
RECONSTRUCTION OF THE STADION AREA OF ANCIENT MESSENE USING 3D COMPUTER GRAPHICS AND ANALYSIS OF ITS TOWNSCAPE

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KEY WORDS: Computer Graphics, Archaeology, Classical Sites, Townscape, Messene,

ABSTRACT

The use of three dimensional computer graphics (3D CG) is now becoming more and more popular, because it often visualizes objects more comprehensively than real ones. Concerning classical architecture and archaeology, sites are usually in ruin and excavated buildings are in demolished condition down to the foundation. Thus, it is hard not only for specialists but also for general people to have vivid images of how they looked like in antiquity without help of reconstructed drawings. 3D CG has drawn strong public attention during recent years for this purpose, and the authors tried to reconstruct the buildings of the stadion area of ancient Messene, a Hellenistic town of Greece, in 3D CG and showed here the results of the reconstruction and townscape analysis.

1 INTRODUCTION

The town of Messene was founded in 369 BC by a Messenian hero, Epaminondas, in Peloponnesos, Greece, and seems to have been prosperous until early Medieval age. Now the site is almost in ruin and covered by olive fields. The excavation has been going on after the World War II and is progressing extensively recent years under the direction of Prof. P. Themelis of Crete University, who is also the director of the Messenian Archaeological Society. The site is still under excavation and many buildings have been found demolished down on the ground level. The works of architects is first of all to make measurements and drawings of the excavated buildings. But, the site spreads around vast area and it is almost impossible to measure the whole site from block by traditional way. We have participated in the excavation of the stadion area since 1997 as a group of architects and topographers. We surveyed the site taking aerial photographs by a model helicopter, and made a topographical map by means of photogrammetry. In addition, we also made detailed survey of some buildings for architectural studies in the seasons of 1998 and 1999.

The objectives of this paper are, firstly, to introduce our surveying method to make a topographical map of archaeological site by the model helicopter, and secondly, to reconstruct the buildings of the stadion area using 3D CG based on the map and the architectural detailed drawings, and thirdly, to analyze the townscape of the area to show the characteristics of the site planning of the area.

2 THE SITE OF STADION AREA

The site of ancient Messenia is among low mountains of Messenia, being surrounded by the city walls which were originally more than 10 km long and still survive partially in good condition. The excavation was concentrated only on the Sanctuary of Asklepios in the city center in 1960s and the stadion area has been dug during these several years. The Stadion lies on the south edge of the city, adjacent to the city wall. The U-shaped seats of 19 rows have been preserved well, though a small stream broke them partially. The race course has not been excavated yet to the original level and the digging is still on the way.

The Stadion was surrounded by three Doric stoas on the east, north, and west side. There have been preserved around 120 columns, many still standing in-situ and others being laid down or lost. The columns of the East Stoa lie in a row on its west, as though they fell down at a time by an earthquake. In the North Stoa there was also a middle colonnade inside. On the northwest corner of the Stoa was a Doric Propylon or a gate where reaches the main street from the agora

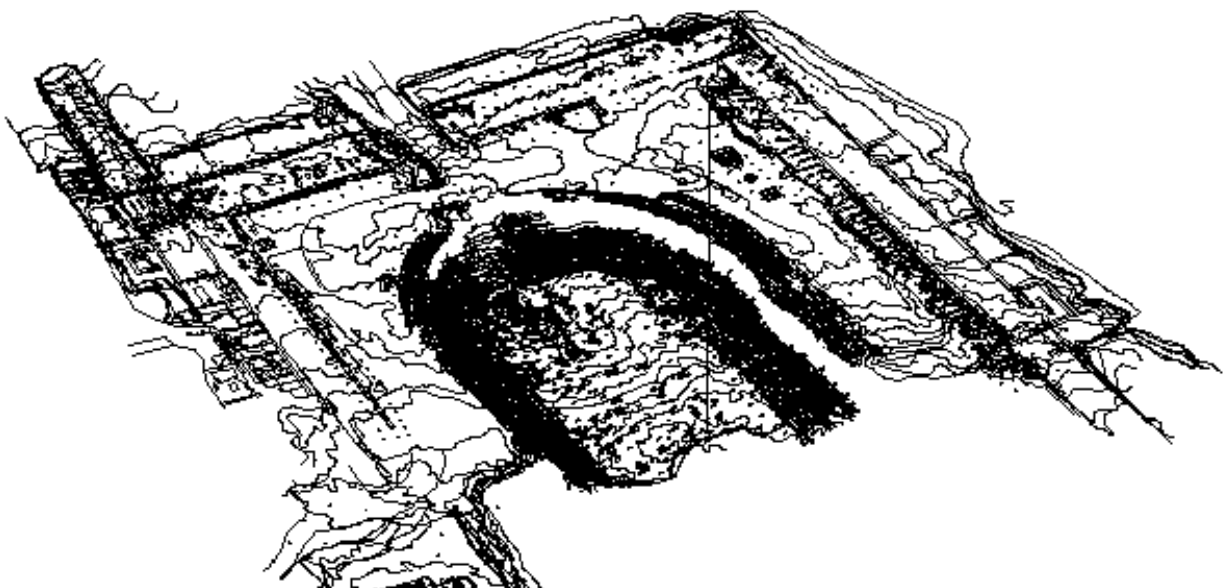
or the central plaza. Along the wall of the West Stoa continues a street beyond the Propylon, and three grave monuments were erected in line along its west side at about 1 m higher level from the street.

The Grave Monument I was a rectangular building of ca.5.87 x 4.09 m with a sculpture of two flanking lions on the top of the elongated pyramidal roof. But the most of upper structure is gone. The wall of the east front had wings on both ends to emphasize its symmetricity. The Grave Monument II was an almost square building of ca.3.34 x 2.80 m most probably with a pyramidal roof. The Grave Monument III of 4.50 x 4.50 m was also a square building but, very peculiarly, with concave conical roof on its top.

3 DATA AQUISION: TOPOGRAPHICAL AND ARCHITECTURAL SURVEY

The whole area of the Stadion, ca. 200 x 150 m or 3 ha, was surveyed in the summer season of 1997. Our team brought a model helicopter which is 2 m long and 1 m high. (Fig. 1) A Hasselblad camera with 6 x 6 cm film was mounted on its skids and a few hundred aerial photographs were taken for photogrammetry, because it was really difficult except this method to survey precisely and quickly such large area from block to block in only a few days. An operator on the ground could change camera angles and release the shutter by tele-control, watching a video monitor on which images of the ground were shown by a small CCD camera which was also mounted on the helicopter. Another operator controlled flight of the helicopter, repeating horizontal flight and hovering at different height. It took three days on the site to finish all the work like preparation of the helicopter, test flight, setting of bench marks, taking photographs, etc. Stereo matching and drawing were carried out using computer by Asia Air Survey in Japan (Fig. 3).

The Grave Monument III was surveyed architecturally in 1998 and 1999, and the Grave Monument I and II in 1999. The dimensions of the stoas and the Stadion were partially measured in order to reconstruct on the paper. These detailed measurement was definitely necessary for architectural study and reconstruction, because the measurement and drawing by photogrammetry were only for topographical map. The remaining buildings were drawn in scale of 1 to 10 and the taking job under the hot sun in summer season. (Fig. 2)



5 TOWNSCAPE ANALYSIS

5.1 View of the Propylon

Visitors came down from the agora toward south along the main street. The west side of the street (or right side of the street in Fig. 5) was a residential quarter which was excavated in 1999 and a Roman atrium house with mosaic was found, though we have not reconstructed it yet here. The Propylon or the main gate was built at the northwest corner of the stadium area and it took a symbolic role as the entrance to the area. (Fig. 5) The visitors would have been impressed by its monumental four-columned façade in Doric style (Fig. 6) and entered into the whole athletic complex.



Fig. 4 Left: 3D CG image of the stadium area. The upper structure of the buildings are all gone, then their forms were conjectured and reconstructed based on our detailed architectural research.

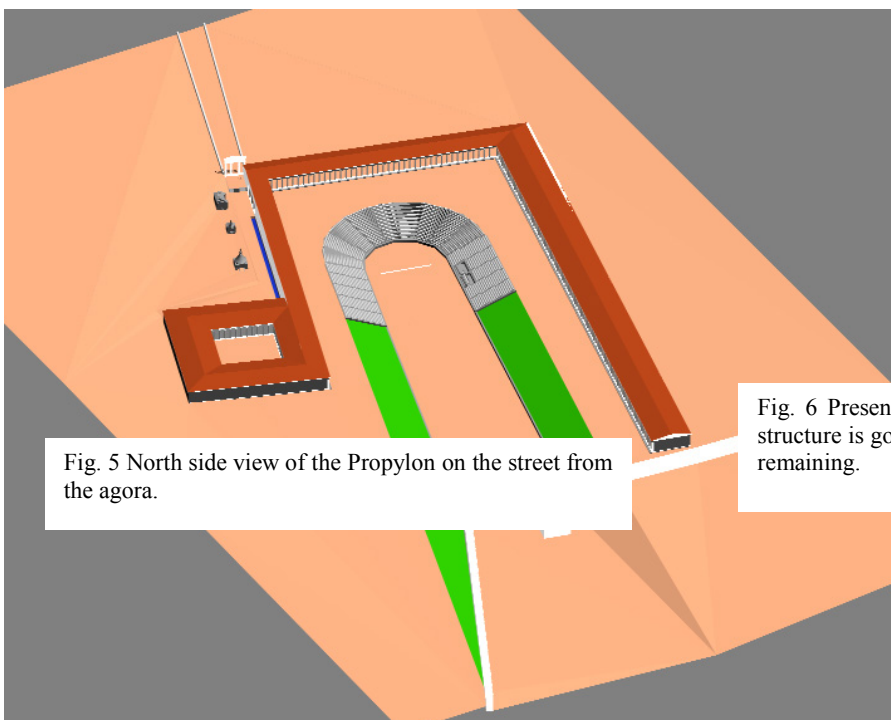


Fig. 5 North side view of the Propylon on the street from the agora.

Fig. 6 Present view of the Propylon. The upper structure is gone and only four Doric columns are remaining.

5.2 View of the grave street from the Propylon

Beyond the Propylon, the street continued toward south along the monotonous back wall of the West Stoa. There were an entrance colonnade to the west stoa on the left and the Grave Monument I on the right. (Fig. 7) Beyond the Grave monument I were located the Grave Monument II and III on the right side of the street, and they enlivened this dull street. In particular, the Grave Monument I just beside the Propylon was in a symmetrical plan being exaggerated by projecting wings on both ends. Its top was crowned by two hunting lions which flanked symmetrically. Thus, this

family grave must have strongly attracted public eyes by their location, form and sculptural decoration.

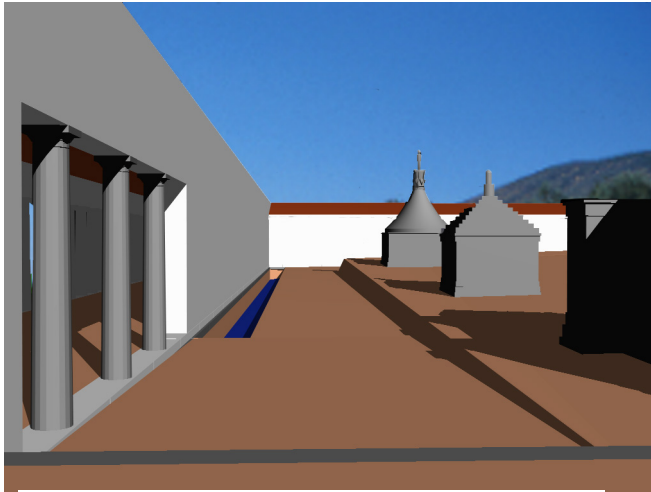


Fig. 7 Southward view from the Propylon. Entrance to the West Stoa on the left and three graves on the right.



Fig. 8 3D CG view of the reconstructed Grave Monument III from southeast on the street.

5.3

Another eye-catching building on the street was the Grave Monument III (Fig. 8), which was located farthest from the Propylon. It was 4.5 m square and 3 m high to the eaves but its roof was concave and conical with a Corinthian capital and a sculpture on its top, reaching to the height of ca.10 m. The peculiar combination of its square plan and round roof was unique and probably the oldest example as a form of grave monument. This grave particularly would have attracted public attention who passed the Propylon and would have aroused visitors' curiosity. They would have read the inscriptions on the wall to make sure whose grave it is and admired the family's wealth and fortune. Fig. 8 is the most probable reconstruction with our detailed study of the blocks, of which approximately 90 percent remains.

5.4 Whole View of the Stadion from its north end

The view of the Stadion with 19 rows of seats was grandiose against the Messenian plane which spreads toward south (Fig. 9). The seats were arranged in U-shape, and its southern half seats might not have been constructed because there can be found no blocks for the seats. We reconstructed the seats as slope of earth like that of Olympia. At the south end of the Stadion and on the city wall was seen the Heroon. From the viewpoint of townscape it worked as an eye-stop for the audience in the Stadion.

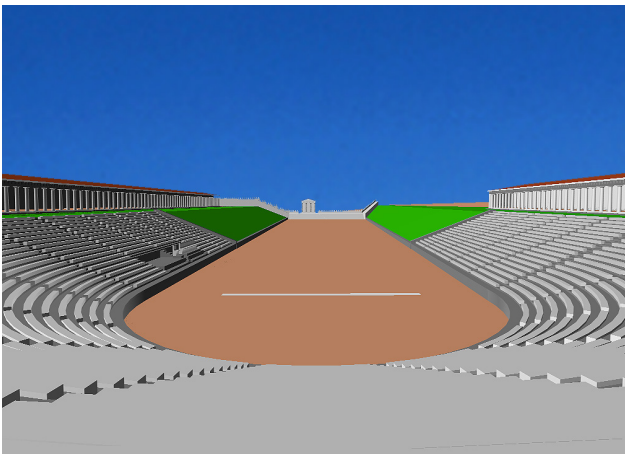


Fig. 9 Southward view of the Stadion. On the east (or left) side were some special seats for important persons of the city. On the very end was the Heroon.



Fig. 10 View of the Heroon high up on the city wall from the race track.

5.5 View of the Heroon

The Heroon, thought to be dedicated to Aristomenes, a Messenian hero, and dated to late Hellenistic, was surveyed and reconstructed by Prof. Cooper, an American archaeologist of University of California, as a Doric temple with four columns in front (Fig. 10). It was standing high at the top of the city wall just at the south end of the Stadion, and this

dramatic treatment was typical Hellenistic characteristic. Right at the foot of the Heroon was the start line of the Stadion, and the eyes of the audiences were fastened on athletes at the moment of starting. The Heroon behind even more emphasized this dramatic scene as a theatrical background and took a role to honor the athletes.

5.6 View from the race track against Mt Ithome

The athletes started from the line just at the foot of the Heroon. The length of the course was 500 ft which was 100 ft shorter than usual ones, the reason of which we do not know. The view from the race course was nothing but a grand spectacle; rows of seats with a VIP box on the right, the pi-shaped stoas which surrounded the Stadion on three sides, and the acropolis of Mt Ithome in front, where the sanctuary of Zeus Ithomatas might have been located (Fig. 11). All these were arranged symmetrically around the axis of the stadion and the athletes ran on this axis toward the direction of the acropolis. The perspective view of the Stadion and the Stoas against the acropolis at their vanishing point was one of the forerunners of a series of Hellenistic site planning of this kind.

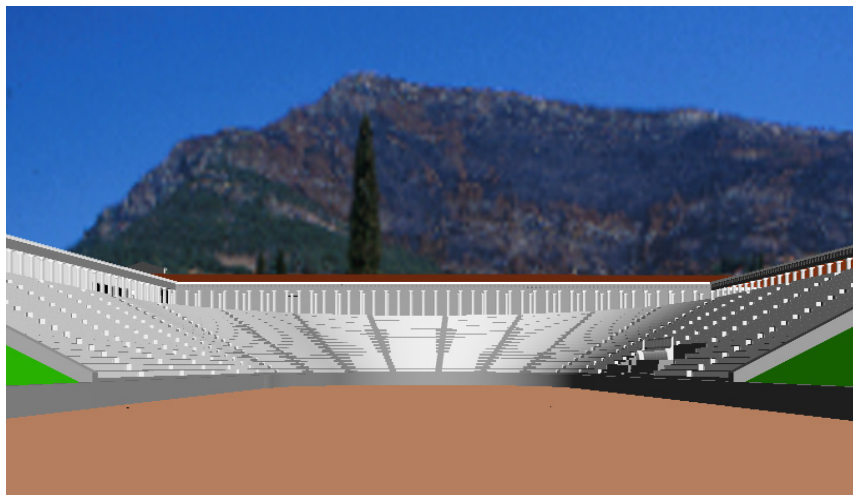


Fig. 11 Photo montage of Mt. Ithome and the CG image of the Stadion. The acropolis is right on the axis of the Stadion.



Fig. 12 A view of the Stadion from southeast in 1998. The race course was still under excavation. The seats were fairly well preserved, although they were partly distorted by small land move.

6 SUMMARY AND CONCLUSION

Reconstruction of the archaeological sites of Messene by 3D CG certainly made it possible not only for specialists but also for non-specialists to have much better three dimensional comprehension the site. We reached the results; firstly, three grave monuments in front of the Propylon were placed quite intentionally to show their architectural grandeur and to impress the wealth and honor of the families to the visitors to the Stadion, secondly, the Stadion was sited at all possibilities in accordance with the direction to the acropolis of Mt Ithome and the surrounding colonnades of the stoas had a role to strengthen the axiality of the site and to exaggerate the dramatic visual effect of the Stadion. And this site planing was the very idea of Hellenism and the idea was transmitted to the Roman town planning during the imperial period.

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