

## PROJECT FOR IDENTIFICATION AND MEASURING A FOREST AREA SITUATED INTO THE ADMINISTRATIVE TERRITORY OF GIROC, TIMIS COUNTY

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**Abstract:** *The forest as main fighting element against soil degradation and pollution is the larger gift that nature could offers to the human being, continuing to be a great miracle even for the greatest specialists. A modern democracy, cannot be consolidate without having the private propriety as main background which is the result of hard work and life saving, due to which the main goal of the human being is to improve its life conditions. The paper shows up a technical documentation for measuring and identification of forest situated on administrative territory of GIROC, TIMIS county. The purpose of the paper consist in registering the forest area into the Land Register Book according to the owners name by applying the 247/2005 law. The whole area is covered by forest vegetation. The 61.90 ha of oak forest, is having a medium density of 4m, the trees height is around 12 m, and the average thick is 0.25m. The forest is situated nearby Timiseni Monastery at the territorial administrative boundary between Sag and Giroc district. The work beneficiary: Timisoara Archbishopric, Saraca Monastery. The work purpose: consist in identification and field measurements in order to land register the woods parcels Pd420, Pd425, Pd425, Pd411, Pd407, Pd408 in the Timisoara Archbishopric propriety, on the territorial administrative territory of Giroc. Concerning the juridical situation of the propriety, for the moment this is part of the Committee of Propriety Laws for the propriety restitutions, of Giroc Council, Timis County. The topographical field measurements were achieved by using TRIMBLE 5503 DR total station. The projecting system used is Stereographic 70 projecting system. The data acquired by the field measurements, was processed by GEOTOP- Odorheiu Secuiesc software, TOPOSYS 5.1.*

**Key words:** *geometrical leveling, total station TRIMBLE 5503 DR, topographical-cadastral works.*

### INTRODUCTION

Being space of the physical existence and of social and national history, the land represent during the time history, not only the essence of the people's life, not only the main source of the living, but the symbol of the millions of hard workers, who passing the land from one generation to another gain the right of being a nation. History prove that a people in his fight for existence is finally having the background only in using the land and therefore it is absolutely necessary to carry out all the necessary efforts for protection and for a rational consumption and development.

Everyone can see, only fragments of the huge forest carpet, which in the past covered up a large part of the land, it is impressive by the trees flour dimensions, by the shapes variety and vegetations colors and by the inside fauna, by the wide variety of event that are taking place over there. Obvious, the step by step knowing process of the components and phenomena that have been take place into the forest has begun end evolved along with the mankind evolution. We will not emphasizing on different stages of how the man tried to acknowledge the forest. However, it must be mentioned that between the developed conceptions about forest

we must focus upon the Romanian forester DRĂCEA M. (1937) who in his exposure mention the following:

„The forest is an organism who can take almost in the last stage of analysis a comparison with organism concept in the manner that biological science establish. The forest birth, live and grow to regenerate and later on towards to a new generation of trees which to replace the older one”.

We could resemble in a more proper manner the forest as a social organism where interesting process of relationship and interaction can be follow through its components.

Unlike the other product device, the land even if it is not the outcome of a specific human work, being a part of mankind production, became a working means, leading to the fact that the ground with the soil and the underground, with the forests and the surface waters represent the natural background of any kind of production process.

It is well known that excepting the soil all other production means has a confined life being replaced by new production means. Compare with this the land can be seen as a production means unconfined only as surface and being also non-replaceable.

Knowing the land found for all owners, the using categories, and the administrative territorial units, is done by introducing the specific activities for maintenance the cadastral works on whole country territory.

In modern democracy, the background of the society is emphasizing by the private propriety as the result of a hard work and life savings, every member of the society improving its life standard becoming much more civilized.

The private propriety right is important not only for the owner but for the whole society. Taking into consideration this social function, it is logic and necessary that the owner of the private propriety to exploit his propriety in a rational manner, with efficient benefits regardless economical point of view. It is his interest to preserve his private propriety being efficient for him and also for the entire community and society.

Considering this context, the paper show the influence and the possibility of applying the modern cadastre in forest field, bringing on this way a slight contribution on the specialist general effort for growing up the productivity of the forestry cadastre works. This has as main target a better protection for the forests and a more rational exploitation of the forestry found.

#### **MATERIAL AND METHODS**

The paper basis has as background the topographic works of a forest parcel and represent a technical documentation prepare to identify and measure a forest in surface of 6190 ha. In Giroc, Timis county (figure 1).



Fig. 3.1 Giroc commune overview

Giroc village has as components two communes Giroc and Chisoda, one of the villages, Giroc being also the residence of the commune.

In the residence commune – Giroc, can be identify the residence of the local public administration which realize the local autonomy: Local Council of Giroc commune, as a main decision factor and the major of Giroc commune as executive authority, having the residence in Giroc commune str. Semenik, nr. 54 and the others authorities and representative public institution for Giroc commune.

The administrative territory of Giroc commune has as neighborhood in the North side Timisoara, at East side Mosnita Noua – Urseni village, at South Timis river, at South-West Sag commune and at West Utvin commune.

Giroc commune is situated in The Lower Plain of Timis, in the West side of Romania, in the central part of Timis county, at the intersection of 45° 50' 30" North lat. Parallel with 21° 30' East long. meridian, situated at South of Timisoara city.

Due to his position, Giroc commune is situated in Banat Plain in the East side of The Great Basin of Sedimentation named Panonic Depression.

Because at the South of locality there is 420 ha of forest, Timis river having a beach of over 40 ha, and beyond Timis river there are 1400 ha of forest, a high interest in development the urban area and fishing area toward the forest and also in the development of touristic areas based on the air quality as the result of the secular trees of the forest and also the vegetation contribution.

The touristic area is already part of Urbanistic Zone Plan named „Recreation Village”, on a considerable surface, where by the owner contribution a Church and a Monastery will be build on a 6000 m<sup>2</sup> surface.

The high interest for the inhabit area between Giroc and the forest is based on the occidental models named "Schlafendorf" more and more Timisoara inhabits and not only express their willing to build in this area.

The paper purpose was to prepare the technical documentation for cadastre and land registration for the real estate situated on the administrative territory of Giroc, having as beneficiary the Timisoara Archiepiscopate, Săraca Monastery belonging to Banat's Metropolitan.

Săraca Monastery (figure 2) is situated in the center of the Banat Plain, in Semlacul Mic locality, Gătaia village, at 67 km South of Timișoara, on the road that link both localities. (figure 3.)



Figure 2. Săraca Monastery

The paper purpose is the land register in the Cadastral Book of the land section having the appropriate names of the owners according to the 247/2005 Law. The technical documentation is not part of the present paper and therefore the paper will consider strictly the technical part, concerning the field measurements in order to achieve the necessary plans. The terrain is covered with forest vegetation.



Figure 3. The chart Protopopies and Monasteries from Timisoara Archiepiscopate

The forest composition is mainly on oak, having a density of around 4 m. the highest of trees being around 12 m. and the average thickness around 0.25m. The forest is situated near to the Timiseni Monastery at the administrative territorial limit between administrative territory of Sag and administrative territory of Giroc, by having the access through the road that lead to the Timiseni Monastery. The terrain where the forest is situated has an extension on the North-South axis of 780 m, and on the East-West of about 910m. being crossed by 5 exploitation roads in length of 6.4 m. Considering the altitude point of view the extension varies between 79 and 80 m. mainly because of the Banat Plain configuration, where there is not a significant level difference (having the reference system Black Sea). For these reason it was also necessary to draw the level contours in equidistant of 0.5 m.

The topographic field measurements were effectuates with the total station TRIMBLE 5503 DR the whole works being made in the Stereographic Projection System STEREO-70

The juridical situation of the real estate: at the disposition of the Commission for propriety law concerning retrocession of real estates from Giroc Council, Timis county.

Topo-Cadastral operation effectuated: For the limits identification, which is the purpose of the paper a topographic survey has been made using TRIMBLE 5503 DR total stations and braids of 30 and 50 meters. For coordinates determination and parcels surface the following points from the geodesic network were use: MONASTERY signal 3<sup>rd</sup> range and TIMISOARA CATHEDRAL 2<sup>nd</sup> range (table 1 and figure 4.).

Table 1

Points of knowing coordinates from the national geodesic network

Point nr.	Point description	X[m]	Y[m]	Z[m]
1	MANASTIREA	469225.017	203603.768	88.550
2	BIS TIMISOARA CAREDRALA	479269.568	206452.197	158.330



Figure 4. Points from the national geodesic network

## RESULTS AND DISCUSSIONS

For the terrain parcels that make the purpose of this paper the STEREO 1970 coordinates were determined using as technical procedure the close tachimetric traverse, having the closing point identical with the starting point. For each parcel corner and road detail typical measurements has been made. The traverse start at RS MINASTIREA by having the azimuth sight on the TIMISOARA CATHEDRAL having the following traverse station points: St\_1, St\_2, St\_7, St\_51, St\_97, St\_207, St\_215, St\_220, St\_304, St\_320, St\_337, St\_347, St\_369, St\_377, St\_384, St\_389, closing on the starting point MINASTIREA signal.

On field, after choosing and marking the station points, the horizontal angles and the horizontal distances were measure, by using the specific facilities of the total station. (figure 5).

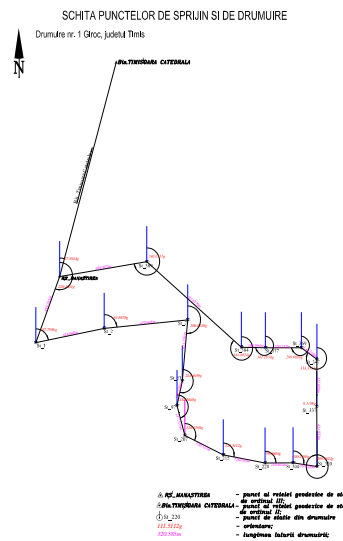


Figure 5. Draft with the network points

For processing the necessary data in order to achieve the profile, after identifying the characteristic points where using the prism the horizontal distance has been measured by using the high facilities of the total station.

Due to the variety of terrain and of the existing vegetation, for a proper data achieving the total station has been installed in each station point and where it was enough visibility the detail points were measured, but in places with insufficient visibility the field measurements process was based on the traverse station points, mainly in forest areas the traverse station points are considerable increased due to the lack of visibility and to the vegetation. For a proper achievement of the technical documentation after field measurements, the recorded data from the internal memory of the total station TRIMBLE 5503 DR are transferred into the computer memory through a specific interface, a COM port, a battery, two cables and obviously the specific software Spectra Precision GST.

For processing the data obtained during the field measurement operation , in order to achieve the points coordinates the software named TOPOSYS 5.1 made by GEOTOP-company from Odorheiu Secuiesc was use.

The data management is made in data base named Projects, and the calculus is made in the section named Works. The graphic window of the software offer the possibility of viewing the points coordinates and the existing observations in the current work together with the points number and the ellipse error.

For each work created in the current project, in the main directory, having the project name is made a sub-directory having this time the name of the work, where log and configuration files are saved.

TOPOSYS software allow also the processing for all kind of geodesic measurements used for stocky the existing local networks.

The primary data :

- coordinate list – fixing points;
- list of horizontal and vertical/zenithal angles and distances;
- height list;
- level difference list.

These values were manually imputed, imported from ASCII files, under different formats. The measured distances are horizontal distances. The coordinates computed approaches are as follows:

- traverse / traverse networks;
- radiere as approximate coordinates approaches;
- radiere – detail points coordinate computation.

The method use for planimetric and altimetry traverse compensation was with measured coordinate network.

The compensation of planimetric and altimetry network has been done by the weight of measures according to the measured distance.

The calculus allows the establishment of the geodesic reference for the digitized cadastral plan including the following:

- stereographic projection STEREO 70;
- GAUSS-KRUGER projection;
- coordinates computation;
- coordinates transformation spatial and horizontal.

This operation has been executed using different ellipsoids.

The outcome data were as follow:

- list of approximate coordinates;
- list of measurements;
- list of compensate coordinates;
- precision parameters of network compensation; the average square error of the weight unit, the square average error of coordinates, the ellipse error data;
- DXF files compatible with AutoCAD having the point disposal, sights, and ellipse error;
- ASCII files.

The name and data operation of calculus effectuated in the paper. All the calculus result is mentioned along its execution. By selecting a operation, the ratio containing the parameters is show.

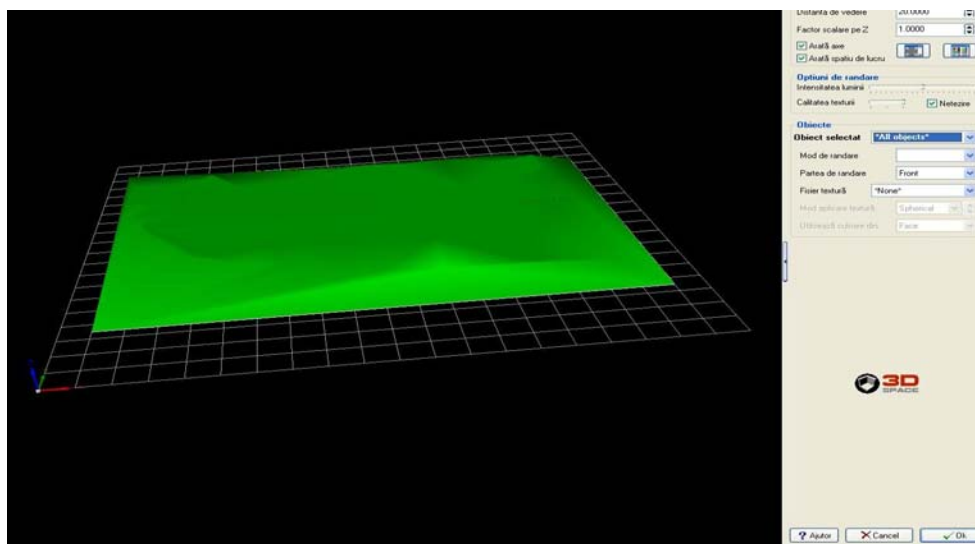
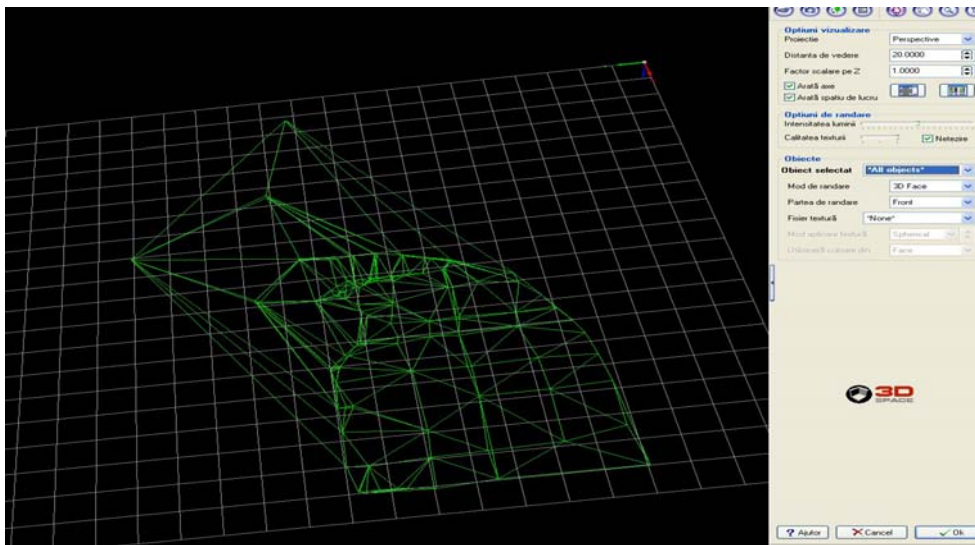
The curve levels was execute with the TopoLT software.

Concerning the altitude the extension varies between the level curves of 79 and 80 m.

Considering the altitude point of view the extension varies between 79 and 80 m. mainly because of the Banat Plain configuration, where there is not a significant level difference (having the reference system Black Sea). For these reason it was also necessary to draw the level contours in equidistant of 0.5 m.

After the processing the measured data for achieving the measured points coordinates, through coordinates data export, heights, leveling measurements using the specific functions of TOPOSYS software – graphic DXF export, the graphic sketch of the measured surface by AUTODESK software, by connecting the points according to the field draft:

- the traverse draft, station points description together with the points from the national geodesic network;
- Framing plan for the forest parcels that have been measured – scale 1 : 25000;
- Section from the Cadastral plan of Giroc – scale 1:10000;
- Topographic plan, with curve levels – scale 1:5000;
- Situation and identification plan – scale 1:5000;
- Orthophotoplan checking of the situation plan – scale 1:5000;



### CONCLUSIONS

Assimilation of measuring techniques is the basic contribution for obtaining good results to achieve a good topographic study.

A very good knowledge of the topographic equipment is a necessary condition for a proper usage into the field measurements.

A basic knowledge concerning the necessary steps and measuring phases is important in achieving topographical studies mainly in cadastre;

Also, it must be mentioned that due to the difficulties caused by covering the forestry found, and considering the techno-economical aspects of this found, the topographical works are to be executed by simplified technical operations, that do not demand a strong planimetric and altimetry precision.

In the near future, the GPS performances, however remarkable, will evolve towards obtaining a highly and superior precision at lower costs. The Geographic Information System is the main beneficiary of this technical evolution, the pin point identification of the SSP – permanent sample surface, from the inventory arrangements.

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