1936.
NEW ZEALAND.

PUBLIC WORKS STATEMENT

(BY THE HON. R. SEMPLE, MINISTER OF PUBLIC WORKS).

MR. SPEAKER,—

Since I took control of the Public Works Department in December last my whole energies have been concentrated in endeavouring to revitalize the activities of this important Department. On assuming office I found there was not in existence a policy which could be relied upon to give sufficient guidance to the head of the Department and his staff and which was necessary if the Department was to function in the most efficient and satisfactory way. My effort has been to frame a policy such as I believe will ultimately result in clearly defining the system upon which the Government intends to carry out its public works, and which will give to the Department that lead which it can rightly expect from the Minister in Control.

I was quite prepared to find, owing to several years of financial depression, that there might not be a settled policy, and I make due allowance for such difficulties, but I was not prepared to find that the whole of the public-works activities had been converted into a system of relief for unemployment.

With this end solely in view, methods of work had been adopted which were not only uneconomical but, to say the least of it, were highly demoralizing to the men compelled to work under such conditions. It was a surprise to me that after years of work under this system the staff and workmen of the Department should have retained the will and energy to work, which I found still existed among them.

The whole position was most unsatisfactory, and gave absolutely no incentive to any one to give of his best. New life needed to be infused into the workmen employed by the Department.

In general, no exception could be taken to the value of the works upon which they were engaged. Some of them I did not approve of, and I did not hesitate to stop them. I shall refer to such works later. Others I would have stopped had they not progressed too far to make it inadvisable to do so; there were other works which should obviously have been started and had not. The Government has gone carefully into the necessity or otherwise of such works, and many of them have now been put in hand. These works are given in more detail in this Statement, and I venture to say that there is not one of them that will not be found to return some economic value to the State.

I wish at present, however, to dwell more upon the method of carrying out these works than upon their national benefit.

In an age when machinery is doing so much to relieve the burden of hard work, and to reduce expenditure in every direction, I could not agree to continue to carry out work by methods that involved the unnecessary expenditure of energy and increase in cost, such as is inherent in a system of work for the relief of unemployment only. The engineers of my Department have had to carry out a most unpleasant

and distasteful duty in being asked to do work in such a way, and I am doing all I can to give them the plant and machinery that will enable them to undertake work in the way it should be carried out in this enlightened age. I have, of course, found it necessary to hold a balance between the use of machinery and the employment of men who are willing to work and cannot find work, and so far I have not found it necessary to diminish the number of men employed, but rather to keep them employed in a more useful way.

I could not, however, ask men to work industriously for the inadequate living-wage they were receiving when the present Government took control of public works.

I decided that this state of affairs should not continue, and at the earliest possible moment issued a properly planned programme of the Department's activities, together with instructions that in future public works were to be undertaken as standard works, and that we were to depart from the relief system which had been followed for years past.

The first objective having been obtained, I then concluded an agreement with the New Zealand Workers' Union covering all employees of the Department. Under this agreement the men have been given the inducement to work—reasonable hours, good conditions, and fair wages.

A five-day week of forty hours has been introduced on public works in New Zealand for the first time, and is proving entirely successful from the point of view both of the Department and of the men.

Living-conditions on the works have been improved by the provision of better camp accommodation, for which no charge is being made.

Wages have been substantially increased, and the men are now able to earn a decent living-wage. In November, 1935, the average wage of workers on public works was 12s. 6d. per day, whereas in June, 1936, the average was 17s. 9d. per day.

As far as possible the aim has been to secure uniformity of average wages in all districts, but climatic conditions and varying types of construction activity result in some differences in earnings.

I have stated elsewhere that I firmly believe in the co-operative contract system of working. This system has been in operation on public works for over forty years, and I am convinced that it encourages the men to give of their best, because they are paid by results and know that they will be paid for what they earn. I have instructed that this system is to be continued at prices allowing men of average ability working industriously to earn the daily rates of wages provided for in the agreement. The workmen are allowed to select their work-mates and to appoint their own headman.

From the 1st April, 1936, arrangements have been made for two pays per month instead of one pay per month, which was the practice hitherto. This concession is, I am sure, very much appreciated by the men and by their dependants.

In addition to providing the five-day week, improved camp accommodation, and increased wages mentioned above, provision has been made for workmen with two months' service to be paid for seven statutory holidays—viz., New Year's Day, Good Friday, Easter Monday, King's Birthday, Labour Day, Christmas Day, and Boxing Day. Workmen with twelve months' continuous service are entitled to two weeks' annual leave per annum, of which five days will be paid for where the continuous service is under two years, and ten days will be paid for where the continuous service with the Department is two years or over.

Recreation-halls and library facilities are being provided on the larger works, and arrangements have been made with the Y.M.C.A. authorities for pictures and other social amenities. The Government has agreed to meet any reasonable cost of the service in excess of the revenue received by the Y.M.C.A.

The agreement with the New Zealand Workers' Union provides for preference to unionists, and workmen are required to become financial members of the union within one month of commencing duty. Arrangements have been made for the Department to collect the union subscription where the men give the necessary legal authority.

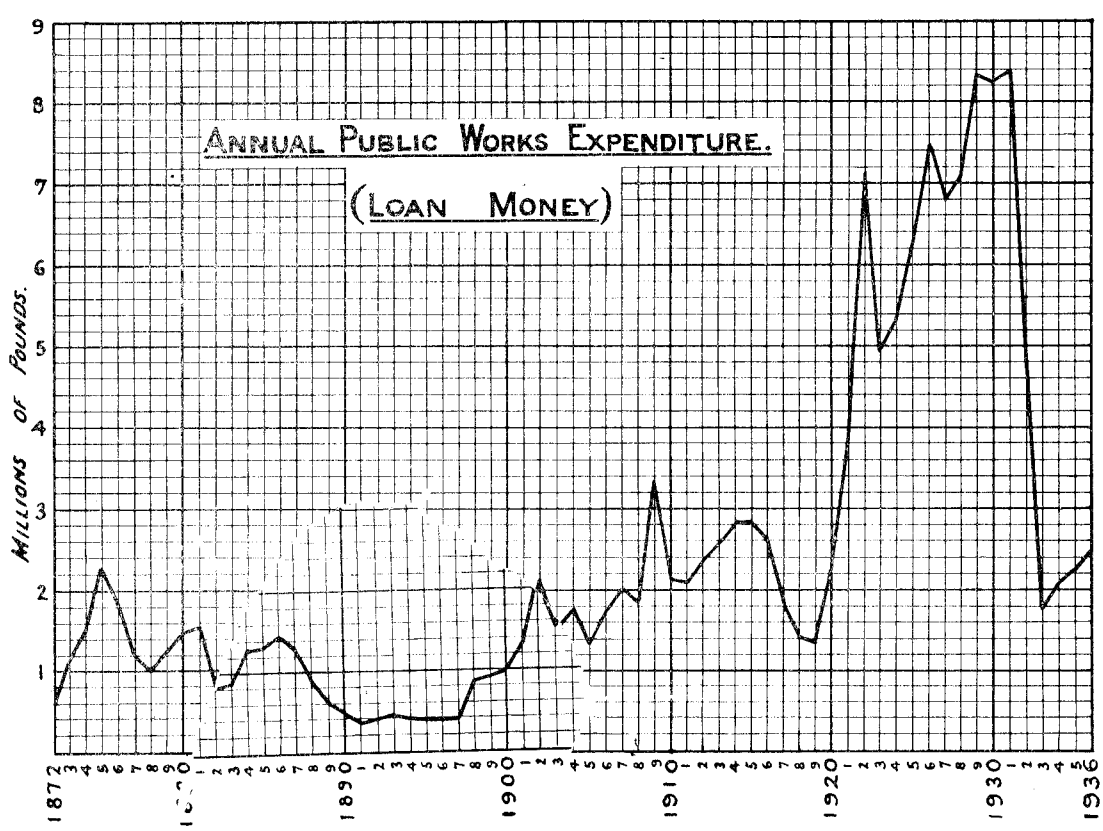
From the above it will be seen that an endeavour has been made to provide reasonable conditions for the men to work under, and I now wish to outline the Government's proposals for works to give employment to as large a number of men as possible. When the Government assumed office at the beginning of December, 1935, 13,696 men were employed on public works, of whom 8,289 were employed on relief work, while for the week ending 15th August, 1936, 15,851 men were employed, most of whom were on standard works. It is intended to increase the number employed on public works to 20,000 as soon as possible.

It will be seen from the estimates of expenditure for the Consolidated Fund already submitted to Parliament that provision has been made for the assistance hitherto provided from unemployment taxation for public-works activities now being found from ordinary revenue. The principal amounts are for irrigation, £97,500; for land improvement, £71,000; for additions and improvements to open railway-lines, £77,000. In addition, the Consolidated Fund is providing £39,000 towards the construction and improvement of settlement roads, £20,000 towards the cost of renewal of road bridges, £80,000 for restoration of roadworks, bridges, &c., damaged by floods, and £20,000 for maintenance and repair of roads. For the construction of aerodromes and emergency landing-grounds £341,000 is being provided, whereas the expenditure from the Consolidated Fund for this service last year was £6,196.

Provision has also been made under the Consolidated Fund this year for £100,000 for the purchase of modern plant, which is additional to the amount of £90,000 for plant for main highways. The total vote for Maintenance of Public Works and Services under the Consolidated Fund is £1,182,500, as compared with an expenditure of £145,492 from this fund last year.

I am anxious to pursue an energetic policy of public works so as to provide national assets, and at the same time assist in relieving the distress caused by the drastic cessation of constructional works by the late Government. My colleague, the Hon. Minister of Finance, in the Budget referred to this subject of the curtailment of public works as being a material factor in the increase in unemployment throughout the Dominion. The diagram below shows how serious this sudden curtailment was in the economic life of the people.

From 1919 to 1931 expenditure increased from £1,350,408 to £8,388,529. In 1932 it dropped to £4,815,542, in 1933 to £1,727,076, and during the years ending 31st March, 1934, 1935, and 1936, expenditure was £2,087,781, £2,242,535, and £2,484,561.



When it is remembered that business develops under settled conditions, it will be realized that any sudden disturbance is fraught with far-reaching consequences. The reduction in expenditure from loan-money of £6,661,453 in two years was disastrous, as when public works should have been expanding an opposite policy was being followed. The present Government is attempting to remedy the position by providing for a reasonable development of the national resources, using ordinary revenue to assist where the works are of such a nature as not to realize a full return of the annual cost.

A study of the proposed expenditure on public works for this year, as indicated in the Public Works estimates, shows that much the greater portion thereof is needed for means of transport and travel. Under broad headings the proposed expenditure is as follows :—

	£
(1) Construction of means of communication and transport (railways, highways, roads, harbours, and aerodromes)	5,605,700
(2) Land-development, including settlement of unemployed workers	959,000
(3) Erection of public buildings	1,215,000
(4) Development of electric power	764,000
	£8,543,700

Railways will this year form a much larger proportion of the cost of the first item than they have for the past few years. Work has been recommenced on the Napier–Gisborne Railway, the South Island Main Trunk Railway, and the Westport–Inangahua Railway. Additional railway construction under the control of the Public Works Department will be the Turakina–Okoia Deviation on the Wellington – New Plymouth Railway.

The proposed expenditure on road communications is very much larger this year than it has ever been in the past, and is more than half the total for all public works. On main highways alone it is proposed to expend £3,050,000, but more than £2,000,000 of this is received from revenue.

The Government is anxious to embark on an extensive programme for the elimination of railway level-crossings over main highways, and is prepared to place a very considerable sum of money on the estimates for this purpose. The design of these crossings, however, involves in each case a problem of its own, and some time must elapse before the full effect of the programme is felt, but I have instructed the Department to expedite the work as much as possible. In a few months' time a very large number of these works will be under way.

I am particularly anxious to improve the roads to our backblock settlers in order to give them easy access to their markets and ports of export, and this year over a million pounds will be provided for this purpose, and for the opening-up of further lands for development. With the policy of land improvement and reclamation, and improved methods of transport, our roading-system must be brought up to a higher standard than has existed in the past.

As Minister of Transport I have a particular interest in improved road conditions, and propose to do all I can to render our roads safer for modern methods of transport and travel. Railways and roads are our chief means for the transportation of the products of the country, and the necessities of the community in general, and are still our principal means of passenger travel, but I believe the day is not far distant when travel by air will play a big part in the passenger traffic of this country.

A comparatively large vote from the Consolidated Fund is asked for this year for the construction of aerodromes and emergency landing-grounds, without which safe and adequate communication by air would be impossible. With an annual provision of this amount, or even less, for the next two or three years I anticipate that air travel in this country will be placed on a safe and satisfactory basis. I consider that the construction of aerodromes is at present lagging behind the development of aviation in general.

The work of erecting public buildings is also very much behind what it should be to keep pace with the development of social and other services of the Government.

Instructions were given to the Public Works Department to considerably increase its staff to cope with this work. This has been done, and the architectural staff has been more than doubled. Anticipating that even this may not wholly meet the demand for public buildings, permission has been given to the heads of the Departments for which buildings are required to allocate some work to architects in private practice if it should be necessary.

Land development and improvement is considered most desirable by the Government. Irrigation plays a large part in the improvement of our farm lands in the South Island, and the Government is anxious to extend work of this nature provided it can secure to itself an adequate return for the expenditure involved in meeting the annual charges on money borrowed for this purpose. The provision of a sum of £1,030,000, including settlement of unemployed workers, is asked for on the estimates for these works.

Hydro-electric supply has received a good deal of my attention since I assumed office. One of the proposed new works to increase power-supply was under investigation at Waikaremoana. I was not satisfied that this was a sufficiently safe proposal, and therefore ordered the work to be stopped until I had an opportunity of going fully into the design of the scheme. This I intend to do as soon as possible. Works for the increase of power-supply from Arapuni were well advanced when I took control of the Department. I am not sure that I would have agreed to this work, but as it had progressed so far I have not taken any steps to prevent its completion.

Further electric power will soon be required to cope with the demand, and a programme of additional work will shortly be considered.

As mentioned in my opening remarks, I am desirous of carrying out public works with the help of the most up-to-date machinery, and I have asked for a considerable sum in my estimates to purchase modern plant. All new railway works, large road works, irrigation works, aerodromes, and other works, will be well equipped with this plant.

I would like to take this opportunity of placing on record my appreciation of the services of Mr. C. J. McKenzie, who retired from the position of Engineer-in-Chief on the 21st July, 1936, on account of ill health. Mr. McKenzie's illness caused concern to every officer of the Department, and it was with pleasure that we learned of his continued progress towards a complete recovery.

I wish also to place on record my appreciation of the services of the other officers of the Department who have been at all times most willing to co-operate with me in my office as Minister of Public Works.

FINANCE.

I now set out in summary form particulars regarding expenditure and receipts for last financial year, and also general information concerning the various classes of works financed from the Public Works Fund.

The payments and receipts for the year 1935–36, and accumulated totals, in connection with the Public Works Fund and other associated votes and accounts are shown in the tabulation below. The gross expenditure amounted to £6,663,091, of which £1,347,097 was expended by other Government Departments; the recoveries in reduction of expenditure amounted to £1,508,549, of which £500,958 was recovered

by other Departments; the net expenditure totalled £5,154,542, of which £846,139 was expended by other Departments. In addition the Department collected £1,028,416 from sales of electricity and from other forms of revenue.

Class of Work.	Expenditure, 1935–36.			Total Net Expenditure to 31st March, 1936.
	Gross.	Recoveries.	Net.	
Expenditure, Public Works Fund.				
Railways	£	£	£	£
New construction	8,088	42,986	*Cr.* 34,898	38,670,448
Improvements and additions to open lines	335,213	42,304	292,909	17,911,888
Roads	522,702	78,325	444,377	22,986,307*
Public buildings	409,649	62,769	346,880	12,069,672†
Lighthouses, harbour-works, and harbour defences	5,629	2,708	2,921	1,322,048
Tourist and health resorts	15,021	1,338	13,683	717,136
Telegraph extension	260,271	64,891	195,380	11,755,918
Departmental	251,189	151,805	99,384	3,091,929
Irrigation, water-supply, and drainage	152,718	67,304	85,414	1,303,179
Lands-improvement	97,568	59,659	37,909	928,036
Swamp land drainage	25,160	12,238	12,922	55,917
Settlement of unemployed workers	220,567	69,222	151,345	664,485‡
Native-land settlement	337,854	265,953	71,901	357,971
Plant, material, and services	343,390	320,952	22,438	140,987
Dairy industry loans	10,750	..	10,750	10,750
Cost and discount, raising loans, &c.	..	..	..	3,828,307
Closed accounts (for more detail see Table 1)	..	..	..	7,995,340
Totals, General Purposes Account	2,995,769	1,242,454	1,753,315	123,810,318§
Electric Supply Account (previously Aid to Water-power Works Account)—				
Construction (expenditure as per accounts in Table 5)	193,331	..	193,331	13,112,485
Working-expenses (expenditure as per accounts in Table 5)	197,968	..	197,968	..
Waihou and Ohinemuri Rivers Improvement Account	..	..	..	709,740
Totals, Public Works Fund	3,387,068	1,242,454	2,144,614	137,632,543
Expenditure, other Votes and Accounts.				
Main Highways Account—				
Revenue Fund—				
Annual appropriation (maintenance, interest and loan redemption)	1,576,069	116,787	1,459,282¶	..
Permanent appropriation (rate subsidies, interest on transfer from Public Works Fund, &c.)	460,125	..	460,125	..
Construction Fund—				
Annual appropriation	530,471	97,203	433,268¶	5,978,495**
Consolidated Fund (maintenance, public buildings, roads, &c.)	197,507	52,105	145,402	..
Closed accounts (for details see Public Works Statement, 1933)	..	..	..	18,955,387
Unemployment Fund (expenditure by Public Works Department): Amounts not included above	511,851	..	511,851	..
Totals, Other votes and accounts	3,276,023	266,095	3,009,928	24,933,882
Grand total of expenditure, Public Works Fund and other votes and accounts for the year ended 31st March, 1936	6,663,091	1,508,549	5,154,542	..
Capital expenditure to date	..	..	..	162,566,425

* Includes £4,500 expended under section 16, subsection (1), Native Land Amendment and Native Land Claims Adjustment Act, 1923. † Excludes expenditure on Workers' Dwellings totalling £319,918 transferred to State Advances Account. ‡ Includes £4,865 expended under Finance Act, 1932 (No. 2), section 6. § Does not include expenditure under Ellesmere Land Drainage Act, 1905, or £1,226,000 transferred to and included in Main Highways Construction Fund. ‖ Excludes interest and loan charges. ¶ For annual income and expenditure accounts, see Appendix E. ** As per accounts in Appendix E.

Class of Work.	Recoveries, 1935–36.
Receipts,* Public Works Department.	£
Ordinary Revenue Account, Irrigation (receipts for year)	17,023
Electric Supply Account (sales of energy, miscellaneous receipts, &c.): Receipts for year ..	993,812
Main Highways Revenue Fund (repayment of advances, &c., and interest): Receipts for year ..	17,581
Total receipts	1,028,416

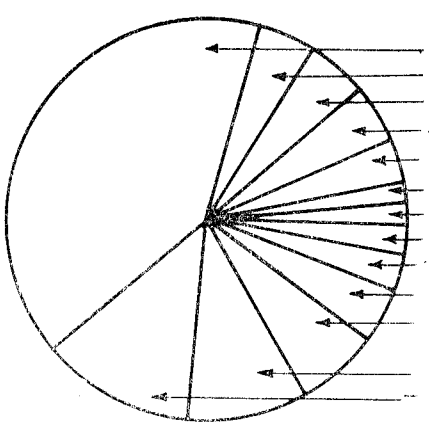
Summary.

—	Public Works Department.	Other Departments.	Total.
	£	£	£
Gross expenditure	5,315,994	1,347,097	6,663,091
Recoveries and receipts	2,036,007	500,958	2,536,965

* Excludes motor-spirits tax, registration fees, &c., collected by other Departments, also other small registration fees, &c.

Of the net payments totalling £5,154,542 shown above, £2,379,914 may be regarded as expended from loan-moneys and £2,774,628 as expended from annual taxation.

In diagrammatic form the ratio which the various classes bear to the whole is shown below. It should be noted that the figures are gross—that is, before deducting recoveries, which include subsidies from the Unemployment Fund and similar amounts which, if deducted, would detract from the true portrayal of activities.



	£	Per Cent.
Roads, including main highways	3,089,367	= 40·16
Public buildings, including schools	409,649	= 5·33
Hydro-electric (construction and working expenses) ..	391,299	= 5·09
Railway construction, improvements, and additions ..	343,301	= 4·46
Settlement of unemployed workers	220,567	= 2·87
Lands improvement	97,568	= 1·27
Irrigation	152,718	= 1·99
Public buildings, roads, &c. (maintenance)	197,507	= 2·57
Telegraph extension	260,271	= 3·38
Native-land Settlement	337,854	= 4·39
Unemployment Board (expenditure by Public Works Department)	511,851	= 6·65
Miscellaneous	651,139	= 8·47
Revenue (receipts)	1,028,416	= 13·37
Total revenue and gross expenditure for year ...	£7,691,507	= 100·00

In regard to the ways and means of the General Purposes Account of the Public Works Fund the position is as under:—

	£	£
Balance available, 1st April, 1935		1,193,331
Add funds received during the year—		
Finance Act, 1930 (No. 2), section 2	613,090	
Finance Act, 1931 (No. 4), section 2	1,636,910	
Miscellaneous	213,165	
		2,463,165
		3,656,496
Deduct expenditure during 1935–36—		
Under annual appropriations ..	1,748,450	
Under permanent appropriations ..	5,395	
		1,753,845
Balance available, 31st March, 1936 ..		£1,902,651

The estimated net expenditure under the General Purposes Account for the current financial year, 1936–37, is £4,686,700, and arrangements are being made with the Minister of Finance to provide the necessary funds. This is the amount shown on the Public Works estimates, which also show an estimated net expenditure of £764,000 from the Electric Supply Account and £2,752,000 from the Main Highways Account, a total for all these accounts of £8,202,700.

MAIN HIGHWAYS.

I have already indicated that main-highways requirements account for the largest proportion of the expenditure which is entrusted to my Department, and this fact in itself goes to show how important is this phase of its activities.

At present the main-highways system is comprised of some 12,000 miles of the most important urban, arterial, and rural roads, and the control of this system is exercised under the jurisdiction of the Main Highways Board by local authorities and the Public Works Department. The Main Highways Board has been responsible for directing and assisting local authorities in the improvement and better maintenance of main highways in a way which has given a great measure of general satisfaction. The improved standard of the principal roads of the Dominion to-day has been brought about only by the co-operative efforts of the Board and the local authorities concerned, but, while the position is as I have stated, it is considered, nevertheless, that the existing methods of administration do not adequately cater for present-day needs. I refer particularly to the divided control of our main highways and the delay and inconvenience which arise through lack of co-ordinated and planned administration. Although many local authorities are possessed of a broad national perspective, there are, unfortunately, others which allow purely local considerations to prejudice their judgment.

Road-transport facilities are vital to our national welfare, and communication by land depends at all times on our main traffic arteries being kept up to a high standard of efficiency. Under the present system of control, it has happened that trunk routes remain uncompleted because of the inability or unwillingness of a local authority to contribute a reasonable share of the finance involved. In order to unify the control of the principal arterial highways and to ensure that such highways are properly conditioned for continuous service, it is proposed to place approximately 4,000 miles under the direct control of the Main Highways Board. This mileage will be selected from existing main highways and classified as a State highways system, so that the full cost of improvements to a reasonable standard and the proper maintenance of that standard will be provided wholly from the Main Highways Account. This will also relieve local authorities of some financial obligations and enable them to devote needed attention to secondary highways of local importance as well as ordinary county or settlement roads.

The necessary legislation to give effect to the foregoing proposal will be brought down in the near future. I have discussed with the Main Highways Board some of the details involved in the change contemplated, and tentative arrangements have already been made in anticipation of the scheme being brought into operation.

On various occasions it has been declared to be the policy of the Government to assume the direct responsibility for the expenditure of public moneys, and, as far as possible, to provide for the administration of public activities through the elected representatives of the people. It is therefore proposed to include in the amending legislation provision for regulating the functions of the Board in accordance with the policy I have mentioned. In making this statement, however, I do not wish to detract in any way from what the Board has accomplished during the past twelve years, because I fully appreciate the excellent service it has rendered in that period.

The extension of the Board's jurisdiction in respect of the proposed State highways system and the intention to retain the Board with its present personnel indicate a recognition by the Government of the success achieved under the Board's administration.

The activities of the Board during the past financial year are more particularly described in its annual report appended to this Statement. The report shows that the total expenditure from highways funds on actual works, as distinct from loan and special charges, amounted to £1,600,000, which is nearly £400,000 more than was expended on similar works during the year immediately preceding. In addition, interest and loan charges accounted for £292,000, while general-rate subsidies, together with a special subsidy on rates levied upon farming-land, involved further payments aggregating £371,000. The question of charging rate subsidies to the Main Highways Account is one which the Government intends to review in connection with its general financial policy as soon as circumstances allow.

Although the present urgent requirements have not yet enabled the matter to be completely investigated, the financing of highways operations entirely from revenue instead of partly from loan-money as hitherto is also receiving serious consideration.

The progressive increase in annual loan charges, in respect of highways, now involves the appropriation of approximately £300,000 per annum, and it is desirable that if at all possible future works be financed from current revenues.

Expenditure from the Highways Revenue Fund throughout the entire highways system averaged the equivalent of £122·4 per mile, compared with £100·3 for the previous year. At present the maintenance costs are relatively high in some localities, due to various factors, such as scarcity of metal, increased traffic, and adverse weather conditions. Where circumstances warrant, permanent surfacing is carried out and the cost of maintenance can then be reduced. The increase in the average expenditure per mile per annum is due to the fact that for a number of years past insufficient funds were available to provide for necessary maintenance works, and it was the aim of all concerned to restrict expenditure in every way, but last year a larger sum was allocated, and this is reflected in the figures quoted.

In its report the Board refers to the steady increase in motor traffic generally as disclosed by the additional registrations of motor-vehicles and the greater importation of motor-spirit. It is apparent that, with the increased traffic, there is an immediate necessity to intensify the maintenance of highway surfaces, and improve, as far as possible, present unsatisfactory alignment. Improvement of alignment is a substantial factor in the elimination of accident risk, and, while much good work in this direction has already been accomplished, a great deal remains to be done.

In order to meet present requirements it is proposed to allocate £1,000,000 from highways funds this year for maintenance purposes.

In addition to this sum, £200,000 is being provided for urgent bridge renewals. The problem of replacing decayed and obsolete bridges is still somewhat acute, and, while this class of work is being carried out as expeditiously as possible, further acceleration is largely dependent on the progress that can be made with engineering surveys, site investigations, foundation-testing, and the designing of suitable and economic structures based on the peculiar features of each case.

The permanent surfacing of trunk routes and radial highways, which carry a sustained volume of traffic, resulted in the completion, during the past year, of 277 miles of dustless pavement. At the 31st March, 1936, the total length of highways thus surfaced was 1,943 miles, which is 16 per cent. of the total main-highways system. This class of work will be continued during the current year, the intention being to concentrate primarily upon the main arterial routes, although other highway sections will receive attention where traffic considerations and maintenance costs justify this form of surfacing.

A number of construction works are in process of completion, and these will be continued during the present year. In addition, further works comprising reconstruction, realignment, widening of narrow and dangerous sections, general improvements, new bridging, and level-crossing eliminations will be undertaken, and for this purpose the sum of approximately £1,300,000 is being appropriated.

The Government has arranged for the Main Highways Board to proceed with a vigorous programme of railway-crossing eliminations, and a considerable amount of investigation and design work has already been completed in this connection. Already a large number of these grade separations are in hand, and within the ensuing twelve months I anticipate that many of the most dangerous locations will have been dealt with. Within the next two years it is hoped to dispose of the majority of the present crossings, thereby removing a considerable source of danger and preventing accident and loss of life which unfortunately result from the failure of road-users to observe adequate precautions when negotiating these danger spots.

The value of State assistance to local authorities in respect of the maintenance and improvement of main highways generally may be gauged from the fact that during the past year the Main Highways Account provided from public funds 80 per cent. of the cost of maintenance and 84 per cent. of the cost of construction.

Such assistance will be continued and wherever possible extended.

SETTLEMENT AND OTHER ROADS.

The net expenditure from capital funds on this class of work during the last financial year amounted to £444,377, as compared with £371,573 for the previous year, an increase of £72,804. These figures do not include any sums which were found by local authorities in respect of subsidies granted towards works under their control.

Most of the expenditure under the immediate control of the Department related to the formation and metalling of roads in outlying areas. Last year 336 miles of road were reformed or formed as against 303 miles for the previous year, while 645 miles were metalled, compared with 714 miles for the previous year.

I am convinced that, notwithstanding the attention which has been given in the past to the provision of some form of access to those in backblock districts, the time has arrived when this question must be given special consideration.

The primary production of the Dominion has been developed most intensively in those places where reasonable and adequate roads exist, and it is practically impossible to expect efficient farming in partially developed areas until proper facilities are available for transport of materials and produce.

It does not follow that improved roading is necessarily justifiable in all parts that have been taken up for settlement, but where further settlement or greater development is possible the need for proper road access is well recognized, and it is intended to devote more attention to this phase of activity with a view to improving present unsatisfactory conditions.

However, apart from the purely commercial aspect, reasonable road access must be provided as a community service where settlement has become established. In the interests of education and public health, and to overcome isolation in periods of emergency, communication by land is vital to the welfare of our people, and it is my intention to give special consideration to improving road conditions wherever possible.

In addition to the formation and metalling of roads, grants and subsidies have been expended in bridging. This class of work often imposes such a burden on local authorities and their ratepayers that it is very necessary to allocate capital moneys by way of assistance towards establishing proper means of communication to developmental areas.

The services of my Department have been made available in the economic design of structures in order to conserve the funds of both the State and local authorities. From a close study of modern methods and practice, it has been possible to design bridges in permanent materials at reasonable cost, and by this means the amount required for regular maintenance expenditure is reduced, with consequent savings to the public taxpayer, without impairing the efficiency of the structures. In a few instances, because of special circumstances, it has been deemed advisable to utilize suitable timber for bridging, but as a general rule this course is not adopted.

The development of the tourist and scenic attractions of the Dominion is only possible according to the measure of their accessibility, and, where necessary, expenditure has been incurred in the construction or improvement of roads leading to these attractions. I am firmly of the opinion that the natural beauties of our country should be within easy reach of all of our citizens and not merely of those who visit us from overseas, and it will be my endeavour to make this objective possible of achievement.

I have referred elsewhere to the past activities of the Department in utilizing roadworks for the purpose of employing labour which otherwise would not be placed. Formerly, a considerable amount of assistance was obtained from unemployment funds towards the prosecution of works which were commenced principally to relieve unemployment. At present, however, all roadworks under the control of my Department are being carried out at standard rates, and I am satisfied that the ultimate results are proving entirely satisfactory.

Although not financed from capital moneys, the restoration of flood damage is a matter in which my Department has taken an active and practical interest. During the month of February last a cyclonic storm visited the Dominion, and, whilst fortunately many districts escaped severe damage or suffered very slightly, a number of others, such as Whangarei, Taranaki, Hawke's Bay, and Wellington districts, experienced considerable damage to settlement roads and bridges. The total cost of restoration in the districts mentioned was estimated to be in the vicinity of £100,000. Many local authorities found it necessary to approach the Government for financial aid towards the cost of repairs, and, after careful investigation of the circumstances, including the capacity of the authorities to meet a reasonable share of the cost, subsidies varying from £1 for £1 to as much as £3 for £1 were made available.

Having regard to the experiences of the past, the climatic changes to which the country is prone, and the probability of flood damage (sometimes of an extremely substantial nature) occurring at frequent intervals, it appears that serious consideration should be given to the inclusion of a reasonable contingency item in the annual budgets of every local road-controlling authority for use should occasion require. The setting-apart of, say, a proportionate amount of a local authority's estimated annual revenue would ensure that finance would be readily available for the purpose mentioned, and, if it happened that the contingency items were not fully expended, the finances of the local authority would be improved by the existence of a satisfactory reserve.

A few of the major works which have been in hand during the past year and are still in course of completion are:—

Reconstruction, including widening and metalling, of the Waikaremoana–Rotorua Road to a standard required for modern motor transport between Lake Waikaremoana and the thermal wonders of the Rotorua district. Work has been in progress at each end of the road for some months, and 377 men are employed.

Widening and extension of the Western Hutt Road, which was started a few years ago as a relief of unemployment work, is now a standard work. This road, when the proposed bridge over the Hutt River at Silverstream has been erected, will provide a much needed additional outlet from Wellington City to the Upper Hutt Valley and the Wairarapa, especially when the present highway through the Taita Gorge is blocked with slips or by flooding of the Hutt River. One hundred and twenty-nine men are employed on this road.

The road which branches off the Western Hutt Road at Haywards and joins the Auckland–Wellington Main Highway at Pahautanui is being widened and otherwise reconstructed to a standard necessary for modern motor transport, and when completed will provide a much better connection between the Hutt Valley and the beach resorts on the West Coast and the Auckland–Wellington Main Highway. Eighty-six men are employed.

Construction of the Lewis Pass Road, involving erection of several bridges, will provide a much shorter connection between North Canterbury and the north and middle portions of the West Coast than by any of the present highway routes. Work has been in progress at the Canterbury end for several years, but a recommencement was not made on the Reefton (West Coast) side until much later. Three hundred and twenty-five men are employed.

Main South Road (Westland): During the past year operations have been confined to the Weheka–Bruce Bay section, on which 107 men are employed.

Two large bridges are under construction, and, as the road work is well advanced, an immediate start is to be made with the next, and last, section to the Haast, on which several large bridges will be needed.

An immediate commencement is also being made with the Haast Pass Road to Otago, which will connect with the South Westland Road by a bridge near the mouth of the Haast River.

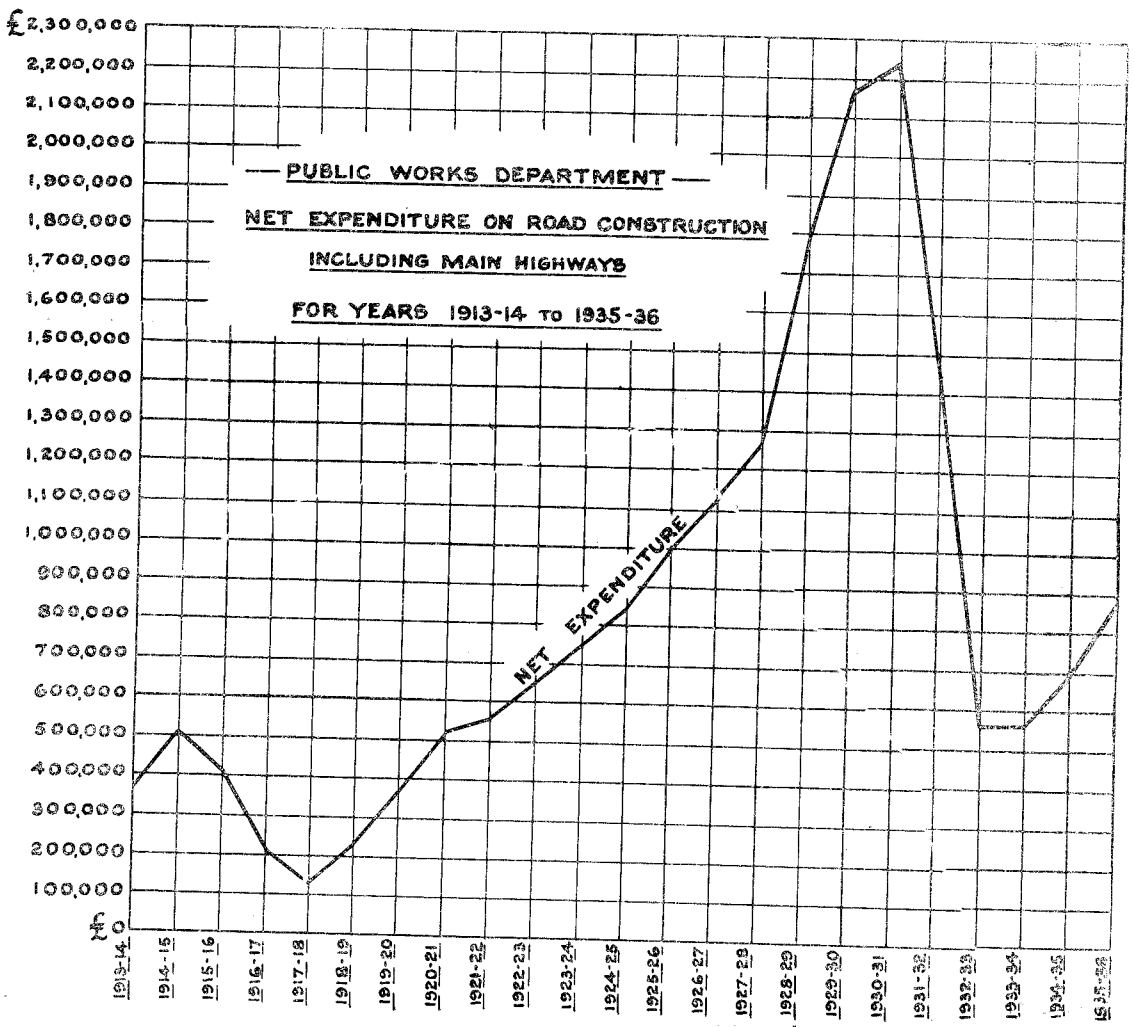
These two roads will provide direct communication between the glaciers and other scenic attractions of Westland and the lakes of Otago. Camps are being erected for 150 workmen at the Makaroro end of Haast Pass Road, but, owing to difficulty in obtaining frequent supplies by steamer, the number of men on the Main South Road of Westland cannot be immediately increased by more than fifty.

Another important work which is being started is completion of the Taumarunui–Tokaanu Road, which will give employment to 200 men. In addition to providing a shorter route between the Main Trunk district and Tokaanu, the road will open up some excellent timber country, and will enable large areas of Native land to be subdivided into farms, both along the route and at the Tokaanu end.

A commencement is also be made with what is known as the Waitakere Ridgeway Drive as soon as Auckland local bodies have found the reasonable sum which they have been asked to contribute. This work will give employment for 200 unemployed married men of Auckland City and suburbs, and when completed will provide an excellent scenic drive near Auckland.

With regard to the present year's programme of roadworks, I am pleased to say that extensive activities have been planned for the purpose of furthering the development of the Dominion's roading-system, and it is proposed to appropriate for this purpose £500,000 more than was provided for the previous year.

The rise and fall of expenditure over the last twenty years is illustrated by graph hereunder:—



HYDRO-ELECTRIC DEVELOPMENT.

Since taking over the portfolio of Public Works I have continued the work in connection with this branch of the Department's activities on the general lines adopted by the preceding Government. It is my intention, however, when more urgent matters requiring attention in other directions have been cleared up, to give more special attention to this important section of the Department's activities.

The principal construction work being carried on is the installation at Arapuni of two additional units, each of 21,000 kw., which was commenced by my predecessor. The difficult work in connection with the foundations for the power-house extensions has been completed and the installation of the machines commenced. It is hoped that the first of the new units will be ready for operation before the peak loads occur in June of next year, and the second unit should be complete a few months later. The main transmission-line is being continued northward from the present terminus at Henderson to give supply at substations at Mareretu and Mangatapere to the North Auckland Electric-power Board, and power should be available to this area during the present year.

Before my taking over control of the Department it was considered desirable that the water leaving Lake Waikaremoana should be directly controlled, as by so doing the upper 400 ft. of fall between Lakes Waikaremoana and Kaitawa, which at present is wasted, may be developed, and also because the control of the outflow from the lake will increase the capacity of the present station and also that of a lower station which at some later date may be developed below the present station. As Waikaremoana forms part of the Government's main interconnected system, full control of the water there would also have quite a considerable influence on the methods of operation and degree of development of the other stations connected to the system.

The country through which the tunnel would have to be driven to obtain full control of the water is, however, of such a nature that I have suspended further work on it until the very fullest and most careful consideration has been given to all the factors of risk, cost, and value.

In the South Island a large amount of finishing and cleaning-up in connection with the Waitaki scheme, which went into operation during the previous year, has been carried on. Certain work in connection with the closing of the final three temporary sluiceways which were used during construction of the dam, and which was not successfully completed before the water rose over the dam crest in 1934, can now only be carried out in the low-water winter months. One of these sluices was closed last winter, and during the present low-water period a second one has been closed, and it is anticipated that the third and final one will be completed within the next few weeks.

Following, particularly, on increased activity in mining there has been a very much increased demand for electric power on the West Coast. The existing local plants have been quite unable to meet the ever-increasing demand, and the Department has had an investigation made of several possible sources of power in the area. After studying all aspects of the problem, it has been decided that the present position can best be met by connecting this district with the existing Government electrical system supplied from Lake Coleridge and Waitaki by means of an extra-high-tension transmission from Lake Coleridge via Arthur's Pass to a central point in the vicinity of Hokitika. From there additional lines will be built to connect with various points where load becomes available. The mining position has been thoroughly investigated in the area in conjunction with my colleague the Minister of Mines, and there is no question but that the provision of a reliable and adequate supply of power in this area will give a great stimulus to the mining industry there, and will also provide a profitable revenue for our hydro-electric-power system. Contracts have already been completed for supply to two large dredges, each using about 800 kilowatts, and negotiations are in hand in respect to others.

During recent months the indication of the approach of more prosperous times has given a great stimulus to the electrical industry, and everywhere there are indications of increasing demands. To provide for this, additional transformers and switchgear will be necessary in many of the existing substations, and arrangements to secure the necessary plant are being made.

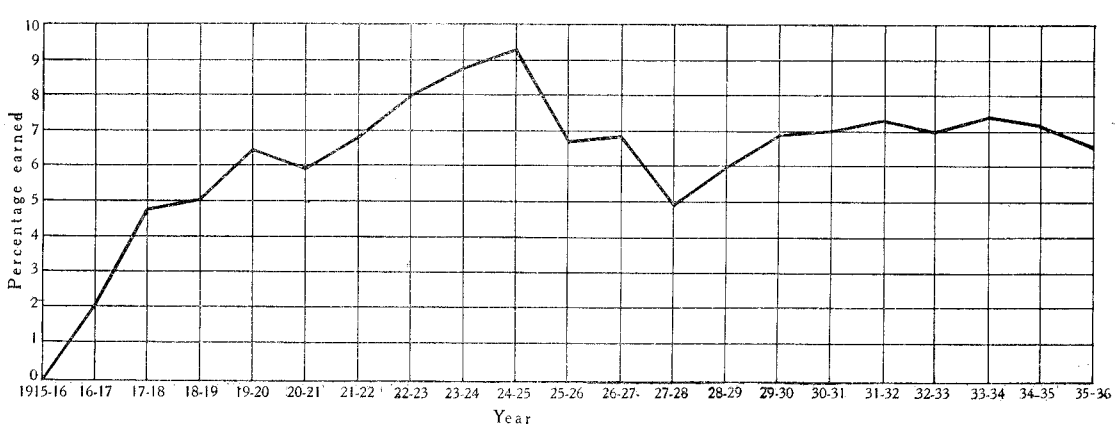
For the year just closed the increase in the number of units generated in the Government stations showed an increase over the previous year of 6·84 per cent. in the North Island and 14·49 per cent. in the South Island, whilst for the quarter ending in June of this year as compared with the corresponding quarter of the previous year the increase has been 11·81 per cent. in the North and 15·97 per cent. in the South.

Financially the year has been a successful one, although in the South Island the position has been affected by the fact that the large amount of capital invested in the Waitaki development has come on the Operating Account for the first complete year. Despite the addition of the large amount of additional capital, however, the whole Electric-supply Account has been able to earn 6·55 per cent. on the operating capital after paying net operating-expenses.

The position of the account is summarized in the following table, and the result since the State commenced operation in the electric-supply business is shown in the following graph :—

PERCENTAGE EARNED ON OPERATING CAPITAL AFTER PAYING WORKING-EXPENSES.

——	Average Operating Capital.	Gross Revenue.	Working-expenses.	Net Balance.	Percentage of Net Balance to Operating Capital.
	£	£	£	£	Per Cent.
North Island System ..	8,445,737	795,391	144,068	651,323	7·71
South Island System ..	4,431,949	245,258	53,900	191,358	4·32
Totals	12,877,686	1,040,649	197,968	842,681	6·55



In the North Island the depreciation reserve required by the State Supply of Electrical Energy Act—viz., 12½ per cent. of the capital invested—has now been reached, and a considerably reduced amount is therefore chargeable to depreciation, with a consequential considerable credit balance of £187,533 on the year's operations. The balance has been used to reduce the amount of deficiency which has been accumulated in earlier years and which now stands at £399,315. In the South Island, where in the past the depreciation reserve had reached the 12½-per-cent. limit mentioned above, the addition of a large amount of additional capital has necessitated the resumption of full payments into the Depreciation Reserve Fund, with the result that the year's operations show a loss of £65,609. To meet this loss the General Reserve has been drawn on, and has been reduced to £175,809.

The general position to date is that the Electric Supply Account has been able to meet all operating and interest charges, has provided £950,988 towards the statutory requirements of £1,350,303 for depreciation, and, in addition, has provided £326,500 to sinking fund and £175,809 to general reserve from profits made from time to time on Lake Coleridge and Horahora systems. In other words, the Electric Supply System as a whole has paid interest and operating charges and provided £1,453,297 in reserves, of which £308,945 has already been utilized by Treasury for the paying-off of loans which formed part of the original capital.

Electric-supply Operating Accounts.

North Island Electric-power System.

The Arapuni-Mangahao-Waikaremoana plants have operated satisfactorily throughout the past year, and the revenue shows an increase of £82,625 over that of the previous year.

The result of the year's operations was as follows :—	£	£
Capital investment at end of year		8,635,000
Revenue	795,391	
Operating-expenses	144,068	
Balance	£651,323	

The balance has been used in paying interest charges (£408,051), and £38,148 as the Department's share of the capital charges on the King's Wharf generating-plant of the Auckland Electric-power Board, also £17,591 to provide the full statutory contribution to depreciation.

Accumulated losses to date amount to £399,315, but the Reserve Accounts established in connection with this system show that £961,757 has been credited to depreciation and £55,930 to sinking fund, which latter amount has been utilized in the redemption of loans.

South Island Electric-supply System.

The Lake Coleridge-Waitaki plants have operated satisfactorily during the past year, and the revenue shows an increase of £17,161 over that of the previous year.

The year's operations resulted as under :—	£	£
Capital investment at end of year		4,460,382
Revenue	245,258	
Operating-expenses	53,900	
Balance	£191,358	

The balance has been used in payment of interest (£177,217), £79,750 has been paid to depreciation, the deficiency of £65,609 being provided from general reserve.

Supply in the Nelson District.

Prior to the present Government coming into power a license to develop a water power on the Cobb River and to supply power in the Nelson and Golden Bay areas had been granted to a private company. After protracted negotiations, authority has now been given to this company, which is interested in various industries in the area, to assign this license to a new company specially constituted to deal solely with the supply of power to the local authorities and special industries in the area. Special precautions have been taken to be certain that the interests of ratepayers and consumers in the area to be supplied are adequately protected, and provision is made for acquisition by the Crown on favourable terms in the event of default by the company, or if in any case such action should appear desirable.

Southland Electric-power Board.

This particular authority, which operates the Monowai power-station and a large reticulation system dependent thereon, has for some years been unable to carry on without resource to rating as a means of augmenting its revenue. Negotiations had been carried on by the previous Government with a view to taking over a part or the whole of this Board's business. An examination of the whole position satisfied me that the best assistance that could be rendered to the ratepayers in this area would be for the Government to take over the whole undertaking and thereafter

operate it as part of the Government system. The loans from which the Board's works have been built had been guaranteed by the State, and as this year the right existed to renew these loans on more favourable terms it appeared, if the change in ownership were desirable, that it should be effected without further delay, so that any advantages that might be obtained by getting the Government to itself arrange the new loan should be secured. Negotiations with the Board with this object in view have been in hand for some time.

Electric-supply Authorities.

Power generated in bulk is in the main sold to local authorities for distribution to the actual consumers. The local authorities are thus really partners with the Department in the complete business of giving supply to consumers, and their action and administration thus has a very considerable influence on the success of the undertaking. In fact, as the Government receives on the average only 0·34d. for each unit sold, and as the consumer pays on the average 1·25d. per unit purchased, it can readily be seen that these supply authorities can have a very considerable influence on success or otherwise of the whole business. On the whole I think it can be said that the general result is good, as there is considerable evidence to prove that the cost and general availability of electricity in New Zealand, particularly in rural areas, compares quite favourably with other places. I have not yet had opportunity to go as fully into the matter as I intend, but there are undoubtedly one or two aspects of distribution and of the relation between the generating authority and the distributing authority which are not quite perfect. There undoubtedly appears in some cases to be lack of co-operation between different owners of generating-plant. It is difficult under any contract to be sure that our available resources are being worked in the way best suited to the national interest. This particular problem has been considered in other places, and there certainly seems to be quite a decided concensus of opinion among power authorities that there should be some centralized control of generating-plants.

Electrical-supply and Electrical-wiring Regulations.

The Electrical-supply Regulations and Electrical-wiring Regulations, which were issued in 1927, and have been under review by the Regulations Advisory Committee since 1931, were finalized during the past year, and complete new editions were gazetted in September, 1935.

General.

The capital invested in the electric-supply systems operating throughout the Dominion totals £33,181,503, which includes £13,095,382 of Government expenditure, and the gross revenue received for the year was £4,823,324. After paying working-costs, interest, sinking fund, and depreciation charges, the net profit for the year under review was £554,154, as compared with £449,499 for 1935, which indicates that the electric-supply business as a whole is in a healthy condition.

It is gratifying to notice there is distinct evidence of expansion of business among the electric-supply authorities. An analysis and summary of the operating results and other statistics furnished by each electric-supply authority reveals the fact that there has been an increased consumption of electrical energy amounting in the aggregate to approximately 8·25 per cent. over that of 1935.

The statistics also indicate that during the past year new consumers have been connected at an average rate of approximately 1,100 per month, and the completed figures for the year show that the ratio of number of consumers of electricity to the total population of the Dominion (1,573,482) is 22·7 per cent., or 24·35 per cent. of population in areas supplied with electricity.

The statistical data relative to each electric-supply authority will be found in the series of tables accompanying the report of the Chief Electrical Engineer.

RAILWAYS.

During the last four years the construction of new railway-lines has been at a standstill, and works actually in hand, some of which were rapidly approaching completion, were abandoned. The existing economic position at that time no doubt led the Railways Board to believe that the various lines under construction were not justified from a commercial point of view, and that the anticipated traffic would not pay the cost of operation let alone any return on the capital cost of construction.

I am of the opinion that from the broad national point of view this attitude was a mistake.

In spite of the large mileage of highly improved main highways and the efficiency of modern motor transport, the railway still remains the predominant factor in the country's transportation system, and the completion of the present isolated systems and the linking-up of the various districts by rail is, in my opinion, the proper and reasonable course to adopt.

When this Government took office it was found impossible to proceed with the abandoned works without obtaining legislative authority enabling it to resume control of this important Department of State, the Railways Department. Legislation to overcome this difficulty was, therefore, given urgency, the Railways Board was abolished, and a new construction policy adopted.

Careful investigations were made concerning the merits of the various lines, and it was decided to proceed with certain of them as a first instalment of the Government's policy.

The completion of the Napier–Gisborne line was considered to be of the first importance, and my Department was authorized to make an immediate start with this work. It was found, however, that a great portion of the construction plant and material had been disposed of, the staff had been reduced, and the organization generally sadly depleted, permanent way and rolling-stock had deteriorated, slips and subsidences had taken place throughout the completed formation, and no attempt had been made to reconstruct the portions of the line damaged during the Napier earthquake, the net result being that a very considerable sum has had to be added to the original cost of construction in order to provide for the general cleaning-up of the sections and the replacement of plant and material. This work is now being vigorously prosecuted, and the number of men employed on the work is rapidly increasing.

The completion of the South Island Main Trunk and the Westport–Inangahua Railway were authorized later, and similar difficulties in regard to the replacement of plant and material and the deterioration of permanent way and formation were experienced.

A start has been made with both these lines, but at the closing of the period covered by this statement there had been time only to make preliminary arrangements.

In carrying out these works it is my policy to utilize as far as possible the latest and most up-to-date labour-saving machinery, and, with this end in view, orders have already been placed for a number of Diesel-engined shovels and drag-lines, air-compressors, lorries, concrete-mixers, service rails, and other construction material.

IRRIGATION.

Although the appropriation for irrigation works for some years past has, compared with appropriations from the Public Works Fund for certain other purposes, been a relatively small one, it has to be pointed out that irrigation works have this important feature, that they create an asset on the land and build up the prosperity of the country both directly and indirectly. Certain large areas with deficient rainfall have productive capacity far below normal without irrigation,

but under irrigation are capable of ranking equally, from a productive point of view, with other lands favoured by the most favourable climatic conditions in New New Zealand. I am satisfied, as a result of my investigations during the time I have held the portfolio of Public Works, that as an avenue for the expenditure of Public Works funds, irrigation works should take a very high place.

While this is so, it has to be remembered that, from the very nature of the enterprise, irrigation works require most careful planning and investigation; moreover arrangements for finance involve negotiations in many cases with settlers, and detailed discussions with the Departments of Lands and Agriculture, and with Treasury. This accounts for what may appear the delay in putting certain projects in hand, but I am hopeful that before the end of this financial year work in hand will be speeded up, and that one major scheme in Otago, under investigation for some time, will be commenced.

This is the Maniototo Irrigation Scheme, which could supply water to a gross area of 83,000 acres, but as a first development it is proposed to undertake work to supply water to 30,000 acres, at an estimated cost of £393,000. Surveys of distributaries and preparation of estimates and plans in relation to this first stage have occupied the year. Consideration is at present being given to acquiring certain areas of land that would be benefited, but all is in order for an immediate commencement with the work as soon as the Government's final approval is available.

Intensive investigation work into irrigation in Canterbury Province has continued. During the year topographic surveys were carried out on close on 200,000 acres, the stream-gauging is being speeded up by the installation of ten more water-level recorders, and soil-type surveys and soil-moisture determinations have continued. One branch of these investigations will show closely the water that is available for irrigation purposes in Canterbury, and the other will closely define the areas which would definitely benefit by irrigation. It can be said that the standard of this investigation is at least as high as that in any part of the world. I would add that preliminary steps for an extension of this investigation into Marlborough Province have been undertaken. River water-level recorders are being arranged for, and rainfall, wind velocity, and evaporation stations have been established.

Coming now to a brief description of the works in hand, the largest in the Otago District is the Omakau Irrigation Scheme, which will supply water to 14,000 acres. The rock-fill dam across the Manuherikia River, with spillway, spillway-shaft, and valve-chamber, and up-stream pavement slab, was completed. Seven miles of main race and 34½ miles of branch and distributary races were completed, together with associated works such as siphons and intake weirs. These works were brought to a conclusion sufficiently early in the season to enable water to be supplied to 5,000 acres.

Marked improvement has followed in the Ida Valley Scheme by the completion of the Poolburn drainage.

The major work in the Teviot Scheme was the driving and lining of a tunnel 5,078 ft. long to eliminate the main 36 in. pipe-line. Close on one-half of the work was done during the year. Work is in hand on renewing two steel pipe siphons with concrete-lined steel mains.

In the Last Chance Scheme, Butchers Creek Dam, concrete-arch type, was completed, some 1,800 cubic yards of concrete being placed during the year. In addition, a tunnel through schist rock, to improve the race system, was completed, the year's work being some 1,900 ft. of tunnelling.

The Fraser River Dam, of concrete-arch type, in the Earnscleugh Scheme made good progress. The purpose of the dam is to augment irrigation supplies to the Earnscleugh Flats.

In the Canterbury Province work on the Redcliff Irrigation Scheme was actively carried on to completion. All races and structures were finished and tested, and water can now be supplied to about 5,000 acres.

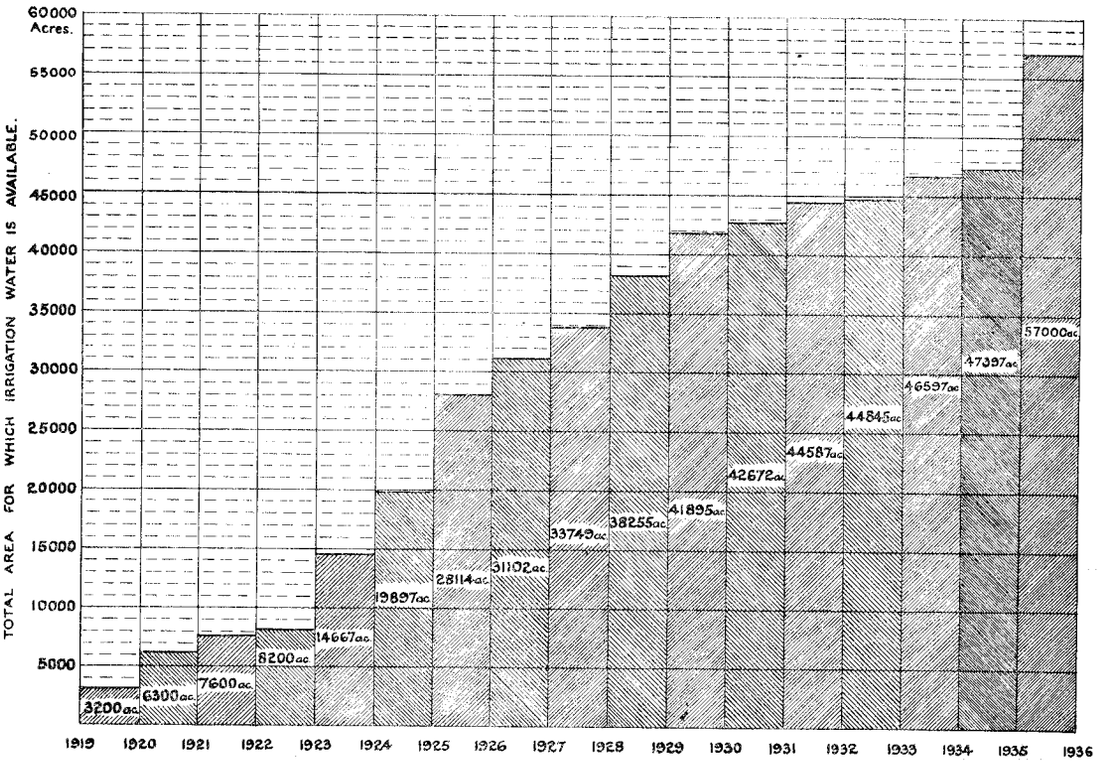
On the Levels Plain Irrigation Scheme work was started on 1st July, 1935. During the year thirty miles of races were excavated, representing 103,000 cubic yards of earthwork. In addition, fifty-one race structures in reinforced concrete were built.

Work was also begun in March last on the Ashburton–Lyndhurst Irrigation Scheme, and good progress is being made. This section of the work will make water available to 25,000 acres of irrigable land.

Reviewing the operating side of irrigation, water was supplied to 43,847 acres, compared with 38,027 acres for the previous year, the increase being mainly due to supply to the new Omakau area. The revenue for the past year for Otago schemes in operation was £22,891, working-expenses £14,666, and gross profit on working £8,225. These figures show a small improvement on the previous year.

The large item for arrears outstanding has not been reduced. Action to have the matter of these arrears investigated by the Otago Mortgagors Relief Commission was discontinued, and I have arranged that this work be carried on by a committee of expert Government officers. I consider that advantage should now be taken of the statutory provision for the collection of water rates as a first charge on the produce of the land, and I have authorized a reasonable enforcement of that provision where necessary. The question of arrears should not then present the same difficulty.

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



LANDS IMPROVEMENT.

The net capital expenditure from the Public Works Fund was £37,909, but the gross expenditure was £97,568, thus indicating that by far the greater portion of the cost of this class of work has been met from revenue funds, and providing a comparison with the previous year's net capital expenditure of £82,092.

The works carried out under the Lands Improvement Section of the Public Works Fund can be classified under the following general headings:—

Works for the drainage of farm lands.
Works for the reclamation of sand-dune areas.
Works for the reclamation of tidal-flat areas.
Works for the improvement and control of rivers.
Works for the clearing of farm lands.

The Taupiri Drainage Scheme in Auckland District is undoubtedly the major work under the first description, providing as it does for the improvement of 93,500 acres of flat land and affecting also the productive capacity of some 56,300 acres of hill country. Operations have now been in hand over three successive years, and, as with all other works of this class, the results now beginning to appear after completion of 75 per cent. of the scheme are of a definitely satisfactory character. Other areas under development by drainage include the Te Kawa Drainage Scheme, also in Auckland District, the Waimatua Drainage Area, adjoining Invercargill, and completed during the year, and the combined drainage and clearing scheme in progress at Paraparaumu, some forty miles north from Wellington. Such works can truly be regarded as of great value to the Dominion.

Sand-dune reclamation works have again received considerable attention, not with the object of rendering these areas fertile and productive, but in an effort to safeguard rich pasture-lands and watercourses from the ever-encroaching sand drift caused by prevailing strong winds. The important areas undergoing reclamation measures are located on the west coast of the North Island, in the Auckland and Wellington Provinces. Programmes of work have been approved over extensive areas totalling several thousands of acres, and in many instances the establishment of marram-grass and lupin has already resulted, according to time, in the partial or more complete stability of the dunes. As the stabilization of the drifts has proceeded, tree-planting operations have been undertaken, and it is intended ultimately to adopt these measures over the whole of the reclaimed areas. The value of these works will be the more evident with the passing of time.

The largest tidal-flat reclamation work in hand during the year was the Ahuriri Lagoon Reclamation at Napier. This area of approximately 7,600 acres was, prior to the earthquake of 1931, an excellent fishing and yachting ground, but its upheaval as a result of the earthquake rendered it a desolate expanse of mud-bank and shallow brackish water. Upon completion of the extensive developmental operations now in progress, it is intended to establish families on small farms. In the North Auckland District the work for the year has been confined to maintenance of the previously completed schemes at Hokianga and Whangaroa Harbours, while in Auckland District the scheme at Kaipara Harbour has been furthered.

The improvement and control of rivers provided useful work for many men, and, indeed, such works can claim much importance by reason of the great benefits accruing to adjacent lands upon completion of each scheme. The clearing of willows from watercourses and the construction of stop-banks, protective groynes, and weirs have been the special features of most of these schemes, which have the common object of improving the drainage of the watersheds and generally safeguarding valuable lands from damage due to flooding and silting whenever heavy rain occurs. Local bodies are capable of rendering invaluable assistance to the Dominion by attending to the smaller works within their own respective borders.

General improvements have been carried out on farm lands during the year, the funds being provided by the interested settlers and the Unemployment Board. The works were individually of a minor nature, but in the aggregate the assistance rendered to primary producers has been very considerable. In fact, in the great majority of cases it is practically certain that the works could never have been undertaken by the settlers without the assistance extended to them under this scheme.

PUBLIC BUILDINGS.

General Departmental Buildings.

At Alexandra a contract is in hand for the erection of new departmental buildings. The excavation of the site of the new departmental building at Wellington and additions to the Public Works Department's garage were made. The total net expenditure under this vote was £39,532, which included a further Government subsidy of £30,000 towards the erection of the National Art Gallery and Dominion Museum building at Wellington. This building was officially opened on 1st August, 1936.

Courthouses.

For a number of years courthouse accommodation in many centres has been inadequate, and it became evident during the year that the additions and alterations then contemplated in a few centres would not meet the Justice Department's needs as a whole to any great extent. The matter has been reviewed, and it is now possible in accordance with the Government's general building policy to commence a definite and steady programme of additions which, within the next two or three years, will place accommodation on a satisfactory basis. The Department of Justice is in close collaboration with the Government Architect in all projected work to ensure that design and layout will provide for convenience and expedition of court and office work, and that the special interior features peculiar to courthouses in the matter of heating, lighting, acoustics, strong-room accommodation, &c., are given full consideration.

The total expenditure for the year ended 31st March last was £8,701, and was incurred on new work which included the completion of the new Wairoa Courthouse, new Putaruru Courthouse, approaching completion of additions at Palmerston North, and also the commencement of the new library additions at the Auckland Supreme Court. A site for the new courthouse at Invercargill was also purchased.

For the year ending 31st March, 1937, a total estimated capital expenditure of approximately £39,000 is being provided for on account, and it is proposed to proceed with the new courthouses at Ashburton, Blenheim, Invercargill, and Kaeo, and extensive reconstruction at Christchurch and alterations at Auckland.

Prison Buildings and Works.

Due to the decreasing population at prison and borstal institutions it has not been necessary to consider further housing-accommodation during the year. The total net expenditure from capital funds during the year amounted to £2,123. This included a wool-shed at Hautu Prison Farm, milking-machinery at No. 1 Dairy, Waikeria Borstal Farm, and an electric ironer at the Women's Borstal, Wellington.

For the current year it has been found necessary to consider a number of improvements to plant and equipment which have been deferred over the depression period. At several institutions laundering was carried on under somewhat unsatisfactory conditions, and improved laundering conditions at Invercargill, Point Halswell, Waikeria, and Addington are provided for in the current year's estimates, and except at Invercargill the installations are at present under way.

Other principal works for the current year are the installation of a meat-chiller at Waikeria for the supply of Mount Eden Prison with meat, and the provision of two additional cottages at that institution to meet the shortage which at present exists.

Police-stations.

The net expenditure on police-stations during the year was £6,710. A police-station was erected at Tikitiki, and a new lock-up at Palmerston North. Additions were made to the Central Police-station at Auckland; a house and land were purchased for use as a police-station at Half-moon Bay, Stewart Island, and a site for police purposes was acquired at Kaeo. Several of the police-stations in the larger towns, notably those at Whangarei, Wanganui, Napier, Palmerston North, Nelson, Greymouth, and Timaru, are very old buildings, which provide inadequate accommodation and are rapidly approaching the end of their period of usefulness. They will require to be replaced in the near future by buildings suitable for present-day requirements.

Post and Telegraph Buildings and Land.

The capital expenditure on erection of Post and Telegraph buildings and garages amounted to £97,800.

During the year new post-office buildings were erected at Toko and Petone, and additions were made to the Rotorua and Wellsford buildings.

A garage was erected at Hamilton, a garage and line-shed at Kaikohe, and an additional garage at Paeroa; and the garages at Taumarunui and Wanganui were extended.

Improvements in the accommodation at a number of post-offices were effected.

The following buildings were in course of erection at the end of the year: Albury, Auckland (garage), Cambridge (addition), Charleston, Dunedin, Hampden (addition), Kaikoura (carrier-current building), Ohingaiti (addition), Pahiatua (post-office and residence), Porangahau, Rangiora, Te Puke (garage), Wellington (additional story on General Post Office building).

Good progress continues to be made with the new chief post-office building at Dunedin, and it is expected that the work will be completed by October.

Plans are being prepared for a number of new buildings. The preparation of the plans for the new chief post-office building at Thames has been protracted owing to structural difficulties. The plans have now been completed, however, and tenders will be called for at an early date.

Areas of land no longer required at the following places were relinquished or disposed of: Lower Hutt (portion of automatic-exchange site for street-widening), Petone (portion of post-office site for street-widening), Palmerston North (strip of chief post-office site), Turakina, and Wanstead.

The disposal was effected of the old post-office building and site at Auckland East, the lineman's residence and site at Ohura, the old post-office site and the school-house thereon at Whakataki, and the line-depot building and site at Stout Street, Wellington.

Areas of land were acquired as follows: Aramoho (extension of post-office site), Belfast (for post-office), Dargaville (for store garage), New Plymouth (for chief post-office), Otorohanga (for post-office), Rangiora (extension of post-office site), Thames (extension of chief post-office site), and Wellington (extension of Mount Etako radio-station site).

The post-office building at Kumeu was destroyed by fire in August.

Mental Hospitals.

The capital expenditure for the year on mental hospitals was £67,465, being £31,165 less than on the previous year. It is proposed to appropriate £216,000 for expenditure on capital works for the current year.

Auckland: At Avondale additions to the boiler-house have been completed, and extensive repairs and renovations carried out.

Puhitahi: At Puhitahi four new villas are under construction, and when completed accommodation will be provided for 600 patients in this institution. A new store is nearing completion in the services block. Two residences, with garages, have been erected, and the roading, sewerage, and electrical services have been extended to the residential quarter of the institution.

Tokanui: At Tokanui two new villas for farm-workers are nearing completion. Roads, water, sewerage, and electrical services have been extended to the new villas, and remodelling of the main sewerage system has been completed. Repairs and renovations have been carried out at the main institution, and new electrical refrigerating plant has been installed in the butchers' shop.

Nelson: At Ngawhatu two additional villas have been erected, and an additional villa is in the course of construction. The installation of the machinery for the laundry and boiler-house has been completed. Roading, water-supply, sewerage works, and electrical reticulation is being extended to the new villas. A new cool store has been constructed, and general maintenance and repair work carried out.

Hokitika: At Hokitika a new villa for fifty patients is nearing completion. A residence and garage has been erected for the Head Attendant. A large addition was made to the laundry, and a new tool-shed erected.

Christchurch: At Sunnyside a new grain-store was erected, and a vegetable-preparation room is nearing completion. The latter is the forerunner of extensive reconstruction of the kitchen block. At Templeton a vocational block and tool-shed in wood have been completed. Two new villas are in the course of construction, and additional roading, water-supply, sewerage works, and electrical reticulation are being extended to these works.

Seacliff: Alterations and repairs have been attended to.

Health and Hospital Institutions.

Expenditure approximating £48,000 is contemplated at Queen Mary Hospital, Hanmer Springs, in providing a new hospital for male patients and a new massage block and bathhouse. Improvements in the water-supply for the hospital and township are also being undertaken. Provision is made for the payment of further instalment on account of the Government grant of £20,000 towards the cost of the new Obstetric Hospital at Dunedin. The erection of a new training clinic for probationer dental nurses at Wellington is being undertaken as early as possible. A site has been selected and plans are in the course of preparation. It is hoped to have the actual construction well advanced within the year and final provision made accordingly. The net expenditure on health and hospital institutions for the year was £2,191.

Education.

The net expenditure of capital funds on the erection of school buildings, additions, and teachers' residences, and the purchase of sites, amounted to £131,457 for the year. This sum includes £10,033 provided by the Consolidated Fund to meet the cost of works under £200.

The expenditure was reduced by credits-in-aid amounting to £48,547. This figure includes a substantial portion of the proceeds from the sale to the Fire Board of the Clyde Quay School site, Wellington, and also a contribution from the Unemployment Board towards the cost of erecting school buildings.

The following table shows for the last three years the capital expenditure on new school buildings, additions, sites, and teachers' residences :—

	1933–34. £	1934–35. £	1935–36. £
Public schools	57,664	35,105	87,908
Secondary schools	2,568	14,679	23,516
Technical schools	1,504	12,851	59,350
Training colleges	..	..	610
Native schools	2,698	5,419	8,399
Child-welfare institutions	..	..	221
Grand total	64,434	68,054	180,004
Less credits-in-aid	7,778	10,894	48,547
	£56,656	£57,160	£131,457

ESTABLISHMENT OF AERODROMES.

During the year considerable expansion has taken place in this side of my Department's activities, and a special branch has been established to work in conjunction with the Civil Aviation and Air Services Branches of the Defence Department. In consequence of the quickened public interest and demand for air-transport facilities and the development of the Air Force stations at Hobsonville and Wigram, much more rapid development of aerodromes and emergency landing-fields has been proceeded with than was originally contemplated.

During the year air services were placed in operation on the Main Air Trunk route between Palmerston North and Dunedin and across Cook Strait from Wellington to Blenheim and Nelson, in addition to the air services already in operation between Gisborne and Napier, and on the West Coast of the South Island. Further extensions to these services are contemplated in the near future.

The development of aerodromes and emergency landing-grounds is being primarily concentrated to provide a chain of fields along the air routes which are either already in operation or shortly to be commenced. Forty aerodromes or landing-grounds were actually under construction during the year, and construction proposals are under consideration for an additional sixty or seventy fields. Work was provided on aerodrome-construction for a maximum number of 2,400 men, who might otherwise have been engaged on less productive work.

Much of the greater portion of the expenditure to cover this work was made available from the Unemployment Funds, and a total of £202,860 was expended from this source. In addition, £3,464 was expended from the Consolidated Fund to cover the provision of tools, plant, materials, and overhead, £79,581 from Defence Department funds (including the £5,000 Civil Aviation vote), and an additional £4,854 from the Public Works funds, most of which is recoverable.

RAILWAYS—IMPROVEMENTS AND ADDITIONS TO OPEN LINES.

The net expenditure out of the Public Works Fund under the above heading for the year ended 31st March, 1936, was £292,909. Almost the whole of this expenditure was incurred on the new terminal facilities at Wellington, which comprise three major works: the Wellington new station building and yard; the Tawa Flat deviation; and the Wellington–Paekakariki electrification. Some preliminary expenditure was incurred on the Wellington–Johnsonville electrification. The only other work of importance in hand during the year was the Puketeraki deviation, which was nearing completion at the 31st March, 1936.

Good progress was made during the year by the contractor with the erection of the new station building at Wellington. At the same time the layout of the new yard was proceeded with by the Railways Department and station platforms and verandas erected. The new signal-cabin was completed and a contract let for the erection of the locomotive depot. The construction of Bunny Street on a new alignment was completed, and at the close of the financial year the construction of a new taxi road was in hand.

The work of electrifying the section between Wellington and Paekakariki was continued according to schedule, the laying of the 33,000-volt cable being completed during the year and the overhead gear and rail bonding proceeded with. Sub-stations for traction power were nearing completion, and the outdoor steelwork for the electrical equipment was completed at two sub-stations.

On the Tawa Flat deviation one line was opened for night goods traffic on 22nd July, 1935. The Thermit welding of the rails on this section of line was completed and ballasting was proceeding. The new Tawa Flat station was nearly completed at the end of the financial year.

LIGHTHOUSES.

The net expenditure on lighthouses for the year was £3,320. At Baring Head additional oil storage was provided and a telephone-line eight miles in length erected to the Exchange at Eastbourne.

At Tiritiri Island a reinforced-concrete building was erected to house the fog-signal apparatus.

HARBOUR WORKS.

During the year the French Pass Wharf and Mangonui Wharf were completed, and the Te Hapua Wharf is now under construction. As far as the Public Works Fund was concerned no new expenditure was incurred on harbour works.

TOURIST AND HEALTH RESORTS.

The expenditure was £13,683, as against £12,880 for the previous year, the main items of which were the purchase of a launch for Milford Sound, new outdoor bathhouse at Morere Hot Springs, and additions to the Te Anau Hotel and to Lake House, Waikaremoana.

During the current year it is proposed to proceed with the erection of staff quarters at the Chateau Tongariro, huts in the Eglinton Valley, extensions to the Rotorua electric system, and additions to the Hotel Milford, Milford Sound.

TELEGRAPH EXTENSION.

The expenditure on telegraph extension by the Post and Telegraph Department for the financial year in respect of telephone, telegraph, and radio services throughout the Dominion amounted to £195,379, as against £135,933 for the year ended the 31st March, 1935.

The long-distance toll service was further improved by the establishment of a three-channel carrier current system for direct operation between Auckland and Wellington. The installation of this system has provided an additional toll outlet between Auckland and Wellington, thus increasing the number of direct outlets between those centres from two to three and enabling better facilities to be made available for emergency purposes via alternative routes. In addition, the installation of several new single-channel carrier current systems provided additional high-grade direct toll circuits between Auckland and New Plymouth, Auckland and Palmerston North, Palmerston North and Wellington, Palmerston North and Masterton, and Wellington and Napier.

The telegraph offices at Whangarei, Hamilton, Rotorua, Masterton, Blenheim, Nelson, Westport, Greymouth, Timaru, Oamaru, and Invercargill, which were hitherto wholly morse offices, were equipped with teleprinter apparatus for the despatch of telegraph traffic to and from their main distributing or controlling centres. Additional teleprinter equipment was installed at each of the main distributing centres—viz., Auckland, Wellington, Christchurch, and Dunedin—to provide new teleprinter channels between Auckland and Whangarei, Auckland and Hamilton, Auckland and Rotorua, Wellington and Masterton, Wellington and Blenheim, Wellington and Nelson, Christchurch and Westport, Christchurch and Greymouth, Christchurch and Timaru, Christchurch and Oamaru, Christchurch and Invercargill, and Dunedin and Invercargill. Additional multiplex equipment also was installed at Auckland, Wellington, and Christchurch to meet special demands during exceptionally busy periods.

Throughout the year new telephone-exchange connections continued to exceed relinquishments, the net gain in subscribers being 5,255, as against 2,200 for the previous year. Although the peak number of main subscribers reached in 1930 has not yet been regained, it is pleasing to record that the grand total of telephone installations of all kinds in the Dominion at the close of the year (166,565) is approximately 200 in excess of the number recorded in 1930. The position in this respect is due largely to the marked increase in extension stations, which now total 30,598, compared with 26,698 in December, 1930, an increase of 3,900; and it indicates that the advantages of the auxiliary telephone-equipment facilities provided by the Department are realized by the business community. A number of the new subscribers for the year were former telephone-exchange subscribers who could be reconnected with a minimum of expense, but in many instances demands for telephone service are being received from new areas which have not previously been reticulated fully. In these cases the necessary cabling, &c., is being proceeded with as fast as is practicable. It has not been necessary to make large additions to the automatic telephone-exchange switching-equipment, but additional two-party-line equipment has been installed at the Auckland Central, Wellington Central, and Dunedin Central Exchanges, while such equipment has been provided initially at the Onehunga, Takapuna, and Oamaru Exchanges. In so far as magneto exchanges are concerned, the major construction works were the installation of branching multiple switchboard equipment at Morrinsville and Rangiora, and the removal of the latter exchange to the new building. A considerable amount was spent during the year in the purchase

of equipment for private automatic branch exchanges, thirteen of which were installed during the year and four existing installations transferred for use elsewhere. The following is a brief summary of the more important operations in regard to the development of telephone-exchange systems in the Dominion :—

The laying of 22 miles of underground cable ducts.

The laying or erecting of 47 miles of lead-covered cable containing 11,156 miles of wire for subscribers' circuits.

The erection of 192 miles of pole-line and 2,196 miles of open aerial wire for telephone-exchange subscribers' circuits.

The installation of seventy public-call offices and seven pay stations.

The installation of additional two-party-line equipment at Auckland Central, Wellington Central, and Dunedin Central, and the initial provision of similar equipment at the Onehunga, Takapuna, and Oamaru automatic telephone exchanges.

The modification at a number of automatic exchanges of the end-line equipment of certain groups to provide "step-on" facilities for private automatic branch exchanges where more than one trunk is leased.

The provision of motor-generator sets with automatic charging control at P.A.B.X. stations at Auckland.

The installation of a stand-by engine-generator set at Wanganui automatic telephone exchange.

The installation of timing-devices in a large number of public-call offices.

The installation of branching multiple switchboard equipment at Morrinsville and Rangiora, and the removal of the latter exchange to the new building.

The installation of increased switchboard accommodation at Kerikeri, Tauranga, and Ranfurly telephone exchanges.

The replacement of the telephone-exchange battery at Greymouth.

The reconstruction or partial reconstruction of open aerial systems at forty-nine exchanges.

The replacement of marline hangers for aerial telephone cable with galvanized-steel cable rings at a number of exchanges.

Extensions and improvements to the plant at Wellington Radio during the year have caused this station to attain, in some respects, the status of a national radio centre conducting not only coastal services for the benefit of shipping, but also services to the island dependencies and certain Pacific Islands of other Administrations. All the short-wave services undertaken by the station are now equipped with transmitters of high-frequency stability, making a notable improvement in the standard of the service given. One of the chief improvements was the replacement by modern equipment of the crystal control type of short-wave transmitter used for the mobile service. Simultaneously with this replacement, automatic apparatus was installed for the transmission of the daily press news to ships at sea and island stations within range. The main transmitter used in the coastal service for medium-wave transmissions has also been replaced by more modern equipment providing higher frequency-stability and improved power-output. At Awarua Radio modern transmitting-apparatus was installed, and this station is now up to modern standards in this respect.

SETTLEMENT OF UNEMPLOYED WORKERS.

During the year steady progress was made with the development of the areas acquired by the small farms for settlement under the provisions of the Small Farms (Relief of Unemployment) Act, 1932–33.

The cottages erected during the twelve months number forty-nine, the average cost of each being £281, as against £241 last year. This increase can be attributed to the increased cost of building materials.

Throughout the year the number of workmen employed on the development work on the blocks remained fairly constant.

The following summary shows the expenditure under the vote, and the results for the year :—

Capital expenditure	£146,480
Number of sections under development, and area	583 ; 48,689 acres
Number of share milkers established ..	5
Number of men employed on development ..	1,246

DEFENCE WORKS.

A large programme of construction work is being carried out on behalf of the Navy Office and the Defence Department.

PLANT AND MECHANICAL EQUIPMENT.

Immediately upon the present Government taking up office, I made a close investigation into the matter of utilizing modern plant upon the Department's construction works as proceeding and as contemplated by the Government.

After visiting most of the works in hand by the Department throughout New Zealand, and after going fully into the question with the Department, I decided upon a policy of instituting the very latest type of construction plant upon such works whereon a combination of plant and man-power would show a decided economy to the Government and at the same time lighten the laborious side of the work with advantage to the men employed.

Although this policy has been in operation for several months now, its full effects have not yet been felt, because the greater portion of the plant on order has not yet arrived upon the works.

The majority of the new plant ordered is being supplied from England, but, wherever economically possible, New-Zealand-made plant is being obtained, and, to foster New Zealand industry, a preference loading is applied to all tenders in favour of New Zealand manufacturers when the quotations are being considered by the Tenders Board.

I should like to point out here that tenders for the Department's plant requirements are invariably called in the public press at the four main centres of New Zealand, and no reputable firm is precluded from tendering. The specifications are also mailed to the High Commissioner for New Zealand so that British firms unrepresented in New Zealand may also have an opportunity of tendering, sufficient time being given for mailing manufacturers' data from England before the closing date.

In this way information is received concerning the very latest equipment available upon the world's markets.

During the year a quantity of plant was maintained upon swamp drainage and the removal of tree-stumps in the Auckland, Stratford, and Taumarunui districts ; irrigation and drainage works in Otago Central and South Canterbury ; various stone-quarries throughout New Zealand ; Arapuni Power-house extensions ; Homer Tunnel ; Ahuriri Lagoon reclamation ; Hutt Estuary reclamation ; and aerodrome-construction works generally ; whilst a quantity of road-maintenance and construction plant was utilized upon the Department's roading-works and main highways throughout New Zealand.

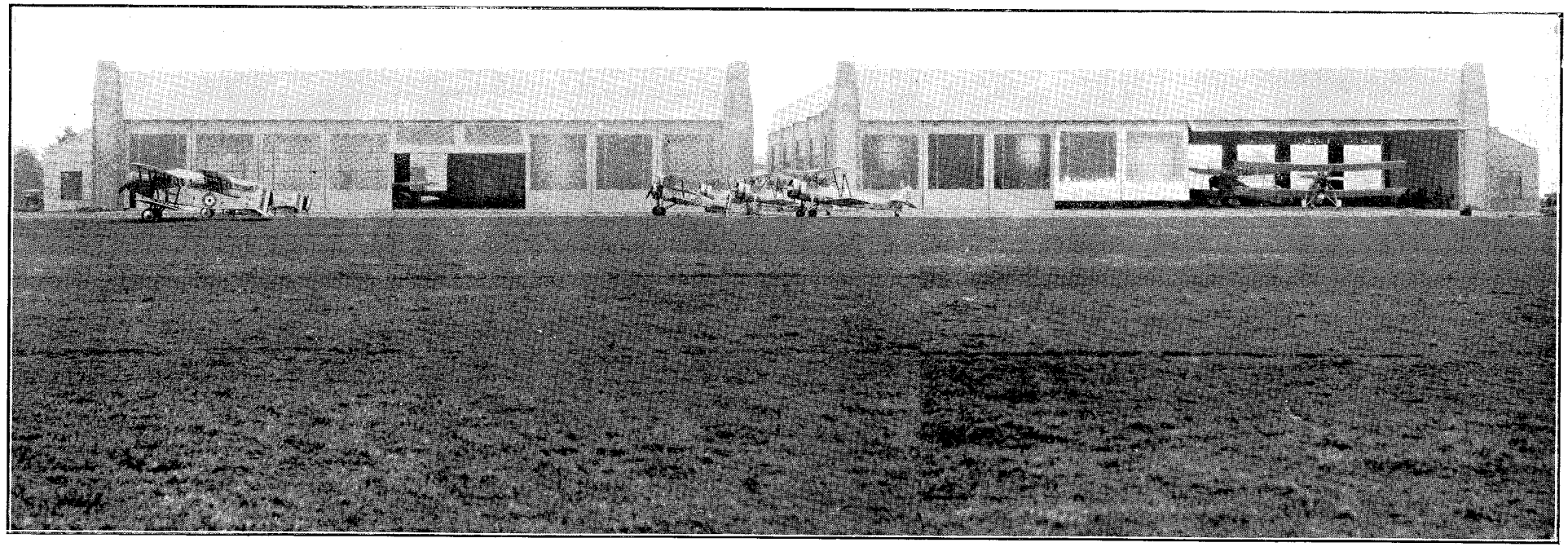
My Department carried out the engineering investigations and the purchase of plant and machine tools required for the New Zealand Government Air Force workshops and for the workshops at the Naval Base, Devonport, Auckland, where an extensive programme is being inaugurated by the Government to allow of the refitting of warships being carried out as far as possible in New Zealand, and so allow of the absorption of New Zealand labour upon the work, instead of sending

the ships home to England for the purpose of refitting. The Department has also arranged the contracts for the supply of a considerable quantity of plant obtained during the year by local bodies on hire-purchase through the Main Highways Board, and has also prepared the proposals and arranged contracts for the supply of all lighthouse equipment and machinery required by the Marine Department.

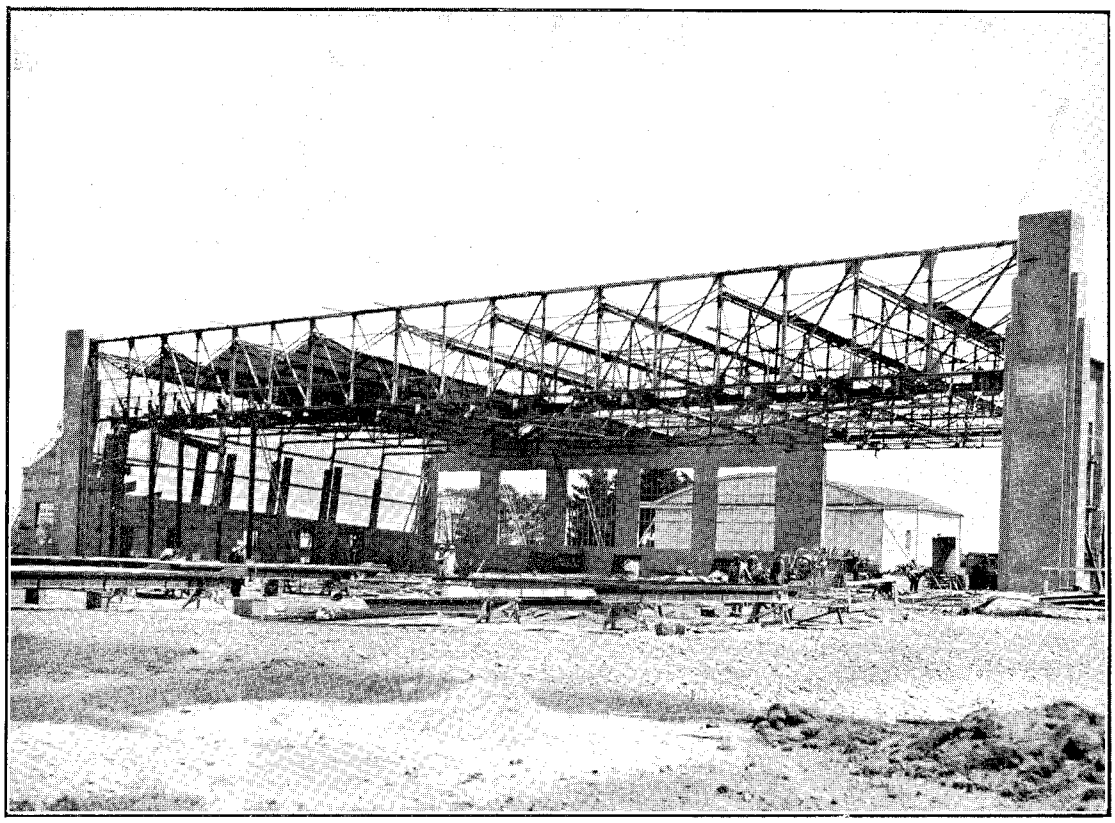
The mechanical inspections necessary during the year in connection with the issue of certificates of fitness for all licensed passenger-carrying vehicles throughout New Zealand have been carried out by the Public Works Department on behalf of the Transport Department.

It is gratifying to note that the total all-in running-cost per mile of the Department's motor-vehicle fleet continues to show a reduction to the present level of 3·12d. per mile for cars and 5·34d. per mile for trucks, as compared with 3·20d. and 5·63d. respectively for the previous year. The saving of $\frac{1}{10}$d. upon the total mileage run during the year represents a sum of £1,550, and the Department applies the closest scrutiny to all matters relating to the cheapest possible running of the motor-vehicle fleet in the best interests of the Government.

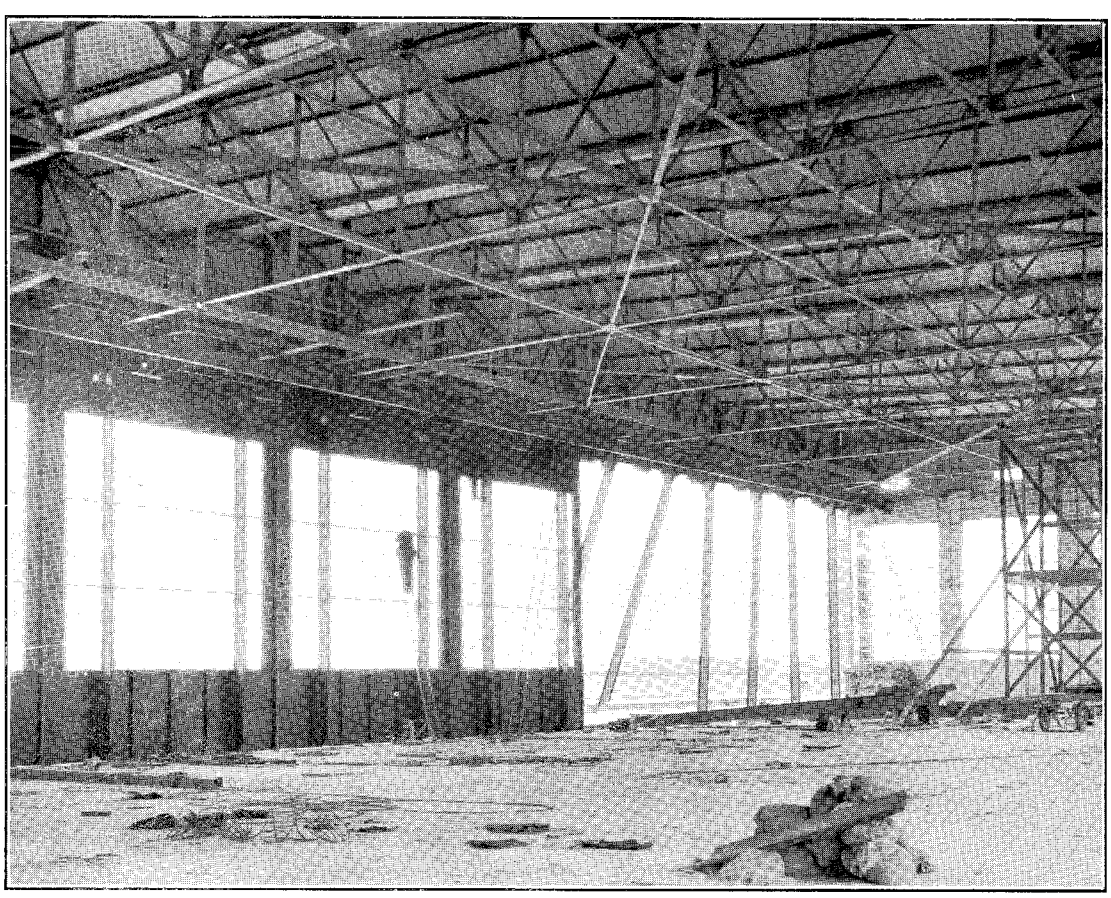
As appendices to the Statement, honourable members will find full details of the principal works carried out by the Department, together with the reports of the Engineer-in-Chief, the Chief Electrical Engineer, the Government Architect, and the Main Highways Board.



HANGARS No. 1 AND No. 2.
WIGRAM AERODROME.

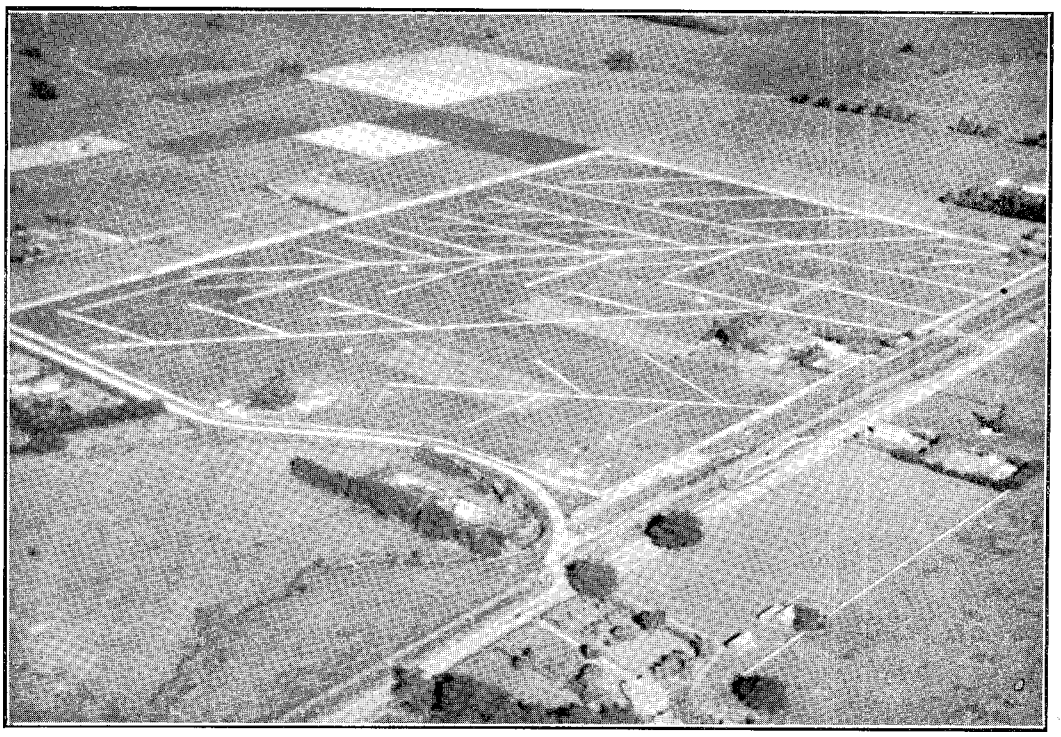


View showing Roof in course of Construction.



Interior View showing Roof Construction and Doors.

WIGRAM AERODROME.

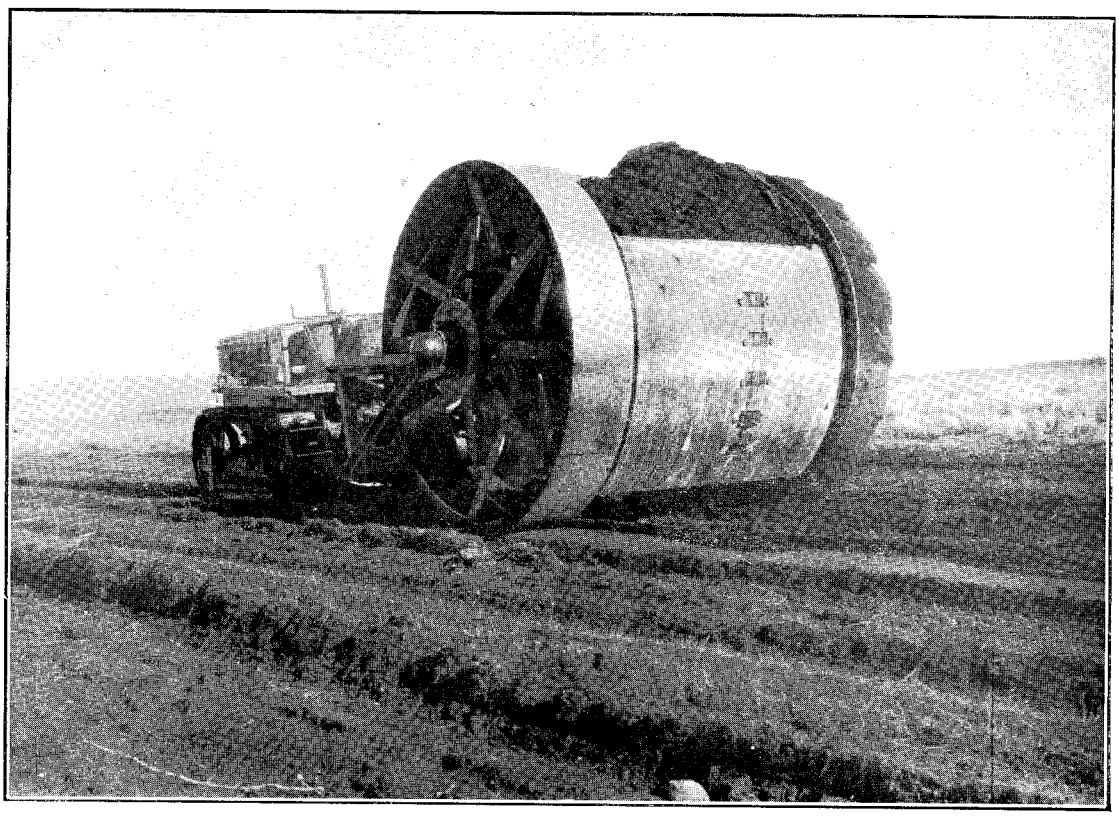


View showing Method of Drainage.

FEILDING AERODROME.

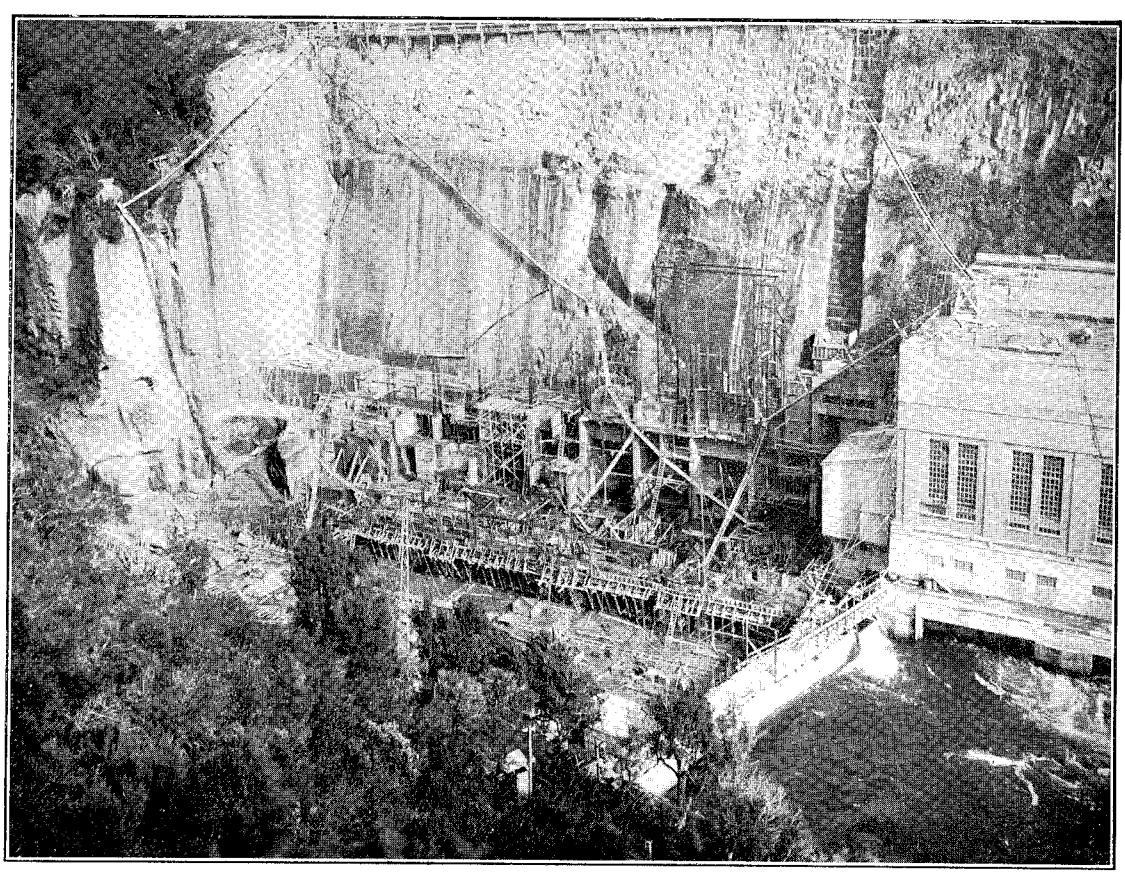
Air-mail Service to South Westland.

HOKITIKA AIRPORT.



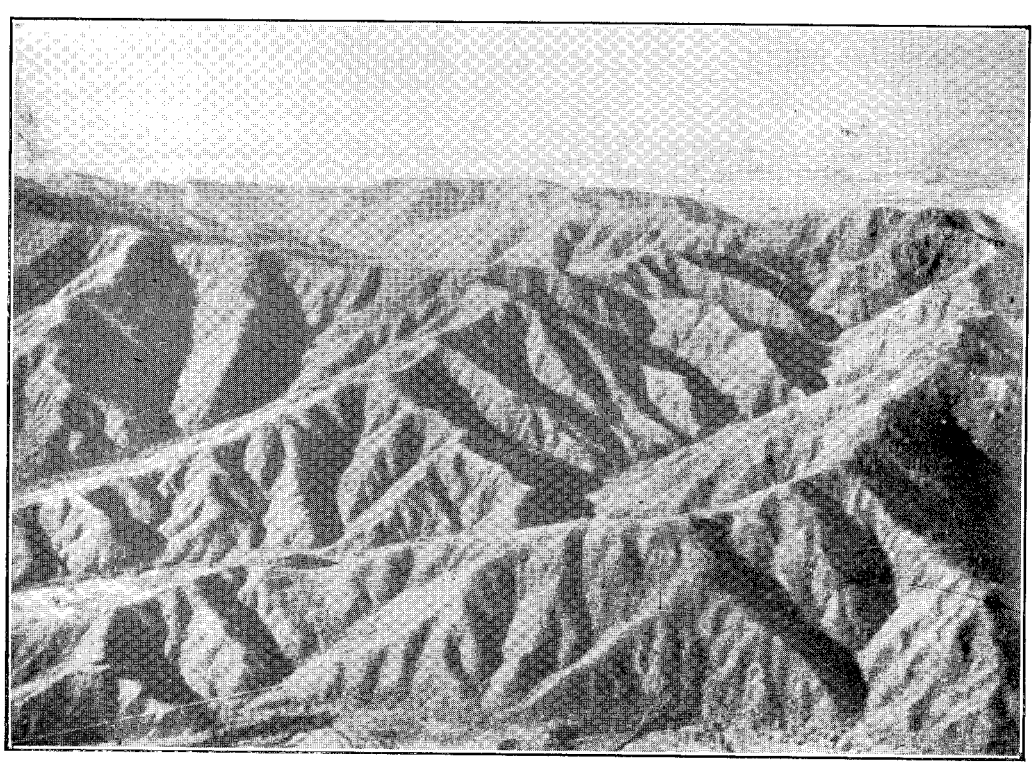
REGRADING WITH TRACTOR-DRAWN EXCAVATOR-CARRIER.

MOUNT COOK AERODROME.



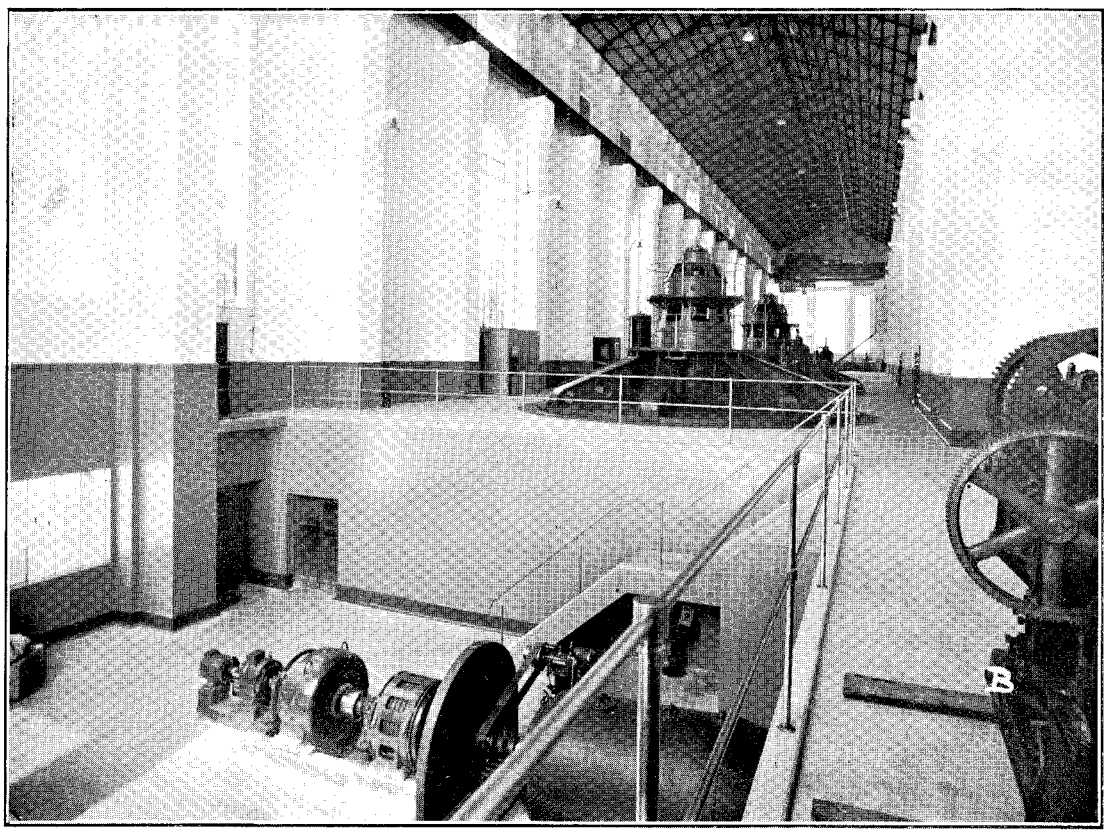
VIEW OF EXTENSIONS TO ARAPUNI GENERATING-STATION, 1936.

NORTH ISLAND ELECTRIC-POWER SYSTEM.

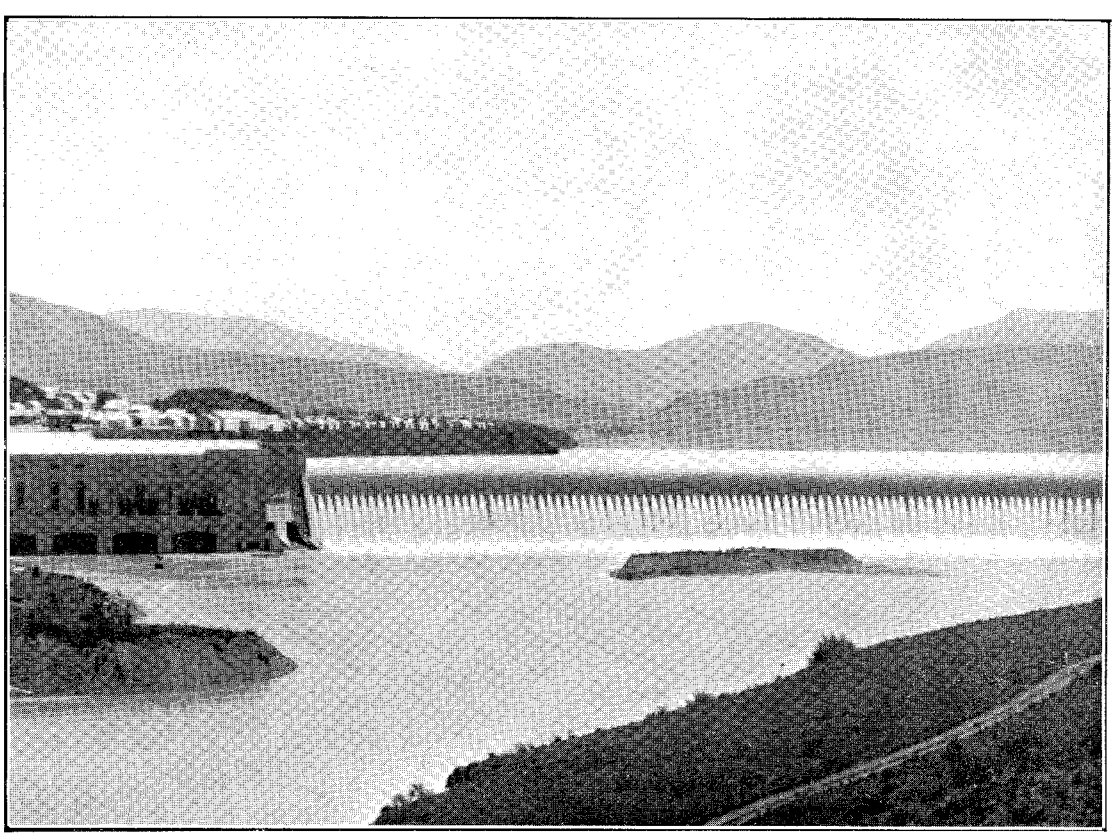


AERIAL VIEWS OF COUNTRY TRAVERSED BY 110 KV. TRANSMISSION-LINE BETWEEN MASTERTON AND MELLING.

NORTH ISLAND ELECTRIC-POWER SYSTEM.

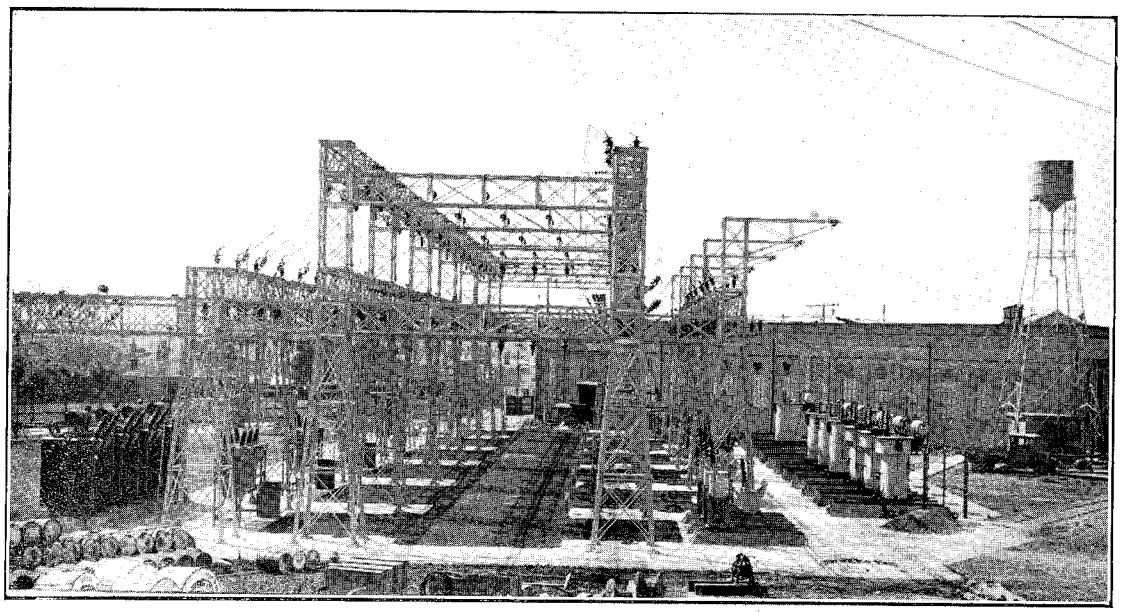


INTERIOR VIEW OF WAITAKI GENERATING-STATION.

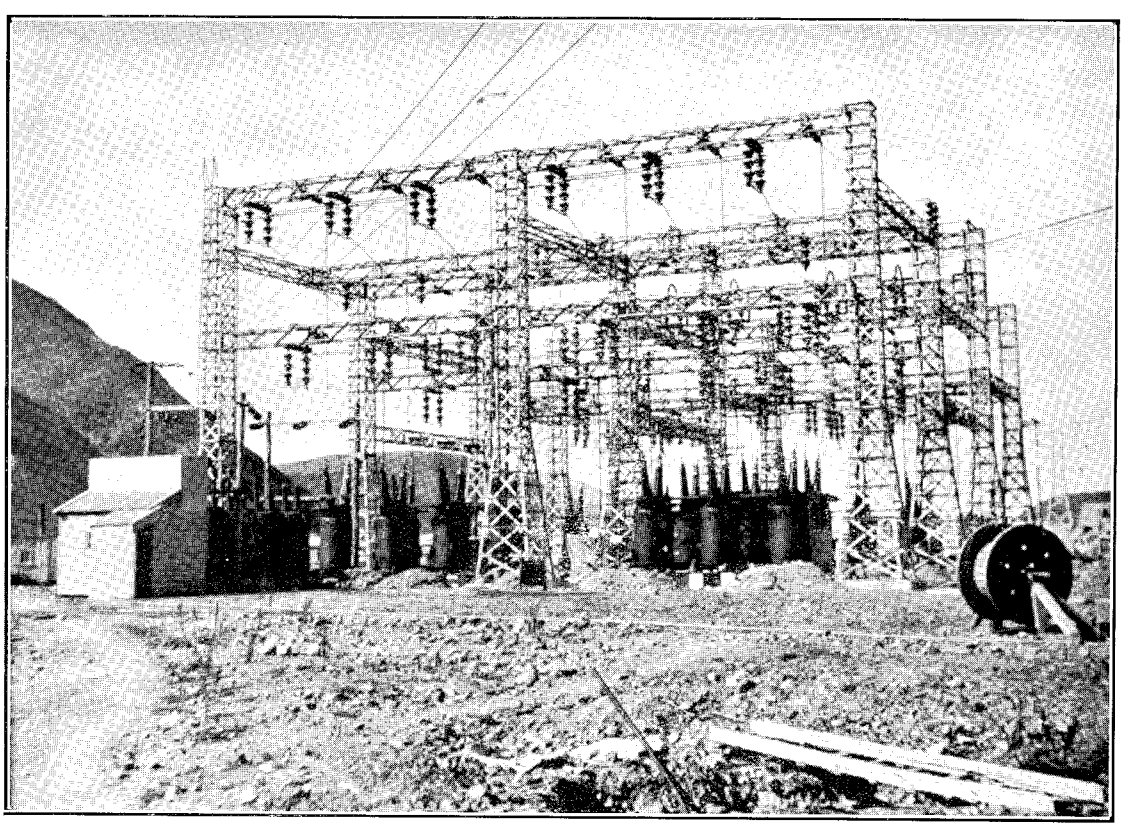


VIEW OF WAITAKI DAM AND PORTION OF GENERATING-STATION.

SOUTH ISLAND ELECTRIC-POWER SYSTEM.

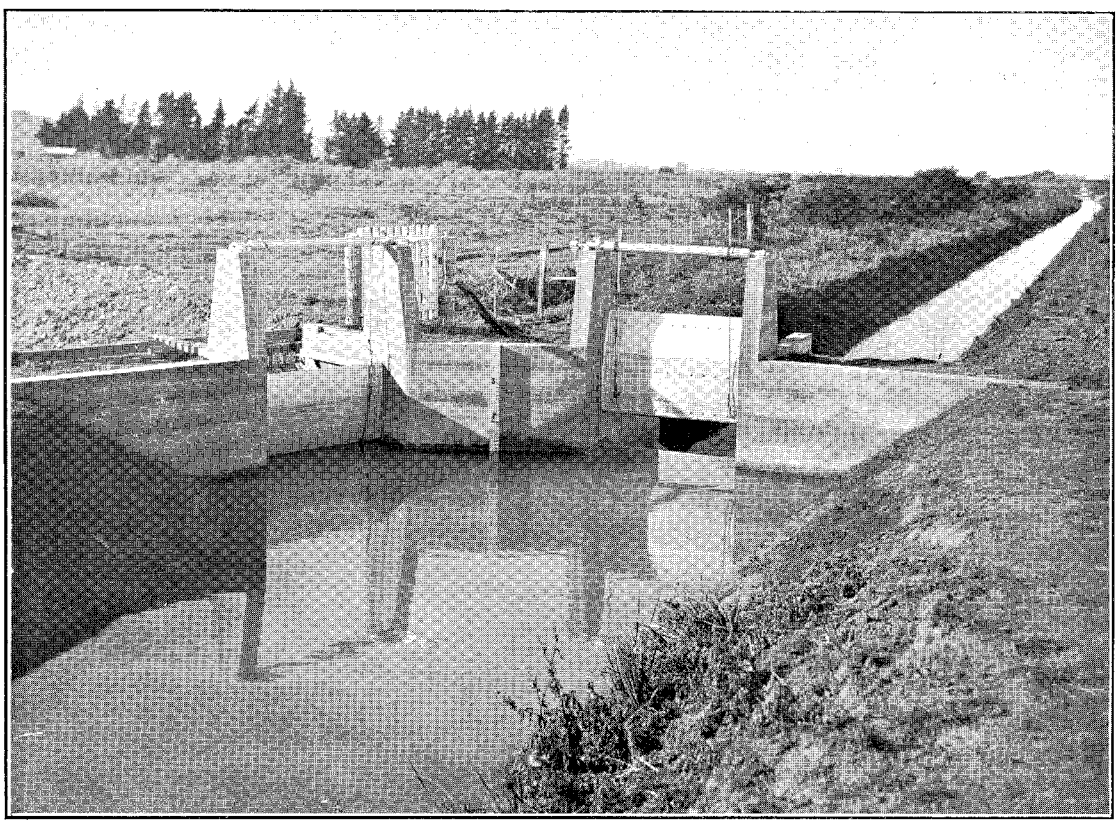


View of Steelwork, Addington Substation.

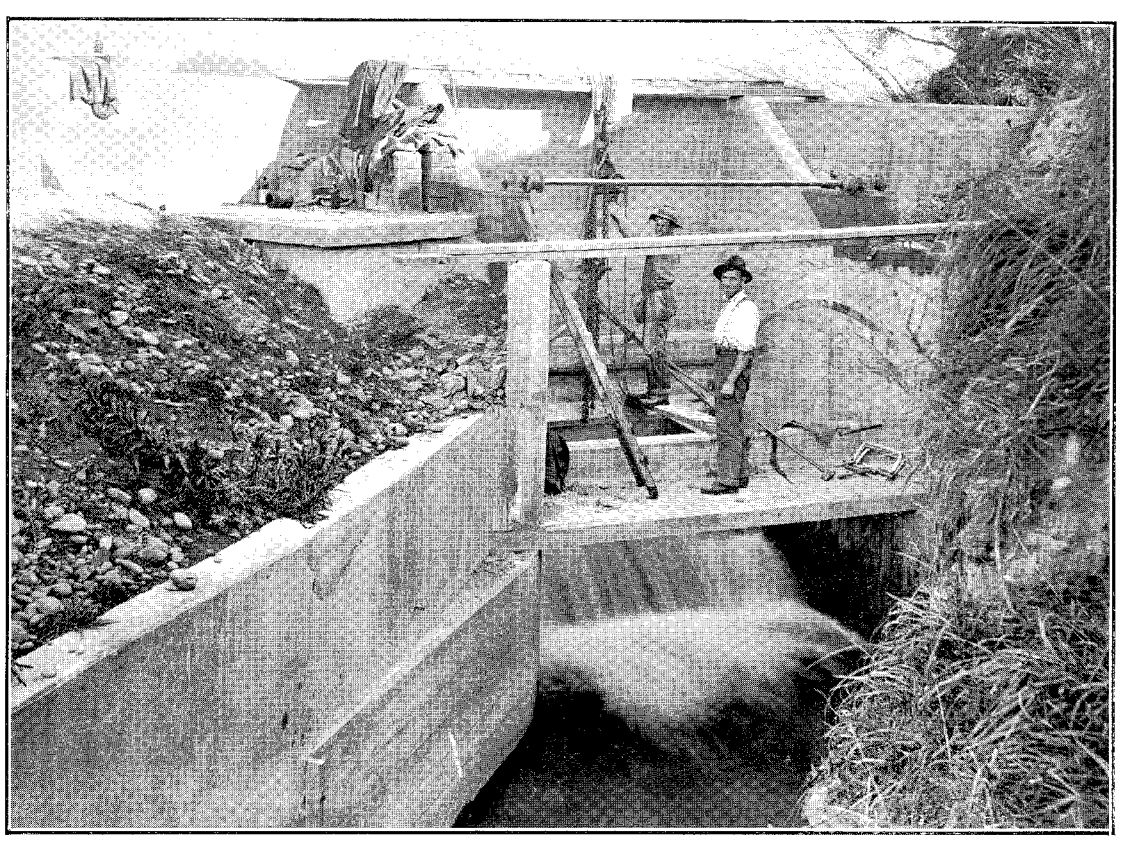


Outdoor Switching-station, Waitaki.

SOUTH ISLAND ELECTRIC-POWER SYSTEM.

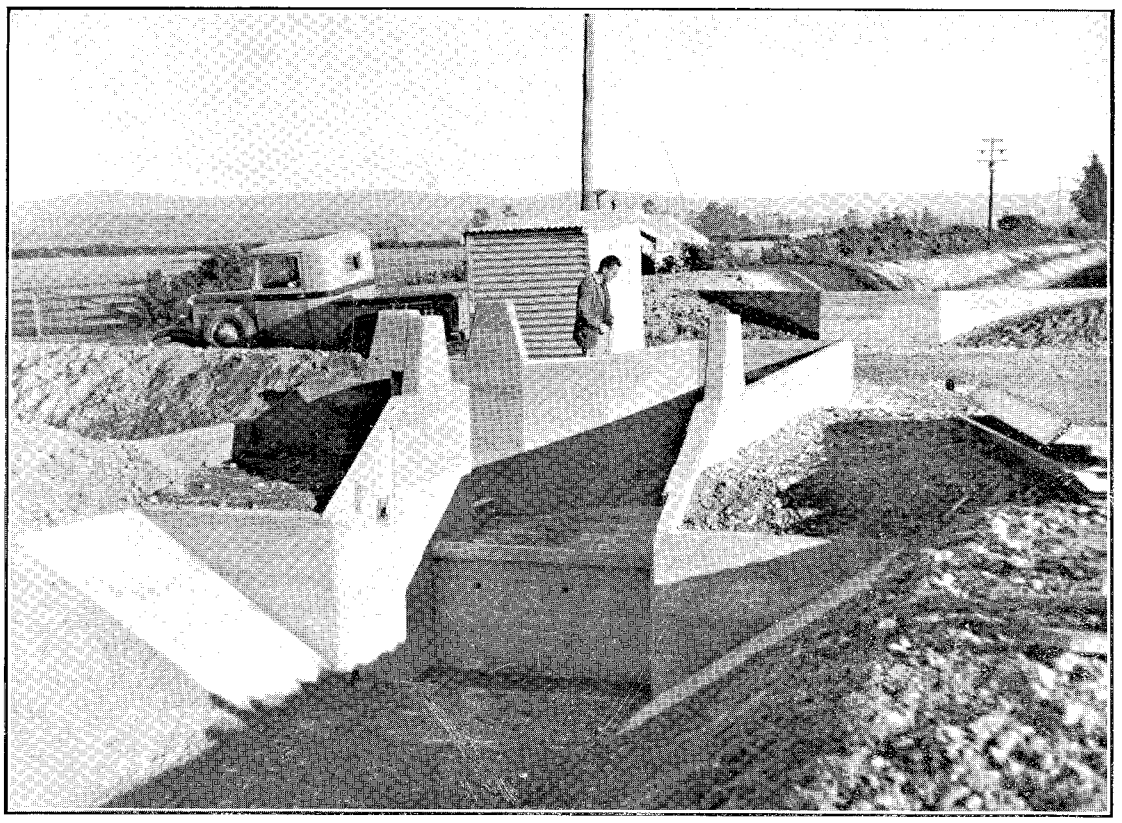


HEADGATES FOR NOS. 1 AND 2 LATERAL.



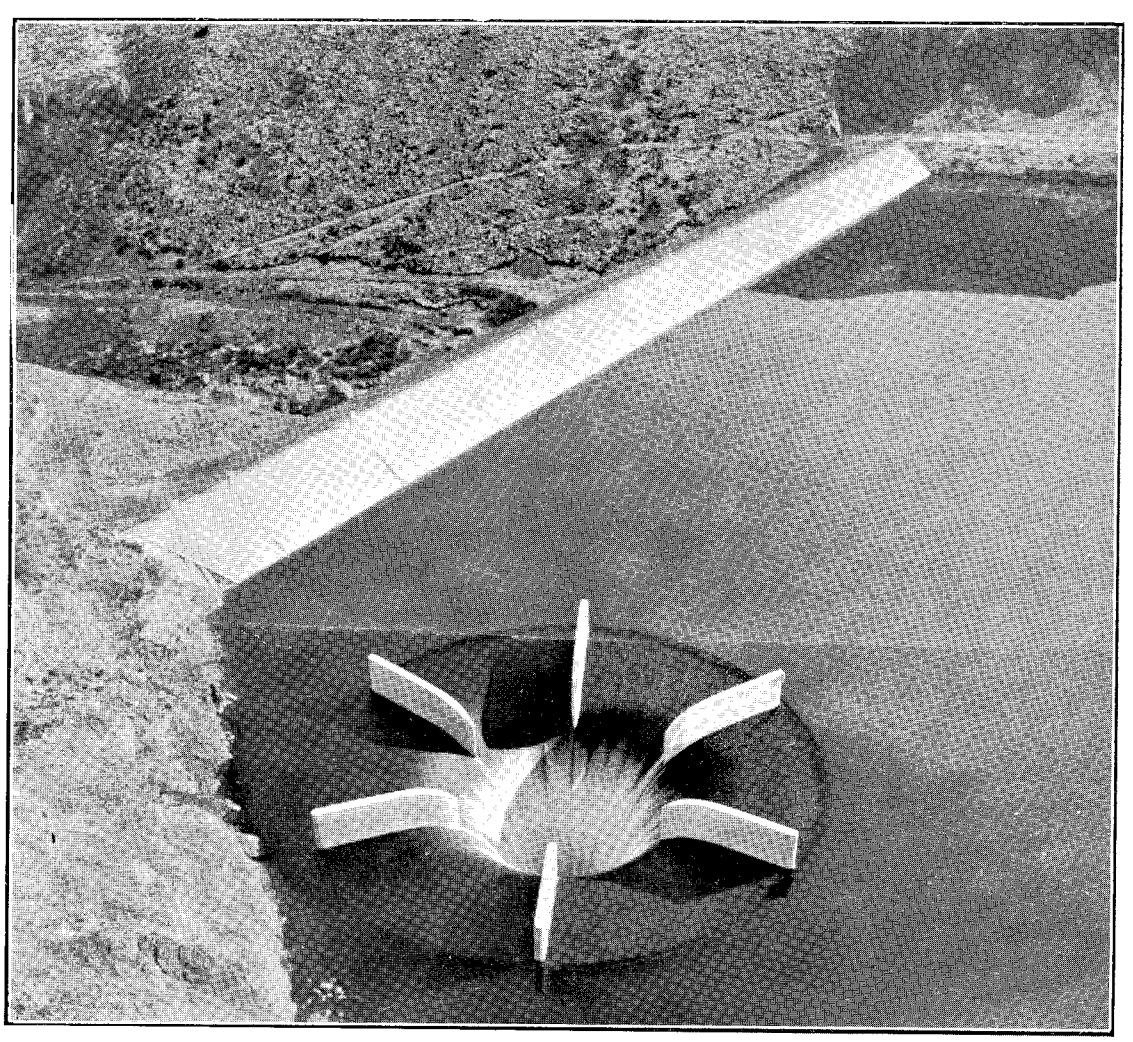
VIEW SHOWING LIFTING-GEAR.

REDCLIFF IRRIGATION SCHEME: INTAKE, WAITAKI RIVER.



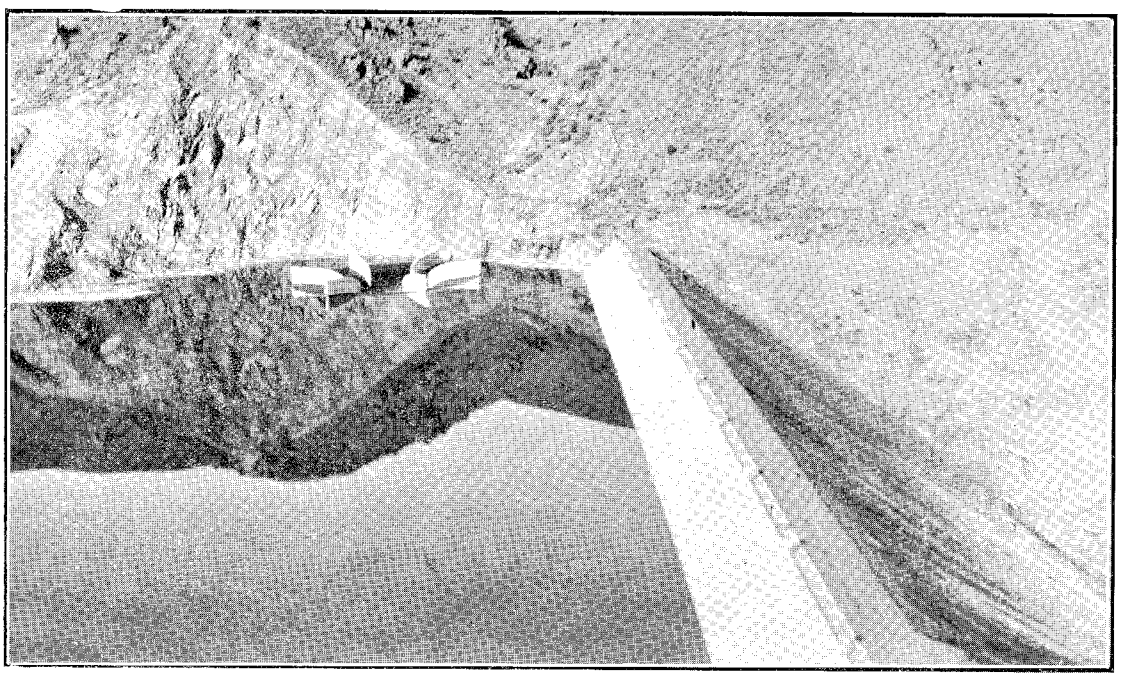
COMBINED SYPHON CULVERT, LATERAL HEADGATE, AND DROP.

LEVELS PLAIN IRRIGATION SCHEME: MAIN RACE.

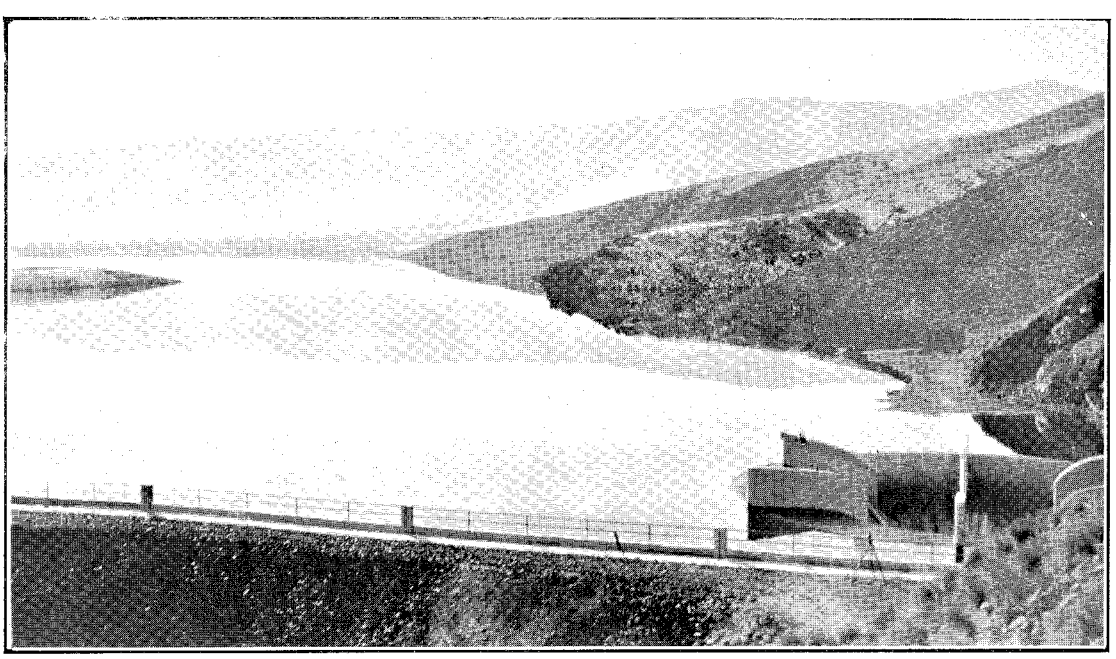


GENERAL VIEW—SHAFT SPILLWAY IN FOREGROUND.

OMAKAU IRRIGATION SCHEME: FALLS DAM.

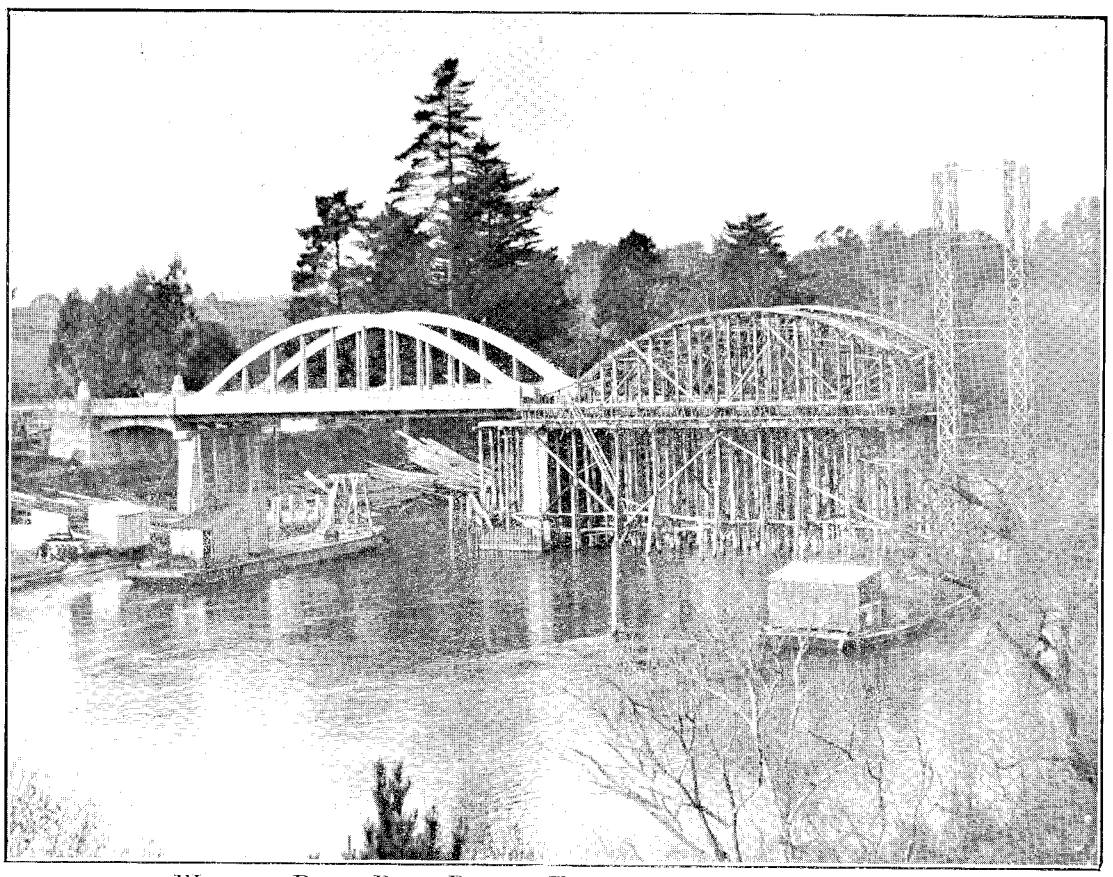


General View. Rock-fill Dam on Right.

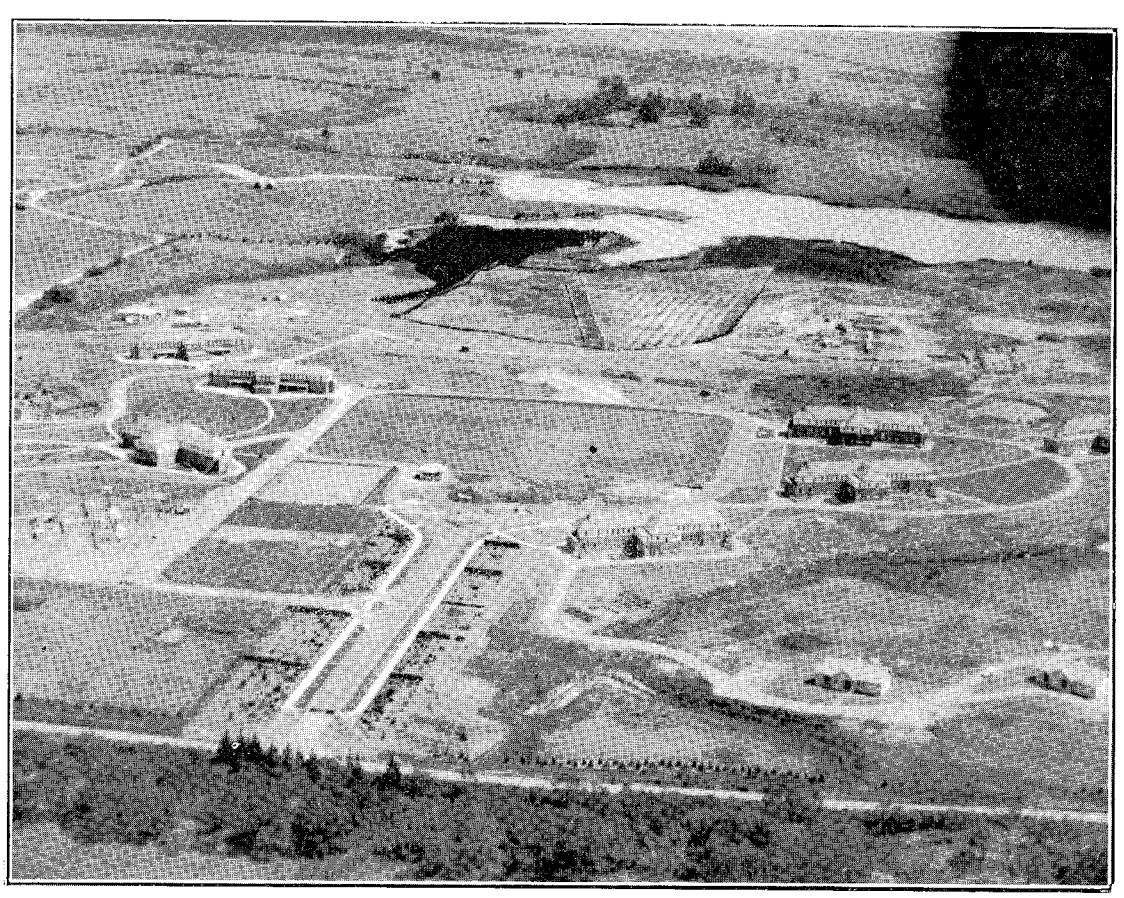


General View showing Water impounded by Dam.

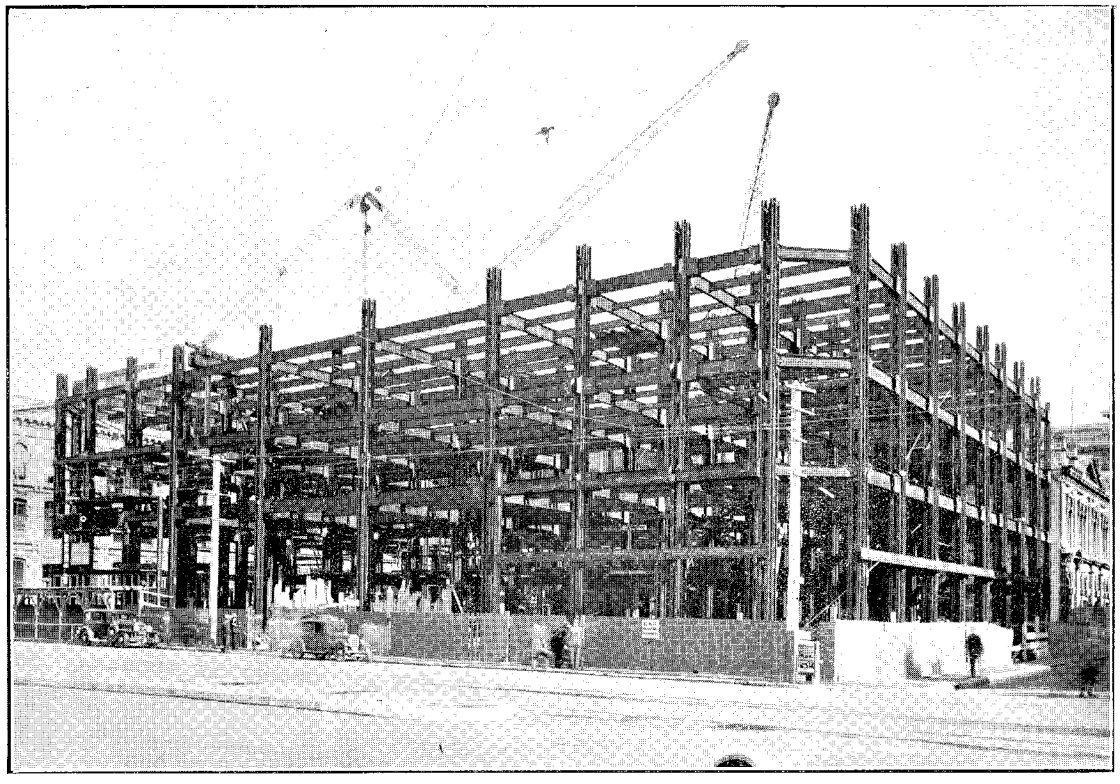
OMAKAU IRRIGATION SCHEME: FALLS DAM.



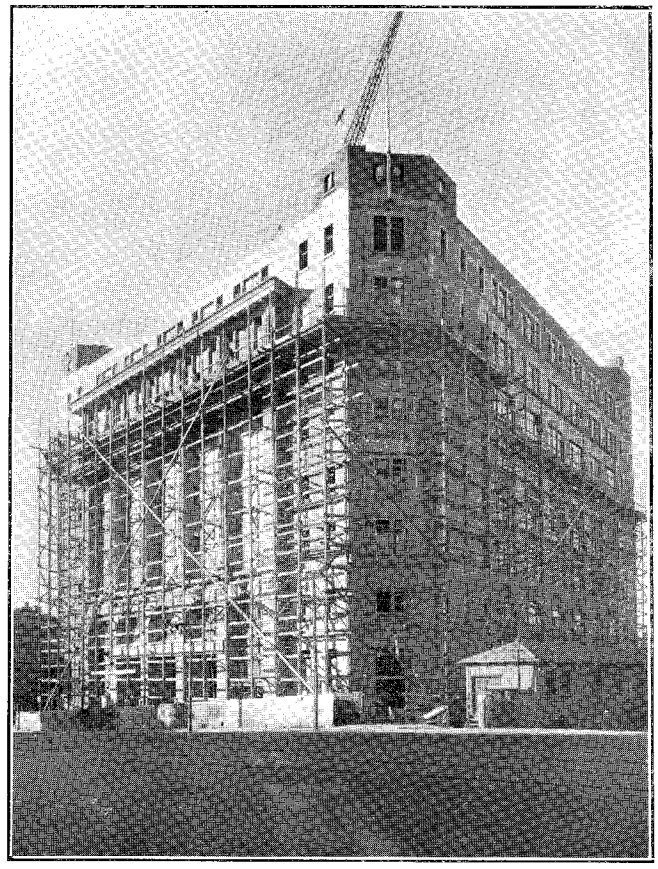
Waikato River Road Bridge, Fairfield, under Construction:
Main Spans 130 ft. Reinforced-concrete Bowstring Spans.



Kingseat Mental Hospital: Aerial View showing General Layout.



GOVERNMENT LIFE INSURANCE BUILDING: STEELWORK IN COURSE OF ERECTION.



DUNEDIN POST-OFFICE—NEARING COMPLETION.

PUBLIC WORKS STATEMENT, 1936.

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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, 1936, AND THE LIABILITIES ON THAT DATE.

Number of Table containing Details.	Works.	Total Net Expenditure to 31st March, 1935.	Expenditure during Twelve Months ended 31st March, 1936.	Recoveries on Account of Services of Previous Years.	Total Net Expenditure to 31st March, 1936.	Liabilities on 31st March, 1936.	Total Net Expenditure and Liabilities.	Works.
		£	£	£	£	£	£	
3	Railways*	56,324,536**	258,011	211	56,582,336	30,770	56,613,106	Railways.*
..	Roads†	22,542,180	444,377	250	22,986,307	57,502	23,043,809	Roads.†
4	Public buildings‡	11,856,763	346,880	133,971	12,069,672	70,383	12,140,055	Public buildings.‡
..	Telegraphs	11,560,538	195,380	..	11,755,918	135,392	11,891,310	Telegraphs.
..	Departmental	3,020,723	99,384	28,178	3,091,929	2,928	3,094,857	Departmental.
..	Charges and expenses of raising loans ..	3,828,307	..	..	3,828,307	..	3,828,307	Charges and expenses of raising loans.
..	Lighthouses, harbour-works, and harbour-defences	1,319,127	2,921	..	1,322,048	674	1,322,722	Lighthouses, harbour-works, and harbour defences.
..	Irrigation and water-supply§ ..	1,217,765	85,414	..	1,303,179	9,984	1,313,163	Irrigation and water-supply.§
..	Lands improvement‖	891,133	37,909	1,006	928,036	8,514	936,550	Lands improvement.‖
..	Tourist and health resorts	703,473	13,683	20	717,136	925	718,061	Tourist and health resorts.
..	Settlement of unemployed workers¶ ..	513,140	151,345	..	664,485	5,716	670,201	Settlement of unemployed workers.¶
..	Plant, material, and services	118,967	22,438	418	140,987	40,870	181,857	Plant, material, and services.
..	Swamp land drainage	43,258	12,922	263	55,917	1,209	57,126	Swamp land drainage.
..	Native land settlement	295,561	71,901	9,491	357,971	21,620	379,591	Native land settlement.
..	Dairy industry loans	..	10,750	..	10,750	..	10,750	Dairy industry loans.
		114,235,471	1,753,315	173,808	115,814,978	386,487	116,201,465	
	Closed accounts :—							Closed accounts :—
..	Immigration	3,313,421	..	362	3,313,059	..	3,313,059	Immigration.
..	Purchase of Native lands	2,054,024	..	..	2,054,024	..	2,054,024	Purchase of Native lands.
..	Defence	1,401,847	..	704	1,401,143	..	1,401,143	Defence.
..	Development of mining	831,015	..	143	830,872	..	830,872	Development of mining.
11 of 1877	Aiding works on Thames goldfields ..	50,000	..	..	50,000	..	50,000	Aiding works on Thames goldfields.
..	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.
..	Motor transport services	33,635	..	..	33,635	..	33,635	Motor transport services.
..	Thermal springs	14,600	..	..	14,600	..	14,600	Thermal springs.
10 of 1878	Coal-exploration and mine-development	10,835	..	..	10,835	..	10,835	Coal-exploration and mine-development.
		7,996,549	..	1,209	7,995,340	..	7,995,340	
..	Transfer to Main Highways Account, Construction Fund	1,226,000	..	..	1,226,000	..	1,226,000	Transfer to Main Highways Account, Construction Fund.
	Totals	123,458,020	1,753,315	175,017	125,036,318	386,487	125,422,805	Totals.

* Does not include expenditure on Hutt Railway and Road Improvement, Wellington-Manawatu Purchase, and Railways Improvement Accounts. Includes £150,000 paid to Midland Railway bondholders. † Includes £4,500 expended under section 16 (1), Native Land Amendment and Native Land Claims Adjustment Act, 1923. ‡ Includes £12,500 expended under Finance Act, 1929, section 32. § 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. ‖ £6,727 previously expended on irrigation under this item now transferred to Irrigation and Water-supply; does not include £300,930 expended and included under Roads Class. ¶ Includes £4,865 expended under Finance Act, 1932 (No. 2), section 6. **After deducting £134,485 for land transferred to and now included under Public Buildings (Post and Telegraph Department).

TABLE No. 2.

GENERAL SUMMARY.

Showing NET YEARLY EXPENDITURE out of PUBLIC WORKS FUND (GENERAL PURPOSES ACCOUNT), 1914–15 to 1935–36.

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, 1914.	Expenditure.										
		1914–15.	1915–16.	1916–17.	1917–18.	1918–19.	1919–20.	1920–21.	1921–22.	1922–23.	1923–24.	1924–25.
	£	£	£	£	£	£	£	£	£	£	£	£
Immigration	2,288,523	33,219	10,010 *Cr. 10*	6,533	3,856	*Cr. 12,018*	*Cr. 62,561*	*Cr. 7,806*	247,528	90,611 *Cr. 140*	92,600 *Cr. 1,267*	136,353 *Cr. 16*
Public Works, Departmental	850,745	100,719	111,489	131,701	127,962 *Cr. 2,662*	115,419 *Cr. 4,119*	121,677	143,280 *Cr. 6,280*	128,002 *Cr. 525*	111,367 *Cr. 131*	110,445 *Cr. 69*	127,556 *Cr. 19*
Irrigation and Water-supply	69,864	32,090	29,874	28,754	11,650 *Cr. 18,451*	22,919	34,115	55,345 *Cr. 9,854*	83,313	58,131	95,467	127,995
Railways	30,898,630	1,146,753 *Cr. 6,022*	1,065,171 *Cr. 4,633*	620,947 *Cr. 4,845*	495,771 *Cr. 110*	387,923 *Cr. 4,924*	748,649 *Cr. 105,196*	1,365,466 *Cr. 388*	3,133,200 *Cr. 751*	2,110,859 *Cr. 3,171*	1,776,413 *Cr. 1,167*	1,878,729 *Cr. 37,924*
Payment to Midland Railway Bondholders	150,000	..	..	..	..	..	..	..	..	..	..	..
Roads :—												
Miscellaneous Roads and Bridges	8,787,127	484,365	400,062	203,746	128,730 *Cr. 6 00*	221,887 *Cr. 997*	376,097 *Cr. 603*	527,854 *Cr. 81*	552,895 *Cr. 197*	643,156 *Cr. 244*	751,370 *Cr. 188*	603,968 *Cr. 231*
Roads on Goldfields..	997,251	30,065	24,432	17,099	6,912	4,186	12,465	11,050	11,264	4,850	2,867	..
Development of Thermal Springs and Natural Scenery ..	16,023	..	..	..	..	..	..	..	..	..	..	2,755
Lands Improvement Account*	300,930	..	..	..	..	..	..	..	..	..	..	..
Total, Roads	10,101,331	514,430	424,494	220,845	135,042	225,076	387,959	538,823	563,962	647,762	754,049	606,492
Development of Mining	882,691	2,384 *Cr. 255*	6,602	4,592	27 *Cr. 6,545*	518 *Cr. 1,000*	1,173 *Cr. 7,008*	2,153 *Cr. 1,606*	2,130 *Cr. 51*	*Cr. 98* *Cr. 1,785*	1,363 *Cr. 2,310*	..
Purchase of Native Lands	1,572,883	*Cr. 1,060*	*Cr. 972*	*Cr. 868*	*Cr. 57*	..	*Cr. 57*	*Cr. 59*	*Cr. 52*	..	..	..
Native Lands Purchase Account	491,980	..	..	..	..	..	..	..	..	..	..	..
Total, Land Purchases	2,064,863	*Cr. 1,060*	*Cr. 972*	*Cr. 868*	*Cr. 57*	..	*Cr. 57*	*Cr. 59*	*Cr. 52*	..	..	..
Telegraph Extension	2,669,772	288,395	249,554	203,311	213,955	198,611	249,379	336,468	590,981	512,657 *Cr. 11,082*	717,409	957,294

* Excludes expenditure subsequent to 1900 included under separate class "Lands Improvement."

[*Continued on page 6.*

TABLE No. 2—*continued.*

GENERAL SUMMARY—*continued.*

Showing Net Yearly Expenditure out of Public Works Fund (General Purposes Account), 1914–15 to 1935–36—*continued.*

Description of Services.	Total Net Expenditure to 31st March, 1914.	Expenditure.										
		1914–15.	1915–16.	1916–17.	1917–18.	1918–19.	1919–20.	1920–21.	1921–22.	1922–23.	1923–24.	1924–25.
Public Buildings:—	£	£	£	£	£	£	£	£	£	£	£	£
General (including Miscellaneous)	296,744	52,239	22,050	12,648	11,646 *Cr. 15,067*	43,168	64,207	39,504	87,057	113,553	8,160	30,791 *Cr. 35*
Parliamentary	375,900	31,478	17,133	22,586	37,233	..	..	..	..	..	..	..
Judicial — Courthouses	800,292	5,171	4,902	299	21	..	868	1,400	4,358	2,018 *Cr. 13*	2,448	5,363 *Cr. 19*
Judicial — Prisons		14,515	17,786	15,685	13,195	16,299	20,981	30,038 *Cr. 800*	41,740	23,113	26,484 *Cr. 2,568*	25,279 *Cr. 86*
Judicial — Police-stations		19,122	25,484	21,147	18,814	6,157	24,944	36,843	22,544	6,298	12,838	18,553
Post and Telegraph	1,123,910	60,838	35,258	22,744	33,525	26,072	66,543	93,364 *Cr. 560*	112,906 *Cr. 675*	77,211 *Cr. 69*	108,395	65,917 *Cr. 210*
Customs	49,441	..	..	..	..	..	..	..	..	..	..	..
Quarantine Stations	6,255	..	..	..	..	..	35,490	15,529	4,581	154	171	284
Mental Hospitals	678,626	53,996	54,898 *Cr. 15*	44,602	26,502	14,640	18,277	27,368	41,838	13,852	26,541	68,438
Public Health	32,754	..	..	..	..	..	..	..	..	..	..	..
Health and Hospital Institutions	138,885	998	1,426	7,570	4,080	2,332	8,484	4,099	26,131	20,981 *Cr. 1,399*	7,420	27,951
School Buildings	2,197,306	122,940	97,972	70,367	63,082	115,656	195,500	244,722	2,469 *Cr. 9,255*	..	..	..
Agricultural	45,870	2,428 *Cr. 34*	2,972	3,046	5,685	4,229	7,227	9,345	1,115	*Cr. 368* 514	*Cr. 1,090* 282	*Cr. 905* 3,242
Workers' Dwellings	110,841	68,275	55,893	35,437	15,505	7,293	26,674	..	..	*Cr. 27*	*Cr. 171*	*Cr. 686*
Total, Public Buildings	5,856,824	431,966	335,759	256,131	214,221	235,846	469,195	500,852	334,809	255,818	188,910	243,877
Lighthouses, Harbour-works, and Harbour-defences:—												
Lighthouses	199,618	3,887	1,415	449	561	1,663	253	758	16,350	3,260	4,473	2,850
Harbour-works	364,505	12,563	9,355	2,280	2,359	3,729	3,245	4,080	2,424	6,524	6,334	423
Harbour-defences	541,381	681	2,903	1,038	56	..	..	..	..	..	..	..
Total, Lighthouses, &c.	1,105,504	17,131	13,673	3,767	2,976	5,392	3,498	4,838	18,774	*Cr. 1,235* 8,549	*Cr. 16* 10,791	3,273
Rates on Native Lands	68,672	..	..	..	..	..	..	..	..	..	..	..

[*Continued on page 7.*

TABLE No. 2—*continued.*

GENERAL SUMMARY—*continued.*

Showing NET YEARLY EXPENDITURE out of PUBLIC WORKS FUND (GENERAL PURPOSES ACCOUNT), 1914-15 to 1935-36—*continued.*

Description of Services.	Total Net Expenditure to 31st March, 1914.	Expenditure.										
		1914–15.	1915–16.	1916–17.	1917–18.	1918–19.	1919–20.	1920–21.	1921–22.	1922–23.	1923–24.	1924–25.
	£	£	£	£	£	£	£	£	£	£	£	£
Contingent Defence	974,394	15,221	37,619	9,742	6,714	8,809 *Cr. 922*	10,187	8,701	15,586	1,702 *Cr. 463*	4,931 *Cr. 280*	27,133 *Cr. 580*
Tourist and Health Resorts	244,528	8,232 *Cr. 12*	5,167 *Cr. 500*	1,094	931	1,620	6,194	19,041	17,996 *Cr. 110*	5,435	27,264	12,343 *Cr. 81*
Lands Improvement*	114,550	13,810 *Cr. 522*	5,936	*Cr. 2,731*	1,838	*Cr. 4,268*	2,964	2,064	17,478	26,204	18,182	34,172
Charges and Expenses of raising Loans	1,252,403	35,495 *Cr. 34,865*	5,037 *Cr. 5,030*	35	1	..	..	184	174,280	62,399	311,905	241,930
Interest and Sinking Funds	218,500	..	..	..	..	..	..	..	..	..	..	..
Coal-exploration and Mine-development	10,835	..	..	..	..	..	..	..	..	..	..	..
Thermal Springs	14,600	..	..	..	..	..	..	..	..	..	..	..
Plant, Material, and Stores	..	..	74,418	9,778	6,811	20,638 *Cr. 31*	47,682	169,910	122,801	*Cr. 4,983*	*Cr. 49,159* *Cr. 16*	*Cr. 30,956* *Cr. 1*
Motor Transport Service	..	..	..	..	..	..	..	..	..	22,679	962	5,000
Transfer to Main Highways Account :— Construction Fund	..	..	..	..	..	..	..	..	..	..	..	226,000
Total Ways and Means Credits	..	*42,770*	*11,160*	*5,713*	*43,492*	*11,993*	*112,864*	*19,628*	*11,616*	*20,127*	*9,142*	*40,793*
Grand Total—Net Expenditure	59,837,229	2,597,109	2,363,658	1,488,786	1,193,930	1,195,489	1,907,850	3,121,132	5,449,351	3,892,320	4,056,423	4,558,570

* Expenditure prior to 1901 (totalling £300,930) included under separate class "Roads."

[*Continued on page 8.*

TABLE No. 2—*continued.*

GENERAL SUMMARY—*continued.*

Showing NET YEARLY EXPENDITURE out of PUBLIC WORKS FUND (GENERAL PURPOSES ACCOUNT), 1914–15 to 1935–36—*continued.*

Description of Services.	Expenditure.											Total Net Expenditure to 31st March, 1936.
	1925–26.	1926–27.	1927–28.	1928–29.	1929–30.	1930–31.	1931–32.	1932–33.	1933–34.	1934–35.	1935–36	
	£	£	£	£	£	£	£	£	£	£	£	£
Immigration	107,521 *Cr. 443*	184,918	67,157	50,266 *Cr. 283*	41,756	33,544	5,265 *Cr. 210*	.. *Cr. 583*	.. *Cr. 532*	.. *Cr. 370*	.. *Cr. 362*	3,313,059
Public Works, Departmental	126,596 *Cr. 129*	115,866 *Cr. 35,918*	130,951 *Cr. 13,328*	142,252 *Cr. 88,499*	132,783 *Cr. 51,671*	131,816 *Cr. 16,381*	151,377 *Cr. 33,947*	104,904 *Cr. 52,639*	98,703 *Cr. 33,872*	76,486 *Cr. 31,154*	99,384 *Cr. 28,178*	3,091,929
Irrigation and Water-supply*	56,227 *Cr. 31*	56,937	49,735 *Cr. 2,798*	55,198 *Cr. 8*	69,657	62,614	37,749	53,290 *Cr. 96*	66,838	91,241	85,414	1,303,179
Railways	1,988,614 *Cr. 16,875*	1,480,807 *Cr. 95,647*	1,141,822 *Cr. 1,699*	1,216,277 *Cr. 2,595*	1,812,521 *Cr. 1,296*	1,987,196 *Cr. 792*	952,388 *Cr. 20,568*	160,853 *Cr. 9,056*	132,111 *Cr. 20*	125,600	258,011 *Cr. 134,696*	56,432,336
Payment to Midland Railway Bondholders	..	..	..	..	..	..	..	..	..	..	..	150,000
Roads:—												
Miscellaneous Roads and Bridges	564,694 *Cr. 4,810*	575,898 *Cr. 981*	669,833 *Cr. 540*	780,990 *Cr. 330*	1,005,330 *Cr. 415*	1,379,810 *Cr. 472*	1,078,270 *Cr. 564*	396,559 *Cr. 1,171*	359,671 *Cr. 445*	371,573 *Cr. 471*	444,377 *Cr. 250*	21,294,672
Roads to give access to Outlying Districts	..	..	33,642	51,582	53,693	91,126	3,940	..	..	..	..	233,983
Roads on Goldfields	3,934	2,230	2,330 *Cr. 467*	1,005	1,885	4,586	..	..	..	..	..	1,140,699
Development of Thermal Springs and Natural Scenery	..	..	..	..	..	..	..	..	..	..	..	16,023
Lands Improvement Account	..	..	..	..	..	..	..	..	..	..	..	300,930
Total, Roads	563,818	577,147	704,798	833,247	1,060,493	1,475,050	1,081,646	395,388	359,226	371,102	444,127	22,986,307
Development of Mining	..	..	.. *Cr. 1,130*	.. *Cr. 260*	.. *Cr. 260*	.. *Cr. 260*	..	.. *Cr. 50*	..	..	.. *Cr. 143*	880,872
Purchase of Native Lands	..	*Cr. 535*	*Cr. 56*	..	..	..	..	..	*Cr. 7,123*	..	..	1,562,044
Native Lands Purchase Account	..	..	..	..	..	..	..	..	..	..	..	491,980
Total, Land Purchases	..	*Cr. 535*	*Cr. 56*	..	..	..	..	..	*Cr. 7,123*	..	..	2,054,024
Settlement of Unemployed Workers	..	..	..	..	..	..	..	118,722	172,109	222,309	151,345	664,485
Telegraph Extension	931,661	558,042	625,540	624,414	594,383	419,756	249,978 *Cr. 32*	99,999	144,160	135,933	195,380	11,755,918

* Includes £6,727 previously included under Lands Improvement class.

TABLE No. 2—*continued.*

GENERAL SUMMARY—*continued.*

Showing NET YEARLY EXPENDITURE out of PUBLIC WORKS FUND (GENERAL PURPOSES ACCOUNT), 1914–15 to 1935–36—*continued.*

Description of Services.	Expenditure.											Total Net Expenditure to 31st March, 1936.
	1925–26.	1926–27.	1927–28.	1928–29.	1929–30.	1930–31.	1931–32.	1932–33.	1933–34.	1934–35.	1935–36.	
	£	£	£	£		£	£	£	£	£	£	£
Public Buildings :—												
General (including Miscellaneous)	29,369	119,864	42,553	4,272	14,106*	85,204	33,189	2,107	594	30,713	39,447	1,015,189
	Cr. 345	*Cr. 429*	*Cr. 1,065*	*Cr. 420*	*Cr. 3,156*	*Cr. 55*	*Cr. 4,231*	*Cr. 2,067*	*Cr. 1,075*	*Cr. 14,087*	*Cr. 125,964*	
Parliamentary	..	..	..	35	27,142	15,723	37	..	..	..	..	527,267
Judicial — Courthouses	7,209	1,261	7,531	8,387	15,765	19,572	3,513	970	72	533	8,701	1,507,251
		Cr. 13	..	*Cr. 95*	*Cr. 29*	*Cr. 16,403*	*Cr. 529*	*Cr. 222*	*Cr. 255*	*Cr. 93*	*Cr. 4,278*	
Judicial — Prisons	24,197	22,812	22,358	12,573	18,814	2,504	2,621	2,026	1,018	1,605	2,123	
		Cr. 908	*Cr. 524*	*Cr. 321*	*Cr. 285*	*Cr. 134*	*Cr. 67*	*Cr. 71*				
Judicial — Police-stations	16,594	7,411	5,561	6,925	8,442	8,360	2,535	1,022	74	2,754	6,710	
	Cr. 102	*Cr. 13*	*Cr. 970*	*Cr. 605*	*Cr. 319*	*Cr. 54*	*Cr. 91*	*Cr. 80*	*Cr. 79*	*Cr. 240*	*Cr. 35*	
Post and Telegraph	89,865	86,052	77,194	62,087	104,157	138,671	104,505	2,763	21,078	100,484	232,285	2,825,495
	Cr. 453	*Cr. 1,114*	*Cr. 834*	*Cr. 1,980*	*Cr. 197*	*Cr. 1,391*	*Cr. 3,179*	*Cr. 4,823*	*Cr. 1,502*	*Cr. 582*	*Cr. 2,760*	
Customs	..	..	..	..	..	..	..	..	..	..	..	49,441
Quarantine Stations	..	..	..	..	..	..	..	..	..	..	..	62,464
Mental Hospitals	77,835	68,635	51,119	96,782	152,096	134,140	45,938	28,756	73,021	98,629	67,465	1,959,196
	Cr. 283		*Cr. 3,600*				*Cr. 860*			*Cr. 40*		
Public Health	..	..	..	..	..	..	..	..	..	..	..	32,754
Health and Hospital Institutions	31,177	15,840	14,361	19,637	16,651	17,338	3,316	301	1,248	656	2,191	370,800
	Cr. 300		*Cr. 310*				*Cr. 1*	*Cr. 113*	*Cr. 150*			
School Buildings	..	..	..	..	..	..	259,149	52,623	52,239	51,506	122,357	3,621,734
	Cr. 1,050	*Cr. 7,953*		*Cr. 2,428*		*Cr. 1,110*	*Cr. 40*		*Cr. 805*	*Cr. 217*	*Cr. 933*	
Agricultural	7,932	4,164	2,863	2,808	2,963	1,509	..	..	48	88	85	98,081
	Cr. 865	*Cr. 310*		*Cr. 2,395*	*Cr. 1,721*	*Cr. 194*	*Cr. 1,927*	*Cr. 1,535*	*Cr. 437*	*Cr. 32*		
Workers' Dwellings†	..	..	..	..	..	..	..	..	..	*Cr. 319,918*	..	..
Total, Public Buildings	280,780	315,299	216,237	205,262	354,429	403,680	443,878	81,657	145,089	*Cr. 48,241*	347,394	12,069,672
Lighthouses, Harbour-works, and Harbour-defences :—												
Lighthouses	5,690	5,758	7,979	2,637	4,460	4,103	5,046	688	1,276	4,021	3,320	279,265
	Cr. 750				*Cr. 500*							
Harbour-works	3,717	13,263	15,891	14,425	10,736	6,742	6,987	*Cr. 5,277*	11,988	2,581	*Cr. 399*	497,975
	Cr. 131	*Cr. 204*	*Cr. 165*									
Harbour-defences	..	..	..	..	..	..	..	..	..	..	..	544,808
Total, Lighthouses, &c.	8,526	18,817	23,705	17,062	14,696	10,845	12,033	*Cr. 4,589*	13,264	6,602	2,921	1,322,048
Rates on Native Lands	..	..	..	..	..	..	..	..	..	..	..	68,672

* Includes £12,500 expended under Finance Act, 1929, section 32. † Transferred to State Advances Account.

TABLE No. 2—*continued.*

GENERAL SUMMARY—*continued.*

Showing NET YEARLY EXPENDITURE out of PUBLIC WORKS FUND (GENERAL PURPOSES ACCOUNT), 1914–15 to 1935–36—*continued.*

Description of Services.	Expenditure.											Total Net Expenditure to 31st March, 1936.
	1925–26.	1926–27.	1927–28.	1928–29.	1929–30.	1930–31.	1931–32.	1932–33.	1933–34.	1934–35.	1935–36.	
	£	£	£	£	£	£	£	£	£	£	£	£
Contingent Defence	89,670 *Cr. 33*	34,014 *Cr. 751*	39,986 *Cr. 465*	67,652 *Cr. 648*	46,766 *Cr. 1,325*	13,812 *Cr. 586*	.. *Cr. 4,039*	.. *Cr. 624*	.. *Cr. 76*	..	.. *Cr. 704*	1,401,143
Tourist and Health Resorts	43,486	31,981	36,673 *Cr. 516*	39,254 *Cr. 440*	20,547 *Cr. 1,213*	60,288 *Cr. 2,494*	87,609 *Cr. 85*	14,454 *Cr. 877*	13,510 *Cr. 21*	12,880 *Cr. 705*	13,683 *Cr. 20*	717,136
Lands Improvement*	70,493 *Cr. 19*	56,267 *Cr. 135*	72,898 *Cr. 2,574*	85,861 *Cr. 87*	79,454 *Cr. 112*	70,534 *Cr. 1,041*	38,899 *Cr. 506*	38,906 *Cr. 248*	71,825 *Cr. 329*	82,092 *Cr. 722*	37,909 *Cr. 1,006*	928,036
Swamp Land Drainage	..	..	..	..	..	..	..	14,808	13,959 *Cr. 297*	15,019 *Cr. 231*	12,922 *Cr. 263*	55,917
Dairy Industry Loans..	..	..	..	..	..	..	..	..	..	..	10,750	10,750
Charges and Expenses of raising Loans	297,180	155,373	100,297	438,238 *Cr. 3,811*	518,158	164,535	98,098	15,851	14	600	..	3,828,307
Interest and Sinking Funds	..	..	..	..	..	..	..	..	..	..	..	218,500
Coal-exploration and Mine-development	..	..	..	..	..	..	..	..	..	..	..	10,835
Thermal Springs	..	..	..	..	..	..	..	..	..	..	..	14,600
Plant, Material, and Services	36,930 *Cr. 855*	*Cr. 9,334* *Cr. 1,992*	*Cr. 17,610* *Cr. 8,985*	*Cr. 6,551* *Cr. 1,224*	*Cr. 35,092* *Cr. 360*	*Cr. 42,824* *Cr. 216*	*Cr. 103,571* *Cr. 1,338*	*Cr. 45,463* *Cr. 161*	1,421 *Cr. 22*	*Cr. 10,513* *Cr. 165*	22,438 *Cr. 418*	140,987
Native Land Settlement	..	..	..	..	..	..	..	..	179,485 *Cr. 52*	125,790 *Cr. 9,662*	71,901 *Cr. 9,491*	357,971
Motor Transport Service	4,994	..	..	..	..	..	..	..	..	..	..	33,635
Transfer to Main Highways Account :— Construction Fund	..	400,000	200,000	200,000	200,000	..	..	..	..	..	..	1,226,000
Total Ways and Means Credits	*27,474*	*146,933*	*40,026*	*106,429*	*62,859*	*41,583*	*72,214*	*74,416*	*47,092*	*378,689*	*309,502*	..
Grand Total—Net Expenditure	4,588,111	3,841,126	3,360,638	3,870,577	4,854,314†	4,769,076	2,994,624	984,446	1,369,370	1,163,891	1,578,298	125,036,318

* 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, 1936.

Lines of Railway.	Mileage opened for Traffic.	Total Expenditure by General Government to 31st March, 1935.	Recoveries on Account of Expenditure of Previous Years.	Expenditure out of Public Works Fund during Year 1935–36 : New Works.		Total Expenditure by General Government to 31st March, 1936.	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	179,143 14 9	..	..	..	179,143 14 9	..
Opua Wharf to Whangarei and Onerahi	58 06	608,258 15 7	..	..	*Cr.* 2,989 19 8	605,268 15 11	..
Otiria to Ngapuhi	13 45	127,370 15 6	..	..	..	127,370 15 6	..
Whangarei Branch (Kioreroa to Waiotira)	19 79	420,483 1 0	..	..	..	420,483 1 0	..
North Auckland Main Trunk—							
Ngapuhi Northwards	11 00	885,640 16 4	..	*Cr.* 3,080 12 4	..	882,560 4 0	..
Helensville Northwards	83 39	2,989,296 4 0	30 0 0	..	*Cr.* 85 0 0	2,989,181 4 0	..
North Auckland Main Trunk to Dargaville	..	455,311 4 11	..	*Cr.* 4,929 0 4	..	450,382 4 7	..
Helensville to Te Awamutu	148 67	6,025,461 19 4	113,390 0 0	..	3,210 16 2	5,915,282 15 6	..
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	506,021 3 7	..	..	..	506,021 3 7	..
Cambridge Branch (Ruakura Junction to Cambridge)	12 02	61,831 17 3	..	..	..	61,831 17 3	..
Morrinsville to Rotorua	69 33	434,127 7 1	140 0 0	..	*Cr.* 385 0 0	433,602 7 1	..
Marton to Te Awamutu	209 69	3,123,162 13 5	490 0 0	..	..	3,122,672 13 5	..
Waipa Gravel Access Branch	..	114 0 0	..	..	..	114 0 0	..
Raetihi Branch	8 50	89,452 2 1	..	..	..	89,452 2 1	..
Rotorua to Taupo	..	37,862 13 11	..	..	..	37,862 13 11	..
Paeroa to Pokeno	..	22,890 1 8	..	..	..	22,890 1 8	..
Paeroa to Tauranga	50 65	1,250,363 10 1	..	11 8 5	..	1,250,374 18 6	..
Tauranga to Taneatua, including Te Maunga to Maunganui Branch	59 17	1,497,930 4 2	..	19 3 4	*Cr.* 395 19 10	1,497,553 7 8	..
Gisborne to Motu	49 32	625,075 6 9	..	..	..	625,075 6 9	..
Gisborne to Ormond Tramway	..	4,975 1 7	..	..	..	4,975 1 7	..
Napier to Gisborne—							
Gisborne Southwards	11 51	285,546 5 10	..	*Cr.* 1 10 0	*Cr.* 698 5 9	284,846 10 1	..
Waikokopu Northwards	..	553,432 17 10	..	*Cr.* 6,526 9 2	..	546,906 8 8	..
Wairoa Northwards	..	20,681 12 6	..	..	..	20,681 12 6	..
Napier Northwards	38 62	2,384,118 6 3	205 0 0	*Cr.* 2,310 9 10	..	2,381,602 16 5	..
Waikokopu Branch	..	628,161 7 1	..	165 6 4	..	628,326 13 5	..
Wellington to Napier—							
Napier to Woodville and Palmerston North	114 06	1,176,834 7 8	10,500 0 0	..	*Cr.* 275 0 0	1,166,059 7 8	..
Wellington to Woodville, including Te Aro Extension	129 30	3,255,551 1 4	..	..	160 7 8	3,255,711 9 0	..
Featherston to Martinborough	..	399 0 0	..	..	..	399 0 0	..
Wellington to Waitara—							
Wellington to Longburn	83 37	3,230,501 8 3	70 0 0	..	300,530 14 1	3,530,962 2 4	..
Foxton to Waitara and Moturoa	196 22	2,110,827 18 11	9,466 0 0	..	1,320 9 3	2,102,682 8 2	..
Mount Egmont Branch	6 00	70,536 1 6	..	..	..	70,536 1 6	..
Moturoa to Opunake	..	3,105 0 0	..	..	..	3,105 0 0	..
Opunake Branch (Te Roti to Opunake)	22 63	447,861 18 7	..	0 18 0	..	447,862 16 7	..
Manaia Branch (Kapuni to Manaia)	..	9,483 6 0	..	..	..	9,483 6 0	..
Rangitikei River Quarry Line	..	206 0 0	..	..	..	206 0 0	..

TABLE No. 3—*continued.*

Expenditure on Railways to 31st March, 1936—*continued.*

Lines of Railway.	Mileage opened for Traffic.	Total Expenditure by General Government to 31st March, 1935.	Recoveries on Account of Expenditure of Previous Years.	Expenditure out of Public Works Fund during Year 1935-36: New Works.		Total Expenditure by General Government to 31st March, 1936.	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	89 00	3,077,760 10 2	..	*Cr.* 5,358 12 9	..	3,072,401 17 5	..
Nelson to Greymouth—							
Nelson to Inangahua	64 47	719,087 12 7	..	*Cr.* 851 19 1	..	718,235 13 6	..
Stillwater to Inangahua	57 32	226,593 15 11	..	..	..	226,593 15 11	78,307 0 0
Ngahere to Blackball	3 40	147,881 12 11	..	..	..	147,881 12 11	279,685 0 0
Westport to Ngakawau	19 56	209,904 14 2	..	..	..	209,904 14 2	..
Ngakawau to Mokihinui	7 12	*	..	..	..	*	..
Mokihinui to Colliery Line	3 69	†	..	..	..	†	..
Westport to Cape Foulwind	7 00	‡	..	..	..	‡	..
Westport to Inangahua	5 74	632,280 10 7	80 0 0	*Cr.* 4,861 9 8	..	627,339 0 11	..
Greymouth to Rewanui	2 44	259,815 10 2	..	..	..	259,815 10 2	..
Point Elizabeth Branch	8 70	74,363 10 11	..	..	..	74,363 10 11	..
Greymouth to Ross and Mikonui	38 68	431,438 12 10	..	..	..	431,438 12 10	..
Picton to Waipara—							
Picton Southwards	56 06	954,910 4 4	..	*Cr.* 2,263 6 10	..	952,646 17 6	..
Waipara Northwards	44 14	608,722 5 1	..	*Cr.* 3,714 4 4	..	605,007 10 9	..
Christchurch to Greymouth—							
Rolleston to Bealey	73 07	1,012,029 5 11	..	..	..	1,012,029 5 11	61,579 0 0
Whitecliffs Branch	11 38	25,021 0 0	..	..	..	25,021 0 0	..
Greymouth to Bealey	58 12	1,978,623 10 6	25 0 0	..	1,176 18 5	1,979,775 8 11	263,889 0 0
Hurunui to Waitaki—							
Main Line (Waiau to Waitaki)	219 07	2,700,470 7 5	..	..	390 1 2	2,700,860 8 7	316,135 0 0
Oxford Branch (Rangiora to Oxford West)	21 76	53,072 8 2	..	..	*Cr.* 3,374 11 0	49,697 17 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	92,181 4 8	..	..	..	92,181 4 8	..
Little River Branch (Lincoln to Little River)	22 46	111,940 7 9	..	..	..	111,940 7 9	..
Rakaia to Methven	22 20	77,090 19 2	..	..	..	77,090 19 2	..
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	70,606 10 8	..	..	*Cr.* 103 15 3	70,502 15 5	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	46,248 0 0	..	..	..	46,248 0 0	..
Whitecliffs to Rakaia	..	542 0 0	..	..	..	542 0 0	..
Temuka to Rangitata	..	5,152 0 0	..	..	..	5,152 0 0	..
Waitaki to Bluff—							
Main Line, including Port Chalmers Branch	252 71	4,163,781 11 8	..	..	16,473 4 3	4,180,254 15 11	82,259 0 0
Duntroon Branch (Pukeuri to Kurow)	37 33	86,564 14 6	..	..	*Cr.* 229 6 0	86,265 8 6	37,500 0 0
Ngapara Branch (Waiareka Junction to Ngapara)	14 76	25,238 2 0	..	..	..	25,238 2 0	58,009 0 0

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

TABLE No. 3—*continued.*

EXPENDITURE ON RAILWAYS TO 31ST MARCH, 1936—*continued.*

Lines of Railway.	Mileage opened for Traffic.	Total Expenditure by General Government to 31st March, 1935.	Recoveries on Account of Expenditure of Previous Years.	Expenditure out of Public Works Fund during Year 1935–36: New Works.		Total Expenditure by General Government to 31st March, 1936.	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	..	..	*Cr.* 7,758 9 7	75,864 15 4	..
Waihemo Branch (Palmerston to Dunback)	8 55	32,906 8 11	..	..	..	32,906 8 11	..
Fernhill Railway	1 60	1,415 0 0	..	..	*Cr.* 85 0 0	1,330 0 0	..
Brighton Road Branch	..	6,474 0 0	..	..	..	6,474 0 0	12,829 0 0
Outram Branch (Mosgiel to Outram)	8 78	12,051 0 7	..	..	..	12,051 0 7	29,691 0 0
Lawrence Branch	58 67	718,258 17 1	..	..	..	718,258 17 1	..
Balclutha to Tuapeka Mouth	..	2,489 0 0	..	..	..	2,489 0 0	..
Catlin's River Branch (Balclutha to Tahakopa)	42 67	463,909 6 3	200 0 0	..	..	463,709 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	50 0 0	..	..	112,294 3 2	..
Edendale to Glenham	9 36	53,593 14 10	..	..	*Cr.* 3,103 0 11	50,490 13 11	..
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	1,453,717 10 1	..	..	..	1,453,717 10 1	..
Invercargill to Kingston—							
Main Line	87 04	369,294 14 9	50 0 0	..	..	369,244 14 9	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	360,075 18 5	..	..	..	360,075 18 5	37,097 0 0
Thornbury to Wairio	22 15	103,790 15 10	..	..	..	103,790 15 10	23,200 0 0
Forest Hill (Winton to Hedgehope)	12 40	23,337 0 0	..	..	..	23,337 0 0	..
Expenses of Railway Commissions and other Expenditure not chargeable to Individual Lines	..	10,337 0 0	..	..	..	10,337 0 0	..
Surveys of New Lines—							
North Island	..	31,235 10 1	..	..	..	31,235 10 1	..
South Island	..	5,763 0 0	..	..	..	5,763 0 0	..
Rolling-stock	..	11,977,319 17 11	..	..	..	11,977,319 17 11	..
Motor-omnibus Service, Wellington	..	60,571 1 11	..	..	..	60,571 1 11	..
General	..	14,076 12 9	..	..	..	14,076 12 9	..
Depreciation provided for out of Railway Revenue and actually repaid to Public Works Fund	..	*Cr.* 762,612 9 4	..	..	..	*Cr.* 762,612 9 4	..
Stock of Permanent-way Materials	..	4,162 11 8	..	*Cr.* 620 7 9	..	3,542 3 11	..
Totals	3,388 46	67,756,578 13 5*	134,696 0 0‡	*Cr.* 34,321 16 0	303,709 3 0	67,891,270 0 5*	1,787,741 0 0†

* The £10,400,000 accrued depreciation of assets referred to in section 23 (2), Government Railways Amendment Act, 1931, not deducted. † Includes value for £150,000 paid to debenture-holders under the Midland Railway Petitions Settlement Act Amendment Act, 1903. ‡ Includes £134,485, land transferred to the Post and Telegraph Department.

TABLE No. 4.

EXPENDITURE ON PUBLIC BUILDINGS OUT OF PUBLIC WORKS FUND TO THE 31ST MARCH, 1936, AND THE LIABILITIES ON THAT DATE.

—	Total Expenditure to 31st March, 1935.	Expenditure for Year ended 31st March, 1936.	Total Expenditure to 31st March, 1936.	Liabilities on Authorities, Contracts, &c., 31st March, 1936.	Total Expenditure and Liabilities.
General—	£	£	£	£	£
Alexandra Depot, Wellington*	8,084	..	8,084	..	8,084
Government House, Wellington (land and new building)	72,645	1,645	74,290	61	74,351
Offices for public Departments†	933,587	*Cr.* 119,054	814,533	2,263	816,796
Miscellaneous	87,390	30,892	118,282	6	118,288
Parliament Buildings—					
Old buildings	76,553	..	76,553	..	76,553
New buildings	393,625	..	393,625	..	393,625
Alterations to streets surrounding grounds, and purchase of land	57,089	..	57,089	..	57,089
Judicial‡	1,494,030	13,221	1,507,251	2,305	1,509,556
Postal and telegraph	2,595,970	229,525‖	2,825,495	39,445	2,864,940
Customs	49,441	..	49,441	..	49,441
Quarantine-stations	62,464	..	62,464	..	62,464
Mental hospitals	1,891,731	67,465	1,959,196	13,198	1,972,394
Health and Hospital Institutions§	401,363	2,191	403,554	15	403,569
School buildings	3,500,310	121,424	3,621,734	12,930	3,634,664
Agricultural	97,996	85	98,081	160	98,241
Totals	11,722,278	347,394	12,069,672	70,383	12,140,055

* Expenditure *re* Defence requirements only. Other expenditure included in "Judicial" class. † Includes £12,500 expended under Finance Act, 1929, section 32. ‡ Includes Courthouses, prisons, and police-stations. § Includes £32,754 previously shown under "Public Health." ‖ Includes £134,485 for land transferred from Railway Department.

TABLE No. 5

ELECTRIC SUPPLY ACCOUNT.—STATEMENT OF ACCOUNTS AT THE 31st MARCH, 1936.

General Balance-sheet

AT 31st March, 1936, COMPARED WITH POSITION AT 31st March, 1935.

Liabilities.	1935–36.		1934–35.	*Assets.*	1935–36.		1934–35.
	£ s. d.	£ s. d.	£ s. d.		£ s. d.	£ s. d.	£ s. d.
Aid to Water-power Works and Electric Supply Accounts—				North Island scheme—			
Debentures Stock issued—				Assets as per separate balance-sheet ..	9,039,956 12 0		8,818,443 6 6
At 3 per cent. interest	954,632 17 3		423,665 0 0	Profit and Loss Account—Loss to date ..	399,315 0 9		586,848 10 7
At 3½ per cent. interest	1,000,000 0 0		1,000,000 0 0			9,439,271 12 9	9,405,291 17 1
At 3¾ per cent. interest	574,555 0 0		574,555 0 0				
At 4 per cent. interest	1,957,890 0 0		1,957,890 0 0				
At 4½ per cent. interest	2,623,913 18 0		2,623,913 18 0				
At 5 per cent. interest	3,159,227 13 6		3,670,219 6 10	South Island scheme—			
At 5½ per cent. interest	4,600 0 0		5,400 0 0	Assets as per separate balance-sheet ..	4,563,834 17 10		4,492,708 16 10
At 6 per cent. interest	1,884,642 6 3		1,884,642 6 3	Investments, Sinking Fund	17,555 5 1		1,669 5 2
Debentures not yet converted	50 0 0		50 0 0			4,581,390 2 11	4,494,378 2 0
		12,159,511 15 0	12,140,335 11 1				
Consolidated Fund—							
Interest accrued on loans to 31st March, 1936	126,724 8 4		128,949 3 7				
Sundry creditors for interest unclaimed ..	25 13 6		54 13 6				
		126,750 1 10	129,003 17 1				
Interest reserve, being excess of interest charged to schemes over interest actually paid on capital liability	..	27,281 1 8	42,137 8 1	Surveys and General	..	17,101 16 10	15,743 7 4
Carried forward	..	12,313,542 18 6	12,311,476 16 3	Carried forward	..	14,037,763 12 6	13,915,413 6 5

TABLE No. 5 - *continued.*

ELECTRIC SUPPLY ACCOUNT.—STATEMENT OF ACCOUNTS AT THE 31st MARCH, 1936—*continued.*

General Balance-sheet

at 31st March, 1936, as compared with Position at 31st March, 1935—*continued.*

Liabilities.	1935–36.		1934–35.	*Assets.*	1935–36.		1934–35.
	£ s. d.	£ s. d.	£ s. d.		£ s. d.	£ s. d.	£ s. d.
Brought forward	..	12,313,542 18 6	12,311,476 16 3	Brought forward	..	14,037,763 12 6	13,915,413 6 5
Sundry Creditors—				Balance in Electric Supply Account at the end of year—			
North Island scheme	70,008 6 9		60,930 17 2				
South Island scheme	20,027 8 9		24,875 12 0	Cash in Public Account	39,501 13 2		330,149 10 10
Surveys and general	195 13 11		..	Imprests outstanding	3,101 17 4		2,308 5 9
		90,231 9 5				42,603 10 6	
			85,806 9 2				332,457 16 7
Charges paid in advance—							
South Island scheme	..	13 15 0	..				
Depreciation Reserve—							
North Island scheme	961,757 2 9		959,085 16 1	Investment Account (amount invested until actually required)	..	175,000 0 0	..
South Island scheme	388,546 3 4		323,599 14 1				
		1,350,303 6 1					
			1,282,685 10 2				
Sinking Fund Reserve—							
Amount utilized for redemption of loans	308,945 0 0		308,145 0 0				
Available for further redemptions ..	17,555 5 1		18,338 15 3				
		326,500 5 1					
			326,483 15 3				
Writings-off in Suspense—							
South Island scheme	..	45 1 0	..				
Reserve Fund—							
South Island scheme	..	175,809 3 3	241,418 11 5	Sundry debtors for interest due but unpaid	..	1,078 15 4	..
Total	..	£14,256,445 18 4	£14,247,871 3 0	Total	..	£14,256,445 18 4	£14,247,871 3 0

Notes.—(*a*) No charge for the cost of exchange on interest payments made in London is included. (*b*) Owing to the interconnection of the undertakings in the North Island it has not been found practicable to show separately the accounts of the various schemes as required by the State Supply of Electrical Energy Act, 1917.

T. A. Barrow, A.R.A.N.Z., Accountant, Public Works Department.

I hereby certify that the General Balance-sheet has been duly compared with the relative books and documents submitted for audit, and correctly states the position as disclosed thereby, subject to the departmental notes enfaced thereon. The following comments are appended :—

1. To avoid delay, the accounts of the Mangahao-Waikaremoana scheme, the audit of which has not been completed by the local Audit Inspector, have been accepted from the Department's records.

2. The agreement with the Wellington City Council for the supply of electricity from Mangahao expired on 30th September, 1935, and the terms of a new agreement have not yet been settled. The accounts as presented include the amount charged for the supply for the balance of the year calculated at an increased rate, but the City Council has paid for this period at the previous rate and disputes liability for the balance of £17,705 3s. 4d.

G. F. C. Campbell, Controller and Auditor-General.

TABLE No. 5 - *continued.*

NORTH ISLAND HYDRO-ELECTRIC-POWER SUPPLY—*continued.*

PROFIT AND LOSS ACCOUNT

FOR YEAR ENDED 31ST MARCH, 1936, COMPARED WITH YEAR ENDED 31ST MARCH, 1935.

Gross Revenue Account.

—	1935-36.		1934-35.	—	1935-36.		1934-35.
	£ s. d.	£ s. d.	£ s. d.		£ s. d.	£ s. d.	£ s. d.
To Generating-expenses, headworks, and power-house—				By Sales of energy—			
Arapuni	10,929 5 3		11,659 2 2	Wholesale	785,264 5 3		703,746 17 1
Horahora	5,615 14 10		5,193 9 4	Retail	2,019 4 6		1,681 17 1
Mangahao	19,883 17 0		10,827 12 6			787,283 9 9	705,428 14 5
Waikaremoana	9,560 19 3		8,523 17 5				
Standby stations	10,272 3 9		912 5 3	Rents—			
		56,262 0 1		Cottages, &c.	6,885 13 3		6,281 6 10
			37,116 6 8	Lines, plant, &c.	667 2 7		679 19 8
Transmission-lines—						7,552 15 10	
Patrol, maintenance, &c.	..	32,501 19 6	27,895 4 4				6,961 6 6
Substations—							
Operation and maintenance ..	..	19,204 15 0	21,989 14 3				
Management and general—				Miscellaneous—			
Salaries, office expenses, accident, sick, and holiday pay, testing, &c.	..	36,099 6 11	33,926 0 8	Tests and inspection	..	360 16 7	336 18 2
				Penalties	..	194 0 1	1 0 0
				Interest	..	..	38 13 6
		144,068 1 6	120,927 5 11				
Balance to Net Revenue Account ..	..	651,323 0 9	591,839 6 8				
		£795,391 2 3	£712,766 12 7			£795,391 2 3	£712,766 12 7

Net Revenue Account.

—	1935-36.	1934-35.	—	1935-36.	1934-35.
	£ s. d.	£ s. d.		£ s. d.	£ s. d.
To Interest for year ended 31st March, 1936	408,050 14 2	414,041 12 3	By Balance from Gross Revenue Account	651,323 0 9	591,839 6 8
Depreciation on completed works	17,591 5 6	150,538 10 5	Balance to Profit and Loss Appropriation Account ..	..	10,428 2 8
King's Wharf Station, half annual charges on capital costs thereon	38,147 11 3	37,687 6 8			
Balance to Profit and Loss Appropriation Account ..	187,533 9 10	..			
	£651,323 0 9	£602,267 9 4		£651,323 0 9	£602,267 9 4

TABLE No. 5—*continued.*

NORTH ISLAND HYDRO-ELECTRIC-POWER SUPPLY—*continued.*

Profit and Loss Appropriation Account

For Year ended 31st March, 1936, compared with Year 31st March, 1935.

—	1935–36.		1934–35.		—	1935–36.		1934–35.	
	£ s. d.		£ s. d.			£ s. d.		£ s. d.	
To Balance from previous year	586,848 10 7		576,420 7 11		By Balance from Net Revenue Account	187,533 9 10		..	
Balance from Net Revenue Account	..		10,428 2 8		Balance to General Balance-sheet	399,315 0 9		586,848 10 7	
	£586,848 10 7		£586,848 10 7			£586,848 10 7		£586,848 10 7	

Depreciation Reserve Account.

	£ s. d.	£ s. d.		£ s. d.	£ s. d.
To Replacements, renewals, &c.	53,283 7 6	18,066 3 7	By Balance at close of previous year	959,085 16 1	794,820 12 9
Balance to General Balance-sheet	961,757 2 9	959,085 16 1	Interest at 4 per cent. per annum	38,363 8 8	31,792 16 6
			Amount set aside as per Net Revenue Account ..	17,591 5 6	150,538 10 5
	£1,015,040 10 3	£977,133 16 5		£1,015,040 10 3	£977,151 19 8

Sinking Fund Account.

	£ s. d.	£ s. d.		£ s. d.	£ s. d.
To Balance	55,929 15 6	55,929 15 6	By Balance at close of previous year	55,929 15 6	55,821 5 9
			Interest on investments	..	108 9 9
	£55,929 15 6	£55,929 15 6		£55,929 15 6	£55,929 15 6

TABLE No. 5—*continued.*

NORTH ISLAND HYDRO-ELECTRIC-POWER SUPPLY—*continued.*

BALANCE-SHEET AT 31ST MARCH, 1936.

Liabilities.	1935–36.		1934–35.	*Assets.*	1935–36.		1934–35.
	£ s. d.	£ s. d.	£ s. d.		£ s. d.	£ s. d.	£ s. d.
Depreciation Reserve		961,757 2 9	959,085 16 1	Headworks, power-house, machinery, &c.—			
Sinking Fund—				Arapuni	2,188,149 16 4		2,111,518 6 10
Utilized for redemption of loans		55,929 15 6	55,929 15 6	Horahora	310,703 14 11		310,279 18 1
				Mangahao	1,273,163 14 11		1,208,775 12 8
				Waikaremoana	542,899 8 11		521,820 13 10
						4,314,916 15 1	
							4,152,394 11 5
				Auxiliary plants—			
				Diesel Station, Penrose	61,801 16 11		61,801 16 11
				Steam Station Grand Junction	9,099 17 4		9,125 19 4
				Steam Station, Huntly	10,847 1 11		10,847 1 11
Sundry creditors		70,008 6 9	60,930 17 2			81,748 16 2	
							81,774 18 2
Head Office Account		8,351,576 7 9	8,329,345 8 4	Transmission-lines		1,518,092 11 8	1,540,374 2 10
				Substations		924,081 1 1	911,832 4 4
				Office buildings, land, railway siding, harbour facilities, &c.		38,234 9 0	34,418 16 8
				Service buildings, workmen's accommodation, &c.			97,977 1 4
				Temporary development, Waikaremoana		39,241 9 10	39,241 9 10
				Salaries and expenses of engineers and others on surveys and during construction		479,987 19 1	428,064 11 9
				Cost of raising loans		297,753 19 11	281,992 11 10
				Interest during construction		940,943 7 4	937,468 18 3
						8,635,000 9 2	8,505,539 6 5
				Plant, motor-vehicles, &c.		43,325 18 11	24,785 17 6
				Stocks		144,043 16 7	107,813 0 7
				Sundry debtors		217,586 7 4	180,305 2 0
				Accumulated loss to 31st March, 1935	586,848 10 7		..
				Profit, 1935–36	187,533 9 10		..
						399,315 0 9	586,848 10 7
		£9,439,271 12 9	£9,405,291 17 1			£9,439,271 12 9	£9,405,291 17 1

NOTE.—Owing to the interconnection of the undertakings in the North Island it has not been found practicable to show separately the accounts of the various schemes as required by the State Supply of Electrical Energy Act, 1917.

TABLE No. 5—*continued.*

SOUTH ISLAND HYDRO-ELECTRIC-POWER SUPPLY.

Profit and Loss Account.

For Year ended 31st March, 1936, compared with Year ended 31st March, 1935.

Gross Revenue Account.

——	1935–36.		1934–35.	——	1935–36.		1934–35.
	£ s. d.	£ s. d.	£ s. d.		£ s. d.	£ s. d.	£ s. d.
To Generating-expenses, headworks, power-houses, and auxiliary plant—				By Sales of energy—			
Lake Coleridge	10,931 13 5		8,998 6 7	Wholesale	241,920 12 2		225,725 2 10
Waitaki	8,313 8 3		927 4 5	Retail	556 10 7		362 12 3
Lyttelton Diesel station	874 10 0		1,428 6 0			242,477 2 9	226,087 15 1
		20,119 11 8					
			11,353 17 0	Discounts forfeited	..	1 3 10	32 8 11
				Rents—			
Transmission and distribution—				Land and buildings	2,209 16 8		
Primary distribution	6,244 2 10		4,948 2 8	Electric lines and poles	199 9 0		
Secondary distribution	2,184 14 0		1,549 11 10	Electric plant	206 13 6		
		8,428 16 10				2,615 19 2	1,871 1 5
			6,497 14 6				
Substations	..	10,545 2 2	7,638 10 11	Fees for testing and repairing electrical appliances and earnings of motor-vehicles	..	163 16 0	105 5 4
Plant, tools, testing, &c.	..	496 2 5	324 0 9				
Electrical testing	..	88 18 1	59 1 5				
Trunk telephone system	..	662 1 9	..				
Management and general expenses ..	..	13,559 13 10	9,209 13 6				
		53,900 6 9	35,082 18 1				
Balance, to Net Revenue Account ..	..	191,357 15 0	193,013 12 8				
		£245,258 1 9	£228,096 10 9			£245,258 1 9	£228,096 10 9

Net Revenue Account.

		£ s. d.	£ s. d.			£ s. d.	£ s. d.
To Depreciation on completed work ..	..	79,749 13 7	78,551 19 3	By Balance from Gross Revenue Account	..	191,357 15 0	193,013 12 8
Interest for year ended 31st March, 1936	..	177,217 9 7	97,792 3 4	Balance to Profit and Loss Appropriation Account	..	65,609 8 2	..
Balance to Profit and Loss Appropriation Account	..	..	16,669 10 1				
		£256,967 3 2	£193,013 12 8			£256,967 3 2	£193,013 12 8

TABLE No. 5—*continued.*

SOUTH ISLAND HYDRO-ELECTRIC-POWER SUPPLY—*continued.*

Profit and Loss Appropriation Account.

——	1935–36.	1934–35.	——	1935–36.	1934–35.
	£ s. d.	£ s. d.		£ s. d.	£ s. d.
To Balance from Net Revenue Account	65,609 8 2	..	By Balance from Net Revenue Account	..	16,669 10 1
Sinking Fund Reserve Account—			Adjustment amount over credited to General Reserve in 1933–34	..	18,419 12 0
Amount appropriated under section 12 (1) of the State Supply of Electrical Energy Act, 1917	..	16,669 10 1	Transfer from General Reserve Account	65,609 8 2	..
Amount appropriated under section 23 of the Finance Act, 1928, for year 1933–34	..	18,419 12 0			
	£65,609 8 2	£35,089 2 1		£65,609 8 2	£35,089 2 1

Depreciation Reserve Account.

	£ s. d.	£ s. d.		£ s. d.	£ s. d.
To Amounts written off—			By Balance from previous year's statement	323,599 14 1	244,501 16 1
Motor-vehicles, tools, plant, &c.	27,747 4 1	9,234 2 8	Interest at 4 per cent. per annum	12,943 19 9	9,780 1 5
Balance	388,546 3 4	323,599 14 1	Amount set aside as per Net Revenue Account	79,749 13 7	78,551 19 3
	£416,293 7 5	£332,833 16 9		£416,293 7 5	£332,833 16 9

General Reserve Account.

	£ s. d.	£ s. d.		£ s. d.	£ s. d.
To Transfer to Profit and Loss Appropriation Account amount over credited, 1933–34	..	18,419 12 0	By Balance at close of previous year	241,418 11 5	259,838 3 5
Transfer to Profit and Loss Appropriation Account under section 13 (2) (*b*) of the State Supply of Electrical Energy Act, 1917	65,609 8 2	..			
Balance	175,809 3 3	241,418 11 5			
	£241,418 11 5	£259,838 3 5		£241,418 11 5	£259,838 3 5

Sinking Fund Reserve Account.

	£ s. d.	£ s. d.		£ s. d.	£ s. d.
Balance	270,570 9 7	270,553 19 9	By Balance at close of previous year	270,553 19 9	233,384 11 3
			Amount set aside as per Profit and Loss Appropriation Account	..	35,087 2 1
			Interest	16 9 10	2,080 6 5
	£270,570 9 7	£270,553 19 9		£270,570 9 7	£270,553 19 9

TABLE No. 5—*continued.*

SOUTH ISLAND HYDRO-ELECTRIC-POWER SUPPLY—*continued.*

BALANCE-SHEET AT 31ST MARCH, 1936.

Liabilities.	1935–36.		1934–35.	*Assets.*	1935–36.		1934–35.
	£ s. d.	£ s. d.	£ s. d.		£ s. d.	£ s. d.	£ s. d.
Depreciation Reserve	..	388,546 3 4	323,599 14 1	Power stations—			
				Lake Coleridge—			
Reserve Fund—				Headworks	544,281 1 8		541,556 10 4
Balance at close of previous year ..	241,418 11 5			Buildings and machinery	247,945 18 2		250,593 0 7
Loss for year	65,609 8 2					792,226 19 10	
		175,809 3 3	241,418 11 5				792,149 10 11
Sinking Fund—				Waitaki—			
Amount utilized for redemption of loans	253,015 4 6		252,215 4 6	Headworks	1,109,652 10 8		1,067,581 15 5
Available for further redemptions ..	17,555 5 1		18,338 15 3	Buildings and machinery	618,427 14 11		615,746 17 10
		270,570 9 7	270,553 19 9			1,728,080 5 7	1,683,328 13 3
				Lyttelton Diesel station	..	89,066 3 7	89,006 5 1
				Transmission and distribution—			
Sundry creditors—				Primary	598,985 5 8		597,133 3 6
Public Works Department	5,354 4 2		17,464 7 6	Secondary	64,462 7 10		71,110 3 4
Other Government Departments ..	280 8 4		416 7 9			663,447 13 6	
Non-departmental	14,392 16 3		6,994 17 6				668,243 6 10
		20,027 8 9	24,875 12 9	Substations	..	416,488 7 11	412,836 13 1
				Trunk Telephone System	29,179 5 6		19,925 8 7
Charges paid in advance	..	13 15 0	..	Exploration and preliminary surveys ..	26,263 6 3		87,447 19 9
				Salaries and expenses during construction	111,910 14 5		48,197 14 0
Writings-off in suspense	..	45 1 0	..	Interest during construction	454,822 18 3		453,865 18 1
				Charges and expenses of raising loans ..	148,896 13 8		142,869 11 0
Head Office Account	..	3,726,378 2 0	3,633,930 4 0			771,072 18 1	
						4,460,382 8 6	4,397,871 0 7
				Plant, tools, &c.	..	21,064 3 11	21,591 12 2
				Stocks of material	..	48,697 1 2	43,722 0 6
				Sundry debtors—			
				Public Works Department	611 2 4		1,340 16 7
				Other Government Departments ..	1,307 7 11		1,046 12 9
				Non-departmental	31,738 17 0		27,114 19 8
						33,657 7 3	
							29,502 9 0
				Payments in advance	..	33 17 0	21 14 7
				Sinking Fund investments	..	17,555 5 1	1,669 5 2
		£4,581,390 2 11	£4,494,378 2 0			£4,581,390 2 11	£4,494,378 2 0

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

TABLE No. 6.

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, 1935.	Area commanded (Gross).	Area for which Irrigation Water is available.	Works authorized.		Works completed.		Expenditure to 31st March, 1936.*	Remarks.
			As per Design.	During 1935–36.					Main Canals.	Distributaries.	Main Canals.	Distributaries.		
Canterbury South—		Cusecs.	Cusecs.	Cusecs.	Inches.	Inches.	Acres.	Acres.	M. ch.	M. ch.	M. ch.	M. ch.	£	
Ashburton ..	Rangitata River ..	1,500	320	..	23·00	25·00	38,000	..	20 0	80 0	..	2 0	1,024	Under construction.
Levels	Opihi River ..	180	180	..	22·00	19·83	20,000	..	7 0	56 0	7 0	20 0	21,101	Under construction.
Redcliff ..	Waitaki River ..	3,000	55	..	21·00	17·8	7,000	4,603	3 69	13 76	3 69	13 76	23,290	Nearing completion.
Otago North—														
Otekaike ..	Otekaike River ..	9	15	..	21·00 (Duntroon)	15·45	1,500	800	14 37	3 47	14 37	3 47	3,631	Completed. Used only on west side of river.
Steward Settlement	Waitaki River ..	..	110	..	20·00 (Steward Settlement)	17·38	18,000	..	14 60	50 31	14 60	50 31	12,115	Completed.
Otago Central—														
Ardgour ..	Lindis River ..	35	20	20	19·62 (Tarras)	21·06	2,000	1,400	13 0	2 40	13 0	2 40	33,700	Completed.
Arrow River ..	Arrow River ..	40	50	27	27·62 (Arrowtown and Frankton)	28·33	6,536	3,421	..	..	9 18	24 2	142,468	Completed.
Bengerburn ..	Bengerburn ..	1	4	4	..	..	1,000	144	2 6	..	2 6	..	751	Completed.
Earnscleugh (Fraser River)	Fraser River and storage dam	10	47 (all races)	71·375	15·37 (Earnscleugh)	16·44	2,743	2,101	11 30	17 60	11 30	17 60	19,136	Completed. Dam being constructed to augment supply.
Hawkdun (formerly Mount Ida)	Tributaries of Manuherikia River and Eweburn Reservoir	..	60	27	23·93 (Naseby and Naseby Plantation)	24·69	10,000	8,242	66 0	101 0	66 0	90 12	72,069	Completed.
Idaburn ..	Idaburn Dam ..	3	8	4·25	23·20 (Moa Creek, Blackstone Hill)	24·69	2,500	615	10 0	0 40	7 26	0 40	6,739	Main scheme completed.
Ida Valley and Galloway—														
Ida Valley ..	Manorburn, Poolburn, Moa Creek, and Totara Creek. (Storage Manorburn Dam)	..	110	90	16·86 (Moa Creek)	23·05	14,000	11,761	73 0	54 0	73 0	29 50	298,667	Completed. Additional storage furnished by Poolburn Dam.
Galloway ..	Manorburn Dam ..	..	30	26	14·25 (Galloway)	14·32	3,450	2,653	10 50	10 7	10 50	10 7		
Lower Manorburn Dam	Manorburn Creek	4	7	7	..	..	..	..	..	2 0	..	2 0	5,131	Dam and race-work completed. Protective works now completed.

TABLE No. 6—*continued.*

IRRIGATION AND WATER-SUPPLY—*continued.*

SCHEDULE OF SCHEMES COMPLETED OR UNDER CONSTRUCTION—*continued.*

Scheme.	Source of Supply.	River Discharge (Minimum).	Main Canal Discharge (Maximum).		Average Rainfall from Records available.	Rainfall, 1935.	Area commanded (Gross).	Area for which Irrigation Water is available.	Works authorized.		Works completed.		Expenditure to 31st March, 1936.*	Remarks.
			As per Design.	During 1935–36.					Main Canals.	Distributaries.	Main Canals.	Distributaries.		
Otago Central—ctd.		Cusecs.	Cusecs.	Cusecs.	Inches.	Inches.	Acres.	Acres.	M. ch.	M. ch.	M. ch.	M. ch.	£	
Last Chance (Fruitlands and Earnscleugh Tops)	Shingle, Coal Gorge, Butcher's Creek, and Conroy's Creek	8	20	13·5	16·49 (Earnscleugh and Roxburgh East)	19·72	4,300	2,231	22 0	5 70	20 78	5 70	57,330	Conroy's Creek Dam completed and 209 acres additional area being served. Butcher's Creek Dam now under construction will augment existing supply and serve an additional area.
Manuherikia–Alexandra - Clyde No. 1	Manuherikia River	77	100	89	15·00 (Alexandra, Ophir, and Clyde)	14·78	7,000	6,090	23 0	46 20	23 0	46 20	239,138	Completed. Portion of present race is being replaced by a tunnel approximately one mile in length.
Omakau ..	Manuherikia River and Storage Dam and Thompson's Creek	36 7	65 7	35 7·5	20·29 (Clyde, Ophir, and Blackstone Hill)	19·61	10,800 (irrigable)	5,000	42 0	50 0	30 10	49 36	280,346	Nearing completion. 8,000 acres will be supplied from main race and 2,800 acres from Thompson's and adjacent creeks.
Tarras	Lindis River ..	35	70	32	19·62 (Tarras)	21·06	6,000	3,952	21 70	17 55	21 70	17 55	136,804	Completed.
Teviot River ..	Teviot River and Lake Onslow Dam	40	80	58	17·61 (Roxburgh East)	23·10	5,300	3,987	20 48	14 57	20 48	14 57	75,747	Completed and serving all land requiring water.
General investigations, and surveys, &c.	..	..	..	..	..	..	..	..	..	..	..	..	14,113	
Total: Schemes completed or under construction							160,129	57,000	375 50	526 23	349 22	400 43	1,443,300	

TABLE No. 6—*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, 1935.	Area commanded (Gross).	Length of Main Canal.	Length of Distributaries.	Expenditure to 31st March, 1936.*	Remarks.
		Cusecs.	Cusecs.	Inches.	Inches.	Acres.	Miles.	Miles.	£	
Canterbury South—										
Barrhill	Rangitata River ..	3,500	..	..	25·0	53,000	..	..	16,049	Investigations into the feasibility of irrigation in the Canterbury Province have been in hand since January, 1934. Investigations include the following phenomena, viz.: Soil moisture, mechanical analysis of soil, depth of ground water, evaporation, rainfall, and river-flow.
Mayfield-Hinds ..	Rangitata River ..	3,500	..	..	26·5	113,000	..	..		
Orari	Rangitata River ..	3,500	..	..	26·5	40,000	..	..		
Rakaia	Rakaia River ..	4,000	450	..	25·37	92,000	..	..		
Valetta-Tinwald ..	Rangitata River ..	3,500	800	23	28·44	84,000	40	..		
Investigations of other proposed schemes	..	..	..	..	..	..	..	..		
Marlborough—										
Investigation of proposed schemes	..	..	..	..	..	..	..	..	748	Comprehensive investigation surveys of schemes for the Wairau Valley and parts of the Wairau Plains are in hand.
Otago Central—										
Cromwell Flat and Lowburn (Roaring Meg)	Hydro-electric development of Roaring Meg and pumping from Clutha and Kawarau Rivers	29 (Roaring Meg)	..	20·55 (Luggate)	22·85	..	..	..	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 Hawea River power and pumping scheme.
Maniototo (Upper Taieri)	Taieri River and storage dam	25	500	16·84 (Waipiata)	14·73	100,000	60	..	15,315	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.
Scandinavian ..	Tributaries of Manuherikia River	..	20	30·66 (St. Bathan's)	31·76	..	..	..	..	For lands about St. Bathin's. To bear £15,000 towards cost of Falls dam, Upper Manuherikia scheme. Irrigable area, 3,000 acres.
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.)	..	21·78 (Hawea Flat, Luggate, and Tarras)	23·28	..	..	..	..	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)	..	20·30 (Clyde, Ophir, and Blackstone Hill)	19·61	16,000	58	60	6,553	Surveys and investigations have been made for the extension of the Omakau scheme (now under construction) to supply lands between Tiger Hill and Clyde. Irrigable area, 12,000 acres.
Investigation of proposed schemes	..	..	..	..	..	..	..	..	2,145	Includes the reading of river and rain gauges.
Total: Schemes under investigation		..	..	..	..	..	..	..	44,584	
Grand total ..	..	..	..	..	..	..	..	..	1,487,884	

* Includes expenditure from Public Works Fund, Consolidated Fund, Unemployment Fund; also administration and loan charges.

APPENDICES TO THE PUBLIC WORKS STATEMENT, 1936.

APPENDIX A.

AUDITED STATEMENT OF EXPENDITURE ON PUBLIC WORKS OUT OF THE PUBLIC WORKS FUND FOR THE YEAR 1935-36.

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

SIR,— Public Works Department, Wellington, 20th June, 1936.

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.,

R. SEMPLE,
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 1935-36.

Vote No.	Summary.	Appropriation.	Gross Expenditure.	Credits in Aid.	Net Expenditure
	General Purposes Account—	£	£ s. d.	£ s. d.	£ s. d.
34	Public Works, Departmental	112,700	251,189 5 6	151,804 13 2	99,384 12 4
35, 36	Railways	446,000	343,301 10 3	85,289 16 4	258,011 13 11
37–44	Public Buildings	569,425	409,648 18 5	62,769 6 6	346,879 11 11
45, 46	Lighthouses and Harbour-works ..	14,250	5,628 18 7	2,707 17 4	2,921 1 3
47	Development of Tourist Resorts ..	29,000	15,021 9 2	1,338 12 8	13,682 16 6
48	Roads, Bridges, and other Public Works	470,500	522,702 6 10	78,325 9 7	444,376 17 3
49	Telegraph Extension	300,000	260,271 4 10	64,891 12 6	195,379 12 4
50	Lands, Miscellaneous	98,330	97,567 12 3	59,658 16 8	37,908 15 7
51	Irrigation, Water-supply, and Drainage..	108,500	152,717 15 11	67,303 19 2	85,413 16 9
52	Swamp Land Drainage	19,000	25,159 17 2	12,237 15 9	12,922 1 5
53	Plant, Material, and Services	40,000	343,389 19 6	320,952 8 6	22,437 11 0
54	Settlement of Unemployed Workers ..	350,000	215,702 2 4	69,222 0 7	146,480 1 9
55	Native Land Settlement	180,166	337,840 7 2	265,953 5 1	71,887 2 1
55A	Dairy Industry Loans	100,000	10,750 0 7	..	10,750 0 7
	Unauthorized—Services not provided for	..	2,560 13 0	2,546 14 7	13 18 5
	Totals, General Purposes Account ..	2,837,871	2,993,452 1 6	1,245,002 8 5	1,748,449 13 1
	Electric Supply Account—				
56	Development of Water-power.. ..	623,000	549,848 4 4	20,773 4 0	529,075 0 4
	Unauthorized—Services not provided for	..	408 0 0	408 0 0	..
	Totals, Public Works Fund ..	3,460,871	3,543,708 5 10	1,266,183 12 5	2,277,524 13 5

APPENDIX A—*continued.*

Vote No.	Name of Vote.	Appropriation.	Gross Expenditure.	Credits in Aid.	Net Expenditure.
	PUBLIC WORKS FUND.				
	General Purposes Account—	£	£ s. d.	£ s. d.	£ s. d.
34	Public Works, Departmental	112,700	251,189 5 6	151,804 13 2	99,384 12 4
	Railways—				
35	Railway-construction	2,000	8,088 2 6	42,985 18 6	*Cr.* 34,897 16 0
36	Railways Improvements and Additions to Open Lines	444,000	335,213 7 9	42,303 17 10	292,909 9 11
	Public Buildings—				
37	General	53,100	39,669 10 7	137 0 7	39,532 10 0
38	Courthouses	12,700	14,257 7 8	5,556 3 0	8,701 4 8
39	Education Buildings	180,000	169,733 8 2	47,375 18 9	122,357 9 5
40	Prison Buildings and Works ..	3,000	2,122 16 9	..	2,122 16 9
41	Police-stations	9,625	8,410 17 3	1,701 5 0	6,709 12 3
42	Postal and Telegraph	200,000	105,088 8 4	7,287 19 11	97,800 8 5
43	Mental Hospital Buildings	92,000	67,700 12 0	235 19 3	67,464 12 9
44	Health and Hospital Institutions ..	19,000	2,665 17 8	475 0 0	2,190 17 8
	Lighthouses and Harbour-works—				
45	Lighthouses	9,250	3,379 11 9	59 8 1	3,320 3 8
46	Harbour-works	5,000	2,249 6 10	2,648 9 3	*Cr.* 399 2 5
47	Development of Tourist Resorts ..	29,000	15,021 9 2	1,338 12 8	13,682 16 6
48	Roads, &c.	470,500	522,702 6 10	78,325 9 7	444,376 17 3
49	Telegraph Extension	300,000	260,271 4 10	64,891 12 6	195,379 12 4
50	Lands, Miscellaneous	98,330	97,567 12 3	59,658 16 8	37,908 15 7
51	Irrigation, Water-supply, and Drainage ..	108,500	152,717 15 11	67,303 19 2	85,413 16 9
52	Swamp Land Drainage	19,000	25,159 17 2	12,237 15 9	12,922 1 5
53	Plant, Material, and Services	40,000	343,389 19 6	320,952 8 6	22,437 11 0
54	Settlement of Unemployed Workers ..	350,000	215,702 2 4	69,222 0 7	146,480 1 9
55	Native Land Settlement	180,166	337,840 7 2	265,953 5 1	71,887 2 1
55A	Dairy Industry Loans	100,000	10,750 0 7	..	10,750 0 7
	Unauthorized—Services not provided for	..	2,560 13 0	2,546 14 7	13 18 5
	Totals, General Purposes Account ..	2,837,871	2,993,452 1 6	1,245,002 8 5	1,748,449 13 1
	Electric Supply Account—				
56	Development of Water-power ..	623,000	549,848 4 4	20,773 4 0	529,075 0 4
	Unauthorized—Services not provided for	..	408 0 0	408 0 0	..
	Totals, Public Works Fund ..	3,460,871	3,543,708 5 10	1,266,183 12 5	2,277,524 13 5

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.

T. A. BARROW, A.R.A.N.Z.
Accountant.

J. WOOD,
Acting Engineer-in-Chief and Under-Secretary.

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

APPENDIX B.

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

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

Sir,—

I have the honour to submit the following report upon the various works under my control completed and in progress throughout the Dominion during the period from 1st July, 1935, to the 30th June, 1936.

Table No. 3 (pages 9–11) shows the expenditure on Government Railways in New Zealand up to the 31st March, 1935, and also the mileage opened for traffic.

RAILWAYS.

North Auckland Main Trunk Railway.—Okaihau Northwards.

Work on this section was again confined to the disposal of surplus stores, buildings, &c., which were on hand when construction was suspended.

The quarry installation was dismantled, and maintenance work was practically nil.

Dargaville Branch Railway.—Tangowahine Section.

No work other than the operation of goods and passenger services and the necessary maintenance of permanent-way was carried out during the period.

There were 5,316 passengers, 388,346 superficial feet of timber, 999 bales of wool, 46,800 head of stock, and 3,625 tons of general goods carried during the year.

Tauraroa Quarry.

This quarry was in active operation for ten months of the year, during which time the average output per month was 2,357 cubic yards. The total amount of metal crushed was 23,570 cubic yards, including 500 cubic yards of spawls. Of this amount 8,706 cubic yards were used on road and highway metalling by this Department, 4,798 cubic yards by local bodies, 9,414 cubic yards by railways, and 650 cubic yards were sold to farmers in the adjoining districts.

The plant has been kept in good order throughout the year, and a metal-washing plant was built in order to obtain a good class of clean concrete metal.

Waikokopu Branch Railway.

This line has been maintained by this Department during the past year in order to permit the carriage of frozen meat from Wairoa to Waikokopu, as well as the general haulage of goods.

During the period a two-year programme of bridge-painting was completed, every bridge on the line having been cleaned and given two coats of paint.

Repairs to the Waikokopu Breakwater to make good storm damage were carried out, and 245 cubic yards of concrete placed in position.

Napier–Gisborne Railway.

Kopuawhara Section.—From 23 m. 0 ch. to 33 m. 72 ch.; length, 10 m. 72 ch. The first steps towards resumption of construction were taken in May, when the repairing of quarters for staff and workmen was commenced.

Operations were extended as soon as possible to embrace all the restoration work requisite for getting construction going, the number of men employed being built up continuously as accommodation became available.

Fifty-one huts for single men were put into good repair, while the Y.M.C.A. recreational building and twelve married quarters were reblocked to make them serviceable. Twelve single huts were received on transfer from Lake Waikaremoana Hydro-electric works and were re-erected.

Attention was given to the service road, which was completely formed and metalled before the cessation of railway-construction. Water-tables were cleaned out, scrub cleared, and culverts put into shape over the full length. The bridges were also repaired where necessary.

The cleaning up of the faces and restoration of the service track as a preliminary to commencement of actual formation work were put in hand in the heavy cuttings along the Waikokopu Bluffs—23 m. 24 ch. to 24 m. and at 28 m. 53 ch.

At the partially completed water-drive at 31 m. 6 ch. (Kaingapipi Stream), a slip over the portal was cleared away, and service-track restorations made to enable co-operative contract driving to be resumed.

Stone-rubble toes for protecting embankments against wave action were erected from 23 m. 73 ch. to 24 m. 11 ch. These are to be faced with a low concrete sea-wall; 50 lineal feet of the latter was completed.

On the cessation of work in 1931, under arrangements with the Wairoa Electric-power Board, the 11,000-volt line had been duplicated from Wairoa to Nuhaka and a new line extended to Waikokopu, at which point supply was being given by the Board. The Department undertook the erection of the line from this point to the Waikoura Tunnel, the last tunnel on the line, and had erected all the poles and strung several miles of wire. Owing to lack of maintenance a considerable amount of repair work was incurred on the completed portion, and a strong party was put on to this, and is carrying on with the erection of the remainder of the wires.

The works system was overhauled from Waikokopu to the main office at No. 3 Camp.

At the end of the period employees totalled 129, and the number was being rapidly increased.

Wharerata Section.—From 14 m. 40 ch., Gisborne Chainage, to 33 m. 72 ch., Waikokopu Chainage: This is the heaviest section between Waikokopu and Gisborne. Work has been mainly confined so far to the erection of workmen's accommodation, reopening service roads and tracks, clearing water-drives, and draining.

Twelve single men's huts were repaired and re-erected for staff quarters.

Thirteen wooden married quarters were repaired.

Nineteen single men's huts were repaired and re-erected.

Thirteen single men's tent quarters were erected.

One new married tent quarters has been erected, and others have been transported to the sites ready for erection. Repainting of old quarters is being proceeded with. The Y.M.C.A. recreational building was reopened and placed under the charge of a resident secretary.

All access roads and tracks have been opened up for the Wharekakaho Valley and Beach Camp Section between 18 m. 40 ch. and 20 m. 30 ch., Gisborne Chainage. The Tikiwhata Road leading to the southern portal of the Coast Road tunnel (46 ch. long) has been cleared of scrub and slips, but the extension of this road to the turntable in the Tikiwhata Valley requires some further repairs. The foot track to the north end of the Coast Road (149 ch.) tunnel has been opened up.

Water-drives were reopened at 18 m. 73 ch., Gisborne Chainage, and at 36 m. 8 ch., 35 m. 65 ch., and 35 m. 34 ch., Wairoa chainages.

Work on formation has been confined to preparations at various points, comprising clearing scrub, draining cuttings, repairing and relaying service track and trucks.

The number of men employed at the end of the period, exclusive of staff, was seventy-two and was being rapidly increased.

Gisborne Section.—From 7·35 ch. to 14 m. 40 ch.; length, 14 m. 47 ch.: No construction work was actually done on this section before the end of the period.

Napier–Gisborne Railway.

Napier–Putorino Section.—0 m. – 37 m. 35 ch.; length, 37 m. 35 ch. A start was made to clear up this section as soon as the work was authorized by Cabinet shortly before the end of the period.

All growth has now been cleared from the track and the rails uncovered as far as the 16 m. peg. Between 12 m. and 16 m. two muck trains have been used to clear slips. The length between Napier and Eskdale is being heavily ballasted and regraded to eliminate earthquake damage, and a gang of artisans is engaged in repairing culvert damage.

The work of lifting and reconditioning the line has been very heavy over the first 8 m., owing to the large amount of uplift on the shingle ground during the 1931 earthquake. No actual final lifting has yet been completed.

Slips and bank subsidences have occurred chiefly in the upper reaches of the Esk Valley—*i.e.*, 13 m. to 20 m.—and all slip material has been utilized to raise and widen weak banks.

Two muck trains have been employed, and to date have shifted 8,012 cubic yards between 12 m. 30 ch. and 16 m. 5 ch.

The ballast-pit at the 5 m. peg was open to use, and to date 11,790 cubic yards of ballast were loaded and removed by the ballast train hired from the Railways Department.

The 2 ft. culvert at 7 m. 13 ch. has been replaced by 18 in. pipes 24 ft. long.

The washed out culvert at 7 m. 59·29 ch. was repaired and the bank made good.

The 6 ft. flat-top culvert at 14 m. 2·81 ch. is being protected by means of a reinforced-concrete spillway.

Tent-accommodation for forty men has been erected at Waipunga (15 m. 20 ch.), together with cookhouse and bathhouse.

A total of 118 men is at present employed on this section.

Putorino–Wairoa Section.—37 m. 35 ch. – 70 m. 67 ch.; length, 32 m. 32 ch.: For the major portion of the year under review the only work carried out was maintenance of the Mohaka Viaduct steel. Spread over two years, a programme of cleaning and painting with two coats of paint was practically complete[illegible]n onset of winter conditions necessitated the closing-down of this work. Towards the end [illegible]nstructions to proceed with completion of the line were received, and at the close of th[illegible]ell in hand, upwards of ninety men being spread over the section in general [illegible]

P[illegible] crushing installation at the south side of the Mohaka Viaduct to pr[illegible]he section, and tenders are to be called immediately for the hau[illegible] for the northern section, large quantities being required

in both cases. At the Mohaka Viaduct site a camp was erected, staff installed, and plant and materials are coming to hand in readiness for the early prosecution of this important undertaking. When the year closed the preparatory work was well in hand, and a start had been made on the erection of the towers for the cable-way which will be used for placing the steelwork.

Westport–Inangahua Railway.

The Te Kuha – Cascade section has been maintained during the year by the Department to handle the coal traffic from the Cascade Mine. Apart from this maintenance no other work was carried out during the period.

South Island Main Trunk Railway.

No constructional work was carried out on this line since my last report; only a very limited amount of maintenance has been carried out, and surplus material has been disposed of as opportunity offered.

The completion of this line has now been authorized by Cabinet, and work on accommodation was commenced almost immediately after 30th June.

A large amount of new plant has been ordered so that a vigorous and progressive policy of construction may be put in hand.

IRRIGATION.

CENTRAL OTAGO.

Operation and Maintenance of Irrigation Schemes.

As shown in the table below, there are now thirteen schemes in operation on a trading basis. The total area irrigated during the season was 43,847 acres, water being supplied to 459 irrigators. The corresponding figures for the 1934–35 season were 38,027 acres and 402 irrigators, the increase being due chiefly to the inclusion of the Omakau scheme, which is now nearing completion.

Excluding this scheme, in which water is purchased as it is required and in which no irrigation agreements are in operation, an area of 38,847 acres was irrigated, as against an area of 44,158 acres which should have been irrigated. The difference was the area to which water was refused on account of the non-payment of the water rates.

The total irrigable area now commanded on all schemes is 60,000 acres.

Generally speaking, the season was a successful one, and was notably free from destructive thunderstorms. The spring and summer were more than usually dry, but stream-flows were well maintained and no shortage of supplies occurred on any schemes. The comparative absence of dry, hot winds during the summer tended to offset the low rainfall.

The completed schemes now in operation are shown in the following table, which also indicates the areas actually irrigated, the area that should have been irrigated if the settlers had paid their arrears of rates, and the number of irrigators in each scheme:—

Scheme.	Area actually irrigated.	Area that could be irrigated.	Number of irrigators.
	Acres.	Acres.	
Arrow River	1,761	2,864	39
Ardgour	1,342	1,364	13
Bengerburn	114	144	13
Earnscleugh	1,865	2,058	47
Galloway	2,591	2,618	22
Hawkdun	7,473	8,736	59
Idaburn	565	565	8
Ida Valley	10,689	11,474	55
Last Chance	1,848	2,118	32
Manuherikia	4,781	5,622	72
Tarras	2,574	2,725	19
Teviot River	3,244	3,870	47
	38,847	..	426
Omakau	5,000	..	33
Totals	43,847	44,158	459

The Omakau scheme was in its first year of operation, and the area now commanded is 13,400 acres.

The financial results of the year's operations are as follow[illegible] £2,891; working-expenses, £14,666; gross profit on working, £8,225.

As far as possible water rates were collected in advanc[illegible] years with their payments. Since 31st March, the amount collected [illegible] under review, £17,023.

The usual work in connection with stream-gauging, lake-level recording, and meteorological records was carried on throughout the year.

Schemes under Construction.

Omakau Scheme: Falls Dam.—This structure, a rock-fill dam 110 ft. high, was completed early in the year. Work done during that period consisted of the completion of the spillway and spillway shaft, lining of 294 ft. of the access-drive to the valve-chamber, and the plugging of the diversion tunnel and installation of valves. These works entailed the placing of some 570 cubic yards of concrete. In addition, the concrete pavement slab, parapet wall, and handrail along the crest of the dam were completed.

The dam has since been filled and put into operation, and is giving very satisfactory service.

Race System.—During the year 7 m. of main race were excavated, making the total to date 30¼ m. 34 m. 36 ch. of branch and distributary races were completed, making a total of 49 m. 36 ch. to date. Of this, 24 m. 46 ch. are in the Omakau section, 10 m. in the Lauder section, and 14 m. 70 ch. in the Matakanui section.

Work on concrete siphons included the completion of the intake siphon of 54 in. diameter, and the laying of distributary lines of smaller diameter.

The main intake weir, silt-trap, and bye-wash were completed, and one siphon spillway installed in the main race.

Other works included the intake weir in Lauder Creek and other structures incidental to irrigation schemes.

This scheme is now practically completed, and water was supplied to an area of 5,000 acres during the past season.

Ida Valley Scheme: Poolburn Drainage.—This work was completed during the year, the length of drain finally excavated being 5 m. 70 ch., of which approximately 2 m. were cut during the period. A very marked improvement has resulted in the lands affected by the drain.

Teviot Scheme: Intake Tunnel.—The driving and lining of the tunnel to eliminate the main 36 in. pipe line was completed. The total length of tunnel, which was put into commission in October last, is 5,078 ft. The year's progress consisted of 1,658 ft. of excavation and 3,078 ft. of lining.

Extension Siphons.—No. 2 siphon, which was in a bad state of repair, was renewed with 510 ft. of 22-in.-diameter concrete-lined steel pipes.

Last Chance Scheme: Butchers Dam.—This dam, of the arched type, of 105 ft. radius and 82 ft. in height, is now nearing completion. 1,800 cubic yards of concrete were placed during the year.

The tunnel, of a total length of 2,388 ft., has been driven and a limited amount of lining-work is being done. The length driven during the year was 1,888 ft. The dam and tunnel will be put into commission for the approaching irrigation season, and will supply Alexandra Borough in addition to lands under the Last Chance scheme.

Earnscleugh Scheme: Fraser River Dam.—Work on this dam is well in hand, which is a concrete arched structure of 175 ft. radius and of 102 ft. in height. During the year foundation excavation work has totalled 3,640 cubic yards, and 1,079 cubic yards of concrete have been placed. Access to the site entailed the construction of 6 miles of road.

Additional works carried out included the erection of 6 m. of transmission-line, installation of plant and buildings, and diversion of the Fraser River.

This dam will augment supplies to the Earnscleugh scheme.

Manuherikia Scheme: Manuherikia Tunnel.—Work on this tunnel, which will eliminate approximately 1½ m. of troublesome race in the Manuherikia Gorge, was commenced late in the year. Camps and buildings were erected and compressor plant and air-lines installed.

Up to the end of June, 504 ft. of tunnel have been driven at the outlet end and 256 ft. from No. 1 adit. The total length of tunnel is 78 ch.

Surveys.

Maniototo Scheme.—Further surveys and investigations of alternative layouts of this scheme were carried out during the year. A considerable amount of work was done in surveying distributary races and in preparing estimates for the full and for a modified scheme.

CANTERBURY.

Schemes under Construction.

Redcliff Irrigation Scheme.—During the year construction work was actively carried on. At the conclusion of the year all works had been completed except the raceman's cottage, which is now in hand.

All structures and races had been finished and tested satisfactorily under full-flow conditions.

Construction was finished too late in the season for the water to be made available to irrigators, but approximately 100 acres of the demonstration area were watered once.

An automatically controlled turnout was constructed to deliver water from our water-races to the Lower Waiho stock water-race, and suitable financial arrangements in respect to this were concluded with the Waimate County Council.

The area commanded by this scheme is 5,134 acres, of which 4,603 acres are considered economically irrigable, and everything is now in order to have the scheme operating next irrigation season.

Levels Plain Irrigation Scheme.—Work was commenced on 1st July, 1935. Buildings for office, stores, and workshops, &c., were erected, and yard established 1¼ m. from Temuka Railway-station and adjacent to Opihi River Bridge, Main South Road. An average of over 120 men have been employed during the year.

Race-formation.—In all, 30 m. of races had been excavated by the end of the year, the mileage being made up as follows:—

Diversion race	1 m. 18 ch.
Main race	5 m. 36 ch.
No. 1 lateral	10 ch.
No. 2 lateral and distributaries	3 m. 33 ch.
No. 3 lateral and distributaries	12 m. 67 ch.
No. 4 lateral and distributaries	5 m. 57 ch.
No. 5 lateral and distributaries	1 m. 16 ch.

A total of 102,837 cubic yards was excavated in the above races. This represents 73 per cent. of total excavation.

Structures.—A total of fifty-one structures in reinforced concrete, averaging approximately 16 cubic yards each, was completed or in hand on 30th June. This represents the bulk of the work on the main race, and includes the larger structures in the scheme.

Ashburton-Lyndhurst Irrigation Scheme.—Work was commenced on 16th March, 1936. Since that time an average of 100 men have been employed, and 4 m. 57 ch. of race constructed, requiring the excavation of approximately 20,000 cubic yards. This is about 6 per cent. of the total earthwork to complete the scheme.

No structures have been built as yet.

A main camp, with store, office, and other buildings was erected at Winchmore, 5 m. from Ashburton. A second camp to accommodate thirty married men was partly erected by the end of the period.

When completed in September, 1938, this scheme will command approximately 38,800 acres, of which 25,500 is regarded as economically irrigable.

Canterbury Irrigation Investigations.

Topographic Survey.—This work was continued from June, 1935, until October, 1935, by two field parties operating from Kirwee and Oxford. Work was discontinued in October in favour of other more urgent work. The area contoured during this period was 183,500 acres, arranged in counties as follows: Rangiora, 15,000; Eyre, 61,000; Tawera, 15,000; Malvern, 72,500; Paparua, 20,000: total, 183,500 acres.

Stream-gauging.—Gauging of rivers has been intermittent during the year. Regular gaugings of the Wairau have been instituted, and an automatic river-level recorder is to be installed.

Four more recorders have been set in operation in Canterbury, and a further six are on order. Of these latter, one is to be installed at Blenheim, one at Lake Heron, and one on each of the following rivers: Ashley, North Ashburton, Waiau, and Hurunui.

The date of commencement of continuous record of flow for the following rivers is as follows: Upper Opihi, 15th November, 1935; Opuha, 22nd February, 1936; South Ashburton, 7th January, 1936; Rangitata, 20th October, 1935.

Observations on depth of ground-water were continued during the year.

Weekly inspections of the tunnels for determining rainfall penetration have been continued, in addition to extra inspections during rainy periods.

Soil-moisture and Rainfall.—Observations of soil-moisture and rainfall have been continued during the year at the fifteen stations in Ashburton County, thus completing a total of twenty-five months of record. Soil-moisture has generally been consistently high during the year under review, and owing to higher rainfall during the summer of 1935–36 no abnormally low values were found such as occurred during the previous summer.

Observations have been continued also in Waimate County on the area served by the Redcliff Irrigation Scheme. As in the case of Ashburton soils, the moisture did not drop to the same extent during the past summer as it did during the previous season (1934–35), but the values obtained were on the whole lower than those recorded for Ashburton County.

Samples have been taken regularly since 1st October, 1935, at four stations in Levels County. Periods of only moderately low soil-moisture were observed during the past summer, and for the rest of the year values have been consistently high. Thirteen stations for soil-moisture observations have been established in the Blenheim district since March, 1936, samples being forwarded fortnightly. To date only normal to high values have been recorded.

Evaporation.—A record of evaporation, with wind, humidity, and temperature observations has been kept at Temuka since 19th September, 1935, and the loss from an open-water surface till 30th June amounted to 26·98 in. Another station was established in April, 1936, at the Blenheim Aerodrome, and observations are made daily.

Soil Surveys, &c.—The detailed soil survey of the Levels Plain has been carried out, and the field work and classification of soil types by mechanical analysis have been completed for the soil survey of the Redcliff area. A number of mechanical and chemical analyses has been carried out on soils from the Blenheim district by way of preliminary examination, and a report submitted thereon. Determinations have also been made of the void content and field capacity of representative soil types from Ashburton and Levels Counties, and the latter values have shown good agreement with the observed behaviour of the soils in the field following conditions of heavy rainfall. Further chemical work included the analysis of river-water and river-silts, and flocculation problems of domestic water-supply.

Rainfall-runoff.—The six automatic rainfall-recording instruments installed in the high country of the North Ashburton Valley were found to be defective owing to excessive friction in the working parts. In December, 1935, they were brought out and the design lightly altered. They were restarted in April, 1936, and just before the conclusion of the year an inspection was made to replace charts. A very satisfactory record was obtained from each instrument.

Rangitata Diversion Race.—During the year a survey was carried out to locate a proposed race from the Rangitata Gorge to near Ruapuna. A distance of 6 m. 51 ch. was traversed and levelled, and typical cross-sections taken.

Oxford and Malvern Counties: Stock Water-supply.—A survey was made during the year of a scheme for raising water from the Waimakariri River above the gorge bridge by means of a hydraulic turbo-pump, and for supplying stock water to Malvern and other counties from an intake situated at the gorge bridge.

HYDRO-ELECTRIC DEVELOPMENT.

Arapuni Scheme.

Very good progress has been made during the year with the work of extension of the power-house for the installation of two additional 20,000 k.w. units in the Arapuni Station.

The foundation work has been very extensive, requiring massive concrete work. Construction work was carefully undertaken by the extensive use of well-timbered shafts, but was prosecuted with despatch.

A summary of the work carried out is as follows :—

Excavation above tailwater level, 28,680 yards.

Excavation below tailwater level, 11,400 yards, including 8,080 yards taken out of fifty-two shafts for the main foundation piers.

Excavation of tailrace, 7,800 yards.

At the end of the year the main excavation work was about 97 per cent. complete, the excavation for piers, &c., about 89 per cent. complete, and the tailrace excavation was complete.

Forty-one boreholes, totalling 1,664 ft. of 2½ in. boring, were put down to explore the foundations, and a 75 ft. tunnel, 7 ft. by 4 ft. dimensions, was excavated for the pitometer gallery.

Concrete was placed as follows :—

Foundations, 7,120 yards (including 6,020 yards for deep foundation work, of which 92·5 per cent. was completed).

Building superstructure, 400 yards in columns and walls and 120 yards in beams and slabs.

Tailrace floor, 190 yards.

Protective work on the cliff face was completed, a total of 3,535 ft. of holes being bored to take steel rods, which were grouted in position.

Waitaki River Scheme.

At the commencement of the year covered by this report construction work at the dam and power-house was practically complete, only a few items requiring completion.

Several of the temporary sluices closed by temporary gates were successfully plugged and filled with concrete. The removal of temporary steel trestling and the cleaning-up and disposal of plant marked the closing stages of the work.

One item that has presented much difficulty is the closing of temporary sluices 9, 10, and 11. Here the gates which had been set in position to close the sluices and enable concreting to be carried out had overrun their positions and could not be restored. Remedial measures have been carried out under great difficulties, but I am now able to report that sluice No. 9 was successfully plugged and concreting is practically complete. At Nos. 10 and 11 the position is now under control, concreting is being carried out at No. 11, and similar procedure will be followed at No. 10 as the river stage allows.

CONSTRUCTION AND IMPROVEMENT OF ROADS AND BRIDGES.

Whangarei District.

Bull's Road (Bay of Islands County).—5 m. 60 ch. was formed 16 ft. wide and metalled 9 ft. by 6 in. during the year.

Motatau to Maromaku Road (Bay of Islands County).—3 m. was metalled, and all settlers have good access to railway and dairy factory.

Opahi to McKenzie's Road (Bay of Islands County).—This road, 1 m. 49 ch. long, was metalled and bridging was completed.

Opua to Black Bridge Road (Bay of Islands County).—3 m. was metalled on this road.

Preston's Road (Bay of Islands County).—A length of 3 m. was formed 12 ft. wide, thus providing a short route from Waipapa to the railhead at Okaihau, and also facilitating the subdivision of an adjacent Government block.

Dargaville to Pukehuia Road (Hobson County).—3 m. 40 ch. was formed 16 ft. wide to serve a district which had been isolated as a result of the cessation of the cream-boat service on the Wairoa River. Metalling and bridging will follow.

Hoyle's Road (Hobson County).—2 m. 63 ch. was metalled, and all seven settlers have satisfactory access.

Mangarata to Arapohue Road (Hobson County).—5 m. 28 ch., which was widened to 16 ft. last year, was metalled, thus giving all-weather access to Pukehuia Railway-station.

Okahu Bridge, Lusk's Road (Hobson County).—A dangerous bridge was replaced by a modern structure of three 30 ft. spans in reinforced concrete.

Omana Main Road (Hobson County).—A length of 3 m. was widened to 16 ft.

Tikinui to Tangaihi Road (Hobson County).—An additional length of 1 m. 8 ch. was metalled. This road will be an important factor in the development of the Pouto Peninsula.

Tutamoe to Wekaweka Road (Hobson County).—3 m. 74 ch. was metalled to serve three settlers.

Mata Road (Hokianga County).—The formation completed last year was badly damaged by floods and metalling was delayed, only 1½ m. being completed this year.

Opononi to Omapere Road (Hokianga County).—The balance of the formation (1 m. 4 ch.) was completed to a width of 16 ft., and 2 m. 35 ch. was metalled.

Omapere to Waimamaku (Hokianga County).—A considerable portion of this road is being realigned, 76 ch. having been formed to a width of 16 ft. with metalling to follow.

Awanui to Mangonui Road, Kaingaroa to Lake Ohia Section (Mangonui County).—4 m. 16 ch. was formed 16 ft. wide, and 3 m. has been metalled.

Gurr's Road (Mangonui County).—1 m. 26 ch. was metalled, thus completing the subdivisional road for a small-farm scheme.

Kaitaia Block Access Road (Mangonui County).—This road, which serves a small-farm scheme on the Kaitaia Swamp, was metalled to a width of 9 ft. over a distance of 2 m. 70 ch.

Parapara to Otukai Road (Mangonui County).—2 m. 24 ch. was metalled to a width of 8 ft. to afford satisfactory access to many European settlers and a Native settlement.

Takahue to Herekino Road (Mangonui County).—This was a very narrow and tortuous road, and was practically impassable because of inefficient drainage. 6 m. 44 ch. was reformed to a width of 16 ft., and metalling is to follow.

Waipapakauri to Tangoake Road (Mangonui County).—This is a section of the road on the far northern peninsula. 7 m. was formed and sanded where necessary.

Bull's Road (Otamatea County).—5 m. was widened to 16 ft. and realigned. 2 m. 40 ch. of metalling was completed.

Hukatere to Te Kowhai Road (Otamatea County).—3 m. 60 ch. was metalled 9 ft. wide.

Hukatere to Tinopai Road (Otamatea County).—Metalling of 1 m. 28 ch. to a width of 9 ft. has completed the surfacing of this road.

Kaiwaka to Oneriri Road (Otamatea County).—2 m. was formed 16 ft. wide, and 1 m. 20 ch. was metalled 9 ft. by 6 in.

Parahi to Lusk's Road (Otamatea County).—This road gives access to Waiotira Railway-station. 3 m. 27 ch. was widened to 16 ft. and metalled 9 ft. by 6 in.

Kauri Mountain Road (Whangarei County).—3 m. was metalled 8 ft. by 6 in.

Marsden Point Road (Whangarei County).—5½ m. was metalled 9 ft. by 6 in., making a very important improvement to the district.

Maungatapere to Kaigoose Road (Whangarei County).—Formation was completed over a length of 1 m. 36 ch., and 2 m. 36 ch. was metalled 9 ft. by 6 in.

Oue Block Road (Whangarei County).—2 m. 40 ch. was metalled 9 ft. by 6 in.

Tangihua and Codlin's Road (Whangarei County).—1 m. 63 ch. of Codlin's Road was formed, and 29 ch. was metalled 9 ft. by 6 in. Completion of the whole programme as proposed will afford satisfactory access to nine settlers.

Waimatenui Road (Whangarei County).—The balance of last year's programme was completed, 3 m. of metalling having been done. Flood damage delayed the work considerably. Two 40-ft.-span concrete bridges were also erected.

Waipu to Mangawai Road Bridges (Whangarei County).—A commencement was made with the erection of three reinforced concrete bridges to replace structures washed away by floods. One of 40 ft. span has been completed, and the other two are in hand.

Pupuke Bridge (Whangaroa County).—This bridge, 120 ft. long, was completed during the year, but shortly afterwards one span was badly damaged during a heavy flood.

Taratara Road (Whangaroa County).—The 3 m. formed last year was metalled 9 ft. by 6 in.

Auckland District.

Colville to Port Jackson Road, Paritu Southwards Section (Coromandel County).—With the formation of 1 m. 18 ch. finished during the year the total length of new work on this road is 5 m. 40 ch., and all of this has been metalled, thus affording a large area of good country at Port Jackson an all-weather access to Coromandel.

Coromandel to Kennedy Bay Road (Coromandel County).—A major deviation on the Coromandel side of the Main Divide has been undertaken, and up till the present 1 m. 36 ch. of formation has been completed to a width of 14 ft.

Awhitu Central to Manukau Heads Road (Franklin County).—All-weather access was provided to six more settlers by the metalling of a further length of 1 m. 33 ch.

Hamilton to West Coast Road, Pollok (Franklin County).—Metalling was continued on this road, an additional 1 m. 49 ch. having been completed.

Blind Bay–Kaitoke–Harataonga Road (Great Barrier Island County).—During the year a length of 2 m. 18 ch. was formed and 65 ch. was metalled.

Kerepehi to Awaiti Road (Hauraki Plains County).—Metalling of this road was extended over a distance of 2 m. 70 ch.

Netherton to Tirohia Road (Hauraki Plains County).—New formation was carried out over a distance of 2 m. 37 ch.

Kaimango Road (Kawhia County).—This is a settlement road, and during the year 4 m. 62 ch. was reformed and widened and 2 m. 26 ch. was metalled.

Taumatatotara East Road (Kawhia County).—Five settlers in a previously isolated district have now an all-weather access as a result of the Department having completed the formation of 4 m. 25 ch. and the metalling of 2 m. 3 ch. of this road.

Botany Bridge (Manukau County).—The County Council erected a concrete bridge of 36 ft. span and 20 ft. between kerbs.

Lane's Bridge, Alfriston to Ardmore Road (Manukau County).—The Council completed the erection of one 40-ft.-span concrete bridge 20 ft. between kerbs to replace a decayed wooden structure.

Matingarahi to Puanoano Road (Manukau County).—Metalling of 2 m. 40 ch. has been completed, thus giving an all-weather road between Clevedon, Orere, Kaiaua, and Pokeno.

French Pass and Te Miro Roads (Matamata County).—Re-formation and metalling work is being carried out on these roads, and up till the present 4 m. 20 ch. has been re-formed, and 3 m. 22 ch. metalled. This is an important settlement work.

Putaruru to Lichfield Road (Matamata County).—Four properties were provided with all-weather access as a result of the Matamata County Council having carried out the metalling of 60 ch. of this road.

Waitoa Bridge, Peria Road (Matamata County).—A new bridge of 30 ft. span and 12 ft between kerbs was built in rolled-steel joist stringers on ironbark piles. The County Council performed this work.

Kennedy's and Dickey's Flat Roads (Ohinemuri County).—1 m. 21 ch. of metalling carried out during the year has provided a good access to six settlers.

Loop and Adams Roads (Otorohanga County).—These are settlement roads, and during the year the Department completed the metalling of 8 m. 32 ch.

Ouruwhero Road (Otorohanga County).—The metalling of 3 m. 10 ch. has eliminated the last clay gap on this road.

Panetapu Settlement Roads (Otorohanga County).—The Panetapu Estate has been settled under the Flock House scheme. On the basis of arrangements made with the trustees the Department is carrying out the formation and metalling of the necessary roads. To date 4 m. 40 ch. of formation has been completed.

Te Tahi Road (Otorohanga County).—Seven settlers have now much improved access as a result of this Department's operations in the metalling of 3 m. 3 ch. of this road.

Waiti Road (Piako County).—There are eight settlers on this road, and during the year 3 m. of widening and 2 m. 34 ch. of metalling was completed.

Grove's Road (Raglan County).—The re-formation and metalling of this road is in hand, and during the year 3 m. of formation work and 49 ch. of metalling has been completed.

Okete Soldiers' Settlement Road (Raglan County).—The metalling of this road was extended for a further distance of 4 m. 39 ch.

Ruapuke Mountain Road (Raglan County).—This road, serving some twelve settlers, was metalled for a further distance of 4 m. 71 ch.

Te Pahu Limeworks Road (Raglan County).—3 m. 17 ch. of this road has been metalled, and, in addition to giving all-weather access to six settlers, the work has provided a useful cream route.

Waingaro Springs to Te Uku Road (Raglan County).—This road provides a through connection between the Waingaro district and Te Uku. The authorized programme is the re-formation and metalling of 6 m. 40 ch., and during the year 4 m. 10 ch. of re-formation and 1 m. 73 ch. of metalling has been completed.

Dills and Vipond's Roads (Rodney County).—2 m. 70 ch. has been widened to 16 ft. and a sandstone base course laid. In addition, 236 ft. of culverts were placed.

Mahurangi Heads West Road (Rodney County).—This road was in very bad condition when the Department undertook improvements in the way of widening to 16 ft. and subsequent metalling. Up till the present, 474 ft. of culverts have been placed and 3 m. 28 ch. of metalling completed, thus affording thirteen settlers an all-weather access to Warkworth.

Run Road and Marcroft's to Duddings Road (Rodney County).—The Council metalled 1 m. 25 ch. of these roads under Government subsidy.

Te Arai Group Roads (Rodney County).—Work has been continued on these roads, 2 m. 58 ch. of widening and re-formation and 5 m. 20 ch. of metalling having been completed this year. The necessity for this work may be understood when it is mentioned that twenty-two settlers now have all-weather access to Hoteo Railway-station.

Kauaeranga Valley Road (Thames County).—2 m. 56 ch. has been metalled.

Hikuai to Whangamata Road (Thames County).—During the year 4 m. 7 ch. of this road was metalled, and when the work is completed it will connect all the metal on the East Coast of the Coromandel Peninsula between Waihi and Mercury Bay.

Feist's Access Road (Waikato County).—The Council completed the metalling of 1 m. 67 ch. of this road during the year, and four settlers are now provided with a good metal access.

Hoe-o-Tainui Block Access Road (Piako and Waikato Counties).—This work, which was commenced last year, has now been completed. During the year 2 m. 24 ch. was formed and 4 m. 64 ch. metalled.

Waerenga to Maramarua Road (Waikato County).—The Council completed the metalling of 1 m. 30 ch. of this road.

Ellicott's Block, Monckton's and Block Roads (Waipa County).—The roading of this Block, which was commenced last year, was continued, and requirements for the new settlement have now been completed. A further length of 2 m. 49 ch. of formation (total to date 7 m. 6 ch.) and metalling of 1 m. 25 ch. (total to date 5 m. 15 ch.) were completed during the year.

Green and Potter's Road (Waitemata County).—The re-formation and metalling of 3 m. 65 ch. of this road completed during the year will give eight settlers an all-weather access and will provide a connection between the Auckland–Maungaturoto and Kumeu–Albany Main Highways and Kumeu Railway-station.

Huia Stream Bridge, Brooklyn to Huia Road (Waitemata County).—A reinforced-concrete bridge of three 31 ft. spans on concrete piers and abutments with 13 ft. roadway between kerbs was erected by the Council to replace an old wooden structure.

McLaughlin's Road (Waitemata County).—The total length of this road is 2 m. 20 ch., and it was metalled throughout during the year. In addition, one 25-ft.-span wooden bridge was erected and 342 ft. of culverts were placed.

Old North Road, Waikoukou State Forest Reserve (Waitemata County).—This road was re-formed and metalled over its entire length of 3 m.

Taylor's and Old North Roads (Waitemata County).—A programme involving the re-formation and metalling of 6 m. 50 ch. of these roads has been undertaken. During the year 2 m. was completed.

Upper Orewa to Upper Waiwera Road (Waitemata County).—Re-formation and metalling over a distance of 2 m., together with the placing of 106 ft. of culverts, was completed during the year.

Upper Waiwera to Tahekeroa Road (Waitemata County).—This road was re-formed and widened to 16 ft. over a distance of 1 m. 61 ch. Metalling was carried out over 5 m. 66 ch. and 278 ft. of culverts were placed.

Wainui to Makarau Road (Waitemata County).—The work carried out during the year in the metalling of 4 m. 4 ch. completes the surfacing of this road throughout its entire length, and an all-weather connection is now provided between Makarau Railway-station at the north and Kaukapakapa Railway-station at the south.

Tauranga District.

Waioeka Bridge, Wairata Road (Opotiki County).—A suspension-span bridge of 144 ft., with two land spans, has been practically completed.

Campbell's Road (Rotorua County).—2 m. of metalling has very considerably benefited seven Crown settlers who are dairy-farming in the locality.

Kaharoa Road (Rotorua County).—1½ m. has been metalled, affording all-weather access to twelve settlers.

Rotorua to Atiamuri Road (Rotorua County).—This important road was widened to 18 ft. for a distance of 1 m. 18 ch. 2½ m. was metalled and 270 ft. of culverts were placed.

No. 2 Road Te Puke (Tauranga County).—1 m. 59 ch. was metalled during the year.

Wharere Small Farms Access Road (Tauranga County).—This road gives access to a Government small-farm scheme. 4 m. 46 ch. was raised and widened, and 3,000 cubic yards of pumice has been delivered for placing on the road.

Broadlands Small Farm Settlement Road (Taupo County).—As indicated, this road serves a small-farm scheme. 3 m. 3 ch. has been formed and metalled.

Eastern Boundary Road (Whakatane County).—1 m. 50 ch. of metalling has been performed.

Eastern Drain Road (Whakatane County).—1 m. 35 ch. has been raised, widened, and metalled, thus giving much improved access to the dairy factory.

Onepu Settlement Road (Whakatane County).—Widening, culverting, and grading has been carried out over a length of 5 m. 20 ch.

Stanley Road (Whakatane County).—Improvements have been carried out over a distance of 5 m. and, while the road is not metalled over all this length, it is nevertheless passable in all weathers.

Murupara to Te Whaiti Road (Whakatane County).—This is a vital link in an important through road which is carrying an ever-increasing amount of traffic. 4 m. 40 ch. was metalled during the year.

Rotorua to Waikaremoana Road (Whakatane County).—A major work is in hand on this scenic route which traverses some unique bush country. The results for the year are—150 ch. formed and widened to 20 ft. in heavy formation; 202 ch. metalled 12 ft. wide; 13,375 cubic yards of slips cleared; and 233 lineal feet of culverts placed.

Gisborne District.

Bushy Knoll Road (Cook County).—80 ch. of formation has been prepared for metalling, 108 ft. of concrete culverts installed, and 50 ch. of base-course metalling completed.

Hangaroa Junction to Waikaremoana Road (Cook County).—2 m. 38 ch. of bottom-course metalling and 6 m. of crushed top-course metalling were completed.

Manutuke to Wairoa Road via Mangapoike Valley (Cook County).—Both abutments of Jex Blake's bridge were constructed. 2 m. of full-depth crushed-stone metalling was completed and a two-coat bitumen seal was applied over a length of 2½ m.

Papatu Road (Cook County).—70 ch. of metalling has completed all proposals for this road.

Waimata River Suspension Bridge (Manders Road), (Cook County).—This bridge, providing for foot and sheep traffic, and also for transport of wool-bales singly, was completed, the length being 180 ft. and the width 3 ft.

Kokomuku Road (Matakaoa County).—1 m. 58 ch. of formation and placing of 448 ft. of concrete culverts was completed.

Kopuapeunamu Road (Matakaoa County).—2 m. 12 ch. of metalling was carried out.

Main East Coast Road: Potaka Junction to Whangaparaoa (Matakaoa County).—9 m. 40 ch. of formation was trimmed and 6 m. 20 ch. was metalled. 1,656 ft. of concrete culverts have also been placed. A small bridge of temporary materials was replaced with a reinforced-concrete structure 20 ft. long.

Kaiaua Road (Uawa County).—47 ch. of metalling was completed.

Kiore Road (Uawa County).—1 m. 32 ch. of metalling was completed.

Tauwhareparae Road (Huanui Junction to Hutchinson's), (Uawa County).—50 ch. of metalling was carried out, thus completing the surfacing of a steep hill section of this road, which is an important access to a very large area of back-country.

Aorangiwai Stream Bridge: Makarika to Matahiia Road (Waiapu County).—This bridge, of two 60 ft. girder spans with 8 ft. roadway on Australian hardwood piled piers, was completed, as well as 30 ch. of approach roading.

Ihungia – Mata – Waitahaia Road (Waiapu County).—A length of 3 m. was prepared for subsequent metalling, 966 ft. of concrete culverts being installed.

Poroporo Bridge, Rangitukia Road (Waiapu County).—A bridge 110 ft. long was erected.

Rangitukia to East Cape Road (Waiapu County).—Under the supervision of the Native Department concrete culverts aggregating 700 ft. were installed.

Tokomaru to Mata Road (Waiapu County).—4 m. has been widened and 813 ft. of concrete culverts installed. 2,500 cubic yards of stone spawls were carted from the Waiau River to a crusher-dump on the roadside.

Wairongomai Stream Bridge (Tapuwaeroa Road), (Waiapu County).—This bridge, of four 60 ft. plate-girder spans, with one 20 ft. rolled-steel joist span, with reinforced-concrete deck, and 8 ft. roadway, was completed.

Gisborne to Motu via Whakarau Road (Waikohu County).—1 m. of metalling was carried out during the year.

Mutuera Stream Bridge (Matawai to Hangaroa Road), (Waikohu County).—A 40 ft. timber bridge on rolled-steel joists was completed.

Rakauroa to Tahora Road (Waikohu County).—3 m. 60 ch. of bottom-course metalling was completed.

Rere to Wharekopae Road (Waikohu County).—1 m. 25 ch. of bottom-course metalling and 37 ch. of top-course metalling was completed during the year.

Tarndale Road (Waikohu County).—2 m. 10 ch. of formation work was carried out and 426 ft. of concrete culverts were installed.

Waihora Stream Bridge (Bruce's Road), (Waikohu County).—This bridge, 106 ft. long, was completed, as well as a road deviation of 40 ch.

Taumarunui District.

Kouturoa Road (Kaitieke County).—A length of 7 m. of second-class formation was trimmed up and dangerous bends widened in readiness for the placing of metal.

Huia and Turoto Roads (Ohura County).—4 m. 20 ch. of re-formation and metalling was completed, thus affording a safer and more regular access to several settlers.

Ohura Road, Toi Toi to Niho Niho Section (Ohura County).—3 m. 40 ch. of re-formation and metalling was completed, and, as a result, all-weather access is now available to settlers who previously contended with irregular access.

Waikaka Road (Ohura County).—1 m. 40 ch. of metalling was carried out.

Waikaka Stream Bridge (Ohura County).—A suspension bridge, 133 ft. in length with 8 ft. roadway and constructed in rolled-steel joists and hardwood towers, was completed.

Taumarunui to Taupo, Taringamotu to Mangakahu Section (Taumarunui County).—Re-formation and metalling were carried out over a distance of 5 m.

Te Maire to Mangaohutu Road (Taumarunui County).—2 m. 10 ch. of re-formation and metalling was completed during the year.

Auahi South Road (Waitomo County).—Re-formation and metalling of 2 m. 10 ch. and the installing of 290 lineal feet of culverts were completed.

Ngatamahine Block Settlement Roads (Waitomo County).—This roading was performed in the interests of the small-farms settlement scheme at Ngatamahine Block, and during the year 2 m. 13 ch. was formed, 3 m. 53 ch. was metalled, and 193 lineal feet of culverts was placed.

Ngatarawa Road (Waitomo County).—4 m. 45 ch. of metalling was carried out, thus affording all-weather access to a considerable area of good farm country.

Te Kuiti to Taumarunui Road, Mangapeehi to Poro-o-tarao Section (Waitomo County).—A length of 2 m. 10 ch. was re-formed and metalled during the year.

Te Marama Road (Waitomo County).—5 m. 10 ch. was re-formed and metalled, and 253 lineal feet of culverts was placed.

Stratford District.

Mangahia Road (Clifton County).—2 m. 10 ch. was metalled on this settlement road.

Mangaonga Road (Clifton County).—2 m. 48 ch. was formed, 48 ft. of culverts were placed, and 2 m. 23 ch. was metalled.

Mokau River Punt (Clifton County).—A punt of substantial structure was provided on the Mokau River as a means of access to the soldier settlers on the south bank of the river.

Moki Road (Clifton County).—31 ch. was formed, 2 m. 1 ch. was metalled, and 196 ft. of culverts was placed.

Uruti to Ngatoto Road (Clifton County).—Formation was carried out over a distance of 3 m. 4 ch., 36 ch. was metalled, and 480 ft. of culverts was placed.

Kaweora Road (Egmont County).—Metalling was carried out over a distance of 3 m.

Opunake to Stratford Road (Egmont County).—1 m. 13 ch. was metalled.

Wiremu Road Group (Egmont County).—An extensive programme of roading improvements has been completed in the district, the work performed this year being the metalling of 65 ch. and the placing of 142 ft. of culverts.

Tonga Stream Bridge, Tangarakau Gorge Road (Ohura County).—A small bridge was erected on this settlement road.

Mangawhio Road (Patea County).—A commencement was made with a comprehensive scheme of roading improvements, 50 ch. of metal being placed this year.

Murimoto and Watershed Roads (Rangitikei County).—6 m. 5 ch. was metalled.

Taihape to Napier Road (Rangitikei County).—1 m. 65 ch. of metalling was carried out.

Matau Road Group (Stratford County).—As a further improvement to the roads in the Matau Settlement, the Department completed 1 m. 65 ch. of metalling.

Makuri Road (Stratford County).—1 m. 20 ch. was formed.

Plymouth Road (Taranaki County).—75 ch. of this road was metalled.

Mangapurua Valley Road (Waimarino County).—This road serves a soldier settlement, and an additional 3 m. 44 ch. has been metalled. A bridge known as "Morgan's Bridge" is also under construction.

Oruakukuru to Karioi Road (Waimarino County).—Metalling was carried out over a distance of 1 m. 40 ch.

Waipapa Valley Road (Waimarino County).—70 ch. of metal was laid.

Otikoki Road (Waitotara County).—43 ch. of this road, which lies on the western bank of the Wanganui River, was formed, and 125 ft. of culverts was placed.

Matahiwi to Ohotu Road (Wanganui County).—2 m. 57 ch. of this road was formed and 482 ft. of water drive constructed.

Wanganui River Road, Left Bank, Bridges (Wanganui County).—A bridge over the Mangoihe Stream was completed and the construction of a bridge over the Motuaruhi Stream is in hand.

Favier and Akama Road (Whangamomona County).—1 m. 72 ch. was formed and metalled.

Kohuratahi and Whitianga Bridges (Whangamomona County).—Two bridges were completed.

Mangaowata Road (Whangamomona County).—60 ch. was formed and metalled.

Mangare Road (Whangamomona County).—1 m. 40 ch. was re-formed and 36 ch. was metalled.

Napier District.

Cowper's Road Bridge, Tiratu Block (Dannevirke County).—Work was commenced on a reinforced-concrete bridge of 20 ft. span.

Mangamaire Road (Dannevirke County).—Metalling of 1 m. 35 ch. has been completed.

Dartmoor Road No. 1 Bridge (Hawke's Bay County).—An old wooden bridge was replaced with 30 ft. of 6 ft. concrete pipe and filling.

Napier to Taihape Road (Hawke's Bay County).—This road was metalled over a length of 4 m.

Puhokio Stream Bridge No. 3, Waimarama to Te Apiti Road (Hawke's Bay County).—This bridge work is in hand under contract.

Mangatarata Road (Patangata County).—60 ch. of this road was metalled during the year.

Wallingford to Blackhead Road, Hunter's Access (Patangata County).—1 m. 64 ch. of this access road was metalled.

Carlyon's Bridge, Kereru to Waipawa Road (Waipawa County).—The erection of this bridge of two 14 ft. diameter spans in reinforced concrete has been commenced under contract.

Two-mile Creek (Butler's) Bridge, Gwavas Road (Waipawa County).—The erection of a bridge of two 14 ft. concrete slabs on piers and abutments has been completed.

Nicholls Road (Waipukurau County).—3 m. of this road was metalled.

Tourere to Whetakura Road (Waipukurau County).—1 m. 20 ch. of metalling was completed under contract.

Glenbrook Road (Wairoa County).—1 m. was metalled, work being spread over several troublesome sections of the road. The Waikare low-level bridge in reinforced concrete 108 ft. long with 8 ft. roadway was completed.

Hinkesman's Access Road Suspension Bridge (Wairoa County).—This stock bridge 300 ft. long was completed under a contract let by the county.

Kopuawhara to Mahia Road (Wairoa County).—1 m. 44 ch. of metalling, being the balance of a contract let last year, was completed.

Rotorua to Waikaremoana Road, Hopuruahine to Ruatahuna Section (Wairoa County).—Work has been pushed along on this road. Improvements are in hand over a length of 8 m. out of the total distance of 15 m. Up till the present 3 m. 50 ch. has been widened to a minimum width of 16 ft. Some 50 ch. of metalling has been completed on the widened portions, and a total length of 105 ft. of new culverts has been placed.

Putere to Maungataniwha Road (Wairoa County).—71 ch. of metalling was completed.

Tangoio to Mohaka Coast Road (Wairoa County).—A length of 1 m. 53 ch. was widened to 14 ft., and 15 ch. of new formation was completed. The Tutaenui River Bridge, a reinforced concrete structure 40 ft. long with 10 ft. roadway, was completed.

Birch Road East (Weber County).—88 ch. of this road was metalled under contract.

Wellington District.

North Range Road (Akitio County).—2 m. 40 ch. of metalling has been carried out on this settlement road.

Range Road (Akitio County).—This is also a settlement road, and during the year 2 m. 60 ch. of metalling was completed.

Waione Bridge, Akitio River Road (Akitio County).—Construction of a reinforced-concrete bridge of two 42 ft. spans has been commenced. Pile-driving is at present in hand.

Waipatakaka Road (Akitio County).—Metal was placed over a distance of 2 m. 20 ch.

Mataikona Road (Castlepoint County).—This road follows the coastline from Whakataki to Mataikona Soldier Settlement. During the year a further length of 65 ch. was metalled.

Castlehill Road Culvert (Eketahuna County).—Construction of a reinforced-concrete culvert 6 ft. by 4 ft. by 34 ft., together with approaches, was completed.

Makakahi Hill Road Culvert (Eketahuna County).—A type of culvert similar to the above but measuring 6 ft. by 6 ft. by 49 ft. was completed, together with approaches.

Hume's Bridge, Tauanui Road (Featherston County).—The erection of a rolled-steel joist bridge of four 46 ft. spans, with timber deck, was completed.

Western Hutt Road (Hutt County).—A programme of major improvements is in hand on this road. The widening, culverting, and metalling of 1 m. was completed during the year.

Haywards–Pahautanui Road (Hutt County).—Improvements of a major character are being effected on this road, and a commencement has already been made.

Evans Road Bridge (Masterton County).—The erection of a timber bridge, of five 25 ft. spans with 8 ft. roadway, was commenced.

Khandallah–Johnsonville Road (Makara County).—This road, including the extension of 15 ch., is now completed, and has been handed over to the Main Highways Board.

Hood's Bridge, South Road (Mauriceville County).—A reinforced-concrete bridge, of one 50 ft. span with 20 ft. roadway, was erected.

Mangamahoe Station Road Bridge (Mauriceville County).—A reinforced-concrete bridge, of one 50 ft. span with 12 ft. 6 in. roadway, was completed during the year.

McCarthy's Bridge, Te Aupapa Road (Pahiatua County).—A bridge, of 50 ft. span and of reinforced-concrete arch design, has been completed, the roadway being 12 ft. wide.

Glenburn Road (Wairarapa South County).—The formation and metalling of 3 m. 36 ch. of this road was completed during the year.

Nelson District.

Atkinson's Road (Awatere County).—Trimming and metalling of 45 ch. of this road was completed.

Ure River Road, Palmers Access (Awatere County).—An engineering survey was carried out on both the left and right banks of the river, and, though no work has yet been accomplished, it is proposed to proceed with the construction of the road on the right bank, the length being 2 m. 55 ch.

Wairoa River - Mangarakau Road (Collingwood County).—This road will give much improved access to a large pastoral, milling, and mining area south of the West Haven Inlet. 4 m. 29 ch. of formation was completed and 758 ft. of concrete culverts were placed. Two bridges, consisting of New Zealand timber spans carried on reinforced-concrete piers and abutments were erected, and the construction of a large bridge at Wairoa River is under way.

Avon Valley Road (Marlborough County).—1 m. 78 ch. of metalling was carried out.

North Bank Road - Wairau River Protective Works (Marlborough County).—Four groynes are being erected in the river to protect the road, and also a school in the near vicinity.

Rai River Bridge (Smarts), (Marlborough County).—A suspension bridge, of 160 ft. span with 2 ft. 6 in. roadway, has been completed.

Tunakino Valley Road (Marlborough County).—The formation, culverting, and metalling of 1 m. 18 ch. of road is nearing completion. This work will be particularly beneficial, as it eliminates a double fording of the dangerous Tunakino River.

Wairau River Bridge (Timms), (North Bank Road), (Marlborough County).—This bridge of seven 25 ft. spans in Australian hardwood was completed.

Howard Bridge (Murchison County).—An 80 ft. truss span bridge was erected to provide safe access to Goldfields.

Maruia River Road, West Bank (Murchison County).—Metalling of a distance of 2 m. 40 ch. is in hand.

Rotoiti Road (Murchison County).—21 ch. of formation and 1 m. 19 ch. of metalling was carried out.

Shenandoah Road (Murchison County).—Trimming and re-formation work was commenced on this road for the purpose of subsequent metalling. The route will be an alternative one between Murchison and Reefton, eliminating the difficult Maruia Saddle.

Roads and Tracks (Sounds County).—As the result of the establishment of local government in the area, it was agreed to proceed with the restoration and construction of roads and tracks in a section of this county. 4 m. of road and 17 m. 60 ch. of track received attention during the year.

Wainui River Bridge (Takaka County).—This bridge of two 25 ft. reinforced-concrete spans, with 5½ ch. of approach roading, is practically completed.

Marahau River Bridge (Waimea County).—A suspension bridge of 140 ft. span, with 3 ft. roadway, was erected to provide access for settlers and school-children on the north bank of the river.

Motueka River Bridge (Waimea County).—The reconstruction of the traffic suspension bridge at Ngatimoti was commenced.

Serpentine Road (Waimea County).—Metalling, over a distance of 70 ch., was completed.

Taylor's Creek Bridge (Pigeon Valley - Stanley Brook Road), (Waimea County).—This bridge, of one 16 ft. and two 12 ft. 6 in. spans, with 12 ft. roadway, was erected in reinforced concrete.

Tadmor to Glenhope Road (Waimea County).—Metalling of 2 m 8 ch. is in hand.

Telenuis Bridge (Spring Grove Back Road), (Waimea County).—A reinforced-concrete bridge, of 20 ft. skew span, with 12 ft. roadway, was erected.

Greymouth District.

Cascade Road (Buller County).—The construction of a road access from Denniston to the Cascade Coal-mine was undertaken by the Buller County Council. The work completed during the year comprises 10 ch. of clearing, 74 ch. of formation, and 56 ch. of metalling and culverting.

Karamea to Collingwood Road, Oparara to Kohaihai Section (Buller County).—The re-formation and metalling of a further 71 ch. of this road was carried out by the Buller County Council as an improvement in the access to four settlers.

Pakihi Roads (Buller County).—The Buller County Council has roading operations in hand to facilitate the subdivision of a large block of pakihi land in the vicinity of Sergeant's Hill. This area is being developed by the Lands Department, with the co-operation and advice of the Cawthron Institute. Formation and metalling has been completed over a length of 64 ch.

Big River to Rough River Road (Grey County).—Construction work has been commenced on a length of 3 m. 64 ch., which, in addition to providing better access to farming country, will afford an alternative route between Blackball and Ikamatua.

Brown Grey River Bridge, First Crossing, Upper Grey Valley to Haupiri Road (Grey County).—The Grey County Council let a contract for the construction of this bridge, consisting of two 50 ft. rolled-steel joist spans on timber piers and abutments. This work is a necessary improvement in the access to settlement lands.

Brunner–Blackball Road (Grey County).—The formation of the remaining portion of this direct route between Brunner and Blackball has been continued during the year. Work carried out comprises 144 ch. of clearing, 246 ch. of formation, 162 ch. of metalling, 62 ch. of widening, 3 ch. of stone-walling, and the placing of 624 ft. of concrete-pipe culverts.

Craigieburn Creek Bridge, Big River to Rough River Road (Grey County).—This bridge, consisting of four 30 ft. rolled-steel joist spans on ironbark piers and abutments, is nearing completion.

Matai Road (Grey County).—Several settlers have been inconvenienced over a number of years by the flooding of this road. A programme of improvements was undertaken, and up till the present a length of 37 ch. has been raised 3 ft.

Orangipuku River Bridge, Kumara to Inchbonnie Road (Grey County).—A bridge 40 ft. in length and of two 20 ft. timber spans on reinforced-concrete piers and abutments has been completed by the Grey County Council.

Crœsus Track (Grey County).—A further length of 2 m. has been reconditioned, making a total of 6 m. which has now been improved. The track provides access for gold prospectors, and one 25 ft. stringer span bridge was also erected.

Jackson's Creek Bridge, Springlands Junction to Hot Springs Road (Inangahua County).—The construction of a 45 ft. reinforced-concrete bridge on reinforced-concrete piles and abutments has been completed. Some 9 ch. of approach roading was also undertaken.

One-mile Creek Bridge, Springlands Junction to Hot Springs Road (Inangahua County).—This bridge is nearing completion. The design is similar to Jackson's Creek Bridge mentioned above.

Mair's Road (Inangahua County).—Work on this settlement road was completed during the year with the formation of 4 ch. and the metalling of 28 ch. A small timber bridge on concrete abutments was also erected.

Waiau to Maruia Road via Lewis Pass (Inangahua County).—This road when completed will connect with the work now being carried out on the Canterbury side of Lewis Pass and will form part of a through road from the West Coast to Canterbury. The work completed during the year comprises 139 ch. of formation, 53 ch. of metalling, and the erection of one temporary bridge.

Arahura to Milltown Road (Westland County).—The Westland County Council has cleared 2 m. 5 ch., and has formed 1 m. 65 ch. of 6 ft. track.

Dry Creek Bridge, Poerua Settlement Road (Westland County).—This bridge, 100 ft. in length and consisting of four 25 ft. spans in New Zealand timbers, together with 6 ch. of approach roading, has been completed. It is a much-needed improvement in the access to several newly established settlers.

Hapuka River Bridge, Okuru (Westland County).—A bridge, of New Zealand timbers, 200 ft. long, and comprising eight 25 ft. stringer spans, has been constructed over the Hapuka River.

Main South Road (Westland County).—Fox River Bridge: The construction of this steel suspension bridge, with reinforced-concrete deck and of 360 ft. span between towers, has been commenced. Excavations for tower foundations and anchorages are nearing completion, and a contract has been let for the supply of steelwork.

Cook River Bridge: This steel and concrete suspension bridge, of 264 ft. span between towers, is under construction. Shafts have been sunk for tower foundations and a contract has been let for the supply of steelwork.

Weheka to Bruce Bay Section: Reconstruction work, formation of deviations, and bridging has been put in hand on this section of the road, which will eventually form part of the main road from the West Coast to Otago. The work carried out includes the clearing of 172 ch. of bush, formation of 43 ch. of new roadway, and 75 ch. of metalling. Plans have been prepared for bridges over the Bullock and Ohinetamatea Streams, and the formation of approaches to these bridges and the protection of river-banks is well in hand. Surveys are in hand to Bruce Bay, and also between Bruce Bay and Haast.

Malfroy's Bridge (Westland County).—Two 60 ft. truss spans have been erected to replace those destroyed by a severe flood. The work included the construction of a new ironbark pier.

Mananui Road (Westland County).—The formation of 68 ch. of new road, and the metalling of 42 ch., has been completed by the Westland County Council.

Christchurch District.

Okain's Bay to Little Akaloa Road (Akaroa County).—A length of 80 ch. has been metalled, thus completing all-weather access to the Little Akaloa Valley.

Hossack Road (Amuri County).—70 ch. of formation and metalling completed during the year will give good access to a Government leasehold estate, and will eventially facilitate the removal of timber from the Hanmer Plantations by the State Forest Service Department.

Lewis Pass Road (Amuri County).—This work has been continued vigorously during the year, an average of 200 men being employed, and the following work has been completed: Metalling (complete) 19 m. 40 ch.; metalling (base coat only) 5 m.; bridges (three), 489 ft. One of these bridges is a permanent one, and the other two are temporary structures, of 333 ft. and 116 ft., over the Hope and Boyle Rivers respectively. Now that the Greymouth end is being worked simultaneously with the Christchurch section, it is expected that this work will be completed before the end of the financial year 1936–37, with the exception of permanent bridges.

Inner Totara Roads (Levels County).—Re-formation and metalling of 3 m. has afforded greatly improved access to eight settlers.

Pareora to Tycho Road (Levels County).—2 m. 40 ch. has been formed and metalled, serving five settlers and opening up a good gravel-pit.

Ball Hut Road (Mackenzie County).—Work on this road was not extensive, only 27½ ch. having been widened and generally improved to permit its safer use by tourists. Previously the road was narrow and in a dangerous condition.

Haldon Road (Mackenzie County).—Metalling has been carried out over approximately 12 m.

Stony Creek Bridge, Te Akatarewa Road (Waimate County).—An 80 ft. light traffic bridge erected during the year has eliminated the most troublesome of three bad fords.

Summit Road (Heathcote, Halswell, and Mount Herbert Counties).—Work on this scenic road has been continued during the year, with an average complement of 200 men. Approximately 2½ m. have been formed and metalled. A vigorous programme has now been decided upon for this road.

Dunedin District.

Big Creek Ford (Bruce County).—A reinforced concrete ford, 50 ft. long by 14 ft. wide, with six 24 in. diameter openings for normal river flow, was completed.

Lovell's Flat to Moneymore Road (Bruce County).—10 ch. of formation and 72 ch. of gravelling were carried out during the year.

Mount Maitland Road (Bruce County).—88 ch. was metalled 9 ft. by 6 in.

Blackburn to Mount Stuart Road (Bruce County).—78 ch. was metalled 9 ft. by 6 in.

Waihola – Taieri Mouth Road (Bruce County).—4 m. 40 ch. was widened and metalled.

Clarendon–Berwick Road (Bruce County).—Widening of 2 m. 70 ch. and metalling of 1 m. 39 ch. were carried out during the year.

Ahuriri – Waiwera Road (Clutha County).—Metalling of 75 ch. was completed.

Greenfield Road (Clutha County).—73 ch. of metalling was completed during the year.

Webb's Road (Clutha County).—Gravelling was carried out over a distance of 88½ ch.

Long Point Road (Clutha County).—A programme involving improvement over a distance of 3 m. was commenced, and 2 m. 21 ch. has been completed.

Kinloch–Routeburn Road (Lake County).—Gravelling of 2 m. 20 ch. was carried out.

Kingston–Queenstown Road (Lake County).—Construction work was continued expeditiously throughout the year. Formation work with the exception of approximately 80 ch. has been completed. First-coat gravelling has been carried out over a length of 20 m. and the erection of Staircase Bridge, of 60 ft. arch design in reinforced concrete, is in hand. The road was declared a main highway on the 1st April, 1936.

Allison's Lane Road (Maniototo County).—1 m. 40 ch. of gravelling has been completed.

Little Kyeburn Bridge (Maniototo County).—This bridge of three 20 ft. timber spans, with 11 ft. wide roadway and 2,810 cubic yards of approaches, was completed.

White Sow Valley Road (Maniototo County).—1 m. 56 ch. of gravelling was carried out.

Kyeburn River Bridge (Maniototo County).—The erection of this bridge, of four 45 ft. spans in reinforced concrete, was commenced.

Heriot–Roxburgh via Moa Flat Road (Tuapeka County).—2 m. 41 ch. of gravelling was completed.

Waipori–Outram Road (Tuapeka County).—3 m. of gravelling was carried out during the year.

Drybread to Lauder Road (Vincent County).—Formation and gravelling of 80 ch. was completed.

Fortification–Weston Road (Waitaki County).—Gravelling was completed over a distance of 60 ch.

Invercargill District.

Caroline–Josephville Road (Southland County).—This important through road connecting Dipton and Lumsden and providing a shorter route from Invercargill to Kingston was completed in March. The total works carried out were 2 m. 37 ch. of 20 ft. formation, with culverting, bridging, and fencing, and gravelling of 3 m. 14 ch.

Gorge to Waituna Road (Southland County).—1 m. 62 ch. of gravelling was completed, and will greatly improve the access to several settlers.

Lumsden–Josephville Road (Southland County).—This road is a connecting-link between Josephville and Lumsden, and 2 m. 67 ch. of gravelling was carried out.

Mandeville–Kingston Road (Southland County).—This is a through road serving several settlers, and 94 ch. of gravelling was completed.

Kaka Road (Wallace County).—Several settlers gain access by this road, of which 1 m. was gravelled during the year.

Pourakino Road (Wallace County).—1 m. 16 ch. of gravelling was completed.

Waiau River Footbridge, Motumote (Wallace County).—This 260 ft. suspension bridge, with 2 ft. 6 in. decking, was completed during the year.

LANDS IMPROVEMENT.

Whangarei District.

Hokianga Harbour Reclamation.—All construction in connection with this work was completed, and operations during the year were confined to maintenance.

Whangaroa Harbour Reclamation.—In this case the same remarks as above will apply.

Ruakaka Block.—4 m. 72 ch. of drains were widened and 58 ch. of new work was completed. Drainage was also carried out in the Uretiti area.

Waiotu Stream Willows.—2 m. 3 ch. of this stream was cleared of willows. Progress was greatly impeded by successive floods.

Sand-dune Reclamation Work.—At Te Kopuru an area of 75 acres was planted in marram-grass. Further work in the vicinity of Kaitaia was in the nature of 310 ch. of fencing to keep wandering stock off the plantations.

Auckland District.

Taupiri Drainage Scheme.—Drainage work on the Taupiri drainage scheme, an area embracing 146 square miles of flat land and 88 square miles of hill country, was continued for the third successive year. On the main drains, Mangawara River, Tauhei and Komakorau Streams of a total length of 41 m. 15 ch., a length of 2½ m. has been completed. The subsidiary drains, totalling 62 m. 55 ch., are located mostly in peat land and have been opened up over the full length. A second lift of 30 m. and a third lift of 4 m., all in swamp land, have also been completed, while a fourth lift has been commenced on one section. Consolidation up to 5 ft. has already been obtained after a period of two years. Wet conditions during the summer hampered operations, but progress generally has been fair, and over 75 per cent. of the work has now been completed. Approximately 400,000 cubic yards were excavated during the year, making a total of 1,400,000 cubic yards to date. Two drag-line machines were employed on bottom-lift excavation in the main channel, and the balance of the work was carried out by hand labour under the co-operative contract system. In areas adjacent to completed drains minor flooding only occurred during the year, and the channels generally are functioning very satisfactorily.

Te Kawa Drainage Scheme.—The work under this scheme was continued during the year, but progress was retarded very considerably on account of the heavy rainfall which was spread over the greater part of the year. The total rainfall recorded on these works during the period was 58·75 in., the wettest month being February, when a reading of 9·35 in. was registered. The work carried out consisted of the widening and deepening of 3 m. 32 ch. of drains the bottom width of which varied from 4 ft. to 8 ft. Despite the exceptionally heavy rainfall no flooding occurred in any portion of the completed drains.

Paewhenua Drainage Scheme.—The Department has in hand the construction of 5 m. 55 ch. of drains in order to improve an area of 215 acres of swamp land to be used for farming purposes. During the period a total length of 121 ch. of drains were completed.

Akaaka Swamp Drainage.—During the year a commencement was made with the widening and deepening of a further 88 ch. on the Eastern drain, and work duly completed brings the total length dealt with up to 11 m. 10 ch.

Upper Waihou River Clearing.—The clearing of this stream was continued during the year from one large camp with two steam log-haulers in operation. The work carried out over the period consisted of the clearing of large willows from both banks and the removal of heavy snags from the waterway over a length of 3 m. 64 ch. All timber and rubbish was stacked and burned.

Ohinemuri River Stop-banks.—The work of raising these stop-banks was commenced during the year. The right bank stop-bank round Paeroa Borough was raised over a distance of 82 ch. and 173 ch. of similar work was carried out on the left bank. The former work was completed just prior to the severe flood which occurred in February, and was the means of preventing the serious flooding of the Paeroa Borough area.

Waihou and Ohinemuri Rivers Improvement (Maintenance).—Operations were continued under a single men's camp scheme during the year, and the clearing of stop-banks between Mangaiti and Tirohia was carried out over a distance of 4 m. 50 ch. In addition to this work, the drains were excavated on the inside of the Lower Waihou right bank stop-bank over a length of 2 m. 16 ch. between Ngahina and Netherton.

Hoteo River Clearing.—During the year a survey party was engaged in carrying out a survey of the Hoteo River and its tributaries in connection with the proposed willow clearing and general improvement to the drainage of the adjacent areas. The survey was carried out over a length of 48¼ m. and plans have been completed to date over 30 m.

Sand-dune Reclamation Works.

In addition to the season's planting programme, the work carried out in previous years was maintained, and replanting was also given attention where necessary.

South Kaipara Heads.—Approximately 100 acres were replanted in marram, and 1,000 lb. of lupin-seed was gathered and sown during the period. A considerable amount of work was also carried out in the removal of mounds to prevent wind-channels.

Woodhill-Muriwai-Helensville.—During the period a further area of 630 acres was planted in marram-grass and 4½ tons of lupin-seed was collected and sown. The total area planted to date has now reached 8,290 acres, and, in addition, 760 acres have been replanted in various areas. The exceptionally heavy gales and storms experienced during the early part of the year caused considerable damage to marram and lupin plants, and a total of 760 acres was replanted in the various areas. Both marram and lupin are making fairly good progress. The nursery was enlarged during the year, and at present 70,000 pine-seedlings are lined out. There are also 8,000 two-year-old pines ready for planting out. During the year 24,000 pines were planted in Rimmer's Block.

Pakiri Sand-dune Reclamation.—A total of 155 acres of marram and lupin was planted in this area, approximately half of which is located at the mouth of the Pakiri River with the object of preventing the sand-drift from silting the stream. In addition to this work 1½ m. of fencing was erected to protect the planting at the mouth of the river. Both marram and lupin are thriving.

Waikato Heads and Karioitahi.—A total area of 3,600 acres has now been planted in marram-grass. Of that area, about 1,800 acres are under lupin. Lupin-seed gathered amounted to 5,030 lb., and four-fifths of that quantity has been sown. The nursery contains 50,000 trees, *P. radiata* and *P. muricata* being ready for lining out. Trees lined out last season to the number of 9,000 are ready to plant out. Grass and trees planted last season are growing satisfactorily, and general progress and results to date in this undertaking are most encouraging.

Napier District.

Kumeti Drain.—A flood of unprecedented severity occurred on the 2nd February, resulting in the washing-out for the second time of Thorburn's Road Bridge and the wooden chute beneath it. Certain survey work was necessary to determine the special features of repair work. Until this flood occurred the only maintenance work carried out had been the planting of 220 bitter-willow cuttings. This flood, however, scoured holes 6 ft. deep on the down-stream side of weirs No. 4 and No. 1, and also degraded the bed down-stream from weir No. 1 for a depth of 10 ft. These weirs were repaired by constructing additional stone and netting gabions and mats and plastering them with 2½ in. of concrete to protect the wire from general wear and tear during more difficult conditions. Other repair work included the raising of end contraction gabions of most of the weirs, as the flood had overtopped them, although no actual damage resulted. On the 21st February a cloud-burst caused a second flood, which for a short period was equal in severity to the first. The system of weirs as a whole stood up to both floods very well indeed, and both weirs No. 14 and No. 13 were buried and weirs No. 4 and No. 1 were seriously threatened, though no actual failure took place.

Taumarunui District.

Willow-clearing, Mokau River.—The river has been cleared of willows from the Eight-mile Junction Bridge (Te Kuiti – Bulls Main Highway) to a point 10 ch. west of the Mapiu Stream, a distance of 16 m. 50 ch., leaving about 5 m. of clearing to complete the programme.

Mokauiti Willow-clearing, &c.—About 1 m. of the Huioteka and Mangawhero Streams was cleared. There is yet a distance of 35 ch. in the Mokauiti Stream to be completed.

Land-development.—The single men's camp at Aukopae was continued until the end of May, when the men were transferred to small-farm schemes. The work carried out was in the nature of various improvements on private properties by arrangement with the landowners, and comprised 28 acres of bushfelling, 89 acres of stumping and logging, 357 acres of scrub-cutting, 9 acres cleared of fern, and 8 acres of rushes grubbed, 98 acres ragwort cut and/or sprayed, 35 acres top-dressed, 127 chains of fences erected or reconditioned, 770 posts and 3,000 battens split, 3 ch. of 12 ft. road and 119 ch. of farm tracks formed, four culverts constructed and 8 ch. of ditching.

General Land-improvement, Taumarunui and Manunui Districts.—There has been a considerable surplus of labour in and about Taumarunui Borough, and, while a few men have been employed on works similar to that at Aukopae, the majority have been engaged in improving adjacent highways and roads, and on river-protection works. Much useful work has been done in this way, though it is hardly possible to tabulate it in a very informative manner.

Wellington District.

Eastbourne Foreshore Protection.—The Department has completed the construction of 33 ch. of stone walling and apron protection as well as eleven timber groynes. The Eastbourne Borough Council is proceeding to extend the work.

Sand-dune Reclamation between Manawatu River and Ohau River.—64,200 trees have been planted out over an extensive area; 330 acres have been planted in marram-grass with flax in swampy places, and break-wind fences have been provided where necessary.

Makowhai Stream Improvements.—The work of straightening, widening, and deepening this stream is now completed and the camp closed down, 74,505 cubic yards of earth being shifted during the period.

Paraparaumu Drainage and Clearing.—Single men located in three nearby camps have been busily engaged in draining, clearing, and stumping considerable areas of rich land, which in its former condition was of little value as farm pastures.

Hutt River Estuary Reclamation.—A commencement has been made with the reclamation of a considerable area at the northern end of Wellington Harbour. Two drag-lines have been installed for excavating the bed of the Hutt River and depositing the material on the low-lying ground in the estuary. Two steam locomotives are being used for hauling material for filling, and quarries have been opened up to provide additional spoil.

General Land-clearing, Hutt Valley.—There were considerable areas of Crown lands in and about the Hutt Valley on which gorse and other weeds had obtained a firm hold. The clearing of this gorse, &c., and the levelling of rough areas, together with the reclamation of low swampy patches, has received attention during the year, and the programme is now complete.

Nelson District.

Fireblight Prevention.—The Department has had a camp of men engaged in cutting hawthorn hedges with the object of preventing fireblight in the apple-growing districts around Nelson. During the year 10½ m. of hedges were cut and burned.

Wairoa River Protective Works, Brightwater.—Additional work for the protection of farm lands in this locality was commenced during the year, the construction of four stone crate groynes each 36 ft. long and the formation of 6½ ch. of stop-bank having been completed. Further surveys were made, and, in view of the progressive erosion of valuable farming-land by the Waimea River and its tributaries, the Wairoa and Wai-iti, it seems necessary to again extend the survey to cover the whole area between Wairoa Gorge and the sea.

Clarence River Protective Works.—A stop-bank 195 ft. long, situated approximately 2 m. above the mouth of the Clarence River, has been completed as a protection for Crown leasehold and freehold farm land. It also affords a greater margin of safety for the main highway.

GREYMOUTH DISTRICT.

Humphreys Gully Water-race.—The old section of this water-race, 10 m. in length, has now been reconditioned, and the new portion, 11 m. in length, is nearing completion. Work carried out during the year included the construction of 1,517 ft. of fluming, 8,677 ft. of tunnelling, the timbering of 3,279 ft. of race and repairs to siphons. Clearing and benching is complete over the whole length, and most of the excavation of the ditch has been carried out. The whole work should be completed by the end of October, 1936.

CHRISTCHURCH DISTRICT.

Ashley River Trust Flood-control Works.—During the year an extensive programme of work was continued on this scheme. Results may be summarized as follows: Formation—North stop-bank, 5 m. completed (102,548 cubic yards); south stop-bank, 2 m. completed (41,742 cubic yards). Willow-planting: 27½ acres planted. Good growth has been made this year, although a large proportion of younger plants were lost by flood. Grassing: All completed work has been sown with grass-seed. Fencing: 14 m. completed. Clearing: 20 acres of control channel cleared of scrub.

On the 20th February a record flood occurred and did considerable damage to all works. 111,466 cubic yards of stop-bank and groyne were lost.

Ashburton and Hinds Rivers Flood Control.—A comprehensive survey of these two rivers is being made with a view to determining a suitable scheme for flood-control purposes.

INVERCARGILL DISTRICT.

Waimatua Drainage Scheme.—This work has been carried on in a vigorous manner, and consists of widening, deepening, and strengthening the existing creek, and the construction of an elaborate system of outfall drains. Operations were completed during the year, 51 m. of outfall drains having been constructed.

SMALL-FARMS SCHEMES.

WHANGAREI DISTRICT.

Mate North-Te Karae Blocks VI and VII.—Development work is being carried out on these blocks by married men, who are later to become established as settlers. The results may be stated as 47 acres cleared of fern, 51 acres of scrub-cutting, 38 acres of heavy logging, 17 acres ploughed, 200 acres sown in grass, 360 acres top-dressed, 240 ch. of fencing and 2 cow-sheds erected.

Taipuha Farm Settlement.—Work in this scheme has been completed during the year. A water-supply was installed, concrete troughs being erected where necessary and connected with the main supply. Other development work was in the nature of 167 acres of surface clearing, 142 acres of scrub-cutting, 17 acres ploughed, 52 acres stumped, 305 ch. of draining, 289 ch. of fencing, 373 acres top-dressed, 22 ch. of access tracks formed, and the erection of 8 farm bridges.

Onekura Farm Scheme.—With the exception of water-troughs the whole of the work on this block has been completed. The programme this year was in the nature of 107 acres of fern and scrub cut, 34 acres ploughed, 136 acres logged and cleared, 224 acres top-dressed, and 913 ch. of fencing, 7 pigsties, and 1 implement-shed erected.

Newman's Block.—The whole of the development work on this block has been completed, water-supply having been provided wherever possible. The main items of the programme for the year were 236 ch. of fencing, 86 acres of fern and scrub cut, and 20 acres top-dressed.

Gurr's Block.—The approved programme on this block has been completed during the year, but other contemplated work is yet under consideration. The more important items performed this year were 267 acres of bush felled, 77 acres of scrub and fern cut, 85 ch. of fencing, and 395 acres top-dressed and sown in grass.

AUCKLAND DISTRICT.

Church Mission Block.—There is now a total of 445 acres in grass on the block. 111 acres were cut for hay and ensilage during the year. Fencing has been considerably extended since last report, and total is now 32 m., made up of 10 m. of road and boundary fences and 22 m. of internal and subdivisional fences. Fortunately a suitable spring with sufficient yield of water was found on each section and an independent supply has been installed for each settler during the year, including an electrically driven pump, storage-tank, reticulation, and troughs. A start has been made with the planting of trees, and it is proposed to plant 30,000 this season. The eight sections on the block are still occupied by the original selectors, and are now in such a state as will enable them to be carried on if necessary without further attention or supervision by this Department.

Mangawai Kauri-gum Reserve.—The development of this block was put in hand during the year, 3 m. of road having been formed to 16 ft. width and 1 m. metalled. In addition, 375 ft. of 12 in. culverts have been placed, 135 ch. of side drains excavated, and the main drain measuring 18 ft. by 15 ft. has been deepened 6 ft. over a length of 54 ch. A considerable amount of engineering survey has also been carried out in connection with the roading and draining of the block.

Kaipara Harbour Mangrove Reclamation.—During the year the reclamation of this area was put in hand. To date 4 m. 9 ch. of drains have been excavated, the material taken out being used in the building of stop-banks over a similar distance. Six floodgates have been constructed complete with 30 in. concrete culverts, parapets, and aprons. About 1,200 cubic yards of clay have been excavated and barged for fillings at creek crossings. Also 1,050 cubic yards sandstone spalls were quarried and barged and used for facing up banks over creek crossings. A total area of 730 acres has now been dewatered, and workmen are engaged in strengthening banks to standard dimensions and generally consolidating the completed work.

Section 25s, Blocks XI and XV, Maungatautari Survey District (late Property of W. L. Foss).—The development of the above block of 438 acres has been carried out during the year by one occupier and the necessary ordinary workmen, and good progress has been made. Scrub and other growth was cleared over an area of 100 acres. 30 acres of ragwort was dealt with, 77 acres were ploughed, 110 acres cultivated in turnips, swedes, and grass. 56 ch. of rabbit-proof fencing and 125 ch. of temporary fences for stock control were erected.

Lot 2 of Section 1, Block XV, Maungatautari Survey District (late L. S. Langdon's Property).—This property, which comprises an area of 456 acres, has been developed during the year by one occupier and the necessary ordinary workmen. To date, scrub and other growth has been cleared over 106 acres, 57 acres of ragwort have been dealt with, 48 acres ploughed, 163 acres cultivated in swedes, turnips, and temporary pasture; 32 ch. of rabbit-proof fencing and 102 ch. of temporary fencing for stock-control have been erected. Further developmental work of a similar nature is proposed to be carried out next year.

Blocks V, VI, X, and IX, Maungatautari Survey District (Ellicott's Block).—In addition to the work previously undertaken, considerable work of a developmental nature has been carried out on this block of 2,900 acres. There are thirty-one farm applicants housed in temporary public-works married quarters, together with other labour required. It is anticipated that the block will be subdivided into seventeen holdings, and it is proposed to proceed with the erection of six permanent cottages, milking-sheds, &c., almost immediately. A particularly good season was experienced for grass, as is indicated by the fact that 200 tons of hay and ensilage were harvested in addition to the inroads made by control stock consisting of bullocks, heifers, and sheep. To date 426 acres of tutu and fern have been grubbed, ragwort has been dealt with over 100 acres, 486 acres have been ploughed, and permanent grass has been sown over 196 acres; 256 acres of new pasture has been harrowed and top-dressed; 609 ch. of fencing has been erected, and 53 ch. of fencing has been repaired and renewed. 225 acres have been cultivated in swedes and temporary grass, five farm bridges have been erected, and a total of 3,450 trees was planted during the year. Further developmental work of a similar nature is proposed to be carried out on this block next year.

Tauranga District.

Wainui South Block, near Apata.—Working-conditions in the block have progressively changed during the year, as from about August, 1935, when milking commenced, much more time has had to be given by the six men in the block to the maintenance of the holdings, and on the development side the most important item remaining to be done is the completion of internal fencing. The year's operations are shown in following summary:—

	Past Year.	To 30/6/36 from Start of Scheme.
Boundary fences	..	606 chains.
Subdivision (internal) fences	340 chains.	583 ,,
Temporary fences (internal)	..	91 ,,
Clearing (scrub-cutting)	71½ acres.	404½ acres.
Ploughing, disking, harrowing, and grassing	71½ ,,	404½ ,,
Harvesting—hay and ensilage	159 ,,	159 ,,
Top-dressing old pasture	280 ,,	280 ,,

Note.—As the boundary and permanent subdivision fences were finalized, the temporary fences were as far as possible dismantled and salvaged, and material re-used in permanent work.

The foregoing summary includes the area of new land recently sown in pasture.

Napier District.

Ahuriri Lagoon Reclamation.—This lagoon, formerly a shallow arm of the sea in Ahuriri Harbour, has now been transformed to an area of approximately 7,500 acres of mud-flat and shallow water, and is being reclaimed with a view to subdivision into small farms for allotment to settlers. The main factors of the scheme now being undertaken by the Department are—(1) A gravity system of drainage affecting 1,500 acres at the southern end of the lagoon; (2) construction of 11 m. of stop-bank to exclude drainage coming off the hill country to the west; and (3) construction of two pumping-stations and internal drainage of the areas served—4,000 acres and 600 acres respectively. Further work has been carried out during the year on the gravity-drainage system, and the drainage of approximately 1,200 acres has been completed to date in that area, but efforts have been mainly concentrated on the building of stop-banks. Although weather conditions have been very unfavourable, progress has been satisfactory, and practically the whole length of stop-bank has been built by hand labour and is now ready for topping up with the drag-line excavator.

The building of both pumping-stations is in hand, and it is anticipated that they will be ready to dewater the stop-banked areas when the banks are completed. On the drained land two tractor units have been ploughing since May last, and have completed an area of 182 acres to date. The primary object of this work is to hasten the leaching-out of salt from this soil, but it may also be regarded as the first step towards bringing the land into a state of productivity.

Details of progress to date are as follows :—

Stop-banks : 260,430 cubic yards of spoil have been placed in $10\frac{3}{4}$ m. of bank, which is now ready for topping up by drag-line.
Dewatering drains : Two miles have been excavated by machine in pumped areas.
Subsidiary drains : $8\frac{3}{4}$ m. of drain of 3 ft. to 5 ft. bottom width have been completed.
Lateral drains : 79 m. of drain have been completed of 12 in. bottom width by 3 ft. deep.
Water drive : Excavation and lining completed (174 ft. long), also portals.
Pumping-stations—
North station : Excavation for foundations has been completed. 1,400 lineal feet of steel sheet piling and 325 lineal feet of concrete piling have been driven.
South station : Excavation for foundations is complete and pile-driving in hand.
South floodgate : An earthen coffer-dam has been built around the site, and excavation for foundations has been completed.
Roading : Approximately 3 m. of access road have been formed, culverted, and metalled.

TAUMARUNUI DISTRICT.

Pururu Block.—Good progress has been made with the developmental work on fourteen sections. 112 acres have been sown in permanent pasture, 50 acres in swedes, and 26 acres in oats and barley. 1 m. 30 ch. of road was metalled and 4 m. 31 ch. of boundary and subdivisional fencing was completed. One cow-byre was built, and water-supply has been provided to four cow-sheds.

Waitanguru Block.—The year's programme of developmental work comprised 10 m. 76 ch. of boundary and subdivisional fencing, the repairing of 3 m. 30 ch. of existing fences, a small amount of road-formation, and the stumping and clearing of 85 acres. In addition 170 acres were sown in permanent pasture, and top-dressing was carried out over 311 acres. Some 20,000 odd battens were split for fencing-work, and nearby farmers took advantage of the Department's organization to fell and burn 72 acres of bush, also to stump and clear 46 acres.

Ngatamahine Block.—Work in this block has been continued, 5 m. of boundary and subdivisional fencing being erected and 75 ch. of existing fences repaired. 2 m. 25 ch. of road was formed and metalled, 93 acres was cleared and some 182 acres was sown in permanent pasture, and the construction of new drains and the deepening of others also received attention.

Owen Block.—Work was commenced in this area during the year, 1 m. 30 ch. of road-metalling, 127 ch. of fencing, and clearing and stumping of 65 acres having been completed. In addition an area of 27 acres was ploughed, and ragwort was treated over 110 acres.

Lee's Property.—This scheme will shortly be completed as far as developmental work is concerned. The year's operations comprise 245 ch. of fencing, 106 ch. of road formation and metalling, 9 acres of clearing and stumping, 114 acres sown in grass, 163 acres ploughed, 43 acres in crops, and 181 ch. of drains. Four houses, four cow-sheds, and one manure-shed were built.

Metcalfe's Estate.—Settlement work is still being carried out on this 335-acre block, the year's progress being evidenced in 139 ch. of fencing, 95 ch. of temporary fencing, 163 ch. of drains, and 173 acres of clearing. There are now 196 acres in grass, and 3,500 shelter-belt trees were planted.

HARBOUR WORKS.

Westport Harbour.—No further construction was carried out during the year, and there was very considerable fluctuation in bar depths. In the early part of the year, up to June, there was a considerable improvement, soundings giving a monthly mean depth of 16 ft. From then onwards there was a steady reduction in bar soundings, the mean depth having fallen to 12 ft. at the end of the year.

In the fairway the average working-depth was 23 ft. 6 in. as against 24 ft. in 1934–35, and 24 ft. 10 in. in 1933–34, the decrease for the past year being due to shoaling.

Dredging operations were carried out by the suction dredge "Eileen Ward"; the bucket dredge "Maui" and the suction dredge "Rubi Seddon" being out of commission.

During the period 171,323 cubic yards were dredged from the bar, 97,277 cubic yards from the lower river, 76,453 cubic yards from the berthages, and 11,582 cubic yards from the floating basin—a total of 356,635 cubic yards, all of which was transported and deposited at sea.

The dredge worked on 127 days for an average cost of 8·01d., a higher rate than that for 1934–35 of 6·499d.

The rainfall recorded on the harbour gauge for the year was 73·33 in., rain falling on 178 days. For the three preceding years the figures were—1932–33, 66·99 in., 179 days; 1933–34, 81·27 in., 174 days; 1934–35, 79·57 in., 169 days.

The "Eileen Ward" was sent to Wellington for annual overhaul, and was well maintained during the whole period.

The shipping in the harbour proved to be practically the same as last year, the total tonnage entering port being 260,111 tons, an increase of 7,070 tons on that of last year. Coal shipped from the port was 291,041 tons, a slight decrease on that of the previous year.

The tug "Mana" was only required once to tow a vessel from the port, but was utilized on several occasions in dragging for submerged objects. Running repairs to the dredges and plant kept the workshops staff fully employed.

Karamea Harbour.—Owing to the alteration of the course of the river at its mouth, the port is not now workable.

Little Wanganui Harbour.—Owing to the lack of sufficient floods and to adverse sea conditions, the entrance at times shoaled sufficiently to interrupt working, which is only possible during spring tides. Since the a.s. "Fairburn" was wrecked on the Westport Breakwater, the harbour was not used for a short period, but another vessel is now taking up the trade.

Okarito Harbour.—The Okarito Harbour Co. has continued to develop this harbour, and in doing so completed the construction of a timber training-wall north of the proposed entrance straight out from the present wall.

A cut was made in the shingle bank, but all efforts to close the present entrance and open a new one have been unsuccessful. The company erected a dam in the north channel of the lagoon, but this was unsuccessful owing to the nature of the underlying strata; various other temporary measures such as the erection of scrub groynes have been tried, but so far without success. The present wharf was demolished and a new wharf commenced. It is now the company's intention to temporarily abandon the project of the new entrance and build a wharf to suit the present entrance.

Waikokopu Harbour.—This port has been operated by the Wairoa Harbour Board on behalf of the Public Works Department. During the year sixty-six coastal vessels worked the port, and handled 3,147 tons of general cargo; 309 42 ft. poles; 9,000 ft. of hardwood timber. In addition seven overseas vessels worked the port, and lifted 8,023 quarters of beef; 81,092 carcasses of mutton and lamb; 1,056 bales of wool; 274 sacks of hides; 41 casks of tallow; 54 tons of manure; 1,639 pigs; 1,019 carcasses of pork; 500 boxes of casings; 2,024 packages sundries; 100 cases of jellied veal.

Necessary repairs have been carried out to the wharf and buildings. Approximately 200 yards of concrete cast in blocks and *in situ* have been added to the top of the breakwater at the sea ends, and this has somewhat improved the conditions at the wharf. Soundings taken during the year show no appreciable change in depth either at the wharf or the roadstead.

Elmslie Bay Wharf and Approach, French Pass.—The erection of a new wharf to replace the existing decayed structure was completed under contract. The structure is built of hardwood timber throughout, and comprises eleven 12 ft. approach spans, 8 ft. roadway carried on two pile piers, and an enlarged end 72 ft. by 30 ft. carried on hardwood piles with steps for launch passengers and davits for the handling of light cargo.

A shed 24 ft. by 12 ft. has been erected on the wharf for storage of cargo. The approach filling is protected from wave action by curved concrete retaining-walls. The wharf serves D'Urville Island and the whole of the French Pass area.

Marlborough Sounds.—Repairs to wharves in the Sounds area are in hand at Torea Bay, Portage, and Onahau Bay in Queen Charlotte Sound, and Waitaria Bay in Kenepuru Sound. The work consists of generally renovating and repairing the existing structures.

Te Hapua Wharf.—Tenders were called for the proposed new concrete wharf at Te Hapua, an isolated Native village in the far North. On account of the locality of the structure it was very difficult to get a satisfactory tender, but the contract has recently been let, and work will shortly be put in hand.

Whangapara Wharf.—The approach to this wharf has been completed in stone to a length of 45 ft. and a width of 15 ft. Steps are being taken to have plans prepared for the new wharf.

Thames Harbour Berthage at Thames Wharf.—The dredging of the berthage at the above wharf has been carried out by the Public Works Department for the Thames Harbour Board over a length of 277 ft. to a width of 60 ft. and a depth of 9 ft. at low water extending to the seaward end of the wharf. A shallow channel has also been extended for a distance of 226 ft. to a width of 50 ft., and a depth of 7 ft. at low water. Dredging operations are still in progress. When completed this work will considerably improve the channel leading to the wharf and enable vessels to work the wharf with much greater facility.

Lighthouses.

Baring Head.—This lighthouse was erected at the entrance to the Wellington Heads towards the end of last year, and was officially opened on 17th June, 1935. It has been operating successfully since that date. Additional oil storage was provided at the power-house, and the approach road to the station was cleaned up generally. A telephone line eight miles in length was erected in order to connect the lighthouse with the exchange at Eastbourne.

Akaroa Lighthouse.—Repairs to the landing-stage and erection of a new stairway were completed during the financial year. Renovations were also carried out to the keeper's cottage.

Godley Head Lighthouse.—Alterations were carried out to the lubricating-system of the engines and compressors.

French Pass Beacon.—About the end of last year the concrete beacon at the entrance to the Pass was damaged and partly unseated from the rock foundation. Repairs consisting of the placing of a concrete band around the base are at present in hand, but the work is rendered difficult owing to the fact that the base of the beacon is practically at the low spring-tide level, and if bad weather is experienced during the spring-tide period the work is very much hampered.

Taiaroa Fog Signal.—Repairs to the engines were carried out during the year.

Tiritiri Fog Signal.—A reinforced concrete building 20 ft. by 21 ft. was erected on the above Island to house the fog signal apparatus. In addition to this work the main lighthouse tower was painted both internally and externally and a lightning conductor installed.

General.

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

Foreshore Licenses.—Westhaven Inlet; Kawarau Rapids, Lake Wakatipu; Tryphena Harbour, Great Barrier Island; Akaroa Harbour.

Breakwater.—Extension at Oamaru.

Wharves and Jetties.—Napier; Te Hapua, Parengarenga; Westhaven Inlet; Tauranga; Quarryman's Bay; Kauri Point, Auckland; Bluff Harbour; Motukaraka, Wairupe Creek; Hokianga; Ravensbourne, Dunedin; Motuihi Island.

Boat Sheds and Skids.—St. Mary's Bay, Auckland; Vauxhall, Otago Harbour; Evans Bay, Wellington (2); Anderson's Bay, Otago; Rocky Point, Otago Harbour; Mechanics Bay, Auckland Harbour.

Bridges.—Port Ahuriri; Pukapuka Stream, Mahurangi; Waitotara River; Puhinui Creek, Manukau Harbour; Long Bay Bridges, Auckland Harbour; Hoteo River Bridge, Whangarei Harbour.

Training-walls.—Motueka Harbour; Protective groyne, Patea River.

Reclamations.—Evans Bay, Wellington; Putiki Bay, Waikeke Island; Hobsonville, Auckland; Okarito Harbour.

Sewerage Outfalls.—East Clive, Hastings.

ESTABLISHMENT OF AERODROMES AND LANDING-GROUNDS.

In pursuance of the Government's policy to establish a chain of aerodromes and intermediate emergency landing-grounds throughout the Dominion to cater for the needs of the New Zealand Air Force, private flying, and commercial air transport, considerable expansion of this branch of the Department's activities has taken place during the year ending 30th June, 1936. In connection with this work, through the attachment of one of my officers to the Defence Department, very close co-operation has been established between my Department and the Royal New Zealand Air Force and Civil Aviation Branches of the Defence Department. Very considerable assistance has also been received from the Labour Department, the Transport Board, and the Lands and Survey Department.

Apart from the actual construction and development of aerodromes and landing-fields, the work has entailed a considerable amount of investigation connected with projected air routes and the selection of the most suitable sites for development as aerodromes. In addition to the expansion and development of the Royal New Zealand Air Force Base at Hobsonville and the Royal New Zealand Air Force Flying Training School at Wigram, investigations have now been extended to 106 sites in both Islands, many of which have been found to be quite unsuitable.

Preliminary surveys have been carried out on twenty-five possible sites, and thirty-two areas have been surveyed with a view to development, and construction actually undertaken on forty, of which nine have been completed at least to a primary stage of development.

During the year by far the greater proportion of the cost of construction was met from the Employment Funds for the utilization of unemployed labour, which would otherwise, in many cases, have been employed on work of little permanent value. Several aerodromes have been commenced, utilizing plant methods of construction, and proposals have been in the course of preparation to undertake all new works commencing in the coming year by plant methods as far as is practicable. During the year a maximum of 2,400 men were employed on aerodrome construction.

In addition to the aerodrome work involving the actual preparation of the flying-fields, this Department is also preparing the designs and supervising the construction and layout of buildings and facilities at the Air Force stations, acts in an expert and advisory capacity in all matters connected with civil aerodromes, the establishment of air routes, and, generally, in conjunction with the Civil Aviation Branch of the Defence Department, in an advisory capacity on many matters pertaining to civil-aviation development.

New Zealand Air Pilot.—In conjunction with the Civil Aviation Branch of the Defence Department, this Department has been responsible for the issue of a New Zealand Air Pilot on similar lines to the Air Pilot of Great Britain. The Aerodrome Branch of the Department has been engaged in the collection, compilation, and preparation of all information in connection with this publication now available to all aviators.

Strip Maps.—In conjunction with the Lands and Survey Department, the preparation of aviation strip maps in six maps covering the whole Dominion has been proceeded with. These maps embody the best features of aviation maps published throughout the world. The first sections are already in the hands of the printer and should be available shortly.

Details of the aerodrome works at present in hand in the various Public Works Districts are as follows:—

Royal New Zealand Air Force.

Auckland District: Hobsonville Air Base.—During the year construction work has been continued on the enlargement and improvement of the flying-field to enable it to accommodate the increased use of land planes at this station; regrading operations are now being extended to cover 90 acres, the work has been heavy and has involved the shifting of 82,500 cubic yards of spoil during the period.

Excavation and reclamation for an additional seaplane hangar has been put in hand, is now nearing completion, and has involved the shifting of 23,500 cubic yards of spoil.

A single men's barracks to accommodate sixty airmen and ten cottages for other ranks, the erection of which were in hand last year, have been completed and put into service.

No. 2 land plane hangar—120 ft. by 85 ft.—has been completed during the period.

In addition to the above structures, extensive improvements to the grounds generally, extensive sewerage, water-supply, and electrical-reticulation schemes have been extended during the year.

Christchurch District: Wigram Aerodrome.—During the year small extensions in the outfield of the flying-field have been regraded and levelled, and a small area of 5 acres near the hangars has been tile drained.

Two large hangars 90 ft. by 180 ft. clear span, with annexes, were completed, and a workshop block has been commenced. Other buildings under construction during the period include a motor-transport station, residence for the Officer Commanding, and a barracks and mess to accommodate forty single airmen.

The residential area has been levelled and roaded, and extensive investigations for sewerage, water-supply, and electrical reticulation have been undertaken.

Nelson District: Woodburne Aerodrome.—A site has been secured to provide an additional Air Force station. Minor improvements to the surface of the field have been undertaken and the field is at present being used temporarily by the Air Transport services.

Civil Aerodromes and Emergency Landing-fields.

Whangarei District.—Sites in the following localities have been investigated: Waipapakauri, Whangarei, Te Hapua, Te Paki, Cooper's Beach, Pukepoto, Maungatapere, Kawakawa, Paparoa, Waitangi, Rawene, Kaikohe, Dargaville, Kerikeri, and Waihopo.

Preliminary surveys have been undertaken on the following sites: Whangarei, Te Hapua, Kaikohe, Dargaville, and Kerikeri.

Construction work has been completed at Waipapakauri Aerodrome over an area of 30½ acres, and extensions are being considered.

Auckland District.—Preliminary investigations have been undertaken for sites in the following localities: Point England (Auckland), Ngaruawahia, Coromandel, Morrinsville, Te Aroha, Pukekohe, Kaawa Valley, Waiuku, Kawhia, Te Uku, Whangamata, Raglan, Lake Whangape, Hamilton, Otamatea and Rodney Counties, and at Great Barrier Island.

Preliminary surveys have been undertaken at the following sites: Ngaruawahia and Kaawa Valley.

Construction proposals were prepared for the following sites: Mangere, Point England, Coromandel, Thames, Ngaruawahia, and Great Barrier Island.

Construction was carried out on the following fields:—

Mangere.—During the period an area of 35 acres was graded involving the shifting of 81,000 cubic yards of spoil, and the work is now approximately half completed.

Ngaruawahia.—Development was commenced toward the end of the period.

Tauranga–Bay of Plenty District.—Preliminary investigations have been carried out for sites in the following localities: Tauranga, Atiamuri, Whakatane, Rangataiki Plains, Galatea, Te Teko, and Opotiki.

Engineering surveys have been undertaken at Tauranga and Opotiki, and construction proposals have been prepared for these two sites.

Construction work has proceeded during the year on the Rotorua Aerodrome, and 75 acres have been levelled to date involving 86,400 cubic yards of earthwork.

The development of Taupo Aerodrome is completed.

Taumarunui-King Country District.—Preliminary investigations have been carried out for sites in the following localities: Taumarunui, Te Awamutu, and Chateau Tongariro.

Construction work has been continued at Te Kuiti, 24 acres of landing-strips have been regraded, and the work of levelling the outfields is nearing completion.

Stratford-Taranaki District.—Preliminary investigations have been carried out for sites in the following localities: Pukearuhe, Waverley, Patea, Karioi, Ohakune, and Waitotara Valley.

Preliminary surveys were undertaken at Karioi and surveys for extensions at New Plymouth.

Construction has been undertaken on the following aerodromes:—

New Plymouth.—The initial development of this aerodrome was completed during the period, and the field available now comprises approximately 150 acres. Very heavy earthwork and surfacing was involved.

Stratford.—Development of this aerodrome was practically completed during the period and involved extensive drainage and earthwork movement; approximately 80 acres having been completed.

Hawera.—Work was put in hand during the period and was well advanced, 40 acres having been completed.

Wanganui.—Development work has been continued under the control of the Wanganui City Council, and is well forward.

Gisborne-Poverty Bay District.—Preliminary investigations were undertaken at Motuhora and Raukauroa, and construction proposals prepared for Gisborne Aerodrome.

Construction was commenced on the Darton Field at Gisborne, utilizing plant methods of construction in conjunction with hand labour, and the first stage of development is approaching completion.

Napier-Hawke's Bay Area.—Preliminary investigations were undertaken at Wairoa, Opoutama, Mohaka, Waikare, Arapawanui, Nuhaka, Titiokura, and Waipukurau.

Engineering surveys were carried out at Opoutama, Mohaka, and Waipukurau.

Construction work was undertaken on the following fields:—

Napier.—It is proposed to develop 140 acres by stop-banking, drainage, and regrading, and 70 acres have now been completed.

Westshore.—A fine landing-ground has been established on portion of the reclaimed inner lagoon, and little work was required to make it suitable.

Hastings.—Of the 75 acres of this aerodrome, 47 acres require relevelling or top-dressing, and, to date, 35 acres have been completed.

Waipukurau.—During the period 15 acres have been relevelled and returfed, and approximately 70 acres remain to be completed.

Dannevirke.—This field of 75 acres has been relevelled and returfed, and was practically completed during the year.

Mohaka.—The construction of an emergency landing-field was undertaken at Mohaka, and, of the 56 acres of the field, 26 acres have been relevelled.

Wellington District.—Preliminary investigations were undertaken for sites in the following localities: Paraparaumu, Waikanae, Bulls, Tokomaru, and Porirua. Engineering surveys were carried out at Martinborough and Levin.

Construction work has been in hand on the following aerodromes:—

Masterton.—This field has now been completely relevelled and finished over 66 acres.

Palmerston North.—Extensive drainage and relevelling operations were in hand during the period, and the work is well forward: 104,000 cubic yards have been excavated from the flying-field, and 8,650 cubic yards from drains; 54 acres have been returfed and completed, while 32,560 linear feet of tile drains were placed and back-filled.

Feilding.—39 acres of this aerodrome have been completed during the period, and extensive ring-draining and internal drainage has been carried out. A total of 15,900 linear feet of tile drains was placed and back-filled.

Rongotai, Wellington.—The development of this aerodrome has been proceeded with under the direction of the Wellington City Council.

Nelson District.—Preliminary investigations for landing-ground sites have been undertaken in the following localities: Takaka, Tadmor, Collingwood, Seddon, Ward, Cape Campbell, Kekerangu, Clarence River, and Whangapeka.

Engineering surveys have been carried out at Nelson, Cape Campbell, Kekerangu, Clarence River, and Takaka.

Development proposals for an airport on the Quarantine Reserve site at Nelson are nearing completion.

Construction work has been undertaken on the following fields:—

Blenheim.—The development of an area of approximately 140 acres has been put in hand, and approximately 80 acres have been completed. Very heavy earthwork has been involved.

Motueka.—Approximately 50 acres of the 70 acres comprising this aerodrome were completed during the year.

Development to provide landing-grounds has also been commenced at Cape Campbell and at Takaka, while an emergency landing has been provided at Kekerangu.

Christchurch-Canterbury District.—Preliminary investigations have been undertaken for sites in the following localities: Hapuku River Mouth, Kaikoura, Amuri Bluff, Conway River Mouth, Hurunui River Mouth, Motunau Island, Washbourne, Fairlie, Lake Pukaki, Simons Pass, Waimate, and Waitaki Hydro, and surveys were completed of the first six.

Construction proposals and plans were prepared for the development of an extended aerodrome at Saltwater Creek, Timaru.

Construction work was completed to an initial stage of development on the Hermitage landing-ground at Mount Cook.

Greymouth-Westland District.—Preliminary investigations were undertaken for sites in the following localities: Karamea, Reefton, Ikamatua, Karangarua, Landsborough, and Arawata.

Engineering surveys have been carried out at Mussel Point, Upper Okuru, Haast, Mahitahi, Karangarua, and Inchbonnie.

Construction work has been in hand on the following aerodromes and landing-grounds:—

Westport.—The construction of the landing-strip system has been completed and surfacing is in hand. Extensive protection work and marram-grass and lupin planting have been necessary to cope with wave and wind action. Further extensions are being investigated.

Greymouth.—Extensive earthwork and surfacing with soil has been carried out on this aerodrome, which is now nearing completion. Extensions are being investigated.

Hokitika.—The development of this field has involved the shifting of a large quantity of earthwork and extensive stream-diversions and stop-banking; 45 acres were finished off during the period and the work is now nearing completion.

Other landing fields under construction during the year were—Inchbonnie, Ross, Waiho, Weheka, Haast, Upper Okuru, and Mussel Point, and, at all, the work is well forward.

Landing-grounds were also established at Landsborough and Arawata, but little construction work was involved.

Dunedin-Otago District.—Preliminary investigations were undertaken for sites in the following localities: Dunedin Foreshore, Oamaru, Queenstown, Ranfurly, Waikouaiti, Balclutha, Heriot, Waianakarua, Middlemarch, Alexandra, and Nevis.

Engineering surveys were carried out at Balclutha, Waikouaiti (two sites), and Taieri.

Construction work has been in hand during the year at Taieri Aerodrome, and 59 acres have been completed and returfed during the year.

Invercargill-Southland District.—Preliminary investigations were undertaken for sites in the following localities: Pembroke, Te Anau, Eglinton Valley, Gore, Stewart Island, and for various temporary landing-fields.

Engineering surveys were carred out at Gore and Invercargill.

Construction work was completed during the year on the new aerodrome at Invercargill; 77 acres were regraded and levelled, but the field still requires draining and grassing.

PLANT AND MECHANICAL EQUIPMENT.

The policy of the present Government caused a change in the attitude adopted by the Department regarding the plant available from the major construction works that were closed down some years ago, and sales of surplus plant or equipment considered likely to prove of value upon future public works were stopped.

In anticipation of instructions to obtain modern construction plant, action was taken immediately after the change of Government to prepare the necessary specifications and advertise contracts for the supply of modern machinery, inc'uding diesel-engine-driven excavators on creeper track with shovel and drag-line equipment; diesel-engine and electric-motor-driven stationary air-compressors; diesel locomotives; pile-driving winches, pumping-sets, and portable air-compressors, all diesel-engine-driven; petrol-engine-driven concrete-mixers with power loading skips; portable rock crushing and screening plant; tunnel ventilating-fans, workshops machine tools, stationary diesel engines; diesel rollers and tractors; diesel-engine- and petrol-engine-driven road-graders; and motor-vehicles for use upon construction works generally.

Plant in Use.—During the year construction plant of various descriptions was used and maintained in good order upon the following works: Kirikopuni–Tangowahine Railway service; Tauraroa metal quarry; Motutara Island metal-quarry, including towing-launches and barges for metal transport; Wade–Waiwera–Warkworth to Waipu Main Highway improvement works; Devonport Naval Base; Auckland District road construction and maintenance; Mangere Aerodrome construction; motor-launch transport, Auckland and Hauraki Gulf; dredging at Thames Wharf tidal basin; swamp drainage, Taupiri district; Upper Waihou River, clearing and snagging; Arapuni Power-house extensions; Milsom Aerodrome; Tangahoe deviation work, Gisborne Aerodrome; Hobsonville Air Force Base; Wairoa–Waikokopu Railway service; Ahuriri Lagoon reclamation, drainage, and stop-banking; Bluff Hill slip, Napier; Esk River Railway bridge pier renewals; Upper Mangahao Power Scheme development work; power-line construction and renewals; Hutt Estuary reclamation; Wairoa River protection works; Ashley River Control Scheme; Lewis Pass Road; Levels Irrigation Scheme; Redcliff Irrigation Scheme; Omakau Irrigation Scheme; Ida Valley Irrigation Scheme; Teviot Irrigation Scheme; Butchers Dam; Fraser River Dam; Summit Road; Te Anau to Milford Road; Homer Tunnel; Waitaki Dam; Civil aerodromes and landing-grounds in Greymouth district; general roading works and road-maintenance works under Public Works vote and Main Highways votes throughout New Zealand.

Motor-vehicle Operations.—The introduction of fortnightly pays on the scattered public-works jobs throughout New Zealand, and also the general increase in works started up, has necessitated an increase in the Department's motor-vehicle fleet and a consequent increase in mileage for the year.

A general summary of the position is as follows:—

PUBLIC WORKS DEPARTMENT'S MOTOR-VEHICLES.

	1935–36.				
	At 1st July, 1934.	At 1st July, 1935.	Purchased.	Sold.	At 30th June, 1936.
Cars	138	141	40	27	154
Light delivery trucks	101	112	26	7	131
Trucks (1 ton and over)	69	72	20	13	79
Totals	308	325	86	47	364

The cost of operating the Public Works Department and Main Highways Board motor-vehicle fleet during the year is shown in the summary below, which also includes the results of the two previous year's operation for comparison.

The costs shown include the following:—

Running-charges: Petrol, oil, grease, tires, tubes, repairs, and maintenance.

Standing-charges—

Interest at 5 per cent. per annum and depreciation varying from a minimum of 20 per cent. to a maximum of 40 per cent. per annum on the capital cost.

Garage rent 5s. per week.

Registration and annual license fees.

Type of Vehicle.	Total Cost.	Total Mileage.	Cost per Mile.
Year 1933–34.	£		£
Cars and light deliveries combined (10 cwt. to 15 cwt.)	32,086	2,278,834	3·38
Trucks (1 ton and over)	15,599	594,925	6·29
All vehicles	47,685	2,873,759	3·98
Year 1934–35.			
Cars and light deliveries combined (10 cwt. to 15 cwt.)	36,430	2,728,110	3·20
Trucks (1 ton and over)	14,563	621,413	5·63
All vehicles	50,993	3,349,523	3·65
Year 1935–36.			
Cars and light deliveries combined (10 cwt. to 15 cwt.)	39,724	3,058,246	3·12
Trucks (1 ton and over)	14,681	660,390	5·34
All vehicles	54,405	3,718,636	3·51

An analysis of the above summary showing the results of the year's operation in the various districts throughout New Zealand is as follows, the schedule including all vehicles that have operated for any part of the year—*i.e.*, vehicles purchased and vehicles sold during the period :—

PUBLIC WORKS DEPARTMENTAL AND MAIN HIGHWAYS BOARD MOTOR-VEHICLES.—MILEAGE AND OPERATING-COSTS FOR YEAR 1935–36.

District.	Cars and Light Delivery Trucks (10 cwt. to 15 cwt.).				Trucks (1 Ton and over).			
	Number of Vehicles.	Mileage.	Total Cost.	Cost per Mile.	Number of Vehicles.	Mileage.	Total Cost.	Cost per Mile.
			£	d.			£	d.
Whangarei	17	228,985	3,196	3·35	2	19,333	475	5·90
Auckland	29	363,749	4,273	2·82	2	15,060	519	8·27
Tauranga	12	154,150	1,746	2·72	4	47,032	741	3·78
Gisborne	8	73,970	1,022	3·32	4	28,845	779	6·48
Taumarunui	11	115,383	1,513	3·15	10	142,907	2,056	3·45
Stratford	18	235,936	2,516	2·56	3	9,719	188	4·64
Napier	12	120,157	1,403	2·80	2	16,868	266	3·78
Wellington	20	205,745	2,353	2·74	8	42,310	1,232	6·99
Nelson	11	120,297	1,310	2·61	5	34,776	624	4·31
Greymouth	18	189,521	2,282	2·89	10	115,590	1,993	4·14
Christchurch	19	242,450	3,021	2·99	4	16,291	468	6·89
Dunedin	25	244,313	3,145	3·09	6	44,107	945	5·14
Totals, general districts	200	2,294,656	27,780	2·91	60	532,838	10,286	4·63
Hamilton Electric-power District	33	256,284	3,765	3·53	9	19,537	859	10·55
Palmerston North ..	41	300,767	4,882	3·90	8	38,569	1,288	8·01
Christchurch Electric-power District	28	206,539	3,297	3·83	12	69,446	2,248	7·77
Totals, Electric-power Districts	102	763,590	11,944	3·75	29	127,552	4,395	8·27
Grand totals, all districts	302	3,058,246	39,724	3·12	89	660,390	14,681	5·34

Motor-vehicle Allowances.—The total amount paid during the year to departmental officers at scale rates for the use of their own cars upon Government business is shown in the following table, which also includes the amounts paid during the two previous years.

The totals comprise a large number of comparatively small sums paid for mileages run at the convenience of the Department where the transfer or purchase of a departmental vehicle was not warranted and the arranging of hire from other sources was inexpedient.

Year.	Total Allowances. £ s. d.
1933–34	803 3 0
1934–35	1,571 10 2
1935–36	1,160 17 5

Plant Repair Depots.—The Department's plant repair depots at Whangarei, Rotorua, and Wellington have functioned satisfactorily during the year, and have been utilized by other Government Departments in the locality. These depots, which are set up principally as running-sheds, are staffed with skeleton staffs of three or four skilled men, who are used to carry out urgent running repairs of road-construction plant and arrange for major plant repairs by private enterprise on best tender.

The plant depot at Wellington also handles the repairs of Public Works Department plant passing through Wellington on transfer from remote districts, and operates the repair and distribution of compressed-air tools to the general construction works throughout New Zealand, wherever warranted.

This air-tool service is proving a decided economy to the Department, and saves the general stocking-up of costly spare parts at various places, whilst the maintenance is in the hands of one expert working full time upon the work.

Several skilled maintenance fitters are operating singly under the control of various district engineers, and are carrying out similar work to that done at the plant depots, but upon a smaller scale, private enterprise being utilized largely to handle major repairs on best competitive quotation.

Inspections of Passenger-carrying Vehicles.—All of the mechanical and structural inspections required by the Transport Department before issuing licenses to private operators were carried out by the Public Works Department's mechanical staff during the year, and certificates of fitness or permits to run were issued as follows :—

District.	Omni-buses.	Service Cars.	Service Coaches.	Passenger Trucks.	Total.
1. Whangarei	13	37	5	55	110
2. Auckland and Tauranga	214	121	32	27	394
4. Gisborne and Napier	78	143	36	1	258
5. Stratford and Taumarunui	12	99	8	26	145
6. Wellington	120	136	8	30	294
7. Nelson and Westland	21	92	1	5	119
8. Christchurch	56	51	10	6	123
9. Dunedin	51	72	4	13	140
10. Invercargill	24	27	4	8	63
Totals	589	778	108	171	1,646

Vehicles condemned, 38 ; vehicles withdrawn voluntarily, 104.

General.—Mechanical work, including the figuring of proposals, preparation of specifications and contracts, inspections and consultations on various mechanical matters, including steam-generation, water-supplies, pumping-schemes, heating-schemes, gasworks, supply of machine tools and workshops equipment, institution of domestic mechanical services, electric-lift installations, and supply of road-construction and special motor-vehicles was carried out for various Government Departments—including Naval Department, Defence Department, Post and Telegraph Department, Mental Hospitals Department, Cook Islands Department, Health Department, Lands Department, Forestry Department, Industries and Commerce Department, Justice Department, Native Department, Mines Department, Marine Department, External Affairs Department, Agriculture Department, and the Government Loans Board.

A considerable quantity of road-construction plant and motor-vehicles was obtained for local bodies on behalf of the Main Highways Board : the work involved covering the preparation of specifications, calling tenders, analysing tenders, and making the necessary recommendations to the Board.

NAVAL AND DEFENCE DEPARTMENTAL WORKS.

During the whole of the year covered by this report a construction programme has been in hand on behalf of the Navy Office and the Defence Department.

Works for the Navy Office include reconstruction of portion of the Devonport Station, Auckland, and the first year's programme in connection with the Kauri Point Depot.

Works for the Defence Department include major structures at Auckland and Wellington, and extensions in connection with the Air Force Bases at Hobsonville, Auckland, and Wigram (Christchurch).

The programme has involved careful and detailed planning, and works are receiving skilled supervision.

TRAMWAYS.

Auckland.—During the year under review the Auckland Transport Board constructed three short lengths of track and overhead equipment of a total length of 13 ch. The Farmers' and Wyndham Street Extensions have been provided in connection with the inauguration of a free tram service to and from Pitt Street and the Farmers' Union Building in Hobson Street. The Sandringham Extension was for the purpose of providing improved terminal facilities.

Fourteen cars were damaged as a result of accidents; twenty, which includes the carry-over from the previous year, were repaired, inspected, and returned to service.

One vehicle has been reconstructed on a streamlined basis.

Two fatal accidents occurred resulting from tramcars coming into collision with pedestrians. Of one the Board was absolved from all blame, and on the other the inquest was adjourned.

New Plymouth.—Progress is being made with the bonding of rails by welding, there being approximately one mile to do. One mile of trolley-wire was renewed. No fatal accidents occurred, and there were no labour disputes.

Wanganui.—The double track in Taupo Quay was completely lifted and replaced by a single track with loops at Wilson Street and Victoria Avenue. The length of line affected was 16 ch. The track in Rangiora Street was extended a further 80 ft. towards the sea to enable trams to be shunted without blocking the motor-parking area. New motors were installed in one car, and trolley-wire grips (to enable motormen to safely handle broken wires) have been issued to all cars.

Wellington.—Two cars were inspected and certificates issued. 26 ch. of track were duplicated in Broadway, Miramar, and a certificate issued.

Christchurch.—The Christchurch Tramway Board proposes to remove all tracks, &c., on the Linwood and Dallington route, and to replace the tram service with diesel-engined buses. The proposal has been investigated and approved.

Alterations to the loop in Selwyn Street, Spreydon, have been made to provide better visibility for motormen.

Dunedin.—During the year no new tramcars were placed in service and no alterations were made to existing cars.

The tram-line on the Anderson's Bay route at Ross's Corner has been converted from a single line to a double track around the curve for a distance of 10 ch.

No accidents necessitating special inspection of equipment occurred during the year.

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.

J. Wood, M.Inst.C.E.,
Engineer-in-Chief.

APPENDIX C.

ANNUAL REPORT OF BUILDINGS BY THE GOVERNMENT ARCHITECT.

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

Sir,—

I have the honour to submit the following report on the activities of the Architectural Branch for the year ended 30th June, 1936.

During the period plans were prepared for fifty-eight buildings of an estimated total value of £1,115,000, of which eighteen contracts, totalling £93,356, have been let. Fifteen other contracts of the value of £123,765 for buildings designed prior to 30th June, 1935, have also been let, making the total contracts let during the year £217,121.

A considerable amount of detail work has been done in connection with Dunedin Chief Post-office, which is nearing completion, the Government Life Insurance Building, Wellington, and other works under construction.

Numerous plans and specifications submitted to the Local Government Loans Board have been examined and reported upon.

The utmost economy, consistent with the factor of maintenance and regard to the nature and importance of the buildings, has been observed.

Building prices, particularly for timber structures, have hardened, but there has been competition resulting in satisfactory contracts. British or New Zealand materials and manufactures have been used almost exclusively, and the standard of locally made articles has been very satisfactory.

Appended is a schedule of works, which includes maintenance work and minor contracts prepared in the various district offices:—

Vice-regal.

Auckland.—Extensive alterations and repairs were effected to the vice-regal residence.

Post-offices.

Whangarei.—Renovations and repairs were undertaken to twenty-two buildings, renovations and additions were carried out to one building, and renovations and alterations were effected to five buildings.

Auckland.—Extensive alterations and additions to the Cambridge Post-office are in hand. A garage in reinforced concrete at Stanley Street is approaching completion. The demolition of the Shortland Street Post-office is nearly finished. A new residence was erected for the Postmaster at Wellsford, and additions were made to the post-office. Repairs and renovations were carried out to fifty-eight buildings.

Taumarunui.—Renovations and repairs were attended to at seventeen buildings.

Tauranga.—Renovations and repairs were effected to fourteen buildings, including alterations and additions to the post-office at Rotorua.

Gisborne.—Renovations and repairs were dealt with at eight buildings.

Stratford.—A new post-office was erected at Toko. Renovations and repairs were effected at fifteen buildings, and alterations and additions made to five.

Napier.—A new post-office was erected at Porangahau. Renovations and repairs were carried out at twenty-one buildings, and alterations and additions made to two.

Wellington.—A two-story concrete post-office was erected at Petone; an additional story in wood was erected on the General Post Office building at Wellington, and extensive alterations made to the subdivision of the third and fourth floors. At Pahiatua a new post-office and a residence for the Postmaster, both in concrete, are being erected.

Nelson.—Renovations and repairs were effected at eleven buildings.

Christchurch—A new post-office was built at Albury, and a carrier-equipment building erected at Kaikoura. The new post-office at Rangiora, a two-story concrete structure, is very nearly completed. Renovations and repairs were carried out at forty-two various buildings, and alterations made to five.

Dunedin.—The new chief post-office is nearing completion, the stone facing is nearly completed, bronze windows are in position and glazed, and all interior partitions, joinery, and other fittings are well advanced. Renovations and repairs were undertaken at thirty-one buildings, and additions made to four.

Greymouth.—A garage was built at Hokitika, and renovations and repairs were effected to seventeen buildings.

Courthouses.

Whangarei.—Renovations and repairs were effected at one building; buildings at Mangawai and Waipu were sold and removed from site.

Auckland.—An extensive addition of two stories and basement was completed for the Law Library at Auckland. Renovations and repairs were carried out at eleven Courthouses.

Taumarunui.—Additions were made to the Taumarunui Courthouse for a law library.

Tauranga.—Renovations and repairs were effected to one Courthouse.

Gisborne.—Renovations and repairs were carried out to one Courthouse.

Stratford.—Renovations and repairs were attended to at three Courthouses, and alterations made to two.

Napier.—A new Courthouse was erected at Wairoa. Renovations and repairs were dealt with at three Courthouses.

Wellington.—Additions were made to the Courthouse at Palmerston North. The Courthouse buildings at Wellington had the exterior cleaned down and coated with a special preparation.

Nelson.—Renovations and repairs were effected to three Courthouses.

Christchurch.—Extensive alterations and additions were made to the Courthouse at Timaru. Alterations were carried out at one Courthouse, and renovations and repairs were undertaken at twelve Courthouses.

Dunedin.—Renovations and repairs were attended to at eleven Courthouses.

Greymouth.—Extensive renovations and repairs were dealt with at three Courthouses. Renovations were made to one Courthouse.

Police-stations and Gaols.

Whangarei.—Renovations and repairs were effected at seven buildings, and plumbing additions were carried out at two buildings.

Auckland.—Extensive alterations and additions were made to the Auckland Central Police-station. A motor-garage and cool-storage accommodation are in course of erection at Waikeria Borstal Institution, and renovations and repairs were effected to buildings and staff cottages. Renovations and repairs were dealt with at twenty-one buildings.

Taumarunui.—At Hautu Prison Farm a bathhouse and laundry were completed and a new wool-shed erected. Renovations and repairs were attended to at eight buildings.

Tauranga.—Renovations and repairs were undertaken at seven buildings.

Gisborne.—A new residence, two-cell lock-up, garage, and stable were erected at Tikitiki. Renovations and repairs were carried out at five buildings, and alterations made to one building.

Stratford.—New buildings are in course of erection at Waitotara, and a new garage was built at Taihape. Renovations and repairs were effected at thirteen buildings, and alterations and additions made to five.

Napier.—A new police-station with four-cell lock-up is in course of erection at Wairoa, and a new police-station and sergeant's residence is being built at Woodville. Renovations and repairs were executed at eight buildings.

Wellington.—A new lock-up in concrete was erected at Palmerston North as part of an extensive rebuilding programme.

Nelson.—Renovations and repairs were dealt with at seven buildings.

Christchurch.—Renovations and repairs were attended to at twenty-four buildings, and alterations and additions were made to three buildings.

Dunedin.—Renovations and repairs were undertaken at twenty-two buildings. Additions to the Invercargill Police-station are in hand.

Greymouth.—Renovations and repairs were effected at twenty-four buildings.

Mental Hospitals.

Avondale.—Additions to the boiler-house were completed, and extensive renovations and repairs were undertaken.

Kingseat.—Four new villas and a store building are well advanced. Two doctors' residences complete with garages were completed.

Tokanui.—Two villas for farm workers are nearing completion, and a new residence for the Medical Superintendent is practically completed. Renovations and repairs were attended to, and a new electric refrigerating plant was installed in the butcher's shop.

Ngawhatu.—Villas Nos. 4 and 5 were completed, and Villa No. 6 is in course of erection. A new cool store is being built, automatic stokers were installed in the boiler-house, and electrical reticulation, water service, and drainage were completed.

Sunnyside.—A new vegetable-cleaning house is three parts completed, and a grain store was erected.

Templeton.—A vocational block, together with a tool-shed, was completed. Two new villas were commenced and general maintenance attended to.

Seacliff.—General renovations and repairs, alterations, and additions were effected.

Hokitika.—A residence and garage for the head attendant were erected, large additions made to the laundry, and a new tool-shed was built. A new villa is nearing completion. General maintenance and repairs were undertaken.

Education Department.

Auckland.—Renovations and repairs were carried out at three homes.

Gisborne.—Renovations and repairs were executed at two buildings, and alterations and additions were made to one building.

Stratford.—Additional class-rooms are being built at the New Plymouth Girls' High School. Renovations and repairs were dealt with at the Stratford Technical High School, and alterations and additions attended to at the Hawera Technical High School.

Napier.—Additions were made to the Dannevirke High School, and renovations were undertaken at the Hastings High School.

Wellington.—Additions were made to the workshops at the Palmerston North Technical School.

Nelson.—At the Richmond Special School for Girls a new annexe is in course of erection, also a drying-room and additions to the laundry. Minor alterations and maintenance work were also attended to. A new Technical block is being built at the Nelson Boys' College, and general maintenance attended to.

Christchurch.—Renovations and repairs were effected at five buildings.

Dunedin.—Renovations and repairs were carried out at three buildings and additions were made to one building.

Health Department.

Auckland.—Renovations and repairs were executed at St. Helens Hospital.

Christchurch.—Repairs were dealt with at St. Helens Hospital, Christchurch.

Dunedin.—Miscellaneous renovations were carried out to St. Helens Hospital, Invercargill.

Greymouth.—A new cottage for the matron and additions to the Nurses' Home at Greymouth were completed.

Defence Department.

Whangarei.—Renovations and repairs were undertaken at the Whangarei Drill-hall.

Tauranga.—Renovations and repairs were effected at two buildings.

Stratford.—Renovations and repairs were carried out at three buildings.

Napier.—Renovations and repairs were executed at three buildings.

Wellington.—New stables were erected and two contracts were let for defence works.

Nelson.—Renovations and repairs were dealt with at two buildings.

Christchurch.—A new building for single men was erected at the Burnham Military Camp. At Wigram Aerodrome a residence was erected for the Officer Commanding, and accommodation for forty single men is in course of erection. Renovations and repairs were attended to at two buildings, and alterations and additions were made to one building.

Greymouth.—Repairs were effected at three buildings.

Department of Agriculture.

Auckland.—A poison-mixing plant is being installed at Hamilton.

Taumarunui.—Repairs were undertaken at one building.

Stratford.—Renovations and repairs were carried out at two buildings.

Napier.—Repairs were executed at one building.

Nelson.—General maintenance was attended to at two buildings.

Christchurch.—Renovations and repairs, together with alterations, were undertaken to two Stock Inspectors' residences.

Dunedin.—Renovations and repairs were effected at ten buildings.

Greymouth.—Additions were made in the Stock Inspector's Office, Greymouth.

Tourist Department.

Auckland.—Extensive interior alterations were completed at the Tourist Office, Auckland, and a neon sign erected.

Taumarunui.—Extensions were made to the Salt Hut at Tongariro, and a commencement was made with the erection of new staff quarters at Chateau Tongariro. At the Waitomo Caves Hostel lock-up garages were erected for six cars, and sundry repairs attended to.

Tauranga.—Alterations and additions were made to the Tourist Department's offices at Rotorua.

Napier.—Twelve staff cubicles and conveniences were completed at Lake House, Waikaremoana, and a cool store was provided at the hostel.

Christchurch.—Extensive alterations were made to the Tourist Department's offices in Christchurch.

Dunedin.—Extensive additions were made to the Tourist Hotel, Te Anau. Sundry alterations were attended to at other buildings.

Miscellaneous.

Whangarei.—A cottage was erected at the Tautoro Bush Property, Kaikohe, for the Forestry Department. Chimneys of the Public Works Department cottages at Okaihau were renewed in brick.

Auckland.—Renovations and repairs were effected to the Customs building. Temporary accommodation for the Labour Department, State Fire, National Provident Fund, and Post-office in Hart's Building, High Street, on account of the demolition of the Shortland Street Post-office, was fitted up. Four cottages were erected for the Lands and Survey Department, and a suite of offices was fitted up for the Government Life Insurance Department. General renovations and repairs were undertaken.

Taumarunui.—Extensive alterations and renovations were carried out to the old post-office at Taumarunui to accommodate various Government Departments, the old departmental building being now occupied by the Public Works Department.

At Te Kuiti the Public Works Department has expanded to occupy all of the departmental buildings, and other Departments are now quartered in rented premises.

A surfaceman's cottage was erected at Ongarue. Renovations and repairs were executed to three dwellings for the Public Works Department.

Tauranga.—A petrol store was built at Rotorua and additions to the Public Works garage are in hand. Additions were made to the Native Land Court at Rotorua.

Gisborne.—Renovations and repairs were dealt with at three buildings.

Stratford.—Renovations and repairs were attended to at four buildings, and alterations and additions were made to four buildings.

Napier.—Alterations were made to the Public Works Department's office, and miscellaneous renovations and repairs were undertaken.

Wellington.—The parapets and other dangerous ornaments on the Government Printing Office were removed to minimize earthquake risk. The foundations of the Government Life Insurance Building were completed, and the erection of the steel-work is well advanced. A new corrugated asbestos roof was laid on the Public Works Department Bulk Store to replace the fabric roofing which had perished. A new lavatory building was erected at the Unemployment Bureau Buckle Street. The site for the new departmental buildings in Stout Street was cleared of all old buildings, and a contract was let for the foundations. After a considerable amount of excavation and underpinning had been done the contract was terminated on account of proposals for a larger building. New farm buildings were completed at the Wallaceville Laboratory. Renovations and repairs were carried out to a large number of police-stations, courthouses, post-offices, &c., also alterations to provide and improve office accommodation on account of expanding activities. A considerable increase of work has fallen to the Public Works Department's Workshops, and additions were made to the shops.

Nelson.—Alterations, renovations, and repairs were attended to.

Christchurch.—Extensive additions and alterations were undertaken for the Unemployment Board and new quarters were provided for the Women's Employment Committee. Extensive rearrangements of accommodation were carried out for the various Departments in consequence of the occupation of the State Fire building. Repairs and renovations were dealt with at five buildings.

Dunedin.—A new office was built for the Public Works Department at Alexandra, and renovations and repairs were attended to.

Greymouth.—Five offices were fitted up for the Labour Department. Renovations and repairs were carried out to six buildings.

Generally.—Work in connection with the fitting-up of polling-booths for the General Election was attended to. Drapings, at short notice, were put up on account of the death of the late King, and arrangements made in connection with the proclamation of the new Monarch.

JOHN T. MAIR, A.R.I.B.A.,
Government Architect.

APPENDIX D.

ANNUAL REPORT OF THE CHIEF ELECTRICAL ENGINEER.

The Chief Electrical Engineer to The Hon. Minister of Public Works.

Sir,—

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

GENERATING-SCHEMES IN OPERATION.

NORTH ISLAND ELECTRIC-POWER SYSTEM.

1. Capital Outlay.

At the close of the year 1935–36 the total capital outlay was £8,461,193, representing assets in operation, and £173,807, representing assets not in operation, giving a total capital outlay of £8,635,000, and Table II gives an analysis of this amount.

2. Financial Results.

The total revenue for the year amounted to £795,391 and working-expenses £144,068, which resulted in a gross profit of £651,323, equal to a return of 7·71 per cent. on the average capital in operation (£8,445,737).

After paying interest (£408,051), depreciation (£17,591), and the departmental proportion of the capital charges on King's Wharf Station (£38,148) there was a net profit of £187,533. The accumulated loss now stands at £399,315 for the North Island system.

Comparative figures for the year ending 31st March, 1935, are as follows: Revenue, £712,766; working-expenses, £120,927; interest, £414,042; depreciation, £150,538; and King's Wharf charges, £37,687—with a net loss of £10,428.

The decrease in the depreciation charge from £150,538 in 1935 to £17,591 in 1936 is on account of the amount in the Fund having now reached the statutory 12½-per-cent. limitation, the payment of £17,591 being all that was necessary to augment the Fund to bring it up to the aforementioned limitation.

The increase in this year's working-expenses is due mainly to the 7½-per-cent. restoration of salaries and wages, maintenance of roads, maintenance of additional main transmission lines, and general increase of work due to growth of load, together with expansion in the amount of testing work now carried out by the Department.

The accumulated Depreciation Reserve and Sinking Funds as at 31st March, 1936, amounted to £1,017,687. Table I gives full particulars of financial results as well as other relevant statistical information.

3. General.

The units generated totalled 622,348,529, and to this must be added 236,134 purchased units, making a grand total of 622,584,663 units output for the system. Units actually sold total 563,673,258, and units used for station auxiliaries, &c., total 6,699,031.

The number of non-productive or lost units total 52,212,374, equivalent to 8·4 per cent. of total output.

The maximum load on the system was 116,800 kw. and the annual load factor 60·85 per cent. The total connected load was 843,209 kw., and the demand factor or ratio of maximum load to connected load was 13·85 per cent.

4. Construction, Operation, and Maintenance.

A. HAMILTON DISTRICT.

(1) Construction.

(*a*) *Power-stations.*

Arapuni.—The most important work in hand is the extension of the station to take two additional 20,000 kw. units.

At the end of the year the main excavation work was about 96·6 per cent. complete, the excavation for piers, &c., about 89 per cent. complete, and the tail-race excavation was complete.

The transformers for the extensions (48,000 kv.a. capacity) arrived and were stored at Putaruru.

(*b*) *Substations.*

Hamilton.—Erection of new 25-ton crane was completed. A new garage and store were built, and a workshop added to the old garage, and extensions were made to the test-room.

Henderson.—Earthing-switches and O.C.B.s were erected on the two incoming 50 kv. circuits, and preliminary work was done for switch-gear for the North Auckland line.

Te Awamutu.—A 50 kv. O.C.B. was installed controlling the outgoing line to Hangatiki.

Ngongotaha.—Building of a third cottage was completed.

Edgecumbe.—Building of a fourth cottage was started.

(*c*) *Transmission-lines.*

North Auckland Line (50 kv.).—Detailed survey of this line proceeded throughout the greater part of the year. Substation sites were selected at Tahekeroa, Mareretu, and Maungatapere. Cartage of poles was commenced in December, 1935, and erection of poles in February, and, at the end of the year, 100 pole structures (9·8 miles) had been erected.

Arapuni–Stratford Line (110 kv.).—Construction of three cottages, garage, and workshop for linemen at Ongarue was completed, and the Tahora depot buildings (two cottages, garage, and workshop) were practically completed.

(2) Operation and Maintenance.

No. 1 unit at Arapuni being out of service for rewinding the generator, it was necessary to run Horahora continuously throughout the year, and occasional assistance over the winter peak load was obtained from the Penrose Diesel plant from May to July, and from McLaren's Falls from June to August. King's Wharf plant and the Diesel plant had to be run on 19th December for a short time when a hot terminal necessitated a shut-down on No. 3 unit at Arapuni, and again between 3rd and 7th of February owing to trouble caused by salt on the 110 kv. transmission-lines.

The Arapuni and Horahora plants were run normally throughout the year in parallel with Mangahao and Waikaremoana without any difficulty.

(*a*) *Power-stations.*

Arapuni.—Turbines: The lower guide bearing of No. 2 unit was found to have rather large clearance, and was replaced by the spare bearing. The brass sleeves on the pilot distributor valves of Nos. 3 and 4 were found to be worn, and were replaced, and on No. 2 the whole valve was replaced. On No. 4 rings were fitted to the piston of the pilot servomotor.

Generators: No. 1 rotor was put in good condition and the stator rewound (after the burn-out on 15th February, 1935) and the unit restored to service on 11th March, 1936. No 2 unit was taken out of service for general overhaul on completion of repairs to No. 1. The brakes on all four units were provided with a new independent air-pipe connection to the compressor.

Transformers: Blow-out vents were fitted to the main transformers. One 110 kv. bushing failed in service, and another was found defective and removed, both of them on the 110/50 kv. bank.

Switch-gear: New larger 110 kv. bushings were installed in O.C.B. No. 58. Three 110 kv. pillar insulators failed in service, one of them during a lightning-storm. Nearly all the work of replacing these pillar insulators with others of a better type was completed during the latter part of the year. Two 50 kv. O.C.B. bushings were found with lower porcelain cones cracked, and were replaced.

Horahora.—Generators: Some new coils and laminations were put in on No. 5 generator, which had been damaged by short-circuit late in the previous year, and the unit was restored to service on 8th January, 1936.

Transformers: A new 5 kv. winding was installed in one of the 5/50 kv. transformers which had been burnt out on a short-circuit in December, 1934.

Switch-gear: New 50 kv. bushings were fitted to the O.C.B.s, replacing all the old style defective bushings. Seven cracked 50 kv. insulators of old type were replaced.

(*b*) *Substations.*

Penrose.—Sixty eye-bolts were fitted to strain insulators connected to the structure to strengthen the existing steel cable connections. Two 110 kv. capacitor bushings broke down in service, and one 110 kv. O.C.B. bushing which caused radio interference was replaced.

Bombay.—New de-Ion contacts were fitted to the two 50 kv. O.C.B.s. A 110 kv. O.C.B. bushing found faulty by a radio-interference detector was replaced.

Waikino.—Two 11 kv. current transformers broke down during the year. A flashover which damaged three 11 kv. insulators and potential transformer fuses was caused by a rat.

Hamilton.—An additional feeder was installed by Hamilton Borough to be connected to the 11 kv. switch-gear. The borough's two existing cables are to be paralleled, and the panel thus made available is to be used for the new and larger feeder. An automatic telephone exchange was installed by the Post and Telegraph Department.

Huntly.—To enable supply to be given to the new fertilizer-factory, a 1,000 kv.a. three-phase 50/11 kv. transformer from Takapuna substation was installed temporarily, and, with a new 11 kv. switch cubicle, was put in service on 1st February, 1936.

Te Awamutu.—A 50 kv. O.C.B. bushing with cracked porcelain shed was replaced.

Hangatiki.—The 50 kv. fuses were removed after installation of a line O.C.B. at Te Awamutu. The 50/11 kv. transformers were overhauled.

(*c*) *Transmission-lines.*

Seven 50 kv. pin insulators failed in service during the year, five of them being damaged by lightning, and one by flashover caused by a bird, and one being found badly cracked.

Also two 110 kv. suspension insulator units were damaged by lightning, and 25 units were damaged by leakage due to salt spray.

Three hundred and seventy-four pin insulators (50 kv.) were found defective by live-line testing during the year, and in addition twenty-eight were found defective by inspection. (A further 111 of two kinds which had been found to be liable to failure were replaced.) Of the 50 kv. insulators, 133 were replaced with live-line tools.

Thirty-four 52 ft., forty-eight 42 ft., three 38 ft., one 35 ft., one 30 ft., and thirteen 25 ft. poles were found defective and replaced during the year. On a number of poles on different lines holes due to decayed knots or other causes were cleaned out and filled with a bitumen mixture to prevent further decay.

On all 110 kv. and 50 kv. lines during the year there were a total of thirty-one outages due to faults on lines, involving outages of the lines on which they occurred of a total time of 170 hours 56 minutes, and, in addition, there were further outages, with a total time of about 300 hours, on the different sections of the Arapuni–Penrose lines due to salt in the severe storm of 2nd to 7th February, 1936.

This year's figures are for twenty-eight sections of lines, so that the interruptions average a little more than one per section, with an average time of about six hours to get the section of line ready again for service, and, in almost all cases, there was an alternative means of supply available to consumers.

The usual maintenance of lines and access tracks, and examination of insulators and poles, was carried out during the year. Special work on individual lines was as follows :—

Arapuni–Penrose 110 kv. Wood-pole Line.—Following the discovery of a pole with decayed heart-wood, all poles on this line were examined for decay by boring small holes right through them. Twenty-seven poles on this line were replaced on account of this defect, and seven for other defects, and several others were strengthened.

Penrose–Takapuna 50 kv. Line.—The overhaul and resagging of this line were completed. A number of tower bases were painted where showing signs of rust.

Hamilton–Frankton 11 kv. Line.—This line was altered by removing circuits from it which are no longer necessary, and is now a four-circuit line to pole 34 (three circuits for Central Waikato Power Board and one for Public Works Department consumers) and two-circuit from pole 34 to pole 124.

On a large number of Post and Telegraph crossings on different lines, double insulators and 7/16 copper wire instead of the existing solid wire were installed to comply with regulations.

Salt-storm in February.—After very heavy easterly wind with torrential rain on Saturday night and Sunday morning (1st and 2nd February, 1936), the rain ceased about noon on Sunday, and the wind changed through north to west and blew heavily all Sunday afternoon from the west without rain. It died down about 8 p.m. From then on the weather was normal, with heavy dews at night, until it rained heavily on Thursday night.

The westerly gale on Sunday must have carried inland an enormous quantity of salt, up to a distance of more than twenty miles, as, when dry, the salt was plainly visible on insulators, in the form of flakes not unlike frost, and traces of it could be seen on the ground at the foot of the towers.

At 3.46 p.m. on Sunday, all three Arapuni-Penrose circuits tripped out on fault, but the wood-pole line was closed in again normally, and hay found on the tower-line by patrol was considered to be the cause of the trouble, but at 11.50 p.m. all three circuits again tripped out in quick succession, and, shortly after, the structure at Bombay was found to be covered with a slimy coating of salt spray, and all insulators and bushings were sparking violently, owing to the combined effect of dew and salt.

About 2 a.m. patrols started from Penrose and Bombay on cleaning insulators, and shortly afterwards linemen from Hamilton started working north from Rangiriri Hills.

A summary of the work is as follows :—

By Monday at 6 p.m. eighteen men working eighteen hours cleaned insulators on both circuits of the steel-tower line on 167 towers, and at 6.48 p.m. both circuits were livened up from Arapuni to Bombay, and they remained in service until about 4 a.m., when they tripped out automatically due to a flashover.

On Tuesday thirty-five men worked twelve hours wiping most of these towers again (it having been found impossible, with the limited gear that can be carried, to clean off wet salt in one wiping), as well as wiping twenty-six additional towers. At 6.30 p.m. both circuits were made alive to Penrose, and remained alive until they tripped out automatically at 5.27 a.m. on Wednesday.

On Wednesday thirty-five men again worked twelve hours on wiping and patrol and completed the wiping from Rangiriri (Tower 313) to Penrose (Tower 527), also from Kainui (201) to Taupiri (214). At 12.56 p.m. both lines were made alive to Penrose, and were put on load, and there were no further flashovers.

On Thursday forty-two men worked twelve hours completing the wiping of the East Circuit (98 towers 215–313) and also wiping on the wood-pole line, while the West Circuit was left on load until 4.15 p.m., when, the East Circuit having been finished, the load was changed over to it.

On Thursday night heavy rain obviated the necessity of completing the wiping of the West Circuit, which was left alive all night, and put into normal service at 8 a.m. on Friday.

On Friday forty men worked ten hours patrolling and examining insulators on the wood-pole line, and found all but a few traces of salt had been washed off by the rain, and the line was tested and ready for service about 5.30 p.m.

In the five days the total number of insulator units cleaned was about 15,000, on 326 towers and 739 poles, on about sixty miles of line between Taupiri and Penrose. Signs of flashover were found on sixty-four strings of insulators, of which six complete strings were replaced, and on fifteen strings the tower (or pole) unit was replaced. Nine lengths of damaged cable have since been replaced, and hay and bark removed from two towers.

(*d*) *Reliability of Supply.*

At the sixteen major points of supply the average number of accidental interruptions was 12·5, of an average duration of 16·9 minutes, compared with fourteen and twenty-two minutes, and 7·5 and 5·5 minutes for the two previous years.

In addition, the average number of pre-arranged interruptions for repairs, &c., was 5·9, of an average duration of 1 hour 48 minutes, compared with 5·6 and 1 hour 40 minutes, and 4·1 and 1 hour 15 minutes for the two previous years.

B. PALMERSTON NORTH DISTRICT.

1. Construction.

(*a*) power-stations.

Mangahao Power-house and Headworks.—The new gate winches at the surge chamber were installed and lifting-tests carried out on them. In the meantime, all the necessary control circuits have been completed with the exception of the tripping-circuit. The contacts of the tripping-devices to be installed on the pipe-lines are being altered from the mercury-in-glass type to a mechanical type in order to eliminate the possibility of mal-operation during earthquakes. The extensions to the surge-chamber and the new winch-house were also completed during the year.

Cottages.—Good progress is being made by the contractor with the erection of seven new staff cottages and additional single men's quarters in the village at Mangaore.

Waikaremoana Power-house and Headworks.—At Onepoto construction was commenced on the lake-control scheme, a camp being established and service transformers installed for the camp and construction plant. This work has, however, been suspended for the present.

In the village good progress is being made by the contractor with the erection of eight new cottages for staff accommodation, and it is anticipated that these will be completed in six weeks' time.

(*b*) substations.

Khandallah.—In connection with the additions to be made to the outdoor switch-gear, three new cantilevers have been erected, and the motor-operating gear has been installed for the transformer air-break switches.

Melling.—Three new single-phase auto-transformers have been dried out and connected into service: these will facilitate the regulation of the voltage on the 11 kv. bus-bars of the substation.

Paraparaumu.—This is a new substation and, to date, the switch-room and two cottages have been completed, while the rest of the equipment—transformers, switch-gear, &c.—is on order.

Bunnythorpe.—The new 110 kv. O.C.B. disconnects and air-break switch, together with the necessary double-line relays, were put into service on the Bunnythorpe–Woodville duplicate line.

Marton.—110 kv. liquid fuses were installed for the purpose of transformer protection.

Wanganui.—The erection of the steelwork for the fourth bay at Wanganui has been completed, as well as the new line O.C.B. and its corresponding air-break switch. The O.C.B. for a new 4,500 kv.a. transformer bank has been erected, and the new transformers have been dried out and the necessary concrete pads installed.

Hawera.—Considerable trouble has been experienced here in the past due to blown lightning-arrester fuses, and the lightning-arresters have now been replaced by a more modern type.

Stratford.—Construction work at this substation has now been completed. The condenser was dried out and put into service, and a 25 kv.a. local service transformer installed.

New Plymouth.—As at Hawera, the lightning-arresters, of an obsolete type, have now been replaced by a modern design.

Woodville.—With the completion of the duplicate line to Bunnythorpe, the outdoor structure was reconstructed. In order to do this a by-pass was erected round the northern and southern sides of the substation, the Masterton line being supplied directly from Bunnythorpe.

A point of interest with regard to this work is that new eye-bolts on the Mangamaire and Dannevirke sides of the structure were fitted with the line alive. These replaced shorter ones in order to give greater clearance between the air-break switch bases and the O.C.B. jumpers.

(*c*) TRANSMISSION-LINES.

Melling–Masterton.—The location and survey of the transmission and telephone lines was practically completed by the end of June.

The final location of the portion of the transmission-line crossing the Rimutaka Range was checked by an aeroplane flight over the route, this being the only feasible method of ensuring that the best route had been selected over very broken country.

Bunnythorpe–Woodville.—The duplicate line between Bunnythorpe and Woodville was completed and put into service during the year.

Tuai–Gisborne.—The duplication of the Tuai–Ruakituri section of this line is well advanced, thirteen out of seventeen miles of poles being erected. Wiring is to be commenced almost immediately, and it is anticipated that the line will be ready for service in October, 1936.

General.—Owing to the unsatisfactory nature of the pole foundations on the Tuai–Ruakituri duplication, a considerable amount of work was carried out in order to decide on a satisfactory method of guying the poles, and a suitable design has now been approved.

(*d*) TELEPHONE SYSTEM.

Owing to the risk of lengthy disruption of telephone communication which may be occasioned by gales and earthquakes, a decision was made to install radiophone transmitting and receiving-sets at Mangahao and Tuai Power-houses. After much investigation the receivers at both power-houses have now been installed in permanent locations, and fairly satisfactory communication is obtained except in the middle of the day, when reception is poor at either end. The question of increasing the power of the transmitting-sets is being considered.

A double-circuit line was run on railway property between the new offices at Palmerston North and Bunnythorpe Substation. The telephone board at Bunnythorpe was completely reconstructed, and automatic selector equipment added, so that the new office now has instantaneous access by telephone to all parts of the system and *vice versa*, two conversations being possible simultaneously.

(*e*) TESTING.

In conjunction with the shifting of the district office to Palmerston North, the test-room was shifted from its old location in the Power-house at Mangahao to more spacious quarters on the ground floor of the new office. Shortly after the shift to Palmerston North, the new testing-equipment came to hand, and has been put into operation. This equipment, which includes current and potential generators with sine wave characteristics, greatly facilitates the testing of meters and relays.

In connection with the expansion of the activities of the testing staff in the field, designs were prepared for a new transport-vehicle, which has now come to hand. This vehicle includes special compartments so that the various instruments may be carried conveniently, in addition to providing ample space for loose equipment.

2. OPERATION AND MAINTENANCE.

(*a*) POWER-STATIONS.

Mangahao Power-house and Headworks.—As a result of the wet season the water-supply was well maintained during the year. At No. 1 dam the rainfall amounted to 175·04 in., rain being recorded on 216 days. A particularly wet period was experienced towards the end of October, and the Arapeti Dam overflowed for the first time since the system went into operation, water flowing over the crest to a depth of 8 in. The total amount of waste water recorded for the year at No. 2 dam was 10,628,000,000 cubic feet.

The access road was blocked on numerous occasions by slips, some of which were of considerable magnitude, and during the gale on the 2nd February, 1936, many large trees were blown across the road. The telephone and indicator lines between Nos. 1 and 2 dams suffered very severely and had to be completely dismantled. A new line is being erected on the same poles as the power-supply.

The General Branch established a camp at the headworks, and, after erecting a new reinforced-concrete bridge at Tramline Creek, proceeded with the work of concreting the Cushion Pool below No. 2 dam. In spite of indifferent weather, the work proceeded smoothly and was completed early in April.

Sandblasting of the bus-pipes in the power-house was completed and Nos. 1, 2, and 3 turbines and governors were completely overhauled. Comprehensive governor tests were then carried out on all three machines, the generators being loaded on the test tank for the purpose.

In continuance of the policy of improving the working-conditions in the switch-gallery, a sound-proof cover has been fitted over the voltage regulators. Investigations were also made with regard to the lighting, and these resulted in a big improvement being effected by excluding all direct daylight, thus reducing very considerably the glare from the black polished panels and the glass faces of the instruments.

Following the removal of the district office to Palmerston North, the old office building was converted into a social hall, while the old test-room in the power-house building was fitted up as a storeroom.

Work was continued on the strengthening of the power-house earthing-system, which is being brought up to present-day standards.

Waikaremoana Power-house and Headworks.—Due to a very wet season, the lake has been at a higher average level this year than for many previous years. The lake-level in August, 1935, was just under 2,020 ft., and the lake level varied over a range of 7 ft. during the year. The average measured discharge was 590 cusecs, and the rainfall for the year 87·78 in.

During the storm in February, 1936, the surge-chamber gate control lines swung together, causing the surge-chamber gate to drop. The push-buttons in the gate-control house have been covered with glass cases, to prevent accidental operation.

The control-room has been silenced by lining the walls with insulating board and putting in double windows, and in order to maintain adequate ventilation a 24-in. fan was installed in the roof and slots opened up in the floor. New lighting fittings were installed, the average intensity of illumination being increased from two and a half to seven foot-candles in the centre of the room.

Test switches have been installed to test the various circuit-breaker trip circuits. A fault on a 110 kv. air-break switch revealed that under certain conditions the indicating lights did not show the true position of the switch-arm, and accordingly new auxiliary switches are being installed to take care of this. Over-voltage relays have been installed to protect the main generators.

In the outdoor station new sleepers were laid in the centre traverser track, and schemes were prepared for lighting the outdoor structure and erecting screens to protect workmen while near high tension apparatus.

(*b*) SUBSTATIONS.

Khandallah.—One 110 kv. capacitor bushing failed, but was taken out of service without causing an interruption. All capacitor bushings have now been fitted with new porcelain rain-sheds.

One single-phase unit from the main transformer banks was taken out of service during the year for inspection. The core and windings were lifted out and found to be in excellent condition after eleven years' service, no trace of sludge or moisture being found. At the same time, the oil was renewed in the high-tension bushings, and the low-tension bushings were overhauled.

New inverse time overload relays were fitted on the east and west 11 kv. transformer O.C.B.s, and on the Wellington City Nos. 1 and 2 feeder O.C.B.s.

Other work done includes the following: Repairs were carried out to the regulator rotor of the Testing transformer, the pilot-lighting of the 11 kv. switch-gear was changed over from D.C. to A.C., and an automatic relay installed, and a new recording K.V.A.H. and K.W.H. meter was installed on the railway feeder. The test-tank for bushings was fitted with immersion heaters in order to carry out tests in hot oil.

Melling.—On the 26th May, lightning struck and caused severe damage to one single-phase unit of the transformer bank. The tank burst, allowing the oil to escape, and the windings were destroyed by fire.

A new transformer unit without radiators and fittings was ordered, and has been dried out as a spare, being fitted with radiators and other serviceable parts from the damaged unit.

At the same time new windings were ordered for the damaged unit and will be fitted to the undamaged core. The old tank was repaired, and will be used as a storage-tank for the reconditioned coils when these are dried out.

During a flood in the Hutt River, the substation site was flooded, the water rising to the level of the lower workshop floor. On another occasion a serious flashover took place on the Hutt Valley Power Board's 11 kv. structure, shattering a number of insulators.

Bunnythorpe.—A synchroscope has been installed for the purpose of paralleling the system on the bus-tie O.C.B., and gear has been installed so that when both bus-tie switches are open, single-line protection will be on the two Bunnythorpe-Mangahao lines.

Marton.—A 110 kv. transformer bushing which gave a low megger reading was changed, and the tripping battery and D.C. wiring overhauled.

Wanganui.—Repairs were carried out to No. 5 air-break switch, and the traverser track and truck were overhauled in readiness for the installation of the new transformer bank.

Hawera.—Interruptions to supply were caused on two occasions during lightning storms. On the first occasion all three lightning-arrester fuses were blown, and on the second one fuse was blown.

Stratford.—On the 13th and 14th April a heavy deposit of salt was left on the structure during a storm, necessitating the cleaning of the whole structure.

The metering-equipment on the Arapuni tie-line has been modified to measure the kw. demand in both directions.

New Plymouth.—No trouble was experienced here during the year, except on one occasion when all three lightning-arrester fuses were blown during a lightning-storm in the district.

Masterton.—During the gale on the 2nd February, 1936, an earthquake release clamp came adrift, allowing a 110 kv. lead to one transformer to fall on the conservator tank, but no damage resulted.

Mangamaire.—A new armature was installed in the operating motor of the 110 kv. O.C.B. Following low megger tests, this O.C.B. was taken out of service and the bushings, pull-rods, and tanks were dried out, and at the same time provision was made for draining the oil from the bushings.

Woodville.—During the reconstruction of the substation, new post insulators were fitted to the air-break switches.

Dannevirke.—Eighteen defective post insulators and four switch units were changed on the structure, and a spare 110 kv. bushing was modified so that it can be readily emptied of oil.

Waipawa.—The metering-equipment was transferred from a panel on the 11 kv. switch-gear to a new swinging panel mounted on the wall, and new meters and relays were installed on No. 1 transformer panel.

Napier.—Four faulty bushings and one faulty cable-box were taken out of service for overhaul before any interruption to supply occurred.

A number of faulty switch and post insulators on the structure were also replaced.

Wairoa.—No trouble was experienced here during the year.

Gisborne.—Due to a series of faults on the Poverty Bay Power Board's system, the earthing reactor burnt out and had to be rewound.

(*c*) TRANSMISSION-LINES.

(i) *110 kv.*

Mangaore–Khandallah Duplicate Line.—The special maintenance gang has been occupied on this line during the year. A very considerable amount of maintenance work has been carried out, including refitting and shortening poles, changing insulators, and other miscellaneous work.

Stiffening of all towers on this line has been completed, and a cross-arm on tower 58, which failed while changing insulators, was repaired.

During the month of October, 1935, a flood in the Ohau River washed out one transmission-line pole and a flood in the Waikanae River endangered two poles, necessitating urgent protective work being carried out. Subsequently, four poles at the Ohau River were replaced by two piled poles, there being sufficient clearance to eliminate two poles altogether. Similarly, at the Waikanae River, two double poles were replaced by two piled double poles, and two single poles were piled.

On the telephone-line a deviation had to be made near Paekakariki to avoid peat fires in the swamp. Two poles were replaced at the Ohau River by one piled pole and a deviation made at the Waikanae River after the October floods, three of the poles in the new line being piled. As a result of these alterations, some six miles of galvanized-iron wire were replaced by copper-weld, and all dry joints were soldered.

During the gale on the 2nd February, 1936, no trouble was experienced on the west line, but three faults occurred on the east line. In the vicinity of Waikanae and Waitohu branches of trees were blown across the line, while near Mangahao Power-house a conductor was broken by the gale. In addition, a fairly large number of poles were loosened in the ground and were found to have a lean towards the west; these were subsequently straightened and re-rammed.

On the telephone-line most of the trouble was caused by trees or branches being blown across the line, breaking the conductors in several places. Several poles were pulled out of line near Waikanae, a lightning-arrester insulator was broken at Potts Road telephone-hut, and a quantity of hay was blown into the line near Ohau and Manakau.

The gale was evidently less severe on the southern section, as no trouble was experienced on the main line south of Waikanae and on the telephone-line south of Paraparaumu.

Poles replaced: 17 transmission-line and 20 telephone-line.
Poles dismantled: 10 transmission-line and 6 telephone-line.
New poles erected: 8 transmission-line and 9 telephone-line.
Broken main line conductors: 1.

Khandallah-Melling.—The usual maintenance work was carried out on this line, no trouble being experienced during the year.

Mangaore–Bunnythorpe Duplicate Line.—Protective work was carried out at the Manawatu River, and strengthening work was completed on the two river towers and the four towers at Mangaore.

During the storm on the 2nd February a conductor was broken by flying material on the west line near Linton; otherwise the damage was confined to poles being blown out of plumb, and a number of hanger brackets which were blown up and had to be readjusted after the storm.

The telephone-line suffered considerably during this gale, two poles being broken, Victoria telephone-hut wrecked, and Whitmore telephone-hut being blown off its foundations.

Poles replaced: 6 telephone-line.
Broken poles: 2 telephone-line.
Main-line conductors broken: 1.

Bunnythorpe–Marton-Wanganui.—Protective work was carried out at the Oroua River crossing, and poles were inspected for sun cracks. No damage was done to the main line by the gale on the 2nd February.

A large amount of damage was done to the telephone-line during February's gale, due to trees falling on the line; at the Wangaehu River crossing the wires were tangled, presumably by a tree coming down the river, which was in high flood.

Poles replaced: 2 telephone-line.
Poles broken: 1 telephone-line (broken by car).

Wanganui–Hawera–Stratford.—During a lightning-storm on the 18th October, 1935, a considerable amount of damage was done to the main transmission and telephone lines. On two structures the damage was mainly confined to shattered insulators, while on a third structure, in addition to shattered insulators, one pole was split.

A post unit on the Waverley air-break switch which had probably been damaged by a rifle-bullet was replaced and the steelwork scraped and painted. Earthing-mats were fitted to the Wanganui River towers.

No damage was caused by the high winds on the 2nd February.

After the lightning-storm mentioned above, one pole and six crossarms had to be replaced.

Poles replaced: 2 telephone-line.

Stratford–Pohokura.—No trouble was experienced on this line during the year.

The telephone-line was deviated to provide better clearance at the Toko rifle range, and five binders had to be replaced after the storm on the 2nd February.

Bunnythorpe–Woodville.—No trouble was experienced on the existing west line, and all towers on this line have now been strengthened.

After the gale on the 2nd February, nearly all the poles on the recently erected east line were found to have a lean and had to be straightened and rammed. The existing west line was undamaged.

The telephone-line was very badly damaged during February's gale and had to be practically reconstructed. In addition, the Summit telephone-hut was blown over and wrecked.

All dry joints on the telephone-line were soldered and the Summit and Ruahine telephone-huts were wired down.

Poles replaced: 2 transmission-line and 10 telephone-line.
Poles broken: 2 telephone-line.

Woodville–Mangamaire–Masterton.—The special maintenance gang completed the overhaul of this line during the year. A large number of poles were replaced, refitted, or had other maintenance carried out on them. The Manawatu and Waingawa River towers were strengthened, and the earth wire was removed from Masterton Substation northwards.

Little damage was done on this line by the gale on the 2nd February. One main-line pole was blown nearly over, and had to be straightened, otherwise the line was undamaged.

Poles replaced: 19 transmission-line and 11 telephone-line.
Poles broken: 1 telephone-pole.

Woodville–Dannevirke–Waipawa–Napier.—The special maintenance gang has nearly completed the overhaul of this line, a small amount of work remaining to be done in the vicinity of Dannevirke. River-protection work was carried out at the Avoca River. The removal of earth wire on this line has been completed with the exception of that on the north side of Waipawa, which has been left to operate the wind-gauge. Bracing has been completed on all towers on this section, and non-standard insulator strings converted to standard strings.

No damage was experienced during the gale of the 2nd February.

During the storm of the 2nd February many trees were blown across the telephone-line, cross-arms and conductors being broken.

Poles replaced: 46 transmission-line and 2 telephone-line.
Poles dismantled: 1 telephone-line.
New poles erected: 2 transmission-line.

Napier–Tuai Duplicate Line.—Both lines have been overhauled, and earth resistance at all towers reduced to 10 ohms.

During the overhaul of the east line a large number of broken cable strands were found in clamps, especially at weighted positions. The position seemed so serious that, during the overhaul of the west line, a very detailed examination was made and the results analysed. Although there were more breaks at suspension positions, the percentage of breaks was greatest for weighted positions, no breaks being found at strain towers. Check tests of the tension were made showing that the line was slightly over-tensioned.

Following the detailed results from the west line, comprehensive tests were carried out with two objects in view—namely, to determine the effect of festoon dampers, and to determine as nearly as possible the exact nature of vibrations at weighted positions. An experimental span was fitted up on which vibrations of any desired frequency could be produced by means of a mechanical device. The results of these tests have been analysed, and consideration is now being given to the problem of overcoming the effect of vibration at the clamps.

(ii) *50 kv.*

Stratford–New Plymouth.—After the gale in February, twenty-seven poles, two of which were blown nearly over, had to be straightened and rammed.

Tuai–Gisborne.—Pole 385 was removed, due to ground slipping, and, following trouble due to contacts between the telephone-wire and one phase of the transmission-line during a high wind, a span breaker was put in between poles 28 and 29, and the telephone-wires were lowered between poles 33 and 34. Another interruption was due to an opossum coming into contact with the main line.

An outage of eighteen hours occurred following the gale on the 2nd February. Subsequent investigations support the theory that the outage was due to a broken insulator on the 50 kv. air-break switch at Gisborne. At the time, however, considerable difficulty was experienced in patrolling the line in an attempt to discover the cause of the outage due to the stormy conditions and lack of telephone communication. The line suffered no damage, however, and power was restored after the Poverty Bay Power Board had carried out temporary repairs to its system.

On the telephone-line fuses were blown at Tuai, Ruakituri, Hangaroa, and Gisborne, due to induced current in the telephone-line. Near Hangaroa the conductors were cut by a sheet of iron blown against the line by the gale.

Poles dismantled: 1 transmission-line.
New poles erected: 1 telephone-line.

Tuai–Wairoa.—An interruption of fourteen hours was caused by a pole breaking during the gale of the 2nd February, otherwise the line gave satisfactory operation during the year.

Poles replaced: 3 transmission-line.
Poles broken: 1 transmission-line.

(iii) *11 kv.*

No trouble was experienced on 11 kv. lines during the year, the only interruption due to trouble on these lines being caused by a piece of hoop-iron which came into contact with the Hutt Valley feeders. A number of poles on these feeders had to be straightened after the storm on the 2nd February.

(iv) *General.*

(1) *Lightning-storms.*—Eight lightning-storms were experienced during the year, seven of which caused interruptions to supply. Four affected apparatus at substations; one near Hawera caused several insulators to flash over on the Hawera–Wanganui line and damaged the telephone-line; one near Khandallah caused a total interruption on the two Mangahao–Khandallah lines, but caused no damage; while the seventh tripped the Mangahao–Bunnythorpe west line, but caused no damage.

The other lightning-storm occurred on the Arapuni–Stratford line, but caused no interruption to supply to any consumer.

(2) *Special Maintenance Work.*—During the year the "live-line" gang carried out the following work with the line alive: 64 poles were replaced, 94 poles lowered, 196 poles refitted, crossarms on 64 poles overhauled, and 123 insulators changed.

In addition to the above-mentioned maintenance work, the following special work was carried out under live-line conditions:—

A damaged isolating-link at Woodville was repaired alive, and at the same substation the eye-bolts at the terminals of the Dannevirke and Mangamaire lines were replaced by longer ones.

During the reconstruction at Woodville jumpers were removed and later replaced to give clearance for work on the structure.

At Mangamaire jumpers from the line to the isolating-links of the O.C.B. were removed and later replaced in order to give clearance for work on the O.C.B. bushings.

At Bunnythorpe the 11 kv. leads from a pothead to the Manawatu-Oroua Power Boards' lines were removed alive and later reconnected.

Experimental work was carried out to check a method of testing post insulators by the buzz-stick method, and subsequently the post insulators at Dannevirke and Waipawa were tested by this method.

The other special maintenance gang was employed on the Mangaore–Khandallah line during the year, and worked under "dead-line" conditions.

(3) *Khandallah High-tension Testing-set.*—The usual retests were made at Khandallah of all insulators found "dud" by the buzz-stick tests and removed from the line. In addition to these, the following special tests were made during the year:—

Flashover and thermal cycle tests were made on sixteen units submitted for test; porosity tests were made on some fifty kv. pin-type insulators, and several post insulators were submitted to a 50-cycle power test under salt conditions.

An 11 kv. strain insulator submitted by a supply authority was tested for wet and dry flashover at 50 cycles, and some 33 kv. pin-type insulators were submitted to a flashover test.

(*d*) TELEPHONE-LINES.

In order to reduce the number of vibration breaks which were occurring on the cadmium-copper sections of the telephone-lines, cork dampers were fitted on all sections, and, with the exception of one break which occurred very shortly after the installation of the dampers, the trouble has ceased.

(*e*) TELEPHONE SYSTEM.

Investigation Work.—Measurements of the induced voltages occurring on the telephone-lines during earth faults on the power-lines were carried out, and these will serve as a basis for rationalizing the degree of insulation required and the system of protection against damage to apparatus and acoustic shock to operators.

General.—The enclosure and sound-proofing of the control-rooms at Tuai and Mangahao Power-houses has been completed, and, as a result, the receiving and transmitting conditions have been greatly improved.

(*f*) TESTING.

Maintenance tests on all relays and metering equipments were carried out in accordance with the six-monthly testing schedule. A large number of special tests were carried out in the test-room and in the field. These included tests on the telephone system and apparatus, and the calibration and testing of meters and substandards for various supply authorities.

Following the mal-operation of No. 6 O.C.B. at Khandallah, an investigation was made and tests were made on the east line capacitor bushings. A number of tests were made, and a method was developed to obtain comparative tests between good and bad bushings, these tests being made with the apparatus in service.

(*g*) GENERAL.

Load.—Standby stations were called on to supply power to the Department on four occasions.

The New Plymouth Borough Council supplied 5,060 units, the Taranaki Power Board supplied 10,136 units, and the Wellington City Council generated 54,826 units at the Department's request, and 19,388 units were supplied back to Khandallah Substation.

The maximum load on the system was 55,120 kw., as compared with 53,010 kw. for last year, an increase of 4 per cent. The total output was 274,728,861 units, as compared with 260,499,714 for last year, an increase of 5.5 per cent. The annual load factor was 56·7 per cent. for this year, as against 56·1 per cent. for last year.

During the year the Mangahao–Waikaremoana system was operated in parallel with the Arapuni system, and the following figures relate to the interchange of power between the two systems :—

Units taken from the Arapuni system totalled 38,414,250 for this year, as against 51,889,765 for last year, while this year 319,901 units were supplied back to the Arapuni system. The maximum demand on the Arapuni system was 19,800 kw., as against 23,160 kw. last year.

Reliability of Supply.—During the year there were seventy-four faults causing interruptions to consumers, forty-one of which originated on the Department's system and thirty-three occurred on consumers' systems.

Due to faults on the Department's system, supply to Khandallah Substation was interrupted on six occasions during the year, of a total duration of fourteen minutes. On one further occasion, while urgent repairs were being carried out on the Mangahao–Khandallah transmission-line, Khandallah Substation was being supplied from the Wellington City Council's station at Evans Bay. During this period an interruption to supply of thirty-four minutes occurred to the other consumers supplied from Khandallah, owing to trouble on the Wellington City Council's system.

The average number of interruptions to each of the nineteen consumers was eight, faults on the Department's system being responsible for an average of five interruptions per consumer. The average duration of each interruption was thirty-five minutes, but, excluding ten major interruptions, this average is reduced to 5·4 minutes. Four of these major interruptions were caused by the gale on the 2nd February, 1936.

Storm on the 2nd February, 1936.—On the 2nd February a storm of unprecedented magnitude was experienced over a wide area, covering most of the Mangahao–Waikaremoana system. The greatest wind intensity was felt in the Manawatu-Oroua and Horowhenua districts, including Palmerston North, where plantations were levelled and many roofs torn off.

In certain parts of the Managahao headworks practically all the large trees were levelled to the ground, and a large amount of damage was done to the telephone and indicator lines by these falling trees.

In the staff village at Mangaore the telephone and local service lines suffered severely, and severe damage was done to the young plantations and to the cottage fences.

Details of the damage to individual lines have been given under their respective headings.

With the exception of that due to a broken pole on the Tuai–Wairoa line, all interruptions were due to branches of trees and building material being blown across the transmission-lines. A considerable amount of tree-cutting has since been done, so that the telephone and transmission systems should be reasonably free from similar troubles in the future.

On the transmission-lines a great deal of work had to be done after the storm in straightening poles which were leaning over, particularly on the newly erected Bunnythorpe–Ashhurst section, where the ground had not had time to consolidate properly.

No trouble whatever was experienced on the sections where the lines are carried on steel towers.

The telephone-line also suffered severely from falling trees. The worst section was the double-circuit line between Bunnythorpe and Woodville, where long plantations of trees crashed across the lines, reducing them to a mass of wreckage. These lines had to be practically rebuilt.

A serious feature was the extensive disorganization of the communication system, but fortunately no serious interruption to supply was experienced as a result of this. As the Post and Telegraph Department's system was also seriously disorganized, communication between Mangahao and Tuai had to be maintained by radio during the storm. This was not altogether satisfactory owing to the poor reception experienced during the daylight hours. In order to meet such an emergency in the future, a scheme is now being investigated with a view to installing small emergency radio-transmitting sets at each substation. By this means communication will be possible at all times from substation to substation.

In addition to the trouble experienced on the Department's system, very considerable damage was caused on most supply authorities' systems, resulting in extensive interruptions to supply. Accordingly, as soon as the necessary repairs had been carried out on the Department's system, assistance was given by the two special maintenance gangs to the Horowhenua, Manawatu-Oroua, Dannevirke, and Tararua Power Boards, and to the Palmerston North City Council. The assistance of these skilled linemen undoubtedly contributed very materially towards the restoration of electricity-supply in the storm-stricken areas with a minimum of delay.

I would like to pay a tribute to the work of the staff, and particularly to the linemen for their work during and after the storm on the 2nd February, 1936.

Transfer of District Office.—During the year, the district office was moved from Shannon to the new office building in Palmerston North, and the transfer was carried out expeditiously with very little interruption to the office routine. The working-conditions have been considerably improved for the staff by the more commodious quarters and better lighting and heating in the new office. Moreover greater efficiency is obtained, from an administrative point of view, by the accommodation of the whole of the office staff, stores, and test-room in the same building.

SOUTH ISLAND ELECTRIC-POWER SYSTEM.

The year ending 31st March, 1936, represents the twenty-first year of operation of the Lake Coleridge undertaking, and the first complete year of operation of the Waitaki Power-station. Since January, 1936, the Dunedin City Corporation plant at Waipori has also been in parallel with the Department's system, and this has led to a peculiar position regarding the annual returns. On one occasion a failure of the Waipori supply threw the major part of the Dunedin load on the Department's system for a few hours, and during this time the maximum system output of 40,100 kw. was registered. Apart

from this isolated peak, the normal peak load was 36,780 kw., and, as we did not derive any revenue from the additional load, the use of the figure of 40,100 kw. would nullify any real comparison between the figures for this and previous years. Therefore, the figure of 36,780 kw. has been adopted as the maximum system load for the period under review.

1. Capital Outlay.

The capital outlay at 31st March was £4,460,382, of which assets to the value of £18,075 were not in operation.

2. Financial Results.

The total revenue for the year was £245,258, and working-expenses £53,900, which made a gross profit of £191,358, equal to a return of 4·32 per cent. on the average capital outlay in operation (£4,431,949).

The interest charge for the year was £177,217, an increase of £79,425 on 1934–35, owing to the Waitaki assets being in operation for the full year. An amount of £65,609 was transferred from the General Reserve Fund to enable the full appropriation to be made for the Depreciation Reserve.

No funds were available for sinking fund this year, the deficiency to this account was £53,493 at 31st March.

The accumulated Depreciation Reserve and sinking funds at 31st March, 1936, amounted to £659,116, and the General Reserve Fund to £175,809.

Table I gives full particulars of financial results, as well as other relevant statistical information.

The detailed operating-costs (Table III) shows that the total costs per unit generated for the year were 0·075d., compared with 0·057d. for the previous year. The increase in working-expenses is due mainly to the $7\frac{1}{2}$-per-cent. restoration of salaries and wages, and the operation of Waitaki Station.

Table V shows the gross financial results of the distribution of energy of the South Island electric-power system and of the supply authorities and consumers who are supplied by it.

3. General.

The total units generated was 170,516,380, representing an increase of 12·67 per cent. on those for last year. Of these units, 149,698, 738 were sold, while 3,329,480 were otherwise accounted for. The balance, representing losses, totalled 17,488,162 units, or 10·25 per cent. of the units generated.

The maximum system load increased from 32,540 kw. to 36,780 kw., an increase of 13 per cent.; although, as previously explained, an isolated peak of 40,100 kw. was registered.

Based on 36,780 kw., the annual load factor was 52·7 per cent.

The connected-load return shows a big increase, but this is largely due to the inclusion of the figures for the Dunedin City Corporation. Apart from this, however, the figures for the Christchurch City Council show a marked increase. The actual connected-load totals 355,840 kw., compared with 249,847 kw. for last year. The demand factor based on 36,780 kw. has fallen from 13·05 per cent. to 10·32 per cent.

4. Construction, Operation, and Maintenance.

(1) Construction.

(*a*) *Power-stations.*

Lake Coleridge Power-station.—There was practically no construction work done during this year, with the exception of the installation of an induction-regulator for use on the local service supply. This installation is not quite completed.

Waitaki Power-station.—The main part of this station was completed prior to the period under review, but minor additions were made consisting of the installation of No. 2 telephone-exchange; meters in staff cottages; fencing around the 110 kv. lightning-arresters; and handrails in the power-house. A 32-volt lighting system was put into operation in the top gallery of the dam.

The new hydraulic recorders for registering the lake and tail-race level were received and erected.

The temporary 66/11 kv. substation through which power was supplied during construction was dismantled.

(*b*) *Substations.*

Addington Substation.—The 66 kv. lightning-arresters were dismantled from the three incoming 66 kv. lines, one set being re-erected near the steel structure and connected to the bus-bars.

The new lighting standards associated with the outdoor structure were erected and put into service, with very satisfactory results.

Another two bays were added to the stores building, owing to the increasing demand for storage space.

Hororata Substation.—Two new cottages were built for the accommodation of linesmen.

Pound Substation.—Extensive alterations are in progress at this substation, due to the dismantling of the line to Ashburton. In future this substation will be unattended.

Ashburton Substation.—The two new cottages were commenced, but as yet have not been completed.

Good progress was made with the installation of the 11 kv. metal-clad switch-gear, the bulk of which was transferred from Timaru Substation. This switch-gear with its control panels is nearly ready for service.

It was found necessary to rebuild one of the line terminal structures in order to accommodate the new line from Hororata, as the poles of the old structure showed signs of decay.

Timaru Substation.—The 11 kv. switch-gear transferred from Addington was completed and put into service on 23rd June, 1935, the old substation being disconnected on the 30th June.

The old 11 kv. switch-gear was dismantled and part forwarded to Oamaru and the balance to Ashburton.

The 66 kv. relay system was finally completed and put into service.

The two original cottages were connected to the sewerage system, and are being supplied with power from the new substation.

Glenavy Substation.—A third concrete cottage was erected during the year for the accommodation of a lineman.

All overhead services were replaced with underground cables.

The fencing round the structure was completed, while the layout and levelling of the section were further improved.

Oamaru Substation.—Two further cottages were erected, and the storm-water drainage was extended.

The 11 kv. switch-gear from Timaru was re-erected, together with the necessary control panels.

Control panels for the 110 kv. lines were installed.

Two more 110 kv. oil-circuit breakers were put into service.

An induction-regulator, transferred from Addington, and the new 11 kv. switch-gear were put into service on 9th February, 1936.

Half-way Bush Substation.—This station was essentially complete and was ready to supply power on 1st April, 1935, but the Dunedin City Corporation did not take load until the 28th April. Minor work was done, including the erection of local service panels, extensions to drainage, fencing, and levelling of section.

(*c*) *Transmission-lines.*

The old 11 kv. southern feeder from Addington to Stoddart's Corner was replaced by a 33 kv. line. This line is built for a double circuit, but only one set of conductors has been run at present. The Banks Peninsula Power Board is now supplied direct from Addington at 33 kv.

This year saw the removal of part of the first 66 kv. transmission-line to Timaru—the section between Point Substation and Ashburton. A new 110 kv. line (operating at 66 kv.) was built from Hororata to Ashburton, and this necessitated the removal of the Point–Ashburton line, which it was designed to supersede. The new line has been completed, but has not yet been put into service.

(*d*) *Telephone System.*

This year has seen the development of the trunk telephone system, which runs, wherever possible, on railway poles. The circuits brought into operation are as follows:—

Addington–Bankside–Hororata–Lake Coleridge.
Addington–Ashburton.
Ashburton–Timaru.
Timaru–Glenavy—Oamaru (previously in service).
Oamaru–Dunedin.

The result is that clear speech is possible from one end of the system to the other, and there is freedom from the noise usually associated with power-line telephones.

Another innovation is the use of weatherproof telephones instead of the usual huts and telephones. The absence of high induced voltages on the telephone system also permits the omission of insulating transformers and drainage coils, with a consequent improvement in speech transmission.

(*e*) *Testing.*

This branch of the Department's activities has had a heavy year, due to the fact that construction work was proceeding right through the system, and has been responsible for the design and development of the substation control panels, transformer tapping switches, and for the testing of all equipment prior to its being put into service. This latter work has involved much travelling and long hours for the staff, as their work is of a very specialized nature and cannot be delegated.

(*f*) *Survey.*

The plans of the Oamaru–Dunedin 110 kv. line were finally corrected and traced.

A complete survey of the 110 kv. Hororata–Ashburton line was made, and also of the Addington–Stoddart's Corner 33 kv. line.

The Bankside – Lake Coleridge telephone-line was located and pegged.

Some survey work was done in connection with the taking of further land at Ashburton.

Apart from the above, general office work and a considerable amount of work relating to easements on the Oamaru–Dunedin line was undertaken.

Preliminary data was obtained for the Coleridge to Arthur's Pass 66 kv. line.

(2) Operation and Maintenance.

General.—During the first few months of parallel operation a certain amount of trouble was experienced, due to difficulties with the voltage-regulators and excitation system at Waitaki. This, combined with the incomplete state of the relay system and with the lack of direct telephonic communication between Coleridge and Waitaki, resulted in several interruptions to the southern substations, but with the correction of the regulators, the completion of the relay scheme, and particularly the completion of the trunk telephone, the number of interruptions dropped in a most marked manner.

Lake Coleridge Power-station.—Due to the parallel operation of the system, it has been possible to keep up the level of Lake Coleridge throughout the year, and there were no difficulties on this account.

The Harper River diversion gates are showing pronounced signs of the wear due to prolonged operation with heavy flow, and proposals are being formulated for the construction of a new set of diversion gates and intake works.

The Acheron diversion was in use for about five months of the year. Further losses of screen-bars have occurred, and the screen-supporting structure is being redesigned accordingly.

On the 18th November, 1935, a disastrous accident occurred, No. 3 pipe-line had been drained for a month in order to permit of the usual scraping and painting. This work was almost complete when the accidental opening of the surge-chamber gate filled the pipe-line with water and caused the death of three men. A small amount of damage was done in the powerhouse itself, and No. 1 generator winding had to be repaired.

Early in December, 1935, an unusual leakage started in the No. 2 tunnel adit. On examination it was found that a small section of the tunnel-lining had been scoured near the surge-chamber. This was repaired, and then it was decided to take advantage of the shut-down to grout the tunnel-lining. This was last done in 1927–28, and since then there has been no opportunity for further work.

Grouting operations were still in progress at the end of March, 1936.

Various repairs and modifications to the Larner Johnson valves of Nos. 2 and 3 units were made, with the result that the remote control of these valves became possible.

Apart from the above the usual maintenance has been necessary.

Waitaki Power-station.—This station has now been in continuous operation since January, 1935, and, on the whole, very little trouble has been experienced. The main difficulty was in connection with the excitation system, which is of a new type. Extensive testing was necessary before stable conditions were reached, but the desired end has now been attained.

Lyttelton Diesel Station.—There has been no occasion to call upon this plant during the past year, but it has been maintained in good condition.

A new automatic pump was installed to cope with the leakage of storm water into the basement.

(*b*) *Substations.*

The new metal-clad 11 kv. switch-gear at Addington has performed satisfactorily, the oil-circuit breakers dealing with any faults without showing signs of distress. The old metal-clad switch-gear has been heat-treated as far as the oil-circuit breakers are concerned, while all the auxiliary wiring has been standardized to permit of the interchange of oil-circuit breakers.

At Ashburton and Hororata substations arrangements are in train for the installation of 110-volt batteries and for altering the 66 kv. oil-circuit breakers to make them suitable for remote control.

The telephone-exchanges at all substations, except Addington and Point, were replaced by a standard type developed by the test department.

Routine maintenance work was carried out at all substations during the year.

(*c*) *Transmission-lines.*

Generally, the condition of the transmission-lines is good, and there were few interruptions due to actual line trouble, with the exception of the interruptions due to the phenomenal snowstorm on the 9th and 10th of June, 1935. On the 10th June, during the thaw, there was a total interruption to the Addington supply of 17½ minutes, this being the first severance of the supply to Addington since 1933.

Fortunately the storm was restricted to the coastal area in the Canterbury Province. The most serious damage was done to the 33 kv. line to North Canterbury Power Board, the supply being interrupted from Sunday night to the following Tuesday evening.

A summary of all interruptions (lasting over one minute) to the 110 kv. and 66 kv. supply (exclusive of pre-arranged shut-downs), is as follows:—

Point Substation.—A failure of the 66/11 kv. transformer caused an outage of seven days, while on the 10th June an outage of seven minutes occurred.

Hororata Substation.—On 10th June an outage of seven minutes occurred as for Point. This was the only accidental interruption at this substation.

Addington Substation.—The only interruption was one of 17½ minutes on 10th June.

Ashburton Substation.—There were eight accidental interruptions totalling fifty-three minutes, of which twenty-nine minutes were taken up on the 9th and 10th June, and were due to trouble on the local feeders during the snowstorm.

Timaru Substation.—Six accidental interruptions here totalled 57½ minutes, the two longest being due to relay trouble and line trouble respectively.

Oamaru Substation.—There were six accidental interruptions totalling sixty-seven minutes, the causes being as for Timaru.

Half Way Bush Substation.—There were fifteen interruptions here, with a total time of eighty-eight minutes. Eight of these occupying fifty-six minutes were due to line trouble, six occupying twenty-eight minutes were due to the faulty operation of relays, and the remaining one was due to regulator trouble at Waitaki.

Line Maintenance.—During the year a careful inspection was made of all poles with a view to determining how far decay has progressed, and to find out how many poles needed replacement. The condition of the timber even in poles that have been in service for over twenty years is surprisingly good, and most of the unsound poles were found to have decayed at points other than the ground-line. Twenty-four poles were replaced following the tests, while two more actually broke in service.

There are a number of poles that are sound, but the section of heart timber is considerably reduced, and it is probable that a large proportion of these will be changed during the ensuing year.

"Live line" testing was again carried out with the following results:—

66 kv. and 110 kv. Insulators:—

Number tested—	
Pin type	15,091
Suspension type	52,685
Strain type	15,968
Defective—	
Pin type	75
Suspension type	113
Strain type	104

Of the above 83,744 insulators, the percentage defective is 0·35.

33 kv. Insulators:—

Number tested—	
Pin type	4,166
Suspension type	99
Strain type	880
Defective—	
Pin type	38
Suspension type	0
Strain type	6

Of these 4,166 insulators, 1·06 per cent. were defective.

(*d*) *Testing.*

Apart from the duties imposed on this branch by the widespread construction, the usual routine maintenance was carried out on oil-circuit breakers, transformers, relays, batteries, telephones, and meters. The number of tests and investigations recorded during the year numbered 337.

This branch also has charge of the time-control apparatus, and is responsible for the accurate maintenance of the system time, which is an important factor now that so many synchronous clocks are installed throughout the country.

DESIGN OFFICE.

A. Electrical Section.

During the year the staff in the Electrical Design Office has been exceptionally busy, and was considerably augmented to cope with the necessary work associated with additions to North Island power-stations and new sub-stations in connection with extensions to the main transmission systems to supply the North Auckland District. In the South Island the activities are associated principally with the extensions to the Lake Coleridge 66 kv. transmission system to give supply to the Westland district, via Arthur's Pass. The specifications, layout and foundation drawings were prepared in connection with the installation of the 250 kw. hydro-electric generating station to supply power for construction purposes at Homer Tunnel.

B. Hydraulic Section.

Investigation of Power Resources.

During the year an examination was made of a portion of the West Coast, particularly in the Hokitika district, for possible power schemes to meet a prospective mining load. Two projects, Toaroha and Waitaha, utilizing the Toaroha and Kakapotahi rivers, have been investigated. Although neither of these schemes could be recommended at the present time, they both present favourable features which may be utilized with advantage when the West Coast is connected with the Coleridge-Waitaki system. When this is done much larger schemes than are now required could be developed at a very reasonable cost per kilowatt.

No finality has been reached in regard to Waikato River investigations, owing to the staff being diverted to the Arapuni extensions, where their time has been fully occupied.

Waikaremoana.

During the year various proposals were considered with a view to controlling the flow from Waikaremoana. To determine the exact nature of the ground a shaft was sunk, after extensive grouting operations, and a short-length tunnel driven. These works were located in such a position as would fit in with one scheme of the development. This work has now been suspended pending further consideration.

While these works were in progress, investigation, location, and design were carried out in connection with possible pipe-lines and other features of the upper development which aimed at using the 440 ft. of fall between Waikaremoana and the intake of the main development.

A detailed survey of the village at Tuai was carried out, and with this was incorporated a diversion canal to pass any water not used in the present main development into the forebay for a lower development, which at a later date may be utilized to develop a further 330 ft. fall below the present power-station.

Preparation has also been made for the penstock for the third unit in the present power-station, and tenders for this have been called.

Statistical Data and Studies.

Collection of river-flow records has been continued, and studies of the growth of load have been made from time to time, together with studies of how these loads are to be met.

World Power Conference.

Communication has been maintained with the World Power Conference, and with the section dealing with large dams. The Department has arranged to exchange information concerning existing dams with other member countries. It is considered that the information so obtained will be of great value.

ELECTRIC-POWER BOARDS.

There are now forty-five districts constituted, and forty-one (including Westland Power, Ltd., operating under delegated license) actually carrying out the distribution and sale of electrical energy (August, 1936). The total area covered is 80,299 square miles, or 77·5 per cent. of the total area of the Dominion (103,415 square miles); the total population concerned is 1,084,836, or 69 per cent. of the total population (1,573,482) of the Dominion; and the unimproved value of the land included in the electric-power districts and outer areas is £249,033,403, or 82·9 per cent. of the total unimproved value of the Dominion (£301,137,513).

So far only one of the four main cities—viz., Auckland—has been included in the inner area of an electric-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 VIII gives details of the gazetted 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 polls taken. The total amount of the loans authorized by the forty-one districts which have taken their polls is £14,410,010. The population of the districts concerned is 976,270, so that the loans authorized amount to £14·76 per head of population, as compared with £14·58 last year. The unimproved valuation of the districts is £222,433,533, the loans authorized amounting to 6·41 per cent. of the unimproved rateable value of the lands pledged as security for the loans. The aggregate voting at the polls totalled 69,720 for and 12,409 against the respective loan proposals.

Table XI shows the capital outlay incurred by each Board up to the end of the financial year 1935–36, together with the revenue and annual expenditure.

The total capital outlay by the forty-one Boards which are in operation is £14,156,962, practically all of which is on works in service. The gross revenue from the sale of electricity by these Boards was £2,338,218. The general result is a profit over the whole business of the Power Boards of £107,321 for appropriation to reserve funds, &c., after paying working-expenses and capital charges for interest, sinking fund, and depreciation.

During the last year five of the Boards struck a general rate, which was collected in all cases, and one of the Boards struck special rates for the security for loans, which were collected in this case.

The following table gives details of the rates levied and collected:—

RATES COLLECTED BY ELECTRIC-POWER BOARDS FOR YEAR ENDED 31ST MARCH, 1936.

Name of Board.	General Rate.		Availability Rate.		Special Rates.		Total Amount collected.
	Levied.	Collected.	Levied.	Collected.	Levied.	Collected.	
	d.	£		£	d.	£	£
Banks Peninsula ..	$\frac{1}{6}$, $\frac{4}{19}$, and $\frac{1}{50}$	2,702*	..	..	..	..	2,702*
Malvern	$\frac{1}{4}$	2,495*	..	..	..	..	2,495*
Marlborough ..	..	..	..	66*	..	..	66*
Manawatu-Oroua ..	..	41*	..	..	..	..	41*
Otago	0·15 and 0·05	330*	..	..	0·15 and 0·175	3,736*	4,066*
Southland ..	$\frac{3}{5}$	32,232*	..	..	..	..	32,232*
Taranaki	..	..	..	43*	..	..	43*
Wairoa	$\frac{1}{16}$	1,845*	..	..	..	..	1,845*
Totals ..	..	39,645	..	109	..	3,736	43,490

* Includes arrears for previous years.

LOCAL ELECTRIC-SUPPLY SYSTEMS.

Including the Government plants, there are now (31st March, 1936), forty-one public electric-power stations operating in the Dominion, as compared with forty last year, the additional one being accounted for by the Otago Central Power Board's new hydro station on the Roaring Meg.

There are ninety-two local electric-supply authorities directly engaged in the retail sale of electricity, and the following table shows the proportion using Government-generated power:—

Class of Local Authority controlling Electric-supply System.	Using Government Supply.	Using Non-Government Supply.
	Number.	Number.
Power Board	28 (*a*)	12 (*b*)
City Council operating own reticulation	3 (*c*)	3 (*d*)
Borough Council operating own reticulation	13 (*e*)	16 (*e*)
County Council operating own reticulation	2	3
Town Board operating own reticulation	2 (*e*)	3 (*e*)
Company	..	5
Private	..	1
Tourist Department	1	..
Totals	49	43
	92	

(*a*) Included in these supply areas are 54 boroughs and 36 town districts. (*b*) Included in these supply areas are 23 boroughs and 11 town districts. (*c*) Palmerston North, Wellington, and Christchurch. (*d*) Nelson, Dunedin, and Invercargill. (*e*) Exclusive of 77 boroughs and 47 town districts incorporated as constituent parts of Power Board supply areas.

On the 19th March, 1936, the Otago Central Electric-power Board's hydro station on Roaring Meg River was officially opened.

During the year Kaikoura County Council installed a 40 kw. Diesel generating-set as an addition to its present installed capacity of 37 kw. of suction-gas plant. Palmerston North City Council has recently commenced the installation of a 2,000 kw. Diesel plant.*

The total installed capacity (excluding standby plant) has increased by 1,649 kw. during the year, being at present 235,403 kw. The increase is due to Otago Central Power Board's 1,600 kw. installation on the Roaring Meg River, and to Kaikoura County Council's additional Diesel plant.

The proportion of installed plant is now as follows:—

	Stations.	Kilowatts.	Proportion per Cent.
Water-power (excluding 11 standby installations)	36	234,425	99·55
Steam-power (excluding standby plants at Portland (3,190 kw.), Auckland (41,160 kw.), Wanganui (1,500 kw.), Wellington (10,000 kw.), Invercargill (1,975 kw.), Gisborne (350 kw.), Waihi,† Huntly (1,500 kw.), Dunedin (1,875 kw.), Christchurch (1,500 kw.), Nelson (500 kw.), Petone (516 kw.), Hokitika (625 kw.): totalling 64,691 kw.)	1	750	0·32
Gas-power (excluding standby plant Palmerston North (1,020 kw.), Westport (210 kw.), Kaikoura (37 kw.), Taihape (75 kw.), Franklin (187 kw.): totalling 1,529 kw.)	0	..	..
Oil-power (excluding standby plants at Penrose (3,750 kw.), Lyttelton (5,760 kw.), Dunedin (860 kw.), Blenheim (456 kw.), Hastings (1,087 kw.), Gisborne (980 kw.), Ashburton (160 kw.), Napier (500 kw.), Thames (262 kw.), Opunake (148 kw.), Ohakune (113 kw.), Hawera (485 kw.), Oamaru (192 kw.), New Plymouth (350 kw.), Hokitika (Kanieri) (150 kw.), Hokitika (200 kw.), Motueka (110 kw.), Patea (64 kw.), Reefton (80 kw.), Petone (316 kw.), Rawene (20 kw.): totalling 16,047 kw.)	4	228	0·13
Total	41	235,403	100·00

The number of consumers supplied has increased from 342,334 to 355,973, an increase of 13,639, or 4 per cent., for the year.

The total population included in the various electric-supply areas is 1,461,770, 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 now exceeds the allocation of 0·15 kw., or 0·2 horse-power, per head of population, the original basis of the design of the Government schemes. Table X shows, for each supply authority, the average maximum demand per consumer.

The units sold per head of population supplied were 531, as compared with 493 last year. (See footnote on Table X.)

The total length of transmission and distribution line in service is 22,424 route-miles, as compared with 21,707 last year, an increase of 717 miles, or 3·29 per cent. This fact would seem to indicate that there is a steady demand for the extension of electric lines to meet the requirements of the rural areas. The number of consumers per route-mile is 15·87, as compared with 15·72 last year.

* Westland Power, Ltd., purchased a 625 kw. turbo-alternator set from the Blackball Coal Co. and re-erected same at Hokitika as auxiliary to the hydro-station at Dillman's.

† 1,640 kw. plant partially dismantled at present.

A new factor introduced for comparative purposes this year is "Units sold per £1 of distribution capital," and appears in Table X. This index figure is computed from the total units sold (section 9 of F.P. 15) divided by the capital outlay shown opposite subsections (*c*) and (*d*) of section 15 of F.P. 15, and is one which it is hoped will be of value to supply authorities in general when its purport is fully appreciated.

The sales per route-mile of line were 34,550 units, and the gross revenue £215. The units are greater than last year (33,000), and there is an increase in revenue as against £211 last year, due to a general reduction in selling-rates and to load-building campaigns. This increase can also be attributed to a decided improvement in the economic conditions which have prevailed during the past three years.

Out of the ninety-three distributing authorities (including Public Works Department, North Island and South Island systems, and excluding Ross Borough), eighty-five showed a profit for the year amounting to £646,911 and eight showed a loss amounting to £92,757. The gross revenue (excluding rates) was £4,823,324, and the general result is a profit for the whole Dominion of £554,154 after paying working-costs (£2,197,770) and capital (interest, sinking fund, and depreciation) charges (£2,071,400) at the rate of 6·25 per cent. on the total capital outlay of £33,181,503. This shows a net profit of 1·67 per cent., as compared with 1·37 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 Tables XI and XII show the financial statistics for each supply authority. It should be noted that the method of compilation and computation adopted for the following table is slightly different to that of years previous to 1933 :—

——	—	Water.	Steam.	Gas.	Oil.	Total.
1. Number of main stations	No.	36	1	..	4	41
2. Installed capacity (main plant)	Kw.	234,425	750	..	228	235,403
3. Number of standby stations	No.	11	10	5	19	45
4. Installed capacity (standby plant)	Kw.	4,186	63,825	1,325	15,627	84,963
5. Number of consumers	No.	352,188	3,075	..	710	355,973
6. Connected load	Kw.	1,332,961	8,732	..	884	1,342,577
7. Units generated	No.	982,494,278	5,047,783	677,771	1,099,824	989,319,656
8. Units sold to consumers (Table X)	No.	773,597,017	1,788,535	..	204,456	775,590,008
9. Percentage of non-productive units	%	21·25	20·99	..	22·85	21·55
10. Total operative capital (including distribution systems and standby plant)	£	33,027,924	117,573	..	36,006	33,181,503
11. Total capital per kilowatt installed (including distributing systems, &c.)	£	103·5	93·7	..	120	103·5
12. Annual working-costs	£	1,095,196*	13,790*	..	4,832	1,113,818*
13. Annual working-cost per unit under section 8	d.	0·34	1·85		5·69	0·344
14. Annual capital costs (interest, sinking fund, and depreciation)	£	2,059,211	9,774	..	2,415	2,071,400
15. Annual capital cost per unit under section 8	d.	0·64	1·30	..	2·85	0·641
16. Annual capital costs as percentage of capital	%	6·25	8·30	..	6·71	6·25
17. Total annual costs (section 12 plus section 14)	£	3,154,407	23,564	..	7,247	3,185,218
18. Total annual cost per unit under section 8	d.	0·97	3·15	..	8·54	0·985
19. Total annual revenue (excluding rates and bulk sales) from consumers	£	3,705,597	27,389	..	6,386	3,739,372
20. Average revenue per unit † under section 8	d.	1·15	3·68	..	7·51	1·175
21. Net profit (section 19, less section 17)	£	551,190	3,825	..	— 861	554,154
22. Ratio working-costs to revenue (section 12 and section 19)	%	29·4	50·3	..	76·0	29·7

* After deducting revenue derived from bulk sales (Table XI). † From retail sale of electricity (Table XI).

GROWTH OF LOAD.

The total connected load at end of the year under review was 1,342,577 kw., compared with 1,228,814 for 1935, an increase of 113,763 kw., or 9·28 per cent.

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 will be seen the annual growth which has taken place in each class :—

Year.	Consumers.	Annual Increase.	Electric Ranges.	Annual Increase.	Electric Water-heaters.	Annual Increase.	Electrified Milking-machines.	Annual Increase.
	Number.	Per Cent.	Number.	Per Cent.	Number.	Per Cent.	Number.	Per Cent.
1925	148,699	..	1,526	..	..	..	3,581	..
1926	192,392	29·3	4,671	205·0	6,654	..	4,856	35·8
1927	228,345	18·7	9,511	104·0	14,160	113·0	6,738	38·8
1928	243,795	6·8	15,766	66·0	21,513	52·0	8,514	26·3
1929	266,306	9·2	20,254	28·5	29,257	36·0	10,161	19·4
1930	284,235	6·7	25,997	28·3	37,564	28·5	11,922	17·3
1931	300,809	5·9	29,480	13·2	42,803	13·9	13,656	14·5
1932	309,360	2·8	31,973	8·5	45,796	7·1	14,163	3·7
1933	322,997	4·4	33,998	6·4	48,070	5·0	15,913	12·4
1934	334,593	3·6	36,081	6·2	50,272	4·6	16,992	6·8
1935	342,334	2·3	39,730	10·1	53,635	6·7	17,200	1·2
1936	355,973	4·0	44,837	12·9	58,864	9·8	18,458	7·4

See Table XV for details for year ended 31st March, 1936.

BROKEN WIRES AND POLES.

Gales of exceptional severity, accompanied in some instances by heavy snowstorms, occurred in many parts of the Dominion during the past year, and account for the extraordinary large number of breaks reported.

There were 8,290 broken wires reported by electric-supply authorities, with 104,499 miles of conductor erected. The corresponding figures for the previous year were 2,204 broken wires, and 102,718 miles of conductor in use.

In 2,852 instances reported involving 8,290 broken wires, falling trees were again the principal cause of the breaks, and accounted for 47 per cent. of the total, as against 26·6 per cent. for 1935.

As regards broken poles, 451 instances were reported for the year, of which 232, or 51·4 per cent., were New Zealand blue-gum.

For 1935 the total number of broken poles reported was 518, and it is still evident that electric-supply authorities who experimented with New Zealand blue-gum and nondescript Australian hardwoods are now being called upon to make replacements sooner than the anticipated life of fifteen years for poles used on distribution-lines.

ACTUAL MILEAGES AND SIZES OF OVERHEAD CONDUCTORS IN USE AT 31ST MARCH, 1936.

Size of Conductors (S.W.G.).	Copper.		Aluminium.		Galvanized Steel.		Galvanized Iron.		Copperweld.		Steel-cored Aluminium.		(1) Bronze, and (2) Cadmium-copper.		Total Breakages.
	Miles.	Breakages.	Miles.	Breakages.	Miles.	Breakages.	Miles.	Breakages.	Miles.	Breakages.	Miles.	Breakages.	Miles.	Breakages.	
7/20 ..	6,964	2,510	..	..	1	..	..	..	..	..	..	..	..	..	2,510
7/18 ..	11,086	1,705	..	..	..	..	..	..	..	..	..	..	..	..	1,705
7/17 ..	2,455	230	..	..	..	..	..	..	..	..	..	..	..	..	230
7/16 ..	20,144	1,088	36	4	90	1	135	1	..	..	177	..	..	..	1,094
7/15 ..	110	..	..	..	..	..	..	..	..	..	78	3	..	..	3
7/14 ..	11,052	258	8	2	49	..	..	..	2	..	723	..	..	..	260
7/13 ..	1,093	6	..	..	4	..	..	..	..	..	..	..	..	..	6
7/12 ..	429	8	146	1	3	..	..	..	5	..	3	..	..	..	9
7/11 ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
7/10 ..	33	..	204	..	..	..	..	..	8	..	51	..	..	..	..
7/9 ..	76	..	15	..	5	..	..	..	..	..	..	..	..	..	..
7/8 ..	..	..	..	..	..	..	..	..	..	..	585	..	..	..	..
7/7 ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19/18 ..	398	7	..	..	..	..	..	..	..	..	..	..	..	..	7
19/17 ..	525	128	..	..	..	..	..	..	..	..	..	..	..	..	128
19/16 ..	1,707	15	..	..	..	..	..	..	..	..	..	..	..	..	15
19/15 ..	171	19	..	..	..	..	..	..	..	..	..	..	..	..	19
19/14 ..	581	10	..	..	..	..	..	..	..	..	..	..	..	..	10
19/13 ..	2,815	7	..	..	..	..	..	..	..	..	..	..	..	..	7
19/12 ..	593	..	..	..	2	..	..	..	..	..	..	..	..	..	..
19/10 ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
37/16 ..	47	..	..	..	..	..	..	..	..	..	..	..	..	..	..
37/15 ..	400	4	..	..	..	..	..	..	..	..	..	..	..	..	4
37/14 ..	90	..	..	..	..	..	..	..	..	..	..	..	..	..	..
37/13 ..	23	..	..	..	..	..	..	..	..	..	..	..	..	..	..
37/12 ..	76	..	..	..	..	..	..	..	..	..	227	..	..	..	..
66/13 ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	2,686	281	..	..	2	..	101	..	12	..	..	..	..	..	281
11	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..
10	8,896	892	..	..	438	..	256	..	442	9	..	..	30(1)	..	901
8	12,956	623	..	..	4,093	20	5,839	196	634	1	..	..	..	..	840
7	772	5	..	..	..	..	96	..	91	10	..	..	..	..	15
6	305	6	..	..	81	..	142	..	623	..	..	..	..	..	6
4	599	..	..	..	..	..	..	..	78	..	2	..	..	..	..
2	66	92	..	..	..	..	..	..	..	..	..	..	..	..	92
0	79	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2/0 ..	..	..	10	16	..	..	..	..	..	..	59	..	..	..	16
3/0 ..	..	..	..	..	..	..	..	..	..	..	399	..	..	..	..
3/13 ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3/12 ..	136	6	26	..	..	..	..	..	..	..	..	..	..	..	6
3/11 ..	..	..	5	..	..	..	..	..	..	..	..	..	..	..	..
3/10 ..	24	..	2	..	..	..	..	..	..	..	..	..	..	..	..
3/9 ..	..	..	10	..	..	..	..	..	..	..	..	..	..	..	..
3/8 ..	..	..	9	2	..	..	..	..	..	..	..	..	..	..	2
4/16 ..	13	..	..	..	..	..	..	..	..	..	..	..	..	..	..
4/14 ..	..	..	..	..	253	3	..	..	..	..	..	..	..	..	5
5/14 ..	..	..	..	..	207	..	..	..	..	..	..	..	..	..	..
2/10 ..	9	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6/·144 ..	..	..	..	..	..	..	..	..	..	..	19	..	..	..	..
7/·186 ..	..	..	..	..	..	..	..	..	..	..	41	..	..	..	..
7/·136 ..	47	..	..	..	..	..	..	..	..	..	..	..	..	..	82
7/·0834 ..	..	..	..	..	..	..	..	..	..	..	44	8	..	..	8
7/·0743 ..	..	..	..	..	..	..	..	..	..	..	83	4	..	..	3
7/·112 ..	..	..	2	..	..	..	..	..	..	..	2	..	..	..	..
1/·112 ..	..	..	..	..	..	..	..	..	..	..	..	..	281(2)	21	21
Miscellaneous ..	54	..	..	1	..	..	4	..	12	..	..	..	..	..	5
Totals ..	87,514	7,988	473	26	5,228	24	6,573	197	1,907	20	2,493	14	301	21	8,290

Grand total, 104,499 miles.

No returns received from Auckland, Christchurch, and Heathcote.

ELECTRICAL SUPPLY AND ELECTRICAL WIRING REGULATIONS.

The revision of the Electrical Supply and Electrical Wiring Regulations gazetted in July, 1927, with the intention of revising same after two years' trial, has now been completed, and the new regulations were published in the *New Zealand Gazette*, No. 65, dated 6th September, 1935.

INSPECTION OF ELECTRIC LINES, ALSO PRIVATE GENERATING-PLANTS.

The annual departmental inspection of the electric lines in operation was carried out in the case of supply authorities last year, and any defects or breaches of the regulations which came under notice were duly notified to the supply authorities concerned. These inspection activities of the Department undoubtedly tend towards the maintaining of a high standard, and the general willingness on the part of the supply authorities to co-operate in a general observance of the regulations governing such matters is of great assistance to this Department.

The following supply authorities have notified extensions to electric lines in their respective districts during the year :—

Power Boards—
- Ashburton.
- Auckland.
- Banks Peninsula.
- Bay of Plenty
- Cambridge.
- Central Hawke's Bay.
- Central Waikato.
- Dannevirke.
- Franklin.
- Grey.
- Hawke's Bay.
- Hutt Valley.
- Horowhenua.
- Marlborough.
- Manawatu-Oroua.
- North Canterbury.
- Otago Central.
- Poverty Bay
- South Canterbury.

Power Boards—*continued.*
- South Taranaki.
- Southland.
- Springs-Ellesmere.
- Taranaki.
- Tararua.
- Tauranga.
- Te Awamutu.
- Thames Valley
- Waitomo.
- Waimea.
- Wairarapa.
- Waitaki.
- Waitemata.
- Wanganui-Rangitikei.

Cities—
- Christchurch.
- Dunedin.
- Wellington.

Boroughs—
- Bluff.
- Hamilton.
- New Plymouth.
- Ohakune.
- Patea.
- Taumarunui.
- Wairoa.
- Westport.

Town District—
- Mangaweka.

County Councils—
- Heathcote.
- Waimairi.

Companies—
- Kanieri Electric, Ltd.
- Skippers Ltd.
- Westland Power, Ltd.

It is not generally known that under the Electrical Wiremen's Registration Amendment Act, 1928, it is mandatory to give notice of the installation of private electric plants, and provision is made for the inspection of these plants before same are placed in service. During the year inspections have been made as opportunity offered.

LICENSES ISSUED.

The following water-power and electric-line licenses (48) and permits (13) have been issued during the period between 30th June, 1935, and 30th June, 1936 : *Licenses*—H. J. Redwood, Okoha ; R. J. Gray, Kauroo Hill ; Hume Pipe Co. (Cobb River) (2) ; Tourist Department, Rotorua (amendment) ; Waitahu Gold-mining Co., Reefton ; Alexander Mines, Reefton ; T. Hotton, Naseby ; A. J. Winchester, Naseby ; S. I. Llewellin, Orinoco ; Blackball Creek Coal Co., Blackball ; N.Z. Flax Investments, Barrytown ; Gordon Bros., Garston ; A. W. McLean, Garston ; W. L. Oswold, Upper Awatere ; A. Rittson-Thomas, Tirohanga ; G. D. Grant, Otiake ; Golden Sands Gold-mining Co., Barrytown ; W. F. Baldwin, Ohaeawai ; J. W. R. Baldwin, Ohaeawai ; Kanieri Electric Ltd. (amendment) ; North Canterbury Power Board (additions) ; C. S. Hammond, Taihape ; C. G. White & D. G. Johnson, Onakaka ; Makarora Ltd., Pembroke ; E. L. Morgan, Lake Brunner ; North Auckland Power Board (amendment) ; J. Minehan, Hokitika ; W. Black, Waimate ; L. Cooper, Rai Valley ; Otago Central Power Board (amendment) ; Grey Power Board (additions) ; F. P. Butler, Matainui ; Skippers, Ltd., Skippers ; Wairakei, Ltd. (amendment) ; E. A. Grey, Horeke ; Bruce Bay Timber Co., Bruce Bay ; H. S. Chadwick, Raetihi ; Taumarunui Borough Council (additions) ; D. W. Win, Owen Junction ; C. W. F. Hamilton, Fairlie ; C. F. Hamilton, Fairlie ; Lewis and Sowman, Upper Takaka ; Clutha River Gold Dredging Co., Alexandra ; C. R. Hall, Woodstock ; C. J. Kerr, Peel Forest ; W. S. C. Bowman, Kaitaia ; J. C. Hickmott, Aorere. *Revocations* (4)— J. Thomson, Ratanui ; G. Laing, Waimauku ; N.Z. Flax Investments, Barrytown ; A. C. Pease, Mangatoki. *Assignment* (1)—N. G. McLean, Rotheram. *Permits* (13)—L. P. Haycock, Pokororo ; J. Paton, Kekerangu ; H. Hebberd, Whangamoa ; A. Drummond, Tapawera ; A. A. McFarlane, Rotheram ; R. S. Thompson, Wetherstone ; R. C. Turnbull, Blackmount ; A. Taylor, Alexandra ; J. H. Price, Wakefield ; Hokianga Dairy Co., Motukaraka ; C. Jackson, Karioi ; J. Hutley, Awanui ; H. Voyce, Mairoa.

ELECTRICAL APPLIANCES BOARD.

An opportunity to submit the draft Bill to give effect to representations regarding the sale and use of unsafe electrical appliances did not present itself during the past year.

ELECTRICAL ACCIDENTS.

During the year there were reported to the Department forty-eight electrical accidents, involving the loss of human life in nine instances. (Four of the accidents included more than one person injured.) Corresponding figures for 1935 were forty-five and seven respectively.

This year's electrical accidents resulted in injuries (fatal and otherwise) to the following :—

Electrical employees	13
Other tradesmen	10
General public	20
Stock	9
Total	52

ELECTRICAL FIRES.

During the year there were twenty-seven fires attributed to electrical causes and reported to the Department by electrical-supply authorities, as per list below. The corresponding figures for 1935 and 1934 were twenty-two and twenty-six respectively.

The sources of this year's electrical fires included the following :—

Electric irons	8
Electric radiators	2
Other electrical appliances	4
Defective installations	12
Soldering-iron accidentally placed on celluloid film	1
Total	27

REGISTRATION OF ELECTRICAL WIREMEN.

The Electrical Wiremen's Registration Act was passed in 1925 to ensure the safety of the public and users of electrical energy by providing qualified persons to install electrical wiring and equipment and by providing qualified inspectors to see that the wiring regulations are complied with.

The apprentices in the electrical-wiring trade are required to pass an examination, to serve three years, and to be not less than nineteen years of age before they can be registered.

The examination consists of two parts, a written part to test the candidate's knowledge of the theory of electricity and his knowledge of the safety regulations, and a practical part to test his workmanship.

The Act has been in operation for ten years, during which time there has been a gradual raising of the standard of electrical work, with the result that the consumer is now obtaining better value for expenditure and an installation which will have a longer life.

During the ten years ended the 31st March, 1936, there have been registered 3,520 electrical wiremen with full registration, 479 with limited registration, and 452 inspectors.

In addition, 4,167 candidates sat for the written part of the examination and 3,323 for the practical part.

A total of 528 reports of breaches of the Act and 424 reports of defective work by registered persons have been received.

For carrying out defective work 76 wiremen have been cautioned, 90 have been censured, 87 have had their registration certificates endorsed, and 5 have had their names removed from the register.

The increasing value of the Act can be gauged from the fact that when it came into force there were 192,392 consumers, and these had increased to 355,973 at the 31st March, 1936.

The success which has attended the administration of the Act has to a large extent been due to the co-operation of the electrical-supply authorities whose duty it is to inspect all electrical wiring.

To make the requirements of the Act more widely known a précis was prepared during the year, and this was included as an appendix to the electrical-wiring regulations. The inquiries with regard to the Act which have been received since the wiring regulations were published indicates that the appendix is serving a very useful purpose.

To keep the registers clear of dead names it is provided that they shall be purged once every five years. This purging took place during the past year, and as a result 502 names were removed from the full-registration register and 55 from the limited-registration register.

About 50 per cent. of removals were due to failure on the part of the registered persons to notify change of address, consequently the notice sent to the person concerned was returned unclaimed. In addition to a notice having been sent to each registered person, posters were forwarded for display in post-offices, by the supply authorities and in the district offices of the Public Works Department, and the secretaries of the respective wiremen's unions were notified in order that they might also bring the matter under the notice of their members.

Up to the end of June 153 names had been restored to the registers.

During the year ended 30th June there were registered 68 wiremen with full registration, 61 with limited registration, and 35 inspectors of electrical wiring. There were 248 candidates for the written part of the examination and 149 for the practical part; the passes were 57 in the written part and 65 in the practical part.

The examiners for the practical part of the examination drew attention to the need for more care being taken in earthing the conduit; and to the unsatisfactory manner in which the plug-sockets were installed and the flexible cord connected to the plugs. They also pointed out that more attention should be given to cleaning the ends of conduits and nipples, that the nipples should be cut to the correct length, that the standard of work in jointing and soldering was very low, and that the tying of the wires to the insulators was very badly done.

There were 46 reports of breaches of the Act during the year ended 30th June, and 15 prosecutions were taken. The fines and costs imposed totalled £44 12s. 6d.

Details of the reports follow:—

Cinematograph operators doing wiring, 2; claiming to be registered, 2; employing an unregistered person, 15; failure to give notice to an electrical-supply authority, 7; failure to return certificates, 3; farmer doing wiring, 1; labourers changing flexible cords, 2; labourers doing wiring, 6; mechanics doing wiring, 2; painters doing wiring, 2; permitting an unregistered person to work, 1; salesmen doing wiring, 1; slaughterman doing wiring, 1; window-dresser doing wiring, 1.

The defective work reports totalled 34 for the same period. As a result of these reports 4 wiremen were cautioned, 6 were censured, and 6 had their registration certificates endorsed. Four reports are still under investigation.

It seems inevitable that as work in the electrical trade increases as a result of increased activity in the building and allied trades the reports of defective work must increase, but it is gratifying to record that in very few cases is a wireman reported for defective work more than once.

Further efforts have been made during the year to impress on dealers in electrical apparatus the need for assembly and repairs to be carried out by skilled persons. A certain amount of success has been achieved with the assistance of the electrical-supply authorities, but much still remains to be done, more especially in view of the large increase in the use of portable appliances. Fortunately, the majority of portable appliances are used in situations where no ill-effects are to be apprehended from shock.

The sale of electrical appliances such as vacuum cleaners, washing-machines, radio-receiving sets, portable signs, portable milking-machines, and vulcanizers is undertaken to a very large extent by speciality salesmen whose main qualifications are ability to sell and not technical knowledge of electricity. These salesmen sometimes install appliances in a manner which does not comply with the safety regulations; they also neglect to notify the electrical-supply authority, and the consumer is left to find out that the appliance must be properly installed, and, in some cases, may not be used at all.

The remedy for this state of affairs appears to be threefold. Firstly, the older children in our schools should be taught how to use electrical equipment properly, how to maintain it in good condition, when it is necessary for the metal case to be connected to earth, and how to ascertain whether it has been assembled correctly and is in good repair; secondly, more of the apprentices to the electrical trade should be trained to become salesmen; and, thirdly, the present salesmen should be given training so that they will know how electrical appliances work, in what situations the metal cases are required by the regulations to be earthed, and so that they will be able to ascertain whether the appliances are in good order.

F. T. M. Kissel, B.Sc., M.I.E.E., A.M.I.C.E.,
Chief Electrical Engineer.

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TABLE I.—SUMMARY OF FINANCIAL AND OPERATING STATISTICS FOR NORTH ISLAND AND SOUTH ISLAND ELECTRIC-POWER SYSTEMS FOR THE YEAR ENDING 31ST MARCH, 1936.

NOTE.—North Island system includes Arapuni–Horahora–Mangahao–Waikaremoana all interconnected. South Island system includes Lake Coleridge and Waitaki interconnected.

(*a*) Financial.

	1935–36 (Second Year).
(1) Capital outlay—	
Assets in operation—	£
North Island system	8,461,193
South Island system	4,442,307
Total assets in operation	12,903,500
Assets not in operation—	
North Island system	173,807
South Island system	18,075
Total assets not in operation	191,882
Total capital outlay	13,095,382
(2) Revenue for year—	
North Island system	795,391
South Island system	245,258
Total revenue for year	1,040,649
(3) Costs—	
Working-costs—	
North Island system	144,068
South Island system	53,900
Total working-costs for year	197,968
(4) Capital charges—	
Interest—	
North Island system	408,051
South Island system	177,217
Depreciation—	
North Island system	17,591
South Island system	79,750
Half capital charges, King's Wharf Station	38,148
Total capital charges for year	720,757
(5) Total costs for year	918,725
(6) Net profit or loss for year—	
North Island system	*Cr.* 187,533
South Island system	*Dr.* 65,609
Total **profit** for year	121,924
(7) Accumulated Depreciation Reserve—	
North Island system	961,757
South Island system	388,546
Total Depreciation Reserve	1,350,303
(8) Accumulated Sinking Fund Reserve—	
North Island system	55,930
South Island system	270,570
Total Sinking Fund Reserve	326,500
(9) Accumulated loss—	
North Island system	399,315
South Island system	Nil.
(10) General Reserve—	
North Island system	Nil.
South Island system	175,809
(11) Electric Supply Account to date*	*Dr.* 223,506

(*b*) Operating Results.

Maximum load (kilowatts)—	
North Island system	116,800
South Island system	36,780†
Average load (kilowatts)—	
North Island system	71,000
South Island system	19,400
Average load factor—	Per Cent.
North Island system	60·85
South Island system	52·70
Units output—	Units.
North Island system	622,584,663
South Island system	170,516,380
Combined	793,101,043
Units distributed—	
Units sold—	
North Island system	563,673,258
South Island system	149,698,738
Combined	713,371,996
Units unsold (station auxiliaries, &c.)—	
North Island system	6,699,031
South Island system	3,329,480
Combined	10,028,511
Total units distributed, North Island system	570,372,289
Total units distributed, South Island system	153,028,218

Line losses—	Units.	Per Cent.
Transmission—		
North Island system	51,879,103	8·30
South Island system	16,175,913	9·48
Combined	68,055,016	..
Distribution—		
North Island system	333,271	..
South Island system	1,312,249	0·85
Combined	1,645,520	..
Total line losses, North Island system	52,212,374	8·40
Total line losses, South Island system	17,488,162	10·25

Revenue—	
Per kilowatt (system maximum)—	£
North Island system	6·81†
South Island system	6·66†
Per unit generated—	d.
North Island system	0·307
South Island system	0·345
Per unit distributed—	
North Island system	0·335
South Island system	0·384
Per unit sold—	
North Island system	0·339‡
South Island system	0·393‡
Working-costs—	
Per kilowatt (system maximum)—	£
North Island system	1·23
South Island system	1·47
Per unit generated—	d.
North Island system	0·056
South Island system	0·075
Per unit distributed—	
North Island system	0·061
South Island system	0·084
Per unit sold—	
North Island system	0·062
South Island system	0·086
Capital Charges—	
Per kilowatt (system maximum)—	£
North Island system	3·97
South Island system	6·99
Per unit generated—	d.
North Island system	0·179
South Island system	0·361
Per unit distributed—	
North Island system	0·195
South Island system	0·403
Per unit sold—	
North Island system	0·197
South Island system	0·411
Total Costs—	
Per kilowatt (system maximum)—	£
North Island system	5·20
South Island system	8·46
Per unit generated—	d.
North Island system	0·235
South Island system	0·436
Per unit distributed—	
North Island system	0·256
South Island system	0·487
Per unit sold—	
North Island system	0·259
South Island system	0·497

* Does not include arrears in sinking fund payments. † See remarks on page 67 regarding accidental peak of 40,100 kilowatts. ‡ Based on gross revenue. For corresponding figures, based on revenue received from sale of electricity only, see Table XIII.

Table II.—Analysis of Capital Outlay as at 31st March, 1936.

North Island System.		South Island System.		Combined Totals.
Headworks and power-stations—		Headworks and power-stations—		
Land, fencing, and roading—	£	Land, fencing, and roading—	£	£
Arapuni	110,401	Coleridge	24,339	
Horahora	3,208	Waitaki	48,554	
Mangahao	72,110			
Waikaremoana	66,744			
				325,356
Headworks—		Headworks—		
Arapuni	1,284,928	Coleridge	519,965	
Horahora	151,423	Waitaki	1,061,099	
Mangahao	848,862			
Waikaremoana	148,515			
				4,014,792
Generating-station, buildings, and village—		Generating-station, buildings, and village—		
Arapuni	345,102	Coleridge	85,420	
Horahora	60,869	Waitaki	434,009	
Mangahao	161,080			
Waikaremoana	152,758			
				1,239,238
Generating plant and machinery—		Generating plant and machinery—		
Arapuni	447,718	Coleridge	162,503	
Horahora	95,204	Waitaki	184,419	
Mangahao	191,111			
Waikaremoana	174,883			
				1,255,838
Auxiliary stations (three)—Penrose, Huntly, Grand Junction	81,749	Auxiliary station (one)—Lyttelton	89,066	170,815
Transmission and distribution—		Transmission and distribution—		
Primary distribution—		Primary distribution—		
11 kv. lines	40,991	11 kv. lines	..	
33 kv. lines	..	33 kv. lines	26,310	
50 kv. lines	324,364	50 kv. lines	..	
66 kv. lines	..	66 kv. lines	314,567	
110 kv. lines	1,146,723	110 kv. lines	258,10	
Secondary distribution	..	Secondary distribution	64,462	
				2,175,525
Substations—		Substations—		
11 kv. substations	15,167	11 kv. substations	..	
33 kv. substations	..	33 kv. substations	11,109	
50 kv. substations	180,412	50 kv. substations	..	
66 kv. substations	..	66 kv. substations	239,235	
110 kv. substations	728,502	110 kv. substations	166,144	
				1,340,569
General—		General—		
General, offices, garages, stores, and other accommodation	33,457	General, offices, garages, stores, and other accommodation	..	
Telephone services	4,777	Telephone services	29,179	
Explorations and preliminary surveys; engineering, office, and general expenses; charges and expenses of raising loans	822,998	Explorations and preliminary surveys; engineering, office, and general expenses; charges and expenses of raising loans	287,071	
Interest during construction	940,944	Interest during construction	454,823	
				2,573,249
Grand totals	8,635,000	..	4,460,382	13,095,382

Table III.—Operating or Working Costs for Year ended 31st March, 1936.

	North Island System.				South Island System.			
	Cost.	Cost per Unit.			Cost.	Cost per Unit.		
		Generated.	Distributed.	Sold.		Generated.	Distributed.	Sold.
	£	d.	d.	d.	£	d.	d.	d.
(*a*) Headworks and power stations	46,688	0·0180	0·0196	0·0198	19,245	0·0270	0·0301	0·0308
(*b*) Auxiliary stations	898	..	..	..	875	..	..	..
	47,586	0·0184	0·0201	0·0206	20,120	0·0282	0·0314	0·0321
(*c*) Transmission and distribution—								
Primary distribution	31,805	0·0123	0·0134	0·0135	6,244	0·0087	0·0098	0·0100
Secondary distribution	..	..	..	..	2,185	0·0030	0·0034	0·0035
(*d*) Substations	19,204	0·0074	0·0081	0·0082	10,545	0·0148	0·0165	0·0169
(*e*) Management and general—								
General expenses	384	..	..	..	585	..	..	..
Management	35,715	0·0138	0·0150	0·0152	14,221	0·0200	0·0223	0·0228
Total costs (*a*) to (*e*)	134,694	0·0520	0·0566	0·0575	53,900	0·0751	0·0838	0·0857
(*f*) Power purchased	84	..	..	..	..	..	..	..
(*g*) Standby provision	9,290	0·0036	0·0039	0·0040	..	..	..	..
Total costs (*a*) to (*g*)	144,068	0·056	0·061	0·062	53,900	0·075	0·084	0·086

North Island System.		*South Island System.*	
Units generated	622,584,663	Units generated	170,516,380
Units distributed	570,372,289	Units distributed	153,028,218
Units sold	563,673,258	Units sold	149,698,738

TABLE IV.—NORTH ISLAND ELECTRIC-POWER SYSTEM.—GROSS FINANCIAL RESULTS OF DISTRIBUTION OF ENERGY FOR THE YEAR ENDED 31ST MARCH, 1936.

Distributing Authority.	Number of Consumers.	Capital Outlay.	Revenue.						Expenditure.									Balance.		
			From Sale of Electrical Energy.		Rates.	Trading Account.	Other Sources.	Total.	Paid for Electrical Energy.	Working-costs and Management.	Interest.	Depreciation.	Sinking Fund.	Principal Repayment.	Exchange.	Other Expenditure.	Total.	Profit.		Loss.
			Retail.	Bulk (for Resale).														Appropriated to Reserves.	Unappropriated.	
		£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
Public Works Department	301	8,635,000*	39,729	747,554	..	..	8,108	795,391	306	137,407	408,051	17,591	..	..	..	6,355	569,710	187,533	..	..
	..	..	..	..	..	..	..	..	..	..	19,312†	7,431†	9,941†	..	..	1,464†	38,148†			
Auckland Power Board	53,931	3,301,876	629,790	..	..	..	10,525	640,315	209,511	108,293	119,170	44,454	62,056	..	45,584	11,846	600,914	2,682	36,719	..
Bay of Plenty Power Board ..	1,653	196,470	40,601	..	..	907	727	42,235	13,016	8,445	9,048	1,305	2,940	..	..	275	35,029	1,771	5,435	..
Cambridge Power Board ..	1,557	115,965	19,104	..	..	149	798	20,051	6,931	6,317	4,576	..	1,851	..	94	64	19,773	..	278	..
Central Hawke's Bay Power Board	1,696	151,960	23,583	..	..	..	55	23,638	7,550	4,425	5,852	846	103	2,516	..	186	21,478	354	1,806	..
Central Waikato Power Board ..	5,260	369,838	60,404	56	..	48	610	61,118	22,364	12,366	15,512	870	5,977	827	..	774	58,690	..	2,428	..
Dannevirke Power Board ..	2,760	222,868	30,139	..	..	58	282	30,479	7,326	6,468	9,328	1,207	3,140	63	..	633	28,165	558	1,756	..
Franklin Power Board	3,936	294,258	47,971	..	..	1,307	3,457	52,735	19,039	9,674	12,949	4,500	4,867	..	..	614	51,643	500	592	..
Hamilton Borough Council ..	4,644	60,782	39,695	..	..	..	190	39,885	13,042	9,926	1,871	..	2,008	..	..	152	26,999	12,665	221	..
Havelock North Town Board ..	312	26,800	3,831	..	..	..	1	3,832	893	910	1,004	500	479	..	..	4	3,790	..	42	..
Hawke's Bay Power Board ..	6,787	353,913	67,133	16,667	..	..	746	84,546	36,292	12,697	17,604	8,328	2,000	3,326	..	907	81,154	3,392	..	..
Horowhenua Power Board ..	4,550	229,154	47,516	..	..	304	830	48,650	20,524	10,533	8,365	..	163	4,150	..	869	44,604	363	3,683	..
Hutt Valley Power Board ..	12,251	383,388	103,347	..	..	403	864	104,614	45,392	23,554	16,957	3,293	1,300	3,842	..	673	95,011	4,109	5,494	..
Inglewood Borough Council ..	427	9,006	3,972	..	..	775	..	4,747	1,709	1,369	453	..	340	103	..	18	3,992	746	9	..
Kaponga Town Board	372	23,052	5,016	..	89	134	62	5,301	772	3,362	712	..	..	80	..	129	5,055	..	246	..
Manawatu-Oroua Power Board ..	5,077	485,514	68,989	17,381	41	353	249	87,013	36,940	15,922	21,100	914	6,703	174	..	575	82,328	..	4,685	..
Mangaweka Town Board ..	120	5,761	978	..	159	8	46	1,191	350	433	91	..	21	..	..	22	917	..	274	..
Napier Borough Council ..	4,809	126,072	43,480	..	..	..	1,249	44,729	15,774	6,333	5,696	2,111	1,581	..	..	1,721	33,216	5,184	6,329	..
New Plymouth Borough Council ..	6,494	357,807	67,525	1,474	..	826	1,527	71,352	8,400	18,728	11,717	500	1,831	4,094	497	973	46,740	14,685	9,927	..
Opunake Power Board	1,000	109,258	12,656	..	..	..	33	12,689	1,464	4,430	3,774	200	1,975	..	..	167	12,010	..	679	..
Palmerston North City Council ..	6,036	242,924	60,696	..	..	134	73	60,903	17,381	11,958	7,744	..	3,029	..	..	194	40,306	20,597	..	..
Patea Borough Council	404	18,129	4,472	..	..	42	7	4,521	1,138	1,188	589	42	156	124	..	21	3,258	1,263	..	..
Poverty Bay Power Board ..	5,191	321,476	58,634	..	..	144	1,851	60,629	16,432	16,829	13,094	1,096	6,909	..	..	737	55,097	5,179	353	..
Rotorua (Tourist Department) ..	2,160	77,653	21,671	..	..	..	660	22,331	6,639	5,781	3,882	1,553	1,553	..	..	..	19,408	..	2,923	..
South Taranaki Power Board ..	3,266	208,271	34,655	1,128	..	221	398	36,402	7,168	10,077	8,538	1,091	3,406	1,424	..	330	32,034	4,368	..	..
Stratford Borough Council ..	1,102	28,111	13,347	..	..	..	3	13,350	4,885	2,196	1,910	..	..	990	..	24	10,005	3,345	..	..
Taihape Borough Council ..	577	10,435	5,564	..	..	..	..	5,564	52	1,922	631	508	106	81	..	61	3,361	1,582	621	..
Taranaki Power Board	2,567	478,086	36,902	8,628	43	..	421	45,994	1,562	10,510	19,493	..	..	7,918	..	1,334	40,817	3,368	1,809	..
Tararua Power Board	1,685	168,839	23,952	..	..	470	151	24,573	6,578	5,678	6,663	1,951	1,860	..	..	58	22,788	595	1,190	..
Te Aroha Borough Council ..	740	16,748	7,476	..	..	43	59	7,578	2,522	3,267	476	..	55	..	..	11	6,331	447	800	..
Te Awamutu Power Board ..	1,979	190,858	29,346	..	..	23	120	29,489	10,066	5,458	6,926	..	..	2,760	..	426	25,636	..	3,853	..
Thames Valley Power Board ..	7,898	804,013	114,684	5,246	..	..	1,282	121,212	39,845	23,219	40,364	240	6,578	531	5,014	697	116,488	..	4,724	..
Thames Borough Council ..	1,169	30,090	12,166	..	..	..	90	12,256	2,728	4,462	856	36	255	..	..	55	8,392	1,000	2,864	..
Wairarapa Power Board.. ..	5,137	353,062	52,146	..	..	641	659	53,446	11,547	11,581	15,021	3,467	3,000	..	..	2,434	47,050	3,496	2,900	..
Wairoa Power Board	395	63,919	7,515	5,343	1,845	44	282	15,029	7,144	2,250	3,021	137	500	802	..	82	13,936	..	1,093	..
Wairoa Borough Council ..	695	11,104	8,366	..	..	..	90	8,456	5,343	1,342	665	..	365	..	..	71	7,786	670	..	..
Waitara Borough Council ..	525	7,321	3,914	..	510	..	50	4,474	1,438	882	552	291	..	365	..	165	3,693	781	..	..
Waitemata Power Board ..	11,106	431,939	80,266	..	..	333	1,083	81,682	29,039	23,772	18,606	2,116	3,108	2,785	..	2,019	81,445	..	237	..
Waitomo Power Board	1,401	105,499	18,482	..	..	256	30	18,768	6,974	4,517	4,631	161	1,270	213	..	..	17,766	770	232	..
Wanganui-Rangitikei Power Board	10,502	530,065	101,207	402	..	..	1,627	103,236	36,455	19,311	22,881	10,758	2,130	9,098	..	1,388	102,021	1,215	..	..
Wellington City Council ..	37,455	1,178,204	333,355	..	..	..	5,252	338,607	94,458	85,596	20,887	26,913	4,809	..	4,690	23,214	260,567	34,571	43,469	..
Total	219,927	20,735,488	2,384,275	803,879	2,687	7,623	44,547	3,243,011	776,989	653,388	890,512	144,410	148,365	46,266	55,879	61,742	2,777,551	317,789	147,671	..

* Includes £173,807 of assets not in operation. † Half capital charges for King's Wharf Station, paid by Department.

Gross profit, £465,460; rates collected, £2,687; net profit, £462,773. Ratio working expenses to revenue = 46 per cent.; ratio capital charges to capital outlay = 6·28 per cent.

TABLE V.—SOUTH ISLAND ELECTRIC-POWER SYSTEM.—GROSS FINANCIAL RESULTS OF DISTRIBUTION OF ENERGY FOR THE YEAR ENDED 31ST MARCH, 1936.

Distributing Authority.	Number of Consumers.	Capital Outlay.	Revenue.						Expenditure.									Balance.		
			From Sale of Electrical Energy.		Rates.	Trading Account.	Other Sources.	Total.	Paid for Electrical Energy.	Working-costs and Management.	Interest.	Depreciation.	Sinking Fund.	Principal Repayment.	Exchange.	Other Expenditure.	Total.	Profit.		Loss.
			Retail.	Bulk (for Resale).														Appropriated to Reserves.	Unappropriated.	
		£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
Public Works Department ..	108	4,460,382*	45,410	197,067	..	164	2,617	245,258	..	53,900	177,217	79,750	..	..	..	..	310,867	..	..	65,609
Ashburton Power Board ..	3,983	326,984	46,003	..	..	..	673	46,676	13,474	9,250	15,075	2,443	442	4,800	..	..	45,484	1,192	..	..
Banks Peninsula Power Board ..	1,012	103,302	11,552	..	2,702	52	217	14,523	3,750	5,143	4,452	..	1,886	..	..	..	15,231	..	..	708
Christchurch City Council ..	30,210	788,996	228,016	9,190	..	873	6,124	244,203	89,000	66,433	9,646	28,464	..	3,466	1,806	2,267	201,082	17,928	25,193	..
Dunedin City Council	27,636	1,618,770	216,014	13,256	..	..	2,228	231,498	9,750	53,560	53,997	28,768	24,018	..	3,522	6,348	179,963	51,535	..	..
Heathcote County Council ..	1,279	26,005	11,046	..	..	..	61	11,107	6,174	2,616	1,010	..	723	..	..	..	10,523	..	584	..
Kaiapoi Borough Council ..	495	10,847	3,060	..	..	46	..	3,106	1,252	1,005	327	52	256	..	..	..	2,892	98	116	..
Lyttelton Borough Council ..	888	12,325	6,857	..	..	..	..	6,857	2,638	1,559	305	175	175	..	..	..	4,852	495	1,510	..
Malvern Power Board	680	71,166	7,768	..	2,495	110	291	10,664	2,362	3,643	3,149	..	846	..	..	..	10,000	..	664	..
North Canterbury Power Board ..	2,195	166,580	22,666	3,156	..	..	753	26,575	10,058	7,321	6,217	148	2,769	44	..	..	26,557	..	18	..
Otago Power Board	4,174	301,236	44,155	..	3,764	..	46	47,965	13,256	8,219	13,100	..	3,050	3,544	..	..	41,169	..	6,796	..
Riccarton Borough Council ..	1,522	22,833	11,689	..	..	285	..	11,974	5,798	3,436	439	257	181	..	..	61	10,172	645	1,157	..
Rangiora Borough Council ..	682	13,677	5,175	..	..	..	56	5,231	1,905	2,288	282	81	75	..	..	..	4,631	..	600	..
South Canterbury Power Board ..	4,268	334,945	39,645	16,005	..	561	848	57,059	27,880	6,213	13,149	3,305	4,805	..	..	693	56,045	..	1,014	..
Springs-Ellesmere Power Board ..	2,574	161,456	29,924	..	..	..	367	30,291	10,886	6,591	6,264	258	2,707	..	..	713	27,419	..	2,872	..
Sumner Borough Council ..	1,068	15,372	5,918	..	..	28	..	5,946	2,836	1,363	310	397	90	..	..	61	5,057	830	59	..
Timaru Borough Council ..	4,532	102,228	34,947	..	..	..	241	35,188	16,015	9,282	1,970	784	3,302	..	..	155	31,508	3,680	..	..
Waimairi County Council ..	3,501	61,993	23,752	34	71	18	44	23,919	9,618	3,875	1,683	4,000	1,444	..	..	203	20,823	3,096	..	..
Waitaki Power Board	3,926	178,906	32,351	..	..	660	304	33,315	11,804	8,046	7,392	1,218	2,649	..	..	790	31,899	..	1,416	..
Totals	94,733	8,778,003	825,948	238,708	9,032	2,797	14,870	1,091,355	238,456	253,743	315,984	150,100	49,418	11,854	5,328	11,291	1,036,174	79,499	41,999	66,317

* Includes £18,075 of assets not in operation.

Gross profit, £55,181; rates collected, £9,032; net profit, £46,149. Ratio working expenses to revenue = 46 per cent.; ratio capital charges to capital outlay = 6·09 per cent.

TABLE VI.—ROUTE-MILES OF LINE OPERATED BY THE PUBLIC WORKS DEPARTMENT, AS AT 31ST MARCH, 1936.

NORTH ISLAND SYSTEM.

Voltage	110 kv.		50 kv.		11 kv.				3 kv.	Total Route-miles,
Number of Circuits	1.	2.	1.	2.	1.	2.	3.	4.	1.	
Miles	486·40	258·57	380·24	28·68	14·81	22·61	0·18	4·55	6·62	1,202·66

SOUTH ISLAND SYSTEM.

Voltage	110 kv.		66 kv.		33 kv.		11 kv.				6·6 kv.	L.T.	Total Route-miles,
Number of Circuits	1.	2.	1.	2.	1.	2.	1.	2.	3.	4.	1.	..	
Miles	221·64	..	380·89	..	17·18	19·69	11·14	21·54	0·27	2·52	4·02	2·3	681·19

Actual Mileages and Sizes of Overhead Conductors in use in connection with above Lines.

—	North Island System.						South Island System.					
	Copper.	A.C.S.R.	Galvanized Iron.	Copperweld.	Cadmium Copper.	Total Miles.	Copper.	Aluminium.	A.C.S.R.	Galvanized Iron.	Copperweld.	Total Miles.
1/·112..	..	..	..	..	278	278	..	..	..	..	..	..
1/·160..	..	..	202	573	..	775	..	..	..	10	14	24
1/·192..	..	..	..	..	..	..	..	..	..	..	..	..
1/0 ..	72	..	..	..	..	72	..	..	..	..	..	..
3/0 ..	..	..	..	..	..	..	..	..	399	..	..	399
7/·064..	71	..	..	..	..	71	53	..	..	..	..	53
7/·080..	664	..	..	..	..	664	323	2	..	..	..	325
7/·104..	200	..	..	..	..	200	..	14	..	..	..	14
7/·128..	..	..	..	..	..	..	14	180	..	..	..	194
7/·135..	..	..	..	..	..	..	..	..	..	..	..	..
7/·167..	..	586	..	..	..	586	..	..	..	..	4	4
7/·182..	..	..	..	..	..	..	..	..	..	..	8	8
19/·052..	3	..	..	..	..	3	..	..	..	..	..	..
19/·064..	408	..	..	..	..	408	40	..	..	..	..	40
19/·072..	2	..	..	..	..	2	..	..	..	..	..	..
19/·080..	..	..	..	..	..	..	1	..	..	..	..	1
19/·092..	1,748	..	..	..	..	1,748	1,054	..	..	..	..	1,054
19/·104..	436	..	..	..	..	436	24	..	..	..	..	24
37/·072..	359	..	..	..	..	359	..	..	..	..	..	..
37/·092..	17	..	..	..	..	17	..	..	..	..	..	..
37/·102..	..	..	..	..	..	..	..	..	227	..	..	227
Totals	3,980	586	202	573	278	5,619*	1,509	196	626	10	26	2,367†

* Includes 1,039 miles of telephone line conductors. † Does not include 1,262 miles of telephone line conductors.

Table VII.—Route-miles of Supply Authorities' Lines connected to Government Systems as at 31st March, 1936.

Voltage	22,000.	11,000.				6,600.				3,300.		400.		Total Route-miles (a)
Number of Circuits	1.	1.	2.	3.	4.	1.	2.	3.	4.	1.	2.	1.	2.	
North Island System.														
Auckland Power Board	54·01	154·53	..	..	..	190·35	..	..	..	..	..	692·06	..	1,116·46
Bay of Plenty Power Board	..	234·62	..	..	..	..	..	..	..	..	..	31·00	..	265·92
Cambridge Power Board	..	1·75	..	..	..	..	..	..	..	115·00	..	73·00	..	189·75
Central Hawke's Bay Power Board	..	158·50	1·50	..	..	30·00	..	..	..	4·25	..	49·00	..	243·40
Central Waikato Power Board	..	306·95	12·35	..	0·67	..	..	..	..	98·58	..	284·03	..	702·58
Dannevirke Power Board	..	24·34	3·00	1·50	..	210·34	0·50	..	..	..	..	81·50	..	322·07
Franklin Power Board	..	404·48	10·81	0·37	0·62	..	..	..	..	..	..	176·00	..	592·28
Hamilton Borough Council	..	6·74	..	..	..	..	..	..	..	..	..	49·63	..	56·37
Hawke's Bay Power Board	..	176·25	15·00	..	..	..	..	..	..	6·25	..	86·50	..	285·50
Horowhenua Power Board	..	169·94	5·80	0·83	..	..	..	..	..	..	..	472·98	..	649·55
Hutt Valley Power Board	..	6·41	21·83	..	..	17·60	67·41	..	..	..	..	182·88	1·78	299·16
Manawatu-Oroua Power Board	..	263·65	33·00	..	1·50	..	..	..	..	166·44	..	152·20	..	616·79
New Plymouth Borough Council	..	256·25	16·00	..	2·00	..	..	..	..	..	..	60·00	..	334·25
Poverty Bay Power Board	..	36·44	6·75	..	..	149·72	11·50	..	0·22	..	..	225·00	0·82	431·44
Rotorua (Tourist Department)	..	..	..	..	..	33·73	5·00	..	..	8·75	..	16·53	0·51	64·52
South Taranaki Power Board	..	180·32	8·88	..	..	..	..	..	..	1·37	..	162·85	..	353·52
Taranaki Power Board	34·26	36·66	..	..	..	311·30	5·01	0·13	0·06	..	..	239·28	0·15	626·85
Tararua Power Board	..	92·21	12·31	..	..	..	..	..	..	140·41	..	147·70	..	392·88
Te Awamutu Power Board	..	61·11	12·00	..	..	..	..	..	..	162·85	4·75	83·86	..	324·57
Te Aroha Borough Council	..	1·00	..	..	..	..	..	..	..	4·20	..	13·63	..	18·83
Thames Borough Council	..	1·25	..	..	..	..	..	..	..	4·50	..	16·00	..	21·75
Thames Valley Power Board	..	524·32	75·00	..	..	..	..	..	..	37·68	..	185·19	..	822·19
Wairarapa Power Board	..	245·06	27·25	1·25	..	..	..	..	..	13·68	..	256·59	..	545·58
Wairoa Power Board	..	38·00	24·00	..	..	..	..	..	..	6·00	..	51·00	..	119·00
Waitemata Power Board	..	681·81	6·45	..	..	..	..	..	..	..	..	..	..	688·26
Waitomo Power Board	..	95·78	5·75	1·00	0·25	..	..	..	..	..	..	23·37	0·50	126·20
Wanganui-Rangitikei Power Board	..	212·50	25·00	..	..	226·00	..	..	..	3·00	..	492·00	..	961·50
*Wellington City Council	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Totals	88·27	4,371·87	322·68	4·95	5·04	1,169·04	89·42	0·13	0·28	772·96	4·75	4,340·25	3·76	11,173·40(a)

Voltage	33,000.	11,000.				6,600.		3,300.			400.		230.	Underground Cable.	Total Route-miles.
Number of Circuits	1.	1.	2.	3.	4.	1.	2.	1.	2.	3.	1.	2.	1.		
South Island System.															
Ashburton Power Board	..	77·44	19·00	0·7	0·62	714·69	2·1	..	..	..	81·64	..	..	1·00	897·19
Banks Peninsula Power Board	22·0	25·30	..	..	..	58·20	4·0	40·13	..	..	54·88	..	..	..	204·50
Christchurch City Council	..	15·38	..	..	..	..	..	6·44	..	..	252·94	..	..	66·52	341·28
Dunedin City Council	96·75	..	..	..	..	171·70	12·60	12·80	1·50	0·20	265·60	..	..	19·61	580·76
Heathcote County Council	..	7·80	..	..	..	..	..	1·63	..	..	24·66	0·22	..	0·75	35·06
Kaiapoi Borough Council	..	..	..	..	..	..	..	1·06	..	..	5·50	..	7·88	..	14·44
Lyttelton Borough Council	..	1·80	..	..	..	..	..	..	..	..	8·28	..	..	0·22	10·31
Malvern Power Board	..	..	..	..	..	171·60	..	..	..	..	12·25	..	..	0·50	184·35
North Canterbury Power Board	..	274·86	14·16	..	..	43·26	..	25·60	..	..	25·60	..	69·42	0·29	453·19
Otago Power Board	40·35	89·88	..	..	..	190·35	0·50	..	..	..	45·68	..	162·70	..	529·45
Rangiora Borough Council	..	..	..	..	..	..	..	2·21	0·57	..	7·06	0·1	3·40	0·09	13·44
Riccarton Borough Council	..	..	..	..	..	..	..	..	2·50	..	15·75	..	..	..	18·25
South Canterbury Power Board	..	30·64	83·50	..	..	541·58	3·5	..	..	..	105·45	0·5	..	1·64	766·81
Springs-Ellesmere Power Board	..	37·73	6·50	..	..	39·94	..	124·70	..	..	114·23	..	..	0·45	323·55
Sumner Borough Council	..	1·00	..	..	..	..	..	2·50	..	..	6·00	..	..	..	9·50
Timaru Borough Council	..	1·19	..	..	..	..	..	4·20	3·60	..	47·26	..	..	2·75	59·00
Waitaki Power Board	..	129·67	0·70	..	..	188·08	..	3·45	..	..	108·44	..	..	0·27	430·61
Waimairi County Council	..	..	..	..	..	37·00	1·0	23·00	..	..	63·50	..	19·00	0·61	144·11
Totals	159·10	692·69	123·86	0·7	0·62	2,156·40	23·70	247·71	8·17	0·20	1,247·71	0·82	262·40	94·71	5,018·79

Table VIII.—Electric-power Districts of New Zealand as constituted at 31st March, 1936.

Name of Board.	Proclamation affecting Constitution gazetted.	Members on Board.	Approximate Area.		Population.		Value of Rateable Property.			Valuation Basis used for Rating Purposes.	Total Amount of Loans authorized.	Total Votes cast for Loan Polls.		Number of Ratepayers.
							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.	
1. Ashburton	17/11/21	12	1,193	1,271	18,870	501	11,500,000	8,314,594	700,000	Capital	411,150	2,999	706	4,175
2. Auckland	1/4/22 7/9/22 21/8/24 15/7/25 12/11/25 29/7/26	12	325	..	225,000	..	78,840,179	50,491,865	..	Capital	2,542,500	11,004	1,367	35,000
3. Banks Peninsula	8/1/20 24/11/21	7	387	..	4,050	..	3,757,770	3,545,448	..	Capital	114,680	658	113	1,081
4. Bay of Plenty	20/8/25	8	536	2,678	10,355	1,815	1,497,032	1,497,032	188,502	Unimproved ..	206,000	654	153	2,294
5. Buller(1)	11/5/22	5	1,987	..	9,197	..	696,374	696,374	..	Unimproved ..	Poll not yet taken.			
6. Cambridge	8/1/20 6/9/23	8	137	..	6,000	..	2,559,567	1,550,262	..	Capital	122,835	749	123	1,600
7. Central Hawke's Bay ..	19/10/22 7/4/27 28/8/30	9	1,300	..	10,490	..	5,589,823	5,589,823	..	Unimproved ..	150,000	543	41	2,717
8. Central Waikato	8/7/20 7/9/22 6/3/24 7/8/24 8/1/25 3/12/25 3/9/27 27/3/30	11	985	155	19,100	N.A.	8,824,339	4,663,847	N.A.	Capital	419,000	2,004	168	4,500
9. Dannevirke	11/8/21	10	578	118	12,188	426	3,582,183	3,582,183	466,663	Unimproved ..	224,000	1,587	330	4,452
10. Franklin	2/10/24 28/7/27 31/10/29	9	628	58	16,770	435	7,761,397	4,926,883	111,365	Capital	329,820	2,471	478	4,352
11. Golden Bay	18/6/25	5	51	967	1,400	1,950	465,514	248,871	318,313	Capital	28,000	393	98	391
12. Grey	26/10/22	9	702	810	14,320	768	2,453,941	650,091	117,700	Capital	315,385	3,095	884	3,293
13. Hawke's Bay	19/6/24 3/2/27 7/4/27 28/8/30	9	1,680	2	45,123	1,142	9,541,249†	9,541,249	124,319	Unimproved ..	429,000	681	68	10,099
14. Horowhenua	1/12/21	9	600	..	17,200	..	6,898,987*	3,403,255	..	Capital	260,000	973	26	3,780(3)
15. Hutt Valley	6/7/22 11/12/24	11	530	..	45,670	..	5,386,273	5,386,273	..	Unimproved ..	390,000	2,333	343	12,044

(For notes see p. 87).

TABLE VIII.—ELECTRIC-POWER DISTRICTS OF NEW ZEALAND AS CONSTITUTED AT 31ST MARCH, 1936—*continued.*

Name of Board.	Proclamation affecting Constitution gazetted.	Members on Board.	Approximate Area.		Population.		Value of Rateable Property.			Valuation Basis used for Rating Purposes.	Total Amount of Loans authorized.	Total Votes cast for Loan Polls.		Number of Rate-payers.
							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.	
16. Lake Wakatipu(1)	1/2/34	7	73	3,800	1,700	1,200	..	171,920	321,690	..	..	Poll not	yet taken.	474
17. Malvern	28/6/23 17/3/30	6	308	1,773	3,550*	1,500*	2,812,044	2,078,625	N.A.‡	Capital	65,000	508	33	1,032
18. Manawatu-Oroua	1/12/21 20/6/29 1/11/34	12	1,301	..	40,000	..	12,918,565	12,918,565	..	Unimproved ..	550,000	1,144	96	9,100
19. Marlborough	25/10/23	8	3,218	..	14,530	..	7,449,979	4,258,916	..	Capital	349,500	1,587	431	3,760
20. North Auckland(1) ..	29/3/23 5/12/29 5/3/31 13/12/34	12	2,218	5	26,516	7,154	3,660,515	3,660,515	846,127	Unimproved ..	297,000	3,512	958	5,974
21. North Canterbury	1/2/34 11/1/34	8	1,628	2,948	11,734	7,551	9,190,828	7,619,765	4,388,264	Capital	210,700	653	150	2,899
22. Opunake	18/8/21 19/3/25 20/8/25	7	230	10	5,030	70	2,191,404	1,162,972	N.A.‡	Capital	95,000	504	107	970
23. Otago Central	26/10/22 4/12/24 19/7/28	9	306	2,378	3,585	1,585	742,782	296,380	727,447	Capital	102,000	688	32	858
24. Otago	18/10/23 23/12/26 1/11/28 26/4/29	9	1,391	890	17,931	6,251	4,797,711	3,061,588	1,634,860	Capital	310,500	1,358	206	5,535
25. Poverty Bay	20/12/23	11	1,747	1,344	24,440	8,610	14,461,734	6,140,499	3,110,233	Capital	379,750	2,319	530	8,173
26. Reefton(1)	30/6/21	5	24	..	1,639	..	178,055	38,054	..	Capital	..	Poll not	yet taken.	..
27. South Canterbury	26/10/22 8/3/28 13/12/28	12	1,673	3,579	35,618	6,980	15,096,516	12,946,839	2,640,530	Capital	380,220	1,919	587	6,410
28. South Taranaki	30/4/25 5/2/31	10	434	46	20,000	1,500	9,059,095	5,296,444	79,442	Capital	227,500	1,237	300	3,847
29. Southland	19/11/19	12	7,918	3,035	72,406	30	11,876,000	11,876,000	110,000	Unimproved ..	1,650,000	6,516	415	20,327
30. Springs-Ellesmere	8/7/20 29/3/23 23/8/23 17/3/30 5/2/31 6/8/31	5	524	N.A.‡	12,330	N.A.‡	7,856,719	5,678,061	32,000	Capital	166,520	1,352	105	3,133

(For notes see p. 87.)

TABLE VIII.—ELECTRIC-POWER DISTRICTS OF NEW ZEALAND AS CONSTITUTED AT 31ST MARCH, 1936—*continued.*

Name of Board.	Proclamation affecting Constitution gazetted.	Members on Board.	Approximate Area.		Population.		Value of Rateable Property.			Valuation Basis used for Rating Purposes.	Total Amount of Loans authorized.	Total Votes cast for Loan Polls.		Number of Ratepayers.
							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.	
31. Taranaki	19/5/22 6/5/26 20/5/26 5/2/31 2/11/33	8	355	1,333	13,985	8,015	6,141,672	2,865,396	3,109,336	Capital	446,000	1,134	263	2,150
32. 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	3,600
33. Tauranga	14/6/23 16/7/31 1/6/33	7	646	3	8,940*	4,030*	1,004,372	1,004,372	517,107	Unimproved ..	184,500	1,555	342	2,563
34. Te Awamutu	8/1/20 27/11/24	8	270	10	8,524	N.A.	2,134,179	2,134,179	N.A.‡	Unimproved ..	178,000	757	146	2,043
35. Teviot	22/7/20 6/11/24	7	102	..	1,830	..	176,839	255,661	..	Unimproved ..	55,500	280	32	391
36. Thames Valley	8/1/20 6/9/23 22/12/24 1/6/33	12	2,295	6	39,910	3,200	14,089,950	6,571,168	44,265	Capital	850,000	3,210	988	13,074
37. Waimea	2/5/29	7	434	1,126	10,000	14,000	2,309,473	N.A.‡	N.A.‡	Capital	84,500	1,184	279	2,438
38. Wairarapa	25/3/20 20/5/26 22/7/26 4/11/26 3/2/27 17/10/29	9	606	1,390	20,940	4,350	10,528,989	5,617,379	2,811,057	Capital	330,600	2,295	312	5,445
39. Wairere	18/1/23 4/11/26 21/3/29 24/9/31	7	382	25	2,500	200	696,621	696,621	163,379	Unimproved ..	45,800	94	8	755
40. Wairoa	29/7/20	10	1,354	..	5,520	..	4,207,351	2,488,442	..	Capital	100,000	504	31	1,461
41. Waitaki	9/8/23 5/4/28	9	520	1,853	17,500	2,500	5,747,283	4,406,970	239,322	Capital	195,650	1,959	222	4,752
42. Waitemata	18/10/23 27/11/24 26/8/26 7/3/29 24/1/35	12	1,106	..	45,630	..	13,903,497	5,821,648	..	Capital	495,000	11,326	2,214	16,206*
43. Waitomo	6/3/24	7	160	1,100	6,670	2,000	801,312	801,312	N.A.‡	Unimproved ..	143,400	784	109	1,634
44. Wanganui-Rangitikei ..	1/12/21 23/12/26 20/3/29 6/11/34	12	1,648	972	52,000	3,000	22,099,617*	6,568,540*	1,408,210*	Capital	375,000	1,315	214	10,350*
45. Westland(2)	28/10/20	9	900	..	3,462	..	401,319	220,810	..	..	Poll not yet taken.			683
Totals, 1935–36 ..	..	401	46,090	34,209	992,268	92,568	338,704,049	223,560,691	25,472,712	..	14,410,010	80,552	14,091	229,815
Totals, 1934–35 ..	..	404	45,954	33,014	982,581	93,470	347,826,237	224,110,453	25,246,895	..	13,766,625	69,720	12,409	227,254

(1) Not yet actively functioning. (2) License delegated to Westland Power, Ltd. (3) 1931–32 figures. Later return not furnished. * 1934–35 figures. † Changed from capital to unimproved basis. ‡ N.A.=not available.

Table IX.—Statistics of Population, Consumers, System Voltages, Route-miles of Lines, etc., for the Year ended 31st March, 1936.

Note.—In the column describing the Source of Supply the following abbreviations are used: G.N. = Government supply, North Island system; G.S. = Government supply, South Island system; I. = Independent supply (own generating-plant); B. = Bulk supply from another authority.

Supply Authority.	Source of Supply.	Year when Supply commenced.	Population included in Area of Supply.	Number of Consumers.	Ratio of Consumers to Population in Area of Supply.	Voltage.				Route-miles of Lines.	Consumers per Route-mile of Line.	Static Head.
						Generation.	Transmission.	Primary Distribution.	Secondary Distribution (and System of Supply).			
Public Works Department.					%							Ft.
1. Arapuni-Mangahao-Waikaremoana ..	I.	1921	..	301	..	11,000 6,600 5,000	110,000 50,000	11,000 3,300	400/230 A.C.	1,203	..	A=175 H= 27 M=896 W=676
2. Coleridge-Waitaki	I.	1915	..	94	..	11,000 6,600	110,000 66,000 33,000	11,000 6,600	400/230 A.C.	681	..	C=480 Wi=70
Totals, P.W.D.	..	..	..	395	..	..	..	..	..	1,884	..	..
Electric-power Boards.												
1. Ashburton	G.S.	1923	18,870	3,983	21·10	400 (*s*)	..	11,000 6,600	400/230 A.C.	897	4·4	..
2. Auckland	G.N.	1908	225,000	53,931	23·97	6,600 (*s*)	22,000	11,000 6,600	400/230 A.C. 460/230 D.C.	1,142	47·2	..
3. Banks Peninsula	G.S.	1921	4,050	1,012	25·00	3,300 (*s*)	33,000	11,000 6,600 3,300	400/230 A.C.	205	4·9	310
4. Bay of Plenty	G.N.	1928	10,355	1,653	15·97	..	..	11,000	400/230 A.C.	266	6·2	..
5. Buller [1]	..	..	..	..	..	..	..	..	..	..	..	..
6. Cambridge	G.N.	1921	6,000	1,557	25·95	..	..	11,000 3,300	400/230 A.C.	190	8·2	..
7. Central Hawke's Bay	G.N.	1925	10,490	1,696	16·17	..	..	11,000 6,600 3,300	400/230 A.C.	239	7·1	..
8. Central Waikato	G.N.	1921	19,010	5,259	27·67	..	..	11,000 3,300	400/230 A.C.	703	7·5	..
9. Dannevirke	G.N.	1925	12,614	2,760	21·90	..	..	11,000 6,600	400/230 A.C.	325	8·5	..
10. Franklin	G.N.	1925	17,205	3,936	22·90	..	..	11,000	400/230 A.C.	592	6·7	..
11. Golden Bay	I.	1929	1,400	396	28·30	400	..	6,600	400/230 A.C.	61	6·5	330
12. Grey	I.	1926	14,320	3,455	24·10	3,300	33,000	11,000	400/230 A.C.	189	18·3	42
13. Hawke's Bay	G.N.	1927	29,833	6,785	22·75	3,300 (*s*)	..	11,000 3,300	400/230 A.C. 460/230 D.C.	345	19·7	..
14. Horowhenua	G.N.	1924	17,150	4,550	26·50	..	..	11,000	400/230 A.C.	326	14·0	..
15. Hutt Valley	G.N.	1925	45,000	12,251	27·22	..	..	11,000 6,600	400/230 A.C.	297	41·3	..
16. Lake Wakatipu [1]	..	..	..	..	..	..	..	..	..	..	..	..
17. Malvern	G.S.	1925	5,050	680	13·46	..	..	6,600	400/230 A.C.	184	3·7	..
18. Manawatu-Oroua	G.N.	1924	39,011	5,076	13·00	..	..	11,000 3,300	400/230 A.C.	616	8·3	..

(For notes, see page 92.)

TABLE IX.—STATISTICS OF POPULATION, CONSUMERS, SYSTEM VOLTAGES, ROUTE-MILES OF LINES, ETC., FOR THE YEAR ENDED 31ST MARCH, 1936—*continued.*

G.N. = Government supply, North Island system. G.S. = Government supply, South Island system. I. = Independent supply (own generating-plant). B. = Bulk supply from another authority.

Supply Authority.	Source of Supply.	Year when Supply commenced.	Population included in Area of Supply.	Number of Consumers.	Ratio of Consumers to Population in Area of Supply.	Voltage.				Route-miles of Lines.	Consumers per Route-mile of Line.	Static Head.
						Generation.	Transmission.	Primary Distribution.	Secondary Distribution (and System of Supply).			
ELECTRIC-POWER BOARDS—*continued.*					%							Ft.
19. Marlborough	I.	1927	14,530	2,888	19·90	6,600	33,000	11,000 6,600	400/230 A.C.	282	10·0	100
20. North Auckland [2]	..	..	..	..	..	..	..	..	..	..	..	..
21. North Canterbury	G.S.	1928	11,734	2,195	18·72	..	..	11,000 6,600 3,300	400/230 A.C.	453	4·9	..
22. Opunake	I. & B.	1924	5,100	1,000	19·60	6,600	..	6,600	400/230 A.C.	152	6·6	47
23. Otago Central	I. & B.	1925	3,585	987	27·50	6,600 [5]	33,000	11,000 6,600	400/230 A.C.	187	5·3	987
24. Otago	B.	1926	17,931	4,174	23·30	..	33,000	11,000 6,600	400/230 A.C.	607	6·9	..
25. Poverty Bay	G.N.	1912	24,440	5,191	21·24	6,600 (*s*)	..	11,000 6,600	400/230 A.C. 460/230 D.C.	378	13·7	..
26. Reefton [1]	..	..	..	..	..	..	..	..	..	..	..	..
27. South Canterbury	G.S.	1925	25,289	4,268	16·88	400 (*s*)	..	11,000 6,600	400/230 A.C.	767	5·6	66
28. South Taranaki	G.N.	1929	20,000	3,265	16·33	5,500 (*s*)	..	11,000	400/230 A.C.	267	12·2	57
29. Southland	I.	1925	48,875	10,198	20·90	6,600	66,000	11,000 3,300	400/230 A.C.	2,408	4·2	154
30. Springs-Ellesmere	G.S.	1922	12,330	2,574	20·87	..	..	11,000 6,600 3,300	400/230 A.C.	324	7·9	..
31. Taranaki	I. & G.N.	1927	22,000	2,562	11·65	6,600	33,000	11,000 6,600	400/230 A.C.	401	6·4	300
32. Tararua	G.N.	1925	8,115	1,685	20·80	..	..	11,000 3,300	400/230 A.C.	224	7·5	..
33. Tauranga	B.	1926	9,564	1,420	14·85	..	33,000	11,000–3 ph. 6,350–1 ph. 3,300–3 ph.	400/230 A.C. 460/230 1 ph. 3 w. A.C.	412	3·5	..
34. Te Awamutu	G.N.	1921	8,524	1,979	23·20	..	..	11,000 3,300	400/230 A.C.	325	6·1	..
35. Teviot	I.	1924	1,830	416	22·75	3,300	..	11,000 6,600 3,300	400/230 A.C.	69	6·0	380
36. Thames Valley	G.N.	1921	35,850	7,896	22·00	..	..	11,000 3,300	400/230 A.C.	823	9·6	..
37. Waimea	I. & B.	1912	9,235	1,859	20·12	400 3,300 2,500	..	11,000 2,500	400/230 A.C.	127	14·6	960/16/10
38. Wairarapa	G.N.	1923	19,500	5,137	26·35	3,300 (*s*)	..	11,000 3,300	400/230 A.C.	524	9·8	429/290
39. Wairere	I.	1925	2,000	351	17·55	6,600	..	6,600	400/230 A.C.	119	3·0	65
40. Wairoa	G.N.	1923	5,520	394	7·14	..	..	11,000 3,300	400/230 A.C.	97	4·1	..

(For notes, see page 92.)

TABLE IX.—STATISTICS OF POPULATION, CONSUMERS, SYSTEM VOLTAGES, ROUTE-MILES OF LINES, ETC., FOR THE YEAR ENDED 31ST MARCH, 1936—*continued.*

G.N.=Government supply, North Island system. G.S.=Government supply, South Island system. I.=Independent supply (own generating-plant). B.=Bulk supply from another authority.

Supply Authority	Source of Supply.	Year when Supply commenced.	Population included in Area of Supply.	Number of Consumers.	Ratio of Consumers to Population in Area of Supply.	Voltage.				Route-miles of Lines.	Consumers per Route-mile of Line.	Static Head.
						Generation.	Transmission.	Primary Distribution.	Secondary Distribution (and System of Supply).			
ELECTRIC-POWER BOARDS—*continued.*					%							Ft.
41. Waitaki	G.S.	1926	17,500	3,926	22·45	3,300 (*s*)	..	11,000 6,600 3,300	400/230 A.C.	431	9·1	250
42. Waitemata	G.N.	1926	45,550	11,106	24·40	..	..	11,000	400/230 A.C.	688	16·2	..
43. Waitomo	G.N.	1926	8,670	1,401	16·18	..	..	11,000	400/230 A.C.	126	11·1	..
44. Wanganui-Rangitikei	G.N.	1924	52,380	10,500	20·05	3,300 (*s*)	..	11,000 6,600 3,300	400/230 A.C. 500 D.C. (Trams)	797	13·2	..
45. Westland [3]	..	..	..	..	..	..	..	..	..	..	..	..
Totals, Power Boards	..	..	905,410	196,352	21·69	..	..	..	..	17,565	..	..
OTHER LOCAL AUTHORITIES.												
City Councils.												
1. Christchurch	G.S.	1903	95,000	30,210	31·80	460 D.C. (*s*)	..	11,000 3,300	400/230 A.C. 460/230 D.C.	341	88·5	..
2. Dunedin	I. & G.S.	1907	92,000	27,636	30·05	6,600 2,400 550 D.C. (*s*)	35,000	6,600 3,300	400/230 A.C. 500 D.C. (Trams)	581	47·6	700
3. Invercargill	B.	1914	22,000	5,911	26·85	3,300 (*s*) 400 (*s*) 600 D.C. (*s*)	..	11,000 3,300	400/230 A.C. 600 D.C. (Trams)	79	74·8	..
4. Nelson	I.	1923	12,000	3,075	25·60	3,300	..	3,300	400/230 A.C.	48	64·1	..
5. Palmerston North	B.	1924	22,191	6,036	27·20	3,300 (*s*)	..	11,000 3,300	400/230 A.C.	82	73·6	..
6. Wellington	G.N.	1907	125,000	37,455	29·95	11,000 (*s*)	..	11,000 3,300	400/230 A.C. 500 D.C. (Trams)	360	104·0	..
Totals, City Councils	..	..	368,191	110,323	29·90	..	..	..	..	1,491	..	..
Borough Councils.												
1. Bluff	B.	1903	2,036	509	25·00	..	..	3,300	400/230 A.C.	11	46·3	..
2. Hamilton	G.N.	1913	16,100	4,644	28·80	..	..	11,000	400/230 A.C.	58	80·1	..
3. Inglewood	B.	1905	1,300	427	32·80	..	..	3,300	400/230 A.C.	8	53·4	..
4. Kaiapoi	B.	1917	1,700	495	29·10	..	..	3,300	400/230 A.C.	14	35·4	..
5. Lyttelton	G.S.	1918	3,300	888	26·90	..	..	11,000	400/230 A.C.	10	88·8	..
6. Napier	B.	1913	15,300	4,809	31·45	3,300 (*s*)	..	3,300	400/230 A.C.	43	111·8	..
7. New Plymouth	I. & G.N.	1905	21,000	6,493	30·90	6,600	..	11,000	400/230 A.C. 500 D.C. (Trams)	334	19·5	240/120
8. Ohakune	B. & I.	1914	1,940	469	24·20	2,400 (*s*)	..	6,600 2,400	400/230 A.C.	17	27·6	42

(For notes, see page 92.)

TABLE IX.—STATISTICS OF POPULATION, CONSUMERS, SYSTEM VOLTAGES, ROUTE-MILES OF LINES, ETC., FOR THE YEAR ENDED 31ST MARCH, 1936—*continued.*

G.N.=Government supply, North Island system. G.S.=Government supply, South Island system. I.=Independent supply (own generating-plant). B.=Bulk supply from another authority.

Supply Authority.	Source of Supply.	Year when Supply commenced.	Population included in Area of Supply.	Number of Consumers.	Ratio of Consumers to Population in Area of Supply.	Voltage.				Route-miles of Lines.	Consumers per Route-mile of Line.	Static Head.
						Generation.	Transmission.	Primary Distribution.	Secondary Distribution (and System of Supply).			
					%							Ft.
OTHER LOCAL AUTHORITIES—*continued.*												
Borough Councils—continued.												
9. Patea	B. & I.	1901	2,310	404	17·50	3,300 (*s*)	..	3,300	400/230 A.C.	17	23·8	78
									460/230 D.C.	11	35·5	279
10. Picton	I.	1917	1,400	390	27·85	460	..	..	400/230 A.C.	7	38·1	510
11. Queenstown	I.	1924	900	267	29·66	3,300	..	3,300	400/230 A.C.	28	14·9	380
12. Raetihi	I.	1917	4,500	418	9·30	6,600 3,300 (*s*)	..	6,600				
								3,300	400/230 A.C.	13	52·5	..
13. Rangiora	B.	1919	2,236	682	30·50	..	..	3,300	400/230 A.C.	18	84·6	..
14. Riccarton	G.S.	1916	5,300	1,522	28·70	..	..	..	..	..	..	..
15. Ross [4]	..	..	..	..	..	..	..	6,600	400/230 A.C.	65	33·2	14
16. Rotorua (Tourist Department)	G.N.	1901	11,400	2,160	18·95	6,600 (*s*)	..	3,300	200/115 A.C.			
								6,600	400/230 A.C.	17	64·8	..
17. Stratford	B.	1898	3,750	1,102	29·40	..	..	11,000	400/230 A.C.	10	10·7	..
18. Sumner	G.S.	1918	3,274	1,068	32·60	..	..	3,300				
									460/230 D.C.	10	57·7	30
19. Taihape	I. & B.	1913	2,182	577	26·45	460/230	..	..	400/230 A.C.	17	60·1	25
20. Taumarunui	I.	1924	5,600	1,022	18·25	3,300	..	6,600 3,300				
21. Tauranga	I.	1915	3,393	1,048	30·90	3,300	50,000 33,000	11,000 3,300	400/230 A.C.	64	16·4	110/80
								3,300	400/230 A.C.	19	39·0	600
22. Te Aroha	B.	1906	2,367	740	31·25	3,300 (*s*)	..	3,300	400/230 A.C.	12	26·4	..
23. Te Puke	B.	1921	980	317	32·35	..	..	11,000	400/230 A.C.	22	53·1	130
24. Thames	B.	1914	4,700	1,169	24·90	3,300 (*s*) 400 (*s*)	..	3,300				
								11,000	400/230 A.C.	59	76·8	..
25. Timaru	B.	1908	17,300	4,532	26·20	..	..	3,300				
								3,300	400/230 A.C.	14	49·7	..
26. Wairoa	B.	1913	2,519	695	27·60	..	..	..	400/230 A.C.	12	43·8	..
27. Waitara	B.	1905	1,977	525	26·55	..	..	6,600	400/230 A.C.	19	49·5	430
28. Westport	I.	1925	4,200	940	22·40	400	..	3,300	400/230 A.C.	68	7·47	258
29. Whakatane	I.	1922	1,732	508	29·30	3,300	22,000	2,200	400/230 A.C.	37	59·8	..
30. Whangarei	B.	1915	7,900	2,214	28·05	..	..					
Totals, Borough Councils	..	..	152,596	41,034	26·98	..	..	..	..	1,034	..	..
Town Boards.												
1. Havelock North	I. & B.	1916	1,250	312	25·00	3,300	..	3,300	400/230 A.C.	17	18·4	50
2. Kamo	B.	1923	600	123	20·50	..	..	2,200	400/230 A.C.	6	20·5	..
3. Kaponga	I. & B.	1916	1,200	372	31·00	3,300	..	3,300	400/230 A.C.	51	7·3	31
4. Mangaweka	B.	1913	386	120	31·10	..	..	2,400	400/230 A.C.	10	12·0	..
5. Manunui	B.	1929	775	165	21·30	..	..	3,300	400/230 A.C.	5	33·0	..
Totals, Town Boards	..	..	4,211	1,092	25·93	..	..	..	..	89	..	..

(For notes, see page 92.)

TABLE IX.—STATISTICS OF POPULATION, CONSUMERS, SYSTEM VOLTAGES, ROUTE-MILES OF LINES, ETC., FOR THE YEAR ENDED 31ST MARCH, 1936—*continued.*

G.N.=Government supply, North Island system. G.S.=Government Supply, South Island system. I.=Independent supply (own generating-plant). B.=Bulk supply from another authority.

Supply Authority.	Source of Supply.	Year when Supply commenced.	Population included in Area of Supply.	Number of Consumers.	Ratio of Consumers to Population in Area of Supply.	Voltage.				Route-miles of Lines.	Consumers per Route-mile of Line.	Static Head.
						Generation.	Transmission.	Primary Distribution.	Secondary Distribution (and System of Supply).			
OTHER LOCAL AUTHORITIES—*continued.*												
County Councils.					%							Ft.
1. Heathcote	G.S.	1914	6,000	1,279	21·31	..	..	11,000 3,300	400/230 A.C.	35	36·6	..
2. Kaikoura	I.	1922	630	167	26·50	3,300	..	3,300	400/230 A.C.	5	33·4	..
3. Murchison	I.	1922	540	188	34·80	3,300	..	3,300	400/230 A.C.	16	11·8	105
4. Uawa	I.	1925	400	100	25·00	230	..	..	230 D.C.	3	33·3	..
5. Waimairi	B.	1917	14,000	3,501	25·00	..	..	6,600 3,300	400/230 A.C.	144	24·3	..
Totals, County Councils ..	..	..	21,570	5,235	24·20	..	..	..	..	203	..	..
Totals, other Local Authorities	..	..	546,568	157,684	28·87	..	..	..	..	2,817	..	..
COMPANIES.												
1. Alderton Utility Co.	I.	1930	300	64	21·33	400	..	6,350	230 A.C.	12	5·3	123
2. Kanieri Electric, Ltd.	I.	1921	2,692	722	26·80	2,400	..	11,000	400/230 A.C.	26	27·8	250/110
3. Reefton Electric Light and Power Co., Ltd.	I.	1887	1,300	378	29·10	230	..	..	230 D.C.	8	47·3	27
4. P. Spender (Rawene)	I.	1926	300	53	17·66	230	..	..	230 D.C.	1	53·0	..
5. Wilson's (N.Z.) Portland Cement, Ltd...	I.	1916	500	172	34·40	5,500	22,000	2,200	400/230 A.C.	44	..	130
6. Westland Power, Ltd.	I. & B.	1928	4,700	153	3·26	6,600 400	..	11,000 6,600	400/230 A.C	67	2·3	260/105
Totals, Companies	..	..	9,792	1,542	15·72	..	..	..	..	158	..	..
Totals, all Supply Authorities ..	..	..	1,461,770	355,973	24·35	..	..	..	..	22,424	..	..

NOTES.—(*s*) = Standby supply. [1] Not actively functioning. [2] Distribution system under construction; supply not yet commenced. [3] License delegated to Westland Power, Ltd.
[4] No returns received. [5] Otago Central Power Board's new generating-station at Roaring Meg commenced supplying power on 19th March, 1936.

Table X.—Results of Generation and Distribution for Year ended 31st March, 1936.

Note.—In the columns detailing the capacity of generating plant the following symbols are used to denote the type of prime mover: * Water; † Steam; ‡ Oil; § Gas.

Supply Authority.	Capacity of Generating Plant.				Maximum Load.	Connected Load.		Demand Factor.	Units.									Annual Load Factor.	Units sold (Average).			Average Maximum Demand per Consumer.	No.
	Main Plant.		Standby Plant.			Including Bulk Supply.	Excluding Bulk Supply.		Generated.				Purchased.	Total generated and purchased.	Sold.		Non-productive.[14]	Percentage Non-productive.		Per Head of Population.	Per Retail Consumer.	Per £1 of Distribution Capital.[24]	
									Water.	Steam.	Oil.	Gas.			Including Bulk Supply for Resale.	Retail to Consumers.							
Public Works Department.	Kw.	Kv.a.	Kw.	Kv.a.	Kw.	Kw.	Kw.	%	No.	No.	No.	No.	No.	No.	No.	No.	No.	%	%	No.	No.	No.	Kw.	
1. Arapuni-Mangahao-Waikaremoana	122,600*	148,810	3,750‡ 1,500†	4,689 1,875	116,800	843,209	18,731	13·85	620,064,155[7]	1,969,872[10]	314,502	..	236,134	622,584,663	563,673,258	32,751,853	58,911,405	9·46	60·85	..	..	231	..	1
2. Coleridge-Waitaki	64,500*	73,972	5,760‡ 1,100†[5]	7,200 1,100	36,780	353,693	23,962	10·40	170,516,380	..	..	..	..	170,516,380	149,698,738	19,109,718	20,817,642	12·21	52·95	..	..	128	..	2
Totals, P.W.D.	187,100	222,782	12,110	14,864	..	..	42,693	..	790,580,535	1,969,872	314,502	..	236,134	793,101,043	713,371,996	51,861,571	79,729,047	10·05	..	..	..	198	..	
Electric-power Boards.																								
1. Ashburton	..	..	160‡	200	1,835	..	16,080	11·41	..	..	15,540	..	7,618,000	7,633,540	..	5,682,737	1,950,803	25·56	47·50	301	1,427	19	0·46	1
2. Auckland	..	..	35,550† 5,610†	43,940 D.C.	37,176	..	220,748	16·85	..	1,814,200[11]	..	..	172,361,412	174,175,612	..	148,834,433	25,341,179	14·55	53·40	662	2,405	91	0·54[25]	2
3. Banks Peninsula	..	..	72*[6]	90	490	..	4,542	10·78	64,836	..	..	..	2,097,400	2,162,236	..	1,619,119	543,117	25·12	50·40	400	1,600	21	0·48	3
4. Bay of Plenty	..	..	..	..	1,350	..	7,367	18·33	..	..	..	..	10,194,664	10,194,664	..	9,031,986	1,162,678	11·40	86·20	872	5,460	60	0·82	4
5. Buller[1]	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5
6. Cambridge	..	..	..	..	834	..	3,351	24·90	..	..	..	..	5,298,356	5,298,356	..	4,371,144	927,212	17·50	72·50	729	2,805	51	0·54	6
7. Central Hawke's Bay	..	..	..	..	904	..	5,473	16·50	..	..	..	..	4,730,486	4,730,486	..	4,134,535	595,951	12·60	59·70	394	2,440	37	0·53	7
8. Central Waikato	..	..	..	..	2,556	..	19,167	13·33	..	..	..	..	16,019,990	16,019,990	13,675,076	13,651,610	2,344,914	14·63	71·55	718	2,597	44	0·49	8
9. Dannevirke	..	..	..	..	900	..	8,264	10·89	..	..	..	..	4,855,776	4,855,776	..	4,337,693	518,083	10·67	61·60	344	1,572	23	0·33	9
10. Franklin	..	..	187§	220	2,430	..	13,232	18·36	..	..	..	..	14,910,403	14,910,403	..	12,738,431	2,171,972	14·57	70·00	740	3,240	53	0·62	10
11. Golden Bay	175*	250	..	..	192	..	1,041	18·43	769,432	..	..	..	2,130	771,562	..	600,038	171,524	22·23	45·80	429	1,515	40	0·49	11
12. Grey	3,060*	3,600	..	..	1,980	..	11,363	17·43	8,726,874	..	..	..	..	8,726,874	..	7,164,108	1,562,766	17·90	50·30	500	2,075	55	0·57	12
13. Hawke's Bay	..	..	520‡ 567‡	650 D.C.	4,608	38,637	26,413	11·93	..	..	1,096	..	25,742,624	25,743,720	23,228,225	13,730,952	2,515,495	9·77	63·80	460	2,024	89	0·43	13
14. Horowhenua	..	..	..	..	2,456	..	15,106	16·25	..	..	..	..	11,582,200	11,582,200	..	10,206,890	1,375,310	11·88	53·80	595	2,240	62	0·54	14
15. Hutt Valley	..	..	..	..	5,194	..	48,101	10·78	..	..	..	..	25,494,980	25,494,980	..	21,696,228	3,798,752	14·90	56·00	482	1,771	92	0·42	15
16. Lake Wakatipu[1]	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	16
17. Malvern	..	..	..	..	227	..	2,751	8·26	..	..	..	..	974,442	974,442	..	688,062	286,380	29·40	49·00	136	1,012	13	0·33	17
18. Manawatu-Oroua	..	..	..	..	4,500	43,187	21,018	10·42	..	..	..	..	29,478,670	29,478,670	26,255,402	12,886,845	3,223,268	10·93	74·90	330	2,540	65	0·53	18
19. Marlborough	1,000*	1,250	456‡	570	960	..	10,850	8·85	5,377,860	..	68,460	..	..	5,446,320	..	4,314,909	1,131,411	20·77	64·75	297	1,492	25	0·33	19
20. North Auckland[2]	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	20
21. North Canterbury	..	..	..	..	1,278	10,829	7,921	11·80	..	..	..	..	5,566,400	5,566,400	4,638,421	3,753,611	927,979	16·65	49·75	305	1,630	31	0·44	21
22. Opunake	315*	450	148‡	185	500	..	2,675	18·70	1,324,900	..	46,035	..	689,780	2,060,715	..	1,577,886	482,829	23·44	47·00	309	1,578	27	0·50	22
23. Otago Central[26]	1,600*	2,000	..	..	440	..	2,080	21·15	17,917	..	..	..	2,618,100	2,636,017	..	2,192,364	443,653	16·80	68·40	611	2,220	27	0·45	23
24. Otago	..	..	..	..	1,734	..	12,439	13·93	..	..	..	..	7,805,609	7,805,609	..	6,002,044	1,803,565	23·10	51·40	334	1,436	26	0·41	24
25. Poverty Bay	..	..	680‡ 300‡	850 D.C.	2,088	..	20,829	10·02	..	..	62,470	..	10,983,400	11,045,870	..	9,338,034	1,707,836	15·45	60·40	382	1,800	40	0·40	25
26. Reefton[1]	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	26
27. South Canterbury	..	..	29*	36	3,496	28,399	13,258	12·32	..	..	..	..	16,681,172	16,681,172	14,535,149	7,166,749	2,146,023	12·86	54·50	284	1,679	56	0·42	27
28. South Taranaki	..	..	555* 485‡	692 607	1,542	9,561	9,093	16·13	2,467,949	..	44,051	..	4,833,934	7,345,934	6,204,343	5,814,641	1,141,591	15·54	54·40	291	1,780	55	0·45	28
29. Southland	6,000*	7,050	..	..	6,600	54,674	36,815	12·07	28,001,600	..	..	..	12,726	28,014,326	20,114,064	13,486,702	7,900,262	28·20	48·50	276	1,322	21	0·43	29
30. Springs-Ellesmere	..	..	..	..	1,200	..	9,861	12·17	..	..	..	..	6,091,861	6,091,861	..	5,083,737	1,008,214	16·55	57·90	412	1,975	38	0·47	30
31. Taranaki	3,200*	3,600	..	..	2,376	14,744	8,620	16·12	13,353,700	..	..	..	19,830	13,373,530	10,367,500	6,277,744	3,006,030	22·45	64·30	285	2,450	54	0·52	31
32. Tararua	..	..	..	..	695	..	6,352	10·94	..	..	..	..	3,780,136	3,780,136	..	3,326,368	453,768	12·00	62·10	410	1,973	30	0·41	32
33. Tauranga	..	..	..	..	..	..	6,040	..	..	..	..	..	4,949,396[15]	4,949,396	..	4,949,396[15]	..	[16]	..	..	518	3,487	39	..	33
34. Te Awamutu	..	..	..	..	1,219	..	7,458	16·35	..	..	..	..	6,885,000	6,885,000	..	5,822,963	1,062,037	15·43	64·50	683	2,945	37	0·62	34
35. Teviot	750*	939	..	..	810	3,538	1,458	22·90	4,573,340	..	..	..	..	4,573,340	4,396,228	1,778,128	177,112	3·87	64·50	972	4,275	140	0·89	35
36. Thames Valley	..	..	..	..	4,595	33,294	29,190	13·80	..	..	..	..	30,768,074	30,768,074	26,606,539	24,300,029	4,161,535	13·53	76·50	678	3,080	60	0·52	36
37. Waimea	390*	482	110‡	137	351	..	3,448	10·18	956,032	..	18,542	..	108,415	1,082,989	..	804,711	278,278	25·72	35·20	87	433	16	0·19	37
38. Wairarapa	..	..	837*	1,188	2,010	..	20,845	9·63	2,280,270[8]	..	..	..	9,346,381	11,626,651	..	9,945,760	1,680,891	14·45	66·10	510	1,935	55	0·39	38
39. Wairere	490*	700	..	..	400	..	1,844	21·70	1,932,950	..	..	..	..	1,932,950	..	1,322,964	609,986	31·55	55·20	661	3,770	54	1·14	39
40. Wairoa	..	..	..	..	852	4,789	1,823	17·80	..	..	..	..	4,113,816	4,113,816	3,520,700	1,403,800	593,116	14·41	55·10	254	3,560	67	0·86	40
41. Waitaki	..	..	120* 192‡	150 240	1,833	..	14,005	13·09	168,211	..	40,106	..	8,268,360	8,476,677	..	7,185,874	1,290,803	15·22	52·80	411	1,830	53	0·47	41
42. Waitemata	..	..	..	..	3,700	..	35,044	10·55	..	..	..	..	19,627,050	19,627,050	..	17,094,814	2,532,236	12·90	60·50	375	1,540	50	0·33	42
43. Waitomo	..	..	..	..	864	..	5,445	15·86	..	..	..	..	3,985,150	3,985,150	..	3,352,455	632,695	15·87	52·75	387	2,390	43	0·62	43
44. Wanganui-Rangitikei	..	..	1,500†	1,875	4,824	37,306	36,973	12·94	..	..	..	..	24,935,067	24,935,067	21,697,140	21,496,753	3,237,927	12·98	59·00	411	1,948	63	0·42[25]	44
45. Westland[3]	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	45
Totals, Power Boards	16,980	20,321	48,078	51,630	..	..	728,383	..	67,913,106[9]	..	296,300	..	503,431,190	571,640,596[9]	..	439,167,247	86,899,181	15·20[17]	..	485	2,236	49	..	

(For notes see page 95.)

TABLE X.—RESULTS OF GENERATION AND DISTRIBUTION FOR YEAR ENDED 31ST MARCH, 1936—*continued.*

NOTE.—In the columns detailing the capacity of generating plant the following symbols are used to denote the type of prime mover: * Water; † Steam; ‡ Oil; § Gas.

Supply Authority.	Capacity of Generating Plant.				Maximum Load.	Connected Load.		Demand Factor.	Units.										Annual Load Factor.	Units sold (Average).			Average Maximum Demand per Consumer.	No.
	Main Plant.		Standby Plant.			Including Bulk Supply.	Excluding Bulk Supply.		Generated.				Purchased.	Total generated and purchased.	Sold.		Non-productive.[14]	Percentage Non-productive.		Per Head of Population.	Per Retail Consumer.	Per £1 of Distribution Capital.[24]		
									Water.	Steam.	Oil.	Gas.			Including Bulk Supply for Resale.	Retail to Consumers.								
OTHER LOCAL AUTHORITIES.																								
City Councils.	Kw.	Kv.a.	Kw.	Kv.a.	Kw.	Kw.	Kw.	%	No.	No.	No.	No.	No.	No.	No.	No.	No.	%	%	No.	No.	No.	Kw.	
1. Christchurch	..	..	400†	D.C.	17,560	144,927	129,037	12·12	..	..	..	..	70,511,713	70,511,713	63,613,135	57,251,504	6,898,578	9·80	45·85	603	1,895	85	0·53	1
2. Dunedin	..	..	1,875†	2,340	18,200	95,777	83,338	19·00	70,401,302	19,340	16,790	..	4,537,300	74,974,732	63,969,875	56,164,266	11,004,857	14·67	47·00	610	1,856	88	0·54[25]	2
			860‡	D.C.																				
3. Invercargill	..	..	1,525†	1,874	1,932	..	16,189	11·94	..	10,700	..	..	6,106,400	6,117,100	..	5,246,500	870,600	14·25	36·10	238	785	63	0·29[25]	3
			450†	D.C.																				
4. Nelson	..	..	500†	624	870	..	8,732	9·97	..	2,400,880	..	..	..	2,400,880	1,896,712	1,788,535	504,168	20·99	31·50	149	582	36	0·27	4
5. Palmerston North	..	..	816§	1,020	2,832	..	22,169	12·77	..	..	..	625,320	13,368,557	13,993,877	..	12,595,306	1,398,571	9·99	56·40	567	2,090	125	0·47	5
6. Wellington	..	..	9,000†	11,250	21,264	..	160,309	13·26	..	694,763[12]	..	..	72,118,500	72,813,263	..	63,088,905	9,724,358	13·35	39·10	505	1,410	77	0·45[25]	6
			1,000†	D.C.																				
Totals, City Councils	18,150	22,687	16,426	17,108	..	..	419,774	..	70,401,302	3,077,911[13]	16,790	625,320	166,642,470	240,763,793[13]	..	196,135,016	30,401,132	12·63[17]	..	532	1,778	77	..	
Borough Councils.																								
1. Bluff	..	..	..	..	249	..	1,670	14·90	..	..	..	..	520,962	520,962	..	450,163	70,799	13·59	23·90	221	885	74	0·49	1
2. Hamilton	..	..	..	..	1,692	..	12,570	13·46	..	..	..	..	6,541,780	6,541,780	..	5,874,864	666,916	10·20	44·00	365	1,265	103	0·36	2
3. Inglewood	..	..	..	..	153	..	1,525	10·03	..	..	..	..	621,830	621,830	..	562,702	59,128	9·51	46·40	433	1,320	80	0·36	3
4. Kaiapoi	..	..	..	..	125	..	954	13·10	..	..	..	..	404,120	404,120	..	378,308	25,812	6·40	36·90	222	765	37	0·25	4
5. Lyttelton	..	..	..	..	274	..	3,312	8·28	..	..	..	..	1,108,664	1,108,664	..	843,940	264,724	23·90	46·20	256	950	82	0·31	5
6. Napier	..	..	400‡	500	1,617	..	11,379	14·21	..	..	270	..	9,320,500	9,320,770	..	8,594,269	726,501	7·80	65·80	562	1,790	136	0·34	6
7. New Plymouth	3,500*	4,375	1,200*	1,500	3,900	23,774	23,524	16·40	12,735,006	..	..	..	5,099,036	17,834,042	15,783,112	15,088,272	2,050,930	11·50	52·20	718	2,194	138	0·51[25]	7
			350‡	437																				
8. Ohakune	..	..	96*	120	100	..	682	14·66	3,434	..	1,026	..	372,850	377,310	..	301,140	76,170	20·20	43·10	155	642	52	0·21	8
			113‡	141																				
9. Patea	..	..	88*	110	154	..	583	26·42	226,209	..	310	..	389,702	616,221	..	543,320	72,901	11·83	45·70	235	1,344	58	0·38	9
			64‡	80																				
10. Picton	125‡	D.C.	..	..	78	..	605	12·90	..	..	182,370	..	..	182,370	..	138,233	44,137	24·20	26·70	99	354	19	0·20	10
	16*	D.C.																						
11. Queenstown	60*	75	..	..	75	..	445	16·85	218,340	..	..	..	..	218,340	..	165,377	52,963	24·23	33·25	184	620	42	0·28	11
12. Raetihi	280*	350	96*	120	265	2,257	1,575	11·74	882,330	..	..	..	..	882,330	843,785	470,935	38,545	4·37	38·00	105	1,126	49	0·39	12
13. Rangiora	..	..	..	..	193	..	1,953	9·88	..	..	690	..	660,690	661,380	..	592,859	68,521	10·36	39·10	265	870	43	0·28	13
14. Riccarton	..	..	..	..	677	..	6,647	10·18	..	..	..	..	2,973,130	2,973,130	..	2,678,829	294,301	9·90	50·15	506	1,760	117	0·44	14
15. Ross[4]	2*	D.C.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	15
16. Rotorua (Tourist Dept.)	..	..	200*	250	797	..	5,814	13·70	271,084	..	..	..	3,318,335	3,589,419	..	2,432,323	1,157,096	32·25	51·40	213	1,125	43	0·37	16
17. Stratford	..	..	..	..	600	..	2,825	21·24	..	..	..	..	2,699,060	2,699,060	..	2,164,606	534,454	19·80	51·40	577	1,965	103	0·54	17
18. Sumner	..	..	..	..	374	..	2,514	14·87	..	..	..	..	1,448,284	1,448,284	..	1,352,028	96,256	6·66	44·10	413	1,265	88	0·35	18
19. Taihape	150*	D.C.	75§	D.C.	229	..	1,183	19·37	574,662	..	..	628	16,800	592,090	..	544,466	47,624	8·04	29·50	250	944	80	0·40	19
20. Taumarunui	425*	500	..	..	340	2,270	2,143	15·00	1,173,042	..	..	..	..	1,173,042	961,523	928,785	211,519	18·03	39·40	166	908	49	0·31	20
21. Tauranga	3,040*	3,500	640*	800	2,514	9,949	2,863	25·27	12,997,199	..	..	..	3,033	13,000,232	9,127,497	3,257,354	3,872,735	29·80	59·00	960	3,110	212	..	21
22. Te Aroha	..	..	133*	166	273	..	2,383	11·45	236,282	..	..	..	956,530	1,192,812	..	1,062,731	130,081	10·90	49·90	449	1,437	76	0·37	22
23. Te Puke	..	..	..	..	142	..	1,046	13·57	..	..	..	..	659,836	659,836	..	628,160	31,676	4·82	53·10	641	1,980	58	0·45	23
24. Thames	..	..	120*	150	268	..	1,721	15·56	..	..	151,475	..	1,349,980	1,501,455	..	1,419,962	81,493	5·43	64·00	302	1,213	126	0·23	24
			262‡	327																				
25. Timaru	..	..	..	..	1,715	..	15,141	11·32	..	..	..	..	7,368,400	7,368,400	..	6,250,380	1,118,020	15·18	49·05	361	1,380	81	0·38	25
26. Wairoa	..	..	..	..	513	..	2,963	17·31	..	..	..	..	2,116,900	2,116,900	..	1,934,563	182,337	8·62	47·10	768	2,784	270	0·74	26
27. Waitara	..	..	..	..	137	..	1,010	13·56	..	..	..	..	515,390	515,390	..	472,177	43,213	8·38	43·00	238	900	89	0·26	27
28. Westport	200*	250	210§	265	288	..	2,109	13·65	792,990	..	..	40,723	..	833,713	..	712,895	120,818	14·49	33·10	170	759	57	0·31	28
29. Whakatane	390*	538	..	..	300	..	1,953	15·36	1,319,390	..	..	..	850	1,320,240	1,170,517	1,169,537	149,723	11·34	50·25	675	2,300	81	0·59	29
30. Whangarei	..	..	..	..	720	6,930	6,561	10·40	..	..	..	..	2,721,950	2,721,950	2,349,543	2,277,143	372,407	13·68	43·10	288	1,030	35	0·29	30
Totals, Borough Councils	8,188	9,588	4,047	4,966	..	..	116,790	..	31,429,968	..	336,141	41,351	51,188,612	82,996,072	..	63,290,321	12,661,800	15·26[17]	..	415	1,542	87	..	

(For notes see page 95.)

TABLE X.—RESULTS OF GENERATION AND DISTRIBUTION FOR YEAR ENDED 31ST MARCH, 1936—*continued.*

NOTE.—In the columns detailing the capacity of generating plant the following symbols are used to denote the type of prime mover: * Water; † Steam; ‡ Oil; § Gas.

Supply Authority.	Capacity of Generating Plant.				Connected Load.			Demand Factor.	Units.									Annual Load Factor.	Units sold (Average).			Average Maximum Demand per Consumer.	No.
	Main Plant.		Standby Plant.		Maximum Load.	Including Bulk Supply	Excluding Bulk Supply.		Generated.				Purchased.	Total generated and purchased.	Sold.		Non-productive.[14]	Percentage Non-productive.		Per Head of Population.	Per Retail Consumer.	Per £1 of Distribution Capital.[24]		
									Water.	Steam.	Oil.	Gas.			Including Bulk Supply for Resale.	Retail to Consumers.							
OTHER LOCAL AUTHORITIES—*ctd.*	Kw.	Kv.a.	Kw.	Kv.a.	Kw.	Kw.	Kw.	%	No.	No.	No.	No.	No.	No.	No.	No.	No.	%	%	No.	No.	No.	Kw.	
Town Boards.																								
1. Havelock North	144*	160	..	..	122	..	845	14·44	351,500	..	..	..	176,773	528,273	..	487,375	40,898	7·75	49·40	390	1,562	56	0·39	1
2. Kamo	..	..	..	..	75	..	369	20·30	..	..	..	..	72,400[16]	72,400	..	72,400[16]	..[16]	..	..	121	588	33	0·61	2
3. Kaponga	96*	120	..	..	218	..	765	23·50	517,280	..	..	..	243,340	760,620	..	597,448	163,172	21·45	39·80	498	1,608	32	0·59	3
4. Mangaweka	..	..	..	..	33	..	296	11·15	..	..	..	..	183,587	183,587	..	144,763	38,824	21·14	63·50	375	1,206	57	0·27	4
5. Manunui	..	..	..	..	25	..	127	19·70	..	..	..	..	32,738	32,738	..	28,800	3,938	12·03	14·95	37	175	10	0·15	5
Totals, Town Boards	240	380	..	..	..	..	2,402	..	868,780	..	..	..	708,838	1,577,618	..	1,330,786	246,832	15·64[17]	..	316	1,218	38	..	
County Councils.																								
1. Heathcote	..	..	..	..	736	..	5,920	12·43	..	..	..	..	2,593,995	2,593,995	..	2,269,746	324,249	12·50	40·20	378	1,774	87	0·58	1
2. Kaikoura	48‡	60	37§	47	43	..	139	30·90	..	..	39,390	11,100	..	50,490	..	42,766	7,724	15·30	13·40	68	256	14	0·26	2
3. Murchison	80*	100	..	..	70	..	373	18·77	218,900	..	..	..	..	218,900	..	163,480	55,420	25·30	35·70	303	870	24	0·37	3
4. Uawa	30‡	D.C.	..	..	14	..	74	18·92	..	..	23,790	..	..	23,790	..	15,726	8,064	33·80	19·30	39	157	8	0·14	4
5. Waimairi	..	..	..	..	1,431	..	15,890	9·00	..	..	..	..	6,482,851	6,482,851	5,834,566	5,830,824	648,285	10·00	51·70	417	1,666	94	0·41	5
Totals, County Councils	158	260	37	47	..	..	22,396	..	218,900	..	63,180	11,100	9,076,846	9,370,026	..	8,322,542	1,043,742	11·13[17]	..	386	1,590	83	..	
Totals, other Local Authorities	26,736	53,236	20,510	22,121	..	..	561,362	..	102,918,950	3,077,911	416,111	677,771	227,616,766	334,707,509	..	269,078,665	44,353,506	13·25[17]	..	492	1,706	79	..	
COMPANIES.																								
1. Alderton Utility Co.	88*	100	..	..	76	..	259	29·30	254,898	..	..	..	..	254,898	..	216,000	38,898	15·25	38·30	720	3,380	93	1·19	1
2. Kanieri Electric, Ltd.	1,500*	1,806	150‡	167	1,120	2,414	1,887	46·40	5,614,800	..	9,980	..	..	5,624,780	4,491,165	4,233,438	1,133,615	20·15	57·35	206[19]	768[19]	206	..	2
3. Reefton Electric Light and Power Co., Ltd.	98*	D.C.	80‡	D.C.	110	..	179	61·50	186,060	..	..	..	..	186,060	..	139,545	46,515	25·00	19·30	107	370	22	0·29	3
4. P. Spender (Rawene)	25‡	D.C.	20‡	D.C.	13	..	66	19·70	..	..	7,931	..	..	7,931	..	7,731	200	2·50	..	26	146	..	0·25	4
5. Wilson's (N.Z.) Portland Cement, Ltd.	2,000*	2,500	3,190†	3,750	2,200	13,028	6,098	16·87	12,987,300	..	..	..	..	12,987,300	11,599,781	8,877,831	1,387,519	10·68	67·40	297[20]	863[20]	..	..	5
6. Westland Power, Ltd.	876*	1,008	625† / 200‡	625 / 250	740	..	1,650	44·85	2,038,629	..	55,000	..	257,727	2,351,356	..	2,007,980	343,376	14·60	36·26	78[21]	2,406[21]	73	..	6
Totals, Companies	4,587	5,414	4,265	4,792	..	..	10,139	..	21,081,687	..	72,911	..	257,727	21,412,325	..	15,482,525	2,950,123	13·78[17]	..	147[22]	930[22]	191	..	
Totals, all Supply Authorities	235,403	281,432	84,963	93,407	..	..	1,342,577	..	982,494,278	5,047,783	1,099,824	677,771	731,541,817	..	..	775,590,008	213,931,857	21·62[18]	..	489[23]	2,006[23]	48	..	

TABLE A.—SUMMARY OF TOTALS RELEVANT TO TABLE X.

Supply Authority.	Units generated.	Population included in Area of Supply.	Number of Consumers.	Capital invested in Transmission and Distribution Systems.
	Number.	Number.	Number.	£
Public Works Department	792,864,909	..	395	3,603,185
Electric-power Boards	68,209,406	905,410	196,352	9,031,101
Other Local Authorities—				
City Councils	74,121,323	368,191	110,323	2,531,529
Borough Councils	31,807,460	152,596	41,034	731,606
Town Boards	868,780	4,211	1,092	34,891
County Councils	293,180	21,570	5,235	99,976
Totals for other Local Authorities	107,090,743	546,568	157,684	3,398,002
Companies	21,154,598	9,792	1,542	81,116
Totals for all Supply Authorities	989,319,656	1,461,770	355,973	16,113,404

NOTES.—[1] Not actively functioning. [2] Distribution system under construction; supply not yet commenced. [3] License delegated to Westland Power, Ltd. [4] No returns received. [5] Christchurch Tramway Board's standby plant available when required. [6] Limited to 30 kw. by Pelton wheel capacity. [7] Includes 2,102,765 units generated for Public Works Department by Wairarapa Power Board's stations at Kourarau. [8] 2,102,765 units of this amount included in units generated by Arapuni-Mangahao-Waikaremoana system; balance only added to totals for Power Boards. [9] 2,102,765 units generated for Public Works Department by Wairarapa Power Board not included in this total (see Notes 7 and 8). [10] Includes 1,922,100 units generated for Public Works Department by Auckland Power Board's steam station, and 47,772 units generated by Wellington City Council's steam station. [11] 1,814,200 units supplied to Auckland Power Board's system but included in units generated for Public Works Department by steam stations, and not added to totals for Power Boards. [12] 47,772 units of this amount included in units generated for Public Works Department by steam stations, and not added to totals for City Councils. [13] Does not include 47,772 units generated for Public Works Department by Wellington City Council's steam plant (see Note 12). [14] Includes units lost in transmission and distribution, units used free of charge, units used for station auxiliaries, &c. [15] Tauranga Power Board pays on units measured at consumers' meters; losses included in Tauranga Borough Council's system losses. [16] Kamo Town Board pays on units measured at consumers' meters; losses included in Whangarei Borough Council's system losses. [17] Percentage of total units generated and purchased. [18] Percentage of total units generated—*i.e.*, 989,319,656. [19] Excludes units supplied for mining purposes (3,678,960). [20] Excludes units supplied to Whangarei (2,721,950) and to Cement Works (8,729,398). [21] Excludes units supplied for mining purposes (1,639,764). [22] After deducting from units sold retail 14,048,122 units supplied for mining and cement manufacture. [23] After deducting from units sold retail 61,216,507 units supplied for traction, mining, and cement manufacture. Without this deduction the figures are: Per head of population, 531; and per retail consumer, 2,178. [24] To nearest unit. [25] Excludes maximum load of tramway systems. [26] New generating station at Roaring Meg commenced supplying power on 19th March, 1936.

Table XI.—Financial Results of Operation for the Year ended 31st March, 1936.

(For Appropriations and Reserves see Table XII.)

Supply Authority.	Capital Outlay on Electric-supply System.	Loan Liability.	Revenue.					Working Expenses.						Capital Charges.						Total Annual Costs.	Net Results.		Amount collected by Rates to make up Deficiencies.	No.
			Sale of Electricity.		Profits from Trading Account.	Other Sources (not including Rates).	Total.	Cost of Power.		Cost of Transmission and Distribution. [12]	Management and General.	Total.	Per Cent. of Revenue.	Interest.	Sinking Fund.	Depreciation.	Other Capital Charges.	Total.	Per Cent. of Capital Outlay.		Profit.	Loss.		
			Retail.	Bulk for Resale.				Generated.	Purchased.															
PUBLIC WORKS DEPARTMENT.	£	£	£	£	£	£	£	£	£	£	£	£	%	£	£	£	£	£	%	£	£	£	£	
1. Arapuni-Mangahao-Waikaremoana	8,635,000	8,351,576	39,729	747,554	..	8,108	795,391	55,956	306	57,036	30,770	144,068	18·11	408,051	..	17,591	38,148 [6]	463,790	5·37	607,858	187,533	..	..	1
2. Coleridge-Waitaki	4,460,382	3,726,378	45,410	197,067	164	2,617	245,258	20,120	..	18,974	14,806	53,900	21·97	177,217	..	79,750	..	256,967	5·76	310,867	..	65,609	..	2
Totals, P.W.D.	13,095,382	12,077,954	85,139	944,621	164	10,725	1,040,649	76,076	306	76,010	45,576	197,968	19·02	585,268	..	97,341	38,148	720,757	5·50	918,725	187,533	65,609	..	
ELECTRIC-POWER BOARDS.																								
1. Ashburton	326,984	344,300	46,003	..	..	673	46,676	240	13,474	5,751	3,259	22,724	48·70	15,075	442	2,443	4,800 [7]	22,760	6·96	45,484	1,192	..	..	1
2. Auckland	3,301,876	2,700,900	629,790	..	..	10,525	640,315	8,384	209,511	63,394	48,361 [8]	329,650 [8]	51·50	119,170 [8]	62,056 [8]	44,454 [8]	45,584 [9]	271,264 [8]	8·22	600,914 [8]	39,401	..	..	2
3. Banks Peninsula	103,302	98,100	11,552	..	52	217	11,821	68	3,750	3,314	1,761	8,893	75·25	4,452	1,886	..	..	6,338	6·14	15,231	..	3,410	2,702	3
4. Bay of Plenty	196,470	205,700	40,601	..	907	727	42,235	..	13,016	5,036	3,684	21,736	51·40	9,048	2,940	1,305	..	13,293	6·77	35,029	7,206	..	..	4
5. Buller [1]	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5
6. Cambridge	115,965	102,836	19,104	..	149	798	20,051	..	6,931	4,433	1,948	13,312	66·40	4,516	1,851	..	94 [9]	6,461	5·57	19,773	278	..	..	6
7. Central Hawke's Bay ..	151,960	139,246	23,583	..	..	55	23,638	..	7,550	2,387	2,224	12,161	51·40	5,852	103	846	2,516 [7]	9,317	6·13	21,478	2,160	..	..	7
8. Central Waikato	369,838	357,187	60,404	56	48	610	61,118	..	22,364	7,526	5,614	35,504	58·00	15,512	5,977	870	827 [7]	23,186	6·27	58,690	2,428	..	..	8
9. Dannevirke	222,868	220,697	30,139	..	58	282	30,479	..	7,326	3,527	3,574	14,427	47·35	9,328	3,140	1,207	63 [7]	13,738	6·16	28,165	2,314	..	..	9
10. Franklin	294,258	307,800	47,971	..	1,307	3,457	52,735	744 [11]	19,039	4,066	5,478	29,327	55·50	12,949	4,867	4,500	..	22,316	7·57	51,643	1,092	..	..	10
11. Golden Bay	27,803	25,300	4,287	..	56	11	4,354	315	18	487	954	1,774	40·70	1,085	256	255	..	1,596	5·75	3,370	984	..	..	11
12. Grey	287,497	292,285	38,144	..	430	605	39,179	1,314	..	2,730	9,150	13,194	33·70	14,354	4,235	1,021	2,587 [7]	22,197	7·72	35,391	3,788	..	..	12
13. Hawke's Bay	353,913	348,477	67,133	16,667	..	746	84,546	29	36,292	7,229	6,346	49,896	59·00	17,604	2,000	8,328	3,326 [7]	31,258	8·83	81,154	3,392	..	..	13
14. Horowhenua	229,154	199,326	47,516	..	304	830	48,650	..	20,524	7,151	4,251	31,926	65·60	8,365	163	..	4,150 [7]	12,678	5·53	44,604	4,046	..	..	14
15. Hutt Valley	383,388	358,193	103,347	..	403	864	104,614	..	45,392	12,905	11,322	69,619	66·50	16,957	1,300	3,293	3,842 [7]	25,392	6·62	95,011	9,603	..	..	15
16. Lake Wakatipu [1]	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	16
17. Malvern	71,166	74,250	7,768	..	110	291	8,169	..	2,362	2,196	1,447	6,005	73·50	3,149	846	..	..	3,995	5·61	10,000	..	1,331	2,495	17
18. Manawatu-Oroua	485,514	495,259	68,989	17,381	353	249	86,972	..	36,940	12,404	4,093	53,437	61·40	21,100	6,708	914	174 [7]	28,891	5·95	82,328	4,644	..	41	18
19. Marlborough	331,477	338,913	29,923	..	22	512	30,457	1,278	..	3,643	2,609	7,530	24·70	14,400	3,842	2,973	..	21,215	6·40	28,745	1,712	..	66	19
20. North Auckland [2]	(9,906) [5]	(12,000) [5]	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	20
21. North Canterbury	166,580	160,200	22,666	3,156	..	753	26,575	..	10,058	4,238	3,083	17,379	65·40	6,217	2,769	148	44 [7]	9,178	5·51	26,557	18	..	..	21
22. Opunake	109,258	83,840	12,656	..	..	33	12,689	1,080	1,464	2,021	1,496	6,061	47·75	3,774	1,975	200	..	5,949	5·45	12,010	679	..	..	22
23. Otago Central	121,043	91,072	11,073	..	127	374	11,574	..	1,252	550	2,419	4,221	36·50	3,705	413	492	1,604 [7]	6,214	5·13	10,435	1,139	..	..	23
24. Otago	301,236	303,298	44,155	..	..	46	44,201	..	13,256	4,674	3,545	21,475	48·60	13,100	3,050	..	3,544 [7]	19,694	6·54	41,169	3,032	..	3,764	24
25. Poverty Bay	321,476	312,605	58,634	..	144	1,851	60,629	1,790	16,432	9,035	6,741	33,998	56·10	13,094	6,909	1,096	..	21,099	6·56	55,097	5,532	..	..	25
26. Reefton [1]	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	26
27. South Canterbury	334,945	310,950	39,645	16,005	561	848	57,059	..	27,880	3,438	3,468	34,786	61·00	13,149	4,805	3,305	..	21,259	6·35	56,045	1,014	..	..	27
28. South Taranaki	208,271	208,348	34,655	1,128	221	398	36,402	1,901	7,168	3,508	4,998	17,575	48·30	8,538	3,406	1,091	1,424 [7]	14,459	6·94	32,034	4,368	..	..	28
29. Southland	1,545,684	1,688,134	110,476	21,591	125	14,566	146,758	6,069	166	29,092	8,721	44,048	30·00	90,600	22,500	6,642	2,409 [7]	122,151	7·90	166,199	..	19,441	32,232	29
30. Springs-Ellesmere	161,456	146,100	29,924	..	..	367	30,291	..	10,886	4,547	2,757	18,190	60·10	6,264	2,707	258	..	9,229	5·72	27,419	2,872	..	..	30
31. Taranaki	478,086	462,150	36,902	8,628	..	421	45,951	1,596	1,562	5,761	4,487	13,406	29·20	19,493	..	..	7,918 [7]	27,411	5·73	40,817	5,134	..	43	31
32. Tararua	168,839	169,900	23,952	..	470	151	24,573	..	6,578	3,428	2,308	12,314	50·20	6,663	1,860	1,951	..	10,474	6·20	22,788	1,785	..	..	32
33. Tauranga	134,429	134,130	24,793	..	16	770	25,579	..	7,572	4,562	2,679	14,813	57·90	5,800	60	800	3,048 [7]	9,708	7·22	24,521	1,058	..	..	33
34. Te Awamutu	190,858	162,200	29,346	..	23	120	29,489	..	10,066	3,141	2,743	15,950	54·00	6,926	..	..	2,760 [7]	9,686	5·08	25,636	3,853	..	..	34
35. Teviot	59,201	54,800	5,402	1,252	..	108	6,762	487	..	496	1,028	2,011	29·70	2,343	..	318	766 [7]	3,427	5·79	5,438	1,324	..	..	35
36. Thames Valley	804,013	823,111	114,684	5,246	..	1,282	121,212	..	39,845	14,861	9,055	63,761	52·50	40,364	6,578	240	5,545 [7, 5]	52,727	6·56	116,488	4,724	..	..	36
37. Waimea	86,535	84,409	12,301	..	..	1,213	13,514	2,254	1,351	2,451	2,189	8,245	61·00	3,760	..	..	..	3,760	4·35	12,005	1,509	..	..	37
38. Wairarapa	353,062	356,700	52,146	..	641	659	53,446	673	11,547	3,471	9,871	25,562	47·80	15,021	3,000	3,467	..	21,488	6·09	47,050	6,396	..	..	38
39. Wairere	48,229	48,200	5,146	..	..	174	5,320	230	..	852	1,269	2,351	44·20	2,054	707	..	..	2,761	5·73	5,112	208	..	..	39
40. Wairoa	63,919	68,180	7,515	5,343	44	282	13,184	..	7,144	1,205	1,127	9,476	71·90	3,021	500	137	802 [7]	4,460	6·98	13,936	..	752	1,845	40
41. Waitaki	178,906	178,250	32,351	..	660	304	33,315	1,273	11,817	5,244	2,306	20,640	62·00	7,392	2,649	1,218	..	11,259	6·30	31,899	1,416	..	..	41
42. Waitemata	431,939	448,696	80,266	..	333	1,083	81,682	..	29,039	14,968	10,823	54,830	67·10	18,606	3,108	2,116	2,785 [7]	26,615	6·16	81,445	237	..	..	42
43. Waitomo	105,499	109,487	18,482	..	256	30	18,768	..	6,974	2,605	1,912	11,491	61·20	4,631	1,270	161	213 [7]	6,275	5·95	17,766	1,002	..	..	43
44. Wanganui-Rangitikei ..	530,065	509,241	101,207	402	..	1,627	103,236	1,076	36,515	11,996	7,567	57,154	55·40	22,881	2,130	10,758	9,098 [7]	44,867	8·47	102,021	1,215	..	..	44
45. Westland [3]	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	45
Totals, Power Boards ..	14,156,962	13,472,770	2,184,631	96,855	7,820	48,912	2,338,218	30,801	703,061	284,323	212,667	1,230,852	52·60	610,312	173,003	106,807	109,923	1,000,045	7·06	2,230,897	132,755	25,434	43,188	

(For notes see page 95.)

Table XI.—Financial Results of Operation for the Year ended 31st March, 1936—*continued.*

(For Appropriations and Reserves see Table XII.)

Supply Authority.	Capital Outlay on Electric-supply System.	Loan Liability.	Revenue.					Working Expenses.						Capital Charges.						Total Annual Costs.	Net Results.		Amount collected by Rates to make up Deficiencies	No.
			Sale of Electricity.		Profits from Trading Account.	Other Sources (not including Rates).	Total.	Cost of Power.		Cost of Transmission and Distribution.[13]	Management and General.	Total.	Per Cent. of Revenue.	Interest.	Sinking Fund.	Depreciation.	Other Capital Charges.	Total.	Per Cent. of Capital Outlay.		Profit.	Loss.		
			Retail.	Bulk for Resale.				Generated.	Purchased.															
OTHER LOCAL AUTHORITIES.																								
City Councils.	£	£	£	£	£	£	£	£	£	£	£	£	%	£	£	£	£	£	%	£	£	£	£	
1. Christchurch	788,996	205,301	228,016	9,190	873	6,124	244,203	..	89,000	44,544	24,156	157,700	64·60	9,646	..	28,464	5,272[7,9]	43,382	5·50	201,082	43,121	..	..	1
2. Dunedin	1,618,770	1,331,200	216,014	13,256	..	2,228	231,498	11,313	9,750	27,890	18,505	67,458	29·15	53,997	24,018	28,768	5,722[9,10]	112,505	6·95	179,963	51,535	..	..	2
3. Invercargill	141,485	106,497	50,752	..	..	1,570	52,322	2,397	16,593	3,892	3,760	26,642	51·00	4,025	..	1,587	2,762[7]	8,374	5·92	35,016	17,306	..	..	3
4. Nelson	117,573	55,400	26,429	1,351	84	876	28,740	10,043	..	2,340	2,758	15,141	52·70	3,324	1,108	4,530	812[9]	9,774	8·32	24,915	3,825	..	..	4
5. Palmerston North	242,924	175,834	60,696	..	134	73	60,903	4,083	17,381	4,183	3,886	29,533	48·50	7,744	3,029	..	..	10,773	4·44	40,306	20,597	..	..	5
6. Wellington	1,178,204	387,127	333,355	..	..	5,252	338,607	16,216	94,458	56,782	35,812	203,268	60·00	20,887	4,809	26,913	4,690[9]	57,299	4·87	260,567	78,040	..	..	6
Totals, City Councils	4,087,952	2,261,359	915,262	23,797	1,091	16,123	956,273	44,052	227,182	139,631	88,877	499,742	52·25	99,623	32,964	90,262	19,258	242,107	5·92	741,849	214,424	..	..	
Borough Councils.																								
1. Bluff	7,211	8,400	4,117	..	..	254	4,371	..	2,392	226	824	3,442	78·80	371	185	..	..	556	7·71	3,998	373	..	..	1
2. Hamilton	60,782	49,100	39,695	..	..	190	39,885	..	13,042	8,318	1,760	23,120	57·90	1,871	2,008	..	..	3,879	6·38	26,999	12,886	..	..	2
3. Inglewood	9,006	10,553	3,972	..	775	..	4,747	..	1,709	702	685	3,096	65·20	453	340	..	103[7]	896	9·95	3,992	755	..	..	3
4. Kaiapoi	10,847	6,715	3,060	..	46	..	3,106	..	1,252	575	430	2,257	72·70	327	256	52	..	635	5·85	2,892	214	..	..	4
5. Lyttelton	12,325	5,500	6,857	..	..	..	6,857	..	2,638	1,242	317	4,197	61·20	305	175	175	..	655	5·31	4,852	2,005	..	..	5
6. Napier	126,072	134,032	43,480	..	..	1,249	44,729	48	15,774	4,466	3,540	23,828	53·30	5,696	1,581	2,111	..	9,388	7·45	33,216	11,513	..	..	6
7. New Plymouth	357,807	257,498	67,525	1,474	826	1,527	71,352	2,160	8,400	14,359	3,182	28,101	39·40	11,717	1,831	500	4,591[7,9]	18,639	5·21	46,740	24,612	..	..	7
8. Ohakune	18,897	12,550	3,439	..	10	..	3,449	78	454	644	557	1,733	50·30	500	339	382	..	1,221	6·46	2,954	495	..	..	8
9. Patea	18,129	13,201	4,472	..	42	7	4,521	145	1,138	395	669	2,347	52·00	589	156	42	124[7]	911	5·02	3,258	1,263	..	..	9
10. Picton	16,171	14,845	3,116	..	..	11	3,127	1,508	..	447	392	2,347	75·10	638	195	400	..	1,233	7·63	3,580	..	453	180	10
11. Queenstown	13,145	11,305	1,823	..	..	85	1,908	238	..	570	125	933	49·00	480	221	121	..	822	6·25	1,755	153	..	..	11
12. Raetihi	22,378	22,364	3,946	454	19	232	4,651	326	..	1,537	573	2,436	52·40	959	290	..	..	1,249	5·58	3,685	966	..	..	12
13. Rangiora	13,677	6,050	5,175	..	..	56	5,231	3	1,905	1,208	1,077	4,193	80·20	282	75	81	..	438	3·20	4,631	600	..	..	13
14. Riccarton	22,833	5,200	11,689	..	285	..	11,974	..	5,798	1,886	1,611	9,295	77·65	439	181	257	..	877	3·84	10,172	1,802	..	..	14
15. Ross[4]	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	15
16. Ro[illegible]rist Department)	77,653	77,653	21,671	..	..	660	22,331	463	6,639	4,543	775	12,420	55·65	3,882	1,553	1,553	..	6,988	9·00	19,408	2,923	..	..	16
17. [illegible]	28,111	44,485	13,347	..	..	3	13,350	..	4,885	1,497	723	7,105	53·25	1,910	..	..	990[7]	2,900	10·32	10,005	3,345	..	..	17
[illegible]	15,372	7,300	5,918	..	28	..	5,946	..	2,836	761	663	4,260	71·70	310	90	397	..	797	5·18	5,057	889	..	..	18
[illegible]ape	10,434	14,620	5,564	..	..	..	5,564	857	52	750	376	2,035	36·60	631	106	508	81[7]	1,326	12·70	3,361	2,203	..	..	19
20. Taumarunui	64,467	51,800	9,559	371	40	364	10,334	1,314	..	665	1,361	3,340	32·33	2,415	..	..	938[7]	3,353	5·20	6,693	3,641	..	..	20
21. Tauranga	161,498	133,779	12,454	8,813	..	530	21,797	2,475	6	1,353	1,555	5,389	24·72	8,017	984	1,000	971[7]	10,972	6·80	16,361	5,436	..	..	21
22. Te Aroha	16,748	7,500	7,476	..	43	59	7,578	478	2,522	1,947	853	5,800	76·50	476	55	..	..	531	3·17	6,331	1,247	..	..	22
23. Te Puke	12,027	7,106	3,713	..	..	52	3,765	..	1,187	485	289	1,961	52·10	304	..	250	138[7]	692	5·75	2,653	1,112	..	..	23
24. Thames	30,090	15,961	12,166	..	..	90	12,256	1,356	2,728	1,922	1,239	7,245	59·10	856	255	36	..	1,147	3·82	8,392	3,864	..	..	24
25. Timaru	102,228	46,300	34,947	..	..	241	35,188	..	16,015	6,335	3,102	25,452	72·40	1,970	3,302	784	..	6,056	5·92	31,508	3,680	..	..	25
26. Wairoa	11,104	16,050	8,366	..	..	90	8,456	..	5,343	500	913	6,756	79·90	665	365	..	..	1,030	9·28	7,786	670	..	..	26
27. Waitara	7,321	12,600	3,914	..	..	50	3,964	..	1,438	417	630	2,485	62·70	552	..	291	365[7]	1,208	16·50	3,693	271	..	510	27
28. Westport	34,699	29,965	7,199	..	15	12	7,226	1,038	..	972	991	3,001	41·50	1,308	576	266	..	2,150	6·20	5,151	2,075	..	..	28
29. Whakatane	35,158	38,037	6,695	3	69	..	6,767	543	8	817	717	2,085	30·80	1,641	756	..	..	2,397	6·82	4,482	2,285	..	..	29
30. Whangarei	73,710	28,337	18,589	598	477	1,213	20,877	..	6,227	3,073	2,271	11,571	55·40	1,308	310	1,783	..	3,401	4·62	14,972	5,905	..	..	30
Totals, Borough Councils	1,389,960	1,088,806	373,944	11,713	2,675	6,975	395,307	13,030	104,388	62,612	32,200	212,230	53·70	50,872	16,185	10,989	8,301	86,347	6·21	298,577	97,183	453	690	
Town Boards.																								
1. Havelock North	26,800	14,930	3,831	..	..	1	3,832	182	893	420	312	1,807	47·20	1,004	479	509	..	1,983	7·40	3,790	42	..	..	1
2. Kamo	2,224	1,931	1,120	..	..	9	1,120	..	598	33	60	691	61·20	95	96	216	..	407	18·28	1,098	31	..	78	2
3. Kaponga	23,052	16,000	5,016	..	134	62	5,212	1,689	772	1,2 0	562	4,263	81·75	712	..	..	80[7]	792	3·43	5,055	157	..	89	3
4. Mangaweka	5,761	1,303	978	..	8	46	1,032	..	350	284	171	805	78·00	91	21	..	..	112	1·94	917	115	..	159	4
5. Manunui	3,166	3,500	894	..	..	..	894	..	371	29	165	565	63·30	186	40	..	..	226	7·14	791	103	..	..	5
Totals, Town Boards	61,003	37,664	11,839	..	142	118	12,099	1,871	2,984	2,006	1,270	8,131	67·20	2,088	636	716	80	3,520	5·77	11,651	448	..	326	

(For notes see page 98.)

TABLE XI.—FINANCIAL RESULTS OF OPERATION FOR THE YEAR ENDED 31ST MARCH, 1936—*continued.*

(For Appropriations and Reserves see Table XII.)

Supply Authority.	Capital Outlay on Electric-supply System.	Loan Liability.	Revenue.					Working Expenses.						Capital Charges.						Total Annual Costs.	Net Results.		Amount collected by Rates to make up Deficiencies.	No.
			Sale of Electricity.		Profits from Trading Account.	Other Sources (not including Rates).	Total.	Cost of Power.		Cost of Transmission and Distribution.[12]	Management and General.	Total.	Per Cent. of Revenue.	Interest.	Sinking Fund.	Depreciation.	Other Capital Charges.	Total.	Per Cent. of Capital Outlay.		Profit.	Loss.		
			Retail.	Bulk for Resale.				Generated.	Purchased.															
OTHER LOCAL AUTHORITIES—*contd.*																								
County Councils.	£	£	£	£	£	£	£	£	£	£	£	£	%	£	£	£	£	£	%	£	£	£	£	
1. Heathcote	26,005	20,874	11,046	..	..	61	11,107	..	6,174	1,867	749	8,790	79·20	1,010	723	..	..	1,733	6·66	10,523	584	..	..	1
2. Kaikoura	10,684	8,600	1,670	..	45	..	1,715	1,116	..	21	440	1,577	92·00	456	173	..	..	629	5·89	2,206	..	491	358	2
3. Murchison	14,895	12,600	2,384	..	41	..	2,425	132	..	612	476	1,220	50·30	558	2	..	..	560	3·76	1,780	645	..	..	3
4. Uawa	6,275	2,242	1,022	..	5	61	1,088	490	..	6	31	527	48·45	110	..	..	443[7]	553	8·82	1,080	8	..	..	4
5. Waimairi	61,994	37,700	23,752	34	18	44	23,848	..	9,618	1 713	2,365	13,696	57·40	1,683	1,444	4,000	..	7,127	11·50	20,823	3,025	..	71	5
Totals, County Councils ..	119,853	82,016	39,874	34	109	166	40,183	1,738	15,792	4,219	4,061	25,810	64·20	3,817	2,342	4,000	443	10,602	8·84	36,412	4,262	491	429	
Totals, other Local Authorities	5,658,708	3,469,845	1,340,919	35,544	4,017	23,382	1,403,862	60,691	350,346	208,468	126,408	745,913	53·10	156,400	52,127	105,967	28,082	342,576	6·05	1,088,489	316,317	944	1,445	
COMPANIES.																								
1. Alderton Utility Co.	5,556	..	935	..	..	..	935	24	..	16	428	468	50·00	161	..	156	..	317	5·70	785	150	..	..	1
2. Kanieri Electric, Ltd. ..	81,414	..	11,942	697	114	190	12,943	4,116	..	1,027	2,957	8,100	62·50	2,944	..	1,303	..	4,247	5·22	12,347	596	..	..	2
3. Reefton Electric Light and Power Co., Ltd.	6,929	..	3,412	..	49	20	3,481	843	..	259	1,605	2,707	77·50	..	..	..	..	..	..	2,707	774	..	..	3
4. P. Spender (Rawene)	2,876	..	436	..	..	20	456	291	..	10	80	381	83·50	..	..	..	..	..	..	381	75	..	..	4
5. Wilson's (N.Z.) Portland Cement, Ltd.	91,065	..	7,039	6,235	..	358	13,632	3,225	..	865	831	4,921	36·10	..	..	..	..	..	..	4,921	8,711	..	..	5
6. Westland Power, Ltd. ..	82,611	..	8,365	..	358	425	9,148	2,738	647	466	2,609	6,460	70·60	1,783	..	1,675	..	3,458	4·19	9,918	..	770	..	6
Totals, Companies ..	270,451	..	32,129	6,932	521	1,013	40,595	11,237	647	2,643	8,510	23,037	56·75	4,888	..	3,134	..	8,022	2·97	31,059	10,306	770	..	
Totals, all Supply Authorities	33,181,503	29,020,569	3,642,818	1,083,952	12,522	84,032	4,823,324	178,805	1,054,360	571,444	393,161	2,197,770	45·57	1,356,868	225,130	313,249	176,153	2,071,400	6·24	4,269,170	646,911	92,757	44,633	

Net profit for all Supply Authorities, £554,154.

NOTES.—[1] Not actively functioning. [2] Distribution system under construction; supply not yet commenced. [3] License delegated to Westland Power, Ltd. [4] No returns received. [5] Capital expenditure and loan liability shown for record purposes, but not added to totals. Board not yet supplying power. [6] Half capital charges on Auckland Power Board's King's Wharf Steam Station paid by Public Works Department. [7] Principal repayment (annual instalment). [8] After deducting proportion of half the capital charges on King's Wharf Steam Station paid by the Public Works Department. [9] Exchange on overseas interest payments. [10] Loan discount. [11] Repairs to stand-by plant only. [12] Includes cost of street lighting.

Table XII.—Appropriations and Reserves for Year ended 31st March, 1936.

(For Statistics of Capital, Revenue, and Expenditure see Table XI.)

Supply Authority.	Appropriations of Net Surplus for Year ended 31st March, 1936 (after paying Working-expenses and Statutory Capital Charges).									Accumulated Reserves and Funds.								Credit Balance, Revenue Account.	Debit Balance, Revenue Account.	No.
										Sinking Fund.		Depreciation.		Renewal.		General and Other Reserves.[7]				
	Renewal Fund.	General Reserve Fund.	Accident Insurance Fund.	Relief of Rates (Local Authorities).	Payment of Dividends (Companies).	Capital Expenditure out of Revenue.	Miscellaneous Payments.	Unappropriated Surplus.	Total (Net Profit for Year).	Reserve.	Funds.	Reserve.	Funds.	Reserve.	Funds.	Reserve.	Funds.			
Public Works Department.	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	
1. Arapuni-Mangahao-Waikaremoana	..	..	..	..	..	..	..	187,533	187,533	55,930	..	961,757	..	..	..	..	..	..	399,315	1
2. Coleridge-Waitaki	..	..	..	..	..	..	..	..	..	270,570	17,555	388,546	..	..	..	175,809	..	..	..	2
Totals, Public Works Department	..	..	..	..	..	..	..	187,533	187,533	326,500	17,555	1,350,303	..	..	..	175,809	..	..	399,315	
Electric-power Boards.																				
1. Ashburton	1,128	..	..	..	..	..	64	..	1,192	4,289	4,295	7,203	2,210	3,100	3,100	..	..	..	11,939	1
2. Auckland	..	..	..	..	..	..	2,682	36,719	39,401	1,135,356	1,111,564	643,506	..	28,346	..	232,651	..	36,719	..	2
3. Banks Peninsula	..	..	..	..	..	..	..	..	..	3,103	3,103	4,939	4,939	..	..	10,100	..	5,258	..	3
4. Bay of Plenty	..	..	..	..	..	1,671	100	5,435	7,206	10,027	8,427	9,478	..	..	..	19,695	..	..	8,057	4
5. Buller[1]	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5
6. Cambridge	..	..	..	..	..	..	..	278	278	7,932	8,049	1,766	1,766	..	..	16,629	..	3,885	..	6
7. Central Hawke's Bay	..	320	..	..	..	..	34	1,806	2,160	1,092	1,092	20,163	15,486	..	..	2,196	1,595	5,137	..	7
8. Central Waikato	..	..	..	..	..	..	..	2,428	2,428	22,624	22,624	29,718	28,848	6,337	6,160	22,535	..	10,781	..	8
9. Dannevirke	..	..	..	..	..	358	200	1,756	2,314	19,644	17,794	20,349	19,143	..	..	8,041	..	7,676	..	9
10. Franklin	280	..	..	..	..	..	220	592	1,092	25,587	25,587	25,000	25,000	..	..	16,195	8,995	4,591	..	10
11. Golden Bay	..	..	..	..	..	315	197	472	984	1,468	1,468	2,045	603	..	..	1,400	..	1,458	..	11
12. Grey	..	..	..	..	..	3,490	298	..	3,788	32,915	35,274	4,929	2,058	..	..	12,215	3,366	..	20,330	12
13. Hawke's Bay	..	..	..	..	..	3,392	..	..	3,392	24,297	24,297	15,913	8,117	..	..	15,366	..	11,052	..	13
14. Horowhenua	..	..	200	..	..	143	20	3,683	4,046	1,091	1,091	30,226	30,226	..	..	47,777	13,900	8,949	..	14
15. Hutt Valley	..	..	..	..	..	4,109	..	5,494	9,603	20,192	21,692	67,738	67,738	5,981	5,981	26,190	..	8,354	..	15
16. Lake Wakatipu[1]	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	16
17. Malvern	..	..	..	..	..	..	..	..	..	5,193	5,193	3,987	..	..	..	900	..	..	2,676	17
18. Manawatu-Oroua	..	..	..	..	..	..	..	4,644	4,644	46,183	55,123	35,365	17,482	..	..	..	..	..	4,448	18
19. Marlborough	..	..	..	..	..	..	1,712	..	1,712	29,051	36,051	23,180	6,167	..	..	4,782	..	..	7,014	19
20. North Auckland[2]	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	20
21. North Canterbury	..	..	..	..	..	..	18	..	18	9,862	7,407	6,794	1,465	..	..	12,304	..	4,494	..	21
22. Opunake	..	..	..	..	..	..	..	679	679	2,029	2,029	2,166	1,966	..	..	16,773	..	6,388	..	22
23. Otago Central	..	..	..	..	..	..	..	1,139	1,139	4,138	4,138	3,827	1,490	..	..	10,928	..	..	1,280	23
24. Otago	..	..	..	..	..	..	..	3,032	3,032	33,195	31,872	29,925	1,960	..	..	..	..	2,581	..	24
25. Poverty Bay	..	1,250	..	..	..	1,929	2,000[5]	353	5,532	34,828	39,123	16,360	6,239	..	..	31,901	..	9,828	..	25
26. Reefton[1]	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	26
27. South Canterbury	..	..	..	..	..	..	..	1,014	1,014	17,817	20,802	12,445	3,022	..	..	31,394	..	3,213	..	27
28. South Taranaki	..	71	..	..	..	3,500	797	..	4,368	14,930	14,930	7,623	7,623	..	..	21,774	9,539	3,258	..	28
29. Southland	..	..	..	..	..	..	..	..	..	400,826	400,826	28,278	16,411	..	..	94,961	..	10,744	..	29
30. Springs-Ellesmere	..	..	..	..	..	..	..	2,872	2,872	6,844	10,597	8,227	8,051	..	..	15,820	..	12,333	..	30
31. Taranaki	..	..	390	..	..	2,959	19	1,766	5,134	2,707	2,707	15,560	9,332	..	..	22,221	..	3,229	..	31
32. Tararua	..	..	..	..	..	..	595	1,190	1,785	15,571	15,571	17,477	10,790	584	..	12,304	..	1,191	..	32
33. Tauranga	..	1,000	..	..	..	..	2	56	1,058	1,249	1,249	10,767	9,946	..	..	15,057	7,274	275	..	33
34. Te Awamutu	..	..	..	..	..	504	..	3,349	3,853	1,193	1,193	6,235	6,235	..	..	30,479	..	6,693	..	34
35. Teviot	..	1,324	..	..	..	..	..	..	1,324	7,611	7,611	3,536	1,767	..	..	75	..	4,329	..	35
36. Thames Valley	..	..	..	..	..	..	..	4,724	4,724	118,433	123,683	21,060	20,820	1,250	..	7,981	..	5,078	..	36
37. Waimea	..	..	..	..	..	..	..	1,509	1,509	..	..	..	..	..	..	1,300	..	1,157	..	37
38. Wairarapa	..	..	..	..	..	3,100	396	2,900	6,396	24,597	26,680	23,589	18,844	..	..	38,168	18,677	4,609	..	38
39. Wairere	..	..	..	..	..	80	..	128	208	3,523	3,283	1,859	1,747	..	..	600	..	592	..	39

(For notes see page 101.)

Table XII.—Appropriations and Reserves for Year ended 31st March, 1936—*continued.*

(For Statistics of Capital, Revenue, and Expenditure see Table XI.)

Supply Authority.	Appropriations of Net Surplus for Year ended 31st March, 1936 (after paying Working-expenses and Statutory Capital Charges).									Accumulated Reserves and Funds.								Credit Balance, Revenue Account.	Debit Balance, Revenue Account.	No.
										Sinking Fund.		Depreciation.		Renewal.		General and Other Reserves.[7]				
	Renewal Fund.	General Reserve Fund.	Accident Insurance Fund.	Relief of Rates (Local Authorities).	Payment of Dividends (Companies).	Capital Expenditure out of Revenue.	Miscellaneous Payments.	Unappropriated Surplus.	Total (Net Profit for Year).	Reserve.	Funds.	Reserve.	Funds.	Reserve.	Funds.	Reserve.	Funds.			
Electric-power Boards—*continued.*	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	
40. Wairoa	..	..	..	..	..	..	..	..	..	2,283	2,268	3,494	2,147	..	..	1,302	..	..	6,643	40
41. Waitaki	..	..	..	..	..	..	..	1,416	1,416	29,540	22,579	20,150	20,150	..	..	13,811	5,125	5,424	..	41
42. Waitemata	..	..	..	..	..	..	..	237	237	49,729	52,293	25,706	25,590	..	..	37,381	10,005	7,948	..	42
43. Waitomo	..	..	..	..	..	770	..	232	1,002	10,883	10,883	2,850	2,689	..	..	213	..	388	..	43
44. Wanganui-Rangitikei	..	..	..	..	..	..	1,215	..	1,215	12,726	12,726	37,797	29,899	1,175	..	66,102	..	11,873	..	44
45. Westland[3]	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	45
Totals, Power Boards	1,408	3,965	590	..	..	26,320	10,569	89,903	132,755	2,194,558	2,197,174	1,251,230	437,966	46,773	15,241	919,521	78,476	209,485	62,387	
Other Local Authorities.																				
City Councils.																				
1. Christchurch	..	..	..	15,833	..	..	2,095	25,193	43,121	60,435	60,435	..	..	35,000	..	384,961	..	25,193	..	1
2. Dunedin	16,024	..	..	35,511	..	..	..	..	51,535	225,602	225,602	236,735	..	216,238	216,238	..	..	91,834	..	2
3. Invercargill	..	..	..	10,000	..	3,706	3,600	..	17,306	15,091	15,091	20,933	20,933	..	..	34,981	..	2,769	..	3
4. Nelson	..	..	..	1,000	..	1,888	..	937	3,825	4,849	4,849	13,862	17,745	21,615	..	14,600	..	37,820	..	4
5. Palmerston North	..	4,602	500	2,000	..	12,700	795	..	20,597	18,703	18,703	35,399	35,399	..	..	83,007	7,225	18,611	..	5
6. Wellington	..	..	..	25,000	..	9,571	..	43,469	78,040	82,178	82,178	373,652	76,225	163,708	87,483	216,366	144,496	469,965	..	6
Totals, City Councils	16,024	4,602	500	89,344	..	27,865	6,490	69,599	214,424	406,858	406,858	680,581	150,302	436,561	303,721	733,915	151,721	646,192	..	
Borough Councils.																				
1. Bluff	..	..	..	120	..	253	..	..	373	1,436	1,436	1,888	1,888	..	..	..	..	322	..	1
2. Hamilton	..	221	..	4,665	..	..	8,000	..	12,886	21,081	21,081	11,205	11,205	..	..	25,750	15,699	13,003	..	2
3. Inglewood	50	..	..	696	..	..	..	9	755	..	4,656	..	14	..	..	..	..	3,633	..	3
4. Kaiapoi	98	..	..	..	..	..	..	116	214	125	125	2,548	1,277	1,330	..	2,285	..	1,733	..	4
5. Lyttelton	..	..	..	..	..	495	..	1,510	2,005	1,381	1,381	966	791	..	..	2,000	..	7,893	..	5
6. Napier	..	..	..	3,754	..	838	592	6,329	11,513	14,328	14,535	24,315	22,205	..	..	5,392	..	6,333	..	6
7. New Plymouth	..	750	..	6,000	..	5,000	2,935	9,927	24,612	19,471	19,471	17,501	17,501	21,990	21,990	182,984	..	30,631	..	7
8. Ohakune	..	..	..	441	..	54	..	..	495	1,450	1,450	1,439	167	..	..	211	..	2,427	..	8
9. Patea	..	85	..	287	..	891	..	..	1,263	862	862	48	48	..	..	6,286	..	..	..	9
10. Picton	..	..	..	..	..	..	..	..	..	2,348	2,348	3,133	2,733	..	..	2,613	..	1,292	..	10
11. Queenstown	..	..	..	150	..	..	..	3	153	359	359	1,294	790	..	..	..	..	1,331	..	11
12. Raetihi	..	..	..	156	..	259	74	477	966	20	20	902	902	..	..	529	..	736	..	12
13. Rangiora	..	..	..	..	..	..	..	600	600	1,791	1,791	1,121	1,042	..	..	..	..	3,989	..	13
14. Riccarton	..	..	..	..	..	490	155	1,157	1,802	1,896	1,162	3,920	3,663	..	..	15,521	..	4,212	..	14
15. Ross[4]	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	15
16. Rotorua (Tourist Department)	..	2,923	..	..	..	..	..	..	2,923	20,916	20,916	19,553	19,553	..	..	8,341	5,418	..	..	16
17. Stratford	..	..	..	2,788	..	557	..	..	3,345	1,515	1,515	1,679	1,429	..	..	990	..	..	13,665	17
18. Sumner	..	..	..	830	..	..	..	59	889	1,175	1,175	1,928	1,531	..	..	..	..	9,389	..	18
19. Taihape	..	..	..	1,582	..	..	..	621	2,203	3,799	3,799	4,369	3,861	..	..	..	..	2,557	..	19
20. Taumarunui	..	..	..	1,200	..	1,618	..	823	3,641	2,370	2,816	4,876	4,876	..	..	13,093	..	2,258	..	20
21. Tauranga	..	..	93	3,000	..	1,540	803	..	5,436	10,699	10,699	7,493	5,768	..	..	37,066	13,551	20,964	..	21
22. Te Aroha	..	..	..	..	..	447	..	800	1,247	493	493	2,381	2,031	..	..	2,545	..	9,704	..	22
23. Te Puke	75	..	..	633	..	..	15	389	1,112	..	..	3,851	3,851	536	..	2,541	..	4,497	..	23
24. Thames	..	..	..	..	..	..	1,000	2,864	3,864	678	678	1,540	1,540	..	..	9,715	1,500	6,368	..	24
25. Timaru	127	..	..	1,000	..	2,553	..	..	3,680	7,875	7,875	2,000	2,000	..	..	52,814	..	8,995	..	25

(For notes see page 101.)

TABLE XII.—APPROPRIATIONS AND RESERVES FOR YEAR ENDED 31ST MARCH, 1936—*continued.*

(For Statistics of Capital, Revenue, and Expenditure see Table XI.)

Supply Authority.	Appropriations of Net Surplus for Year ended 31st March, 1936 (after paying Working-expenses and Statutory Capital Charges).									Accumulated Reserves and Funds.								Credit Balance, Revenue Account.	Debit Balance, Revenue Account.	No.
	Renewal Fund.	General Reserve Fund.	Accident Insurance Fund.	Relief of Rates (Local Authorities).	Payment of Dividends (Companies).	Capital Expenditure out of Revenue.	Miscellaneous Payments.	Unappropriated Surplus.	Total (Net Profit for Year).	Sinking Fund.		Depreciation.		Renewal.		General and Other Reserves.[7]				
										Reserve.	Funds.	Reserve.	Funds.	Reserve.	Funds.	Reserve.	Funds.			
OTHER LOCAL AUTHORITIES—*continued.*																				
Borough Councils—continued.	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	
26. Wairoa	..	..	..	670	..	..	..	..	670	1,474	1,474	1,053	1,053	..	..	1,115	..	30	..	26
27. Waitara	..	..	..	271	..	..	..	..	271	3,660	3,660	1,591	1,264	..	..	827	..	1,081	..	27
28. Westport	..	..	..	1,000	..	720	..	355	2,075	7,854	7,854	3,386	3,235	..	..	1,067	..	6,818	..	28
29. Whakatane	..	..	..	1,111	..	..	..	1,174	2,285	977	1,289	144	144	..	..	..	..	..	449	39
30. Whangarei	..	..	..	2,316	..	2,459	..	1,130	5,905	7,239	7,235	7,410	7,410	..	..	52,160	..	..	..	30
Totals, Borough Councils	350	3,979	93	32,670	..	18,174	13,574	28,343	97,183	137,272	142,155	133,534	123,772	23,856	21,990	425,845	36,168	150,196	14,114	
Town Boards.																				
1. Havelock North	..	..	..	..	..	..	..	42	42	2,223	2,223	509	509	..	..	7,000	..	5,223	..	1
2. Kamo	..	..	..	..	..	31	..	..	31	52	..	..	..	..	..	307	..	192	..	2
3. Kaponga	..	..	..	..	..	..	..	157	157	..	268	..	..	..	..	..	862	477	..	3
4. Mangaweka	..	..	..	..	..	..	..	115	115	847	847	..	..	..	..	..	..	5,567	..	4
5. Manunui	..	..	..	..	..	..	..	103	103	379	379	276	..	..	..	..	..	416	..	5
Totals, Town Boards	..	..	..	..	..	31	..	417	448	3,501	3,717	785	509	..	..	7,307	862	11,875	..	
County Councils.																				
1. Heathcote	..	..	..	..	..	..	..	584	584	..	..	..	8,020	..	..	..	..	11,543	..	1
2. Kaikoura	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,408	2
3. Murchison	..	..	..	645	..	..	..	..	645	..	..	..	..	..	..	..	..	516	..	3
4. Uawa	..	..	..	..	..	..	..	8	8	..	..	..	..	..	..	4,165	..	..	164	4
5. Waimairi	..	1,207	..	..	..	1,818	..	..	3,025	8,212	8,227	13,985	..	..	..	33,022	..	..	..	5
Totals, County Councils	..	1,207	..	645	..	1,818	..	592	4,262	8,212	8,227	13,985	8,020	..	..	37,187	..	12,059	1,572	
Totals, other Local Authorities	16,374	9,788	593	122,659	..	47,888	20,064	98,951	316,317	555,843	560,957	828,885	282,603	460,417	325,711	1,204,254	188,751	820,322	15,686	
COMPANIES.																				
1. Alderton Utility Co.	..	..	..	..	..	..	..	150	150	..	..	..	..	..	..	..	..	199	..	1
2. Kanieri Electric, Ltd.	..	..	..	..	..	596	..	..	596	..	..	..	..	..	..	7,218	..	3,345	..	2
3. Reefton Electric Light and Power Co., Ltd.	..	..	..	..	375	..	120	279	774	..	..	..	..	..	..	1,293	..	..	..	3
4. P. Spender (Rawene)	..	..	..	..	..	..	..	75	75[6]	..	..	..	..	..	..	..	..	..	..	4
5. Wilson's (N.Z.) Portland Cement, Ltd.	..	..	..	..	..	..	..	8,711	8,711[6]	..	..	..	..	..	..	..	..	..	..	5
6. Westland Power, Ltd.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10,900	6
Totals, Companies	..	..	..	..	375	596	120	9,215	10,306	..	..	..	..	..	..	8,511	..	3,544	10,900	
Totals, all Supply Authorities	17,782	13,753	1,183	122,659	375	74,804	30,753	385,602	646,911	3,076,901	2,775,686	3,430,418	720,569	507,190	340,952	2,308,095	267,227	1,033,351	488,288	

NOTES.—[1] Not actively functioning. [2] Distribution system under construction; supply not yet commenced. [3] License delegated to Westland Power, Ltd. [4] No returns received. [5] Paid into Load Development Reserve. [6] Gross surplus.
[7] Includes General Reserves, Accident Fund Reserves, Loan Repayment Reserves, Capital Expenditure out of Revenue, Load Development Reserves, Bad Debts Reserves, &c.

Table XIII.—Averages Derived from Tables IX, X, and XI, for Year ended 31st March, 1936.

(For Summary of Relevant Totals from above-named Tables see Table B on page 104.)

Supply Authority.	Capital Outlay.			Revenue (Averages).							Working-costs.		Capital Charges.		Total Costs.		No.
	Per Capita.	Per Route-mile of Line.	Per £1 of Revenue. (a)	Per Unit sold. (b)	Per Unit sold (Retail Supply). (d)	Per Unit sold (Retail Domestic Supply).	Per Capita. (e)	Per Retail Consumer. (f)	Per Kw. of Maximum Demand. (g)	Per Route-mile of Line. (g)(5)	Per Unit sold. (h)	Per Kw. of Maximum Demand.	Per Unit sold. (h)	Per Kw. of Maximum Demand.	Per Unit sold. (h)	Per Kw. of Maximum Demand.	
Public Works Department.	£	£	£	d.	d.	d.	£	£	£	£	d.	£	d.	£	d.	£	
1. Arapuni-Mangahao-Waikaremoana	..	7,180	10·97	0·335	..	..	..	..	6·74	654	0·062	1·23	0·197	3·97	0·259	5·20	1
2. Coleridge-Waitaki	..	6,550	18·40	0·389	..	..	..	..	6·60	356	0·086	1·47	0·411	6·99	0·497	8·46	2
Averages, Public Works Department	..	6,950	12·71	0·346	..	..	..	..	..	547	0·067	..	0·242	..	0·309	..	
Electric-power Boards.																	
1. Ashburton	17·33	365	7·11	1·942	1·942	2·696	2·47	11·55	25·08	51	0·960	12·38	0·962	12·40	1·922	24·78	1
2. Auckland	14·67	2,890	5·24	1·015	1·056	0·865	2·85	10·58	16·95	552	0·532	8·87	0·438	7·30	0·970	16·17	2
3. Banks Peninsula	25·50	504	8·94	1·712	1·712	1·732	2·92	11·42	23·58	56	1·318	18·15	0·940	12·94	2·258	31·09	3
4. Bay of Plenty	18·87	739	4·84	1·079	1·079	2·652	4·08	24·55	30·10	153	0·578	16·10	0·353	9·85	0·931	25·95	4
5. Buller [1]	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5
6. Cambridge	19·33	610	6·07	1·049	1·049	1·5	3·34	12·27	22·90	101	0·732	15·98	0·354	7·75	1·086	23·73	6
7. Central Hawke's Bay	14·50	636	6·44	1·369	1·369	3·14	2·26	13·90	26·10	99	0·706	13·45	0·541	10·30	1·247	23·75	7
8. Central Waikato	19·45	526	6·12	1·061	1·061	2·590	3·21	11·48	23·65	86	0·623	13·89	0·407	9·07	1·030	22·96	8
9. Dannevirke	17·67	686	7·40	1·667	1·667	4·185	2·42	10·92	33·50	93	0·799	16·03	0·760	15·26	1·559	31·29	9
10. Franklin	17·10	498	6·13	0·903	0·903	2·027	3·06	12·20	19·75	81	0·552	12·06	0·420	9·17	0·972	21·23	10
11. Golden Bay	19·85	455	6·49	1·715	1·715	4·68	3·11	10·82	22·32	70	0·710	9·25	0·639	8·30	1·349	17·55	11
12. Grey	20·10	1,520	7·54	1·278	1·278	2·2	2·74	11·04	19·27	202	0·442	6·67	0·743	11·20	1·185	17·87	12
13. Hawke's Bay	11·87	1,026	4·22	0·866	1·173	2·055	2·28	9·90	18·18	243	0·515	10·82	0·323	6·78	0·838	17·60	13
14. Horowhenua	13·36	703	4·82	1·117	1·117	2·574	2·84	10·44	19·35	146	0·751	13·00	0·298	5·16	1·049	18·16	14
15. Hutt Valley	8·52	1,290	3·71	1·143	1·143	2·361	2·32	8·44	19·89	348	0·770	13·40	0·281	4·89	1·051	18·29	15
16. Lake Wakatipu [1]	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	16
17. Malvern	14·08	387	9·16	2·710	2·710	..	1·62	11·43	34·24	42	2·093	26·46	1·393	17·60	3·486	44·06	17
18. Manawatu-Oroua	12·45	789	5·63	0·790	1·284	..	1·78	13·60	19·20	140	0·489	11·88	0·264	6·42	0·753	18·30	18
19. Marlborough	22·80	1,176	11·08	1·665	1·665	2·934	2·10	10·35	31·15	106	0·419	7·85	1·181	22·10	1·600	29·95	19
20. North Auckland [2]	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	20
21. North Canterbury	14·20	368	6·45	1·336	1·522	2·22	2·00	10·32	20·22	57	0·900	13·60	0·475	7·18	1·375	20·78	21
22. Opunake	21·42	719	8·64	1·925	1·925	4·0	2·49	12·66	25·31	83	0·922	12·12	0·906	11·90	1·828	24·02	22
23. Otago Central	33·70	647	10·94	1·212	1·212	3·42	3·23	11·21	25·17	59	0·462	9·59	0·680	14·13	1·142	23·72	23
24. Otago	16·80	496	6·82	1·765	1·765	..	2·47	10·57	25·46	73	0·859	12·38	0·788	11·36	1·647	23·74	24
25. Poverty Bay	13·15	850	5·48	1·507	1·507	2·387	2·48	11·30	28·10	155	0·874	16·30	0·542	10·10	1·416	26·40	25
26. Reefton [1]	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	26
27. South Canterbury	13·25	437	6·02	0·919	1·327	2·380	1·62	9·29	15·92	73	0·574	9·95	0·351	6·08	0·925	16·03	27
28. South Taranaki	10·41	780	5·82	1·384	1·430	1·5	1·76	10·61	23·40	134	0·680	11·38	0·560	9·37	1·240	20·75	28
29. Southland	31·60	642	11·70	1·576	1·966	2·87	2·56	10·83	20·00	55	0·526	6·68	1·457	18·50	1·983	25·18	29
30. Springs-Ellesmere	13·09	498	5·40	1·412	1·412	2·232	2·46	11·62	24·95	92	0·859	15·16	0·435	7·70	1·294	22·86	30
31. Taranaki	21·70	1,190	10·50	1·054	1·411	1·58	1·70	14·40	19·16	114	0·310	5·64	0·635	11·53	0·945	17·17	31
32. Tararua	20·80	754	7·05	1·729	1·729	4·444	3·03	14·21	34·45	107	0·888	17·72	0·756	15·08	1·644	32·80	32
33. Tauranga	14·05	326	5·42	1·202	1·202	2·141	2·67	17·45	..	60	0·718	..	0·471	..	1·189	..	33
34. Te Awamutu	22·40	587	6·50	1·210	1·210	2·84	3·46	14·83	24·08	90	0·658	13·08	0·399	7·95	1·057	21·03	34
35. Teviot	32·35	858	8·90	0·363	0·730	1·55	3·01	12·97	8·22	97	0·110	2·48	0·187	4·23	0·297	6·71	35
36. Thames Valley	22·40	977	6·70	1·081	1·133	3·0	3·24	14·52	26·10	146	0·575	13·87	0·475	11·48	1·050	25·35	36
37. Waimea	9·37	682	7·03	3·670	3·670	..	1·46	6·62	35·05	97	2·460	23·50	1·120	10·72	3·580	34·22	37
38. Wairarapa	18·10	674	6·77	1·258	1·258	2·920	2·74	10·15	25·93	100	0·617	12·71	0·519	10·69	1·136	23·40	38
39. Wairere	24·11	405	9·38	0·934	0·934	2·044	2·66	14·63	12·87	43	0·426	5·88	0·502	6·90	0·928	12·78	39
40. Wairoa	11·58	659	4·97	0·877	1·285	3·4	1·42	19·08	15·10	133	0·646	11·12	0·304	5·24	0·950	16·36	40
41. Waitaki	10·22	415	5·53	1·080	1·080	1·593	1·90	8·24	17·65	75	0·690	11·26	0·376	6·14	1·066	17·40	41
42. Waitemata	9·48	628	5·38	1·126	1·126	2·11	1·79	7·23	21·70	117	0·770	14·80	0·374	7·20	1·144	22·00	42
43. Waitomo	12·18	838	5·71	1·323	1·323	2·312	2·16	13·20	21·40	147	0·823	13·30	0·449	7·26	1·272	20·56	43
44. Wanganui-Rangitikei	10·12	665	5·22	1·124	1·156	2·534	1·96	9·39	21·07	128	0·632	11·84	0·496	9·30	1·128	21·14	44
45. Westland [3]	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	45
Averages, Power Boards	15·63	806	6·21	1·194(c)	1·216	..	2·48	10·82	..	130	0·672(k)	..	0·546(k)	..	1·218(k)	..	
Other Local Authorities. *City Councils.*																	
1. Christchurch	8·30	2,310	3·33	0·895	0·957	0·851	2·47	7·55	13·50	695	0·595	8·98	0·164	2·47	0·759	11·45	1
2. Dunedin	17·60	2,787	7·06	0·860	0·956	0·912	2·37	7·40	12·60	395	0·253	3·70	0·422	6·18	0·675	9·88	2
3. Invercargill	6·44	1,791	2·79	2·322	2·522	5·0	2·38	8·25	26·25	643	1·219	13·80	0·383	4·33	1·602	18·13	3
4. Nelson	9·79	2,450	4·23	3·516	3·547	4·0	2·28	8·60	32·00	579	1·916	17·41	1·237	11·23	3·153	28·64	4
5. Palmerston North	11·95	2,965	4·00	1·155	1·155	2·513	2·74	10·05	21·45	741	0·563	10·42	0·206	3·81	0·769	14·23	5
6. Wellington	9·42	3,270	3·53	1·269	1·370	0·910	2·71	8·04	15·67	926	0·774	9·55	0·218	2·70	0·992	12·25	6
Averages, City Councils	11·10	2,742	4·35	1·120(c)	1·157	..	2·53	7·88	..	630	0·612(k)	..	0·296(k)	..	0·908(k)	..	

(For notes see page 104.)

Table XIII.—Averages Derived from Tables IX, X, and XI, for Year ended 31st March, 1936—*continued.*

(For Summary of Relevant Totals from above-named Tables see Table B on page 104.)

Supply Authority.	Capital Outlay.			Revenue (Averages).							Working-costs.		Capital Charges.		Total Costs.		No.
	Per Capita.	Per Route-mile of Line.	Per £1 of Revenue. (*a*)	Per Unit sold. (*b*)	Per Unit sold (Retail Supply). (*d*)	Per Unit sold (Retail Domestic Supply).	Per Capita. (*e*)	Per Retail Consumer. (*f*)	Per Kw. of Maximum Demand. (*g*)	Per Route-mile of Line. (*g*) [5]	Per Unit sold. (*h*)	Per Kw. of Maximum Demand.	Per Unit sold. (*h*)	Per Kw. of Maximum Demand.	Per Unit sold. (*h*)	Per Kw. of Maximum Demand.	
Other Local Authorities—*continued.* *Borough Councils.*	£	£	£	d.	d.	d.	£	£	£	£	d.	£	d.	£	d.	£	
1. Bluff	3·54	655	1·75	2·192	2·192	3·560	2·14	8·09	16·52	374	1·834	13·82	0·296	2·23	2·130	16·05	1
2. Hamilton	3·78	1,048	1·53	1·622	1·622	3·49	2·48	8·55	23·45	685	0·945	13·65	0·158	2·29	1·103	15·94	2
3. Inglewood	6·93	1,126	2·27	1·692	1·692	3·115	3·65	9·31	25·96	497	1·320	20·24	0·382	5·86	1·702	26·10	3
4. Kaiapoi	6·38	775	3·54	1·942	1·942	2·0	1·83	6·18	24·50	219	1·432	18·05	0·403	5·08	1·835	23·13	4
5. Lyttelton	3·74	1,233	1·80	1·950	1·950	2·766	2·08	7·72	25·00	686	1·193	15·32	0·186	2·39	1·379	17·71	5
6. Napier	8·24	2,930	2·90	1·214	1·214	2·365	2·92	9·04	26·90	1,010	0·666	14·74	0·262	5·81	0·928	20·55	6
7. New Plymouth	17·04	1,072	5·18	1·049	1·107	2·5	3·33	10·12	17·70	207	0·427	7·20	0·284	4·78	0·711	11·98	7
8. Ohakune	9·74	1,112	5·50	2·742	2·742	4·595	1·78	7·33	34·39	202	1·382	17·33	0·974	12·21	2·356	29·54	8
9. Patea	7·85	1,067	4·05	1·975	1·975	3·7	1·96	11·07	29·05	263	1·037	15·24	0·402	5·92	1·439	21·16	9
10. Picton	11·55	1,470	5·19	5·410	5·410	5·3	2·24	7·98	40·00	283	4·075	30·10	2·141	15·80	6·216	45·90	10
11. Queenstown	14·60	1,878	7·22	2·645	2·645	..	2·12	6·83	24·30	260	1·353	12·44	1·191	10·96	2·544	23·40	11
12. Raetihi	4·98	800	5·09	1·251	2·010	3·395	0·93	9·44	16·60	157	0·693	9·19	0·355	4·71	1·048	13·90	12
13. Rangiora	6·12	1,053	2·64	2·095	2·095	2·9	2·34	7·59	26·82	398	1·696	21·73	0·177	2·27	1·873	24·00	13
14. Riccarton	4·31	1,268	1·95	1·048	1·048	1·5	2·26	7·68	17·27	650	0·833	13·73	0·079	1·30	0·912	15·03	14
15. Ross [4]	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	15
16. Rotorua (Tourist Department)	6·81	1,194	3·58	2·140	2·140	1·81	1·96	10·03	27·20	334	1·227	15·61	0·690	8·77	1·917	24·38	16
17. Stratford	7·50	1,652	2·10	1·480	1·480	2·705	3·56	12·11	22·24	785	0·788	11·83	0·322	4·83	1·110	16·66	17
18. Sumner	4·70	1,537	2·60	1·050	1·050	1·73	1·82	5·54	15·83	592	0·756	11·40	0·141	2·13	0·897	13·53	18
19. Taihape	4·78	1,043	1·88	2·450	2·450	2·852	2·55	9·65	24·30	556	0·896	8·88	0·584	5·79	1·480	14·67	19
20. Taumarunui	11·50	3,790	6·49	2·480	2·470	..	1·78	9·35	29·20	584	0·834	9·83	0·837	9·86	1·671	19·69	20
21. Tauranga	47·60	2,524	7·59	0·560	0·918	0·902	3·83	11·87	8·46	332	0·142	2·14	0·288	4·37	0·430	6·51	21
22. Te Aroha	7·08	882	2·24	1·688	1·688	3·66	3·20	10·10	27·40	394	1·310	21·25	0·120	1·95	1·430	23·20	22
23. Te Puke	12·28	1,002	3·24	1·420	1·420	2·684	3·84	11·71	26·10	309	0·750	13·80	0·264	4·87	1·014	18·67	23
24. Thames	6·40	1,367	2·47	2·060	2·060	3·5	2·61	10·40	45·40	553	1·225	27·00	0·194	4·28	1·419	31·28	24
25. Timaru	5·91	1,732	2·93	1·342	1·342	1·653	2·03	7·71	20·40	593	0·978	14·85	0·232	3·53	1·210	18·38	25
26. Wairoa	4·41	793	1·33	1·037	1·037	1·708	3·35	12·03	16·30	598	0·838	13·17	0·128	2·01	0·966	15·18	26
27. Waitara	3·70	610	1·87	1·990	1·990	3·523	2·00	7·46	28·60	326	1·263	18·13	0·614	8·82	1·877	26·95	27
28. Westport	8·26	1,825	4·82	2·425	2·425	3·5	1·72	7·66	25·00	379	1·010	10·41	0·725	7·47	1·735	17·88	28
29. Whakatane	20·30	517	5·25	1·374	1·374	3·602	3·90	13·17	22·33	99	0·428	6·95	0·492	7·99	0·920	14·94	29
30. Whangarei	9·34	1,990	3·84	1·961	1·961	3·0	2·57	8·39	26·65	519	1·182	16·09	0·348	4·72	1·530	20·81	30
Averages, Borough Councils	9·10	1,344	3·61	1·417(*c*)	1·430	..	2·51	9·07	..	373	0·805(*k*)	..	0·327(*k*)	..	1·132(*k*)	..	
Town Boards.																	
1. Havelock North	21·45	1,575	7·00	1·885	1·885	3·130	3·06	12·28	31·40	225	0·891	14·81	0·976	16·25	1·867	31·06	1
2. Kamo	3·71	371	1·99	3·713	3·713	6·0	1·88	9·11	14·94	187	2·290	9·21	1·350	5·43	3·640	14·64	2
3. Kaponga	19·20	452	4·60	2·014	2·014	6·0	4·35	13·49	23·00	98	1·712	19·56	0·318	3·63	2·030	23·19	3
4. Mangaweka	14·92	576	5·89	1·622	1·622	3·0	2·67	8·15	29·65	98	1·335	24·40	0·186	3·40	1·521	27·80	4
5. Manunui	4·09	633	3·54	7·450	7·450	7·770	1·15	5·42	35·75	179	4·710	22·60	1·880	9·04	6·590	31·64	5
Averages, Town Boards	14·48	685	5·15	2·136(*c*)	2·136	..	2·87	10·85	..	133	1·465(*k*)	..	0·635(*k*)	..	2·100(*k*)	..	
County Councils.															d.		
1. Heathcote	4·33	743	2·35	1·168	1·168	1·1	1·85	8·63	15·01	316	0·930	11·94	0·183	2·35	1·113	14·29	1
2. Kaikoura	16·96	2,137	6·39	9·370	9·370	10·5	2·72	10·00	38·85	334	8·850	36·70	3·530	14·62	12·380	51·32	2
3. Murchison	27·60	930	6·24	3·500	3·500	3·0	4·50	12·69	34·05	149	1·790	17·43	0·822	8·00	2·612	25·43	3
4. Uawa	15·69	2,092	6·13	15·600	15·600	16·50	2·72	10·22	7·31	341	8·040	3·76	8·440	3·95	16·480	7·71	4
5. Waimairi	4·43	430	2·60	0·978	0·978	0·978	1·70	6·78	16·61	165	0·564	9·57	0·293	4·98	0·857	14·55	5
Averages, County Councils	5·56	591	3·01	1·150(*c*)	1·150	..	1·86	7·62	..	197	0·744(*k*)	..	0·306(*k*)	..	1·050(*k*)	..	
Averages, other Local Authorities	10·35	2,010	4·11	1·196(*c*)	1·229	..	2·50	8·20	..	489	0·666(*k*)	..	0·306(*k*)	..	0·972(*k*)	..	

(For notes see page 104.)

Table XIII.—Averages Derived from Tables IX, X, and XI, for Year ended 31st March, 1936—*continued.*

(For Summary of Relevant Totals from above-named Tables see Table B below.)

Supply Authority.	Capital Outlay.			Revenue (Averages).							Working-costs.		Capital Charges.		Total Costs.		No.
	Per Capita.	Per Route-mile of Line.	Per £1 of Revenue. (*a*)	Per Unit sold. (*b*)	Per Unit sold (Retail Supply). (*d*)	Per Unit sold (Retail Domestic Supply).	Per Capita. (*e*)	Per Retail Consumer. (*f*)	Per Kw. of Maximum Demand. (*g*)	Per Route-mile of Line. (*g*) [5]	Per Unit sold. (*h*)	Per Kw. of Maximum Demand.	Per Unit sold. (*h*)	Per Kw. of Maximum Demand.	Per Unit sold. (*h*)	Per Kw. of Maximum Demand.	
Companies.	£	£	£	d.	d.	d.	£	£	£	£	d.	£	d.	£	d.	£	
1. Alderton Utility Co.	18·52	463	5·95	1·038	1·038	1·92	3·12	14·60	12·30	78	0·520	6·16	0·352	4·17	0·872	10·33	1
2. Kanieri Electric, Ltd.	30·20	3,130	6·44	0·676	2·680	3·256	2·42	8·59	11·30	486	0·433	7·23	0·227	3·79	0·660	11·02	2
3. Reefton Electric Light and Power Co., Ltd.	5·33	866	2·03	5·870	5·870	6·0	2·68	9·03	31·00	427	4·660	24·55	..	..	4·660	24·55	3
4. P. Spender (Rawene)	9·58	2,876	6·60	13·540	13·540	14·90	1·52	8·23	33·55	436	11·830	29·30	..	..	11·830	29·30	4
5. Wilson's (N.Z.) Portland Cement, Ltd.	10·10	2,070	6·86	0·275	2·272	3·915	3·53	8·17	6·04	302	0·102	2·24	..	..	0·102	2·24	5
6. Westland Power, Ltd.	17·58	1,233	9·88	1·003	2·350	1·5	1·95	23·56	11·30	125	0·775	8·73	0·415	4·67	1·190	13·40	6
Averages, Companies	27·63	1,712	6·92	0·498(*c*)	2·660	..	3·44	10·37	..	247	0·357(*k*)	..	0·124(*k*)	..	0·481(*k*)	..	
Averages, all Supply Authorities, 1936	22·70	1,480	7·02	1·127(*c*)	1·175	..	2·56	9·82	..	211	0·680(*k*)	..	0·641(*k*)	..	1·321(*k*)	..	
,, 1935	22·60	1,512	7·32	1·17	1·22	..	2·48	9·80	..	206	0·69	..	0·69	..	1·38	..	
,, 1934	21·27	1,443	6·87	1·24	1·26	..	2·43	9·60	..	210	..	..	..	..	..	..	
,, 1933	22·10	1,512	6·94	1·28	1·34	..	2·54	10·50	..	218	..	..	..	..	..	..	
,, 1932	21·68	1,500	7·08	..	..	..	2·56	11·63	..	211	..	..	..	..	..	..	

Notes.—(*a*) Capital outlay divided by revenue from sale of electricity retail plus bulk supply for resale. (*b*) Revenue from retail plus bulk sales divided by units sold, including bulk supply where given. (*c*) Revenue from retail sales divided by units sold retail to customers. (*d*) Revenue from retail sales less revenue from traction and/or mining, &c., loads divided by units sold retail less units supplied for traction and/or mining, &c., loads. (*e*) Gross revenue, excluding rates and revenue from bulk supply where given. (*f*) Revenue from retail sales less revenue from traction and/or mining, &c., loads. (*g*) Revenue from retail plus bulk sales. (*h*) Total units sold, including bulk supply where given. (*k*) Total units sold retail to consumers. [1] Not actively functioning. [2] Distribution system under construction; supply not yet commenced. [3] License delegated to Westland Power, Ltd. [4] No returns received. [5] To nearest £.

Table A.

Traction, Mining, &c.—Units sold and Revenue obtained for Year ended 31st March, 1936.

Supply Authority.	Type of Load.	Units sold.	Revenue.
Public Works Department.		No.	£
Coleridge-Waitaki	Traction—N.Z.R., Christchurch	2,148,000	4,512
	Christchurch Tramways	8,148,470	15,278
Totals	..	10,296,470	19,790
Power Boards.			
Auckland	Traction ..	19,210,555	59,441
Wanganui-Rangitikei	Traction ..	1,035,230	2,624
Totals	..	20,245,785	62,065
Cities and Boroughs.			
Dunedin	Traction ..	4,841,567	11,422
Invercargill	Traction ..	610,931	2,037
New Plymouth	Traction ..	841,323	1,800
Wellington	Traction ..	10,332,309	32,288
Totals	..	16,626,130	47,547
Companies.			
Kanieri Electric, Ltd.	Mining ..	3,678,960	5,748
Westland Power, Ltd.	Mining ..	1,639,764	4,761
Wilson's (N.Z.) Portland Cement, Ltd.	Cement-manufacture	8,729,398	5,634
Totals	..	14,048,122	16,143
Totals for above Supply Authorities	..	61,216,507	145,545

Table B.

Summary of Totals from Tables IX, X, and XI.

	Public Works Department.	Power Boards.	Other Local Authorities.					Companies.	Totals, all Supply Authorities.
			City Councils.	Borough Councils.	Town Boards.	County Councils.	Total.		
	No.	No.	No.	No.	No.	No.	No.	No.	No.
Population	..	905,410	368,191	152,596	4,211	21,570	546,568	9,792	1,461,770
Consumers	395	196,352	110,323	41,034	1,092	5,235	157,684	1,542	355,973
Units sold retail to consumers	51,861,571	439,167,247	196,135,016	63,290,321	1,330,786	8,322,542	269,078,665	15,482,525	775,590,008
Less units consumed by traction, mining loads, &c.	10,296,470	20,245,785	15,784,807	841,323	..	..	16,626,130	14,048,122	61,216,507
Net units sold retail	41,565,101	418,921,462	180,350,209	62,448,998	1,330,786	8,322,542	252,452,535	1,434,403	714,373,501
Route-miles of lines	1,884	17,565	1,491	1,034	89	203	2,817	158	22,424
	£	£	£	£	£	£	£	£	£
Capital outlay	13,095,382	14,156,962	4,087,952	1,389,900	61,008	119,853	5,658,708	270,451	33,181,503
Revenue (retail sales)	85,139	2,184,631	915,262	373,944	11,839	39,874	1,340,919	32,129	3,642,818
Revenue (bulk sales)	944,621	96,855	23,797	11,713	..	34	35,544	6,932	1,083,952
Revenue (retail plus bulk sales)	1,029,760	2,281,486	939,059	385,657	11,839	39,908	1,376,463	39,061	4,726,770
Revenue from retail sales, less revenue from traction, mining loads, &c.	65,349	2,122,566	869,515	372,144	11,839	39,874	1,293,372	15,986	3,497,273
Gross revenue (excluding rates)	1,040,649	2,338,218	956,273	395,307	12,099	40,183	1,403,862	40,595	4,823,324
Gross revenue less revenue from bulk sales	96,028	2,241,363	932,476	383,594	12,099	40,149	1,368,318	33,663	3,739,372
Working-costs	197,968	1,230,852	499,742	212,230	8,131	25,810	745,913	23,037	2,197,770
Capital charges	720,757	1,000,045	242,107	86,347	3,520	10,602	342,576	8,022	2,071,400
Total costs	918,725	2,230,897	741,849	298,577	11,651	36,412	1,088,489	31,059	4,269,170
Rates collected	..	43,188	..	690	326	429	1,445	..	44,633

Table XIV.—Abridged Schedule of Selling-rates for Electrical Energy, 1935–36.

(Note.—In the following table, on account of space limitations, only an outline of the rates is given. Details may be obtained from the Rate-book of the Electric-power Boards and Supply Authorities Association or from individual supply authorities' tariff schedules. T.S. = Time switch; C.O.S. = Change-over switch used with range, motors, &c.)

Supply Authority.	Domestic.	Commercial.
Public Works Department.		
1. Arapuni-Mangahao-Waikaremoana 2. Coleridge-Waitaki ..	Bulk supply only: £2 10s. per kv.a. of maximum demand per quarter for first 200 kv.a.; £2 per kv.a. of maximum demand per quarter for next 4,800 kv.a.; £1 15s. per kv.a. of maximum demand per quarter for next 15,000 kv.a.; £1 6s. 3d. per kv.a. of maximum demand per quarter for all over 20,000 kv.a.	
Electric-power Boards.		
1. Ashburton	8d., 3d., and 2d.; 8d., 3d., and 1¾d. (with range over 3 kw.); water-heating (metered): ⅛d.; flat rates, 600 w., 7s. 6d.; 1,000 w., 12s. 6d. per month on T.S. or C.O.S.	Lighting, 6d.; heating, 2d., 1½d., and 1d.; power, 3d., 2d., and 1½d. Reduced rates for guarantees and for off-peak supply; night rate (9.30 p.m. to 7 a.m.), ¾d.
2. Auckland	4d., 3d., and ¾d.; water-heating: £12 12s. per kw. per annum or *pro rata* according to wattage of element. Alternatively, ⅜d. per unit with thermostat control. Discount, 10 per cent.	Lighting: 4d. and 1½d.; radiators: 4d. (1st May to 31st October); power: 2½d., 1d., and ¾d. Alternative rate, 8s. per kv.a. of M.D. per month plus $\frac{9}{16}$d. per unit; night rate (10 p.m. to 7 a.m.), ½d. (for approved purposes). Discount, 10 per cent.
3. Banks Peninsula	9d. and 3d. (for lighting, ironing, &c.); 9d., 2d., and 1½d. (for lighting, heating, and power); 9d. and 1½d. (with range); water-heating: ¾d.; $\frac{3}{10}$d. (9.30 p.m. to 5.30 a.m.). Both on T.S. Day heating, on C.O.S. with range. Discount, 7½ per cent.	Lighting: 7d.; heating: 2d. and 1½d.; dairy water-heaters: ¼d. (on T.S. or C.O.S.); power: 2d. and 1½d. (milking-motors); 3d., 2d., and 1½d. (general-purpose motors); night rate (9 p.m. to 5 a.m.), ½d. Discount, 7½ per cent.
4. Bay of Plenty	9d., 2d., and 1¼d.; water-heating: 4s. per 100 w. per quarter (on T.S.)	Lighting: 9d. (shops and offices); 9d. and 6d. (hotels, &c.); heating: 4d.; 3d. and 1½d. on T.S., (shops and offices); 2d. and 1¼d. (hotels, &c.); power: 3d., 2½d., and 2d. (general-purpose motors); 5d. and 1½d. (milking-motors).
5. Cambridge	Lighting: 6d.; heating and cooking: 3d., 1½d., and ¾d. (discount, 5 per cent.); water-heating: £4 10s. per annum up to 750 w. (on T.S.); £6 per annum up to 1,000 w. (on T.S.); £12 per annum per kw. (continuous)	Lighting: 6½d., 5½d., and 4½d. (discount, 5 per cent.); dairy water-heaters on C.O.S.: £4 per annum for 600 w.; £6 per annum for 1,000 w.; power: 3d., 1½d., and ¾d.; 3d., 1½d., ¾d., and ½d. (restricted hours); milking-motors, 4d. and 1d. Discount, 5 per cent.
6. Central Hawke's Bay	7d., 3½d., 2d., and 1½d.; water-heating: £6 per annum per 1,000 w. with range or milking-motor; £8 per annum per 1,000 w. without	Lighting: 7d.; heating: 3d., 2d., and 1½d.; 2d. and 1d. (off peak); power: 3d., 2½d., and 2d. (industrial); 2½d. and 2d. (milking-motors).
7. Central Waikato	Lighting: 5d.; heating and cooking: 1½d.; "electric home" rate: 5d., 1½d., and 1d.; water-heating: 16s. per 100 w. per annum on T.S.; 22s. per 100 w. per annum unrestricted. Discount, 5 per cent.	Lighting: 5d.; heating and cooking: 1½d.; power: 2½d. for general-purpose and milking motors up to 2 h.p.; 2½d. and 1½d. (off peak); water-heating: 12s. per 100 w. per annum on C.O.S. with milking motor. Discount, 5 per cent.
8. Dannevirke	Lighting and heating: 7d. and 4d.; cooking: 3d. and 1¼d.; water-heating: (*a*) ½d. per unit (T.S.); (*b*) £1 per 100 w. per annum (T.S.)	Lighting: 6d.; heating: 3d. and 1d.; power: 3d., 2d., and 1¾d.; ¾d. (9 p.m. to 5 a.m.); milking-motors: £1 per h.p. per annum plus 4d., 2½d., and 1d. per unit; water-heating: (*a*) and (*b*) As for domestic; (*c*) 600 w., £4 10s., 1,000 w., £6 per annum on C.O.S.
9. Franklin	Lighting: 5d.; heating, power and cooking: 1¼d. and 1d.; water-heating: 15s. per 100 w. per annum on T.S. or C.O.S.; 20s. per 100 w. per annum continuous. Discount, 10 per cent.	Lighting and water-heating: As for domestic; power: milking and industrial motors, 2½d. and 2d.; general-purpose farm motors, £1 per h.p. per annum plus 4d. per unit. Discount, 10 per cent.
10. Golden Bay	Lighting: 8½d. and 7d. (discount, 5 per cent.); heating: 4¼d., 2¾d., 1½d., and 1d.; cooking: 1½d., 1d., and ¾d. (discount, 5 per cent.); water-heating: £1 per 100 w. per annum; £6 per kw. per annum with range	Lighting, &c.: As for domestic; power: 3¾d., 2¾d., and 1d. Discount, 5 per cent.
11. Grey	Lighting: 6d. and 4d.; cooking and heating: 1d.; water-heating: ½d. per unit (without range); ¼d. per unit (with range)	Lighting: 6d. and 4d.; heating: 1½d.; power: 2d.
12. Hawke's Bay	Country area—7d., 2d., and 1¼d.; water-heating: £1 per 100 w. per annum (T.S.). Hastings—6d., 2d., and 1¼d.; water-heating: £10 per kw. per annum (twenty-four hours)	Country area—Lighting: 7d., 5d., and 4d.; heating: 2d. and 1½d.; cooking: 2d. and 1d.; power: 3d., 1½d., and 1¼d. Hastings—Lighting: 6½d. and 2½d.; heating: 3d.; power: 2½d. and 1¼d.
13. Horowhenua	Lighting and heating: (*a*) 7d. and 3d. (minimum charge, 3s. 6d. per month), (*b*) 7d. and 1⅜d. (minimum charge, 7s. per month), (discount for (*a*) and (*b*), 2d. per unit on units at 7d.), (*c*) with electric range, 10s. per month plus 1d. per unit; water-heating: £12 per kw. per annum (continuous), £9 per kw. per annum on C.O.S.	Lighting: 7d. and 4d. (discount, 2d. per unit on units at 7d.); heating: 3d. (minimum charge, 1s. 9d. per month), or 1⅜d. and 1d. (minimum charge, 6s. per month); power: 3d. and 2d.; 2½d. and 2d. (milking-motors).

TABLE XIV.—ABRIDGED SCHEDULE OF SELLING-RATES FOR ELECTRICAL ENERGY, 1935–36—*continued.*

Supply Authority.	Domestic.	Commercial.
ELECTRIC-POWER BOARDS—*continued.*		
14. Hutt Valley	4½d., 1½d., 1d., and ¾d.; water-heating: 19s. 6d. per 100 w. per annum (twenty-two hours); 16s. 9d. per 100 w. per annum (thermostat); 12s. per 100 w. per annum (thermostat and C.O.S.); 5s. per 100 w. per annum (night rate). Discount, 8⅓ per cent.	Lighting: 5d., 4d., and 3d.; heating: 2½d. 2d., and 1½d.; power: 3d., 2d., 1½d., and 1d.; 1s. per h.p. per month plus 0·65d. per unit (10 p.m. to 7 a.m.); £1 2s. per h.p. per annum plus 2d. and 1d. per unit (milking-motors). Discount, 8⅓ per cent.
15. Malvern	9d. and 3d. (minimum charge, £4 10s. per annum), down to 9d., 2d., 1½d., and 1d. (minimum charge, £24 per annum); 9.30 p.m. to 7.30 a.m., ½d. per unit (T.S.); water-heating: (*a*) ⅓d. (9.30 p.m. to 7.30 a.m., T.S.), (*b*) twenty-four hours' service: general domestic rates, (*c*) ½d. and ⅓d. with range (twenty-four hours)	Power: 3d., 2d., and 1½d. (minimum charge, 15s. per quarter per h.p.); 3d., 2d., and 1d. (minimum charge, £15 per quarter); ½d. (night rate).
16. Manawatu-Oroua	7d. and 3½d. (single meter); lighting: 7d. (separate meter); heating: 1½d. (separate meter); water-heating: 600 w., £5 8s. per annum; 1,000 w., £9 per annum (on T.S., C.O.S., or pilot wire)	Lighting: 7d.; power: milking-motors, 3d., 2½d., and 1¾d., other motors, 3½d., 3d., and 1¾d.
17. Marlborough	8d., 2½d., 2d., and 1½d.; water-heating: 9s. 6d. per 100 w. per annum (8 p.m. to 6.30 a.m. on T.S.)	Lighting: 8d.; heating: 3d. and 1½d. (shops, &c.), 2½d. and 2d. (hotels, &c.); power: 4d., 2½d., and 2d.
18. North Canterbury	6d., 3d., 2d., and 1½d.; 6d., 2d., and 1½d. (27s. 6d. per month guarantee), with range; 6d., 2d., 1½d., and 1d. (35s. per month guarantee), with range; water-heating: ½d. per unit first 600 units per quarter; ¼d. per unit balance, with T.S. and thermostat	Lighting: 6d. and 4d.; heating: 2d., 1⅓d., and 1d.; power: 3d., 2d., and 1½d.; night rate, ½d. (T.S.).
19. Opunake	8d. and 3d.; 8d. and 1½d. (twelve months or more); water-heating: £1 per 100 w. per annum (twenty-four hours); 15s. per 100 w. per annum on C.O.S. Discount, 10 per cent.	Power: Industrial motors, 3d. (200 units), 2d. (excess); milking-motors, 4d. (60 units), 2d. (excess). Discount, 10 per cent.
20. Otago Central	Lighting: £10 per kw. per annum plus 4d., 2d., and 1d. per unit; heating and cooking: £1 per annum per kw. of maximum demand (or 70 per cent. connected load); water-heating: £12 per kw. per annum (continuous); £6 per kw. per annum on C.O.S.	Lighting: 8d.; lighting and heating: 8d., 4d., and 2d.; power: £2 per h.p. per annum plus 4d., 2d., and 1d. per unit.
21. Otago	(*a*) 9d., 4d., and 2d.; (*b*) 9d. and 2½d. (with range over 2½ kw.); with water-heater and range over 3 kw.: (*c*) 9d., 2d., and 1½d. (minimum charge, £4 10s. per quarter); (*d*) 9d., 2d., 1½d., and 1d. (minimum charge, £6 per quarter); water-heating: £10 per kw. per annum with thermostat and C.O.S.	Lighting: 9d. and 3d.; heating: (*a*) 3d.; (*b*) 1½d. (off peak); power: 4d., 2d., and 1d.; 1¼d. (10 p.m. to 7 a.m.).
22. Poverty Bay	Lighting: Borough, 5½d.; country, 6½d.; heating: 3½d.; cooking: 3d. and 1d.; water-heating: £1 per 100 w. per annum (T.S. or C.O.S.)	Lighting: Borough, 5½d. and 4d.; country, 6½d. and 4d.; heating: 3½d.; 1¾d. (April to September on T.S.); water-heating (dairy sheds): 16s. per 100 w. per annum on T.S. or C.O.S. power: 2½d., 2¼d., and 2d.
23. South Canterbury	7d., 3d., and 1d.; water-heating: with range, 13s. 4d.; without range, 16s. 8d. per month for 1 kw.; 6s. 8d. per month for each additional kw. (20 to 22 hours per day)	Lighting: 7d., 5d., and 4d.; heating: 3d.; cooking: 2d. and 1d.; general-purpose motors: 3d., 2d., and 1d.; milking-motors: £3 per h.p. per annum plus 2d. per unit.
24. South Taranaki..	Lighting: 6d. and 4½d.; heating and cooking: 2d. and 1½d.; water-heating: twenty hours, 15s. per 100 w. per annum with range or milking-motor; 20s. per 100 w. per annum without range or milking-motor. For twenty-four hours the rates are 20s. and 25s. respectively. Discount: Unit basis, ½d. per unit; flat rates and minimum charges, 5 per cent.	Lighting: 6d. and 4½d.; industrial motors: 3d. and 2d.; milking-motors: 3d.; dairy-factory motors: 2¼d., 2d., and 1½d. Discount, as for domestic.
25. Southland	Lighting, heating, and power: 7d., 4d., 2½d., and 1½d.; cooking: 1d.; water-heating: ⅝d. on C.O.S. with range or motor	Lighting, heating, cooking, and small power: As for domestic.
26. Springs-Ellesmere	Lighting and heating: 6d. and 2d.; cooking: 1½d. and 1d.; water-heating: £1 per 100 w. per annum (C.O.S. and thermostat); £4 per kw. per annum (9 p.m. to 7.30 a.m.)	Lighting: 6d.; heating: 3d. and 2d.; milking-motors: 3d.; general power: 3d., 2d., and 1½d. (up to 15 h.p.).
27. Taranaki	Lighting: 6½d.; heating: 3¼d. (combination meter), 1½d. (special meter); cooking: 1½d. (special meter); water-heating: £6 per annum for 600 w. (twenty-four hours), 10s. per annum for each additional 50 w.	Lighting and heating: As for domestic; dairy water-heating: £6 per annum for 600 w. on C.O.S., 10s. per annum for each additional 50 w.; power: 3¼d. up to ½ h.p. (combination meter), 3½d. up to ½ h.p. (separate meter), 3½d. (½ to 5 h.p. and all milking-motors). Special rates for large motors.

TABLE XIV.—ABRIDGED SCHEDULES OF SELLING-RATES FOR ELECTRICAL ENERGY, 1935-36—*continued.*

Supply Authority.	Domestic.	Commercial.
ELECTRIC-POWER BOARDS—*continued.*		
28. Tararua	General rate: 8d. and 4d.; heating and cooking: 1½d. and 1d.; water-heating: On T.S., 600 w., 10s. per month; 1,000 w., 15s. 4d. per month; 9 p.m. to 6 a.m., 600 w., 16s. per quarter; 1,000 w., 26s. per quarter	Lighting, &c.: As for domestic; dairy water-heaters on C.O.S. with motor: 600 w., 24s. per quarter; 1,000 w., £2 per quarter.
29. Tauranga	5d., 3d., and 1d.; with range and water-heater: £7 10s. per annum plus ½d. per unit; water-heating: flat rate, 1s. 8d. per 100 w. per month	Lighting: 8d.; heating: 1½d.; motors under 5 h.p.: 3d., 2½d., and 1½d.
30. Te Awamutu	5d. and 3d.; heating and cooking: with range, 1½d.; without range, 2d. and 1½d.; water-heating: on T.S. or C.O.S., with range or milking-motor, 600 w., £3 per annum; 1,000 w., £5 per annum	Lighting: 5d.; power: 3d., 2d., and 1½d.; ¾d. (9 p.m. to 5 a.m.).
31. Teviot..	Lighting: £10 per kw. per annum plus 3d., 1d., and ½d. per unit; heating and cooking: 10s. per kw. per annum plus 3d., 1d., and ½d. per unit; water-heating: £10, continuous, £6, intermittent (C.O.S.) per kw. per annum	Lighting, &c.: As for domestic; motors: £1 13s. per h.p. per annum plus a unit charge for units used over 99 of 1d. (continuous use) and 3d. (intermittent use).
32. Thames Valley	Lighting: 6½d.; heating and cooking: 3d. and 1d.; water-heating: 13s. per 100 w. per annum on T.S.; 24s. per 100 w. per annum continuous. Night rate (9.30 p.m. to 5.30 a.m.): 0·225d. per unit.	Lighting, &c.: As for domestic; industrial: 3d. to 0·6d. (unrestricted), 0·5d. (9.30 p.m. to 5.30 a.m.); milking and farm motors, 3d.
33. Waimea	10d., 3½d., 3d., and 2½d.; water-heating: £10 per kw. per annum (off peak)	Lighting: 10d. and 7d.; heating: 4d., off peak, 2½d.; motors: 4½d., 3½d., and 3d.; 2d. (8 p.m. to 6 a.m.).
34. Wairarapa	Lighting: 5½d.; heating: 2¾d.; cooking: 1¼d. and ¾d.; water-heating: £10 per kw. per annum for twenty-one hours. Reduced rates for shorter periods	Lighting: 5½d. and 4½d.; heating: 1¾d. (9 a.m. to 4 p.m.), ¾d. (10 p.m. to 6 a.m.); power: 2¾d. and 2d. (industrial motors up to 4 h.p.). Special rates for large motors. 2d. (milking-motors).
35. Wairere	9d., 2d., ¾d., and 1d.; water-heating (on T.S. or C.O.S.): 600 w., 11s. per month; 1,000 w., 15s. per month	Lighting, heating, and cooking: 9d., 2d., and 1d.; general power: 4½d.; night rate (7 p.m. to 6 a.m.), ¾d.; milking-motors: 3½d., 2d., and ¾d.
36. Wairoa	9d., 3d., 2d., and 1d.; water-heating (on T.S.): 600 w., 22s. 6d. per quarter; 1,000 w., 32s. 6d. per quarter	General power: 3d., 2d., and 1½d.; milking-motors: ½ to 1 h.p., £8 5s. per annum up to 300 units, 3d. per unit for next 200 units, and 1½d. per unit over 500 units.
37. Waitaki	Lighting and small domestic uses: 6d., 3d., and 1½d. General rate (with range over 3 kw.): Oamaru and suburbs—(*a*) 6d. and 1½d. (minimum, 10s. per month), (*b*) 6d., 1½d., and 1d. (minimum, £1 per month) Country and districts: (*c*) 6d. and 1½d. (minimum, £2 10s. per quarter), (*d*) 6d., 1½d., and 1d. (minimum, £5 per quarter) Water-heating: 1s. per 100 w. per month on C.O.S.; continuous, 2s.; night rate (10 p.m. to 7 a.m.), ⅓d. Discount, 30 per cent.	Lighting: 6d. and 3d. (10 p.m. to 7 a.m., 3d.); heating: 2d.; cooking: 1½d. (10 p.m. to 7 a.m., ¾d.); industrial power: 3d., 2d., 1½d., and 1d. (number of units at primary rates depend on h.p. or kv.a.); milking-motors: £2 per h.p. per annum plus 2d. per unit. Discount, 30 per cent. on general commercial use; 15 per cent. on motor uses
38. Waitemata	Lighting: 5d.; heating, cooking, and power: 3d. and 1¾d.; with range (5 kw. or larger), £5 per annum plus 1d. per unit; water-heating: twenty-hour service, 21s. per 100 w. per annum (minimum charge, £5 5s. per annum); eight-hour night service, 6s. 4d. per 100 w. per annum (minimum charge, £3 16s. per annum). Discount, 25 per cent.	Lighting: 15s. per ampere of maximum demand per quarter plus 2½d. per unit; industrial load: 3d., 2½d., and 1¾d.; milking-motors: 5s. per h.p. per month plus 2d. per unit. Discount, 25 per cent.
39. Waitomo	Lighting: 6d.; heating: 3d. and 1½d.; cooking: 1d.; water-heating: (*a*) 600 w., on C.O.S. with range, £4 16s. per annum; (*b*) on T.S. without range, £6 per annum; (*c*) continuous, £10 per annum. Larger wattages, *pro rata*	Lighting: 6d. (special rate, 3d.); heating: 3d. and 1½d.; industrial power: up to 50 h.p., 2½d. and 1½d. (units at primary rate depend on h.p.); over 50 h.p., special; farm motors, 2½d.
40. Wanganui-Rangitikei	5d., 1½d., and 1d.; water-heating: with range or milking-motor, 15s.; without, 20s. per 100 w. per annum (on pilot control or T.S.); night water-heating (11 p.m. to 7 a.m.), half ordinary rates	Lighting: 5d., 4d., and 3d.; heating: 1d. and ½d. (on pilot control); industrial power: 3d., 2d., 1½d., and 1d.; milking-motors, 1½d. (where condenser installed), 3d. (no condenser); night power (11 p.m. to 7 a.m.), ½d.
CITY COUNCILS.		
1. Christchurch	Lighting: 4d. and ¾d.; heating, cooking, and small power: ¾d.; water-heating: unrestricted, £1 per 100 w. per annum, or ¾d. per unit; C.O.S. or thermostat, ½d. per unit; night rate (10 p.m. to 7 a.m.), ⅓d.	Lighting: 5d. and 1d. (flat rate, 4d.); heating: 2d. (offices, &c.), 1d. (hotels, &c.); water-heating: 30s. per 100 w. per annum; industrial power: 1¼d. and ½d.; milking-motors: 30s. per ½ h.p. per annum plus ¾d. per unit.

TABLE XIV. ABRIDGED SCHEDULE OF SELLING-RATES FOR ELECTRICAL ENERGY, 1935-36—*continued.*

Supply Authority.	Domestic.	Commercial.
CITY COUNCILS—*continued.*		
2. Dunedin	Lighting, heating, and cooking: City area—4½d. and ¾d. Country districts—4½d. and 1½d.; 4½d. and 1d. (minimum charge, £6 per annum), 4½d. and ¾d. (minimum charge, £12 per annum) Water-heating: twenty-four hours, £10 per kv.a. per annum; 10 p.m. to 7.30 a.m., £3 per kv.a. per annum (T.S.); on C.O.S. with range or milking-motor, £6 per kv.a. per annum	Lighting: (*a*) 5d., (*b*) 5d. for units amounting to kv.a. demand × 45, 1d. excess; heating: (*a*) 1½d., (*b*) 1½d. for units amounting to kv.a. demand × 50, ½d. excess; power: 1½d. for first 50 units per month per b.h.p., or per kv.a. of maximum demand, ½d. excess (minimum charge, 2s. 6d. per month per h.p., or per kv.a. of maximum demand, May–September); 10 p.m. to 7.30 a.m., ½d.
3. Invercargill	Lighting: (*a*) Primary units at 3½d., excess at power rates; (*b*) flat rate, 6d.; heating and cooking: 1½d.	Lighting, heating, &c.: As for domestic; power: general rate, 2½d., 1½d., and 1¼d.; rate C. 4: 2¼d. (7 a.m. to 11 p.m.), ¾d. (11 p.m. to 7 a.m.).
4. Nelson	Lighting: 6d.; heating: 4d., 3d., and 2d. Discount: 1d. for lighting, ½d. for heating and power	Lighting: 6d., 4d., and 3d.; small power: 3d. and 2d.; large power: 1¾d. and 1½d. (restricted use); heating and power (11 p.m. to 7 a.m.), 1¾d. Discount, 1d. for lighting, ½d. for heating and power.
5. Palmerston North	Lighting: 6d.; heating and cooking: 1½d. and 1d. (discount, 16⅔ per cent.); water-heating: 1s. 4d. per 100 w. per month (21½ hours), 2s. per 100 w. per month (24 hours)	Lighting: 6d. and 3d.; heating: 1½d. and 1d.; motors: 3d., 2½d., and 1¾d.; night power (10.30 p.m. to 7.30 a.m.): ½d. Discount, 12½ per cent.
6. Wellington	General rate: 4d. and ½d.; water-heating: 8s. 4d. per 500 w. per month (thermostat), 6d. per 100 w. per month (10.30 p.m. to 7.30 a.m.)	Lighting: (*a*) 4½d. to 2½d. (discount, 15 per cent.); (*b*) 5d. per unit per kv.a. of maximum demand × 45, 1d. excess; heating: 2d. (discount, 10 per cent.); power: (*a*) 2½d., 1¾d., 1½d., and 1¼d. (discount, ½d. per unit); (*b*) 6s. per month per kv.a. of maximum demand up to 50 kv.a.; 5s. per month per kv.a. of maximum demand additional plus ½d. per unit (discount, 20 per cent. on units).
BOROUGH COUNCILS.		
1. Bluff	Lighting: 6d. and 4d.; heating: 2d.	Lighting and heating: As for domestic; power: 3d. and 1⅞d.
2. Hamilton	General rate: 5d., 1½d., and 1d.; water-heating: 19s. per 100 w. per annum on T.S. (off peak), 24s. per 100 w. per annum (continuous), 8s. per 100 w. per annum (10 p.m. to 8 a.m.)	Lighting: 5d., 4d., and 3d.; power: 2d., 1½d., and 1d.
3. Inglewood	Lighting: 6d.; heating: 2d.; domestic rate: 1¼d.	Lighting: 6d.; heating: 2d.; power: 2d. and 1¼d.
4. Kaiapoi	Lighting: 4d. (April to September), 6d. (October to March); cooking, &c.: 2s. 6d. first kw., 1s. extra kw. of connected load plus 1½d. and 1d. per unit; heating: 600 w., 2d. (minimum charge, 5s. per month), 1,000 w., 2d. (minimum charge, 10s. per month)	Lighting and heating: As for domestic; motors: 2s. 6d. per month per h.p. plus 2d. and 1d. per unit; 10.30 p.m. to 6.30 a.m., ½d.
5. Lyttelton	Lighting: 4½d. (net); heating: 1d. (net)	Lighting: 4½d. (net); heating: 1d. (net); power: 3d., 2d., 1½d., and 1d.
6. Napier	General rate: 6½d., 1¾d., and 1d. (discount, 10 per cent.); water-heating: 1s. 10d. per 100 w. per month (restricted), 3s. per 100 w. per month (unrestricted); with range over 2 kw., 1s. 8d. and 2s. 8d. respectively	Lighting: 6½d. for M.D. × 30 units per month, balance 2¼d. (discount, 10 per cent.). (M.D. = installed wattage). Heating and small power: 3¼d., 2d., and 1½d. Motors (unrestricted): (*a*) 3¼d., 2d., and 1¼d. (discount, 10 per cent.); (*b*) 2½d. per unit per kv.a. for first 500 units per month; balance, 1¼d. (discount, 10 per cent.).
7. New Plymouth	Lighting: 5d. (minimum charge, 1s. 6d. per month); heating: 2d. and 1d. (minimum charge, 1s. 6d. per month); cooking and heating: 1d. (minimum charge, 7s. 6d. per month); water-heating: £1 per 100 w. per annum (twenty-four hours)	Lighting: 6d., 5d., and 4d.; power: 2d. per unit per h.p. for first 50 units, 1d. for excess; dairy factories: 1¼d., with annual minimum.
8. Ohakune	General rate (one meter): Graduated tariffs from 10d. and 3½d. to 7d., 1½d., and 1d. (discount, 20 per cent.); general rate separate meters)—lighting: 10d. (less 20 per cent.), and 9d. (less 33⅓ per cent.); heating: 4d. (less 25 per cent.), 2d., and 1½d.; water-heating: 600 w., £4 per annum (twenty hours)	General rate: Graduated from 10d. and 3¾d. to 8d., 2d., and 1d. (discount, 20 per cent.); shops, offices, &c. (separate meters)—lighting: 10d. (less 20 per cent.), and 9d. (less 33⅓ per cent.); heating: 4d. (less 25 per cent.), 3d., and 1½d. (both less 33⅓ per cent.); motors up to 10 h.p., 4d. (less 25 per cent.), 3d. and 1½d. (both less 33⅓ per cent.).
9. Patea	Lighting: 7d. and 6d. (minimum charge, 3s. per month), (net); heating and cooking: 4d., 1½d., and 1d. (net); water-heating: 15s. per 100 w. per annum	Lighting, &c.: As for domestic; power: 3d., 2½d., 2d., and 1d. (net).
10. Picton	General rate: 8d., 4d., 3d., and 2d.; 8d. and 2d. (with range)	General rate: 8d., 6d., 4d., 3d., and 2d.; power: 4d.

TABLE XIV.—ABRIDGED SCHEDUDE OF SELLING-RATES FOR ELECTRICAL ENERGY, 1935–36—*continued.*

Supply Authority.	Domestic.	Commercial.
BOROUGH COUNCILS—*continued.*		
11. Queenstown	Lighting rate: 7d. to 2d.	Lighting rate: 7d. to 2d.; power: 4d., 3d., and 2d.
12. Raetihi	Lighting: 8d., 5d., and 3d.; heating: 2d. and 1d.; water-heating: per month, 600 w., 5s.; 750 w., 6s. 3d.; 1,000 w., 8s. 4d.	Lighting, &c.: As for domestic; power: 3d., 2½d., 2d., and 1½d.
13. Rangiora	General rate: 6d., 3d., 1½d., 1d., and ¾d. (discount, 7½ per cent.); water-heating: 24s. per 100 w. per annum; ½d. on C.O.S. with range	Lighting: 6d., 5d., 4d., and 3d. (discount, 7½ per cent.); radiators: 2½d. and 1½d. (discount, 7½ per cent.); power: (*a*) 3d. and 1d., (*b*) ½d. (9.30 p.m. to 7.30 a.m.).
14. Riccarton	Lighting: (*a*) 4d., (*b*) 6d. per unit per kw. of maximum demand × 40; ⅞d. excess; heating and cooking: ⅞d.; water-heating: twenty hours, 16s. 8d. per 100 w. per annum. Discount, 10 per cent.	Lighting, &c.: As for domestic; power: 1½d. Discount, 10 per cent.
15. Rotorua (Tourist Department) ..	Lighting: 6½d., 6d., 5½d., and 5d.; lighting, heating, and cooking: 6½d., 3d., 1½d., and 1d.; water-heating: ½d. (off peak)	Lighting: 6½d., 6d., 5½d., and 5d.; heating and power: 3d., 2d., and 1d.; water-heating: £5 per kw. per annum on C.O.S. with milking-motor.
16. Stratford	General rate: 8d. and 2d.; heating and cooking: 2d. and 1d.; water-heating: 1s. per 100 w. per month (twenty hours), 2s. per 100 w. per month (twenty-four hours), 6d. per 100 w. per month (night)	Lighting: 8d. and 3d.; heating: 3d., 2d., and 1d.; power: up to 10 h.p., 4d. per unit for first 20 units per h.p. per month, 1d. excess.
17. Sumner	Lighting: 4d.; heating: 1d.; water-heating: 10s. per 100 w. per annum (10.30 p.m. to 6.30 a.m.), £1 per 100 w. per annum (11.30 p.m. to 3.30 p.m.), £1 10s. per 100 w. per annum (continuous)	Lighting, &c.: As for domestic; power: 1d.
18. Taihape	Lighting: 7·4d.; heating and cooking: 1½d.; water-heating: £2 per kw. per annum	Lighting, &c.: As for domestic; power: 2d. 1d., and ½d.
19. Taumarunui	Lighting: 8d.; heating: 4d. and 2d.; water-heating: on T.S. with 3 kw. range, £6 per annum for 500 w.; £1 each extra 100 w.	Lighting: 8d.; heating: 3d. and 2d.; power: 3½d., 2½d., 2d., 1¾d., 1½d. (discount, ½d. per unit).
20. Tauranga	Lighting: 5d.; heating: 1d.; water-heating: 2s. per 100 w. per month	Lighting: 5d.; heating: (*a*) 1d., (*b*) ⅛d. per kw. installed plus ¾d. per unit; power: 2d. and 1d.
21. Te Aroha	Lighting: 6d., 5½d., and 5d. (net); heating, cooking, and power: 2½d., 2d., and 1d. (net); water-heating: with range, 1s. 1d. per 100 w. per month; without range, 1s. 3d. per 100 w. per month on T.S. Discount, 10 per cent.	Lighting: 6d., 5½d., and 5d. (net); heating: 3d., 2d., 1d., and ½d. (net); motive-power: 3d., 2d., 1½d., and 1d. (discount, 10 per cent.); night rate, ½d.
22. Te Puke	Lighting: 7d. (net); heating: 2d. and 1d.; water-heating: 9s. 4d. per month for 500 w. (T.S.); 13s. 8d. per month for 500 w. (twenty-four hours)	Lighting: 7d. (net); heating and power: 2½d. and 1¼d.
23. Thames	Lighting: 6d., 4d., 3d., and 1½d.; heating and cooking: 3d., 2d., and 1½d.; water-heating: £7 4s. per 500 w. per annum or *pro rata*	Lighting: 8d.; power: 3d. to ½d.
24. Timaru	Lighting and heating: 5d. and 1d.; water-heating: 0·3d. (sixteen hours)	Lighting and heating: 4d., 2d., and ½d.; power: 2d. per unit per h.p. per month × 50; excess, ½d.
25. Wairoa	Lighting, heating, and cooking: 5d., 2½d., 1d., and ½d.; water-heating: 600 w., 11s. 6d. per month; 1,000 w., 18s. 2d. per month	Lighting: 5d.; alternative rate, 5d. per unit for first 3 units per 100 w.; excess, 1¼d.
26. Waitara	Lighting: 7d.; heating: 3d., 2d., and 1d...	Power: 3d. and 1d.
27. Westport	Lighting: 6d., 3d., and 1d.; water-heating: 1s. per 100 w. per month (twenty-four hours)	Lighting: 6d. and 5d.; heating: 3d. and 1d.; power: 3d. for first 27 units per h.p.; next 200 at 2½d.; excess, 2d.
28. Whakatane	Lighting and heating: 8d. and 2d.; cooking: 1½d.; water-heating: £1 per 100 w. per annum	Lighting, &c.: As for domestic; power: 3½d., 2½d., and 1½d.
29. Whangarei	Lighting: 4½d. and 4d.; domestic power: 1½d.; water-heating: £1 per 100 w. per annum (T.S.)	Lighting: 4½d. and 4d.; power: 3d., 2½d., 2d., and 1½d.
TOWN BOARDS.		
1. Havelock North	General rate: 7d., 2d., and 1½d.	Lighting: 7d., 5d., and 4d.; heating and cooking: 2d. and 1½d.
2. Kamo	Lighting: 7½d. (net)	Power: 4d. Discount, 20 per cent.
3. Kaponga	Lighting: 8d., 4d., and 2d.; heating: 2d. and 1d.; cooking: 1½d.; water-heating: £1 per 100 w. per annum	Lighting, &c.: As for domestic; power: 4d. and 2d.; milking-motors: 3½d. and 2d.
4. Mangaweka	Lighting: 7d.; heating: 2½d. and 1½d.; cooking: 1½d. and 1d.; water-heating (twenty hours): 10s. per annum per 50 w. (T.S.), 7s. 6d. per annum per 50 w. (with range)	Lighting, &c.: As for domestic; power: 4d.
5. Manunui	General rate: 9d. and 4½d.	Lighting: 9d.; heating: 4½d.

TABLE XIV.—ABRIDGED SCHEDULE OF SELLING-RATES FOR ELECTRICAL ENERGY, 1935-36—*continued.*

Supply Authority.	Domestic.	Commercial.
COUNTY COUNCILS.		
1. Heathcote	Lighting: 5d. (Cashmere area, 4d.); heating: 1d. (Cashmere area, ⅞d.); water-heating: £8 per kw. per annum (eighteen hours)	Lighting, &c.: As for domestic; power: 3 h.p. or less, 2d. and 1d.; over 3 h.p., 3d., 2d., and 1d.
2. Kaikoura	Lighting: 10½d.	Power: 4d.
3. Murchison	Lighting: 7s. per month for each twelve lighting and two heating points plus 4d. per unit; heating: 3d.; cooking: 2d.; water-heating: (*a*) 15s. per 100 w. per annum on T.S. or C.O.S. with range or motor; (*b*) 20s. per 100 w. per annum continuous	Lighting, &c.: As for domestic; power: £3 per h.p. per annum plus 3d. and 2d. per unit; milking-motors: £6 per h.p. per annum plus 2d. per unit.
4. Uawa	Lighting: 17d.; heating: 11d. ..	Power: 11d.
5. Waimairi	Lighting: 4d. and 1d.; heating and cooking: 1d. (all units), (discount, 1d. per 1s.); water-heating: 10s. per month per 100 w. (nineteen hours); 3s. 6d. per month per 100 w. (10 p.m. to 7 a.m.)	Lighting, &c.: As for domestic; power up to 10 h.p.: 2d. and 1d., ½d. (night rate); milking-motors: £5 per h.p. per annum plus 1d. per unit.
COMPANIES.		
1. Alderton Utility Co.	General rate: 6d., 4d., 2d., and 1d.; water-heating: 20s. per 100 w. per annum (T.S.)	Power: £5 per h.p. per annum.
2. Kanieri Electric, Ltd.	Lighting: First 200, 6d. (net); excess, 4d. (net); heating, &c.: 1d. (net); water-heating: ½d. net (twenty-four hours, thermostat). ⅝d. net (T.S. or C.O.S.)	Lighting, &c.: As for domestic; power: Class PA, 3d. to 0·4d.; Class PB (over 6,000 units per month), £15 per month plus 0·4d. per unit.
3. Reefton Electric Light and Power Co., Ltd.	Lighting: 9d.	Power: 4d. and 1½d.
4. P. Spender (Rawene)	Lighting: 15d.	Power: 9d.
5. Wilson's (N.Z.) Portland Cement, Ltd.	Lighting: 5½d. up to 150 units per quarter, 5d. for excess; domestic power: 1½d.; water-heating: ½d. (C.O.S.). Discount, 3 per cent.	Lighting: As for domestic; power: (*a*) 3d. up to 300 units per quarter, 2½d. for excess (discount, 3 per cent.); (*b*) 1¾d. and 1½d. (discount, 3 per cent.); (*c*) £1 10s. per kv.a. of maximum demand per quarter plus ¼d. per unit (discount, 10 per cent.).
6. Westland Power, Ltd.	Lighting: 1s., reducible to 9d. if water-heater, range, or 2 h.p. motor installed; heating only: 3d.; with range, 2½d.; cooking: 2½d.; water-heating: meter rate, 1½d.; flat rate, £1 6s. 8d. per 100 w. per annum (discount, 25 per cent.)	Lighting, &c.: As for domestic; power: up to 15 h.p., 6s. per h.p. per month plus 4d. and 2d. per unit; milking-motors: £10 per h.p. per annum if water-heater also installed (discount, 25 per cent.).

Table XV.—Return of Electric Ranges, Water-heaters, and Milking-machines connected to Electric-supply Systems as at 31st March, 1936.

Supply Authority.	Number of Consumers.			Ranges.					Water-heaters.			Milking-machines.		
	Domestic.	Commercial.	Total.	Under 5 Kilowatts.	5 Kilowatts and over.	Total Number.	Total Kw.	Percentage of Number of Domestic Consumers.	Number.	Total Kilowatts.	Percentage of Total Number of Consumers.	Number.	Horse-power.	Not yet electrified.
Public Works Department.	No.	No.	No.	No.	No.	No.		Per Cent.			Per Cent.			No.
1. Arapuni-Mangahao-Waikaremoana ..	290	11	301	13	158	171	1,225	59·00	162	194	53·80	..	..	..
2. Coleridge-Waitaki	62	32	94	30	54	84	498	..	117	146	..	2	6	..
Totals, Public Works Department..	352	43	395	43	212	255	1,723	72·40	279	340	70·65	2	6	..
Electric-power Boards.														
1. Ashburton	3,486	497	3,983	145	804	949	6,439	27·22	518	1,009	13·00	85	119	19
2. Auckland	43,608	10,323	53,931	..	6,461	6,461	45,227	14·82	12,404	6,822	23·00	306	612	..
3. Banks Peninsula	948	64	1,012	68	155	223	1,310	23·52	205	302	20·26	198	147	..
4. Bay of Plenty	1,429	224	1,653	57	497	554	3,340	38·80	1,086	790	65·70	604	887	33
5. Buller (1)	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6. Cambridge	1,395	162	1,557	16	180	196	1,128	14·05	543	413	34·85	374	498	9
7. Central Hawke's Bay	1,342	354	1,696	7	226	233	1,521	17·37	281	281	16·57	99	182	..
8. Central Waikato	4,739	520	5,259	86	353	439	2,526	9·26	1,472	911	28·00	1,425	2,415	350
9. Dannevirke	2,278	482	2,760	6	223	229	1,524	10·05	541	381	19·60	405	542	..
10. Franklin	3,544	392	3,936	210	650	860	4,274	24·26	1,728	1,047	43·90	1,398	1,785	..
11. Golden Bay	325	71	396	15	26	41	194	12·62	55	42	13·90	83	84	10
12. Grey	2,945	510	3,455	..	317	317	2,097	10·76	205	215	5·94	12	14	..
13. Hawke's Bay	6,020	765	6,785	70	719	789	6,706	13·10	826	534	12·17	256	378	..
14. Horowhenua	3,438	1,112	4,550	8	738	746	4,651	21·70	1,164	731	25·60	998	1,001	..
15. Hutt Valley	11,535	716	12,251	123	2,068	2,191	11,743	19·00	1,731	1,924	14·13	74	115	..
16. Lake Wakatipu (1)	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17. Malvern	600	80	680	16	133	149	943	24·84	69	117	10·15	6	10	..
18. Manawatu-Oroua	4,933	143	5,076	..	894	894	5,042	18·12	1,684	1,022	33·20	1,180	1,931	..
19. Marlborough	2,448	440	2,888	157	364	521	2,782	21·29	308	222	10·66	96	161	..
20. North Auckland (2)	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21. North Canterbury	1,988	207	2,195	94	242	336	1,962	16·90	204	336	9·30	84	127	..
22. Opunake	875	125	1,000	..	94	94	475	10·74	132	84	13·20	275	444	..
23. Otago Central	767	220	987	6	135	141	812	18·39	152	160	15·40	79	59	..
24. Otago	4,142	32	4,174	17	350	367	2,189	8·86	322	318	7·72	112	190	..
25. Poverty Bay	4,166	1,025	5,191	..	1,115	1,115	7,190	26·77	763	517	14·70	149	149	..
26. Reefton (1)	..	..	..	..	..	..	..	..	..	..	..	..	..	..
27. South Canterbury	3,696	572	4,268	75	613	688	4,393	18·61	474	721	11·10	166	232	20
28. South Taranaki	..	..	3,265	21	254	275	1,651	..	503	428	15·41	525	783	124
29. Southland	8,821	1,377	10,198	16	1,344	1,360	9,441	15·42	380	456	3·73	1,060	2,006	..
30. Springs-Ellesmere	2,329	245	2,574	46	235	281	1,709	12·07	145	163	5·63	133	222	..
31. Taranaki	1,235	1,327	2,562	8	340	348	2,457	28·18	920	556	35·90	987	1,792	..
32. Tararua	1,530	155	1,685	44	190	234	1,481	15·29	415	266	24·60	376	510	..
33. Tauranga	1,314	106	1,420	47	265	312	1,836	23·74	687	436	48·40	532	854	57
34. Te Awamutu	1,642	337	1,979	29	240	269	1,618	16·38	620	440	31·30	647	1,013	30
35. Teviot	345	71	416	12	143	155	938	44·92	118	99	28·36	..	..	..
36. Thames Valley	7,074	822	7,896	56	996	1,052	7,130	14·87	2,857	1,954	36·20	2,628	4,671	..
37. Waimea	..	..	1,859	20	28	48	180	..	26	13	1·40	12	10	..
38. Wairarapa	4,256	881	5,137	55	466	521	3,586	12·24	805	811	15·67	470	799	28
39. Wairere	294	57	351	4	101	105	665	35·70	170	95	48·40	93	140	..
40. Wairoa	324	70	394	31	83	114	608	35·20	130	85	33·00	139	119	2

(For notes, see page 113.)

Table XV.—Return of Electric Ranges, Water-heaters, and Milking-machines connected to Electric-supply Systems as at 31st March, 1936—*continued.*

Supply Authority.	Number of Consumers.			Ranges.					Water-heaters.			Milking-machines.		
	Domestic.	Commercial.	Total.	Under 5 Kilowatts.	5 Kilowatts and over.	Total Number.	Total Kw.	Percentage of Number of Domestic Consumers.	Number.	Total Kilowatts.	Percentage of Total Number of Consumers.	Number.	Horse-power.	Not yet electrified.
Electric-power Boards—*continued.*	No.	No.	No.	No.	No.	No.		Per Cent.			Per Cent.			No.
41. Waitaki	3,217	709	3,926	83	638	721	4,768	22·41	699	888	17·80	36	53	..
42. Waitemata	..	..	11,106	58	2,032	2,090	12,623	..	2,073	1,380	18·67	471	464	..
43. Waitomo	1,052	349	1,401	36	263	299	1,908	28·42	393	251	28·05	207	315	..
44. Wanganui-Rangitikei	8,395	2,105	10,500	..	1,131	1,131	7,662	13·47	1,560	1,061	14·85	697	958	..
45. Westland [3]	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Totals, Power Boards	..	..	196,352	1,742	26,106	27,848	178,729	..	39,368	28,291	20·05	17,477	26,791	682
Other Local Authorities.														
City Councils.														
1. Christchurch	24,994	5,216	30,210	623	5,885	6,508	41,812	26·05	5,839	5,902	19·33	18	33	..
2. Dunedin	21,001	6,635	27,636	167	1,408	1,575	9,118	7·50	2,459	2,628	8·90	112	200	..
3. Invercargill	..	..	5,911	11	95	106	619	..	1	1	..	..	..	..
4. Nelson	..	..	3,075	..	..	..	..	..	2	3	..	..	..	..
5. Palmerston North	4,891	1,145	6,036	87	594	681	4,034	13·92	1,444	914	23·90	3	6	..
6. Wellington	26,306	11,149	37,455	220	1,682	1,902	12,041	7·23	3,915	4,428	8·53	..	..	..
Totals, City Councils	..	..	110,323	1,108	9,664	10,772	67,624	..	12,940	13,876	11·73	133	239	..
Borough Councils.														
1. Bluff	422	87	509	5	3	8	25	1·90	1	2	0·20	..	..	..
2. Hamilton	3,393	1,251	4,644	12	133	145	887	4·27	284	206	6·12	..	..	..
3. Inglewood	367	60	427	3	29	32	205	8·72	26	23	6·09	2	3	..
4. Kaiapoi	426	69	495	48	25	73	328	17·13	7	7	1·41	3	1	..
5. Lyttelton	815	73	888	7	75	82	521	9·23	42	46	4·37	1	3	..
6. Napier	3,606	1,203	4,809	31	184	215	1,405	5·96	665	413	13·83	..	..	..
7. New Plymouth	5,504	989	6,493	198	920	1,118	5,705	20·30	1,184	715	18·23	420	770	..
8. Ohakune	365	104	469	7	11	18	85	4·93	19	15	4·05	6	6	3
9. Patea	..	..	404	22	26	48	213	..	31	20	7·67	17	17	2
10. Picton	320	70	390	1	1	2	11	0·62	..	..	..	..	..	..
11. Queenstown	..	..	267	2	6	8	46	..	..	..	..	..	..	..
12. Raetihi	330	88	418	2	14	16	97	4·85	33	25	7·90	26	37	..
13. Rangiora	592	90	682	3	50	53	344	8·95	44	57	6·45	..	..	..
14. Riccarton	1,394	128	1,522	43	355	398	2,491	28·55	409	363	26·88	..	..	..
15. Ross [4]	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16. Rotorua (Tourist Department)	1,580	580	2,160	96	149	245	1,213	15·50	298	264	13·80	79	118	..
17. Stratford	854	248	1,102	8	183	191	959	22·37	179	163	16·25	3	4	..
18. Sumner	..	..	1,068	46	117	163	973	..	104	88	9·74	1	3	..
19. Taihape	424	153	577	1	10	11	58	2·60	17	17	2·95	1	5	..
20. Taumarunui	680	342	1,022	5	31	36	206	5·30	35	27	3·42	26	23	..
21. Tauranga	739	309	1,048	95	351	446	2,676[5]	60·40	490	196	46·75	..	..	..
22. Te Aroha	513	227	740	4	54	58	399	11·30	74	49	10·00	7	15	..
23. Te Puke	205	112	317	10	28	38	212	18·54	50	31	15·77	7	10	..
24. Thames	910	259	1,169	4	19	23	133	2·53	48	29	4·10	..	..	..
25. Timaru	3,568	964	4,532	..	503	503	3,263	14·10	412	413	9·09	..	..	..
26. Wairoa	499	196	695	7	153	160	1,095	32·07	183	102	26·33	..	..	..

(For notes, see page 113.)

Table XV.—Return of Electric Ranges, Water-heaters, and Milking-machines connected to Electric-supply Systems as at 31st March, 1936—*continued.*

Supply Authority.	Number of Consumers.			Ranges.					Water-heaters.			Milking-machines.		
	Domestic.	Commercial.	Total.	Under 5 Kilowatts.	5 Kilowatts and over.	Total Number.	Total Kw.	Percentage of Number of Domestic Consumers.	Number.	Total Kilowatts.	Percentage of Total Number of Consumers.	Number.	Horse-power.	Not yet electrified.
	No.	No.	No.	No.	No.	No.		Per Cent.			Per Cent.			No.
27. Waitara	434	91	525	6	34	40	245	9·22	33	25	6·29	1	2	..
28. Westport	708	232	940	1	13	14	94	1·98	27	22	2·87	1	2	..
29. Whakatane	376	132	508	12	89	101	651	26·87	112	70	22·05	8	4	..
30. Whangarei	..	..	2,214	34	174	208	1,265	..	138	82	6·23	13	24	..
Totals, Borough Councils	..	..	41,034	713	3,740	4,453	25,805	..	4,945	3,470	12·03	622	1,047	5
Town Boards.														
1. Havelock North	284	28	312	58	4	62	246	21·83	21	14	6·73	..	..	..
2. Kamo	116	7	123	..	..	..	..	..	..	..	..	1	2	..
3. Kaponga	317	55	372	..	15	15	84	4·73	45	29	12·10	112	211	26
4. Mangaweka	90	30	120	1	16	17	93	18·89	16	7	13·33	11	9	..
5. Manunui	145	20	165	..	..	..	..	..	..	..	..	2	1	..
Totals, Town Boards	952	140	1,092	59	35	94	423	9·88	82	50	7·51	126	223	26
County Councils.														
1. Heathcote	1,276	3	1,279	97	345	442	2,652(5)	34·62	327	304	25·57	4	6	..
2. Kaikoura	120	47	167	..	..	..	..	..	..	..	..	..	..	..
3. Murchison	167	21	188	7	4	11	38	6·59	11	7	5·58	20	27	3
4. Uawa	86	14	100	..	..	..	..	..	..	..	..	..	..	..
5. Waimairi	3,311	190	3,501	55	784	839	4,849	25·35	806	758	23·02	22	27	..
Totals, County Councils	4,960	275	5,235	159	1,133	1,292	7,539	26·04	1,144	1,069	21·86	46	60	3
Totals, other Local Authorities	..	..	157,684	2,039	14,572	16,611	101,391	..	19,111	18,465	12·11	927	1,569	34
Companies.														
1. Alderton Utility Co.	56	8	64	10	19	29	147	51·80	30	17	46·90	7	4	..
2. Kanieri Electric, Ltd.	499	223	722	14	55	69	400	13·83	33	36	4·57	..	..	..
3. Reefton Electric Light and Power Co., Ltd.	291	87	378	..	..	..	..	..	2	3	0·53	1	2	..
4. P. Spender (Rawene)	32	21	53	..	..	..	..	..	..	..	..	..	..	..
5. Wilson's (N.Z.) Portland Cement, Ltd.	133	39	172	4	1	5	16	3·76	6	4	3·49	24	50	..
6. Westland Power, Ltd.	125	28	153	2	18	20	109	16·00	35	45	22·90	20	40	150
Totals, Companies	1,136	406	1,542	30	93	123	672	10·82	106	105	6·88	52	96	150
Totals, all Supply Authorities, 1936	..	..	355,973	3,854	40,983	44,837	282,515	..	58,864	47,201	16·53	18,458	28,462	866
,, 1935	..	..	342,334	3,889	35,841	39,730	247,607	..	53,635	42,860	15·66	17,200	27,458	1,003
,, 1934	..	..	334,593	3,378	32,713	36,091	225,240	..	50,272	39,559	15·02	16,992	26,428	1,344(6)
,, 1933	..	..	322,997	2,198	31,525	33,723	..	..	47,772	38,832	14·80	15,913	25,953	1,330(6)
,, 1932	..	..	309,360	2,054	29,919	31,973	..	..	45,796	37,444	14·80	14,163	25,220	1,046

(1) Not actively functioning. (2) Distribution system under construction; supply not yet commenced. (3) License delegated to Westland Power, Ltd. (4) No returns received. (5) Estimated figures. (6) Increase accounted for by improved collection of statistic.

TABLE XVI.—SAMOAN ADMINISTRATION (APIA).—STATISTICS FOR YEAR ENDING 31ST MARCH, 1936.

Installed in December, 1928.

Statistical.	1935.	1936.	Financial.	1935.	1936.
				£	£
Installed capacity (hydro) ..	80 kw.	80 kw.	Capital outlay	21,563	23,325
Installed capacity (Diesel)* ..	..	45 kw.	Revenue from sale of electricity ..	3,548	3,755
Static head	192 ft.	192 ft.	Revenue, miscellaneous ..	330	317
Generating voltage	2,200 volts	2,200 volts	Working-expenses	1,053	1,075
Supply voltage	220/110 volts	220/110 volts	Capital charges	1,228	1,233
Number of consumers (domestic)	214	256	Total annual costs	2,281	2,308
Number of consumers (commercial)	74	82	Profit	1,597	1,764
Units generated (hydro) ..	200,911	208,429	Accumulated Depreciation Reserve	7,895	9,128
Units generated (Diesel)* ..	..	..		d.	d.
Units sold	164,912	165,031	Average revenue per unit sold ..	5·20	5·45
Units non-productive	17·9 per cent.	20·8 per cent.	Average working-cost per unit sold	1·53	1·57
Maximum load	70 kw.	65 kw.	Average total cost per unit sold	3·30	3·36
Connected load	234 kw.	238 kw.		£	£
Average load factor	32·9 per cent.	36·4 per cent.	Capital outlay per £1 of revenue	6·35	5·73
Demand factor	29·8 per cent.	27·3 per cent.		Per Cent.	PerCent
Route-miles of reticulation—			Ratio working-expenses to gross revenue	29·75	26·40
Overhead	$10\frac{1}{4}$	$10\frac{1}{2}$			
Underground	$6\frac{3}{4}$	$6\frac{3}{4}$	Ratio capital charges to capital outlay	5·68	5·29
			Ratio net profit to capital outlay	7·38	7·57

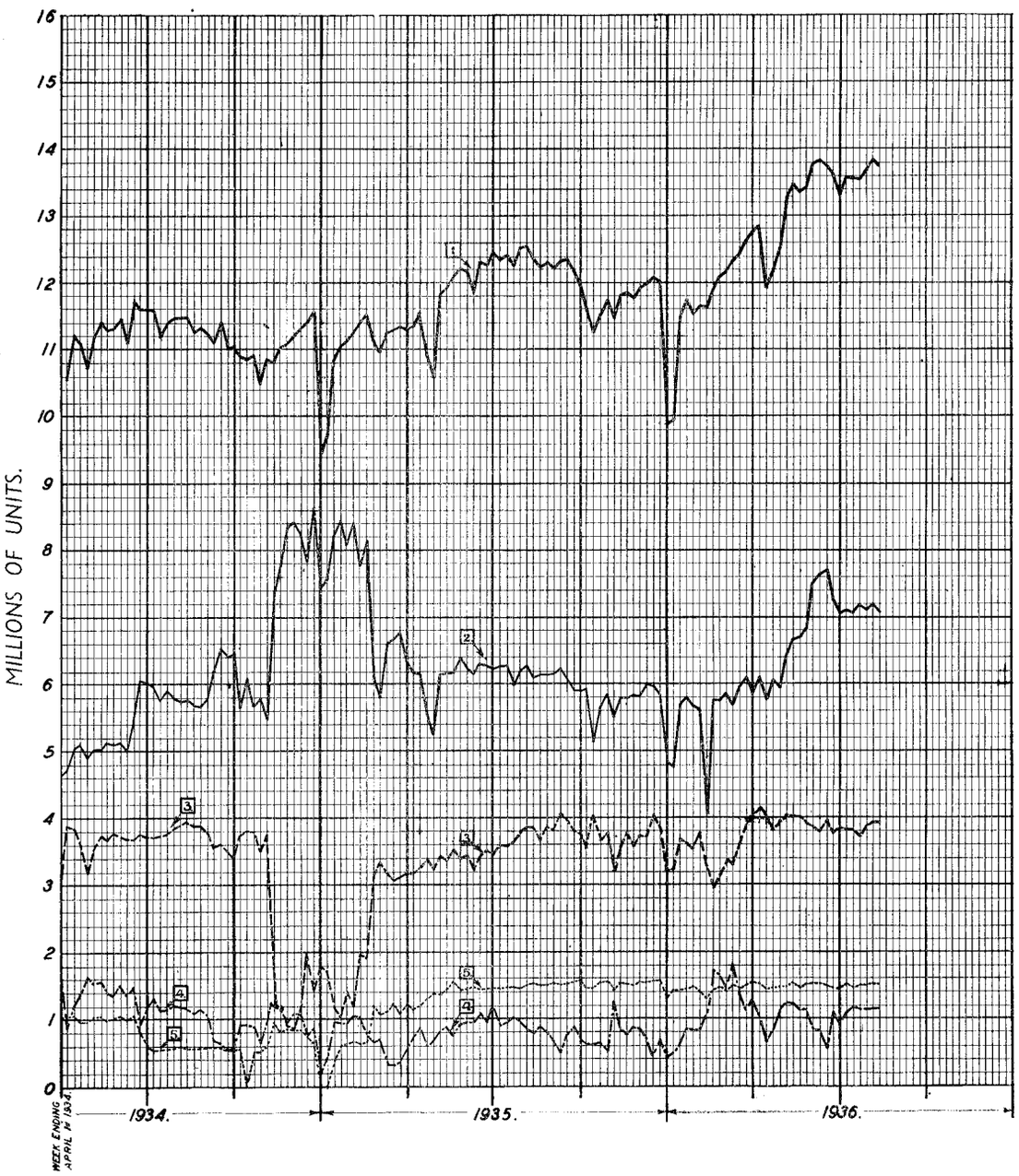
* Not yet in operation.

NORTH ISLAND POWER SYSTEM.

UNITS GENERATED PER WEEK.

CURVES:

1. *NORTH ISLAND SYSTEM.*
2. *ARAPUNI POWER STATION.*
3. *WAIKAREMOANA POWER STATION.*
4. *MANGAHAO POWER STATION.*
5. *HORAHORA POWER STATION.*



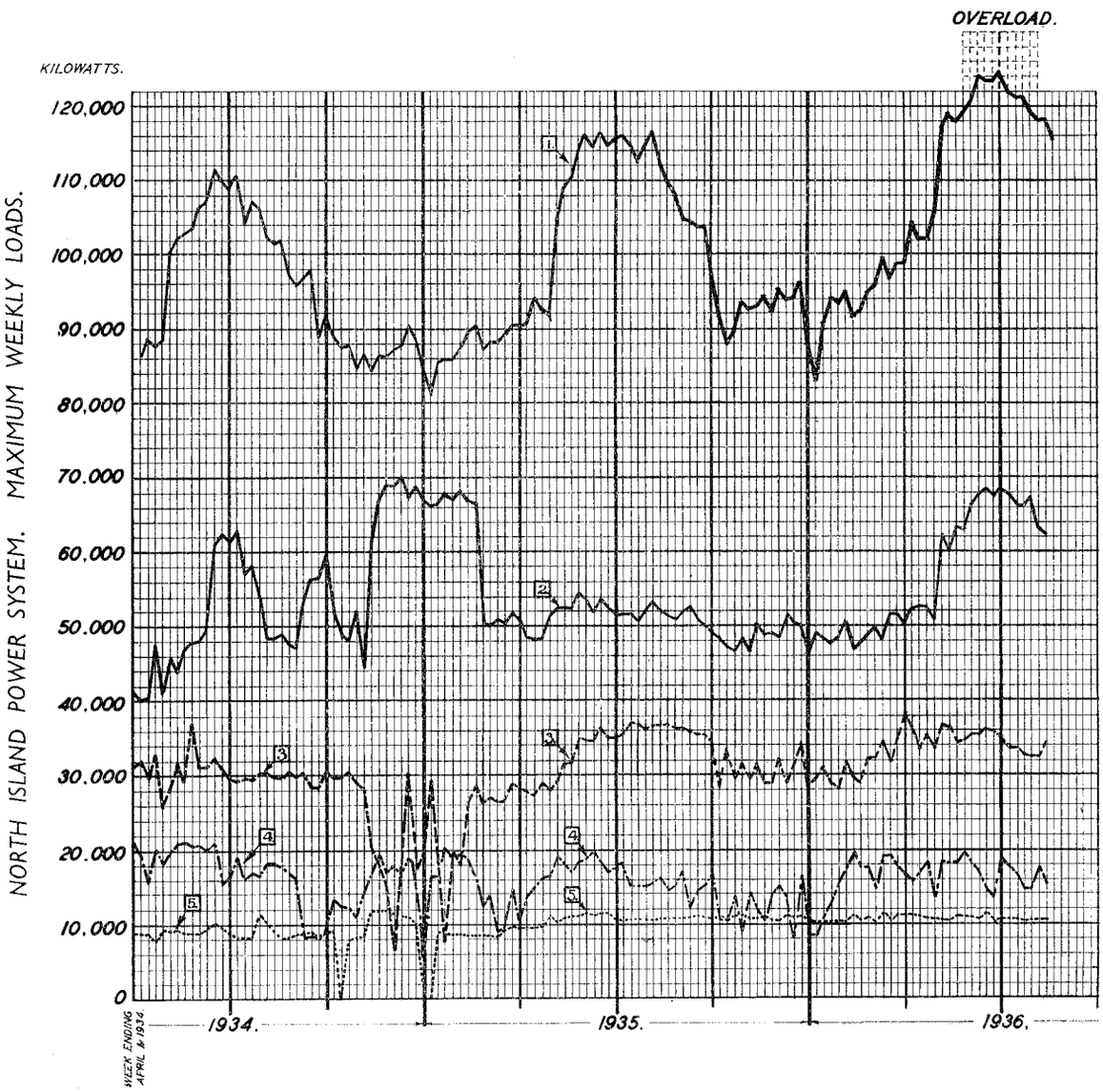
NORTH ISLAND POWER SYSTEM.

MAXIMUM WEEKLY LOADS.

CURVES:

1. *NORTH ISLAND SYSTEM.*
2. *ARAPUNI POWER STATION.*
3. *WAIKAREMOANA POWER STATION.*
4. *MANGAHAO POWER STATION.*
5. *HORAHORA POWER STATION.*

PLANT-CAPACITY INSTALLED: MAIN PLANT, 122,600 kw.; STANDBY PLANT, 5,250 kw.

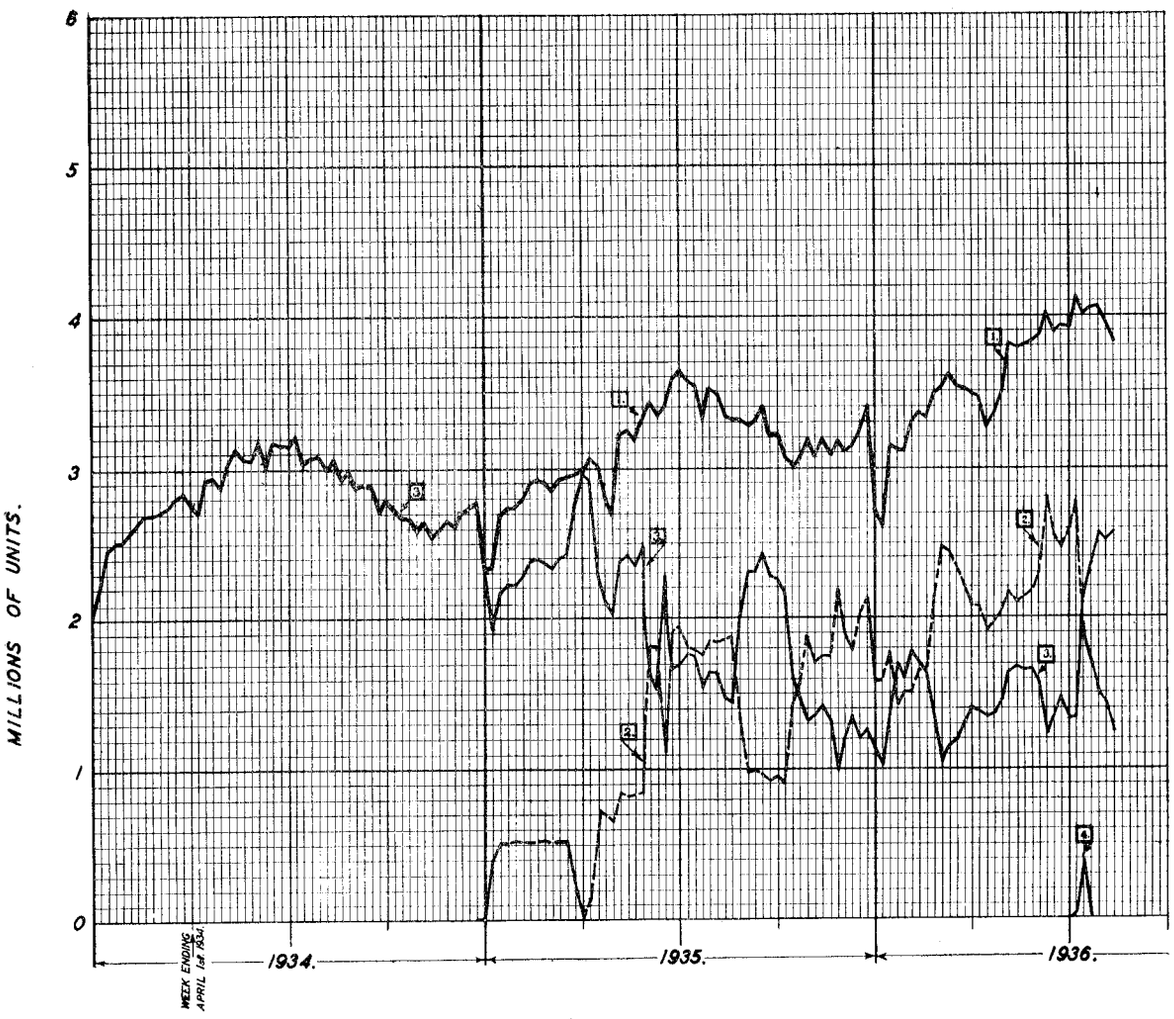


LAKE COLERIDGE-WAITAKI POWER SYSTEM.

UNITS GENERATED PER WEEK.

CURVES:

1. COLERIDGE-WAITAKI SYSTEM.
2. WAITAKI POWER STATION.
3. COLERIDGE POWER STATION.



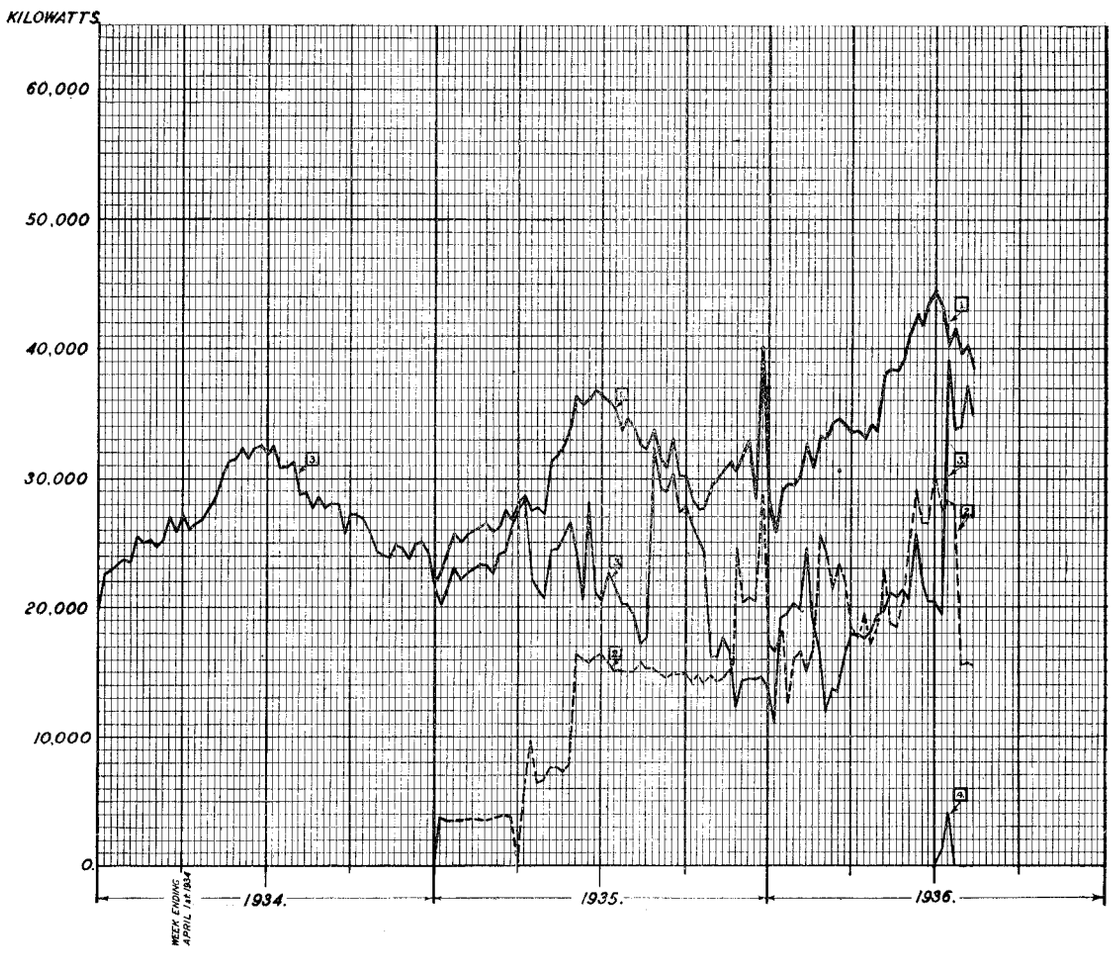
LAKE COLERIDGE-WAITAKI POWER SYSTEM.

MAXIMUM WEEKLY LOADS.

CURVES:

1. *COLERIDGE-WAITAKI SYSTEM.*
2. *WAITAKI POWER STATION.*
3. *COLERIDGE POWER STATION.*

PLANT-CAPACITY INSTALLED: MAIN PLANT, 64,500 kw.; STANDBY PLANT, 5,760 kw.



APPENDIX E.

TWELFTH ANNUAL REPORT OF THE MAIN HIGHWAYS BOARD.

The Main Highways Board to the Hon. Minister of Public Works, Wellington.

Sir,—

In accordance with the requirements of section 24 of the Main Highways Act, 1922, the Main Highways Board has the honour to submit its twelfth annual report for presentation to Parliament.

The report covers the period from the 1st April, 1935, to the 31st March, 1936, though a number of matters referred to are subsequent to the latter date and are included for convenience and completeness of record.

General.

The present length of main highways maintained or subsidized by the Board is 12,040 miles, and particulars of expenditure for the year ended 31st March, 1936, as well as a detailed statement on the position of various works, are shown later in this report.

The total length of formed roads and streets throughout the Dominion is approximately 52,000 miles, and, excluding streets in boroughs and town districts, the present main highways system embraces, with few exceptions, all the more important roads in each district.

The total expenditure from main highways funds for the financial year ended on the 31st March, 1936, amounted to £2,337,558, compared with £1,943,814 for the year immediately preceding.

The expenditure from the Revenue Fund for the year 1935–36 was £1,909,534, as compared with £1,618,331 for 1934–35 and £1,147,731 for 1933–34. These figures include a number of charges against the Revenue Fund under special legislative authority, and which are not directly related to matters covered by the Main Highways Act, 1922.

The amounts expended from the Revenue Fund on actual maintenance of main highways (including items such as flood damage, &c.) during the last four years were as follow: 1932–33, £600,324; 1933–34, £674,026; 1934–35, £932,675; 1935–36, £1,190,179. The Board's standard subsidy for maintenance work is £3 for £1, but in some cases a higher rate is paid because of special circumstances.

The expenditure from the Construction Fund for the year 1935–36 was £428,024, as compared with the following amounts spent during the three preceding years: 1932–33, £159,323; 1933–34, £198,295; 1934–35, £325,483.

Towards the end of the last calendar year it became apparent that highways revenue was buoyant and that taxation receipts were likely to exceed the original estimates. A supplementary programme of works was prepared, and an additional £75,000 appropriated by Parliament, which amount was augmented to some extent by the Unemployment Board in consideration of the employment of a substantial number of men from Government Registration Bureaux.

The increase in expenditure under both funds for the year 1935–36 is accounted for principally by (1) the resumption of normal activities as a result of the general improvement in the Dominion's financial position; (2) the supplementary programme of works undertaken to assist towards the relief of unemployment; and (3) the construction of the Milford Sound Highway, the cost of which became chargeable to the Main Highways Account as from the 21st May, 1935.

In its last annual report the Board drew attention to the steady increase manifested in the amount of traffic on main highways. The increase in motor-vehicle registrations and petrol importations is evidence that the volume of traffic on main highways is becoming still greater. Progress has been made in the direction of continuing improvement works such as realignment, widening of sharp corners and narrow sections, reconstruction and dustless surfacing.

Personnel.

Consequent upon obtaining an appointment in the Treasury, Mr. E. L. Greensmith relinquished his membership of the Board, and Mr. T. A. Barrow, Accountant to the Public Works Department, filled the vacancy. The Board recorded in its minutes its appreciation of Mr. Greensmith's services.

Since the end of the financial year a great loss was sustained by the resignation, for reasons of ill-health, of Mr. C. J. McKenzie, C.B.E., who had been a member of the Board since 1924, and had occupied the office of Chairman since 1932. Due in no small measure to Mr. McKenzie's personal qualities, the relations of the Board with the various public and local authorities have been of a most happy nature, and the utmost harmony has prevailed in the Board's administration. Members have expressed their sincere regret that Mr. McKenzie was not able to continue in office, and placed on record their appreciation of his work together with their best wishes for a complete restoration to health.

Mr. John Wood, Engineer-in-Chief and Under-Secretary of the Public Works Department, has been appointed Chairman of the Board, and Mr. A. J. Baker, formerly an acting-member, has been appointed as a member representing the Government. Mr. H. H. Sharp has replaced Mr. Baker as an acting-member.

LEGISLATION.

New legislation affecting the Board, and passed since last report, has been as follows:—

Section 20 of the Finance Act, 1935, authorized the payment to local authorities out of the Main Highways Revenue Fund of subsidies equal to 12½ per centum of the total amount of rates levied in respect of lands used for farming purposes. The subsidies thus received by local authorities were to be applied in granting to the ratepayers concerned a rebate or refund of 12½ per centum of the rates levied by each local authority.

The full text of section 20 reads:—

"(1) This section applies with respect to—

(*a*) All rates levied on its own account by a County Council on lands used exclusively or principally for agricultural, horticultural, or pastoral purposes:

(*b*) All rates levied on its own account by any Road Board (other than a Road Board to which paragraph (*d*) of this subsection applies) on lands used exclusively or principally for agricultural, horticultural, or pastoral purposes:

(*c*) All rates levied on its own account by a Town Board whose district forms part of a county, on lands used exclusively or principally for agricultural, horticultural, or pastoral purposes:

(*d*) All rates levied on its own account by a Borough Council, Town Board, or Road Board on any urban farm land (within the meaning of the Urban Farm Land Rating Act, 1932), included as at the last day of February, nineteen hundred and thirty-six, in any farm-land roll under that Act (whether or not the farm-land roll has come into force on that date):

(*e*) All rates levied by the Valuer-General pursuant to section fifty-eight or section fifty-nine of the Hospitals and Charitable Institutions Act, 1926, on lands used exclusively or principally for agricultural, horticultural, or pastoral purposes.

"(2) For the purposes of this section any rates levied by a County Council pursuant to a delegation under section one hundred and seventeen of the Road Boards Act, 1908, shall be deemed to be levied by the Council on its own account, and any rates levied by any Road Board or Town Board pursuant to a delegation under section one hundred and twenty-eight of the Counties Act, 1920, or pursuant to a direction given under section eighty-five of the Rating Act, 1925, shall be deemed to be rates levied on its own account by that Road Board or Town Board, as the case may be.

"(3) To every local authority that for the year ending the thirty-first day of March, nineteen hundred and thirty-six, has levied any rates to which this section applies there shall in accordance with this section be paid a subsidy equal to twelve and one-half per centum of the total amount of such rates.

"(4) The subsidy payable to any local authority pursuant to this section shall, not later than the thirty-first day of March, nineteen hundred and thirty-six, be paid out of the Main Highways Revenue Fund without further appropriation than this section.

"(5) For the purpose of enabling effect to be given to the foregoing provisions of this section every local authority that is entitled to receive a subsidy thereunder shall, as soon as practicable after the passing of this Act, furnish to the Valuer-General, in a form to be approved by him, a statement, certified as correct by the Chairman or Mayor pursuant to a resolution of the local authority, showing—

(*a*) In the case of lands that are not included in a farm-land roll either—

(i) The names of the owners and occupiers of all rateable properties in its district that are used exclusively or principally for agricultural, horticultural, or pastoral purposes, together with the rateable value of each such property and the total amount of rates levied by the local authority on its own account in respect thereof for the current financial year; or

(ii) The aggregate amount of the rates levied by the local authority on its own account for the current financial year on all the rateable property in its district; and, in respect of rateable property in its district that is not used exclusively or principally for agricultural, horticultural, or pastoral purposes, the name of the owner and occupier of any such property, its rateable value, and the total amount of the rates levied by the local authority on its own account in respect thereof for the current financial year:

(*b*) In the case of lands that are included in a farm-land roll, the aggregate amount of the rates levied by the local authority on its own account for the current financial year on all lands included in that roll:

(*c*) Any other particulars that the Valuer-General may require.

"(6) Every local authority that receives a subsidy under the foregoing provisions of this section shall grant to the ratepayers concerned a rebate or refund, as the case may require, of an amount equal to twelve and one-half per centum of the rates to which this section applies, levied by such local authority.

"(7) Nothing in this section or in section twenty-eight of the Finance Act (No. 3), 1934, shall affect or be deemed to have affected the amount of the subsidies payable to any local authority under the authority of section nine of the Appropriation Act, 1916, or section seventy-one of the Municipal Corporations Act, 1933, and such subsidies shall be calculated and paid in all respects as if no refunds or rebates had been granted under this section or under section twenty-eight of the Finance Act (No. 3), 1934, as the case may be.

"(8) For the purposes of this section, unless the context otherwise requires,—

The term "local authority" includes the Valuer-General acting under the authority of section fifty-eight or section fifty-nine of the Hospitals and Charitable Institutions Act, 1926; and

The term "rates" does not include any charges which by any Act are made recoverable as if they were rates or are declared to be rates unless the amount of such charges is in fact computed by reference to the rateable value of the rateable property on which they are charged."

The amount of subsidies paid from the Main Highways Revenue Fund during the year 1935-36 under the authority of the foregoing legislation was £186,117.

The total amount of special rate subsidies paid during the last few years under legislation of a similar nature, and including last year's payments, has been £618,257.

Section 3 of the Finance Act (No. 2), 1935, provided for the abolition of the Main Highways Revenue Fund and of the Main Highways Construction Fund, as from the 1st April, 1936.

The section reads as follows:—

"3. (1) The Main Highways Revenue Fund and the Main Highways Construction Fund established by subsection two of section thirteen of the Main Highways Act, 1922, are hereby abolished.

"(2) All references in the Main Highways Act, 1922, or in any other Act, to the Main Highways Revenue Fund or the Main Highways Construction Fund shall, unless the context otherwise requires, be deemed to be references to the Main Highways Account established by section thirteen of the Main Highways Act, 1922.

"(3) The Main Highways Act, 1922, is hereby consequentially amended as follows:—

(*a*) By repealing subsection two of section thirteen:

(*b*) By omitting from paragraph (*e*) of subsection one of section fifteen the words "not being moneys payable out of the Construction Fund":

(*c*) By repealing subsection two of section fifteen:

(*d*) By repealing paragraph (*c*) of section sixteen.

"(4) Section three of the Main Highways Amendment Act, 1927, and subsection two of section five of the Finance Act, 1928, are hereby consequentially repealed.

"(5) This section shall come into force on the first day of April, nineteen hundred and thirty-six."

This enactment will simplify accounting and obviate the necessity for keeping two Funds within the Main Highways Account. For convenience, the expenditure on works is now being recorded under three divisions—viz., maintenance, renewals, and construction, which latter term includes improvements. In the past, expenditure from the Revenue Fund has not shown the actual maintenance costs, as renewal items have also been included. However, from the 1st April, 1936, true maintenance expenditure, as distinct from renewals and construction, will be available. The figures appearing throughout this report relate to expenditure from the respective Funds, rather than to the particular nature of the works undertaken, and on this basis are comparable with the details as presented in previous reports.

Finance.

The actual income of the Main Highways Revenue Fund from external sources for the year 1935-36 amounted to £1,941,655. The table below shows how this amount is made up, and the corresponding figures over the previous nine years:—

——	1926–27.	1927–28.	1928–29.	1929–30.	1930–31.	1931–32.	1932–33.	1933–34.	1934–35.	1935–36.
	£	£	£	£	£	£	£	£	£	£
Transfer from Consolidated Fund	35,000	35,000	35,000	35,000	†	†	†	†	†	†
Proceeds of tax on tyres and tubes collected through the Customs Department	188,450	219,658	196,747	155,722	129,188	84,649	63,253	62,979	91,693	93,308
Registration and license fees of motor-vehicles, &c.	283,963	303,861	341,017	378,135	397,139	372,224	354,216	354,444	355,990	397,606
Motor-spirits tax ..	..	130,461	730,414	873,369	1,219,209	1,231,202	644,126	669,868	970,506	1,449,125
Mileage-tax ..	..	..	..	..	..	..	..	1,133	1,284	1,616
Totals ..	507,413	688,980	1,303,178	1,442,226	1,745,536	1,688,075	1,061,595	1,088,424	1,419,473	1,941,655

† Further transfers abolished by amending legislation.

The receipts from the Customs-tax on tyres and tubes shows a small increase on the amount for the preceding year.

Registration, license fees, &c., amounted to a record total, exceeding by £500 the previous highest figures, reached in 1930–31. The receipts under this heading for the year ended 31st March, 1936, were over £40,000 more than for the year 1934–35.

The proceeds from the motor-spirits tax were very much higher for the year 1935–36, exceeding the previous year's figure by £478,000, and representing the largest sum which has been credited to the Revenue Fund in any one year.

The gross importations of motor-spirits since 1926 have been as follows, these figures providing a good index of the volume of motor traffic, to which maintenance requirements especially are closely related :—

	Gallons.		Gallons.
1926 (January to December) ..	44,800,000	1931 (January to December)..	61,800,000
1927 ,, ..	48,000,000	1932 ,, ..	58,400,000
1928 ,, ..	54,500,000	1933 ,, ..	55,400,000
1929 ,, ..	62,400,000	1934 ,, ..	64,600,000
1930 ,, ..	68,300,000	1935 ,, ..	65,300,000

It will be seen that the importations for the calendar year 1935 were slightly more than for 1934.

For the year ended 31st March, 1936, the summarized expenditure under the Revenue Fund was as follows :—

	Expenditure. £
Maintenance works—	
North Island	771,289
South Island	418,890
Administration and general charges	56,732
Loan charges (including commutation of toll-gate charges and Hutt Road fees)	291,651
Subsidies on rates	184,855
Special subsidy on farm-land rates. (Finance Act, 1935)	186,117
	£1,909,534

An analysis of the expenditure for 1935–36 by the Board and by local authorities on maintenance, as distinct from interest on loans and other overhead charges, is shown in the tabulation below :—

——	Board's Contribution.	Local Authorities' Contribution.	Total.	Percentage Board's Contribution to Total.	Percentage Local Authorities' Contribution to Total.
	£	£	£		
North Island	771,289	190,619	961,908	80·18	19·82
South Island	418,890	93,804	512,694	81·70	18·30
Total	1,190,179	284,423	1,474,602	80·71	19·29

An analysis of the actual expenditure by the Board on maintenance in each Island, as compared with the number of motor-vehicles in each Island at the 31st March, shows the following comparisons for the last ten years :—

——	1926–27.	1927–28.	1928–29.	1929–30.	1930–31.	1931–32.	1932–33.	1933–34.	1934–35.	1935–36.
North Island—										
Maintenance expenditure	64·86	67·51	66·13	62·30	59·23	62·31	62·84	63·80	65·44	64·80
Motor-vehicles ..	61·86	62·19	63·08	63·63	63·84	63·77	63·78	63·94	64·31	64·84
South Island—										
Maintenance expenditure	35·14	32·49	33·87	37·70	40·77	37·69	37·16	36·20	34·56	35·20
Motor-vehicles ..	38·14	37·81	36·92	36·37	36·16	36·23	36·22	36·06	35·69	35·16

An analysis of the Board's expenditure and the expenditure by local authorities, for the year 1935-36, 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.
	£	£	£		
North Island	235,755	58,134	293,889	80·22	19·78
South Island	192,269	20,129	212,458	90·53	9·47
Totals	428,024	78,263	506,347	84·54	15·46

The following tabulation shows the amounts which have been provided by the Board and the local authorities on both maintenance and construction during the last ten years:—

—	1926–27.	1927–28.	1928–29.	1929–30.	1930–31.	1931–32.	1932–33.	1933–34	1934–35.	1935–36.
	£	£	£	£	£	£	£	£	£	£
Maintenance by Board ..	438,762	523,581	756,399	1,049,249	872,577	849,734	600,324	674,026	932,675	1,190,179
Maintenance by local authorities	276,349	269,065	284,526	375,849	317,839	215,568	168,466	187,735	226,554	284,423
Construction by Board ..	540,362	449,904	936,148	1,007,957	667,902	361,969	159,323	198,295	325,483	428,084
Construction by local authorities	255,860	262,538	214,155	203,148	150,984	94,973	43,181	55,997	57,975	78,263
Totals	1,511,333	1,505,088	2,191,228	2,636,203	2,009,302	1,522,244	971,294	1,116,053	1,542,687	1,980,949
Percentages.	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.
Maintenance by Board ..	61·4	66·0	72·7	73·6	73·3	79·8	78·1	78·2	80·5	80·7
Maintenance by local authorities	38·6	34·0	27·3	26·4	26·7	20·2	21·9	21·8	19·5	19·3
Construction by Board ..	67·9	63·1	81·4	83·3	81·6	79·2	77·6	77·0	84·9	84·5
Construction by local authorities	32·1	36·9	18·6	16·7	18·4	20·8	22·4	23·0	15·1	15·5

The maintenance figures in the above tabulation exclude indirect charges such as supervision, interest, &c., but include the cost of earthquake and flood damage restoration.

It will be noticed that under both maintenance and construction expenditure the figures show an increase on the expenditure of recent years.

The following statement shows the total expenditure by the Board in each Island from both Revenue and Construction Funds for the financial year ended 31st March, 1936. The figures include administration charges:—

—	Expenditure on Maintenance.	Expenditure on Construction.	Total Expenditure in each Island.	Percentage of Expenditure in each Island.
	£	£	£	
North Island	798,328	244,020	1,042,348	62·23
South Island	433,575	199,072	632,647	37·77
Totals	1,231,903	443,092	1,674,995	100·00

Unfortunately it has not yet been possible for the Government to arrange for all current expenditure on highways works to be met from revenue, but, as the cost of interest and sinking fund payments is already a very large annual charge against revenue, the Board has, on several occasions, made strong representations concerning the use of loan-money for highways purposes.

Quite apart from the consideration as to whether or not the classes of work being carried out should be met from revenue moneys, the position concerning the Board is that the annual charges in respect of loans have steadily increased and a very substantial liability must now be met each year.

The following table discloses the growth of annual loan charges and demonstrates how the use of borrowed moneys involves the appropriation of future revenues, thereby reducing the amounts which would otherwise be available for current requirements.

MAIN HIGHWAYS ACCOUNT.

Annual Loan Charges.

Year.	£	Year.	£
1925–26	23,235	1931–32	262,078
1926–27	71,578	1932–33	269,179
1927–28	31,630	1933–34	258,674
1928–29	116,178	1934–35	281,871
1929–30	126,416	1935–36	291,651
1930–31	224,605		

The matter is one which is at present receiving the earnest consideration of the Government, and the representations submitted from the highways viewpoint are being studied in connection with future financial policy.

Assistance from the Unemployment Fund.

In recent years the Board has undertaken a number of improvement works, somewhat in advance of the normal programme, for the purpose of assisting as far as possible towards the relief of unemployment. Such a course was rendered practicable through the Unemployment Board granting subsidies based on the amount of labour employed. This arrangement provided extra finance, and enabled additional works to be commenced, and consequently a much greater number of men to be employed, without unduly restricting the prosecution of ordinary works.

In effect, highways funds were applied to advantage in relieving the unemployment situation, while at the same time additional progress was made possible in carrying out improvement work.

There is, of course, a limit to which Highways Funds should be used in relieving unemployment. It does not always follow that works requiring attention are necessarily situated in the localities where unemployment is most acute, but in considering proposals, the circumstances of each case were examined carefully, in order that, as far as possible, justifiable work and not the labour situation, governed the actual selections that were made.

The subsidies previously granted from the Unemployment Fund have been withdrawn as from the 1st April, 1936, and highways funds will require to be allocated for the whole of the cost involved in completing these special works, most of which are in the progressive stage.

Maintenance.

The primary requirement for any highway system is its proper maintenance, and the Board has impressed on local controlling authorities the necessity for continuous attention being given to this phase of the work. Maintenance has generally been of a reasonable standard though many floods caused much scouring of metal surfaces over a wide area.

The heaviest floods occurred in February and March, and caused considerable damage, the estimated cost of the repairs being in the vicinity of £100,000. The Taranaki District suffered most, where the damage was estimated at £68,000. The principal losses in this district were six concrete bridges.

With a view to improving the standard of maintenance and reducing cost, the Board made arrangements with the Public Works Department to design a special power-grader suitable for New Zealand conditions, and embodying up-to-date mechanical features. Photographs of two models of the grader are attached to this report. These machines are almost wholly New Zealand made and are giving very satisfactory service. When the graders were first produced, it was found necessary to make adjustments of a minor nature, but now that the machines have been run in, excellent service is being obtained. The Board has also purchased for a number of local bodies many modern grading units, the local bodies undertaking to acquire such equipment under terms of hire-purchase.

Due attention has also been given to dustless surfaces. The designed speed of motor-vehicles has increased during the last two or three years by twenty to thirty miles per hour, greatly increasing road impact. There is ample evidence that many of the old surfaces are becoming progressively rougher, and that it will be necessary to pay more and more attention to the application of smoothing-coats to overcome unevenness, and thus prevent impact damage to the metal crust. Already the technique of smoothing-coat work has developed to the extent that production cost of plant-mix material, using cut-back bitumen, has been reduced in some districts from £2 2s. 6d. per ton to £1 6s. 6d. per ton. There is no doubt that the appearance and riding comfort of the sections that have been treated have been vastly improved. Roughometer readings have been reduced from two hundred units to the mile to as low as five units to the mile. The viagraph appended to this report shows by comparison the relative roughness of the different types of pavement between Christchurch and Glenavy.

Of some 12,000 miles in the highways system, approximately 2,000 miles are paved; the remainder has gravel or crushed-rock surfaces. Much of this latter type will be treated in due course with bituminous materials; but there are many hundreds of miles of highway where the traffic densities are so low that it is likely to be many years before sealing or similar surface treatment can be economically justified. Therefore, in the meantime, grading equipment must be maintained to the highest possible standard.

The average expenditure on maintenance per mile per annum on the whole highways system by the Board and local authorities, since 1924, is shown in the following table :—

Year.	Average Expenditure per Mile per Annum.	Year.	Average Expenditure per Mile per Annum.
	£		£
1924–25	51·7	1930–31	103·1
1925–26	73·2	1931–32	92·5
1926–27	111·9	1932–33	70·7
1927–28	119·9	1933–34	78·6
1928–29	100·1	1934–35	100·3
1929–30	128·6	1935–36	122·4

Construction, Reconstruction, and Surfacing.

The expenditure from the Construction Fund for the year 1935–36 was £428,024, an increase of 32 per cent. on the corresponding expenditure for the preceding year.

The season just past was not a good one for bituminous surfacing in most districts owing to wet weather being generally experienced.

During the year ended 31st March, 1936, 152 miles of main highways were reconstructed, formed, or widened, 358 miles of dustless surfacing, including stage construction, were completed, of which 245 miles were sealing, and 93 miles plant-mix or road-mix pavement.

The table below shows the extent and types of work carried out on the main highways system by the Board and local authorities since the Board commenced active operations in 1924.

Year.	Formation and Widening.	Gravelling and Metalling.	Tar and Bituminous Sealing.	Road-and-Plant-mix Bituminous Surfacing.	Bituminous Macadam (Penetration).	Bituminous Concrete.	Portland-cement Concrete.	Bridges.
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Ft.
1924–25 ..	19	63	6	..	6	..	..	2,434
1925–26 ..	45	88	16	..	45	4	6	5,168
1926–27 ..	174	151	35	..	38	12	16	6,408
1927–28 ..	173	133	83	..	34	..	6	7,760
1928–29 ..	224	185	122	..	51	14	11	9,482
1929–30 ..	173	179	133	..	39	31	12	7,547
1930–31 ..	130	128	95	..	41	14	9	11,175
1931–32 ..	139	69	129	..	32	9	3	4,062
1932–33 ..	56	45	72	..	8	..	..	3,178
1933–34 ..	44	28	75	..	7	..	1	4,988
1934–35 ..	113	69	172	27	3	..	2	6,641
1935–36 ..	152	98	245	91	2	..	..	8,718
Totals ..	1,442	1,236	1,183	118	306	84	66	77,561

A description of some of the major works is as follows :—

Auckland District.

Auckland–Wellington Main Highway, Waipa County Division.—This work, extending over a length of 30 miles and estimated to cost £162,000, consists of improving the alignment, remetalling, and plant-mix surfacing, together with the reconstruction of several bridges in reinforced concrete, and the renewal of all culverts in permanent materials.

As this highway is one of the most heavily trafficked in the Dominion, a high standard has been set. The minimum radius of curvature is 10 chains and vertical sight distances 500 ft. Good progress has been maintained and at least half of the work completed. The surfacing comprises a cushion course of sand or inferior metal on the subgrade, followed by a 6 in. consolidated thickness of crushed basalt rock. A mulch-dressing of chippings is then applied, and maintained for at least three weeks under traffic, after which a first-seal coat of No. 1 tar is laid. Finally a plant-mix surface, $\frac{3}{4}$ in. thick, of densely-graded aggregate with M.C. 3 binder is planed on with a long base planer.

Tauranga District.

Rotorua County, Sealing.—Rotorua is one of the most important tourist resorts in the Dominion, and in the holiday season there is a large influx of visitors. It has been recorded that 2,400 vehicles traversed the main road between 5 p.m. and 5 a.m. on one day. The original surfacing was for the most part the natural pumice, which in dry weather dispersed clouds of dust, to the great discomfort and danger of motorists. The Board undertook some 20 miles of surface sealing in the area at a cost of £26,000. It was necessary to utilize local materials, as much as possible, as stone-chipping, which had to be obtained from remote areas, cost as much as £1 6s. per cubic yard. The pumice itself consists of fine fragments of glass, with very little cohesion, and is very absorbent. When the surface was

brought to shape the pumice was sprayed with ½ gallon of No. 1 tar per square yard, and before the tar was wholly absorbed a coat of chippings graded ⅞ in. to ⅝ in. was applied. After the lapse of a few weeks a second coat of heavy road-oil at the rate of $\frac{5}{12}$ gallon per square yard was sprayed, and covered with chippings graded ⅝ in. to ⅜ in. This type of work enables the maximum use to be made of inferior local materials.

Stratford District.

Stratford–Taumarunui Main Highway: Moki Tunnel.—This tunnel is through a razor-backed papa ridge and is 8 chains in length, 12 ft. in width, having a Gothic arch, the point of which is 20 ft. above road-level. Owing to the uneven bedding of the papa strata, large flakes are apt to become dislodged from the roof, and for this reason a small amount of timber lining has been placed in the roof. The saving in climb and distance to motor-vehicles justified the construction of this tunnel.

Wellington District.

Wellington–Napier Main Highway: Sealing in Wairarapa Division.—At the beginning of the year there were on this highway several lengths of gravel surfaces totalling 20 miles. The Board was anxious to close the gaps and so give a continuous length of dustless surfacing from Wellington to some 10 miles north of Napier, a total distance of 230 miles. Contracts for the whole of the work were let, and generally have been about 50 per cent. completed. The work was delayed by wet weather. On one contract many timber stumps were discovered below the subgrade, causing considerable expense and delay.

The type of surfacing on these contracts generally consists of a priming coat of light tar, followed by an application of heavy road-oil and large chippings, 1 in. to ⅝ in.

Auckland–Wellington Main Highway: Whirokino Deviation.—The Whirokino Section receives the flood overflow from the Manawatu River, and during a wet season the highway may be covered with water up to a depth of 10 ft. Traffic is disorganized for from twenty to thirty days per annum, and in order to provide an all-weather route it was decided to put in hand the raising of the road above flood-level. The flood-discharge of the Manawatu River is estimated at 200,000 cusecs, and in order to provide for this volume of water it is necessary to build a viaduct 55 chains long, in addition to a new bridge over the Manawatu River, which requires to be 600 ft. long to span the main channel.

The work of forming the approach banks up to 14 ft. in height over a distance of 60 chains has been put in hand, likewise the driving of test piles to obtain preliminary information for bridge-designing purposes. The work will cost approximately £80,000.

Nelson District.

Takaka Hill, Whangamoa Hill, and Hope Saddle: Improvements.—The widening and improvements on these sections of highway are typical of many works undertaken throughout the country for the relief of unemployment.

The Takaka Hill in particular is regarded as the longest and most tortuous hill road in the Dominion. It is 10 miles long on the Riwaka side and 7 miles on the Takaka side, and the summit is 2,600 ft. above sea-level. At the higher elevations it is subject to snow-storms and severe frosts in winter, making traffic conditions unpleasant and dangerous. The improvements being undertaken will give ample road-width, and the dangerous section near Hawk Crag has been superseded by a deviation on the sunny side of the hill. It is perhaps not out of the way to remark here on the lack of consideration that has been shown by some motorists using this road. They have complained frequently about conditions which it is natural to expect while major reconstruction work of this kind is in progress. Regular users of the road, however, recognize that some inconvenience must be suffered if the route is to be improved and at the same time kept open for traffic. Every effort is made to give to road users the best service that is possible.

Nelson–Inangahua Junction Main Highway: Richmond–Belgrove Section.

On this section an important improvement was the plant-mix surfacing over a distance of 13 miles. The surface was first built up, shaped, and primed with bitumen, cut-back with fuel oil and tar-oil, and later surfaced with ¾ in. thickness of plant-mix of densely graded aggregate. The whole work cost £12,000.

West Coast District.

Inangahua Junction–Weheka Main Highway: Kumara–Flowery Creek Deviation.—This deviation, 8 miles in length, will reduce the distance between Greymouth and Hokitika by 8½ miles. During the period over 3 miles were completed. The work involves the construction of six reinforced concrete bridges, all of which are in hand.

Canterbury District.

Christchurch–Dunedin Main Highway: Rangitata Deviation.—During the period a commencement was made with this deviation, which is 20 miles long, and which shortens the distance between Christchurch and Dunedin by 10 miles. Generally, the formation is very light. Two large bridges, however, are required, one 2,000 ft. long over the north branch of the Rangitata River, and the other 1,000 ft. long over the south branch. Good progress has been made on the 6 miles of the section between Hinds and Ealing.

McNamara's Corner to Waitaki River, Surfacing.—This section is 12 miles in length and was metalled in preparation for ordinary sealing. During crushing-operations for chips, &c., a considerable quantity of quarry waste had accumulated. The grading of this waste was found suitable for a plant-mix aggregate, and at the request of the local authority this type of surfacing was adopted. The thickness of the pavement on the primed surface is 1 in., and the cost including the priming was £750 per mile.

Dunedin District.

Christchurch–Dunedin Main Highway: Waitaki River to Oamaru.—As a result of the excellent riding qualities of the section in Waimate County described above, the neighbouring Waitaki County also requested this plant-mix drag type of surface on 7¾ miles of new first-coat seal and on 4½ miles of old, uneven sealing. The work was carried out at a cost of £488 per mile, the thickness of surfacing being ⅝ in.

Oamaru–Dunedin.—Considerable progress was made on this section. Fairly heavy earthwork has been undertaken by employment camps between Hillgrove and Shag Point over a length of 6 miles. On this section the road passes under the railway at two points, by subways with sharp approaches. The subways are being eliminated by a deviation skirting the sea coast.

On this section 8 miles of two-coat sealing were carried out. The sealing only, cost £600 per mile.

Southland District.

Gore–Te Anau–Milford Main Highway.—The last section of this highway between Hollyford and Milford, is now under construction. The route is entirely scenic, and opens up one of New Zealand's national parks. It presents to the visitor or tourist something which is calculated to excel almost anything in the world. Approaching the Park along the floor of the Eglinton Valley, glorious vistas of lake and mountain scenery open up in the birch forests through which the route has been formed. Flanked on either hand are towering cliffs and mountains 5,000 ft. to 8,000 ft. high, rising almost perpendicularly from the floor of the valley to well above the snow line.

Approaching the Hollyford Valley the country becomes more rugged and the grandeur increases. Construction is here more difficult till the portal of the Homer Tunnel is reached. The tunnel, which was recently commenced, will be some three-quarters of a mile in length and is being built double lane on a 1 in 10 grade. The eastern portal is sited at an elevation of 3,100 ft., and the western portal at 2,700 ft., above sea-level. From the higher elevations of the route on the western side there will be exposed magnificent views of Milford Sound, hundreds of feet below. Mirrored on its surface will be seen the high rock-walls and tumbling waters with depth of colour and tone unsurpassed.

BRIDGES.

During the period a very heavy bridge programme was undertaken. Proposals were submitted for examination at the rate of twenty per month, and involved considerable checking and requisitions for improvement in the design.

Apart from the examination of the plans, considerable preliminary information is required, as the Board insists on a thorough investigation of foundations by way of test pits, bores, or test piles, so that in each case the cost of the substructure can be correlated with the cost of the superstructure, and the most economical design obtained.

In spite of the substantial progress recorded, there is still much leeway to make up. Many large structures have been given extended life at the expense of high maintenance-cost, but it is not economical to continue this process indefinitely, and the reconstruction of these bridges will have to be faced in the near future. For many of them plans are already in hand. The policy of building in reinforced concrete has been continued.

During the period 232 bridges were put in hand, and of these 164 were completed.

Among the most important structures at various stages of completion the following may be particularly mentioned:—

Waitangi Washout Bridge, on the Napier–Wellington via Wairarapa Main Highway, about 3 miles south of Napier, has a roadway 24 ft. wide and is 800 ft. long. It is built entirely of reinforced concrete and consists of twenty 40 ft. spans supported on pile piers and abutments. The total cost was approximately £11,500, equal to 12s. per square foot of deck.

Waitangi Bridge, also on the Napier–Wellington via Wairarapa Main Highway, is about half a mile southwards from the Waitangi Washout Bridge, and is of similar width and construction, and is 600 ft. long. The cost will be approximately £9,700, or 13s. 6d. per square foot of deck. The new bridge replaces an old timber one-way bridge, which was a frequent cause of delay on this heavily trafficked highway.

The lengths of both the Waitangi Washout and Waitangi Bridges were fixed by the widths of the flood-channels required for the Hawke's Bay River Board's flood-control scheme now under construction. The construction of these two bridges eliminates two level crossings over the railway.

Tangahoe Bridge is on the Auckland–Wellington Main Highway about 4 miles south of Hawera. The main span in the new bridge is a reinforced concrete, open spandrel, hingeless arch, having two parabolic arch ribs with a span of 90 ft. and a rise of 41 ft. There are two 26 ft. girder approach spans at the Hawera end, and two 35 ft. spans at the other end. The width of roadway is 20 ft., and the total length is 217 ft. The deck-level of the bridge is 80 ft. above the bed of the stream. The bridge replaces an old low-level timber bridge over the Tangahoe stream, and with a deviation of the highway 56 chains long, the through distance by road is reduced by about 24 chains, and the alignment is greatly improved. The cost of the bridge was about £6,010, while the formation of the deviation, apart from the bridge, cost £10,000.

Waitara Town Bridge.—This bridge, built in 1913, consists of four 60 ft. plate-girder spans, with an 18 ft. roadway and two footways each 4 ft. wide. The piers were of concrete carried on piles. In 1935, during a heavy flood, timber carried down the river was caught up in the piles of one pier below water-level and below the level of the pier concrete, damaging the piles and allowing the pier to cant downstream. To remedy the trouble temporary timber staging was built in the river and the superstructure, which had subsided with the pier, was lifted back into place. The old pier was demolished, and a new pier, carried on reinforced-concrete cylinders sunk under an air lock, was constructed. This work was done with practically no interruption to traffic. To prevent a recurrence of the trouble, the other two piers in the river are being demolished and replaced by new cylinder piers, of sufficient width to take a wider roadway should this become necessary in the future.

Paremata Bridge, on the Paremata–Plimmerton Main Highway at the crossing of the Pahautanui arm of the Porirua Harbour, has a roadway of 22 ft. and two footways each of 4 ft. width. It is built of reinforced concrete on pile piers, and is 450 ft. long, consisting of 50 ft. spans. The cost of the bridge will be about £12,500.

Waimakariri River Bridge, on the Upper Riccarton – Arthur's Pass Main Highway at Bealey, is 880 ft. long and consists of 44 ft. spans. The roadway is 10 ft. wide, and a central span 18 ft. wide is provided for passing purposes. The bridge is of reinforced concrete on pile piers, and will cost approximately £7,000. Traffic will no longer be required to ford this river, which has always been one of the greatest obstructions on this highway.

Traffic Census.

The traffic census taken last year has been tabulated and is shown in graphical form on the maps attached to this report.

The census has proved invaluable to the Board in considering the relative urgency of improvement works and paving, also the bridge-width that should be adopted on each highway, and the elimination of level crossings.

Many interesting traffic features have been disclosed. For instance, much weight has often been given to "foreign" traffic—that is, traffic domiciled outside the area served by a particular highway. However, the census shows generally that traffic is intensely local, and that as a rule a large proportion of vehicles keeps within a radius of 25 miles of the centre at which it is domiciled.

Another interesting feature disclosed is the use that is made of the highways system. Four hundred miles, or 3 per cent., of the most intensely trafficked highways, carry 30 per cent. of the highways traffic. Four thousand miles, or 30 per cent. of the most densely trafficked highways, carry nearly 80 per cent. of the highways traffic. It is a coincidence that 4,000 miles is the length that the Government proposes to take over to form a State arterial system. In this system certain highways, although not amongst those with greatest traffic density, are included on account of their arterial character.

Probably next year it will be advisable to take another census, so that further traffic studies can be made, more particularly with regard to the weight of the vehicles and loads carried.

Contact with Local Bodies.

It has been the practice of the Board to maintain contact with local bodies interested in the control of main highways, by paying annual visits of inspection to the various districts in the North Island and South Island respectively in alternate years. Such inspections also enable the Board as a whole to investigate local problems and conditions, and to discuss particular aspects of administration and finance with those authorities exercising local jurisdiction. By this means the Board is in a better position to co-relate applications for financial assistance, and to consider the recommendations submitted from time to time by District Highways Councils, which advisory bodies are composed of local-body representatives.

The Board had proposed to visit the South Island towards the end of the last financial year, but as Parliament assembled earlier than usual, and the Board was awaiting an indication of the Government's future highways policy, it was deemed advisable to cancel the arrangements which had been made and to defer the matter till a later occasion.

Local authorities generally have continued to satisfactorily administer highways affairs under their control. However, the Board finds it necessary to record that there have been some cases, fortunately few in number, where local authorities have been unwilling to proceed with works as planned, principally with a view to receiving greater financial aid, or of being entirely relieved of all financial responsibility. The proposal of the Government to introduce a system of State highways will obviate delay in prosecuting urgent works on arterial highways included in the new system, where previously the reluctance of a local authority to meet its obligations caused a postponement of such works.

Proposed State Highways System.

With the change in the Administration, an announcement has been made that legislation is to be introduced providing for a system of State highways. The proposal contemplates the transfer of control and responsibility, in respect of arterial main highways, from local authorities to the Board, and the financing of the Dominion's national highways wholly from the Main Highways Account.

The principal advantages of this change will be, firstly, that essential works on arterial main highways will not be subject to delay through the financial difficulties of local authorities; secondly, that local authorities which previously contributed towards arterial routes, will be relieved of such contributions, and the relief thus afforded will enable them to give needed attention to main highways and ordinary county or settlement roads; and, thirdly, that continuous works in the way of improvements and permanent surfacing will be possible, without interruptions arising from circumstances involving the position of a local authority. On the other hand, the estimated savings to local authorities in respect of both construction and maintenance, are approximately £120,000 per annum, which sum will now become a liability on the Main Highways Account.

Although the legislation has not yet been passed, the Board has made preliminary arrangements of a tentative nature, in order to facilitate the change at the appropriate time.

It is of interest to note that, as a result of the announcement regarding the proposed State system, a number of local authorities likely to derive some relief therefrom have sought to obtain further main highways in order to secure additional subsidies; but it is unlikely that the present general highways system will be increased very much in the meantime, in view of the additional cost to the Main Highways Account of the State Highways System.

In the past many local authorities have displayed a tendency to press for special consideration of their claims, without proper regard to the relative merits of their position. Quite frequently application has been made for preferential assistance above the standard rate of subsidy, and it has been noticed that, no matter what the standard rate might be, a higher rate has been sought. It will be necessary in future for the Board to adhere more rigidly to the standard subsidy rates, in view of the fact that highways funds are to meet the full cost of the requirements of the State system.

Soon after the Government's proposals for the State system were made known some local authorities saw fit to modify their construction activities, presumably with a view to conserving their own finances. In a few instances works in hand were tapered off, and in other cases reconstruction works about to be commenced were postponed indefinitely. Unfortunately, maintenance also was curtailed, and complaints have been received regarding the condition of some highway surfaces, which have been neglected. Where necessary the Board has taken the matter up with the authorities concerned, with a view to essential work being continued. Generally speaking, it may be said that the majority of local authorities have co-operated, by maintaining those highways which have been selected tentatively for inclusion in the proposed State system. Where maintenance is deteriorating, or construction work suspended, the Board will be faced with the necessity of restoring surfaces and resuming work as soon as possible after the inauguration of the State scheme.

Elimination of Level-crossings on Main Highways.

As reported last year, an agreement was reached between the Main Highways Board, the Railways Department, and the Unemployment Board, dividing the cost of level-crossing elimination in the proportion 50 per cent. to the Main Highways Board, 33⅓ per cent. to the Unemployment Board, and 16⅔ per cent. to the Railways Department.

However, during the year it was found that Unemployment funds were required for that Department's more urgent requirements, and the Minister of Employment found it necessary to cancel the agreement in so far as he was concerned.

Fresh arrangements are being made, and the Government has intimated the likelihood of the Board's share being reduced considerably. Although it is anticipated that only some £100,000 will come to charge this year, it is expected that next year's expenditure will reach £1,000,000.

The Government has indicated that it desires to have this work prosecuted vigorously, and with this end in view, a preliminary study has been made of all of the level crossings on main highways, totalling some 530, the elimination of all of which will cost approximately £3,500,000.

Since this policy has been announced, innumerable suggestions by the public for removing the dangers have been submitted through the Minister. These for the most part are devices to draw the attention of the motorist to the fact that he is approaching the crossing, and take the form of narrowing the trafficable width of pavement, or of introducing sharp curves, humps, or joggles on the road-surface. All of these devices are considered unsatisfactory in that, in attempting to remove one danger, they introduce others potentially as great.

The only way to wholly remove the danger is to separate the grades. This solution can be considered to be the final opinion of the best thought in the world that has been applied to the problem.

The first consideration was to schedule the crossings in order of urgency. This was done by applying a factor obtained by multiplying the road traffic by the rail traffic, and by 1, 2, 3, or 4 depending on whether the visibility at the crossing was described as good, fair, poor, or bad. Of the total of 530 crossings, 100 have a factor greater than 10,000, 23 lie between 7,500 and 10,000, with the rest graduating down to a factor as low as 30.

The methods of elimination are by (*a*) deviation of highway or railway, (*b*) road overbridge, and (*c*) road subway.

The deviation of the highway is not usually a 100-per-cent. solution, since a small amount of local traffic may still require the crossing. The subway often introduces drainage problems, and the great majority of the eliminations will therefore be by overbridge.

In preparing designs it was first thought that it would be possible to standardize a few types, but as site-plans were submitted it became apparent that each elimination required special treatment, due to the varying angles of skew, topographical features, proximity to populous areas, and various railway clearances. However, now that a considerable number of crossings have been designed, it is possible to more or less adapt some of these designs to suit other locations.

Owing to the difficulty experienced in keeping design work ahead of construction, a certain amount of time has necessarily elapsed before final detailed plans of some schemes have been available. Specially trained staff has been entrusted with the designing of particular structures which involve difficult features, and the information and experience now available will enable the design-work to proceed more expeditiously. Wherever possible, the formation of approach ramps or cuttings has been commenced in advance, up to within suitable distance of the site of the proposed structure. This practice allows a certain amount of consolidation to take place, in readiness for traffic when the structure itself has been finished.

All overbridges are being constructed in reinforced concrete, and, because of their long life, special consideration is being given to the alignment of the bridges and approaches, and to vertical sight distances. The minimum curvature, except in special cases, is 10 chains radius, with 400 ft. vertical sight distance. The vertical curve in all cases is built into the bridge. The minimum width of deck will be 22 ft.

Pile-foundations are not generally required, so that where material for the construction of the ramps is not available on short haul, the bridge is often designed much longer, at no additional cost over the whole job.

The longer bridge has the advantage that it does not cover up frontage of properties as does an earth fill, and still leaves a strip of road reserve for access purposes.

A brief description of some typical overbridges is as follows :—

Styx.—Length, 575 ft. ; roadway, 30 ft., with 2-ft. wide kerbs on each side. Grade approaches 1 in 20. Bridge on straight except for one end span. Bridge on skew of about 50° to railway. Bridge has been used in preference to bank, down to a height of about 6 ft. This was economical on account of the high cost of filling, and the fact that access was required at ground-level parallel to the bridge, and if bank had been used retaining-walls would have been necessary. A contract has been let for this bridge. The total cost of the bridge only will be £7,521, or about 8s. per square foot.

Mokoia.—Three 30 ft. spans ; roadway, 24 ft., all on a curve of 10 chains radius. The bridge spans a fairly deep cutting, giving ample clearance to the railway. The centre-line of railway is 9½° skewed to the radial line at the centre of bridge, and all piers and abutments are parallel to centre-line of railway. The approximate cost will be £1,420, or about 13s. 6d. per square foot.

Pokeno.—Length, 125 ft., consisting of three continuous spans 32 ft., 61 ft., and 32 ft., supported on piles. Roadway, 24 ft. The bridge is on a skew of 30° to the centre-line of railway, and is wholly on a curve of 25 chains radius. The bridge is canted at ½ in. to the foot, and this cant, combined with the skew piers and vertical curve, makes the determination of deck-levels complicated. The cost is £3,600, and the cost per square foot £1 4s.

Oio.—Length, 130 ft. ; roadway, 22 ft. Continuous spans of 40 ft., 50 ft., and 40 ft., supported on pile piers. The bridge is straight and on a vertical curve. The skew to the railway is about 30⅓°. The piers and abutments are parallel to the railway, giving the same complicated deck-levels as is evident in the Pokeno design. Owing to the necessity of providing access to the passenger platform and for a tramway, these features could not be avoided. The estimated cost is £3,200, or £1 2s. 6d. per square foot.

Piriaka.—Length, 135 ft. ; roadway, 24 ft., three 45 ft. simple spans on pile foundations. The railway is on a skew of about 40° to the centre-line of bridge, but the piers are skewed to 60°. This tends to square up the ends of the bridge. The deck reinforcement is all laid parallel to the piers. The estimated cost is £2,570, or about 16s. per square foot.

This design shows the use of a span over the railway longer than necessary, to partly square up the piers. Where the piers are skewed at less than 60° to the centre-line of the bridge, it is usually necessary to lay the deck reinforcement square to centre-line of bridge, which requires varying rod-lengths.

Normanby.—Length, 160 ft. ; roadway, 24 ft. Four 40 ft. simple spans on footing foundations, the whole being on a curve of 7½ chains radius. The centre-line of railway is on a skew of about 39½° to the bridge. For bridges on curves the details are greatly simplified if the piers and abutments can be made radial to the curve. This has been done by adopting what has been named the " step over " pier, which consists of columns outside the horizontal clearance-lines of the railway connected by a cap above the vertical clearance-line. The estimated cost is £2,600, or 13s. 6d. per square foot.

Kiwi.—Length, 200 ft. ; roadway, 24 ft. Four 50 ft. simple spans on footing foundations. The bridge is on the straight, but crosses a curve on the railway on a sharp skew. The piers have been kept square to the centre-line of bridge by adopting a " step over " pier, as in Normanby. The estimated cost is £3,579, and the cost per square foot, 18s. 6d.

Lorneville.—Length, 200 ft. ; roadway, 40 ft., with 4 ft. footway. Five 40 ft. simple spans on footing foundations. The bridge is on a curve of 25 chains radius, and the centre-line of railway is only slightly skewed. Piers and abutments are radial, which makes the details fairly straightforward. The wide roadway was adopted on account of the large amount of stock traffic. The estimated cost is £5,600, or about 13s. per square foot.

Acquisition of Gravel-deposits, etc.

In its last report the Board stated that intimation had been given to local authorities that in approved cases it would acquire metal-deposits, from which supplies could be drawn for highways purposes at cheaper unit rates. As previously explained, the object of this decision was to ensure

continuous supplies at reasonable cost, and to obviate the practice which had developed amongst local authorities of paying royalties, instead of exercising their statutory powers for acquiring deposits outright.

A number of areas have already been set aside, and negotiations are in progress for the acquisition of others.

Advances to Local Authorities.

The Board, during the year under review, continued its usual policy of advancing money to those local authorities which were unable to raise from other sources, their share of the cost of particular works which the Board was desirous of undertaking. Once again a considerable increase in the amount so advanced is recorded, the total number of agreements entered into last year being twenty-one, and the amount advanced being £24,523 12s. 9d., as compared with fourteen, totalling £18,938 10s. 9d., for the preceding year.

The total principal outstanding at 31st March, 1936, in respect of all advances made prior to that date was £89,799 3s. 11d.

Traffic-control.

Since last report the Board has continued to subsidize the cost of traffic-control carried out by approved groups on the lines which have been followed for some years. As the result of unsatisfactory conditions regarding enforcement of regulations governing traffic and transport services, the matter was discussed with the Transport Department, and the Board agreed to extend its activities in this connection by appointing additional Inspectors, and assuming, where possible, direct control in lieu of group control. Consequent upon this arrangement, new appointments were made and officers stationed at Okaihau and Stratford respectively. The subsidies previously paid to the Waikato, Waitomo, Rangiora, and South Canterbury groups were withdrawn and the group Inspectors taken over by the Board. The Waitomo Group Inspector had resigned through ill health, and the vacancy in this case was filled by the appointment of a new departmental Inspector.

Negotiations are in progress with other groups and the supervision of traffic enforcement by a centralized authority having Dominion-wide jurisdiction should produce a measure of uniformity not possible hitherto, and at the same time result in more efficient administration.

The testing of loadometers for any local authorities interested in traffic-control was continued, and, in addition, regular tests were made of the Board's own instruments.

The total number of Group Inspectors subsidized by the Board is now fourteen, while a similar number of traffic officers operate directly under the Board's control.

Signposting, Centre-line Marking, etc.

The cost of signposting carried out on main highways during the year ended 31st March, 1936, was subsidized at the rate of £3 for £1, the cost to the Board being £1,851 12s. 2d. The total amount contributed by the Board towards this work up to the date mentioned was £11,549 9s. 3d.

The marking of centre-lines on paved surfaces and the lettering of standard warning-notices on pavements adjacent to railway crossings and other dangerous locations have been extended.

Plant.

Local authorities have continued to make use of the facilities provided by the Board to enable them to obtain plant on the hire-purchase system, and an increase in these transactions has been recorded. The purchases for 1935–36 amounted to £18,090, as compared with £9,166 for 1934–35, £3,368 for 1933–34, and £1,117 for 1932–33.

Since the inception of this scheme plant to the value of £193,912 has been purchased, of which sum only £23,273 remained outstanding at the 31st March, 1936.

The items purchased during the year under this scheme were: Trucks, 6; power-graders, 10; planer and tractor, 1; crusher and elevator, 1; belt-conveyor and rotary screen, 1; portable screening and crushing plant, 1; tractor, 1.

The Board also purchased a quantity of new plant for its own use, as well as replacing some that had become obsolete. The following items were purchased: Tractors, 5; motor-cars, 5; road-planers, 3; trailer, 1; motor-lorries, 2; machine-saw, 1; machine-sharpener, 1; power-graders, 5; drilling-machine, 1; compressors, 2; crushers, 2.

Classification of Main Highways under the Heavy Motor-vehicle Regulations, 1932.

Provision exists in the Heavy Motor-vehicle Regulations, 1932, whereby road-controlling authorities are enabled to restrict the gross loading of heavy motor-vehicles according to the weight-carrying capacity of each road. This restriction is effected by means of classification which requires the prior approval of the Minister of Transport. It is essential that, having regard to the nature of its construction, a road should not be subjected to traffic loads of undue weight, otherwise considerable expenditure of public moneys is necessary for repair and maintenance. Although for some years many local authorities were reluctant to classify roads, the position now is that many miles of roads and highways are appropriately classified. There is no doubt that a system of classification for gross loads is of material assistance towards stabilizing maintenance-costs. The Board is making its best endeavours to co-operate with the Transport Department and local authorities, with a view to securing some measure of uniformity in the permissible loading on main highways, and progress in this direction

can be recorded. It may be stated that the general aim of the Board is to provide for a standard classification, so that rural main highways will carry gross loading up to 6½ tons for two-axled vehicles and up to 10 tons for multi-axled vehicles. Many highways are definitely below such a standard, but as funds permit, the foundations and general construction are being strengthened year by year, where traffic density justifies such action.

Stock Traffic on Main Highways.

With a view to facilitating the transfer of stock between the Poverty Bay and Bay of Plenty districts, and obviating inconvenience to both motorists and stock-owners, an endeavour was made to confine all through stock traffic to the highway via the Motu. By-laws were enacted which prohibited such through traffic from using the alternative route through the Waioeka Valley, where the road is of fairly recent construction and, though of ample width for vehicular purposes, is somewhat narrow for large mobs of stock. The Motu route has been used for very many years, and in point of distance is no longer than the Waioeka route.

It was held by a Court that these by-laws were unreasonable and therefore invalid. It appears that no special legislative provision exists for controlling stock traffic in country districts to the same extent as is possible in municipal areas. The Board is of opinion that the matter merits special consideration and, with the intention of submitting proposals to the Government, the New Zealand Counties' Association has been consulted. The association obtained the views of its constituent counties, and ascertained that by far the majority of replies favoured the Board's suggestions.

Suitable representations are being made to the Government, so that where an alternative route is available for stock traffic, a local authority may be able to make special by-laws, to prevent long-distance stock traffic from congesting vehicular routes.

Testing of Highway Materials.

The Board's Petrologist has continued the testing of road-metal and similar materials from numerous sources, and details of standard tests are shown in Table 6 appended to this report.

Subgrade soils have also been examined, and standard tests will be carried out as soon as the necessary equipment has been completely installed.

The Dominion Analyst has carried out, on the Board's behalf, numerous tests of tar, bitumen, road-oil, and emulsion, for surfacing-work.

Examination for Foremen and Overseers of Road Construction.

The tenth examination for foremen and overseers of road construction was held on the 30th October, 1935, and at twenty centres throughout the Dominion fifty-five candidates presented themselves. The examination is divided into two papers, one relating to general road construction and maintenance and the other to tar, bituminous, and concrete-road construction. Three candidates passed in both papers and twelve secured a partial pass by satisfying requirements in respect of only one paper. Of those who had previously obtained a partial pass, three were successful in completing the examination. Since the institution of the examination, it has been the Board's practice to withhold the issue of a certificate of competency until satisfied that the candidate has had reasonable practical experience in modern roadwork. During the year, certificates were issued to four candidates who had passed previous examinations and had, in the meantime, produced evidence of adequate practical experience, these candidated being B. L. Williscroft, M. J. Scally, A. S. Henry, and M. Winter.

The names of the candidates who passed or completed a pass at this examination are as follows, those to whom a certificate was issued being indicated by an asterisk: R. Jackman, *R. Hanna, *W. H. Claris, G. E. Berry, *P. S. Butler, *H. W. Stansfield.

Recent examinations have disclosed that comparatively few of the candidates had had practical experience of tar, bituminous, and concrete-road construction. It was therefore decided that, until a candidate had produced satisfactory evidence of at least one year's experience in this class of work, he should not be admitted for examination in paper No. 2.

Operation of Magnetic Truck.

The Board's magnetic truck, which was acquired for the purpose of clearing main highways of iron or steel puncture-producing articles, has been in operation in the North Island during the year, except for the period April to July, 1935, when the machine was out of commission owing to replacement of the engine unit. The length of road surface actually cleared from 29th July, 1935, to 31st March, 1936, was 1,514 miles, and the weight of material picked up by the magnet was 3,935 lb., which equals an average of 2·6 lb. to the mile cleared. This is a reduction when compared with the average of 3·25 lb. for the previous year. The machine was also occasionally hired to local authorities for use on roads other than main highways.

Declaration of New Main Highways and Adjustments.

In pursuance of section 11 of the Main Highways Act, 1922, the usual annual review of main highways was made during the year ended 31st March, 1936.

Recommendations by District Highways Councils included proposals for approximately 1,311 miles of new main highways, and for the revocation of 44 miles of the existing system. The Board, however, recommended the declaration of 542 miles 23 chains of new main highways, and the revocation of lengths totalling 47 miles 77 chains, these latter in some cases being merely formal cancellations, to facilitate the description or renaming of highways which were being extended or relocated.

Apart from the extensions and reductions arising from the recommendations of the District Highways Councils, a number of other alterations were made at the suggestion of the Board, most of which were in the nature of adjustments, or to meet special circumstances,

The following list shows the lengths of main highways which were declared during the year ended the 31st March, 1936, including adjustments.

Main Highways declared.

	Miles.	Chains.
No. 1 Highway District—		
Dargaville–Kaihu	10	6
Awanui–Kaiangaroa	4	41
Te Kopuru – Tikinui	8	16
Mititai–Tauraroa	23	4
Opononi Road	1	60
Mangonui – Cooper's Beach	1	0
No. 2 Highway District—		
Coromandel Wharf Road	0	70
Waiuku–Otaua	4	5
Ngatea–Waharoa via Morrinsville	16	32
Papakura–Kawakawa via Clevedon	9	60
Bucklands Beach Road	3	40
Carruth Road	1	12
Panmure–Otahuhu	2	45
Matamata Station Road	0	21
Great South Road (Newmarket Borough)	0	75
Taupiri–Morrinsville	6	0
Whatawhata – Te Rore	13	8
Hamilton–Tauhei via Gordonton	15	0
New Lynn – Huia via Brooklyn	11	0
No. 3 Highway District—		
Rotorua–Atiamuri	23	0
Whakatane Wharf Road	0	5
No. 4 Highway District—		
Hicks Bay Wharf Road	0	60
Gisborne – Tolaga Bay via Waimata	3	10
Gisborne–Opotiki via the Coast	2	40
Mangakino–Waiomatatini	0	55
Motu Front Road	8	0
No. 5 Highway District—		
Waipawa–Pourerere	0	79
Cole Road	0	46
Freelands Road	2	10
Tuki Tuki – Haumoana Beach	0	46
Elsthorpe–Kairakau	8	28
Neave–Harpham	0	58
Waipukurau Racecourse Road	2	72
Gisborne–Wairoa via Hangaroa (Wairoa Borough)	0	25
Napier–Gisborne via Wairoa (Wairoa Borough)	0	19
Wairoa Marine Parade	0	8
Greatford–Woodville	0	41
No. 6 Highway District—		
National Park Station Road	0	40
Taumarunui–Ongarue	30	20
Pio Pio – Mangaohae	16	40
No. 7 Highway District—		
Waihi Road (Hawera)	1	17
Opunake Beach Road	0	33
Mangaotuku Road	6	20
No. 8 Highway District—		
Marton Station Road	0	60
Waitotara Valley Extension	9	40
Otara Road	1	70
Raetihi–Ohura	6	0
Patea Beach Road	1	27
Wanganui River (Right Bank) Road	2	20
No. 9 Highway District—		
Paremata–Plimmerton	1	19
West Street	0	60
Shannon–Mangahao	7	33
Cheltenham – McKays Line	2	0
Johnsonville–Newlands	3	6
Feilding–Raumai via Colyton	2	44
Feilding – Cliff Road via Stanway	6	31
No. 10 Highway District—		
Pa Valley Road	6	10
Featherston–Martinborough	0	52
Featherston Station Road	0	66
Tutaekara Road	1	44
Chester Road	3	0

Main Highways declared—continued.

	Miles.	Chains.
No. 11 Highway District—		
Picton–Havelock via The Grove	23	55
No. 12 Highway District—		
Inangahua Junction – Weheka	8	30
Kumara – Arthurs Pass	5	72
Stafford Loop Road	10	48
No. 14 Highway District—		
Pigeon Bay Road	3	0
Okain's Bay Road	3	0
Kaiapoi–Tuahiwi	6	12
Leithfield Beach Road	0	75
Marshlands – New Brighton	1	17
Harewood Road	5	20
West Melton – Tai Tapu	13	32
Glenroy–Hororata	6	0
Aylesbury – Lake Coleridge	8	40
Ilam Road	2	35
Little River – Teoka Saddle	5	20
No. 15 Highway District—		
Arundel – Peel Forest Extension	4	20
Walnut Avenue	0	52
Tinwald–Mayfield via Westerfield	8	28
Rakaia–Methven via Barrhill	11	28
Timaru – Holm Station Bridge	8	8
Bluecliffs Road	3	40
Morven – Waihao River Bridge	2	0
Waimate – Waihao River Bridge	4	10
Albury – Burke Extension	7	8
No. 16 Highway District—		
Gore – Te Anau – Milford Extension	26	40
Port Chalmers – Waitati	6	18
Port Chalmers – Aramoana	6	72
Oturehua – Hills Creek	4	60
No. 17 Highway District—		
Kaitangata – Paretai Punt	5	40
Waikawa–Papatowai	13	10
Romahapa – Port Molyneux	2	50
Kaikorai Valley Road	0	38
Gladstone Road	4	25
Allanton–Outram	4	20
Roxburgh – Miller's Flat	10	0
Kelso–Tapanui	3	0
No. 18 Highway District—		
Wallacetown–Branxholm	2	21
Chatton–Waikaka	5	26
Waitane–Mataura	4	48
Woodlands South Road	3	29
Lindsay–Calcium	3	50
Half-moon Bay – Horse-shoe Bay	3	0
Total	564	6

The following list shows the lengths of main highways which were revoked during the year ended the 31st March, 1936, including adjustments:—

Main Highways revoked.

	Miles.	Chains.
No. 1 Highway District—		
Dargaville–Kaihu	17	28
No. 4 Highway District—		
Gisborne–Opotiki via the coast	1	48
Rotokautuku–Waiomatatini	0	65
No. 5 Highway District—		
Waipawa–Pourerere (Waipawa Borough)	0	62
Napier–Gisborne via Wairoa (Wairoa Borough)	0	25
No. 6 Highway District—		
Taumarunui–Taringamotu	12	0
Mairoa	10	0
No. 9 Highway District—		
Taonui–Raumai	3	24

Main Highways revoked—continued.

	Miles.	Chains.
No. 10 Highway District—		
Featherston–Martinborough	0	66
No. 11 Highway District—		
Blenheim–Christchurch via Parnassus	12	34
No. 12 Highway District—		
Inangahua Junction – Weheka	16	40
No. 14 Highway District—		
Christchurch – New Brighton via Wainoni Road	0	64
Aylesbury – Lake Coleridge	8	42
Total	85	18

In submitting its recommendations regarding alterations or extensions to the main highways system, the Board is influenced largely by the availability of funds from which subsidies and grants have to be provided. Wherever possible, additional highways are nominated, in order that State aid can be given towards the maintenance and improvement of relatively important roads in the various districts.

Generally speaking, the preliminary selections by District Highways Councils are reviewed prior to framing final recommendations. In some cases, however, it becomes necessary to declare as main highways roads which have been constructed from State funds, in order that the assets thus created will be preserved for public benefit. In the latter category a section of the Summit Road, Christchurch, and the Wanganui River Left Bank Road are recent typical examples.

In November, 1935, the boundaries of the No. 18 Highway District were altered to include Stewart Island County, thus enabling a road in that county to be declared a main highway.

PROGRESS REPORT.

The following statement shows the more important construction work carried out under the control of the Board during the year ended 31st March, 1936 :—

Waipapakauri–Maungatapere :—

Kawakawa Corner Flooding : A length of 30 ch., which was subject to frequent flooding, was reconstructed at a higher level.

Wells' Culvert : A 6 ft. by 4 ft. concrete culvert was completed, with approaches on improved alignment.

Okaihau–Kaitaia : Fifty-two blind corners were cut back, giving greatly improved visibility.

Waihou River Bridge : A concrete bridge of five 40 ft. spans, together with 18 ch. of approaches, was completed.

Auckland–Maungaturoro (No. 1 District) :—

Massey Road–Orewa : 2 m. 37 ch. was widened, and 60 ch. of top-course metal laid.

Orewa–Waiwera : 3 m. 61 ch. was reconstructed and metalled. The re-formation of the Waiwera Hill, on improved grades and alignment, was commenced.

Waiwera–Puhoi : The reconstruction of this length was put in hand ; 1 m. 13 ch. has been formed and 20 ch. of sandstone base-course placed.

Puhoi–Warkworth : The re-formation of Schedewy's Hill, Barker's Deviation, and Wilson's Deviation is in progress.

Warkworth–Dome : 1 m. 79 ch. of widening was completed and base-course metal laid.

Grimmer's Bridge : This bridge, of one 32 ft. span, was completed, on improved alignment.

Mission Culvert : An 8 ft. by 5 ft. concrete culvert was constructed.

Dome–Wayby : 51 ch. was re-formed and metalled. This, in conjunction with a stream-diversion, cuts out a narrow and tortuous section of the highway.

Wellsford – Te Hana : 40 ch. was widened and metalled. First-coat sealing was afterwards applied over this length.

Topuni–Maungaturoto : 12 ch. was raised, metalled, and sealed in one coat.

Lake Omapere–Maungaturoto :—

Kawakawa Flooding : The construction of a 54 ch. deviation above flood-level was put in hand. 30 ch. of embankment was completed and three temporary bridges constructed.

Whakapara Flooding : The embankment and concrete floodway have been completed.

Kamo–Hikurangi : 1 m. was reconstructed and 3 m. metalled in preparation for sealing.

McLeod's Deviation : This 62 ch. deviation, which eliminates two level crossings near Hikurangi, was put in hand ; the formation and half the metalling being completed at the end of the year.

Oakleigh–Waipu : The bituminous resurfacing of this section was completed.

Otamatea County : 1 m. between Grant's Corner (Maungaturoto) and the railway-station was re-formed and metalled in preparation for sealing.

Whangarei–Dargaville :—

Whangarei–Maungatapere : 1 m. of base-course metal was laid, and sealing put in hand.

Kirikopuni Bridge : This concrete bridge, of four 40 ft. spans, was completed.

Dargaville Borough : 1 m. 60 ch. received a first sealing-coat.

Dargaville–Maungaturoto : 19 ch. was sealed in Dargaville Borough.

Warkworth–Tauhoa.—Beresford's Bridge: This 50 ft. span concrete structure was completed.

Warkworth–Leigh.—Whangateau Bridge: A 20 ft. span concrete bridge has been erected.

Waimate–Kaeo–Mangonui:—

Kaeo Flooding: The construction of an embankment, to relieve the periodical isolation of Kaeo Township by floods, is in hand.

Oruaiti Culvert: A 7 ft. by 5 ft. concrete culvert was completed, and 20 ch. of approaches are in hand.

Kaukapakapa – Port Albert.—Wharchine Bridge: The former wooden structure was replaced by a concrete bridge of four 45 ft. spans, and 14 ch. of approaches formed and metalled.

Wellsford–Leigh:—

Barton's Bridge: The erection of a 40 ft. concrete bridge is in hand.

Salt's Bridge: This bridge is also being rebuilt in concrete.

Whangarei–Kiripaka.—Otangarei Culvert: A 10 ft. by 8 ft. concrete culvert has been constructed on a deviation.

Kaitaia–Motukaraka.—Onetoke Bridge: Two 15 ft. spans were added in place of a length of the approaches damaged by flood.

Pamapuria–Mangonui.—Fisher's Bridge Flooding: A 20 ch. length was lifted above flood level, and is being metalled.

Auckland–Maungaturoto (No. 2 District):—

Albany Bridge: A concrete-arch structure of a total length of 120 ft., together with its approaches, has been completed.

Birkenhead Borough: Widening of the paved surface has been carried out.

Great South Road:—

Mount Wellington Road District: An 8 ft. sealed shoulder was constructed, principally as a cycle-track.

Franklin County: The remaining bituminous-penetration shoulder-work on this length was completed, a length of 26 ch. being carried out.

Slippery Creek Bridge, 90 ft. long, and Leatham's Bridge, 40 ft. long, were completed, and approaches formed and metalled. 7 ch. of approaches were concreted at the former bridge, and 28 ch. sealed at the latter.

A contract was let for bituminous-penetration surfacing over a length of 4 m. 74 ch., 2 m. 2 ch. of which was completed.

Ngaruawahia Borough Section, of 2 m. 17 ch., was reconstructed, and sealed in one coat; a contract was also let for plant-mix surfacing over this length.

Waipa County: The work between Ngaruawahia and Hamilton was completed, a length of 5 m. 34 ch. being sealed this year. A contract was let for placing plant-mix surfacing on this section, and 6 m. 55 ch. completed. Between Hamilton and Ohaupo two contracts covering a length of 10 m. 31 ch. were let, 9 m. 24 ch. of reconstruction and metalling and 5 m. 18 ch. of sealing being completed. Between Te Awamutu and Otorohanga a contract covering 2 m. 14 ch. was let, and 44 ch. of formation completed. A bridge 228 ft. long is under construction at the Puniu Stream.

Te Awamutu Borough: The widening of 1 m. 26 ch. was carried out.

Auckland–Helensville–Waiwera:—

Waitemata County: A length of 4 m. 76 ch. has been constructed and sealed. Contracts for formation over a further 3 m. 30 ch. are in progress.

Punganui Bridge, 120 ft. long, and Wright's Bridge, 50 ft. long, with approaches, have been completed.

Helensville Town District: The reconstruction and sealing of 45 ch. were completed.

Kumeu–Albany.—Waitemata County: The Riverhead Bridge, a 250 ft. concrete structure of five spans, with its approaches, has been completed.

Pokeno–Waihi.—Franklin County: The Mangatawhiri Stream Diversion was completed.

Hauraki Plains County: A contract has been let for the reconstruction and sealing of 7 m., and $3\frac{3}{4}$ m. of reconstruction carried out.

A contract was let for the construction of the Waitakaruru Canal Bridge, 90 ft. long, and the work is well in hand.

Ohinemuri County: A small bridge was destroyed by flood at Waikino, and replaced with a 6 ft. by 6 ft. concrete culvert. The widening on this section has been continued, and the improvement of the Karangahake Gorge put in hand. The work is principally in rock cutting, with high batters, and massive stone walling adjoining the river.

Level crossing elimination near Waihi: A contract was let for the elimination, by a 70 ch. deviation, of a highway level-crossing, an unsatisfactory subway, and a level-crossing on a by-road. The formation of the first 34 ch., including the placing of all culverts, has been completed.

Waihi Borough: A contract has been let for a new concrete bridge over the Ohinemuri River, and work is in hand.

Pipiroa–Coromandel:—

Thames County: From Waihou Bridge to Kopu, a length of 52 ch., has been sealed in two coats.

Thames Borough: The whole length of Queen Street, 1 m. 20 ch., has been sealed in one coat. This represents the complete surfacing of the urban portion of the section.

Kopu–Raglan :—

Thames County : A contract was let for reconstruction and sealing between Puriri and Kopu, a distance of 4 m. 20 ch. Reconstruction was practically completed, and 1½ m. between Puriri and Matatoki sealed in one coat.

Ohinemuri County : The section between Thames County boundary and Paeroa received a second-coat seal during the year. Between Paeroa and Tirohia, a distance of 4½ m., was also given a second coat. A contract was let for two-coat sealing between Tirohia and Te Aroha, a distance of 7 m., and the work was completed, making the sealing continuous from Hikutaia through Paeroa and Te Aroha to Morrinsville. The reconstruction and metalling of 1 m. 50 ch. near Waitoki was carried out. A new bridge 25 ft. long was constructed over the Patuwhao Stream near Mangaiti. Level-crossings at Mangaiti Station and Mace's were re-formed to easy curves, metalled and sealed.

Waikato County : A further 15½ ch. of the Hinton's Gully deviation was completed during the year, and the whole deviation of 68½ ch. opened for traffic. 2 m. 30 ch. of sealing, west of Eureka Station Road, was carried out.

Waipa County : The reconstruction of this section, 5 m. 51 ch. in length, is in hand.

Hamilton–Rotorua :—

Cambridge Borough : The sealing of 14 ch. was carried out.

Matamata County : A total length of 7 m. 10 ch. was sealed during the year.

Waitoa–Taupo :—

Piako County : A contract was carried out for the reconstruction and two-coat sealing of 3 m. 30 ch.

Matamata County : Second-coat sealing was applied to 1 m. 73 ch. between Tirau and Putaruru.

The Mangawhero Stream Bridge, of one 25 ft. span in concrete, was completed.

A concrete bridge, of one 40 ft. span, has been constructed over the Oraka Stream at Putaruru.

Matamata–Tauranga :—

Matamata County : The Mangawhero Stream Bridge, of one 40 ft. and two 10 ft. concrete spans, was completed.

A concrete culvert, 9 ft. by 8 ft., was built to replace a small bridge east of the Waihou Stream, and 28 ch. of deviation formed and metalled.

Papakura–Kawakawa, via Clevedon :—

Manukau County : Black's Bridge, consisting of one 35 ft. concrete span, with approaches, was completed.

A contract was let for the construction of the Waitarata Bridge and approaches, on the newly-declared length of this highway.

Drury–Awhitu, via Waiuku.—Franklin County : Alignment was straightened and sealing carried out on a length of 1 m. 69 ch. between Pukekohe and Paerata.

Takapuna–Silverdale.—Waitemata County : Reconstruction and sealing were completed over a length of 62 ch.

Te Aroha – Waharoa.—Piako County : Reconstruction and sealing were carried out over a length of 3 m. 60 ch.

Mount Albert – Royal Oak.—Mount Roskill Road District : A contract has been let for the reconstruction and concrete paving of a length of 34 ch., 12 ft. wide.

Te Awamutu – Barton's Corner.—Waipa County : From Te Awamutu Borough to 7 ch. south of Puniu Bridge, 117 ch. of two-coat sealing was completed.

Henderson–Kumeu, via Swanson :—

Henderson Town District : Reconstruction was commenced, and 20 ch. of base-course metal laid.

Waitemata County : The reconstruction of 57½ ch. was commenced.

Kaukapakapa – Port Albert.—Waitemata County : The approaches to the Waitangi Bridge were completed, and the erection of the Makarau Bridge, consisting of one 8 ft. and two 30 ft. spans, together with its approaches, was carried out.

Waikumete – West Coast :—

Glen Eden Town District : Reconstruction was carried out over a length of 1 m. 43 ch.

Waitemata County : 60 ch. of reconstruction was put in hand.

Te Kauwhata – Waitakaruru.—Waikato County : Rock's deviation, 16 ch. in length, was completed.

Papakura–Hunua.—Franklin County : A contract has been let for Lockwood's Bridge, a single 18 ft. concrete span.

Papatoetoe–Howick :—

Papatoetoe Town District : Second-coat sealing was applied on a 13 ch. length.

Manukau County : Two-coat sealing is in hand.

Howick–Manurewa.—Manukau County : Kimpton's and Hunterville Bridges, of one 32 ft. and one 20 ft. span respectively, were erected.

Tuakau–Onewhero.—Raglan County : 90 ch. was sealed in two coats.

Ngatea–Waharoa, via Morrinsville :—

Piako County : Reconstruction and sealing were carried out for a length of 1 m. 30 ch. northwards from Tahuna Township ; 2 m. from Hangawhera Road to Tauhei Road, and 2 m. eastward from Walton Township.

Matamata County—Waitoa Stream Bridge : A concrete bridge of two 20 ft. and one 25 ft. spans, with 10 ch. of approaches, was completed.

Tuakau–Pokeno, via Whangarata.—Tuakau Town District : A contract for sealing a length of 48 ch. was carried out.

Waihi Beach.—Waihi Borough : Three corners on the Gorge section were straightened to one easy curve by two heavy cuttings and a fill. In addition, a length of 12 ch. near the Beach on a high fill was widened to 24 ft.

Ngatea–Turua.—Hauraki Plains County : A contract was let for reconstruction and sealing of the unsealed length of 1 m. 56 ch., and reconstruction completed.

Waihi–Tauranga.—Tauranga County : 56 ch. was sealed in two coats, and 2 m. 32 ch. received a second coat.

Tauranga–Whakatane :—

Tauranga County : 82 ch. of second-coat sealing was applied, and 3 m. sealed in two coats.

Twin Bridges : A 24 ft. span concrete bridge was erected, replacing two small wooden bridges.

Atuaroa Bridge : This single 40 ft. concrete span was completed.

Whakatane County : 28 ch. of two-coat sealing in Matata Township was carried out.

Gisborne–Whakatane, via Motu :—

Whakatane County—Roberts' Culvert and Deviation : An 8 ft. by 6 ft. concrete culvert was installed to replace a small bridge, and 35 ch. of deviation formed and metalled.

Nukuhou Bridge : A concrete bridge, 72 ft. long, was completed.

Waiotahi Bluffs : Three groynes, each 165 ft. long, were erected to protect the highway from sea-erosion. Stone-pitching of the toe of the bank is also to be carried out.

Hamilton–Rotorua (No. 3 District).—2 m. 10 ch. of deviation was formed and metalled and 8 m. 24 ch. of two-coat sealing carried out.

Rotorua–Napier (No. 3 District) :—

Rotorua County : 5 m. of two-coat sealing was completed.

Wharepapa and Mangakara Bridges : These concrete bridges, each of one 30 ft. span, were erected.

Mangahoanga Bridge : The existing bridge was replaced with twin 5 ft. concrete pipes.

Taupo Township : 3 m. 28 ch. of two-coat sealing was completed.

Waitoa–Taupo (No. 3 District).—Mangaharakeke Bridge : A concrete bridge of one 30 ft. span was erected.

Rotorua–Whakatane :—

Rotorua County : 5½ m. of two-coat sealing was completed.

Puarenga Bridge : This 40 ft. span concrete bridge was completed.

Wingaiti Bridge : A single 20 ft. span concrete bridge was erected, replacing an old bridge.

Whakatane County—Reid's Drain Bridge : The old bridge was replaced by an 8 ft. span concrete bridge 66 ft. wide.

Maungaroa Bridge : A 6 ft. by 6 ft. concrete culvert was installed to replace this bridge.

Gisborne–Opotiki, via Coast (No. 3 District).—Oruaiti Bridge : This bridge having been carried away by a slip, an 8 ft. by 4 ft. concrete culvert was built in its place.

Rotorua–Tauranga (Direct).—Tauranga County : 4 m. was widened and metalled.

Papamoa – Mount Maunganui.—2 m. was widened and 1 m. metalled.

Rotorua–Atiamuri.—1½ m. was metalled and 5 m. coated with pumice.

Gisborne–Opotiki, via Motu :—

Cook County : The reconstruction of 2½ m. was completed, and the length sealed in two coats.

Waikohu County : The metalling and sealing of ¾ m. through the Te Karaka Township was completed.

Gisborne–Wairoa, via Morere.—Cook County—Wharerata Hill : Reconstruction over a distance of 2¼ m. has been continued.

Gisborne–Opotiki, via Coast (No. 4 District) :—

Cook County : 4 miles to 6 miles : The contract for reconstruction and sealing of 2 m. was completed.

Tatapouri Deviation : This 45 ch. deviation has been completed.

Gisborne–Wairoa, via Hangaroa :—

Cook County : 6 m. 56 ch. to 44 m. : The sealing of 3 m. 8 ch., and the reconstruction of a further length of 3 m. have been carried out.

Harris Hill—Reconstruction : The metalling of this section was completed, the length being 3 m. 44 ch.

25 m. to 25 m. 64 ch. : This section was reconstructed and metalled.

25 m. 64 ch. to 27 m. 64 ch. : Improvements to grade, width, and alignment are in progress, 1½ m. being completed.

24 m. 64 ch. to 43 m. 20 ch. : Five small timber bridges have been replaced by pipe culverts. Improvements to alignment and width have been effected in conjunction with these replacements.

Patutahu–Rere :—
Cook County : 1 m. 31 ch. of formation and ½ m. of metalling have been carried out.
An old wooden bridge has been replaced by a 10 ft. by 6 ft. concrete culvert.
Waikohu County : A 7 ft. by 6 ft. concrete culvert has been constructed.

Takapau–Ihungia.—Waiapu County : The Makarika Stream bridge, comprising three 40 ft. steel-joist spans on concrete piers, with concrete deck, has been erected.

Hicks Bay Wharf Highway.—The construction of a 250 ft. concrete bridge over the Wharekahika River was commenced.

Napier–Gisborne, via Wairoa, Hawke's Bay County :—
Napier Borough Boundary to Te Ngaru Crossing : A deviation 40 ch. in length, avoiding the Whirinaki Hill and eliminating six sharp curves, is nearing completion.
Te Ngaru Crossing to Tutira : The widening of this section has been completed.
Tutira to Waikare : Extensive widening and metalling have been carried out.
Wairoa Borough : 67 ch. was reconstructed, and sealed in two coats.

Napier–Wellington, via Wairarapa (No. 5 District) :—
Hawke's Bay County : This section, which had broken up badly, was metalled for a length of 1¾ m. and sealed in two coats.
A concrete bridge of 30 ft. span was built at Pakipaki, also a 6 ft. concrete pipe culvert, works which replaced two narrow wooden bridges.
Waitangi Washout Bridge : This bridge, consisting of twenty 40 ft. concrete spans with a 24 ft. deck, together with its approaches, was completed. The bridge eliminates two level-crossings.
Waitangi Stream Bridge : The construction of this fifteen-span bridge is in progress.
Waipawa County : A length of 3 m. 21 ch., from Waipawa Borough to Otane, was reconstructed and sealed.
Waipukurau County : The sealing of 2 m. 66 ch. was completed.
Dannevirke County : Manawatu Hill Deviation : The formation of this deviation, 66 ch. long, is nearing completion.
Woodville County : A deviation of 4½ ch. at Papatawa railway-crossing was completed.
1 m. of original sealed surfaces has been reconstructed, in preparation for improved surfacing.

Rotorua–Napier (No. 5 District) :—
Hawke's Bay County : Widening has been carried out between Maori Gully and Te Pohue, and is in hand near Glengarry.
Mohaka Bridge – Rangitaiki River : A 6 ft. by 4 ft. water-drive, 76 ft. long, was put in at Peka Creek, to replace the existing bridge.
The Waipunga River Bridge, consisting of one 40 ft. and two 20 ft. steel-joist spans, was completed.

Napier–Hastings, via Fernhill.—A contract for metalling and sealing 5 m. 10 ch., from the Redclyffe Bridge to Fernhill, was carried out.

Otane–Tukituki, via Elsthorpe.—Hawke's Bay County : A 40 ft. concrete bridge was constructed over the Oho Stream.

Waipawa–Tikokino.—A length of 1 m. at the Waipawa end was reconstructed and sealed.
Two-mile Creek Bridge : A contract has been let for the erection of this bridge.

Waipawa–Ongaonga.—1 m. was sealed in one coat.

Dannevirke–Waipukurau, via Porangahau :—
Waipukurau County : The contract for sealing 1 m. 59 ch. was completed, and a further contract let for 2 m. 76 ch., of which 2 m. 40 ch. has been completed.
Patangata County : The Kokomoko Bridge, of one 40 ft. concrete span, was erected.
Weber County Section, Morgan's Bridge and Approaches : Contracts for these works are in progress.

Dannevirke–Waipukurau, via Porangahau.—Dannevirke County : 3 m. of two-coat sealing was carried out.

Hastings–Maraekakaho.—2½ m. was reconstructed and metalled.

Ruakituri Valley.—Te Reinga Bridge: The erection of a 278 ft. suspension bridge, to replace the existing bridge, is in hand.

Waipawa–Pourerere :—
Patangata County : The erection of Logan's Bridge was completed, the structure comprising three 45 ft. concrete spans.
Two culverts of 11 ft. span were erected.

Waipukurau–Matamau, via Hatuma :—
Waipawa County : 1 m. through the Takapau Township has been sealed.
Waipukurau County : 1 m. 55 ch. has been prepared, and a contract let for the sealing.

Mangateretere – Te Awanga :—
2 m. at the Mangateretere end was reconstructed, and sealed in two coats.
An 8 ft. span concrete culvert was put in at Muddy Creek.

Petane–Eskdale.—This highway was reconstructed, and sealed in two coats.

Takapau Saleyards :—
This highway, 36 ch. in length, was reconstructed in preparation for sealing.

Takapau West:—

Reconstruction of the full length of 72 ch., in preparation for sealing next year, was carried out.

Hastings–Waimarama:—

Hawke's Bay County: A 28 ch. deviation, with an 8 ft. span concrete culvert, was put in at the western end of the Tukituki River Bridge.

A new concrete bridge over the Waipuka Stream was completed.

Auckland–Wellington, via Taranaki (No. 6 District).—Te Kuiti – Pio Pio Section: This length has been reformed, metalled, and prepared for sealing, the contract for which has been let.

Te Kuiti – Bulls, via Taumarunui (No. 6 District):—

Mangaiti Turnoff – Mapiu Gates: 1 m. 20 ch. of re-formation was completed, and base-course metalling commenced.

Manunui Town District: 1 m. 30 ch. of re-formation and metalling was completed, in preparation for sealing.

Stratford–Taumarunui (No. 6 District).—Between Taumarunui and the Ohura County boundary the elimination of two sharp corners is in hand.

Raurimu – Wade's Landing.—Meade's Bridge: This bridge, 35 ft. in length, of steel joists on concrete abutments, was completed.

Pio Pio – Tatu.—2 m. of re-formation, terminating at the Waitewhena Stream Bridge, was completed.

National Park – Taupo.—National Park – Tongariro River Bridge, Otukou Deviation: 1 m. 30 ch. of re-formation was completed, and 1½ m. coated with shingle.

Manunui–Owhango.—1 m. of re-formation was completed between Manunui and the Victory Bridge.

Auckland–Wellington, via Taranaki (No. 7 District):—

Clifton County: A short deviation on Mount Messenger has been completed.

In the Mimi Valley a further 60 ch. of the deviation has been formed and 103 ch. metalled.

The formation of a deviation near the Okoke Road Junction is in hand, 33 ch. of formation and 18 ch. of metalling being completed.

The Urenui Hill Deviation has been completed by the metalling of 26 ch. north of Urenui. 2 m. 41 ch. between Urenui and the Ohanga Road Junction has been prepared, and sealed in one coat.

Taranaki County: At Lepperton Junction a 13 ch. deviation has been formed, metalled, and sealed.

Hawera County: 24 ch. of formation of the Tangahoe Deviation was carried out, and at the end of the year the Tangahoe Stream Bridge was nearing completion.

Lepperton Junction – Hawera, via Opunake:—

40 ch. of new formation, providing improved alignment of the Oakura Hill section, has been completed.

Egmont County: A contract has been let for the construction of a new bridge over the Ouri Stream.

New Plymouth – Kaimata.—The formation, metalling, and sealing of a deviation 36 ch. in length, west of the Waiwakaiho River, and the reconstruction and sealing of a further 57 ch., have been carried out.

Opunake–Eltham.—Eltham County: The bituminous surfacing has been widened to 18 ft. over a 40 ch. section, east of Kaponga.

Stratford–Taumarunui (No. 7 District):—

The formation of a short deviation at the foot of the Whangamomona Saddle was completed.

The Makahu and Rackohua Stream bridges, of 35 ft. and 20 ft. spans, have been erected, and the construction of a concrete bridge of one 16 ft. and two 45 ft. spans, at the Mangapapa Stream, is in hand.

The Moki Saddle tunnel was completed early in the year, and 15 ch. of approach-road formed.

Skeet Highway.—1 m. 70 ch. of bituminous surfacing was widened to 15 ft.

Ohawe–Skeet.—3¼ m. of bituminous surfacing was widened to 14 ft.

Flood Damage.—On the 9th January and 2nd February, 1936, disastrous floods caused a great deal of of damage in the district, twelve bridges and concrete culverts being either destroyed or seriously damaged. Restoration works are well in hand.

Auckland–Wellington, via Taranaki (No. 8 District):—

Patea County: The reconstruction and metalling of 33 ch. of the Manawapou Hill, and the reconstruction of 25 ch. of the Whenuakura Hill were completed. The reconstruction of 52 ch. of the Waitotara Hill is well advanced.

Waitotara County: The metalling of 1 m. 32 ch. was completed, and a contract let for the reconstruction of 62½ ch. Sealing, in one coat, of 1 m. 51 ch. at Maxwell and 11 ch. on the Kai Iwi Hill, was carried out. A second sealing-coat was applied over a further length of 60 ch.

Rangitikei County: Glasgow's Deviation, 54 ch. in length, was sealed in one coat, thereby completing the sealing of the county section.

Te Kuiti – Bulls, via Taumarunui (No. 8 District) :—

Tohanga Road Section : 6 ch. of reconstruction and 1 m. 36 ch. of metalling were carried out, and a contract let for the construction of the Rongokaupo Stream Culvert.

Rangitikei County : The reconstruction of 8 m. of the Mangaweka-Utiki section was put in hand.

Greatford–Bulls Section : The reconstruction and base-course metalling of 3 m. 50 ch. and the installation of a 10 ft. by 4 ft. concrete culvert at Greatford were carried out. 10 ch. in Ohingaiti Township was sealed, a wooden bridge was replaced by a 4 ft. pipe culvert, and a contract was let for the widening of the Porewa Stream Bridge.

Taihape Borough : The reconstruction of two lengths, totalling 1 m. 46 ch., has been commenced.

Kaharoa Highway.—A length of 30 ch. was sealed.

Kohi Highway.—43 ch. in Kohi Gorge was re-formed, metalled, and 38 ch. prepared for sealing.

Rangitatau East and Watershed Highway.—Metalling was continued over a length of 3 m. 50 ch. between Kauarapaoa Road and Ahuahu Road. A length of 1 m. remains to complete this highway as an all-weather road.

Wanganui–Horopito :—

Wanganui County : 2 m. of widening, 1 m. 45 ch. of regrading, 1 m. 37 ch. of metalling, and 38 ch. of fencing were carried out on the hill section.

2 m. 4 ch. between Wanganui East and Upokongaro was reconstructed and metalled in preparation for sealing.

Pipiriki–Raetihi–Ohakune :—

Ohakune Borough : 2 m. 26 ch. was reconstructed and sealed, and the Mangateitei Stream Bridge, a rigid-frame concrete structure of 45 ft. span, was erected.

Raetihi Borough : 7 ch. was regraded on the approach to the Makotuku Stream Bridge, and 8½ ch. widened near the western boundary.

Wanganui–Karioi.—Wanganui County : At 30½ m. a large concrete pipe culvert, 90 ft. long, and a water-drive, 90 ft. by 9 ft. by 5 ft. at Chimney Creek have been put in, to replace old timber bridges. 40 ch. of re-formation and metalling in preparation for sealing was carried out.

Awahuri–Mangaweka, via Kimbolton (No. 8 District).—Mangaweka Town District : The Mangateweka Stream Bridge, a 30 ft. concrete span, was completed.

Waverley Beach Highway.—Patea County : 33 ch. of metalling was carried out.

Turakina–Cliff Road, via Marton.–Rangitikei County—Turakina–Marton Section : A contract was let for the re-formation and metalling of 8 m. 38 ch., and at the end of the year 2 m. 14 ch. of reconstruction and base-course metalling were completed. Two concrete culverts were installed, one at Bonny Glen and the other near Fern Flats Junction.

Waitotara Valley Highway.—Waitotara County : 15 ch. of widening near Waitotara and on Parekama Hill has been completed.

Wellington–Auckland, via Taranaki (No. 9 District) :—

Makara County—Porirua–Paremata Section : The realignment of this section was completed by the construction of 8 ch. of formation and 63 ch. of metalling on deviations. The whole length of 75 ch. received a coat of tar-primer.

Manawatu County—Whirokino Section : The deviation and raising of this 2¾-mile section, between the Manawatu River and Foxton, which has been flooded on numerous occasions, has been put in hand. Included in the proposal is the renewal of the Whirokino Bridge, of 550 ft., and the construction of a concrete viaduct 55 ch. in length.

Himatangi–Sanson Section : At Himatangi 40 ch. was prepared for sealing and a tar-primer applied.

From Sanson southwards, 5 m. of reconstruction and road-mix bituminous surfacing has been completed.

Sanson–Bulls Section—Piakatutu and Makowhai Bridges : These concrete bridges, each of one 20 ft. span, were completed.

Wellington–Napier, via Wairarapa (No. 9 District).– Akatarawa–Rimutaka Summit : On the Mungaroa Hill 46 ch. of heavy widening on a narrow section was carried out.

Awahuri–Mangaweka, via Kimbolton.—Kiwitea County : Between Cheltenham and Kimbolton 3 m. 75 ch. has been reconstructed, and of this length 3 m. 35 ch. was tar-primed and sealed in one coat.

Feilding–Cliff Road, via Stanway.—Feilding Borough : 54 ch. was prepared, tar-primed, and sealed in one coat.

Levin – Palmerston North, via Shannon :—

Horowhenua County—Waoku Bridge and Deviation : This concrete bridge, of one 32 ft. span, was completed, also a 14 ch. deviation at the bridge-site.

Ihakara Hill : South of Shannon an unsurfaced gap of 3 m. is being prepared for sealing.

Mangaore Bridge : This bridge, comprising two 30 ft. concrete beam-spans, was completed.

Ashhurst–Pohangina.—Oroua County : 3 m. has been reconstructed, and 40 ch. primed.

Upper Hutt – Waikanae.—Widening near Akatarawa : Widening was continued during the year, a length of 1 m. 10 ch. being completed, and 62 ch. metalled.

Longburn–Rongotea.—In the Rongotea Township preparation, tar-priming, and one-coat sealing were completed over a length of 40 ch.

Bunnythorpe–Kairanga.—2 m. has been reconstructed, tar-primed, and sealed in one coat. The whole of this highway is now sealed.

Pahautanui–Plimmerton.—In the Plimmerton Township 25 ch. was prepared, tar-primed, and sealed.

Pohangina Valley – Apiti.—Pohangina County—Porewa, Te Ekaou, and Opawe Bridges: These three concrete bridges, two being of 30 ft. and the last of 50 ft. span, were erected.

Otaki Beach Highway.—Otaki Borough: 2 m. 56 ch. has been prepared for sealing, and has received a coat of tar-primer.

Paremata–Plimmerton:—

1 m. of formation of this new highway has been completed. A length of 20 ch. is still in hand.

Paremata Bridge: This concrete bridge over the Porirua Harbour, between Paremata and Plimmerton, consisting of nine 50 ft. spans, is in hand. At the end of March 200 ft. had been erected, and the bridge is now nearing completion.

Wellington–Napier, via Wairarapa (No. 10 District):—

Rimutaka Summit – Featherston: 1 m. 11 ch. of widening in rock was carried out on a narrow length of the Rimutaka Hill.

Wairarapa South County: The northern abutment of the Waiohine Bridge is being protected by placing large concrete blocks.

Masterton County: At the north end of this section 41 ch. of widening and preparation for sealing were completed, also 18 ch. of deviations.

Mauriceville County: Preparation for sealing was completed over a distance of 3 m. 31 ch., and of this 30 ch. was tar-primed and sealed in one coat.

Eketahuna County: Preparation was completed over a length of 2 m. 33 ch., and 50 ch. tar-primed and sealed in one coat.

Pahiatua County: 8 m. of preparation and 2 m. 73 ch. of tar-priming and first-coat sealing were completed.

Pahiatua–Akitio, via Pongaroa:—

Pahiatua County: Heavy widening was carried out for a length of 37 ch. in the Makuri Gorge. Some of this work comprised the restoration of earthquake damage.

Hotel Bridge: A contract has been let and work is in hand on this concrete bridge, of one 34 ft. arched span.

Akitio County.—Gichards Bridge, of one 28 ft. concrete span, was erected.

Lodge Bridge, of similar construction, has also been completed.

Wareware Bridge, of one 30 ft. concrete span, has been erected, and Meech's culvert, 8 ft. by 6 ft. by 97 ft. long, is in hand.

Masterton–Weber, via Alfredton:—

Mauriceville County: Widening and raising above flood-level were carried out over a length of 53 ch.

Eketahuna County: A contract is in hand for Napier's Bridge, comprising one 45 ft., two 42 ft., and one 33 ft. concrete spans.

Widening was completed over a length of 16 ch.

Akitio County, Kohiku Bridge: This 30 ft. concrete bridge is in course of erection.

Masterton–Castlepoint, via Tinui:—

Masterton County: The Wangaehu Overflow Bridges at 2·2 m. and 2·3 m. were completed.

Castlepoint County: A contract for a 20 ch. deviation is in hand.

Masterton–Stronvar, via Weraiti.—Masterton County: The Wangaehu Overflow Bridge at 0·6 m. has been completed. The Awatiritiri Bridge was replaced by a concrete culvert 9 ft. by 9 ft. by 48 ft. long.

Martinborough–Masterton, via Gladstone:—

Featherston County: Preparation was completed over a length of 69 ch., and 1 m. of tar-priming and one-coat sealing applied.

Masterton County: Preparation, tar-priming, and one-coat sealing were carried out over a length of 2 m. 58 ch.

The Makoura Stream Bridge, of one 25 ft. concrete span, was completed.

Tupurupuru – Te Wharau.—Wairarapa South County: The Deep Creek Bridge, of one 55 ft. arched concrete span, was constructed.

Carterton–Longbush.—Wairarapa South County: A bridge at 0 m. 35 ch., of one 9 ft. concrete span, was completed, and contracts are in hand for the renewal of three other small bridges on this highway.

Martinborough–Awhea.—Featherston County: 40 ch. of preparation for sealing was carried out.

Martinborough – Lake Ferry:—

Featherston County: The preparation of 2 m. 22 ch. and the priming and one-coat sealing of 2 m. 13 ch. were completed.

Perry's Bridge, of two 13 ft. concrete spans, and Kelly's Bridge, of one 12 ft. concrete span, have been erected.

Kahautara Highway.—Featherston County: Tar-priming and one-coat sealing were carried out over a length of 3 m. 32 ch. William's Bridge was replaced by a concrete box culvert.

Featherston – Pigeon Bush.—Featherston County: Preparation, priming, and one-coat sealing were completed over 45 ch.

Pahiatua Station Highway. — Pahiatua County: 1 m. 2 ch. of preparation, priming, and one-coat sealing was carried out, completing the sealing of this highway.

Ponotahi Highway.—Featherston County: Tar-priming and one-coat sealing were applied over a distance of 55 ch.

Rimu Highway.—Akitio County: Robertson's Bridge, of one 35 ft. concrete span, was completed.

Te Ore Ore–Bideford.—Masterton County: The Tauera River Bridge, comprising two 50 ft. and one 60 ft. concrete spans, was erected.

Mangaone Valley Highway:—

Eketahuna County: A contract was let and work commenced on Godfrey's Bridge.

Pahiatua County: 15 ch. of widening was carried out.

The Mangaone River Bridge, comprising one 80 ft. concrete arch span and two 33 ft. land-spans, was completed.

Pahiatua Borough: Preparation, tar-priming, and one-coat sealing were carried out over a length of 44 ch.

Blairlogie–Langdale.—Masterton County: 30 ch. of heavy widening was completed.

Picton–Bluff (No. 11 District):—

Picton Borough: 20 ch. has been prepared for sealing.

Marlborough County: The Long Gully Culvert, consisting of triple 42 in. iron pipes, 40 ft. long, and the formation and metalling of 17 ch. of approaches were carried out.

Awatere County: The construction of the Hog Swamp Bridge Deviation, involving the formation and metalling of 20 ch., has been completed. A contract for the erection of the bridge is in progress.

60 ch. of widening was carried out between Dashwood and Awatere Bridge, and scrub protective work placed at Kekerangu Beach.

Blenheim–Nelson:—

Marlborough County: Raising formation at Canvastown: This work, comprising the raising of 16 ch. on the Blenheim side of the Wakamarina Bridge and 11 ch. on the Nelson side, is in hand.

Marriott's Creek Culvert: This work, comprising the construction of a 10 ft. span concrete culvert, together with the formation and metalling of 5½ ch. of approaches, and the construction of 10½ ch. of creek diversion, has been completed.

Waimea County: Collins and Whangamoa Valleys: This work has been extended to include the whole of the section from the Rai Saddle to the foot of the Whangamoa Hill on the Nelson side, a total distance of 18 m.

During the year 9 m. 36 ch. of widening and improvement to grade and alignment have been completed, together with 6 m. 21 ch. of base-course and 4 m. 55 ch. of top-course metalling.

Nelson–Inangahua (No. 11 District):—

Waimea County.—Richmond–Belgrove Section: Bituminous plant-mix surfacing has been applied over a distance of 13 m. 52 ch. This makes the length of continuous sealing on this highway, from Nelson City, 21 m. 28 ch. Twin 30 in. pipe culverts have been installed at several creeks on this section, replacing fords and obsolete structures.

Foxhill–Glenhope Section: Newport's Creek Bridge: This 13 ft. span concrete bridge has been erected.

Tunnicliffe's Gully Bridge, a 35 ft. concrete beam span, together with the protection of the abutments by stone crates, and the formation and metalling of 5 ch. of approaches, have been completed.

Moorhouse Creek Bridge, comprising a concrete beam span, and the formation and metalling of 5 ch. of approaches, has been completed.

Little Hope Stream Bridge: The construction of this 31 ft. concrete bridge was carried out.

Hope Saddle–Kawatiri: The widening and improvement to grade and alignment on the Hope Saddle was extended to cover the section to Kawatiri. During the year 5 m. 68 ch. has been completed, together with two short deviations. Base-course metalling has been completed over 4 m. 48 ch. and top-course over 1 m. 74 ch.

Murchison County.—Kawatiri Creek Bridge: The erection of a 23 ft. concrete span and the formation and metalling of 7 ch. of approaches have been put in hand.

Owen River Bridge Approaches: The approaches, including a deviation, cover a distance of 30 ch., and of this 17 ch. was constructed during the year, together with approaches to the Owen River East Bank Road, and the installation of two pipe culverts. The work has been completed.

Kerr's Creek Culvert: This work included the construction of an 8 ft. by 8 ft. concrete culvert, 2 ch. of creek diversion, and the formation and metalling of 3 ch. of approaches, and has been completed.

Staircase Creek Culvert: The erection of a 6 ft. by 4 ft. concrete culvert, the construction of 1 ch. of creek diversion, and the formation and metalling of 2½ ch. of approaches have been carried out.

Buller Gorge: The first of a series of retaining-walls in the Gorge is in progress. This wall is of the reinforced concrete cantilever type, and extends for a length of 78 ft.

O'Rourke's No. 2 Creek Bridge: The construction of this bridge, comprising a 45 ft. concrete span, and the formation and metalling of 4 ch. of approaches, is in hand.

Richmond–Collingwood:—

Waimea County: 3 m. 9 ch. was sealed in two coats.

Takaka Hill Section: The widening and improvement to grade and alignment have been continued. The deviation to eliminate Hawk's Craig has been completed, 1 m. 48 ch. being constructed during the year, and 4 m. 31 ch. of reconstruction of the existing highway. Base-course metalling over 6 m. has been completed.

Spring Creek–Raranga.—Chaytor's Bridge: A contract for this work, comprising a 34 ft. concrete bridge and the formation and metalling of 5 ch. of approaches, is in hand.

Murchison–Reefton:—

Woodcock's Creek Culvert: A contract for a concrete box culvert 8 ft. by 6 ft., with 5 ch. of approaches, has been completed.

Bunting's Creek Bridge: This work, comprising the construction of a 14 ft. span concrete bridge and 3 ch. of approaches, was carried out.

Appleby–Motueka, via Tasman.—O'Connor's Creek Bridge: The erection of this bridge, of one 38 ft. concrete span, has been completed, and the approaches are in hand.

Motueka Wharf Highway.—Motueka Borough: 48 ch. has been sealed in two coats.

Takaka–Terakohe.—Takaka Town District: 49 ch. of two-coat sealing is in hand.

Collingwood–Bainham.—8 ch. of two-coat sealing has been completed in Collingwood Township.

Westport–Karamea:—

Kongahu Deviation: The formation of this deviation, 2½ m. long, which was necessitated by sea-erosion, is nearing completion.

Mokihinui River Bridge: Eight stringer spans in rimu, of a total length of 200 ft., are being renewed in reinforced concrete; the temporary bridge connecting with the hardwood truss spans has been built, and three piers concreted.

Jones Creek Bridge: A weak steel and timber bridge has been replaced by a concrete structure of 46 ft. span. A small creek nearby has been bridged by a 12 ft. span. The highway in the vicinity, which was subject to flooding, has been raised over a length of 13 ch., and stop-banks built for the control of the main creek.

Karamea Bridge – Karamea Post-office: Raising road near Dairy Factory: This work, consisting of a filling across a flood-channel and the erection of a timber bridge, is in hand.

Westport–Mokihinui Section: Improvements 0 m. to 3 m.: A further length of 27 ch. has been widened to 24 ft.

Inangahua Junction – Westport:—

Westport Borough: A length of 22 ch. has been sealed, completing the sealing of the borough section.

Buller County: At 19 m. 47 ch. (Stitt's Bluff) a cantilever reinforced concrete wall, 67 ft. in length, has been completed, and improvements to the adjoining length of highway are in hand.

Extensive widening has been carried out on Waimea and Norris' Hills, at Nine-mile Creek, and in the vicinity of Tiroroa.

Five-mile Creek Culvert: A 6 ft. by 6 ft. concrete culvert has been completed, and the approaches widened.

Nelson–Inangahua Junction (No. 12 District).—8 m. Inangahua Junction; Arnold Creek Culvert: A concrete culvert 6 ft. by 6 ft. by 56 ft. long, on improved alignment, has been built to replace a timber bridge.

Inangahua Junction – Weheka:—

Bourke's Creek Bridge: The existing timber bridge is being replaced by a single 50 ft. concrete span.

Landing Creek Bridge: The former timber bridge has been replaced by a concrete structure of three 35 ft. spans.

York Creek Bridge: The construction of this 40 ft. span concrete bridge, on the deviation near Larry's Creek, has been completed.

Minehan's Creek Bridges: These two 30 ft. and 40 ft. single-span concrete bridges are being built to eliminate two open fords. The highway is also being deviated for 37 ch. to provide better alignment. During the year the formation of the deviation and part of the metalling have been completed, while all piles have been driven for the bridges.

Friend's Creek Bridges: Three 28-ft.-span concrete bridges, together with 61 ch. of widening and improvement of the highway, have been completed.

Deviation near Larry's Creek: This deviation, 36 ch. in length, which eliminates two level-crossings, has been completed.

Reefton Township: A 92 ch. length, leading from the railway-station to the centre of the township, has been prepared for sealing.

Devil's Creek Bridge: The construction of this 40 ft. span concrete bridge has been completed.

Adamstown Creek Overflow Bridge: A 12-ft.-span concrete structure has been built to replace an old timber bridge.

Greymouth–Brunner Improvements: Improvements of this 2¾ m. section, consisting chiefly of raising low lengths, improving curves, culverting, and drainage, including an 8 ft. by 8 ft. concrete culvert, were carried out.

The largest filling was at Kaiata Creek, where a 25 ch. length, frequently flooded 3 ft. deep, was lifted.

Kaiata Creek Bridge: A concrete bridge of 40 ft. span has been constructed.

Racecourse Creek Bridge: This 42 ft. hardwood bridge has been strengthened, and widened to 20 ft.

Greymouth–Omoto Improvements: Improvements in grade, line, and width of a 22 ch. length have been completed, and a further length of 1 m. 30 ch. commenced.

Paroa–Taramakau: A length of 3 m. 66 ch. was reconstructed and sealed.

Brunner Borough: Sealing was completed over a length of 3 m. 52 ch.

Kumara – Flowery Creek Deviation: This 8 m. deviation, which will reduce the distance between Greymouth and Hokitika by 8½ m., and includes six bridges, in in progress, the formation of 3 m. 9 ch. being completed.

Kaihinu – Flowery Creek: A length of 1 m. 56 ch. has been reconstructed and sealed, also a short length at Shenandoah Creek.

Hokitika River Bridge at Kanieri: The 165 ft. temporary bridge, replacing three spans demolished by flood, was completed; and a contract has recently been let for the construction of a new reinforced concrete bridge 806 ft. long.

Deep Creek Bridge: A contract has been let for the construction of a 10 ft. by 10 ft. by 132 ft. concrete culvert to replace the timber bridge. The work includes 36 ch. of realignment.

Gow's Creek Culvert: The construction of a 12 ft. by 11 ft. concrete culvert, on improved alignment, has been completed. The road work is in hand.

Urquhart's Creek Culvert: The 8 ft. by 8 ft. culvert and associated road-improvements have been completed.

Arthurs Pass – Kumara:—

Kelly's Creek Bridge: This 120 ft. concrete bridge has been completed.

North Creek Culvert: This 8 ft. by 8 ft. concrete culvert, together with 72 ch. of improvement to width and alignment, is in hand.

Humphrey's Creek Culvert: An 8 ft. by 8 ft. concrete culvert and 12 ch. of approaches have been completed.

Culverts near Jackson's: The construction of two small reinforced concrete culverts and the straightening and regrading of 14 ch. of highway are in progress.

The above four culverts eliminate open fords which gave trouble in times of heavy rain.

Rangiriri Creek Bridge: This 22 ft. span concrete bridge has been completed.

Taipo River Bridge: This bridge, which consisted of four 110 ft. timber truss-spans on cylinder piers, had become unsafe, and is being reconstructed, utilizing two of the existing piers. The new structure will consist of two 110 ft. plate-girder spans and one 40 ft. steel joist span, with reinforced-concrete deck and abutments, a deep filling being substituted for one full span and part of another.

During the year a temporary bridge, 200 ft. long, and concrete abutments, have been built, and the erection of the new superstructure is in progress.

Rocky Point Culvert: A 6 ft. by 6 ft. concrete culvert, with a retaining-wall at its outlet, is being constructed to replace a timber bridge.

Goat Creek Bridge: A contract has been let for a bridge over this creek and the improvement of 16 ch. of approaches. The bridge will consist of two 20 ft. hardwood stringer spans and one 40 ft. steel-joist span, on ironbark piles.

Westport–Greymouth Coast Highway:—

Four Mile – Charleston Section: The improvement of the surface of this section has been undertaken over considerable lengths.

Protective Work at 13 m. 10 ch.: The bank of the Little Totara River below the highway has been revetted with stone.

Charleston – Fox's River Section: Widening and metalling have proceeded throughout the year. Deep Creek Gorge has been greatly improved, and widening is in progress between Bromielow Creek and Candlelight.

Fox's River – Punakaiki Section: A series of groynes has been built along the toe of the northern approach to Fox's River Bridge.

Rockford Creek Culvert: An 8 ft. by 4 ft. concrete culvert is being built to eliminate a ford.

Greymouth–Punakaiki Section—Deviation at 9¾ m.: This deviation, 53 ch. in length, made necessary by sea-erosion, has been completed.

Lawson's Creek Bridge: A concrete bridge, 35 ft. long, has been completed.

Coal Creek Bridge, First Crossing: This timber bridge is being reconstructed to a width of 20 ft.

Runanga Borough: This 70 ch. section has been widened and prepared for sealing.

Kanieri–Koiterangi.—Stopforth's Bridge: This bridge, of two 25 ft. spans, has been slewed 12 ft. to improve a dangerous approach.

Lake Kanieri Highway.—Coal Creek Bridge: The timber bridge is being renewed in concrete, the new structure having a single span of 50 ft.

Reefton–Maruia.—Crushington Deviation: In connection with the renewal of Lankey's Creek Bridge a 34 ch. deviation has been formed. The bridge will be replaced by a large concrete culvert.

Granity–Stockton.—Extensive works are being carried out, comprising realignment, widening, and curve-improvement, particularly of the steep zig-zag section.

Waimangaroa – Burnett's Face.—Extensive widening, to a minimum of 14 ft., has been carried out.

Picton–Bluff (No. 13 District).—The following bridges have been completed: Glen Colwyn Creek, one 30 ft. span; Ruth's Creek, one 30 ft. span; Hawkswood Creek, one 30 ft. span; Stony Creek, three 33 ft. spans.

Waipara–Kaikoura, via Culverden:—

Conway River Bridge Approaches: 32 ch. of formation was completed.

Hurunui – Red Post Junction: Preparation for sealing is in hand.

Hurunui – Karaka Creek: 4 m. 36 ch. of sealing was carried out.

Karaka Creek Bridge: This 30 ft. span bridge was erected.

Mina – Gore Bay.—Shore-protection work at Gore Bay was put in hand.

Leader–Waiau.—The Castaly River and Stanton River Bridges, of two 25 ft. and one 37 ft. span respectively, were completed.

Picton–Bluff (No. 14 District) :—

Eyre County :

Kaiapoi Borough – Waimakariri Bridge : Shoulders of the concrete pavement were sealed for a length of 1 m. 59 ch.

Rolleston–Rakaia—Bituminous surfacing : A length of 6 m. was surfaced, completing the 19½ m. contract.

Upper Riccarton – Arthurs Pass :—

Paparua County :

Masham–West Melton : Reconstruction was completed over 8 m. 51 ch., and 5 m. of mixed-in-place and plant-mix surfacing laid.

Tawera County :

Waimakariri River Bridge : Piles were driven in fourteen piers, ten piers concreted, and 308 ft. of deck-slab constructed.

53 ch. of approach road was completed.

Bealey – Arthurs Pass : Widening was carried out over 63 ch. of this section.

Christchurch–Akaroa :—

Riccarton Borough : Two-coat seal was applied over a length of 21 ch.

Springs County : 25 ch. was sealed in two coats.

Rangiora–Oxford, via Loburn.—Reconstruction and first-coat sealing of 1 m. 40 ch. were completed.

Sockburn – Southbridge – Rakaia Huts :—

Sockburn–Prebbleton : The two-coat sealing of 3 m. 31 ch. was completed.

Doyleston–Leeston : The two-coat sealing of 1 m. 37 ch. was completed.

Leeston Town District : Reconstruction and first-coat sealing were carried out over a length of 75 ch.

Christchurch – Governor's Bay.—Kiwi – Governor's Bay : The work of widening this section was completed over a length of 77 ch.

Cashmere–Heathcote.—1 m. 25 ch. of sealing was carried out.

Ashley Gorge.—The widening of corners has been carried out over a length of 10 m. 75 ch.

Masham–Belfast.—Mixed-in-place and plant-mix surfacing was applied over a length of 1 m. 55 ch.

Picton–Bluff (No. 15 District) :—

Ashburton County :

Rakaia River Bridge : Test-piles were driven on the line of the proposed new bridge.

Ashburton–Hinds : A two-coat seal was applied over a distance of 9 m. 73 ch.

Geraldine County and Borough : The original sealed surface having in course of time become very uneven, a bituminous plant-mix smoothing coat was applied over a total length of 20½ m.

Levels County, Timaru – Pareora River : Preparation for sealing has been carried out on lengths of this section.

Waimate County, Waitaki River – McNamara's Corner : Plant-mix surfacing was applied on this 12 m. section.

Deep Creek – Waihao Downs – Dip Creek.—Waimate Borough : 1 m. 10 ch. was similarly resurfaced.

Ashburton to Junction Darfield–Arundel M.H.—Ashburton–Winchmore : Preparation for sealing was carried out over a length of 1 m. 63 ch.

Geraldine–Fairlie.—Robb's Bridge, Dixon's Bridge, and Pringle's Bridge were erected, the first of 80 ft. and the two latter of 40 ft. span.

Timaru–Cave.—Timaru–Gleniti : Two-coat sealing was applied over 75 ch.

Timaru–Queenstown :—

Washdyke – Pleasant Point : A priming-coat was applied on a length of 7 m. 79 ch., also on 1 m. 30 ch. in the Pleasant Point Town District.

Ma Waro Bridge : This 80 ft. bridge was completed.

Ashburton–Wakanui.—Ashburton Borough : 71 ch. of plant-mix surfacing was laid.

Lake Pukaki – Hermitage.—Bush Creek Bridge : All piles were driven, and ten piers, 280 ft. of beams, and 200 ft. of deck-slab concreted.

Picton–Bluff (No. 16 District) :—

Waitaki County : 7¾ m. between the Waitaki River and Pukeuri was reconstructed and sealed. Similar work is in hand between Oamaru and Maheno.

Reconstruction between Waianakarua and Hampden, 3 m. 35 ch., was completed, and a two-coat seal applied between Herbert and Hampden, 6 m. 55 ch. A concrete bridge, consisting of five 20 ft. spans, was erected at Big Kuri Stream.

Extensive improvements were carried out between Hillgrove and Shag Point, a length of some 6 m. being involved. Several sharp corners were eliminated by a 50 ch. deviation, and other sections improved by regrading on improved alignment.

The elimination of the level-crossing at Kartigi by an overbridge was commenced at the end of the year.

Improvements between Shag Point and Palmerston, 4 m. 50 ch., were commenced.

A two-coat seal was applied on the Waikouaiti Borough section, 1 m. 41 ch.

At the junction with the Evansdale–Merton Main Highway, a narrow bridge was replaced by a twin 4 ft. culvert, and the formation widened.

70 ch. on the steep section of the Kilmog Hill, between Merton and Evansdale, was widened to provide a track for horse-drawn traffic.

Timaru–Queenstown.—Construction was continued on the Lindis Pass section, 2 m. 61 ch. of formation and 1 m. 10 ch. of metalling being completed. The erection of the Lindis River Bridge, of three 40 ft. spans, was carried out, and two 20 ft. span bridges erected over the Cardrona River.

Pukeuri–Omarama.—A 30 ch. deviation at Otematapaio was completed.

Waiareka–Duntroon.—The widening of 1 m. on the Ngapara Hill was completed.

Palmerston–Queenstown.—The realignment, regrading, and metalling of 3 m. 39 ch. between Chatto Creek and Springvale were carried out. The Lauder Creek Bridge, of 40 ft. span in concrete, was erected.

Clarksville–Springvale (No. 16 District).—A deviation at Butcher's Gully, rendered necessary by the construction of a reservoir, was commenced, 60 ch. of formation, and 1 m. of fencing being completed.

Dunedin – Port Chalmers.—28½ ch. of two-coat sealing was applied in the Port Chalmers Borough.

St. Bathan's Loop.—A 20 ft. span bridge was erected over Station Creek.

Waipiata–Styx.—The Sowburn Creek Bridge, 70 ft. in length, was erected.

Kyeburn–Middlemarch.—The erection of Last Creek Bridge is in progress.

Picton–Bluff (No. 17 District) :—

Bruce County: The reconstruction and sealing of the Taieri Ferry – Milton section were completed, 5 m. 39 ch. of metalling and 12 m. 60 ch. of sealing being carried out.

The realignment and regrading of the junction with the Clarksville–Springvale Main Highway was completed.

The widening of several sharp bends between Milton and Balclutha was carried out, also the dismantling of the old Balclutha Bridge.

Clarksville–Springvale (No. 17 District) :—

The Glenore Culvert was renewed by an 8 ft. by 8 ft. concrete structure, and 6 ch. of realignment completed.

Bowlers Creek Bridge: This 12 ft. timber structure was widened to 24 ft.

McNab – Rae's Junction.—The widening of Featherstone's Bridge, near Edievale, to 24 ft. was completed.

Balclutha–Papatowai.—The erection of the Puruhaua Stream Bridge, a 20 ft. concrete span, was commenced.

Gladstone Highway.—33½ ch. was sealed in the Mosgiel Borough.

Picton–Bluff (No. 18 District) :—

Two sections, Gore–McNab (2 m. 26 ch.) and Brydone–Mataura (3 m. 60 ch.), have been sealed in two coats, and a small bridge over the Lowburn Stream rebuilt in concrete.

Between Edendale and Morton Mains a 50 ch. length of narrow formation has been widened.

Lorne–Castlerock :—

Southland County: 2 m. 5 ch. is being reconstructed in preparation for sealing.

Wrey's Bush – Mossburn.—A small bridge of 15 ft. span has been renewed in concrete, and the alignment of 13 ch. of highway improved at this point.

Gore – Te Anau – Milford Sound :—

Between Mossburn and Te Anau, general improvements are being undertaken, and at 31st March work was in hand over a length of 1 m.

Hollyford Section: During the year the main objective has been the gaining of access to the Homer Tunnel, and the installation of plant and buildings to enable this work to proceed. (The tunnel is described elsewhere.)

A power-house generating 250 k.w. has been provided on the Hollyford River, with a transmission-line 4 m. in length.

At the Homer a fully equipped workshop has been built, compressors erected and housed, a blacksmith's shop, explosives magazine, and appurtenant buildings, including accommodation, erected, and water-supply and telephone-line installed.

At 31st March the tunnel had been opened up and two lengths timbered, while concreting had commenced on the first length. The road-construction for some 6 m. was originally formed as an access track and subsequently widened and improved, but is not yet to standard.

The following work had been completed at 31st March: Formation, 18 ch.; gravelling, 1 m. 71 ch.; culverts, 622 lin. ft.; bridges, 65 ft.

Milford End: Work was commenced at the Milford End in October.

A hardwood jetty and wharf-shed have been built in Fresh-water Basin adjacent to the Milford launch anchorage, and a base-camp established 2 m. from this point. Buildings, comprising store, canteen, hospital, office, and cook-house, were erected, besides usual accommodation.

Bush-work, formation, and bridge-construction on the first 2¾ m. are well in hand.

Public Works Department.

Since the inception of the Main Highways system all field investigations, designing, and supervision apart from that carried out by local authorities, have been undertaken for the Board by the Public Works Department, which receives payment in accordance with arrangements approved by the Minister.

The Board acknowledges the continued co-operation of the Department, and records its appreciation of the valuable services rendered at all times by the Department and its officers.

Signed on behalf of the Main Highways Board,

J. Wood,
Chairman.

TABLE 1.—MAIN HIGHWAYS ACCOUNT.

REVENUE FUND.

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31ST MARCH, 1936, AND TOTAL TO DATE.

EXPENDITURE			Total for Year 1935–36.			Total since Inception of Main Highways Act, 1922, to 31/3/36.		
Net expenditure on maintenance, repairs, &c., of main highways :—								
Highway District—			£	s.	d.	£	s.	d.
No. 1	.. ..		85,235	0	10	571,115	14	6
No. 2	.. ..		171,198	4	11	1,062,904	8	5
No. 3	.. ..		100,798	19	11	467,692	18	5
No. 4	.. ..		52,607	18	1	358,633	7	2
No. 5	.. ..		78,033	4	11	626,469	10	1
No. 6	.. ..		52,998	6	9	395,956	12	7
No. 7	.. ..		47,248	13	0	448,218	14	3
No. 8	.. ..		49,800	4	0	376,962	15	7
No. 9	.. ..		65,379	4	7	545,694	17	1
No. 10	.. ..		67,994	7	2	467,560	18	11
Totals for North Island	.. ..		771,289	4	2	5,321,209	17	0
No. 11	.. ..		62,598	13	11	453,105	14	6
No. 12	.. ..		104,566	8	5	807,820	9	6
No. 13	.. ..		17,224	12	2	202,614	9	6
No. 14	.. ..		47,935	6	0	330,303	16	11
No. 15	.. ..		60,851	10	9	414,288	3	10
No. 16	.. ..		44,776	17	6	265,901	10	0
No. 17	.. ..		40,400	9	8	276,469	18	5
No. 18	.. ..		40,535	11	4	304,049	17	3
Totals for Dominion	.. ..		1,190,178	13	11	8,375,763	16	11
Administration—								
Administration expenses (including salaries, travelling-expenses, office rents, printing, stationery, postages, and miscellaneous expenses)	.. ..	£ 52,354 12 8	..			376,409	0	7
Fees and travelling-expenses of members of the Main Highways Board other than Government members	..	983 14 0	..			14,798	14	7
Miscellaneous expenses—								
Advertising, maps, rent of halls, traffic tallies, transport of samples, depreciation of furniture, &c.	.. ..	83 11 7	..			5,111	10	1
Compensation under section 3, Public Works Amendment Act, 1925	.. ..	..	..			1,015	1	6
Exchange on remittances	.. ..	1,920 2 11	..			1,920	2	11
Petrological laboratory and other experimental work, Expenses of	.. ..	1,389 10 3	..			8,142	12	0
Total administration	.. .. ..		56,731	11	5	*407,397*	*1*	*8*
Carried forward	.. ..		1,246,910	5	4	8,783,160	18	7

INCOME.				Total for Year 1935–36.			Total since Inception of Main Highways Act, 1922, to 31/3/36.		
Income from—				£	s.	d.	£	s.	d.
Motor-registration licenses, fees, and fines (section 24, Motor-vehicles Act, 1924)	.. ..			421,951	13	4	3,930,252	2	2
Less Commission on collection by Post and Telegraph Department—		£	s. d.						
Motor-registration fees and licenses	.. ..	17,324	1 5						
Fees for registration of change of ownership	..	7,021	19 0						
				24,346	0	5	197,504	10	9
				397,605	12	11	3,732,747	11	5
Interest from investments of		£	s. d.						
Construction Fund	.. ..	848	13 10						
Revenue Fund	.. ..	141	11 1						
				990	4	11	216,146	5	5
Interest from local authorities on plant purchased on their behalf	..			889	2	10	21,208	6	2
Interest on advances to local authorities	.. ..			3,448	15	11	22,525	14	11
Milcage Tax (Finance Act, 1931-32 (No. 2), section 19)	.. ..			1,615	14	11	4,032	18	9
Miscellaneous receipts	.. ..			188	0	7	1,579	16	7
Motor-spirits tax (section 9, Motor-spirits Taxation Act, 1927)	..			1,449,124	18	5	7,918,280	1	10
Tire-tax (sections 13 and 14, Main Highways Act, 1922)	.. ..			93,308	9	11	1,921,241	15	4
Transfer from Consolidated Fund (section 14, Main Highways Act, 1922)				..			210,000	0	0
Rent of and tolls from ferries	.. ..			..			2,081	10	6
Carried forward	.. ..			1,947,171	0	5	14,049,844	0	11

TABLE 1.—MAIN HIGHWAYS ACCOUNT—*continued.*

REVENUE FUND—*continued.*

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31ST MARCH, 1936, AND TOTAL TO DATE—*continued.*

EXPENDITURE.	£ s. d.	Total for Year 1935–36. £ s. d.	Total since Inception of Main Highways Act, 1922, to 31/3/36. £ s. d.
Brought forward		1,246,910 5 4	8,783,160 18 7
Loan charges—			
Charges and expenses of raising loans, management charges of Consolidated Stock on account of Construction Fund, &c.	164 14 0	..	48,831 18 9
Interest on amount appropriated out of Public Works Fund and paid into Main Highways Account Construction Fund	61,300 0 0	..	367,800 0 0
Interest on loans, recoupment to Consolidated Fund (section 4, Finance Act, 1919)	119,105 6 1	..	834,963 11 3
Transfer to reserve for redemption of main highway securities	85,419 0 0	..	499,635 0 0*
Payment to local authorities in commutation of toll-gate charges (Finance Act, 1925, section 20)	1,663 8 10	..	24,295 6 3
Payment to Wellington City Council in commutation of fees chargeable in respect of motor-vehicles using Hutt Road (Finance Act, 1927 (No. 2), section 33)	23,998 19 8	..	181,610 9 8
Total loan charges		291,651 8 7	*1,957,136 5 11*
Subsidies, &c., in respect of other than main highways—			
Municipal Corporations (Municipal Corporations Act, 1933, section 71)	24,655 8 8	..	149,750 12 5
County Councils and other local authorities (Finance Act, 1930, section 37)	160,199 12 2	..	965,742 1 5
Subsidies to County Councils for rebate to ratepayers (Finance Act (No. 4), 1931, section 45)	..	..	253,892 12 1
Subsidy on rates levied on farming land (Finance Act 1935, section 20)	186,117 3 9	..	364,363 10 9
Maintenance and construction of roads giving access to outlying areas (Finance Act (No. 3), 1931)	..	..	45,918 8 8
Total subsidies		370,972 4 7	*1,779,667 5 4*
		1,909,533 18 6	12,519,964 9 10
Transfers to Construction Fund		3,000 0 0	1,503,000 0 0
		1,912,533 18 6	14,022,964 9 10
Balance, being excess of income over expenditure, carried to general balance-sheet		34,637 1 11	26,879 11 1
		1,947,171 0 5	14,049,844 0 11

INCOME.	Total for Year 1935–36. £ s. d.	Total since Inception of Main Highways Act, 1922, to 31/3/36. £ s. d.
Brought forward	1,947,171 0 5	14,049,844 0 11
	1,947,171 0 5	14,049,844 0 11

* Excludes £53,256 19s. 5d. interest credited.

NOTE.—No charge for the cost of exchange on interest payments made in London is included in the accounts.

TABLE 1.—MAIN HIGHWAYS ACCOUNT—*continued.*

CONSTRUCTION FUND—CAPITAL ACCOUNT.

INCOME AND EXPENDITURE FOR THE YEAR ENDED 31ST MARCH, 1936, AND TOTAL TO DATE.

EXPENDITURE.	Total for Year 1935–36.	Total since Declaration of Main Highways (9/6/24).	INCOME.	Total for Year 1935–36.	Total since Declaration of Main Highways (9/6/24).
Net expenditure on construction and improvement of main highways—					
Highway District—	£ s. d.	£ s. d.	Loans raised under Main Highways Act, 1922—		
No. 1	43,201 1 6	673,957 1 10	Stock and Debentures issued	£ s. d.	£ s. d.
No. 2	68,069 12 9	880,122 19 9	At 3 per cent. interest	150,000 0 0	266,365 0 0
No. 3	4,319 2 4	180,301 2 2	At 3½ per cent. interest	..	108,295 0 0
No. 4	26,225 13 4	403,792 10 10	At 3¾ per cent. interest	..	403,000 0 0
No. 5	14,788 19 7	299,699 16 0	At 4 per cent. interest	..	1,750,980 0 0
No. 6	10,535 19 2	350,079 18 7	At 4½ per cent. interest	..	542,004 10 10
No. 7	15,070 14 6	358,446 18 4	At 5⅛ per cent. interest	..	17,000 0 0
No. 8	6,274 9 0	214,839 2 1	At 5½ per cent. interest	..	6,250 0 0
No. 9	30,185 5 4	605,290 8 6	Securities redeemed, Loans Redemption Account	..	5,000 0 0
No. 10	17,084 2 6	232,693 18 10	Consolidated Fund—Public Debt Redemption Fund	..	55,720 0 0
Totals for North Island	235,755 0 0	4,199,223 16 11			3,154,614 10 10
No. 11	23,430 9 8	184,908 18 0	Receipts under section 15, Finance Act, 1923, from Public Works Fund,		
No. 12	13,054 3 7	168,528 11 10	General Purposes Account (at 5 per cent. interest)	..	1,226,000 0 0
No. 13	5,196 17 1	168,439 7 7	Transfer from Revenue Fund	3,000 0 0	1,503,000 0 0
No. 14	36,994 7 1	339,835 1 9	Temporary transfers from other accounts	100,000 0 0	100,000 0 0
No. 15	17,406 10 0	176,722 6 3	Balance, being excess of expenditure over income, carried to general		
No. 16	35,393 19 3	196,141 5 9	balance-sheet	175,024 1 1	13,390 12 2
No. 17	3,221 10 4	380,510 4 3			
No. 18	57,571 4 1	164,185 10 8			
Totals for Dominion	428,024 1 1	5,978,495 3 0			
Premium on conversion of loans	..	18,510 0 0			
	428,024 1 1	5,997,005 3 0		428,024 1 1	5,997,005 3 0

TABLE 1.—MAIN HIGHWAYS ACCOUNT—*continued.*

General Balance-sheet as at 31st March, 1936.

LIABILITIES.	Revenue Fund.	Construction Fund.	Total.
	£ s. d.	£ s. d.	£ s. d.
Revenue Fund—			
Excess of income over expenditure for 1935–36 ..	34,637 1 11		
Less Balance at 31/3/35	7,757 10 10		
	26,879 11 1	..	26,879 11 1
Sundry creditors—			
Public Works Department	5,119 0 7	2,417 15 0	7,536 15 7
Other Government Departments	1,936 16 5	669 11 8	2,606 8 1
Non-departmental	141,565 18 3	44,990 19 5	186,556 17 8
Interest accrued on loans	28,471 6 5	..	28,471 6 5
Motor-registration fees paid in advance	80,000 15 0	..	80,000 15 0
Writings-off in Suspense	71 4 0	69 11 4	140 15 4
Reserve for redemption of securities	547,891 19 5	..	547,891 19 5
	831,936 11 2	48,147 17 5	880,084 8 7

ASSETS.		Revenue Fund.	Construction Fund.	Total.
		£ s. d.	£ s. d.	£ s. d.
Cash in Public Account—				
At call		87,522 17 0	1,868 5 7	89,391 2 7
Sundry debtors				
Public Works Department		1,684 2 4	1,254 8 0	2,938 10 4
Other Government Departments		5,378 3 11	2,063 5 0	7,441 8 11
Non-departmental		3,961 17 0	3,870 10 4	7,832 7 4
Advances to local authorities (Main Highways Amendment Act, 1926, section 2)		89,797 3 11	..	89,797 3 11
Advance on subsidies (Finance Act, 1930, sections 37 and 39, and Finance Act, 1932, section 36)		3,002 1 3	..	3,002 1 3
Motor-registration fee in hands of Postal Department ..		4,290 11 10	..	4,290 11 10
Interest due and accrued		2,244 2 1	..	2,244 2 1
Stocks of materials, tools, &c.		29,696 12 4	25,631 5 0	55,327 17 4
Stocks Deficits Account		71 4 0	69 11 4	140 15 4
Furniture, fittings, &c. ..	£ s. d.			
Expenditure to 31/3/36	2,016 17 9			
Less depreciation to 31/3/36	780 2 11			
		1,236 14 10	..	1,236 14 10
Plant and equipment—				
For Main Highways Board—				
Expenditure to 31/3/36	120,147 6 1			
Less depreciation charged to works ..	88,260 19 5			
		31,886 6 8	..	31,886 6 8
Purchased for local authorities—				
Expenditure to 31/3/36	193,911 16 6			
Less repayments of principal ..	170,639 1 11			
		23,272 14 7	..	23,272 14 7
Amount transferred to Loans Redemption Account	548,948 7 7			
Less amount utilized for redemption of securities	5,000 0 0			
	543,948 7 7			
Interest accrued to 31/3/36	3,943 11 10			
		547,891 19 5	..	547,891 19 5
Construction Fund—				
Excess of expenditure over income for 1935–36	175,024 1 1			
Less Balance at 31/3/35	161,633 8 11			
		..	13,390 12 2	13,390 12 2
		831,936 11 2	48,147 17 5	880,084 8 7

Note.—No liability is included for interest on loans redeemed out of Public Debt Redemption Fund.

T. A. Barrow, A.R.A.N.Z., Accountant, Public Works Department.
J. Wood, 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, subject to the departmental notes enfaced thereon. The following comment is appended: A Reserve of £547,891 19s. 5d. for redemption of securities has been set up and paid over to Loans Redemption Account, but only £5,000 has been applied to the redemption of securities.—J. H. Fowler, Deputy Controller and Auditor-General.

TABLE 2.—LENGTHS OF MAIN HIGHWAYS AT 31ST MARCH, 1936.

Number and Name of Highway District.	Type of Surface.			Total.
	Dustless.	Gravel or Macadam.	Clay or Pumice.	
	M. ch.	M. ch.	M. ch.	M. ch.
1. Auckland North	55 20	922 69	..	978 9
2. Auckland South	346 79	858 42	8 22	1,213 63
3. Tauranga	73 41	339 10	311 73	724 44
4. Gisborne	65 56	309 4	0 40	375 20
5. Napier	166 22	564 66	6 0	737 8
6. King-country	27 19	635 44	26 3	688 66
7. Taranaki	321 8	140 36	11 56	473 20
8. Wanganui	98 20	421 65	4 60	524 65
9. Wellington West ..	199 14	297 78	..	497 12
10. Wellington East	106 42	397 57	..	504 19
Totals, North Island ..	1,460 1	4,887 71	369 14	6,717 6
11. Nelson	42 8	617 26	10 27	669 61
12. West Coast	24 63	507 18	8 30	540 31
13. Canterbury North ..	28 39	305 25	..	333 64
14. Canterbury Central ..	138 42	600 34	..	738 76
15. Canterbury South ..	110 59	691 15	..	801 74
16. Otago Central	55 79	757 19	2 0	815 18
17. Otago South	48 22	474 37	..	522 59
18. Southland	33 56	874 31	..	908 7
Totals, South Island ..	482 48	4,827 45	20 57	5,330 70
Totals, Dominion ..	1,942 49	9,715 36	389 71	12,047 76

TABLE 3.—CONSTRUCTION WORK COMPLETED DURING YEAR, 1935–36.

Number and Name of Highway District.	Formation and Widening.	Gravelling and Metalling.	Tar and Bituminous Sealing.	Road- and Plant-mix Bituminous Surfacing.	Bituminous Macadam (Penetration).	Bituminous Concrete.	Portland Cement Concrete.	Bridges.	Engineering Surveys.
	M. ch.	M. ch.	M. ch.	M. ch.	M. ch.	M. ch.	M. ch.	Ft.	M. ch.
1. Auckland North	6 1	1 39	2 76	0 39	..	..	..	795	17 65
2. Auckland South	10 39	27 5	57 27	6 55	2 2	..	0 7	1,439	6 31
3. Tauranga	2 45	9 5	26 25	..	..	..	..	589	6 45
4. Gisborne	7 37	12 53	8 32	..	..	..	..	132	15 26
5. Napier	2 14	1 38	23 22	..	..	..	..	2,108	2 59
6. King-country	9 12	4 72	..	..	..	..	..	35	..
7. Taranaki	3 1	2 58	3 59	2 0	..	..	..	63	4 45
8. Wanganui	14 16	4 53	5 22	..	..	..	..	75	18 15
9. Wellington West ..	22 48	0 77	7 14	15 50	..	..	..	1,045	49 61
10. Wellington East	26 5	0 18	16 2	..	..	..	..	600	26 18
11. Nelson	16 26	5 67	7 68	13 52	..	..	..	151	13 74
12. West Coast	7 1	3 11	10 0	..	..	..	..	553	26 66
13. Canterbury North ..	0 38	0 6	4 10	..	..	..	..	306	0 51
14. Canterbury Central ..	13 28	..	12 50	12 36	..	..	..	160	23 75
15. Canterbury South ..	1 63	..	23 71	33 35	..	..	..	240	22 26
16. Otago Central	9 0	17 45	16 26	4 40	..	..	..	390	5 64
17. Otago South	0 19	5 58	13 14	1 59	..	..	..	8	11 57
18. Southland	0 39	0 13	6 20	..	..	..	..	29	29 0
Totals	152 32	97 58	244 58	90 46	2 2	..	0 7	8,718	281 58

TABLE 4.—LENGTHS OF MAIN HIGHWAYS METALLED AND SURFACED SINCE INCEPTION OF BOARD'S OPERATIONS (9TH JUNE, 1924).

At close of Period ending	Total Main Highways.	Type of Surface.			Dustless Surfacing added during Year.	Percentage of Dustless Surfacing to Total Main Highways.
		Clay and Pumice.	Gravel and Macadam.	Dustless Surfacing.		
	Miles.	Miles.	Miles.	Miles.	Miles.	
9th June, 1924 ..	5,954	1,535	4,171	248	..	4·2
31st March, 1925 ..	5,954	1,472	4,222	260	12	4·4
,, 1926 ..	6,272	1,384	4,557	331	71	5·3
,, 1927 ..	6,391	1,233	4,726	432	101	6·8
,, 1928 ..	6,608	1,100	4,953	555	123	8·4
,, 1929 ..	10,403	915	8,735	753	198	7·2
,, 1930 ..	10,408	736	8,705	967	214	9·3
,, 1931 ..	10,419	608	8,685	1,126	159	10·8
,, 1932 ..	10,846	539	9,009	1,298	172	12·0
,, 1933 ..	10,878	494	9,005	1,379	81	12·7
,, 1934 ..	10,974	466	9,047	1,461	82	13·3
,, 1935 ..	11,557	397	9,494	1,666	205	14·4
,, 1936 ..	12,048	390	9,715	1,943	277	16·1
Percentage at 31st March, 1936	100	3·2	80·7	16·1	..	..

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.									
					1935–36.	1934–35.	1933–34.	1932–33.	1931–32.	1930–31.	1929–30.	1928–29.	1927–28.	1926–27.
	M. ch.	£	£	£	£	£	£	£	£	£	£	£	£	£
1. Auckland North ..	978 9	85,235	22,482	107,717	110·1	97·9	71·6	61·2	79·2	83·4	115·7	90·3	103·6	65·6
2. Auckland South ..	1,213 63	171,198	49,017	220,215	181·4	141·1	124·6	106·9	145·3	175·8	214·3	183·0	203·3	181·0
3. Tauranga ..	724 44	100,799	10,103	110,902	153·1	87·1	72·9	61·9	70·7	80·4	90·7	74·5	80·3	69·1
4. Gisborne ..	375 20	52,608	14,208	66,816	178·1	164·9	106·4	96·3	117·3	163·5	189·5	124·9	104·3	152·7
5. Napier	737 8	78,033	24,342	102,375	138·9	117·7	81·4	79·3	75·9	121·2	146·7	120·3	170·0	169·4
6. King-country ..	688 66	52,998	8,457	61,455	89·2	99·7	70·8	57·1	70·0	85·8	115·7	61·4	56·2	69·8
7. Taranaki ..	473 20	47,244	11,139	58,383	123·4	102·5	83·8	84·5	125·2	136·0	172·8	155·9	195·7	198·8
8. Wanganui ..	524 65	49,800	14,250	64,050	122·0	87·5	80·8	66·0	101·0	126·7	176·1	88·5	145·3	167·6
9. Wellington West ..	497 12	65,379	16,216	81,595	164·1	124·7	106·0	110·8	149·8	179·0	224·3	185·6	228·9	166·3
10. Wellington East ..	504 19	67,995	20,405	88,400	175·3	181·3	114·9	91·4	128·6	141·6	159·0	138·4	138·8	138·0
Totals, North Island	6,717 6	771,289	190,619	961,908	143·2	118·3	91·3	81·0	104·5	124·8	155·8	119·9	141·2	131·6
11. Nelson	669 61	62,599	15,619	78,218	116·8	101·1	74·1	66·6	103·6	82·0	112·8	88·7	102·1	119·9
12. West Coast ..	540 31	104,566	11,330	115,896	214·5	142·6	110·8	104·1	136·7	122·4	166·8	144·9	118·3	114·2
13. Canterbury North	333 64	17,225	3,721	20,946	62·8	55·7	58·3	50·0	55·4	72·6	99·7	81·1	90·1	79·5
14. Canterbury Central	738 76	47,935	11,999	59,934	81·1	55·2	50·9	50·2	76·5	75·2	77·3	68·8	87·3	81·4
15. Canterbury South	801 74	60,852	16,720	77,572	96·7	66·9	59·3	67·0	78·7	88·0	89·6	66·3	105·0	79·5
16. Otago Central ..	815 18	44,777	12,344	57,121	70·1	75·1	50·3	46·4	52·8	36·4	73·9	47·7	77·2	49·3
17. Otago South ..	522 59	40,400	10,707	51,107	97·8	84·6	73·8	72·8	99·5	90·8	108·1	77·1	90·5	81·7
18. Southland ..	908 7	40,536	11,364	51,900	57·1	53·9	44·4	41·6	43·2	58·7	57·9	49·9	63·4	76·0
Totals, South Island	5,330 70	418,890	93,804	512,694	96·2	77·6	62·7	60·3	77·4	75·8	94·1	75·0	91·4	85·4
Totals, Dominion ..	12,047 76	1,190,179	284,423	1,474,602	122·4	100·3	78·5	70·7	92·5	103·1	128·6	100·1	119·9	111·9

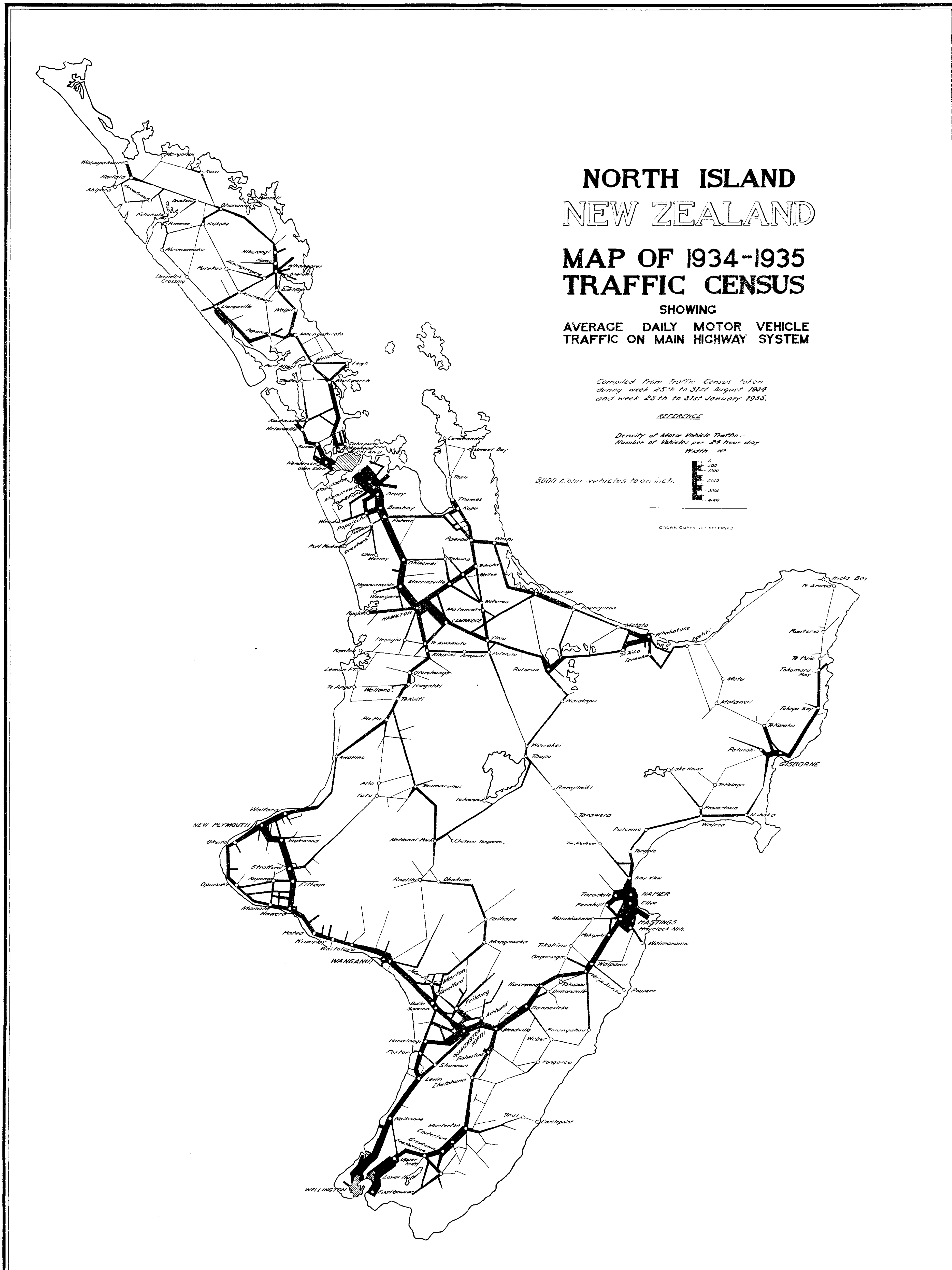
TABLE 6.—TESTS OF STONE COMPLETED DURING THE YEAR ENDED 31ST MARCH, 1936.

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 Co-efficient.			
283	Hope's Quarry, Palmerston South	187·5	0·40	2·50	16·0	19·0	28	Basalt.
284	Grinter Bros., Auckland ..	171·5	1·30	3·20	11·9	19·0	27	Granite.
285	Linnell's Quarry, Kaiwaka ..	160·2	2·20	2·78	14·7	17·8	25	Trachyte.
286	Waipu Quarry, Whangarei ..	165·8	0·25	7·48	5·3	..	..	Greywacke.
287	Aitcheson's Quarry, Heriot ..	169·0	0·45	2·86	14·0	17·3	14	Brecciated greywacke.
288	Takaka Hill, Nelson ..	164·6	0·35	10·46	3·8	10·0	11	Marble.
289	Karapiro, Waikato River, Matamata County	170·8	0·57	2·48	16·1	19·1	23	Greywacke.
290	Waerenga-a-kuri Quarry, Cook County	166·8	1·20	5·50	7·1	16·5	11	Limestone.
291	Whimp's Quarry, Kauri, Whangarei	167·1	0·65	4·10	9·7	18·1	18	Basalt.
292	Hardie's Quarry, Tikipunga, Whangarei	166·5	1·60	3·18	12·6	16·9	13	Basalt.
293	Culbert's Quarry, Onerahi, Whangarei	174·3	0·30	4·36	9·4	11·3	15	Basalt.
294	Waldron's Quarry, Whatatiri, Whangarei	173·3	1·03	3·90	9·7	16·9	18	Basalt.
295	Waipu Gorge, Otamatea County	165·6	0·42	7·94	5·0	..	..	Greywacke.

Numerous other tests were made by abrasion with steel shot, sieve analysis, gravitation, microscopic examination, &c., as required by the nature of the samples submitted.

By Authority: G. H. LONEY, Government Printer, Wellington.—1936.

[1,031 6/36—4052


NORTH ISLAND
NEW ZEALAND
MAP OF 1934-1935
TRAFFIC CENSUS
SHOWING
AVERAGE DAILY MOTOR VEHICLE
TRAFFIC ON MAIN HIGHWAY SYSTEM
Compiled from Traffic Census taken
during week 25th to 31st August 1934
and week 25th to 31st January 1935.
REFERENCE
Density of Motor Vehicle Traffic :-
Number of Vehicles per 24 hour day
Width No
0
500
1000
2000
3000
4000
8,000 Motor vehicles to an inch.
CROWN COPYRIGHT RESERVED
Waipapakauri
Kaitaia
Ahipara
Mangonui
Kaeo
Russell
Okaihau
Ohaeawai
Kohukohu
Rawene
Kaikohe
Waimamaku
Hikurangi
Kamo
Whangarei
Onerahi
Parekao
Maungatapere
Donnelly's Crossing
Oakleigh
Kirikopuni
Dargaville
Waipu
Paparoa
Maungaturoto
Wellsford
Leigh
Port Albert
Warkworth
Kaukapakapa
Helensville
Kumeu
Takapuna
Birkenhead
AUCKLAND
Henderson
Glen Eden
Coromandel
Mercury Bay
Tapu
Papatoetoe
Manurewa
Papakura
Drury
Bombay
Thames
Kopu
Waiuku
Pukekohe
Tuakau
Onewhero
Port Waikato
Glen Murray
Paeroa
Waihi
Ohinewai
Tahuna
Te Aroha
Waitoa
Ngaruawahia
Morrinsville
Waingaro
Waharoa
Tauranga
Paengaroa
Raglan
HAMILTON
Matamata
CAMBRIDGE
Matata
Whakatane
Opotiki
Hicks Bay
Te Araroa
Pirongia
Te Awamutu
Tirau
Te Teko
Taneatua
Ruatoria
Kawhia
Kihikihi
Arapuni
Putaruru
Rotorua
Te Puia
Tokomaru Bay
Lemon Pt.
Otorohanga
Motu
Te Anga
Waitomo
Hangatiki
Matawai
Te Kuiti
Waiotapu
Tolaga Bay
Pio Pio
Te Karaka
Wairakei
Patutahi
Taupo
GISBORNE
Awakino
Lake House
Rangitaiki
Te Reinga
Aria
Tatu
Taumarunui
Tokaanu
Frasertown
Waitara
Tarawera
Nuhaka
Wairoa
NEW PLYMOUTH
Inglewood
National Park
Chateau Tongariro
Putorino
Okato
Te Pohue
Tangoio
Stratford
Bay View
Opunake
Kaponga
Eltham
Raetihi
Ohakune
Taradale
NAPIER
Fernhill
Clive
Manaia
Hawera
Taihape
Maraekakaho
HASTINGS
Havelock Nth.
Patea
Waverley
Waitotara
Pakipaki
Waimarama
Mangaweka
WANGANUI
Tikokino
Ongaonga
Waipawa
Waipukurau
Marton
Greatford
Norsewood
Takapau
Ormondville
Porangahau
Pourere
Feilding
Bulls
Sanson
Ashhurst
Dannevirke
Woodville
Weber
PALMERSTON NORTH
Himatangi
Foxton
Pahiatua
Shannon
Pongaroa
Levin
Eketahuna
Tinui
Castlepoint
Waikanae
Masterton
Carterton
Greytown
Featherston
Upper Hutt
Lower Hutt
WELLINGTON
Eastbourne

SOUTH ISLAND
NEW ZEALAND

MAP OF 1934-1935 TRAFFIC CENSUS

SHOWING

AVERAGE DAILY MOTOR VEHICLE TRAFFIC ON MAIN HIGHWAY SYSTEM

Compiled from Traffic Census taken during week 25th to 31st August 1934 and week 25th to 31st January 1935.

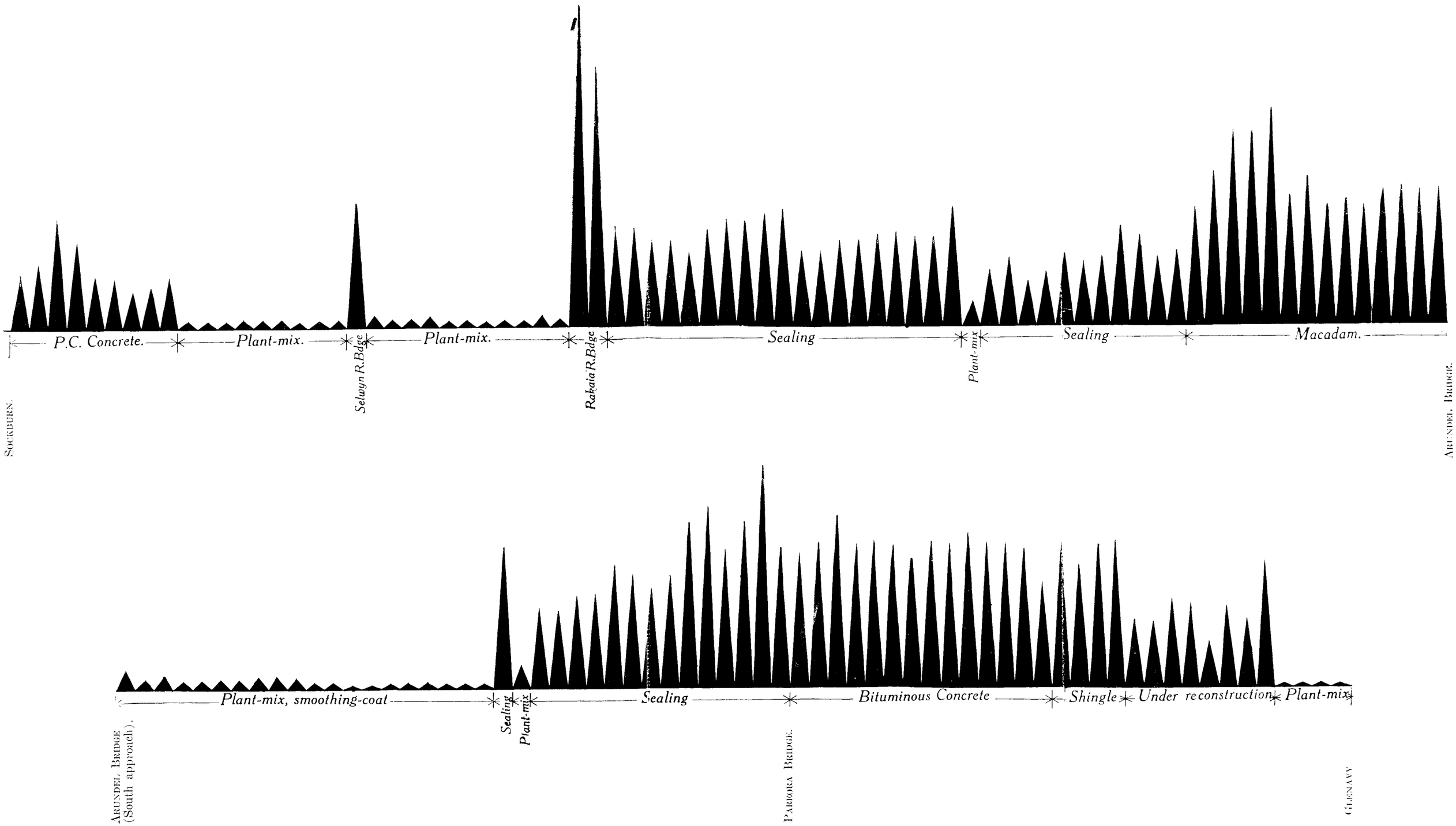
REFERENCE

Density of Motor Vehicle Traffic :- Number of vehicles per 24 hour day.

Width No.

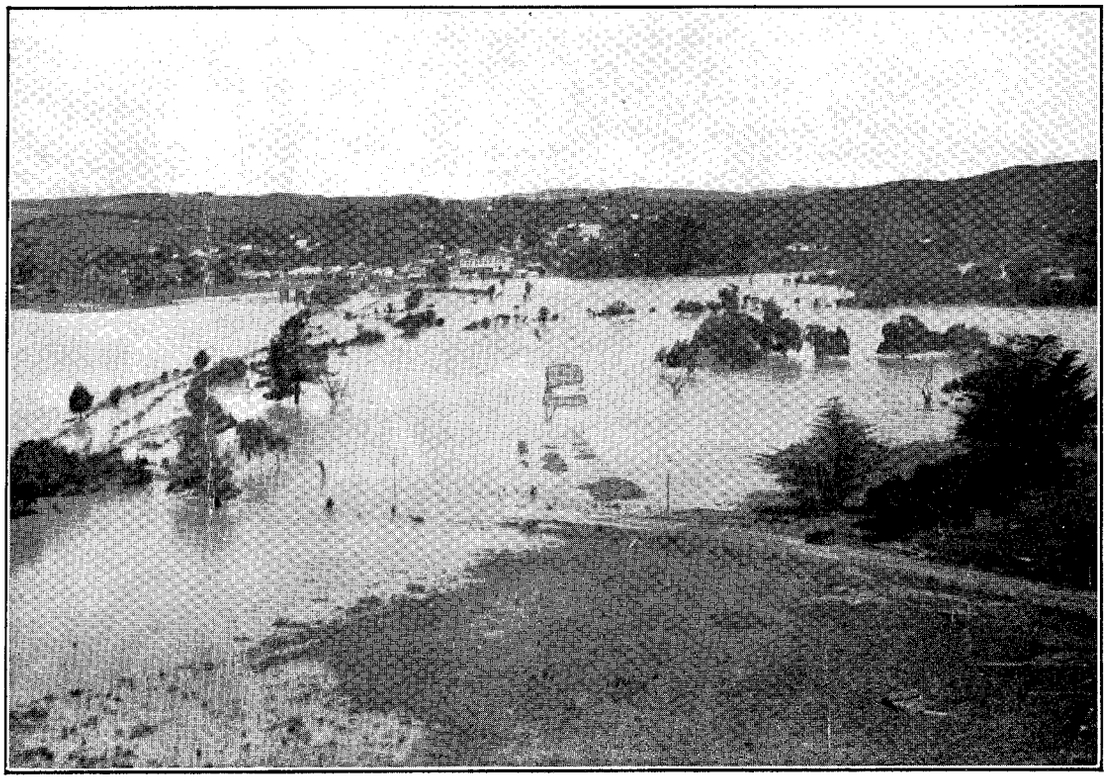
8000 Motor-vehicles to an inch.

0
500
1000
2000
3000
4000



Viagraph showing Comparative Smoothness of Surfaces between Sockburn and Glenavy according to Different Types of Construction—compiled from Roughometer Recordings.

CHRISTCHURCH–DUNEDIN MAIN HIGHWAY.

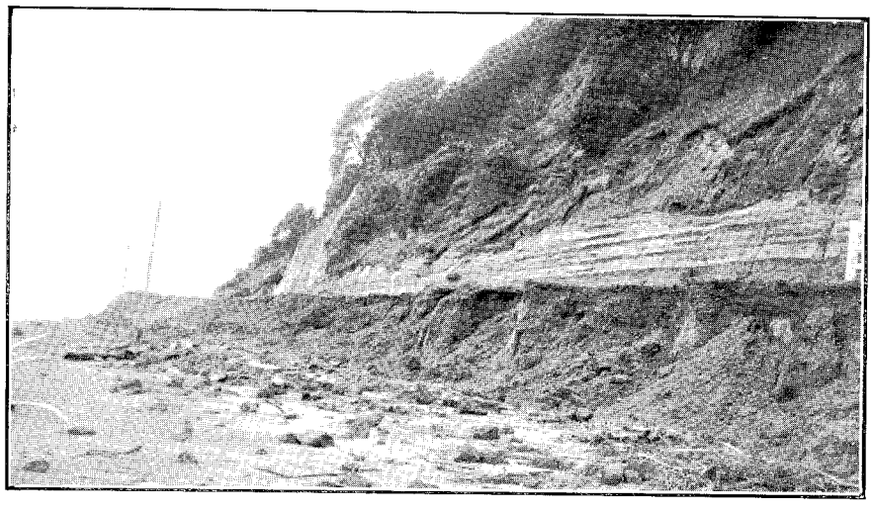


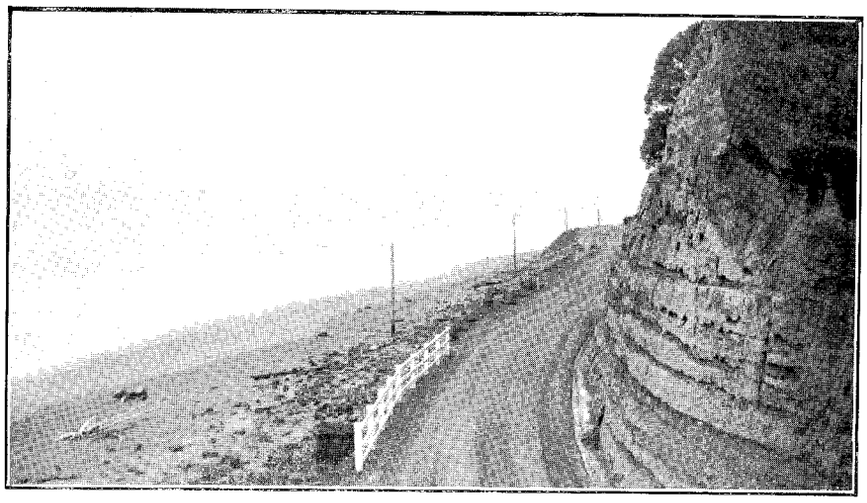
Raising Roadway at Kawakawa Township above Flood-level on New Alignment: New Alignment appearing in Centre, Old Route on Left.

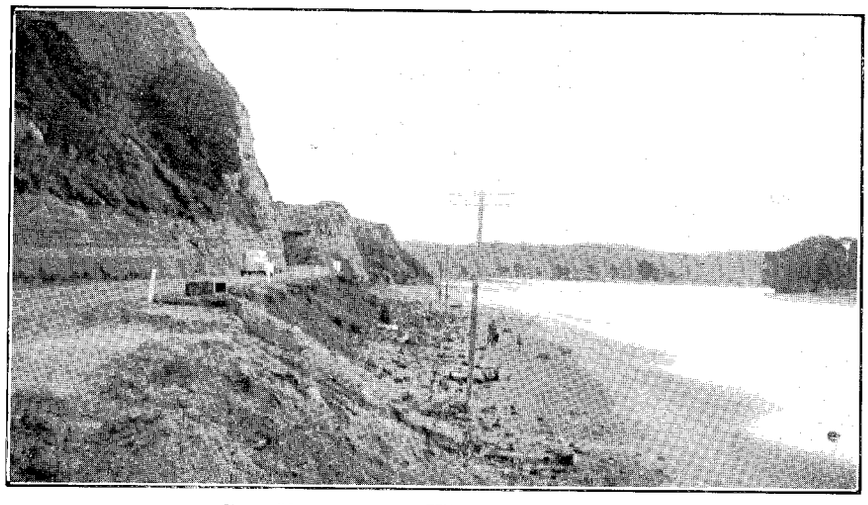
LAKE OMAPERE–MAUNGATUROTO VIA WHANGAREI MAIN HIGHWAY.

Re-alignment and Sealing on Ngongotaha–Mamaku Bush Section.

HAMILTON–ROTORUA MAIN HIGHWAY, ROTORUA COUNTY DIVISION.

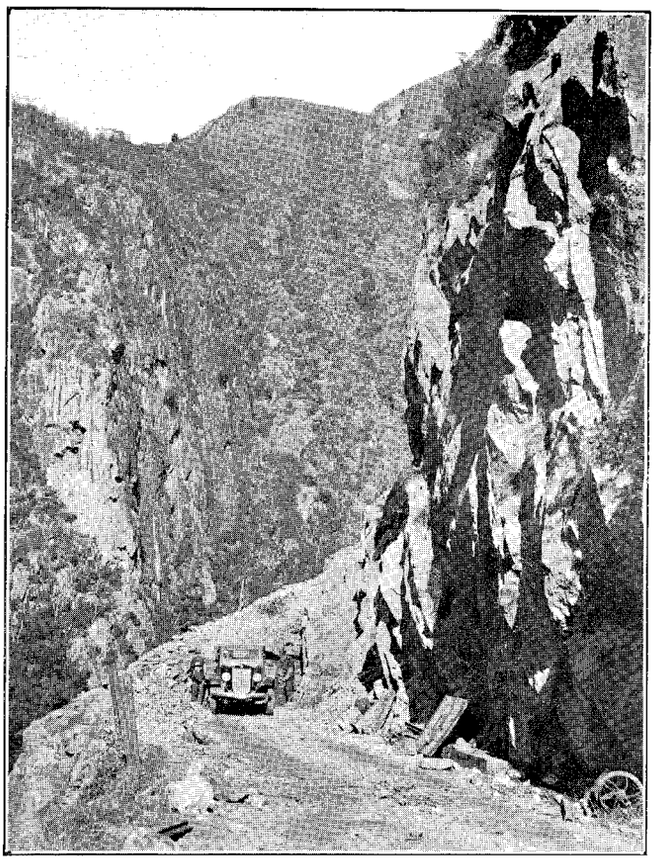




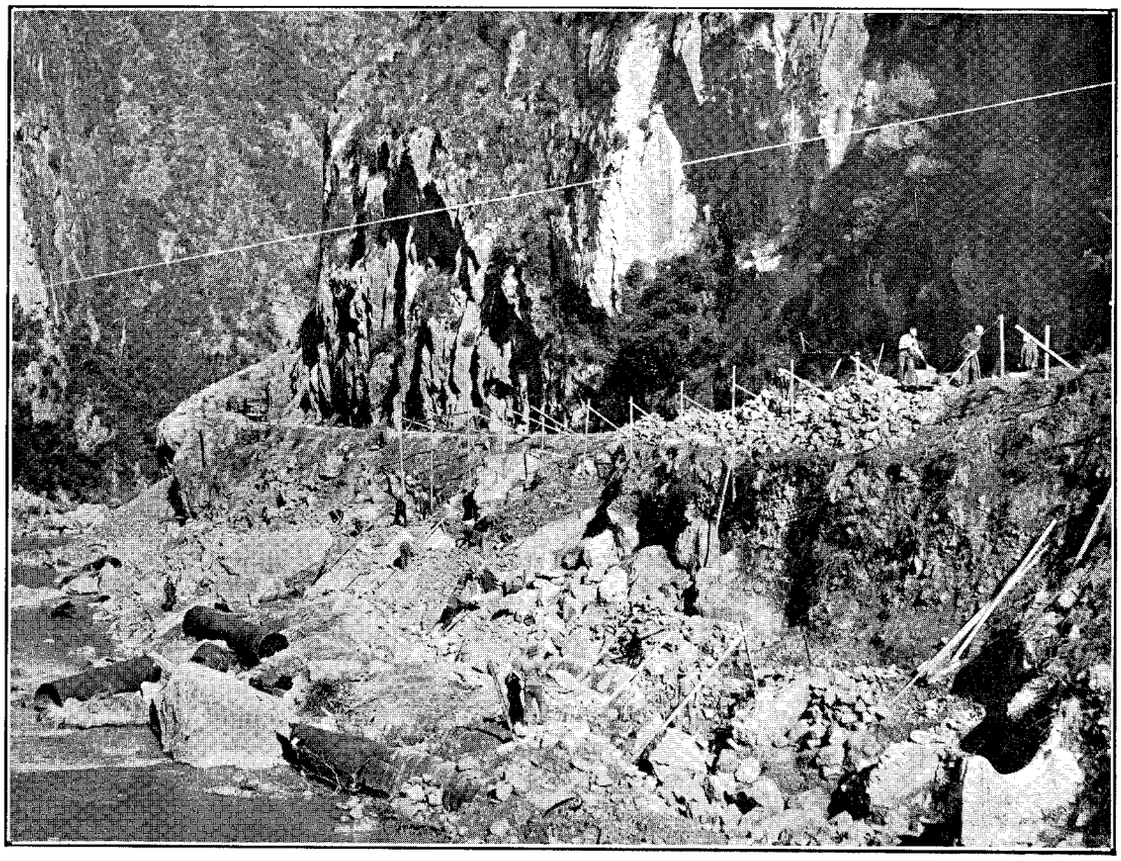


SEA EROSION AT WAIOTAHI BLUFFS.

GISBORNE–WHAKATANE VIA MOTU MAIN HIGHWAY,
OPOTIKI COUNTY DIVISION.

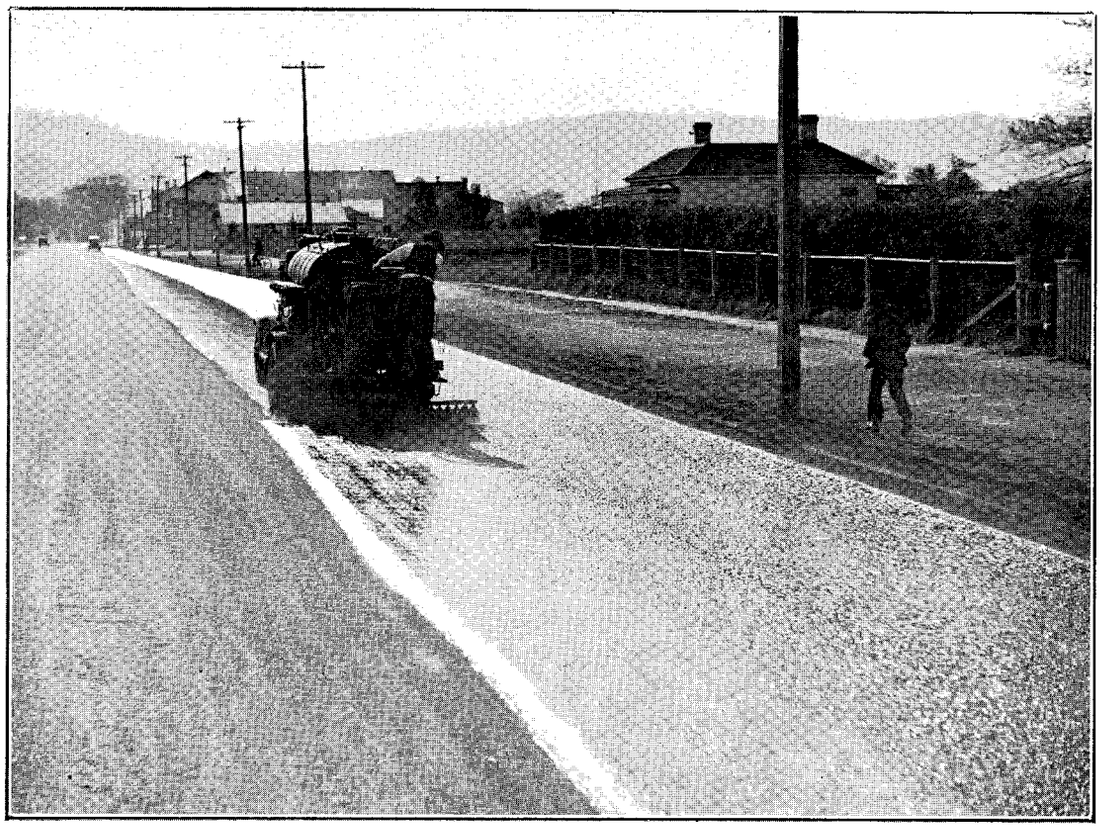


WIDENING AND RECONSTRUCTION IN KARANGAHAKE GORGE.



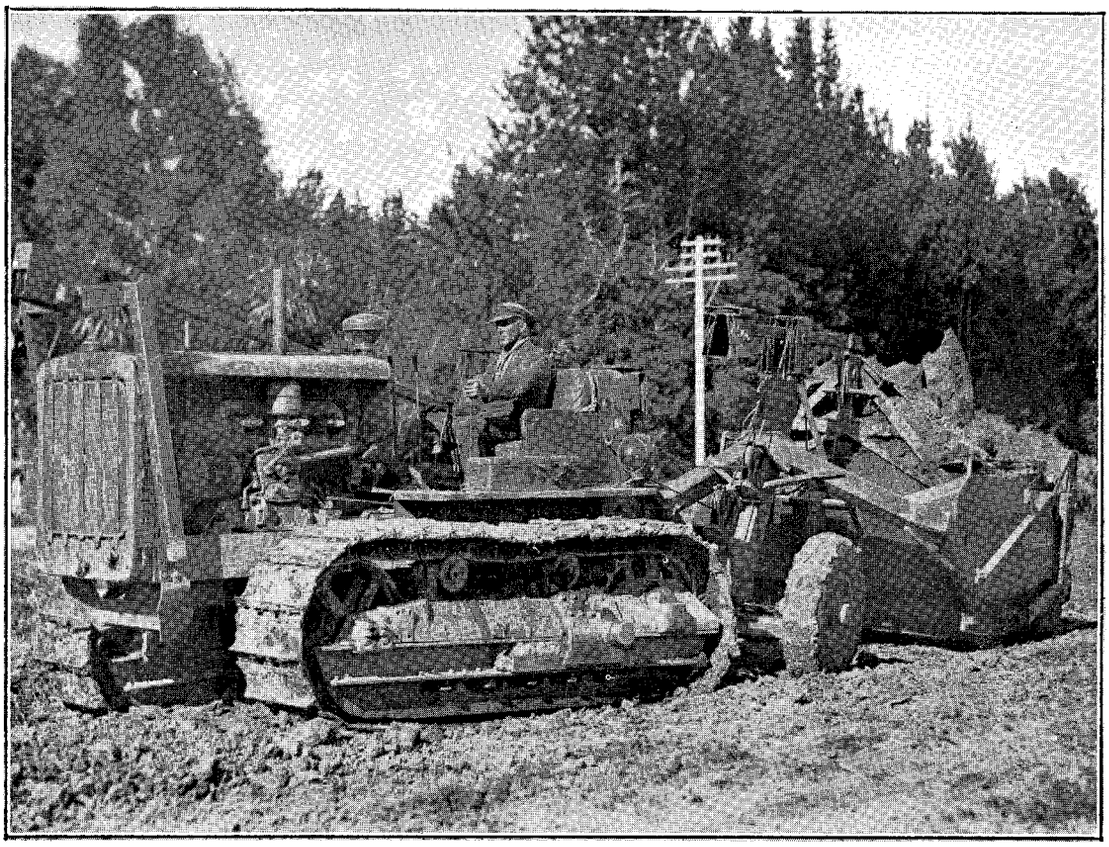
WIDENING AND RECONSTRUCTION IN KARANGAHAKE GORGE.

POKENO–WAIHI MAIN HIGHWAY, OHINEMURI COUNTY DIVISION.



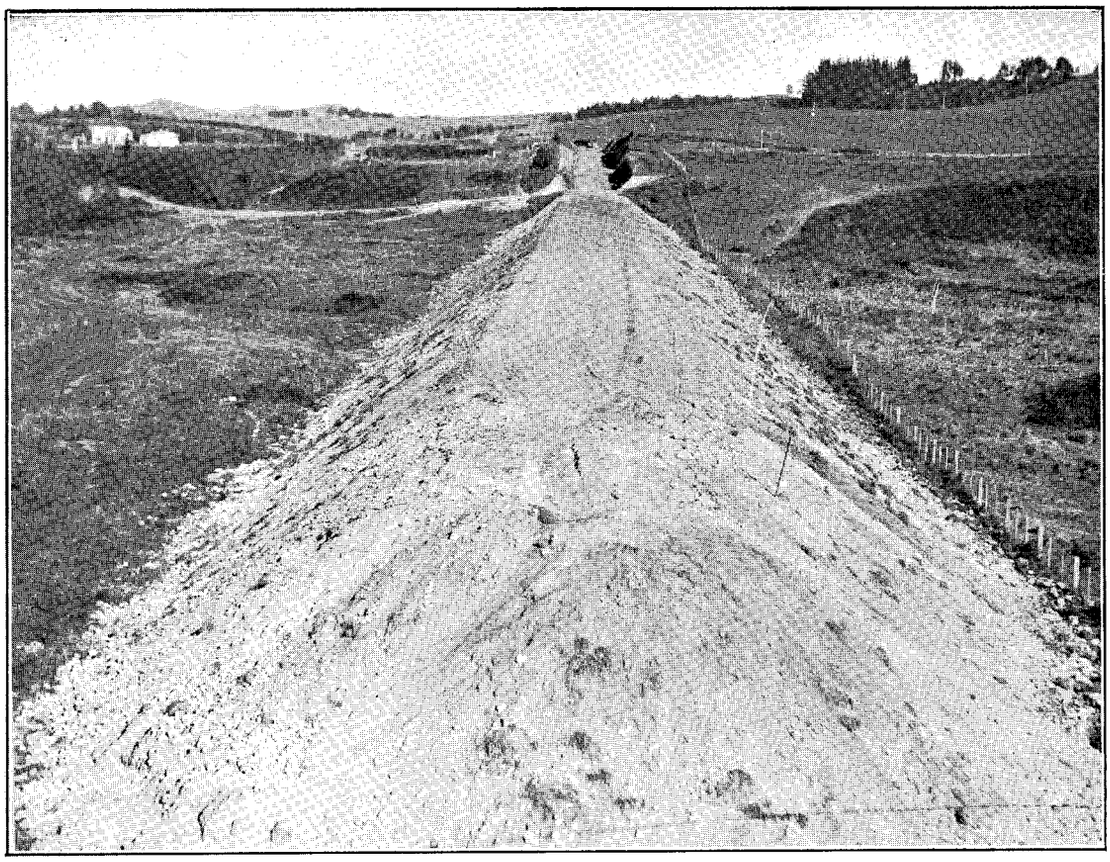
SHOULDER SEALING.

AUCKLAND–WELLINGTON VIA TARANAKI MAIN HIGHWAY, NGARUAWAHIA BOROUGH DIVISION.

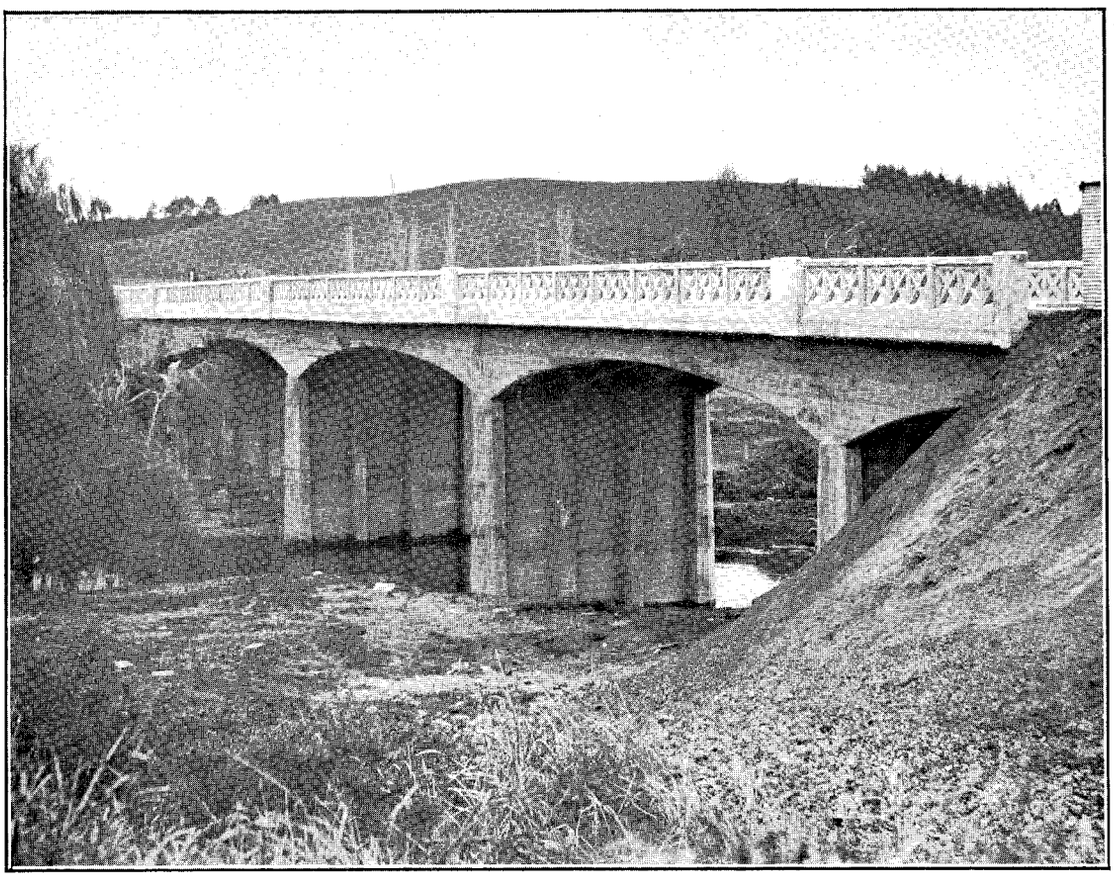


VIEW SHOWING 6-YARD CARRY-ALL SCRAPER IN OPERATION.

AUCKLAND–WELLINGTON VIA TARANAKI MAIN HIGHWAY, WAIPA COUNTY DIVISION: RECONSTRUCTION.

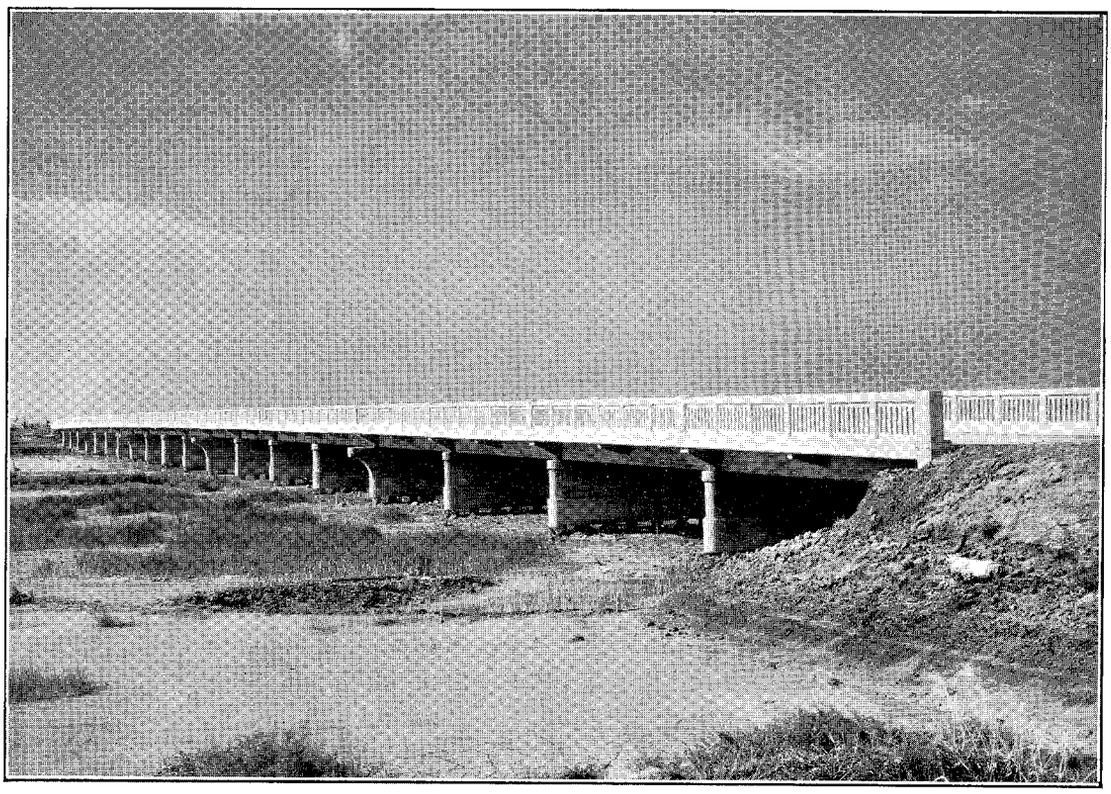


PUNIU DEVIATION.



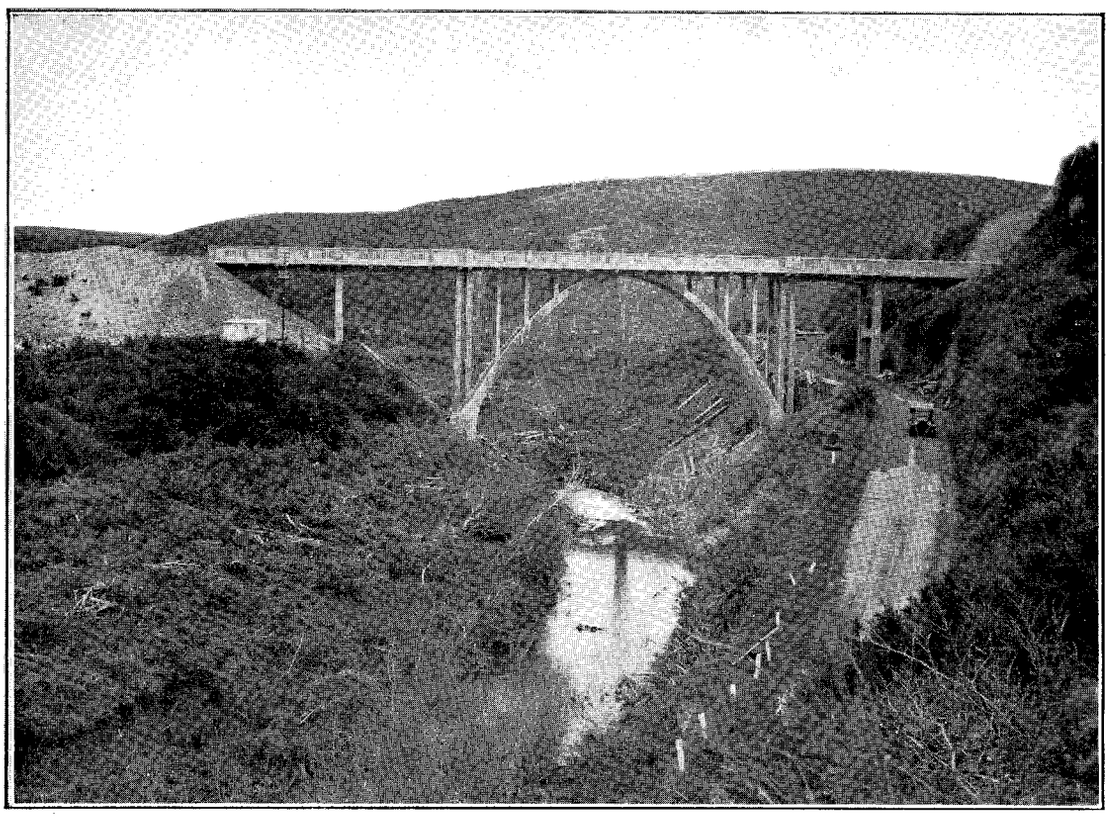
PUNIU BRIDGE ON NEW DEVIATION.

AUCKLAND–WELLINGTON VIA TARANAKI MAIN HIGHWAY, WAIPA COUNTY DIVISION: RECONSTRUCTION.



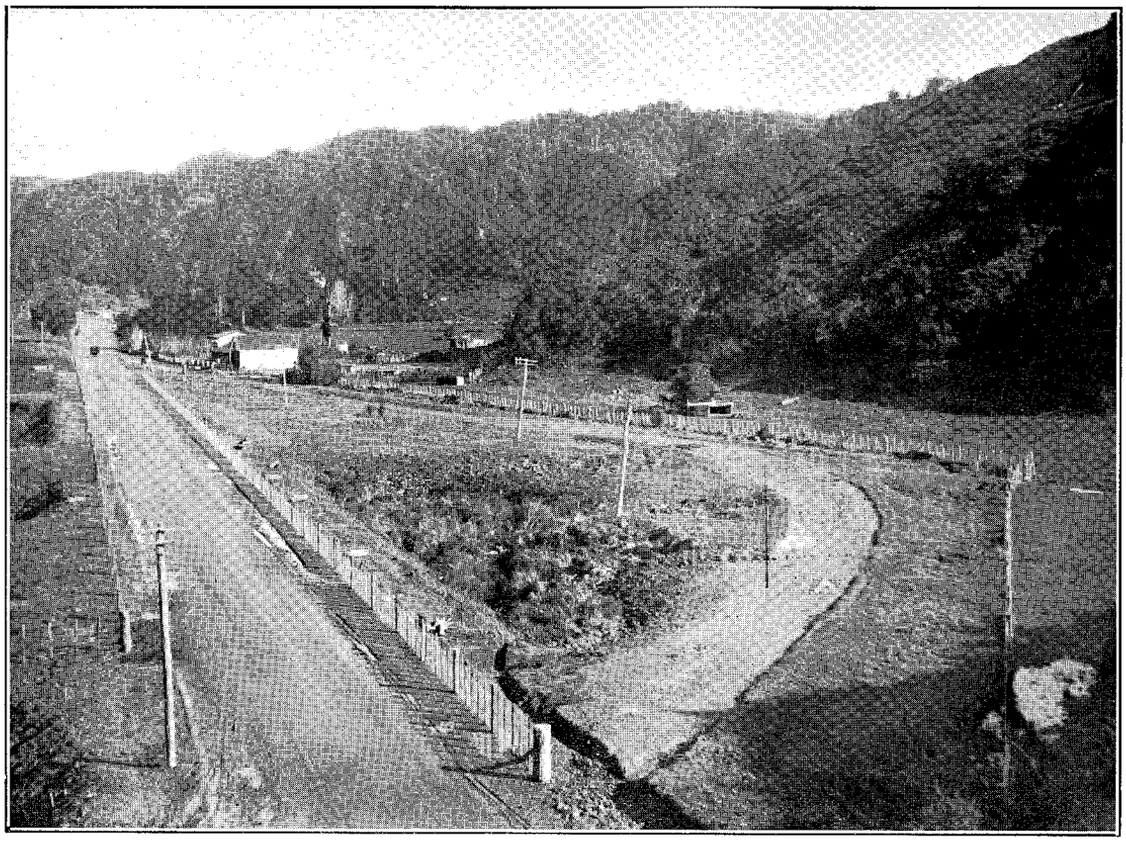
Waitangi Washout Bridge: Twenty 40 ft. Spans, 24 ft. Roadway.

NAPIER–WELLINGTON VIA WAIRARAPA MAIN HIGHWAY.



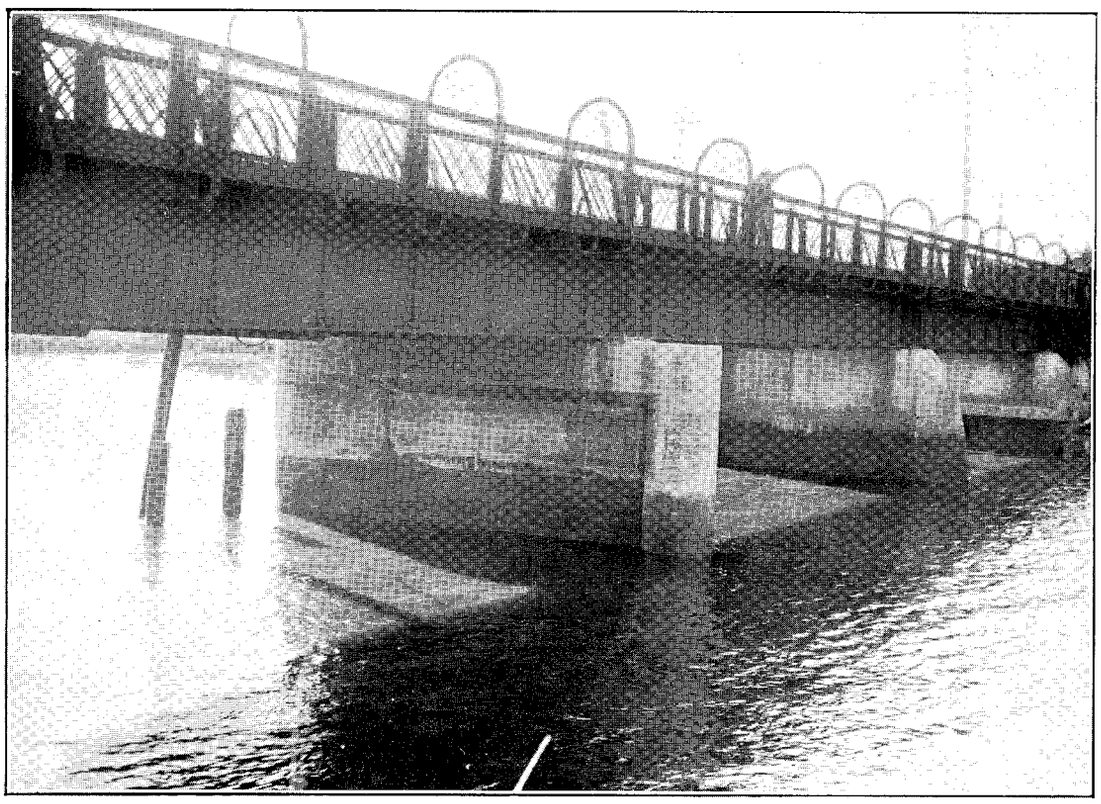
Tangahoe Bridge on New Deviation: 90 ft. Arch Span with 41 ft. Rise; Total Length 214 ft., 20 ft. Roadway; Deck-level 80 ft. above Stream.

AUCKLAND–WELLINGTON VIA TARANAKI MAIN HIGHWAY, HAWERA COUNTY DIVISION.



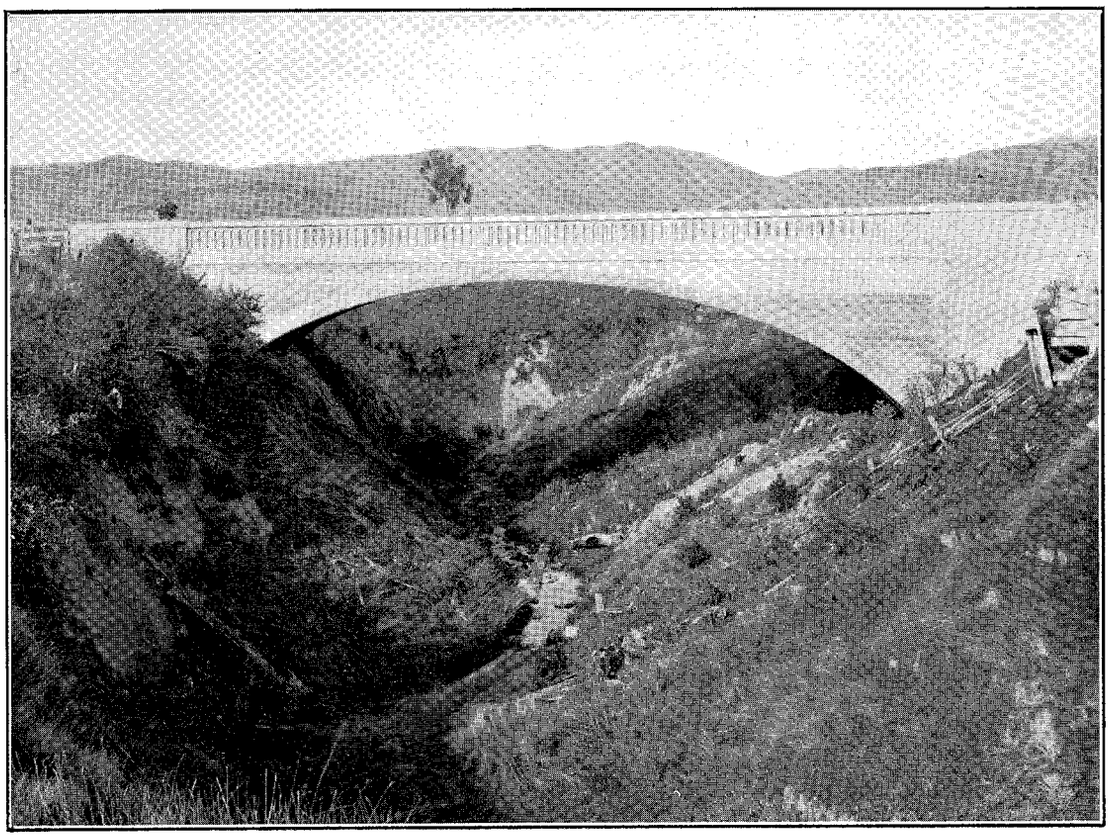
Re-alignment: Mimi Valley Section.

AUCKLAND–WELLINGTON VIA TARANAKI MAIN HIGHWAY.



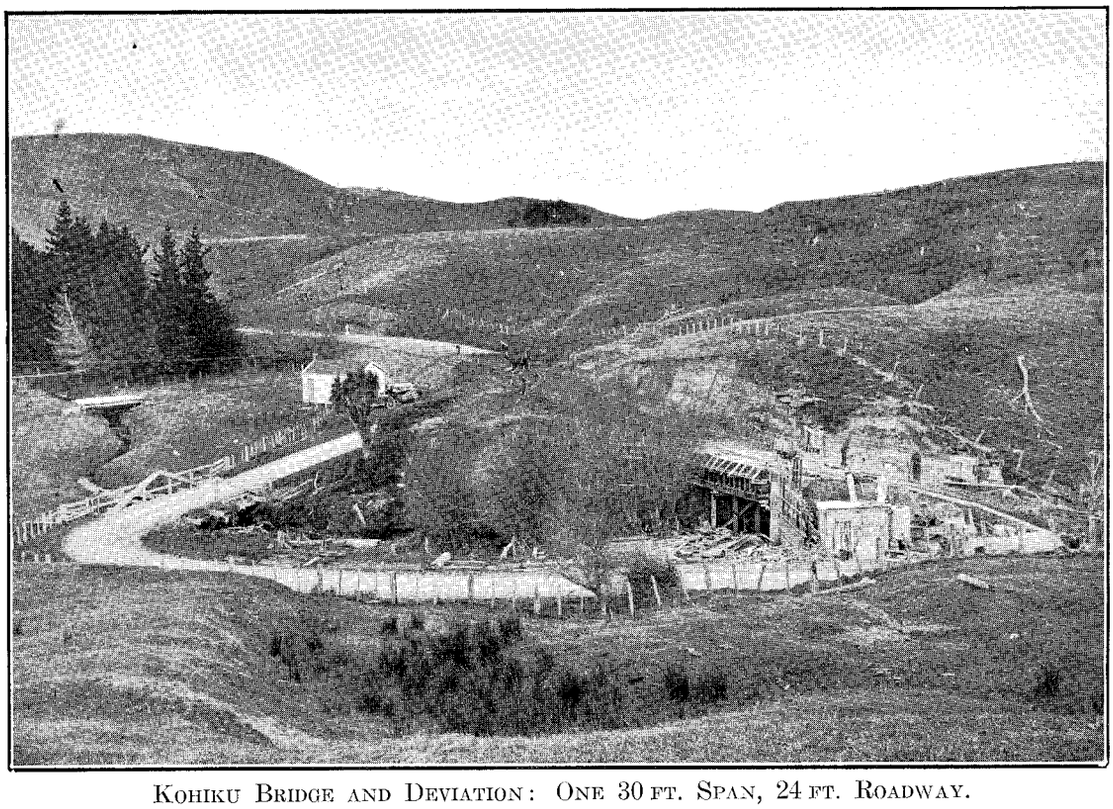
Waitara River Bridge, Waitara Borough: View showing in Foreground Pier reconstructed after Flood Damage.

AUCKLAND-WELLINGTON VIA TARANAKI MAIN HIGHWAY.



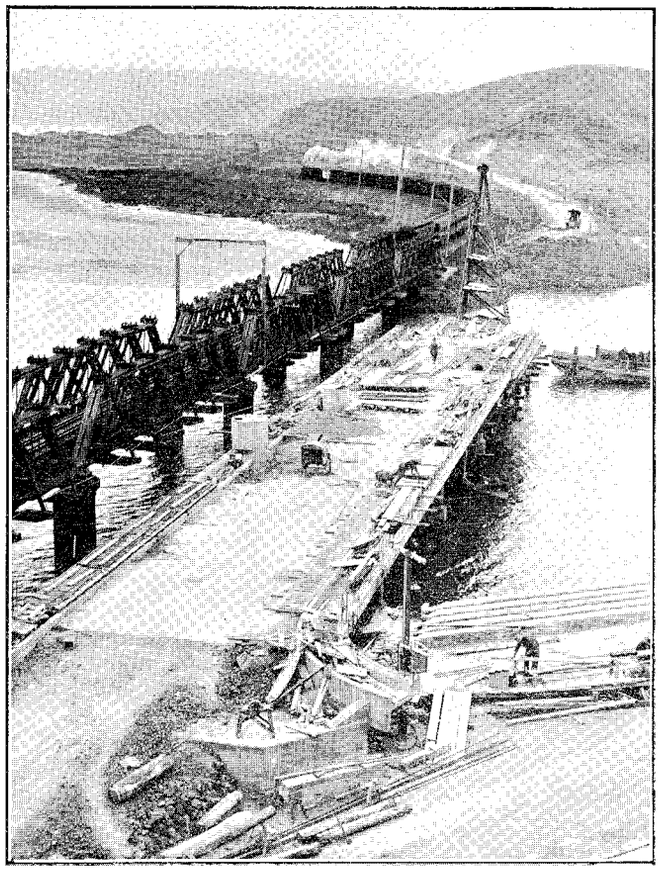
PARAWHAITI BRIDGE, MASTERTON COUNTY DIVISION.

MASTERTON–STRONVAR VIA WERAITI MAIN HIGHWAY.



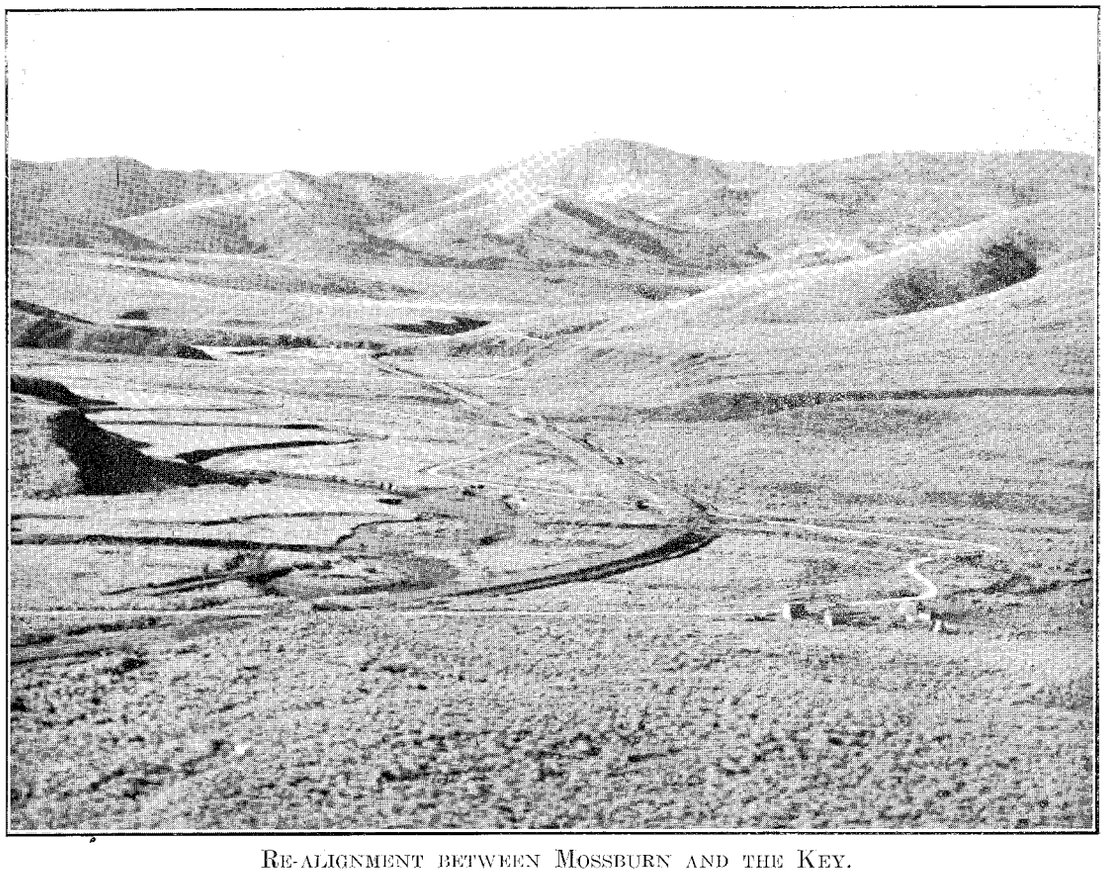
KOHIKU BRIDGE AND DEVIATION: ONE 30 FT. SPAN, 24 FT. ROADWAY.

MASTERTON–WEBER VIA ALFREDTON MAIN HIGHWAY.



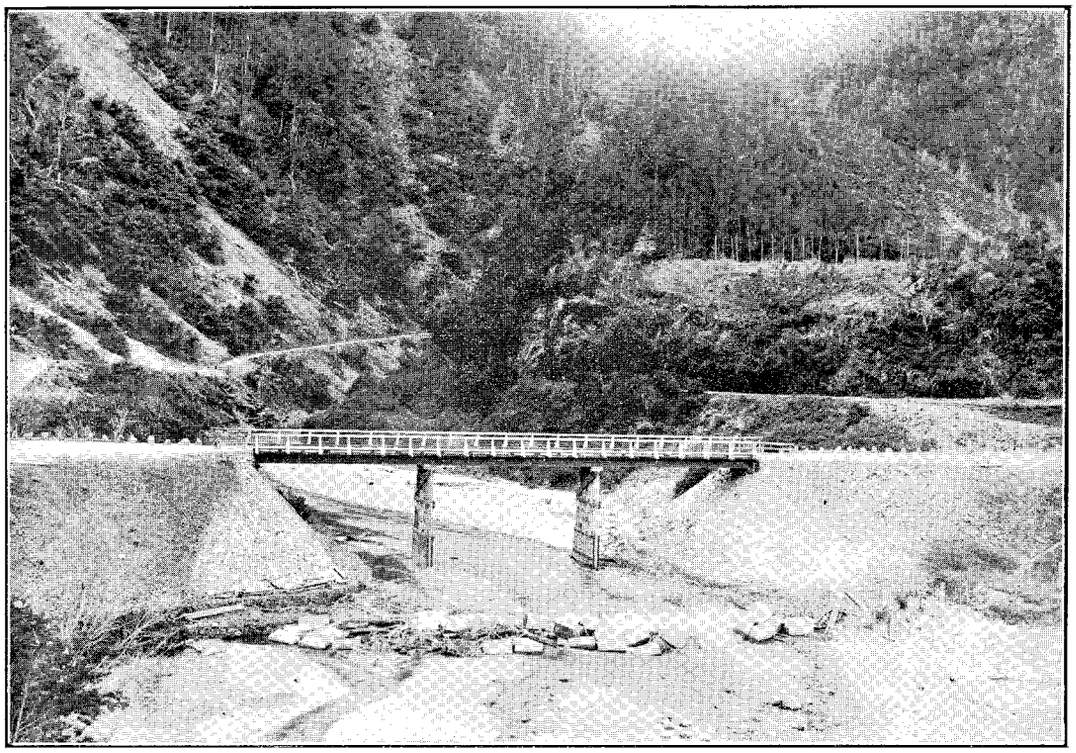
PAREMATA TRAFFIC BRIDGE ACROSS PAHAUTANUI ARM OF PORIRUA HARBOUR: VIEW SHOWING BRIDGE IN COURSE OF CONSTRUCTION.

PAREMATA–PLIMMERTON MAIN HIGHWAY,
HUTT COUNTY DIVISION.



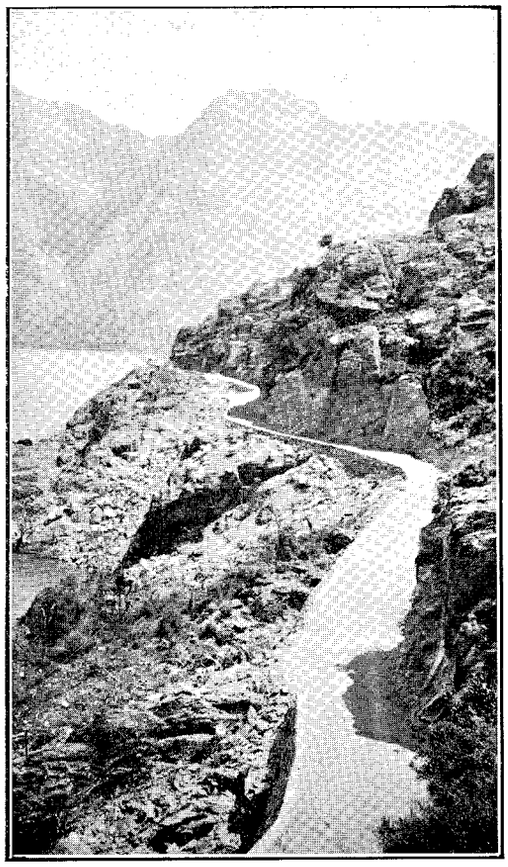
RE-ALIGNMENT BETWEEN MOSSBURN AND THE KEY.

GORE – TE ANAU – MILFORD SOUND MAIN HIGHWAY.



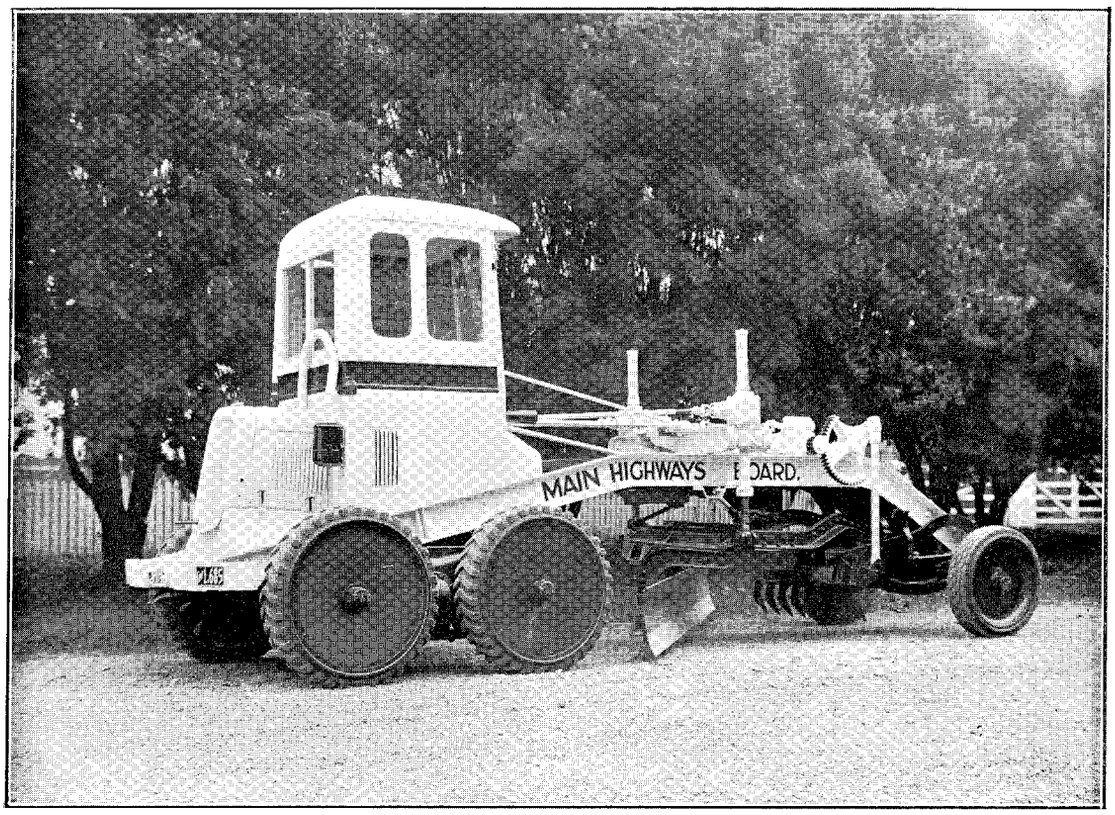
Lyell Creek Bridge: Three 40 ft. Rolled-steel Joist Spans.

NELSON–INANGAHUA JUNCTION MAIN HIGHWAY, MURCHISON COUNTY DIVISION.

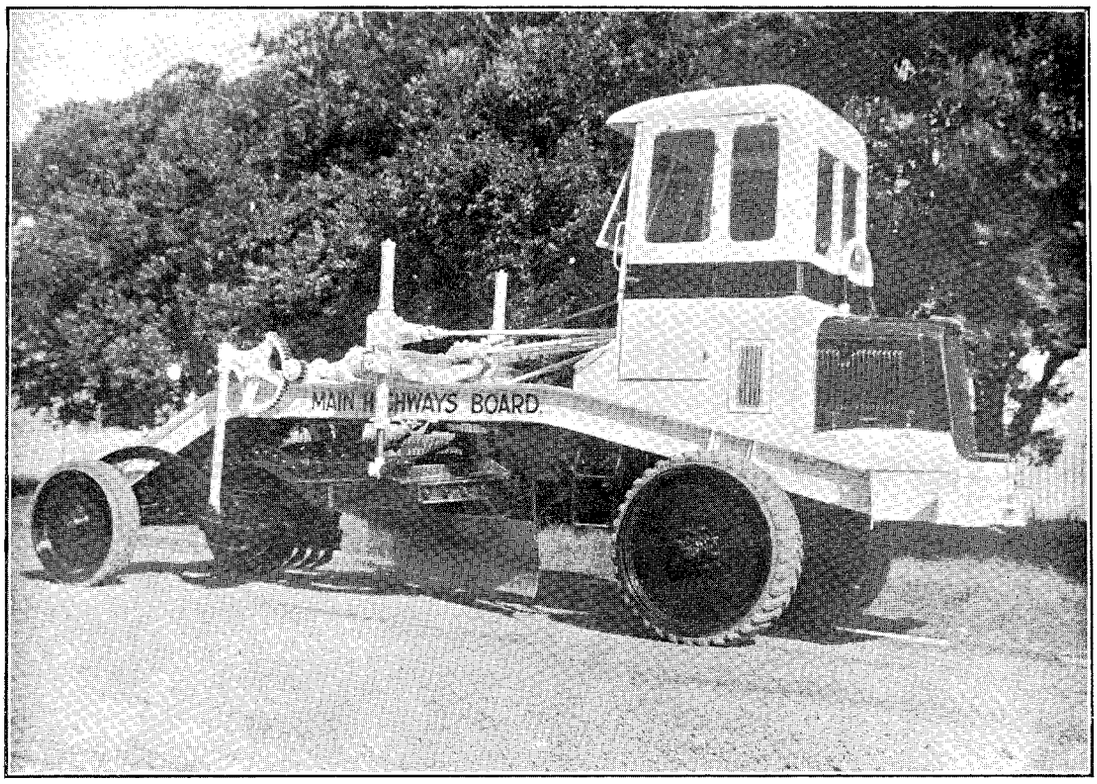


View showing New Highway alongside Lake Wakatipu.

LUMSDEN–QUEENSTOWN VIA KINGSTON MAIN HIGHWAY, LAKE COUNTY DIVISION.

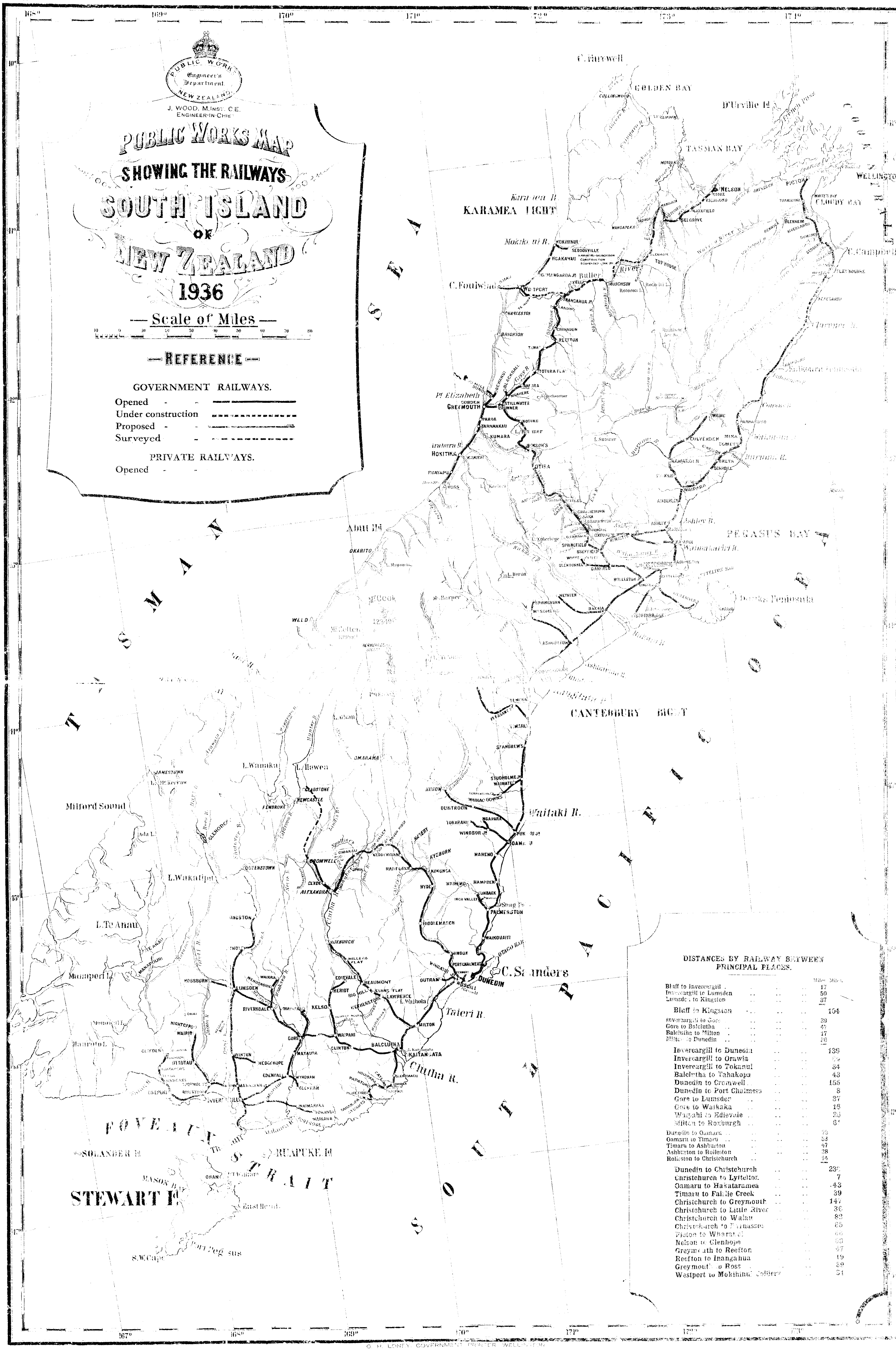


STANDARD MODEL 88.



STANDARD MODEL 90.

POWER GRADERS DESIGNED BY THE PUBLIC WORKS DEPARTMENT FOR MAIN HIGHWAYS.



DISTANCES BY RAILWAY BETWEEN PRINCIPAL PLACES.

	Miles	Miles
Bluff to Invercargill	17	
Invercargill to Lumsden	50	
Lumsden to Kingston	37	
Bluff to Kingston		104
Invercargill to Gore	39	
Gore to Balclutha	47	
Balclutha to Milton	17	
Milton to Dunedin	36	
Invercargill to Dunedin		139
Invercargill to Orawia		[illegible]
Invercargill to Tokanui		34
Balclutha to Tahakopa		43
Dunedin to Cromwell		155
Dunedin to Port Chalmers		8
Gore to Lumsden		37
Gore to Waikaka		16
Waipahi to Edievale		23
Milton to Roxburgh		[illegible]
Dunedin to Oamaru	78	
Oamaru to Timaru	53	
Timaru to Ashburton	47	
Ashburton to Rolleston	38	
Rolleston to Christchurch	14	
Dunedin to Christchurch		[illegible]
Christchurch to Lyttelton		7
Oamaru to Hakataramea		43
Timaru to Fairlie Creek		39
Christchurch to Greymouth		147
Christchurch to Little River		36
Christchurch to Waiau		82
Christchurch to Parnassus		85
Picton to Wharanui		[illegible]
Nelson to Glenhope		[illegible]
Greymouth to Reefton		47
Reefton to Inangahua		19
Greymouth to Ross		39
Westport to Mokihinui Colliery		31

G. H. LONEY, GOVERNMENT PRINTER, WELLINGTON.

PUBLIC WORKS
Engineer's Department
NEW ZEALAND.

J. WOOD, M.INST. C.E.
ENGINEER-IN-CHIEF.

PUBLIC WORKS MAP
SHOWING THE RAILWAYS
NORTH ISLAND
OF
NEW ZEALAND
1936

— Scale of Miles —

10 0 10 20 30 40 50 60 70 80

— REFERENCE —

GOVERNMENT RAILWAYS.

Opened - -
Under construction
Surveyed -

PRIVATE RAILWAYS.

Opened - -

DISTANCES BY RAILWAY BETWEEN PRINCIPAL PLACES.

	Miles.	Miles.
Wellington to Palmerston North .. .	87	
Palmerston North to Wanganui (Aramoho Junction)	60	
Aramoho to New Plymouth	104	
Wellington to New Plymouth .. .		251
Wellington to Palmerston North	87	
Palmerston North to Woodville	18	
Woodville to Napier (Spit)	97	
Wellington to Napier via Manawatu .. .		202
Wellington to Woodville	115	
Woodville to Napier (Spit)	97	
Wellington to Napier via Wairarapa .. .		212
Auckland to Onehunga		8
Auckland to Hamilton (Frankton Junction) ..	85	
Hamilton to Ongarue	75	
Ongarue to Taumarunui	15	
Taumarunui to Ohakune	50	
Ohakune to Waiouru	17	
Waiouru to Marton	68	
Marton to Wellington	116	
Auckland to Wellington		426
Auckland to Hamilton (Frankton Junction) ..	85	
Hamilton to Te Aroha	30	
Te Aroha to Thames	33	
Auckland to Thames		148
Auckland to Taneatua		227
Auckland to Rotorua		171
Auckland to Whangarei		133
Dargaville to Donnelly's Crossing .. .		24
Whangarei to Opua		53
Kawakawa to Okaihau		29
Gisborne to Motuhora		49
Thames to Waihi		33
Stratford to Okahukura		89

G. H. LOVEL, GOVERNMENT PRINTER, WELLINGTON.