



A Review of the Quality of Reinstatement in Queensland Survey Plans and Identification Plans

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Abstract/Summary

For a considerable period of time there have been concerns expressed that the integrity of the cadastre is being damaged by poor reinstatement, particularly in relation to identification survey plans. The purpose of this work was to provide a systematic examination of the quality of reinstatement being shown on cadastral survey plans lodged in Queensland that would confirm or refute the assertions being made.

Five cadastral surveyors were engaged to assess the reinstatement of a representative sample of lodged survey plans. Using criteria extracted from the critical cadastral standards, the study found that the difference between the survey plan rating and the identification plan rating was not significant for the majority of criteria. The findings of the study indicated that there is a non-trivial amount of poor surveys being performed but these occur through poor understanding of reinstatement rather than a simple case of non-compliance.

Given that the paper establishes that it is a knowledge rather than compliance problem, the paper canvases possible remedial actions that may be taken by the industry.

Introduction

For a considerable period of time there have been concerns expressed that the integrity of the cadastre is being damaged by poor reinstatement, particularly in relation to identification survey plans. The purpose of this work was to provide a systematic



examination of the quality of reinstatement being shown on cadastral survey plans lodged in Queensland that would confirm or refute the assertions being made.

Critical Reinstatement Standards

The regulation associated with cadastral survey standards is substantial and a comprehensive examination of all standards was considered beyond the financial and practical limitations of this project. Instead, six critical reinstatement standards were considered as indicators of the overall standard of the survey.

The *Surveying and Mapping Infrastructure Regulation 2004 (SMIR 2004)* addresses the principles that need to be applied to the carrying out of cadastral surveys and boundary reinstatement. Section 11 of that regulation requires surveyors to consider the rights of all parties to the reinstatement of a boundary.

11 Taking account of parties' rights and obligations

(1) A cadastral surveyor carrying out a cadastral survey must, in identifying or marking a boundary of land, take account of the rights and obligations of each party affected by the boundary.

(Survey and Mapping Infrastructure Regulation 2004 (Qld), s.11)

This requires that the survey to reinstate a boundary obtains cadastral evidence of sufficient reliability and extent to ensure that all neighbouring properties and the road do not have their rights and obligations limited. Of particular concern are the rights of properties that abut the rear of the subject land.

Section 11 continues by stressing the importance of adhering to the hierarchy of reinstatement evidence which is the set of rules recognised in the surveying profession for giving weight to evidence of cadastral boundaries (*Survey and Mapping Infrastructure Regulation 2004 (Qld), s.11 (3)*).

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(2) This may be achieved by, for example, ensuring each of the following—

- (a) cadastral boundaries are reinstated in accordance with the hierarchy of reinstatement evidence;

(Survey and Mapping Infrastructure Regulation 2004 (Qld), s.11)

The rules that make up the hierarchy have been distilled from court judgements to guide the surveyor as to how courts have interpreted the worth of cadastral evidence in the past and are likely to interpret it in the future.

Section 10 and 18 of the regulation emphasise the importance of considering and reporting evidence of occupation as part of a cadastral survey.

(2) A boundary of land is shown on the plan by recording—

- (a) each of the following things used as reference points for the survey—
 - (i) permanent improvements on the land;

(Survey and Mapping Infrastructure Regulation 2004 (Qld), s.10)

- (a) look for evidence of the boundary by finding out the positions and descriptions of existing survey marks and permanent improvements on the land that have been used to define the boundary;
- (g) find out and record the position of any permanent improvements on the land that affect, or are affected by, a reinstated boundary.

(Survey and Mapping Infrastructure Regulation 2004 (Qld), s.18 (2))

Lastly, as the Queensland cadastral system is an evidence based system, standards have been set that describe the quantity and quality of physical evidence that must be left behind at the conclusion of the survey. The most expedient measure of this requirement is given by s3.22.2 of the *Cadastral Survey Requirements (CSR)*.

A cadastral surveyor must place sufficient reference marks on a cadastral survey to facilitate future reinstatement of a cadastral survey.

(Cadastral Survey Requirements (Qld), S3.22.2)



The assessment criteria have been summarised in Table 1.

Table 1 Table of the considered critical reinstatement criteria

Standard	Aspect	Abbreviation
<i>SMIR 2004 s11 (1)</i>	Reinstatement Reliability	Reliability
	Reinstatement Extent	Extent
	Depth Proven	Depth
<i>SMIR 2004 s11 (2)</i>	Hierarchy of Evidence	Hierarchy
<i>SMIR 2004 s10 (2) & s18(2)(a) & (g)</i>	Description of Permanent Structures	Occupation
<i>Cadastral Requirements s3.22.2</i>	Presence of Reference marks	Ref Marks

Method

Selection of Plans

Two hundred cadastral plans were selected randomly from those lodged with the Department of Environment and Resource Management (DERM) over a six month period. The 200 plans consisted of 120 survey plans and 80 identification survey plans (being approximately 1.2% of annual lodgments for each category).

From each group of plans selected, those involving a subject lot which was created in the last five years were noted and recorded but took no further part in the project. From the balance of plans selected 60 survey plans and 40 identification survey plans were randomly selected for further assessment.

Assessment

Five survey firms from throughout the state were selected to each carry out an examination of 12 survey plans and 8 identification plans using the criteria extracted from the critical cadastral standards.



The assessors were provided with a complete cadastral search for each survey plan and they assessed the compliance of each plan on each of the critical cadastral standard on a scale of 1 –10. A score of one corresponded to no compliance and a score of 10 corresponded to complete compliance. Table 1 shows the source of the assessment criteria.

Results

One hundred plans were selected as described and distributed to the assessing surveyors. In one case a plan that had been lodged by one of the assessing surveyors was allocated to the same surveyor. It has been excluded from the sample. Similarly one plan was allotted to two surveyors and so one of those assessments has been deleted. The final sample size was 98 plans with 59 survey plans and 39 identification survey plans. In some cases the plans were for secondary interests for which there was no need to prove the lot's depth. There were 8 survey plans and 2 identification plans that were removed from the sample for the depth criterion.

Geographic Distribution

The plans were selected randomly and their distribution represents the level of surveying activity throughout the state. The majority of the surveys assessed were in the south east corner of the state but there were a non-trivial number of surveys from the non-metropolitan areas. Figure 1 shows the geographic distribution of assessed plans.

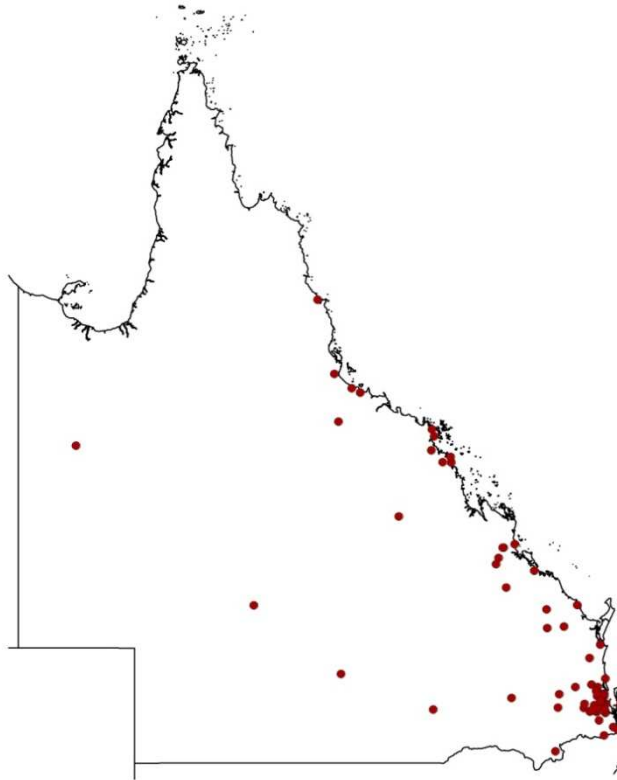


Figure 1 Plan showing the geographic distribution of assessed plans. Each red dot marks the locality of a plan that was assessed.

Inter-Assessor Evaluation

One of the fundamental difficulties in reinstatement is the application of professional judgment to the evidence that is presented. To investigate the inter-assessor variability, the means of the criterion ratings for each assessing surveyor were calculated and compared. Since the surveyors had an equal ratio of survey plans to identification survey plans it was assumed that the mean of their ratings for each criterion should be equal. Table 2 shows the result of that comparison. If the comparison of means between two surveyors showed a difference that was significant at a 95% for a using a two tailed t test the comparison square is marked with an asterisk.



Table 2 Table showing the inter-assessor variability. An asterisk indicates that the means for that criterion were different at a 95% confidence interval using a two tailed *t* test. The abbreviations in the column headings are R - Reliability, E - Extent, D - Depth, H - Hierarchy, O - Occupation, M - Ref Marks

	Surveyor 1					Surveyor 2					Surveyor 3					Surveyor 4							
	R	E	D	H	O	M	R	E	D	H	O	M	R	E	D	H	O	M	R	E	D	H	O
Surveyor 2			*	*	*	*																	
Surveyor 3	*	*	*									*	*										
Surveyor 4	*	*	*	*							*						*						
Surveyor 5	*	*	*	*	*		*	*	*	*	*	*				*	*						

It is clear from Table 2 that there is substantial inter-assessor variation. This indicates that the overall assessment result should be treated with caution.

Survey Type Evaluation

The ratings given for each criterion were allocated into two samples; survey plan and identification plan and the mean values and standard deviations were calculated. The results are tabulated in Table 3 and distributions of the ratings for each plan type are shown in Figure 2 and Figure 3.

Survey Plan Ratings

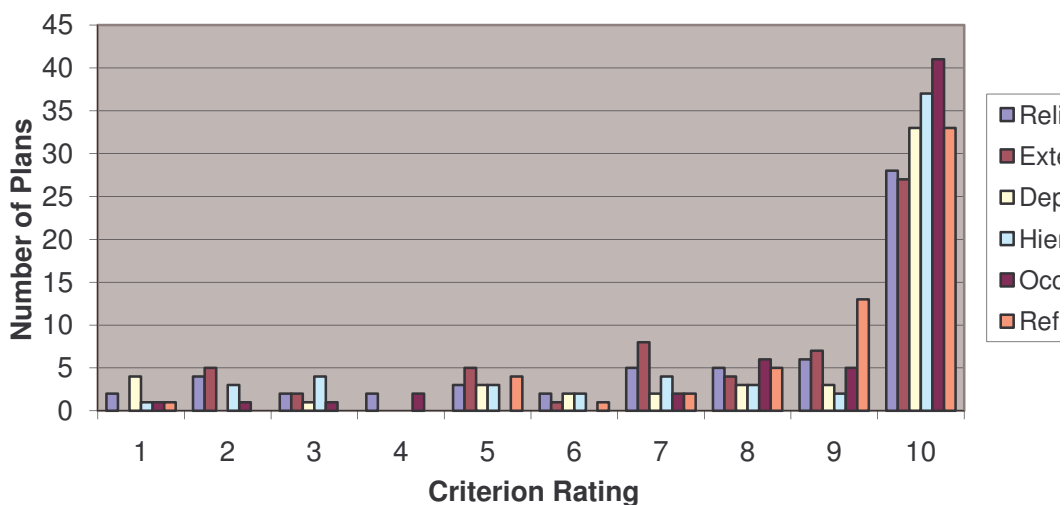




Figure 2 Histogram of the criterion ratings given to the survey plans.

Identification Plan Ratings

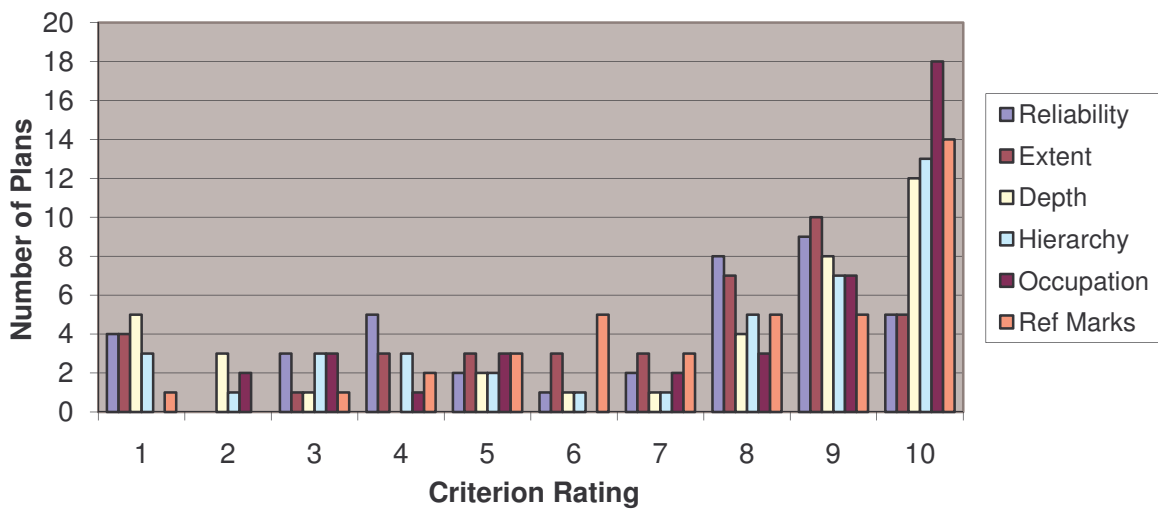


Figure 3 Histogram of the criterion ratings given to the identification plans.

Table 3 Table showing the means and standard deviations of the consolidated ratings for the survey and identification plans. * indicates that the result is significant at 95% using a two tailed t test.

Criterion	Survey Plan		Identification Plan	
	Mean	Std Dev	Mean	St Dev
Reinstatement Reliability	7.93*	2.63	6.62*	2.94
Reinstatement Extent	7.80	2.88	6.90	2.78
Depth Proven	8.24	2.76	7.23	3.10
Hierarchy of Evidence	8.41	2.77	7.05	3.43
Description of Permanent Structures	9.00	2.09	8.03	2.67
Presence of Reference Marks	8.95*	1.78	7.77*	2.38

It is clear that the survey plans scored better in all criteria but it is important to note that the differences are only significant for the reliability of the reinstatement and the number of reference marks.



Discussion

It would be expected that since the survey plans undergo a form of third party checking through the DERM registration process that they should rate better in all criteria. What is worthy of note is that difference between the survey plan rating and the identification plan rating is not significant for the majority of criteria. One interpretation of this would be that the variation of quality within a group is greater than the variation of quality between the groups. This interpretation is consistent with the findings of the inter-assessor evaluation that found considerable difference in the interpretation of what is an adequate level of compliance.

In both samples there are a significant amount of plans that have ratings of less than five on one or more criteria which would indicate that the reinstatement is of inadequate quality. To put the results into simple terms; surveyors that do adequate survey plans also do adequate identification plans and that surveyors that do inadequate identification plans also do inadequate survey plans. The combination of these conclusions would tend to indicate that there is a non-trivial amount of poor surveys being performed but these occur through poor understanding of reinstatement rather than a simple case of non-compliance.

Remedial Actions

The lack of a difference in reinstatement quality between registered and identification survey plans indicates that the industry is confronted with an education problem rather than an enforcement problem. To ensure the competency of cadastral surveyors is part of the Surveyors Board of Queensland's responsibility but the power to set and enforce standards for reinstatement and survey lies with DERM. This leaves the apparent deficiency in a regulatory gap. Leaving aside the discussion about who can and should do what, any remedial action needs to consider a number of factors.



It is clear that the reinstatement practice of the majority of cadastral surveyors was satisfactory. It would also be safe to assume that the risk that a registered plan may be audited by DERM means that surveyors would not lodge a plan that shows anything other than their best understanding of what is required for proper cadastral reinstatement. This would indicate that there is a subset of cadastral surveyors who are not aware of the deficiencies in their reinstatement practice. This phenomena is recognised in psychology as illusory superiority (Hoorens 1993). For example one study of university lectures found that 90% thought they were better than average teachers and 68% thought that they were in the top 25% of teachers (Cross 1977). Given that cadastral surveyors are prone to the same bias, how can the industry identify those surveyors who need the most help, as they are very unlikely to self nominate or attend professional development courses?

Because of the variety of cadastral reinstatement problems and the crowded curriculum, universities have always recognised that they have a limited opportunity to impart to students more than the theoretical basis of cadastral reinstatement. Often, by necessity, this is done when students have very little understanding of the cadastral surveying context. The industry is reliant on supervising surveyors for the bulk of practical training for graduates and overseas trained surveyors. If there is a subset of cadastral surveyors with a poor understanding of cadastral reinstatement, how do we stop poor reinstatement understanding being perpetuated onto the next generation of graduates?

What opportunities do graduate surveyors have to receive alternative perspectives on reinstatement beyond those of their immediate supervisors? The *Surveyors Act 2003* describes competency as qualifications, skills, knowledge and *experience* needed for registration as a surveyor (s39). The present competency framework primarily focuses on the first three elements. Would it be desirable to require applicants to undergo professional development that exposed them to perspectives from experienced cadastral surveyors other than their work supervisors? Could this be done while still retaining the



flexibility that is the prime advantage of the present competency assessment scheme?

Table 2 shows that there was considerable difference in the interpretation of what an adequate level of compliance was even between the assessors chosen for this study. Would a cadastral reinstatement standard more detailed than the *CSR* and *SMIR 2004* assist surveyors to understand the expectations of the industry and registering authorities? History has shown that standards can create adverse outcomes if they are made too prescriptive, but a standard that is broadly agreed by the industry would give more direction to surveyors working in isolation than the present regime. The development of the standard would give an opportunity to debate legitimate questions such as whether the value of the land or the age of the previous survey should be considerations in a cadastral survey.

Conclusion

This study found that the difference between the survey plan rating and the identification plan rating was not significant for the majority of reinstatement criteria but indicated that there is a non-trivial amount of poor surveys being performed. It suggested that these occur through poor understanding of reinstatement rather than a simple case of non-compliance.

The study has identified possible actions that might be taken to address the identified deficiency. In the short term, actions that increase the clarity of instruction to surveyors should be coupled with programs of remedial training to ensure that cadastral surveyors are capable of complying with the new instructions. Medium to long term strategies need to target the post graduate / pre registration training gap. However no preferred strategy has been put forward as there is no 'quick fix' to the problem, nor is there one that can be rectified by the universities, DERM or the Surveyors Board working in isolation.



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Legislation cited

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