

Analysis of Interior Space of a Room in a Traditional Turkish House with respect to Construction Material and Application Techniques: Safranbolu Region House

Deniz Demirarslan¹,

¹(*Interior Architecture Department, Architecture and Design Faculty, Kocaeli University, Turkey*)
Corresponding Author: Deniz Demirarslan

Abstract: The formation of traditional Turkish house which occupies a significant position due to its architectural and cultural features expands from interior to exterior space. The basic planning unit of this house is room. Upper floor which is formed with the merging of rooms is the main living space. That is why the room is the key in planning traditional Turkish house. Outer shell of the house is the outside reflection of interior space. Although the kind of constructional materials used in interior space of house changes with respect to regions, still the general planning principles of the room remain unchanged. Furthermore, application methods of construction materials are also the same in each region and these application methods constitute material application methods of civil Turkish architecture. It is possible to obtain information on both the formation of traditional Turkish house and construction material in Turkish civil architecture by analyzing construction materials and application methods within interior spaces of room. In present study, construction materials and application methods employed in Safranbolu region houses bearing all the characteristics of traditional Turkish house have been analyzed. In the end, the kind of construction materials employed in the structuring of traditional Turkish house and characteristics of application methods, the motives for selecting such methods and their impacts on space design have been detected.

Keywords: Application technique, construction material, interior space, Safranbolu, traditional Turkish house

Date of Submission: 25-10-2017

Date of acceptance: 08-11-2017

I. INTRODUCTION

In design, material is the element forming structure and enabling the design to reach a certain form. Construction material is defined as the kind of items within the body of a design, enabling the formation of this design in its emergence and application process as well as arranging the health and comfort standards of the design user [1]. It is only possible to turn a piece of work into a monument by transferring it to next generations. A durable structure can be formed only by selecting and applying proper construction materials. Once the material affecting the design is used in structure appropriately, it turns into traditional application forms in time. To illustrate; traditional designs which can be observed in the urban tissues of certain regions that reflect their particular characteristics have emerged in this manner. Besides, based on its objective, a structure is expected to meet all kinds of needs required by its dwellers. The most critical factor at this point is the conscious use of materials according to their specifications. Having an idea about the behaviors material perform against certain physical, mechanical, chemical and parallel events means forming the proper construction and application standards. That consciousness allows the durability and economy of structures. Therefore in architectural constructions with monumental features, a sustainable approach is surfaced. An analysis of the construction material use and application methods particularly in architectural structures with monumental features shall be helped in the conservation practices of such structures. Additionally, setting traditional standards in selecting material for construction design shall also put light to modern designs.

Within that scope, traditional Turkish house is a significant example for analyzing the use of construction material on monument structures. Traditional Turkish house which is amongst the most essential elements in Turkish civil architecture is a house type expanding over a vast geography and possessing vital architectural and cultural values. The main unit in the planning of this house is the room which is made up of various design components. The materials used in the structuring of design components forming the room as well as a majority of application techniques have also been applied in the structuring of building since traditional Turkish house is a structure expanding from inside to outside. By analyzing physical characteristics of the construction materials forming the room of this house, application techniques and the effects gained by

these materials to space it is possible to have information about the materials used in the structuring of traditional Turkish house, their construction methods and design specifications. Besides, since all of the construction techniques applied in the interior space of this room belong to Ottoman age Turkish civil architecture, it also becomes possible to obtain data concerning Ottoman age Turkish civil architecture.

II. RESEARCH OBJECTIVE AND METHOD

The objective of present research is to analyze design features of the room which constitute the design base of traditional Turkish house as well as construction materials and application techniques that are in actuality the foremost components of design and yet not have been analyzed in detail so far. The main scope of present research is structured on briefly introducing the characteristics of the applied construction materials and focusing on the physical effects they gained to the design of room hence describing this house in terms of its structure and close surrounding.

The scope of current study has been established as Safranbolu region houses where today approximately 2000 traditional houses remain untouched. Safranbolu region houses possess all the characteristics of traditional Turkish house, reflect the geographical, economical and social structure of the region in the best way on houses, make use of characteristics belonging to room interior space and they are rather rich samples in terms of the construction materials and application techniques. To that end, the analysis has been based on the finest selections of Safranbolu city center houses and Safranbolu Juruk village houses in terms of construction materials and application methods. Amongst Safranbolu city center houses Emirhocazade Ahmet Bey House, Mektepçiler House, Kaymakamlar House, Kileciler House, Mümtazlar House and amongst Juruk ("Yörük" in Turkish language) village houses Sipahioğlu Mansion and Sucu Hafız Mansion have been the samples analyzed. All these samples belong to the ends of 18th century and 19th century. In the first stage of research, written research analysis has been conducted and in the second stage, by performing on-site observations on the selected samples, they have been visually documented. The best sample of each application technique amongst the analyzed houses has been visually presented in the article. At the end of the research and analyses the main setup of research has been detected as describing traditional Turkish house, analyzing general characteristics of Safranbolu region houses, specifying the general characteristics of room in those houses and examining construction materials and application techniques employed in the constituents of room. In present research, general features of the application materials have been mentioned and analyzed with respect to its relation with material application technique. As a conclusion, some information has been given about through which methods construction materials were used on the components of room and by detecting the features of these methods, some data related to the material use in traditional Turkish house have been rendered.

III. GENERAL CHARACTERISTICS OF TRADITIONAL TURKISH HOUSE

Parallel to the expansion and growth of Ottoman Empire, around Anatolia, Balkans and Caucasia, a new traditional house type known as "Turkish House" reflecting Anatolian, Islamic and Turkish cultures has emerged. Formal properties and development of this house was for the first time put forward by Sedad Hakkı Eldem in his survey and restitution studies [2]. Turkish house which intrigued and inspired architects like Le Corbusier and Frank Lloyd Wright showed a gradual progress starting from the 15th century, became widespread during 17th and 18th centuries and in the 19th century, it developed under the influence of Western architecture. In the planning of this house, climate and geographical features played roles whereas in the interior space, multi-functional design of spaces and interior furniture, family structure, tradition and customs have been influential elements. In both planning and reflection of space-shaping elements on house, construction materials and application techniques are significant elements. It is true that construction materials vary with respect to the region and climatic conditions of site area but still in each region, the criteria to focus on in the selection of material and application method are the same. Easy access, simple workability and application, access to the proper detail analyses, economy and suitability to climatic conditions constitute the criteria for selecting material and application technique. There are two essential plan elements constituting traditional Turkish house. The first one is the room which is the core of house and the second one is the space namely "sofa" (hall) joining these rooms. According to the position of sofas between rooms, these houses vary in plans as houses with exterior sofa, interior sofa, central sofa and without sofa. The balconies and bays on façade are the most significant attributions of these houses. There is symmetry in plan, façade and interior space. Of these houses which are mostly structured as 2-storey, ground floor includes service spaces and upper floor encloses rooms and sofas where daily life is spent. It is rather hard to see a window on ground floor on privacy grounds. Each house owns a private yard.

IV. GENERAL CHARACTERISTICS OF SAFRANBOLU REGION AND SAFRANBOLU REGION HOUSES

Safranbolu is an old settlement located in Western Black Sea Region of Turkey. This forested city which exhibits the characteristics of continental climate is surrounded by mountains from the north and west. Situated 12 km eastward of Safranbolu, Juruk village possesses the very same qualities as well. Since city of Safranbolu includes the finest samples of traditional Turkish houses reflecting 18th and 19th century architecture and social life, the city has been selected by UNESCO as a World Heritage city. Juruk village is a rural settlement inhabiting traditional Turkish houses all of which represent historical artifact characteristics and acclaimed as a protected site. Within the region since winters were cold while summers hot, people from upper crust built winter and summer houses separately. Throughout the region, life style, family structure, climate, local material and workmanship, cultural and material wealth has been the elements designating the size and form of houses. Since local people were mostly from entourage of Ottoman Palace, 19th century house building techniques and material selection in Istanbul were sources of inspiration. As construction materials; limestone, mud brick, tile which are easily accessible in the region and wood-since it is a forested region- were widely applied.

Of the houses which are structured in exterior and central sofa plan types within the traditional Turkish house plan type classification, ground floor is masonry and upper floor is wood carcass termed as “hımıs” (Fig. 1). Façades of some houses are covered by coating known as “lath-and-plaster”. The houses are mostly two or three-storey. Number of rooms varies from five to eight. In big mansions, there is an interim floor with a lower ceiling used in winter to heat the surrounding more comfortably. Comprising the most ostentatious rooms, upper floor which is directed towards the street with balconies, is the main living space of the house. There is also a pool in one room of some rich mansions which functions to cool the interior space in summer. Grounded on religion and tradition, in houses of the rich, there is a division as “selamlik” for men and “harem” for women. Although above-stated features are common in almost all Safranbolu region houses, there are also dissimilar and unique samples particularly with respect to construction materials used in the formation of interior space and application techniques.



Figure 1. In Safranbolu region houses ground floor is masonry and upper floor is wood carcass. In some samples façade is coated.

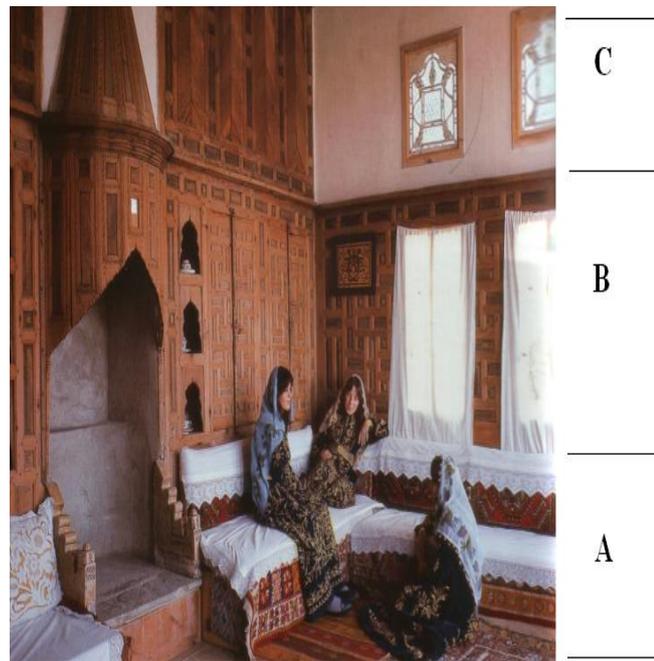


Figure 2. The room of a traditional Turkish house is shaped around divan- furnace- closet [3]. Interior space of room is vertically divided into three parts with respect to function, ergonomics and material application: A. Life surrounding, B. Accessible surrounding, C. Rarely used surrounding.

V. GENERAL CHARACTERISTICS OF THE ROOMS IN SAFRANBOLU REGION HOUSES

Multi-functionality is the common feature of all the rooms. It is possible to eat, sleep, sit, cook and bath in any room. Simplicity, economy, frugality, functionality and flexibility are the major design principles of the room. Hence in the construction of Safranbolu region houses, wood has been the most widely applied material. The prevalence of wood material is distinguishable in the interior spaces of rooms. The size of the room was determined with respect to the size of wood- main structure material of the house. Based on the length of timber, the width of room was designed as 3- 4 meters. Square-planned room of which wideness is three or four meters compared to timber length is shaped around divan- furnace- closets and the center of the room is left empty for daily activities (Fig. 2). The rooms of Safranbolu region houses are mostly composed of wooden materials which are basically shaped alongside with architectural structure. These components are space planes made up of floor, wall, ceiling, window, doors, furnace, closet, divan, separator, niche and shelves. A brief analysis of these design elements shall enlighten the topic even better.

5.1. Floor, wall and ceiling

Since inside the room all actions are performed on the ground and on a plane nearby the ground, floor and wall planes have been designed in three main parts serving the use objective (Fig.2). Accordingly, floor plane and its surrounding have been set as “life surrounding” where all daily activities are performed. On the floor which is covered with timber that is nailed on top of wooden deck girders, textile products like rug, carpet and cover have been widely used. Textile products are also helpful in providing thermal comfort. The distance from sitting level to the highest level where a standing person can reach is named as “accessible surrounding”. Storing and washing activities, furnace, window and door have been designed inside this section. As illustrated in the analyzed samples as well, it is observed that in this section the wall is coated with whitewash over a plaster termed generally as “box plaster” and the decoration is richened with wooden door closets. There are also certain samples where this section is covered by wood through a method named “kunderkari” (marquetry) (Fig. 2). In some samples, there is wall painting named “hand-carved” on plaster (Fig.13) or pargetting inside this section. The section between the upper level of window and ceiling is “rarely used surrounding”. The stores which enclose rarely used materials and ceiling windows are scattered in this section. Ceiling design too determines the social hierarchy of its user [4]. Wood is the commonly applied material in the formation of ceiling. By connecting wooden pieces with an application technique known as “citakari” (ceiling ornamentation) or via kunderkari technique, ceilings with geometric pattern have been formed (Fig. 5, Fig. 6). Widespread use of wooden material on wall and ceiling assists in setting the space in acoustic perspective. Furthermore wooden material not only provides an aesthetical view in space but physically, it also provides thermal comfort.

5.2. Furnace

Inside the room, furnace is a major design component. In the region, wooden or stone hood furnaces are common (Fig. 2, Fig. 9). Rather than aesthetical concerns, the furnaces are functioned to resolve fire and air conditioning problems, proportional to the size of space and formed in way to heat the room in the best manner. To prevent the break of fire, the ground of furnace is spreading towards the room in rectangular or circular form. Next to the furnace, there are wooden closets and niches. The hoods of some furnaces are lime plastered and there is shelf made of stone to prevent the spread of fume on the cincture of furnace to interior space. Reflecting the characteristics of Baroque style, these furnaces are called “European furnace” [3]. Adobe has also been applied in the formation of some furnaces.

5.3. Window, door and separators

In the planning of these design components, principle of privacy in life has been adopted. Entrance to the room is usually through the corner of the room [3]. Room door is framed with molding and doorstep. Room doors are mostly constructed by paneled construction. Door framework is made from pine and panel is from walnut tree. Therefore by providing color and tissue contrast a simple aesthetical approach has been developed. The unpainted, wooden door turns into reddish brown in time and creates a fine contrast with white-limed wall surface [3] (Fig. 3). In these doors which were in Ottoman architecture constructed by placing a plate inside a framework for the aim of strengthening durability, the corners of framework were fixed with strong joggles [5]. In Safranbolu region houses, mostly a wooden separator was used to secure privacy at the entrance of the room.



Figure 3. Formation of closet and door inside the room - Kileciler House.

There are numerous windows inside the room. In some houses, to lighten the room small ceiling windows are present above the windows (Fig. 2). Until the 19th century, in many houses within the region glass was missing in windows. During this glass-less period, thick paper was placed around door frame. This long-lasting paper is similar to paper material used in Japanese windows named “Shoji” [3]. As an outcome of the innovations introduced during the Period of Reforms, Ottoman society got under the influence of Western which impacted architecture as well. As a result of several trade contracts signed with Western countries, a great number of construction material was imported. In 1688 in France, following the invention of Bernard Perrot who enabled the serial production of glass plate, starting from the last quarter of 18th century in Turkish houses too, glass plated windows started to be available [6]. In some resources it is noted that window glass was imported from Austria to Ottoman market [7]. With the application of glass in windows, ceiling windows were no longer produced and ceiling height of rooms started to be lowered as well. The size of window sashes is $\frac{1}{2}$ and opens as two wings vertically and horizontally. Window frame sections are simple profiled. The windows are thoroughly wooden and in their production joggle, slot and wooden pins (trunnel) are applied (Fig. 4). To prevent the extension of opened wings inside the room space, to lower the load on hinges and due to the small size of glass, the windows are mostly of two wings. Each wing is divided in a way to enable the use of small size glass pieces [3]. Glasses are mounted on a joint towards the window without the assistance of nail and paste [5]. To refrain from weather conditions like rain and cold, windows are externally covered by wooden coats. For security purposes, wooden railings have been used on the outer frame of windows.



Figure 4. Window formation and details inside the room - Juruk village Sucu Hafiz house.

5.4. Goods

In a traditional Turkish house room, goods are fixed, immovable elements structured with the building itself. In the construction of divan, closet, niche and shelves wooden material has been commonly preferred. The width of divan is 75–105 cm and its height is 35 cm. On top of the wooden skeleton of divan, cushions filled with rice leaf are placed (Fig. 2). To allow the storing of several materials, the closets have a depth of 75–90 cm, width of 130-150 cm. and usually in plated- click-fit system with two wings (Fig. 3). Inside some closets, washing action could be performed inside a specially designed mechanism. Some niches made of wooden material create a sense of emptiness and fullness on room walls. As obvious, such design components are the elements shaping the formation of room with the structure itself.

VI. THE CHARACTERISTICS OF THE CONSTRUCTION MATERIALS USED IN ROOM COMPONENTS AND THE APPLICATION TECHNIQUES

In the interior space of a Safranbolu region room, we meet the most significant construction materials and application techniques used in traditional Turkish architecture. The dense application of wood as a construction material in rooms can be attributed to the forested nature of the region. Secondly, limestone widely abundant in the region has a significant share in the construction of rooms. Other materials and techniques have also been used. All the materials are easily accessible within the region and compatible with their own geography and climate.

6.1. Wooden material specifications and application techniques

City of Karabuk that encloses Safranbolu region is a forested area. Currently 8.669.000 m³ of all the forests here are made up of coniferous trees and 1.396.000 m³ are regular leaved trees [8]. Wooden material extracted from these forests have been used in the region on wooden carcass structures as balk, girder and pillar and they also have been applied on door and window joineries, on floor and ceiling covering, closets and roof formation. In the application of wooden material in these elements, as a necessity, wooden structure and “adze handle” module were used hence the establishment of modular system assisted the formation of an axle serial and size of the room was determined [9]. Common trees like yellow pine, black pine, white spruce, walnut and poplar have been widely used materials in the formation of room [10]. Although oak and chestnut trees are rare in the region, as of being rather durable and precious, they have been employed in the most eye-catching buildings. Rather than these trees, in regular houses fir tree has been used [11]. Since cutting period of trees was always taken into consideration, rotting, bug-infesting and worming of trees could be prevented. The cutting time of trees is when it is full moon in the region. Yet the cutting season also bears great significance. For instance, in this region pine and fir tree are cut in fall whereas poplar tree in spring. This tree is composed of a construction material from yellow pine wooden resin. The heartwood of this tree is resistant against mushroom damages. It is easy to work on; its capacity to hold nail, nut and glue is fine. It has high elasticity. That is why it has been applied in the structure, floor board, wall board, cooker hood, cupboard doors and room doors. Fir tree does not contain resin canal. Its wooden material is soft since its fibers are straight and uniform [12]. Compared to yellow pine, this tree is more favorable for surface works. Since the amount of juice sap inside its body is high, it has been used in window and door construction. It is easy to work on; its capacity to hold nail and nut is fine. Its surface is not so favorable for painting. Similar to yellow pine, when contacted with iron and in damp environment bluish-gray spots occur on its surface. Since it has high resistance against mechanical impacts like pressure, it has been employed in the main bearing elements of wooden carcass. In addition to being used as a girder, it has also been applied in the flooring and beams of upper floor.

Walnut tree is a medium-hard and closely ringed wooden material. It has sufficient capacity to establish connection with nail, nut and glue and resistant against physical impacts. It is highly susceptible to the temperature and moisture differences in the environment. For that reason by employing wooden material joint technique the environment is safeguarded against physical conditions. Its workability is simple and comfortable hence it has been employed in the coating of wall surfaces, doors and closets. Poplar tree is rather soft, light, regular fibred, has low resistance against pressure and elastic tensile, rough and loosely structured. It is not susceptible to environmental temperature and moisture differences [12]. It is cut easily and attached well with glue. It has weak resistance against mechanical impacts. Therefore it has been used in components like parapet which has no bearing function and on accounts of being favorable for lathe workmanship it has been applied in fields requiring lathe work. Despite the scarcity of wooden material type used in room formation, the same wooden material differs in form and size with respect to its application field. To give an example; the closet door having a width of about 60 cms and the same wooden material used as one piece in flooring gains difference with the application technique. In Safranbolu region houses thanks to application techniques, wooden material has been reused and re-explored as a new item each time [13].

Amongst the leading application techniques employed in the construction of design components of wooden material, a vital surface formation technique of Turkish architecture-namely “kundekari” draws attention. This is a method which forms surfaces by joining small wooden pieces without glue. Kundekari is a construction technique of which internal stresses are decreased in a way to let the emergence of expansion possible to arise with the relative humidity and temperature change of the environment it is used in wooden material. It is a technique which is used in joining small pieces to form large and decorative surfaces. While locating the pieces in this technique, special care is paid to place fiber side of each one opposing the next one [5]. It has been applied in closet doors, room doors, wall board and ceilings. As pointed earlier, walnut tree is rather favorable for the application of this technique (Fig. 5).



Figure 5. Ceiling illustrating Kundekari technique - Emirhocazade Ahmet Bey House [3].



Figure 6. Ceiling and lath-and-plaster workmanship with Citakari technique - Kileciler House.

Another noteworthy technique is “citakari” (ceiling ornamentation) which means connecting wooden pieces by nails. This technique has been employed particularly in wall panels, decorations in ceiling and ceiling center. The thickness of partition joints is around 1,5 cm. Profile or reglet has been opened in partition joint edges (Fig. 6, Fig. 11). On accounts of being a forested region, lathe workmanship also known as “hırhırçı” (noisy work) by locals is rather developed throughout the region. It is known that master builders in this region used to work in lathe ornamentations of traditional Turkish houses or in other cities like well-recognized city Beypazarı. Horizontal axis wooden lathes widely applied in Ottoman architecture were used in those houses as well. This forming method has been followed in window guards, separator and closet parapets (Fig. 7). Saw carving and chipping are the most widely used techniques in the interior space design of room. Tree is cut with various saws, dressed and shaped. This method has been applied on door coves, furnace arches, niches, window guards, separator, parapets, closet, door and window frames (Fig. 8).



Figure 7. A separator reflecting “Hırhırçı” workmanship- Kileciler House.



Figure 8. Niches constructed via saw carving and chipping technique - Kaymakamlar House.

In Safranbolu region house, physical quality of wooden material-breathing and cleaning the air inside-enabled a continuous and natural air circulation throughout the structure. Due to dense usage of wooden material in room formation the air inside the room is freshened by exhausting moisture, odor and gases inside the space. As an outcome of water absorption quality of wooden material, there is no perspiration on room walls. Since wooden material provides a high level of heat insulation, the houses in the region offer cool comfort in summer and warm comfort in winter. No continuous heater has been needed inside. Rapid balancing of surface temperature with air temperature slows down the air circulation inside the room. Therefore parallel to the lessened air circulation the ratio of dust in the air also decreases.

6.2. Stone material specifications and application techniques

Stone composing street floor is the wall material on ground floor. However its application within the room is limited. In stone workmanship local stone, limestone, also known as chalk and “kufunk” (a porous, lightweight stone) has been applied. This stone material is formed after the sedimentation of bicarbonate waters. It is light, porous and soft enough to be carved even with an axe. This stone is generally obtained from forests, places nearby water resources. Kufunk is used as infill material between wooden carcass in wall construction as well as chimney building. Since wood is the prevalent material used in traditional Turkish house, fire is amongst

the biggest threats. Due to that reason, being nonflammable and fire-resistant, stone material has mostly been applied in and around furnace. Throughout the region, as connectors between the stones forming furnaces, clayey mortar including hays and plasterer's hair has been employed. Stones have been formed via carving and engraving technique (Fig. 9).



Figure 9. Furnace samples illustrating stone carving and engraving techniques- Sipahioğlu Mansion.

6.3. Features of mortar and plasters and application techniques

A range of mortars have been used in house construction in Safranbolu region. “Sandık harcı” (box plaster) is a mortar type formed after mixing lime with water inside a wooden crate and following an interval of one-day, adding fiber to this mixture [3]. In the interior space, at the construction of final plaster it has been used in 2–3 cm. thickness. There is whitewash on it (Fig. 10).

In Safranbolu houses, basically over adobe or stone material which is the filling material between wooden carcass hay-added clay and straw plaster has been applied. On this plaster finish coating including 1/3 lime, 2/3 sand, and strengthened with animal or vegetative fiber has been put [14]. Another mortar type is “Brickdust mortar” which is hydraulic [15]. Being water-resistant, it was mostly used in places with water, in particular rooms with pool. This mortar was prepared by combining lime, brick particles and linseed oil.

The most widely applied plaster technique in the rooms is “lath-and-plaster” which is known to be a significant application technique in Turkish architecture. It is the technique of applying plaster on laths which are horizontally hammered in 1–2 cm gaps onto stone or brick filled wall in between wooden carcass [16]. Allowing the shaping of a plastic form, it has been used in the formation of curvilinear surfaces. The places it has been used most widely are curvilinear ceilings of room entry as well as curvilinear intersection points on ceiling and wall joints (Fig. 11). Also, as stated above, in stone furnaces clayey mortar has been employed to join the stones with each other.



Figure 10. Interior space plaster - Sipahioğlu Mansion.



Figure 11. Lath-and-plaster workmanship of the ceiling representing Cítakari artisanship and its joint with the wall - Kaymakamlar House.

6.4. Plaster material specifications and application techniques

This white colored, inorganic binding plaster material has been used in places which have no water contact since it is not a water-resistant material. It has been used on wall and window decorations in particular. On plastered surfaces of wall and furnace hoods, it has been illustrated with geometrical patterned reliefs. The same technique- termed as “malakari” (sgraffito) technique- can also be viewed on façade ornamentations. In Ottoman architecture Malakari is a decoration technique containing gypso-plaster and paint and applied on dome, ceiling and walls [16]. In Safranbolu region houses, there are some samples of colored malakari workmanship on the side of room facing façade (Fig. 12). Furthermore, plaster has been used on ceiling windows inside the room. Despite the existence of construction elements contacting exterior wall and window water, since wide eaves of house prevented the contact of water with these elements, plaster was liberally used. Of the ceiling windows, main framework is wooden and inner records are plaster. In the formation of these plaster records; die casting method has been applied. In this application, the number of windows, refinement of the ornaments on window and skills of the artisan bear great significance. Stained-glass workmanship has been conducted via small colored glasses located within plaster record thus the light entering interior space has been controlled.



Figure 12. Application of Malakari technique on the façade of room - Mektepçiler House. [3]

6.5. Paint material specifications and application techniques

Paint work is a rare practice on the rooms of local houses. Wooden surfaces are seldom oil painted. As there is no paste layer below the paint, wooden tissue protrudes. Ottoman linseed oil has been used as film maker material in oil paint. The artisan facilitated viscosity by adding chromogen metal oxides and filling pigments inside linseed oil. Oil paint is mostly used on ceilings, joints of wall as well as doors. For the most part, walls are lime-washed. In the application of lime-wash, olive oil is used to dilute lime and attribute drier effect (siccative). To diffuse lime, the mixture containing vinegar and salt has been applied with a brush. Due to its vapor permeability, lime-wash has been preferred in the room walls. In some rooms it is possible to come across colored wall painting applications known as “hand-carved” (Fig. 13). This technique involves spreading onto wooden surface or plasters a paste layer containing linseed oil and white lead and subsequently painting via a brush by using natural soil or madder on the smoothed surface after it gets dry. To increase the longevity of paints, egg yolk has been added. However since in some houses these wall paintings are white washed, there are limited samples available today [17].

6.6. Metal material specifications and application techniques

The use of metal material is limited and yet the most frequently applied metal is iron. Although throughout history in Safranbolu forging has been a vital branch of manufacturing it was only applied in the tools used in manufacturing of goods, door handles and locks (Figure 14). Due to the exclusivity and uniqueness in their workmanship and design for each different house, in Safranbolu houses door handles were accepted as symbols. Another metal used in rooms is bronze. Bronze has been used in curtain valances and curtain holders. The floor of washing units inside closets is covered by zinc to ensure water insulation.



Figure 13. An interior space of room enriched by hand-carved works and textiles- Sipahioğlu Mansion.



Figure 14. Use of metal material as lock and pusher on door - Kaymakamlar House.

6.7. Textiles and the places they are used

Following forestry and ironworking, textile is the other significant production branch in the region. On the floor inside the room, carpet, rug and curtain on windows and covers on divan and cushions can be observed. A quilt named “alacabey” unique to the region has been widely used on cushions and divan. Textiles act like elements almost completing the formation of room not only aesthetically but also acoustically and thermally (Fig. 2, Fig. 13). In traditional Turkish house architecture, master builders occupied a significant position in the application of all these workmanships. Master builders generally worked in guild order. In Safranbolu region too, stone and plaster builders were mostly Rum and wooden masters were Turk [3]. As the analyzed samples also put forth all the furniture forming the room that is built by these master builders is actually composed of fixed elements shaped with architectural structure. Furthermore architectural components like door, window and furnace have also been viewed as a part of decoration.

VII. FINDINGS

As illustrated in the analyzed samples;

- The sizes of construction materials have been determiners in setting the size of rooms. In room design, modulation system has been set in accordance with the specifications of wooden construction material.
- Room interior space has been separated into 3 parts vertically in functional and ergonomic aspects. Construction material is the most significant element underlying this separation (Figure 2).
- Although each house’s room is in the same plan order, the kind of construction materials used and application techniques are different.
- In the design of each room, a unity of material-function-form is observable.
- In the rooms of Safranbolu region’s traditional houses the most densely applied construction material is wood. By considering the physical qualities of tree material application methods of tree material have been developed and employed to prevent the deformation of tree material under physical conditions. The very same tree material has been used with different size and techniques hence a richness in design has been created.
- Mortar and plaster are the second prevalent construction materials used in room interior space. The type of mortar and plaster to use has been selected and applied according to the physical features of surface. Mortar and plaster applications have been applied in the same manner on façade as well.
- Another material type commonly used is textile. The biggest attribution of textiles is that they not only bring aesthetical taste but they also regulate comfort standards of interior space.
- Paint and lime-wash are other construction materials used in room design. In the selection of these construction tools physical qualities of application surface have been noted. In addition to improving physical conditions of the room, they also serve aesthetical purposes. Influence by Western architecture, paint techniques started to be employed in room design.
- Stone material is relatively less preferred. Its application is based on its fire-resistance quality.
- The least frequently applied construction materials are metals all of which simply serve functional purposes.
- All of these construction materials used in room design are local sources complying with climate conditions of the region. They are easy to access, simple to work on and economic. Simple tools have been used in shaping.

The only construction material outside region is glass. Imported use of glass material caused a change in the form windows; ultimately the shape of the whole room.

-All the forms obtained via application techniques are compatible with physical features and formation methods of construction material. These materials and techniques meet the needs of space like acoustic, thermal comfort, water and fire insulation etc. There is no formation serving merely aesthetical purposes.

-The application technique and construction materials selected reflect the financial status of house dweller.

VIII. CONCLUSION

To conclude, room interior spaces of Safranbolu houses reflect all the cultural and technical characteristics belonging to the Turkish houses built during 18th and 19th centuries. As illustrated in the analyzed samples, the formation of room's interior space, as a significant attribution of traditional Turkish house, is a vital element determining cultural, economical and hierarchical status of the person living in it and room decoration of each house is the same in terms of general features yet different when it comes to application techniques. The variety and richness in room decorations enabled the development of application techniques. For that reason in Safranbolu which was a financially rich region, a particular care was paid to interior spaces of rooms as a reflection of its commercial relations with city of Istanbul. To reflect this welfare, in room decorations major ornamentation techniques of Turkish civilian architecture were employed. The materials used in these techniques could be freely found in the region and easily shaped. It is an established fact that in architecture -which is formed by culture, tradition and material, construction material is shaped in line with financial status of the owner.

REFERENCES

- [1] M. Eric. Construction physics and material. (Istanbul: Literature Publishing; 1994).
- [2] S.H. Eldem. Turkish house. Ottoman period v1. (Istanbul: Turkish Foundation for Preserving Monuments, Environment and Tourism Assets, 1984).
- [3] R.Gunay. Turkish house tradition and Safranbolu houses. (Istanbul: YEM Publishing; 1999).
- [4] O.Kuçukerman. The rooms. (Istanbul: Turkish Turing and Automotive Association; 1973).
- [5] F.Uluengin, B.Uluengin, M. Uluengin. Classic construction details of Ottoman monumental architecture. (Istanbul: YEM Publishing, 2001).
- [6] U.Tanyeli. The Ottoman period from the beginning to the age of modernization. In: Yildiz Sey editor. Housing and settlement in Anatolia a historical perspective (Istanbul: Turkish Historical Institution; 1999).
- [7] M.Kucukkalay, N. Elibol. A study of the European overland exports to the Ottoman empire: 1795-1804. Journal of Social Sciences 2000; 2, p. 170.
- [8] Karabuk II Environmental Report, 2009.
- [9] N.H. Uluengin. Development of window gaps in Ottoman Turkish civil architecture. (Istanbul: YEM Publishing; 1998).
- [10] B.Uysal. Application of wood material in Ancient Safranbolu houses. I. Symposium Safranbolu in National History. (Ankara: Institute of Turkish History Publication; 2003).
- [11] S. Ekinci, U. Arpacioğlu. Construction physics in traditional wooden structures and impacts of material problems on bearing system. II. National Construction Materials Congress. (Istanbul; 6-8 October 2004).
- [12] S. Sevimli S. Roles of traditional and advanced wooden structure elements in architectural design. (Istanbul: Yildiz Technical University Press, Phd Thesis, 2003).
- [13] G. Gulmez. Safranbolu. In: Can Pulhan editor. Turkey in World Heritage. (Ankara: Turkish Republic Ministry of Culture and Tourism Publications; 2006).
- [14] I.Canbulat. Conservation and Sustenance. Facts about the restoration of Mektepciler house. Architecture 2006; 330.
- [15] H. Boke, S.Akkurt, B.Ipekoglu. Qualities of brickdust mortar and plasters used in historical structures. Yapı, April 2004; 269.
- [16] D.Hasol. Encyclopedic dictionary of architecture. (Istanbul: YEM Publishing; 1990).
- [17] E.Eti, O.Akpınar. An analysis on hand-carved works in Safranbolu and Juruk village houses, I. Symposium Safranbolu in National History. (Ankara: Institute of Turkish History Publication; 2003).

Deniz Demirarslan Analysis of Interior Space of a Room in a Traditional Turkish House with respect to Construction Material and Application Techniques: Safranbolu Region House.” IOSR Journal Of Humanities And Social Science (IOSR-JHSS), vol. 22, no. 11, 2017, pp. 01-11.