EARTHQUAKES AND RESIDENTIAL CONSTRUCTION IN JAPAN

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ABSTRACT

While much effort has been spent on analysis of individual structures, building class seismic damage estimators for earthen buildings in seismic zones, of value in disaster planning, code-writing, city planning, national hazards policy formulations etc., have been little investigated. First, details of the typical construction in Japan incorporating earthen elements are presented, with emphasis on those providing lateral resistance. Next, based largely on data from Sendai City, Japan in the 12 June 1978 Miyagiken -oki earthquake (M_L-7.4), estimators of seismic damage for low-rise buildings in urban Japan have been determined, based on damage to over 60,000 buildings. Damage ratios for onset of damage and collapse and for cost of damage are found to correlate best with response spectra at 0.75 s. Using published test data and average building properties, a seismic damage model explains the low-rise building behaviour and permits examination of the effect of structural changes on the estimated damage.

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