



Numerical Modelling and Seismic Assessment of the Vasari's House Museum in Arezzo

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Abstract

The paper discusses the static behaviour and the seismic vulnerability of Vasari's House Museum in Arezzo (Italy), a three-storey masonry construction composed of disordered stone and brick masonry walls. Floors were realized with different typologies: masonry vaults at the lower levels, wooden, steel and reinforced concrete floors at the upper ones. The seismic vulnerability of the Museum was evaluated according to the provision of the Italian "Guidelines for the assessment and mitigation of the seismic risk of the cultural heritage" (DPCM2011) that identify a methodology of analysis based on three different levels of evaluation (LV1, analysis at territorial level; LV2, local analysis and LV3, global analysis), according to an increasing level of knowledge. A detailed and careful knowledge process, which included an experimental in-situ investigation, allowed to characterize the geometric and mechanical parameters required to perform a reliable structural assessment. The seismic assessment of Vasari's House, in particular, was performed analysing both local mechanisms and global behaviour assuming different structural configurations (based on the degree of connection between the structural elements as observed during the knowledge process). This paper, through the discussion of an emblematic case study, highlights the importance of the level of knowledge for the vulnerability assessment of an historic building.

Keywords: seismic vulnerability, local and global analysis, museum, masonry building, historic structure, masonry, pushover.

1 Introduction

The research project "ARCUS" among the MIBACT - Ministry for the Heritage, Cultural Activities and Tourism (Ministero dei Beni e delle Attività Culturali e del Turismo) and the Universities of the Italian territory, has been conceived for the seismic safety analysis of the Italian Museums, in accordance with the requirements