USE OF MODERN TECHNIQUE IN PREPARING THE TECHNICAL DOCUMENTATION FOR THE REGISTRATION IN THE LAND BOOK OF A PROPERTY

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ABSTRACT

The paper presents the way of drawing up the cadastral documentation for the first registration in the Land Book of a property. The total station and GNSS receivers were used as topographic devices for measurements, which offered a high accuracy of the measured data and a shortening of the time spent in the field. The data processing and the elaboration of the documentation was done through specialized programs (Toposys, Autocad). As the surveying method was used the method of closed planimetric traverse supported on known coordinate points (previously determined with GNSS technology), combined with the method of polar coordinates.

INTRODUCTION

The elaboration of the technical documentation necessary for the registration in the Land Book of the properties is one of the basic works for the authorized persons or the companies that work in the field of cadastre. Reducing working time in the field and in the office is essential for all entities involved in this operation.

The use of modern techniques in terms of equipment used for measurements but also in the processing of collected data and in the preparation of cadastral documentation is the best choice in increasing productivity in this sector of activity.

MATERIAL AND METHOD

The paper presents the preparation of documentation for the first registration in the Land Book of a building. For the realization of the topo-cadastral documentation, the first step is represented by the technical documentation which consists in:

a) analysis of the existing situation, according to the data and documents held by the owner;

b) request for information in the database of the territorial office / territorial office (inventory of coordinates, plans for framing in the area, plot plan, orthophotoplan, coordinates of neighborhood points, land book extract for information, copies of minutes in possession and their attached sketches in the case of real estate acquired under the property laws).

This is followed by the execution of field works - measurements for the realization of geodetic networks of thickening and lifting in national stereographic projection system 1970, collection of cadastral planimetric details on the boundary and inside the building, collection of attributes, verifications and validations of existing data. The points of the lifting network will be materialized, according to the technical norms for the introduction of the general cadastre.

After the field phase, it is continued with the data processing and the elaboration of the documentations, by drafting and drawing up the work file in analog and digital format.

The topographic survey was carried out in the 1970 Stereographic projection system, with the FOIF OTS 632L Total Station whose accuracy is ± 02^{cc} and the GNSS technology.

The building that is the object of the work is located in Giubega locality, Dolj county, it is bordered to the North by Calea Craiovei Street, and to the South by Aleea Morii (Figure 1).

Figure 1. Framing the area of the property

The geodetic network of thickening and lifting was designed to ensure the number of points necessary for topographic and cadastral detailed measurements.

In the field, the points of the geodetic support network were marked with metal pickets, being measured the horizontal angles, the vertical angles and the length of each alignment.

The operations performed in the field consisted in moving to the respective property, where the station points (100, 101, 102, 103, 104, 105 and R) were materialized with metal pickets.

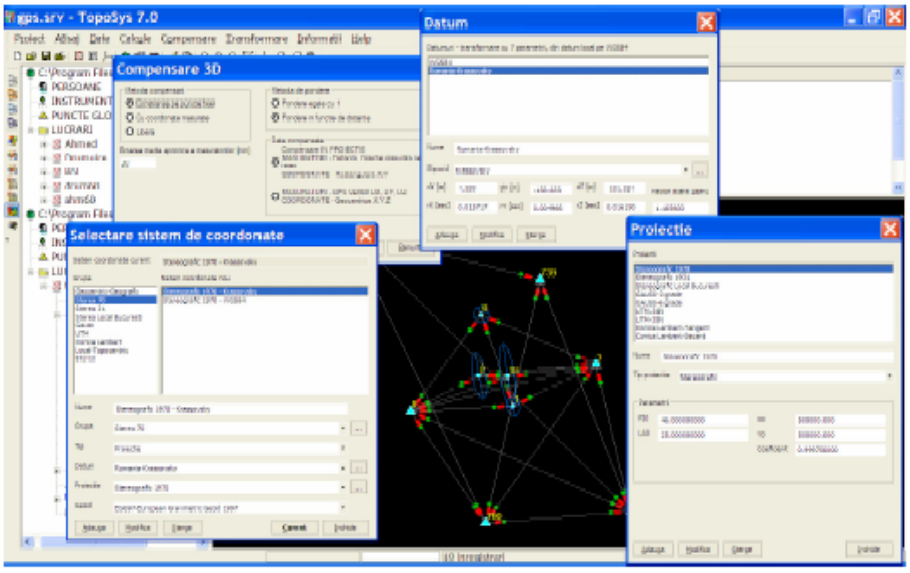

Figure 2. Files resulting from the download of the TopoSys program

The calculation operations were performed based on data collected from the field (horizontal and vertical distances and angles) introduced and processed in specialized software TopoSys and IntelliCad, finally obtaining the absolute rectangular coordinates in the 1970 stereographic projection system of the points that delimits the property.

The reporting operations were performed in AutoCad, materialized by the location and delimitation plan, being represented the points that delimit the surface, on a paper format A3 at a scale of 1: 500.

RESULTS AND DISCUSSIONS

In order to determine the station points 100, 101, 102, 103, 104, 105, in the field it was stationed landmark B2002, targeting landmark B2001 and Giubega Church (2000), then from the station 2002 a closed traverse was made 2002-100 -101-102-103-104-105-2002, and from station 102 the R station was radiated, then from stations 102 and R all the detail points were surveyed.

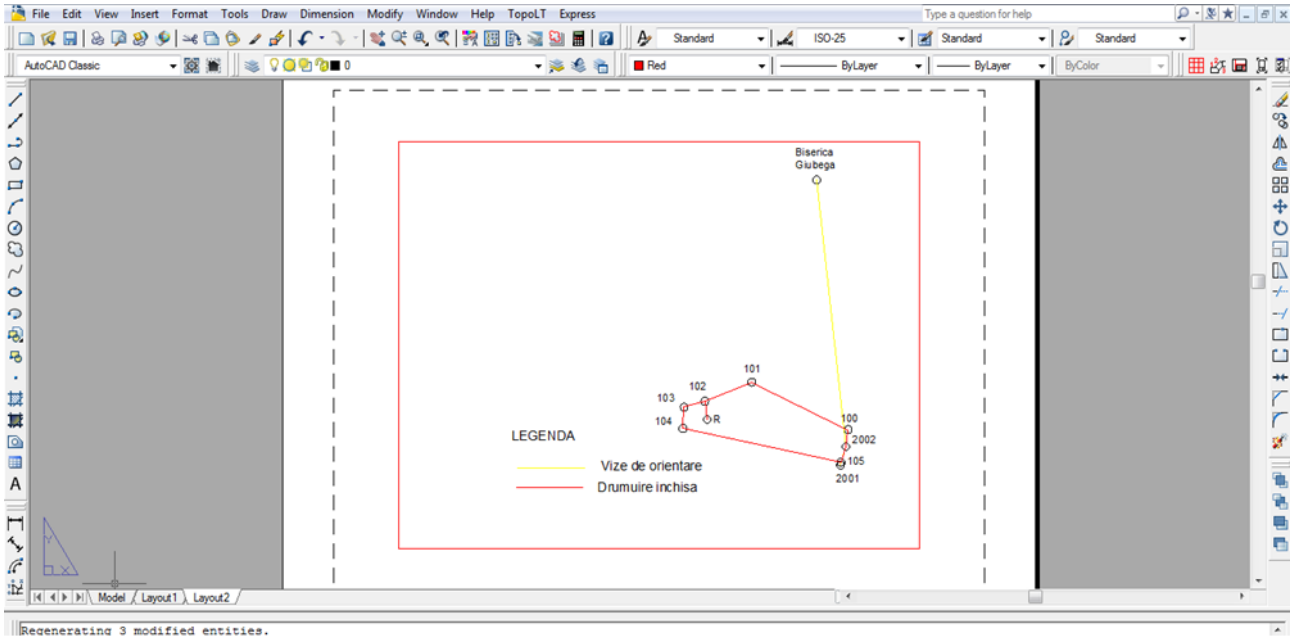

Figure 3. Outline of the support network

Stations 2002 and 2001 are the 2002N and 2001N points that resulted from GNSS (GPS) determinations using the static method (Figure 4).

Points 2002 and 2001 were materialized in the field by metal pickets, as well as stations 100, 101, 102, 103,104,105 and R.

After locating the station points 2001, 2002, 100, 101, 102, 103, 104, 105, from station 102 the station R was surveyed, and from station R and station 102 the detail points marked from 1 to 63 were measured.

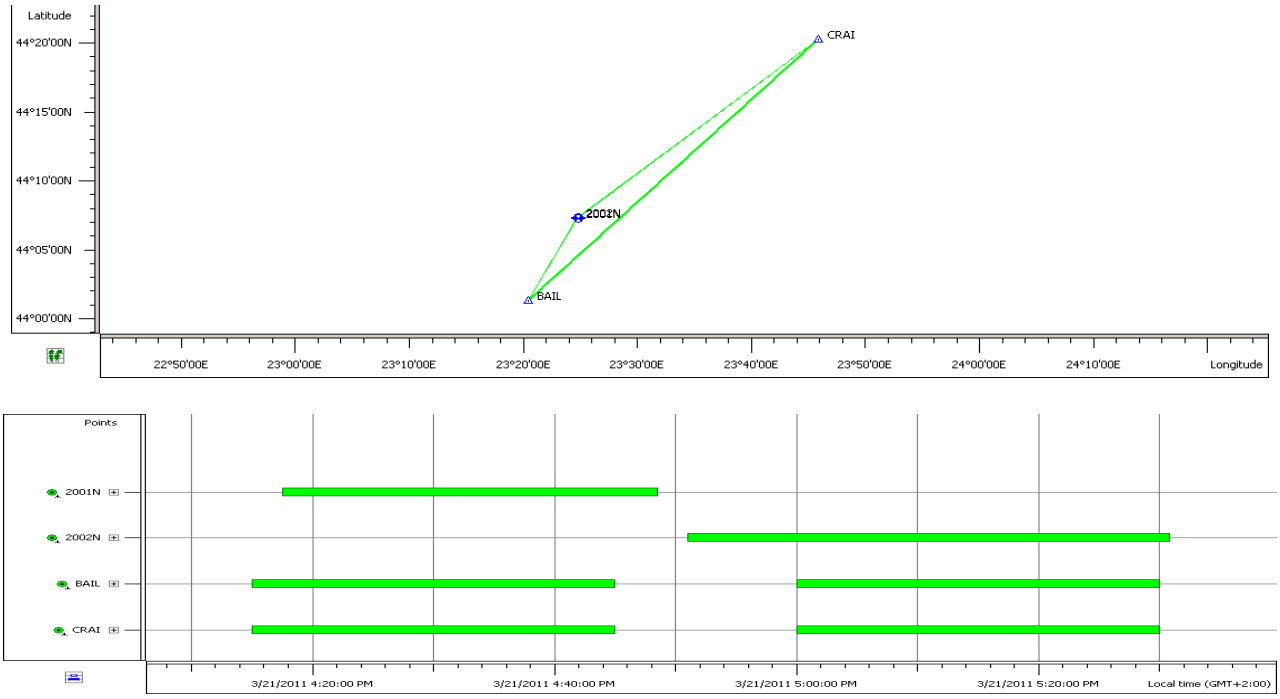

Figure 4. GNSS technology measurement sheet

The data taken from the field were downloaded to a computer and processed in TopoSys, starting from the coordinates of the support points found in Table 1.

Table 1

Inventory of coordinates - support points

Point	X	Y
Giubega Church	372947.372	293300.402
2000	373029.846	292665.527
2001	372777.715	292786.344

The following coordinates for the traverse points resulted:

Table 2.

Coordinates of traverse points

Point no.	X	Y
100	373029.846	292665.527
101	372777.715	292786.344
102	372654.987	292737.820
103	372600.240	292722.345
104	372597.603	292668.447
105	373011.029	292582.359

Finally, the coordinates of the detail points found in Table 3 were calculated:

Table 3.

Coordinates of detail points

Point no.	X	Y	Point no.	X	Y	Point no.	X	Y
1	372651.773	292755.859	22	372677.370	292725.091	43	372676.484	292718.010
2	372629.746	292745.963	23	372672.232	292724.117	44	372676.721	292720.258
3	372630.781	292735.896	24	372672.122	292724.697	45	372678.183	292720.104
4	372615.424	292729.531	25	372667.956	292723.907	46	372674.040	292711.802
5	372634.606	292734.847	26	372647.057	292726.932	47	372672.243	292694.746
6	372658.168	292741.698	27	372639.790	292725.118	48	372681.929	292693.726
7	372690.193	292751.153	28	372640.141	292723.711	49	372678.505	292689.180
8	372615.454	292725.742	29	372637.570	292723.069	50	372680.905	292688.955
9	372645.483	292733.239	30	372637.219	292724.476	51	372679.399	292672.926
10	372677.907	292741.356	31	372627.109	292721.952	52	372677.000	292673.151
11	372687.758	292744.397	32	372627.461	292720.546	53	372682.259	292690.981
12	372685.770	292725.086	33	372625.171	292719.974	54	372678.469	292654.166
13	372659.608	292732.219	34	372624.820	292721.381	55	372640.500	292662.194
14	372666.159	292733.388	35	372615.302	292719.005	56	372632.945	292664.054
15	372670.325	292734.178	36	372614.706	292721.392	57	372640.641	292695.300
16	372670.068	292735.534	37	372616.433	292721.823	58	372648.195	292693.440
17	372674.735	292736.418	38	372678.786	292725.832	59	372644.673	292711.672
18	372674.996	292735.043	39	372685.241	292725.152	60	372613.157	292711.614
19	372679.289	292735.856	40	372683.726	292710.781	61	372614.386	292716.797
20	372680.881	292727.456	41	372677.272	292711.461	62	372647.221	292650.004
21	372677.059	292726.732	42	372677.946	292717.856	63	372625.428	292728.218

From the coordinates of the measured points, the plan of location and delimitation of the building was drawn up, in AutoCAD, being then printed on A3 format paper at a scale of 1: 500. Also from the coordinates of the contour points were calculated the total area of the building, the category of use being: construction yards. The total area of the building resulting from the measurements was 3917 sqm (Table 4).

Table 4

Total area of the building 1CC

Point no.	Coordinate contour points		Side lengths D(i, i+1)
	x[m]	y[m]	
8	372615.454	292725.742	10.80
9	372645.483	292733.239	11.25
63	372625.428	292728.218	32.90
10	372677.907	292741.356	3.47
11	372687.758	292744.397	12.29
12	372685.770	292725.086	12.92
53	372682.259	292690.981	117.92
54	372678.469	292654.166	15.25
55	372640.500	292662.194	77.66
56	372632.945	292664.054	30.14
57	372640.641	292695.300	24.76
59	372644.673	292711.672	13.38
60	372613.157	292711.614	4.75
61	372614.386	292716.797	6.22
35	372615.302	292719.005	15.60
36	372614.706	292721.392	10.35
S= 3917 sqm			

The property also included 6 constructions (C1, C2, C3, C4, C5, C6) whose area was also calculated from coordinates. Finally, in AutoCad, the location and delimitation plan was made, which was then printed on A3 format paper at a scale of 1: 500.

CONCLUSIONS

Reducing working time on the ground but also in the office is essential for all entities involved in the operation of first registration in the land register of a property.

The use of modern techniques regarding the equipment used for measurements but also in the processing of collected data and in the preparation of cadastral documentation is a simple and efficient way to increase productivity in the case of companies or individuals authorized in the field.

Total station type equipment and GNSS receivers also ensure a high accuracy of the data collected and implicitly of the deliverables obtained for the prepared documentation.

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