

Preservation of Isparta Yılan Kırkan (Yılan Kıran) Fountain within the Scope of Sustainability

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Abstract—Sustainable architecture is an approach which accepts the climatic and tomographic data as a necessary preliminary data package by favoring the relationship between human and nature and which strives to use the sources economically. The reflection of sustainable architecture approach to preservation - restoration discipline is including the architectural inheritance to daily life with its unique or new function by restoring it.

The restoration decisions of Yılan Kırkan Fountain in Isparta province of Turkey is a good example of the works of sustainable architecture and the preservation of architectural inheritance. It is aimed that Yılan Kırkan Fountain, which is desolate nowadays with no function, to be restored by the local authorities and university, included in the daily life and continue its function.

Keywords—Conservation and Restoration, Sustainable Architecture, Movement Technique, Isparta Yılan Kırkan Fountain.

I. INTRODUCTION

SUSTAINABLE architecture is an approach which accepts the climatic and tomographic data as a necessary preliminary data package by favoring the relationship between human and nature and which strives to use the sources economically [5]. The reflection of sustainable architecture approach to preservation - restoration discipline is including the architectural inheritance to daily life with its unique or new function by restoring it.

Sustainable construction principles firstly put forward by Kibert (1994) in 1994. These six principles are as follows:

- Minimizing the resource consumption (Preservation),
- Maximizing the reuse of the resources (Reusing)
- Using the renewable or recyclable resources (Renewing/Recycling),
- Protecting the natural environment (Protecting the nature),
- Creating a healthy and non-toxic environment (Non-toxic),
- Maintaining quality while creating artificial environment [7].

Architectural inheritance is the current sources of a country within architecture. According to the principles of sustainable architecture, architectural inheritance should be eligible for reusing via being included in the daily life. However, firstly the architectural inheritance, which is ancient and has suffered

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deterioration, should go through constructional restoration. It should be available for use after the risk to collapse should be removed and it fulfills the comfort conditions.

II. ISPARTA

The city of Isparta is located in the center of Mediterranean Region of Turkey (Fig. 1). It is a small settlement which surrounded by mountains. Date of establishment begins in an upper Paleolithic period that was written prehistoric period. Isparta, which was residential area of Luwian and Arzava communities at BC 2000, was administered by respectively the Phrygians, Lydians, Persians, Bergama Kingdom, Roman, Byzantine, Seljuk, Principality of Hamidogullari, Ottoman Empire and the Republic of Turkey then [10], [11].



Fig. 1 Location of Isparta in Turkey and Location of City Center in Isparta

The historical urban fabric of Isparta also constitutes at the center of the city of Isparta today. Nowadays, the urban center of Isparta is the area of between Aksu, Hastane, Fevzi Pasa Streets and Belonu River; at the same time this area is the historical city center which is named "bazaar" with mosques, covered bazaar, Turkish baths and churches. The mentioned area on 14.10.1977 has been recognized as "Second and third degree protected site" [12].

The historical city center of Isparta composed of many buildings that were built by different ethnic groups. It is known that until early part of the twentieth century, not only Turks, but also different ethnic groups as Circassians, Armenians and Greeks lived in Isparta. This difference observed notably in religious buildings.

III. THE LOCATION AND HISTORY OF YILAN KIRKAN FOUNTAIN

Yılan Kıran (Yılan Kırkan) Fountain is located in Isparta Province, Sülübey Neighborhood, İçci Street (street no 3702), in front of the house known to be owned by İlyasoğulları (Fig. 2) It is located in parcel 55 in island 1321. It's also known as "Dolma" or "Çukur" Fountain. It was built by İsa Fakih, son of Mehmet.



Fig. 2 Yılan Kırkan Fountain location and layout (relief)

It's registered by the decision no. 5021 by Antalya Cultural Heritage Preservation Board dated 14.06.2001. The property of the fountain belongs to Isparta Municipality [2].

The construction date of Yılan Kırkan Fountain, known as the oldest fountain of Isparta, is not precisely known. In the archive photos, two inscriptions are visible in the facing of the fountain (Fig. 3). The dates 1038 and 812 are written on these inscriptions. However, Süleyman Sami Böcüzade stated that it was built in 1138, while Hikmet Turhan Dağhoğlu stated that the date is 1135 [4], [6]. Furthermore, the fountain was repaired in 1519 [6].



Fig. 3 Yılan Kırkan Fountain's inscription from fountain's old photographs [8]

It can be derived from a diary dated 1728 that a woman named Amine Hatun collects the water of a bath located in the town center from a fountain being filled from a stream (Andık Stream) and this water was taken from this fountain. It is thought that the fountain giving water to this bath is Yılan Kırkan Fountain [9].

The debris on the immovable was cleaned in 1999 and the fountain was revealed. During the debris cleaning, an inscription of the fountain with the proportions of 0.26 x 1.01 m was found. A cleaning excavation was carried out with the by the decision no. 3087 by Antalya Cultural Heritage Preservation Board dated 30.04.2009 [3] (Fig. 4).



Fig. 4 Yılan Kırkan Fountain, from worksite which located besides fountain

IV. THE ARCHITECTURE OF YILAN KIRKAN FOUNTAIN

Yılan Kırkan Fountain consists of a rectangular water reservoir and the fountains to the north and south of this reservoir (Fig. 5). Water reservoir 7.00 m. x 4.60m. It fits on a field and is 4.40 meters high.

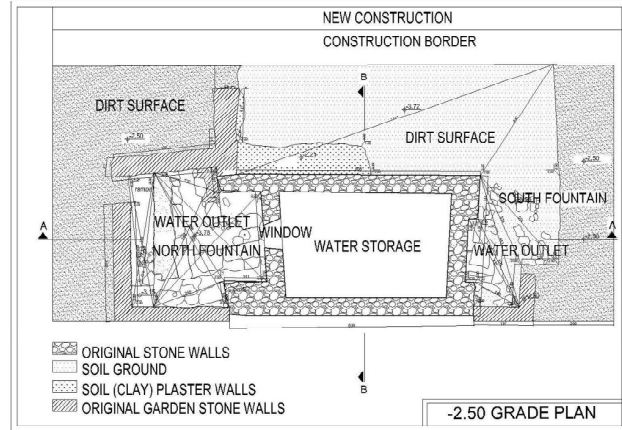


Fig. 5 Yılan Kırkan Fountain's plan (relief)

Yılan Kırkan Fountain was built with grey local material, known as grey "sav" stone that was common in the area, through using masonry construction technique. The body walls built with debris stone technique was covered with the squared stones.

The north and south sides of the fountain consist of niches with semi-circle arch within a rectangular molding. It is known that there were inscriptions in these sides; however, this inscription did not survive to these days. In the north side of the fountain, there is a semi-circle arch window gap opening to the water reservoir (Figs. 6 and 7).



Fig. 6 Fountain's south and east facades



Fig. 7 Fountain's north façade

The top of the fountain is rubbed with arched vault. The structure of the cover coat is unknown since it didn't survive to today. However, the top of the fountain is formed with stepped

with square-formed cut stone rows.

Its unique basin and berms are covered with proper cut-stones. It has a unique ramp (stairway) descending to the north side [8]. However, the steps of the stairway descending to the North fountain are completely gone today.

V. THE PRESERVATION PROBLEMS OF YILAN KIRKAN FOUNTAIN AND DETERIORATIONS

Today, the attempts of contractor-style structuring crushes, even destroys many historical constructions. The construction, structuring of which started in the same parcel with Yılan Kırkan Fountain, got too close to the fountain and due to elevation difference, the fountain which went below remained neglected and desolate (Fig. 8 and 9).

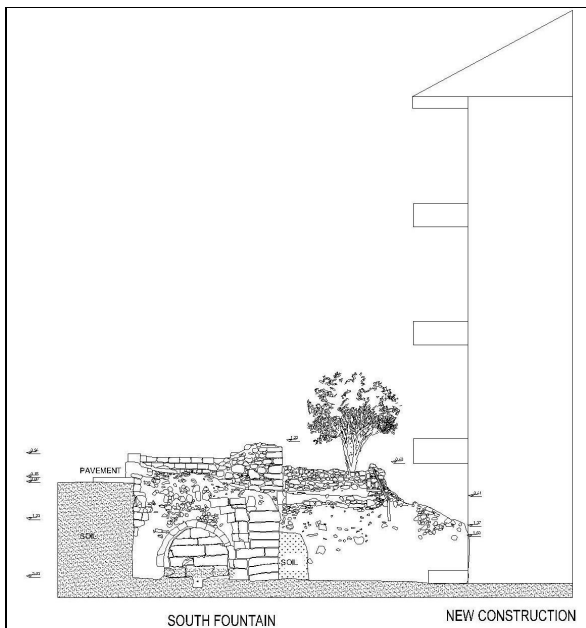


Fig. 8 Yılan Kırkan Fountain's south facade (relief)

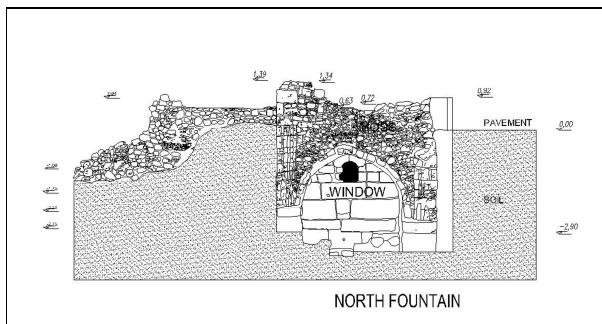


Fig. 9 Yılan Kırkan Fountain's north facade (relief)

The debris removed during the structuring works too close to the fountain was thrown on the historical fountain and while starting the structuring on the fountain yard, the cover coat of the historical fountain was damaged during the cleaning of the debris. Most of the cover stones on the sides of the fountain

have dropped.

A large portion of the fountain is destroyed; material losses occurred in the north and south sides. There are vegetation problems on the sides and dampness and mossiness problem on the ground. The west side remained under the rising road elevation and the main mass of the structure remained in the construction yard of an apartment that is being built. The distance between the apartment and the fountain is less than 1 meter (Fig. 10).



Fig. 10 Fountain deteriorations (material losses, vegetation on the sides, dampness, mossiness problems from the ground etc.)

VI. SUGGESTIONS TO PRESERVE YILAN KIRKAN FOUNTAIN

After the analysis works made concerning Yılan Kırkan Fountain, it's been found out that the construction encounters significant problems due to its location.

It is suggested that the fountain should be moved to an area appropriate for its nature in the town center and repaired, since;

- The surrounding historic fabric and the fountain are stuck between the high buildings and thus it stands unperceivable and alien where it stands;
- The new construction activities continue due to the high income around its area and the vibrations to occur during these construction activities will affect the historical structure negatively;
- The road which has a higher elevation than the fountain has high traffic and the vibrations caused by these traffic might damage the historical structure;
- It is understood that it needs a broader area to be included in the daily life of public in order to be perceived by the public and due to the architecture principles.

After the historical fountain is moved, the restoration should be completed with reintegration, consolidation and liberating techniques.

VII. RESTORATION TECHNIQUES SUGGESTED TO PRESERVE YILAN KIRKAN FOUNTAIN

A. Relocation

Public works activities (road, dam construction), geological structure or natural disasters can make it harder or impossible for a monument or a historical settlement to be preserved where it stands. In this case, the monument or settlement may need to be moved a pre-defined location and stand there. The relocation process is carried out using various techniques based on the size, material and the construction technique of the monument. The easiest is to number and disassemble all the elements of the monument and reassemble them

elsewhere. The stone monuments which cannot be preserved where they stand are surveyed in detail and their pictures are taken [1].

B. Consolidation

Consolidation applications are made by increasing the endurance of the materials in order to keep the structures standing longer. The consolidation of the stone structures is made via consolidating the stone material and soil mixture between the stones. The stone consolidation materials, which are applied to stone via spraying, rubbing with brush or vacuuming, need to be selected by experts and to be applied in line with their suggestions under supervision. The consolidation method is determined based on the stone type and deterioration status [1]. In the event that stone consolidation materials do not suffice, such stone is removed and replaced with the same type stone with same size.

C. Reintegration

The process of completing the structures and units, a part of which is damaged or destroyed, into the integrity of their first design by using conventional or contemporary material is called "reintegration". The factors directing the integration may be aesthetical, functional or structural balance concerns. By integration, a structure that does not appeal to the eye with its desolated state reaches its aesthetical integrity; is made available for use and can be saved from complete destruction [1].

D. Liberation

Liberation covers the works to move the dirt and extraneous layers that have formed on the material surface due to various reasons away from the surface. These activities on the surface appear as formations creating harmful effects in terms of chemical or mechanical aspects and defacing the surface. The liberation is a type of work aiming to preserve and maintain the surface qualities; to clean the dirt and to improve the material.

historical fountain would be moved to Atatürk Park, which remains in the property borders of the Governorate and is an important public area of Isparta province center. After moving, the consolidation, integration and liberation works of the historical fountain will be made. So, an architectural inheritance will be both moved to a location where the public can perceive and use and the property issues will be overcome.

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VIII. CONCLUSION AND EVALUATION

In the light of sustainable architecture principles, the architectural inheritance should be included in our lives with its new function and preserved. However, the structures which have a change to continue its unique function and which cannot be reshaped for a new one should help regain their unique functions. On the other hand, the preservation of architectural inheritance is also a technical issue. In order for a structure to be included in the daily life with its unique or new function; the property, environment, structural and physical problems should be solved.

Firstly environmental problems should be overcome in order to preserve and use the selected Yılan Kırkan Fountain. It is not possible to preserve the historical fountain in its own place due to its location and property issues. Thus, firstly the fountain needs to be carried to a new area. After Antalya Cultural Heritage Preservation Board had approved for its moving, the Governorate and University favored that the