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Land Information New Zealand

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Interim guide to the amended Rules for Cadastral Survey 2010

LINZG65704

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New Zealand Government

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Table of contents

FIGURES

Foreword

Terms and definitions

- LINZS65003: Rules for Cadastral Survey 2010, amended 1 November 2012, are referred to in this interim guideline as 'amended Rules'.
- For all other terms and definitions, refer to the amended Rules.

Introduction

- This interim guide to the amended Rules is issued under the authority of the Surveyor-General, who has responsibility for setting standards for the conduct of cadastral surveys, specifications, and guidelines in accordance with legislation and departmental policy.
- This interim guide is intended for use by licensed cadastral surveyors and those working under their direction when conducting a cadastral survey and lodging a cadastral dataset with LINZ.

Purpose

The purpose of this interim guide is to assist in the correct interpretation of the significant changes that are in the amended Rules.

Effective date

This interim guide is effective from 1 January 2013, which is the same date the amended Rules come into effect.

Relationship with interpretation guide

- This interim guide should be read in conjunction with the *LINZG65700: Interpretation guide to Rules for Cadastral Survey 2010*, published 6 December 2011.
- If the information is inconsistent between the two guides, this interim guide should take precedence.

Note: It is anticipated that this interim guide will be integrated into the interpretation guide entitled *LINZG65700 Interpretation guide to Rules for Cadastral Survey 2010* in the near future.

All the amended Rules not covered

This interim guide is not a complete interpretation of every amended rule. It only deals with those amendments where clarification is necessary.

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Foreword, continued

References

The following references are necessary for the application of this interim guide:

- LINZ 2012, *LINZS65003: Rules for Cadastral Survey 2010*, Office of the Surveyor-General, LINZ, Wellington
- LINZ 2011, *LINZG65700: Interpretation guide to Rules for Cadastral Survey 2010*, Office of the Surveyor-General, LINZ, Wellington
- LINZ 2012, *LINZS20009: Standard for Canterbury Earthquake Recovery Act 2011*, Registrar-General of Land, LINZ, Wellington

Superseded documents

The following will be superseded on 1 January 2013 by this interim guide:

- LINZ 2012, *LINZG65702: Guideline for Rules for Cadastral Survey (Canterbury Earthquake) 2010*, published 20 February 2012, Office of the Surveyor-General, LINZ, Wellington

Versions and amendments

Sequence	Amendments to *Interim guide to the amended Rules for Cadastral Survey 2010*	Published
1	Version 1.0	11/12/2012

Defining by survey class A boundaries

1. Overview

Introduction to the new requirements relating to class A boundaries

The amended Rules have changed the requirements that apply to 'defining by survey' existing boundary points on urban parcels. This section explains these changes and also clarifies when some boundaries may be 'defined by adoption'.

Links to new requirements on class A boundaries

This section contains the following topics:

2. Where an existing class A parcel is at least 90 % of extinguished parcel

Rules relating to class A parcels less than 0.4 ha

- Rule 6.2(a)(iv) in the amended Rules is a new rule that applies when 10 % or less is being divided off an existing urban parcel.
- The exceptions in former rule 6.2(a)(iv) (current until 1 January 2013) have been retained and are now set out in new rule 6.2(c)(ii).

(refer to When class A parcels under 0.4 ha may be defined by adoption and Applying rule 6.2(c)(ii) below)

When class A parcels under 0.4 ha must be defined by survey

All existing Class A boundaries or boundary points on a primary parcel less than 0.4 ha must be 'defined by survey' unless:

- the parcel contains (coincides with) 90 % or more of the parcel being extinguished by the survey (refer to When class A parcels under 0.4 ha may be defined by adoption).
- all of the boundaries are existing primary parcel boundaries defined in approved CSDs (refer to Applying rule 6.2(c)(ii) below).

When class A parcels under 0.4 ha may be defined by adoption

Existing class A boundaries or boundary points on a primary parcel less than 0.4 ha may be 'defined by adoption' where:

- the parcel contains (coincides with) 90 % or more of the parcel being extinguished by the survey providing the accuracy tolerances are able to be met [r 6.2(a)(iv)].

  Examples where this could occur are:

  - a boundary adjustment survey (refer to Figure 1: Example of a boundary adjustment survey below), or
  - a land acquisition survey (refer to Figure 2: Example of a land acquisition survey below).

- all of the boundaries are existing primary parcel boundaries defined in approved CSDs (refer to Applying rule 6.2(c)(ii) below).

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Where an existing class A parcel contains 90 % or more of the extinguished parcel, continued

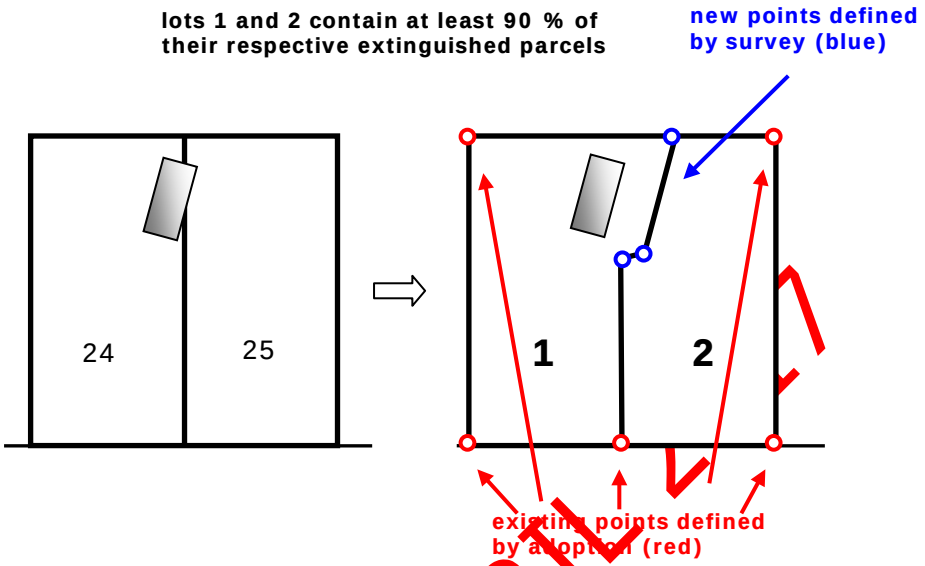

Figure 1: Example of a boundary adjustment survey

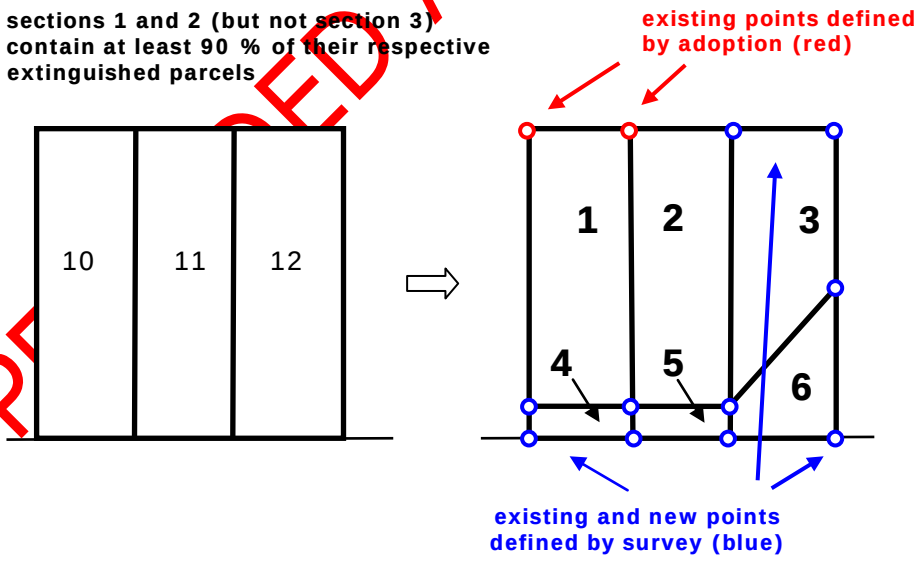

Figure 2: Example of a land acquisition survey

3. Where all class A boundaries already exist

Applying rule 6.2(c)(ii) where boundaries exist

- Existing boundaries and boundary points may be defined by adoption on a primary parcel less than 0.4 ha where all the boundaries:
  - are existing primary parcel boundaries defined in approved CSDs, and
  - are right-lines or arcs, and
  - meet the accuracy tolerances for class A [r 6.2(c)(ii)].
- This rule is identical in its application to old rule 6.2(a)(iv) in place prior to the amended Rules.

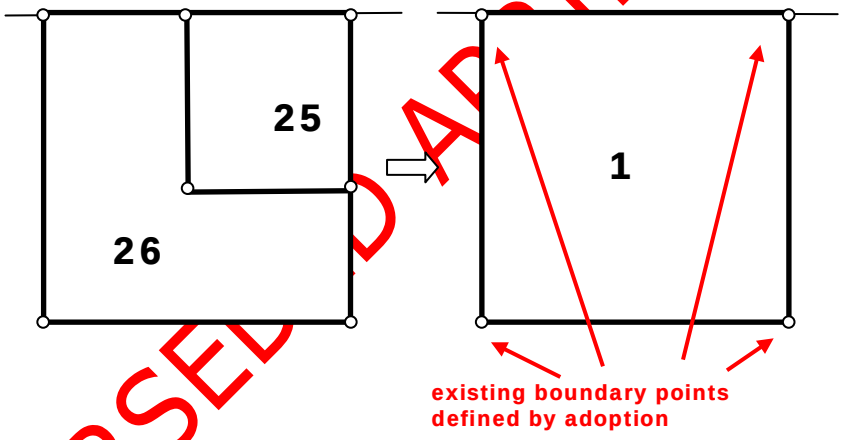

Figure 3: Example of class A adopted boundary points

4. Abutting parcel boundary points

Class A boundary points of abutting parcels

- A boundary point is not required to be defined by survey if it is on a primary parcel less than 0.4 ha and it only defines the end point of an abutting parcel boundary [r 6.2(c)(i)].
- Irrespective of the above, a boundary point must be defined by survey under rule 6.2 if it is:
  - an angle on the new parcel [r 6.2(a)(iv)],
  - an angle on a new primary parcel boundary that was previously only a non-primary parcel boundary point [6.2(a)(xii)],
  - a boundary point marked by the survey [6.2(a)(v)],
  - an old boundary mark that has been connected to by the survey [6.2(a)(v)].

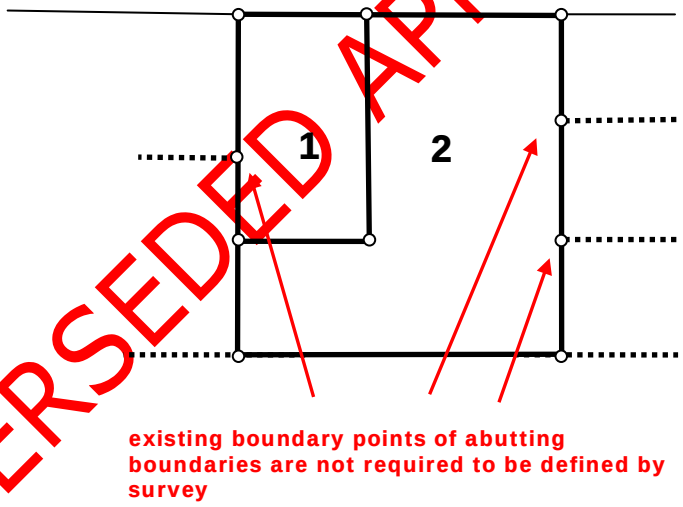

Figure 4: Example of class A abutting boundary points

Defining large rural parcels

5. Overview

Introduction to the requirements relating to large rural parcels

The amended Rules have reduced the requirements that apply to rural parcels over 100 ha.

Links to related topics on requirements for large rural parcels

This section contains the following topics:

6. Accepting boundaries of rural parcels over 100 ha

Accepting boundaries of parcels over 100 ha

A boundary on a rural parcel that is over 100 ha may be accepted unless it is in common with another parcel on the survey that is 100 ha or less [r 6.3(c)].

Note: Where the existing boundary is MHWM refer to Accepting MHWM boundaries and the Marine and Coastal Area Act 2011 or Resource Management Act 1991 below).

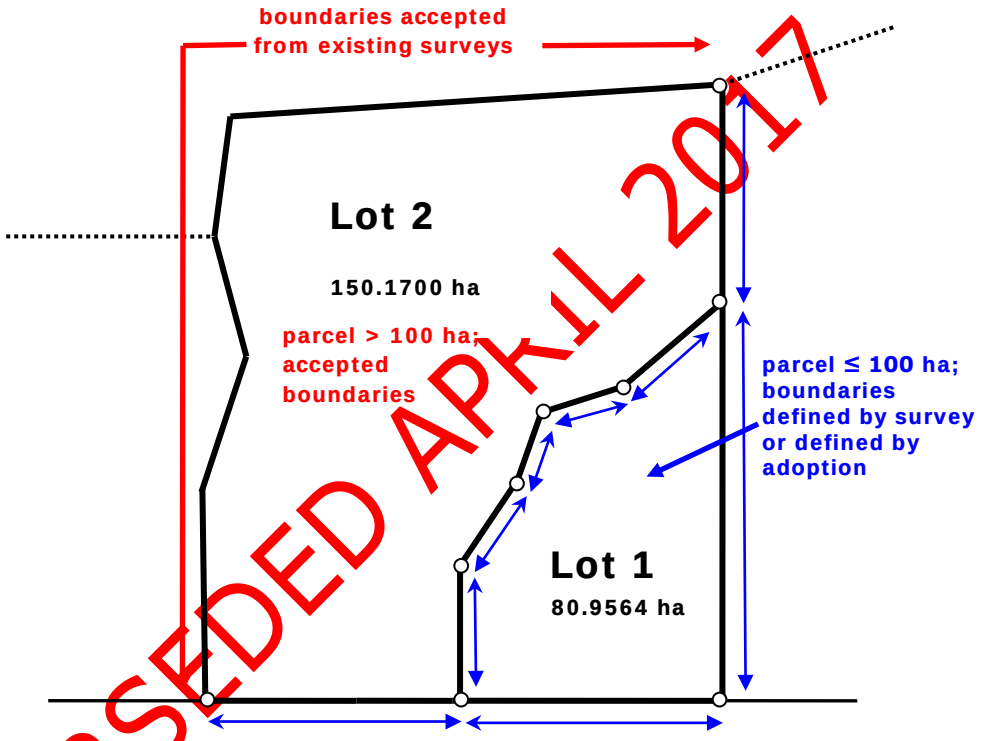

Figure 5: Lot 2 over 100 ha with accepted boundaries

7. CSD requirements for accepted boundaries of rural parcels over 100 ha

Boundary information in the CSD

Where a boundary of a rural parcel over 100 ha has been accepted under rule 6.3(c):

- the CSD must include:
  - on the Diagram of Survey, the CSD reference from which the boundary is sourced [r 9.6.14(b)(iv)],
  - on the Diagram of Survey and the Diagram of Parcels, the annotation 'area not determined by survey' clearly related to the relevant parcel [r 9.6.11 and r 10.4.8],
  - on the Diagram of Survey and the Diagram of Parcels, the annotation 'boundary accepted from existing survey' clearly related to the relevant boundary [r 9.6.12 and r 10.4.8];
- the CSD is not required to include:
  - vectors that enable the relationship between the accepted boundary and other marks or boundaries to be determined [r 8.1(d) and r 8.1(e)],
  - boundary point information and symbols [r 9.6.2 and r 12.2 (Table 12)],
  - boundary vectors and dimensions [r 9.6.14(b)(iv) and r 10.4.9(a)(iii)].

(see Figure 6: Lot 2 over 100 ha with accepted boundaries below)

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CSD requirements for accepted boundaries of large rural parcels, continued

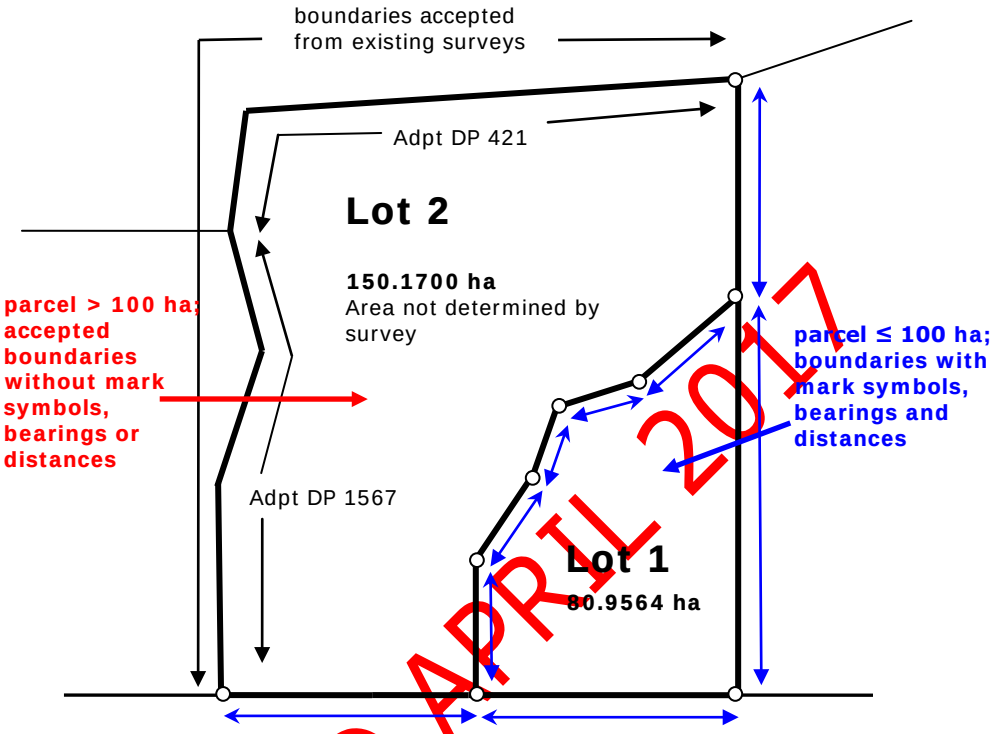

Figure 6: Lot 2 over 100 ha with accepted boundaries

Accepting MHWM boundaries and the MACAA or RMA

- In some cases, the Marine and Coastal Area (Takutai Moana) Act 2011 (MACAA) or the Resource Management Act 1991 (RMA) will prevent rule 6.3(c) from being applied.

  Where an existing parcel boundary is defined as MHWM and the identification of the common marine and coastal area (between MHWM and MHWS) is required, the existing documentary line of MHWM can only be accepted if seaward of, or coincident with, the new MHWS line.

- Examples where this could occur are where the following take effect:

  - sections 9, 11(3), and 11(4) of the MACAA
  - section 237A(1)(b) of the RMA.

Covenant surveys (rule 16)

8. Overview

Introduction to alternative requirements for covenant parcels - rule 16

- This section explains the requirements where a new covenant parcel which would normally be class B, is surveyed in terms of rule 16 (Alternative requirements for covenant parcels).
- For a covenant only survey where the relationship between the covenant parcel and the underlying parcel boundaries has not been, or cannot be, determined accurately, rule 16 (Alternative requirements for covenant parcels) or rule 17 (Alternative requirements for non-primary parcels) may be applied.

  Note: Under rule 16 only PRMs are required but under rule 17, witness marks as well as PRMs are required.

All rules to be applied where appropriate

- Rule 16 contains specific requirements that supplement rules 1-15, and provides some alternative requirements to those set out in rules 1-15.
- This means that rules 1-15 must also be applied where relevant and unaffected by rule 16. Examples are:
  - Rule 16.1 (enabling class C accuracy tolerances for covenant boundaries) varies rule 3.2.5 (which normally requires new boundaries to be either class A or B).
  - Rule 16 does not include requirements about covenant parcel appellations, as these are contained in rule 5.5.

Links to related topics on alternative requirements for covenant parcels

This section contains the following topics:

9. Accuracy of covenant boundaries

Class C covenant boundaries

Class C boundary accuracies may be used for covenant boundaries where class B would normally apply [r 16.1].

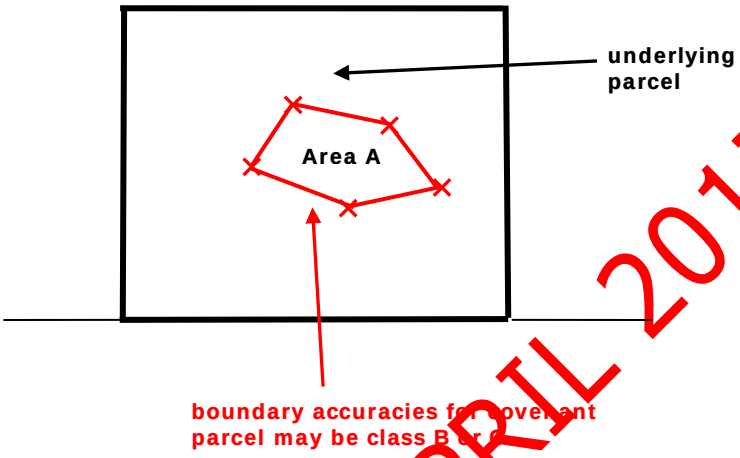

Figure 7: Class C covenant boundary accuracies

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Class C and D covenant boundaries

Where the boundary or boundary point of a covenant, which would normally be class B:

- **has been determined** accurately relative to its underlying parcel boundaries, the covenant boundary points that intersect or coincide with the underlying parcel will be either class B or C. This is illustrated by the red and black boundaries of Area A and points E and F in Figure 8: Classes of covenant parcel boundary points below.

- **has not been determined** accurately relative to its underlying parcel boundaries [r 16.3(a)], the covenant boundaries and boundary points that intersect or coincide with the underlying parcel boundaries must be class D. [r 16.3(c)]. This is illustrated by the red boundaries of Area A and points E and F in Figure 8: Classes of covenant parcel boundary points below.

  In this case, the black boundaries may be class B or C [r 16.1] and the existing coincident points and boundaries must be accepted and be class D.

- In respect of the witnessing of boundary positions that are marked [r 16.2(b], if position E is to be marked (including a post), the class of survey for this point must be upgraded to either class B (or A) [r 3.2.5(b)]. The position must also be defined by survey [r 6.2(a)(ii)], witnessed [r 7.3.1(c)], and the survey include PRMs [r 7.4.1].

  (see also Accuracies to ensure no overlap below)

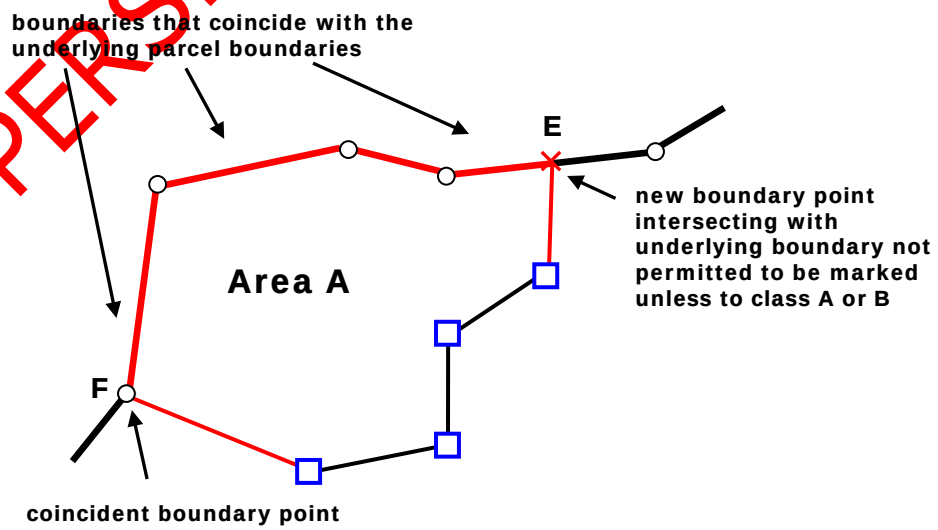

Figure 8: Classes of covenant parcel boundary points

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Accuracies to ensure no overlap

- Where the relationship between a covenant parcel and its underlying parcel has not been determined accurately, the relationship between its boundaries and its underlying parcel boundaries must be sufficiently accurate to ensure that its boundary points are either within, or coinciding with, the underlying parcel boundaries [r 16.3(b)].

- As illustrated in Figure 9: Covenant boundary points within its underlying parcel below, covenant boundary points A and B must be within, or coinciding with, the boundaries of Lot 25. They are not permitted to overlap into Lot 26.

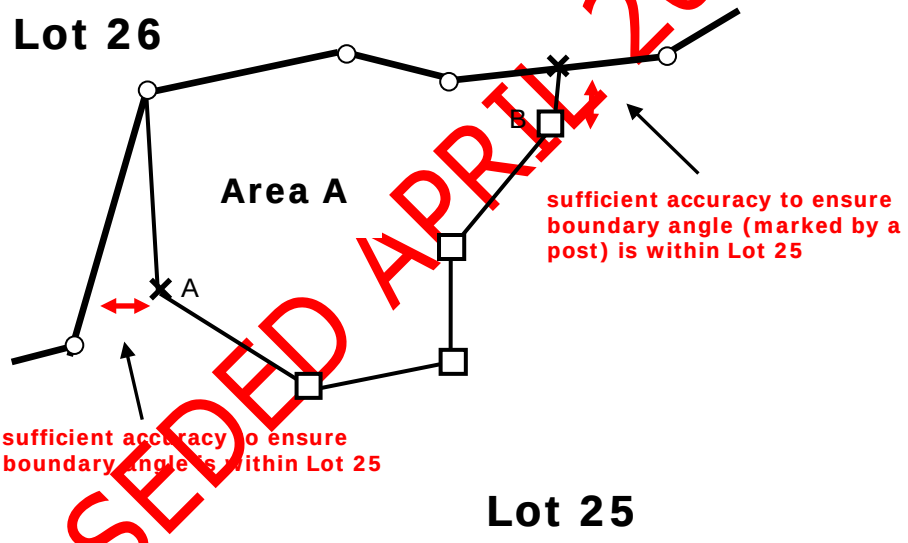

Figure 9: Covenant boundary points within its underlying parcel

10. Survey and CSD requirements for covenant parcels

Survey requirements when covenant not in terms of underlying parcel

Where a covenant parcel is not determined accurately relative to its underlying parcel boundaries:

- bearings (other than magnetic bearings) must be in terms of NZGD2000 [r 16.4(a)]. Any bearing adjustment need only be determined to sufficient accuracy to ensure compliance with the applicable accuracy standard (eg, class C).
- a connection must be made to at least one cadastral survey network mark [r 16.4(b)]. This applies irrespective of the distance to this network mark.
- two PRMs must be included, each within 500 m (class B) or 1000 m (class C) of at least one of the new covenant boundary points, and the connection must comply with the accuracy tolerances in table 14, rule 16.4. To illustrate this, in Figure 10: PRMs for covenant parcels below:
  - parcels A and B are contiguous, so the requirement for two PRMs within the required distance criteria of at least one new boundary point can be satisfied in respect of any point or points on either parcel A or parcel B,
  - parcel C is a separate parcel, so there must also be at least two PRMs within the required distances of at least one boundary point on this parcel,
  - the boundary points that intersect with the underlying parcel boundaries (shown with red crosses) will be class D and are excluded for the purposes of the PRM distance criteria [r 16.4(c)(i)].

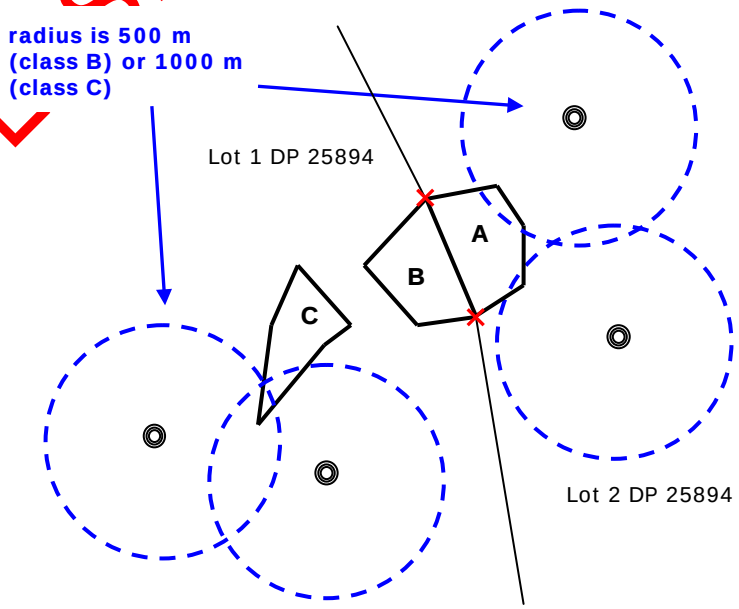

Figure 10: PRMs for covenant parcels

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Witnessing of covenant boundary points

- If a new covenant boundary point (whether class B or C) that is not coincident with an existing boundary is marked by a post, it is not required to be witnessed [r 16.2(a)] (refer to the blue boundary posts in Figure 8: Classes of covenant parcel boundary points above). This means that in some cases the CSD is not required to include any survey information.
- If a boundary mark other than a post is used (eg a wooden peg], normal witnessing [r 7.3] and PRM requirements [r 7.4] will apply.

CSD requirements for covenant parcels

- The survey report must note where class C or class D has been applied in the survey [r 16.5(a)].
- On the Diagram of Survey, the annotation 'class D' must be shown for all related boundaries and vectors [r 16.5(b)].
- On the Diagram of Parcels, the annotation 'not defined by survey' must be shown for the related class D boundaries [r 16.5(c)].

Non-primary parcels and poor underlying boundaries (rule 17)

11. Overview

Introduction to alternative requirements for non-primary parcels - rule 17

- This section explains the requirements where a new non-primary parcel's boundaries are unable to be determined accurately in terms of the underlying parcel boundaries. In these cases, the survey must be in terms of rule 17 (Alternative requirements for non-primary parcels).
- It is anticipated that rule 17 will only be applied in the rare cases where the underlying parcel boundaries are of poor accuracy.
- For a covenant only survey where the relationship between the covenant parcel and the underlying parcel has not been or cannot be determined accurately, rule 16 (Alternative requirements for covenant parcels) or rule 17 (Alternative requirements for non-primary parcels) may be applied.

  Note: Under r 17, witness marks as well as PRMs are required but under r 16 only PRMs are required.

All rules to be applied where appropriate

- Rule 17 contains specific requirements that supplement rules 1-15 and provides alternative requirements to those set out in rules 1-15.
- This means that rules 1-15 must also be applied where relevant and unaffected by rule 17. Examples are:
  - Rule 17.1(d)(iii) (requiring the connection to a cadastral survey network mark irrespective of the distance to it) varies rule 4.2 which has a distance criteria.
  - Rule 17 does not include requirements for non-primary parcel appellations as these are contained in rule 5.5.

Related topics on alternative requirements for non-primary parcels

This section contains the following topics:

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12. Accuracy of non-primary parcel boundaries

Understanding when rule 17 applies to non-primary parcels

- Rule 17 is to be applied where:
  - the purpose of a survey is to define a non-primary parcel only (eg, an easement only survey), and
  - the accuracy of the relationship between the non-primary parcel boundaries and the underlying parcel boundaries cannot be determined accurately.
- For illustrations of where to apply rule 17, refer to:
  - Rule 17 where a non-primary parcel does not intersect an underlying parcel boundary, and
  - Rule 17 where a non-primary parcel intersects an underlying parcel boundary
- It is expected that rule 17 will not be applied very often. Examples of when it may be applied include a RoW or an electricity easement that passes over multiple parcels whose boundaries are poorly defined.

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Accuracy of non-primary parcel boundaries, continued

Rule 17 where a non-primary parcel does not intersect an underlying parcel boundary

Rule 17 applies where the accuracy of the relationship between all of the non-primary parcel boundaries and its underlying parcel boundaries is unable to be determined accurately. The rule:

- applies even if the non-primary parcel does not intersect with its underlying parcel boundaries [r 17.1(a)(iii)],
- will not apply if the relationship between the non-primary parcel boundaries and at least one of the underlying boundary points is accurately defined (for example, if the relationship with point A was sufficiently accurate).

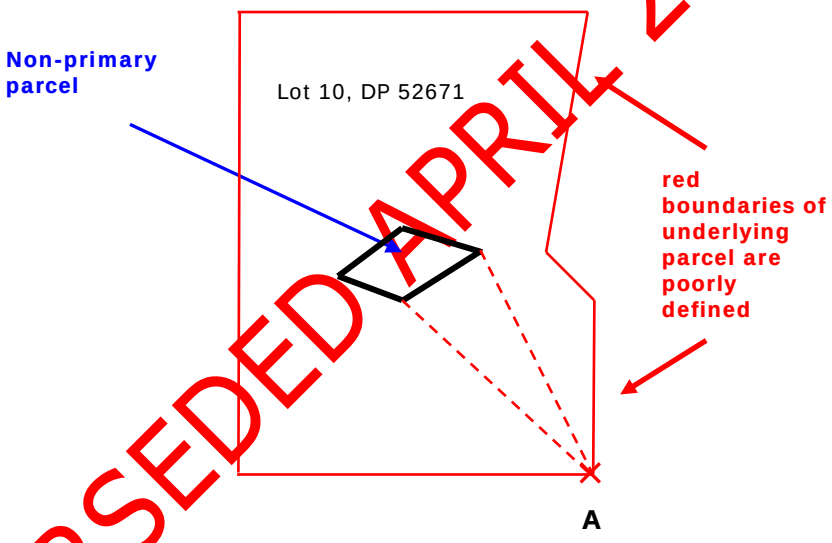

Figure 11: Applying rule 17 where there is no intersecting boundaries

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Rule 17 where a non-primary parcel intersects an underlying parcel boundary

- Rule 17 applies where the accuracy of **all** of the intersections of a non-primary parcel with its underlying parcel boundaries cannot be accurately determined [r 17.1(a)(ii)].
- The rule will not apply if the relationship between the non-primary parcel boundaries and at least one of the underlying boundary points is accurately defined.

  An example of this is illustrated below where boundary points C and D are defined accurately in relation to point B. In this case, for a rural survey, points B, C, and D would be class B and points E and F would be class D.

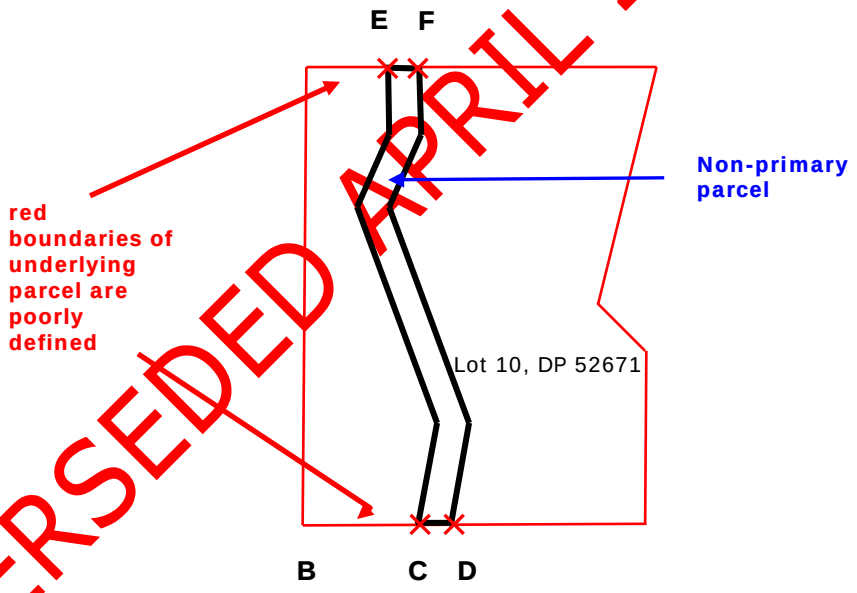

Figure 12: Applying rule 17 where there are intersecting boundaries

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Accuracy of non-primary parcel boundaries, continued

Accuracies to ensure no overlap

- Where a non-primary parcel has not been accurately determined relative to its underlying parcel boundaries, the relationship between its boundaries and its underlying parcel boundaries must be sufficiently accurate to ensure that its boundary points are either within, or coinciding with, the underlying parcel boundaries [r 17.1(c)].
- As illustrated in Figure 12: Non-primary boundary points within its underlying parcel below, non-primary boundary points A, B, and C must be within, or coinciding with, the boundaries of Lot 25. They are not permitted to overlap into Lot 26.

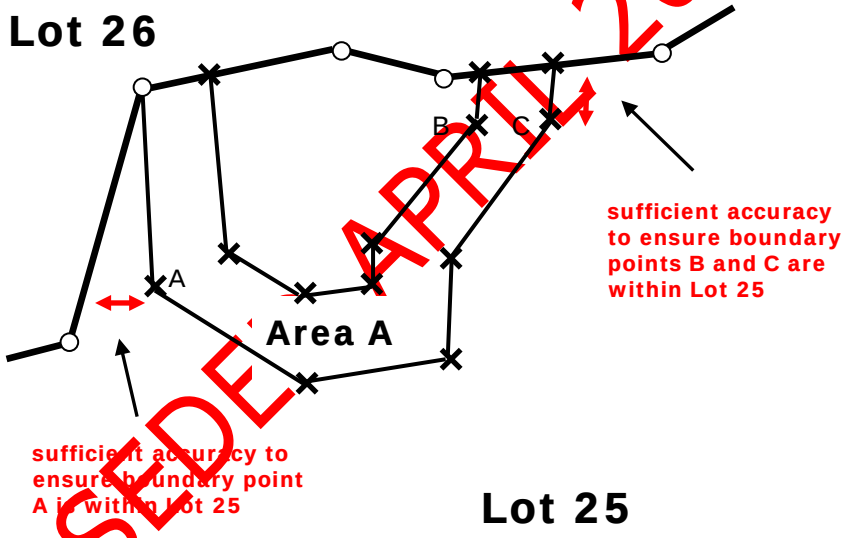

Figure 13: Non-primary boundary points within its underlying parcel

Rule 17 does not apply to units and leases

Rule 17 does not apply to unit and lease areas [r 17.1(b)]. In these cases, the new non-primary parcels must be located accurately in terms of the underlying parcel boundaries.

13. Survey and CSD requirements for non-primary parcels

Survey requirements when rule 17 is applied to non-primary parcels

Where a new non-primary parcel is unable to be determined accurately in relation to its underlying parcel boundaries in terms of rule 17.1 (refer Figure 13: Example where underlying boundaries are poorly defined):

- bearings (other than magnetic bearings) must be in terms of NZGD2000 [r 17.1(d)(ii)]. Any bearing adjustment need only be determined to sufficient accuracy to ensure compliance with the applicable accuracy standard (eg, class C)
- a connection must be made to at least one cadastral survey network mark [r 17.1(d)(iii)]. This applies irrespective of the distance to this network mark,
- all new non-primary boundary points must be witnessed and comply with the requirements set out in the following rules:
  - rule 3.6 (accuracy of boundary witnessing),
  - rule 7.3.2 (number and distance of witness marks)
  - rule 7.4.2(a) (number of PRMs and distance between PRMs and a boundary point).

  This does not include the new points that coincide or intersect with the underlying parcel boundaries as these are inaccurate [r 17.1(d)(iv)].

CSD requirements where rule 17 is applied

Where a new non-primary parcel is unable to be determined accurately in relation to its underlying parcel boundaries, in terms of rule 17.2 (refer Figure 13: Example where underlying boundaries are poorly defined):

- the survey report must note where class D has been applied [r 17.2(a)],
- on the Diagram of Survey, the annotation 'Class D' must be shown for the related boundaries and vectors [r 17.2(b)],
- on the Diagram of Parcels, the annotation 'not defined by survey' must be shown for the related boundaries [r 17.2(c)].

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Diagram illustrating application of rule 17

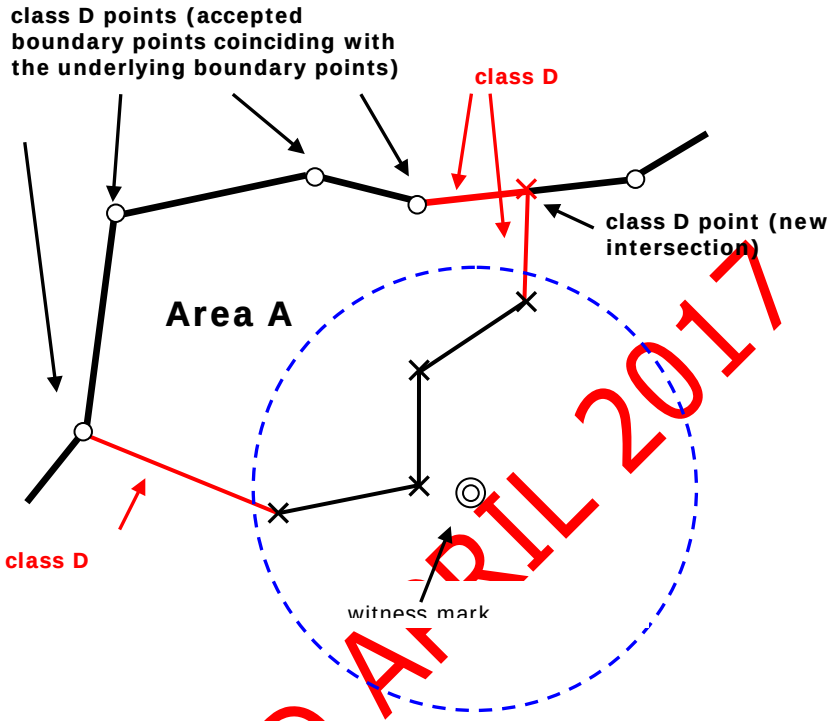

Figure 14: Example where underlying boundaries are poorly defined

Boundaries affected by ground movement (rule 18)

14. Overview

Introduction to rule 18 - boundaries affected by ground movement

Rule 18 sets out requirements relating to the re-establishment of boundary points and boundaries affected by ground movement. They replace the *Rules for Cadastral Survey (Canterbury Earthquake) 2010* and additional requirements also set out in the guidelines to these Rules. Rule 18 applies nationwide.

All rules to be applied where appropriate

- Rule 18 contains specific requirements that supplement rules 1-15 and provides alternative requirements to those set out in rules 1-15.
- This means that rules 1-15 must also be applied where relevant and where unaffected by rule 18. Examples are:
  - Rule 18.2 (enabling class D to be applied to boundaries that would normally be class C) varies rules 3.2.3 and 3.2.4 which set other requirements for classes C and D.
  - Rule 18 does not include requirements on the evidence for defining boundaries as this is contained in rule 6.1.

Links to related topics on boundaries affected by ground movement

This section contains the following topics:

15. Boundary evidence, disturbed and unproven marks where ground movement

Evidence for survey definition where ground movement

- Rule 6.1(a) requires a surveyor to 'gather all evidence relevant to the definition of the boundary and its boundary points'. Examples of relevant evidence where there has been ground movement may include:
  - the condition of witness and boundary marks and the ground conditions immediately surrounding these marks
  - visible evidence of a fault trace, slump lines, or liquefaction of soils
  - broken or cracked fencing or kerbs or building foundations
  - visible evidence of repair to, or reinstatement of, occupational features damaged by soil liquefaction or fault trace
  - photographic evidence including historical aerial photographs or photographs taken immediately before and after the ground movement event
  - local knowledge from occupiers, neighbours, and present or past owners
  - Local Authority records
  - news media articles
  - engineering reports.
- The established hierarchy of evidence applies where the displacement effect of ground movement is within the applicable tolerances of rule 3.3.1 (boundary points), rule 3.4 (water and irregular boundaries), rule 3.5 (permanent structure boundaries), and rule 3.6 (boundary witnessing).

Note: In the now superseded Guideline for Rules for Cadastral Survey (Canterbury Earthquake) 2010, the boundaries unaffected by ground movement were referred to as Category One boundaries.

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Boundary evidence, disturbed and unproven marks where ground movement, continued

Removal of disturbed boundary marks

- Where an existing boundary mark on a new parcel boundary is determined as being disturbed and no longer represents the true boundary position, the mark must be:
  - connected to by the survey and included in the CSD as a disturbed mark, and
  - either be driven below ground so that it is not visible, or
  - removed.

    If it is removed, the survey report must report this. For future users' benefit, a notation 'removed' could be added as a suffix to the mark information on the Diagram of Survey.
- Approval to remove marks in these circumstances is not required.

(for the capture of disturbed marks refer to: http://www.landonline.govt.nz/esurvey/best-practice/tips-and-hints#79)

Unproven marks where ground movement

A CSD may include an unproven mark where the mark has been affected by ground movement and it is not being used to define a boundary [r 18.3(a)(i)]. In this case, the Diagram of Survey must indicate each mark that is unproven [r 18.3(b)].

(for the capture of unproven marks refer to: http://www.landonline.govt.nz/esurvey/best-practice/tips-and-hints-full-index#81)

16. Orientation and connection where ground movement

Horizontal orientation where there is ground movement

All surveys that meet the criteria of rule 4.1 (horizontal datum – orientation) must be in terms of NZGD2000. This includes surveys where there is ground movement.

Note: Although no longer permissible, surveys that were completed in Canterbury under *Rules for Cadastral Survey (Canterbury Earthquake) 2010* (23 December 2010 - 31 December 2012) were permitted to base their orientation on existing survey marks:

- that retained the same relationship to each other as they held before the Canterbury earthquake, and
- where it was not practical to determine an orientation in terms of an official projection.

In these cases, a notation was shown on the Diagram of Survey *'Orientation is in terms of pre-Canterbury earthquake 2010 data and may not be accurate relative to the official geodetic projection'*. Later surveys using the information from these CSDs will need to confirm if the orientation is in terms of NZGD2000.

Horizontal connection where there is ground movement

- All surveys that meet the criteria of rule 4.2 (horizontal datum – connection) must connect to a cadastral survey network mark. This includes surveys where there is ground movement.
- Where differential ground movement has occurred between the site of the survey and the cadastral survey network mark, this connection may need to be made by field measurements as adoptions may not meet the required accuracy tolerances.

17. Boundaries affected by block shift

Defining boundaries where there has been block shift

- A boundary that has been affected by a block shift will have maintained its relativity with local survey marks and other physical evidence although its absolute geographic position will have changed.
- In these cases, the established hierarchy of evidence will apply; that is, the boundary re-location must be based on reliable local survey marks and other physical evidence, all of which will have been subject to the same or similar block shift [r 18.1(c)].
- Sometimes a boundary may have been subject to block shift as well as shear, distortion, or soil liquefaction effects. The impact of these other displacements will need to be dealt with separately.

Note: Survey marks that have been affected only by block shift are undisturbed (see r 2 for definition of 'disturbed').

Impact in Canterbury

Most of the land area consisting of Christchurch City, Selwyn District, and Waimakariri District has been affected by relatively uniform block movement.

Note: In the now superseded Guideline for Rules for Cadastral Survey (Canterbury Earthquake) 2010, the boundaries subject to block shift were referred to as Category Two boundaries.

18. Boundaries affected by deep-seated distortion

Where deep-seated distortion has occurred

A boundary that has been distorted by deep-seated movement greater than the applicable accuracies set out in rule 3.3.1 (boundary points), rule 3.4 (water and irregular boundaries), or rule 3.5 (permanent structure boundaries), must reflect that distortion [r 18.1(a)]. This applies for horizontal boundaries and boundaries with a vertical component.

Where shear and lateral distortion has occurred

- Where a boundary has shear or lateral distortion (normally at a fault rupture):
  - a boundary that was formerly a straight line may now include one or more angles,
  - a boundary that moved with the earth will hold the same relationship to relevant physical evidence as it did prior to the earthquake. An example is a boundary that coincided with a fence line will continue to coincide with that fence line. Boundary points will still be defined in terms of close survey marks,
  - a water boundary or an irregular boundary moves with the ground movement in the same manner as points on a right line boundary.

    Note: A sudden change of a water boundary as a result of ground movement (other than distortion or block shift) is avulsion and must be dealt with in accordance with common law principles.

  Illustrations C and D in Figure 14: Examples of distorted boundaries below are examples of new boundary angles being created.

- If the distortion in the boundary is less than the applicable accuracies set out in rule 3.3.1, the boundary should retain its original shape and the established hierarchy of evidence will apply.

  Illustrations A and B in Figure 14: Examples of distorted boundaries below are examples where new boundary angles are not created.

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Examples of distorted boundary

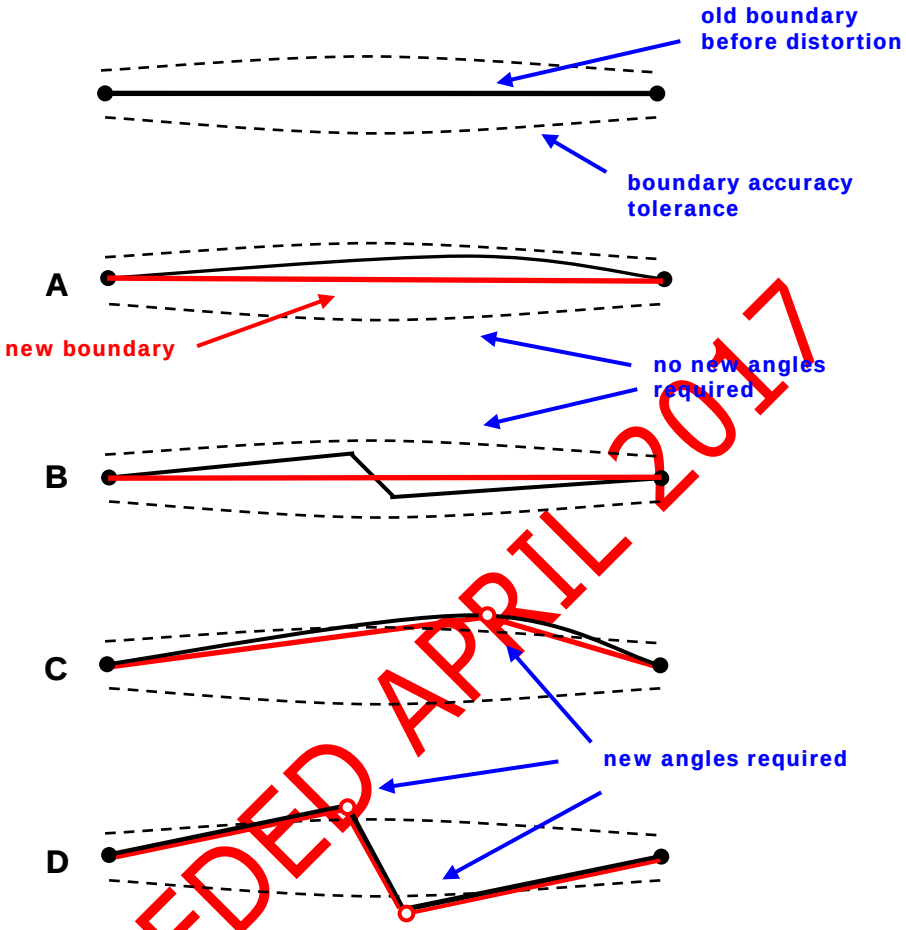

Figure 15: Examples of distorted boundaries

Vertical movement of boundaries where deep-seated movement

Where the boundary is a stratum boundary [r 6.8] or defined by reduced levels (by Regulations and Rules pre-dating 2010) and the movement is deep-seated, then the vertical relationship between levelled and undisturbed witness marks, PRMs, or benchmarks used on those surveys may be able to be retained.

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Impact of distortion in Canterbury

- The full extent of the zone of distortion in Canterbury is unknown and will only be discovered as cadastral surveys are carried out.
- Surveyors will need to be aware of the location of fault ruptures. These ruptures (overlaid on the cadastre) are mapped on the LINZ website:
  www.linz.govt.nz/survey-titles/cadastral-surveying/canterbury-earthquake/information-surveyors/index.aspx.
- In the now superseded *Guideline for Rules for Cadastral Survey (Canterbury Earthquake) 2010*, the boundaries in these areas were referred to as Categories Three and Four boundaries.

Consent of adjoining owners for distorted boundaries

- Where a boundary has been distorted by deep-seated movement and extra boundary angles are being created [r 18.1(a)] surveyors are advised to discuss the proposed boundary location with the adjoining owner and, if possible, include in the CSD their consent to the boundary as re-established.
- If consent is not provided, then before issuing a new title for the re-established parcel, the Registrar General of Land (RGL) will serve notice to the adjoining owner to ensure the new title will not include any land from the neighbour's title. If the neighbour objects to the new boundary because of a claim to ownership of part of the re-established parcel, the RGL will advise the applicant and decline to deposit the plan until the objection is resolved (for more information refer to *LINZS20009: Standard for Canterbury Earthquake Recovery Act 2011 registration* published by the Registrar General of Land[1]).
- An example of a neighbour's consent is:

  'I/we *[Full Name/s]* registered proprietor/s of CFR *[123456]* agree with the definition of the common boundary of our land with Lot *[X]* shown hereon and consent to the deposit of this plan.

  Signed

  Date: dd/mm/yyyy'

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[1] LINZS20009*: Standard for Canterbury Earthquake Recovery Act 2011 registration* will be available early 2013.

Boundaries affected by deep-seated distortion, continued

CSD requirements where a boundary has been distorted

Where an existing boundary has been distorted and new angles are created in terms of rule 18.1(a), the CSD:

- must include:
  - a diagram showing information on occupation and physical features [r 18.1(b)(ii)],
  - a prominent notation on the Diagram of Survey and Diagram of parcels 'Boundary includes new angles due to deep-seated movement' related to the relevant boundary [r 18.1(b)(iii)],
  - information in the survey report regarding the definition of boundaries that have been defined by survey [r 18.4]. This will need to include the information relating to boundaries affected by distortion;
- should include, if possible, the consent of the adjoining owner (refer to Consent of adjoining owners for distorted boundaries above).

Boundary reinstatement survey not permitted where distorted boundary

Where an existing boundary has been distorted by deep-seated ground movement and new angles created [refer rule 18.1(a)], a reinstatement of that boundary is not permitted [r 18.1(b)(i)]. The new angles must be defined as part of a new parcel.

Adopting a boundary not permitted where distorted boundary

An existing boundary that has been distorted by deep-seated ground movement in excess of the applicable accuracies (refer rule 18.1(a)) is not permitted to be defined by adoption irrespective of rules 6.2(c)(ii) and 6.4. The boundaries must be defined by survey as part of a new parcel.

19. Boundaries affected by shallow surface movement

Defining boundaries where there has been shallow surface movement

- Where an area of land has been affected by shallow surface movement (including liquefaction, slumping, and landslip) there are a number of factors that will influence the relocation of the boundaries. Normally a boundary should be relocated back in its original position in accordance with common law. However, where there is conflicting evidence, determining an appropriate solution is often difficult (refer to Evidence for survey definition where ground movement above).

- In some circumstances the boundaries may be reinstated in terms of marks and positions not affected by localised ground movement, but this must be weighed against any conflicting evidence such as occupation.

- In areas where the change in the ground surface has resulted in the random or significant movement of survey marks and land features, the evidence of a boundary location may be extremely difficult to interpret. This is common in areas of Canterbury where there is liquefaction.

  The difficulty lies in firstly, identifying marks and positions not affected by the ground movement and, secondly, enabling the boundaries to be defined in a local context so that they have some relevance to occupation, albeit with some distortion. The following are examples of this difficulty:

  - The extent and direction of surface flow can vary within the area of land under survey. Groups of existing boundary and non-boundary points may have retained pre-earthquake relativity with one another, but not with other such groups. In some cases, this may result in some distortion being reflected in the new parcel.

  - Some boundary points may need to be reinstated in positions that are different from existing boundary marks. In these cases, the old boundary mark will be connected to, recorded as a disturbed mark, and either be driven below ground or removed (refer Removal of disturbed boundary marks above).

  - In some cases, positions may have been displaced in a vertical sense but not horizontally (and vice versa).

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Boundaries affected by shallow surface movement, continued

Vertical movement of boundaries where shallow surface movement

Where the boundary is a stratum boundary [r 6.8] or defined by reduced levels (by Regulations and Rules pre-dating 2010) and the movement has been shallow surface movement, the original vertical relationship between levelled and undisturbed witness marks, PRMs, or benchmarks may not be able to be re-established. In these cases, other evidence will be needed to re-establish the boundary that best meets the intention of the original survey.

Shallow surface movement in Canterbury

- Some liquefaction areas where property was damaged in 2010 have been mapped on the EQC website at www.eqc.govt.nz.

  See Tonkin & Taylor Limited Geotechnical Report Stage 2 http://canterbury.eqc.govt.nz/publications/2010/11/stage2.

- There are, however, unmapped areas affected by liquefaction and surveyors will need to identify these by the evidence on the ground.

- In the now superseded *Guideline for Rules for Cadastral Survey (Canterbury Earthquake) 2010*, the boundaries in these areas were referred to as Category Five boundaries.

Survey reporting where shallow surface movement

The basis of decisions made must be reported when a boundary that is affected by ground movement is defined by survey [r 18.4]. This will need to include the fact that the boundaries have been affected by shallow surface movement.

20. Accepting boundaries where ground movement

Class C and D boundaries where ground movement

- Where a boundary affected by ground movement meets the criteria for class C under rule 3.2.3, but may have been subject to distortion greater than the accuracy tolerances specified in rule 3.3.1 (boundary points), rule 3.4 (water and irregular boundaries), or rule 3.5 (permanent structure boundaries), then this boundary must be either:

  - accepted and be assigned class D [r 18.2(a)(i)], or
  - defined by survey.

  The boundary is not permitted to be defined by adoption [r 18.2(a)].

- A boundary that does not meet the criteria for class C [r 3.2.3] or D [r 6.3] must be defined by survey where distortion is greater than the accuracy tolerances specified in rules 3.3.1, 3.4, or 3.5. If the distortion is less than the accuracy tolerances, the boundary may be defined by adoption.

CSD requirements for accepted boundary where ground movement

Where a boundary is accepted under rule 18.2(a), the CSD must include a prominent notation on the Diagram of Survey and Diagram of Parcels 'Boundary not surveyed since ground movement' related to the relevant boundary [r 18.2(b)].

Defining existing boundaries where limitations are to remain

21. Evidence where limitations as to parcels is to remain

Defining by survey where title is to remain limited

- When defining a boundary by survey, rule 6.1(b) requires the surveyor to interpret evidence in accordance with all relevant enactments and rules of law. The evidence relevant to the determination of the boundary and its boundary points will differ depending on whether limitations as to parcels is to remain or not.

- Where a new limited title is to be created, the issues relating to the extent of lawful possessory ownership are not being addressed (ie notices to adjoining owners will not be sent out by the Registrar-General of Land pursuant to the Land Transfer Act 1952). Possessory occupation that is not on the parcel boundary must not be taken into account.

  An example of this is illustrated below in Figure 15: Limited title and a legalisation CSD.

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Legalisation surveys where limited title to remain

- In the case of a legalisation survey, where the parcel to be extinguished has a limited title, a new limited title will be issued for the land not affected by the legalisation action. This title will be based on the new parcel depicted in the survey office (SO) legalisation CSD.

- Even though a legalisation survey is not required to support the uplifting of limitations for the land not subject to the legalisation, in some circumstances, rule 6.2 still requires an existing boundary point to be defined by survey for this land. This will occur where:

  - there is conflict [r 6.2(a)(vi)],
  - the boundary is inadequately defined [r 6.2(a)(vii), or
  - the 90 % threshold has not been reached for a class A parcel [r 6.2(a)(iv)].

  When determining the parcel boundaries, possessory occupation that is not on the parcel boundary must not be taken into account.

- An example of this is illustrated in Figure 15: Limited title and a legalisation CSD below where the existing boundary points of Sec 2 are shown with blue crosses.

  Note: These positions should not be marked even where conflict has been resolved or where the boundary was previously inadequately defined [r 7.1(b)(ii)].

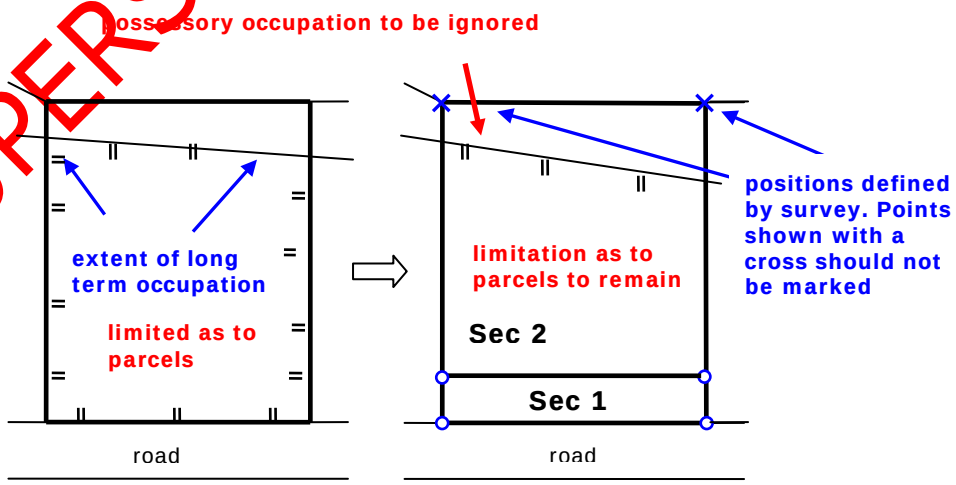

Figure 16: Limited title and a legalisation CSD