



Documentation and Sustainability of Construction Techniques for the Protection of Cultural Heritage: Kitchen Hearths and Chimneys in Traditional Diyarbakır Houses

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ABSTRACT

This article analyses the construction techniques of the kitchen hearths (fireplaces) and chimneys in the kitchens of traditional Diyarbakır (Turkey) houses. The first part of the study examines the historical development of kitchens. The second part investigates the architectural features of the kitchens of traditional Diyarbakır houses and the construction techniques and smoke evacuation methods of the hearths and chimneys in these kitchens. For this purpose, the hearths and chimneys of traditional kitchens, which are still used in their original form, and those of the demolished houses have been examined. They all have been documented by drawings and photographs. This study aims to contribute to the documentation and sustainability of cultural heritage and traditional construction techniques, and to guide the restoration practices that will be carried out in Suriçi.

Introduction

Throughout history, fire and hearths that were used for both heating and cooking have been treated as the crucial elements of living spaces in all civilizations [1]. While in single-spaced houses, people made use of the fire burning in the middle of the space to cook, with the increase of the number of spaces, kitchens were designed as private spaces for the fire [2]. Designed as cooking and storage spaces, kitchens are one of the most important places that shape the architectural plans of traditional houses. The hearths and chimneys of the kitchens in traditional Diyarbakır (Turkey) houses are important building parts that have survived to the present day.

The kitchens in traditional Diyarbakır houses have completely lost their past functional characteristics, and today they have been adapted in their layouts and interior equipment to meet the changing comfort standards. Due to

the use of gas stoves and electric ovens for cooking today, the original hearths have been walled-up or have become out of use. Since the hearths were not used, the smoke chimneys have not been maintained. Today, there are only a few hearths and chimneys that preserve their original form and continue to be used.

Although there are many publications on the architectural features of the traditional houses in Diyarbakır, which is an important historical city of South-eastern Anatolia [3-11], the construction techniques of hearths and chimneys of these houses have not been studied properly. The demolition of most of the houses and the decrease in the number of stonemasons who knew traditional construction techniques have resulted with the loss of the information on these building parts which have not been studied and documented sufficiently. This article aims to fill this gap in the literature. In the first part of the study, the historical development of kitchens and the architecture of the

kitchens in traditional houses in South-eastern Anatolia are explained. In the second part, the locations, materials, construction techniques and dimensions of the hearths and chimneys and the construction and smoke evacuation techniques of the chimneys in the kitchens of traditional Diyarbakır houses have been investigated. The information gathered have been documented with photographs and drawings.

Historical development of the kitchen in Anatolia and kitchens in the Southeastern Anatolia

The word "mutfak" in Turkish is derived from the word "matbah" in Arabic. The word "matbah", which derives from the Arabic verb tabh (to cook), means the place where food is cooked [12]. The Turks gave the kitchen names such as "aşevi, aş damı, aş ocağı, aşlık." The kitchen was either built outside the house or as a room downstairs adjacent to the main building but with an independent door. There has usually been a cellar near the kitchen [13].

The history of the kitchen has been largely linked to the development of heat sources [1]. Hearths and cooking spaces have been identified in the Neolithic settlements of Anatolia, such as Çatalhöyük. In the Bronze Age, there was a hearth in the middle of the megaron, which was composed of a single space incorporating both cooking and living functions. There were separate cooking places in Anatolian houses during also the Hittite and Urartu periods [14].

In ancient Greece, in addition to cooking, the kitchen was used as a gathering and living space. In the classical Roman and Byzantine houses, the kitchen was treated as an important place. In the Roman period, it became one of the sections next to the great hall. In some of the Mesopotamian cultures, on the other hand, the kitchen was built underground. It was ventilated and received light through a window opened from the ceiling [2].

In the Seljuk houses, cooking was done with the help of a hearth or tandoor in the kitchen. In Anatolian Seljuk houses, kitchens were on the ground floor of the houses or in one of the corners of the *sofa* [14].

The tents of some Turkmen communities, who continued their traditional lives in Anatolia, had a hearth called "fireplace" or "korluk" in the middle. These were generally used for heating but sometimes also for cooking [15]. The top of the tent was open above the stove and when the furnace was not in use, this part was covered with felt.

Thus, the smoke from the fire burning in the stove was allowed to get out and fresh air was let inside [16].

The tripod and the cauldron on the hearth, which was on during the whole day, were the two most important fittings of the tent. Mattresses were placed on both sides of the stove at night, and in the morning they were collected and stored in the closet [17]. There was also a simple "U" shaped stone hearth outside that was designed to be used when the weather conditions were suitable. Food preparation and cooking actions were also performed here [15].

For Turks, the fire / hearth was sacred. It had to survive. Because of this importance, it was used synonymously with the family (ocak) [16]. To wish for the continuity of the fire in the hearth to burn and of the chimney to smoke have been expressions of good will for a long time. In Anatolia, the fire in the hearth was covered with ash to be maintained until the morning. This fire was easily ignited again in the morning.

In the hearths, there were stone bases on which cauldrons and pots of different sizes were placed and there were chains for hanging the cauldrons. Wood and dung were used as energy sources in the hearths and tandoori [14].

When settlements replaced tents, the hearth that was located in the centre of the inner space of the tent, had not lost its importance and sanctity. It has been pushed sideways and placed into the wall [17, 18].

In different regions of Anatolia, as a result of cultural and geographical factors, different types of kitchens have been designed [14]. Kitchens were generally detached from the main building but were in direct contact with the courtyard or garden. Kitchens that were attached to the main building, were placed in the lower floors of the house in order to be able to be placed close to the courtyard and also to prevent the smell of the food access to the rooms.

Similar features are found also in the traditional residential kitchens in the other cities of South-eastern Anatolia Region, such as Gaziantep, Mardin, and Urfa.

In the traditional **Gaziantep** houses, the kitchens, that are called "ocaklık", are located either in the ground floor or on the opposite side of the house, in the garden. Since food is cooked by the fire made by using wood or coal, kitchens are preferred to be located far from the living quarters. There are hearths of different sizes in these "ocaklık", depending on the economic power of the owners. These hearths, which are made of stone, are 40-50 cm above the

ground. In traditional Gaziantep houses, the “ocak” part which is the zone for cooking, is large enough to accommodate three different sized copper cauldrons. The size of the ventilation hood above the stove is the same as the area these copper pots take up when they are brought side by side [19] (Figure 1).

The kitchen, which is also called "tandırılık" in traditional **Urfa** houses, is located in the harem part of the house. The kitchens are vaulted and their front part opens to the courtyard with an arch. In this space, there are one or more stone hearths which are 20 cm high from the floor and in which large cauldrons can fit. The tradition of having so many guests resulted with the building of large kitchens with 7-8 hearths. These hearths are connected to a single chimney on the roof. Over time, the arch opening to the courtyard was walled up. Alternating stones of the arch have been removed to provide air flow [20-21] (Figure 2).



Figure 1. Kitchen fittings in a Gaziantep house [22]



Figure 2. Kitchen fittings in an Urfa house [23]

In the traditional **Mardin** houses, the kitchens are usually in the ground floor. Their sizes vary according to the size of the house. The central and large kitchens in the ground floors were later replaced by small kitchens in the upstairs.

Dimensions vary in proportion to the size of the house. Simple U-shaped hearths made of stone are found in almost all kitchens [24] (Figure 3).

Kitchens in traditional **Diyarbakır** houses show formal similarities with kitchens in Mardin, Urfa and Gaziantep. The kitchens in Diyarbakır houses differ from the others by the material and design of their hearths and chimneys (Figure 4).

Some traditional houses that have been re-functioned [25, 26] as ethnography museums are aimed to introduce the traditional culinary culture to new generations. (Figure 1-2, 4-5)



Figure 3. Kitchen hearth in Mardin house



Figure 4. Kitchen fittings in a Diyarbakır house

Kitchens in traditional Diyarbakır houses

Traditional Diyarbakır houses are embodiment of hundreds of years of experience in terms of design strategy and construction techniques [5] (Figure 5). Kitchens are the places where cooking takes place. In houses with parts divided as harem and selamlık, the kitchen is located in the harem section. Kitchen sizes vary according to the size of

traditional houses and the population of the families. As it is the case also in the rooms, the length of the timber beam which was used to cover the space was crucial in determining the size of the space. Kitchen sizes are larger in the houses where larger families live.



Figure 5. A traditional kitchen

Kitchens are usually located in the winter section of the house. Since the arched façade of the kitchen facing the courtyard is usually oriented towards the south, the kitchen is a warm space as a result of the sunshine starting from early in the morning on cold winter days and because of the hearth that was on whole day. There are also kitchens that faced east or west. Few kitchens were oriented north (Figure 6). Since the south wing, which is the summer wing of the house, is preserved for living spaces such as iwans and rooms, the service elements such as the kitchen are mostly located in the other wings of the courtyard.

The kitchens are usually in the form of a small iwan with a single arch opening to the courtyard. Its most distinctive feature is the segmental arch on its front. The height of the arch of the kitchen is less than the height of the arches of the iwan. The difference between the arches of the iwan and the kitchen are easily visible on the façade [4] (Figure 7). In a few houses, the upper part of the arch of the kitchen is covered with a wooden grill. In the later period, measures have been taken against the cold by installing doors in the arches of some of the kitchens [11]. In some of the houses,

the front side of the kitchens facing the courtyard is walled up and the ventilation is done through a small window or a door instead of an arch (Figure 8c).

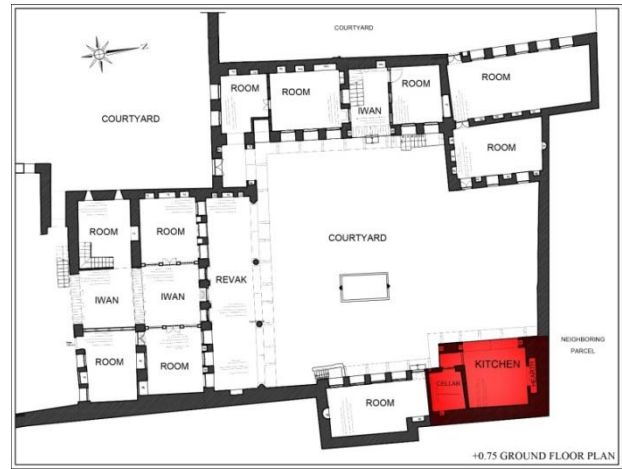


Figure 6. Traditional Diyarbakır house, Tigrel Konağı (Tigrel Mansion), Harem section



Figure 7. A rare example where the kitchen and the iwan are on the same side [4]

The floors of the kitchens are stone paved. In a few houses, the ground is rammed earth. Since levels of the floors of the courtyard and the kitchen are usually the same, it is difficult to open windows to the cellars which are under ground. That is why, finding cellars built under the kitchens is rare. In some houses, small cellars are adjacent to the kitchen. The upper structures of the kitchens are carried with straight timber beams. There is no water supply in the kitchens, but there are few examples with a well. The water was usually supplied from the wells in the courtyard. There are niches on the kitchen walls (Figures 8 and 9).

Kitchens have either a single hearth or two hearths. In large and crowded houses, there were two stoves in the kitchen due to necessity (Figures 8, 9).

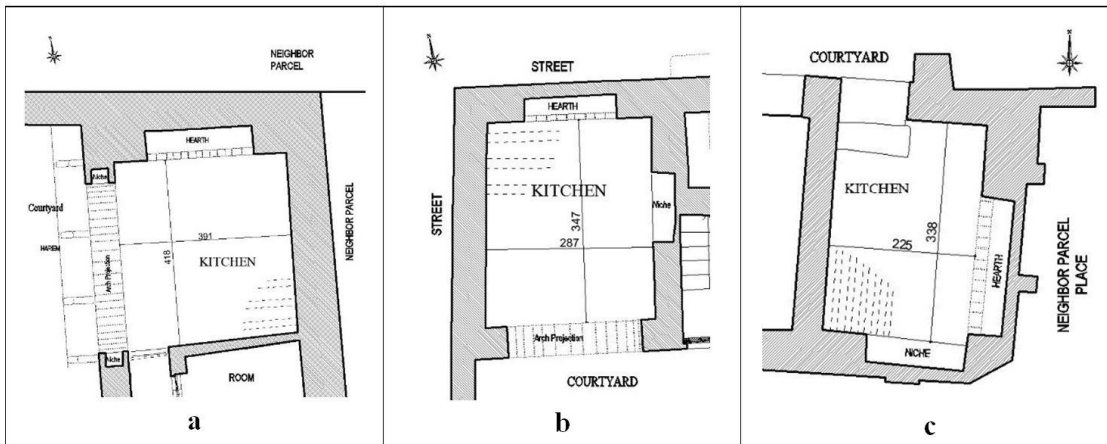


Figure 8. Kitchens with a single hearth

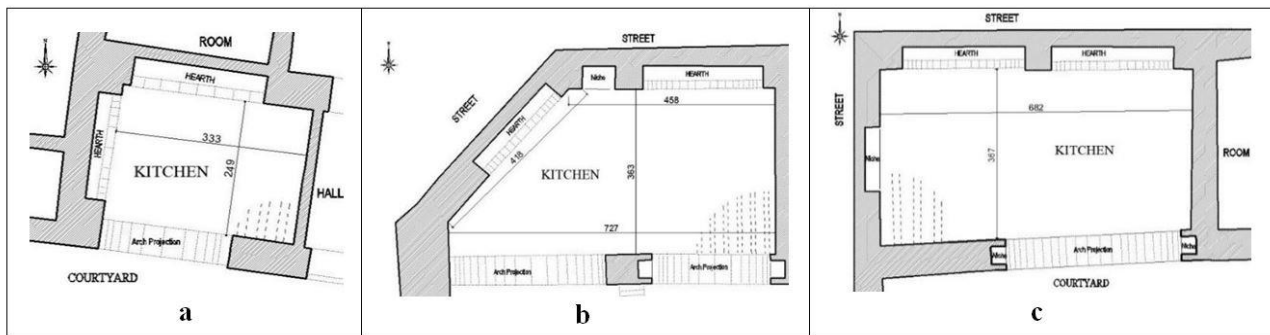


Figure 9. Kitchens with two hearths

Hearths

Since there were no heating systems in the rooms of traditional Diyarbakır houses, there was a hearth only in the kitchen. Since the number and size of the hearths varied according to the needs of the house, some large houses and mansions had more than one hearth. Hearths were used for baking and cooking, as well as heating water for washing laundry or bathing.

The hearth could be located either on the wall adjacent to the neighbouring house, on the partition wall that the kitchen shared with the room next to it, or on the wall facing the street. The width of the cooking area of the hearths varied between 90-280 cm. Large hearths were divided into sections of 30-45 cm width by partition stones in order to be able to put more than one pots side by side. Large pots were placed directly on the stones, whereas smaller pots were placed on mobile independent iron grids for cooking. The partition stones of some of hearths have been removed since they were not used any more (Figure 10-11).

The stoves were lit with firewood, and the wood burning under the hearth was mixed with the help of a small iron shovel until it turned into hot aisle. The firewood used for burning the fire in the stove was stacked on top of each other under the stairs or in a less used part of the cellar. When needed, they were brought in the kitchen from there [27].

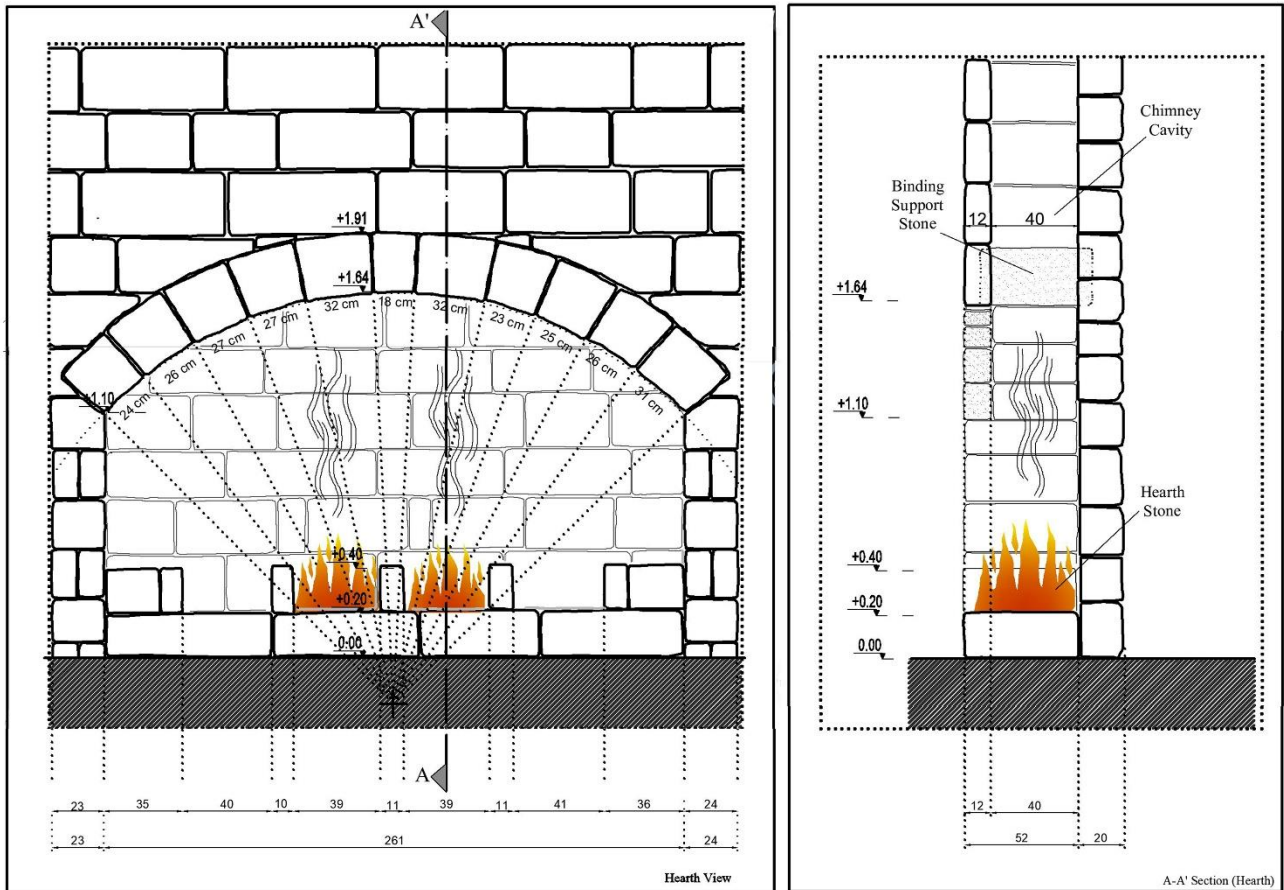


Figure 10. An elevation and section drawing of a hearth in a traditional house



Figure 11. Hearths in traditional houses

Chimneys

In traditional Diyarbakır houses, chimneys are located in the centre of the hearth. They were used to extract the smoke created by the burning fire and to discharge it to the outside. They are voids, surrounded by stone walls that continue along the wall behind them. Their bottom part is wide, whereas they get narrower at the top. Their main construction material is basalt.

The dimensions of the lower parts of the chimneys are approximately 80-280 cm x 40-45 cm, and of the upper narrow part on the roof are 25-30 cm x 40-45 cm. Thus, the chimneys started with a wide section and got narrower as they went up to the roof. The chimney of a kitchen located in the ground floor of a house was unearthed during its restoration. The chimney could be examined in detail as the roof had collapsed. The shaft of the chimney was measured as 28x45 cm on the roof. The walls of the chimney were made of basalt (Figure 12, 13). The width of the chimneys that come out of the side wall vary.



Figure 12. An original chimney detail of a destroyed house



Figure 13. A view from inside the chimney

The parts of the kitchen chimneys which are above the level of the earthen roof have a wooden frame which are plastered over with mud. This part is also called “*tütünlük*” (Figure 14) [9].

A common detail in all the examined chimneys was the “binding support stone”. Binding support stones (*atki taşı*) are usually placed just behind the keystone of the arch of the hearth. Their thickness is between 4-6 cm and their width is the same with the width of the chimney. It serves as an important structural element in order to keep the chimney cavity stable and to connect the two walls horizontally (Figure 15). There are also examples where the binder support stones are not just behind the keystone, but are designed to the right and left of the centre. There are examples where they are placed at equal distances to the centre on both sides.

Smoke evacuation techniques of chimneys vary according to the location of the kitchen. Two different techniques can be seen in these houses:

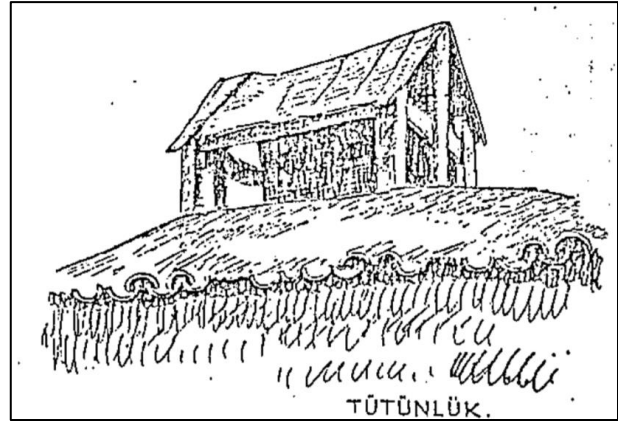


Figure 14. The drawing of the original cover of a chimney of a traditional Diyarbakır house, which is called “*tütünlük*” [9]



Figure 15. Binding support stone

- If the hearth is on the wall facing the street, smoke is evacuated from the street wall with small wall gaps located side by side or with pipes of 10-20 cm in diameter. These windows or pipes serve as chimneys. At the end of the chimney shaft, holes were opened to change the direction of the smoke and get it evacuated towards the street (Figures 16, 17, 18).

- If the hearth is located on the wall of the kitchen adjacent to the neighbouring house or on the wall adjacent to any other room of the house, the smoke is evacuated from the roof (Figures 16, 17).

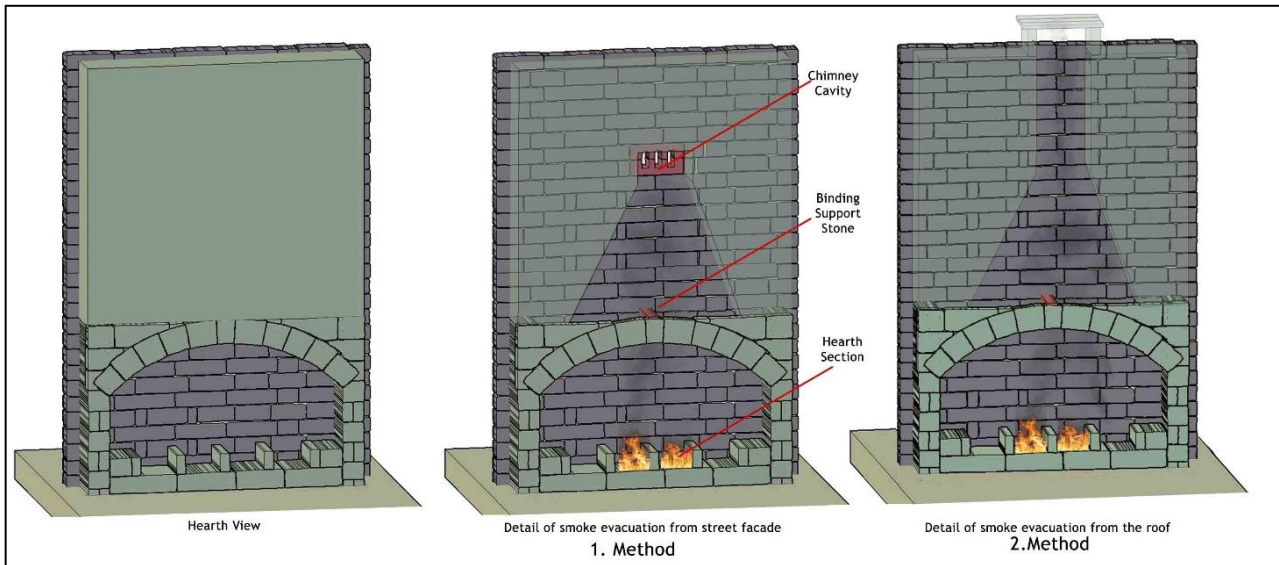


Figure 16. Three dimensional visual representation of hearths and chimneys

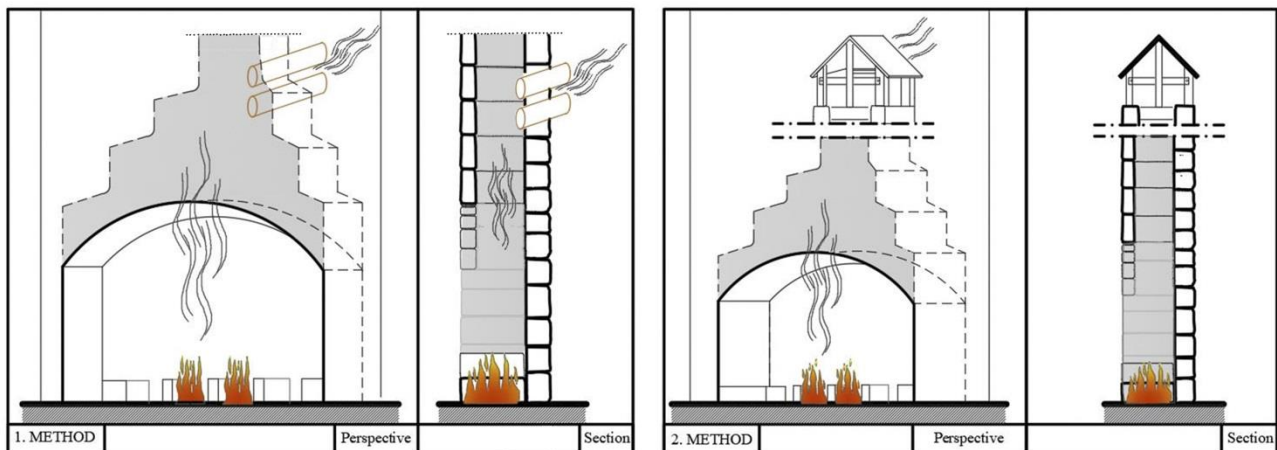


Figure17. Evacuation of the smoke (1. Method: from the street wall, 2. Method: from the roof)

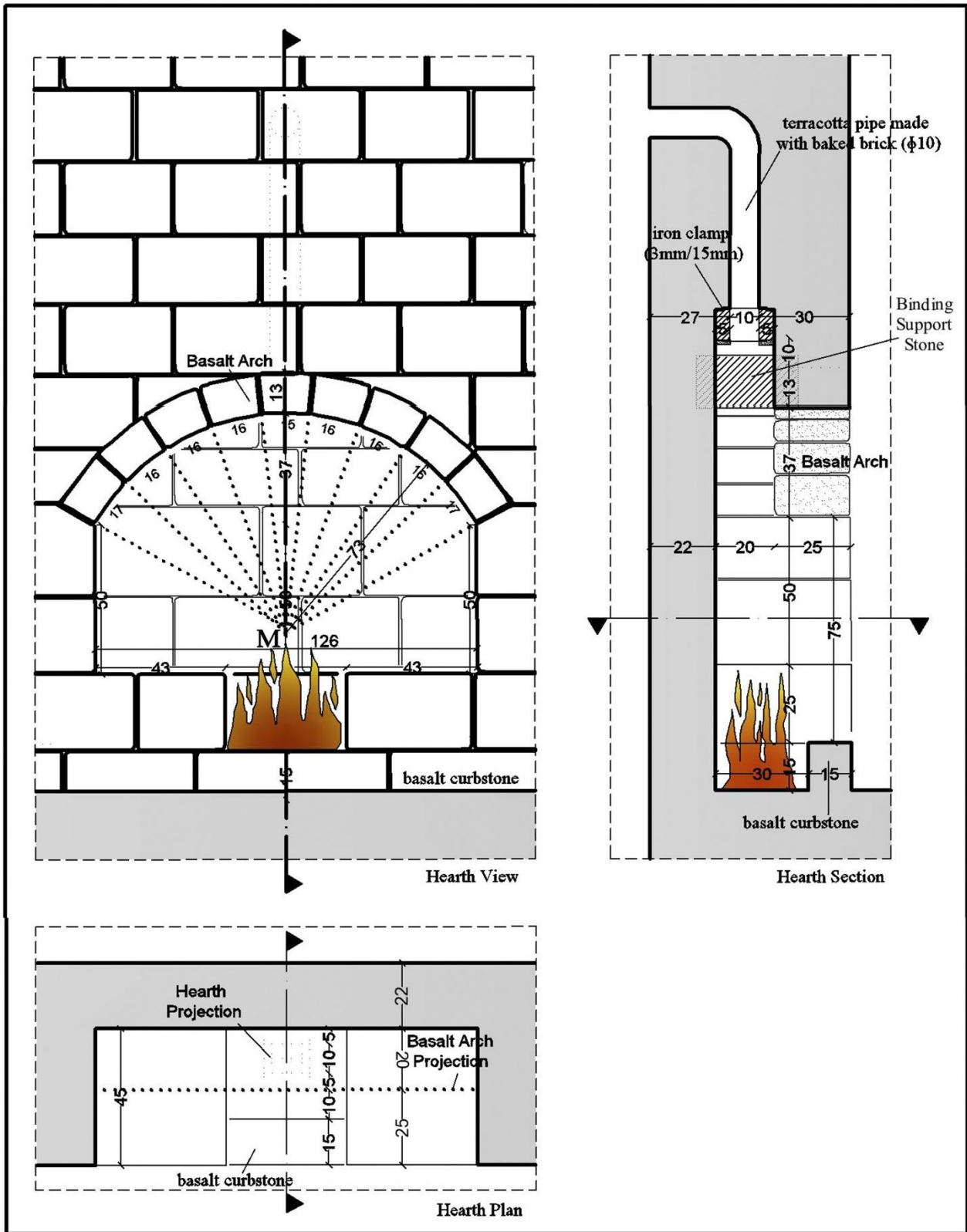


Figure18. Detail of the evacuation of the smoke from the street wall by pipes

Chimneys directed to the street façades of the houses were opened at the closest possible distance to the fire source. In many houses, smoke is evacuated from the wall of the kitchen facing the street, also as a solution that partly prevents the rainwater from entering the house. Erginbaş [5] stated that this method was used in some houses because of taking into the consideration of the fact that the roof soil could not be squeezed well in the sides of the chimney and as a result, the ceiling leaked.

Every small opening that can be seen on the street façades of the houses should not be considered as chimneys. Many of these small openings are made for the ventilation of spaces such as toilets, cellars and depots. Although they look similar to the chimneys, there is generally blackening around the chimneys (Figure 19).

In both methods, the wall with the chimney openings is made thicker than the other walls of the house. In this way, the fire resistance of the chimneys was preserved for many years.



Figure 19. Examples of chimneys that evacuate smoke from the street facade

Conclusion

In this study, the building elements that make up the kitchen were examined in order to preserve the traditional culture and transfer it to future generations. Traditional construction techniques of hearths and chimneys have been documented. The findings of the research are important because it is the first study conducted in this field and it enables the reinterpretation of the collected information in relation to the technological developments. Sustainability can be achieved by the documentation of traditional construction details, interpreting them in today's conditions and making them used in restorations and new architectural designs. We hope that the information gathered in this study would be used in the restorations that are planned to be undertaken in Diyarbakır Suriçi and that these results would assist in making intervention decisions in accordance with the original characteristics of the houses. We also hope that this study would provide data to those who will work further on this subject.

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