

Architectural Factors Playing a Determining Role in Reuse of Historical Buildings³⁷

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Abstract

The function that will be given to a historical building should be a sustainable function which is respectful to history, cultural and artistic values of the building and to the environment and suitable for meeting the users' needs according to physical conditions of the building, and which enables transferring the building to the next generations. In order to decide accurately on this function, a feasibility study should be made. "technical researches" which is one of the phases constituting four phases of feasibility study consists of reports prepared by specialists of the subjects. When it is about reuse of historical buildings, architectures are actively involved in this phase. Architects determines a new function for the building or they searches about the new function put forward as an entrepreneur's opinion in terms of whether it is appropriate for the building or not. The purpose of this study is to search and determine architectural factors which are determinants in choosing new function for historical buildings. Only architectural factors from the determinants in choosing function are dealt with. According to this, structural factors, environmental factors and additional building opportunities of the cultural asset should be evaluated and the most appropriate function should be determined. The thing to be paid attention is to give new function to the building without ignoring functional and economic value of it and by conserving its historical, aesthetical and social value.

Keyword: Feasibility; Historical building; Refunction; Reuse.

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1. Introduction

The function to be given to the historical buildings should be respectful to cultural, artistic and historical values of the building, suitable to fulfill the needs of users according to the physical conditions of building, and sustainable to transfer the building to next generation. “Feasibility study” must be conducted in order to give the right decision. Feasibility study consists of four stages as in technical (architectural) researches, financial researches, economical researches and juristic researches.

Technical researches stage of the feasibility study consists of “Architectural Factors”. At this stage architectures, who are accepted as determiners and authorized mechanism, designate a new function for the building or look into the suggestion from entrepreneur whether it is suitable for the historical building or not.

2. Determining Architectural Factors While Choosing The Function

In the process of reusing, not every function can be suitable for the historical building. There are some factors which hinder, direct or determine the functions. These factors can be scrutinized under two main headings as factors depending to the building and factors depending to the environment. Limitations generated by physical conditions of the historical building, form building dependent factors; needs of the city and physical, functional, social, cultural, economic status of the environment of the historical building, form the environment dependent factors.

2.1. Building Dependent Factors

Spatial necessity and constitution, spatial dimensions and capacity, interspace relationship setup, structure, materials and technical equipment are the factors affecting the reuse of the historical building. Any problem among these factors can either cause functional error or intervention to prevent any functional error can damage the historical building. We must be attentive not to give a function heavier than the historical building can manage. If necessary, at planning stage another function research should be made.

2.1.1. Spatial Necessity and Constitution

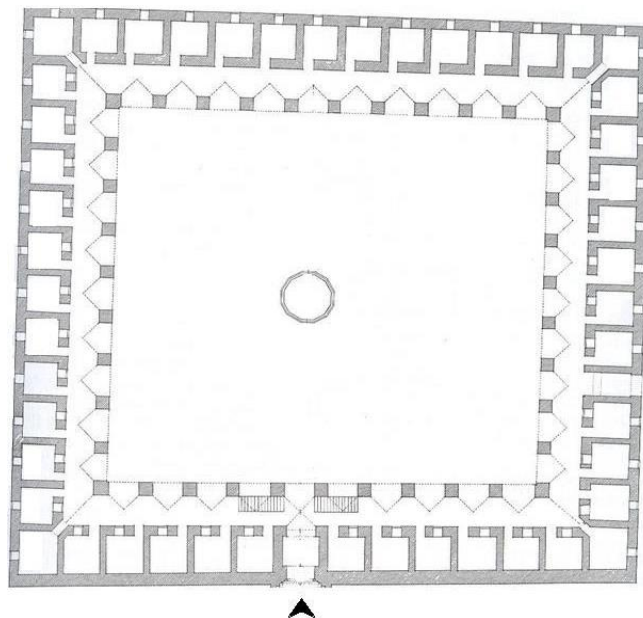
Spatial necessities will change according to the function planned to be given to historical building. Each function requires different spaces. For instance a space needed for a workshop is way different

than the space needed for a café business. On the other hand, there are some common areas for both functions (like toilets).

The new function should be chosen after functional analysis and it should not harm the authenticity of the historical building and it should be based on the user's satisfaction (Aydın and Yıldız, 2010). User satisfaction can be provided by detecting the needs correctly and satisfy them. Necessary user needs determines the least qualification the area should have. Any absence in these qualifications may cause malfunctioning for the business and disturbance for the users (Arcan ve Evcı, 1999). Not satisfying the needs of the users in sufficient amount can cause the users to intervene to the building and any uncontrolled intervention is a risk for authenticity of the historical buildings.

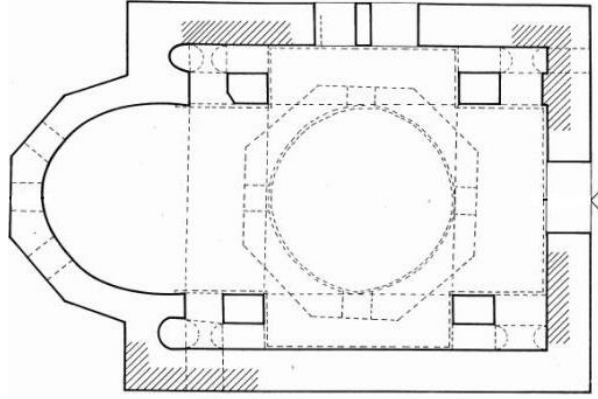
Apart from the functionality, spatial necessities can also vary due to the physical environmental conditions. For instance in the high temperature regions covered areas for shading or half-open top areas; in the rainy regions full covered areas will be preferred (Eraybat, 2011).

Reusing the historical buildings can be accepted as representation designed within defined limits. As in all representation process, the necessary places are detected and listed. The areas of the historical building should be examined if they are suitably aligned for new function. Spatial constitution of the building can consist of repetitive volumes, single volume or mixed plan schema (Altınoluk, 1998), (Figure 1,2,3).



Repetitive Volumes Example

Figure 1. Bursa, Fidan Inn (Bağbancı, 2007)



Single Volume Example

Figure 2. Niğde, Bor, Yeşilyurt Church (Pekak, 2008)

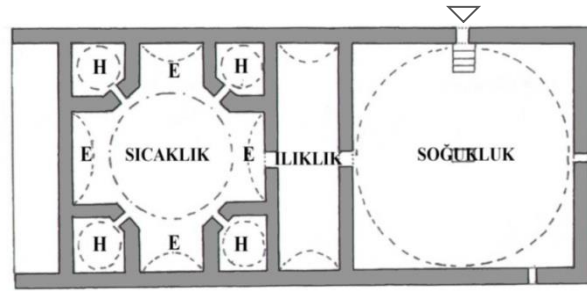


Figure 3. Mixed Plan Schema Example

Şanlıurfa, Siverek, Abdal Ağa Bathhouse (Halaç et al., 2018)

Spatial constitution of the historical building affects the new function to be assigned directly. If the spatial constitution is not suitable for planned function, a new function research should be made. For instance a historical building which has single volume is not suitable for courses which need several classes, but it can be an art gallery or museum. Likewise, demolishing the walls of madrasah in order to gain a single volume is not efficient either (Altınoluk, 1998).

2.1.2. *Spatial Dimensions and Capacity*

Detecting the necessary places for planned new function is not enough. Capacity and spatial dimensions suitable for capacity for new function must be determined too. Unit – space study and necessity program are made for that purpose. Necessary areas and height measurements for necessity program and space study, changes according to the number of the users (capacity), qualities and

actions required for function. Necessities can be detected via literature review like standards, regulations and books etc. (Altınoluk, 1998; Ülker, 1985).

It is impossible to enlarge the existing area, to demolish the walls of brick masonry buildings. As it is known, at masonry constructions wall are carriers and demolishing them can endanger the building. Besides all that, since the buildings carries historical, cultural and artistic value and because of preservation policies demolishing the walls is unacceptable. Thus, the necessary spatial dimensions (width, height, and depth) and capacity for new function should be compared with existing building's dimensions and capacity. Dimensions should be examined if they are necessary. For some areas acceptable maximum and minimum values should be detected. After all these studies, if the necessities for new function is not met there will be two solution; if the historical building can be intervened within the preservation principles, a new part can be built, if not another new function will be searched for the building (Eraybat, 2011).

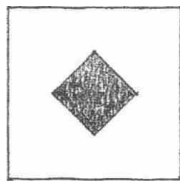
2.1.3. Interspace relationship setup

Function is defined as suitability to the purpose of usage (Arcan ve Evci, 1999). In order for a building to be functional, spatial constitution and dimensions' suitability is not enough. Interspace relationship should also be functioning well. Regulation of this functioning is done via functional relationship matrixes and relationship (function) schemas before even designing.

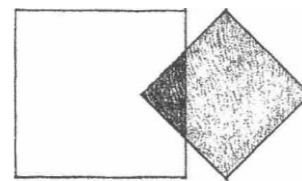
Relationship matrixes are lists of sections, sub-sections or sectors and systems showing the relationship between them. In matrixes relationships are shown if they exist between spaces, if they exists then their relationship level and direction is shown too. The important point when creating the relationship matrix is to compare equivalent places. Relationship between main sections of the building should be examined with each other, likewise sub-sections with each other and places of sub-sections with each other. After all this scrutinizing the whole inter-space relationship can be examined (Dinçer, 1988).

The relations determined via functional relation matrixes can be seen more clearly with relationship schemas. These schemas show existence of relationship, direct or indirect relation, for which users is the relationship is valid and called as "function schema, organization schema". Places' names are written in geometric shapes like rectangles or circles, later these shapes are grouped if they are related or they combine with each other (Erdoğan, 1997; Dinçer, 1988).

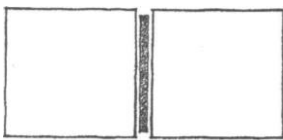
As a necessity of newly planned function, places of historical building should be examined too, in order to create interspace relationship properly. Relationship between spaces are; s Space within a space, interlocking spaces, adjacent spaces, (adjacent spaces separated with a single wall, adjacent spaces separated with platform standing freely, adjacent spaces separated with column row, adjacent spaces separated with elevation difference), a common space connecting two far or near spaces (Ching, 2002), (Figure 4).



a. Space within a space (Ching, 2002).



b. Interlocking spaces (Ching, 2002).



c. Adjacent spaces (Ching, 2002)



d. Spaces linked by a common space (Ching, 2002)

Figure 4. Relationship between spaces

2.1.4. Structure

Before giving a new function to the historical building, structural researches should be conducted. Structural schema of the building, load capacity, whether the planned function brings extra burden to the building, if yes whether the building have the capacity to carry it, detecting structural problems if there is one, strengthening suggestions developed to solve those problems, suitability of these suggestions to the historical building, whether the new parts to be built will bring extra burden to the building or not should be analyzed. Along with these researches financial source of the intervention to be done, should be investigated. All of these studies must be conducted in cooperation between restaurateurs, art historians, civil engineers and architectures who are masters in restoration and preservation (Eraybat, 2011).

Historical building's being not able to carry the burden of new function, strengthening's being not suitable for historical building or newly additions' creating unplanned economic burden can hinder the process. In that case another new function research should be conducted (Eraybat, 2011).

2.1.5. *Materials*

Main materials consisting the building should be studied. Endurance of the material is important, in the aspect of structural endurance of building; water absorption in weight and volume, vapor diffusion resistance, capillarity like features are important in the aspect of water resistance; acoustical absorption factor, acoustical transmission resistance like features are important in aspect of acoustical comfort. Hence, if the historical building will be reused for conference, seminar, theatre etc. functions, materials flammability because common people will use it and acoustical features because of functional necessities became important (Eraybat, 2011).

Corruptions on the material and its kind can be detected with eye, yet for further detailed study samples can be examined in laboratory. As a consequence, physical, chemical and mechanical features of main materials which consist the building and in addition to that types and percentages of materials consist the mortar are determined. The gathered data is a guiding light upon the strengthening techniques to be applied over existing material and choosing suitable material while changing the necessary ones. It is also important to detect the coherence between new modern material necessary for new function and old materials (Eraybat, 2011).

2.1.6. *Technical Equipment*

These are necessary equipment for planned function for historical building to perform sufficiently. Features of technical equipment to be used can differ according to planned function, physical status of historical building and expected comfort level (Eraybat, 2011).

While reusing the building and designing modern hardware factors to have comfort, installation projects should be respectful to authenticity and architectural integrity of the building. Generally these installments are plumbing, electricity wiring, heating, air conditioning plant and fire extinguishers (Eraybat, 2011).

2.2. Environment Dependent Factors

Among the building dependent factors environmental factors are also determiners to choose new function of the historical buildings. For this purpose, two analysis must be conducted as immediate vicinity and city-wide analysis.

Environment dependent factors are more variable than building dependent factors. In time they are effected by social, cultural and economic structural changes. A function which is suitable for immediate vicinity and city necessities, can become old because of environmental changes, a new function can be needed. Since the function given to historical building may become old in time and a new one may be needed, a flexible design should be made. Conducting interventions according to “recyclability” principle provides both flexibility for designer in the future for new functions and preservation of authenticity with every reuse (Eraybat, 2011).

2.2.1. Immediate Vicinity Analysis

Dwellers constituting the immediate vicinity of the historical building, sometimes can keep pace with environment, yet some other times can change the environment according to physical, esthetical, economic and social needs. The changes in time in the immediate vicinity which is considered as whole with historical building, inevitably affects the historical building. For instance it is very hard to choose new function for a historical building located in elite environment years ago, but now a suburban location (Eraybat, 2011).

Changing environment in time exercises influence over historical building. This can be physical pressure from disrespectfully shaped environment or functional pressure of the existent buildings. For instance someone who has the ownership of the historical building which is located between trade blocs, may want to use the building for trade business. At that point the architect should present suitable ideas, thinking that the historical building and its immediate vicinity is whole and analyzing the immediate vicinity physically, socially, culturally and economically, not damaging buildings’ authenticity and identity, taking into consideration the dependent factors of building architecture (Kuban, 2000; Altınoluk, 1998). Immediate vicinity analysis which is determiner while choosing suitable function, is conducted over four different points; physical analysis, functional analysis, social-cultural analysis, economic analysis.

Physical analysis: Examining the physical qualities of natural and artificial environment constituting the immediate vicinity of historical building. (Akyıldız, 2008).

Functional analysis: Functional actions in the area are analyzed while classifying the artificial environment. (Region-sourced actions from residential district, commercial district, corporate region, industrial zone, recreation area) (Altınoluk, 1998).

Social-Cultural analysis: Social constitution of the habitants around historical building, shouldn't be ignored while reusing the building, because the individuals shape the social structure where they live with their philosophy of life and standards of judgement. A function converse to the social environment can cause friction and problems. Constituting the environment, individuals' values, norms and behaviors constitutes society's philosophy and way of life. Traditionalized cultural structure which was generated with information and values by society, should be analyzed. A new function should be chosen according to this environment's social sensitivity. (Özkalp, 2004).

Economic analysis: The planned new function becomes sustainable by identifying the needs of the local people. Otherwise it is possible to see the idle buildings again.

Economic well-being of the people around the historical building can cause them to have expectations. New business opportunities can show up like souvenir shop and tourism agency etc.

2.2.2. City Needs

The needs of the city which is changing constantly, is in a state of flux. Identifying new needs and giving new functions to idle historical buildings according to these needs would be rationalistic. Giving a suitable need to satisfy city needs will be advantageous for both preserving the building, and raising the living standards of city dwellers physically, socially, culturally and economically.

Needs of townsfolk which is a social being consists of individuals living together, constitutes the social needs of the city. Cultural needs on the other hand consist of need of place where functions needed by people who synthesize their abstract cultural beings such as beliefs, traditions, customs, common usage and ethic laws of townspeople with tangible cultural beings reflecting technology, technique, skills and art's development stages which produced in the past and meant existence of the society. What needed to be done is that conducting surveys to identify the social and cultural needs of townspeople, hence an idle historical building could be in reuse to satisfy the needs of city (Eraybat, 2011).

3. Additions of Building Possibilities

We should identify the needs of users of historical building which will be reused in order to satisfy them. In evaluation process, relationship between space dimensions and spaces themselves are studied. For new function existing spaces of the historical building is controlled and they are checked if their relationship with each other functional or not (Haştemoğlu ve Sezgin, 2007). In case of any

absence or inadequacy another new function is researched or they will be solved with a suitable addition.

Determiner and shaper of the addition to be added to historical building is itself. The relationship between historical building and additions are determined by design principles (proportion, rhythm, texture, color etc.) and preservation principles (Kuban, 2000; Onur, 1991). While applying these two principles, additions of building should be modern designed, environmental friendly and has little effect over appearance. According to preservation principles, a function which will give damage to the historical building, cannot be given. If any function heavier than historical building can carry is selected, additions size can make mass harmony difficult (Ahunbay, 2009).

Additional buildings to be designed for historical building are categorized into four; additional building lateral or near the historical building, additional building over the historical building, additional building lateral and over the building, additional building below the building (Onur, 1991), (Figure 5,6,7,8).

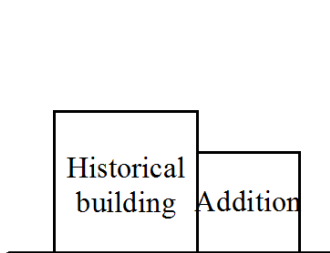


Figure 5. Schematic drawing showing

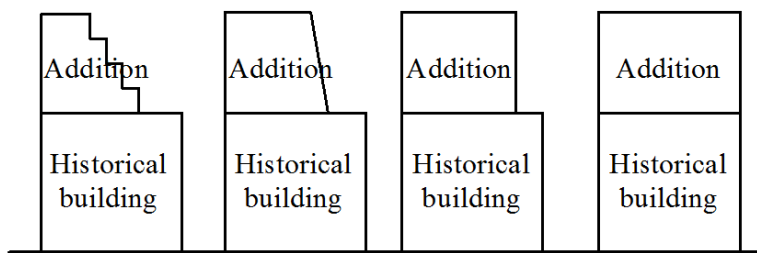


Figure 6. Schematic drawing showing addition over the building example

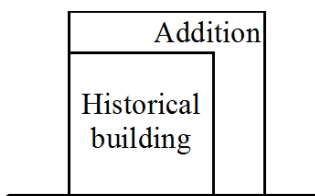


Figure 7. Schematic drawing showing lateral and over the

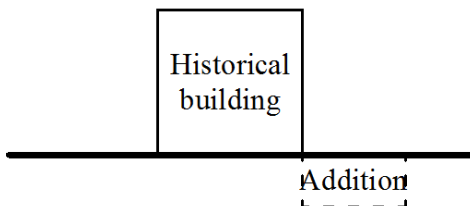


Figure 8. Schematic drawing showing addition below the building example

In order to satisfy the needs of building additional construction elements can be made which are generated by gathering various materials and components together via suitable techniques. This additions can be space defining addition or space connecting addition (Figure 9,10).



Space Defining Addition

Figure 9. A café generated by covering the porticos with glass, Alcala De Henares/ SPAIN (20.05.2016)



Space Connecting Addition

Figure 10. The new staircase added during the restoration, since the original staircase of Edirne Deveci Inn couldn't survived until today, Edirne /TURKEY (Eraybat, 2013).

3.1. New Additions To Integration-Wise Impossible Historical Remaining

In order to have integrity of first design, using traditional or modern materials according to data gathered to replenish the partly or totally damaged historical building is called “completion”. Completion can only be offered if there is authentic information and documentation. Otherwise, since the historical building’s data may change, the next generations can have misinformation about the building (Ahunbay, 2009).

When there is no authentic and true data, they can be misleading, thus completion is not appropriate. In that cases all the remaining should be preserved as they were. Yet the building will be out of use if it is left as it was, so it will be hard to survive.

Alternatively in order the remaining to survive a modern additional building can be added without changing the building. This was both historical building can be taken care of and a need of the city may be satisfied. For instance, in Gölcük province of Kocaeli at Kazıklı Caravanserai there were not enough information and documentation to perform completion thus all remaining were consolidated and another additional new building 2.5 m inside of it were built as a multi-purpose hall (Dedehayır, 2011) (Figure 11).



Figure 11. Additional Building at Kazıklı Caravanserai (Köksal and Altınışık, 2010)

Additional building can be built on a historical building that cannot be completed by preserving its authenticity. A new function can be appointed to this newly added building. This was historical building will be preserved and a need of the city will be satisfied (Eraybat, 2011).

In order to reuse the historical buildings whose original purpose is not valid today, they should be redesigned to satisfy the needs of modern age. For some necessities additional buildings can be needed. There points are important when designing additional building: Additional building must be

in coherence with historical building functionally and visually (Ahunbay, 2009; Kuban, 2000). Additions must be emphasized that it is modern addition (Venice Charter, 1964, Article 9). Additions must be recyclable and non-damaging to historical building (Kuban, 2000).

4. Conclusion

There are some problems emerge when preserving idle historical buildings. It is realistically known that with reusing they can be added into the modern life, filled with human warmth and transferred to next generations. Hence, reusing the historical building can be seen as a tool to preserve them.

Reusing is important since it provides preservation, maintenance and socially, culturally and economically sustainability of historical buildings. Injecting the historical building into our daily lives is an effective tool to build bridges between past and future.

Reusing of the historical building must be accepted that it is an intervention. This planned intervention should be applied without harming the historical, cultural, artistic values of the historical building. Advantages and disadvantages of the new function should be studied well so that it is suitable to preservation principles and functional. If the advantages are more than disadvantages, it can give as clues whether the adaptation of reuse will be successful.

The point to be taken into consideration is that functional value and to be preserved values of the historical building must be approached within the “preserve-use balance”. A multi-discipline study system must be setup in order to generate feasibility study correctly and research new function according to preserve-use balance. In these studies, an architect who is master in restoration and preservation field, a civil engineer who is master in ground studies and fortification of historical buildings, an art historian, a restaurateur, a mechanical engineer and an electric engineer must be working together. Determining factor to choose new unction should be senior architect or architects to have more accurate conclusions.

References

- Ahunbay, Z. (2009). “Tarihi Çevrede Koruma ve Restorasyon”, İstanbul: Yapı Endüstri Merkezi Yayını, 38-180.
- Akyıldız, B. (2008). “Çevresel Etkinlik Analizi: Kuznets Eğrisi Yaklaşımı”, Dokuz Eylül Üniversitesi, Sosyal Bilimler Enstitüsü, İktisat Anabilim Dalı, Yüksek Lisans Tezi, 4.

- Altınoluk, Ü. (1998). “Binaların Yeniden Kullanımı”, İstanbul: Yapı Endüstri Merkezi Yayınları, 19-138.
- Arcan, E. F., Evcı, F. (1999). “Mimari Tasarıma Yaklaşım Bina Bilgisi Çalışmaları”, İstanbul: Tasarım Yayın Grubu, 12-171.
- Aydın, D., Yıldız, E. (2010). “Yeniden Kullanıma Adaptasyonda Bina Performansının Kullanıcılar Üzerinden Değerlendirilmesi”, *METU JFA*, 27(1), 1-22.
- Bağbancı, K. Ö. (2007). “Bursa Hanlar Bölgesi Değişim Ve Dönüşüm Sürecinin İncelenmesi Ve Bölgenin Korunması Üzerine Bir Araştırma”, Yıldız Teknik Üniversitesi, Fen Bilimleri Enstitüsü, Mimarlık Anabilim Dalı, Rölöve-Restorasyon Programı, Doktora Tezi, 137.
- Köksal, G., Altınışik B. (2010). XII.Ulusal Mimarlık Ödülleri 2010, “Yapı Dalı / Koruma-Yaşatma Başarı Ödülü: Kazıklı Kervansaray Restorasyonu Ve Çok Amaçlı Kültür Merkezi İç Ek Yapısı, Gölcük-Kocaeli” *Mimarlık Dergisi, Mimarlar Odası Yayını*, 353, 32-33.
- Ching, D. K. F. (2002). “Mimarlık, Biçim, Mekân ve Düzen” (Lökçen S. Çeviren), İstanbul: YEM Yayınları, 173-279.
- Dedehayır, H. (2011). Tarihi ve Kültürel Mirası Koruma Proje ve Uygulamalarını Özendirme Yarışması 10, İstanbul: Tarihi Kentler Birliği, 86-87.
- Dinçer, K. Z. (1988). “Belgeli Konaklama Tesisi, Eski Yapıların Seçimi İçin Bir Yöntem Önerisi”, Yıldız Teknik Üniversitesi, Fen Bilimleri Enstitüsü, Mimarlık Anabilim Dalı, Doktora Tezi, 18-140.
- Eraybat, F. G., Başar E. M. (2013). Tarihi Yapıya Uygulanabilecek Eklerin Sınıflandırılması: Edirne Deveci Han Örneği, 8th International Symposium on Architect Sinan, 25-26 Nisan 2013 – Edirne, 349-356.

- Eraybat, F. G. (2011). Tarihi Konaklama Yapılarının Doğuşu, Gelişimi Ve Günümüzde Çağdaş İşlevle Değerlendirilmesi: Edirne Rüstempaşa Kervansarayı Örneği, Trakya Üniversitesi, Fen Bilimleri Enstitüsü, Mimarlık Ana Bilim Dalı, Tezli Yüksek Lisans, 41-69.
- Erdoğan, N. (1997). “Bina Bilgisi II Ders Notları (Bina Tasarım Bilgisi ve Bina Türleri-Konutlar)”, Trakya Üniversitesi, Mühendislik-Mimarlık Fakültesi, Mimarlık Bölümü Yayını, Edirne, 20.
- Halaç, H. H., Kalak, M., Yıldırım Ö. C. (2018). Siverek Tarihi Hamam Yapılarının Kullanım Durumları, *Al-Farabi Uluslararası Sosyal Bilimler Dergisi*, ISSN - 2564-7946 2018 Vol. 1/1, 54-74.
- Haştemoğlu, H., Sezgin, F. (2007). “Tarihi Yapıların Yeniden Kullanımı; Isparta Damgacı Sokak Örneği”, Tarihi Eserlerin Güçlendirilmesi ve Geleceğe Güvenle Devredilmesi Sempozyumu-1, Ankara, 482.
- Kuban, D. (2000). “Tarihi Çevre Korumanın Mimarlık Boyutu Kuram Ve Uygulama”, Yapı Endüstrisi Yayını, İstanbul, s.39-203.
- Onur, H. (1991). “Korunması Gerekli Mimari Anıtlara Ek Yapı Tasarımında İlkeler”, Mimar Sinan Üniversitesi, Fen bilimleri Enstitüsü, Yayınlanmamış Doktora Tezi,18-284.
- Özkalp, E. (2004). “Toplum ve Toplumsal Yapı”, Davranış Bilimlerine Giriş, Anadolu Üniversitesi Yayını No:1355, Eskişehir, 43-103.
- Pekak, M. S. (2008). Kappadokia’da Bizans Dönemine Ait Haç Planlı İki Kilise, *Sanat Tarihi Dergisi*, XVII/2 / October 2008, 85-113.
- Ülker, H. (1985) “Koruma Amacına Yönelik Bir Yenileme Çalışması”, İstanbul Teknik Üniversitesi, Sosyal Bilimler Enstitüsü, Yüksek Lisans Tezi, 11-19.