

## TOPO-CADASTRAL WORKS CARRIED OUT IN VIEW OF THE CADASTRAL PLAN CORRESPONDING TO THE CADASTRAL SECTOR NUMBER 108 FROM THE VILLAGE OF SĂLIȘTEA, ALBA COUNTY

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**Abstract:** The introduction of systematic cadastre in Romania represents a project entitled "National Cadastre and Land Registration Programme", developed at a national level since 2015. The period for the National Cadastre and Land Registration is from 2015 to 2023 and it aims at the systematic registration of buildings in 2337 LAUs located in rural and urban areas. The objective is to register buildings in the integrated cadastre and land registration system, tax-free, accompanied by the issue of certificates for the registration of owners.

**Keywords:** systematic cadastre, cadastral sector, local administrative units (LAUs).

### 1. Introduction

Systematic cadastre is achieved by mass measurement of all property (land with or without buildings) belonging to an administrative-territorial unit or a cadastral sector, finding the owners and holders of real rights, opening land books for those buildings, operations performed in a single procedure for the entire cadastral sector or for the entire administrative unit.

The objective of the systematic registration works is the registration in the integrated system of cadastre and land book of the buildings located in the cadastral sectors.<sup>1</sup>

Once the systematic cadastral works are completed, the technical cadastral documentation is set up, such as the cadastral register of real estate, the alphabetical list of the holders of real property rights, of the owners and other holders and the cadastral plan.

The village of Săliște is located in the southern part of Alba county, with a linear territorial shape on the NE-SW direction, and dividing into two tentacles to the South. The cadastral sector number 108 is outside the village, with a regular shape and covers an area of 40,095 hectares, with 166 registered properties.



Figure 1. Cadastral sector number 108 from Săliște<sup>2</sup>

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<sup>1</sup> Order no.1427/2017 – Regarding the approval of the Technical cadastral specs in view of registering the real estate in the land registration system;

<sup>2</sup> Diana Monica Vancea, Bachelor's degree project: Topo-cadastral works carried out in view of the cadastral plan afferent to the cadastral sector number 108 from the village of Săliște, Alba County, University “1 Decembrie 1918” of Alba Iulia, 2021- Scientific coordinator: senior lecturer Eng.D. Magdolna Eva Koncsag;

Following the organization and development of the local public information campaign through which the citizens were notified about the beginning of the systematic registration works, the limits of the designated LAUs were identified and the specialised works were carried out as follows: conducting field interviews in order to identify the location and boundaries of the buildings, the actual carrying out of land measurements, the legal owners of the measured buildings and the collection of legal documents related to the measured property.

Afterwards, the information collected from the field was updated with that from the sporadic integration and the elaboration of the cadastral technical documents. The commissioning of the cadastral technical documents was also carried out by the commissioning committee and the information campaign regarding the display of the technical documents of the cadastre was carried out (the owners of the measured buildings visualized the geometry, surface and neighbours of their plot, based on rectification requests).

The technical documents of the cadastre were updated following the rectification solution and the systematic works were closed in order to be registered in the land book.

The land book extract for information and the cadastral plan extract were then communicated, after which the documents that formed the basis for the real estate registration were archived.

## 2. Materials and methods

During the campaign for measuring the limit of the cadastral sector number 108 located in Sălișteea, the GPS used consisted of the Stonex S 800 A receiver, the Stonex S 4 II controller and related accessories.



Figure 2. Stonex S 4 II Controller<sup>3</sup>

The measurement method used in the measurements performed using the GPS in order to determine the boundary of the contour of the cadastral sector number 108 was the real-time kinematic method - RTK.

### Measurements and data processing

During the field measurements, four essential steps were taken, namely: field recognition; carrying out specialized works; identifying the boundaries of cadastral sector number 108, setting and configuring the GPS.

In order to make the measurements, the starting point was the North-West corner of the cadastral sector number 108 (the first starting point was number 1) following the continuation of the measurements towards the North-East corner of the sector, crossing its limit clockwise in order to carry out the topographic survey of all its points. (Figure 3.).

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<sup>3</sup> Diana Monica Vancea, Bachelor's degree project: Topo-cadastral works carried out in view of the cadastral plan afferent to the cadastral sector number 108 from the village of Sălișteea, Alba County, University “1 Decembrie 1918” of Alba Iulia, 2021- Scientific coordinator: senior lecturer Eng.D. Magdolna Eva Koncsag;

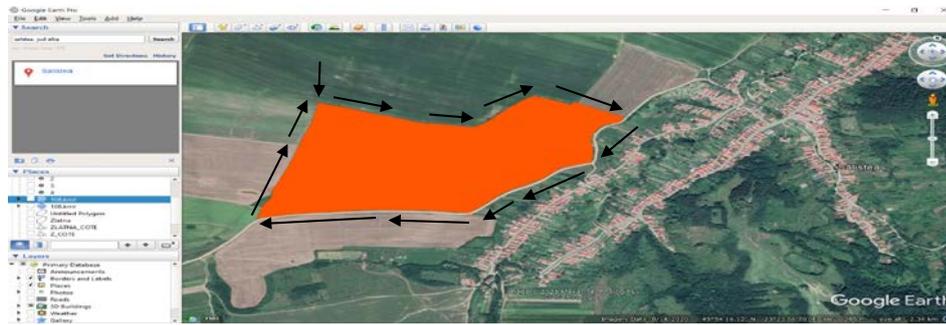


Figure 3. View of the cadastral sector in Google Earth Pro<sup>4</sup>

The GPS on point 1, then the Stonex S 4 II controller and the Stonex S 800 A receiver were started consecutively, performing a first configuration of the topo-geodetic equipment, namely checking the battery status: the device was opened by pressing the ON / OFF button, the device menu was accessed, choosing the “SurvCE” menu and selecting “Battery Setup”. Next, a new job was created in which the queries of the measured points belonging to the cadastral sector number 108 were filed.

The “SurvCE” menu was accessed and a new job was created by selecting “Select New Job”, named “2019S108VANCEA”, which was validated.



Figure 4. Setup and save of Job<sup>5</sup>

The next step was to set up and verify the job. To achieve this, the "Paper settings - System" were accessed by choosing the units of measurement and the Stereographic 1970 projection system, respectively the 1975 Black Sea projection system. Then followed the connection of the equipment to an internet source. In order to make this possible, the device was connected via the Bluetooth function to the mobile phone. An imperative connection was also that of the GPS with the controller. The next essential setting was to initiate the connection of the device to the ROMPOS network, and the setting of the RTK kinematic measurement method occurred implicitly.

Positioned in the North-West corner of cadastral sector number 108, the starting point was registered, which was named point 1. From the basic menu of the topo-geodetic equipment “SurvCE” “the Job” was chosen, more precisely “Save points”, entering the name of point number 1 and then “Store” was pressed.

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<sup>4</sup> Diana Monica Vancea, Bachelor’s degree project: Topo-cadastral works carried out in view of the cadastral plan afferent to the cadastral sector number 108 from the village of Săliște, Alba County, University “1 Decembrie 1918” of Alba Iulia, 2021- Scientific coordinator: senior lecturer Eng.D. Magdolna Eva Koncsag;

<sup>5</sup> Idem;



Figure 5. Registration of the first point<sup>6</sup>

Then, the next point was chosen clockwise (2), and this was done automatically, without the need to select it manually. At each recording of the coordinates of a point, there were three times of measurement to obtain the most rigorous values.



Figure 6. Measuring three times, corresponding to each coordinates registration<sup>7</sup>

During the measurements, it was necessary to check the number of satellites received, the GDOP values, if the antenna was in a fixed position and view the sky map with the exact positioning of each satellite, in order to obtain accurate and concise values.

Once the cadastral sector measurement session 108 was over, the measured data were exported. For this, the “Import / Export” option was accessed, selecting “Export Ascii file” by choosing the comma delimitation. Everything was validated within the Job “2019S108VANCEA” and the confirmation “Operation complete” was received.



Figure 7. Ascii export of the field measurements<sup>8</sup>

The field measurements were followed by downloading the field card to the personal computer via a USB and by opening the controller by pressing the ON key. Accessing the “SurvCE” menu of the GPS controller, the “Job” submenu was accessed, from which “Export/Import” was chosen, looking for the job in which the data measured in the field “2019S108VANCEA” were saved and the five field notebook files with the extensions: \* .inf, \* .not, \* .rw5, \* .sys and \* .txt were retrieved. The five files were copied to the personal computer and then stored in a folder called "Measurements".

<sup>6</sup> Diana Monica Vancea, Bachelor’s degree project: Topo-cadastral works carried out in view of the cadastral plan afferent to the cadastral sector number 108 from the village of Săliște, Alba County, University “1 Decembrie 1918” of Alba Iulia, 2021- Scientific coordinator: senior lecturer Eng.D. Magdolna Eva Koncsag;

<sup>7</sup> Idem;

<sup>8</sup> Ibidem;;



Due to the topographic equipment used, the compensation of the coordinates of the points taken in the field was done automatically, which means that it was no longer necessary to use specialized software to perform data compensation.

Thus, the coordinates of the points related to the boundary of cadastral sector number 108 were directly imported into the graphics software using the TopoLT application.

After configuring the TopoLT application, the coordinates were imported into the AutoCAD 2006 graphics software. From the TopoLT application, the “Coordinates” option was chosen, more precisely “Report points” and the \*.xlsx file was searched, in which the field book was processed, copying in turn the columns corresponding to the X, Y and Z planimetric coordinates.

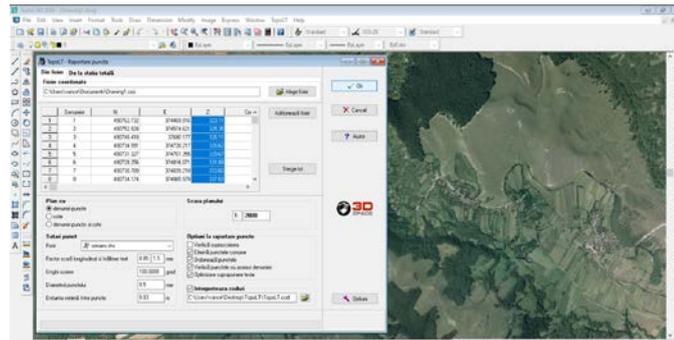


Figure 11. Import of coordinates for the points corresponding to the limit of the cadastral sector number 108<sup>12</sup>

On the worksheet of the AutoCAD 2006 software, the 524 points related to the cadastral sector boundary 108 were imported and joined. In order to obtain the polygonal route related to the boundary of the cadastral sector 108, the command “Polyline” was taken from the drawing bar and the joining of the points was started starting from point 1 clockwise. The limit of the polygonal route corresponding to the cadastral sector number 108 was obtained.

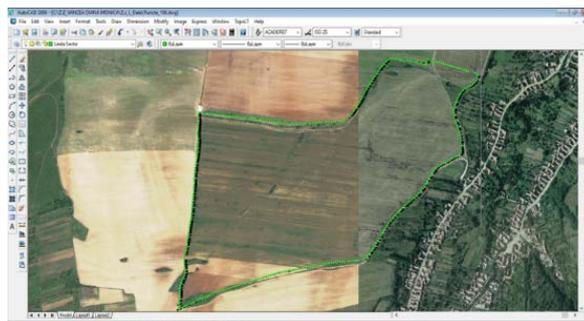


Figure 12. The limit of the cadastral sector number 108<sup>13</sup>

To set the plotting, the TopoLT application was used, selecting the “Surfaces” option, more precisely “Multiple detachment” and selecting the plotting in a line parallel to the North-East side of the cadastral sector.

<sup>12</sup> Diana Monica Vancea, Bachelor’s degree project: Topo-cadastral works carried out in view of the cadastral plan afferent to the cadastral sector number 108 from the village of Săliște, Alba County, University “1 Decembrie 1918” of Alba Iulia, 2021- Scientific coordinator: senior lecturer Eng.D. Magdolna Eva Koncsag;

<sup>13</sup> Idem;

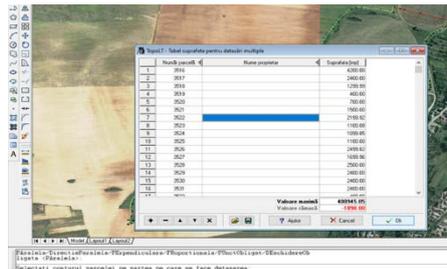


Figure 13. Plotting using the option of multiple detachment within the TopoLT app<sup>14</sup>

The data entered in the table related to the multiple plotting were validated and thus the final product was obtained, namely the plot plan of the cadastral sector number 108 from the village of Săliște.

In order to obtain the cadastral plan, the scaled boards were conveniently uploaded using the TopoLT application to perfectly fit the geometry of sector 108. Accessing “TopoLT” - “Boards” - “Draw a board”, the scale 1: 2000 was selected and the two boards were imported, because the surface of the cadastral sector is a large one and it cannot be completely included in just one of the boards.

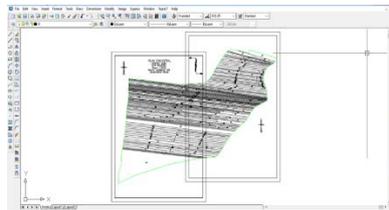


Figure 14. Import of cadastral plan boards using the TopoLT application<sup>15</sup>

In order to obtain the digital cadastral plan in its final form, the TopoLT application was used again and the grid of the cadastral plan was made. Its legend was imported: “TopoLT” - “Boards” - “Draw the grid”, respectively “Boards” - “Drawing options”.

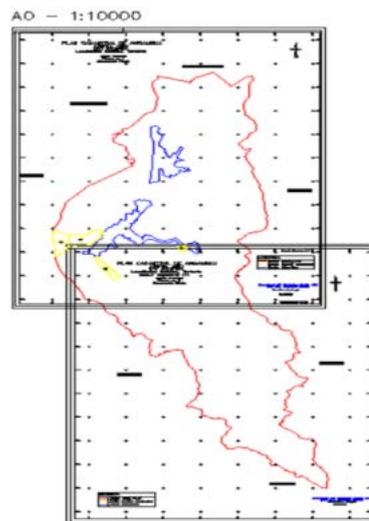


Figure 15 Annex 6 – Cadastral plan<sup>16</sup>

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<sup>14</sup> Ibidem;

<sup>15</sup> Diana Monica Vancea, Bachelor’s degree project: Topo-cadastral works carried out in view of the cadastral plan afferent to the cadastral sector number 108 from the village of Săliște, Alba County, University “1 Decembrie 1918” of Alba Iulia, 2021- Scientific coordinator: senior lecturer Eng.D. Magdolna Eva Koncsag;

<sup>16</sup> Idem;

The inventory of coordinates of the points related to the cadastral sector was then generated: “TopoLT” - “Coordinates” - “Create coordinate table”.

At the end, the size of the partial areas and that of the cadastral sector 108 was calculated, which was 40,095 hectares.

#### 4. Conclusions

The present paper is highly important in the development of rural society in Romania, as it determines technical, economic and legal information regarding property. The introduction of the systematic cadastre in Romania seems to be improving from year to year; the aim of the Romanian government is to have the entire territory of Romania completely surveyed by 2023.

We believe that there are many benefits from it, such as: free registration of all properties, creation of land merger premises, registration of real estate owned without documents, issuance of certificates of inheritance, registration of public and private domain of the territorial administrative unit and the Romanian state, the rapid development of infrastructure projects, the development of the mortgage market, economic growth, the shortening of deadlines for land book and cadastral plan applications, updating the records of the mayor's office and many other more.

#### 5. References

1. *Law 7/1996 of cadastre and land registration;*
2. *Order no.1427/2017 – Regarding the approval of technical specs for systemic surveying work in view of registering property in the land registration system ;*
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