TOPO-CADASTRAL WORKS REQUIRED FOR ENTRY IN LAND REGISTER OF A SECTION FROM COUNTY ROAD 677 A, SIRINEASA COMMUNE, VALCEA COUNTY

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ABSTRACT

The aim of the work it was registering ownership right over DJ 677 A real estate located in the municipality Sirineasa, Valcea County.

In order to enter in the Land Register of the building mentioned above were performed measuring operations and computational and reporting operations. The works were completed in 1970 Stereographic projection system and measuring elements on the ground were performed with a Topcon GR-3 GPS and LEICA TC 805 total station.

For the road section was drawn up a location and delimitation plan at 1: 1000 scale, respecting the existing regulations.

INTRODUCTION

Located 27 km away from Ramnicu Valcea, the county capital, and 20 km away from Horezu, Sirineasa neighbours the Babeni town to the East and North, and the communes Ionesti to the East, Popesti to the West, Pesceana and Scundu to the South. The settlement has a total area of 4664 hectares and includes five villages: Şirineasa, the administrative centre, Ciorasti, Slavitesti, Aricioaia and Valea Alunisului (www.sirineasa.ro).

WORK METOHDS

Measurement, calculation and reporting operations were performed for the first Land Book registration of the real estate located in Sirineasa, Valcea county. The works were performed in the Stereographic 1970 projection system, and on-site measurements were made with a GPS TOPCON GR-3 and a total station LEICA TC 805.

GPS measurements were performed to determine the points of the supporting network and a supported road management was applied to enhance the density of such network, in order to register the real estate in Sirineasa with the Land Book. Detail points were raised through the radiation method.

Calculations were based on the site data, thus obtaining absolute coordinates in the Stereographic 1970 projection system, for the points delimiting the studied land.

The operations for drawing up the location plan and delimiting the property consist of a representation of points delimiting the surface on an A2 sheet, at a scale of 1:1000.

The used devices include a Topcon GPS system with 72 channels and two work frequencies and a Leica TC 805 total station, used for road planning stations and the existing planimetric details.

The **GR-3 receiver** includes a unique, double communication system, with cellular and radio technology. Providing 915 MHz internal Tx/Rx or UHF digital radio Spread Spectrum technology, GR-3 may serve either as an RTK base or as a rover system. Optionally, using the system with internal communication modem GSM/GPRS/CDMA through the easily accessible SIM card slot, a user may extend the scope beyond radio capacities or may use both receivers as rover systems with no fixed basis or network system (http://www.gisromania.ro/Topcon_gps.htm).

The GR-3 Topcon receiver is now available with the new UHF digital radio system, using DSP technology. This technological progress ensures higher reliability and performance compared to the former UHF analog technology and establishes new standards for performance, accuracy and innovative design (fig. 1).

Fig. 1. Receiver GPS Topcon GR-3

The TC 805 total station is manufactured by Leica Geosystems of Switzerland and is dedicated to topographic elevation, routing and construction works.

The device includes the tachimeter and the calculation unit equipped with data recording memory.

The LEICA TC 805 total station is a complex opto-electronic tool, aimed at measuring horizontal directions, vertical angles and distances, measurements to be recorded/stored and processed.

The name comes from the integration within a single device of the components of a teodolite, of the EDM (Electronic Distance Measurement) module and the electronic block allowing for the storage, processing and display of site collected data.

RESULTS AND DISCUSSIONS

The planimetric elevation of a land needs the following operations:

a) operations for the documentation and elaboration of the planimetric elevation project;

b) site operations (actual site measurement of all elements needed for planimetric elevation);

c) calculation and reporting operations.

When drawing up the work project, one should first study a plan or a map, perform site recognition and draw up the site sketch at a chosen scale (fig. 2).

4 points were determined by means of the GPS, with a supported road being built between them, and planimetric details were raised from road planning stations through the radiation method with the Leica TC 805 total station.

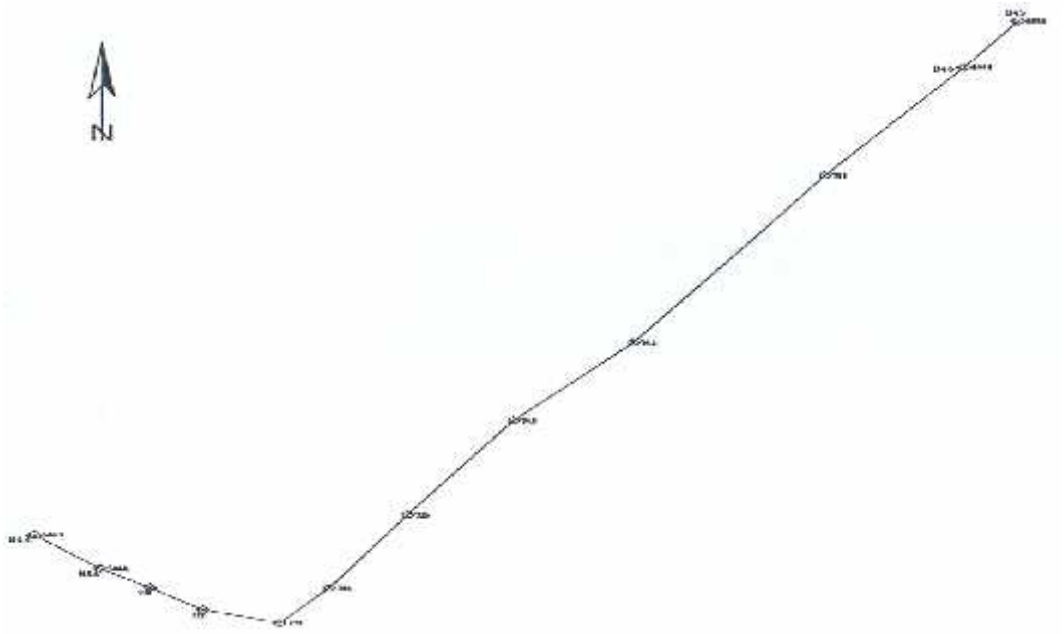

Fig. 2. Sketch of the support network

The 4 points have the following coordinates within the GPS network (table 1).

Table 1.

Inventory of coordinates for old points

Point name	X (m)	Y (m)
GPS 5043	381833.054	434659.834
GPS 5044	381772.792	434720.394
GPS 5045	382743.857	435574.877
GPS 5046	382662.458	435525.471

As shown in the sketch of the support network (fig.2), a supported road started on the land from point 5044, oriented towards point 5043, passing through points 731, 732, 733, 734, 735, 743, 742, 741, with a closure on point 5046 and oriented towards point 5045.

The site data was processed with the TopoSys software, resulting in the coordinates of road planning points (table 2.).

Table 2.

Inventory of coordinates for new points

Point no.	X (m)	Y (m)
731	381738.468	434766.930
732	381698.608	434816.139
733	381674.379	434887.193
734	381736.903	434933.656
735	381867.204	435006.809
741	382470.718	435395.225
742	382173.093	435218.712
743	382034.571	435106.074

Planimetric details were elevated from the station points determined upon road planning, through the radiation method. The coordinates of radiation points were determined after the performance of calculations.

After determining the absolute coordinates of points, they shall be reported to a scale on the plane, and then joined according to site sketches, resulting in the land location plan that is the result of planimetric elevations.

The location and delimitation plan was drawn up with the AutoCad software. Eventually, the resulting plan was printed on an A2 paper sheet, at a scale of 1:1000 (fig. 3).

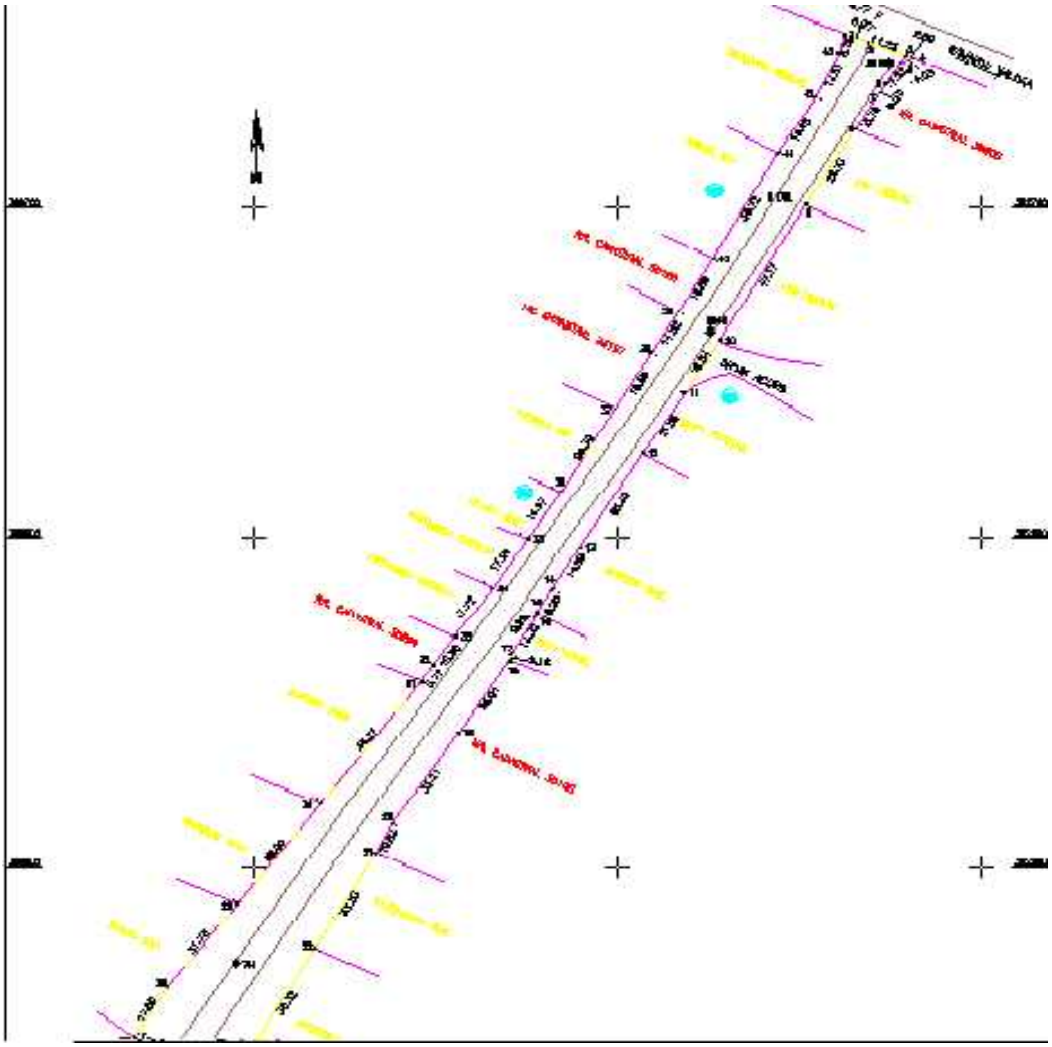

Fig.3. Emplacement plan

CALCULATION OF SURFACES

Having the absolute coordinates of points, the surface of the property was calculated through the *analytical method*, using one of the following calculation formulae:

$$2S = \sum_{n=1}^{n} X_n (Y_{n+1} - Y_{n-1}). \quad 2S = \sum_{n=1}^{n} X_n (Y_{n+1} - Y_{n-1}).$$

The total measured area of the land section in Sirineasa, Valceacounty is 9468 sq m.

CONCLUSIONS

1. The work aimed at intabulating the ownership right on the real estate DJ 677 A located in Sirineasa, Valcea county.

2. A density enhancement and elevation network had to be created by using GPS technology, combined with total station measurements, with a view to developing topographic measurement to establish the limits of the relevant real estate.

3. 4 points were determined by means of the GPS, through the RTK measurement method, with a supported road being built between them, and planimetric details were raised from road planning stations through the radiation method, resulting in rectangular coordinates.

4. The areas were determined according to the rectangular coordinates of the contour points resulting from site measurement processing.

5. The operations for drawing up the location plan and delimiting the property consist of a representation of points delimiting the surface on an A2 sheet, at a scale of 1:1000.

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