

Preliminary Seismic Vulnerability Assessment of Existing Historic Masonry Building in Pristina, Kosovo

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Abstract : The territory of Kosova is actually included in one of the most seismic-prone regions in Europe. Therefore, the earthquakes are not so rare in Kosova; and when they occurred, the consequences have been rather destructive. The importance of assessing the seismic resistance of existing masonry structures has drawn strong and growing interest in the recent years. Engineering included those of Vulnerability, Loss of Buildings and Risk assessment, are also of a particular interest. This is due to the fact that this rapidly developing field is related to great impact of earthquakes on the socioeconomic life in seismic-prone areas, as Kosova and Prishtina are, too. Such work paper for Prishtina city may serve as a real basis for possible interventions in historic buildings as are museums, mosques, old residential buildings, in order to adequately strengthen and/or repair them, by reducing the seismic risk within acceptable limits. The procedures of the vulnerability assessment of building structures have concentrated on structural system, capacity, and the shape of layout and response parameters. These parameters will provide expected performance of the very important existing building structures on the vulnerability and the overall behavior during the earthquake excitations. The structural systems of existing historical buildings in Pristina, Kosovo, are dominantly unreinforced brick or stone masonry with very high risk potential from the expected earthquakes in the region. Therefore, statistical analysis based on the observed damage-deformation, cracks, deflections and critical building elements, would provide more reliable and accurate results for the regional assessments. The analytical technique was used to develop a preliminary evaluation methodology for assessing seismic vulnerability of the respective structures. One of the main objectives is also to identify the buildings that are highly vulnerable to damage caused from inadequate seismic performance-response. Hence, the damage scores obtained from the derived vulnerability functions will be used to categorize the evaluated buildings as “stable”, “intermediate”, and “unstable”. The vulnerability functions are generated based on the basic damage inducing parameters, namely number of stories (S), lateral stiffness (LS), capacity curve of total building structure (CCBS), interstory drift (IS) and overhang ratio (OR).

Keywords : vulnerability, ductility, seismic microzone, ductility, energy efficiency

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