Impacts of Supplemental Viscous Damping on Seismic Responses of Building Structures for Construction Extended Renovation Projects under Multilevel Decomposition Design Model Frame

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Abstract

The installation of supplemental viscous damping devices can effectively reduce the seismic responses of the engineering structure, so as to reduce the construction quantity of the renovation project. This paper addresses the impacts of supplemental viscous damping devices on the seismic responses of the construction extended renovation projects under the multilevel decomposition design model frame. Firstly, the multilevel decomposition design model of the seismic design of engineering structures is introduced. Secondly, the typical driving factors of the construction extended renovation projects are discussed. The impacts of supplemental damping on the seismic response of the structure are then investigated from the perspective of response spectrum. This paper takes a 250m ultra-tall structure as engineering case to analyse the multilevel decomposition design model, the driving factors of the construction extended renovation projects and the impacts of supplemental damping on the seismic responses of the structure. The results show that the supplemental viscous damping can effectively reduce the construction quantity of renovation projects.

Keywords: multi-level decomposition design; viscous damping; construction extended renovation project; seismic vibration mitigation design.

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