

# Regulatory Quality Assurance

*Audit Process for Cadastral Surveys*

**Office and Field Audit Approach**

**January 2007**

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**Issued to:** Licensed Cadastral Surveyors

**Copied to:** New Zealand Institute of Surveyors  
Institute of Cadastral Surveying  
Cadastral Surveyors Licensing Board

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## 1. Overview

The Land Information New Zealand (LINZ) **future vision** for the Audit of Cadastral Surveys is one where:

- the Survey Profession actively undertakes its own Quality Assurance processes (Field and Office) of Licensed Cadastral Surveyors (LCS), and
- LINZ monitors the quality of Cadastral Survey Datasets (CSD's) via the LINZ approvals process, together with reports from the survey profession, and undertaking field and office visits.

The purpose of a cadastral survey audit comes down to answering the following question:

***‘Can a licensed cadastral surveyor by looking at the field and office records for a Cadastral Survey gain reasonable assurance that the work in the field and office complies with the Cadastral Survey Act 2002 and the Surveyor-General’s Rules 2002/2?’***

The change in audit process is one of the steps towards the future vision.

This document outlines a recently tested methodology for checking that Cadastral Surveys are being undertaken to the required quality.

The objective of a LINZ cadastral survey audit is to provide the Surveyor-General with reasonable assurance that Cadastral Surveyors are complying with the Act and Rules.

**The objective of this document is** to outline the audit process with regard to the:

- selection of CSD's,
- information to be reviewed,
- methodology used for audit conclusions.

The Survey Profession has been, and continues to be, self checking to some extent by utilising underlying survey work, even though, it may take many decades before a survey is “checked”. If formalised processes were developed by the professional survey bodies to record the performance of their members, LINZ could obtain further assurance that member LCS's are preparing compliant CSD's.

When LCS's submit a CSD they are:

- certifying that the quality of the CSD meets the requirements of the Act and Rules,
- affirming professional responsibilities under the Act,
- affirming licensing requirements.

Note: where the term CSD is referred to in this document it is taken to incorporate, where appropriate, the end-to-end survey process (including fieldwork).

## 2. Setting the Scene

LINZ accepts CSD's from LCS's in accordance with the Cadastral Survey Act 2002 (hereafter referred to as the Act) and the Surveyor-General's Rules for Cadastral Survey 2002/2. The surveyors are licensed by the Cadastral Survey Licensing Board (CSLB) and may be members of the New Zealand Institute of Surveyors (NZIS), the Institute of Cadastral Surveying (ICS) (or both) or not affiliated to any professional organisation representing cadastral surveyors.

One of the functions and duties of the Surveyor-General in terms of the Cadastral Survey Act 2002, is to “audit compliance by cadastral surveyors with the standards ...” s7(i)(j).

Regulatory Quality Assurance (Regulatory QA) is part of the LINZ Regulatory Group which provides assurance to the Surveyor-General, that surveyors and LINZ Customer Services have effective controls and processes in place to verify compliance with regulatory requirements (i.e. legislation, standards, rules).

Historically, auditing of surveys by LINZ and its predecessors has been limited to field audit (i.e. confirming the placement of pegs and survey marks) and extensive checks on CSD’s lodged with LINZ including some post-approval desktop (LINZ office) audits. Undertaking a field audit gives assurance only for the CSD audited and may not be indicative of the quality and the reliability of other CSD’s submitted to LINZ by an individual LCS.

During the first six months of 2006, Regulatory QA prepared a pilot Audit Programme that was developed with the agreement of the Surveyor-General, Consulting Surveyors of New Zealand (CSNZ - a group within the New Zealand Institute of Surveyors), Institute of Cadastral Surveyors and piloted survey firms.

In addition to field audit, the Quality Assurance (QA) processes and controls practised by survey firms were examined. The findings of the pilot programme were presented to LINZ, the CSNZ committee, and participating firms during August/September 2006.

It was concluded that the Pilot Audit approach provided:

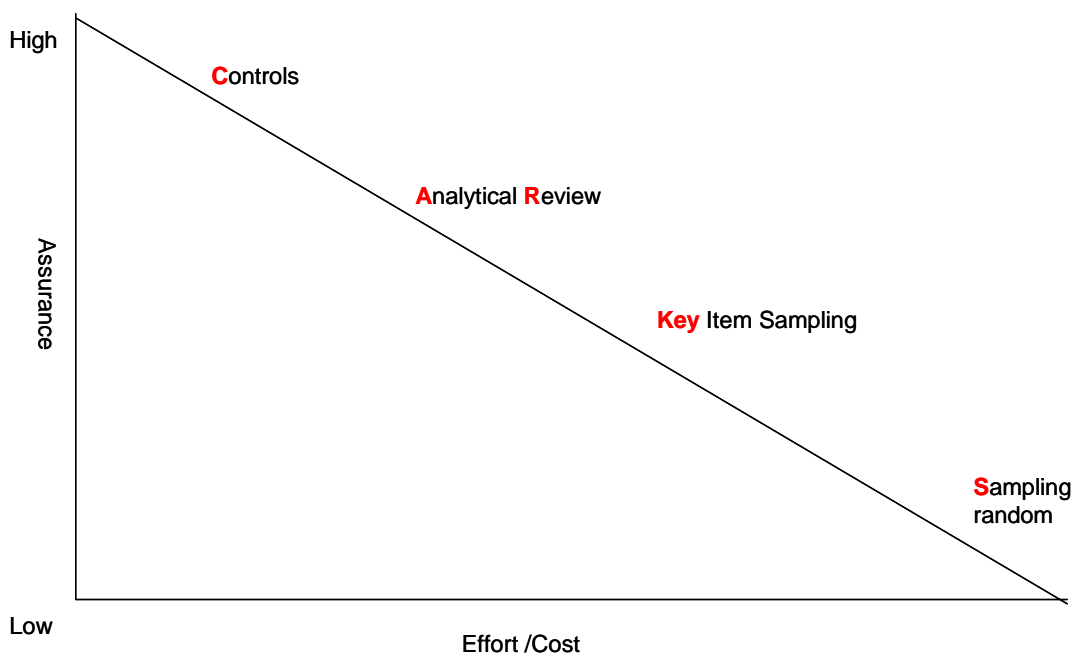
- an assessment of the survey firms current QA processes (Office and Field) in relation to the submission of CSD’s,
- process improvement suggestions which assist LCS’s to improve compliance,
- increased assurance to the Surveyor-General that CSD’s submitted by an LCS are likely to be compliant.

Feedback from the firms was positive as they were able to review their processes with the assistance of LINZ. This helped the LCS’s to better manage the risks associated with the preparation of CSD’s as well as other non cadastral surveying activities (e.g. engineering set-out and building monitoring).

The Cadastral Survey audit approach will continue to focus on survey firms’ QA systems and controls that are utilised in both the office and field.

### **3. Better Practice Auditing**

The diagram below, referred to as the “Car Keys” diagram, indicates that Random Field Audits (i.e. random sampling) have a higher effort/cost for a lower level of assurance than audits which focus on QA Controls. In other words, LINZ can be more efficient and effective if it looks at a firm’s overall QA systems and controls rather than performing field audits only.



Each year some 14,000 CSD's are processed by LINZ. The selection and undertaking of an adequate random sample for field audit requires a large number of qualified surveyor resources, time and cost to provide reasonable assurance to the Surveyor-General that those CSD's sampled were compliant. Any recommendations from the field audit can only be to fix errors made and request that they avoid these errors in the future. This is neither cost effective nor efficient in terms of providing the Surveyor-General with reasonable assurance that other fieldwork and CSD's are compliant or that future CSD's will be compliant.

By auditing and working with the firm to improve their QA processes and controls around preparing a compliant CSD, LINZ gains better assurance that all future CSD's will be compliant.

As stated previously, the profession has always been one that has the capability to self check over time. The basis of self checking is that surveyors utilise their own previous surveys and also that of other surveyors. This assists the identification of discrepancies. There is still a risk of errors in an underlying CSD being adopted and the perpetuation and propagation of the error in future surveys.

The principles of the pilot are now being implemented as an effective means to audit cadastral surveyors. These include the use of Field Audits and QA Process Audits to assess the Quality Assurance Processes adopted by the survey firm and LCS's.

The result of this better practice methodology for audits is that LINZ will obtain a higher level of assurance as to whether a LCS is complying with the Act and the Rules.

## 4. Key Risks

The following **key risks** to the cadastral survey system were identified by LINZ Regulatory Quality Assurance and Surveyor-General:

- pre-fieldwork processes are inadequate to maintain the integrity of the cadastre,
- fieldwork of a cadastral survey is deficient,
- the submitted Cadastral Survey Data set (CSD) contains substantive deficiencies

From a LCS perspective these key risks translate to:

- poor access to and processes to search CSD's may result in not all the relevant information being considered in the preparation of the survey,
- previous LCS's fieldwork is deficient to the point that it does not enable subsequent surveys to be completed efficiently,
- incomplete CSD's submitted to LINZ cause delays in obtaining approval or deposit which usually results in increased costs for the client,
- post approval correction from later identification of an error which costs the surveyor, adversely affects title-holders and risks loss of cadastral license.

## **5. The Need to Audit**

The Government requires assurance, via the Surveyor-General, that the cadastral survey system is meeting its objectives.

An audit of the quality of cadastral surveyor's work satisfies both:

- the LINZ perspective to ensure the cadastre is of high quality, and
- the Survey Profession maintains a professional status

The audit could be undertaken by Survey Professional Bodies though the Surveyor-General is required by law to audit cadastral surveyors.

There is no definition of audit stated in the Cadastral Survey Act 2002 though it is reasonable to interpret this audit as that commonly defined by the professional auditors. Simply stated, this is an evaluation of the systems and controls that the LCS has in place to ensure quality of cadastral surveys.

## **6. Base Level of Auditing**

To ensure fairness and equity for all LCS's it is appropriate to determine an average base level of auditing. This base level is such that a competent LCS can be audited with the following input by the LCS and LINZ. Input for the firm and the LCS includes time to:

- complete the pre-office visit questionnaire,
- participate in the office visit, and
- review the draft audit report.

LINZ input will be:

- preparation,
- analysis of CSD lodgement statistics,
- perform field audits,
- undertake the office visit,
- report preparation, and
- reporting back to the LCS and firm.

This base level auditing will normally give LINZ and the LCS a sufficient understanding of the controls and procedures used by the LCS to undertake surveys and prepare CSD's. LINZ auditors will then be able to form a professional opinion as to whether the Surveyor-General can have reasonable assurance that surveys undertaken by a LCS comply with the standards.

The LINZ audit team will comprise experienced LCS's and professional auditors.

## 7. Time table

### Until September 2007

This period will be a transition time where the primary focus will be on advising the survey profession of the changes to the audit process. The audits will be focused on Cadastral Surveys that may have issues.

### From September 2007

With the survey profession aware of the new auditing process, the full process can be implemented during this year and into the future.

## 8. Selection Process

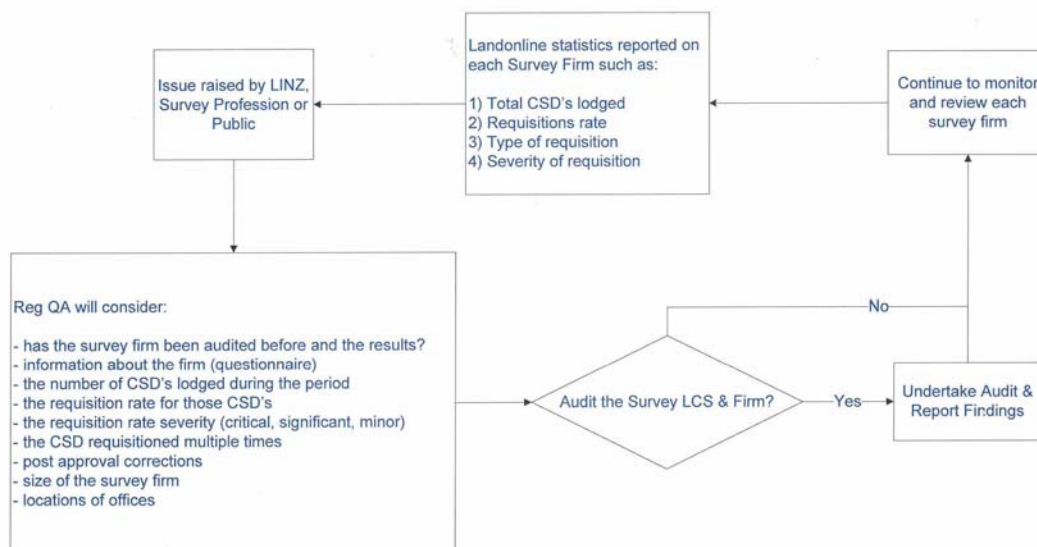
The selection of Cadastral Surveys for Audit can be initiated from two different scenarios referred to as Random Audits or Issue Based Audits.

**Random Audits** are part of the regular audit programme undertaken by Regulatory QA to provide assurance to the Surveyor-General. Cadastral Surveys for audit will be selected from any of the CSD's lodged with LINZ.

**Issue Based Audits** are selected from CSD's associated with:

- an issue raised during LINZ validation and approval,
- post-approval issues identified by the public or survey profession,
- LCS's or Survey Firms with higher than average requisition rates,
- An area of focus for the Surveyor-General.

The following diagram illustrates some of the matters which are considered in the Issue Based Audit process.



It should be noted that not all LCS's and firms would be covered each year by audit. Over a 3-5 year period it is anticipated that the audit coverage would encompass a thorough representative sample of CSD's lodged. It is expected that if an office of a firm with national operations is audited the audit report will be discussed and recommendations implemented nationally by that firm.

## **9. Audit Approach**

The audit findings are prepared based on information obtained from at least three separate sources. These sources are described in the following sections along with the findings methodology.

### **9.1. Field Audit**

Two CSD's will be selected for field audit from a list of CSD's submitted by the firm within the preceding 12 months. The field audits will be executed in accordance with the Cadastral Survey Audit Manual (SG Manual 1). They will include evaluating the field evidence, testing survey dimensions and testing the adequacy of location and connection to existing survey reference or boundary marks (i.e. the definition).

A future option being considered as an alternative to LINZ undertaking the field audits is for the Survey Firm to provide reports from their own field and office audit programme. These audits can be in the form of LCS's within a firm reviewing a selection of their staff or colleagues' surveys as part of training and quality assurance processes. For firms with multiple offices they can derive greater assurance and value if their audit programme utilises inter-office reviews. For smaller firms, they may choose to "buddy-up" with another small firm to provide the same peer review opportunities. For firms auditing surveys it is worth considering any potential conflicts of interest both between offices and between firms.

### **9.2. Historic Performance**

The Landonline processing records associated with the CSD's to be Field Audited will be reviewed to determine if any concerns had been raised during the validation, approval and integration process within LINZ.

An analysis of all the CSD's submitted to LINZ (in particular the last 12 months) by the LCS being audited, along with fellow LCS's in the firm, will be undertaken. It will compare the LCS's Requisition Rate against the national average and list the frequency of individual requisition codes. This analysis will be provided to the LCS and discussed as part of the office visit. As can be expected the higher the requisition rate, the lower the assurance level the Surveyor-General has in the LCS. A higher than normal requisition rate, however depending on the nature of the requisitions, can indicate a learning phase with a firm's transition to e-survey.

Items from previous office and field audits will be reviewed to confirm that previous observations and ideas have been considered and any agreed action items implemented.

The findings from these Historic Performance investigations will form part of the overall Office Audit results.

### **9.3. QA Process Audit**

The QA Process Audit, also referred to as the Office Audit, is an office visit to the LCS's firm to discuss and assess the processes and controls utilised to undertake cadastral surveys and prepare CSD's.

Prior to the office visit being conducted, a questionnaire will be sent to the office manager to gain an understanding of the size of the associated firm, staffing and quality control processes. This will assist Regulatory QA to plan the audit programme.

The QA Process Audit will be conducted by LINZ staff who may be supported by consultants. When using consultants LINZ will discuss with the firm the proposed consultants so any potential conflicts of interest can be identified and managed. It is expected

that the office visit will occupy one day. During that day the Audit team will require input, for different lengths of time, from the company director, the firms’ LCS’s, and ideally field staff connected with the surveys under review.

The office visit will include the following:

- review the processes, hopefully documented, of the survey firm which are used by the LCS in the execution of cadastral surveys and the submission of CSD’s to LINZ;
- identify controls used by the survey firm for the submission of CSD’s and determine if these controls are adequate to provide sufficient assurance to the Surveyor-General;
- assess any peer review processes; and
- sample files and determine if the controls identified have been performed correctly.

The review of the QA processes will enable the audit team to indicate to the Surveyor-General that Cadastral Surveys are undertaken and CSD’s are prepared in a consistent and compliant manner prior to lodgement with LINZ.

While survey firms will normally develop company QA processes, the ultimate responsibility for the accuracy of a cadastral survey and CSD lies with the surveyor who certifies the CSD.

Discussions will be held throughout the audit with the LCS’s as any issues or process improvement ideas are identified. These will also be summarised in a close out meeting where the findings and recommendations are discussed prior to the audit report being drafted.

## 10. Audit Conclusions

The LINZ results from the Field Audits when combined with the QA Process Audit will form the basis of an overall conclusion that will also take into account the audit team’s professional judgement. In reaching a conclusion, the audit team will consider options as summarised in the following matrix and subsequent discussions.

Scenario	Field Work	QA Processes	Assurance to SG
A	✓	✓	Reasonable
B	✗	✓	Uncertain
C	✓	✗	Uncertain
D	✗	✗	Unsatisfactory

✓ = pass or satisfactory      ✗ = not satisfactory

Only Scenario A provides LINZ with reasonable assurance, and is the scenario that ideally all LCS’s and firms will obtain. From our pilot sample it was noted that a majority of the firms obtained Scenario A.

### Scenario A

Occurs when the Field Audit determines that both CSD’s are compliant and the QA Processes are also determined to be suitable. The Regulatory QA Audit Team can report to the Surveyor-General with **reasonable assurance** that the audited LCS and firm are providing CSD’s to LINZ that are compliant with the standards.

### Scenario B

Occurs when the Field Audit determines that either (or both) of the CSD’s have deficiencies in terms of the standards or rules, though the QA Processes are determined to be suitable. At

this stage the Regulatory QA Audit Team would be **unable** to conclude that the LCS and firm audited is providing CSD's to LINZ that are compliant with the standards.

There are a number of options available to the Audit Team once they have reached this conclusion. They are discussed in section 11.

### **Scenario C**

Occurs when the Field Audit determines that both of the CSD's are compliant in terms of the standard but the QA Processes are not clear. At this stage the Regulatory QA Audit Team would be **unable** to conclude that the firms' LCS's will be able to provide future CSD's to LINZ that are compliant with the standards.

There are a number of options available to the Audit Team once they have reached this conclusion. They are discussed in section 11.

### **Scenario D**

Occurs when the Field Audit determines that either (or both) of the CSD's have deficiencies in terms of the standard and the QA Processes are not clear. The Regulatory QA Audit Team would be **unable** to conclude that the LCS audited has or can provide future CSD's to LINZ that are compliant with the standards. The Surveyor-General will determine whether the issues raised warrant presenting the information to the CSLB or undertaking further audit sampling (see section 11).

### **Reporting**

A draft report which identifies risks together with process improvement ideas will be sent to each LCS for comment prior to finalisation. Once the LCS comments have been received a final report will be issued to the Firm's Director/s and the Surveyor-General.

The Surveyor-General may decide to further investigate any observations from the report, and has a duty to advise the CSLB of any significant failure by an LCS to comply with the standards (Section 7(1)(c)). This is not restricted to failings discovered during an audit. The Surveyor-General makes the final decision on whether a particular error or deficiency constitutes a “significant failure” in terms of Section 7(1)(c).

[It is worth noting that where the CSLB receives such advice, the next license renewal for that LCS will not be automatic but will be carefully considered by the Board. The Board may seek advice from the surveyor that any issues have been addressed before renewing their licence. Refer to the CSLB Competencies and Standards section 3.2.2 last paragraph (<http://www.cslb.org.nz/Competence/Competence.htm>).]

## **11. Additional Auditing**

When LINZ cannot gain reasonable assurance (i.e. Scenario B, C or D - see Section 10) with the base level of auditing, then further sampling is required and can be in the form of:

- additional field audits
- follow-up audits to assess the implementation of agreed upon process improvement ideas,
- survey firm monitoring, including CSD submissions.

The decision as to which form the further sampling will take will be determined following consultation between Regulatory QA and the Office of the Surveyor-General. The decision will be communicated to the LCS and the associated firm, and could include the charging of audit fees.

To date LINZ has not utilised the option of charging for audits though the fees and charges regulations do provide for the ability to charge for auditing compliance with the Surveyor-General's Rules (see Cadastral Survey (Fees) Regulations 2003 – Schedule Fees – Part 2 – “Auditing Compliance With Standards”).

The findings from the additional auditing will be reported to the LCS in draft form for their comment prior to finalisation. The additional audit report will then be finalised and issued to the Firm's Director/s and the Surveyor-General.