 1930–31 the cost of maintenance of all highways was shared between the Board and the local authorities in the ratio of 73·3 per cent. to 26·7 per cent. In 1931–32 the percentages were 79·8 and 20·2 respectively. The change was brought about by the increase in the Board's standard maintenance subsidy from £2 for £1 to £3 for £1 from the 1st April, 1931.

The following tabulation shows the amount which has been provided by the Board and the local authorities for expenditure on both construction and maintenance of main highways during the eight years the Board has been in operation:—

——	1924–25.	1925–26.	1926–27.	1927–28.	1928–29.	1929–30.	1930–31.	1931–32.
	£	£	£	£	£	£	£	£
Maintenance by Board ..	123,675	279,404	438,762	523,581	756,399	1,049,249	872,577	849,734
Maintenance by local authorities	110,001	185,015	276,349	269,065	284,526	375,849	317,839	215,568
Construction by Board.. ..	222,422	421,880	540,362	449,904	936,148	1,007,957	667,902	361,969
Construction by local authorities	80,000	142,761	255,860	262,538	214,155	203,148	150,984	94,973
Totals	536,098	1,029,060	1,511,333	1,505,088	2,191,228	2,636,203	2,009,302	1,522,244

The figures in the above tabulation exclude indirect charges such as supervision, interest, &c., but include the cost of earthquake restoration.

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.
North Island—								
Maintenance expenditure	64·49	65·27	64·86	67·51	66·13	62·30	59·23	62·31
Motor-vehicles	60·90	61·41	61·86	62·19	63·08	63·63	63·84	63·77
South Island—								
Maintenance expenditure	35·51	34·73	35·14	32·49	33·87	37·70	40·77	37·69
Motor-vehicles	39·10	38·59	38·14	37·81	36·92	36·37	36·16	36·23

In accordance with the direction contained in section 21 of the original Act, and following on the Board's resolution passed in May, 1925, an apportionment of the tire duty, registration and license fees for the year ending 31st March, 1932, has been made between the two Islands in proportion to the number of motor-vehicles registered in each Island on that date.

Although no statutory provision exists requiring an apportionment of the proceeds from the petrol-tax between the two Islands, that portion of the tax which is paid into the Main Highways Revenue Fund has been allocated between the two Islands in accordance with the consumption of motor-spirits in each Island. As in previous years, the Board obtained confidential data from oil companies, and these figures showed that during the calendar year 1931 approximately 67 per cent. of the motor-spirit imported was consumed in the North Island and approximately 33 per cent. in the South Island, these ratios being practically the same as for the previous year. Without taking into account the expenditure involved in the rebate on rural rates authorized by section 45 of the Finance Act, 1931 (No. 4), and the metalling of backblock roads from the proceeds of the petrol-tax authorized by the Finance Act, 1931 (No. 3), both of which items are outside of the Board's control, the balances to the credit of the North and South Island respectively on the 31st March, 1932, were £406,808 19s. 5d. and £286,526 1s. 3d.

The following statement shows the manner in which these balances have been obtained :—

NORTH ISLAND.

Expenditure.	£	s.	d.	*Income.*	£	s.	d.
Expenditure (general)	529,393	5	9	Balance at 1st April, 1931	193,409	4	3
Abolition of toll-gates	1,807	0	0	Interest from investments	14,063	16	1
Interest and expenses of raising loans, &c., and reserve for redemption of securities	129,663	12	4	Motor registration, annual license fees, and tire-tax	291,348	2	5
Interest on past Public Works grants ..	46,365	8	0	Motor-spirits tax	824,905	2	9
Commission on collection of motor fees, &c.	12,470	16	7				
Miscellaneous expenditure	30,662	5	9				
Finance Act, 1927 (No. 2), section 33 (Wellington City Council)	22,245	15	0				
Finance Act, 1930 (subsidy on rates to local authorities)	128,296	13	7				
Relief camps for single men (net) ..	14,557	9	5				
Combined road and railway bridges ..	1,454	19	8				
Balance	406,808	19	5				
	£1,323,726	5	6		£1,323,726	5	6

SOUTH ISLAND.

Expenditure.	£	s.	d.	*Income.*	£	s.	d.
Expenditure (general)	320,340	6	5	Balance at 1st April, 1931	190,307	19	10
Interest and expenses of raising loans, &c., and reserve for redemption of securities	47,062	0	10	Interest from investments	10,337	12	6
Interest on past Public Works grants ..	14,934	12	0	Motor registration—Annual license fees, and tire-tax	165,525	4	2
Commission on collection of motor fees, &c.	7,085	2	5	Motor-spirits tax	406,296	11	3
Miscellaneous expenditure	18,546	19	5				
Finance Act, 1930 (subsidy on rates to local authorities)	62,909	3	8				
Relief camps for single men (net) ..	7,143	1	9				
Combined road and railway bridges ..	7,920	0	0				
Balance	286,526	1	3				
	£772,467	7	9		£772,467	7	9

From the above statement it will be seen that the total balance unaccounted for is £693,335. This sum has been or is to be entirely devoted to purposes other than highway construction or maintenance, and disposed of in the following manner :—

	£
Rebate on rates to rural ratepayers, 1931–32	253,893
Metalling of backblock roads, 1931–32	45,133
A sum equivalent to the balance of accumulated fund at the 1st April, 1932, to be completely diverted to the Consolidated Fund under authority of section 37 of the Finance Act, 1932	394,309
Total	£693,335

The balances, therefore, standing to the credit of the North and South Islands which are available for highway construction or maintenance and are not earmarked for other purposes are nil.

In the light of the special knowledge which it possesses, the Board is forced to place on record that it does not concur that the whole of the diversions authorized in 1931 and 1932 are wise from a roading standpoint for the following reasons :—

(1) A substantial portion of the accumulated fund must be ascribed to the non-replacement of wear-and-tear on the highways during the past two years, but this replacement must inevitably be made and finance will be necessary. A year ago the thickness of the metal foundation on the average highway was 33 per cent. less than the thickness to which the roads were originally built, and the position is now worse.

(2) The Board has been of the opinion that as much construction as possible should be financed from revenue, particularly in the case of bridge-construction, which in most instances is largely in the nature of renewals. On account of the diversion of its funds in 1931, the Board was forced to finance the whole of its construction work in 1931–32 from borrowed money. This is the first occasion since 1927 when the Construction Fund was not reinforced by a transfer from the Revenue Fund.

(3) The Board has consistently adhered to a policy during the past eight years of having a fairly substantial reserve in its Revenue Fund to meet emergencies, such as floods and earthquakes. As a result of that policy, practically the whole cost of the Murchison and Hawke's Bay earthquakes has been met from revenue. There are now no reserves whatever to meet such emergencies in the future.

(4) The Board has been of the opinion for some years that the time would arrive when the supply of borrowed money would cease, but it has also realized that although loan funds might not be available, nevertheless the reconstruction of a large number of bridges would have to be faced annually. It was hoped that the balance of the accumulated fund, together with possible transfers from the Revenue Fund, would enable these vital links in the country's arterial- and feeder-road system to be maintained without dependence on borrowed money. By the 31st March, 1933, bridge reconstruction on the highways will be behind the necessary programme by about £250,000.

(5) On account of the diversion to the Consolidated Fund of up to £500,000, authorized by the Finance Act, 1932, the provision for highway-maintenance is insufficient to maintain the assets to their original standard, and therefore some borrowed capital invested therein must be irretrievably lost. The continuance for two more years of the policy of reduced maintenance which has been in operation for the past eighteen months will bring about the drastic physical collapse of many sections of the most important roads in the country.

Stated briefly, the Board's opinion is simply that expenditure temporarily avoided by neglecting maintenance and bridge-renewals does not constitute savings.

Another result of the diversions has been that paving in dustless and durable materials has had to be postponed practically indefinitely. The Board, however, considers broadly that in view of the general financial situation in the Dominion this postponement is not unreasonable, but there are certain cases in which postponement is uneconomical.

For the year ending 31st March, 1932, the expenditure, including administration charges, &c., under the Construction Fund was as follows :—

	Expenditure. £
North Island	271,529
South Island	112,616
Total	£384,145

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	235,788	55,870	291,658	80·84	19·16
South Island	89,210	32,028	121,238	73·58	26·42
Totals	324,998	87,898	412,896	78·71	21·29
		(2) *Secondary Highways.*			
	£	£	£		
North Island	20,928	4,392	25,320	82·65	17·35
South Island	16,043	2,683	18,726	85·67	14·33
Totals	36,971	7,075	44,046	83·94	16·06
		(3) *Complete System.*			
North Island	256,716	60,262	316,978	80·99	19·01
South Island	105,253	34,711	139,964	75·20	24·80
Totals	361,969	94,973	456,942	79·22	20·78

It is noteworthy to point out that the average proportion of the cost found by the Board towards construction in 1931–32 is almost exactly the same as that found towards the cost of maintenance, the ratio being £4 to £1 in each case.

MAINTENANCE.

In the last annual report it was shown that on account of the curtailment by local authorities of their own expenditure the highways were not adequately maintained, particularly during the latter half of the year. The realization of the position, combined with the fact that it was considered necessary still further to relieve the rural ratepayers during the period of economic stress, induced the Board on the 19th August, 1931, to increase the subsidy for ordinary maintenance from £2 for £1 to £3 for £1, the increase to date from the 1st April, 1931. In spite of the increase in subsidy the Board has again to report that the highways during the year 1931–32 did not receive maintenance commensurate with the traffic carried by them, even after making every proper allowance for reduction in wages and other costs. The inadequate maintenance was not reflected in the surface conditions of most of the roads, but it is definitely known that the replacement of gravel and metal was considerably below the amount of material lost by wear-and-tear, with a consequent decrease in the thickness of the metal foundations.

The amount of benzine imported into the country is probably the closest indication of the volume of the Dominion's motor traffic. The gross importations of benzine since 1926 are as follows:—

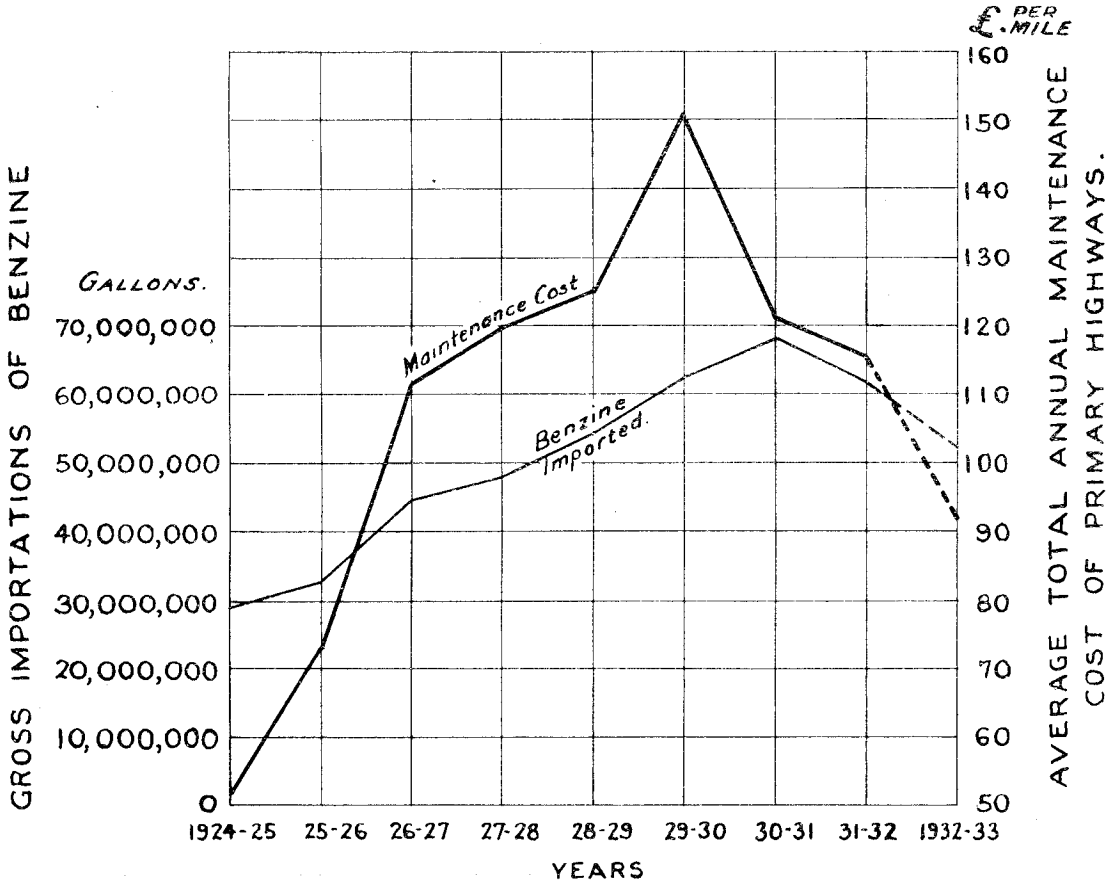
	Gallons.		Gallons.
1926	44,800,000	1929..	62,400,000
1927	48,000,000	1930..	68,300,000
1928	54,500,000	1931..	61,800,000

It will be noted that the above figures are gross simply because the net figures are not available for the earlier years, but investigations made into the comparatively small amounts of motor-spirits upon which rebates of tax have been made in the more recent years indicate that any deductions will not be distorted by the use of the gross figures.

In the same period the total expenditure on maintenance of primary highways, including local authority contributions, but excluding special earthquake damage, has been as follows:—

	£		£
1926–27	715,111	1929–30..	990,953
1927–28	792,646	1930–31..	806,366
1928–29	832,618	1931–32..	773,142

From the above figures it will be seen that, whereas the traffic in 1931 was approximately the same as in 1929, the expenditure on maintenance was about 22 per cent. less. The following graph illustrates the trends in the gross importations of benzine and in the annual maintenance cost of the primary highways since 1924.



It is obvious from the graph that the attention which will be given to maintenance during the current year will be dangerously low, even after due allowance has been made for the reduction in working-costs. It is necessary for the Board to issue a warning that unless the traffic on the roads is

substantially reduced the continuance of the present policy is certain to be followed by serious results, particularly if the seasons are adverse. 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 (estimated)	92·0	50·0	75·0

Construction.

The expenditure on construction for the year 1931–32 dropped by 46 per cent. as compared with the expenditure for the previous year, consequently the results of the Board's operations have been less noteworthy than usual. The town of Ohura was connected up with the rest of the North Island by an all-weather road for the first time in its history. A number of sealing contracts were in hand at the beginning of the financial year, and most of these have been carried to completion.

It is desirable to mention that it has been the aim of the Main Highways Board to carry out as much of its work by the contract system as possible, and that as a result of this consistent policy over a period of eight years a corps of efficient modern road-contracting organizations has become established. These organizations have invested a considerable amount of money in up-to-date plant, and have trained a large body of men as experts in paving-work. As a result, the roading authorities of the country have greatly benefited in reduced prices for work when let by public tender, and in much-improved workmanship. It is to be deplored that the drastic curtailment in the Board's operations has already resulted in the partial breaking-up of these efficient organizations, and there is every reason to believe that in a short time they will completely disappear.

Bridge-construction has also suffered drastic curtailment. Last year the total length of bridges erected was 11,175 lineal feet, while during the year under review only 4,062 lineal feet of bridging was completed. As a result of the last eight years' experience, and also as a result of the information gathered by detailed inspections of over three thousand bridges of the highways, it is considered that the necessary bridge replacements over the next ten years will have to be at the rate of 9,000 lineal feet per annum. This means that the replacements during the past year were 5,000 lineal feet behind requirements. During 1932–33 it is probable that the replacements will be 6,000 ft., or 7,000 ft. behind requirements, so that by the 31st March, 1933, the necessary reconstruction programme will be behind, as already mentioned, by about £250,000.

Review of Past Operations.

The Main Highways Board has now been operating for a period of approximately eight years. A tabulation indicating the extent of the achievements in the way of construction on the highway system is therefore presented:—

Year.	Formation and Widening.	Gravelling and Metalling.	Tar and Bituminous Sealing.	Bituminous Macadam (Penetration).	Bituminous Concrete.	Portland-cement Concrete.	Totals.	Bridges.
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Ft.
1924–25 ..	19	63	6	6	..	..	94	2,434
1925–26 ..	45	88	16	45	4	6	204	5,168
1926–27 ..	174	151	35	38	12	16	426	6,408
1927–28 ..	173	133	83	34	..	6	429	7,760
1928–29 ..	224	185	122	51	14	11	607	9,482
1929–30 ..	173	179	133	39	31	12	567	7,547
1930–31 ..	130	128	95	41	14	9	417	11,175
1931–32 ..	139	69	129	32	9	3	382	4,062
Totals ..	1,077	996	619	286	84	63	3,126	54,036

It is interesting to note that the efforts of the local authorities and the Board since the main highways scheme was inaugurated has resulted in the provision of 1,052 miles of dustless road. The maps at the end of the report show the extent of the dustless roads in each Island in 1924, when the main-highways scheme commenced, and also the position at the 31st March, 1932. The extent of the improvements in the eight-year period are most noticeable, but the maps also illustrate effectively the untreated gaps in the highway system which it is most desirable should be completed.

Railway-crossing Elimination and Protection.

The elimination of railway-crossings is a work which is usually financed jointly by the Railways Department, the Main Highways Board, and local authorities. At the commencement of the present depression the Railways Department notified the Main Highways Board that it was unable to finance any new elimination schemes, consequently the only work of this nature carried out during the year under review was the completion of the approaches to the new overhead bridge erected on the Auckland–Wellington Main Highway over the railway in the vicinity of the Borough of Waitara. The condition of the Main Highways Board's funds as a result of the large diversion authorized by Parliament will also preclude any work of this nature during the financial year 1932–33.

Advances to Local Authorities.

Under section 2 of the Main Highways Amendment Act, 1926, which authorizes the Board to advance moneys by way of loan to local authorities for highway purposes, a sum of £39,204 was advanced, making a total to the 31st March, 1932, of £96,581. All loans are made on the instalment-repayment system, the local authorities being required to make equal annual payments, which include interest on the amount for the time being outstanding and part repayment of principal. The principal repaid to the 31st March, 1932, amounted to £16,183, leaving a balance outstanding of £80,398. Most of the advances made are in respect of work carried out in the South Island.

Traffic-control.

As mentioned 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. In cases of approved joint schemes the Board indicated that it would subsidize the wages and expenses of a Traffic Inspector on a pound-for-pound basis. During the year under review the normal subsidy was increased to £2 for £1, the increase to date from the 1st October, 1931. In a few cases, however, on account of special circumstances, the Board's subsidy remains at a lower rate. As a result of the Board's policy, four further group schemes have been inaugurated. 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, Ngaruawahia and Huntly Boroughs.
Thames Group, including Thames and Ohinemuri 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.
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 Blenheim Borough and Awatere and Marlborough Counties.
Waimea Group, including Waimea County, Richmond and Motueka Boroughs.
Waimairi Group, including Waimairi and Paparua Counties.
Temuka 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, Palmerston and Waikouaiti Boroughs.

In addition to these subsidized schemes administered by local authorities, the Board employs three full-time Inspectors, who operate in the Auckland, Wellington, and West Coast districts, while a number of departmental officers controlling certain sections of highways throughout the country are vested with the powers of a Traffic Inspector for the purpose of general traffic supervision.

Signposting and Centre-line marking.

Signposting and centre-line marking on highways carry the same rate of subsidy from the Board as is applicable to ordinary general maintenance.

Earthquake Damage.

The restoration of the damage to main highways caused by the earthquake of the 17th June, 1929, was continued in the Nelson and West Coast districts. The total expenditure by the Board for the year was £28,195. The expenditure on restoration work in these districts up to the 31st March, 1931, was £195,198, so that to the 31st March, 1932, the Murchison earthquake has cost the Board £223,393.

There is still necessity for some further expenditure, principally on bridges which were seriously damaged but were put into a condition to carry traffic temporarily. In view of the general financial situation, a number of these works are being postponed, but their postponement, of course, cannot be indefinite. The expenditure for the past three years was made up as follows :—

Highway.	1929–30.	1930–31.	1931–32.	Total.
	£	£	£	£
Westport–Nelson	51,907	44,539	9,950	106,396
Murchison–Reefton	11,652	5,685	150	17,487
Westport–Karamea	15,936	55,937	17,995	89,868
Other works	7,383	2,159	100	9,642
	86,878	108,320	28,195	223,393

Up to the 31st March, 1932, the major portion of the damage caused to the highways by the disastrous earthquake in Hawke's Bay District on the 3rd February, 1931, had been dealt with, with the exception of two large bridges. The total expenditure for the year, excluding the said bridges, was £30,821. The expenditure during the previous financial year was £7,473. The two large bridges are the Wairoa Bridge, on the Napier–Gisborne via Wairoa Main Highway, and the Redclyffe Bridge, on the Napier–Tukituki via Omahu Main Highway, the former estimated to cost £45,000 and the latter £15,000. Good progress was made with the Wairoa Bridge, the expenditure to the 31st March, 1932, being £14,930. The Redclyffe Bridge has not been commenced, but the plans and specifications are in course of preparation. The total expenditure by the Board on earthquake restoration in this district to the 31st March, 1932, was therefore £53,224. In addition to this sum the local authorities found £2,798.

The allocation of the expenditure is shown in the following tabulation :—

Highway.	1930–31.	1931–32.		Total.
	By Board.	By Board.	By Local Bodies.	
	£	£	£	£
Wairoa Bridge	..	14,930	..	14,930
Gisborne–Napier via Wairoa ..	6,578	20,642	..	27,220
Napier–Wellington via Wairarapa	..	851	284	1,135
Petane–Taupo	558	1,967	195	2,720
Napier–Tukituki via Omahu ..	15	5,027	1,676	6,718
Other works	322	2,334	643	3,299
	7,473	45,751	2,798	56,022

The total expenditure from the Board's funds to the 31st March, 1932, in respect of the two large earthquakes has been £276,617.

Since the above statement was prepared the Board has to report very serious damage to the partially constructed Wairoa Bridge, as a result of a further heavy earthquake shock on the 16th September, 1932.

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 during the year were on a very much reduced scale as compared with previous years. The total value of plant purchased during 1931–32 under this system was £2,815, as compared with £15,878 expended last year. The grand total value of plant purchased for local authorities since the scheme was inaugurated is £158,509. Of this sum, £122,636 has been recovered from local authorities, leaving a balance outstanding of £35,873. These figures indicate that the Board's hire-purchase system has been operated very successfully, and has no doubt proved an excellent substitute for the previous system in many countries of financing plant by means of long-term loans.

The following list shows the plant hired to local authorities from the 1st April, 1931, to the 31st March, 1932 : Power grader, 1 ; motor-lorries, 2 ; crusher, elevator, and screen, 1.

The Board purchased for its own use at a total cost of £1,154 the following items : Motor-cars, 2 ; portable spraying-machines, 2 ; concrete-mixer, 1 ; tractor, 1 ; drilling-machine, 1 ; road-magnet, 1.

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, bituminous emulsions, and bituminous concrete was efficiently undertaken as usual by the Dominion Analyst, Wellington. The reduction in construction work has, of course, been reflected in a reduction in the amount of testing work undertaken.

Examination of Foremen and Overseers employed on Road-construction.

The sixth examination of foremen and overseers for the purpose of issuing certificates of competency was held on the 11th August, 1931. Ninety-one candidates sat for the examination, as compared with twenty-six, fifty, fifty-two, forty-eight, and eighty-four respectively in previous years. Thirteen candidates passed the full examination; six candidates completed the examination, having passed in one subject previously; and thirteen candidates obtained a partial pass. Although nineteen candidates completed the examination, only eight certificates were issued, as the remainder of the candidates, although qualified theoretically, did not possess sufficient experience in practical work to justify the issue of certificates of competency. Their cases are to be periodically reviewed.

For the information of local authorities the following is a complete list of successful candidates since the examinations were originated: S. Annabell, G. Avery, V. L. Bagnall, D. Baldwin, F. H. Bastin, M. Batten, J. W. Bean, G. T. Beere, E. G. Billinghurst, H. V. Bond, W. J. Bowden, D. E. Brown, H. Chappell, S. J. Conradson, W. E. Cottrell, F. Crompton, A. H. Davis, A. M. Darling, J. G. Dennison, G. L. K. Drew, L. E. Earle, E. J. Ferguson, P. S. Finlayson, J. Forbes, W. I. Gardiner, G. E. Gibbs, E. C. Glass, V. W. Grahame, E. Grant, W. J. Hawkes, E. Hazledine-Barber, F. Hermans, O. G. Hewison, T. J. Hickey, M. G. Houlihan, R. G. Howell, T. R. Hutton, E. D. Jack, W. J. Jenkins, W. J. E. Jenkins, J. H. Kendall, R. M. Lankshear, B. L. Larson, R. G. Lysnar, J. G. Mahood, O. R. Marshall, G. Mascull, F. F. Maynard, J. E. Mays, H. N. McDonald, J. G. McIvor, B. McKenzie, K. G. McLean, C. D. Molesworth, J. I. Monfries, F. Muggeridge, J. V. Neill, R. H. Newman, R. F. Newton, L. Oldham, W. Page, R. B. Price, E. M. B. Revill, S. G. H. Robinson, D. J. Scott, J. I. Shields, H. B. Smart, T. G. Smith, T. R. Sneddon, S. G. Stockley, J. Stringer, C. B. Thomson, P. A. Wallwork, J. W. Weaver, R. H. Westbrook, J. A. Williams, H. J. L. Wotten, H. O. Wylde.

Magnetic Truck.

In last year's report it was mentioned that the Board had authorized the construction of a special magnetic truck to remove nails and other metal fragments from the road-surfaces. The truck commenced operation on the 23rd October, 1931, and up to the end of the financial year 1,945 miles of highway had been swept, resulting in the recovery of 3,208 lb. of metal, or at the rate of 1·65 lb. per mile. Between the 1st April, 1932, and the 30th September, 1932, a length of 1,377 miles of highway was swept, resulting in the recovery of 3,502 lb. of metal, or at the rate of 2·54 lb. per mile.

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, 1932:—

Fairburn Road.—Povey's Bridge: The approaches to this bridge have been completed.

Victoria Valley – Mangonui.—Garton's Corner Bridge: The erection of this bridge, with approaches, has been completed.

Puriri Bridge: The erection of this 40-ft.-span bridge with rolled-steel joists on concrete piles has been completed, and the approaches formed and metalled.

Broadwood–Kaitaia.—Onetoke to Awaroa Bridge: 2 m. 36 ch. has been widened to 20 ft.

Awaroa Bridge – Herekino: 2 m. 68 ch. of formation has been completed.

Waimate–Kaeo–Mangonui.—Kahoe Bridge: The erection of this bridge of 31 ft. span in steel and concrete has been completed, and the approaches are in hand.

Whangaroa – Waiare Junction.—Whangaroa–Kaeo Section: 19 ch. of stone wall has been constructed on a narrow embankment.

Waimamaku–Ohaeawai.—Waiwharu Stream Bridge: The original bridge having collapsed, the erection of a new bridge 29 ft. long, in hardwood, has been completed.

Maungatapere–Kaikohe.—Titoki–Awarua Bridge Section: 2 m. 25 ch. has been widened to 20 ft.

Awaroa Gorge: Three bridges, totalling 185 ft. in length, have been constructed in steel and hardwood, and the approaches formed and metalled.

Whangarei–Kawakawa.—Otonga–County Boundary Section. The approaches to the five bridges built last year have been completed, and the metalling of the section is in hand, 38 ch. being completed.

Whangarei–Dargaville.—Whangarei–Maungatapere Section: 3 m. of bituminous penetration surfacing has been completed.

Dargaville–Maungaturoto.—Anderson's Bridge: The approaches have been formed and metalled.

Bascombes Bridge: The erection of this bridge of three 30 ft. spans in steel and concrete has been completed, and the approaches formed and metalled.

Powell's Bridge: This bridge has been completed.

Wayby–Mangawai.—A length of 90 ch. was metalled in the Wayby Valley.

Kaukapakapa – Port Albert.—Tauhoa–Wharehine Section: Further metalling has been carried out over a length of 4 miles.

Omaumau–Putahi Section: One mile of metalling has been completed.

Auckland–Maungaturoto (No. 1 Highway District).—Waiwera Southwards—Metalling: On the length of permanent formation between 2 m. 29 ch. and 2 m. 63 ch., Sykes' Hill—north side—was reshaped, the base course widened, and wearing-course metal laid. 9 ch. of the south approach to the Waiwera Bridge was widened and completely metalled.

Waiwera Bridge: This bridge, a reinforced concrete structure 330 ft. in length, was completed.

Waiwera–Warkworth Section—Puhoi Bridge: Concrete piles were constructed for the foundations of this bridge.

Formation: 8 ch. of deviation at the north approach to the Waiwera Bridge was constructed and base-course metal laid; 4 ch. of retaining-walls has been erected, and 20 ch. of spall drains laid.

Metalling: Top-course metalling was carried out over a total length of 4 m. 21 ch. This completes the metalling on all lengths of reconstruction work between Puhoi and Warkworth, a total length of 8 m.

Warkworth–Dome–Wayby Section—Culverts: One reinforced-concrete culvert, one water-drive, and 1,138 ft. of pipe culverts have been installed.

Formation: The deviation on the southern side of the Dome Hill has been commenced, and four earthwork contracts are in hand.

Metalling—Base Course: A total of 2 m. 46 ch. of base-course metal was laid between 19 m. 10 ch. and 23 m. 25 ch. Top-course metal was laid on short lengths between 20 m. 41 ch. and 23 m. 25 ch.

Wayby – Wellsford – Te Hana – Topuni Sections—Bituminous surfacing: A length of 9 m. 33 ch. has received a first sealing-coat, on one mile of which the second coat has been applied, and contracts have been let for a further 4 m. 1 ch. of first- and 7 m. 22 ch. of second-coat work.

Auckland–Maungaturoto (No. 2 Highway District).—Waitemata County Section: 56 ch. of bituminous-penetration surfacing was completed.

Great South Road.—Manukau County Section—Tamaki Bridge: The reconstruction work, including the widening of the approaches, has been completed. 8 ch. of concrete pavement was included in this work, and a length of 15 ch. has also been paved at Westfield Overbridge.

Franklin County Section: A deviation is in hand south of Ramarama.

Bombay Hills Deviation: A contract was let for metalling 5¾ m. of the deviation. At the end of the year this work was two-thirds completed, and is now complete and in use by traffic.

Waikato County Section: Between Mercer and Ohinewai a further 26 ch. of bituminous penetration was laid, and between Taupiri and Ngaruawahia a length of 3 m. 75 ch. was completed by contract, including the improvement of the Hopu Hopu Railway crossing. The old Ngaruawahia Railway Bridge, 430 ft. long, was converted for road traffic, and 15½ ch. of approaches formed and metalled. The approaches to the Whangamarino, Rangiriri, and Te Onetea Stream Bridges, a total length of 23 ch., were metalled and surfaced with bitumen.

Auckland–Helensville–Waiwera.—New Lynn Borough—Whau Bridge: The reconstruction of this bridge has been proceeded with during the year, the bridge itself being completed in December and opened for traffic. The construction of parapets and approaches, and the completion of the concrete paving work is in hand.

Waitemata County Section: Brigham's Creek Bridge has been completed.

Pokeno–Waihi.—Franklin County Section—Mangatawhiri Stream: Widening of the stream to 40 ft. has been carried out for a distance of 1 m. 70 ch. to low-water level, affording an appreciably better discharge for flood-waters.

Hauraki Plains County Section: A contract was let for 8 m. 68 ch. of bituminous sealing.

Ohinemuri County Section: A considerable amount of widening has been carried out in the Karangahake Gorge.

Waihi Borough: 1 m. 42 ch. of bituminous sealing was carried out, completing the sealing of the highway through this borough, with the exception of a length of 8 ch.

Pipiroa–Coromandel.—Thames County Section: The reconstruction of the approach to the Kaueranga Bridge is in hand, and the earthwork and metalling have been completed. Widening has been carried out through the borough, including the construction of a concrete sea wall near Tararu.

Thames County Section: A length of this section north of the borough is being widened, and a sea wall 8 ch. in length has been erected in Loughlin's Bay.

Kopu–Raglan.—Ohinemuri County Section: The Komata Bridge, consisting of three 35 ft. spans, in steel and concrete, was completed.

Te Aroha Borough: A considerable amount of widening of the bituminous surfacing has been undertaken.

Piako County Section: The widening of the Waitoa Bridge to 20 ft. is in hand. Between Waitoa Stream and Waiharakeke Stream a contract for the reconstruction and bituminous sealing of 3½ m. is in hand, and the first sealing coat has been applied. From Waiharakeke to the County boundary sealing has been completed, except for 8 ch. at the Piako Bridge; a length of 1 m. 60 ch. of reconstruction, and 4 m. 60 ch. of sealing being carried out during the year. Improvements have been made at the Piako Railway Crossing.

Raglan County Section: A contract was let for the formation and metalling of the deviation across the Raglan Town Hill, a length of 44½ ch., and the work has been practically completed.

Hamilton–Rotorua.—Waikato County Section: Reconstruction and bituminous-penetration surfacing were carried out between Hamilton and Hillcrest over a distance of 61·40 ch.

Matamata County Section: Between Cambridge and Tapapa a further 1 m. 4 ch. was widened and top-dressed with shingle, and a length of 2 m. 8 ch. near the Waimakariri Stream was improved by widening, deviations, and metalling.

Northcote Road.—Northcote Borough: The shoulders on the eastern side of the concrete pavement have been sealed with bitumen.

Titirangi Road.—The concrete paving of the full length of this highway was completed during the year, with the exception of 12 ch. adjacent to the railway crossing at New Lynn.

Mount Albert – Royal Oak.—A contract was let for paving the half-width of this highway between Sandringham Road and Vincent Road, and the work has been commenced.

Te Awamutu – Cambridge.—Leamington Town District: A length of 10 ch. was sealed with two coats of tar.

Ngaruawahia–Waingaro.—A further 1 m. 73 ch. has been widened, and 1 m. 57 ch. metalled.

Pukekohe – Glen Murray, via Tuakau.—Raglan County Section—Tuakau Bridge: A contract was let for the construction of a new reinforced-concrete bridge, consisting of six 110 ft. bowstring trusses and one 35 ft. girder span, over the Waikato River, and the work is in progress.

Pukekohe–Bombay.—Pukekohe Borough: The central strip, which was left with a macadam surface last year, has now been sealed in bitumen.

Howick–Manurewa.—Manukau County Section: Cemetery Bridge having become impassable, a temporary bridge was erected pending reconstruction.

Huntly–Rotongaro.—Huntly Borough: A length of 7 ch. has been surfaced with bitumen.

Ngatea–Waharoa, via Morrinsville.—Piako County Section: A contract was let for the bituminous sealing of 1 m. 72 ch., and sealing was carried out immediately south of Tahuna Township.

Waitoa–Maukoro.—A 5 ft. by 5 ft. concrete culvert was constructed at the Whakahoro Road crossing.

Massey Road.—168 ch. of metalling was carried out between No. 1 Main Highway and White Hills School.

Gisborne–Whakatane, via Motu (No. 3 Highway District).—Motu – Willow Tree Crossing–Nukuhou—Opotiki County Section—Kukumoa Stream Bridge: A reinforced-concrete bridge 22 ft. long has been erected and 7 ch. of approach road formed and gravelled.

Opotiki Borough: Bituminous sealing has been applied to a length of 40 ch. in two coats.

Whakatane–Tauranga.—Tauranga County Section—Otamarakau – Paengaroa – Te Puke: A small deviation was constructed near the Pongakawa Railway Station.

Te Puke – Tauranga: 8 m. was reconstructed and culverted, and 8 m. 30 ch. metalled. A contract was let for three-coat bituminous sealing of 9 m. 30 ch. Six miles has been completed, and the remainder has received one coat.

Kopuroa Stream Bridge: A new bridge, consisting of one 30 ft. steel span on hardwood piles, has been erected.

Tauranga–Waihi.—Tauranga County Section: Bituminous sealing: 90 ch. of two-coat work has been carried out through the Katikati Township, and a contract let for sealing 80 ch. of the Judea Hill.

Tauranga–Matamata: Tauranga County Section — Tauranga–Ruahihi: 139 ch. of two-coat bituminous sealing has been completed.

Whakatane–Rotorua.—Whakatane Borough: 58 ch. of King Street was sealed in two coats.

Rotorua County Section—Culverts: Four reinforced-concrete culverts were constructed between 2 m. 20 ch. and 6 m. 70 ch.

Waiohewa Stream Bridge: A reinforced-concrete bridge of 24 ft. span was erected over this stream.

Te Ngae – Paengaro.—Te Ngae – Waiwhakaretu: 108 ft. of stone protection-wall has been constructed along Rotoiti Lake.

Waioeka Road.—Opotiki Borough: Bituminous sealing in two coats was applied over a length of 10 ch.

Papamoa – Mount Maungunui.—66 ch. has been reformed and 26 ch. metalled.

Gisborne–Opotiki, via Coast.—Cook County Section: From 5·4 m. to 6·3 m. 70 ch. of regrading was completed, eliminating a dangerous crossing and approach at the Makarori Creek and a steep descent to the beach at 6·3 m. A bottom course of metal has been laid and the surplus material from the excavation used for widening the formation from 4 m. to 7 m. On the reconstruction contract between 14 m. and 24 m. 53 ch., 2¾ m. of formation was completed, 4 m. 13 ch. of base-course metal laid, and 7 m. 53 ch. of bituminous penetration and sealing carried out. The work involved extensive subgrade drainage, some 12,000 ft. of stone and tile drains being laid.

16·3 m. to 17·2 m.: A contract for the formation of 64 ch. on an improved alignment was completed, and a bottom course of shingle laid.

Uawa County Section: Tenders were called for the strengthening and bituminous surfacing of 6 m. 23 ch. from 24 m. 57 ch. to 31 m.

Waiapu County Section: An 8 ft. by 6 ft. reinforced-concrete culvert has been constructed at 47·5 m.

Shepherd's Bridge, at 53·1 m.: A contract for the construction of this bridge is in progress.

97·7 m. to 98·7 m: Contracts for the reforming, culverting, and metalling of 1 m. were completed.

Matakaoa County Section: Awatere River Bridge.—This bridge, which consists of three 60 ft. plate girder spans and one 35 ft. approach span in concrete, with approaches, has been completed.

Gisborne–Wairoa, via Morere (No. 4 Highway District).—Cook County Section: Between 9 m. and 10·2 m. the base-course metal on 98 ch. of new formation was completed and the construction of a bituminous penetration surface put in hand.

Maraetaha Bridge at 19 m.: The construction of this 100 ft. steel and concrete bridge was carried out.

Gisborne–Opotiki, via Motu (No. 4 Highway District).—Cook County Section: The bituminous-penetration surfacing between 7·5 m. and 9 m. has been completed.

Rotokautuku–Waiomatatini.—Wairoa Stream Bridge: The construction of this 80 ft. steel and concrete bridge, together with 32 ch. of approaches, is nearing completion.

Matawai–Koranga.—The 5-mile section of this highway between Matawai and the Waioeka turnoff, which is now a component part of the main Gisborne–Auckland route via Waioeka Road, has been improved in width, alignment, and curvature over a length of 57 ch., and the work is being continued.

Napier–Gisborne, via Wairoa (No. 5 Highway District).—The restoration of the damage to this and other main highways caused by the earthquake of the 3rd February, 1931, has been continued.

Hawke's Bay County Section: The damaged bridge over the Petane Stream was replaced by a 4 ft. reinforced-concrete culvert. The timber bridge over the Esk River was reinstated by the erection of new concrete piers and abutment-walls with steel and concrete superstructure. Widening is being carried out between Te Ngaru Crossing and Tutira Homestead gate.

Wairoa River Bridge: A new concrete and steel bridge to replace the old bridge wrecked by the earthquake is in course of construction. At the end of the year pile-driving was well towards completion, and the placing of concrete casings and the building-up of piers was in hand. A vehicular ferry surface was put into operation to convey traffic across the river. (This bridge has since been very seriously damaged by the earthquake of the 16th September, 1932.)

Napier–Wellington, via Wairarapa (No. 5 Highway District).—Hawke's Bay County Section: The bridge at Pakowhai over the Ngaruroro River, which collapsed during the earthquake, was repaired by driving additional piles and replacing damaged portions of the trusses.

The Te Aute Hill deviation was sealed with three coats of bitumen.

Waipawa County Section: A length of 4 m. between Waipawa and Waipukurau Traffic Bridges received two coats of bituminous sealing. The final two coats of sealing were completed on the Takapau Plains for a distance of 3½ miles.

Dannevirke County Section: A length of 2 m. 30 ch., commencing at Norsewood, was sealed in two coats of bitumen, and 41 ch. on the Mangatewai-iti Hill was similarly treated.

Woodville County Section: Several lengths, totalling 120 ch., between Papatawa and the borough boundary were given two coats of bituminous sealing.

Petane–Taupo.—Hawke's Bay County Section: Extensive repairs were carried out to Nunn's Bridge on the Mangakopikopiko Stream, and the old bridge over the same stream at Marshall's Crossing was replaced on an improved alignment by a concrete and steel structure. Two other bridges were replaced by concrete-pipe culverts. The road was improved by cutting back corners and widening the formation between Eskdale and Lucky Hill.

Napier–Tukituki, via Omahu.—Hawke's Bay County Section: Extensive temporary repairs have been carried out to the Redclyffe Bridge and the Taradale No. 4 Bridge. The Havelock Bridge over the old Ngaruroro Stream, which was totally wrecked, has been replaced by a new structure of six spans, in reinforced concrete with steel joists.

Dannevirke–Waipukurau, via Porangahau.—Patangata County Section: A number of corners were improved on the Wimbledon Road, and widening carried out near Wanstead.

Dannevirke County Section: Corners have been cut back and widening carried out between 10 m. and 15 m. The Mangatera Stream Bridge approaches were fenced and 15 ch. of protective fencing erected on the 4 m. hill.

Weber County Section: 6 ch. of protective fencing was erected at the approaches to Sargent's Bridge.

Waipatiki Deviation: The earthwork for this deviation, 50 ch. in length, was practically completed.

Woodville – Palmerston North.—Manawatu Gorge Bridge: This bridge and its approaches have been completed.

Weber–Eketahuna.—A corner was cut back and 15 ch. of protective fencing erected at 14 m.

Woodville–Tamaki.—Woodville County Section: A 10 ch. deviation was put in on England's Hill to cut out a bad bend, a further 30 ch. on this hill was widened, and a corner near the Papatawa School cut back.

Waipukurau–Matamau, via Hatuma.—Dannevirke County Section: 17 ch. of protective fencing was erected on Holden's Hill.

Hastings–Pakipaki.—Hawke's Bay County: A deviation was constructed at the Pakipaki Township, eliminating two bends.

Auckland–Wellington, via Taranaki (No. 6 Highway District).—Otorohanga–Hangatiki—Mangapu Bridge: This bridge, consisting of two 60 ft. spans in steel and concrete, was completed. Formation and metalling: 12 ch. of formation was completed, 4 m. of base-course and 3 m. of top-course metal laid.

Te Kuiti – Bulls, via Taumarunui (No. 6 Highway District).—Tangitu–Taumarunui Section: An 81 ft. truss bridge was completed at the foot of the Hiwi Hill.

Stratford–Taumarunui (No. 6 Highway District).—Paparata County Boundary Section: The clay gap in this length (2 m. 68 ch.) was metalled, giving the township of Ohura an all-weather route to Taumarunui.

County Boundary – Taumarunui Section.—Base-course metal was laid on the 6 m. unmetalled portion of the section; 2 m. of top-course metalling was also completed.

Caves – Lemon Point.—Hangatiki – County Boundary Section: 2½ m. has been widened.

Otorohanga–Honikiwi.—Two bridges each 25 ft. in length were constructed over the McKenzie and Oamaru Streams.

Tokirima Road.—60 ch. of metalling was carried out between Old's Bluff and Tokirima Station Road.

National Park – Taupo.—National Park – Tokaanu Section—Otukou Deviation: 3 m. 44 ch. of new formation and two bridges totalling 125 ft. in length were completed.

Auckland–Wellington, via Taranaki (No. 7 Highway District).—Mahoenui–Mokau: 108 ch. of first-coat and 12 ch. of second-coat sealing were carried out.

Mokau – Pukearuhe Junction: 65 ch. of bituminous penetration surfacing has been laid south of Uruti, and a 40 ft. reinforced-concrete bridge erected over the Mangahia Stream.

Taranaki County Section: The railway overbridge near Waitara and the formation metalling and fencing of 9 ch. of approaches have been completed. Bituminous-penetration surfacing has been laid on the 24 ch. deviation south of Lepperton.

Eltham Borough: 48 ch. of bituminous surfacing was widened.

Lepperton Junction – Hawera, via Opunake.—Taranaki County Section: The Katikara Deviation, 37 ch. in length, received a bituminous penetration course, which completes the work. 46 ch. on Bett's Hill was sealed in two coats of bitumen.

Egmont County Section: the 17 ch. deviation at the Oeo Stream has been metalled.

New Plymouth – Kaimata.—Taranaki County Section: 12 ch. of formation and metalling of deviations was completed, and the bitumen surface was brought up to standard as regards width and superelevation over a further length of 130 ch.

Stratford–Taumarunui (No. 7 Highway District).—Stratford County Section: Between Stratford and Toko (5 m.) the shoulders were built up and sealed with bitumen.

Toko Road.—130 ch. was sealed with one coat of bitumen.

Ngamotu Road.—82 ch. has been sealed with bitumen.

Eltham–Opunake.—Eltham County Section: The bituminous surfacing has been widened for a distance of 1 m. 20 ch.

Normanby – Manaia – Mount Egmont.—The bituminous surfacing was widened over a length of 196 ch.

Skeet Road.—Waimate West County Section: One mile of the bituminous surfacing has been widened.

Egmont County Section: 30 ch. of first- and second-coat sealing was carried out.

Auckland–Wellington, via Taranaki (No. 8 Highway District).—Patea County Section: 3 m. 70 ch. of widening of the bituminous surface was completed, making a total of 12 m. on the section.

Waverley Town District: 58 ch. of widening of the bituminous surface was carried out.

Waitotara County Section: A contract for the reconstruction of the Waitotara Hill is in progress, 40 ch. of formation and 24 ch. of metalling being completed.

75 ch. was reconstructed and metalled on the Okehu Section, and on the Kai-iwi Hill 59 ch. was reconstructed and metalled and 33 ch. sealed in bitumen.

Wanganui County Section: The Wangaehu Hill, 77 ch. in length, was sealed in bitumen, which completes the reconstruction and surfacing of the County Section.

Rangitikei County Section: The reconstruction of the length between Turakina and Bulls is in hand, 3 m. 49 ch. of formation and metalling being completed. A first coat of bituminous surfacing was applied on 4 m. between Wangaehu and Turakina.

Ball Road.—A further 1 m. 8 ch. of two-coat bituminous surfacing has been applied.

Bonny Glen – Norwood Corner.—10 ch. of reformation has been carried out at Fern Flats.

Te Kuiti – Bulls, via Taumarunui (No. 8 Highway District).—Mangaweka Town District: The reconstruction and bituminous surfacing of 1 m. 14 ch. was carried out, and a further 5 ch. reconstructed.

Taihape Borough: 6 ch. has been reconstructed and metalled.

Rangitikei County Section: The Hautapu River Bridge, a reinforced-concrete arch span of 100 ft. with two 40 ft. concrete-beam spans, has been completed, and the approaches are in hand. Improvements to curves have been extensively carried out on this section.

Ohakune Borough: A length of 8 ch. has been reconstructed and sealed.

Tohanga Road Section: A contract was let for the metalling of the clay portion of the section and 1 m. 36 ch. of base-course has been laid.

Kaharoa Road.—A length of 1 m. has been sealed in two coats of bitumen.

Koki Road.—46 ch. of metalling was carried out.

Mangaweka–Feilding.—Mangaweka Town District: 49 ch. of reconstruction and two-coat bituminous surfacing was completed.

Momahaki State Farm Road.—Second-coat bituminous surfacing was applied over a length of 40 ch., and improvement to corners carried out on Ngutuwera Hill.

Rangitatau East and Watershed Roads.—One mile of metal was laid near Paparangi Hill and 28½ ch. of formation widened.

Turakina Cliff Road, via Marton.—The reconstruction of Gower's Hill, involving heavy formation, is being continued.

Wanganui–Horopito.—Wanganui County Section: Reconstruction and improvement of this highway is in progress, 2 m. 11 ch. of widening has been completed, and 1 m. 25 ch. is in hand between 16 m. and 34 m., and a large water-tunnel is being driven at the Kakatahi Stream.

Waimarino County Section: A water-tunnel 216 ft. in length and a filling is being put in to replace a bridge at McLean's Stream. Widening, improvement of curves, and culverting is being undertaken on this section.

Waverley Beach Road.—21 ch. of metalling and 63 ch. of bituminous surfacing have been completed.

Wanganui Airport Road.—Improvements have been carried out, including the replacing of an old bridge by a triple 3 ft. concrete-pipe culvert, and the construction of a loop road at the Airport end.

Wanganui–Karioi.—The alignment has been improved by widening, several bridges replaced by culverts, and the surfacing materially strengthened.

Wellington–Auckland, via Taranaki (No. 9 Highway District).—Makara County Section—Johnsonville – Tawa Flat: On this section three short lengths previously unpaved were surfaced with bituminous concrete, a total length of 31 ch. being laid.

Porirua–Paremata: The realignment of this section was continued during the year, a total length of 1 m. 12 ch. being formed and metalled.

Hutt County Section—Paremata–Waikanae: On the Paekakariki Hill 2 m. 32 ch. of second-coat sealing was completed. From McKay's Crossing to Paraparaumu 1 m. 57 ch. of shoulders were built up and sealed with one coat of bitumen.

Horowhenua County Section: The approaches and the decking of the Manakau Bridge, a length of 10 ch., were surfaced with bituminous material. The whole of the section between Levin and the Wirokino Bridge, with the exception of the Wirokino Deviation, has now been reconstructed and surfaced with bitumen. Widening and preparation work comprised 1 m. 65 ch., new formation and metalling of the deviation 35 ch., and bituminous penetration 1 m. 70 ch.

Otaki River Flood Protection: To prevent flooding of the main highway at Otaki, a stop-bank 21 ch. long was erected across a flood channel of the Otaki River 1½ m. above the bridge.

Foxton Borough: At the northern end of the borough a deviation 15 ch. in length was formed and metalled.

Manawatu County Section: The bituminous concrete pavement between Foxton and Himatangi was completed, 2 m. 25 ch. being laid during the year. Between Himatangi and Sanson 1 m. of widening of shoulders was carried out.

Levin – Palmerston North, via Shannon.—Horowhenua County Section: Broadbelt's Bridge, a 15 ft. concrete span, was completed by contract. The bridge deck and approaches were paved with bituminous material. On Pott's Hill a further 10 ch. of heavy widening was carried out.

Shannon Borough: Widening and preparation for sealing was completed, a length of 41 ch. being carried out during the year.

Kairanga County Section—Kahuterawa Bridge: A contract was let for the erection of this bridge, which comprises two 40 ft. steel and concrete spans. At the end of the year all the piles had been cast.

Sanson – Palmerston North.—Manawatu County Section: On the Mount Stewart Hill, 60 ch. of second-coat sealing was completed.

Awahuri–Mangaweka, via Kimbolton.—Oroua County Section: Between Feilding and Cheltenham 4 m. was prepared for sealing, 3 m. of three-coat sealing, and 1 m. of priming coat were completed.

Kiwitea County Section: At the Cheltenham Cross Roads intersection, an area equal to 7 ch. of road has been prepared for sealing, and received a priming coat.

Ashhurst–Pohangina.—Oroua County Section: In the Ashhurst Township 26 ch. was surfaced with 2 coats of bitumen.

Greatford–Woodville, via Feilding and Ashhurst.—Aorangi Bridge: The construction of this bridge was completed and the deck and footpath surfaced with bitumen. The approaches, comprising 14 ch. of formation and 19 ch. of metalling, were formed and metalled, and a contract let for sealing.

Kairanga County Section: The three-coat sealing between Aorangi Bridge and Taonui has been completed, 46 ch. of two-coat work being laid during the year.

Foxton–Shannon.—Shannon Borough: This section, 43 ch. in length, was widened and remetalled, and 24 ch. surfaced with 2 coats of bitumen.

Wellington–Napier, via Wairarapa (No. 9 Highway District).—Hutt County Section—Taita Gorge: As a result of a serious flood in the Hutt River, a 10 ch. length through the Taita Gorge was badly washed out. This was repaired with a wired stone gabion breastwork stepped down from road-level to the bottom of the river.

Akatarawa–Rimutaka Summit: 71 ch. of heavy widening was completed, the work being mostly in rock. A concrete block crib-wall 130 ft. long by 23 ft. high was constructed at a weak point. Preparation and first-coat sealing were completed over a length of 2 m. 66 ch. Second-coat work was completed over a length of 3 m. The whole of this 11 m. section is now surfaced with one-coat and a large proportion with two-coat sealing.

Feilding–Hunterville.—Kiwitea County Section—Haycock's Bridge: This concrete bridge of three 35 ft. spans was erected, and the approaches, 12 ch. in length, formed and metalled.

Bunnythorpe–Kairanga.—Kairanga County Section: One mile was prepared for sealing and received a priming coat of bituminous material. Improvements to alignment and visibility at the Bunnythorpe Railway Crossing were completed, comprising 9 ch. of formation and metalling.

Upper Hutt – Waikanae.—Widening to 20 ft. was completed over a length of 2 m. 38 ch.

Porirua – Titahi Bay.—The road was widened and prepared for sealing over a length of 28 ch., and 18 ch. was sealed with two coats of bitumen.

Wellington–Napier, via Wairarapa (No. 10 Highway District).—Featherston County Section—Rimutaka Summit – Featherston: On this section 46 ch. of heavy widening was completed. A stone groyne 42 ft. long was constructed in Abbott's Creek to prevent erosion of the road. Three concrete-block crib retaining-walls were built of a total length of 110 ft. The remaining unsealed portion of this section was prepared and sealed with two coats over a length of 1 m. 20 ch. The whole of this section is now surfaced with two-coat sealing.

Wairarapa South County Section: Protective sheet-piling works were carried out at the Waiohine Bridge.

Masterton County Section: Between Masterton and the Ruamahanga Bridge 9 m. was widened and reformed, and the first 3 m. 40 ch. surfaced with three-coat bituminous sealing.

Eketahuna County Section: Two small bridges were replaced with large-diameter concrete pipes.

Eketahuna Borough: At the south end of the Borough a narrow section 40 ch. in length was widened, reformed, and metalled. Two concrete culverts 3 ft. in diameter were installed. 1 m. 6 ch. was prepared and sealed with three-coat bituminous surfacing.

Pahiatua County Section: Over a length of 10 m. the shoulders have been raised and widened.

Carterton–Longbush.—Wairarapa South County Section: Protective works were carried out at the Kokotau Bridge, and widening over a length of 78 ch. was undertaken.

Carterton–Gladstone.—Protective works were carried out at the Backwater Bridge.

Tupurupuru–Westmere.—Widening was carried out over a distance of 15 ch.

Martinborough–Masterton, via Gladstone.—Martinborough Borough Section: 78 ch. was sealed with a first coat of bitumen.

Featherston County Section: A 5 ft. by 4 ft. reinforced-concrete culvert was constructed.

Wairarapa South County Section: Widening was completed over a length of 3 ch. and two concrete culverts built.

Masterton County Section: Widening was completed over a distance of 2 m.

Pahiatua Station Road.—Mangatainoka River Bridge: A contract has been let for the construction of this bridge, which comprises seven 68 ft. concrete bowstring spans, and protective works. The protective works have been completed, and a commencement has been made with the pile driving for the bridge piers.

Greytown–Bidwill's Cutting.—Featherston County Section: 2 m. 40 ch. has been reformed, widened, and metalled. One mile of first-coat sealing was also completed.

Featherston – Pigeon Bush.—Wilkinson's Bridge: This concrete bridge of one 30-ft. span was completed, together with its approaches.

Westmere Highway.—A reinforced-concrete culvert 8 ft. by 4 ft. 6 in. was constructed to replace a small wooden bridge.

Picton–Bluff (No. 11 Highway District).—Picton Borough: 30 ch. has been surfaced with bitumen.

Dashwood Pass Deviation: Formation has been continued throughout the year, the length completed, with culverts, being 1 m. 6 ch. The total length of completed formation is now 7 m. 34 ch. Metalling has been completed over a length of 2 m. 9 ch. Fencing has been erected for a length of 3 m. 7 ch. Bridges: Construction is in hand on the following bridges: Overbridge at 0 m. 18 ch., Seventeen Valley Stream Bridge at 1 m. 38 ch.; Pukapuka Stream Bridge at 2 m. 9 ch., overbridge at 4 m. 28 ch., bridges at 6 m. 74 ch., and 7 m. 37 ch., and Stafford Creek Bridge at 7 m. 67 ch. Reinforced-concrete culverts have been constructed at 4 m. 34 ch., 4 m. 38·5 ch. and 6 m. 7 ch.

Blenheim–Nelson.—Waimea County Section: The reformation and three-coat sealing of 1 m. 29 ch. adjacent to the Nelson City boundary was completed. In connection with this work 25 ch. of sea-wall was erected.

Nelson–Inangahua (No. 11 Highway District).—Tahunanui Town District: The bituminous-penetration surfacing was completed to a total length of 2 m. 10 ch. The widening of Abattoir Creek Bridge was completed, and the retaining-wall at Magazine Point extended for a distance of 100 ft.

Richmond Borough: 1 m. 69 ch. was surfaced with three-coat sealing, completing the sealing throughout the borough.

Richmond–Pakawau.—Waimea County Section: The metalling and fencing of the Moutere Deviation have been completed. The construction of Thompson's Bridge, a 40 ft. span in steel and concrete, is in hand.

Branch River – Hope Junction.—The erection of Connor's Creek Bridge, Six-mile Creek Bridge (Upper), Six-mile Creek Bridge (Lower), and Roundell Creek Culvert, all in reinforced concrete, have been completed.

Westport–Karamea.—Karamea Bridge to Karamea Post-office—Protective Work at Overflow: Four permeable groynes, aggregating 207 ft. in length, have been constructed.

Mokihinui–Karamea Bridge Section—Tidal Creek Bridge: The construction of this bridge, which consists of two 40-ft. and one 30-ft. steel-joist spans on hardwood piles, is in hand.

Little Wanganui River Erosion: Five permeable timber groynes, totalling 120 ft., were built above the bridge.

Stone Pitching, Otumahana Lagoon: The batter of the filling between the Blackwater and Granite Creek Bridges was stone-pitched to prevent erosion. Temporary bridges have been built at Sandal and Surveyor's Creeks. A considerable amount of culverting has been carried out.

Westport–Mokihinui Section—Rapid Creek Bridge Approaches: The raising of the road above flood-level is in hand, and work on the Westport end has been completed.

Improvements 11 m. 40 ch. to 12 m. This work, comprising the raising of a length of road through swamp, is nearing completion.

Improvements 15 m. to 15 m. 40 ch. From the Westport end of the Little Ditch Bridge the road has been raised and widened through a swamp.

Westport–Nelson (No. 12 Highway District).—Westport – Eight-mile Section—Coal Creek Bridge: The construction of a new bridge of two 40-ft. spans has been commenced.

Railway Overbridge at 0 m. 60 ch., Inangahua: A reinforced-concrete overbridge of three 20-ft. spans has been built over the Westport–Inangahua Railway formation.

Culvert at 3 m. 10 ch. (Spring Creek): An 8 ft. span reinforced-concrete bridge has been built to replace an old timber structure.

Erosion at 29 m.: The gabion and pile groyne in the Inangahua River at the Junction has been extended, and a low length of road between the groyne and Jackson's Gully raised.

Horseshoe Bend: A pile and crib retaining-wall with stone backing has been built across a washout.

White Bridge: A bridge consisting of two 40-ft. steel spans has been erected.

Lyell Creek Bridge: The replacement of the damaged bridge with a new structure of three 40-ft. steel spans on improved grade and alignment was commenced.

Washout at 14 m. 60 ch.: A concrete retaining-wall has been completed and the road widened

Washout at 15 m.: A bridge of one 40-ft. steel span on concrete abutments has been completed.

Inangahua–Waiho.—Inangahua–Reefton Section—Culvert at 7 m. 16 ch.: A twin 30-in. concrete-pipe culvert has been installed to replace a small timber bridge.

Mile Creek Bridge at 17 m. 30 ch.: The construction of this bridge—a 20 ft. ironbark span on concrete abutments—has been put in hand.

Reefton – Big Grey Section—Slab Hut Creek Culvert: The bridge over this creek has been replaced with a 6 ft. pipe culvert.

Big Grey Protective Work: Three pile groynes, aggregating 90 ft. in length, have been constructed on the upstream right bank of the Big Grey River.

Snowy Creek Bridge: The work of replacing the old wooden bridge with a steel and concrete structure has been commenced.

Big Grey – Taramakau Section—Ahaura River Bridge: The approaches were completed, and the bridge opened for traffic.

Greymouth–Omoto—Widening and Improvements: The first section was completed during the year. The work consisted of regrading and widening 7 ch. of narrow road with improved alignment.

Nelson Creek Railway Crossing: This crossing was improved by regrading and widening.

Taramakau–Ross Section—Waimea Creek Bridge at Goldsborough: The superstructure of this bridge has been renewed. A concrete culvert (8 ft. span) has been constructed at Kumara.

Ross–Waiho Section—La Fontaine Creek: The raising of 10 ch. of roadway adjacent to the La Fontaine bridge was carried out.

O'Neill's Creek Bridge: This structure, which consists of one 20 ft. timber span on ironbark piles, together with stone crate protection work and approaches, was completed.

Vine's Creek Bridge: Crate protection work at the abutments of this bridge was completed.

Butler's Creek Bridge: A timber bridge of 25 ft. span, with approaches, was completed.

Rodger's Creek Culvert: The construction of a 10 ft. span reinforced concrete culvert was completed.

McDonald's Creek Bridge: Stone-crate protection at abutments and approaches was carried out.

Little Wanganui River Bridge: Heavy concrete block protection has been placed round the northern abutment. A pile and crate groyne 50 ft. long has been constructed, also 30 ft. of permeable timber groyne.

Waitangi River Bridge: The extensive repair work due to the serious floods last year has been completed. This work included the reconstruction of 22 ch. of approach road with stone-crate protection and spur groynes. Heavy concrete blocks were placed as a protection at the abutment. 200 ft. of permeable timber groyne work was constructed, and 9 acres planted with willows.

Westport–Greymouth Coast Road.—Charleston–Brighton Section: A masonry retaining wall 80 ft. long was built near Deep Creek.

Deviation at Mountain Creek: The approaches to Mountain Creek Bridge have been straightened and improved.

Culvert at 10 m.: A small bridge was replaced by a 3 ft. concrete pipe culvert.

Improvement 12 m. to 17 m.: Extensive improvements are in hand on this length. 68 ch. of clearing, and 41 ch. of reforming and widening have been completed, and metalling is in progress.

Charleston–Brighton Section: Widening, straightening, and metalling on narrow lengths is in hand.

Greymouth–Punakaiki Section—Deviation at Sea Erosion between 9 m. 39 ch. and 9 m. 65 ch.: This work is nearing completion.

Reefton–Maruia.—Reefton – Nine-mile Section—Murray Creek and Garvey's Creek Bridges: 20 ft. timber span bridges have been constructed at these creeks.

Picton–Bluff (No. 13 Highway District).—Waipara County Section: 4 m. of two-coat and 1½ m. of one-coat bituminous sealing have been applied, and reformation carried to a distance of 13 m. from Waipara.

Dashwood–Upcot.—Blairich River Bridge: This bridge, of three 40 ft. steel-joist spans, was completed.

Picton–Bluff (No. 14 Highway District).—Waimairi County Section: 1 m. 20 ch. of cement concrete paving and 13½ ch. of bituminous paving were carried out.

Eyre County Section: 6·5 ch. of bituminous concrete and 14 ch. of cement concrete pavement were completed.

Kaiapoi Borough: 4 ch. of cement concrete paving, and 1 m. 26 ch. of bituminous sealing of shoulders were completed.

Springs County Section: A 1 m. experimental strip of bituminous surfacing has been laid near Rolleston.

Christchurch – New Brighton, via Pages Road.—New Brighton Borough—Avon River Bridge: This bridge, 74 ft. long in reinforced concrete, has been erected, and the approaches 1·8 ch. in length paved with bituminous concrete.

Picton–Bluff (No. 15 Highway District).—Ashburton County Section—Rakaia–Dromore: A contract was let for 9 m. 5 ch. of reconstruction and bituminous sealing, 1 m. 31 ch. of priming coat being completed.

Dromore–Ashburton: Three-coat sealing has been completed from the Ashburton Borough Boundary to Dromore Station Road, a distance of 7 m. 60 ch.

Ashburton River Bridge: The approaches to this bridge have been sealed in one coat for a total distance of 27½ ch.

Ashburton Borough: 78½ ch. of three-coat sealing has been completed.

Geraldine County Section: The approaches to Cooper's Creek, Waihi River, and Waihi Creek Bridges have been surfaced with mixed-in-place bituminous pavement for a total distance of 7 ch.

Opihi River to Timaru Borough Boundary—Levels County Section: 7 m. 65 ch. of three-coat sealing has been completed.

Ashburton–Staveley.—A reinforced-concrete culvert of 8 ft. span has been constructed near Springburn.

Picton–Bluff (No. 16 Highway District).—Waikouaiti County Section—Waitati–Merton: Contracts were carried out for the bituminous surfacing of the whole of this section.

Merton – Palmerston Section: The reformation and widening of the road northward from the old Merton Creamery was put in hand, and 40 ch. completed except for additional metalling.

Waitaki County Section—Herbert–Maheno: A contract was let for two-coat sealing on this section for a distance of 4 m. 64 ch. and 2 m. of first-coat work completed.

Dunedin – Port Chalmers.—West Harbour Borough: Sealing was carried out over a length of 89 ch.

Palmerston–Queenstown, via Becks.—Maniototo County Section: River-channel clearing and stop-bank erection for the protection of the Kyeburn River Bridge were carried out.

Lake County Section: A concrete arch retaining-wall, pierced by two 3 ft. culverts, was constructed to replace the Swiftburn bridge. The height of the wall is 45 ft. and the crest length 60 ft. The approaches for a total length of 20 ch. were widened and regraded. Two 3 ft. culverts were installed at Lake Hayes to replace a small bridge.

Timaru–Queenstown, via Lindis Pass.—Vincent County Section: The construction of Black Bridge over the Lindis River near Morven Hills was completed. Reconstruction work in Lindis Pass, principally widening, was carried out over a length of 1 m. 19 ch., 25 ch. of which has been metalled.

Dunback–Middlemarch.—44 ch. between Macrae's and Moonlight has been metalled.

Clarksville–Springvale (No. 16 Highway District).—Vincent County Section: Widening of corners in the vicinity of Gorge Creek and Alexandra has been undertaken.

Picton–Bluff (No. 17 Highway District).—Taieri County Section: 5 m. 63 ch. of bituminous-concrete pavement was laid from Hope Hill to the Taieri River Bridge, including the bridge deck and the curve at the south approach.

Clutha County Section: Widening has been carried out on lengths between Clinton and the county boundary.

Mosgiel Junction – Middlemarch.—Mosgiel Borough: A contract for three-coat sealing through the borough was carried out, the total length being 1 m. 62 ch.

Taieri County Section—Deep Stream Deviation: A deviation 1 m. 53 ch. in length, to obviate an exceptionally steep hill on this section, was put in hand. 120 ch. of formation and 37 ch. of base-course metalling have been completed.

Dunedin–Portobello.—Reconstruction was carried out on this highway from the end of the bituminous pavement at 4 m. 0 ch. towards Portobello, 9 m. 72 ch. The earth-works and sea-wall were completed throughout, and metal laid from 4 m. 0 ch. to 7 m. 50 ch. 24 ch. of footpath was formed at Portobello, and a 7 ft. reinforced concrete culvert, 106 ft. long, with 51 ft. of concrete channel, constructed at Macandrew's Bay.

Clarksville–Springvale (No. 17 Highway District).—Tuapeka County Section: 8 ch. of low-lying road at Docherty's bridge near Lawrence, has been raised to a higher level.

Lawrence Borough: 24 ch. in the business area has been sealed in bitumen.

Balclutha–Papatowai.—Corners have been widened on the Balclutha Section.

Picton–Bluff (No. 18 Highway District).—Southland County Section—Mataura–Gore: 4 m. 49 ch. has been sealed in bitumen.

Lorne–Castlerock.—Southland County Section—Winton Channel Bridge: A new bridge 18 ft. long has been erected.

Argyle–Tuatapere.—Wallace County Section—Devery's and Gorrie's Bridges: New bridges 40 ft. and 60 ft. in length respectively have been erected.

Riverton–Orepuki.—Riverton–Roundhills Section: 4 m. 20 ch. has been widened, and further widening is being undertaken.

Signed on behalf of the Main Highways Board,

F. W. FURKERT,
Chairman.

APPENDIX A.

The Finance Act, 1931 (No. 3).

"2. Section forty of the Finance Act, 1930, is hereby amended as follows:—

"(*a*) By omitting from subsection one the reference to the thirty-first day of August, nineteen hundred and thirty-one, and substituting a reference to the thirty-first day of August, nineteen hundred and thirty-two:

"(*b*) By omitting from paragraph (*a*) of subsection two the reference to the first day of September, nineteen hundred and thirty-one, and substituting a reference to the first day of September, nineteen hundred and thirty-two:

"(*c*) By omitting from paragraph (*b*) of subsection two the reference to the thirty-first day of August, nineteen hundred and thirty-one, and substituting a reference to the thirty-first day of August, nineteen hundred and thirty-two:

"(*d*) By omitting from paragraph (*c*) of subsection two the reference to the thirtieth day of June, nineteen hundred and thirty-one, and substituting a reference to the thirtieth day of June, nineteen hundred and thirty-two:

"(*e*) By omitting from paragraph (*d*) of subsection two the reference to the thirty-first day of March, nineteen hundred and thirty-one, and substituting a reference to the thirty-first day of March, nineteen hundred and thirty-two."

The Finance Act, 1931 (No. 4).

"45. (1) There shall, without further appropriation than this section, and not later than the thirty-first day of March, nineteen hundred and thirty-two, be paid to every County Council out of the Main Highways Revenue Fund a subsidy at the rate of two shillings and sixpence in the pound on the amount certified by the Government Statistician to be the average annual amount of all rates collected by such Council during the period of three years ended on the thirty-first day of March, nineteen hundred and thirty.

"(2) Every Council shall, on receiving such subsidy, apply the same for the purpose of granting to each of its ratepayers a refund, or a rebate, as the case may require, of twelve and one-half per centum of the amount payable in respect of rates levied for the financial year ending on the thirty-first day of March, nineteen hundred and thirty-two, and paid by such ratepayer not later than that date. Any balance of such subsidy remaining after making all such refunds or rebates shall be credited to the Council's General Account for such of the purposes thereof, other than expenditure on Main Highways, as the Minister of Public Works approves:

"Provided that if the rates made and levied by any Council in respect of the current financial year are lower than the corresponding rates for the last preceding financial year, the Minister of Public Works may authorize such reduction in the rate of such refund or rebate as he thinks proper.

"(3) A subsidy shall be paid pursuant to this section to every Road Board the district of which is situated wholly within a county in which the Counties Act, 1920, is in full force, and the foregoing provisions of this section shall extend and apply accordingly to every such Road Board."

The Finance Act, 1932.

"36. Section forty of the Finance Act, 1930, and section two of the Finance Act, 1931 (No. 3), are hereby repealed.

"37. (1) During the financial year ending on the thirty-first day of March, nineteen hundred and thirty-three, there may be retained in the Consolidated Fund for the purposes thereof such amount or amounts, not exceeding in all the sum of five hundred thousand pounds, as the Minister of Finance directs, out of the net revenues derived during that year from Customs duty on motor-spirits and otherwise payable pursuant to paragraph (*a*) of subsection one of section nine of the Motor-spirits Taxation Act, 1927, into the Revenue Fund of the Main Highways Account established under the Main Highways Act, 1922. Before giving any direction for the purposes of this section the Minister of Finance shall take into consideration the estimated expenditure from the Revenue Fund of the Main Highways Account for the financial year aforesaid, and no direction shall be given by the Minister that would reduce the amount which in his opinion is necessary to meet the proper requirements of that Fund.

"(2) Section thirty-eight of the Finance Act, 1930 is hereby repealed.

. . . . . .

"39 (1) For all the purposes of subsection one of section forty-five of the Finance Act, 1931 (No. 4), all rates collected during the period of three years ended on the thirty-first day of March, nineteen hundred and thirty, by the Road Board of any road district which not later than the thirty-first day of March, nineteen hundred and thirty-one, has been merged in the county of which it formed part, shall be deemed to have been rates collected by the Council of such county during the said period of three years.

"(2) Any certificate heretofore given by the Government Statistician as to the average annual amount of rates collected during the said period by any County Council to which this section applies shall be amended by him accordingly, and such additional amount of subsidy under the said section forty-five as may be required by reason of such amendment shall, without further appropriation than this section, be paid out of the Main Highways Revenue Fund. All payments of additional subsidy heretofore made that would have been lawfully so made had this section been then in force are hereby validated.

"(3) The refund or rebate of rates provided for by subsection two of the said section forty-five shall be granted to every ratepayer of every County or Road District notwithstanding that his rates may not have been paid within the time limited by that subsection. Where any such rates have not been paid at the passing of this Act, such rebate may, if the County Council or Road Board, as the case may be, thinks fit, be granted by way of writing off the amount thereof from a ratepayer's liability in respect of such rates."

APPENDIX B.

No. 1 Highway District.—Waipoua Forest Road: A length of 30 miles was declared.

Kaukapakapa–Port Albert via Glorit and Tauhoa Main Highway: A length of 20 miles was revoked, but was redeclared on the 26th May, 1932.

No. 2 Highway District.—Albany–Browns Bay Main Highway: A length of 3 miles 40 chains was declared.

Tuakau–Pokeno via Whangarata Main Highway: A length of 5 miles 55 chains was declared.

Papakura–Titi Main Highway: A length of 17 miles 37 chains was declared.

Waihi Beach Road Main Highway: A length of 5 miles 41 chains was declared.

Frankton–Pirongia Main Highway: A length of 16 miles 52 chains was declared.

Tuakau Bridge–Port Waikato Main Highway: A length of 15 miles 20 chains was declared.

Takapuna–Silverdale Main Highway: A length of 8 miles was revoked.

No. 3 Highway District.—Gisborne–Opotiki via Waioeka Main Highway: A length of 32 miles 25 chains was declared.

Opotiki–East Cape Main Highway: A length of 13 miles 40 chains was declared.

Rotorua–Lake Tarawera Main Highway: A length of 8 miles 60 chains was declared.

Waimangu Road Main Highway: A length of 4 miles was declared.

Rotorua–Napier Main Highway: A length of 27 miles 40 chains was redeclared on the completion of construction work by the Public Works Department.

No. 4 Highway District.—Kanakanaia Road: A length of 10 miles 48 chains was declared.

Gisborne–Opotiki via Waioeka Main Highway: A length of 5 miles was declared.

Gisborne–Opotiki via Coast Main Highway: A length of 7 miles 40 chains was declared.

No. 7 Highway District.—Mangaotuku Road: A length of 4 miles 36 chains was declared.

No. 8 Highway District.—Wanganui Airport Road: A length of 2 miles 20 chains was declared.

No. 9 Highway District.—Lower Hutt–Eastbourne Main Highway: An adjustment was made in this highway by revoking 27 chains and declaring a further length of 19 chains.

Pohangina Valley Road Main Highway: A length of 11 miles was declared.

Heatherlea–Foxton via Koputaroa Main Highway: A length of 7 miles 16 chains was declared.

No. 10 Highway District.—Wellington–Napier via Wairarapa Main Highway: A length of 11 chains was declared.

Mangaone Valley–Pahiatua Main Highway: A length of 12 miles was declared.

No. 11 Highway District.—Branch River–Hope Junction Main Highway: A length of 35 miles 60 chains was declared.

No. 12 Highway District.—Westport–Greymouth (Coast Road) Main Highway: A length of 8 miles 56 chains was declared.

Blackwater–Waiuta Main Highway: A length of 8 miles 46 chains was declared.

No. 13 Highway District.—Mendip–Waiau Main Highway: A length of 14 miles 56 chains was declared.

Motunau – Motunau Beach Main Highway: A length of 1 mile 15 chains was revoked and an alternative length of 36 chains was declared.

No. 14 Highway District.—Christchurch–Blenheim to Bennett's via Swannanoa Main Highway: In connection with the completion of the new Waimakariri River Bridge a length of 1 mile 20 chains was revoked and a further length of 1 mile 13 chains was declared.

Rangiora–Christchurch via Flaxton Main Highway: A length of 1 mile 50 chains was revoked.

Christchurch–Blenheim via Parnassus Main Highway: In connection with the completion of the new Waimakariri River Bridge a length of 70 chains was revoked and a further length of 1 mile 5 chains was declared.

Kaiapoi–Waddington via Rangiora and Bennett's Main Highway: A length of 68 chains was declared.

Akaroa – Long Bay Saddle Main Highway: A length of 4 miles was declared.

Homebush–Waddington Main Highway: A length of 4 miles 70 chains was declared.

Christchurch–Akaroa Main Highway: A length of 25 chains was declared.

No. 15 Highway District.—Maronan–Cracroft Main Highway: A length of 7 miles 25 chains was declared.

Mayfield–Westerfield Main Highway: A length of 9 miles 12 chains was declared.

Fairlie – The Monument Main Highway: A length of 7 miles was declared.

Wright's Bridge – Dip Creek Main Highway: A length of 4 miles 50 chains was declared.

Upper Stumps – Orton Main Highway: A length of 5 miles 20 chains was declared.

No. 16 Highway District.—Palmerston–Queenstown via Beck's Main Highway: A length of 3 miles 22 chains was revoked and a length of 5 miles 63 chains declared.

Glenorchy–Paradise Main Highway: A length of 11 miles 4 chains was declared.

Palmerston–Bushey Main Highway: A length of 3 miles 9 chains was declared.

No. 17 Highway District.—Clinton–Clydevale Main Highway: A length of 4 miles 35 chains was declared.

Miller's Flat – Railway-station Main Highway: A length of 26 chains was declared.

Portobello–Otakou Main Highway: A length of 5 miles 32 chains was declared.

No. 18 Highway District.—Mossburn – Five Rivers Main Highway: A length of 12 miles 30 chains was declared.

Tuatapere–Clifden Main Highway: A length of 8 miles 50 chains was declared.

Riverton–Rocks Main Highway: A length of 2 miles 18 chains was declared.

NORTH ISLAND

SHOWING EXTENT OF

DUSTLESS ROADS.

at

1st April, 1924

Scale of Miles

10 5 0 10 20 30 40 50 60 70 80 90 100 110

KAITAIA
RUSSELL
WHANGAREI
DARGAVILLE
HELENSVILLE
AUCKLAND
TITIRANGI
PAPAKURA
THAMES
PAEROA
WAIHI
NGARUAWAHIA
MORRINSVILLE
TE AROHA
TAURANGA
HAMILTON
MATAMATA
WHAKATANE
OPOTIKI
CAMBRIDGE
TE AWAMUTU
ROTORUA
TE KUITI
TOLAGA BAY
TAUPO
GISBORNE
NEW PLYMOUTH
TAUMARUNUI
RAETIHI
OHAKUNE
WAIROA
STRATFORD
OPUNAKE
NAPIER
HAWERA
TAIHAPE
MARTON
WAIPAWA
HASTINGS
WANGANUI
FELDING
WOODVILLE
WAIPUKURAU
DANNEVIRKE
FOXTON
PONGAROA
LEVIN
PALMERSTON N.
FEATHERSTON
MASTERTON
LOWER HUTT
EASTBOURNE
MARTINBOROUGH
WELLINGTON

LEGEND.

P.C. CONCRETE SURFACES SHEWN

TAR AND BITUMINOUS " "

METALLED ROADS "

NORTH ISLAND

SHOWING EXTENT OF

DUSTLESS HIGHWAYS

at

1st April, 1932

Scale of Miles

10 5 0 10 20 30 40 50 60 70 80 90 100 110

KAITAIA
RUSSELL
WHANGAREI
DARGAVILLE
HELENSVILLE
AUCKLAND
TITIRANGI
PAPAKURA
THAMES
PAEROA
WAIHI
NGARUAWAHIA
MORRINSVILLE
TE AROHA
TAURANGA
HAMILTON
MATAMATA
WHAKATANE
OPOTIKI
CAMBRIDGE
TE AWAMUTU
ROTORUA
TE KUITI
TOLAGA BAY
TAUPO
GISBORNE
NEW PLYMOUTH
TAUMARUNUI
RAETIHI
OHAKUNE
WAIROA
STRATFORD
OPUNAKE
NAPIER
HAWERA
TAIHAPE
MARTON
WAIPAWA
HASTINGS
WANGANUI
FELDING
WOODVILLE
WAITOTARA
DANNEVIRKE
FOXTON
PONGAROA
LEVIN
PALMERSTON N.
FEATHERSTON
MASTERTON
LOWER HUTT
EASTBOURNE
MARTINBOROUGH
WELLINGTON

LEGEND.

P.C. CONCRETE SURFACES SHEWN

TAR AND BITUMINOUS " "

METALLED ROADS "

SOUTH ISLAND

SHOWING EXTENT OF

DUSTLESS ROADS.

at

1st April, 1924

Scale of Miles.

10 5 0 10 20 30 40 50 60 70 80 90 100 110

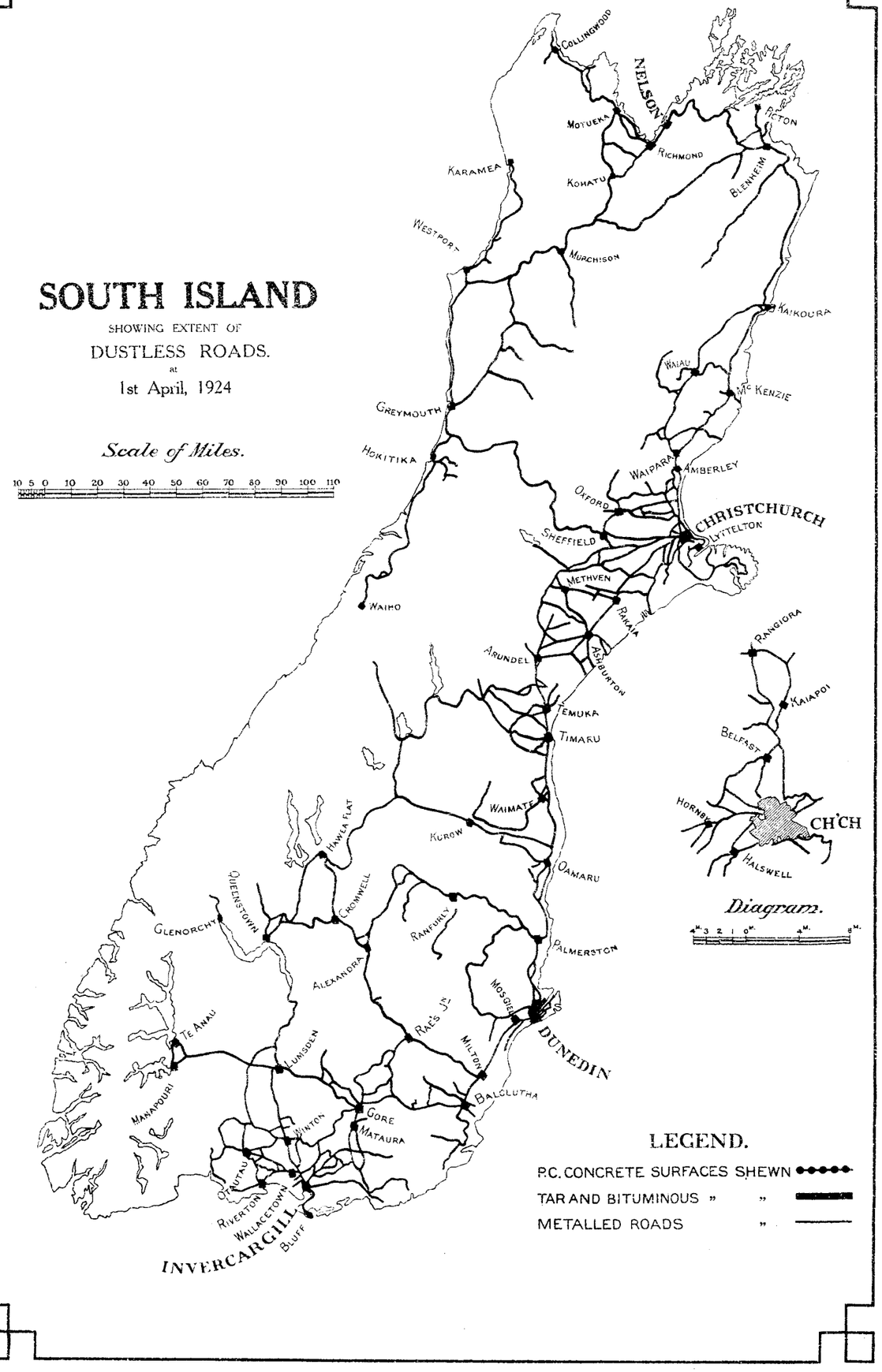


Diagram.

4M. 3 2 1 0M. 4M. 8M.

LEGEND.

P.C. CONCRETE SURFACES SHEWN

TAR AND BITUMINOUS " "

METALLED ROADS "

SOUTH ISLAND

SHOWING EXTENT OF

DUSTLESS HIGHWAYS

at

1st April, 1932

Scale of Miles.

10 5 0 10 20 30 40 50 60 70 80 90 100 110

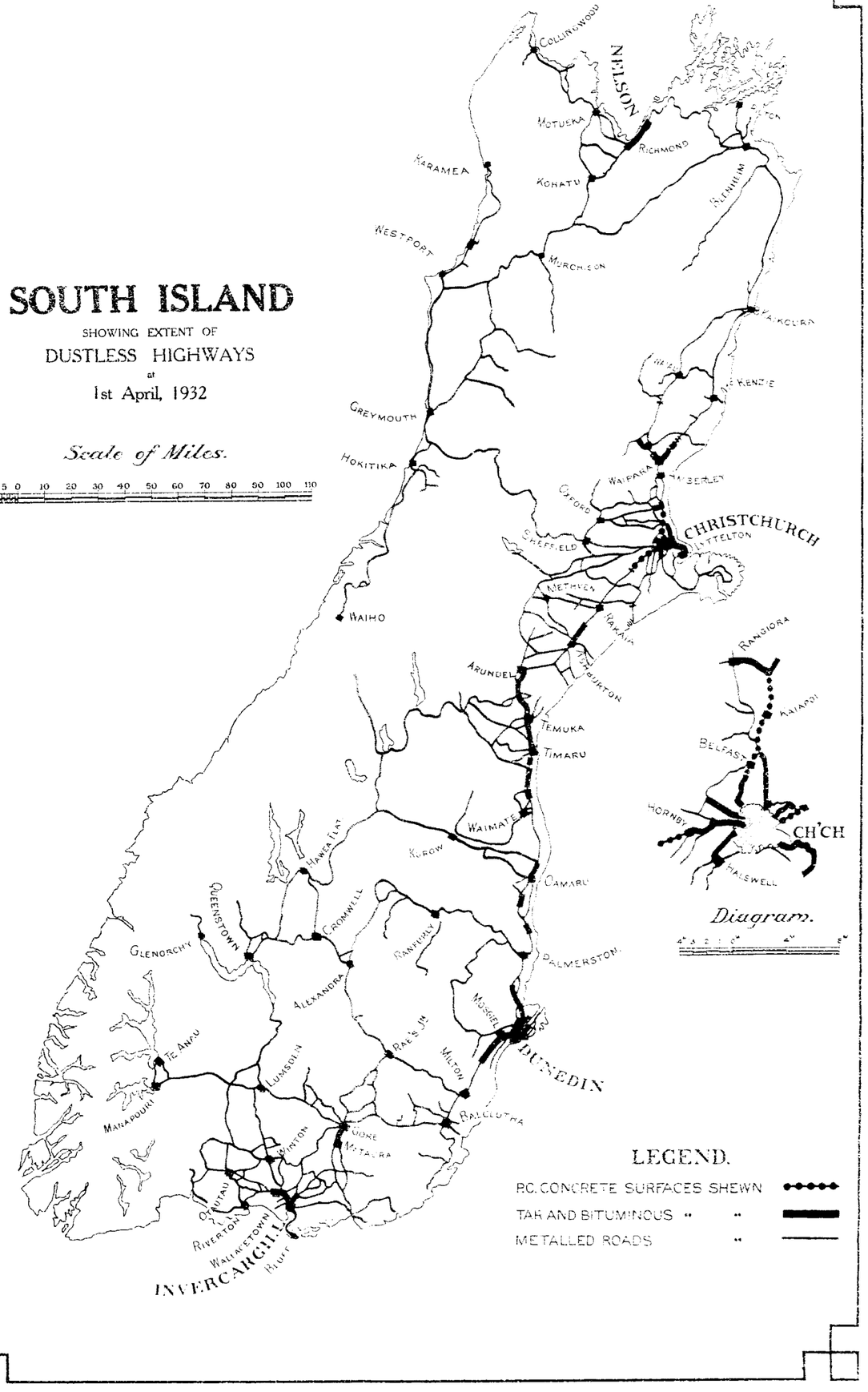


Diagram.

4M. 3 2 1 0M. 4M. 8M.

LEGEND.

P.C. CONCRETE SURFACES SHEWN

TAR AND BITUMINOUS " "

METALLED ROADS "

TABLE 1.—MAIN HIGHWAYS ACCOUNT.

REVENUE FUND.

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31ST MARCH, 1932, AND TOTAL TO DATE

EXPENDITURE.	Total for Year 1931–32.	Total since Inception of Main Highways Act, 1922, to 31/3/32.
	£ s. d.	£ s. d.
To Net expenditure on ordinary maintenance of main highways :—		
Highway District—		
No. 1	53,055 3 3	318,228 5 1
No. 2	120,004 14 2	583,383 7 11
No. 3	40,403 19 6	235,204 14 9
No. 4	33,485 2 6	200,404 14 4
No. 5	70,838 16 8	395,028 16 3
No. 6	37,126 16 6	215,700 5 5
No. 7	42,582 11 6	303,806 0 2
No. 8	35,839 14 6	236,150 8 10
No. 9	52,056 18 2	348,107 7 2
No. 10	43,999 9 0	257,899 18 1
Totals for North Island	529,393 5 9	3,093,913 18 0
No. 11	45,343 9 11	272,421 12 3
No. 12	86,837 4 9	528,775 18 1
No. 13	18,326 15 1	134,281 19 11
No. 14	39,141 0 4	187,170 8 3
No. 15	43,247 8 0	238,989 3 1
No. 16	28,354 4 9	114,030 9 8
No. 17	32,968 14 2	153,872 5 5
No. 18	26,121 9 5	169,895 19 3
Totals for Dominion	849,733 12 2	4,893,351 13 11
Relief camps for single men— £ s. d.		
Expenditure to 31st March, 1932 .. .. 35,603 14 10		
Less amount recovered from Unemployment Board 13,903 3 8		
	21,700 11 2	21,700 11 2
Maintenance and construction of roads giving access to outlying areas (Finance Act (No. 3), 1931)	45,133 1 1	45,133 1 1
Abolition of toll-gates (section 20, Finance Act, 1925)	1,807 0 0	17,572 14 7
Accident compensation	1,188 1 2	5,208 14 7
Administration and supervision expenses (including salaries and expenses of Public Works officers), printing, stationery, postages, and miscellaneous expenses	37,965 1 0	223,676 10 6
Charges and expenses of raising loans, management charges of Consolidated Stock on account of Construction Fund, &c.	978 15 1	47,518 8 6
Commission on collection of motor-registration fees by Postal Department	15,559 17 6	88,477 3 4
Commission on registration of change of ownership	3,996 1 6	25,868 5 0
Depreciation of furniture, fittings, &c.	75 5 1	383 0 11
Carried forward	978,137 5 9	5,368,890 3 7

INCOME.	Total for Year 1931–32.	Total since Inception of Main Highways Act, 1922, to 31/3/32.
	£ s. d.	£ s. d.
By Income from—		
Interest from investments of— £ s. d.		
Construction Fund 8,705 10 10		
Revenue Fund 7,971 18 11		
	16,677 9 9	203,947 13 5
Interest from local authorities on plant purchased on their behalf ..	2,666 15 5	17,508 0 7
Interest on advances to local authorities	4,826 9 8	8,605 9 2
Miscellaneous receipts	230 13 9	590 7 3
Motor-registration licenses, fees, and fines (section 24, Motor-vehicles Act, 1924	372,223 19 2	2,422,556 0 7
Motor-spirits tax (section 9, Motor-spirits Taxation Act, 1927) ..	1,231,201 14 0	4,184,654 17 8
Rent of and tolls from ferries	..	2,081 10 6
Tire-tax (sections 13 and 14, Main Highways Act, 1922)	84,649 7 5	1,610,008 3 2
Transfer from Consolidated Fund (section 14, Main Highways Act, 1922)	..	210,000 0 0
Carried forward	1,712,476 9 2	8,659,952 2 4

TABLE 1.—MAIN HIGHWAYS ACCOUNT—*continued.*

REVENUE FUND—*continued.*

EXPENDITURE.	Total for Year 1931–32.	Total since Inception of Main Highways Act, 1922, to 31/3/32.	INCOME.	Total for Year 1931–32.	Total since Inception of Main Highways Act, 1922, to 31/3/32.
	£ s. d.	£ s. d.		s. d.	£ s. d.
Brought forward	978,137 5 9	5,368,890 3 7	Brought forward	1,712,476 9 2	8,659,952 2 4
To Net expenditure on maintenance of main highways—*continued.*					
Depreciation of plant not in service	..	88 0 0			
Expenses of District Councillors attending District Council meetings and annual conference	38 17 6	612 5 5			
Fees and travelling-expenses of members of the Main Highways Board, other than Government members	999 1 6	10,947 1 6			
Finance Act, 1930, section 37 (1), subsidies on rates,—					
Subsidies to municipalities	26,366 16 6	56,315 13 11			
Subsidies to County Councils and other local authorities	164,839 0 9	354,205 15 2			
Finance Act (No. 4), 1931, section 45,—					
Subsidies to County Councils for rebate to ratepayers	253,892 12 1	253,892 12 1			
Hutt Road annual charges—Finance Act, 1927 (No. 2), section 33 ..	22,245 15 0	83,782 6 6			
Interest on amount appropriated out of Public Works Fund and paid into Main Highways Account Construction Fund	61,300 0 0	122,600 0 0			
Interest on loans, recoupment to Consolidated Fund (section 4, Finance Act, 1919)	119,128 18 1	382,992 13 7			
Level crossings, Alarm-signals at	1,544 1 1	2,142 7 11			
Maintenance of combined road and railway bridges	9,374 19 8	9,374 19 8			
Miscellaneous expenses—					
Advertising, maps, rent of halls, traffic tallies, transport of samples, &c.	100 14 7	3,952 2 3			
Compensation under section 3, Public Works Amendment Act, 1925..	200 0 0	1,015 1 6			
Petrological laboratory and other experimental work, Expenses of ..	1,243 17 10	1,973 17 10			
Reserve for redemption of main highway securities	56,618 0 0	201,254 0 0			
Signposts, Erection of	1,611 2 8	5,068 0 11			
Traffic inspection	4,243 2 9	6,535 13 0			
	1,701,884 5 9	6,865,642 14 10			
Transfers to Construction Fund	..	1,400,000 0 0			
	1,701,884 5 9	8,265,642 14 10			
Balance, being excess of income over expenditure, carried to general balance-sheet	10,592 3 5	394,309 7 6			
	1,712,476 9 2	8,659,952 2 4		1,712,476 9 2	8,659,952 2 4

TABLE 1.—MAIN HIGHWAYS ACCOUNT—*continued.*

CONSTRUCTION FUND.

INCOME AND EXPENDITURE ON CAPITAL ACCOUNT FOR THE YEAR ENDED 31ST MARCH, 1932, AND TOTAL TO DATE.

EXPENDITURE.	Total for Year 1931–32.	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	34,070 10 8	561,249 4 2
No. 2	59,359 14 8	689,004 18 11
No. 3	14,496 14 0	169,273 4 9
No. 4	42,219 0 8	324,244 17 7
No. 5	23,703 5 6	228,470 0 9
No. 6	15,850 13 0	307,280 18 0
No. 7	10,729 4 1	327,452 2 6
No. 8	14,599 9 9	171,265 18 8
No. 9	45,218 8 3	527,558 12 2
No. 10	11,281 19 3	186,581 15 8
Totals for North Island	271,528 19 10	3,492,381 13 2
No. 11	17,178 5 9	134,650 11 1
No. 12	3,757 4 11	135,057 13 1
No. 13	8,157 13 0	157,288 2 1
No. 14	11,071 6 0	238,223 13 7
No. 15	28,104 6 3	145,286 19 9
No. 16	12,364 10 7	144,443 7 6
No. 17	28,294 8 8	324,675 15 11
No. 18	3,688 5 8	96,095 11 1
Totals for Dominion	384,145 0 8	4,868,103 7 3
Balance, being excess of income over expenditure, carried to general balance-sheet	..	109,504 6 9
	384,145 0 8	4,977,607 14 0

INCOME.	Total for Year 1931–32.	Total since Declaration of Main Highways (9/6/24).
	£ s. d.	£ s. d.
By Receipts under section 15, Finance Act, 1923, from Public Works Fund, General Purposes Account	..	1,226,000 0 0
Loans raised under Main Highways Act, 1922—		
Stock and Debentures issued—		
At 4 per cent. interest	..	109,000 0 0
At 4½ per cent. interest	..	592,004 10 10
At 5 per cent. interest	..	125,750 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	380,000 0 0	1,175,150 0 0
Transfer from Revenue Fund	..	1,400,000 0 0
Charges and expenses of raising loans (adjustment)	..	3 3 2
Balance, being excess of expenditure over income, carried to general balance-sheet	4,145 0 8	
	384,145 0 8	4,977,607 14 0

TABLE 1.—MAIN HIGHWAYS ACCOUNT—*continued.*

General Balance-sheet as at 31st March, 1932.

LIABILITIES.	Revenue Fund.	Construction Fund.	Total.
	£ s. d.	£ s. d.	£ s. d.
Accumulated Revenue Fund—			
Balance at 31/3/31	383,717 4 1		
Excess of income over expenditure for 1931–32 ..	10,592 3 5		
	394,309 7 6	..	394,309 7 6
Construction Fund—			
Balance at 31/3/31	..	99,493 10 4	
District expenditure subsequently treated as advances	..	14,155 17 1	
		113,649 7 5	
Less excess of expenditure over income for 1931–32	..	4,145 0 8	
		109,504 6 9	109,504 6 9
Sundry creditors—			
Public Works Department			
Other Government Departments	44,786 3 3	6,083 6 4	50,869 9 7
Non-departmental	1,839 3 8	330 19 11	2,170 3 7
Interest accrued on loans	80,665 13 11	35,908 9 2	116,574 3 1
Motor-registration fees paid in advance	14,852 0 2	..	14,852 0 2
Writings-off in Suspense	63,244 18 2	..	63,244 18 2
Reserve for redemption of securities	78 16 8	69 18 0	148 14 8
	213,655 10 5	..	213,655 10 5
	813,431 13 9	151,897 0 2	965,328 13 11

ASSETS.		Revenue Fund.	Construction Fund.	Total.
		£ s. d.	£ s. d.	£ s. d.
Cash in Public Account—				
At call		398,859 7 1	99,674 19 1	498,534 6 2
Sundry debtors—				
Public Works Department		3,149 15 8	27,665 2 8	30,814 18 4
Other Government Departments		5,098 3 0	..	5,098 3 0
Non-departmental		1,813 13 5	7,494 15 6	9,308 8 11
Motor-registration fees in hands of Postal Department ..		2,205 10 11	..	2,205 10 11
Interest due and accrued		3,298 13 9	..	3,298 13 9
Stocks of materials, tools, &c.		20,713 8 5	12,288 5 5	33,001 13 10
Stocks, deficits account		78 16 8	69 18 0	148 14 8
Roadmen's cottages, huts, and road buildings generally ..		8,372 16 0	4,703 19 6	13,076 15 6
Furniture, fittings, &c.	£ s. d.			
Expenditure to 31/3/32	1,204 12 3			
Less depreciation to 31/3/32 ..	386 18 4			
		817 13 11	..	817 13 11
Plant and equipment—				
For Main Highways Board—				
Expenditure to 31/3/32	90,882 7 3			
Less depreciation charged to works	51,785 6 10			
		39,097 0 5	..	39,097 0 5
Purchased for local authorities—				
Expenditure to 31/3/32	158,508 12 3			
Less repayments of principal ..	122,635 17 9			
		35,872 14 6	..	35,872 14 6
Amount in Loans Redemption Account ..	212,002 15 5			
Interest accrued to 31/3/32	1,652 15 0			
		213,655 10 5	..	213,655 10 5
Advances to local authorities (Main Highways Amendment Act, 1926, section 2)		80,398 9 7	..	80,398 9 7
		813,431 13 9	151,897 0 2	965,328 13 11

J. J. Gibson, Accountant, Public Works Department.

F. W. Furkert, 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 comment is appended: A reserve of £212,002 15s. 5d. for redemption of securities has been set up and paid over to Loans Redemption Account, but the amount has not yet been applied to the redemption of securities.—J. H. Fowler, Deputy-Controller and Auditor-General.

TABLE 2.—LENGTHS OF MAIN HIGHWAYS AT 31ST MARCH, 1932.

Number and Name of Highway District.	Primary Highways.		Secondary Highways.		Total.	
	M.	ch.	M.	ch.	M.	ch.
1. Auckland North	508	26	301	46	809	72
2. Auckland South	557	4	463	2	1,020	6
3. Tauranga	436	49	234	63	671	32
4. Gisborne	249	56	114	8	363	64
5. Napier	456	8	232	7	688	15
6. King-country	350	20	306	60	657	0
7. Taranaki	308	23	129	12	437	35
8. Wanganui	324	58	154	0	478	58
9. Wellington West	314	54	143	48	458	22
10. Wellington East	339	3	126	2	465	5
Totals, North Island ..	3,844	61	2,205	8	6,049	69
11. Nelson	327	33	206	50	534	3
12. West Coast	347	10	163	48	510	58
13. Canterbury North	312	20	103	26	415	46
14. Canterbury Central	405	60	253	17	658	77
15. Canterbury South	348	43	353	5	701	48
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 ..	2,840	17	1,956	13	4,796	30
Totals for Dominion ..	6,684	78	4,161	21	10,846	19

TABLE 3.—CONSTRUCTION WORK COMPLETED DURING YEAR 1931-32.

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	11 4	5 44	9 26	3 0	..	..	1,004	37 6	26 1
2. Auckland South	10 53	14 42	21 44	6 5	..	1 44	237	18 64	18 64
3. Tauranga	8 56	8 56	10 17	0 7	..	..	52	..	..
4. Gisborne	4 67	6 59	..	10 13	..	..	315	8 45	7 68
5. Napier	3 64	0 15	8 38	..	..	..	989	25 79	25 33
6. King-country	3 56	13 48	0 58	..	..	..	375	..	..
7. Taranaki	0 21	0 42	..	1 46	..	..	74	13 55	13 5
8. Wanganui	10 41	3 23	10 10	..	..	..	180	6 55	10 63
9. Wellington West ..	17 76	2 30	8 70	2 1	2 56	..	120	12 57	12 57
10. Wellington East	28 60	..	7 64	..	..	..	30	8 17	8 17
11. Nelson	2 58	0 42	3 66	..	..	..	98	24 61	8 34
12. West Coast	0 27	0 17	..	..	..	..	55	15 61	14 40
13. Canterbury North ..	0 54	0 54	9 70	..	..	..	120	1 44	1 44
14. Canterbury Central ..	8 71	0 31	4 40	1 0	0 22	1 38	90	28 20	28 20
15. Canterbury South ..	0 43	0 43	16 70	0 7	..	..	8	..	..
16. Otago Central	2 5	1 76	7 13	7 49	..	..	197	..	..
17. Otago South	11 55	9 33	2 2	..	5 63	..	..	3 66	3 66
18. Southland	11 42	..	7 49	..	..	..	118	12 61	7 0
Totals	138 53	69 15	128 77	31 48	8 61	3 2	4,062	218 51	186 32

TABLE 4.—APPROPRIATIONS AND EXPENDITURE FOR THE YEAR ENDING 31ST MARCH, 1932.

Number and Name of Highway District.	Construction.		Maintenance.	
	Available for Authorization.	Expenditure.	Available for Authorization.	Expenditure.
	£	£	£	£
1. Auckland North	49,756	34,071	55,779	53,055
2. Auckland South	100,687	59,360	146,046	120,005
3. Tauranga	15,136	14,497	44,854	40,404
4. Gisborne	58,205	42,219	56,152	33,485
5. Napier	25,509	23,703	85,319	70,839
6. King-country	17,414	15,851	53,643	37,127
7. Taranaki	12,864	10,729	51,932	42,583
8. Wanganui	29,097	14,599	49,785	35,840
9. Wellington West ..	49,923	45,218	64,030	52,057
10. Wellington East ..	14,963	11,282	48,950	44,000
11. Nelson	21,607	17,178	48,243	45,343
12. West Coast	6,028	3,757	97,221	86,837
13. Canterbury North ..	8,588	8,158	20,378	18,326
14. Canterbury Central ..	32,030	11,071	43,155	39,141
15. Canterbury South ..	39,682	28,104	41,405	43,247
16. Otago Central	19,842	12,365	32,427	28,354
17. Otago South	34,663	28,295	35,751	32,969
18. Southland	12,001	3,688	35,589	26,121
Totals for Dominion ..	547,995	384,145	1,010,659	849,733
Totals for North Island	373,554	271,529	656,490	529,395
Totals for South Island	174,441	112,616	354,169	320,338

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.							
					1931–32.	1930–31.	1929–30.	1928–29.	1927–28.	1926–27.	1925–26.	1924–25.
Primary System.												
	M. ch.	£	£	£	£	£	£	£	£	£	£	£
1. Auckland North	508 26	39,739	7,235	46,974	92·41	93·29	125·34	102·28	103·6	65·6	56·1	77·0
2. Auckland South	557 4	91,415	19,457	110,872	199·03	210·10	218·87	233·82	203·3	181·0	85·1	53·5
3. Tauranga	436 49	33,600	5,927	39,527	90·53	93·70	110·47	90·59	80·3	69·1	48·6	28·1
4. Gisborne	249 56	28,686	7,724	36,410	145·81	183·37	218·70	146·40	104·3	152·7	93·9	59·5
5. Napier	456 8	32,737	9,723	42,460	93·09	147·57	187·03	158·72	170·0	169·4	104·5	73·4
6. King-country	350 20	28,878	6,721	35,599	101·64	113·83	170·63	90·18	56·2	69·8	55·4	58·5
7. Taranaki	308 23	32,094	8,972	41,066	133·20	133·55	189·83	182·93	195·7	198·8	105·0	67·1
8. Wanganui	324 58	26,154	9,411	35,565	109·52	141·63	193·86	96·12	145·3	167·6	88·9	54·4
9. Wellington West	314 54	43,789	13,460	57,249	181·93	215·70	270·58	228·91	228·9	166·3	120·2	91·7
10. Wellington East	339 3	37,669	13,383	51,052	150·58	158·75	177·48	158·02	138·8	138·0	104·7	77·7
Totals, North Island ..	3,844 61	394,761	102,013	496,774	129·21	145·47	180·38	147·29	141·2	131·6	82·9	62·9
11. Nelson	327 33	37,693	8,131	45,824	139·95	106·17	153·18	121·31	102·1	119·9	63·9	48·1
12. West Coast	347 10	40,985	6,936	47,921	138·05	109·70	154·06	158·56	118·3	114·2	94·6	61·6
13. Canterbury North	312 20	15,573	3,911	19,484	62·40	79·49	111·63	94·06	90·1	79·5	47·7	37·7
14. Canterbury Central	405 60	29,451	8,302	37,753	93·04	89·98	77·74	77·85	87·3	81·4	46·1	52·2
15. Canterbury South	348 43	32,013	8,590	40,603	116·49	107·50	128·43	95·69	105·0	79·5	73·9	39·7
16. Otago Central	340 18	18,699	5,505	24,204	71·14	38·92	84·86	61·25	77·2	49·3	26·1	12·6
17. Otago South	295 21	26,242	9,436	35,678	120·83	106·59	124·24	88·96	90·5	81·7	54·2	22·5
18. Southland	463 52	18,065	6,836	24,901	53·70	74·46	70·62	67·13	63·4	76·0	56·6	24·6
Totals, South Island ..	2,840 17	218,721	57,647	276,368	97·31	88·48	111·19	94·96	91·4	85·4	59·6	38·5
Totals, Dominion ..	6,684 78	613,482	159,660	773,142	115·65	121·42	151·20	125·19	119·9	111·9	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.			
					1931–32.	1930–31.	1929–30.	1928–29.
				Secondary System.				
	M. ch.	£	£	£	£	£	£	£
1. Auckland North	301 46	13,316	3,852	17,168	56·93	65·57	98·84	68·85
2. Auckland South	463 2	28,590	8,735	37,325	80·61	126·36	207·63	109·12
3. Tauranga	234 63	6,804	1,149	7,953	33·87	49·27	38·87	32·23
4. Gisborne	114 8	4,800	1,461	6,261	54·87	108·85	109·45	67·79
5. Napier	232 7	7,280	2,470	9,750	42·01	69·31	68·65	45·97
6. King-country	306 60	8,249	2,171	10,420	33·97	53·84	54·09	29·17
7. Taranaki	129 12	10,488	3,230	13,718	106·22	142·38	129·53	87·91
8. Wanganui	154 0	9,686	3,082	12,768	82·91	93·55	136·68	71·64
9. Wellington West	143 48	8,268	3,097	11,365	79·14	86·97	105·12	74·18
10. Wellington East	126 2	6,331	2,432	8,763	69·54	90·50	104·00	80·04
Totals, North Island ..	2,205 8	103,812	31,679	135,491	61·44	84·66	107·70	66·20
11. Nelson	206 50	7,500	1,997	9,497	45·96	43·96	49·08	37·14
12. West Coast	163 48	17,807	4,075	21,882	133·75	152·81	196·99	111·98
13. Canterbury North	103 26	2,754	788	3,542	34·28	48·69	58·54	36·31
14. Canterbury Central	253 17	9,689	2,993	12,682	50·08	50·40	76·58	54·05
15. Canterbury South	353 5	11,234	3,377	14,611	41·38	66·71	49·78	36·23
16. Otago Central	363 29	9,655	3,261	12,916	35·55	33·99	61·19	31·95
17. Otago South	154 48	6,727	2,339	9,066	58·64	58·58	75·09	52·62
18. Southland	358 30	8,056	2,573	10,629	29·66	36·78	40·30	26·07
Totals, South Island ..	1,956 13	73,422	21,403	94,825	48·48	55·93	67·42	43·79
Totals, Dominion ..	4,161 21	177,234	53,082	230,316	55·35	71·00	88·51	55·51
				Complete Highway System.				
1. Auckland North	809 72	53,055	11,087	64,142	79·20	83·37	115·66	90·26
2. Auckland South	1,020 6	120,005	28,192	148,197	145·28	175·83	214·30	182·99
3. Tauranga	671 32	40,404	7,076	47,480	70·72	80·38	90·73	74·50
4. Gisborne	363 64	33,485	9,186	42,671	117·29	163·47	189·52	124·91
5. Napier	688 15	40,017	12,193	52,210	75·87	121·18	146·72	120·35
6. King-country	657 0	37,127	8,892	46,019	70·04	85·82	115·75	61·44
7. Taranaki	437 35	42,582	12,202	54,784	125·24	136·04	172·85	155·92
8. Wanganui	478 58	35,840	12,493	48,333	100·96	126·70	176·13	88·53
9. Wellington West	458 22	52,058	16,556	68,614	149·72	179·00	224·31	185·63
10. Wellington East	465 5	43,999	15,816	59,815	128·62	141·56	158·96	138·38
Totals, North Island ..	6,049 69	498,572	133,693	632,265	104·51	124·76	155·78	119·87
11. Nelson	534 3	45,193	10,127	55,320	103·59	82·05	112·83	88·69
12. West Coast	510 58	58,792	11,011	69,803	136·68	122·37	166·76	144·87
13. Canterbury North	415 46	18,327	4,699	23,026	55·41	72·65	99·69	81·07
14. Canterbury Central	658 77	39,141	11,295	50,436	76·54	75·16	77·29	68·85
15. Canterbury South	701 48	43,247	11,967	55,214	78·70	87·96	89·58	66·32
16. Otago Central	703 47	28,354	8,766	37,120	52·76	36·45	73·89	47·67
17. Otago South	449 69	32,968	11,775	44,743	99·46	90·82	108·15	77·06
18. Southland	822 2	26,122	9,409	35,531	43·22	58·66	57·90	49·90
Totals, South Island ..	4,796 30	292,144	79,049	371,193	77·39	75·77	94·12	75·04
Totals, Dominion ..	10,846 19	790,716	212,742	1,003,458	92·52	103·14	128·57	100·06

For the purpose of computing the average costs per mile in the above tables the expenditure on the restoration of earthquake damage in the Nos. 5, 11, and 12 Highway Districts has been excluded. The Board expended from the Revenue Fund for this purpose the sum of £59,017, which, when added to the total of £790,716 shown above, enables a reconciliation to be made with the total in the last column of Table 4.

TABLE 6.—TESTS OF STONE COMPLETED DURING THE YEAR ENDING 31ST MARCH, 1932.

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.			
196	Moutere, Nelson	..	..	25·20	1·58	..	..	Gravel.
197	Brook Street Quarry, Nelson ..	191·5	..	3·10	12·50	19·20	24·0	Altered basalt.
198	Motuhora Quarry, Gisborne ..	166·0	..	4·00	10·00	19·23	15·0	Greywacke.
199	Rangiriri	167·3	0·90	5·51	7·26	18·76	22·5	Hypersthene andesite.
200	Papamoa Quarry, Tauranga ..	170·5	1·30	2·90	13·80	18·00	23·5	Hypersthene andesite.
201	McCallum's Quarry, Little Island, Hauraki Gulf	162·5	0·73	3·86	10·40	19·82	8·0	Cherty breccia.
202	Wharanui, Awatere County ..	164·3	0·59	4·81	8·30	16·60	18·0	Siliceous limestone.
203	Waimate, South Canterbury ..	173·9	0·21	2·55	15·70	19·39	40·5	Welded conglomerate.
204	Hicks Bay, Matakaoa County..	159·0	0·65	5·45	7·34	17·65	7·5	Altered basalt.
205	Hicks Bay, Matakaoa County..	159·6	0·17	5·86	6·80	15·68	7·5	Altered basalt.
206	Hicks Bay, Matakaoa County..	165·2	0·14	6·61	6·05	17·02	5·5	Altered basalt.
207	Hicks Bay, Matakaoa County..	159·0	0·02	5·50	7·38	..	8·0	Altered basalt.
208	Hicks Bay, Matakaoa County..	161·2	0·55	5·60	7·10	17·20	6·0	Altered basalt.
209	Hicks Bay, Matakaoa County..	157·0	0·70	4·36	9·10	16·20	10·5	Altered basalt.
210	Mangaone Stream, Kairanga County	..	..	12·65	3·20	..	..	Weathered greywacke gravel.
210A	Crosso's No. 1, Weber County..	112·3	9·35	7·20	5·50	..	..	Mudstone.
211	Viddler's 2nd, Weber County ..	126·6	9·96	8·50	4·70	..	..	Mudstone.
212	Viddler's Best, Weber County	135·3	11·20	5·54	7·20	..	..	Mudstone.
213	Pudding Hill, Weber County ..	116·6	15·60	10·50	3·80	..	..	Mudstone.
214	Morgan's, Weber County ..	112·0	10·60	6·08	6·58	..	..	Mudstone.
215	Karamea	167·5	0·82	9·30	4·30	18·99	11·5	Granite.
216	Huanui Quarry, Gisborne ..	156·8	2·69	7·06	5·66	16·00	9·0	Polyzoal limestone.
217	Huanui Quarry, Gisborne ..	164·6	1·32	7·38	5·42	15·18	13·0	Polyzoal limestone.
218	Huanui Quarry, Gisborne ..	161·2	1·42	6·24	6·40	15·16	9·0	Polyzoal limestone.
219	Bombay Deviation, North end	180·5	1·35	3·39	11·80	17·99	10·0	Basalt.
220	Bluff Borough Quarry ..	184·3	1·28	3·56	11·20	18·61	15·5	Hornblende gabbro.
221	Bombay Deviation, North end	175·0	1·31	4·94	8·10	17·40	13·5	Basalt.
222	Mangatainoka River ..	..	..	4·04	9·90	..	..	Greywacke gravel.
223	Bombay Deviation, North end	175·2	1·73	3·28	12·20	19·03	40·5	Basalt.

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