Optimization of the Structural Design for an Irregular Building in High Seismicity Zone

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Abstract : The present study focuses on the optimization of different structural systems employed in tall steel buildings, with a specific focus on the city of Acapulco, Guerrero, a region known for its high seismic activity. Using the spectral modal method, analyses were conducted to assess the ability of these buildings to withstand seismic forces and other external loads. After performing a detailed analysis of various models, the results were compared based on various engineering parameters, including maximum interstory drift, base shear, displacements, and the total weight of the structures, the latter being considered as an estimate of the cost of the proposed systems. The findings of this study indicate that steel frames stand out as a viable option for tall buildings in question. However, areas of potential improvement were identified, suggesting opportunities for further optimization of the design and seismic resistance of these structures. This study provides a deep and insightful perspective on the optimization of structural systems in tall steel buildings, offering valuable information for engineers and professionals in the field involved in similar projects.

Keywords : high seismic zone, irregular buildings, optimization design, steel buildings
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