

Seismic performance and cost analysis for reinforced concrete school building under different type of soil

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ABSTRACT

Concern towards the significant hazards and damages occurred to the people and buildings due to an earthquake event such as Ranau earthquake that happened in June 2015 has led to the development of sustainable structures that against seismic loading in Malaysia. The present research investigates the effect of soil types on the seismic performance and the total cost of the reinforced concrete school building. The seismic performance of a building influences by the soil types, where foundation soils are the main elements in performing a correct seismic design for structures. Therefore, 14 models of reinforced concrete school building comprising of two-storey and four-storey, which under different soil types were used. The models had been designed based on Eurocode 2 and Eurocode 8 by using Tekla Structural Designer software. The results were discussed in terms of seismic base shear force and cost of material used. Models that designed under Ground Type D and Ground Type E are experienced the greatest seismic base shear force. It is also observed that the soil type strongly influences the total cost where the increment of the cost of material is between 33.80% and 110.60% for four-storey building and 22.06%–55.46% for two-storey building as compared to the building without seismic resistance.

KEYWORDS

Chool; Seismic; Performance; Earthquake

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