

Impact of seismic design on cost of structural materials for two storey hostel building in Sabah

ABSTRACT

Previously, damaging earthquakes were fortunately rare in Malaysia. However, after Sumatera-Andaman earthquake on 26 December 2004 affected Peninsular Malaysia causing deaths, injuries and loss of property. Furthermore, some of the local earthquake that had occurred in Malaysia are probably due to the reactivations of ancient inactive fault due to increasing seismic activities in and around Malaysia. On 5th June 2015, Malaysia experienced a devastating earthquake with magnitude Mw 6.0 in Ranau results in 18 fatalities and affected 61 buildings. Mostly, the fatalities and injuries persistent during an earthquake is caused by structural failures which not include the seismic action into design. Reinforced concrete hostel building in school area will act as a temporary shelter for refuge during the disaster and until it dwindles. Although Malaysia is located on a stable plate and far from the Pacific Ring of Fire, it is essential to consider seismic practice, especially when dealing with cost. Therefore, this paper presents the influence of seismic consideration on cost of material and the factors which influencing the cost by implementing the soil factor, S as proposed by National Annex to Eurocode 8. A typical two storey reinforced concrete hostel building has been generated as basic model. A total of four soil type namely soil type B, C, D and E and five seismicity level has been taken into account where the value of reference peak ground acceleration, $agR = 0.04g, 0.06g, 0.07g, 0.12g \text{ \& } 0.16g$. Overall, this research work had been conducted based on 3 phases. Based on result, the cost of structural works for the whole building increases around 1% to 12% depend on soil type and level of seismicity.