



# Interim standard for mark protection surveys (Canterbury earthquake)

LINZS10004

10 September 2012

## How to have your say

Please email your comments to [regulatorysubmissions@linz.govt.nz](mailto:regulatorysubmissions@linz.govt.nz).

### Your comments

- (a) Comments, in electronic format, should be on the technical content, wording, and general arrangement of the proposed standard.
- (b) Please provide supporting reasons for your comments and suggested wording for proposed changes.
- (c) Please do not return marked-up drafts as comments.
- (d) Editorial matters such as spelling, punctuation, grammar, numbering, and references will be corrected before final publication.

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## Foreword

### Purpose of interim standard

Following the Canterbury earthquake, reconstruction work will result in the destruction of many geodetic control marks, cadastral survey marks, and other cadastral boundary evidence.

Before survey marks are destroyed, it is important that evidence of their positions is recorded by establishing survey connections to threatened marks from alternative survey marks in positions free from disturbance. This will enable the reliable location of new infrastructure services, and assist in the correct re-establishment of cadastral boundaries in the future.

It is a statutory requirement to obtain the approval of the Surveyor-General prior to removing a survey mark under s 55 of the Cadastral Survey Act 2002 (the Act) and normally Land Information New Zealand (LINZ) approves the removal of these marks on a case by case basis. For the purpose of post-earthquake reconstruction, this approval is provided subject to the requirements set out in this interim standard.

### Superseded documents

This is a new interim standard and replaces the *LINZ specification for post-earthquake protection of survey marks on projects under the control of Stronger Christchurch Infrastructure Rebuild Team (SCIRT)* issued under the authority of the Surveyor-General on 21 December 2011.

### References

- LINZ 2010, *LINZS65000; Rules for Cadastral Survey 2010*, Office of the Surveyor-General, LINZ, Wellington.
- LINZ 2009, *LINZS25006; Standard for tiers, classes, and orders of LINZ data*. Office of the Surveyor-General, LINZ, Wellington.

## Scope

This interim standard provides the Surveyor-General's approval for the removal of survey marks affected by Canterbury Earthquake activity, subject to the requirements specified in this standard being met.

## Intended use of standard

- (a) A person or organisation must comply with this standard if they intend removing a survey mark during reconstruction work following the Canterbury earthquake.
- (b) Licensed Cadastral Surveyors must comply with this standard when undertaking a protection survey and preparing the cadastral survey dataset (CSD) of that survey.
- (c) The Chief Executive has a function to determine whether CSDs and cadastral surveys comply with the Rules for Cadastral Survey 2010 (RCS2010) and this interim standard.

## Title and commencement

- (a) This interim standard may be cited as the interim standard for mark protection surveys (Canterbury earthquake),
- (b) The interim standard comes into effect on 10 September 2012.

## Terms and definitions

For the purposes of this interim standard, the following terms and definitions apply. For other terms, refer to Rule 2 of the Rules for Cadastral Survey 2010.

<b>Term/abbreviation</b>	<b>Definition</b>
Act	Cadastral Survey Act 2002
Canterbury earthquake	also known as the Darfield earthquake that occurred on 4 September 2010 and includes the related series of aftershocks.
CSD	as defined in Rule 2 Rules for Cadastral Survey 2010
interim standard	interim standard for mark protection surveys (Canterbury earthquake)
LINZ	Land Information New Zealand
PRM	as defined in Rule 2 Rules for Cadastral Survey 2010
protected mark	a survey mark whose position is protected and whose removal is approved in accordance with this standard.
protection survey	a survey carried out for the purpose of recording the position of a protected mark
RCS2010	Rules for Cadastral Survey 2010

## 1 Authority to remove survey mark

In terms of sections 55(5) and (6) of the Act, the Surveyor-General approves the removal of a survey mark subject to compliance with the provisions in this interim standard.

## 2 Application of standard

A survey mark may be removed where:

- (a) the land has been affected by the Canterbury Earthquake, and
- (b) its removal is for the purposes of post-earthquake reconstruction, and
- (c) a protection survey is completed in terms of this interim standard and the RCS2010, and
- (d) a CSD recording the protection survey, in terms of this interim standard and the RCS2010, is lodged with LINZ.

## 3 Surveyor to carry out protection survey

A protection survey and the CSD that records this survey must be undertaken by, or under the direction of, a Licensed Cadastral Surveyor.

## 4 Additional requirements for control marks

Before a geodetic control mark of Landonline horizontal order 5 or better or vertical order 3V or better is removed, the LINZ National Geodetic Office must be consulted for any requirements in addition to those specified in this interim standard.

### GUIDANCE

- (i) LINZ will provide additional advice on the extent of survey mark protection required if requested.
- (ii) Staff in the National Geodetic Office of LINZ have a delegation from the Surveyor-General to approve the removal of survey marks subject to any terms and conditions relating to the replacement of marks where necessary. The contact for the National Geodetic Office is John Ritchie – [jritchie@linz.govt.nz](mailto:jritchie@linz.govt.nz).
- (iii) The location of geodetic control marks can be viewed on a Google map at [www.linz.govt.nz/gdb](http://www.linz.govt.nz/gdb). Maps showing the location of geodetic control points are also available from the beforeudig service at [www.b4udig.co.nz](http://www.b4udig.co.nz).
- (iv) In areas affected by ground movement, particularly where the reliability or otherwise of survey marks has yet to be proven, connections to as many marks as can reasonably be located and to other cadastral evidence (including occupation) will benefit the future re-establishment of boundaries.

## 5 Horizontal datum – orientation

Irrespective of Rule 4.1 of the RCS2010, every bearing in a protection survey must be oriented in terms of the official geodetic projection applicable to the area.

### GUIDANCE

Until the geodetic survey control network is resurveyed and adjusted, global navigation satellite system methods will provide for the most reliable orientation.

## 6 Permanent Reference Marks

- (a) At least two permanent reference marks (PRMs) that meet the criteria in Rule 7.4.3 of the RCS2010 must be included in a protection survey.
- (b) At least two PRMs must be within 300 metres of each protected mark.

### GUIDANCE

- (i) A PRM may be an existing or new mark.
- (ii) For LINZ to consider upgrading the PRMs to geodetic control marks, it would be beneficial if these marks are readily accessible and suitably located for global navigation satellite system methods observations.
- (iii) It is preferable that these PRMs are spaced throughout the extent of the protection survey.

## 7 Unproven marks

- (a) A survey mark on a protection survey is not required to be determined as being either disturbed or undisturbed,
- (b) If this determination is not carried out, the mark is unproven.

### GUIDANCE

- (i) Determining the reliability of a protected mark by comparing its current relationship to other marks, with its pre-earthquake relationship to other marks, is not required. However, sufficient work will need to be carried out to ensure that all old marks are correctly identified and the unproven mark's relationship with other survey marks on the protection survey is ascertained and verified in accordance with the relevant accuracy standards of Rule 3 RCS2010.
- (ii) The PRMs required by this interim standard may also be unproven existing marks.

## 8 Cadastral Survey Dataset

- (a) A CSD recording a protection survey must be lodged with LINZ within three months of completion of the field survey.
- (b) The CSD must:
  - (i) include as captured information all survey marks and related vectors, including adoptions used for the purpose of the survey,
  - (ii) include as captured information sufficient vectors in terms of Rule 8.1(d) of the RCS2010,
  - (iii) indicate on the Diagram of Survey each mark that is unproven,
  - (iv) include in the information in the 'Mark Plan Ref' field of the 'Mark Details' capture screen of Landonline, a suffix '(unproven)' for each mark that is unproven,
  - (v) with the exception of disturbed marks, link all old marks including unproven marks to their existing mark nodes if they exist in Landonline. If this linking causes failures to be identified in the pre-validation report or network adjustment rule failure report, these failures must be explained in the survey report,
  - (vi) include a statement in the survey report that the survey has been carried out in terms of this interim standard.

### GUIDANCE

- (i) The CSD type in Landonline is a 'Survey Information CSD'. There is no lodgement fee.
- (ii) To assist future users of the CSD, the CSD description should be 'Survey Mark Protection' and include the road name(s) where appropriate.
- (iii) For clause 10(b)(iv), an example is 'ITI DP 12345 (unproven)'. If a survey mark has a geodetic code, Landonline will not allow the 'unproven' suffix to be added in the mark details. In these cases the suffix will need to be added to the Diagram of Survey by user-added text and a request submitted to the National Geodetic Office for the mark to be identified as unproven. These requests can be made by searching the mark within the Geodetic Database and selecting 'User feedback/unproven status' under detailed information.
- (iv) If in future a surveyor proves that the mark is disturbed or not disturbed, then the 'unproven' status can be changed to 'disturbed' in terms of Rule 7.6 RCS2010, or the status removed altogether. Where it is subsequently established that a mark is disturbed, a new Landonline node will need to be created for the new position. LINZ can move any existing post-earthquake observations to the new node if appropriate.
- (v) The recording of evidence that could assist future surveyors in the location of boundaries eg occupation, is desirable. This information could be included in an occupation diagram supporting document which would be incorporated with the CSD plan.