



## **Integrated Use of Geophysical And Geotechnical Data In Urban Environments for Microzonation Studies : Sisli (Istanbul) Example**

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**Main purpose of this study is to provide the combined use of geophysical and geotechnical data in context of microzonation. Earthquake occurrences on the North Anatolian Fault being usually characteristic and well documented in history, a time dependent model can be reasonably used for the probabilistic assessment of the seismic hazard in Istanbul. For the study area, the probabilistic seismic hazard analysis were determined by using Poisson and Gumbel probabilistic approaches. The hazard gives the probability that a given level of acceleration will be exceeded (% 20) in a given time period (30 years). By using deterministic seismic hazard analysis, the magnitudes were estimated by the four rupture (with four different fault length, 108 km, 119 km and 37 km and 174 km) model of North Anatolian Fault Zone in Marmara Region. By using both analysis ( deterministic and probabilistic), magnitude of design earthquake were taken as 7.6. From these design earthquake, accelerations were estimated for several distances ( from 15 km to 50 km) by several attenuation relations. In the second phase of the study, soil amplification factors and site characteristic periods were determined and estimated by seismic measurements and SPT test data for the area of Şişli where is important part of Istanbul city. From Shear and Compressional wave velocities, several soil properties were determined and presented in table form. Geotechnical test data from boreholes and laboratory measurements were evaluated with geophysical data. Soil amplification values estimated by empirical relationships by shear wave velocities are in range between 1,0 and 2,1 values. Shear wave velocity ( $V_s$ , 30) values are 381,5 and 915 (m/s) values. Site**

**Characteristic period range are between 0,2 and 0,5 s.**