

Diagrid Structural System

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Abstract : The interrelationship between the technology and architecture of tall buildings is investigated from the emergence of tall buildings in late 19th century to the present. In the late 19th century early designs of tall buildings recognized the effectiveness of diagonal bracing members in resisting lateral forces. Most of the structural systems deployed for early tall buildings were steel frames with diagonal bracings of various configurations such as X, K, and eccentric. Though the historical research a filtering concept is developed original and remedial technology- through which one can clearly understand inter-relationship between the technical evolution and architectural esthetic and further stylistic transition buildings. Diagonalized grid structures - "diagrids" - have emerged as one of the most innovative and adaptable approaches to structuring buildings in this millennium. Variations of the diagrid system have evolved to the point of making its use non-exclusive to the tall building. Diagrid construction is also to be found in a range of innovative mid-rise steel projects. Contemporary design practice of tall buildings is reviewed and design guidelines are provided for new design trends. Investigated in depths are the behavioral characteristics and design methodology for diagrids structures, which emerge as a new direction in the design of tall buildings with their powerful structural rationale and symbolic architectural expression. Moreover, new technologies for tall building structures and facades are developed for performance enhancement through design integration, and their architectural potentials are explored. By considering the above data the analysis and design of 40-100 storey diagrids steel buildings is carried out using E-TABS software with diagrids of various angle to be found for entire building which will be helpful to reduce the steel requirement for the structure. The present project will have to undertake wind analysis, seismic analysis for lateral loads acting on the structure due to wind loads, earthquake loads, gravity loads. All structural members are designed as per IS 800-2007 considering all load combination. Comparison of results in terms of time period, top storey displacement and inter-storey drift to be carried out. The secondary effect like temperature variations are not considered in the design assuming small variation.

Keywords : diagrid, bracings, structural, building

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