

Site-Specific Probabilistic Seismic Hazard Assessment Analyses in Zeytinburnu, Istanbul

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The first step in estimation of seismic losses in urban areas is the assessment of regional seismic hazard. The source and local site parameters determine the accuracy of the hazard model. Using locally derived input parameters in site response modeling and hazard analyses, the earthquake potential of Zeytinburnu region in Istanbul is investigated in detail. In this study, two alternative source models including area and fault (line) sources are considered in the hazard computations. Analyses are initially performed using both generic rock and soil conditions considering return periods of 475, 975 and 2475 years. Then, site-specific seismic hazard analyses are made using available local soil conditions. Probabilistic seismic hazard analyses with line sources and local soil models yield significantly different results than area sources and a generic soil model for all return periods. This observation points out the fact that detailed local source and site parameters should be employed in hazard analyses. In summary, numerical results obtained with locally derived input parameters indicate that Istanbul has significant potential for hazard in terms of both local earthquake occurrence and site amplifications.