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## Original Research Article

## Applying Approaches Driven from the Facades of Historic Houses to the Facades of New Buildings (Case Study: Historic Houses of Tabriz)

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### Abstract

**Problem Statement:** Today, the facades of new buildings are among the most important issues in the urban context and especially the historical-cultural context of any city. Historic houses are one of the valuable architectural treasures that can provide experience for the facades of new buildings. Despite the importance of this issue and the need to achieve the architectural patterns of historic houses, today there are scattered and few studies are available in this field. The present study seeks to answer how to use the facades of historic houses in designing the facades of new buildings, by recognizing the pattern of historic houses in Tabriz.

**Research objective:** In this research, an attempt has been made to raise the awareness of the elements and architectural details of the facades of historic houses to extract the patterns and methods used in their facades and to provide new patterns for new buildings by taking advantage of the current condition of historic facades; At the same time, it aims to destroy the field of improper exploitation of the physical capabilities of historic facades in today's conventional facades.

**Research method:** In this regard, using a descriptive-analytical method, the situation and elements in the facade of the research's selected historic houses were described and interpreted. After gathering the required data from both library and field methods, the components and elements of the historic houses' facades were analyzed.

**Conclusion:** The method of applying the patterns and elements obtained from the analysis of the facades of the new buildings is the result of this study.

**Keywords:** *Facades, Historic houses of Tabriz, Facade pattern, New buildings, Continuity of architecture.*

### Introduction

The existence of various materials with various colors and patterns and their various combinations based on different patterns and tastes, has caused the concern of today's experts in the field of

architecture and has made the city managers attempt planning in the field of facades of new buildings. Benefiting from historical experiences and local architectural assets is always one of the proposed solutions by experts to organize and improve the facades of new buildings. So that in all the rules and instructions provided in this field, one

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can observe similar expressions, such as protection of Iranian and Islamic Identity, or preserving the identity of architecture and urban planning<sup>1</sup>. However, due to the lack of explanation in the concepts above in the aforementioned sources, the issue of protection and use of the facade capabilities of historic buildings, is always obvious and hidden in the architectural community of the country. Among the issues related to the obvious dimension of this issue is the architects' use of elements and details of the facades of historic buildings in new buildings, and among its hidden dimension is the manner of use and its related issues. Therefore, to put the use of the facades of historic buildings into practice in the design of new facades, this study has identified and analyzed historic houses as one of the powerful fields in the facade. Historic houses of Tabriz have a significant share among the historical architectural works registered in the National Heritage List (Nejad Ebrahimi, Narangi, Beyti, Keinejad, & Pourjavad Asl, 2014). This is due to the high architectural and aesthetic features of the Qajar and Pahlavi houses that have survived until today, which makes them rich and valuable resources for architects; By re-reading and extracting the patterns and methods used in their architectural composition, the grounds for the continuation of architectural experiences in their various forms can be provided. Therefore, the questions raised in this research can include the following:

- What prominent patterns can be identified in the facades of historic houses in Tabriz?
- What elements and components are the facades of historic houses in Tabriz made of?
- How can the facade features of historic houses be used in the facades of new buildings?

## Literature review

Although the facades of historic houses and the facades of new buildings are two widely used fields of research in architecture, no research deals with the relationship between the two. Research topics in these two fields are widely distributed.

Typology, aesthetics, influencing factors, affectivity, constituent elements, and phenomenology are the topics that researchers have addressed in connection with modern facades. It is also possible to access research on the typology of historic houses in different cities of Iran. In connection with the pattern recognition of the facades of historic houses in Tabriz, one can refer to the research of Ali Asl mamaghani and Mohammadzadeh (2014) that in a conference paper, have analyzed the changes of the facades of residential buildings in the three periods of Qajar, the first Pahlavi, and the second Pahlavi, and have identified the similarities and differences of the mentioned periods. They have also presented approaches for organizing and reducing the irregularities of the facades in the contemporary era, and beatification of them. One of the important points in the pattern recognition of the facades of historic houses in Tabriz is their constituent levels and layers. In their study, Wahdattalab, Yaran, and Mohammadi Khoshbin (2018, 66) quantitatively measured these layers by categorizing the facades of historic houses in Tabriz and determining the numerical coefficient for a variety of porosities as a visual quality in aesthetic evaluations of architectural walls. Haghjoo, Soltanzadeh, Tehrani, and Ayvazian (2019, 121) in an article related to the historic houses of Tabriz, by selecting samples, analyzed their planned parts and also dealt with the common patterns in facades. In this study, the authors have considered the influence of planned lines in the facades of houses, without mentioning the details of the patterns. Also, effective elements in organizing the facades of historic houses in Tabriz can be found in a study by Babazadeh Oskooi, and Pakravan (2011).

In the mentioned researches related to the facades of historic houses in Tabriz, even though there is no specific pattern recognition of facades in any of them, however, researchers have indirectly considered the patterns based on historical periods. In the present study, while investigating this issue and completing it, it has also been considered to

answer how to use the facade elements of historic houses in new buildings.

### Theoretical foundations

Today, despite all the progress made in the construction and the changes in the fields related to usable materials, construction techniques, and architectural styles and methods, there are also charters regarding the concept of “semantic importance” that gain their distinctive features in historical cities and from historical, artistic, aesthetic, cultural and such values (ICOMOS, 2005). Therefore, all changes must be managed with the aim of maintaining semantic significance and distinctive features. In other words, by accepting that the dimension of change is necessary for the essence of urban dynamics, we should try to continue the architectural culture, traditions, and values and consider change while maintaining a constant state (Fadaeinejad & Eshrati, 2014). The facades of new buildings, as visible parts of the buildings’ architecture in urban areas in accordance with the nature of architectural dynamics, can change over time and in relation to architectural traditions in various cases, however, for architecture to continue, it must also be original. In this area, originality is considered an important factor in controlling and determining competence in relation to values (Pourbahador & Fadaeinejad, 2018). Reviewing the sources related to the historical architecture of Iran along with field studies provides recognition of architectural values in the facade of historical buildings; By benefiting from them, it is possible to take an important step in preserving the originality of the facade of new buildings and determining their competence in relation to the historical values of architecture, and to create the grounds for the continuation of the country’s architecture; And in this regard, houses, as the most important parts of the architecture of any city, play an important role. In connection with the condition of the walls and facades of historic houses in the sources of historical architecture of Iran, it is mentioned that in the past,

passing from one neighborhood to another has been evident due to the specific signs of each neighborhood (Sultanzadeh, 2010, 86). However, historic houses are a symbol of harmony, balance, and proportion in terms of height, volume, materials, and exterior decorations, and in general, they have simplicity, composure, and congruency, and ostentation is at its minimum (Noghrekar, 2008, 534). One of the most evident characteristics of historic houses’ architecture in Iran is introversion, and the real value of the building is given to its essence and inner core (Memarian, 1996, 6). The introversion of Iranian architecture has led to the conservative emphasis on the appearance, body, and decorations, and only around the front door is changed to some degree (Mousavi, 2013). Also, effects such as the following can be mentioned as the results of introversion in the facades of the houses: 1-No direct visual connection between the interior spaces of the house with urban space, 2-Organization of the different spaces of the house with a yard or covered estrades, in a way that fenestration and operable windows opened to these elements (Memarian, 1996, 8).

According to the ancient tradition of Iranian introverted architecture, all the interior spaces of historic houses in Tabriz face the inner and outer courtyards of the house without direct connection with public passages and pathways. In this pattern, by putting the open spaces in the center and the formation and arrangement of closed spaces around it [the courtyard], the houses of [Tabriz] have been created so that nature is set in the heart of the house (Beyti, 2010, 63). In his travelogue and related to the houses of Tabriz, Conte de Sercey wrote: “The alleys are surrounded with tall walls on the sides, and the path can only fit one person, but as we pass through the narrow and low entering, we enter yards that are always decorated with trees and flowers or gardens that are clean and green” (Conte de Sercey, 2011, 89). In the historic houses of Tabriz, the northern front of the courtyard has always been considered important, due to the climatic issues of the region and the need to use the sun in the cold seasons of the year, as well

as proper lighting; and generally, the main living spaces are on this front (Keinejad & Shirazi, 2010, 12). Due to this importance, the façade of the north front of the courtyard (facing south) in the historic houses of Tabriz, especially in the Qajar houses, is considered the main facade and compared to other facades, they have obvious physical characteristics. The manner of the combination of the elements and the parts in various sets, the color, the decorations, and so on, in these facades are different, and they have been created based on their purposes (Ahri, 2001, 323). In other words, one of the main features of the main facade is to reflect the main lines of the plan of the house in the facade (Haghjoo, et al. 2019, 136).

### Research methodology

The present study tries to review and analyze the elements and concepts in the facades of historic houses. Therefore, regarding the executive process, this study is qualitative and based on variables, in which the majority are subjective in nature. Also, based on the objectives of the study, the qualitative method was selected to identify common principles governing the facades of historic houses in Tabriz. This exploratory descriptive-analytical method was used to propose certain models of facades. This study attempts to provide components that can be efficient and effective in the design and implementation of the facades of new buildings. This study can be considered as applied research, as its results have provided solutions for the needs in areas related to the design of facades for new buildings and such problems.

### Research findings (Patterns of the historic and nationally registered houses of Tabriz)

All the historic houses of Tabriz registered in the list of national heritage belong to one of the Qajar and Pahlavi periods. Different historical periods, as well as variations in the location of construction, are accompanied by variety in parts and the body of houses. As a result of these variations, the main

wall is either located around the central courtyard of the house or in front of the building's entrance (the door of houses that are like kiosks and the courtyard is located around it), still, most of them are located in the southern side (the southern facade) (Wahdattalab, Yaran & Mohammadi Khoshbin, 2018, 75). Therefore, to achieve the pattern of the main facades of houses, the period of their construction must be considered in the first stage. The placement of the main facade of the house on the northern front of the courtyard can be seen in both the Qajar and Pahlavi periods; With the difference that most of the houses of the Qajar period, following the archetype of Iranian introverted architecture, have inner and outer courtyards; But in the houses of the Pahlavi period, with the diminishing division of the house into inner and outer parts, there is only one courtyard and one main facade on the northern front. It should be noted that in this period, under the influence of Western architecture, houses with four main facades were built in the form of gazeboes (Siqat al-Islam and Ordubadi houses). Despite the existence of multifaceted facades in different directions of each house, to achieve the facade patterns of the historical houses of Tabriz, this study only examined the main facade of the house, which is often located on the northern front of the courtyard.

#### • Qajar period's pattern





The general image of most of the facades of houses from the Qajar period in Tabriz includes a semi-open columnar space. This space, which is called a porch or patio, consists of columns that are placed individually or in pairs in front of the floors of the house and are connected with decorative arches and a frieze covered with plaster and lime. The multi-layered nature of the façade is a prominent feature of this pattern. In other words, if we call the facade, that is composed of columns, the first layer of the facade, the second layer is a facade consisting of elements of interior spaces. Since the houses of this period often have a large Tanbi space (hall) in the middle of the plan and several side rooms that are connected with the courtyard and the main

facade of the house through a sash or a margined window, the outer walls of the house are located in a short distance from the facade of the semi-open columned space in the second layer of the facade, which include hall or sash windows, small windows of the vestibules and porches of the chambers. The mentioned facade composition, which is called the columnar porch pattern in this study, has had a good response to the climatic conditions of Tabriz due to preventing the direct entry of intense sunlight in summer and severe winter cold. Also, this pattern has a high visual quality due to being multi-layered. In the examination of the numerous examples of Qajar houses in Tabriz that can be seen with this pattern, different methods can be observed. The brilliant architects of the Qajar era, using various construction methods in the construction of semi-open space, have used various methods in this model and pattern. The most common way was to create overall columns. In most houses, the columns are placed in front of the entire floors of the houses. In some houses, the columns of the semi-open space are constructed separately for each floor, and not

in an overall manner. Creating a semi-open space as a combination of the two methods mentioned above exists as an independent method in some Qajar houses in Tabriz. In this method, the columns of the middle part are constructed from the floor up to the ceiling entirely, and on the sides of the facade separately on two floors. Finally, the fourth method of this pattern can be seen in removing the columns of the lower floor; In these cases, as the interior of the lower floor progresses, the semi-open space columns of the upper floor are placed on it. In Heydarzadeh's house, as one of the most beautiful examples of this method, the columns of the upper floor, in pairs and with a slight protrusion in the plan, have created the semi-open space of the first floor. Therefore, in explaining the executive methods related to creating a semi-open space in the pattern of a columnar porch, four methods can be mentioned in Table 1.

In all of the above methods, the main facade consists of two levels or two outer and inner layers; In which the facade of the columned porch is called the outer surface, and the facade of the outer wall of the house, which is located in a short distance from the

Table 1. Facade execution methods in the pattern of the columnar porch in the historical houses of Tabriz. Source: Authors.

Row	Method	Method execution - Diagram	Examples
A	Overall semi-open space	Columns facing all the floors 	Behnam House - Ganjeizyadeh House - Ghadaki House - Blourchian House - Nikdel House - Sherbatoghli House - Rahimi House - Hajshikh House - Khatai House - Sharbatzadeh House - Sultan Al-Qaraei House
B	Separated semi-open spaces	Separate columns on each floor 	Ahdi House - Nematzadeh House
C	Combined semi-open space (Combination of A and B)	Middle columns entirely and separate columns on the sides for each floor 	Kuzehkonani House - Sedghiani House
D	Top semi-open space	Columns only in the top part of the facade 	Naghshineh House - Heidarzadeh House - Meshkian House



first layer, is called the inner surface of the facade. Each of these levels has elements and details that are similar in almost every way. However, due to the differences in the visible floors in the facade, some executed examples are different from each other. Table 2 introduces the elements and details of the examples' facades in the columnar porch pattern.

The distinction of the physical elements of each of the execution methods in the pattern of the columnar porch is as Figs. 1-4.

#### • Pahlavi period's pattern

In the houses of the Pahlavi period, by simplifying the facade of Qajar houses and eliminating the semi-open space, the main facade of the house appears in one layer. The facades in this period, while recounting the condition of the interior spaces of the house, along with various details, have created a proportionate and symmetrical collection. In

some flat facades of this period, components such as porches or stairs can be seen protruding from them. In other words, in cases where the mentioned components are required, they have created it individually and by connecting to the required interior space.

Therefore, in this model, two dominant execution methods can be mentioned. The first method is a completely flat facade on the main surface; Many one or two-story houses of this period consisting of a basement and first floor were built in this way. The second method is the facade of houses that due to the presence of protruding components from the main facade, such as stairs to the interior spaces in the middle or sides of the facade and porches connected to the second-floor spaces in a covered or exposed manner, are two-layer facades consisting of main and protruding surfaces. Therefore, in explanation of

Table 2. Characteristics, components, and facade elements of historical houses of Tabriz in the pattern of a columnar porch. Source: Authors.

Facade execution method (In the columned porch pattern)	Examples	Visible Floors in the facade	facade layers	Layer type	Facade elements and details
A: Overall semi-open space	Houses of Behnam, Ganjeiyzadeh, Qadaki, Bloorchian, Nikdel, Sharbat Oghli, Rahimi, Haj Sheikh, Khatai, Sharbatzadeh, Sultan Al-Qaraei	Two or three	Two layers	*Layer One	Pedestal, column, Headstone, frieze, final stringcourse
				** Layer two	Entrance stairs, plinth, framing, decorations, doors and windows, middle stringcourse.
B: Separate semi-open space	Ahdi House, Nematzadeh house	Two	Two layers	First layer	Pedestal (In this method, they exist only in the columns of the lower part), column, capital, middle stringcourse, frieze, final stringcourse.
				Second layer	Framing, decorations, doors, and windows.
C: Combined semi-open space	Kuzehkonani house, Sedghiani house	Two	Two layers	First layer	Pedestal (In this method, the upper columns on the sides do not have a pedestal), column, capital, middle stringcourse, frieze, final stringcourse.
				Second layer	Plinth, framing, decorations, doors and windows, middle stringcourse.
D: Top semi-open space	Naghshine house, Heydarzadeh House, Moshkian House	Two	Two layers	First layer	Plinth, framing, doors, and windows, middle stringcourse, column, capital, frieze, final stringcourse.
				Second layer	Framing, decorations, doors, and windows.
*The first layer of the facade is the columnar porch facade, which in this pattern is visible as the outer surface of the facade.					
**The second layer of the facade means the layer related to the outer wall of the house, which in the main facade, after the columned porch facade, is visible as the inner surface of the facade.					

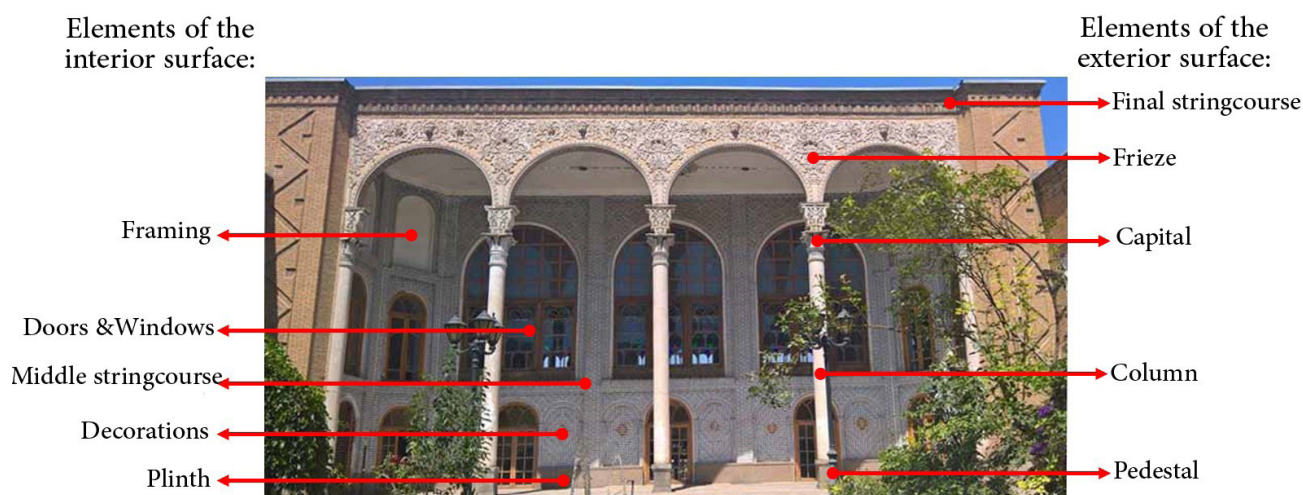


Fig. 1. Façade elements of Qadaki historic house with the execution method of the overall semi-open space in the pattern of a columnar porch. Source: Authors.

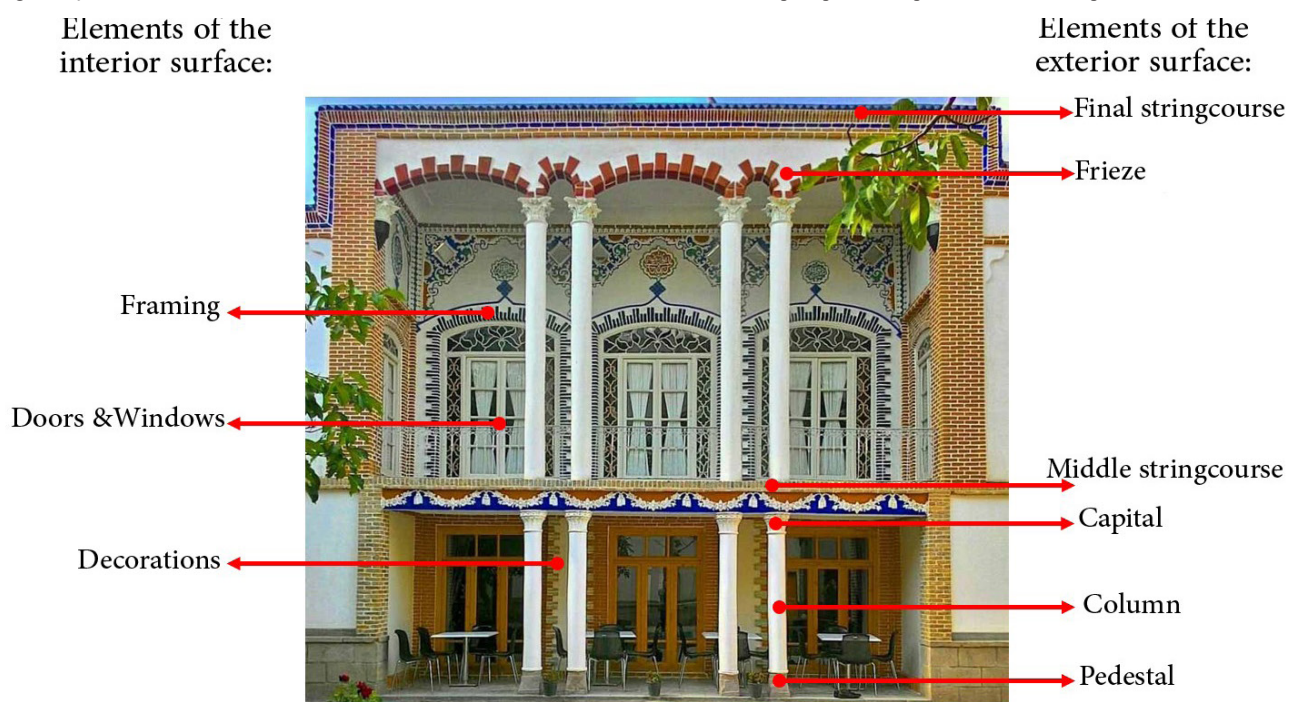


Fig. 2. Façade elements of Nematzadeh historical house with the execution method of separate semi-open space in the pattern of a columnar porch. Source: Authors.

the executive methods related to the facades of the Pahlavi period houses in the flat facade model, two methods can be mentioned in [Table 3](#).

The number of floors of the house and the manner of entering the interior spaces are two main factors determining the elements and the execution method of this model. Also, the use of various shapes and different arrangements of bricks is one of the facade features in this pattern. [Table 4](#) introduces the elements and details of the examples of facades in the flat view pattern.

The distinction of the physical elements of each of the execution methods in the pattern of the flat facade pattern is as [Figs. 5 & 6](#).

#### • The eclectic pattern

In addition to the two mentioned patterns, some facades have different execution methods than them. The reason for this difference can be related to the wishes of the founder, or the implementation of the architect's personal tastes, which were influenced by particular cultural currents in that period. In these examples, one can see the traces of both the



Fig. 3. Facade elements of Kuzehkonani historical house with the execution method of combined semi-open space in the pattern of a columnar porch. Source: Authors.



Fig. 4. Facade elements of Heydarzadeh historical house with the execution method of the top semi-open space in the pattern of a columnar porch. Source: Authors.

indigenous architecture and traditional methods of the landscaping of that era, as well as the modeling of non-indigenous architecture. Therefore, these cases, which are unique among the historical houses of Tabriz and do not correspond to the general characteristics of the two dominant models, are introduced in a separate model under the eclectic facade. In examining these examples, one can observe cases such as pediments in the center of the facade, rough lines and combinations with semicircles or polygons in the main facade plan, or the use of unusual columnar porches that are unique, regarding their manner of combination with each other on floors or in terms of volume and number. Table 5 introduces some examples whose

facades are included in the eclectic façade pattern due to their unique characteristics.

The examples presented in the eclectic facade model, although they do not correspond to the conventional execution methods in the historical houses of Tabriz, all have obvious physical, functional, and aesthetic characteristics. Therefore, the distinct items mentioned in the facade of each example can not be mentioned as unacceptable or impossible elements in the facade; And in the meantime, the pediment element is considered as a common and acceptable element among the distinct elements due to its repetition in most of the houses examined in the eclectic facade pattern.



Table 3. Facade execution methods in the flat facade pattern in historical houses of Tabriz. Source: Authors.


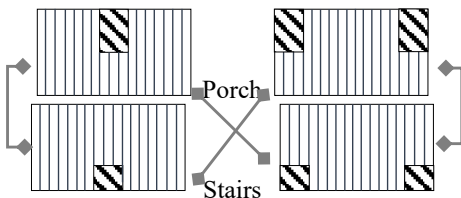
Row	Method	Method execution - Diagram	Examples
A	Facade on the main surface	All facade components are on the same surface. 	Rastegar House - Ali Monsieur House - Khiabani House - Amir-fatemi House - Seylabi House - Solhjoo House
B	Facade on two main and protruding surfaces	The entrance stairs and the porch protrude from the main facade on the center on the sides 	Sehati House - Lalehyi House - Siqat-al-Islam House - Mirza Mohammad Siqat-al-Islam House - Neyshabouri House - Parvin Etesami House - Amir Parviz House - Mojtahedi House

Table 4. Details, components, and facade elements of historical houses in Tabriz in a flat facade pattern. Source: Authors.

Facade execution method	Examples	Floors in the facade	Facade layers	Layer type	Facade elements and details
A: Facade on the main surface	Rastegar, Ali Monsieur, Khiabani, Amir-fatemi, Seylabi, Solhjoo houses	Two	One layer	Main layer	Plinth, stairs, framing, doors and windows, middle stringcourse, decorations, gutter, final stringcourse.
B: Facade on two main and protruding surfaces	Sehati, Lalehyi, Siqat-al-Islam, Mirza Mohammad Siqat-al-Islam, Neyshabouri, Parvin Etesami, Amir Parviz, Mojtahedi houses	Two or three	Two layers	Main layer Protruding layer	Plinth, stairs, framing, doors and windows, middle stringcourse, decorations, gutter, final stringcourse. Entrance stairs, Porch



Fig. 5. Elements of the façade of the Solhjoo historical house on the main surface in a flat facade pattern. Source: Authors.



Fig. 6. Elements of the facade of the Siqat-al-Islam historical house in two main and protruding surfaces in the flat facade pattern. Source: Authors.

Components and physical elements of the facade of historical houses in Tabriz

The physical elements of the facade of historical houses, despite the differences in details and the manner of their combination with each other, are repeated in the identified facade patterns (columnar porch, flat, and eclectic) and include the following.







Columnar porch: This element is the outer surface (first layer) of the facade of Qajar houses, consisting of several columns, decorative arches, friezes on the arches, and final stringcourses.

- 1) Column: consists of three components: pedestal, column or shaft, and capital, and is part of the columnar porch pattern and is made of building materials of stone, wood, and plaster.
- 2) Frieze: The upper part in the columnar porch pattern, located at the junction of the columns. The bottom line is made of decorative arches on the capitals and the top line is created before the final stringcourse of the building.
- 3) Pediment: It is one of the common elements in western architecture that can be seen in some historical houses of Tabriz as the upper part of the main facade.
- 4) Entrance stairs: In some houses, the first floor is above the courtyard floor, the entrance to the first floor is done through stairs in the middle or on both sides.
- 5) Porch: They can be seen in two roofed/covered

and open/exposed conditions and are connected to the interior spaces of the second floor.

- 6) Plinth: The lower part of the facade, which is located at an accessible height and is mainly made of rubble stone and with the end edge protruding from the main body of the facade.
- 7) Middle stringcourse: The horizontal protrusion of the middle part of the facade using bricks in various shapes, which indicates the place where the floors separate from each other.
- 8) Final stringcourse: The protrusion of the final part of the facade using bricks in various shapes.
- 9) Doors and windows: Both are in square and rectangular shapes, simple or arched, as well as sash windows with various designs and colored glass.
- 10) Framing: in the form of rectangular and arched indentations in the rafters, peripheral protrusions on the doors and windows or around the foundations (vertical skeleton of the building), and are made to create contrast and prevent the uniformity of the facade.
- 11) Gutters: Used in one-layer facades with vertical connection to the main facade, to drain rainwater from the roof to the yard.
- 12) Decorations: Plaster and limestone decorations related to the top of arches and capitals are of the surface type of decoration, and the decorations that have been created by transposition of materials

Table 5. Profiles of historical houses in Tabriz with eclectic facade features. Source: Authors.

Title	Period	Image	Distinguished façade features in comparison with the common patterns in historical houses of Tabriz
Sorkheiy House	Qajar		<ul style="list-style-type: none"> <li>- The overall columns of the façade are combined with pediments.</li> </ul>
Amir-Nezam Garoosi House	Qajar		<ul style="list-style-type: none"> <li>- Façade columns have two different heights.</li> <li>- It has a pediment above the porch.</li> </ul>
Kalantari House	Qajar		<ul style="list-style-type: none"> <li>- Rough lines have been used in the plan line.</li> <li>- The columns of the two floors are not aligned and their diameters are different.</li> <li>- The gable of the arch above the columns on the first floor is tiled.</li> </ul>
Seraghlari House	Qajar - Pahlavi		<ul style="list-style-type: none"> <li>- It has a pediment above the porch.</li> <li>- The skyline is composed of oblique pediment lines and two semicircles.</li> <li>- Unknown motifs have been used in the decorations of the southern facade.</li> </ul>
Savajablaghi House	Pahlavi		<ul style="list-style-type: none"> <li>- Façade columns on the two floors do not have the same height.</li> <li>- It has a pediment above the porch.</li> </ul>
Ordubadi House	Pahlavi		<ul style="list-style-type: none"> <li>- The facade is completely asymmetric.</li> <li>- Cubical volume is combined with polygonal volumes.</li> </ul>
Company House	Pahlavi		<ul style="list-style-type: none"> <li>- In the main facade, cubical and semi-cylindrical volumes are combined.</li> <li>- Unusual circular and crowned windows have been used in the facade.</li> <li>- Unknown shapes and motifs have been used in decorating the facade.</li> </ul>

and various brick arrangements are (deep) body decorations.

#### • Aesthetic facade elements of historical houses of Tabriz<sup>2</sup>

In addition to the form analysis based on the form of the components, the components of the facade need to pay attention to the concepts that

connect them because the whole of the facade is a result of the physical features, in addition to geometric relationships and aesthetic dimensions of its components. Theoretical literature related to the aesthetics of Islamic architecture considers beauty in the physical or formal principle, which also has traces in the cultural, historical, and semantic beauties and



is referred to as symbolic beauty. In other words, the combination of concepts and meanings increases the life of a phenomenon's beauty and by penetrating the deepest layers of the human psyche, it ends in eternal or symbolic beauty (Tabbaz, 2003, 87). In examining the concepts related to the manner of accompaniment and composition of components in the facade of the examples, the obvious and common aesthetic elements in them can be considered as the following.

13) Proportion: Basically, the existence of a relationship between two things is called proportionality<sup>3</sup>. Proportion is a determining factor for coordination and can only be examined in relation to shape. In architecture, proportionality is a relation that expresses the relationship between two or more dimensions (Groter, 2011, 360). Similar shapes used with common dimensions vertically and horizontally in the facade, establish the proportion and coordination between the various components of the facade in the historic houses of Tabriz.

14) Symmetry: The congruity of two shapes on either side of a point is called symmetry. <sup>4</sup>Symmetry is at the top of a firm idea which plays an important role in the integrity of the work and balancing it by clear guidelines (Nourani-Yazdi, 2018, 6). A symmetrical structure that can be seen as a whole or as a suitable part of it acts as a kind of magnet. [Symmetry causes] the mind that is constantly seeking to understand the things that are offered to it without any difficulty (Mays, 2005, 82). Vertical symmetry resulting from the symmetry of the eastern and western parts of the facade is one of the perceptual elements in the facade of the historical houses of Tabriz.

15) Centrality: The center has a dimensional semantic system, that has been considered by each theorist in different degrees. Today, the application of this concept in architecture often indicates its functional and physical centrality. The center is a part of the place that organizes the environment around itself as a mass or sphere and creates a geometric order (Nadimi, Mandgari, & Mohammadi, 2014, 123). In the facade, placing an element in the center is usually

done to emphasize it. Sashes, porches, and stairs are among the physical elements located in the center of the facades of historical houses in Tabriz.

Rhythm and repetition: According to Lefebvre, rhythm can be defined as the movement and dynamics that occur from a single repetition over time and in space (Qal'e-noiy & Jebal Ameli an, 2015, 70). Rhythm introduces repetition into architecture to organize forms and space. Almost all buildings are composed of elements that have a repetitive nature. The repetition of beams and columns forms modules (Moeini & Zolfagharzadeh, 2017, 9). Repetition of elements such as doors and windows, framing, porches, and various decorations cause rhythm in the facades of historical houses in Tabriz. Therefore, the manifestation of beauty in the composition of the physical elements of the facades in the houses of the Qajar period (Fig. 7) and the Pahlavi period (Fig. 8) can be described by relying on four elements of proportion, symmetry, centrality, and rhythm (repetition). Various factors such as light, color, texture, and form are also effective in the perception of beauty.

### Discussion (efficient components in the facades of new buildings)

Analyzing the facades of historical houses and re-reading their artistic and technical values is an attempt to achieve the continuity of architectural traditions regarding wall-making and its application in contemporary architecture. From the point of view of architectural experts, continuity in Iranian architecture has been achieved not by simulation but by an evolutionary process and the invention of specific methods in each period<sup>5</sup>. Therefore, benefiting from the results related to recognizing the aesthetic and physical elements of historical houses as an approach in new buildings requires attention to the contemporary conditions of construction and facade.

In the current conditions of construction, observance of the general requirements of construction and instructions related to different cities and urban areas, to regulate construction activities, presents restrictions on reusing some components and elements of historical



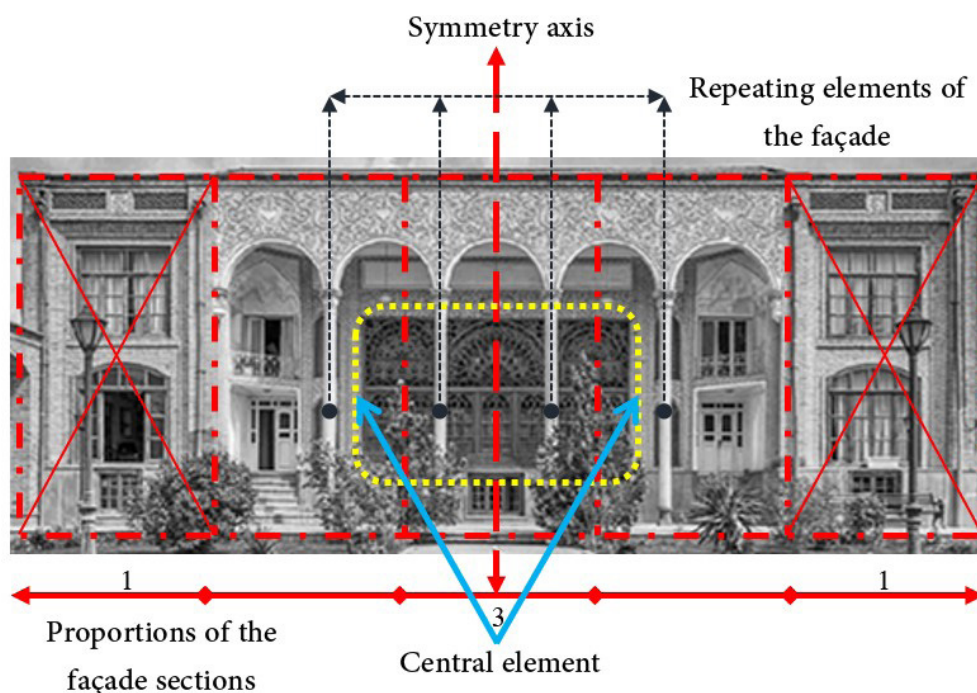


Fig. 7. Aesthetic elements in the facade of Behnam historical house with the pattern of the columnar porch. Source: Authors.

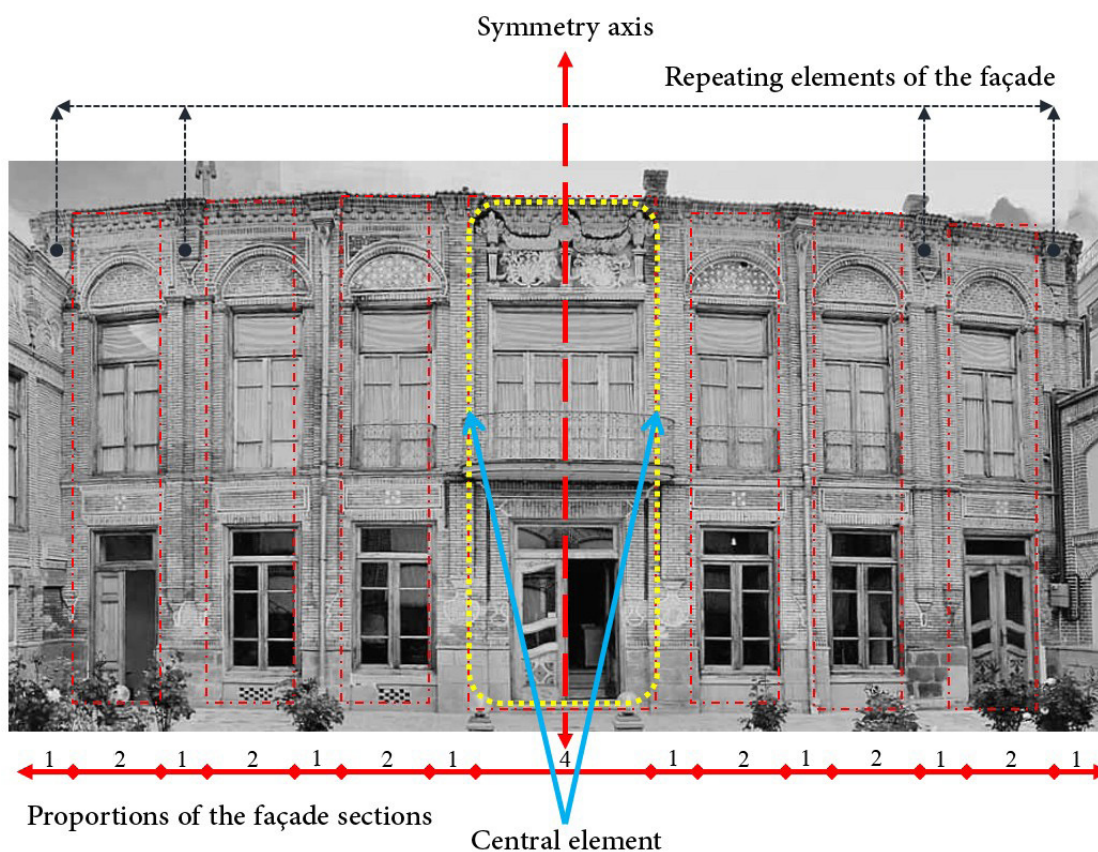


Fig. 8. Aesthetic elements in the facade of Amir Parviz historical house with a flat facade pattern. Source: Authors.

buildings. In this regard, requirements such as the protrusion of the facades of new buildings in different passages, the method of draining rainwater

from the roof to the rain well, the dimensions of the windows, and ... are all examples that each in some way limits the direct use of elements and methods

used in historical buildings. Also, the general trend in construction, the most important of which is the tendency to high-rise construction, is another case related to the current conditions of construction, which has a high impact on the facade and its components.

Therefore, it can be seen that it is not possible and appropriate today to use the patterns and architectural components of the facades of historic houses directly and as it was in the past. Benefiting from the physical elements identified from the facades of historical houses based on their concepts and elements of beauty, and creating new methods that are influenced by the contemporary concerns and conditions of architecture, provides a wide range for architects and designers to use the experiences of historical buildings in the design and execution of facades in new buildings. Based on the analysis of the facades of the historical houses in Tabriz, the components that can be used in the facades of new buildings include the following.

- 1) The general shape of the facade: Facades of historical houses, according to their overall size, are in horizontal square or rectangular shapes, while the height of the facade from the ground includes two, two and a half, or three floors. Today, observance of this point under the influence of the general tendency to high-rise construction can be considered in the form of dividing the facade into several square or rectangular sections and using other physical elements in the construction of the main facades.
- 2) Multi-faceted facades: In the historical houses of Tabriz, considering the climatic conditions, there is often one main facade in the direction of the sun and other facades in other directions that are in harmony with each other in terms of proportions and continuity of horizontal components (stringcourses). It is important to observe this point to create an integrated and harmonious facade in different parts of the facades of new buildings.
- 3) Facade layering: Patterns related to the facades of the historical houses in Tabriz indicate different levels and surfaces with different components and

elements in the main, indented, and protruding layers. Paying attention to the fact that it depends on the observance of the current rules of construction of the facade of new buildings, if possible in the implementation of porches, balconies, and entrances can be considered by designers.

- 4) Plinth: Plinth or ground line is a part of the facades of historical houses. The line is located at the junction of the facade and the ground at human height (maximum 150 cm) and is made of sharp materials and with a protruding edge of the body. It is one of the prominent elements in the general composition of the facade, where in addition to the technical cases, it plays an important role in the beauty of facade surfaces. This element can be used with the mentioned specifications in the facade of new buildings.

- 5) Middle stringcourse: Middle stringcourses are implemented in the facades of historical houses in Tabriz, to adjust the overall height of the facade and create small environmental units on the facade surface; Which are often made at the separation point of the floors and with materials in forms and arrangements different than the main facade and a little more protruding. They are divided into horizontal lines. This case also has the ability to enter the composition of the facade of new buildings.
- 6) Final stringcourse: According to the patterns provided by the facades of historical houses in Tabriz, there are the three dominant forms of flat, stepped and sloping, that make up the final section of the facade in harmony with the middle stringcourse. Relative to the facade of the new building, they can also be used for different purposes today.

- 7) Framing: Framing in the facades of historical houses with the transposition of the main materials, has a great effect on creating contrast and eliminating the uniformity of the facade. Brick framing in the form of protrusions around doors and windows, pedestals (vertical skeleton of the building), and rafters in various shapes can be implemented today in the facades of new buildings.

- 8) Decorations: In the facade of historical houses,

decorations are made either in the form of geometric and arabesque motifs on the surface or through the in-depth arrangement of materials next to each other. Utilizing the forms and methods of decoration used in native architecture and avoiding patterns and decorative methods in Western architecture (especially classical style architecture) will play an important role in the quality of the facade of today's buildings.

9) Materials: The materials used in the facades of historical houses in Tabriz have provided the possibility of identifying the components related to the type, color, texture, luminosity, and composition of materials, and then benefiting from them in the facades of new buildings. If there is enough attention paid to the facades of new buildings, due to the very high diversity of materials in the current conditions of construction, they can play a significant role in the coordination of urban textures, especially in urban-historical areas.

10) Aesthetic elements: The most important concern regarding the use of the physical elements

mentioned above in the design of the facades of new buildings, is related to how they accompany each other. The facade design of new buildings based on the physical elements of the facade of historic houses is considered regardless of the concepts that connect them a superficial impression, the result of which will not be much different from not paying attention to historical buildings. Therefore, it is very important to pay attention to the aesthetic concepts used in the facade of historical buildings. The aesthetic elements evident in the facades of historic houses in Tabriz include proportion, symmetry, centrality, and rhythm (repetition), which can be used in accordance with the physical conditions of the building in different parts by today's designers. Therefore, the components taken from the historical houses of Tabriz for use in the facades of new buildings are as [Table 6](#).

## Conclusion

The continuity of architecture through benefiting from the local architectural experiences and

Table 6. Efficient components in the facades of newly built residential buildings taken from the facade of historical houses in Tabriz. Source: Authors.

Efficient components in the facades of newly built residential buildings	
Physical	- General shape of the facade: In the form of a square or horizontal rectangle, so that the height of the facade includes two, two, and a half or three floors.
	- Multi-faceted facade Includes the main facade and side facades in different directions.
	- Facade layering: Execution of the main facade on different surfaces (protruding, main, and indented).
	- Plinth (ground line): It is parallel to the point of connection between the facade and the ground at human height, and is made from hard material, and has an edge protruding from the body.
	- Middle stringcourse: They are the middle and horizontal protruding lines, which are made with original materials in the junction point of the floors.
	- Final stringcourse (skyline): The final protruding lines of the facade, which can be flat, stepped or sloping.
	- Framing: The protrusions around the openings, pedestals (vertical skeleton of the building), and rafters are to eliminate uniformity and create contrast in the facade.
	- Decorations: Creating decorative patterns on the surface or using the arrangement of materials next to each other in-depth.
	- Type: The main part includes bricks, stone, glass, and wood.
	- Color: Often involves the use of warm colors (such as brown and ochre).
Materials	- Texture: There is no use of polished surfaces in hard materials (stone and brick).
	- Gloss: Mainly involves the use of opaque and non-glossy surfaces (except window glass).
	- Composition: There is the use of coarse and hard materials in the lower parts and small and soft materials in the high parts of the facade.
Aesthetic	- Proportion: There is coordination between the facade components through size and shapes and other visual factors such as color.
	- Symmetry: symmetry includes the part between two or more sections of the facade.
	- Centrality: Placing an architectural element in the center of the facade to emphasize it or create order in the facade.
	- Rhythm (repetition): Repetition of various architectural elements in the facade, which causes the organization of its components.



traditions and their growth and excellence in technical fields, and then the implementation of findings in contemporary architecture, has always been praised by architectural experts. As a step towards achieving the continuity of Iranian architecture, the purpose of this study is to identify the physical and semantic features of the historical houses of Tabriz. By doing so, in addition to paying attention to the features of local architecture, their application in the design of the facades of new buildings are facilitated, and designers can use the mentioned cases as general ideas in designing the facades of new buildings, and the assimilation of them with the urban-historical context. For this purpose, first, the facade of some sample historic houses has been modeled by analyzing the physical features of the period of their construction, and the execution methods and constituent elements of each have been identified. Finally, after considering the current requirements in the field of construction, those components related to the facades of historic

houses that can be efficient and effective in the facades of new buildings are introduced. Generally, the aggregation of components related to physical and aesthetic issues taken from the facades of historic houses in Tabriz can be mentioned in the image below, as a usable model in the design and execution of facades of new buildings. Fig. 9 is a schematic design, reminiscent of a facade that incorporates the identified facade components.

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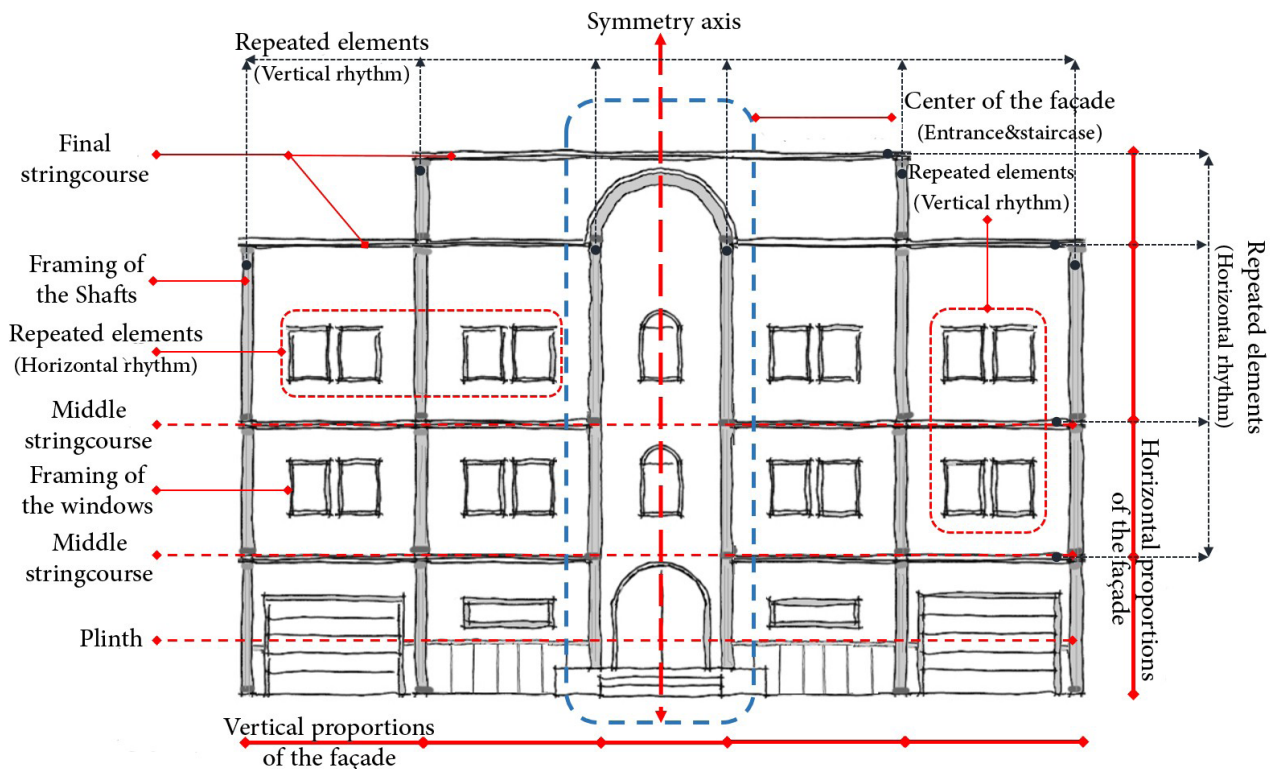


Fig. 9. Physical and aesthetic elements that can be applied in new facades. Source: Authors.



Declaration of non-conflict of interest: The authors state that there was no conflict of interest for them in conducting this research.

## Endnote

1. Among the criteria in which the concepts of identity are mentioned, 'The Guideline for Organizing the Facades of Buildings in the City of Tehran' (Tehran: Deputy of Architecture and Urban Planning of Tehran Municipality (2014)), and 'The Guideline for Designing and Implementing the Facades of Buildings in the Historical-Cultural Axis of Tabriz' (Tabriz: Deputy of Architecture and Urban Planning of Tabriz Metropolitan Municipality (2014)) can be mentioned.
2. The more or less emotional aspects of construction are more in the realm of aesthetics, which are neither measurable nor precisely definable. This word is originally Greek and is equivalent to perception (see Grutter, 2011).
3. Moein Persian dictionary, below "proportionality".
4. Amid Persian Dictionary, below "Symmetry".
5. Akbar Tajvidi, in an article entitled "Continuity in Iranian Architecture", believes that Iranian architecture, like many other cultural manifestations of Iran, has enjoyed unparalleled continuity throughout its life history.

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