

## Seismic Vulnerability Assessment of Masonry Buildings in Seismic Prone Regions: The Case of Annaba City, Algeria

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**Abstract :** Seismic vulnerability assessment of masonry buildings is a fundamental issue even for moderate to low seismic hazard regions. This fact is even more important when dealing with old structures such as those located in Annaba city (Algeria), which the majority of dates back to the French colonial era from 1830. This category of buildings is in high risk due to their highly degradation state, heterogeneous materials and intrusive modifications to structural and non-structural elements. Furthermore, they are usually shelter a dense population, which is exposed to such risk. In order to undertake a suitable seismic risk mitigation strategies and reinforcement process for such structures, it is essential to estimate their seismic resistance capacity at a large scale. In this sense, two seismic vulnerability index methods and damage estimation have been adapted and applied to a pilot-scale building area located in the moderate seismic hazard region of Annaba city: The first one based on the EMS-98 building typologies, and the second one derived from the Italian GNDT approach. To perform this task, the authors took the advantage of an existing data survey previously performed for other purposes. The results obtained from the application of the two methods were integrated and compared using a geographic information system tool (GIS), with the ultimate goal of supporting the city council of Annaba for the implementation of risk mitigation and emergency planning strategies.

**Keywords :** Annaba city, EMS98 concept, GNDT method, old city center, seismic vulnerability index, unreinforced masonry buildings

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