



An Example from Mudanya Historical Houses: Examination of Reconstruction Works

Mudanya Tarihi Evlerinden Bir Örnek: Yeniden Yapım Çalışmalarının İncelenmesi

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Abstract

Mudanya is a district of Bursa, and the old city texture is a protected area. Mudanya is a tourist town in terms of its coastline and historical structure. In this study, the houses in the parcels numbered 9–10–11–12 were examined. These parcels are located on block number 1158. Due to the dangerous nature of the demolished buildings, their surveys were drawn and approved by the Bursa Conservation Board. The structures in parcels 9 and 10, which are not currently available, are registered. There are no buildings in parcels 11 and 12. Due to the structural deterioration and loss of functional structure in these registered buildings, they were abandoned before they started to collapse. A reconstruction project in the traditional construction technique in parcels 9 and 10 and a new reinforced concrete structure project in parcels 11 and 12 was prepared according to the construction conditions given in the Conservation Board Plan.

Keywords: Restoration, Architecture, Reconstruction, Traditional Buildings, Historical Texture

Özet

Mudanya Bursa'nın bir ilçesidir ve eski şehir dokusu sit alanıdır. Mudanya, kıyı şeridi ve tarihi yapısı itibarıyla turistik bir kasabadır. Bu çalışmada 9–10–11–12 numaralı parsellerdeki evler incelenmiştir. Bu parseller 1158 ada üzerinde yer almaktadır. Yıkılan binaların tehlikeli olması nedeniyle etütleri yapılmış ve etütleri Bursa Koruma Kurulu tarafından onaylanmıştır. 9 ve 10 nolu parsellerde hali hazırda mevcut olmayan yapılar tescillidir. 11 ve 12 nolu parsellerde bina bulunmamaktadır. Tescilli bu binalarda yapısal bozulma ve işlevsel yapının yitilmesi nedeniyle önce kullanımı terk edilmiş, sonra yıkılmaya başlamıştır. 9 ve 10 no'lu parsellerde geleneksel yapım tekniğinde rekonstrüksiyon projesi ayrıca 11 ve 12 no'lu parsellerde ise betonarme yapı projesi, Koruma Kurulu Planında verilen yapım şartlarına göre hazırlanmış ve uygulanmıştır.

Anahtar Kelimeler: Restorasyon, Mimari, Yeniden Yapılanma, Geleneksel Binalar, Tarihi Doku.

1. INTRODUCTION

Mudanya houses have traditional Turkish house architectural features. It is also possible to see the cantilevers, which are an indispensable element in the Turkish house (Kuban, 1995; Günay, 1998; Eldem, 1954).

Historical buildings are one of the most important problems of modern societies (Kazaz, 2017; Ürer, 2013; Croci, 1998; Sayın et al., 2015; Kuban, 2007; Küban, n.d.). Significant damages occur in historical buildings due to time and environmental factors (Güllü, 2015; Ercan, 2018; Valente & Milani, 2016; Cüneyt & Gökhan, 2018; Gonen, Dogan, Karacasu, Ozbasaran, & Gokdemir, 2013). For this reason, the importance of preserving historical buildings is increasing. One of the important issues to be considered in the restoration of historical buildings is that the material used in the restoration stage is close to the original material (Erdoğan, Nas, Nayır, 2017). Many historical buildings are in danger from seismic aspects (Durutürk, 2012; Terzi & Ignatakis, 2018; Lubowiecka, Armesto, Arias, & Lorenzo, 2009; Eslami, Ronagh, Mahini, & Morshed, 2012). These structures perform well under vertical loads and are not sufficiently resistant to lateral loads such as earthquakes (Kazaz, 2017).

The civil engineering education in Turkey does not include courses on cultural heritage and ancient technology. Therefore, there is a need to provide information about the current rules and methodology for developing proper documentation and projects for the conservation of cultural heritage for civil engineers (Vakıflar Genel Müdürlüğü, 2016).

In order to reconstruction a demolished historical building, it must meet at least one of the following requirements. In addition, the building must be completely demolished or the carrying capacity lost (Ahunbay, 2009; Aktürk Engin, 2017; Özden Örnek, 2017):

- Having information and documents of the original state of the building (survey and restitution drawings and photographs etc.)
- The building must belong to a person who has a socially prominent person
- The building has witnessed a historical event
- The building must have superior properties
- The building should represent a certain trend and style
- The building must have become the symbol of the city.

2. RESTITUTION STAGES

In Figure 1, the restitution front frontages of the buildings in parcels 9 and 10 are given. The restitution drawings of the plans and frontages of the building in parcel number 9 are given in Figures 2 and 3. The restitution drawings of the plans and frontages of the building in parcel number 10 are given in Figures 4 and 5. The buildings in parcels 9 and 10 are registered and built using traditional techniques.

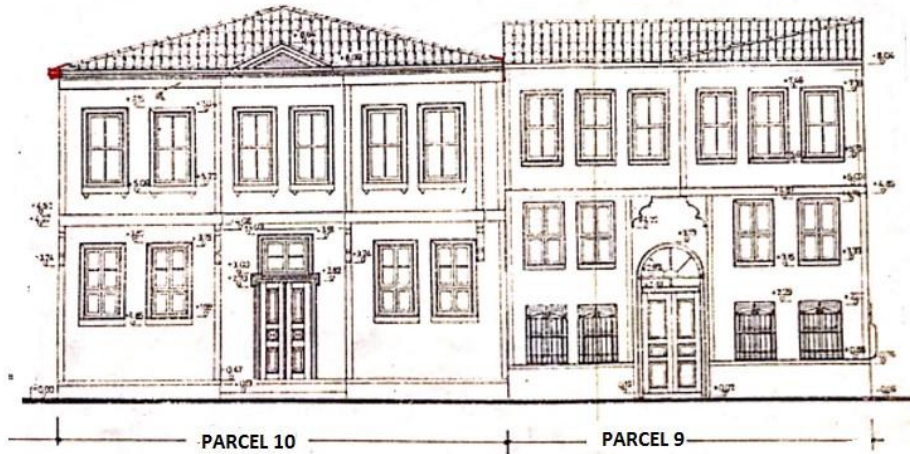


Figure 1. Restitution studies of parcels 9 and 10 (Scale: 1/100)

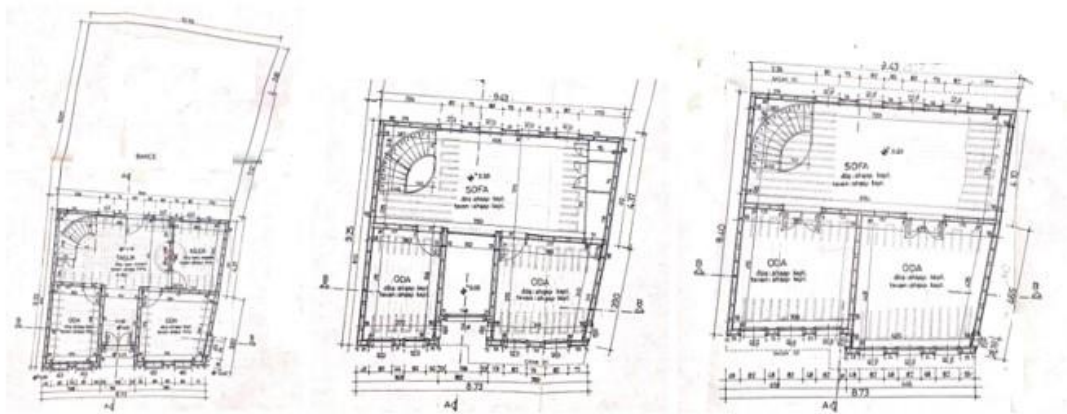


Figure 2. Basement and 1 and 2 floors plan of parcel number 9 (Scale:1/50)

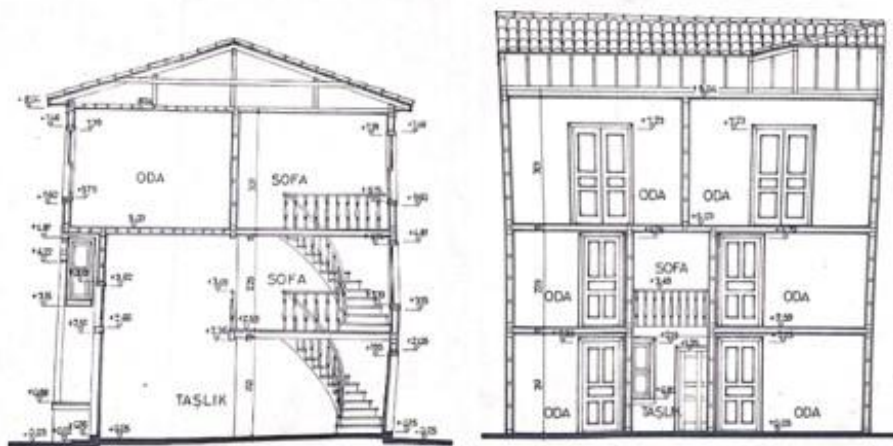


Figure 3. A-A and B-B Section of parcel number 9 (Scale: 1/50)

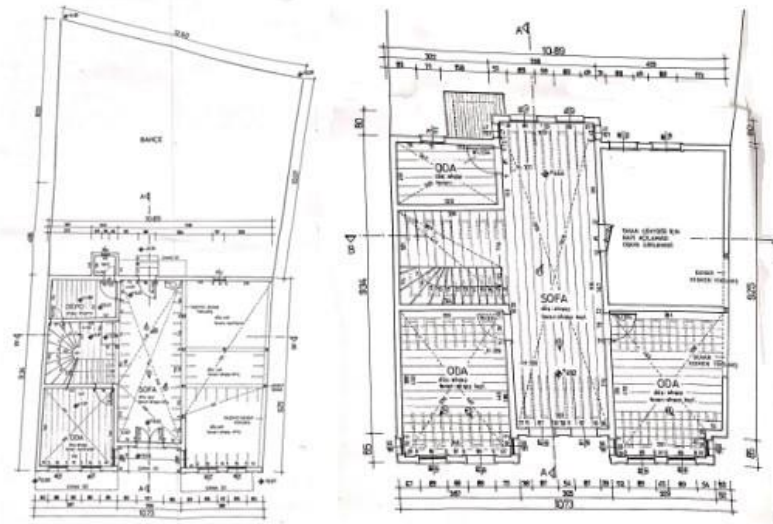


Figure 4. Basement and 1. floors plan of parcels number 10 (Scale.1/50)

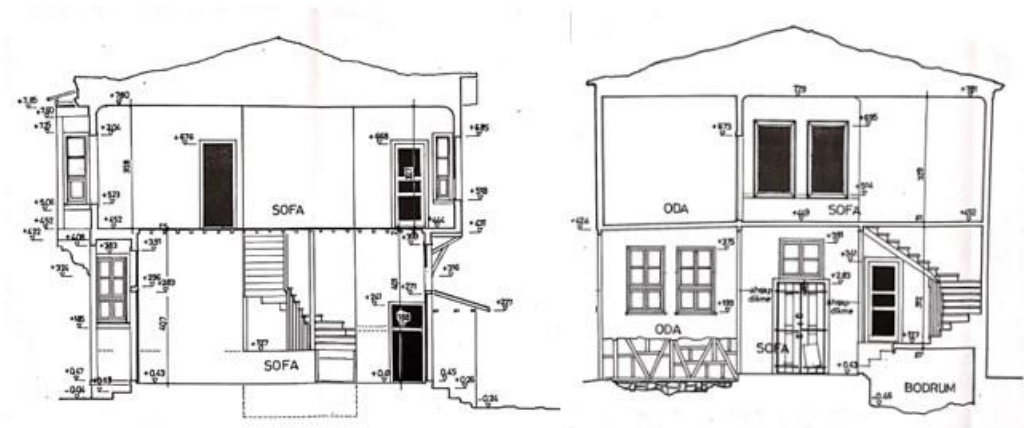


Figure 5. A-A and B-B Section of parcel number 10 (Scale. 1/50)

3. SURVEY STAGES

Most of the building has been damaged. As can be seen in Figure 6 particularly, most of the building and roof was collapsed and damaged there is in the parcel number 9. Over time, the buildings in both parcels disappeared. The survey drawings of the front frontages of the parcels 9 and 10 are given in Figure 7. As it can be seen from the front and rear frontage views given in Figure 8, it is understood that the structure located in parcel number 10 has lost its bearing characteristics.



Figure 6. Restitution of buildings in parcel numbers 9 and 10



Figure 7. Survey studies of parcels 9 and 10 (Scale: 1/100)

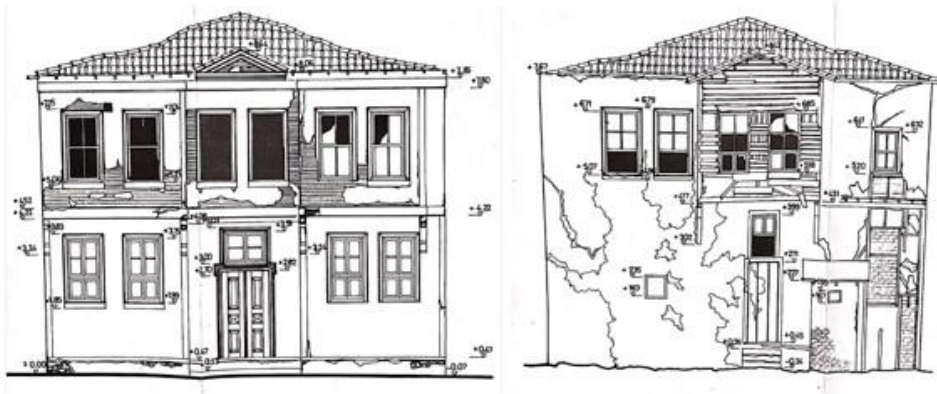


Figure 8. Front and rear view of parcel number 10 (Scale: 1/50)

4. RECONSTRUCTION STAGES

Parcels 9 and 10 were built using the traditional construction technique. Since there is not enough information about the buildings in parcels 11 and 12, since they were collapsed before, it was preferred to be built with reinforced concrete technique.

Reconstruction was carried out on parcels number 9 and 10 based on the survey and restitution project. In order to meet today's storage needs and to install heating installations, the basement floor is needed in the building. Therefore, the basement floor was arranged as reinforced concrete under the soil level. The wooden carcass of the building was constructed in the traditional building system and plan scheme. Bathrooms were needed in the rooms, which would be necessary for the use of the building as an accommodation unit. In order to increase the number of rooms, rooms have been created in the hall. These add-on bathrooms and rooms were kept separate from the traditional carrier system of the registered building. It can be dismantled and restored to its original state later, if desired or needed. It was planned in such a way that it can be clearly seen that these additional dividing walls were added to the structure later. The bathrooms in the rooms are designed to give the appearance of a cupboard that is part of the traditional building culture. Ventilation in bathrooms will be provided mechanically. In order to prevent fire, gable wall was built on the roof adjacent to the parcel number 10.

The parcels numbered 11 and 12 were arranged by the municipality according to the protection zoning plan in 2 storeys ($h = 6,50\text{m}$) height and in the adjacent order. The adjacent structure and traditional urban fabric in the plan and the existing formation were maintained. The buildings were functionalized as a boutique hotel. The floor heights are determined as 3 m. The ground floor is suitable as lobby and administrative areas. Ventilation in the bathrooms will be provided mechanically. Ceiling and floor coverings of the structure were preferred depending on the original and easily obtainable wooden dimensions. The existing gardens for all buildings were combined. Since the building in parcels 11 and 12 is a corner structure, consoles were built on both sides and the architecture of the old buildings was stylized as per the plan conditions. In these buildings, basement and ground floor were built. The reason of the originality of this study is that it is beyond the criteria for reconstruction.

In the planning made for the usability of four parcels; the parcel number 10 has been accepted as the main entrance of all buildings, and the passage to other buildings is planned from the back garden. The ground floor; it was designed as a reception area and lobby area due to the continuation of the usability of the entrance door and garden door and the adequacy of its dimensions. The adjacent building order and traditional urban texture in the plan and the existing formation were maintained.

The buildings function as hotels. The gardens in parcels 9 and 10 are used as common areas for buildings. The layout plan is given in Figure 9. In Figure 10, the reconstruction plans of the basement, 1st and 2nd floors belonging to the building located on parcel 9 are shown. In Figure 11, section plans of parcel 9 are given. In Figure 12, the reconstruction plans of the basement, 1st and 2nd floors of the building in the parcel 10 are shown. In Figure 13, section plans of the parcel 10 are given. Figure 14 shows the reconstruction plans of the 1st and 2nd floors of the building in parcel 11. In Figure 15, section plans of parcel 11 are given. In Figure 16, the reconstruction plans of the basement, 1st and 2nd floors belonging to the building on parcel 12 are shown. In Figure 17, section plans of the parcel 12 are given.



Figure 9. Layout plan (Scale: 1/200)

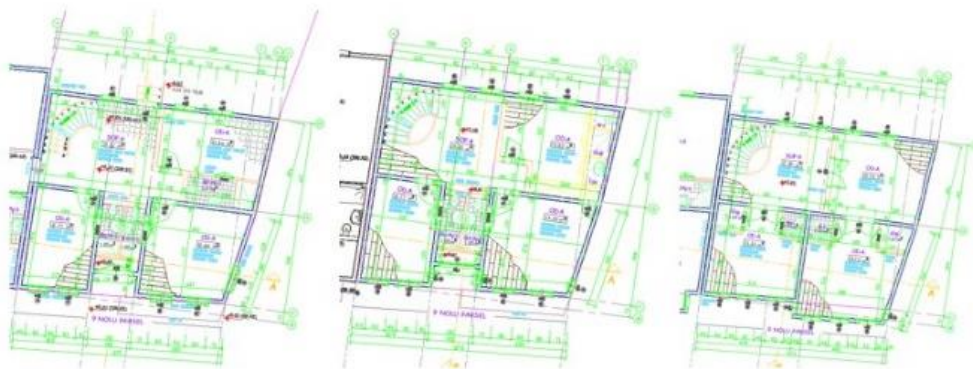


Figure 10. Basement and 1. and 2. floors plan of parcel number 9 (Scale:1/50)



Figure 11. A-A and B-B Section of parcel number 9 (Scale: 1/50)



Figure 12. Basement, 1. and 2. floors plan of parcel number 10 (Scale:1/50)



Figure 13. Section of the building on parcel number 10 A-A and B-B (Scale:1/50)



Figure 14. Basement, 1. and 2. floors plan of parcel number 11 (Scale:1/50)



Figure 15. Section of the building on parcel number 11 A-A and B-B



Figure 16. 1. and 2. floors plan of parcel number 12 (Scale.1/50)



Figure 17. Section of the building on parcel number 12 A-A and B-B

The foundations of the buildings in the parcel numbers 9-10-11-12 were built as a raft foundation. It is shown in Figure 18 and 19. The buildings in the parcels number 9 and 10 were built with the traditional timber frame method. It is shown in Figures 20. The buildings in parcel 11 and 12 were built as reinforced concrete. Because the historical structures that were previously here have completely collapsed and no data has been found. Therefore, in order to adapt to the street

silhouette, a similar structure was planned and constructed as reinforced concrete. It is shown in Figures 21. Views of the floor and roof details of the buildings in parcels numbers 9 and 10, which were given made with the traditional technique, were given in Figures 22 and 23. Wastewater piping and heating system and power sockets are shown in Figure 24. Figures 25 and 26 show post-reconstruction pictures of the buildings.



Figure 18. Construction of the foundation of parcels numbers 9 and 10



Figure 19. Construction of parcels numbers 11 and 12



Figure 20. Constructing of the structures in parcel numbers 9 and 10 with traditional techniques



Figure 21. Reconstruction of the buildings



Figure 22. Reconstruction of the buildings with traditional techniques and roof details



Figure 23. Construction of floor covering



Figure 24. Waste water piping and heating system and power socket



Figure 25. Post-restoration of the buildings



Figure 26. Post-restoration of the buildings, a view from the courtyard

Alternative suggestions for the building; the building was designed as a boutique hotel and it is important that the intervention was made under very flexible conditions, considering that it can be used as a restaurant, home, kindergarten or work offices in the future.

5. DISCUSSION and CONCLUSION

The preservation of cultural heritage is essential for preserving and transmitting the memory of monuments and regions to the future. This can be achieved with constant and careful maintenance, but it is important to be able to give the structure its proper function. The refunctioned of historical buildings for the purpose of protection is an important reason in the preservation of historical buildings. Today, the idea of keeping the building alive by moving away from the concept of preservation by freezing (the concept of preserving the building as it is) and fulfilling the requirements of the age is becoming widespread. With this understanding of protection, the building continues its life and at the same time, its economic and cultural continuity is ensured. It is easy to understand how essential it is to set a compatible use for preserving historical property. From this point of view, renovation works should be carried out by taking into account both the social, cultural and economic identities of historical buildings, as well as their integrity and preservation of their structures.

A new reinforced concrete construction project was prepared and implemented in the construction conditions given in the Conservation Development Plan in parcels 11 and 12, with a reconstruction project in wooden traditional construction technique based on approved restitution of the registered structures in parcels 9 and 10 from the parcels. Since the structures in parcels 11 and 12 were not in place and the survey and restitution plans of them could not be reached, these structures have been styled by comparison with parcels 9 and 10. The adjacent building order and traditional urban texture in the plan and in the existing formation were continued. The reconstruction project prepared on the basis of the approved survey and restitution project of the registered building in parcels 9 and 10 has been implemented. Since the buildings in parcels 9 and 10 were built as wooden construction, the gable wall between the roofs of buildings 9 and 10 was raised as a fire precaution. Due to the corner structure of the building located in parcel number 11, the architecture of the historical buildings was planned to the extent permitted by the plan conditions by making cantilevers on both facades.

Since the building will be used as a hotel, extra rooms and bathrooms were needed, differently from the original plan. For this reason, add-on partition walls can be dismantled and restored to their original state, if desired or needed, without damaging the structure, taking into account the "recyclability" principle.

In order to create the highest and best usage model, an innovative and economical evaluation model is proposed in this study. Since it is a touristic district on the coastline of Mudanya, the buildings in this study gained functionality used as a hotel. However, recyclable interventions were

planned, prepared and built so that the buildings could offer different uses such as offices or homes in the future, by making minor modifications. Although it is planned to use the buildings in four parcels together, it was planned to use each building separately with the cancellation of the passages between them. Multi-criteria methods may be necessary and important for restoring and enhancing historical heritage. The building has been an exemplary reconstruction work by providing today's technology and comfort to its users.

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