TOPO-CADA1STRAL WORK FOR URBANIZATION IN THE VILLAGE OF DUMBRAVITA

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Abstract. *This paper aims at placing in-line GF+1F houses and GF+1F Duplex building in the built-up area of Dumbravita, 14 Octavian Goga Street, Timis county. At the moment being, the land is under Building Yards use category, according to the Land Registry excerpt no. 412015, issued by O.C.P.I. Timis. This work involves the placement of dwelling buildings on an area of 1,388 sqm. The building comprises a total of 4 3-bedroom apartments and 2 4-room apartments. The building structure is Confined brick masonry made of ceramic bricks. In order to conduct this item of work the following phases were run: Phase 1 - building construction, Phase 2 - apartment construction. The planimetric measurement was conducted in the field with the GPS Stonex S9 equipment using the GNSS TIM1_2.3 permanent station of the class A National Geodetic Network, obtaining 1970 stereographic coordinates, the Black Sea level-related system and a total Leica TC 805 station to determine the detail points of the land, road inflections, gutters inflections and edges, aerial electrical network pillars, property limits, constructions, fences, utility networks, etc. The field data were downloaded in the computer in order to process the layout with specific software (AutoCAD Civil 3D 2009, Topo LT V7.5).*

Key words: *O.C.P.I, G.P.S, TopoLT, AutoCAD, Stereographic 1970, GNSS*

INTRODUCTION

In order to execute this project, several criteria must be taken into consideration, for example in order to erect a building, a building permit must be issued. The procedure for obtaining the building permit for the construction or demolition of buildings is regulated by the Law No 50/1991 regarding the authorisation of construction execution, republished in the Official Gazette, Part I, No. 933 of 13/10/2004, as subsequently amended and supplemented, and by the Implementing Rules of Law No. 50/1991, approved by Order No. 839/2009.

The execution of construction works is only allowed based upon a building permit for construction or demolition, issued under applicable laws, upon request of an immovable - land and/or building - property right holder, identified by a cadastral number, unless otherwise provided by the law.

The building permit represents the final act of authority issued by the local public administration, based upon which the execution of construction works is allowed, in compliance with the measures provided by the applicable laws regarding the disposition, the design, the construction means, exploitation and post-use of buildings.

MATERIALS AND METHODS

In order to execute the construction works and the apartment partitioning scheme for the building in question, the following cadastral procedures were performed: The planimetric plan of the land was executed with the GPS Stonex S9 (Fig.1) device with double frequency, with the following Horizontal static precision: +/-2,5 mm + 0,3 ppm , Vertical static : +/-5 mm 0,5 ppm , Horizontal RTK : +/-0,8 cm + 1 ppm , Vertical RTK : +/- 1,5 cm + 1 ppm , by means of RTK method (Real Time Kinematic) in order to determine points S1 and S2 and a Leica TC 805 (Fig.1). station – with an angle measurement precision of 5 cc and distances measurement precision of 2 ppm, stationed on S1 point; with this station, the S2 point was

targeted, then the detailed points of the land were determined, i.e. road points of inflexion, inflexion points and edges of rills, overhead electrical energy network's columns, property limits, constructions, fences, urban networks etc. The permanent GNSS station from Timișoara was used, i.e. TIM1_2.3 of the National Geodesic Network, class A, determining Stereo 1970 coordinates, with the reference of the Black Sea level. The registered field data were downloaded in the computer in order to process the site plan by means of specific work programs (AutoCAD Civil 3D 2009, Topo LT V.7.5.)

Figure 1 - GPS Stonex S9

Figure 2 - Leica TC 805

RESULTS AND DISCUSSION

In order to execute the construction works for the building in question, a land survey in Stereo 1970 projection system was performed, on the plot identified according to the cadastral number 412015 of the Land Registry No. 412015, situated in the build-up area of Dumbrăvița, 14 Octavian Goga Street. As a result of the processing procedure, the final coordinates of the measured points were obtained, followed up by the definition of construction limits for the building subject to this documentation, thus achieving the site plan drafted on a scale of 1 to 500, in compliance with the actual field data (Table 2).

Table 1

Geodesic points

GNSS permanent station TIM 1_2.3			
No. Pt.	X(m)	Y(m)	Z(m)
TIM1_2.3	482495.1240	207132.2493	111.5529

Table 2

New points

New points			
Pt. No	X(m)	Y(m)	Z(m)
S1	483860.454	208438316	-
S2	483832.298	208413.908	-

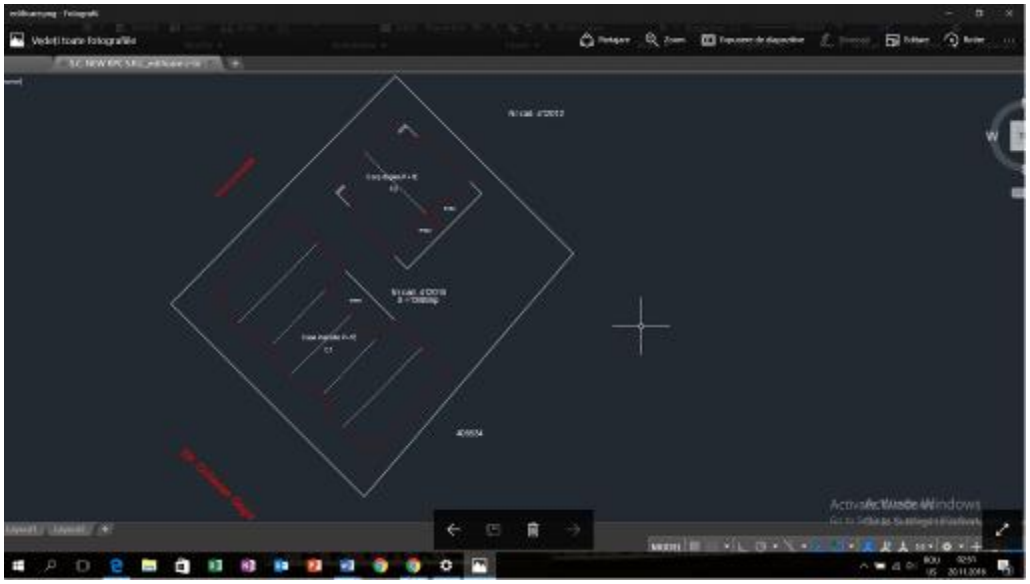

Figure 3 - Construction of the building

The plot with the identification cadastral number 412015 has a surface of 1388 sqm. In order to determine the GPS station point, the Stop&Go method was used (or Real Time Kinematic), using the reference station TIM1_2.3 from Timișoara (Table1). For the execution of land surveys, the following operations were performed:

- Site recognition;
- Measurements with Leica TC 805 total station;
- GPS measurements (Global Positioning System) by means of cinematic RTK method (Real Time Kinematic), using the reference station in Timișoara;
- Download of devices by means of Leica Geo Office Combined software;
- Raw Data Analysis;
- Data processing;

- Importing the points into AutoCAD by means of TopoLT software;
  The Coordinates system:
- The survey was performed in Stereo 1970 Projection System having the reference of the Black Sea level 1975

For the apartment partitioning scheme for terraced houses and duplexes, the survey operations were similar to the ones performed for the construction of the building (Fig.3, 4, 5).

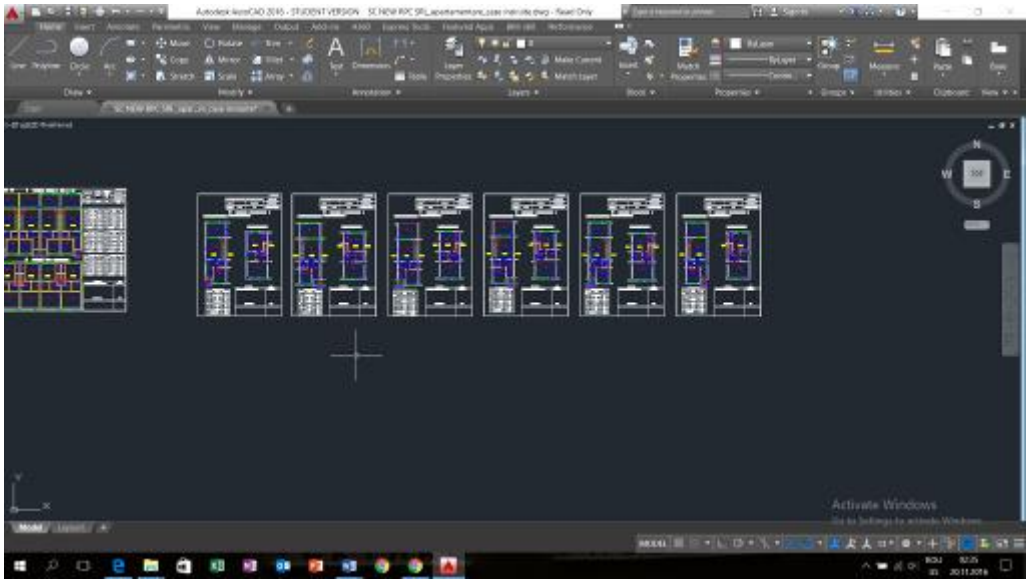

Figure 4 - Terraced houses apartment partitioning scheme

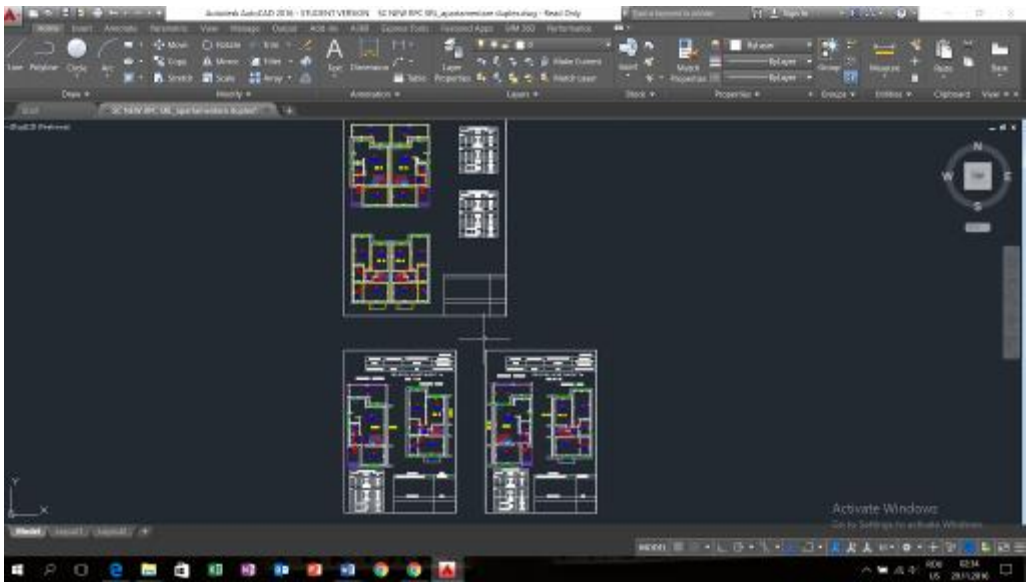

Figure 5 - Duplex houses apartment partitioning scheme

CONCLUSIONS

This documentation demonstrates the major role of land survey with respect to its applicability.

By this survey, we acknowledge the efficiency of urbanization and its benefits.

In order to perform a high-quality work, it is compulsory to comply with standards provided by the implementing rules

Favourable results require high-end devices and technical training in the previously mentioned fields.

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