



MULTIDISCIPLINARY CO-OPERATION IN BUILDING DESIGN ACCORDING TO URBANISTIC ZONIFICATION AND SEISMIC MICROZONATION

M. Bostenaru Dan

University of Karlsruhe (bostenaru@tmb.uni-karlsruhe.de)

Bucharest, the capital of Romania, saw 1920-1940, in two decades of intense building efforts, the construction of the buildings which give its face of today. The Master Plan of Bucharest from 1934 embodied theoretical and practical ideas on urbanism in one of the most progressive general plans of the time in Europe. Urban legislation reacted herewith to the anticipated impact of the significant economic development in inter-war time in Romania on urban infrastructures. On the 10th of November 1940 the first strong Vrancea-earthquake ($M=7.2$) of the XXth century affected Bucharest, posing a first test to the newly constructed mid and high-rise reinforced concrete buildings in the city centre. On the 4th of March 1977 another strong earthquake ($M=6.7$) occurred in Vrancea along a fault in intermediate depth beneath the Carpathian Mountains. The effects were felt over a million square kilometres, but destruction was greatest in Bucharest, located 170km from the epicentre. This destruction amount was attributed mainly to the so-called "Mexico-city" effect, as Bucharest lays along the rivers of Dâmbovită and Colentina, on alluvial soil deposits. The reinforced concrete schelet buildings founded on soft sandy soil with high level of ground water along the main avenues in the city centre, suffered again most. In the year following the earthquake a number of damaged buildings were repaired and strengthened, while those collapsed were replaced by new ones. However, recent research of fellow scientists shows that the potential performance of some of these buildings would be bellow satisfactory in case of an earthquake of similar strength, due to high structural vulnerability of these architectonic landmarks on most unfavourable sites according to seismic microzonation. This paper documents the role of successful co-operation between those involved in the design of these buildings for seismic performance with the aim of giving incentives for further multidisciplinary co-operation during retrofit measures to be taken.