



Microzonation Studies based on Soil Liquefaction: Yalova and Izmit (Turkey) Cities

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Over the last 35 years, tremendous effort has been expended to understand the mechanics of liquefaction. Understanding liquefaction behavior begins with understanding that liquefaction, in all its forms, is the frictional behavior of cohesionless soils under elevated porewater pressure during rapid loading. Soil liquefaction is a natural event in which the strength and stiffness of a soil is reduced by earthquake vibrations or other dynamic loading. As it is known, liquefaction occurs in saturated soils, that is, soils in which the space between individual particles is completely filled with water. Before the dynamic loading, the water pressure is relatively low. However, earthquake vibrations can cause the water pressure to increase to the point where the soil particles can readily move with respect to each other. Microzonation is the identification of separate individual areas having different potentials for hazardous earthquake effects. In the last decades seismic microzonation became one of the fundamental aspects in engineering seismology. The traditional method for evaluating soil liquefaction assesses the liquefaction potential based on the safety factor it produces. One of these methods based on Cyclic Stress Approach. In this method, safety factor is defined as CRR / CSR . CRR is Cyclic resistance ratio that represents soil liquefaction susceptibility, and CSR is cyclic stress ratio that represents earthquake effect. In this study, for several design magnitudes and accelerations, the soil liquefaction maps, based on field data (N60 and Vs data), were produced for microzonation aims in Yalova and Izmit (Turkey) Cities.