CONSERVATION AND PRESENTATION OF GRECO-ROMAN TEMPLE REMAINS IN WESTERN ANATOLIA: A CRITICAL ASSESSMENT ON SELECTED EXAMPLES THROUGH THE CONCEPT OF ANASTELOSIS

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ABSTRACT

CONSERVATION AND PRESENTATION OF GRECO-ROMAN TEMPLE REMAINS IN WESTERN ANATOLIA: A CRITICAL ASSESSMENT ON SELECTED EXAMPLES THROUGH THE CONCEPT OF ANASTELOSIS

Anastelosis, a conservation and presentation technique in archaeological sites, is the practice of reassembling the scattered original parts of the structures. It can be stated that anastelosis ensures a better protection of the architectural fragments by re-placing them in their original places and contributes to the necessity of conservation practice by providing three-dimensional information about the structures. The aim of this study was, to contribute to the conservation and presentation of the structures in archaeological sites and to determine the basic principles to be considered during the implementations by analysing and evaluating the anastelosis implementations in Western Anatolia. Accordingly, anastelosis examples of Ancient Greek and Roman period temple structures that had significance in polis and sanctuaries were selected from Western Anatolia. Method of the study was on-site examination of the implementations, archive and literature research and evaluation of the information obtained from excavation reports prepared by the excavation team. In the evaluation, anastelosis principles, within the framework of international conservation documents and publications, were determined as emphasis of the structure within site scale and in original state, structural and visual integrity of the monument, authenticity, reliability, distinguishability, visual and material compatibility, reversibility and re-treatability. It can be stated that the implementations examined, in line with these principles, emphasized the importance of the temples in ancient times, contributed to better conservation of the scattered structure elements and transfer of information concerning the constructions. However, in some cases, the implementation has transformed to restoration or reconstruction as the authenticity principle could not be met; the temple became dominant than its original due to the inability to emphasize the structure within site principle; the mass of the temple could not be perceived due to lack of integrity principle; and the implementations that need to be redone have been identified as the use of new materials damaged the original elements.

Keywords: Cultural heritage, Archaeological heritage, Anastylosis, Archaeological site, Conservation approaches, Temple, Greek, Roman

ÖZET

BATI ANADOLU'DA GREKO-ROMEN TAPINAK KALINTILARININ KORUNMASI VE SUNUMU: SEÇİLMİŞ ÖRNEKLERDE ANASTİLOSİS KAVRAMI BAĞLAMINDA ELEŞTİREL BİR DEĞERLENDİRME

Arkeolojik alanlarda bir koruma ve sunum tekniği olan anastilosis, yapıların dağılmış özgün parçalarının bir araya getirilerek ayağa kaldırılmasıdır. Uygulamayla, özgün yerlerine yerleştirilen mimari elemanların, alanda dağınık haldeki durumlarına göre daha iyi korunmalarının sağlanacağı ve yapılar hakkında üç boyutlu bilgi aktararak koruma pratiğinin gerekliliğini anlatmada katkı sağlanacağı ileri sürülebilir. Bu çalışmanın amacı, Batı Anadolu'daki anastilosis uygulamalarını inceleyerek ve değerlendirerek, arkeolojik alanlardaki yapıların korunarak sergilenmesine yönelik uygulamalara katkı sağlamak ve uygulamalarda dikkate alınması gereken genel ilkeler belirlemektir. Bu doğrultuda, antik dönem kent ve kutsal alanlarında önemli yeri olan Yunan ve Roma dönemi tapınak yapılarındaki anastilosis örnekleri Batı Anadolu'dan seçilmiştir. Çalışmanın yöntemi, uygulamaların yerinde incelenmesi, arşiv ve literatür araştırması, kazı ekibi tarafından hazırlanan kazı raporlarının değerlendirilmesidir. Değerlendirmede, uluslararası koruma dokümanları ve yayınlar çerçevesinde anastilosis ilkeleri; çevre ölçeğinde yapının vurgusu, yapısal ve görsel bütünlük, özgünlük, güvenilirlik, ayırt edilebilirlik, görsel ve malzeme uyumluluğu, geri alınabilirlik ve yeniden müdahale edilebilirlik olarak belirlenmiştir. Bu ilkeler doğrultusunda uygulamaların, tapınakların antik dönemde sahip olduğu önemi vurguladığı, dağılan yapı elemanlarının daha iyi korunmasına ve yapılar hakkında bilgi aktarımına katkıda bulunduğu ileri sürülebilir. Ancak, özgünlük ilkesinin sağlanamaması nedeniyle uygulamanın restorasyon ya da rekonstrüksiyona dönüştüğü, çevre ölçeğindeki vurgu ilkesinin sağlanamaması sonucu tapınağın alanda özgününden baskın hale geldiği, anıt bütünlüğü ilkesinin sağlanamaması sonucu tapınak kitlesini algılatmaya katkı sağlamadığı ve yeni malzemelerin özgünlere zarar vermesi sonucunda yenilenmesi gereken uygulamalar da belirlenebilmektedir.

Anahtar Kelimeler: Kültürel miras, Arkeolojik miras, Anastilosis, Arkeolojik alan, Koruma yaklaşımları, Tapınak, Yunan, Roma

To my parents Öznur and Süleyman
and my aunt Gülizar,

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CHAPTER 1

INTRODUCTION

Anastelosis is a conservation and presentation implementation in archaeological sites, which is defined as re-erection of the structure by bringing together its dismantled pieces caused by natural disasters and uncovered with excavations (ICOMOS 1931 art. IV; Carta del Restauro Italiana 1931 art. 3; ICOMOS 1964 art. 15; Italian Restoration Charter 1972 art. 7.3; Gazzola, 1972; Sanpaolesi 1972a; Sanpaolesi, 1972b; Fielden, 1982; UNEP PAP/RAC 1990 art. III; Fielden & Jokilehto, 1993; Mertens, 1995; Schmidt, 1997; Hueber, 2002; Woolfitt, 2007; White, 2007). Anastelosis ensures the organization of a structure's demolished and randomly scattered members in a meaningful way and better protection for the members rather than laying them over the ground. The implementation is often a preferred presentation technique in the presentation of archaeological sites throughout the world, as it informs about the original state of the structure.

The basic principle of anastelosis is to re-assemble the structures using their original architectural elements. In each application, the purpose is not to provide the structural integrity of the complete structure, but to focus only on the sections of the structure where the original parts are in excess amount (Mertens, 1995; Starosta, 1999; Woolfitt, 2007). Partial anastelosis applications, which give an idea about the whole structure, can be performed for that reason.

In the implementation, the sustainability of the construction technique and structural authenticity of the building is as important as its material authenticity. However, the necessity of using new structural systems in implementation is due to the fact that every member of the structure did not survive to present day, the remaining are fragmented and resistance against earthquakes need to be ensured. In this case, the structural system to be developed should not damage the original building members and be compatible with the original members.

Since the application is based on the principle that the parts of the structure must be placed in their original places, the remains must have certain shapes in order to determine their original places. In addition, the construction traces left on the structure

elements during their building help the detection of the location of elements. For this reason, even though anastelosis is applied worldwide, it has been concentrated in the Mediterranean region (Woolfitt, 2007) where there is a lot of cut stone architecture connected with dowels and clamps without mortar (Petzet, 1999).

The implementation of anastelosis differs from the restoration and reconstruction applications via consideration of the originality as the primary principle. Some applications, which had planned as anastelosis work have been turned into reconstruction applications due to the usage of excessive new material. As in restoration and reconstruction applications, anastelosis application is possible if reliable information on the original condition of the structure is provided. The new material used, even in small quantities, should be visually and structurally compatible with the structure but distinguishable, as in other applications.

Anastelosis contributes to the exhibit of the structures in their original form. During the application, not only the construction, but also the authenticity of the site is taken into consideration. The significance of the structure had in the beginning in context should be parallel to the situation that will change after application of anastelosis. For this reason, the relation of the structure with the site should be handled as much as the integrity of the structure in itself. Exceeding completion of the structure or bringing a brand new look to the structure might alienates the structure to the site and causes the original knowledge to be distorted. It should not be forgotten that the re-establishing implementations are applications that cannot resurrect the history, but only reflect the memories of past.

Anastelosis is a presentation technique that provides information about the original situation of structures as well as a conservation application in archaeological sites. The problem of bringing a single period into the forefront occurs when re-established structures have many construction layers. The study should be handled in such a way as to reflect the entire construction period holistically, not in a frozen state in one period. The implementation process should be carefully planned so that the date of construction, construction technique, or its relationship with the site is not misrepresented at the end of the study. However, the incentive of promotion of historical buildings and archaeological sites associated with tourism concerns without planning constitutes contradictions with international contemporary conservation principles. The German Archaeological Institute, working in Priene, emphasized in their publications and personal interview that the re-erection at the Temple of Athena for the purpose of

increasing the interest in the archaeological site was carried out by Turkish authorities, far from their own scientific methods (Rumscheid, 2000; Koenigs, 2015). Similarly, the German Archaeological Institute, which also conducts studies in Pergamon, stated that the re-erection at the Temple of Trajan was carried out in order to show gratitude to the country and to meet the expectations of the Turkish authorities (Nohlen, 1999; Nohlen, 2014). As in other examples, these implementations aimed at meeting the tourism expectation indirectly contribute to the preservation of the structures, but they are misinformed about structures that do not involve scientific method as in Priene. In Laodikeia, the whole of the site's rapid and total effort to re-erect destroys the possibility of studying the site for research purposes; causing traces of the past to disappear rapidly.

Under these circumstances, anastelosis stands out as an appropriate method for conserving and exhibiting architectural elements that are already uncovered in archaeological sites. Just as each structure is unique, the solutions of the problems that arise in practice are not similar to each other. Although there are general principles of practice for anastelosis, the different solutions followed in practice causes the inability to determine exact rules for anastelosis. In this study, anastelosis applications in Turkey has been evaluated in accordance with established principles of modern conservation practices. The study is important in terms of contributing to conservation practices in archaeological sites based on information obtained after the evaluation of anastelosis implementations.

1.1. Definition of the Problem

Opening to visitation and informative presentation of archaeological sites requires a serious planning process. Today, however, decision-making processes are rapidly being implemented and applications are being made in many archaeological site. This leads to the misrepresentation of the archaeological site and to the false impression about the structures. There are many archaeological sites where excavation and research work is still ongoing, work of re-erection is also being carried out immediately. The re-establish works that play an influential role in promoting the site should be carefully planned.

Archaeological sites are seen as tourism objects in Turkey. The anastelosis and reconstruction implementations that correspond to tourism expectancy rather than conservation are giving symbolic value to the structure. For example, the Library of

Celsus at Ephesus in İzmir, Turkey, which was re-assembled in 1970-78, has been used for promotion purposes, also used as an icon on the back of the newly issued 20.000,000 TL banknotes in 2001-06 ("Yirmimilyon Türk Lirası", 2018). Thus, the implementation of the re-erection brings that structure to the forefront from other structures and the structure becomes the most well-known edifice on the site (Schmidt, 1997; Demas, 1997). Re-instatement works, which ignore the more important structures in the site, increases the intensity of tourists at the same time. Intensive visitor flow causes destruction in archaeological sites that are not suitable for human population. For example, Ephesus Curetes Street floor covering stones have eroded because of the visitors.

The international conservation charters, recommendations and documents on anastelosis are very few and inadequate to inform about it. In order to understand and determine the basic principles of anastelosis, the opinions and experiences of the experts in the publications needed to be considered.

When the anastelosis applications in archaeological sites in Turkey are examined, conditions can be determined that have not performed the basic principles of anastelosis. In addition, restoration and reconstruction applications are also referred to as anastelosis.

As the effects of the applications are not evaluated, the structures are not observed after the application; anastelosis applications are beginning to pose a threat to the structures. For example, deterioration in joining materials used in anastelosis, uncontrolled moisture in the site, can create new problems. These are the consequences of the lack of planning and monitoring stages.

This study will provide data for new applications to be made by evaluating the implementations in the selected examples.

1.2. Aim of the Study

Anastelosis, one of the common practices in conservation studies in archaeological sites, is a conservation and presentation method. This practice contributes to the spatial perception of structures in ruin state and to the display of archaeological sites. The aim of this study is to contribute to conservation practices in archaeological sites and to evaluate the practices of anastelosis in order to establish general principles to be considered during the implementations. In this respect, in this study, anastelosis practices in temple structures in selected archaeological sites have been evaluated in accordance with the principles set out in international charters and agreements.

1.3. Limits of the Study

Anastelosis implementations have been carried out in many archaeological sites especially in the Mediterranean region (Woolfitt, 2007). In order to compare the implementation techniques used in the anastelosis of similar architectural members among the examples, it has been adopted to select the same building type. In this direction, examples of applications in the study have been identified as the temple structures in archaeological sites in Turkey. Re-erection implementations in temples which were named as anastelosis by excavation or project team were chosen. Three-dimensional virtual anastelosis, which helps to increase the perceptibility of archaeological sites, is excluded from the scope of the thesis.

1.4. Method of the Study

The method of the study is the analysis and evaluation of data obtained from site survey study and previous publications.

Within the scope of the study, seven temple structures were selected considering the availability of adequate documentation about implementations. These are; the Temple of Athena at Assos (~530 BC, Behramkale, Ayvacık, Çanakkale), the Temple of Athena at Priene (4th century BC, Güllübahçe, Söke, Aydın), the Temple of Leto at Letoon (160-130 BC, Kumluova, Seydikemer, Muğla), the Temple of Apollo at Smintheion (2nd century BC, Gülpınar, Ayvacık, Çanakkale), the Temple of Apollo at Side (2nd century AD, Side, Manavgat, Antalya), the Temple of Trajan at Pergamon (114-129 AD, Bergama, İzmir) and Temple A at Laodikeia (2nd century AD, Eskihisar, Denizli). Within the scope of the study, the Temple of Zeus at Aizanoi (Çavdarhisar, Kütahya), the Temple of Artemis at Sardes (Salihli, Manisa), the Temple of Apollo at Didyma (Didim, Aydın), the Temple of Apollo at Claros (Menderes, İzmir), the Temple of Zeus at Olba (Silifke, Mersin), the Temple of Zeus at Euromos (Milas, Muğla), the Temple of Aphrodite at Aphrodisias (Karacasu, Aydın), theatre temple at Pessinus (Ballıhisar, Eskişehir), the Temple of Rome Augustus at Ankyra (Ulus, Ankara) were examined and excluded from the study because there was no anastelosis implementation in these temples.

In this study, the principles of anastelosis application were determined primarily by examining the literature, international charters, agreements and recommendations.

When analysing, evaluating the selected examples, principles of emphasis of the structure within site scale both in the archaeological site and in original context, structural and visual integrity of the monument, authenticity, reliability, distinguishability, visual and material compatibility, reversibility and re-treatability have been taken into consideration that are discussed in literature and international documents[1].

As a subject of the study, the site survey of the temples was carried out in 2016-2018. In this context, Temple A at Laodikeia Temple in April 2017, the Temple of Athena at Assos in October 2016 and June 2017, the Temple of Apollo at Smintheion in June 2017, the Temple of Athena at Priene in May 2017, the Temple of Apollo at Side in October 2017, the Temple of Leto at Letoon in October 2017, the Temple of Trajan at Pergamon in March 2018 were examined. In the site survey, the anastelosis implementations at present were documented by observations and photographs in site and structure scale. During the observations, the present situation of the site, the impact of the implementation within the site, original and completed parts on the structure, visual harmony of completed and original parts, compatibility of new materials, and deteriorations, if there exist, were examined. Excavation reports prepared by the excavation team and other publications about anastelosis have been examined for the anastelosis application processes of the structures.

In the study, it was aimed to examine and evaluate the principles laid down in international charters, agreements and recommendations, and the following research questions were identified:

- What should be the basic principles of anastelosis application?

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[1] Emphasis of the structure within site scale: Carta del Restauro Italiana 1931; UNESCO 1968; Sanpaolesi, 1972a; ICOMOS/ICAHM 1990; Fielden & Jokilehto, 1993; Schmidt, 1993; Jokilehto, 1995; Mertens, 1995; ICOMOS 1999b; English Heritage 2001; Hueber, 2002.
Integrity of the monument: ICOMOS 1964; Mertens, 1995; Ahunbay, 1996; Starosta, 1999.
Authenticity: ICOMOS 1931; ICOMOS 1964; Sanpaolesi, 1972b; ICOMOS 1982; ICOMOS/ICAHM 1990; ICOMOS 1994; Mertens, 1995; Ahunbay, 1996; English Heritage 2001; Hueber, 2002; ICOMOS 2003; Woolfitt, 2007.
Reliability: Carta del Restauro Italiana 1931; ICOMOS 1964; Sanpaolesi, 1972b; UNEP PAP/RAC 1990; Fielden & Jokilehto, 1993; Philippot, 1996; ICCROM/ UNESCO 2000; English Heritage 2001; Hueber, 2002.
Distinguishability and compatibility: ICOMOS 1931; Carta del Restauro Italiana 1931; ICOMOS 1964; Italian Restoration Charter 1972; Sanpaolesi, 1972a; ICOMOS/ICAHM 1990; Fielden & Jokilehto, 1993; Mertens, 1995; Ahunbay, 1996; Melucco Vaccaro, 1996b; Philippot, 1996; ICOMOS 1999a; ICOMOS 2003; English Heritage 2008; Hueber, 2002.
Reversibility and retreatability: Fielden, 1982; Fielden & Jokilehto, 1993; Mertens, 1995; ICOMOS 1999a; Hueber, 2002; ICOMOS 2003; English Heritage 2008.

- What is the contribution to archaeological sites and remains of the application of anastelosis?
- Why do some anastelosis studies require re-intervention?
- What are the positive and negative effects of the new materials and techniques used in the anastelosis implementation?

1.5. Literature Review

Researches and publications on anastelosis are varied in the examination of the term and principles of anastelosis, the evaluation and comparison of different applications and introduction of the applications. These studies can be grouped under four headings.

- Publications on term and the principles of anastelosis practice:

In P. Sanpaolesi's articles named "General Principles" and "Conservation and Restoration: Operational Techniques", the different approaches in anastelosis and reconstruction applications are discussed by mentioning the demolished ancient structures caused by disasters and destroyed cities after World War II. It was emphasized that each sample should be assessed under its own conditions, that a single approach to anastelosis or reconstruction practices cannot be applied to each structure. However, the principle, which is important in each case, is that the implementation is based on maintaining the authentic value of the structure and the application is based on reliable sources (Sanpaolesi, 1972a; Sanpaolesi, 1972b).

J. Dimacopoulos examined the etymological roots of the anastelosis term in his article named "Anastylosis and Anasteloseis" and corrected the mistakes made in translation of the word into different languages. He introduced Balanos's restorations in the Acropolis of Athens, who gave name of anastelosis to his works (Dimacopoulos, 1985).

D. Mertens describes the anastelosis and reconstruction implementations applied in the archaeological site presentation in his article named "Planning and Executing Anastylosis of Stone Buildings". He explained the principles to be considered, the materials and techniques that can be used in practice, and the different approaches in anastelosis. He defined the problems arising in the conservation of stone buildings and

suggestions for solutions with examples from different archaeological sites (Mertens, 1995).

F. Hueber, who has a large number of studies on anastelosis, evaluated anastelosis as a management plan by improving the definition of anastelosis in international charters and described its positive and negative aspects in his article named "Building Research and Anastylosis". He drew attention to the research phase of the study by explaining in detail the points to be considered; emphasized that even if anastelosis of a structure may not be possible, it is necessary that a detailed investigation in terms of conservation. Hueber provided detailed and clear information on anastelosis with these studies (Hueber, 2002).

K. Vacharopoulou analysed theoretical, philosophical, technical aspects of implementation and value-based anastelosis in her articles named "Monument Conservation in the Mediterranean: Issues and Aspects of Anastylosis" and "Conservation and Management of Archaeological Monuments and Sites in Greece and Turkey: A Value-Based Approach to Anastylosis" (Vacharopoulou, 2005a; Vacharopoulou, 2005b).

Z. Ahunbay, informed about implementations in Turkey and new materials and structural systems to be used in anastelosis and by defining anastelosis in accordance with international charters in her book named "Tarihi Çevre Koruma ve Restorasyon" and her article named "Arkeolojik Alanlarda Koruma Sorunları: Kuramsal ve Yasal Açılardan Değerlendirme" (Ahunbay , 1996; Ahunbay, 2010).

- Publications where different anastelosis implementations are compared and evaluated:

H. Schmidt revealed differences between anastelosis and reconstruction; evaluated application examples related to the presentation of archaeological sites, in his book named "Wiederaufbau". He pointed out that objectives, phases of application and decision-making process should be known in the evaluation of applications in archaeological sites. He reviewed the results of charters and recommendations and examined the practices in different archaeological sites (Schmidt, 1993; Jokilehto, 1995).

U. Starosta evaluated different structural intervention approaches in anastelosis practice in her article named "Structural Concepts of Anastylosis" (Starosta, 1999).

- Publications on introduction and evaluation of single applications:

In the publications on the single application, with a majority of them is about anastelosis implementations on the Acropolis of Athens, the restorations of structures in the Acropolis from the beginning of the 20th century, were documented in detail and evaluated. These publications, which were prepared by the acropolis restoration team, are an example for other ancient buildings in terms of documentation and publishing (Hurwit, 2001; Mallouchou-Tufano, 2001; Mallouchou-Tufano, 2003; Calabresi, 2003; Jokilehto, 2004; Mallouchou-Tufano, 2006a; Mallouchou-Tufano, 2006b; Mallouchou-Tufano, 2007; Bouras, 2007; Papanikolaou, 2012; Ioannidou, 2001; Ioannidou,2003; Ioannidou, 2007a; Ioannidou, 2007b; Lambrinou, 2010; Lebidaki, 2011; Michalopoulou & Mamalougas, 2011; Koutsadelis & Petropoulou, 2015; Eleftheriou, 2015).

M. Yorulmaz et al. made the introduction of the structural anastelosis of the Perge Demetrius-Apollonius Arch in the declaration named "Anastylosis of the Arch of Demetrius-Apollonius in Perge" and also the structural details of the anastelosis implementation of the Temple of Apollo at Side "Anastylosis of the Apollo Temple in Side / Antalya, Turkey" (Yorulmaz, Tanyeli & İzmirligil, 1989; Yorulmaz, Çili & Ahunbay, 1989).

Publications prepared by the excavation team on the application of anastelosis of the Late Hellenistic fountain in the ancient city of Sagalassos gave information about material and structural details (Patricio, & van Balen, 1993; Ercan, Patricio, & van Balen, 1997; Van Balen, Ercan, Patricio, 1999).

G. Paul, in his article entitled “Die Anastylose des Tetrapylons” introduced the anastelosis implementation of tetrapylon at Aphrodisias completed in 1990 (Paul, 1996).

K. Nohlen, in his article entitled "The Partial Re-erection of the Temple of Trajan at Pergamon in Turkey: A German Archaeological Institute Project", dealt with the method used in the anastelosis of the Temple of Trajan in Pergamon; evaluated the application from the theoretical and technical perspectives (Nohlen, 1999).

In the book entitled "The Venice Charter Revisited: Modernism, Conservation and Tradition in the 21st Century" edited by M. Hardy, the articles of the Venice Charter were reviewed again to assess anastelosis studies in a variety of single practices (Hardy, 2008).

The introduction and evaluation of the anastelosis applied at the stage of the Hierapolis theatre were discussed in numerous publications. These studies also provided

information on the material and structural details of the application. (Masino, Sobra, Gabellone & Limoncelli, 2011, D'Andria, 2012, Sobra, 2012a, Sobra, 2012b; Masino, 2012; Mighetto, 2012; Masino, & Sobra, 2012; D'Andria, 2016).

- Theses on Anastelosis:

U. Starosta evaluated 28 of anastelosis applied in Greek and Roman period structures in her thesis entitled "Reparatur und Wiederaufbau antiker Bauwerke". By evaluating the structural approaches of the applications, she examined different re-erection techniques and the materials used in these applications (Starosta, 1991).

K. Vacharopoulou evaluated different anastelosis implementations by choosing examples from Greece and Turkey in her thesis named "Conservation of Classical Monuments: A Study of Anastylosis with Case Studies from Greece and Turkey". Based on the knowledge gained from these assessments and interviews with experts and visitors in the site (Vacharopoulou, 2006).

O. Bakacak examined the different intervention periods and the main approaches during the anastelosis applications in the Arch of Demetrius-Apollonius, the north-south colonnaded street and agora / macellum in the archaeological site of Perge in her thesis entitled "Critical Evaluation on the Conservation Approaches in the Archaeological Site of Perge" (Bakacak, 2007).

G. Şimşek investigated the effects of monuments to the site as a result of anastelosis and restoration practices in the so-called Temple of Hadrian, the Library of Celsus, the Fountain of Trajan and the Monument of Memmius on Curetes Street at Ephesus in her thesis named "Interventions on Immovable Archaeological Heritage as a Tool for New Formation Process" (Şimşek, 2009).

A. P. Kousgaard, dealt with steel, fiberglass, and titanium materials used in anastelosis applications; tested fiberglass, epoxy, and cement based adhesive materials in laboratory environments in order to understand the effect of the bonding materials on the original material, in his thesis named "Material Durability in the Anastylosis of Ancient Structures" (Kousgaard, 2016).

There are also dissertations about anastelosis of single structures such as Library of Celsus at Ephesus (Hueber, 1978), the Late Hellenistic Period fountain at Sagalassos (Patricio, 1992), Temple of Nike at Acropolis (de Bree, 2010).

The aforementioned publications related principles of anastelosis try provide information about the keys needed to be considered during the implementation. Studies of Sanpaolesi (1972), Mertens (1995), Hueber (2002) form a base on the theoretical frame of anastelosis. Also in these studies, positive and negative sides of the examples were explained and discussed. Dimacopoulos (1985), traces the etymological root of the word anastelosis and explains the first introduction to this conservation area. Schmidt (1993) and Starosta (1999) mostly emphasize the technical and structural aspects of anastelosis by comparing different re-erection applications. Publications on introduction of single implementation provide ideas about different implementation approaches, materials and techniques used in anastelosis. Some of these are aimed at discussing conservation interventions in archaeological sites including anastelosis, while some of them introduce and explain single applications. Vacharopoulou (2006) particularly showed similarity with this study in terms of evaluation of different implementation examples. However this study differs by determining basic principles of anastelosis and evaluating examples based on these principles rather than conservation values or opinions of visitors and experts. In this study, providing a holistic approach between site scale and monument itself, and also the original context of the structure and its present situation in the site by realizing the anastelosis implementations or evaluating them was achieved. This study carries value since implementation history of the examples was handled in detail and different anastelosis approaches were compared.

CHAPTER 2

THEORETICAL AND TECHNICAL ASPECTS OF ANASTELOSIS IMPLEMENTATION

The conservation and presentation techniques in archaeological sites varies from the most conservative to the most intervening. In order to understand the position of anastelosis among them, which used as "anastylosis" erroneously, these techniques were examined and explained with known examples.

The concept of anastelosis in international charters, agreements and documents was introduced in *the Athens Charter for the Restoration of Historic Monuments (1931), Carte del Restauro Italiana (1931), the International Venice Charter for the Conservation and Restoration of Monuments and Sites (1964)* and *the Italian Restoration Charter (1972)*. In addition, *the Lausanne Charter for the Protection and Management of the Archaeological Heritage (1990)* is based on the preservation of the archaeological sites, *the Nara Document on Authenticity (1994)* emphasizes the value of originality, *the Mexico International Cultural Tourism Charter Managing Tourism at Places of Heritage Significance (1999)* and *the Zimbabwe Principles for the Analysis, Conservation and Structural Restoration of Architectural Heritage (2003)* are important documents for conservation work in archaeological sites, since the policies should be considered within the framework of integrity.

The anastelosis applications, through the selected examples in this study, were evaluated within the framework of the principles determined in the direction of conservation charters. In such situations which conservation charters are indefinite, since there are few documents on anastelosis and published studies of conservation experts were consulted.

2.1. Term of Anastelosis

The term anastelosis is most commonly used in the restoration of archaeological sites in the Mediterranean region although is used for conservation practices in various parts of the world. Dimacopoulos (1985) based the root of the word to the Byzantine

origin in Orthodox history and stated as the restoration of the icons *(άναστήλωσις των εικόνων)*. The use of the concept of anastelosis *(άναστήλωσις)*, first appeared in Greece and was used by Nikolaos Balanos (1931) to describe the re-erection application performed in the Acropolis of Athens in Greece. Balanos introduced this term at the *International Conference on the Protection and Conservation of Artistic and Historical Monuments* in Athens in 1931 (Dimacopoulos, 1985; Iamandi, 1997; Schmidt, 1997). The term of anastelosis was widely recognized by *the Venice Charter* (1964), which was defined in *the Athens Charter* (1931) and *the Carta del Restauro Italiana* (1931). The term has begun to be used as an application technique in architectural conservation since it was described in the charters.

Anastelosis *(άναστήλωσις)* is derived from anastelo *(άναστηλώ)*. It consists of a combination of prefix *ανά* -ana- (up, over) and verb *στηλώ* -stilo- derived from *στήλη* -stili- (stele, standing stone). When the term was translated to other languages, there occurred a mistake in Italian. It was thought that it translated from *στίλος* -stilos-, but correct writing of the word in Greek is *στύλος* -stilos-. Duplication of the same pronunciation was attempted by putting the letter "i" in place of "y", which is not in Italian alphabet, and this lead to mistake in writing. Therefore, the words anastylosis (Eng, De), anastylose (Fr), anastilosi (It) should be changed to anastelosis (Eng, De), anastelose (Fr), anastelosi (It) (Dimacopoulos, 1985). The French translation and English were used in translating the term into Turkish from different charters. While Kuban preferred the *anastiloz* in the translation of *the Carta del Restauro Italiana* (Kuban, 1962), Erder used it as an English *anastylosis* in the translation of *the Venice Charter* (Erder, 1968). It is also possible to come across French translation (Hueber, 1991; Kuban, 2000), English use (Erder, 1977; Ahunbay, 2010) or the use of Turkified *anastilosis* in different publications (Ahunbay, 1996). The term in this thesis is used as *anastelosis* as it is in the Greek reading, and it is proposed to be used as *anastilosis* in Turkish.

The erroneous writing "anastylosis" was corrected by Dimacopoulos (1985) and then used as "anastelosis" in the Acropolis Restoration Bulletins published at 2001 (Dimacopoulos 1985; Bouras et al., 2001-2005). This term, pioneered by Greece, describes the minimum practice with original material in archaeological sites in the world, but it can express many different types of intervention in Greek such as conservation, consolidation, restoration, rehabilitation or even reconstruction. In Greece, use of anastelosis in meaning of *the Venice Charter* and use of *αποκατάστασις* -apokatastasis- for restoration have been attempted for clarification (Dimacopoulos, 1985).

2.2. Conservation and Presentation Techniques Applied in Archaeological Sites

The cultural assets that shed light on past cultures are revealed through archaeological studies. The conservation and presentation of archaeological sites, which have become tourist stops with increasing tourism expectations, play an important role in transferring past information. Many different conservation and presentation methods have been developed in archaeological sites where knowledge of the past has been rapidly lost, because of weather conditions, vegetation, intense visitor flow, etc. These methods have been ordered as follows to provide the most protection by minimum intervention, to the maximum intervention and the position of anastelosis among them have been discussed (Stubbs, 1995; Matero, 2008).

Leaving unexcavated: In present day, due to the developing technology, it is possible to view and document many subterranean archaeological sites without excavating by using geographical imaging systems. This technique allows mapping of underground using geophysical methods. As a result of the work, it is decided that some areas should be conserved and presented only by documenting without digging. The Whitley Castle in Northumberland, England was identified and documented with gradiometer and earth resistance surveys between 2007 and 2009 and the presentation was performed without excavation (Went & Ainsworth, 2009) (Figure 2.1, Figure 2.2, Figure 2.3).

Re-burial: In archaeological excavations were mosaics or mudbricks, which have potential to erode quickly, re-burial is carried out after the excavation and documentation work has been completed. It is intended to return to the original buried forms of archaeological sites already excavated by re-burial or to create a healthier conservation environment for the remains (Demas, 2004). In this method, the depth of the remains from the surface, the properties of the material to be used in the re-burial process, the permeability of the material and the effect to the remains are taken into account. Following the re-burial process, physical, chemical and biological properties of the backfill are monitored and factors such as moisture content and plant growth must be controlled (Agnew, Barrow, Demas, Ford, Roby, Stanley-Price, Taylor & Teutonico, 2004). Some of the remains in particularly large sites are completely buried while some are opened to visit; or temporary burials are carried out to prevent further erosion of the

site until further study, or some of the remains are periodically opened and presented for visit (Demas, 2004; Teutonico, 2004). The wall remains at Boğazköy Hattuşa in Çorum, Turkey were partially re-buried and by reconstruction work with new stones, two-dimensional plan was created on the surface for visitors (Seeher & Schachner, 2014) (Figure 2.4). The mosaic of Orpheus in the Roman villa at Woodchester, England, was opened periodically after being re-buried, and finally a replica of the mosaic was produced and exhibited (Stubbs, 1995; Demas, 2004) (Figure 2.5, Figure 2.6). Allianoi ancient city, a well preserved state near Pergamon, Turkey, was buried (Hamamcıoğlu Turan, Arısoy, Nuhoğlu & Erturan, 2013) and covered with water after its sculptural members were removed to museum in 2011 as a consequence of the decision to build the Yortanlı Dam (Figure 2.7).

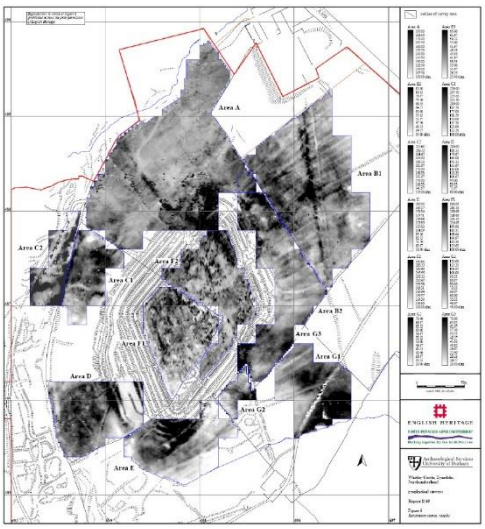

Figure 2.1. Geophysical (resistance) plan of Whitley Castle in Northumberland, England (Source: Went & Ainsworth, 2009).

Figure 2.2. Aerial view of Whitley Castle in Northumberland, England (Source: Went & Ainsworth, 2009).

Figure 2.3. Presentation of Whitley Castle in Northumberland, England with information boards (Source: https://www.tripadvisor.com.tr Retrieved at April 11, 2018).

Figure 2.4. Reconstruction after reburial of Temple 1 at lower city of Hattusa-Boğazköy in Çorum, Turkey (Source: Seeher & Schachner, 2014).

Figure 2.5. Original Orpheus mosaic in Woodchester, England in situ (Source: https://www.geocaching.com Retrieved at April 12, 2018).

Figure 2.6. Reconstructed replica of Orpheus mosaic in Woodchester, England after completed in 2010 (Source: http://www.dailymail.co.uk Retrieved at April 12, 2018).

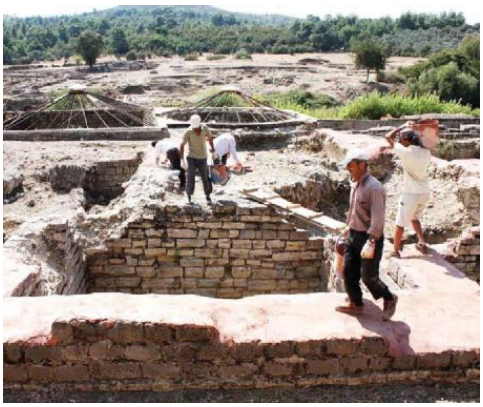

Figure 2.7. Allianoi in İzmir, Turkey. Capping work before re-burial (Source: Hamamcıoğlu Turan et al., 2013, taken from IZTEK 2010).

Left as found with minimum intervention: The remains in this group have been conserved and exhibited in such a way as to minimize the interventions after the excavation. In this presentation technique, which is called leaving as it is, the ruin image of the remains provides a landscape integrity with the area they are in. While the other structures were reconstructed in the ancient settlement of Tikal, Guatemala, there was no intervention at the Seven Temples Square except partial excavations (Stubbs, 1995) (Figure 2.8).

Consolidation or structural stabilization: Consolidation practices can be made in order to ensure that the structural integrity of the structures is maintained rather than having further intervention. These applications can be in the form surface erosion prevention by capping technique with compatible materials to the original structure or providing structural support with additional frames. The Hadrian's Wall in England, 118 km long and a large part has survived, has been continuously monitored and strengthened for over 150 years (Mason, MacLean, & de la Torre, 2003; Wilmott, 2009) (Figure 2.9). The building remains of the Rosewell Plantation in Virginia, USA however, are trying to survive with metal support elements, due to the fact that only the outer walls remain after a fire in 1916 (Figure 2.10). The bent walls of the Temple of Roma Augustus in Ankara, Turkey were stabilized in 2010 with a steel structure tension system (Görkay & Mitchell, 2011; "Augustus Temple Project", 2018) (Figure 2.11).

Figure 2.8. Seven Temples Square at Tikal, Guatemala
(Source: https://www.360cities.net Retrieved at April 12, 2018).

Figure 2.9. Consolidation work of Hadrian Wall at the bathhouse at Vindolanda, England in 1972 (Source: Wilmott, 2009).

Figure 2.10. Structural stabilization of the Mansion at Rosewell Plantation in Virginia, USA (Source: https://colonialghosts.com Retrieved at April 12, 2018).

Figure 2.11. Structural stabilization of the Temple of Augustus Rome in Ankara, Turkey (Source: http://e-seyyah. blogspot.com.tr Retrieved at April 12, 2018).

Protective shelter: Taking protection with protective shelter is a preferred method of conservation in archaeological sites. Generally, mosaics or mural paintings, which are interior decorations protected by structural elements in original state, or in the case where there are building elements such as mudbricks, which exposed erode, are applied. The protective shelter should be visually appropriate with the site and should not alienate the applied area to the rest of the site, provide efficient protection for the remains, its foundation should be positioned so as not to damage the remains, and not create new climatic interior conditions that will damage the remains (Agnew, 2002; Price & Jokilehto, 2002; Teutonico, 2002). When the mosaics and mural paintings found in the Building Z at Pergamon, Turkey were discovered, they were temporarily buried for conservation. In the 2000s, using protective shelter application, the original walls of the structure were completed up to a certain height, and the steel structure roof was placed on these walls. The southern wall of the structure is incomplete and closed with intermittent metal louvers to allow ventilation. The protective shelter provides protection from rain while balancing interior climate and provides natural lighting by its permeable presence (Bachmann & Schwarting, 2008) (Figure 2.12). The mudbrick constructions at Çatalhöyük in Konya, Turkey began to deteriorate rapidly even during excavations. The mural painting was removed to the museum since it was not possible to protect it at that time, then the protective shelter was designed for the site. In 2000, two different protective

shelter applications were made. In the first application in the south, the steel space frame system was covered with polycarbonate panels. The second protective shelter, which was later built in the north, was designed by placing polycarbonate panels on wooden arches. Side panels of both shelters can open to provide ventilation in summer. It provides the possibility of continuing excavation and research work and viewing it for sightseeing, even though it does not provide efficient protection for these original ruins (Yaka Çetin, 2013) (Figure 2.13).

Anastelosis: Anastelosis is a preferred method of conservation and presentation when a large number of original architectural members are present in order to provide better protection to these elements and to help visitors perceive the structure by regaining their context in the past. Anastelosis slows the erosion of dismantled parts by removing them from the ground and reduces the appearance of the stone mass of the site by rearrangement. The basic principle of anastelosis is to repair the ruins as much as possible using original architectural pieces or materials. The Tetrapylon[2] at Aphrodisias in Aydın, Turkey was re-erected at the end of the 1980s with 80% of its original material (Erim, 1989; Smith, 1993; Paul, 1996) (Figure 2.14). The first floor of the scaenea[3] frons and proscenium[4] below the stage of the theatre at Hierapolis in Denizli, Turkey also an example of anastelosis which was carried out with high amount of original material (Masino, 2012) (Figure 2.15).

Restoration: Restoration is defined as the preservation of authentic elements, in a way that reveals the aesthetic and historical value of the building (ICOMOS 1964 art. 9), bringing the structure back to an earlier known state (ICCROM / UNESCO 2000 art 1.7). Controversy over the concept of restoration continues and the term was seen as an intervention according to English Romantic Movement that harms the authenticity of the structure; it was used as a roof term to cover all kinds of conservation interventions in Latin languages (Fielden & Jokilehto, 1993). This term is used in this study to describe the re-erection application involving more new materials and interventions than the anastelosis. Although the difference from the reconstruction of the restoration is stated that no usage of new material in restoration (ICCROM / UNESCO 2000 art 1.7), it might

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[2] Tetrapylon: A structure having four gateways as features of an architectural composition. (Retrieved at May 20, 2018 from dictionary.com)

[3] Scaenea frons: In the Roman theatre, the decorated architectural façade of the scaena (Greek skene) which served as the background to the playing area (Retrieved at May 20, 2018 from oxfordreference.com).

[4] Proscenium: The part of a theatre stage in front of the curtain (Retrieved at May 20, 2018 from oxforddictionaries.com).

be necessary to use new materials even in anastelosis implementation, it is very unlikely to be able to perform restorations without using new materials. The practice in the Titus Arch in Rome, Italy is an example of early restoration work in the 19th century. In restoration work, incomplete parts were completed with travertine and the elements were produced without ornamentation in order to be distinguishable from the original marble material (Erder, 1986) (Figure 2.16).

Figure 2.12. Protective shelter of Building Z at Pergamon, İzmir, Turkey (May 13, 2016).

Figure 2.13. North protective shelter at Çatalhöyük, Konya, Turkey (Source: https://scotthaddow.wordpress.com Retrieved at April 12, 2018).

Figure 2.14. Tetrapylon at Aphrodisias, Aydın, Turkey (April 6, 2017).

Figure 2.15. Scaenea frons of the theatre at Hierapolis, Denizli, Turkey (April 5, 2017).

Figure 2.16. Arch of Titus in Rome, Italy. Completed parts are left plain.
(Source: https://upload.wikimedia.org Retrieved at May 15, 2018)

Relocation: It has become an ordinary practice that the mosaic or sculptural elements designed together with the buildings in the ancient sites are exhibited disconnected from the context by removing them to museums. What is exceptional, however, is that some architectural structures, which are under threat, are pulled out completely and moved to another location. This practice usually arises when the ancient structures will be submerged underwater by dam to be built near them and there are no other solutions for protection. Abu Simbel Temple, which will be under water in the Aswan dam in Egypt, was dismantled and by cutting into pieces from the rock which it was built in and was reassembled on a higher level in reinforced concrete shell like rock that would not be flooded in the 1960s. As long as the details of the application are not known, it may be thought that its authenticity is maintained visually, but it has lost structural and contextual authenticity (Figure 2.17). The Agios Stratigos fountain, which was excavated in the rescue excavations before the dam construction at Kestel Brook region in the northeast of Pergamon, was removed from its place and relocated in the city

near the agora (Erdemgil, 1982) (Figure 2.18). Similarly, in Hasankeyf at Batman, Turkey, which will remain under the waters of Ilısu Dam, only Zeynel Bey Tomb was taken out of context and relocated opposite the city in 2017, while it was decided that the rest of the city to be covered by water and diving tourism would be opened (Figure 2.19).

Reconstruction: Reconstruction is a remake of the structure, which does not survive or very little of its original architectural elements survive, with the new material, in the direction of solid evidence, as it was in the past (Carta del Restauro Italiana 1931 art. 1; Fielden & Jokilehto, 1993; ICCROM / UNESCO 2000 art. 20.1). The reconstruction in the archaeological sites is experimental study and presentation, and should be carefully planned to avoid damage to the original remains (ICOMOS / ICAHM 1990 art. 7). However, contrary to these didactic aims, the reconstruction realized for tourism might disturb the authenticity rate and cause the structure to dominate the site (Mertens, 1995; ICOMOS 1996 art.7). Reconstruction in archaeological sites is tried to accept realizable, arguing symbolic value, education value; reuse and tourism potentials. However, the fact that the picturesque image of the ruined structure with the site, authenticity cannot be provided within rebuilt structure and is transformed into an imitation of authentic one, the impossibility of obtaining accurate information about the original state of the structure during the application, the loss of the original knowledge of the structure by destroying the original elements, the negative effects of the remake structure on the authentic values of the site, possibility of dominance on the site, and a misleading image of the structure and the site should be taken into consideration (Stanley Price, 2009). Reconstruction of the Knossos Palace at Crete, Greece in 1990s, constitutes a distorted image about the site. Concrete application has become a greater threat for the original material, which remains in small quantities (Kienzle, 1997; Papadopoulos, 1997; Stanley-Price, 2009) (Figure 2.20). Many temple structures in pre-Hispanic settlements such as Tikal, Guatemala; Chichen Itza, Mexico; Teotihuacan, Mexico; Copan, Honduras, were reconstructed on a large scale in the middle of the 20th century for promotion of the sites (Kidder II, 1968; Molina-Montes, 2013) (Figure 2.21, Figure 2.22). In reconstruction implementation, structures that have been destroyed as a result of a disaster or war and reconstructions of them for sustaining their research and memory value such as the Mostar Bridge in Bosnia-Herzegovina and old town of Warsaw, Poland should be considered separately from the reconstruction examples in archaeological sites (Stanley-Price, 2009).

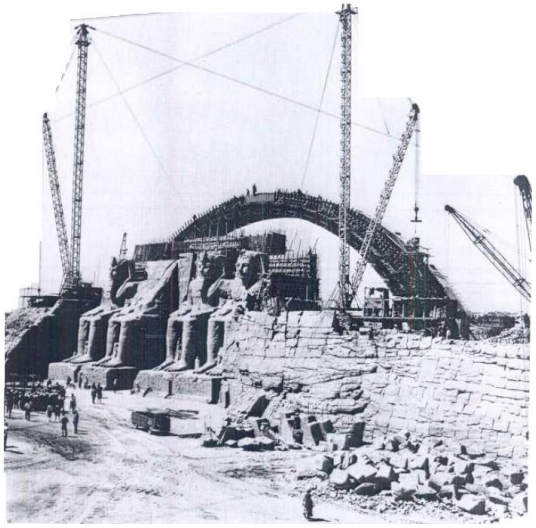

Figure 2.17. Relocation of Abu Simbel in Aswan, Egypt (Source: Berg, 1978).

Figure 2.18. Nymphaeum of Agios Stratigos at Pergamon, İzmir, Turkey (April 1, 2018).

Figure 2.19. Relocation of Zeynel Bey Tomb at Hasankeyf, Batman, Turkey (Source: https://www.ntv.com.tr Retrieved at April 12, 2018).

Figure 2.20. Reconstructed Knossos Palace in Crete, Greece (Source: https://en. wikipedia.org Retrieved at April 12, 2018).

Figure 2.21. Excavations at Tikal, Guatemala during the 1960s excavations (Source: http://overlandtravel.org Retrieved at April 12, 2018).

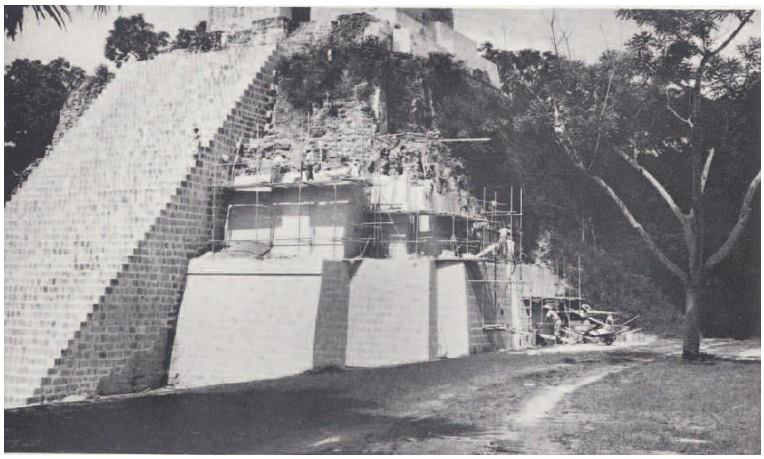

Figure 2.22. Reconstruction of Temple II at Tikal, Guatemala (Source: Kidder II, 1968).

When evaluated the conservation and presentation methods applied in archaeological sites, it is clear that applications such as leaving unexcavated or re-burial provide better protection for the original architectural elements than anastelosis. Anastelosis should only be preferred as a method that can be followed in the conservation of already excavated architectural elements; excavation should not be done in order to make anastelosis. In practice, it differs from restoration and reconstruction applications in archaeological sites by trying to minimize the use of new materials. However, as in restoration and reconstruction, the new material used in the anastelosis should be compatible and distinguishable (Carta del Restauro Italiana 1931 art. 8; ICOMOS 1964 art. 12; ICOMOS / ICAHM 1990 art. 7; ICOMOS 1999a art. 20) and should be realized when reliable information can be obtained (Carta del Restauro Italiana 1931 art. 1; ICOMOS 1964 art. 9). Although didactic purposes such as perceptibility of the structure, providing structural integrity in restoration and reconstruction (Woolfitt, 2007; Matero, 2008; Stanley Price, 2009), are also applicable to anastelosis, conservation of original elements should be the primary goal, rather than transmitting information to visitors and implementations should be carried out in accordance with this basic principle (Schmidt, 1999).

2.3. International Conservation Documents and Charters on Anastelosis and Reconstruction in Archaeological Sites

Many international and national charters, declarations and recommendations have been prepared to guide this area since conservation awareness has become vital. Organizations such as UNESCO, ICOMOS, ICCROM, ICOM and national organizations have held conferences and published conclusions. The concept of anastelosis is taking place in very few international documents, and it is possible to make conclusions about anastelosis from the articles concerning how restoration should be done. These documents also help to understand the differences between reconstruction and anastelosis.

The concept of anastelosis was first encountered in *the Athens Charter for the Restoration of Historic Monuments* which was published after *International Conference on the Protection and Conservation of Artistic and Historical Monuments* in 1931. According to this charter, if possible, the original members, salvable by anastelosis, should be put in place in ruin structures. The new material used in this process should be distinguishable (Article VI). The usage of modern techniques especially reinforced concrete was recommended in restorations (Article IV). The historic monument or building group should be handled with its natural surrounding in order to preserve their ancient character (Article III).

After *the Athens Charter, the Carta del Restauro Italiana* was published by the Council for Antiquities and Fine Arts in Italy in 1931. *The Carta del Restauro Italiana* refers to the anastelosis based on the previous *the Athens Charter*. Practices for completion of monuments should be avoided in archaeological sites, which are defined as "no more civilizations live on" according to this regulation; only anastelosis should be considered, which means reorganizing of fallen existing parts. When implementing this practice, the use of new materials should be kept to a minimum to ensure conservation conditions (Article 3). The use of new material should be distinguishable from its original; details should be completed in a simple manner without imitation and these applications should be described, in writing, in order not to be misleading (Article 8). If reconstruction is to be preferred, it should be done from reliable sources with the knowledge gained from the structure (Article 2). This regulation also addresses the importance of in situ protection (Article 10).

The Venice Charter, which is the most widely known in conservation charters and deals with the conservation components separately, was published in 1964. As in *the Carta del Restauro Italiana*, mentioned that anastelosis, which means replacing scattered parts, should be preferred by avoiding all reconstruction applications in *the Venice Charter*. The material used to join the original pieces must be distinguishable and should be used as little as possible (Article 15). In addition, it was stated that no hypothetical applications should be made during restoration work (Article 9), that modern techniques can be used in case traditional methods are insufficient (Article 10), the restoration should be done in a way that is not misleading with new material compatible with the original material (Article 12), and that all conservation work should be documented (Article 16).

In *Recommendation Concerning the Preservation of Cultural Property Endangered by Public or Private Works* published in 1968 emphasized the importance of in situ conservation (Article 9), it mentioned that the damaged cultural assets can be repaired, restored and reconstructed as it is inherited (Article 28).

In *the Italian Restoration Charter*, which was drafted by the Italian Ministry of Education and the Council for Antiquities and Fine Arts in 1972, regarded that addition of small pieces acceptable for the purpose of ensuring completeness, and the connection between the new material and the original material should be clearly visible. It is also mentioned in the same article that anastelosis can be applied only when it is distinguishable from its original, and it is recommended not to complete the missing details (Article 7).

The Declaration of Dresden in 1982, which deals with the preservation of cultural assets destroyed or damaged by war or natural disaster, addresses important principles related to reconstruction. The reason for the reconstruction was explained as the spiritual value attributed to the monuments and the desire to recognize them (Article 1). The need for protection was raised because the artefacts that were destroyed after the war constitute the memory value. The evolution of the structures until today and their roots which constitute their authenticity, make them worth protecting (Article 4). It was also stated that in case of war and destruction, documentation of single structure and building groups would benefit for their reconstruction (Article 5).

The International Lausanne Charter for the Protection and Management of the Archaeological Heritage published in 1990, is important because it was prepared considering archaeological sites only. It stated that the archaeological sites are non-renewable cultural assets, examples of which are not as much as other historical buildings

(Article 2). Site presentation is important for transfer of information to the community, the community to understand its roots and development; and also to provide conservation awareness. Site presentation and the information to be transferred must be constantly renewed and current approaches should be adopted. In this charter, the purpose of reconstruction is explained as experimental research and interpretation, and it is advised that the reconstruction should be carried out with great care, without rush and should be distinguishable (Article 7).

It was stated in *Workshop on Planning, Designing and Implementation Projects in Historic Areas in Barcelona* in 1990 that the anastelosis defined as a re-composition to replace the original parts of historical structures and reconstruction should be exceptionally allowed in light of reliable sources (Article 3).

The Nara Document on Authenticity, which constitutes a very important place in the conservation of the cultural assets, was specially prepared in 1994. In the world of standardization and globalization, authenticity was described as a unique element that must be held in conservation practice in order not to ignore minority cultures (Article 4).

The difference between reconstruction and restoration was explained in *the Burra Charter for the Conservation of Places of Cultural Significance* prepared in 1999. Reconstruction was defined as the addition of new material to the structure (Article 1). In some cases, the importance of the structure might be regained by reconstruction (Article 20). Minimal intervention is defined as coherence in order to respect the cultural significance of the building in practice (Article 1). Reconstruction should be as distinguishable as it is compatible (Article 20). As in *the Venice Charter*, it is mentioned that modern techniques can be used in the case where traditional methods are insufficient (Article 4). In addition, practices that reduce cultural value should be able to be reversed and should be reversed when the circumstances allowed (Article 15).

In the conclusion of the meeting, *International Cultural Tourism Charter Managing Tourism at Places of Heritage Significance* held in Mexico in 1999 shows that heritage sites are integrated with the living cultures, collections, physical and ecological values of this place and social, economic, political, cultural and tourism development policies should be considered with this integrity (Article 2.1). Once the natural and cultural values of the area site are determined, appropriate limits on the number of visitors, local access and transport systems and their effects should be established (Article 2.6). Visitors should be ensured to experience the site with the routes and these routes

should be the least intrusive on the physical texture, natural and cultural character of the site (Article 3.2).

Although it is explicitly stated in *the Venice Charter* that reconstruction should be avoided, in *the Riga Charter on Authenticity and Historical Reconstruction in Relationship to Cultural Heritage* prepared in 2000, states that reconstruction may be allowed and the term of anastelosis was not referred. The situations that reconstruction may be allowed are the loss of cultural assets as a result of human or natural caused disaster, the heritage has symbolic, artistic, urban or rural value or being important for regional culture. If there is adequate documentation of the structure, reconstruction can be performed in order not to harm to present historical texture or be misleading (Article 6).

Reconstruction was described as bringing the structure to a known earlier state and the difference from restoration is use of new material in reconstruction in *English Heritage Policy Statement on Restoration, Reconstruction and Speculative Recreation of Archaeological Sites Including Ruins*, prepared in 2001 (Article 5). In the same document, archaeological reconstructions are indicated as more problematic than buildings still in use. This is because the less information obtained concerning archaeological sites, the possibility that the application to be done is suspicious and the reconstruction can damage the structure (Article 16). Every practice in archaeological sites has the potential to change the character of the site. In order to minimize these changes and protect the texture, long-term and least intervention should be performed after examining the values and the importance of the site (Article 30).

In *the Principles for the Analysis, Conservation and Structural Restoration of Architectural Heritage* prepared in Zimbabwe in 2003, it was mentioned that every intervention should not harm the heritage values, but should be minimal as to keep them intact (Article 3.5). As in *the Venice* and *Burra Charters*, it was stated that traditional and innovative technique selection in conservation practices should be made on a case-by-case basis, taking into account the most harmonized with the heritage value (Article 3.7). Parallel to *the Burra Charter*, all applications must be reversible; however they should not limit new practices when they are not reversible (Article 3.9). Dismantling and reassembly procedures should be carried out only if it is not possible to protect the structure with other methods (Article 3.17). The new material used in the restoration work should be selected in accordance with the original material in consideration of the effects on the long term (Article 3.10), the authentic qualities of the structure and environment

should not lose in applications (Article 3.11), interventions should respect the authentic state of the structure and leave their marks to be recognized in the future (Article 3.12). It also emphasized the importance of the development of integrated site management in this charter (Article 3.13).

The principles of implementation was described in detail in the *English Heritage Conservation Principles Policies and Guidelines for the Sustainable Management of the Historic Environment* published in 2008. About the possibility of applications being reversible it was stated that, our current decision-making authority is limited, that future understandings may be different from today's; so that the interventions should be reversible (Article 100). In addition, it has been recommended to use materials and techniques that have been tried earlier so their effects are predictable and less harmful to the structure (Article 119).

The aforementioned international documents draw attention to differences between anastelosis and reconstruction. Thus, the differences between the two implementations and the approaches to be considered in archaeological areas are understood. Within this scope, anastelosis and reconstruction differences in archaeological sites can be explained as follows: Anastelosis is the re-erection of the structure by replacing original parts as much as possible and using minimum new material. Reconstruction is to exceptionally rebuild the structure, which is important for the site in previous known state, in the light of reliable sources. The common principle to be careful in both practices is that the implementations are applied in the light of reliable sources and that the new material used is distinguishable from the original material.

Although the difference between anastelosis and reconstruction might be understood from international conservation documents, since there are very few charters on anastelosis, the principles of anastelosis are not clear in related charters. This situation causes investigation of other conservation charters on reconstruction or restoration and deduce about anastelosis from these documents. Also opinions and experiences of the experts in the publications needed to be consulted in order to understand and determine the basic principles of anastelosis implementation.

2.4. Anastelosis Principles in Conservation

Anastelosis is the re-erection of the structures by placing the original pieces, belonging to scattered structural members to their original places, in archaeological sites (ICOMOS 1931 art. IV; Carta del Restauro Italiana 1931 art. 3; ICOMOS 1964 art. 15; Italian Restoration Charter 1972 art. 7.3; Gazzola, 1972; Sanpaolesi 1972a; Sanpaolesi, 1972b; Fielden, 1982; UNEP PAP/RAC 1990 art. III; Fielden & Jokilehto, 1993; Mertens, 1995; Ahunbay, 1996; Schmidt, 1997; Hueber, 2002; Woolfitt, 2007; White, 2007; Ahunbay, 2010). The use of original elements and the identification of their original locations is essential in the practice.

Dimacopoulos describes the applications of anastelosis and reconstruction, which are often confused with each other, as different faces of a coin (Dimacopoulos, 1985). Reconstruction is applied, using high amount of new material, in situations where the structure has been completely destroyed and no remains or has been left with little part of original building elements. Reconstruction is the re-build of the destroyed structure or parts of structure based on reliable documentation. This application is technically different from anastelosis since it requires a lot of new material (Sanpaolesi, 1972b; Hueber, 1991; Mertens, 1995; Schmidt, 1997; Hueber, 2002). In archaeological sites, reconstruction is an application that should be avoided. The Stoa[5] of Attalos at the Agora of Athens, Greece, has been rebuilt on its original foundations to perform the museum function in the site; this practice has caused the document value of the ruins to be lost irrecoverably (Figure 2.23). In a similar way, the gymnasion[6] at Sardes in Manisa, Turkey, is a negative reconstruction example of the fact that the original remains are lost and come to the forefront as scale in archaeological sites (Figure 2.24). Recently, the bouleuterion[7] at Patara in Antalya, Turkey and the Temple of Tyche at Side in Antalya, Turkey have been reconstructed. These applications, in which the original material is in small amount, have transformed the buildings into a striking brand new structure in the site with the level of completeness and colour of the new material used (Figure 2.25, Figure 2.26).

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[5] Stoa: Type of Ancient Greek portico of limited depth but great length, with a long wall at the back and colonnade on the front, usually facing a public space, used for promenades, meetings, etc. (Curl, 1999).

[6] Gymnasion: Place for physical exercise and teaching in Ancient Greece (Curl, 1999).

[7] Bouleuterion: Meeting space or debating chamber for senate in a Greek city (Curl, 1999).

Columns are the preferred elements for anastelosis application; while the height of other structural elements is insufficient, columns are more convenient to visualize and perceive the space (Starosta, 1999; Woolfitt, 2007). The application of anastelosis can be carried out on a variety of scales from a few columns to whole structure, depending on the amount of survived members.

Figure 2.23. The Stoa of Attalos in Agora of Athens, Greece (July 21, 2017).

Figure 2.24. Gymnasion at Sardes, Manisa, Turkey (Source: https://www.pinterest.com Retrieved at April 17, 2018).

Figure 2.25. Reconstructed bouleuterion at Patara, Antalya, Turkey (October 28, 2017).

Figure 2.26. The Temple of Tyche at Side, Antalya, Turkey (October 29, 2017).

The aim of anastelosis practice should be to conserve the integrity of the structure and maintain its original values (Mertens, 1995). The practice is designed to transfer the

knowledge of the structure as three dimensional. It is difficult for a layman to imagine the previous state of the destroyed structure, by seeing its scattered members on the ground (Fielden, 1982). Unlike restitution drawing on paper, anastelosis provides physical integration of fragments and recognition of fragments as three-dimensional (Hueber, 1991). Instead of being in a ruin state, the structure that is re-erected will provide more information. Also, if the pieces of the structures that are scattered on the ground are re-assembled, they are less worn than when they are on the ground; which provides better conservation for the members. The application of anastelosis plays a convincing role in conserving cultural assets, creating more meaningful structures for visitors as well as contributing directly to the conservation of the elements. The use of the pieces, on the ground for anastelosis application, also helps to organize the archaeological site and provides a better exhibition and circulation. In this way technical measures for the conservation of pieces can be made easier (Hueber, 1991; Melucco Vaccaro, 1996a; Hueber, 2002). Meeting expectations of visitors, raised by mass tourism and technological developments, has increased the number of anastelosis implementations (Melucco Vaccaro, 1996a; Melucco Vaccaro, 1996b). In practice, the purpose should be neither to meet expectations of visitors nor to use opportunities of technology, but should be to protect the structure and give meaning to it.

2.4.1. Construction Technique

Unlike reconstruction, anastelosis is a term used only for structures in archaeological sites (Fielden, 1982; Hueber, 1991; Philippot, 1996). Although implementation practice is commonly seen in the Mediterranean region (Woolfitt, 2007), it is not a correct approach to limit the application to Greek and Roman periods. The important point is to determine the location of the building elements correctly and replace them with minimal intervention to the original material. For this reason, anastelosis can be made in high strength cut stone structures, which are built with specific sized stones, without mortar in dry technique. Structures made from materials such as mudbricks, rubble stone and brick are not suitable for anastelosis application because the mudbricks are suitable to deterioration, rubble stones have no characteristic shape and brick structures were built using mortar (Sanpolesi, 1972a; Fielden & Jokilehto, 1993; Mertens, 1995; Philippot, 1996; Hueber, 2002).

2.4.2. Authenticity

Anastelosis is an application that can be done where the original elements of the structure are in excess. The main difference that separates this practice from reconstruction is the principle of authenticity. Anastelosis should not be done in cases when original material is very rare; otherwise the application turns into a reconstruction (Sanpaolesi, 1972b; UNEP PAP / RAC 1990 art. III; Ahunbay, 1996; Hueber, 2002). In practice, as the original elements are used; also the original locations of these elements should be determined and locate their places in the detailed study results (Sanpaolesi, 1972b; Mertens, 1995; Ahunbay, 1996; Petzet, 1999; Woolfitt, 2007). Balanos randomly placed architectural elements in the anastelosis of structures in the Acropolis of Athens, Greece. For this reason, in the recent period studies, the misplaced elements were dismantled and correctly replaced (Jokilehto, 1999). Care should be taken so no further damage is done to the structure when the elements are placed in locations. It should be taken into account that some of the parts lying on the ground may have lost their detail to not be used in anastelosis (Fielden & Jokilehto, 1993; Schmidt, 1993; Jokilehto, 1995; Philippot, 1996; Hueber, 2002). It is essential to maintain the construction technique and structural characteristics as well as material authenticity. In anastelosis applications, the mortar is not used between the architectural elements; the blocks are connected to each other by newly produced dowels and clamps. Unfortunately, it is not possible to use the dowels and clamps in their original state due to deteriorations, so that these pieces are produced with new material compatible with the original stones. In some cases such as Letoon in Muğla, Turkey even the ancient machines were reproduced and anastelosis studies were tried with them in order to maintain entire construction technique (Figure 2.27).

In practice, attempts are made to maintain different authenticity values. Still, there are some opinions that although the authentic values of the structure are conserved and maintained, the original structure can never be recovered; anastelosis is a ruin architecture that produces an artificial ruin (Schmidt, 1993; Jokilehto, 1995). Since the ruins are witnesses of the history, they should be treated in respect of their authentic values in the image of ruined site (Schmidt, 1999).

2.4.3. New Material

New materials may be used in small amounts to achieve visual and structural integrity of the structure anastelosis, or new material may not be added if the present original elements can come together seamlessly (Woolfitt, 2007). The important thing to note when using new materials is that the material should not draw attention at first sight; is in harmony with structure's original elements. The use of new material should not get ahead of original elements of the structure, and it should not disturb the ratio of authenticity (Carta del Restauro Italiana 1931 art.3; ICOMOS 1964 art. 15). The formal integrity of the structure has to be maintained. When completeness of lacuna, which means void of lost material occurred in time, is hypothetical or there is more lacuna to be completed than original members, restoration should be done to reduce this complexity. The use of too much new material to re-erect the structure can destroy the lacuna effect and cause the original material to become worthless alongside the new material. The anastelosis of structures with too many lacunae should be avoided in order not to be able to pass on information fragmentally about their original past (Melucco Vaccaro, 1996b; Philippot, 1996).

The use of new material in excess amount can cause the creation of a new structure by breaking the original and historical value of the structure; this can also cause misinterpretation of the structure by visitors (Sanpaolesi, 1972a; Fielden & Jokilehto, 1993; Mertens, 1995; Ahunbay, 1996; Hueber, 2002). In some applications, new materials that do not harmonised physically to the original material can be used by exaggerating the principle of distinguishability of new material (ICOMOS 1931 art. IV; Carta del Restauro Italiana 1931 art. 8; ICOMOS 1964 art. 9, art. 12, art. 15; Italian Restoration Charter 1972 art. 7.1, art. 7.3; ICOMOS/ICAHM 1990 art. 7; ICOMOS 1999a art. 20). Completion of the originally white marble columns and architraves with bricks in the Forum of Pompeii in Naples, Italy is an application that breaks the visual harmony and the integrity (Ahunbay, 1996) (Figure 2.28). The use of new material should be compatible with the original material, not only physically but also structurally. With the encouragement of new technologies in the 20th century, cement was used abundantly in archaeological sites without considering the results. Over the next few decades the damage caused by the cement has become visibly. Cement has been used both in joining broken parts and in reinforced concrete structures, in place of missing parts. The cement-based binders have been replaced by epoxy over time. However, it should not be forgotten that epoxy is an

irreversible adhesive. The most suitable adhesive should be determined after the analysis of the original material has been carried out in the laboratory. The use of clamps and pegs to combine architectural elements must be completely abandoned, the use of stainless steel should only be preferred when necessary. Instead of stainless steel, fiberglass or titanium bars should be used which give better results in heat and weight changes (Mertens, 1995). In recent years, these materials have been preferred in applications in Sagalassos at Burdur, Turkey and the Acropolis of Athens, Greece (Van Balen, Ercan & Patricio, 1999; Ioannidou, 2007b) (Figure 2.29, Figure 2.30). In the case where the stone quarry used in the construction of the original structure is known, the new material can be obtained from the same stone quarry. However, because of lack of knowledge, budget and time, artificial stone production was chosen. In this case, artificial stone production is suggested by adding stone dust, stone fragments and binding additives for compatibility to the original material (Mertens, 1995). However, it should be taken into consideration that artificial stones containing cement material may damage the original structure over time. Completion of missing parts should be done for structural necessity, and should not be aimed reaching the full volume of the structure in every case. If the structure is to be completed in such a way as to reach its full volume, this original form should be in the form of a full imitation. Completion in an abstract way in the original volume may lead to misinterpretation of the structure (Mertens, 1995; Philippot, 1996). Completion of missing architectural parts is accomplished by making exact copies of the parts or by plain copies without ornamentation.

Figure 2.27. Using ancient systems for placing of stones at Letoon, Muğla, Turkey (Source: https://www.didierlaroche.org Retrieved at April 17, 2018).

Figure 2.28. Completion of missing parts with brick in Eumachia at Pompeii, Naples, Italy (Source: https://www.encirclephotos.com Retrieved at April 17, 2018).

Figure 2.29. Fiberglass rods in restoration of the Sagalassos monuments in Burdur, Turkey (Source: Patricio, 2011).

Figure 2.30. Titanium clamps in restoration of the Acropolis Monuments in Athens, Greece (Source: Ioannidou, 2007).

2.4.4. Integrity and Structural System

It is important to ensure structural integrity as well as visual integrity when structures are re-erected. It should re-gain the structural function of the building by re-uniting its architectural elements have not survived, if it is not possible, the new structural system should be designed in order to be re-assemble (ICOMOS 1964 art. 10; Mertens, 1995; Ahunbay, 1996; ICOMOS 1999a art. 4; ICOMOS 2003 art. 3.7). At the beginning of the 20th century, reinforced concrete and steel materials were used extensively in anastelosis with the recommendations of international charters. Starosta addressed two methods of re-erection of columns that play an important role in the anastelosis. The first is to support the columns with reinforced concrete system and to transfer the load. The second is to raise the columns with the side walls or entablature or the structure and to provide to carry their own loads. In the anastelosis of the Treasury of the Athenians at Delphi, Greece it was provided to carry the structure's own load (Figure 2.31). Reinforced concrete or iron elements are included in the system when the original structure is inadequate as load-bearing (Starosta, 1999). In 1856, the columns of the Deorum Consentis Portico in Rome, Italy were re-erected and connected to the wall behind them with iron tension rods (Figure 2.32).

Reinforced concrete is used as a substitute for stone elements that are missing, and it is also a preferred method for providing structural strength in the re-erected structure. However, the new structure system should be carefully planned. It has been found that these materials damaged to original structure by overloading or salting. Balanos placed iron beams into the stone architraves of the caryatid's portico in Erechtheion at the Acropolis of Athens, Greece. In this method, which developed as an alternative to the original structural system, the iron material rusted and also caused the cracking of the caryatids due to weighting (Starosta, 1999; Mallouchou-Tufano, 2006a; Mallouchou-Tufano, 2006b) (Figure 2.33). In gymnasion at Sardes in Manisa, Turkey, the structure was re-erected by a new reinforced concrete system; the original stone elements were used as façade cladding material to conceal the reinforced concrete system. Sometimes, in order to provide strength in applications, the columns are raised on a new reinforced concrete foundation while the missing parts of the building are completed with reinforced concrete. However, as in the Knossos Palace at Crete, Greece, over the years it has been observed that reinforced concrete material damages the structure (Papadopoulos, 1997).

Partial anastelosis, which is made up of only the existing upper parts when the lower structure does not reach present day, causes the scale to be misrepresented in some cases. The existing parts of the Memmius Monument at Ephesus in İzmir, Turkey were tried to be re-erected. This work, done with few elements, caused the structure not to be perceived as a whole (Figure 2.34). Instead, it may be more appropriate to display all the available elements as display pieces rather than putting them together (Mertens, 1995).

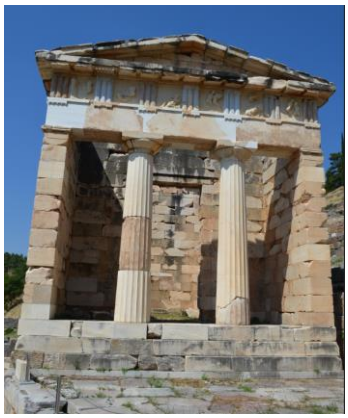


Figure 2.31. Anastelosis of the Treasury of Athenians at Delphi, Greece (July 20, 2017).

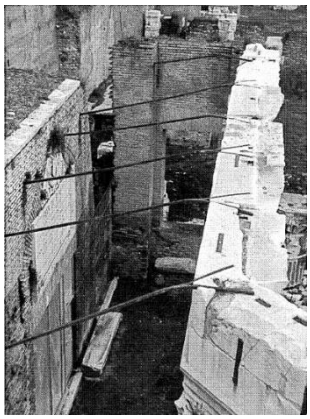


Figure 2.32. Iron tension rods in the Deorum Consentis Portico, Rome, Italy (Source: Starosta, 1999).

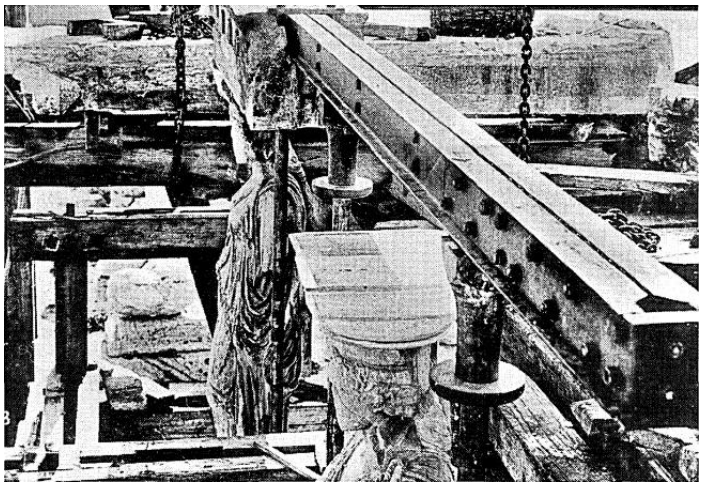


Figure 2.33. Iron I-beams in architrave of the Caryatid's Portico in Erechtheion, the Acropolis of Athens, Greece (Source: Starosta, 1999).

Figure 2.34. The Memmius Monument at Ephesus, İzmir, Turkey (January 17, 2015).

2.4.5. Reliability

As in the case of reconstruction, it is necessary to make anastelosis based on reliable documentation. By making researches and examinations, information such as original volume, form, height should be figured out and the places of scattered architectural elements should be precisely determined. Where such information about the

structure cannot be determined, intervention should be avoided (Carta del Restauro Italiana 1931 art. 2; ICOMOS 1964 art. 9; Sanpaolesi, 1972b; UNEP PAP/RAC 1990 art. III; Fielden & Jokilehto, 1993; Philippot, 1996; Ahunbay, 1996; Hueber, 2002). The new materials and systems used should be such as to accurately convey the integrity of the structure; wrong impressions should be avoided. Information about the application should be transferred to the visitors in the site. The details of the conservation works in Pergamon in İzmir, Turkey have been described to visitors by information panels in the site (Figure 2.35).

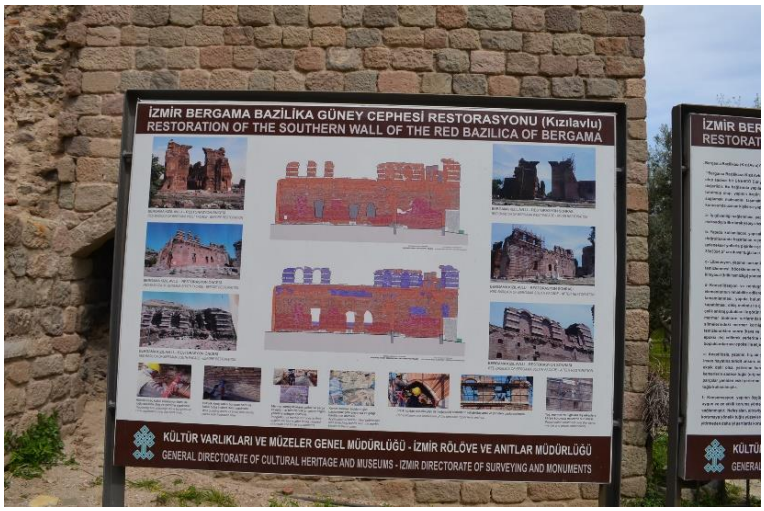


Figure 2.35. Information panels about restorations of the Red Basilica at Pergamon, İzmir, Turkey (April 1, 2018).

2.4.6. Reversibility

Implementation of anastelosis may lead to errors in practice even though it is done in the light of reliable sources. In addition to this, thanks to developing material technologies, it may be possible to carry out applications in later periods that do not exist in the past. Even the materials that are considered modern at that time can be damaged after a while. For this reason, the application of anastelosis should be reversible (Fielden, 1982; Fielden & Jokilehto, 1993; Mertens, 1995; ICOMOS 1999a art. 15; Hueber, 2002; ICOMOS 2003 art. 3.9). Reversing should be done without damaging the original elements. Anastelosis should be seen as a period in history of the structure, and it should

not be forgotten that every intervention made leaves a trace in the structure (Hueber, 2002). For this reason, reversibility remains as an unrealistic concept to be fully achieved without damaging original members. The Sagalassos restoration team preferred the term of re-treatability by evaluating reversibility is an impossible task. The integration of the architectural elements was made with fiberglass rods in the applications in the ancient city of Sagalassos in Burdur, Turkey. Thus, in the moment of an earthquake, the original elements will be broken, not the fiberglass rods. Rods that are easy to change afterwards make it possible to intervene without damaging the structure (Van Balen, Ercan & Patricio, 1999).

2.4.7. Documentation

The application of anastelosis should be primarily considered as a research project. Scientific research should be carried out meticulously since the application should be done with high reliability. The research study also reveals the authentic values of the work, contributing to the understanding of the history and the periods of its construction, as it will increase reliability. Scientific research should be carried out as a precondition for conservation work even in cases where anastelosis cannot be done. In addition, every step of anastelosis application should be documented. Findings should be recorded before implementation, and necessary documentation should be made at project stages. Once the application is complete, information such as cramp locations, which provide information about the construction techniques of the structures, will become unavailable, but will be visible through the documents. The restoration work carried out in the Acropolis of Athens, Greece provides a research area, the structures are examined in detail and each application is documented and shared with the public (ICOMOS 1964 art. 16; Italian Restoration Charter 1972 art. 7.3; Sanpaolesi, 1972b; Hueber, 1991; Fielden & Jokilehto, 1993; Ahunbay, 1996; Hueber, 2002; Ahunbay, 2010).

2.4.8. Effect to the Site

Integrity in the anastelosisis is not only based on the structure that is re-erected, but should also be assessed by foreseeing the effect that the structure will have on the archaeological site after the anastelosis. When the anastelosis to be done in the case where

the other structures in the site are mostly standing will not cause harm, the anastelosis to be done in the site where structures are mostly ruined will come that structure to the forefront by emphasis too much. In addition, the significance of the structure that will gain after anastelosis should be parallel to its original importance within the context. The Library of Celsus at Ephesus in İzmir, Turkey, which was re-erected in 1970-78, became the focal point of the site (Schmidt, 1997; Demas, 1997) (Figure 2.36). In contrast to this practice, the Trajan Fountain at Ephesus has been re-erected by pressing the original height to avoid giving too much emphasis to the structure. Although the emphasis of building is reduced, the practice should be debated because it gives incorrect information about the height (Fielden & Jokilehto, 1993; Schmidt, 1993; Jokilehto, 1995; Mertens, 1995; Ahunbay, 1996; Hueber, 2002) (Figure 2.37). It should not be forgotten that the structure re-erected by anastelosis is complete with the site it is in. A structure that is exhibited in the museum by breaking away from its original context, becomes an object of exhibition (UNESCO 1968 art. 9; UNESCO 1972 art. 5; Sanpaolesi, 1972a, Mertens, 1995; ICOMOS 1999b art. 2.1, art. 2.6). The Altar of Zeus at Pergamon, Turkey was brought from the site and combined together in the Pergamon Museum in Berlin, Germany leaving only a foundation part in the site that does not make sense (Figure 2.38, Figure 2.39).

Figure 2.36. The Library of Celsus at Ephesus, İzmir, Turkey as focal point of the site (January 17, 2015).

Figure 2.37. The Fountain of Trajan at Ephesus, İzmir, Turkey with reduced height (January 17, 2015).

Figure 2.38. The Altar of Zeus at Pergamon Museum, Berlin, Germany.
(Source: http://www.wiki-zero.com Retrieved at April 17, 2018)

Figure 2.39. Foundation of the Altar of Zeus at Pergamon, İzmir, Turkey.
(April 1, 2018)

In conclusion, of the basic principles of anastelosis, authenticity principle comes to the forefront among other principles. As being a distinctive principle from restoration and reconstruction, it is also essential that maintenance of structural and contextual authenticity as much as material authenticity. In order to sustain the contextual components of the structure after the anastelosis implementation, it should be handled with original setting that it is located in. The effect of the re-erected structure to the archaeological site also should be considered to not disturb other ruins in their landscape and create a harmonious image of the ancient site. The new material, used only in small amount, is expected to provide material compatibility while being noticeable from original material and not to break the visual integrity. The new structural system, designed when it is not possible to re-erect the structure with its original structural system, should also not harm the authentic features and should regain its structural integrity. All the implementations including anastelosis should be seen as a research project and are required as a result of scientific study based on reliable sources since the determining original places of fallen members is fundamental. Since any kind of intervention leaves traces as a matter of material and time, it is not achievable to reverse them without damaging original structure, but at least they should be re-treatable in order to re-intervene the structure in case of finding new information or material technologies or else any mistake in previous implementation. Therefore, the basic principles of anastelosis were determined in the direction of international conservation charters and ideas of experts as emphasis of the structure within site scale and in original context, structural and visual integrity of the monument, authenticity, reliability, distinguishability, visual and material compatibility, reversibility and re-treatability.

CHAPTER 3

EXAMINATION OF THE CASE STUDY EXAMPLES

The worship activity, the architectural development of the Greek and Roman temples, plan features, the temple-city relation were investigated in order to understand both the significance of the temple in city and social life, and the reasons of why temple was chosen for anastelosis implementation, since temple was chosen as the structure type of the anastelosis implementation in the study.

The Temple of Athena at Assos (~530 BC, Behramkale, Ayvacık, Çanakkale), the Temple of Athena at Priene (4th century BC Güllübahçe, Söke, Aydın), the Temple of Leto at Letoon (160-130 BC Kumluova, Seydikemer, Muğla), the Temple of Apollo at Smintheion (2nd century BC, Gülpınar, Ayvacık, Çanakkale), the Temple of Apollo at Side (2nd century AD, Side, Manavgat, Antalya), the Temple of Trajan at Pergamon (114-129 AD, Bergama, İzmir) and Temple A at Laodikeia (2nd century AD, Eskihisar, Denizli) are determined as anastelosis examples (Table 3.1, Figure 3.1). Within the scope of the study, the survived structures in the ancient cities were introduced in order to understand the effect of the anastelosis implementation on the site scale. Then excavation and restoration / anastelosis studies including the first excavations and present-day practices in the city were examined chronologically. The evaluation was carried out in line with the principles that emphasis of the structure within site scale, integrity of the monument, authenticity, reliability, distinguishability and compatibility, reversibility and re-treatability. The present situation of the structure in the archaeological site and its original context within the city in site scale principle, both structural and visual integrity in integrity principle, also both visiual and material compatibility in distinguishability and compatibility principle were examined.

Table 3.1. General information on the selected temple examples.

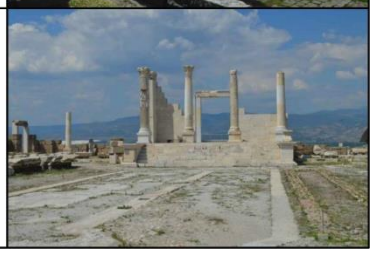
Structure	Location	Construction Date	Implementation Date and Team	View of the Temple after Implementation
Temple of Athena at Assos	Behramkale, Ayvacık, Çanakkale	~530 BC	1981-2005 Ümit Serdaroğlu / Ege University 2007-2010 Nurettin Arslan / Onsekiz Mart University	
Temple of Athena at Priene	Güllübahçe, Söke, Aydın	3rd quarter of 4th c. BC	1965-1966 Turkish authorities	
Temple of Leto at Letoon	Kumluova, Seydikemer, Muğla	160-130 BC	2000-2007 Didier Laroche / IFEA	
Temple of Apollo at Smintheion	Gülpınar, Ayvacık, Çanakkale	3rd quarter of 2nd c. BC	1980-1995 2005-2014 Coşkun Özgünel / Ankara University	
Temple of Apollo at Side	Side, Manavgat, Antalya	2nd c. AD	1983-1989 Jale İnan / İstanbul Technical University	
Temple of Trajan at Pergamon	Bergama, İzmir	114-129 AD	1979-1994 Wolfgang Radt / DAI	
Temple A at Laodikeia	Eskihisar, Denizli	2nd c. AD	2009-2011 Celal Şimşek / Pamukkale University	

Figure 3.1. Locations of studied sites
(Source: Google Earth date of image: 31.12.2016 date of editing: 23.05.2018).

3.1. Importance of Temples in Ancient Greek and Roman Cities

The first structure in which the worship function is performed is a hut-like, rectangular-shaped structure in which the cooker in the centre and the eating function is arranged, or simple structures in with the cult image in it. It is known that the sacrifice rituals are main act and after that eating together is realized (Gebhard, 1993; Burkert 1993; Marinatos, 1993).

The altar in front of the temples is the element in the primary necessity for the sanctuary, and its presence predates the temple. Before the classical period, it was determined that temple structures did not exist and worship was done at the altar. Many sanctuaries existed before the temples, and some have never had temples. For the ritual of worship, the presence of altar and temenos[8] is sufficient. The development of the Greek temple is not due to a change in the practice of worship but to the decision of monumentalization. In later periods, sacrifice and eating activities continued as the basis of the ritual of worship (Sourvinou-Inwood, 1990; Sourvinou-Inwood, 1993; Marinatos, 1993).

[8] Temenos: A sacred enclosure surrounding a temple or the holy spot (Harris, 1993).

Starting from the 8th century BC, structures dedicated to a cult or god / goddess developed. These structures are in rectangular or horseshoe form consisting of a single space and provided with entrance from the east to meet the sun (Figure 3.2). Later, the peristasis[9] with wooden columns was added to protect the mudbrick walls of the sacred room with eaves and enrich the view of the sacred room. Stone columns and walls replaced wooden columns and adobe walls when tile was started to be use as roof material. Temples started to be built with durable materials not only to carry a heavy roof; but also they symbolized the power of the settlement (Fletcher, 1896/1996; Kostof, 1985; Burkert, 1988) (Figure 3.3). During this period, a trend toward monumentalization began. As the polis emerged and religion became the focal point of the city, some cities took the temple to the centre to describe themselves. The continuous wars between the city states, the interaction with the Greek world and the outside world, the increasing interest in Greek identity and heroism, the colonization in the islands and Anatolia, increased competition between cities and the need to establish sanctuaries defining the new polis raised. The temple has become a symbol for city states, a manifestation of power and prestige. The temple began to be built in areas containing an altar defining the sacred area and occasionally a sacred focus, such as tree, rock, spring or cave. The altar, the most important element in temenos, has lost its spatial significance and centrality against the temple, which has become physically more impressive. During this transformation some sanctuaries were completely abandoned or temples were built on or near some of them (Mazarakis, 1988; Sourvinou-Inwood, 1990). It is argued that the Greek temple should be seen as sculptural element rather than functional enclosure since all the commun worship activity still realized in altar and no one allowed to enter the temple except priests (Norberg Schulz, 1975).

The Greek temple form with stone walls and pediment[10] began to develop in the 7th century BC. There are opinions that the new architecture was inspired by the Near East and Egypt; temple, cult, and altar elements from Near East, colonnades and their feeling of monumentality was inspired by Egyptian hypostyles[11] (Burkert, 1988; Marinatos, 1993) (Figure 3.4). Doric and Ionic orders that Vitruvius mentioned in De Architectura

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[9] Peristasis: A four sided porch or hall of columns surrounding the cella in an Ancient Greek temple (Retrieved from yourdictionary.com May 20, 2018).

[10] Pediment: Low pitched triangular gable following the roof-slopes over a portico or façade in Classical architecture, formed with raked cornice of the same section as that of the horizontal entablature at its base and mitring with it in part (Curl, 1999).

[11] Hypostyle: Having a roof supported by pillars, typically in several rows (Retrieved from oxforddictionaries.com May 20, 2018).

developed in the 6th century BC. Between 600 and 300 BC, well known temples such as the Temple of Apollo at Didyma in Aydın, Turkey; Parthenon at the Acropolis of Athens, Greece; the Temple of Apollo at Delphi, Greece; the Temple of Zeus at Olympia, Greece were built (Burkert, 1988; Marinatos, 1993) (Figure 3.5, Figure 3.6, Figure 3.7, Figure 3.8). In some cases, the entrance of the temple within the sanctuary area, called temenos, which in some cases was marked by the boundary stones called peribolos[12], has been provided from the east if there was no geographical obstacle. There are water basins in the temenos to purify before ritual. The temple is usually elevated in odd numbered steps. Sometimes the colonnaded passage surrounding the whole temple creates a visual boundary between the sacred room and the outdoor. There are statues in some temples in the sacred room. Behind this statue there can be a back room that serves as storage. The altar opposite the entrance to the temple is where the fire is burned and the sacrifice is done (Burkert, 1988; Vitruvius III, trans. 1990; Sourvinou-Inwood, 1990).

Vitruvius (1st century BC) conveyed as the development of the temples that, the megaron-like *in-antis* temple first developed and then by increasing the number of columns prostylos, amphiprostylos, peripteros, dipteros and pseudo-dipteros forms emerged. The temple type called in-antis, compromised with two columns within ante[13] walls, are extensions of the side walls of the cella[14] and proportioned pediment above these columns. The temple that the walls of the cella are not extent, but four columns opposite the cella is prostylos. If these four columns are symmetrically located to both façades of cella, this is amphiprostylos. 6x11 columned temples are defined as peripteros, 8x15 double row columned as dipteral. Pseudo-dipteros is a temple formed from dipteros plan by removing second column row between cella and a peristyle[15] (Figure 3.9). In addition to these, there are also temples in dipteros style where their cella are left without a roof as uncovered such as the Temple of Apollo at Didyma in Aydın, Turkey. The temples are also divided into five classes according to the ratio of the column spacing. These classes, with spacing between columns increased are pycnostylos, systylos, diastylos, araeostylos and eustylos (Figure 3.10). The architectural order of the temples

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[12] Peribolos: An enclosure, wall or colonnade around an ancient Greek (or Roman) temple or sacred space; the sacred space enclosed by this (Retrieved from oxforddictionaries.com May 20, 2018).

[13] Ante: A square pilaster on either side of a door, or at the corner of a building (Retrieved from oxforddictionaries.com May 20, 2018).

[14] Cella: Enclosed part of a Greek or Roman temple including the sacred chamber and vestibule, in fact everything within the walls. In Greek, naos (Curl, 1999).

[15] Peristyle: A row of columns surrounding a space within a building such as a court or internal garden or edging a veranda or porch (Retrieved from oxforddictionaries.com May 20, 2018).

are in three classes: Doric, Ionic and Corinthian (Figure 3.11). For Doric order that preceded the other orders, Vitruvius proclaimed that this order emerged in the Temple of Hera at Argolis, Greece which was built by Dorus, king of Akhaia. Although there are no certain proportions in the first Doric temples, in the following examples, a similarity between the temple and the human body was established and the proportions of the human body were transferred to the temple members. Doric order is rougher compared to the Ionic order because of its proportions, so it is likened to male body. There is no base under the column in the Doric order; the column rises above the stylobate[16]. An architrave[17] is carried over the column with the aid of a pillow-shaped capital[18]. Above architrave, there are triglyph[19] that correspond to between the columns; and among triglyph blocks there are metope[20] which are ornamented sometimes. Transition to the roof was achieved with the cornice[21] above the triglyph and metope. The columns are intended to look elegant and by giving a curve called entasis[22]; (Vitruvius III, IV, trans. 1990; Kostof, 1985). The Temple of Concordia at Agrigento in Sicily, Italy which was built in the 5th century BC, is an example for Doric-style temples (Figure 3.12).

On the colonized West Anatolian land, these temples' order were named as Ionic order, inspired by Ion, the leader of the colonies. Contrary to the Doric order, the Ionic order was based on female body. It was tried to create a more pleasant order by eliminating the ratio mistakes in Doric order. The columns are thinner and higher than Doric order. There is a base to carry them under the columns, flutes in the body of the column, which express the folds of women's clothing, volutes in the capital were inspired by the curves of the hair. Architrave blocks are placed on the capitals. There are blocks

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16 Stylobate: 1. Upper step of a three stepped crepidoma forming the platform on which a Greek temple any colonnade or peristyle stands. 2. In Classical architecture any continuous base, plinth or pedestal on which a row of columns is set, properly the uppermost part of a stereobate (Curl, 1999).

17 Architrave: Essentially a formalized beam or lintel, it is the lowest of the three main parts of an entablature; itself often divided into fasciae (Curl, 1999).

18 Capital: Head or topmost member of a colonnette, column, pilaster, pier, etc., defined by distinct architectural treatment and often ornaments (Curl, 1999).

19 Triglyph: One of the upright block occurring in series in a Doric frieze on either side of the metopes, possibly suggesting the outer ends of timber beams. Each plain face of the triglyph has two vertical V-shaped channels cut in it called glyphs, and the edges are chamfered with half-glyphs, hence the three glyphs in all (Curl, 1999).

20 Metope: Plain or enriched slab on the frieze of the Doric order between triglyphs (Curl, 1999).

21 Cornice: A horizontal moulded projection crowning a building or structure, especially the uppermost member of the entablature of an order, surmounting the frieze (Retrieved from oxforddictionaries.com May 20, 2018).

22 Entasis: A slight convex curve in the shaft of a column, introduced to correct the visual illusion of concavity produced by a straight shaft (Retrieved from oxforddictionaries.com May 20, 2018).

of friezes[23] above architrave which the historical events were ornamented. The transition to the roof is provide with the cornice as in the Doric order (Vitruvius III, IV, trans. 1990; Kostof, 1985). The Temple of Artemis at Ephesus in İzmir, Turkey, built in 560-550 BC, exemplifies the first temples in Ionic order (Figure 3.13).

There is no difference from the Ionic order except for the capital of the Corinthian order[24]. The column in the Temple of Apollo at Bassae, Greece dated to the 5th century BC, is the first temple where the Corinthian order was used, is more visual than structural. Temples of Apollo were surrounded by trees, referring to the myth that Leto, who was pregnant with Apollo and Artemis, escaped from Hera to find no place to give birth, and eventually gave birth by lying a daphne tree in Delos. It is thought that for the first time in the Temple of Apollo at Bassae this tree myth was moved into the temple and the capital carved with acanthus leaves was used in the cella (Vitruvius III, IV, trans. 1990, Kostof, 1985) (Figure 3.14, Figure 3.15).

As it is in other structures of the Roman period, the temple continued its inheritance from Greek architecture. In the design of the Roman temple, one or two elements differ from the Greek temple in the foreground. The Greek temple is accessible from all directions in the site. It had a sacred boundary, which is temenos, within the city but as a landscape element of its surroundings. The Greek temple, which was seem to have been randomly placed, was placed near natural elements such as rocks and springs associated with the characteristics of the gods and goddesses (Figure 3.16). It can be argued that the temple identified with the place itself. The Temple of Apollo at Delphi was located on a slope of Mount Parnassos that had dominant view over the valley (Figure 3.7). From 5th century BC, Greek temple became an element of grid plan city; not like in orthogonal hierarchy as in Egypt but as the easiest way of planning a colonial city. Still, the temple was located according to a natural determinative element (Norberg Schulz, 1975). In Miletos, an early grid plan city, temples were placed in organized city plan but still they enclosed with sacred space and had dominance among other structures. In a similar way, Priene, near Miletos, had a grid plan and the Sanctuary of Athena was located

[23] Frieze: Horizontal central band of a Classical entablature below the cornice and over the architrave, occasionally omitted in the Greek Ionic order. It is a flat unornamented band in Tuscan order; it is broken up into metopes and triglyps in the Doric order; and is plain or enriched with sculptural relief in the Ionic, Corinthian and composite orders (Curl, 1999).

[24] Vitruvius mentioned the capital of the Corinthian order to the following story; to commemorate a young girl who lost her life in Corinth, wet nurse filled her basket with items from the girl and put a roof tile above the items when visiting her tomb. The basket placed on the acanthus root as a result of coincidence. This capital emerged when the acanthus root sprouted and the leaves bent because of weight of the roof tile (Vitruvius IV, trans. 1990).

in the upper part of the city on a slope of Mount Mykale that could be easily seen from lower parts and in a unity with sacred mountain (Figure 3.61, Figure 3.78). Crepis[25], which circles the four sides of the building, also provides access to the peristyle section of the temple from every side. In the Roman period, temple turned into a part of well organized and planned city; the surroundings of the temple were determined and limited with galleries in most examples. Temple was approached from one direction and its front façade was emphasized more. The temple was raised on a podium and it was only reached by the cella section with steps from the front. The effect of the Roman city plan, reflected in the design of the temple. The area where the temple was located has been carefully planned and the orientation to the temple in the city has been provided. The importance of the temple within Greek polis, as being the greatest building, began to decrease in Roman period; the size of the temple shrunk and became like an ordinary element of the city. Social structures such as baths, basilicas or palaces as parts of the building complex were greater in size and magnificence than temple structures (Figure 3.17). The Temple of Fortuna Primigenia at Praeneste (Palestrina), Italy was positioned at the top of the terraces. Forum located at the bottom terrace, in the other terraces there are colonnaded shops, the square with religious displays was surrounded by Corinthian porticos, the rows of semi-circular steps for spectators and the circular temple at the top. During the Roman period religious rituals were combined with performance and transformed into a kind of activity for the spectators (Norberg Schulz, 1975; Kostof, 1985; Roth, 2000) (Figure 3.18). These theatre-temples were designed by building the temple on the theatre cavea[26] (Stratonikeia in Muğla, Turkey) (Figure 3.19) or by building the temple behind the scene (Temple of Dionysus at Pergamon in İzmir, Turkey) (Figure 3.20) so that the spectators in cavea can watch the religious ceremony (Kostof, 1985; Serdaroğlu, 2004).

It is seen that besides other orders, the Corinthian order is preferred in the Roman temple. The columns surrounding the cella are integrated sometimes with the cella wall and called pseudo (fake) column. One of the best preserved examples of the Roman temple is Maison Carree in Nimes, France. The temple was raised on a podium; of the peristyle cella reaching from the front are surrounded by fake Corinthian columns on the back and side parts (Figure 3.21). In addition to the rectangular temples in the Roman

[25] Crepis: 1. Foundation of a building. 2. Platform or crepidoma or crepido on which a Greek temple stood, normally three steps, the topmost platform surface of which was termed stylobate (Curl, 1999).

[26] Cavea: The tiered semicircular seating space of an ancient theatre (Retrieved from merriam-webster.com May 20, 2018).

period, circular planned temples called tholos, such as the Temple of Tyche at Side in Antalya, Turkey and the Temple of Vesta at Tivoli, Italy, were also designed (Kostof, 1985; Vitruvius, IV, trans. 1990; Roth, 2000) (Figure 3.22, Figure 3.23).

The locations of the sanctuaries can be examined in three groups according to their relation to the city (Marinatos, 1993):

1. Urban sanctuaries: This group can be divided into two groups as the temples in the acropolis (the Acropolis of Athens, Greece; the Temple of Athena at Assos in Çanakkale, Turkey, etc.) (Figure 3.24, Figure 3.25) and those around the agora (the Agora Temple at Assos (Serdaroğlu, 2004), the Temple of Apollo at Corinth, Greece, etc.) (Figure 3.26, Figure 3.27). Since the acropolis is the utmost point of the city, temples may have been built here in order to increase visibility from every point of the city. After, agora where all the activities are done and located in the city centre, have become more preferred points for the temples (Burkert, 1988).
2. Extra-urban sanctuaries: These temples, while being governed by a city-state, were built outside the city as cultural centres to identify or expand the city's territory (the Temple of Apollo at Miletus-Didyma in Aydın, Turkey; the Temple of Poseidon at Athens-Sounion in Greece, etc.) (Figure 3.28). These temples such as the Asklepieion at Pergamon, may also be building groups which have been transformed into centres of medicine or oracle by other structures established in their surroundings (Marinatos, 1993; Serdaroğlu, 2004) (Figure 3.29).
3. Inter-urban sanctuaries: These sanctuaries are centres that are far away from the large cities and are under the control of the neighbouring city states but neutral. (Sanctuaries of Olympia, Delphi and Nemea in Greece) (Figure 3.30, Figure 3.31). These centres, where events can be arranged, are to enable citizens to engage in political and cultural interaction; festivals, rituals, athletics competitions are such places. Temples such as the Temple of Poseidon at Sounion in Athens, Greece, which is located outside the city centre and easily accessible from land and sea, are also centres for gathering refugees from outside the city due to their location (Fletcher, 1896/1996; Schumacher, 1993; Sinn, 1993; Marinatos, 1993).

Aristotle stated that the temples should be built in the most visible but less unbeaten areas of the city (Aristotle, trans. 1993; Serdaroğlu, 2004). This may be due to the fact that the temple is a symbol of strength and trust at the time of war and need (Burkert, 1988). For this reason, temples may have been raised on crepis to increase their visibility. In addition, as a result of developing and transforming society needs, the

temples were not only worshiped places; but also the gifts called anathema presented to the gods were hidden and exhibited. For this reason, they sustained their significance by turning into common identity places (Burkert, 1988).

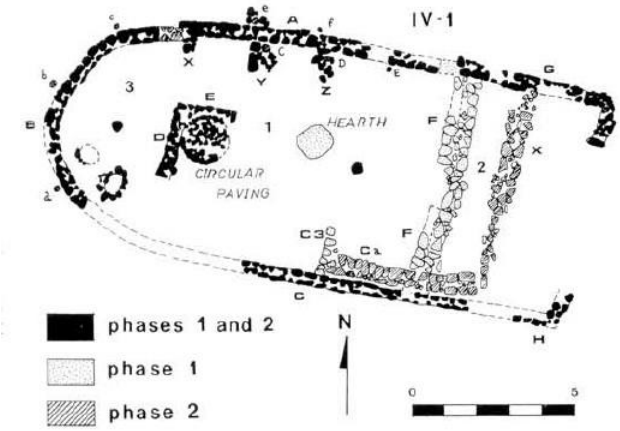


Figure 3.2. Early Greek hut IV-1 at Nichoria, Greece (Source: Mazarakis, 1988).

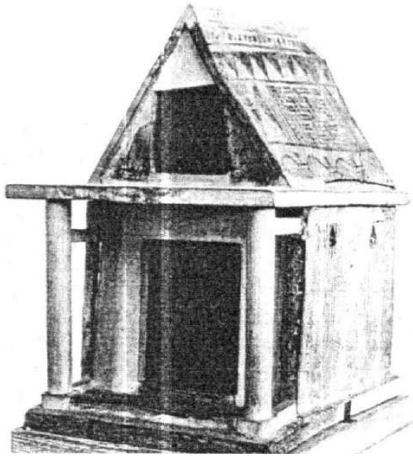


Figure 3.3. Greek shrine model from Argos, Greece 8th century BC (Source: Kostof, 1985).

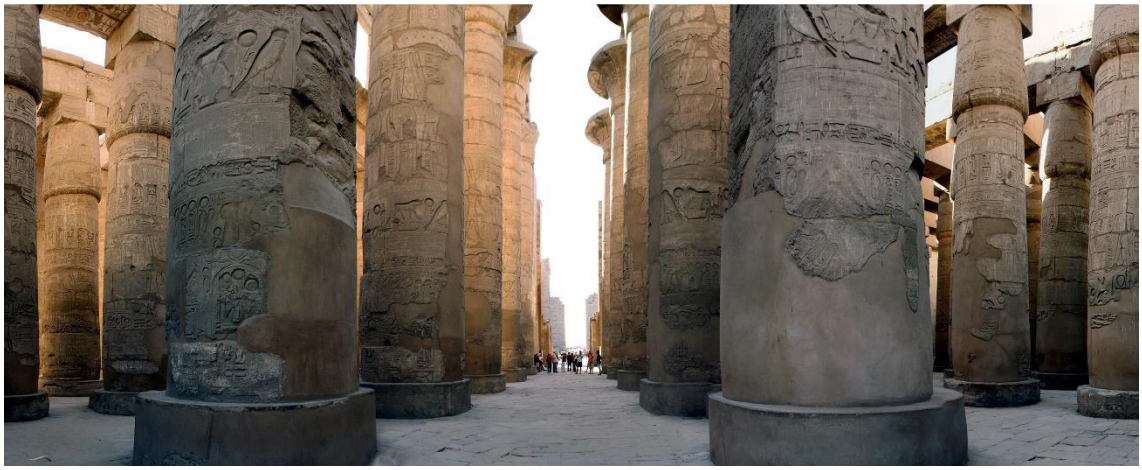


Figure 3.4. Hypostyle Hall of Temple of Karnak, Egypt 1250 BC.
(Source: https://www.khanacademy.org Retrieved at April 18, 2018)

Figure 3.5. The Temple of Apollo at Didyma, Aydın, Turkey (June 14, 2017).

Figure 3.6. Parthenon at the Acropolis of Athens, Greece (July 21, 2017).

Figure 3.7. The Temple of Apollo at Delphi, Greece on slope of the Mount Parnassos (July 20, 2017).

Figure 3.8. The Temple of Zeus at Olympia, Greece (July 17, 2017).

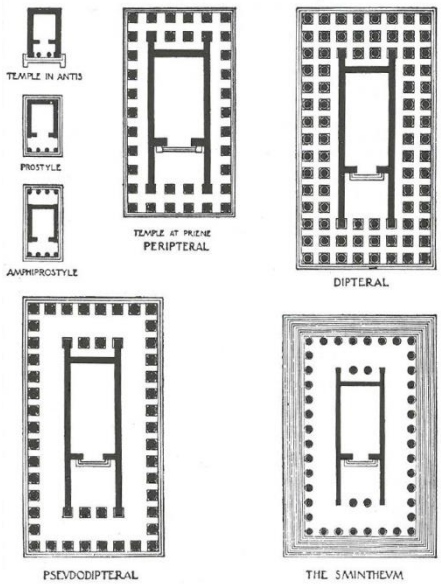


Figure 3.9.Types of temple plans. (Source: Vitruvius III, trans. 1990)

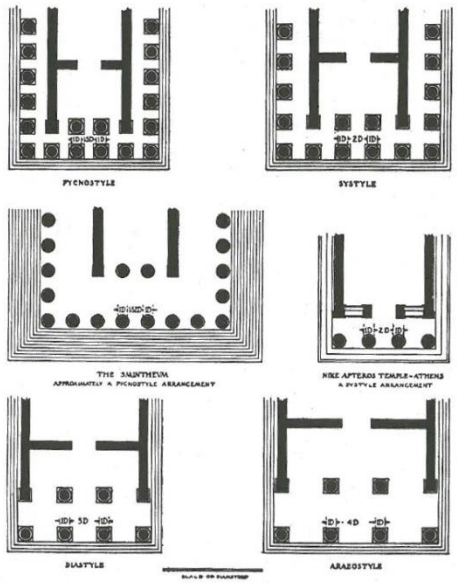


Figure 3.10. Types of temple plans according to column spacing (Source: Vitruvius III, trans. 1990).

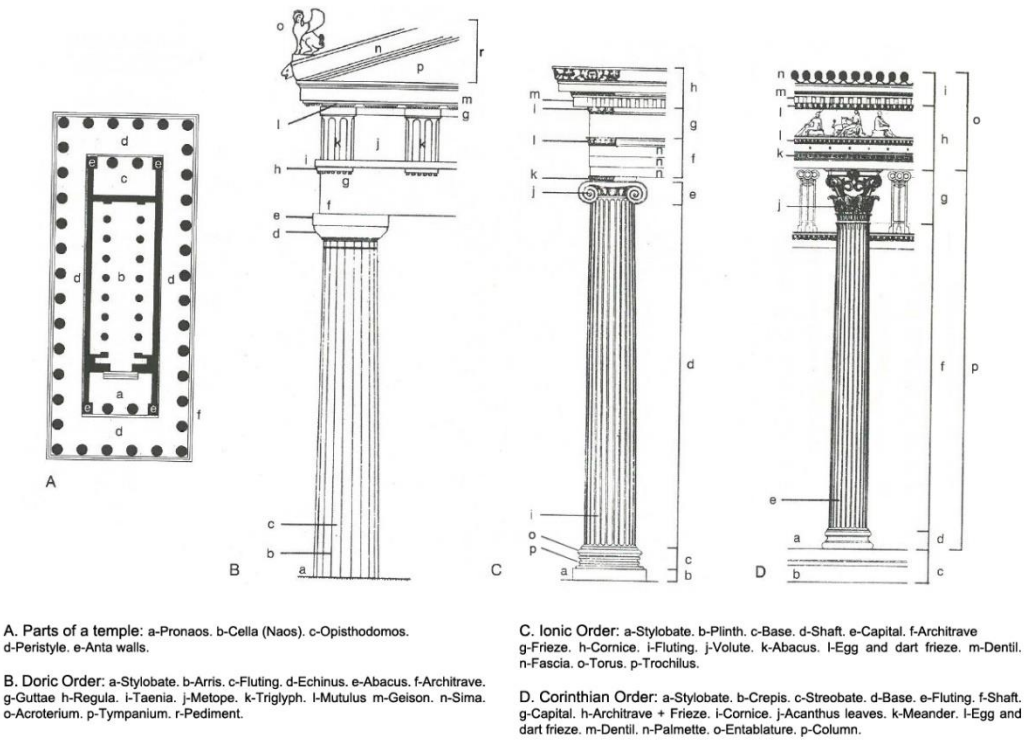


Figure 3.11. Plan of a temple and Doric, Ionic, Corinthian orders.
(Source: Edited from Sözen & Tanyeli, 1986 / 2016)

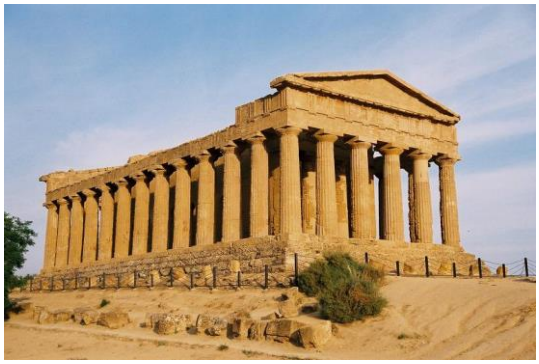


Figure 3.12. The Temple of Concordia at Agrigento, Sicily, Italy (Source: https://www.trekearth.com/gallery Retrieved at April 18, 2018).

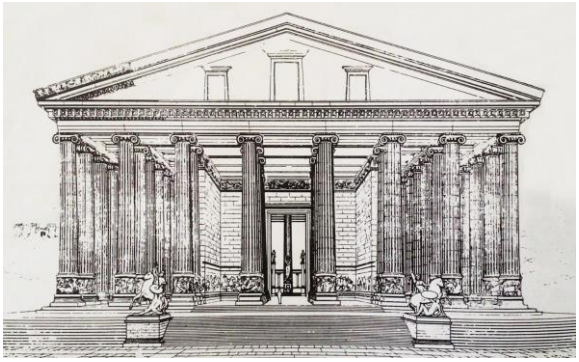


Figure 3.13. The Temple of Artemis at Ephesus, İzmir, Turkey (Source: Fletcher, 1896 / 1996).

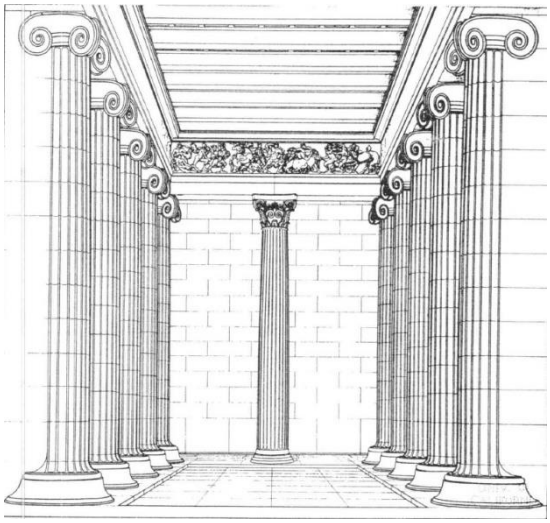


Figure 3.14. Restitution drawing of Corinthian column in the cella of the Temple of Apollo at Bassae, Greece (Source: Kostof, 1985).

Figure 3.15. The Temple of Apollo at Bassae, Greece (Source: https://www.mcgill.ca Retrieved at April 18, 2018)

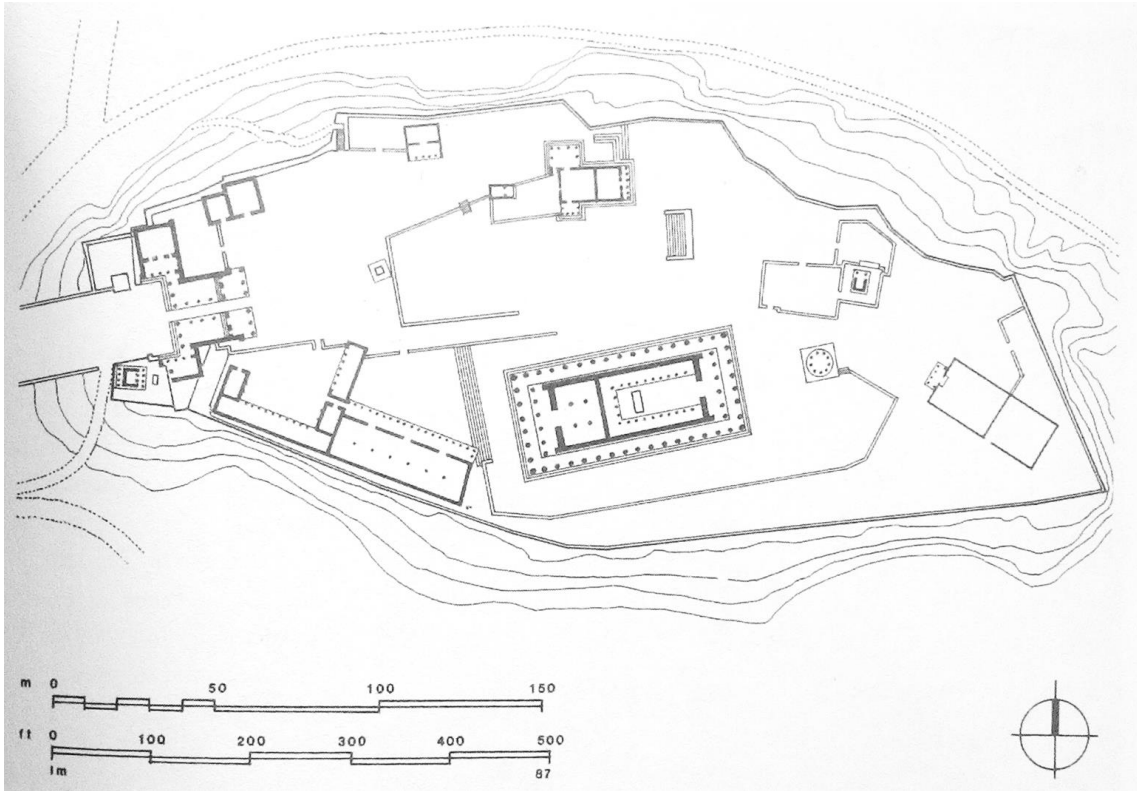


Figure 3.16. The acropolis of Athens around 400 BC. Temple structures look like free-standing but designed to human perspective (Source: Roth, 2000).

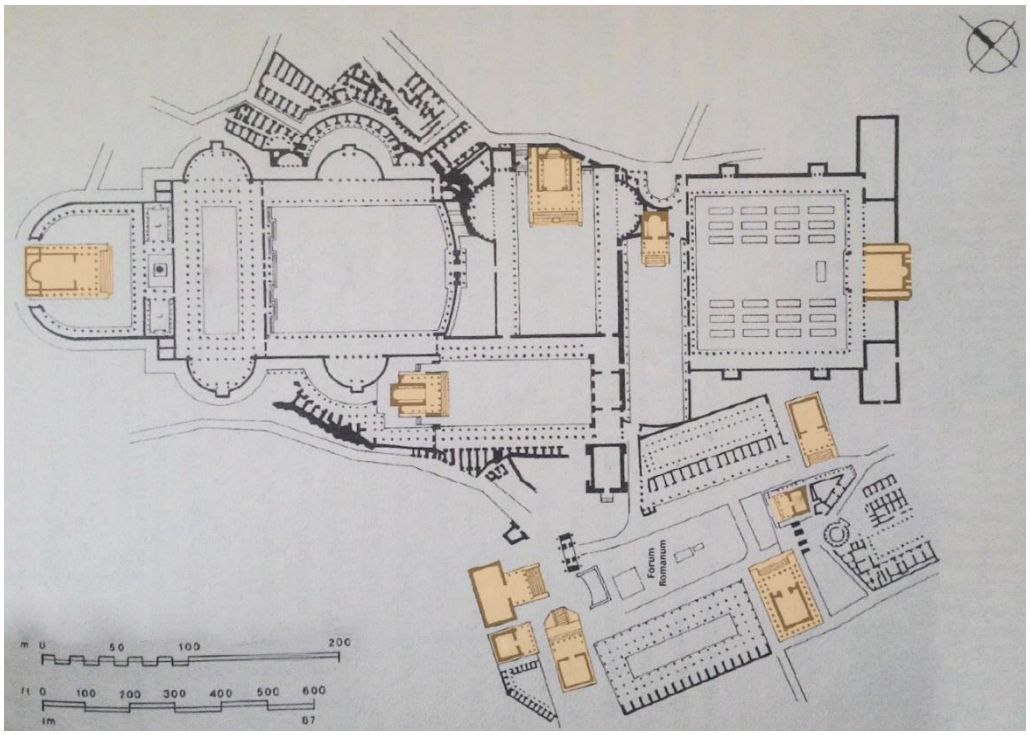


Figure 3.17. Temple structures in earlier Forum Romanum on the top and Imperial Forum at the bottom in 54 BC -117 AD (Source: Roth, 2000).

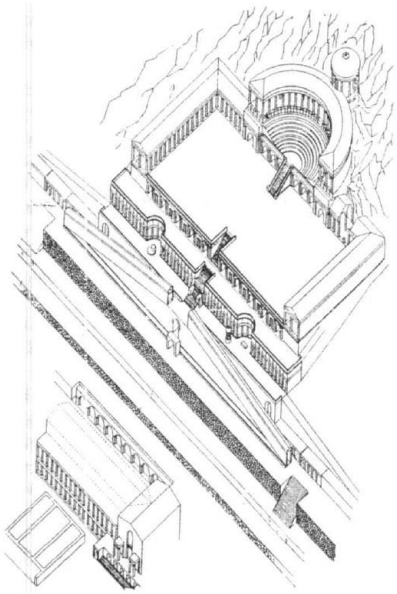


Figure 3.18. The Temple of Fortuna Primigenia at Praeneste (Palestrina), Italy (Source: Kostof, 1985).

Figure 3.19. The temple above the theatre at Stratonikeia, Muğla, Turkey (Source: https://thumbs.dreamstime.com Retrieved at April 18, 2018).

Figure 3.20. The Temple of Dionysos at Pergamon, İzmir, Turkey (April 1, 2018).

Figure 3.21. The Temple of Maison Carree at Nimes, France (Source: http://www.architecturecourses.org Retrieved at April 18, 2018).

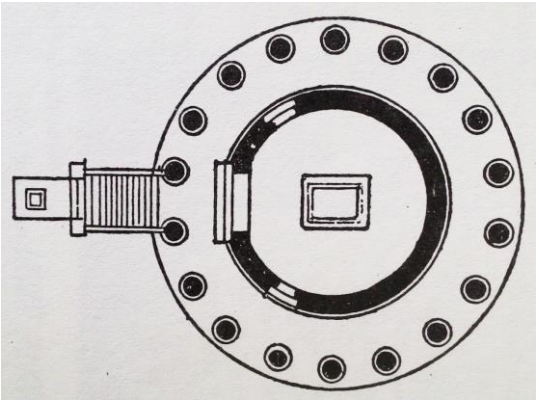


Figure 3.22. Tholos plan (Source: Vitruvius IV, trans. 1990).

Figure 3.23. The Temple of Vesta at Tivoli, Italy (Source: https://www.itinari.com at April 18, 2018).

Figure 3.24. The Acropolis of Athens, Greece (July 22, 2017).

Figure 3.25. The Acropolis of Assos, Çanakkale, Turkey (June 17, 2017).

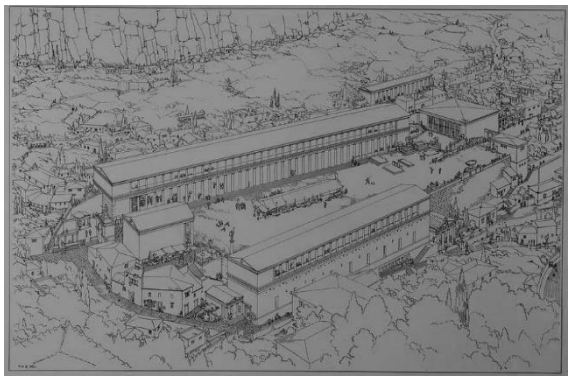


Figure 3.26. The restitution drawing of the Agora Temple in Assos, Çanakkale, Turkey. The Agora temple is on the left end
(Source: Clarke, Bacon & Koldewey, 1904).

Figure 3.27. The Temple of Apollo at Corinth, Greece
(Source: https://www.trekearth.com Retrieved at April 18, 2018).

Figure 3.28. The Temple of Poseidon at Sounion, Athens, Greece (September 26, 2017).

Figure 3.29. Asklepieion at Pergamon, İzmir, Turkey (April 1, 2018).

Figure 3.30. Aerial view of Sanctuary of Olympia, Greece. Temples are in the middle, stadion is on top (Source: http://ancientolympics.arts.kuleuven.be Retrieved at April 18, 2018).

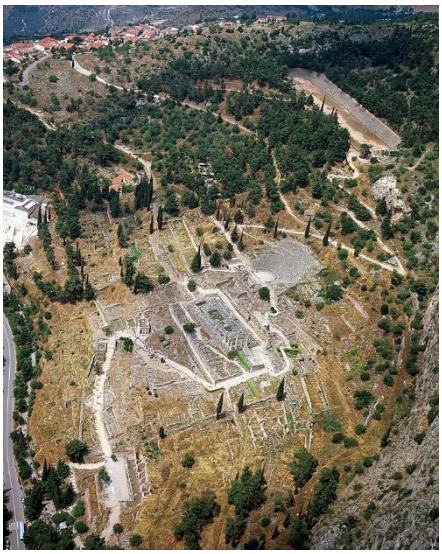


Figure 3.31. Aerial view of Sanctuary of Delphi, Greece. The Temple of Apollo is in the middle, stadion is in the upper part of the city (Source: https://greece.terrabook.com/ Retrieved at April 18, 2018).

3.2. The Temple of Athena at Assos

3.2.1. Location of the Site

Assos[27] is located in Behram (Behramkale) neighbourhood/village of Ayvacık district of Çanakkale. It is 17 km from the centre of Ayvacık (Figure 3.32). Located in the Troas Region in antiquity, the city was built on a hilltop which is dominated position to the Edremit Gulf (Figure 3.33, Figure 3.34, Figure 3.35). The city is surrounded by city walls 3 km in length, and most of these walls and the gates are still standing (Figure 3.36, Figure 3.37). At the highest point of the city, the Temple of Athena, the cistern and the 14th century Murat Hüdavendigar Mosque are located in the acropolis (Figure 3.38, Figure 3.39). These structures are surrounded by walls with square and curvilinear towers built during the Late Byzantine period between the 12th and 13th centuries (Figure 3.40). Entrance to the city is provided from the west gate with towers on two sides which is located on the lower terrace of the acropolis. The necropolis with the tombs, the earliest one determined to have been built in the 7th century BC ("Necropolis", 2016) is lying on both sides of the street in front of the west gate (Arslan et al., 2010). When entering the city from the west gate, there is a gymnasion to the east. The agora temple to the east of the gymnasion, the Roman bath, north and south stoas and bouleuterion constitutes agora of the city (Figure 3.26). The theatre with a capacity of 5000 people (Serdaroğlu, 1995) facing the sea is located in the south lower terrace of the agora. The ancient harbour in the south is observable although being partially submerged. The Village of Behram, where the ancient city is intertwined today, was built in the 14th century on the northern slope of the hill, not facing the sea, probably for protection from pirate attacks (Clarke, 1882).

3.2.2. Brief History of the Site

It is thought that Assos was founded in the 7th century BC by the Methymnals from Lesbos, the neighbouring island, 10 km south of Assos (Akurgal, 1970; Arslan et al., 2010). Assos was ruled by Lydians in the 6th century BC and then Phrygians at the

[27] Assos was added to the Tentative World Heritage List of UNESCO in April 2017 (http://whc.unesco.org/en/tentativelists/6242/).

end of the same century. It joined the Athenian (Delian) - League in the 5th century BC and was ruled by the Kingdom of Pergamon between 241-133 BC (Akurgal, 1970). Assos became the centre of bishopric by embracing Christianity in the 1st century AD. The city was burned down during the Crusades in the 12th century. It came under Ottoman administration in the 14th century (Serdaroğlu, 1995).

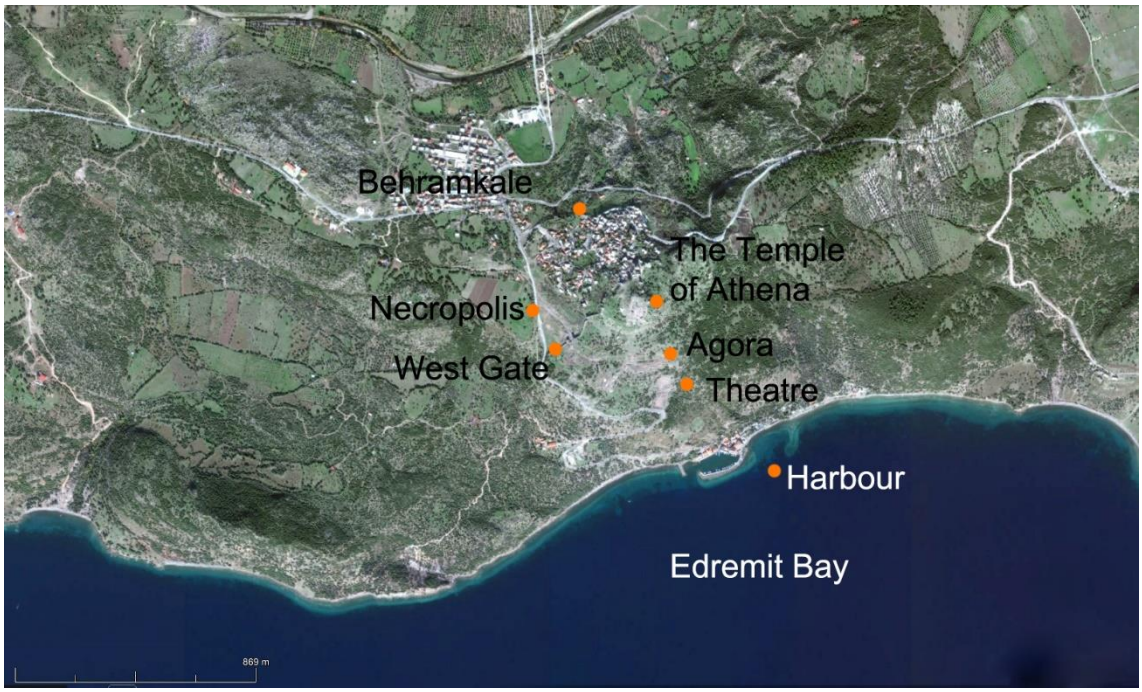


Figure 3.32. Location of Assos
(Source: Google Earth date of image: 11.11.2015 date of editing: 27.11.2017).

Figure 3.33. View of Behramkale and acropolis from east (June 17, 2017).

Figure 3.34. Edremit Bay from acropolis (June 16, 2017).

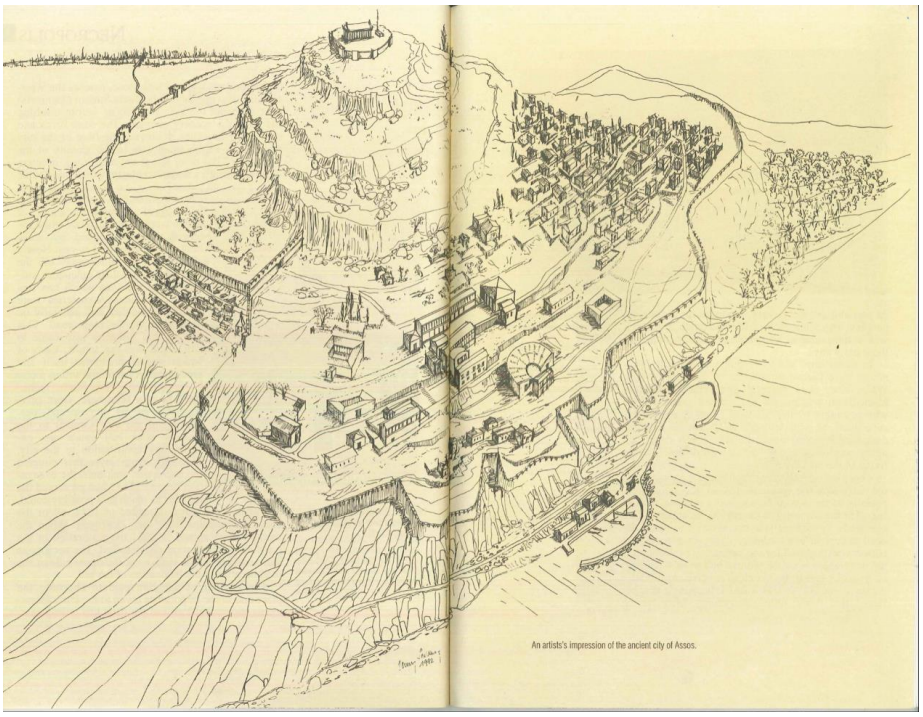


Figure 3.35. General sketch of Assos.
(Source: Serdaroğlu, 1995)

Figure 3.36. Site plan of Assos.
(Source: Serdaroğlu, 1995)

Figure 3.37. City walls and west gate (June 16, 2017).

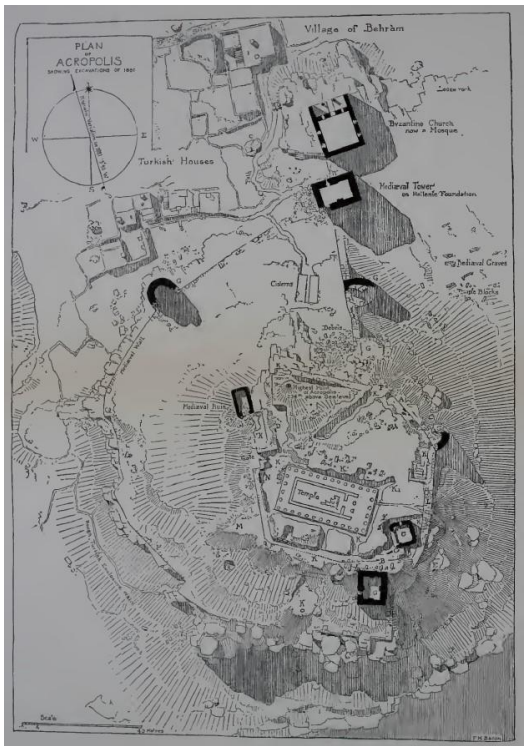


Figure 3.38. Plan of the acropolis of Assos (Source: Clarke, 1882).

Figure 3.39. Current situation of the Temple of Athena (June 16, 2017).

Figure 3.40. Byzantine towers (June 16, 2017).

3.2.3. Architectural Characteristics of the Temple

The rock structure of the Troas Region is seen in the acropolis where the Temple of the Athena is located; the temple was built on the main rock. The temple is partially

re-erected to the top of the capitals with six columns at present. The Temple of Athena was located at the highest point of the city in the northwest-southeast direction around 530 BC. There is a water cistern in the northern lower point; the temple and the cistern are surrounded by city walls and towers. The 14th century Murat Hüdavendigar Mosque is outside the city walls. The entrance of the temple was provided from the east. There are six columns on the short side, and thirteen columns on the long side, surrounding the inner cella wall on two-stepped crepis. Measures of the stylobate of the temple, which was built in peripteros style, are 14.03x30.31 m (Figure 3.41). The temple is in Doric order; but the architrave ornamented with frieze is an Ionic architectural element (Akurgal, 1970; Wescoat, 2012) (Figure 3.42). It is a rare example of Anatolian temple architecture due to the fact that the structure, Doric and Ionic elements were used together. Local andesite stone was used in the temple. The architectural elements were brought together with clamps and dowels (Serdaroğlu, 1995). In the excavations made by Clarke in 1881, a black and white mosaic with a wave and diamond ornament was found on the cella pavement of the temple (Clarke, 1882; Akurgal, 1970). The mosaic is not in place today (Figure 3.43).

3.2.4. Excavation and Implementation Program

The first excavations in Assos were conducted by the Archaeological Institute of America (AIA) in 1881[28] (Figure 3.44). After a hundred years, excavation works were

[28] Assos was visited and documented by many travellers since the 1800s. Clarke, Bacon and Koldewey, who were assigned by the Archaeological Institute of America in 1881, published a report on excavation work first done in the area in 1881-1883. The first publications about Assos are listed below (Clarke, 1882; Wescoat, 2012).
- de Choisel-Gouffier, Marie Gabriel Florent Auguste (1809). *Voyage Pittoresque de la Grèce,* tome second. Paris.
- Walpole, Robert (ed.). (1820). *Travels in Various Countires of the East; being a continuation of Memoirs relating to European and Asiatic Turkey.* London.
- Ebers, Johann Philip Gustav (1822). *Wallfahrten im Morgenlande. Aus seinen Tagebüthern und Briefen dargestellt*. Berlin.
- Leake, William Martin (1824). *Journal of a Tour in Asia Minor, with comparative remarks on the ancient and modern geography of that country.* London.
- Michaud, Joseph François, & Poujoulat, Jean Joseph François (1834). *Correspondance d'Orient*. Vol III. Paris.
- von Osten, Ritter Prokesch (1836-37). *Denkwürdigkeiten und Erinnerungen aus dem Orient*. Stuttgart.
- Fellows, Charles (1839). *A Journal written during an excursion in Asia Minor*. London.
- Webb, Philip Barker (1844). *Topographie de la Troade*. Paris.
- Texier, Charles (1849). *Description de l'Asie Mineure, faite por ordre du Gonvernement français de 1833 à 1837 et publiée par le Ministère de l'Instruction publique.* Paris.

restarted by archaeologist restoration expert architect Prof. Dr. Ümit Serdaroğlu from Ege University in 1981 (Figure 3.45). The first works were done at the Temple of Athena; 31 of 36 capitals, 51 column drum[29], 6 triglyph blocks of the temple were found (Serdaroğlu, 1983; Wescoat, 2012).

Repair and installation works were carried out on the northwest side of the temple in 1990. The original lower drums were placed on the western façade, and the drums produced from the new concrete material in the northwest corner were placed top of the original stone bottom drums. The new parts of the columns, which were replaced in previous years, were finished by sculptures. In order to produce new blocks, polyester moulds of capital, drum, architrave, triglyph, metope and sima[30] blocks were taken (Serdaroğlu, 1992).

Until the death of Prof. Dr. Ümit Serdaroğlu in 2005, 3 columns in the south and 2 columns in the north of the temple were re-erected to the top level of capitals by using original and reinforced concrete elements in 15 years period of time of re-erection (Arslan, 2008) (Figure 3.46, Figure 3.47).

From 2007 onwards, the excavations were carried out by archaeologist Prof. Dr. Nurettin Arslan from Çanakkale Onsekiz Mart University. Since the reinforced concrete elements used in the re-erection work weathered over time and threatened the durability of original materials, it was decided that parts of the temple would be dismantled and re-anastelosis work would be performed with new stone material compatible with the original material (Arslan, 2008). Scattered pieces of the temple were collected from around the acropolis and were placed in their original places in 2008. It was decided to remove the concrete drums of three columns re-erected in 1990s in south façade and new drums were produced from the stone to replace them. The newly produced members were marked for distinguishability (Arslan et al., 2010).

- de Tchihatcheff, Pierre (1853-1869). *Asie Mineure, description physique, statistique et archéologique de cette contrée*. Paris.
- Texier, Charles, & Pullan, Richard Popplewell (1865). *The Principal Ruins of Asia Minor, illustrated and described*. London.
- Abbot, Mr. (1878). *Handbook for Travellers for Turkey in Asia*. London.
- Clarke, Joseph Thacher (1882). *Report on the Investigations at Assos, 1881, Papers of the Archaeology Institute of America, Classical Series I.* Boston.
- Clarke, Joseph Thacher, Bacon, Francis H. & Koldewey, Robert (1902). *Investigations at Assos. Drawings and Photographs of the Buildings and Objects Discovered during the Excavation of 1881-1882-1883.* London.

[29] Drum: One of the nearly cyclindrical pieces of which column shafts is constructed (Curl, 1999).

[30] Sima: Cyma, cima. Projecting moulding common in Classical Architecture, with an ogee section usually of equal cavex and concave arcs with a plain fillet above and below it (Curl, 1999).

Architectural elements of the temple were classified and documented in 2009. Concrete column drums and stylobate blocks, used in the previous restoration, were removed and new stone drums and blocks were produced compatible with the original material. For this, large andesite rock masses, which were found to the north of the village, were taken and shaped. In order to test, stylobate block and drums of only one column were removed and replaced with new pieces of andesite stone; parts of other columns were prepared and left unattended. Joining material was not placed between the capital and the drums, but lead plates were placed between the old eroded drums when necessary (Figure 3.48). After the column was erected, it was fluted. The concrete blocks of the cella wall were removed. Stylobates that are scattered and used in other structures are taken and put in their places. Two blocks of the eastern pediment were taken and placed on top of the cella wall blocks (Arslan, Böhlendorf Arslan, Türk, Koçyiğit, & Müller, 2011).

Repairs were made in the southern and western parts in 2010, which had been restorated in previous years. The concrete drums and blocks placed between the original blocks were dismantled and new drums and blocks made of stone were put in place (Figure 3.49). On the west side, the fourth column, with missing pieces made of andesite, was made anastelosis by using the original drums also. The perception of the mass of the temple was increased by adding a column from the west side to a single line of anastelosied columns of south side, in this way. Concrete blocks were placed in previous restoration in place of stylobates that did not survived and in these parts, destruction has occurred over time. These concrete parts were removed and new blocks made of stone were put in place. New stylobate blocks were produced smaller than the original size so that they could be distinguished from the original ones (Arslan, 2012) (Figure 3.50, Figure 3.51).

In the on-site examination in October 2016 and June 2017, it was determined that the northwestern pediment of the cella was joined to the floor of the temple (Figure 3.52).

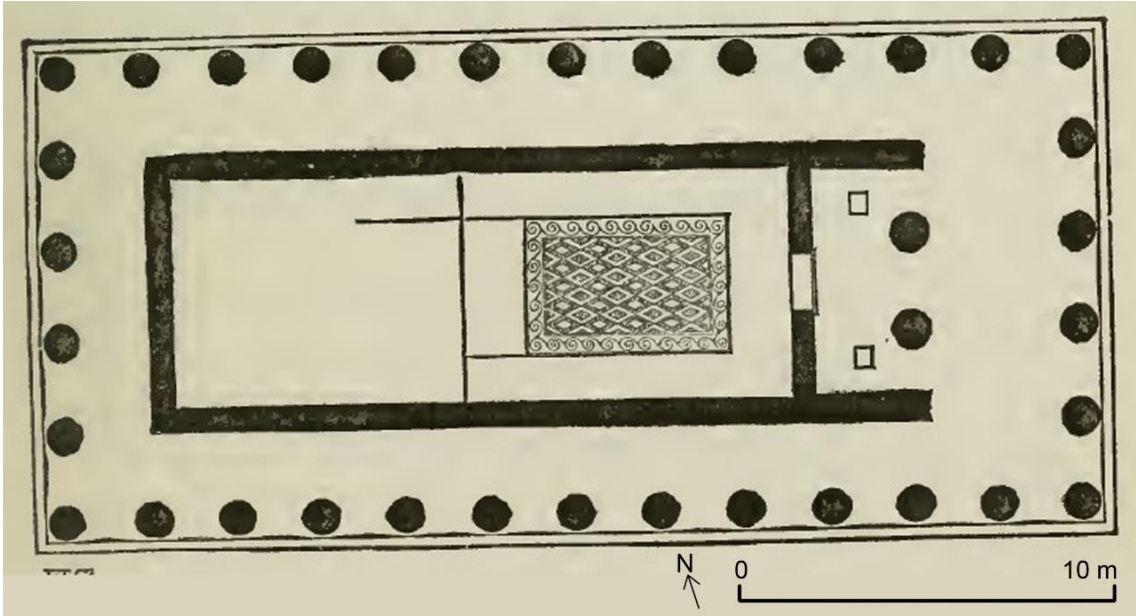


Figure 3.41. Restitution plan of the temple.
(Source: Clarke, 1882)

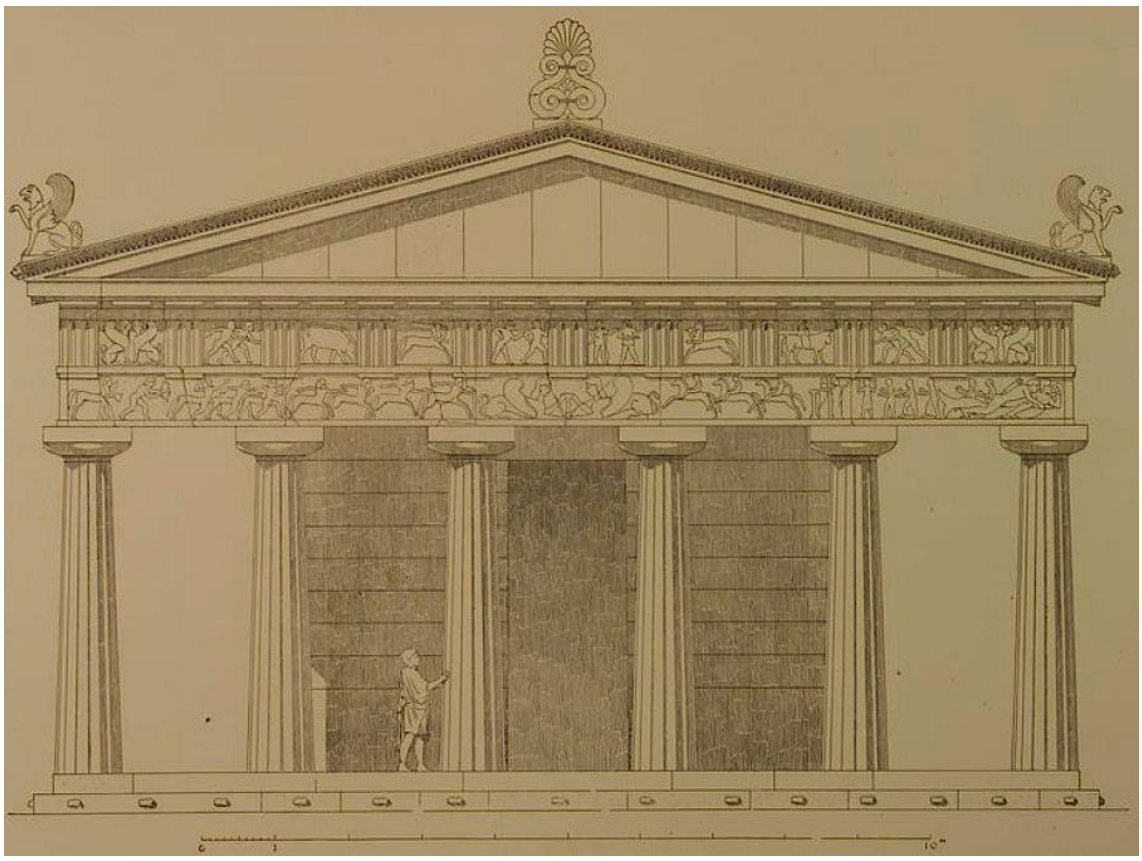


Figure 3.42. Restitution elevation of the Temple of Athena.
(Source: Clarke, Bacon & Koldewey, 1904)

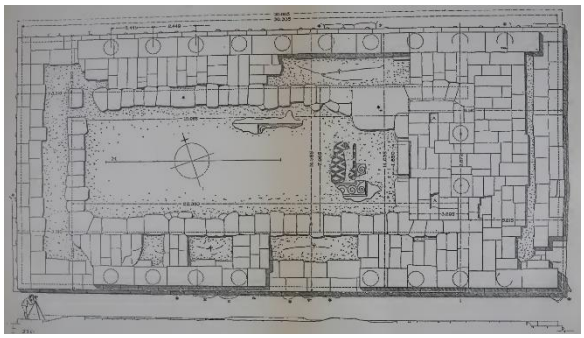


Figure 3.43. Measured drawing of the Temple of Athena in 1881 (Source: Clarke, 1882).

Figure 3.44. The Temple of Athena in 1881-1883 (Source: Clarke, Bacon & Koldewey, 1904).

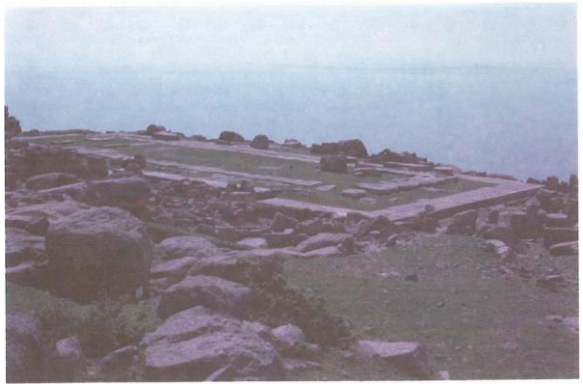


Figure 3.45. Situation of the temple in the beginning of Serdaroğlu excavations (Source: Serdaroğlu, 1995).

Figure 3.46. Re-erection of columns in Serdaroğlu excavations (Source: Salcan, 2009 taken from Assos Excavation Archive).

Figure 3.47. Completion of implementation at the end of Serdaroğlu intervention period (Source: Serdaroğlu, 1995).

Figure 3.48. Lead plates between column drums (June 16, 2017).

Figure 3.49. Placing of drums and capitals (Source: AIA, December 2017 courtesy Nurettin Arslan 2008 Retrieved at April 8, 2018 from https://www.archaeological.org/proje ct/assos).

Figure 3.50. New stylobate blocks in smaller size than original (June 16, 2017).

Figure 3.51. Completion of implementation at the end of Arslan intervention period (Source: AIA, December 2017 courtesy Nurettin Arslan 2008 Retrieved from https://www.archaeological.org/project/assos April 8, 2018).

Figure 3.52 Reintegration of the northwest pediment of the cella on the ground (June 16, 2017).

3.2.5. Evaluation of Interventions

The restoration of the Temple of Athena at Assos in the 1990s with concrete was dismantled starting in 2007 and anastelosis work with andesite stone compatible with original material was done. The application might be regarded as restoration intervention,

not anastelosis because of the use of new materials in large amount. This restoration work to reverse the improperly placed drums in the previous restoration can be evaluated positively in terms of the use of the original drums and capitals and the selection of materials compatible with the original material (Table 3.2).

- **Emphasis of the Structure within Site Scale**

The Temple of Athena at Assos, a rare example of the structure designed with both Doric and Ionic architectural elements among the Anatolian temples and dedicated to city's protector goddess, is located at the highest point in the city's acropolis. The structure was built in a dominant position in Edremit Bay and the towers were positioned lower points in a way that emphasizes the influence of the temple in the site. Today, the acropolis is entered from the side of the mosque from the ticket office and the temple cannot be seen at that level but it emerges completely after a climb. With this position, which the temple possesses and help of restoration work, the temple has a striking effect as it was in original. It can be stated that the restoration intervention is aimed at regaining the importance that the temple has in the original situation. For this reason, the restoration implementation is parallel to the original context of the temple. The acropolis floor was left naked to exhibit the main rock on which it was built; visitors climbs over the rocks to the hill. As the columns of the temple were partially re-erected, the appearance of the ruins was continued and the visual integrity with the partially demolished towers was established. The temple is in harmony with the fortified walls and towers around it in terms of integrity and restoration intervention. The perception of the entire structure was increased by exhibiting the restitutive model of the temple on a platform in front of it (Figure 3.53).

- **Integrity of the Monument**

Since some of sculptural members of the temple were moved to the Louvre, Boston Fine Arts, Çanakkale and İstanbul Archaeological Museums, members cannot be placed in their original positions more (Figure 3.54). The stones and architectural elements of the temple were used in the towers of the acropolis, the mosque, and the houses in the villages. For these reasons, the temple has lost its structural integrity. Nevertheless, members that have been scattered over to the city from the acropolis slopes and found in the village have been collected for use in restoration studies and are exhibited around the temple now. It is thought that these collected elements will be placed in future studies. The restoration work provides information about the temple such as the form, the mass and the height. Visual integrity was provided in the implementation since andesite stone which is the original construction material was used in restoration.

- **Authenticity**

Architrave blocks of the superstructure, with most blocks exhibited in museums, were not reproduced and the temple was raised to the top level of the capitals. The foundation of the structure that has survived, however the stylobate blocks were reproduced in large quantities from new materials. The back pediment blocks and capitals, which positions can be determined, are present and exhibited on the ground in the temple. In restoration of the temple, original elements were used as much as possible and new materials were used in cases where original elements could not be found. Nevertheless, the amount of new material used in drums and stylobate blocks led to a decrease in authenticity. It can be argued that the original construction system with the lead plates placed between the drums was partially maintained.

- **Reliability**

The accurate information about the dimensions of the temple, the walls of the cella, and the places of the columns was provided from the foundation which survived intact. Since the drums of the temple were matched at the end of the documentation work and successive drums were selected, joining is reliable. The missing stylobate blocks were reproduced from andesite stone material, but this application gives incorrect information about the stylobate block dimensions as they are reduced in size so that they can be distinguished from their original blocks.

- **Distinguishability and Compatibility**

Unlike the first restoration studies in the 1990s, the andesite stone, which is the same as the original material, was chosen to ensure the compatibility in new period restoration work. These stones were obtained, as far as possible, by shaping the free stone masses in the village or removing from stone quarry. The visual harmony was provided by using the same material as the original material as a new material. Concrete material used in the first restoration work led to deterioration due to salination in original blocks. In new restoration, it can be argued that original and new materials will behave in harmony because the chemical and physical properties are the same. The new blocks can be distinguished from the original ones due to their sharp details and being uneroded (Figure 3.55). Stylobate blocks were produced in smaller sizes so that they can be distinguished from their original. However, this practice is inconsistent with the concern of being distinguish of stylobates while drums are distinguishable with their uneroded details.

- **Reversibility and Re-treatability**

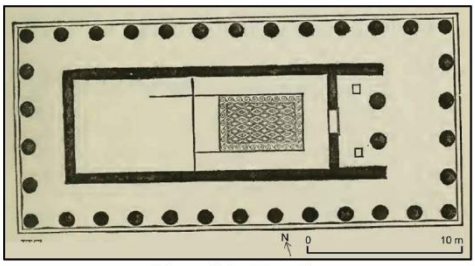
Binding material were not used in joining of the column drums and capitals and also placing of the stylobate blocks. To ensure the stability of only worn drums, lead plates were placed between them. New drums made of andesite stone, the same original material, can be replaced if original drums are found. However, even though the stylobate blocks are separable from each other, the application cannot be reversed because it is not possible to remove the lead plates without damaging the original column drums.

Figure 3.53. Restitution model near the temple (June 16, 2017).

Figure 3.54. Architrave and frieze of the temple in Louvre Museum. (Source: https://www.louvre.fr Retrieved at April 8, 2018).

Figure 3.55. Differentiation between old and new blocks (June 16, 2017).

Table 3.2. Analysis and evaluation of implementation on the Temple of Athena at Assos.

Temple of Athena at Assos		
STRUCTURE	**Location** Behramkale, Ayvacık, Çanakkale	 Northwest view of the Temple after implementation
	Construction date ~530 BC	
	Excavation periods 1881-1883 J. T. Clarke, F. H. Bacon, R. Koldewey (Archaeological Institute of America (AIA)) 1981-2005 Ümit Serdaroğlu (Ege University) 2007- Nurettin Arslan (Çanakkale Onsekiz Mart University)	 Plan of the Temple
IMPLEMENTATION	**Implementation date** 1990-2005 (first restoration) 2007-2010 (re-restoration)	
	Director of excavation Ümit Serdaroğlu / Nurettin Arslan	
	Responsible for the project Ümit Serdaroğlu / -	
	Original material Local andesite stone	**New material** New andesite stone Lead plates in necessary places
	Applied parts Re-erection of three columns on south, one on west, two on north sides to upper level of capital; placing other drums, capitals and west pediment on the ground	**New structural system** No new system Only placed lead plates on eroded parts
EVALUATION	**Emphasis of the structure within the site scale** Regained its historical significance as main worshipped temple in the acropolis Partially re-erected structure is in harmony with the ruin monuments on terraced site	**Reliability** Placing members with correct data obtained from a detailed study False information about stylobate size due to their decreased sizes
	Integrity of the monument Medium structural integrity due to structure's elements are in different museums or were used in other buildings in the site and village. Visual integrity due to use of the same new material with original	**Distinguishability and compatibility** New andesite stones distinguished with uneroded details at present Visual and material compatibility was provided by using of the same new material with original
	Authenticity High amount of new stylobate blocks New drums in necessary places New material is the same with original Medium authenticity	**Reversibility and re-treatability** Separable stylobates and drums but nonreversible lead plated without damaging original members
	Result Restoration implementation by using new material in large amount	

3.3. The Temple of Athena at Priene

3.3.1. Location of the Site

Priene is located to the south of Dilek peninsula in Güllübahçe neighbourhood / village of Söke, district of Aydın[31]. The distance to the centre of Söke is 16 km (Figure 3.56). Located in the Ionian region in antiquity, the city was built on the edge of the Aegean Sea, but the resulting alluvial deposits carried by the Great Menderes (Maiandros) River, the city is far from the coast today. The city is located on the southern slope of Mount Samson (Mykale), and the eastern, western and southern sides of the city are surrounded by walls. It has a dominant position facing the Menderes Plain (Figure 3.57, Figure 3.58, Figure 3.59). The city, which has an acropolis on top of the hill, has a grid plan (Figure 3.60, Figure 3.61). The main roads extend east- west direction (Figure 3.62). Due to the slope, accesses are provided in the north-south direction via stairs. Generally there are four houses with courtyards in the building blocks. The larger public buildings were designed to cover three or four blocks (insulae), such as agora, gymnasion and theatre. The main gate of the city is in the northeast. There are also gates on the eastern and western ends of the main street passing through the agora. Today, the entrance is provided from the northeast gate. After entering the gate, the ancient city is ascended and first the upper gymnasion in the north of the city is reached. The gymnasion was built in the 4th century BC and a bath was built on the northern part of the gymnasion in the 2nd century AD. Adjacent to the west of the bath, is the archbishopric church was built in the Byzantine period. In the block of the east of gymnasion there is the Sanctuary of Egyptian Gods (Raeck, 2009) thought to be dated to the 1st century BC. To the north of the gymnasion there is a theatre with a capacity of 5000 people dated to the 4th century BC. Square planned bouleuterion, dated to 2nd century BC, with entrance provided from south, a prytaneion[32] adjacent to the bouleuterion in the lower level of theatre and gymnasion and a sacred stoa in front of them. On the main street, passing by the sacred stoa, there is the Temple of Zeus Olympios, Asklepieion and agora dated to the 3rd century BC opposite

[31] Priene was added to the Tentative World Heritage List of UNESCO in May 2018 (https://whc.unesco.org/en/tentativelists/6348/).

[32] Prytaneion: The public hall of a Greek state or city, in which a sacred fire was kept burning; especially (in ancient Athens) the hall in which distinguished citizens, foreign ambassadors, etc., were entertained at public expense (Retrieved from oxforddictionaries.com May 21, 2018).

the bouleuterion and the stoa, and there is a food market[33] to the west of them. The Sanctuary of Athena, which is reached by stairs in the north of stoa is located in the upper level (Figure 3.63). The entrance to the sanctuary is provided by the propylon[34] in the east. To the south of the city, there is the lower gymnasion dated to the 2nd century BC and stadion adjacent to it (Akurgal, 1970).

3.3.2. Brief History of the Site

It is believed that Priene was rebuilt in its present location in 350 BC. Such a claim has been put forward in the city because no remains were found before the Hellenistic period. The previous Priene settlement was at about the same place and had two ports; it is thought that the area, where the settlement is located, has become a marsh or as a result of major earthquakes it was relocated to the present place. Although the remains of the first Priene city were not found, a coin printed in 500 BC was found (Akurgal, 1970; Aksu, Piper & Konuk, 1987; Altunel, 1998; Rumscheid, 2000). It is known that the city joined the Ionian Federation that was founded in the 8th century BC. The city, which was ruled by the king of Pergamon for some time, entered the Roman administration in the 2nd century BC. It was the episcopate centre in the 5th century AD. The city passed into Turkish rule in the 1280s. It is known that the village of Samson was near the ancient city in 1673. The Kelebeş village, which was founded on the slope east of the Samson village and thought Armenians and Greeks lived before Turks moved in after the 1920s, was left and settled in the village of Güllübahçe in the east of the ancient city, due to an earthquake in 1955. (Akurgal, 1970; Rumscheid, 2000).

[33] Food market: Roman macellum. Meat or product market in a covered hall (Harris, 1993).
[34] Propylon: Imposing monumental entrance gateway leading to a temple, sacred court or enclosure (Curl, 1999).

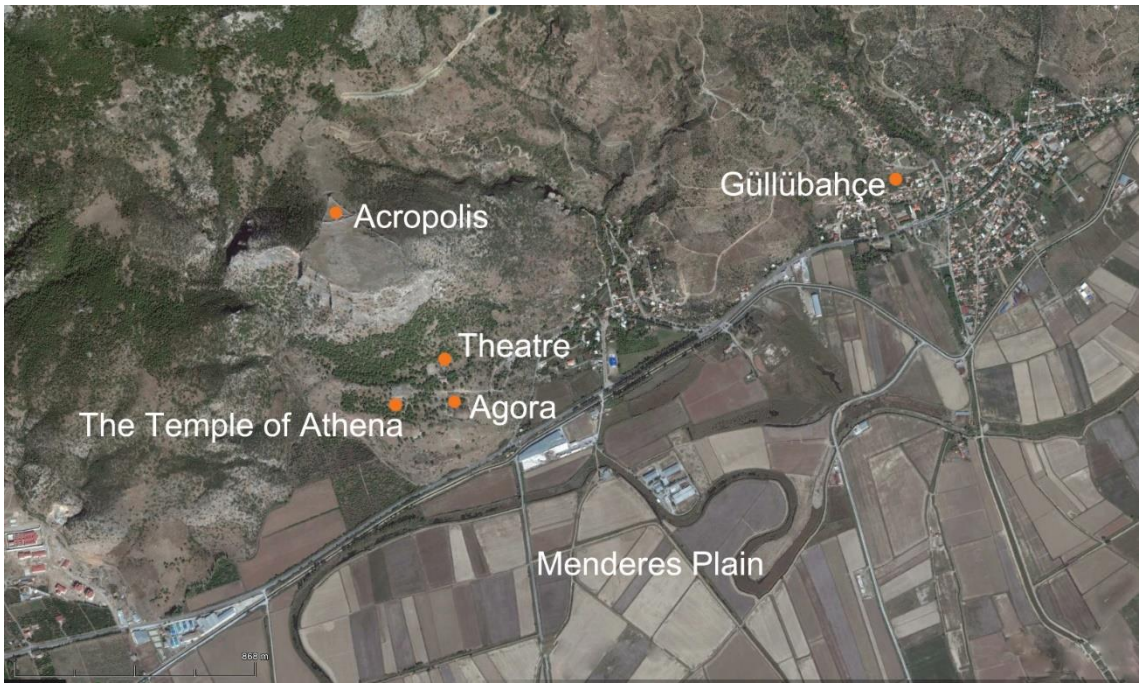


Figure 3.56. Location of Priene.
(Source: Google Earth date of image: 05.05.2013 date of editing: 27.11.2017)

Figure 3.57. View of Priene and the Temple of Athena from the west (May 19, 2017).

Figure 3.58. Menderes plain from the Sanctuary of Athena (May 19, 2017).

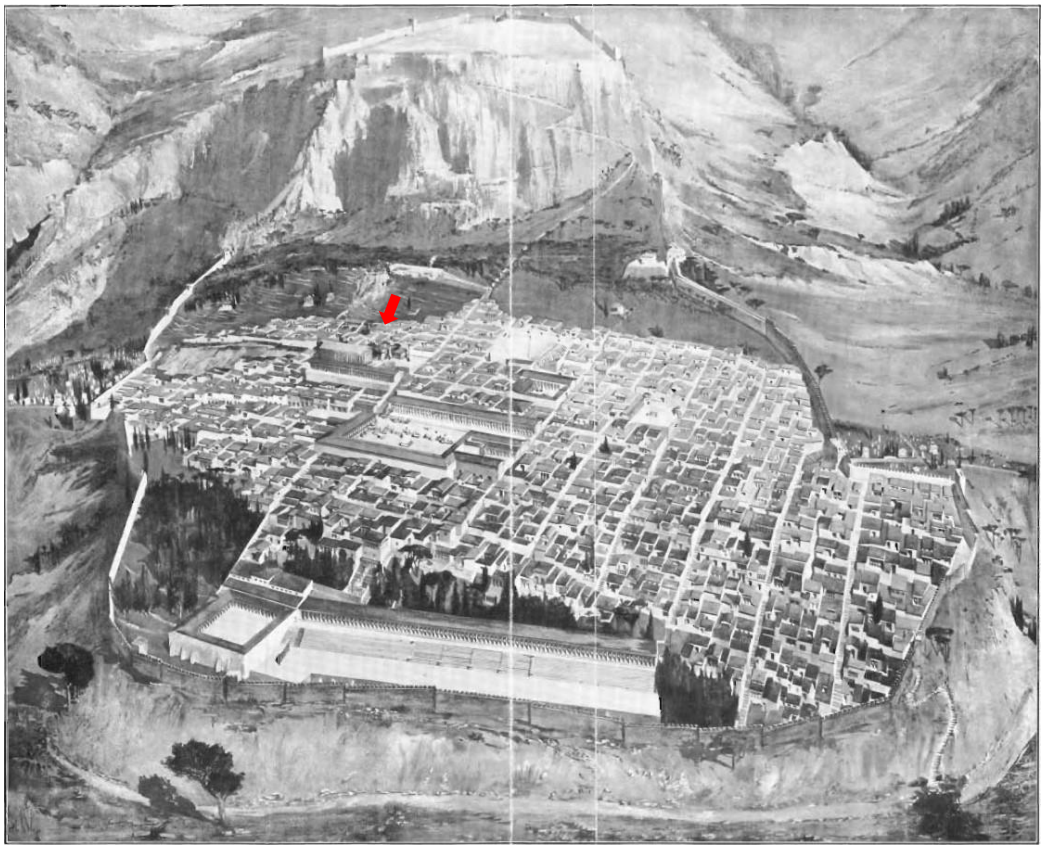


Figure 3.59. General sketch of Priene.
(Source: Wiegand, 1910)

Figure 3.60. Site plan of Priene with the acropolis.
(Source: Rumscheid, 2000)

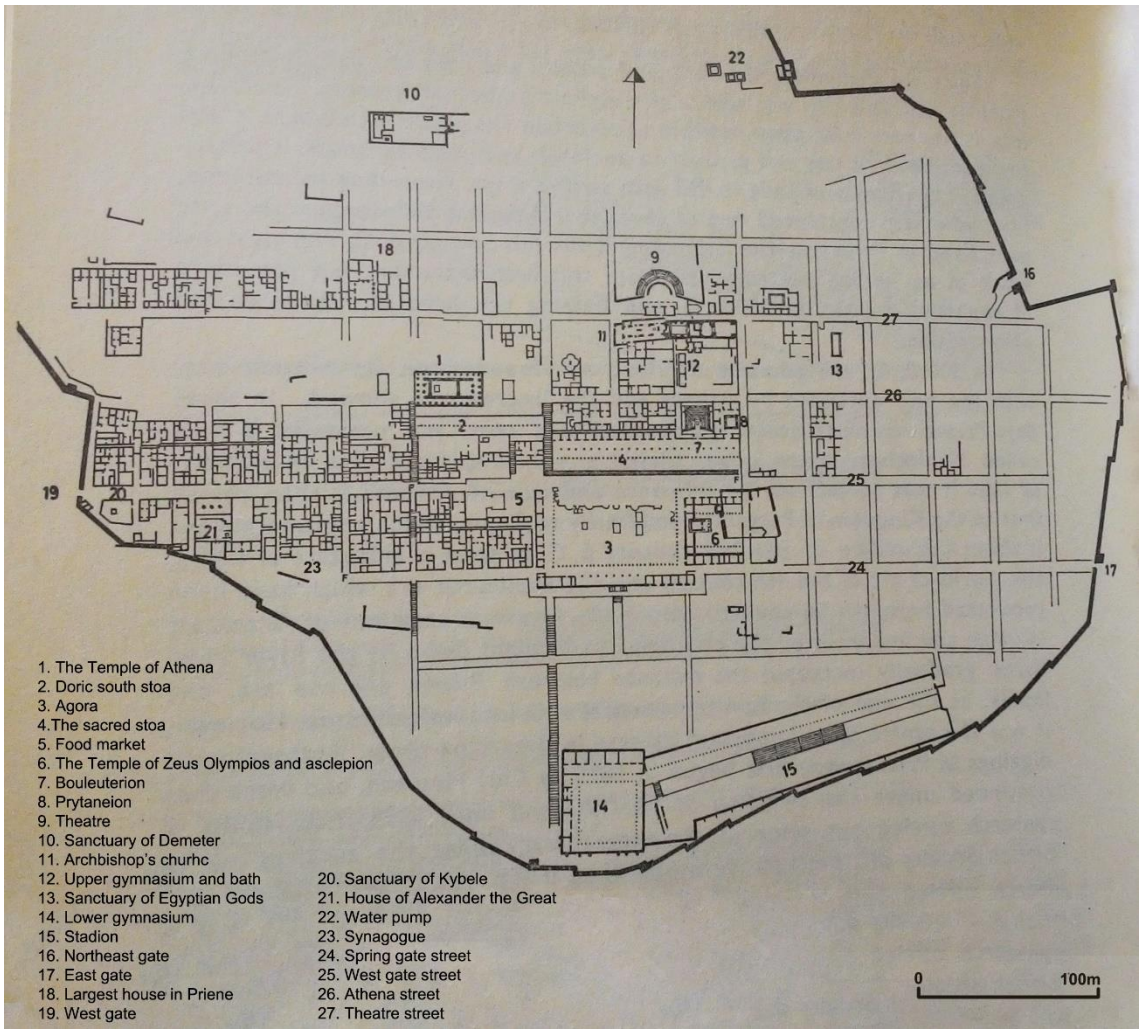


Figure 3.61. Detailed site plan of Priene.
(Source: Akurgal, 1970)

Figure 3.62. General view of Priene. Agora Street from west to east (May 19, 2017).

Figure 3.63. The Sanctuary of Athena (May 19, 2017).

3.3.3. Architectural Characteristics of the Temple

Located at one of the highest points of the city, the Sanctuary of Athena is partially standing with five columns on the northern side of the temple, the south wall of the propylon (Figure 3.64) and the terrace walls. Propylon is to the east of the temple, and Doric gallery is in the south (Figure 3.65). The temple can be reached in different ways; one of which is stairs from the agora and to propylon of the temple in the east (Figure 3.66), the other is Athena Street in the east in front of the propylon and the third is the stairs that originates from the western gate of the city and ends west of the temple. Apart from these, it is possible to reach the temple from the northern part of the city and from the theatre. The stepped propylon, that overflows the street, provides access to the temple in three directions. Propylon has four Ionic columns on the eastern and western sides, and the northern and southern sides contain walls. Propylon is thought to have been built in the end of the 1stcentury BC or early in the 1st century AD (Rumscheid, 2000). The steps leading from the agora in the south to the temple are still standing today; the altar in the east has not survived. The south gallery, with its thirty two columns, is dominant in the plain. The terrace wall underneath reaches a height of 7 m. The temple was built in the east-west direction in the third quarter of the 4th century BC (Figure 3.67). On the three-step crepis, there are six columns on the short sides and eleven columns on the long sides (Figure 3.68). The entrance to the temple is provided from the east. Stylobate of the temple, built in peripteros style, measures 19.50x37.15 m. The temple has an Ionic order and the building material is marble (Akurgal, 1970; Rumscheid, 2000; Hennemeyer, 2013; Koenigs, 2015).

Figure 3.64. South wall of the propylon (May 19, 2017).

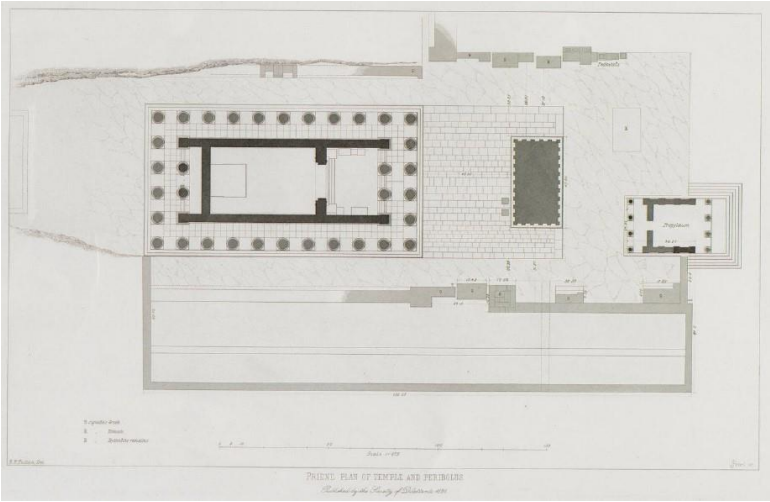


Figure 3.65. Plan of the Sanctuary of Athena. (Source: Society of Dilettanti, 1881)

Figure 3.66. East stairs and terrace wall of the sanctuary (May 19, 2017).

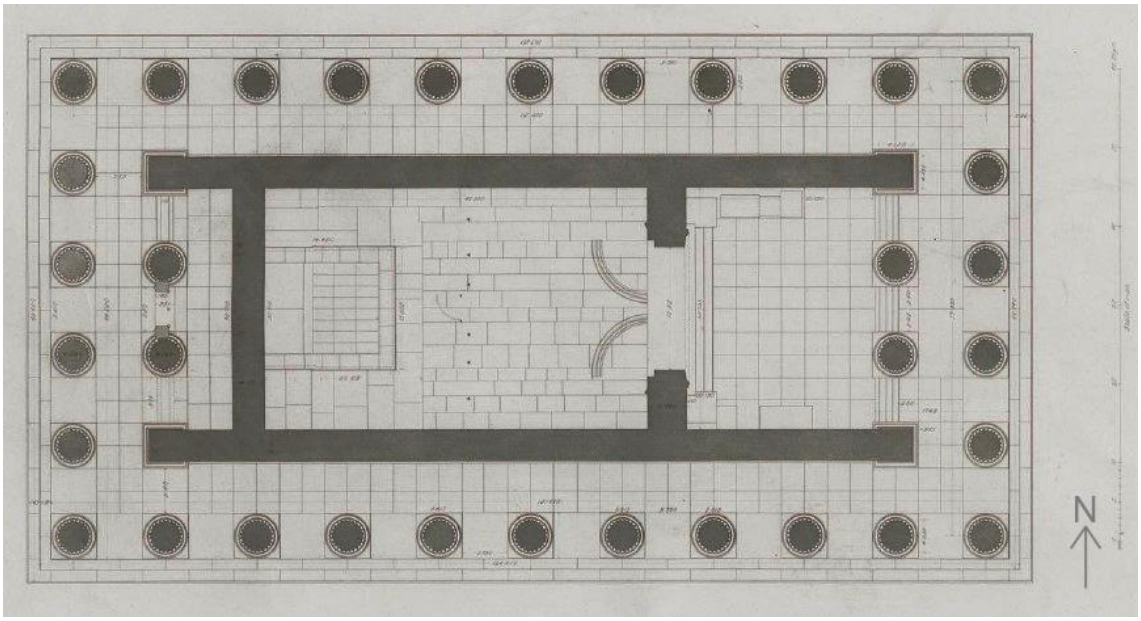


Figure 3.67. Restitution plan of the Temple of Athena.
(Source: Society of Dilettanti, 1881)

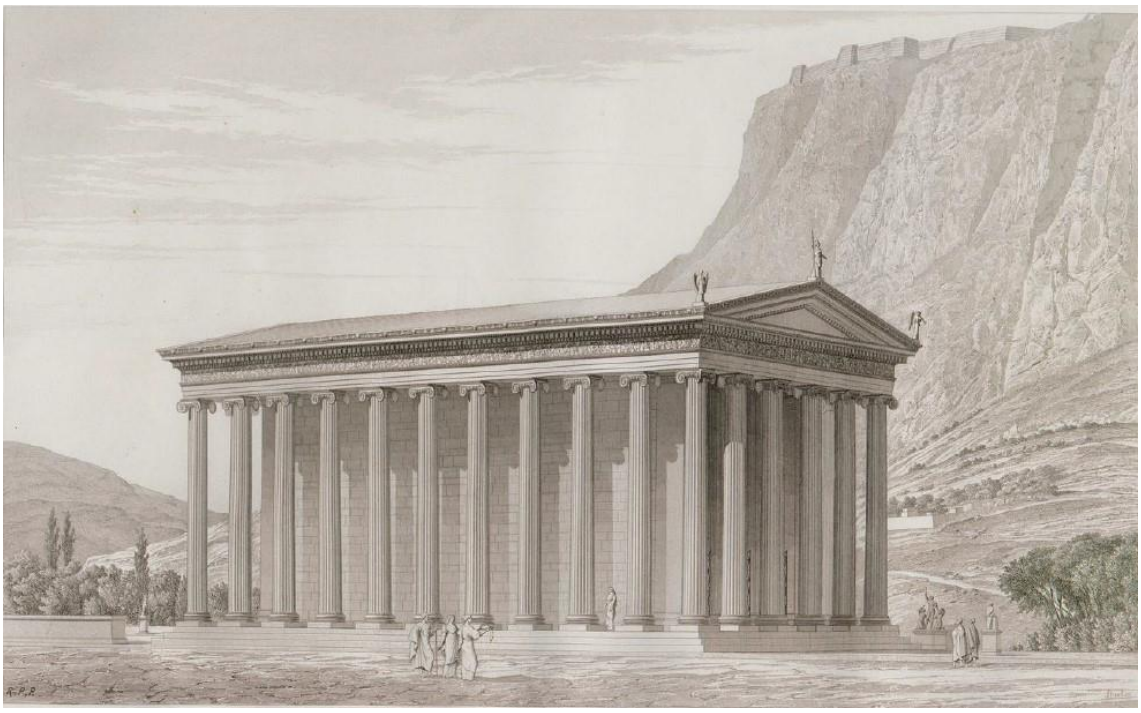


Figure 3.68. Perspective view of the Temple of Athena.
(Source: Society of Dilettanti, 1881)

3.3.4. Excavation and Implementation Program

Archaeological excavations in Priene were first done by Carl Humann in 1895[35]. It was excavated by archaeologist Theodor Wiegand until 1899. The German Archaeological Institute (DAI) charged architect archaeologist Prof. Dr. Wolfgang Müller-Wiener as excavation director in 1977-1982 and excavations continued. Architect archaeologist Prof. Dr. Wolf Koenigs, Technical University of Munich, and archaeologist Prof. Dr. Wulf Raeck, Goethe University Frankfurt, carried out excavations from 1990 and archaeologist Prof. Dr. Frank Rumscheid also acted as a representative from time to time from 2002 until 2013 (Koenigs et al., 2000; Rumscheid, 2000; Koenigs, 2015). Since 2014 archaeologist Hasibe İslam Akat from Miletos Museum, archaeologist Prof. Dr. İbrahim Hakan Mert from Uludağ University and archaeologist Dr. Axel Filges from Goethe University in Frankfurt carried out the excavations (İslam Akat, H.; Mert, İ. H. & Filges, A., 2016).

After the excavations at the end of the 19th century, the ancient city was transformed into a park where remains were surrounded by pine trees and rare plants. Although this park view does not match the character of the city in antiquity, it created a landscape worth preserving. As there are not enough architectural elements for anastelosis, although a number of column drums survived in the Temple of Athena and agora, the restorations are intended to protect the existing blocks, to make simple repairs, to complete and transfer the architectural knowledge. When the German Archaeological

[35] Priene was first discovered as far as is known by British merchants in Smyrna in 1673, after being abandoned. The report was prepared by Salter and Pickering during this trip. In 1750 Robert Wood visited Priene and prepared a report, which resulted in the incorporation of Priene into the Society of Dilettanti's research program; Richard Chandler, William Pars and Nicolas Revett conducted the first researches at the Temple of Athena (Figure 3.69, Figure 3.70). In 1811/12, Francis Bedford and John Peter Gandy and Sir William Gell were assigned by Society of Dilettanti to update Antiquities of Ionia. Richard Pullan was again commissioned by the Society of Dilettanti in 1868-69 to conduct excavations in the Sanctuary of Athena (Figure 3.71, Figure 3.72). Carl Humann was licensed in 1895 and began to excavate in Priene and continued until his death in 1896. After Humann's death, the excavations were carried out until 1899 under the presidency of Theodor Wiegand (Figure 3.73). Researches between 1977 and 1982 were carried out by the German Archaeological Institute conducted under the direction of Prof. Dr. Wolfgang Müller-Wiener. Since 1990, excavations have been conducted by Prof. Dr. Wolf Koenigs and Prof. Dr. Wulf Raeck (Figure 3.74, Figure 3.75). Below is a list of the first publications about Priene (Rumscheid, 2000).

- Wheler, George (1682). *A Journey in Greece.* London.
- Society of Dilettanti (1769). *Ionian Antiquities.* London.
- Society of Dilettanti (1821). *Antiquities of Ionia*. London.
- Society of Dilettanti (1881). *Antiquities of Ionia IV.* London.
- Wiegand, Theodor, & Scrader, Hans (1904). *Priene, Ergebnisse der Ausgrabungen und Untersuchungen in den Jahren 1895-1898.* Berlin.
- Wiegand, Theodor & Schrader, Hans (1910). *Priene, Ein Begleitwort zur Rekonstruktion von A. Zippelius, Neue Jahrbücher für das Klassische Altertum, Geschichte und deutsche Literatur 25*. Berlin.

Institute began excavations in 1977, the five columns on the northern side of the Temple of Athena were re-erected (Koenigs, 2015).

The re-erection work carried out by Turkish authorities in order to draw attention of visitor in 1965/66, no scientific preliminary work was undertaken, the torus[36] parts of the column bases were not used and the columns were re-erected to a height of 8 m short by 3.5 m from the original height considering possible earthquake (Bauer, 1969; Akurgal, 1970; Rumscheid, 2000; Koenigs, 2015; W. Koenigs, personal communication, January 28, 2018)[37]. In this study, no material was placed between the drums for joining. Debris around the temple was cleaned to find the necessary column drums, many of which were brought back to the temple terrace, especially from the southern slope. Crepis was cleaned from the grass. The architectural elements collected were placed in the north and south of the temple and still stand on the ground today, irregular and prone to erosion. Work was started in 1977 to ensure the preservation of existing parts and to avoid loss of ornamentation; the architrave block fragments of the inscription dedicated to Augustus were assembled. Some of the capital in the north were organized in the site so that their protected surfaces were not visible. The ruins collected from 1980 and 1992 were kept at the newly established depot at Turunçlar area (Koenigs, 2015).

Documenting studies were started in 1999 to reach the full size and architectural parts of the Sanctuary of Athena, thus the height of the propylon column were determined (Koenigs & Raeck, 2001). As a result of ongoing research and documentation studies in 2001, important results were obtained regarding the reconstruction of the propylon of the temple. Propylon was a little shorter than the last one in the first construction period dated to 1st century BC or AD in Augustus period (2.40 m. to 6.60 m.), besides Corinthian columns on east façade there were Ionic columns on west façade in second construction period of the altar, and that there were three doorways on the entrance façade and side ones were closed later by wall were obtained in the research (Rumscheid, 2000; Raeck, 2003).

Architectural pieces were placed in order to clarify the boundaries of cella, pronaos and opisthodomos in the temple in 2005. Eave was reconstructed on the east façade of propylon (Raeck, 2007). Security measures were taken in the pit opened for research purposes during the excavations at Wiegand period in the 19th century on the

[36] Torus: Bold projecting convex moulding of semicircular section on either side of the section in an Attic base (Curl, 1999).

[37] The reconstruction in original height of the two columns and eaves of the temple is in Berlin Pergamon Museum. Only one base and a piece of lower column drum of the elements used in the reconstruction are original (Rumscheid, 2000) (Figure 3.76).

southern side of the temple in 2013. The drilling pit is about 6 m in length, 2 m in width and 3 m in depth. This pit was not closed in order to learn about the foundation wall observed only in the western and southern parts of the temple when the rest of the temple was sitting on the rock. The drilling pit was consolidated by building a new wall with lime mortar and field stone. While the pit was being cleaned, a mortar-free wall remain was found. In order to exhibit this wall, which is thought to have been constructed in the same period as the temple, the new wall extending in the north and south direction was suspended with the steel supports of the upper part wall by leaving some gaps in the wall. The pit was covered with a detachable grate (Raeck, Mert, & Filges, 2015) (Figure 3.77).

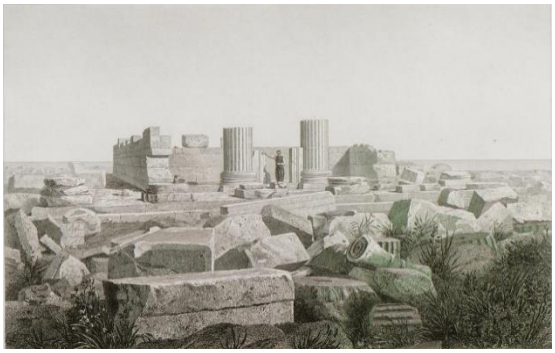


Figure 3.69. The temple looking east in 1881 (Source: Society of Dilettanti, 1881).

Figure 3.70. Pronaos of the temple looking from west in 1881 (Source: Society of Dilettanti, 1881).

Figure 3.71. Excavations in the propylon in 1868 (Source: Photo taken by R. P. Pullan in ~1868, retrieved from Hennemeyer, 2006).

Figure 3.72. The Propylon from north in 1868 (Source: Photo taken by R. P. Pullan in ~1868, retrieved from Hennemeyer, 2006).

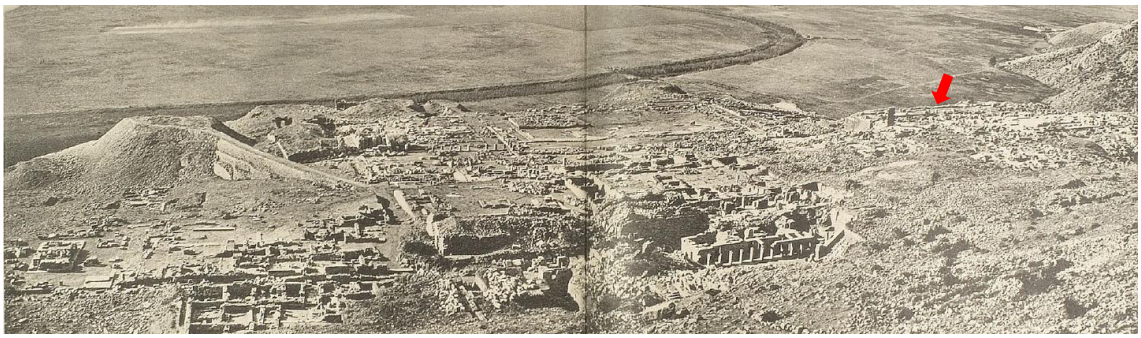


Figure 3.73. View from north of theatre. The propylon is to the right in 1904. (Source: Wiegand & Schrader, 1904)

Figure 3.74. The Temple of Athena after re-erection in 1965/1966 from the north (Source: Hennemeyer, 2006).

Figure 3.75. The Temple of Athena after re-erection and planting of the site (Source: Hennemeyer, 2006).

Figure 3.76. Partial reconstruction of the Temple of Athena at Berlin Pergamon Museum. Only left base and little part of bottom drum are original (Source: Rumscheid, 2000).

Figure 3.77. The drilling hole next to the foundation wall of the temple (May 19, 2017).

3.3.5. Evaluation of Interventions

Anastelosis principles cannot be provided in the work in the Temple of Athena in 1965/1966, because it was argued that it was not a scientific work, drums were randomly joined and even if original elements were used, it gives wrong information about column heights and torus (Table 3.3).

- **Emphasis of the Structure within Site Scale**

The Temple of Athena at Priene was built at a dominated position to Menderes Plain and slope of the Samson Mountain. It is a dominant place in the city due to its location. The re-erected five columns present an impressive image especially when reached to the sanctuary from theatre. When the mountain is taken in the background, the columns increase the attractiveness by integrating a whole with nature. It is possible to observe the Menderes Plain, which was the sea in ancient times then filled with alluvial deposits from the terrace of the sanctuary, which is located. The propylon, which only south wall survived today, reached by stairs next to the agora is the secondary position beside the columns as it was in original. It can be said that the re-erection work of the temple which was dedicated to the main goddess of the city and had a high position in the city, and that the temple could be seen at present from the lower parts of the city as in the past; is for regaining its original significance. It may be thought that the columns provide the landscape integrity with trees behind. Since the architectural elements of the temple were scattered on the ground, the five re-erected columns seem to have survived untouched since ancient times. Although this is a misleading image, this ruinous image of the temple is in harmony with other constructions and landscape in the ancient city (Figure 3.78).

- **Integrity of the Monument**

Re-erection of five columns belong to only one side of the temple cannot give a general idea of the mass of the temple. It is not even clear which side of the temple, the five columns belong, without checking plan drawings. The southern wall of the propylon of the temple is still standing, but it is hard to imagine what kind of structure this two-dimensional wall belongs to. Since, most architectural elements of the temple lie unorganized on the ground, also members belonging to the Doric gallery and the altar of the temple were not re-erected; the presence of these different styles of the structures in the sanctuary cannot be understood (Figure 3.79). As a result of site survey with no

definite information available, the use of new materials in the re-erection study was not observed, so the architectural elements of the temple are visually harmonized.

- **Authenticity**

Architectural elements belonging to the five columns, which were re-erected, are thought to be original as a result of the examination done in the site with no definite information available. As a result of the observations, it was determined that no new material was used in the re-erection (Figure 3.80). It is possible to say that the authenticity rate of architectural elements is high. There is doubt, however, the re-erected drums, the capitals and the bases, are matched. Column heights are 3.5 m shorter than original. In addition, during the re-erection, the torus elements belonging to the bases were not used (Figure 3.81). For this reason, it cannot be said that the original structural system was maintained. As the drums were placed on top of each other, no dowel was used between them; for this reason it is not possible to mention the authenticity of the construction technique.

- **Reliability**

It is known that the columns of the temple were re-erected randomly without preliminary study and scientific method. The fact that the drums, capitals and the bases are matched is doubtful, the torus elements were omitted during the re-erection gives incorrect information about the elements and the order of the temple. In addition, considering the major earthquakes in the region, the columns were re-erected to 3.5 m shorter than their original height, in order to avoid collapse in a possible earthquake. For this reason, the re-erection work done is far from reliable.

- **Distinguishability and Compatibility**

As a result of the site survey studies it was determined that no new material was used in the re-erection work. For this reason, it is not possible to talk about a situation that would create compatibility problems with original materials.

- **Reversibility and Re-treatability**

It is known that no joining material was used between the elements of the temple during the re-erection work. Worn temple elements were not completed with new material. For this reason, it is thought that these elements can be removed without being damaged in the future anastelosis / restoration work. Other elements left to wear on the ground may need to be repaired if they will be used for anastelosis / restoration work.

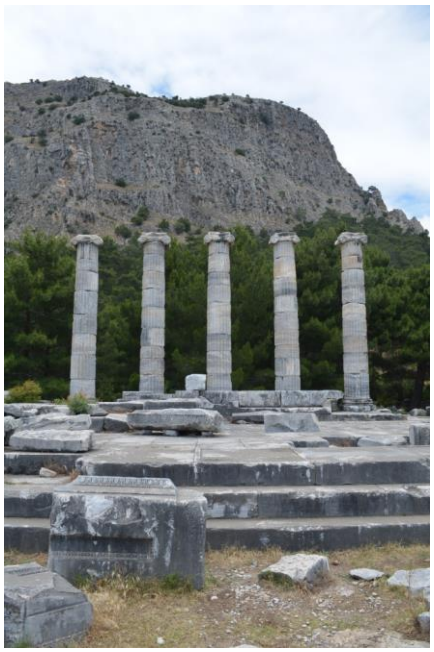


Figure 3.78. The Temple of Athena with pine trees and mountain behind (May 19, 2017).

Figure 3.79. Unorganized site as uninformative (May 19, 2017).

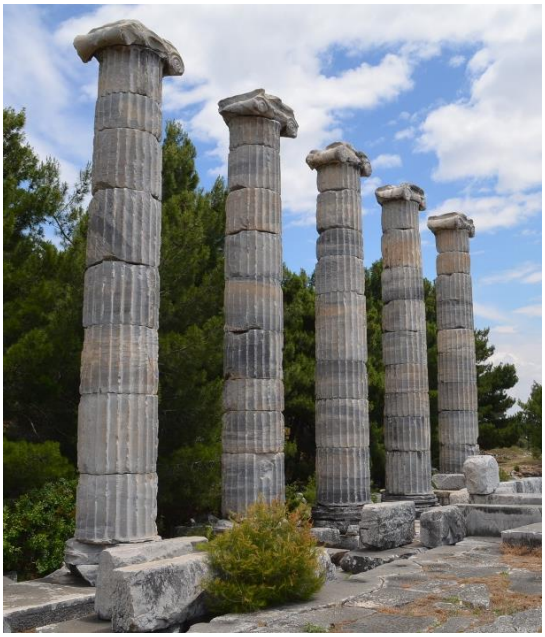
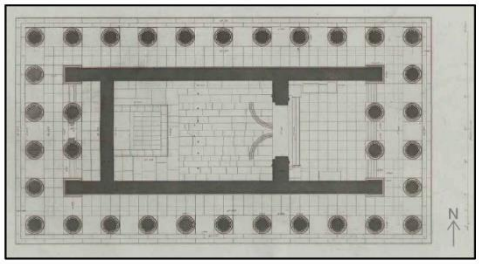


Figure 3.80. Original drums of the columns (May 19, 2017).

Figure 3.81. Missing torus part of the bases (May 19, 2017).

Table 3.3. Analysis and evaluation of implementation on the Temple of Athena at Priene.

Temple of Athena at Priene		
STRUCTURE	**Location** Güllübahçe, Söke, Aydın	 Southeast view of the Temple after implementation
	Construction date Third quarter of 4th century BC	
	Excavation periods 1868-1869 R. P. Pullan (Society of Dilettanti) 1895-1896 Carl Humann 1896-1899 Theodor Wiegand 1977-1982 Wolfgang Müller-Wiener (DAI) 1990-2013 Wolf Koenigs & Wulf Raeck (DAI) 2014- Hasibe İslam Akat (Miletos Museum) & İ. Hakan Mert (Uludağ University) & Axel Filges (Goethe University)	 Plan of the Temple
IMPLEMENTATION	**Implementation date** 1965-1966	
	Director of excavation -	
	Responsible for the project Turkish authorities	
	Original material Marble	**New material** No new material was obtained during site survey
	Applied parts Re-erection of 5 columns on north side	**New structural system** No new structural system was obtained during site survey
EVALUATION	**Emphasis of the structure within the site scale** Regained its historical importance as main temple located upper part of the city. Harmonious within pine trees and acropolis hill behind also the rest of the ruin site	**Reliability** Randomly placed drums Incorrect information about height of the columns Unused torus parts of the bases
	Integrity of the monument Low structural integrity of temple with five columns only one side One wall of propylon provides inadequate information Visually integrated since no new material	**Distinguishability and compatibility** No distinguishability and compatibility problem since no new material in restoration
	Authenticity High authenticity with original drums No joining elements between members	**Reversibility and re-treatability** Detachable members since no new material in joining or compliting
	Result Re-erection with random joining, wrong information about height and unused torus parts	

3.4. The Temple of Leto at Letoon

3.4.1. Location of the Site

The Sanctuary of Letoon[38] is located in Kumluova neighbourhood / village of Muğla, on the border of the provinces of Seydikemer and Kaş. It is 58 km from the centre of Seydikemer (Figure 3.82). The Sanctuary of Letoon, which was connected to Xanthos 4 km north, the capital of Lycian civilization in antiquity, is located on the edge of Tümtüm Hill, an alluvial land surrounded by modern day greenhouses, on the western side of the Eşen (Xanthos) Stream in the Eşen Plain (figure 3.83). For this reason, the land has a high water table and the ruins are often covered with water. While Xanthos was at the forefront with tomb architecture, Letoon was the political and religious centre of Lycia; the pacts signed between cities were explained and kept here[39]. Letoon was a sacred area dedicated to the twins Apollo and Artemis, and their mother Leto. In antiquity the area was entered through a gate from the south (Figure 3.84, Figure 3.85). On the north of the sacred road east of the gate lies the Temples of Leto, Artemis and Apollo side by side (Figure 3.86, Figure 3.87). The Roman nymphaeum and the church dated to 6th century AD are on the south of the sacred road. The porticos was excavated on the west and north of the temples. There is a theatre with a capacity of 7800 people, thought to be dated to the end of the 2nd century BC or the beginning of the 1st century AD, is on the north of the site (Des Courtils & Laroche, 2009; Atik Korkmaz, 2016). Today, the entrance of the site is provided from the northwestern part, which is arranged as ticket office.

3.4.2. Brief History of the Site

It was believed that Leto, who newly given birth to twin children, escaped from the wrath of Zeus's wife Hera, sheltered into a waterside in Lycia, but the people of the region did not accept her thereupon Leto turned them into frogs. It was discovered that

[38] Letoon, together with Xanthos, was added to the UNESCO World Heritage List in 1989 (http://whc.unesco.org/en/list/484).

[39] The three-lingual inscription of Lycian, Ancient Greek and Aramaic dated to the 4th century BC was found in the excavations in 1973 near the Temple of Apollo (Metzger, 1975).

the first settlement and the rituals of worship of the water goddess around the sacred spring goes back to the 8th century BC. In the Lycian language the water fairies, called *eliyana*, turned into nymphs[40] by Hellenization of the cult; the temples were built in the site and Leto and her children began to be worshiped. The sanctuary continued its importance during the Persian occupation, Roman and Byzantine periods. With the capture of Rhodes by the Arabs, it is thought that Letoon was abandoned with the increase of their powers in the Mediterranean. With the arrival of Turkish tribes in the 12th century and the settlement of immigrants from Rhodes in the 18th century, the region became important again (Des Courtils, 2003; Des Courtils & Laroche, 2009; Atik Korkmaz, 2016).

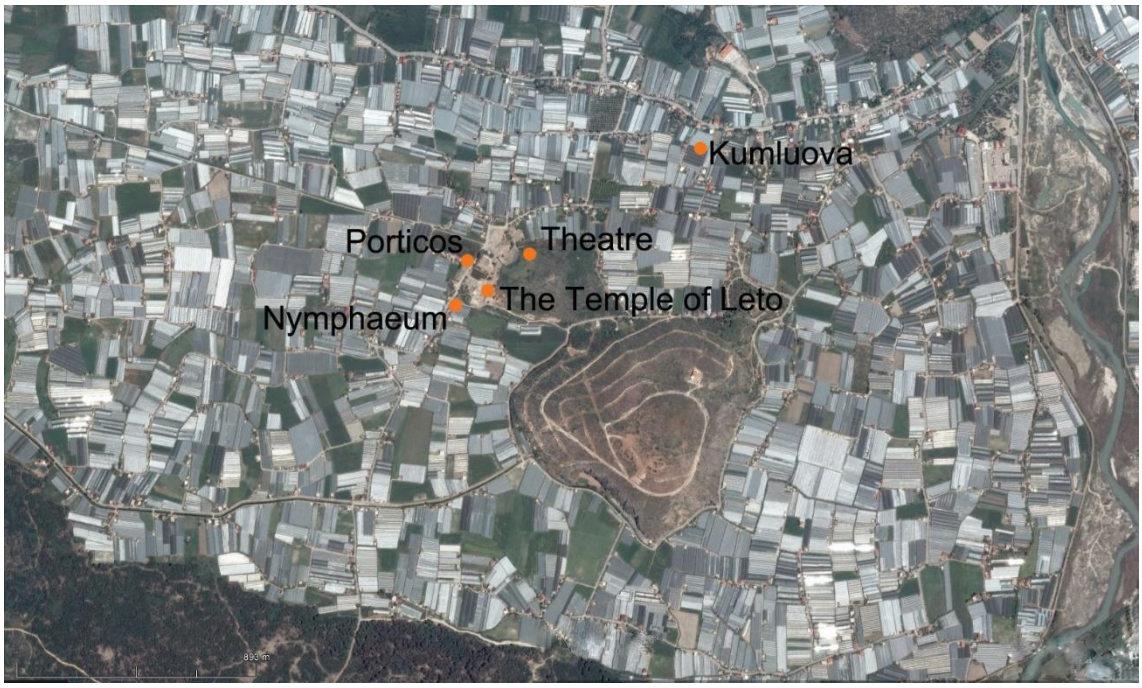


Figure 3.82. Location of Letoon.
(Source: Google Earth date of image: 13.04.2016 date of editing: 27.11.2017)

[40] Nymph: A mythological spirit of nature imagined as a beautiful maiden inhabiting rivers, woods, or other locations (Retrieved from oxforddictionaries.com May 21, 2018).

Figure 3.83. Aerial view of Letoon.
(Source: Atik Korkmaz et al., 2013)

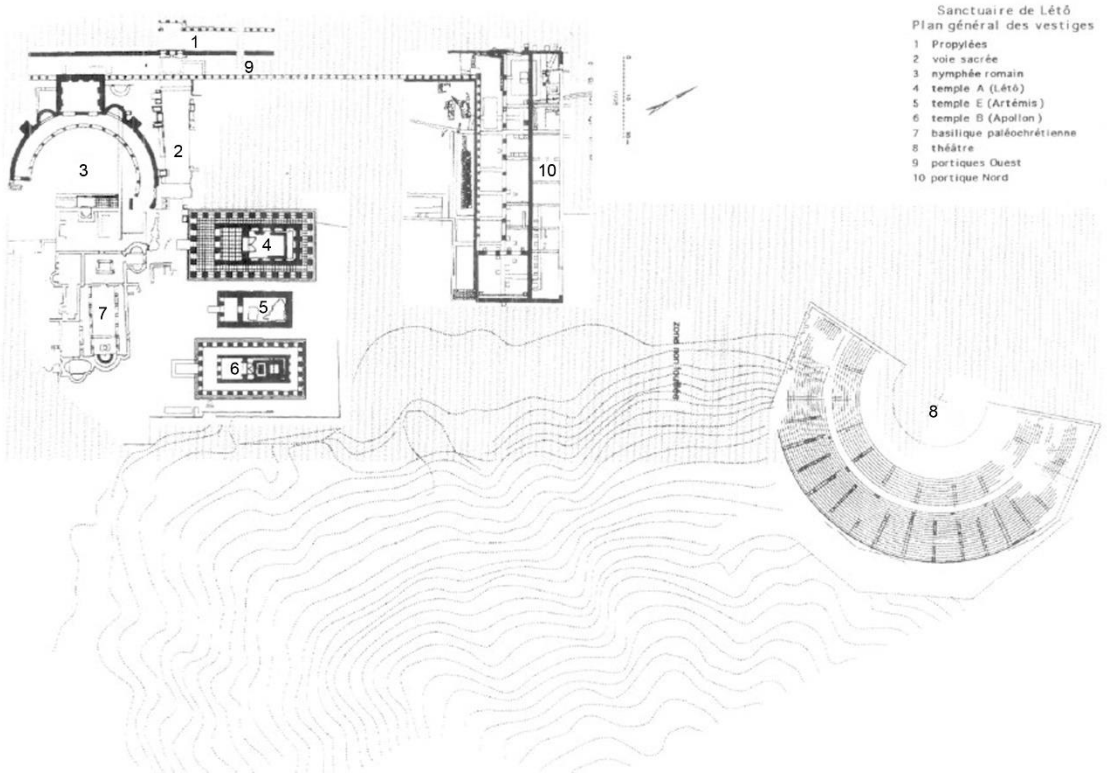


Figure 3.84. Site plan of Letoon.
(Source: Des Courtils & Laroche, 1998)

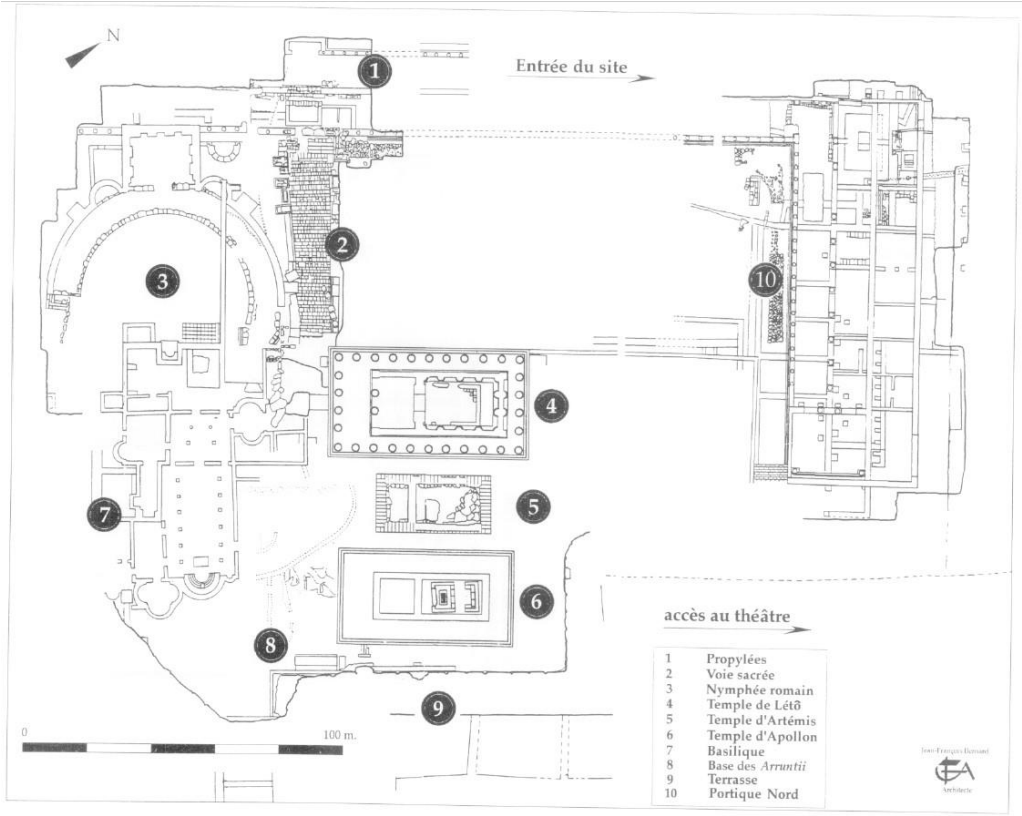


Figure 3.85. Detailed site plan of temple area.
(Source: Laroche, & Bernard, 1998)

Figure 3.86. The Temple of Leto (October 28, 2017).

Figure 3.87. The Temples lying next to each other.
(Source: Cavalier, 2011)

3.4.3. Architectural Characteristics of the Temple

The Temples of Leto, Artemis and Apollo were built on rocks side by side in the Sanctuary of Letoon. Among the temples the biggest one is dedicated Leto, then the Temple of Apollo. An orthogonal order was followed in the planning of the sanctuary. In the Roman period, the previous constructions were spatially rearranged and a monumental nymphaeum was built. The road on the west side, which is the lowest level of the sanctuary, was raised to protect it from groundwater. The Roman nymphaeum, which is an important part of the cult centre, was located in the southwestern side of the Temple of Leto in order to regulate the water and to keep the water level under control which is still an issue today. In the Byzantine period, the temples were demolished and the basilica was built to the south of the temples (Laroche & Bernard, 1998; Des Courtils & Laroche, 2009) (Figure 3.88).

The Temple of Leto dated to160-130 BC is thought to have been built on an earlier temple of the 4th century BC. The temple has Ionic order. On the three-step crepis, there are six columns on the short sides and eleven columns on the long sides. The temple, which is periperos but has pseudo-dipteros plan features in front façade, lying in the north-south direction, has two Ionic semi-columns in the middle of the opisthodomos wall; designed adjacent to the wall between the ante walls (Hansen, 1991; Atik Korkmaz, 2016)

(Figure 3.89). In the inner walls of the cella adjacent to the wall, there are two semi-columns in the north, three each in the west and east, and quarter columns on the wall corners in Corinthian order (Figure 3.90). The entrance of the temple is provided from the south and the temple measures 15.75x32.25 m (Atik Korkmaz, 2016). Unlike the Temples of Apollo and Artemis, which were used as lime quarry and suffered great damage, the architectural elements of the Temple of Leto were mostly preserved as they were buried in alluvion after demolishing (Figure 3.91). Nevertheless, it is possible to say that the elements of the temple were disassembled in antiquity and used in the basilica (Laroche, 2007). The temple, whose main material was limestone, was built with dry technique, without the use of binders between the stones. Between the blocks, iron dowels were used on vertical, bronze clamps were used on horizontal and they were covered with lead (Des Courtils & Laroche, 2002).

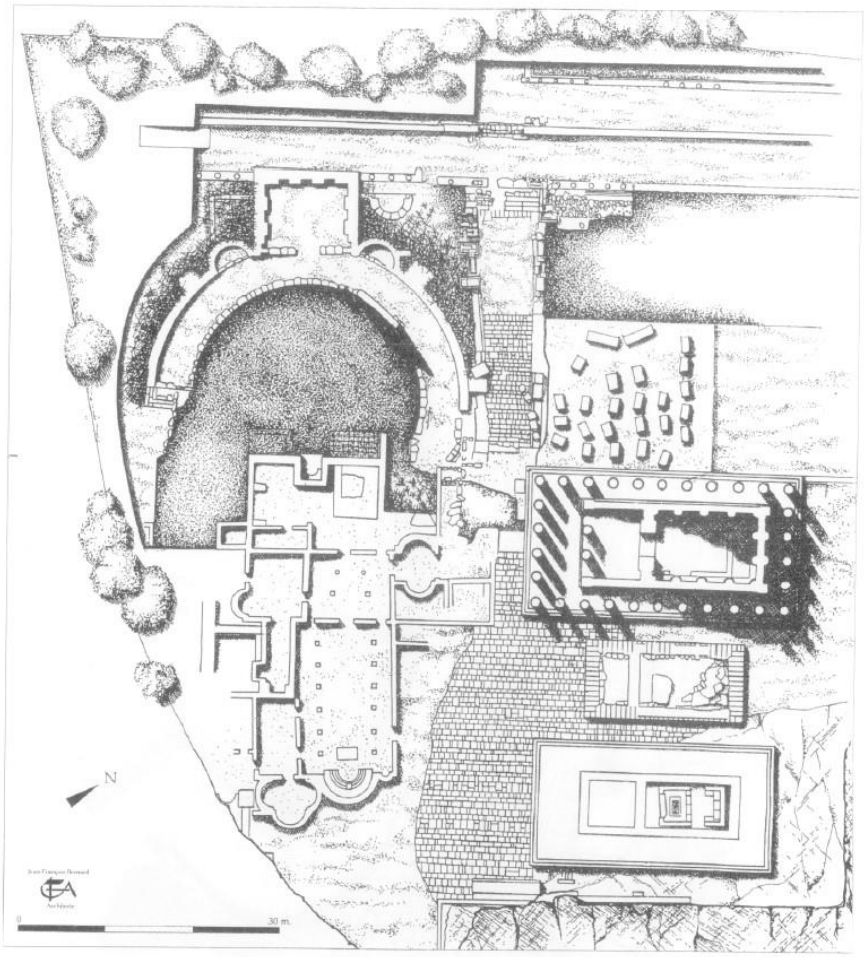


Figure 3.88. Drawing proposal of the temple area with nymphaeum and basilica.
(Source: Laroche & Bernard, 1998)

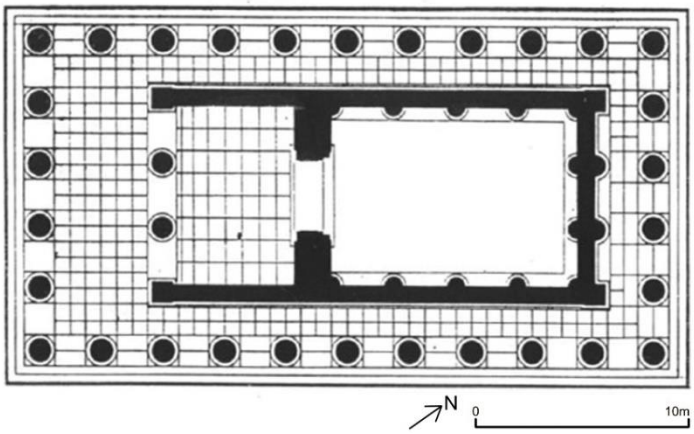


Figure 3.89. Restitution plan of the Temple of Leto.
(Source: Hansen, 1991)

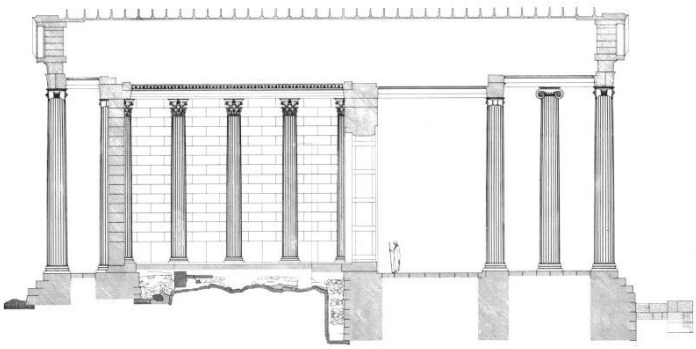


Figure 3.90. North-south section of the temple with Ionic and Corinthian columns.
(Source: Hansen, 1991)

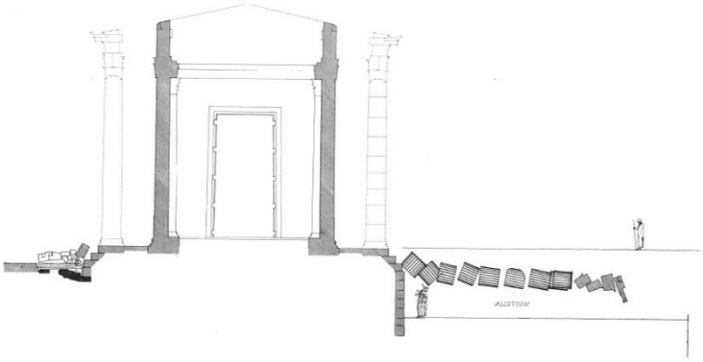


Figure 3.91. Destruction scenario of the temple. West side of the temple was covered into alluvion (Source: Hansen, 1991).

3.4.4. Excavation and Implementation Program

The first excavations in the Letoon ancient city were carried out by the French team, who have continued to work in Xanthos since 1951, under the direction of archaeologist Prof. Dr. Henry Metzger in 1962 in the name of French Institute for Anatolian Studies (IFEA) (Metzger, 1964; Atik Korkmaz, Sayar, Küçük, Ergüder, Babayiğit, Emmungil, & Bilgiç, 2013). Excavations have been led by archaeologist Prof. Dr. Christian Le Roy from University of Caen since 1980 (Le Roy, 1981). Xanthos-Letoon excavations were carried out together until 1997, then separated; while the head of the Xanthos excavations was Jacques des Courtils, a member of the Bordeaux Montaigne University, the chairman of the Letoon excavations was the architect Assoc. Dr. Didier Laroche from University of Strasbourg (Des Courtils & Laroche, 1999a). Starting from 2011, the excavations have been carried out by archaeologist Assoc. Dr. Sema Atik Korkmaz from Başkent University (Atik Korkmaz & Demirtaş, 2016)[41].

In 1962, works were carried out in the Temple of Leto, as well as, the theatre. After the first cleaning work, it was observed that most of the south side of the temple was destroyed, but the architectural elements were mostly present in the site (Metzger, 1964) (Figure 3.92).

The Temple of Artemis located between Leto and Apollo was reached using the mechanism established the previous year in order to remove the fallen cella blocks of the Temple of Leto and investigate the site safely in 1966 (Metzger, 1968) (Figure 3.93).

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[41] The remains of Letoon were discovered in 1840 by British officer R. Hoskyn. Presented by Hoskyn for the Royal Geographical Society, Letoon was introduced to the western world. In the following periods, Charles Fellows did surveys here and especially the works of Xanthos were moved to London. Then Thomas Abel Brimage and Edward Forbes and Austrian epigraphers Otto Benndorf and George Niemann visited the area. The first plan of the area was prepared by Ernst Krickl in 1892. The excavations which have been carried on since 1962 were conducted by H. Metzger, C. Le Roy, J. des Courtils, D. Laroche, L. Cavalier and S. Atik Korkmaz in order. The list of the first published books about the field is given below (Atik Korkmaz et al., 2013; Atik Korkmaz, 2016).

- Hoskyn, Richard (1842). "Narrative of a Survey of Part of the South Coast of Asia Minor and a Tour into the Interior of Lycia in 1840-1841." *Journal of the Royal Geographical Society of London*.
- Fellows, Charles (1841). *An Account of Discoveries in Lycia.* London.
- Fellows, Charles (1842). *The Xanthian Marbles; Their Acquisition and Transmission to England.* London: John Murray.
- Spratt, Thomas Abel Brimage, & Forbes, Edward (1847). *Travels in Lycia, Milyas and the Cibyratis: in company with the Late Rev. E.T. Daniell.* London: John van Voorst.
- Benndorf, Otto, & Niemann, George (1884). "Reisen in Lykien und Karien". In: Vol. I of *Reisen im sudwestlichen Kleinasien*. Vienna: C. Gerold's Sohn.
- Krickl, Ernst (1892) *Lycian Journal 1892*. Başgelen, Nezih, ed. İstanbul: Suna and İnan Kıraç Foundation, Arkeoloji ve Sanat Yayınları, 2005.

The process of cleaning the site from stone blocks, which started in previous years, continued in 1972 work. The peristyle, pronaos and cella parts of the Temple of Leto were removed from the stones and these stones were moved to the empty area west of the temple (Metzger, 1974) (Figure 3.94).

The classification of architectural pieces belonging to the Temple of Leto was continued; pronaos and opisthodomos pieces in 1979. The restoration project was prepared for the survived original fragments (Metzger, 1980). The classification of about 2000 pieces of the temple was completed and drawings of the northern façade were done in 1980 (Le Roy, 1981). The cella and peristyle parts of the temple were completely unearthed, and numerous drums were found on the southwestern corner, while cella and peristyle blocks were found on the north in 1981. In addition, a total of three capitals were found belong to semi-column of back of the cella, northwest and northeast corners (Le Roy, 1983). In 1984, the restitution drawings of the Corinthian capitals of the cella were studied (Le Roy, 1985). In 1987, architectural members, more than 60 belonging to the temple, were found (Le Roy, 1988). In the 1989 work, a drilling pit was opened (7x5 m) in northwest corner of the temple in order to obtain information on foundation (Le Roy, 1990). In 1991 and 1992, the inventory of the architectural parts of the temple was continued, and it was decided to make partial anastelosis in the temple due to the fact that the number of original architectural elements was more than 5000 (Le Roy, 1995).

2/3 of the colonnaded parts, 80% of the cella wall blocks of the temple survived to present day. The anastelosis project for the temple was prepared in 1999, started in 2000 and completed in 2007. Especially the southern columns of the temple were lost and many of the drums were used in the church. When preparing the anastelosis project in order to perceive the mass of the structure, partial anastelosis was decided to harmonize the temple with the appearance of the site as a ruin and not to have an overwhelming effect on the Temples of Apollo and Artemis with its new mass. It was decided that to complete the cella walls to middle height and re-erect lower parts of the columns in different heights in the eastern side just to make understandable the plan setup. For this reason, by considering the relationship between the temple and the other structures and the circulation scheme, the focus of the anastelosis was the northern part which would perceive the original façade image. The proportion of reusable drums was around 30%. However, when these drums were desired to place in their original locations, the number of columns that could reach original height decreased, only a partial anastelosis of five columns was aimed. In addition, the western elements of the temple were planned to be

exhibited on the ground in order to convey the destruction of the temple during the Christian era. For anastelosis, the original locations of the elements of the southern façade were tried to be determined and this was done at a high reliability rate. The new blocks were produced from limestone, similar to the original blocks, removed from the vicinity of the original quarry. Completions only were done where necessary. Vertical clamps were produced from iron, horizontal clamps were made from bronze, and the surroundings were covered with lead. Particularly in the places of the cella blocks, ancient methods were followed; the blocks were placed with the aid of a crowbar without the use of a crane. Despite the fact that it was planned to design and use ancient leverage for this purpose, this project could not be realized due to budget and information inefficiency (Laroche & Bernard, 1998; Des Courtils & Laroche, 2000; Des Courtils & Laroche, 2003; Laroche, 2007; Des Courtils & Laroche, 2009).

Research was conducted around the temple and scattered blocks were collected in 1998 (Des Courtils & Laroche, 1999b). Worked on column drums in 1999. 180 drums were counted that were used in Christian era structures or scattered and stayed in fallen position on the ground. There should be 270 drums in the peristyle of the temple where each column has nine drums. In this case, the surviving 180 drums is a low ratio of 67%. In the cella part of the temple this ratio is around 80%. Since some of the existing drums were damaged but in a number that cannot be ignored, it was decided to use these members in the anastelosis. Except the fallen drums in the western part of the temple, 90 of the 125 drums were obtained as usable. From there, a restitution drawing was prepared. It was calculated that up to a dozen columns could be re-erected with the existing drums (Figure 3.95). The missing parts of damaged drums were planned to be completed. First of all, the two columns that had all of the drums except one drum, were planned to be re-erected on the northern side. Since well-preserved column bases did not survive, it was planned that the two bases would be produced, placed and sculptured from limestone in addition to the missing lower drum. The broken pieces of the southeast stylobate block of the temple were adhered as a preparation for the re-erection study (Des Courtils & Laroche, 2000) (Figure 3.96).

The toichobate[42] blocks were repaired and put in place with tools similar to those used in antiquity, and they were connected to each other with clamps in 2001 (Figure

[42] Toichobate: Greek Wall stood on a plinth of orthostates (slabs placed on edge), which in turn rested on a low course (Campbell, 2007).

2.27). Of the orthostate[43] blocks, 25 were put in place, and a newly constructed block was used at the western wall. The 20 blocks of the southern wall were prepared to be put in their places. A block of the first row east of the cella door and a semi-column of the northern wall were placed. In addition, base and three drums of the third column from the northwest corner on north side were placed (Figure 3.97). Other architectural pieces belonging to the temple were placed on top of each other in a reconstructive manner. The column drums that could be used in the anastelosis were investigated in the site. The damaged lower blocks of the cella were repaired (Des Courtils & Laroche, 2002).

Two blocks belonging to western first row of the cella, half block of south-eastern ante wall and all of the ornamented blocks of first row were placed in 2002 work. In order to solve the problem of joining in the eroded parts of the blocks, it was decided to place lead plates between the blocks in accordance with authenticity and reversibility principles, instead of intervening with the block itself. Orthostate blocks were repositioned, except for the five blocks in the south, missing pieces were produced with new material and connected with clamps. The location of the cella blocks was determined as a result of detailed studies and placed 22 blocks, the column that was started to re-erect in previous year was completed. Only the base of this column was produced from the new material, which was damaged in the Byzantine period. Where the column drums fell, they were buried in the ground for years and only the upper surfaces were eroded. The well preserved surfaces are the outside of the columns of the temple towards the visitors. In order to provide stability, the missing parts of the columns were completed with new material. With the help of a crane, the re-erected drums were connected to each other by three iron bars (Figure 3.98), dowels were adhered to their places with adhesives and covered with lead (Des Courtils & Laroche, 2003) (Figure 3.99).

The production of the northwest corner stylobate of the temple was completed in 2003. New blocks that were put in their places in 2002 were processed and finalized. A new stylobate block was also cut and readied to be placed in place. Broken architrave blocks scattered in the site were collected and organized according to their original order (Figure 3.100). Only one architrave block was unbroken. In addition to this, the column next to the column re-erected the previous year was re-erected. Damaged parts of column, 5 out of 9 drums, were completed with new material. The drums were connected to each

[43] Orthostate: One of several vertical stone parts set in the base of a wall to form part of the facing sometimes carved. Forming part of the revetment at the base of a temple cella (Curl, 1999).

other by iron dowels; lead plate was only used in 5th drum where necessary (Des Courtils & Laroche, 2004) (Figure 3.101).

During 2004, the northern wall of the cella was worked on. 101 blocks of 119 blocks were available. Thirty of these blocks needed to be repaired; it was planned to reproduce the missing eight (Figure 3.102). The eastern semi-column of opisthodomos was reproduced and put in place. Also five drums of the northwest corner column were placed (Figure 3.103). The missing base was reproduced; only one of the drum had to be completed with new material (Laroche, 2005).

The aim was to complete the eastern, western and northern walls of the cella in 2005. In total, 90 blocks were put in their places, 29 of them were produced with new material. In the work of 2005, it was determined that the blocks of the cella, which were located at the bottom of the structure in original situation but remained uncovered after the destruction of the building at the end of ancient period, had become very damaged by erosion over time. For this reason, the lower blocks used in anastelosis were not well preserved (Laroche, 2006a; Laroche, 2006b).

Letoon studies which were suspended in 2007, were started again in 2011. Site management plan via The Letoon Archaeological Research Project (LAAP) in 2011 included cleaning, inventory preparation, emergency protection, emergency repair, planning of restoration work, research and excavation work, geomorphological researches, epigraphic surveys and organization of the site. Architectural elements belonging to the upper structure of the Temple of Leto, which were idle in the site were planned to be used in future restoration works and arranged in the site according to their original positions in the temple (Atik Korkmaz et al., 2013). In 2013 and 2014, measurements were made with a total station in order to document the temple in a digital environment. In addition, an attempt was done to integrate the pediment of the temple, and 59 architectural pieces were assembled (Figure 3.104). A site organization project for the ancient city was prepared and drainage was carried out in order to solve the water level problem originating from the greenhouses since 1961 (Atik Korkmaz & Demirtaş, 2016; Atik Korkmaz, 2016).

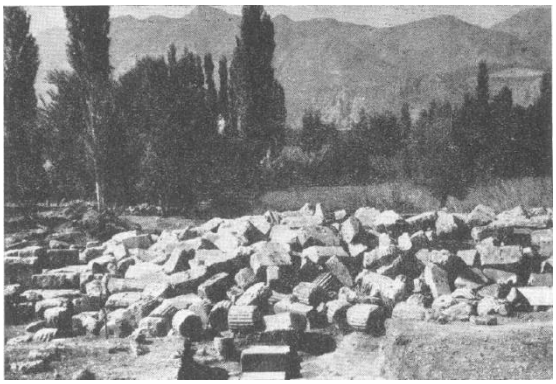


Figure 3.92. Situation of the Temple of Leto when excavations began in 1962 (Source: Metzger, 1964).

Figure 3.93. Excavated Temples of Apollo and Artemis. The Temple of Leto behind in 1966 (Source: Metzger, 1968).

Figure 3.94. Cella in 1976 purified from blocks (Source: Hansen & Le Roy, 1976).

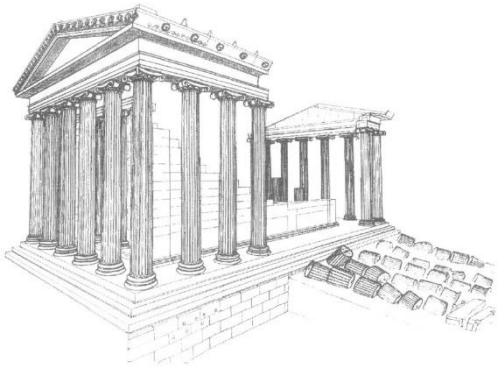


Figure 3.95. First anastelosis project in 1998 (Source: Laroche & Bernard, 1998).

Figure 3.96. Situation of the Temple of Leto before implementation in 2001. (Source: https://didierlaroche.wixsite.com Retrieved at April 27, 2018)

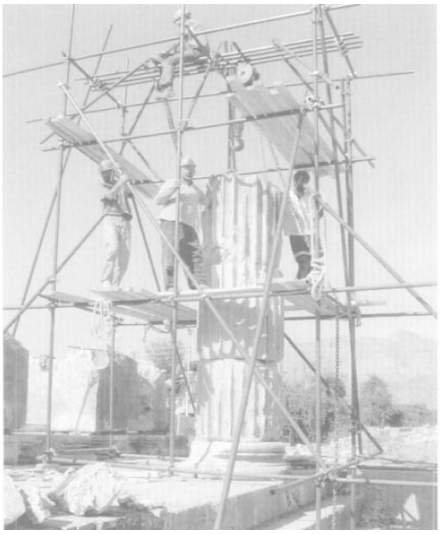


Figure 3.97. Placing drums of third column from northwest corner (Source: Des Courtils & Laroche, 2002).

Figure 3.98. Three iron dowels in drum (Source: Des Courtils & Laroche, 2003).

Figure 3.99. Re-erection work at the end of 2002 (Source: Des Courtils & Laroche, 2003).

Figure 3.100. Organization of architrave blocks of cella and peristyle on the ground (Source: Des Courtils & Laroche, 2004).

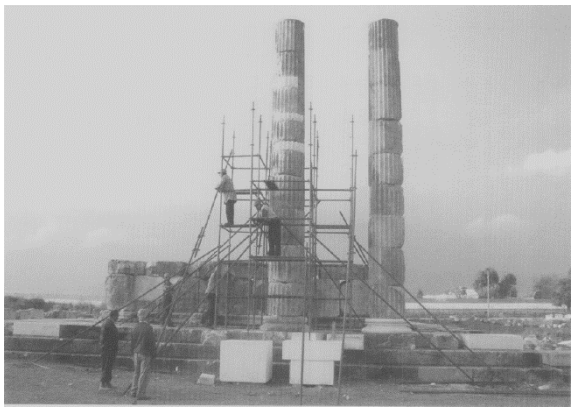


Figure 3.101. Re-erection work at the end of 2003 (Source: Des Courtils & Laroche, 2004).

Figure 3.102. Re-placing of missing semi-column of cella (Source: https://www.didierlaroche.org Retrieved at April 27, 2018).

Figure 3.103. Re-erection of northwest column in 2004 (Source: Laroche, 2005).

Figure 3.104. Joining of pediment blocks on the ground (Source: Atik Korkmaz & Demirtaş, 2016).

3.4.5. Evaluation of Interventions

The authenticity ratio of architectural elements is quite high in the application. The new material was restricted to the required places and a material similar to the original material was used. In the placement of the architectural blocks, scientific methods were followed and the correct locations of the elements were determined. For this reason, anastelosis principles were followed in the implementation (Table 3.4).

- **Emphasis of the Structure within Site Scale**

The Sanctuary of Letoon is the only place dedicated to the goddess Leto in Anatolia. The temples dedicated to Leto and her children Artemis and Apollo were built side by side in the site. There is a well-preserved theatre in Letoon, which does not have a settlement feature due to it is sacred area; porticos in the north and west of the temples and basilica and nymphaeum excavations in the south. It can be said that the anastelosis work in the Temple of Leto was intended to regain the significance of the temple in its original situation, when considered the temple was built greater than the Temples of Apollo and Artemis, that the sanctuary was primarily dedicated to Leto and that the sanctuary was called with her name. For this reason, it is parallel to the original situation that the Temple of Leto Temple is in the forefront rather than the Temples of Apollo and Artemis in the site. Still, the anastelosis work in the Temple of Leto was carried out in a way that nearby the Temples of Artemis and Apollo were not crushed, considering that these temples survived to today only in plan level. Even though 80% of the architectural elements belonging to the temple are present, partial anastelosis was done; cella and columns of the temple were re-erected in different heights as transfer its mass, in order to the re-erected temple be in harmony with the ruin image of the site. For this, the northwest corner of the temple which is not next to the Temples of Artemis and Apollo was not chosen. However, as a result of the practice, considering the effect that the temple would have left on visitors, it was planned to draw attention to the temple when entered through the northwest entrance which is different from the original entrance of the sanctuary. Intervening the original elements used in the anastelosis was avoided as much as possible; the blocks are visually integrated with other building blocks in the site due to their worn state, even though they were re-erected (Figure 3.105).

- **Integrity of the Monument**

The surplus of architectural blocks belonging to the cella part of the temple and re-erection of the northern, eastern and western walls of the cella using them; provided the perceptibility of the mass of the cella which is not available in other temple examples. Other existing elements belonging to upper structure that have not yet been used in the anastelosis work were arranged around the temple on the ground (Figure 3.106). By placing these elements in their original places in the future, information about the upper structure of the temple can be obtained, which can not be obtained as a whole at present. In the north-eastern corner of the temple, which was not re-erected, only four of the bases were placed in order to perceive the plan scheme (Figure 3.107). The fact that the new material was used in a small amount, provided the integrity between the elements of the temple (Figure 3.108).

- **Authenticity**

The Temple of Leto at Letoon is one of the best preserved temples in the world with an 80% authenticity ratio (Atik Korkmaz, 2016). Lower rows of northern, eastern and western walls of cella and north-western corner of the peristyle, which had many original architectural elements of the temple, were chosen as the application point. Although there are original elements available, for not breaking this authenticity ratio, the anastelosis of the parts requiring much new material for the re-erection was avoided.

The original architectural elements of the temple were not intervened as much as possible in order to preserve their originality; additional material was put in places that need structural stability rather than intervening with the block itself.

The temple was brought to its original appearance as much as possible, and in the placement of the elements, as far as possible, the techniques of the ancient period were followed; crowbars were used instead of a crane.

Apart from the column drums, the temple blocks were assembled following the original techniques, iron clamps were used and their surroundings were covered with lead (Figure 3.109). These practices can be considered as applications where temple authenticity was maintained both materially and technically.

- **Reliability**

The blocks used in the anastelosis study were matched as a result of detailed studies by examining the falling places, clamps and dowel traces, and other traces left on the other members during construction. The location of the column drums were easier to

detect, and there was doubt about the original location of only a couple of the cella blocks (Laroche, 2005; Laroche, 2006b).

Even if the number of existing column was high, non-matching drums were avoided to bring together. Due to these reasons and stages of the study were documented in detail and transparently shared, the study is highly reliable (Figure 3.110, Figure 3.111).

- **Distinguishability and Compatibility**

In the anastelosis study, as little material as possible was used, the parts of the temple where the original blocks were in excess were re-erected. The limestone, which is the original material of the temple, was removed from the nearby original quarry and was used in anastelosis. It is possible to say that the new limestone fragments used are compatible with the original material in terms of physical and chemical properties. The unworn parts of the column drums are on the outer surface. Completion with limestone is mostly done on the inside of the drums, so it does not draw visitors' attention at first sight. Likewise, in the cella, usually interior semi-columns were completed with limestone (Figure 3.112). The new limestone fragments are distinguishable from original fragments at present, though they are not worn (Figure 3.113). The new material does not draw attention as it was only used where necessary and to the fact that availability of the original elements were taken into consideration.

- **Reversibility and Re-treatability**

Iron and bronze clamps in cella blocks, as in original and iron bars in columns, were used by joining of the Temple of Leto. Although the clamps are detachable and allow for further intervention, it is not possible to say the same for iron bars. In addition, these bars were fixed in place with adhesive and in order to complete some blocks, adhesive was also used. These materials are not recyclable without damaging original members. Except for these pieces fixed with adhesive, the original pieces were not intervened, the problem of stability was solved by inserting lead plates between damaged drums in order to follow reversibility principle. However, it does not seem possible to remove the lead plates without damaging the original elements.

Figure 3.105. General view of the site from entrance (October 28, 2017).

Figure 3.106. Organization of architectural members around the temple (October 28, 2017).

Figure 3.107. Placing of bases on northeast corner (October 28, 2017).

Figure 3.108. Northwest view of the temple (October 28, 2017).

Figure 3.109. New iron clamps on cella blocks (Source: https://www.didierlaroche.org Retrieved at April 27, 2018).

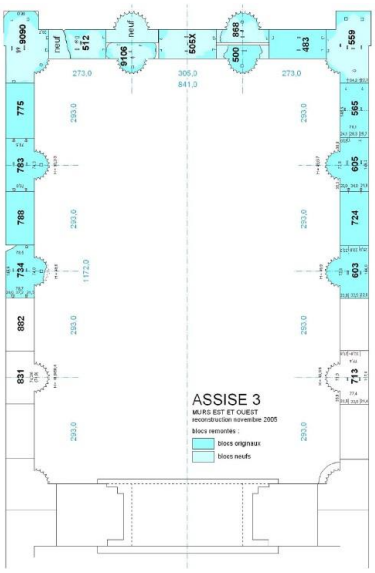


Figure 3.110. Detailed study on matching architectural members (Source: Laroche, 2006b).

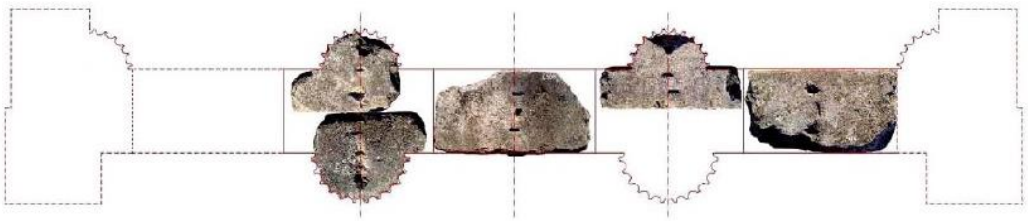
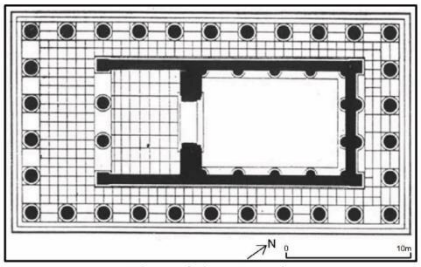


Figure 3.111. Detailed study on matching architectural members. (Source: Laroche, 2006b)

Figure 3.112. Completion with new material of semi-drums in cella (October 28, 2017).

Figure 3.113. Completion with new material in inner side of drums. Base and stylobate block in new material (October 28, 2017).

Table 3.4. Analysis and evaluation of implementation on the Temple of Leto at Letoon.

Temple of Leto at Letoon		
STRUCTURE	**Location** Kumluova, Seydikemer, Muğla	 Northwest view of the Temple after implementation
	Construction date 160-130 BC	
	Excavation periods 1962-1979 Henry Metzger (French Institute for Anatolian Studies (IFEA)) 1980-1996 Christian Le Roy (IFEA) 1997-2010 Didier Laroche (IFEA) 2010- Sema Atik Korkmaz (Başkent University)	 Plan of the Temple
IMPLEMENTATION	**Implementation date** 2000-2007	
	Director of excavation Didier Laroche	
	Responsible for the project Didier Laroche	
	Original material Limestone	**New material** New limestone Lead plates in necessary places Steel bars and iron clamps for joning
	Applied parts Re-erection of 3 columns on north in different heights. Re-erection of cella walls on north, east and west sides	**New structural system** No new system Steel bars for joning
EVALUATION	**Emphasis of the structure within the site scale** Regained its historical significance in the sanctuary as main temple. Partially re-erected structure is in harmony with the ruin monuments. Nondominant since opposite side of the temple was re-erected partially from other temples	**Reliability** Detailed study before implementation Only places of few cella blocks are doubtful
	Integrity of the monument Structural integrity in cella part, but no information about the superstructure Visual integrity provided by using new material in low amount and the same with original	**Distinguishability and compatibility** New limestones distinguished with uneroded details at present. Visual and material compatibility was provided by using of the same new material with original. Completed parts are inner sides of the columns and cella; unseen from distant
	Authenticity High authenticity Partially sustained construction technique New material is the same with original	**Reversibility and re-treatability** Separable cella blocks Cuttable but nonreversible iron bars without original material
	Result Anastelosis with high authenticity, scientific study, use of new material in small amount	

3.5. The Temple of Apollo at Smintheion

3.5.1. Location of the Site

The Temple of Apollo Smintheius is located on the southwestern part of the Biga peninsula, in Gülpınar neighbourhood / village of the Ayvacık district of Çanakkale, at the Smintheion sanctuary at the northwest end of the neighbourhood / village (Figure 3.114). It is 33 km away from Tuzla village and 45 km away from Assos to centre of Ayvacık. The village, which was named Külahlı before the Republic, passes as Külahlı in the sources published in the 18th and 19th centuries (Özgünel, 1983). The area surrounded by the Tuzla Stream in the north is on a volcanic plateau. In the sanctuary, northeast of the Temple of Apollo, there are Roman baths dating from the 1st century AD, the hall of sports games and inscriptions, water reservoirs and sacred road remains starting from Alexandria Troas ancient city (Figure 3.115, Figure 3.116, Figure 3.117). There are also a spring and water pump that meets the need of water around the temple and 19th century Ottoman fountain at the entrance of the site. The olive oil workshops top of the ancient structures were expropriated and demolished in 1971-1973, 1980, 1983 and 1994 and qualified one on southeast was preserved and transformed to entrance, museum and storage building (Özgünel, 2001; Özgünel, 2015).

3.5.2. Brief History of the Site

Smintheion is one of the important cult centres of the Troas region in antiquity. It is believed that the "sminthos" which is a mouse in Mysia language, is identified with Apollo and Apollo both protects agricultural products from field mouse and destroys crops with mouse to punish people at the same time (Özgünel, 2001; Özgünel, 2015). It is understood that the sanctuary continued its presence in the Roman period as understood from the Roman bridge on the Tuzla Stream in the region and Roman bath.

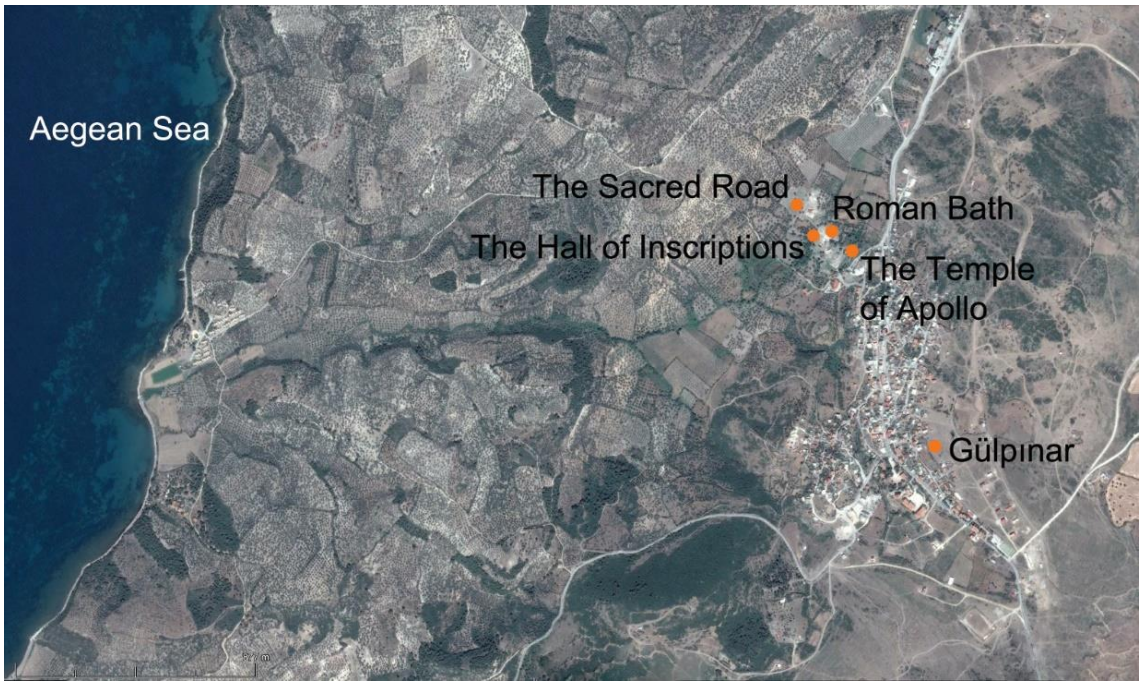


Figure 3.114. Location of Smintheion.
(Source: Google Earth date of image: 03.06.2016 date of editing: 27.11.2017)

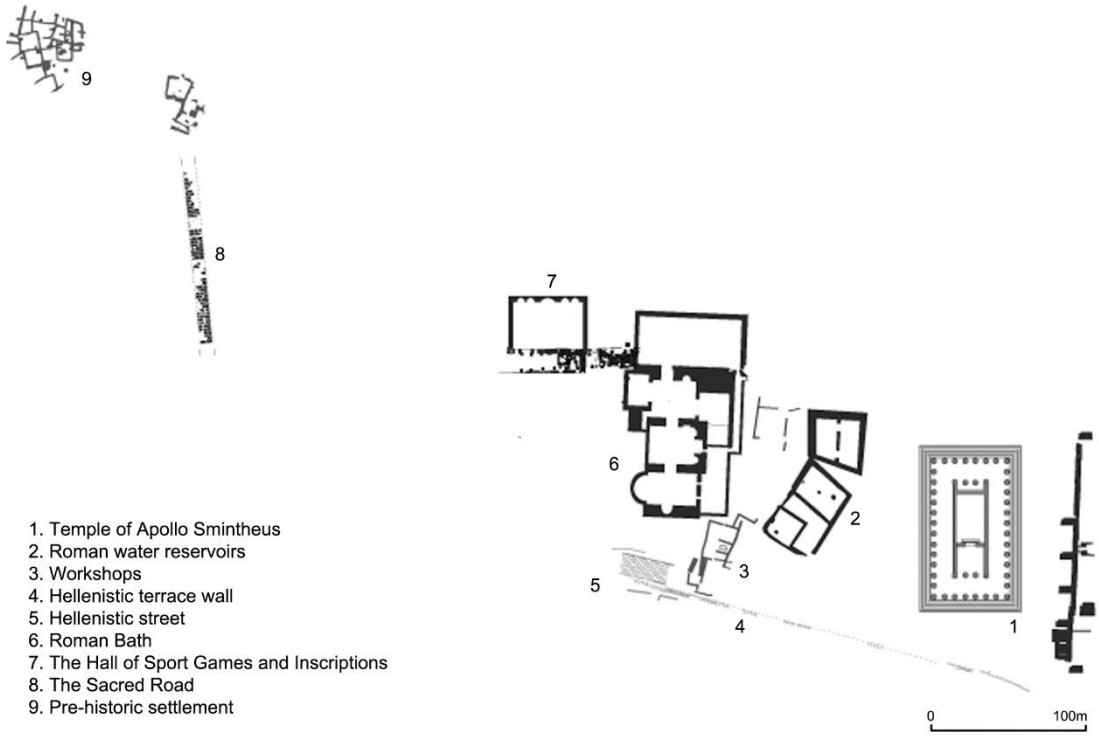


Figure 3.115. Site plan of Smintheion.
(Source: http://www.smintheion.com Retrieved at April 19, 2018)

Figure 3.116. The Temple of Apollo Smintheus (June 17, 2017).

Figure 3.117. Present situation of the site. The Hall of Sport Games and Inscriptions in front (June 17, 2017).

3.5.3. Architectural Characteristics of the Temple

The Temple of Apollo Smintheus was built in the northwest-southeast direction in the third quarter of the 2nd century BC (Rumscheid, 1995; Gökçe, 2000). The temple, which has eleven steps, is surrounded by eight columns on short sides and fourteen columns on long sides. The stylobate of the temple, which has a pseudo-dipteros plan and Ionic order, measures 22.39x40.27 m, foundation 29.63x47.51 m (Gökçe, 2000) (Figure 3.118, Figure 3.119). Columns called columna caelata, which are last drums under the capitals, are ornamented with reliefs staged from the Iliad epic. The temple was built with three types of stone materials: tuff, andesite and marble (Özgünel, 2001). Tuff blocks were connected to each other by wooden clamps, andesite and marble blocks were connected by iron lead clamps (Gökçe, 2000). It is thought that tuff blocks used at the lowest level of the foundation were preferred considering that they have high water holding capacity and do not exhibit fragile behaviour at the time of earthquake. Andesite blocks were placed between the marble and tuff blocks to prevent water permeability. Marble blocks were used as finish material (Özgünel, 2001) (Figure 3.120).

3.5.4. Excavation and Implementation Program

The first investigations in Smintheion were done in 1785, the first excavations in 1866[44]. Between 1971 and 1973 Çanakkale Archaeology Museum conducted a drilling survey around the temple. In the same years, the olive oil workshops on the long southeast side of the remains were expropriated. Excavation work was started by archaeologist Prof. Dr. Coşkun Özgünel from Ankara University in 1980. The restoration project of the

[44] The Temple of Apollo has been explored since 1785 and its architectural structure has been examined. The first systematic excavations were carried out by R. P. Pullan in 1866 on behalf of the Society of Dilettanti. Below is a list of publications about Smintheion published by travellers and researchers until today's work (Özgünel, 2001; Özgünel, 2015).
- le Chevalier, Jean Baptiste (1802). *Voyage de la Troadefait dans les Années 1785 et 1786*. Paris.
- Cook, John Manuel (1973). *The Troad, Archaeological and Topographical Study*. Oxford.
- Texier, Charles (1852). *Asie Mineure, description géographique historique et archéologique des provinces et des villes de la chersonnése*. Paris.
- Spratt RN, Thomas Abel Brimage (1856). *On the site of the Temple of Apollo Smintheus*, Transactions of the Royal Society of Literature of the United Kingdom. Second Series Vol. 5. London.
- Society of Dilettanti (1881). *Antiquities of Ionia IV*. London.
- Schliemann, Heinrich (1881). *Reise in der Troas im Mai 1881*. Leipzig.
- Leaf, Walter (1923). *Strabo on the Troad, Book XIII, Cap. I*. Cambridge.
- Weber, Hans (1966). *Zum Apollon-Smintheus Tempel in der Troas*. İstanbuler Mitteilungen, Band 16. Tübingen.

temple was prepared in accordance with the doctoral dissertation of architect Dr. Fuat Gökçe from Middle East Technical University. The members of the temple, which spread to nearby villages and neighbourhoods, were tried to be identified. Tuff foundation structure on north-southeast side and south short side, after expropriation and demolition of workshops, of the temple and andesite basalt step rows on southeast long side, were excavated in 1980 (Özgünel, 1983) (Figure 3.121). The first anastelosis was realized by combining the marble pieces belong to first step row in 1981. With the expropriation of the land, which the temple was located, the new workshop above the temple was demolished and it was fully accessible to the temenos of the temple in 1983. Conservation and restoration work began in 1989. The first conservation trial was carried out on unearthed foundation blocks on the southeast corner of the temple. Since tuff is a material eroded under solar rays, a mixture of tuff dust, fine sand, lime, oxide soil paint and water was sprayed on the surfaces to protect the surfaces of the tuff blocks. It was asserted that the protective layer, which is similar to the original material, gives strength to the blocks. The south side of the temple were drained in order to control the humidity problem. For the restoration of the temple steps, the southwest edge was chosen which was very damaged and had lost its original volume. It was aimed to consolidate the original foundation with the new material here. Concrete was poured over the main step beds to bring the southwest corner to the original stylobate level. Then the feet were also poured from the concrete for the columns to be applied anastelosis later (Figure 3.122). Feet poured from the concrete to the stylobate were sprayed with soil paint mixture plaster and andesite view was provided. The number of artificial andesite basalt steps was determined as nine and strengthened by applying portland cement, water, red stone brass, red soil paint, fine-coarse sand mixture with 6mm iron bars. The marble imitation steps were produced using white cement, marble chips and water. The prepared artificial steps were placed in concrete poured tuff step beds (Figure 3.123). The artificial steps were installed in 1990 and 1991 (Figure 3.124). It was aimed to provide a visually harmonised transition from the southwest and southeast side artificial steps of the temple to the original foundation in 1992 work (Özgünel, 2001).

Concrete stylobates were poured under the columns for the anastelosis studies of the columns to be carried out in the later works in 1994. The walls of the new building on top of the temple were completely removed. Anastelosis work of the columns of the southwest corner was carried out in 1995. On the artificially prepared steps and stylobates, three columns of six drums were desired to be re-erected, but due to wear on the drums,

the columns could only be re-erected as five, four and three drums (Özgünel, 2001) (Figure 3.125). According to this, reconstruction was applied in the foundation, crepis and stylobate sections, and anastelosis was applied in the three columns in the southwest corner (Figure 3.126).

A new project was prepared for restoration work in 2003. In the project, it was aimed to re-erect the architectural pieces originally from the stylobate level to the frieze level and to give the temple a three-dimensional appearance. Although this project was intended to be applied in the southwest corner, which had been re-erected in previous work, it could not be realized due to lack of original parts and structural problems in existing parts. For this reason, it was decided re-erection of already worn southeast short side in order to avoid further damage to the temple. The reinforced foundation was built on the original worn foundation by the thought of preparing a solid foundation for anastelosis. For the anastelosis study, the existing base, architrave, frieze, capital, drum parts were tried to be matched using a computer program. The eighteen drum that match the diameters of each other were brought together, but it was determined from the dowels that they did not match each other. Nevertheless, in order to gain visual three-dimensional view, it was aimed to re-erect the two column rows from the stylobate to the top of the capital by choosing the parts which have no structural problem. It was planned to join the parts to each other using fiber rods and epoxy. Some cracks in the columns were planned to be repaired using chrome bars (Özgünel, 2005). Restoration works for floor and wall blocks in cella and pronaos sections of the temple were performed in 2006 and 2007 (Özgünel, 2008; Özgünel & Kaplan, 2009) (Figure 3.127, Figure 3.128, Figure 3.129). At the end of the studies completed in 2014, crepis of the southwestern short side was rebuilt with reinforced concrete blocks in terms of harmony with the previous application. The columns on this side were re-erected to different heights and the broken column bases were completed with reinforced concrete. A display was made by putting two rows of column on the southeastern long side with their bases, one drums, columna caelata, capitals each, one architrave and one frieze blocks over these columns. Other architectural elements belonging to the temple were arranged on the west side (Özgünel, Takaoğlu, Kaplan, Gürdal & Özdemir, 2018). In addition in the examination carried in June 2017, newly produced drums in the northeast corner that were overlaid on top of each other was obtained (Figure 3.130, Figure 3.131).

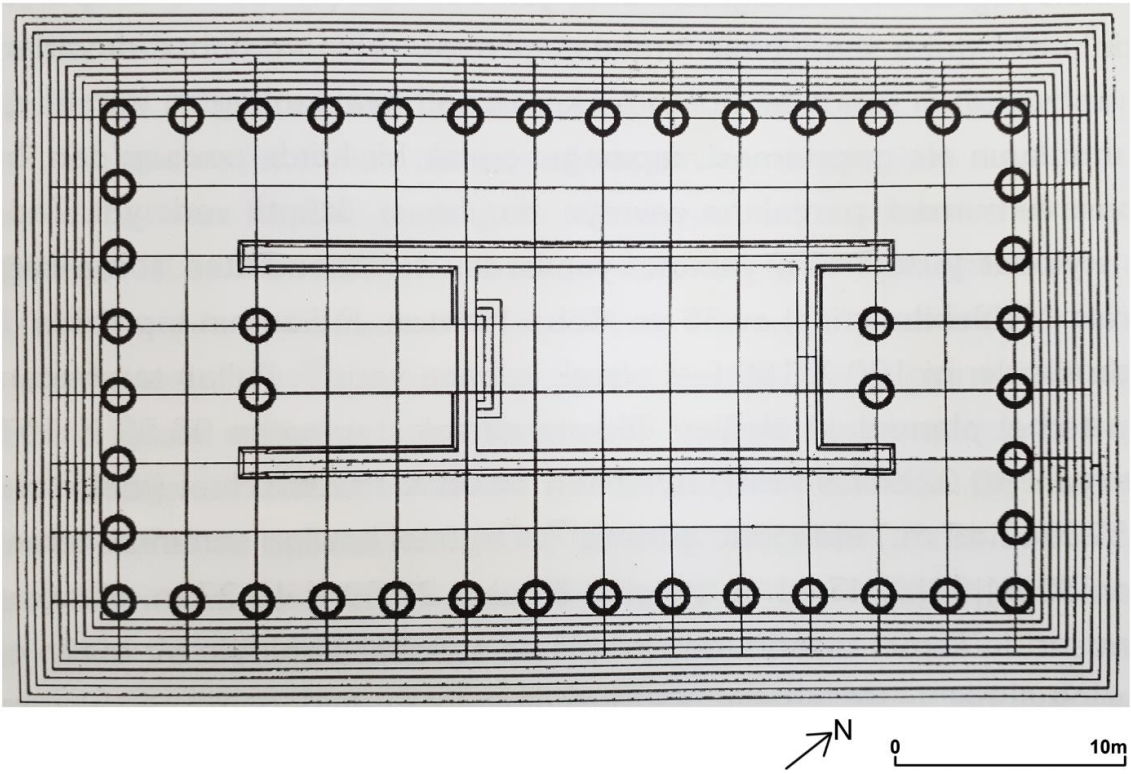


Figure 3.118. Restitution plan of the temple.
(Source: Gökçe, 2000)

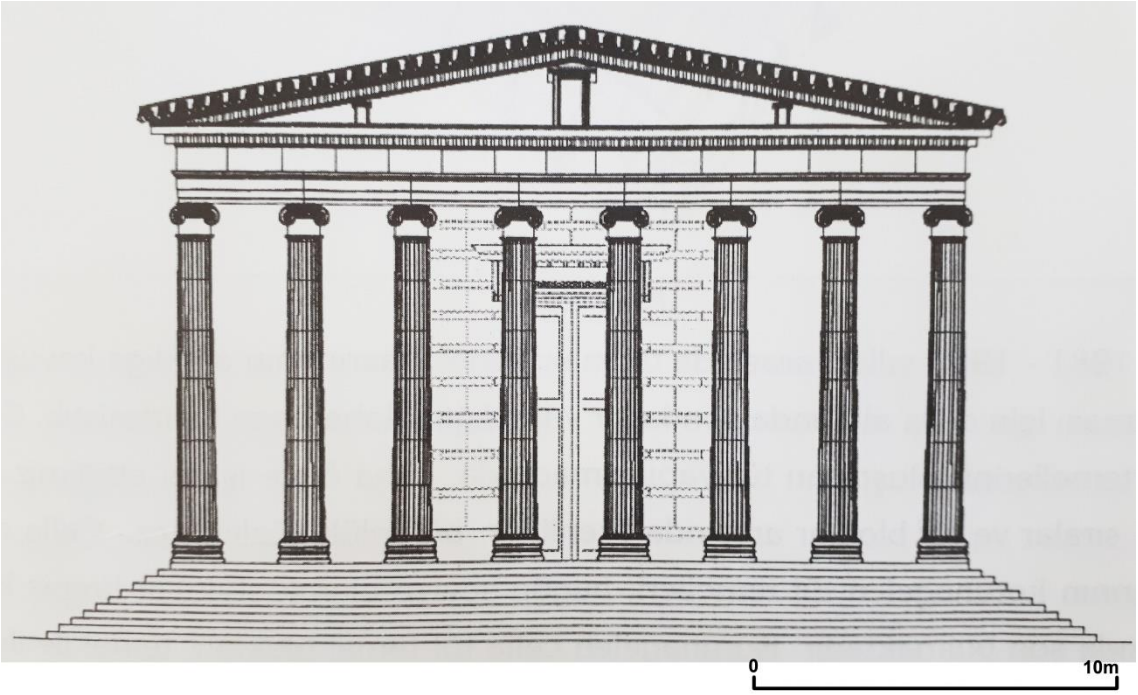


Figure 3.119. Restitution elevation of the temple.
(Source: Gökçe, 2000)

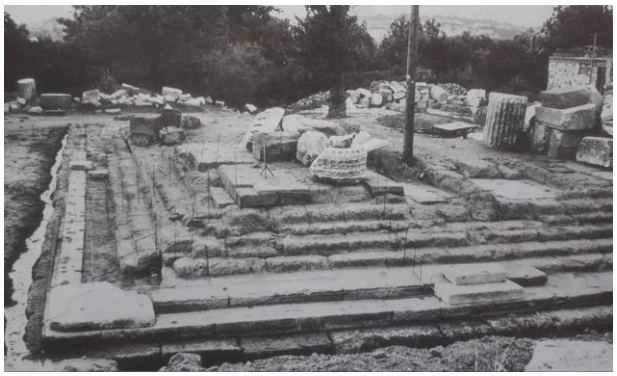


Figure 3.120. Foundation of the temple on southeast corner (Source: Özgünel, 2001).

Figure 3.121. Structure top of the northeast corner of the temple in 1980 before expropriation (Source: http://www.smintheion.com Retrieved at April 20, 2018).

Figure 3.122. Pouring concrete for column footing in 1989 (Source: Özgünel, 2001).

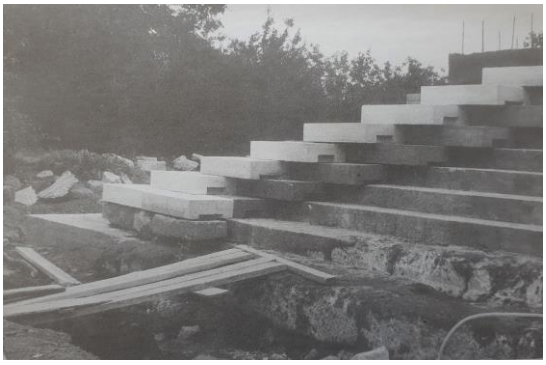


Figure 3.123. Placing artificial andesite and marble step blocks on reconstructed foundation in 1989 (Source: Özgünel, 2001).

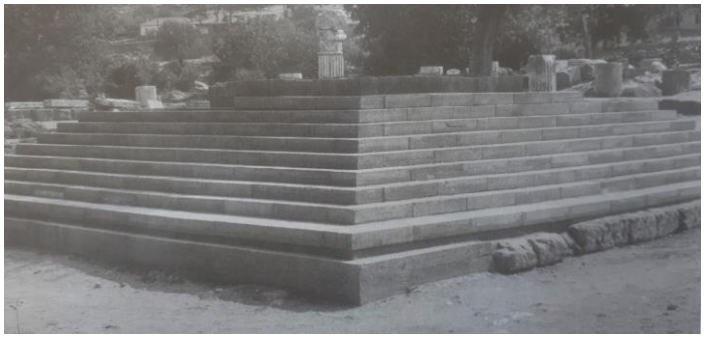


Figure 3.124. Finished state of artificial andesite and marble steps on reconstructed foundation in 1991 (Source: Özgünel, 2001).

Figure 3.125. Re-erection of columns on southwest corner in 1995 (Source: Özgünel, 2001).

Figure 3.126. Re-erection of columns on southwest corner in 1995 (Source: Özgünel, 2001).

Figure 3.127. Floor of cella before restoration in 2006 (Source: Özgünel, 2008).

Figure 3.128. Floor of cella after restoration in 2006 (Source: Özgünel, 2008).

Figure 3.129. Aerial view of the temple after cella restoration in 2013.
(Source: Özgünel, 2015)

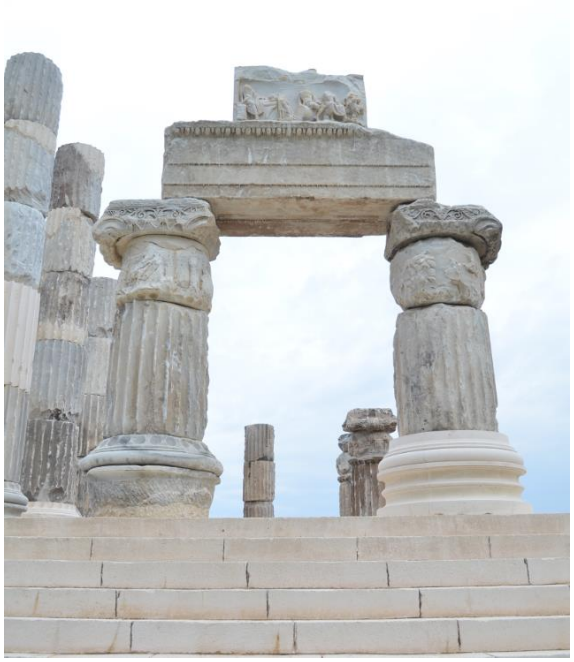


Figure 3.130. Organization of two column rows on southeast side (June 17, 2017).

Figure 3.131. New drums on northeast corner (June 17, 2017).

3.5.5. Evaluation of Interventions

Since no original element was used in the crepis of the Temple of Apollo, the work done should be evaluated as reconstruction. Even though it was argued that anastelosis was applied by using original drums in columns, only three columns on southwestern corner were applied anastelosis, principles of anastelosis were not followed in southwestern short side since drums were joined randomly. The work of put top of each other of two rows of column in southeastern long side with their bases, one drums, columna caelata, capitals each, one architrave and one frieze blocks over these columns was evaluated as partial display (Philippot, 1996). The reconstruction done in the crepis of the temple attracts more attention than the re-erection work done in the columns at first sight (Table 3.5).

- **Emphasis of the Structure within Site Scale**

The Sanctuary of Smintheion is located in Gülpınar village, at the northwestern end of the village, and the temple columns can be seen from the road without entering the site due to the low level of the road passing through the southeast of the temple and the entrance is closed to the ruins. In order to increase the effect, when it is approached from a distance, it was filled with soil on foundation instead of being raised from the ground during the period of construction (Gökçe, 2000). The monumental influence of the temple, although surrounded by building groups on the road side, still continues with implementation. Today, the temple is in the foreground as it is in its original, rather than secondary service units such as baths such as baths, the hall of sports games and inscriptions in the sanctuary. For this reason, it can be argued that the implementation regained the position that the temple has in its original context. The terraces that are created behind the entrance provide a view to the temple from above, as the structure of the olive oil workshop in the southeast of the temple was expropriated and converted into the entrance and museum-warehouse structure (Figure 3.132). However, the fact that the entrance was designed in the vicinity of the temple does not allow the temple to be perceived as a landscaping element from a distant in the site (Figure 3.133). Especially the crepis of the temple are striking because there is no structure in the sanctuary except the temple that has been re-erected by using new material in excess quantity. The turfing around of the temple, moreover turfing only at the entrance side of the temple, turned the

re-erection of the southwestern side of the structure into an object exhibited by breaking it from the sanctuary; alienating it from the site.

- **Integrity of the Monument**

The marble blocks belonging to the crepis, that constitutes the lower structure of the temple, were completely lost, most of the andesite blocks were not found and the tuff steps were exposed to weather conditions and scattered. Some columns and bases belonging to the upper structure were used for re-erection work, and architrave, frieze and cella blocks were exhibited on the northwest of the temple on the ground and in the museum (Figure 3.134). The reconstruction done in the crepis of the temple creates visual contrast with the re-erection of the original columns and the worn-out state of the original foundation in the southwest due to the use of new materials. The difference in colour between the steps, as reconstructed in different periods of crepis, distorts the visual integrity of crepis. (Figure 3.135, Figure 3.136). With a different understanding than the re-erection of the other columns; the structural integrity of the two columns in the southeast side, where the original height is not provided, which is believed to be done as partial display with missing drums, could not be provided due to the lack of drums.

- **Authenticity**

It is not possible to say that all the architectural qualities of the Temple of Apollo were determined in full, since only some of the sub-structure of the temple can be protected in situ and the other uncovered parts and some architectural were few and destroyed (Gökçe, 2000). Excess amount of concrete material was used in crepis reconstruction. In order to place new steps in the crepis, the tuff foundation was rebuilt with reinforced concrete system which has damaged both the porous and open to external effect tuff material and the original construction system. As column bases and column drums were reproduced when necessary, the ratio of authenticity of the implementation was reduced.

- **Reliability**

Even though the original crepis steps have survived to present day in a small amount, they have provided the right information about the foundation system. The reconstructed crepis was created by placing andesite and marble imitation blocks on the tuff foundation as it was originally. These blocks, copied from the original material, can be seen as a misleading application because they are reinforced concrete and given the appearance of marble and andesite with paint. Drums that were assembled together are not the ones that belong to each other but were less damaged ones and chosen to provide

durability of the structure. For this reason joining columns, which drums suits to each other in terms of diameter but not according to their dowels, are misleading.

- **Distinguishability and Compatibility**

In the re-erection of temple columns, the drum and bases were copied from original pieces using new material when necessary. These newly produced parts were left plain and unornamented. They are also distinguishable from the original material by their uneroded form at the present time (Figure 3.137, Figure 3.138). The blocks used in crepis reconstruction are also quite different and distinct from the original material. In addition, the difference in colour between blocks produced in two different periods attracts attention (Figure 3.132). However, it is possible that the reinforced concrete parts in re-erection and rebuilding the foundation as reinforced concrete could damage the structure in the near future. The white cement new material used in the re-erection of the columns is visually compatible but not structurally similar to the original material. The new marble and andesite imitated reinforced concrete steps used in crepis are at the forefront of the re-erected columns and evoke the feeling that the temple is new.

- **Reversibility and Re-treatability**

In the restoration work the column drums were combined with fiber rods and epoxy. Considering that random drums were assembled, implementation is positive in terms of allowing these materials to be used for new applications. However, it is obvious that the structural elements will be damaged during the dismantling process. The crepis steps are detachable since the blocks are built up on top of each other. However, it is not possible to reverse the concrete poured into the tuff foundation without causing damage.

Figure 3.132. View of the temple from entrance terrace (June 17, 2017).

Figure 3.133. Inadequate distance between museum and the temple (Source: http://www.smintheion.com Retrieved at April 20, 2018).

Figure 3.134. Architectural members of the temple on the ground (June 17, 2017).

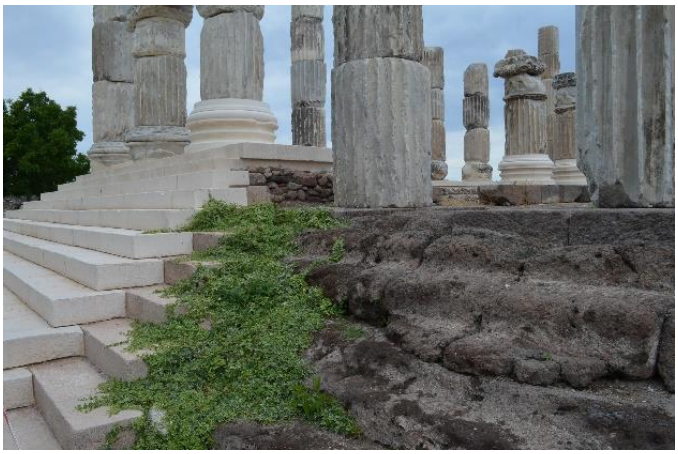


Figure 3.135. Disharmonious transition between new and original blocks of crepis (June 17, 2017).

Figure 3.136. Original foundation with new columns in background (June 17, 2017).

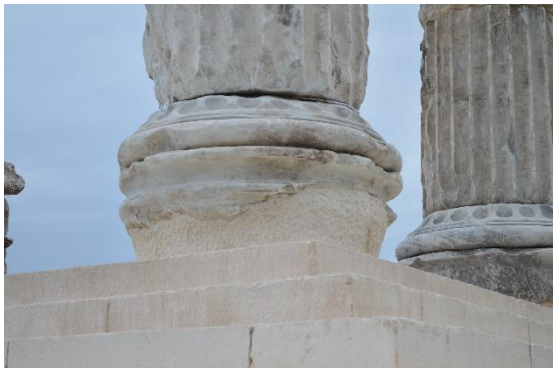


Figure 3.137. Completion of missing parts with new material (June 17, 2017).

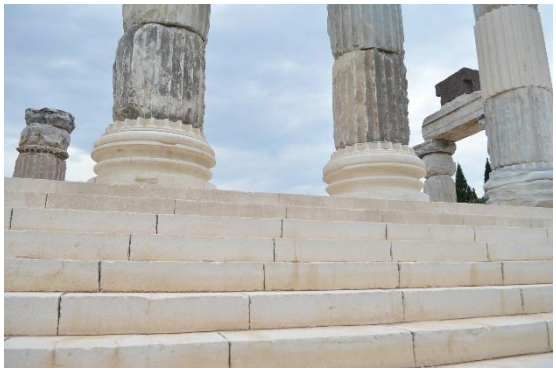
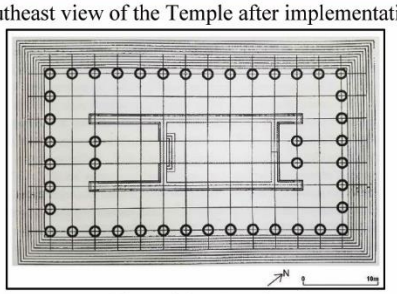


Figure 3.138. New material columns bases and crepis (June 17, 2017).

Table 3.5. Analysis and evaluation of implementation on the Temple of Apollo at Smintheion.

Temple of Apollo at Smintheion		
STRUCTURE	**Location** Gülpınar, Ayvacık, Çanakkale	 Southeast view of the Temple after implementation
	Construction date Third quarter of 2nd century BC	
	Excavation periods 1866 R. P. Pullan (Society of Dilettanti) 1980-2011 Coşkun Özgünel (Ankara University) 2011- Davut Kaplan (Ondokuz Mayıs University)	 Plan of the Temple
IMPLEMENTATION	**Implementation date** 1980-1995 2005-2014	
	Director of excavation Coşkun Özgünel	
	Responsible for the project Fuat Gökçe (METU) / Coşkun Özgünel	
	Original material Tuff and andesite stone in substructure Marble in upper structure and as covering	**New material** Reinforced concrete on foundation; andesite-basalt steps made of portland cement, red stone brass, red soil paint, fine-coarse sand; marble steps made of white cement and marble chips; chrome, fiber bars and epoxy for joining
	Applied parts New foundation on south side, re-erection of columns of different heights on southwest, organization of the two columns on the southeast side comprises a base, a drum, a columna caelata and an architrave and frieze over these	**New structural system** Reinforced concrete foundation New concrete members joined with chrome and fiber bars
EVALUATION	**Emphasis of the structure within the site scale** Regained its historical significance as main structure in the sanctuary near service structures of worshipping. Reconstructed south side is striking in the ruin site	**Reliability** Correct image of foundation system but with artificially coloured concrete blocks Non-matching column drums
	Integrity of the monument Different implementation approaches which re-erection, anastelosis, partial display without columns, reconstruction. Reconstructed foundation in different periods is disharmonious with both original foundation and re-erected columns, also in colour	**Distinguishability and compatibility** New artificial blocks distinguishes with uneroded details and without ornamentation Material incompatibly of new reinforced concrete parts Visual compatibility of new concrete parts
	Authenticity Reconstructed foundation High amount of new concrete blocks on crepis Low authenticity	**Reversibility and re-treatability** Nonreversible new foundation without damaging original foundation Separable crepis blocks and drums, cuttable metal bars
	Result Reconstruction of foundation, re-erected columns, anastelosis of three columns, partial display	

3.6. The Temple of Apollo at Side

3.6.1. Location of the Site

The ancient city of Side is located on the Mediterranean coast, in the Side neighbourhood / town of Antalya's Manavgat district. It is 75 km from the centre of Antalya (Figure 3.139). Located in the Pamphylia region in antiquity, the city was founded on a peninsula about 1 km long (Figure 3.140). Modern Side settlement is on the peninsula at present. The city is entered from the eastern gate dated to the 2nd century BC (Figure 3.141). Outside the walls, opposite the gate there is a nymphaeum[45] built in the 2nd century AD to the east. When entering the gate, a Corinthian order colonnaded street, which has two branches and dated to the 2nd century AD, the 1 km long north branch is still used and joins the theatre in the middle of the peninsula. There is an agora to the south of the colonnaded street, measuring 91x94 m, with a square plan and the circular Temple of Tyche in its middle (Figure 2.26), dated to the 2nd century AD; and the agora bath is north of the colonnaded street dated to the 5th century AD serving today as a museum building. The aqueducts dated to the 2nd century AD to north of the colonnaded street, reach the bath. There is a half-circle latrina[46] in the northwest corner of agora that is for 24 people. Attius Philippus Wall passing through the centre of the city and east of the theatre and adjacent to the stage wall was built in the 4th century AD and the size of the settlement was reduced to half. This wall was built adjacent to the theatre, and western part of the city was entered via an arch in the wall. Later, this monumental arch was also reduced and entrance to the city was provided through a small gate. On the left side of the arch there is the Vespasianus Monument, which was transferred from its original place and placed here in the 2nd century AD and later turned into a fountain (Mansel, 1963; Akurgal, 1970). The theatre with a capacity of 15.000 people has a half-circle plan, and it is known that it was built on an earlier theatre even if it seems to be the 2nd century AD Roman theatre (Mansel, 1963; Akurgal, 1970; İzmirligil, 2006). The building, which has a courtyard with Ionic order called “M Building” east of the theatre, was thought to be a state agora, but from the four adjoining rooms east of the courtyard it was understood in

[45] Nymphaeum: A room decorated with plants, sculpture and fountain often decorated with nymphs and intended for relaxation (Harris, 1993).

[46] Latrina: An ancient Roman term of public water closet (Harris, 1993).

the 2010 excavations that it was the fourth bath of Side; and it was suggested that the courtyard is a palaestra[47] of the bath (Alanyalı, 2012). The colonnaded street with modern settlement on top of it, continues to the harbour from the west of the theatre. There is a harbour bath to the north of street, and a great bath to the south. There are the Temples of Apollo (Figure 3.142) and Athena dated to the 2nd century AD (Figure 3.143). A three-nave basilica, dated to the 5th century AD, was built on the temples. After the demolition of this basilica, a chapel was built on the apse of the basilica in the 7th century AD and its walls are mostly still standing (Figure 3.144). To the east of these structures, the Temple of Men, which is dated to the 3rd century AD, is located on the sea shore like the Temples of Apollo and Athena (Mansel, 1963; Akurgal, 1970).

Figure 3.139. Location of Side.
(Source: Google Earth date of image: 24.09.2017 date of editing: 27.11.2017)

[47] Palaestra: Antique wrestling school or building for athletics often an open area surrounded by colonnaded (Curl, 1999).

Figure 3.140. Aerial view of Side.
(Source: Manavgat Municipality archive Retrieved from
http://www.manavgat.bel.tr/foto-galeri/side)

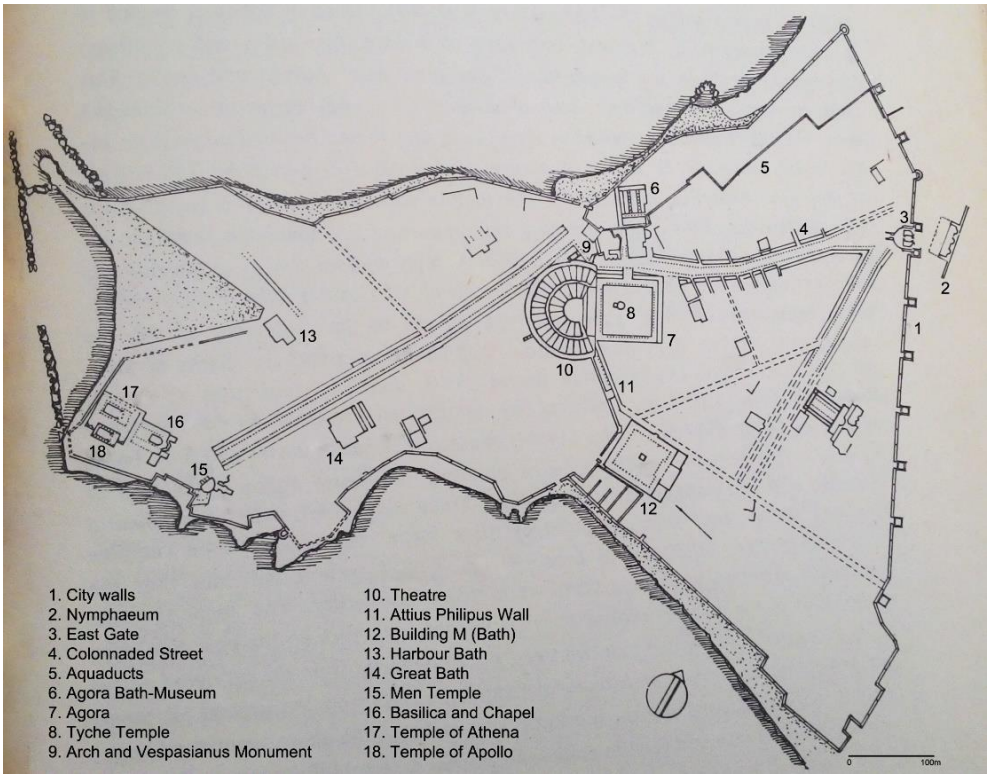


Figure 3.141. Site plan of Side.
(Source: Akurgal, 1970, retrieved from Mansel, 1963)

Figure 3.142. The Temple of Apollo (October 29, 2017).

Figure 3.143. Ruins of the Temple of Athena (October 29, 2017).

Figure 3.144. Chapel and walls of Basilica (October 29, 2017).

3.6.2. Brief History of the Site

Side was founded by the inhabitants of Kyme in the 7th century BC (Strabon, trans. 2015). From the inscriptions of the 3rd century BC it is known that Sidetic language was spoken here. The city first came under Ptolemy and Seleucid administrations in the 3rd century BC; after the conquest by Alexander the Great, Greek began to be spoken. The

city lived its golden era in the 2nd and 3rd centuries AD during the Roman period, and many buildings were built in this period. With the collapse of the Roman Empire, the city shrank in the middle of the 4th century AD and a wall was built in front of the theatre which is the narrowest place in the peninsula, and northeast side of the city was abandoned. In the 5th and 6th centuries AD, the city was enlarged and reached its former dimensions which started the identity of the city as an episcopate centre (Mansel, 1963; Akurgal, 1970). The city passed into Turkish rule in the 12th century. The village of Selimiye was built in the southern part of the city, in the area between the theatre and the harbour, and immigrants from Crete were inhabited in here in the 1900s (Mansel, 1963).

3.6.3. Architectural Characteristics of the Temple

The Temple of Apollo, located to the north of the colonnaded street that reached the harbour in the original city plan, was built along with the Temple of Athena, which was dedicated to the city's other protective goddess and positioned on the shore in order to meet the ships coming to the port (Mansel, 1958; Mansel, 1963). There are ruins of a basilica built in east-west direction in the 5th century AD and chapel built in the 7th century AD on the temples (Figure 3.145, Figure 3.146). Today, five columns of the Temple Apollo in the west have been partially re-erected, with their capital, architrave, frieze and pediment. The Temple of Apollo, was built in the 2nd century AD, has a Corinthian order. Stylobate of the temple was built in peripteros style measures 16.37x29.50 m. There are six columns on the short sides and eleven columns on the long sides (Mansel, 1958; Mansel, 1963; Akurgal, 1970) (Figure 3.147, Figure 3.148). Two conglomerate[48] blocks each were placed under the stylobate blocks beneath the column bases without mortar at the foundation of the temple. Below the stylobates between the columns there is one conglomerate block each. Below the conglomerate blocks are 1.5 m wide wall made of rubble stone and hard mortar (İnan, 1985). Marble was used at the upper structure of the temple; columns are monolithic marble (Yorulmaz, Çili & Ahunbay, 1989).

[48] Conglomerate: Rock consisting of rounded pebbles which are cemented together with a finer material (Harris, 1993).

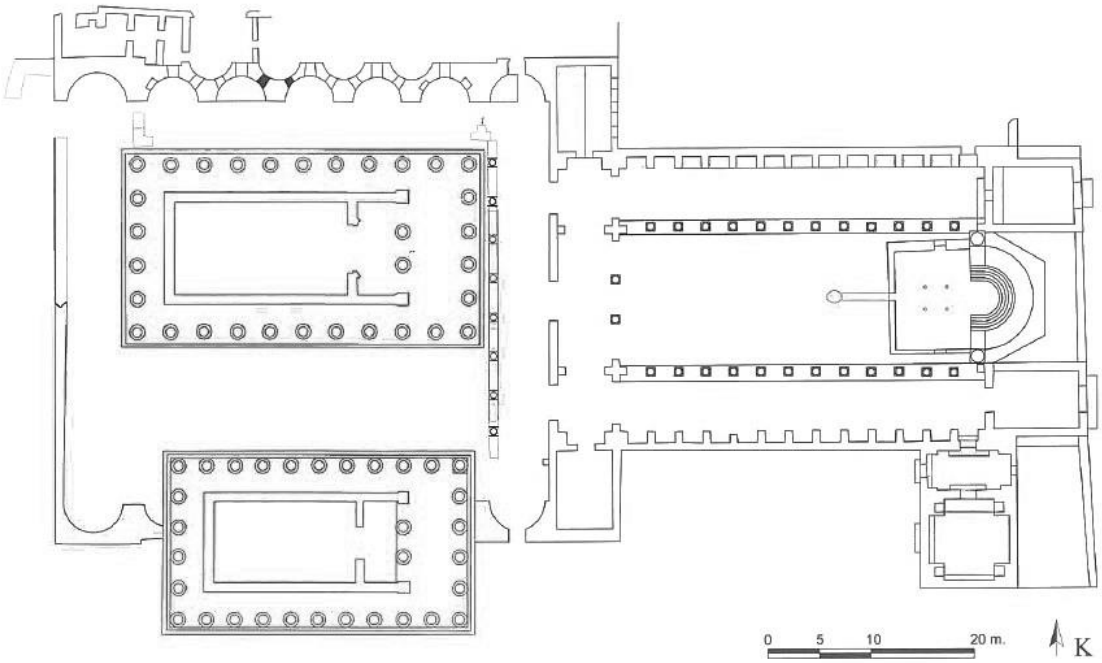


Figure 3.145. Plan of the Temples, Basilica and Chapel.
(Source: Alanyalı, 2014)

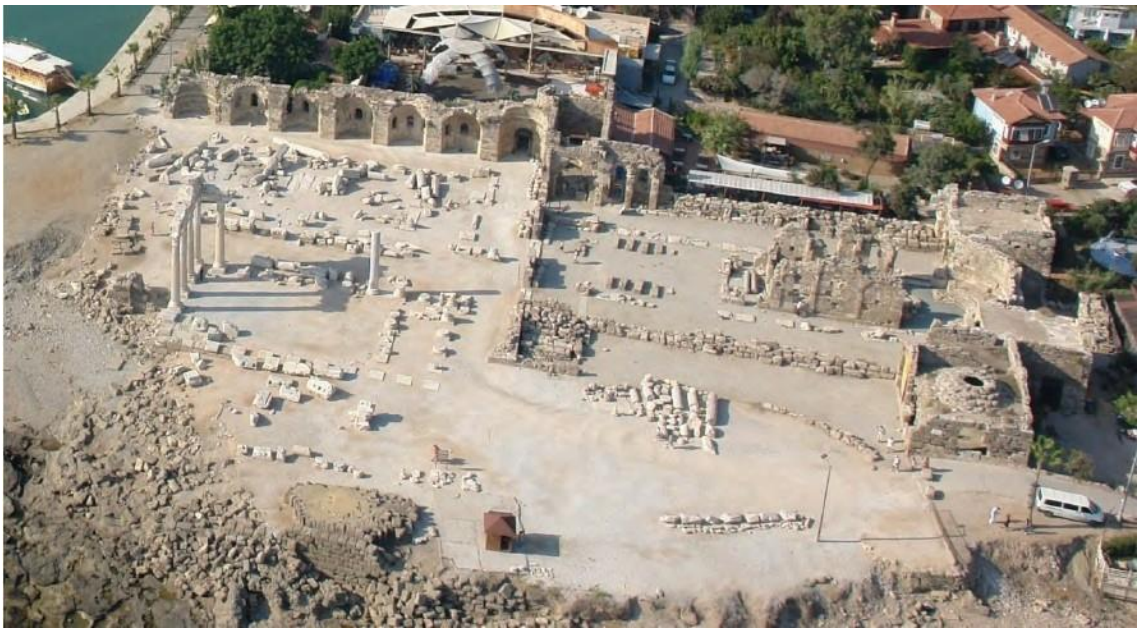


Figure 3.146. Aerial view of the Temple area.
(Source: Alanyalı, 2011b)

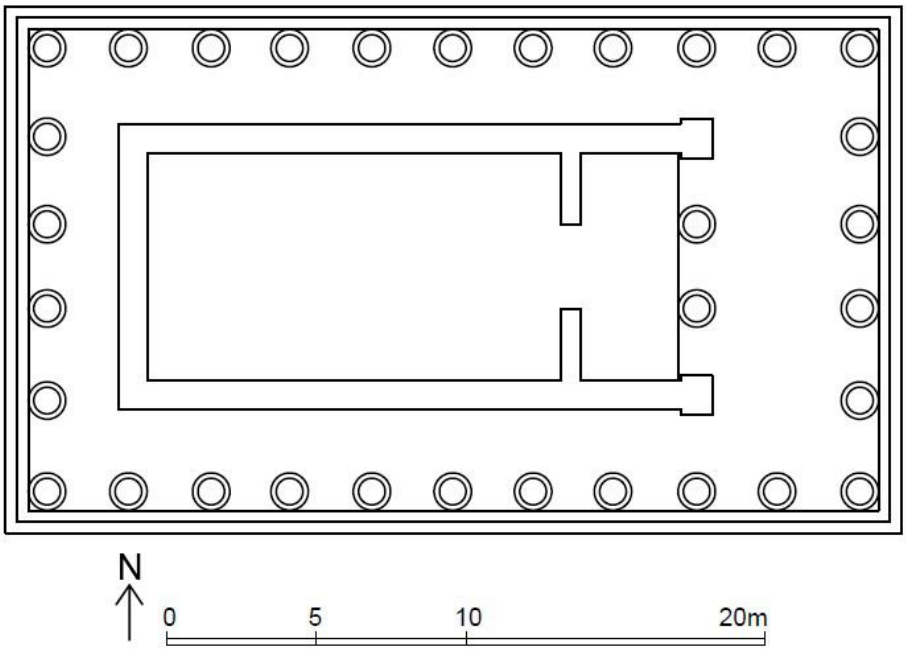


Figure 3.147. Restitution plan of the Temple of Apollo.
(Source: Edited from Alanyalı, 2014)

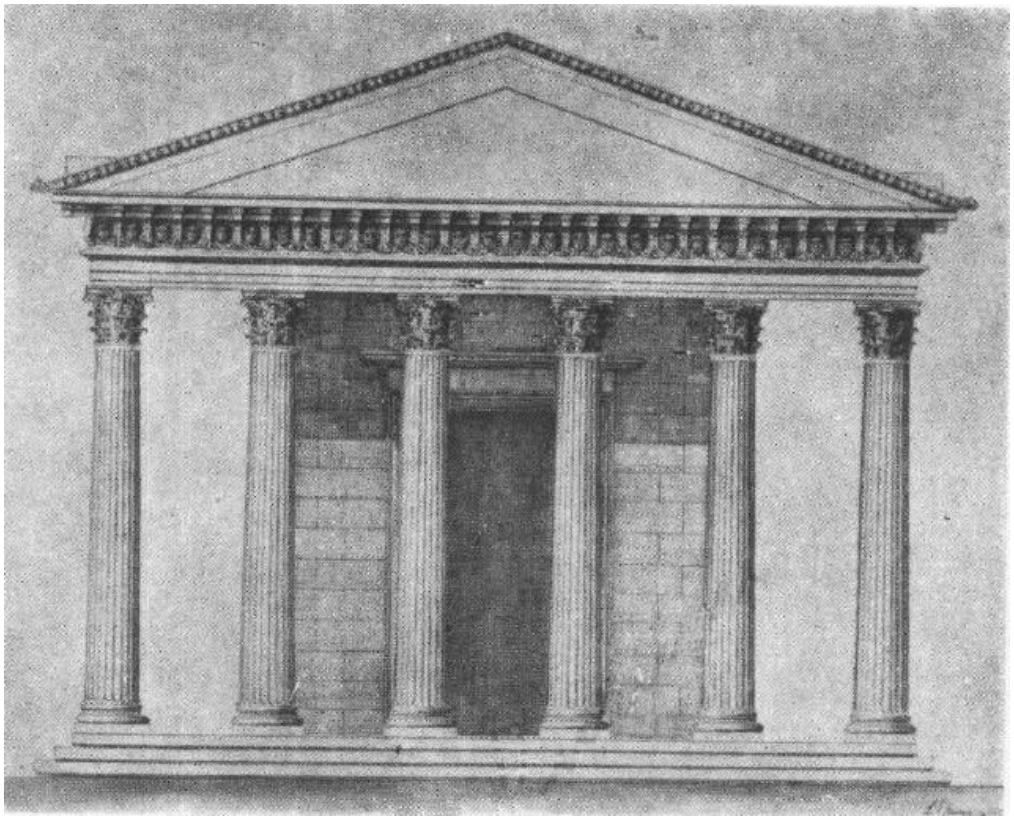


Figure 3.148. Restitution elevation of the Temple of Apollo.
(Source: Mansel, 1958)

3.6.4. Excavation and Implementation Program

Excavations were first carried out between 1947 and 1966 by archaeologist Ord. Prof. Ord. Dr. A. Müfid Mansel on behalf of the Turkish Historical Society with contributions of Prof. Dr. Jale İnan[49]. After the death of Prof. Dr. A. Müfid Mansel, the studies were continued by archaeologist Prof. Dr. Jale İnan retired from İstanbul University, on behalf of the International Friends of Side Foundation in 1977 (İnan, 1985). The remains of the Temples of Apollo, Athena and the basilica in the sanctuary area were excavated beginning in 1947, the excavations continued until 1962; meanwhile friezes with Medusa head belonging to the Temple of Apollo were found (Mansel, 1958; Mansel, 1964) (Figure 3.149, Figure 3.150). The repair project of the temple, which has been studied since 1977, was prepared by architect Prof. Dr. Müfit Yorulmaz, civil engineer Prof. Dr. Feridun Çili and architect Prof. Dr. Zeynep Ahunbay from İstanbul Technical University and restoration started in 1983 (Figure 3.151). For the restoration of the temple, the western side facing the sea, where the original remains are located extent, the northwest corner and the second column of the north long side were chosen. It was aimed to re-erect four columns from the six columns of the west façade and two columns of the north side with the anastelosis study. In addition to the columns, capitals, architrave blocks, Medusa-headed friezes, geisons[50], 2/3 part of the pediment, simas and eaves were also planned to be used in implementation to reach the original height assumed to be 16 meters (İnan, 1985).

Foundation reinforcement studies were started for anastelosis, in which the architectural parts in the northwest corner on the foundation and the conglomerate blocks

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[49] First investigations in Side started in the 19th century. The French consul, L. A. O. de Corancez, who came to the area, did research on structures and coins. Admiral Francis Beaufort found that the settlement was named as "Side" and prepared the city plan in 1812. Publications of researchers visiting the city are given in the following list (Güven Ulusoy, 2014).
- Beaufort, Francis (1818). *Karamania, a Brief Description of the South Cost of Asia Minor and the Remains of Antiquity with Plans, Views.* London.
- Cockerell, Charles Robert (1903). *Travels in Southern Europe and Levant 1810-1817.* London.
- Leake, William Martin (1824). *Journal of a Tour in Asia Minor, with comparative remarks on the ancient and modern geography of that country*. London.
- Cramer, John Anthony (1832). *A Geographical and Historical Description of Asia Minor*. Oxford.
- Fellows, Charles (1839). *A Journal written during an excursion in Asia Minor*. London.
- Spratt RN, Thomas Abel Brimage & Forbes, Edward (1847). *Travels in Lycia, Milyas and the Cibyratis.* London.
- Danieloğlu, Dimitri (1855). *1850 Yılında Yapılan bir Pamphylia Seyahati*. Suna-İnan Kıraç Mediterranean Civilizations Research Institute.
- von Lanckoronski-Brzezie, Karl Graf (1890). *Städte Pamphyliens und Psidiens, Band I, II*. Wien.

[50] Geison: Block of stone forming part of a Classical cornice and its subordinate mouldings (Curl, 1999).

belonging to the foundation were removed and numbered. Reinforced concrete foundation was built by pouring lean concrete 1.5 m below the stylobate. A mixture of marble dust, marble chips, sand and white cement was poured into the moulding made of sheet metal in order to complete the missing parts of the columns. Moulding made of plaster was prepared for the bases. In order to re-erect corner column in the southwest corner; the missing stylobate block, base and the bottom 4.25 m part of the column were poured from the concrete with the help of sheet metal and plaster mouldings on top of the iron connecting rods on the foundation (Figure 3.152). Holes were left on the reinforced concrete part of the column in order to mount it on its original section. The original column's broken section was flattened by adding concrete material in order to place the capital; the two members were attached to each other by steel rods and araldite mixed with marble dust. The original column piece and the reinforced concrete column piece were also assembled by the same method. The fluting of the reinforced concrete column sections was done after the joining was completed (İnan, 1985).

It was planned to re-erect the fourth column of the west façade as the second column in 1984. Since the lower parts of the stylobate, base and the bottom 4 m part of the column were missing, these parts were reproduced from the concrete (Figure 3.153). Unlike the previous year, a polyester moulding was used for the base, not plaster, and it was observed that it was easier to work with this moulding. The cracks of the column were reinforced with stainless steel clamps, reinforced concrete and original column parts were joined together with stainless steel bars, the assembled parts were fitted with steel bars to reinforced concrete foundation (Figure 3.154). The columns were re-erected without flutings, and the fluting was done according to the original sections after the assembly process was completed (İnan, 1986).

The second column of the west façade of the temple was re-erected in 1985. Since the stylobate block was present, the base and the bottom 3 m part of the column were poured from the concrete and mounted together with stainless steel bars. The missing parts of the column were also completed with concrete and integrated with the original column piece. In addition, the second column of the north façade was re-erected. Since this column also had stylobate, only the base and bottom 3.90 m part of the column were poured from the concrete. The cracks of the stylobate were reinforced with stainless steel clamps. The reinforced concrete column piece was combined with the original column piece in the same as previous columns (İnan, 1987).

The fourth column of the west façade was re-erected in 1986. The incomplete bottom part of the column and base, with its stylobate present, were poured from concrete. The cracks of the surviving original capital were consolidated with steel clamps and araldite, and the missing corner parts were completed with reinforced concrete. Small pieces of other capitals were also completed with reinforced concrete material. The original pieces of the capitals were put into the mouldings and the appropriate reinforcement was prepared and concrete was poured in this way (İnan, 1988) (Figure 3.155).

It was decided to use the capital (C7) restored in the previous year in the north corner column in 1987. Four capitals were placed on top of the completed columns as reinforced concrete (Figure 3.156). Four architrave blocks were put on the fifth column that was re-erected. The missing parts of the architrave blocks were integrated using reinforced concrete material, stainless steel bars and araldite. The architrave block, which will put on the northwest corner column and the second column of the west façade, was restored first (İnan, 1989).

Studies of the completion and placement of the fifth capital and architrave blocks were continued in 1988. The architrave block (D21), located on the north corner of the west façade, was placed. The surface of the second architrave block (D20), completed with reinforced concrete in the previous year, was sculptured. Parts of the north corner architrave (D15), which were divided into two, were combined with steel clamps and araldite (İnan, 1990) (Figure 3.157).

Restoration, integration and placement of architrave and frieze blocks were carried out in 1989. The D20 architrave, restored the previous year, was placed. The missing parts of D15 architrave were completed with reinforced concrete and placed in place. The cracks of the frieze block (E12), belonging to the northwest corner of the temple, were reinforced with steel clamps and placed. The E6, E15, E30 frieze blocks were also integrated with the help of wooden mouldings and E6 block was placed (İnan, 1991) (Figure 3.158).

Excavations have proceeded by archaeologist Prof. Dr. H. Sabri Alanyalı from, Anadolu University, since 2009. Until the death of Prof. Dr. Jale İnan in 2001, the west façade of the temple was re-erected, including the pediment; there was no other anastelosis work done at the temple. It was decided that the artefacts, which have been excavated over 63 years, will be examined and evaluated before the new excavation, the necessary restoration and urgent conservation work will be started (Alanyalı, 2011a).

The documentation and organization work of the temple continued in 2010 and 2011. In order to prevent uncontrolled circulation in the ancient city and to better introduce the area where the temples are located, a site arrangement project was implemented (Alanyalı, 2012; Alanyalı, 2013a).

In the on-site examination in October 2017, it was determined that the second column of the northeast was re-erected after the re-erection application of five columns to the pediment level on west side of the temple.

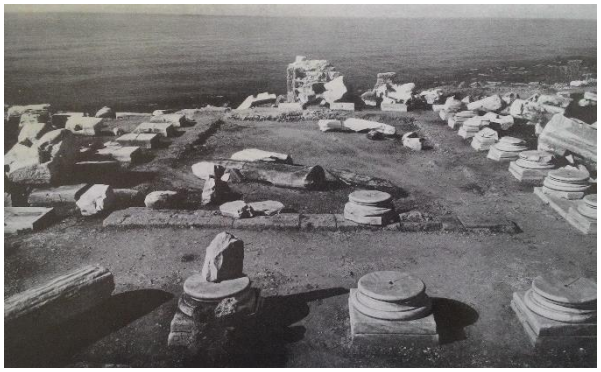


Figure 3.149. General view of the Temple of Apollo in 1950s (Source: Mansel, 1963).

Figure 3.150. Frieze of the Temple of Apollo in 1947 (Source: Mansel, 1958).

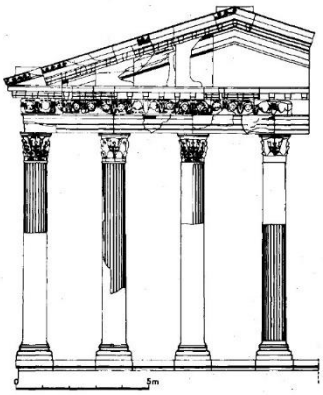


Figure 3.151. Re-erection Project of west façade (Source: Drawing of Ahunbay, İnan, 1985).

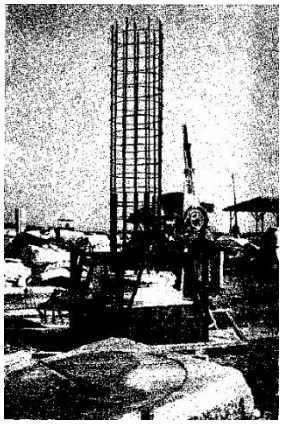


Figure 3.152. Reproduction of missing part of a column with reinforcing iron bars (Source: İnan, 1985).

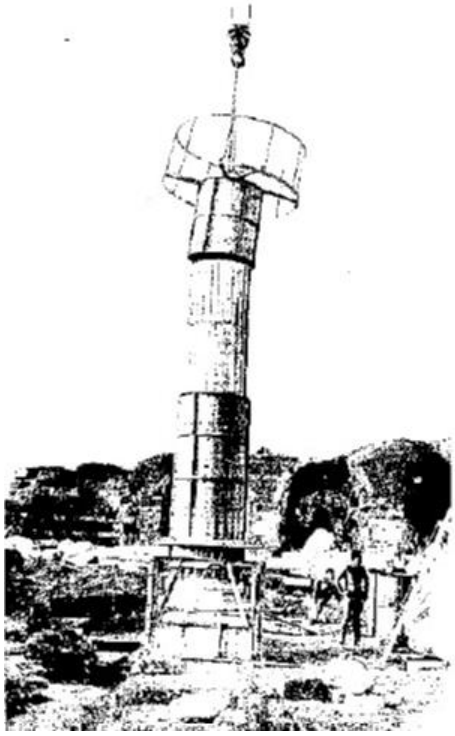


Figure 3.153. Moulding of a column.
(Source: İnan, 1986)

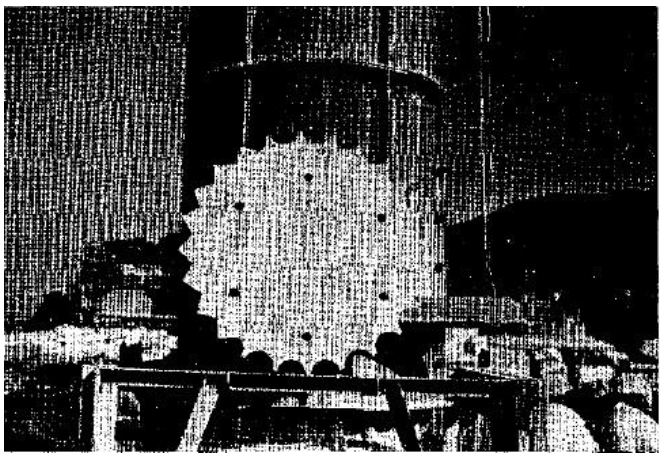


Figure 3.154. Drilling holes in drum of a column.
(Source: İnan, 1986)

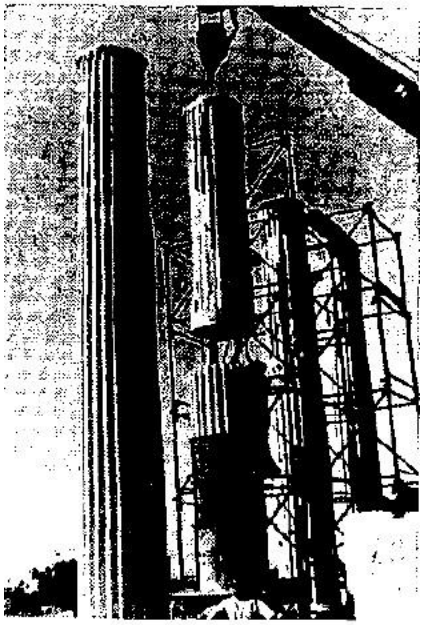


Figure 3.155. Re-erection of a column.
(Source: İnan, 1988)

Figure 3.156. Completion of a capital.
(Source: İnan, 1989)

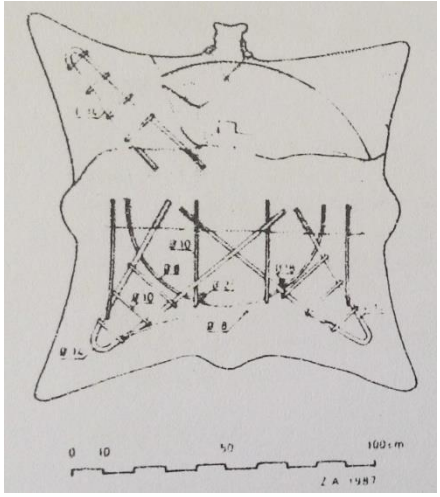


Figure 3.157. Reinforcement of capital. (Source: Yorulmaz, Çili & Ahunbay, 1989)

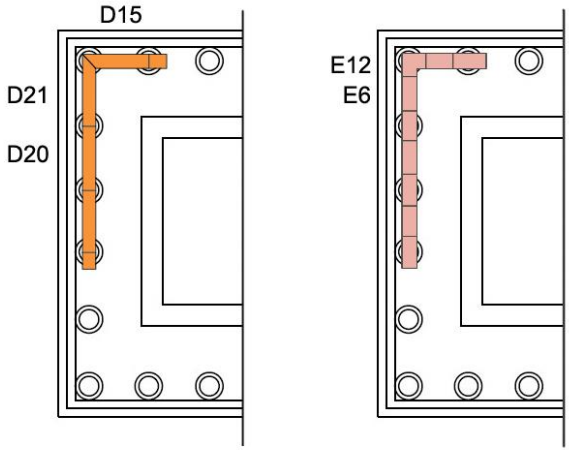


Figure 3.158. Number codes of architraves and friezes schematically (Source: Edited from Alanyalı, 2014).

3.6.5. Evaluation of Interventions

In the Temple of Apollo at Side, the west façade, where the original materials were absent, anastelosis was started, however, since the excess amount of reinforced concrete material was used to complete the missing pieces, the application might be evaluated as reconstruction. Preparation of reinforced concrete to re-erect the columns was also evaluated as reconstructive application (Table 3.6).

- **Emphasis of the Structure within Site Scale**

The Temple of Apollo was built in the 2nd century AD at the same time as the Temple of Athena in the north, then later the basilica was built on the foundation walls of these two temples; when the basilica was demolished, a chapel was built on its apse. For this reason, the area, where the temple was located has maintained its holiness throughout the periods. When the ships were approaching the port, these structures were built in the harbour area, the temples were seen first. The Temple of Athena lost its third dimension look with the construction of the basilica, and the basilica was destroyed later. After the reconstruction of the Temple of Apollo, the temple came to the forefront in comparison with basilica remains and the Temple of Athena, even though it was designed and built together with the Temple of Athena and the Temple of Athena was greater and more important in terms of size and worshipping (Mansel, 1963). The temple area, which has maintained its sanctuary throughout the periods, is again dominant by the work of re-

erection it, but the Temple of Apollo is more dominant than the other structures beside it. Outside of the intensive residential area, besides being on the coast, the temple is in focus with no three-dimensional structure in the nearby area (Figure 3.159).

- **Integrity of the Monument**

Architectural elements, such as the original column, architrave pieces of the temple, are exhibited beside the temple. The reconstruction of the columns on the west side of the temple can be seen as an informative application of the upper structure of the Temple of Apollo. However, the original pieces in the columns are few and the visual integrity of the columns has been lost as the completions made with the concrete material differentiated in colour and texture. It is expected that the completions are as compatible as possible with the original pieces, not be striking in overview but distinguishable in close inspection so that the completions can be successful. The difference in thickness between the newly poured reinforced concrete parts and the original parts caused the columns not to be perceived as one piece (Figure 3.160).

- **Authenticity**

The cella blocks and the east part of the temple have not survived to present. For this reason, only the west part of the temple was partially re-erected (Yorulmaz, Çili & Ahunbay, 1989). Since the original parts were few, reinforced concrete material was used in excess in the implementation. Before starting the reconstruction of the upper structure of the temple, the original foundation was excavated and consolidated with lean concrete. This practice broke the authenticity of the foundation system. Stylobates removed from their places during this process were reproduced, which damaged ones without being used in practice, so the authenticity ratio was reduced. Missing stylobates, bases and bottom section of columns were poured in one piece with the aid of mouldings in the reconstruction and the original construction technique was not maintained.

- **Reliability**

In the reconstruction of the temple, there are uncertainties about whether the capitals, architrave and frieze blocks were used in the original locations. It cannot be said that the application is reliable because of the ambiguity of the fact that the original parts have been used in their place. The entire unbroken column in original height belonging to the Temple of Apollo could not be found. For this reason, the column length of the Temple of Apollo was calculated by taking into account an entire column of the Temple of Athena by proportioning measures of the two temples. New columns were produced on the basis of an analogy, however do not provide full reliability. It is misleading that

the colour of the temple is yellow instead of white, as in the original state, because of the reinforced concrete material used in practice goes yellow over time.

- **Distinguishability and Compatibility**

Concrete was preferred instead of marble, as a new material, considering that it will provide convenience in joining the original and new materials and that the resistance will be high in the event of an earthquake (Yorulmaz, Çili & Ahunbay, 1989). Since the white cement reinforced concrete material, used in abundance in the reconstruction, has deteriorated and changed colour from white to yellow, it can be distinguished from marble unintentionally, which is the original material of the temple. In some reinforced concrete parts, the original material was damaged due to salting caused by cement and this lead to deterioration of its colour (Figure 3.161, Figure 3.162). In these parts, the original and new material is not easily distinguishable. Only architrave blocks were reproduced without ornamentation; capitals, pediment and frieze blocks were reproduced in the same manner as the original (Figure 3.163). For this reason it is easier to distinguish the new architrave blocks. In addition, the difference in thickness between the newly produced reinforced concrete parts and the original ones causes distinguishability of original and new parts. However, this situation has caused the columns not to be perceived as monolithic. Reinforced concrete material is not in material compatibility with the original material because it is easily salted by the effect of sea salt and causes the original material to deteriorate.

- **Reversibility and Re-treatability**

It is not possible to remove the concrete used for the integration of the columns of the temple and the steel bars used for joining without damaging the elements. However, it can be considered that the bars will be cut and allowed to intervene again. It is also impossible to reverse the lean concrete that was poured on the foundation.

Figure 3.159. General view of the temple from northwest corner (October 29, 2017).

Figure 3.160. Difference of thickness and colour between authentic and new material (October 29, 2017).

Figure 3.161. Decay of the new material in column base (October 29, 2017).

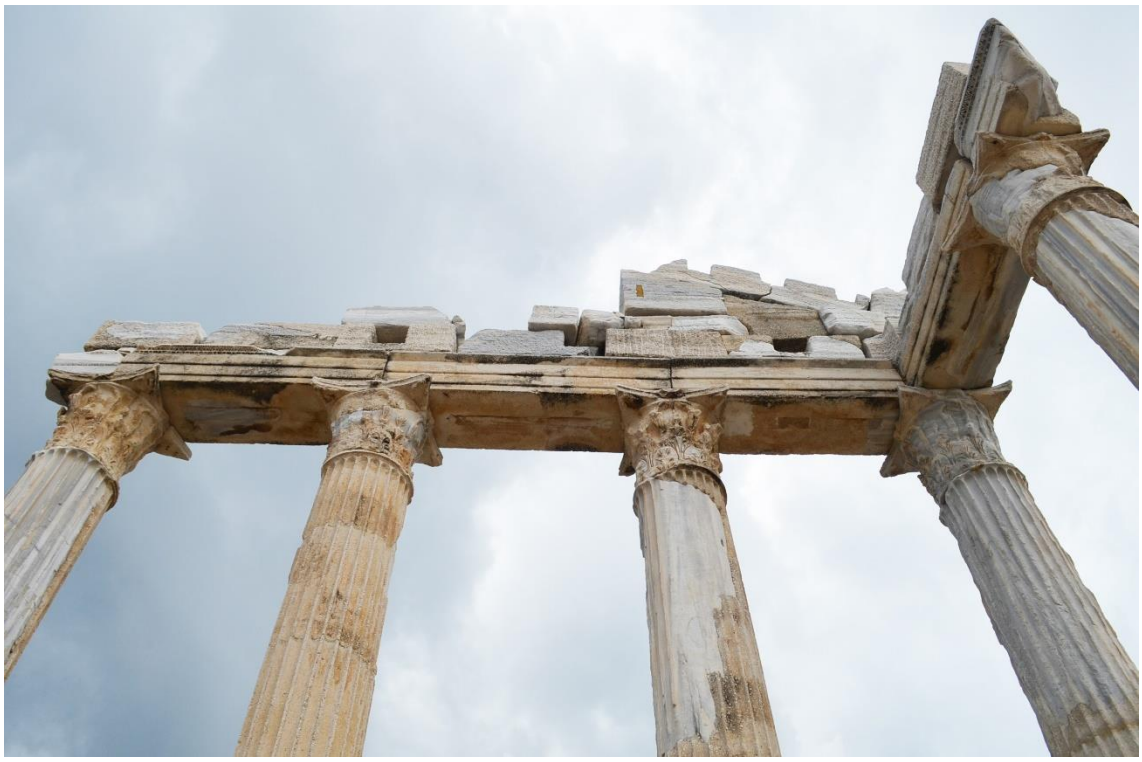
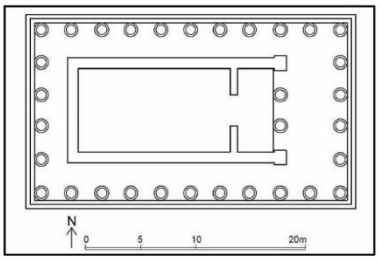


Figure 3.162. Decay of the new material in architraves (October 29, 2017).

Figure 3.163. Reproduction of architraves and friezes without ornamentation (October 29, 2017).

Table 3.6. Analysis and evaluation of implementation on the Temple of Apollo at Side.

Temple of Apollo at Side		
STRUCTURE	**Location** Side, Manavgat, Antalya	 Northwest view of the Temple after implementation
	Construction date 2nd century AD	
	Excavation periods 1947-1966 A. Müfid Mansel (İstanbul University) 1977-2001 Jale İnan (İstanbul University) 2009- Hüseyin Sabri Alanyalı (Anadolu University)	 Plan of the Temple
IMPLEMENTATION	**Implementation date** 1983-1989	
	Director of excavation Jale İnan	
	Responsible for the project M. Yorulmaz, F. Çili, Z. Ahunbay (İTU)	
	Original material Conglomerate blocks on foundation Marble in upper structure	**New material** Lean concrete on foundation Reinforced concrete made of marble dust, marble chips, sand and white cement in missing parts Steel bars and araldite for joining
	Applied parts Re-erection of 5 columns on northwest corner including partial pediment New foundation	**New structural system** Reinforced concrete system on foundation and lower parts of columns. New reinforced concrete parts joined with steel bars
EVALUATION	**Emphasis of the structure within the site scale** The more greater and important Temple of Athena near temple cannot be recognizable Focal point in the temple area near the seaside	**Reliability** Doubt about original height of the columns and placing of survived members Misleading information about colour of the temple
	Integrity of the monument Structural integrity gives an idea about superstructure. Low visual integrity due to new reinforced concrete parts in different colour and thickness from original	**Distinguishability and compatibility** Unornamented architrrave blocks Unintentional distinguishability by colour and thickness Material incompatibility of new reinforced concrete parts
	Authenticity High amount of reinforced concrete New structural system on foundation	**Reversibility and re-treatability** Nonreversible foundation and reinforced concrete parts without damaging original members Cuttable metal bars
	Result Reconstruction of foundation and upper structure by using new material in large amount	

3.7. The Temple of Trajan at Pergamon

3.7.1. Location of the Site

Pergamon[51] is located in the province of Bergama in İzmir, in a valley where the Bakırçay (Kaikos) River passes. The distance to the centre of Izmir is about 110 km (Figure 3.164). The city was established on the hill between the Bargama (Selinos) and Kestel (Ketios) streams, which are the arms of Bakırçay. Kozak (Pindasos) Mountains are on the north of the valley and Yund (Aspordenon) Mountain on the south. It is possible to mention three regions in the city which were built on terraces in the east and west direction. The Sanctuary of Athena, the Altar of Zeus, Trajaneum, theatre, library, upper agora in the acropolis are at the highest point of the region; the Sanctuary of Demeter, gymnasion, lower agora and residential area established on the south slope of the hill between two centres form the centre of the lower city and the Sanctuary of Egyptian Gods, amphitheatre, Roman theatre, stadion and the Sanctuary of Asklepieion are connected by a 1 km sacred road to the city from the west and constitute the lowest part of the city which outside of city walls and was settled in Roman period when city was enlarged (Figure 3.165, Figure 3.166).

The buildings in the city, built according to the slope of the topography, were positioned to look at the valley on the west. The Acropolis is where the sanctuaries are located and Trajaneum, which is surrounded by galleries on three sides, was built at the highest point of the city in 114-129 AD (Figure 3.167). There are a number of arsenals that cannot be seen from the lower part of the city on the north of the Trajaneum. It was thought that the library had 200,000 volume books and dated to the 2nd century BC was located next to north gallery of Sanctuary of Athena in south terrace of Trajaneum. The Sanctuary and the Temple of Athena, surrounded by galleries on three sides dated to 330 BC, is in the lower south terrace of the library. The Altar of Zeus (Figure 2.39), which is larger than the temples in the city and decorated friezes about battle between gods and giants dated to 170 BC, is in the lowest south level of the Sanctuary of Athena. On the southern lower terrace of the Altar of Zeus, there is the upper agora dated to the 3rd century

[51] Pergamon was added to UNESCO's World Heritage List as multi-layered cultural landscape in 2014 (http://whc.unesco.org/en/list/1457).

BC. The eastern side of these structures in the acropolis which was built into the city walls and entrance was provided with a gate on the southeast of the Sanctuary of Athena, was surrounded by palaces of the kings. On the western side, the theatre dated to the 3rd century BC was built on a slope that sheltered place from strong northeast wind. On the western side, where the stage building of the theatre is located, there is a theatre terrace and this terrace is passed to reach the Temple of Dionysus dated to the 2nd century BC in the north, which is identified with the theatre culture (Akurgal 1970; Radt, 2002) (Figure 3.20).

The houses, with courtyard and peristyle, are on the southern slope of the city. The gymnasion, which consists of upper, middle and lower parts, in which odeion, bath and palaestra are located, was built in the 2nd century BC. In the northwest corner of gymnasion, there is the Sanctuary of Demeter dated to 270 BC, surrounded by galleries. Between the gymnasion and the Sanctuary of Demeter, there is a structure called Building Z dated to the 2nd century BC, with well-preserved mosaics in it (Figure 2.12). When descending from the gymnasion to the south, there is the House of Attalos on the southwest and the lower agora dated to the 3rd century BC (Akurgal, 1970; Radt, 2002).

There is the Sanctuary of Egyptian Gods outside the city walls on the south, dated to the 2nd century AD, and is now called the Red Courtyard, because red bricks were used in the construction. In the westernmost part of the city, the Asklepieion, which was constructed as a treatment centre in the 4th century BC, is reached by a sacred way from the city (Figure 3.29). In the western part of the city between the Red Courtyard and the Asklepieion, there is the Roman theatre, the amphitheatre and the stadion (Akurgal, 1970; Radt, 2002).

3.7.2. Brief History of the Site

Due to intensive Roman period structuring in the city, a settlement trace that goes back to before the 3rd millennium BC could not be detected. According to legend, Pergamon was founded in the 2nd millennium BC. The Pergamon Kingdom was established in the 4th century BC, during which Pergamon became one of the most important centres of the Hellenistic Period. In the following Kingdom Period, great buildings were built in the acropolis, Pergamon played a leading role in architecture and art. From the end of the Kingdom Period in 129 BC, Pergamon became an Asia province of Roman Empire. Pergamon, which continued to be important under Roman rule, Roman

structures that constitute characteristics of the city today, were built on the structures of the previous period. After the acceptence of Christianity, a population living in the city in the 3rd century AD is known to be Christian, although the city was not the centre of the archbishopric. Church in the Sanctuary of Egyptian Gods and the lower agora were built in the 5th century AD. In the 8th century AD, Pergamon passed into the hands of the Arabs. In the 14th century, it entered the domination of Karesi Beyliği and then to the Ottoman administration (Akurgal, 1970; Radt, 2002).

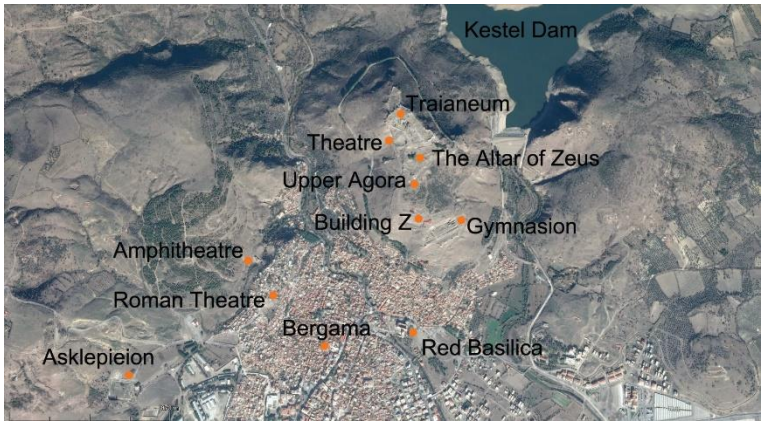


Figure 3.164. Location of Pergamon.
(Source: Google Earth date of image: 19.11.2016 date of editing: 08.04.2018)

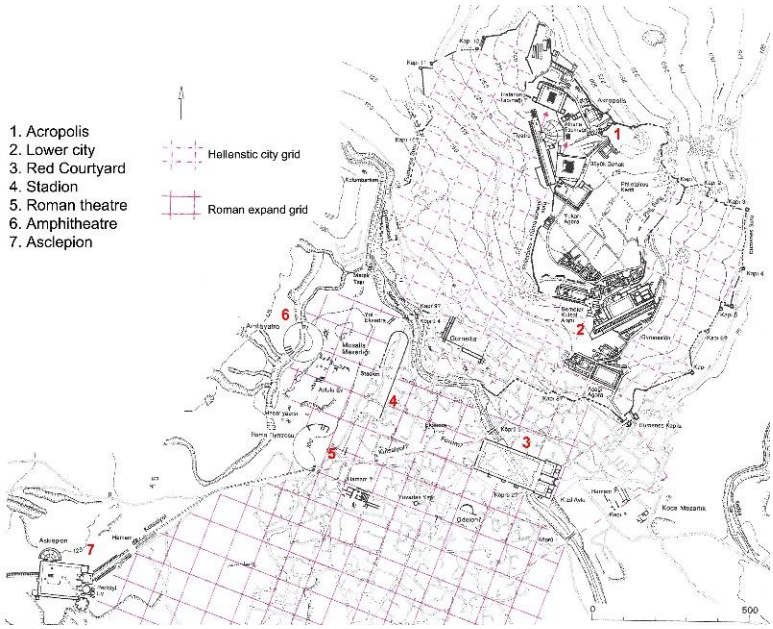


Figure 3.165. Site plan of Pergamon.
(Source: Radt, 2002)

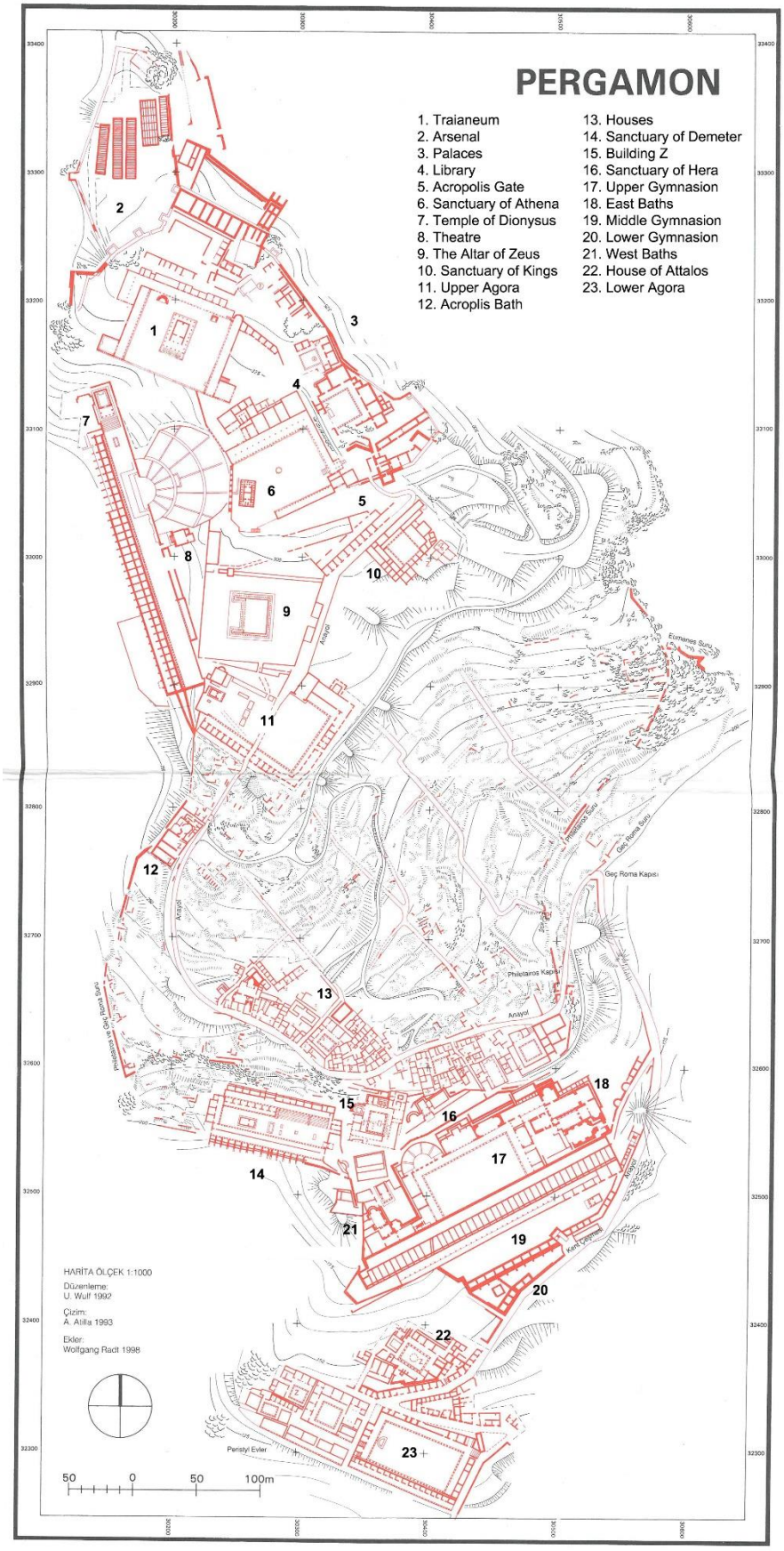


Figure 3.166. Upper city plan of Pergamon.
(Source: Radt, 2002)

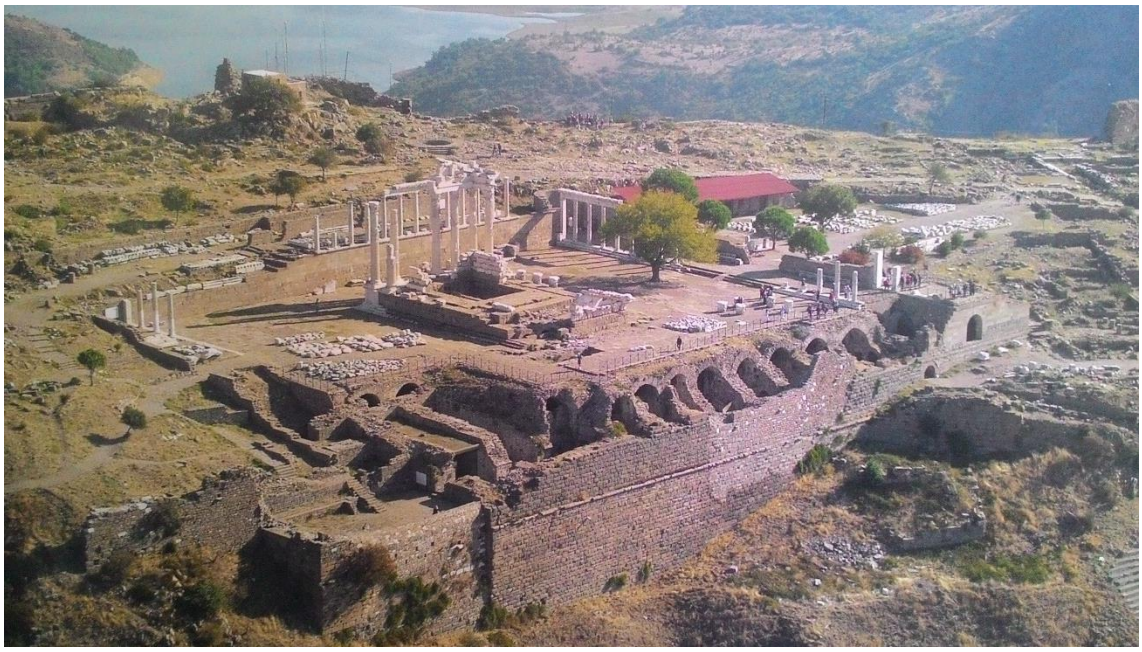


Figure 3.167. General view of Trajaneum from southwest.
(Source: Nohlen, 2014 retrieved from DAI - F. Pirson archive)

3.7.3. Architectural Characteristics of the Temple

The Sanctuary of Trajan was built at the highest point of the acropolis, and can be seen from the lower city (Figure 3.168). The northern, eastern and western sides of the sacred area are surrounded by colonnaded galleries and was built in the north-south direction as the southern part toward the view (Figure 3.169). Due to the level difference in the area, the northern gallery was raised on a wall built of andesite stones as retaining wall (Figure 3.170). For the same reason, in the southern part where there is a great level difference, a substructure consisting of barrel vaulted rooms parallel to each other under the sacred area was built in order to balance this level difference (Figure 3.171). An arched passage provides a transition between these rooms (Figure 3.172). The sacred area, has a courtyard, size 70x65 m, and the temple size 32x20 m (Radt, 2002) (Figure 3.173).

The entrance to the temple rising on the podium is provided by steps from the south. The temple with peripteros plan was built in Corinthian order. On the long sides there are ten columns and on the short sides there are six columns (Figure 3.174). The podium of the temple was made of andesite cut stone and overlaid with marble plates; the other architectural elements of the temple are also marble. The construction of the temple was started in the time of Trajan (98-117 AD) and finished in the time of Hadrian (117-138

AD). Considering the many pieces of sculptures belonging to Trajan and Hadrian near the temple, it is thought that the temple was dedicated to these emperors (Radt, 2002).

3.7.4. Excavation and Implementation Program

The first systematic excavations at Pergamon were realized by railway engineer Carl Humann, Alexandar Conze from Berlin Museums and architect Richard Bohn between 1878 and 1886, in areas where the Altar of Zeus, the Temple of Athena and the upper agora were located. During the second excavations between 1900 and 1913, conducted by architect archaeologist Wilhelm Dörpfeld, the middle and lower part of the city was excavated. Arsenals in the acropolis, the Red Courtyard and Asklepieion were unearthed during the third excavation period conducted by archaeologist Theodor Wiegand in the name of German Archaeological Institute (DAI) between 1927 and 1936 (Akurgal, 1970; Radt, 2002). The fourth excavation that started in 1959, was directed by archaeologist Prof. Dr. Erich Boehringer, studies at Asklepieion were also continued[52] (Schäfer, 1960). Excavations were carried out in the Trajaneum and the architectural fragments of the structure were documented between 1964 and 1976 (Pinkwart, 1968; Radt, 1981a) (Figure 3.175). Studies were carried out by archaeologist Prof. Dr. Wolfgang Radt from 1972 to 2004 (Radt, 1974). Excavations were began to carry out by archaeologist Prof. Dr. Felix Pirson from German Archaeological Institute since 2005 (Pirson, F., 2007).

The restoration project of the Trajaneum was prepared and conducted by Prof. Dr. Klaus Nohlen. In the barrel vaults that constitute the substructure of the sanctuary, the

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[52] Pergamon was the subject of many traveller's work before the systematic first excavations by Carl Humann began. Below is a list of these publications (Radt, 2002).
- de Choisel-Gouffier, Marie Gabriel Florent Auguste (1809). *Voyage Pittoresque de la Grèce,* tome second. Paris.
- Arundell, Francis Vyvyan Jago (1828). *A Visit to the seven Churchs of Asia; with an Excursion into Pisidia; containing Remarks on the Geography and Antiquities of those Countries, a Map of the Author's Routes and numerous Inscriptions*, London.
- MacFarlane, Charles (1829). *Constantinople in 1828. A residence of sixteenth months in the Turkish capital and privinces: With an account of the present state of the naval and military power, and of the resources of the Ottoman Empire*, London.
- von Osten, Ritter Prokesch (1836-37). *Denkwürdigkeiten und Erinnerungen aus dem Orient*. Stuttgart.
- Fellows, Charles (1839). *A Journal written during an excursion in Asia Minor*. London.
- Texier, Charles (1842). *Asie Mineure: Description Géographique, Historique et Archéologique des Provinces et des Villes de la Chersonnèse d'Asie*. Paris.
- Mordtmann, Andreas David (1925). *Anatolien, Skizzen Und Reisebriefe Aus Kleinasien (1850-1859), Eingeleitet Und Mit Anmerkungen Versehen Von Franz Babinger*, Hannover.

necessary protection interventions were done by cleaning debris that filled the passage over time, without considering re-erection of whole structure but only safeguarding so that visitors can tour. Some of the completely destroyed arches were rebuilt; red coloured mortar was used in the joints to distinguish the completed parts (Nohlen, 1999).

The columns of the Trajaneum's north gallery began to be placed in 1979. In order to provide material differentiation, the andesite - cement mixture artificial stones were produced for the northern wall and the wall was partially completed (Radt, 1981b; Radt, 1982; Nohlen, 1999) (Figure 3.176).

The columns of the Trajaneum's north gallery, which were uncovered at the end of excavations in 1982, were lifted to their original stylobates (Radt, 1984). In order to ensure the perception of the width of the gallery, there was no other re-erection study except that these columns in the totally collapsed north gallery (Nohlen, 1999).

A decision was made in 1984 to restore in the corners of north and east galleries, so that the sanctuary could be spatially perceived. For this purpose, the north-eastern corner was partially restored and five columns were re-erected with capitals, architraves and cornices belonging to the east gallery (Radt, 1986; Nohlen, 1999).

Two architrave blocks of the temple were joined in 1985. The broken parts were combined with titanium reinforced stainless steel bars and epoxy. In order not to strain the marble at identical cross sections, holes were drilled in different depths. The length of the holes are deeper than the length of the rods and in order to avoid the tensions that would occur due to thermal expansion, their distance from the outside surface is at least 8 cm. Fiberglass rods were used instead of steel to reduce the risk of lightning when joining elements with high position in the construction. To emphasize the age value of the construction, cracks were left untouched. The new material was artificially made of marble crushed white cement reinforced with steel mesh reinforcement. The marble used for artificial stone production was brought from Marmara (Proconnesus) Island as it was in ancient times. For the temple bases, new materials were produced and processed for ornamentation from artificial marble (Radt, 1987; Nohlen, 1999).

Strengthening and conservation work on the southern vaulted substructure of the Trajaneum was completed and the passageway was opened for visit in 1986. The repair of the east and west galleries was completed. Rails were installed on the temple terrace for safety of the visitors. The architectural elements of the northwest corner of the temple began to be combined on the ground. New parts for the missing parts of the elements were made of artificial marble (Radt, 1988a) (Figure 3.177).

For anastelosis, two architraves, out of three, of the northeast corner of the temple were compounded. Capitals for the same corner were also available. However, only one of the bottom parts of the column drums survived to present day. Column bases were in pieces. Stylobate and orthostate blocks were also fragmented. The missing 22 pieces of bases, orthostates, stylobates and lower drums belonging to substructure were made from new material. The newly produced parts were left unornamented, only the contour of the ornamentations was processed (Figure 3.178). The Medusa heads on the friezes in original situation were broken and were exhibited in the museum. The original friezes for the anastelosis study were used without Medusa heads, newly friezes were produced with Medusa heads in order to convey the original ornamentation of the structure. Some precautions were taken to prevent shrinkage in newly produced concrete elements. Cold marble aggregate and cold water from old water springs were used in the early morning hours with cold weather in production. Concrete parts were buried under the earth for several weeks to prevent weathering and cracking; so they were hardened by keeping them at constant temperature and humidity (Radt, 1988b; Nohlen, 1999).

Andesite blocks belonging to the temple podium were placed and the outer part of the blocks was covered with original and artificial marble orthostate blocks in 1987 (Radt, 1989a). Eight columns and three parts belonging to the frieze were reproduced in 1988. In the northwest corner, three stylobate blocks were put in place and three columns were re-erected. Corner capital was placed (Radt, 1989b; Radt, 1990).

The four columns of the northeast of the temple were re-erected in 1989. For later work, pediment and architrave pieces were prepared. The original sculpture on the apse in the corner of the north and east galleries of Trajaneum was removed to the museum and a replica was positioned in place (Radt, 1991a; Radt, 1991b) (Figure 3.179).

Stylobates and north-eastern friezes of the temple were placed in 1990. The columns that were previously placed were fluted (Radt, 1992). Corner geison, cornices, raking geisons and simas were placed in 1991 on the frieze placed the previous year on the eastern corner of the northern pediment of the temple (Figure 3.180). Thus the re-erection of the north-eastern corner of the temple was completed. A large part of the original pieces of the southern pediment were placed on the protected elements of the podium on the south-eastern corner of the temple. It was suggested that this work was carried out in order that the size of the temple could be perceived, the parts of the pediment were protected by removal from the ground and close examination (Radt, 1993).

Placement of the parts of the southern pediment, which started the previous year, was completed in 1992. In addition, some of the original blocks of cella were placed on the pedestal of artificial stone on the north-eastern corner of the cella (Radt, 1994) (Figure 3.181).

The pediment belonging to the west gallery of Trajaneum was united and exhibited on the pedestal in 1993. Visitor paths were made, architectural elements in the site were arranged. The protective concrete layer in the temple courtyard was removed to reveal the original stone floor (Radt, 1995).

The conservation work at the Trajaneum was completed in 1994. Southern and western sides of the temple were afforested. The east section of eastern courtyard, steps and ramps were built for visitors. Information panels concerning the sanctuary were placed (Radt, 1996).

Damage was detected in a column in the western gallery of Trajaneum in 2001. Cracks occurred from the use of poor quality white cement with marble aggregate in the column. This time for the repair of the column, new marble material was chosen, not artificial stone. The artificial stone part of the column was separated, with the help of the crane, from original stylobate. Stainless steel dowels were left in place for reuse and were adhered to the new marble piece with araldite. The original upper part of the column with the reproduced marble part was joined with three stainless steel dowels. After the joining process, the fluting of the new column piece were processed (Radt, 2003).

Figure 3.168. Trajaneum from Asklepieion. Temple in front (April 1, 2018).

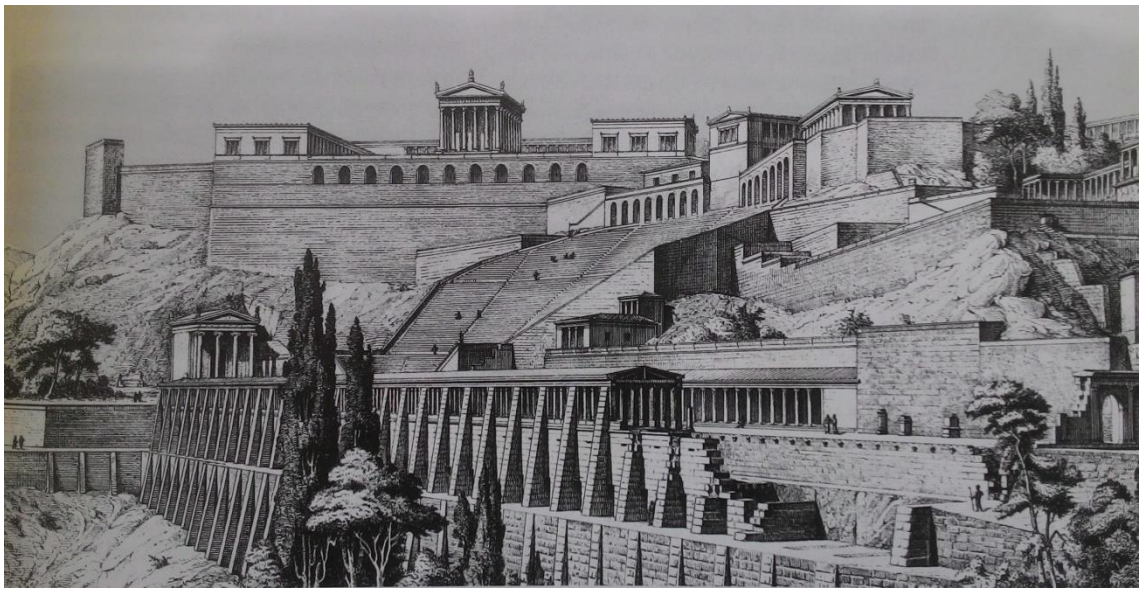


Figure 3.169. Drawing of the Trajaneum.
(Source: Drawing of R. Bohn. Retrieved from Radt, 2002)

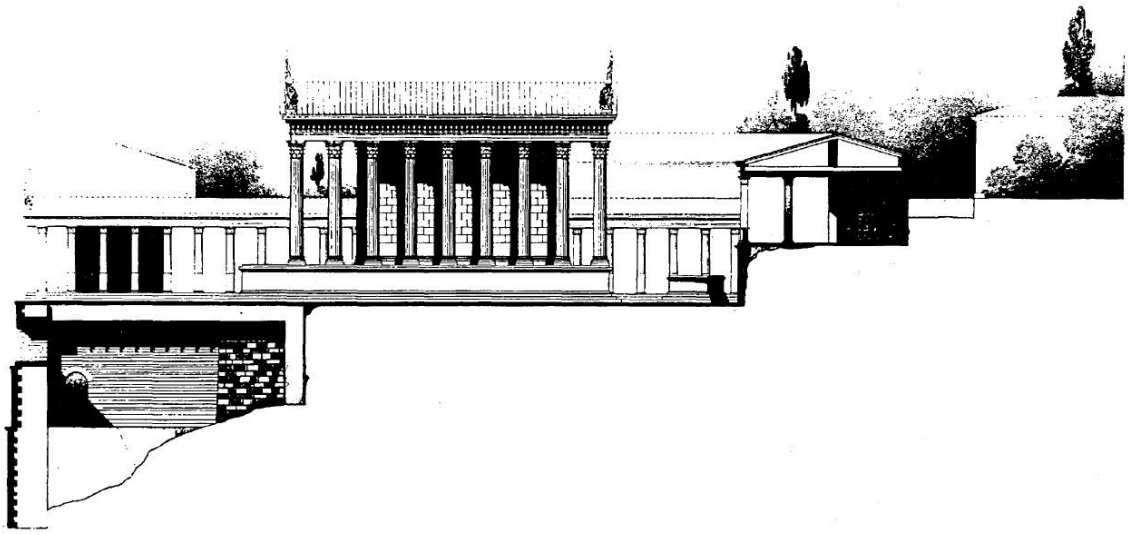


Figure 3.170. Restitution section of the Trajaneum.
(Source: Nohlen, 1999)

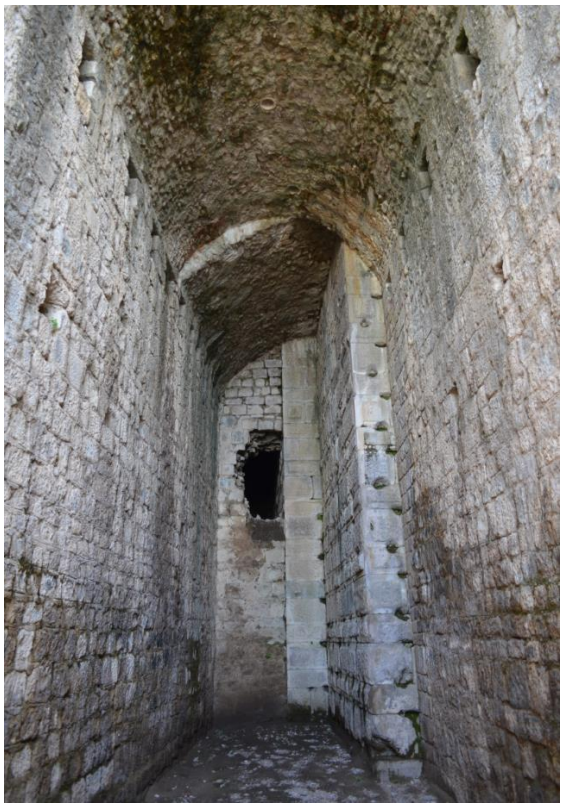


Figure 3.170. Foundation wall of the temple in vaulted room as substructure (April 1, 2018).

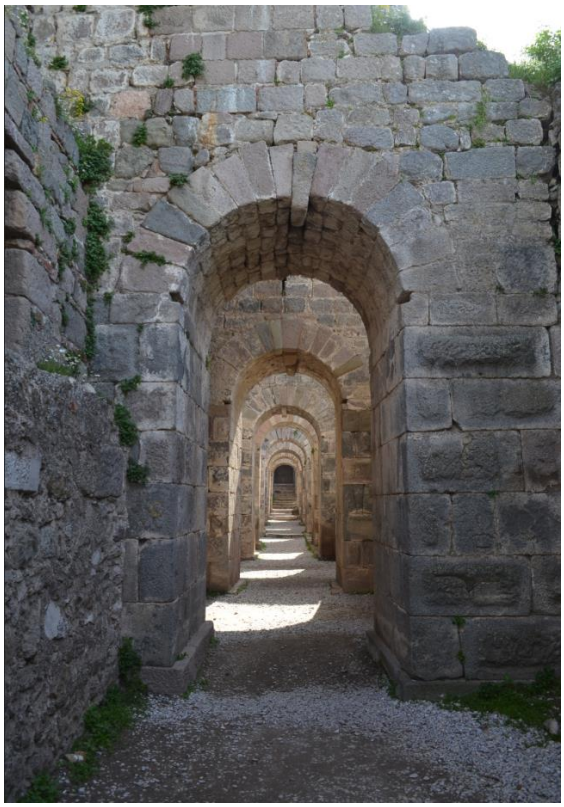


Figure 3.172. Arched gallery in front of vaulted rooms (April 1, 2018).

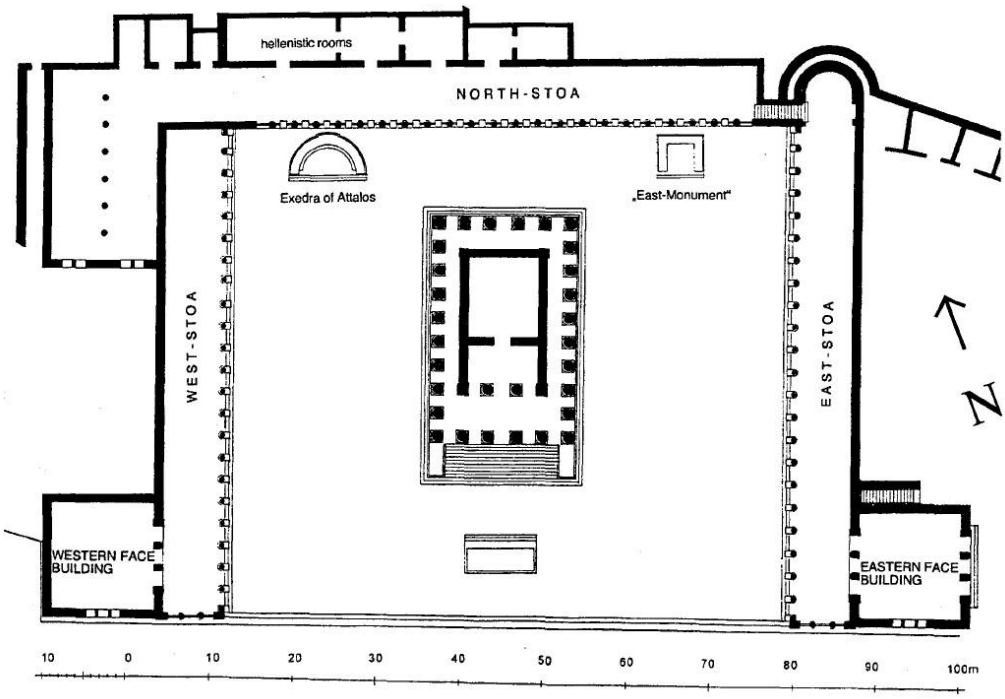


Figure 3.173. Restitution plan of the Trajaneum.
(Source: Nohlen, 1999)

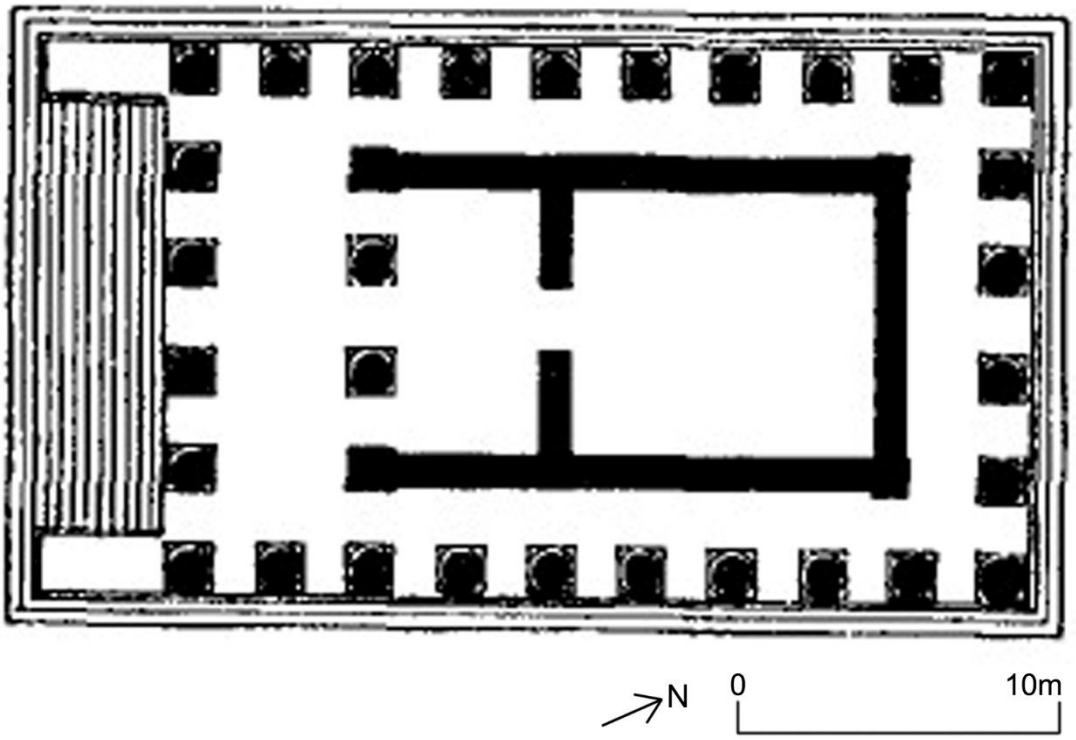


Figure 3.174. Restitution plan of the Temple of Trajan.
(Source: Edited from Nohlen, 1999)

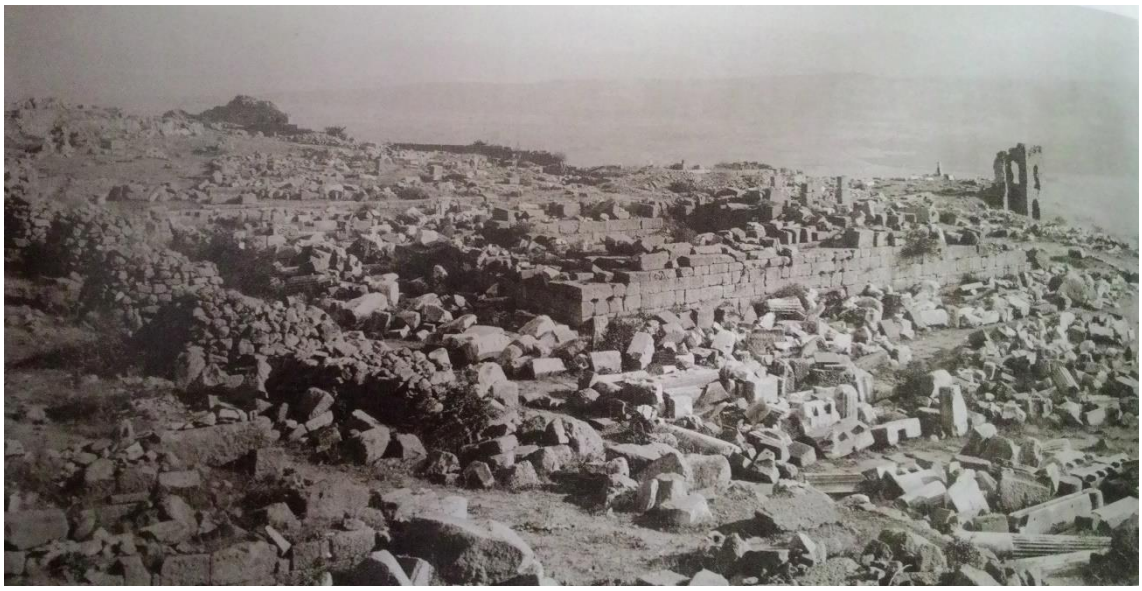


Figure 3.175. Trajaneum from southeast after excavation in the 1900s.
(Source: Radt, 2002)

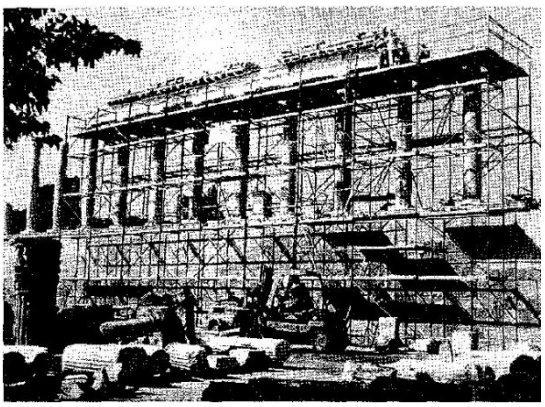


Figure 3.176. Re-erection of north gallery in 1979 (Source: Radt, 1984).

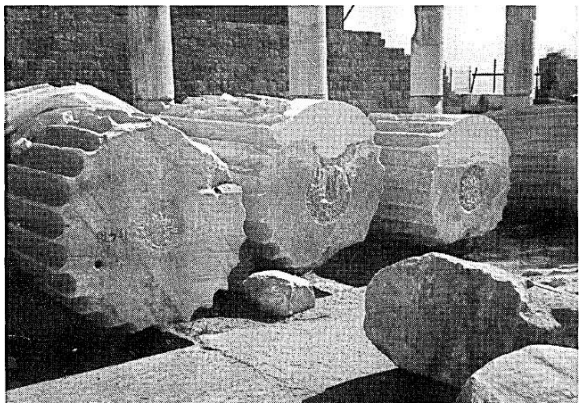


Figure 3.177. Completion of drums with new material (Source: Nohlen, 1999).

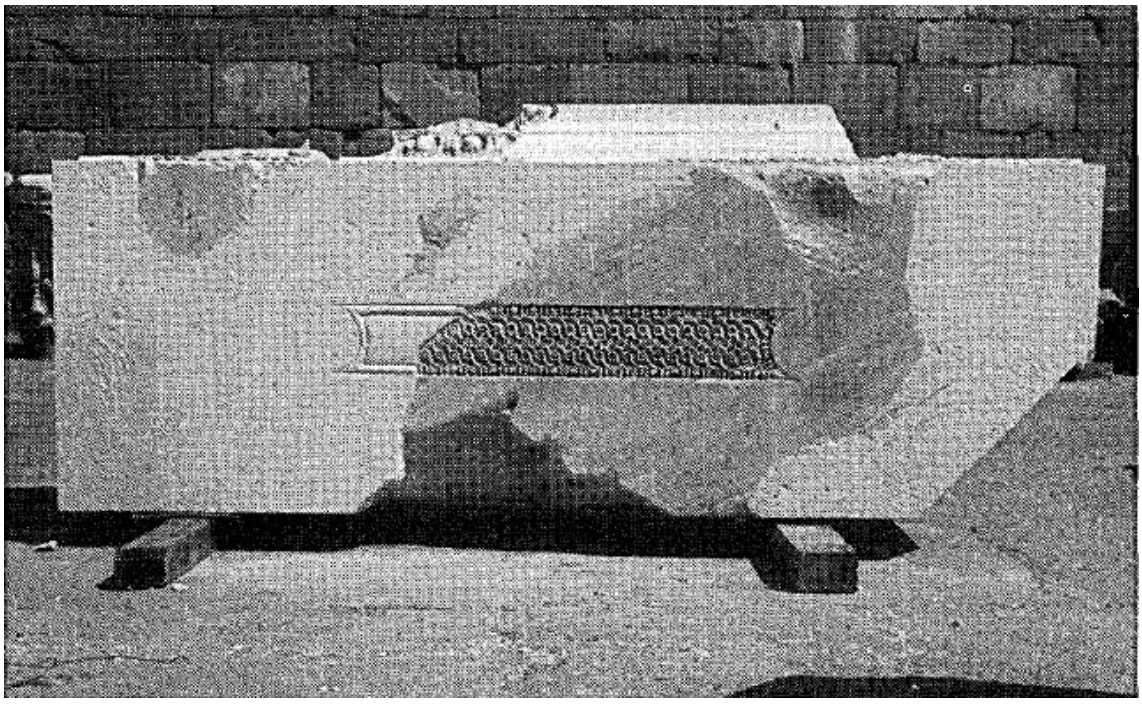


Figure 3.178. Completion of missing parts of an architrave without ornamentation. (Source: Nohlen, 1999)

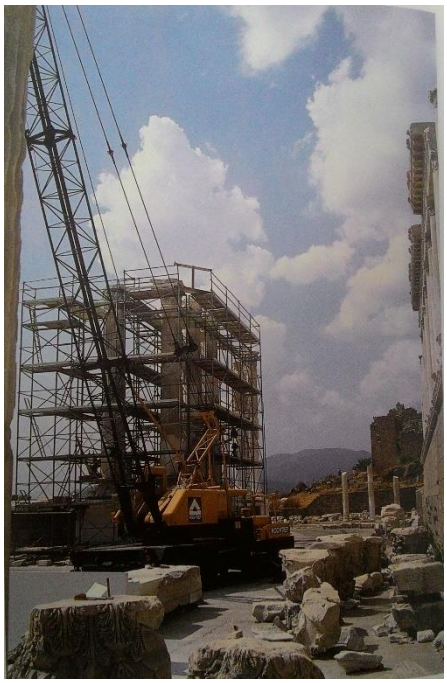


Figure 3.179. Re-erection of temple columns in 1989 (Source: Radt, 2002).

Figure 3.180. Placement of geison and sima. (Source: Nohlen, 1999)

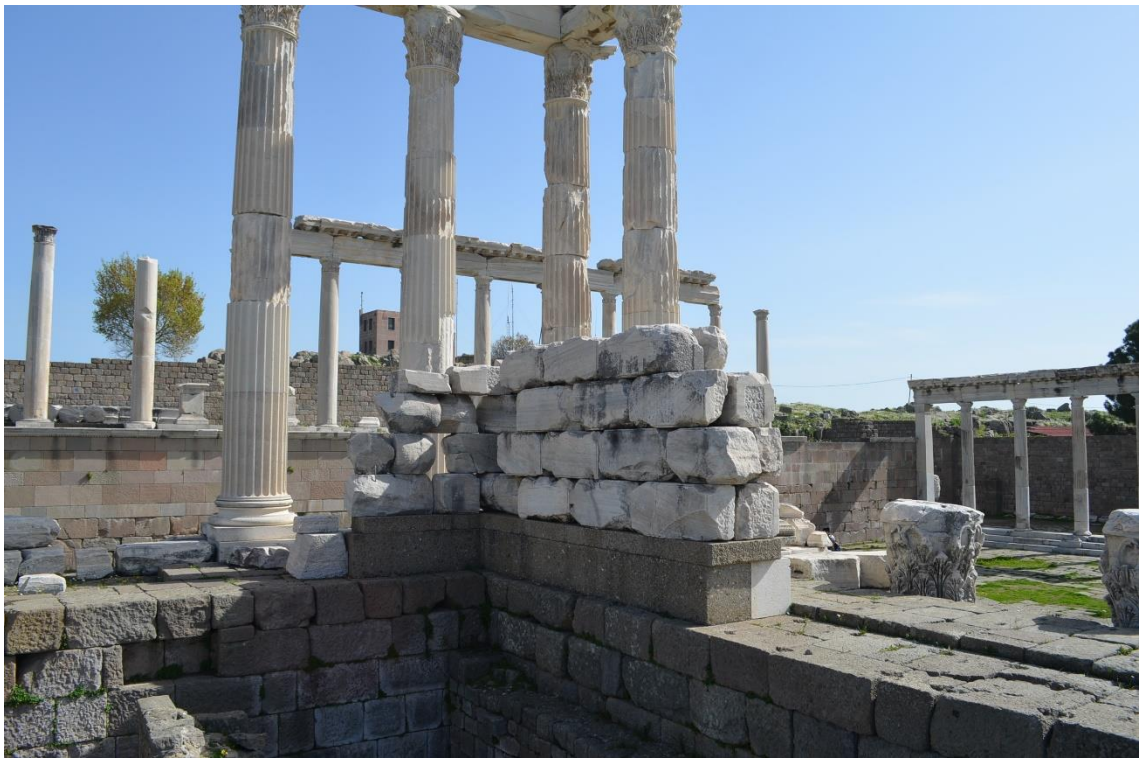


Figure 3.181. Original cella blocks (April 1, 2018).

3.7.5. Evaluation of Interventions

The anastelosis studies in Trajaneum were intended at preserving the authenticity value of the structure and conveying the right information to visitors. In anastelosis study, it was aimed to give information about the original situation of the temple via the survived members, not re-erecting it completely. The production of new materials was meticulously carried out in necessary situations (Table 3.7).

- **Emphasis of the Structure within Site Scale**

The Temple of Trajan was built at the highest point of the Pergamon acropolis and is therefore visible from the lower city. With the restoration application done at the substructure of the temple, this section was opened to visitors by establishing a trip route and the temple terrace was structurally strengthened. The anastelosis study in the temple ensured that the temple was partly restored to its impressive appearance in antiquity and maintained its presence as a symbol on the city. However the Temple dedicated to city's protector goddess Athena which located in the lower terrace and considered was built first (Radt, 2002), cannot maintain its place in original context by becoming Trajaneum as focal point (Figure 3.182). However, contrary to the tradition in Hellenistic period, in the Roman Empire period it started to be built structures upper levels than god / goddess temples; it can be argued that today's anastelosis application is parallel to that political approach by bringing forefront Trajaneum from the Temple of Athena. The image of the city in the Roman period was reinforced rather than in Hellenistic period with implementation (Radt, 2002). It was argued that partial anastelosis was realized in order to avoid over intervention to city's topographical structure (Bachmann, 2014). Considering that the site is formed from terraces of different levels and most of the structures on these terraces are also survived, it can be said that it is in harmony with the surroundings of the anastelosis practice of the temple (Figure 3.183). However it is difficult to recognize the existence of the Temple of the Athena which most members did not survived (Kästner, 2014) and was not re-erected. In the same way, the Altar of Zeus, which was built for the Athena cult, is not in the site, cannot be recognizable so, Trajaneum became the most important structure in the site.

- **Integrity of the Monument**

As a result of the application of the anastelosis, it was aimed to transfer the original knowledge of the structure, but not intended to reach its original integrity

completely (Nohlen, 1999; Nohlen, 2014). For this reason, partial anastelosis application was preferred. The parts of the Trajaneum which were completely destroyed, were not removed. Only some of the columns were re-erected in the north and west galleries so that the width of the space could be perceived.

Missing parts were completed without ornemantation. The only exception was the new production of Medusa headed friezes for done ornamentation (Figure 3.184). Visual integrity was provided by producing new parts similar colour tone with original members.

Anastelosis studies were carried out in the northeastern corner where the number of original elements in the temple was many (Figure 3.185). Parts that required more material were not re-erected. Re-erected structure parts provide information about upper structure and part of the cella. To give as much information as possible about the temple with the existing architectural elements, the southern pediment of the temple was assembled on the southern podium without columns (Figure 3.186). The same study was also carried out on the western gallery pediment displayed on the pedestal (Figure 3.187). This work, done without three-dimensions, can be negative in terms of perceptibility of the integrity of the structure.

- **Authenticity**

Anastelosis studies were attempted to use as few new materials as possible in the sanctuary. For the application of anastelosis, the part with the most original material was identified. The damaged gallery and temple sections were not intervened. In order to be placed in their original place, the elements, such as the south pediment, which require more material, were combined and displayed on the ground.

In the anastelosis study, although the original construction system could not be maintained, it was planned to work independently from the structural standpoint, instead of planning a completely modern structural system (Nohlen, 1999). Just as in the original construction technique, the elements were assembled without mortar. In the new material production, the water coming from ancient spring and the marble coming from the original quarry were used. With these applications, it can be argued that material authenticity was partially maintained.

- **Reliability**

In the application of anastelosis, the structure was not converted into its original form, but all interventions were made visible. The original architectural members were left with cracks and fractures. Hypothetical restorations where there was insufficient information about the original state of the structure (junction of north and east galleries)

were avoided (Nohlen, 1999) (Figure 3.188, Figure 3.189). Possibilities related to the original situation were transferred through publications or information panels.

The fact that the pediment members were exhibited on the podium without being re-erected to their original height can make a false impression on the height of the structure at first glance. However, information about this application is shared with the visitors at the site.

- **Distinguishability and Compatibility**

Artificial stone was used for anastelosis application because it was economically more suitable (Radt, 2003). With the marble dust used, a material that is both compatible and different from the original in visual point of view was obtained. Newly produced parts were left unornamented (Figure 3.190, Figure 3.191). Measures were taken to ensure that the artificial stone material produced poses the least threat to the original material. Nevertheless, it is open to debate that the preferred material was compatible in terms of material with the original material. In a newly produced column in the west gallery of Trajaneum, cracks were detected after a few years. The damaged part was replaced by natural stone material (Figure 3.192). In subsequent maintenance operations, it may be anticipated that the application will be made more compatible with the original material by using natural stone.

Under a possible earthquake, it was predicted that stainless steel bars with titanium reinforcement will break before the marble elements and will not damage the original elements (Nohlen, 1999). For these reasons, it can be argued that new structural system was aimed to be structurally compatible with original members.

- **Reversibility and Re-treatability**

It is not possible to say that the titanium reinforced stainless steel rods and araldite adhesive used for anastelosis application are reversible without damaging original members. However, a column that cracked a few years after the application, was replaced with natural stone material. During this process, the steel rods on the original part were not removed and were used in renovation. Therefore, it can be said that the application of anastelosis enables intervention again. Natural stone material was used instead of the previous artificial stone material in the re-intervention process. The same approach might be followed in subsequent maintenance practices**.**

Figure 3.182. Ruins of the Temple of Athena (April 1, 2018).

Figure 3.183. Trajaneum from terrace of the Altar of Zeus (April 1, 2018).

Figure 3.184. New production Medusa heads on friezes (April 1, 2018).

Figure 3.185. Northwest corner of the temple (April 1, 2018).

Figure 3.186. South pediment of the temple without columns (April 1, 2018).

Figure 3.187. Pediment of west gallery (April 1, 2018).

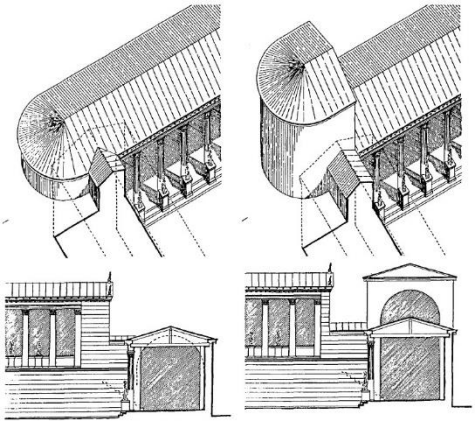


Figure 3.188. Two hypothetical restitution of point of junction of east and north galleries (Source: Drawing of Peter Feichtner. Retrieved from Nohlen, 1999).

Figure 3.189. Point of junction left incomplete (April 1, 2018).

Figure 3.190. New material of drums, bases and stylobates (April 1, 2018).

Figure 3.191. New orthostate blocks. Differentiated from original and left unornamented (April 1, 2018).

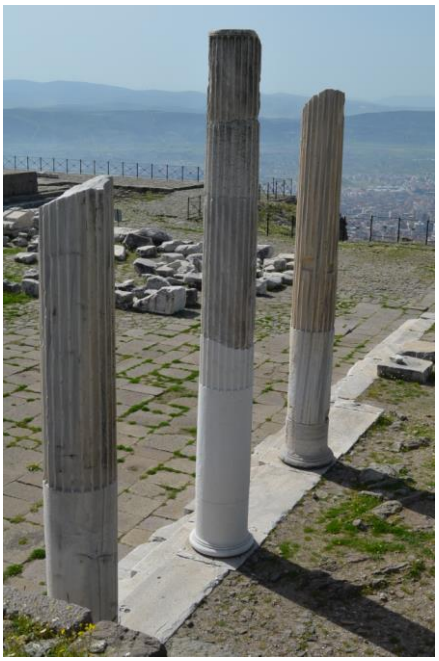
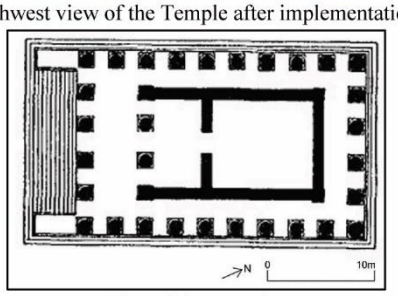


Figure 3.192. Changing damage part of the column with new marble (April 1, 2018).

Table 3.7. Analysis and evaluation of implementation on the Temple of Trajan at Pergamon.

Temple of Trajan at Pergamon		
STRUCTURE	**Location** Bergama, İzmir	 Northwest view of the Temple after implementation
	Construction date 114-129 AD	
	Excavation periods 1878-1886 Carl Humann, Alexander Conze, Richard Bohn 1927-1936 Theodor Wiegand (German Archaeological Institute (DAI)) 1959-1971 Erich Boehringer (DAI) 1972-2004 Wolfgang Radt (DAI) 2005- Felix Pirson (DAI)	 Plan of the Temple
IMPLEMENTATION	**Implementation date** 1979-1994	
	Director of excavation Wolfgang Radt	
	Responsible for the project Klaus Nohlen (DAI)	
	Original material Local andesite stone in foundation Marble in upper structure and as covering	**New material** Reinforced concrete made of white cement and marble aggrega in missing parts Titanium reinforced steel bars and epoxy for joining
	Applied parts Consolidation on south substructure, re-erection of columns on north, west and south galleries, 4 columns on northeast corner including pediment, 3 columns on northwest, joining south pediment and cella of the temple	**New structural system** No new system Titanium reinforced steel bars and fiberglass bars for joining
EVALUATION	**Emphasis of the structure within the site scale** Regained its historical importance in the acropolis but the main Temple of Athena cannot be recognizable. Might be parallel in Roman Imperial period understanding. Partially re-erected structure is in harmony with the ruin monuments on terraced site	**Reliability** Detailed study before implementation Avoid hypothetical completions Information about both structure and implementation shared on boards
	Integrity of the monument Structural integrity gives and idea about the superstructure and cella. South pediment of the temple and south pediment of the west gallery joined without columns Visual integrity of new reinforced concrete parts were provided with colour tone	**Distinguishability and compatibility** Distinguishability with new unornamented parts Material incompatibility of new reinforced concrete parts Visual compatibility by colour tone
	Authenticity Implementation applied on northeastern corner which high amount of original material is present Relative material and technique authenticity	**Reversibility and re-treatability** Nonreversible steel bars and araldite without damaging original members Re-treatability sustained by changing deteriorated column piece with new marble
	Result Anastelosis of authentic part, scientific study, new production meticulously	

3.8. The Temple A at Laodikeia

3.8.1. Location of the Site

Laodikeia[53] is located in Denizli, between Eskihisar, Goncalı and Bozburun neighbourhoods / villages. The distance from the centre of Denizli is about 7 km (Figure 3.193). The city is located in the valley of Çürüksu (Lykos). The city was called Laodikeia ad Lycum (Laodikeia on Lykos) in order to be distinguished from other cities of the same name established in the Hellenistic period (Şimşek, 2005). Çürüksu (Lykos) from the northeast of the city, Başlıçay (Kapros) from the southwest and Gümüşçay-Goncalı (Asopos) Rivers pass from the southwest. The Lykos Plain is surrounded by Çökelez Mount in the north, Sazak Mountain in the west, Babadağ (Salbakos) in the south, and Honaz (Kadmos) in the southeast. The region is rich in terms of groundwater (Şimşek, 2007b).

Laodikeia was built with a grid plan in the northwest-southeast direction. The five main streets in the city were named as Syria Street, Stadion Street, Ephesus Street, Aphrodisias Street and Hierapolis Street by the excavation team (Şimşek, 2005; Şimşek, 2007b). At the end of these streets are the entrance doors of the city with the same name, dated to the 1st century AD. In the 4th century AD, the city was encircled by city walls (Figure 3.194). Today, entrance to the ancient city is provided by the East Byzantine Gate. The buildings that were excavated in the city are located on Syria Street which has porticos and shops on both sides (Figure 3.195). Syria Street extends 900 m to the northeast until junction of the Caracalla Nymphaeum, which dated to the 3rd century AD. A street, which goes towards south from the junction and reaches the stadion, was called Stadium Street. In the excavated part of the city, on the north of Syria Street respectively, the 3rd century AD house A (Şimşek, 2013a), the 4th century AD Laodikeia Church (Şimşek, 2016), the 2nd century AD Temple A (Figure 3.196), the 2nd century AD Septimus Severus Nymphaeum (Nymphaeum A), the 4th century AD Clubhouse of the Greens, the 1st century BC sacred north agora (Şimşek, 2013b) and the 3rd century AD propylons of agora; on the south the 4th century AD central church (Şimşek, 2012), the Roman period central agora, the 3rd century AD Caracalla Nymphaeum and the 2nd

[53] Laodikeia was added to the UNESCO's Tentative World Heritage List in April 2014 (https://whc.unesco.org/en/tentativelists/5823/).

century AD central bath are located. There are also west theatre dated to the 2nd century AD and earlier Hellenistic period north theatre which is next to the city walls and a water distribution centre on the direction of stadion dated to the 1st century AD (Şimşek, 2007b).

Figure 3.193. Location of Laodikeia.
(Source: Google Earth date of image: 31.07.2017 date of editing: 08.04.2018)

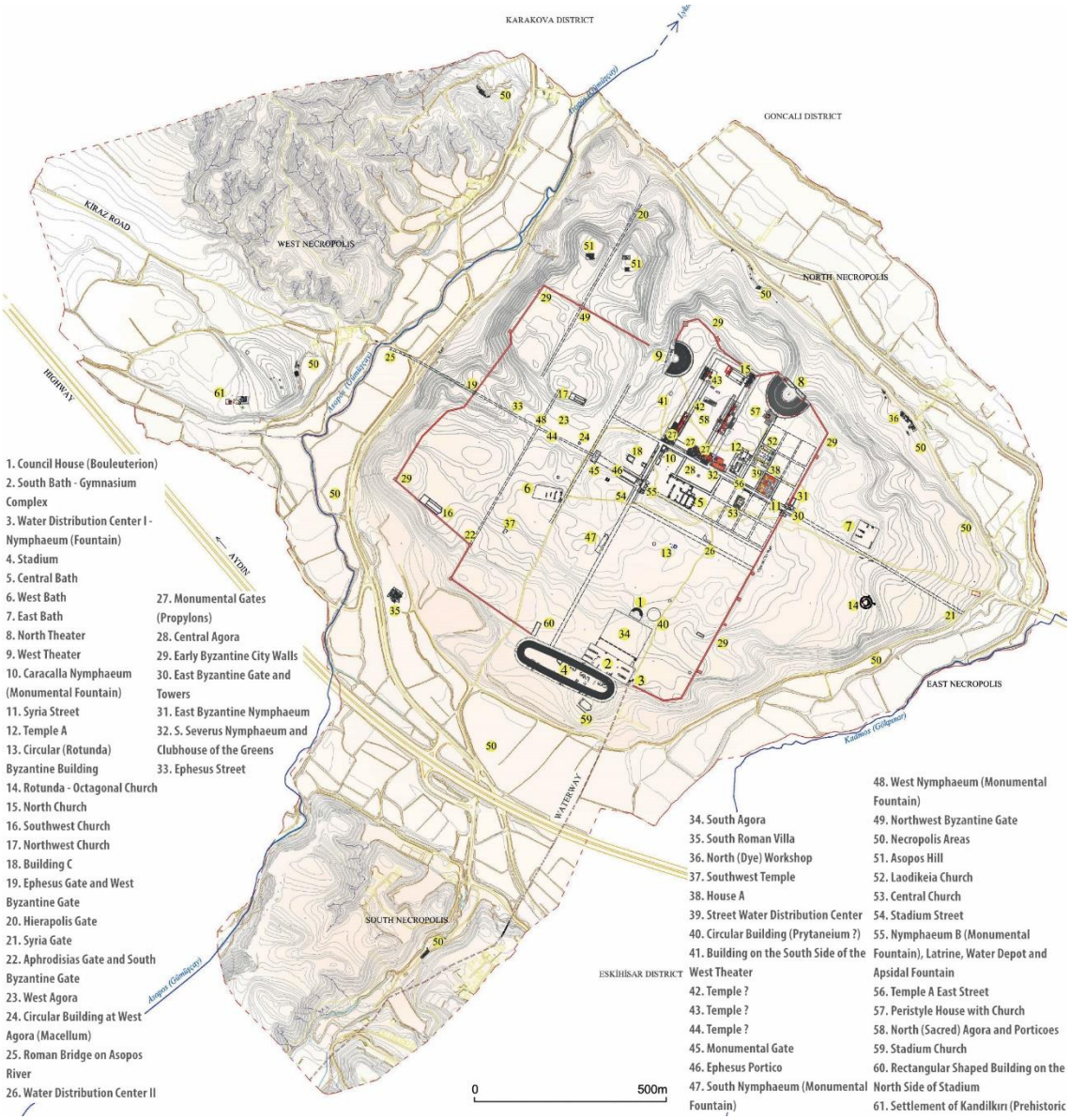


Figure 3.194. Site plan of Laodikeia.
(Source: Ancient City of Laodikeia, 2015)

Figure 3.195. Syria Street (February 7, 2015).

Figure 3.196. Temple A (July 1, 2018).

3.8.2. Brief History of the Site

Findings dated to 3000 BC were discovered in excavations on western and southwestern sides of the city. The Hellenistic city was established for the Seleucid Queen Laodike, by her husband, in the middle of the 3rd century BC. Since its founding, the city has played an important role in regional trade due to its position. It entered the management of the Pergamon Kingdom in 188 BC. After the death of Attalos III, the king of Pergamon in 133 BC, it was connected to the Roman Empire. Beginning from the 1stcentury AD, construction the buildings that survived to today started. With the construction of the pilgrimage church in the 4th century AD, Laodikeia became an important centre for Christianity. The city, which was located on the earthquake zone, was subjected to major earthquakes frequently after its foundation and the constructions in the city were constantly renewed (Şimşek, 2005). After a massive earthquake in the 7th century AD, the city was completely abandoned and moved to Babadağ's northern slope and Hisarköy. In 1206, the region entered Turkish administration, the Laodikeia name became Ladik and the ancient building elements were used as spolia materials in the new structures (Akurgal, 1970; Şimşek 2007b).

3.8.3. Architectural Characteristics of the Temple

Temple A was built in the 2nd century AD to the north of a courtyard accessed from Syria Street (Şimşek, 2009). The courtyard surrounded by porticos in the east, south and west, is 58x42.33 m in size. The temple measures 27.75x13.6 m (Şimşek, 2007a) (Figure 3.197, Figure 3.198). The temple, which is raised on podium, is reached from seven steps, with stone balustrades on two sides, from the south. The porticos from the east and west directions combine with the cella wall in the podium of the temple, making 90 degrees at the courtyard corners. There are four columns on pronaos (Figure 3.199). The outer columns are half square in back and half-twisted fluting in front, inner columns are with full twisted fluting. There are postaments[54] under the columns. The capitals of the columns are in Corinthian order. The main building material is travertine and was covered with marble plates (Şimşek, 2006).

[54] Postament: A pedestal, a base (Retrieved from oxforddictionaries.com May 21, 2018).

The architectural elements of the temple were reused in other structures in the antique period, and the building itself was also used as a stone quarry. For this reason, a small number of architectural elements survived. The excavated artefacts were thought to be built for both the cult of gods and the emperor. Starting from the 4th century AD, various additions such as oven and latrina were built into the porticos and next to the temple cella walls. The vaulted room, which is believed to have been constructed as a religious archive under the cella, was entered by the door and stairs of the southeastern corner of the cella (Şimşek, 2006).

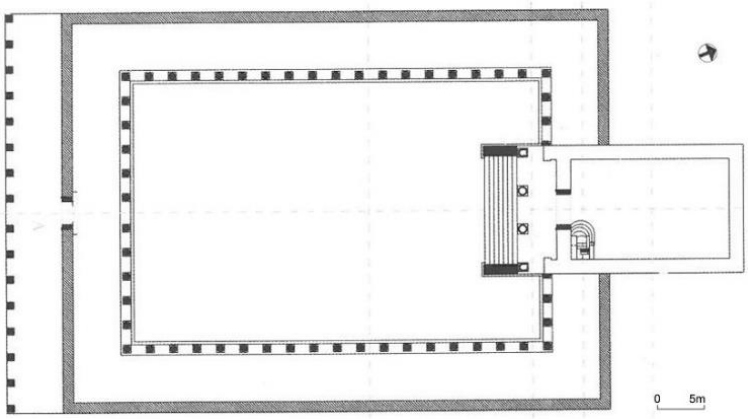


Figure 3.197. Restitution plan of Temple A with courtyard.
(Source: Şimşek, 2007b)

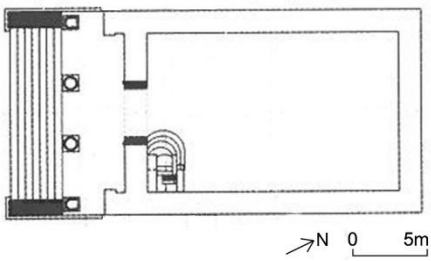


Figure 3.198. Detailed restitution plan of Temple A (Source: Edited from Şimşek, 2007b).

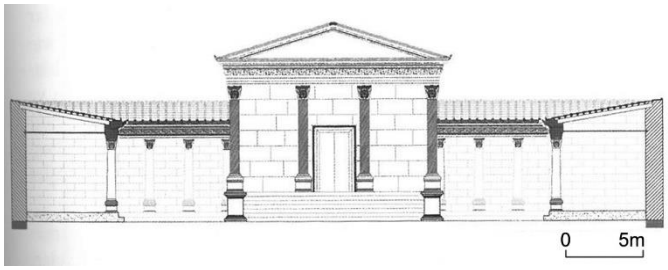


Figure 3.199. Restitution section of Temple A.
(Source: Şimşek, 2007b)

3.8.4. Excavation and Implementation Program

The first researches in Laodikeia were done by G. Weber in 1833-1843 and the plan of the city was prepared. Excavations were carried out in the Caracalla Nymphaeum under the direction of archaeologist Prof. Dr. Jean des Gagniers from Quebec Laval University in 1961 and 1963. A rescue excavation was carried out on Syria Street under the directorate of Denizli Museum by archaeologist Haşim Yıldız in 1992. Surveys were conducted in the city by archaeologist Prof. Dr. Gustavo Traversari from Ca' Foscari University in 1995-2002[55]. Systematic excavations in the ancient city of Laodikeia were started by archaeologist Prof. Dr. Celal Şimşek from Pamukkale University in 2003. In the first period of excavations were carried out on the Syria Street, Septimus Severus Nymphaeum and bath-basilica structure (Şimşek, 2005).

Excavations were started in Temple A in 2004. Cella walls and steps of the temple were unearthed. The borders of the courtyard were identified. In the middle of the temple,

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[55] The excavations carried out in the Caracalla Nymphaeum in 1961-1963 were published in "Laodicée du Lycos le Nymphée". “Laodiceia di Frigia I” and “Laodiceia di Frigia II” were published by conducting a survey study in 1995-2002. A list of early studies about the city was given below (Şimşek, 2007b).

- Spon, Jacob. & Wheler, George (1678). *Voyage d’Italie, de Dalmatie, de Grèce et du Levant, fait aux annès 1675-1676*. Lyon.
- Pococke, Richard (1743-1745). *Description of the East and Some Others Countries, Vol 1,2*. London.
- Leake, William Martin (1824). *Journal of a Tour in Asia Minor, with comparative remarks on the ancient and modern geography of that country*. London.
- Chandler, Richard (1825). *Travels in Asia Minor 1764-1765*. London.
- Arundell, Francis Vyvyan Jago (1828). *A Visit to the seven Churchs of Asia; with an Excursion into Pisidia; containing Remarks on the Geography and Antiquities of those Countries, a Map of the Author's Routes and numerous Inscriptions*, London.
- Cramer, John Anthony (1832). *Geographical and Historical Description of Asia Minor*. Reprint of the Edition Oxford.
- Arundell, Francis Vyvyan Jago (1834). *Discoveries in Asia Minor, Band 2*. London.
- le Laborde, Leon Emmanuel Simon Joseph (1838). *Voyage de la Syrie et de l’Asie Mineure*. Paris.
- Fellows, Charles (1839). *A Journal written during an excursion in Asia Minor*. London.
- Hamilton, William John (1842). *Researches in Asia Minor, Pontus and Armenia*. London,
- Texier, Charles (1842). *Asie Mineure: Description Géographique, Historique et Archéologique des Provinces et des Villes de la Chersonnèse d'Asie*. Paris.
- Fellows, Charles (1852). *Travels and Researches in Asia Minor*. London.
- Suetoni Tranquilli, C. (1858). *Quae Supersunt Omnia*. Lipsiae.
- Cochran, William (1887). *Pen and Pencil in Asia Minor or, Notes from the Levant*. London.
- Ramsay, William Mitchell (1895). *Cities and Bishoprics of Phrygia*. Oxford.
- Anderson, John George Clark (1897). *A Summer in Phrygia: I. JHS XVII*. London.
- Ramsay, William Mitchell (1897). *St. Paul the Traveller and the Roman Citizen*. London.
- Humann, Carl, et al. (1898). *Altertümer von Hierapolis*. Berlin.
- Weber, Georg (1898a). *Die Hochdruck-Wasserleitung von Laodicea ad Lycum*. Jahrbuch Des Kaiserlich Deutschen Archäologischen Insti-tuts, Band XIII. Berlin.
- Weber, Georg (1898b). *Die Flüesse von Laodicea*. Mittheilungen Des Kaiserlich Deutschen Archaeologischen Instituts, Athenische Abthei-lung Band XXIII. Athens.
- Hawley, Walter Augustus (1918). *Asia Minor*. London,

it was determined that some elements such as columns, friezes, architraves of the temple were unearthed with illegal excavations earlier. At the end of the excavations in cella, a vaulted space was discovered under the temple (Şimşek, 2006) (Figure 3.200).

Excavations were done in vaulted room under the cella and porticos in 2005 and 2007. A chapel in the west portico and original marble flooring in the south of the courtyard were unearthed. It was determined that 10% of the original architectural elements belonging to the temple survived to present day. Partial anastelosis work was done on the western courtyard wall. (Şimşek, 2007a; Şimşek, 2009) (Figure 3.201).

Restoration and anastelosis studies were started in Temple A in 2009. It was decided to make anastelosis by using few prostylos columns, courtyard portico columns, architrave, frieze, geison and sima blocks which survived. The missing steps of the temple were replaced with travertine blocks, which are a different material from the original material. (Şimşek, 2011).

The missing marble stylobate blocks in pronaos were reproduced from travertine. The original stereobate[56] blocks were connected with sheet iron and lead clamps as if they were in the original state. Postament of east full twisted fluting column was completed with marble-white cement mixture new artificial material was then placed. The postaments of the half-twisted fluting columns at the edges of prostylos were reproduced from the marble because they did not survived to present day, and they were put in their places. Base of west edge column was completed with marble, then the column was re-erected including its capital. In order to exhibit damage caused by the sledgehammer on the front part of the middle drum of the same column, this section was not completed and three steel bars were placed between the upper and lower drums to make the damage visible. The missing part of the upper drum of the column was completed with new material produced from marble and white cement mixture. The missing middle drum of the second column from the west was reproduced from the marble and cracks on its lower drum were not completed which was thought not to be a structural problem. The missing parts of the upper drum of the column were completed with concrete material. After completing work, the column was re-erected (Figure 3.202). The other two columns in the prostylos were also re-erected without capitals (Figure 3.203). From the 54 columns of the porticos that surround the courtyard of the temple on the four sides, very few columns survived. From the columns of the west, east and south porticos, two columns

[56] Stereobate: Top of a foundation or substructure, forming a solid platform on which a Classical temple stand (Curl, 1999).

were re-erected on each side. The original height of the columns was calculated as 3.35 m from a column, which survived intact. Architrave and frieze blocks of column pairs re-erected were also put in their places. Northeast, north and northwest walls of vaulted room under the cella, which an arch of vault was rebuilt in 2005 in it, were completed (Şimşek, 2011) (Figure 3.204, Figure 3.205).

Floor pavement, the pool and channel system built during the Early Byzantine period were discovered in excavations in the courtyard of Temple A in 2010. The north wall of the vaulted room under the cella was completed with original travertine blocks and covered with steel construction and unbreakable glass (Figure 3.206, Figure 3.207). Two ornamented columns and other architectural elements found in vaulted room were placed in this space for exhibition. The railing was installed for visitors on sides of terrace of Temple A (Şimşek, 2012). The cella door, made of marble blocks, was completed with new material produced from concrete and marble then re-erected (Figure 3.208). Chrome steel, araldite and lead were used in joining the pieces. (Şimşek, 2013b; "2010 Yılı Çalışmaları / Tapınak A", 2018). The missing blocks of the balustrades were reproduced from the travertine. The missing marble plates on the pronaos floor were completed with travertine plates. The channel in courtyard was covered with new travertine plates. Architectural elements that were not used in restoration were arranged in the site by elevating them from the ground with wooden wedges ("2010 Yılı Çalışmaları / Tapınak A", 2018).

The wall between pronaos and cella of Temple A was partly completed using new travertine blocks and original ante capital and frieze in western wall were placed in 2011 (Figure 3.209). The restoration project was completed and fifteen of the columns belonging to the porticos were re-erected (Şimşek, 2013a; Şimşek, 2013b) (Figure 3.210).

The earth ground of the temple courtyard was covered with a mixture of sand and pozzolana in 2012 for the solution of the problem of moisture and algae ("2012 Yılı Çalışmaları / Tapınak A ve Avlusu", 2018).

Capping implementation was performed in 2013 in the pool and chapel in the courtyard of the temple by using fragments of brick taken from the site and clayey mud ("2013 Yılı Çalışmaları / Restorasyon ve Konservasyon Çalışmaları", 2018).

Deteriorations occurred over time in the glass terrace that covers the vaulted room (Figure 3.208). The rusts in the steel structure were cleaned and painted with epoxy oil paint, the silicon between the glasses was replaced by new black silicon in 2017 ("2017 Yılı Çalışmaları / Restorasyon ve Konservasyon Çalışmaları", 2018).

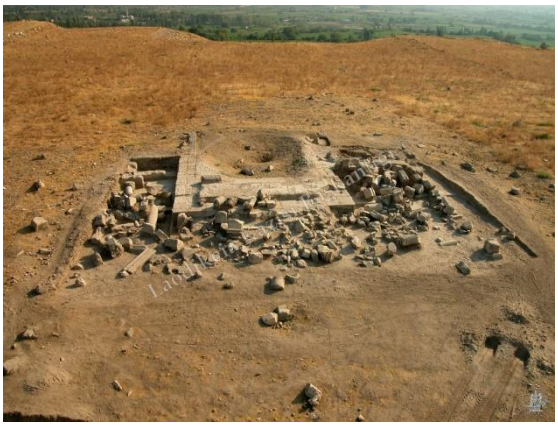


Figure 3.200. Temple A after excavation in 2004.
(Source: http://laodikeia.pau.edu.tr Retrieved at March 28, 2018)

Figure 3.201. Unearthed Temple A and its courtyard.
(Source: Şimşek, 2009)

Figure 3.202. Joining of column (Source: http://laodikeia.pau.edu.tr Retrieved at March 28, 2018).

Figure 3.203. Re-erection of columns in prostylos (Source: Şimşek, 2011).

Figure 3.204. Reconstruction of arch in vaulted room.
(Source: http://laodikeia.pau.edu.tr Retrieved at March 28, 2018)

Figure 3.205. Situation of Temple A at the end of 2009 work.
(Source: http://laodikeia.pau.edu.tr Retrieved at March 28, 2018)

Figure 3.206. New steel structural system of terrace (Source: http://laodikeia.pau.edu.tr Retrieved at March 28, 2018).

Figure 3.207. New steel structural system of terrace before covered with glass (Source: http://laodikeia.pau.edu.tr Retrieved at March 28, 2018).

Figure 3.208. Re-erection of temple door (Source: http://laodikeia.pau.edu.tr Retrieved at March 28, 2018).

Figure 3.209. Partial completion of cella front wall (Source: http://laodikeia.pau.edu.tr Retrieved at March 28, 2018).

Figure 3.210. Temple A after implementation in 2010 (Source: http://laodikeia.pau.edu.tr Retrieved at March 28, 2018).

Figure 3.211. Rusting in steel structure. (Source: http://laodikeia.pau.edu.tr Retrieved at March 28, 2018).

3.8.5. Evaluation of Interventions

The practice in Temple A at Laodikeia was called anastelosis and anastelosis base restoration in the publications prepared by the excavation team[57]. This application should be considered as reconstruction, because the original material is 10% in ratio (Şimşek, 2007a; Şimşek, 2009) (Table 3.8).

- **Emphasis of the Structure within Site Scale**

Due to the frequent earthquakes in the history of Laodikeia, most structures did not survive in a stable condition. Systematic excavations in the site were started in the 2000s (Figure 3.212). From this period, many excavations and re-erection practices were carried out rapidly in many structures in the city (Figure 3.213). Since most of the buildings in the city are being re-erected, the reconstruction practice in Temple A might be in harmony with other implementations in the city. However, when considered that almost all of the structures in the ancient city lost their third dimension, it is concluded that this process, is a period of rebuilding and constitutes a false perception. It can be argued that Temple A maintains its place in original context considering the re-erection of sacred agora and its propylons, and the Laodikeia Church nearby the temple. The temple does not draw more attention than original since other structures were also re-erected.

- **Integrity of the Monument**

The work of re-erection with the existing portico and prostylos elements of Temple A was insufficient for the perception of the space. Even though the application gives an idea of the temple courtyard and the front façade at first glance, the application is not visually holistic because most of the material used was new (Figure 3.214). When entered through the gate of the temple, the mass of the cella is unrecognizable, since there are no wall pieces belonging to the cella. The vaulted room under the cella was covered with a glass terrace for exhibition; this application broke visual integrity of the temple (Figure 3.215, Figure 3.216). The fact that the application of the glass terrace was done it also distorted the visual integrity of the temple. Moreover, the idea of exhibiting behind glass is meaningless because the arch and walls of the vaulted space to be exhibited under the terrace are also reconstruction applications. It was determined that different materials

[57] For anastelosis and anastelosis base restoration see: Şimşek, 2007a; Şimşek, 2011; Şimşek, 2013a; "2010 Yılı Çalışmaları / Tapınak A", 2018; "2009 Yılı Çalışmaları / Restorasyon Çalışmaları", 2018.

were preferred as a result of site survey, for the integration of the original elements that were produced from the same material. No information about the reason for this preference was reached, but it was concluded that pieces of missing blocks were produced using materials closer to the original material and produced without ornamentation, but completely missing blocks were produced from different coloured material with ornamentation (Figure 3.217). This practice on the same construction element prevents the monument being perceived as a whole. In addition, damage was emphasized in some of the destroyed elements, but there was no intervention in some of them (Figure 3.218). In the same way some completed parts were wholly completed and some were left damaged. Also the original channels in the courtyard were covered with travertine plates and the remaining area covered with sand was an application that distorted the integrity (Figure 3.219, Figure 3.220).

- **Authenticity**

The ratio of architectural elements that survived in Temple A is around 10% (Şimşek, 2007a; Şimşek, 2009). However, in the temple, the re-erection was carried out with these few existing elements. The missing parts were completed with marble-white cement mixture, completely missing blocks were reproduced from travertine and marble. In the reconstruction application, it was planned to remove the front façade of the temple re-erect. This led to the use of new travertine blocks on the whole façade of the cella (Figure 3.221). For these reasons, the ratio of the application is low. When the blocks were brought together, they were combined with lead covered iron clamps as originally. Thus the construction technique authenticity was partially maintained might be thought.

- **Reliability**

As in all the other structures in the ancient city, excavation and reconstruction works were carried out at Temple A at the same time. For this reason, there is some doubt that the reconstruction project was documented in detail before the application. Reconstruction in the same way was also done quickly. As a result of the investigations, no knowledge that trials were carried out before the existing parts were re-erected. Steel bars were left as visible in the west column of prostylos may suggest that work will continue in this and material will be completed later or steel bars are showing. However, it was stated that the purpose of this intervention was to emphasize the destruction (Şimşek, 2011).

- **Distinguishability and Compatibility**

In the reconstruction of Temple A, three types of materials were used: travertine, marble and white cement. Originally marble stylobates while being reproduced from travertine for the distinguishability of the new material; originally marble drums and postaments were produced from marble again, caused both visual disharmony and inconsistency in practice (Figure 3.222, Figure 3.223). It was also inconsistent that the missing parts in the blocks were completed with white cement and that the completely missing elements were reproduced from marble or travertine. New materials produced from travertine and marble may be considered to be structurally compatible with the original material, but new white cement pieces may harm original building materials when considering the continental climate of the region. The steel construction covering the vaulted room needed to be renewed after a short period of time because it rusted. New materials that directly contacted with the original elements may be considered harmful in the future. The glass terrace is a striking feature even when viewed from a distance. It suddenly draws attention in the interior of the temple, causing the cella to become completely alienated to the rest of the temple and to be more foreground than the original building parts.

- **Reversibility and Re-treatability**

The new blocks used in the steps of the temple, cella façade and postaments are considered to be recyclable as they are brought together with clamps. However, the missing parts of the original elements cannot be reversed without damaging original members because they were bonded with araldite using white cement material. It is not possible to disassemble the steel rods used in the same way. Still, it can be considered that these bars will be cut off and allowed to intervene again.

Figure 3.212. Laodikeia before excavations in 2002.
(Source: Şimşek, 2014)

Figure 3.213. Laodikeia in 2013. Rapid restoration works.
(Source: Şimşek, 2014)

Figure 3.214. Front façade of Temple A (July 1, 2018).

Figure 3.215. Front façade from interior of cella (July 1, 2018).

Figure 3.216. Interior of cella (February 7, 2015).

Figure 3.217. Completion with white cement and new material from marble in temple door (July 1, 2018).

Figure 3.218. Steel bars in west column (July 1, 2018).

Figure 3.219. Left as incomplete members in courtyard (July 1, 2018).

Figure 3.220. Travertine plates and sand covering in courtyard (July 1, 2018).

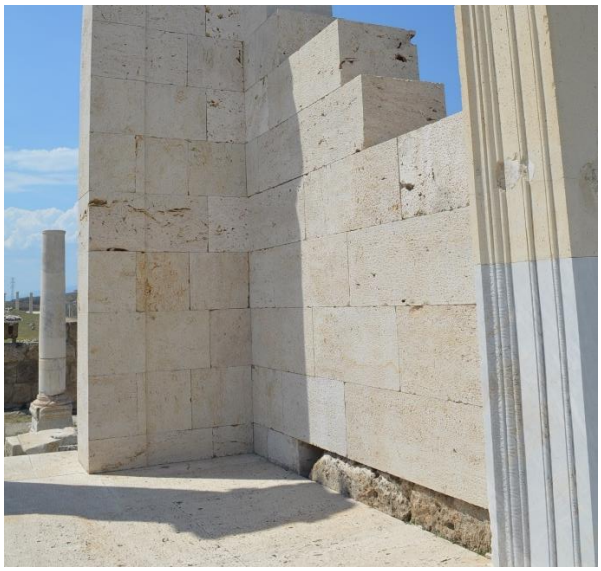


Figure 3.221. Few amount of original cella blocks (July 1, 2018).

Figure 3.222. New production marble drums and postament in back. Completion of drum and base with white cement in front (July 1, 2018).

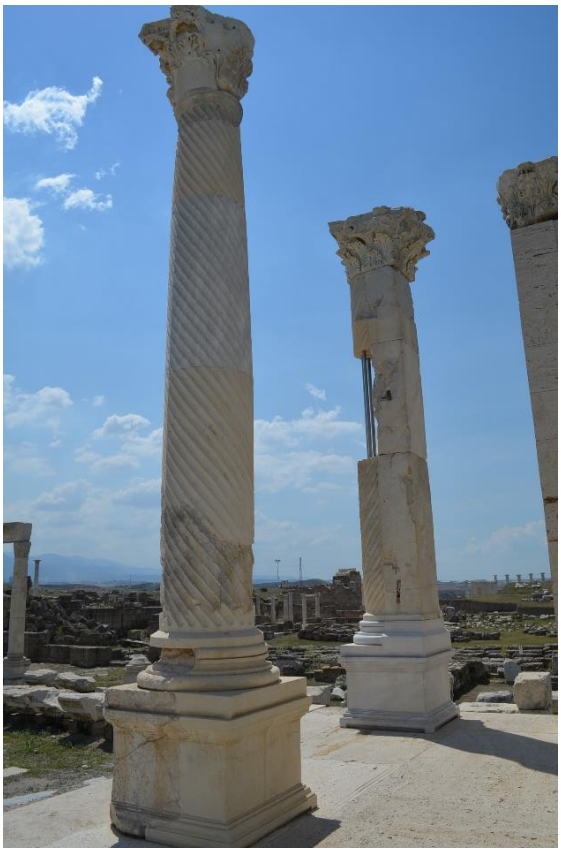
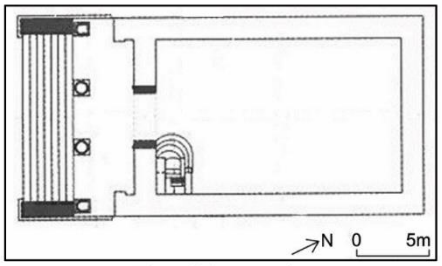


Figure 3.223. New production marble postament and base in back. Completion drum, base and postament with white cement in front (July 1, 2018).

Table 3.8. Analysis and evaluation of implementation on the Temple A at Laodikeia.

Temple A at Laodikeia		
STRUCTURE	**Location** Eskihisar, Denizli	 South view of the Temple after implementation
	Construction date 2nd century AD	
	Excavation periods 1961-1963 Jean des Gagniers (Quebec Laval University) 1992 Haşim Yıldız (salvation excavation) 1995-2002 Gustavo Traversari (Ca' Foscari University) 2003- Celal Şimşek (Pamukkale University)	 Plan of the Temple
IMPLEMENTATION	**Implementation date** 2009-2011	
	Director of excavation Celal Şimşek	
	Responsible for the project -	
	Original material Travertine Marble in upper structure and as covering	**New material** New travertine blocks on stylobate and cella New marble on architectural members Concrete made of cement and marble in missing parts Chrome steel, iron clamps and araldite for joining
	Applied parts Re-erection of 4 columns on prostylos; 15 columns on porticos Completion of cella façade, podium and vaulted room Glass terrace on cella floor	**New structural system** No new system Chrome steel and iron clamps for joining
EVALUATION	**Emphasis of the structure within the site scale** Regained its historical importance in the city, also re-erected nearby structures. Re-constructed structure is in harmony with re-constructed site Striking glass terrace in the site	**Reliability** Suspect about detailed study before implementation Misleading information about destructed column
	Integrity of the monument Gives and idea about façade. Low visual integrity due to different approaches in implementations such as completing with concrete, travertine and marble in missing elements, showing destruction of column, glass terrace on cella	**Distinguishability and compatibility** Incoherence on distinguishability; some new members are different from original for distinguishability, some are the same Visual disharmony due to use of different materials in place of the same original members. Material incompatibility of concrete parts
	Authenticity High amount of new material Quite low authenticity Partially maintained original structural system	**Reversibility and re-treatability** Separable stylobates and podium steps Nonreversible concrete completions without damaging original members
	Result Reconstruction with quite low authenticity, fragmented approach with different materials	

CHAPTER 4

EVALUATION

Anastelosis, which carries purposes of both preservation and presentation of archaeological remains, contributes to the introduction of archaeological sites and plays a role in the realization of tourism objectives. In anastelosis practice, the impact of the structure to the archaeological site and in original context, structural and visual integrity, authenticity, reliability, distinguishability, visual and material compatibility, reversibility and re-treatability principles, which are undertaken in this study to be followed as a holistic approach, ensures in achieving the purpose of the implementation. The implementations examined in the study were evaluated as follows in the framework of the determined basic anastelosis guidelines.

- **Emphasis of the Structure within Site Scale**

Before the anastelosis decision is taken, the effect that the implementation will create in the site, as well as, the contribution it provides to the integrity of the structure should be taken into account. Parallelism of the re-erected structure with significance in original context of the city, the relationship with other structures in the site, the survival situation of other structures should be discussed. The restoration implementation of the Temple of Athena at Assos made it a focal point in the site as it had originally. The temple, which was built at a high point in the acropolis of the city, can be seen today as it was in originally from the road below the city and in the direction of the Gulf of Edremit and the temple is in harmony with the close environment. Similarly, the re-erection implementation of the Temple of Athena at Priene, which in an upper level in the city, made the temple visible from the road below. Since the site was later afforested and other structures are still standing, the temple is not emphasized in the site and it is in the landscape unity with its close surroundings. The anastelosis implementation of the Temple of Trajan at Pergamon, which is located in the acropolis, can be seen from the Asklepieion, which is about 1 km further down the city, as it was originally. The design of the city in the form of terraces eliminated the influence of the temple over other constructions that might be dominant. Nevertheless, against the possibility of dominance, it was preferred to perform the re-erection work on the northeastern corner of the temple

away from the southern slope. The galleries surrounding the temple in the close vicinity were also been partially re-erected. However, the Temple of Athena, located on the lower terrace of the Temple of Trajan and dedicated to the protective goddess of the city, is unrecognizable compared to the Temple of Trajan. It can be said that even though, the decision of re-erection of the Temple of Trajan comes to the forefront of the Temple of Athena, is in parallel with the Roman period that cult of the emperors came to the forefront of the cult of the gods / goddesses. In the anastelosis implementation of the Temple of Leto at Letoon, the far corner of the temple was re-erected from the other temples considering the situation of the Temples of Artemis and Apollo, which lost the third dimension, and even though more architectural elements survived, these elements were not used in the anastelosis. The Temple of Leto is emphasized more than the temples nearby by re-erecting, as it was built greater and worshipped as main temple in the sanctuary. In contrast, the reconstruction of the Temple of Apollo at Side, which is located in the harbour, provided the temple to be stunning as seen from the sea, as it was in the past, but it did not perceive the Temple of Athena, which was located next to it as main goddess of the city and only column bases are visible. The reconstruction work on the crepis of the Temple of Apollo at Smintheion even though emphasized the temple further, which was the most important structure in original situation, created disharmony between the ruined and untreated structures in the site. It can be said that the reconstruction implementation of Temple A at Laodikeia does not draw attention considering the reconstructions performed on many buildings in the city, but the glass terrace built on the vaulted space attracts attention in the site. It can be argued that the place of Temple A in original context is maintained by also re-erecting sacred agora with its propylons and the Laodikeia Church.

- **Integrity of the Monument**

The fact that anastelosis is done with a small amount of architectural elements causes to break structural integrity; while fragmented approaches followed in practice or new materials are preferred cause the structures not to be perceived as a whole in visual. As in the Temple of Athena at Assos, absent of the unique ornamented Doric architraves of the structure and the presence of other elements of the superstructure in different museums led to the inability to convey information about the superstructure. The temple mass is unperceivable since the five columns belonging to only one side of the temple were re-erected in the Temple of Athena at Priene and the lack of environmental organization. In the Temple of Apollo at Smintheion, a fragmented approach was

followed, while the crepis were being rebuilt with new material, the columns were done anastelosis on one corner and re-erected to different heights on one side, and on the other side two columns including one drum, base, capital and architrave and frieze over these two columns to convey information about the superstructure. Such an application did not create a correct perception, but led to three different outcomes in the temple. Another example in which different application approaches are observed is Temple A at Laodikeia; completely missing elements were reproduced with marble or travertine with ornamentation, and the part-based deficiencies were completed with reinforced concrete material without ornamentation, resulting in visual and textual incompatibility. In addition, some elements were not completed and reinforced with steel bars to emphasize the destruction, some of them were completed, and others were left as they are. While the porticos around the temple and the prostylos of the temple were reconstructed with little original material, the cella wall and the pronaos floor were completed with new material. Although a holistic approach in applications was not followed, the application gives a general idea of the temple mass. In the Temple of Trajan at Pergamon and the Temple of Leto at Letoon, partial anastelosis was performed in the parts where the original material was abundant. This approach provided information about different parts of the temple and prevented the temple's dominance alongside other buildings in the site. As the elements belonging to the cella survived, these elements were used in the anastelosis and contributed to the gain of more information about the temple architecture than other examples. However, in the Temple of Leto at Letoon, where only the cella and some of columns were re-erected in order to not become dominant in the site, the information of the superstructure is missing. It can be argued here that the southern pediment of the Temple of Trajan was joined on the podium without missing columns in order not to use new material in excess. The pediment combined on the podium without the columns can give a misleading impression of the structure of the temple at first glance. In the Temple of Apollo at Side, partial re-erection similar to the Temple of Trajan at Pergamon gives a general idea of the whole of the structure. The situations in which the new material preferred in practice is in different colour and texture from the original material may adversely affect the visual integrity of the structure. The colour difference in the crepis of the Temple of Apollo at Smintheion is striking since the applications were performed in different periods. In Temple A at Laodikeia, reproducing completely missing members from marble or travertine with ornamentation; completing part-based losts from concrete without ornamentation resulted in visual and textual incompatibility. In the Temple of

Apollo at Side, visual integrity could not be achieved because of the excessive amount of new material used in the reconstruction, reinforced concrete parts changed colour due to weathering and transformed to a different colour than original material and workmanship problems such as the thickness of new material is bigger than original. Visual integrity was ensured in the Temple of Athena at Assos and the Temple of Leto at Letoon through the use of new material that is the same as the original material. Since the new pieces used in the Temple of Leto at Letoon are located on the inner side of the columns and the cella, they do not draw attention at first sight in the site. There is no situation in the Temple of Athena at Priene that would distort the visual integrity as new material was not used. The visual integrity was provided by producing new reinforced concrete parts close colour tone with the original material in the Temple of Trajan at Pergamon.

- **Authenticity**

It was seen that authenticity, which is the basic principle of the anastelosis, is not taken as a basis in all the applications of the study examples. Temple A at Laodikeia was re-erected even though the original material survived in small amount and the implementation turned into a reconstruction application. The foundation of the Temple of Apollo at Smintheion was reconstructed and its columns were re-erected. Although the original column fragments survived, the reconstruction implementation on the foundation reduced the originality rate. In the Temple of Apollo at Side, lean concrete was poured into the foundation to ensure the stability of the columns. This is an application that is decreasing authenticity as it was in the Temple of Apollo at Smintheion. In the superstructure, the originality rate is low because too much new material was used and the existing but damaged pieces were reproduced. It is possible to say that the originality rate is considerably high in the implementations of the Temple of Trajan at Pergamon and the Temple of Leto at Letoon. In both examples, the practice was planned in parts where the original architectural elements of the temple were in excess. Even where it was possible to raise the temples more, but in cases where it was necessary to produce a large amount of new material for such a work, these parts were not reconstructed. The pediment belonging to the Temple of Trajan was joined on the podium in place without columns, and the pediment belonging to the Temple of Leto was also joined on the ground and exhibited. A similar approach was also observed in the Temple of Athena at Assos. Pediment elements are displayed in place in the cella. However, the originality rate decreased in this implementation because the drum and stylobate blocks were reproduced. In the re-erection implementation of the Temple of Athena at Priene, there is no precise

information but the result of the field survey is that no new material was used. For this reason, although the originality of the application is high, this practice gives false information about column heights.

The maintenance of the authenticity of the construction system as well as the material authenticity is one of the bases of anastelosis. New structural systems have to be developed in anastelosis applications due to the incomplete access of elements of the structure and the possibility of earthquakes. The original foundation system was reconstructed with reinforced concrete in the Temple of Apollo at Smintheion and the Temple of Apollo at Side in order to ensure the stability of the re-erection of columns. This harmed the structural system as well as the original material. In the Temple of Apollo at Side, since the missing parts of the stylobate, base and column were produced as one piece with reinforced concrete and connected to the other elements with steel rods, original structural system was not sustained. Although the missing elements were produced with reinforced concrete in the Temple of Trajan at Pergamon, a reinforced concrete system was not produced and the elements were connected to each other by steel bars. It can be argued that the original construction technique was maintained since the newly produced marble pieces in the Temple of Leto at Letoon and Temple A at Laodikeia were connected by iron clamps. However, there are broken architectural elements that are inevitably joined with steel rods, as it was in the Temple of Apollo at Smintheion, in order to provide stability in the structural system. In the Temple of Athena at Assos, dowels or bars were not used, lead plates were placed between the andesite members for joining. It can be argued that the construction technique was maintained by considering lead plates as dowel functions. In the Temple of Athena at Priene, new material was not used to combine elements as far as is known. However, considering the possibility of an earthquake, the columns were re-erected at a lower elevation than originally, and the torus part of the column bases was not used in implementation. For this reason, it is not possible to say that the original construction technique was fully maintained.

- **Reliability**

Anastelosis should provide accurate information about the original state of the structure. The applications should be done at the end of a detailed research and documentation process and should avoid interference in unsure situations. No information was available on the research stage of the re-erection application that was carried out quickly at Temple A at Laodikeia. Since there are no columns that survived as a single

piece at the Temple of Apollo at Side, the height of a column was calculated by analogy of the column of the Temple of Athena and the sizes of the temples. There is also uncertainty as to whether the capital, architrave and frieze blocks were used in their original locations. In the Temple of Apollo at Smintheion, in order to provide strength, solid drums with diameters matching but dowels spaces that do not match, were chosen, so the lining of drums is different than original. In the Temple of Athena at Priene columns that were re-erected lower than the original elevation to avoid collapse in a possible earthquake with missing drums, give false information about the height of the structure. Also, the fact that the torus parts belonging to base were not used in re-erection lead to misinformation about the columns. At the Temple of Athena at Assos, the stylobate blocks were produced in a smaller size than the original with concern of distinguishability, so the application conveys incorrect information about the stylobate. In the applications of the Temple of Leto at Letoon and the Temple of Trajan at Pergamon, the structures were researched before the work, the locations of the original elements were definitely determined, and the ones that could not be determined were mentioned through the publications. As in the junction of east and north galleries of Trajaneum, alternative situations related to the original state were transferred through drawings; the structure was avoided from the hypothetical intervention in cases where the precise information about the original state could not be obtained. Information on implementation process was also provided in the publications and on the information panels in the site.

- **Distinguishability and Compatibility**

Different approaches were followed to ensure that new materials used in anastelosis are compatible with the original materials but can be distinguished. Missing parts of the Temple of Trajan at Pergamon, the Temple of Apollo at Side and the Temple of Apollo at Smintheion, were produced as reinforced concrete in close colour to the original material. However, deteriorations in the new parts of the Temple of Apollo at Side caused discolouration. This deterioration in new material also threatened the original elements. In the newly produced columns, a difference in thickness occurred due to poor workmanship, which facilitated the unintentional distinction. Although reinforced concrete is a preferred material because it provides durability and easy workability, it is not a material that is compatible with stone material. For this reason, it cannot be said that the reinforced concrete material in the foundation and upper structures of the Temple of Apollo at Side and the Temple of Apollo at Smintheion are compatible with the original material. However it is not possible to suggest that the reinforced concrete material is

compatible with the original material, in the implementation of the Temple of Trajan at Pergamon, most of the problems originating from reinforced concrete materials were tried to be reduced. In order to prevent material cracks due to climatic conditions, reinforced concrete material was buried into the soil after it was poured and it was hardened under stable temperature and humidity. In order to be able to distinguish new parts, these elements were produced without ornamentation. Different approaches were followed in Temple A at Laodikeia for the use of new materials. Completely incomplete elements were reproduced with marble or travertine with ornamentation, while part-based deficiencies were completed with concrete material without ornamentation. These different approaches, which can be observed on the same member, are visually incompatible. It is not possible to say that the concrete parts are compatible with the original material. In the Temple of Athena at Assos and the Temple of Leto at Letoon, it was aimed to distinguish the new parts, which were produced from the same material with original, by their uneroded details. However, there is a possibility that when new parts wear out over time they become indistinguishable. Also, the newly produced stylobates of the Temple of Athena at Assos were produced in different dimensions from the original, and tried to achieve distinguishability. In both applications, compatibility issues are not expected to arise because the new elements are the same as the original ones. The implementation of the Temple of Athena at Priene does not have a situation where compatibility and distinguishability problems can arise because no new material was used in the re-erection. New pieces produced in the Temple of Apollo at Smintheion and the Temple of Trajan at Pergamon without ornamentation are easily to be distinguished.

- **Reversibility and Re-treatability**

The principle of reversibility is far from being realistic because every application leaves a mark on the original material. It is clear that, metal components used in joining of pieces, lead plates and adhesives; the concrete poured into the foundation of the Temple of Apollo at Smintheion and the Temple of Apollo at Side cannot be recovered. Instead, selected examples were discussed in the direction of re-treatability, a more realistic principle. After the first restoration of the Temple of Athena at Assos, reinforced concrete elements, which were found to be damaging the original elements were dismantled and the new application was realized with new andesite elements which are exactly the same as the original ones. Similarly, the worn out reinforced concrete column in the west gallery of the Temple of Trajan at Pergamon was replaced with a new marble material a few years later. In these examples it appears that the principle of re-treatability was

provided. Similarly, it is thought that metal bars used in the Temple of Apollo at Smintheion, the Temple of Apollo at Side, the Temple of Leto at Letoon and Temple A at Laodikeia could be cut to allow for new applications. In addition, these practices are re-treatable, as the steps in crepis of the Temple of Apollo at Smintheion are removable, clamps were used in joining in the Temple of Leto at Letoon and Temple A at Laodikeia. The fact that new materials were not used to join the elements at the Temple of Athena at Priene is positive in terms of re-treatability when considering that there were missing elements in application.

Within the scope of the study, it was understood that not all of the implementations could be described as anastelosis, by evaluating them in terms of the emphasis of the structure within site scale, integrity of monument, authenticity, reliability, distinguishability and compatibility, reversibility and re-treatability. Accordingly, the implementation should be considered as anastelosis in the Temple of Leto at Letoon and the Temple of Trajan at Pergamon; considered as restoration in the Temple of Athena at Assos; considered as re-erection in the Temple of Athena at Priene; considered as reconstruction in crepis of the Temple of Apollo at Smintheion; anastelosis in three columns in its corner and re-erection of its other columns; considered as reconstruction in the Temple of Apollo at Side and Temple A at Laodikeia.

CHAPTER 5

CONCLUSION

Anastelosis, which is among the various conservation approaches in archaeological sites, is the practice of re-erection of a structure by bringing its original pieces together. The objectives of anastelosis vary. Besides protecting the original elements of a structure by raising them from where they lay on the ground, it can also be considered that it indirectly contributes to the development of conservation consciousness by allowing visitors to perceive the buildings as three-dimensional. In addition to these, there are also re-erection applications in order to make the archaeological site known and to meet the expectations of tourism industry.

In this study, examples of anastelosis implementations in the temple structures in Western Anatolia that have a significant place in ancient cities and sanctuaries, have been examined. The implementations have been evaluated for a structure within a site that was identified based on international charters, recommendations, documents and when they are not sufficient to provide information, publications, along the principles of the emphasis of the structure within site scale at present and in original context, structural and visual integrity of monument, authenticity, reliability, distinguishability, visual and material compatibility, reversibility and re-treatability. These examples are the Temple of Athena at Assos (~530 BC, Behramkale, Ayvacık, Çanakkale), the Temple of Athena at Priene (4th century BC, Güllübahçe, Söke, Aydın), the Temple of Leto at Letoon (160-130 BC Kumluova, Seydikemer, Muğla), the Temple of Apollo at Smintheion (2nd century BC, Gülpınar, Ayvacık, Çanakkale), the Temple of Apollo at Side (2nd century AD, Side, Manavgat, Antalya), the Temple of Trajan (114-129 AD, Bergama, İzmir) and Temple A (2nd century AD, Eskihisar, Denizli).

It can be said that some of the implementations of the anastelosis in the temple structures studied within the scope of the thesis brought back the importance the temple had in acropolis, ancient city or sanctuary. These temples which were located at upper level in acropolis or in city, due to the topography of the land, are visible from the lower levels (the Temple of Athena at Assos, the Temple of Athena at Priene and the Temple of Trajan at Pergamon). In other sites, temple structures that were re-erected draw

attention in the site as they were in original situation (the Temple of Leto at Letoon, the Temple of Apollo at Smintheion, the Temple of Apollo at Side, Temple A at Laodikeia). However, in the absence of standing structures in the close vicinity of these structures (the Temple of Apollo at Side) or when much interfered, the temples became dominant in the site compared to other ruins (the Temple of Apollo at Smintheion). There are also cases where the re-erection interventions caused the temples to be given more importance than their original state and come to the forefront of the main temples in the city (the Temple of Apollo at Side, the Temple of Trajan at Pergamon).

In the examples where different parts were re-erected, through the resulting structural integrity, structural elements and parts of the temple can be perceived (the Temple of Leto at Letoon, the Temple of Apollo at Side, the Temple of Trajan at Pergamon). On the other hand, the lack of original elements (the Temple of Athena at Assos) or not included in the application (the Temple of Leto at Letoon) or inadequately done re-erection and unorganized site (the Temple of Athena at Priene) adversely affected the structural integrity of the structures. Visual integrity could not be achieved in applications done with partial approaches (the Temple of Apollo at Smintheion, Temple A at Laodikeia) or when labor problems occurred (the Temple of Apollo at Side).

The implementations, in which the original elements were used in large quantities, provide both integrity as well as the conservation of original elements (the Temple of Leto at Letoon, the Temple of Trajan at Pergamon). In some cases, although the original material was available in small quantities, the application was still carried out (The Temple of Apollo at Side, Temple A at Laodikeia and crepis of the Temple of Apollo at Smintheion) but the visual integrity and authenticity were not achieved. In implementations it can be put forth that the original construction system was partly maintained. The original and new parts were combined with metal bars, the blocks were combined with clamps and dowels, and the original construction technique was preserved (the Temple of Athena at Assos, the Temple of Leto at Letoon, the Temple of Apollo at Smintheion, the Temple of Apollo at Side, the Temple of Trajan at Pergamon, Temple A at Laodikeia). The original construction system could not be maintained in the cases where the foundation was reconstructed as reinforced concrete (the Temple of Apollo at Smintheion and the Temple of Apollo at Side), reinforced concrete structural system was designed (the Temple of Apollo at Side) or structural order was broken due to some of architectural parts were not used in implementation (the Temple of Athena at Priene).

Identification of the locations of the original elements through detailed studies before the applications were carried out and accurate information about the structure was provided to ensure the reliability of implementations (the Temple of Athena at Assos, the Temple of Leto at Letoon, the Temple of Trajan at Pergamon). It can be said that reliability principle could not be achieved in the applications where controversial or incorrect information were provided about the location of the original elements or about the structure itself (the Temple of Apollo at Smintheion, Temple A at Laodikeia, the Temple of Apollo at Side, the Temple of Athena at Priene).

Distinguishability in applications has been achieved by producing damaged or missing elements without any ornamentation (the Temple of Apollo at Smintheion, the Temple of Trajan at Pergamon) or using new elements that are uneroded at present (the Temple of Athena at Assos, the Temple of Leto at Letoon). Visual compatibility was ensured by using completely original members (the Temple of Apollo at Priene), new material being the same as the original (the Temple of Athena at Assos, the Temple of Leto at Letoon). Visual compatibility was also provided by producing new material in close colour tone with original material (the Temple of Apollo at Smintheion, the Temple of Trajan at Pergamon), however, new materials selected in some applications created a visual (crepis of the Temple of Apollo at Smintheion, the Temple of Apollo at Side, Temple A at Laodikeia) or material (the Temple of Apollo at Side, the Temple of Trajan at Pergamon, Temple A at Laodikeia) incompatibility with the original.

Re-treatability in applications was ensured by the use of clamps and metal bars being cuttable (the Temple of Leto at Letoon, the Temple of Apollo at Smintheion, the Temple of Apollo at Side, Temple A at Laodikeia) and some applications were re-interfered completely or partially (the Temple of Athena at Assos, the Temple of Trajan at Pergamon). However, as these bars were fixed by adhering they cannot be reversed without damaging original material.

Implementations aimed at the promotion of the site can make the site vulnerable to the consequences of intensive tourist flow. Therefore, conservation work should be done as a result of serious planning. Anastelosis should not be aimed at when there is not enough information about the original state of the structure or the original material is only in a small amount. It may be preferred to convey the information about the building through harmless presentation methods. Visual anastelosis has become accessible today through rapidly developing technology. In this application, the original form of the building or the city is modelled in digital environment on the basis of existing

information. Besides this, a building or a city in question can be constructed as a model, or animation of the original situation through drawings in the site may be used. Although such studies may contain fictitious and hypothetical parts and might convey misleading information, there is no possibility for creating any damage to the original elements as concrete interventions are not being used on the structures and the model can be updated as new information is gathered.

In this study, the re-erection implementations carried out in temple structures in Western Anatolia have been examined in the environmental and structural scale within the archaeological site, have been documented chronologically and the intervention methods in the applied practices have been evaluated within the framework of determined anastelosis principles. The evaluations made in the scope of this study are significant in terms of contributing to the conservation of the structures by applying anastelosis in archaeological sites. In further studies, changes in understanding of intervention on implementations over time and the effect of the financial state of the excavations on the application differences can be examined.

GLOSSARY

Anastelosis: A conservation and presentation implementation in archaeological sites, which is defined as the re-erection of the structure by replacing its scattered original members as much as possible to their original places and using minimum new material.

Ante: A square pilaster on either side of a door, or at the corner of a building.

Architrave: Essentially a formalized beam or lintel, it is the lowest of the three main parts of an entablature; itself often divided into fasciae.

Bouleuterion: Meeting space or debating chamber for senate in a Greek city.

Capital: Head or topmost member of a colonnette, column, pilaster, pier, etc., defined by distinct architectural treatment and often ornaments.

Cavea: The tiered semi-circular seating space of an ancient theatre.

Cella: Enclosed part of a Greek or Roman temple including the sacred chamber and vestibule, in fact everything within the walls. In Greek, naos.

Conglomerate: Rock consisting of rounded pebbles which are cemented together with a finer material.

Cornice: A horizontal moulded projection crowning a building or structure, especially the uppermost member of the entablature of an order, surmounting the frieze.

Drum: One of the nearly cylindrical pieces of which column shafts is constructed.

Entasis: A slight convex curve in the shaft of a column, introduced to correct the visual illusion of concavity produced by a straight shaft.

Food market: Roman macellum. Meat or product market in a covered hall.

Frieze: Horizontal central band of a Classical entablature below the cornice and over the architrave, occasionally omitted in the Greek Ionic order. It is a flat unornamented band in Tuscan order; it is broken up into metopes and triglyphs in the Doric order; and is plain or enriched with sculptural relief in the Ionic, Corinthian and composite orders.

Geison: Block of stone forming part of a Classical cornice and its subordinate mouldings.

Gymnasion: Place for physical exercise and teaching in Ancient Greece.

Hypostyle: Having a roof supported by pillars, typically in several rows.

Latrina: An ancient Roman term of public water closet.

Metope: Plain or enriched slab on the frieze of the Doric order between triglyphs.

Nymph: A mythological spirit of nature imagined as a beautiful maiden inhabiting rivers, woods, or other locations.

Nymphaeum: A room decorated with plants, sculpture and foundations often decorated with nymphs and intended for relaxation.

Orthostate: One of several vertical stone parts set in the base of a wall to form part of the facing sometimes carved. Forming part of the revetment at the base of a temple cella.

Palaestra: Antique wrestling school or building for athletics often an open area surrounded by colonnaded.

Pediment: Low pitched triangular gable following the roof-slopes over a portico or façade in Classical architecture, formed with raked cornice of the same section as that of the horizontal entablature at its base and mitring with it in part.

Peribolos: An enclosure, wall or colonnade around an ancient Greek (or Roman) temple or sacred space; the sacred space enclosed by this.

Peristasis: A four sided porch or hall of columns surrounding the cella in an Ancient Greek temple.

Peristyle: A row of columns surrounding a space within a building such as a court or internal garden or edging a veranda or porch.

Postament: A pedestal, a base.

Propylon: Imposing monumental entrance gateway leading to a temple, sacred court or enclosure.

Proscenium: The part of a theatre stage in front of the curtain.

Prytaneion: The public hall of a Greek state or city, in which a sacred fire was kept burning; especially (in ancient Athens) the hall in which distinguished citizens, foreign ambassadors, etc., were entertained at public expense.

Reconstruction: Remake of the structure, which does not survive or very little of its original architectural elements survive, with the new material, in the direction of solid evidence, as it was in the past.

Restoration: This term is used in this study to describe the re-erection application involving more new materials and interventions than the anastelosis based on reliable sources.

Scaenea frons: In the Roman theatre, the decorated architectural façade of the *scaena* (Greek skene) which served as the background to the playing area.

Sima: Cyma, cima. Projecting moulding common in Classical Architecture, with an ogee section usually of equal cavex and concave arcs with a plain fillet above and below it.

Stereobate: Top of a foundation or substructure, forming a solid platform on which a Classical temple stand.

Stoa: Type of Ancient Greek portico of limited depth but great length, with a long wall at the back and colonnade on the front, usually facing a public space, used for promenades, meetings, etc.

Stylobate: 1. Upper step of a three stepped crepidoma forming the platform on which a Greek temple any colonnade or peristyle stands. 2. In Classical architecture any continuous base, plinth or pedestal on which a row of columns is set, properly the uppermost part of a stereobate.

Temenos: A sacred enclosure surrounding a temple or the holy spot.

Tetrapylon: A structure having four gateways as features of an architectural composition.

Toichobate: Greek Wall stood on a plinth of orthostates (slabs placed on edge), which in turn rested on a low course.

Torus: Bold projecting convex moulding of semi-circular section on either side of the section in an Attic base.

Triglyph: One of the upright block occurring in series in a Doric frieze on either side of the metopes, possibly suggesting the outer ends of timber beams. Each plain face of the triglyph has two vertical V-shaped channels cut in it called glyphs, and the edges are chamfered with half-glyphs, hence the three glyphs in all.

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