

The structural requirements of single curve suspended structures and their effects on Architectural form and function¹

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Abstract

The rapid development of construction techniques in the world has created new challenges for architects to develop an understanding of structural concepts of these new construction techniques and their effects on architectural form, space and function. Suspended structures are currently widely used in contemporary architecture. It is not unusual to find this type of structure integrated either as a main component or as a secondary one. They are frequently used for supporting glass walls, providing shelter for building entrances or as roofs for large span spaces.

The aim of this research is to develop an understanding of the structural requirements of single curve structures. The research focuses in particular on the requirements for absorbing horizontal components of forces and their impact on architectural concepts that make good use of appropriate structural, functional and aesthetic solutions.

The research methodology is based on the following stages:

- 1- A background study tracing the historical developments of suspended structures since their appearance
- 2- An analysis of different types and elements of suspended structures and their classification
- 3- Case Study analysis of three buildings with a single curve suspended roof in order to evaluate the structural requirements and how they have been dealt with architecturally. The case study buildings are: 26th Hall in Hanover, Germany; Liverpool University Sport Hall, Liverpool, UK and Sport Hall in Qunaitra- Qunaitra, Syria.
- 4- An analysis of the effect of structural requirements on architectural form through the evaluation of 17 types of structural solutions for absorbing the horizontal components of forces

¹ For the paper in Arabic see pages (251-268).

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