Seismic Design and Analysis of a 20-Storey Demonstration Wood Building

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Summary:

This paper presents the seismic design and analysis of a 20-storey demonstration wood building, which was conducted as a part of the NEWBuildS tall wood building design project. A hybrid lateral load resisting system was chosen for the building. The system consisted of shear walls and a shear core, both made of structural composite lumber, connected with dowel-type connections and heavy-duty HSK (wood-steel-composite) system. The core and the shear walls were linked with horizontal steel beams at each floor. The wood-based panel-to-panel interface was designed to be the main energy dissipating mechanism of the system. A detailed finite element model of this building was developed and non-linear time history analyses were performed using 10 earthquake motions. The results showed that the seismic response of the 20-storey demonstration building met the various design criteria and the design details are appropriate.

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