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New Additions to Existing Built Heritage and Their Contributions to Sustainable Development: Cases from Ankara, Turkey

Gulsen Disli

Abstract

New additions to historic buildings are mostly required either to extend the longevity of the building or to meet the new program requirements imposed to the built heritage as part of historic preservation process. The additions might be in the form of a rooftop, front, rear, side, or basement attachment. In all cases, the question of what is a sensitive addition according to the world-wide preservation standards is to be well analyzed. This study uses data from a new survey on five case study historic mosques and khans in Ankara with new exterior or interior additions to reveal the quality, compatibility and/or incompatibility of contemporary new additions and their contributions to sustainability. Case study analysis, in-situ observations, archival and literature survey are the principle methods applied during the study. Research findings show that, the additions follow different paths; they can be differentiated from the main historic building with their massing, material, and either color, or they hinder the existing built heritage, or even damage its character-defining features. Hence, for sensitive and successful new additions, restorations should be in compatible with world-wide standards and should be well analyzed and applied by the related authorities both during project approval and restoration phases.

Keywords: existing built heritage, historic preservation, rehabilitation, adaptive reuse, new additions, alterations, sustainability, Ankara

1. Introduction

Historic buildings bear the traces of different periods because of additions attached to the building in different times. Among them, the contemporary new additions, commonly applied as part of historic preservation treatment, either in the form of exterior additions or interior alterations, expand the outer limits of the original building, or create new spaces in building interiors [1]. A new exterior addition is mostly required for programmatic reasons and is accepted as an appropriate alternative only if “the new program requirements cannot be met within the existing building envelope” or by altering only interior spaces without changing character defining features of the building [1–4]. Interior additions are similarly applied to make compatible use of the property through interior repairs

and alterations [4]. As US Standards for Rehabilitation & Guidelines for Rehabilitating Historic Buildings has proposed and if an exterior addition has to be done, it should be clearly differentiated from the original and should be built without damaging character defining features of the old [4]. This research examines the new exterior additions and interior alterations observed in five case study historic buildings, three khans and two mosques, across historic Ulus district, in Ankara. They provide examples of both adaptation projects and original use, all maintaining significant details of the old building, and at the same time have new additions that attract public attention. Selection parameters are; they should be public buildings, they are to be located in historic fabric of city of Ankara, and their new additions should exemplify either the need for adaptive reuse or continuous use of original function of the old building. Main objectives of the study are first to question the compatibility of the new additions and alterations with international standards and to investigate their contributions to sustainable development of the district. It begins with a literature review on the type of new additions to existing built heritage, followed by international legal framework and guidelines on new additions and continued with case study buildings and their new additions with an evaluation of their compatibility with the standards and their sustainable contributions.

There is a vast amount of literature on new additions to historic buildings [5–14]. Among them, there are various studies examining the issue of evaluating those new additions, possible approaches applied in their designs, and their appropriateness to the historic fabric [5–10]. New additions have also been discussed by scholars within adaptive reuse and rehabilitation framework and with a focus on sustainable benefits of rehabilitation [11–14].

There are also considerable literature related to prehistoric and historic development of historic city center of Ankara; on municipal, construction, agriculture, and commercial activities mainly in historic Ulus district, and related to urban, archeological, natural, and historical protected areas and strata's of the area [15–22]. Among them, Taş's research includes a comprehensive archival research on commercial activities, administrative structure, neighborhood, and public and private life in the seventeenth century Ankara [18]. Various studies similarly focus on the historic districts and architecture of the city including historic buildings belonging to Roman, Seljuk, Ottoman, and Republican periods [23–29]. Though in limited number, some scholars also examined the urban conservation process in Ulus district and alterations and special transformations of historical buildings in due course, as well as their sustainable conservation issues [30–33].

Although, all those existing literature tend to focus on architecture and history of Ulus district, and they rarely address the issues of new additions to historic buildings and their contributions to sustainable development in the area. Hence, this study is significant in terms of providing data on compatible and incompatible new additions to the case study old buildings located in the district and providing evaluations on their contributions to the revitalization of the area.

1.1 New additions to existing built heritage

New exterior additions, as part of rehabilitation treatment, can be inevitable in order to extend the longevity of the historic building falling into disuse because of the problem of abandonment, misuse, or damage. Changes in present day requirements, programmatic needs caused by adaptive reuse, and need for the completion of damaged parts in historic buildings esthetically, functionally, and structurally, as well as user expectations also cause differentiations in the form of exterior additions and/or interior alterations to the built heritage [9, 34]. Al-Jameel and Saffo (p. 3)



Figure 1.
 New additions designed according to three different approaches: Standard, contrasting, and identical [3, 7, 39, 40].

also counts the “factors such as natural changes, disasters, social, economic, cultural and political transformations” among the very reasons of constructing new additions with different types and models [35].

There is not a certain formula about the type and form of the addition, such that it can be “traditionalist, contemporary or a simplified version of the historic building”, as long as it preserves a balance between the differentiation and compatibility [36]. Though there are some recommendations, there are not certain rules on scale (height and width), form, massing, setback, orientation, alignment, rhythm, spacing, and proportion of a new addition [1, 3, 4, 37]. It can be as small as a vestibule, or as large as an entire building mass, but it is encouraged that it should be smaller than and not overwhelm the original building and should be less visible from the street side [2, 37]. Hence, it is more appropriate to position a new addition at the rear or side elevation of the existing building, and front additions are to be avoided as much as possible [37].

According to “The Secretary of the Interior’s Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring & Reconstructing Historic Buildings”, White (p. 38) categorizes the various recommended and discouraged methodologies toward additions to historic buildings in three groups: standard, contrasting, and identical [7] (**Figure 1**). Standard approach is explained as “compatible,” but “differentiated” from the old, thus ensuring that it “subordinates” to the historic building [7]. Also known as abstraction, in this approach, a new addition should be similar, but slightly different from the original building [6]. As another approach, contrasting style is defined as in “extreme contrast” to the old, thus avoids potential misunderstanding of what is original and what is new [6, 7]. On the other hand, in identical approach, new additions are almost the same with the old, in terms of style, design elements, material, scale, and detail [6, 7]. Semes similarly defines four possible strategies in designing new construction in a historic setting and calls them as the following; “(1) literal replication, (2) invention within the same or a related style, (3) abstract reference, and (4) intentional opposition [38].”

In addition to above mentioned design approaches, there are also some criteria that should bear in mind in designing new additions. Tanaç-Zeren (pp. 31–33) explains the criterion in new additions constituting the esthetic impression as follows [34]:

- “Environmental impact: the historic neighborhood in which the building is located and the building plot affects the location, material, and style of new addition.
- Impact of scale: horizontal and vertical dimensions of the new addition and its impact on human scale and its proportions affect the esthetic factors. Hence, new additions with correct dimensions/scales will not dominate the historic building.

- Impact of contrast: contrast can be set up by means of material, color, and scale.
- Impact of mass: selection of form in a new addition affects the sense of massing and builds its compatibility or contrast with the historic building.
- Impact of the rhythm: while designing new additions, it is possible to use rhythmic adaptation with the historic building by means of repeating the original material, proportion, or component.
- Impact of the material: material selection in new additions is an important criterion in determining quality of the addition.”

According to the historic preservation standards, primary exterior new additions include [1, 3, 4, 7, 41] (**Figures 2 and 3**);

- Rear additions,
- Side additions,
- Camelback (second story) additions,
- Rooftop additions, and
- Storefronts.

Tanaç-Zeren (pp. 37–38) groups those new additions, which were generated as part of space and program requirements of secondary functions given to the old buildings, as follows [34]:

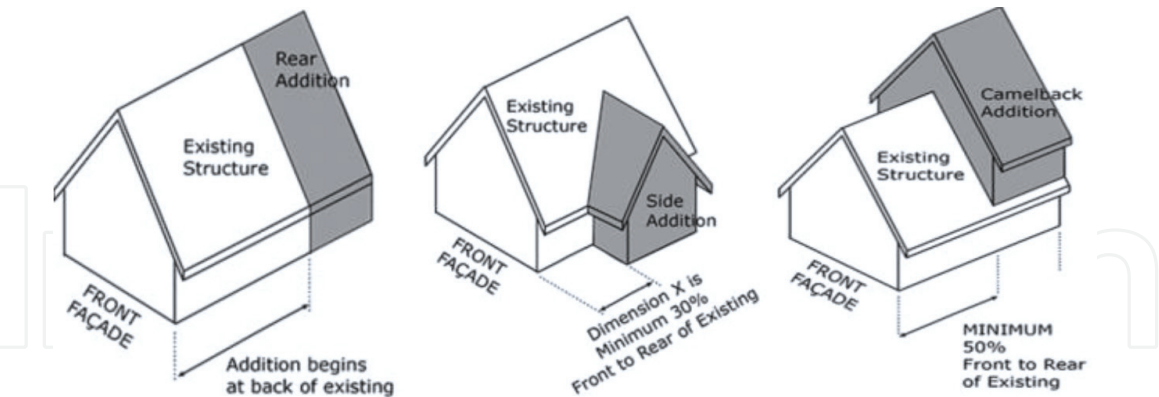


Figure 2.
Drawings showing different types of appropriate additions according to the City of Houston historic preservation manual, 2015 [7].

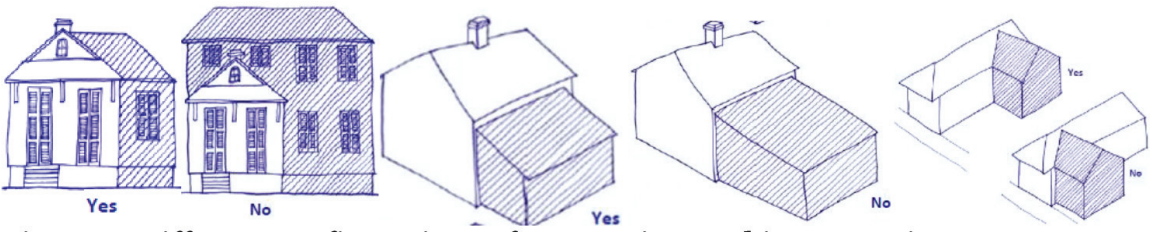


Figure 3.
Different configurations of appropriate and inappropriate new additions to historic buildings [37].

- “completions of roof,
- completions of façade,
- transition elements between the two buildings,
- fire escapes attached to the historic buildings, and
- eaves additions.”

There are also front and basement additions observable in historic buildings. But, especially the front additions are mostly avoided or even prohibited in order not to hinder the visibility of the original building from the street side [37].

US Secretary of the Interior's Standards for Rehabilitation recommend that functions and services necessary for the new use are to be located in noncharacter defining interior spaces instead of constructing a new exterior addition [1]. Interior alterations may include “inserting an additional floor; an entirely new mechanical system; or creating an atrium or light well, but such alterations should not radically change, obscure, or destroy character defining spaces, materials, features, or finishes” [42].

2. International and legal framework and guidelines on new additions

In principle, world's leading preservation organizations such as United Nations Educational, Scientific and Cultural Organization (UNESCO), the International Council of Monuments and Sites (ICOMOS), and the U.S. National Park Service (NPS) oppose to the attachment of new additions to historic buildings [6, 10]. Nevertheless, they welcome compatible additions if required for the benefit of users and for present day use as long as they do not affect character defining features of the old building [6]. Those primary international charters, guidelines, and standards related to new additions to historic buildings and their related articles/sections are given below:

- Venice Charter, 1964, Article “12” and “13” [43],
- Third General Assembly of ICOMOS, 1972, Article “3” and “4” [44],
- The Declaration of Amsterdam, 1975, section “f” [45],
- U.S. Preservation Briefs 18, 1988 [46],
- U.S. Secretary of Interiors Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings, 1990, “p. 62”, Article “9” and “10” [4],
- U.S. Secretary of Interiors Standards for Rehabilitation and Illustrated Guidelines for Rehabilitating Historic Buildings, 1997, “pp. 91–93” [1],
- ICOMOS Charter of 14th General Assembly in Victoria Falls, Zimbabwe, 2003, Article “2.3” [47],
- UNESCO Fifteenth General Assembly, 2005, “p. 4”, section “D-18” and “D-21” [48],

- ICOMOS New Zealand Charter 2010, “p. 8”, Article “21” [49],
- U.S. Preservation Brief 14, 2010 [3],
- The Burra Charter, 2013, Articles “7.2., 15, 21.1, 21.2, 22.1” [50].

In addition to those international guidelines, in Turkey, there are also some regulations, which partially mention about the new additions to historic buildings though there is not a regulation solely related to the issue [51–53]. Among them, The High Council Resolution No: 731, dated 19.06. 2007, regulates the restoration interventions, applications, and inspections for the cultural heritage such as mosques, masjids, and tombs supervised and managed by Directorate General of Foundations [51]. According to this Resolution, in adaptive reuse of monumental historical buildings with waqf root, their original functions, if specified in their waqf documents, are to be preserved. Any kind of house reserved for someone who holds a particular job in a mosque or shops/stores cannot be built attached to the historic building itself or in their courtyards. Similarly, late comers’ portico cannot be closed even with glass material, and in ablution spaces and in such areas, new material use that will destroy the traditional texture both structurally and visually is not allowed [51]. In addition, The High Council Resolution No: 660, dated 05.11. 1999, groups the immovable cultural heritage and regulates the conditions of their maintenance and repairs [52]. In this Resolution, it is noted that, if a new function is to be given to an old building, opinion of the Conservation Board is to be taken regarding the characteristics of new additions and their integration with the old, and those new additions can be applied only after its approval by the mentioned Conservation Board [52]. Furthermore, in The High Council Resolution No: 720, dated 04.10.2006, on Conservation and Usage Conditions in Urban Protected Areas, it is stated that it is not possible to build new buildings whose locations and height might adversely affect the protected urban silhouette of the street or zoning island that they are located [53]. Those existing regulations in Turkey show that they lack a detailed explanation about the approaches, types, and recommendations on application procedures of new additions to old buildings.

3. New additions to historic buildings and their contributions to sustainable development: cases from Ankara, Turkey

The case studies discussed in this part of the chapter are all historic public buildings, easily accessible located in historic Ulus district, in Ankara. The cases clearly exhibit both compatible and incompatible exterior and interior additions according to the international guidelines. Most of the examples selected were built in the sixteenth century, and the architectural landmark of the district and the additions were attached in last 80 years. In all of the cases, the exterior and/or interior additions, either in the form of small interventions or major additions, were attached to the existing building during the extensive restoration works. The case studies involve front, rear, side, basement, storefront, and rooftop exterior additions and some interior alterations. Among the case studies, the mosques are still used in their original function, and the khans exemplify adaptive reuse rehabilitation treatment; two are converted to a museum and one is started to be used as a boutique hotel. New exterior additions of case studies employ both standard and contrasting approaches explained in part 1.1. of this chapter.

3.1 Cases of historic buildings with compatible new additions

At this part, three cases—Çengel Khan, Çukur Khan, and Zağfiran Khan are selected which have contemporary additions, exemplifying both standard and contrasting design approaches. Original function of all cases is khan and located on the southwest side of historic Ankara Castle, one of the most important touristic routes of the district (**Figure 4**).

3.1.1 Çengel Khan

It is located in historic Ulus district, on the southwest side of the castle (**Figure 4**). According to its inscription panel, it was built in 1522–1523 by Rustem Pasha [28, 55]. It has an open-courtyard plan type constructed in masonry technique with stone and brick. Thanks to the sloppy topography of the site, two-story building has also a basement floor on the southwest side. The only entrance to the building is from the northeast façade, along which shops/stores are aligned. Its latest restoration was completed in 2005, and the building has started to be used as a museum with stores and a café, hence created new job opportunities. Adaptation of Çengel Khan to an exclusive cultural, social, and educational place attracts many local and international tourists. During the latest restoration, a steel and glass rooftop was added above the central courtyard, and thus, the courtyard could be used as an exhibition hall (**Figure 5**). Another new addition is observable on the basement floor, in the form of a rectangular room with large wooden windows at the southwest facade, used as a permanent exhibition area (**Figure 5**). On that facade, there is another rear addition located above the masonry walls (**Figure 5**). Similarly, wood and glass storefronts with wooden pillars and slightly sloppy awnings alongside the northeast façade of the building were added during the last restoration works (**Figure 5**). The masjid above the entrance vault changed its function, and this part was renovated with large wooden windows and started to be used as a café (**Figure 5**). Hence, in Çengel Khan, front, rear, rooftop, and storefront exterior additions are observable, all attached during 2003–2005 restoration works in order to meet the requirements of new function and usage of the building (**Figures 5 and 6**). Interior additions, on the other hand, are mostly seen in wet spaces and in the form of mechanical installations (**Figure 7**). Scale of interventions in both exterior and interior new additions is small, reversible, and differentiated with its material, form, and color, thus compatible with the old building.

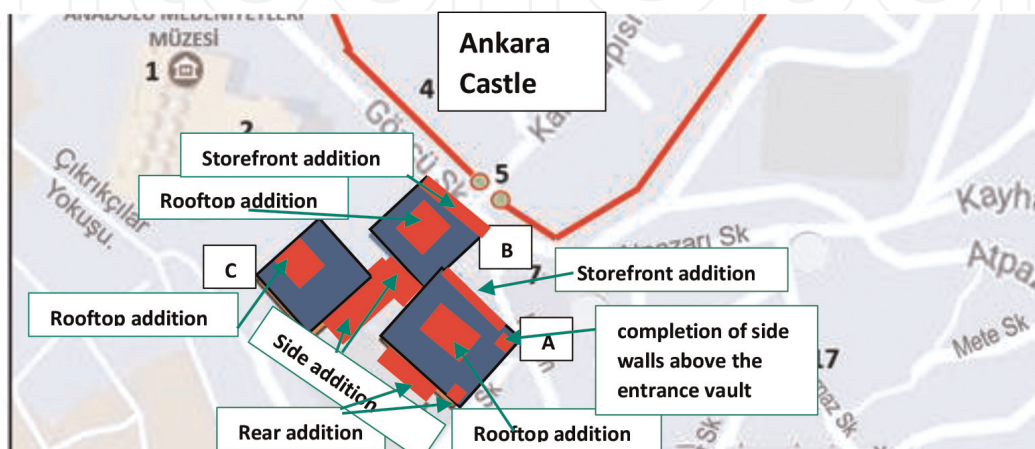


Figure 4. A map showing the location of case study historic buildings with compatible new additions in ulus district. (A) Çengel khan, (B) Çukur khan, and (C) Zağfiran khan (Safran/Zafran) [54].



Figure 5.
Çengel khan: Rooftop addition covering the courtyard, exterior (a) [56] and interior views (b), completion of side walls above the entrance vault and storefront additions (c) and views from rear additions (d, e, and f) [39].

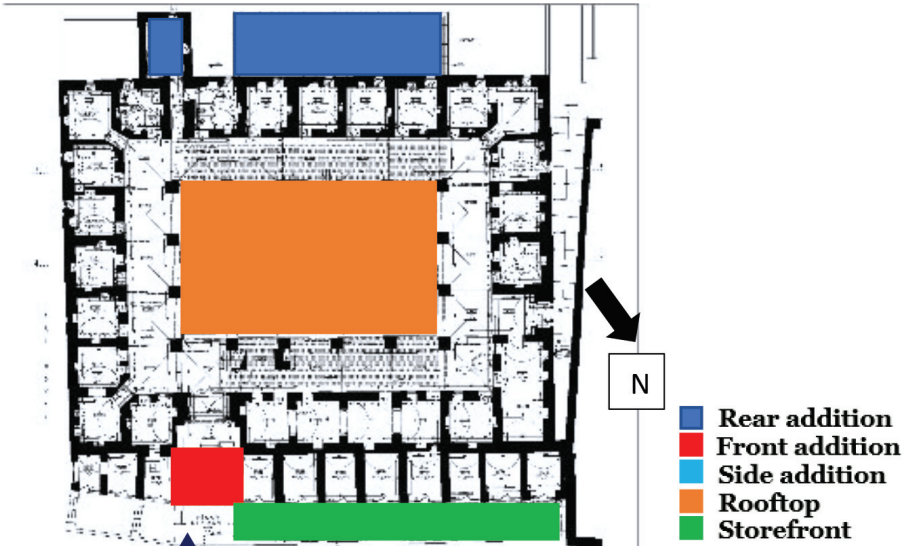


Figure 6.
Ground floor plan drawing of Çengel khan with new additions shown in different colors (source: Rearranged from [56]).

3.1.2 Zağfiran (Safran/Zafran) Khan

It is located in Salman Street behind (southwest side) the Çukur Khan. It was built in 1512 [28, 55]. The two-story building has an open central courtyard with the rooms lined beneath the semi-open riwaqs. Main body walls were constructed with rubble stone, and arches and vaults were built with brick material. Losing its function during the end of raw silk trade, it was used as a jail at the last periods of Ottoman Empire and at the beginning of the Republican Period [57]. Entrance to the building was from the west side [26]. As a result of new renovations and adaptations, today entrance is provided by means of a new addition passageway from the Cengel Khan. The building had many alterations in time and redesigned

and adapted to a museum by Rahmi M. Koç Museum and Culture Foundation in 2012–2016. The upper level has been adapted for a restaurant with an open terrace. Regarding its contemporary exterior additions, Zağfiran Khan has a major side addition attached to its west facade and a rooftop addition above the central courtyard (Figures 8–10). New additions are clearly modern in their use of material, massing, and space arrangement. Rooftop architecture has a flat form built with glass and steel material (Figure 8). It creates a visual richness on the terrace of the restaurant and at the same time, enables permanent exhibition in the courtyard beneath. Side addition on the west side has similarly been created for various functional reasons, such as wet spaces, restaurant, and service halls for the stairs and elevators. Its facade is covered with glass material (Figure 9). Interior additions are mostly seen in west side addition, and in the old part, as door passageways and mechanical installations (Figure 11). In Zağfiran Khan, all those new additions exhibit present day appearance by means of contrasting style with



Figure 7.
Interior additions in Çengel Khan are mostly observable at mechanical installations, handicapped lift, and door and window alterations and at designing wet spaces [39].

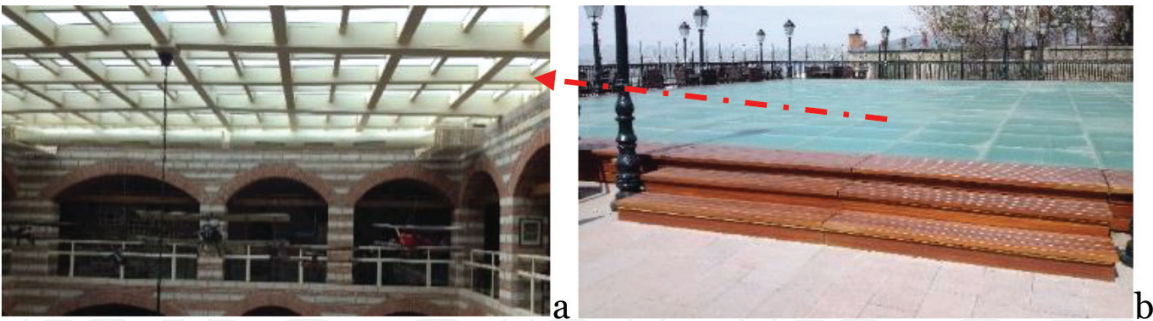


Figure 8.
Interior (a) and exterior (b) views of rooftop addition in Zağfiran Khan [39].



Figure 9.
Side addition of Zağfiran Khan; views from the restaurant, terrace (a), and whole south and west façade of the side addition (b) [39].

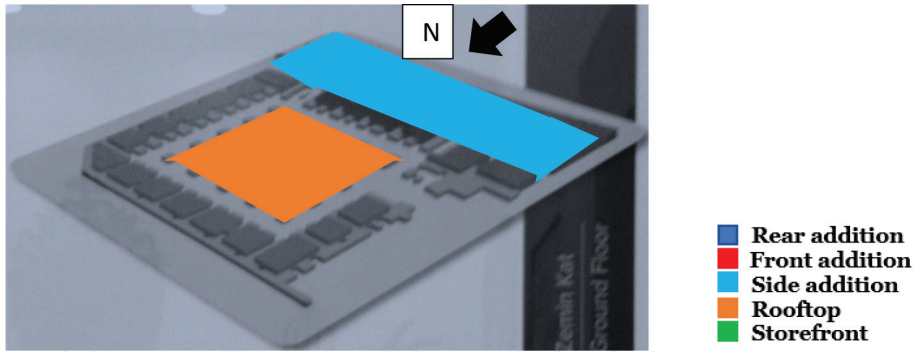


Figure 10. Schematic plan drawing of Zağfiran Khan with new additions shown in different colors (source: Redrawn from [57]).

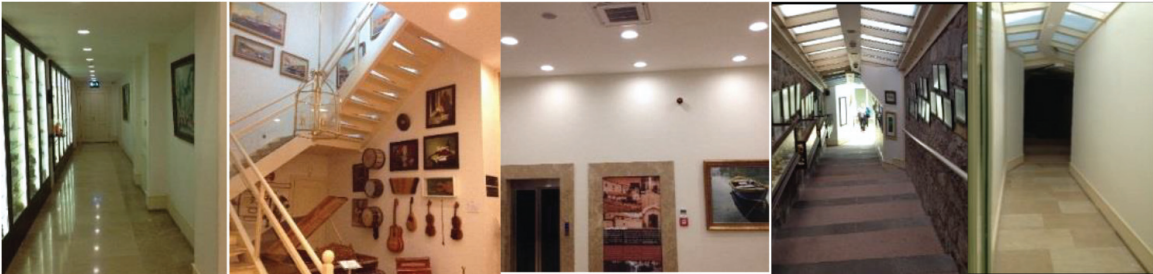


Figure 11. Interior new additions of Zağfiran Khan; stairs, elevator, wet spaces, and newly added passageway between Çengel Han and Zağfiran Khan [39].

their material, color, and form, hence original and new parts can easily be differentiated from each other.

3.1.3 Çukur Khan

It was constructed in the sixteenth century with rubble stone foundation walls. Above the rubble stone foundation are wooden pillars and trusses with mud-brick infill. The two-story building has a wooden hipped roof. The building is located in Atpazarı, next to Çengel Khan. It has an open courtyard plan type, surrounded by semi-open riwaqs, and the rooms behind. Entrance to the building is provided on the north side [28]. It lost its historic character and character defining features to a great extent during its repair works in 1950s [26]. Hence, it was in a ruined condition before its last restoration which was completed in 2010. During the last adaptations, the building was converted to a boutique hotel with all the rooms having a different concept. Hence, it still retains its original accommodation use, and with the renovated shops on the north façade, it continues to provide public access/use and preserves its streetscape character. During its restoration in 2007–2010, its open courtyard was covered with a rooftop, and thus the space below could serve as a bar restaurant (**Figures 12 and 13**). This rooftop addition exhibits a contrasting approach in terms of material (glass and steel) selection and construction technique, so can easily be distinguishable from the original. The entire storefronts on the north facade, that were too deteriorated to repair or were not existent, were replaced with wood and glass material, by using the physical evidence as a model as suggested in The Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings (**Figure 12**) [4]. Both the new rooftop and storefront additions are compatible with the size, scale, and massing of the historic



Figure 12.
Çukur khan: Rooftop addition (a and b) and storefronts (c) [39, 57].

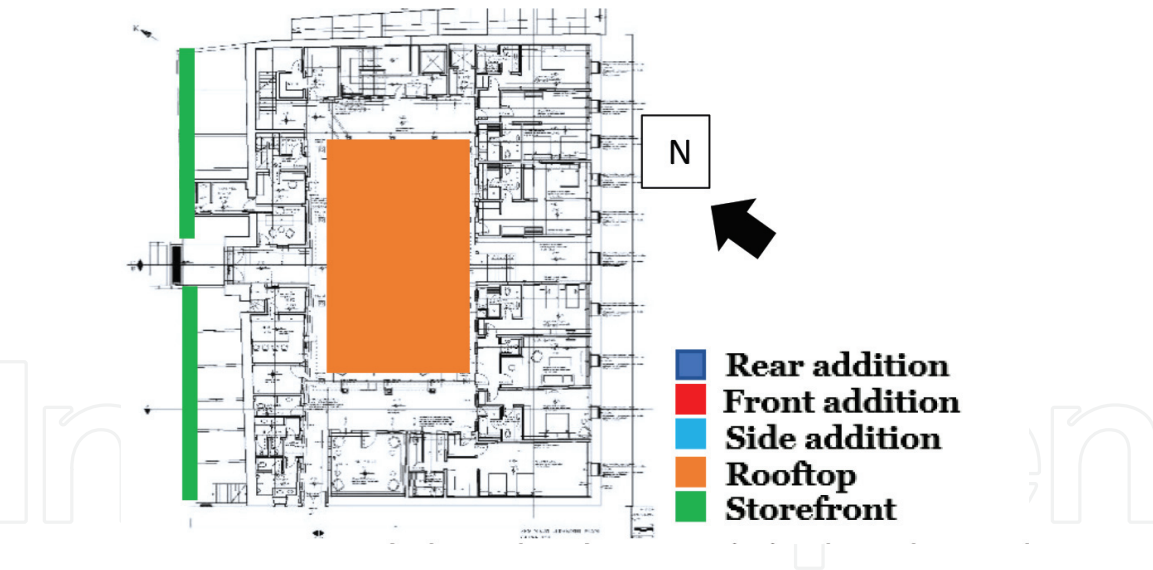


Figure 13.
Ground floor plan drawing of Çukur khan with new additions shown in different colors (source: Rearranged from [56]).

building. New interior additions include alterations and adaptations in wet spaces and mechanical installations.

3.2 Cases of historic buildings with incompatible new additions

At this part, two cases—Hacı Bayram-ı Veli Mosque and Kursunlu Mosque—are selected with exterior additions, exemplifying standard and contrasting design approaches. Original and present-day function of both cases is a mosque.

3.2.1 Hacı Bayram-ı Veli mosque

The building was constructed in 1427/1428 [26]. It is located in historic Ulus district, attached to August Temple of Roman period on the east side. Main prayer space has a rectangular plan, covered with a flat wooden ceiling, above which is a hipped roof with tile covering. Main body walls were built with brick material. On the south side of the mosque, there is Hacı Bayram-ı Veli Tomb, which has a square plan covered with a dome above [58]. The mosque undertook comprehensive repair works between 1703–1730 and 1757–1774, later in nineteenth century, in 1941, and in 1970 [26, 56, 58–60]. Especially during the last 80 years, the mosque was enlarged with new exterior additions, causing severe lost in its architectural and historic entity [58]. Late comers’ portico on the north side of the mosque was enlarged, and a riwaq was added on the north, east, and west sides. Also, a basement floor was added for women’s praying and for wet spaces. The first addition was conducted on the west side of the mosque with a vaulted gateway beneath, in early eighteenth century repairs [56]. Later, in 1941, late comers’ portico was enlarged with a concrete addition covered with tile material [56]. It took its present-day appearance during its latest restorations completed in 2011 (**Figures 14 and 15**). At present, the front addition on the north side, together with its side riwaqs, is nearly larger than the original façade of the building. Though the old and new are at the same height, have similar material, and color, because of the location and massing of the new additions, the original building is suppressed by the new and cannot be perceived from the north side. Similarly with the basement addition, the square area



Figure 14. Hacı Bayram-ı Veli mosque new exterior additions on the north side ((a) view from the north, (b) view from the east, and (c) view from the west) and views from the basement addition (d, e, and f) [39].

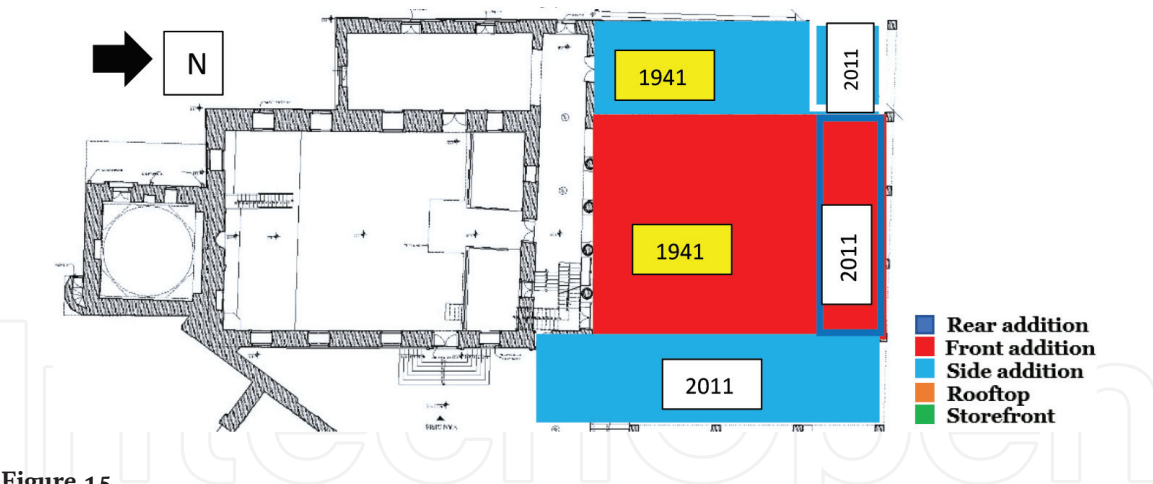


Figure 15.
Ground floor plan drawing of Hacı Bayram-ı Veli mosque with new additions shown in different colors (source: Rearranged from [56]).



Figure 16.
Exterior (a and b) and interior (c) views of front addition [39].

of the building was enlarged 2.5 times larger than the original size of the mosque itself [58]. Hence, in Hacı Bayram-ı Veli Mosque, exterior additions were applied with standard approach in the form of front and side additions, and basement addition exhibits the contrasting approach. They are all incompatible with the old building according to the international standards. On the other hand, regarding the interior alterations, providing access to the wet spaces and women’s prayer space by means of a newly added escalator exemplifies the social responsibility role of new designs, taking into consideration of physically disabled and handicapped.

3.2.2 Kursunlu mosque

It is located in Ulus district, Samanpazarı area. Though the mosque does not have an inscription panel, it is dated to the sixteenth century [26, 55, 59]. It has a square main prayer area covered with a dome. Main body walls were built with alternating rows of stone and brick, and window arches and minaret were built with brick material. There is a minaret on the northeast side of the main prayer hall. The minaret was rebuilt after the earthquake in 1921 [26, 59]. The mosque was restored in 1914 and in 1990, and its late comers’ portico on the north side was replaced with concrete two-story addition in 1972 repairs [28, 56] (**Figures 16 and 17**). Today, this front side addition is used for women’s prayer area and for religious education of the children, but the original function of the main building is still continued. Its basement floor is allocated for wet spaces and water depot. The material used for the new addition—concrete columns and beams—is incompatible with the original building and also incompatible in terms of historic preservation rules. In addition, neither its massing and location nor its material is size respectful to the old building,

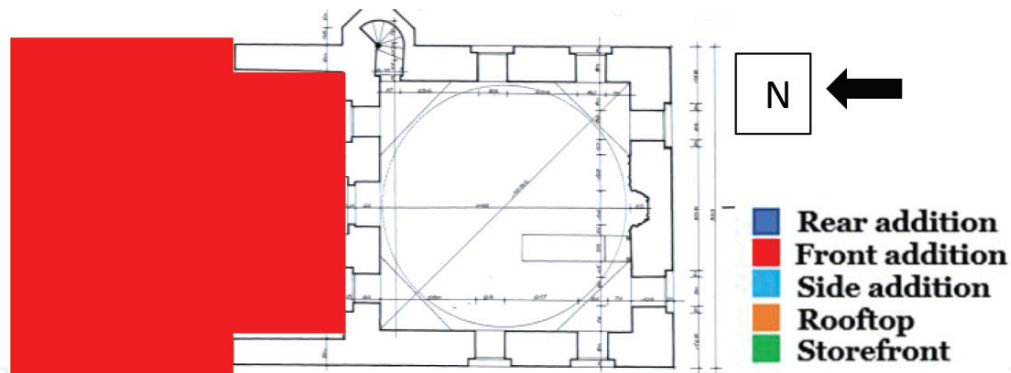


Figure 17.
Front addition in Kursunlu mosque located on the north side of the historic building (source: Rearranged from [56]).

and in that, the perception of old building is blocked from its north façade. Although, international guidelines suggest the control of mass, proportion, volume, material, color, and placing of new additions, in Kursunlu Mosque, and none of these criteria are observable.

3.3 Evaluation of case studies in terms of their new additions and their compatibility with the international preservation guidelines

As Torres (p. 6) states, in order to better evaluate the cohesiveness between historic buildings and their new additions, first, one has to clarify the methods of evaluation [6]. In order to establish an evaluation criteria and analysis method of compatibility of new additions, in their research, Yüceer and İpekoğlu (pp. 419–425) determined the architectural characteristics including “environment and setting, the site, the mass, and the facade order”, and values of historic building before and after its new additions [9]. Mısırlısoy’s (pp. 207–214) evaluation method, on the other hand, is based on the international guidelines [10]. Similarly, in this research, Mısırlısoy’s (p. 213) evaluation chart has been developed more, and the five case studies of this research have been evaluated in terms of the type, approach, and compatibility of their new additions with the international conservation charters, standards, and guidelines on new additions to historic buildings that have been outlined in part two of this chapter. In this study, according to those international guidelines, total 11 subtitles have been determined as shown in **Table 1**. Then, the case studies have been assessed whether their contemporary additions meet or avoid a full level of cohesiveness with the old building according to those subtitles. In addition to the determination of evaluation criterion based on the international guidelines, archival and historical research, as well as field surveys constituted the other research methods. Among the five case studies, Çengel Khan, Hacı Bayram-ı Veli Mosque, and Kursunlu Mosque have front additions; Çengel Khan, Çukur Khan, and Zağfiran Khan have rooftop additions; Çengel Khan and Çukur Khan also have storefront additions; Hacı Bayram-ı Veli Mosque and Zağfiran Khan have side additions; Çengel Khan has a rear, and Hacı Bayram-ı Veli Mosque has a basement addition. Although in Çengel Khan, four different types of new additions—front, rear, rooftop, and storefront—are observable, in Kursunlu Mosque, only the front addition was applied (**Table 1**). In all cases, either the standard or contrasting design approaches were used, or for the compatible contrasting cases, new and modern materials such as steel and glass were incorporated. Regarding the cases which have rear, front, or side additions, the new attachments either maintain the same

Name and no of case study buildings	Case study buildings				
	Compatible		Incompatible		
	Compatibility of case study buildings				
1-Cengel Khan, 2-Cukur Khan, 3-Zağfiran, Khan, 4-Hacı Bayram-ı Veli Mosque, and 5-Kursunlu Mosque	1	2	3	4	5
Types of exterior additions: front (a), rear (b), side (c), basement (d), rooftop (e), and storefront (f)	a, b, e, f	e, f	c, e	a, c, d	a
Approaches in new additions: Contrasting (C), Standard (S), Identical (I)	a-(C), b-(C), e-(C) f-(S)	e-(C) f-(S)	c-(C) e-(C)	a-(S), c-(S) d-(C)	a-(C)
1-New additions preserve and respect the character and integrity of historic building	√	√	√	x	x
2- Reversible new additions	√	√	√, x	x	x
3- New additions can be differentiated form the old to preserve its character, by taking its design cues from, but not copy the historic building.	√	√	√	√, x	√, x
4- New additions can be compatible with the old with volume/mass, form, size, scale, color, texture, surface articulation, and material	√	√	√	√, x	x
5- Placement or location of new additions are carefully considered	√	√	√, x	x	x
6- New additions are simple and unobtrusive	√	√	√, x	x	x
7- New additions have less impact and are not highly visible from the public, and subordinate the historic building in size & design	√	√	√, x	x	x
8- New additions do not include imitations that falsify the public right of way	√	√	√	x	√
9- New additions are respectful and in harmony with the close neighborhood	√	√	√	√, x	x
10- New addition preserve the historic building's form/ envelope, significant materials and features	√	√	√	x	x
11- Rooftop additions are not much visible, have less impact, and inconspicuous when viewed from surrounding streets	√	√	√	—	—

Table 1.
An evaluation of case studies in terms of their new additions and their compatibility with the international preservation standards, charters, and guidelines.

height or less than the original building height, and general forms of the additions are rectangular cubes.

When evaluated according to the subtitles determined in **Table 1**, in terms of international standards, new additions in Çengel Khan and Çukur a Khan are the most compatible cases, and Zağfiran Khan similarly exemplifies a compatible case with their respectful design approaches both with the old building and with the neighborhood as well. On the other hand, Kursunlu Mosque and Hacı Bayram-ı Veli Mosque fulfill only two or three steps among the 11 subtitles, and thus have been categorized as incompatible cases. Their huge front additions, neither respect to the massing nor to the scale and proportion of the old building, at the same time

dominate the historic fabric. In Kursunlu Mosque, the concrete attachment on the north side is also incompatible in terms of material selection.

4. Contributions of cases to sustainable development and rehabilitation of the building and the nearby built environment

Expanding damage to historic buildings because of natural changes, disasters, social, economic, cultural, and even political transformations, as well as the growth of the functional requirements and user expectations make the rehabilitation of old buildings in the form of new additions and adaptive reuse critical [35]. Thus, as Torres (p. 6) states, by reusing existing buildings, it becomes both possible to preserve the history and natural resources as well, by providing historic, economic, and sustainable contribution [6]. Kóródy and Vukoszávlyev, also, emphasize the importance of building rehabilitations in environmental, economic, and social responsibility, such that with their fewer new additions, and without demolition, rehabilitation projects both save energy, improve functional use, and “contribute to the local community’s consciousness” [14]. Similarly, The Declaration of Amsterdam (1975) states that rehabilitation of old monuments is less costly than new construction and “social costs” are to be taken into account while deciding which one to choose [45].” Yüceer (p. 90) explains the economic value as “the potential of building for the satisfaction of maintenance expenses and for extra income with the financial gain in its present situation [8].”

When our cases are evaluated in that context, Cengel Khan, Cukur Khan, and Zağfiran Khan clearly exhibit economic, environmental, and social value with their new compatible additions and income generating new functions. Adaptation of those former khan buildings to museums and a boutique hotel with shops, café, and restaurant facilities increased the financial value of the buildings, and at the same time, both initiated a fine socio-cultural precinct in this part of Ulus district and brought new job opportunities back to this once intensively used buildings. Those cases, with their new use also demonstrate the importance of functional change and need for modernization for sustainability, as well as reveal the role of heritage conservation in urban revitalization. Such that they became important meeting and visiting points in the area attracting both local and international tourists, thus positively increased the quality of the vicinity and contributed to the economic, cultural, and social development of the local community.

Among the five case study buildings of this research, Hacı Bayram-ı Veli Mosque and Kursunlu Mosque still survive their functional continuity, though found incompatible according to international standards in terms of their new additions. Cengel Khan, Cukur Khan, and Zağfiran Khan were given a new function in order to meet the requirements of contemporary conditions with new exterior additions and interior alterations. In all cases, they positively contribute to the historical continuity and thus to the sustainability of heritage buildings, and urban fabric since they are still alive and can be transferred to next generations. Especially the compatible cases demonstrate that adaptive reuse of historic buildings can make them sustainable places linking the past with the present, as well as preserving their historic character. Also, considering the construction waste and cost, adaptation of historic buildings into new uses or retaining their original uses is also important in terms of economic and environmental point of view [61]. In all cases of this research, since they are still used in their original function or with their new functions by the attachment of new additions, instead of constructing new ones, construction wastes are reduced, and sustainability is increased. In addition, escalator, elevator, and handicapped lift attachments during their rehabilitations gave

way to accessibility of physically disabled as part of social responsibility of sustainability. Hence, the cases presented in this research justify the importance of compatible new additions and adaptive reuse and at the same time, exemplify their contributions to sustainable development.

5. Discussion and conclusion

This research aimed to reveal the quality, compatibility, and/or incompatibility of contemporary new additions and their contributions to sustainability in five case study historic buildings in Ankara, Ulus district. In those cases, it has been determined that either standard or contrasting approaches have been used for the new additions. Compatible case study examples showed that thanks to those new additions and adaptive reuse treatments, and it became possible to contribute to the cultural, social, functional, and economic survivability of the historic buildings. But, it should be noted that since the human needs are consistent and unlimited, it is still possible that those buildings may be subjected to new additions in time that might cause to overwhelm the original building. In those circumstances, it should be strictly avoided to make again new additions to historic buildings. For instance, in Hacı Bayram-ı Veli Mosque and Kursunlu Mosque, it might have been a better solution to direct the users of the mosques to nearby ones, which are quite near to those buildings, during the prayer times, instead of constructing incompatible, overwhelming new additions. As Yüceer (p. 110) mentions, although refunctioning of historic buildings with new additions have some economic and functional gains, may at the same time cause lost “in the cultural, contextual and authentic values” in old buildings [8]. Hence, though new additions are required for sustainable development, the borders of new additions are to be determined thoroughly, and during their applications, both national and international standards and guidelines are to be obeyed strictly. Yet, when the local guidelines are examined, it is understood that, in terms of new additions, they are formulated at a general level, without direct information on types, possible approaches, and conditions of new additions, instead emphasizing that at specific situations, Conservation Boards are authorized and shall make a decision. In this research, especially the incompatible cases showed that, during the applications of new additions, international standards were not followed.

As future suggestions, this research can be a starting point for the evaluation of other historic buildings in Turkey with new additions, and it might give an insight for the new additions planned to be built to existing built heritage in the near future. It is also suggested to develop general local guidelines and standards on the issue, as the future suggestion. It is thought that increase in fieldworks by examining much more examples with new additions to historic buildings will contribute both to development of the local general guidelines and evaluation of their contributions to sustainability.

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