

1944
NEW ZEALAND

DEPARTMENT OF LANDS AND SURVEY
SURVEYS

(ANNUAL REPORT ON)

Presented to both Houses of the General Assembly by Command of His Excellency

Wellington, 7th July, 1944.

THE SURVEYOR-GENERAL to the Hon. the MINISTER OF LANDS.

SIR,—

I have the honour to present herewith my report on the survey operations of the Department for the year ending 31st March, 1944.

I have, &c.,
R. G. DICK,
Surveyor-General.

The Hon. the Minister of Lands.

REPORT

I HAVE much pleasure in presenting a brief report of the activities of the Survey and Draughting Branch of the Department for the year ending 31st March, 1944. In spite of additional responsibilities brought about by the war situation, the staff has been able to cope with all essential works.

Topographical mapping for military purposes has constituted the major activity of the staff. Routine work has been further reduced to meet the bare requirements of State and public land transactions.

The various activities are reported on briefly as set out hereunder.

ROUTINE ACTIVITIES

Land Surveys

The amount of routine land survey work carried out by staff and contract surveyors during the year has shown a small increase on the previous year. This work is falling into arrears because of the national shortage of registered surveyors available to undertake contracts for other Departments.

The number of private practising surveyors engaged on various contract surveys, mainly for the Housing Department, has increased from forty-two to fifty-two. Of the thirty-five staff surveyors, the majority were employed on topographical mapping.

With the increase in housing and land-settlement activities, urgent surveys are accumulating. The release of registered surveyors from topographical mapping will assist to a small extent in the reduction of these arrears.

The following is a summary of the land survey work carried out for the year ending 31st March, 1944:—

Summary of Field-work

Class of Survey.	—	Average Cost.	Total Cost.
Topographical survey for settlement	5,646 acres ..	9-7d. per acre ..	£ s. d. 227 11 5
Topographical survey for housing	126 acres ..	£2-38 per acre ..	300 11 0
Rural and suburban	27,459 acres ..	22-66s. per acre	3,648 16 6
Town sections	1,047 sections	£3-43 per section	3,592 18 6
Native land	1,232 acres ..	4-86s. per acre	299 5 3
Road and railway	48-9 miles ..	£35-85 per mile	1,748 15 8
Other work	2,849 11 7
Total cost	12,667 9 11

This summary does not include surveys carried out by private practising surveyors under the direct instruction of other Departments of State. A large area of Native land has been surveyed by contract surveyors, the returns of which are not included in the summary.

Under the heading "Other Work" is included such miscellaneous surveys as boundary location surveys, inspection and investigation surveys, and special surveys for the Armed Services, which latter comprised 50 per cent. of the total.

The total expenditure is distributed among the various districts as follows:—

District.	Total Cost.	Percentage.	District.	Total Cost.	Percentage.
	£ s. d.			£ s. d.	
Auckland	5,511 9 5	3.5	Nelson	340 15 3	2.7
Gisborne	81 8 3	0.6	Westland	407 7 10	3.2
Hawke's Bay	1,359 8 0	10.7	Canterbury	1,059 6 6	8.4
Taranaki	238 4 11	1.9	Otago	521 4 6	4.1
Wellington	1,560 11 10	12.3	Southland	82 13 7	0.7
Marlborough	1,504 19 10	11.9			
			Totals	12,667 9 11	100.0

In the Marlborough District the large expenditure is due to the completion of extensive railway surveys commenced prior to the outbreak of war.

Field-work in Hand

As already indicated, a considerable amount of land boundary survey work has accumulated in the various districts, which will necessitate the employment of contract surveyors to a much greater extent than in past years. This accumulation does not include rehabilitation settlement surveys and housing surveys which will be required during the year. Any resumption of public works will also have a relative effect on these accumulations. Until these surveys are reduced to reasonable limits it would appear that there will be little opportunity of putting in hand such specialized surveys as second and third order triangulation, standard traversing, and precise levelling, which have been held in abeyance during the war period.

The following summary sets out the total amount of land boundary survey work at present awaiting survey in the various districts:—

Rural surveys	25,209 acres
Native surveys	58,844 acres
Road and railway surveys	120 miles
Town section surveys	1,000 sections

Town Scheme Subdivisions

The number of town scheme subdivisions dealt with under section 16 of the Land Act, 1924, during the year has shown the remarkable increase of 90 per cent. on the previous year, exceeding even the number dealt with in some pre-war years. This would indicate that rural areas on the outskirts of cities and boroughs are being absorbed as residential areas. Over 90 per cent. of the area dealt with comprises freehold property for private sale.

The following table sets out the areas dealt with in the various districts for the year ending 31st March, 1944:—

District.	Number of Plans.	Number of Saleable Lots.	Total Area.
			A. R. P.
Auckland and North Auckland	95	1,343	507 0 22
Gisborne	2	4	5 1 08
Hawke's Bay	3	22	11 0 30
Taranaki	1	1	4 0 21
Wellington	31	115	72 0 23
Marlborough	3	46	11 0 28
Nelson	8	97	28 3 11
Westland	2	14	3 0 33
Canterbury	30	221	70 0 16
Otago	6	53	13 0 23
Southland	3	13	4 0 22
Totals	184	1,929	730 1 37

It will be noted that approximately 70 per cent. of the number of saleable lots and areas dealt with is located in the Auckland and North Auckland Land Districts.

Of the total area dealt with, approximately 11 per cent., or 82 acres, were set aside in accordance with the provisions of the Act as areas for recreation reserves, plantation reserves, foreshore or esplanade reserves, and road reserves.

It is proposed to bring down amending legislation in the near future to provide for a better control of subdivisional development and the setting-aside of suitable areas for public purposes. The selection and siting of reserves and open spaces to serve the requirements of residents is a problem that requires further enabling powers under the Act.

Office-work (Plan Examination)

The depleted office staff has been called on to handle an increase in the amount of civil work as well as cope with the mapping and other requirements of the Services. The office-work carried out in connection with land survey plans and documents for the year ending 31st March, 1944, is scheduled hereunder:—

District.	Plans placed on Instruments of Title.	Survey Plans examined and approved.			
		Crown.	Other Departments.	Native.	Land Transfer.
Auckland and North Auckland	10,048	114	149	52	487
Gisborne	461	28	..	7	31
Hawke's Bay	889	10	14	2	64
Taranaki	745	6	16	8	44
Wellington	3,009	16	103	4	178
Marlborough	237	4	12	1	17
Nelson	847	17	30	..	67
Westland	519	27	1	..	7
Canterbury	2,628	10	37	1	160
Otago	1,268	14	17	..	79
Southland	708	..	14	..	42
Totals	21,359	246	393	75	1,176

This summary reveals that, compared with the previous year, there has been approximately a 12-per-cent. increase in the amount of land title work. Indications are that this work will tend to increase, as the accumulated arrears at the end of the year were greater than those of the previous year.

Other Office-work

A large portion of the staff are continually employed on various classes of work consequent on survey plan examination, such as the maintenance of record maps, the preparation of land descriptions, investigations of title, tracings, photostats, &c.

The following is a summary of the amount of miscellaneous office-work carried out by the staff:—

Record maps	32
Cadastral maps	Nil
Tracings	3,209
Photostats and prints	53,644

Warrants

During the year 156 warrants for certificates of title and 11 Proclamations of road-lines under the Native Land Act, 1931, were dealt with.

Summarized Expenditure

A schedule of summarized salary expenditure is not included in the report this year. The total expenditure for all districts is shown as £103,406 6s. 6d., as compared with £96,843 15s. 3d. for last year.

The expenditure under the various items is as follows:—

General (Crown surveys, records, investigations, tracings, diagrams, and general office-work)	£	s.	d.
Triangulation (computations only)	31,172	8	11
Topographical mapping (departmental staff—salaries only)	9,435	8	7
Standard traverse (office only)	7	8	6
Survey maintenance (standard blocks and trig signals)	24	19	11
Precise levelling	286	0	4
Inspection and investigation surveys	282	1	5
Town scheme plans	260	11	0
Land-development (topographical and schemes)	244	16	5
Tidal analysis (computations)	125	3	5
Work for—			
Native Department	1,735	2	4
Land and Deeds Department	8,425	10	3
Public Works Department	3,278	3	11
Housing Department	1,673	18	4
Other Departments	45,615	6	6
Total	£103,406	6	6

It will be noted that approximately 60 per cent. of the salary expenditure of the staff is devoted to work for other Departments of State.

The summary does not include the cost of a large number of surveys carried out by private practising surveyors under contract from the Department the cost of which has been met by the Department requiring the survey.

Map Sales

The restriction on the sale of departmental maps during the war period, coupled with the decline in civil activities, is reflected in the number of maps disposed of. The only maps available for disposal are the cadastral 1 mile to an inch series and territorial maps. All topographical maps have been entirely withdrawn from sale.

No maps subject to royalty payment have been published by private organizations during the year.

SPECIALIZED ACTIVITIES

Standard Traverses

No new work or revision has been carried out under this heading. New standard traverses are urgently required throughout the Dominion for the control of land surveys, but will have to be held in abeyance until the post-war period, when it is hoped that staff will be available for the purpose.

Triangulation

Geodetic Triangulation.—The party engaged on this work completed all terrestrial angular observations during the 1939-40 season. Arrangements had been made with the Colonial Office prior to the outbreak of war for the use of base-line-measuring equipment to be employed in the measurement of the three new base-lines in the South Island and the remeasurement of at least one of the old North Island bases.

However, as it was not possible to obtain certificates of comparison for the invar bands to be employed, the base measurements have been held in abeyance until the post-war period. It is hoped that this work can be completed at an early date, thus finalizing operations that were commenced in 1910 in accordance with the recommendations made by Major Palmer to the Government in 1875.

It is estimated that the field observations for the geodetic triangulation can be completed in under two years, the remaining work being base-line measurements and observations at a few stations for longitude, latitude, and azimuth. In addition to the value of the work for land surveys, it will have a scientific value in the field of geodesy and other allied sciences.

The existing work has been employed for the purpose of providing provisional values for military mapping, particularly in the Otago-Southland area, where the original circuit co-ordinates were unsatisfactory.

In order to correct discrepancies in this district a limited amount of second order triangulation was put in hand towards the end of the year.

Tidal Analysis

For the purpose of tidal predictions carried out for the Marine Department, analyses of tide-gauge records of the years 1926, 1929, 1932, 1935, and 1938 for the Port of Auckland were completed by the Computing Branch.

The automatic tide-gauges operated by the Harbour Boards at Wellington and Lyttelton were inspected during the year.

The tidal predictions for the seven standard ports carried out annually by the Tidal Institute, Liverpool, from harmonic constants supplied by the Department had not come to hand by the end of the year.

Precise Levelling

The only work being carried out under this heading is a traverse of precise levels required by the Public Works Department in the Canterbury District.

The continuation of this work will prove of great value for the co-ordination of engineering levels.

Topographical Mapping

At the outbreak of the war in September, 1939, the Department set aside certain routine work to undertake topographical mapping for the Army Department. Except for a few isolated areas mapped during the Great War, the only maps available for military operations were the territorial and cadastral map series issued by the Department.

It was therefore necessary to put into operation a programme of mapping to meet the essential requirements of the Army. In 1935, in consultation with the Army, the Dominion was subdivided into a mile to an inch map series on a predetermined grid.

Prior to the war the mapping of these series from aerial photographs supplied by the Royal New Zealand Air Force was being carried out by a small staff at Head Office. Two Barr and Stroud precise stereoscopes were employed for the plotting of these maps from the photographs, height control and identification having previously been supplied by a field staff. The first map of this series was published in March, 1939.

It was decided on the outbreak of the war to cease work on this series and concentrate on the mapping of vital fortress areas on a scale of 1/25,000 (approximately 32 chains to an inch). The Royal New Zealand Air Force were unable to make aircraft available to supply the aerial photographs required as a basis for mapping on the scale selected. Contracts were therefore issued to the New Zealand Aerial Mapping Co., Ltd., Hastings, by the Army Department, and by November, 1939, mapping was commenced in the Auckland District.

In November, 1941, it was decided by the Army Department to concentrate on the production of the 1 in. series, priorities being laid down for the mapping of vital areas to meet the requirements of military operations. Mapping on the 1/25,000 scale was therefore held in abeyance and all personnel transferred to mapping on the 1 in. scale. Army transport, equipment, and trained personnel were made available, and eventually thirteen large mapping parties located throughout various parts of the Dominion. At the end of the year personnel engaged on this work had been reduced by 50 per cent., and further reduction is to be made during the present year.

A full report of the Department's mapping operations during the war period will be published at some future date. The progress made to date is set out in the following summaries:—

Summary of 1/25,000 Topographical Mapping carried out as from September, 1939, to 31st March, 1944

	Area (Square Miles).	Sheets.
Maps published	950	22
Drawings completed	600	14
Mapping in hand (completed)	880	18
Totals	2,430	54

As indicated, very little work has been carried out on this series since November, 1941.

Summary of 1 Mile to an Inch (1/63,360) Topographical Mapping carried out as from 1st November, 1941, to 31st March, 1944

	North Island.		South Island.		Totals.	
	Area (Square Miles).	Sheets.	Area (Square Miles).	Sheets.	Area (Square Miles).	Sheets.
Maps published	12,025	48	15,225	49	27,250	97
Drawings completed	2,550	10	4,725	14	7,275	24
Mapping in hand (completed)	4,600	18	3,200	14	7,800	32
Totals	19,175	76	23,150	77	42,325	153

Approximately 20,000 square miles of the total area of 42,325 square miles scheduled above has been photographed by the New Zealand Aerial Mapping Co., Ltd., Hastings, under contract to the Army Department.

Aerial Photography

Consequent on the phenomenal increase in mapping operations, the economic organization and control of aerial photography has become a function of the Department. During the past year all aerial photography required for military and other State purposes has been carried out by the New Zealand Aerial Mapping Co., Ltd., Hastings. By far the largest percentage of the photography has been carried out for the Army Department, forming the basis for about 50 per cent. of the topographical mapping undertaken by the Department.

All orders for photography and copies of prints are dealt with by Head Office, Wellington. A complete index of all photography and a photographic library is maintained in Wellington for reference purposes. To facilitate departmental and public requirements, it is proposed to establish as early as possible similar indices and libraries in the various Chief Surveyors' offices.

During the year the following photography and photographs have been completed and indexed:—

Area photographed	5,160 square miles.
Number of photographs indexed	11,654 prints.

Air Charts

The Department is responsible to the Royal New Zealand Air Force for the preparation of air navigation and air plotting charts of areas in New Zealand and the Pacific. A regular draughting staff is employed at Head Office for this purpose.

Miscellaneous Work

A large volume of work of a miscellaneous nature has been undertaken for the Armed Services by the staff. The fixing and co-ordinating of gun positions and other vital points, the preparation of special maps and plotting charts, and the copying of maps have been ably carried out to the satisfaction of the Services concerned.

HONORARY GEOGRAPHIC BOARD

This Board held its eighteenth annual meeting on 27th May, 1943, at which 250 names were dealt with, 192 being approved, the balance being deferred for further investigation.

The publication of the new 1 mile to an inch topographical series has given opportunity for the Department to revise the spelling and naming of localities. Various authorities in the localities are communicated with in cases where the spelling of a place-name is in doubt.

SURVEY BOARD

Two examinations were held during the year, the results being as follows:—

September, 1943.—Seventeen candidates presented themselves for examination, two of whom were successful in passing the final examination, while the remainder obtained credits in various subjects:

March, 1944.—Ten candidates presented themselves for examination, seven of whom were successful in obtaining credits in various subjects.

The Survey Examination Regulations 1943 and the Surveyors Professional Regulations 1943 came into operation on 1st January, 1944. These regulations, which amended the Survey Examination Rules 1934, were drawn up in terms of the uniform regulations agreed on at a conference of reciprocating Boards held in Melbourne in 1940. They make provision for the conduct of the Surveyors' Examination, the registration of surveyors, and the taxation of charges made by surveyors for work carried out under the Survey Regulations 1940.

During the year the following students were registered as pupils:—

Lands and Survey Department	3
Under articles of indenture to private surveyors	11
Total	14

One surveyor was dealt with by the Board for defective survey work.

STAFF

In closing, I wish to thank all members of the staff for the way in which they have loyally carried out their duties in the field and in the office during the year. The field and office staff engaged on topographical mapping have demonstrated their zeal and efficiency in the fine results produced. To a no less extent have the depleted staff engaged on routine work efficiently carried out their duties, the results of whose work are not so evident to the eye.

Mr. H. E. Walshe, who had held the office of Surveyor-General since April, 1929, retired after forty-four years' service on 31st December, 1943. We all wish him joy and happiness in a well-earned retirement after 14½ years of office as Surveyor-General.