Sustainability of the urban planning of the Fortress (Cetate) neighborhood from Timisoara – Past,present and future.

VALENTIN CAPOTESCU.
Department of Civil Engineering
Politehnica University of Timiкoara
2nd T. Lalescu, 300223 ï Timiкoara
ROMANIA
,capotescuvalentin@yahoo.com,valentin.capotescu@ct.upt.ro, http://www.ct.upt.ro

Abstract: - Sustainability of the urban planning, by comparing the old historic city-plans and overlaping them with today satellite view of the city used In this paper the experimental studies on Timisoara and the old bastioned fortress, using 3D restorations and detailed means of constructions are presented. All the theoretical work has been performed by the author having as a basis the various studies of Military Architecture Theory. In the first part of the article are described the various plans of the city before the year 1716 (habsburg siege) and the siege . The second part is dedicated to the new city, the ideal planning of the Austrian citadel with its three belts of city walls fortifications . In the final part the conclusion and our days studies-according with the current situation of the fortress are presented.

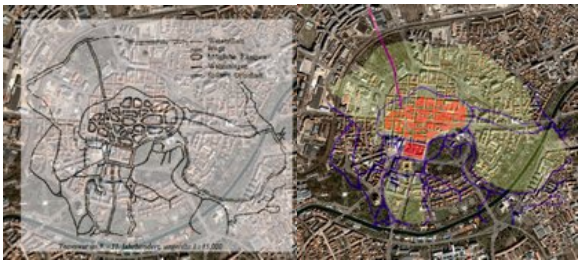
Key-Words: - Military Architecture Theory, Fortifications, bastioned fortress.

1 Introduction

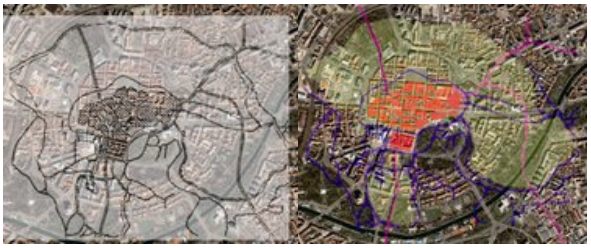
The urban history of Timisoara was always a subject of debate between scientists, architects and urbanist. There was a lack of information in this mater till now. The new 3D virtual reality programs, capable to restore the old view of the city allow us to see, analysis and compare the most important stages in city evolution. During this experiment have been analysis several historical stage in the evolution of Timisoara city and its fortification, beginning with de IX-th century till modern era. The particular stages subject for study were : IX-th-XI-th century, 1240,1300,1350,1450-1500,1660-1716,1716. For the first time is presented the overlap of the Turkish city over the actual city. The square area, perimeter, of the Turkish city is compared and overlap on the actual city map.(fig.1,2)

Fig.1 Fig.2

Fig 1. The overlap of the Turkish city
Fig 2. The area and perimeter of the Turkish city.

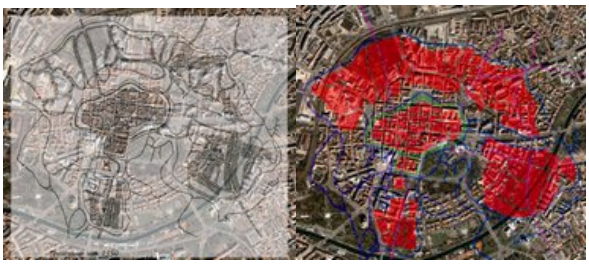


Sec.IX-city plan overlap the satellite view

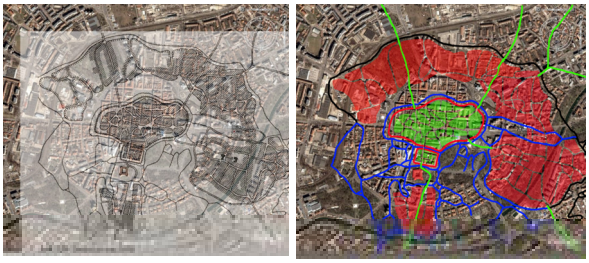


1240- city plan overlap the satellite view

1300- city plan overlap the satellite view



1350- city plan overlap the satellite view



1450-1500- city plan overlap the satellite view

1600-1716- city plan overlap the satellite view

The siege of Timisoara led by Austrians in 1716 and the army-corps disposition, generals name is revealed in a digital restoration of the battlefield.(fig.3)

Fig 3. The reconstitution of the 1716 siege

In following lines are revealed the geometrical theory and methods adopted by the Austrians to construct the new fortifications. In particular is up to study Count Pagan`s Method, which is applied at Timisoara. This Method is a proof that Timisoara is NOT a Vauban-type Fortification.(fig.4,5)

Fig.4 Pagan system

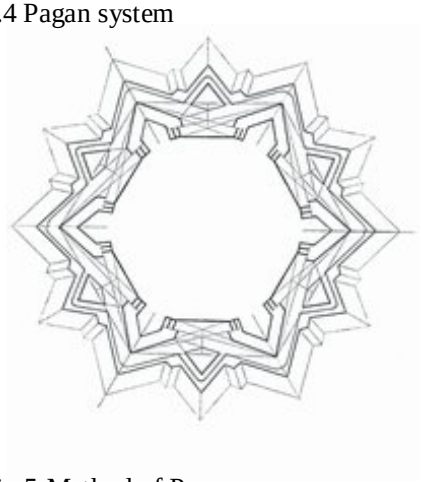


Fig.5-Method of Pagan

Several other systems were studied since 1716 until 1730 when the work for the new fortifications was begun. Some important phases in the evolution of the bastioned fortress are presented (1730-1732-1736-1740-1744-1748-1756-1760-1770-1790-1808) Continuing, the study is presented the detailed geometrical trace, component elements and the tracing method of the fortress. It is then detailed explained the geometrical method for the bastions and for the ravelin tracing according with the Pagan`s Method which was then adopted by Vauban in his First System-The tracing method used at the Timisoara fortress. This study continue with a chronology of the city and its fortress evolution since 1808 to 2009. Making a restoration of the way the city could looked like in our days if the fortification wall were not demolished in 1892-1907.

For this study have been used historical maps from that period, or representing tha situation from that period of time.

The city fortress in 1730

The city fortress in 1732

The city fortress in 1736

The city fortress in 1744

The city fortress in 1790-1808

The city and its fortress in 1808

Fig.6 (The fortress 3D models showing important stages of urban evolution: 1730-1732-1736-1744-1790-1808)

Fig.7 the overlap of the 1808 situation over the actual view of the city.

2 Sustainability of the Cetate neighborhood by comparing with the old city-fortress.

The research program was carried out in order to study the way we can rehabilitate urban the old historic neighbourhood of the city (Old Fortress). For this reason has been study theoretical and practical models (other cities) with common features like Timisoara. The analysis has been made having as basis the historical maps of the city and 3D

reconstruction of some important stages in the history of the citadel. It has been demonstrated in this study the membership of Timisoara to the *Ideal City Concept*, by finding out the geometric method of the citadel tracing which ,was discovered after a detailed analysis of the fortress plan and the geometric decomposition of the citadel plan.

As a result of this study had been demonstrated that the fortress is a particular case unique in Europe with three geometric centres $0_1 0_2 = 0_2 0_3$ (fig.7)

Fig.7- The geometric trace of the Timisoara fortress

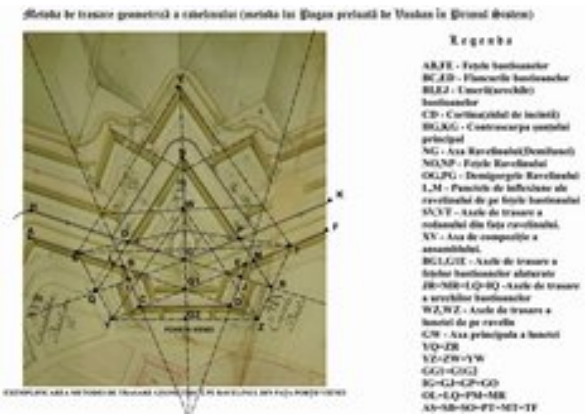


Fig.8- The geometric trace of the fortress ravelin.

Fig.9- The geometric trace of the fortress ravelin.

Based on the studies performed, respectively on the models and maps, the following conclusions were drawn:

1. The theoretical models used in the study approximate with sufficient accuracy and a detail analysis of the 3D models demonstrate that *Timisoara is an ideal city*.
2. The overlap of the historical maps over the satellite view allows the chronology and dating of the buildings and architectural ensemble from Cetate neighbourhood with a 95% accuracy. (fig.10)

Fig.10 The overlap of the old fortress over the actual satellite view of the city.

3 Problem Solution

Although the existence of the three wall-belts of the fortress has been known since the 80`s, because of a absence of a detailed map with the overlap of the old fortifications over the actual city (satelitte view), many remains of the fortifications that came out during various construction sites, have been deliberated destroyed or without knowing. This study is a solution for the Timisoara`s fortification and thir position on the actual map of the city. The new GPS technologies combine with satellite images with a maximum accuracy have helped to delimitate the archeological sites which contain old fortification remains,thus now, any constructor can find out precisely if ,on its construction site there are or not fortification remains.
Another solution of this matter result from the study of the *acceses, circulations and urban density* within Cetate neighborhood starting with the 19th century to our days. The study of the circulation and density helps for a good solution for the auto and pedestrian traffic problems within Cetate neighborhood.

Fig.11 3D reconstruction of the old fortress the way would look like if the city wall were not been demolished.

4 Conclusion:

The aim of this research program was the theoretical and experimental (based on 3D models) study regarding the sustainability of the urban planning in Cetate neighborhood.
Based on the results the intention was to clarify some of the aspects regarding the interaction between the ideal geometric methods of ideal fortification realised at Timisoara and the present day concepts of urban planning and revitalization of the historical centre. After this study the results show that Cetate neighbourhood has kept in 80% its *ideal-city* characteristic from the old citadel, but unfortunately in the urban context (related with the rest of the city) through the communication ways and squares (urban spaces) this *ideal-city* no longer function.
It has been made a study containing in the digital restoration of the old citadel over the satellite view of actual city. It has been observed that if the fortification wall had been kept, the fortress would be much easier to rehabilitate and reorganize.(fig.12,fig.13)

Fig.12-reprezent the communication ways in with the citadel if the fortification would be intact today

Fig.13-reprezent the communication ways in with the citadel today, the squares, and the additional circulation ring.

In the figures 14-15 is presented the entire city-map with and without the fortifications keep. Here it can be seen the relations and the links between the city and the historical centre. Here it can be seen what is the urban impact of the fortress over the entire city. The role as a *centre*, the ideal-concept developed at Timisoara is still remaining in the general view of the city plan. Timisoara is a radio-centric city, the urban core been formed by the inner fortress, or the urban area which once was the interior of the fortification, behind citywalls. As seen in fig.14, only three ways were available to access the fortress if this one was kept. The Bega Channel and the railroad are traced beside the old fortess in order to can in the range of the artillery fire (military and strategic reason).

Fig.14-reprezent the communication ways in with the citadel if the fortification would be intact today

Fig.15-reprezent the communication ways in with the citadel if the fortification would be intact today.

In our days, without the citywalls the situation is different, a huge belt of parks and green spaces have emerged in the center of the city because of the defortification process, and the suppress of the glacis and non-aedificandi area.

5 Acknowledgements

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