SPECIFIC CADASTRAL REGULATIONS TO OBTAIN CONSTRUCTION PERMIT

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Abstract: *The object of the present cadastral work is the realization of the documentation necessary for the preparation of the Documentation for obtaining the Building Permit (CA) regarding the investment objective in accordance with the provisions of the design theme approved by the beneficiary. The documentation is elaborated in accordance with law 50 republished, amended and completed and the elements arising from the study of the related legislation in the field. The building in which it is to be built is located in bucovat commune, BUCOVAT village – jud. TIMIS according to the land registry extract no. 401937 with no. topo 401937. After performing topographic surveys in the field with the Total Trimble S5 Station, where for data collection, it uses the Trimble TCU control unit optimized for the Robot and Autolock versions, together with the Trimble Access software, using simple and user-friendly operations under any conditions. On the basis of the calculation roundup, the calculation of the foundations was drawn up according to the Geotechnical Study for CF 401937, Bucovăt, jud. Timis where the basic conventional pressure for Df=2.00m and B=1.00m we have pconv.=294kPa the corrected pressure for Df=0.90m and B=0.50m is pconv.corrected =205kPa. Also, the list of the quantities of excavation and concrete was drawn up, as well as the conditions of foundation, strength and stability. The data processing was carried out with Terramodel Design Software, which is a package of programs with different applications, intended for design works in the field of civil engineering and includes modules for generating the digital model of the terrain and contours, for the design of communication ways, computer-aided design (CAD) and various calculations (COGO). Each module contains sets of commands, which add specific functionalities to the basic possibilities of FDM. Terramodel contains a macrolimbage (TML) that also allows the creation of custom commands.*

Key words*: *Trimble TCU, AC, CAD, COGO, Terramodel, TLM

INTRODUCTION

Before starting any kind of endeavor, it must be known, the intention, to build (Erghelegiu B., 2013) or not and whether or not this requires a building permit from the authorities. The building permit is issued for certain types of constructions, among which we mention:

- construction works (Grecea C., Herban I.S., 2008), reconstruction, consolidation, modification, extension, change of destination or repair of constructions of any kind, as well as of the installations related to them;
- construction, reconstruction, extension, repair, consolidation, protection, restoration, preservation of buildings declared as historical monuments;
- temporary works, arrangements and constructions (Grecea, C. et all, 2013) such as kiosks, totes, booths, billboards, companies and advertisements, awnings, pergolas, necessary to organize the execution of basic works, if they have not been authorized together with the main construction around which they are located.

Many types of work can be carried out without a building permit. Mainly, it is about works that do not change the strength structure or architectural appearance of constructions. According to Article 11 of Law. 50/1991 on the authorization of the execution of construction works, the following works may be carried out without authorization:.

- repairs to fences, roofs, coverings or terraces, when their shape and the materials from which they are made do not change;
- repairs and replacements of interior and exterior joinery, if the shape, dimensions of the voids and the joinery are preserved, including where the materials from which the works are carried out are changed, with the exception of buildings declared historical monuments;
- repairs and replacements of heating stoves;
- interior painting and painting;
- exterior painting and painting, unless the façade elements and colors of the buildings are changed;
- repairs to the interior installations, connections and external connections, of any kind, related to the constructions, within the limits of the property, the installation of local heating and domestic hot water preparation systems with approved boilers, as well as the installation of individual air conditioning and / or metering devices for utility consumption;
- repairs and replacements to floors;
- energy rehabilitation works of the envelope and/or roof - if its constructive system is not changed, respectively terrace / framing - on individual residential buildings with no more than 3 levels, which are not historical monuments classified or in the process of classification, respectively located outside the protection areas of monuments and / or protected built-up areas established according to the law;

According to Law nr. 50/1991 and Law nr. No 350/2001, the procedure for authorising the execution of construction works begins with the submission of the application for the issuance of the urbanism certificate in order to obtain the building permit.

Step 1: Requesting the urbanism certificate from the city hall

Step 2: Conducting the geotechnical study

Step 3: Design of the house

Step 4: Get your opinions

Step 5: Submission of the file to the city hall

Once the building permit is obtained (Șmuleac et all, 2014, Herbei et all. 2013, 2018), the technical documentation is also developed in the technical project (P.Th.). Thus, the technical design and the execution details (P.Th.+D.E.), the written and drawn documentation, which includes the information necessary for the execution of the construction, will be carried out. The technical documentations will be in accordance with the legal provisions of the urbanism certificate, but also allthe characteristics of the location (Grigore V. M., 2015).

Autorization has a validity of no more than 12 months from the date of issue, during which you are obliged to start the works. If you start the project within the 12 months, then the validity of the permit is extended for the entire duration of the execution of the works provided for by the permit, in accordance with the technical project.

MATERIAL AND METHODS

The topographical measurements for the execution of the works and obtaining the building permit were made with the total station Trimble S5, where the data processing (Șmuleac et all, 2020) was carried out with the Terramodel program and the realization of the situation plans with the help of CAD programs.

The topographical elevations were made in the Stereographic 1970 and Black Sea 1975 systems (Șmuleac et all, 2014).

For data collection, trimble S5 (figure 1) uses the Trimble TCU control unit optimized for Robot and Autolock versions, together with Trimble Access software, using simple and

convenient operations tothe user, under any conditions (https://www.trimble.com/en/; https://www.giscad.ro/).

Trimble Acess data collection software works on a wide range of Trimble control units. In the office, Trimble Business Center helps to verify, process and adjust data collected in the field with the help of Trimble machines, all in one soft solution.

Fig. 1 Presentation of the Total Trimble S5 Station

The Trimble® S5 is aprecise andstill-in-place tool with MagDrive™ technology in place, a TSC3 control unit for collecting Trimble Access™ data and fast data processing in the office with the help of Trimble Business Center software.

The total Trimble S5 stationhas built on Trimble technologies such as SurePoint™, MagDrive, and DR Plus EDM for more reliable efficiency while achieving high accuracy. Theelectromagnetic T-ehnology of movement of the Trimble MagDrive device, performs the movement of the device through only a few components, which alsohas low service requirements.

Sof tware Terramodel design - Terramodel Suite, is a package of programs with different applications, intended for design work in the field of civil engineering, and cuprinde modules for generating the digital model of the terrain and contours, design of communication paths, computer aided design (CAD) and various calculations (COGO). Each module contains sets of commands, which add specific functionalities to the basic possibilities of FDM. Terramodel contains a macrolimbage (TML) that allows the creation of custom commands.

The main characteristics of the Field Data Module FDM are inclined towards downloading/importing measured data with total stations, calculating coordinates, writing the original field, including lines andinscriptions, exporting and uploading data. Using the Terramodel program, one can import data collected with trimble optical instruments but alsofrom other types of devices. The program allows to perform all geometric calculations, the rapid demand of road projects, the generation of contours, the calculation of volumes, etc.

Main features:

- Conventional data processing and compensation
- Deformation monitoring options
- Drawing plans automatically
- Transverse and longitudinal profiles, contour curves, volume calculation
- 3D view
- Design of roads, tunnels, pipelines

AutoCAD Civil 3D, is an application for construction inautodesk autocad civil 3D infrastructure, which supports workflows for BIM (Building Information Modeling) by expanding the value of the model.

Focused on optimizing the workflows of transport design and infrastructure in general, AutoCAD Civil 3D offers improved use and greater efficiency during 3D modeling, layout of profiles and technical drawings for execution.

The tools in Autodesk AutoCAD Civil 3D support building information modeling (BIM) type processes and help reduce the time required for design, analysis and implementation of changes; evaluates several scenarios andoptimizes project performance; streamlines workflows by automating time-consuming tasks.

Autodesk AutoCAD Civil 3D helps designers, draftsmen and technicians to better understand andcontrol project performance, to improve and maintainmore coherent relationships and respond faster to changes in the project.

RESULTS AND DISCUSSIONS

The present work includes the technical documentation necessary to obtain the building permit for the *Ground floor dwelling with 2 apartments and fencing CF 401937, Bucovăt village, Timis County*.

FOUNDATION CONDITIONS:

The ±0.00m elevation corresponds to the level of the finished floor on the ground floor and is 35cm from the level of the systematized land.

Conform Geotechnical Study for CF 401937 Loc Bucovăt Jud.Timis, on the site there are the following foundation conditions:

•The good foundation ground consists of the sandy dusty clay layer, hard consistent state.

- Conventional base pressure P_{conv} = 294kPa (for B=1.00m and Df=2.00m).
  $P_{conv\ .calcul\ =}$ 104 kPa (for B = 0.50 m and Df = 0.90 m).
- The minimum elevation of foundation is 0.90m from the share of the natural land, the effective foundation quota is -1.25 m compared to ±0.00 m.
- The groundwater was encountered in the drilling at the elevation of -3.00m compared to the share of the natural land (Şmuleac L. et all, 2014, 2016).

When executing the works, the provisions of the project were respected, as well as all the norms and norms in force:

•for concreting - NE 012 - 2007, concrete, -NP112-14, foundations, -STAS 438/89; 438/2 - 80
•for masonry – CR6-2013,P100/2013
•in constructions-NP 005-2003
•to wood-NP 019-2003

OBJECT OF THE WORK:

The object of the present work is the realization of a Documentation for obtaining the Building Permit (Pasolea M. et all, 2017) regarding the investment objective in accordance with the provisions of the theme of proiectation. The documentation is elaborated in accordance with the lawof 50 republishedand the elements arising from the study of the conexe legislation in the field (Şmuleac et all 2014; Casian A. et all, 2019; Miță, R. et all, 2020).

The building in which it is to be built is located in Bucovat commune, Bucovăț village – Timiș County, according to the Land Registry extract no. 401937 with the graphic topo no. 401937 (http://www.ancpi.ro/pnccf/).

EXISTING SITUATION:

The land area is 500sqm and has a rectangular base shape with dimensions of (21.90m x 22.80m). The access to the plot is made on the side of 21.90 m from the street proposed by the PUZ approved by the PUZ with HCL no. 36 of 26.09.2018, located in the southern part of the plot (Popescu G. et all, 2016; Șmuleac et all, 2020).

The plot is delimited as follows:

- to the north: plot No. topo 401922
- to the south: plot No. topo 401954 – access road
- to the east: plot No. topo 401938
- to the west: plot No. topo 401936

The land is free of construction. On the field, the geotechnical study and the topometric study (figure 2) necessary for the location of the new construction were carried out, studies that are an integral part of the work (figure 3).

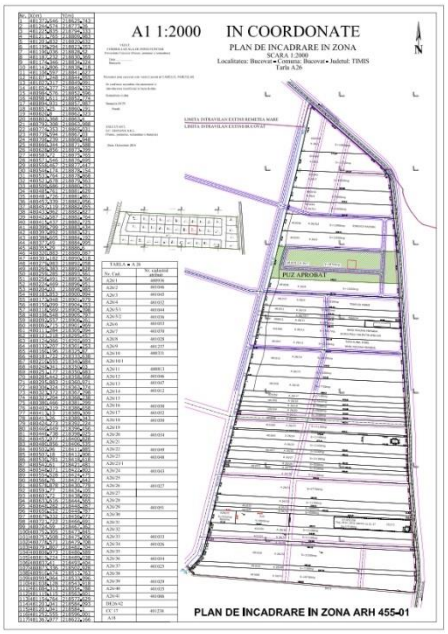

Fig. 2 Plan of framing in the tarla

Fig. 3 Land situation plan

PROPOSED SITUATION:

Itis proposed to build a building with residential function, namely two housing units coupled under the same roof with ground floor height regime.

The conditions of location of the building are given by the regulation of the zoning urban plan approved by HCL nr. 36 from 26.09.1018, namely:

- Mandatory withdrawal to the street front of 3.20 m;
- Withdrawal of min. 2.00 m from the lateral limits;
- Providing 2 parking places for each apartment - on the plot;
- Withdrawal of min.7.50 m from the posterior limit;
- Maximum height at the cornice of 7.50 m;
- The maximum occupancy percentage of the land of 35%;
- Maximum land use coefficient of 0,80.

The conditions imposed for fencing the plot are:

- The fence on the street will be made transparent with a maximum height of 2.00 m and opaque plinth of max. 60 cm;
- The side fence starting with the alignment and the fence of the posterior limit will be made opaque with a maximum height of 2.50 m.

The technical-municipal equipment obliged the connection to the existing utilities in the area and until the sewerage works were carried out, it was imposed the use of a septage septic tank approved by the public health authority for each residential module.

Under the given conditions, the project proposal was:

- Maintain the mandatory alignment of 3.20 to the street (figure 4);
- Withdrawals from the lateral limits according to the urbanism certificate;
- The distances from the posterior limit is min. 7.50 m;
- The access is made directly from the proposed street to the south;
- The fence will be executed in accordance with the provisions of the urbanism certificate;
- Each of the two housing units was connected to a septage septic tank approved by the public health authority that will be located on the owners' land;
- Each housing unit will have its own water and sewerage

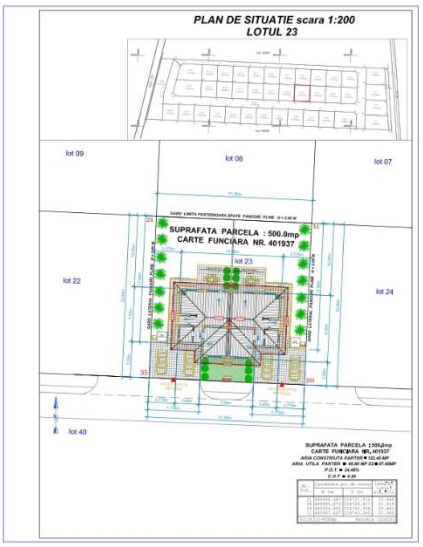

Fig. 4 Situation plan with building proposal

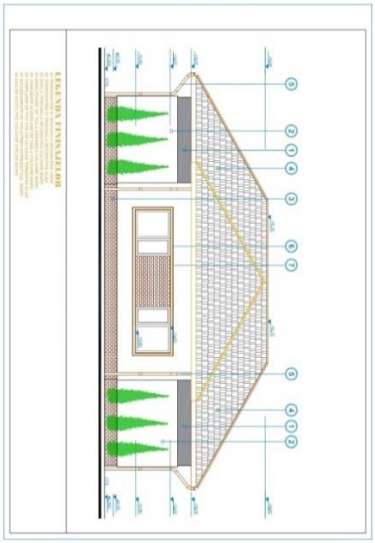

Fig. 5 Plot development plan

The height regime of the ground floor and attic type is characterized by:

- Height at the eaves (cornice) of 2,70 m (measured from zero elevation);
- Height at the mane of 5,65 m (measured from zero elevation).

Compared to the elevation of the systematized land (CTS) the height at the cornice is about. 3.05 m respectively at the mane of about. 6.00 m. The zero elevation will be positioned two steps above the CTS (about 35.00 cm) (figure 5).

From the functional point of view, the two dwelling units are perfectly symmetrical, which is why it is sufficient to describe the interior spaces for a safe one, as follows (Figure 6):

Access hall 4,15 sqm

Bucătărie10,00 sqm

Living room	17,60 sqm
Room	12,80 sqm
Bathroom	4,15 sqm
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Usable area ground floor / apartment	48,80 sqm
Usable area totala ground floor	97,60 sqm
FIELD INDICATORS	
Land area	500,00 sqm
Built on the ground	122,40 sqm
Built area deployed	122,40 sqm
The occupancy rate of the land	24,48 %
Land use efficiency	0,24

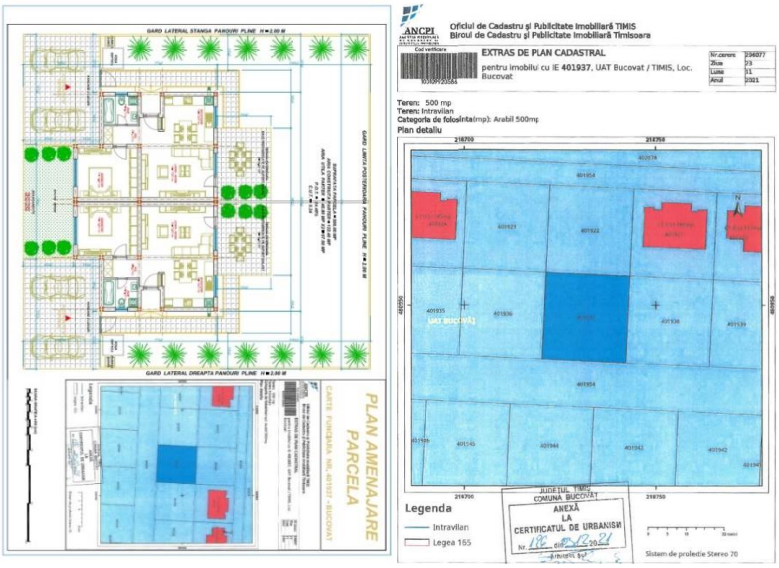

Fig. 6 Furnishing apartments

From the point of view of the positioning of the building in relation to the neighborhoods, the proposed height regime and the location in relation to the cardinal points and the field checks have shown that there are no problems related to the sunnyness for the proposed building, nor to the shading of the buildings already built,in accordance with the legislation in force.

The calculation breviary was also drawn up:

UPLOADS

Framing loads:

Covering weight	50 x 1.15 = 58daN/m^2
Astersal weight	0.025x 800x1.15 = 26 daN/m^2
	84x1.35 = 110 daN/m^2
Snow weight	150x1.5=225 daN/m^2
Total	336 daN/m^2

Foundation dimensination

Spindle Foundation 1

Framing	336x3.00= 1008 daN/m
Floor	798x1.21= 966 daN/m
Wall	weight 2267 daN/m
Elevation weight	590 daN/m
	4831 daN/m
Foundation weight	1350 daN/m
Total	6181 daN/m

N=5777 daN/m

Dimensions 40cm $\mathbf{P_{correct.}}$ =1.88daN/cm²

$$Pef = \frac{6181}{100x40} = 1.54 daN/cm^2 < \mathbf{P_{correct.}}$$

Spindle Foundation 3,4

Framing	336x2.00= 672 daN/m
Floor	798x2.05= 1636 daN/m
Wall weight	2267 daN/m
Elevation weight	590 daN/m
	2x 5165=10330 daN/m
Foundation weight	2531 daN/m
Total	12861 daN/m

N=12861 daN/m

Dimensions 70cm $\mathbf{P_{correct.}}$ =1.88daN/cm²

$$Pef = \frac{12861}{100x70} = 1.83 daN/cm^2 < \mathbf{P_{correct.}}$$

Spindle foundation C

Framing	336x3.60= 1209 daN/m
Floor	798x3.05= 2433 daN/m
Wall weight	2267 daN/m
Elevation weight	590 daN/m
	6500 daN/m
Foundation weight	1350 daN/m
Total	7850 daN/m

N=7850 daN/m

Dimensions 40cm $\mathbf{P_{correct.}}$ =1.88daN/cm²

$$Pef = \frac{7850}{100x40} = 1.94 daN/cm^2 < \mathbf{P_{correct.}}$$

E-axis foundation

Framing	336x4.00= 1344 daN/m
Floor	798x2.52= 4404 daN/m
Wall weight	2267 daN/m
Elevation weight	590 daN/m
	8605 daN/m
Foundation weight	1350 daN/m

Total 9955daN/m

N=9955 daN/m

Dimensions 50cm $\mathbf{P_{correct.}}$. =1.88daN/cm²

Pef = 9955 = 1.99daN/cm²< $\mathbf{P_{correct.}}$

100x50

CONCLUSIONS

Based on the above, the following are revealed:

✓ The construction fully satisfies the requirements of exigency stipulated in law 10/1995. This documentation was drawn up in accordance with law 50/1996 and results in obtaining the Building Permit necessary for the subsequent stages of execution.

✓ The beneficiary will be able to start the execution phase only after obtaining the Building Permit and will hire an authorized site supervisor who will ensure the development of the execution and settlement stages.

✓ For the investment subject to the Authorization phase, all the approvals stipulated by the Urbanism Certificate were obtained. For the design and execution phase, the topographical study necessary for the identification andlocation of the building before construction and the geotechnical study for establishing the conditions of foundation andunloading on the ground were elaborated.

✓ The execution stages were completed in accordance with the provisions of the Site Control Program previously approvedby ISC Timiș.

✓ The beginning of the execution works was communicated to the Bucovăt City Hall, to the Timiș State Inspectorate for Constructions by mounting the display panel to identify the works.

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