

# **Problems in Registration in the Third Vertical Dimension in the Unified Land Registry in Hungary and Possible Solution**

**András OSSKÓ, Hungary**

Key words: 3D cadastre, 3D registration, condominium, condominium unit.

## **ABSTRACT**

Many countries in Europe and all over the world, especially in metropolitan area, there is scarcity of vacant land for development. In respect of above investors, real estate developers try to use space under and above the surface, constructing valuable properties. In the same time there is a growing interest to register these properties in the cadastre and land registry creating secure ownership. In the traditional land registry and cadastre there are difficulties to register the ownership of properties, constructed under and above the surface because the traditional cadastral map and legal registry have been created for 2D space.

In Hungary we face the same difficulties especially in Budapest capital and other city areas.

In case of the Unified Land Registry System in Hungary, integration of cadastre and legal registry, the solution of 3D registration must be simultaneous in the legal and mapping part of the system because the data consistency between the two parts is compulsory by law.

The Hungarian Land Registry System is a multipurpose nature containing elements of the 3D registration, like condominium registration, therefore with amendment of the land registry law the gradual introduction of the 3D registration could be possible.

## **CONTACT**

András Osskó, MSc.  
Budapest Land Office (Fővárosi Földhivatal)  
Budapest, Sas u 19  
1051  
HUNGARY  
Tel. + 36 1 302 3052  
Fax. + 36 1 302 3049  
E-mail: [ffhigazg@elender.hu](mailto:ffhigazg@elender.hu)

# **Problems in Registration in the Third Vertical Dimension in the Unified Land Registry in Hungary and Possible Solution**

**András OSSKÓ, Hungary**

## **1. INTRODUCTION**

Many countries in Europe and all over the world, especially in metropolitan area, there is scarcity of vacant land on surface for development.

There is no sufficient parking place in cities.

The number of public utilities have been increased during the recent years (telecommunication cables) and the majority of public utilities have been privatised, creating new ownership situation.

The car traffic has been multiplied during the last decades, new public transport facilities, like metro, motorways, underground railways, flyovers, had to be constructed under and above the surface in metropolitan areas to ease and avoid traffic difficulties.

Because of above problems, investors, real estate developers and other parties use space under and above the surface for constructing engineering structures, objects and in the same time valuable properties.

There is a growing interest for registration of these properties in the cadastre and land registry creating secure ownership and mapping facilities of real estate objects. But on the other hand the traditionally cadastre, land registry haven't been prepared to register 3D.

## **2. PROBLEMS IN REGISTRATION**

The paper based cadastral map have registered the legal status of parcel boundaries and other objects in 2D space.

In the land registry there are also difficulties to register the ownership and other rights of real estate objects under or above the surface. Public domains, like roads, streets, squares have not been the part of the land registry and many objects have been constructed under the surface of public domains ( public utilities, underground public garages, metro stations, etc.).

Currently there are few exceptions for registration of objects, properties constructed under or above the surface using condominium or strata title legislation.

In big cities, metropolitan areas there is growing interest and needs in using space under and above the surface for constructing real estate objects but the legal changes in the land registries didn't follow the growing request mentioned above and there are still difficulties, constrains to register the ownership of real properties created under and above the surface.

Apart from the introduction of the modern IT and digital cadastral mapping the right geometric descriptions and mapping is not yet solved. There is no more technical difficulties for mapping of real objects, existing under and above the surface thanks for the IT and GIS.

The main problem is the lack of changes in law. The legal profession is always very conservative, they are very much attached the old, traditional land registry law and legal changes generally takes quite a long times.

To solve the registration of properties in strata, requires comprehensive tools and solution in the legal and mapping sides, practically in the cadastre and land registry. Only the simultaneous solution can guarantee the data consistency, of course even in Europe there are several kind of cadastre and land registry concerning data content, legal and institutional framework, therefore there is no single recipe and solution. We have to find the elements which are common in different systems creating guidelines for all countries facing the problems of 3D registration in cadastres and land registries.

The approach is also different in countries running single authority unified land registry or separate cadastre and land registry under multi authority. In case of multi authority the comprehensive decision making is more difficult but the implementation of 3D registration in separate organisations maybe is easier because the full data consistency between the organisations not always compulsory by law.

In case of single authority unified land registry there is one decision maker and the comprehensive solution is easier to achieve, The data consistency between the legal and mapping part is compulsory by law therefore the implementation of 3D registration is more complicated.

### **3. THE HUNGARIAN SITUATION**

In Hungary we face the same problems as many countries in Europe and all over the world. In Budapest capital and other bigger cities there are growing number of objects, properties constructed under and above the surface, like underground public garages, shops, metro stations, etc. The legal and mapping registration of these objects as property in the unified land registry system is possible only in case of condominiums and other special case.

The current Land Registry law issued in 1997, it's quite new, but still based on the traditional law ( Grundbuch) and didn't take many new requirements into consideration and the mapping and geometric description of objects under and above the surface is partly solved.

The Unified Land Registry system in Hungary, the integration of cadastre and legal registry(Grundbuch) on legal basis and institutional level. The comprehensive solution of 3D registrations from one side is easier due to the single authority legal and institutional framework but from the other side is more complicated because the data consistency between the legal and mapping part is compulsory by law.

#### 4. CURRENT CONDITIONS, POSSIBLE SOLUTIONS

The Hungarian Unified Land Registry System is a multipurpose nature. The registration of condominium units as properties is also the part of the land registry. In Budapest more than 900 000 properties have been registered. 230 000 land parcels, 670 000 condominium unit properties.

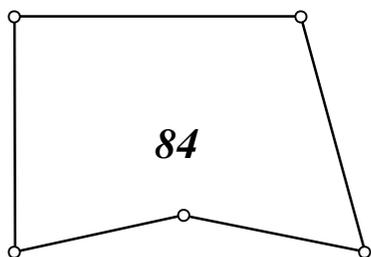
In case of condominiums there is no problem to register any objects, units as a property above or under the surface if the property within a construction or building. The building, construction must be located on land parcel.

It's essential that every registered property have unique identity number. The ID number of properties in condominium are based on the parcel number of the land. The other requirement to register a property in condominium the geometric description. In case of land parcels the cadastral map represents the geometric description of parcels, the legal documents represent land titles.

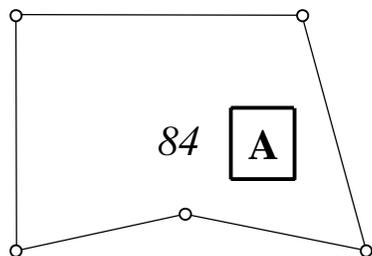
When we form condominium for registration of condominium units, map and deed is required.

The “map” is a scaled lay out plan, about of each level (storey) the building, with numbering (identifying) of each property (unit). These numbers with link to the parcel number will be the unique ID numbers. This lay out plan is the so called “map of condominium.”

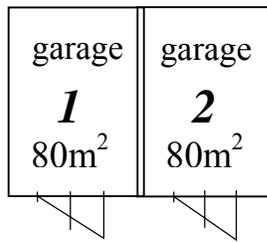
##### 4.1 The Way of Creating ID Number of Condominium Units



Parcel number of the land 84



ID number of condominium  
84/A



of condominium units

84/A/1 84/A/2

#### 4.2 Registration of Condominium, Creation of Legal Document (Property Sheet)

Basic property sheet of the parcel contains the description of the land parcel

Parcel number	84
Area	1000 sqm
Address	.....
Status	condominium

This basic property sheet contains the land parcel information only.

#### 4.3 Property Sheets of Condominium Units

Each unit in condominium has unique ID number and separate property sheet (legal document).

There are three parts of the property sheet

- I. descriptive part
 

Parcel number	84/A/1
Address	main floor 1
Description	garage 80 sqm
Share in the common	
Ownership	1/10
- II. ownership information
- III. mortgage and other rights

It's obvious that any object in condominium, under and above the surface as well, could be registered as any lands or other real estate properties.

The other possibility for creating and registering of properties under the surface of land parcel with unique ID number is an underground construction (wine cellar, garage, etc.) in case with direct access to public domain (street, road, square). It's important that the objects must be located under the land parcel.

## **5. 3D REGISTRATION, POSSIBLE SOLUTION**

The Hungarian Unified Land Registry Systems already registers certain properties locating under or above the surface, like condominiums, other objects but there is no comprehensive solution.

There are three large groups of objects in vertical dimension, currently with registration problems.

1. A, Underground constructions (public garages, metro stations, shops, etc)
2. B, Public utilities, cables, telecommunication lines

C, Underground roads, railways, tunnels, flyovers

I think it's obvious that, among others, two essential problems must be solved to introduce the 3D registration.

- 1, The geometric description, mapping of real objects above or under the surface.
- 2, Creation of unique identity number of real objects as properties.

## **6. 1, GEOMETRIC DESCRIPTION**

Today thanks for the advanced information technologies there are no more technical difficulties to introduce the digital cadastral mapping allowing us to create digital maps with different layers.

In case of digital maps we can use any number of layers for the third dimension but it's important to locate the horizontal and vertical position of the object.

Analogue cadastral maps are still existing describing the real estate objects in 2D space.

Description of objects in 3D, side-maps must be used, like condominium maps and the accurate location of the objects is also essential. Of course where the digital cadastral mapping is not yet introduced, the solution of 3D mapping is more difficult but possible.

Key symbols on cadastral maps must be used to indicate the location and ID number of real objects under and above the surface.

## 7. 2, CREATION OF UNIQUE ID NUMBER

Any real estate, land property, registered, has unique ID number in the land registry and the cadastre, therefore it's essential and the most important task in the 3D issue to find out an ID numbering method of objects under and above the surface.

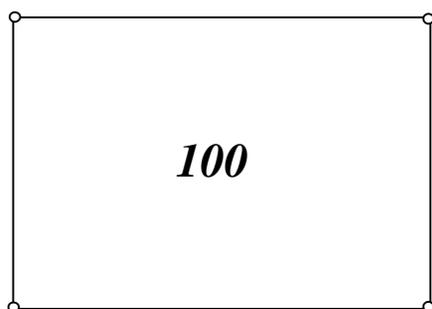
In the cadastre and land registry the parcel number is the common unique ID number. On the cadastral map and in the legal document the same parcel (property) has the same parcel or ID number. This is the link between the cadastre and land registry and in case of unified land registry between the legal documents and mapping information.

At the registration of condominium units as individual properties the ID number of the unit is related to the land parcel as I described earlier. Using the similar structure the ID numbering of objects under and above the surface could be related to the neighbouring parcel on the surface.

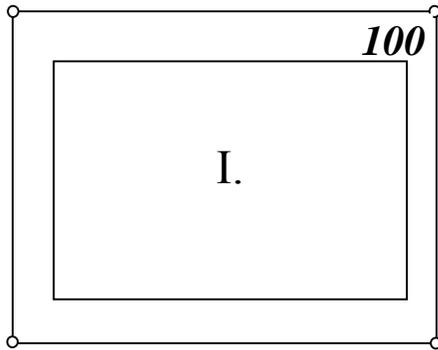
I specified three large groups of objects under and above the surface with registration problems.

The first group, like underground public garages, metro stations, shops, etc should be the easiest case. If the object is the part of condominium, there is no problem with the registration. If the object is locating under the land parcel or public domain, the ID numbering could be the similar to condominium. Generally the area of these constructions are not bigger then the area of the parcel on the surface. It's easy to survey and determine 3D coordinates of the objects and the geometric description and mapping can be solved.

Proposal for the ID numbering

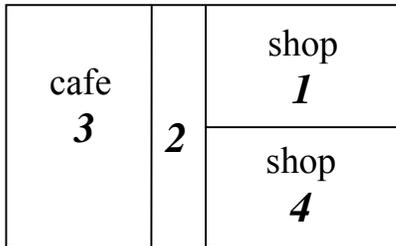


Parcel No of the land  
100



number of the underground  
Construction

100/ I



ID number of units

100/I/1 shop

100/I/2 corridor

100/I/3 cafe

100/I/4 shop

If the ID numbering is accepted the registration of objects as properties is possible both on maps and on legal documents and the data consistency between them is realised.

The second group of objects the public utilities, telecommunication cables, etc. The survey, geometric description and mapping of these linear objects are simple surveyor tasks but the ID numbering and therefore the registration of this type of objects as properties is not yet solved.

Linear objects generally locate under or above road, street surface ( public domains ). The length of these objects are hundred of meters, kilometres or more, touching many parcel numbers. The length of a street or road as parcel is limited. The linear objects ( public utilities) could be divided according to the length of the road as a parcel. The ID number of the object could be related to the parcel number of the street, road, etc. This is a rough idea only, there is no example for this numbering in Hungary.

The third group of constructed objects under and above the surface are underground railways, tunnels, flyovers, etc.

The mapping, ID numbering and therefore the registration of these objects as properties, in my opinion, maybe the most complicated, difficult part of the 3D issue. Underground, railways, tunnels are crossing a lot of parcels and there is no advanced parcel for ID numbering of the object.

In the Hungarian Unified Land Registry, the comprehensive solution, the geometric description, mapping and the registration of the objects as properties in three dimensions must be simultaneous because the full data consistency is compulsory by law.

Currently the legal environment and the land registry law is not 100% prepared for the 3D registration, but due to the multipurpose nature of the Hungarian Unified Land Registry and the digital cadastral mapping the major part of 3D objects could be registered in the land registry with few changes in the law. There is no doubt that the final aim is the comprehensive solution of the 3D registration but it's possible to solve the 3D registration gradually.

In my opinion and according to the needs by clients the registration of underground constructions like metro stations, shops, public garages in metropolitan area, as I specified earlier 1, group of objects, is the most important. Luckily, thanks for the nature of the Hungarian Unified Land Registry, the creation of 3D registration of these objects is possible in the nearer future. The condominiums as registered properties are part of the land registry and we have to adapt the ID numbering and geometric description method to the underground objects specified above. I am convinced, there are no fundamental legal difficulties to amend the land registry law to fit it to the 3D registration. The amendment of the law and the introduction of 3D registration depends on the legal side and decision makers.

## **8. ECONOMIC ASPECTS OF THE 3D REGISTRATION**

Practically we cant avoid the comprehensive solution of 3D registration in the near future because there is a growing interest to register all of the real objects, under and above the surface as properties, in the land registry.

There are many economic benefit , for investors and the state as well.

### **8.1 Investors, Potential Owners**

1. In case of registration of objects, the land registry guarantee the security of tenure, owners can deal with them as real estate properties.
2. Owners can use these properties for collateral of mortgages
3. Investors are encouraged for developing space under and above the surface.

### **8.2 State**

1. Extension of the land market.
2. Increasing number of transactions generates more tax, stamp duty
3. Extended data content in the land registry increasing the income of the data service approaching to the cost recovery requirements.

## BIOGRAPHICAL NOTES

### **András Oskó**

Academic experience: Dipl. Ing. Land Surveyor MSc. Budapest Technical University  
Dipl. Certified Engineer, Budapest Technical University

Current position: Deputy Director Budapest Land Office  
Head of Cadastral Survey Department

Employment Head of Cadastral Survey Department, Budapest Land Office  
(Unified Land Registry) 1970-75, 1987-  
Head of Cadastral Survey Department, Budapest Surveying and  
Mapping Co. 1975-77, 1979-82  
International Expert, Nigeria 1977-79, 1982-86

Practical experience: Cadastral Surveying and Mapping  
International expert in cadastre, large scale mapping and land  
Registry matters, 1977-  
Advisor, Consultant in EU Phare projects “ Computerisation of  
Land Offices “in Hungary, 1991-  
Project Manager Swiss-Hungarian project in Budapest Land  
Offices LIS 1994-99  
Judicial expert in cadastre, land registry matters.

Professional membership: Member Hungarian Society of Surveying, Mapping and Remote  
Sensing (MFTTT) 1971-  
Member Chamber of Judicial Experts 1996-  
Hungarian Delegate FIG Commission 7 1995-Chairman FIG  
Commission 7 Working Group 3 on Land markets 1998.