Estimation of the Seismic Response Modification Coefficient in the Superframe Structural System

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Abstract : In recent years, an earthquake has occurred approximately every five years in certain regions of Iran. To mitigate the impact of these seismic events, it is crucial to identify and thoroughly assess the vulnerability of buildings and infrastructure, ensuring their safety through principled reinforcement. By adopting new methods of risk assessment, we can effectively reduce the potential risks associated with future earthquakes. In our research, we have observed that the coefficient of behavior in the fourth chapter is 1.65 for the initial structure and 1.72 for the Superframe structure. This indicates that the Superframe structure can enhance the strength of the main structural members by approximately 10% through the utilization of super beams. Furthermore, based on the comparative analysis between the two structures conducted in this study, we have successfully designed a stronger structure with minimal changes in the coefficient of behavior. Additionally, this design has allowed for greater energy dissipation during seismic events, further enhancing the structure's resilience to earthquakes. By comprehensively examining and reinforcing the vulnerability of buildings and infrastructure, along with implementing advanced risk assessment techniques, we can significantly reduce casualties and damages caused by earthquakes in Iran. The findings of this study offer valuable insights for civil engineering professionals in the field of structural engineering, aiding them in designing safer and more resilient structures.