

The New Zealand Surveyor – the 21st Century

B J COUTTS and D B GRANT, New Zealand

Key words: change, licensing, regulation, qualifications, cadastral, institutions.

SUMMARY

This paper charts the development of the unique nature of the New Zealand Surveyor from navigator and early explorer to the multi discipline land development consultant of the 1980s. The structural changes that have taken place in government institutions are identified with an explanation of why these were necessary. The consequential effects on the survey profession are also outlined, together with an assessment of how the principal surveying professional body has responded. This will allow the international community to be better informed of the various levels of professional recognition and what these may mean with respect to an individual New Zealand Surveyor they may encounter.

The New Zealand Surveyor – the 21st Century

B J COUTTS and D B GRANT, New Zealand

1. ORIGINS

1.1 The Maori had occupied New Zealand since about 800 AD and so had been in residence for about 800 years by the time Abel Tasman passed by, and 1000 years before the organised European settlement began. The earliest settlers had been whalers and sealers who established bases on the mainland of New Zealand, and some stayed and were absorbed into Maori families.

1.2 The European - that is specifically British - settlement of New Zealand began as early as 1814, though it was sporadic and informal. McRae (1981) suggests that it was probably sailors with some knowledge of measurement who first laid out plots of land bought from Maori. The first known 'professional' surveyor to settle was Thomas Florence, who arrived in 1834, and whose name appears on surveys in the Bay of Islands, and who later assisted with the layout of Auckland.

1.3 Following the signing of the Treaty of Waitangi in 1840, the colony was administered through a provincial system, with the provincial governments having considerable autonomy. Under the Treaty the Government had reserved to itself the sole right to purchase land from the Maori, and all purchases prior to the Treaty were declared void until they could be ratified by the Governor (McRae 1981).

1.4 The administration was assisted by Chief Surveyors who were immigrants with some sort of surveying training, often from military establishments. The six original provinces were, for survey purposes, pretty much autonomous, and differing systems developed as a consequence. The bulk of the survey work carried out for settlement was done by surveyors employed by the New Zealand Company, a body set up specifically to facilitate the migration of British people to establish the new colony.

1.5 In 1874 a Major H S Palmer RE, who was in New Zealand to observe the Transit of Venus, was asked to comment on the survey system within the colony. Given that there was no one system covering the "country" as a whole, his principal recommendations in this context were that the General Government take charge of all survey operations in the Colony, to be placed under a Surveyor-General, and that a single triangulation system be spread over the whole country (McRae, 1981).

1.6 Like the other settlers of the time, they had to be hardy folk. Much of the early exploration of this strange and unfriendly land was carried out by "surveyors" who mapped and planned as they went. What equipment they lacked they had to make up for by ingenuity. If there was expertise required that was not otherwise available, then they had to acquire it. They could not be further from "home", and there was no civilisation to support them.

1.7 In specific terms, little is known about the earliest surveyors who came to New Zealand. They were mostly experienced in some way in topographical surveying, and were able to set up local systems to control their work. Some had qualified as architects or engineers, and many were from the regiments of

the militia, some of whom had been trained in the United Kingdom. Palmer had little criticism of the surveys of individuals, only that they could not be connected into a single compatible system.

1.8 Palmers report was closely followed (coincidentally) by legislation that abolished the provincial system of government, and a new department of Lands had been set up and consistent with Palmer's recommendation, with John Turnbull Thomson as Surveyor-General. Thomson quickly established a national survey control system and published a set of instructions for surveyors to ensure a uniform standard of work. These regulations also set out the qualifications for entrance into the new Survey department (McRae).

1.9 Palmer also recommended that the Surveyor-General should prescribe a test for the qualification of surveyors. Under Thomson, and his successor James McKerrow, the Department used surveyors under contract. In order to be a contract surveyor, the individual had to prove to the Chief Surveyor of the Land District that they had 5 years experience in mathematically checked work, and were competent and of known integrity, such that the Chief Surveyor could issue a certificate. On that basis, the surveyor would then be authorised to carry out surveys on behalf of the Crown. They were, then, Authorised Surveyors.

1.10 Those in private practice were required to provide samples of projects, what instruments they had and evidence of good character. They then could get the Chief Surveyor's approval and subsequently be "authorised" by the Surveyor-General. It was a further step then to get a "licence" from the Registrar General of Lands under the Land Transfer Act in order to do cadastral work. They would then be Licensed Surveyors.

1.11 The statutory regulation of the Surveying profession began with the passing of the *New Zealand Institute of Surveyors and Board of Examiners Act 1900*. Under this, the already existing New Zealand Institute of Surveyors (NZIS), founded in 1888, was made a body of statute. Any Rules made by the Institute were required to be approved by the Minister of Lands.

1.12 In addition there was established a Surveyors Board to set standards for and examine people wishing to act as "licensed" surveyors. That Board was appointed by the Governor and comprised the Surveyor-General, two nominees of the Institute and two nominees of the Minister of Lands. This Board was required to keep a register.

1.13 In the *Surveyors Registration Act 1928*, the name of the Board was changed to the Survey Board of New Zealand, and provision made for the registration of surveyors. A decade later, the Surveyors Act 1938 required the holding of Annual Practicing Certificates and made it compulsory for surveyors on the register to be members of the NZIS. The Minister of Lands appointed the Board according to the same specification as before. It was at this time, then, that the qualified surveyors were exclusively and definitively "Registered Surveyor" and other designations (licensed, authorized) fell into disuse. Further statutes governing, but generally not altering, the operation of the Institute and the Board were the *Surveyors Act 1966* and the *Survey Act 1986*.

1.14 Thus the system for the regulation of surveyors, originally recommended by Major Palmer RE in 1874, was finally completed in 1938 and operated without further significant amendment from that time until 2002. In 1902 the Survey Board of New Zealand entered into a reciprocal agreement with all of the Australian states to work within one system. Qualified surveyors in one jurisdiction would be recognised

in each of the others. Further, the Board would take turns in setting written papers that would be sat by candidates for Registration.

1.15 Survey cadets (trainees for professional recognition) were employed under an apprenticeship scheme that saw them work directly under a named qualified surveyor. They were taken on as party of the field party and learned their skills in part by experience – that is they were taught by their “master” surveyor. At the same time they sat the written examinations set by Survey Board.

1.16 When they had passed all of the papers (60% in any examination was required for a pass), they were then eligible to send a set of plans of projects that they had compiled, and be orally examined on these projects by members of the Board through a series of face-to-face interviews. If successful with these, then they were issued with a Certificate of Competency. With this Certificate they were then eligible to be entered onto the Register and become members of the NZIS (compulsory after 1938). This process took at least four years, though most candidates took five, and some took considerably longer.

1.17 The significant change that did take place through this period (1900 -2002) was the shift from correspondence-based examinations, in conjunction with full employment as an indentured cadet to a master surveyor, to university education and examinations in the 1960s. Pressure by the profession for a university education had begun since the 1920s, a desire which was rekindled in the 1950s, and while hotly debated, came to fruition in 1963 when the University of Otago opened the Department of Surveying. The first qualification offered was a Diploma in Land Surveying, which was augmented with a Bachelor of Science degree in 1968. In 1978 both were replaced with a four-year Bachelor of Surveying degree.

2. THE 20TH CENTURY MODEL

2.1 The earliest surveyors in New Zealand were mostly people who had qualified “in the field”. They may have been trained in a British military context, had learned from others how to apply those skills in the field, and on proof by demonstration to a government official, were invested with the authority to carry out surveys.

2.2 They were adventurous men: adventurous because they had uprooted themselves from their homelands to explore the greater world around them – and explore they did. Most of New Zealand was “opened up” for settlement by Europeans by those early surveyors. And they were men because the social mores of those Victorian times would not permit women to follow such “uncivilised” pursuits.

2.3 were also self-reliant people. They were because they had to be. They were on the opposite side of the world from access to equipment and other knowledge. There were no towns or cities, there were no colleges of learning, and there were no industries to make the tools they required. They had to wait months for anything they ordered to come from “the old country”, and so they learnt to make do with what they had. However, they did rely considerably on Maori as guides and skilled bushmen, familiar with the nature of New Zealand terrain and forest.

2.4 The 20th century brought order and consistency to the Surveyors world. But it also brought war, depression and war again. While trade was good, especially as the food production potential and the

refrigerated ships became available, goods and services remained limited. The New Zealand surveyor still had to be largely self reliant.

2.5 The tradecraft learnt through working in the field was handed down through the indentured cadet system – and the field was a fairly difficult place to be. Where there was forest it was dense and difficult to penetrate. Maori guides played a key role as well. Where there was open space, there was the weather to contend with. Changeable and unpredictable as life in the Roaring 40s could only be - wet on the west side, dry and hot in the rain-shadow of the east. In many places the locals were hostile – “when the surveyor comes, the land goes” was an old Maori saying!

2.6 With the advent of a university course there was, at first, some expectation that the graduates would be the equals of the articled cadet of several years experience. The two years required for eligibility to be examined by the Survey Board for Registration generally overcame the difference. It came as a gradual realisation that while these graduate surveyors knew a lot about surveying, their practical skills were somewhat less than those of an articled cadet of similar years of experience (and indeed sometimes less than those of an experienced technician), as the university course, then being only two professional years, had limited time in which to expose students to field skills. However, they were generally quick learners of the practical aspects, having been selected for the limited number of places on their academic abilities.

2.7 However, graduates were taught directly in the field by those people who had been articled cadets under the old system, so the old field competencies lived on for some time. Since 1978 the content of the education programme, that is the Bachelor of Surveying from the University of Otago, has evolved in its content to keep pace with changing technologies and more recently, changing legislation. Instead of the two professional years of earlier times, there are now three and two thirds years of direct teaching of surveying in the programme.

2.8 Through the 20th Century, the latter part of it in particular where international travel has become easier, the New Zealand surveyor has found it easy to get employment overseas. In fact, in many places the New Zealand surveyor has been sought after – places as far flung (from New Zealand at least) as Australia, Hong Kong, Qatar, the United Kingdom, and in diverse aspects of surveying such as off-shore oil rig positioning, oil pipe line set out, major civil construction, and international boundary definition.

3. THE OLD INSTITUTIONAL ARRANGEMENTS

3.1 Department of Lands and Survey (Lands and Survey)

3.1.1 The Department of Lands and Survey existed from about 1876 until its disestablishment in 1986. The date of establishment is not accurate as it formed first as two separate departments, that of Survey on one hand and Lands on the other, before being amalgamated into “Lands and Survey” as it was generally known. In the early period of settlement the transfer of land (by necessity Crown land) through the New Zealand Government meant that the two were closely linked. John Turnbull Thomson became Surveyor General in 1876, thereby beginning the Survey Department, and the Land Act of 1877 created the position of Secretary of Crown Lands. The two became one in 1891.

3.1.2 The position of Surveyor General had been established following the signing of the Treaty, but fell into disuse. It was re-established in 1876 following the recommendation of Major Palmer, who further recommended that J T Thomson, the Chief Surveyor of the Otago Province, be appointed, as the system he had established in Otago was appropriate to extend over the whole of the colony. The Surveyor General was first head of the Survey Department, and in 1891 became the head of the combined Lands and Survey. Over time, as the role of Lands and Survey expanded, the departmental permanent head became the Director General, and the position of Surveyor General became subordinate to the permanent head. In the final period of its existence, the Surveyor General was designated as one of two Deputy Directors General, maintaining the two principal streams of “Lands” and “Survey” within the department.

3.1.3 A number of major land departments were spawned by Lands and Survey (i.e. the Forest Service, Valuation Department, Department of Agriculture) through the 20th century. The Department of Lands and Survey was disbanded in 1986 as part of a major restructuring of environmental management structures in New Zealand.

3.1.4 Lands and Survey maintained the survey records and checked every cadastral plan lodged by surveyors. The plans themselves were stored in district offices and were directly available to surveyors for reference when doing new work, and to the public. In the 1970s all plans were micro-filmed in order to maintain the record and to protect the original plans. This also provided the ability to keep multiple copies, allowing for a “disaster set” in a remote storage, in case of natural catastrophic events. One such event had occurred in 1931, when an earthquake completely destroyed the land record for the province of Hawke’s Bay. A considerable staff was maintained to check all plans, despite the fact that only fully qualified registered surveyors were permitted to lodge such plans.

3.2 The New Zealand Institute of Surveyors (NZIS)

3.2.1 After a few unsuccessful attempts, the NZIS was formed as an association in 1881. The legislation passed in 1900 made it a “statutory body” in that its incorporation was defined in the *New Zealand Institute of Surveyors and Board of Examiners Act 1900* and its constitution, functions, membership and management were defined. While this was an advantage in terms of security, and later in 1938 this was enhanced by compulsory membership for Registered Surveyors, it came at a cost.

3.2.2 The first constraint was that the Institute’s rules were required to be approved by the Minister of Lands. While this does not seem particularly onerous, in recent times it did hold up rule changes and discouraged the NZIS from regular or minor amendments. The second constraint was that the Council of the Institute believed it was unable to expel members, since the legislation said that all Registered Surveyors were required to belong. This provided some inhibition to the Institute in disciplining members for misconduct, and also left them unable to choose who would and who would not be admitted to the organisation.

3.2.3 Secondly, and quite importantly, up until 1986 the fees relating to cadastral surveys were prescribed. Every aspect of a cadastral survey had a price attached to it, and Registered Surveyors were required to charge clients according to that scale. This was later changed to hourly charge-out rates, before being dispensed with by omission from the Surveyors Act 1986. Not only were they controlled directly by the “Scale of Fees”, but that scale had to be approved by the Minister of Lands on the recommendation of the Survey Board.

3.2.4 The Institute was managed by a Council, whose membership was defined by the Act. Through this period the Surveyor General was entitled (in fact required) to nominate a member of that Council. While not mandatory, it was traditional for the Surveyor General to nominate the Assistant Surveyor General (latterly this was the Deputy Surveyor-General as there were several Assistants). This person was in all ways, a full voting member of the Council, the balance of which were elected by the members. All members of the Council were required to be Registered Surveyors.

3.2.5 The Institute remained constituted as it had been in 1900, until the significant changes that were made by the Cadastral Survey Act 2002, though membership admission criteria had been broadened by the Surveyors Act 1966 to allow other than qualified cadastral surveyors to belong.

3.3 The Survey Board of New Zealand (SBNZ)

3.3.1 The SBNZ was also established by the statute of 1900. Its constitution required that its members be appointed by the Minister of Lands. Two were to be appointed on the recommendation of the NZIS and two were to be the Minister's own appointments. In addition the Surveyor General was an *ex officio* member, and was also the Chairman of the Board.

3.3.2 All of those members had to be registered surveyors. In later years the Board was expanded by one lay member (that is, not a surveyor) to represent the general public interest. However, that person was only a member of the Board while exercising its disciplinary powers.

3.3.3 The Board's main functions were to register eligible surveyors, and to discipline those who breached professional standards. Originally the Board took its turn with the Australian states in setting examination papers, and then conducted oral examinations with candidates on their specific experience as demonstrated by a set of projects. Those projects came to be defined as triangulation, urban cadastral surveys, rural cadastral surveys, town planning and subdivisional engineering (design, set out and construction supervision). Board members themselves conducted these professional interviews.

3.3.4 The disciplinary aspect of the Board's functions was exercised with caution. Cases of improper conduct were few and far between, with most problems being sorted out without the need for formality. Those complaints that did come before the Board were almost always prosecuted by the Chief Surveyor of a land district,

3.4 Conclusion

3.4.1 Under the old institutional arrangements the Surveyor General was central to the operation of the entire system. He was the head of the government survey and mapping organisation; he was the Chairman of the registration Board; and he was represented by a voting member on the Council of the Institute. In general terms, he was considered to be the titular head of the survey profession in New Zealand.

3.4.2 The system was therefore tightly tied together with a variety of cross connections. It had three principal parts, the government department, the Institute and the Board. As a relatively small community, most of the Registered Surveyors were known to one and other personally, and certainly by reputation if not by sight. The system was highly paternalistic, insisting on a rigorous educational and practical

training programme before registering surveyors, and then checking every cadastral survey that they lodged before entering it into the record.

3.4.3 In some respects this model typifies New Zealand society in the 20th Century. Central government tended to be at the centre of all activity, both economic and social, and the economy was highly regulated. It was a change of government in 1984 that precipitated sweeping changes in the internal and external way in which New Zealand operated.

4. THE NEW INSTITUTIONAL ARRANGEMENTS

4.1 Land Information New Zealand (LINZ)

4.1.1 With respect to the surveying institutional arrangements, the first came in 1986 as part of a restructuring of all of the central government environmental agencies, when the historic department of Lands and Survey was disestablished in favour of dedicated survey and mapping organisation, namely the Department of Survey and Land Information (DoSLI). At first the position of Director General and Surveyor General were conjointly held, but in 1995 an appointment of a separate Surveyor General was made as the first step in the restructure that resulted in LINZ. DoSLI maintained the records, was the government's principal mapping agency, and carried out cadastral surveys on behalf of other government departments, now in competition with private practitioners.

4.1.2 In 1996 further restructuring was carried out, and DOSLI was disestablished and regulatory functions were split from field operations. The mapping and surveying activities were passed to a new state owned enterprise (a trading company owned by the government) known as Terralink, while the record keeping and regulation of surveys were put into the newly created department of Land Information New Zealand (LINZ).

4.1.3 The Office of the Surveyor General was established in LINZ, as was that of the Registrar General of Lands (previously in the Department of Justice), but which had been added to DoSLI in 1995. The Office of the Valuer General (previously in the Valuation Department) was brought into LINZ in 1998. This served to create a single central government body with responsibility for all aspects of land information and record, with specific focus on regulation of incoming information, rather than the creation of that information themselves. LINZ also added the Hydrographic Division of the Royal New Zealand Navy, and more recently the Overseas Investment Office (see Figure 1).

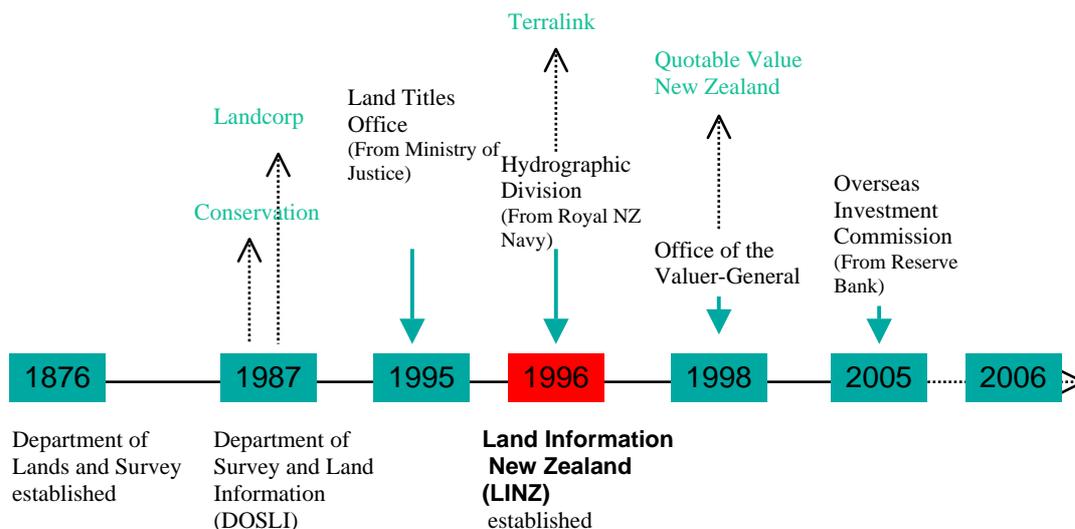


Fig. 1. Land information restructuring 1987 - 2006

4.1.4 In addition to the legislative and structural changes, in accordance with a general shift towards e-government, LINZ has undertaken a dramatic shift in moving into the electronic storage and operation of digital data. This system includes both survey and title records, and will require the lodgement of all land information as digital data sets. Access to this system is only permitted to authorised professionals, who can contribute information to the system directly from their offices. Public access is still maintained for searching purposes.

4.2 The New Zealand Institute of Surveyors

4.2.1 Changes to the New Zealand Institute of Surveyors were brought about by the Cadastral Survey Act 2002, but NZIS as a corporate body, remained largely unaffected directly. It did have its statutory position removed, and was required to register its corporate existence under the Incorporated Societies Act 1907. It did this using the constitution and rules that were already in place, and maintained the structure, management and administration that it had. There were, however, indirect effects.

4.2.2 The first was that no one was required to be a member. That is, the compulsory nature of membership, established in 1938, for practicing cadastral surveyors was removed. While this meant that membership was totally voluntary, it also meant that the Institute had the power to expel members, or not to admit them in the first place. The transition to an incorporated society was achieved without disruption of any sort, and the voluntary nature of membership has not so far (since 2002) caused a noticeable decline in membership. It may be noted that a new group, the Institute of Cadastral Surveying, was established about this time focussing directly on cadastral matters.

4.2.3 The Institute found at this time that it needed to formulate entry criteria for itself. Since 1900 it had relied on the Survey Board to examine and certify surveyors competent in the sub-disciplines specified above. Since membership was then compulsory in order to get an Annual Practising Certificate (APC), NZIS needed to take no further action, other than to require a completed application form and a

fee. Its response to this aspect of its new found freedom was at first to replicate the old system, but then over the 5 years since, to modify and widen the entry provisions to professional membership. Consequently, NZIS can, if its members wish, create and enforce more stringent disciplinary powers.

4.2.4 NZIS has also found a new freedom to amend its Rules as and when it sees fit. Since the changes have taken place, there have been almost annual amendments to the constitution as relatively minor matters crop up. These can be dealt with more or less immediately, rather than, as happened in the past, being delayed until such time as there were sufficient alterations to make it worthwhile to make a trip to the Minister, with the risk of further time delays and potential for other interference.

4.2.5 Under this legislation, the Surveyor-General has not statutory connection to the management of the Institute, that is, there is no representation of the Surveyor-General on the NZIS Council.

4.3 The Cadastral Surveyors Licensing Board (CSLB)

4.3.1 The Cadastral Survey Act 2002 disestablished the Survey Board of New Zealand, as put in place in 1900, as of 30 May 2002. It replaced the SBNZ with the Cadastral Surveyors Licensing Board and required that the Board “ . . . *issue and update standards that persons applying for licences . . . must meet . . .*” . It then constrained those standards to the consideration of “ . . . *the competencies required by cadastral surveyors to meet the standards set by the Surveyor-General . . .*” and “ . . . *to the legislative requirements for the subdivision of land to the extent that they are relevant to cadastral surveying*” (CSA 2002, s.11)

4.3.2 The fact that there was a general election in June 2002, within 3 weeks of the Act taking effect, meant that no appointments were made to the CSLB until December of that year. For 5 months there was no licensing or disciplinary body for the regulation of surveyors. More importantly however, was the fact that there was no examining body for the cohort of graduate surveyors coming through expecting to complete their “registration”, something they had been working towards for at least 5 years.

4.3.3 In the hiatus, the NZIS took action. It convened an Admissions Committee, comprising all of the members of the disestablished SBNZ (who were all members of NZIS), and proceeded to run the old registration professional interviews as if nothing had happened. It was one of the first actions of the CSLB to recognise the examinations the NZIS were conducting, and to declare that it would issue licenses to those candidates who the Institute gave passes to in the cadastral aspects of the old process.

4.3.4 Given the satisfactory nature of the NZIS process, the CSLB elected not to become directly involved in the examination of candidates for licences, but to remain a policy generating, standard setting and disciplinary body. The Institute has developed and refined its entry requirements, and remains the only recognised examiner of candidates wishing to obtain a licence.

4.3.5 As an interim measure, the CSLB also adopted the standards applying before the CSA 2002 was passed. It issued its own new standards in September 2004, having conducted a lengthy process which included submissions from and consultation with the main interest groups, the NZIS, the Institute of Cadastral Surveying, and the Surveyor-General.

4.3.6 The membership of the CSLB is very similar to that of its predecessor. The Surveyor-General is an *ex officio* member but is not permitted to be the Chair; the Minister appoints five other members, four of whom must be or have been licensed surveyors (or Registered Surveyors under the previous Act), two on the recommendation of bodies representing licensed cadastral surveyors and two others. The fifth member must be someone who is not and never has been a licensed surveyor, nor be employed in the survey profession. The Chair of the Board is elected by its members.

4.4 The University of Otago

4.4.1 The School of Surveying at the University of Otago remains the only provider of the academic requirements needed as a prerequisite for both full membership of the NZIS and for the issue of a licence. The School provides a four year Bachelor of Surveying (BSurv), as well as three year Bachelors of Science (BSc) degrees in (a) Spatial Information, (b) Measurement Science and (c) Land Planning and Development.

4.4.2 Only the BSurv meets the full requirements for licensing and full Institute membership. However, it could be possible for holders of any of those BScs subsequently to add the necessary course for recognition through a post graduate diploma. There are opportunities open to holders of the BSurv or any of the BScs to be employed within New Zealand and many other parts of the world.

4.4.3 The School maintains liaison with both the NZIS and the CSLB in the development of its curriculum.

5. PRINCIPLES OF CHANGE

5.1 Levels of Government Intervention

5.1.1 From a government perspective, the principles of change were based on a view, which reached prominence in New Zealand in the mid 1980's, that the government was intervening too much in the market place. It was accepted that the government would sometimes need to intervene in the case of market failure, to ensure that the market was free and fair, or where there was a particular Crown interest, but otherwise should seek to allow minimal or self regulation.

5.1.2 In some countries, (e.g. the Netherlands) cadastral surveys are still carried out by public servants but in New Zealand there is a long history of private sector surveyors, engaged by landowners. Private surveyors sometimes fretted under the government regulations and ministerial control of their Institute. Prior to the creation of DoSLI in 1986, they noted that they were denied the opportunity to tender for surveys carried out for government agencies. After 1986 they were able to tender for government work but were competing with a large government department.

5.1.3 It was inevitable that both private surveyors and the government would increasingly question whether the government should continue to exercise the level of control that it did over their area of business.

5.2 Occupational Regulation

5.2.1 Occupational regulation, such as the system of registration of surveyors, was seen as being anti-competitive and therefore inherently undesirable unless it could be justified by a clear public benefit which exceeded the cost. Strengthening of consumer protection legislation and opportunities for small disputes and claims to be heard in a special low cost tribunal, were seen as mechanisms that could protect the public from poor surveyors without necessarily regulating the occupation of surveying.

5.2.2 It was noted that engineering surveying was not regulated despite the significant cost, including potentially public safety risks, that could result from poor set-out of large buildings or public works. Similarly, although surveyors had long been trained in land planning and development, and continued to be examined in these areas for registration, there was no longer a legal requirement for surveyors to be involved in this phase of development. Where surveyors continued to work in these areas, it was because their clients valued their expertise and services – not because the government insisted on it.

5.2.3 The one area where the Crown was seen to have a particular interest in the quality of survey work was the cadastre. The following public policy factors were central to the decision that the Crown had an interest in the competency of cadastral surveyors and that therefore some form of occupational regulation would be necessary.

- If a member of the public were to choose an incompetent surveyor from a fully deregulated marketplace (presumably chosen in ignorance but also influenced by price), the effects of the surveyor's errors would be experienced, not just by their client, but by other 3rd parties. These would be neighbours and future owners of the land. These 3rd parties have no opportunity to require a more expensive but competent surveyor to be selected versus a cheaper but incompetent surveyor.
- The loss that may be suffered by the 3rd parties may not be able to be reversed. If there is overlap of title, one of the parties must lose land that they expected to own. Monetary compensation will not necessarily satisfy them in their loss, particularly if they have an emotional attachment to the land, which many landowners do.
- The loss may not be discovered for many decades by which time the surveyor may be no longer available for rectification of the error or recovery of damages. Similarly the land may have been on-sold many times and the surveyor's client who made the original poor choice may also not be available for recovery of damages. The average time between resurveys of land in New Zealand is about 50 years. The average time between transfers of land is 7 years.
- Land provides a secure low-risk investment base which is vital to the New Zealand economy. This is recognised in ownership by the Crown guarantee of title. The Crown does not guarantee boundaries but examples of boundary dispute are low. Therefore investors in land can have a high level of assurance as to (a) who owns the land (title); and (b) what land they own (cadastral survey). A loss of public confidence would increase the perception of investment risk and thus weaken the value of this investment base to the economy.
- Finally, there is a wide range of central and local government land administration functions that depend on a reliable cadastral system. These include the resource management and planning systems, emergency services and management, electoral boundaries. The Crown maintains a cadastral database, not just for land-owners, but for these government purposes also.

5.2.4 The Crown therefore has a direct interest in the quality of data going into this cadastral database. With other Crown databases such as topographic, hydrographic, geodetic, the Crown can maintain the quality by only tendering out to competent data providers. In the case of a fully deregulated private sector cadastral market, the Crown does not choose the data provider (cadastral surveyor). The cadastral surveyor is chosen by individual landowners who may not be fully informed purchasers of the cadastral services and who will be significantly influenced by price. Therefore the Crown has a direct interest in the competency of those who are available to do this work.

5.3 Scope of Occupational Regulation of Surveyors

5.3.1 The above arguments for occupational regulation of cadastral surveyors do not apply to occupational regulation of planning / resource management or to engineering design and set-out. While there is some public interest in these areas, the existing deregulated market in these services was not seen to be causing a significant problem.

However the Survey Board of New Zealand continued to examine candidates for registration in these topics. This raised the possibility that a candidate, competent in the cadastral area, might fail to gain registration because of their planning or engineering work. This was seen as an unnecessary restriction on the cadastral services market.

5.3.2 On the other hand, it was recognised that a cadastral survey is part of a longer land development process, which is itself regulated under the Resource Management Act, and that the cadastral surveyor needed some understanding of the preceding and subsequent legal requirements in this process. A cadastral surveyor may not prepare a resource consent application for subdivision, but they are required to implement it within the constraints of the cadastral survey. Thus they must at least understand the legal aspects of it. Similarly, a cadastral surveyor may not produce the engineering design and may not set out the engineering works. Nevertheless they must understand it so that it is able to be set out (in terms of the legal requirements of the resource consent) when they have completed their cadastral survey.

5.3.3 In particular, the Crown's regulated resource management process depends on a cadastral surveyor being competent to:

- Look at and understand a resource consent for subdivision;
- Establish the boundaries of the land being subdivided;
- Look at the lay of the land available inside those boundaries;
- Look at and understand the engineering design;

and recognise any difficulties that may arise for compliance with the resource consent or set-out and construction of the engineering work necessary for the subdivision to be legally completed. This area of competency was therefore included within the scope of cadastral surveyor competencies to be implemented by the Cadastral Surveyors Licensing Board.

5.4 Separation of Powers and Accountabilities

5.4.1 As noted above in section 3.4, the Surveyor-General had previously been central to the administration and management of the whole cadastral system:

- chair of the Survey Board;
- having a representative on the Council of the NZIS;
- advisor to the Minister who in turn approved any changes to NZIS Rules;

- warranting the Chief Surveyors who approved cadastral surveys;
- there was a statutory right of appeal to the Surveyor-General in survey disputes.

In the review of the Survey Act 1986, which resulted in the Cadastral Survey Act 2002, it was considered desirable to separate out different areas of accountability and make them independent.

5.4.2 The Surveyor-General remains a key role. The main cadastral elements of that role are to set standards and audit compliance with those standards. Decision-makers have independent authority and accountabilities but operate within the standards framework set by the Surveyor-General, and are held accountable for compliance with the standards through audit.

In particular:

- The CSLB is not chaired by the Surveyor-General and is independent of LINZ both financially and administratively. It is accountable to the Minister. The Surveyor-General is still an *ex-officio* member of the Board except in disciplinary hearings.
- The function of approving cadastral surveys is held by the Chief Executive of LINZ and delegated to the operational part of the department designated “Customer Services”. The Surveyor-General independently audits the exercise of this function.
- The management and maintenance of the cadastral database is the responsibility of Chief Executive of LINZ and delegated to the Customer Services part of the department in. The Surveyor-General sets standards for this function and independently audits the exercise of this function.
- Neither the Surveyor-General, nor the Minister, have a statutory role in the NZIS. An alternative body representing surveyors, the Institute of Cadastral Surveying, has also formed. The Surveyor-General is required to consult with all such bodies, as well as the CSLB, when setting standards.
- The right of appeal to the Surveyor-General in the case of cadastral survey disputes has been removed.
- Licensed Cadastral Surveyors are legally accountable for their cadastral surveys. This has long been the case in law but in practice, the department historically played a strong role in advising surveyors in areas of survey practise and the use of survey technology. Increasingly, the professional bodies are picking up the role of “good survey practise” and survey technology while the department concentrates on standards and compliance.
- The CSLB is now fully independent of the NZIS. Previously, because all registered surveyors were also NZIS members, the NZIS set the fee for the annual practising certificate, collected those fees, and reimbursed the Survey Board for costs from those fees.
- The Institutes (NZIS and ICS) set their own membership entry conditions which may extend beyond the CSLB requirements for licensing.

5.5 Optimal Regulation

5.5.1 Another recent change towards ensuring that government intervention is no greater than necessary, is the concept of optimal regulation – described succinctly by the phrase “as little as possible, as much as necessary”. This is being applied to all regulated areas in LINZ. It involves a process of identifying the desired government outcomes, assessing the risks of not achieving those outcomes, identifying the minimal level of regulation that will effectively and efficiently manage those risk. All standards are currently under review.

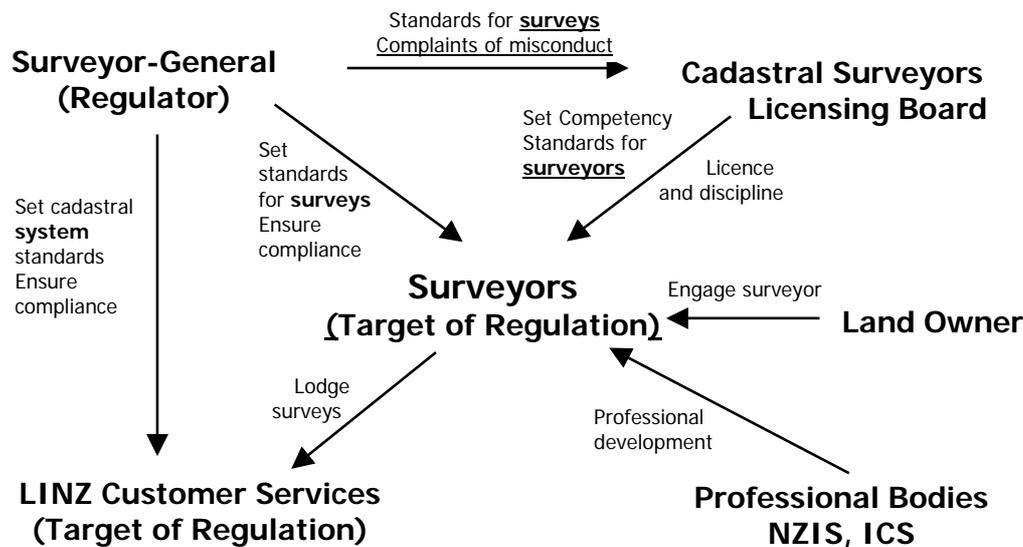


Fig. 2. Current relationships in cadastral surveying

5.5.2 In particular the Surveyor-General’s Rules for Cadastral Survey, which have the power of regulation, are in the middle of a zero-based review in which all new rules will be clearly linked to the outcomes and objectives that they are necessary to achieve.

6 THE NEW ZEALAND SURVEYOR OF THE 21ST CENTURY

6.1 What is Different?

6.1.1 Given that there has been considerable institutional and apparent structural change, what in reality can the international community expect from the New Zealand Surveyor of the 21st century?

6.1.2 The familiar title “Registered Surveyor” has lost the statutory protection it has had since 1938. The old register of surveyors still exists, so those who qualified under the old system, i.e. before June 2002, may still legitimately call themselves by that title. The CSLB has that register, so anyone wishing to confirm an individual’s right to use that title can check with the Board. There is, however, no legal restriction on anyone using those words even if they have no entitlement to them.

6.1.3 As a result there are new terms to describe surveyors who may have different sets of qualifications. It is useful to describe them, and to broadly define what they imply.

6.2 The Licensed Cadastral Surveyor (LCS)

6.2.1 In abolishing the old, statutorily restricted term (Registered Surveyor) the new legislation brought into being the new term “licensed cadastral surveyor” to describe those authorised by the government to

define land title boundaries, and with similar legislative protection. That is it is an offence for anyone to claim or imply that they are one when they are not.

6.2.2 The competencies required by a licensed cadastral surveyor are defined by the standards of the CSLB. The educational requirements are met through the BSurv at the University of Otago, and no other institution to date has indicated any desire or intention to replicate that base knowledge set. The remaining standards are met through supervised practice under the direction of an LCS. The practice standards are tested by appearance before a panel with a portfolio of the work completed under supervision, and a declaration from the supervisor that the candidate, in their view, has the competencies to be licensed.

6.2.3 Those competencies relate specifically to the ability to apply the law of the land, use the appropriate measurement techniques, and analyse the data gathered in order to define boundaries for the issue of a title that is guaranteed with respect to its spatial location and its dimensions, by the government, and to lodge that data in the central record.

6.2.4 Fully qualified overseas surveyors wishing to obtain a license in New Zealand will generally be required to sit and pass an examination on the laws and regulations relating to land, to work for some period under the direction of an LCS, and to obtain a declaration from their supervisor that they are considered to be competent. New Zealand continues its reciprocity arrangements with all of the Australian states established in 1902, whereby any licensed or registered surveyor in one jurisdiction will be automatically recognised and given the equivalent status in any other jurisdiction.

6.2.5 There are no post-nominal designations attached to the holding of a license or from gaining recognition of competency by the CSLB, although many licence holder use the term Licensed Cadastral Surveyor in advertising and correspondence.

6.3 Members of the NZIS

6.3.1 Up until 2002, the NZIS accepted passes in the professional interviews of the SBNZ as evidence of professional competence and admitted all those who satisfied that criteria. Occasionally, and after the legislation of 1966 permitted it to do so, it admitted people with alternative knowledge, skills and experience who were considered to be of equivalent standing to a Registered Surveyor. This required nomination by four existing members and approval by the Institute Council.

6.3.2 Since 2002, NZIS has developed an admissions policy and now recognises a variety of specialities in which it will admit candidates to full membership. All candidates are required to prove their ability in the area of measurement science, and then choose 4 other areas upon which they will be examined. The list to choose from includes cadastral, mining, hydrographic, geodetic, planning, subdivisional engineering, photogrammetry, remote sensing, GIS, engineering surveying and project management.

6.3.3 In order to be eligible for the Professional Interviews, a candidate had to have proven academic standing (BSurv), sat and passed (60%) a written examination on the application of the laws relating to survey practice, have worked under supervision for a period of time (usually two years), and produce documentary evidence of projects that had been worked on in the form of sets of plans and supporting documents. As under the previous system, the final examination is an oral one, where a member of the

Admissions Panel interviews the candidate on the work that they have undertaken in the area applied for. The NZIS now holds entry interviews twice a year.

6.3.4 Whereas in earlier times all professional New Zealand surveyors had passed an identical test, now there is likely to be some variance between those who hold full membership of the Institute. This does mean, however, that the post nominal designation of MNZIS is one of a qualification, as well as being an indication of membership of a society. The qualification represents proof of having met the standards required of a mature and respected professional body.

6.4 The Registered Professional Surveyor

6.4.1 Many members of NZIS were unhappy with the loss of the statutorily protected term “Registered Surveyor”. While their MNZIS was of critical importance, it did not bring with it any particular title. Additionally, though the matter had been the subject of debate over several decades, the Council of the Institute had been unable to introduce continuing professional development as a mandatory requirement for continued membership, through lack of “popular” support.

6.4.2 Both concerns were addressed by the creation of a new designation, that is, “Registered Professional Surveyor” abbreviated to RPSurv. While it took some time to settle on an appropriate and acceptable wording, this status was introduced in 2005, and has had considerable uptake among members.

6.4.3 In order to be granted the status of RPSurv a surveyor must have first met the requirements of full membership of the Institute, that is already carry the designation MNZIS. They must then practice for a further period of 3 years and demonstrate advanced competence in two of the specialities defined for membership. There is also a requirement that any applicant for this status must make a commitment to continuing professional development.

6.4.4 Any New Zealand surveyor holding this status (RPSurv) may be recognised as a mature and experienced professional surveyor in the eyes of the New Zealand professional community.

6.5 The New Zealand Surveyor – the 21st Century

6.5.1 Institutional arrangements have changed dramatically in New Zealand in the last two decades. This has required the New Zealand surveyor to adapt to the most significant changes to the structure of their professional activities in over a century. The final step in that adjustment is due later in 2007 when all cadastral surveys will be required to be submitted electronically.

6.5.2 The academic qualifications that New Zealand surveyors obtain have kept pace with the theoretical and technological advances that have occurred and with practice in New Zealand and internationally. The post graduation training given to graduates by the profession has been maintained though the examination and recognition of experience, formalised through the professional entrance examinations of the Institute of Surveyors.

6.5.3 The NZIS issues a Certificate of Competence to successful candidates, irrespective of whether the candidate actually joins the Institute. That Certificate is equivalent to the former title “Registered

Surveyor” and is now designated by the right to use the post-nominal MNZIS if the surveyors chooses to join the NZIS, but may refer to a different set of skills than those for the earlier qualification.

6.5.4 The Institute has created a new designation for well experienced and qualified surveyors – Registered Professional Surveyor. Surveyors holding the RPSurv title will have had their greater experience in particular aspects of surveying audited and approved by the NZIS before it is awarded.

6.5.5 What has not changed is the character of the New Zealand surveyor – grown from the pioneering spirit and the self-reliance born of remoteness from the rest of the world. When the breadth of education they receive is added to this, a confident, capable and resourceful surveyor is produced, at least the equal of his or her predecessors.



REFERENCES

McRae, J.A. *New Zealand Institute of Surveyors 1888 – 1988*. New Zealand Institute of Surveyors. Wellington, New Zealand. 1989.

New Zealand Statutes. *New Zealand Institute of Surveyors and Board of Examiners Act 1900; Surveyors Registration Act 1928; Surveyors Act 1966; The Local Government Act 1974; Survey Act 1986; The Resource Management Act 1991; Cadastral Survey Act 2002*.

BIOGRAPHICAL NOTES

Brian Coutts is a Senior Lecturer in Surveying at the National School of Surveying at the University of Otago. He is a past president of the New Zealand Institute of Surveyors, and has been the Chair of the Cadastral Surveyors Licensing Board since its establishment in 2002. He is the New Zealand Correspondent for Commission 1 of FIG.

Don Grant was appointed as the Surveyor-General of New Zealand in 2005. He was the Deputy Surveyor-General and the Surveyor-General's nominee on the Council of NZIS from 1996 to 2002. He has been a member of the Cadastral Surveyors Licensing Board since 2004.

CONTACTS

Brian J Coutts
National School of Surveying
University of Otago
P O Box 56
Dunedin
NEW ZEALAND

Ph + 64 3 479 7609
Fax + 64 3 479 7689
brian.coutts@otago.ac.nz
www.surveying.otago.ac.nz

D B Grant
Office of the Surveyor General
Land Information New Zealand
P O Box 5501
Wellington
NEW ZEALAND

Ph +64 460 0110
Fax +64 4460 0112
dgrant@linz.govt.nz
www.linz.govt.nz