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LIQUEFACTION PROBABILITY IN BUCHAREST AND INFLUENCING FACTORS

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Abstract

Bucharest, the capital of Romania with about 2.5 million inhabitants, is frequently struck by intense, damaging earthquakes (the last one in 1977). In 1995 a Collaborative Research Center 461 (CRC-461) entitled: "Strong Earthquakes - a Challenge of Geosciences and Civil Engineering" was initiated in July 1996 and ended in December 2007. It was funded by the German Research Foundation and supported by the Land of Baden-Württemberg, as well as the University of Karlsruhe (TH). The CRC aimed strategic research in the field of strong earthquakes with regional focus on the Vrancea seismic events in Romania. Between 1995-2007, several studies and field works were executed in Romania, together with Romanian research institutes and the University of Bucharest. One of the research questions was, if during strong earthquakes liquefaction can occur within shallow sandy layers in Bucharest. As known, strong earthquakes can cause, under certain geologic conditions, liquefaction followed sometimes by ground failure of different intensity. In the present paper we aim to analyse the liquefaction risk for Bucharest. For this purpose, at 10 representative sites in Bucharest, Seismic Cone Penetration Tests (SCPT) were executed. Due to very high costs of such tests, the number of test sites had to be reduced to a minimum. Due to the reduced number of executed tests, only spotty information about liquefaction probability could be obtained ("factor of safety" (F_S) against liquefaction and the "probability of liquefaction" (P_L)) .But even these few results are first important information in this domain for Bucharest.

Key words: liquefaction probability, factor of safety, strong earthquakes, hydrogeologic conditions

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