



SUPPLEMENT
TO THE
NEW ZEALAND GAZETTE

OF
THURSDAY, AUGUST 29, 1907.

Published by Authority.

WELLINGTON, THURSDAY, AUGUST 29, 1907.

Land Transfer Survey Regulations.

WHEREAS "The Land Transfer Act, 1885," empowers the Surveyor-General of the colony, with the approval of the Governor in Council, to make such regulations as he may think necessary for insuring the accuracy of plans and surveys required under the said Act, and to cancel and alter such regulations when and as necessary: Now, therefore, I, Thomas Humphries, the Surveyor-General of New Zealand, do, in pursuance of the said power, and with approval as aforesaid, hereby revoke, as from the first day of October, one thousand nine hundred and seven, the regulations made by the Surveyor-General on the seventeenth day of December, one thousand eight hundred and ninety-six, and published in the *New Zealand Gazette* of the fourth day of February, one thousand eight hundred and ninety-seven, as the Surveyors' Board has made regulations of even date in lieu thereof under the provisions of "The New Zealand Institute of Surveyors and Board of Examiners Act, 1900."

As witness my hand, this eighth day of August, one thousand nine hundred and seven.

THOS. HUMPHRIES,
Surveyor-General of New Zealand.

In pursuance of the provisions of "The Land Transfer Act, 1885," His Excellency the Governor of the Colony of New Zealand, with the advice and consent of the Executive Council of the said colony, approves of the cancellation of the regulations dated the seventeenth day of December, one thousand eight hundred and ninety-six, as from the first day of October, one thousand nine hundred and seven.

Approved in Council, this sixteenth day of August, one thousand nine hundred and seven.

J. F. ANDREWS,
Acting Clerk of the Executive Council.

PLUNKET, Governor.

Survey Regulations under "The Land Act, 1892."

PLUNKET, Governor.

IN pursuance and in exercise of the powers and authorities conferred upon me by the fourth section of "The Land Act, 1892," I, William Lee, Baron Plunket, the Governor of the Colony of New Zealand, do hereby make the regulations hereinafter set forth for the purposes of the said Act, as from the first day of October, one thousand nine hundred and seven; and I do also hereby revoke as from the same date the regulations heretofore in force for like purposes made on the twenty-first day of December, one thousand eight hundred and ninety-six, and published in the *New Zealand Gazette* of the twenty-fifth day of January, one thousand eight hundred and ninety-seven.

REGULATIONS.

1. These regulations are for the guidance of officers of the Department of Lands and Survey, who are required to strictly observe them.
2. In these regulations, if not inconsistent with the context,—
 - "Chief Surveyor" means the officer in charge of the surveys in any land district of the colony;
 - "Inspecting Surveyor" means the Chief Surveyor or other surveyor appointed to carry out the duties of inspection specified in these regulations;
 - "Surveyor" means a surveyor licensed by the Surveyors' Board to execute surveys within the Colony of New Zealand, and in the case of Land Transfer surveys or surveys of Native lands, also authorised by the Surveyor-General.
3. The Under-Secretary is the executive head of the Department, and is responsible for its general administration and control.
4. The Surveyor-General has charge of the technical and survey branches of the Department, and deals with matters relating thereto.

SURVEYS OF TOWN LANDS.

5. In surveys of towns open spaces are to be set apart and reserved for recreation-grounds, the number of such reserves being regulated by the superficial area of the town, being not less than one-tenth of such area, the separate size of such reserves in no case being less than 12½ square chains. The superficial area means the area divided into town sections, and the necessary streets to give access thereto.
6. Municipal reserves are to be made at the rate of 1 acre to every 10 acres of the saleable area of the town; also one or two school-sites of not less than 2 acres each. There should also be laid out sufficient land, either outside or inside such towns, for sites for depositing nightsoil, dirt, and rubbish, and such sites shall be selected on such side of the said towns as shall be opposite to the quarter from which the prevailing summer wind blows; also sufficient land, either outside or inside such towns, for sites for gravel-pits and stone-quarries, and for depositing gravel, stone, or other materials required for making and repairing roads within such towns, provided that gravel, stone, or other road materials can be obtained in the locality.
7. Reserves for public purposes suitable to all towns, such as are enumerated in section 235 of "The Land Act, 1892," are to be recommended. On the plans these areas to have their specific purposes written on each, either in full or in abbreviated form.
8. No reserve is to be made for cemetery purposes within any town.

SURVEYS OF NATIVE LANDS.

9. Where not otherwise agreed upon between the Chief Surveyor and the surveyors, the following are the rates to be paid for the survey of Native lands for the purposes of the Native Land Court:—

Schedule Rates per Acre.

Area.	Acres.	Bush.		Open.	
		Rate per Acre.	But not less than	Rate per Acre.	But not less than
		£ s. d.	£ s. d.	£ s. d.	£ s. d.
10 to 15	0 5 0	3 0 0	0 3 4	2 0 0
15 to 20	0 4 6	3 15 0	0 3 0	2 10 0
20 to 30	0 4 0	4 10 0	0 2 8	3 0 0
30 to 50	0 3 6	6 0 0	0 2 4	4 0 0
50 to 100	0 3 0	8 15 0	0 2 0	5 16 8
100 to 200	0 2 6	15 0 0	0 1 6	10 0 0
200 to 300	0 2 0	22 10 0	0 1 4	15 13 4
300 to 500	0 1 7	30 0 0	0 1 0	20 0 0
500 to 1,000	0 1 3	38 11 8	0 0 10	25 0 0
1,000 to 2,000	0 1 0	52 10 0	0 0 8	41 13 4
2,000 to 5,000	0 0 8	100 0 0	0 0 5	65 13 4
5,000 to 10,000	0 0 4	166 13 4	0 0 3	104 13 4

(a.) Where two or more surveys adjoin, a deduction from the sum total arrived at by the above rates is to be made as follows:—

Where two sides adjoin, deduct 25 per cent. of total, or
three " " 37½ " "

(b.) If the surveyors' camp is situated over 10 miles from the nearest store, in the discretion of the Chief Surveyor, there may be added to the above rates 5 per cent.; if 20 miles, 10 per cent.; if 30 miles, 15 per cent.; if 40 miles, 20 per cent.; and above that by special arrangement.

(c.) Subdivisional surveys will be allowed at mileage rates, except in very exceptional cases, when the Chief Surveyor may allow the above acreage rates or a modification of them.

(d.) Schedule Rates per Mile.

Rough bush country—	£ s. d.
Road surveys per mile	20 0 0
Traverse or boundary line "	14 0 0
Ordinary bush country, with scrub—	
Road surveys "	16 0 0
Traverse or boundary line "	13 0 0
Hilly, open country, with scrub—	
Road surveys "	10 0 0
Traverse or boundary line "	8 0 0
Open country—	
Road surveys "	8 0 0
Traverse or boundary line "	6 0 0

(e.) Wherever deductions are made for contiguity, an allowance of £1 per mile will be given for plotting and calculating adopted work; the same will apply when mileage rates only are allowed. For topographical and other internal work, where acreage rates are not used, a payment of 10s. per square mile will be allowed if, in the opinion of the Chief Surveyor, the work is worth it.

(f.) In travelling to the work, by railway or coach, the surveyor will be allowed £2 a day, and four men at 7s. a day, with rail and coach fares added. For pack-horse work 7s. 6d. a mile will be allowed up to 40 miles, which includes surveyor and men's pay.

(g.) It shall be competent for the Chief Surveyor of any district to make special arrangements with respect to any block, and to fix rates by the mile, or by a daily rate or other equitable rate, for surveys which do not come strictly under any of the above descriptions.

10. All claims to be made for charging orders under section 65 of "The Native Land Court Act, 1894," must be made in accordance with the Rules and Regulations of the Native Land Court. No Chief Surveyor is bound to certify to costs which exceed, in his opinion, what is a fair charge, even in cases where arrangements have been previously made as to such costs.

11. Charges acquired by the Crown for the survey of Native lands under section 87 of "The Native Land Laws Amendment Act, 1896," are to be drawn in the Form E given in Schedule.

OFFICE RECORD.

12. Field-books, working-plans, record maps, and documents relating thereto and to titles are to be kept in a fireproof safe.

13. Working-plans, whether of meridional circuits, major triangulations, minor triangulations, or block surveys are to be drawn on antiquarian paper, cut to 30 in. square. These are to be laid flat in drawers in a close press set up in the fireproof strong-room attached to the Survey Office, or where such are not provided, then in portfolios 33 in. square to lie on shelves 34 in. square in place of drawers.

14. The compiled or index plans, being unavoidably of large size, should be mounted and kept in rolls. The tops and bottoms of these maps should have thin laths glued or tacked to them, and extra-fastened with copper tacks.

15. An index plan of each county in the land district, on a scale of 80 chains to an inch, coloured to show the tenure and mounted on rollers, should be exhibited in the chief office of each district, and hung in a convenient place for public access.

16. In order to make the county maps in the Head Office as complete as possible, a tracing showing alterations, subdivisions, roads and road deviations, and new surveys made during each month must be forwarded by the Chief Surveyor with his monthly report.

17. Original plans, block-sheets, and record plans are open to surveyors and professional draughtsmen only, under the supervision of the officer having charge of the plans when not in use by the Department; but other compiled plans are open to the public.

18. The following are the scales to be used in plans of surveys:—

<i>Working-plans.</i>	
Town sections, or sections under half an acre	1 to 2 chains to an inch.
Suburban sections	3 to 5 "
Rural sections	10 "
Minor triangulations	40 "
Topographical	40 "
Meridional circuits	320 "
Reconnaissance and major triangulation	160 "
Index maps	80 "
<i>Copied or Compiled Plans.</i>	
Town or village selection maps	5 or 10 chains to an inch.
Town or village Crown-grant record maps	2 "
Rural selection maps (after survey)	10 "
(before survey)	40 "
Crown-grant record maps (rural)	20 "
Territorial maps	4 or 16 miles to an inch.
<i>Extreme Areas contained in Plans.</i>	
Working-plans of town sections	$\frac{1}{4}$ mile square.
" rural sections	34 miles "
" minor triangulations	124 "
" topographical	124 "
" reconnaissance and major triangulations	60 "
" meridional circuits	120 "

19. Wall-maps may be of any size and scale.

20. With a view to the systematic record of all transactions of the Land Transfer Branch, and of surveys executed under the Public Works or other Acts, record maps on the same scales as for original surveys—namely, 20 chains to an inch for rural lands, and 1 or 2 chains to an inch for town lands—are to be prepared, on which all road-lines, subdivisions, and other details surveyed since the issue of the Crown grant, under the Land Transfer Act, Public Works Acts, the Land Act, Native Land Acts, or any other proper authority, should be recorded.

21. Computation books should be of one size, so as to fit the shelves in the safe. The size should be a little above the ordinary foolscap, and the books should be numbered, paged, and the contents indexed, for easy reference.

MAP PUBLICATIONS.

22. Plans of towns may be reduced to any convenient scale. Plans of rural and suburban block or section surveys will be reduced to a scale of 20 chains or 40 chains to an inch, as the area of the sections is small or great. Plans of survey districts are to be compiled to a scale of 40 chains to an inch, for reduction by photography to a scale of 80 chains to an inch.

23. The paper on which the drawing is made is to be perfectly white and smooth, free from dirt, creases, or wrinkles, and of such quality as will admit of a second or third drawing surface if necessary after erasures have been made. Tracing-cloth may be used, but tracing-paper, unless perfectly white and the drawing carefully done, is inadmissible.

24. The drawing is to be executed with good Indian ink, freshly rubbed down, quite black, and free from grit or glaze, a little indigo blue mixed with the ink will improve it.

25. The lines are to be firm and clean, not too fine or too close together. They must all be perfectly black, and pale ink must on no account be used. Thick lines in the printing and borders should be well filled in. Washes of any colour are inadmissible.

26. If cross-hatching or shading is required, the lines composing it must be kept as open and distinct as possible, and they should not be too fine, but firm enough to reproduce well. Generally it is better to have fine hatching done by transfer from plate, and in such case the drawing should give only the outline. Intensity of shade should be shown by an increase in the thickness of the lines rather than by their being placed close together, as it must be borne in mind that throughout the process there is a tendency for the lines to thicken, so that if they are too close they are liable to block up in the printing, and the work will appear heavy and unsightly. This rule also applies to hill-shading, the darker portions of which should be drawn in thick distinct lines, but not crossed and recrossed with fine lines.

27. As the process produces a perfect fac-simile of the original, it is essential that the latter must be complete in every respect, and the drawing, printing, and writing should all be done in as neat a style as possible, so that the result may be fit for immediate publication, and not require to be altered or touched up after transfer to stone, by which the work is always damaged more or less. The hair strokes of the printing must not be too fine. Border lines, which could not be conveniently shown on a large scale plan, can be drawn on the stone.

28. When plans are intended for reduction, the lines should be of the proper thickness relatively to the scale of reduction. The printing and detail must also be relatively large in proportion. This rule is often neglected, and the result is the loss of all the finer lines, words, and figures. When drawing for reduction, care must be taken to leave sufficient space between the lines of the hill-shading, water-lines, or cross-hatching, so that they may be well separated when reduced, and may not block up in the printing.

29. When possible, it will be better to draw the original on a larger scale than is required for the copy, as a photographic reduction is always much sharper and much clearer than a reproduction.

30. In all cases a scale is to be drawn on the plan, and not stated as a scale of so many chains, feet, or miles, &c., to an inch.

31. In preparing maps and plans (other than for the Defence Department) no reference whatever is to be made therein to forts, works of defence, submarine mining, torpedo establishments, electric-light emplacements, &c.; and no public plan should show these works.

32. The preparation of plans and certificates by officers for private persons is strictly forbidden; and no officer is allowed to undertake private work.

DEPOSITS.

33. Deposits made for surveys to be executed by or under the authority of the Lands and Survey Department are in the first instance to be paid to the Receiver of Land Revenue or of Gold Revenue, as the case may be, and shall be by him placed in a deposit account.

34. When the plans are received and have been approved, the Chief Surveyor shall—in cases where the survey has been made by an officer of the staff—forward to the Receiver an abstract or voucher, duly certified, in favour of the "Public Account, Lands and Survey Vote." When the survey has been made by an authorised private surveyor, an abstract or voucher for the sum or sums due, in favour of the person employed, shall be sent in like manner.

35. The Receiver of Land or of Gold Revenue may, after approval of a voucher by the Chief Surveyor, pay to the person entitled any sum up to 50 per cent. of amount of deposit, and on

approval of the survey by the Chief Surveyor, and the production of a voucher, shall pay out of his deposit account the balance, or full amount due, as the case may be. Such payment shall be made into the Public Account, or to the surveyor entitled to receive, as the case may require. Should there be a balance, he shall repay it to the depositor or to the Public Account, as he may be specially instructed.

SCALE OF FEES FOR SURVEYS OF CROWN LANDS SELECTED BEFORE SURVEY.

36. The charges for the survey of unsurveyed forest-covered rural lands open for purchase or selection are,—

- Not exceeding 80 acres, £6.
- Exceeding 80 and up to 50 acres, 8s. 6d. per acre, but not less than £6.
- Exceeding 50 and up to 100 acres, 3s. per acre, but not less than £8 15s.
- Exceeding 100 and up to 200 acres, 2s. 6d. per acre, but not less than £15.
- Exceeding 200 and up to 300 acres, 2s. per acre, but not less than £25.
- Exceeding 300 and up to 500 acres, 1s. 6d. per acre, but not less than £30.
- Exceeding £500 and up to 1,000 acres, 1s. 4d. per acre, but not less than £41 13s. 4d.
- Exceeding 1,000 and up to 2,000 acres, 1s. per acre, but not less than £66 13s. 4d.

37. For the survey of any area of open rural land the scale of charges shall be two-thirds the foregoing rates.

38. In case any question shall arise as to what lands are included in the expression "open land," the same shall be settled by the Surveyor-General, whose decision shall be conclusive.

39. The Chief Surveyor may vary the above charges by substituting a charge per mile, or per day, for such work as may not come under the foregoing scale, but in no case may the charges be exceeded without proper authority first obtained.

GENERAL.

40. One officer under the control of each Chief Surveyor shall be named by him to be entirely responsible for the preparation of the draft plans for certificates of title, Crown grants, leases, licenses, or other instruments of title, and the same officer should compare the fair copies, and certify to the correctness of the plans thereon.

41. When a plan is placed on a Crown grant or other deed, the name of the Chief Surveyor, the name of the surveyor who executed the survey, and the name of the draughtsman who prepared the plan should be placed thereon. The names of the two former should be printed, and the draughtsman should sign his name.

42. Surveyors in the employment of Government, or executing any surveys which are to be approved by the Surveyor-General, a Chief Surveyor, or an Inspecting Surveyor, are to report to the Chief Surveyor of the district monthly, in the Form A given in the schedule hereto. Government surveyors shall also furnish, on the 31st March in each year, a report and summary of work done, cost, &c., for the past twelve months, in the Form B given in the said schedule.

43. Chief Surveyors will report to the Surveyor-General as soon as possible after the termination of each month, but not later than the 15th of the following month, giving a summary of work executed by the surveyors acting under their supervision, the arrears, or work on hand, and proposed course of duty for the following month, according to the Form C in the schedule hereto. They shall also, as soon as possible after the 31st March in each year, furnish a statement of the work, and its cost, executed during the past year, and the expenditure in the district, in the Form D given in the said schedule.

44. With the monthly report Chief Surveyors will send diagrams of field inspections that have been made in the actual surveys then going on.

45. In land districts having not more than ten parties at work, field inspection is to be done by the Chief Surveyor; but if there

be more than ten parties, an officer shall be employed as Inspecting Surveyor—in conjunction with his ordinary duties, if the number to be inspected be few—to be stationed in such district and over such parties as the Chief Surveyor himself cannot overlook.

46. It shall be the duty of the Inspecting Surveyor to inspect and check field surveys, plans, field-books, equipment, accounts, reports, or other duties which the Chief Surveyor may direct him to perform, and for that purpose shall have access to all documents, instruments, &c., connected with any survey he may be instructed to inspect.

47. Surveyors engaged on Government work are to repair all trigonometrical stations that are seen to be dilapidated, or report their inability to do so. All renewed stations are to have same letter as the old station.

48. The original Maori names of places are to be preserved as far as possible. To this end the Chief Surveyor should see that these are added from time to time to his maps, and when the 80-chain maps are to be published by the Department the Head Office should be notified. The names should be verified by Natives or by Native experts whenever an opportunity occurs. Names of places given by the original explorers or otherwise are not to be altered without the consent of the Surveyor-General.

49. All selection and general plans, such as county maps, &c., are to be open to public inspection free of charge.

50. Surveyors desiring to consult working-plans, record, or other survey maps are not to be charged fees for inspection, or for taking tracings therefrom when required to enable them to carry out surveys, and none but surveyors or draughtsmen are to be allowed to copy working-plans or maps.

51. The following fees will be payable for the inspection of original maps other than selection or index maps:—

	s.	d.
For general inspection of a map	1	0
" permit to copy from a working-plan, one section ..	1	0
" each section after the first up to ten sections, each ..	0	6
" any number of sections above ten, each	0	8
" the whole of any map	10	0

The draughtsman in charge of maps may make a rough tracing of a section or sections with detail for deeds on payment of a fee of 2s. 6d.

52. The fees charged for inspection of or copying plans, or for the purchase of lithographs, protractors, &c., must be paid to the Receiver of Land Revenue every Saturday morning before 11 o'clock, and the draughtsman in charge of plans must keep an account-book in which all fees received and the names of the persons from whom received are to be entered.

53. In the case of selectors of Crown lands who are about to occupy their selections, a tracing from the working-plan of their holdings may be made by the draughtsman in charge, if the selector so requests, free of charge.

54. The forms hereafter set forth in the schedule shall be used for the purpose of the foregoing regulations in the several cases to which they are applicable, and shall be deemed to be part of the said regulations, and may be modified in each case as the circumstances require.

D.

FORM OF YEARLY RETURN.

RETURN OF FIELDWORK executed by Staff and Contract Surveyors in the Land District of , under the Supervision of , from 1st April, 19 , to 31st March, 19 .

Surveyor.	District.	Minor Triangulation and Topographical Survey.			Topographical and Trigonometrical Surveys.			Rural and Suburban.			Town Section Survey.			Native Land Court Surveys.					
		Acres.	Cost per Acre.	Total Cost.	Acres.	Cost per Acre.	Total Cost.	Acres.	No. of Sections.	Cost per Acre.	Total Cost.	Acres.	No. of Allotments.	Cost per Allotment.	Total Cost.	Acres.	No. of Sections or Divisions.	Cost per Acre.	Total Cost.
		£ s. d.			£ s. d.			£ s. d.				£ s. d.				£ s. d.			£ s. d.

Surveyor.	District.	Gold-mining Surveys.			Roads, Railways, and Water-races.			Detection by Native Opposition or other Causes.		Other Work.		Total Cost of Surveyor and Party from 1st April to 31st March.		Remarks.
		Acres.	No. of Sections.	Cost per Acre.	Miles.	Cost per Mile.	Total Cost.	Cost.	Cost.	Cost.	Cost.	£ s. d.	£ s. d.	
							£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	

E.

In the master of section 37 of "The Native Land Laws Amendment Act, 1893," and of certain [Mention the instrument] hereinafter particularly mentioned.

To the Registrar of Deeds [or District Land Registrar] of the Registration District of

Take notice that the under-mentioned [Specify the instrument] has been acquired by His Majesty the King under the provisions of section 37 of the above-mentioned Act, and in pursuance thereof you are hereby required to register His Majesty as the proprietor thereof.

Particulars of Security.	Amount.
	£ s. d.

As witness my hand, this day of , 19 .

Native Minister.

Given under the hand of His Excellency the Governor of New Zealand, at the Government House, at Wellington, this twenty-third day of August, in the year of our Lord one thousand nine hundred and seven.

ROBERT McNAB,
Minister of Lands.

Regulations for conducting the Survey of Land in New Zealand.

IN pursuance and in exercise of the powers and authorities conferred by "The New Zealand Institute of Surveyors and Board of Examiners Act, 1900," the Surveyors' Board doth hereby make the following regulations for the guidance of surveyors under "The Land Act, 1892," "The Native Land Court Act, 1894," "The Land Transfer Act, 1885," and their amendments, or under any enactment of the General Assembly of New Zealand relating to or affecting surveys of land, and doth hereby declare that such regulations shall come into force on and the first day of October next.

REGULATIONS.

Interpretation.

1. In these regulations, if not inconsistent with the context,—
 "Surveyor-General" and "Chief Surveyor" mean the persons holding such official positions respectively, or the persons for the time being acting for either of these officers;
 "Surveyor" means a person holding a license from the Surveyors' Board to execute surveys within the colony, and, in respect of Land Transfer surveys, licensed also by the Surveyor-General in that behalf.

TRIANGULATION.

Major triangulation.

2. The existing so-called major triangulation of this colony partakes of the character of a secondary series, as the base-lines were not required to be measured to a greater accuracy than 3 in. per 100 chains, and the discrepancy in the summation of the angles of a triangle was accepted where it approximated to 20"; but the experience of many years has demonstrated that bases can be measured rapidly and economically with a probable error of less than 1 in. in 100 chains, and the angles with 8 in. to 12 in. theodolites to an average of 5" in the summation of each triangle.

Base.

3. The site for a base three or more miles in length should be chosen having regard to the facilities it offers for ready and accurate measurement, and for extension and connection with the triangulation. The apparatus and methods to be adopted must conform to those in vogue in the United States Coast and Geodetic Survey (*vide* United States Coast and Geodetic Survey Report, 1892, Appendix 8, chap. iv; also United States Coast and Geodetic Survey Annual Report, 1901, page 257 *et seq.*), unless more refined apparatus and more exact methods are approved and authorised. The standard base measuring-tape to be used is of steel or, better, nickel-steel 500 links long, $\frac{1}{4}$ in. wide, and $\frac{1}{8}$ in. thick, the terminals of the 500 links being indicated by fine lines graven on the tape, denoting the precise distance between these lines at a certain tension and at a temperature of 62° Fahr. in terms of the New Zealand Survey Department standard, at the Surveyor-General's office. A comparator should be set up in the vicinity of the base which must be in exact accord with the above standard, and be used to verify the base-tape both prior to and during the measurements of the base.

Measurement of base.

4. The measurement of the base should be effected as follows: The ends of the tape and straining apparatus should be supported on posts or portable stands, its terminal marks falling over zinc plates fastened to the tops of other posts or stands, the tape being supported at intervals of 50 links by smooth-topped stakes, or on hooks suspended from horizontal arms to same, or to vertical steel rods, all so adjusted as to insure that the tape may be in exact alignment throughout, and that the supports in each stretch of tape when practicable are in one uniform grade from end to end. The extremities of the tape must be attached to proved spring balances or weights and adjusting straining-gear so as to apply a strain of 25 lb., and to bring the zero point of the tape into exact coincidence with a fine line previously drawn upon the zinc plate on the rear post. This being accomplished a fine

line is drawn upon the forward zinc plate at the 500 links graduation, the readings of three standardised thermometers (suspended one at the centre, the others at one-sixth of the length of tape from each end) being recorded simultaneously. The operation being extended the full length of the base, the recorded measurements are corrected for the error, if any, of tape; for variation from standard temperature; for stretch due to excess or deficiency in pull as compared with that applied when the tape was standardised; for sag; for reduction from slope-measurements to the horizontal value; and for reduction to sea-level.

5. The base should be measured independently three times in calm and cloudy weather or at night. To counteract errors due to uncertainty of temperature of tape, measurements should be effected with both rising and falling temperatures, and the coefficient of expansion of the tapes used specially determined. The mean of the several corrected and reduced measurements is to be adopted. If possible it is desirable that the base be divided into two or three sections, and compared one with the other through subsidiary triangles.

Method of angular observation.

6. According to reliable authorities, the repeating system has again come into favour. The method of recording at each trigonometrical station the bearings of the surrounding stations of the polygon and also of a few of the more prominent outside ones in continuous rounds, all referred to a common origin, has, however, been found in this colony to be expeditious and sufficiently accurate to meet the standard of accuracy prescribed as necessary for the control of settlement surveys.

Sets of readings.

7. The observations at each station should comprise two complete sets of readings, taken as follows:—

- (a.) Face direct: Vernier A set approximately to back bearing of the station of origin; all other stations being observed in consecutive order from left to right, the return reading of origin being also booked, care being taken that no station is overshot.
- (b.) Face reversed: Vernier A being moved on 30° approximately, with proportional forward movement on vernier; this round to be taken in the same manner, except that the rotation is to be from right to left.
- (c.) Face direct: Vernier A set forward approximately another 30° , with proportional movement on vernier; this round to be taken from left to right.
- (d.) Face reversed: Vernier A being set forward approximately another 30° , with proportional movement on vernier; this round to be taken from right to left.

A 10 in. Everest with three verniers will thus furnish a complete set of twelve readings, the arithmetical means of which, corrected proportionately for the difference between the starting and return readings, and also reduced to the true back bearing of origin, will complete the set. Two sets taken under favourable conditions should suffice, but the observer will use his judgment as to the expediency of supplementing them. If the theodolite be provided with only two verniers, six rounds as above must be taken to constitute a set.

Hypsometrical observations.

8. The angles of elevation or depression to the surrounding signals, the exact heights of the telescopic axis and of the signal sighted to in each case being noted, should comprise not less than two sets of readings—one with circle right, the other with circle left. The divisions of the eye and object end of the level attached to the vertical are in each case should be noted, in order that the vertical angles may be reduced to their true value.

Particulars to be recorded.

9. Each set of observations should be headed to show clearly the observing station, stations observed to, instrument used, the state of the weather, height of barometer and thermometer, observer's name, and the date and hour. Notes should also be taken of the definition or otherwise of the signals—whether clear, sharp, and

distinct; or the contrary—and any other circumstance bearing upon the reliability and satisfactory character of the observations. (See Appendix 1.)

Computations.

10. The computations of the series of triangles should emanate from a base or well-established sides, and be carried forward systematically so as to insure the best values obtainable, avoidance of discrepancies and disturbing factors, and the greatest weight obtainable for the value of sides in the series common to other triangulations.

Verification bases.

11. As bases are capable of more accurate determination than angular measurements, verification bases, measured in a similar manner to the original base, should be established at approved intervals.

Mapping.

12. Major triangulation is to be delineated upon mounted antiquarian paper to a scale of 1 in. to two miles.

MINOR TRIANGULATION.

Breaking down.

13. When the country is already covered by a major triangulation, it will be necessary to incorporate therewith a minor series of triangles. This can be effected by "breaking down" from the major sides by a homogeneous network, which must be brought into harmony with the major series by the method of Ray Trace computation.

Procedure similar to major processes.

14. The measurements of a base, where major triangulation is not available, and also the observations and computations, are to be conducted in a similar manner to those prescribed for major triangulation, and the datum for computation of heights taken from the standard maps.

Trigonometrical stations.

15. Stations should be as nearly as practicable from two to four miles apart, and are to be marked in the following manner: Iron tubes, 2 in. internal diameter, cut to 2½ ft. length, are to be inserted into cast-iron plates with sockets, and secured by iron pins. The survey district distinguishing alphabetical letter of the station is to be cut on the upper end of the tube, or the circuit numeral stamped in, and the tube sunk to a depth of 2 ft. 3 in. and well rammed, a bottle being first placed below it. Excepting in sandy soil, a circular ditch, 12 ft. diameter, 1 ft. deep, and 18 in. wide, should be dug around the tube, and the soil excavated spread evenly within the circle. On rocky ground, where a ditch cannot be dug, a circle of large stones should be substituted. It is not desirable to build mounds, but at times these may be found necessary; the surveyor will in such cases exercise his own judgment. If mounds are built, the exterior rim should be of stone or sods, with earth in the centre. In positions where the nature of the soil may require modifications, special directions will be given. (See Appendix 5.)

Signals.

16. The signals and flags to be used must be varied to suit the positions and relative elevations of the stations. Metal or timber pyramids of the regulation pattern are to be provided for the principal stations, but temporary and smaller ones will suffice for the others. (See Appendix 6.)

Triangles and their arrangement.

17. The stations are to be selected so as to furnish well-conditioned triangles, no angles being less than 30° nor greater than 120°, except under special circumstances. As far as practicable, overlapping triangles are to be avoided, excepting where they serve to form quadrilaterals, and each triangle should appear on the map distinct from others; but when a valuable additional series of triangles can be constructed from the observations these should be plotted and shown on a separate plan. It is essential that, whenever practicable, the triangulation be carried forward in a

polygonal or quadrilateral series, and it must be closed upon adjacent triangulations.

Limit of error.

18. The maximum error in minor triangulation must not exceed 6 in. to the mile, represented by the discrepancies in the computed values of common sides in the polygons and quadrilaterals, or by the close on to another series; the error in the summation of angles of a triangle can, with care, be kept under 10", and must not exceed 20". All work having error in excess of these limits will require revision.

Computations.

19. The calculation of the triangulation is to be made and recorded upon the printed forms, seconds corrections being systematically applied so as to make the side values and closures harmonize. When the final values of the sides and angles have been determined, the positions of all stations are to be calculated on the meridian and perpendicular of the initial station of the circuit, and a table of the same prepared, from which maps must be constructed to prescribed scale. (See Appendices 2 and 3.)

Mapping.

20. The trigonometrical work in each survey district is to be mapped on one plan, which should show major or geodetical stations with three, and minor stations with two, concentric pink circles, with their alphabetical letters or numbers and local names, which should be the original Native ones where obtainable. A base-line should be shown in pink colour, other lines in blue, bearings in blue, calculated distances and bearings black, the observed angles and the summation in the middle of each triangle black. (See Appendix 7.)

21. The meridian and perpendicular values, and the respective altitudes of each station above mean sea-level, should be tabulated on the plan. There should also be a note giving the results of the several measurements of the base-line, if any, and on completion of a triangulation of any class the surveyor should send in a special report stating the instruments used, number of triangles, maximum and average error of angular measurement, detailed list of closures, clear statement and diagram of origin of bearing, originating sides, closing and verification sides, and general remarks.

TOPOGRAPHICAL SURVEY.

Described.

22. Combined with the trigonometrical operations a topographical survey is to be made of the natural features, also roads, tracks, remarkable objects, natural and artificial, &c., and these must be shown on a topographical map. For altitudes, vertical angles are to be observed to prominent objects and important points such as peaks, passes, valleys, and confluence of streams. A surveyor with a good eye can make a serviceable sketch-map from the trig. stations by means of cross-bearings, and bearings with estimated distances of objects; but if the country be intricate, bearings from intervening positions should be taken. Prismatic compass and aneroid may be used for filling in detail; in forest country this is especially necessary, as is also the determination of heights of saddles and valleys, river-beds, lakes, swamps, &c.

Topographical map.

23. The topographical map must show the trig. stations as named, lettered, or numbered, trigonometrical heights in feet (in pink), barometrical heights also in pink and marked "Bar.," streams (in blue), hills shaded (in Indian ink), the Native or local names of places, streams, hills, &c.; roads in use (in firm burnt-sienna lines), tracks (dotted burnt-sienna), bush (green), suggested main lines of future roads (in firm pink line), and any other features, natural or artificial, which can be shown. Shade the boundary of the district in colour. (See Appendix 8.)

STANDARD TRAVERSE.

Marking of stations.

24. As implied by its designation "standard traverse" is a more elaborate and accurate class of work than ordinary traverse,

and when resorted to, whether as the basis of town, suburban, or rural surveys, the stations must be permanently marked and accurately centred. "Standard blocks" of stone or concrete are to be laid down in towns, and iron tubes elsewhere; all placed in positions least liable to disturbance in the carrying-out of subsequent public or private works. The stations must be selected so that the standard lines shall, if practicable, be parallel to the side lines of the streets or roadways.

Angular observations.

25. The angular measures will comprise observations effected as in minor triangulation, modified where necessary according to the importance and special circumstances affecting the area under survey.

Lineal measurement and limit of error.

26. In lineal measurements, corrections for tension, sag, temperature, inclination, &c., must be carefully applied, and the maximum error must not exceed 1 link per mile, according to the degree of accuracy prescribed by the Chief Surveyor in each case.

Connection with triangulation.

27. The standard traverse must be connected with the triangulation (if any) and any discrepancy reported. In cases where a district presents difficulties preventing minor triangulation or approved traverse circuit, the matter must be reported to the Chief Surveyor, who will issue special instructions to meet the case.

Method to be pursued.

28. The whole work must be computed on a system of circuit-closures, increased weight being given to the measurements as compared with angular observations; correction must be applied in the recognised manner to furnish the true co-ordinated values. The survey includes the connecting with all adjacent surveys, and the fixing of boundaries and corners of properties as indicated by pegs, fences, hedges, walls, buildings, and other artificial and natural features. The results, being carefully delineated upon plans, on scales ranging from 1 to 10 chains to the inch, according to the class of survey, serve as records of title, boundaries, and occupation, and as the basis of present and future surveys, especially those for purposes of "The Land Transfer Act, 1885." (See Appendix 9.)

SETTLEMENT SURVEYS.

Survey districts and blocks.

29. A survey district as a rule comprises an area of $12\frac{1}{2}$ miles square or thereabouts and a block comprises an area of $3\frac{1}{4}$ miles square. In numbering the blocks within a full-sized survey district, the numbers are to commence at the north-west corner and be numbered towards the right from I to IV; No. V will come immediately to the south of No. I, and so on throughout the district.

Irregular districts.

30. When a district has an irregular boundary the same order of numbering must be followed so far as the area will allow, care being taken to use the numbers consecutively. The lines dividing districts and blocks should be straight, unless where road-lines, rivers, or section-boundaries approximate the right line, in which case they should be adopted. No survey block should exceed in length or breadth the distance of 250 chains unless under special circumstances.

Sections to be adapted to country.

31. Flat or easy undulating country should be laid off in rectangular sections, but in rugged or hilly country their form must be modified to suit the ridges and valleys and also, in the case of rolling arable land, care must be taken to arrange boundaries favourable to ploughing operations. Where the country is suitable it is desirable to have the boundaries on the meridian and perpendicular, but when the general features run obliquely to these, especially in rough districts, the boundaries must be arranged accordingly, so as to form lines which can be easily

fenced, but the less diversity of bearing the better. When road-lines sever sections the areas of the severed portions, and also the total net areas of the sections, are to be shown on the map.

Form and scheme of sections.

32. Sections are to have as nearly as practicable a depth of not less than twice the width or frontage to a road, stream, lake, or coast; but where the land is open for selection before survey the sections must have a depth of not less than 40 chains, and must conform to a general scheme, with frontages, depth, &c., as may be approved by the Chief Surveyor and the Land Board.

Boundaries, how marked.

33. All boundaries of blocks and sections are to be pegged at every angle. In open country, straight boundary-lines under a mile in length must be cleared where necessary, and distinctly marked by pegs and lockspits at intervals not exceeding 20 chains, or 30 chains on lines that exceed one mile in length, which, however, at the discretion of the Chief Surveyor, may be varied to suit the conformation of the country. Advantage should be taken of the most prominent and favourable positions on the line for the pegging, so that the direction may be seen from peg to peg.

34. In forest country the boundary-lines must be cut, ranged, and pegged in the same manner, and at similar intervals, advantage being taken in rough country of ridge-crossings for the pegging, in which case, where measurements are not required, subject to the approval of the Chief Surveyor, only such cutting of the line will be required as will insure adjacent pegs being visible from each other, but it must be sufficient to enable the distances of such pegs along the line to be arrived at approximately for showing on the map. Under any circumstances the lines must be cut from the frontage from 3 to 5 chains and pegged, but should the peg come in an impracticable or unsuitable position for extending the line, then the cutting must be continued until the peg can be placed in a position that will enable this to be done, and in either case its distance from the front peg must be noted in field-book and on maps.

Pegging at intersections.

35. The points of intersection of all section-lines with traverse-lines are to be pegged, measured to, and noted on the map, and should the section-pegs be off the traverse-lines, the distances of the section-pegs from such points should also be given. The measured or calculated distances from the section-pegs to the adjacent road-angle pegs on same side should be given, and the boundary of a section intersecting a road must in all cases be pegged on the traverse-line as well as on both sides of the road.

Line-cutting.

36. Lines in bush must be cut and cleared four feet wide, the scrub cut close to the ground, and overhead seven feet from the ground. All trees three feet through and under to be cut down, and the height of the stump should not exceed its diameter. In open country, with scrub, the lines must be cut and cleared at least two feet wide.

Traverses and trig. connection.

37. In traversing, the surveyor is to proceed to the nearest trig. station and base his work on the circuit meridian, clearly denoting on the plan the line and the bearing so used, and the co-ordinate values in terms of the initial of the circuit. Connections should be made with trig. stations or other established points when opportunity offers to test the accuracy of the work. Surveyors are to report as to trig. stations requiring repair.

All traverse stations should be pegged before being measured or observed to, and the surveyor when at a trig. station should take readings to traverse or subsidiary stations in view. All check bearings should be repeated and thrown forward, so as to limit the accumulation of instrumental errors, and checks and closures must be noted in the field-book. Vertical angles are to be observed by theodolite to reduce all inclined measurements to their horizontal values.

Magnetic bearing.

38. No magnetic bearings are admissible unless for filling in topographical detail work, and then very sparingly, and with permission only.

Offsets.

39. Offsets to irregular boundaries such as rivers, streams, terraces, and fences must not exceed 2 chains in length, and must be taken at intervals in the traverse not greater than 3 chains, but at shorter distances when necessary to correctly define the irregularities of such boundaries.

Astronomical check.

40. In case of long traverses in the bush where check bearings cannot be obtained, recourse should be had to stellar or solar observations for checking bearings, such observations being duly noted in field-book and referred to on plan.

Recording observations.

41. Trigonometrical observations and connections must be given in detail on the proper forms, and the astronomical observations and the results derived therefrom must also be entered on the forms and forwarded with the plan.

Road-traverse.

42. After being graded and located the road-lines should be traversed along the centre, the traverse stations being selected on the line of the grade as nearly as may be.

River-bed traverses.

43. In cases where traverses are carried along or through an open river-bed, and the stations are not on safe ground, it will be necessary, at intervals of not more than 20 chains, to place reference pegs or iron tubes properly connected with the traverse in secure positions on the banks, and record their positions in field-books and on plans. This also applies specially to dredging claims.

Hanging traverses.

44. Where surveys are not closed on trig. stations or by circuit traverse, all "hanging" lines must be twice measured and observed, and a note to this effect must be recorded on plan and in field-book.

Close on to former surveys.

45. The connection and close with former surveys must be clearly shown. Should "adopted" work fail to close with the new work within the prescribed limits, a resurvey of the old work must be made.

Adopted work.

46. The Chief Surveyor, before permitting old work to be "adopted," may, in his discretion, require it to be verified or resurveyed.

Features to be shown.

47. Notes are to be made of all crossings of creeks and tracks in public use; also such other notes as will enable the topographical features to be delineated on the working-plan, together with buildings and boundary-fences.

Limits and elimination of error.

48. The error attached to the traverse survey necessarily varies with the nature of the ground, and should not be allowed to accumulate above 10 links. Where the accumulation exceeds this amount it will be necessary to have recourse to subsidiary triangulation to correct or reduce the error. On an average, surveyors can measure a mile within an error of 2 links; the limit of error in traverse must in no case exceed 4 links to the mile. Should the error in closing with the triangulation, or other recognised established point, exceed this limit, the work must be revised. So also traverses should close in bearing with an error not exceeding 2' of arc. The difference or error of closure within these limits is to be eliminated by distribution in the usual manner in proportion to the length of the whole traverse to that of each line.

Reduction of traverses.

49. All traverses executed by the surveyor are to be computed and co-ordinated in terms of the meridian and perpendicular of the initial station. These computations must be kept worked up to

date, so that no actual measurements get in advance of this mode of check. (See Appendix 4.)

Tabulations.

50. The positions of all chained lines (excepting to range-pegs), all corners of blocks or of isolated sections (whether chained or not), and all intersections of section-boundaries with traverses, are also to be calculated and tabulated, and all tabulations of any survey must accompany the map of such survey. When initial values are adopted from former surveys, references to volumes and folios of tabulations must be given on the traverse sheet.

Prior claims.

51. All adjacent or included prior claims and surveys and their boundaries are to be investigated, and, if necessary, redefined in accordance with the titles and original plans. These claims are to be surveyed as held by established or indicated marks on the ground, and must be shown on the map by black lines if the boundaries disagree with recorded measurements based on original plans and descriptions. If owners of prior claims cannot be found, and if the marks of their claims are obliterated, then it will be competent for the surveyor to re-establish the boundaries by actual survey. A general rule is not to interfere with original boundaries, but, the surveyor being in doubt, the matter must be referred to the Chief Surveyor for decision.

Isolated sections.

52. In surveying an isolated section or claim, the surveyor must proceed to the nearest geodetical or trigonometrical station, or to other properly established survey point, and connect his section-work by minor triangulation or traverse with such other station or point, and prepare a plan of the section and its connections on special sheets provided for that purpose.

TOWN SURVEYS.

Standard marks.

53. The main streets in all towns, whether on Crown lands or private lands, unless otherwise authorised, are to be laid out of a breadth not less than 150 links, and side streets not less than 100 links wide. In grass country the sides of the main-street lines are to be pared; in fern and bush, cut. In addition to the pegs at the corners of every section, stone or concrete blocks, or iron trig. tubes, all provided with fine centre marks, shall be placed at intersection of streets about 25 links from and parallel to the building-lines, and so that those adjacent shall be visible from each other. On these standard lines the angular and lineal measurements of the town are to be based.

Limit of error.

54. The maximum error in lineal measurements must not exceed 1 link per mile, and in all measurements, corrections for tension, sag, temperature, &c., should be made.

Streets to be at right angles.

55. The streets of all towns are to be laid off in straight lines, and at right angles to each other as nearly as a due regard to the natural features of the country and drainage of the land will permit, and allotments are to be laid off wherever practicable at right angles to the streets which they front.

Approval of Governor necessary.

56. In every case where any allotments or sections or blocks of land are to be sold or advertised for sale as a town, the proposed name of such town, whether public or private, together with a plan of such town showing the streets and the width thereof respectively and the reserves made in such town to be prepared by a licensed surveyor, must be approved of by the Governor prior to sale.

"Town," as defined by the Land Act, means "any parcel of land outside a borough divided into areas for building purposes." Sections of over 1 acre should not be included.

ROADS.

Grades, curves.

57. Main roads, where practicable, should not have a steeper grade than 1 in 20, or a sharper curve than 66 ft. radius when formed. District roads to be laid off with grades not exceeding 1 in 15, and having no curve less than 33 ft. radius when formed. The grades in cross-roads should not exceed 1 in 12.

Widths.

58. All roads, as far as practicable, must be on the sunny sides of hills and spurs, graded on the best lines obtainable, and be reserved to a width of not less than 66 ft. In broken country, and where heavy cuttings and banks occur, the width of a road must be increased where necessary.

Grading.

59. In grading roads along sideling ground, when the difference in level between the terminal points will permit, it is advisable while running round sharp curves and gullies either to keep the line level, or to ease the grade where required, to allow for through cuttings and banks being made at some future time to straighten and shorten the road without unduly increasing the grade, and where necessary sufficient land should be reserved to allow of this being done. In fact, wherever practicable, the grade on the finished road should be eased at sharp turns. In certain cases longitudinal and cross sections will be necessary, for which special instructions will be given. All gradients steeper than 1 in 20 should be written on the plan, with arrows indicating the direction of fall. Grade-lines should be marked with stakes not less than 2 in. diameter at intervals of a chain, more or less, according to the ground.

Pegging and width.

60. In level or undulating country the opposite road-angles must all be pegged; but in rough hilly country, where land is of little value and the traverse-lines short and intricate, the outside pegs at each angle may be dispensed with, and the road shown by straight lines adjacent to conveniently situated traverse-pegs, the lines forming the sides of the road to be calculated, and such side lines to be pegged. The lines bounding the road in such cases need not be parallel, but must not approach nearer than 50 links to the centre of the road, nor be distant therefrom more than 150 links without permission of the Chief Surveyor.

Delineation.

61. In whatsoever manner the side lines of the road are laid off, the bearings and lengths thereof must be computed and shown on the map, and also their positions in relation to the traverse-stations, especially as regards section-corners.

Reference-tubes.

62. At distances of about a mile apart a group of three iron $\frac{3}{4}$ in. reference tubes, 2 ft. 6 in. in length, are to be inserted in positions not likely to be disturbed, and be visible from each other, and, where possible, from a trig. station.

Railway-crossings.

63. In cases where roads abut upon or cross railway-lines the surveyor must communicate with the District Engineer of Railways on the subject, with the view of arranging for suitable crossings.

GENERAL.


Pegging and marking.


64. All pegs are to be of sawn or split and dressed heart of totara, kowhai, blue-gum, kauri, matai, puriri, or hinau, $2\frac{1}{4}$ in. by $2\frac{1}{4}$ in., or, if not procurable, 3 in. by 2 in., and 2 ft. long, driven not less than 18 in. into the ground, a hole having first been made with an iron jumper. In special circumstances the length of peg must be varied—thus, in loose sand or in swamp pegs may be used 3 ft. or more in length; while on public roads, railways, and centre road traverse, where pegs must be driven flush with the surface, 18 in. pegs or 8 in. iron spikes may be used. The front pegs of sections must have the numbers of the sections


and the letter R branded on them; back pegs are also to be branded with the section-numbers; road-traverse pegs must be marked with the station-number in Roman numerals, the letter R, and the broad arrow; ranging-pegs with the broad arrow only. In forest, conspicuous trees adjacent to section-corners should be marked with a distinctive mark, and a description of the tree, with its bearing and distance from the corner, noted in the field-book. Pegs must be inserted and lockspits made in open country at the intersections of the boundaries of sections with every road, large stream, or path in positions likely to be seen by the public; and in standing forest iron pins 15 in. long and $\frac{1}{4}$ in. diameter should be driven alongside every corner peg. All traverse-pegs should be centred with a tack, and all pegs split in driving must be replaced.


Trenches and lockspits.

65. In open country, wherever possible, all pegs should have trenches dug, as shown below:—

At adjacent section-frontages, thus: 

At traverse boundaries, thus: 

At corners of isolated (spotting) sections, thus: 

On road-lines, thus: 

In all cases commencing 2 ft. from the peg.

The trenches to be of the following dimensions:—

(a.) At corners of survey blocks, 6 ft. long, 15 in. wide, and 12 in. deep.

(b.) At corners of isolated sections and at the ends of lines over 80 chains in length, 4 ft. long, 12 in. wide, and 10 in. deep.

(c.) At all road, ranging, and corner pegs other than as above, 3 ft. long, 9 in. wide, and 9 in. deep.

In town and suburban surveys trenches will only be required at the corners of each block of subdivisions.

[NOTE.—Where trenches cannot be dug and stones are available, the peg should be packed round with stones, and the direction of the lines should be indicated in like manner.]

Mapping.

66. In mapping, meridian and perpendicular lines are to be drawn in blue colour at exact distances of 5 in. apart, and in their true relative positions to the circuit initial station; from these lines the boundaries and traverses are to be set off from the computed co-ordinated distances in the traverse tables. An Ordnance protractor may be used in filling in topographical detail. The top of the map must always be to the north. The area of a rectilinear figure of not more than twelve sides must be calculated; but if a figure has a greater number of sides, or has a natural boundary, planimeter areas, within a limit of error not exceeding $\frac{1}{2}$ per cent., will be accepted.

67. Measured lines are to be drawn in red, calculated lines in black, with figures in red and black respectively. Bush-lines cut but not chained are to be drawn in red, the linkages in black. All lineal dimensions are to be in links and decimals. Observed bearings are to be written in blue, and those calculated in black. New pegs should be marked by a small red circle; old pegs, when found only, by a small black circle; old pegs renewed, by a red circle enclosing a small black circle; iron tubes or spikes, by a blue circle. Water to be coloured Prussian blue, roads burnt sienna, bush green. Hills to be shaded in light Indian ink. Adopted prior-survey data to be similarly represented, but noted as such with reference to original field-book, plan, and traverse reductions. (See Appendices 10 and 11.)

Title to plan to be signed by surveyor.

68. All adjacent sections and blocks are to be shown. A title in bold, upright letters, denoting section, block, and survey district,

scale, name of surveyor, date of survey, and number of field-book, must be written upon the map. The interior-detail writing should be clear and distinct, and as far as possible should be legible from the foot of the plan. The plan should be surrounded with a neat, plain, rectangular border, and be signed and certified, when required, by the surveyor who executed the work.

Plans: Size and scale.

69. The dimensions of plans and the scales to be used in connection with surveys under the several Land and Native Acts are set out in Schedule A of the Appendix hereto.

Plans, &c., Government property.

70. All plans and field-books deposited with any Chief Surveyor or inspecting officer for examination become the property of the Government, and their return for alteration, correction, or addition does not give to the person to whom they are returned any right or claim to their retention.

All plans, field-books, tabulations, or other documents returned to surveyors for correction are to be sent back to the Chief Surveyor with all reasonable despatch, and any unnecessary delay in this respect will be reported to the Surveyor-General.

Field-books.

71. Field-books are to be neatly kept and inked in, and must specify the block, section, road, or other particular survey recorded, and from page to page the special boundary, traverse, &c., surveyed. Each day's work to be dated, and the field-book must be indexed to clearly indicate the page where the field-notes of each section, &c., are to be found, and be signed by the surveyor.

Duly numbered field-books when issued from the District Survey Office must be returned to the office when filled. The number of book is to be entered on each plan when sending it to the office.

72. Surveyors cannot be too careful in recording their field-notes, as they are of more value as evidence than the original plan. The notes should be full and clear, so entered that any one may plot from them, and must distinctly show the back and forward bearings at each station; the initial and all check bearings must be clearly given, and the discrepancy or close in each case, with the correction applied to the observed traverse bearings, the actual measurements made, the inclination, and the reduced final distances. Connections with other lines, pegs (old and new), are to be recorded, and also the comparison of bearings and measurements therewith. The fullest information is to be given in a separate part of the field-book (if necessary) as to the character of the country, the nature of the soil, vegetation, and all natural and artificial features. The method of keeping field-notes required by the Department should be adhered to.

73. It is to be understood that all field-books and maps in the hands of any official or contract surveyor are the property of the Government. When considered necessary by the Chief Surveyor, field-books will be issued by the Lands and Survey Department for any surveys requiring departmental approval, and in each case these must be handed in by the surveyor with the plan, and at his request be reissued to him until filled up, subject to the right of the Chief Surveyor to call for its production at any time. When the field-book is completed it must be returned to the Chief Surveyor for record and custody, and be available for inspection and reference. The number of the field-book and of the respective pages must be shown in the proper column of the tabulated traverse reductions, and should also be noted on the plan against each traverse, &c. The whole of the contents of the field-book should be plotted before it is returned to be filed for reference.

Traverse reductions.

74. The traverse reductions should be computed and tabulated as the work progresses, as provided in Regulation No. 49, so that the inspecting surveyor may check the work at any time. Each traverse must be closed and the results recorded upon the forms in full detail, each sheet being headed and noted to indicate plainly the survey and particular part thereof represented, and be signed and dated by the surveyor.

Reserves.

75. Suitable school-sites of about 10 acres are to be reserved. Reserves at least 100 links in width must be made along the whole of the frontages to all coasts, bays, inlets, tidal rivers, and creeks, and the margins of all lakes, and along the banks of all rivers and streams of an average width exceeding 50 links. In the discretion of the Chief Surveyor the reservation along the bank of any river or stream of less width may be less than 100 links in width. Such reserves shall, if directed by the Chief Surveyor, be bounded by right lines, but not necessarily by the traverse-lines nor by lines parallel thereto, such lines to be duly pegged and the survey data thereof shown on the plan.

76. Bushes in sparsely timbered country are to be reserved; and in forest country all milling or valuable timber; also reserves to include stone, gravel, and sand for roadmaking, as conveniently situated as possible for use on main and district road-lines. The tops of all high ranges, when wooded, are to be reserved, more especially at the sources of streams; and reserves for all or any of the purposes mentioned in sections 17 and 235 of "The Land Act, 1892," should be recommended for reservation and be marked on the plan.

77. Places of historical or scenic interest, also outcrops of lime and other building-stone, coal or other minerals, are to be recorded on working-plans, and special reports recommending their reservation are to be forwarded therewith. Reserves for rifle ranges, where suitable sites are available, should be made adjacent to towns, villages, and railway-lines. The specific purpose of each reserve is to be written on the plan.

Surveyors' assistants.

78. No licensed surveyor will be allowed to employ more than one unlicensed assistant, and then only on the written authority of the Chief Surveyor of the district in which the land to be surveyed is situated.

Surveyors who have been authorised to employ assistants who are not licensed must certify on the plans representing the work of such assistants that both the field and office work have been done under the immediate supervision of the licensed surveyor, who must satisfy himself by personal field check as to the accuracy of the survey.

SURVEY OF NATIVE LANDS.

Foregoing regulations apply.

79. The foregoing regulations apply equally to the survey of Native lands for any purpose whatsoever, and, in addition thereto, the following regulations are to be observed.

Boundary-lines to be cut.

80. All boundary-lines of original blocks must be distinctly marked on the ground by lines cut through all vegetation above 2 ft. in height, and must also be thoroughly pegged, observed, and measured. Subsequent subdivisions may, in the discretion of the Chief Surveyor, be marked in the same manner as sections of Crown lands, except in the case of poor and remote lands, when the Chief Surveyor may modify these requirements.

Boundary-lines, general.

81. When triangulation is available for ascertaining distances it will not be necessary, provided the Chief Surveyor consents, to chain long lines if the crossings of streams, ridges, or other natural features are fixed by intersections; but the crossings over ridges must be cut and cleared and well pegged with direction pegs. Where a boundary-line abuts on a stream, lake, or coast-line, the length of such line, as well as the traverse-length, must be supplied. Swamp or terrace boundaries are inadmissible; they must be shown by right lines.

Features and roads.

82. The positions of all remarkable hills, ridges, passes, eel-weirs, graves, Native cultivations, tracks, battlefields, villages, *rāhuis*, boundary-stones, &c., within or near the block under survey must be correctly fixed; and the courses of rivers, forests, margins of swamps, lakes, coast-lines, or other natural or artificial features must be sketched in for delineation in their proper position on the

map. All legal roads traversing a block must be properly surveyed and shown on map, and in cases where unsurveyed formed roads intersect such a block they must be similarly surveyed and shown.

Native names.

83. The Native names of all boundaries or natural features within or pertaining to the block must be ascertained, together with the names and positions of adjacent lands, and be shown on the map.

Mapping.

84. Maps should be neatly drawn, in accordance with specimens to be seen in any of the Survey Offices, to the sizes and scales given in Schedule A of the Appendix hereto. The whole boundary of the land forming the subject of the claim is to be conspicuously indicated by a tint of pink carried all round within it, and when islands are intended to be included in the claim they must be distinguished by the same tint. The map should have a plain title stating the Native name of the block, the survey district, and the land district in which the land lies. The boundaries of the survey districts and blocks, and also the number of the latter, must be shown upon the plan, together with the names of the applicants, and the names of those who pointed out the boundaries.

85. The scale of the map, the meridian of the circuit in which the block is situated, and the area must be plainly drawn. In the lower left-hand corner must be quoted the number, and the date of letter of instructions to the surveyor, and the number of the field-book. The map must bear a certificate signed by the surveyor making the survey in the form marked Schedule B in the Appendix hereto, or to the like effect. After examination the map, if in order, is to be approved by the Chief Surveyor of the district. A copy of the plan or a mounted cloth tracing must also be furnished by the surveyor, to be used for the purpose of the Native Land Court; and payment for the tracing, to be fixed by the Chief Surveyor, will be a charge upon the block.

No additions to be made to approved plans.

86. Original plans of blocks which have been approved by the Chief Surveyor must not have further survey work or detail of a permanent character added to them. Subdivisions of such original blocks as ordered by the Native Land Court, or made at the instance of the owners of the land, must be on separate maps.

Charging orders.

87. All claims for charging orders under section 65 of "The Native Land Court Act, 1894," must be made in accordance with sections 2 and 3 of "The Native and Maori Land Laws Amendment Act, 1902," and the rules and regulations of the Native Land Court.

No Chief Surveyor is bound to certify to costs which exceed, in his opinion, what is a fair charge. Surveyors' charges when approved by the Surveyor-General are not open to revision by the Native Land Court.

Surveyors to be authorised.

88. All surveys undertaken for the purposes of the Court, or for lands dealt with under any Act affecting Native lands, when not done by the official staff, must be made by licensed surveyors specially authorised by the Surveyor-General, who shall issue a specific authority in writing in each case.

SURVEYS UNDER PUBLIC WORKS AND OTHER ACTS, RAILWAYS, ROADS, ETC.

Regulations 1 to 73 shall equally apply to surveys and plans of land taken for roads, railways, or other public purpose under the provisions of the Public Works Act or any other Acts wherever they are not inconsistent with the following special regulations.

Traverse connections.

89. The traverse of the survey should be connected to the corners of the sections or properties through which the road passes, at intervals not greater than two miles and a half, to the trig. stations of the district. The regulations for ordinary road-surveys, already prescribed, will equally apply in these cases.

Reference-marks.

90. Where no triangulation exists the traverse should be chained and observed twice, and, if possible, connected at about one-mile intervals to some permanent topographical feature outside the line of formation, such points to be marked by iron reference-tubes as described in Regulation No. 62.

Traverse and plot.

91. The traverse should generally commence at the same end, and the pegs should be numbered in the same direction as that of the engineering traverse, if any, and should be plotted upon drawing-paper of regulation size to a scale of 10 chains to an inch, or to such larger scale as will allow of all necessary details being shown. In the case of railways surveys for the preparation of land-plans the uniform scale of 3 chains to an inch is to be used, and the work must be plotted the length of the sheet irrespective of the north point, and each sheet should not contain more than one mile.

Length of sides.

92. The lengths of the boundary-lines of the area proposed to be taken should be given for each separate ownership, as well as its true position in the property.

Names, numbers, and markings.

93. The names of the present owners of properties, wherever they can be ascertained, and the numbers of the sections or subdivisions, blocks, &c., should be written on each plan; also the area of land taken for the work from each property or separate holding. The ground-marking, pegging, &c., should be done generally as directed in a previous part of these regulations.

Requirements as to map-details.

94. Maps must be drawn to the sizes and in the colours prescribed for working-plans. Boundaries of road districts should be edged in light colour, and the name printed in the same colour, each district having different colours. Lands to be taken are to be coloured in different colours for each adjoining property. Roads to be closed to be coloured green. In addition to the plan two copies on mounted tracing-cloth must be supplied. The plan is to be certified as correct (in the form given in Schedule B of the Appendix, modified to suit) by the surveyor who made the survey, and also "approved" by the Chief Surveyor of the district in which the land lies, and the title should state the Act, and the section thereof, under which the land is being taken. (See Appendix 12.) In roads taken under authority of the Governor's warrant a further certificate is to be written on the plan in the form marked Schedule C in the Appendix hereto (modified to suit).

Schedule.

95. An accurate schedule of the land proposed to be taken from each property must be furnished with the plan in the form marked in Schedule D of the Appendix hereto.

LAND TRANSFER SURVEY REGULATIONS.

Regulations to apply.

96. The foregoing regulations numbered 13 to 78 shall equally apply to surveys made under "The Land Transfer Act, 1885," wherever they are not inconsistent with the following regulations, which shall apply specially to surveys made under "The Land Transfer Act, 1885."

Statutory declaration.

97. Any plan purporting to be a survey, a resurvey, or subdivision of any land is to be signed by the surveyor who actually made the measurements in the field, and shall also be verified by statutory declaration of the licensed surveyor employed to make such survey, in the form given in Schedule E of the Appendix hereto, or to the like effect.

Plan to be lodged.

98. Such plan shall be sent through the District Land Registrar for approval by the Chief Surveyor or officer acting for him, and when so approved shall be deemed to be accurate for all purposes of the Land Transfer Act.

Surveys to be connected.

99. Wherever permanent standard blocks have been placed the surveyor must use the standard blocks as his initial for bearing and distance, and in all cases he must start his work from one and close his work on another standard block. No hanging traverses will be permitted without the consent of the Chief Surveyor.

In the case of a whole section.

100. In districts where there is no standard survey, but a triangulation is available, if a resurvey or subdivision of a rural section is made for the purposes of the Land Transfer Act, the survey must be connected with the nearest trig. station.

In the case of a part of a section.

101. If only part of a section on an already deposited plan is being dealt with, the survey need only be connected with two or more points of that section, provided always that the previous survey shows proper connection to have been made to original points.

Included angles and tie-lines.

102. Included angles are not admissible, nor are the tie-lines allowed, except in the subdivision of very small pieces of land.

Initial bearing.

103. The bearing and distance between adjacent trig. stations or standard blocks will be always obtained by reference to the survey office of the land district; the bearing adopted as origin to be clearly shown on the plan, and the closing and check bearings must also be shown in the field-book.

Natural features.

104. Where a boundary consists of natural features they must be traversed, unless they form the boundary of the original section and have been recently traversed by a Government Surveyor. A retraverse of such boundaries may, however, be required in cases where the original survey appears to be in error beyond the limit allowed, or where the features show alteration.

Surveys must be closed.

105. Should a property be bounded on one or more sides by natural features of which a retraverse is not required, the survey must be closed by actual measurements in such a manner as will enable the work to be thoroughly checked. Adjacent standard work and prior surveys should be connected with.

Irregular boundaries. Offsets.

106. When an irregular boundary is defined by offsets measured thereto from one or more survey-lines, the surveyor must show on his plan the distances along such line or lines at which offsets have been taken, and the measured length of such offsets.

Traverses to be reduced.

107. All traverse-pegs to be numbered, and their positions mathematically reduced on the meridian and perpendicular of the initial station of the circuit, or, if that is not required by the Chief Surveyor, then on the starting or initial point of the survey; and traverse-tables, signed by the surveyor, are to be deposited with field-book and plan.

Pegging and marking.

108. Where wooden pegs cannot be driven, as in cities, iron bolts of $\frac{1}{2}$ in. diameter and 12 in. length, or 8 in. iron spikes, are to be used as pegs, and should be shown on plan by a small blue circle. Wherever possible, pegs must be inserted on the boundary; but in the case of stone or rubble walls, and suchlike obstacles, they may be placed parallel to, and at stated distances from, the true boundary.

Surrounding rights.

109. Every plan of any survey made under the Land Transfer Act must exhibit, distinctly delineated, the natural features within or adjacent to the survey, and sides of roads, streets, passages, thoroughfares, and their widths, also all easements, fences, aqueducts,

and reserves for public use which bound or are adjacent to such survey, and also show all sections and allotments into which the land is divided, marked with distinctive numbers and colours. In towns the buildings abutting on or which overlap or closely approach the boundaries of adjoining lots are to be shown on the plan, and their position relative to the boundaries clearly specified and delineated. (See Appendix 13.)

Colouring.

110. Roads, streets, and rights-of-way to be coloured with burnt sienna; railways, red; edge of land to be dealt with, green; natural features (when boundaries) with sepia.

Where the land forms a part of two or more original sections the boundaries and numbers of such sections must be shown by a distinguishing colour, and should the boundaries on the ground differ materially from the Crown-grant boundaries, such Crown-grant boundaries must be shown by dotted black lines. The distances and bearings according to the original survey and titles must also be shown in black.

Definition of boundaries.

111. If the boundary is a wall it must be shown whether it is a party wall, and whether the line runs through the centre or otherwise. The position of all boundary-fences must be shown in respect of the boundary claimed; and the nature of the boundary of the land, whether wall, house, fence, ditch, hedge, stream, or road, should be stated. The position of all traverse-lines relative to such boundaries should be clearly shown, and whether the line measured is inside, outside, or in the middle of the boundary. Swamps, terraces, or irregular fences are inadmissible as boundaries except if so made by Crown grant, in which case the consent in writing of the adjoining owners should be asked, and these boundaries should, with such consent, be reduced to right lines, with defined bearings and distances, and the adjoining owners should sign the plan.

Diagrams to be shown on plans.

112. In cases where details are numerous plans should be enlarged to 10 links or 20 links to an inch. Marginal diagrams of intricate portions may be used. All plans should be signed by the surveyor executing the work, and be drawn in a neat, plain, and professional manner in accordance with examples which will be shown to surveyors on application.

Names, &c., to be shown on plan.

113. For bringing land under the Act the sectional numbers or names of Native blocks, with the names of the owners or occupiers of the land represented by the plan, and also the names of the owners or occupiers of adjoining lands, should be written on the plan. Names of adjoining proprietors are not required in surveys for subdivisional purposes, but in all Land Transfer plans the numbers of all plans affecting surveys under the Act must be given.

Owner to sign plan.

114. All plans for use under the Land Transfer Act shall show on the face of them the district, block, and section, town, or other designation as the case may require, within which the land is situated, and are to be signed by the proprietor of the land in each case, or by his lawfully authorised attorney or agent.

Title by occupation.

115. When a title is claimed by "occupation" it will be the duty of the surveyor to endeavour to obtain information in respect of occupation, such as walls, fences, buildings, &c., which he finds upon the ground, and the age of same; and if such boundaries are departed from, the reasons for so doing should be noted on the plan.

Original points unchangeable.

116. The actual measurements made in the field must be given, notwithstanding that they may not agree with the Crown grant or public map, and should the difference be material the measured distance and bearing to the next adjoining Crown-grant boundary

is to be furnished, in order to determine whether there is any real encroachment, or whether the differences arise from former defective surveys. The license of any surveyor may be cancelled if it is found that the measurements or bearings certified by him as correct differ materially from those which exist on the ground. And in dealing with this subject the surveyor must adhere to the principle of the unchangeableness of original lines and corners established by Government or other duly authorised surveyors done in good faith; in other words, where the lines and corners are originally established on the ground by a proper officer, in pursuance of the survey system ordered by the law of the time, they must be regarded as the true lines and corners which they represent, even if subsequent surveys indicate that the posts, pegs, or marks are out of line, and that the corners are out of position according to the original description thereof. Surveyors should also bear in mind that the Act prohibits the District Land Registrar from issuing a title to land held in adverse occupation.

Information not to be withheld.

117. The surveyor will be expected to disclose all doubts, discrepancies, and difficulties, and to afford all such other information obtainable by him relating to the property and the application for certificate of title or transfer as will aid in securing accuracy and completeness in the business of the Land Transfer Department. A regard to the interests of his employer will not be considered as excusing in any degree the withholding of any information affecting the merits of the application, even though the description supplied may be literally and technically correct.

Private townships.

118. All plans of private townships or of extensions of private townships, outside of boroughs, require to be submitted for the approval of His Excellency the Governor. (See Regulations 53, 54, 55, and 56.)

THOS. HUMPHRIES,
Chairman, Surveyors' Board.

C. E. ADAMS,
Secretary, Surveyors' Board.

Dated at Wellington, this 8th day of August, 1907.

[Regulations 59, 84, and 85.]

SCHEDULE A.

SIZE AND SCALE OF PLANS.

The following are the scales and sizes to be used:—

Working-plans.

Town sections, or sections under		
half an acre	...	1 to 2 chains to an inch.
Suburban sections	...	3 to 5 " "
Rural sections	...	10 " "
Minor triangulation	...	40 " "
Topographical	...	40 " "

Working-plans of minor triangulations or block and section surveys are to be drawn on Whatman's best hand-made mounted antiquarian drawing-paper cut to 30 in. square. Isolated sections may be drawn on sheets 18 in. by 16 in.

Land Transfer Plans.

1 to 10 perches, not less than	...	$\frac{1}{2}$ chain to an inch.
10 to 20 "	...	$\frac{3}{4}$ " "
20 perches to 1 acre	...	1 to 2 chains "
1 acre to 10 acres	...	3 to 5 " "
10 acres to 50 acres	...	5 to 10 " "
51 acres to 3,000 acres	...	10 " "
3,000 acres and over	...	20 " "

Land Transfer surveys are to be plotted on similar mounted paper, and must measure 30 in. by 30 in. or 20 in. by 20 in.

Native Land Court Plans.

Scales as for working-plans, but not less than 10 chains to an inch; and in every case a space of at least 100 square inches must be left clear of any survey detail for recording the notes and decisions of the Court.

Native Land Court surveys should be delineated on similar mounted paper, and (except with special permission) should be 30 in. by 30 in. or 18 in. by 16 in.

[Regulations 85 and 94.]

SCHEDULE B.

I HEREBY certify that this plan has been made from surveys executed by me or under my own personal supervision, inspection, and field check; that both plan and survey are correct; and that all the rules and regulations with respect to the survey of Native lands have been strictly complied with.

Dated at _____, this _____ day of _____, 19____.
Licensed Surveyor.

[Regulation 94.]

SCHEDULE C.

FORM OF CERTIFICATE ON PLANS OF ROADS TAKEN THROUGH NATIVE LANDS [or as the case may be].

I HEREBY certify,—

1. That the road-line shown on this plan was surveyed by me under authority of a warrant signed by His Excellency the Governor dated _____
2. That notice of the intention to take the road has been served on the owners, and the meaning thereof explained to them, and the line pointed out to them on the ground, on the _____ day of _____
3. That no pa, village, Native cultivation, or burial-ground has been included in the road shown on this plan.

_____, Licensed Surveyor.
[Date.]

[NOTE.—When the road is taken under the Surveyor-General's direction, under section 72, "The Native Land Court Act, 1894," the above certificate is to be used after substituting "Surveyor-General" in place of "His Excellency the Governor."]

[Regulation 95.]

SCHEDULE D.

LAND REQUIRED FOR _____ [or PORTIONS OF ROAD REQUIRED TO BE CLOSED].

FORM OF SCHEDULE UNDER "_____"
Schedule.

THE several parcels of land mentioned in list hereunder:—

Approximate Area of each of the Parcels of Land required to be taken [or closed].	Being through Section or Portion of Section No.	Situated in Block No.	Shown on Plan marked.	Coloured on Plan.	Situated in the Borough, Township, Parish, or Survey District of †
A. R. P.			1		*

* This column is left blank in case any heading is required in addition to or in lieu of those already printed in the other columns given.
† The heading herein to be altered to suit the requirements of each case by striking out such portions as do not apply and adding anything further which may be requisite.
‡ Here insert name of local body.

All in the Land District of : as the same are more particularly delineated on the plan [or plans] marked , deposited in the Head Office, Department of , at Wellington, in the Land District of Wellington, and thereon coloured as above mentioned.

[Signature of Licensed Surveyor.]

[Date.]

[Signature of Chief Surveyor.]

[Date.]

Examined and found correct.

[Regulation 97.]

SCHEDULE E.

DECLARATION.

I HEREBY certify that this plan has been made from surveys executed by me, or under my own personal supervision, inspection, and field check, and that both plan and survey are correct and have been made in accordance with the regulations of the Surveyors' Board dated

And I make this solemn declaration conscientiously believing the same to be true, and by virtue of an Act of the General Assembly of New Zealand intituled "The Justices of the Peace Act, 1892."

, Licensed Surveyor.

[Date.]

In pursuance of the provisions of "The New Zealand Institute of Surveyors and Board of Examiners Act, 1900," His Excellency the Governor of the Colony of New Zealand, with the advice and consent of the Executive Council of the said Colony, approves of the foregoing regulations.

Approved in Council, this twenty-third day of August, one thousand nine hundred and seven.

PLUNKET, Governor.

ALEX. WILLIS,
Clerk of Executive Council.