

Surveyor-General's Rules for Cadastral Survey 2002/2 - Explanation of Changes

Office of the Surveyor-General

17 October 2002

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Introduction

In accordance with Sections 7 and 49(1) of the Cadastral Survey Act 2002, the Surveyor-General may make rules specifying--

- (a) Standards for the conduct of cadastral surveys (including the use of cadastral survey marks); and*
- (b) Standards for cadastral survey datasets.*

As a transitional measure, the first set of rules was made pursuant to Section 50 of the Cadastral Survey Act 2002 and took effect from 1 June 2002. A revised set of rules, known as the **Surveyor-General's Rules for Cadastral Survey 2002/2** is made under Section 49 of the Act.

These rules set the standards, in terms of Section 7(1)(c) of the Cadastral Survey Act 2002:

to determine how the spatial extent (including boundaries) of interests in a tenure system must be defined and described

This document provides an explanation of the changes between these Rules and the previous version of the Rules. Any comments or queries should be forwarded to the Surveyor-General.

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SURVEYOR-GENERAL'S RULES FOR CADASTRAL SURVEY 2002/2 - EXPLANATION OF CHANGES

1 Title & Commencement – R1, Sch1

These rules, being the second set of rules set in 2002 are suffixed “2002/2”. They come into force on 29 October 2002. This will be on or before the first day on which digital surveys can be prepared and lodged.

2 Class IV available for Class I Surveys – R2, R31, R44

Provides for Class IV surveys in Class I areas as specified in the revised Rule 44. This allows (for example) for cases where some boundary points in urban areas are relatively inaccessible (e.g. in a scrub filled gully) and a Class IV dispensation may be appropriate.

3 Low Intensity Residential for Class II Survey – R2

It was originally intended, in developing the Survey Regulations 1998, that Class II would cover low intensity residential usage such as lifestyle block parcels. However the wording of the regulations (and subsequently, the first set of Rules) resulted in a narrower interpretation with lifestyle blocks being required to be Class I. This change allows mixed usage parcels such as lifestyle blocks in rural/residential areas to be Class II.

The wording change to the Class III is made for completeness and similarly prevents a narrow interpretation that a rural farm with a house on it is also being used for residential purposes and would consequently have to be Class I or II.

4 Areas in ha – R3A, R29, R30 Sch2(9A), Sch3(9A)

Landonline survey products, like DCDB and SDI before them, show areas only in hectares – not m². This will also apply to the automatically generated plans from **Landonline** Stage Two and data entry must be in hectares. We need to change the current standard so that the new plan images will provide a legally correct representation of the area.

The current standard for hard copy plans is retained with the new standard only applying to digital survey and digital title plans. This has no impact on surveyors producing hard copy plans and the use of a different standard for hard copy and digital surveys will be reasonably obvious through being associated with significantly different plan formats.

The standards for areas in R29 and R30 have been changed to hectares.

In the Rules, reference to areas has been removed from Rule 3A and clauses 9A have been added to both schedules 2 and 3.

5 Clarification of Wording – R5

NZIS proposed changing two references to “it” to “the survey” for clarity.

6 Witness Marks not Adopted – R12 , R13, R26(2)a(ii), R26(2)b(ii), R26(2)c(ii), R36, Sch2(6), Sch3(6)

The requirement for witnessing in the first set of Rules appeared to apply to adopted boundary marks too, even though it has never been implemented that way. The change clarifies this. The change in R36 clarifies that an adopted mark cannot serve the role of a witness mark. The changes in R13(a)ii and R13(b)ii clarify that adopted natural boundaries also do not have to be within the distances specified in R13. The symbology of Clauses 6 in both Schedules 2 and 3 explicitly indicate that there is no symbol for an adopted witness mark.

7 Origin of Co-ordinates – R17

The origin of coordinates only needs to be stated for a hard copy survey. On a digital survey , the surveyor does not provide coordinates. However the marks that provide the origin of bearings still need to be identified for a digital survey.

8 Certification – R18

Minor change to cover both physical signing on a form and digital certification.

9 Balance Parcels – R19

The dispensations of R19(2) for hard copy surveys cannot apply to a digital survey because **Landonline**, as a spatial cadastral database, requires new parcels to completely fill the void that would be left by the extinguished parcels. This is an essential component of avoiding gaps or overlaps (and thus potentially conflicting rights) within the cadastral survey system. In the case of a hard copy plan, this is accounted for by LINZ staff processing the survey. In the case of a digital CSD, LINZ staff cannot undertake this work but it can readily be carried out by the surveyor prior to lodgement using special functionality in **Landonline** to create balance parcels from information in the database. In these cases, the boundaries of the balance parcels on a digital survey can be adopted as boundary linework from the database and, where dimensions are not available in the database, do not have to be dimensioned.

However any boundaries that are changed by the survey (recalculated or intersected) do need to be dimensioned.

10 R26(2)a(i) – Class I Accuracy

When the 1998 Regulations were being formulated, there was some logic applied to the values initially chosen for the constant term in the accuracy standards. It was based on the radius of a typical or acceptable mark. The logic (supported by the change to require the standard to be met between any pair of marks) was that it should be possible to get agreement between a measurement and the marks themselves – even if not between the middle of the marks. Therefore a typical radius for various marks was specified as follows:

Traverse/witness/origin	0.01	including a few mm of plumbing error
Class I (typically a peg)	0.02	half the narrowest dimension of a 50 x 75 mm peg less the 5mm chamfer
Class II (typically a post)	0.05	half of a 100 x 100 mm post
Class III (typically a post)	0.125	half of a 250 mm post

This results in the following constant (distance independent) errors:

Class I

Bdy – Bdy	$0.04 = 0.02 + 0.02$
Bdy – traverse/witness/origin	$0.03 = 0.02 + 0.01$
Traverse/witness/origin – traverse witness origin	$0.02 = 0.01 + 0.01$

Class II

Bdy – Bdy	$0.10 = 0.05 + 0.05$
Bdy – traverse/witness/origin	$0.06 = 0.05 + 0.01$
Traverse/witness/origin – traverse witness origin	$0.02 = 0.01 + 0.01$

Class III

Bdy – Bdy	$0.25 = 0.125 + 0.125$
Bdy – traverse/witness/origin	$0.13 = 0.125 + 0.01$ (rounded)
Traverse/witness/origin – traverse witness origin	$0.02 = 0.01 + 0.01$

(Note that these accuracy standards apply regardless of the actual boundary mark used.)

Despite this initial assessment, the Class I boundary – boundary standard of 0.04 was lowered to 0.03 in the Survey Regulations 1998 because 0.04 seemed, at the time, to be too much of a relaxation from the 0.01 m standard in the Survey Regulations 1972.

However, subsequent to this, *Landonline* has allowed a rigorous calculation and application of the Survey Regulations 1998 – especially the important new provisions requiring these standards to be met between all marks which prevents an undesirable growth in errors over several lines.

Experience with this rigorous calculation, both in Survey Conversion and *Landonline* validation, resulted in the discovery that many Class I surveys that would have been considered acceptable as Class A surveys under the Survey Regulations 1972, were only just failing the boundary – boundary test. Typically they failed by only a few

millimetres. Therefore this standard was relaxed in practice (in both survey conversion and **Landonline** validation) from 30 mm to 40 mm. This resulted in a significant improvement in validation results.

This standard was therefore been amended on the basis that:

- It is consistent with the practical logic used to derive the other standards.
- It has been shown, over many survey validations, to be consistent with experienced judgements on what constitutes an acceptable standard of boundary definition.
- It is the standard that has actually been applied in **Landonline** for well over a year.

11 R26(2)a(iii), R26(2)b(iii), R26(2)c(iii) – Boundary – Traverse Marks

Due to an oversight, the Survey Regulations 1998 (and consequently, the first set of Rules) have no explicit standard between traverse marks and boundary marks. It can be argued that the origin – boundary standard can only be achieved if the same standard is also achieved between both boundary and traverse and the specified standard between traverse – origin.

However this is a gap in the accuracy standards of the current regulations/rules. It is also a standard that is almost universally achieved through good survey practice. These clauses were amended to make this as a specific standard for clarity and certainty.

Landonline validation reports already implement this standard.

12 Digital Information – R39

Cross reference to the new Schedule 3 for digital CSD's

13 Format of hard copy plan – R40

Clarification that the requirements in Schedule 2 apply only to hard copy plans

14 Traverse Sheets – R41

Traverse sheets are not required for digital surveys. The digital plan includes a tabulation of marks, bearings and distances but these are generated automatically from the information submitted by the surveyor and do not include coordinates.

15 Field Sheets – R43

This corrects an oversight in the first set of rules. The Surveyor-General has responsibility for setting standards for the format of survey records in general and this should include field notes.

16 Class IV surveys – R44

Failure to include R31 in the scope of Class IV was an oversight (corrected here) in the Survey Regulations 1998. Non-inclusion of Class I was deliberate at the time but has proved to be overly restrictive.

17 Revocation and Savings – R49

The first set of rules – The Surveyor-General's Rules for Cadastral Survey 2002/1 – are revoked.

The savings provisions required by the first set of rules were established by Sec 68(4) of the Cadastral Survey Act 2002. The second set of rules require a new savings provision. This covers both the Survey Regulations 1998 and the first set of SG Rules.

18 Survey Plan & Survey & Title Sheets – Sch2(2), (3), (9), (13), (14), (16), (17)

The definition of “Survey Plan” has caused significant problems in the past. There is the whole set of plans, which, in various Acts is called the “Survey Plan”. Then we have a subset of the Survey Plan (the survey sheets) which unfortunately in the regulations and the first set of Rules has also been called the “Survey Plan”.

These amendments resolve this ambiguity.

19 Unique Mark Names – Sch2(7), Sch3(7)

All new marks require a reference number or label that is unique to the survey. This extends the current requirement for traverse marks to boundary marks. It does not apply to existing old or adopted marks, which retain their original name (or lack of a name). This applies to hard copy plans and digital surveys.

This makes it easier for surveyors using *Landonline* Stage Two as the pre-validation reports refer to the marks by name and if all boundary marks have the same name, it is much harder to find and resolve issues. It will also help future surveyors who find or adopt these marks and can benefit from being able to refer to them unambiguously or interpret reports about them.

This change allows LINZ capture staff to capture surveys from hard copy CSD's more quickly and accurately. It reduces the risk of capture errors going undetected. Capture errors do sometimes slip through (where the survey is correct but the data in **Landonline** is wrong). These errors, if they remain undetected, affect other surveyors – particularly in **Landonline** Stage Two where this data can be adopted electronically from the database.

It makes survey validation, approval and network adjustment easier in **Landonline** (for both hard copy and digital surveys) because the validation, approval and adjustment staff will be able to interpret the **Landonline** validation reports, and the surveyor's written survey report, more easily. The benefits to surveyors of this will be faster processing - a benefit not just to the surveyor (and their client) who put the unique mark names on their survey, but to all other surveyors and clients who have plans in the queue and are waiting for resources to be freed up to process their surveys.

The Rules do not specify how these marks should be uniquely referenced - that is up to the surveyor - just that they must be unique. They could be Roman numerals (discouraged), Arabic numerals, letters, or some combinations of numerals and letters. A common practice, where boundary marks are uniquely referenced, is to have the number of the traverse mark that they are set out from, followed by a letter. It would be in the interests of the surveyor to choose logical names/numbers.

20 Disturbed Marks – Sch2(7), Sch3(7)

In **Landonline**, in order to maintain relationships between surveys that use common marks, there is a need to identify marks that have been renewed/replaced (generally covered in Schedule 2 & 3 by clause (7)(b)) and those that have been found disturbed and fixed in their disturbed position. The latter case is currently only covered in the Rules by the survey report although general practice is for the survey plan to identify disturbed marks by annotation on the plan.

It is important in **Landonline** (and particularly in an eSurvey) for this to be identified at the capture stage. This allows the database to distinguish between the original position of the mark and its new disturbed position.

These requirements are covered by subclause 7(f) in Schedule 2 and 7(g) in Schedule 3.

21 Line Symbols – Sch2(8)

Land district, survey district, survey block, territorial authority and registration district boundaries are no longer required on the plan. The line weight for easement boundaries is changed to 0.35 mm, which is the line weight generally used anyway.

22 Existing Easements – Sch2(11), Sch3(11)

The former practice of requiring the dominant tenement to be shown for existing easements has changed. This is because of the confusion and ambiguity that can be caused by the dominant tenement being changed by subdivision subsequent to its creation, even though the easement still remains.

The Cadastral Survey Guidelines were amended some time ago to reflect this change in requirements. The changes to these clauses reflect the new policy.

23 TA Consents for Deposit – Sch2(14), Sch3(14)

Section 167A of the Land Transfer Act provides for consents such as TA certifications to be provided with the deposit documents lodged with the RGL as an alternative to being included in the CSD lodged for approval. The revised wording of these clauses reflects the fact that some consents, although required by law for deposit, do not have to accompany the survey for approval. However, where they are required, they should be on or attached to the title sheets.

24 Multi-level Unit Appellations – Sch2(21)

A representation was made by a surveyor that the requirement for appellations in a multilevel unit development to be related to the appropriate level number was sometimes not what the client wanted. It is agreed that this is not a matter requiring a Surveyor-General's standard and this clause has been amended to delete this requirement.

25 Standards for Digital Surveys – Sch3

Schedule 3 is, in general, a copy of schedule 2 with changes as appropriate to cover digital data or digital plan images rather than hard-copy plans. The differences between Schedule 2 and Schedule 3 are explained in the following sections.

26 Definitions – Sch3(1)

Defines digital CSDs.

Defines Diagram Image. This covers both the digital plan (below) as well as any images supplied by the surveyor as part of the digital CSD.

Defines Digital Plans. These are the plan images that **Landonline** will generate based on the digital data provided and incorporates digital images.

27 Digital Survey & Title Plans – Sch3(2)

The definition of the products changed in **Landonline** Stage Two. In **Landonline** the system generates these plans semi-automatically (the surveyor interactively specifies layout of diagrams) as a set of images. These standards apply to those images. The digital survey plan is the equivalent of all the survey sheets and title sheets on a hard copy survey plan. The digital title plan is the equivalent of the title sheets on a hard copy survey plan except that only boundary dimensions are shown – not boundary bearings.

Note that these digital plans do not show total distances on straight lines – only intermediate distances.

28 Digital Title Plan for title purposes – Sch3(3)

It is the digital title plan that is used for legal purposes. For LT surveys in **Landonline**, it is be the digital title plan that is assessed for deposit in a new title transaction. The graphic pages of this plan also serve the purpose of a title diagram.

29 Scale – Sch3(4)

The digital plans are produced by the system although the surveyor does have to intervene by producing diagrams to ensure a reasonable level of legibility. Note that all observations are automatically tabulated also. The plan scale is indicated approximately by a drawn scale. This is determined automatically to cover the extents of the survey and will not be a standard metric scale.

30 Plotting – Sch3(5)

5(1) and 5(2) are automatically satisfied by the **Landonline** software. There is no provision for 5(3) or 5(4) so these have been deleted. Note also that there is no provision for distorted diagrams.

31 Mark Symbols – Sch3(6)

The symbology is extended to include symbols for origin marks that are also witness marks, origin marks that are not witness marks and unmarked points. Note that all origin marks have a filled circle. In some cases, (e.g. compiled or computed plans) an origin mark can be adopted. It is also possible for an origin mark to be a new mark replacing an existing mark. In the case of adopted origin marks, a special symbol would have added complexity for a rare event without much benefit. In the latter case, an old mark was found and the filled circle symbol is still appropriate.

There is no separate symbol for bench marks, survey control stations or network stations. If these are new or old, stable and unlikely to be disturbed, the witness mark

symbol is appropriate. If adopted (and therefore unable to be witness marks) or there is doubt about their stability and permanence, the adopted traverse symbol is appropriate. Control marks are readily identified in **Landonline** and therefore do not need to be explicitly identified on the digital plans.

32 Mark Information – Sch3(7)

This information is provided in the CSD. Some of the information is also reflected on the digital plan and some is not, but the most important requirement is to ensure that it is provided in the digital dataset.

All marks must have their type specified (including pegs). There is a set of generic mark types available through a drop down list (including mark types of “unmarked” and “other”).

Note the requirement that all new marks be uniquely identified (discussed in section 19 above).

33 Line Symbols – Sch3(8)

The linework on digital plans is automatically specified according to attributes supplied by surveyors. The weights for automatically generated lines will be 1 point, 2 point and 3 point. These weights apply to an A3 image and correspond approximately to the current line weights scaled down by a factor of 1.4 to account for the A2 to A3 plan format change.

Land district, survey district, survey block, territorial authority and registration district boundaries are not shown on the digital plan (and are no longer required on the hard copy plan).

Road boundaries are not explicitly shown by line work. However the surveyor can choose to indicate roads by getting **Landonline** to add them to the plan as shaded areas. Alternatively, the roadsides can be manually plotted on-screen on the plan image in the same symbology as abutting boundaries (fine dotted lines).

Fences are not shown on the digital survey plan. This information must be provided on an image of a diagram. However, standard symbology should still be used on that diagram image.

CT boundaries cannot be plotted in the traditional way. A 1 point dash – dot line is used instead (this line style no longer being required for Survey District boundaries). These boundaries are not automatically plotted and must be manually added on-screen to the digital plan image by the surveyor where required.

34 Additional information on linework – Sch3(9)

Because the **Landonline** system, rather than the surveyor, plots the lines and generates the tabulated observations, the line attributes that are used to generate these lines must be supplied with the digital data.

The plotting of bearing and distance is automatic.

Equipment type (selection from a few generic types) is required for all measurements – not just GPS. This makes the requirements to provide this information, technology-independent. A label like GPS will not be plotted on the digital survey plan.

9(d) is a new requirement to ensure that the surveyor specifies what type of boundary a line is (primary parcel, secondary – easement, centreline, strata, etc) or that it is a non-boundary traverse line. This information fills a potential information gap in eSurveys formerly covered by plan layout and symbology on hard copy plans.

35 Reference Plans – Sch3(10)

Reference plans are identified in the digital dataset not on the plan face. **Landonline** then tabulates these in the digital plan header.

36 Easements – Sch3(11)

The CSD must identify the position and extents of easements, etc. This then allows them to be depicted automatically on the digital plans.

The easement schedules will be supplied in image form which will then be incorporated into the set of images that make up the digital plans.

37 Occupation – Sch3(12)

Occupation information will be provided by the surveyor as an image or images of diagrams. These could be images of clearly drawn field notes for example. These images will then be incorporated into the set of images that make up the digital plans.

38 Roads – Sch3(13)

There is currently no provision in the structured digital data format to specify road names, width or legality. However the surveyor can choose to indicate roads by getting **Landonline** to add them to the plan as shaded areas. Road names from **Landonline** can also be displayed. Also there is provision with the automatically generated digital plan images, for the surveyor to manually add annotations on-screen to the plan images. A shaded road with no annotation will be taken to be legal road.

If shading is not used, an annotation as to road legality will be required. The nominal road width will need to be added as a manual annotation on-screen.

39 Consents – Sch3(14)

Consents and approvals will be supplied by the surveyor in image form, which will then be incorporated into the set of images that make up the digital plans.

40 Computed & Compiled Surveys – Sch3(15)

The specification of a CSD as compiled or computed is part of the survey header information supplied by the surveyor in the digital CSD. It is also automatically added to the digital plan images.

41 Legalisation Plans – Sch3(16)

The title references for abutting land will need to be manually added on-screen to the digital plan image as annotations.

The schedule will be supplied by the surveyor as an image and will then be incorporated into the set of images that make up the digital plans.

42 LT Plans – Sch3(17)

The CT's for the land concerned are referenced in the digital data and also appear on the header sheet of the digital plan.

References to adjacent CT's where required, will need to be manually added on-screen to the plan image as annotations.

43 Maori Land Surveys – Sch3(18)

Some of these provisions (e.g. 18(1)c & 18(1)d) should arguably be shifted to the body of the rules as they describe how to conduct the survey, not how to depict it. However, that will be considered during the next revision of the Rules in 2003.

In some cases, a Maori Land Court order may specify that the balance of the land is not to be shown on the plan. It is not possible to comply with this requirement for a digital CSD in **Landonline** as the digital dataset must include new parcels that completely fill the void left by the underlying parcel when it is extinguished. In this case, the options will be to:

- submit the survey as a hard copy plan requiring LINZ to create the balance parcel when capturing the survey; or
- (with the Court's permission) to include the balance of the land on the survey (with a parcel appellation for the balance) but depict the parcel with plotted but

undimensioned boundaries – possibly with an annotation that the balance parcels are not defined by survey.

44 Flat, Cross Lease & Unit Surveys – Sch3(19), (20), (21)

Flat and unit plans can be digitally lodged. The surveyor creates the header as digital structured data, incorporating any survey data if easements have been defined and/or pegged. They then include an image of the graphical component of a flat or unit plan which will be much the same as now (i.e. in conformity with Schedule 2). One difference will be that the image will not require all the header and panel details as these will be supplied as structured data, or as images of consents, schedules, etc. The header details, consent images, schedule images and graphical plan images will be incorporated in the set of images that make up the digital plans.

45 Mining Plans – Sch3(22)

This information will be provided by the surveyor as part of the digital CSD rather than in plan form. A digital plan will be generated by the system which will show the relationship between the mining permit and the underlying parcel boundaries. If there are existing permits within 100 metres that are not spatially depicted in **Landonline**, the surveyor may need to supply an image of a new plan graphic showing the relationships of the existing permits and the new permit. Alternatively, the boundaries of the existing permit could be spatially defined by survey dimensions and observations - then allowing the spatial relationships and intersections to be plotted on the digital plan images.