



USV Timisoara

"YOUNG PEOPLE AND MULTIDISCIPLINARY RESEARCH IN APPLIED LIFE SCIENCES"

16-17 November 2023



"Young people and multidisciplinary research in applied life sciences"

DIGITIZATION OF ANALOG TOPGRAPHIC AND CADASTRAL MAPS FOR THE CREATION OF THEMATIC PLANS FOR THE COMMUN

AUTHOR: Student Petru VASILE

Student Larisa-Nicoleta IVU

COORDINATOR : Lecturer Dr. Ing. Costel BÂRLIBA

Lecturer Dr. Ing. Livia Luminita BÂRLIBA

University of Life Sciences "King Michael I" from Timisoara, Romania

SPECIALIZATION: Land measurement and cadastre, IV

Abstract : This scientific work aims to highlight the use of analog topographic and cadastral maps in digital format, in order to have a better perception of the entire territory, but also to have an overview of all the geographical elements existing on it. This work contains the stages of its realization in which we have, the digitization of maps and topographic plans from analog format to digital format, in order to create a thematic map of the entire territory of the Eftimie Murgu Commune in Caraș-Severin County but also to observe its geographical elements plus territorial limits.

Autocad 2013 and Raster Design 2013 were used to create this map for the entire territory. Mainly to introduce the maps and plans in these programs, we established the limits of the commune. With its help, it was possible to arrange the 1:5.000 cadastral plan of the entire County. Then, following also with the help of the territorial limit, the grid of the entire territory is made, discovering the nomenclature of each map belonging to the Eftimie Murgu Commune in Caraș-Severin County. For this, 1:5.000 military maps were used, which were attached according to the grid that was made. The entire work was done in Autocad 2013 and in Raster Design 2013 resulting in a digitized map and plan of the entire territory of the Eftimie Murgu Commune in Caraș-Severin County.

Thus, we ended up having a well-established cadastral plan in which we can observe all its geographical and cadastral elements.

Keywords: cartography, maps, border of territorial administrative unit, cadastral plans.

• Introduction

Digital maps are maps or cartographic representations created and stored in digital form. They can be accessed and used on electronic devices such as computers, smartphones, tablets or GIS systems. Digital maps are widely used in navigation, geolocation, urban planning, terrain analysis, scientific research, video games, and many other fields.

Digitization of analog topographic and cadastral maps is an important process to convert traditional paper maps into digital format, which enables users to create thematic plans, perform spatial analysis and access geospatial information more efficiently.

Digital maps allow users to interact with geographic information. They may provide navigation instructions, enable location searches or provide additional information such as reviews and photos of places of interest.

They can be quickly updated to reflect changes in infrastructure, new construction or changes in the topography of the area. This makes digital maps useful in land management and planning. But they can also be used in spatial data analysis, to understand geographic relationships and make informed decisions. They are used in fields such as geography, ecology, urban planning, natural resource management, cartography and business planning.

• Material and method

The first objectives proposed in the realization of this work were the digitization of 1:5.000 military maps on a large part of the Eftimie Murgu Commune in Caras-Severin County in order to solve as deeply as possible a well-defined cadastral plan of this Commune. In the attached table you can find the nomenclatures used for the digitization of maps. This is one of the multiple maps that this project includes



Figure 1. Topographical map L-34-117-A-c-1-IV

The materials used are:

- Analog maps with scales 1:5.000;
- Atlas of Conventional Signs for Topographical Maps.

• Results and discussions

The specialized programs Autocad 2013 and Raster Design 2013 were used in this project. Georeferencing is the process of assigning geographic coordinates (latitude and longitude or other coordinate systems) to data or images so that they can be placed in a spatial reference frame. This process is essential to ensure that data or images can be correctly placed on maps or geographic information systems (GIS).

In the first part, we delimited the territorial limit of the Eftimie Murgu commune in Caraș-Severin County. In which with its help we managed to find the exact location of the locality within the entire county of which it is a part.

Thus we used the sketch of the entire territorial administrative unit to be able to find its borders.

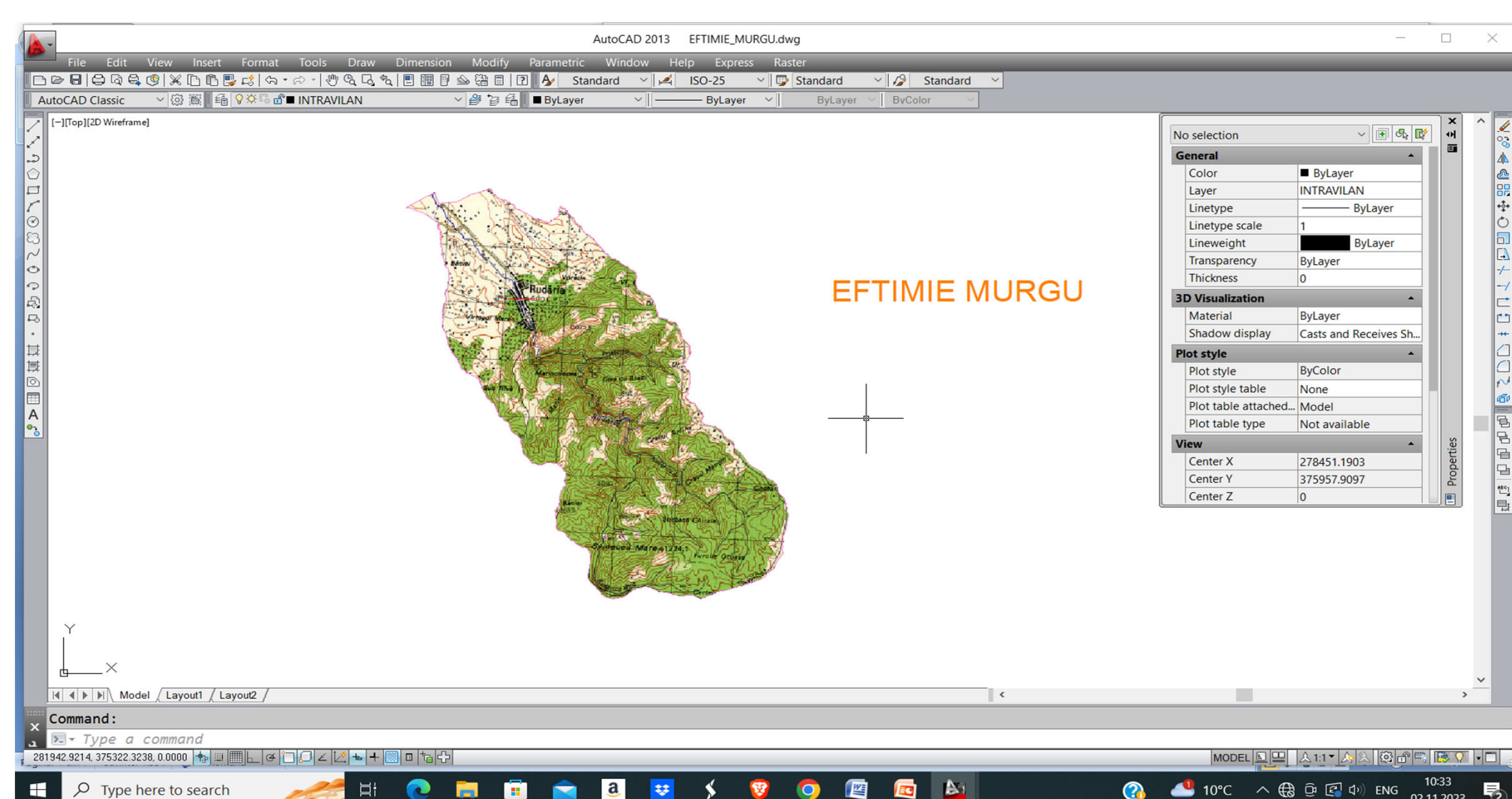


Figure 2. Sketch of the Eftimie Murgu territorial administrative unit

This is how we discovered the territorial border of Eftimie Murgu Commune in Caraș - Severin County. (Fig.3)

The second stage consists in creating layers according to the elements of the project. For a better delimitation of all its elements, as well as certain elements of the maps.

Any drawing, plan, map as long as it is entered in Autocad has at least three elements: line, point, circle, layer or color. Thus, with the help of layers, we can make them visible or invisible (close them from the layers), each element in the project itself.(Fig.4)

The third stage is the one in which we used the cadastral plans of the territorial administrative unit Eftimie Murgu Commune from Caraș-Severin County where with the help of Raster Design we managed to completely plan the entire commune.(Fig.5)

For the complete alignment of these plans that were well delimited by the border of the commune, the Align command was used to bring each piece of the related plan, to be correctly aligned and completely in coordinates.(Fig.6)

In the fourth stage, for better accuracy and precision of looking at the entire territory, we made the grid of the entire territory to discover exactly each positioning of each map with the nomenclature related to this location.(Fig.7)

In order to better see the existing geographical elements in this territory, we used military maps to make a complete plan of the commune.(Fig.8)

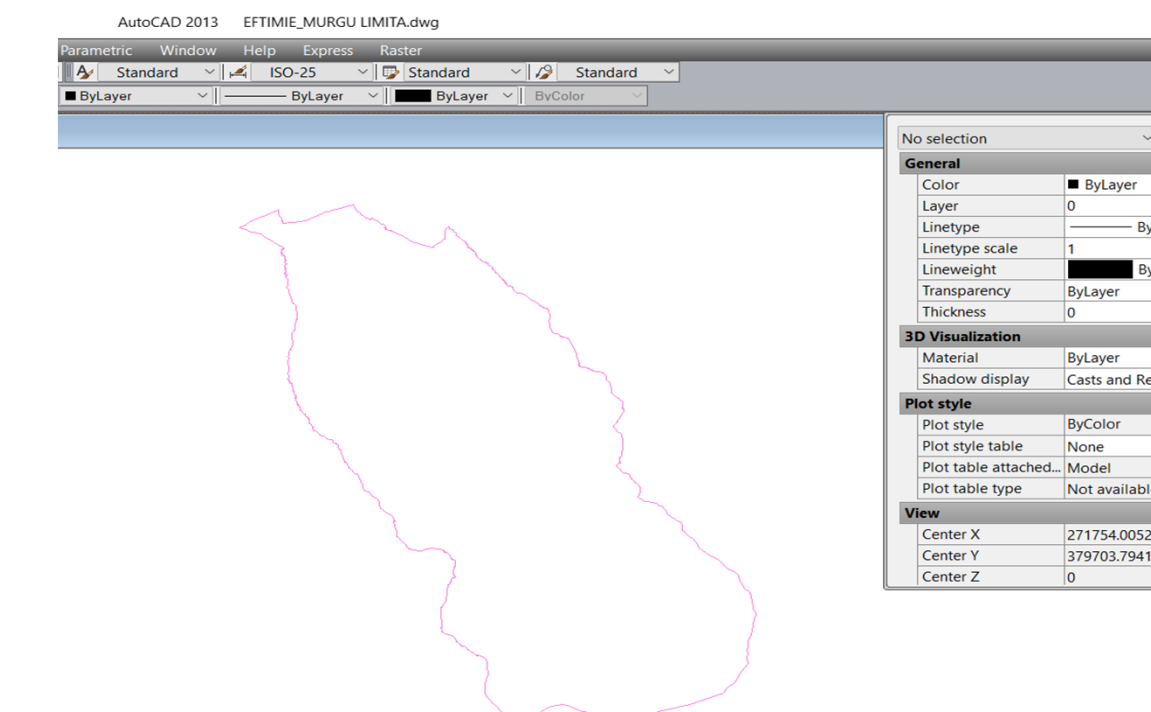


Figure 3. The territorial border of the Eftimie Murgu Commune

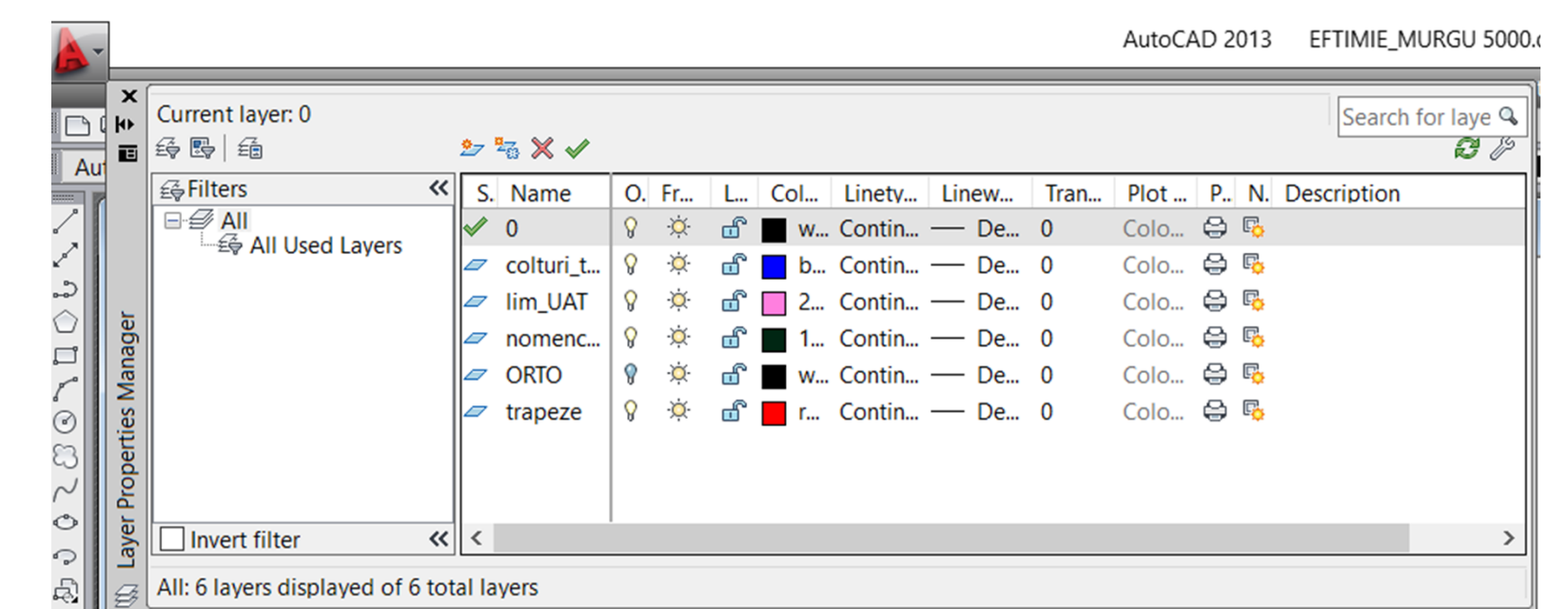


Figure 4. Creating layers

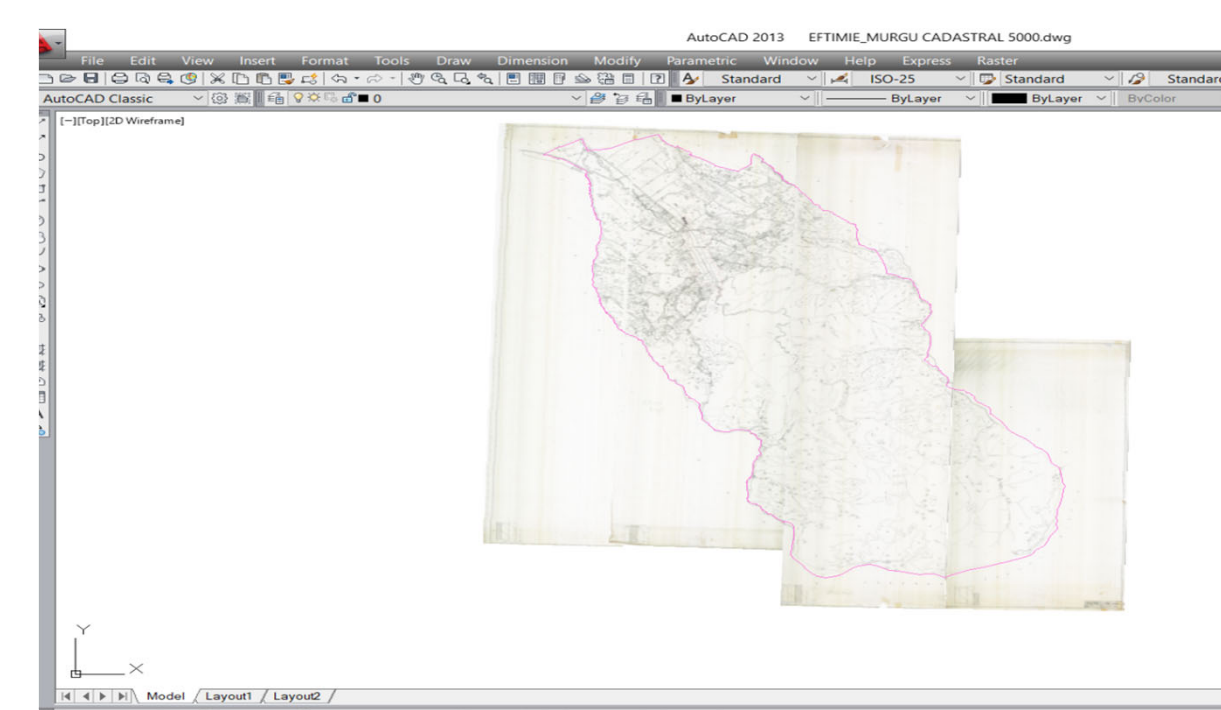


Figure 5. The cadastral plan of the Eftimie Murgu Commune

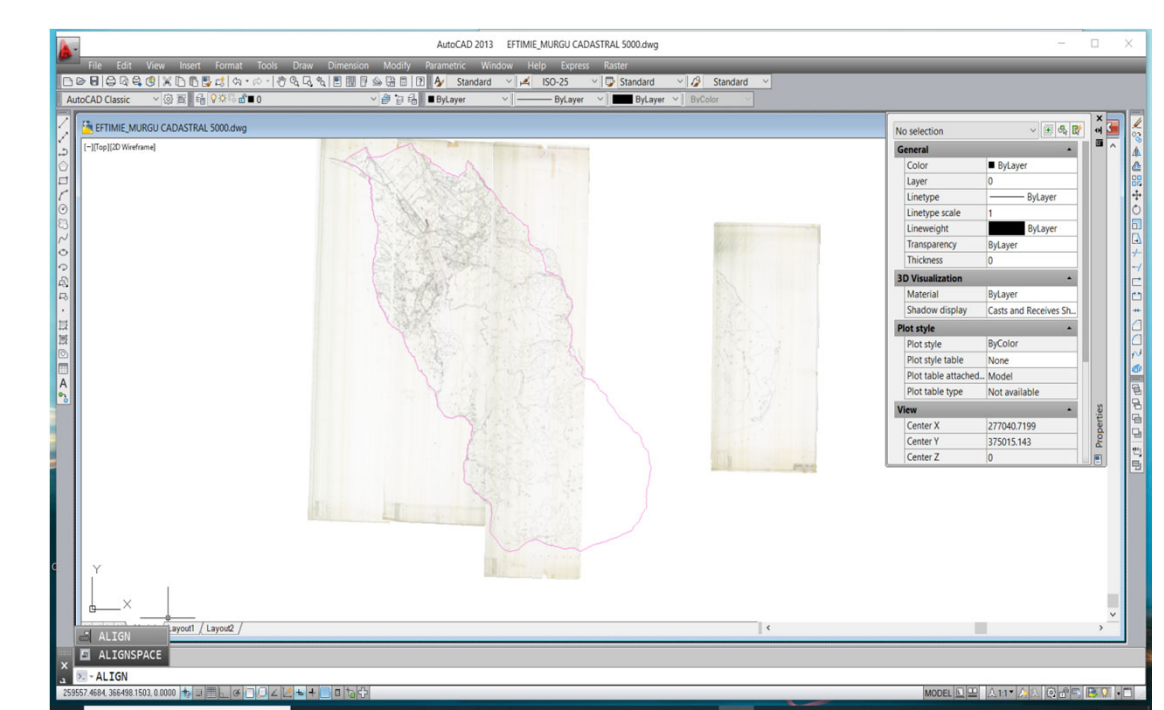


Figure 6. Alignment of plans in coordinates

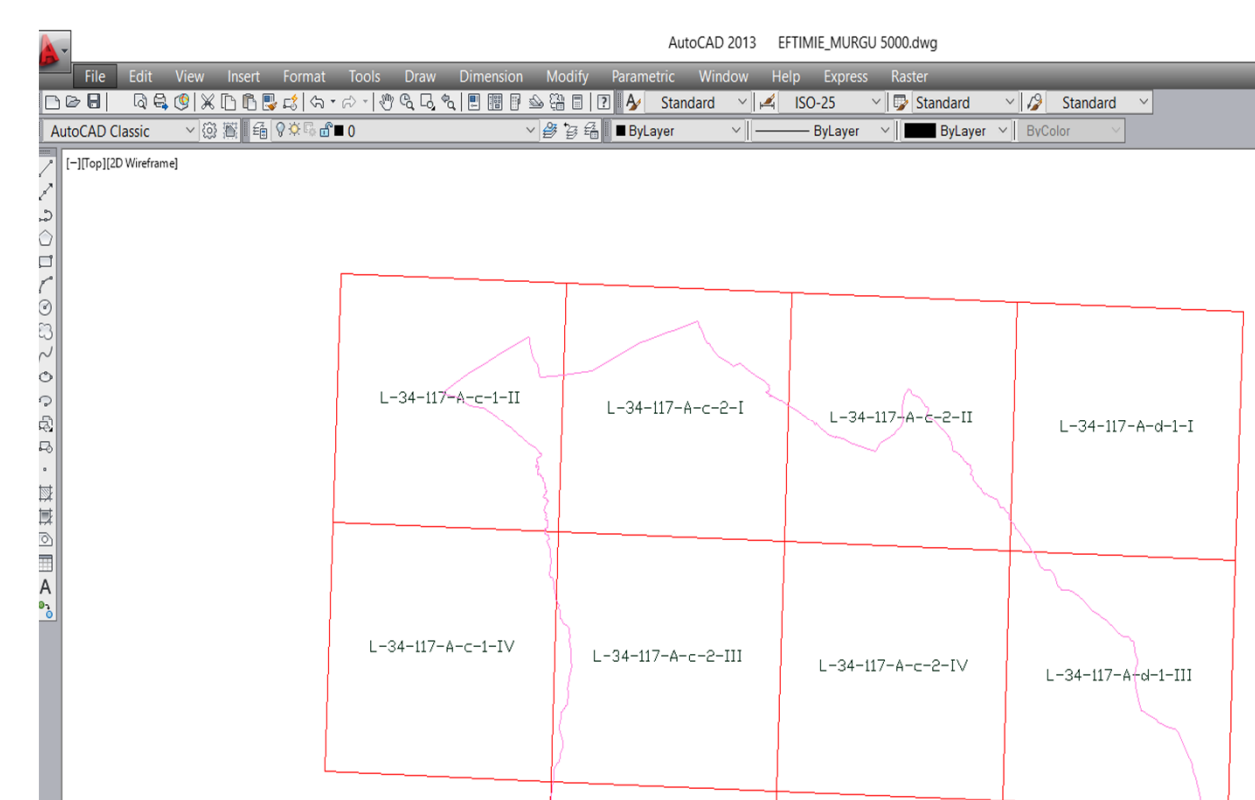


Figure 7. The grid of the Eftimie Murgu territorial administrative unit

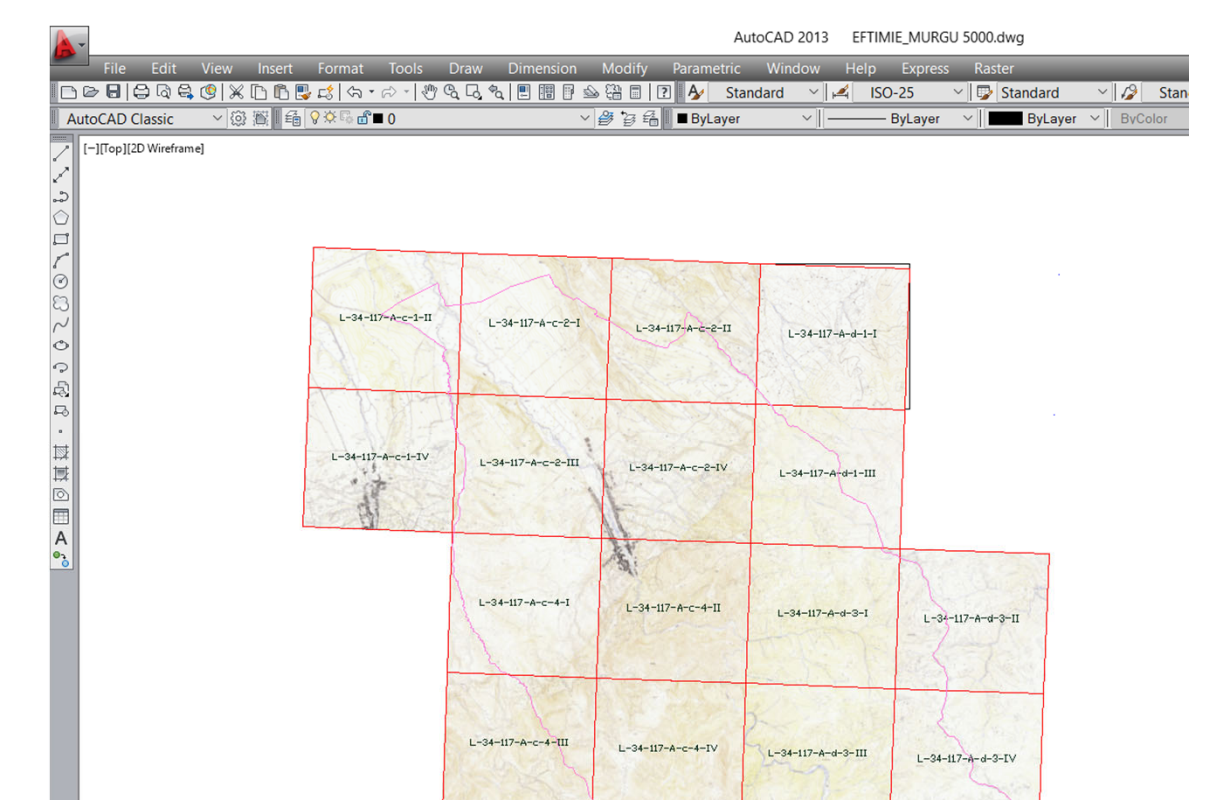


Figure 8. The final plan of the Eftimie Murgu territorial administrative unit

• Conclusions

In conclusion, the digitized analog maps for Eftimie Murgu Commune in Caras-Severin County helped us to have a better perception of the entire well-defined territory and especially of its structure.

Thus, this cadastral plan aims to use it to perceive the territorial and geospatial plan of the Eftimie Murgu Commune in Caraș-Severin County; but also to have a better overview of all the geographical elements of the entire commune.