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Largely Neglected Areas of Application of Skeletal Space Structures

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Abstract: Skeletal space structures have been used widely in the form of double and triple layer grids, braced barrel vaults, braced domes and so on as roof structures to cover areas for which rather large spans are required in both perpendicular directions. Initially, attention had been focused on lesser material consumption, ease and speed of fabrication/erection and economical mass production to satisfy the basic needs in the reconstruction process after the Second World War. Later, with the advent of new materials/techniques together with changing demands, many architects and engineers concentrated on creating innovative space structural forms for attractive monumental buildings where in contrast to the customary usage of modular space structures, each structure was supposed to be unique in shape and character. This paper examines the potentialities of skeletal space structures in largely disregarded vast areas of suitable application where little or no attempts have been exercised by the engineering community to appreciate their advantages. In this context, the feasibility of future use of skeletal space structures have been studied for a few classes of engineering structures, namely: offshore platforms, residential apartment buildings and short to medium span bridges as well as the reconstruction and retrofit of damaged buildings and urban areas of cultural heritage. Also, some particulars of modern project management of space structures have been addressed with emphasis on engineering and economic factors, production management, environmental aspects, quality management and the reliability, maintainability and sustainability of such structures.