

Ribs in domes and Iranian's historical structures: Integration of architecture and structure

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Abstract The combination of structure and architecture brings about a composition of technology, art and aesthetic values. It needs knowledge of structural and constructional systems and acquaintance with materials and their behavior. The fact that architecture comes into being only in combination with structure makes the consideration of foundation, columns, ceiling, etc. inevitable.

In different eras, architects paid attention to the rules of load transference, position of supporting elements and their connection with other structural elements, diminishing of forces in the walls led to elimination of unnecessary mass and reducing weight, But still lots of effort was spent on increasing the resistance of the buildings. One solution for supporting structures was the usage of supporting ribs.

Rib is a supportive structure that resists horizontal forces and its utilization leads to stability and equilibrium of the building during and after construction. It causes concentration of materials in right places, increases useful area, increases resistance against bending and horizontal forces and augments the efficiency of the structure.

Iran as a pioneer in architectural innovations played an important role in introducing the usage of many varieties of ribs in traditional buildings. This paper focuses on ribs in different types of domes and other parts of the building. Its goal is to analyze different types of supporting ribs to clarify their typologies and functions. Thus referring to different types of historical buildings, various types of ribs usage in domes and buildings are examined and discussed.

This work provides an overall view about traditional Iranian's architecture and the solutions used to stabilize the domes. In addition to contributing to our historical knowledge of Iranian's architecture, it will clarify different types of dome's ribs according to their shape, material and functions. The result can be used in contemporary buildings and preservation and rehabilitation projects of historical sites.

Keywords Domes, Ribs, Iranian's traditional architecture