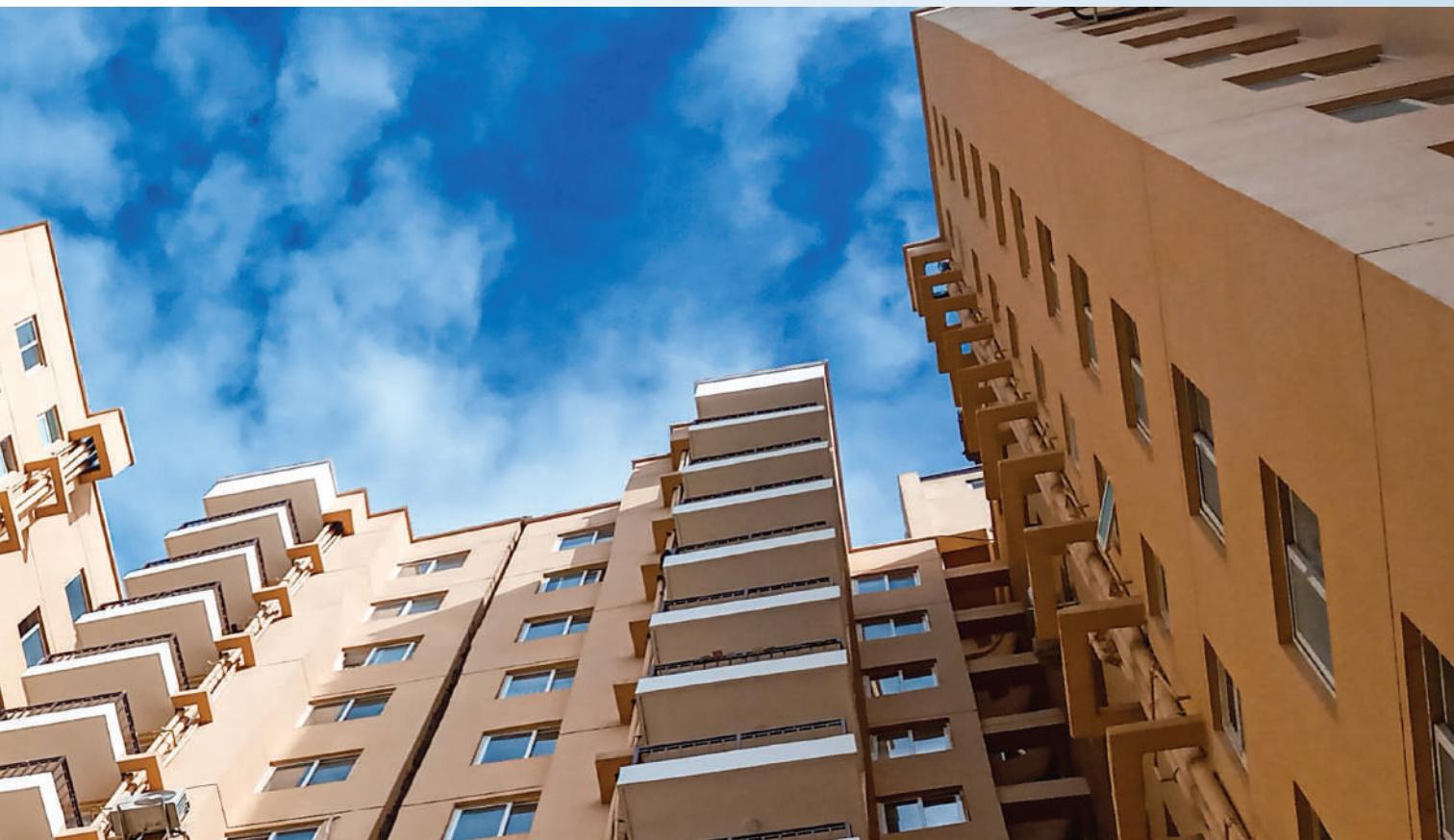




THE COUNCIL OF EUROPEAN GEODETIC SURVEYORS
INTEREST GROUP OF PUBLICLY APPOINTED AND REGULATED LIBERAL SURVEYORS

IG-PARLS



CONDOMINIUM ...

as Seen by Surveyors



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IG-PARLS – Interest Group of Publicly Appointed and Regulated Liberal Surveyors – is a group of European private surveyors from different countries who, under the umbrella organisation Comité de Liaison des Géomètres Européens (CLGE), foster the interests of property surveyors and their role in individual activities and services (by “property”, throughout this compendium, we mean land and/or built property). We present good practices in individual countries, raise awareness, and foster sound legislative solutions.

The way IG-PARLS works is project-based. Usually, we select a professional topic, and our members – representatives of different countries – present how they implement this topic in their country. Based on the analysis of the national presentations and additional consultations, we create a report with conclusions and guidelines based on best practices.

On this occasion we are dealing with the very important issue of multi-apartment buildings and the definition of ownership within these buildings – the so-called condominium design.

This short report sheds light on this issue from different angles, defines the role of certified (property) surveyors within the process, and indicates the direction of the development of condominium design in the future, as we see it.

We hope that you will enjoy reading this document and will glean some valuable insights from it.



WHAT IS A CONDOMINIUM PROPERTY?

A condominium property is a relatively new type of real property in Europe that provides the possibility to establish individual ownership of a part of a building. However, such ownership can be traced back to ancient Egypt and was used in the Middle Ages, so this type of property was not entirely unknown when condominium statutes were introduced in jurisdictions around Europe during the 20th century.

Condominium law is primarily designed to convert buildings consisting of residential rental apartments into individual ownership for each apartment resident, but other types of non-residential use are also quite common in many jurisdictions. These include commercial condominium units: underground parking garages and shopping centres, hotels, cinemas, etc.

The term “condominium” originates from Latin and means “joint sovereignty” or, in other words, “the concept of individual ownership rights in a common property”. In theory, two distinct types of condominium concepts can be distinguished, namely the uniform and dualistic types.

The perception of the uniform concept is that the owners possess the whole property in common. Individually, they each hold an exclusive right to use part of the common property – usually a residential owner’s apartment.

The perception of the dualistic concept is that the property/building is converted into several individually owned property units, instead of the owners only obtaining an exclusive right. The “mother parcel” and common facilities (pipes for heating, gas, and water) and outer walls, the roof, and supporting parts of the construction are considered common property. Inside the building, all rooms not converted to condominium units are considered common property. Normally, this includes common stairwells, elevators, and access halls.

The jurisdictions that chose the uniform system are those



that hold to the classic *maxim superficies solo cedit* – meaning that everything connected to the parcel belongs to the owner of the parcel. This ownership right stretches from the core of the earth through the surface and into the sky. Thus, horizontal property boundaries, necessary in the dualistic concept, are not allowed. However, in reality, each jurisdiction can form the condominium institution on the basis of a uniform or dualistic perception to accommodate the same possibilities for secure property rights that benefit the condominium owners and satisfy the mortgage lenders. In each case, there will be a common property to manage.

Managing a common property is not an easy task, as identified by many researchers throughout history, e.g. in Garrett Hardin’s famous article “Tragedy of the commons” and Michael Heller’s “Tragedy of the anticommmons”. Good governance is the Achilles heel of a functional condominium property. Condominium statutes include an obligatory governance body (the co-owners’ association). The legal framework includes rules to secure good governance and avoid conflicts between owners regarding the management of the common property. It establishes, so to speak, a local democracy able to make decisions at a general assembly based on a majority of votes. Registration



- the number of votes at the general assembly;
- the ownership share(s) in the common property; and
- the contribution to the common expenses – a calculation often determined by a notary or a lawyer, but in some countries also performed by chartered surveyors.

It has been acknowledged that the chartered surveyor's ability to combine rights and/or responsibilities over the common property with maps not only creates a more accurate registration but is also efficient in generating a transparent and clear organisation. Indeed, the registration of property rights over the common property is not dependent only on text documents, which sometimes are subject to misunderstandings. An excellent example is Denmark, where it is a tradition that the chartered surveyor, in addition to measuring and preparing the mandatory documentation, works as a legal adviser, counselling the owner/developer on legal issues determining the co-owner share, and assisting them in preparing a customised by-law and/or easements.

There is reason to believe that the use of the condominium concept will increase in the future because multiple ownerships in mixed-use buildings around the world are growing. This is mainly due to an intensification in urbanisation that focuses on creating interesting, safe, and sustainable cities (as stated in UN sustainable development goal no. 11). This challenges existing condominium institutions around the world. Therefore, each jurisdiction might gain positive outcomes by analysing its condominium institution in terms of adoption of optimised solutions.

of clear boundaries between individual interests and the common property is essential in a functional condominium democracy.

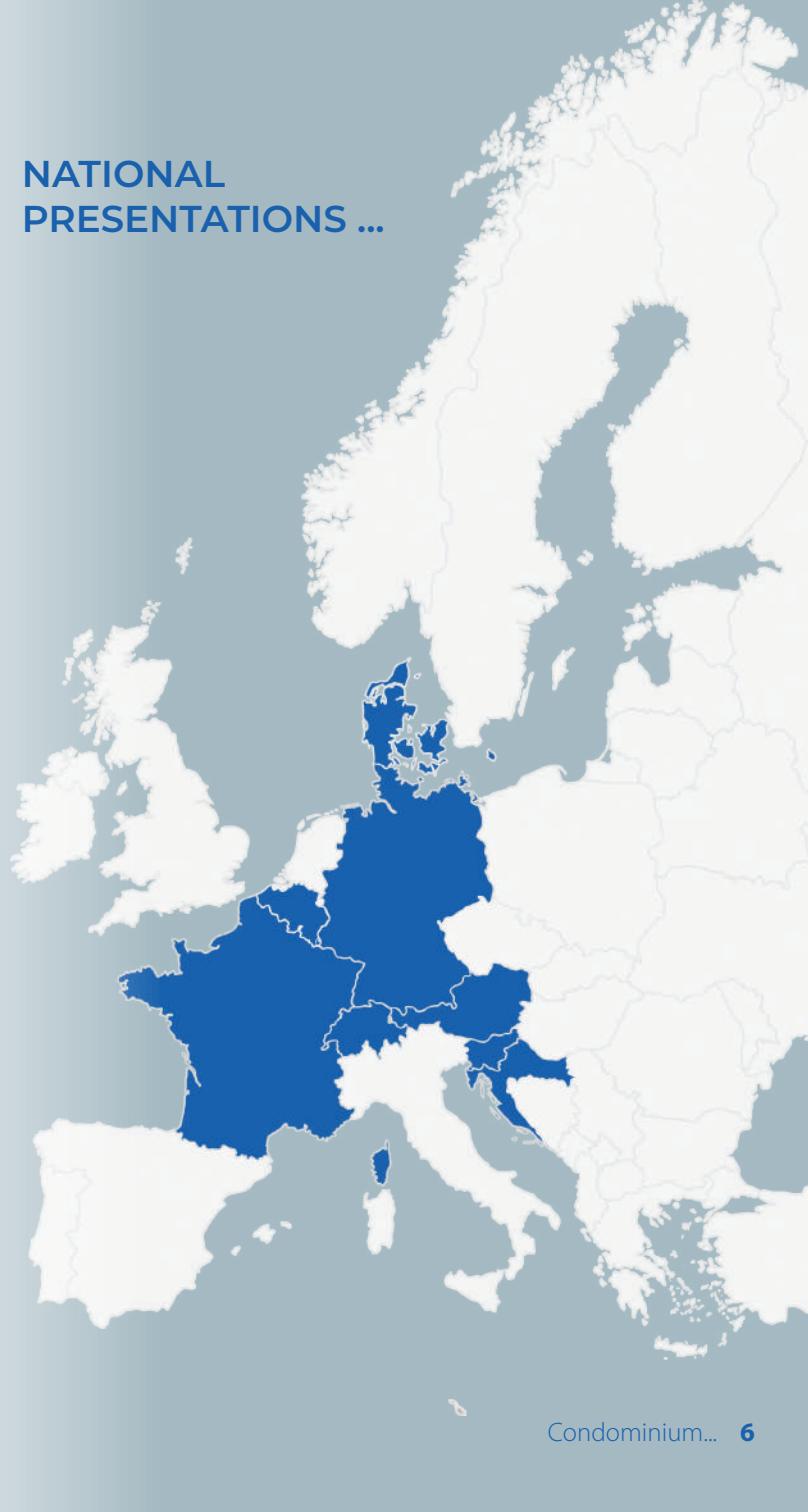
The practical conditions regarding the conversion of a property/building into a condominium property differ across jurisdictions. For IG-PARLS, which operates within CLGE, the role of the property surveyor in the process of determining condominium ownership is very important. In some jurisdictions, the chartered surveyor's role is limited to measuring the building and preparing the obligatory documentation, including a map of the condominium units and a list containing details of each condominium's unit number, location address, size, and co-ownership share. The calculation of the co-ownership share determines:



11 SUSTAINABLE CITIES AND COMMUNITIES



NATIONAL PRESENTATIONS ...



AUSTRIA (AT)

In Austria, surveyors carry out only the measurement – not the valuation – and the legislation does not take account of a first phase (plan preparation, valuation) and a second phase (construction, area control, final report), as is the case in many countries. In Austria, this is stipulated in the Condominium Act (WEG § 9 (1), as follows:

“The usable values are to be determined by the expert opinion of a civil engineer responsible for building construction or a generally sworn and legally certified expert for building construction or real estate.”

The surveyor’s office asks the client for the existing plans (construction plans or authorisation plans). If these are available, the surveying office performs punctual checks. If any changes are found, the necessary surveys are carried out. On occasion, the surveying or surveying control is done by architects or master builders, which is not optimal as neither are experts in property surveying.

Existing buildings to be transformed

The surveyor carries out an as-built survey (surveying the existing condition).

An architect/technical office then carries out the planning for the changes to be carried out on the existing building and makes the new plans.

If construction is then carried out exactly according to the plans, a surveying office is not called in. The old, original plans are replaced by new, up-to-date ones.

However, a first valuation may have to be prepared at an early stage, as a basis for the sale of individual apartments, which then has to be replaced by a second valuation, after the construction is completed, because parts of the house have been converted.

New buildings

Condominiums are sold based on the plan. Smaller construction companies especially sell parts of buildings in advance, i.e. the



construction begins. In this situation, it is not uncommon that new buyers can have changes made during construction. In this case, one would have to measure again.

Also, some construction companies do not set out the building precisely, so errors can occur with the garden parts, for instance. In this case, one would also have to measure again.

Role of surveyors/surveying companies

In Austria, there are two chambers: the Chamber of Architects and Chartered Engineering Consultants, and the Chamber of Commerce/Trade.

Only chartered surveying engineers of the first chamber are allowed to work in the Cadastre. The rest can also be done by surveyors who are members of the Chamber of Commerce.

In principle, only chartered surveying engineers are allowed to work on condominiums; but in reality, the commercial surveying companies and master builders (i.e. the trades) also do it.

Situation

As far as the motivated report (valuation deed) is concerned, the valuation may only be done by experts in building construction (architects, civil engineers in building construction, real-estate agents); see §9 (1) WEG. This is a notarial contract in which the utility value appraisal is processed.

Goal

Since only ZT surveyors (the first chamber) are allowed to do the property surveying [for land], it would be consistent and logical that the measurements of residential property according to the WEG could also be carried out only by ZT surveyors (chartered surveying engineers).

BELGIUM (BE)

The Belgian Civil Code (Art. 577-4) prescribes that an authentic deed is mandatory for any condominium or forced co-ownership. This authentic deed is drawn up by a notary and must contain the basic deed, the condominium by-laws, and the internal rules. The basic deed and the condominium by-laws constitute the statutes of the immovable property and must be the subject of an authenticated deed to be modified.

The basic deed includes a description of the property complex and the private and common parts. It also includes the determination of the share of the common parts for each private part, for which the respective value of these parts is taken into account. This is determined as a function of the net floor area and the use and location of the private part, based on a motivated report established by a notary, a property surveyor (géomètre-expert), an architect, or a real-estate agent. This report is included in the basic deed.

The condominium by-laws must include a description of the rights and obligations of each owner, the motivated criteria, and the method of calculating the distribution of charges.

Another law prescribes that any plan joined to an authentic deed must be drawn by a property surveyor (géomètre-expert). Hence, the plan that is attached to a basic deed should be drawn and signed by a property surveyor. In practice, it appears that this rule is not systematically applied, especially when parts of the property are sold before the construction of the building.

New buildings

In the case of new buildings, the abovementioned professionals are allowed to prepare the motivated report based on, among other elements, the building plans before construction. The architect has to follow these plans, since they got the building permit. However, very often the plans are not totally followed, and this implies that the motivated

report and corresponding basic deed can contain more or less important errors. No as-built plan or even control measurements are required.

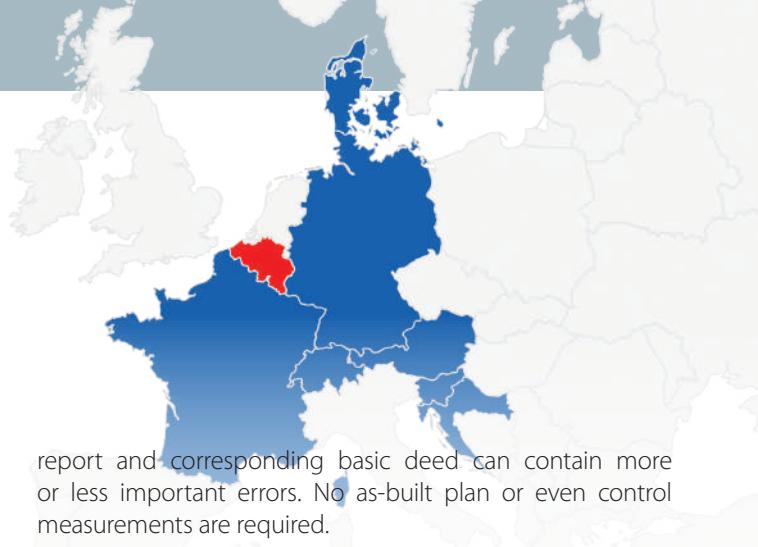
Currently, the Belgian surveying associations are discussing with the Federation of Notaries and with the Cadastre if this situation can be changed to achieve improved legal security.

Essentially, the property surveyors would prefer that the motivated report could be written by the four abovementioned professions; however, the plans should only be drawn by property surveyors based on on-site surveys and as-built plans or onsite control surveys.

Existing buildings

Very often, existing buildings are transformed into another use. For instance, late 19th- or early 20th-century master houses are transformed into condominiums. In these cases, surveys are very frequently made before starting the transformations. Well-advised project owners ask property surveyors to perform surveys and produce plans for the existing situation. After completion of the allowed transformation works, a property surveyor must be appointed to draw the final plans, based either on a full survey or on control surveys, depending on the volume of work that was done and the involvement of the property surveyor during the planning phase.

In the case of the transformation of existing buildings, the law can also be disregarded, as with new buildings, but this is less frequent.



CROATIA (HR)

In the field of condominiums, Croatian legislation currently does not have differences in procedures between new and existing buildings. Before starting the condominium process, the registration of any building has the following requirements:

- Each building is on a single parcel of the Land Registry.
- The building has a use (construction) permit.
- The ownership, co-ownership, or right to build on the Cadastral (condominium) parcel is established.

The documentation attesting compliance with these requirements can only be produced by chartered geodetic engineers. For existing buildings, it is done through geodetic reports which are submitted to local Cadastral offices for verification, and then to the courts. New buildings go through the same procedure.

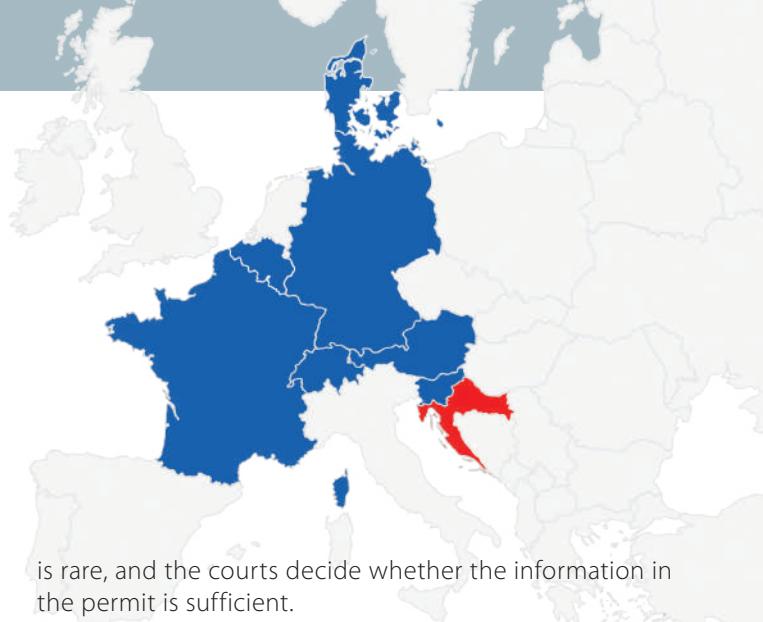
Once the requirements are fulfilled, a condominium plan is drawn. Who can make the condominium plan is not strictly defined by law, but it is mostly done by chartered architects, chartered building engineers, and chartered surveyors. In the case of new buildings, the documents can be based on the authorised architectural plans, provided the abovementioned geodetic reports are handled by a chartered geodetic engineer.

Once the plan is made, it is submitted for verification, along with the building permit, to the local State offices for spatial planning. The State verifies that each individual unit is built or made in accordance with its building permits, and that each individual unit in the plan is in fact an individual unit. The State administration sends its agent(s) to inspect the building and confirm whether the plans were followed. The plan also consists of a list and detailed descriptions for each unit. In the case of new buildings this stage can be skipped if the permit already contains information about the individual units, but this

is rare, and the courts decide whether the information in the permit is sufficient.

Once the plan is verified, it is submitted to the Court. In addition to the condominium plan, a legal document must be submitted: the “manifestation of will” if all co-owners have signed it, or, when this document does not exist, a Court decision on the value of each individual unit and its ratio in the entire condominium. The manifestation of a will is a document in which all co-owners declare that they agree to limit their ownership rights to their unit only (and their share in the common parts). This is done usually by lawyers, sometimes by real-estate agents, and rarely by surveyors. Every owner must have his or her signature verified by a notary. Once the Court finishes its process, the condominium is complete, and the individual units are then inscribed in Court ledgers.

There is an exception to these rules for buildings whose owners are not registered in the Land Registry, because they bought their apartments during the communist era, during which one could not have private property registered on State parcels, and such ownership was registered in a special registry in Court. Building managers were then required to submit a request for a condominium (and do all the required actions) by 31 December 2015 by following the same condominium procedures.



DENMARK (DK)

Denmark has specific legislation to facilitate apartment ownership (condominium property). The “law of owner apartments” (Ejerlejlighedsloven) was implemented in Danish legislation in 1966. In addition, a standard by-law was implemented. Unless other agreements are made and declared in the Land Registry, the standard by-law applies. In simple buildings, the standard by-law is typically sufficient, but in more complex buildings the by-law is adjusted according to the nature of the building. Either a lawyer or a surveyor (or a combination of the two) draws and registers the adjustments in the (customised) by-law, and draws and registers deeds and other rights through easements.

From 1966 to 2020, condominium property was registered only in the Land Registry. Today, condominium property is also registered in the Cadastre. The documentation needed to apply for the conversion includes a map of each condominium unit and an application document that provides information regarding each condominium unit, such as a unique identification number, address, location in the building, use, size, and fraction share.

The fraction share (or co-ownership share) is three-dimensional and (1) denotes the relative value each condominium unit holds of the common property, (2) determines the relative contribution of each condominium to common expenses, and (3) the relative vote, at the owners’ association’s general assembly. Based on the relative size and value of each condominium, the surveyor calculates a fraction share; however, this is not regulated by legislation. The surveyor is only an adviser, and the owners/developers can set the fraction share for each condominium unit as they see fit. If no fraction share is noted in the application, all owners are given an equal share.

Only a chartered surveyor can, on behalf of the owner, apply for the conversion of a building into a condominium.

New buildings

Based on building plans, a chartered surveyor prepares the documentation. However, the chartered surveyor must also perform a full as-built survey after construction. In the case of

variations between the building plans and the as-built survey, the documentation must be adjusted accordingly.

It is possible to register an initial “early-stage condominium property” in the Land Registry before the building is constructed and registered in the Cadastre. The required documentation is based on building plans. This early-stage registration is possible for financial reasons; for example, in order to sell apartments during the project stage. It is therefore possible to register deeds, mortgages, customised by-laws, and easements on each condominium unit. It is particularly important to keep in mind that the building plans and as-built survey must not vary. If variations are identified, owners and mortgagees must approve the changes before the final registration in the Cadastre may be approved.

Mixed-use condominium developments are widespread in Denmark. Such cases are often very complex and require customised by-laws and an organisation based on easements etc. In these cases, a chartered surveyor can perform the full project, including the measurement and determination of fraction share(s), the by-laws, and even the deed. However, often the deed and by-laws are written by a lawyer, while the rest is done by the chartered surveyor. It is often done cooperatively.

Following a recent trend, more and more often developers acknowledge that surveyors have a better spatial understanding and might be more capable of drawing up the customised by-law without the intervention of a lawyer. Currently, only a handful of surveyors write these by-laws for very complex projects, but this could evolve in the future.

Existing buildings

Only buildings for which construction began after 1 July 1966 can be converted into condominiums. This regulation is meant to secure the number of cheap rental apartments not to be subjected to individual ownership. However, some exceptions are implemented in the law.

A chartered surveyor must carry out a full as-built survey of the building.

FRANCE (FR)

Currently, condominiums, called *copropriétés*, are regulated by a law of 10 July 1955. This is relevant each time the ownership of a parcel is divided and transferred to several persons (natural or legal).

For each condominium, a “lot” must have a private part and a share of the common parts of the building – these two elements are a non-separable part of a “lot”.

A condominium must have a deed, published by a notary, which contains the property origins, all the required diagnostics, specific rules that are added to the rules defined by the law, and the description of the condominium (*etat descriptif de division* – EDD). This EDD is composed of the definition of the parcel; the definition of the building(s), level by level; the architect or as-built plans; the definition of the common and private parts; the definition of each lot; and a distribution of expenditures that can differ from the share of common parts.

There is no list of professionals that are allowed to participate in the writing of the EDD. They must be professionals – notaries, property surveyors (*géomètres-experts*), lawyers – but they are not defined. That is why, in some cases, the documents are written by diagnosticians, building experts, real-estate agents, or architects. The notary in charge of publishing the Act will have to check the report but will not be responsible for the calculation of errors or a wrong description.

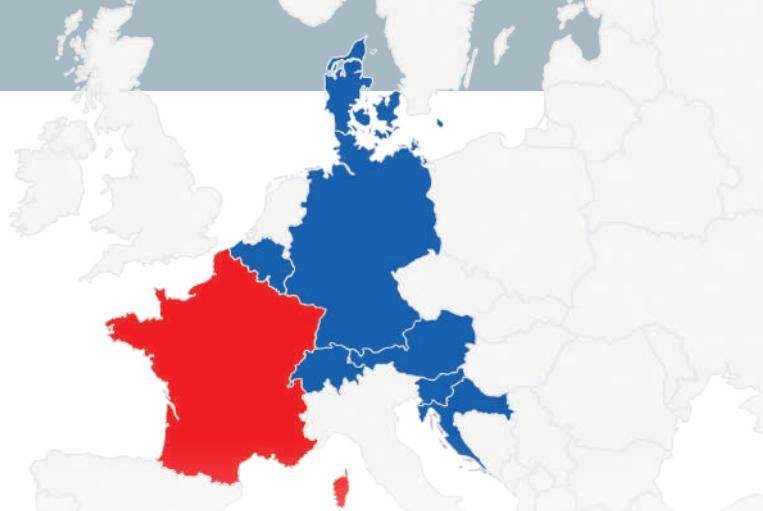
New buildings

Plans of the project must be used for the definition of the common and private parts and the definition of each lot. These plans must be compliant with the authorisation to build given by the building authority. Note that in these authorisations the presence of plans of the inside of buildings is not mandatory.

The condominium status begins when the first apartment is sold to another person (natural or legal).

Existing buildings

For an existing building, plans must be made from on-site measurements for the parcel and each level within the building,



in 2.5 dimensions (2D + height) – the height will be used, like other parameters (level, shape, view, sun, etc.), to compute weighted areas for the calculation of the share of commons parts.

A measurement of the outside and the inside of the buildings must be done on-site. The description and calculations have to be done by analysing these measurements. The condominium status begins when the first apartment is sold to another person or entity.

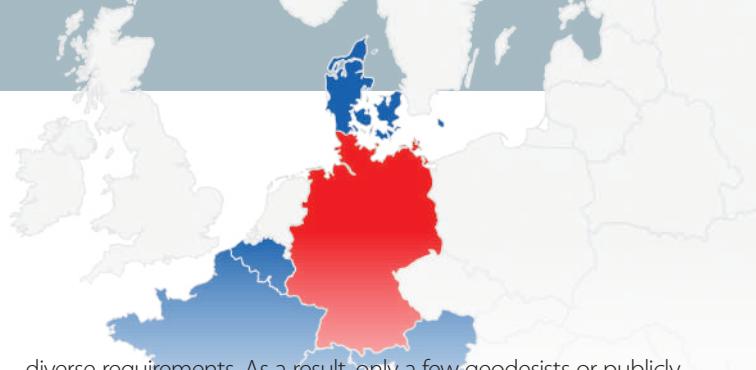
Modified buildings

When a building has been or is going to be modified, e.g. an apartment divided into two, a commercial space turned into a residential space, or an extension of a building with the creation of new common and private parts, the adapted description of the condominium must be accepted by the general assembly and by the city, and the description and calculation of shares will have to be modified to fit the new situation.

This task must be done with plans of the project or by measurements on-site if changes have already been made.

In some cases, there are buildings for which the description or the rules are not compliant with the law or the reality. Those situations cannot stay like this. The EDD will need to be modified or renewed if it is too complicated to manage necessary adaptations by simple modifications.

In general terms, the EDD has to reflect what was built and this must be in line with what was authorised by the city. This description will be published in the Land Registry.



GERMANY (DE)

In Germany, residential and partial ownership was introduced in 1951 and was amended by the Condominium Act (Wohnungseigentumsgesetz, WEG) 2021. Condominium ownership concerns residential rooms; part-ownership concerns rooms and areas not used for residential purposes. However, both are otherwise regulated almost identically to separate property.

For the formation of condominium ownership, a declaration of division by a notary is regularly required, in which it is determined with regard to the geometry of ownership: which rooms and property areas belong to which special property; everything else belongs to the common property. A condominium or part ownership Land Register is formed for each of those separate special properties, that are part of the declaration of division. All part-owners together form a legally capable community.

A component of the declaration of division is a certificate of seclusion, which the building authorities of the local authority district issue on application on the basis of building plans and site plans. In the construction plans, all rooms belonging to a part-ownership are marked with the corresponding number of the part-ownership. In addition, other rooms (e.g. cellar, attic, storerooms) and partial ownership areas (terraces, garden areas, parking spaces) are marked with the same number.

In addition to the certificate, a so-called 1000ths calculation is required for the declaration of division, which states with what share the condominium participates in the overall property. This determines the voting rights and participation in costs of the common property.

There are no legal requirements for the quality of construction drawings and site plans. The only stipulation is that they have to be "existing property plans", which is not what surveyors call "as-built" plans. They can be made by anyone. In this respect, no distinction is made between new construction projects and the existing buildings. In new buildings, there is no comparison between the planned and the as-built state, and in existing buildings, there is no obligation to take measurements for "as-built" plans. Visually checked old construction plans are sufficient.

The building authorities of the local authority district have very

diverse requirements. As a result, only a few geodesists or publicly appointed surveyors (Öffentlich bestellte Vermessungsingenieure ÖbVI) devote themselves to this field of work. Whether geodesists become active in this field depends on personal contacts with notaries, building authorities, architects, and project developers. However, some land surveyors (ÖbVI) have discovered this field of activity for themselves and in some cases have intensively expanded it.

The extent of part ownership is not recorded in the Cadastre. To identify the extent, one must refer to the declaration of division or certificate of seclusion, which is not always available at the Land Registry. Sometimes this requires research at notaries' offices and/or building authorities. Due to the lack of certainty and clarity of the documents on the extension of the partial ownership or the previous special-use rights to areas, there are a considerable number of court disputes about the relationship of co-owners to each other, in particular about the location, size, and form of the special-use areas, but also about the size of the flat areas.

From the point of view of the publicly appointed surveyors, the Länder (federal states) as well as the building authorities could entrust surveyors with the issuing of certificates of seclusion, because the ÖbVI has authority status and the federal government at the national level has created a basis of authorisation for the federal states for this. However, efforts to do this in the federal state of Rhineland-Palatinate have come to nothing, and until now, all over Germany, only the local building authorities are in charge of issuing of certificates of seclusion.

Another suggestion of the ÖbVI is the standardisation of the requirements for building and site plans for more legal certainty. As a long-term goal, from the point of view of the publicly appointed surveyors, the proof of the extension of condominium ownership in three dimensions should be mapped in the Cadastre on an equal footing with the proof of land and building ownership.

LUXEMBOURG (LU)

In the Grand Duchy of Luxembourg, all condominiums should have a complete report (table of the parts of each private part, plans to indicate the private and common parts, different views from the building, Cadastral plan of the parcel, plan that indicates the authorised distance from the building to the border, etc.).

The new types of reports have been made since 2002. The previous reports existed since the laws of 1975 and 1988.

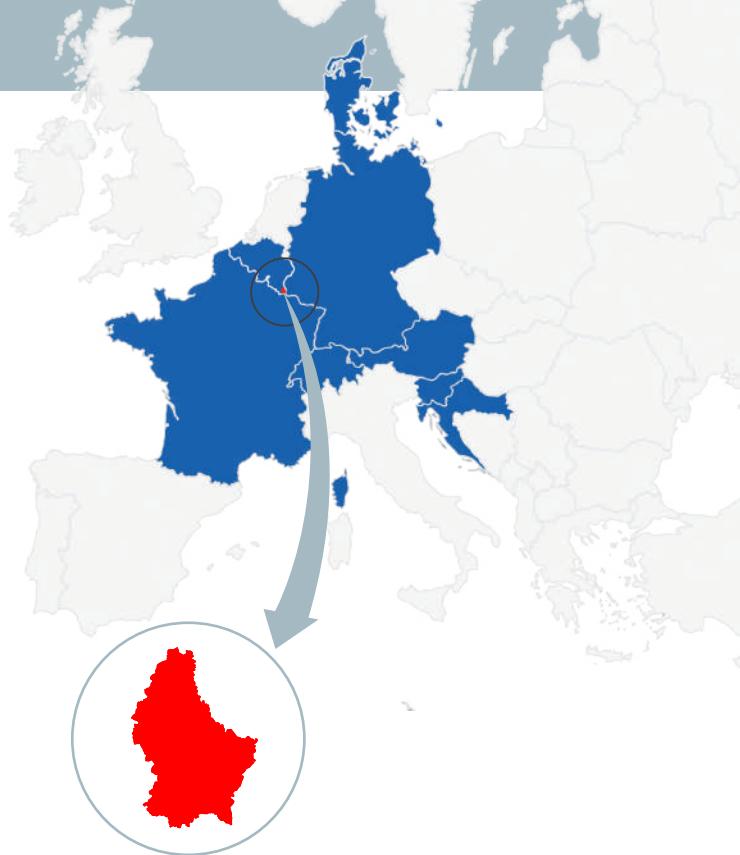
To generate a report, there are the following cases:

- new buildings (before construction);
- buildings with a new report, where there is a transformation that is changing the old report;
- buildings that exist without any report – the building is transformed into a condominium; and
- buildings with an outdated report (changing old reports into new reports is treated like buildings without reports).

The full report may only be written by a member of the OAI (Ordre des Architectes et Ingénieurs – Chamber of Architects and Engineers), including surveyors, chartered surveyors, civil engineers, architects, etc.). Notaries, lawyers, and real-estate agents are not allowed to establish this report. The report is sent to the Cadastre for checking. After validation, the report can be used by the notary to sell the different parts of the building.

New buildings (before construction)

Only the authorised architect's plans can be taken as the base of the report (city stamp on the plan). A control after the construction is not required. Each city has to control the correct execution of the constructions. Where large errors in the report are known to exist, they show that the building was not built as authorised – in this case, the report must be transformed.



Buildings with a transformation (after transformation)

The surveyor/engineer only has to control the transformation. They have to adapt the report, based on the original report. If, according to the measurements from the transformation, the surveyor/engineer finds a problem with other spaces in the original report, they have to control everything (see also buildings without report).

Buildings without a report/buildings with an outdated report

The surveyor/engineer measures the whole building, and makes all the plans to get a building authorisation from the city (for example, there might be an unauthorised room in the attic that must be sorted and regularised. Then they can fix the full report.

SLOVENIA (SI)

Condominium ownership in Slovenia is determined by the Law of Property Code, which has been in force since 2002. Registration of condominium property is conducted in the Land Registry. The condominium is created by a court decision and by an entry in the Land Registry.

The basis for entry is a Land Registry proposal, which must contain an agreement on the division of co-ownership into condominium ownership. In Slovenia, it is called a division agreement. The division agreement is usually prepared by a chartered surveyor who performs measurements in the building. In some cases, real-estate agents, designers, or architects can also prepare it. In addition to the division agreement, the Land Registry proposal must contain a decision on the registration of the building in the Building Cadastre.

Only a notary can submit a land registry proposal. The process takes place digitally, and the entry goes directly into the Land Registry.

A unique feature of Slovenia among all the IG-PARLS countries is the established Building Cadastre, which is maintained by the Surveying and Mapping Authority of the Republic of Slovenia. This is a technical registry of buildings. When establishing condominiums, the surveyor must make a plan with all the technical data, which must be entered into the Building Cadastre. The certificate of entry in the Building Cadastre must be attached to the Land Registry proposal.

Existing buildings

When creating condominiums from existing (old) buildings that are highly likely to have changed throughout their history, we must always measure the existing situation. Before the entry of condominium property into the Land Registry, each such building must be previously registered in the Building Cadastre and be subject to the rules described

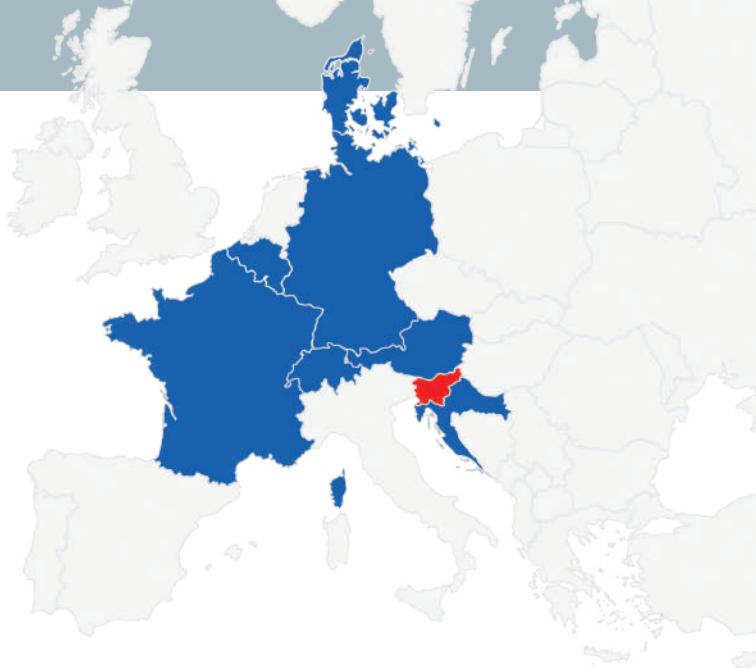
above. There are no exceptions – it is always necessary to measure the existing situation.

New buildings

In most cases, apartments are sold before their construction. In cases where an apartment is sold before construction, the area of the apartment (for the purposes of the contract) is taken from the project documentation. An integral part of the contract is a special supplement that in Slovenia is called the general conditions. In these conditions, it is determined that due to the method of construction, the surface can deviate plus or minus 3–5% max. If the deviation of floor area after construction is greater, it is necessary to conclude an annex to the contract and the final payment will be made following this annex.

After construction, a survey of the as-built situation is mandatory in Slovenia. This measurement is the basis for the floor plan. The floor plan is the basic document for the Building Cadastre and the basis of the division agreement.

The most important thing is that the as-built situation is always measured and recorded.



SWITZERLAND (CH)

The current concept of the condominium was introduced into the Swiss Civil Code (Code Civil Suisse, CCS) by the federal law of 19 December 1963, modifying the fourth book of the CCS (co-ownership and property by floors).

In Switzerland, the specifications for the implementation of condominiums are regulated at a cantonal level. Since it is impossible to describe all the cantons, the following text details the procedures in the canton of Geneva, which is a pioneer in this field.

In accordance with the historical customs of the canton, the lots are defined up to the outer edge of the facade, thus including the outer envelope of the building (insulation, load-bearing walls, and/or facade). This practice in Geneva is contrary to the federal definition, which considers the facade and roof elements as common parts.

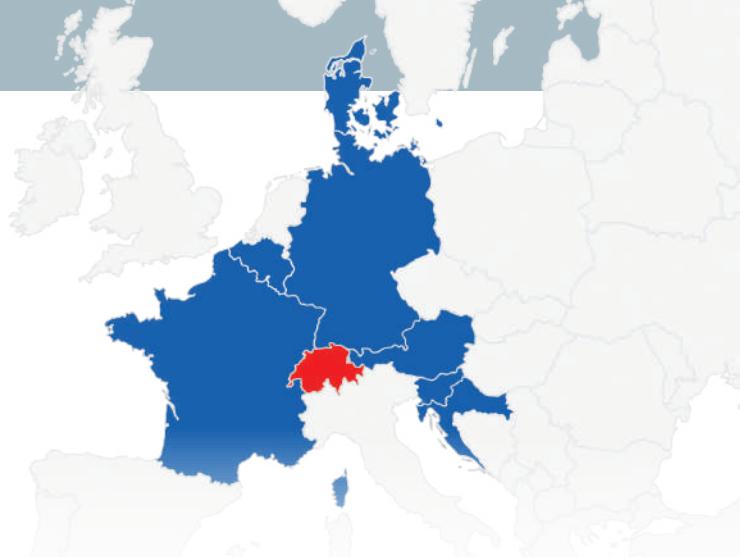
Existing buildings

Condominiums constituted on an existing building are characterized by the necessity of an initial measurement of the situation after transformation. The calculation of the shares (called thousandths) is carried out based on the surfaces that are derived from the survey. It is registered directly without mention. This survey is carried out in the building. The property surveyors have the monopoly of this task.

New buildings

The establishment of the condominium before construction is the most common in the canton of Geneva. The lots are then sold based on the architect's plans as approved by the building authority. In this case, upon completion of the work, the surfaces must be certified by the surveyors. The difference between the measurements in the space allocation book and the actual measurements must meet defined tolerances:

- ± 10 cm for lot boundary points;
- $\pm 1\%$ for surfaces.



The operations are prescribed by Geneva cantonal law ("RMOC – Règlement cantonal sur la mensuration officielle et les cadastres des restrictions de droit public à la propriété foncière, du sous-sol et 3D"). The sequence of operations is as follows:

- Establishment of a condominium distribution book with the mention "before construction" based on the authorised architect's plans.
- The condominium is registered in the Land Registry with this designation, which is mentioned for each lot.
- Once the construction is completed, the property surveyor is required to check if the plans have been properly executed (in accordance with the Cadastral tolerances) and, in case of compliance, they send a request to the Land Registry to remove the "before construction" mention.
- If differences or modifications to the geometry of the lots exceeding the above-mentioned tolerances are recorded, a new book is established.

With experience in condominiums and expertise in land surveying, a property surveyor from Geneva can advise clients throughout the process on many key aspects of condominiums: thousandths, the definition of lots, the creation of adequate easements, the change of the land parcels, and subsequent modification of lots.

History of euREAL/IPMS – the technical part

Historically, there are numerous standards for measuring property. All over the world, properties are compared without any guarantee as to the quality of the various processes. With so many different methods of measurement in use, it makes it difficult for property surveyors, other professionals, or occasional users to compare spaces accurately or consistently.

Research done by the European Commission in 2010 showed that, depending on the method used, a property's floor area can deviate by as much as 27%. Those results proved that there was an economic need for a single property measurement standard. Such a standard should ensure that properties are measured in a consistent manner, creating a more transparent market and increasing public confidence with legal certainty.

Since 2007, a Franco-Belgian working group consisting of surveyors, together with technicians from the European Commission, have worked together to develop a measurement code that is as universal as possible. The aim of the working group was to draw up standard definitions and rules common to all buildings, irrespective of their use, and to propose a simple, fair, user-friendly, and robust code.

CLGE strongly supports the harmonisation of the measurement and valuation of buildings across Europe. Therefore, CLGE collaborated intensively with the working group and together they unanimously adopted the developed measurement code. Since 2012 the code has been advertised and promoted via the initiative called European Real Estate Area Label (euREAL) under the umbrella of CLGE.



euREAL/IPMS and CONDOMINIUM

euREAL = European Real Estate Area Label

IPMS = International Property Measurement Standard



euREAL defines three reference areas:

- The external area (SEM) refers to the outer perimeter of the building (used for town planning purposes or the planimetric representation of the building).
- The internal area (SIM) refers to the inner perimeter of all building elements and is subdivided into four types: primary areas, residual areas, other areas, and service areas (used as a reference unit of measure in valuation, property transactions, renting, and building management).
- The constructed area (SDC) is the difference between the external area and the internal area (used as technical data).

euREAL provides a clear answer to the question “What do we measure and what we do not measure?”. The code defines the concepts of “above ground” and “below ground”, and it also provides a rule for measuring the common parts. All built-up areas are classified according to their nature and purpose in two annexes, namely “the detailed area chart” and “the table of areas”.

The code was conceived as a platform for further improvement and cooperation with other bodies, especially the European Commission. This plan has already been successful since the INSPIRE thematic working group on buildings adopted the measurement code as the default description for areas in buildings. This was endorsed by the European Commission in April 2012, and our approach is now part of version 3.0 of the INSPIRE data specifications.

By offering a tool to harmonise the measurement of the floor area(s) of buildings, the code directly contributes to the cross-border mobility of surveyors and to the protection of consumers, who can easily and consistently compare the prices of buildings throughout Europe.

To share this innovative European approach with the rest of the world, the International Property Measurement Standards Coalition (IPMSC) was created. In July 2013 the IPMSC selected real-estate experts from around the world to form its Standards Setting Committee (SSC) and develop a single global standard for property measurement. The euREAL document served as a basis for the development of IPMS.

The SSC research found that measurement practices vary substantially across local and global markets. There is a need to consistently measure the external area of a building along with the internal area(s) of a building for planning purposes, for the summary costing of development proposals, for making efficient

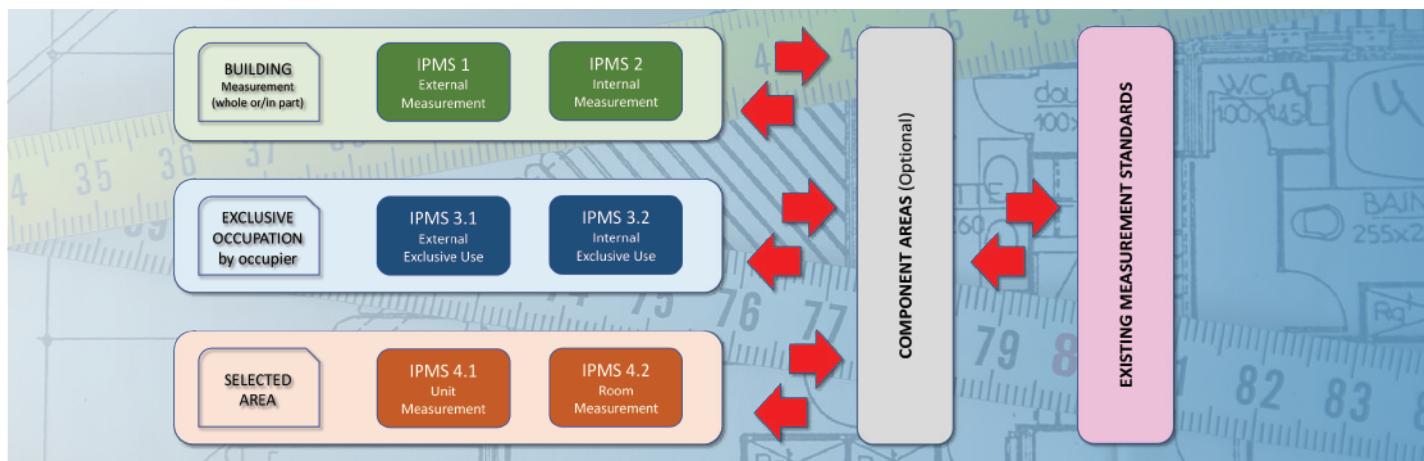
use of space, and for benchmarking data. It was also important to measure areas in exclusive occupation for transactions and other purposes. Facility managers and corporate occupiers have also been asked to define partial areas within a building.

After several standards were developed for office buildings, residential buildings, industrial buildings, and retail buildings, the SSC proposed to create a single universal standard that could be used for all building classes. The proposal was accepted by the Board of Trustees of the IPMSC. This single standard is in line with the euREAL document and defines six reference areas in three fundamentally different groupings:

- IPMS 1 and IPMS 2 are external and internal measurements for the whole or part of a building.
- IPMS 3.1 and IPMS 3.2 are external land and internal measurements respectively, required for exclusive occupation.
- IPMS 4.1 and IPMS 4.2 are unit and room measurements respectively, required for selected areas.

Compared to euREAL, IPMS 1, measured to the external extent of the external walls, and IPMS 2, measured to the internal extent of the internal dominant face (IDF), are similar to the external and the internal area. IPMS 4.2, measured to finished surfaces, is nearly the same as the internal area.

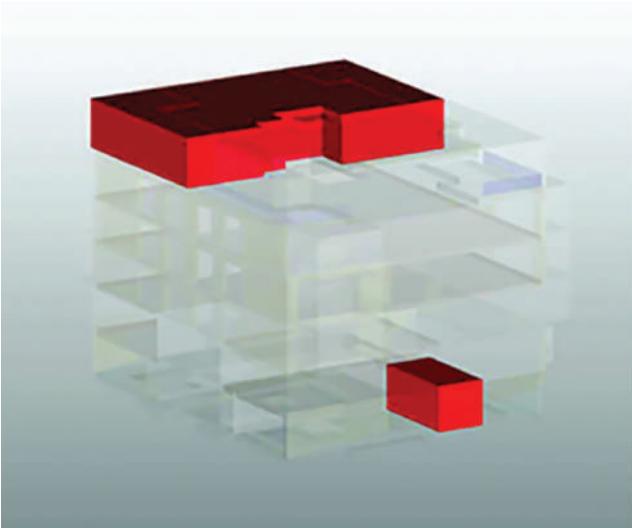
When the final IPMS is approved, euREAL will be made IPMS-compliant and will be fit for use in Europe.





3D Cadastre and BIM

BIM = building information modelling



Today, with the increasing development of BIM in building construction projects, it is interesting to consider the possibility of setting up a condominium registration through this tool.

Surveyors must adapt their approach and work differently. The process should allow establishment of a condominium from a 3D model, using 3D tools, and achieving a 3D result. The surveyor would then be perfectly integrated into the very principle of BIM; this tool is indeed based on collaboration and its multi-trade and multi-use character.

BIM software

BIM software is used at the genesis of many construction projects, by a large number of professionals involved in the design and construction phases. As we have seen, the surveyor often works with the data provided by the architect. Architects are increasingly working with BIM models instead

of 2D plans for the design of buildings. As for the surveyor, the use of the BIM software is mainly focused on the live project and its development. BIM software is, therefore, an ideal tool for collaboration and exchange between the various professions on which the proposed new process of establishing a condominium can be based.

Its use has many advantages. BIM software can perform quality visualisations in 3D and 2D and has aspects that are closely related to CAD and surveying. It also becomes the central data repository since all the necessary information can be inserted. The information can come from different sources, and we see here that the role of a BIM manager is key. The choice of this software is therefore crucial: the coordination of the different actors implies the use of the same software.

When BIM is not directly developed into a standardised template, there is a lengthening of the process. In the case of close and frequent collaboration, the architect could be provided with such a template at the beginning of the project so that they can work directly with it and increase the efficiency of the process by facilitating exchanges. The treatment of the BIM would then be improved and would reinforce the collaboration between the stakeholders.

This 3D model, supplemented with this information, would facilitate the notary's control in drawing up the space allocation booklet: a 3D model is always more realistic and understandable. It would then be useful for making decisions, in particular concerning the creation of easements on the condominium buildings. Similarly, measurement tools are available. However, this solution is not available now and remains futuristic.

This 3D visualisation model could also become an integral part of a condominium. If the book of distribution included all the information on the premises and the CAD data, it could become a reference document and be integrated into the same book as the documents already present.

It is possible to envisage entirely digital approaches, composed only of graphic documents and usable by the

various actors. Unfortunately, this is not feasible at the moment, both because of the reluctance of the actors to make such a big change and because of the current legislation.

The question of collaboration between the various trades will be at the heart of future discussions: common rules will have to be established. The subject of the ownership of a BIM model will also have to be debated: who owns it, how it can be used and by whom, etc.

Property surveyors and BIM

With their experience in condominiums and their expertise in land surveying, property surveyors can advise clients throughout the process about many key condominium points. They are key players, since the creation of a condominium is frequently accompanied by a change in the land parcel.

Property surveyors are also regularly called on to carry out modifications to existing specifications. The purchase/sale of a modified lot (with a change in surface area and thousandths) is the most frequent factor motivating a modification.

Property surveyors are the right specialists for fast and accurate indoor surveys. While the cadastral systems are mostly still in 2D, some in 2.5D and a minority in 3D, property surveyors are specialised in 3D surveys and have been for

several centuries. The sometimes intricate 3D relations encountered in modern condominiums lead to an increased role for property surveyors, not only for technical surveys but for the translation of complex spatial relations into deeds – this is becoming more frequent.

Conclusion

The current digital revolution and the increasing ease of use of 3D tools and mobile applications will bring new perspectives to the management of cadastral survey data, in particular in condominiums. The real challenge will be to build a digital condominium directly in a BIM environment.

As far as modelling in collaboration with architects and others is concerned, the advantages are certain: more accurate and faster 3D, more reliable architectural plans, and a 3D model of the entire building. The condominium will be directly integrated into the building project!

BIM and 3D are increasingly present in the surveying profession; they are the future of the profession. Property surveyors must adapt to the new technologies and the new opportunities that they generate. The evolution is taking place right now: this is why it is so important to think now about how surveyors will adapt and transition to their roles in the future. 2D plans will gradually give way to 3D. The constitution of condominiums will greatly depend on this technological advance.





CONCLUSIONS and RECOMMENDATIONS

ROLE OF PROPERTY SURVEYORS

In Europe and many other parts of the world, the profession of property surveyor is well established.

Property surveyors are the professionals who draw the property plans and establish legal limits between adjacent properties. In most countries around the world, no other professionals are allowed to do so. Hence, property surveyors are the natural partners of the notaries, solicitors, or lawyers in charge of establishing the official documents required for any conveyance.

While this is well known by the general public for land, it is not so well understood for built property, although the same legal principles are at stake.

The situation is quite a paradox, since prices per square metre are always higher for buildings than for land. Very often they are much higher, with a ratio of 10:1 not being unusual. Errors in building surveys can therefore have even more serious effects than errors in land surveys. Hence, the conclusion is clear: property surveyors should definitely guarantee both land and built property when legal property rights are at stake.



Our study has shown that it is important to draw attention to this divergence, which leads us to the following rules and recommendations:

-  Property surveyors are the only professionals who are allowed to draw property plans and by doing so they establish the legal limits between adjacent properties.
-  This monopoly applies to all kinds of property, i.e. to land and built property.
-  The case of condominiums requires special attention, since, very often, lots are sold before the start or during the construction phase of the buildings.
-  With the intention of establishing legal security, and regardless of the preceding specificity, it is advisable (at a State or administrative level) to impose as-built surveys after the completion of buildings, especially condominium buildings.
-  These as-built surveys are not different from normal property surveys and can only be performed by property surveyors.
-  If the motivated report has been established based on construction plans, a property surveyor must confirm that these plans were executed during the construction phase. If this is not the case, the motivated report establishing the shares, duties, and rights of the co-owners must be corrected.
-  With their thorough understanding of property rights and spatial relations, property surveyors are very well placed to establish the motivated reports that are the basis of each condominium. If other professionals take care of this task, they need at least to rely on the advice and inputs of a property surveyor for the legal delimitation of private and common parts of the condominium.
-  Frequently the official documents for property transfers are established by notaries, solicitors, or lawyers. In a few countries, property surveyors are allowed to do such work.
-  It cannot be the aim of this study to challenge the predominant model in a given country; however, for the sake of increased legal security, the aforementioned notaries, solicitors, and lawyers should require that all property plans be drawn by property surveyors, whenever they establish the legal documentation of condominiums.



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