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Restoration and use of the early medieval fortifications in the east Mediterranean countries



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THE CASTLE OF SERVIA. HISTORICAL DOCUMENTATION, ARCHITECTURAL DESCRIPTION, PATHOLOGY, PROPOSED REPAIR WORKS

KLEOPATRA THEOLOGIDOU

Architect Restorer

I. INTRODUCTION

The castle of Servia is located in a magnificent area. Steep rocks, ravines, forests, the Aliakmon river and the artificial lake of Polifiton, which is crossed probably by the longest bridge in the Balkans area, are parts of the scenery. This is the area where the ruined castle lies. A position of strategic importance from the ancient times, as it was one of the three passages that connected Macedonia to Thessaly and one of the two passages that connected the upper to the lower Macedonia. As a result, the area had a great growth, but it was also a place of violent battles. The castle was built on a hill. Two extremely steep ravines were protecting it and made the whole area impregnable.

The date of its erection is not exactly known. Archaeological evidence proves that the area was inhabited from the ancient times. Many researchers position the erection of the castle in the Justinian period (527-565), when the fortifications of the Roman Empire were strengthened. The first written document about the castle is owed to Konstantinos Porfirogenitos (905-959) in the 10th century, while another one is owed to Kekavmenos (11th century), who gave a detailed description of it and the surrounding area. The castle was gradually abandoned until the end of the 17th or the beginning of the 18th century.

The study of the castle of Servia was the Greek participation in the European Community Fortmed program. A methodology of a holistic approach was applied on this study, so that a complete image of the castle and its problems is acquired and the most appropriate proposals are designated for its repair and revitalization. This presentation is part of this study and is briefly referred to:

1. The historical documentation of the castle
2. Its architectural description
3. Its building history
4. Information about the surrounding area and the modern town of Servia, so that its potential for development is explored
5. The pathology of the constructions
6. Proposals for its repair
7. Some broad ideas about the possibilities for its development



2. HISTORY IN BRIEF

The main events that stand out as landmarks in its history are presented to the chronography that follows (table 1). Among these events it is worth mentioning the repair of the castle by the emperor Romanos Lekapinos in the 10th century, its demolition by the emperor Basil II in 1018, its reconstruction in the 11th century, its repair in 1257 by Michael B', who offers it to the Kingdom of Nicaea, events that are connected to its building history. The houses were already extended outside the castle in the 14th century. The castle was gradually abandoned in the 18th century, the same period that the area was declined.

6th century Emperor Justinian (527-565)	Castle's foundation (?)
Emperor Leon Vardas (813-820)	The castle was repaired (?)
10th century Emperor Konstantinos Porfirogenitos (905-959)	First written reference by Konstantinos Porfirogenitos
Emperor Romanos Lekapinos. (920-944)	Second repair of the castle
995-1001	Bulgarian occupation (Samuel)
1001 Emperor Basilio II (976-1025)	Rejoined the Byzantine Empire
1018	Demolished by Emperor Basilio II
11th century	Reconstruction of the castle
1204	Occupied by the Francs crusades
1216 (Theodoros Doukas)	Under the Despotate of Epirus
1257	Repaired by Michail B' (1231-1271), who offered it to the kingdom of Nicaea
1341	Occupied by the Serbians, under Stefanos Dousan
A few years later	Conceded to the Byzantine Empire, according to special treatment
End of 15th century	Under Ottoman rule
1745	The headquarters of the bishopric, which was in Serbia from the 9th century, was moved to Kozani
1912	Joined the Greek State
1941	Bombarded by the German troops
1943	Burned by the Italian troops

Table 1: Chronography.

3. ARCHITECTURAL DESCRIPTION

According to the preserved ruins and written evidence, the castle was divided into three parts, the outer enclosure, the inner enclosure and the Acropolis (plan I).

The outer enclosure was the most populated area, where the civilians lived. It is here that many churches are still preserved, such as the church of St. John the Baptist (14th century), the church of St. Theodore (11th century) with a tiny aqueduct in its courtyard, the Basilica of Catechized or St. Demetrius (11th century) (figure 1), which was probably the cathedral, the ruins of some other churches, while traces of buildings are spread all over. At the south side of this enclosure, the remnants of some buildings, probably handicrafts, a small bath and a cistern were found. The entrance to the castle is preserved, very close to the Basilica. It seems that this part of the castle was the religious and administrative center. The outer enclosure is preserved in bad condition and many parts of it are completely



Plan I: The castle of Servia. Ground plan.

figure 1: Basilica of Catechized, or St. Demetrius (11th century).



figure 2: Inner Enclosure.



figure 3: Acropolis.

demolished. As a result, its perimeter is not quite clear and therefore, archaeological research is necessary for its revealing.

The military lived in the inner enclosure. This enclosure is better preserved (figure 2). Most of its perimeter is visible and is saved at a relatively large height. It has a polygonal form and it was the second line of defense and the shelter for the population, in case of capture of the outer part. At the intermediate wall, two rectangular towers are distinguished. Though this part of the castle is better preserved, traces of entrance have not been revealed so far. Only the traces of a small secondary entrance on the southwest part are visible (figures 2, 4), which later on was transformed to a window and even later was filled up. This entrance, very close to the Acropolis, was on an unapproachable location, due to the strong inclination of the ground. The inner enclosure was thinly inhabited. The ruins of buildings in this area are sparse. Traces of a cistern are visible, which preserve hydraulic plaster on the internal façade of its masonry.

The Acropolis was the last line of defense (figure 3). There existed the house of the sovereign and military buildings. Some remains of them are still visible. The Acropolis is the better preserved part of the castle. Its perimeter is saved at a large height. It had a quadrilateral form. Three towers are preserved at a large height. The two of them are rectangular and very much alike (figures 12, 17, 18, 22, 23, 24), while the third one, at the southwest corner, is polygonal and massive (figures 4, 19, 20). The rectangular towers were three-storey buildings with timber floors and probably roofed with a flat timber terrace, which was accessible, as battlements, partly preserved, indicate. Traces of the timber beams are inscripted on the masonry (figures 23, 24). Narrow windows with brick arches existed on the upper floors. These towers are the only structures of the fortification, where brick decoration is observed (figure 5).

The castle has not been explored so far. However, detailed documentation on site together with laboratory tests within the FORTMED program help to reach some first observations concerning the castle and its structure, for which further research and confirmation are needed.

Though most of the remnants of the castle are not preserved in full height, it is easy to conclude from the height preserved, that the walls were very high. This was partly due to the strong inclination of the ground. Rectangular towers were interposed to strengthen the

defense. However, it is worth mentioning that the towers were not in close order, because their position was probably considered impregnable. For example, in the southeast part of the inner enclosure only two rectangular towers existed, at a length of 460m. Traces of entrances or small gates are not visible in general. Only the entrance to the outer enclosure is claimed to be the traces of walls on the east part of it. Moreover, according to written evidence and visual inspection, there were not any ditches in front of the walls.

Acropolis was strengthened with more towers. Visible archaeological remnants indicate that there was one tower at each corner and additionally one tower on its northwest walls, the longest side of Acropolis (570m). Furthermore, the remnants of two buildings, possibly towers, are distinguished attached to the southwest façade, one in the middle of and outside the perimeter of Acropolis and one inside, closer to the west tower (plan 5). There is not enough information whether these buildings belong to the same structural phase. Archaeological research is necessary to certify these observations. Traces of wall, parallel to the west part of Acropolis and inside it, indicate that the wall in this area was double (figure 11, plan 5). A narrow corridor between the two walls existed, either for a kind of circulation or for other unknown reasons. Laboratory test showed that these two walls belong to the same structural phase. Traces of the entrance to Acropolis are not found. However, the inclination of the ground, the whole arrangement of the castle and the demolished (missing) parts of the walls of Acropolis show that it was probably at the southwest part, between the south and the west tower. In addition, the traces of the towers attached to this façade, as mentioned above, and the milder inclination of the ground indicate the position of the entrance towards the west tower. *The towers, traced so far all over the castle, are of a rectangular form and only one is polygonal. It is possible that the circular towers, mentioned in the bibliography, belong to earlier phases of the castle. More details are given below, in the chapter of structural phases.*

Towers and walls were stone masonry constructions. Dense use of bricks is observed almost in most parts of the walls, positioned mainly horizontally and more seldom vertically, in a random way, without decorative intention. Only on the two rectangular towers of Acropolis decorative motives are distinguished. The walls were built, according to visual inspection, with strong lime mortar, where small pebbles were added. Although exposed to adverse weather conditions for centuries, mortars preserve their coherence and hardness. Masonry was strengthened with horizontal timber beams positioned at different heights. Most of them were invisible on the face of the wall, hidden behind a stone layer and they were usually three at each layer.

4. ARCHITECTURAL SURVEY¹

Architectural survey was based on land surveying plans and tape measurements on site. Land surveying plans² contained a dense network of altitudinal curves of the ground (1m). Using the information of these plans, the profile of the ground, close to each façade of the walls, together with the exact position of the façade were drawn and they were used as the terminal for the tape measurements.

1. The collaboration with the 11th Ephorate of Byzantine Antiquities was very important at this stage. The architectural drawings were carried out by S. Kakayianni and M. Saskalidou, under the supervision of Kl. Theologidou.
2. These plans were kindly offered by the Municipality of Servia.



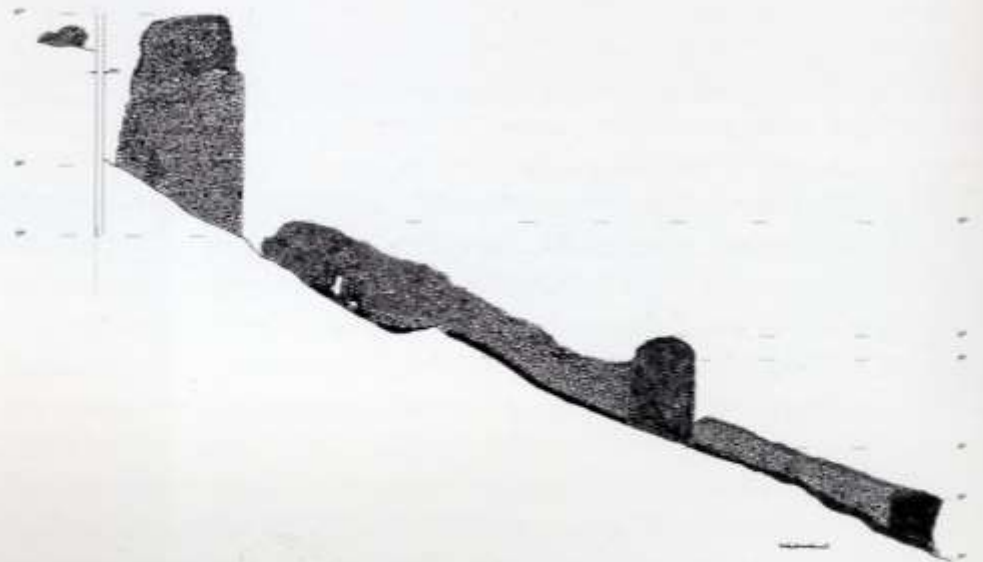
figure 4: The massive tower of Acropolis. The lower part belongs to the first phase and the upper to the second.



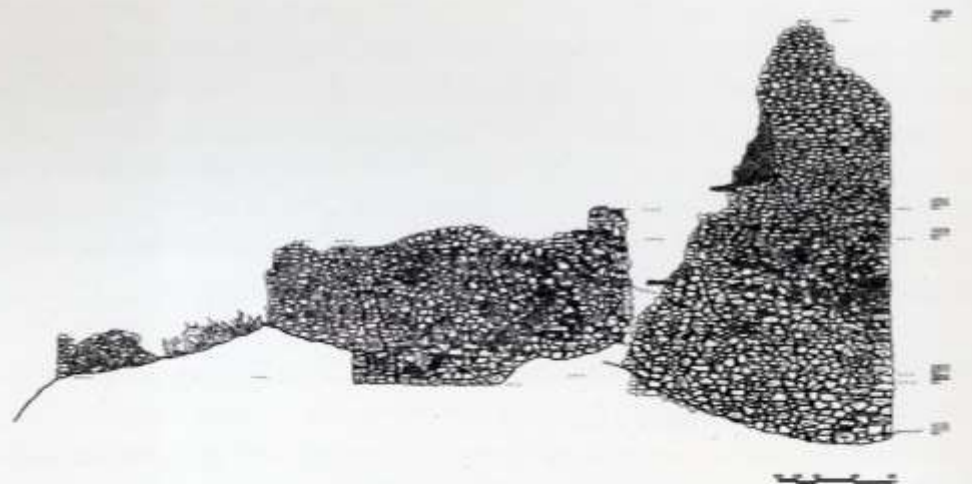
figure 5: Northwest rectangular tower. Detail of brick decoration.

Detailed tape measurements were taken on site. They included measurements of the height of the walls at different positions, so that the exact skyline of the preserved walls would be recorded. Additional measurements were taken of the position of characteristic elements of the masonry, such as the borders of different construction techniques, the position of decorative elements or timber ties, the position of building materials of a large size and the characteristic damages. Furthermore, detailed photographs were taken in parallel to the walls, where possible, which allowed for their development in scale. The deformations at the borders of the pictures were faced with the measurements taken and additional pictures with overlapping parts. These photographs were used for drawing the stone masonry pretty accurately.

The ground plan has been drawn in a scale of 1:100. All façades of the walls, internal and external, have been drawn in a scale of 1:50 (plans 2, 3, 4).



Plan 2: Massive tower of Acropolis and part of the inner enclosure.



Plan 3: Northwest rectangular tower of Acropolis and part of the walls.



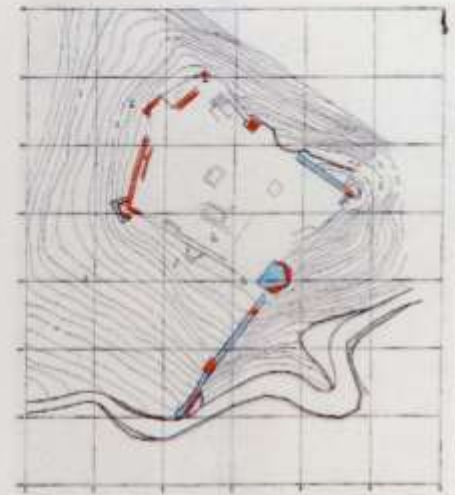
Plan 4: South part of the inner enclosure.

5. BUILDING PHASES

Full archaeological research is necessary, so that the building phases of the castle are better defined. However, some observations, based on visual inspection and laboratory tests, lead to some interesting remarks.

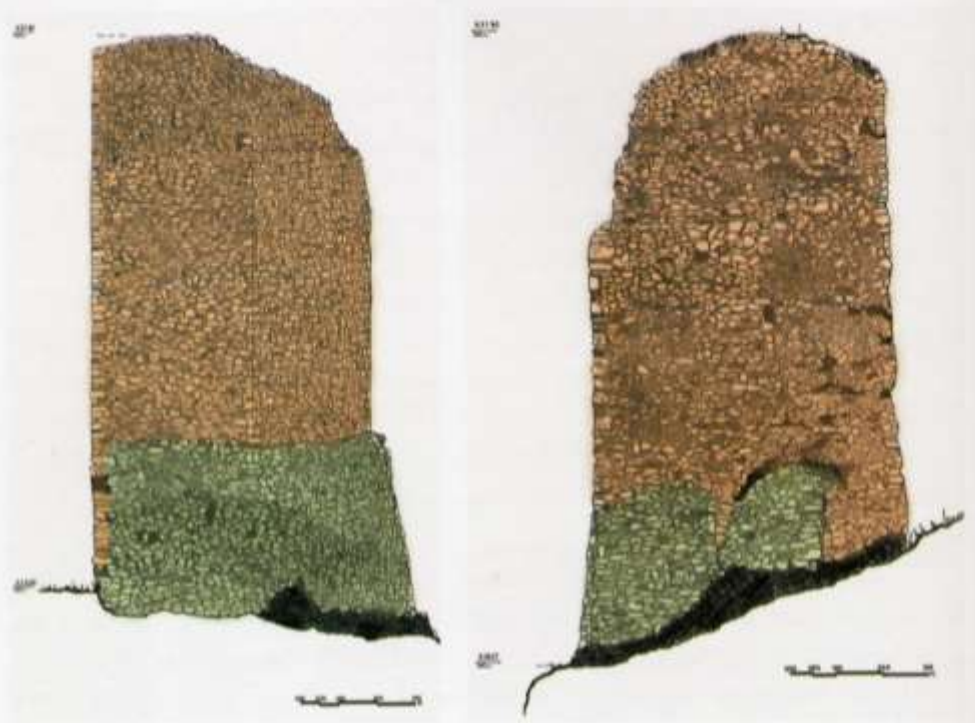
Three building phases are distinguished; the two of them are shown on plan 5. These two phases shown on the plan have been noted due to different building techniques, different mortar composition, as proved by chemical analysis, and in some cases, building joints. The third phase observed is located to the upper parts of the rectangular towers of Acropolis and was localized due to its different building technique. However, because of its unapproachable position it was not easy to get samples for further chemical analysis. The broad dating of these phases was possible because of their position on the structures and comparative work to dated parts of the castle and from written evidence. More specifically, different building phases are observed at:

1. The polygonal massive tower of Acropolis, where two phases are noticed, one at its lower parts and the other at the upper (figure 4, 19, 20, plan 6). The phase at the base is obviously the earlier one. It appears that initially this tower was a round one, not massive, as shown by its internal face, which continues underneath the later construction (figure 6). It seems that later on, the massive part was constructed on the ruins of the round tower. This massive part has a similar way of structure, with stones and bricks all over, which shows that it has only one phase.
2. The northeast corner of Acropolis. A joint that separates the masonry in two parts, parallel to its thickness, prove two different phases at this position, as well. It seems that at this part the thickness of the walls was increased by building a second wall in contact with the internal façade of the existing one (figure 8). This is proved by the observation that the internal façade of the outer part of the wall, which was revealed due to its division from the inner wall, is formed as a visible face with stones and horizontal bricks. On the contrary, the external façade of the inner wall is flat due to its contact with the external wall, without however having a formed face. Moreover, traces on the ground prove the position of a building here, which could be a tower (figure 9).
3. The northeast façade of Acropolis. In the middle of this façade there is a structure, which seems to be a massive tower. Mortars from the core of the masonry have the same composition with the first phase and mortars from the face have the same composition with the second phase (plan 5).
4. Northwest part of Acropolis. It seems that all this part belongs to the first phase. There are indications that a tower also existed at its north corner. There are also indications that this part of the wall was double, with a narrow corridor between the two walls, either for a kind of circulation or for other unknown reasons. Chemical analysis proved that these two walls belong to the same structural phase.
5. West tower. At this tower three faces were recorded. According to chemical analysis, the lower parts of this tower belong to the earlier phase, the same to the lower parts of the massive tower while a little higher, some parts belong to the second phase. The upper parts belong to the third phase (figure 22).
6. Southeast part - inner enclosure. It appears that the outer face of the walls in this area, most of which has collapsed, belong to the first phase and the inner face, better preserved, belongs to the second. A joint on the demolished edge of these walls between its outer and inner face support this argument (figures 10, 25).



Plan 5: Acropolis. Building phases.

Plan 6: Massive tower of Acropolis. Building phases.



7. Other parts of the inner enclosure, according to building techniques and laboratory tests belong to the second phase.

According to the above observations, it seems that those parts of the walls of Acropolis and the inner enclosure, at least these facing towards north-east and south-east, were strengthened by new walls built in touch to the existing ones, on the inside part of the castle, thus increasing their thickness.

A vital question arises concerning the dates of the three phases. As written in the historical note, the Byzantine emperor Basil II destroyed the castle in 1018 to avoid its reoccupation. Another reference about the castle concerns its occupation by the Franks crusaders in 1204. Therefore, between 1018 and 1204, it was rebuilt and obviously the sound parts were reused. Consequently, it seems possible that most of the visible parts of the castle

figure 6: Massive tower of Acropolis. The face of the wall of the earlier phase continues under the upper massive structure.



figure 7: Basilica of Catechized. South façade. The arches date from the 14th century.



figure 8: Acropolis. Northeast corner. The two phases are easily distinguished.

(second phase of Acropolis and most parts of the inner enclosure) date from the 11th century. The way these parts are built with extended use of bricks positioned to a random way, mainly horizontally, supports this point of view. There have not been found any documents so far to support a theory, concerning the date of the first phase. The third phase was noticed to the upper parts of the two rectangular towers of Acropolis. If we compare the techniques of building to those of the basilica of Catechized, we will find many similarities to this part dating from the 14th century³ (figure 7, 22).

6. PATHOLOGY

The castle suffers from extended demolition due to its abandonment for centuries. Whole parts are completely missing, especially those of the outer enclosure. Moreover, all the upper parts of towers and walls have also collapsed, with only one exception, the west tower of Acropolis, which still preserves some traces of the battlements (figures 23, 24).

The main cause of these extended collapses was abandonment and neglect. Human action was another main cause of decay. The reuse of building materials, during the centuries, for the construction of new buildings was a very usual action. In the period between the two world wars, a forest with pine trees was created to cover the hill of the castle and retain the sliding of the ground. The roots of the trees must have caused serious damage to the archaeological remains of the settlement and to those parts of the walls, surrounded by trees (figure 13). At the same time this forest protected some other parts of the walls, by preventing the sliding of their foundation ground. Furthermore, earthquakes (figure 16), weathering, ageing, climatic conditions and especially rain and frost, as well as the quality of ground are other causes for these collapses.

All these factors above are also the main reasons for the decay observed on the remaining parts of the castle. In addition, different types of vegetation, grown on the masonry and humidity aggravate the existing condition.



figure 9: Acropolis. North corner. Traces of a building, possibly a tower.



figure 10: Inner enclosure. Southeast part. The two different phases. The inner part was probably constructed later to increase the thickness of the wall.

3. Ξυγγόπουλου, Α. Τα Μνημεία των Σερβίων. Αθήναι, 1957



figure 11: Traces of wall, parallel to the west part of Acropolis.



figure 12: Acropolis at the beginning of the century. Before the creation of the forest.

The pathology of the remaining parts was carefully recorded and transferred to the relevant drawings (plans 7, 8). The most common decay at the remaining parts is weathered joints in depth, loose masonry and extended masonry demolition (figure 23) at the lower parts of the walls, threatening the superstructure with collapse (figures 15, 19, 20, 26). It has been observed that this type of damage appears mainly at the base and top of masonry, while the part in between is preserved at a better condition (figures 19, 20, 22). This could be partly attributed to ground condition and water action, together with frost that characterizes its climate during the winter. Another decay most commonly met is the detachment of whole parts of the face of masonry. In many cases it is due to the inadequate bonding between the core and the face, together with the bad quality of the ground, where the foundation is based (figure 25).



figure 13: Trees close to the walls of the inner enclosure.



figure 14: Acropolis. Northwest part of the wall. Internal façade. Loose masonry at the upper part and rotten tie beams.



figure 15: Acropolis. West part of the walls. Internal façade. Demolished masonry at the lower part.



figure 17: Acropolis Northwest tower. After the earthquake in 1995.

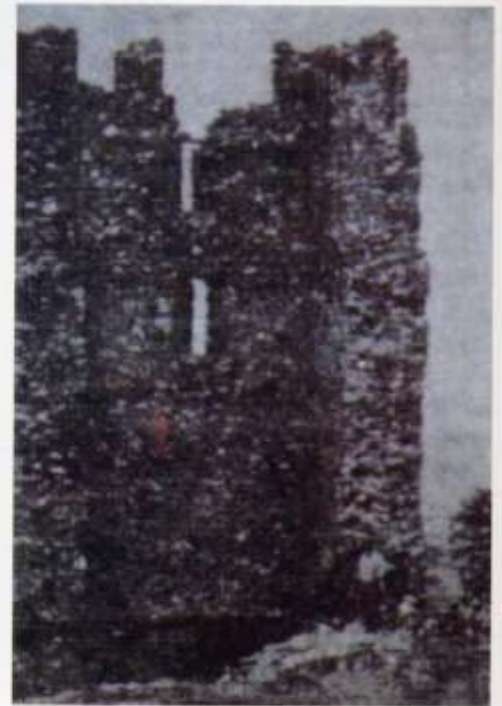


figure 18: Acropolis Northwest tower at the beginning of the 20th century.



figure 19, 20: Acropolis. Massive tower. Ground problems and demolished masonry at the lower and upper parts.

respect for original material and authentic documents (Venice Charter, Article 9). Replacement of missing parts must integrate harmoniously with the whole, but at the same time be distinguishable from the original so that restoration does not falsify the artistic or historic evidence" (Venice Charter, Article 12). "The Presentation of the archaeological heritage to the general public is an essential method of promoting an understanding of the origins and development of modern societies. Presentation and information should be conceived as a popular interpretation of the current state of knowledge. It should take into



figure 21: Acropolis. Massive tower. Decayed joints and timber ties, behind the face of the wall.

account of the multifaceted approaches to an understanding of the past. Reconstruction should be carried out with great caution, and they should take account of evidence from all sources in order to achieve authenticity". (Archaeological Heritage Management, Article 7)

Therefore, the repair works for the conservation of the castle of Servia should bear the following characteristics:

1. The original materials should be preserved as much as possible.
2. Traditional materials and techniques should be used for the repair works.
3. The interventions should be minimized.
4. Reconstruction should be made only when it is necessary, either for stability or for educational reasons.
5. Reconstruction should be distinguishable from the original structure.

For the conservation works a step-by-step approach is proposed starting from the most threatened with collapse parts. These works will have the purpose to repair the decayed parts of the superstructure, following traditional methods, in order to reconstitute as much as possible its structural function and eliminate or minimize some causes of its decay. The proposed monitoring of the condition of the repaired parts will prove whether some additional strengthening measures are necessary and will help to their designation.

The proposed repair works are:

1. Repointing, rebuilding and grouting of cracks.
2. Joint pointing in depth, where they are deeply decayed.
3. Rebuilding of demolished masonry at the lower parts of the walls, to stabilize the superstructure.
4. Rebuilding of loose masonry.
5. Limited grouting to fill voids, where necessary.
6. Replacement of rotten timber ties.
7. Building a sacrificial stone layer on top of the walls to prevent rainwater from penetrating the masonry.



figure 22: Acropolis. West tower damaged by the earthquake in 1995.



figure 23: West tower in 1997. The battlements on top are distinguished.



figure 24: West tower in 1995. The rate of decay is obvious.



figure 25: Southeast part-Inner enclosure. Most of the external part (first phase) has collapsed.



figure 26: Southeast part-Inner enclosure. External façade. Detail of the demolished foundation.

8. Vegetation removal and repair of masonry, following one of the methods above.
9. Archaeological excavation to reveal the foundations, where rebuilding is necessary.
10. Furthermore, measures for the stabilization of the foundation ground are necessary, to prevent masonry sliding.
11. Special care should be taken so that all traces of structural phases are maintained.

The composition of mortars and grouts is proposed in the relevant chapter of the project.



figure 27: Acropolis. Northeast part. The strong inclination and the quality of the ground.

8. THE MODERN TOWN OF SERVIA

The modern town of Servia is the center of an area, which consists of 14 villages (communities) and constitutes the Municipality of Servia. The town of Servia is the headquarters of the Municipality. The total population of the area, according to the census of 1991 is 10.392 inhabitants⁴, while in 2001 it reached the 11.000. A slight increase of population during summer is observed.

The constitution of the population according to the age is:

0-14 years old:	21%
15-64 years old:	66% (productive age)
older than 65:	14%

The population of the area has been diminished in the last decades, due to unemployment, which made a part of the population to emigrate from 1960s onwards. However, a slight return of emigrants from Western Europe has been taken place since 1975, due to the increase of occupation on the secondary sector (lignite, chromium, etc.). A return from Eastern Europe from 1980 is also observed. However, due to limited occupation opportunities, the area is unable to attract its emigrants.

There are 5 primary schools, with approximately 545 pupils and 38 teachers. Four of them are located in the town of Servia. There are also 2 gymnasiums, 1 lyceum and 1 technical professional lyceum. Furthermore, programs for professional specialization are taking place or being programmed.

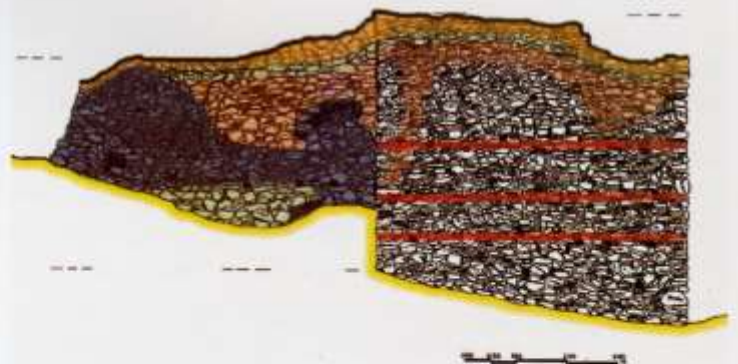
Most of the population is largely occupied in the tertiary sector (Services and small shops); agriculture and cattle breeding are following, while the rest of the population is occupied in the secondary sector (mainly at the P.P.C.). A large number of workmen commute every day because a number of work positions are out of the borders of the area. Unemployment is high, which mainly affects young people.

4. Most of the information about the area is owed to studies made on behalf of the Regional Development Agency of West Macedonia (ANKO S.A.), willingly offered for the purposes of the FORTMED E.C. Program.



Plan 9: Acropolis. Massive tower. Proposals for its repair.

Plan 10: Inner enclosure. Rectangular tower and part of the walls. Proposals for their repair.



	Προστατευτική στρώση λιθοδομής Sacrifice stone layer		Συγκόλληση ρωγμών Crack repair
	Αντικατάσταση ξυλοδεσιών Replacement of timber ties		Ανάκτηση καταστραμμένης τοιχοποιίας Rebuilding of demolished masonry
	Προστατική καθαίρεση & ανάκτηση Careful removal of loose masonry and rebuilding		Απομάκρυνση βλάστησης - στερέωση λιθοδομής Vegetation removal and masonry repair
	Βαθιά αρμολόγημα Joint pointing in depth		Ανασκαφική έρευνα για την αποκάλυψη θεμελίων Excavation for the reveal of foundations

Most of the modification units have a family character (occupy 2 to 3 persons). Some of them tend to diminish because the traditional trades disappear. Modern handicrafts have satisfactory equipment. However, there is deficiency in specialized persons. The development of industrial units, concerning the quarrying and manufacture of marbles, as well as the construction of agricultural equipment and the modification of agricultural products seems promising.

Servia is the commercial center of the area. Commerce has also a family character. However, there are not many possibilities for its development, because the population is also using the market in Kozani or even Thessaloniki.

Servia is the administrative center of the Municipality and it concentrates most of the Services. The training of young people is necessary to improve the level of services, which is characterized as unsatisfactory.

Tourism is not developed in the area. However, the area possesses important tourist resources, which have very low substructure. Some of these are the artificial lake of Polifiton,

Aliakmon river, Titaros mountain, Neraida cave, Servia gorge, Neolithic settlements in Servia, 16 positions of Neolithic settlements close to Aliakmon river, the Byzantine Castle of Servia, the church of St. George in a cave close to Servia, the small and large Hermitage of St Ilarion, the church of St. Theodore in Kastania and the church of St. George and St. Nicolas in Goules

Furthermore, it is worth mentioning the Municipalities of Velventos and Aiani, which are very close to the Municipality of Servia. There are a great number of Byzantine and Post-Byzantine churches and monasteries in both of them. In addition, the Neolithic settlements and the natural landscape of Velventos are important. A program for the tourist connection of these three Municipalities would largely contribute to the development of the area.

Limited actions have been taken for the tourist development of the area. These are:

- The conservation of Byzantine and Post- Byzantine churches (Basilica of Catechized in the castle of Servia, St. Anargiri very close to the castle, Panagya Aianis, St. Nicolas in Goules, Velvento),
- The construction of a path across the gorge of Chouni,
- The construction of an open-air theatre very close to the castle of Servia.

As described above, the whole area has a potential for the development of cultural and natural tourism. This development will help to its economic development, to the employment and to the improvement of the everyday life. This means a proper management is necessary for the enhancement of cultural and natural property. The collaboration of the three municipalities of Servia, Velventos and Aiani towards this direction will help to the designation of cultural and natural routes, which will attract many visitors. A managerial program is necessary to be designated for the necessary actions to be taken. The aims of this program could be:

- The protection and enhancement of the cultural property of the area,
- The conservation of the monuments,
- The harnessing of water resources,
- The environmental education for the protection of cultural and natural heritage,
- The improvement of services,
- The publication and broad delivery of information material,
- The organization of varied cultural activities for the attraction of visitors and for the improvement of the everyday life,
- The institution of a Society for the cultural and tourist development of the area.



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