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Increase the Ductility of Tall Buildings Using Green Material Bamboo for Earthquake Zone

Authors : Shef Amir Arasy

Abstract : In 2023, the world's population will be 7.8 billion, which has increased significantly in the last 20 years. Every country in the world is experiencing the impacts of climate change directly and indirectly. However, the community still needs to build massive infrastructure and buildings. The massive CO2 emissions which lead to climate change come from cement usage in construction activity. Bamboo is one of the most sustainable materials for reducing carbon emissions and releasing more than 30% oxygen compared to the mass of trees. Besides, bamboo harvest time is faster than other sustainable materials, around 3-4 years. Furthermore, Bamboo has a high tensile strength, which can provide ductility effectively to prevent damage to buildings during an earthquake. By the finite element method, this research analyzes bamboo configuration and connection for tall building structures under different earthquake frequencies and fire. The aim of this research is to provide proper design and connection of bamboo buildings that can be more reliable than concrete structures.

Keywords : bamboo, concrete, ductility, earthquake.
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