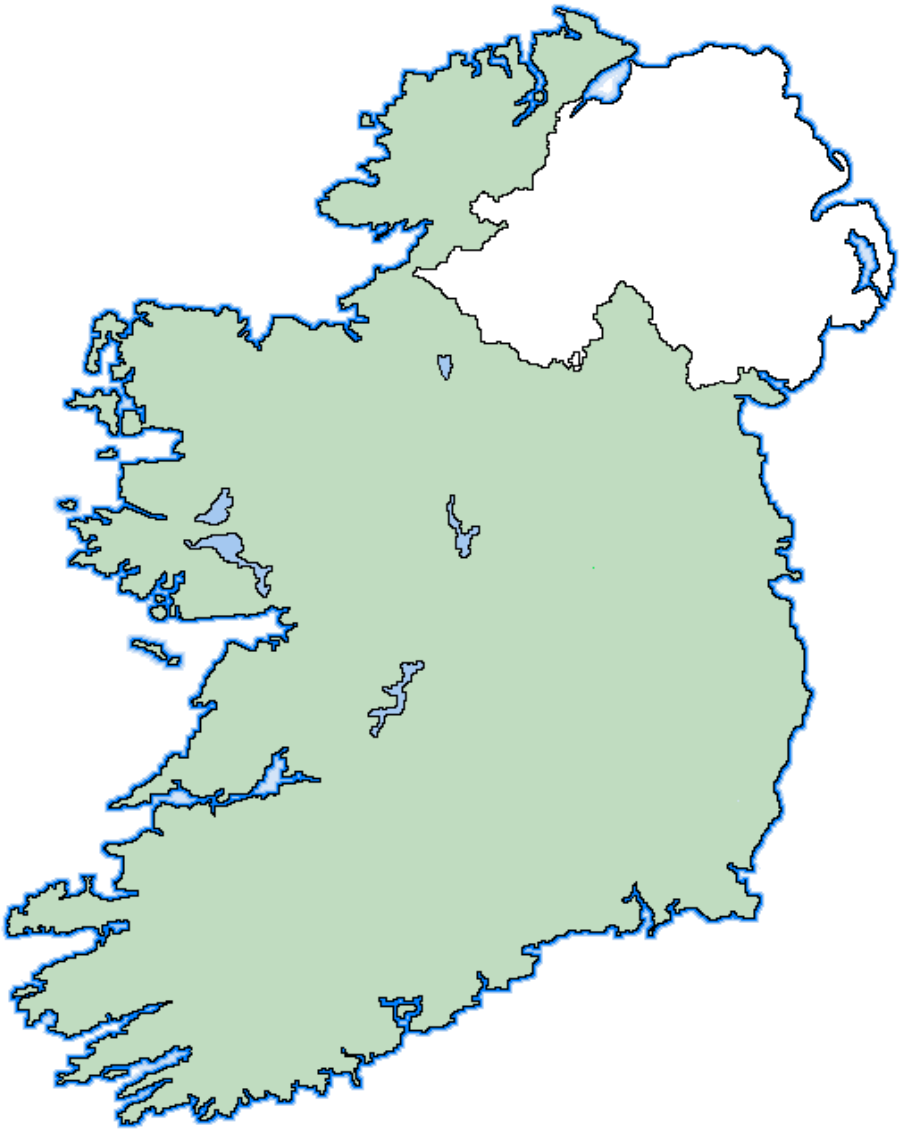
Mapping for

Property Registration

in Ireland



The Irish Institution of Surveyors

Mapping for

Property Registration

in Ireland

Report of a Seminar examining the need for change of the present Land Registration System used in Ireland

The Irish Institution of Surveyors

1998

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Acknowledgements

I wish to offer my sincere thanks to the members of the Irish Institution of Surveyor's committee who examined the Land Registry's "Mapping Procedures for Registration Purposes". They were Eugene McGovern (Dublin Institute of Technology), Pat Shine (Dublin Corporation), Mike Flynn and Brendan Arrigan (Ordnance Survey Ireland), who were ably led by P. J. Byrne (Fingal County Council) as chairman.

I also wish to extend my gratitude to the management of the Land Registry for agreeing to work with us on our examination of the application of their procedures, and particularly to Aidan Mullaney for his valuable contributions.

Finally, many thanks are also due to P.J. Byrne (Fingal County Council), Frank Corcoran and Paddy Prendergast (Dublin Institute of Technology) who organised this seminar on behalf of the Institution.

Muiris de Buitléir F.I.S.
President - The Irish Institution of Surveyors

Introduction

The Land Registry updated it's "Mapping Procedures for Registration Purposes" in February 1996. In June 1996 the IIS established a committee to examine and prepare guidelines to assist its members in the preparation of mapping for property registration purposes in response to the publication of the updated procedures by Land Registry. Some of the IIS members had experienced difficulties in the practical implementation of these procedures in the past, and felt that some clarification would be useful, which would be of mutual benefit to the IIS members and the Land Registry.

The IIS intention was to produce a booklet on "*Guidelines for mapping for Property Registration in Ireland*" which incorporated the Land Registry's "Mapping Procedures for Registration Purposes". We wished to ensure that :

a) the guidelines would be practical in their application, and not just theoretical
b) IIS member's submissions would fully comply with Land Registry requirements
c) international standards for mapping property boundaries would apply

Whilst collecting information for the booklet it became obvious that there was a need to make the process as inclusive as possible. Initially Land Registry was approached to liaise with us with our investigation, but eventually we decided to host a seminar to widen the debate to include all the professional groups involved.

The seminar on "Mapping for Property Registration in Ireland" was held in the Grand Hotel, Malahide, Co. Dublin on Thursday 30th April 1998. The aim of the seminar is to provide a forum to debate the technical, legal and policy issues relating to the operation of the mapping archive of property boundaries by the Land Registry. The intention is to assess the need for change of the current system of land registration in Ireland which was initiated in 1891 and now needs to be reviewed.

Finally, I wish to indicate that our initial examination of Land Registry procedures and the subsequent seminar did not include any analysis of the situation pertaining to Northern Ireland. This analysis is being deferred to another day when a more inclusive examination will hopefully be conducted with a view to a harmonisation of services within Ireland and within Europe.

W.P.Prendergast F.I.S.
President - Council of European Geodetic Surveyors

Official Programme

08.45 a.m. Registration.

Session 1 *Chaired by Mr Muiris de Buitléir F.I.S., President of the Irish Institution of Surveyors.*

09.30 a.m. **Land Registration Systems in operation in Ireland** by Mr Chris Hogan, Deputy Registrar of the Land Registries.

09.50 a.m. **Mapping Procedures for Land Registration** by Mr Aidan Mullaney, Chief Superintendent of Mapping, Land Registry.

10.10 a.m. **Mapping Difficulties being experienced within the present System** by Mr P.J. Byrne M.I.S., Vice-President of the Irish Institution of Surveyors.

10.30 a.m. Discussion.

11.00 a.m. Coffee

Session 2 *Chaired by Mr Jim Higgins T.D., Fine Gael Shadow Spokesman for Justice, Equality and Law Reform.*

11.30 a.m. **Current Practice and flaws in the present mapping system and Feasible Solutions** by Mr Rory O'Donnell, Law Society.

12.00 a.m. **Summary of Statute Law and an Investigation of Case Law with respect to Property Boundaries to identify the current position** by Mr Frank Corcoran, Lecturer in Property Law, Dept. of Surveying, Dublin Institute of Technology.

12.30 p.m. Discussion.

01.00 p.m. Lunch

Session 3 *Chaired by Mr Paddy Prendergast F.I.S., President of the Council of European Geodetic Surveyors.*

02.30 p.m. **Ordnance Survey large scale mapping for Property Registration** by Mr Richard Kirwan F.I.S., Director of Operations, Ordnance Survey Ireland.

02.50 p.m. **Graphical Registration Systems for Property Boundaries** by Mr Paul Burke M.I.S., Managing Director, Precise Control Ltd., Cork.

03.10 p.m. **The Minister for Justice, Equality and Law Reform, Mr John O'Donoghue T.D.**

03.20 p.m. **Co-ordinate Registration Systems for Property Boundaries** by Herr. Klaus Rürup, Vice President of the Council of European Geodetic Surveyors.

03.40 p.m. Discussion.

04.00 p.m. Official Closing and Coffee

Land Registration Systems in Operation in Ireland

by

Mr Chris Hogan, Deputy Registrar, Land Registry

Introduction

There are two separate systems in Ireland for registering property transactions. One is for the registration of deeds and the other for the registration of title. In this context a "deed" is a document in writing which affects property and a "title" is the ownership of an interest in property.

The systems were established at different times and under different legislation. In each case the legislation provided for:-

(i) the establishment of the Registry,
(ii) the class or type of register,
(iii) the form of the register,
(iv) the manner of registration,
(v) the effect or consequence of registration,
(vi) the person or authority responsible for the registration.

They operate from different locations, maintain different registers, in different forms, effect registrations differently, and the consequences of such registration differs from one to the other.

While they differ in many respects they share :

a common purpose - (the protection of purchasers),
a common registrar - (The Registrar of Deeds & Titles), and sometimes
a common deed (affecting different properties or affecting different interests in the same property).

One is described as dealing with registered property, the other with unregistered property,
One deals mainly with rural property, the other mainly with urban property,
One is regarded as compulsory, the other voluntary,
One is map based, the other is not,
And finally, one is designed to replace the other.

Registration of Deeds

This system was established by The Registration of Deeds Act, 1707. It is administered by the Registry of Deeds, located at Henrietta Street, Dublin 7. The deed is produced there together with a summary thereof called a memorial. The memorial is required to contain certain particulars as follows:

(a) the date of the deed,
(b) the names and descriptions of the parties to the deed,
(c) the names and descriptions of the witnesses,
(d) a statement of the lands affected to include the County and barony or the city, or town, and parish as set out in the deed.

The memorial is retained in the Registry and filed according to the time of receipt there. The deed is endorsed to certify such registration, showing the date and time and the reference under which the memorial is filed e.g. Book and number, and is returned to the solicitor. Registration is of the fact that such a deed exists and that it has a particular priority. As between a registered deed and a conflicting unregistered deed, the registered one will prevail and as between two conflicting registered deeds, the one registered first in time will prevail. Registration is voluntary and, with the exception of an affidavit of judgement, does not add any legality or validity to the deed.

The register of deeds is the accumulated memorials. From them is generated an index of names of persons disposing of property and a book of abstracts of those memorials.

Maps are not required for deeds or memorials. They may of course be used with the deed and also with the memorial. Evidence of the ownership is provided by the actual deeds. Apart from the priority, the advantage of registration of deeds is the availability of the memorial, in the event of the loss of the original. A certified copy of the memorial may be accepted as evidence of ownership in lieu of the missing original.

The 1707 Act is still in force. It was amended by the Registration of Deeds (Amendment) Act 1832 and extended by subsequent amending acts.

This system applies to deeds affecting property wherever situate in the State. However, with the introduction of the Registration of Title system in 1891, the concentration of same on rural properties and the compulsory nature of that system, the original Registry of Deeds system is now largely but not exclusively confined to urban properties.

Registration of Title

This system was established under the Local Registration of Title (Ireland) Act 1891. It was and is administered by the Land Registry. This consisted of a Central Office located in Dublin and a local office for each county outside Dublin. The local office is located in each of the Circuit Court offices outside of the city and county of Dublin. Since August 1997 the ''Central Office'' includes a decentralised office in Waterford. The Waterford local office has been closed.

The ownership of property is registered. Deeds similar to those for the Registry of Deeds, are lodged and retained in the Land Registry. Registration is of the effect of the deed, i.e., A B of ..... is full owner. Subject to certain limitations registration is conclusive and is guaranteed by the State, which will compensate any person who suffers a loss by reason of any error originating in the Land Registry.

Registration is generally compulsory. The interest purported to be transferred will not actually vest in the purchaser until registration is completed.

There are three separate registers - one of ownership's of freehold interests, one of ownership's of leasehold interests and one of ownership's of other interests. Such other interests include sporting rights, fishing rights, fee farm rents payable out of freehold interests, charges, judgement mortgages, etc.

Each register is divided into 26 parts, one for each of the 26 counties. Each county division is divided to reflect individual ownerships. Each ownership is registered on a folio and is numbered sequentially, e.g., Folio 1234 (pre 1970), and 1234F (post 1970) (both freehold), 1234L (leasehold) and 1234S for the third register, called the subsidiary register, all say Co. Dublin. There is in excess of 1.2m live folios in all.

Each folio is divided into three parts. [The earliest freehold folios were not so divided.]
Part I - describes the property, the title to which is registered on that folio. Each folio may comprise an interest in one or more separate properties or plots. The description will identify the Townland and Barony in which the property is located together with the area (if known), or the street parish and town. It will also contain a plan reference number for the map on which the property is identified. (All properties in respect of which a title is registered must be identified on a Land Registry map.) It will also contain a reference to any appurtenant easements or other rights which may be attached to the ownership registered.

Part II of the folio describes the owner of the folio and the nature of his interest in it. He may be the full owner or a limited owner, i.e., limited for any period or circumstances. It will also indicate the quality of title. It may be absolute or qualified or possessory.

Part III describes the burdens that affect the title, e.g., mortgages, easements, leases etc. Where a lease is registered as a burden the ownership or title of the leasehold interest can be registered on a leasehold folio. If it is a burden on a

leasehold folio, the title of the lease or sublease may be registered on another leasehold folio.

Where individual filed plans or maps are available in respect of a registered title, one is attached to the folio. Where the folio is computerised, the filed plan is filed separately. Where filed plans are not available, the property is identified on a master map which is stored elsewhere in the Registry.

Records generated from the registers are an index of names of registered owners linking the name with relevant folio number and an index of the lands the subject of the registered titles linking the map with relevant folio number.

The original folios, maps and indexes are maintained in the Central Office of the Registry, located in Dublin and Waterford. Those at present in Waterford relate to counties Waterford, Cork, Kerry, Limerick, Tipperary, Laois and Offaly. Those relating to counties Carlow, Kilkenny and Wexford are due to be located there by the end of 1998.

They are available for public inspection and searching. Certified copies of the folios and maps may be obtained in person or by post. Fees are payable for such inspection, searching and copying, as set out in the Land Registration (Fees) Order 1991 [S.I. No.363 of 1991]

Duplicates of the relevant folios and index of names are kept in the respective local offices in each of the 24 counties other than Dublin and Waterford. These are also available for local public inspection and copying, on payment of the appropriate fee.

Duplicates of the maps are not available in the local offices. Duplicates of the index of lands are not kept there either.

Evidence of the ownership of registered property is provided by a certified copy of the folio and map or a certificate of the title, called a Land Certificate.

The 1891 Act has been replaced by the Registration of Title Act 1964. The Land Registration Rules 1972 to 1986, made under the 1964 Act, are the rules currently in operation.

Upon first registration of a title in the Land Registry, a memorial of such registration is filed in the Registry of Deeds effectively closing that Registry to any further deeds affecting that title or ownership.

The Land Registry Maps

The latest available Ordnance Survey maps for the State are kept in the Land Registry pursuant to Section 84(1) of the 1964 Act.

The Registrar may in any particular case adopt any other map as she considers satisfactory [Section 84(3)].

On such maps is marked or defined the property the title to which has been registered. Such maps then become the Registry Maps [Section 84(2)].

Rule 174 of the Land Registration Rules 1972 provides as follows:
" The Registry map shall include-

(a) general and/or index maps showing thereon the position and extent of every registered property,
(b) individual plans of registered properties (otherwise known as filed plans) which may be annexed to the folios of the register in which such properties are registered or may be filed separately in the Registry,
(c) plans referred to in Rule 30,
(d) any map adopted under the provisions of Section 84 (3) of the Act.

The maps maintained for property in all areas shall as far as possible, be on the 25 inch or such larger scale adopted for a specified area as the Registrar may direct. Where this is not feasible maps may be maintained for such areas and on such scale as the Registrar allows.

Where a map on a particular scale is adopted for a specified area, all plans of property in that area shall be shown on the scale adopted for the area."

Rule 3 of the Land Registration Rules 1986 provides as follows:
" The maps maintained for property in urban areas shall as far as possible be on the 1/1000 scale or such other scale as the Registrar allows.

All plans of property in such areas shall be shown on such scale with necessary or obvious adjustments to conform to Ordnance detail or with such consents or after such enquiries or notices as the Registrar may direct."

Rule 175(2) of the 1972 Rules provides that:
Every plan shall be defined on the registry map by an edging in colour or otherwise as the Registrar may deem convenient in a particular case and shall have a number or symbol thereon; and the property described in each folio shall be identified therein by a reference to its plan or plans on the registry map.

The marking or defining on the Registry map shall not however be conclusive as to the boundaries or the extent of the land [Section 85].

Every application for registration of title for the first time is to be accompanied by a plan of the property drawn on the current largest scale map published by the Ordnance Survey [Rule 15(1)(c)].

Where the property comprises a flat, or floor, or part of a flat or floor, of a house, or a cellar or tunnel, or mines or minerals or an underground space apart from the surface the plan drawn on the largest current scale map published by the O.S. of the surface under or over which the property to be registered lies shall be accompanied by such other plans, sections or other description as the Registrar may deem necessary [Rule 30(1)]. Such other plans are most frequently referred to as multi-storey plans.

Sub-divisions of registered properties are to be shown by a plan drawn on the current largest scale map published by the O.S., unless such part is clearly defined on the existing Registry map (Rule 56). Such sub-divisions are effected by allocating a new plan number to the new plot, amending the area on part 1 of the original folio, and opening a new folio for the new plot.

The Registry map is open to public inspection [Section 84(2)]. Rule 198(1) provides for the inspection of the maps and folios. "Any person, on payment of the prescribed fee, may search in the registry maps, the index of names, the index of property and the folios of the registers, in the hours during which the Registry is open to the public. Copies of maps or folios or extracts from folios may be obtained on payment of the prescribed fee."

Any person may request the Registry to conduct an official search and to certify

(a) whether a named person is entered on the names index of a county and if so, the folio reference of the register in which the name of such person appears;

(b) whether the ownership of a parcel of land to be identified by a plan drawn on the current largest scale map published by the O.S. is entered in the register of ownership [Rule 190].

The registry maps are in paper form. They are strengthened with linen backing. Regrettably they are subject to damage as a consequence of constant handling and require to be re-constructed from time to time. As the Ordnance Survey revises its maps, The Land Registry should revise its map also.

We are aware of the developments and trends in digital mapping. However in view of the costs associated with the of data capture of the Registry map record, digital mapping is not an immediate option for the Registry.

Mapping Procedures for Land Registration

by

Mr Aidan Mullaney, Chief Superintendent of Mapping, Land Registry

INTRODUCTION

For many years the Land Registry has had its mapping procedures. They are a set of written procedures that were laid down for the benefit of Land Registry's mapping staff and the members of the public so that both might comply with the legal mapping requirements of the Registration of Title Act, 1964 and its associated Rules.

Procedures were developed for applicants and their agents so that there would be a standardised approach to the preparation and lodgement of maps. Similarly, 'in-house procedures' were formulated to ensure a standardised approach to the recording of the data submitted into one coherent map record.

Under Land Registry's Strategic Management Plan both of these procedures are currently being reviewed. With the introduction of new technology the needs of Land Registry's customers are changing. The Registry itself is also undergoing change. It is to be re-constituted as a semi-state body.

Today's seminar hopefully will raise many issues. The Land Registry can only gain from this experience by listening to its customers' ideas and requirements and incorporating them into any new procedures that will emerge under the Registry's strategic plan.

At the present time the Land Registry deals with maps in paper format only. It is recognised that this situation may change in the near future. However, it is also recognised that the paper map will be around for many years yet and hence with this in mind the procedures were up-dated and some new changes introduced especially with regard to multi-storey registrations.

The revised documents issued early 1996 in five separate leaflets, namely, LR Map 1, 2, 2A, 3 and 4. These are not new documents but just up-dated versions of existing ones and every one should have copies in their hand-outs.

As those assembled here to-day are primarily concerned with the 'application map' procedures it is proposed to deal with these first, however, it must be understood that 'in-house' procedures also have an effect on the way the property is finally mapped onto the Land Registry map.

THE APPLICATION MAP

The 'Application Map' is the map lodged with a dealing and is the map referred to in the Deed of Transfer.

The standard of the application map is always dependent on three things:

(i) the base map or framework on which the new boundaries are shown
(ii) the accuracy of the survey work
(iii) the accuracy of the plotting

The application map which shows the location and extent of a property submitted for registration is the most important map as far as the Land Registry is concerned. If the application map is substandard the resulting Land Registry map will also be substandard. As copies of Land Registry's map (filed plans) are frequently used as the base map or framework for further application maps it is very clear that errors once they are introduced into the mapping system can cause major problems for subsequent applicants.

If the Land Registry map is to reflect the customers' intentions the map lodged must do likewise.

Bearing in mind that the application map is the only map that the Registry has recourse to, it is essential that this map be accurate at the time of registration and

that the physical qualities of the map document itself be such that it will retain this accuracy, as this map may have to be referred to at any future date - maybe 100 years later.

Application Map Procedures

There are basically three different types of application maps:

(i) Maps for single properties
(ii) Maps for development schemes
(iii) Maps for multi-storey registrations

As already stated there are five separate leaflets relating to mapping. These outline the requirements for application maps and the procedures to be employed in lodging these maps.

The main points on each leaflet are:-

LR Map 1

LR Map 1 deals with the general requirements for **all** maps lodged with applications for the registration of property in Land Registry.

The Land Registry rules, 1972 (*Rule 56*) provide that all application maps be drawn on the current largest scale map published by Ordnance Survey (*an original*) unless the part dealt with is clearly defined on the Registry map and may be clearly identified thereon from the description in the instrument or unless there is a plan thereof on some monument of title sufficient to identify it on the registry map.

Land Registry's own mapping procedures allow that the application map may in addition to Rule 56 be drawn on a copy of the Land Registry filed plan (if suitable) or on a computer-generated map (provided it is to Ordnance Survey standards with regard to both projection, accuracy, scale and currency).

Provision is also made for accepting maps at a larger scale to that published by the OS to accommodate registrations which cannot be unambiguously shown at the largest scale published. Such an enlargement must be accompanied by a location map.

LR Map 2

LR Map 2 deals with a special arrangement for application maps for development schemes - i.e. a development of five or more sites.

Briefly, the mapping requirement consists of **two** identical drawings of the development on:

original OS maps
or, if suitable, certified copies of the Land Registry filed plan
or computer-generated maps.

The procedure is that both maps are stamped with an 'approval stamp'. One is retained by the Registry and the second is returned to the vendor. The application map for any property on this approved map will be a photocopy of the original map which was returned to the vendor with the particular site marked and numbered thereon.

This arrangement was introduced to accommodate developers who wished to sell sites/properties. It is important to stress here that the requirement is that when a development scheme plan is submitted for approval it should reflect the boundaries on the ground (See par.2.5 - LR Map 2). This mapping arrangement often causes problems for the Registry because rarely do the development plans submitted match the final completed development as surveyed by the OS. This would indicate that either the survey work is very poor or that it was never done. With the proliferation of housing developments, more and more Land Registry time is lost trying to rectify these discrepancies.

When the new up-to-date OS map issues for the development it sometimes becomes apparent what large differences can exist between the 'layout' and the

'as built' position. This is not always due to carelessness in survey work, it is often due to unforeseen ground conditions forcing the site overseer to move a few feet this way or that to get around rock or some other hidden feature. This can be done without any regard to the consequences for the Land Registry and its customers. Quite small 'site adjustments' are known to have caused quite large headaches for the Land Registry and some of its customers.

LR Map 2A

LR Map 2A deals with the special requirements for multi-storey registrations.

The mapping requirement in these cases involves recording of three-dimensional registrations on a two-dimensional map.

The procedure here is that three identical drawings of the development are submitted for approval along with a location map. As with the Development Schemes the drawings are stamped approved and one copy returned to the vendor. The application 'map' for the registration of any floor or apartment will be a photocopy of the approved drawing.

The first application for registration of a multi-storey property within a building must be submitted with a plan of all floors or levels within that building.

There must be a written statement with each application for registration that all necessary construction for that property has been completed. (See Par. 3.3 - LR Map 2A)

As the mapping of multi-storey registrations is done within a book system and not on the Land Registry office map there is a requirement that the drawings submitted be A3 in size only.

The only part of these drawings/plans that will become map detail are the outsides of the main structural walls of the building hence there is generally no problem reconciling multi-storey developments with up-to-date OS detail.

LR Map 3

LR Map 3 deals with maps produced from a computerised system and its requirements apply to all application maps lodged with dealings. The acceptance of paper output from digital systems was to accommodate those customers who had purchased maps in digital format from the Ordnance Survey. The requirement that non-OS detail be clearly recognisable stems from the fact that the Registry always wishes to know whether a boundary is OS detail or not as the Act ties the Registry to the OS map.

LR Map 4

LR Map 4 deals with issues when the applicant doesn't comply with the requirements in the previous notices. The eight points listed on the top of the front page of this document gives a good summary of the important mapping requirements for application maps.

General

It would be good advice for anyone preparing a map for registration purposes to inspect the Land Registry map first, (a) to establish the location of the registered boundaries (which may not agree with the boundaries on the ground) and (b) to ensure that there has been no further registrations since the date of issue of the copy of filed plan.

THE LAND REGISTRY MAP

The standard of the Land Registry map record depends on three sources of map data, namely,

i. data supplied by the OS topographic maps
ii. boundary data supplied by the application map
iii. the amalgamation of both of data sets (i) and (ii) above by Land Registry mapping staff into a composite map

Because all of these three datasets can be used in the production of application maps all three can have a bearing on the quality of the Land Registry map.

There are two aspects to 'in-house' Land Registry mapping.

i. The initial mapping from the application map onto the official Land Registry map
ii. The updating of the map according as the OS produce new maps or according as the Land Registry map through usage needs replacing

The Land Registry can only map on their office sheets what is presented to them on the application maps and if a new boundary on an application map does not conflict with mapped location of existing boundaries the Registry will accept the application map as correct.

The Ordnance Survey were and are always revising their maps. At the present time their revision programme is in top gear and this in turn is causing problems for the Land Registry who, under Section 84(1) of the Act, "shall keep in the central office the latest available Ordnance Survey maps for the state". Coupled with this is the normal wear and tear on office sheets and the result is that the mapping section of the Registry is over-stretched.

In this situation the registering of new properties has to take precedence over the up-dating of the record, hence the public may have to live with maps that may not be the latest edition available from the OS.

In-house Procedures

There are in-house procedures laid down to cover two main aspects of Land Registry mapping work:

i. the creation of the composite map record, and
ii. the maintenance of the Land Registry map - referred to as map reconstruction and revision.

(Other major functions of mapping staff within the office are the preparation of filed plans and map searches).

The procedures for all mapping functions are contained in the what are called Practice Directions and General Mapping Office Notices. These documents are now in the public domain and are available for perusal by anyone who wishes to do so at any of the Registry's public counters or on the Internet.

Practice Directions Nos. 12 and 21 deal with mapping issues. The Mapping Office Notices deal with issues that arise in relation to the implementation of the Practice Directions or actual approved changes to the Practice Directions themselves.

The main thrust of these in-house procedures is to ensure uniformity of mapping practice across the Registry. With Land Registry mapping staff working in four different buildings it is imperative that these practices are rigidly adhered to.

Set out very briefly hereunder are the normal procedures that take place when a map is submitted with a dealing.

i. The map is checked to see if it complies with the requirements of LR Map 1, LR Map 2 etc. i.e. if it is an original OS map , original copy of filed plan, proper size, proper scale etc.
ii. The map is checked for boundary conflict.
iii. The map is checked with the deed of transfer to ensure compatibility between the two documents.
iv. Any new boundaries are marked on the official Land Registry map by scaling from the application map. (Scaling takes precedence over dimensions)
v. The new subdivided parcel gets a new unique plan number on the map. This same plan number is entered on the parent folio and then transferred onto the new folio.
vi. This plan number is also entered in the Townland Index Book which is the only cross reference between the map and the folio.

Areas

Generally, the Land Registry does not get involved in the computation of areas, it accepts the areas as calculated by the applicant. Folios of less than 0.4 ha(1 acre) will not necessarily show areas. All other folios will show the acreage as shown in the documents lodged. The onus is on the applicant to compute the area correctly.

Centre of Roads, Streams etc.

Generally, Land Registry map to the centre of adjoining public roads, but if it is the customer's wish to register a subdivision to the roadside fence the Land Registry will comply. Similarly, registrations are often shown to the centre of streams that run between properties or other ground features that appears as a double line on the map.

Accuracy & Errors

It was always the intention that the Land Registry map would be an accurate map and not just an index to properties. Also, the public's perception of what information can be taken from the map would indicate that they expect an accurate map. Yet accuracy, the most important attribute of the map is beyond the control of the Registry except of course for the 'in-house' scaling and plotting.

Errors unfortunately do happen and usually come to light under three circumstances;

i. An accurate application map discloses a conflict with an existing registration,
ii. Customers inspect either L.R. maps at the public counter or copy of their filed plan and draw the Registry's attention to the error, or
iii. During the reconstruction/revision process, the registered boundary does not agree with the new Ordnance Survey detail.

There are specific in-house procedures which are laid out in the Practice Directions and General Mapping Notices to deal with errors. The following are the main procedures in relation to solving errors:

i. The resolution of any mapping error always requires that the application map(s) be consulted
ii. The resolution of errors on application maps may necessitate Deeds of Rectification which can be a costly and a time-consuming exercise both for the Registry and its customers
iii. The rectification of errors in the Land Registry map caused by the Land Registry staff may be achieved with the consent of the parties. Failing such consent, an order of the court would be necessary.
iv. When the map record is being updated onto a new map the Registrar does allow Ordnance Survey detail to be adopted within certain tolerances
v. Adoption of boundary changes beyond the limits of the tolerances require the consents of the relevant parties

In order that the data can be reliably taken from one map and plotted on another it is necessary that the physical quality of the original document is such to enable the location and extent of a property to be established on the office sheet. Unfortunately, it is only the physical attributes of the paper map that the Land Registry can check.

As stated, the public believe that the LR map is accurate, yet the same public will get all kinds of non-professionals to prepare the application maps. As there is no legislation governing this, the non-OS defined boundaries on the Land Registry maps while representing the client's intentions in that they agree with the map lodged, may not agree with the ground position.

With the new NPS maps from the Ordnance Survey and with the modern measuring and plotting equipment available there is no reason why maps should not be accurate. Even without the benefit of modern technology the maps lodged could be so much better if prepared by professionals and the resulting Land Registry map which would be composite record of all the registered

boundaries in the State would be a reliable national asset and an invaluable layer in a national geographic information system.

Finally, it is hoped that this short talk will be have given some insight into the mapping procedures within Land Registry. It is not in anybody's interest that maps are rejected for not complying with the regulations hence it is good to see the Irish Institution of Surveyors, making the effort through this seminar to ensure that their members at least know the regulations thereby saving themselves, their clients who are Land Registry customers and the Registry a lot of time and money.

Mapping Difficulties being Experienced within the present System

by

Mr P.J. Byrne M.I.S., Vice-President of the Irish Institution of Surveyors

Introduction

In July 1996 a sub-committee was formed by the IIS, at the request of it's members to examine drafting IIS approved procedures for dealing with Land Registry. I was appointed to chair the sub-committee and the following paper is the result of our investigations over the last two years. I would like to thank the members of the sub-committee for their help and the Land Registry and Ordnance Survey for their co-operation and assistance in compiling this report.

Boundaries

The dictionary of English law defines boundary as the imaginary line which divides two pieces of land from one another[1] and in land ownership it is understood as the Legal or Title boundary. It is an exact line having no thickness, which is possible to define within a specified accuracy tolerance by co-ordinates or bearings and distances.

There is also the physical boundary,[2] this is a physical feature such as a hedge, wall, ditch, fence, road, stream or high-water mark. Physical boundaries have thickness and, although they may follow the title boundary, the precise limit of ownership, e.g. whether to the centre or one side of the feature, is not usually specified if a general or non-conclusive system is adopted.

The boundary system introduced in Ireland under the Registration of Title (Ireland) Act. 1891 is known as the non-conclusive boundary system. This system had

been introduced in England under the Land Transfer Act (the Cairns Act) of 1875. Under this system the exact location of the title boundary lines are not defined but it is necessary to map accurately the location of the physical feature along which or between which the title boundary lines run.

In the standard work on registration of title in the U.K. by Ruoff & Roper[3].
The principal object of registration of title is to confer certainty. One way in which this object is achieved is by the provision, for every registered title of a plan of scientific accuracy, based upon the Ordnance Survey Map, revised to date, which identifies the registered land.

Mapping procedures for registration

Every applicant submitting a map for registration purposes is under legal obligation to furnish sufficient information thereon to enable lands to be accurately shown on the Land Registry map.[4]

The Land Registry maps are based on the Ordnance Survey maps for the state and the map scales adopted for any specified area are those which the Registrar may direct. The basic map scales are 1:10 560, 1:2 500 and 1:1 000.[4]

An application dealing with part of a registered property and an application for first registration of a property must be accompanied by a plan of the property referred to drawn on the current largest scale map published by the Ordnance Survey or certified Land Registry copy filed plans, when suitable, or a computer generated map at the map scale recommended by the Registrar,[4] this computer generated map must have been digitised from the current edition of the largest scale map published by the Ordnance Survey.[5]

Mapping difficulties being experienced

In the last thirty years there has been major developments in co-ordinate systems, survey instrumentation and computer technology allowing geodetic surveyors work in a digital environment. The physical features along which or between

which the boundary lines run are expressed simply and accurately in terms of co-ordinates. The difficulty now arises in transferring these boundaries graphically onto an unstable material such as paper to meet Land Registry mapping requirements. What is a straightforward survey field operation of mapping boundary features now becomes a difficult compromising procedure for the reasons stated below.

(a) On the old 25-inch map scales there is no grid co-ordinate system on which to relate surveys showing new boundary features.

(b) Old physical features have to be identified and re-surveyed together with the new physical boundaries and when one considers the age of these maps, what was the centre of a hedge, or stream over a hundred years ago, may not be the same today.

(c) The new survey is plotted at the scale of the Ordnance map, and then manoeuvred on the Ordnance map to give a best possible fit so that the new boundary detail can be plotted, with the end result not representing accurately on the map what is on the ground.

To give some idea of the difficulties encountered in working with this graphical mapping system I would like to refer to a study commissioned by the Society of Chartered Surveyors in January 1991 entitled "Surveying and Mapping in the Republic of Ireland".[6]

Approximately two thirds of the country has not been revised or remapped since 1918, so the largest available scale for two thirds of the country is over 70 years out of date, the remaining one-third has been overhauled and revised, but not resurveyed.

The original 25-inch series maps have been optically/photographically rectified to fit National Grid Sheet corners. This method is flawed : the original maps contain inherent errors arising from the type of map projection system used, and the age and condition of the original map document. These errors are not removed or

reduced in the overhaul process, but are increased.[6] This is very evident at the county boundaries, where composite maps are being produced showing the same boundary detail (i.e. a stream) plotted in two separate locations on the one map and up to 20 metres apart.[9]

From 1983 to 1995 the Ordnance Survey's method of map publication was by means of photocopying from master transparencies.[7] This system produced a very poor-quality map in terms of paper and print quality and as paper is heated during the photocopying process the resulting maps were distorted. In December 1994 it was necessary to send the following correspondence to the Ordnance Survey. "*Our most recent purchase of 1:1 000 sheets on 28th November 1994 were stretched and distorted by up to ten metres, and on checking the 1:1 000 sheets in our drawing cabinet we have found that a large number are distorted. We are now in a position where we cannot use these sheets for the preparation of land acquisition and disposal maps and for land registry purposes along with the many other uses we employ these sheets for.*" Thankfully this system has been replaced by the Tellus system of map production.

Again, quoting from the 1991 report "*No official accuracy specification exists for the basic scales mapping, and the user is given no indication of the reliability of detail plotted on the maps*". However, enquiries yield unofficial indicators which are alarming: errors of between 1 and 2 metres in distances between adjacent points have been reliably reported at 1:1 000 scale, and between 5 and 10 metres at 1:2 500 scale.

A letter was sent from Dublin County Council in August 1985 to the Assistant Director of the Ordnance Survey with the following enquiry "*Are the paper copies issued by you suitable for scaling and the measurements obtained accurate for court purposes*" and the reply was "*A root mean square error for resurveyed and continuous revision for 1: 1 000 scale maps of 0.5 metres and 2.25 metres for 1:2 500 scale revised and continually revised maps.*" The letter goes on to read "*Scaling from unstable materials such as paper introduces significant distortions in respect of measurement on maps and is not to be recommended,*" and yet this is what we are legally obliged to do to satisfy Land Registry mapping requirements.

The Land Registry gives a guarantee of Title but no guarantee as to the location or extent of the parcel of land to which the Title refers. It is not the function of officials of the Registry to ensure that the intentions of the parties - in respect of location or extent of property for registration - are correctly shown on the map(s) submitted,[10] this responsibility rests with the applicant. This being the case, it would be interesting to know what penalties are imposed, and by whom, on the applicant who submits misleading or incorrect mapping data.

With regard to the survey accuracy of boundary information, the State does not appear to have a monitoring function[10], and does not dictate any requirements relating to the qualifications of the individual or organisation that submits maps for registration purposes. Where a map is submitted for subdivision purposes there is no check carried out to ensure that the new boundaries shown on the map physically exist on the ground. There are no official technical requirements governing the accuracy of maps for transfer of land in Ireland.[10] Provided boundaries submitted for Registration of Title do not conflict with the plotted location of previously registered boundaries - which in turn may or may not be correctly mapped - they will be recorded on the Registry Map. Under this system, incorrectly mapped boundaries may be accepted for registration while correctly mapped boundaries may be rejected on the grounds that they are creating a conflict with existing (incorrectly mapped) registration boundaries.[10] There is no mention in the mapping guidelines as to how this problem may be resolved. It appears that the Registrar will leave it to the applicant to sort this situation out. This may entail either a Deed of Rectification where the parties agree or a Court application in default of agreement.

Development Schemes

To quote from Mapping Procedures for Registration of DEVELOPMENT SCHEMES (LRMap 2)

The following notes are intended as a guide to solicitors and other practitioners acting for developers of housing and industrial estates.

1 Procedure prior to first application for registration.

1.1 Before the first application is lodged, the solicitor for the vendor must send to the Land Registry, for approval:-

(i) two identical drawings of the development scheme plotted on original Ordnance Survey maps

or

(ii) two certified Land Registry copy filed plans, when suitable.

or

(iii) two computer generated maps at the map scale recommended by Land Registry for the particular area.

1.2 After approval, one scheme map will be retained in the Land Registry. The duplicate, marked as officially approved, will be returned to the applicant.

1.3 Negotiations between vendor and purchaser can now proceed using one to one photocopies of this approved scheme map.

2.1 The scheme map must clearly define the precise extent of each plot or property and show the number or other reference by which it is described in the deed.

To ensure that the boundaries submitted for registration reflect the applicant's intentions, it is recommended that :

(i) Boundary corners be unambiguously defined and clearly marked on the ground before survey for registration is carried out.

(ii) Maps submitted for registration be prepared and certified by competent Land Surveyors.

The guidelines go on to state that where it is found necessary to change the pattern of the scheme lay-out or a boundary of an individual site after the approved Scheme Map has been issued, the Solicitor for the vendor should immediately notify the Land Registry of this and return the old approved Scheme

Map without delay together with two new Scheme Maps showing the revised boundary locations.

Unfortunately, it would appear, that in certain cases, these guidelines are being ignored in the course of the development, and boundaries are not being set out as per the scheme map. This, in turn leads to incorrect maps being used during the conveyancing stage and mapping difficulties for the Land Registry at a later stage.

Consider the following example shown on Map 1. It was proposed to develop the shaded area known as Lannery's farm. The architect for the developer received two certified Land Registry copy filed plans (map 3) on which to plot the development to enable Land Registry approve a Scheme Map for registration purposes. The certified Land Registry filed plan showed the plots and reference numbers (158 p) of the adjacent development scheme of Rockingham which had been constructed.

The survey for the proposed development (map 2) was overlaid on the certified Land Registry copy filed plan (map 3) with the result shown on (map 4). There is a considerable difference between what was shown on the Scheme Map for plot 110 p for example and what was constructed. If we consider Map 5, the occupants of number 2, Rockingham Ave (plot 110 p), purchased the site (shown on Map 5 heavily dashed) from a scheme map, the boundaries were not yet constructed. The heavy dashed line was the map used in negotiations between vendor and purchaser with the reference 110p referred to in the deeds and the eastern boundary running up to the centre of the hedge. The area measured from this scheme is 656 square metres, while the actual area within the constructed boundary walls is 626 square metres leaving a shortfall of 30 square metres. The purchase price of the site was twenty seven thousand punts and the deficit of 30 square metres is approximately one thousand two hundred punts. A number of problems now exist due to poor mapping practice.

(i) The purchasers are not happy with the existing boundaries and want the eastern boundary extended to the centre of the hedge as per the

scheme map. In time, when the adjacent development is constructed they fear that their wall, as it exists will form the boundary.

(ii) If the developer builds a wall at the centre of the hedge as per his scheme map, or back from the hedge leaving an open corridor which is undesirable for reasons which I think is obvious.

(iii) The Land Registry now have the problem of plotting this site on their index map. The survey agrees with the latest 1:1 000 Ordnance Survey publication (3194-11, 3194-15) which shows Rockingham and the Scheme Map has the same discrepancies as shown on Map 5.

I would like at this stage to refer to the Land Registration Rules 1986, section 3. The maps maintained for property in urban areas shall as far as possible be on the 1:1 000 scale or such other scale as the Registrar allows. All plans of property in such areas shall be shown on such scale with necessary or obvious adjustments to conform to Ordnance detail or with such consents or after such enquiries or notices as the Registrar may direct.

I believe the term adjustment as mentioned above is being treated rather lightly by Land Registry, for, to my knowledge, the filed plans used during the conveyancing stage can be adjusted by up to 14 metres to conform to the Ordnance map without notification to the property holder. If the error is greater than this, then I believe that notification is sent to the property holders, informing them that revised mapping on the OS map is taking place and if they have any objections to please reply within a certain time, which I think is fourteen days.

My advice to a prospective property purchaser would be to insist on having the boundaries pegged out with boundary markers and to negotiate on the basis of what is measured on the ground and not to rely on a vague scheme map and ensure that the boundaries are constructed as per the position of the markers.

Conclusive Boundaries

Section 87 of the 1964[11] Act makes provision for boundaries to be made conclusive and section 148 of the Land Registration Rules, 1972[12] provides for boundaries to be conclusively defined by reference to the physical features bounding the properties, i.e. centre of wall, face of fence etc. Where such features have been accurately mapped from reliable survey control, those conclusive boundaries can be re-established on the ground with a minimum of ambiguity should the need arise. However, where conclusive boundaries are being established relative to Ordnance Survey detail it must be borne in mind that Ordnance Survey plans have no definite legal significance when ascertaining private boundaries and that those plotting from firm OS detail are limited to a root mean square accuracy of 2 metres when working at 1:2 500 scale. Under such mapping constraints it is difficult to see how a surveyor could effectively re-establish the location of a conclusive boundary should the physical feature (i.e. ditch, wall, of fence) to which the boundary was originally referred, be destroyed. Where physical boundaries do not exist, any general map maintained in the Registry becomes an index to the Register - it cannot be considered an authoritative record to location and extent of lands registered.[10]

Certified Land Registry copy filed plans.

A word of caution on the use of Land Registry copy filed plans. As they are only photocopies, and indeed photocopies of photocopies, and hence distorted, they should in all fairness be stamped with the warning " For Identification Purposes Only ", and never be used for measuring distances.

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Current Practice and Flaws in the Present Mapping System, and Feasible Solutions

by

Mr Rory O'Donnell, Law Society Member

The title for this talk was set by the Irish Institution of Surveyors who are holding this Seminar and I was asked by the Conveyancing Committee of the Law Society to speak to this title. I have been in practice as a solicitor in Dublin for over thirty years. Because most conveyancers are solicitors and I am not sure to what extent surveyors are familiar with the overall process of conveyancing I have decided to commence with a few brief comments as to how maps and mapping are relevant in routine conveyancing.

Land includes buildings. Conveyancers transfer the ownership of land. By statute buildings pass with the land without specific mention. So also do all easements appurtenant to the property, such as rights of way, rights to draw water or rights of turbary or collops.

Duty of Disclosure on Vendor / Caveat Emptor. A vendor is obliged at common law to disclose all onerous covenants affecting a property. A vendor does not have to disclose something which should be apparent from an inspection. Generally caveat emptor applies.

Forms of Contracts for Sale. The Law Society publish standard forms of contract for sale and revise these from time to time in the light of changes in the law or practice. The contract for sale includes general conditions which will apply unless altered for any sale and are designed to be used for sales by private treaty or auction. The conveyancer preparing a contract for sale must include all the essential provisions for the particular case i.e. the parties, price, property and provisos. He or she must also understand all relevant matters relating to the title and the property and draft special conditions which will override the general conditions where appropriate.

Forms of Requisitions on Title. The Law Society also publish requisitions on title which are a general form set of inquiries with some sets of requisitions for special cases such as new houses, new or second-hand apartments, and licensed premises. Conveyancers acting for purchasers tailor these to meet the facts of the particular case.

Contract for sale of land without subdivision. Conveyancers acting for a purchaser get a copy of the maps relating to the property to which title appears to be shown and give this to their client and advise them to get this checked against the actual property by a competent person. This applies whether the title to the property is registered in the Registry of Deeds or in the Land Registry. From time to time there are delays in getting a copy Land Registry map of a particular plot of ground which can delay the preparation of a proper contract.

Contract for sale of land involving subdivision. An accurate map is essential for the contract and again a conveyancer acting for a purchaser will give a copy to the purchaser for checking as in the last paragraph. Again this applies regardless of whether the property is held under a title registered in the Registry of Deeds or in the Land Registry. The map on the contract is the most important map because the map on the deed which follows merely implements the contract. These comments do not apply to the sale and mapping of new housing estates which I deal with later.

Errors or Mis-description. Clause 33 of the Contract for sale provides that a purchaser cannot be compelled to complete the purchase of a property which differs materially from what he or she agreed to buy. If there is a serious error, say in the description of the property, a purchaser may elect to rescind the contract or seek a reduction of the price. If the error is not serious a purchaser may only seek a reduction of the price. In default of agreement the amount of abatement of the price will be determined by arbitration. Typical errors would be a misrepresentation of the acreage, or for example that there is a gas main running through the property which the vendor should have disclosed and which interferes with the development proposals of the purchaser.

Evidence of Identification. In the sale of newly built properties it is the custom for the vendor/developer to furnish evidence of identification. This is usually done by furnishing a statutory declaration by an architect, engineer or surveyor confirming that the house, apartment or office building or whatever is within the property to which title has been shown. It usually goes on to deal with the same point in relation to the main services which are roads, and drainage. In the sale of second-hand property it is not the practice for a vendor to have to furnish evidence of identification. A vendor would normally furnish such maps as are available.

Contract for Sale is the first step. The first step in a conveyancing transaction is to enter into a contract for sale. Next the vendor shows the full title to the property and the purchaser's solicitor investigates it. The queries on the title, planning etc., are called requisitions on title. These would not usually be concerned about mapping because if best practice is followed the mapping would be dealt with pre-contract.

The Deed. The deed which actually conveys or transfers the ownership must have a map attached if subdivision of the vendor's title is involved. The only exception I can think of to this rule is where the vendor's title consists of separate and self-contained plots which are already mapped either on deeds if the title is a Registry of Deeds title or in the Land Registry. In such a case a deed can transfer part of what a vendor owns by description or in the case of the Land Registry by its map reference. A map for a deed must comply with Land Registry requirements if the title is registered in the Land Registry.

I now propose to deal with a few other relevant issues.

New Housing Developments

The procedure in relation to the mapping of new housing estates for title purposes is as follows.

The most usual procedure is that at the commencement of the development the person dealing with the mapping for the developer (in Dublin this would usually be the developer's architect) will prepare two original maps on original Ordnance Survey maps and will arrange to have these accepted as "scheme maps" by the appropriate Land Registry mapping department. These maps would usually be based on the approved layout on foot of which planning permission was obtained. The builder then proceeds to build to the approved layout. It is a fact that builders do not always succeed in doing so.

In most cases and for practical purposes the Statute of Limitations resolves these mapping errors in time. It does this by vesting in a "squatter" the legal ownership in a property in which the "squatter" has been in adverse possession for twelve years.

Sales of individual houses are carried out by reference to this scheme map. The best practice in relation to new housing is for the developer to agree to sell the houses on the basis of the layout approved by the planning authority but to have a more accurate map prepared for use for title purposes when the boundaries are settled. Scheme maps are done piecemeal in blocks of ten or twelve. The submission of scheme maps piecemeal puts an extra burden on the Land Registry mapping department who are generally over-stretched but in my opinion is worth it for procuring the registration on foot of a more accurate map. I think that the best practice should be made compulsory. I also think that the law should be amended to facilitate the adoption by the Land Registry of maps which reflect the reality in law and fact.

Accuracy of Maps – Are Measurements a Help?

Very accurate maps or maps with measurements are only a help if they coincide with what is physically on the ground. If they do not coincide they are actually unhelpful.

From the point of view of conveyancers the most reassuring thing you can find out about a property is that it is situated within boundaries which have been in situ for

more than twelve years and that the owner clearly occupied the entire property within the boundaries to the exclusion of all others.

Undefined Boundaries

If a conveyancer is acting in the purchase of a site without boundaries or with one or more undefined boundaries then the more accurate the map the better. It is better still if actual measurements are shown. However undefined boundaries tend to be troublesome. The best practice when setting out an undefined boundary is to tell the adjoining owner what is being done and give him or her an opportunity of getting their mapper to check the line proposed for the boundary and agree it. For some reason which I do not understand people tend not to want to do this and builders particularly seem to have a habit of blundering into other people's property first and checking the title maps second. When buying a property with an undefined boundary I advise my client to insist on the boundary being pegged out and the line agreed with the neighbour before completion of the sale. This applies even if the neighbour is the vendor.

Poorly Drawn Maps

In practice as a solicitor I come across many cases where the maps on contracts or deeds are badly drawn and everyone agrees are wrong. In most cases this is due to the maps not having been prepared by an expert. However some of the most intractable problems are not caused by the lack of expertise of the mapper or the quality of the map. They are due to the fact that walls drains roads or buildings were not built where they were supposed to be. Another frequent problem is the use of fourth generation photocopies of a map where the map is distorted in some places and which mappers generally speaking refuse to try to scale.

Should the Boundaries shown in Land Registry Maps be Deemed to be Conclusive?

This suggestion is often made but if adopted would in my opinion be a complete disaster. Bearing in mind that a great many title maps have small discrepancies (and this includes Land Registry maps) there are remarkably few boundary disputes. Boundary disputes tend to be difficult and emotive and solicitors and surveyors generally try to avoid them like the plague.

Even if a boundary between two building plots is in the wrong position and a person is in possession of a plot of land the title to which is registered in the name of his neighbour the Statute of Limitations in almost all cases "corrects" matters after twelve years.

If title boundaries were deemed conclusive a person who purchases a house which had been occupied within very clear and established boundaries for fifty years might be faced by a neighbour claiming part of the property and seeking to have the boundaries moved. To deal with this a purchaser would have to get a full survey carried out before signing a contract and to have this compared with the title maps available. Many of the existing title maps (and this again includes Land Registry maps) are on such a small scale that a surveyor could probably not say categorically that the maps adequately show the property on the ground. The result is that there would be pressure to provide larger scale and more accurate maps.

In my opinion the cost and disruption of this would not be justified for urban housing.

There are fewer problems with commercial property as there is usually more money involved and clients more readily understand the need to retain competent professionals who check the physical property against the title maps.

Priority of Maps

Many title problems are compounded by the priority given to the maps. A legal document should indicate the priority accorded to the map. In other words is the description of the property to have priority or is the map to have priority. For example if I was acting in the sale of our offices which are a pair of Georgian buildings in Fitzwilliam Place in the contract I would sell by reference to the description of the buildings because they have been occupied within established boundaries for over one hundred years. Even though there is a recently revised Ordnance Survey map of the area I would not use this at all and if I did attach a copy map I would specify that it was only for the purposes of identification. If I

were acting in the sale of a site forming part of a larger plot with two undefined boundaries an accurate map would be essential and the contract would make it clear that it was the map that defined what was being sold.

Many legal documents I examine in the course of my work break these basic rules. As a result it is sometimes not possible to say what exactly has been transferred by a particular deed.

The phrase "this map is only for identification" is often used as a means of trying to avoid legal liability by both solicitors and the professionals who prepare maps. In many cases it is used where there is no other means of ascertaining the property supposed to be dealt with by the documents and is a contradiction in terms.

The Marking of Maps

In the course of my work I also come across many cases where maps are not marked correctly. Outlined in red means that the inside of the red line should be along the boundary. Edged in red arguably could mean that it is outlined in red or in-lined in red. It is not unusual to see maps where the redline is all over the place. It is very helpful to solicitors if the person marking the map says what they are doing by including a clear legend. If a particular boundary needs to be marked with two colours for some technical legal reason then it is not possible to have both colours along the actual boundary. In that case one has a choice between having two maps or having one in-lined and the other outlined. There should be no difficulty in dealing with these problems if they are given appropriate attention. On far too many occasions they are not given the attention they deserve. Also in many cases the maps are marked by a solicitor or the client who may or may not have the necessary capability of marking it correctly. I am strongly in favour of the maps being marked by the mapper in consultation with the solicitor particularly if the situation is complicated. Ideally maps should also indicate the status of the boundaries i.e. are they party walls or do they belong to the property.

Party Walls and Overhanging Eaves

Strangely there are not too many disputes over party walls or getting access to clear and maintain gutters and overhanging eaves. However like boundary disputes when they do arise they tend to be very difficult. Dublin has the benefit of a Dublin Corporation act which contains useful provisions relating to party walls. It would be very helpful to have some statutory reform for the country as a whole with similar but updated provisions to deal with party walls and fences and also deal with access to adjoining property where that is the only practical way of getting access to gutters or eaves.

Spatial Data for the Future

by

Mr Richard Kirwan, Director of Operations, Ordnance Survey Ireland

Copies of the slides used for Mr Kirwan's presentation are provided in lieu of a paper.

OBJECTIVES of OSi

Meet fundamental requirements for spatial data within the State and thereby satisfy customer expectation.

Ongoing Programmes :

- Converted all mapping series to digital form
- Structured databases for urban and some rural areas
- Created scale free, sheet free system for paper and digital output
- Undertaken ambitious updating and resurvey programme for large scale mapping
- New national control system based on GPS for consistency and future user requirements
- Introducing Geocoded Address Database for urban areas.

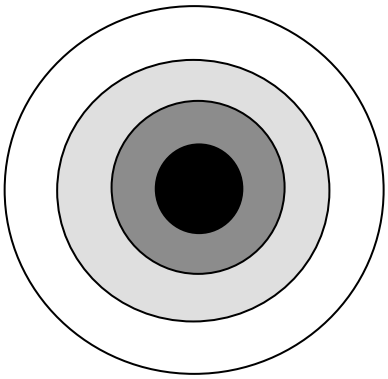
LARGE SCALE MAPPING PROGRAMME

- Traditionally defined by scale
- Guided by limitations of past technology (methodologies and materials)
- Future approach guided by needs of information society
- Specification
- Data sources
- Integration processes for data sources
- Update requirements
- Potential funding

Product Output :

- Digital formats
- Paper formats - new place map series

FUTURE LARGE SCALE DATABASES



Urban 90 000 ha

Suburban 1.5M ha

Rural Developed 4.0m ha

Rural 1.5m ha

- Digital vector data
- Consistent with other data sources (photography, GPS)
- Locally and universally consistent

RESURVEY PROGRAMME

Urban	:	follow development
Suburban	:	complete in 6 years
Rural Developed	:	proposals for 7 year programme with Department of Finance
Rural	:	7 years

UPDATING PROGRAMME

- Urban

Current	-	3 years
End 1998	-	2 years
In Year 2000	-	6 - 12 months

- Suburban

Current	-	5 years
End 1999	-	3 years
Objective	-	same as urban

- Rural Developed - 5 years

- Rural - 10 years

FUTURE REFERENCE SYSTEMS

Current system

- Transverse Mercator (TM) Projection
- Airy modified spheroid
- 1975 Triangulation adjustment
- National Grid Reference System

Alternative System

- based on 1995 zero order GPS Network
- GPS control densification
- adjusted to ETRF 89
- possibly UTM projection
- possibly new reference grid

LEGACY - Vs - FUTURE MAPPING DATABASES

1) Legacy Systems

- Control systems
- locally consistent
- universally restricted

- Mapping
- locally consistent
- age effect of revision, materials and technology

- GPS, GIS, Future proof?
- Future uses
- Widely used and accepted

LEGACY - Vs - FUTURE MAPPING DATABASES

2) Future Systems

- Control systems
- globally and locally consistent

- Mapping
- meets GPS, GIS requirements

- Formats meet future needs

- EU future requirement?

OPTIONS

- Update / resurvey using legacy control and mapping system
- New control and new mapping
- Operate both systems with approved transformation methods

OSi APPROACH

- New mapping based on new control system
- Parameters to transform to existing system
- Customer choice

Graphical Registration Systems for Property Boundaries

(A Practitioners Viewpoint in Ireland)

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Introduction

We live in a rapidly changing world and we must be at all times ready to move and adapt to change and all that it brings. It is because of the fact that so many people in Ireland involved with land registration realise the general need for improvement and change in the current system, that this paper is being written. In essence there appears to be concern over where the profession should be heading with regard to the mapping side of land registry. It has been many years, well over 100 at this stage, since the basis of the current system began and in this time, whilst various parts have been revised and updated, the procedure for mapping has remained relatively unchanged until the advent of computer technology. In that same time we have gone from the horse and cart as the main means of transport to where vehicles can now travel faster than the speed of sound. In the same way we have progressed from measuring rods and chains to EDM Total Stations to satellite positioning systems that can rapidly provide co-ordinates to millimetre accuracy.

In these next few pages I will attempt to raise some issues about the current system in operation in Ireland that concerns the private practitioner, and I will also endeavour to make a few realistic suggestions for improvement. I will now look at the current situation involving the maps used for land registration in Ireland and some of the problems we are currently facing.

Registration Systems

In common law countries, like Ireland, the system for the registration of title would normally be either the Torrens system or the English system (a modified version of Torrens). Whilst the Torrens system is best suited for "newer" countries like Australia, New Zealand, Canada and the U.S.A., the English system is more appropriate for countries which had a history of land titles operating through an unregistered system long before a registered system was introduced.

Ireland operates under a system which is basically the English system but with some parts that are more specifically Torrens system, like the fact that the register is open to public inspection. Two systems of registration relating to land in Ireland exist and they are the registration of deeds system introduced in 1707 and the Record of Title (Ireland) Act, 1865 (and the subsequent Local Registration of Title Act, 1891). It was Torrens himself who drafted the 1865 Record of Title Act which was the first such Irish Act. Torrens was a Corkman who first introduced his system in South Australia in 1858. Under the Torrens system, the State sets up a scheme for the registration of the titles themselves.

Conveyance of a registered title is by registered transfer. Unlike deeds delivered under common law title, dealings with land delivered to the transferee under the Act do not take effect upon execution and delivery, but upon their subsequent registration under the Act. So, whilst the Registry of Deeds provides for the registration of documents in land dealings, the Land Registry provides for the registration of the ownership of the land. It needs to be said that even though registration of deeds and registration of title are both current systems of registration, they are mutually exclusive, and the system of registration of deeds is being, and will continue to be, displaced by the system of registration of title. Today, there are more than 50 countries who have subscribed to the Torrens system of registration.

The whole purpose of the registration of title system is to provide a simple and accessible record of title to property. The registration of title system replaces

the intricate task of investigating title under the deeds system and, upon final examination by the Land Registry, a permanent register is opened and the burdens found to affect each property are registered. The Land Registry office administers and operates the system originally set up by the 1891 Act and now operates under the current Registration of Title Act 1964 and the Land Registration Rules 1972,1981 and 1986.

Under the current system there is provision for a land registry map of each registered property. This is based on the Ordnance Survey map and identifies each separate piece of property registered. This is to be kept with the folio on the register. I would like to point out that the description of land in the register (or on the maps) is not conclusive as to the boundaries or the extent of the land. Section 85 of the Act says that the description of such lands in registers or on such maps shall not be conclusive as to the boundaries or the extent of land. In other words the land registry map is an index map and identifies properties, not boundaries. The description of the land on such maps is not conclusive as to the boundaries or extent for several reasons. The map does not indicate the following things: whether the boundary consists of a ditch, wall, hedge or fence, if the boundary runs along the centre of the wall/fence or on either face of same, whether the land includes part or whole of any adjoining stream or road. Where registration is made to the centre of a stream or a road, the map is not conclusive proof that it is included in the property. The boundaries on these maps are what are referred to as "general boundaries". As stated before, the map is not actually part of the register.

Current Land Registration Mapping Practice in Ireland

I would like to concentrate on certain aspects of the paper maps themselves, and the inherent problems associated with them. Paper is not as dimensionally stable as other drawing mediums like the numerous plastic films that are currently available. Changes in temperature and humidity over the course of each year will actually change the shape of the paper, thus maps will give differing results depending on time of year and the prevailing weather conditions.

Indeed, in my experience even two copies of the same map printed by the Ordnance Survey will not necessarily, or usually, overlay very well. This would not be entirely due to paper stability as there appears that some of the Ordnance Survey maps in circulation are very poorly printed as well. Paper has the ability to change size by several millimetres in even some of the smaller size sheets, let alone the A0 size page. Normal procedure in other Land Registries is to transfer the submitted maps onto an archive held on film. Since the boundaries of properties are graphical only, the scaling of same will inevitably lead to errors, even by scaling from the original deposited land registry copy.

This leads to a further problem the private practitioner experiences with land registry procedures. The practice of using photocopies of the above maps by the Land Registry office for a "true" certified copy. Paper, generally, used for photocopying is of even lighter grade than the Ordnance Survey sheets. This means that a dimensionally unstable map is photocopied onto an even more unstable medium and the placing of an official stamp on the said copy does not make this any better. As well as this, photocopiers themselves introduce a considerable amount of distortion in the copying of an image. The end result of all of this is that you end up with a map of a parcel of land that is different in shape and size to what was originally surveyed in the field. I know that, legally, the map is only a general guide to the property but in a lot of cases it is the only reference as to the size of the parcel of land in question. In the past it was possible to obtain Ordnance Survey maps on stable films, and still possible, and it may be a good idea to look at this again. A solution to the above paper problem may be that, in future, all Ordnance Survey maps submitted for land registry should not be on paper but on stable film. Most plastic films used today have coefficients of linear expansion that are almost negligible, especially compared to paper. As with all types of error in any process, each one that can be eliminated is a big step forward.

Another problem is to be found with the copy map supplied by the Land Registry. When maps are first submitted for registry the boundary of the site would normally have been surrounded by a thick red line to highlight the particular parcel of land in question. When this is photocopied the red line

becomes a thick black band. This obscures any of the fine detail that may be of use when dealing with the said boundaries at a later stage. A suggestion, that would be easy to implement, would be the purchase of colour photocopiers for use in issuing copy maps. Some may see this as a minor problem but it is a real one and does have a huge effect in some instances. I would like to point out, however, that I would like to see the practice of using photocopies, for the purposes of land registry, discontinued altogether. Apart from this point, another problem encountered with these copy maps is that a high degree of accuracy is lost when attempting to re-instate boundaries. Because of this, it is not normally possible to replace the boundary where it was originally intended with only the registry map to go by. We need some kind of definitive method for the positioning of property boundaries, something I will discuss shortly.

There is also a problem that most practitioners will face when using Ordnance Survey maps for land registry. While the Ordnance Survey is to be commended for its excellent mapping of the country as a whole, and its constant upgrading, inaccuracies in aerial surveys are often apparent. I must point out that there are large portions of the country that have not been re-surveyed since before World War I, which is yet another problem. These discrepancies in the Ordnance Survey maps are generally accepted, but they cause significant problems in terms of land registry mapping. I would also like to raise the point of scale of the Ordnance Survey maps used for land registry. Generally speaking, a scale of 1:1000 or 1:2500 for maps being used for land registry systems is quite acceptable and very common in similar systems world-wide. However, we must ask ourselves some questions about scale. Even the 1:1000 maps do not show any small irregularities or features present in many boundaries. As land prices continue to increase, especially in urban areas, and parcel sizes get smaller and smaller, the scale is becoming more and more inadequate. This problem can be overcome with increased use of computers and digitised data, but we haven't got there yet. I will cover this topic in more detail later.

The term "general boundary" leaves many issues open to interpretation. Legally speaking the land registry map is not significant as we have already discovered. The registry maps themselves need to provide more information to

make them more useful for future use. Another alternative might be to use a "metes and bounds" description, as is common in many other countries, to accompany registry maps. These would at least tell us what the intended boundary was, centre of wall for example, and the limit of its extents. At the very least we need, as a basic minimum requirement, all maps that are submitted for registry purposes to include dimensions. This would counteract two current problems. We would have a dimension that can easily be re-measured at a later date enabling the surveyor to more accurately replace boundaries near to the original intent. It would also make the scale problem much less of an issue, but it would still not solve it altogether.

It would be a good idea to also standardise mapping practise in the above regard. The best way to achieve this would be to begin to licence individuals, usually surveyors, to prepare maps to a nominated specification for registration. Under current circumstances in Ireland, there is a distinct the lack of qualified and properly experienced surveyors, who are competent in mapping for land registration. However, we must keep land registration in perspective. It is but merely a part of the machinery of government and not something that will automatically produce good land use and development. Land registration is only a means to an end, it is not an end in itself but it is important to remember that good mapping practice stimulates confidence in property and makes the system more effective and efficient.

To this end I would like to talk a little about some of the past and some more about what is to come. The problems I listed above and the solutions offered for them could be seen as intermediate short-term solutions to problems with an old system. We live in a modern computerised society and we are doing less and less paperwork, as such, and more and more digital work. I think we must consider the application of Land Information Systems as a whole and realise that its implementation is vital to the future of land management in Ireland. Remember, computers are here to stay - they are not a fad - and the sooner we come to grips with this, the sooner we will realise that to adjust the current practices this way or that is not looking to the future. There is no better time than

today to look ahead and make plans for the next 100 years, not look at the next 5 or 10 years and short-term solutions.

Development of Land Registers and Cadastre

Historically, land records were established for two main purposes. Firstly, as fiscal records for accurate taxation of land and secondly as legal records to register ownership. On the European continent the development of fiscal record systems was heavily influenced by Napoleon I and his decision to establish a French cadastre. The UN Ad Hoc Group of Experts on Cadastral Surveying and Land Information Systems (1985) uses the following definition: "The *Cadastre* is a methodically arranged public inventory of data on the properties within a certain country or district based on a survey of their boundaries: such properties are systematically identified by means of some separate designation. The outlines of the property and the parcel identifier are normally shown on large scale maps". Essentially, a cadastre is thus a systematic description of the land units within an area. The description is made by maps that identify the location and boundaries of each unit and by records.

Closely connected to the word cadastre is the term of cadastral survey which is defined as simply a survey of boundaries of land units. A cadastral survey would be carried out initially when the parcel is formed and for any subsequent changes to same. A cadastral survey would also be carried out to re-establish missing boundaries. I will now give a brief history of cadastre and what it has led to in modern times.

In 1850 the French national cadastre was completed. Its purpose, according to directives by Napoleon I were: *To survey parcels of land and classify them by fertility and production capacity. Bring this together under the name of the owner, along with other parcels he owns, and determine total productive capacity and revenue. Make a record of this assessment and use it thereafter as a basis for future assessment*. The survey itself was spectacular and was based on control points determined by triangulation. As its purpose was purely fiscal it was natural to record the parcels according to the owners. Its usefulness quickly diminished

mainly due to lack of updating of records. The French example of cadastre, however, spread quickly around Europe. Most German states, the Netherlands and Denmark completed their cadastral surveys soon after the French precedent.

Initially, the cadastre did not influence the existing land registration systems in any noticeable degree and the two systems existed parallel to each other. In practically all cadastral countries that also have a land registration system, the property concerned is identified by its cadastre description. In Spain, Portugal and most of Latin America, where this is not the case, the registry of deeds is practically independent of the cadastre and it is without the unique identification.

The cadastre has been used to enhance the registration of deeds and also helped with the change from there toward registration of title systems. In this respect, Germany led the way with its 1899 Civil Code and the same steps were taken by others including Switzerland, Austria and Sweden. Countries like Australia and New Zealand are working in the opposite direction. They already have an efficient land registration system in place and are now enhancing that with cadastral surveys. Differences in initial conditions have led to vast differences in types of combinations of land registration and cadastral systems. Many third world countries, and some parts of the U.S.A., have weak and incomplete land information systems. It is increasingly being recognised that the two systems should be treated as components of larger, more integrated, land information systems.

Ireland and the 21st Century

Instead of looking back upon the current system and investigating ways of improving current problems, we need to look to the future. Are we just re-organising the current system without thinking ahead 50 years or more? If we are only thinking about changes in the now rather than the tomorrow, we are already way behind the starting blocks. In Europe today, cadastral/land registration systems are strongly influenced by the land information concept. The main trends can be seen to be in the following terms: multiple uses, automation, geocodes

and digitisation. Remember that, in the long run, there will be no single purpose land record. It could be seen as essential for future development that we set goals of multiple usage and integration of the modern cadastral/land information systems.

To this end there seems to be only one real logical step to take in the mapping of parcels for registration. This is the move toward the use of co-ordinates to delineate parcel boundaries and use these as part of the identifier of the property in question. As in Sweden, we could adopt the use of the centroid co-ordinates as a part of the identifier to each parcel. This is the co-ordinate of the central point of each parcel of land and as such would be unique and not open to duplication. With the development of computers, the hard fact is that we must computerise and automate our mapping of land parcels. This would of course provide the potential to eliminate possible scale problems mentioned earlier as computerised maps will be able to show all manner of information in a "scale-less" environment.

To fulfil this goal we must start with one very important factor. This is that the inclusion of every land parcel/unit must be compulsory. In Ireland today there are only 3 counties that have compulsory registration: Carlow, Meath and Laois. Even though the 1964 Act purports to all counties eventually becoming compulsory. Most urban areas are still working under the deeds system and, apart from the 3 counties, it is still voluntary to register title. If this is to continue it will be many years before our register of titles is in any way going to near completion. Under this current system, the individual concerned bears the cost of registering his land parcel. This would seem to be fair as he would be doing it out of his own interests. We must, therefore, look at a systematic, area by area, compulsory registration of title and, in practice, this would mean that the burden of most of the cost would have to be borne by the public sector.

It is important to remember that, based on experiences in other countries, we must give careful consideration to maintenance and updating from the very start. To this end, I would like to propose what might be seen as a fairly radical suggestion. I would suggest that we abolish the Land Registry and the Ordnance

Survey and combine the two into an organised central office subscribing to a complete land information system. Whilst the two bodies are currently separate entities, they are both attempting to progress to semi-state agency status and as they are not private corporations, the merger of them, possibly along with other related government departments, would be quite feasible. Such a move could prove to be both successful and cost effective especially in the long term. If it proved not to be the case, we could aim for an entirely new department that would be akin to a central register and would be responsible for the control, information and co-ordination of the overall process. Another suggestion would be that the Land Registry take over the large scale mapping of the country at 1:1000 and 1:2500 scales. As I said before, whilst we can all concentrate on correcting the current mapping practices, we must, in all reality, look at the big picture. We are, all of us involved with land registry mapping, labouring under the same constraints within the present, unsatisfactory system. What better way to move forward than toward a total land management system for the 21st century.

Summary

I said at the beginning that we live in a rapidly changing world. It wasn't until I was asked to present this paper that I realised how much things have changed. Initially, I was all for criticising the Land Registry for the way in which registry is handled from the mapping point of view. I was also going to criticise the Ordnance Survey for the quality of their maps in so far as the scale and paper problems we encounter when using them for registration purposes, even though it was not the use that they had originally intended for their maps. I have listed some of the problems the private practitioner faces under the current system but I have pulled right back from my original plan to rebuke the afore mentioned bodies. Why? Well, after extensive research I have come to some basic conclusions. We are, all of us, working with a system that lists its age by centuries, and not individual years. In spite of various updates and re-workings over the years the basis has remained more or less the same. I have realised that there is no point in being retrospective and that the only real way to approach this topic was to look to where we should be in 50 or 100 years from now.

Whether or not you choose to ponder on some of the suggestions I have raised here is irrelevant. The most important thing to remember is what I said about computers and the overall big picture. Computers are not a fad and we must take them on board and exploit them to the greatest degree possible. To this end, I see the only logical way to move forward is to forget the problems we are facing today, live with them if we must in the short term, and look only to the future. We should use all our knowledge and experience, in a positive way, and design a new system from the bottom up that will still be relevant many years from now.

Ireland has the opportunity to look globally at systems already in place. We can learn from other countries and their experiences in relation to establishing overall land information systems. We certainly have good structures in place currently but good structures are not enough. A well-known statement, "life wasn't meant to be easy", was never more true. It will not be easy, more near impossible, to correct the current system to where it can be viable for the long term. It may even be harder still to start from scratch and build a new system, but when you look far into the future this is the only realistic solution.

No matter how we look at it, we cannot escape the fact that we must adopt an all inclusive land information system for the future. The longer we leave it, the more work that will have to be done in the future. I hope that I have opened your minds a little more as to the direction that land registry world-wide, and land systems generally, are inevitably heading. We have no choice but to jump in with both feet, or face the possibility of being left way behind, and what better time to begin than today.

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Background of Precise Control Limited:

It may be of interest to give a little background on Precise Control Ltd. We are a surveying company and we work under the broad title of Land and Engineering Surveyors. The company was established in Cork in 1980 by Larry Southard FIS, at a time when private practising land surveyors in Ireland were thin on the ground. The company works in many areas including mapping, setting out, as-built building surveys, deformation monitoring etc. and of course mapping for land registration. The company has the benefit of being able to draw on a wealth of land registry experience with staff trained in Ireland, America and Australia. We understand that Precise Control Ltd. was the first company to attain ISO 9002 certification, under the title of "Land Surveying", in Ireland. This was achieved through hard work and the realisation that, by its very nature, surveying is an ideal profession for total quality control. The company currently has ten staff and works out of offices adjacent to Cork Airport. Whilst land registry is not our main source of income it plays an important role in our day to day working lives (the number of Ordnance Survey. maps with registry work in progress around the office will attain to this).

Ministerial Address

by

Mrs Mary Wallace, T.D., Minister of State for Justice, Equality and Law Reform.

Distinguished guests, ladies and gentlemen

First of all I am deputising for my colleague, John O'Donoghue, T.D., Minister for Justice, Equality and Law Reform, who regrettably due to urgent Government business is unable to be here today. I want to thank the Irish Institution of Surveyors for the invitation and for the opportunity afforded to me to address this seminar today.

As a Deputy from a rural constituency I am well acquainted with the importance of the system of Registration of Title to Irish Society. The importance of ownership of land and property is something that is deep-rooted in the Irish psyche.

The function of the Registries is to provide a secure, reliable and effective legal system for registering property ownership and so enable property and related financial transactions to take place with confidence.

There are two separate systems for recording transactions in relation to property in Ireland; the Registration of Title System operated by the Land Registry which provides a state guaranteed title to property and the Registration of Deeds System operated by the Registry of Deeds which caters for property, the title to which has not yet been registered in the Land Registry.

Both systems operate within the aegis of the Minister for Justice, Equality and Law Reform and are under the control and management of the Registrar of Deeds and Titles who is an independent statutory officer appointed by Government.

The operation of a dual system of registration of land is not uncommon. Similar dual systems operate in Northern Ireland, Scotland, Greece, Germany, Finland

and Luxembourg. There is no duplication of registration in the process. And there are no additional costs involved.

From a conveyancing point of view registration in the Land Registry is the better option as following registration of the property, thereafter the title is guaranteed by the State and is evidenced, not by the deeds, but by a copy of the registered folio. For this reason the long-term objective of the Government is to extend the process of compulsory registration to other areas and phase out the need for the Registry of Deeds over a period of time.

The Institution will be aware that recent years have seen a very heavy demand on the staff and resources of the Registries, particularly the Land Registry. The roar of the Celtic Tiger has been heard in the Land Registry arising out of the recent buoyancy in the property market.

The Land Registry office has experienced an enormous increase in activity between the years 1991 and 1997. During this time the percentage increase in intake of applications for registration of dealings, the core business of the Registry, has been 37%. The increase in applications over all categories of service provided by the Land Registry including dealings has been 41%.

Moreover, every year since 1994 has seen an increase in the number of applications for registration. In 1996 the increase was 7.8%, followed by an increase of 5.5% for 1997.

The Institution will also be aware that notwithstanding this increase, the Registry has increased its throughput yearly, resulting in a reduction of the arrears since 1991, dramatically improved productivity and an improvement in customer service and satisfaction.

I might just quote a few figures to put this in context. In 1993 the intake of applications for registration was 91,060. This steadily increased to a figure of 120,301 in 1997. The corresponding output figures were 94,295 and 121,803

respectively. Moreover, over this period, the average processing time for an application dropped from a high of 4.4 months to 2.9 months.

In any language, this is an achievement of note when one considers the pressures placed on the Office.

Indeed at this point I think it fair to pay tribute to the staff who have displayed an admirable devotion to duty. I want to acknowledge their efforts and their success over the past number of years in reducing delays in the Registry.

I think that it is also important to mention that considerable investment has been made in computerisation and Information Technology in the Land Registry.

I know that the Management of the Registries is aware of developments in Digital Mapping and that the matter has been the subject of discussion with the Department of Finance. A feasibility study of the business case, rather than the technological case, for the future of Digital Mapping technology within the Registry has been undertaken.

I understand that a report is being compiled for submission to the I.T. Steering Committee in the Registry. I look forward to important and exciting developments for the Registries in this area.

I welcome the initiative by the Institution to hold this Seminar and the involvement of personnel from the Land Registry. I think it is only right and in keeping with the ideals of the Strategic Management Initiative that the Minister responsible and the Land Registry should listen to the views of their customers.

I want to conclude by saying that the Minister looks forward to reading the papers presented at the Seminar and to hearing an account of the views expressed. I have no doubt that they will be a useful input into the process of developing further policy options in this area. I know that we can all look forward with anticipation to important and exciting developments for the Registries in the years ahead.

Co-ordinate Registration Systems for Property Boundaries

by

Herr Klaus Rürup, Geodetic Surveyor in Private Practice

Introduction

Before going into details with co-ordinate registration systems I will briefly present the cadastral system in Germany. In Germany we have two registers, the 'Grundbuch', which is the juridical register and the cadastre, which shows the plot of land geometrically. Both are linked very closely, so you can say one cannot live without the other. Every piece of land even roads, rail tracks, airports and waterways are laid down in the registers. Registration of land is compulsory in Germany.

The 'Grundbuch' contains in different sections the ownership, the description (name) of the plot of land, the rights (easements) and the mortgages. Every change in the 'Grundbuch' has to be certified by a notary. The close link with the cadastre exists in the section of inventory and the ownership.

The cadastre as a technical register has three parts, the cadastral maps, the cadastral books and the cadastral figures. The maps show the geometry of the properties, the books contain the size in m^2, the actual owner and other descriptions of quality, and the record of figures consists of co-ordinates, every single measurement and other data recorded. The cadastral register started with maps only in the 19th century. They had to be drawn in the field sometimes in strange scales because of the dimensions of measurements (Rute, Elle, Fuß, etc). But when we went to the metric system (meter convention) the used scales were 1:500, 1:1 000, 1:2 500, 1:5 000. In former times the cadastre was built up for tax funding only. Later it became a multi-purpose cadastre.

Every change in the cadastre, in case of new roads or subdivision of a plot of land for example, has to be certified by a notarising geodetic surveyor before it will find entry into the register. Since the existence of the cadastre every change of boundaries or re-fixing boundaries is based on exact measurements taken in the field. These original figures have to be proved and certified by the notarising geodetic surveyor. This document we call 'Fortführungsriß' and you can follow through generations from the present back to the very first measurement of this particular plot of land. All these documents are in the archives of the cadastre.

With these 'Fortführungsrissen' the cadastral maps are being updated after every single measurement, so that the cadastral map is always up to date. Because every single measurement should be based on the network (triangulation and traverse), you can calculate co-ordinates of every single point. There are rules and regulations how a measurement should take place. And every figure might be provable through an independent measurement.

In Northrhine-Westfalia about 80% of the area is fixed with co-ordinates. The remaining 20% have never been touched since the very first measurement took place (forest, lakes and moor-areas for example). But not all co-ordinates are in the same system. During the last 100 years systems have changed considerably. When the first measurements took place they chose important points for the origin of the co-ordinate-system like the cathedral of Cologne or the tower of an astronomical observation station. The next step was the 'Soldner-System' and after that we are now in the 'Gauß-Krüger-System'. But even in this system there are differences in the regions depending on the reference system (WGS 84, EUREF, NET 77, etc.). But with today's modern computer technology there is no worry about transformations.

In Germany we started digitising maps around 1980/85. At that time there was a need to have digital maps for planning and other purposes. The industry - water, gas, electricity, transport and travel - asked for digital data to make their work more efficient and more accurate. In areas with a new co-ordinate system and excellent maps it is no problem but in other regions especially in the b.m. untouched areas we have to digitise the old original maps. There are a lot of

uncertainties. Sometimes the only way out is to go into the field and make a new survey and connect it with the net.

A quite important question is the money. Who has to pay for it? Keeping the net and registers is a state duty, covered by the states' money as a kind of preservation of public welfare. Digitising maps is almost completely financed by selling digital data to customers and every single survey has to be paid by the applicant or the ultimate beneficiary. If for example a farmer has a couple of acres for development, the value of the land increases by subdivision into single plots for the prospected building. So the previous owner can ask for a higher price selling ready-made building sites than ordinary farmland. To get this higher quality of land you have to invest some money in surveying, planning and maybe development.

Digital Maps

If we talk about digital maps in Germany we mean object orientated geographical systems and not CAD-systems. Depending on the scale and the contents there is a difference between LIS (land-info-system), GIS (geographical-info-system) and ALK - the equivalence in English might be ACM (automatic-cadastral-map).

In GIS' we handle complex objects with all added attributes and information concerning the object (voting districts with results, children and their health, size of families with consumed water or electricity in reference to their level of education for example). Below that there are objects and part of objects like a building or a boundary. The elements of geometry are the bottom of the stairs. Every single co-ordinate, text or line is an element but if you add attributes it can become an object (trigonometric points for example).

With German efficiency we have rules and regulations for digital data. There are

OSKA	(Objekt-Schlüssel-Katalog)
OBAG	(Objekt-Abbildungskatalog)
ZVAUT	(Zeichen-Vorschrift-Ausgestaltung)

DB (Datenbank)

I think here is neither the time nor the place to discuss these regulations!

Concerning digital maps in general there are some main issues to think about. These are the scale, the purpose and the contents. If you are talking about a map in the scale 1 : 25 000 for travel purposes you might consider different priorities than for a cadastral map in the scale of 1:1 000 concerning the contents. For cadastral maps you have to take into consideration the problems of accuracy, completeness and actuality. The last one leads to the question how maps should be generated by digitising or by converting raster-data.

On the surface of it, converting raster-data seems to be more efficient because of the costs and the time you save. But on the way to the finished product you may discover that only 80 - 90% of the raster-data can be converted automatically, this means the remaining 10 - 20% of the map must be completed or corrected by hand. In the final analysis, whether or not you should take this route to get digital data, depends on the quality of the old map. But at least we should not forget that an analogue map is a picture and the digital maps cannot be more than that.

As we have heard there are areas with and areas without co-ordinates. In the first case the production of digital maps is easy because you have to load the co-ordinates into your system and connect the points as required. To produce digital maps in areas without co-ordinates you have to digitise every single point. Sometimes calculation of points from the field survey book is necessary or even a survey in the field to get reference points for digitising. Quite often there are uncertainties at the edges of old maps. Reasons for that are firstly the distance from the middle (old origin of the system) of the maps and secondly inaccuracies if you lay the neighbouring sheet alongside. To overcome these difficulties the competence and knowledge of a geodetic surveyor is required.

During the period of building up a digital cadastre, which should be as short as possible, the expenditure of updating the data is rather high because the work has to be done twice, in the old and new maps simultaneously.

Final Considerations

In considering which way should be taken to begin with digital data and maps in surveying the final targets to aim for should be thought about very intensively. The idea for example, if I have digital maps and co-ordinates for every point of a boundary so that it seems to be a technical procedure to set them out into the field, is totally wrong. To fix or re-fix a boundary of a property is a legal act and not a technical process. For these legal acts you need a public notarising surveyor or 'Geometer' in Germany. They are geodetic surveyors with a university degree and an additional education and practice of two and a half years at the state. A second examination by the state empowers them to set legal acts about all questions concerning land and properties with signature and seal. All documents of this kind are under a 'public believe' (Öffentlicher Glaube) or conclusive evidence, meaning among other things they are right and valid until they are proved wrong.

If digital maps are required as multi-purpose-cadastre maps all users should be able to rely on them with a guarantee of correctness of contents and geometry. Then the conversion of maps and a well organised cadastre is worth the investment.

In general I would like to state as follows:

- **If you demand a first-class digital map you need excellent data**
- **to get excellent data you need reliable measurements**
- **reliable measurements can only be executed by highly qualified and competent persons**
- **these highly qualified and competent persons we call in the EU geodetic surveyors**.