Assessing Cadastral Surveying Competency

A report into the cadastral surveyor competency assessments imposed by each jurisdiction affiliated with the Council of Reciprocating Surveyors Boards of Australia and New Zealand

June 2017

Prepared by Bill Hirst
Disclaimer:

The findings and recommendations in this report are those of the author based on substantial research and discussions. While care has been taken to accurately reflect all views it is not possible to guarantee the validity of findings. No responsibility can be accepted for the consequence of any decisions made based on material in this report.

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1 Introduction

1.1 Background

As a consequence of both the Commonwealth Mutual Recognition Act (1992) and the Trans-Tasman Mutual Recognition Act (1997) a surveyor with the necessary qualifications to conduct cadastral surveys in any one Australian jurisdiction, or in New Zealand, must be accepted in any or all other jurisdictions. This concept of mutual recognition has been recognised by the cadastral surveying profession since the initial conference of Reciprocating Surveying Boards in 1892. The Council of Reciprocating Surveyors Boards of Australia and New Zealand (CRSBANZ) was established as a mechanism to ensure cadastral surveying qualification requirements in each jurisdiction remain acceptably consistent.

Through regular CRSBANZ meetings and consultations, academic and competency requirements have been kept broadly compatible however more rigorous reviews of the content of degrees and the process(es) required for cadastral registration were considered worthwhile.

1.2 Report objectives

In 2013 CRSBANZ released a report by John Fryer and Harvey Mitchell entitled ‘The Attributes of Surveying Degrees’. That report provided CRSBANZ with benchmark academic levels providing the Council with a basis to endorse university surveying courses.

The value of the university review highlighted the need for a further review, this time examining the different competency assessments enforced by the various boards prior to accepting graduates for registration. This report compares these different jurisdictional requirements to identify commonalities and highlight differences.

1.3 Terminology

Having attained a surveying degree, the graduate wishing to be registered, or licensed, to perform cadastral surveys must first complete a competency assessment administered by a jurisdiction’s Surveyors’ Board. A candidate who successfully passes their Board’s assessment is then entitled to apply for registration or license to conduct cadastral surveys. This is where terminology differs between jurisdictions.

For example, in NSW a successful candidate is awarded a ‘certificate of competency’ and can then apply for registration. In Victoria, having passed all requirements a candidate becomes a Licensed Surveyor and is placed on the register of licensed surveyors.

In Queensland, however the examination process is in two stages. Having passed the first stage, a surveying graduate may apply for registration as a surveyor and is then eligible to undertake further assessment for ‘cadastral endorsement/registration’.

For the purposes of this report the following terminology will be used:

**Certification Process:** In this report ‘certification process’ means the entire process a graduate surveyor must undertake to be qualified to complete or supervise cadastral surveys.

**Graduate Surveyor:** In this report refers to a person who has successfully completed a four year university degree course in Surveying or other degree acceptable to their Board. This includes overseas qualifications accepted by the Bureau of Assessment of Overseas Qualifications (under CRSBANZ).
Registered: In this report registered means the certification process has been passed and the successful candidate has been accepted for registration (or license) as a cadastral surveyor. This usually involves an annual registration fee and Continuing Professional Development (CPD). In Queensland, this would mean a registered surveyor with cadastral endorsement unless otherwise specified.

2 Why have Registration / Licensing (the Justifications)

The registration of surveyors and restricting cadastral surveying to only registered surveyors carries considerable overheads and limits competition. Nevertheless, the entire system is justified due to:

1. The Torrens system of guaranteed title (reducing government risk);
2. The obligation of surveyors to act in the interest of cadastral integrity as well as to their client (in this context they are sometimes referred to as ‘agents of the crown’). Put another way, when a surveyor defines a client’s boundary, by default, they also define the neighbour’s boundary;
3. Surveyor’s Acts in most jurisdictions give surveyors considerable powers of entry onto private land, and
4. Registration facilitates public confidence in the profession.

Boards have the power to investigate complaints against registered surveyors and impose restrictions, or even remove the surveyor’s registration, if misconduct or malpractice is proven. The integrity of the certification process should be aimed at ensuring the community is protected and the above justifications addressed.

2.1 What level of certification process is appropriate?

Consideration of the justifications for registration listed above, suggests that society benefits from a system which ensures that registered surveyors are competent, ethical and accountable. The mere fact that registration can be removed as a disciplinary action leads to a high level of accountability. However cadastral surveying can be complex requiring a high level of experience and knowledge to maintain cadastral integrity. Ensuring that graduates have relevant experience and relevant knowledge is therefore appropriate. It is also worth noting that investigating complaints against surveyors is stressful, time consuming and expensive.

Although all jurisdictions have much in common, such as the requirement of a 4 year degree and generally at least 2 years’ experience, the testing and examination practices vary significantly.

It is reasonable to assume that each jurisdiction has set their requirements based on the experience of board members, feedback from industry and the findings of investigations into complaints. Nevertheless, it could be argued that it is considerably easier to pass the certification process in some jurisdictions than others.

Some Australian jurisdictions have been concerned about falling numbers of registered surveyors as new registrant numbers seemed unlikely to equal those soon to retire. In consideration of this, some have questioned the difficulty of the certification process and whether this deters graduates from becoming registered or even deters students from a surveying degree. However, there is no evidence that making professional entry easier increases numbers. More importantly, to use the registration system to lift or reduce numbers would risk the entire system’s integrity and validity.

Seemingly in contradiction to this, Queensland has introduced a system designed to encourage graduates down the path of registration and then cadastral endorsement. In Queensland, to work
on a cadastral survey, even under supervision, requires initial basic registration. The names of these registered surveyors also appear on final plans they have worked on, together with the signature of the supervising surveyor. A stick and carrot approach. Although this system may be designed, at least in part, to increase the number of registered surveyors, it also tightens the supervision requirements potentially leading to improved cadastral integrity. This initial registration is not overly onerous for graduates. As such, it can be justified against the registration justifications listed above. It is also worth noting that the Queensland system of registration with cadastral endorsement is far from easy and so there certainly has been no reduction in standards to increase numbers.

The challenge for each board is to develop a certification process(s) which gives them confidence in the quality of their new professionals without it being overly onerous.

It is worth considering how comprehensive the certification process needs to be. Candidates should expect to be examined on all major competencies however that does not necessarily mean that every candidate must be tested on every competency.

### 3 Overview of requirements

All jurisdictions have requirements which must be met before a graduate surveyor is registered as a cadastral surveyor (the certification process). These requirements vary between jurisdictions but comprise a mixture of the following basic elements:

1. A surveying related degree of at least four years’ duration (this is common to all jurisdictions)
2. Professional training (experience) under the guidance of an experienced registered surveyor.
3. An examination in relevant laws and regulations
4. An examination on field procedures (only WA have formal practical examination.)
5. Projects submitted to the board or an examiner detailing the candidates work on:
   a. Rural cadastral survey
   b. Urban cadastral survey
   c. Strata and/or community title surveys
   d. Engineering surveys
   e. Town planning
6. Interview / oral examination

A summary of each jurisdictions requirements are summaries below:

#### 3.1 Australian Capital Territory

The ACT does not have a separate Board of Surveyors and relies upon a Memorandum of Understanding (MoU) with the NSW Board of Surveying and Spatial Information (BOSSI) and/or mutual recognition to provide registered surveyors in the Territory. Under the MoU the ACT provides an examiner when ACT candidates sit BOSSI exams. The ACT Surveyor-General has an observer role on BOSSI and efforts have been made to align legislation to the extent possible. The ACT has its own system for investigation of complaints against surveyors and disciplinary procedures.

As the ACT does not license surveyors this jurisdiction is not considered separately in this report.
3.2 New Zealand
The Cadastral Surveyors Licensing Board operates under the Cadastral Survey Act 2002. It has 6 members including the Surveyor General. Two other members must be allocated by the professional body (or bodies) representing the surveying profession and one member must be a person who has never been registered as a surveyor and is not employed in the surveying profession.

Before a graduate can sit the Professional Entrance Exams, they must have completed 24 months (4000 hours) experience working as a surveyor with at least 12 months of this being land title surveying.

The Professional Entrance Exams cover all discipline areas, are typically based upon presented projects, and require a professional interview. If a candidate is seeking a cadastral license then they must first have successfully completed the cadastral law examination. This examination is in two parts. The first is a research component with a case study assignment provided to candidates 10 days before the written exam. The written exam is 2 hours’ duration.

Candidates requiring a cadastral licence must also take the Professional Entrance Examinations in the following disciplines:

- Spatial Measurement, (no project, however oral examination of topics should be expected)
- Cadastral Surveying, (full projects required)
- Land Development Engineering, (no project, however oral examination of topics should be expected)
- Planning Design and Resource Management, (either an urban development and subdivision or a rezoning project required)
- Geodetic Surveying, (full project required)

For those seeking a cadastral license, projects are required in three disciplines (as detailed above). The cadastral project is to be a fully documented example of a large and/or complex cadastral survey they have completed. They are also required to provide a brief report on complex surveys on which they have worked. The planning design and resource management project can be selected from a number of options however typically involve application of town planning and design principles. The geodetic project can be a GNSS survey showing an understanding of GNSS application, adjustment, errors etc. Alternatively, the geodetic project may be an astronomical survey.

3.3 New South Wales
The NSW Surveying and Spatial Information Act 2002 authorises the Board of Surveying and Spatial Information (BOSSI) with members including the Surveyor General, industry association representatives (surveying, mining and spatial), and an education representative.

NSW have two slightly different accreditation processes. Each process requires at least two years’ (104 weeks) of formal experience. Most candidates opt to complete five projects and related oral exams. The town planning and engineering projects can be completed and submitted any time after 26 weeks of experience. Candidates require at least 52 weeks of cadastral experience before they can be assessed on the cadastral projects. The alternative method requires a more formal Professional Training Agreement (PTA) and submission of projects followed by a single interview. Why this PTA pathway is less common is unclear although it does require greater commitment from...
the supervising surveyor, discipline required to stick to the structured program and, being less common, lacks the clearer understanding of requirement and peer support of the project approach.

The more common project approach requires at least two years’ practical experience of which one year (52 weeks) must be specific NSW cadastral experience. A record of experience must be submitted to the board at least every 12 months or when the candidate changes employer.

Unless undertaking the formal PTA process, the candidate must prepare five projects being an example of each of the following:

1. Urban survey
2. Rural Survey
3. Strata title or community title
4. Engineering
5. Town Planning

The candidate presents each project to a panel of two or three examiners and will be questioned on the project or more broadly on the topic. Examiners may also inquire about the candidate’s knowledge on matters such as ethics, CPD, client and professional relationships.

Once all five projects have been passed the candidate will receive a Certificate of Competency and be eligible to apply for registration.

An interesting aspect of the NSW certification process is that there are a number of training workshops designed to assist candidates with their projects and interview preparation. BOSSI conduct an annual ‘Candidate Training Workshop’ designed to help candidates to understand the process of registration and project/examination requirements. The professional organisations (Institution of Surveyors NSW and Association of Consulting Surveyors NSW) also hold a number of workshops and training courses throughout the year to help candidates prepare for their examinations. All events are organised on a fee-paying basis. These events have proven very successful in increasing the number of candidate surveyors passing their registration examinations.

Tasmania has a similar system of workshops (see 3.7 below for details).

3.4 Northern Territory

The Surveyors Board of the Northern Territory is authorised by the NT Licensed Surveyors Act and comprises 5 members including the Surveyor General and 4 other registered surveyors appointed by the relevant minister. Of these 4, 2 are selected from 3 nominated by the Institution of Surveyors of the NT. (This is now sent to SSSI NT region – currently a legislation update is in progress and this will refer to SSSI NT Region)

The certification process in the NT requires a candidate to have completed a degree acceptable to the Board. They also need to have at least two years’ experience under the supervision of a registered (licensed) surveyor. At least 12 months (240 days) of this training must be cadastral with at least 6 months in the NT. The mix of urban and rural must be considered by the board to be acceptable and there is an expectation that the candidate will undertake at least 5 surveys in each arena.

The training must be under a formal agreement lodged with the Board. Progress reports, endorsed by the supervising surveyor, must be submitted to the board at least every 6 months. In these reports the supervising surveyor may sign off on various competencies which they believe the candidate has successfully demonstrated.
The supervising surveyor must have had at least two years’ experience as a registered (licensed) surveyor and cannot supervise more than 2 candidates at any one time.

During their training the candidates must have completed 5 urban and 5 rural surveys. Exemptions of up to 12 months are available for candidates who have trained in another jurisdiction within the past 2-3 years. Up to 6 months training under a licensed surveyor may be accepted while still a student.

Candidates must also submit practical projects to the Board during the period of training. These projects are on:

- Urban cadastral
- Rural cadastral
- Subdivision development
- Unit development
- Geodetic survey

Once the training and projects have been completed the candidate must sit an oral examination before the Board (or nominated member) on law relating to survey, survey practice generally and the practical projects submitted.

3.5 Queensland

Queensland has a unique system of registration whereby a graduate attains initial registration, and then is entitled to seek various endorsements, including a cadastral endorsement.

The Queensland Surveyors Act 2003 authorises the Surveyors Board of Queensland with 8 members, 6 of which must be surveyors, 4 of which must be cadastral surveyors with one of these an employee of the relevant government department. There is also a representative of surveying education.

Queensland has multiple levels of registration, Surveying Associate, Surveying Graduate, Registered Surveyor and Registered Surveyor with endorsement. A registered surveyor may seek the following endorsements:

- Cadastral
- Engineering
- Mining (3 endorsements (Open cut, Underground Coal, Underground Metalliferous))
- Consulting endorsement (for cadastral surveyors who operate a business or charge for services)

Registration as a surveying associate, surveying graduate or surveyor is required to work on cadastral surveys, even under supervision. Unlike most other jurisdictions, registration alone does not qualify the surveyor to authorise cadastral surveys. Only registered surveyors who have a cadastral endorsement have this authority. Where a registered person without cadastral endorsement works on a cadastral survey (under supervision), their name is included on the plan which is signed by a registered surveyor with cadastral endorsement.

Rather than a fixed period of professional training, surveying graduates are required to submit a Post-graduate Training Plan (PTP) after one years’ registration as a surveying graduate. This is to demonstrate how they intend to satisfy the surveyor competency framework. This requires the
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graduate to gain an understanding of what skills and competencies they must demonstrate and how this can be achieved. Assessment of competency is by the Board, not the supervising surveyor.

In the second year of registration the surveying graduate must start to provide evidence of the professional skills and competency they are developing in accordance with their PTP. Competency is demonstrated by the graduate progressively submitting Career Episode Reports (CERs) that demonstrate competency against the surveyor competency framework. Usually 4 CERs are completed but competency can be completed in one submission. The number of submissions is at the discretion of the surveying graduate. Alternatively, a graduate may demonstrate competency via an oral presentation with two board members. While no specific time requirement is placed on the demonstration of competency, there is a requirement that graduates progress to surveyor registration and continue to develop professional skills to retain graduate registration. A surveying graduate who does not progress to a registered surveyor may have their status with the Board downgraded to associate surveyor.

Under this plan, graduates need to demonstrate competency in the following areas:

1. Personal qualities
2. Collection of data and measurement
3. Development Surveys (basic set-out, topographic, volumes, workplace health and safety)
4. Process field measurements (errors, accuracy, combining data, plan preparation)
5. Communication
6. Survey control incorporating GNSS.

All CERs submitted by surveying graduates are assessed by the Board appointed Training Advocate and this achieves consistency of assessment.

While a candidate can achieve registration with a 3 year degree, a 4-year degree is required before seeking cadastral endorsement. Cadastral endorsement requires a Registered Surveyor to demonstrate competency against the cadastral competency framework which includes the following:

1. Relevant Laws
2. Plan, organise, direct and control people and resources
3. Search cadastral records
4. Search for physical evidence
5. Reinstate boundaries
6. Mark cadastral boundaries
7. Prepare plans
8. Prepare basic development applications
9. Prepare and manage basic State action applications (systems used to control tenure and land use)
10. Design lot layouts

These competencies (both for registration and cadastral endorsement) are demonstrated by the candidate submitting Career Episode Reports (CERs). CERs may be submitted progressively or all at one time. Alternatively, if the candidate has considerable experience, they may prove their competency via an oral presentation and interview.

Once the cadastral endorsement competencies have been accepted, the candidate may apply for a Professional Assessment Project (PAP). The PAP is a project the candidate is working on which
involves reasonable complexity. The PAP allows the two assessors to evaluate the candidate’s practical competency in the field while completing the survey work and in dealing with the client and related parties eg local councils and government departments.

Having successfully completed the PAP, the candidate attends an interview with 2 board members. The Board will review the PAP and the last 10 survey plans the candidate worked on (remembering names included on plans even though the supervised surveyors sign plans.) and ask questions about these plans.

A Registered Surveyor with Cadastral Endorsement wishing to charge for services will also require a Consulting Endorsement. This endorsement requires demonstrated competency in:

1. Professional Practice (highly professional, understand obligations, code of ethics, accept responsibility)
2. Business management and Quality Assurance
3. Communication

Consulting endorsement competencies are assessed by the Spatial Industry Business Association (SIBA).

3.6 South Australia

The South Australian Survey Act 1992 provides the Institution of Surveyors (SA Division) with the power to manage the registration and licensing of surveyors. This division has established the South Australian Board of Surveyors to perform this role on their behalf in accordance with the Act and regulations.

In South Australia, a graduate may become registered (non-cadastral) or licensed (cadastral). The process for registration and licensing are much the same however the candidate seeking a licence must enter into a training agreement and select cadastral survey as a major category. The category options are:

- Cadastral survey
- Engineering survey
- Geodetic survey
- Hydrographic survey
- Topographic survey
- Land Information
- Project Management
- Land Development

At least 2 years (400 days) experience is required with 200 days’ minimum experience in the major category (cadastral survey if seeking to become a licensed surveyor).

During the training agreement period, the supervising surveyor must submit 6 monthly reports (which includes commentary from the registered graduate) to the Board assessor who presents report to the Board for approval. Experience to be attained for cadastral competency is listed in the South Australian Institution of Surveyors Standard Operating Procedures and is divided into 4 main modules. These are:
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1. Generic Surveying and Communication Skills (basic skills and knowledge including code of conduct and ethics)
2. Survey Practice Management (general surveying procedure)
3. Cadastral Surveying (Urban, rural, strata, community title, Identification etc)
4. Engineering Surveying

Once the Board has accepted the final report from the supervising surveyor indicating the candidate has achieved the required experience the candidate may then begin a Professional Assessment Project. This project must be considered by the Board to be sufficiently complex and a Board member is allocated as an examiner. The examiner visits the work site and assesses the candidate’s work procedures as well as work submitted.

Once this project has been approved by the examiner, the candidate makes a presentation to the Board. The presentation may be on the project or any other survey related material. After the presentation, the whole Board may ask questions on legal and professional matters. Subject to satisfactory completion of these stages, the candidate is eligible for a cadastral licence.

3.7 Tasmania

The Surveying Regulations 2014 (TAS) authorises the Institute of Surveyors Tasmania (IST) as the Prescribed Institute responsible for accreditation of surveyors in Tasmania. IST has established the Tasmanian Land Surveyor Accreditation Board (TLSAB) to perform these duties.

A surveying graduate wishing to be registered in Tasmania to perform cadastral surveys must:

1. Have a relevant degree of at least 4 years’ duration. (In Tasmania it is 3 year undergrad plus 1 year grad dip in Land surveying which considered equivalent to the requirements of other jurisdictions).
2. Enter a Professional Training Agreement and have at least 2 years’ relevant experience. (at least 18 months’ cadastral experience, 12 of which must be after graduating and 6 months’ cadastral experience within Tasmania)
3. Submit 2 rural and 3 urban surveys as examples of their work done under supervision, to a mentor surveyor appointed by TLSAB.
4. Prepare a rural and urban project for examination purposes which must be entirely their own work.
5. Sit a Professional Practice Examination.

Having established a Professional Training Agreement (PTA), the candidate must submit Statements of Professional Development. These are normally required at 3, 6, 12 months and every 6 months thereafter. During this period of the PTA the candidates submit examples of the work done either by themselves or with limited supervision. Unless the candidate has been granted an exemption, these examples should include 2 rural and 3 urban surveys and include complexities such as natural boundaries and concealed boundaries. A mentor, appointed by TLSAB, will provide feedback on these work examples. These example surveys do not represent part of the formal assessment however must demonstrate adequate progress to have the PTA accepted.

A candidate must complete all PTA requirements, with the supervising surveyor confirming that requirements have been met, before sitting for the examinations. Nevertheless, candidates may begin work on their rural and urban projects before the PTA has been completed. The completed projects must be submitted with all field notes, computations, search etc. These are reviewed and must be passed by the examiners prior to being awarded a certificate of competency.
The final stage for the candidate is to sit a Professional Practice Exam. Candidates are asked a variety of questions and examiners have the discretion to ‘drill down’ if they are concerned about some aspect of knowledge. The results of this examination will not be provided until the candidate has passed the rural and urban project examinations.

Like NSW, Tasmania has a system of workshops to assist candidates prepare for examination. As explained by Frank Hoogesteger:

‘A non-compulsory (usually bi-annual) workshop is conducted by TLSAB and concentrates on cadastral reinstatement. Members of TLSAB and more broadly IST working with small groups of candidates present different cadastral problems and discuss solutions. The ¾ day event is generally very well attended, informative for candidates and provides excellent opportunity to build relationship across the profession. This is not an examination as such.’

The workshops also include ethics, professional responsibilities, community expectations etc which may be presented by non-surveyor guest speakers.

3.8 Victoria

The Surveyors Registration Board of Victoria (SRVB) is empowered by the Surveying Act 2004. Under the provisions of this Act, the Board comprises 8 members, one of whom is the Surveyor General (Chair). Other members include 2 licensed surveyors nominated by a professional association representing the majority of licensed surveyors [in the State]; a teacher of cadastral surveying at a tertiary institution; a licensed surveyor employed by the State government; an administrative lawyer; a member who represents the interest of the community; and a member representing the interests of property and development. Functions of the Board under the Act include the determination of practical training required to establish competence and to hold examinations [projects] to test competence of candidates for registration as licensed surveyors.

To become registered, a candidate must enter in a Professional Training Agreement (PTA) with a licensed (supervising) surveyor and the Board. PTA Guidelines require candidates to gain at least 240 days of cadastral surveying experience and at least 120 days of other surveying experience. During their training the candidates complete training modules on:

1. Generic Skills,
2. Boundary Definition Surveys,
3. Development Planning,
4. Engineering Surveying, and
5. Professional Practice Management

During the PTA and under the direction of their supervising surveyor, the candidate must submit 4 projects to the Board for examination as part of their competency assessment.

Projects in rural cadastral surveying, urban cadastral surveying and cadastral law examined by a licensed surveyor (mostly from the private sector) and then given to licensed surveyor members of the Board who moderate projects within their designated field (ie rural surveys, urban surveys or cadastral law). This ensures consistency between examiners.

The Cadastral Law Project is a research project dealing with actual and hypothetical land boundary and/or parcellation proposals designed to demonstrate a candidate’s complete knowledge of the application of cadastral surveying legislation and statutory provisions regarding the obligations of a licensed surveyor (SRVB Guidelines for Examinations and Projects). Candidates have 6 months to complete the project.
The fourth project is the Professional Assessment Project set to demonstrate the candidate’s understanding of the land development process and ability to meet the requirements of clients and stakeholders. This project is examined at the final oral examination.

The projects must be all the candidate’s own work, submitted with all background material and written explanatory reports and countersigned by the supervising surveyor as meeting the Board’s requirements.

The final interview examines matters of professional relationships and ethics; land development planning and matters highlighted within the candidate’s responses to projects.

3.9 Western Australia

The Land Surveyors’ Licensing Board of Western Australia is constituted under Section 4 of the Licensed Surveyors Act 1909. The Board consists of six members, the Surveyor General, one member nominated by the Chief Executive (Landgate), two nominated by the Institution of Surveyors WA, one nominated by the Minister, and one member of the teaching staff of the course of surveying nominated by the educational institution.

The certification process involves (succinct summary provided by G Holloway):

1. Two years training under a Professional Training Agreement

A Professional Training Agreement is for a minimum of two (2) years. The training shall include at least 460 working days (92 weeks) in total, at least 290 (58 weeks) working days on cadastral surveys including a minimum 115 working days (23 weeks) of urban surveys and a minimum of 60 working days (12 weeks) on rural surveys where 1 week is 5 working days not including public holidays and annual leave. Training must be completed before being eligible to sit practical exams.

2. Application of Survey Law (valid for 2 years)

A written exam held twice a year and must be passed to sit the practical exams.

3. Projects (valid for 4 years)

Projects can be submitted after half the training period has been completed and must be submitted to sit practical exams.

- Cadastral Survey in a rural area
- Cadastral Survey in an urban area
- Strata (Built) Survey
- Land Development and Management
- Mining Tenement Survey (Case study allowed)

The Board may grant an exemption to one or more projects in cases where the candidate can prove extensive experience or has completed a similar project successfully in another jurisdiction.

4. Practical Exams (valid for 4 years)

Practical exams can only be attempted after the training period has been completed, Application of Survey Law has been passed and all projects have been submitted.

- Field Practice (Survey and Levelling)
5. Professional Interview

An interview with the full Board is the final stage and provides the Board with an opportunity to assess the candidate’s knowledge, sense of responsibility and professional approach.

4 Subjects covered in Certification Process

It is difficult to be too specific about the topics covered during the certification process. In many jurisdictions, the questions asked are at the board or examiner’s discretion. This is not a random process as examiners naturally target areas where they have reason to believe the candidate may not be adequately informed.

4.1 Survey Measurement (GNSS, Errors, Adjustments, Calibration of instruments, etc)

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<tr>
<td>NSW</td>
<td>No specific exam however may be covered during interviews on related projects. Key issues, such as instrument calibration, identified on examiners check list.</td>
</tr>
<tr>
<td>NT</td>
<td>These are part of the topics that must be addressed and discussed in the project reports. In the NT, the cadastre is linked to the geodetic network therefore a report on a cadastral project includes GNSS observations, managing errors, adjustment of control and parcel data and calibration of equipment. These can all be raised in the final oral examination. These competencies may be signed off by supervising surveyor as part of the training reporting process.</td>
</tr>
<tr>
<td>QLD</td>
<td>Competency must be demonstrated via Career Episode Reports as part of initial registration (before seeking cadastral endorsement)</td>
</tr>
<tr>
<td>SA</td>
<td>Part of the training agreement requirements to be signed off by the supervising surveyor</td>
</tr>
<tr>
<td>TAS</td>
<td>It is generally assumed that the candidates have learnt adequate skills during their degree course however aspects of this topic may be questioned as part of the training agreement, projects or final exam. Measurement forms a specific requirement of the projects and students are required to include a small dissertation on measurement in the context of the urban project (Hoogesteger).</td>
</tr>
<tr>
<td>VIC</td>
<td>Candidates complete a generic skills module as part of their professional training.</td>
</tr>
<tr>
<td>WA</td>
<td>Field examinations are conducted to examine calibration of instruments and the survey and calculation of survey control.</td>
</tr>
</tbody>
</table>

4.2 Laws and Regulations

<table>
<thead>
<tr>
<th>NZ</th>
<th>Covered by an assignment (research component) with 10 days to complete followed by a written exam.</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSW</td>
<td>No specific exam however each aspect covered during interviews on related projects with examiner checklist to ensure major aspects covered.</td>
</tr>
<tr>
<td>NT</td>
<td>Covered as part of the projects and included in the final oral examination process.</td>
</tr>
<tr>
<td>QLD</td>
<td>No specific exam however candidates must demonstrate knowledge of relevant laws in their Career Episode Reports, Professional Assessment Project and in oral exam.</td>
</tr>
<tr>
<td>State</td>
<td>Description</td>
</tr>
<tr>
<td>-------</td>
<td>-------------</td>
</tr>
<tr>
<td>SA</td>
<td>No specific exam however candidates must have demonstrated an understanding of relevant law to the supervisor during training agreement. They must also prepare a Professional Assessment project and sit an oral examination which may cover various aspects of relevant law.</td>
</tr>
<tr>
<td>TAS</td>
<td>No specific exam however covered in urban and rural examination process plus the professional practice exam.</td>
</tr>
<tr>
<td>VIC</td>
<td>The candidate must complete a research project set by the Board that deals with hypothetical land development proposals designed to demonstrate a candidate’s complete knowledge of the application of cadastral surveying legislation and statutory provisions in regard to the obligations of a licensed surveyor including the ability to provide professional advice to a client. The candidate receives the project upon request to the Board and has six (6) months from the date of receipt to submit the completed project for examination. The project submission is in the form of a written report listing the options available and supported by relevant plans and diagrams.</td>
</tr>
<tr>
<td>WA</td>
<td>Covered by a 4-hour written examination (past papers are available).</td>
</tr>
</tbody>
</table>

### 4.3 Urban Surveying

<table>
<thead>
<tr>
<th>State</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NZ</td>
<td>Candidates submit a complex project (urban or rural) and sit an oral examination centred around this. They may also submit a report briefly detailing other complex surveys they have undertaken. However, this type of report is not mandatory.</td>
</tr>
<tr>
<td>NSW</td>
<td>Candidates sit an oral examination centred on (but not limited to) a submitted urban project which must involve defining a boundary by indirect methods. Examiners have a check list of topics to cover.</td>
</tr>
<tr>
<td>NT</td>
<td>At least 5 urban surveys must be completed while training and an urban survey submitted to the board.</td>
</tr>
<tr>
<td>QLD</td>
<td>Competency must be demonstrated by Career Episode Reports and may be covered in the Professional Assessment Project. The examiner may raise any concerns they have in oral interviews.</td>
</tr>
<tr>
<td>SA</td>
<td>Candidates must demonstrate competency during the training agreement and have their supervising surveyor sign off on this. They also complete a professional assessment project which may be either rural or urban, and then sit an oral exam.</td>
</tr>
<tr>
<td>TAS</td>
<td>Candidates must submit 3 urban surveys which they were involved with during their professional training. These are examined and comments provided however do not form part of the candidate’s assessment. After this they prepare a major urban project which is all their own work and which forms part of their assessment. They may also be questioned on urban principles during the oral (professional practice) exam.</td>
</tr>
<tr>
<td>VIC</td>
<td>Candidates must complete a boundary definition module and a fully documented cadastral survey in an urban area. The site of the survey is selected by the candidate but pre-approval must be obtained from the moderator of the urban cadastral project before the candidate can commence the survey that is to be submitted to the Board for examination. The project is designed to demonstrate the candidate’s understanding of traditional field traversing and checking techniques; collection of survey data; computation/re-establishment and final documentation.</td>
</tr>
<tr>
<td>WA</td>
<td>Candidates must complete an urban project as well as pass the cadastral law examination.</td>
</tr>
</tbody>
</table>

### 4.4 Strata Titles / Unit development / Community Titles

<table>
<thead>
<tr>
<th>State</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NZ</td>
<td>Candidates submit a complex project (urban or rural) and sit an oral examination centred around this. They also submit a report briefly detailing other complex surveys they have undertaken.</td>
</tr>
</tbody>
</table>
Assessing cadastral surveying competency

| NSW | Candidates sit an oral examination centred on (but not limited to) a submitted strata/unit survey or a community title survey. Examiners have a checklist of topics to cover. |
| NT | An example of a unit title survey undertaken by the candidate must be submitted to the Board. (The Board does accept theoretical based components to this project.) |
| QLD | Competency could be demonstrated by Career Episode Reports (CERs) and may be covered in the Professional Assessment Project. This topic is not specifically identified although may be required by CERs. |
| SA | Candidates must demonstrate competency in community and strata plans during training agreement and have this competency signed off by the supervising surveyor. |
| TAS | The urban major project may include strata elements and the candidates may be questioned on strata / unit titles at the oral Professional Practice Examination. |
| VIC | This topic is addressed as part of the Professional Assessment Project and the Cadastral Law Project. |
| WA | Candidates must complete a strata project as well as pass the cadastral law examination. |

### 4.5 Rural Surveys

| NZ | Candidates submit a complex project (urban or rural) and sit an oral examination centred around this. They also submit a report briefly detailing other complex surveys they have undertaken. |
| NSW | Candidates sit an oral examination centred on (but not limited to) a submitted rural project which must involves some complexity (such as a natural feature boundary). Examiners have a checklist of topics to cover. |
| NT | At least 5 rural surveys must be completed while training and a rural survey submitted to the Board. |
| QLD | Competency must be demonstrated by Career Episode Reports and may be covered in the Professional Assessment Project. Examiner concerns could be raised in oral interviews. |
| SA | Candidates must demonstrate competency during the training agreement and have their supervising surveyor sign off on this. They also complete a professional assessment project which may be either rural or urban, and then sit an oral exam. |
| TAS | Candidates must submit 2 rural surveys which they were involved with during their professional training. These are examined and comments provided however do not form part of the candidate’s assessment. After this they prepare a major rural project which is all their own work and which forms part of their assessment. They may also be questioned on rural principles during the oral exam. |
| VIC | Candidates must complete a boundary definition module and a fully documented cadastral survey in a rural environment. The site of the survey is selected by the candidate but pre-approval must be obtained from the moderator of the rural cadastral project before the candidate can commence the survey that is to be submitted to the Board for examination. The project is designed to demonstrate the candidate’s understanding of traditional field traversing and checking techniques; collection of survey data; computation/re-establishment and final documentation. |
| WA | Candidates must complete a rural project as well as pass the cadastral law examination. |

### 4.6 Land Development Process / Town Planning

| NZ | Candidates submit and are examined on one of the following types of project: urban extension, rural development, urban development and subdivision, urban design |
### Assessing cadastral surveying competency

<table>
<thead>
<tr>
<th>Location</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NSW</strong></td>
<td>Candidates must submit a town planning project and sit an oral examination covering aspects of planning legislation.</td>
</tr>
<tr>
<td><strong>NT</strong></td>
<td>An example of a subdivision development undertaken by the candidate must be submitted to the Board. (The Board does accept theoretical based components to this project.)</td>
</tr>
<tr>
<td><strong>QLD</strong></td>
<td>For cadastral endorsement, candidates must demonstrate competency in basic development applications, understanding of basic State action applications (systems used to control tenure and land use) and design lot layouts.</td>
</tr>
<tr>
<td><strong>SA</strong></td>
<td>Candidates are to demonstrate competency in Survey Practice Management which covers some aspects of this topic. The professional assessment project provides an opportunity to demonstrate these competencies.</td>
</tr>
<tr>
<td><strong>TAS</strong></td>
<td>Not specifically identified in the guidelines however may be considered in the major project evaluation.</td>
</tr>
<tr>
<td><strong>VIC</strong></td>
<td>Largely covered in the professional assessment project and the related oral examination.</td>
</tr>
<tr>
<td><strong>WA</strong></td>
<td>Candidates must complete a site planning and management project.</td>
</tr>
</tbody>
</table>

### 4.7 Geodetic surveying

<table>
<thead>
<tr>
<th>Location</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NZ</strong></td>
<td>Candidates submit and are examined on a geodetic project (GNSS or Astronomical)</td>
</tr>
<tr>
<td><strong>NSW</strong></td>
<td>Not specifically covered however may be covered in oral exams.</td>
</tr>
<tr>
<td><strong>NT</strong></td>
<td>An example of a geodetic survey undertaken by the candidate must be submitted to the Board.</td>
</tr>
<tr>
<td><strong>QLD</strong></td>
<td>Demonstration of survey control is required to be demonstrated by Career Episode Reports prior to initial registration.</td>
</tr>
<tr>
<td><strong>SA</strong></td>
<td>Not specifically covered.</td>
</tr>
<tr>
<td><strong>TAS</strong></td>
<td>All surveys to be connected to GDA94 coordinates in accordance with mandatory requirements of the Survey Directions.</td>
</tr>
<tr>
<td><strong>VIC</strong></td>
<td>May be part of the generic surveying module in the training agreement.</td>
</tr>
<tr>
<td><strong>WA</strong></td>
<td>Urban or rural survey project must be connected to GDA coordinates. Adjusted MGA coordinates must be provided for the control points surveyed in the survey control exam.</td>
</tr>
</tbody>
</table>

### 4.8 Engineering

<table>
<thead>
<tr>
<th>Location</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NZ</strong></td>
<td>Candidates submit and are examined on an engineering design and construction plan of a proposed urban street of not less than 200 m in length. This design should include all ancillary services such as drainage and sewerage.</td>
</tr>
<tr>
<td><strong>NSW</strong></td>
<td>Specific engineering road and drainage design project must be submitted and candidates sit an oral exam.</td>
</tr>
<tr>
<td><strong>NT</strong></td>
<td>No project is required.</td>
</tr>
<tr>
<td><strong>QLD</strong></td>
<td>Registered surveyors can seek an engineering endorsement with or without a cadastral endorsement. To gain this endorsement they must demonstrate competency against the engineering framework.</td>
</tr>
<tr>
<td><strong>SA</strong></td>
<td>Cadastral candidates are required to show competency in Engineering Surveying which includes topographic surveys, construction set out, quality assurance, and data management. This is a separate module under the training agreement requiring sign off by the supervising surveyor.</td>
</tr>
<tr>
<td><strong>TAS</strong></td>
<td>Not specifically examined.</td>
</tr>
<tr>
<td><strong>VIC</strong></td>
<td>Not specifically examined</td>
</tr>
</tbody>
</table>

---

20
4.9 Professional Practice / Ethics

<table>
<thead>
<tr>
<th>State</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>NZ</td>
<td>Will be covered during oral examinations.</td>
</tr>
<tr>
<td>NSW</td>
<td>May be covered during the five project-based oral examinations.</td>
</tr>
<tr>
<td>NT</td>
<td>The Board has recently asked a candidate to present on this topic at the final oral examination which includes survey practice. There is no formal examination of these topics, however the Survey Practice Directions and Licensed Surveyors Act are due for review and this would be a consideration for new Acts and regulations. Parts of this competency are signed off by supervising surveyor as part of the training reporting process.</td>
</tr>
<tr>
<td>QLD</td>
<td>Candidates must demonstrate personal qualities via Career Episode Reports for initial registration. Cadastral endorsed surveyors who wish to charge for their services require a consulting endorsement necessitating competency in professional practice, business management and quality assurance, and communication.</td>
</tr>
<tr>
<td>SA</td>
<td>Various aspects of professional practice such as ethics and communication must be demonstrated under the training agreement and signed off by the supervising surveyor.</td>
</tr>
<tr>
<td>TAS</td>
<td>Forms part of final oral exam. Training workshops can include professionals (not necessarily surveyors) to discuss ethics, professional responsibility etc.</td>
</tr>
<tr>
<td>VIC</td>
<td>Covered in the professional assessment project and oral examination.</td>
</tr>
<tr>
<td>WA</td>
<td>Covered in final interview.</td>
</tr>
</tbody>
</table>

5 Summary of the various aspects

5.1 Degree:
The Fryer, Mitchell report ‘The Attributes of Surveying Degrees’ has clarified the CRSBANZ expectations of a university degree requirements for a graduate to be eligible for progressing towards registration. Most jurisdictions have universities offering such courses and the University of Southern Queensland offers a suitable remote degree via on-line/correspondence.

5.2 Professional Training
All jurisdictions require graduates to undertake professional training under the supervision of an experienced registered surveyor. A training agreement with a registered supervising surveyor is necessary and must be approved by the Board. Most jurisdictions require regular progress reports (most commonly every 6 months). Some jurisdictions require supervising surveyors to have had at least 2 or 3 years of experience after registration and may be restricted to having no more than 2 candidates under their supervision at a time.

The roles and responsibilities of the supervising surveyor vary between jurisdictions. In some jurisdictions, such as South Australia and Northern Territory, the supervisor has a very significant role in reviewing and authorising competency. Other jurisdictions, such as New Zealand and Western Australia rely more on projects, interviews and examinations. New South
Wales most commonly relies upon projects and interviews with examiner checklists however also have an option for Professional Training Agreements where the supervising surveyor is more involved remains.

<table>
<thead>
<tr>
<th>Professional Training</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th></th>
<th>NZ</th>
<th>NT</th>
<th>NSW</th>
<th>QLD</th>
<th>SA</th>
<th>TAS</th>
<th>VIC</th>
<th>WA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Period (years)</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Cadastral period (months) / experience</td>
<td>≥ 12 Cadastral</td>
<td>≥ 5 surveys each</td>
<td>≥ 6 Urban</td>
<td>≥ 3 Rural</td>
<td>Based on reports</td>
<td>Every 6 months 12 Cadastral</td>
<td>≥ 18 12 as graduate 6 in Tas</td>
<td>≥ 18 mnth (6 mnth other)</td>
</tr>
<tr>
<td>Exemptions for experience elsewhere</td>
<td>Y</td>
<td>&lt; 12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Time counted as a student</td>
<td></td>
<td></td>
<td>N/A</td>
<td>&lt; 6 months</td>
<td></td>
<td>&lt; 6 months</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reports to the Board</td>
<td>Every 6 months</td>
<td>Every 12 mth</td>
<td>4 CERs²</td>
<td>Every 6 months</td>
<td>Every 6 months</td>
<td>Every 6 months</td>
<td>Every 6 months</td>
<td></td>
</tr>
</tbody>
</table>

1. Queensland requires graduates to submit a Post-graduate Training Plan (PTP) specifying when each competency level is planned to be attained. Expectations are that at least 2 years will be required to meet registration requirements.

2. Career Episode Reports demonstrate competencies learnt while training.

5.2.1 Training Conclusions:
It is clear from the above analysis that the following practice has been adopted by most, if not all, jurisdictions:

1. Two years training is accepted as a minimum.
2. How much of this 2-year period must be urban/rural cadastral experience varies however is normally not less than 12 months.
3. A formal training agreement authorised by an experienced supervising (registered) surveyor and lodged with the relevant board is required.
4. Most jurisdictions limit the number of candidates a supervising surveyor may be training at any one time. Some jurisdictions require a supervising surveyor to have had at least two years’ experience before being eligible to engage a candidate.
5. Regular reporting (usually every 6 months) detailing progress is also commonly required. These reports typically contain statements of competencies attained in both the candidates and the supervisor’s opinions.
6. Most boards consider applications for exemptions to the amount of training under special circumstances, such as extensive previous experience which may not have been under a formal agreement but can be authenticated.
5.3 Survey measurement
Except for Western Australia, no jurisdiction requires practical examination in this competency. The subject is most commonly part of the professional training agreements with supervising surveyors endorsing the competency and/or various issues covered in oral exams. In South Australia, the appointed examiner may visit the candidate in the field. Queensland requires demonstrated competency in adjustments, error propagation and GNSS control surveys for initial registration.

Most survey measurement skills should be adequately taught during the candidate’s university training. That said, boards may have legitimate concerns that emerging technologies such as the use of GNSS in cadastral surveying, warrant additional validation. The use of these technologies may be questioned in oral interviews.

5.3.1 Survey measurement conclusions
Most jurisdictions either assume candidates have adequate competencies in this area or raise concerns during interviews (possibly based on their project reports). Emerging technologies such as use of reflectorless EDM, laser scanning, GNSS, Unmanned Aerial Vehicles (UAVs), 3D technology, laser scanning etc. offer innovative survey opportunities and challenges.

It could be argued however that recent surveying graduates are the most likely to be well trained in the use of such technologies, or at least better trained than older currently registered surveyors. This does not mean that testing in this area is unnecessary, rather it suggests that clear guidelines, regulations and regular CPD training is where the emphasis should lie.

5.4 Laws and Regulation
Many laws and regulations vary between each jurisdiction, particularly in relation to land development and more recent land use concepts such as community title and unit developments.

Common law principles relating to boundary definition and the Torrens Title system are, of course, common to all.

New Zealand and Western Australia have specific written examinations on laws and regulations. Tasmania also has a general professional assessment examination which covers various aspects of law. Other jurisdictions rely upon projects, supervisor’s assessments and interviews. Some jurisdictions, such as NSW and NT, have examiners check lists to ensure that key legal aspects are covered during interviews. Victoria asks candidates to complete a research project dealing with a complex real and hypothetical cadastral law application and another related to land development processes.

This topic obviously overlays cadastral practice and those jurisdictions requiring a written examination also test the application of the laws and regulations through urban and/or rural projects.

5.5 Urban and Rural surveys
Testing candidate’s competency in urban and rural surveying is basically the same process although covering separate legal concepts and surveying techniques. Both examinations usually involve the submission of both a complex urban and rural project (a survey in which the candidate was involved, or may have had sole responsibility). These projects are examined by board members, or examiners appointed by the board, and the candidate may be questioned on various aspects during formal interviews.
Although many aspects of statute and common law may be relevant to both urban and rural surveys, most boards select topics to be tested under each heading. This avoids duplication and helps focus examiners on important competencies. A suggested list of topics which may be covered under each heading is provided in Appendix A.

5.5.1 Urban and Rural surveys conclusions
There is reasonable consistency between jurisdictions in that all require at least one example of a rural and urban survey be submitted to the board and additional questions may be asked during formal interviews. However, topics considered by examiners are not consistently documented making it difficult to determine what matters are covered in each jurisdiction.

5.6 Unit Title / Strata / Community Title Surveys
Not all jurisdictions single out unit, strata, and/or community title surveys for separate projects or examination. Those that don’t generally include those areas relevant to their jurisdiction within the urban survey examinations and/or as a required area in the training agreement. NSW, NT, and WA all require separate unit title or similar projects to be submitted while SA require competencies to be attained and agreed to by the supervising surveyor. Questions on legal aspects of these types of survey may be asked during interviews.

5.7 Land Development Process and Town Planning
Most jurisdictions require an understanding of the planning processes, legislation and basic planning principles. This competency is most commonly tested by the candidate submitting a project (commonly an urban survey or subdivision) which describes the entire approval processes. NSW has a separate town planning project and oral examination which cover legislation and town planning design concepts. This topic also provides an opportunity to test candidates on their knowledge of Geographic Information Systems and spatial information management, such as data licensing, creative commons, metadata, etc.

5.8 Geodetic Surveys
Only NZ and NT require separate control surveys to be submitted to the board although Qld require this topic to be covered via a Career Episode Report while training. Most other jurisdictions require surveys to be connected to the control network and may examine candidates on this process.

5.9 Engineering
This subject is treated very differently across the different jurisdictions. Part of this difference is due to definition of what is involved in engineering. In South Australia, there is a separate engineering module however subjects covered relate to measurement, quality control, topographic mapping etc. In NZ and NSW engineering refers more to sewerage drainage and road design. In NZ, there is a common expectation that subdivision design by a surveyor will include such detailed design. Many surveyors in NSW also perform these roles.

However, in other jurisdictions this subject is considered to be outside the scope of cadastral surveying. Queensland require candidates to be able to design lots that minimise the costs of sewer and storm-water services however they have a separate endorsement (similar to cadastral endorsement) for engineering.

5.9.1 Engineering conclusion
Expectations of a registered surveyor’s role in engineering design appears to vary between jurisdictions and even within jurisdictions. The Queensland model of testing cadastral surveyor’s
ability to ensure lot design is considers sewerage and drainage however separating detailed engineering design as a separate module (endorsement) may be workable compromise.

5.10 Professional Practice / Ethics
In most jurisdictions competency in professional practice is tested during a final interview. In Queensland, registered surveyors with cadastral endorsement wishing to charge for their services must also have consulting endorsement. This tests competency in professional practice, business management and quality assurance, and communication.

6 Overall conclusions and recommendations
The methods used to determine candidate’s competency vary between jurisdictions. This is problematic if the standard of qualified surveyors is inadequate in any jurisdiction or if the differences are leading to a lack of confidence in the mutual recognition system. There is however no strong evidence that this is the case.

The following are observations of the current processes:

1. The certification process is, by necessity, lengthy, complex and challenging. It is suggested that, where possible, any future amendments are integrated into existing processes, or added to the university course, as opposed to adding any significant additional requirements.

2. There seems to be merit in conducting workshops, such as those conducted annually in NSW, to assist candidates prepare for project work and interviews. NSW Surveyor General, Narelle Underwood, explains additional benefits of workshops as follows:
   Workshops also enable a closer relationship between candidate surveyors and a range of more experienced surveyors. There is opportunity for succession planning for these future registered surveyors to take up examination themselves in the future or other contributions to our small profession. Also, a lot of good feedback can be gained from face-to-face workshops with a number of candidate surveyors.

3. Documentation of the requirements for registration in some jurisdictions is inadequate, confusing, difficult to locate or overly complex. Most commonly each aspect of processes is provided in detail without an overall explanation of the entire process.

4. Several jurisdictions rely more heavily upon the supervising surveyor’s validation of candidate’s competency. This could result in real or perceived inequality in acceptable standards of competency.

5. Emerging technologies such as the use of reflectorless EDM, GNSS and UAVs need to be considered however CRSBANZ should be encouraging universities to adequately train graduates in these areas. It is also noted that the entire profession may benefit from instructions, guidelines and possibly, regulations on the use of such technologies. Candidates may still be questioned on the application of such technologies in cadastral surveying.
6.1  Suggested certification process
Greater consistency in the certification process will ensure that the competency of registered surveyors is more consistent and add to continuing confidence in mutual recognition. It would also make it far easier for candidates to change jurisdiction during their training.

To achieve this, it is suggested that an ‘ideal’ model be developed which is acceptable to all jurisdictions. This is not to suggest that all jurisdictions abandon current practices and adopt this suggested model. Rather, if changes are proposed, this model be considered so that jurisdictions begin to converge.

The following is suggested as a possible model and basis for further CRSBANZ consideration and debate. This model recognises that all current systems have been developed over many years by numerous highly qualified professional surveyors. Therefore, this initial model is based on a combination of features of each system. This approach also minimises the changes required by each jurisdiction to develop (or work towards) a national system.

6.1.1  Minimum requirements:
1. Two years minimum experience. This should include formal competency frameworks or a training agreement. This agreement should detail what experience (competencies) the candidate is expected to attain and be subject to regular (6 monthly) reporting. The competencies are important and should include surveying techniques as well as experience across all areas which will be subject to projects and interviews as detailed below and in Appendix A.
2. Competency in the following subjects needs to be demonstrated:
   a. Urban survey (including submitting a complex project previously approved by examiner). Candidates should expect that they may be questioned about any of the issues identified at Appendix A.
   b. Rural survey (including submitting a complex project previously approved by examiner). Candidates should expect that they may be questioned about any of the issues identified at Appendix A.
   c. Subdivision design demonstrating knowledge of planning approvals, environmental and basic sewerage and drainage considerations. Include basic Geographic Information System knowledge including data licensing and metadata.
   d. Unit, strata or community title survey (complex area previously approved by examiner). Candidates should expect that they may be questioned about any of the issues identified at Appendix A.
   e. Professional obligations including ethics. (This could be combined with above interviews).

To test candidates on these competencies it is suggested that examiners are appointed by the Board rather than relying solely upon the supervising surveyor’s opinion. Candidates should prepare practical projects which will be the focus of an interview which should also test their broader knowledge of the subject. It has been suggested that the candidate should present at least one of these projects, preferably a cadastral project, as though presenting to a client. Separate interviews would preferably be conducted on each subject although combining some may be acceptable. Interviews should be conducted by at least two examiners, preferably with checklists of topics to cover. A final interview with a presentation has also been suggested, particularly when interview topics are combined or less interviews conducted. The final interview may involve the candidate...
presenting on a broad survey related topic followed by questions on such things as current issues facing the profession, ethics, cadastral law etc.

6.1.2 Suggested additional requirements
Examination on relevant laws and regulations with emphasis on statute law rather than common law which will be tested during cadastral projects/interviews above. An examination may not be necessary although if candidates are encouraged to sit exams early in their training they may find such knowledge assists them in training and with projects.

6.1.3 Suggested optional professional endorsements
Candidates may elect to do additional training to prove their competency in any, or all, of the following fields. It is suggested that these topics be optional with successful candidates being awarded endorsements to complement their registration.

a. Engineering related to subdivision design (sewerage, drainage, road design)
b. Detailed consultancy practice in cadastral surveying
c. Mining
d. Spatial
e. Hydrographic

The first two are directly related to cadastral surveying and may be administered by the Board although it is noted that consultancy practice is administered by the Spatial Industry Business Association (SIBA) in Queensland. Depending upon the jurisdiction’s legislation, the Board may also administer mining surveying qualifications. Spatial endorsement may be more appropriately administered by the Surveying and Spatial Sciences Institute (SSSI). Hydrographic surveying would presumably be administered by the national Hydrographic Office.

Graduate surveyors may elect to do any of the final three with or without cadastral endorsement. Terminology would need to be agreed nationally.

7 Application for Registration under Mutual Recognition
When a surveyor registered in any Australian jurisdiction, or in New Zealand, applies for registration in another jurisdiction, this registration is usually granted subject to few or no conditions. This is consistent with the Mutual Recognition Act and the Trans-Tasman Mutual Recognition Act. However, these Acts appear to allow conditions to be applied to the extent that they ensure equivalency. CRSBANZ may wish to seek legal advice on how this applies in practice however the following conditions are recommended in permissible by law:

- The applicant may be required to attend an interview with the Board or with the relevant office involved in survey plan examination to ensure that they understand local requirements;
- The applicant may be advised that their survey plans will be subject to careful examination for a reasonable time or say for the first 5 plans lodged; and/or
- It may be acceptable to require the applicant to complete an examination on the jurisdiction’s laws and regulations. This could be a relatively simple open book or even online test which ensures the applicant is aware of relevant provisions and where to find them.
8 Restoration of Registration

Circumstances involving a previously registered surveyor seeking to restore their registration vary. The major considerations include the time since the registration was cancelled, the circumstances of the cancellation, the length of time since being actively engaged in cadastral surveying and/or involvement in regular Continuing Professional Development (CPD). As applications for restoration of registration are not common, most jurisdictions treat such applications on a case by case basis. Victoria however has clear procedures including options for a Board to consider prior to approving restoration. The Victorian model is provided in Appendix B.
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Ron Jarman            Deputy Surveyor General of the ACT
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Craig Sandy           Surveyor General, NT
Michael Spiteri       Registrar, NSW Board of Surveying and Spatial Information
Haydn Smith           Chief Executive, New Zealand Institute of Surveyors
John Tullock          Surveyor General, Victoria
Narelle Underwood     Surveyor General, NSW
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APPENDIX A

List of potential topics to be covered in cadastral examinations

Although many aspects of statute and common law are relevant to both urban, strata and rural surveys, grouping elements to be tested under separate headings helps avoid duplication and allows examiners to focus on important competencies.

The following lists indicative only and should be added to/amended over time. Some topics may be more relevant than others in different jurisdictions.

The topics listed below are grouped under headings which are commonly examined separately. Many topics may be more appropriately listed in different groups and this may depend upon circumstances in different jurisdictions.

The expectation for candidates is that these topics may be examined however it may be impractical and unnecessary to examine all candidates on all topics.

Legal examinations (where applicable)

Written examinations in applicable laws and regulations are used in some jurisdictions. It is suggested that this could be focussed on those laws and regulations specific to that jurisdiction. If this were the case, consideration could be given to requiring surveyors applying for registration under mutual recognition to sit these examinations.

Urban Projects/Interviews

It is suggested that urban survey projects and/or interviews include the following topics:

- Relevant legislation and regulations (including survey practice regulations/directions)
- Re-establishing existing boundaries (hierarchy of evidence)
- Understanding of how to recover past search information
- Different types of roads and their significance
- Adverse possession / Possessory Title
- Obscured or hidden boundaries
- Easements
- Leases
- Identification surveys
- Party walls
- Encroachments
- Potential and limitations of different measurement techniques including GNSS (and potentially other technologies such as 3D data, etc) in urban surveys
- Mark placement requirements
- Plan preparation
- Urban planning guidelines / restrictions (this may be covered in land development if separately examined)
The expectation for candidates is that these topics may be examined however it may be impractical and unnecessary to examine all candidates on all topics.

**Rural Projects / Interviews**

It is suggested that rural survey projects and/or interviews include the following topics:

- Relevant legislation and regulations (including survey practice regulations/directions)
- Re-establishing existing boundaries (hierarchy of evidence)
- Natural boundaries and the doctrine of accretion / erosion
- Defining legal tidal levels
- Surveying of long and non-straight boundaries
- Defining river banks
- Native Title implications
- Use of various surveying techniques including GNSS for rural surveys and network adjustment.
- Mark placement and connection to geodetic network.

**Units / Strata / Community Titles**

It is suggested that unit / strata / community title projects and/or interviews include the following topics:

- Block requirements necessary before unit/strata development
- Unit area determination requirements
- Unit entitlement (and community entitlements and the role of valuers)
- Unit subsidiaries / common property
- Understanding of addressing guidelines as they apply to units and community titles.
- Strata measurements and stage of building (structure) required.
APPENDIX B

Surveyors Registration Board of Victoria Criteria for Restoration of Registration

There are two options available for restoration of name to the Register of Licensed Surveyors should the situation arise where a former licensed surveyor wishes to return to the Register and take up a practising or non-practising registration.

Option A:
If the application for restoration is submitted within two years from the date of removal of the licensed surveyor’s name from the Register, section 12 of the Surveying Act 2004 provides for the licensed surveyor’s name to be restored to the Register subject to:

• the former licensed surveyor undertaking any further examination, practical training or course of study required by the Board; and
• payment of the prescribed fee.

Option B:
If the application for restoration is submitted outside the two year timeframe, former licensed surveyors wishing to regain registration may be required to make application for registration in accordance with section 4 of the Surveying Act 2004. This is effectively a new application for registration.

Applications for restoration are considered on a case-by-case basis and the Board has discretion in determining the requirements (if any) that have to be met in order for a former licensed surveyor to be restored to the Register.

Requirements for Restoration:

Licensed surveyors applying for restoration in the ‘practising’ category will be required to demonstrate their level of competency at the time of making application. The Board may request that any number of requirements be satisfied before restoring a former licensed surveyor to the Register. While the list below is not meant to be exhaustive, the Board’s requirements may include the following:

• interview before the Board (in a format similar to the Professional Practice Interview)
• checking of plans and work by another licensed surveyor for a set period of time
• some form of updated study and/or training
• providing plans, sample plans, documents and details of surveys to the Board for preliminary assessment
• any combination of the above which the Board may consider to be appropriate under the circumstances.

The requirements listed above are usually waived for licensed surveyors applying for restoration in the ‘non-practising’ category.