



Analyzing the Relationship Between Architectural Forms and Structural Forms in Traditional Architecture with a Research Approach in the Religious Buildings of Mashhad¹




Majid Azizi², Mohsen Vafamehr³, Mohammad hadi Mahdi nia⁴

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Abstract

From a distant position concerning the building, it is the form and volume of the building that visually governs our perception of the building, not its details, and it is the external form and mass of the building that invites revelation and examination of the relationship between architectural form and structure. Before exploring the relationships between structural form and the designer's architectural choices, it's essential to clarify some key terms. Architectural form is often used by designers, but it is rarely defined. It breaks the tradition of using the word "freely." Although this concept is clearly defined, the definition remains vague and imprecise. It is suggested that architectural form should be understood as a comprehensive term referring to the external form or overall design of the building's appearance, and to a lesser degree, the internal organization and the connection of design principles and rules through architectural form. It is also notable that the word "shape" includes several visual and communication features; this means that size, color, texture, position, orientation, and visual inertia are all under the concept of building shape. The architectural form is taken from the external form and shape of the building and is limited to it. Such deliberate simplification and clarification exclude the concept of form and considerations regarding internal and external structural organization

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2. Instructor, Faculty of Art & Architecture, Department of Architecture, Mashhad Branch, Islamic Azad University, Mashhad, Iran (Corresponding Author).
Email: engmazizi636@gmail.com  0009-0001-1556-4402
3. Professor, Faculty of Art & Architecture, Department of Architecture, Mashhad Branch, Islamic Azad University, Mashhad, Iran. Email: Dr.Vafamehr@iau.ac.ir  0000-0003-2951-1763
4. Assistant Professor, Faculty of Art & Architecture, Department of Architecture, Mashhad Branch, Islamic Azad University, Mashhad, Iran.
Email: h_mahdinia@mshdiau.ac.ir  0000-0001-5584-8904



from architectural form. This idea is an acknowledgment of the fact that the three-dimensional volume of the building may not have anything to do with its structure. By separating architectural form from what is commonly used, an opportunity is provided to examine the structure with specific aspects of architecture that in the past included more general definitions of architectural form. These aspects include topics such as texture, order, and spatial organization.

Such a limited definition of architectural form, without considering structural considerations, reflects observations about both aspects of architectural design attitudes and built and executed architecture. In the design process, during the practice of architectural design, it is common to distinguish between architectural form and structure.

The structural form also needs explanation. In architecture, the traditional use of the structure means the structural essence of the building. For example, a beam-column structural form may be described as a skeleton. Beams and columns may be used as supports for the flat floor structure and stabilized by a shear wall. The viewer perceives the building's structural framework as a robust system. Perhaps this framework (beams and columns) is a more expressive element than a shear wall. Conceivably, the visibility of the structural frame elements (beams and columns) is increased due to the absence of internal separating blades. Of course, when the shear walls are also moved back so that they are in the background of the frame and not in its plane

The architecture and the structure in the traditional building are in combination with each other, and the traditional architect has created an eternal work based on the teachings of the traditional architects and using traditional and natural materials. With the change in the type of materials and based on mathematical calculations and the development of technology, architecture and structure have become separated and now they are separated as two separate disciplines, which in this research is based on the examination of religious works in the city of Mashhad as a religious metropolis. In the Islamic world, which has been stable throughout history in different styles of architecture, the factors of integration and combination in Islamic architecture were studied based on the method of applied research with library studies and face-to-face encounters with the works that include 41 religious buildings in Mashhad city. The types of materials, the nature of the work, and the arrangements used were analyzed by SP software for their impact on the structure and architecture. Data analysis was carried out. By analyzing each work from the perspective of recognizing structural and architectural form patterns, the interaction factors between structures in traditional buildings were identified. It was found that most of the buildings in the Safavid and then Timurid periods have a pattern of combining architecture and structure using the sub-pattern of the walls and arcs.

Keywords: Islamic architecture, Structure, Religious building, Mashhad city