EFFICIENCY OF THE TOPOGRAPHIC WORKS FOR DETACHMENT OF A PROPERTY

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Keywords: efficiency, automation, performant equipment, accuracy

ABSTRACT

This paper refers to choice efficient ways of preparation topo-cadastral documentation in order to detachment a property and combine classical methods of measuring with elements of GPS technology. Determination of station points was performed by the RTK-Cinematic in real time using real-time differential corrections from the reference station RGN- GNSS integrated, and the contour and detail points of the land was done by polar coordinates method. All operations necessary to obtain the correction of the coordinate, directions and horizontal distances were performed using TopoLT program, based on data from the total station downloading. For the efficiency of the topographic work, required a series of facilities, especially modern devices, GPS receivers, total stations, and performant PCs, appropriate software for data recording and obtain the final products.

INTRODUCTION

The paper refers to the choice of efficient way of topo-cadastral documentation preparation in order to obtaining the construction permit and detachment a property.

Modern technologies in the terrestrial measurements are doubled by computer systems for the collection, transfer, automated data processing and interpretation.

Worldwide, there is a tendency for all surveying to be done with modern equipment having an automatic data recording, transfer, processing data in some cases directly on the ground and reporting automated plans using appropriate software, specialized certain applications.

Increasingly visible lack of triangulation points, because their destruction by unknowing or irresponsibility of public authorities and citizens leads to expansion among civil users of GPS technology and beyond (Calina, 2012).

Topo-cadastral documentation was conducted in three stages: property dismemberment, building permits release for housing and enclosure; detachment real estate, works being located within the built area of locality Slatina, Olt County (Figure 1.)

MATERIALS AND METHODS

Automatizarea lucrărilor topo-cadastrale începe chiar din faza de culegere a datelor. Procesul de automatizare a preluării datelor diferă, după cum datele sunt achiziţionate fie prin ridicare pe cale clasică direct în teren(cu instrumente clasice sau automate), fie prin măsurători GPS, fie pe cale fotogrammetrică, fie prin digitizare (Tămăioagă, 2007).

Field measurements were performed with Leica GS09 GPS and Total Station LEICA TS06. In the first stage determination of surveying network points was achieved by GPS measurements and surface and detail contour points by the traverses combined with the polar coordinates method.

Figure 1. The works location

In the second stage was performed a mobile station using which were determined rectangular coordinates of the two points from which was made a supported traverse.

Determination of station points was performed by the RTK-Cinematic in real time (using real-time differential corrections from the reference station RGN- GNSS integrated Slatina by cooordinates: X = 324 965.112 m, Y = 449 706.004 m). Contour points and details were surveyed by polar coordinates method. The emplacement and delimitation plan of the property was executed at 1: 200 scale. Topographic measurements were performed in the coordinate system of the state geodetic network. The accuracy of points determination was made according to ODG 634 and Decision no. 1 on achieving kinematic GNSS measurements issued by the Director of Geodesy and Cartography Department from ANCPI.

In the last stage was executed a work of separation of the property from the previous step. Measurements were performed in accordance with current technical norms and surveyng network points were determined by GPS measurements. The determination of contour and detail points of the land was done by traverse combined with polar coordinates methodes.

Calculation of the surface in the first and last step was performed in automated programs and graphical representation in AutoCAD 2012, TopoLT, which allows scale representation of the surface.

RESULTS AND DISCUSSION

In the first step, after identifying the property boundaries were made the following (Figure 2.a.):

- were measured by the GPS Leica GS09 points 100 and 200, determining the X, Y, Z coordinates of the points.
- from the point 100 and 200 were taken points 9, 10, 11, 12, 13, 14, 15, 16, 17, 18.

In stage two points 1000 and 1001 were determined by GS0l LEICA GPS and from station 1000 were taken every contour and detail points, point 1001 was used for orientation (Figure 2.b.).

The third stage was performed by supported traverse combined with polar coordinate method. On the ground were measured with Leica GS09 GPS points S1 and S2, and determined the X, Y, Z values of the points. First station was made in S1, using for orientation S2 point, after from the point of station S1 and S2 were taken visas towards sideshots (Fig.2.c.).

Determination of station points was performed by the RTK-Cinematic in real time using real-time differential corrections from the reference station RGN- GNSS integrated, and the contour and detail points of the land was done by polar coordinates method. All operations necessary to obtain the correction of the coordinate, directions and horizontal distances were performed using TopoLT program, based on data from the total station downloading.

In the first stage from 1323.34 sqm area were estranged 623.00 sqm. Following measurements showed that the resulting property has a total area of 700 sqm.

In the second phase the measured surface is arable land use category of 700.00 sqm. The land will be enclosed on all sides for a length of 108.89 m; the works in the second stage had as objective to preparing the documentation to release the construction permit.

In the last stage property has an initial area of 700.00 sqm and by detachment resulted two surfaces of 378.00 sqm and 322.00 sqm. Also is calculated the total area of the two buildings completed in the second stage when the works were compiled to obtain the construction permit.

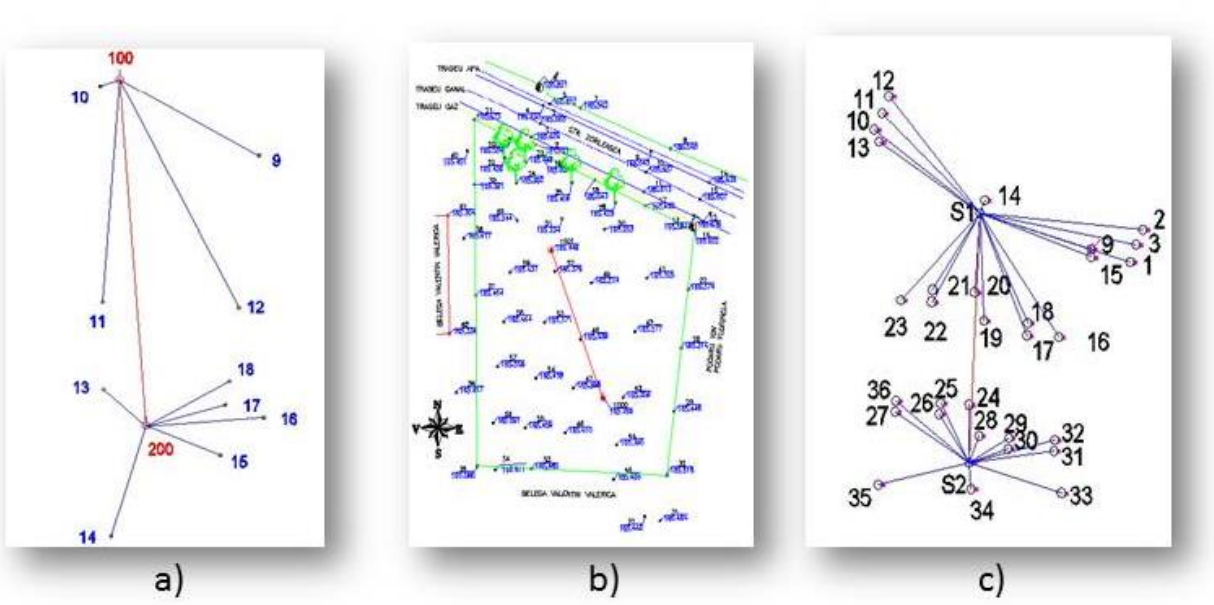

Figure 2. Network support points and contour

Coordinates transsmision in the work area was made by methods of GNSS (Global Navigation Satellite System) for determination of autonomous geo-spatial position. Processing GNSS base was made with specialized software (Leica Geo Office), based on permanent station Slatina. Field operations were conducted according to the three stages: dismantling, building permit release, detachment. Surface calculation and graphical representation was made with AutoCAD 2012 and TopoLT programs that allow surface representation at scale.

For the efficiency of the topo-cadastral works are necessary a number of facilities, especially modern devices, GPS receivers, total stations, and performant PCs, appropriate software for data recording and obtain the final products.

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