

CONFERENCE ABSTRACTS

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Probabilistic seismic hazard analysis of Kuala Pilah region

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Abstract: The study focuses on the development of probabilistic seismic hazard analysis of Kuala Pilah, Negeri Sembilan. This area is chosen as there was a series of earthquakes reported occurred in the Kuala Pilah region, in between 2007 to 2009, with the maximum magnitude of 3.5 mb. Although there is no report of fatality and destruction caused by the earthquakes, it is crucial to identify the potential seismic hazard that may cause in the future from a bigger local earthquake as well as the impact of regional strong earthquake from Sumatra. Besides probabilistic

PERTEMUAN PERSATUAN (MEETINGS OF THE SOCIETY)

seismic hazard analysis (PSHA) method, this study also incorporates Horizontal to Vertical Spectral Ratio (HVSr) analysis in order to examine the soil site effects by determining the properties of the soil such as resonant frequency, amplification factor and seismic vulnerability index. The peak ground acceleration (PGA) of the Kuala Pilah region was computed for 2% and 10% probability of exceedance by using seismic sources such as Sumatran subduction zone, Sumatran strike-slip fault zone as well as local faults. In the HVSr analysis, the dominant frequency of the region is in between 2 to 11 Hz with the amplification factor of 2 to 14. With the higher resonant frequency showing an increasing trend towards the eastern side of Kuala Pilah, there is a high possibility of soft sediments amplification for high magnitude localized earthquake. Nevertheless, the PSHA analysis indicates the peak ground motion intensity of 2% and 10% probability of exceedance are 0.09 g and 0.055 g respectively. From both results, it is concluded that high seismic hazard probability will occur if any high magnitude ruptures originated from local Bukit Tinggi-Kuala Pilah fault zone with less influence was determined from Sumatran earthquake activity.

Keywords: Probabilistic seismic hazard, peak ground acceleration, horizontal-to-vertical spectral ratio, Kuala Pilah