Analyses of Sustainability Lessons from Iranian Traditional Architecture in Museum of Contemporary Art of Tehran

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Abstract: Iranian traditional architecture which is based on five principles: 1. considering the human proportions, 2. Contentment (Avoid frivolity), 3. self-reliance (using local and accessible materials), 4. Nyaresh (structure), 5. Introversion (to protect privacy and authenticity) is based on the ability to adapt in all public, residential, cultural and art buildings. Tehran Museum of contemporary arts which utilizes outstanding elements such as Badgir (wind catcher), Chaharsou (intersection between two main spaces), Hashi (vestibule), Ma’bar (passageway) and their combination in designing this building and the surrounding area, is a successful sample of contemporary sustainable structure in Iran that may show the sustainable lessons of interior and exterior parts of the building in a proper method.

Key words: Sustainability, Art Museum, Architecture, Order, Construction

1 Introduction

Contemporary art museum is one of the museums of Tehran (35.6833° N, 51.4167° E), Iran (fig. 1). This museum was built in 1977 by Farah Pahlavi on the west side of Laleh Park (fig.2). The museum contains the most comprehensive collection of Western art from the continent of Asia.

Figure 1: Tehran map, Iran

The unique and modern architecture of this museum is inspired by the principle of Iranian architecture which has a philosophical concept. These principles are considering the human proportions, Contentment (Avoid frivolity), self-reliance (using local and accessible materials), Nyaresh (structure) and introversion (to protect privacy and authenticity).

Figure 2: Circulation paths in Laleh Park, Tehran, Iran

The designing style of the museum is regarding to the sustainable lessons from traditional Iranian architecture and it’s cleverly combination with needs of contemporary architecture [1].
2 Problem Statement

Two views are considered during the contemporary art museum design that both were well chosen and reviewed: 1) designing the museum in the middle of the park comes from the Persian garden (Koushk) design ideas: means that Laleh Park is a relatively large area and the other is, access paths to the museum is located along one of the axes of motion. Designer of the museum used the idea of central courtyard to be a sign of Iranian architecture and in addition, make a separate area from the park. Also, the central locating idea of museum goes back to Koushk (Iranian Palaces). Koushk, was called to the royal family, head of government officials and aristocrat’s residence [2].

2) Unity between the inside and outside of the park with the city's approach to the idea of being rich in geographical range of Iranian architecture in particular represents an example of Paradise with soaring trees. These gardens have magnificent and pleasing buildings with the architectural elements such as wind catcher and vestibule.

There is a large area in the heart of the park which is known as “statue garden “with its outstanding artist’s statues. It is exactly reminds the Persian gardens which comes out from the heart of dignified history and noble thoughts of Iran. In addition, four elements of sustainable traditional Iranian architecture are used in the museum design [3].

2.1 Elements of Sustainable Architecture in Iran

Traditional sustainable architectural elements used in the design of the museum are: wind catcher (Badgir), Chaharsou, vestibule (Hashti), passageway (Ma’ bar).

2.1.1- Wind catcher (Badgir): is one of the architecture symbols of Iranian civilization so that Yazd city, which is located in the central part of Iran, is famous with the name “Capital city of wind catchers/ Badgir “. Badgir, was innovated by the Iranian architects to cope with the harsh conditions of the desert areas as a natural ventilation system for a thermal comfort that is had been used by the desert regions residents. It is a device that flow the air inside the building and catches the outside air and leads it to the indoor space [4].
Dowlatabad Garden’s wind catcher in Yazd, Iran, (Figure 8 and 9) is one of the most famous and longest eight-sided wind catchers of the world with 33 meters height from the ground. It was well able to provide the natural ventilation of the palace (Koushk).

2.1.2 Chaharsou: is the intersection of two major orders of the public buildings and traditional markets. In some instances, in the intersection space of two orders Chaharsou has been made and in order to its communicative situation, it was considered worthwhile [5].

2.1.3 Vestibule: the space right after entering the doorway. The space which is separated from the closed area of house and provide the connection with the outside. Vestibule is a polygon or circular environment between the courtyard entrance and the street and there were platforms on both sides to sit. The main function of the vestibule is dividing the indoor space into two or more parts for maintaining the privacy of the home.

Furthermore, sustainability of contemporary arts museum according to Iranian architecture elements has been studied.
2.2 Contemporary Art Museum of Tehran, Iran

2.2.1 Components
This museum in one of the most active cultural and artistic centres in Tehran that manifests appealingly in the urban area that is well impressed by traditional Iranian architecture patterns.

2.2.1.1 Materials
The building is constructed from stone and concrete in the area of 8500 square meters. Overall surface of the walls is over 2500 square meters.

2.2.1.2 Construction system
Tehran museum of contemporary art is a postmodern building using ancient Iranian architectural elements that poses minimalistic. Traditional rustic arches and skylights are designed from desert ventilators. Internal spiral design of the building follows modern patterns.

2.2.1.3 Illumination
Wind catchers (Badgir) clearly glare in the building, which they previously had the role in air flow and air conditioning.

2.2.1.4 Galleries and the site
The museum includes 9 fully-equipped large and small galleries to display artworks. At the center of the vestibule the fine artwork of Japanese artist “Noriuki Haraguchi” is placed that is made of oil and steel. In another corridor the memorable artwork of Henry Moore is placed and spatial artworks of artists like Parviz Tanavoli, Henry Moore and Alberto Jakumeti are located on the surrounding green yard that is called “Bagh-e-Tandis” (statue garden). Tehran museum of contemporary art also contains several lateral parts that cinematic, achieve, professional library, bookstore, artwork treasure and café besides 8 main galleries can be mentioned.

3 Explaining the Sustainable Iranian Traditional Architecture in Tehran Museum of Contemporary Art, Iran

Vestibule becomes important in museum circulation. The audiences are lead to the basement in a spiral & zigzag movement (steep of the ramp) slowly so the audiences are dismissed from the crowded outside of the museum and are directed to the particular position with strong sense.

Figure 13: Perspective section of contemporary art museum of Tehran, Iran

Figure 14: the map of areas and functions of contemporary art museum, Tehran, Iran

Another way to the museum is beside one of the paths of the Laleh Park. The reason of choosing the idea of central courtyard in design of the museum is to present symptoms and arrays of Iranian architecture and provide the separated spatial view of the park at the same time[6].
Table 1: Comparative table of sustainable elements of Persian architecture and how to use them in the Tehran Museum of Contemporary Art, Iran

<table>
<thead>
<tr>
<th>Elements of Persian Architecture</th>
<th>Function in Traditional Architecture</th>
<th>Picture</th>
<th>Function in Museum Architecture</th>
<th>Picture</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wind Catcher</td>
<td>Natural Air Ventilation</td>
<td></td>
<td>Skylight</td>
<td></td>
<td>IT HAS BEEN EXIST IN HOT AND DRY REGIONS</td>
</tr>
<tr>
<td>Vestibule</td>
<td>Entry into the Home of the Museum</td>
<td></td>
<td>Central Hall of the Museum</td>
<td></td>
<td>THE LOBBY AND MAIN NAVIGATION</td>
</tr>
<tr>
<td>Passageway</td>
<td>Direction of Movement in Public Spaces</td>
<td></td>
<td>Spiral Movement of Person in the Museum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chaharso</td>
<td>Intersection of Two Major Orders</td>
<td></td>
<td>Enter and Exit of the Galleries</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4 Conclusion

Tehran museum of contemporary art, Iran, is one of the successful projects that succeeded to present some of the patterns and the elements of Iranian traditional architecture with updating sustainable elements of Iranian traditional architecture in the building of the museum in the best way as follows:

A) Reassignment of the Wind catchers function while maintaining its originality of natural ventilation to Skylight with controlled diffuse lighting (indirect) to the required museum and gallery spaces

B) Converting vestibule from only being as a space distribution to lobby and access to the other parts of the museum

C) Passageway with the old function of passing in the traditional Iranian architecture but in a wider context with the museum conditions

D) Chaharso, with benchmarking the intersection role from traditional Iranian architecture in museum and plays the role of communication way in different parts of it

Finally, the museum can be a successful model for the design of spaces and art collections of all time.

References: