The Role of the Principles of Architectural Design in the Abbasid Palaces

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Abstract: A The aim of this paper is to analyzed the characteristics of the Abbasid palaces (Qasr Al-Jawsaq Al-Khakani palace, Balaklora Palace and Al-Jaafari Palace) and applied the principles of architectural design on the plan of Abbasid palaces and made their comparative analysis. The research identified the principles of architectural design with six points, including proportionality, symmetry, balance, axes, repetition and gradation, beginning with a simplified definition of each palace and then each design principle and applying the principle to the plan of Abbasid palaces.

Keywords: Abbasid Palaces, Proportion, Architectural design, principles of design.

1. Introduction

This research aims to explain the Abbasid Palaces in the city of Samarra, The name of the city of Samarra means "the secret of the saw". When German archaeologist Ernest Hertzfeld[ ] saw the city of Samarra with its grandeur, he remembered Berlin . On the palace of the caliph in Samarra, Hertzfeld wrote in 1914 that "the area on which the palace is built is roughly the same as the central area of Berlin, which is bordered by Leipzig Strasse, in the south, Brandenburg Gate in the west and the River Sabriya to the north and east. The palace represents the heart of Samarra - the magnificent city taken by Abbasid caliphs.Islamic architecture adopted abstract relations from any formality that conflicted with the spirituality of the Islamic religion, where abstraction and symbolism were two characteristics of the Islamic art, so this research took the principles of design in one of these palaces as example

2. Analysis of Abbasid palaces:

2-1 Al-Josq Khakani Palace was built in the city of Samarra in the first Abbasid era by the Caliph Mu'tasim, where the archaeological evidence indicated that Mu'tasim had built three important palaces in the beginning, including this palace, which ordered Khattan Artuj Abi al-Fath bin Khakan construction.

2-2 Belklora Palace : One of the most prominent palaces of Al-Mutawakel Palace of Belklora which was built in the far south of the city of Samarra in the area of Qadisiyah, pursuant to his plan to expand the city to its destinations, and the ruins today is six kilometers from the current city of Samarra. built by the Caliph Mu'taz in 801 A.H. This Palace built adjacent to the wall from the north in a rectangular link to the entrance to the palace corridor covered with a vault leading to the vestibule to the right and north of a long corridor to the south of the vestibule is located large lobby and right and left corridors behind the rooms, The middle part of the palace is called the courtyard of honor where the throne hall occupies the southern part and on the axis of the entrance completely surrounded by a number of rooms and reception halls.

2-3 Al-Ja'afari Palace The palace occupies a patch of rectangular land consisting of three parallel rectangles. The palace follows in its planning a so-called tripartite division along the lines of the Emirate House in Kufa, Al-Mashta palace, Al-Akhaydir Palace and Belkwara Palace. Al-Jaafari palace plan according to the following:

2.3.1 Proportion in the Jaafari Palace is the relationship between the different parts of the composition, ie, the relationship between the element as a part and its overall content, and proportionality based on the ratio, which means the relationship between two things of the same type, ie the comparison of sizes, spaces, Means the standard relationship designed for any planned proportion of the amounts and intervals of the same type as time, space or step or color and so on .... It is one aspect of the aesthetic phenomenon, which works to send alerts and stimuli and internal emotional in the recipient raises in his heart admiration and acceptance. "Agreement of predestination numbers b "The ratios that connect the measurements of certain parts of the building should be easy to understand to show that these parts of the building are connected to each other by these proportions. Hence, these percentages should be expressed in small numbers such as (1/1), (1 / 2), (2/3) and so on.

The aesthetic proportion of the engineers takes a meaning based on the suitability of the elements and subjecting them to the optimal proportions, the proportions involved in the taste of the artist and his sense of it, either unconsciously or consciously. This is the ratio that would have strongly supported his work and attributed it to a high class of creative. The proportions of the forms and their situations and movements are at the core of the Islamic composition on that mathematical basis, and the aesthetic pleasure which stimulates the rhythms inherent in the ratios and not the same classifications. There are many factors that lead to change the real proportions of the architectural work, for example the existence of a number of straight lines contained within the work This indicates that the building is vertical or that the building is horizontal and according to the direction of the lines specified in the ratios. The analytical attempts of the old buildings showed that there is a fixed proportion used in the dimensional relations Of the origin, that is, the dimensions, if different, the ratios remain constant. In ancient Greek and Egyptian architecture it was found, The ratio is equal to 1: 1.618, which is the golden ratio which is the most used and aesthetic. In the field of architecture and plastic arts, it is explained in the golden mean (1.618: 1) for the division of lines and is one of the appropriate design bases for the production of the aesthetic unit between the various divisions. Geometric ... This ratio can be expressed with an approximate accuracy with a fraction of my computation so that the spread of this fraction is one of the Fibonacci sequence numbers and the number of the following is followed by this sequence: 1-2-3-5-8-13-21-34-55-89- 144-233- .... etc. The proportional systems are the unification of the multi-element in architectural design by making all its parts come back The same family of proportionality, thus achieving sense of the system order also increases the continuity of spaces with the stabilization of relations between the internal and external elements of the building, all systems of proportionality, but aims to create and create sense of order

Ratio $1 \sqrt[2]{} 2$

Islamic architecture adopted abstract relations from any formality that conflicted with the spirituality of the Islamic religion, where abstraction and symbolism were two characteristics of the Islamic art, and considered the square Muslim architecture as the basic form of harmony and proportionality because it achieves balanced balanced relations, stable and simplified among its parts, inspired by the essence of the Islamic religion It adopts simplicity, balance and stability. Fig.5 (5- 1a) (5-1b)
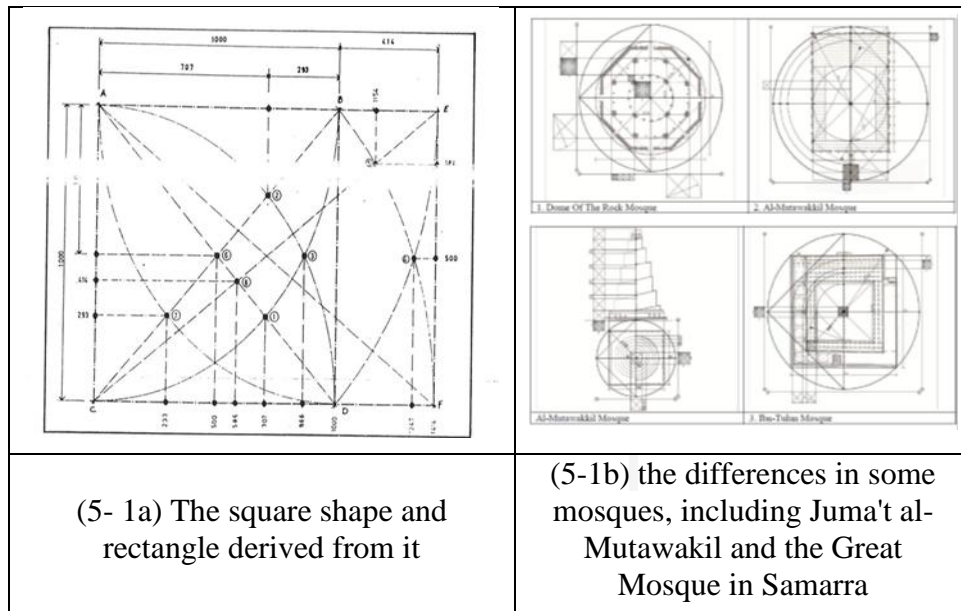
(5- 1a) The square shape and rectangle derived from it	(5-1b) the differences in some mosques, including Juma't al-Mutawakil and the Great Mosque in Samarra

Fig. 5.1 Proportion principle.

On the basis that the square is the ideal form balanced, the ratio was adopted between the length of the rib and the length of the tendon is 1: 22 A 1: 1.414 base for the consistency of the consistency between the dimensions. The sequential numerical sequence, an engineering sequence, is as follows

1.44, 1.0.7 07.0, 500.0 .354.0 .50.0 .176.0 .125 The proportionate and consistent relationships can be determined by collecting a section of these objects according to the chosen aesthetic form. Figure 5.3 shows how to determine Some of the numerical values of the geometry are estimated using the points of the intersection of strings and arcs
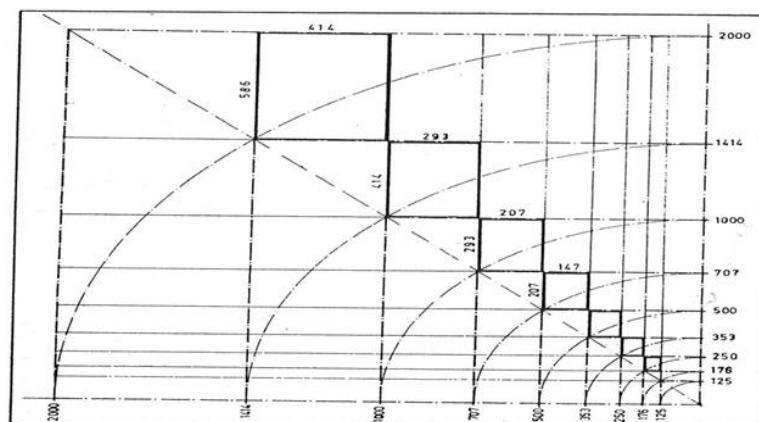

Fig. 5.3 the Rule (1: 22) and proportionality ratio.

In his research (aesthetic proportionality of Islamic architecture), Al-Bajath studied the applications of the Islamic architecture for aesthetic suitability by using geometric tools by applying them to the horizontal projections and the vertical sections of Islamic architectural works dating from a period of time (from the seventh century to the fifteenth century) Arabic section 11, including the city of Samarra, where the proportion of the mosque in the form (5-4) and the current research records a new effect in the palace Jaafari where applied the golden ratio also

Fig.5-4 the page of aesthetic proportionality in the Grand Mosque of Samarra paragraph 11 LED. Arafa

The percentage (1: 22) was applied by the researchers at Al-Jaafari Palace and reached a map (2-5) which shows that the palace was built on a clear and repeated ratio on all rooms of the palace. This work is calculated as the first research to examine the aesthetic and architectural proportion in the Jafari Palace
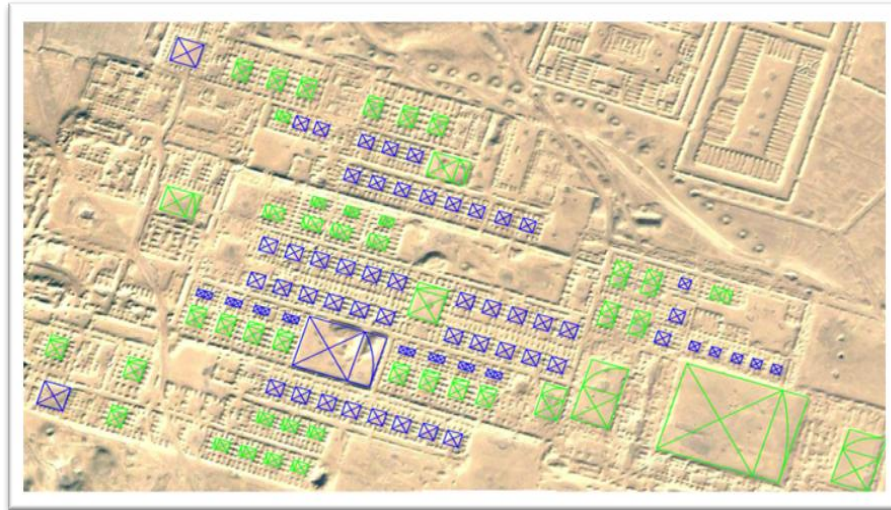
Map.2,5 proportion in the Jafari Palace

2 - symmetry in the palace Jaafari: symmetry (Symmetry) property can be described by many things like engineering objects and sports equations and others, is that the elements drawn one block divided by the vertical axis of the drawing area to two symmetrical and symmetry two types:

2.1 Total symmetry is reflective symmetry and a shape is called a reflective symmetry if it applies to itself exactly when it is bent around a line in the middle called the line of hypocrisy. Figure (5-5)
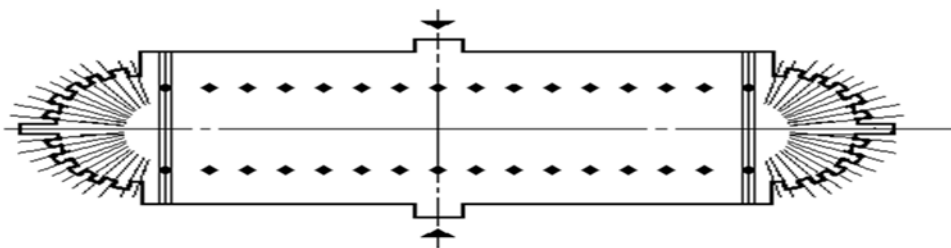

Figure (5-5) Total symmetry

2-2 The partial view is the semi-symmetry and is called a semi-symmetrical form if the first half completes the second half when he is bent around the line of Mar in the middle, and the search reached map (5-3), which shows that the palace was built on the principle of partial symmetry in its plan by axes The medium that was found in each part of it. Plan No. (5-3)

Map No. (5-3) symmetry in the Jaafari Palace

3. (Axis) in the palace Jaafari:

1. The palace was built Jaafari on the principle of the chest and the ambiguity of the axis of the length of each plan shows the main road in the movement channel map (5-4)
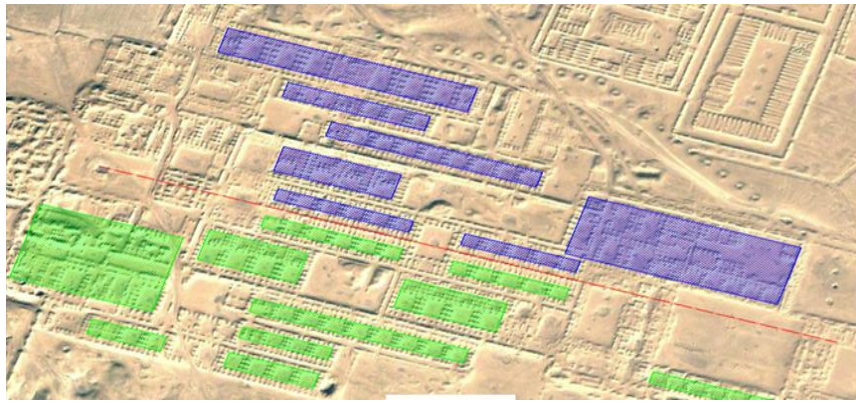

Map 5.4 Axis in the palace Jaafari

4 - Balance principle in the palace Jaafari: Balance is the equation of opposing forces, and there are two types of balance:

4-1 Formal Balance is the balance on both ends of the axis of one or more elements in a limb with identical or very similar elements at the other end. The nominal balance is symmetrical or alternatively repeated to the two sides of the axis

4.2 The formal balance in equilibrium is the balance on both ends of the axis of one or more elements in a limb with elements that are not identical or different at the other end. This balance is not symmetrical. map(5-5)

Map (5-5) Formal balance in the palace Jaafari

3-2 - Repeation in the palace Jaafari: Repetition is a general phenomenon and fundamental nature of nature, such as the frequency of tides and the succession of night and day, and occurs in the repetition in the field of space (space) may be repetition is complete subject or meaning or not complete any map minus (5- 6.)

Map (5-6) Repeat ion principle in the palace Jaafari

5-6 Graduation in Al-Jaafari Palace: Staging is a series of successive parts of a similar or compatible transition or continuity of flow in size, direction, colors and axes. Map (5-7)

Map (5-7) gradation in Al-Jaafari Palace

6. Conclusions

This research found many of Architectural principles on abasiad palaces that tack part in the design are given below.

1-The proportion principle which used in palaces is fully applied at the level of horizontal and vertical schemes even in the size of internal and external openings

2-A symmetry This principle is found in the galleries and open spaces of the palace

3-The Formal balance This principle of full balance is applied in the horizontal plan within a well-known base is the Al-Heri style

4-principle of axsis,is found horizontally &vertically in the main plan of every palace

5-Repetition, This principle we see it through repeated square areas that are open and open in the corners of one palace

6-gradation This principle is found in the square areas that increase in size to the right and left.

7. Recommendations:

The study recommends many points to Al-Jafari's palace in these points :

1.Spread the Environment culture and raise the level of local sense among generations and the level of the factors affecting the new buildings by expanding the scope of academic research on this subject

2.Adoption of the proportions used in the parts of Al-Jafari's in the development of contemporary home designs

3.focus on the relationship of building materials used in the Al-Jafari's and the site to the environment give it the legal force to stay all years

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