

# **Examination Copy**

**A survey to assess perceptions on the value of examining  
survey records within the Surveyor-General(s) Office(s).**

By

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of Land Information Management in the School of Environmental Sciences  
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## **ABSTRACT**

The examination of survey diagrams and records submitted by Professional Land Surveyor(s), has been the responsibility of the Surveyor-General(s) Office(s) in South Africa since the passing of the Land Survey Act 9 of 1927 and its successor, the Land Survey Act 8 of 1997. As it stands Professional Land Surveyor(s), registered with the South African Institute of Professional and Technical Surveyors, are the only persons authorised to place and replace cadastral boundaries. Together with the Surveyor-General(s) Office(s), they ensure the integrity of our land tenure system. This research investigated the perceptions of the Professional Land Surveyor(s) and the examiners, as to whether this examination process is necessary to ensure the integrity of the land tenure system, or whether it is a mere hindrance to the registration of land within the Deeds Office(s). A qualitative research approach was undertaken whereby a questionnaire was developed and distributed to all registered Professional Land Surveyor(s) operating in KwaZulu-Natal. In addition, semi-structured interviews were performed at the offices of the Surveyor-General with the staff involved with the examination process. It was established that the examination, although perceived as a delay in the registration of property, is vital and if compromised there is a distinct risk of losing the security and integrity that presently exist within the cadastral system. It would appear that the integrity of our cadastral system is not found solely in the professional land surveyor or the examination section, but rather that the combined efforts of the two parties provides an end product that is accurate, correct and ensures that the integrity of the cadastre system is maintained.

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# CHAPTER ONE

## Introduction

### 1.1 Land Surveying

Surveying is defined by Kavanagh (2007: 2) as the “art and science of taking field measurements on or near the surface of the earth.” These measurements are collected in the field and usually comprise of all, or a combination of, horizontal and vertical angles, horizontal or slope distances and vertical distances. Through the manipulation of these field measurements, the surveyor is able to facilitate the design of roads, buildings, locate and establish property boundaries determine volumes and calculate areas (Kavanagh, 2007). The discipline of surveying is broken down into many professionalised areas of which Engineering, Topographical, Hydrographical, Mining and Cadastral surveying are generally regarded as the key foci (Kavanagh, 2007). Although these specialist fields exist, it is not uncommon for them to integrate to provide a service to both Government and the private sector.

Surveying has been described as one of the oldest professions in the world, having its roots in Biblical times; Deuteronomy 27:17 states, “Cursed is he who moves his neighbours boundary marks”. McCormac (1991: 1) “it is impossible to determine when surveying was first used, but in its simplest form it is surely as old as recorded civilization”. Archaeologists have discovered that the Egyptians were the first to use survey measurements, around 1400 BCE, to define property boundaries during their shift from a nomadic existence to a more settled, food producing existence where the importance of property and boundaries had become necessary to show ownership and rights to land (McCormac, 1991). Evidence of this was found as permanent markers placed above the flood plains of the Nile which were used to re-establish the property boundaries after flooding. It is believed that rudimentary surveying was used to position the Great Pyramids of Gizeh, through effective

means of rope pulling and diagonal measuring resulting in errors of approximately 8 inches, over a 750-foot base (metric equivalent 20.32 cm over a base of 228.60 m) (McCormac, 1991). There is proof that the Babylonians in 2500 BCE practised some form of surveying as archaeologists have located maps on tablets from this time period. Furthermore, evidence from paintings on the walls of the tombs suggests that not only was surveying used to establish property boundaries, but also used as a form of public land registration which was primarily used for taxation purposes (McCormac, 1991). This system is similar in many respects to land registration systems in existence today.

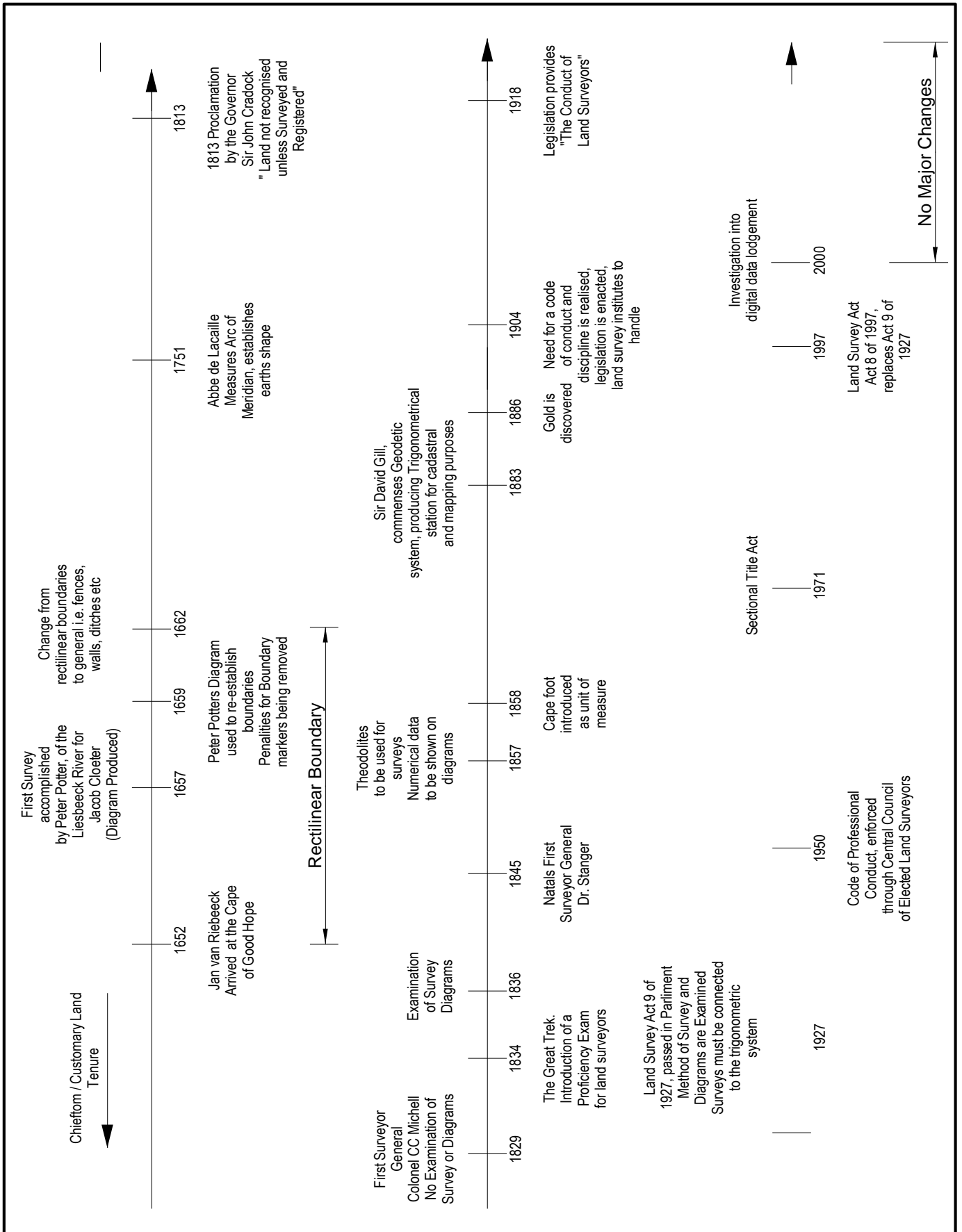
Shifts in technological ability have resulted in changes in the methods of accomplishing surveying, from the rope pulling Egyptians and the measuring wheel of the Romans to digital total stations, global positioning systems, laser levels and electronic distance measurers. Regardless of the tools used, the need to establish and maintain property boundaries continues. In Australia, it is dated to the start of the country's colonization in approximately 1788 and is now accomplished by land surveyors working in the private sector who are register or licensed with the governing body and are therefore permitted to work in the cadastral section of land surveying (Cadastral Template, 2011). China's modern cadastral system began in 1930 for the purpose of tax collection and ownership. Only licenced companies are permitted to perform such surveys. Sweden's cadastral system dates back to 1530 and was established for taxation purposes for the King. The system was well advanced in that each village and unit in the village was provided with a unique number, which is still used in their land registration system today (Cadastral Template, 2011). By the 17<sup>th</sup> century the books providing the unique numbers were enhanced with maps (Österberg, 2003). This is similar to the Domesday book commissioned in the 11<sup>th</sup> century by William the Conqueror, which contains records of settlements in the English counties, for the purpose of managing taxations and military services for the King (The National Archives, 2011).

## 1.2 South Africa

In 1652, Jan van Riebeeck arrived at the Cape of Good Hope, instructed by the Dutch East India Company to establish a refreshment station for passing ships. It was soon realised that to achieve this, farming and producing of suppliers would need to take place resulting in a change to the existing land management and, in 1657, Mr Pieter Potter completed the first survey (Simpson and Sweeney, 1973). Thus, commenced South Africa's move from a customary land management system, where a tribal authority managed and distributed land, to a statutory land management system based on ownership document of surveys filed and used to re-establish boundary positions if removed or damaged. This practise of property surveying continued and developed, resulting in the Land Survey Act 9 of 1927, used to guide the surveying profession, subsequently replaced by the Land Survey Act 8 of 1997. Prior to 1652, the cadastral system in South Africa resembled that of a customary land tenure system which, over the last 350 years, has undergone major changes; from the first survey diagram completed by Pieter Potter in 1657, the appointment of a Surveyor-General in 1829, to legislation being adopted by the passing of the Land Survey Act 9 of 1927 and the examination of survey data that commenced in 1836 (see Table 1.1 for a detailed timeline) (Simpson and Sweeney, 1973).

At present, land registration and cadastral survey fall under the Department of Rural Development and Land Reform (DRDLR), at the time of the field work the Department of Land Affairs and cadastral surveys are accomplished in the private sector by Professional Land Surveyor(s) who are registered with the South African Institute of Professional and Technical Surveyors (PLATO). Registration is accomplished by completing a four-year degree in land surveying followed by a practical article period and passing of survey law exams. The primary function of the

Table 1.1 – Cadastral Surveying – South African Time Line



cadastral system in South Africa is to define ownership rights, although taxation on property does occur. It is for this reason that accuracy and correctness of submitted data is achieved within our cadastral system. In the early stages of South Africa's cadastral development no examinations were undertaken of the diagrams produced, such as the first survey accomplished by Pieter Potter, which, according to Simpson and Sweeney (1973) proved insufficient when required to relocate the land parcel's boundaries only two years later. This is clearly not acceptable when legal implications of ownership are at stake. After many years of gradual improvements to the South African cadastral system the first cadastral data was submitted and examined in 1836.

### **1.3 Statement of the Problem**

The South African cadastral system has undergone minor change since the Land Survey Act 9 of 1927 and the succeeding Land Survey Act 8 of 1997. The Land Survey Act 9 of 1927 established that both the process of the survey, reflected in the survey records, and the property diagrams need to be examined for consistency, accuracy and reflecting the latest changes within the land tenure system. This examination system is twofold as docket are first inspected for detail and visual correctness after which the docket is examined for survey correctness and consistence against the existing data held at the Surveyor-General(s) Office(s). This process is manual, with assistance through computer-based software. The general perception from industry is that the examination of data is a necessity and stricter examinations systems should be implemented and enforced to ensure sound data quality. However, the question needs to be asked why registered professionals, who take responsibility as laid out in the Land Survey Act (Land Survey Act 8 of 1997, Section 11) need to have their workmanship examined?

## **1.4 Research Aim and Objectives**

### **1.4.1 Aim**

The aim of this research is to document and discuss whether the examination of survey records, within the Surveyor-General(s) Office(s), is perceived as either a necessity to ensure the integrity of our land tenure or a hindrance to the registration of land within the deeds registry. A secondary aim is to assess perceptions regarding reducing the examination process.

### **1.4.2 Specific Objectives**

To achieve the above aim the specific objectives were to:

- a) understand the perceptions of the Professional Land Surveyor(s) and examiners at the Surveyor-General(s) Office(s) towards the examination of cadastral data in KwaZulu-Natal, as necessary to ensure the integrity of our land tenure system;
- b) assess the interest in the implementation of a reduced examination process by KwaZulu-Natal Professional Land Surveyors.

## **1.5 Research Method**

The research was achieved through a qualitative approach which commenced with unstructured interviews with the examination team at the Surveyor-General(s) Office(s). These unstructured interviews along with observations of the stages of examination were used to construct a perception questionnaire. Through a pilot study the questionnaire was refined before being emailed to all Professional Land Surveyor(s) registered with PLATO in the KwaZulu-Natal area. The raw data was then summarised to assist with the semi-structured interviews of the examination staff at the Surveyor-General(s) Office(s). Common themes were identified and analysed along with any interest in a reduced examination process.

## 1.6 Conclusions

Licensing and registration are frequently portrayed as a mark of professional competence and thus a form of protection to the wider community. This being the case, it is questionable why survey examination by Surveyor General's Offices should be necessary, if the people providing the data are professionals. Thus, the question arises whether it is necessary to have survey examinations, which ultimately protects the professionals from the consequences of their errors as suggested by Kentish *et al.* (1999).

Engineering surveyors in South Africa, whose projects are more costly, in monetary terms, take full responsibility for their surveys and no examination body exists to check their work. They are however protected by having professional indemnity insurance which protects against claims due to any professional negligence. The difference between engineering surveyors and land surveyors is the time factor, in that engineering work is utilised within a short time frame and mistakes can be determined and the necessary action taken; whereas in land surveying, the diagram may only be used in 10 -20 years and the ability to place responsibility becomes difficult.

Having no examination may not be the answer, however a reduced examination process could assist South Africa in reducing the work load on the examination staff at the Surveyor-General(s) Office(s) and increase the efficiency of diagram approval. The perception of the stakeholders towards a reduced examination process will be addressed in this research as well as the perception as to whether it would benefit South Africa's cadastral system or jeopardise the quality of the data presently being submitted and managed by the Surveyor-General(s) Office(s)?

## **CHAPTER TWO**

### **Literature Review**

#### **2.1 Surveying**

The art of surveying is the observation and combination of the measurements taken in the field, and the manipulation through scientific means to produce an outcome such as positioning of a building, roads, dams, areas, volumes, maps and diagrams (McCormac, 1991). Surveying is subdivided into two distinct areas, geodetic and plane survey. The difference between the two is the size of the area being surveyed. Geodetic survey deal with large areas, such as provincial boundary surveys and corrections need to be made to take into consideration that the surface of the earth is rounded or ellipsoidal in shape. However, plane surveying is conducted at a smaller scale/size and consequently the surface of the earth can be assumed to be flat, thereby allowing a parallel grid to be placed over the area. This grid is referred to as a YX or an easting northing grid. Properties are registered on a mapping plan which is a projection from the curved earth surface, and hence cadastral surveying is two dimensional.

Surveying is a generalist term used to describe the many different areas in which surveyors apply their skills. The five dominate fields of enquiry are engineering, topographical, hydrographical, mine and cadastral surveying. Kavanagh (2007: 3) defines engineering survey as “those activities involved in the planning and execution of survey for the location, design, construction, maintenance, and operations of civil and other engineering projects”, such as road construction and stadiums. It is in this field that surveyors work closely with civil engineers to ensure that construction is taking place in the correct area, is connecting to existing structures and is following the design set down by the civil engineers.

Topographical surveys are the creation of a three-dimensional model, the third dimension being made visible by showing contour lines, which are lines drawn on plans or maps



joining all places of equal height. “Detailed information is obtained pertaining to elevations as well as to the locations of constructed and natural features (building, roads, streams, etcetera.) and the entire information is plotted on maps (called topographic maps)” (McCormac, 1991: 5).

Hydrographic surveying pertains to the sea, lakes, streams and other bodies of water where the establishment of flood control and shapes of areas beneath water surfaces are determined says McCormac (1991). This particular type of survey requires specialised equipment which is very different to the other four types of surveys, which can be accomplished by standard survey practises and equipment, that of GPS, total stations and EDM.

Mine surveying is a very specialised field of work and, in South Africa, to practise one needs to be registered with the Institute of Mine Surveyors of South Africa. In this type of survey one deals with below ground survey, but relates the position to that on the earth’s surface (McCormac, 1991).

Cadastral surveying is regarded as the oldest type of surveying (McCormac, 1991) and deals with the tracing of existing land ownership boundaries or the creation of new boundaries (Kavanagh, 2007). This type of surveying is reserved for Professional Land Surveyor(s), registered with the South African Council for Professional and Technical Surveyors (PLATO). It is within this area of survey that this research will focus as it deals with cadastral data submitted by registered Professional Land Surveyor(s) to the Surveyor-General(s) Office(s) and the examination that takes place to ensure accuracy and consistency, thereby ensuring the integrity of a land administration system.

## 2.2 Cadastral Systems

Since colonial times, the cadastral system has primarily been a means of providing a spatial and written description of land parcels for the purpose of acquisition and registration of land rights (Silayo, 2002). It is for this reason that a huge demand and interest has been placed on developing and monitoring a successful cadastral system within countries. “Not only do cadastral boundaries provide for legal protection regarding ownership” (Bogaerts and Zevenbergen 2001:1) but, according to Silayo (2002), also provides a source of revenue for the States. For a cadastral system to be beneficial it must contain, according to Williamson (1983), the following elements:

1. The introduction of cheap, secure and efficient system of recording and transferring interests in land.
2. The reduction of boundary disputes and expensive related litigation.
3. The ability to increase long-term credit by using land title as security. In urban areas this leads to increased land development and an improved land market. In rural areas it promotes long term farm planning, better cropping patterns, long term crop management and soil conservation practices, and enables the farmers to buy more efficient equipment to invest in farming improvements programs.
4. The ability to establish an efficient and equitable taxation system. With such a land system, all land parcels may have a tax levied on them, based on realistic value. In simple terms, land cannot be taxed unless the location, size and ownership of the land are known.
5. The ability to prepare an up-to-date cadastral map which has many uses other than for land registration and conveyancing, such as local administration, planning, utility authorities and private organisations.
6. The use of the cadastral system to control land transactions and ownership, for example many countries desire to restrict ownership of land by aliens.

7. The use of the cadastral system as the basis for land reform. Without such a system, land reform can be a lengthy process with a reduced chance of success.
8. The development of a cadastral system, and particular the creation of the cadastral maps in a systematic manner, which makes it possible for a Government to determine the amount of state land it owns. This fact alone has been sufficient justification for some countries to carry out a cadastral survey, such as the Domesday Book of the English in 1085 (The National Archives, 2011).
9. The creation of an efficient system based on title registration in a form which is readily computerised. With the advances in computer design, in conjunction with reduced costs for computers, simple, computerised non-graphic 'Land Information systems' are becoming a realistic proposition.

Thus, it is clear that a cadastral system is multi-functional and can provide benefit to both the Government and private sector. According to Borgaerts and Zevenbergen (2001), cadastral systems vary worldwide and no two systems are truly alike; instead each is a variant or an adaption of more than one system ensuring a cadastral system that fulfils the needs of Government and the private sector. Bogaerts and Zevenbergen (2001: 326) note, "It is important for all cadastral experts, whether they are local or foreigners to know that there are many alternatives, which in general, give a good solution". The list below provides a breakdown of the variation that exists between cadastral systems (Bogaerts and Zevenbergen 2001);

1. The decentralised versus the centralised cadastral system, which defines whether the cadastral system for a country is managed locally i.e. in each of its regions/provinces (for example Poland has 400 cadastral offices), or whether data is managed in a central location and then distributed to the various regions.

Improvement in telecommunication has resulted in the location of cadastral information being less relevant.

2. The land registration and the cadastral system may exist as one system or be viewed as two separate entities – (Austria, Bulgaria and Poland have these separated). It is interesting to note that seventy per cent of the attributes required for land registration and cadastral system (Bogaerts and Zevenbergen 2001: 331) are duplicated, resulting in maintenance being labour intensive, especially in old manual systems.
3. The cadastral system may be established for fiscal or legal purposes. A fiscal cadastral system is established for taxation reasons which is the sector within which most cadastral systems are established and is cheaper and simpler to maintain and establish compared to a legal cadastral which is established to prove ownership (Bogaerts and Zevenbergen 2001: 331). It is this legal systems that requires constant updating to ensure accuracy.
4. The cadastral system of fixed or general boundaries. “Whether it is in deeds, for land registration or on cadastral maps, the unit of land that makes up a certain property (parcel) has to be defined and identified” (Bogaerts and Zevenbergen, 2001: 331). General boundaries are identified by natural or artificial features found on the ground, such as a hedge, path, river etcetera. However, with a fixed boundary the responsibility lies with the land surveyor to indicate the position of each boundary in a permanent way, using suitable equipment and with a high degree of accuracy. This method is slow and more costly than the general boundary method and has resulted in many countries such as Tunisia and Tanzania taking many years to establish a fixed boundary cadastral system. Silayo (2002) states that in the 10 years from 1991 – 2001 only 8 021 plots were surveyed annually in Tanzania where the national demand was established at 150 000 plots.

5. The cadastral system may be government controlled or a self-supported system. In a government supported system, such as with many European countries, the government maintains the system and any income goes directly into the state treasury. This implies that the government provides the funding for the cadastral system. On the other hand, in the Netherlands, the national cadastral system has been privatised and has become an independent organisation. "Since then, the fees have been reduced by about fifty per cent, the organisation is fully self-supporting and operates with an annual surplus" (Bogaerts and Zevenbergen, 2001: 334).

### **2.3 Establishment of a Cadastral System in South Africa**

The cadastre system in South Africa commenced in 1652 when Jan van Riebeeck landed at the Cape and brought with him a Eurocentric approach to land ownership, that of "deposition over the land and the right to use the land" (Bonn 1980: 7). Bonn (1980) states that prior to this method of ownership, land was managed under the tribal system and granted by the chieftain to members of his/her tribe. Although Jan van Riebeeck was ordered to merely set up a fortified trading station, which was to be used as a supply stop to ships bound for the East, it soon became apparent that a more formal institution would be required to provide food, and so 'free burghers' were granted 20 acre plots to meet the demands of the passing ships. According to Simpson and Sweeney (1973) it was at this stage that the value of property was established and the necessity to survey and demarcate its' position became a necessity.

The importance of the surveyor and surveys grew as land became a sought after commodity. "Pieter Potter was the first to survey land along the Liesbeeck River for the purpose of transferring it from the Dutch East India Company to servant Jacob Cloeten, a free Burgher", says Simpson and Sweeney (1973: 14). The position of the beacons and boundaries were then drawn up and became part of the first land title, which comprised

much of what is standard practice for document submission today at Surveyor-General's Office(s) nationwide; that of land ownership, the rights bound to the land, and the position and the size of the land parcel. Simpson and Sweeney, (1973) state that two years later, the document created by Potter was put to the test as it was used to re-establish the position of the boundary of Jacob Cloeten's property and was found to be inaccurate. As a result, the original boundary's position was impossible to re-establish, thus placing huge importance on correctness and accuracy of such a document. Two possible reasons for these inaccuracies in the diagram established by Pieter Potter could have been the equipment used to establish direction, that of magnetic compasses, plane tables and circumferentor, and the ability to measure distance through timed horseback rides or foot pacing.

This is rudimentary in comparison to today's standards of equipment, where angular accuracies of one second can be measured and network accuracies of one millimetre can, and are, being achieved.

#### **2.4 Land Tenure in South Africa**

Land tenure is described as the system of rights and institutions that govern access to and use of land (United Nations, 2003). The United Nations Economic Commission for Africa indicates that in South Africa there are two land tenure system operating, that of customary and statutory tenure. Tembo (2008) confirms this and sub-divides the statutory tenure system into that of freehold and leasehold. Customary tenure "is a land tenure system that is governed by unwritten traditional rules and administered by traditional leaders" (United Nations, 2003: 2). Ownership is made evident by showing use, building houses etc. and by following conditions, yet this ownership does not allow for use as collateral for loans from banks. Diagrams and paper documents showing and demarcating one person's land from another are not requirements of customary tenure. However, statutory tenure provides the

owner with exclusive rights, which guarantees land tenure security. This system requires management as this tenure system is supported by documentary evidence and administered by the Government. It is this system that requires the examination of the documents submitted by Professional Land Surveyor(s). Only once these documents are approved and registered in the Deeds Office(s), is security of tenure awarded to the owner who is then granted exclusive rights.

## **2.5 Examination process in South Africa**

As the importance of survey diagrams in providing security of tenure grew, so the abilities of surveyors needed to be improved and, in 1834, an examination system was introduced to improve the proficiency of the land surveyors. The exam comprised of four stages: proficiency in drawing, the elementary principles of geometry, the practical application of surfaces, heights and distances, the element of nautical astronomy, finding the latitude, variation of the compass and the practical examination in the field to test the candidate's abilities Simpson and Sweeney, (1973).

This examination was supplemented by ensuring that all land surveyors' pay a deposit to the Government to cover any faulty survey produced by the individual, which was used to cover the costs involved in re-surveying. It was at this stage that a separation between surveyors occurred; those who completed the above mentioned examination were regarded as 'Government surveyors', able to survey Government land, and those not having complied were regarded as 'Sworn surveyors', permitted only to work on private land. Two years later, in 1836, the diagrams produced by either Government or Sworn surveyors were examined in the Surveyor-General(s) Office(s) to ensure that the work undertaken and submitted was of a suitable standard to ensure security of tenure.

In 1904, the South African Supreme Court stated that the lawful position of a property beacon is according to the diagrammatic representation of it and not necessarily according to the original beacon itself (Simpson and Sweeney, 1973). A decision was taken by Government that the position of the boundary reflected on the diagram, submitted by the surveyor, is the lawful and true position. This law increased the land surveyors responsibility as the diagrams produced reflect the true position and any errors will result in the property boundary being compromised which could have severe consequences for the occupants of the land and resulting in boundary disputes. However, in 1924 the law was reversed to specify that the lawful position is no longer that of the diagram but rather the position of the original beacon as it stands in the ground (Simpson and Sweeney, 1973). This rule still exists and is practiced today by all Professional Land Surveyor(s) in South Africa. Once again, this demonstrated the importance of accuracy and an increase in the responsibility placed upon registered land surveyors, as their documents are now recognised, accepted by law and used to prove land title.

The examination of the diagrams continued until 1927 when, for the first time, not only the diagrams, but also the survey records were examined. The survey record provides information regarding how the surveyor fulfilled the survey, in term of how he /she established control by observing trigonometrical beacons or town survey marks, which property beacons were observed and from which point they were observed and all the necessary calculations, reductions and comparisons required to ensure that property boundaries and diagrams are correct. These records were examined and held as evidence, for future boundary relocations, within the Surveyor-General(s) Office(s) (Simpson and Sweeney, 1973). The examination and approval of the surveys is still practised in this manner today.



Although much research has been undertaken with regards to the survey system (Bevin and Haanen, 2002; de Vries 2004; Falzon and Williamson 1998, Kentish, Jones and Rowe, 1999) little information is available regarding the examination of survey data by the Surveyor-General(s) Office(s) with particular reference to South Africa.

In South Africa, at a Surveyor-General(s) Office(s), all documentation is thoroughly examined and checked for accuracy, consistency and methodology by examiners who are registered land surveyors working for the State. In Australia and New Zealand, the examination of documents submitted by surveyors has been reduced to ten per cent of the plans lodged and these are examined for quality purposes only, to ensure that the standard are maintained, with the remaining passing through without examination (Falzon and Williamson, 1998).

In the case of Australia, the reduced examination process has been accomplished through the introduction of an accreditation scheme to which surveyors can affiliate themselves (Falzon and Williamson, 1998). Bevin and Haanen (2002) reiterated this by stating that in New Zealand surveyors who demonstrate a level of quality, specified by an accreditation standard, are provided with a reduced examination process on submission of their data. This accreditation scheme is managed by an organisation, either government or private. In South Australia it is managed by the Land Service Group (LSG), in Western Australia the Department of Land Administration (DOLA) and in New Zealand by the Land Information New Zealand. Although not addressed in this research project, the above points raise pertinent questions for South Africa. Who would be responsible for such an accreditation scheme; who has the capacity to oversee this? Would accreditation rest with PLATO, or would it rest with the Surveyor-General(s) Office(s); or would a new accreditation body have to be established (Government or private?) to monitor the success of such an accreditation scheme? Would Professional Land Surveyor(s) pay for such privileges, or

would they be accommodating of the fact that they might need to undergo regular annual testing to remain accredited, such as continual professional development points (CPD)? Such questions could be the focus of further research in this field.

## **2.6 The Land Survey Act 8 of 1997**

The examination of cadastral data in South Africa started in 1834 and comprised the examination of survey diagrams. In 1927, both the diagrams and survey records were examined, as a result of the passing of the Land Survey Act 9 of 1927 (Simpson and Sweeney, 1973). This Act has since been superseded by the Land Survey Act 8 of 1997, which dictates the responsibilities and the authority of the Surveyor-General towards storing and maintaining of the data and the examination of submitted data. The Act also dictates the responsibilities of the land surveyors with respect to the submission of new data for examination (Appendice A). It is interesting to note that in the Land Survey Act 8 of 1997 (section 11(b)) it indicates that the land surveyor takes full responsibility for the survey and no responsibility lies with the Surveyor-General(s) Office(s). In the Land Survey Act 9 of 1927 (section 13(3)), this was expressed in the following manner, "Neither the Government nor any officer thereof shall be liable for any defective survey or work pertaining thereto, performed by a land surveyor". Based on this understanding, it is strange that so much effort is placed on the examination of data when the responsibility for the integrity of the data lies with the land surveyor and not those examining the data. Again, one needs to ask the question whether this examination of data is necessary or merely a hindrance to the registration process, if responsibility lies with the land surveyor, as indicated in the Land Survey Act 8 of 1997, then surely they should ensure that their work submitted is in the correct format and error free?

Further, the Land Survey Act 8 of 1997 (section 12(1)) deals with improper conduct of a land surveyor (Appendice B). The seriousness of contravening this Act and the punishment

that could be implemented by PLATO may deter any land survey and ensure commitment to accurate and error free data submissions to the Surveyor-General(s) Office(s), thereby eliminating the need for examinations.

## **2.7 Qualitative Approach**

As perceptions are gauged by qualitative research, this section provides a discussion on qualitative research and the methods used to collect and assess data. Qualitative research is “primarily to describe a situation, phenomenon, problem or event; the information is gathered through the use of variables measured” (Kumar 1999: 10). It is, “primarily an inductive process of organising data into categories and identifying patterns (relationships) among categories” (McMillian and Schumscher 1993: 479). Qualitative research is used to enable the researcher to obtain data, in a natural environment through techniques of observation, interviews and questionnaires states Kumar (1999). This data is referred to as primary data as it is obtained by first hand. Kumar (1999) and Mays and Pope (2000) indicate that although the data is primary, it is not 100% accurate leading to possible errors in qualitative research. As a researcher, the ability to control and improve validity/trustworthiness is important. Mays and Pope (2000) suggest ways of ensuring validity of qualitative research through the following: that of triangulation, a clear exposition of methods of data collection and analysis, reflexivity, attention to negative cases and fair dealings.

1. Triangulation – is aimed at being able to make a comparison between the result of two different methods of collecting data, finding consistent results, or a commonality between interview data and questionnaire data. This strengthens the validity of the data obtained.
2. Clear exposition of methods of data collection and analysis – as it is difficult to control responses in a natural setting, it is important to ensure that all means of data collection are presented and made transparent. “The written account

should include sufficient data to allow the reader to judge whether the interpretation proffered is adequately supported by the data” (Mays and Pope 2000: 51).

3. Reflexivity – relates to the structure setup by the researcher which is guiding the responses based on assumptions the researcher might have. This structure needs to be indicated at the beginning of the research.
4. Attention to negative cases – which deals with investigations into outliers and data that contradict or differ from the norm. Outliers or contradictory data/results should lead to further investigations and explanation for all data obtained.
5. Fair dealings – takes into consideration that the researcher has not limited the perspective to a certain group but rather ensured that the participants of the research cover a wide range so as to obtain a well-rounded response.

## **2.8 Quality of data**

It is generally perceived by land surveyors that the security of land tenure in South Africa lies with the correctness of property diagrams and the accuracy of the work of the land surveyors who performed the survey. This examination of data at the Surveyor-General(s) Office(s) controls both of these steps and contributes to the land tenure security for all who have land ownership. As examination of data is taking place, the quality of that data under examination will directly affect the perceptions of the Professional Land Surveyor(s) and the examiners at the Surveyor-General(s) Office(s).

To understand quality in this environment it is necessary to view quality from two perspectives. The first, that of data, which is defined as the method of the survey undertaken along with the accuracy of the calculations and the correctness of the drawings, submitted in the form of survey diagrams, general plans and sectional titles schemes and whether the quality of this submitted data could ensure that the examination stage is no

longer necessary. However, is this quality achievable throughout the land surveyors or would the accuracy and integrity of our cadastral system be compromised? “This means that it is critical to measure the cost of quality or, more precisely, the cost of non-quality” (Sterling 1993: 36).

The second aspect of quality with the service provided by the examiners is the Surveyor-General’s Office(s) service quality check that would ensure a short approval time? However a short approval time has a direct link with the quality of the data received. If poor work is submitted then the time to examine is lengthy, however if accurate, and correct work is submitted, then the time for approval is reduced. “Poor data quality increases operational cost because time and other resources are spent detecting and correcting errors” (Redman 1998: 80). Redman (1998) continues by stating that, “poor data quality makes it difficult to reengineer. One way of looking at many reengineered projects is that they aim to put the right data in the right place at the right time to better serve a customer” (Redman 1998: 81). It must be mentioned at this point that one of the main customers at the Surveyor-General(s) Office(s) are the Professional Land Surveyor(s) using the data which ironically they provide. Therefore they will be directly influenced by the quality of their own work.

Service quality is a measure of how well the service level delivered matches customer expectations. Delivering quality service means conforming to customer expectations on a consistent basis (Lewis and Booms, 1983). If the examination process were to follow Lewis and Booms’s (1983) definition of service quality and conform to the expectation of its customers, in this case the land surveyors, would the cadastral integrity be maintained within the Surveyor-General(s) Office(s)? In this research quality will be defined as “Zero defects – doing it right the first time Crosby (1979).”

## **2.9 Conclusions**

The South African cadastral system has undergone many changes since inception in 1657, from the first survey being completed by Pieter Potter to a contemporary system that is managed and controlled by the State. To ensure that the integrity of this land tenure system remains, the examination and record of survey data was introduced when the Land Survey Act 9 of 1927 was implemented. The successor Act of 1997 still prescribes the responsibilities of the Surveyor-General and the professional land surveyor to ensure accurate and error free data. The question needs to be asked whether the data submitted requires examination or is the quality of work that is submitted to the Surveyor-General(s) Office(s) at a level that will continue to ensure the integrity of our land tenure system, even if a reduction in examination were to be implemented to speed up the registration process?

## CHAPTER THREE

### Methods

#### 3.1 Introduction

This chapter outlines the methodology used to accomplish the research, that being the perceptions of the professional land surveyor and the examiners at the Surveyor-General(s) Office(s), towards the examination of the work submitted by professionals. The perception of the professional land surveyor was established through the development of a questionnaire, and that of the examiners through a set of semi-structured interviews.

#### 3.2 Case Study Approach

The qualitative research design for this research was based on a case study approach. “In a case study, a single person, program, event, process, institution, organisation, social group or phenomenon is investigated within a specific time frame, using a combination of appropriate data collection devices” (Creswell 1994). To achieve its purpose a case study “is constructed to richly describe, explain or assess and evaluate a phenomenon” (Gall, Borg *et al*, 1996: 549) and it is accomplished through obtaining information on site generally through interaction between researcher and the participants/ respondents, thereby making the data collection that of a primary nature. This data, according to Gall, Borg *et al.* (1996), is analysed using three methods;

1. Interpretational Analysis – where the researcher is trying to establish patterns in the data,
2. Structural Analysis – where patterns are found when the conversations are investigated /analysed.
3. Reflective Analysis – where the study is handed over to a highly qualified expert to provide understanding using his/her judgement.

Once the analysis is complete the research communicates the findings. “The case narrative richly and fully reports the subject perceptions about the phenomenon being investigated” (Leedy 1997: 158).

### **3.3 Data Collection Methods**

Kumar (1999) describes three methods to obtain primary data, observation, interviewing and questionnaires.

#### **3.3.1 Observations**

“Observation is a purposeful, systematic and selective way of watching and listening to an interactive or phenomenon as it takes place” (Kumar 1999: 105). This method of data collection is adopted when the ability to obtain data through the other methods, i.e. interviews and questionnaires, is ineffective. Kumar (1999) defines these situations as when the respondents are not co-operative or are unaware of the answers. This method of data collection is best used when the behavioural response is the type of data required. This particular method has not been used in this research, instead the research has concentrated on the two methods as described.

#### **3.3.2 The interview**

“Any person-to-person interaction between two or more individuals with a specific purpose in mind is called an interview” (Kumar 1999: 109). Kumar (1999) suggests that there are two types of interviews which are classified according to their flexibility, that of an unstructured and a structured interview. In an unstructured interview, the researcher develops a framework called an ‘Interview guide’, which is used to provide a structure, where the questions are spontaneous in nature, resulting in freedom within this method to deviate slightly, but not outside of the framework. “In a structured interview the investigator asks a predetermined set of questions, using the same wording and order of questions as



specified in the interview schedule” (Kumar 1999: 109). Through this method uniform information is obtained which enables comparability of data.

Nuwaha (2002) provides another interview option, that of a semi-structured interview process, which provides a median between structured and un-structured design. In a semi-structured approach, questions are provided through the interview schedule, however freedom is allowed to ensure a greater perception to be obtained from the respondent within the research area, as the respondents not only answer the questions given but provide their views and opinions.

### **3.3.3 The Questionnaire**

“A questionnaire is a written list of questions, the answers to which are recorded by respondents. In a questionnaire respondents read the questions, interpret what is expected and then write down the answer” (Kumar 1999: 110). Questionnaires and interviews will normally contain the same questions, however the means of the response is different. As a result questionnaires need to be structured carefully to ensure that the questions are simple and understandable as no interpretation is available, as in an interview. Kumar (1999) describes three situations where a questionnaire or an interview should be used:

1. The nature of the investigation – if personal or sensitive information is required which could result in the respondent being reluctant to discuss with the researcher.
2. The geographic distribution of the study population – where the respondents cover a wide geographical area.
3. The type of study population – “if the study population is illiterate, very young or very old, handicapped there may be no option but to interview respondents” (Kumar 1999: 110).

Kumar (1999) suggests three ways of administering a questionnaire, the mailed approach, the collective administration and the administration in a public place. The mailed approach is conducted either by post or emails but these suffer from a low rate (Kumar 1999). The collective administration is where you have a captive audience such as a classroom or conference and the public place method will be decided upon depending on your area of study.

#### **3.3.4 Study Site**

The geographical area of this study was KwaZulu-Natal, South Africa and the Professional Land Surveyor(s) that operate in the Province and submit data to the Surveyor-General(s) Office(s) which is located in the Department of Land Affairs building, in Pietermaritzburg, Pietermaritzburg, KwaZulu-Natal. Contact was made with South African Council for Professional and Technical Surveyors (PLATO), to assist in providing a list of contact details for all registered Professional Land Surveyor(s), as PLATO is the governing body that ensures and controls professional registration, which is a prerequisite for submitting survey data to the Surveyor-General(s) Office(s). A total of 58 Professional Land Surveyor(s) were identified that operate and hold registration in the KwaZulu-Natal area. Contact with these Professional Land Surveyor(s) was achieved through the use of email addresses obtained from the list, as the geographical distribution of the surveyors placed limitations on the ability to visit to conduct interviews.

As the necessity for examination of data forms the basis of this research, it was necessary to establish the perception of the two parties involved in the process; those of the professional land surveyors and the examiners working at the Surveyor-General(s) Office(s). These perception were ascertained through two sample methods; a questionnaire, were distributed to all the Professional Land Surveyor(s) and semi-structured interview with the examination heads at the Surveyor-General(s) Office(s). It is

important to note that the examination process at the Surveyor-General(s) Office(s) in KwaZulu-Natal comprises of two stages; the first stage is a technical examination which is managed by 13 examiners, comprising of two chiefs and 11 examiners working independently. The next stage is conducted by three Professional Land Surveyor(s), referred to as Professional Assistants (PA). (Refer to Appendices C and D, Surveyor-General's Check list.)

### **3.4 Pilot Study**

The questionnaire was developed, based on an initial interview with the examiners at the Surveyor-General(s) Office(s). This interview was used to better understand the process involved in the examination stage. The interview was un-structured so as to provide the examiners an opportunity to define the problems and concerns with which they are dealing on a day-to-day basis. On conclusion of this interview, a questionnaire was developed, which was structured in a manner necessary to answer the research problem and provide some alternative solutions. Telephonic contact was made with two Professional Land Surveyor(s) for the purpose of conducting a pilot study of the questionnaire and to refine the questionnaire by removing any ambiguity in the questions, spelling mistakes and ensuring that the questions asked would provide the correct response to answer the research aim. A structured interview was established but due to unforeseen circumstances could not take place due to an inability from the Professional Land Surveyor(s) to find a suitable meeting date. Thus, electronic communication via e-mails was the preferred method of communication and the pilot study continued with some informative direction being provided. Section B question 9 introduced a graded likert scale; no reference was inserted to indicate what number reflected reliant or not reliant, and so was corrected. Section C question 6a was inserted to probe further the penalties for substandard submission to the Surveyor-General(s) Office(s) that could be implemented at the

suggestion of the Professional Land Surveyor(s). Section D question 6 was introduced as a possible alternative to the reduced examination, where the examination process is not compromised but rather preference is given to data where an increased rate has been paid. The remaining changes were language and grammar corrections and the restructured questionnaire was finalised based on the direction provided and the guidelines described below by Steudler, *et al* (2004).

### **3.5 The Structure and Content of the Questionnaire**

The questionnaire followed the guidelines described by Steudler, *et al* (2004) which indicated that questionnaires should be;

1. easy to fill out, without too many explanations,
2. a simple structure, although the results should still reflect the main issues,
3. as short as possible, to reduce time wastage by person/s filling it out,
4. simplistic, with easy to understand questions in order to have a satisfactory response rate, and
5. set up such that the respondents do not need to be asked for precise figures or statistics; estimates will be good enough.

Taking these considerations into account, a questionnaire was developed, comprising of four pages and divided into four sections (Appendix C). There were 34 questions in total, with each section providing a desired outcome to the research. The questionnaire consisted of multiple choice type questions with a response based on a graded likert scale, while some questions required a short answer which provided the Professional Land Surveyor(s) an opportunity to express their opinions or clarify issues.

Section A was a generalised section to obtain information regarding the respondent/company, to establish length of service and workings with the Surveyor-

General(s) Office(s). Section B, was related to cadastral data and aimed at establishing volume of submitted data, waiting period between submitted data and approval, and the response to whether the examination of data is a hindrance or a necessity. A question was asked regarding the use of the email lodgement facility within the Surveyor-General(s) Office(s) and the benefits perceived by this method. This question was inserted to attempt to establish how well reform implemented by the Surveyor-General(s) Office(s) is accepted within the professional land surveying community.

Section C, asked questions based on survey records submitted and establishing whether the examination stage was necessary to ensure accuracy of data stored at the Surveyor-General(s) Office(s). Questions were asked regarding returned data, and whether returns were justifiable, the number of returns, what penalties should exist for repeated poor workmanship, their responsibility as professionals and what they felt should be improved within the Surveyor-General(s) Office(s). Section D explored possible ways to reduce the examination stage and provide a speedier approvals process for land surveyors who have possibly furthered their qualification or registration. The rationale was to determine their perception towards an environment that has been implemented in Victoria, Australia, whereby if a land surveyor is accredited with a certain body, their examination process is only 10% of the data submitted, while the remaining 90% goes un-examined. A further question was asked as to who the Professional Land Surveyor(s) thought should be held responsible if such a scheme were to be put in place in South Africa; should it lie with the Surveyor-General(s) Office(s), PLATO or a new private body.

The questionnaire was distributed to all 58 Professional Land Surveyor(s) during mid-September 2010, however a closing date was not provided which resulted in a poor response. The questionnaire was sent out again a month later and once again in early November 2010, in an attempt to achieve a reasonable return. At the time of writing only 17

responses had been received, resulting in a twenty-nine per cent return, much lower than desired after three months and three attempts to obtain returns. However, on six of the returned forms more than one professional land surveyor was indicated as working for the same company. An assumption was made that working for the same company would result in a similar perception to the questionnaire, as the working environment would be similar or the same. Taking this into consideration, an improved return rate of 28 Professional Land Surveyor(s) was achieved, resulting in a forty-eight per cent return rate. As mentioned by Hornik (1982: 243) "The boon of mail questionnaires is their low cost and the bane is their low response rate with the attendant problem of nonresponsive bias" this research experienced a similar finding.

### **3.6 Semi-Structured Interviews**

Initial contact was made with the Surveyor-General(s) Office(s) in March 2010, to introduce the research and to gain the Surveyor General's Office staffs, opinion on the topic and to understand the process from the examiners' perspective. Using this information and the desired outcome from the research, the questionnaire was established and distributed in mid-September 2010.

A more formal interview was scheduled with the examination section of the Surveyor-General(s) Office(s) for late November 2010, as a follow-up to the questionnaire and to discuss their opinions on matters mentioned by the responses from the Professional Land Surveyor(s). The meeting took place in the Surveyor-General(s) Office(s), DRDLR building Pietermaritzburg. The purpose of the meeting was twofold, first the technical section head was questioned and then a Professional Assistants (A professional land surveyor working at the Surveyor-General(s) Office(s)). The interviews were semi-structured, as they were guided by the questionnaire submitted to the land surveyors, "which was necessary to

assure the comparability of data” (Kumar 1999: 109), yet an open-ended approach was adopted to better gauge their perceptions.

### **3.7 Conclusion**

The initial semi-structured interview at the Surveyor-General(s) Office(s) was informative and indicated that this research was topical, could become controversial in nature and worth pursuing. This was followed by the establishment of a questionnaire with the assistance of Professional Land Surveyor(s), through a pilot study. The final questionnaire was emailed and follow-up resulted in a forty-eight per cent return rate. A preliminary analysis of the questionnaire was conducted, based on the responses, and a semi-structured interview was held at the Surveyor-General(s) Office(s) to obtain a response and to gauge their views on the responses provided by the registered surveyors.

## **CHAPTER FOUR**

### **Results**

#### **4.1 Introduction**

This chapter provides the feedback obtained through the questionnaire by the Professional Land Surveyor(s) who responded, and the Surveyor General's Office examiners. The chapter is divided into the four sections of the questionnaire: general information regarding the land surveyors, cadastral data and submissions, survey records and their return rate and the Professional Land Surveyor(s)' perceptions or opinions regarding a possible reduction in examination.

#### **4.2 Section A – General Information**

An analysis of section A reveals that surveyed companies are small enterprises comprising of one to three surveyors of which one is registered with PLATO as a professional land surveyor, and tends to operate in all fields of expertise from field work, drafting of plans and diagrams, overseeing work and managing the office, and taking ownership responsibility. The remainder are either registered survey technicians, still undergoing training, professional engineering surveyors, which are not allowed to practise in the cadastral field, or are operating as surveyors but are not registered with PLATO (the latter was not an option on the questionnaire) (Figure 4.1). The length of service to their companies is generally greater than ten years, with only two out of twenty-eight indicating between three to five years. Of note was their response to the number of years working in the cadastral field (section A, question 6) which is generally greater than fifteen years with only two indicating less.



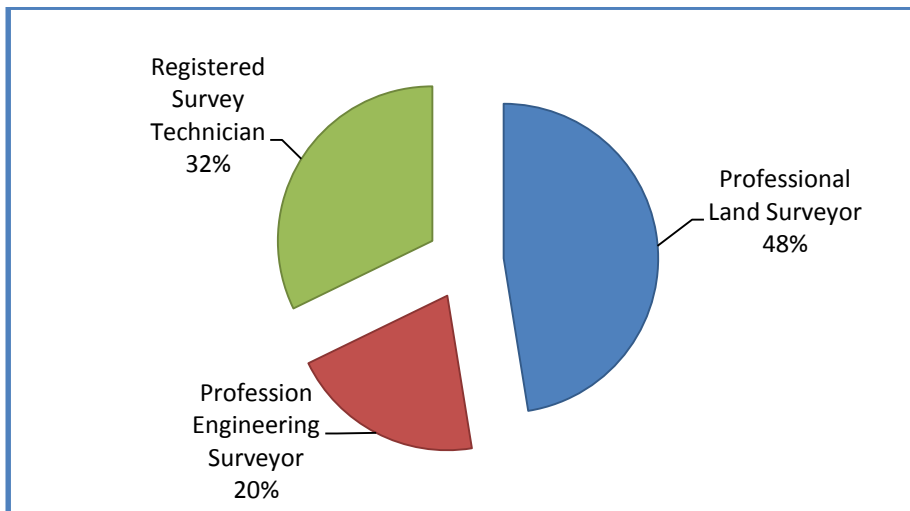


Figure 4.1: Percentage registrations.

### 4.3 Section B - Cadastral Surveying

In this section, the first question asked (section B, question 1) was whether the examination process was a hindrance or a necessity to the integrity of the cadastral system. A hundred per cent responded that it was a necessity. This was further confirmed through the semi-structured interviews with the examiners at the Surveyor-General(s) Office(s). When asked to provide reasons for their answer to the above, the following comments were made:

*“Cadastre Highest Level, last defence against errors”*

*“We are all human therefore we do make mistakes which the cadastre system cannot afford”*

*“Many land surveyors produce substandard work. The cadastral system is secure because of the examination process and record keeping.”*

*“Too many errors occur when work is unchecked”*

*“We have excellent reliable cadastre. This due to the professionalism, including checking of work, maintenance of standards. Entire built environment depends on accurate data.”*

When asked the number of cadastral surveys undertaken for clients each year (section B, question 3), all except one indicated greater than 15 surveys, with the one outlier indicating

between five to nine surveys per year. All respondents indicated a high dependence on the Surveyor-General(s) Office(s) either through examination or the acquiring of data.

The question regarding the waiting period between submissions and approval (section B, question 5), although a valid question, produced skewed response data. At the time this survey was emailed, the Surveyor-General(s) Office(s) was on a 'go slow' strike, indicating on average an eight week delay. However, on one of the response forms it mentioned that, "*this year has been an anomaly*", indicating that the Professional Land Surveyor(s) were aware that this year was different. On consultation with the Surveyor-General(s) Office(s), these figures were confirmed and proof was provided from their records, which indicated that in previous years this was not the case. The Surveyor-General(s) Office(s) introduced a strategic plan to improve the examination period Chief Surveyor-General A. Van den Berg indicated, "When I first laid down this challenge, little did I realise our staff was capable of such dedication and team work. I would have been happy with an examination period of 15 to 20 days, but this is beyond my wildest dreams." The expected turnaround time for examination has been reduced to fewer than ten days (Chief Surveyor-General, 2009), however the response from the land surveyors indicates a much longer waiting period (Figure 4.2). Forty-three per cent of Professional Land Surveyor(s) indicated that they were satisfied with the waiting period, and seventy-one per cent indicated that they were satisfied with the services provided by the Surveyor-General(s) Office(s) (Figure 4.3), although of those who indicated dissatisfaction with the Surveyor-General(s) Office(s), fourteen per cent made reference to the 'go slow' action of this year. It could be assumed that if the 'go slow' had not taken place at the time of the survey, then the seventy-one per cent satisfaction could have been higher. One respondent indicated that the service delivery of the Surveyor-General(s) Office(s) was not as good as it was ten years ago and one indicated dissatisfaction due to delay in receiving payment from a client, as payment is based on survey approval.

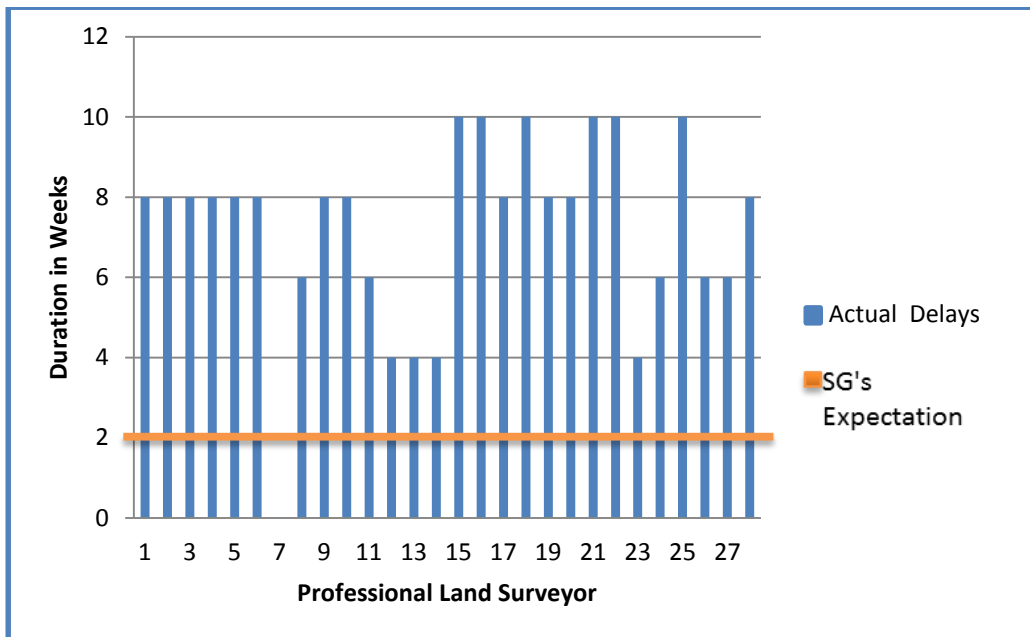


Figure 4.2: Delays experienced due to examination process

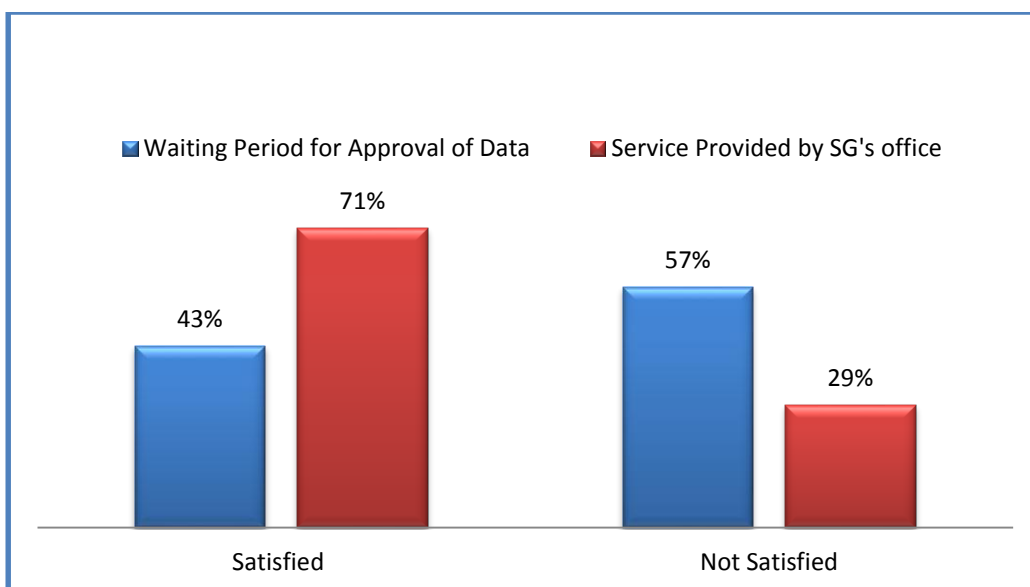


Figure 4.3: Satisfaction of Professional Land Surveyor(s)

The remaining questions in section B focused on assistance through the use of computers (question 9) to fulfil the work, of which all except one indicated that they are completely reliant on 'computer systems' to perform the work. The outlier scored a four which still indicating a high reliance on computers. The rationale for this question was to determine

the potential to use the digital lodgement facility provided by the Surveyor-General(s) Office(s) (section B, question 10). When asked regarding the digital lodgement facility at the Surveyor-General(s) Office(s), only four out of the 28 (14%) indicated that they were using this method. Those who do make use of this facility mentioned that it does not reduce the examination process but rather speeds up the delivery of data to the Surveyor-General(s) Office(s). One commented that it saves money as no courier services are required and no chance of data being lost in the post. In conversation with the Surveyor-General(s) Office(s), they indicated that there was an increase in interest in the digital lodgement facility.

#### **4.4 Section C - Survey Records**

The first question asked (section C, question 1) was whether or not the Professional Land Surveyor(s) had ever had cadastral surveys submitted for examination and subsequently returned. One hundred per cent indicated that at some point or another they have had their surveys returned; encouragingly seventy-five per cent claimed that the reason for the return was justifiable in ensuring the integrity of the cadastral system. In general, most claimed that they have a less than ten per cent return on their survey data, however, worryingly, some indicated that fifty per cent of their submitted data is returned. A controversial question was posed (section C, question 4), "Do you use the examination process to fix problems and insert data into your submission records, data that you did not have time to obtain?" Ninety-six per cent declared that they had not abused the system in this way; however one indicated that they had. In the interview with the examiners, this outlier was mentioned and their response was that in their opinion the abuse of the examination process is taking place.

With regards to sub-standard work and whether penalties should be enforced (section C, question 6), eighty-two per cent indicated that it should take place through an increased re-

submission fee. According to the Surveyor-General(s) Office(s) an increase in re-submissions fees has occurred, however it is perceived as more of an annual increase and based on the sentiment of the Professional Land Surveyor(s) it should be a value that would result in deterring 'shoddy work'. Further comments regarding sub-standard work by the Professional Land Surveyor(s) were;

*"The L/S involved should attend additional training at his cost if more than 10% of his work is returned for correction."*

*"Delay the examination/approval time and leave more time for examination of good surveys"* *"Consistent substandard work should rather be reported to Plato."*

*"Removal from the register for consistently shoddy work"*

Regarding responsibility, the Land Survey Act 8 of 1997 states that the land surveyor shall be responsible to the Surveyor-General for the correctness of every survey carried out by him or her or under his or her supervision, and of every general plan and diagram which bears his or her signature" (section 11(b), pg. 14), seventy-one per cent indicated that the responsibility lies with the professional land surveyor, although it was suggested that increased responsibility should not result in a decrease in examination at the Surveyor-General(s) Office(s). A similar response was provided when asked regarding quality of work submitted. The question asked (section C, question 8) if they felt their work was at a standard that would warrant no or less examination. Forty-six per cent felt that the work they submitted was sufficient not to be examined and still maintain the integrity of the data at the Surveyor-General(s) Office(s), although concern was again raised that this should not result in a reduced examinations by the Surveyor-General(s) Office(s). The following quote validates this response, *"We are all human therefore we do make mistakes which the cadastre system cannot afford"*.

#### 4.5 Section D - Reduction in Examination of Data

In response to whether the Professional Land Surveyor(s) would be interested in a reduced examination process if they were to undergo further training or registration (section D, question 1), eighty-six per cent agreed that they would be prepared to sit an exam to make this reduction in examination possible. As to who should facilitate this process (section D, question 3), twenty-seven per cent said it should be PLATO's responsibility, sixty-five per cent said it should rest with the Surveyor-General(s) Office(s) and eight per cent indicated that a new private body should be established to manage this process (Figure 4.4). The examination section of the Surveyor-General(s) Office(s) suggested that whatever body takes responsibility, if this were ever to be implemented, then members of the existing Surveyor-General's examination team should be allowed to sit on the body/panel.

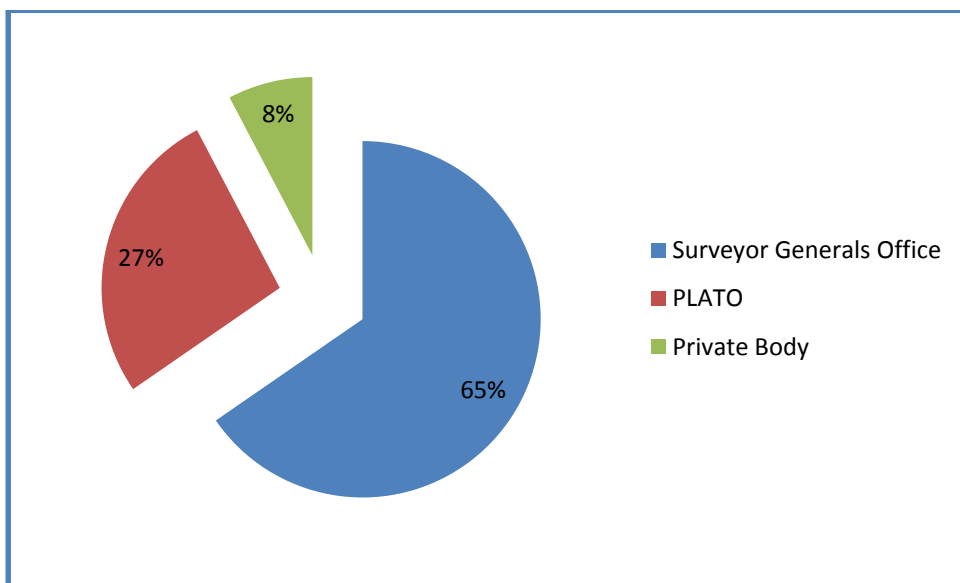


Figure 4.4: Responsibility if a reduced examination were to be introduced

Although the Professional Land Surveyor(s) seem generally positive towards a reduced examination of data at the Surveyor-General(s) Office(s), seventy-one per cent indicated that this would jeopardise the cadastral system that exists in South Africa. Below are some of the comments made:

*“Short term benefits of speedier examination times but potentially detrimental to the cadastre in the long term”*

*“Time - at long term degradation”*

A question (section D, question 6) was posed regarding a reduced examination process through an increased fee structure and sixty per cent indicated that they would be prepared to pay more for a speedier examination process.

The final question (section D, question 7) asked to the Professional Land Surveyor(s) was what they would change if they were running the Surveyor-General(s) Office(s). Some suggested ‘privatization’, others an increase in staff and improved salaries, better communication between the Professional Land Surveyor(s) and the requirements of the Surveyor-General(s) Office(s). In general, training and motivation were the main concerns and suggested areas of improvement.

#### **4.6 Conclusions**

In general, survey companies are small, comprising of various levels of registration from registered Professional Land Surveyor(s) through registered engineering surveyors to, registered survey technicians and surveyors that are not registered. Those practising in cadastral surveying have been doing so for a period greater than 15 years and submitting on average fifteen cadastral surveys per year to the Surveyor-General(s) Office(s) for examination.

All research participants agreed that the examination process is a necessity even though at times it can be a hindrance to the registration of land due to the delay associated with the examination of the data. The perception received indicated that the concern for the integrity

of the cadastral system supersedes the desire for a quick turn around and a reduced examination stage, or even no examination at all.

All Professional Land Surveyor(s) have had a survey returned to them for corrections, by the examination section, and seventy-five per cent pointed out that the reason for the return was justifiable and necessary to ensure the integrity of the cadastre system. This creates the opinion that there is a relationship between the Surveyor-General's examination team and the Professional Land Surveyor(s), which works as a synergy to ensure that the cadastre system retains its integrity and is respected by the sector.



## **CHAPTER FIVE**

### **Discussion**

#### **5.1 Introduction**

This chapter integrates and discusses the results of the questionnaire and the semi-structured interviews, and draws an interpretation regarding the necessity for the examination of data at the Surveyor-General(s) Office(s) or whether this examination of data is merely a hindrance to the examination process, by delaying the registration of land submitted by professionally register land surveyors. This chapter provides reasons as to why the system has substantially the same since the Land Survey Act 9 of 1927 and. This chapter will discuss international cadastral systems and attempt to ascertain whether those systems could be introduced into South Africa's cadastre system, focusing specifically on the reduced examination that occurs in Australia and New Zealand.

#### **5.2 South African Cadastral System**

Borgaerts and Zevenbergen (2001) provides a list used to classify cadastral systems. Based on this list, South Africa's cadastral system would be described as a decentralised, not integrated, legal, fixed boundary, Government-supported cadastral system. Decentralised, as South Africa's cadastral system is divided into eight regions/ provinces and each region managing the examination of data for that region, under the supervision of a Chief Surveyor-General (figure 5.1).

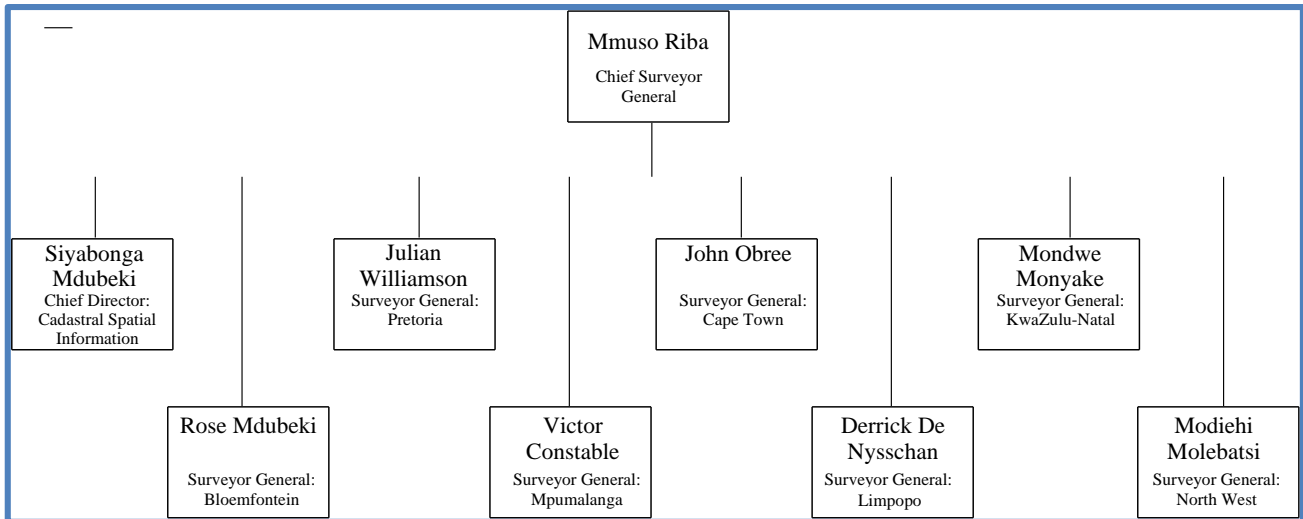


Figure 5.1: Structure of the South African Surveyor-General(s) Office(s) (Chief Surveyor-General, 2011)

South Africa's cadastral system and land registration/title deed system are not fully integrated and operate as two separate sections in the management of land. South Africa's cadastral system serves as a legal description through the use of a fixed boundary approach, resulting in boundary positions indicated through placed positions and not that of natural features as shown on a standard cadastral diagram (Appendix F & G). It is a Government-supported cadastral system, managed, funded and maintained by the State. A question was asked of the professional land surveyor at the end of the survey as to what they would do to improve the Surveyor-General(s) Office(s). One comment was '*Privatisation!*', which has been very successfully implemented into the Dutch cadastre-system, resulting in an independent organisation which according to Bogaerts and Zevenbergen (2001), has achieved a fifty per cent reduction in fees and is fully self-supporting and operating with an annual surplus.

### 5.3 Demographics of Survey Response

Most respondents have been involved in the survey field and dealing with the Surveyor-General(s) Office(s) on cadastre system for ten to fifteen years. This has resulted in a

familiarisation with the process and requirements of the Surveyor-General(s) Office(s) and resulting in a skewing of the results. It would have been interesting to have heard from more recently registered Professional Land Surveyor(s) to obtain their perspective regarding the examination phase and determine whether it is different from that provided by the more mature Professional Land Surveyor(s). It is a given that people can become comfortable with a situation which results in an unwillingness to change their ways and reluctant to try something new. However, newer surveyors may favour change and have the ability to change practises instead of conforming, which could have shown a difference in the outcome of the questionnaire. The question can only be answered with further research, it is however apparent from emailed responses that younger Professional Land Surveyor(s) are working in the engineering field and not in the field of the cadastral system.

#### **5.4 Examination Process**

The times have changed, along with vast improvements in technology and a high reliance on computer technology, which was confirmed by those partaking in the research questionnaire by stating that they are either fully reliant, or that computers play a large role in their abilities to fulfil their day-to-day office work. However, it would appear that the examination process has not progressed as effectively, as most of the examination process still maintains a high human interaction in the completion of an examination.

The research attempts to understand the professional land surveyor's perception regarding the examination of data and whether they felt it was a necessity to ensure the integrity of the cadastre system, or merely a hindrance by delaying the registration of land at the Deeds Office(s). Kentish *et al* (1999) asks why professionals need to have their work examined, and as a result, are protected from the consequences of their errors? The Land Survey Act 8 of 1997 states that (section 11(b), pg. 14), "the land surveyor shall be responsible to the Surveyor-General for the correctness of every survey carried out by him

or her or under his or her supervision, and of every general plan or diagram which bears his or her signature.” This stresses the point that the examination of data seems unnecessary however the research indicated a different perception from the Professional Land Surveyor(s) as quoted below, *‘Examination and approval of records and diagrams is the essence of our security of tenure’* and *‘Although Land Surveyors should take responsibility of their work, it can only be proven that the system is good or excellent or the opposite if checking thereof is done.’*

### **5.5 Sub-standard Work**

The Professional Land Surveyor(s) agree that sub-standard work should not be accepted and should be returned for corrections. However the question arises, can professionals not recognise sub-standard work and if it is sub-standard then why is it still being submitted? Williamson (1983) indicated that for a cadastral system to be beneficial it must contain a cheap, secure and efficient system to record and transfer interests in land. It would seem that data moving backwards and forwards in an attempt to become correct would not result in such a system, certainly not a cheap and efficient system. The perception provided by the examiners in this research, is that no real penalty exists for sub-standard work other than the delay of approval and the resubmission fee. This fee appears not to be at a value that would deter sub-standard work. The perception from the Professional Land Surveyor(s) is that an increased submission fee should be implemented, one that would deter sub-standard work. Other options presented were that there should be *‘removal from the register for constantly shoddy work’*, or *‘the land surveyor involved should attend additional training at his or her cost if more than 10% of his work is returned for correction’*. On consultation with the examiners, it was made apparent that although guilty parties can be submitted to PLATO and removed from the register if severe, this rarely happens due to a good relationship that has developed between the examiners and the Professional Land Surveyor(s). The question remains, whether a more serious approach should be taken

such as a large increase in re-submission fees, or the removal of professionals from the register. This would deter and improve the standard of work submitted to the Surveyor-General(s) Office(s) with the possibility of improving the examination period, or should the working relationship that has been established over time continue. Thus ensuring that the sum of the two parties provides an end product that is accurate, correct and ensure the integrity of our cadastral system?

### **5.6 Examination Period**

The perception of the Professional Land Surveyor(s) towards the examination period is that on average, the waiting time for an approved examination is approximately eight weeks. Although the questionnaire did not make reference to different types of submissions such as general plan or sectional title, which could result in lengthier examination due to more complex diagrams and survey records. Regardless, no professional land surveyor indicated an examination period which correlates with the two week period (ten days) advertised by the Surveyor-General(s) Office(s) (Chief Surveyor-General, 2009). Reference was made to a 'go slow' taking place at the Surveyor-General(s) Office(s) during 2010, which may have skewed the results based on a lengthier examination period. The South African Geomatics Institute (SAGI) chairperson R. van Yaarsveld indicated that the 'go slow' has resulted in R4.5 billion worth of property development being delayed in KwaZulu-Natal (Daily News, 2010). Based on this extreme value it is clear that the data being submitted to the Surveyor-General(s) Office(s) cannot afford to be tied up in lengthy examination process and forced delays by the Surveyor-General(s) Office(s), such as 'go slow'. It is apparent that the Surveyor-General(s) Office(s) needs to research new ways to improve the examination process through better use of computers, this does not seem to be the situation. The perception provided by the Professional Land Surveyor(s) of the services provided by the Surveyor-General(s) Office(s) was very positive with seventy-one per cent indicating general satisfaction, however fifty-seven per cent indicated that they were not

satisfied with the delays resulting from the examinations period. These values seem to contradict each other confirming the concern around the examination process. It must be mentioned that the duties of the Surveyor-General(s) Office(s) is not restricted to the examination of data, but also to the maintaining, updating and providing the data to the public, which could be the reason why there is this difference. Regardless, it seems that the examination process is a sector where improvement could take place by increasing the technology available and reducing human dependability.

### **5.7 Reduced Examination Process**

Bevin and Haanen (2002) and Falzon and Williamson (1998) indicated that in various jurisdictions of Australia and New Zealand a reduced examination process has been implemented through an accreditation scheme. This accreditation results in a lower percentage of submitted data being examined. The examination process is perceived more as an audit process, to check consistency and correctness with the requirements of submission, as opposed to an examination of data. The perception provided by the Professional Land Surveyor(s) towards a similar audit process being implemented into South Africa's cadastral system was not favourable, with seventy-one per cent indicating that if such a system were to be incorporated that the cadastre system would gradually decline, with comments such as, '*Short term benefits of speedier examination time but potentially detrimental to the cadastre in the long term*'. Eighty-five per cent indicated that although the future of the cadastre is their main area of concern, they would be willing to improve their qualification to enable them to benefit from a reduced examination. The perception from the examiners at the Surveyor-General(s) Office(s) was favourable towards such a system being implemented, however concerns were raised at who would provide and manage such a process. The Professional Land Surveyor(s) indicated that it should be managed within the Surveyor-General(s) Office(s) which was confirmed by the examiners who indicated that whoever manages such a process needs to ensure that members of the

examination process are members of the panel. The question remains, would a reduced examination process benefit South Africa? It would appear from the research that there is hesitation to adopt such a process. An alternative was proposed which indicated that sixty-one per cent of Professional Land Surveyor(s) would be willing to pay a higher submission fee to obtain a speedier examination process. This would not result in a reduced examination process, but rather make an examination a priority. Although this was not posed to the Surveyor General's office it could be a feasible option to fast track urgent registration by an increased fee. This could lead to the possible exploitation of the client to shorten the delays in payment for the professional land surveyor.

During the semi-structured interviews it was indicated that some Professional Land Surveyor(s) abuse the examination stage by submitting incomplete work with the intentions of the examiners finding the problem and either correcting it themselves or returning it to the Professional Land Surveyor(s) for correction. In the questionnaire (section C, question 4), ninety-six per cent indicated that they have never abused the system in this way. Abusing the examination section, besides being unethical and contrary to the Land Survey Act, will severely affect any decision on the part of the Surveyor-General to implement a reduced examination stage. In fact it will probably have the opposite effect of increasing the examiners scrutiny of the data submitted.

Redman (1998) indicated that training should be a first priority before implementing change as the lower the quality of the work submitted the greater the need for examination and the longer the examination will take to correct, however if data submitted is correct and in accordance with requirements the examination process is vastly improved. It would seem that South Africa is not ready for implementing new processes to reduce the reliance on the examiners at the Surveyor-General(s) Office(s). Instead training needs to be made

available to increase the excellence of those submitting data, which could open a door for implementing a reduced examination system in the future.

## **5.8 Conclusions**

The research establishes the perception of the Professional Land Surveyor(s) and the examiners as to the examination process and whether it is seen as a hindrance or as a necessity. Although the response to the questionnaire was poor, only forty-eight per cent responding and with that the possibility of the responses been skewed by more mature Professional Land Surveyor(s) responding and the 'go slow' at the Surveyor-General(s) Office(s), it would seem that the need for the examination process exists and that the present situation works and will continue. The perception is that both the Professional Land Surveyor(s) and the examiners are working together as a team to ensure that the stability, consistency and accuracy of the South African cadastre system remains. It is for this reason that little disciplinary action is taken against offenders submitting poor, sub-standard work. It is also for this reason that the time delays, although extreme during the time of the research with the 'go slow', are generally accepted. Professional Land Surveyor(s) showed resistance towards the adoption of other processes in operation in other countries, specifically the ten per cent examination which exists in Australia and New Zealand. It appears that people are conscious of the need for a robust, acceptable and creditable system which appears to be in place at present.



## CHAPTER SIX

### Conclusion

#### 6.1 Conclusions

The aim of this research was to document and discuss the perceptions of the Professional Land Surveyor(s) and examiners at the Surveyor-General(s) Office(s) towards the examination of cadastral data in KwaZulu-Natal, as necessary to ensure the integrity of our land tenure. A secondary aspect of the research was to establish the perception towards a reduced examination process/scheme.

The conclusion was that the examination of data is imperative to the integrity of the South Africa cadastre system, and although in many regards the Professional Land Surveyor(s) are dissatisfied with the time taken to examine, which could be seen as a hindrance to the approval of data, they are unwilling to change from the current examination process.

It seems strange that with greater than 15 cadastral surveys performed each year, totalling over 420 surveys per year by the respondents, and having worked in the industry for over fifteen years, one would expect perfection, that the quality would be, as Crosby (1979) indicated, "Zero defects – doing it right the first time". However, this is not the case and the examination process is still seen as a necessity, or perhaps the examination section is simply a reassurance for the Professional Land Surveyor(s) submitting data, or perhaps it is a necessity because of the incredible respect which the Professional Land Surveyor(s) have for the cadastral system. If this is the case it is reassuring to know that the cadastral system in South Africa will remain at an excellent standard, ensuring security of tenure for all South Africans who obtain registered land.

Regarding a reduction in examinations, although 85% of the Professional Land Surveyor(s), that were surveyed, are eager to see this take place, both the Professional

Land Surveyor(s) and the examiners are concerned for the future of the cadastral system, and the concern which comes with the unknown. The digital lodgement facility has been available for many years and still only a few Professional Land Surveyor(s) are making use of this facility, although all indicate that computers are hundred per cent necessary to complete their work. "The Surveyor-General(s) Office(s) in Cape-Town has been using the multimedia lodgement process since March 2007 with approximately twenty per cent (20%) of land surveyors submitting work in this way" (Engineering IT online, 2008). With only fourteen per cent of the respondents utilising this method, could this reluctance to use this method be a result of having to change? Change is challenging.

This research investigated the perception of the Professional Land Surveyor(s) and the examiners at the Surveyor-General(s) Office(s) regarding the need for the examination of data and whether it is a necessity or a hindrance to the registration process and the integrity of data stored at the Surveyor-General(s) Office(s). A questionnaire was developed and in consultation with PLATO distributed to all Professional Land Surveyor(s), operating out of KwaZulu-Natal, to obtain their perception towards the examination process. The outcome of the questionnaire was presented to the examination section at the Surveyor-General(s) Office(s), through semi-structured interviews, to acquire their response and obtain their opinion.

The final analysis is clear: the examination process must remain as it is, as it is seen by all who work with it that it is a necessity and, although there is interest in change it seems any change that takes place will be a slow and gradual process.

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## APPENDICES A – POWERS AND DUTIES OF SURVEYOR-GENERAL

6. (1) A Surveyor-General shall be in charge of the office in respect of which he or she has been appointed and shall, subject to this Act -

(a) take charge of and preserve all records pertaining to surveys of land which were, prior to the commencement of this Act, preserved as records in that Surveyor-General's office and which, after the commencement, become records of that office;

(b) before any registration is effected in a deeds registry, examine and approve or provisionally approve all general plans and diagrams which have been prepared in accordance with this Act and, when applicable, are in accordance with any statutory consent in so far as the layout is concerned;

(c) on the diagram of any piece of land -

(i) define the geometrical figure representing any portion of that land, the transfer of which has been registered in a deeds registry, and deduct the numerical extent of that portion;

(ii) define the geometrical figure representing any portion thereof for which a certificate of township title or registered title has been issued under the Deeds Registries Act, 1937 (Act No. 47 of 1937), and deduct the numerical extent of that portion; and

(iii) define the geometrical figure and make the necessary endorsements in respect of any servitude or lease over or on that land which has been surveyed in terms of this Act and registered in a deeds registry;

(d) cancel or amend in accordance with the provisions of any law any general plan or diagram;

- (e) prepare, certify and issue, at the request of any person and on payment by that person of the prescribed fees, copies of diagrams, general plans and other documents filed in his or her office and available to the public, and copies of general plans and diagrams registered in a deeds registry in the province concerned;
  - (f) compile and amend such cadastral plans as may be required, and generally exercise all such powers and perform all such duties as are by any law conferred or imposed upon a Surveyor-General, and perform such other functions as the Chief Surveyor-General may assign to him or her.
- (2) Any land surveyor employed in a Surveyor-General's office may, if delegated thereto by the Surveyor-General concerned, perform any function which may be performed in terms of this Act or any other law by that Surveyor-General and a Surveyor-General may delegate any power referred to in subsection (1)(c) to an officer in his or her office.

## DUTIES OF LAND SURVEYOR

### 11. A land surveyor shall -

- (a) carry out every survey undertaken by him or her in accordance with this Act, and in a manner that will ensure accurate results;
- (b) be responsible to the Surveyor-General for the correctness of every survey carried out by him or her or under his or her supervision, and of every general plan or diagram which bears his or her signature;
- (c) deposit with the Surveyor-General for the purpose of being examined and permanently filed in that Surveyor-General's office such records as may be prescribed in respect of any survey carried out by him or her for the purpose of, or

in connection with, any registration of land in a deeds registry, and in respect of any general plan or diagram prepared as a result of that survey, and in respect of any survey carried out by him or her for the replacement of a beacon; and

- (d) correct without delay, when required by the Surveyor-General, any error in any survey carried out by that land surveyor or in respect of any work related thereto due to failure to comply with this Act and take such steps as may be necessary to ensure the correction of any diagram, general plan and title deed based on the incorrect survey and to adjust the position of any beacon which he or she has placed in accordance with the incorrect survey.



## APPENDICES B - IMPROPER CONDUCT OF LAND SURVEYORS

12. (1) A land surveyor shall be guilty of improper conduct if he or she -

- (a) signs, except as provided in section 16 or in the prescribed circumstances, a general plan or diagram of any piece of land in respect of which he or she has not carried out or supervised the whole of the survey and field operations, and carefully examined and satisfied himself or herself of the correctness of any entries which may have been made by any other person in any field book, and of the calculations, working plans or other records in connection therewith;
- (b) signs a defective general plan or diagram knowing it to be defective;
- (c) performs, through negligence or incompetence, defective surveys or surveys to which adequate checks have not been applied;
- (d) makes any entry in a field book or other document, which purports to have been derived from actual observation or measurements in the field when it was not so derived;
- (e) supplies erroneous information to the Surveyor-General in connection with any survey, boundaries or beacons of land, knowing it to be erroneous; or
- (f) contravenes any provision of this Act or fails to comply therewith.

(2) The Chief Surveyor-General may, in respect of any land surveyor referred to in subsection (1)-

- (a) refer any complaint or allegation of improper conduct to the South African Council for Professional and Technical Surveyors established by section 2 of the Professional and Technical Surveyors' Act, 1984 (Act No. 40 of 1984), for enquiry in terms of section 29 of that Act; or

(b) apply to the court by way of motion for the suspension or cancellation of the right of that land surveyor to practise as such, and the court may thereupon suspend or cancel that right or make such other order as it deems fit.

APPENDICES C – Diagram examination docket

<b>Surveyor General</b>	
<b>DIAGRAM EXAMINATION DOCKET</b>	
Batch No: #1824/2010	SG. No: 2572/2010
Description: PTN 1 OF ERF 3297 DUNDEE	Date Received: 25/11/2010
Number of Diagrams: 1	
Surveyor /s:	Survey Record: SR781/2010
Submitted By:	
Return To:	
	Surveyor Ref:
Name of Checker:	File Reference: DUNDEE/90
Name of Examiner:	Examination Fees: 320.00

Passed to:			
1	Fees checked	16	District/L.A. checked
2	Designation checked	17	Checked against conditions of consent
3	Entered in numbering register	18	Property fully subdivided/Rem?
4	Data capture checked/captured	19	Purpose of diagram noted
5	Survey Record data compared	20	Office reference completed
6	Scale and plot checked	21	Withdrawals
7	Reg.Number, signature and date checked	22	Road Closures/Amendments
8	System, Constant and co-ords.Checked	23	Interdicts required
9	Noted on original	24	Survey Records examined
10	References to original checked	25	Established beacons/boundaries shown
11	Figure description checked	26	Beacons replaced : diagrams endorsed
12	Tenure Lines checked	27	Noted on compilation
13	Servitudes checked	28	GIS updated      Spatial Alpha/Num
14	Boundary description checked	29	Scanned
15	True North checked	30	Documents captured

1	P.T.B./L.A./Act 4/2001	Yes/No	1
2	Act 113/1991	Yes/No	2
3	National Road Act 7/1998	Yes/No	3
4	Agricultural Land Act 70/1970	Yes/No	4
5	D.F.A.	Yes/No	5
6			6



## Survey Questionnaire

Master Research project:

**The examination of Survey Records, a necessity or a hindrance.**

Researcher: Oliver Rowe (083 6529326)

Supervisor: Dr. Dorman Chimhamhiwa (033-2605719)

The purposes of this survey is to gather information, from registered members of the South African Council for Professional and Technical Surveyors (PLATO), with the view to assessing and evaluating the opinions of Professional Surveyor in regards to the Surveyor-General's (SG's) examination of records.

This Questionnaire can be completed and forwarded either by email or fax.

Email: [oliver@dut.ac.za](mailto:oliver@dut.ac.za) fax: 033 8458941

This questionnaire is completely confidential, and no information will be used for anything else other than this master research. There are no right or wrong answers and if you require clarification on any issues please don't hesitate to call. Please indicate with a ✓ the box that you feel is true for you.

On completion of this research an outcome will be email to all interested parties as to whether, **the examination of surveying Records is indeed a necessity or merely a hindrance to the flow of work.**

A big thank you for you kind assistance and participation.

### Section A: General Information

A 1. The name of the company at which you are employed (optional)

A 2. Number of Surveyors working within this company

1 - 3     4 - 6     7 - 10     10 <

A 3. Number of Surveyor that are registered with PLATO as;

a. Professional Surveyors (Bsc)

b. Professional Engineering Surveyors

c. Register Survey Technician

A 4. Your position in the company

Survey Field     Fieldwork and Drafting     Overseeing work     Manager / Owner

A 5. Length of Service within the company

1 - 2     3 - 5     6 - 10     10 <

A 6. Number of Years operating as a Surveyor fulfilling Cadastral work.

1 - 4     5 - 9     10 - 14     15 <

**Section B: Cadastral Surveys**

B 1. Do you feel that the examination process that accompanies submission of survey records is a  Hindrance  or a  Necessity  to the integrity of our cadastre system.

B 2. Please substantiate your answer above with reasons

.....  
.....  
.....

B 3. On an annual basis, how many Cadastral surveys does your company undertake?

1 - 4  5 - 9  10 - 14  15 <

B 4. Of these, how many require the examination of you survey records for submission purposes?

1 - 2  3 - 5  6 - 10  10 <

B 5. On average, what is the waiting period between submission and approval by examiners

4 weeks  6 weeks  8 weeks  10 weeks <

B 6. Are you satisfied with this waiting period Yes  No

B 7. Are you satisfied with the service given by the SG's office  Yes   
No

B 8. If you answered No to the above question, please substantiate you answer with reasons.

.....  
.....  
.....  
.....

B 9. To what degree are you reliant on computer to do your work, (5 being fully reliant, can't work without them and 1 being don't use them at all)

1  2  3  4  5

B 10. Do you make use of the Multimedia (PDF) lodgement option

Yes  No

B 11. If you are using this option, how has it benefitted you, (from a submission + Examination Perspective)?

.....  
.....  
.....  
.....

**Section C: Survey Records**

c 1. Have you every had surveys returned to you from the Surveyor-General(s) Office(s)

Yes  No

c 2. Of that which you have submitted how much has been returned at least once?

<10%  10-20%  20-50%  50% <

c 3. Did you feel that the reason for the returned data was justifiable, i.e. it was detrimental to the integrity of the cadastre system

Yes  No

c 4. Do you use the examination process to fix problem and insert data into your submission records, data that you didn't have time to obtain.

Yes  No

c 5. How often?

<10%  10-20%  20-50%  50% <

c 6. Do you feel that there should be penalties for substandard work, drawing etc?

Yes  No

a. If yes, what sort of penalties would you suggest?

.....  
.....  
.....

c 7. Do you feel that as a Professional, you should take more responsibility for work submitted and the SG's office less? (Less would be a reduction in examination or no examination)

Yes  No

c 8. In your opinion do you feel your submitted data is of a standard that would warrant no or less examination

Yes  No

c 9. If you were to run the examination section of the SG's office, what changes would you propose?

.....  
.....  
.....  
.....  
.....  
.....

**Section D: Reduction in Examination of Data**

D 1. If procedures were put in place to reduce the time factor, through an audited examination procedure, would you be interested. (E.g. Only 10% of data submitted is examined)

Yes  No

D 2. If, to enable you to receive a reduced examination required you to improve, would you be prepared to sit for that exam?

Yes  No

D 3. If the above were to take place, who do you feel should take responsibility for the process?

PLATO  Surveyor Generals Office  Private body

D 4. If a reduced examination process were to be established do you feel it would jeopardise the cadastre system of this country.

Yes  No

D 5. What do you perceive to be the benefits of a reduced examination system for the SG's office

.....  
.....

D 6. If the SG's office were to increase submission fees for a speedier examination process would you be interested

Yes  No

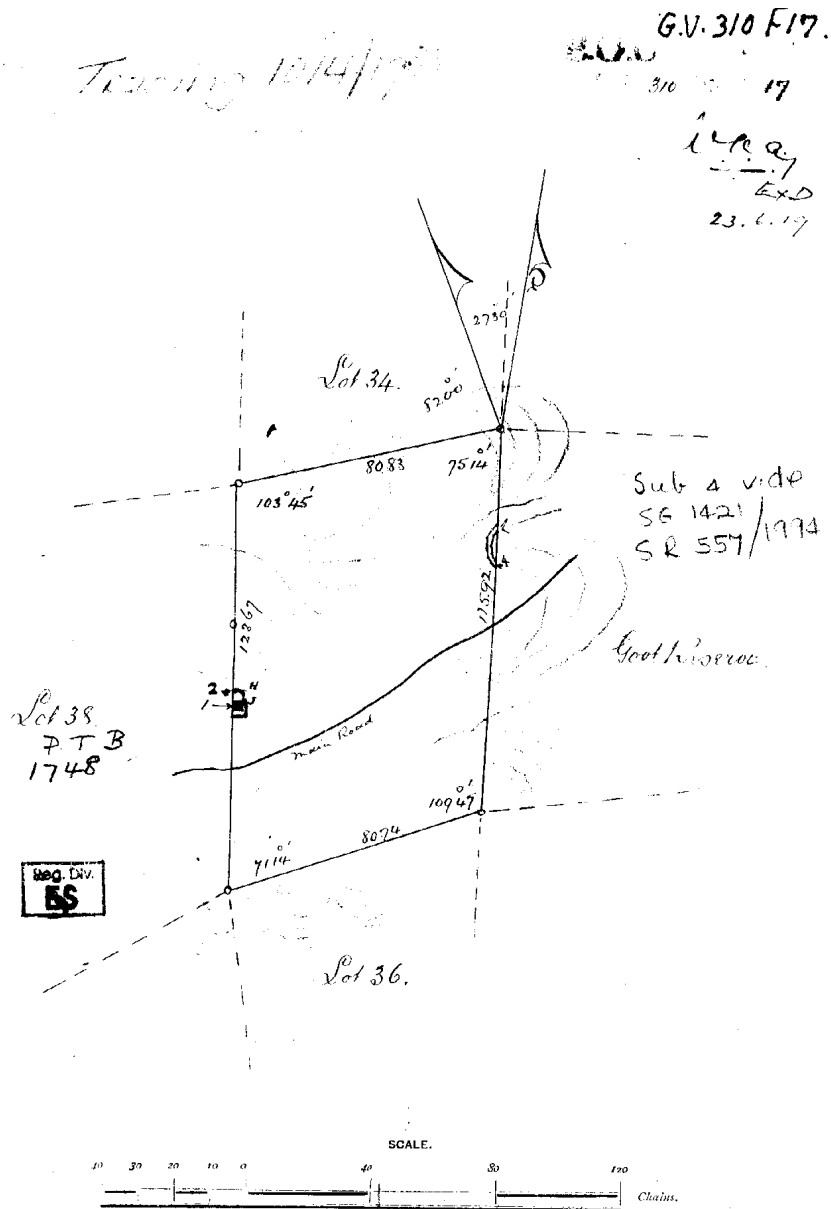


D7. In your opinion what would you do to improve the SG's office, if you were placed into a position that enables you to implement change?

.....  
.....  
.....  
.....  
.....  
.....

– END –  
Thank you for your participation

APPENDICES F - EXAMPLE SURVEY DIAGRAM (JUNE 1895)



The above Diagram represents a piece of Land, in extent 92 1/2 acres,  
3 roads, 30 perches, called Lot No. 35 Dronk Vlei Reserve, N° 9438  
 and being in the County of Pietermaritzburg, Colony of Natal.

It is bounded North by Lot 34, South by Lot 36.  
 East by Goat Reserve, West by Lot 35.

Surveyed by me,

*G.C. Williams*  
 Sworn Land Surveyor.

June, 1895.

S.R 34-804

ESNE ESNE 119, 133  
 COMPES-2B 6431

APPENDICES G - EXAMPLE SURVEY DIAGRAM (DECEMBER 1986)

TARBOTON, HOLDER, ROSS & PARTNERS  
SUB-DIVISIONAL DIAGRAM

SIDES	METRES	DIRECTIONS	CO-ORDINATES		S.G. No. <b>4401 / 1986</b>
			Y SYSTEM	Lo 31° X	
		Constants		0,00	
AB	39,62	310 39 30	A +	55 549,36	+ 3 200 000,00
BC	27,12	40 39 30	B +	55 319,30	+ 79 230,41
CD	39,62	130 39 30	C +	55 336,97	+ 79 256,23
DA	27,12	220 39 30	D +	55 367,03	+ 79 276,80
		249	Δ +	59 886,96	+ 79 250,98
		274	Δ +	57 872,04	+ 82 144,68
					+ 86 418,09

Approved  
*S. de Wet*  
Surveyor-General  
1987-03-02

**REG. DIV. FT**

**BEACON DESCRIPTIONS**  
 A, C, D . : 16mm iron peg .  
 B : Drill hole in concrete .

**SCALE: 1 : 750**

The figure A B C D  
 represents 1 075 Square Metres of land, being  
SUB 58 (OF 14) OF LOT 1562 PIETERMARITZBURG  
 situate in the City of Pietermaritzburg, Administrative District and Province of Natal.  
 surveyed in November and December 1986  
 by me *[Signature]* Land Surveyor

This diagram relates to No. <i>D/17 6399/1988</i> Registrar of Deeds.	The original diagram is S.G. No. 4400 / 1986 Transfer/ <del>Grant</del> No. 13540 / 1971	File No. PMB 1510 (Vol v) S.R. No. 1736/1986 Comp. FT - 5D - 4B Degree Sheet 53
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