CADASTRAL SURVEYORS LICENSING BOARD OF NEW ZEALAND

Standards for Licensing Cadastral Surveyors

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1 Licence to Practice

Standards set by the Cadastral Surveyors Licensing Board of New Zealand, acting under authority granted by the Cadastral Survey Act 2002, define the level of competence required by cadastral surveyors to obtain or renew a licence to conduct cadastral surveys.

Before determining those standards, the Board established the competencies required to hold a licence to carry out cadastral surveys. All standards relate to the competencies required. The Board requires cadastral surveyors be competent in

- survey measurement;
- land tenure systems and boundary definition;
- land settlement; and
- information systems

in order to be able to apply rules set by the Surveyor General, and to implement properly the legislative requirements for the subdivision of land to the extent they are relevant to cadastral surveying. This in turn requires competence in the

- land planning process; and
- land development engineering principles.

Standards which flow from the competencies will be reviewed from time to time and, when required, updated.

Licensed cadastral surveyors are authorised under the Cadastral Survey Act 2002 to undertake cadastral surveys and prepare survey datasets to enable the creation and transfer of interests in land. The standards are set to uphold sound boundary definition and the determination and description of the spatial extent of interests in land under all tenure systems. They aim to ensure that cadastral surveys conform to all legislative requirements relevant to land subdivision and cadastral surveying, and the creation and transfer of interests.

The competencies established and consequentially the standards set aim to ensure the accuracy of the cadastre, and the information and survey databases that support the cadastre and other administrative uses of those databases, and to maintain public confidence in the cadastre.

The licensed cadastral surveyor shall act in the interests of Crown with respect to its responsibilities for the operation of tenure systems, and to balance the interests of the current and future owners of the land and adjacent landowners and any other affected parties in relation to boundary definition and defining and describing interests in land.

2 Competencies

To gain a licence to practice cadastral surveying candidates must show competence in the following aspects of surveying, to the extent they are relevant to carrying out cadastral surveys.

2.1 Survey Measurement

Objective statement

The foundation for competency in survey measurement is a sound knowledge of, and the ability to apply, all the principles of plane and geodetic surveying appropriate to cadastral surveying. Competency requires understanding the various survey disciplines for measuring and collecting spatial data and applying the primary methods of spatial data capture by terrestrial survey methods, Global Positioning Systems (GPS), remote sensing, photogrammetry and image interpretation. An ability in mathematics, computing and analysis to identify and solve practical survey problems, adjust survey networks, eliminate material observational errors, and achieve the required measurement accuracies that will support the application of these survey principles and disciplines is required. Competency in survey measurement also requires understanding the proper use, care and calibration of surveying instruments and the application of appropriate instruments and techniques to different surveying situations.

Competencies

The competencies required in survey measurement are:

2.1.1. An understanding of the principles of plane surveying, geodetic surveying, remote sensing, and photogrammetry.

2.1.2. An ability to:

- apply suitable measuring methods and techniques,
- eliminate material measurement errors, and
- correct and adjust measurements.

2.1.3. An ability to apply statistical and mathematical analysis and adjustments to:

- geodetic and plane survey networks,
- map projections, and
- GPS observations.

2.1.4. An ability to undertake coordinate transformations and relate measurements to the geodetic reference systems and datums.

2.1.5. An ability to interpret and determine topographic and hydrographic features relevant to the definition or location of boundaries.

2.1.6. An ability to use and calibrate survey equipment correctly.

2.1.7. An ability to record and document measurements and other survey observations accurately.

2.2 Land Tenure Systems

Objective statement

Land tenure describes the kind of right or title by which land is held and land tenure systems provide for the creation or transfer of interests in land.

Competency in land tenure requires understanding the law and administrative systems relating to lands held under Land Transfer, Crown, Maori, Unit Titles, Marine, Mining, and Deeds legislation and the related record systems and survey and tenure information that is processed in those systems. It also requires knowledge of other legislation (Conservation Act 1987, Crown Minerals Act 1991, Land Act 1948, Local Government Act 2002 Public Works Act 1981, Resource Management Act 1991, Reserves Act 1977, Te Ture Whenua Maori Act 1993), and subordinate legislation that has implications for land subdivision and cadastral surveying.

Competencies

The competencies required in land tenure are:

2.2.1. An understanding of the origins of the control of land subdivision, principles and administrative practices of land registration, land tenure and the operation of the different land tenure systems in New Zealand.

2.2.2. An understanding of the different types of surveys and their purpose in relation to land tenure and the subdivision of land.

2.2.3. An understanding of the concepts of indefeasibility of title, real property rights, and legislation affecting interests and rights in land.

2.2.4. An understanding of central and local government legislation processes that affect land tenure.

2.2.5. An understanding of the implications of the Local Government Act 2002, Parts II, VII, VIII, IX and XI of the Public Works Act 1981 to land use and subdivision, and cadastral surveying.

2.2.6. An understanding of the Crown's responsibility for the operation of tenure systems.

2.2.7. An ability to determine the status of land and associated interests and rights.

2.3 Land Boundary Definition

Objective statement

Accurate land boundary location and correct definition is fundamental to cadastral surveying and requires a sound knowledge of, and ability to apply correctly, the hierarchy of evidence applicable to the definition of cadastral boundaries. It requires the ability to resolve discrepancies and gaps in this evidence. Knowledge of topographic, marine and hydrographic surveying is required to relate water, marine and other natural features to boundaries and interests in land.

Competencies

The competencies required in boundary definition are:

2.3.1. An understanding of the principles of boundary definition.

2.3.2. An ability to interpret and add information to cadastral records correctly.

2.3.3. An ability to apply the Surveyor General's Rules for Cadastral Surveying

2.3.4. An ability to resolve anomalies in the cadastre.

2.3.5. An ability to interpret and apply all Acts, Regulations, Rules, and case law relating to cadastral boundaries.

2.3.6. An ability to locate old boundaries, interests, property rights, covenants and limitations on public, private and Maori land, including relevant physical, historical and legal evidence.

2.3.7. An ability to determine the position of new boundaries, including natural and obstructed boundaries, with respect to existing boundaries, interests and property rights.

2.3.8. An ability to determine the position of boundaries, interests and rights with reference to the vertical datum.

2.3.9. An ability to describe and determine boundaries of interests and property rights for marine licenses and other interests in the seabed.

2.3.10. An ability to describe and determine boundaries and interests of mineral rights.

2.3.11. An ability to interrogate and interpret survey, title and land information records and databases.

2.3.12. An ability to interpret digital cadastral survey datasets and reports from the digital cadastre.

2.3.13. An ability to balance the interests of all current and future affected parties in relation to boundary definition and defining and describing interests in land.

2.4 Information Systems

Objective statement

Information technology and spatial information systems facilitate recording, interrogating and enhancing cadastral survey datasets. Competency in information systems requires understanding the application of survey information technology to cadastral surveying and subdivision of land. Competency also requires the ability to use relevant information and to enhance information systems with new and accurate datasets.

Competencies

The competencies required in information systems are:

2.4.1. An understanding of survey information technology, survey data sources and systems, and their analysis and interrogation, relevant to cadastral surveying and subdivision of land.

2.4.2. An understanding of the basic principles, concepts and methods, for using digital spatial and attribute data for visual presentation.

2.4.3. An understanding of the basic principles of geographic information systems management and operations, their development process, and the application of these concepts to intelligent spatial information systems.

2.4.4. An ability to access and retrieve information from data sources and systems and to enhance them by presenting new and accurate datasets.

2.4.5. An ability to merge and transfer digital spatial and attribute data into and between other formats or systems

2.5 Legislative Requirements for the Subdivision of Land

Planning Process

Objective Statement

An integral component of land subdivision is the requirement to obtain consents under the Resource Management Act 1991. Part X of the Act in particular deals with subdivision. The processes for implementing subdivisional consents also require knowledge of other parts of the Act that relate to the overall consent process. Competency in the planning process as a licensed cadastral surveyor requires ability to understand subdivisional consents and their implementation.

Competencies

The competencies required in the planning process are:

2.5.1. An understanding of the application of Parts I, II, III, VI and X of the Resource Management Act 1991 to the subdivision of land.

2.5.2. An understanding of the relevance of district and regional plans to the subdivision of land.

2.5.3. An ability to interpret rules in district and regional plans as they relate to the subdivision of land.

Engineering Principles

Objective Statement

The legislative requirements relating to engineering principles are included in Section 106 of the Resource Management Act 1991 and codes of practice and rules in district and regional plans as they relate to the subdivision of land. Competency requires an ability to understand subdivision engineering principles and requirements necessary to gain regulatory consents for safe, stable and sustainable subdivision. This includes an appreciation of the necessary

measures to mitigate potential land instability, flooding and other detrimental effects of earthworks and land development. Competency also includes understanding all aspects of roading, wastewater and stormwater, water reticulation, and other services as they relate to land subdivision.

Competencies

The competencies required in engineering principles are:

2.5.4. An understanding of the basic principles of soil properties, land stability, and inundation, as they relate to the subdivision of land.

2.5.5. An understanding of the basic principles of earthworks, roading, wastewater and stormwater drainage, water supply systems, and the provision of utility services as they relate to the subdivision of land.

2.5.6. An ability to interpret an engineering design to the extent necessary to identify where it may be incompatible with the topography, subdivision consent, existing rights and interests, or existing cadastral boundaries.

2.5.7. An ability to interpret an engineering design and to correctly define all easements and other rights or restrictions to ensure the proper servicing of the subdivision.

3 Standards for Licensing of Cadastral Surveyors

3.1 Initial Licence

Each person applying for a cadastral surveying licence under the Cadastral Survey Act 2002 for the first time must hold a relevant educational qualification, have undertaken the appropriate practical training, and uphold professional practice standards in order to satisfy the Board that he or she will meet the following standards to practice as a licensed surveyor.

3.1.1 Relevant Educational Qualification

An applicant for a licence must hold a relevant educational qualification in surveying that meets all the theoretical and practical survey skills components of the competencies described in Section 2 of this document[1].

3.1.2 Appropriate Work-Context Practical Training

An applicant for a licence must demonstrate his or her ability to undertake cadastral surveys and produce cadastral survey datasets that:

3.1.2.1 use proper survey marks and are connected to adjoining surveys and geodetic control networks,

3.1.2.2 consistently comprise survey measurements free of or corrected for material instrumental and measurement error, and that have been adjusted to account for geodetic, projection and image rectification corrections to comply with rules set by the Surveyor General,

3.1.2.3 consistently have been prepared applying appropriate measuring techniques using appropriate equipment to achieve results that comply with rules set by the Surveyor General,

3.1.2.4 utilise the appropriate class of survey for the purpose of the title or land interest and relevant legislation,

3.1.2.5 accurately define and describe boundaries and interests in land, free of anomalies, and having accounted for obstructions, limitations, natural and stratum boundaries, and are capable of integration into the national digital cadastral dataset for issue of title or registration of interests,

3.1.2.6 accurately define interests in land and property rights capable of registration in the appropriate tenure system in order for the proposed dealing to proceed unimpeded,

3.1.2.7 support sustainable development, resource use, allocation and management,

[1] A Bachelor of Surveying degree from the University of Otago, that includes all the core courses as defined by that University, currently meets this standard.

3.1.2.8 facilitate and enhance information systems and databases containing legal, ecological and environmental, economic, utility, land use, property rights, and property asset information,

3.1.2.9 include all the necessary consents and approvals to achieve the intended purpose of the survey, and

3.1.2.10 have all necessary rights and interests relating to the subdivision correctly defined and described.

An applicant for a licence must demonstrate knowledge of and the ability to deal with requirements and processes imposed by the Resource Management Act 1991 and territorial and regional authorities so that:

3.1.2.11 land subdivisions comply with all statutory and regulatory requirements so as to become eligible to gain all required consents and certificates.

An applicant for a licence must demonstrate the ability to deal with the engineering design and land subdivisional process to the extent that subdivisions:

3.1.2.12 are eligible to gain the necessary regulatory consents,

3.1.2.13 provide stable building sites free from the hazards identified in section 106 of the Resource Management Act 1991,

3.1.2.14 have new roads designed and constructed according to the national and local authority codes of practice and standards,

3.1.2.15 have stormwater and wastewater systems designed and constructed to meet the necessary requirements of the subdivision,

3.1.2.16 have water supply systems designed and constructed to provide sufficient water and to meet central and local government public health and fire fighting standards, and

3.1.2.17 provide accessible lots with the required communications and energy connections.

3.1.3 Professional Practice

An applicant for a licence must demonstrate and understand that licensed cadastral surveyors must at all times:

3.1.3.1 act to maintain the accuracy and integrity of the cadastre and efficiency of the survey and cadastral systems,

3.1.3.2 uphold the rights and responsibilities of the Crown,

3.1.3.3 act to maintain public confidence in the survey and land tenure systems, and

3.1.3.4 take into account, within his or her duties, the lawful interests of the land owner, the adjoining land owners, and other affected parties.

3.2 Renewal of a Licence

Each applicant for renewal must hold evidence for the term of their licence that they have:

3.2.1 maintained their skills, knowledge or experience in cadastral surveying as defined by the competencies defined in Section 2, and

3.2.2 maintained their knowledge in those competencies where they have not practiced, in the last three years.

The Board recognises that some surveyors will specialize in different aspects of cadastral surveying but it requires licensed cadastral surveyors to maintain current knowledge to meet the standards described in Section 3.1.2 and 3.1.3

An applicant who has lodged a minimum of three cadastral survey datasets in the preceding three years that have been approved as to survey by Land Information New Zealand is deemed to meet the level of competency defined in Sections 2.1 to 2.4 relevant to s11(3)(a) of the Cadastral Survey Act 2002. An applicant who has not lodged three such cadastral survey datasets shall certify in their application that they have practiced in those topics defined in Sections 2.1 to 2.4 in the last three years.

In relation to competencies defined in Section 2.5 relevant to s11(3)(b) the Cadastral Survey Act 2002 all applicants must have maintained their knowledge of the areas they have not practised in by means of private study, attendance at seminars, workshops, or other similar means.

The Board does not require evidence to be submitted with applications for renewal but may, at any time, require an applicant to produce the evidence supporting his or her certification.

Where the Board has received a notice from the Surveyor-General in the preceding three years, of significant failure in accordance with s7(1)(d) of the Cadastral Survey Act 2002, the Board will consider applications for renewal of licences in greater detail, and may include the provision of further information to support the application.

3.3 Reapplication for a Licence

The standards for reapplication apply to applicants who have previously been licensed or registered surveyors, who do not hold a current licence. The standards for Section 3.2 Renewal of a Licence, apply. The Board will consider applications from surveyors in these circumstances in greater detail, and may include the provision of further information to support the application.

The Board shall require the application to include:

3.3.1 a curriculum vitae of cadastral surveying experience in the previous three years,

3.3.2 two referees of the applicants' cadastral surveying experience – one of whom must be able to attest to recent cadastral surveying experience.

The applicant must be able to demonstrate current competence in cadastral surveying practice in New Zealand gained within the previous three years which may include any or all of the following:

3.3.3 a period of cadastral surveying experience under the supervision of a currently licensed cadastral surveyor,

3.3.4 other evidence of current cadastral surveying experience,

3.3.5 a pass in written and or oral examinations specified by the Board,

3.3.6 being interviewed by the Board.